Commit 39258d3

tiran authored on Apr 17, 2021 Verified

bpo-43669: PEP 644: Require OpenSSL 1.1.1 or newer (GH-23014)

- Remove HAVE_X509_VERIFY_PARAM_SET1_HOST check
- Update hashopenssl to require OpenSSL 1.1.1
- multissltests only OpenSSL > 1.1.0
- ALPN is always supported
- SNI is always supported
- Remove deprecated NPN code. Python wrappers are no-op.
- ECDH is always supported
- Remove OPENSSL_VERSION_1_1 macro
- Remove locking callbacks
- Drop PY_OPENSSL_1_1_API macro
- Drop HAVE_SSL_CTX_CLEAR_OPTIONS macro
- SSL_CTRL_GET_MAX_PROTO_VERSION is always defined now
- security level is always available now
- get_num_tickets is available with TLS 1.3
- X509_V_ERR MISMATCH is always available now
- Always set SSL_MODE_RELEASE_BUFFERS
- X509_V_FLAG_TRUSTED_FIRST is always available
- get_ciphers is always supported
- SSL_CTX_set_keylog_callback is always available
- Update Modules/Setup with static link example
- Mention PEP in whatsnew
- Drop 1.0.2 and 1.1.0 from GHA tests

main (#23014) · v3.15.0a8 ••• v3.10.0b1

1 parent b467d9a commit 39258d3

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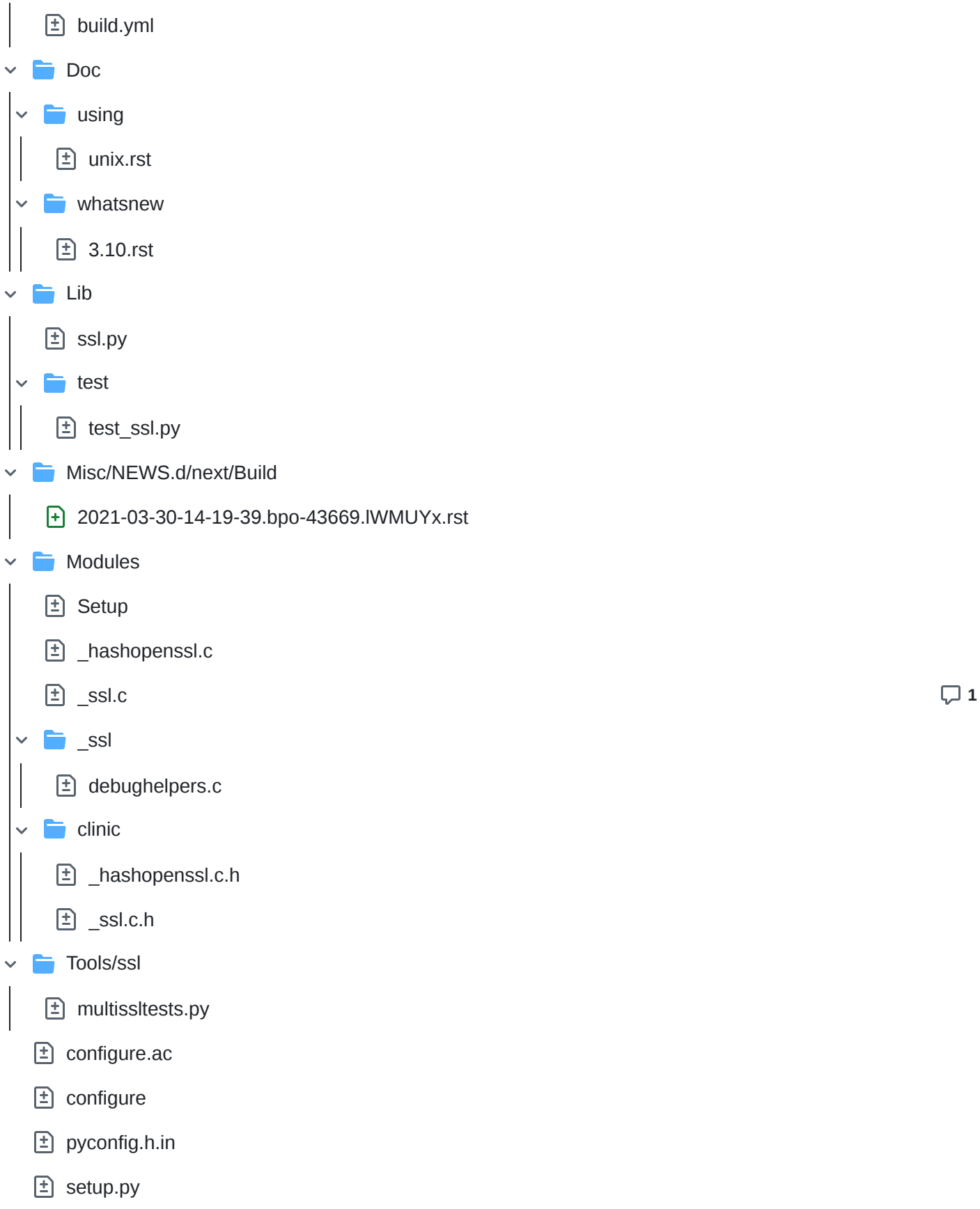
.github/workflows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.github/workflows/build.yml

```
@@ -177,7 +177,7 @@ jobs:
177 177        strategy:
178 178          fail-fast: false
179 179          matrix:
180     -          openssl_ver: [1.0.2u, 1.1.0l, 1.1.1k, 3.0.0-alpha14]
    180 +          openssl_ver: [1.1.1k, 3.0.0-alpha14]
181 181        env:
182 182          OPENSSL_VER: ${{ matrix.openssl_ver }}
183 183          MULTISSL_DIR: ${{ github.workspace }}/multissl
```

