SSLSmart – Smart SSL Cipher Enumeration

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Introduction

While performing web application penetration testing, PCI compliance audits and network assessments, correctly verifying Secure Sockets Layer (SSL) versions and cipher suites supported by the web server is an important test case. A number of tools exist that allow users to test for supported SSL ciphers suites. Most of the existing tools however provide testers with a fixed set of cipher suites. Further, testing itself is performed by initiating an SSL socket connection with one cipher suite at a time. This approach is inefficient, fraught with false positives and often does not provide a clear picture of the true vulnerability of the server.

SSLSmart is designed to combat these shortcomings. SSLSmart is a highly flexible and interactive tool aimed at improving efficiency and reducing the false positives during SSL testing.

SSLSmart Features

SSLSmart offers a wide range of features to improve testing efficiency and reduce false positives. These features are discussed below:

Content/CONNECT Scans

During the initial SSL handshake, the web server and the browser negotiate the cipher suite to be used for the communication channel. If both the browser and the server support a common cipher suite, a communication channel is established for data transfer. If not, the end result is one of the following two scenarios:

1. Web server terminates the connection during initial handshake and no data is transferred.
2. Web server completes the handshake and transfers minimum data in the form of an error page and terminates the connection. Any future attempts with these unsupported cipher suites encounter the same result.

Since a complete SSL connection is established and data is transferred in the second scenario above, most of the SSL testing tools (including commercial scanners) falsely conclude that the cipher suite is supported. It is therefore important for the testers to be able to see the actual server response for each cipher suite. SSLSmart offers two different types of scans to investigate and weed out false positives owing to this behavior.

1. **Content Scan (default):** Exact server response can be seen in HTML and Text forms for each cipher suite selected for the test URL. Figures 1, 2 and 3 below show various server error messages received for weak cipher suites from live systems.

2. **CONNECT Scan:** Focuses only on success or failure of SSL socket connection with various cipher suites. This behavior does not offer any advantage over existing SSL testing tools and is thus likely to have similar issues with false positives. However, this scan is faster and consumes fewer network and CPU resources.

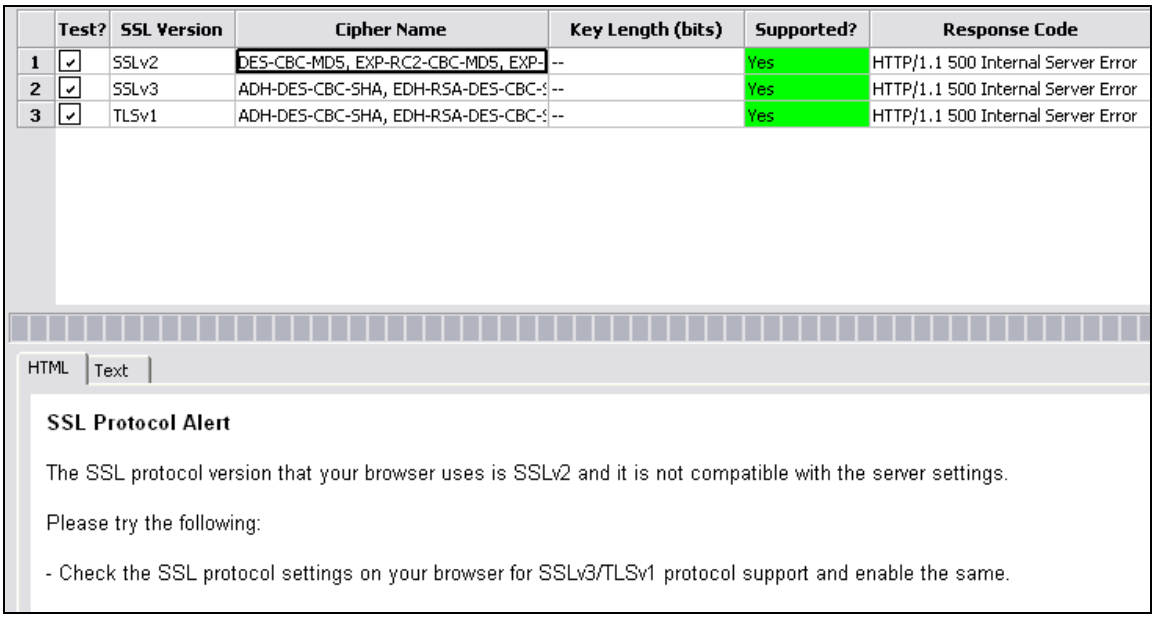


Figure 1: Image shows error message with SSLv2 support disabled on web server.

