ONVIF®

Security Configuration
Client Test Specification

Version 19.06

June 2019
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## REVISION HISTORY

<table>
<thead>
<tr>
<th>Vers.</th>
<th>Date</th>
<th>Description</th>
</tr>
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| 19.06 | Jun 14, 2019 | The following was done according to #309:  
'Validated Feature' section for each feature updated to be synchronized with feature ID used in feature list.  
'Feature Under Test' section for each test case updated to be synchronized with sub-feature ID used in feature list.  
'Validated Feature List' test case section removed. |
| 18.12 | Dec 19, 2018 | The following were updated in the scope of #258:  
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Introduction section was updated (ONVIF Advanced Security Client Test Specification was replaces with ONVIF Security Configuration Client Test Specification)  
Normative references section was updated (ONVIF Advanced Security Client Test Specification was replaces with ONVIF Security Configuration Client Test Specification)  
Test Overview section was updated (ONVIF Advanced Security Client Test Specification was replaces with ONVIF Security Configuration Client Test Specification)  
For all test cases Pre-Requisites were updated (ONVIF Advanced Security Client Test Specification was replaces with ONVIF Security Configuration Client Test Specification)  
Other minor changes in description related to renaming of ONVIF Advanced Security Client Test Specification to ONVIF Security Configuration Client Test Specification |
| 18.06 | Jun 21, 2018 | Reformatting document using new template |
| 18.06 | Apr 05, 2018 | 'Required Number of Devices Summary' Annex added according to #241 |
| 18.06 | Feb 14, 2018 | The following were updated in the scope of #241:  
Feature Level Requirement (updated with new rules)  
Each Feature Level Requirement (updated with Check Condition based on Device Features and Required Number of Devices) |
| 17.06 | Jun 15, 2017 | Links in Normative references section were updated. |
| 16.07 | May 11, 2016 | Expected Scenarios Under of TLS Configuration was updated. |
| 16.07 | Mar 16, 2016 | Docbook stylesheets were updated. |
| 16.07 | Mar 16, 2016 | Feature was renamed from Advanced Security to TLS Configuration  
Tests prefixes were changed from ADVANCEDSECURITY to TLSCONFIGURATION  
TLSCONFIGURATION-13 test case was added |
<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar 10, 2016</td>
<td>TLSCONFIGURATION-14 test case was added</td>
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<tr>
<td></td>
<td>tls_configuration.scenario section was updated</td>
</tr>
<tr>
<td>Feb 25, 2016</td>
<td>UploadCertificate added in ADVANCEDSECURITY-3 test case</td>
</tr>
<tr>
<td></td>
<td>ADD SERVER CERTIFICATE ASSIGNMENT Test Case added</td>
</tr>
<tr>
<td></td>
<td>REMOVE SERVER CERTIFICATE ASSIGNMENT Test Case added</td>
</tr>
<tr>
<td></td>
<td>REPLACE SERVER CERTIFICATE ASSIGNMENT Test Case added</td>
</tr>
<tr>
<td>Dec 30, 2015</td>
<td>Initial version:</td>
</tr>
<tr>
<td></td>
<td>General parts added</td>
</tr>
<tr>
<td></td>
<td>UPLOAD PASSPHRASE Test Case added</td>
</tr>
<tr>
<td></td>
<td>DELETE PASSPHRASE Test Case added</td>
</tr>
</tbody>
</table>
Table of Contents

1 Introduction ........................................................................................................................ 7
  1.1 Scope ........................................................................................................................... 7
  1.2 TLS Configuration .................................................................................................... 8

2 Normative references ........................................................................................................ 9

3 Terms and Definitions ..................................................................................................... 10
  3.1 Conventions ............................................................................................................. 10
  3.2 Definitions ............................................................................................................... 10
  3.3 Abbreviations .......................................................................................................... 10
  3.4 Namespaces ............................................................................................................. 11

4 Test Overview .................................................................................................................. 12
  4.1 General ................................................................................................................... 12
    4.1.1 Feature Level Requirement ..................................................................... 12
    4.1.2 Expected Scenarios Under Test .......................................................... 12
    4.1.3 Test Cases .................................................................................................. 13
  4.2 Test Setup .............................................................................................................. 13
  4.3 Prerequisites ........................................................................................................... 13

5 TLS Configuration Test Cases ....................................................................................... 15
  5.1 Feature Level Requirement: ................................................................................... 15
  5.2 Expected Scenarios Under Test: ............................................................................ 15
  5.3 UPLOAD PASSPHRASE ......................................................................................... 18
  5.4 DELETE PASSPHRASE ......................................................................................... 19
  5.5 CREATE PKCS#10 CERTIFICATION ................................................................. 20
  5.6 UPLOAD CERTIFICATE ......................................................................................... 22
  5.7 DELETE CERTIFICATE .......................................................................................... 23
  5.8 DELETE CERTIFICATION PATH .......................................................................... 24
  5.9 DELETE KEY ......................................................................................................... 25
  5.10 GET KEY STATUS ................................................................................................ 26
  5.11 UPLOAD PKCS12 ............................................................................................... 27
  5.12 ADD SERVER CERTIFICATE ASSIGNMENT .................................................... 29
  5.13 REMOVE SERVER CERTIFICATE ASSIGNMENT .............................................. 30
1 Introduction

The goal of the ONVIF Test Specification set is to make it possible to realize fully interoperable IP physical security implementations from different vendors. This specification also acts as an input document to the development of a test tool which will be used to test the ONVIF Client implementation conformance towards ONVIF standard. This Client Test Tool analyzes network communications between ONVIF Devices and Clients being tested and determines whether a specific Client is ONVIF conformant (see ONVIF Conformance Process Specification).

