ONVIF®

Authentication Behavior Device Test Specification

Version 19.06

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REVISION HISTORY

Vers.	Date	Description
18.12	Aug 17, 2018	First issue of Authentication Behavior Device Test Specification
18.12	Dec 21, 2018	Switching Hub description in 'Network Configuration for DUT' section was added according to #1737
19.06	Jan 21, 2019	The following were updated in the scope of #1719: AUTH_BEHAVIOR-1-1-1 AUTHENTICATION BEHAVIOR SERVICE CAPABILITIES (note was updated to check SupportedAuthenticationModes capability) AUTH_BEHAVIOR-4-1-2 CREATE AUTHENTICATION PROFILE WITH AUTHENTICATION POLICY (step 8 was added, step 9 was updated) AUTH_BEHAVIOR-4-1-3 MODIFY AUTHENTICATION PROFILE (steps 11, 12, and 28.1 were added, steps 6, 14, 28.2 were updated) AUTH_BEHAVIOR-4-1-4 DELETE AUTHENTICATION PROFILE (step 3 was added, step 5 was updated) AUTH_BEHAVIOR-4-1-6 SET NEW AUTHENTICATION PROFILE WITH AUTHENTICATION POLICY (steps 3 and 9 were added, step 10 was updated) AUTH_BEHAVIOR-4-1-7 SET AUTHENTICATION PROFILE (steps 11, 12, and 28.1 were added, steps 6, 14, 28.2 were updated) AUTH_BEHAVIOR-4-1-9 CREATE AUTHENTICATION PROFILE - CAPABILITY VIOLATED (MAX POLICIES PER AUTHENTICATION PROFILE) (step 8 was added, step 9 was updated) AUTH_BEHAVIOR-4-1-11 MODIFY AUTHENTICATION PROFILE - CAPABILITY VIOLATED (MAX POLICIES PER AUTHENTICATION PROFILE) (step 8 was added, steps 5, 9 were updated) AUTH_BEHAVIOR-4-1-12 SET AUTHENTICATION PROFILE - CAPABILITY VIOLATED (MAX POLICIES PER AUTHENTICATION PROFILE)(step 7 was added, steps 8, 5 were updated) Annex A.16 Create Authentication Profile (step 3 was added, step 4 was updated, input parameter was added)
19.06	Jan 21, 2019	The following were updated in the scope of #1721: AUTH_BEHAVIOR-3-1-1 GET AUTHENTICATION PROFILES (note was updated) AUTH_BEHAVIOR-4-1-1 CREATE AUTHENTICATION PROFILE WITHOUT AUTHENTICATION POLICIES (note was updated) AUTH_BEHAVIOR-4-1-2 CREATE AUTHENTICATION PROFILE WITH AUTHENTICATION POLICY (step 9 was updated, note was updated) AUTH_BEHAVIOR-4-1-3 MODIFY AUTHENTICATION PROFILE (steps 14, 28.2 were updated, note was updated)

		AUTH_BEHAVIOR-4-1-5 SET NEW AUTHENTICATION PROFILE WITHOUT AUTHENTICATION POLICIES (note was updated) AUTH_BEHAVIOR-4-1-6 SET NEW AUTHENTICATION PROFILE WITH AUTHENTICATION POLICY (step 10 was updated, note was updated) AUTH_BEHAVIOR-4-1-7 SET AUTHENTICATION PROFILE (steps 14, 28.2 were updated, note was updated) AUTH_BEHAVIOR-4-1-9 CREATE AUTHENTICATION PROFILE - CAPABILITY VIOLATED (MAX POLICIES PER AUTHENTICATION PROFILE) (step 9 was updated) AUTH_BEHAVIOR-4-1-11 MODIFY AUTHENTICATION PROFILE - CAPABILITY VIOLATED (MAX POLICIES PER AUTHENTICATION PROFILE) (step 8 was updated) AUTH_BEHAVIOR-4-1-12 SET AUTHENTICATION PROFILE - CAPABILITY VIOLATED (MAX POLICIES PER AUTHENTICATION PROFILE) (step 8 was updated) Annex A.16 Create Authentication Profile (step 4 was updated)
19.06	Mar 26, 2019	Some misspelling were fixed. The following were updated in the scope of #1731: AUTH_BEHAVIOR-7-1-3 CREATE SECURITY LEVEL WITH RECOGNITION METHODS (TODO in RecognitionType value was replaced with description) AUTH_BEHAVIOR-7-1-4 MODIFY SECURITY LEVEL (TODO in RecognitionType value was replaced with description) AUTH_BEHAVIOR-7-1-8 SET SECURITY LEVEL WITH RECOGNITION METHODS (TODO in RecognitionType value was replaced with description) AUTH_BEHAVIOR-7-1-9 SET SECURITY LEVEL (TODO in RecognitionType value was replaced with description) AUTH_BEHAVIOR-7-1-11 CREATE SECURITY LEVEL - CAPABILITY VIOLATED (MAX RECOGNITION GROUPS PER SECURITY LEVEL) (TODO in RecognitionType value was replaced with description) AUTH_BEHAVIOR-7-1-12 CREATE SECURITY LEVEL - CAPABILITY VIOLATED (MAX RECOGNITION METHODS PER RECOGNITION GROUP) (TODO in RecognitionType value was replaced with description) AUTH_BEHAVIOR-7-1-15 MODIFY SECURITY LEVEL - CAPABILITY VIOLATED (MAX RECOGNITION GROUPS PER SECURITY LEVEL) (TODO in RecognitionType value was replaced with description) AUTH_BEHAVIOR-7-1-16 MODIFY SECURITY LEVEL - CAPABILITY VIOLATED (MAX RECOGNITION METHODS PER RECOGNITION GROUP) (TODO in RecognitionType value was replaced with description) AUTH_BEHAVIOR-7-1-18 SET SECURITY LEVEL - CAPABILITY VIOLATED (MAX RECOGNITION GROUPS PER SECURITY

		LEVEL) (TODO in RecognitionType value was replaced with description) AUTH_BEHAVIOR-7-1-19 SET SECURITY LEVEL - CAPABILITY VIOLATED (MAX RECOGNITION METHODS PER RECOGNITION GROUP) (TODO in RecognitionType value was replaced with description) Annex A.17 Create Security Level (TODO in RecognitionType value was replaced with description) Annex A.31 Get Supported Recognition Types (added)
19.06	Mar 26, 2019	The following were updated in the scope of #1731: AUTH_BEHAVIOR-8-1-3 AUTHENTICATION PROFILE CHANGED EVENT renamed to AUTH_BEHAVIOR-8-1-3 SECURITY LEVEL CHANGED EVENT AUTH_BEHAVIOR-8-1-4 AUTHENTICATION PROFILE REMOVED EVENT renamed to AUTH_BEHAVIOR-8-1-4 SECURITY LEVEL REMOVED EVENT
19.06	Mar 26, 2019	The following were updated in the scope of #1731: Scope\Authentication Profile Management (updated with events functionality) Scope\Security Level Management (updated with events functionality) Test Policy\Authentication Profile Info (changes in the wording) Test Policy\Authentication Profile (changes in the wording) Test Policy\Authentication Profile Management (changes in the wording, Security Level events were removed) Test Policy\Security Level Info (changes in the wording) Test Policy\Security Level (changes in the wording) Test Policy\Security Level Management (changes in the wording, events duplicates were removed) Test Policy\Authentication Behavior Events (changes in the wording)

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1 Introduction

The goal of the ONVIF test specification set is to make it possible to realize fully interoperable IP physical security implementation from different vendors. The set of ONVIF test specification describes the test cases need to verify the [ONVIF Network Interface Specs] and [ONVIF Conformance] requirements. In addition, the test cases are to be basic inputs for some Profile specification requirements. It also describes the test framework, test setup, pre-requisites, test policies needed for the execution of the described test cases.

This ONVIF Authentication Behavior Device Test Specification acts as a supplementary document to the [ONVIF Network Interface Specs], illustrating test cases need to be executed and passed. In addition, this specification acts as an input document to the development of test tool that will be used to test the ONVIF device implementation conformance towards ONVIF standard. This test tool is referred as ONVIF Client hereafter.

1.1 Scope

This ONVIF Authentication Behavior Device Test Specification defines and regulates the conformance testing procedure for the ONVIF conformant devices. Conformance testing is meant to be functional black-box testing. The objective of this specification is to provide test cases to test individual requirements of ONVIF devices according to the ONVIF Authentication Behavior Service, which is defined in [ONVIF Authentication Behavior Spec].

The principal intended purposes are:

1. Provide self-assessment tool for implementations.
2. Provide comprehensive test suite coverage for [ONVIF Network Interface Specs].

This specification **does not** address the following:

1. Product use cases and non-functional (performance and regression) testing.
2. SOAP Implementation Interoperability test i.e. Web Services Interoperability Basic Profile version 2.0 (WS-I BP2.0).
3. Network protocol implementation Conformance test for HTTPS, HTTP, RTP and RTSP protocols.
4. Wi-Fi Conformance test

The set of ONVIF Test Specification will not cover the complete set of requirements as defined in [ONVIF Network Interface Specs]; instead it will cover its subset.

This ONVIF Authentication Behavior Test Specification covers the ONVIF Authentication Behavior Service, which is a functional block of [ONVIF Network Interface Specs]. The following section gives a brief overview of each functional block and its scope.

1.1.1 Capabilities

The Capabilities section covers the test cases needed for getting capabilities from an ONVIF device.

The scope of this specification section is to cover the following functions:

- Getting Authentication Behavior service address with GetServices command via Device service
- Getting capabilities with GetServiceCapabilities command
- Getting capabilities with GetServices command via Device service

1.1.2 Authentication Profile Info

The Authentication Profile Info section covers the test cases needed for getting authentication profile list and information from an ONVIF device.

The scope of this specification section is to cover the following functions:

- Getting authentication profile information list with GetAuthenticationProfileInfoList command
- Getting authentication profile information with GetAuthenticationProfileInfo command

1.1.3 Authentication Profile

The Authentication Profile section covers the test cases needed for getting authentication profile list from an ONVIF device.

The scope of this specification section is to cover the following functions:

- Getting authentication profile information list with GetAuthenticationProfileList command
- Getting authentication profile information with GetAuthenticationProfiles command

1.1.4 Authentication Profile Management

The Authentication Profile section covers the test cases needed for create, modify, delete and set authentication profile on an ONVIF device.

The scope of this specification section is to cover the following functions:

- Creating authentication profile with CreateAuthenticationProfile command
- Modifying authentication profile with ModifyAuthenticationProfile command
- Deleting authentication profile with DeleteAuthenticationProfile command
- Set authentication profile with SetAuthenticationProfile command
- Providing tns1:Configuration/AuthenticationProfile/Changed event whenever configuration data for an authentication profile is changed or an authentication profile is added
- Providing tns1:Configuration/AuthenticationProfile/Removed event whenever an authentication profile is removed

1.1.5 Security Level Info

The Security Level Info section covers the test cases needed for getting security level list and information from an ONVIF device.

The scope of this specification section is to cover the following functions:

- Getting security level information list with GetSecurityLevelInfoList command
- Getting security level information with GetSecurityLevelInfo command

1.1.6 Security Level

The Security Level section covers the test cases needed for getting security level list from an ONVIF device.

The scope of this specification section is to cover the following functions:

- Getting security level information list with GetSecurityLevelList command
- Getting security level information with GetSecurityLevels command

1.1.7 Security Level Management

The Security Level section covers the test cases needed for create, modify, delete and set security level on an ONVIF device.

The scope of this specification section is to cover the following functions:

- Creating security level with CreateSecurityLevel command

- Modifying security level with ModifySecurityLevel command
- Deleting security level with DeleteSecurityLevel command
- Set security level with SetSecurityLevel command
- Providing tns1:Configuration/SecurityLevel/Changed event whenever configuration data for an security level is changed or an security level is added
- Providing tns1:Configuration/SecurityLevel/Removed event whenever an security level is removed

1.1.8 Authentication Behavior Events

The Authentication Behavior Events section covers the test cases needed for for checking specified events format.

The scope of this specification section is to cover the following functions:

- Getting event properties with GetEventProperties command for the following events:
  - tns1:Configuration/AuthenticationProfile/Changed
  - tns1:Configuration/AuthenticationProfile/Removed
  - tns1:Configuration/SecurityLevel/Changed
  - tns1:Configuration/SecurityLevel/Removed

2 Normative references

- [ONVIF Conformance] ONVIF Conformance Process Specification:

  https://www.onvif.org/profiles/conformance/

- [ONVIF Profile Policy] ONVIF Profile Policy:

  https://www.onvif.org/profiles/

- [ONVIF Network Interface Specs] ONVIF Network Interface Specification documents:

  https://www.onvif.org/profiles/specifications/

- [ONVIF Core Specs] ONVIF Core Specification:

  https://www.onvif.org/profiles/specifications/

- [ONVIF Schedule Spec] ONVIF Schedule Specification:

  https://www.onvif.org/profiles/specifications/

- [ONVIF Authentication Behavior Spec] ONVIF Authentication Behavior Specification:

  https://www.onvif.org/profiles/specifications/

- [ISO/IEC Directives, Part 2] ISO/IEC Directives, Part 2, Annex H:

  http://www.iso.org/directives

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

  https://www.iso.org/obp/ui/#!iso:std:63753:en

- [SOAP 1.2, Part 1] W3C SOAP 1.2, Part 1, Messaging Framework:

  http://www.w3.org/TR/soap12-part1/

- [XML-Schema, Part 1] W3C XML Schema Part 1: Structures Second Edition:

  http://www.w3.org/TR/xmlschema-1/

- [XML-Schema, Part 2] W3C XML Schema Part 2: Datatypes Second Edition:

  http://www.w3.org/TR/xmlschema-2/

- [WS-Security] "Web Services Security: SOAP Message Security 1.1 (WS-Security 2004)", OASIS Standard, February 2006.:

http://www.oasis-open.org/committees/download.php/16790/wss-v1.1-spec-os-SOAPMessageSecurity.pdf

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 defines terms that are specific to the [ONVIF Authentication Behavior Spec] and tests.

Authentication Policy — Each authentication policy associates a security level with a schedule (during which the specified security level will be required at the access point).

Authentication Profile — Authentication profiles are used to define authentication behaviour for a type of access points. For instance, all entrance access points are configured to require Card access during office hours, Card+PIN access during night-time, and no access during holidays.

Recognition — Recognition is the action of identifying authorized users requesting access by the comparison of presented credential data with recorded credential data.

Recognition Group — Recognition groups are used to define a logical OR between the recognition methods in a security level. Example: One recognition group contains the recognition methods pt:Card and pt:Fingerprint. Another group contains the recognition methods pt:Card and pt:Face. The resulting effect is that the access point will require either Card+Fingerprint, or Card+Face.

Recognition Method — A recognition method is either memorized, biometric or held within a physical credential.

Recognition Type — A recognition type is either a recognition method or a physical input such as a request-to-exit button.

Security Level — Security Levels are defined as individual recognition methods, combinations of recognition methods (using logical AND or OR), or no recognition methods (open). Security levels are given explanatory names, such as “Card”, “Card+ PIN”, “Fingerprint or Iris”, “Open”, etc.

3.3 Abbreviations

This section describes abbreviations used in this document.

DUT Device Under Test

HTTP Hypertext Transfer Protocol

PACS Physical Access Control System

4 Test Overview

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

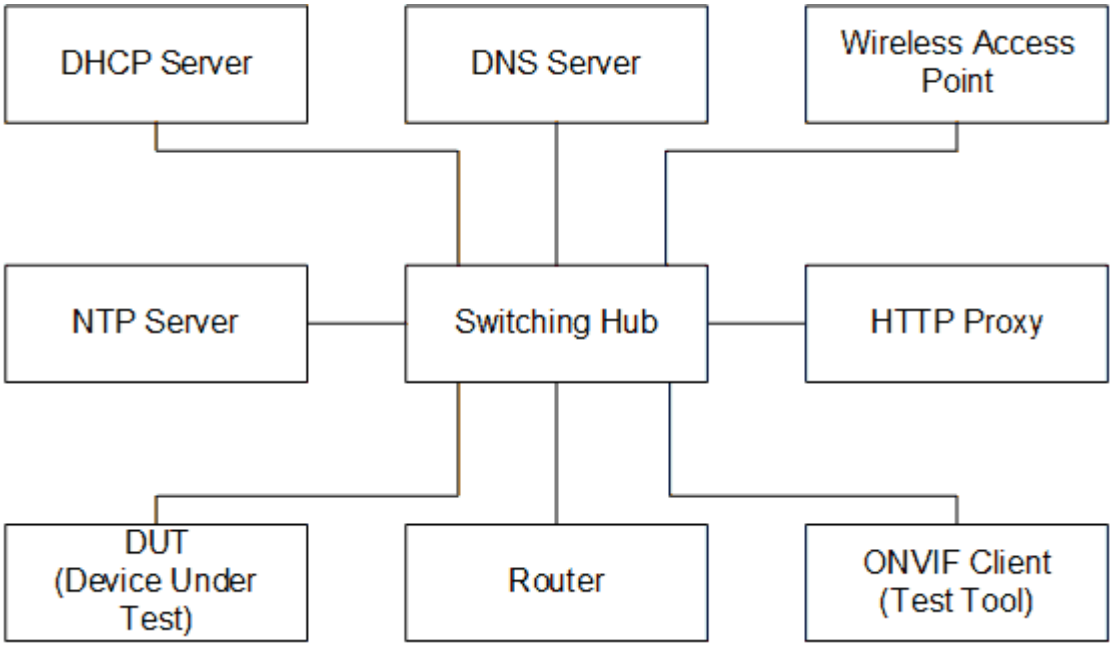
4.1 Test Setup

4.1.1 Network Configuration for DUT

The generic test configuration for the execution of test cases defined in this document is as shown below (Figure 4.1).

Based on the individual test case requirements, some of the entities in the below setup may not be needed for the execution of those corresponding test cases.

Figure 4.1. Test Configuration for DUT



DUT: ONVIF device to be tested. Hereafter, this is referred to as DUT (Device Under Test).

ONVIF Client (Test Tool): Tests are executed by this system and it controls the behavior of the DUT. It handles both expected and unexpected behavior.

HTTP Proxy: provides facilitation in case of RTP and RTSP tunneling over HTTP.

Wireless Access Point: provides wireless connectivity to the devices that support wireless connection.

DNS Server: provides DNS related information to the connected devices.

DHCP Server: provides IPv4 Address to the connected devices.

NTP Server: provides time synchronization between ONVIF Client and DUT.

Switching Hub: provides network connectivity among all the test equipments in the test environment. All devices should be connected to the Switching Hub. When running multiple test instances in parallel on the same network, the Switching Hub should be configured to use filtering in order to avoid multicast traffic being flooded to all ports, because this may affect test stability.

Router: provides router advertisements for IPv6 configuration.

4.2 Prerequisites

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

- The DUT shall be configured with an IPv4 address.
- The DUT shall be IP reachable in the test configuration.
- The DUT shall be able to be discovered by the Test Tool.
- The DUT shall be configured with the time, i.e. manual configuration of UTC time and if NTP is supported by DUT, then NTP time shall be synchronized with NTP Server.

4.3 Test Policy

This section describes the test policies specific to the test case execution of each functional block.

The DUT shall adhere to the test policies defined in this section.

4.3.1 Capabilities

The test policies specific to the test case execution of Capabilities functional block:

- DUT shall give the Authentication Behavior Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.
- DUT shall support the following commands:
  - GetServices
  - GetServiceCapabilities
- The following tests are performed
  - Getting capabilities with GetServiceCapabilities command

- Getting capabilities with GetServices command

Please refer to Section 5.1 for Cabilities Test Cases.

4.3.2 Authentication Profile Info

The test policies specific to the test case execution of Authentication Profile Info functional block:

- DUT shall give the Authentication Behavior Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.
- DUT shall support the following commands:
  - GetAuthenticationProfileInfo
  - GetAuthenticationProfileInfoList
- Additionally, DUT shall support the following commands which will be used as supplementary during the testing:
  - GetServices
  - GetServiceCapabilities
  - CreateAuthenticationProfile
  - DeleteAuthenticationProfile
  - CreateSecurityLevel
  - GetSecurityLevelInfoList
  - DeleteSecurityLevel
- DUT shall not return more items in GetAuthenticationProfileInfo and GetAuthenticationProfileInfoList responses than specified in service capabilities by MaxLimit.
- DUT shall not return more items in GetAuthenticationProfileInfoList response than specified by Limit parameter in a request.
- DUT shall not return items with the same tokens in GetAuthenticationProfileInfoList responses for one authentication profile info list resieving.
- DUT shall not return more AuthenticationProfileInfo items in GetAuthenticationProfileInfoList responses than specified in service capabilities by MaxAuthenticationProfiles.

- DUT shall not return any fault if GetAuthenticationProfileInfo was invoked for non-exciting authentication profile token. Such tokens shall be ignored.
- DUT shall return SOAP 1.2 fault message (InvalidArgs/TooManyItems) if more items than MaxLimit was requested by GetAuthenticationProfileInfo command.
- The following tests are performed
  - Getting authentication profile info with GetAuthenticationProfileInfo command
  - Getting authentication profile info list with GetAuthenticationProfileInfoList command with using different Limit and NextReference values
  - Getting authentication profile info with invalid authentication profile token
  - Getting authentication profile info with number of requested items is greater than MaxLimit

Please refer to Section 5.2 for Authentication Profile Info Test Cases.

4.3.3 Authentication Profile

The test policies specific to the test case execution of Authentication Profile functional block:

- DUT shall give the Authentication Behavior Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.
- DUT shall support the following commands:
  - GetAuthenticationProfiles
  - GetAuthenticationProfileList
- Additionally, DUT shall support the following commands which will be used as supplementary during the testing:
  - GetServices
  - GetServiceCapabilities
  - GetAuthenticationProfileInfoList
  - CreateAuthenticationProfile
  - DeleteAuthenticationProfile
  - CreateSecurityLevel
  - GetSecurityLevelInfoList

    - DeleteSecurityLevel
- DUT shall return only requested items in GetAuthenticationProfiles response that specified in GetAuthenticationProfiles request.
- DUT shall return all requested items in GetAuthenticationProfiles response that specified in GetAuthenticationProfiles request.
- DUT shall not return more items in GetAuthenticationProfiles responses than specified in service capabilities by MaxLimit.
- DUT shall return the same information in GetAuthenticationProfiles responses and in GetAuthenticationProfileInfoList responses for the items with the same token.
- DUT shall not return more items in GetAuthenticationProfileList response than specified by Limit parameter in a request.
- DUT shall not return items with the same tokens in GetAuthenticationProfileList responses for one authentication profile list resieving.
- DUT shall return the same information in GetAuthenticationProfiles responses and in GetAuthenticationProfileList responses for the items with the same token.
- DUT shall return the same information in GetAuthenticationProfileList responses and in GetAuthenticationProfileInfoList responses for the items with the same token.
- DUT shall return the same authentication profiles in GetAuthenticationProfileList responses and in GetAuthenticationProfileInfoList responses.
- DUT shall return SOAP 1.2 fault message (InvalidArgs/TooManyItems) if more items than MaxLimit was requested by GetAuthenticationProfiles command.
- The following tests are performed
    - Getting authentication profile with GetSchedule command and test that it includes the same information with GetAuthenticationProfileInfoList command
    - Getting authentication profile info list with GetAuthenticationProfileList command with using different Limit and NextReference values and test that it includes the same information with GetAuthenticationProfileInfoList command
    - Getting authentication profiles with invalid authentication profile token
    - Getting authentication profiles with number of requested items is greater than MaxLimit

Please refer to Section 5.3 for Authentication Profile Test Cases.

4.3.4 Authentication Profile Management

The test policies specific to the test case execution of Authentication Profile Management functional block:

- DUT shall give the Authentication Behavior Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.
- DUT shall support the following commands and notification topics:
  - CreateAuthenticationProfile
  - ModifyAuthenticationProfile
  - SetAuthenticationProfile
  - DeleteAuthenticationProfile
  - tns1:Configuration/AuthenticationProfile/Changed
  - tns1:Configuration/AuthenticationProfile/Removed
- Additionally, DUT shall support the following commands which will be used as supplementary during the testing:
  - GetServices
  - GetServiceCapabilities
  - GetAuthenticationProfiles
  - GetAuthenticationProfileInfo
  - GetAuthenticationProfileList
  - GetAuthenticationProfileInfoList
  - CreateSecurityLevel
  - GetSecurityLevelInfoList
  - DeleteSecurityLevel
  - GetScheduleInfoList
  - GetServiceCapabilities (Schedule Service)
  - CreateSchedule

- DeleteSchedule

- The DUT shall support creation of authentication profile with sending tns1:Configuration/AuthenticationProfile/Changed notification.
- The DUT shall support modification of authentication profile with sending tns1:Configuration/AuthenticationProfile/Changed notification.
- The DUT shall support deletion of authentication profile with sending tns1:Configuration/AuthenticationProfile/Removed notification.
- DUT shall return SOAP 1.2 fault message (InvalidArgVal) if authentication profile token is specified in CreateAuthenticationProfile request.
- DUT should return SOAP 1.2 fault message (InvalidArgVal/NotFound) if ModifyAuthenticationProfile or DeleteAuthenticationProfile command was invoked for non-exciting authentication profile token token.
- DUT should return SOAP 1.2 fault message (CapabilityViolated/MaxPoliciesPerAuthenticationProfile) if MaxPoliciesPerAuthenticationProfile capability was violated for CreateAuthenticationProfile or ModifyAuthenticationProfile command.
- If DUT supports token supplying as indicated by ClientSuppliedTokenSupported capability:
  - The DUT shall support creation or update of authentication profile by set command with sending tns1:Configuration/AuthenticationProfile/Changed notification.
  - DUT shall return SOAP 1.2 fault message (InvalidArgVal) if authentication profile token is not specified in SetAuthenticationProfile request.
  - DUT should return SOAP 1.2 fault message (CapabilityViolated/MaxPoliciesPerAuthenticationProfile) if MaxPoliciesPerAuthenticationProfile capability was violated for SetAuthenticationProfile command.
- The following tests are performed:
  - Creating authentication profile with CreateAuthenticationProfile command with empty token and test that corresponding notification message is received:
    - without any authentication policies
    - with authentication policies
  - Modifying authentication profile with ModifyAuthenticationProfile command and test that corresponding notification message is received

- Deleting authentication profile with DeleteAuthenticationProfile command and test that corresponding notification message is received
- Creating authentication profile with CreateAuthenticationProfile command with specified token
- Creating authentication profile with CreateAuthenticationProfile command with maximum number of security policies and with violated MaxPoliciesPerAuthenticationProfile capability
- Modifying authentication profile with ModifyAuthenticationProfile command with invalid token
- Modifying authentication profile with ModifyAuthenticationProfile command with maximum number of security policies and with violated MaxPoliciesPerAuthenticationProfile capability
- Deleting authentication profile with DeleteAuthenticationProfile command with invalid token
- Deleting authentication profile with DeleteAuthenticationProfile command with empty token
- If DUT supports token supplying as indicated by ClientSuppliedTokenSupported capability:
  - Creating authentication profile with SetAuthenticationProfile command with empty token and test that corresponding notification message is received:
    - without any authentication policies
    - with authentication policies
  - Modifying authentication profile with SetAuthenticationProfile command and test that corresponding notification message is received
  - Setting authentication profile with SetAuthenticationProfile command with maximum number of security policies and with violated MaxPoliciesPerAuthenticationProfile capability
  - Setting authentication profile with SetAuthenticationProfile command with epmty token

Please refer to Section 5.4 for Authentication Profile Management Test Cases.

4.3.5 Security Level Info

The test policies specific to the test case execution of Security Level Info functional block:

- DUT shall give the Authentication Behavior Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.
- DUT shall support the following commands:
  - GetSecurityLevelInfo
  - GetSecurityLevelInfoList
- Additionally, DUT shall support the following commands which will be used as supplementary during the testing:
  - GetServices
  - GetServiceCapabilities
  - CreateSecurityLevel
  - DeleteSecurityLevel
- DUT shall not return more items in GetSecurityLevelInfo and GetSecurityLevelInfoList responses than specified in service capabilities by MaxLimit.
- DUT shall not return more items in GetSecurityLevelInfoList response than specified by Limit parameter in a request.
- DUT shall not return items with the same tokens in GetSecurityLevelInfoList responses for one security level info list resieving.
- DUT shall not return more SecurityLevelInfo items in GetSecurityLevelInfoList responses than specified in service capabilities by MaxSecurityLevels.
- DUT shall not return any fault if GetSecurityLevelInfo was invoked for non-exciting security level token. Such tokens shall be ignored.
- DUT shall return SOAP 1.2 fault message (InvalidArgs/TooManyItems) if more items than MaxLimit was requested by GetSecurityLevelInfo command.
- The following tests are performed
  - Getting security level info with GetSecurityLevelInfo command
  - Getting security level info list with GetSecurityLevelInfoList command with using different Limit and NextReference values

- Getting security level info with invalid security level token
- Getting security level info with number of requested items is greater than MaxLimit

Please refer to Section 5.5 for Security Level Info Test Cases.

4.3.6 Security Level

The test policies specific to the test case execution of Security Level functional block:

- DUT shall give the Authentication Behavior Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.
- DUT shall support the following commands:
  - GetSecurityLevels
  - GetSecurityLevelList
- Additionally, DUT shall support the following commands which will be used as supplementary during the testing:
  - GetServices
  - GetServiceCapabilities
  - GetSecurityLevelInfoList
  - CreateSecurityLevel
  - DeleteSecurityLevel
- DUT shall return only requested items in GetSecurityLevels response that specified in GetSecurityLevels request.
- DUT shall return all requested items in GetSecurityLevels response that specified in GetSecurityLevels request.
- DUT shall not return more items in GetSecurityLevels responses than specified in service capabilities by MaxLimit.
- DUT shall return the same information in GetSecurityLevels responses and in GetSecurityLevelInfoList responses for the items with the same token.
- DUT shall not return more items in GetSecurityLevelList response than specified by Limit parameter in a request.

- DUT shall not return items with the same tokens in GetSecurityLevelList responses for one security level list resieving.
- DUT shall return the same information in GetSecurityLevels responses and in GetSecurityLevelList responses for the items with the same token.
- DUT shall return the same information in GetSecurityLevelList responses and in GetSecurityLevelInfoList responses for the items with the same token.
- DUT shall return the same security levels in GetSecurityLevelList responses and in GetSecurityLevelInfoList responses.
- DUT shall return SOAP 1.2 fault message (InvalidArgs/TooManyItems) if more items than MaxLimit was requested by GetSecurityLevels command.
- The following tests are performed
  - Getting security level with GetSchedule command and test that it includes the same information with GetSecurityLevelInfoList command
  - Getting security level info list with GetSecurityLevelList command with using different Limit and NextReference values and test that it includes the same information with GetSecurityLevelInfoList command
  - Getting security levels with invalid security level token
  - Getting security levels with number of requested items is greater than MaxLimit

Please refer to Section 5.6 for Security Level Test Cases.