Doc/using/unix.rst

```
@@ -135,6 +135,7 @@ some Unices may not have the :program:`env` command, so
you may need to hardcode
135 135
136 136    To use shell commands in your Python scripts, look at the :mod:`subprocess`
         module.
137 137
    138 + .. _unix_custom_openssl:
138 139
139 140    Custom OpenSSL
140 141    ==============
```

Doc/whatsnew/3.10.rst

```
@@ -65,6 +65,7 @@ Summary -- Release highlights
65 65
66 66     .. PEP-sized items next.
67 67
    68 + * :pep:`644`, require OpenSSL 1.1.1 or newer
68 69
69 70
70 71     New Features
@@ -1438,6 +1439,10 @@ CPython bytecode changes
1438 1439    Build Changes
1439 1440    =============
```

```
1440  1441
      1442  + * :pep:`644`: Python now requires OpenSSL 1.1.1 or newer. OpenSSL 1.0.2 is no
      1443  +   longer supported.
      1444  +   (Contributed by Christian Heimes in :issue:`43669`.)
      1445  +
1441  1446      * The C99 functions :c:func:`snprintf` and :c:func:`vsnprintf` are now
                required
1442  1447        to build Python.
1443  1448        (Contributed by Victor Stinner in :issue:`36020`.)
                  @@ -1483,7 +1488,6 @@ Build Changes
1483  1488        (Contributed by Christian Heimes in :issue:`43466`.)
1484  1489
1485  1490
1486        -
1487  1491    C API Changes
1488  1492    =============
1489  1493
```

Lib/ssl.py

```
                  @@ -909,15 +909,12 @@ def selected_npn_protocol(self):
909   909             """Return the currently selected NPN protocol as a string, or
                      ``None``
910   910             if a next protocol was not negotiated or if NPN is not supported by
                      one
911   911             of the peers."""
912         -         if _ssl.HAS_NPN:
913         -             return self._sslobj.selected_npn_protocol()
914   912
915   913         def selected_alpn_protocol(self):
916   914             """Return the currently selected ALPN protocol as a string, or
                      ``None``
917   915             if a next protocol was not negotiated or if ALPN is not supported by
                      one
918   916             of the peers."""
919         -         if _ssl.HAS_ALPN:
920         -             return self._sslobj.selected_alpn_protocol()
      917   +         return self._sslobj.selected_alpn_protocol()
921   918
```

```
922  919          def cipher(self):
923  920              """Return the currently selected cipher as a 3-tuple ``(name,
     ↕ ↕          @@ -1126,10 +1123,7 @@ def getpeercert(self, binary_form=False):
1126 1123         @_sslcopydoc
1127 1124         def selected_npn_protocol(self):
1128 1125             self._checkClosed()
1129      -          if self._sslobj is None or not _ssl.HAS_NPN:
1130      -              return None
1131      -          else:
1132      -              return self._sslobj.selected_npn_protocol()
     1126 +          return None
1133 1127
1134 1128         @_sslcopydoc
1135 1129         def selected_alpn_protocol(self):
     ↕
```