This particular document defines test cases required for testing Imaging Service features of a Client application e.g. Get Imaging Capabilities, Video Sources List, Get Imaging Settings, Imaging Settings Configuration, Focus Control. It also describes the test framework, test setup, prerequisites, test policies needed for the execution of the described test cases.

1.1 Scope

This ONVIF Security Configuration Client Test Specification defines and regulates the conformance testing procedure for the ONVIF conformant Clients in the scope of Security Configuration Service features. Conformance testing is meant to be black-box network traces analysis and verification. The objective of this specification is to provide the test cases to test individual requirements of ONVIF Clients in the scope of Security Configuration Service features according to ONVIF Security Configuration Service Specification.

The principal intended purposes are:

- Provide self-assessment tool for implementations.
- Provide comprehensive test suite coverage for Security Configuration Service features.

This specification does not address the following:

- 3rd parties Client use cases
- Non-functional (performance and regression) testing and analysis.
- SOAP Implementation Interoperability test i.e. Web Services Interoperability Basic Profile version 2.0 (WS-I BP2.0).
- Network protocol implementation Conformance test for HTTPS and HTTP protocols.

The following sections cover test cases needed for the verification of relevant features as mentioned in the ONVIF Profile Specifications.
1.2 TLS Configuration

TLS Configuration section specifies Client ability to manage the associations between certification paths and the TLS server on Device.
2 Normative references

- ONVIF Conformance Process Specification:
  https://www.onvif.org/profiles/conformance/

- ONVIF Profile Policy:
  https://www.onvif.org/profiles/

- ONVIF Core Specifications:
  https://www.onvif.org/profiles/specifications/

- ONVIF Core Client Test Specification:
  https://www.onvif.org/profiles/conformance/client-test/

- ONVIF Security Configuration Specification:
  https://www.onvif.org/profiles/specifications/

- ISO/IEC Directives, Part 2, Annex H:
  http://www.iso.org/directives

- ISO 16484-5:2014-09 Annex P:

- WS-BaseNotification:
  http://docs.oasis-open.org/wsn/wsn-ws_base_notification-1.3-spec-os.pdf

- W3C SOAP 1.2, Part 1, Messaging Framework:
  http://www.w3.org/TR/soap12-part1/

- W3C XML Schema Part 1: Structures Second Edition:
  http://www.w3.org/TR/xmlschema-1/

- W3C XML Schema Part 2: Datatypes Second Edition:
  http://www.w3.org/TR/xmlschema-2/

- W3C Web Services Addressing 1.0 – Core:
  http://www.w3.org/TR/ws-addr-core/
3 Terms and Definitions

3.1 Conventions

The key words "shall", "shall not", "should", "should not", "may", "need not", "can", "cannot" in this specification are to be interpreted as described in [ISO/IEC Directives Part 2].

3.2 Definitions

This section describes terms and definitions used in this document.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profile</td>
<td>See ONVIF Profile Policy.</td>
</tr>
<tr>
<td>ONVIF Device</td>
<td>Computer appliance or software program that exposes one or multiple ONVIF Web Services.</td>
</tr>
<tr>
<td>ONVIF Client</td>
<td>Computer appliance or software program that uses ONVIF Web Services.</td>
</tr>
<tr>
<td>Conversation</td>
<td>A Conversation is all exchanges between two MAC addresses that contains SOAP request and response.</td>
</tr>
<tr>
<td>Network</td>
<td>A network is an interconnected group of devices communicating using the Internet protocol.</td>
</tr>
<tr>
<td>Network Trace Capture file</td>
<td>Data file created by a network protocol analyzer software (such as Wireshark). Contains network packets data recorded during a live network communications.</td>
</tr>
<tr>
<td>SOAP</td>
<td>SOAP is a lightweight protocol intended for exchanging structured information in a decentralized, distributed environment. It uses XML technologies to define an extensible messaging framework providing a message construct that can be exchanged over a variety of underlying protocols.</td>
</tr>
<tr>
<td>Client Test Tool</td>
<td>ONVIF Client Test Tool that tests ONVIF Client implementation towards the ONVIF Test Specification set.</td>
</tr>
<tr>
<td>Security Configuration Service</td>
<td>Service for keystore and a TLS server on an ONVIF device.</td>
</tr>
<tr>
<td>Valid Device Response</td>
<td>Device has responded to specific request with code HTTP or RTSP 200 OK and SOAP fault message has not appeared.</td>
</tr>
</tbody>
</table>

3.3 Abbreviations

This section describes abbreviations used in this document.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTTP</td>
<td>Hyper Text Transport Protocol.</td>
</tr>
<tr>
<td>HTTPS</td>
<td>Hyper Text Transport Protocol over Secure Socket Layer.</td>
</tr>
<tr>
<td>URI</td>
<td>Uniform Resource Identifier.</td>
</tr>
<tr>
<td>WSDL</td>
<td>Web Services Description Language.</td>
</tr>
</tbody>
</table>
3.4 Namespaces

Prefix and namespaces used in this test specification are listed in Table 1. These prefixes are not part of the standard and an implementation can use any prefix.

