ONVIF®

Analytics Engine Device Test Specification

Version 21.06

June 2021
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<td>Apr 18, 2017</td>
<td>ANALYTICS-1-1-1 GET SUPPORTED RULES (MOTION REGION DETECTOR) added</td>
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**ANALYTICS-1-1-3 CREATE MOTION REGION DETECTOR RULE**

**ANALYTICS-1-1-4 MODIFY MOTION REGION DETECTOR RULE**

**ANALYTICS-2-1-1 MOTION REGION DETECTOR EVENT**

The following annexes were added according to #1398:

Annex A.8 Calculate Free Space for Rule

Annex A.9 Delete Rule with Requested Type

The following test cases were updated according to #1185:

**ANALYTICS-1-1-3 CREATE MOTION REGION DETECTOR RULE**

**ANALYTICS-1-1-4 MODIFY MOTION REGION DETECTOR RULE**

**ANALYTICS-2-1-1 MOTION REGION DETECTOR EVENT**

The following annexes were added:

Annex A.10 Create Motion Region Detector Rule

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18.06 Jan 22, 2018

18.12 Aug 16, 2018

18.12 Sept 05, 2018

18.12 Oct 08, 2018

18.12 Dec 21, 2018

18.12 Dec 27, 2018
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| Apr 26, 2019 | The following was changed according to #1833:  
|            | Scope (Analytics Engine section was replaced with the following sections: Motion Region Detector, Events, Capabilities)  
|            | Scope (Analytics Modules section was added)  
|            | Test Policy (Analytics Modules section was added)  
|            | Analytics Engine (Analytics Modules section was added)  
|            | ANALYTICS-4-1-1 Get Supported Analytics Modules (added)  
|            | ANALYTICS-4-1-2 Get Analytics Module Options (added)  
|            | ANALYTICS-4-1-3 Get Analytics Modules (added)  
|            | A.11 Topic Format Verification (added)  
|            | A.12 Valid Topic Format (added)  
| Oct 18, 2019 | The following was changed according to #1831:  
|            | Introduction (Analytics Modules section was updated)  
|            | Test Policy (Analytics Modules section was updated)  
|            | ANALYTICS-4-1-4 Get Supported Metadata (added)  
|            | ANALYTICS-3-1-1 Get Services and Get Analytics Service Capabilities Consistency (updated with adding of Note)  
|            | ANALYTICS-3-1-2 Analytics Service Capabilities (added)  
|            | Annex A.13 Get Installed Analytics Modules (added)  
|            | Annex A.14 Get Supported Metadata (added)  
| Oct 23, 2019 | The following was changed according to #1837:  
|            | ANALYTICS-4-1-5 Object Class Descriptor (added)  
| Jan 16, 2020 | The following was changed according to #1841:  
|            | ANALYTICS-5-1-2 Vehicle Information Descriptor (added)  
|            | The following was changed according to #1845:  
|            | ANALYTICS-5-1-3 Geo Location Metadata (added)  
| Jan 17, 2020 | The following was changed according to #1953:  
|            | ANALYTICS-4-1-5 Create Analytics Modules (added)  
|            | ANALYTICS-4-1-6 Delete Analytics Modules (added)  
|            | ANALYTICS-4-1-7 Modify Analytics Modules (added)  
| Feb 10, 2020 | The following was changed according to #1820:  
|            | ANALYTICS-5-1-4 Human Face Descriptor (added)  

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| Mar 17, 2020 | The following was changed according to #1843:  
|            | ANALYTICS-5-1-5 License Plate Information Descriptor (added)                  |
|            | The following was changed according to #1839:  
|            | ANALYTICS-5-1-6 Human Body Descriptor (added)                                  |
| Apr 16, 2020 | The following test cases were updated according to #2037:  
|            | ANALYTICS-5-1-4 Human Face Descriptor                                            |
|            | ANALYTICS-5-1-5 License Plate Information Descriptor                             |
|            | ANALYTICS-5-1-6 Human Body Descriptor                                           |
| May 13, 2020 | The following was changed according to #1999:  
|            | ANALYTICS-2-1-1 MOTION REGION DETECTOR EVENT (step 21, 26 updated)             |
| Jun 15, 2020 | The following was changed according to #2018:  
|            | ANALYTICS-4-1-4 GET SUPPORTED METADATA (step 7.2, 8.8 added)                   |
| Aug 05, 2020 | The following was added according to #2015:  
<p>|            | Introduction\Rules                                                                 |
|            | Test Policy\Rules                                                               |
|            | ANALYTICS-6-1-1 GET SUPPORTED RULES                                             |
|            | ANALYTICS-6-1-2 GET RULE OPTIONS                                                |
|            | ANALYTICS-6-1-3 GET RULES                                                       |
|            | ANALYTICS-6-1-4 CREATE RULES                                                    |
|            | ANALYTICS-6-1-5 DELETE RULES                                                    |
|            | ANALYTICS-6-1-6 MODIFY RULES                                                    |
|            | Annex A.27 Device Configuration For Create Rule                                 |
|            | Annex A.28 Get List of Non-Fixed Analytics Configurations With Supporting of Rules |
|            | Annex A.29 Get Supported Rules                                                  |
|            | Annex A.30 Prepare Free Space for Rule                                           |
|            | Annex A.31 Delete Rule                                                          |
|            | Annex A.32 Create Rule                                                          |
|            | Annex A.33 Select Existing Rule                                                  |
| Aug 24, 2020 | The following test case was updated according to #2065:                         |</p>
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<td>A.34 Device Configuration For Create Specific Rule</td>
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<td>A.35 Select Value For Rule String Parameter Type</td>
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<td>A.38 Select Analytics Module Description with Parameters without Options</td>
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<td>A.39 Get Analytics Module Options</td>
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<td>A.18 Prepare Free Space for Analytics Module (steps 5 - 7 added)</td>
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<td>A.10 Create Motion Region Detector Rule (steps 1, 2, 3, 6 removed)</td>
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| Feb 01, 2021 | The following was changed according to #2065:  
ANALYTICS-4-1-7 MODIFY ANALYTICS MODULES was updated and renamed to ANALYTICS-4-1-7 MODIFY ANALYTICS MODULES (PARAMETERS WITH OPTIONS)  
A.40 Device Configuration For Modify Analytics Module (updated) |
| Feb 07, 2021 | Profile T was added as Pre-Requisite according to #2128:  
ANALYTICS-1-1-3 CREATE MOTION REGION DETECTOR RULE  
ANALYTICS-1-1-4 MODIFY MOTION REGION DETECTOR RULE  
ANALYTICS-2-1-1 MOTION REGION DETECTOR EVENT |
| Mar 07, 2021 | The following was changed according to #2070:  
ANALYTICS-6-1-6 MODIFY ANALYTICS MODULES was updated and renamed to ANALYTICS-6-1-6 MODIFY RULES (PARAMETERS WITH OPTIONS)  
ANALYTICS-6-1-7 MODIFY RULES (PARAMETERS WITHOUT OPTIONS) added  
A.41 Select Rule Description To Modify  
A.42 Device Configuration For Modify Rule (added) |
| Mar 29, 2021 | The following test cases were added according to #1849:  
ANALYTICS-8-1-1 GET SUPPORTED RULES (LICENSE PLATE RECOGNITION)  
ANALYTICS-8-1-2 GET LICENSE PLATE RECOGNITION RULE OPTIONS  
ANALYTICS-2-1-3 LICENSE PLATE RECOGNITION EVENT |
| Mar 29, 2021 | The following were updated according to #2023:  
A.27 Device Configuration For Create Rule (step 7 added)  
A.10 Create Motion Region Detector Rule (steps 1, 2, 3, 6 removed)  
Steps with device configuration for adding a rule was replaced with Annex A.34 Device Configuration For Create Specific Rule  
ANALYTICS-1-1-3 CREATE MOTION REGION DETECTOR RULE  
ANALYTICS-1-1-4 MODIFY MOTION REGION DETECTOR RULE  
ANALYTICS-2-1-1 MOTION REGION DETECTOR EVENT |
| Apr 22, 2021 | The following test cases and annexes were added according to #1853:  
ANALYTICS-2-1-4 LINE CROSSING COUNTER EVENT  
ANALYTICS-9-1-1 GET SUPPORTED RULES (LINE CROSSING COUNTER)  
ANALYTICS-9-1-2 GET LINE CROSSING COUNTER RULE OPTIONS  
A.43 Profile Configuration With Specific Rule Type |
## A.44 Select Profile With Specific Rule Type

## A.45 Select Existing Rule With Specific Type

## A.46 Rule Engine Topic Format Verification

### 21.06 Apr 30, 2021

The following test cases were updated according to #2090:

- **ANALYTICS-4-1-7** MODIFY ANALYTICS MODULES (PARAMETERS WITH OPTIONS) (step 6, 6.1 updated)
- **ANALYTICS-4-1-8** MODIFY ANALYTICS MODULES (PARAMETERS WITHOUT OPTIONS) (step 6, 6.1 updated)
- **ANALYTICS-6-1-6** MODIFY RULES (PARAMETERS WITH OPTIONS) (step 6, 6.1 updated)
- **ANALYTICS-6-1-7** MODIFY RULES (PARAMETERS WITHOUT OPTIONS) (step 6, 6.1 updated)

### 21.06 May 13, 2021

The following test cases were updated according to #2200:

- **ANALYTICS-4-1-4** GET SUPPORTED METADATA (step 6 added)

### 21.06 May 24, 2021

The following test cases were updated according to #2202:

- **ANALYTICS-5-1-1** OBJECT CLASSIFICATION METADATA (steps 4.1.1 and 4.1.2 changed)

### 21.06 May 26, 2021

Profile M was added as Pre-Requisite according to #2193:

- **ANALYTICS-2-1-4** LINE CROSSING COUNTER EVENT
- **ANALYTICS-4-1-5** CREATE ANALYTICS MODULES
- **ANALYTICS-4-1-6** DELETE ANALYTICS MODULES
- **ANALYTICS-4-1-7** MODIFY ANALYTICS MODULES (PARAMETERS WITH OPTIONS)
- **ANALYTICS-4-1-8** MODIFY ANALYTICS MODULES (PARAMETERS WITHOUT OPTIONS)
- **ANALYTICS-6-1-4** CREATE RULES
- **ANALYTICS-6-1-5** DELETE RULES
- **ANALYTICS-6-1-6** MODIFY RULES (PARAMETERS WITH OPTIONS)
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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 Analytics Engine Test Specification acts as a supplementary document to the [ONVIF Network Interface Specs], illustrating test cases need to be executed and passed. And this specification acts as an input document to the development of test tool, which 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 Analytics Engine 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 to provide test cases to test individual requirements of ONVIF devices according to ONVIF Analytics service(s) which is defined in [ONVIF Network Interface Specs].

The principal intended purposes are:

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

This specification does not address the following:

- Product use cases and non-functional (performance and regression) testing.
- SOAP Implementation Interoperability test i.e. Web Service Interoperability Basic Profile version 2.0 (WS-I BP 2.0).
- Network protocol implementation Conformance test for HTTP, HTTPS, RTP and RTSP protocol.
- Poor streaming performance test (audio/video distortions, missing audio/video frames, incorrect lib synchronization etc.).
- 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 Analytics Engine Test Specification covers Analytics 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.

1.2 Motion Region Detector

Motion Region Detector test cases cover verification of Rule interface for Motion Region Detector feature as mentioned in [ONVIF Analytics Spec]. It means that the following commands are covered by these test cases:

- GetSupportedRules (for Motion Region Detector Rule scope only);
- CreateRules (for Motion Region Detector Rule scope only);
- ModifyRules (for Motion Region Detector Rule scope only);
- DeleteRules (for Motion Region Detector Rule scope only);
- GetRules (for Motion Region Detector Rule scope only).

1.3 Events

Events test cases cover verification of property events defined in [ONVIF Analytics Spec]. Currently the following events are covered by these test cases:

- tns1:RuleEngine/MotionRegionDetector/Motion.

1.4 Capabilities

Capabilities test cases cover verification to get Analytics Service capabilities. It means that the following commands are covered by these test cases:

- GetServices (Analytics Service);
- GetServiceCapabilities.

1.5 Analytics Modules

Analytics Modules test cases cover verification of analytics modules configuration feature as mentioned in [ONVIF Analytics Spec]. It means that the following commands are covered by these test cases:
• GetSupportedAnalyticsModules;
• GetAnalyticsModules;
• GetAnalyticsModuleOptions;
• GetSupportedMetadata;
• CreateAnalyticsModules;
• DeleteAnalyticsModules;
• ModifyAnalyticsModules.

1.6 Scene Elements

Scene Elements test cases cover verification of scene elements in supported metadata as mentioned in [ONVIF Analytics Spec]. It means that the following features are covered by these test cases:

• Object Classification descriptor;
• Vehicle information descriptor;
• Human Face descriptor;
• Human Body descriptor;
• License plate information descriptor;
• Geo location metadata;
• GetSupportedMetadata;
• Image Data.

1.7 Rules

Rules test cases cover verification of rules configuration feature as mentioned in [ONVIF Analytics Spec]. It means that the following commands are covered by these test cases:

• GetSupportedRules;
• GetRules;
• GetRuleOptions;
1.8 Face Recognition Rule

Face Recognition Rule test cases cover verification of Rule interface for Face Recognition feature as mentioned in [ONVIF Analytics Spec]. It means that the following commands are covered by these test cases:

- GetSupportedRules (for Face Recognition Rule scope only);
- CreateRules (for Face Recognition Rule scope only);
- ModifyRules (for Face Recognition Rule scope only);
- DeleteRules (for Face Recognition Rule scope only);
- GetRules (for Face Recognition Rule scope only).
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 Media2 Spec] ONVIF Media 2 Specification:
  https://www.onvif.org/profiles/specifications/
- [ONVIF Analytics Spec] ONVIF Analytics Specification:
  https://www.onvif.org/profiles/specifications/
- [ONVIF Base Test] ONVIF Base Device Test Specification:
  https://www.onvif.org/profiles/conformance/device-test/
  http://www.iso.org/directives
- [SOAP 1.2, Part 1] W3C SOAP 1.2, Part 1, Messaging Framework:
  http://www.w3.org/TR/soap12-part1/
  http://www.w3.org/TR/xmlschema-1/
  http://www.w3.org/TR/xmlschema-2/
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 describes terms and definitions used in this document.

<table>
<thead>
<tr>
<th>Profile</th>
<th>See ONVIF Profile Policy.</th>
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<tr>
<td>ONVIF Device</td>
<td>Computer appliance or software program that exposes one or multiple ONVIF Web Services.</td>
</tr>
<tr>
<td>ONVIF Client</td>
<td>Computer appliance or software program that uses ONVIF Web Services.</td>
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<tr>
<td>Media Profile</td>
<td>A media profile maps a video and/or audio source to a video and/or an audio encoder, PTZ and analytics configurations.</td>
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<tr>
<td>Device Test Tool</td>
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<tr>
<td>Video Analytics</td>
<td>Algorithms used to evaluate video data for meaning of content.</td>
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<td>Audio Analytics</td>
<td>Algorithms used to evaluate audio data for meaning of content.</td>
</tr>
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</table>

3.3 Abbreviations

This section describes abbreviations used in this document.

HTTP   Hyper Text Transport Protocol.
WSDL   Web Services Description Language.
XML    eXtensible Markup Language.
PTZ    Pan/Tilt/Zoom.
4 Test Overview

This section describes about the test setup and prerequisites needed, 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:

1. The DUT shall be configured with an IPv4 address.
2. The DUT shall be IP reachable [in the test configuration].
3. The DUT shall be able to be discovered by the Test Tool.
4. The DUT shall be configured with the time i.e. manual configuration of UTC time and if NTP is supported by the DUT, then NTP time shall be synchronized with NTP Server.
5. The DUT time and Test tool time shall be synchronized with each other either manually or by common 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 Motion Region Detector

The test policies specific to the test case execution of Motion Region Detector functional block:

- DUT shall give the Analytics Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.
- DUT shall give the Media2 Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.
- DUT shall provide Motion Region Detector rule, if DUT supports this rule. Otherwise, these test cases will be skipped.
DUT shall support the following commands:

- GetServiceCapabilities

If DUT returns RuleSupport capability as supported, then DUT shall support commands listed below. Otherwise, these test cases will be skipped.

- GetServiceCapabilities
- GetSupportedRules
- GetRules
- CreateRules
- ModifyRules
- DeleteRules

If DUT returns RuleOptionsSupported capability as supported, then DUT shall support GetRuleOptions command. Otherwise, the following test cases will be skipped:

- GET MOTION REGION DETECTOR RULE OPTIONS
- MODIFY MOTION REGION DETECTOR RULE

Please, refer to Section 5.1 for Motion Region Detector Test Cases.

### 4.3.2 Events

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

- DUT shall give the Analytics Service entry point and Event Service entry points by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.

- DUT shall give the Media2 Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.

- DUT shall provide Motion Region Detector rule, if DUT supports this rule. Otherwise, these test cases will be skipped.

- DUT shall provide tns1:RuleEngine/MotionRegionDetector/Motion notification topic and Initialized event, if DUT supports Motion Region Detector rule. Otherwise, these test cases will be skipped.

- DUT shall support the following commands:
• GetServiceCapabilities

• GetEventProperties

• CreatePullPointSubscription

• PullMessages

• Unsubscribe

• If DUT returns RuleSupport capability as supported, then DUT shall support commands listed below. Otherwise, these test cases will be skipped.

• GetServiceCapabilities

• GetSupportedRules

• CreateRules

• DeleteRules

• If DUT returns RuleOptionsSupported capability as supported, then DUT shall support GetRuleOptions command. Otherwise, these test cases will be skipped.

Please, refer to Section 5.2 for Motion Region Detector Test Cases.

4.3.3 Capabilities

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

• DUT shall give the Analytics 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 5.3 for Capabilities Test Cases.
4.3.4 Analytics Modules

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

- DUT shall give the Analytics Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.

- DUT shall support the following commands:
  - GetSupportedAnalyticsModules
  - GetAnalyticsModules
  - GetAnalyticsModuleOptions
  - GetSupportedMetadata
  - CreateAnalyticsModules
  - DeleteAnalyticsModules
  - ModifyAnalyticsModules

- Additionally, DUT shall support the following commands which will be used as supplementary during the testing:
  - GetServices

- DUT shall return all supported analytics modules in GetSupportedAnalyticsModulesResponse response for the video analytics configuration specified in GetSupportedAnalyticsModules request.

- If DUT supports Supported Metadata as indicated by the Capabilities.SupportedMetadata, then DUT shall support the following commands
  - GetSupportedMetadata

- DUT shall indicate maximum number of analytics modules through the maxInstances attribute in GetSupportedAnalyticsModulesResponse.

- DUT shall return unique names of the parameters for each supported analytics modules in GetSupportedAnalyticsModulesResponse response.

- DUT shall return unique names of the messages for each supported analytics modules in GetSupportedAnalyticsModulesResponse response.

- DUT shall return valid parent topic value for each supported analytics modules in GetSupportedAnalyticsModulesResponse response.
• DUT shall return all configured analytics modules in GetAnalyticsModulesResponse response for the video analytics configuration specified in GetAnalyticsModules request.

• DUT shall return all analytics modules, which marked as fixed in GetSupportedAnalyticsModulesResponse response, in GetAnalyticsModulesResponse response for the video analytics configuration specified in GetAnalyticsModules request.

• If DUT shall return configured analytics modules in GetAnalyticsModulesResponse response with the structure defined in GetSupportedAnalyticsModulesResponse response for the corresponding analytics module type.

• If DUT supports receiving of analytics module options as indicated by AnalyticsModuleOptionsSupported capability:
  • DUT shall return options for all parameters of all supported analytics modules in GetAnalyticsModuleOptionsResponse response for the video analytics configuration specified in GetAnalyticsModuleOptions request, if Type is skipped.
  • DUT shall return options for all parameters in GetAnalyticsModuleOptionsResponse response for the video analytics configuration and supported analytics module specified in GetAnalyticsModuleOptions request.
  • DUT shall not return RuleType for any option in GetAnalyticsModuleOptionsResponse response.

• The following tests are performed:
  • Receiving of supported analytics modules for each video analytics configuration.
  • Receiving of all configured analytics modules for each video analytics configuration.
  • Verifying of consistency between configured analytics modules and supported analytics modules description.

• If DUT supports receiving of analytics module options as indicated by AnalyticsModuleOptionsSupported capability:
  • Receiving of all analytics module options for each video analytics configuration.
  • Receiving of analytics module options for specified analytics module type for each video analytics configuration.
  • Verifying of consistency between analytics module options and supported analytics modules description.
• If DUT supports receiving of supported metadata as indicated by SupportedMetadata capability:
  • Receiving of supported metadata for each installed module type.

Please refer to Section 5.4 for Analytics Modules Test Cases.

4.3.5 Scene Elements

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

• DUT shall give the Analytics Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.

• If DUT supports Supported Metadata as indicated by the Capabilities.SupportedMetadata, then DUT shall support the following commands
  • GetSupportedMetadata

• The following tests are performed
  • Getting supported metadata with GetSupportedMetadata command;
  • Check that sum of Likelihood of Object is not greater than 1;
  • Check Vehicle Information Descriptor in Supported Metadata;
  • Check Geo Location Metadata in Supported Metadata;
  • Check Human Face Descriptor in Supported Metadata;
  • Check Human Body Descriptor in Supported Metadata;
  • Check License Plate Information Descriptor in Supported Metadata;
  • Check Image Data in Supported Metadata;

Please refer to Section 5.5 for Scene Elements Test Cases.

4.3.6 Rules

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

• DUT shall give the Analytics Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.
• DUT shall give the Media2 Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.

• DUT shall support Rule Engine as defined by RuleSupport capability. Otherwise, these test cases will be skipped.

• DUT shall support Rule Options as defined by RuleOptionsSupported capability. Otherwise, the following test cases will be skipped:
  • ANALYTICS-6-1-2 (see Section 5.6.2)

• DUT shall supports Profile M. Otherwise, the following test cases will be skipped:
  • ANALYTICS-6-1-4 (see Section 5.6.4)
  • ANALYTICS-6-1-5 (see Section 5.6.5)
  • Section 5.6.6, "MODIFY RULES (PARAMETERS WITH OPTIONS)"

• DUT shall support the following commands:
  • GetSupportedRules
  • GetRules
  • GetRuleOptions
  • CreateRules
  • DeleteRules
  • ModifyRules

• DUT shall support the following commands if DUT supports Rule Options:
  • GetSupportedRules
  • GetRuleOptions

• Additionally, DUT shall support the following commands which will be used as supplementary during the testing:
  • GetServices
  • GetAnalyticsConfigurations

• DUT shall return all supported rules in GetSupportedRulesResponse response for the video analytics configuration specified in GetSupportedRules request.
DUT shall indicate maximum number of rules with the same type through the maxInstances attribute in GetSupportedRulesResponse.

DUT shall indicate maximum number of rules through the Limit attribute in GetSupportedRulesResponse if there is such limitation.

DUT shall return unique names of the parameters for each supported rules in GetSupportedRulesResponse response.

DUT shall return unique names of the messages for each supported rules in GetSupportedRulesResponse response.

DUT shall return valid parent topic value for each supported rules in GetSupportedRulesResponse response.