4.3.7 Security Level Management

The test policies specific to the test case execution of Security Level Management functional block:

- DUT shall give the Authentication Behavior Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.
- DUT shall support the following commands and notification topics:
  - CreateSecurityLevel
  - ModifySecurityLevel
  - SetSecurityLevel
  - DeleteSecurityLevel

  - tns1:Configuration/SecurityLevel/Changed
  - tns1:Configuration/SecurityLevel/Removed
- Additionally, DUT shall support the following commands which will be used as supplementary during the testing:
  - GetServices
  - GetServiceCapabilities
  - GetSecurityLevels
  - GetSecurityLevelInfo
  - GetSecurityLevelList
  - GetSecurityLevelInfoList
- The DUT shall support creation of security level with sending tns1:Configuration/SecurityLevel/Changed notification.
- The DUT shall support modification of security level with sending tns1:Configuration/SecurityLevel/Changed notification.
- The DUT shall support deletion of security level with sending tns1:Configuration/SecurityLevel/Removed notification.
- DUT shall return SOAP 1.2 fault message (InvalidArgVal) if security level token is specified in CreateSecurityLevel request.
- DUT should return SOAP 1.2 fault message (InvalidArgVal/DuplicatePriority) if duplicated priority is specified in CreateSecurityLevel or ModifySecurityLevel request.
- DUT should return SOAP 1.2 fault message (InvalidArgVal/NotFound) if ModifySecurityLevel or DeleteSecurityLevel command was invoked for non-exciting security level token token.
- DUT should return SOAP 1.2 fault message (CapabilityViolated/MaxRecognitionGroupsPerSecurityLevel) if MaxRecognitionGroupsPerSecurityLevel capability was violated for CreateSecurityLevel or ModifySecurityLevel command.
- DUT should return SOAP 1.2 fault message (CapabilityViolated/MaxRecognitionMethodsPerRecognitionGroup) if MaxRecognitionMethodsPerRecognitionGroup capability was violated for CreateSecurityLevel or ModifySecurityLevel command.
- If DUT supports token supplying as indicated by ClientSuppliedTokenSupported capability:

- The DUT shall support creation or update of security level by set command with sending tns1:Configuration/SecurityLevel/Changed notification.
- DUT shall return SOAP 1.2 fault message (InvalidArgVal) if security level token is not specified in SetSecurityLevel request.
- DUT should return SOAP 1.2 fault message (InvalidArgVal/DuplicatePriority) if duplicated priority is specified in SetSecurityLevel request.
- DUT should return SOAP 1.2 fault message (CapabilityViolated/MaxRecognitionGroupsPerSecurityLevel) if MaxRecognitionGroupsPerSecurityLevel capability was violated for SetSecurityLevel command.
- DUT should return SOAP 1.2 fault message (CapabilityViolated/MaxRecognitionMethodsPerRecognitionGroup) if MaxRecognitionMethodsPerRecognitionGroup capability was violated for SetSecurityLevel command.

- The following tests are performed:
  - Creating security level with CreateSecurityLevel command with empty token and test that corresponding notification message is received:
    - without any recognition groups
    - without any recognition methods
    - with any recognition methods
  - Modifying security level with ModifySecurityLevel command and test that corresponding notification message is received
  - Deleting security level with DeleteSecurityLevel command and test that corresponding notification message is received
  - Creating security level with CreateSecurityLevel command with specified token
  - Creating security level with CreateSecurityLevel command with maximum number of recognition groups and with violated MaxRecognitionGroupsPerSecurityLevel capability
  - Creating security level with CreateSecurityLevel command with maximum number of recognition methods and with violated MaxRecognitionMethodsPerRecognitionGroup capability
  - Creating security level with CreateSecurityLevel command with duplicated priority

- Modifying security level with ModifySecurityLevel command with invalid token
- Modifying security level with ModifySecurityLevel command with maximum number of recognition groups and with violated MaxRecognitionGroupsPerSecurityLevel capability
- Modifying security level with ModifySecurityLevel command with maximum number of recognition methods and with violated MaxRecognitionMethodsPerRecognitionGroup capability
- Modifying security level with ModifySecurityLevel command with duplicated priority
- Deleting security level with DeleteSecurityLevel command with invalid token
- Deleting security level with DeleteSecurityLevel command with empty token
- If DUT supports token supplying as indicated by ClientSuppliedTokenSupported capability:
  - Creating security level with SetSecurityLevel command with empty token and test that corresponding notification message is received:
    - without any recognition groups
    - without any recognition methods
    - with any recognition methods
  - Modifying security level with SetSecurityLevel command and test that corresponding notification message is received
  - Setting security level with SetSecurityLevel command with maximum number of recognition groups and with violated MaxRecognitionGroupsPerSecurityLevel capability
  - Setting security level with SetSecurityLevel command with maximum number of recognition methods and with violated MaxRecognitionMethodsPerRecognitionGroup capability
  - Setting security level with SetSecurityLevel command with duplicated priority
  - Setting security level with SetSecurityLevel command with epmty token

Please refer to Section 5.7 for Security Level Management Test Cases.

4.3.8 Authentication Behavior Events

The test policies specific to the test case execution of Authentication Behavior Events functional block:

- DUT shall give the Authentication Behavior Service and Event Service entry points by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.
- DUT shall support the following commands and notification topics:
  - GetEventProperties
  - tns1:Configuration/AuthenticationProfile/Changed
  - tns1:Configuration/AuthenticationProfile/Removed
  - tns1:Configuration/SecurityLevel/Changed
  - tns1:Configuration/SecurityLevel/Removed
- Additionally, DUT shall support the following commands which will be used as supplementary during the testing:
  - GetServices
- The following tests are performed
  - Getting event properties with GetEventProperties command for the following notification topics:
    - tns1:Configuration/AuthenticationProfile/Changed
    - tns1:Configuration/AuthenticationProfile/Removed
    - tns1:Configuration/SecurityLevel/Changed
    - tns1:Configuration/SecurityLevel/Removed

Please refer to Section 5.8 for Authentication Behavior Events Test Cases.

5 Authentication Profile Test Cases

5.1 Capabilities

5.1.1 AUTHENTICATION BEHAVIOR SERVICE CAPABILITIES

Test Case ID: AUTH_BEHAVIOR-1-1-1

Specification Coverage: ServiceCapabilities (ONVIF Authentication Behavior Service Specification), GetServiceCapabilities command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetServiceCapabilities (for Authentication Behavior Service)

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify that Authentication Behavior Service is received using GetServices request, to verify DUT Authentication Behavior Service Capabilities, and to verify Get Services and Authentication Behavior Service Capabilities consistency.

Pre-Requisite: Authentication Behavior Service is received from the DUT

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes **GetServices** message with parameters:
   - IncludeCapability := false
4. The DUT responds with a **GetServicesResponse** message with parameters:
   - Service list =: *listOfServicesWithoutCapabilities*
5. If *listOfServicesWithoutCapabilities* does not contain item with Namespace = "http://www.onvif.org/ver10/authenticationbehavior/wsdl", FAIL the test, restore the DUT state, and skip other steps.
6. Set *authServ* := item from *listOfServicesWithoutCapabilities* list with Namespace = "http://www.onvif.org/ver10/authenticationbehavior/wsdl".

7. If *authServ*.Capabilities is specified, FAIL the test, restore the DUT state, and skip other steps.
8. ONVIF Client invokes **GetServices** with parameters
   - IncludeCapability := true
9. The DUT responds with a GetServicesResponse message with parameters
   - Services list =: *servicesList*
10. ONVIF Client selects Service with Service.Namespace = "http://www.onvif.org/ver10/authenticationbehavior/wsdl":
    - Services list [Namespace = "http://www.onvif.org/ver10/authenticationbehavior/wsdl"] =: *authServ*
11. ONVIF Client invokes **GetServiceCapabilities**.
12. The DUT responds with a **GetServiceCapabilitiesResponse** message with parameters
    - Capabilities =: *cap*
13. If *cap* differs from authServ.Capabilities.Capabilities, FAIL the test, restore the DUT state, and skip other steps.

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send GetServiceCapabilitiesResponse message.
- The DUT did not send GetServicesResponse message.

Note: The following fields are compared at step 13:

- MaxLimit
- MaxAuthenticationProfiles
- MaxPoliciesPerAuthenticationProfile
- MaxSecurityLevels
- MaxRecognitionGroupsPerSecurityLevel
- MaxRecognitionMethodsPerRecognitionGroup

- ClientSuppliedTokenSupported
- SupportedAuthenticationModes

5.2 Authentication Profile Info

5.2.1 GET AUTHENTICATION PROFILE INFO

Test Case ID: AUTH_BEHAVIOR-2-1-1

Specification Coverage: AuthenticationProfileInfo (ONVIF Authentication Behavior Service Specification), GetAuthenticationProfileInfo command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetAuthenticationProfileInfo

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Authentication Profile Info.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of authentication profiles by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - out *authProfileInfoCompleteList* - complete list of authentication profiles information
   - out *createdAuthProfileTokensList* - list of created authentication profiles tokens
   - out *securityLevelToken* - created security level token (if any)
   - out *cap* - Authentication Behavior Service capabilities
4. Set *tokenList* := [subset of *authProfileInfoCompleteList*.token values with items number equal to *cap*.MaxLimit]
5. ONVIF client invokes **GetAuthenticationProfileInfo** with parameters
   - Token list := *tokenList*

6. The DUT responds with **GetAuthenticationProfileInfoResponse** message with parameters
   - AuthenticationProfileInfo list =: *authProfileInfoList1*
7. If *authProfileInfoList1* does not contain AuthenticationProfileInfo item for each token from *tokenList*, FAIL the test, restore the DUT state, and skip other steps.
8. If *authProfileInfoList1* contains at least two AuthenticationProfileInfo items with equal token, FAIL the test, restore the DUT state, and skip other steps.
9. If *authProfileInfoList1* contains other AuthenticationProfileInfo items than listed in *tokenList*, FAIL the test, restore the DUT state, and skip other steps.
10. For each AuthenticationProfileInfo.token *token* from *authProfileInfoCompleteList* repeat the following steps:
    10.1. ONVIF client invokes **GetAuthenticationProfileInfo** with parameters
    - Token[0] := *token*

    10.2. The DUT responds with **GetAuthenticationProfileInfoResponse** message with parameters
    - AuthenticationProfileInfo list =: *authProfileInfoList2*

    10.3. If *authProfileInfoList2* does not contain only one AuthenticationProfileInfo item with token equal to *token*, FAIL the test, restore the DUT state, and skip other steps.

    10.4. If *authProfileInfoList2*[0] item is not equal to *authProfileInfoCompleteList*[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.
11. Remove all authentication profiles with tokens from *createdAuthProfileTokensList*.
12. If *securityLevelToken* is specified:
    12.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetAuthenticationProfileInfoResponse** message.

Note: If number of items in *authProfileInfoCompleteList* is less than *cap*.MaxLimit, then all *authProfileInfoCompleteList*.Token items shall be used for the step 4.

Note: The following fields are compared at step 10.4:

- AuthenticationProfileInfo:
  - token
  - Name
  - Description

5.2.2 GET AUTHENTICATION PROFILE INFO LIST - LIMIT

Test Case ID: AUTH_BEHAVIOR-2-1-2

Specification Coverage: AuthenticationProfileInfo (ONVIF Authentication Behavior Service Specification), GetAuthenticationProfileInfoList command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetAuthenticationProfileInfoList

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Authentication Profile Info List using Limit.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of authentication profiles by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - out *authProfileInfoCompleteList* - complete list of authentication profiles information
   - out *createdAuthProfileTokensList* - list of created authentication profiles tokens
   - out *securityLevelToken* - created security level token (if any)

- out *cap* - Authentication Behavior Service capabilities

4. ONVIF client invokes **GetAuthenticationProfileInfoList** with parameters
   - Limit := 1
   - StartReference skipped
5. The DUT responds with **GetAuthenticationProfileInfoListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - AuthenticationProfileInfo list =: *authProfileInfoList1*
6. If *authProfileInfoList1* contains more AuthenticationProfileInfo items than 1, FAIL the test, restore the DUT state, and skip other steps.
7. If *cap*.MaxLimit is equal to 1, go to step 16.
8. ONVIF client invokes **GetAuthenticationProfileInfoList** with parameters
   - Limit := *cap*.MaxLimit
   - StartReference skipped
9. The DUT responds with **GetAuthenticationProfileInfoListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - AuthenticationProfileInfo list =: *authProfileInfoList2*
10. If *authProfileInfoList2* contains more AuthenticationProfileInfo items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.
11. If *cap*.MaxLimit is equal to 2, go to step 16.
12. Set *limit* := [number between 1 and *cap*.MaxLimit].
13. ONVIF client invokes **GetAuthenticationProfileInfoList** with parameters
    - Limit := *limit*
    - StartReference skipped
14. The DUT responds with **GetAuthenticationProfileInfoListResponse** message with parameters

- NextStartReference =: *nextStartReference*
- AuthenticationProfileInfo list =: *authProfileInfoList3*

15. If *authProfileInfoList3* contains more AuthenticationProfileInfo items than *limit*, FAIL the test, restore the DUT state, and skip other steps.
16. Remove all authentication profiles with tokens from *createdAuthProfileTokensList*.
17. If *securityLevelToken* is specified:
    17.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetAuthenticationProfileInfoListResponse** message.

5.2.3 GET AUTHENTICATION PROFILE INFO LIST - START REFERENCE AND LIMIT

Test Case ID: AUTH_BEHAVIOR-2-1-3

Specification Coverage: AuthenticationProfileInfo (ONVIF Authentication Behavior Service Specification), GetAuthenticationProfileInfoList command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetAuthenticationProfileInfoList

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Authentication Profile Info List using StartReference and Limit.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of authentication profiles by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - out *authProfileInfoCompleteList* - complete list of authentication profiles information
   - out *createdAuthProfileTokensList* - list of created authentication profiles tokens
   - out *securityLevelToken* - created security level token (if any)
   - out *cap* - Authentication Behavior Service capabilities
4. ONVIF client invokes **GetAuthenticationProfileInfoList** with parameters
   - Limit := *cap*.MaxLimit
   - StartReference skipped
5. The DUT responds with **GetAuthenticationProfileInfoListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - AuthenticationProfileInfo list =: *authProfileInfoCompleteList1*
6. If *authProfileInfoCompleteList1* contains more AuthenticationProfileInfo items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.
7. Until *nextStartReference* is not null, repeat the following steps:
   7.1. ONVIF client invokes **GetAuthenticationProfileInfoList** with parameters
      - Limit := *cap*.MaxLimit
      - StartReference := *nextStartReference*
   7.2. The DUT responds with **GetAuthenticationProfileInfoListResponse** message with parameters
      - NextStartReference =: *nextStartReference*
      - AuthenticationProfileInfo list =: *authProfileInfoListPart*
   7.3. If *authProfileInfoListPart* contains more AuthenticationProfileInfo items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.

7.4. Set *authProfileInfoCompleteList1* := *authProfileInfoCompleteList1* + *authProfileInfoListPart*

8. If *authProfileInfoCompleteList1* contains at least two AuthenticationProfileInfo item with equal token, FAIL the test, restore the DUT state, and skip other steps.
9. If *cap*.MaxLimit is equal to 1, go to step 26.
10. ONVIF client invokes **GetAuthenticationProfileInfoList** with parameters
    - Limit := 1
    - StartReference skipped
11. The DUT responds with **GetAuthenticationProfileInfoListResponse** message with parameters
    - NextStartReference =: *nextStartReference*
    - AuthenticationProfileInfo list =: *authProfileInfoCompleteList2*
12. If *authProfileInfoCompleteList2* contains more AuthenticationProfileInfo items than 1, FAIL the test, restore the DUT state, and skip other steps.
13. Until *nextStartReference* is not null, repeat the following steps:
    13.1. ONVIF client invokes **GetAuthenticationProfileInfoList** with parameters
        - Limit := 1
        - StartReference := *nextStartReference*
    13.2. The DUT responds with **GetAuthenticationProfileInfoListResponse** message with parameters
        - NextStartReference =: *nextStartReference*
        - AuthenticationProfileInfo list =: *authProfileInfoListPart*
    13.3. If *authProfileInfoListPart* contains more AuthenticationProfileInfo items than 1, FAIL the test, restore the DUT state, and skip other steps.
    13.4. Set *authProfileInfoCompleteList2* := *authProfileInfoCompleteList2* + *authProfileInfoListPart*
14. If *authProfileInfoCompleteList2* contains at least two AuthenticationProfileInfo item with equal token, FAIL the test, restore the DUT state, and skip other steps.

15. If *authProfileInfoCompleteList2* does not contain all authentication profiles from *authProfileInfoCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.

16. If *authProfileInfoCompleteList2* contains authentication profiles other than authentication profiles from *authProfileInfoCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.

17. If *cap*.MaxLimit is equal to 2, go to step 26.

18. Set *limit* := [number between 1 and *cap*.MaxLimit]

19. ONVIF client invokes **GetAuthenticationProfileInfoList** with parameters

    - Limit := *limit*
    - StartReference skipped

20. The DUT responds with **GetAuthenticationProfileInfoListResponse** message with parameters

    - NextStartReference =: *nextStartReference*
    - AuthenticationProfileInfo list =: *authProfileInfoCompleteList3*

21. If *authProfileInfoCompleteList3* contains more AuthenticationProfileInfo items than *limit*, FAIL the test, restore the DUT state, and skip other steps.

22. Until *nextStartReference* is not null, repeat the following steps:

    22.1. ONVIF client invokes **GetAuthenticationProfileInfoList** with parameters

    - Limit := *limit*
    - StartReference := *nextStartReference*

    22.2. The DUT responds with **GetAuthenticationProfileInfoListResponse** message with parameters

    - NextStartReference =: *nextStartReference*
    - AuthenticationProfileInfo list =: *authProfileInfoListPart*

    22.3. If *authProfileInfoListPart* contains more AuthenticationProfileInfo items than *limit*, FAIL the test, restore the DUT state, and skip other steps.

    22.4. Set *authProfileInfoCompleteList3* := *authProfileInfoCompleteList3* + *authProfileInfoListPart*

23. If *authProfileInfoCompleteList3* contains at least two AuthenticationProfileInfo item with equal token, FAIL the test, restore the DUT state, and skip other steps.
24. If *authProfileInfoCompleteList3* does not contain all authentication profiles from *authProfileInfoCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.
25. If *authProfileInfoCompleteList3* contains authentication profiles other than authentication profiles from *authProfileInfoCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.
26. Remove all authentication profiles with tokens from *createdAuthProfileTokensList*.
27. If *securityLevelToken* is specified:
    27.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetAuthenticationProfileInfoListResponse** message.

5.2.4 GET AUTHENTICATION PROFILE INFO LIST - NO LIMIT

Test Case ID: AUTH_BEHAVIOR-2-1-4

Specification Coverage: AuthenticationProfileInfo (ONVIF Authentication Behavior Service Specification), GetAuthenticationProfileInfoList command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetAuthenticationProfileInfoList

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Authentication Profile Info List without using Limit.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of authentication profiles by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - out *authProfileInfoCompleteList* - complete list of authentication profiles information
   - out *createdAuthProfileTokensList* - list of created authentication profiles tokens
   - out *securityLevelToken* - created security level token (if any)
   - out *cap* - Authentication Behavior Service capabilities
4. ONVIF client invokes **GetAuthenticationProfileInfoList** with parameters
   - Limit skipped
   - StartReference skipped
5. The DUT responds with **GetAuthenticationProfileInfoListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - AuthenticationProfileInfo list =: *authProfileInfoCompleteList*
6. If *authProfileInfoCompleteList* contains more AuthenticationProfileInfo items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.
7. Until *nextStartReference* is not null, repeat the following steps:
   7.1. ONVIF client invokes **GetAuthenticationProfileInfoList** with parameters
      - Limit skipped
      - StartReference := *nextStartReference*
   7.2. The DUT responds with **GetAuthenticationProfileInfoListResponse** message with parameters
      - NextStartReference =: *nextStartReference*
      - AuthenticationProfileInfo list =: *authProfileInfoListPart*

7.3. If *authProfileInfoListPart* contains more AuthenticationProfileInfo items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.

7.4. Set *authProfileInfoCompleteList* := *authProfileInfoCompleteList* + *authProfileInfoListPart*

8. If *authProfileInfoCompleteList* contains at least two AuthenticationProfileInfo item with equal token, FAIL the test, restore the DUT state, and skip other steps.

9. If *authProfileInfoCompleteList* contains more AuthenticationProfileInfo items than *cap*.MaxAuthenticationProfiles, FAIL the test, restore the DUT state, and skip other steps.

10. Remove all authentication profiles with tokens from *createdAuthProfileTokensList*.

11. If *securityLevelToken* is specified:

11.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters

- in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetAuthenticationProfileInfoListResponse** message.

5.2.5 GET AUTHENTICATION PROFILE INFO WITH INVALID TOKEN

Test Case ID: AUTH_BEHAVIOR-2-1-5

Specification Coverage: AuthenticationProfileInfo (ONVIF Authentication Behavior Service Specification), GetAuthenticationProfileInfo command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetAuthenticationProfileInfo

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Authentication Profile Info with invalid token.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of authentication profiles by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - out *authProfileInfoCompleteList* - complete list of authentication profiles information
   - out *createdAuthProfileTokensList* - list of created authentication profiles tokens
   - out *securityLevelToken* - created security level token (if any)
   - out *cap* - Authentication Behavior Service capabilities
4. Set *invalidToken* := value not equal to any *authProfileInfoCompleteList*.token
5. ONVIF client invokes **GetAuthenticationProfileInfo** with parameters
   - Token list := *invalidToken*
6. The DUT responds with **GetAuthenticationProfileInfoResponse** message with parameters
   - AuthenticationProfileInfo list =: *authProfileInfoList*
7. If *authProfileInfoList* is not empty, FAIL the test, restore the DUT state, and skip other steps.
8. If *cap*.MaxLimit is less than 2, go to step 14.
9. ONVIF client invokes **GetAuthenticationProfileInfo** with parameters
   - Token[0]:= *invalidToken*
   - Token[1]:= *authProfileInfoCompleteList*[0].token
10. The DUT responds with **GetAuthenticationProfileInfoResponse** message with parameters
    - AuthenticationProfileInfo list =: *authProfileInfoList*
11. If *authProfileInfoList* is empty, FAIL the test, restore the DUT state, and skip other steps.
12. If *authProfileInfoList* contains more than one item, FAIL the test, restore the DUT state, and skip other steps.

13. If *authProfileInfoList*[0].token is not equal to *authProfileInfoCompleteList*[0].token, FAIL the test, restore the DUT state, and skip other steps.
14. Remove all authentication profiles with tokens from *createdAuthProfileTokensList*.
15. If *securityLevelToken* is specified:
    15.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetAuthenticationProfileInfoResponse** message.

5.2.6 GET AUTHENTICATION PROFILE INFO - TOO MANY ITEMS

Test Case ID: AUTH_BEHAVIOR-2-1-6

Specification Coverage: AuthenticationProfileInfo (ONVIF Authentication Behavior Service Specification), GetAuthenticationProfileInfo command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetAuthenticationProfileInfo

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Authentication Profile Info in case there are more items than MaxLimit in request.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.

3. ONVIF Client creates number of authentication profiles by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - out *authProfileInfoCompleteList* - complete list of authentication profiles information
   - out *createdAuthProfileTokensList* - list of created authentication profiles tokens
   - out *securityLevelToken* - created security level token (if any)
   - out *cap* - Authentication Behavior Service capabilities
4. If *authProfileInfoCompleteList*.token items number is less than *cap*.MaxLimit or equal to *cap*.MaxLimit, go to step 8.
5. Set *tokenList* := [subset of *authProfileInfoCompleteList*.token values with items number equal to *cap*.MaxLimit + 1]
6. ONVIF client invokes **GetAuthenticationProfileInfo** with parameters
   - Token list := *tokenList*
7. The DUT returns **env:Sender/ter:InvalidArgs/ter:TooManyItems** SOAP 1.2 fault.
8. Remove all authentication profiles with tokens from *createdAuthProfileTokensList*.
9. If *securityLevelToken* is specified:
   9.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
      - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgs/ter:TooManyItems** SOAP 1.2 fault.

5.3 Authentication Profile

5.3.1 GET AUTHENTICATION PROFILES

Test Case ID: AUTH_BEHAVIOR-3-1-1

Specification Coverage: AuthenticationProfile (ONVIF Authentication Behavior Service Specification), GetAuthenticationProfiles command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetAuthenticationProfiles

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Authentication Profile.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of authentication profiles by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - out *authProfileInfoCompleteList* - complete list of authentication profiles information
   - out *createdAuthProfileTokensList* - list of created authentication profiles tokens
   - out *securityLevelToken* - created security level token (if any)
   - out *cap* - Authentication Behavior Service capabilities
4. ONVIF Client retrieves a complete list of authentication profile info by following the procedure mentioned in Annex A.3 with the following input and output parameters
   - out *authProfileCompleteList* - complete list of authentication profiles information
5. Set *tokenList* := [subset of *authProfileCompleteList*.token values with items number equal to *cap*.MaxLimit].
6. ONVIF client invokes **GetAuthenticationProfiles** with parameters
   - Token list := *tokenList*
7. The DUT responds with **GetAuthenticationProfilesResponse** message with parameters
   - AuthenticationProfile list =: *authProfilesList1*
8. If *authProfilesList1* does not contain Authentication Profile item for each token from *tokenList*, FAIL the test, restore the DUT state, and skip other steps.

9. If *authProfilesList1* contains at least two Authentication Profile items with equal token, FAIL the test, restore the DUT state, and skip other steps.
10. If *authProfilesList1* contains other Authentication Profile items than listed in *tokenList*, FAIL the test, restore the DUT state, and skip other steps.
11. For each AuthenticationProfile.token *token* from *authProfileCompleteList* repeat the following steps:
    11.1. ONVIF client invokes **GetAuthenticationProfiles** with parameters
    - Token[0] := *token*

    11.2. The DUT responds with **GetAuthenticationProfilesResponse** message with parameters
    - AuthenticationProfile list =: *authProfilesList2*

    11.3. If *authProfilesList2* does not contain only one AuthenticationProfile item with token equal to *token*, FAIL the test, restore the DUT state, and skip other steps.

    11.4. If *authProfilesList2*[0] item does not have equal field values to *authProfileCompleteList*[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.
12. Remove all authentication profiles with tokens from *createdAuthProfileTokensList*.
13. If *securityLevelToken* is specified:
    13.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetAuthenticationProfilesResponse** message.

Note: If number of items in *authProfileCompleteList* is less than *cap*.MaxLimit, then all *authProfileCompleteList*.Token items shall be used for the step 5.

Note: The following fields are compared at step 11.4:

- AuthenticationProfile:
  - token
  - Name
  - Description
  - DefaultSecurityLevelToken
  - AuthenticationPolicy list
    - ScheduleToken
    - SecurityLevelConstraint list
      - ActiveRegularSchedule
      - ActiveSpecialDaySchedule
      - AuthenticationMode
      - SecurityLevelToken

5.3.2 GET AUTHENTICATION PROFILE LIST - LIMIT

Test Case ID: AUTH_BEHAVIOR-3-1-2

Specification Coverage: AuthenticationProfile (ONVIF Authentication Behavior Service Specification), GetAuthenticationProfileList command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetAuthenticationProfileList

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Authentication Profile List using Limit.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.

3. ONVIF Client creates number of authentication profiles by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - out *authProfileInfoCompleteList* - complete list of authentication profiles information
   - out *createdAuthProfileTokensList* - list of created authentication profiles tokens
   - out *securityLevelToken* - created security level token (if any)
   - out *cap* - Authentication Behavior Service capabilities
4. ONVIF client invokes **GetAuthenticationProfileList** with parameters
   - Limit := 1
   - StartReference skipped
5. The DUT responds with **GetAuthenticationProfileListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - AuthenticationProfile list =: *authProfilesList1*
6. If *authProfilesList1* contains more AuthenticationProfile items than 1, FAIL the test, restore the DUT state, and skip other steps.
7. If *cap*.MaxLimit is equal to 1, go to step 16.
8. ONVIF client invokes **GetAuthenticationProfileList** with parameters
   - Limit := *cap*.MaxLimit
   - StartReference skipped
9. The DUT responds with **GetAuthenticationProfileListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - AuthenticationProfile list =: *authProfilesList2*
10. If *authProfilesList2* contains more AuthenticationProfile items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.
11. If *cap*.MaxLimit is equal to 2, go to step 16.
12. Set *limit* := [number between 1 and *cap*.MaxLimit]

13. ONVIF client invokes **GetAuthenticationProfileList** with parameters
    - Limit := *limit*
    - StartReference skipped
14. The DUT responds with **GetAuthenticationProfileListResponse** message with parameters
    - NextStartReference =: *nextStartReference*
    - AuthenticationProfile list =: *authProfilesList3*
15. If *authProfilesList3* contains more AuthenticationProfile items than *limit*, FAIL the test, restore the DUT state, and skip other steps.
16. Remove all authentication profiles with tokens from *createdAuthProfileTokensList*.
17. If *securityLevelToken* is specified:
    17.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetAuthenticationProfileListResponse** message.

5.3.3 GET AUTHENTICATION PROFILE LIST - START REFERENCE AND LIMIT

Test Case ID: AUTH_BEHAVIOR-3-1-3

Specification Coverage: AuthenticationProfileInfo (ONVIF Authentication Behavior Service Specification), AuthenticationProfile (ONVIF Authentication Behavior Service Specification), GetAuthenticationProfileList command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetAuthenticationProfileList

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Authentication Profile List using StartReference and Limit.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of authentication profiles by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - out *authProfileInfoCompleteList* - complete list of authentication profiles information
   - out *createdAuthProfileTokensList* - list of created authentication profiles tokens
   - out *securityLevelToken* - created security level token (if any)
   - out *cap* - Authentication Behavior Service capabilities
4. ONVIF client invokes **GetAuthenticationProfileList** with parameters
   - Limit := *cap*.MaxLimit
   - StartReference skipped
5. The DUT responds with **GetAuthenticationProfileListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - AuthenticationProfile list =: *authProfileCompleteList1*
6. If *authProfileCompleteList1* contains more AuthenticationProfile items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.
7. Until *nextStartReference* is not null, repeat the following steps:
   7.1. ONVIF client invokes **GetAuthenticationProfileList** with parameters
      - Limit := *cap*.MaxLimit
      - StartReference := *nextStartReference*
   7.2. The DUT responds with **GetAuthenticationProfileListResponse** message with parameters

- NextStartReference =: *nextStartReference*
- AuthenticationProfile list =: *authProfilesListPart*

7.3. If *authProfilesListPart* contains more AuthenticationProfile items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.

7.4. Set *authProfileCompleteList1* := *authProfileCompleteList1* + *authProfilesListPart*.

8. If *authProfileCompleteList1* contains at least two AuthenticationProfile item with equal token, FAIL the test, restore the DUT state, and skip other steps.

9. If *cap*.MaxLimit is equal to 1, do the following steps:

9.1. ONVIF Client compares Authentication Profile List and Authentication Profile Info List by following the procedure mentioned in Annex A.7 with the following input and output parameters

- in *authProfileCompleteList1* - list of authentication profiles information
- in *authProfileInfoCompleteList* - list of authentication profiles

9.2. Skip other steps.

10. ONVIF client invokes **GetAuthenticationProfileList** with parameters

- Limit := 1
- StartReference skipped

11. The DUT responds with **GetAuthenticationProfileListResponse** message with parameters

- NextStartReference =: *nextStartReference*
- AuthenticationProfile list =: *authProfileCompleteList2*

12. If *authProfileCompleteList2* contains more AuthenticationProfile items than 1, FAIL the test, restore the DUT state, and skip other steps.

13. Until *nextStartReference* is not null, repeat the following steps:

13.1. ONVIF client invokes **GetAuthenticationProfileList** with parameters

- Limit := 1
- StartReference := *nextStartReference*

13.2. The DUT responds with **GetAuthenticationProfileListResponse** message with parameters

- NextStartReference =: *nextStartReference*
- AuthenticationProfile list =: *authProfilesListPart*

13.3. If *authProfilesListPart* contains more AuthenticationProfile items than 1, FAIL the test, restore the DUT state, and skip other steps.

13.4. Set *authProfileCompleteList2* := *authProfileCompleteList2* + *authProfilesListPart*

14. If *authProfileCompleteList2* contains at least two AuthenticationProfile item with equal token, FAIL the test, restore the DUT state, and skip other steps.

15. If *authProfileCompleteList2* does not contain all authentication profiles from *authProfileCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.

16. If *authProfileCompleteList2* contains authentication profiles other than authentication profiles from *authProfileCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.