Table 3.1. Defined namespaces in this specification

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Namespace URI</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>soapenv</td>
<td><a href="http://www.w3.org/2003/05/soap-envelope">http://www.w3.org/2003/05/soap-envelope</a></td>
<td>Envelope namespace as defined by SOAP 1.2 [SOAP 1.2, Part 1]</td>
</tr>
<tr>
<td>xs</td>
<td><a href="http://www.w3.org/2001/XMLSchema">http://www.w3.org/2001/XMLSchema</a></td>
<td>Instance namespace as defined by XS [XML-Schema, Part1] and [XMLSchema,Part 2]</td>
</tr>
<tr>
<td>tas</td>
<td><a href="http://www.onvif.org/ver10/advancedsecurity/wdsl">http://www.onvif.org/ver10/advancedsecurity/wdsl</a></td>
<td>The namespace for the WSDL Security Configuration service</td>
</tr>
</tbody>
</table>
4 Test Overview

This section provides information for the test setup procedure and required prerequisites that should be followed during test case execution.

An ONVIF client with Security Configuration features support can provide key configuration, certificate configuration and TLS server configuration.

An ONVIF Profile is described by a fixed set of functionalities through a number of services that are provided by the ONVIF standard. A number of services and functionalities are mandatory for each type of ONVIF Profile. An ONVIF Device and ONVIF Client may support any combination of Profiles and other optional services and functionalities.

4.1 General

Test Cases are grouped depending on features. Each Test Cases group provides description of feature requirement level for Profiles, expected scenario under test and related test cases:

- Feature Level Requirement
- Expected Scenarios Under Test
- List of Test Cases

4.1.1 Feature Level Requirement

Feature Level Requirement item contains a feature ID, check condition based on Device features, required number of Devices and feature requirement level for the Profiles, which will be used for Profiles conformance.

To claim this Feature as supported Client shall pass Expected Scenario Under Test:

- for each Device, which supports Device Features defined in Check Condition Based on Device Features
- for at least with number of Devices specified in Required Number of Devices

If Feature Level Requirement is defined as Mandatory for some Profile, Client shall support this Feature to claim this Profile Conformance.

4.1.2 Expected Scenarios Under Test

Expected Scenarios Under Test item contains expected scenario under test, conditions when the feature will be defined as supported and as not supported.
4.1.3 Test Cases

Test Case items contain list of test cases which are related to feature. Test cases provide exact procedure of testing feature support conditions.

Each Test Case contains the following parts:

• Test Label - Unique label for each test
• Test Case ID - Unique ID for each test
• Profile Normative References - Requirement level for the feature under test is defined in Profile Specification. This reference is informative and will not be used in conformance procedure.
• Feature Under Test - Feature which is under current test. Typically a particular command or an event.
• Test Purpose - The purpose of current test case.
• Pre-Requisite - The pre-requisite defines when the test should be performed. In case if pre-requisite does not match, the test result will be NOT DETECTED.
• Test Procedure - scenario expected to be reflected in network trace file.
• Test Result - Passed and failed criteria of the test case. Depending on these criteria test result will be defined as PASSED or FAILED.

4.2 Test Setup

Collect Network Traces files required by the test cases.

Collect Feature List XML files for Devices detected in the Network Trace files.

Client shall support all mandatory and conditional features listed in the Device Feature List XML file supplied for the Profiles supported by the Client.

For ONVIF compatibility, the ONVIF Client shall follow the requirements of the conformance process. For details please see the latest ONVIF Conformance Process Specification.

4.3 Prerequisites

The pre-requisites for executing the test cases described in this Test Specification include:

The Device shall be configured with an IPv4 address.
The Device shall be able to be discovered by the Client.
5 TLS Configuration Test Cases

5.1 Feature Level Requirement:

**Validated Feature**: TLS Configuration (TLSConfiguration)

**Check Condition based on Device Features**: TLS Server (Security Configuration Service) is supported by Device.

**Required Number of Devices**: 1

**Profile A Requirement**: None

**Profile C Requirement**: None

**Profile G Requirement**: None

**Profile Q Requirement**: Conditional

**Profile S Requirement**: None

5.2 Expected Scenarios Under Test:

1. Client connects to Device to manage the associations between certification paths and the TLS server.

2. Client is considered as supporting TLS Configuration if the following conditions are met:
   - Client may upload a passphrase from the keystore of the Device using `UploadPassphrase` operation if Device supports Passphrase handling AND
   - Client may delete a passphrase to the keystore of the Device using `DeletePassphrase` operation if Device supports Passphrase handling AND
   - Client is able to generates a DER-encoded PKCS#10 using `CreatePKCS10CSR` operation and upload created certificate using `UploadCertificate` operation if Device supports PKCS10ExternalCertificationWithRSA AND
   - Client is able to upload a certificate using `UploadCertificate` operation if Device supports PKCS10ExternalCertificationWithRSA AND
   - Client is able to delete a certificate to the keystore of the Device using `DeleteCertificate` operation if Device supports
PKCS10ExternalCertificationWithRSA or SelfSignedCertificateCreationWithRSA or PKCS12CertificateWithRSAPrivateKeyUpload AND