DUT shall return all configured rules in GetRulesResponse response for the video analytics configuration specified in GetRules request.

DUT shall return all rules, which marked as fixed in GetSupportedRulesResponse response, in GetRulesResponse response for the video analytics configuration specified in GetRules request.

DUT shall return configured rules in GetRulesResponse response with the structure defined in GetSupportedRulesResponse response for the corresponding rule type.

If DUT supports receiving of rule options as indicated by RuleOptionsSupported capability:

DUT shall return options for all parameters, for which options is defined, of all supported rules in GetRuleOptionsResponse response for the video analytics configuration specified in GetRuleOptions request, if Type is skipped.

DUT shall return options for all parameters, for which options is defined, in GetRuleOptionsResponse response for the video analytics configuration and supported rule specified in GetRuleOptions request.

DUT shall not return AnalyticsModule for any option in GetRuleOptionsResponse response.

The DUT shall support creating of a rule if at least one non-fixed rule is supported.

The DUT shall support deleting of a rule if at least one non-fixed rule is supported.

The DUT shall support modifying of a rule.

If DUT supports Profile M:
• DUT shall support creating of a rule with default parameters values, if at least one non-fixed rule is supported, if empty Parameters list was specified in CreateRules request.

• DUT shall support modifying of a rule with default parameters values, if empty Parameters list was specified in ModifyRules request.

• The following tests are performed:
  • Receiving of supported rules for each video analytics configuration.
  • Receiving of all configured rules for each video analytics configuration.
  • Verifying of consistency between configured rules and supported rules description.
  • If DUT supports receiving of rule options as indicated by RuleOptionsSupported capability:
    • Receiving of all rule options for each video analytics configuration.
    • Receiving of rule options for specified rule type for each video analytics configuration.
    • Verifying of consistency between rule options and supported rules description.
  • If DUT supports Profile M:
    • Creating a rule with CreateRules command with empty Parameters list.
    • Modifying a rule with ModifyRules command with empty Parameters list.
    • Deleting a rule with DeleteRules command.

Please refer to Section 5.6 for Rules Test Cases.

4.3.7 Face Recognition Rule

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

• DUT shall give the Analytics Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.

• DUT shall give the Media2 Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.

• DUT shall provide Face Recognition rule, if DUT supports this rule. Otherwise, these test cases will be skipped.

• DUT shall support the following commands:
• GetServiceCapabilities

• If DUT returns RuleSupport capability as supported, then DUT shall support commands listed below. Otherwise, these test cases will be skipped.
  • GetServiceCapabilities
  • GetSupportedRules

• If DUT returns RuleOptionsSupported capability as supported, then DUT shall support GetRuleOptions.

• The following tests are performed:
  • Receiving of Face Recognition rule description for each video analytics configuration that supports this rule.
  • If DUT supports receiving of rule options as indicated by RuleOptionsSupported capability:
    • Receiving of Face Recognition rule options for each video analytics configuration that supports this rule.

Please, refer to Section 5.7 for Face Recognition Rule Test Cases.

### 4.3.8 License Plate Recognition Rule

The test policies specific to the test case execution of License Plate Recognition functional block:

• DUT shall give the Analytics Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.

• DUT shall give the Media2 Service entry point by GetServices command, if DUT supports this service. Otherwise, these test cases will be skipped.

• DUT shall provide License Plate Recognition rule, if DUT supports this rule. Otherwise, these test cases will be skipped.

• DUT shall support the following commands:
  • GetServiceCapabilities

• If DUT returns RuleSupport capability as supported, then DUT shall support commands listed below. Otherwise, these test cases will be skipped.
  • GetServiceCapabilities
• GetSupportedRules

• If DUT returns RuleOptionsSupported capability as supported, then DUT shall support GetRuleOptions.

• The following tests are performed:

• Receiving of License Plate Recognition rule description for each video analytics configuration that supports this rule.

• If DUT supports receiving of rule options as indicated by RuleOptionsSupported capability:

• Receiving of License Plate Recognition rule options for each video analytics configuration that supports this rule.

Please, refer to Section 5.8 for License Plate Recognition Rule Test Cases.
5 Analytics Engine

5.1 Motion Region Detector

5.1.1 GET SUPPORTED RULES (MOTION REGION DETECTOR)

Test Case ID: ANALYTICS-1-1-1

Specification Coverage: Get Supported rules (ONVIF Analytics Service Spec), Motion Region Detector (ONVIF Analytics Service Spec)

Feature Under Test: GetSupportedRules, RuleDescription for tt:MotionRegionDetector

WSDL Reference: analytics.wsdl, media2.wsdl

Test Purpose: To verify that device includes tt:MotionRegionDetector in GetSupportedRulesResponse. To verify structure of Motion Region Detector.

Pre-Requisite: Analytics Service is received from the DUT. Media2 Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capabilities. Motion Region Detector Rule is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out analyticsConfList - a list of Analytics configurations

4. For each Analytics Configuration analyticsConf in analyticsConfList repeat the following steps:
   4.1. ONVIF Client invokes GetSupportedRules request with parameters
       - ConfigurationToken := analyticsConf.@token
   4.2. DUT responds with GetSupportedRulesResponse message with parameters
       - SupportedRules := supportedRules
4.3. If `supportedRules` contains `RuleDescription` element (`motionRegionDetectorRuleDescription`) with Name value is equal to `tt:MotionRegionDetector`:

4.3.1. If `motionRegionDetectorRuleDescription` does not have `maxInstances` attribute, FAIL the test and skip other steps.

4.3.2. If `motionRegionDetectorRuleDescription` does not have `Parameters.ElementItemDescription` element with Name attribute value is equal to "MotionRegion", FAIL the test and skip other steps.

4.3.3. If Type attribute value is not equal to "axt:MotionRegionConfig" for `motionRegionDetectorRuleDescription.Parameters.ElementItemDescription` with Name attribute value is equal to "MotionRegion", FAIL the test and skip other steps.

4.3.4. If `motionRegionDetectorRuleDescription` does not have `Messages.Source.SimpleItemDescription` element with Name attribute value is equal to "VideoSource", FAIL the test and skip other steps.

4.3.5. If Type attribute value is not equal to "tt:ReferenceToken" for `motionRegionDetectorRuleDescription.Messages.Source.SimpleItemDescription` with Name attribute value is equal to "VideoSource", FAIL the test and skip other steps.

4.3.6. If `motionRegionDetectorRuleDescription` does not have `Messages.Source.SimpleItemDescription` element with Name attribute value is equal to "RuleName", FAIL the test and skip other steps.

4.3.7. If Type attribute value is not equal to "xs:string" for `motionRegionDetectorRuleDescription.Messages.Source.SimpleItemDescription` with Name attribute value is equal to "RuleName", FAIL the test and skip other steps.

4.3.8. If `motionRegionDetectorRuleDescription` does not have `Messages.Data.SimpleItemDescription` element with Name attribute value is equal to "State", FAIL the test and skip other steps.

4.3.9. If Type attribute value is not equal to "xs:boolean" for `motionRegionDetectorRuleDescription.Messages.Data.SimpleItemDescription` with Name attribute value is equal to "State", FAIL the test and skip other steps.
4.3.10. If Messages.ParentTopic value is not equal to "tns1:RuleEngine/MotionRegionDetector/Motion" for Messages with Source.SimpleItemDescription.Name value is equal to VideoSource and with Source.SimpleItemDescription.Name value is equal to RuleName, FAIL the test and skip other steps.

5. If there was no RuleDescription element with Name value is equal to tt:MotionRegionDetector in at least one supportedRules at step 4.2 [34], FAIL the test.

Test Result:

PASS –
• DUT passes all assertions.

FAIL –
• DUT did not send GetSupportedRulesResponse message.

5.1.2 GET MOTION REGION DETECTOR RULE OPTIONS

Test Case ID: ANALYTICS-1-1-2

Specification Coverage: Get Rule Options (ONVIF Analytics Service Spec), Motion Region Detector (ONVIF Analytics Service Spec)

Feature Under Test: GetRuleOptions, MotionRegionConfigOptions

WSDL Reference: analytics.wsdl, media2.wsdl

Test Purpose: To verify retrieving of MotionRegionConfigOptions by GetRuleOptions operation.

Pre-Requisite: Analytics Service is received from the DUT. Media2 Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capabilities, Rule Options is supported by the Device as indicated by the RuleOptionsSupported capabilities. Motion Region Detector Rule is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a list of Analytics Configurations that supports tt:MotionRegionDetector type by following the procedure mentioned in Annex A.2 with the following input and output parameters
• in `tt:MotionRegionDetector` - rule type

• out `analyticsConfListWithSupportingOfMotionRegionDetector` - a list of Analytics configurations

4. If `analyticsConfListWithSupportingOfMotionRegionDetector` is empty, FAIL the test and skip other steps.

5. For each Analytics Configuration `analyticsConf` in `analyticsConfListWithSupportingOfMotionRegionDetector` repeat the following steps:

5.1. ONVIF Client invokes `GetRuleOptions` request with parameters

   • RuleType := `tt:MotionRegionDetector`

   • ConfigurationToken := `analyticsConf.@token`

5.2. DUT responds with `GetRuleOptionsResponse` message with parameters

   • RuleOptions list =: `ruleOptionsList`

5.3. If `ruleOptionsList` does not contain RuleOption with @Name = `MotionRegion` and with @Type = `axt:MotionRegionConfigOptions` (if @Type is present), FAIL the test and skip other steps.

5.4. If RuleOption element with @Name = `MotionRegion` and with @Type = `axt:MotionRegionConfigOptions` (if @Type is present) does not contain `MotionRegionConfigOptions` element, FAIL the test and skip other steps.

Test Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send `GetRuleOptionsResponse` message.

5.1.3 CREATE MOTION REGION DETECTOR RULE

Test Case ID: ANALYTICS-1-1-3

Specification Coverage: Create Rules (ONVIF Analytics Service Spec)

Feature Under Test: Create Rules
**WSDL Reference:** analytics.wsdl, media2.wsdl

**Test Purpose:** To verify adding of Motion Region Detector Rule to an AnalyticsConfiguration by CreateRules operation.

**Pre-Requisite:** Analytics Service is received from the DUT. Media2 Service is received from the DUT. Rule Engine is supported by the DUT as indicated by the RuleSupport capabilities. Motion Region Detector Rule is supported by the DUT. Profile T is supported.

**Test Configuration:** ONVIF Client and DUT

**Test Procedure:**

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client configures device for adding of new Motion Region Detector rule by following the procedure mentioned in Annex A.34 with the following input and output parameters
   - in "tt:MotionRegionDetector" - Rule type
   - out nonFixedRuleSupported - Indication of non-fixed FaceRecognition Rule support
   - out analyticsToken - a token of Analytics Configuration
   - out ruleDescription - a rule description
   - out ruleToRestore - a rule to restore, if it was removed
   - out profile - media profile with Analytics Configuration
4. If nonFixedRuleSupported = false, FAIL the test and skip other steps.
5. ONVIF Client retrieves Rule Options of tt:MotionRegionDetector type by following the procedure mentioned in Annex A.3 with the following input and output parameters
   - in tt:MotionRegionDetector - Rule type
   - in analyticsToken - Analytics Configuration token
   - out ruleOptions - Rule Options
6. If ruleOptionsList does not contain RuleOption with @Name = MotionRegion and with @Type = axt:MotionRegionConfigOptions (if @Type is present), FAIL the test and skip other steps.
7. If RuleOption element with @Name = `MotionRegion` and @Type = `axt:MotionRegionConfigOptions` (if @Type is present) does not contain `MotionRegionConfigOptions` element, FAIL the test and skip other steps.

8. Set `motionRegionConfigOptions` := RuleOption[0].MotionRegionConfigOptions, where RuleOption[0] is element with @Name = `MotionRegion` and with @Type = `axt:MotionRegionConfigOptions` (if @Type is present).

9. ONVIF Client invokes CreateRules request with parameters

   • ConfigurationToken := profile.Configurations.Analytics.@token

   • Rule[0].@Name := TestMotionRegion

   • Rule[0].@Type := tt:MotionRegionDetector

   • Rule[0].Parameters.ElementItem[0].@Name := "MotionRegion"

   • Rule[0].Parameters.ElementItem[0].MotionRegion.Polygon.Point[0].@x := profile.Configurations.VideoSource.Bounds.@x

   • Rule[0].Parameters.ElementItem[0].MotionRegion.Polygon.Point[0].@y := profile.Configurations.VideoSource.Bounds.@y

   • Rule[0].Parameters.ElementItem[0].MotionRegion.Polygon.Point[1].@x := profile.Configurations.VideoSource.Bounds.@x


• Rule[0].Parameters.ElementItem[0].MotionRegion.@Armed := true if motionRegionConfigOptions.DisarmSupport = true, otherwise skipped.

• Rule[0].Parameters.ElementItem[0].MotionRegion.@Sensitivity := 1

10. The DUT responds with **CreateRulesResponse**.

11. ONVIF Client retrieves updated Rule list by following the procedure mentioned in Annex A.5 with the following input and output parameters

   • in profile.Configurations.Analytics.@token - Analytics configuration token

   • out updatedRuleList - Rule list.

12. If updatedRuleList does not contain Rule with @Name = TestMotionRegion and with Type = tt:MotionRegionDetector, FAIL the test and skip other steps.

13. Set rule := Rule with @Name = TestMotionRegion and with Type = tt:MotionRegionDetector from updatedRuleList.

14. If rule.Parameters does not contain ElementItem with @Name = "MotionRegion", FAIL the test and skip other steps.

15. If rule.Parameters.ElementItem with @Name = "MotionRegion" is not equal to Parameters.ElementItem[0] element from step 9 [39], FAIL the test and skip other steps.

16. ONVIF Client invokes **DeleteRules** request with parameters

   • ConfigurationToken := profile.Configurations.Analytics.@token

   • RuleName := TestMotionRegion

17. The DUT responds with **DeleteRulesResponse**.

18. ONVIF Client retrieves updated Rule list by following the procedure mentioned in Annex A.5 with the following input and output parameters

   • in profile.Configurations.Analytics.@token - Analytics configuration token

   • out updatedRuleList - Rule list.

19. If updatedRuleList contains Rule with @Name = TestMotionRegion and with Type = tt:MotionRegionDetector, FAIL the test and skip other steps.

20. ONVIF Client restores ruleToRestore if any.

21. ONVIF Client restores media profile if it was changed at step 3.
Test Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send `CreateRulesResponse` message.
• DUT did not send `DeleteRules` message.

Note: The following fields are compared at step 15 [40]:

• MotionRegion.Polygon.Point[0].@x
• MotionRegion.Polygon.Point[0].@y
• MotionRegion.Polygon.Point[1].@x
• MotionRegion.Polygon.Point[1].@y
• MotionRegion.Polygon.Point[2].@x
• MotionRegion.Polygon.Point[2].@y
• MotionRegion.Polygon.Point[3].@x
• MotionRegion.Polygon.Point[3].@y
• If `CreateRules` request contained Armed filed:
  • MotionRegion.@Armed
  • MotionRegion.@Sensitivity

5.1.4 MODIFY MOTION REGION DETECTOR RULE

Test Case ID: ANALYTICS-1-1-4

Specification Coverage: Get Rule Options (ONVIF Analytics Service Spec), Modify Rules (ONVIF Analytics Service Spec)

Feature Under Test: Modify Rules

WSDL Reference: analytics.wsdl, media2.wsdl
**Test Purpose:** To verify modifying of Motion Region Detector Rule by ModifyRules operation.

**Pre-Requisite:** Analytics Service is received from the DUT. Media2 Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capability. Rule Options is supported by the Device as indicated by the RuleOptionsSupported capability. Motion Region Detector Rule is supported by the DUT. Profile T is supported.

**Test Configuration:** ONVIF Client and DUT

**Test Procedure:**

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client configures device for adding of new Motion Region Detector rule by following the procedure mentioned in Annex A.34 with the following input and output parameters
   - in "tt:MotionRegionDetector" - Rule type
   - out nonFixedRuleSupported - Indication of non-fixed FaceRecognition Rule support
   - out analyticsToken - a token of Analytics Configuration
   - out ruleDescription - a rule description
   - out ruleToRestore - a rule to restore, if it was removed
   - out profile - media profile with Analytics Configuration

4. If nonFixedRuleSupported = false, FAIL the test and skip other steps.

5. ONVIF Client retrieves Rule Options of tt:MotionRegionDetector type by following the procedure mentioned in Annex A.3 with the following input and output parameters
   - in tt:MotionRegionDetector - Rule type
   - in profile.Configurations.Analytics.token - Analytics Configuration token
   - out ruleOptions - Rule Options

6. If ruleOptionsList does not contain RuleOption with @Name = MotionRegion and with @Type = axt:MotionRegionConfigOptions (if @Type is present), FAIL the test and skip other steps.

7. If RuleOption element with @Name = MotionRegion and @Type = axt:MotionRegionConfigOptions (if @Type is present) does not contain MotionRegionConfigOptions element, FAIL the test and skip other steps.
8. Set $motionRegionConfigOptions := RuleOption[0].MotionRegionConfigOptions$, where
$RuleOption[0]$ is element with @Name = $MotionRegion$ and with @Type =
$axt:MotionRegionConfigOptions$ (if @Type is present).

9. ONVIF Client creates Motion Region Detector Rule by following the procedure mentioned
in Annex A.10 with the following input parameter

- in $analyticsToken$ - Analytics Configuration Token.
- in $motionRegionConfigOptions$ - motion region configuration option.

10. ONVIF Client invokes $ModifyRules$ request with parameters

- ConfigurationToken := $profile.Configurations.Analytics.@token$
- Rule[0].@Name := TestMotionRegion
- Rule[0].@Type := tt:MotionRegionDetector
- Rule[0].Parameters.ElementItem[0].@Name := "MotionRegion"
- Rule[0].Parameters.ElementItem[0].MotionRegion.Polygon.Point[0].@x := $profile.Configurations.VideoSource.Bounds.@x$
- Rule[0].Parameters.ElementItem[0].MotionRegion.Polygon.Point[0].@y := $profile.Configurations.VideoSource.Bounds.@y$
- Rule[0].Parameters.ElementItem[0].MotionRegion.Polygon.Point[1].@x := $profile.Configurations.VideoSource.Bounds.@x$

• Rule[0].Parameters.ElementItem[0].MotionRegion.@Armed := false if motionRegionConfigOptions.DisarmSupport = true, otherwise skipped.

• Rule[0].Parameters.ElementItem[0].MotionRegion.@Sensitivity := 0

11. The DUT responds with **ModifyRulesResponse**.

12. ONVIF Client retrieves updated Rule list by following the procedure mentioned in Annex A.5 with the following input and output parameters

   • in profile.Configurations.Analytics.@token - Analytics configuration token

   • out updatedRuleList - Rule list.

13. If `updatedRuleList` does not contain Rule with @Name = "TestMotionRegion" and with Type = `tt:MotionRegionDetector`, FAIL the test and skip other steps.

14. Set `rule` := Rule with @Name = "TestMotionRegion" and with Type = `tt:MotionRegionDetector` from `updatedRuleList`.

15. If `rule`.Parameters does not contain ElementItem with @Name = "MotionRegion", FAIL the test and skip other steps.

16. If `rule`.Parameters.ElementItem with @Name = "MotionRegion" is not equal to Parameters.ElementItem[0] element from step 11 [43], FAIL the test and skip other steps.

17. ONVIF Client invokes **DeleteRules** request with parameters

   • ConfigurationToken := profile.Configurations.Analytics.@token

   • RuleName := TestMotionRegion

18. The DUT responds with **DeleteRulesResponse**.

19. ONVIF Client restores `ruleToRestore` if any.

20. ONVIF Client restores media profile if it was changed at step 3.

**Test Result**:

**PASS** –

• DUT passes all assertions.

**FAIL** –
• DUT did not send `CreateRulesResponse` message.

• DUT did not send `ModifyRulesResponse` message.

• DUT did not send `DeleteRules` message.

**Note:** Symbol `[ ]` at step 10 [43] means integer part of value (floor function).

**Note:** The following fields are compared at step 16 [44]:

• `MotionRegion.Polygon.Point[0].@x`

• `MotionRegion.Polygon.Point[0].@y`

• `MotionRegion.Polygon.Point[1].@x`

• `MotionRegion.Polygon.Point[1].@y`

• `MotionRegion.Polygon.Point[2].@x`

• `MotionRegion.Polygon.Point[2].@y`

• `MotionRegion.Polygon.Point[3].@x`

• `MotionRegion.Polygon.Point[3].@y`

• If `ModifyRules` request contained Armed field:
  • `MotionRegion.@Armed`
  • `MotionRegion.@Sensitivity`

### 5.2 Events

#### 5.2.1 MOTION REGION DETECTOR EVENT

**Test Case ID:** ANALYTICS-2-1-1

**Specification Coverage:** Motion Region Detector (ONVIF Analytics Service Spec)

**Feature Under Test:** tns1:RuleEngine/MotionRegionDetector/Motion

**WSDL Reference:** analytics.wsdl, media2.wsdl

**Test Purpose:** To verify tns1:RuleEngine/MotionRegionDetector/Motion event format. To verify event generation for tns1:RuleEngine/MotionRegionDetector/Motion.
Pre-Requisite: Analytics Service is received from the DUT. Media2 Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capability. Rule Options is supported by the Device as indicated by the RuleOptionsSupported capability. Motion Region Detector Rule is supported by the DUT. Profile T is supported.

Test Configuration: ONVIF Client and DUT.

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client configures device for adding of new Motion Region Detector rule by following the procedure mentioned in Annex A.34 with the following input and output parameters
   - in "tt:MotionRegionDetector" - Rule type
   - out nonFixedRuleSupported - Indication of non-fixed FaceRecognition Rule support
   - out analyticsToken - a token of Analytics Configuration
   - out ruleDescription - a rule description
   - out ruleToRestore - a rule to restore, if it was removed
4. If nonFixedRuleSupported = false, FAIL the test and skip other steps.
5. ONVIF Client retrieves Rule Options of tt:MotionRegionDetector type by following the procedure mentioned in Annex A.3 with the following input and output parameters
   - in tt:MotionRegionDetector - Rule type
   - in profile.Configurations.Analytics.token - Analytics Configuration token
   - out ruleOptions - Rule Options
6. If ruleOptionsList does not contain RuleOption with @Name = MotionRegion and with @Type = axt:MotionRegionConfigOptions (if @Type is present), FAIL the test and skip other steps.
7. If RuleOption element with @Name = MotionRegion and @Type = axt:MotionRegionConfigOptions (if @Type is present) does not contain MotionRegionConfigOptions element, FAIL the test and skip other steps.
8. Set motionRegionConfigOptions := RuleOption[0].MotionRegionConfigOptions, where RuleOption[0] is element with @Name = MotionRegion and with @Type = axt:MotionRegionConfigOptions (if @Type is present).
9. ONVIF Client creates Motion Region Detector Rule by following the procedure mentioned in Annex A.10 with the following input parameter

   • in `analyticsToken` - Analytics Configuration Token.
   • in `motionRegionConfigOptions` - motion region configuration option.