17. If *cap*.MaxLimit is equal to 2 do the following steps:

17.1. ONVIF Client compares Authentication Profile List and Authentication Profile Info List by following the procedure mentioned in Annex A.7 with the following input and output parameters

- in *authProfileCompleteList2* - list of authentication profiles information
- in *authProfileInfoCompleteList* - list of authentication profiles

17.2. Skip other steps.

18. Set *limit* := [number between 1 and *cap*.MaxLimit].

19. ONVIF client invokes **GetAuthenticationProfileList** with parameters

- Limit := *limit*
- StartReference skipped

20. The DUT responds with **GetAuthenticationProfileListResponse** message with parameters

- NextStartReference =: *nextStartReference*

- AuthenticationProfile list =: *authProfileCompleteList3*

21. If *authProfileCompleteList3* contains more AuthenticationProfile items than *limit*, FAIL the test, restore the DUT state, and skip other steps.

22. Until *nextStartReference* is not null, repeat the following steps:

    22.1. ONVIF client invokes **GetAuthenticationProfileList** with parameters

    - Limit := *limit*
    - StartReference := *nextStartReference*

    22.2. The DUT responds with **GetAuthenticationProfileListResponse** message with parameters

    - NextStartReference =: *nextStartReference*
    - AuthenticationProfile list =: *authProfilesListPart*

    22.3. If *authProfilesListPart* contains more AuthenticationProfile items than *limit*, FAIL the test, restore the DUT state, and skip other steps.

    22.4. Set *authProfileCompleteList3* := *authProfileCompleteList3* + *authProfilesListPart*

23. If *authProfileCompleteList3* contains at least two AuthenticationProfile item with equal token, FAIL the test, restore the DUT state, and skip other steps.

24. If *authProfileCompleteList3*does not contain all authentication profiles from *authProfileCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.

25. If *authProfileCompleteList3* contains authentication profiles other than authentication profiles from *authProfileCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.

26. ONVIF Client compares Authentication Profile List and Authentication Profile Info List by following the procedure mentioned in Annex A.7 with the following input and output parameters

    - in *authProfileCompleteList3* - list of authentication profiles information
    - in *authProfileInfoCompleteList* - list of authentication profiles

27. Remove all authentication profiles with tokens from *createdAuthProfileTokensList*.

28. If *securityLevelToken* is specified:

28.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters

- in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetAuthenticationProfileListResponse** message.

5.3.4 GET AUTHENTICATION PROFILE LIST - NO LIMIT

Test Case ID: AUTH_BEHAVIOR-3-1-4

Specification Coverage: AuthenticationProfileInfo (ONVIF Authentication Behavior Service Specification), AuthenticationProfile (ONVIF Authentication Behavior Service Specification), GetAuthenticationProfileList command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetAuthenticationProfileList

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Authentication Profile List without using Limit.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of authentication profiles by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - out *authProfileInfoCompleteList* - complete list of authentication profiles information
   - out *createdAuthProfileTokensList* - list of created authentication profiles tokens
   - out *securityLevelToken* - created security level token (if any)
   - out *cap* - Authentication Behavior Service capabilities

4. ONVIF client invokes **GetAuthenticationProfileList** with parameters
   - Limit skipped
   - StartReference skipped
5. The DUT responds with **GetAuthenticationProfileListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - AuthenticationProfile list =: *authProfileCompleteList*
6. If *authProfileCompleteList* contains more AuthenticationProfile items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.
7. Until *nextStartReference* is not null, repeat the following steps:
   7.1. ONVIF client invokes **GetAuthenticationProfileList** with parameters
      - Limit skipped
      - StartReference := *nextStartReference*
   7.2. The DUT responds with **GetAuthenticationProfileListResponse** message with parameters
      - NextStartReference =: *nextStartReference*
      - AuthenticationProfile list =: *authProfilesListPart*
   7.3. If *authProfilesListPart* contains more AuthenticationProfile items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.
   7.4. Set *authProfileCompleteList* := *authProfileCompleteList* + *authProfilesListPart*
8. If *authProfileCompleteList* contains at least two AuthenticationProfile item with equal token, FAIL the test, restore the DUT state, and skip other steps.
9. ONVIF Client compares Authentication Profile List and Authentication Profile Info List by following the procedure mentioned in Annex A.7 with the following input and output parameters
   - in *authProfileCompleteList* - list of authentication profiles information
   - in *authProfileInfoCompleteList* - list of authentication profiles
10. Remove all authentication profiles with tokens from *createdAuthProfileTokensList*.

11. If *securityLevelToken* is specified:

    11.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters

    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetAuthenticationProfileListResponse** message.

5.3.5 GET AUTHENTICATION PROFILES WITH INVALID TOKEN

Test Case ID: AUTH_BEHAVIOR-3-1-5

Specification Coverage: AuthenticationProfile (ONVIF Authentication Behavior Service Specification), GetAuthenticationProfiles command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetAuthenticationProfiles

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Authentication Profile with invalid token.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of authentication profiles by following the procedure mentioned in Annex A.4 with the following input and output parameters

    - out *authProfileInfoCompleteList* - complete list of authentication profiles information

- out *createdAuthProfileTokensList* - list of created authentication profiles tokens
- out *securityLevelToken* - created security level token (if any)
- out *cap* - Authentication Behavior Service capabilities

4. Set *invalidToken* := value not equal to any *authProfileInfoCompleteList*.token.
5. ONVIF client invokes **GetAuthenticationProfiles** with parameters
   - Token list := *invalidToken*
6. The DUT responds with **GetAuthenticationProfilesResponse** message with parameters
   - AuthenticationProfile list =: *authProfilesList*
7. If *authProfilesList* is not empty, FAIL the test, restore the DUT state, and skip other steps.
8. If *cap*.MaxLimit is less than 2, go to step 14.
9. ONVIF client invokes **GetAuthenticationProfileInfo** with parameters
   - Token[0] := *invalidToken*
   - Token[1] := *authProfileInfoCompleteList*[0].token
10. The DUT responds with **GetAuthenticationProfileInfoResponse** message with parameters
    - AuthenticationProfileInfo list =: *authProfilesList*
11. If *authProfilesList* is empty, FAIL the test, restore the DUT state, and skip other steps.
12. If *authProfilesList* contains more than one item, FAIL the test, restore the DUT state, and skip other steps.
13. If *authProfilesList*[0].token is not equal to *authProfileInfoCompleteList*[0].token, FAIL the test, restore the DUT state, and skip other steps.
14. Remove all authentication profiles with tokens from *createdAuthProfileTokensList*.
15. If *securityLevelToken* is specified:
    15.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetAuthenticationProfilesResponse** message.

5.3.6 GET AUTHENTICATION PROFILE - TOO MANY ITEMS

Test Case ID: AUTH_BEHAVIOR-3-1-6

Specification Coverage: AuthenticationProfile (ONVIF Authentication Behavior Service Specification), GetAuthenticationProfiles command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetAuthenticationProfiles

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Authentication Profile in case there are more items than MaxLimit in request.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of authentication profiles by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - out *authProfileInfoCompleteList* - complete list of authentication profiles information
   - out *createdAuthProfileTokensList* - list of created authentication profiles tokens
   - out *securityLevelToken* - created security level token (if any)
   - out *cap* - Authentication Behavior Service capabilities
4. If *authProfileCompleteList*.token items number is less than *cap*.MaxLimit or equal to *cap*.MaxLimit, go to step 8.

5. Set *tokenList* := [subset of *authProfileInfoCompleteList*.token values with items number equal to *cap*.MaxLimit + 1].
6. ONVIF client invokes **GetAuthenticationProfiles** with parameters
   - Token list := *tokenList*
7. The DUT returns **env:Sender/ter:InvalidArgs/ter:TooManyItems** SOAP 1.2 fault.
8. Remove all authentication profiles with tokens from *createdAuthProfileTokensList*.
9. If *securityLevelToken* is specified:
   9.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
   - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgs/ter:TooManyItems** SOAP 1.2 fault

5.4 Authentication Profile Management

5.4.1 CREATE AUTHENTICATION PROFILE WITHOUT AUTHENTICATION POLICIES

Test Case ID: AUTH_BEHAVIOR-4-1-1

Specification Coverage: AuthenticationProfileInfo (ONVIF Authentication Behavior Service Specification), AuthenticationProfile (ONVIF Authentication Behavior Service Specification), CreateAuthenticationProfile command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: CreateAuthenticationProfile

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify creation of authentication profile without any authentication policies and generating of appropriate notifications.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Event Service was received from the DUT. The DUT shall have enough free storage capacity for one additional Authentication Profile.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a complete list of authentication profile info by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out *authProfileInfoInitialList* - complete list of authentication profiles information
4. ONVIF Client find existing or create new security level by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *newSecurityLevel* - flag if new security level was created
5. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
   - in **"tns1:Configuration/AuthenticationProfile/Changed"** - Notification Topic
   - out *s* - Subscription reference
   - out *currentTime* - current time for the DUT
   - out *terminationTime* - Subscription termination time
6. ONVIF client invokes **CreateAuthenticationProfile** with parameters
   - AuthenticationProfile.token := ""
   - AuthenticationProfile.Description := "Test Description"
   - AuthenticationProfile.Name := "Test Name"
   - AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
   - AuthenticationProfile.AuthenticationPolicy is skipped
7. The DUT responds with **CreateAuthenticationProfileResponse** message with parameters

- Token =: *authProfileToken*

8. ONVIF Client retrieves and checks **tns1:Configuration/AuthenticationProfile/Changed** event for the specified Authentication Profile token by following the procedure mentioned in Annex A.10 with the following input and output parameters
   - in *s* - Subscription reference
   - in *currentTime* - current time for the DUT
   - in *terminationTime* - subscription termination time
   - in *authProfileToken* - Authentication Profile token
9. ONVIF Client retrieves a authentication profile by following the procedure mentioned in Annex A.11 with the following input and output parameters
   - in *authProfileToken* - authentication profile token
   - out *authProfilesList* - authentication profile list
10. If *authProfilesList*[0] item does not have equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
11. ONVIF Client retrieves a authentication profile information by following the procedure mentioned in Annex A.12 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
    - out *authProfileInfoList* - authentication profile information list
12. If *authProfileInfoList*[0] item does not have equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
13. ONVIF Client retrieves a complete list of authentication profile info by following the procedure mentioned in Annex A.1 with the following input and output parameters
    - out *authProfileInfoCompleteList* - complete list of authentication profiles information
14. If *authProfileInfoCompleteList* does not have AuthenticationProfileInfo[token = *authProfileToken*] item with equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
15. ONVIF Client retrieves a complete list of authentication profiles by following the procedure mentioned in Annex A.3 with the following input and output parameters
    - out *authProfileCompleteList* - complete list of authentication profiles

16. If *authProfileCompleteList* does not have AuthenticationProfile[token = *authProfileToken*] item with equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
17. For each AuthenticationProfileInfo.token (*token*) from *authProfileInfoInitialList* do the following:
    17.1. If *authProfileCompleteList* does not have AuthenticationProfile[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.
18. ONVIF Client deletes a authentication profile by following the procedure mentioned in Annex A.13 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
19. If *newSecurityLevel* = true:
    19.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
        - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **CreateAuthenticationProfileResponse** message.

Note: The following fields are compared at steps 10 and 14:

- AuthenticationProfile:
  - token
  - Name
  - Description
  - DefaultSecurityLevelToken
  - AuthenticationPolicy list
    - ScheduleToken
    - SecurityLevelConstraint list

- ActiveRegularSchedule
- ActiveSpecialDaySchedule
- AuthenticationMode
- SecurityLevelToken

Note: The following fields are compared at step 12 and 16:

- AuthenticationProfileInfo:
  - token
  - Name
  - Description

5.4.2 CREATE AUTHENTICATION PROFILE WITH AUTHENTICATION POLICY

Test Case ID: AUTH_BEHAVIOR-4-1-2

Specification Coverage: AuthenticationProfileInfo (ONVIF Authentication Behavior Service Specification), AuthenticationProfile (ONVIF Authentication Behavior Service Specification), CreateAuthenticationProfile command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: CreateAuthenticationProfile

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify creation of authentication profile and generating of appropriate notifications.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Schedule Service is received from the DUT. Event Service was received from the DUT. The DUT shall have enough free storage capacity for one additional Authentication Profile.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters

- out *cap* - Authentication Behavior Service capabilities

4. ONVIF Client retrieves a complete list of authentication profile info by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out *authProfileInfoInitialList* - complete list of authentication profiles information
5. ONVIF Client find existing or create new security level by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *newSecurityLevel* - flag if new security level was created
6. ONVIF Client find existing or create new schedule by following the procedure mentioned in Annex A.14 with the following input and output parameters
   - out *scheduleToken* - schedule level token
   - out *newSchedule* - flag if new schedule was created
7. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
   - in **"tns1:Configuration/AuthenticationProfile/Changed"** - Notification Topic
   - out *s* - Subscription reference
   - out *currentTime* - current time for the DUT
   - out *terminationTime* - Subscription termination time
8. Set *authenticationMode* := *cap*.SupportedAuthenticationModes[0] (if *cap*.SupportedAuthenticationModes is skipped or empty, set *authenticationMode* := "pt:SingleCredential").
9. ONVIF client invokes **CreateAuthenticationProfile** with parameters
   - AuthenticationProfile.token := ""
   - AuthenticationProfile.Description := "Test Description"
   - AuthenticationProfile.Name := "Test Name"
   - AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
   - AuthenticationProfile.AuthenticationPolicy[0].ScheduleToken := *scheduleToken*

- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].ActiveRegularSchedule = true
- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].ActiveSpecialDaySchedule = true
- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].AuthenticationMode = *authenticationMode*
- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].SecurityLevelToken = *securityLevelToken*

10. The DUT responds with **CreateAuthenticationProfileResponse** message with parameters
    - Token =: *authProfileToken*
11. ONVIF Client retrieves and checks **tns1:Configuration/AuthenticationProfile/Changed** event for the specified Authentication Profile token by following the procedure mentioned in Annex A.10 with the following input and output parameters
    - in *s* - Subscription reference
    - in *currentTime* - current time for the DUT
    - in *terminationTime* - subscription termination time
    - in *authProfileToken* - Authentication Profile token
12. ONVIF Client deletes PullPoint subscription by following the procedure mentioned in Annex A.9 with the following input and output parameters
    - in *s* - Subscription reference
13. ONVIF Client retrieves a authentication profile by following the procedure mentioned in Annex A.11 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
    - out *authProfilesList* - authentication profile list
14. If *authProfilesList*[0] item does not have equal field values to values from step 9, FAIL the test, restore the DUT state, and skip other steps.
15. ONVIF Client retrieves a authentication profile information by following the procedure mentioned in Annex A.12 with the following input and output parameters
    - in *authProfileToken* - authentication profile token

- out *authProfileInfoList* - authentication profile information list

16. If *authProfileInfoList*[0] item does not have equal field values to values from step 9, FAIL the test, restore the DUT state, and skip other steps.
17. ONVIF Client retrieves a complete list of authentication profile info by following the procedure mentioned in Annex A.1 with the following input and output parameters
    - out *authProfileInfoCompleteList* - complete list of authentication profiles information
18. If *authProfileInfoCompleteList* does not have AuthenticationProfileInfo[token = *authProfileToken*] item with equal field values to values from step 9, FAIL the test, restore the DUT state, and skip other steps.
19. ONVIF Client retrieves a complete list of authentication profiles by following the procedure mentioned in Annex A.3 with the following input and output parameters
    - out *authProfileCompleteList* - complete list of authentication profiles
20. If *authProfileCompleteList* does not have AuthenticationProfile[token = *authProfileToken*] item with equal field values to values from step 9, FAIL the test, restore the DUT state, and skip other steps.
21. For each AuthenticationProfileInfo.token (*token*) from *authProfileInfoInitialList* do the following:
    21.1. If *authProfileCompleteList* does not have AuthenticationProfile[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.
22. ONVIF Client deletes a authentication profile by following the procedure mentioned in Annex A.13 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
23. If *newSchedule* = true:
    23.1. ONVIF Client deletes schedule by following the procedure mentioned in Annex A.23 with the following input and output parameters
        - in *scheduleToken* - schedule token
24. If *newSecurityLevel* = true:
    24.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
        - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **CreateAuthenticationProfileResponse** message.

Note: The following fields are compared at steps 14 and 18:

- AuthenticationProfile:
  - token
  - Name
  - Description
  - DefaultSecurityLevelToken
  - AuthenticationPolicy list
    - ScheduleToken
    - SecurityLevelConstraint list
      - ActiveRegularSchedule
      - ActiveSpecialDaySchedule
      - AuthenticationMode
      - SecurityLevelToken

Note: The following fields are compared at step 16 and 20:

- AuthenticationProfileInfo:
  - token
  - Name
  - Description

5.4.3 MODIFY AUTHENTICATION PROFILE

Test Case ID: AUTH_BEHAVIOR-4-1-3

Specification Coverage: AuthenticationProfileInfo (ONVIF Authentication Behavior Service Specification), AuthenticationProfile (ONVIF Authentication Behavior Service Specification), ModifyAuthenticationProfile command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: ModifyAuthenticationProfile

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify modifiing of authentication profile and generating of apropriate notifications.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Schedule Service is received from the DUT. Event Service was received from the DUT. The DUT shall have enough free storage capacity for one additional Authentication Profile.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a complete list of authentication profile info by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out *authProfileInfoInitialList* - complete list of authentication profiles information
4. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
5. ONVIF Client gets the schedule service capabilities by following the procedure mentioned in Annex A.18 with the following input and output parameters
   - out *capSchedule* - Schedule Service capabilities
6. ONVIF Client creates Authentication Profile by following the procedure mentioned in Annex A.16 with the following input and output parameters
   - in *cap* - authentication behavior service capabilities
   - out *authProfileToken* - authentication profile token
   - out *authProfile* - authentication profile
   - out *newSecurityLevel* - flag if new security level was created

- out *newSchedule* - flag if new schedule was created

7. Set *newSecurityLevel2* := false.
8. If *cap*.MaxSecurityLevels > 1:
   8.1. ONVIF Client creates security level by following the procedure mentioned in Annex A.17 with the following input and output parameters
      - out *securityLevelToken2* - security level token
   8.2. Set *newSecurityLevel2* := true.
9. Set *newSchedule2* := false.
10. If *capSchedule*.MaxSchedules > 1:
    10.1. ONVIF Client creates schedule by following the procedure mentioned in Annex A.20 with the following input and output parameters
       - out *scheduleToken2* - schedule token
    10.2. Set *newSchedule2* := true.
11. Set *authenticationMode0* := *authProfile*.AuthenticationPolicy[0].SecurityLevelConstraint[0].AuthenticationMode.
12. Set *authenticationMode1* := *cap*.SupportedAuthenticationModes[1] (if *cap*.SupportedAuthenticationModes is skipped or contains less than two items, set *authenticationMode* := *authenticationMode0*).
13. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
    - in **"tns1:Configuration/AuthenticationProfile/Changed"** - Notification Topic
    - out *s* - Subscription reference
    - out *currentTime* - current time for the DUT
    - out *terminationTime* - Subscription termination time
14. ONVIF client invokes **ModifyAuthenticationProfile** with parameters
    - AuthenticationProfile.token := *authProfileToken*
    - AuthenticationProfile.Description := "Test Description2"

- AuthenticationProfile.Name := "Test Name2"
- AuthenticationProfile.DefaultSecurityLevelToken := if *newSecurityLevel2* = true, then *securityLevelToken2*, else *securityLevelToken*
- AuthenticationProfile.AuthenticationPolicy[0].ScheduleToken := if *newSchedule2* = true, then *scheduleToken2*, else *scheduleToken*
- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].ActiveRegularSchedule := false
- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].ActiveSpecialDaySchedule := false
- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].AuthenticationMode := *authenticationMode1*
- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].SecurityLevelToken := if *newSecurityLevel2* = true, then *securityLevelToken2*, else *securityLevelToken*

15. The DUT responds with **ModifyAuthenticationProfileResponse** message.
16. ONVIF Client retrieves and checks **tns1:Configuration/AuthenticationProfile/Changed** event for the specified Authentication Profile token by following the procedure mentioned in Annex A.10 with the following input and output parameters
    - in *s* - Subscription reference
    - in *currentTime* - current time for the DUT
    - in *terminationTime* - subscription termination time
    - in *authProfileToken* - Authentication Profile token
17. ONVIF Client retrieves a authentication profile by following the procedure mentioned in Annex A.11 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
    - out *authProfilesList* - authentication profile list
18. If *authProfilesList*[0] item does not have equal field values to values from step 14, FAIL the test, restore the DUT state, and skip other steps.
19. ONVIF Client retrieves a authentication profile information by following the procedure mentioned in Annex A.12 with the following input and output parameters

- in *authProfileToken* - authentication profile token
- out *authProfileInfoList* - authentication profile information list

20. If *authProfileInfoList*[0] item does not have equal field values to values from step 14, FAIL the test, restore the DUT state, and skip other steps.
21. ONVIF client invokes **ModifyAuthenticationProfile** with parameters
    - AuthenticationProfile.token := *authProfileToken*
    - AuthenticationProfile.Description := "Test Description3"
    - AuthenticationProfile.Name := "Test Name3"
    - AuthenticationProfile.DefaultSecurityLevelToken := if *newSecurityLevel2* = true, then *securityLevelToken2*, else *securityLevelToken*
    - AuthenticationProfile.AuthenticationPolicy is skipped
22. The DUT responds with **ModifyAuthenticationProfileResponse** message.
23. ONVIF Client retrieves and checks **tns1:Configuration/AuthenticationProfile/Changed** event for the specified Authentication Profile token by following the procedure mentioned in Annex A.10 with the following input and output parameters
    - in *s* - Subscription reference
    - in *currentTime* - current time for the DUT
    - in *terminationTime* - subscription termination time
    - in *authProfileToken* - Authentication Profile token
24. ONVIF Client retrieves a authentication profile by following the procedure mentioned in Annex A.11 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
    - out *authProfilesList* - authentication profile list
25. If *authProfilesList*[0] item does not have equal field values to values from step 21, FAIL the test, restore the DUT state, and skip other steps.
26. ONVIF Client retrieves a authentication profile information by following the procedure mentioned in Annex A.12 with the following input and output parameters
    - in *authProfileToken* - authentication profile token

- out *authProfileInfoList* - authentication profile information list

27. If *authProfileInfoList*[0] item does not have equal field values to values from step 21, FAIL the test, restore the DUT state, and skip other steps.

28. If *cap*.MaxPoliciesPerAuthenticationProfile > 1:

    28.1. Set *authenticationMode2* := *cap*.SupportedAuthenticationModes[2] (if *cap*.SupportedAuthenticationModes is skipped or contains less than three items, set *authenticationMode* := *authenticationMode0*).

    28.2. ONVIF client invokes **ModifyAuthenticationProfile** with parameters

    - AuthenticationProfile.token := *authProfileToken*
    - AuthenticationProfile.Description := "Test Description4"
    - AuthenticationProfile.Name := "Test Name4"
    - AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
    - AuthenticationProfile.AuthenticationPolicy[0].ScheduleToken := *scheduleToken*
    - AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].ActiveRegularSchedule = false
    - AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].ActiveSpecialDaySchedul = false
    - AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].AuthenticationMode = *authenticationMode2*
    - AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].SecurityLevelToken = *securityLevelToken*
    - AuthenticationProfile.AuthenticationPolicy[1].ScheduleToken := if *newSchedule2* = true, then *scheduleToken2*, else *scheduleToken*
    - AuthenticationProfile.AuthenticationPolicy[1].SecurityLevelConstraint[0].ActiveRegularSchedule = false
    - AuthenticationProfile.AuthenticationPolicy[1].SecurityLevelConstraint[0].ActiveSpecialDaySchedul = false
    - AuthenticationProfile.AuthenticationPolicy[1].SecurityLevelConstraint[0].AuthenticationMode = *authenticationMode1*

- AuthenticationProfile.AuthenticationPolicy[1].SecurityLevelConstraint[0].SecurityLevelToken if *newSecurityLevel2* = true, then *securityLevelToken2*, else *securityLevelToken*

28.3. The DUT responds with **ModifyAuthenticationProfileResponse** message.

28.4. ONVIF Client retrieves and checks **tns1:Configuration/AuthenticationProfile/Changed** event for the specified Authentication Profile token by following the procedure mentioned in Annex A.10 with the following input and output parameters

- in *s* - Subscription reference
- in *currentTime* - current time for the DUT
- in *terminationTime* - subscription termination time
- in *authProfileToken* - Authentication Profile token

28.5. ONVIF Client retrieves a authentication profile by following the procedure mentioned in Annex A.11 with the following input and output parameters

- in *authProfileToken* - authentication profile token
- out *authProfilesList* - authentication profile list

28.6. If *authProfilesList*[0] item does not have equal field values to values from step 28.1, FAIL the test, restore the DUT state, and skip other steps.

28.7. ONVIF Client retrieves a authentication profile information by following the procedure mentioned in Annex A.12 with the following input and output parameters

- in *authProfileToken* - authentication profile token
- out *authProfileInfoList* - authentication profile information list

28.8. If *authProfileInfoList*[0] item does not have equal field values to values from step 28.1, FAIL the test, restore the DUT state, and skip other steps.

29. ONVIF Client deletes PullPoint subscription by following the procedure mentioned in Annex A.9 with the following input and output parameters

- in *s* - Subscription reference

30. ONVIF Client retrieves a complete list of authentication profile by following the procedure mentioned in Annex A.3 with the following input and output parameters

- out *authProfileUpdatedList* - complete list of authentication profiles information

31. If *authProfileUpdatedList* does not have AuthenticationProfile[token = *authProfileToken*] item, FAIL the test, restore the DUT state, and skip other steps.

32. For each AuthenticationProfile.token (*token*) from *authProfileInitialList* do the following:

    32.1. If *authProfileUpdatedList* does not have AuthenticationProfile[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.

33. ONVIF Client deletes a authentication profile by following the procedure mentioned in Annex A.13 with the following input and output parameters

    - in *authProfileToken* - authentication profile token

34. If *newSchedule* = true:

    34.1. ONVIF Client deletes schedule by following the procedure mentioned in Annex A.23 with the following input and output parameters

    - in *scheduleToken* - schedule token

35. If *newSecurityLevel* = true:

    35.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters

    - in *securityLevelToken* - security level token

36. If *newSchedule2* = true:

    36.1. ONVIF Client deletes schedule by following the procedure mentioned in Annex A.23 with the following input and output parameters

    - in *scheduleToken2* - schedule token

37. If *newSecurityLevel2* = true:

    37.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters

    - in *securityLevelToken2* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **ModifyAuthenticationProfileResponse** message.

Note: The following fields are compared at steps 18, 25, and 28.6:

- AuthenticationProfile:
  - token
  - Name
  - Description
  - DefaultSecurityLevelToken
  - AuthenticationPolicy list
    - ScheduleToken
    - SecurityLevelConstraint list
      - ActiveRegularSchedule
      - ActiveSpecialDaySchedule
      - AuthenticationMode
      - SecurityLevelToken

Note: The following fields are compared at step 20, 27, and 28.8:

- AuthenticationProfileInfo:
  - token
  - Name
  - Description

5.4.4 DELETE AUTHENTICATION PROFILE

Test Case ID: AUTH_BEHAVIOR-4-1-4

Specification Coverage: AuthenticationProfileInfo (ONVIF Authentication Behavior Service Specification), AuthenticationProfile (ONVIF Authentication Behavior Service Specification), DeleteAuthenticationProfile command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: DeleteAuthenticationProfile

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify deleting of authentication profile and generating of apropriate notifications.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Event Service was received from the DUT. The DUT shall have enough free storage capacity for one additional Authentication Profile.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
4. ONVIF Client retrieves a complete list of authentication profiles by following the procedure mentioned in Annex A.3 with the following input and output parameters
   - out *authProfileInitialList* - complete list of authentication profiles
5. ONVIF Client creates Authentication Profile by following the procedure mentioned in Annex A.16 with the following input and output parameters
   - in *cap* - authentication behavior service capabilities
   - out *authProfileToken* - authentication profile token
   - out *authProfile* - authentication profile
   - out *newSecurityLevel* - flag if new security level was created
   - out *newSchedule* - flag if new schedule was created
6. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
   - in **"tns1:Configuration/AuthenticationProfile/Removed"** - Notification Topic
   - out *s* - Subscription reference
   - out *currentTime* - current time for the DUT
   - out *terminationTime* - Subscription termination time

7. ONVIF client invokes **DeleteAuthenticationProfile** with parameters
   - AuthenticationProfile.token := *authProfileToken*
8. The DUT responds with **DeleteAuthenticationProfileResponse** message.
9. ONVIF Client retrieves and checks **tns1:Configuration/AuthenticationProfile/Removed** event for the specified Authentication Profile token by following the procedure mentioned in Annex A.21 with the following input and output parameters
   - in *s* - Subscription reference
   - in *currentTime* - current time for the DUT
   - in *terminationTime* - subscription termination time
   - in *authProfileToken* - Authentication Profile token
10. ONVIF Client deletes PullPoint subscription by following the procedure mentioned in Annex A.9 with the following input and output parameters
    - in *s* - Subscription reference
11. ONVIF Client retrieves a authentication profile by following the procedure mentioned in Annex A.11 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
    - out *authProfilesList* - authentication profile list
12. If *authProfilesList* is not empty, FAIL the test, restore the DUT state, and skip other steps.
13. ONVIF Client retrieves a authentication profile information by following the procedure mentioned in Annex A.12 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
    - out *authProfileInfoList* - authentication profile information list
14. If *authProfileInfoList* is not empty, FAIL the test, restore the DUT state, and skip other steps.
15. ONVIF Client retrieves a complete list of authentication profile info by following the procedure mentioned in Annex A.1 with the following input and output parameters
    - out *authProfileInfoList* - complete list of authentication profiles information
16. If *authProfileInfoList* contains AuthenticationProfileInfo.[token = *authProfileToken*] item, FAIL the test, restore the DUT state, and skip other steps.

17. ONVIF Client retrieves a complete list of authentication profiles by following the procedure mentioned in Annex A.3 with the following input and output parameters
    - out *authProfileList* - complete list of authentication profiles
18. If *authProfileList* contains AuthenticationProfile.[token = *authProfileToken*] item, FAIL the test, restore the DUT state, and skip other steps.
19. For each AuthenticationProfile.token (*token*) from *authProfileInitialList* do the following:
    19.1. If *authProfileList* does not have AuthenticationProfile[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.
20. If *newSchedule* = true:
    20.1. ONVIF Client deletes schedule by following the procedure mentioned in Annex A.23 with the following input and output parameters
    - in *scheduleToken* - schedule token
21. If *newSecurityLevel* = true:
    21.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **DeleteAuthenticationProfileResponse** message.

5.4.5 SET NEW AUTHENTICATION PROFILE WITHOUT AUTHENTICATION POLICIES

Test Case ID: AUTH_BEHAVIOR-4-1-5

Specification Coverage: AuthenticationProfileInfo (ONVIF Authentication Behavior Service Specification), AuthenticationProfile (ONVIF Authentication Behavior Service Specification), SetAuthenticationProfile command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: SetAuthenticationProfile

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify creation of authentication profile without any authentication policies and generating of appropriate notifications using SetAuthenticationProfile command.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Event Service was received from the DUT. Token supplying is supported by the DUT as indicated by ClientSuppliedTokenSupported capability. The DUT shall have enough free storage capacity for one additional Authentication Profile.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a complete list of authentication profile info by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out *authProfileInfoInitialList* - complete list of authentication profiles information
4. ONVIF Client find existing or create new security level by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *newSecurityLevel* - flag if new security level was created
5. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
   - in **"tns1:Configuration/AuthenticationProfile/Changed"** - Notification Topic
   - out *s* - Subscription reference
   - out *currentTime* - current time for the DUT
   - out *terminationTime* - Subscription termination time
6. Set *authProfileToken* := token that differs from tokens listed in *authProfileInfoInitialList*.
7. ONVIF client invokes **SetAuthenticationProfile** with parameters
   - AuthenticationProfile.token := *authProfileToken*
   - AuthenticationProfile.Description := "Test Description"

- AuthenticationProfile.Name := "Test Name"
- AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
- AuthenticationProfile.AuthenticationPolicy[0].ScheduleToken := *scheduleToken*
- AuthenticationProfile.AuthenticationPolicy is skipped

8. The DUT responds with **SetAuthenticationProfileResponse** message.
9. ONVIF Client retrieves a authentication profile by following the procedure mentioned in Annex A.11 with the following input and output parameters
   - in *authProfileToken* - authentication profile token
   - out *authProfilesList* - authentication profile list
10. If *authProfilesList*[0] item does not have equal field values to values from step 7, FAIL the test, restore the DUT state, and skip other steps.
11. ONVIF Client retrieves a authentication profile information by following the procedure mentioned in Annex A.12 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
    - out *authProfileInfoList* - authentication profile information list
12. If *authProfileInfoList*[0] item does not have equal field values to values from step 7, FAIL the test, restore the DUT state, and skip other steps.
13. ONVIF Client retrieves a complete list of authentication profile info by following the procedure mentioned in Annex A.1 with the following input and output parameters
    - out *authProfileInfoCompleteList* - complete list of authentication profiles information
14. If *authProfileInfoCompleteList* does not have AuthenticationProfileInfo[token = *authProfileToken*] item with equal field values to values from step 7, FAIL the test, restore the DUT state, and skip other steps.
15. ONVIF Client retrieves a complete list of authentication profiles by following the procedure mentioned in Annex A.3 with the following input and output parameters
    - out *authProfileCompleteList* - complete list of authentication profiles
16. If *authProfileCompleteList* does not have AuthenticationProfile[token = *authProfileToken*] item with equal field values to values from step 7, FAIL the test, restore the DUT state, and skip other steps.