- Client is able to delete a certification path using **DeleteCertificationPath** operation if Device supports TLSServerSupport or PKCS12CertificateWithRSAPrivateKeyUpload AND

- Client is able to delete a key using **DeleteKey** operation if MaximumNumberOfKeys is greater than zero on Device AND

- Client is able to get key status using EITHER **GetKeyStatus** operation OR using **tns1:Advancedsecurity/Keystore/KeyStatus** event if MaximumNumberOfKeys is greater than zero on Device AND

- Client supports EventHandling_Pullpoint feature (please, see ONVIF Core Client Test Specification) when **tns1:Advancedsecurity/Keystore/KeyStatus** event is supported AND

- Client is able to upload a certification path consisting of X.509 certificates using **UploadCertificateWithPrivateKeyInPKCS12** operation if Device supports PKCS12CertificateWithRSAPrivateKeyUpload AND

- Client is able to assigns a key pair and certificate along with a certification path to the TLS server on the Device using **AddServerCertificateAssignment** operation if Device supports TLSServerSupport AND

- Client is able to remove key pair and certificate assignment to the TLS server on the Device using **RemoveServerCertificateAssignment** operation if Device supports TLSServerSupport AND

- Client is able to replace an existing key pair and certificate assignment to the TLS server on the Device by a new key pair and certificate assignment using **ReplaceServerCertificateAssignment** operation if Device supports TLSServerSupport AND

- Client is able to create certification path using **CreateCertificationPath** operation if Device supports TLSServerSupport AND

- Client is able to generate RSA key pair using **CreateRSAKeyPair** operation if Device supports RSAKeyPairGeneration AND

- Client supports network_protocols_configuration.set_network_protocols feature (see ONVIF Core Client Test Specification).

3. Client is considered as NOT supporting TLS Configuration if ANY of the following is TRUE:
• No valid responses for **UploadPassphrase** request if detected if Device supports Passphrase handling OR

• No valid responses for **DeletePassphrase** request if detected if Device supports Passphrase handling OR

• No valid responses for **CreatePKCS10CSR** request if Device supports Passphrase handling OR

• No valid responses for **UploadCertificate** request if Device supports Passphrase handling OR

• No valid responses for **DeleteCertificate** request if Device supports PKCS10ExternalCertificationWithRSA or SelfSignedCertificateCreationWithRSA or PKCS12CertificateWithRSAPrivateKeyUpload OR

• No valid responses for **DeleteCertificationPath** request if Device supports TLSServerSupport or PKCS12CertificateWithRSAPrivateKeyUpload OR

• No valid responses for **DeleteKey** request if MaximumNumberOfKeys is greater than zero on Device OR

• No valid responses for **GetKeyStatus** request if detected if MaximumNumberOfKeys is greater than zero on Device OR

• Client unable to get key status using **GetKeyStatus** request OR using tns1:Advancedsecurity/Keystore/KeyStatus event if MaximumNumberOfKeys is greater than zero on Device OR

• Client does not support EventHandling_Pullpoint feature (please, see ONVIF Core Client Test Specification) when Client supports tns1:Advancedsecurity/Keystore/KeyStatus notification if if MaximumNumberOfKeys is greater than zero on Device OR

• No valid responses for **UploadCertificateWithPrivateKeyInPKCS12** request if Device supports PKCS12CertificateWithRSAPrivateKeyUpload OR

• No valid responses for **AddServerCertificateAssignment** request if Device supports TLSServerSupport OR

• No valid responses for **RemoveServerCertificateAssignment** request if Device supports TLSServerSupport OR

• No valid responses for **ReplaceServerCertificateAssignment** request if Device supports TLSServerSupport OR
• No valid responses for CreateCertificationPath request if Device supports TLSServerSupport OR

• No valid responses for CreateRSAKeyPair request if Device supports RSAKeyPairGeneration OR

• Client does not support network_protocols_configuration.set_network_protocols feature (see ONVIF Core Client Test Specification).

5.3 UPLOAD PASSPHRASE

Test Label: Upload Passphrase

Test Case ID: TLSCONFIGURATION-1

Feature Under Test: Upload Passphrase (TLSConfiguration_UploadPassphrase)

Profile A Normative Reference: None

Profile C Normative Reference: None

Profile G Normative Reference: None

Profile Q Normative Reference: Optional

Profile S Normative Reference: None

Test Purpose: To verify that Client is able to upload a passphrase to the keystore of the Device using UploadPassphrase operation.

Pre-Requisite:

• The Network Trace Capture files contains at least one Conversation between Client and Device with UploadPassphrase operation present.

• Device supports Security Configuration Service.

• Device supports Passphrase handling.