Lib/test/test_ssl.py

```
     ↕          @@ -40,7 +40,6 @@
40   40      PROTOCOLS = sorted(ssl._PROTOCOL_NAMES)
41   41      HOST = socket_helper.HOST
42   42      IS_LIBRESSL = ssl.OPENSSL_VERSION.startswith('LibreSSL')
43       -  IS_OPENSSL_1_1_0 = not IS_LIBRESSL and ssl.OPENSSL_VERSION_INFO >= (1, 1, 0)
44   43      IS_OPENSSL_1_1_1 = not IS_LIBRESSL and ssl.OPENSSL_VERSION_INFO >= (1, 1, 1)
45   44      IS_OPENSSL_3_0_0 = not IS_LIBRESSL and ssl.OPENSSL_VERSION_INFO >= (3, 0, 0)
46   45      PY_SSL_DEFAULT_CIPHERS = sysconfig.get_config_var('PY_SSL_DEFAULT_CIPHERS')
     ↕ ↕          @@ -270,18 +269,6 @@ def handle_error(prefix):
270  269          if support.verbose:
271  270              sys.stdout.write(prefix + exc_format)
272  271
273      -  def can_clear_options():
274      -      # 0.9.8m or higher
275      -      return ssl._OPENSSL_API_VERSION >= (0, 9, 8, 13, 15)
276      -
277      -  def no_sslv2_implies_sslv3_hello():
278      -      # 0.9.7h or higher
279      -      return ssl.OPENSSL_VERSION_INFO >= (0, 9, 7, 8, 15)
280      -
281      -  def have_verify_flags():
```

```
282      -      # 0.9.8 or higher
283      -      return ssl.OPENSSL_VERSION_INFO >= (0, 9, 8, 0, 15)
284      -
285  272        def _have_secp_curves():
286  273            if not ssl.HAS_ECDH:
287  274                return False
                    @@ -372,17 +359,15 @@ def test_constants(self):
372  359                ssl.OP_SINGLE_DH_USE
373  360                if ssl.HAS_ECDH:
374  361                    ssl.OP_SINGLE_ECDH_USE
375      -          if ssl.OPENSSL_VERSION_INFO >= (1, 0):
376      -              ssl.OP_NO_COMPRESSION
         362    +          ssl.OP_NO_COMPRESSION
377  363                self.assertIn(ssl.HAS_SNI, {True, False})
378  364                self.assertIn(ssl.HAS_ECDH, {True, False})
379  365                ssl.OP_NO_SSLv2
380  366                ssl.OP_NO_SSLv3
381  367                ssl.OP_NO_TLSv1
382  368                ssl.OP_NO_TLSv1_3
383      -          if ssl.OPENSSL_VERSION_INFO >= (1, 0, 1):
384      -              ssl.OP_NO_TLSv1_1
385      -              ssl.OP_NO_TLSv1_2
         369    +          ssl.OP_NO_TLSv1_1
         370    +          ssl.OP_NO_TLSv1_2
386  371                self.assertEqual(ssl.PROTOCOL_TLS, ssl.PROTOCOL_SSLv23)
387  372
388  373        def test_private_init(self):
                    @@ -1161,7 +1146,6 @@ def test_python_ciphers(self):
1161 1146                self.assertNotIn("RC4", name)
1162 1147                self.assertNotIn("3DES", name)
1163 1148
1164     -      @unittest.skipIf(ssl.OPENSSL_VERSION_INFO < (1, 0, 2, 0, 0), 'OpenSSL too
               old')
1165 1149        def test_get_ciphers(self):
1166 1150            ctx = ssl.SSLContext(ssl.PROTOCOL_TLS_CLIENT)
1167 1151            ctx.set_ciphers('AESGCM')
                    @@ -1181,15 +1165,11 @@ def test_options(self):
1181 1165                self.assertEqual(default, ctx.options)
```

```
1182  1166            ctx.options |= ssl.OP_NO_TLSv1
1183  1167            self.assertEqual(default | ssl.OP_NO_TLSv1, ctx.options)
1184        -         if can_clear_options():
1185        -             ctx.options = (ctx.options & ~ssl.OP_NO_TLSv1)
1186        -             self.assertEqual(default, ctx.options)
1187        -             ctx.options = 0
1188        -             # Ubuntu has OP_NO_SSLv3 forced on by default
1189        -             self.assertEqual(0, ctx.options & ~ssl.OP_NO_SSLv3)
1190        -         else:
1191        -             with self.assertRaises(ValueError):
1192        -                 ctx.options = 0
      1168  +         ctx.options = (ctx.options & ~ssl.OP_NO_TLSv1)
      1169  +         self.assertEqual(default, ctx.options)
      1170  +         ctx.options = 0
      1171  +         # Ubuntu has OP_NO_SSLv3 forced on by default
      1172  +         self.assertEqual(0, ctx.options & ~ssl.OP_NO_SSLv3)
1193  1173
1194  1174        def test_verify_mode_protocol(self):
1195  1175            ctx = ssl.SSLContext(ssl.PROTOCOL_TLS)
```

```
@@ -1327,8 +1307,6 @@ def test_security_level(self):
1327  1307            }
1328  1308            self.assertIn(ctx.security_level, security_level_range)
1329  1309
1330        -     @unittest.skipUnless(have_verify_flags(),
1331        -                          "verify_flags need OpenSSL > 0.9.8")
1332  1310        def test_verify_flags(self):
1333  1311            ctx = ssl.SSLContext(ssl.PROTOCOL_TLS_SERVER)
1334  1312            # default value
```

```
@@ -1797,7 +1775,6 @@ class MySSLObject(ssl.SSLObject):
1797  1775            obj = ctx.wrap_bio(ssl.MemoryBIO(), ssl.MemoryBIO())
1798  1776            self.assertIsInstance(obj, MySSLObject)
1799  1777
1800        -     @unittest.skipUnless(IS_OPENSSL_1_1_1, "Test requires OpenSSL 1.1.1")