17. For each AuthenticationProfileInfo.token (*token*) from *authProfileInfoInitialList* do the following:

    17.1. If *authProfileCompleteList* does not have AuthenticationProfile[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.

18. ONVIF Client deletes a authentication profile by following the procedure mentioned in Annex A.13 with the following input and output parameters

    - in *authProfileToken* - authentication profile token

19. If *newSecurityLevel* = true:

    19.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters

    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **SetAuthenticationProfileResponse** message.

Note: The following fields are compared at steps 10 and 14:

- AuthenticationProfile:
  - token
  - Name
  - Description
  - DefaultSecurityLevelToken
  - AuthenticationPolicy list
    - ScheduleToken
    - SecurityLevelConstraint list
      - ActiveRegularSchedule
      - ActiveSpecialDaySchedule

- AuthenticationMode
- SecurityLevelToken

Note: The following fields are compared at step 12 and 16:

- AuthenticationProfile:
  - token
  - Name
  - Description

5.4.6 SET NEW AUTHENTICATION PROFILE WITH AUTHENTICATION POLICY

Test Case ID: AUTH_BEHAVIOR-4-1-6

Specification Coverage: AuthenticationProfileInfo (ONVIF Authentication Behavior Service Specification), AuthenticationProfile (ONVIF Authentication Behavior Service Specification), SetAuthenticationProfile command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: SetAuthenticationProfile

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify creation of authentication profile and generating of appropriate notifications using SetAuthenticationProfile command.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Schedule Service is received from the DUT. Event Service was received from the DUT. Token supplying is supported by the DUT as indicated by ClientSuppliedTokenSupported capability. The DUT shall have enough free storage capacity for one additional Authentication Profile.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters

- out *cap* - Authentication Behavior Service capabilities

4. ONVIF Client retrieves a complete list of authentication profile info by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out *authProfileInfoInitialList* - complete list of authentication profiles information
5. ONVIF Client find existing or create new security level by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *newSecurityLevel* - flag if new security level was created
6. ONVIF Client find existing or create new schedule by following the procedure mentioned in Annex A.14 with the following input and output parameters
   - out *scheduleToken* - schedule level token
   - out *newSchedule* - flag if new schedule was created
7. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
   - in **"tns1:Configuration/AuthenticationProfile/Changed"** - Notification Topic
   - out *s* - Subscription reference
   - out *currentTime* - current time for the DUT
   - out *terminationTime* - Subscription termination time
8. Set *authProfileToken* := token that differs from tokens listed in *authProfileInfoInitialList*.
9. Set *authenticationMode* := *cap*.SupportedAuthenticationModes[0] (if *cap*.SupportedAuthenticationModes is skipped or empty, set *authenticationMode* := "pt:SingleCredential").
10. ONVIF client invokes **SetAuthenticationProfile** with parameters
    - AuthenticationProfile.token := *authProfileToken*
    - AuthenticationProfile.Description := "Test Description"
    - AuthenticationProfile.Name := "Test Name"
    - AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*

- AuthenticationProfile.AuthenticationPolicy[0].ScheduleToken := *scheduleToken*
- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].ActiveRegularSchedule = true
- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].ActiveSpecialDaySchedule = true
- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].AuthenticationMode = *authenticationMode*
- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].SecurityLevelToken = *securityLevelToken*

11. The DUT responds with **SetAuthenticationProfileResponse** message.
12. ONVIF Client retrieves and checks **tns1:Configuration/AuthenticationProfile/Changed** event for the specified Authentication Profile token by following the procedure mentioned in Annex A.10 with the following input and output parameters
    - in *s* - Subscription reference
    - in *currentTime* - current time for the DUT
    - in *terminationTime* - subscription termination time
    - in *authProfileToken* - Authentication Profile token
13. ONVIF Client deletes PullPoint subscription by following the procedure mentioned in Annex A.9 with the following input and output parameters
    - in *s* - Subscription reference
14. ONVIF Client retrieves a authentication profile by following the procedure mentioned in Annex A.11 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
    - out *authProfilesList* - authentication profile list
15. If *authProfilesList*[0] item does not have equal field values to values from step 10, FAIL the test, restore the DUT state, and skip other steps.
16. ONVIF Client retrieves a authentication profile information by following the procedure mentioned in Annex A.12 with the following input and output parameters
    - in *authProfileToken* - authentication profile token

- out *authProfileInfoList* - authentication profile information list

17. If *authProfileInfoList*[0] item does not have equal field values to values from step 10, FAIL the test, restore the DUT state, and skip other steps.
18. ONVIF Client retrieves a complete list of authentication profile info by following the procedure mentioned in Annex A.1 with the following input and output parameters
    - out *authProfileInfoCompleteList* - complete list of authentication profiles information
19. If *authProfileInfoCompleteList* does not have AuthenticationProfileInfo[token = *authProfileToken*] item with equal field values to values from step 10, FAIL the test, restore the DUT state, and skip other steps.
20. ONVIF Client retrieves a complete list of authentication profiles by following the procedure mentioned in Annex A.3 with the following input and output parameters
    - out *authProfileCompleteList* - complete list of authentication profiles
21. If *authProfileCompleteList* does not have AuthenticationProfile[token = *authProfileToken*] item with equal field values to values from step 10, FAIL the test, restore the DUT state, and skip other steps.
22. For each AuthenticationProfileInfo.token (*token*) from *authProfileInfoInitialList* do the following:
    22.1. If *authProfileCompleteList* does not have AuthenticationProfile[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.
23. ONVIF Client deletes a authentication profile by following the procedure mentioned in Annex A.13 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
24. If *newSchedule* = true:
    24.1. ONVIF Client deletes schedule by following the procedure mentioned in Annex A.23 with the following input and output parameters
        - in *scheduleToken* - schedule token
25. If *newSecurityLevel* = true:
    25.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
        - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **SetAuthenticationProfileResponse** message.

Note: The following fields are compared at steps 15 and 19:

- AuthenticationProfile:
  - token
  - Name
  - Description
  - DefaultSecurityLevelToken
  - AuthenticationPolicy list
    - ScheduleToken
    - SecurityLevelConstraint list
      - ActiveRegularSchedule
      - ActiveSpecialDaySchedule
      - AuthenticationMode
      - SecurityLevelToken

Note: The following fields are compared at step 17 and 21:

- AuthenticationProfileInfo:
  - token
  - Name
  - Description

5.4.7 SET AUTHENTICATION PROFILE

Test Case ID: AUTH_BEHAVIOR-4-1-7

Specification Coverage: AuthenticationProfileInfo (ONVIF Authentication Behavior Service Specification), AuthenticationProfile (ONVIF Authentication Behavior Service Specification), SetAuthenticationProfile command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: SetAuthenticationProfile

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify modifiing of authentication profile and generating of apropriate notifications using SetAuthenticationProfile command.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Schedule Service is received from the DUT. Event Service was received from the DUT. Token supplying is supported by the DUT as indicated by ClientSuppliedTokenSupported capability. The DUT shall have enough free storage capacity for one additional Authentication Profile.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a complete list of authentication profile info by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out *authProfileInfoInitialList* - complete list of authentication profiles information
4. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
5. ONVIF Client gets the schedule service capabilities by following the procedure mentioned in Annex A.18 with the following input and output parameters
   - out *capSchedule* - Schedule Service capabilities
6. ONVIF Client creates Authentication Profile by following the procedure mentioned in Annex A.16 with the following input and output parameters
   - in *cap* - authentication behavior service capabilities
   - out *authProfileToken* - authentication profile token
   - out *authProfile* - authentication profile
   - out *newSecurityLevel* - flag if new security level was created

- out *newSchedule* - flag if new schedule was created

7. Set *newSecurityLevel2* := false.
8. If *cap*.MaxSecurityLevels > 1:
   8.1. ONVIF Client creates security level by following the procedure mentioned in Annex A.17 with the following input and output parameters
      - out *securityLevelToken2* - security level token
   8.2. Set *newSecurityLevel2* := true.
9. Set *newSchedule2* := false.
10. If *capSchedule*.MaxSchedules > 1:
    10.1. ONVIF Client creates schedule by following the procedure mentioned in Annex A.20 with the following input and output parameters
       - out *scheduleToken2* - schedule token
    10.2. Set *newSchedule2* := true.
11. Set *authenticationMode0* := *authProfile*.AuthenticationPolicy[0].SecurityLevelConstraint[0].AuthenticationMode.
12. Set *authenticationMode1* := *cap*.SupportedAuthenticationModes[1] (if *cap*.SupportedAuthenticationModes is skipped or contains less than two items, set *authenticationMode* := *authenticationMode0*).
13. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
    - in **"tns1:Configuration/AuthenticationProfile/Changed"** - Notification Topic
    - out *s* - Subscription reference
    - out *currentTime* - current time for the DUT
    - out *terminationTime* - Subscription termination time
14. ONVIF client invokes **SetAuthenticationProfile** with parameters
    - AuthenticationProfile.token := *authProfileToken*
    - AuthenticationProfile.Description := "Test Description2"

- AuthenticationProfile.Name := "Test Name2"
- AuthenticationProfile.DefaultSecurityLevelToken := if *newSecurityLevel2* = true, then *securityLevelToken2*, else *securityLevelToken*
- AuthenticationProfile.AuthenticationPolicy[0].ScheduleToken := if *newSchedule2* = true, then *scheduleToken2*, else *scheduleToken*
- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].ActiveRegularSchedule := false
- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].ActiveSpecialDaySchedule := false
- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].AuthenticationMode := *authenticationMode1*
- AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].SecurityLevelToken := if *newSecurityLevel2* = true, then *securityLevelToken2*, else *securityLevelToken*

15. The DUT responds with **SetAuthenticationProfileResponse** message.
16. ONVIF Client retrieves and checks **tns1:Configuration/AuthenticationProfile/Changed** event for the specified Authentication Profile token by following the procedure mentioned in Annex A.10 with the following input and output parameters
    - in *s* - Subscription reference
    - in *currentTime* - current time for the DUT
    - in *terminationTime* - subscription termination time
    - in *authProfileToken* - Authentication Profile token
17. ONVIF Client retrieves a authentication profile by following the procedure mentioned in Annex A.11 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
    - out *authProfilesList* - authentication profile list
18. If *authProfilesList*[0] item does not have equal field values to values from step 14, FAIL the test, restore the DUT state, and skip other steps.
19. ONVIF Client retrieves a authentication profile information by following the procedure mentioned in Annex A.12 with the following input and output parameters

- in *authProfileToken* - authentication profile token
- out *authProfileInfoList* - authentication profile information list

20. If *authProfileInfoList*[0] item does not have equal field values to values from step 14, FAIL the test, restore the DUT state, and skip other steps.
21. ONVIF client invokes **SetAuthenticationProfile** with parameters
    - AuthenticationProfile.token := *authProfileToken*
    - AuthenticationProfile.Description := "Test Description3"
    - AuthenticationProfile.Name := "Test Name3"
    - AuthenticationProfile.DefaultSecurityLevelToken := if *newSecurityLevel2* = true, then *securityLevelToken2*, else *securityLevelToken*
    - AuthenticationProfile.AuthenticationPolicy is skipped
22. The DUT responds with **SetAuthenticationProfileResponse** message.
23. ONVIF Client retrieves and checks **tns1:Configuration/AuthenticationProfile/Changed** event for the specified Authentication Profile token by following the procedure mentioned in Annex A.10 with the following input and output parameters
    - in *s* - Subscription reference
    - in *currentTime* - current time for the DUT
    - in *terminationTime* - subscription termination time
    - in *authProfileToken* - Authentication Profile token
24. ONVIF Client retrieves a authentication profile by following the procedure mentioned in Annex A.11 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
    - out *authProfilesList* - authentication profile list
25. If *authProfilesList*[0] item does not have equal field values to values from step 21, FAIL the test, restore the DUT state, and skip other steps.
26. ONVIF Client retrieves a authentication profile information by following the procedure mentioned in Annex A.12 with the following input and output parameters
    - in *authProfileToken* - authentication profile token

- out *authProfileInfoList* - authentication profile information list

27. If *authProfileInfoList*[0] item does not have equal field values to values from step 21, FAIL the test, restore the DUT state, and skip other steps.

28. If *cap*.MaxPoliciesPerAuthenticationProfile > 1:

    28.1. Set *authenticationMode2* := *cap*.SupportedAuthenticationModes[2] (if *cap*.SupportedAuthenticationModes is skipped or contains less than three items, set *authenticationMode* := *authenticationMode0*).

    28.2. ONVIF client invokes **ModifyAuthenticationProfile** with parameters

    - AuthenticationProfile.token := *authProfileToken*
    - AuthenticationProfile.Description := "Test Description4"
    - AuthenticationProfile.Name := "Test Name4"
    - AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
    - AuthenticationProfile.AuthenticationPolicy[0].ScheduleToken := *scheduleToken*
    - AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].ActiveRegularSchedule = false
    - AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].ActiveSpecialDaySchedul = false
    - AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].AuthenticationMode = *authenticationMode2*
    - AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].SecurityLevelToken = *securityLevelToken*
    - AuthenticationProfile.AuthenticationPolicy[1].ScheduleToken := if *newSchedule2* = true, then *scheduleToken2*, else *scheduleToken*
    - AuthenticationProfile.AuthenticationPolicy[1].SecurityLevelConstraint[0].ActiveRegularSchedule = false
    - AuthenticationProfile.AuthenticationPolicy[1].SecurityLevelConstraint[0].ActiveSpecialDaySchedul = false
    - AuthenticationProfile.AuthenticationPolicy[1].SecurityLevelConstraint[0].AuthenticationMode = *authenticationMode2*

- AuthenticationProfile.AuthenticationPolicy[1].SecurityLevelConstraint[0].SecurityLevelToken
  if *newSecurityLevel2* = true, then *securityLevelToken2*, else *securityLevelToken*

28.3. The DUT responds with **ModifyAuthenticationProfileResponse** message.

28.4. ONVIF Client retrieves and checks **tns1:Configuration/AuthenticationProfile/Changed** event for the specified Authentication Profile token by following the procedure mentioned in Annex A.10 with the following input and output parameters

- in *s* - Subscription reference
- in *currentTime* - current time for the DUT
- in *terminationTime* - subscription termination time
- in *authProfileToken* - Authentication Profile token

28.5. ONVIF Client retrieves a authentication profile by following the procedure mentioned in Annex A.11 with the following input and output parameters

- in *authProfileToken* - authentication profile token
- out *authProfilesList* - authentication profile list

28.6. If *authProfilesList*[0] item does not have equal field values to values from step 28.2, FAIL the test, restore the DUT state, and skip other steps.

28.7. ONVIF Client retrieves a authentication profile information by following the procedure mentioned in Annex A.12 with the following input and output parameters

- in *authProfileToken* - authentication profile token
- out *authProfileInfoList* - authentication profile information list

28.8. If *authProfileInfoList*[0] item does not have equal field values to values from step 28.2, FAIL the test, restore the DUT state, and skip other steps.

29. ONVIF Client deletes PullPoint subscription by following the procedure mentioned in Annex A.9 with the following input and output parameters

- in *s* - Subscription reference

30. ONVIF Client retrieves a complete list of authentication profile by following the procedure mentioned in Annex A.3 with the following input and output parameters

- out *authProfileUpdatedList* - complete list of authentication profiles information

31. If *authProfileUpdatedList* does not have AuthenticationProfile[token = *authProfileToken*] item, FAIL the test, restore the DUT state, and skip other steps.
32. For each AuthenticationProfile.token (*token*) from *authProfileInitialList* do the following:
    32.1. If *authProfileUpdatedList* does not have AuthenticationProfile[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.
33. ONVIF Client deletes a authentication profile by following the procedure mentioned in Annex A.13 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
34. If *newSchedule* = true:
    34.1. ONVIF Client deletes schedule by following the procedure mentioned in Annex A.23 with the following input and output parameters
        - in *scheduleToken* - schedule token
35. If *newSecurityLevel* = true:
    35.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
        - in *securityLevelToken* - security level token
36. If *newSchedule2* = true:
    36.1. ONVIF Client deletes schedule by following the procedure mentioned in Annex A.23 with the following input and output parameters
        - in *scheduleToken2* - schedule token
37. If *newSecurityLevel2* = true:
    37.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
        - in *securityLevelToken2* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **SetAuthenticationProfileResponse** message.

Note: The following fields are compared at steps 18, 25, and 28.6:

- AuthenticationProfile:
  - token
  - Name
  - Description
  - DefaultSecurityLevelToken
  - AuthenticationPolicy list
    - ScheduleToken
    - SecurityLevelConstraint list
      - ActiveRegularSchedule
      - ActiveSpecialDaySchedule
      - AuthenticationMode
      - SecurityLevelToken

Note: The following fields are compared at step 20, 27, and 28.8:

- AuthenticationProfileInfo:
  - token
  - Name
  - Description

5.4.8 CREATE AUTHENTICATION PROFILE - NOT EMPTY TOKEN

Test Case ID: AUTH_BEHAVIOR-4-1-8

Specification Coverage: CreateAuthenticationProfile command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: CreateAuthenticationProfile

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify create authentication profile with not empty token.

Pre-Requisite: Authentication Behavior Service is received from the DUT. The DUT shall have enough free storage capacity for one additional AuthenticationProfile.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client find existing or create new security level by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *newSecurityLevel* - flag if new security level was created
4. ONVIF client invokes **CreateAuthenticationProfile** with parameters
   - AuthenticationProfile.token := "Token"
   - AuthenticationProfile.Name := "Test Name"
   - AuthenticationProfile.Description is skipped
   - AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
   - AuthenticationProfile.AuthenticationPolicy is skipped
   - AuthenticationProfile.Extension is skipped
5. The DUT returns **env:Sender/ter:InvalidArgVal** SOAP 1.2 fault.
6. If *newSecurityLevel* = true:
   6.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
      - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgVal** SOAP 1.2 fault.

5.4.9 CREATE AUTHENTICATION PROFILE - CAPABILITY VIOLATED (MAX POLICIES PER AUTHENTICATION PROFILE)

Test Case ID: AUTH_BEHAVIOR-4-1-9

Specification Coverage: CreateAuthenticationProfile command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: CreateAuthenticationProfile

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify creation of authentication profile with maximum number of authentication policies per authentication profile.

Pre-Requisite: Authentication Behavior Service is received from the DUT. The DUT shall have enough free storage capacity for one additional Authentication Profile.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
4. If *cap*.MaxPoliciesPerAuthenticationProfile value is more than 50, skip other steps.
5. ONVIF Client find existing or create new security level by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *newSecurityLevel* - flag if new security level was created
6. ONVIF Client find existing or create new schedule by following the procedure mentioned in Annex A.14 with the following input and output parameters

- out *scheduleToken* - schedule level token
- out *newSchedule* - flag if new schedule was created

7. If *cap*.MaxPoliciesPerAuthenticationProfile is equal to one, go to step 13.
8. Set *authenticationMode* := *cap*.SupportedAuthenticationModes[0] (if *cap*.SupportedAuthenticationModes is skipped or empty, set *authenticationMode* := "pt:SingleCredential").
9. Set *authenticationPolicy* :=
   - ScheduleToken := *scheduleToken*
   - SecurityLevelConstraint[0].ActiveRegularSchedule := true
   - SecurityLevelConstraint[0].ActiveSpecialDaySchedule := true
   - SecurityLevelConstraint[0].AuthenticationMode := *authenticationMode*
   - SecurityLevelConstraint[0].SecurityLevelToken := *securityLevelToken*
10. ONVIF client invokes **CreateAuthenticationProfile** with parameters
    - AuthenticationProfile.token := ""
    - AuthenticationProfile.Description := "Test Description"
    - AuthenticationProfile.Name := "Test Name"
    - AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
    - AuthenticationProfile.AuthenticationPolicy list := *authenticationPolicy* duplicated *cap*.MaxPoliciesPerAuthenticationProfile number of times
11. The DUT responds with **CreateAuthenticationProfileResponse** message with parameters
    - Token =: *authProfileToken*
12. ONVIF Client deletes a authentication profile by following the procedure mentioned in Annex A.13 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
13. ONVIF client invokes **CreateAuthenticationProfile** with parameters
    - AuthenticationProfile.token := ""

- AuthenticationProfile.Description := "Test Description"
- AuthenticationProfile.Name := "Test Name"
- AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
- AuthenticationProfile.AuthenticationPolicy list := *authenticationPolicy* duplicated *cap*.MaxPoliciesPerAuthenticationProfile + 1 number of times

14. The DUT returns **env:Sender/ter:CapabilityViolated/ter:MaxPoliciesPerAuthenticationProfile** SOAP 1.2 fault.
15. If *newSchedule* = true:
    15.1. ONVIF Client deletes schedule by following the procedure mentioned in Annex A.23 with the following input and output parameters
    - in *scheduleToken* - schedule token
16. If *newSecurityLevel* = true:
    16.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **CreateAuthenticationProfileResponse** mesage.
- The DUT did not send **env:Sender/ter:CapabilityViolated/ter:MaxPoliciesPerAuthenticationProfile** SOAP 1.2 fault.

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.4.10 MODIFY AUTHENTICATION PROFILE - INVALID TOKEN

Test Case ID: AUTH_BEHAVIOR-4-1-10

Specification Coverage: ModifyAuthenticationProfile command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: ModifyAuthenticationProfile

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify modifiing of authentication profile with invalid token.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a complete list of authentication profile info by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out *authProfileInfoList* - complete list of authentication profiles information
4. Set *invalidToken* := value not equal to any *authProfileInfoList*.token
5. ONVIF Client find existing or create new security level by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *newSecurityLevel* - flag if new security level was created
6. ONVIF client invokes **ModifyAuthenticationProfile** with parameters
   - AuthenticationProfile.token := *invalidToken*
   - AuthenticationProfile.Name := "Test Name"
   - AuthenticationProfile.Description is skipped
   - AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
   - AuthenticationProfile.AuthenticationPolicy is skipped
   - AuthenticationProfile.Extension is skipped
7. The DUT returns **env:Sender/ter:InvalidArgVal/ter:NotFound** SOAP 1.2 fault.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgVal/ter:NotFound** SOAP 1.2 fault

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.4.11 MODIFY AUTHENTICATION PROFILE - CAPABILITY VIOLATED (MAX POLICIES PER AUTHENTICATION PROFILE)

Test Case ID: AUTH_BEHAVIOR-4-1-11

Specification Coverage: ModifyAuthenticationProfile command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: ModifyAuthenticationProfile

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify modification of authentication profile with maximum number of authentication policies per authentication profile.

Pre-Requisite: Authentication Behavior Service is received from the DUT. The DUT shall have enough free storage capacity for one additional AuthenticationProfile.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities

4. If *cap*.MaxPoliciesPerAuthenticationProfile value is more than 50, skip other steps.
5. ONVIF Client creates Authentication Profile by following the procedure mentioned in Annex A.16 with the following input and output parameters
   - in *cap* - authentication behavior service capabilities
   - out *authProfileToken* - authentication profile token
   - out *authProfile* - authentication profile
   - out *newSecurityLevel* - flag if new security level was created
   - out *newSchedule* - flag if new schedule was created
6. If *cap*.MaxPoliciesPerAuthenticationProfile is equal to one, go to step 11.
7. Set *authenticationMode* := *cap*.SupportedAuthenticationModes[0] (if *cap*.SupportedAuthenticationModes is skipped or empty, set *authenticationMode* := "pt:SingleCredential").
8. Set *authenticationPolicy* :=
   - ScheduleToken := *scheduleToken*
   - SecurityLevelConstraint[0].ActiveRegularSchedule := true
   - SecurityLevelConstraint[0].ActiveSpecialDaySchedule := true
   - SecurityLevelConstraint[0].AuthenticationMode := *authenticationMode*
   - SecurityLevelConstraint[0].SecurityLevelToken := *securityLevelToken*
9. ONVIF client invokes **ModifyAuthenticationProfile** with parameters
   - AuthenticationProfile.token := *authProfileToken*
   - AuthenticationProfile.Description is skipped
   - AuthenticationProfile.Name := "Test Name"
   - AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
   - AuthenticationProfile.AuthenticationPolicy list := *authenticationPolicy* duplicated *cap*.MaxPoliciesPerAuthenticationProfile number of times
10. The DUT responds with **ModifyAuthenticationProfileResponse** message.
11. ONVIF client invokes **ModifyAuthenticationProfile** with parameters

- AuthenticationProfile.token := *authProfileToken*
- AuthenticationProfile.Description is skipped
- AuthenticationProfile.Name := "Test Name"
- AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
- AuthenticationProfile.AuthenticationPolicy list := *authenticationPolicy* duplicated *cap*.MaxPoliciesPerAuthenticationProfile + 1 number of times

12. The DUT returns **env:Sender/ter:CapabilityViolated/ter:MaxPoliciesPerAuthenticationProfile** SOAP 1.2 fault.
13. ONVIF Client deletes a authentication profile by following the procedure mentioned in Annex A.13 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
14. If *newSchedule* = true:
    14.1. ONVIF Client deletes schedule by following the procedure mentioned in Annex A.23 with the following input and output parameters
    - in *scheduleToken* - schedule token
15. If *newSecurityLevel* = true:
    15.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **ModifyAuthenticationProfileResponse** mesage.
- The DUT did not send **env:Sender/ter:CapabilityViolated/ter:MaxPoliciesPerAuthenticationProfile** SOAP 1.2 fault.

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.4.12 SET AUTHENTICATION PROFILE - CAPABILITY VIOLATED (MAX POLICIES PER AUTHENTICATION PROFILE)

Test Case ID: AUTH_BEHAVIOR-4-1-12

Specification Coverage: SetAuthenticationProfile command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: SetAuthenticationProfile

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify set of authentication profile with maximum number of authentication policies per authentication profile.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Token supplying is supported by the DUT as indicated by ClientSuppliedTokenSupported capability. The DUT shall have enough free storage capacity for one additional AuthenticationProfile.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
4. If *cap*.MaxPoliciesPerAuthenticationProfile value is more than 50, skip other steps.
5. ONVIF Client creates Authentication Profile by following the procedure mentioned in Annex A.16 with the following input and output parameters
   - in *cap* - authentication behavior service capabilities
   - out *authProfileToken* - authentication profile token
   - out *authProfile* - authentication profile
   - out *newSecurityLevel* - flag if new security level was created

- out *newSchedule* - flag if new schedule was created

6. If *cap*.MaxPoliciesPerAuthenticationProfile is equal to one, go to step 11.
7. Set *authenticationMode* := *cap*.SupportedAuthenticationModes[0] (if *cap*.SupportedAuthenticationModes is skipped or empty, set *authenticationMode* := "pt:SingleCredential").
8. Set *authenticationPolicy* :=
   - ScheduleToken := *scheduleToken*
   - SecurityLevelConstraint[0].ActiveRegularSchedule := true
   - SecurityLevelConstraint[0].ActiveSpecialDaySchedule := true
   - SecurityLevelConstraint[0].AuthenticationMode := *authenticationMode*
   - SecurityLevelConstraint[0].SecurityLevelToken := *securityLevelToken*
9. ONVIF client invokes **SetAuthenticationProfile** with parameters
   - AuthenticationProfile.token := *authProfileToken*
   - AuthenticationProfile.Description is skipped
   - AuthenticationProfile.Name := "Test Name"
   - AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
   - AuthenticationProfile.AuthenticationPolicy list := *authenticationPolicy* duplicated *cap*.MaxPoliciesPerAuthenticationProfile number of times
10. The DUT responds with **SetAuthenticationProfileResponse** message.
11. ONVIF client invokes **SetAuthenticationProfile** with parameters
    - AuthenticationProfile.token := *authProfileToken*
    - AuthenticationProfile.Description is skipped
    - AuthenticationProfile.Name := "Test Name"
    - AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
    - AuthenticationProfile.AuthenticationPolicy list := *authenticationPolicy* duplicated *cap*.MaxPoliciesPerAuthenticationProfile + 1 number of times

12. The DUT returns **env:Sender/ter:CapabilityViolated/ter:MaxPoliciesPerAuthenticationProfile** SOAP 1.2 fault.
13. ONVIF Client deletes a authentication profile by following the procedure mentioned in Annex A.13 with the following input and output parameters
    - in *authProfileToken* - authentication profile token
14. If *newSchedule* = true:
    14.1. ONVIF Client deletes schedule by following the procedure mentioned in Annex A.23 with the following input and output parameters
    - in *scheduleToken* - schedule token
15. If *newSecurityLevel* = true:
    15.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **SetAuthenticationProfileResponse** mesage.
- The DUT did not send **env:Sender/ter:CapabilityViolated/ter:MaxPoliciesPerAuthenticationProfile** SOAP 1.2 fault.

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.4.13 SET AUTHENTICATION PROFILE - EMPTY TOKEN

Test Case ID: AUTH_BEHAVIOR-4-1-13

Specification Coverage: SetAuthenticationProfile command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: SetAuthenticationProfile

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify set of authentication profile with empty token.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Token supplying is supported by the DUT as indicated by ClientSuppliedTokenSupported capability. The DUT shall have enough free storage capacity for one additional AuthenticationProfile.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client find existing or create new security level by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *newSecurityLevel* - flag if new security level was created
4. ONVIF client invokes **SetAuthenticationProfile** with parameters
   - AuthenticationProfile.token := ""
   - AuthenticationProfile.Description is skipped
   - AuthenticationProfile.Name := "Test Name"
   - AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
   - AuthenticationProfile.AuthenticationPolicy is skipped
5. The DUT returns **env:Sender/ter:InvalidArgs** SOAP 1.2 fault.
6. If *newSecurityLevel* = true:
   6.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
   - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgs** SOAP 1.2 fault.

5.4.14 DELETE AUTHENTICATION PROFILE - INVALID TOKEN

Test Case ID: AUTH_BEHAVIOR-4-1-14

Specification Coverage: DeleteAuthenticationProfile command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: DeleteAuthenticationProfile

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify deleting of authentication profile with invalid token.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a complete list of authentication profile info by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out *authProfileInfoList* - complete list of authentication profiles information
4. Set *invalidToken* := value not equal to any *authProfileInfoList*.token
5. ONVIF Client invokes **DeleteAuthenticationProfile** with parameters
   - Token := *invalidToken*
6. The DUT returns **env:Sender/ter:InvalidArgVal/ter:NotFound** SOAP 1.2 fault.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgVal/ter:NotFound** SOAP 1.2 fault.

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.4.15 DELETE AUTHENTICATION PROFILE - NO TOKEN

Test Case ID: AUTH_BEHAVIOR-4-1-15

Specification Coverage: DeleteAuthenticationProfile command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: DeleteAuthenticationProfile

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify deleting of authentication profile without token.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes **DeleteAuthenticationProfile** with parameters
   - Token := ""
4. The DUT returns **env:Sender/ter:InvalidArgVal** SOAP 1.2 fault.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgVal** SOAP 1.2 fault.