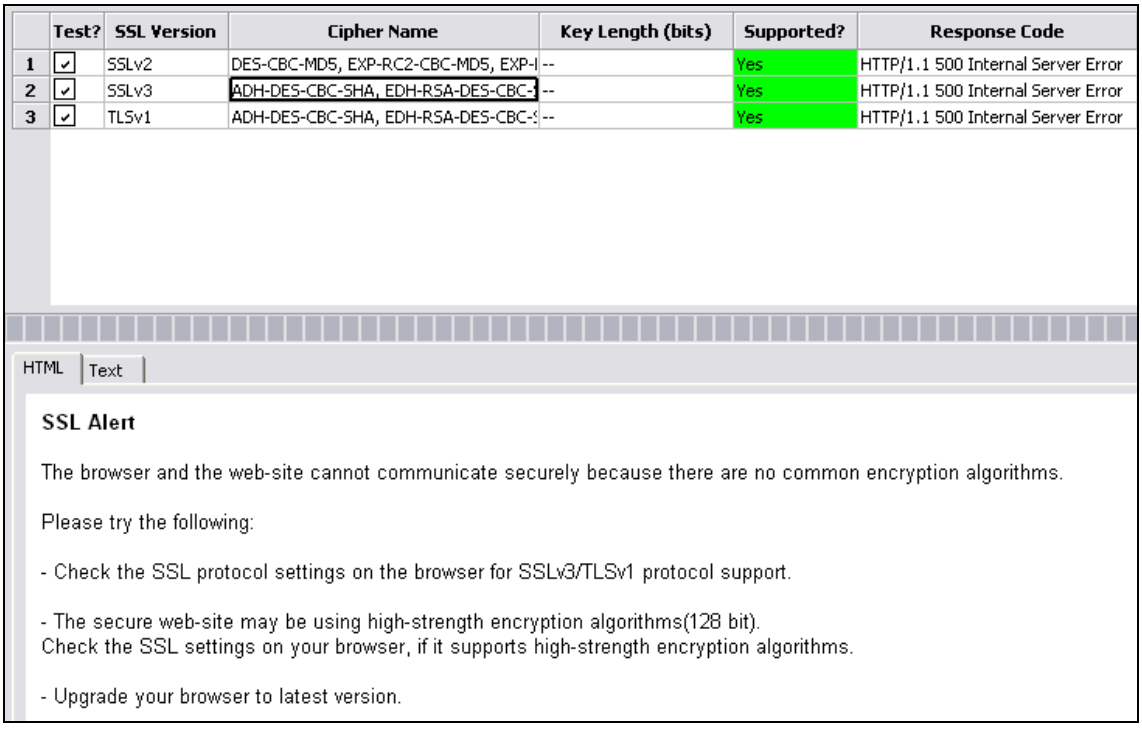
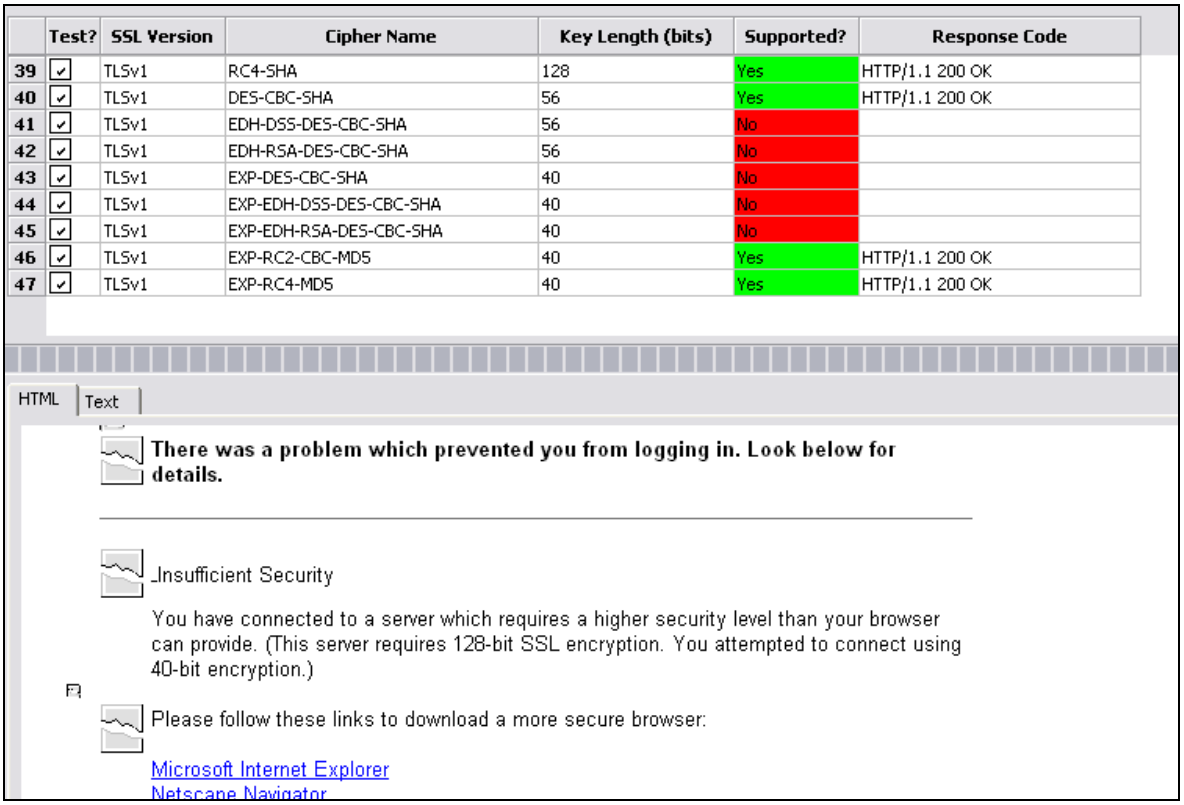


Figure 2: Image shows error page when only strong cipher suites are supported by remote server.



	Test?	SSL Version	Cipher Name	Key Length (bits)	Supported?	Response Code
39	☑	TLSv1	RC4-SHA	128	Yes	HTTP/1.1 200 OK
40	☑	TLSv1	DES-CBC-SHA	56	Yes	HTTP/1.1 200 OK
41	☑	TLSv1	EDH-DSS-DES-CBC-SHA	56	No	
42	☑	TLSv1	EDH-RSA-DES-CBC-SHA	56	No	
43	☑	TLSv1	EXP-DES-CBC-SHA	40	No	
44	☑	TLSv1	EXP-EDH-DSS-DES-CBC-SHA	40	No	
45	☑	TLSv1	EXP-EDH-RSA-DES-CBC-SHA	40	No	
46	☑	TLSv1	EXP-RC2-CBC-MD5	40	Yes	HTTP/1.1 200 OK
47	☑	TLSv1	EXP-RC4-MD5	40	Yes	HTTP/1.1 200 OK

Figure 3: Image shows server response for DES-CBC-SHA (56 bits) cipher suite

Dynamic Cipher Suite Support

Most SSL testing tools provide a fixed set of cipher suites. SSLSmart hooks into Ruby[1] OpenSSL[2] bindings and offers dynamic "on the fly" cipher suite generation capabilities. Various options are listed below:

1. Cipher suite grid can be created as per requirements using OpenSSL filters[3].
2. Individual cipher suites can be selected or de-selected. This allows fine grained control over cipher suites to test.
3. SSL cipher suites can be grouped as per SSL version to perform quick SSL version and cipher group checks for higher efficiency.

Certificate Verification

SSLSmart performs server certificate verification. It uses the Firefox Root CA Certificate[4] repository to perform Root CA verification. Additional Root CA Certificates can be added to the rootcerts.pem file or a custom .pem file can be supplied for Root CA Certificate verification.

[1] http://ruby-lang.org/
[2] http://openssl.org/
[3] http://www.openssl.org/docs/apps/ciphers.html

Proxy Support

SSLSmart provides web proxy support. For results to be accurate, it is important to use a transparent proxy[5].

Reporting

Reports can be generated in XML, HTML and Text formats along with their verbose versions. Verbose report versions include complete application response for each cipher suite and full details of the server certificate.

API's

Monkey patched Ruby API's that form the backbone of SSLSmart can be consumed to write custom Ruby scripts for quick tests. These API's can be consumed by users who work with the SSLSmart gem.

Platform Support and Installers

SSLSmart has been tested to work on the following platforms and versions of Ruby:

1. **Windows:** Ruby 1.8.6 with wxruby[6] (2.0.0) and builder[7] (2.1.2).
2. **Linux:** Ruby 1.8.7/1.9.1 with wxruby (2.0.0) and builder (2.1.2).
3. Installer is available in two formats:
    a. **Windows installer:** Windows installer is created using ruby 1.8.6 code base. Ruby installation is not required to get this working.
    b. **SSLSmart gem:** SSLSmart gem includes source code and can be consumed by users who have Ruby installed on their systems.

[4] http://curl.haxx.se/ca/cacert.pem
[5] http://en.wikipedia.org/wiki/Proxy_server
[6] http://wxruby.rubyforge.org/wiki/wiki.pl
[7] http://builder.rubyforge.org/

SSLSmart Installation

The SSLSmart zip file containing the Microsoft Windows installer and gem can be downloaded from http://www.mcafee.com/us/downloads/free-tools/index.aspx. Installation details for Windows setup and SSLSmart gem are provided below:

Installing with SSLSmart Windows Setup

After extracting the contents from the zip file, go to the directory where the zip file is extracted and run SSLSmart1.0.exe. This will begin the installation process. The installer is self explanatory. Figures 4 below show the first installation screen on Windows.