1801  1778        def test_num_tickest(self):
1802  1779            ctx = ssl.SSLContext(ssl.PROTOCOL_TLS_SERVER)
1803  1780            self.assertEqual(ctx.num_tickets, 2)
```

```
@@ -2956,8 +2933,6 @@ def test_getpeercert(self):
```

```
2956  2933                    after = ssl.cert_time_to_seconds(cert['notAfter'])
2957  2934                    self.assertLess(before, after)
2958  2935
2959        -     @unittest.skipUnless(have_verify_flags(),
2960        -                          "verify_flags need OpenSSL > 0.9.8")
2961  2936        def test_crl_check(self):
2962  2937            if support.verbose:
2963  2938                sys.stdout.write("\n")
      ↓ ↑   @@ -3859,12 +3834,7 @@ def test_version_basic(self):
3859  3834                    self.assertIs(s.version(), None)
3860  3835                    self.assertIs(s._sslobj, None)
3861  3836                    s.connect((HOST, server.port))
3862        -                 if IS_OPENSSL_1_1_1 and has_tls_version('TLSv1_3'):
3863        -                     self.assertEqual(s.version(), 'TLSv1.3')
3864        -                 elif ssl.OPENSSL_VERSION_INFO >= (1, 0, 2):
3865        -                     self.assertEqual(s.version(), 'TLSv1.2')
3866        -                 else:  # 0.9.8 to 1.0.1
3867        -                     self.assertIn(s.version(), ('TLSv1', 'TLSv1.2'))
      3837  +                 self.assertEqual(s.version(), 'TLSv1.3')
3868  3838                self.assertIs(s._sslobj, None)
3869  3839                self.assertIs(s.version(), None)
3870  3840
      ↓ ↑   @@ -3966,8 +3936,6 @@ def test_default_ecdh_curve(self):
3966  3936            # explicitly using the 'ECCdraft' cipher alias.  Otherwise,
3967  3937            # our default cipher list should prefer ECDH-based ciphers
3968  3938            # automatically.
3969        -         if ssl.OPENSSL_VERSION_INFO < (1, 0, 0):
3970        -             context.set_ciphers("ECCdraft:ECDH")
3971  3939            with ThreadedEchoServer(context=context) as server:
3972  3940                with context.wrap_socket(socket.socket()) as s:
3973  3941                    s.connect((HOST, server.port))
      ↓ ↑   @@ -4099,15 +4067,11 @@ def test_ecdh_curve(self):
4099  4067            server_context.set_ciphers("ECDHE:!eNULL:!aNULL")
4100  4068            server_context.options |= ssl.OP_NO_TLSv1 | ssl.OP_NO_TLSv1_1
4101  4069            try:
4102        -               stats = server_params_test(client_context, server_context,
4103        -                                          chatty=True, connectionchatty=True,
```

```
4104      -                                   sni_name=hostname)
     4070 +            server_params_test(client_context, server_context,
     4071 +                               chatty=True, connectionchatty=True,
     4072 +                               sni_name=hostname)
4105 4073          except ssl.SSLError:
4106      -            pass
4107      -        else:
4108      -            # OpenSSL 1.0.2 does not fail although it should.
4109      -            if IS_OPENSSL_1_1_0:
4110      -                self.fail("mismatch curve did not fail")
     4074 +            self.fail("mismatch curve did not fail")
4111 4075
4112 4076      def test_selected_alpn_protocol(self):
4113 4077          # selected_alpn_protocol() is None unless ALPN is used.
          @@ -4117,7 +4081,6 @@ def test_selected_alpn_protocol(self):
4117 4081                                  sni_name=hostname)
4118 4082          self.assertIs(stats['client_alpn_protocol'], None)
4119 4083
4120      -    @unittest.skipUnless(ssl.HAS_ALPN, "ALPN support required")
4121 4084      def test_selected_alpn_protocol_if_server_uses_alpn(self):
4122 4085          # selected_alpn_protocol() is None unless ALPN is used by the client.
4123 4086          client_context, server_context, hostname = testing_context()
          @@ -4127,7 +4090,6 @@ def
          test_selected_alpn_protocol_if_server_uses_alpn(self):
4127 4090                                  sni_name=hostname)
4128 4091          self.assertIs(stats['client_alpn_protocol'], None)
4129 4092
4130      -    @unittest.skipUnless(ssl.HAS_ALPN, "ALPN support needed for this test")
4131 4093      def test_alpn_protocols(self):
4132 4094          server_protocols = ['foo', 'bar', 'milkshake']
4133 4095          protocol_tests = [
          @@ -4150,22 +4112,17 @@ def test_alpn_protocols(self):
4150 4112              except ssl.SSLError as e:
4151 4113                  stats = e
4152 4114
4153      -        if (expected is None and IS_OPENSSL_1_1_0
4154      -                and ssl.OPENSSL_VERSION_INFO < (1, 1, 0, 6)):
4155      -            # OpenSSL 1.1.0 to 1.1.0e raises handshake error