10. ONVIF Client invokes `GetEventProperties`.

11. The DUT responds with `GetEventPropertiesResponse` with parameters

   • TopicNamespaceLocation list
   • FixedTopicSet
   • TopicSet = `topicSet`
   • TopicExpressionDialect list
   • MessageContentFilterDialect list
   • MessageContentSchemaLocation list

12. If `topicSet` does not contain `tns1:RuleEngine/MotionRegionDetector/Motion` topic, FAIL the test and skip other steps.

13. Set `topic := tns1:RuleEngine/MotionRegionDetector/Motion` topic from `topicSet`.

14. If `topic`.MessageDescription.IsProperty is not equal to true, FAIL the test and skip other steps.

15. If `topic` does not contain `MessageDescription.Source.SimpleItemDescription` item with Name = "VideoSource", FAIL the test and skip other steps.

16. If `topic`.MessageDescription.Source.SimpleItemDescription with Name = "VideoSource" does not have Type = "tt:ReferenceToken", FAIL the test and skip other steps.

17. If `motionRegionConfigOptions`.MotionRegionConfigOptions.RuleNotification = true:

   17.1. If `topic` does not contain `MessageDescription.Source.SimpleItemDescription` item with Name = "RuleName", FAIL the test and skip other steps.

   17.2. If `topic`.MessageDescription.Source.SimpleItemDescription with Name = "RuleName" does not have Type = "xs:string", FAIL the test and skip other steps.

18. If `topic` does not contain `MessageDescription.Data.SimpleItemDescription` item with Name = "State", FAIL the test and skip other steps.
19. If \( \text{topic.messageDescription.data.simpleItemDescription} \) with Name = "State" does not have Type = "xs:boolean", FAIL the test and skip other steps.

20. If DUT supports Pull-Point Notification feature

20.1. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.6 with the following input and output parameters

- in "tns1:RuleEngine/MotionRegionDetector/Motion" - Notification Topic
- out \( s \) - Subscription reference
- out \( \text{currentTime} \) - current time for the DUT
- out \( \text{terminationTime} \) - Subscription termination time

20.2. Until \( \text{timeout1} \) expires, repeat the following steps:

20.2.1. ONVIF Client waits for time \( t := \min\{ (tt-ct)/2, 1 \text{ second} \} \).

20.2.2. ONVIF Client invokes \text{PullMessages} to the subscription endpoint \( s \) with parameters

- Timeout := PT60S
- MessageLimit := 1

20.2.3. The DUT responds with \text{PullMessagesResponse} message with parameters

- CurrentTime =: \( ct \)
- TerminationTime =: \( tt \)
- NotificationMessage list =: notificationMessageList

20.2.4. If notificationMessageList contains more than one notification, FAIL the test and skip other steps.

20.2.5. If notificationMessageList is not empty and notificationMessageList[0].Topic is not equal to "tns1:RuleEngine/MotionRegionDetector/Motion", FAIL the test and skip other steps.

20.2.6. If notificationMessageList is not empty and notificationMessageList[0].PropertyOperation = "Initialized" and notificationMessageList[0] has Source.SimpleItem with Name = "VideoSource" and with Value = profile.Configurations.VideoSource.SourceToken:

www.onvif.org
20.2.6.1lf

\( \textit{motionRegionConfigOptions.MotionRegionConfigOptions.RuleNotification} \) is not equal to true, go to step 21.3 [49].

20.2.6.2lf \( \textit{notificationMessageList[0]} \) has Source.SimpleItem with Name = "RuleName" and with Value = "TestMotionRegion", go to step 21.3 [49].

20.2.7lf \( \textit{timeout1} \) timeout expires for step 21.2 without Notification corresponds to step 21.2.6 [48], FAIL the test and skip other steps.

20.3. If \( \textit{notificationMessageList[0]} \) does not have Data.SimpleItem with Name = "State" and with Value with type = "xs:boolean", FAIL the test and skip other steps.

21. ONVIF Client invokes \texttt{DeleteRules} request with parameters

- ConfigurationToken := \( \textit{profile.Configurations.Analytics.@token} \)
- RuleName := TestMotionRegion

22. The DUT responds with \texttt{DeleteRulesResponse}.

23. ONVIF Client restores rule if it was deleted at step 10 [47].

24. ONVIF Client restores \textit{ruleToRestore} if any.

25. ONVIF Client restores media profile if it was changed at step 3.

\textbf{Test Result:}

\textbf{PASS –}

- DUT passes all assertions.

\textbf{FAIL –}

- DUT did not send \texttt{CreateRulesResponse} message.
- DUT did not send \texttt{DeleteRules} message.
- DUT did not send \texttt{GetEventPropertiesResponse} message.
- DUT did not send \texttt{PullMessagesResponse} message.

\textbf{5.2.2 FACE RECOGNITION EVENT}

\textbf{Test Case ID:} ANALYTICS-2-1-2
**Specification Coverage:** Recognition rule engines (ONVIF Analytics Service Spec), Face Recognition (ONVIF Analytics Service Spec)

**Feature Under Test:** tns1:RuleEngine/Recognition/Face

**WSDL Reference:** event.wsdl

**Test Purpose:** To verify tns1:RuleEngine/Recognition/Face topic format.

**Pre-Requisite:** Event Service is received from the DUT. Face Recognition Rule is supported by the DUT.

**Test Configuration:** ONVIF Client and DUT.

**Test Procedure:**

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes **GetEventProperties**.
4. The DUT responds with **GetEventPropertiesResponse** with parameters
   - TopicNamespaceLocation list
   - FixedTopicSet
   - TopicSet =: topicSet
   - TopicExpressionDialect list
   - MessageContentFilterDialect list
   - MessageContentSchemaLocation list
5. **If topicSet** does not contain tns1:RuleEngine/Recognition/Face topic, FAIL the test and skip other steps.
6. Set **topic :=** tns1:RuleEngine/Recognition/Face topic from **topicSet**.
7. **If topic**.MessageDescription contains @IsProperty = true, FAIL the test and skip other steps.
8. ONVIF Client verifies rule engine message format by following the procedure mentioned in **Annex A.46** with the following input and output parameters
   - in **topic**.MessageDescription - message description to be verified
9. **If topic** does not contain MessageDescription.Data.SimpleItemDescription item with Name = "Likelihood", FAIL the test and skip other steps.
10. If \textit{topic}.MessageDescription.Data.SimpleItemDescription with Name = "Likelihood" does not have Type = "xs:float", FAIL the test and skip other steps.

11. If \textit{topic} contains MessageDescription.Data.SimpleItemDescription item with Name = "Label" and its Type \neq "xs:string", FAIL the test and skip other steps.

12. If \textit{topic} contains MessageDescription.Data.SimpleItemDescription item with Name = "ImageUri" and its Type \neq "xs:anyURI", FAIL the test and skip other steps.

13. If \textit{topic} contains MessageDescription.Data.SimpleItemDescription item with Name = "EnrollmentID" and its Type \neq "xs:string", FAIL the test and skip other steps.

14. If \textit{topic} contains MessageDescription.Data.SimpleItemDescription item with Name = "RefImageUri" and its Type \neq "xs:anyURI", FAIL the test and skip other steps.

15. If \textit{topic} contains MessageDescription.Data.ElementItemDescription item with Name = "Image" and its Type \neq "xs:base64Binary", FAIL the test and skip other steps.

16. If \textit{topic} contains MessageDescription.Data.ElementItemDescription item with Name = "BoundingBox" and its Type \neq "tt:Rectangle", FAIL the test and skip other steps.

\textbf{Test Result:}

\textbf{PASS} –

\begin{itemize}
  \item DUT passes all assertions.
\end{itemize}

\textbf{FAIL} –

\begin{itemize}
  \item DUT did not send \texttt{GetEventPropertiesResponse} message.
\end{itemize}

\section*{5.2.3 LICENSE PLATE RECOGNITION EVENT}

\textbf{Test Case ID:} ANALYTICS-2-1-3

\textbf{Specification Coverage:} Recognition rule engines (ONVIF Analytics Service Spec), License Plate Recognition (ONVIF Analytics Service Spec)

\textbf{Feature Under Test:} tns1:RuleEngine/Recognition/LicensePlate

\textbf{WSDL Reference:} event.wsdl

\textbf{Test Purpose:} To verify tns1:RuleEngine/Recognition/LicensePlate topic format.

\textbf{Pre-Requisite:} Event Service is received from the DUT. License Plate Recognition Rule is supported by the DUT.

\textbf{Test Configuration:} ONVIF Client and DUT.
Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes **GetEventProperties**.
4. The DUT responds with **GetEventPropertiesResponse** with parameters
   - TopicNamespaceLocation list
   - FixedTopicSet
   - TopicSet =: *topicSet*
   - TopicExpressionDialect list
   - MessageContentFilterDialect list
   - MessageContentSizeSchemaLocation list
5. If *topicSet* does not contain **tns1:RuleEngine/Recognition/LicensePlate** topic, FAIL the test and skip other steps.
6. Set *topic* := *tns1:RuleEngine/Recognition/LicensePlate* topic from *topicSet*.
7. If *topic*.MessageDescription contains @IsProperty = true, FAIL the test and skip other steps.
8. ONVIF Client verifies rule engine message format by following the procedure mentioned in Annex A.46 with the following input and output parameters
   - in *topic*.MessageDescription - message description to be verified
9. If *topic* does not contain MessageDescription.Data.SimpleItemDescription item with Name = "Likelihood", FAIL the test and skip other steps.
10. If *topic*.MessageDescription.Data.SimpleItemDescription with Name = "Likelihood" does not have Type = "xs:float", FAIL the test and skip other steps.
11. If *topic* contains MessageDescription.Data.SimpleItemDescription item with Name = "Label" and its Type != "xs:string", FAIL the test and skip other steps.
12. If *topic* contains MessageDescription.Data.SimpleItemDescription item with Name = "ImageUri" and its Type != "xs:anyURI", FAIL the test and skip other steps.
13. If *topic* contains MessageDescription.Data.SimpleItemDescription item with Name = "VehicleImageURI" and its Type != "xs:anyURI", FAIL the test and skip other steps.
14. If topic contains MessageDescription.Data.ElementItemDescription item with Name = "BoundingBox" and its Type != "tt:Rectangle", FAIL the test and skip other steps.

15. If topic contains MessageDescription.Data.ElementItemDescription item with Name = "Image" and its Type != "xs:base64Binary", FAIL the test and skip other steps.

16. If topic does not contain MessageDescription.Data.ElementItemDescription item with Name = "LicensePlateInfo", FAIL the test and skip other steps.

17. If topic.MessageDescription.Data.ElementItemDescription with Name = "LicensePlateInfo" does not have Type = "tt:LicensePlateInfo", FAIL the test and skip other steps.

18. If topic contains MessageDescription.Data.ElementItemDescription item with Name = "VehicleInfo" and its Type != "tt:VehicleInfo", FAIL the test and skip other steps.

19. If topic contains MessageDescription.Data.ElementItemDescription item with Name = "VehicleImage" and its Type != "xs:base64Binary", FAIL the test and skip other steps.

Test Result:

PASS –
• DUT passes all assertions.

FAIL –
• DUT did not send GetEventPropertiesResponse message.

5.2.4 LINE CROSSING COUNTER EVENT

Test Case ID: ANALYTICS-2-1-4

Specification Coverage: Line crossing counting (ONVIF Analytics Service Spec)

Feature Under Test: tns1:RuleEngine/CountAggregation/Counter

WSDL Reference: event.wsdl

Test Purpose: To verify tns1:RuleEngine/CountAggregation/Counter topic format. To verify tns1:RuleEngine/CountAggregation/Counter initialize event generation.

Pre-Requisite: Event Service is supported by the DUT. Line crossing counting Rule is supported by the DUT. Profile M is supported.

Test Configuration: ONVIF Client and DUT.

Test Procedure:

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

3. ONVIF Client invokes GetEventProperties.

4. The DUT responds with GetEventPropertiesResponse with parameters
   - TopicNamespaceLocation list
   - FixedTopicSet
   - TopicSet =: topicSet
   - TopicExpressionDialect list
   - MessageContentFilterDialect list
   - MessageContentSchemaLocation list

5. If topicSet does not contain tns1:RuleEngine/CountAggregation/Counter topic, FAIL the test and skip other steps.


7. If topic.MessageDescription.@IsProperty = !true, FAIL the test and skip other steps.

8. ONVIF Client verifies rule engine message format by following the procedure mentioned in Annex A.46 with the following input and output parameters
   - in topic.MessageDescription - message description to be verified

9. If topic does not contain MessageDescription.Data.SimpleItemDescription item with Name = "Count", FAIL the test and skip other steps.

10. If topic.MessageDescription.Data.SimpleItemDescription with Name = "Count" does not have Type = "xs:int", FAIL the test and skip other steps.

11. If DUT supports Pull-Point Notification feature
   
   11.1. ONVIF Client configures profile with Line crossing counting rule by following the procedure mentioned in Annex A.43 with the following input and output parameters
   - in "tt:LineCounting" - Rule type
   - out videoSourceToken - token of the video source present in the media profile
   - out ruleName - name of the rule present in the media profile
   - out analyticsToken - a token of Analytics Configuration present in the media profile
• out ruleToRemove - a rule to restore, if it was removed

• out ruleToDelete - a rule to delete, if it was created

11.2. ONVIF Client creates PullPoint subscription for the specified topic by following the procedure mentioned in Annex A.6 with the following input and output parameters

• in "tns1:RuleEngine/CountAggregation/Counter" - Notification Topic

• out s - Subscription reference

• out currentTime - current time for the DUT

• out terminationTime - Subscription termination time

11.3. Until timeout1 timeout expires, repeat the following steps:

11.3.1. ONVIF Client waits for time $t := \text{min}\{\frac{(t_t-ct)}{2}, 1\text{ second}\}$.

11.3.2. ONVIF Client invokes PullMessages to the subscription endpoint $s$ with parameters

• Timeout := PT60S

• MessageLimit := 1

11.3.3. The DUT responds with PullMessagesResponse message with parameters

• CurrentTime =: ct

• TerminationTime =: tt

• NotificationMessage list =: notificationMessageList

11.3.4. If notificationMessageList contains more than one notification, FAIL the test and skip other steps.

11.3.5. If notificationMessageList is not empty and corresponds the following parameters:

• notificationMessageList[0].Topic = "tns1:RuleEngine/CountAggregation/Counter",

• notificationMessageList[0].PropertyOperation = "Initialized",

• notificationMessageList[0] has Source.SimpleItem with Name = "Rule" and Value = ruleName,
• `notificationMessageList[0]` has `Source.SimpleItem` with Name = "VideoSource" and with Value = `videoSourceToken`,

• if `notificationMessageList[0]` has `Source.SimpleItem` with Name = "AnalyticsConfiguration" then its Value = `analyticsToken`, then the ONVIF Client checks notification:

11.3.5.1 If `notificationMessageList[0]` does not contain `Data.SimpleItem` with Name = "Count", FAIL the test, restore DUT settings and skip other steps.

11.3.5.2 If `Data.SimpleItem` with Name = "Count" has Value type differ from integer, FAIL the test, restore DUT settings and skip other steps.

11.3.5.3 Go to step 11.4.

11.3.6 If `timeout1` timeout expires for step 11.3 without Notification corresponds to parameters in step 11.3.6 [55], FAIL the test and skip other steps.

11.4. ONVIF Client deletes `ruleToDelete` if any to restore DUT settings.

11.5. ONVIF Client restores media profile if it was changed at step 11.1.

11.6. ONVIF Client creates `ruleToRestore` if any to restore DUT settings.

11.7. ONVIF Client deletes PullPoint subscription by following the procedure mentioned in Annex A.7 with the following input and output parameters

• in `s` - Subscription reference

Test Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send `GetEventPropertiesResponse` message.

• DUT did not send `PullMessagesResponse` message.
5.3 Capabilities

5.3.1 GET SERVICES AND GET ANALYTICS SERVICES CAPABILITIES CONSISTENCY

**Test Case ID:** ANALYTICS-3-1-1

**Specification Coverage:** Capability exchange (ONVIF Core Specification), Capabilities (ONVIF Analytics Service Spec)

**Feature under test:** GetServices, GetServiceCapabilities (Analytics)

**WSDL Reference:** devicemgmt.wsdl, analytics.wsdl

**Test Purpose:** To verify getting Analytics Service using GetServices request. To verify Get Services and Analytics Service Capabilities consistency.

**Pre-Requisite:** Analytics Service was 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/ver20/analytics/wsdl", FAIL the test and skip other steps.

6. Set analyticsServ := item from listOfServicesWithoutCapabilities list with Namespace = "http://www.onvif.org/ver20/analytics/wsdl".

7. If analyticsServ.Capabilities is specified, FAIL the test and skip other steps.

8. ONVIF Client invokes GetServices message with parameters:
• IncludeCapability := true

9. The DUT responds with a **GetServicesResponse** message with parameters:
   • Service list =: **listOfServicesWithCapabilities**

10. If **listOfServicesWithCapabilities** does not contain item with Namespace = "http://www.onvif.org/ver20/analytics/wsdl", FAIL the test and skip other steps.

11. Set **analyticsServ** := item from **listOfServicesWithCapabilities** list with Namespace = "http://www.onvif.org/ver20/analytics/wsdl".

12. If **analyticsServ.Capabilities** is not specified, FAIL the test and skip other steps.

13. If **analyticsServ.Capabilities** does not contain valid Capabilities element for Analytics service from "http://www.onvif.org/ver20/analytics/wsdl" namespace, FAIL the test and skip other steps.

14. ONVIF Client invokes **GetServiceCapabilities** (Analytics) request.

15. The DUT responds with **GetServiceCapabilitiesResponse** message with parameters
   • Capabilities =: **cap**

16. If **cap** differs from **analyticsServ.Capabilities.Capabilities** (see Note at the end of the test), FAIL the test.

**Test Result:**

**PASS** –
   • DUT passes all assertions.

**FAIL** –
   • The DUT did not send **GetServicesResponse** messages.
   • The DUT did not send **GetServiceCapabilitiesResponse** message.

**Note:** The following fields are compared at step 16:

• RuleSupport
• AnalyticsModuleSupport
• RuleOptionsSupported
5.3.2 ANALYTICS SERVICE CAPABILITIES

Test Case ID: ANALYTICS-3-1-2

Specification Coverage: Capabilities (ONVIF Analytics Service Spec)

Feature under test: GetServiceCapabilities (Analytics Service)

WSDL Reference: analytics.wsdl

Test Purpose: To verify Analytics Service Capabilities.

Pre-Requisite: Analytics Service was 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 GetServiceCapabilities request.
4. The DUT responds with GetServiceCapabilitiesResponse message with parameters
   • Capabilities =: cap
5. If capSupportedMetadata = true and capAnalyticsModuleSupport = false or skipped, FAIL the test.

Test Result:

PASS –
• DUT passes all assertions.

FAIL –
• The DUT did not send GetServicesResponse messages.
• The DUT did not send GetServiceCapabilitiesResponse message.
5.4 Analytics Modules

5.4.1 GET SUPPORTED ANALYTICS MODULES

Test Case ID: ANALYTICS-4-1-1

Specification Coverage: GetSupportedAnalyticsModules (ONVIF Analytics Service Spec)

Feature under test: GetSupportedAnalyticsModules (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify getting supported analytics modules using GetSupportedAnalyticsModules request.

Pre-Requisite: Analytics Service was received from the DUT. Media2 Service was received from the DUT. Analytics Modules is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters

   • out analyticsConfList - a list of Analytics configurations

4. For each Analytics Configuration analyticsConf in analyticsConfList repeat the following steps:

   4.1. ONVIF Client invokes GetSupportedAnalyticsModules request with parameters

       • ConfigurationToken := analyticsConf.@token

   4.2. DUT responds with GetSupportedAnalyticsModulesResponse message with parameters

       • SupportedAnalyticsModules := supportedModules

   4.3. For each Analytics Module Description analyticsModuleDescription in supportedModules.AnalyticsModuleDescription list repeat the following steps:
4.3.1. If \textit{analyticsModuleDescription} does not have \texttt{maxInstances} attribute, FAIL the test, restore the DUT state, and skip other steps.

4.3.2. If at least one item in \textit{analyticsModuleDescription}.Parameters list (\texttt{SimpleItemDescription} or \texttt{ElementItemDescription} item) has the same Name value with other item from the same list, FAIL the test, restore the DUT state, and skip other steps.

4.3.3. If at least one item in \textit{analyticsModuleDescription}.Messages list (\texttt{Source}, or \texttt{Key}, or \texttt{Data}; \texttt{SimpleItemDescription} or \texttt{ElementItemDescription} item) has the same Name value with other item from the same list, FAIL the test, restore the DUT state, and skip other steps.

4.3.4. If \textit{analyticsModuleDescription}.ParentTopic is not valid topic (see Annex A.11), FAIL the test, restore the DUT state, and skip other steps.

4.3.5. If \textit{analyticsModuleDescription}.fixed = true:

   4.3.5.1. If \textit{analyticsConf} does not contain at least one \texttt{AnalyticsEngineConfiguration.AnalyticsModule} with \texttt{Type = analyticsModuleDescription.Name}, FAIL the test, restore the DUT state, and skip other steps.

Test Result:

PASS –

• DUT passes all assertions.

FAIL –

• The DUT did not send \texttt{GetSupportedAnalyticsModulesResponse} messages.

5.4.2 GET ANALYTICS MODULES OPTIONS

Test Case ID: ANALYTICS-4-1-2

Specification Coverage: GetAnalyticsModuleOptions (ONVIF Analytics Service Spec)

Feature under test: GetAnalyticsModuleOptions (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify getting supported analytics module options using GetAnalyticsModuleOptions request.
Pre-Requisite: Analytics Service was received from the DUT. Media2 Service was received from the DUT. Analytics Modules is supported by the DUT. Analytics Module Options is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out analyticsConfList - a list of Analytics configurations

4. For each Analytics Configuration analyticsConf in analyticsConfList repeat the following steps:

   4.1. ONVIF Client invokes GetSupportedAnalyticsModules request with parameters
       - ConfigurationToken := analyticsConf.@token

   4.2. DUT responds with GetSupportedAnalyticsModulesResponse message with parameters
       - SupportedAnalyticsModules := supportedModules

   4.3. ONVIF Client invokes GetAnalyticsModuleOptions request with parameters
       - Type is skipped
       - ConfigurationToken := analyticsConf.@token

   4.4. DUT responds with GetAnalyticsModuleOptionsResponse message with parameters
       - Options list := analyticsModuleOptionsFullList

   4.5. If at least one item in analyticsModuleOptionsFullList list contains RuleType, FAIL the test, restore the DUT state, and skip other steps.

   4.6. For each Analytics Module Description analyticsModuleDescription in supportedModules.AnalyticsModuleDescription list repeat the following steps:

       4.6.1. ONVIF Client invokes GetAnalyticsModuleOptions request with parameters
• Type := analyticsModuleDescription.Name

• ConfigurationToken := analyticsConf.@token

4.6.2. DUT responds with GetAnalyticsModuleOptionsResponse message with parameters

• Options list := analyticsModuleOptionsList

4.6.3. If at least one item in analyticsModuleOptionsList list contains RuleType, FAIL the test, restore the DUT state, and skip other steps.

4.6.4. If at least one item in analyticsModuleOptionsList list contains AnalyticsModule which is not equal to analyticsModuleDescription.Name, FAIL the test, restore the DUT state, and skip other steps.