Test Procedure (expected to be reflected in network trace file):

1. Client invokes UploadPassphrase request message to upload a passphrase to the Device.

2. Device responds with code HTTP 200 OK and UploadPassphraseResponse message.

Test Result:
PASS -

- Client **UploadPassphrase** request messages are valid according to XML Schemas listed in Namespaces AND

- Client **UploadPassphrase** request in Test Procedure fulfills the following requirements:
  - [S1] *soapenv:Body* element has child element *tas:UploadPassphrase* AND

- Device response on the **UploadPassphrase** request fulfills the following requirements:
  - [S2] It has HTTP 200 response code AND
  - [S3] *soapenv:Body* element has child element *tas:UploadPassphraseResponse*.

FAIL -

- The Client failed PASS criteria.

5.4 DELETE PASSPHRASE

**Test Label:** Delete Passphrase

**Test Case ID:** TLSCONFIGURATION-2

**Feature Under Test:** Delete Passphrase (TLSConfiguration_DeletePassphrase)

**Profile A Normative Reference:** None

**Profile C Normative Reference:** None

**Profile G Normative Reference:** None

**Profile Q Normative Reference:** Optional

**Profile S Normative Reference:** None

**Test Purpose:** To verify that Client is able to delete a passphrase from the keystore of the Device using **DeletePassphrase** operation.

**Pre-Requisite:**

- The Network Trace Capture files contains at least one Conversation between Client and Device with **DeletePassphrase** operation present.


- Device supports Passphrase handling.

**Test Procedure (expected to be reflected in network trace file):**
1. Client invokes **DeletePassphrase** request message to delete a passphrase from the Device.

2. Device responds with code HTTP 200 OK and **DeletePassphraseResponse** message.

**Test Result:**

**PASS -**

- Client **DeletePassphrase** request messages are valid according to XML Schemas listed in **Namespaces** AND
- Client **DeletePassphrase** request in Test Procedure fulfills the following requirements:
  - [S1] `soapenv:Body` element has child element `tas:DeletePassphrase` AND
- Device response on the **DeletePassphrase** request fulfills the following requirements:
  - [S2] It has HTTP 200 response code AND

**FAIL -**

- The Client failed PASS criteria.

---

### 5.5 CREATE PKCS#10 CERTIFICATION

**Test Label:** Create PKCS#10 Certification

**Test Case ID:** TLS_CONFIGURATION-3

**Feature Under Test:** Create PKCS#10 Certification (TLSConfiguration_CreatePKCS10Certification)

**Profile A Normative Reference:** None

**Profile C Normative Reference:** None

**Profile G Normative Reference:** None

**Profile Q Normative Reference:** Conditional

**Profile S Normative Reference:** None

**Test Purpose:** To verify that Client is able to generates a DER-encoded PKCS#10 using **CreatePKCS10CSR** operation, create an X.509 certificate from a PKCS#10 certification request and upload created certificate using **UploadCertificate** operation.

**Pre-Requisite:**
• The Network Trace Capture files contains at least one Conversation between Client and Device with CreatePKCS10CSR operation present.

• Device supports Security Configuration Service.

• Device supports PKCS10ExternalCertificationWithRSA.

Test Procedure (expected to be reflected in network trace file):

1. Client invokes CreatePKCS10CSR request message to generate PKCS#10 on the Device.

2. Device responds with code HTTP 200 OK and CreatePKCS10CSRResponse message.

3. Client creates a certificate from the PKCS#10 request with RSA key pair and associated CA certificate and a corresponding private key


Test Result:

PASS -

• Client CreatePKCS10CSR request messages are valid according to XML Schemas listed in Namespaces AND

• Client CreatePKCS10CSR request in Test Procedure fulfills the following requirements:
  • [S1] soapenv:Body element has child element tas:CreatePKCS10CSR AND

• Device response on the CreatePKCS10CSR request fulfills the following requirements:
  • [S2] It has HTTP 200 response code AND
  • [S3] soapenv:Body element has child element tas:CreatePKCS10CSRResponse.

• There is Client UploadCertificate request in Test Procedure that fulfills the following requirements:
  • [S4] It is invoked after the Client CreatePKCS10CSR request AND

  • tas:UploadCertificate/tas:Certificate element value fulfills the following requirements:
    • [S5] It contains Subject element with value equals to Subject element value from tas:CreatePKCS10CSRResponse/tas:PKCS10CSR AND

    • [S6] It contains Public Key element with value equals to Public Key element value from tas:CreatePKCS10CSRResponse/tas:PKCS10CSR AND

• Device response to the UploadCertificate request fulfills the following requirements:
• [S7] It has RTSP 200 response code AND

FAIL -
• The Client failed PASS criteria.

5.6 UPLOAD CERTIFICATE

Test Label: Upload Certificate

Test Case ID: TLSCONFIGURATION-4

Feature Under Test: Upload Certificate (TLSConfiguration_UploadCertificate)

Profile A Normative Reference: None

Profile C Normative Reference: None

Profile G Normative Reference: None

Profile Q Normative Reference: Conditional

Profile S Normative Reference: None

Test Purpose: To verify that Client is able to upload a certificate using UploadCertificate operation.

Pre-Requisite:
• The Network Trace Capture files contains at least one Conversation between Client and Device with UploadCertificate operation present.
• Device supports Security Configuration Service.
• Device supports PKCS10ExternalCertificationWithRSA.