4156      -            self.assertIsInstance(stats, ssl.SSLError)
4157      -        else:
```

```
4158        -                msg = "failed trying %s (s) and %s (c).\n" \
4159        -                    "was expecting %s, but got %%s from the %%s" \
4160        -                        % (str(server_protocols), str(client_protocols),
4161        -                           str(expected))
4162        -                client_result = stats['client_alpn_protocol']
4163        -                self.assertEqual(client_result, expected,
4164        -                                 msg % (client_result, "client"))
4165        -                server_result = stats['server_alpn_protocols'][-1] \
4166        -                    if len(stats['server_alpn_protocols']) else 'nothing'
4167        -                self.assertEqual(server_result, expected,
4168        -                                 msg % (server_result, "server"))
            4115 +            msg = "failed trying %s (s) and %s (c).\n" \
            4116 +                "was expecting %s, but got %%s from the %%s" \
            4117 +                    % (str(server_protocols), str(client_protocols),
            4118 +                       str(expected))
            4119 +            client_result = stats['client_alpn_protocol']
            4120 +            self.assertEqual(client_result, expected,
            4121 +                             msg % (client_result, "client"))
            4122 +            server_result = stats['server_alpn_protocols'][-1] \
            4123 +                if len(stats['server_alpn_protocols']) else 'nothing'
            4124 +            self.assertEqual(server_result, expected,
            4125 +                             msg % (server_result, "server"))
4169        4126
4170        4127        def test_selected_npn_protocol(self):
4171        4128            # selected_npn_protocol() is None unless NPN is used
                    @@ -4175,31 +4132,8 @@ def test_selected_npn_protocol(self):
4175        4132                                        sni_name=hostname)
4176        4133            self.assertIs(stats['client_npn_protocol'], None)
4177        4134
4178        -    @unittest.skipUnless(ssl.HAS_NPN, "NPN support needed for this test")
4179        4135        def test_npn_protocols(self):
4180        -        server_protocols = ['http/1.1', 'spdy/2']
4181        -        protocol_tests = [
4182        -            (['http/1.1', 'spdy/2'], 'http/1.1'),
4183        -            (['spdy/2', 'http/1.1'], 'http/1.1'),
4184        -            (['spdy/2', 'test'], 'spdy/2'),
4185        -            (['abc', 'def'], 'abc')
4186        -        ]
4187        -        for client_protocols, expected in protocol_tests:
4188        -            client_context, server_context, hostname = testing_context()
```

```
4189      -             server_context.set_npn_protocols(server_protocols)
4190      -             client_context.set_npn_protocols(client_protocols)
4191      -             stats = server_params_test(client_context, server_context,
4192      -                                        chatty=True, connectionchatty=True,
4193      -                                        sni_name=hostname)
4194      -             msg = "failed trying %s (s) and %s (c).\n" \
4195      -                   "was expecting %s, but got %%s from the %%s" \
4196      -                       % (str(server_protocols), str(client_protocols),
4197      -                          str(expected))
4198      -             client_result = stats['client_npn_protocol']
4199      -             self.assertEqual(client_result, expected, msg % (client_result,
          "client"))
4200      -             server_result = stats['server_npn_protocols'][-1] \
4201      -                 if len(stats['server_npn_protocols']) else 'nothing'
4202      -             self.assertEqual(server_result, expected, msg % (server_result,
          "server"))
          4136 +         assert not ssl.HAS_NPN
4203 4137
4204 4138         def sni_contexts(self):
4205 4139             server_context = ssl.SSLContext(ssl.PROTOCOL_TLS_SERVER)
          @@ -4369,8 +4303,7 @@ def test_session(self):
4369 4303             self.assertGreater(session.time, 0)
4370 4304             self.assertGreater(session.timeout, 0)
4371 4305             self.assertTrue(session.has_ticket)
4372      -         if ssl.OPENSSL_VERSION_INFO > (1, 0, 1):
4373      -             self.assertGreater(session.ticket_lifetime_hint, 0)
          4306 +         self.assertGreater(session.ticket_lifetime_hint, 0)
4374 4307             self.assertFalse(stats['session_reused'])
4375 4308             sess_stat = server_context.session_stats()
4376 4309             self.assertEqual(sess_stat['accept'], 1)
```