4.6.5. If analyticsModuleOptionsFullList list does not contain all items from analyticsModuleOptionsList list (AnalyticsModule and Name to be used as unique identifier), FAIL the test, restore the DUT state, and skip other steps.

Test Result:

PASS –

• DUT passes all assertions.

FAIL –

• The DUT did not send GetSupportedAnalyticsModulesResponse messages.

• The DUT did not send GetAnalyticsModuleOptionsResponse messages.

5.4.3 GET ANALYTICS MODULES

Test Case ID: ANALYTICS-4-1-3

Specification Coverage: GetAnalyticsModules (ONVIF Analytics Service Spec)

Feature under test: GetAnalyticsModules (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify getting supported analytics modules using GetAnalyticsModules request.

Pre-Requisite: Analytics Service was received from the DUT. Media2 Service was received from the DUT. Analytics Modules is supported by the DUT.
Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters

   • out analyticsConfList - a list of Analytics configurations

4. For each Analytics Configuration analyticsConf in analyticsConfList repeat the following steps:

   4.1. ONVIF Client invokes GetSupportedAnalyticsModules request with parameters

       • ConfigurationToken := analyticsConf.@token

   4.2. DUT responds with GetSupportedAnalyticsModulesResponse message with parameters

       • SupportedAnalyticsModules =: supportedModules

   4.3. ONVIF Client invokes GetAnalyticsModules request with parameters

       • ConfigurationToken := analyticsConf.@token

   4.4. DUT responds with GetAnalyticsModulesResponse message with parameters

       • AnalyticsModule list =: analyticsModuleList

   4.5. If at least one item in analyticsModuleList list contains Type which is not equal to Name field of at least one item at supportedModules.AnalyticsModuleDescription list, FAIL the test, restore the DUT state, and skip other steps.

   4.6. For each Analytics Module Description analyticsModuleDescription in supportedModules.AnalyticsModuleDescription list repeat the following steps:

       4.6.1. If analyticsModuleDescription.fixed = true:

           4.6.1.1. If analyticsModuleList does not contain item with Type = analyticsModuleDescription.Name, FAIL the test, restore the DUT state, and skip other steps.

       4.6.2. If analyticsModuleList contains item with Type = analyticsModuleDescription.Name:
4.6.2.1. Set \( \text{analyticsModule} := \text{analyticsModuleList}[\text{Type} = \text{analyticsModuleDescription.Name}] \).

4.6.2.2. If \( \text{analyticsModule}.\text{Parameters.SimpleItem} \) contains at least one SimpleItem which does not have item with the same Name in \( \text{analyticsModuleDescription.Parameters.SimpleItemDescription} \) list, FAIL the test, restore the DUT state, and skip other steps.

4.6.2.3. If \( \text{analyticsModule}.\text{Parameters.ElementItem} \) contains at least one ElementItem which does not have item with the same Name in \( \text{analyticsModuleDescription.Parameters.ElementItemDescription} \) list, FAIL the test, restore the DUT state, and skip other steps.

Test Result:

PASS –

• DUT passes all assertions.

FAIL –

• The DUT did not send \text{GetSupportedAnalyticsModulesResponse} messages.

• The DUT did not send \text{GetAnalyticsModulesResponse} messages.

5.4.4 GET SUPPORTED METADATA

Test Case ID: ANALYTICS-4-1-4

Specification Coverage: GetSupportedMetadata (ONVIF Analytics Service Spec)

Feature under test: GetSupportedMetadata (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify getting supported metadata using GetSupportedMetadata request.

Pre-Requisite: Analytics Service was received from the DUT. Media2 Service was received from the DUT. Analytics Modules is supported by the DUT. Supported Metadata feature is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:
1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client retrieves full list of supported Analytics Modules by following the procedure mentioned in Annex A.13 with the following input and output parameters
   - out fullAnalyticsModuleDescriptionList - a list of supported Analytics Module Description

4. Set analyticsModuleTypeList := list of @Name values from fullAnalyticsModuleDescriptionList

5. ONVIF Client retrieves a list of supported metadata by following the procedure mentioned in Annex A.14 with the following input and output parameters
   - out analyticsModuleList1 - Analytics Module List with Metadata Info

6. If analyticsModuleList1 is empty, FAIL the test and skip other steps.

7. If analyticsModuleList1 contains at least two elements with the same @Type, FAIL the test and skip other steps.

8. For each Analytics Module analyticsModule from analyticsModuleList1 repeat the following steps:
   8.1. If analyticsModule.@Type is not equal to at least one Type from analyticsModuleTypeList, FAIL the test and skip other steps.
   8.2. ONVIF Client checks that object bounding boxes and shapes are located in the top left quarter of the image by following the procedure mentioned in Annex A.25 with the following input and output parameters
      - in analyticsModule.SampleFrame - sample frame of analytics module

9. For each Analytics Module Type analyticsModuleType from analyticsModuleTypeList repeat the following steps:
   9.1. ONVIF Client invokes GetSupportedMetadata request with parameters
      - Type := analyticsModuleType
   9.2. DUT responds with GetSupportedMetadataResponse message with parameters
      - AnalyticsModule list =: analyticsModuleList2
   9.3. If analyticsModuleList2 contains more than one element, FAIL the test and skip other steps.
9.4. If \texttt{analyticsModuleList2[0].@Type} is not equal to \texttt{analyticsModuleType}, FAIL the test and skip other steps.

9.5. If set of fields in \texttt{analyticsModuleList2[0]} is not equal to set of fields in corresponding AnalyticsModule from \texttt{analyticsModuleList1} (see Note at the end of the test), FAIL the test and skip other steps.

9.6. ONVIF Client checks that object bounding boxes and shapes are located in the top left quarter of the image by following the procedure mentioned in Annex A.25 with the following input and output parameters

- in \texttt{analyticsModuleList2[0].SampleFrame} - sample frame of analytics module

\textbf{Test Result:}

\textbf{PASS –}

- DUT passes all assertions.

\textbf{FAIL –}

- The DUT did not send \texttt{GetSupportedMetadataResponse} messages.

\textbf{Note:} Presence of all fields without their values are compared at step 8.5, @Type value is used as key.

\section{5.4.5 CREATE ANALYTICS MODULES}

\textbf{Test Case ID:} ANALYTICS-4-1-5

\textbf{Specification Coverage:} CreateAnalyticsModules (ONVIF Analytics Service Spec)

\textbf{Feature under test:} CreateAnalyticsModules (Analytics)

\textbf{WSDL Reference:} analytics.wsdl

\textbf{Test Purpose:} To verify creating of analytics module using CreateAnalyticsModules request.

\textbf{Pre-Requisite:} Analytics Service was received from the DUT. Media2 Service was received from the DUT. Analytics Modules is supported by the DUT. Profile M is supported.

\textbf{Test Configuration:} ONVIF Client and DUT

\textbf{Test Procedure:}
1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client configures device for adding of new analytics module by following the procedure mentioned in Annex A.23 with the following input and output parameters:
   - `out nonFixedModuleSupported` - if non fixed Analytics Module is supported
   - `out (optional) analyticsToken` - a token of Analytics Configuration
   - `out (optional) analyticsModuleDescription` - analytics module description
   - `out moduleToRestore` (optional) - analytics module to restore

4. If `nonFixedModuleSupported` = false, skip other steps with PASS result.

5. Set `moduleName` := generated random string.

6. ONVIF Client invokes `CreateAnalyticsModules` request with parameters:
   - `ConfigurationToken := profile.Configurations.Analytics.token`
   - `AnalyticsModule[0].@Name := moduleName`
   - `AnalyticsModule[0].@Type := analyticsModuleDescription.@Name`
   - `AnalyticsModule[0].Parameters := empty Parameters element`

7. DUT responds with `CreateAnalyticsModulesResponse` message.

8. ONVIF Client retrieves a set of analytics modules assigned of Analytics Configuration by following the procedure mentioned in Annex A.20 with the following input and output parameters:
   - `in profile.Configurations.Analytics.token` - a token of Analytics Configuration
   - `out analyticsModuleList` - analytics module list

9. If `analyticsModuleList` does not contain `AnalyticsModule` with `@Type = analyticsModuleDescription.@Name` and with `@Name = moduleName`, FAIL the test.

10. Set `createdAnalyticsModule1` := `AnalyticsModule` with `@Type = analyticsModuleDescription.@Name` and with `@Name = moduleName` from `analyticsModuleList`.

11. For each `SimpleItem` element `simpleItem` in `createdAnalyticsModule1.Parameters` repeat the following steps:
11.1. If `supportedAnalyticsModules.AnalyticsModuleDescription[0].Parameters` does not contain at least one `SimpleItemDescription` with `@Name = simpleItem.@Name`, FAIL the test and skip other steps.

12. For each `ElementItem` element `elementItem` in `createdAnalyticsModule1.Parameters` repeat the following steps:

12.1. If `supportedAnalyticsModules.AnalyticsModuleDescription[0].Parameters` does not contain at least one `ElementItemDescription` with `@Name = elementItem.@Name`, FAIL the test and skip other steps.

13. ONVIF Client retrieves an Analytics Configuration by following the procedure mentioned in Annex A.21 with the following input and output parameters

- in `profile.Configurations.Analytics.token` - a token of Analytics Configuration
- out `analyticsConf` - analytics configuration


15. If `analyticsConf[0].AnalyticsEngineConfiguration` does not contain AnalyticsModule element with `@Type = analyticsModuleDescription.@Name` and with `@Name = moduleName`, FAIL the test.

16. Set `createdAnalyticsModule2 := AnalyticsModule with @Type = analyticsModuleDescription.@Name` and with `@Name = moduleName` from `analyticsConf[0].AnalyticsEngineConfiguration`.

17. If list of `SimpleItem.@Name` in `createdAnalyticsModule2` does not equal to list of `SimpleItem.@Name` in `createdAnalyticsModule1`, FAIL the test.

18. For each `SimpleItem` element `simpleItem` in `createdAnalyticsModule2.Parameters` repeat the following steps:

18.1. If `simpleItem.@Value` != `@Value` of corresponding `SimpleItem` in `createdAnalyticsModule1` (@Name will be used as key), FAIL the test.

19. If list of `ElementItem.@Name` in `createdAnalyticsModule2` does not equal to list of `ElementItem.@Name` in `createdAnalyticsModule1`, FAIL the test.

20. ONVIF Client deletes created analytics module to restore the DUT by following the procedure mentioned in Annex A.19 with the following input and output parameters

- in `profile.Configurations.Analytics.token` - token of Analytics configuration
- in `moduleName.@Name` - Name of the analytics module to be deleted
21. ONVIF Client restores \textit{moduleToRestore}.

22. ONVIF Client restores media profile if it was changed at step 3.

Test Result:

PASS –

• DUT passes all assertions.

FAIL –

• The DUT did not send \texttt{CreateAnalyticsModulesResponse} messages.

5.4.6 DELETE ANALYTICS MODULES

Test Case ID: ANALYTICS-4-1-6

Specification Coverage: DeleteAnalyticsModules (ONVIF Analytics Service Spec)

Feature under test: DeleteAnalyticsModules (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify delete of analytics module using \texttt{DeleteAnalyticsModules} request.

Pre-Requisite: Analytics Service was received from the DUT. Media2 Service was received from the DUT. Analytics Modules is supported by the DUT. Profile M is supported.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client configures device for adding of new analytics module by following the procedure mentioned in \texttt{Annex A.23} with the following input and output parameters

   • out \texttt{nonFixedModuleSupported} - if non fixed Analytics Module is supported
   
   • out (optional) \texttt{analyticsToken} - a token of Analytics Configuration
   
   • out (optional) \texttt{analyticsModuleDescription} - analytics module description
   
   • out \texttt{moduleToRestore} (optional) - analytics module to restore

4. If \texttt{nonFixedModuleSupported} = false, skip other steps with PASS result.
5. Set `moduleName` := generated random string.

6. ONVIF Client creates new analytics module by following the procedure mentioned in Annex A.22 with the following input and output parameters
   - in `profile.Configurations.Analytics.token` - a token of Analytics Configuration
   - in `moduleName` - analytics module name
   - in `analyticsModuleDescription.@Name` - analytics module type

7. ONVIF Client invokes `DeleteAnalyticsModules` request with parameters
   - `ConfigurationToken` := `profile.Configurations.Analytics.token`
   - `AnalyticsModule[0].@Name` := `moduleName`

8. DUT responds with `DeleteAnalyticsModulesResponse` message

9. ONVIF Client retrieves a set of analytics modules assigned of Analytics Configuration by following the procedure mentioned in Annex A.20 with the following input and output parameters
   - in `profile.Configurations.Analytics.token` - a token of Analytics Configuration
   - out `analyticsModuleList` - analytics module list

10. If `analyticsModuleList` contains `AnalyticsModule` with `@Type = analyticsModuleDescription.@Name` and with `@Name = moduleName`, FAIL the test.

11. ONVIF Client retrieves an Analytics Configuration by following the procedure mentioned in Annex A.21 with the following input and output parameters
    - in `profile.Configurations.Analytics.token` - a token of Analytics Configuration
    - out `analyticsConf` - analytics configuration

12. If `analyticsConf[0].@token` != `profile.Configurations.Analytics.token`, FAIL the test.

13. If `analyticsConf[0].AnalyticsEngineConfiguration` contains `AnalyticsModule` element with `@Type = analyticsModuleDescription.@Name` and with `@Name = moduleName`, FAIL the test.

14. ONVIF Client restores `moduleToRestore`.

15. ONVIF Client restores media profile if it was changed at step 3.

Test Result:
PASS –
  • DUT passes all assertions.

FAIL –
  • The DUT did not send DeleteAnalyticsModulesResponse messages.

5.4.7 MODIFY ANALYTICS MODULES (PARAMETERS WITH OPTIONS)

Test Case ID: ANALYTICS-4-1-7

Specification Coverage: ModifyAnalyticsModules (ONVIF Analytics Service Spec)

Feature under test: ModifyAnalyticsModules (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify modification of analytics module’s parameters that have corresponding options using ModifyAnalyticsModules request.

Pre-Requisite: Analytics Service was received from the DUT. Media2 Service was received from the DUT. Analytics Modules is supported by the DUT. Analytics Module Options is supported by the DUT. Profile M is supported.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client selects analytics module description that has parameters with options by following the procedure mentioned in Annex A.38 with the following input and output parameters

   • in true - flag shows if parameters of selected Analytics Module have corresponding options

   • out (optional) analyticsToken - a token of Analytics Configuration

   • out (optional) analyticsModuleDescription - analytics module description

   • out (optional) itemListDescription - list of SimpleItemDescription/ElementItemDescription elements that have options
4. If Annex A.38 procedure did not return `analyticsModuleDescription`, skip other steps with PASS result.

5. ONVIF Client selects or create analytics module with required type by following the procedure mentioned in Annex A.40 with the following input and output parameters
   - in `analyticsToken` - a token of Analytics Configuration
   - in `analyticsModuleDescription` - analytics module description
   - out `analyticsModule1` - Analytics Module with required type

6. For for the first SimpleItemDescription/ElementItemDescription (`itemDescription`) in `itemListDescription`

   6.1. ONVIF Client invokes `ModifyAnalyticsModules` request with parameters
       - ConfigurationToken := `analyticsToken`
       - AnalyticsModule[0].@Name := `analyticsModule1.@Name`
       - AnalyticsModule[0].@Type := `analyticsModule1.@Type`
       - AnalyticsModule[0].Parameters.SimpleItem/ElementItem[@Name = `itemDescription.@Name`].@Value := value of corresponding parameter type with option provided in the table in Annex A.37

   6.2. DUT responds with `ModifyAnalyticsModulesResponse` message

   6.3. ONVIF Client retrieves a set of analytics modules assigned of Analytics Configuration by following the procedure mentioned in Annex A.20 with the following input and output parameters
       - in `analyticsToken` - a token of Analytics Configuration
       - out `analyticsModuleList` - analytics module list

   6.4. If `analyticsModuleList` does not contain AnalyticsModule with @Type = `analyticsModule1.@Type` and with @Name = `analyticsModule1.@Name`, FAIL the test.

   6.5. Set `modifiedAnalyticsModule1` := AnalyticsModule with @Type = `analyticsModule1.@Type` and with @Name = `analyticsModule1.@Name` from `analyticsModuleList`. 
6.6. If \( \text{modifiedAnalyticsModule1.Parameters} \) does not contain SimpleItem/ElementItem with Name = \( \text{itemDescription}.@Name \) and with value set at step 6.1, FAIL the test and skip other steps.

6.7. ONVIF Client retrieves an Analytics Configuration by following the procedure mentioned in Annex A.21 with the following input and output parameters:

- in \( \text{analyticsToken} \) - a token of Analytics Configuration

- out \( \text{analyticsConf} \) - analytics configuration

6.8. If \( \text{analyticsConf}[0].@token \) != \( \text{analyticsToken} \), FAIL the test.

6.9. If \( \text{analyticsConf}[0].\text{AnalyticsEngineConfiguration} \) does not contain AnalyticsModule element with \( @Type = \text{analyticsModule1}.@Type \) and with \( @Name = \text{analyticsModule1}.@Name \), FAIL the test.

6.10. Set \( \text{modifiedAnalyticsModule2} := \text{AnalyticsModule} \) with \( @Type = \text{analyticsModule1}.@Type \) and with \( @Name = \text{analyticsModule1}.@Name \) from \( \text{analyticsConf}[0].\text{AnalyticsEngineConfiguration} \).

6.11. If \( \text{modifiedAnalyticsModule2.Parameters} \) does not contain SimpleItem/ElementItem with Name = \( \text{itemDescription}.@Name \) and with value set at step 6.1, FAIL the test and skip other steps.

7. ONVIF Client deletes analytics module created at step 5 if any to restore the DUT by following the procedure mentioned in Annex A.19 with the following input and output parameters:

- in \( \text{analyticsToken} \) - token of Analytics configuration

- in \( \text{moduleName}.@Name \) - Name of the analytics module to be deleted

8. ONVIF Client restores \( \text{moduleToRestore} \) if any.

9. ONVIF Client restores analytics module if it was changed at step 5.

Test Result:

PASS –

- DUT passes all assertions.

FAIL –

- The DUT did not send \( \text{ModifyAnalyticsModulesResponse} \) messages.
5.4.8 MODIFY ANALYTICS MODULES (PARAMETERS WITHOUT OPTIONS)

Test Case ID: ANALYTICS-4-1-8

Specification Coverage: ModifyAnalyticsModules (ONVIF Analytics Service Spec)

Feature under test: ModifyAnalyticsModules (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify modification of analytics module's parameters that do not have corresponding options using ModifyAnalyticsModules request.

Pre-Requisite: Analytics Service was received from the DUT. Media2 Service was received from the DUT. Analytics Modules is supported by the DUT. Analytics Module Options is supported by the DUT. Profile M is supported.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects analytics module description that has parameters without options by following the procedure mentioned in Annex A.38 with the following input and output parameters
   - in false - flag shows if parameters of selected Analytics Module have corresponding options
   - out (optional) analyticsToken - a token of Analytics Configuration
   - out (optional) analyticsModuleDescription - analytics module description
   - out (optional) itemListDescription - list of SimpleItemDescription/ElementItemDescription elements that do not have options
   - out (optional) limit - maximum number of concurrent modules per configuration
4. If Annex A.38 procedure did not return analyticsModuleDescription, skip other steps with PASS result.
5. ONVIF Client selects or create analytics module with required type by following the procedure mentioned in Annex A.40 with the following input and output parameters
• in `analyticsToken` - a token of Analytics Configuration

• in `analyticsModuleDescription` - analytics module description

• out `analyticsModule1` - Analytics Module with required type

6. For the first `SimpleItemDescription/ElementItemDescription` (`itemDescription`) in `itemListDescription`

6.1. ONVIF Client invokes `ModifyAnalyticsModules` request with parameters

- `ConfigurationToken := analyticsToken`

- `AnalyticsModule[0].@Name := analyticsModule1.@Name`

- `AnalyticsModule[0].@Type := analyticsModule1.@Type`

- `AnalyticsModule[0].Parameters.SimpleItem/ElementItem[@Name = itemDescription.@Name].@Value := value of corresponding parameter type with skipped option provided in the tabe in Annex A.37`

6.2. DUT responds with `ModifyAnalyticsModulesResponse` message

6.3. ONVIF Client retrieves a set of analytics modules assigned of Analytics Configuration by following the procedure mentioned in Annex A.20 with the following input and output parameters

- in `analyticsToken` - a token of Analytics Configuration

- out `analyticsModuleList` - analytics module list

6.4. If `analyticsModuleList` does not contain AnalyticsModule with `@Type = analyticsModule1.@Type` and with `@Name = analyticsModule1.@Name`, FAIL the test.

6.5. Set `modifiedAnalyticsModule1 := AnalyticsModule with @Type = analyticsModule1.@Type` and with `@Name = analyticsModule1.@Name` from `analyticsModuleList`.

6.6. If `modifiedAnalyticsModule1.Parameters` does not contain `SimpleItem/ElementItem with Name = itemDescription.@Name` and with value set at step 6.1, FAIL the test and skip other steps.

6.7. ONVIF Client retrieves an Analytics Configuration by following the procedure mentioned in Annex A.21 with the following input and output parameters
• in `analyticsToken` - a token of Analytics Configuration

• out `analyticsConf` - analytics configuration

6.8. If `analyticsConf[0].@token != analyticsToken`, FAIL the test.

6.9. If `analyticsConf[0].AnalyticsEngineConfiguration` does not contain `AnalyticsModule` element with `@Type = analyticsModule1.@Type` and with `@Name = analyticsModule1.@Name`, FAIL the test.

6.10. Set `modifiedAnalyticsModule2 := AnalyticsModule` with `@Type = analyticsModule1.@Type` and with `@Name = analyticsModule1.@Name` from `analyticsConf[0].AnalyticsEngineConfiguration`.

6.11. If `modifiedAnalyticsModule2.Parameters` does not contain `SimpleItem/ElementItem` with `Name = itemDescription.@Name` and with value set at step 6.1, FAIL the test and skip other steps.

7. ONVIF Client deletes analytics module created at step 5 if any to restore the DUT by following the procedure mentioned in Annex A.19 with the following input and output parameters

• in `analyticsToken` - token of Analytics configuration

• in `moduleName.@Name` - Name of the analytics module to be deleted

8. ONVIF Client retores `moduleToRestore` if any.

9. ONVIF Client restores analytics module if it was selected at step 5.

Test Result:

PASS –

• DUT passes all assertions.

FAIL –

• The DUT did not send `ModifyAnalyticsModulesResponse` messages.

5.5 Scene Elements

5.5.1 OBJECT CLASSIFICATION METADATA

Test Case ID: ANALYTICS-5-1-1
**Specification Coverage**: Object Class descriptor (ONVIF Analytics Service Spec)

**Feature under test**: GetSupportedMetadata (Analytics)

**WSDL Reference**: analytics.wsdl

**Test Purpose**: To verify Object Class descriptor.

**Pre-Requisite**: Analytics Service was received from the DUT. Object Classification feature is supported by the DUT.

**Test Configuration**: ONVIF Client and DUT

**Test Procedure**:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a list of supported metadata by following the procedure mentioned in Annex A.14 with the following input and output parameters:
   - out analyticsModuleList - Analytics Module List with Metadata Info
4. For each Object `object` from `analyticsModule`.SampleFrame.Object list repeat the following steps:
   4.1. If `object` contains Appearance.Class:
      4.1.1. For each Type in Appearance.Class:
          4.1.1.1. If Type.@Likelihood > 1, log WARNING message
          4.1.2. PASS the test.