Test Procedure (expected to be reflected in network trace file):

Test Result:
PASS -
• Client **UploadCertificate** request messages are valid according to XML Schemas listed in **Namespaces** AND

• Client **UploadCertificate** request in Test Procedure fulfills the following requirements:
  • [S1] `soapenv:Body` element has child element `tas:UploadCertificate` AND

• Device response on the **UploadCertificate** request fulfills the following requirements:
  • [S2] It has HTTP 200 response code AND

FAIL -
  • The Client failed PASS criteria.

5.7 DELETE CERTIFICATE

**Test Label:** Delete Certificate

**Test Case ID:** TLSCONFIGURATION-5

**Feature Under Test:** Delete Certificate (TLSConfiguration_DeleteCertificate)

**Profile A Normative Reference:** None

**Profile C Normative Reference:** None

**Profile G Normative Reference:** None

**Profile Q Normative Reference:** Conditional

**Profile S Normative Reference:** None

**Test Purpose:** To verify that Client is able to delete a certificate using **DeleteCertificate** operation.

**Pre-Requisite:**

• The Network Trace Capture files contains at least one Conversation between Client and Device with **DeleteCertificate** operation present.

• Device supports Security Configuration Service.

• Device supports PKCS10ExternalCertificationWithRSA or SelfSignedCertificateCreationWithRSA or PKCS12CertificateWithRSAPrivateKeyUpload.

**Test Procedure (expected to be reflected in network trace file):**

1. Client invokes **DeleteCertificate** request message to delete a certificate from the Device.

Test Result:

PASS -

- Client DeleteCertificate request messages are valid according to XML Schemas listed in Namespaces AND
- Client DeleteCertificate request in Test Procedure fulfills the following requirements:
  - [S1] soapenv:Body element has child element tas:DeleteCertificate AND
- Device response on the DeleteCertificate request fulfills the following requirements:
  - [S2] It has HTTP 200 response code AND

FAIL -

- The Client failed PASS criteria.

5.8 DELETE CERTIFICATION PATH

Test Label: Delete Certification Path

Test Case ID: TLSCONFIGURATION-6

Feature Under Test: Delete Certification Path (TLSConfiguration_DeleteCertificationPath)

Profile A Normative Reference: None

Profile C Normative Reference: None

Profile G Normative Reference: None

Profile Q Normative Reference: Conditional

Profile S Normative Reference: None

Test Purpose: To verify that Client is able to delete a certification path using DeleteCertificationPath operation.

Pre-Requisite:

- The Network Trace Capture files contains at least one Conversation between Client and Device with DeleteCertificationPath operation present.
• Device supports TLSServerSupport or PKCS12CertificateWithRSAPrivateKeyUpload.

**Test Procedure (expected to be reflected in network trace file):**

1. Client invokes **DeleteCertificationPath** request message to delete a certification path from the Device.
2. Device responds with code HTTP 200 OK and **DeleteCertificationPathResponse** message.

**Test Result:**

**PASS -**

• Client **DeleteCertificate** request messages are valid according to XML Schemas listed in Namespaces AND

• Client **DeleteCertificationPath** request in Test Procedure fulfills the following requirements:
  • [S1] soapenv:Body element has child element tas:DeleteCertificationPath AND

• Device response on the **DeleteCertificationPath** request fulfills the following requirements:
  • [S2] It has HTTP 200 response code AND
  • [S3] soapenv:Body element has child element tas:DeleteCertificationPathResponse.

**FAIL -**

• The Client failed PASS criteria.

5.9 DELETE KEY

**Test Label:** DeleteKey

**Test Case ID:** TLSCONFIGURATION-7

**Feature Under Test:** Delete Key (TLSConfiguration_DeleteKey)

**Profile A Normative Reference:** None

**Profile C Normative Reference:** None

**Profile G Normative Reference:** None

**Profile Q Normative Reference:** Conditional

**Profile S Normative Reference:** None

**Test Purpose:** To verify that Client is able to delete a key using DeleteKey operation.
Pre-Requisite:

- The Network Trace Capture files contains at least one Conversation between Client and Device with DeleteKey operation present.
- MaximumNumberOfKeys is greater than zero.

Test Procedure (expected to be reflected in network trace file):

1. Client invokes DeleteKey request message to delete a key from the keystore of Device.
2. Device responds with code HTTP 200 OK and DeleteKeyResponse message.

Test Result:

PASS -

- Client DeleteKey request messages are valid according to XML Schemas listed in Namespaces AND
- Client DeleteKey request in Test Procedure fulfills the following requirements:
  - [S1] soapenv:Body element has child element tas:DeleteKey AND
- Device response on the DeleteKey request fulfills the following requirements:
  - [S2] It has HTTP 200 response code AND
  - [S3] soapenv:Body element has child element tas:DeleteKeyResponse.

FAIL -

- The Client failed PASS criteria.

5.10 GET KEY STATUS

Test Label: Get Key Status

Test Case ID: TLS_CONFIGURATION-8

Feature Under Test: Get Key Status (TLSConfiguration_GetKeyStatus)

Profile A Normative Reference: None

Profile C Normative Reference: None

Profile G Normative Reference: None

Profile Q Normative Reference: Optional
Profile S Normative Reference: None

Test Purpose: To verify that Client is able to get key status using GetKeyStatus operation.