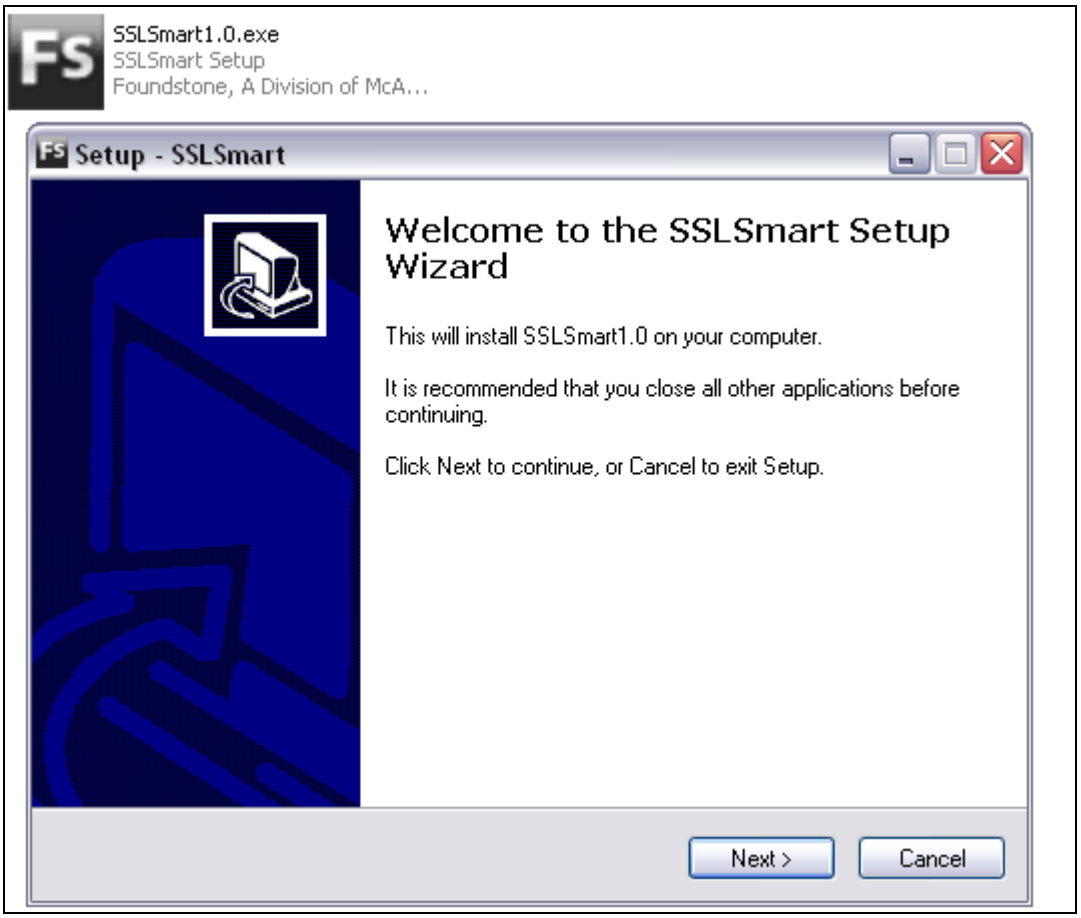


Figure 4: SSLSmart Setup

Installing SSLSmart Gem

A working Ruby installation is required to install the SSLSmart gem and execute the extracted code. From the command shell, go to the directory where the contents of the SSLSmart zip file are extracted. Inside the directory, execute the following command:

```
gem install sslsmart-1.0.gem
```

The above mentioned command will install SSLSmart gem along with its dependencies (wxruby and builder).

Sample installation paths for Linux and windows are shown below:

- `Linux:  /usr/lib/ruby/gems/1.8/gems/sslsmart-1.0/`
- `Windows:  C:\ruby\lib\ruby\gems\1.8\gems\sslsmart-1.0\`

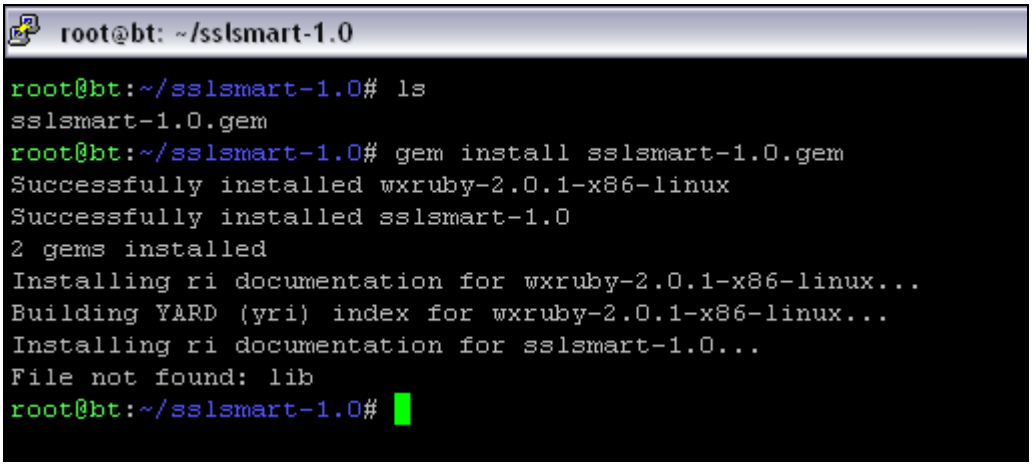


Figure 5: Image shows SSLSmart installation on Linux (BackTrack 4)

Figure 6: SSLSmart gem installation on Windows

Once the gem is installed, go to the bin directory inside the installation path to find the SSLSmart source code. Run the following command to start SSLSmart GUI.

```
ruby sslsmartgui.rb
```