**Test Result**:

**PASS** –
- DUT passes all assertions.

**FAIL** –
- None.

**Note**: At step 4.1.1.1 if Appearance.Class.Type element does not contain @Likelihood, the ONVIF Client assumes it as 1.
5.5.2 VEHICLE INFORMATION DESCRIPTOR

Test Case ID: ANALYTICS-5-1-2

Specification Coverage: Vehicle information descriptor (ONVIF Analytics Service Spec)

Feature under test: GetSupportedMetadata (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify Vehicle information descriptor.

Pre-Requisite: Analytics Service was received from the DUT. Vehicle Info feature is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a list of supported metadata by following the procedure mentioned in Annex A.14 with the following input and output parameters
   - out analyticsModuleList - Analytics Module List with Metadata Info
4. If analyticsModuleList does not contain at least one AnalyticsModule that contains SampleFrame.Object.Appearance with VehicleInfo element, FAIL the test and skip other steps.

Test Result:

PASS –
- DUT passes all assertions.

FAIL –
- None.

5.5.3 GEO LOCATION METADATA

Test Case ID: ANALYTICS-5-1-3

Specification Coverage: GeoLocation metadata (ONVIF Profile M Spec)
Feature under test: GetSupportedMetadata (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify GeoLocation metadata.

Pre-Requisite: Analytics Service was received from the DUT. Geo Location feature is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a list of supported metadata by following the procedure mentioned in Annex A.14 with the following input and output parameters
   • out analyticsModuleList - Analytics Module List with Metadata Info
4. If analyticsModuleList does not contain at least one AnalyticsModule with SampleFrame.Object. Appearance.GeoLocation element, FAIL the test and skip other steps.

Test Result:

PASS –
   • DUT passes all assertions.

FAIL –
   • None.

5.5.4 HUMAN FACE DESCRIPTOR

Test Case ID: ANALYTICS-5-1-4

Specification Coverage: Face descriptor (ONVIF Analytics Service Spec)

Feature under test: GetSupportedMetadata (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify Human Face descriptor.

Pre-Requisite: Analytics Service was received from the DUT. Human Face feature is supported by the DUT.
**Test Configuration:** ONVIF Client and DUT

**Test Procedure:**

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client retrieves a list of supported metadata by following the procedure mentioned in Annex A.14 with the following input and output parameters
   - `out analyticsModuleList` - Analytics Module List with Metadata Info

4. If `analyticsModuleList` does not contain at least one AnalyticsModule with SampleFrame.Object.Appearance with HumanFace element, FAIL the test and skip other steps.

**Test Result:**

**PASS** –
- DUT passes all assertions.

**FAIL** –
- None.

### 5.5.5 LICENSE PLATE INFORMATION DESCRIPTOR

**Test Case ID:** ANALYTICS-5-1-5

**Specification Coverage:** License plate information descriptor (ONVIF Analytics Service Spec)

**Feature under test:** GetSupportedMetadata (Analytics)

**WSDL Reference:** analytics.wsdl

**Test Purpose:** To verify License Plate Information descriptor.

**Pre-Requisite:** Analytics Service was received from the DUT. License Plate Info feature is supported by the DUT.

**Test Configuration:** ONVIF Client and DUT

**Test Procedure:**

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

3. ONVIF Client retrieves a list of supported metadata by following the procedure mentioned in Annex A.14 with the following input and output parameters

   • out analyticsModuleList - Analytics Module List with Metadata Info

4. If analyticsModuleList does not contain at least one AnalyticsModule with SampleFrame.Object.Appearance with LicensePlateInfo element, FAIL the test and skip other steps.

Test Result:

PASS –

• DUT passes all assertions.

FAIL –

• None.

5.5.6 HUMAN BODY DESCRIPTOR

Test Case ID: ANALYTICS-5-1-6

Specification Coverage: Human body descriptor (ONVIF Analytics Service Spec)

Feature under test: GetSupportedMetadata (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify Human Body descriptor.

Pre-Requisite: Analytics Service was received from the DUT. Human Body feature is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client retrieves a list of supported metadata by following the procedure mentioned in Annex A.14 with the following input and output parameters
4. If `analyticsModuleList` does not contain at least one `AnalyticsModule` with `SampleFrame.Object.Appearance` with `HumanBody` element, FAIL the test and skip other steps.

**Test Result:**

**PASS** –

- DUT passes all assertions.

**FAIL** –

- None.

### 5.5.7 IMAGE DATA

**Test Case ID:** ANALYTICS-5-1-7

**Specification Coverage:** Image Data (ONVIF Analytics Service Spec)

**Feature under test:** GetSupportedMetadata (Analytics)

**WSDL Reference:** analytics.wsdl

**Test Purpose:** To verify Image Data metadata.

**Pre-Requisite:** Analytics Service was received from the DUT. Image Sending feature is supported by the DUT.

**Test Configuration:** ONVIF Client and DUT

**Test Procedure:**

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client retrieves a list of supported metadata by following the procedure mentioned in Annex A.14 with the following input and output parameters

   - `out analyticsModuleList` - Analytics Module List with Metadata Info

4. If the DUT supports Local Storage Image Sending Type feature or Remote Storage Image Sending Type feature:
4.1. If `analyticsModuleList` does not contain at least one AnalyticsModule with SampleFrame.Object. Appearance.ImageRef element, FAIL the test and skip other steps.

5. If the DUT supports Embedded Image Sending Type feature:

5.1. If `analyticsModuleList` does not contain at least one AnalyticsModule with SampleFrame.Object. Appearance.Image element, FAIL the test and skip other steps.

Test Result:

PASS –

• DUT passes all assertions.

FAIL –

• None.

5.6 Rules

5.6.1 GET SUPPORTED RULES

Test Case ID: ANALYTICS-6-1-1

Specification Coverage: GetSupportedRules (ONVIF Analytics Service Spec)

Feature under test: GetSupportedRules (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify getting supported rules using GetSupportedRules request.

Pre-Requisite: Analytics Service was received from the DUT. Media2 Service was received from the DUT. Rule Engine is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters

   • `out analyticsConfList` - a list of Analytics configurations
4. For each Analytics Configuration `analyticsConf` in `analyticsConfList` repeat the following steps:

4.1. ONVIF Client invokes `GetSupportedRules` request with parameters

   - `ConfigurationToken := analyticsConf.@token`

4.2. DUT responds with `GetSupportedRulesResponse` message with parameters

   - `SupportedRules := supportedRules`

4.3. If `supportedRules` contains at least two RuleDescription items with the same `@Name` value, FAIL the test and skip other steps.

4.4. For each Rule Description `ruleDescription` in `supportedRules.RuleDescription` list repeat the following steps:

   4.4.1. If `ruleDescription` does not have `maxInstances` attribute, FAIL the test, restore the DUT state, and skip other steps.

   4.4.2. If at least one item in `ruleDescription.Parameters` list (SimpleItemDescription or ElementItemDescription item) has the same Name value with other item from the same list, FAIL the test, restore the DUT state, and skip other steps.

   4.4.3. If at least one item in `ruleDescription.Messages` list (Source, or Key, or Data; SimpleItemDescription or ElementItemDescription item) has the same Name value with other item from the same list, FAIL the test, restore the DUT state, and skip other steps.

   4.4.4. If `ruleDescription.ParentTopic` is not valid topic (see Annex A.11), FAIL the test, restore the DUT state, and skip other steps.

   4.4.5. If `ruleDescription.fixed = true`:

      4.4.5.1. If `analyticsConf` does not contain at least one `RuleEngineConfiguration.Rule` with `Type = ruleDescription.Name`, FAIL the test, restore the DUT state, and skip other steps.

**Test Result:**

**PASS** –

- DUT passes all assertions.

**FAIL** –

- The DUT did not send `GetSupportedRulesResponse` messages.
5.6.2 GET RULE OPTIONS

Test Case ID: ANALYTICS-6-1-2

Specification Coverage: GetRuleOptions (ONVIF Analytics Service Spec)

Feature under test: GetRuleOptions (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify getting rule options using GetRuleOptions request.

Pre-Requisite: Analytics Service was received from the DUT. Media2 Service was received from the DUT. Rule Engine is supported by the DUT. Rule Options is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters
   • out analyticsConfList - a list of Analytics configurations
4. For each Analytics Configuration analyticsConf in analyticsConfList repeat the following steps:
   4.1. ONVIF Client invokes GetSupportedRules request with parameters
        • ConfigurationToken := analyticsConf.@token
   4.2. DUT responds with GetSupportedRulesResponse message with parameters
        • SupportedRules := supportedRules
   4.3. ONVIF Client invoked GetRuleOptions request with parameters
        • RuleType is skipped
        • ConfigurationToken := analyticsConf.@token
   4.4. DUT responds with GetRuleOptionsResponse message with parameters
        • RuleOptions list := ruleOptionsFullList
4.5. If at least one item in \(ruleOptionsFullList\) list contains AnalyticsModule, FAIL the test, restore the DUT state, and skip other steps.

4.6. For each Rule Description \(ruleDescription\) in \(supportedRules.RuleDescription\) list repeat the following steps:

4.6.1. ONVIF Client invokes \(GetRuleOptions\) request with parameters

- \(\text{RuleType} := \text{ruleDescription.Name}\)
- \(\text{ConfigurationToken} := \text{analyticsConf.@token}\)

4.6.2. DUT responds with \(GetRuleOptionsResponse\) message with parameters

- \(\text{RuleOptions list} := \text{ruleOptionsList}\)

4.6.3. If at least one item in \(ruleOptionsList\) list contains AnalyticsModule, FAIL the test, restore the DUT state, and skip other steps.

4.6.4. If at least one item in \(ruleOptionsList\) list contains RuleType which is not equal to \(\text{ruleDescription.Name}\), FAIL the test, restore the DUT state, and skip other steps.

4.6.5. If \(ruleOptionsFullList\) list does not contain all items from \(ruleOptionsList\) list (see NOTE at the end of the test case), FAIL the test, restore the DUT state, and skip other steps.

Test Result:

**PASS** –

- DUT passes all assertions.

**FAIL** –

- The DUT did not send \(GetSupportedRulesResponse\) messages.
- The DUT did not send \(GetRuleOptionsResponse\) messages.

**NOTE:** At step 4.6.5 RuleType and Name to be used as unique identifier. If RuleType is skipped in full list, the ONVIF Client assumes that this option is compatible with each supported RuleType that supports parameter with such Name.

5.6.3 GET RULES

**Test Case ID:** ANALYTICS-6-1-3
Specification Coverage: GetRules (ONVIF Analytics Service Spec)

Feature under test: GetRules (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify getting rules using GetRules request.

Pre-Requisite: Analytics Service was received from the DUT. Media2 Service was received from the DUT. Rule Engine is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out analyticsConfList - a list of Analytics configurations
4. For each Analytics Configuration analyticsConf in analyticsConfList repeat the following steps:
   4.1. ONVIF Client invokes GetSupportedRules request with parameters
       - ConfigurationToken := analyticsConf.@token
   4.2. DUT responds with GetSupportedRulesResponse message with parameters
       - SupportedRules := supportedRules
   4.3. ONVIF Client invokes GetRules request with parameters
       - ConfigurationToken := analyticsConf.@token
   4.4. DUT responds with GetRulesResponse message with parameters
       - Rule list := ruleList
   4.5. If at least one item in ruleList list contains Type which in not equal to Name field of at least one item at supportedRules.RuleDescription list, FAIL the test, restore the DUT state, and skip other steps.
   4.6. For each Rule Description ruleDescription in supportedRules.RuleDescription list repeat the following steps:
4.6.1. If ruleDescription.fixed = true:

4.6.1.1. If ruleList does not contain item with Type = ruleDescription.Name, FAIL the test, restore the DUT state, and skip other steps.

4.6.2. If ruleList contains item with Type = ruleDescription.Name:

4.6.2.1. Set rule := ruleList[Type = ruleDescription.Name].

4.6.2.2. If rule.Parameters.SimpleItem contains at least one SimpleItem which does not have item with the same Name in ruleDescription.Parameters.SimpleItemDescription list, FAIL the test, restore the DUT state, and skip other steps.

4.6.2.3. If rule.Parameters.ElementItem contains at least one ElementItem which does not have item with the same Name in ruleDescription.Parameters.ElementItemDescription list, FAIL the test, restore the DUT state, and skip other steps.

Test Result:

PASS –

• DUT passes all assertions.

FAIL –

• The DUT did not send GetSupportedRulesResponse messages.

• The DUT did not send GetRulesResponse messages.

5.6.4 CREATE RULES

Test Case ID: ANALYTICS-6-1-4

Specification Coverage: CreateRules (ONVIF Analytics Service Spec)

Feature under test: CreateRules (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify rule creation with empty parameters list using CreateRules request.

Pre-Requisite: Analytics Service was received from the DUT. Media2 Service was received from the DUT. Rule Engine is supported by the DUT. Profile M is supported.

Test Configuration: ONVIF Client and DUT
ONVIF Analytics Engine Device Test Specification Version 21.06

Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client configures device for adding of new rule by following the procedure mentioned in Annex A.27 with the following input and output parameters
   - out nonFixedRuleSupported - indication of non-fixed Rule support
   - out analyticsToken - a token of Analytics Configuration
   - out ruleDescription - a rule description
   - out ruleToRestore - a rule to restore, if it was removed

4. If nonFixedRuleSupported = false, skip other steps with PASS result, restore the DUT state.

5. Set ruleName := generated random string.

6. ONVIF Client invokes CreateRules request with parameters
   - ConfigurationToken := analyticsToken
   - Rule[0].@Name := ruleName
   - Rule[0].@Type := ruleDescription.@Name
   - Rule[0].Parameters := empty Parameters element

7. DUT responds with CreateRulesResponse message

8. ONVIF Client retrieves a set of rules assigned to Analytics Configuration by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - in analyticsToken - a token of Analytics Configuration
   - out ruleList - rule list

9. If ruleList does not contain Rule with @Type = ruleDescription.@Name and with @Name = ruleName, FAIL the test, restore the DUT state, and skip other steps.

10. Set createdRule1 := Rule with @Type = ruleDescription.@Name and with @Name = ruleName from ruleList.

11. For each SimpleItem element simpleItem in createdRule1.Parameters repeat the following steps:
11.1. If `supportedRule.RuleDescription[0].Parameters` does not contain at least one `SimpleItemDescription` with `@Name = simpleItem.@Name`, FAIL the test, restore the DUT state, and skip other steps.

12. For each `ElementItem` element `elementItem` in `createdRule1.Parameters` repeat the following steps:

12.1. If `supportedRule.RuleDescription[0].Parameters` does not contain at least one `ElementItemDescription` with `@Name = elementItem.@Name`, FAIL the test, restore the DUT state, and skip other steps.

13. ONVIF Client retrieves an Analytics Configuration by following the procedure mentioned in Annex A.21 with the following input and output parameters

- in `analyticsToken` - a token of Analytics Configuration
- out `analyticsConf` - analytics configuration

14. If `analyticsConf[0].@token != analyticsToken`, FAIL the test, restore the DUT state, and skip other steps.

15. If `analyticsConf[0].RuleEngineConfiguration` does not contain Rule element with `@Type = ruleDescription.@Name` and with `@Name = ruleName`, FAIL the test, restore the DUT state, and skip other steps.

16. Set `createdRule2 := Rule with @Type = ruleDescription.@Name` and with `@Name = ruleName` from `analyticsConf[0].RuleEngineConfiguration`.

17. If list of `SimpleItem.@Name` in `createdRule2` does not equal to list of `SimpleItem.@Name` in `createdRule1`, FAIL the test, restore the DUT state, and skip other steps.

18. For each `SimpleItem` element `simpleItem` in `createdRule2.Parameters` repeat the following steps:

18.1. If `simpleItem.@Value != @Value of corresponding SimpleItem in createdRule1 (@Name will be used as key)`, FAIL the test, restore the DUT state, and skip other steps.

19. If list of `ElementItem.@Name` in `createdRule2` does not equal to list of `ElementItem.@Name` in `createdRule1`, FAIL the test, restore the DUT state, and skip other steps.

20. ONVIF Client restores the DUT state.

Test Result:

PASS –
• DUT passes all assertions.

FAIL –

• The DUT did not send `CreateRulesResponse` messages.

5.6.5 DELETE RULES

**Test Case ID:** ANALYTICS-6-1-5

**Specification Coverage:** DeleteRules (ONVIF Analytics Service Spec)

**Feature under test:** DeleteRules (Analytics)

**WSDL Reference:** analytics.wsdl

**Test Purpose:** To verify rule deletion using DeleteRules request.

**Pre-Requisite:** Analytics Service was received from the DUT. Media2 Service was received from the DUT. Rule Engine is supported by the DUT. Profile M is supported.

**Test Configuration:** ONVIF Client and DUT

**Test Procedure:**

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client configures device for adding of new rule by following the procedure mentioned in Annex A.27 with the following input and output parameters
   • `out nonFixedRuleSupported` - indication of non-fixed Rule support
   • `out analyticsToken` - a token of Analytics Configuration
   • `out ruleDescription` - a rule description
   • `out ruleToRestore` - a rule to restore, if it was removed
4. If `nonFixedRuleSupported` = false, skip other steps with PASS result, restore the DUT state.
5. Set `ruleName` := generated random string.
6. ONVIF Client creates new rule by following the procedure mentioned in Annex A.32 with the following input and output parameters
   • `in analyticsToken` - a token of Analytics Configuration
7. ONVIF Client invokes `DeleteRules` request with parameters

- `ConfigurationToken := analyticsToken`
- `RuleName := ruleName`

8. DUT responds with `DeleteRulesResponse` message

9. ONVIF Client retrieves a set of rules assigned of Analytics Configuration by following the procedure mentioned in Annex A.5 with the following input and output parameters

- `in analyticsToken - a token of Analytics Configuration`
- `out ruleList - rule list`

10. If `ruleList` contains Rule with `@Type = ruleDescription.@Name` and with `@Name = ruleName`, FAIL the test, restore the DUT state, and skip other steps.

11. ONVIF Client retrieves an Analytics Configuration by following the procedure mentioned in Annex A.21 with the following input and output parameters

- `in analyticsToken - a token of Analytics Configuration`
- `out analyticsConf - analytics configuration`

12. If `analyticsConf[0].@token` != `analyticsToken`, FAIL the test, restore the DUT state, and skip other steps.

13. If `analyticsConf[0].RuleEngineConfiguration` contains Rule element with `@Type = ruleDescription.@Name` and with `@Name = ruleName`, FAIL the test, restore the DUT state, and skip other steps.

14. ONVIF Client restores the DUT state.

**Test Result:**

**PASS –**

- DUT passes all assertions.

**FAIL –**

- The DUT did not send `DeleteRulesResponse` messages.
5.6.6 MODIFY RULES (PARAMETERS WITH OPTIONS)

Test Case ID: ANALYTICS-6-1-6

Specification Coverage: ModifyRules (ONVIF Analytics Service Spec)

Feature under test: ModifyRules (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify modification of rule’s parameters that have corresponding options using ModifyRules request.

Pre-Requisite: Analytics Service was received from the DUT. Media2 Service was received from the DUT. Rules is supported by the DUT. Rule Options is supported by the DUT. Profile M is supported.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client selects rule description that has parameters with options by following the procedure mentioned in Annex A.41 with the following input and output parameters

   • in true - flag shows if parameters of selected Rule have corresponding options

   • out (optional) analyticsToken - a token of Analytics Configuration

   • out (optional) ruleDescription - rule description

   • out (optional) itemListDescription - list of SimpleItemDescription/ElementItemDescription elements that have options

   • out (optional) limit - maximum number of concurrent rules per configuration

4. If Annex A.41 procedure did not return ruleDescription, skip other steps with PASS result.

5. ONVIF Client selects or create rule with required type by following the procedure mentioned in Annex A.42 with the following input and output parameters

   • in analyticsToken - a token of Analytics Configuration

   • in ruleDescription - rule description
6. For the first `SimpleItemDescription/ElementItemDescription` (\textit{itemDescription}) in \textit{itemListDescription}

6.1. ONVIF Client invokes \textbf{ModifyRules} request with parameters

- ConfigurationToken := \textit{analyticsToken}
- Rule[0].@Name := \textit{rule1}.@Name
- Rule[0].@Type := \textit{rule1}.@Type
- Rule[0].Parameters.SimpleItem/ElementItem[@Name = \textit{itemDescription}.@Name].@Value := value of corresponding parameter type with option provided in the table in Annex A.37

6.2. DUT responds with \textbf{ModifyRulesResponse} message

6.3. ONVIF Client retrieves a set of rules assigned of Analytics Configuration by following the procedure mentioned in Annex A.5 with the following input and output parameters

- in \textit{analyticsToken} - a token of Analytics Configuration
- out \textit{ruleList} - rule list

6.4. If \textit{ruleList} does not contain Rule with @Type = \textit{rule1}.@Type and with @Name = \textit{rule1}.@Name, FAIL the test.

6.5. Set \textit{modifiedRule1} := Rule with @Type = \textit{rule1}.@Type and with @Name = \textit{rule1}.@Name from \textit{ruleList}.

6.6. If \textit{modifiedRule1}.Parameters does not contain SimpleItem/ElementItem with Name = \textit{itemDescription}.@Name and with value set at step 6.1, FAIL the test and skip other steps.

6.7. ONVIF Client retrieves an Analytics Configuration by following the procedure mentioned in Annex A.21 with the following input and output parameters

- in \textit{analyticsToken} - a token of Analytics Configuration
- out \textit{analyticsConf} - analytics configuration

6.8. If \textit{analyticsConf}[0].@token != \textit{analyticsToken}, FAIL the test.
6.9. If `analyticsConf[0].AnalyticsEngineConfiguration` does not contain Rule element with `@Type = rule1.@Type` and with `@Name = rule1.@Name`, FAIL the test.

6.10. Set `modifiedRule2 := Rule` with `@Type = rule1.@Type` and with `@Name = rule1.@Name` from `analyticsConf[0].AnalyticsEngineConfiguration`.

6.11. If `modifiedRule2.Parameters` does not contain SimpleItem/ElementItem with Name = `itemDescription.@Name` and with value set at step 6.1, FAIL the test and skip other steps.

7. ONVIF Client deletes rule created at step 5 if any to restore the DUT by following the procedure mentioned in Annex A.31 with the following input and output parameters
   
   • in `analyticsToken` - token of Analytics configuration
   • in `ruleName.@Name` - Name of the rule to be deleted

8. ONVIF Client restores `ruleToRestore` if any.

9. ONVIF Client restores rule if it was canged at step 5.

Test Result:

PASS –
   • DUT passes all assertions.

FAIL –
   • The DUT did not send `ModifyRulesResponse` messages.