Pre-Requisite:

- The Network Trace Capture files contains at least one Conversation between Client and Device with GetKeyStatus operation present.
- MaximumNumberOfKeys is greater than zero.

Test Procedure (expected to be reflected in network trace file):

1. Client invokes GetKeyStatus request message to get a key status from the Device.
2. Device responds with code HTTP 200 OK and GetKeyStatusResponse message.

Test Result:

PASS -

- Client GetKeyStatus request messages are valid according to XML Schemas listed in Namespaces AND
- Client GetKeyStatus request in Test Procedure fulfills the following requirements:
  - [S1] soapenv:Body element has child element tas:GetKeyStatus AND
- Device response on the GetKeyStatus request fulfills the following requirements:
  - [S2] It has HTTP 200 response code AND
  - [S3] soapenv:Body element has child element tas:GetKeyStatusResponse.

FAIL -

- The Client failed PASS criteria.

5.11 UPLOAD PKCS12

Test Label: Upload PKCS12

Test Case ID: TLSCONFIGURATION-9

Feature Under Test: Upload PKCS12 (TLSConfiguration_UploadPKCS12)

Profile A Normative Reference: None

Profile C Normative Reference: None
Profile G Normative Reference: None

Profile Q Normative Reference: Conditional

Profile S Normative Reference: None

Test Purpose: To verify that Client is able to upload a certification path consisting of X.509 certificates using UploadCertificateWithPrivateKeyInPKCS12 operation.

Pre-Requisite:

- The Network Trace Capture files contains at least one Conversation between Client and Device with UploadCertificateWithPrivateKeyInPKCS12 operation present.
- Device supports PKCS12CertificateWithRSAPrivateKeyUpload.

Test Procedure (expected to be reflected in network trace file):

1. Client invokes UploadCertificateWithPrivateKeyInPKCS12 request message to upload a PKCS12 to the Device.

Test Result:

PASS -

- Client UploadCertificateWithPrivateKeyInPKCS12 request messages are valid according to XML Schemas listed in Namespaces AND
- Client UploadCertificateWithPrivateKeyInPKCS12 request in Test Procedure fulfills the following requirements:
  - [S1] soapenv:Body element has child element tas:UploadCertificateWithPrivateKeyInPKCS12 AND
- Device response on the UploadCertificateWithPrivateKeyInPKCS12 request fulfills the following requirements:
  - [S2] It has HTTP 200 response code AND

FAIL -

- The Client failed PASS criteria.
5.12 ADD SERVER CERTIFICATE ASSIGNMENT

Test Label: Add Server Certificate Assignment

Test Case ID: TLS_CONFIGURATION-10

Feature Under Test: Add Server Certificate Assignment

(TLSConfiguration_AddServerCertificateAssignment)

Profile A Normative Reference: None

Profile C Normative Reference: None

Profile G Normative Reference: None

Profile Q Normative Reference: Conditional

Profile S Normative Reference: None

Test Purpose: To verify that Client is able to assigns a key pair and certificate along with a certification path to the TLS server on the Device using AddServerCertificateAssignment operation.

Pre-Requisite:

• The Network Trace Capture files contains at least one Conversation between Client and Device with AddServerCertificateAssignment operation present.

• Device supports Security Configuration Service.

• Device supports TLSServerSupport.

Test Procedure (expected to be reflected in network trace file):

1. Client invokes AddServerCertificateAssignment request message to assign of a certificate to a TLS server.


Test Result:

PASS -

• Client AddServerCertificateAssignment request messages are valid according to XML Schemas listed in Namespaces AND
• Client `AddServerCertificateAssignment` request in Test Procedure fulfills the following requirements:
  • [S1] `soapenv:Body` element has child element `tas:AddServerCertificateAssignment` AND
  • Device response on the `AddServerCertificateAssignment` request fulfills the following requirements:
    • [S2] It has HTTP 200 response code AND

FAIL -

• The Client failed PASS criteria.

5.13 REMOVE SERVER CERTIFICATE ASSIGNMENT

Test Label: Remove Server Certificate Assignment

Test Case ID: TLS_CONFIGURATION-11

Feature Under Test: Remove Server Certificate Assignment (TLSConfiguration_RemoveServerCertificateAssignment)

Profile A Normative Reference: None

Profile C Normative Reference: None

Profile G Normative Reference: None

Profile Q Normative Reference: Conditional

Profile S Normative Reference: None

Test Purpose: To verify that Client is able to remove key pair and certificate assignment to the TLS server on the Device using `RemoveServerCertificateAssignment` operation.

Pre-Requisite:

• The Network Trace Capture files contains at least one Conversation between Client and Device with `RemoveServerCertificateAssignment` operation present.

• Device supports Security Configuration Service.

• Device supports TLSServerSupport.

Test Procedure (expected to be reflected in network trace file):
1. Client invokes `RemoveServerCertificateAssignment` request message to remove server certification assignment.


Test Result:

PASS -

- Client `RemoveServerCertificateAssignment` request messages are valid according to XML Schemas listed in Namespaces AND

- Client `RemoveServerCertificateAssignment` request in Test Procedure fulfills the following requirements:
  - [S1] `soapenv:Body` element has child element `tas:RemoveServerCertificateAssignment` AND

- Device response on the `RemoveServerCertificateAssignment` request fulfills the following requirements:
  - [S2] It has HTTP 200 response code AND

FAIL -

- The Client failed PASS criteria.