5.5 Security Level Info

5.5.1 GET SECURITY LEVEL INFO

Test Case ID: AUTH_BEHAVIOR-5-1-1

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), GetSecurityLevelInfo command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetSecurityLevelInfo

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Security Level Info.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of security levels by following the procedure mentioned in Annex A.24 with the following input and output parameters
   - out *securityLevelInfoCompleteList* - complete list of security levels information
   - out *createdSecurityLevelTokensList* - list of created security levels tokens
   - out *cap* - Authentication Behavior Service capabilities
4. Set *tokenList* := [subset of *securityLevelInfoCompleteList*.token values with items number equal to *cap*.MaxLimit]
5. ONVIF client invokes **GetSecurityLevelInfo** with parameters
   - Token list := *tokenList*
6. The DUT responds with **GetSecurityLevelInfoResponse** message with parameters

- SecurityLevelInfo list =: *securityLevelInfoList1*

7. If *securityLevelInfoList1* does not contain SecurityLevelInfo item for each token from *tokenList*, FAIL the test, restore the DUT state, and skip other steps.
8. If *securityLevelInfoList1* contains at least two SecurityLevelInfo items with equal token, FAIL the test, restore the DUT state, and skip other steps.
9. If *securityLevelInfoList1* contains other SecurityLevelInfo items than listed in *tokenList*, FAIL the test, restore the DUT state, and skip other steps.
10. For each SecurityLevelInfo.token *token* from *securityLevelInfoCompleteList* repeat the following steps:
    10.1. ONVIF client invokes **GetSecurityLevelInfo** with parameters
    - Token[0] := *token*

    10.2. The DUT responds with **GetSecurityLevelInfoResponse** message with parameters
    - SecurityLevelInfo list =: *securityLevelInfoList2*

    10.3. If *securityLevelInfoList2* does not contain only one SecurityLevelInfo item with token equal to *token*, FAIL the test, restore the DUT state, and skip other steps.

    10.4. If *securityLevelInfoList2*[0] item is not equal to *securityLevelInfoCompleteList*[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.
11. Remove all security levels with tokens from *createdSecurityLevelTokensList*.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetSecurityLevelInfoResponse** message.

Note: If number of items in *securityLevelInfoCompleteList* is less than *cap*.MaxLimit, then all *securityLevelInfoCompleteList*.Token items shall be used for the step 4.

Note: The following fields are compared at step 10.4:

- SecurityLevelInfo:

- token
- Name
- Priority
- Description

5.5.2 GET SECURITY LEVEL INFO LIST - LIMIT

Test Case ID: AUTH_BEHAVIOR-5-1-2

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), GetSecurityLevelInfoList command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetSecurityLevelInfoList

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Security Level Info List using Limit.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of security levels by following the procedure mentioned in Annex A.24 with the following input and output parameters
   - out *securityLevelInfoCompleteList* - complete list of security levels information
   - out *createdSecurityLevelTokensList* - list of created security levels tokens
   - out *cap* - Authentication Behavior Service capabilities
4. ONVIF client invokes **GetSecurityLevelInfoList** with parameters
   - Limit := 1
   - StartReference skipped

5. The DUT responds with **GetSecurityLevelInfoListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - SecurityLevelInfo list =: *securityLevelInfoList1*
6. If *securityLevelInfoList1* contains more SecurityLevelInfo items than 1, FAIL the test, restore the DUT state, and skip other steps.
7. If *cap*.MaxLimit is equal to 1, go to step 16.
8. ONVIF client invokes **GetSecurityLevelInfoList** with parameters
   - Limit := *cap*.MaxLimit
   - StartReference skipped
9. The DUT responds with **GetSecurityLevelInfoListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - SecurityLevelInfo list =: *securityLevelInfoList2*
10. If *securityLevelInfoList2* contains more SecurityLevelInfo items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.
11. If *cap*.MaxLimit is equal to 2, go to step 16.
12. Set *limit* := [number between 1 and *cap*.MaxLimit].
13. ONVIF client invokes **GetSecurityLevelInfoList** with parameters
    - Limit := *limit*
    - StartReference skipped
14. The DUT responds with **GetSecurityLevelInfoListResponse** message with parameters
    - NextStartReference =: *nextStartReference*
    - SecurityLevelInfo list =: *securityLevelInfoList3*
15. If *securityLevelInfoList3* contains more SecurityLevelInfo items than *limit*, FAIL the test, restore the DUT state, and skip other steps.
16. Remove all security levels with tokens from *createdSecurityLevelTokensList*.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetSecurityLevelInfoListResponse** message.

5.5.3 GET SECURITY LEVEL INFO LIST - START REFERENCE AND LIMIT

Test Case ID: AUTH_BEHAVIOR-5-1-3

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), GetSecurityLevelInfoList command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetSecurityLevelInfoList

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Security Level Info List using StartReference and Limit.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of security levels by following the procedure mentioned in Annex A.24 with the following input and output parameters
   - out *securityLevelInfoCompleteList* - complete list of security levels information
   - out *createdSecurityLevelTokensList* - list of created security levels tokens
   - out *cap* - Authentication Behavior Service capabilities
4. ONVIF client invokes **GetSecurityLevelInfoList** with parameters
   - Limit := *cap*.MaxLimit

- StartReference skipped

5. The DUT responds with **GetSecurityLevelInfoListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - SecurityLevelInfo list =: *securityLevelInfoCompleteList1*
6. If *securityLevelInfoCompleteList1* contains more SecurityLevelInfo items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.
7. Until *nextStartReference* is not null, repeat the following steps:
   7.1. ONVIF client invokes **GetSecurityLevelInfoList** with parameters
      - Limit := *cap*.MaxLimit
      - StartReference := *nextStartReference*

   7.2. The DUT responds with **GetSecurityLevelInfoListResponse** message with parameters
      - NextStartReference =: *nextStartReference*
      - SecurityLevelInfo list =: *securityLevelInfoListPart*

   7.3. If *securityLevelInfoListPart* contains more SecurityLevelInfo items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.

   7.4. Set *securityLevelInfoCompleteList1* := *securityLevelInfoCompleteList1* + *securityLevelInfoListPart*
8. If *securityLevelInfoCompleteList1* contains at least two SecurityLevelInfo item with equal token, FAIL the test, restore the DUT state, and skip other steps.
9. If *cap*.MaxLimit is equal to 1, go to step 26.
10. ONVIF client invokes **GetSecurityLevelInfoList** with parameters
    - Limit := 1
    - StartReference skipped
11. The DUT responds with **GetSecurityLevelInfoListResponse** message with parameters
    - NextStartReference =: *nextStartReference*
    - SecurityLevelInfo list =: *securityLevelInfoCompleteList2*

12. If *securityLevelInfoCompleteList2* contains more SecurityLevelInfo items than 1, FAIL the test, restore the DUT state, and skip other steps.
13. Until *nextStartReference* is not null, repeat the following steps:
    13.1. ONVIF client invokes **GetSecurityLevelInfoList** with parameters
    - Limit := 1
    - StartReference := *nextStartReference*

    13.2. The DUT responds with **GetSecurityLevelInfoListResponse** message with parameters
    - NextStartReference =: *nextStartReference*
    - SecurityLevelInfo list =: *securityLevelInfoListPart*

    13.3. If *securityLevelInfoListPart* contains more SecurityLevelInfo items than 1, FAIL the test, restore the DUT state, and skip other steps.

    13.4. Set *securityLevelInfoCompleteList2* := *securityLevelInfoCompleteList2* + *securityLevelInfoListPart*
14. If *securityLevelInfoCompleteList2* contains at least two SecurityLevelInfo item with equal token, FAIL the test, restore the DUT state, and skip other steps.
15. If *securityLevelInfoCompleteList2* does not contain all security levels from *securityLevelInfoCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.
16. If *securityLevelInfoCompleteList2* contains security levels other than security levels from *securityLevelInfoCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.
17. If *cap*.MaxLimit is equal to 2, go to step 26.
18. Set *limit* := [number between 1 and *cap*.MaxLimit]
19. ONVIF client invokes **GetSecurityLevelInfoList** with parameters
    - Limit := *limit*
    - StartReference skipped
20. The DUT responds with **GetSecurityLevelInfoListResponse** message with parameters
    - NextStartReference =: *nextStartReference*
    - SecurityLevelInfo list =: *securityLevelInfoCompleteList3*

21. If *securityLevelInfoCompleteList3* contains more SecurityLevelInfo items than *limit*, FAIL the test, restore the DUT state, and skip other steps.
22. Until *nextStartReference* is not null, repeat the following steps:
    22.1. ONVIF client invokes **GetSecurityLevelInfoList** with parameters
    - Limit := *limit*
    - StartReference := *nextStartReference*

    22.2. The DUT responds with **GetSecurityLevelInfoListResponse** message with parameters
    - NextStartReference =: *nextStartReference*
    - SecurityLevelInfo list =: *securityLevelInfoListPart*

    22.3. If *securityLevelInfoListPart* contains more SecurityLevelInfo items than *limit*, FAIL the test, restore the DUT state, and skip other steps.

    22.4. Set *securityLevelInfoCompleteList3* := *securityLevelInfoCompleteList3* + *securityLevelInfoListPart*
23. If *securityLevelInfoCompleteList3* contains at least two SecurityLevelInfo item with equal token, FAIL the test, restore the DUT state, and skip other steps.
24. If *securityLevelInfoCompleteList3* does not contain all security levels from *securityLevelInfoCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.
25. If *securityLevelInfoCompleteList3* contains security levels other than security levels from *securityLevelInfoCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.
26. Remove all security levels with tokens from *createdSecurityLevelTokensList*.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetSecurityLevelInfoListResponse** message.

5.5.4 GET SECURITY LEVEL INFO LIST - NO LIMIT

Test Case ID: AUTH_BEHAVIOR-5-1-4

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), GetSecurityLevelInfoList command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetSecurityLevelInfoList

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Security Level Info List without using Limit.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of security levels by following the procedure mentioned in Annex A.24 with the following input and output parameters
   - out *securityLevelInfoCompleteList* - complete list of security levels information
   - out *createdSecurityLevelTokensList* - list of created security levels tokens
   - out *cap* - Authentication Behavior Service capabilities
4. ONVIF client invokes **GetSecurityLevelInfoList** with parameters
   - Limit skipped
   - StartReference skipped
5. The DUT responds with **GetSecurityLevelInfoListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - SecurityLevelInfo list =: *securityLevelInfoCompleteList*
6. If *securityLevelInfoCompleteList* contains more SecurityLevelInfo items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.
7. Until *nextStartReference* is not null, repeat the following steps:

   7.1. ONVIF client invokes **GetSecurityLevelInfoList** with parameters
   - Limit skipped

- StartReference := *nextStartReference*

7.2. The DUT responds with **GetSecurityLevelInfoListResponse** message with parameters

- NextStartReference =: *nextStartReference*
- SecurityLevelInfo list =: *securityLevelInfoListPart*

7.3. If *securityLevelInfoListPart* contains more SecurityLevelInfo items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.

7.4. Set *securityLevelInfoCompleteList* := *securityLevelInfoCompleteList* + *securityLevelInfoListPart*

8. If *securityLevelInfoCompleteList* contains at least two SecurityLevelInfo item with equal token, FAIL the test, restore the DUT state, and skip other steps.
9. If *securityLevelInfoCompleteList* contains more SecurityLevelInfo items than *cap*.MaxSecurityLevels, FAIL the test, restore the DUT state, and skip other steps.
10. Remove all security levels with tokens from *createdSecurityLevelTokensList*.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetSecurityLevelInfoListResponse** message.

5.5.5 GET SECURITY LEVEL INFO WITH INVALID TOKEN

Test Case ID: AUTH_BEHAVIOR-5-1-5

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), GetSecurityLevelInfo command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetSecurityLevelInfo

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Security Level Info with invalid token.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of security levels by following the procedure mentioned in Annex A.24 with the following input and output parameters
   - out *securityLevelInfoCompleteList* - complete list of security levels information
   - out *createdSecurityLevelTokensList* - list of created security levels tokens
   - out *cap* - Authentication Behavior Service capabilities
4. Set *invalidToken* := value not equal to any *securityLevelInfoCompleteList*.token
5. ONVIF client invokes **GetSecurityLevelInfo** with parameters
   - Token list := *invalidToken*
6. The DUT responds with **GetSecurityLevelInfoResponse** message with parameters
   - SecurityLevelInfo list =: *securityLevelInfoList*
7. If *securityLevelInfoList* is not empty, FAIL the test, restore the DUT state, and skip other steps.
8. If *cap*.MaxLimit is less than 2, go to step 14.
9. ONVIF client invokes **GetSecurityLevelInfo** with parameters
   - Token[0]:= *invalidToken*
   - Token[1]:= *securityLevelInfoCompleteList*[0].token
10. The DUT responds with **GetSecurityLevelInfoResponse** message with parameters
    - SecurityLevelInfo list =: *securityLevelInfoList*
11. If *securityLevelInfoList* is empty, FAIL the test, restore the DUT state, and skip other steps.
12. If *securityLevelInfoList* contains more than one item, FAIL the test, restore the DUT state, and skip other steps.

13. If *securityLevelInfoList*[0].token is not equal to *securityLevelInfoCompleteList*[0].token, FAIL the test, restore the DUT state, and skip other steps.

14. Remove all security levels with tokens from *createdSecurityLevelTokensList*.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetSecurityLevelInfoResponse** message.

5.5.6 GET SECURITY LEVEL INFO - TOO MANY ITEMS

Test Case ID: AUTH_BEHAVIOR-5-1-6

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), GetSecurityLevelInfo command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetSecurityLevelInfo

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Security Level Info in case there are more items than MaxLimit in request.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of security levels by following the procedure mentioned in Annex A.24 with the following input and output parameters
   - out *securityLevelInfoCompleteList* - complete list of security levels information
   - out *createdSecurityLevelTokensList* - list of created security levels tokens

- out *cap* - Authentication Behavior Service capabilities

4. If *securityLevelInfoCompleteList*.token items number is less than *cap*.MaxLimit or equal to *cap*.MaxLimit, go to step 8.
5. Set *tokenList* := [subset of *securityLevelInfoCompleteList*.token values with items number equal to *cap*.MaxLimit + 1]
6. ONVIF client invokes **GetSecurityLevelInfo** with parameters
   - Token list := *tokenList*
7. The DUT returns **env:Sender/ter:InvalidArgs/ter:TooManyItems** SOAP 1.2 fault.
8. Remove all security levels with tokens from *createdSecurityLevelTokensList*.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgs/ter:TooManyItems** SOAP 1.2 fault.

5.6 Security Level

5.6.1 GET SECURITY LEVELS

Test Case ID: AUTH_BEHAVIOR-6-1-1

Specification Coverage: SecurityLevel (ONVIF Authentication Behavior Service Specification), GetSecurityLevels command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetSecurityLevels

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Security Level.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of security levels by following the procedure mentioned in Annex A.24 with the following input and output parameters
   - out *securityLevelInfoCompleteList* - complete list of security levels information
   - out *createdSecurityLevelTokensList* - list of created security levels tokens
   - out *cap* - Authentication Behavior Service capabilities
4. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.25 with the following input and output parameters
   - out *securityLevelCompleteList* - complete list of security levels information
5. Set *tokenList* := [subset of *securityLevelCompleteList*.token values with items number equal to *cap*.MaxLimit].
6. ONVIF client invokes **GetSecurityLevels** with parameters
   - Token list := *tokenList*
7. The DUT responds with **GetSecurityLevelsResponse** message with parameters
   - SecurityLevel list =: *securityLevelsList1*
8. If *securityLevelsList1* does not contain Security Level item for each token from *tokenList*, FAIL the test, restore the DUT state, and skip other steps.
9. If *securityLevelsList1* contains at least two Security Level items with equal token, FAIL the test, restore the DUT state, and skip other steps.
10. If *securityLevelsList1* contains other Security Level items than listed in *tokenList*, FAIL the test, restore the DUT state, and skip other steps.
11. For each SecurityLevel.token *token* from *securityLevelCompleteList* repeat the following steps:

    11.1. ONVIF client invokes **GetSecurityLevels** with parameters
    - Token[0] := *token*

    11.2. The DUT responds with **GetSecurityLevelsResponse** message with parameters

- SecurityLevel list =: *securityLevelsList2*

11.3. If *securityLevelsList2* does not contain only one SecurityLevel item with token equal to *token*, FAIL the test, restore the DUT state, and skip other steps.

11.4. If *securityLevelsList2*[0] item does not have equal field values to *securityLevelCompleteList*[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.

12. Remove all security levels with tokens from *createdSecurityLevelTokensList*.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetSecurityLevelsResponse** message.

Note: If number of items in *securityLevelCompleteList* is less than *cap*.MaxLimit, then all *securityLevelCompleteList*.Token items shall be used for the step 5.

Note: The following fields are compared at step 11.4:

- SecurityLevel:
  - token
  - Name
  - Priority
  - Description
  - RecognitionGroup list
    - RecognitionMethod list
      - RecognitionType
      - Order

5.6.2 GET SECURITY LEVEL LIST - LIMIT

Test Case ID: AUTH_BEHAVIOR-6-1-2

Specification Coverage: SecurityLevel (ONVIF Authentication Behavior Service Specification), GetSecurityLevelList command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetSecurityLevelList

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Security Level List using Limit.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of security levels by following the procedure mentioned in Annex A.24 with the following input and output parameters
   - out *securityLevelInfoCompleteList* - complete list of security levels information
   - out *createdSecurityLevelTokensList* - list of created security levels tokens
   - out *cap* - Authentication Behavior Service capabilities
4. ONVIF client invokes **GetSecurityLevelList** with parameters
   - Limit := 1
   - StartReference skipped
5. The DUT responds with **GetSecurityLevelListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - SecurityLevel list =: *securityLevelsList1*
6. If *securityLevelsList1* contains more SecurityLevel items than 1, FAIL the test, restore the DUT state, and skip other steps.
7. If *cap*.MaxLimit is equal to 1, go to step 16.
8. ONVIF client invokes **GetSecurityLevelList** with parameters
   - Limit := *cap*.MaxLimit

- StartReference skipped

9. The DUT responds with **GetSecurityLevelListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - SecurityLevel list =: *securityLevelsList2*
10. If *securityLevelsList2* contains more SecurityLevel items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.
11. If *cap*.MaxLimit is equal to 2, go to step 16.
12. Set *limit* := [number between 1 and *cap*.MaxLimit]
13. ONVIF client invokes **GetSecurityLevelList** with parameters
    - Limit := *limit*
    - StartReference skipped
14. The DUT responds with **GetSecurityLevelListResponse** message with parameters
    - NextStartReference =: *nextStartReference*
    - SecurityLevel list =: *securityLevelsList3*
15. If *securityLevelsList3* contains more SecurityLevel items than *limit*, FAIL the test, restore the DUT state, and skip other steps.
16. Remove all security levels with tokens from *createdSecurityLevelTokensList*.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetSecurityLevelListResponse** message.

5.6.3 GET SECURITY LEVEL LIST - START REFERENCE AND LIMIT

Test Case ID: AUTH_BEHAVIOR-6-1-3

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), SecurityLevel (ONVIF Authentication Behavior Service Specification), GetSecurityLevelList command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetSecurityLevelList

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Security Level List using StartReference and Limit.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of security levels by following the procedure mentioned in Annex A.24 with the following input and output parameters
   - out *securityLevelInfoCompleteList* - complete list of security levels information
   - out *createdSecurityLevelTokensList* - list of created security levels tokens
   - out *cap* - Authentication Behavior Service capabilities
4. ONVIF client invokes **GetSecurityLevelList** with parameters
   - Limit := *cap*.MaxLimit
   - StartReference skipped
5. The DUT responds with **GetSecurityLevelListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - SecurityLevel list =: *securityLevelCompleteList1*
6. If *securityLevelCompleteList1* contains more SecurityLevel items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.
7. Until *nextStartReference* is not null, repeat the following steps:

   7.1. ONVIF client invokes **GetSecurityLevelList** with parameters

- Limit := *cap*.MaxLimit
- StartReference := *nextStartReference*

7.2. The DUT responds with **GetSecurityLevelListResponse** message with parameters

- NextStartReference =: *nextStartReference*
- SecurityLevel list =: *securityLevelsListPart*

7.3. If *securityLevelsListPart* contains more SecurityLevel items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.

7.4. Set *securityLevelCompleteList1* := *securityLevelCompleteList1* + *securityLevelsListPart*.

8. If *securityLevelCompleteList1* contains at least two SecurityLevel item with equal token, FAIL the test, restore the DUT state, and skip other steps.

9. If *cap*.MaxLimit is equal to 1, do the following steps:

9.1. ONVIF Client compares Security Level List and Security Level Info List by following the procedure mentioned in Annex A.26 with the following input and output parameters

- in *securityLevelCompleteList1* - list of security levels information
- in *securityLevelInfoCompleteList* - list of security levels

9.2. Skip other steps.

10. ONVIF client invokes **GetSecurityLevelList** with parameters

- Limit := 1
- StartReference skipped

11. The DUT responds with **GetSecurityLevelListResponse** message with parameters

- NextStartReference =: *nextStartReference*
- SecurityLevel list =: *securityLevelCompleteList2*

12. If *securityLevelCompleteList2* contains more SecurityLevel items than 1, FAIL the test, restore the DUT state, and skip other steps.

13. Until *nextStartReference* is not null, repeat the following steps:

13.1. ONVIF client invokes **GetSecurityLevelList** with parameters

- Limit := 1
- StartReference := *nextStartReference*

13.2. The DUT responds with **GetSecurityLevelListResponse** message with parameters

- NextStartReference =: *nextStartReference*
- SecurityLevel list =: *securityLevelsListPart*

13.3. If *securityLevelsListPart* contains more SecurityLevel items than 1, FAIL the test, restore the DUT state, and skip other steps.

13.4. Set *securityLevelCompleteList2* := *securityLevelCompleteList2* + *securityLevelsListPart*

14. If *securityLevelCompleteList2* contains at least two SecurityLevel item with equal token, FAIL the test, restore the DUT state, and skip other steps.

15. If *securityLevelCompleteList2* does not contain all security levels from *securityLevelCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.

16. If *securityLevelCompleteList2* contains security levels other than security levels from *securityLevelCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.

17. If *cap*.MaxLimit is equal to 2 do the following steps:

17.1. ONVIF Client compares Security Level List and Security Level Info List by following the procedure mentioned in Annex A.26 with the following input and output parameters

- in *securityLevelCompleteList2* - list of security levels information
- in *securityLevelInfoCompleteList* - list of security levels

17.2. Skip other steps.

18. Set *limit* := [number between 1 and *cap*.MaxLimit].

19. ONVIF client invokes **GetSecurityLevelList** with parameters

- Limit := *limit*
- StartReference skipped

20. The DUT responds with **GetSecurityLevelListResponse** message with parameters

- NextStartReference =: *nextStartReference*

- SecurityLevel list =: *securityLevelCompleteList3*

21. If *securityLevelCompleteList3* contains more SecurityLevel items than *limit*, FAIL the test, restore the DUT state, and skip other steps.

22. Until *nextStartReference* is not null, repeat the following steps:

    22.1. ONVIF client invokes **GetSecurityLevelList** with parameters

    - Limit := *limit*
    - StartReference := *nextStartReference*

    22.2. The DUT responds with **GetSecurityLevelListResponse** message with parameters

    - NextStartReference =: *nextStartReference*
    - SecurityLevel list =: *securityLevelsListPart*

    22.3. If *securityLevelsListPart* contains more SecurityLevel items than *limit*, FAIL the test, restore the DUT state, and skip other steps.

    22.4. Set *securityLevelCompleteList3* := *securityLevelCompleteList3* + *securityLevelsListPart*

23. If *securityLevelCompleteList3* contains at least two SecurityLevel item with equal token, FAIL the test, restore the DUT state, and skip other steps.

24. If *securityLevelCompleteList3*does not contain all security levels from *securityLevelCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.

25. If *securityLevelCompleteList3* contains security levels other than security levels from *securityLevelCompleteList1*, FAIL the test, restore the DUT state, and skip other steps.

26. ONVIF Client compares Security Level List and Security Level Info List by following the procedure mentioned in Annex A.26 with the following input and output parameters

    - in *securityLevelCompleteList3* - list of security levels information
    - in *securityLevelInfoCompleteList* - list of security levels

27. Remove all security levels with tokens from *createdSecurityLevelTokensList*.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetSecurityLevelListResponse** message.

5.6.4 GET SECURITY LEVEL LIST - NO LIMIT

Test Case ID: AUTH_BEHAVIOR-6-1-4

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), SecurityLevel (ONVIF Authentication Behavior Service Specification), GetSecurityLevelList command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetSecurityLevelList

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Security Level List without using Limit.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of security levels by following the procedure mentioned in Annex A.24 with the following input and output parameters
   - out *securityLevelInfoCompleteList* - complete list of security levels information
   - out *createdSecurityLevelTokensList* - list of created security levels tokens
   - out *cap* - Authentication Behavior Service capabilities
4. ONVIF client invokes **GetSecurityLevelList** with parameters
   - Limit skipped
   - StartReference skipped
5. The DUT responds with **GetSecurityLevelListResponse** message with parameters

- NextStartReference =: *nextStartReference*
- SecurityLevel list =: *securityLevelCompleteList*

6. If *securityLevelCompleteList* contains more SecurityLevel items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.
7. Until *nextStartReference* is not null, repeat the following steps:
   7.1. ONVIF client invokes **GetSecurityLevelList** with parameters
      - Limit skipped
      - StartReference := *nextStartReference*
   7.2. The DUT responds with **GetSecurityLevelListResponse** message with parameters
      - NextStartReference =: *nextStartReference*
      - SecurityLevel list =: *securityLevelsListPart*
   7.3. If *securityLevelsListPart* contains more SecurityLevel items than *cap*.MaxLimit, FAIL the test, restore the DUT state, and skip other steps.
   7.4. Set *securityLevelCompleteList* := *securityLevelCompleteList* + *securityLevelsListPart*
8. If *securityLevelCompleteList* contains at least two SecurityLevel item with equal token, FAIL the test, restore the DUT state, and skip other steps.
9. ONVIF Client compares Security Level List and Security Level Info List by following the procedure mentioned in Annex A.26 with the following input and output parameters
   - in *securityLevelCompleteList* - list of security levels information
   - in *securityLevelInfoCompleteList* - list of security levels
10. Remove all security levels with tokens from *createdSecurityLevelTokensList*.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetSecurityLevelListResponse** message.

5.6.5 GET SECURITY LEVELS WITH INVALID TOKEN

Test Case ID: AUTH_BEHAVIOR-6-1-5

Specification Coverage: SecurityLevel (ONVIF Authentication Behavior Service Specification), GetSecurityLevels command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetSecurityLevels

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Security Level with invalid token.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client creates number of security levels by following the procedure mentioned in Annex A.24 with the following input and output parameters
   - out *securityLevelInfoCompleteList* - complete list of security levels information
   - out *createdSecurityLevelTokensList* - list of created security levels tokens
   - out *cap* - Authentication Behavior Service capabilities
4. Set *invalidToken* := value not equal to any *securityLevelInfoCompleteList*.token.
5. ONVIF client invokes **GetSecurityLevels** with parameters
   - Token list := *invalidToken*
6. The DUT responds with **GetSecurityLevelsResponse** message with parameters
   - SecurityLevel list =: *securityLevelsList*
7. If *securityLevelsList* is not empty, FAIL the test, restore the DUT state, and skip other steps.
8. If *cap*.MaxLimit is less than 2, go to step 14.
9. ONVIF client invokes **GetSecurityLevelInfo** with parameters
   - Token[0] := *invalidToken*

- Token[1] := *securityLevelInfoCompleteList*[0].token

10. The DUT responds with **GetSecurityLevelInfoResponse** message with parameters
    - SecurityLevelInfo list =: *securityLevelsList*
11. If *securityLevelsList* is empty, FAIL the test, restore the DUT state, and skip other steps.
12. If *securityLevelsList* contains more than one item, FAIL the test, restore the DUT state, and skip other steps.
13. If *securityLevelsList*[0].token is not equal to *securityLevelInfoCompleteList*[0].token, FAIL the test, restore the DUT state, and skip other steps.
14. Remove all security levels with tokens from *createdSecurityLevelTokensList*.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetSecurityLevelsResponse** message.

5.6.6 GET SECURITY LEVEL - TOO MANY ITEMS

Test Case ID: AUTH_BEHAVIOR-6-1-6

Specification Coverage: SecurityLevel (ONVIF Authentication Behavior Service Specification), GetSecurityLevels command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: GetSecurityLevels

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify Get Security Level in case there are more items than MaxLimit in request.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.

2. Start the DUT.
3. ONVIF Client creates number of security levels by following the procedure mentioned in Annex A.24 with the following input and output parameters
   - out *securityLevelInfoCompleteList* - complete list of security levels information
   - out *createdSecurityLevelTokensList* - list of created security levels tokens
   - out *cap* - Authentication Behavior Service capabilities
4. If *securityLevelCompleteList*.token items number is less than *cap*.MaxLimit or equal to *cap*.MaxLimit, go to step 8.
5. Set *tokenList* := [subset of *securityLevelInfoCompleteList*.token values with items number equal to *cap*.MaxLimit + 1].
6. ONVIF client invokes **GetSecurityLevels** with parameters
   - Token list := *tokenList*
7. The DUT returns **env:Sender/ter:InvalidArgs/ter:TooManyItems** SOAP 1.2 fault.
8. Remove all security levels with tokens from *createdSecurityLevelTokensList*.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgs/ter:TooManyItems** SOAP 1.2 fault

5.7 Security Level Management

5.7.1 CREATE SECURITY LEVEL WITHOUT RECOGNITION GROUPS

Test Case ID: AUTH_BEHAVIOR-7-1-1

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), SecurityLevel (ONVIF Authentication Behavior Service Specification), CreateSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: CreateSecurityLevel

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify creation of security level without any recognition groups and generating of appropriate notifications.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Event Service was received from the DUT. The DUT shall have enough free storage capacity for one additional Security Level.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLevelInfoInitialList* - complete list of security levels information
4. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
   - in **"tns1:Configuration/SecurityLevel/Changed"** - Notification Topic
   - out *s* - Subscription reference
   - out *currentTime* - current time for the DUT
   - out *terminationTime* - Subscription termination time
5. ONVIF client invokes **CreateSecurityLevel** with parameters
   - SecurityLevel.token := ""
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoInitialList*
   - SecurityLevel.Description := "Test Description"
   - SecurityLevel.RecognitionGroup is skipped
6. The DUT responds with **CreateSecurityLevelResponse** message with parameters

- Token =: *securityLevelToken*

7. ONVIF Client retrieves and checks **tns1:Configuration/SecurityLevel/Changed** event for the specified Authentication Profile token by following the procedure mentioned in Annex A.27 with the following input and output parameters
   - in *s* - Subscription reference
   - in *currentTime* - current time for the DUT
   - in *terminationTime* - subscription termination time
   - in *securityLevelToken* - Security Level token
8. ONVIF Client retrieves a security level by following the procedure mentioned in Annex A.30 with the following input and output parameters
   - in *securityLevelToken* - security level token
   - out *securityLevelsList* - security level list
9. If *securityLevelsList*[0] item does not have equal field values to values from step 5, FAIL the test, restore the DUT state, and skip other steps.
10. ONVIF Client retrieves a security level information by following the procedure mentioned in Annex A.29 with the following input and output parameters
    - in *securityLevelToken* - security level token
    - out *securityLevelInfoList* - security level information list
11. If *securityLevelInfoList*[0] item does not have equal field values to values from step 5, FAIL the test, restore the DUT state, and skip other steps.
12. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
    - out *securityLevelInfoCompleteList* - complete list of security levels information
13. If *securityLevelInfoCompleteList* does not have SecurityLevelInfo[token = *securityLevelToken*] item with equal field values to values from step 5, FAIL the test, restore the DUT state, and skip other steps.
14. ONVIF Client retrieves a complete list of security levels by following the procedure mentioned in Annex A.25 with the following input and output parameters
    - out *securityLevelCompleteList* - complete list of security levels

15. If *securityLevelCompleteList* does not have SecurityLevel[token = *securityLevelToken*] item with equal field values to values from step 5, FAIL the test, restore the DUT state, and skip other steps.
16. For each SecurityLevelInfo.token (*token*) from *securityLevelInfoInitialList* do the following:
    16.1. If *securityLevelCompleteList* does not have SecurityLevel[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.
17. ONVIF Client deletes a security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **CreateSecurityLevelResponse** message.