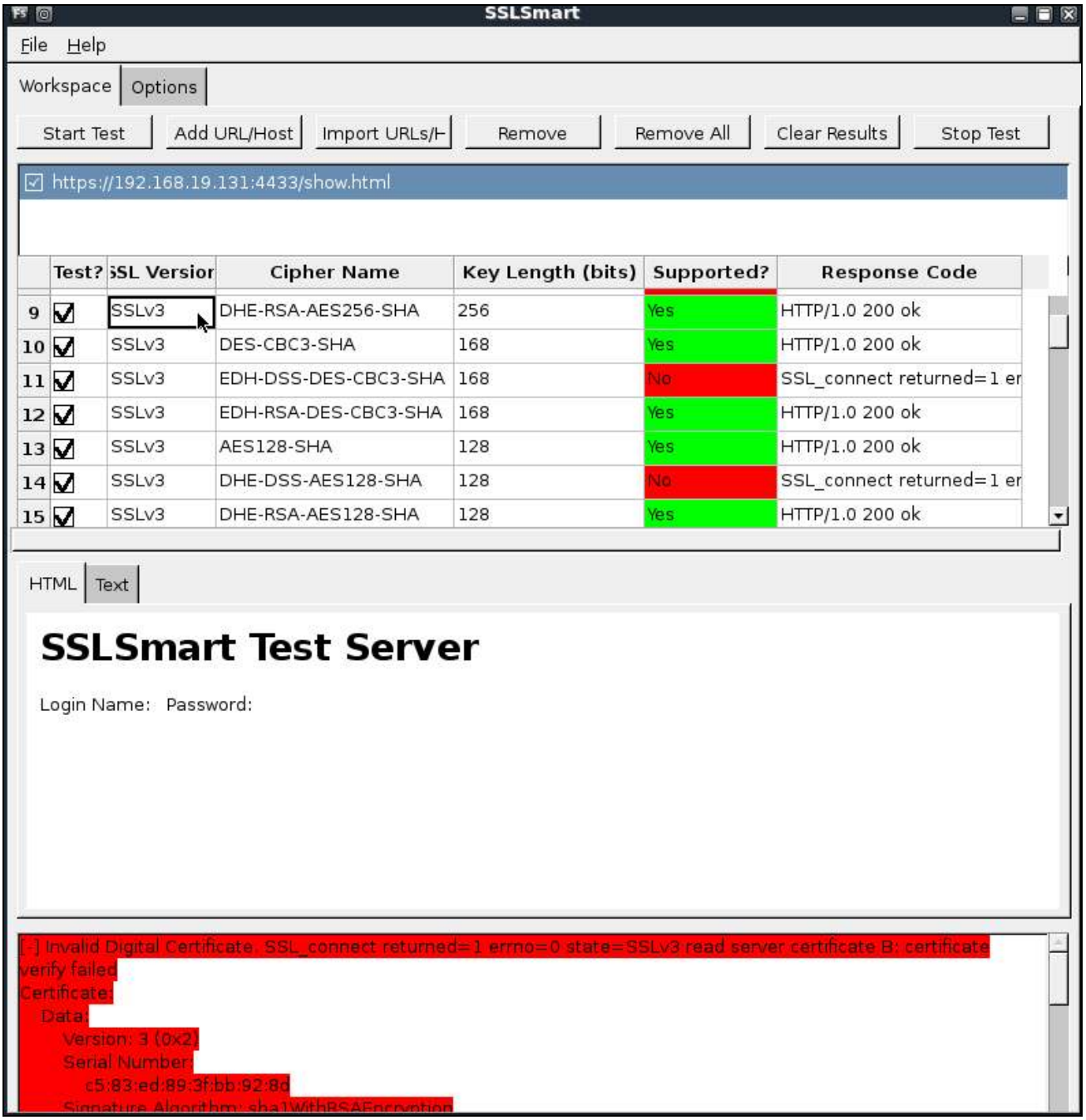


Figure 7: Image shows SSLSmart running on Linux (BackTrack 4)

SSLSmart GUI

We will now look at various components of the SSLSmart GUI.

The Workspace

The workspace tab contains the controls required to start/stop scans, import hosts, view application response, results and view progress. Figure 8 shows a screenshot and is followed by a brief discussion of various controls seen on the workspace tab.

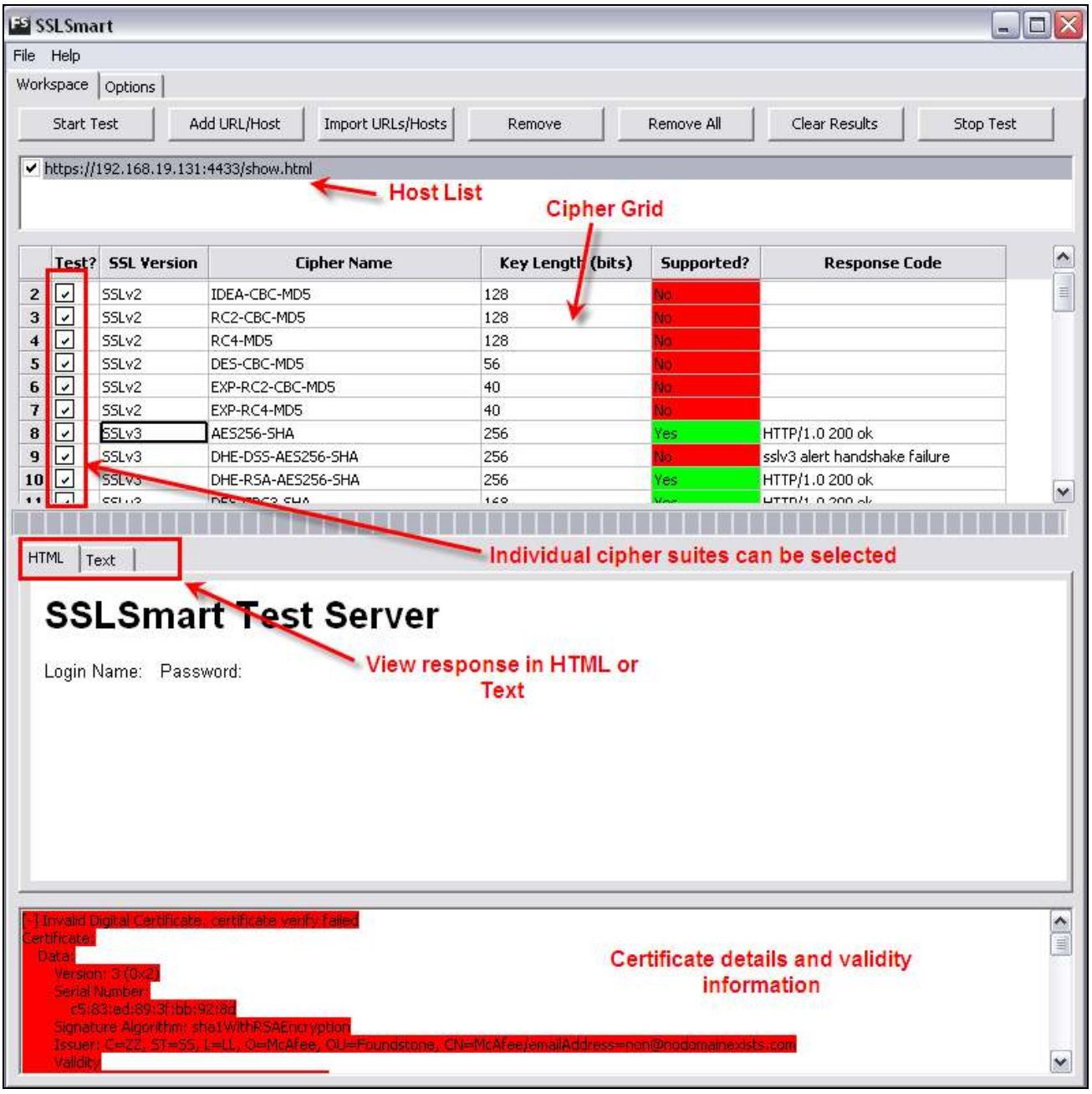


Figure 8: Image shows SSLSmart GUI workspace

Various Buttons:

1. **Start Test:** Starts test on all the added hosts. Once a test is started, the Options tab is not accessible until the test completes or is stopped.
2. **Add URL/Host:** Provides an input box to add a single URL.
3. **Import URLs/Hosts:** Allows several URLs/Hosts to be imported for testing. Example entries are provided below:

```
http://www.example.com

http://www.example.com/file.jsp

https://www.example.com

https://www.example.com:449?query=123

www.example.com

11.11.11.11

www.example.com?query=123
```

4. **Remove:** Removes selected (checked or highlighted) hosts from the host list.
5. **Remove All:** Removes all hosts from the host list.
6. **Clear Results:** Clears all results if no scan is in a running state.
7. **Stop Test:** Stops a running test.