5.6.7 MODIFY RULES (PARAMETERS WITHOUT OPTIONS)

Test Case ID: ANALYTICS-6-1-7

Specification Coverage: ModifyRules (ONVIF Analytics Service Spec)

Feature under test: ModifyRules (Analytics)

WSDL Reference: analytics.wsdl

Test Purpose: To verify modification of rule’s parameters that do not have corresponding options using ModifyRules request.

Pre-Requisite: Analytics Service was received from the DUT. Media2 Service was received from the DUT. Rules is supported by the DUT. Rule Options is supported by the DUT. Profile M is supported.
Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client selects rule description that has parameters without options by following the procedure mentioned in Annex A.41 with the following input and output parameters
   - in false - flag shows if parameters of selected Rule have corresponding options
   - out (optional) analyticsToken - a token of Analytics Configuration
   - out (optional) ruleDescription - rule description
   - out (optional) itemListDescription - list of SimpleItemDescription/ElementItemDescription elements that do not have options
   - out (optional) limit - maximum number of concurrent rules per configuration

4. If Annex A.41 procedure did not return ruleDescription, skip other steps with PASS result.

5. ONVIF Client selects or create rule with required type by following the procedure mentioned in Annex A.42 with the following input and output parameters
   - in analyticsToken - a token of Analytics Configuration
   - in ruleDescription - rule description
   - out rule1 - Rule with required type

6. For the first SimpleItemDescription/ElementItemDescription (itemDescription) in itemListDescription

   6.1. ONVIF Client invokes ModifyRules request with parameters

   • ConfigurationToken := analyticsToken

   • Rule[0].@Name := rule1.@Name

   • Rule[0].@Type := rule1.@Type

   • Rule[0].Parameters.SimpleItem/ElementItem[@Name = itemDescription.@Name].@Value := value of corresponding parameter type with skipped option provided in the table in Annex A.37

   6.2. DUT responds with ModifyRulesResponse message
6.3. ONVIF Client retrieves a set of rules assigned of Analytics Configuration by following the procedure mentioned in Annex A.5 with the following input and output parameters

- in analyticsToken - a token of Analytics Configuration

- out ruleList - rule list

6.4. If ruleList does not contain Rule with @Type = rule1.@Type and with @Name = rule1.@Name, FAIL the test.

6.5. Set modifiedRule1 := Rule with @Type = rule1.@Type and with @Name = rule1.@Name from ruleList.

6.6. If modifiedRule1.Parameters does not contain SimpleItem/ElementItem with Name = itemDescription.@Name and with value set at step 6.1, FAIL the test and skip other steps.

6.7. ONVIF Client retrieves an Analytics Configuration by following the procedure mentioned in Annex A.21 with the following input and output parameters

- in analyticsToken - a token of Analytics Configuration

- out analyticsConf - analytics configuration

6.8. If analyticsConf[0].@token != analyticsToken, FAIL the test.

6.9. If analyticsConf[0].AnalyticsEngineConfiguration does not contain Rule element with @Type = rule1.@Type and with @Name = rule1.@Name, FAIL the test.

6.10. Set modifiedRule2 := Rule with @Type = rule1.@Type and with @Name = rule1.@Name from analyticsConf[0].AnalyticsEngineConfiguration.

6.11. If modifiedRule2.Parameters does not contain SimpleItem/ElementItem with Name = itemDescription.@Name and with value set at step 6.1, FAIL the test and skip other steps.

7. ONVIF Client deletes rule created at step 5 if any to restore the DUT by following the procedure mentioned in Annex A.31 with the following input and output parameters

- in analyticsToken - token of Analytics configuration

- in ruleName.@Name - Name of the rule to be deleted

8. ONVIF Client restores ruleToRestore if any.
9. ONVIF Client restores rule if it was changed at step 5.

**Test Result:**

**PASS –**

- DUT passes all assertions.

**FAIL –**

- The DUT did not send `ModifyRulesResponse` messages.

### 5.7 Face Recognition Rule

#### 5.7.1 GET SUPPORTED RULES (FACE RECOGNITION)

**Test Case ID:** ANALYTICS-7-1-1

**Specification Coverage:** Get Supported rules (ONVIF Analytics Service Spec), Recognition rule engines (ONVIF Analytics Service Spec), Face Recognition (ONVIF Analytics Service Spec)

**Feature Under Test:** GetSupportedRules, RuleDescription for `tt:FaceRecognition`

**WSDL Reference:** `analytics.wsdl`, `media2.wsdl`

**Test Purpose:** To verify that device includes `tt:FaceRecognition` in `GetSupportedRulesResponse`. To verify structure of Face Recognition.

**Pre-Requisite:** Analytics Service is received from the DUT. Media2 Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capabilities. Face Recognition Rule is supported by the DUT.

**Test Configuration:** ONVIF Client and DUT

**Test Procedure:**

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters

   - `out analyticsConfList` - a list of Analytics configurations

4. For each Analytics Configuration `analyticsConf` in `analyticsConfList` repeat the following steps:
   
   4.1. ONVIF Client invokes `GetSupportedRules` request with parameters
ONVIF Analytics Engine Device Test Specification Version 21.06

- ConfigurationToken := analyticsConf.@token

4.2. DUT responds with GetSupportedRulesResponse message with parameters

- SupportedRules := supportedRules

4.3. If supportedRules contains RuleDescription element (faceRecognitionRuleDescription) with Name value is equal to tt:FaceRecognition:

4.3.1. If faceRecognitionRuleDescription does not have maxInstances attribute, FAIL the test and skip other steps.

4.3.2. If faceRecognitionRuleDescription.Parameters has SimpleItemDescription element with @Name = "IncludeImage" and its @Type value != xs:string, FAIL the test and skip other steps.

4.3.3. ONVIF Client verifies rule engine message format by following the procedure mentioned in Annex A.46 with the following input and output parameters

- in faceRecognitionRuleDescription.Messages - message description to be verified

4.3.4. If faceRecognitionRuleDescription does not have Messages.Data.SimpleItemDescription element with @Name = "Likelihood", FAIL the test and skip other steps.

4.3.5. If @Type != "xs:float" for faceRecognitionRuleDescription.Messages.Data.SimpleItemDescription with @Name = "Likelihood", FAIL the test and skip other steps.

4.3.6. If faceRecognitionRuleDescription.Messages.Data has SimpleItemDescription element with @Name = "Label" and its @Type value != xs:string, FAIL the test and skip other steps.

4.3.7. If faceRecognitionRuleDescription.Messages.Data has SimpleItemDescription element with @Name = "ImageUri" and its @Type value != xs:anyURI, FAIL the test and skip other steps.

4.3.8. If faceRecognitionRuleDescription.Messages.Data has SimpleItemDescription element with @Name = "EnrollmentID" and its @Type value != xs:string, FAIL the test and skip other steps.
4.3.9. If `faceRecognitionRuleDescription.Messages.Data` has SimpleItemDescription element with @Name = "RefImageUri" and its @Type value != xs:anyURI, FAIL the test and skip other steps.

4.3.10. If `faceRecognitionRuleDescription.Messages.Data` has ElementItemDescription element with @Name = "Image" and its @Type value != xs:base64Binary, FAIL the test and skip other steps.

4.3.11. If `faceRecognitionRuleDescription.Messages.Data` has ElementItemDescription element with @Name = "BoundingBox" and its @Type value != tt:Rectangle, FAIL the test and skip other steps.

4.3.12. If Messages.ParentTopic value is not equal to "tns1:RuleEngine/Recognition/Face" for Messages with Source.SimpleItemDescription.@Name = VideoSource, and with Source.SimpleItemDescription.@Name = Rule, FAIL the test and skip other steps.

5. If there was no RuleDescription element with Name value is equal to `tt:FaceRecognition` in at least one `supportedRules` at step 4.2 [100], FAIL the test.

Test Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send `GetSupportedRulesResponse` message.

5.7.2 GET FACE RECOGNITION RULE OPTIONS

Test Case ID: ANALYTICS-7-1-2

Specification Coverage: Get Rule Options (ONVIF Analytics Service Spec), Recognition rule engines (ONVIF Analytics Service Spec), Face Recognition (ONVIF Analytics Service Spec), Configuration options (ONVIF Analytics Service Spec).

Feature Under Test: GetRuleOptions, Face Recognition Rule Options

WSDL Reference: analytics.wsdl, media2.wsdl

Test Purpose: To verify retrieving of Face Recognition Options by GetRuleOptions operation.

Pre-Requisite: Analytics Service is received from the DUT. Media2 Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capabilities, Rule
Options is supported by the Device as indicated by the RuleOptionsSupported capabilities. Face Recognition Rule is supported by the DUT.

**Test Configuration:** ONVIF Client and DUT

**Test Procedure:**

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a list of Analytics Configurations that supports `tt:FaceRecognition` type by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - in `tt:FaceRecognition` - rule type
   - out `analyticsConfList` - a list of Analytics configurations with supporting of Face Recognition
4. If `analyticsConfList` is empty, FAIL the test and skip other steps.
5. For each Analytics Configuration (`analyticsConf`) in `analyticsConfList` repeat the following steps:
   5.1. ONVIF Client retrieves a list of supported rules by following the procedure mentioned in Annex A.29 with the following input and output parameters
       - in `analyticsConf.@token` - a token of Analytics Configuration
       - out `supportedRules` - supported rules.
   5.2. ONVIF Client invokes `GetRuleOptions` request with parameters
       - RuleType := `tt:FaceRecognition`
       - ConfigurationToken := `analyticsConf.@token`
   5.3. DUT responds with `GetRuleOptionsResponse` message with parameters
       - RuleOptions list =: `ruleOptionsList`
   5.4. If `ruleOptionsList` contains RuleOption with @Name = `IncludeImage`
       5.4.1. If `includeImageOption` contains @RuleType and @RuleType != "tt:FaceRecognition", FAIL the test and skip other steps.
5.4.2. If $includeImageOption$ does not contain $StringItems$ element or $StringList$ element, FAIL the test and skip other steps.

Test Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send $GetRuleOptionsResponse$ message.

5.8 License Plate Recognition Rule

5.8.1 GET SUPPORTED RULES (LICENSE PLATE RECOGNITION)

Test Case ID: ANALYTICS-8-1-1

Specification Coverage: Get Supported rules (ONVIF Analytics Service Spec), Recognition rule engines (ONVIF Analytics Service Spec), License Plate Recognition (ONVIF Analytics Service Spec)

Feature Under Test: GetSupportedRules, RuleDescription for tt:LicensePlateRecognition

WSDL Reference: analytics.wsdl, media2.wsdl

Test Purpose: To verify that device includes tt:LicensePlateRecognition in GetSupportedRulesResponse. To verify structure of License Plate Recognition.

Pre-Requisite: Analytics Service is received from the DUT. Media2 Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capabilities. License Plate Recognition Rule is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters
out analyticsConfList - a list of Analytics configurations

4. For each Analytics Configuration analyticsConf in analyticsConfList repeat the following steps:

4.1. ONVIF Client invokes **GetSupportedRules** request with parameters

   • ConfigurationToken := analyticsConf.@token

4.2. DUT responds with **GetSupportedRulesResponse** message with parameters

   • SupportedRules := supportedRules

4.3. If supportedRules contains RuleDescription element (licensePlateRecognitionRuleDescription) with Name value is equal to **tt:LicensePlateRecognition**:

   4.3.1. If licensePlateRecognitionRuleDescription does not have maxInstances attribute, FAIL the test and skip other steps.

   4.3.2. ONVIF Client checks set of items inside Parameters of licensePlateRecognitionRuleDescription:

      4.3.2.1. If licensePlateRecognitionRuleDescription.Parameters has SimpleItemDescription element with @Name = "IncludeImage" and its @Type value != xs:string, FAIL the test and skip other steps.

      4.3.2.2. If licensePlateRecognitionRuleDescription.Parameters has SimpleItemDescription element with @Name = "PlateLocation" and its @Type value != xs:string, FAIL the test and skip other steps.

      4.3.2.3. If licensePlateRecognitionRuleDescription.Parameters has ElementItemDescription element with @Name = "Region" and its @Type value != tt:Polygon, FAIL the test and skip other steps.

      4.3.2.4. If licensePlateRecognitionRuleDescription.Parameters has ElementItemDescription element with @Name = "SnapLine" and its @Type value != tt:Polyline, FAIL the test and skip other steps.

   4.3.3. ONVIF Client checks set of items inside Messages.Source of licensePlateRecognitionRuleDescription:

      4.3.3.1. ONVIF Client verifies rule engine message format by following the procedure mentioned in Annex A.46 with the following input and output parameters
• in `licensePlateRecognitionRuleDescription.Messages` - message description to be verified

4.3.4. ONVIF Client checks set of items inside `Messages.Data` of `licensePlateRecognitionRuleDescription`:

4.3.4.1. If `licensePlateRecognitionRuleDescription` does not have `Messages.Data.SimpleItemDescription` element with `@Name = "Likelihood"`, FAIL the test and skip other steps.

4.3.4.2. If `@Type != "xs:float"` for `licensePlateRecognitionRuleDescription.Messages.Data.SimpleItemDescription` with `@Name = "Likelihood"`, FAIL the test and skip other steps.

4.3.4.3. If `licensePlateRecognitionRuleDescription.Messages.Data` has `SimpleItemDescription` element with `@Name = "Label"` and its `@Type` value `!= xs:string`, FAIL the test and skip other steps.

4.3.4.4. If `licensePlateRecognitionRuleDescription.Messages.Data` has `SimpleItemDescription` element with `@Name = "ImageUri"` and its `@Type` value `!= xs:anyURI`, FAIL the test and skip other steps.

4.3.4.5. If `licensePlateRecognitionRuleDescription.Messages.Data` has `SimpleItemDescription` element with `@Name = "VehicleImageURI"` and its `@Type` value `!= xs:anyURI`, FAIL the test and skip other steps.

4.3.4.6. If `licensePlateRecognitionRuleDescription.Messages.Data` has `ElementItemDescription` element with `@Name = "BoundingBox"` and its `@Type` value `!= tt:Rectangle`, FAIL the test and skip other steps.

4.3.4.7. If `licensePlateRecognitionRuleDescription.Messages.Data` has `ElementItemDescription` element with `@Name = "Image"` and its `@Type` value `!= xs:base64Binary`, FAIL the test and skip other steps.

4.3.4.8. If `licensePlateRecognitionRuleDescription` does not have `Messages.Data.ElementItemDescription` element with `@Name = "LicensePlateInfo"`, FAIL the test and skip other steps.

4.3.4.9. If `@Type != "tt:LicensePlateInfo"` for `licensePlateRecognitionRuleDescription.Messages.Data.ElementItemDescription`
with @Name = "LicensePlateInfo", FAIL the test and skip other steps.

4.3.4.10. If `licensePlateRecognitionRuleDescription.Messages.Data` has ElementItemDescription element with @Name = "VehicleInfo" and its @Type value != tt:VehicleInfo, FAIL the test and skip other steps.

4.3.4.11. If `licensePlateRecognitionRuleDescription.Messages.Data` has ElementItemDescription element with @Name = "VehicleImage" and its @Type value != xs:base64Binary, FAIL the test and skip other steps.

4.3.5. If `Messages.ParentTopic` value is not equal to "tns1:RuleEngine/Recognition/LicensePlate" for `Messages` with `Source.SimpleItemDescription.@Name` = VideoSource, and with `Source.SimpleItemDescription.@Name` = Rule, FAIL the test and skip other steps.

5. If there was no RuleDescription element with Name value is equal to `tt:LicensePlateRecognition` for at least one `supportedRules` at step 4.3, FAIL the test.

Test Result:

PASS –
• DUT passes all assertions.

FAIL –
• DUT did not send `GetSupportedRulesResponse` message.

5.8.2 GET LICENSE PLATE RECOGNITION RULE OPTIONS

Test Case ID: ANALYTICS-8-1-2

Specification Coverage: Get Rule Options (ONVIF Analytics Service Spec), Recognition rule engines (ONVIF Analytics Service Spec), License Plate Recognition (ONVIF Analytics Service Spec), Configuration options (ONVIF Analytics Service Spec).

Feature Under Test: GetRuleOptions, MotionRegionConfigOptions

WSDL Reference: analytics.wsdl, media2.wsdl

Test Purpose: To verify retrieving of License Plate Recognition Options by GetRuleOptions operation.

Pre-Requisite: Analytics Service is received from the DUT. Media2 Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capabilities, Rule
Options is supported by the Device as indicated by the RuleOptionsSupported capabilities. License Plate Recognition Rule is supported by the DUT.

**Test Configuration:** ONVIF Client and DUT

**Test Procedure:**

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client retrieves a list of Analytics Configurations that supports `tt:LicensePlateRecognition` type by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - in `tt:LicensePlateRecognition` - rule type
   - out `analyticsConfList` - a list of Analytics configurations with supporting of License Plate Recognition
4. If `analyticsConfList` is empty, FAIL the test and skip other steps.
5. For each Analytics Configuration (`analyticsConf`) in `analyticsConfList` repeat the following steps:
   5.1. ONVIF Client retrieves a list of supported rules by following the procedure mentioned in Annex A.29 with the following input and output parameters
       - in `analyticsConf.@token` - a token of Analytics Configuration
       - out `supportedRules` - supported rules.
   5.2. ONVIF Client invokes `GetRuleOptions` request with parameters
       - RuleType := `tt:LicensePlateRecognition`
       - ConfigurationToken := `analyticsConf.@token`
   5.3. DUT responds with `GetRuleOptionsResponse` message with parameters
       - RuleOptions list =: `ruleOptionsList`
   5.4. If `ruleOptionsList` contains RuleOption with @Name = `IncludeImage`
       (includeImageOption)
       5.4.1. If `includeImageOption` does not contain `StringItems` element or `StringList` element, FAIL the test and skip other steps.
5.5. If ruleOptionsList contains RuleOption with @Name = PlateLocation (plateLocationOption)

5.5.1. If plateLocationOption does not contain StringItems element or StringList element, FAIL the test and skip other steps.

5.6. If ruleOptionsList contains RuleOption with @Name = Region (regionOption)

5.6.1. If regionOption does not contain tt:PolygonOptions element, FAIL the test and skip other steps.

5.7. If ruleOptionsList contains RuleOption with @Name = SnapLine (snapLineOption)

5.7.1. If snapLineOption does not contain tt:IntRange element, FAIL the test and skip other steps.

Test Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send GetRuleOptionsResponse message.

5.9 Line Crossing Counting Rule

5.9.1 GET SUPPORTED RULES (LINE CROSSING COUNTER)

Test Case ID: ANALYTICS-9-1-1

Specification Coverage: Get Supported rules (ONVIF Analytics Service Spec), Line crossing counting rule (ONVIF Analytics Service Spec)

Feature Under Test: GetSupportedRules, RuleDescription for tt:LineCounting

WSDL Reference: analytics.wsdl, media2.wsdl

Test Purpose: To verify that device includes tt:LineCounting in GetSupportedRulesResponse. To verify structure of Line crossing counting.

Pre-Requisite: Analytics Service is received from the DUT. Media2 Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capabilities. Line crossing counting Rule is supported by the DUT.
Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters

   - out analyticsConfList - a list of Analytics configurations

4. For each Analytics Configuration analyticsConf in analyticsConfList repeat the following steps:

   4.1. ONVIF Client invokes GetSupportedRules request with parameters

      - ConfigurationToken := analyticsConf.@token

   4.2. DUT responds with GetSupportedRulesResponse message with parameters

      - SupportedRules := supportedRules

   4.3. If supportedRules contains RuleDescription element (lineCountingRuleDescription) with Name value is equal to tt:LineCounting:

      4.3.1. If lineCountingRuleDescription does not have maxInstances attribute, FAIL the test and skip other steps.

      4.3.2. ONVIF Client checks set of items inside Parameters of lineCountingRuleDescription:

         4.3.2.1. If lineCountingRuleDescription.Parameters has SimpleItemDescription element with @Name = "ReportTimeInterval" and its @Type value != xs:duration, FAIL the test and skip other steps.

         4.3.2.2. If lineCountingRuleDescription.Parameters has SimpleItemDescription element with @Name = "ResetTime" and its @Type value != xs:time, FAIL the test and skip other steps.

         4.3.2.3. If lineCountingRuleDescription.Parameters has SimpleItemDescription element with @Name = "Direction" and its @Type value != tt:Direction, FAIL the test and skip other steps.
4.3.2.4. If `lineCountingRuleDescription.Parameters` has SimpleItemDescription element with `@Name` = "PassAllPolylines" and its `@Type` value != xs:boolean, FAIL the test and skip other steps.

4.3.2.5. If `lineCountingRuleDescription.Parameters` does not have ElementItemDescription element with `@Name` = "Segments", FAIL the test and skip other steps.

4.3.2.6. If Type value of ElementItemDescription element with `@Name` = "Segments" is not equal to tt:Polyline, FAIL the test and skip other steps.

4.3.3. If Messages.IsProperty != "true", FAIL the test and skip other steps.

4.3.4. ONVIF Client checks set of items inside Messages.Source of `lineCountingRuleDescription`:

4.3.4.1. ONVIF Client verifies rule engine message format by following the procedure mentioned in Annex A.46 with the following input and output parameters

- in `lineCountingRuleDescription.Messages` - message description to be verified

4.3.5. ONVIF Client checks set of items inside Messages.Data of `lineCountingRuleDescription`:

4.3.5.1. If `lineCountingRuleDescription` does not have Messages.Data.SimpleItemDescription element with `@Name` = "Count", FAIL the test and skip other steps.

4.3.5.2. If Type value of Messages.Data.SimpleItemDescription element with `@Name` = "Count" is not equal to xs:int, FAIL the test and skip other steps.

4.3.6. If Messages.ParentTopic value is not equal to "tns1:RuleEngine/CountAggregation/Counter" for Messages with Source.SimpleItemDescription.@Name = VideoSource, and with Source.SimpleItemDescription.@Name = Rule, FAIL the test and skip other steps.

5. If there was no RuleDescription element with Name value is equal to `tt:LineCounting` for at least one `supportedRules` at step 4.3, FAIL the test.
Test Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send GetSupportedRulesResponse message.

5.9.2 GET LINE CROSSING COUNTER RULE OPTIONS

Test Case ID: ANALYTICS-9-1-2

Specification Coverage: Get Rule Options (ONVIF Analytics Service Spec), Line crossing counting rule (ONVIF Analytics Service Spec), Configuration options (ONVIF Analytics Service Spec).

Feature Under Test: GetRuleOptions, Line crossing counting rule

WSDL Reference: analytics.wsdl, media2.wsdl

Test Purpose: To verify retrieving of Line crossing counting Options by GetRuleOptions operation.

Pre-Requisite: Analytics Service is received from the DUT. Media2 Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capabilities, Rule Options is supported by the Device as indicated by the RuleOptionsSupported capabilities. Line crossing counting Rule is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.

3. ONVIF Client retrieves a list of Analytics Configurations that supports tt:LineCounting type by following the procedure mentioned in Annex A.2 with the following input and output parameters

   • in tt:LineCounting - rule type
   
   • out analyticsConfList - a list of Analytics configurations with supporting of Line crossing counting

4. If analyticsConfList is empty, FAIL the test and skip other steps.
5. For each Analytics Configuration (analyticsConf) in analyticsConfList repeat the following steps:

5.1. ONVIF Client retrieves a list of supported rules by following the procedure mentioned in Annex A.29 with the following input and output parameters

- in analyticsConf.@token - a token of Analytics Configuration
- out supportedRules - supported rules.