Note: The following fields are compared at steps 9 and 13:

- SecurityLevel:
  - token
  - Name
  - Priority
  - Description
  - RecognitionGroup list
    - RecognitionMethod list
      - RecognitionType
      - Order

Note: The following fields are compared at step 11 and 15:

- SecurityLevelInfo:
  - token

- Name
- Priority
- Description

5.7.2 CREATE SECURITY LEVEL WITHOUT RECOGNITION METHODS

Test Case ID: AUTH_BEHAVIOR-7-1-2

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), SecurityLevel (ONVIF Authentication Behavior Service Specification), CreateSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: CreateSecurityLevel

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify creation of security level without any recognition methods and generating of appropriate notifications.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Event Service was received from the DUT. The DUT shall have enough free storage capacity for one additional Security Level.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLevelInfoInitialList* - complete list of security levels information
4. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
   - in **"tns1:Configuration/SecurityLevel/Changed"** - Notification Topic
   - out *s* - Subscription reference

- out *currentTime* - current time for the DUT
- out *terminationTime* - Subscription termination time

5. ONVIF client invokes **CreateSecurityLevel** with parameters
   - SecurityLevel.token := ""
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoInitialList*
   - SecurityLevel.Description := "Test Description"
   - SecurityLevel.RecognitionGroup[0]
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod is skipped
6. The DUT responds with **CreateSecurityLevelResponse** message with parameters
   - Token =: *securityLevelToken*
7. ONVIF Client retrieves and checks **tns1:Configuration/SecurityLevel/Changed** event for the specified Authentication Profile token by following the procedure mentioned in Annex A.27 with the following input and output parameters
   - in *s* - Subscription reference
   - in *currentTime* - current time for the DUT
   - in *terminationTime* - subscription termination time
   - in *securityLevelToken* - Security Level token
8. ONVIF Client retrieves a security level by following the procedure mentioned in Annex A.30 with the following input and output parameters
   - in *securityLevelToken* - security level token
   - out *securityLevelsList* - security level list
9. If *securityLevelsList*[0] item does not have equal field values to values from step 5, FAIL the test, restore the DUT state, and skip other steps.
10. ONVIF Client retrieves a security level information by following the procedure mentioned in Annex A.29 with the following input and output parameters

- in *securityLevelToken* - security level token
- out *securityLevelInfoList* - security level information list

11. If *securityLevelInfoList*[0] item does not have equal field values to values from step 5, FAIL the test, restore the DUT state, and skip other steps.
12. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
    - out *securityLevelInfoCompleteList* - complete list of security levels information
13. If *securityLevelInfoCompleteList* does not have SecurityLevelInfo[token = *securityLevelToken*] item with equal field values to values from step 5, FAIL the test, restore the DUT state, and skip other steps.
14. ONVIF Client retrieves a complete list of security levels by following the procedure mentioned in Annex A.25 with the following input and output parameters
    - out *securityLevelCompleteList* - complete list of security levels
15. If *securityLevelCompleteList* does not have SecurityLevel[token = *securityLevelToken*] item with equal field values to values from step 5, FAIL the test, restore the DUT state, and skip other steps.
16. For each SecurityLevelInfo.token (*token*) from *securityLevelInfoInitialList* do the following:
    16.1. If *securityLevelCompleteList* does not have SecurityLevel[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.
17. ONVIF Client deletes a security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **CreateSecurityLevelResponse** message.

Note: The following fields are compared at steps 9 and 13:

- SecurityLevel:

- token
- Name
- Priority
- Description
- RecognitionGroup list
  - RecognitionMethod list
    - RecognitionType
    - Order

Note: The following fields are compared at step 11 and 15:

- SecurityLevelInfo:
  - token
  - Name
  - Priority
  - Description

5.7.3 CREATE SECURITY LEVEL WITH RECOGNITION METHODS

Test Case ID: AUTH_BEHAVIOR-7-1-3

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), SecurityLevel (ONVIF Authentication Behavior Service Specification), CreateSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: CreateSecurityLevel

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify creation of security level and generating of appropriate notifications.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Schedule Service is received from the DUT. Event Service was received from the DUT. The DUT shall have enough free storage capacity for one additional Security Level.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLevelInfoInitialList* - complete list of security levels information
4. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
   - in **"tns1:Configuration/SecurityLevel/Changed"** - Notification Topic
   - out *s* - Subscription reference
   - out *currentTime* - current time for the DUT
   - out *terminationTime* - Subscription termination time
5. ONVIF client invokes **CreateSecurityLevel** with parameters
   - SecurityLevel.token := ""
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoInitialList*
   - SecurityLevel.Description := "Test Description"
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].RecognitionType := *firstSupportedRecognitionType* (see Annex A.31 for details)
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].Order := 1
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].Extension is skipped
   - SecurityLevel.RecognitionGroup[0].Extension is skipped
   - SecurityLevel.Extension is skipped
6. The DUT responds with **CreateSecurityLevelResponse** message with parameters
   - Token =: *securityLevelToken*

7. ONVIF Client retrieves and checks **tns1:Configuration/SecurityLevel/Changed** event for the specified Security Level token by following the procedure mentioned in Annex A.27 with the following input and output parameters
   - in *s* - Subscription reference
   - in *currentTime* - current time for the DUT
   - in *terminationTime* - subscription termination time
   - in *securityLevelToken* - Security Level token
8. ONVIF Client deletes PullPoint subscription by following the procedure mentioned in Annex A.9 with the following input and output parameters
   - in *s* - Subscription reference
9. ONVIF Client retrieves a security level by following the procedure mentioned in Annex A.30 with the following input and output parameters
   - in *securityLevelToken* - security level token
   - out *securityLevelsList* - security level list
10. If *securityLevelsList*[0] item does not have equal field values to values from step 5, FAIL the test, restore the DUT state, and skip other steps.
11. ONVIF Client retrieves a security level information by following the procedure mentioned in Annex A.29 with the following input and output parameters
    - in *securityLevelToken* - security level token
    - out *securityLevelInfoList* - security level information list
12. If *securityLevelInfoList*[0] item does not have equal field values to values from step 5, FAIL the test, restore the DUT state, and skip other steps.
13. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
    - out *securityLevelInfoCompleteList* - complete list of security levels information
14. If *securityLevelInfoCompleteList* does not have SecurityLevelInfo[token = *securityLevelToken*] item with equal field values to values from step 5, FAIL the test, restore the DUT state, and skip other steps.
15. ONVIF Client retrieves a complete list of security levels by following the procedure mentioned in Annex A.25 with the following input and output parameters

- out *securityLevelCompleteList* - complete list of security levels

16. If *securityLevelCompleteList* does not have SecurityLevel[token = *securityLevelToken*] item with equal field values to values from step 5, FAIL the test, restore the DUT state, and skip other steps.
17. For each SecurityLevelInfo.token (*token*) from *securityLevelInfoInitialList* do the following:
    17.1. If *securityLevelCompleteList* does not have SecurityLevel[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.
18. ONVIF Client deletes a security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **CreateSecurityLevelResponse** message.

Note: The following fields are compared at steps 10 and 14:

- SecurityLevel:
  - token
  - Name
  - Priority
  - Description
  - RecognitionGroup list
    - RecognitionMethod list
      - RecognitionType
      - Order

Note: The following fields are compared at step 12 and 16:

- SecurityLevelInfo:

- token
- Name
- Priority
- Description

5.7.4 MODIFY SECURITY LEVEL

Test Case ID: AUTH_BEHAVIOR-7-1-4

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), SecurityLevel (ONVIF Authentication Behavior Service Specification), ModifySecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: ModifySecurityLevel

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify modifiing of security level and generating of apropriate notifications.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Schedule Service is received from the DUT. Event Service was received from the DUT. The DUT shall have enough free storage capacity for one additional Security Level.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
4. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLevelInfoInitialList* - complete list of security levels information
5. ONVIF Client creates Security Level by following the procedure mentioned in Annex A.17 with the following input and output parameters
   - out *securityLevelToken* - security level token

- out *securityLevel* - security level

6. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
   - in **"tns1:Configuration/SecurityLevel/Changed"** - Notification Topic
   - out *s* - Subscription reference
   - out *currentTime* - current time for the DUT
   - out *terminationTime* - Subscription termination time
7. ONVIF client invokes **ModifySecurityLevel** with parameters
   - SecurityLevel.token := *securityLevelToken*
   - SecurityLevel.Name := "Test Name2"
   - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoInitialList* and other than *securityLevel*.Priority
   - SecurityLevel.Description := "Test Description2"
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].RecognitionType := *secondSupportedRecognitionType* (see Annex A.31 for details)
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].Order := 2
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].Extension is skipped
   - SecurityLevel.RecognitionGroup[0].Extension is skipped
   - SecurityLevel.Extension is skipped
8. The DUT responds with **ModifySecurityLevelResponse** message.
9. ONVIF Client retrieves and checks **tns1:Configuration/SecurityLevel/Changed** event for the specified Security Level token by following the procedure mentioned in Annex A.27 with the following input and output parameters
   - in *s* - Subscription reference
   - in *currentTime* - current time for the DUT
   - in *terminationTime* - subscription termination time
   - in *securityLevelToken* - Security Level token

10. ONVIF Client retrieves a security level by following the procedure mentioned in Annex A.30 with the following input and output parameters
    - in *securityLevelToken* - security level token
    - out *securityLevelsList* - security level list
11. If *securityLevelsList*[0] item does not have equal field values to values from step 7, FAIL the test, restore the DUT state, and skip other steps.
12. ONVIF Client retrieves a security level information by following the procedure mentioned in Annex A.29 with the following input and output parameters
    - in *securityLevelToken* - security level token
    - out *securityLevelInfoList* - security level information list
13. If *securityLevelInfoList*[0] item does not have equal field values to values from step 7, FAIL the test, restore the DUT state, and skip other steps.
14. ONVIF client invokes **ModifySecurityLevel** with parameters
    - SecurityLevel.token := *securityLevelToken*
    - SecurityLevel.Name := "Test Name2"
    - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoInitialList* and other than *securityLevel*.Priority
    - SecurityLevel.Description := "Test Description2"
    - SecurityLevel.RecognitionGroup is skipped
    - SecurityLevel.Extension is skipped
15. The DUT responds with **ModifySecurityLevelResponse** message.
16. ONVIF Client retrieves and checks **tns1:Configuration/SecurityLevel/Changed** event for the specified Security Level token by following the procedure mentioned in Annex A.27 with the following input and output parameters
    - in *s* - Subscription reference
    - in *currentTime* - current time for the DUT
    - in *terminationTime* - subscription termination time
    - in *securityLevelToken* - Security Level token

17. ONVIF Client retrieves a security level by following the procedure mentioned in Annex A.30 with the following input and output parameters
    - in *securityLevelToken* - security level token
    - out *securityLevelsList* - security level list
18. If *securityLevelsList*[0] item does not have equal field values to values from step 14, FAIL the test, restore the DUT state, and skip other steps.
19. ONVIF Client retrieves a security level information by following the procedure mentioned in Annex A.29 with the following input and output parameters
    - in *securityLevelToken* - security level token
    - out *securityLevelInfoList* - security level information list
20. If *securityLevelInfoList*[0] item does not have equal field values to values from step 14, FAIL the test, restore the DUT state, and skip other steps.
21. If *cap*.MaxRecognitionGroupsPerSecurityLevel > 1:
    21.1. ONVIF client invokes **ModifySecurityLevel** with parameters
    - SecurityLevel.token := *securityLevelToken*
    - SecurityLevel.Name := "Test Name3"
    - SecurityLevel.Priority := other then specified for SecurityLiveIlnfo items in *securityLevelInfoInitialList* and other than *securityLevel*.Priority
    - SecurityLevel.Description := "Test Description3"
    - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].RecognitionType := *firstSupportedRecognitionType* (see Annex A.31 for details)
    - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].Order := 3
    - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].Extension is skipped
    - SecurityLevel.RecognitionGroup[0].Extension is skipped
    - SecurityLevel.RecognitionGroup[1].RecognitionMethod[0].RecognitionType := *firstSupportedRecognitionType* (see Annex A.31 for details)
    - SecurityLevel.RecognitionGroup[1].RecognitionMethod[0].Order := 1
    - SecurityLevel.RecognitionGroup[1].RecognitionMethod[0].Extension is skipped

- SecurityLevel.RecognitionGroup[1].Extension is skipped
- SecurityLevel.Extension is skipped

21.2. The DUT responds with **ModifySecurityLevelResponse** message.

21.3. ONVIF Client retrieves and checks **tns1:Configuration/SecurityLevel/Changed** event for the specified Security Level token by following the procedure mentioned in Annex A.27 with the following input and output parameters

- in *s* - Subscription reference
- in *currentTime* - current time for the DUT
- in *terminationTime* - subscription termination time
- in *securityLevelToken* - Security Level token

21.4. ONVIF Client retrieves a security level by following the procedure mentioned in Annex A.30 with the following input and output parameters

- in *securityLevelToken* - security level token
- out *securityLevelsList* - security level list

21.5. If *securityLevelsList*[0] item does not have equal field values to values from step 21.1, FAIL the test, restore the DUT state, and skip other steps.

21.6. ONVIF Client retrieves a security level information by following the procedure mentioned in Annex A.29 with the following input and output parameters

- in *securityLevelToken* - security level token
- out *securityLevelInfoList* - security level information list

21.7. If *securityLevelInfoList*[0] item does not have equal field values to values from step 21.1, FAIL the test, restore the DUT state, and skip other steps.

22. ONVIF Client deletes PullPoint subscription by following the procedure mentioned in Annex A.9 with the following input and output parameters

- in *s* - Subscription reference

23. ONVIF Client retrieves a complete list of security level by following the procedure mentioned in Annex A.25 with the following input and output parameters

- out *securityLevelUpdatedList* - complete list of security levels information

24. If *securityLevelUpdatedList* does not have SecurityLevel[token = *securityLevelToken*] item, FAIL the test, restore the DUT state, and skip other steps.
25. For each SecurityLevel.token (*token*) from *securityLevelInitialList* do the following:
    25.1. If *securityLevelUpdatedList* does not have SecurityLevel[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.
26. ONVIF Client deletes a security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **ModifySecurityLevelResponse** message.

Note: The following fields are compared at steps 11, 18, and 21.5:

- SecurityLevel:
  - token
  - Name
  - Priority
  - Description
  - RecognitionGroup list
    - RecognitionMethod list
      - RecognitionType
      - Order

Note: The following fields are compared at step 13, 20, and 21.7:

- SecurityLevelInfo:
  - token
  - Name

- Priority
- Description

5.7.5 DELETE SECURITY LEVEL

Test Case ID: AUTH_BEHAVIOR-7-1-5

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), SecurityLevel (ONVIF Authentication Behavior Service Specification), DeleteSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: DeleteSecurityLevel

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify deleting of security level and generating of apropriate notifications.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Event Service was received from the DUT. The DUT shall have enough free storage capacity for one additional Security Level.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a complete list of security levels by following the procedure mentioned in Annex A.25 with the following input and output parameters
   - out *securityLevelInitialList* - complete list of security levels
4. ONVIF Client creates Security Level by following the procedure mentioned in Annex A.17 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *securityLevel* - security level
5. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
   - in **"tns1:Configuration/SecurityLevel/Removed"** - Notification Topic
   - out *s* - Subscription reference

- out *currentTime* - current time for the DUT
- out *terminationTime* - Subscription termination time

6. ONVIF client invokes **DeleteSecurityLevel** with parameters
   - SecurityLevel.token := *securityLevelToken*
7. The DUT responds with **DeleteSecurityLevelResponse** message.
8. ONVIF Client retrieves and checks **tns1:Configuration/SecurityLevel/Removed** event for the specified Security Level token by following the procedure mentioned in Annex A.28 with the following input and output parameters
   - in *s* - Subscription reference
   - in *currentTime* - current time for the DUT
   - in *terminationTime* - subscription termination time
   - in *securityLevelToken* - Security Level token
9. ONVIF Client deletes PullPoint subscription by following the procedure mentioned in Annex A.9 with the following input and output parameters
   - in *s* - Subscription reference
10. ONVIF Client retrieves a security level by following the procedure mentioned in Annex A.30 with the following input and output parameters
    - in *securityLevelToken* - security level token
    - out *securityLevelsList* - security level list
11. If *securityLevelsList* is not empty, FAIL the test, restore the DUT state, and skip other steps.
12. ONVIF Client retrieves a security level information by following the procedure mentioned in Annex A.29 with the following input and output parameters
    - in *securityLevelToken* - security level token
    - out *securityLevelInfoList* - security level information list
13. If *securityLevelInfoList* is not empty, FAIL the test, restore the DUT state, and skip other steps.
14. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters

- out *securityLevelInfoList* - complete list of security levels information

15. If *securityLevelInfoList* contains SecurityLevelInfo.[token = *securityLevelToken*] item, FAIL the test, restore the DUT state, and skip other steps.
16. ONVIF Client retrieves a complete list of security levels by following the procedure mentioned in Annex A.25 with the following input and output parameters
    - out *securityLevelList* - complete list of security levels
17. If *securityLevelList* contains SecurityLevel.[token = *securityLevelToken*] item, FAIL the test, restore the DUT state, and skip other steps.
18. For each SecurityLevel.token (*token*) from *securityLevelInitialList* do the following:
    18.1. If *securityLevelList* does not have SecurityLevel[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **DeleteSecurityLevelResponse** message.

5.7.6 SET SECURITY LEVEL WITHOUT RECOGNITION GROUPS

Test Case ID: AUTH_BEHAVIOR-7-1-6

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), SecurityLevel (ONVIF Authentication Behavior Service Specification), SetSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: SetSecurityLevel

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify creation of security level without any recognition groups and generating of appropriate notifications.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Event Service was received from the DUT. The DUT shall have enough free storage capacity for one additional Security Level.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLevelInfoInitialList* - complete list of security levels information
4. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
   - in **"tns1:Configuration/SecurityLevel/Changed"** - Notification Topic
   - out *s* - Subscription reference
   - out *currentTime* - current time for the DUT
   - out *terminationTime* - Subscription termination time
5. Set *securityLevelToken* := token that differs from tokens listed in *securityLevelInfoInitialList*.
6. ONVIF client invokes **SetSecurityLevel** with parameters
   - SecurityLevel.token := *securityLevelToken*
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoInitialList*
   - SecurityLevel.Description := "Test Description"
   - SecurityLevel.RecognitionGroup is skipped
7. The DUT responds with **SetSecurityLevelResponse** message with parameters
   - Token =: *securityLevelToken*
8. ONVIF Client retrieves and checks **tns1:Configuration/SecurityLevel/Changed** event for the specified Authentication Profile token by following the procedure mentioned in Annex A.27 with the following input and output parameters
   - in *s* - Subscription reference

- in *currentTime* - current time for the DUT
- in *terminationTime* - subscription termination time
- in *securityLevelToken* - Security Level token

9. ONVIF Client retrieves a security level by following the procedure mentioned in Annex A.30 with the following input and output parameters
   - in *securityLevelToken* - security level token
   - out *securityLevelsList* - security level list
10. If *securityLevelsList*[0] item does not have equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
11. ONVIF Client retrieves a security level information by following the procedure mentioned in Annex A.29 with the following input and output parameters
    - in *securityLevelToken* - security level token
    - out *securityLevelInfoList* - security level information list
12. If *securityLevelInfoList*[0] item does not have equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
13. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
    - out *securityLevelInfoCompleteList* - complete list of security levels information
14. If *securityLevelInfoCompleteList* does not have SecurityLevelInfo[token = *securityLevelToken*] item with equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
15. ONVIF Client retrieves a complete list of security levels by following the procedure mentioned in Annex A.25 with the following input and output parameters
    - out *securityLevelCompleteList* - complete list of security levels
16. If *securityLevelCompleteList* does not have SecurityLevel[token = *securityLevelToken*] item with equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
17. For each SecurityLevelInfo.token (*token*) from *securityLevelInfoInitialList* do the following:

17.1. If *securityLevelCompleteList* does not have SecurityLevel[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.

18. ONVIF Client deletes a security level by following the procedure mentioned in Annex A.22 with the following input and output parameters

    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **SetSecurityLevelResponse** message.

Note: The following fields are compared at steps 10 and 14:

- SecurityLevel:
  - token
  - Name
  - Priority
  - Description
  - RecognitionGroup list
    - RecognitionMethod list
      - RecognitionType
      - Order

Note: The following fields are compared at step 12 and 16:

- SecurityLevelInfo:
  - token
  - Name
  - Priority

- Description

5.7.7 SET SECURITY LEVEL WITHOUT RECOGNITION METHODS

Test Case ID: AUTH_BEHAVIOR-7-1-7

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), SecurityLevel (ONVIF Authentication Behavior Service Specification), SetSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: SetSecurityLevel

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify creation of security level without any recognition methods and generating of appropriate notifications.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Event Service was received from the DUT. The DUT shall have enough free storage capacity for one additional Security Level.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLevelInfoInitialList* - complete list of security levels information
4. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
   - in **"tns1:Configuration/SecurityLevel/Changed"** - Notification Topic
   - out *s* - Subscription reference
   - out *currentTime* - current time for the DUT
   - out *terminationTime* - Subscription termination time

5. Set *securityLevelToken* := token that differs from tokens listed in *securityLevelInfoInitialList*.
6. ONVIF client invokes **SetSecurityLevel** with parameters
   - SecurityLevel.token := *securityLevelToken*
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoInitialList*
   - SecurityLevel.Description := "Test Description"
   - SecurityLevel.RecognitionGroup[0]
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod is skipped
7. The DUT responds with **SetSecurityLevelResponse** message with parameters
   - Token =: *securityLevelToken*
8. ONVIF Client retrieves and checks **tns1:Configuration/SecurityLevel/Changed** event for the specified Authentication Profile token by following the procedure mentioned in Annex A.27 with the following input and output parameters
   - in *s* - Subscription reference
   - in *currentTime* - current time for the DUT
   - in *terminationTime* - subscription termination time
   - in *securityLevelToken* - Security Level token
9. ONVIF Client retrieves a security level by following the procedure mentioned in Annex A.30 with the following input and output parameters
   - in *securityLevelToken* - security level token
   - out *securityLevelsList* - security level list
10. If *securityLevelsList*[0] item does not have equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
11. ONVIF Client retrieves a security level information by following the procedure mentioned in Annex A.29 with the following input and output parameters
    - in *securityLevelToken* - security level token

- out *securityLevelInfoList* - security level information list

12. If *securityLevelInfoList*[0] item does not have equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
13. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
    - out *securityLevelInfoCompleteList* - complete list of security levels information
14. If *securityLevelInfoCompleteList* does not have SecurityLevelInfo[token = *securityLevelToken*] item with equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
15. ONVIF Client retrieves a complete list of security levels by following the procedure mentioned in Annex A.25 with the following input and output parameters
    - out *securityLevelCompleteList* - complete list of security levels
16. If *securityLevelCompleteList* does not have SecurityLevel[token = *securityLevelToken*] item with equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
17. For each SecurityLevelInfo.token (*token*) from *securityLevelInfoInitialList* do the following:
    17.1. If *securityLevelCompleteList* does not have SecurityLevel[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.
18. ONVIF Client deletes a security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **SetSecurityLevelResponse** message.

Note: The following fields are compared at steps 10 and 14:

- SecurityLevel:
  - token

- Name
- Priority
- Description
- RecognitionGroup list
  - RecognitionMethod list
    - RecognitionType
    - Order

Note: The following fields are compared at step 12 and 16:

- SecurityLevelInfo:
  - token
  - Name
  - Priority
  - Description

5.7.8 SET SECURITY LEVEL WITH RECOGNITION METHODS

Test Case ID: AUTH_BEHAVIOR-7-1-8

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), SecurityLevel (ONVIF Authentication Behavior Service Specification), SetSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: SetSecurityLevel

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify creation of security level and generating of appropriate notifications.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Schedule Service is received from the DUT. Event Service was received from the DUT. The DUT shall have enough free storage capacity for one additional Security Level.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLevelInfoInitialList* - complete list of security levels information
4. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
   - in **"tns1:Configuration/SecurityLevel/Changed"** - Notification Topic
   - out *s* - Subscription reference
   - out *currentTime* - current time for the DUT
   - out *terminationTime* - Subscription termination time
5. Set *securityLevelToken* := token that differs from tokens listed in *securityLevelInfoInitialList*.
6. ONVIF client invokes **SetSecurityLevel** with parameters
   - SecurityLevel.token := *securityLevelToken*
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoInitialList*
   - SecurityLevel.Description := "Test Description"
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].RecognitionType := *firstSupportedRecognitionType* (see Annex A.31 for details)
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].Order := 1
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].Extension is skipped
   - SecurityLevel.RecognitionGroup[0].Extension is skipped
   - SecurityLevel.Extension is skipped
7. The DUT responds with **SetSecurityLevelResponse** message with parameters
   - Token =: *securityLevelToken*

8. ONVIF Client retrieves and checks **tns1:Configuration/SecurityLevel/Changed** event for the specified Security Level token by following the procedure mentioned in Annex A.27 with the following input and output parameters
   - in *s* - Subscription reference
   - in *currentTime* - current time for the DUT
   - in *terminationTime* - subscription termination time
   - in *securityLevelToken* - Security Level token
9. ONVIF Client deletes PullPoint subscription by following the procedure mentioned in Annex A.9 with the following input and output parameters
   - in *s* - Subscription reference
10. ONVIF Client retrieves a security level by following the procedure mentioned in Annex A.30 with the following input and output parameters
    - in *securityLevelToken* - security level token
    - out *securityLevelsList* - security level list
11. If *securityLevelsList*[0] item does not have equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
12. ONVIF Client retrieves a security level information by following the procedure mentioned in Annex A.29 with the following input and output parameters
    - in *securityLevelToken* - security level token
    - out *securityLevelInfoList* - security level information list
13. If *securityLevelInfoList*[0] item does not have equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
14. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
    - out *securityLevelInfoCompleteList* - complete list of security levels information
15. If *securityLevelInfoCompleteList* does not have SecurityLevelInfo[token = *securityLevelToken*] item with equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
16. ONVIF Client retrieves a complete list of security levels by following the procedure mentioned in Annex A.25 with the following input and output parameters

- out *securityLevelCompleteList* - complete list of security levels

17. If *securityLevelCompleteList* does not have SecurityLevel[token = *securityLevelToken*] item with equal field values to values from step 6, FAIL the test, restore the DUT state, and skip other steps.
18. For each SecurityLevelInfo.token (*token*) from *securityLevelInfoInitialList* do the following:
    18.1. If *securityLevelCompleteList* does not have SecurityLevel[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.
19. ONVIF Client deletes a security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **SetSecurityLevelResponse** message.

Note: The following fields are compared at steps 11 and 15:

- SecurityLevel:
  - token
  - Name
  - Priority
  - Description
  - RecognitionGroup list
    - RecognitionMethod list
      - RecognitionType
      - Order

Note: The following fields are compared at step 13 and 17:

- SecurityLevelInfo:

- token
- Name
- Priority
- Description

5.7.9 SET SECURITY LEVEL

Test Case ID: AUTH_BEHAVIOR-7-1-9

Specification Coverage: SecurityLevelInfo (ONVIF Authentication Behavior Service Specification), SecurityLevel (ONVIF Authentication Behavior Service Specification), SetSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: SetSecurityLevel

WSDL Reference: authenticationbehavior.wsdl, event.wsdl

Test Purpose: To verify modifiing of security level and generating of apropriate notifications.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Schedule Service is received from the DUT. Event Service was received from the DUT. The DUT shall have enough free storage capacity for one additional Security Level.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
4. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLevelInfoInitialList* - complete list of security levels information
5. ONVIF Client creates Security Level by following the procedure mentioned in Annex A.17 with the following input and output parameters
   - out *securityLevelToken* - security level token

- out *securityLevel* - security level

6. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.8 with the following input and output parameters
   - in **"tns1:Configuration/SecurityLevel/Changed"** - Notification Topic
   - out *s* - Subscription reference
   - out *currentTime* - current time for the DUT
   - out *terminationTime* - Subscription termination time
7. ONVIF client invokes **SetSecurityLevel** with parameters
   - SecurityLevel.token := *securityLevelToken*
   - SecurityLevel.Name := "Test Name2"
   - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoInitialList* and other than *securityLevel*.Priority
   - SecurityLevel.Description := "Test Description2"
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].RecognitionType := *secondSupportedRecognitionType* (see Annex A.31 for details)
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].Order := 2
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].Extension is skipped
   - SecurityLevel.RecognitionGroup[0].Extension is skipped
   - SecurityLevel.Extension is skipped
8. The DUT responds with **SetSecurityLevelResponse** message.
9. ONVIF Client retrieves and checks **tns1:Configuration/SecurityLevel/Changed** event for the specified Security Level token by following the procedure mentioned in Annex A.27 with the following input and output parameters
   - in *s* - Subscription reference
   - in *currentTime* - current time for the DUT
   - in *terminationTime* - subscription termination time
   - in *securityLevelToken* - Security Level token

10. ONVIF Client retrieves a security level by following the procedure mentioned in Annex A.30 with the following input and output parameters
    - in *securityLevelToken* - security level token
    - out *securityLevelsList* - security level list
11. If *securityLevelsList*[0] item does not have equal field values to values from step 7, FAIL the test, restore the DUT state, and skip other steps.
12. ONVIF Client retrieves a security level information by following the procedure mentioned in Annex A.29 with the following input and output parameters
    - in *securityLevelToken* - security level token
    - out *securityLevelInfoList* - security level information list
13. If *securityLevelInfoList*[0] item does not have equal field values to values from step 7, FAIL the test, restore the DUT state, and skip other steps.
14. ONVIF client invokes **SetSecurityLevel** with parameters
    - SecurityLevel.token := *securityLevelToken*
    - SecurityLevel.Name := "Test Name2"
    - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoInitialList* and other than *securityLevel*.Priority
    - SecurityLevel.Description := "Test Description2"
    - SecurityLevel.RecognitionGroup is skipped
    - SecurityLevel.Extension is skipped
15. The DUT responds with **SetSecurityLevelResponse** message.
16. ONVIF Client retrieves and checks **tns1:Configuration/SecurityLevel/Changed** event for the specified Security Level token by following the procedure mentioned in Annex A.27 with the following input and output parameters
    - in *s* - Subscription reference
    - in *currentTime* - current time for the DUT
    - in *terminationTime* - subscription termination time
    - in *securityLevelToken* - Security Level token

17. ONVIF Client retrieves a security level by following the procedure mentioned in Annex A.30 with the following input and output parameters
    - in *securityLevelToken* - security level token
    - out *securityLevelsList* - security level list
18. If *securityLevelsList*[0] item does not have equal field values to values from step 14, FAIL the test, restore the DUT state, and skip other steps.
19. ONVIF Client retrieves a security level information by following the procedure mentioned in Annex A.29 with the following input and output parameters
    - in *securityLevelToken* - security level token
    - out *securityLevelInfoList* - security level information list
20. If *securityLevelInfoList*[0] item does not have equal field values to values from step 14, FAIL the test, restore the DUT state, and skip other steps.
21. If *cap*.MaxRecognitionGroupsPerSecurityLevel > 1:
    21.1. ONVIF client invokes **SetSecurityLevel** with parameters
    - SecurityLevel.token := *securityLevelToken*
    - SecurityLevel.Name := "Test Name3"
    - SecurityLevel.Priority := other then specified for SecurityLiveIlnfo items in *securityLevelInfoInitialList* and other than *securityLevel*.Priority
    - SecurityLevel.Description := "Test Description3"
    - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].RecognitionType := *firstSupportedRecognitionType* (see Annex A.31 for details)
    - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].Order := 3
    - SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].Extension is skipped
    - SecurityLevel.RecognitionGroup[0].Extension is skipped
    - SecurityLevel.RecognitionGroup[1].RecognitionMethod[0].RecognitionType := *firstSupportedRecognitionType* (see Annex A.31 for details)
    - SecurityLevel.RecognitionGroup[1].RecognitionMethod[0].Order := 1
    - SecurityLevel.RecognitionGroup[1].RecognitionMethod[0].Extension is skipped

- SecurityLevel.RecognitionGroup[1].Extension is skipped
- SecurityLevel.Extension is skipped

21.2. The DUT responds with **SetSecurityLevelResponse** message.

21.3. ONVIF Client retrieves and checks **tns1:Configuration/SecurityLevel/Changed** event for the specified Security Level token by following the procedure mentioned in Annex A.27 with the following input and output parameters

- in *s* - Subscription reference
- in *currentTime* - current time for the DUT
- in *terminationTime* - subscription termination time
- in *securityLevelToken* - Security Level token

21.4. ONVIF Client retrieves a security level by following the procedure mentioned in Annex A.30 with the following input and output parameters

- in *securityLevelToken* - security level token
- out *securityLevelsList* - security level list

21.5. If *securityLevelsList*[0] item does not have equal field values to values from step 21.1, FAIL the test, restore the DUT state, and skip other steps.