Cipher Grid:

The cipher grid displays all the cipher suites that will be tested. This cipher grid is dynamic and can be changed at run-time (as long as no test is running) by applying OpenSSL filters from the Options tab. Individual cipher suites can be selected or deselected from the cipher grid. Only the cipher suites that are selected (checked) are tested.

HTML/Text:

Once a URL is selected, server response for any chosen cipher-suite is displayed in HTML and Text formats. Occasionally, the HTML returned by server cannot be rendered for viewing. In such scenarios, the text tab helps view the exact server response for each cipher suite.

Certificate Pane:

The certificate pane shows certificate details and validity information. The text background color turns green when a certificate is valid, red when a certificate is invalid.

SSLSmart Options

The Options tab contains various settings for SSLSmart. These settings allow the user to modify the type of scan, groups cipher suites as per SSL version, change proxy settings and modify the cipher grid as per OpenSSL filters. Figure 14 is a screenshot of the Options dialog and is followed by a discussion of various controls seen on this tab.

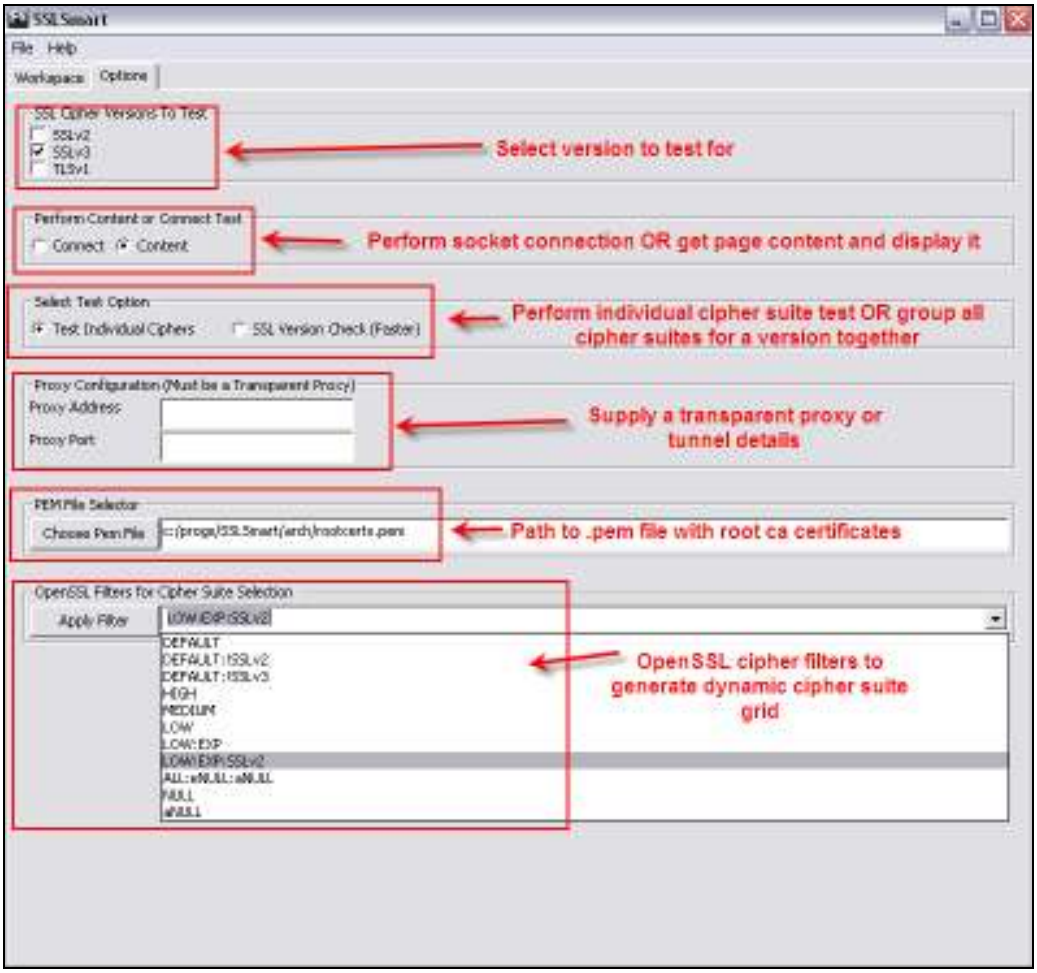


Figure 9: Image shows various SSLSmart options available

SSL Cipher Versions to Test: Allows the user to select or deselect SSL versions to test. Selecting or de-selecting a checkbox next to the SSL version modifies the cipher grid in the workspace tab.

Perform Content or Connect Test: This group of radio buttons designates if a content or connect scan is performed.

1. **Content Scan:** Selecting this radio button allows the user to view a server response for a given cipher suite. This behavior is default and desirable to weed out false positives.

2. **Connect Scan:** Selecting this radio button allows the user to perform a quick SSL socket connection with given cipher suite. Success/failure in establishing a socket connection determines the result. This scan is faster, consumes fewer resources but is less accurate as it does not render any content in HTML or Text tabs for review.

Select Test Option: This group of radio buttons determines if the cipher suites are individually tested or are grouped together for quick tests.

1. **Test Individual Ciphers (default):** When this radio button is selected, all the cipher suites are individually tested.
2. **SSL Version Check (Faster):** When this radio button is selected, cipher suites are grouped as per SSL version. The cipher suites grouped for each version are determined by the OpenSSL Filter in the Options tab. For example, if the filter is set to NULL, and the Test Option is set to "SSL Version Check", the ciphers for a particular SSL version will be as shown below:

	Test?	SSL Version	Cipher Name	Key Length (bits)	Supported?	Response Code
1	☑	SSLv3	NULL-SHA, NULL-MD5	--		
2	☑	TLSv1	NULL-SHA, NULL-MD5	--		

Figure 10: Image shows NULL ciphers grouped as per SSL version

Proxy Support: The proxy settings provided here are used by SSLSmart to route all traffic. It is important to note that the provided proxy must be a transparent proxy for accurate results. If your proxy is not transparent, you will end up with results that show the cipher suites supported by the web proxy.