5.2. ONVIF Client invokes GetRuleOptions request with parameters

- RuleType := tt:LineCounting
- ConfigurationToken := analyticsConf.@token

5.3. DUT responds with GetRuleOptionsResponse message with parameters

- RuleOptions list := ruleOptionsList

5.4. If ruleOptionsList contains RuleOption with @Name = ReportTimeInterval (reportTimeIntervalOption)

5.4.1. If reportTimeIntervalOption does not contain tt:DurationRange element, FAIL the test and skip other steps.

5.5. If ruleOptionsList contains RuleOption with @Name = Segments (segmentsOption)

5.5.1. If segmentsOption does not contain tt:IntRange element, FAIL the test and skip other steps.

Test Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send GetRuleOptionsResponse message.
Annex A Helper Procedures and Additional Notes

A.1 Get Analytics Configurations List

Name: HelperGetAnalyticsConfigurationsList

Procedure Purpose: Helper procedure to retrieve Analytics Configurations List.

Pre-requisite: Media2 Service is received from the DUT.

Input: None.

Returns: Analytics Configurations list (analyticsConfList).

Procedure:

1. ONVIF Client invokes GetAnalyticsConfigurations request with parameters
   - ConfigurationToken skipped
   - ProfileToken skipped

2. The DUT responds with GetAnalyticsConfigurationsResponse with parameters
   - Configurations list = analyticsConfList

3. If analyticsConfList is empty, FAIL the test.

Procedure Result:

PASS –
   - DUT passes all assertions.

FAIL –
   - DUT did not send GetAnalyticsConfigurationsResponse message.

A.2 Get List of Analytics Configurations With Supporting of Required Rule Type

Name: HelperGetAnalyticsConfigurationSupportsRequiredRuleTypeList

Procedure Purpose: Helper procedure to retrieve full list of Analytics Configuration that supports required rule type.
**Pre-requisite:** Analytics Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capabilities.

**Input:** Rule Type (*ruleType*).

**Returns:** List of Analytics Configuration that supports rule with type equals to *ruleType* (*analyticsConfSupportsRuleTypeList*).

**Procedure:**

1. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out `analyticsConfList` - a list of Analytics configurations

2. For each Analytics Configuration `analyticsConf` in `analyticsConfList` repeat the following steps:
   1. ONVIF Client invokes `GetSupportedRules` request with parameters
      - ConfigurationToken := `analyticsConf`.@token
   2. DUT responds with `GetSupportedRulesResponse` message with parameters
      - SupportedRules := `supportedRules`
   3. If `supportedRules` contains RuleDescription element with Name value is equal to *ruleType*, set `analyticsConfSupportsRuleTypeList` := `analyticsConfSupportsRuleTypeList` + `analyticsConf`.@token

**Procedure Result:**

**PASS** –
- DUT passes all assertions.

**FAIL** –
- DUT did not send `GetSupportedRulesResponse` message.

**A.3 Get Specific Rule Options**

**Name:** HelperGetSpecificRuleOptions

**Procedure Purpose:** Helper procedure to retrieve options of required rule type.

**Pre-requisite:** Analytics Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capabilities.
Input: Analytics Configuration Token (analyticsConfToken), Rule Type (ruleType).

Returns: Rule Options ruleOptions of ruleType.

Procedure:

1. ONVIF Client invokes GetRuleOptions request with parameters
   - RuleType := ruleType
   - ConfigurationToken := analyticsConf.@token

2. DUT responds with GetRuleOptionsResponse message with parameters
   - RuleOptions list := ruleOptionsList

3. If ruleOptionsList contains more than one RuleOptions element, FAIL the test and skip other steps.

4. If ruleOptionsList is empty, FAIL the test and skip other steps.

5. Set ruleOptions := ruleOptionsList[0].

Procedure Result:

PASS –
- DUT passes all assertions.

FAIL –
- DUT did not send GetRuleOptionsResponse message.

A.4 Configure Media Profile with required Analytics Configuration

Name: HelperConfigureMediaProfileWithRequiredAnalytics

Procedure Purpose: Helper procedure to configure Media Profile to contain required Analytics Configuration.

Pre-requisite: Media2 Service is received from the DUT. Analytics is supported by the DUT.

Input: List of Analytics configurations analyticsConfList

Returns: Media Profile (profile) that contains Analytics Configuration from analyticsConfList and Video Source Configuration.

Procedure:
1. ONVIF Client invokes **GetProfiles** request with parameters
   - Token skipped
   - Type[0] := VideoSource
   - Type[1] := Analytics

2. The DUT responds with **GetProfilesResponse** message with parameters
   - Profiles list =: *profileList*

3. For each Media Profile *profile1* in *profileList* with both Configuration.VideoSource and
   Configuration.Analytics repeat the following steps:
   3.1. For each Analytics (*analytics*) in *analyticsConfList*:
      3.1.1. If *profile1*.Configuration.Analytics.@token value is equal to *analytics*.@token, set
      *profile := profile1* and skip other steps in procedure.

4. For each Media Profile *profile1* in *profileList* that contains VideoSource configuration repeat
   the following steps:
   4.1. ONVIF Client invokes **GetAnalyticsConfigurations** request with parameters
      - ConfigurationToken skipped
      - ProfileToken := *profile1*.@token
   4.2. The DUT responds with **GetAnalyticsConfigurationsResponse** message with parameters
      - Configurations list =: *acList*
   4.3. If *acList* contains analytics (*analytics*) from *analyticsConfList* (comparing by analytics
      token):
      4.3.1. ONVIF Client invokes **AddConfiguration** request with parameters
         - ProfileToken := *profile1*.@token
         - Name skipped
         - Configuration[0].Type := Analytics
         - Configuration[0].Token := *analytics*.Configurations.@token
      4.3.2. The DUT responds with **AddConfigurationResponse** message.
4.3.3. Set profile := profile1 and skip other steps in procedure.

5. FAIL the test and skip other steps.

Procedure Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send GetProfilesResponse message.

• DUT did not send GetAnalyticsConfigurationsResponse message.

• DUT did not send AddConfigurationResponse message.

A.5 Get Rules

Name: HelperGetRules

Procedure Purpose: Helper procedure to retrieve Rules list for Analytics configuration.

Pre-requisite: Media2 Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capabilities.

Input: Analytics configuration token (analyticsToken).

Returns: Rule list (ruleList).

Procedure:

1. ONVIF Client invokes GetRules request with parameters

   • ConfigurationToken := (analyticsToken)

2. The DUT responds with GetRulesResponse with parameters

   • Rule list =: ruleList

Procedure Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send GetRulesResponse message.
A.6 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.7 Delete Subscription

**Name:** HelperDeleteSubscription

**Procedure Purpose:** Helper procedure to delete subscription.

**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.8 Calculate Free Space for Rule

Name: Annex_HelperCalculateFreeSpaceForRule

Procedure Purpose: Helper procedure to calculate free space for additional rules with required Rule Type for requested Analytics Configuration.

Pre-requisite: Analytics Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capabilities.

Input: Analytics Configuration token *analyticsConfigToken*. Required Rule Type *ruleType*.

Returns: Flag if maxInstances is supported (*maxInstances*). Amount of additional rules with requested type that may be added for requested Analytics Configuration (*amountOfAdditionalRules*) (optional, returned in case *maxInstances* = true).

Procedure:

1. ONVIF Client invokes **GetSupportedRules** request with parameters
   
   • ConfigurationToken := *analyticsConfigToken*

2. DUT responds with **GetSupportedRulesResponse** message with parameters
   
   • SupportedRules =: *supportedRules*

3. If *supportedRules* does not contain RuleDescription element with Name value is equal to *ruleType*, FAIL the test and skip other steps.

4. Set *rule* := *supportedRules*.RuleDescription[0], where RuleDescription[0] is RuleDescription element with Name value is equal to *ruleType*.
5. If rule does not contain maxInstances attribute, set maxInstances := false, return it in test procedure and skip other annex steps.

6. Set maxInstances := true.

7. ONVIF Client invokes GetRules request with parameters
   • ConfigurationToken := analyticsConfigToken

8. DUT responds with GetRulesResponse message with parameters
   • Rule list := ruleList

9. Set amountOfExistingRules := amount of Rules in ruleList with Type = ruleType.


Procedure Result:

PASS –
   • DUT passes all assertions.

FAIL –
   • DUT did not send GetSupportedRulesResponse message.
   • DUT did not send GetRulesResponse message.

A.9 Delete Rule with Requested Type

Name: HelperDeleteRuleWithRequestedType

Procedure Purpose: Helper procedure to delete existing Rule with requested type for specified Analytics Configuration.

Pre-requisite: Media2 Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capabilities.

Input: Analytics configuration token (analyticsToken). Rule type to delete (ruleType).

Returns: None.

Procedure:

1. ONVIF Client invokes GetRules request with parameters
   • ConfigurationToken := analyticsToken

2. DUT responds with GetRulesResponse message with parameters
3. Set \( \text{ruleToDelete} := \text{ruleList}[0] \), where \( \text{ruleList}[0] \) is the first Rule with Type = \( \text{ruleType} \).

4. ONVIF Client invokes \texttt{DeleteRules} request with parameters

   - ConfigurationToken := \( \text{analyticsToken} \)
   - RuleName[0] := \( \text{ruleToDelete}.\text{Name} \)

5. The DUT responds with \texttt{DeleteRulesResponse}.

   \textbf{Procedure Result:}

   - **PASS** –
     - DUT passes all assertions.
   - **FAIL** –
     - DUT did not send \texttt{DeleteRulesResponse} message.

\textbf{A.10 Create Motion Region Detector Rule}

\textbf{Name:} HelperCreateMotionRegionDetectorRule

\textbf{Procedure Purpose:} Helper procedure to create Motion Region Detector Rule.

\textbf{Pre-requisite:} Media2 Service is received from the DUT. Rule Engine is supported by the Device as indicated by the RuleSupport capabilities.

\textbf{Input:} Rule Options \( \text{ruleOptions} \). Analytics Configuration Token \( \text{analyticsToken} \).

\textbf{Returns:} None.

\textbf{Procedure:}

1. ONVIF Client invokes \texttt{CreateRules} request with parameters

   - ConfigurationToken := \( \text{analyticsToken} \)
   - Rule[0].@Name := TestMotionRegion
   - Rule[0].@Type := tt:MotionRegionDetector
   - Rule[0].Parameters.ElementItem[0].@Name := "MotionRegion"
   - Rule[0].Parameters.ElementItem[0].MotionRegion.Polygon.Point[0].@x := profile.Configurations.VideoSource.Bounds.@x
• Rule[0].Parameters.ElementItem[0].MotionRegion.Polygon.Point[0].@y := profile.Configurations.VideoSource.Bounds.@y

• Rule[0].Parameters.ElementItem[0].MotionRegion.Polygon.Point[1].@x := profile.Configurations.VideoSource.Bounds.@x


• Rule[0].Parameters.ElementItem[0].MotionRegion.@Armed := true if motionRegionConfigOptions.DisarmSupport = true, otherwise skipped.

• Rule[0].Parameters.ElementItem[0].MotionRegion.@Sensitivity := 1

2. The DUT responds with CreateRulesResponse.

Procedure Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send CreateRulesResponse message.

A.11 Topic Format Verification

Name: HelperTopicCheck
**Procedure Purpose:** Helper procedure to verify topic format.

**Pre-requisite:** None.

**Input:** Topic to be verified \((topic)\).

**Returns:** None.

**Procedure:**

1. If \(topic\) contains at least one whitespace, FAIL the test, restore the DUT state, and skip other steps.

2. If \(topic\) does not correspond to the format defined in Annex A.12, FAIL the test, restore the DUT state, and skip other steps.

3. If \(topic\) contains at least one namespace prefix which namespace is not declared according to [XML Schema Part 2], section 3.2.18 QName, FAIL the test, restore the DUT state, and skip other steps.

**Procedure Result:**

**PASS** –

- DUT passes all assertions.

**FAIL** –

- DUT does not pass all assertions.

**A.12 Valid Topic Format**

Topic shall correspond to the following format in Extended Backus Naur Form:

- \(TopicExpression ::= TopicPath\)
- \(TopicPath ::= RootTopic ChildTopicExpression^\star\)
- \(RootTopic ::= QName\)
- \(ChildTopicExpression ::= '/' ChildTopicName\)
- \(ChildTopicName ::= QName | NCName\)

**A.13 Get All Supported Analytics Modules**

**Name:** GetAllSupportedAnalyticsModules

**Procedure Purpose:** Helper procedure to retrieve full list of Analytics Modules supported by a DUT.
**Pre-requisite:** Media2 Service is received from the DUT. Analytics Modules is supported by the DUT.

**Input:** None.

**Returns:** Full Analytics Module Description List (`fullAnalyticsModuleDescriptionList`).

**Procedure:**

1. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - `analyticsConfList` - a list of Analytics configurations

2. For each Analytics Configuration `analyticsConf` in `analyticsConfList` repeat the following steps:
   1. ONVIF Client invokes `GetSupportedAnalyticsModules` request with parameters
      - `ConfigurationToken := analyticsConf.@token`
   2. DUT responds with `GetSupportedAnalyticsModulesResponse` message with parameters
      - `SupportedAnalyticsModules := supportedAnalyticsModules`
   3. Set `supportedAnalyticsModules.AnalyticsModuleDescription list := analyticsModuleDescriptionList1`
   4. Set `fullAnalyticsModuleDescriptionList := fullAnalyticsModuleDescriptionList + analyticsModuleDescriptionList1`

**Procedure Result:**

**PASS** –
- DUT passes all assertions.

**FAIL** –
- DUT did not send `GetSupportedAnalyticsModulesResponse` message.

**A.14 Get Supported Metadata**

**Name:** HelperGetSupportedMetadata

**Procedure Purpose:** Helper procedure to retrieve full list of metadata supported by a DUT.
Pre-requisite: Supported Metadata feature is supported by the DUT.

Input: None.

Returns: Analytics Module List with Metadata Info (analyticsModuleList).

Procedure:

1. ONVIF Client invokes GetSupportedMetadata request with parameters
   - Type skipped

2. DUT responds with GetSupportedMetadataResponse message with parameters
   - AnalyticsModule list = analyticsModuleList

Procedure Result:

PASS –
   - DUT passes all assertions.

FAIL –
   - DUT did not send GetSupportedMetadataResponse message.

A.15 Get Supported Metadata for Analytics Module Type

Name: HelperGetSupportedMetadataForAnalyticsModuleType

Procedure Purpose: Helper procedure to retrieve metadata supported by a requested Analytics Module Type.

Pre-requisite: Supported Metadata feature is supported by the DUT.

Input: Analytics Module Type (analyticsModuleType).

Returns: Analytics Module List with Metadata Info (analyticsModuleList).

Procedure:

1. ONVIF Client invokes GetSupportedMetadata request with parameters
   - Type := analyticsModuleType

2. DUT responds with GetSupportedMetadataResponse message with parameters
   - AnalyticsModule list = analyticsModuleList

Procedure Result:
PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send `GetSupportedMetadataResponse` message.

A.16 Get List of Analytics Configurations With Supporting of Non Fixed Analytics Modules

Name: HelperGetAnalyticsConfigurationSupportsNonFixedAnalyticsModules

Procedure Purpose: Helper procedure to retrieve full list of Analytics Configuration that supports at least one non fixed Analytics Module.

Pre-requisite: Analytics Service is received from the DUT. Media2 Service is received from the DUT. Analytics Modules is supported by the DUT. Media2 Service.

Input: None.

Returns: List of Analytics Configuration that supports Analytics Modules (`analyticsConfListSupportsAnalyticsModules`).

Procedure:

1. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters

   • out `analyticsConfList` - a list of Analytics configurations

2. For each Analytics Configuration `analyticsConf` in `analyticsConfList` repeat the following steps:

   2.1. ONVIF Client invokes `GetSupportedAnalyticsModules` request with parameters

      • ConfigurationToken := `analyticsConf`.@token

   2.2. DUT responds with `GetSupportedAnalyticsModulesResponse` message with parameters

      • SupportedAnalyticsModules =: `supportedModules`

   2.3. If `supportedModules.AnalyticsModuleDescription` list is not empty and has at least one AnalyticsModuleDescription with @fixed ! = true, set `analyticsConfListSupportsAnalyticsModules` := `analyticsConfListSupportsAnalyticsModules` + `analyticsConf`.@token
Procedure Result:

PASS –
• DUT passes all assertions.

FAIL –
• DUT did not send `GetSupportedAnalyticsModulesResponse` message.

A.17 Get Supported Analytics Modules

Name: HelperGetSupportedAnalyticsModules

Procedure Purpose: Helper procedure to retrieve a list of analytics modules that are supported by the given analytics configuration.

Pre-requisite: Analytics Modules is supported by the DUT.

Input: Analytics configuration token (`analyticsConfigToken`).

Returns: Supported Analytics Modules (`supportedAnalyticsModules`).

Procedure:

1. ONVIF Client invokes `GetSupportedAnalyticsModules` request with parameters
   • ConfigurationToken := `analyticsConfigToken`

2. DUT responds with `GetSupportedAnalyticsModulesResponse` message with parameters
   • SupportedAnalyticsModules = `supportedAnalyticsModules`

Procedure Result:

PASS –
• DUT passes all assertions.

FAIL –
• DUT did not send `GetSupportedAnalyticsModules` message.

A.18 Prepare Free Space for Analytics Module

Name: HelperFreeSpaceForModule

Procedure Purpose: Helper procedure to configure Analytics Configuration with free space for adding of Analytics Module with requested type.
Pre-requisite: Analytics Service is received from the DUT. Analytics Modules is supported by the DUT.

Input: Analytics Configuration token `analyticsConfigToken`. Analytics module type (`analyticsModuleType`) for which free space is required. Maximum number of instances per configuration `maxInstances`. (optional) Maximum number of concurrent modules per configuration (`limit`).

Returns: Analytics module (optional) (`deletedModule`).

Procedure:

1. ONVIF Client invokes `GetAnalyticsModules` request with parameters
   - `ConfigurationToken := analyticsConfigToken`

2. DUT responds with `GetAnalyticsModulesResponse` message with parameters
   - `AnalyticsModule list =: analyticsModuleList`

3. Set `amountOfExistingRequiredModules := amount of AnalyticsModule in analyticsModuleList with Type = analyticsModuleType`.

4. If `amountOfExistingRequiredModules = maxInstances`
   4.1. Set `moduleToDelete := the first analytics module from analyticsModuleList that has @Type = analyticsModuleType`.
   4.2. ONVIF Client deletes one analytics module by following the procedure mentioned in Annex A.19 with the following input and output parameters
       - `in analyticsConfigToken - token of Analytics configuration`
       - `in moduleToDelete.@Name - Name of the analytics module to be deleted`
   4.3. Update `analyticsModuleList`.
   4.4. Returns `moduleToDelete`.

5. If `limit` is not specified, skip other steps of the procedure and return to the test.


7. If `amountOfExistingModules = limit`
   7.1. ONVIF Client retrieves a list of supported analytics modules by following the procedure mentioned in Annex A.17 with the following input and output parameters
       - `in analyticsConfigToken - a token of Analytics Configuration`
7.2. Set $\text{nonFixedAnalyticsModulesTypeList} := \text{list of AnalyticsModuleDescription.@Name}$ items from $\text{supportedAnalyticsModules}$ with AnalyticsModuleDescription.@fixed != true.

7.3. If $\text{analyticsModuleList}$ does not contain item with @Type listed in $\text{nonFixedAnalyticsModulesTypeList}$, FAIL the test, restore the DUT state, and skip other steps.

7.4. Set $\text{moduleToDelete} := \text{the first analytics module from analyticsModuleList that has @Type listed in nonFixedAnalyticsModulesTypeList}$.

7.5. ONVIF Client deletes one analytics module by following the procedure mentioned in Annex A.19 with the following input and output parameters

- in $\text{analyticsConfigToken}$ - token of Analytics configuration
- in $\text{moduleToDelete.@Name}$ - Name of the analytics module to be deleted

7.6. Returns $\text{moduleToDelete}$.

Procedure Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send $\text{GetAnalyticsModulesResponse}$ message.

A.19 Delete Analytics Module

Name: HelperDeleteAnalyticsModule

Procedure Purpose: Helper procedure to delete analytics module from specified Analytics Configuration.

Pre-requisite: Analytics Service is received from the DUT. Analytics Modules is supported by the DUT.

Input: Analytics configuration token ($\text{analyticsToken}$). Name of the analytics module ($\text{analyticsModuleName}$).

Returns: None.
Procedure:

1. ONVIF Client invokes `DeleteAnalyticsModules` request with parameters
   - ConfigurationToken := `analyticsToken`
   - AnalyticsModuleName[0] := `analyticsModuleName`

2. The DUT responds with `DeleteAnalyticsModulesResponse`.

Procedure Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send `DeleteAnalyticsModulesResponse` message.

A.20 Get Analytics Modules

Name: `HelperGetAnalyticsModules`

Procedure Purpose: Helper procedure to retrieve currently assigned set of analytics modules of an Analytics Configuration.

Pre-requisite: Analytics Modules is supported by the DUT.

Input: Token of Analytics Configuration (`analyticsConfToken`).

Returns: Analytics Module List (`analyticsModuleList`).

Procedure:

1. ONVIF Client invokes `GetAnalyticsModules` request with parameters
   - ConfigurationToken := `analyticsConfToken`

2. DUT responds with `GetAnalyticsModulesResponse` message with parameters
   - AnalyticsModule list := `analyticsModuleList`

Procedure Result:

PASS –

• DUT passes all assertions.

FAIL –
A.21 Get Analytics Configuration

Name: HelperGetAnalyticsConfiguration

Procedure Purpose: Helper procedure to retrieve Analytics Configuration.

Pre-requisite: Media2 Service is received from the DUT.

Input: Token of Analytics Configuration (analyticsConfToken).

Returns: Analytics Configuration (analyticsConf).

Procedure:

1. ONVIF Client invokes GetAnalyticsConfigurations request with parameters
   - ConfigurationToken := analyticsConfToken
   - ProfileToken skipped

2. The DUT responds with GetAnalyticsConfigurationsResponse with parameters
   - Configurations list =: analyticsConfList

Procedure Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send GetAnalyticsConfigurationsResponse message.

A.22 Create Analytics Module

Name: HelperCreateAnalyticsModule

Procedure Purpose: Helper procedure to create analytics module from specified Analytics Configuration.

Pre-requisite: Analytics Service is received from the DUT. Analytics Modules is supported by the DUT.

Input: Analytics configuration token (analyticsToken). Name of the analytics module (analyticsModuleName). Type of the analytics module (analyticsModuleType).
Returns: None.

Procedure:

1. ONVIF Client invokes CreateAnalyticsModules request with parameters
   - ConfigurationToken := analyticsToken
   - AnalyticsModule[0].@Name := analyticsModuleName
   - AnalyticsModule[0].@Type := analyticsModuleType
   - AnalyticsModule[0].Parameters := empty Parameters element

2. DUT responds with CreateAnalyticsModulesResponse message

Procedure Result:

PASS –
   • DUT passes all assertions.