5.14 REPLACE SERVER CERTIFICATE ASSIGNMENT

Test Label: Replace Server Certificate Assignment

Test Case ID: TLSCONFIGURATION-12

Feature Under Test: Replace Server Certificate Assignment (TLSConfiguration_ReplaceServerCertificateAssignment)

Profile A Normative Reference: None

Profile C Normative Reference: None

Profile G Normative Reference: None

Profile Q Normative Reference: Conditional

Profile S Normative Reference: None
**Test Purpose:** To verify that Client is able to replace an existing key pair and certificate assignment to the TLS server on the Device by a new key pair and certificate assignment using ReplaceServerCertificateAssignment operation.

**Pre-Requisite:**
- The Network Trace Capture files contains at least one Conversation between Client and Device with ReplaceServerCertificateAssignment operation present.
- Device supports TLSServerSupport.

**Test Procedure (expected to be reflected in network trace file):**

1. Client invokes ReplaceServerCertificateAssignment request message to replace certificate assignment to a TLS server.

**Test Result:**

**PASS** -

- Client ReplaceServerCertificateAssignment request messages are valid according to XML Schemas listed in Namespaces AND
- Client ReplaceServerCertificateAssignment request in Test Procedure fulfills the following requirements:
  - [S1] soapenv:Body element has child element tas:ReplaceServerCertificateAssignment AND
- Device response on the ReplaceServerCertificateAssignment request fulfills the following requirements:
  - [S2] It has HTTP 200 response code AND

**FAIL** -

- The Client failed PASS criteria.

**5.15 CREATE CERTIFICATION PATH**

**Test Label:** Create Certification Path
Test Case ID: TLS_CONFIGURATION-13

Feature Under Test: Create Certification Path (TLSConfiguration_CreateCertificationPath)

Profile A Normative Reference: None

Profile C Normative Reference: None

Profile G Normative Reference: None

Profile Q Normative Reference: Conditional

Profile S Normative Reference: None

Test Purpose: To verify that Client is able to create certification path using CreateCertificationPath operation.

Pre-Requisite:

- The Network Trace Capture files contains at least one Conversation between Client and Device with CreateCertificationPath operation present.
- Device supports TLSServerSupport.

Test Procedure (expected to be reflected in network trace file):

1. Client invokes CreateCertificationPath request message to create certification path.
2. Device responds with code HTTP 200 OK and CreateCertificationPathResponse message.

Test Result:

PASS -

- Client CreateCertificationPath request messages are valid according to XML Schemas listed in Namespaces AND

- Client CreateCertificationPath request in Test Procedure fulfills the following requirements:
  - [S1] soapenv:Body element has child element tas:CreateCertificationPath AND

- Device response on the CreateCertificationPath request fulfills the following requirements:
  - [S2] It has HTTP 200 response code AND
  - [S3] soapenv:Body element has child element tas:CreateCertificationPathResponse.

FAIL -
• The Client failed PASS criteria.

5.16 CREATE RSA KEY PAIR

Test Label: Create RSA Key Pair

Test Case ID: TLSCONFIGURATION-14

Feature Under Test: Create RSA Key Pair (TLSConfiguration_CreateRSAKeyPair)

Profile A Normative Reference: None

Profile C Normative Reference: None

Profile G Normative Reference: None

Profile Q Normative Reference: Conditional

Profile S Normative Reference: None

Test Purpose: To verify that Client is able to generate RSA key pair using CreateRSAKeyPair operation.

Pre-Requisite:

• The Network Trace Capture files contains at least one Conversation between Client and Device with CreateRSAKeyPair operation present.

• Device supports Security Configuration Service.

• Device supports RSAKeyPairGeneration.

Test Procedure (expected to be reflected in network trace file):

1. Client invokes CreateRSAKeyPair request message to create RSA key pair.

2. Device responds with code HTTP 200 OK and CreateRSAKeyPairResponse message.

Test Result:

PASS -

• Client CreateRSAKeyPair request messages are valid according to XML Schemas listed in Namespaces AND

• Client CreateRSAKeyPair request in Test Procedure fulfills the following requirements:
  • [S1] soapenv:Body element has child element tas:CreateRSAKeyPair AND
• Device response on the CreateRSAKeyPair request fulfills the following requirements:
  • [S2] It has HTTP 200 response code AND
  • [S3] soapenv:Body element has child element tas:CreateRSAKeyPairResponse.

FAIL -

• The Client failed PASS criteria.
Annex A Test for Appendix A

A.1 Required Number of Devices Summary

Required number of devices and Device feature dependency used in this test specification are listed in the Table.

Table A.1. Required Number of Devices Summary

<table>
<thead>
<tr>
<th>Feature ID</th>
<th>Feature Name</th>
<th>Required Number of Devices</th>
<th>Check Condition based on Device Features</th>
<th>Check Condition based on Device Features ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>tc.TLSConfiguration</td>
<td>TLS Configuration</td>
<td>1</td>
<td>TLS Server (Security Configuration Service) is supported by Device.</td>
<td>TLSServerSupport</td>
</tr>
</tbody>
</table>