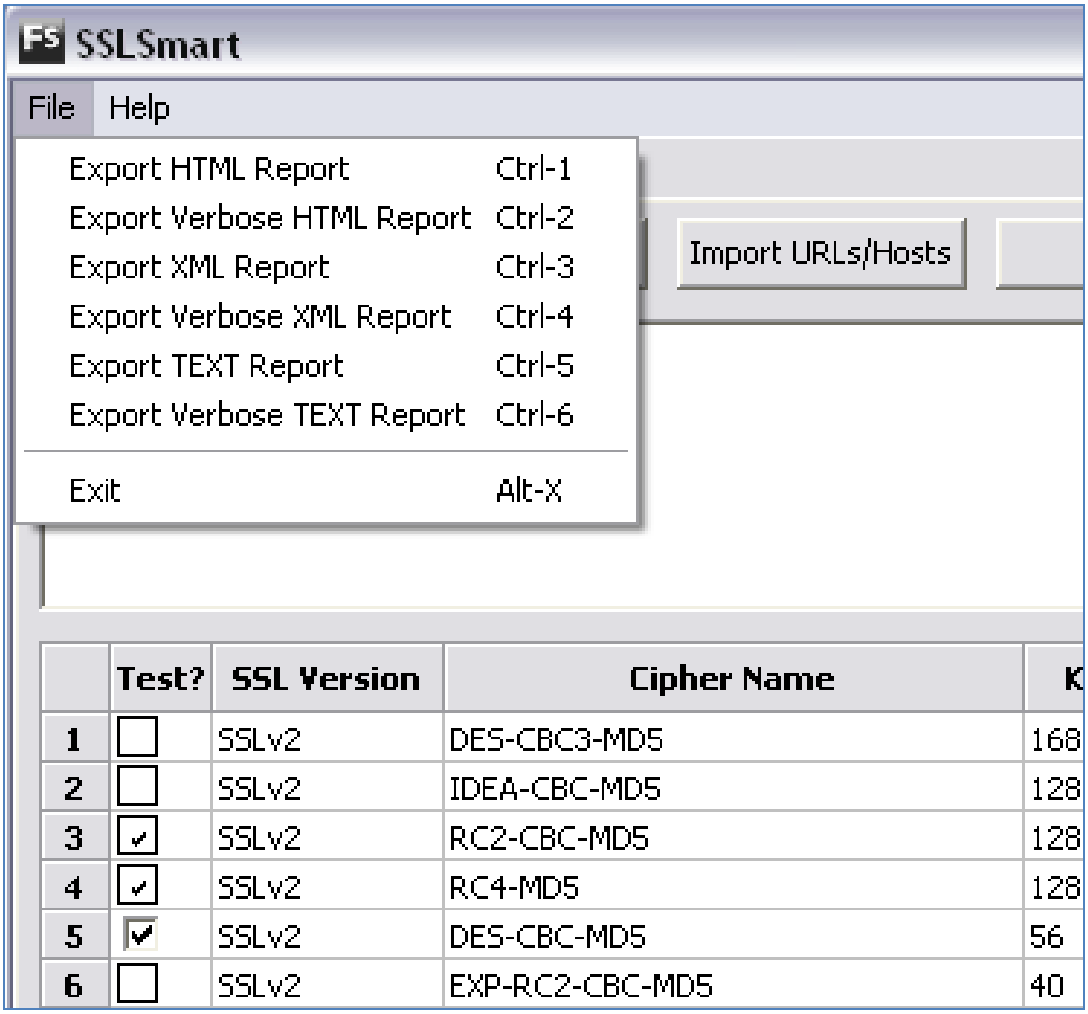
PEM File Selector: The .pem file provided here is used by Firefox to perform Root CA Certificate validation. The default file provided with SSLSmart is sourced from the cURL[8] project. You can generate your own .pem file with custom Root CA Certificates and supply it as an input here.

OpenSSL Filters for Cipher Suite Selection: Various OpenSSL filters can be used to generate the cipher suite grid. To select any particular filter, select the filter and click on "Apply Filter". The corresponding cipher grid will be changed in the workspace tab. You can also type in your own OpenSSL filters for custom cipher grid generation.

SSLSmart Reporting

XML, HTML, Text and their corresponding verbose versions are available to users. In addition to details in the normal report, verbose versions include complete application responses for each cipher suite and full details of server certificates.

[8] http://curl.haxx.se/ca/cacert.pem



	Test?	SSL Version	Cipher Name	K
1	☐	SSLv2	DES-CBC3-MD5	168
2	☐	SSLv2	IDEA-CBC-MD5	128
3	☑	SSLv2	RC2-CBC-MD5	128
4	☑	SSLv2	RC4-MD5	128
5	☑	SSLv2	DES-CBC-MD5	56
6	☐	SSLv2	EXP-RC2-CBC-MD5	40

Figure 11: Image shows SSLSmart reporting options

SSLSmart Results

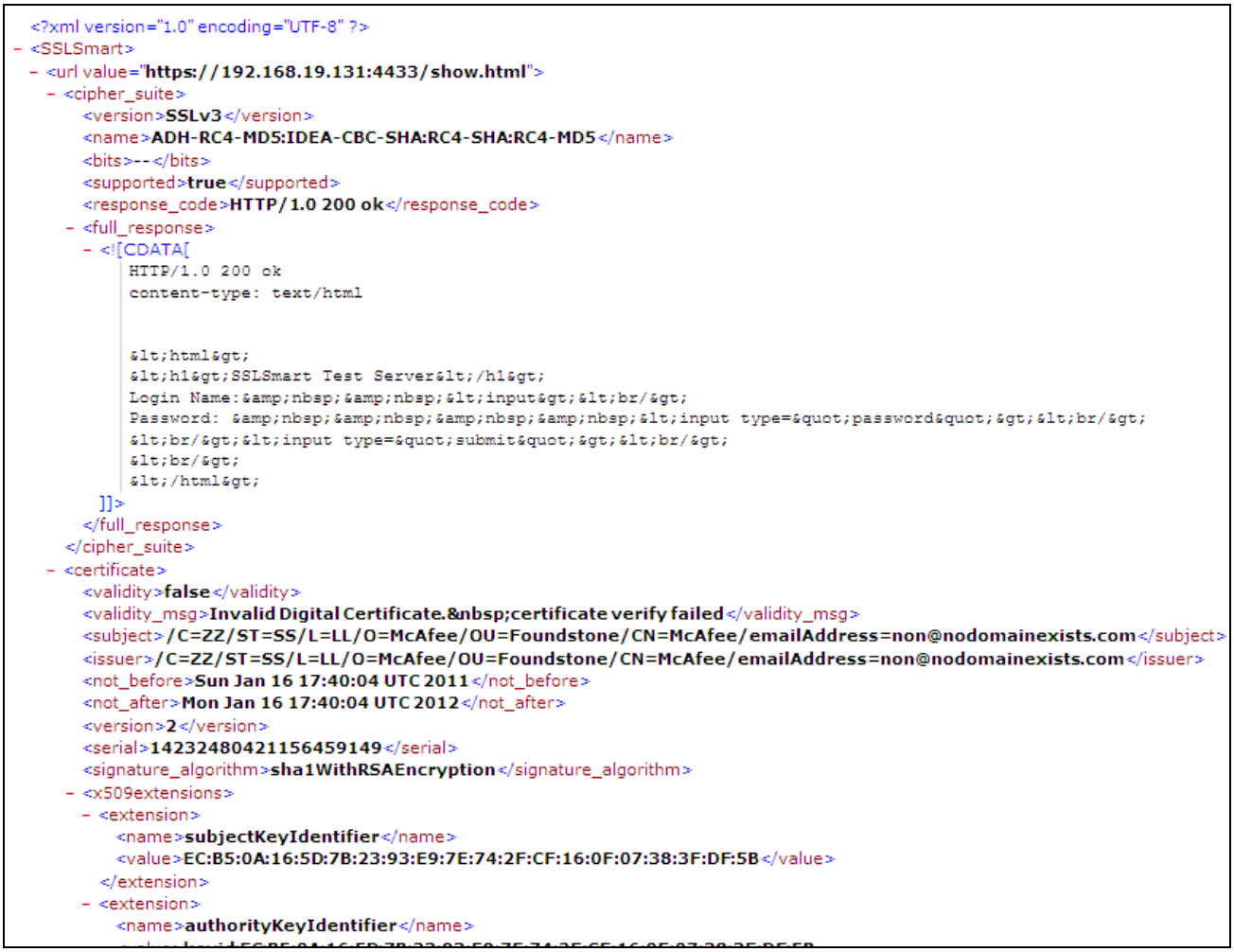
https://192.168.19.131:4433/show.html

Supported?	Version	Cipher Suite	Bits	Response Code
No	SSLv3	ADH-RC4-MD5	128	sslv3 alert handshake failure
No	SSLv3	IDEA-CBC-SHA	128	sslv3 alert handshake failure
Yes	SSLv3	RC4-MD5	128	HTTP/1.0 200 ok
Yes	SSLv3	RC4-SHA	128	HTTP/1.0 200 ok