21.6. ONVIF Client retrieves a security level information by following the procedure mentioned in Annex A.29 with the following input and output parameters

- in *securityLevelToken* - security level token
- out *securityLevelInfoList* - security level information list

21.7. If *securityLevelInfoList*[0] item does not have equal field values to values from step 21.1, FAIL the test, restore the DUT state, and skip other steps.

22. ONVIF Client deletes PullPoint subscription by following the procedure mentioned in Annex A.9 with the following input and output parameters

- in *s* - Subscription reference

23. ONVIF Client retrieves a complete list of security level by following the procedure mentioned in Annex A.25 with the following input and output parameters

- out *securityLevelUpdatedList* - complete list of security levels information

24. If *securityLevelUpdatedList* does not have SecurityLevel[token = *securityLevelToken*] item, FAIL the test, restore the DUT state, and skip other steps.

25. For each SecurityLevel.token (*token*) from *securityLevelInitialList* do the following:

    25.1. If *securityLevelUpdatedList* does not have SecurityLevel[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.

26. ONVIF Client deletes a security level by following the procedure mentioned in Annex A.22 with the following input and output parameters

    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **SetSecurityLevelResponse** message.

Note: The following fields are compared at steps 11, 18, and 21.5:

- SecurityLevel:
  - token
  - Name
  - Priority
  - Description
  - RecognitionGroup list
    - RecognitionMethod list
      - RecognitionType
      - Order

Note: The following fields are compared at step 13, 20, and 21.7:

- SecurityLevelInfo:
  - token

- Name
- Priority
- Description

5.7.10 CREATE SECURITY LEVEL - NOT EMPTY TOKEN

Test Case ID: AUTH_BEHAVIOR-7-1-10

Specification Coverage: CreateSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: CreateSecurityLevel

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify create security level with not empty token.

Pre-Requisite: Authentication Behavior Service is received from the DUT. The DUT shall have enough free storage capacity for one additional SecurityLevel.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLevelInfoList* - complete list of security levels information
4. ONVIF client invokes **CreateSecurityLevel** with parameters
   - SecurityLevel.token := "Token"
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoInitialList*
   - SecurityLevel.Description is skipped
   - SecurityLevel.RecognitionGroup is skipped

- SecurityLevel.Extension is skipped

5. The DUT returns **env:Sender/ter:InvalidArgVal** SOAP 1.2 fault.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgVal** SOAP 1.2 fault.

5.7.11 CREATE SECURITY LEVEL - CAPABILITY VIOLATED (MAX RECOGNITION GROUPS PER SECURITY LEVEL)

Test Case ID: AUTH_BEHAVIOR-7-1-11

Specification Coverage: CreateSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: CreateSecurityLevel

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify creation of security level with maximum number of recognition groups per security level.

Pre-Requisite: Authentication Behavior Service is received from the DUT. The DUT shall have enough free storage capacity for one additional Security Level.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities

4. If *cap*.MaxRecognitionGroupsPerSecurityLevel value is more than 50, skip other steps.
5. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLevelInfoList* - complete list of security levels information
6. If *cap*.MaxRecognitionGroupsPerSecurityLevel is equal to one, go to step 11.
7. Set *recognitionGroup* :=
   - RecognitionMethod[0].RecognitionType := *firstSupportedRecognitionType* (see Annex A.31 for details)
   - RecognitionMethod[0].Order := 1
   - RecognitionMethod[0].Extension is skipped
8. ONVIF client invokes **CreateSecurityLevel** with parameters
   - SecurityLevel.token := ""
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoInitialList*
   - SecurityLevel.Description is skipped
   - SecurityLevel.RecognitionGroup list := *recognitionGroup* duplicated *cap*.MaxRecognitionGroupsPerSecurityLevel number of times
   - SecurityLevel.Extension is skipped
9. The DUT responds with **CreateSecurityLevelResponse** message with parameters
   - Token =: *securityLevelToken*
10. ONVIF Client deletes a security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token
11. ONVIF client invokes **CreateSecurityLevel** with parameters
    - SecurityLevel.token := ""
    - SecurityLevel.Name := "Test Name"

- SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoInitialList*
- SecurityLevel.Description is skipped
- SecurityLevel.RecognitionGroup list := *recognitionGroup* duplicated *cap*.MaxRecognitionGroupsPerSecurityLevel + 1 number of times
- SecurityLevel.Extension is skipped

12. The DUT returns **env:Sender/ter:CapabilityViolated/ter:MaxRecognitionGroupsPerSecurityLevel** SOAP 1.2 fault.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **CreateSecurityLevelResponse** mesage.
- The DUT did not send **env:Sender/ter:CapabilityViolated/ter:MaxRecognitionGroupsPerSecurityLevel** SOAP 1.2 fault.

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.7.12 CREATE SECURITY LEVEL - CAPABILITY VIOLATED (MAX RECOGNITION METHODS PER RECOGNITION GROUP)

Test Case ID: AUTH_BEHAVIOR-7-1-12

Specification Coverage: CreateSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: CreateSecurityLevel

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify creation of security level with maximum number recognition methods per recognition group.

Pre-Requisite: Authentication Behavior Service is received from the DUT. The DUT shall have enough free storage capacity for one additional Security Level.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
4. If *cap*.MaxRecognitionMethodsPerRecognitionGroup value is more than 50, skip other steps.
5. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLevelInfoList* - complete list of security levels information
6. If *cap*.MaxRecognitionMethodsPerRecognitionGroup is equal to one, go to step 11.
7. Set *recognitionMethod* :=
   - RecognitionType := *firstSupportedRecognitionType* (see Annex A.31 for details)
   - Order := 1
   - Extension is skipped
8. ONVIF client invokes **CreateSecurityLevel** with parameters
   - SecurityLevel.token := ""
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoInitialList*
   - SecurityLevel.Description is skipped
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod list := *recognitionMethod* duplicated *cap*.MaxRecognitionMethodsPerRecognitionGroup number of times
   - SecurityLevel.RecognitionGroup[0].Extension is skipped

- SecurityLevel.Extension is skipped

9. The DUT responds with **CreateSecurityLevelResponse** message with parameters
   - Token =: *securityLevelToken*
10. ONVIF Client deletes a security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token
11. ONVIF client invokes **CreateSecurityLevel** with parameters
    - SecurityLevel.token := ""
    - SecurityLevel.Name := "Test Name"
    - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoInitialList*
    - SecurityLevel.Description is skipped
    - SecurityLevel.RecognitionGroup[0].RecognitionMethod list := *recognitionMethod* duplicated *cap*.MaxRecognitionMethodsPerRecognitionGroup + 1 number of times
    - SecurityLevel.Extension is skipped
    - SecurityLevel.RecognitionGroup[0].Extension is skipped
12. The DUT returns **env:Sender/ter:CapabilityViolated/ ter:MaxRecognitionMethodsPerRecognitionGroup** SOAP 1.2 fault.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **CreateSecurityLevelResponse** mesage.
- The DUT did not send **env:Sender/ter:CapabilityViolated/ ter:MaxRecognitionMethodsPerRecognitionGroup** SOAP 1.2 fault.

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.7.13 CREATE SECURITY LEVEL - DUPLICATE PRIORITY

Test Case ID: AUTH_BEHAVIOR-7-1-13

Specification Coverage: CreateSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: CreateSecurityLevel

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify creation of security level with duplicated priority.

Pre-Requisite: Authentication Behavior Service is received from the DUT. The DUT shall have enough free storage capacity for one additional Security Level.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
4. If *cap*.MaxSecurityLevels = 1, skip other steps.
5. ONVIF Client find existing or create new security level by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *securityLevel* - security level
   - out *newSecurityLevel* - flag if new security level was created
6. ONVIF client invokes **CreateSecurityLevel** with parameters
   - SecurityLevel.token := ""
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := *securityLevel*.Priority

- SecurityLevel.Description is skipped
- SecurityLevel.RecognitionGroup is skipped
- SecurityLevel.Extension is skipped

7. The DUT returns **env:Sender/ter:InvalidArgVal/ter:DuplicatePriority** SOAP 1.2 fault.
8. If *newSecurityLevel* = true:
   8.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
   - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgVal/ter:DuplicatePriority** SOAP 1.2 fault.

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.7.14 MODIFY SECURITY LEVEL - INVALID TOKEN

Test Case ID: AUTH_BEHAVIOR-7-1-14

Specification Coverage: ModifySecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: ModifySecurityLevel

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify modifiing of security level with invalid token.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.

2. Start the DUT.
3. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLevelInfoList* - complete list of security levels information
4. Set *invalidToken* := value not equal to any *securityLevelInfoList*.token
5. ONVIF client invokes **ModifySecurityLevel** with parameters
   - SecurityLevel.token := *invalidToken*
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := 0
   - SecurityLevel.Description is skipped
   - SecurityLevel.RecognitionGroup is skipped
   - SecurityLevel.Extension is skipped
6. The DUT returns **env:Sender/ter:InvalidArgVal/ter:NotFound** SOAP 1.2 fault.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgVal/ter:NotFound** SOAP 1.2 fault

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.7.15 MODIFY SECURITY LEVEL - CAPABILITY VIOLATED (MAX RECOGNITION GROUPS PER SECURITY LEVEL)

Test Case ID: AUTH_BEHAVIOR-7-1-15

Specification Coverage: ModifySecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: ModifySecurityLevel

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify modification of security level with maximum number of recognition groups per security level.

Pre-Requisite: Authentication Behavior Service is received from the DUT. The DUT shall have enough free storage capacity for one additional SecurityLevel.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
4. If *cap*.MaxRecognitionGroupsPerSecurityLevel value is more than 50, skip other steps.
5. ONVIF Client creates Security Level by following the procedure mentioned in Annex A.17 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *securityLevel* - security level
6. If *cap*.MaxRecognitionGroupsPerSecurityLevel is equal to one, go to step 10.
7. Set *recognitionGroup* :=
   - RecognitionMethod[0].RecognitionType := *firstSupportedRecognitionType* (see Annex A.31 for details)
   - RecognitionMethod[0].Order := 1
   - RecognitionMethod[0].Extension is skipped
8. ONVIF client invokes **ModifySecurityLevel** with parameters
   - SecurityLevel.token := *securityLevelToken*
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := *securityLevel*.Priority

- SecurityLevel.Description is skipped
- SecurityLevel.RecognitionGroup list := *recognitionGroup* duplicated *cap*.MaxRecognitionGroupsPerSecurityLevel number of times
- SecurityLevel.Extension is skipped

9. The DUT responds with **ModifySecurityLevelResponse** message.
10. ONVIF client invokes **ModifySecurityLevel** with parameters
    - SecurityLevel.token := *securityLevelToken*
    - SecurityLevel.Name := "Test Name"
    - SecurityLevel.Priority := *securityLevel*.Priority
    - SecurityLevel.Description is skipped
    - SecurityLevel.RecognitionGroup list := *recognitionGroup* duplicated *cap*.MaxRecognitionGroupsPerSecurityLevel + 1 number of times
    - SecurityLevel.Extension is skipped
11. The DUT returns **env:Sender/ter:CapabilityViolated/ter:MaxPoliciesPerSecurityLevel** SOAP 1.2 fault.
12. ONVIF Client deletes a security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **ModifySecurityLevelResponse** mesage.
- The DUT did not send **env:Sender/ter:CapabilityViolated/ter:MaxPoliciesPerSecurityLevel** SOAP 1.2 fault.

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.7.16 MODIFY SECURITY LEVEL - CAPABILITY VIOLATED (MAX RECOGNITION METHODS PER RECOGNITION GROUP)

Test Case ID: AUTH_BEHAVIOR-7-1-16

Specification Coverage: ModifySecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: ModifySecurityLevel

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify modification of security level with maximum number recognition methods per recognition group.

Pre-Requisite: Authentication Behavior Service is received from the DUT. The DUT shall have enough free storage capacity for one additional SecurityLevel.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
4. If *cap*.MaxRecognitionMethodsPerRecognitionGroup value is more than 50, skip other steps.
5. ONVIF Client creates Security Level by following the procedure mentioned in Annex A.17 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *securityLevel* - security level
6. If *cap*.MaxRecognitionMethodsPerRecognitionGroup is equal to one, go to step 10.
7. Set *recognitionMethod* :=

- RecognitionType := *firstSupportedRecognitionType* (see Annex A.31 for details)
- Order := 1
- Extension is skipped

8. ONVIF client invokes **ModifySecurityLevel** with parameters
   - SecurityLevel.token := *securityLevelToken*
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := *securityLevel*.Priority
   - SecurityLevel.Description is skipped
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod list := *recognitionMethod* duplicated *cap*.MaxRecognitionMethodsPerRecognitionGroup number of times
   - SecurityLevel.RecognitionGroup[0].Extension is skipped
   - SecurityLevel.Extension is skipped
9. The DUT responds with **ModifySecurityLevelResponse** message.
10. ONVIF client invokes **ModifySecurityLevel** with parameters
    - SecurityLevel.token := *securityLevelToken*
    - SecurityLevel.Name := "Test Name"
    - SecurityLevel.Priority := *securityLevel*.Priority
    - SecurityLevel.Description is skipped
    - SecurityLevel.RecognitionGroup[0].RecognitionMethod list := *recognitionMethod* duplicated *cap*.MaxRecognitionMethodsPerRecognitionGroup + 1 number of times
    - SecurityLevel.RecognitionGroup[0].Extension is skipped
    - SecurityLevel.Extension is skipped
11. The DUT returns **env:Sender/ter:CapabilityViolated/ter:MaxRecognitionMethodsPerRecognitionGroup** SOAP 1.2 fault.
12. ONVIF Client deletes a security level by following the procedure mentioned in Annex A.22 with the following input and output parameters

- in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **ModifySecurityLevelResponse** mesage.
- The DUT did not send **env:Sender/ter:CapabilityViolated/ter:MaxRecognitionMethodsPerRecognitionGroup** SOAP 1.2 fault.

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.7.17 MODIFY SECURITY LEVEL - DUPLICATE PRIORITY

Test Case ID: AUTH_BEHAVIOR-7-1-17

Specification Coverage: CreateSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: CreateSecurityLevel

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify modification of security level with duplicated priority.

Pre-Requisite: Authentication Behavior Service is received from the DUT. The DUT shall have enough free storage capacity for one additional Security Level.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
4. If *cap*.MaxSecurityLevels = 1, skip other steps.

5. ONVIF Client find existing or create new security level by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - out *securityLevelToken1* - security level token
   - out *securityLevel1* - security level
   - out *newSecurityLevel* - flag if new security level was created
6. ONVIF Client creates Security Level by following the procedure mentioned in Annex A.17 with the following input and output parameters
   - out *securityLevelToken2* - security level token
   - out *securityLevel2* - security level
7. ONVIF client invokes **ModifySecurityLevel** with parameters
   - SecurityLevel.token := *securityLevel2*
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := *securityLevel1*.Priority
   - SecurityLevel.Description is skipped
   - SecurityLevel.RecognitionGroup is skipped
   - SecurityLevel.Extension is skipped
8. The DUT returns **env:Sender/ter:InvalidArgVal/ter:DuplicatePriority** SOAP 1.2 fault.
9. If *newSecurityLevel* = true:
   9.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
      - in *securityLevelToken1* - security level token
10. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken2* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgVal/ter:DuplicatePriority** SOAP 1.2 fault.

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.7.18 SET SECURITY LEVEL - CAPABILITY VIOLATED (MAX RECOGNITION GROUPS PER SECURITY LEVEL)

Test Case ID: AUTH_BEHAVIOR-7-1-18

Specification Coverage: SetSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: SetSecurityLevel

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify modification of security level with maximum number of recognition groups per security level using SetSecurityLevel command.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Token supplying is supported by the DUT as indicated by ClientSuppliedTokenSupported capability. The DUT shall have enough free storage capacity for one additional SecurityLevel.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
4. If *cap*.MaxRecognitionGroupsPerSecurityLevel value is more than 50, skip other steps.
5. ONVIF Client creates Security Level by following the procedure mentioned in Annex A.17 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *securityLevel* - security level

6. If *cap*.MaxRecognitionGroupsPerSecurityLevel is equal to one, go to step 10.
7. Set *recognitionGroup* :=
   - RecognitionMethod[0].RecognitionType := *firstSupportedRecognitionType* (see Annex A.31 for details)
   - RecognitionMethod[0].Order := 1
   - RecognitionMethod[0].Extension is skipped
8. ONVIF client invokes **SetSecurityLevel** with parameters
   - SecurityLevel.token := *securityLevelToken*
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := *securityLevel*.Priority
   - SecurityLevel.Description is skipped
   - SecurityLevel.RecognitionGroup list := *recognitionGroup* duplicated *cap*.MaxRecognitionGroupsPerSecurityLevel number of times
   - SecurityLevel.Extension is skipped
9. The DUT responds with **SetSecurityLevelResponse** message.
10. ONVIF client invokes **SetSecurityLevel** with parameters
    - SecurityLevel.token := *securityLevelToken*
    - SecurityLevel.Name := "Test Name"
    - SecurityLevel.Priority := *securityLevel*.Priority
    - SecurityLevel.Description is skipped
    - SecurityLevel.RecognitionGroup list := *recognitionGroup* duplicated *cap*.MaxRecognitionGroupsPerSecurityLevel + 1 number of times
    - SecurityLevel.Extension is skipped
11. The DUT returns **env:Sender/ter:CapabilityViolated/ter:MaxPoliciesPerSecurityLevel** SOAP 1.2 fault.
12. ONVIF Client deletes a security level by following the procedure mentioned in Annex A.22 with the following input and output parameters

- in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **SetSecurityLevelResponse** mesage.
- The DUT did not send **env:Sender/ter:CapabilityViolated/ter:MaxPoliciesPerSecurityLevel** SOAP 1.2 fault.

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.7.19 SET SECURITY LEVEL - CAPABILITY VIOLATED (MAX RECOGNITION METHODS PER RECOGNITION GROUP)

Test Case ID: AUTH_BEHAVIOR-7-1-19

Specification Coverage: SetSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: SetSecurityLevel

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify modification of security level with maximum number recognition methods per recognition group using SetSecurityLevel command.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Token supplying is supported by the DUT as indicated by ClientSuppliedTokenSupported capability. The DUT shall have enough free storage capacity for one additional SecurityLevel.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.

3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
4. If *cap*.MaxRecognitionMethodsPerRecognitionGroup value is more than 50, skip other steps.
5. ONVIF Client creates Security Level by following the procedure mentioned in Annex A.17 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *securityLevel* - security level
6. If *cap*.MaxRecognitionMethodsPerRecognitionGroup is equal to one, go to step 10.
7. Set *recognitionMethod* :=
   - RecognitionType := *firstSupportedRecognitionType* (see Annex A.31 for details)
   - Order := 1
   - Extension is skipped
8. ONVIF client invokes **SetSecurityLevel** with parameters
   - SecurityLevel.token := *securityLevelToken*
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := *securityLevel*.Priority
   - SecurityLevel.Description is skipped
   - SecurityLevel.RecognitionGroup[0].RecognitionMethod list := *recognitionMethod* duplicated *cap*.MaxRecognitionMethodsPerRecognitionGroup number of times
   - SecurityLevel.RecognitionGroup[0].Extension is skipped
   - SecurityLevel.Extension is skipped
9. The DUT responds with **SetSecurityLevelResponse** message.
10. ONVIF client invokes **SetSecurityLevel** with parameters
    - SecurityLevel.token := *securityLevelToken*
    - SecurityLevel.Name := "Test Name"

- SecurityLevel.Priority := *securityLevel*.Priority
- SecurityLevel.Description is skipped
- SecurityLevel.RecognitionGroup[0].RecognitionMethod list := *recognitionMethod* duplicated *cap*.MaxRecognitionMethodsPerRecognitionGroup + 1 number of times
- SecurityLevel.RecognitionGroup[0].Extension is skipped
- SecurityLevel.Extension is skipped

11. The DUT returns **env:Sender/ter:CapabilityViolated/ter:MaxRecognitionMethodsPerRecognitionGroup** SOAP 1.2 fault.
12. ONVIF Client deletes a security level by following the procedure mentioned in Annex A.22 with the following input and output parameters
    - in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **SetSecurityLevelResponse** mesage.
- The DUT did not send **env:Sender/ter:CapabilityViolated/ter:MaxRecognitionMethodsPerRecognitionGroup** SOAP 1.2 fault.

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.7.20 SET SECURITY LEVEL - DUPLICATE PRIORITY

Test Case ID: AUTH_BEHAVIOR-7-1-20

Specification Coverage: SetSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: SetSecurityLevel

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify creation of security level with duplicated priority using SetSecurityLevel command.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Token supplying is supported by the DUT as indicated by ClientSuppliedTokenSupported capability. The DUT shall have enough free storage capacity for one additional Security Level.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
4. If *cap*.MaxSecurityLevels = 1, skip other steps.
5. ONVIF Client find existing or create new security level by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *securityLevel* - security level
   - out *newSecurityLevel* - flag if new security level was created
6. ONVIF client invokes **SetSecurityLevel** with parameters
   - SecurityLevel.token := string other than *securityLevelToken*
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := *securityLevel*.Priority
   - SecurityLevel.Description is skipped
   - SecurityLevel.RecognitionGroup is skipped
   - SecurityLevel.Extension is skipped
7. The DUT returns **env:Sender/ter:InvalidArgVal/ter:DuplicatePriority** SOAP 1.2 fault.
8. If *newSecurityLevel* = true:

8.1. ONVIF Client deletes security level by following the procedure mentioned in Annex A.22 with the following input and output parameters

- in *securityLevelToken* - security level token

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgVal/ter:DuplicatePriority** SOAP 1.2 fault.

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.7.21 SET SECURITY LEVEL - EMPTY TOKEN

Test Case ID: AUTH_BEHAVIOR-7-1-21

Specification Coverage: SetSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: SetSecurityLevel

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify set of security level with empty token.

Pre-Requisite: Authentication Behavior Service is received from the DUT. Token supplying is supported by the DUT as indicated by ClientSuppliedTokenSupported capability. The DUT shall have enough free storage capacity for one additional SecurityLevel.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF client invokes **SetSecurityLevel** with parameters
   - SecurityLevel.token := ""
   - SecurityLevel.Name := "Test Name"

- SecurityLevel.Priority := 0
- SecurityLevel.Description is skipped
- SecurityLevel.RecognitionGroup is skipped
- SecurityLevel.Extension is skipped

4. The DUT returns **env:Sender/ter:InvalidArgs** SOAP 1.2 fault.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgs** SOAP 1.2 fault.

5.7.22 DELETE SECURITY LEVEL - INVALID TOKEN

Test Case ID: AUTH_BEHAVIOR-7-1-22

Specification Coverage: DeleteSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: DeleteSecurityLevel

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify deleting of security level with invalid token.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLevelInfoList* - complete list of security levels information

4. Set *invalidToken* := value not equal to any *securityLevelInfoList*.token
5. ONVIF Client invokes **DeleteSecurityLevel** with parameters
   - Token := *invalidToken*
6. The DUT returns **env:Sender/ter:InvalidArgVal/ter:NotFound** SOAP 1.2 fault.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgVal/ter:NotFound** SOAP 1.2 fault.

Note: If the DUT sends other SOAP 1.2 fault message than specified, log WARNING message, and PASS the test.

5.7.23 DELETE SECURITY LEVEL - NO TOKEN

Test Case ID: AUTH_BEHAVIOR-7-1-23

Specification Coverage: DeleteSecurityLevel command (ONVIF Authentication Behavior Service Specification)

Feature Under Test: DeleteSecurityLevel

WSDL Reference: authenticationbehavior.wsdl

Test Purpose: To verify deleting of security level without token.

Pre-Requisite: Authentication Behavior Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes **DeleteSecurityLevel** with parameters
   - Token := ""

4. The DUT returns **env:Sender/ter:InvalidArgVal** SOAP 1.2 fault.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **env:Sender/ter:InvalidArgVal** SOAP 1.2 fault.

5.8 Authentication Behavior Events

5.8.1 AUTHENTICATION PROFILE CHANGED EVENT

Test Case ID: AUTH_BEHAVIOR-8-1-1

Specification Coverage: Authentication profile (ONVIF Authentication Behavior Service Specification), Notification topics (ONVIF Authentication Behavior Service Specification), Get event properties (ONVIF Core specification).

Feature Under Test: GetEventProperties

WSDL Reference: event.wsdl

Test Purpose: To verify tns1:Configuration/AuthenticationProfile/Changed event format.

Pre-Requisite: Authentication Behavior Service is supported by the DUT. Event Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes **GetEventProperties**.
4. The DUT responds with a **GetEventPropertiesResponse** message with parameters
   - TopicNamespaceLocation list
   - FixedTopicSet

- TopicSet =: *topicSet*
- TopicExpressionDialect list
- MessageContentFilterDialect list
- MessageContentSchemaLocation list

5. If *topicSet* does not contain tns1:Configuration/AuthenticationProfile/Changed topic, FAIL the test, restore the DUT state, and skip other steps.
6. ONVIF Client verifies tns1:Configuration/AuthenticationProfile/Changed topic (*authProfileChangedTopic*) from topicSet:
   6.1. If *authProfileChangedTopic*.MessageDescription.IsProperty equals to true, FAIL the test, restore the DUT state, and skip other steps.
   6.2. If *authProfileChangedTopic* does not contain MessageDescription.Source.SimpleItemDescription item with Name = "AuthenticationProfileToken", FAIL the test, restore the DUT state, and skip other steps.
   6.3. If *authProfileChangedTopic*.MessageDescription.Source.SimpleItemDescription with Name = "AuthenticationProfileToken" does not have Type = "pt:ReferenceToken", FAIL the test, restore the DUT state, and skip other steps.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetEventPropertiesResponse** message.

5.8.2 AUTHENTICATION PROFILE REMOVED EVENT

Test Case ID: AUTH_BEHAVIOR-8-1-2

Specification Coverage: Authentication profile (ONVIF Authentication Behavior Service Specification), Notification topics (ONVIF Authentication Behavior Service Specification), Get event properties (ONVIF Core specification).

Feature Under Test: GetEventProperties

WSDL Reference: event.wsdl

Test Purpose: To verify tns1:Configuration/AuthenticationProfile/Removed event format.

Pre-Requisite: Authentication Behavior Service is supported by the DUT. Event Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes **GetEventProperties**.
4. The DUT responds with a **GetEventPropertiesResponse** message with parameters
   - TopicNamespaceLocation list
   - FixedTopicSet
   - TopicSet =: *topicSet*
   - TopicExpressionDialect list
   - MessageContentFilterDialect list
   - MessageContentSchemaLocation list
5. If *topicSet* does not contain tns1:Configuration/AuthenticationProfile/Removed topic, FAIL the test, restore the DUT state, and skip other steps.
6. ONVIF Client verifies tns1:Configuration/AuthenticationProfile/Removed topic (*authProfileChangedTopic*) from topicSet:
   6.1. If *authProfileChangedTopic*.MessageDescription.IsProperty equals to true, FAIL the test, restore the DUT state, and skip other steps.
   6.2. If *authProfileChangedTopic* does not contain MessageDescription.Source.SimpleItemDescription item with Name = "AuthenticationProfileToken", FAIL the test, restore the DUT state, and skip other steps.
   6.3. If *authProfileChangedTopic*.MessageDescription.Source.SimpleItemDescription with Name = "AuthenticationProfileToken" does not have Type = "pt:ReferenceToken", FAIL the test, restore the DUT state, and skip other steps.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetEventPropertiesResponse** message.

5.8.3 SECURITY LEVEL CHANGED EVENT

Test Case ID: AUTH_BEHAVIOR-8-1-3

Specification Coverage: Security level (ONVIF Authentication Behavior Service Specification), Notification topics (ONVIF Authentication Behavior Service Specification), Get event properties (ONVIF Core specification).

Feature Under Test: GetEventProperties

WSDL Reference: event.wsdl

Test Purpose: To verify tns1:Configuration/SecurityLevel/Changed event format.

Pre-Requisite: Authentication Behavior Service is supported by the DUT. Event Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes **GetEventProperties**.
4. The DUT responds with a **GetEventPropertiesResponse** message with parameters
   - TopicNamespaceLocation list
   - FixedTopicSet
   - TopicSet =: *topicSet*
   - TopicExpressionDialect list
   - MessageContentFilterDialect list

- MessageContentSchemaLocation list

5. If *topicSet* does not contain tns1:Configuration/SecurityLevel/Changed topic, FAIL the test, restore the DUT state, and skip other steps.
6. ONVIF Client verifies tns1:Configuration/SecurityLevel/Changed topic (*authProfileChangedTopic*) from topicSet:
   6.1. If *authProfileChangedTopic*.MessageDescription.IsProperty equals to true, FAIL the test, restore the DUT state, and skip other steps.
   6.2. If *authProfileChangedTopic* does not contain MessageDescription.Source.SimpleItemDescription item with Name = "SecurityLevelToken", FAIL the test, restore the DUT state, and skip other steps.
   6.3. If *authProfileChangedTopic*.MessageDescription.Source.SimpleItemDescription with Name = "SecurityLevelToken" does not have Type = "pt:ReferenceToken", FAIL the test, restore the DUT state, and skip other steps.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetEventPropertiesResponse** message.

5.8.4 SECURITY LEVEL REMOVED EVENT

Test Case ID: AUTH_BEHAVIOR-8-1-4

Specification Coverage: Security level (ONVIF Authentication Behavior Service Specification), Notification topics (ONVIF Authentication Behavior Service Specification), Get event properties (ONVIF Core specification).

Feature Under Test: GetEventProperties

WSDL Reference: event.wsdl

Test Purpose: To verify tns1:Configuration/SecurityLevel/Removed event format.

Pre-Requisite: Authentication Behavior Service is supported by the DUT. Event Service is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes **GetEventProperties**.
4. The DUT responds with a **GetEventPropertiesResponse** message with parameters
   - TopicNamespaceLocation list
   - FixedTopicSet
   - TopicSet =: *topicSet*
   - TopicExpressionDialect list
   - MessageContentFilterDialect list
   - MessageContentSchemaLocation list
5. If *topicSet* does not contain tns1:SecurityLevel/AuthenticationProfile/Removed topic, FAIL the test, restore the DUT state, and skip other steps.
6. ONVIF Client verifies tns1:Configuration/SecurityLevel/Removed topic (*authProfileChangedTopic*) from topicSet:
   6.1. If *authProfileChangedTopic*.MessageDescription.IsProperty equals to true, FAIL the test, restore the DUT state, and skip other steps.
   6.2. If *authProfileChangedTopic* does not contain MessageDescription.Source.SimpleItemDescription item with Name = "SecurityLevelToken", FAIL the test, restore the DUT state, and skip other steps.
   6.3. If *authProfileChangedTopic*.MessageDescription.Source.SimpleItemDescription with Name = "SecurityLevelToken" does not have Type = "pt:ReferenceToken", FAIL the test, restore the DUT state, and skip other steps.