...ld/2021-03-30-14-19-39.bpo-43669.lWMUYx.rst

```
          @@ -0,0 +1 @@
     1  + Implement :pep:`644`. Python now requires OpenSSL 1.1.1 or newer.
```

Modules/Setup

```
          @@ -207,11 +207,23 @@ _symtable symtablemodule.c
```

```
207  207    #_socket socketmodule.c
208  208
209  209    # Socket module helper for SSL support; you must comment out the other
210       - # socket line above, and possibly edit the SSL variable:
211       - #SSL=/usr/local/ssl
212       - #_ssl _ssl.c \
213       - #   -DUSE_SSL -I$(SSL)/include -I$(SSL)/include/openssl \
214       - #   -L$(SSL)/lib -lssl -lcrypto
     210  + # socket line above, and edit the OPENSSL variable:
     211  + # OPENSSL=/path/to/openssl/directory
     212  + # _ssl _ssl.c \
     213  + #     -I$(OPENSSL)/include -L$(OPENSSL)/lib \
     214  + #     -lssl -lcrypto
     215  + #_hashlib _hashopenssl.c \
     216  + #     -I$(OPENSSL)/include -L$(OPENSSL)/lib \
     217  + #     -lcrypto
     218  +
     219  + # To statically link OpenSSL:
     220  + # _ssl _ssl.c \
     221  + #     -I$(OPENSSL)/include -L$(OPENSSL)/lib \
     222  + #     -l:libssl.a -Wl,--exclude-libs,libssl.a \
     223  + #     -l:libcrypto.a -Wl,--exclude-libs,libcrypto.a
     224  + #_hashlib _hashopenssl.c \
     225  + #     -I$(OPENSSL)/include -L$(OPENSSL)/lib \
     226  + #     -l:libcrypto.a -Wl,--exclude-libs,libcrypto.a
215  227
216  228    # The crypt module is now disabled by default because it breaks builds
217  229    # on many systems (where -lcrypt is needed), e.g. Linux (I believe).
```

Comments 0