Certificate Details

Validity	Invalid Digital Certificate. certificate verify failed
Subject	/C=ZZ/ST=SS/L=LL/O=McAfee/OU=Foundstone/CN=McAfee/emailAddress=non@nodomainexists.com
Issuer	/C=ZZ/ST=SS/L=LL/O=McAfee/OU=Foundstone/CN=McAfee/emailAddress=non@nodomainexists.com
Valid Not before	Sun Jan 16 17:40:04 UTC 2011
Valid Not After	Mon Jan 16 17:40:04 UTC 2012

Figure 12: Image shows SSLSmart HTML report for medium strength SSLv3 ciphers



```
<?xml version="1.0" encoding="UTF-8" ?>
- <SSLSmart>
  - <url value="https://192.168.19.131:4433/show.html">
    - <cipher_suite>
        <version>SSLv3</version>
        <name>ADH-RC4-MD5:IDEA-CBC-SHA:RC4-SHA:RC4-MD5</name>
        <bits>--</bits>
        <supported>true</supported>
        <response_code>HTTP/1.0 200 ok</response_code>
      - <full_response>
        - <![CDATA[
            HTTP/1.0 200 ok
            content-type: text/html


            &lt;html&gt;
            &lt;h1&gt;SSLSmart Test Server&lt;/h1&gt;
            Login Name:&amp;nbsp;&amp;nbsp;&lt;input&gt;&lt;br/&gt;
            Password: &amp;nbsp;&amp;nbsp;&amp;nbsp;&amp;nbsp;&lt;input type=&quot;password&quot;&gt;&lt;br/&gt;
            &lt;br/&gt;&lt;input type=&quot;submit&quot;&gt;&lt;br/&gt;
            &lt;br/&gt;
            &lt;/html&gt;
          ]]>
        </full_response>
      </cipher_suite>
    - <certificate>
        <validity>false</validity>
        <validity_msg>Invalid Digital Certificate. certificate verify failed</validity_msg>
        <subject>/C=ZZ/ST=SS/L=LL/O=McAfee/OU=Foundstone/CN=McAfee/emailAddress=non@nodomainexists.com</subject>
        <issuer>/C=ZZ/ST=SS/L=LL/O=McAfee/OU=Foundstone/CN=McAfee/emailAddress=non@nodomainexists.com</issuer>
        <not_before>Sun Jan 16 17:40:04 UTC 2011</not_before>
        <not_after>Mon Jan 16 17:40:04 UTC 2012</not_after>
        <version>2</version>
        <serial>14232480421156459149</serial>
        <signature_algorithm>sha1WithRSAEncryption</signature_algorithm>
      - <x509extensions>
        - <extension>
            <name>subjectKeyIdentifier</name>
            <value>EC:B5:0A:16:5D:7B:23:93:E9:7E:74:2F:CF:16:0F:07:38:3F:DF:5B</value>
          </extension>
        - <extension>
            <name>authorityKeyIdentifier</name>
```

Figure 13: Image shows sample SSLSmart XML Verbose report

SSLSmart Sample Use Cases

We will now see a few use cases for SSLSmart and how some of the options can be used to perform efficient and accurate testing.

Testing Only for SSLv2 Support: In this use case, all the SSLv2 cipher suites are grouped together to communicate with the web server being tested. The resulting behavior is equivalent to a web browser talking SSLv2 to the web server.

1. **Options → Select Test Option → SSL Version Check (Faster)**
2. Go to **Options → OpenSSL Filters for Cipher Suite Selection**
3. Select `SSLv2` or type in `SSLv2` as the filter and click on **Apply Filter**
4. Go to **Options** and unselect `SSLv3` and `TLSv1` checkboxes from the **SSL Cipher Versions To Test** checkbox group.

Performing Exhaustive Cipher Suite Check: In this use case, all the cipher suites (including Anonymous and NULL ciphers) supported by the OpenSSL bindings are tested.

1. Go to **Options → OpenSSL Filters for Cipher Suite Selection**
2. Select `DEFAULT:aNULL:eNULL` as the filter and click on **Apply Filter.** This will add all the ciphers supported by current OpenSSL bindings to the cipher grid.
3. Add hosts and run the test to perform exhaustive cipher suites tests.

Performing Certificate Verification Only: In this use case, SSL certificate verification is performed for all hosts. No cipher verification is done.

1. Go to **Options** and unselect all versions from **SSL Cipher Versions To Test**.
2. Add/Import hosts and run the scan.
3. Only certificate verifications will be performed and certificate details can be seen in the certificate pane and the exported reports.

Individual Cipher Suite Check for Low and Export Ciphers: In this use case, LOW (56 bit key length) and Export (40 bit key length) grade SSL ciphers are tested individually.

1. Go to **Options → OpenSSL Filters for Cipher Suite Selection**
2. Select `LOW:EXP` as the filter and click on **Apply Filter**
3. Add hosts and run test.

Group Cipher Check for Low and Export Ciphers: In this use case, LOW (56 bit key length) and Export (40 bit key length) grade SSL ciphers are grouped and tested as per SSL version.

1. **Options → Select Test Option → SSL Version Check (Faster)**

2. Go to **Options → OpenSSL Filters for Cipher Suite Selection**
3. Select **`LOW:EXP`** as the filter and click on **Apply Filter**
4. Add hosts and run test. Various cipher groups will be tested.

Using SSLSmart API's

The API's that form the backbone for SSLSmart tests can be used to write custom scripts. A few example scenarios are discussed below:

Query cipher suites supported by OpenSSL bindings:

```
irb(main):001:0> require 'rubygems'
=> true

irb(main):002:0> require 'sslsmartlib'
=> true

irb(main):003:0> a=OpenSSL::SSL.get_cipher_suites("DEFAULT") #Use OpenSSL's
DEFAULT filter to view SSL Cipher suites supported.
=> [["DHE-RSA-AES256-SHA", "TLSv1/SSLv3", 256, 256], ["DHE-DSS-AES256-SHA",
"TLSv1/SSLv3", 256, 256], ["AES256-SHA", "TLSv1/SSLv3", 256, 256], ["EDH-RSA-
DES-CBC3-SHA", "TLSv1/SSLv3", 168, 168], ...]

irb(main):004:0> a=OpenSSL::SSL.get_mod_cipher_suites("DEFAULT")
=> [["DES-CBC3-MD5", "SSLv2", 168, 168], ["RC2-CBC-MD5", "SSLv2", 128, 128],
["RC4-MD5", "SSLv2", 128, 128], ["DES-CBC-MD5", "SSLv2", 56, 56], ["EXP-RC2-CBC-
MD5", "SSLv2", 40, 128], ... <REMOVED> ... ["DES-CBC-SHA", "TLSv1", 56, 56],
["EXP-EDH-RSA-DES-CBC-SHA", "TLSv1", 40, 56], ["EXP-EDH-DSS-DES-CBC-SHA",
"TLSv1", 40, 56], ["EXP-DES-CBC-SHA", "TLSv1", 40, 56]]

irb(main):005:0> a=OpenSSL::SSL.get_mod_cipher_suites("SSLv2") # View cipher
suites supported for SSLv2
=> [["DES-CBC3-MD5", "SSLv2", 168, 168], ["DES-CBC-MD5", "SSLv2", 56, 56],
["EXP-RC2-CBC-MD5", "SSLv2", 40, 128], ["RC2-CBC-MD5", "SSLv2", 128, 128],
["EXP-RC4-MD5", "SSLv2", 40, 128], ["RC4-MD5", "SSLv2", 128, 128]]

irb(main):006:0> get_cipher_suites("LOW")
=> [["ADH-DES-CBC-SHA", "TLSv1/SSLv3", 56, 56], ["EDH-RSA-DES-CBC-SHA",
"TLSv1/SSLv3", 56, 56], ["EDH-DSS-DES-CBC-SHA", "TLSv1/SSLv3", 56, 56], ["DES-
CBC-SHA", "TLSv1/SSLv3", 56, 56], ["DES-CBC-MD5", "SSLv2", 56, 56]]
```

Querying Certificates:

```
irb(main):001:0> require 'rubygems'
=> true

irb(main):002:0> require 'sslsmartlib'
=> true

irb(main):003:0> q = Net::HTTP.new('192.168.19.131',4433) #create a new HTTP
object
```

```
=> #<Net::HTTP 192.168.19.131:4433 open=false>

irb(main):004:0> cert = q.get_cert_details #get certificate details
=> #<ResultContainer:0x2cda788 @status=true, @data=#<OpenSSL::X509::Certificate
subject=/C=ZZ/ST=SS/L=LL/O=McAfee/OU=Foundstone/CN=McAfee/emailAddress=non@nodom
ainexists.com,issuer=/C=ZZ/ST=SS/L=LL/O=McAfee/OU=Foundstone/CN=McAfee/emailAddr
ess=non@nodomainexists.com, serial=14232480421156459149, not_before=Sun Jan 16
17:40:04 UTC 2011, not_after=Mon Jan 16 17:40:04 UTC 2012>>

irb(main):005:0> cert.class
=> ResultContainer

irb(main):006:0> cert.data #access data attribute for ResultContainer class
=> #<OpenSSL::X509::Certificate
subject=/C=ZZ/ST=SS/L=LL/O=McAfee/OU=Foundstone/CN=McAfee/emailAddress=non@nodom
ainexists.com,issuer=/C=ZZ/ST=SS/L=LL/O=McAfee/OU=Foundstone/CN=McAfee/emailAddr
ess=non@nodomainexists.com, serial=14232480421156459149, not_before=Sun Jan 16
17:40:04 UTC 2011, not_after=Mon Jan 16 17:40:04 UTC 2012>

irb(main):007:0> cert.data.class
=> OpenSSL::X509::Certificate

irb(main):008:0> puts cert.data.to_text #display certificate information in text
Certificate:
    Data:
        Version: 3 (0x2)
        Serial Number:
            c5:83:ed:89:3f:bb:92:8d
        Signature Algorithm: sha1WithRSAEncryption
        Issuer: C=ZZ, ST=SS, L=LL, O=McAfee, OU=Foundstone,
CN=McAfee/emailAddress=non@nodomainexists.com
        Validity
            Not Before: Jan 16 17:40:04 2011 GMT
            Not After : Jan 16 17:40:04 2012 GMT

            .... Removed for Brevity
```

Querying cipher suites supported by web server:

```
irb(main):001:0> require 'rubygems'
=> true

irb(main):002:0> require 'sslsmartlib'
=> true

irb(main):003:0> q = Net::HTTP.new('192.168.19.131',4433)
=> #<Net::HTTP 192.168.19.131:4433 open=false>

irb(main):004:0> r = q.verify_ssl_config(:SSLv3, "AES256-SHA",
Net::HTTP::CONTENT, "/show.html")  # "AES256-SHA" is supported for SSLv3
=> => #<ResultContainer:0x2cab000 @status=true, @data=#<Net::HTTPOK 200 ok
readbody=true>>
```

```
irb(main):005:0> r.status
=> true

irb(main):006:0> puts r.data.body # View response body
<html>
<h1>SSLSmart Test Server</h1>
Login Name: <input><br/>
Password: <input type="password"><br/>
<br/><input type="submit"><br/>
</html>
=> nil

irb(main):006:0> q.verify_ssl_config(:SSLv2,nil,Net::HTTP::CONTENT,"/show.html")
# SSLv2 is not supported.
=> #<ResultContainer:0x2c9cadc @status=false, @data=OpenSSL::SSL::SSLError>
```

Querying SSL version supported by web server:

```
irb(main):001:0> require 'rubygems'
=> true

irb(main):002:0> require 'sslsmartlib'
=> true

irb(main):003:0> q = Net::HTTP.new('192.168.19.131',4443)
=> #<Net::HTTP 192.168.19.131:4443 open=false>

irb(main):004:0> q.set_ssl_config(:SSLv3) #use only SSLv3
=> 0

irb(main):005:0> r = q.get("/show.html") #get "/show.html" path
=> #<Net::HTTPOK 200 OK readbody=true>

irb(main):006:0> q.set_ssl_config(:SSLv2) #use only SSLv2. This is not supported
and will result in error message when page is requested.
=> 0

irb(main):007:0> r = q.get("/show.html")
OpenSSL::SSL::SSLError: SSL_connect returned=6 errno=0 state=SSLv2 read server
hello A
        from /usr/lib/ruby/1.8/net/http.rb:586:in `connect'
        from /usr/lib/ruby/1.8/net/http.rb:586:in `connect'
        from /usr/lib/ruby/1.8/net/http.rb:553:in `do_start'
        from /usr/lib/ruby/1.8/net/http.rb:542:in `start'
        from /usr/lib/ruby/1.8/net/http.rb:1035:in `request'
        from /usr/lib/ruby/1.8/net/http.rb:772:in `get'
        from (irb):7
```

Conclusion

To meet ever growing business challenges, organizations continue to develop and deploy web applications that transmit sensitive information. To protect this sensitive information in transit, web servers must be tested and configured to support strong cryptographic algorithms. SSLSmart offers a reliable and efficient mechanism to test the strength of this SSL configuration to ensure the communication is as secure as it can be.

About The Author

Gursev Singh Kalra serves as a Managing Consultant at Foundstone Professional Services, A Division of McAfee. Gursev focuses on web application penetration testing, external assessments and mobile application security testing. Gursev has also developed internal tools for internal / external network assessments. At Foundstone, Gursev has had the opportunity to work with some of the biggest financial institutions, technology and telecom companies.

About Foundstone Professional Services

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