Test Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetEventPropertiesResponse** message.

Annex A Helper Procedures and Additional Notes

This section describes the meaning of the following definitions. These definitions are used in the test case description.

A.1 Get Authentication Profiles Information List

Name: HelperGetAuthenticationProfileInfoList

Procedure Purpose: Helper procedure to get complete authentication profiles information list.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: None.

Returns: The complete list of authentication profiles information (*authProfileInfoCompleteList*).

Procedure:

1. ONVIF client invokes **GetAuthenticationProfileInfoList** with parameters
   - Limit skipped
   - StartReference skipped
2. The DUT responds with **GetAuthenticationProfileInfoListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - AuthenticationProfileInfo list =: *authProfileInfoCompleteList*
3. Until *nextStartReference* is not null, repeat the following steps:
   3.1. ONVIF client invokes **GetAuthenticationProfileInfoList** with parameters
      - Limit skipped
      - StartReference := *nextStartReference*
   3.2. The DUT responds with **GetAuthenticationProfileInfoListResponse** message with parameters
      - NextStartReference =: *nextStartReference*
      - AuthenticationProfileInfo list =: *authProfileInfoListPart*

3.3. Set *authProfileInfoCompleteList* := *authProfileInfoCompleteList* + *authProfileInfoListPart*.

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetAuthenticationProfileInfoListResponse** message.

A.2 Get Service Capabilities

Name: HelperGetServiceCapabilities

Procedure Purpose: Helper procedure to get service capabilities.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: None.

Returns: The service capabilities (*cap*).

Procedure:

1. ONVIF client invokes **GetServiceCapabilities**.
2. The DUT responds with a **GetServiceCapabilitiesResponse** message with parameters
   - Capabilities =: *cap*

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetServiceCapabilitiesResponse** message.

A.3 Get Authentication Profiles List

Name: HelperGetAuthenticationProfileList

Procedure Purpose: Helper procedure to get complete authentication profiles list with.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: None.

Returns: The complete list of authentication profiles (*authProfileCompleteList*).

Procedure:

1. ONVIF client invokes **GetAuthenticationProfileList** with parameters
   - Limit skipped
   - StartReference skipped
2. The DUT responds with **GetAuthenticationProfileListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - AuthenticationProfile list =: *authProfileCompleteList*
3. Until *nextStartReference* is not null, repeat the following steps:
   3.1. ONVIF client invokes **GetAuthenticationProfileList** with parameters
      - Limit skipped
      - StartReference := *nextStartReference*
   3.2. The DUT responds with **GetAuthenticationProfileListResponse** message with parameters
      - NextStartReference =: *nextStartReference*
      - Schedule list =: *authProfilesListPart*
   3.3. Set *authProfileCompleteList* := *authProfileCompleteList* + *authProfilesListPart*

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetAuthenticationProfileListResponse** message.

A.4 Create Number of Authentication Profiles

Name: HelperCreateAuthenticationProfiles

Procedure Purpose: Helper procedure to create number of authentication profiles requiered for test cases.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: None.

Returns: The complete list of authentication profiles information (*authProfileInfoCompleteList*). List of created authentication profiles tokens (*createdAuthProfileTokensList*). The service capabilities (*cap*). Created security level token (*securityLevelToken*).

Procedure:

1. ONVIF Client retrieves a complete list of authentication profile info by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out *authProfileInfoInitialList* - complete list of authentication profiles information
2. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
3. Set *requieredNumberOfAuthProfile* := min {50; *cap*.MaxLimit; *cap*.MaxAuthenticationProfiles}.
4. Set *authProfileInfoCompleteList* := *authProfileInfoInitialList*.
5. If *requieredNumberOfAuthProfile* <= number of AuthenticationProfileInfo items in *authProfileInfoInitialList*, skip other steps of the procedure.
6. Set *numberOfAuthProfilesToBeCreated* := *requieredNumberOfAuthProfile* - number of AuthenticationProfileInfo items in *authProfileInfoInitialList*.
7. ONVIF Client find existing or create new security level by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *newSecurityLevel* - flag if new security level was created
8. ONVIF client invokes **CreateAuthenticationProfile** with parameters
   - AuthenticationProfile.token := ""

- AuthenticationProfile.Name := "Test Name"
- AuthenticationProfile.Description is skipped
- AuthenticationProfile.AuthenticationPolicy is skipped
- AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
- AuthenticationProfile.Extension is skipped

9. The DUT responds with **CreateAuthenticationProfileResponse** message with parameters
   - Token =: *authProfileToken*
10. Set *authProfileInfoCompleteList* := *authProfileInfoInitialList* + new AuthenticationProfileInfo (with token := *authProfileToken*; Name := "Test Name"; DefaultSecurityLevelToken := *securityLevelToken*).
11. Set *createdAuthProfileTokensList* := *createdAuthProfileTokensList* + *authProfileToken*.
12. Set *numberOfAuthProfilesToBeCreated* := *numberOfAuthProfilesToBeCreated* - 1
13. If *numberOfAuthProfilesToBeCreated* > 0, go to step 8
14. If *newSecurityLevel* = false:
    14.1. Set *securityLevelToken* := null.

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **CreateAuthenticationProfileResponse** message.

A.5 Find or Create Security Level

Name: HelperFindOrCreateSecurityLevel

Procedure Purpose: Helper procedure to find existing or create new security level.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: None.

Returns: Security level token (*securityLevelToken*). Flag if new security level was created (*newSecurityLevel*). Security level (*securityLevel*).

Procedure:

1. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLivelInfoList* - complete list of security levels information
2. If *securityLivelInfoList* contains at least one SecurityLevelInfo:
   2.1. Set *securityLevelToken* := *securityLivelInfoList*[0].token.
   2.2. Set *securityLevel* := *securityLivelInfoList*[0].
   2.3. Set *newSecurityLevel* := false.
   2.4. Skipe other steps of the procedure.
3. Set *newSecurityLevel* := true.
4. Set *securityLevel* :=
   - token := ""
   - Name := "Test Name"
   - Priority := 0
   - Description is skipped
   - RecognitionGroup is skipped
   - Extension is skipped
5. ONVIF client invokes **CreateSecurityLevel** with parameters
   - SecurityLevel := *securityLevel*
6. The DUT responds with **CreateSecurityLevelResponse** message with parameters
   - Token =: *securityLevelToken*

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **CreateSecurityLevelResponse** message.

A.6 Get Security Levels Information List

Name: HelperGetSecurityLevelInfoList

Procedure Purpose: Helper procedure to get complete security levels information list.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: None.

Returns: The complete list of security levels information (*securityLevelInfoCompleteList*).

Procedure:

1. ONVIF client invokes **GetSecurityLevelInfoList** with parameters
   - Limit skipped
   - StartReference skipped
2. The DUT responds with **GetSecurityLevelInfoListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - SecurityLevelInfo list =: *securityLevelInfoCompleteList*
3. Until *nextStartReference* is not null, repeat the following steps:
   3.1. ONVIF client invokes **GetSecurityLevelInfoList** with parameters
      - Limit skipped
      - StartReference := *nextStartReference*
   3.2. The DUT responds with **GetSecurityLevelInfoListResponse** message with parameters
      - NextStartReference =: *nextStartReference*
      - SecurityLevelInfo list =: *securityLevelInfoListPart*
   3.3. Set *securityLevelInfoCompleteList* := *securityLevelInfoCompleteList* + *securityLevelInfoListPart*.

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetSecurityLevelInfoListResponse** message.

A.7 Compare Authentication Profile List and Authentication Profile Info List

Name: HelperCompareAuthProfilesList

Procedure Purpose: Helper procedure to compare Authentication Profile List and Authentication Profile Info List.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: The list of authentication profiles information (*authProfileInfoList*). The list of authentication profiles (*authProfilesList*).

Returns: None.

Procedure:

1. If *authProfilesList* does not contain all tokens from *authProfileInfoList*, FAIL the test, restore the DUT state, and skip other steps.
2. If *authProfilesList* contains tokens other than tokens from *authProfileInfoList*, FAIL the test, restore the DUT state, and skip other steps.
3. For each AuthenticationProfileInfo.token *token* from *authProfileInfoList* repeat the following steps:

    3.1. If *authProfilesList*[token = *token*] item does not have equal field values to *authProfileInfoList*[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- None.

Note: The following fields are compared at step 3.1:

- AuthenticationProfile/AuthenticationProfileInfo:
  - token
  - Name
  - Description

A.8 Create Pull Point Subscription

Name: HelperCreatePullPointSubscription

Procedure Purpose: Helper procedure to create PullPoint Subscription with specified Topic.

Pre-requisite: Event Service is received from the DUT.

Input: Notification Topic (*topic*).

Returns: Subscription reference (*s*), current time for the DUT (*ct*), subscription termination time (*tt*).

Procedure:

1. ONVIF Client invokes **CreatePullPointSubscription** request with parameters
   - Filter.TopicExpression := *topic*
   - Filter.TopicExpression.@Dialect := "http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet"
2. The DUT responds with **CreatePullPointSubscriptionResponse** message with parameters
   - SubscriptionReference =: *s*
   - CurrentTime =: *ct*
   - TerminationTime =: *tt*

Procedure Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **CreatePullPointSubscriptionResponse** message.

A.9 Delete Subscription

Name: HelperDeleteSubscription

Procedure Purpose: Helper procedure to delete supscribtion.

Pre-requisite: Event Service is received from the DUT.

Input: Subscription reference (*s*)

Returns: None

Procedure:

1. ONVIF Client sends an **Unsubscribe** to the subscription endpoint s.
2. The DUT responds with **UnsubscribeResponse** message.

Procedure Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **UnsubscribeResponse** message.

A.10 Retrieve Authentication Profile Changed Event by PullPoint

Name: HelperPullAuthProfileChanged

Procedure Purpose: Helper procedure to retrieve and check tns1:Configuration/AuthenticationProfile/Changed event with PullMessages.

Pre-requisite: Event Service is received from the DUT.

Input: Subscription reference (*s*), current time for the DUT (*ct*), Subscription termination time (*tt*) and Authentication Profile token (*authProfileToken*).

Returns: None

Procedure:

1. Until *operationDelay* timeout expires, repeat the following steps:
   1.1. ONVIF Client waits for time *t* := min{(*tt*-*ct*)/2, 1 second}.
   1.2. ONVIF Client invokes **PullMessages** to the subscription endpoint *s* with parameters
      - Timeout := PT60S
      - MessageLimit := 1
   1.3. The DUT responds with **PullMessagesResponse** message with parameters
      - CurrentTime =: *ct*
      - TerminationTime =: *tt*
      - NotificationMessage list =: *notificationMessageList*
   1.4. If *notificationMessageList* is not empty and the AuthenticationProfileToken source simple item in *notificationMessageList* is equal to *authProfileToken*, skip other steps and finish the procedure.
   1.5. If *timeout1* timeout expires for step 1 without Notification with Token source simple item equal to *authProfileToken*, FAIL the test, restore the DUT state, and skip other steps.

Procedure Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **PullMessagesResponse** message.

Note: *operationDelay* will be taken from Operation Delay field of ONVIF Device Test Tool.

A.11 Get Authentication Profile

Name: HelperGetAuthenticationProfile

Procedure Purpose: Helper procedure to get authentication profile.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: Authentication Profile Token (*authProfileToken*).

Returns: Authentication Profile List (*authProfileList*).

Procedure:

1. ONVIF client invokes **GetAuthenticationProfiles** with parameters
   - Token[0] := *authProfileToken*
2. The DUT responds with **GetAuthenticationProfilesResponse** message with parameters
   - AuthenticationProfile list =: *authProfileList*

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetAuthenticationProfilesResponse** message.

A.12 Get Authentication Profile Info

Name: HelperGetAuthenticationProfileInfo

Procedure Purpose: Helper procedure to get schedule info.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: Authentication Profile Token (*authProfileToken*).

Returns: Authentication Profile Info List (*authProfileInfoList*).

Procedure:

1. ONVIF client invokes **GetAuthenticationProfileInfo** with parameters
   - Token[0] := *authProfileToken*
2. The DUT responds with **GetAuthenticationProfileInfoResponse** message with parameters
   - AuthenticationProfileInfo list =: *authProfileInfoList*

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetAuthenticationProfileInfoResponse** message.

A.13 Delete Authentication Profile

Name: HelperDeleteAuthenticationProfile

Procedure Purpose: Helper procedure to delete authentication profile.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: Authentication Profile Token (*authProfileToken*).

Returns: None.

Procedure:

1. ONVIF client invokes **DeleteAuthenticationProfile** with parameters
   - Token =: *authProfileToken*
2. The DUT responds with empty **DeleteAuthenticationProfileResponse** message

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **DeleteAuthenticationProfileResponse** message.

A.14 Find or Create Schedule

Name: HelperFindOrCreateSchedule

Procedure Purpose: Helper procedure to find existing or create new schedule.

Pre-requisite: Schedule Service is received from the DUT.

Input: None.

Returns: Schedule token (*scheduleToken*). Flag if new Schedule was created (*newSchedule*).

Procedure:

1. ONVIF Client retrieves a complete list of schedules info by following the procedure mentioned in Annex A.18 with the following input and output parameters
   - out *scheduleInfoList* - complete list of schedules information
2. If *scheduleInfoList* contains at least one ScheduleInfo:
   2.1. Set *scheduleToken* := *scheduleInfoList*[0].token.
   2.2. Set *newSchedule* := false.
   2.3. Skipe other steps of the procedure.
3. Set *newSchedule* := true.
4. ONVIF Client generates appropriate iCalendar value for the AuthenticationProfile.Standard field by following the procedure mentioned in Annex A.15 with the following input and output parameters
   - out *scheduleiCalendarValue* - iCalendarValue for the AuthenticationProfile.Standard field
5. ONVIF client invokes **CreateSchedule** with parameters
   - Schedule.token := ""
   - Schedule.Description is skipped
   - Schedule.Name := "Test Name"
   - Schedule.Standard := *scheduleiCalendarValue*
   - Schedule.SpecialDays is skipped
6. The DUT responds with **CreateScheduleResponse** message with parameters
   - Token =: *scheduleToken*

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **CreateScheduleResponse** message.

A.15 Generate iCalendar Value for Schedule

Name: HelperScheduleiCalendarGeneration

Procedure Purpose: Helper procedure to generate iCalendar value for Schedule.Standard field.

Pre-requisite: Schedule Service is received from the DUT.

Input: None.

Returns: iCalendar value for Standard field (*scheduleiCalendarValue*) that is compliant to [RFC 2445].

Procedure:

1. Set *uid* := new Globally Unique Identifier value.
2. Set *scheduleiCalendarValue* := "BEGIN:VCALENDAR

   BEGIN:VEVENT

   SUMMARY:Access on weekdays from 9 AM to 6 PM for employees

   DTSTART:1970<current month><current day>T090000

   DTEND:1970<current month><current day>T180000

   RRULE:FREQ=WEEKLY;BYDAY=MO,TU,WE,TH,FR

   UID:*uid*

   END:VEVENT

   END:VCALENDAR"

A.16 Create Authentication Profile

Name: HelperCreateAuthProfile

Procedure Purpose: Helper procedure to create authentication profile.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: The service capabilities (*cap*).

Returns: Authentication profile token (*authProfileToken*). Authentication profile (*authProfile*). Flag if new Schedule was created (*newSchedule*). Flag if new security level was created (*newSecurityLevel*).

Procedure:

1. ONVIF Client find existing or create new security level by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - out *securityLevelToken* - security level token
   - out *newSecurityLevel* - flag if new security level was created
2. ONVIF Client find existing or create new schedule by following the procedure mentioned in Annex A.14 with the following input and output parameters
   - out *scheduleToken* - schedule level token
   - out *newSchedule* - flag if new schedule was created
3. Set *authenticationMode* := *cap*.SupportedAuthenticationModes[0] (if *cap*.SupportedAuthenticationModes is skipped or empty, set *authenticationMode* := "pt:SingleCredential").
4. Set *authProfile* :=
   - AuthenticationProfile.token := ""
   - AuthenticationProfile.Description := "Test Description"
   - AuthenticationProfile.Name := "Test Name"
   - AuthenticationProfile.DefaultSecurityLevelToken := *securityLevelToken*
   - AuthenticationProfile.AuthenticationPolicy[0].ScheduleToken := *scheduleToken*
   - AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].ActiveRegularSchedule := true
   - AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].ActiveSpecialDaySchedule := true
   - AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].AuthenticationMode := *authenticationMode*
   - AuthenticationProfile.AuthenticationPolicy[0].SecurityLevelConstraint[0].SecurityLevelToken := *securityLevelToken*

5. ONVIF client invokes **CreateAuthenticationProfile** with parameters
   - AuthenticationProfile := *authProfile*
6. The DUT responds with **CreateAuthenticationProfileResponse** message with parameters
   - Token =: *authProfileToken*

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **CreateAuthenticationProfileResponse** message.

A.17 Create Security Level

Name: HelperCreateSecurityLevel

Procedure Purpose: Helper procedure to create security level.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: None.

Returns: Security level token (*securityLevelToken*). Security level (*securityLevel*).

Procedure:

1. ONVIF Client retrieves a complete list of security level info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLivelInfoList* - complete list of security levels information
2. Set *securityLevel* :=
   - SecurityLevel.token := ""
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLivelInfoList*
   - SecurityLevel.Description := "Test Description"

- SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].RecognitionType = *firstSupportedRecognitionType* (see Annex A.31 for details)
- SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].Order = 1
- SecurityLevel.RecognitionGroup[0].RecognitionMethod[0].Extension is skipped
- SecurityLevel.RecognitionGroup[0].Extension is skipped
- SecurityLevel.Extension is skipped

3. ONVIF client invokes **CreateSecurityLevel** with parameters
   - SecurityLevel := *securityLevel*
4. The DUT responds with **CreateSecurityLevelResponse** message with parameters
   - Token =: *securityLevelToken*

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **CreateSecurityLevelResponse** message.

A.18 Get Schedules Information List

Name: HelperGetScheduleInfoList

Procedure Purpose: Helper procedure to get complete schedules information list.

Pre-requisite: Schedule Service is received from the DUT.

Input: None.

Returns: The complete list of schedules information (*scheduleInfoCompleteList*).

Procedure:

1. ONVIF client invokes **GetScheduleInfoList** with parameters
   - Limit is skipped

- StartReference is skipped

2. The DUT responds with **GetScheduleInfoListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - ScheduleInfo list =: *scheduleInfoCompleteList*
3. Until *nextStartReference* is not null, repeat the following steps:
   3.1. ONVIF client invokes **GetScheduleInfoList** with parameters
      - Limit skipped
      - StartReference := *nextStartReference*
   3.2. The DUT responds with **GetScheduleInfoListResponse** message with parameters
      - NextStartReference =: *nextStartReference*
      - ScheduleInfo list =: *scheduleInfoListPart*
   3.3. Set *scheduleInfoCompleteList* := *scheduleInfoCompleteList* + *scheduleInfoListPart*

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetScheduleInfoListResponse** message.

A.19 Get Schedule Service Capabilities

Name: HelperGetScheduleServiceCapabilities

Procedure Purpose: Helper procedure to get service capabilities.

Pre-requisite: Schedule Service is received from the DUT.

Input: None.

Returns: The service capabilities (*cap*).

Procedure:

1. ONVIF client invokes **GetServiceCapabilities**.
2. The DUT responds with a **GetServiceCapabilitiesResponse** message with parameters
   - Capabilities =: *cap*

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetServiceCapabilitiesResponse** message.

A.20 Create Schedule

Name: HelperCreateSchedule

Procedure Purpose: Helper procedure to create schedule.

Pre-requisite: Schedule Service is received from the DUT.

Input: None.

Returns: Schedule token (*scheduleToken*).

Procedure:

1. ONVIF Client generates appropriate iCalendar value for the AuthenticationProfile.Standard field by following the procedure mentioned in Annex A.15 with the following input and output parameters
   - out *scheduleiCalendarValue* - iCalendarValue for the AuthenticationProfile.Standard field
2. ONVIF client invokes **CreateSchedule** with parameters
   - Schedule.token := ""
   - Schedule.Description is skipped
   - Schedule.Name := "Test Name"
   - Schedule.Standard := *scheduleiCalendarValue*
   - Schedule.SpecialDays is skipped
3. The DUT responds with **CreateScheduleResponse** message with parameters

- Token =: *scheduleToken*

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **CreateScheduleResponse** message.

A.21 Retrieve Authentication Profile Removed Event by PullPoint

Name: HelperPullAuthProfileRemoved

Procedure Purpose: Helper procedure to retrieve and check tns1:Configuration/AuthenticationProfile/Removed event with PullMessages.

Pre-requisite: Event Service is received from the DUT.

Input: Subscription reference (*s*), current time for the DUT (*ct*), Subscription termination time (*tt*) and Authentication Profile token (*authProfileToken*).

Returns: None

Procedure:

1. Until *operationDelay* timeout expires, repeat the following steps:

   1.1. ONVIF Client waits for time *t* := min{(*tt*-*ct*)/2, 1 second}.

   1.2. ONVIF Client invokes **PullMessages** to the subscription endpoint *s* with parameters

   - Timeout := PT60S
   - MessageLimit := 1

   1.3. The DUT responds with **PullMessagesResponse** message with parameters

   - CurrentTime =: *ct*
   - TerminationTime =: *tt*
   - NotificationMessage list =: *notificationMessageList*

1.4. If *notificationMessageList* is not empty and the AuthenticationProfileToken source simple item in *notificationMessageList* is equal to *authProfileToken*, skip other steps and finish the procedure.

1.5. If *timeout1* timeout expires for step 1 without Notification with Token source simple item equal to *authProfileToken*, FAIL the test, restore the DUT state, and skip other steps.

Procedure Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **PullMessagesResponse** message.

Note: *operationDelay* will be taken from Operation Delay field of ONVIF Device Test Tool.

A.22 Delete Security Level

Name: HelperDeleteSecurityLevel

Procedure Purpose: Helper procedure to delete security level.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: Security Level Token (*securityLevelToken*).

Returns: None.

Procedure:

1. ONVIF client invokes **DeleteSecurityLevel** with parameters
   - Token =: *securityLevelToken*
2. The DUT responds with empty **DeleteSecurityLevelResponse** message

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **DeleteSecurityLevelResponse** message.

A.23 Delete Schedule

Name: HelperDeleteSchedule

Procedure Purpose: Helper procedure to delete schedule.

Pre-requisite: Schedule Service is received from the DUT.

Input: Schedule Token (*scheduleToken*).

Returns: None.

Procedure:

1. ONVIF client invokes **DeleteSchedule** with parameters
   - Token =: *scheduleToken*
2. The DUT responds with empty **DeleteScheduleResponse** message

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **DeleteScheduleResponse** message.

A.24 Create Number of Security Levels

Name: HelperCreateSecurityLevels

Procedure Purpose: Helper procedure to create number of security levels requiered for test cases.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: None.

Returns: The complete list of security levels information (*securityLevelsInfoCompleteList*). List of created security levels tokens (*createdSecurityLevelsTokensList*). The service capabilities (*cap*).

Procedure:

1. ONVIF Client retrieves a complete list of security levels info by following the procedure mentioned in Annex A.6 with the following input and output parameters
   - out *securityLevelInfoInitialList* - complete list of security level information
2. ONVIF Client gets the service capabilities by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - out *cap* - Authentication Behavior Service capabilities
3. Set *requieredNumberOfSecurityLevel* := min {50; *cap*.MaxLimit; *cap*.MaxSecurityLevels}.
4. Set *securityLevelInfoCompleteList* := *securityLevelInfoInitialList*.
5. If *requieredNumberOfSecurityLevel* <= number of SecurityLevelInfo items in *securityLevelInfoInitialList*, skip other steps of the procedure.
6. Set *numberOfSecurityLevelToBeCreated* := *requieredNumberOfSecurityLevel* - number of SecurityLevelInfo items in *securityLevelInfoInitialList*.
7. ONVIF client invokes **CreateSecurityLevel** with parameters
   - SecurityLevel.token := ""
   - SecurityLevel.Name := "Test Name"
   - SecurityLevel.Priority := other then specified for SecurityLivelInfo items in *securityLevelInfoCompleteList*
   - SecurityLevel.Description is skipped
   - SecurityLevel.RecognitionGroup is skipped
   - SecurityLevel.Extension is skipped
8. The DUT responds with **CreateSecurityLevelResponse** message with parameters
   - Token =: *securityLevelToken*
9. Set *securityLevelInfoCompleteList* := *securityLevelInfoInitialList* + new SecurityLevelInfo (with token := *securityLevelToken*; Name := "Test Name"; DefaultSecurityLevelToken := *securityLevelToken*).
10. Set *createdSecurityLevelTokensList* := *createdSecurityLevelTokensList* + *securityLevelToken*.
11. Set *numberOfSecurityLevelToBeCreated* := *numberOfSecurityLevelToBeCreated* - 1

12. If *numberOfSecurityLevelToBeCreated* > 0, go to step 7

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **CreateSecurityLevelResponse** message.

A.25 Get Security Level List

Name: HelperGetSecurityLevelList

Procedure Purpose: Helper procedure to get complete security levels list with.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: None.

Returns: The complete list of security levels (*securityLevelCompleteList*).

Procedure:

1. ONVIF client invokes **GetSecurityLevelList** with parameters
   - Limit skipped
   - StartReference skipped
2. The DUT responds with **GetSecurityLevelListResponse** message with parameters
   - NextStartReference =: *nextStartReference*
   - SecurityLevel list =: *securityLevelCompleteList*
3. Until *nextStartReference* is not null, repeat the following steps:
   3.1. ONVIF client invokes **GetSecurityLevelList** with parameters
      - Limit skipped
      - StartReference := *nextStartReference*
   3.2. The DUT responds with **GetSecurityLevelListResponse** message with parameters
      - NextStartReference =: *nextStartReference*

- Schedule list =: *securityLevelsListPart*

3.3. Set *securityLevelCompleteList* := *securityLevelCompleteList* + *securityLevelsListPart*

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetSecurityLevelListResponse** message.

A.26 Compare Security Level List and Security Level Info List

Name: HelperCompareSecurityLevelsList

Procedure Purpose: Helper procedure to compare Security Level List and Security Level Info List.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: The list of security levels information (*securityLevelInfoList*). The list of security levels (*securityLevelsList*).

Returns: None.

Procedure:

1. If *securityLevelsList* does not contain all tokens from *securityLevelInfoList*, FAIL the test, restore the DUT state, and skip other steps.
2. If *securityLevelsList* contains tokens other than tokens from *securityLevelInfoList*, FAIL the test, restore the DUT state, and skip other steps.
3. For each SecurityLevelInfo.token *token* from *securityLevelInfoList* repeat the following steps:

   3.1. If *securityLevelsList*[token = *token*] item does not have equal field values to *securityLevelInfoList*[token = *token*] item, FAIL the test, restore the DUT state, and skip other steps.

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- None.

Note: The following fields are compared at step 3.1:

- SecurityLevel/SecurityLevelInfo:
  - token
  - Name
  - Priority
  - Description

A.27 Retrieve Security Level Changed Event by PullPoint

Name: HelperPullSecurityLevelChanged

Procedure Purpose: Helper procedure to retrieve and check tns1:Configuration/SecurityLevel/Changed event with PullMessages.

Pre-requisite: Event Service is received from the DUT.

Input: Subscription reference (*s*), current time for the DUT (*ct*), Subscription termination time (*tt*) and Security Level token (*securityLevelToken*).

Returns: None

Procedure:

1. Until *operationDelay* timeout expires, repeat the following steps:
   1.1. ONVIF Client waits for time *t* := min{(*tt*-*ct*)/2, 1 second}.
   1.2. ONVIF Client invokes **PullMessages** to the subscription endpoint *s* with parameters
      - Timeout := PT60S
      - MessageLimit := 1
   1.3. The DUT responds with **PullMessagesResponse** message with parameters
      - CurrentTime =: *ct*
      - TerminationTime =: *tt*

- NotificationMessage list =: *notificationMessageList*

1.4. If *notificationMessageList* is not empty and the SecurityLevelToken source simple item in *notificationMessageList* is equal to *securityLevelToken*, skip other steps and finish the procedure.

1.5. If *timeout1* timeout expires for step 1 without Notification with Token source simple item equal to *securityLevelToken*, FAIL the test, restore the DUT state, and skip other steps.

Procedure Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **PullMessagesResponse** message.

Note: *operationDelay* will be taken from Operation Delay field of ONVIF Device Test Tool.

A.28 Retrieve Security Level Removed Event by PullPoint

Name: HelperPullSecurityLevelRemoved

Procedure Purpose: Helper procedure to retrieve and check tns1:Configuration/SecurityLevel/Removed event with PullMessages.

Pre-requisite: Event Service is received from the DUT.

Input: Subscription reference (*s*), current time for the DUT (*ct*), Subscription termination time (*tt*) and Security Level token (*securityLevelToken*).

Returns: None

Procedure:

1. Until *operationDelay* timeout expires, repeat the following steps:

1.1. ONVIF Client waits for time *t* := min{(*tt*-*ct*)/2, 1 second}.

1.2. ONVIF Client invokes **PullMessages** to the subscription endpoint *s* with parameters

- Timeout := PT60S
- MessageLimit := 1

1.3. The DUT responds with **PullMessagesResponse** message with parameters

- CurrentTime =: *ct*
- TerminationTime =: *tt*
- NotificationMessage list =: *notificationMessageList*

1.4. If *notificationMessageList* is not empty and the SecurityLevelToken source simple item in *notificationMessageList* is equal to *securityLevelToken*, skip other steps and finish the procedure.

1.5. If *timeout1* timeout expires for step 1 without Notification with Token source simple item equal to *securityLevelToken*, FAIL the test, restore the DUT state, and skip other steps.

Procedure Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **PullMessagesResponse** message.

Note: *operationDelay* will be taken from Operation Delay field of ONVIF Device Test Tool.

A.29 Get Security Level Info

Name: HelperGetSecurityLevelInfo

Procedure Purpose: Helper procedure to get security level info.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: Security Level Token (*securityLevelToken*).

Returns: Security Level Info List (*securityLevelInfoList*).

Procedure:

1. ONVIF client invokes **GetSecurityLevelInfo** with parameters
   - Token[0] := *securityLevelToken*
2. The DUT responds with **GetSecurityLevelInfoResponse** message with parameters

- SecurityLevelInfo list =: *securityLevelInfoList*

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetSecurityLevelInfoResponse** message.

A.30 Get Security Level

Name: HelperGetSecurityLevel

Procedure Purpose: Helper procedure to get security level.

Pre-requisite: Authentication Behavior Service is received from the DUT.

Input: Security Level Token (*securityLevelToken*).

Returns: Security Level List (*securityLevelList*).

Procedure:

1. ONVIF client invokes **GetSecurityLevels** with parameters
   - Token[0] := *securityLevelToken*
2. The DUT responds with **GetSecurityLevelsResponse** message with parameters
   - SecurityLevel list =: *securityLevelList*

Procedure Result:

PASS –

- The DUT passed all assertions.

FAIL –

- The DUT did not send **GetSecurityLevelsResponse** message.

A.31 Get Supported Recognition Types

Name: HelperGetSupportedRecognitionTypes

Procedure Purpose: Helper procedure to get supported recognition types.

Pre-requisite: None.

Input: None.

Returns: First supported recognition type (*firstSupportedRecognitionType*). Second supported recognition type (*secondSupportedRecognitionType*).

Procedure:

1. Set *firstSupportedRecognitionType* := value of First Supported Recognition Type of ONVIF Device Test Tool.
2. If Second Supported Recognition Type of ONVIF Device Test Tool is defined
   - set *secondSupportedRecognitionType* := value of Second Supported Recognition Type of ONVIF Device Test Tool,

   otherwise
   - set *secondSupportedRecognitionType* := *firstSupportedRecognitionType*.