FAIL –
   • DUT did not send CreateAnalyticsModulesResponse message.

A.23 Device Configuration For Create Analytics Module

Name: HelperDeviceConfigurationForCreateAnalyticsModule

Procedure Purpose: Helper procedure for device configuration for adding of analytics module.

Pre-requisite: Analytics Service is received from the DUT. Analytics Modules is supported by the DUT.

Input: None.

Returns: If non fixed Analytics Module is supported (nonFixedModuleSupported). Analytics configuration token (optional) (analyticsToken). Analytics module description (optional) (analyticsModuleDescription). Analytics module to restore (optional) (moduleToRestore)

Procedure:

1. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out analyticsConfList - a list of Analytics configurations
2. ONVIF Client retrieves a list of Analytics Configurations that supports non fixed AnalyticsModules by following the procedure mentioned in Annex A.16 with the following input and output parameters
   • out analyticsConfListSupportsAnalyticsModules - a list of Analytics configurations

3. If analyticsConfListSupportsAnalyticsModules is empty, set nonFixedModuleSupported = false and return to test procedure.

4. ONVIF Client configures media profile with Analytics Configuration from analyticsConfListSupportsAnalyticsModules list by following the procedure mentioned in Annex A.4 with the following input and output parameters
   • in analyticsConfListSupportsAnalyticsModules - list of Analytics configurations.
   • out profile - media profile.

5. Set analyticsToken := profile.Configurations.Analytics.token

6. ONVIF Client retrieves a list of supported analytics modules by following the procedure mentioned in Annex A.17 with the following input and output parameters
   • in analyticsToken - a token of Analytics Configuration
   • out supportedAnalyticsModules - supported analytics modules.

7. If supportedAnalyticsModules.AnalyticsModuleDescription list is empty, FAIL the test and skip other steps.

8. Set analyticsModuleDescription := first supportedAnalyticsModules.AnalyticsModuleDescription item with @fixed != true.

9. Set limit := supportedAnalyticsModules.@Limit (if specified).

10. If analyticsModuleDescription does not contain maxInstances attribute, FAIL the test.

11. If analyticsModuleDescription.@maxInstances = 0, FAIL the test.

12. ONVIF Client prepares free space for adding of new analytics module with required type into the Analytics Configuration by following the procedure mentioned in Annex A.18 with the following input and output parameters
   • in analyticsToken - a token of Analytics Configuration
   • in analyticsModuleDescription.@Name - analytics module type
   • in analyticsModuleDescription.@maxInstances - maximum number of instances per configuration
• (optional) in limit - limit
• out moduleToRestore (optional) - analytics module to restore

Procedure Result:

PASS –
• DUT passes all assertions.

FAIL –
• None.

A.24 Select Existing Analytics Module

Name: HelperSelectExistingAnalyticsModule

Procedure Purpose: Helper procedure to select Analytics Module existing on the device.

Pre-requisite: Analytics Service is received from the DUT. Analytics Modules is supported by the DUT.

Input: None.

Returns: Analytics module (optional) (analyticsModule), Analytics Configuration token (analyticsToken).

Procedure:

1. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters
   • out analyticsConfList - a list of Analytics configurations

2. For each Analytics Configuration analyticsConf in analyticsConfList repeat the following steps:

   2.1. ONVIF Client retrieves a set of analytics modules assigned of Analytics Configuration by following the procedure mentioned in Annex A.20 with the following input and output parameters
       • in analyticsConf.@token - a token of Analytics Configuration
       • out analyticsModuleList - analytics module list

   2.2. If analyticsModuleList list is not empty
2.2.1.Set \textit{analyticsModule} := \textit{analyticsModuleList}[0].

2.2.2.Set \textit{analyticsToken} := \textit{analyticsConf}@token.

2.2.3.Return to test procedure.

Procedure Result:

PASS –

• DUT passes all assertions.

FAIL –

• None.

A.25 Check Shape Descriptor Coordinates

Name: HelperSelectExistingAnalyticsModule

Procedure Purpose: Helper procedure to check that object bounding boxes or shapes included into sample frame of GetSupportedMetadataResponse are located in the top left quarter of the image.

Pre-requisite: None.

Input: SampleFrame \textit{sampleFrame}

Returns: None.

Procedure:

1. Set \textit{translateX} = 0.

2. Set \textit{translateY} = 0.

3. Set \textit{scaleX} = 1.

4. Set \textit{scaleY} = 1.

5. If \textit{sampleFrame} contains Transformation element, rewrite variables:

   5.1. If \textit{sampleFrame}.Transformation.Translate.@x is specified, set \textit{translateX} = \textit{sampleFrame}.Transformation.Translate.@x.


   5.3. If \textit{sampleFrame}.Transformation.Scale.@x is specified, set \textit{scaleX} = \textit{sampleFrame}.Transformation.Scale.@x.
5.4. If \( \text{sampleFrame}.\text{Transformation}.\text{Scale}@y \) is specified, set \( \text{scaleY} = \text{sampleFrame}.\text{Transformation}.\text{Scale}@y \).

6. For each Object.Appearance with Shape element (appearance) in \( \text{sampleFrame} \) repeat the following steps:

6.1. If appearance contains Transformation element, rewrite variables:

6.1.1. If \( \text{appearance}.\text{Transformation}.\text{Translate}@x \) is specified, set \( \text{translateX} = \text{appearance}.\text{Transformation}.\text{Translate}@x \). Otherwise set \( \text{translateX} = 0 \).

6.1.2. If \( \text{appearance}.\text{Transformation}.\text{Translate}@y \) is specified, set \( \text{translateY} = \text{appearance}.\text{Transformation}.\text{Translate}@y \). Otherwise set \( \text{translateY} = 0 \).

6.1.3. If \( \text{appearance}.\text{Transformation}.\text{Scale}@x \) is specified, set \( \text{scaleX} = \text{appearance}.\text{Transformation}.\text{Scale}@x \). Otherwise set \( \text{scaleX} = 1 \).

6.1.4. If \( \text{appearance}.\text{Transformation}.\text{Scale}@y \) is specified, set \( \text{scaleY} = \text{appearance}.\text{Transformation}.\text{Scale}@y \). Otherwise set \( \text{scaleY} = 1 \).

6.2. If appearance.Shape contains BoundingBox element:

6.2.1. ONVIF Client transforms bottom coordinate to default coordinate system by following the procedure mentioned in Annex A.26 with the following input and output parameters

- in \( \text{appearance}.\text{Shape}.\text{BoundingBox}@bottom \) - coordinate of point to transform
- in \( \text{translateY} \) - Translational value
- in \( \text{scaleY} \) - Scaling value
- out \( \text{bottom} \) - bottom in default coordinate system

6.2.2. ONVIF Client transforms top coordinate to default coordinate system by following the procedure mentioned in Annex A.26 with the following input and output parameters

- in \( \text{appearance}.\text{Shape}.\text{BoundingBox}@top \) - coordinate of point to transform
- in \( \text{translateY} \) - Translational value
- in \( \text{scaleY} \) - Scaling value
- out \( \text{top} \) - top in default coordinate system
6.2.3. ONVIF Client transforms right coordinate to default coordinate system by following the procedure mentioned in Annex A.26 with the following input and output parameters:

- in `appearance.Shape.BoundingBox.@right` - coordinate of point to transform
- in `translateX` - Translational value
- in `scaleX` - Scaling value
- out `right` - right in default coordinate system

6.2.4. ONVIF Client transforms left coordinate to default coordinate system by following the procedure mentioned in Annex A.26 with the following input and output parameters:

- in `appearance.Shape.BoundingBox.@left` - coordinate of point to transform
- in `translateX` - Translational value
- in `scaleX` - Scaling value
- out `left` - left in default coordinate system

6.2.5. If `bottom` > 1 or `bottom` < 0, FAIL the test.

6.2.6. If `top` > 1 or `top` < 0, FAIL the test.

6.2.7. If `right` > 0 or `top` < -1, FAIL the test.

6.2.8. If `left` > 0 or `top` < -1, FAIL the test.

6.2.9. For each `appearance.Polygon.Point`:

   6.2.9.1. ONVIF Client transforms X coordinate to default coordinate system by following the procedure mentioned in Annex A.26 with the following input and output parameters:

   - in `appearance.Polygon.Point.@x` - coordinate of point to transform
   - in `translateX` - Translational value
   - in `scaleX` - Scaling value
   - out `pointX` - X of point in default coordinate system
6.2.9.2. ONVIF Client transforms Y coordinate to default coordinate system by following the procedure mentioned in Annex A.26 with the following input and output parameters

- in `appearance.Polygon.Point.@y` - coordinate of point to transform
- in `translateY` - Translational value
- in `scaleY` - Scaling value
- out `pointY` - Y of point in default coordinate system

6.2.9.3. If `pointY > 1` or `bottom < 0`, FAIL the test.

6.2.9.4. If `pointX > 0` or `top < -1`, FAIL the test.

Procedure Result:

PASS –
• DUT passes all assertions.

FAIL –
• None.

A.26 Transform Coordinate To Default Coordinate System

Name: HelperTransformCoordinateToDefaultCoordinateSystem

Procedure Purpose: Helper procedure to transform coordinate into default coordinate system.

Pre-requisite: None.

Input: Coordinate of point to transform `coordinate`, Scaling value `scale`, Translational value `translate`.

Returns: Coordinate of point transformed into default coordinate system `coordinate`.

Procedure:

1. Set `coordinate = coordinate * scale + translate`

Procedure Result:

PASS –
• DUT passes all assertions.

FAIL –
• None.

A.27 Device Configuration For Create Rule

Name: HelperDeviceConfigurationForCreateRule

Procedure Purpose: Helper procedure for configuring DUT in order to add a rule.

Pre-requisite: Analytics Service is received from the DUT. Rule Engine is supported by the DUT.

Input: None.

Returns: Indication of non-fixed Rule support (nonFixedRuleSupported), Analytics configuration token (optional) (analyticsToken). Rule description (optional) (ruleDescription). Rule to restore (optional) (ruleToRestore)

Procedure:

1. ONVIF Client retrieves a list of Analytics Configurations that supports non-fixed Rules by following the procedure mentioned in Annex A.28 with the following input and output parameters
   • out analyticsConfListSupportsRules - a list of Analytics configurations

2. If analyticsConfListSupportsRules is empty, set nonFixedRuleSupported = false and return to test procedure.

3. ONVIF Client configures media profile with Analytics Configuration from analyticsConfListSupportsRules list by following the procedure mentioned in Annex A.4 with the following input and output parameters
   • in analyticsConfListSupportsRules - list of Analytics configurations.
   • out profile - media profile.

4. Set analyticsToken := profile.Configurations.Analytics.token

5. ONVIF Client retrieves a list of supported rules by following the procedure mentioned in Annex A.29 with the following input and output parameters
   • in analyticsToken - a token of Analytics Configuration
   • out supportedRules - supported rules.
6. If `supportedRules.RuleDescription` list is empty, FAIL the test, restore the DUT state, and skip other steps.

7. Set `limit := supportedRules.@Limit` (if specified).

8. If `supportedRules.RuleDescription` list does not contain item with `@fixed != true`, FAIL the test, restore the DUT state, and skip other steps.

9. Set `ruleDescription := first supportedRules.RuleDescription` item with `@fixed != true`.

10. If `ruleDescription` does not contain `maxInstances` attribute, FAIL the test, restore the DUT state, and skip other steps.

11. If `ruleDescription.@maxInstances` = 0, FAIL the test, restore the DUT state, and skip other steps.

12. Set `nonFixedRuleTypeList := list of RuleDescription.@Name` items from `supportedRules` with `RuleDescription.@fixed != true`.

13. ONVIF Client prepares free space for adding of new rule with required type into the Analytics Configuration by following the procedure mentioned in Annex A.30 with the following input and output parameters:
   - in `analyticsToken` - a token of Analytics Configuration
   - in `supportedRules.@Limit` - maximum number of concurrent rules per configuration
   - in `nonFixedRuleTypeList` - list of non-fixed rule types that could be removed
   - in `ruleDescription.@Name` - rule type for which free space is required
   - in `ruleDescription.@maxInstances` - maximum number of rules with `ruleDescription.@Name` type per configuration
   - (optional) in `limit` - limit
   - out `ruleToRestore` - rule to restore (if a rule was removed)

**Procedure Result:**

**PASS** –
   - DUT passes all assertions.

**FAIL** –
   - None.
A.28 Get List of Analytics Configurations With Supporting of Non-Fixed Rules

Name: HelperGetAnalyticsConfigurationSupportsNonFixedRules

Procedure Purpose: Helper procedure for retrieving full list of Analytics Configurations that supports at least one non-fixed Rule.

Pre-requisite: Analytics Service is received from the DUT. Media2 Service is received from the DUT. Rule Engine is supported by the DUT.

Input: None.

Returns: List of Analytics Configuration that supports non-fixed Rules (analyticsConfListSupportsRules).

Procedure:

1. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out analyticsConfList - a list of Analytics Configurations

2. For each Analytics Configuration analyticsConf in analyticsConfList repeat the following steps:
   2.1. ONVIF Client invokes GetSupportedRules request with parameters
       - ConfigurationToken := analyticsConf.@token
   2.2. DUT responds with GetSupportedRulesResponse message with parameters
       - SupportedRules =: supportedRules
   2.3. If supportedRules.RuleDescription list is not empty and has at least one RuleDescription with @fixed != true, set analyticsConfListSupportsRules := analyticsConfListSupportsRules + analyticsConf.@token

Procedure Result:

PASS –
   - DUT passes all assertions.

FAIL –
   - DUT did not send GetSupportedRulesResponse message.
A.29 Get Supported Rules

**Name:** HelperGetSupportedRules

**Procedure Purpose:** Helper procedure for retrieving a list of rule types which are supported by the given analytics configuration.

**Pre-requisite:** Analytics Service is received from the DUT. Rule Engine is supported by the DUT.

**Input:** Analytics configuration token (analyticsConfigToken).

**Returns:** Supported Rules (supportedRules).

**Procedure:**

1. ONVIF Client invokes `GetSupportedRules` request with parameters
   - ConfigurationToken := analyticsConfigToken

2. DUT responds with `GetSupportedRulesResponse` message with parameters
   - SupportedRules =: supportedRules

**Procedure Result:**

**PASS** –
- DUT passes all assertions.

**FAIL** –
- DUT did not send `GetSupportedRulesResponse` message.

A.30 Prepare Free Space for Rule

**Name:** HelperFreeSpaceForRule

**Procedure Purpose:** Helper procedure for configuring Analytics Configuration with free space in order to add Rule with requested type.

**Pre-requisite:** Analytics Service is received from the DUT. Rule Engine is supported by the DUT.

**Input:** Analytics Configuration token (analyticsConfigToken). Maximum number of concurrent rules per configuration (limit). List of non-fixed rule types (nonFixedRuleTypeList). Rule type for which free space is required (ruleType). Maximum number of rules with ruleType type per configuration (maxInstances).

**Returns:** Rule (optional) (deletedRule).
Procedure:

1. ONVIF Client invokes **GetRules** request with parameters
   - ConfigurationToken := *analyticsConfigToken*

2. DUT responds with **GetRulesResponse** message with parameters
   - Rule list := *ruleList*

3. Set **amountOfExistingRequiredRules** := amount of Rule items in *ruleList* with Type = *ruleType*.

4. If **amountOfExistingRequiredRules** = **maxInstances**
   
   4.1. Set **ruleToDelete** := the first rule from *ruleList* that has @Type = *ruleType*.

   4.2. ONVIF Client deletes one rule by following the procedure mentioned in Annex A.31
   
   with the following input and output parameters
   
   • in *analyticsConfigToken* - token of Analytics configuration
   
   • in *ruleToDelete*.@Name - Name of the rule to be deleted

   4.3. Skip other steps of the procedure and return to the test.

5. If **limit** is not specified, skip other steps of the procedure and return to the test.

6. Set **amountOfExistingRules** := amount of Rule items in *ruleList*.

7. If **amountOfExistingRules** = **limit**

   7.1. If *ruleList* does not contain item with @Type listed in *nonFixedRuleTypeList*, FAIL the test, restore the DUT state, and skip other steps.

   7.2. Set **ruleToDelete** := the first rule from *ruleList* that has @Type listed in *nonFixedRuleTypeList*.

   7.3. ONVIF Client deletes one rule by following the procedure mentioned in Annex A.31
   
   with the following input and output parameters
   
   • in *analyticsConfigToken* - token of Analytics configuration
   
   • in *ruleToDelete*.@Name - Name of the rule to be deleted

Procedure Result:

**PASS** –
• DUT passes all assertions.

FAIL –
• DUT did not send GetRulesResponse message.

### A.31 Delete Rule

**Name:** HelperDeleteRule

**Procedure Purpose:** Helper procedure to delete rule from specified Analytics Configuration.

**Pre-requisite:** Analytics Service is received from the DUT. Rule Engine is supported by the DUT.

**Input:** Analytics configuration token (*analyticsToken*). Rule name (*ruleName*).

**Returns:** None.

**Procedure:**

1. ONVIF Client invokes **DeleteRules** request with parameters
   - ConfigurationToken := *analyticsToken*
   - RuleName[0] := *ruleName*

2. The DUT responds with **DeleteRulesResponse**.

**Procedure Result:**

PASS –
• DUT passes all assertions.

FAIL –
• DUT did not send **DeleteRulesResponse** message.

### A.32 Create Rule

**Name:** HelperCreateRule

**Procedure Purpose:** Helper procedure for rule creation for specified Analytics Configuration.

**Pre-requisite:** Analytics Service is received from the DUT. Rule Engine is supported by the DUT.

**Input:** Analytics configuration token (*analyticsToken*). Name of the rule (*ruleName*). Type of the rule (*ruleType*).

**Returns:** None.
Procedure:

1. ONVIF Client invokes CreateRules request with parameters
   - ConfigurationToken := analyticsToken
   - Rule[0].@Name := ruleName
   - Rule[0].@Type := ruleType
   - Rule[0].Parameters := empty Parameters element

2. DUT responds with CreateRulesResponse message.

Procedure Result:

PASS –
   - DUT passes all assertions.

FAIL –
   - DUT did not send CreateRulesResponse message.

A.33 Select Existing Rule

Name: HelperSelectRule

Procedure Purpose: Helper procedure for existing rule selection.

Pre-requisite: Analytics Service is received from the DUT. Rule Engine is supported by the DUT.

Input: None.


Procedure:

1. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out analyticsConfList - a list of Analytics configurations

2. For each Analytics Configuration analyticsConf in analyticsConfList repeat the following steps:
   2.1. ONVIF Client retrieves a set of rules related to Analytics Configuration by following the procedure mentioned in Annex A.5 with the following input and output parameters
• in `analyticsConf.@token` - a token of Analytics Configuration

• out `ruleList` - rule list

2.2. If `ruleList` list is not empty

2.2.1.Set `rule := ruleList[0]`.

2.2.2.Set `analyticsToken := analyticsConf.@token`.

2.2.3.Skip other steps and return to the test procedure.

**Procedure Result:**

**PASS** –

• DUT passes all assertions.

**FAIL** –

• None.

**A.34 Device Configuration For Create Specific Rule**

**Name:** HelperDeviceConfigurationForCreateSpecificRule

**Procedure Purpose:** Helper procedure for configuring DUT in order to add a rule with specified rule type.

**Pre-requisite:** Analytics Service is received from the DUT. Rule Engine is supported by the DUT.

**Input:** Rule type (`ruleType`).

**Returns:** Indication of non-fixed Rule support (`nonFixedRuleSupported`). Analytics configuration token (optional) (`analyticsToken`). Rule description (optional) (`ruleDescription`). Rule to restore (optional) (`ruleToRestore`). Media profile (optional) (`profile`).

**Procedure:**

1. ONVIF Client retrieves a list of Analytics Configurations that supports non-fixed rule with `ruleType` type by following the procedure mentioned in Annex A.36 with the following input and output parameters

   • in `ruleType` - rule type

   • out `analyticsConfListSupportsRules` - a list of Analytics configurations that support non-fixed required rule type
2. If `analyticsConfListSupportsRules` is empty, set `nonFixedRuleSupported` = false and return to test procedure.

3. ONVIF Client configures media profile with Analytics Configuration from `analyticsConfListSupportsRules` list by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - in `analyticsConfListSupportsRules` - list of Analytics configurations.
   - out `profile` - media profile.

4. Set `analyticsToken` := `profile.Configurations.Analytics.token`

5. ONVIF Client retrieves a list of supported rules by following the procedure mentioned in Annex A.29 with the following input and output parameters
   - in `analyticsToken` - a token of Analytics Configuration
   - out `supportedRules` - supported rules.

6. If `supportedRules.RuleDescription` list does not contain item with `@Name = ruleType` and `@fixed != true`, FAIL the test, restore the DUT state, and skip other steps.

7. Set `ruleDescription` := first `supportedRules.RuleDescription` item with `@Name = ruleType` and `@fixed != true`.

8. If `ruleDescription` does not contain `maxInstances` attribute, FAIL the test, restore the DUT state, and skip other steps.

9. If `ruleDescription.@maxInstances` = 0, FAIL the test, restore the DUT state, and skip other steps.

10. Set `nonFixedRuleTypeList` := list of `ruleDescription.@Name` items from `supportedRules` with `ruleDescription.@fixed != true`.

11. ONVIF Client prepares free space for adding of new rule with required type into the Analytics Configuration by following the procedure mentioned in Annex A.30 with the following input and output parameters
    - in `analyticsToken` - a token of Analytics Configuration
    - in `supportedRules.@Limit` - maximum number of concurrent rules per configuration
    - in `nonFixedRuleTypeList` - list of non-fixed rule types that could be removed
    - in `ruleType` - rule type for which free space is required
• in `ruleDescription.@maxInstances` - maximum number of rules with `ruleDescription.@Name` type per configuration

• out `ruleToRestore` - rule to restore (if a rule was removed)

Procedure Result:
PASS –
• DUT passes all assertions.

FAIL –
• None.

A.35 Select Value For Rule String Parameter Type

Name: `HelperSelectValueForRuleStringParameterType`  

Procedure Purpose: Helper procedure for select value for string parameter type of a rule.

Pre-requisite: Analytics Service is received from the DUT. Rule Engine is supported by the DUT.

Input: Rule Option of String Parameter Type (`ruleOption`).

Returns: Value for string parameter type `stringValue`.

Procedure:

1. If `ruleOption` does not contain `StringItems` element or `StringList` element, FAIL the test and skip other steps.

2. If `ruleOption` contains `StringItems` element
   2.1. Set `stringValue := value of the 1st Item element`.
   2.2. Skip other steps and return to the test procedure.

3. If `ruleOption` contains `StringList` element
   3.1. Set `stringValue := value of the 1st element in the string list`.

Procedure Result:
PASS –
• DUT passes all assertions.

FAIL –
A.36 Get List of Non-Fixed Analytics Configurations With Supporting of Specific Rules

**Name:** HelperGetAnalyticsConfigurationSupportsNonFixedSpecificRules

**Procedure Purpose:** Helper procedure for retrieving full list of Analytics Configurations that supports at least one non-fixed Rule with specified rule type.

**Pre-requisite:** Analytics Service is received from the DUT. Media2 Service is received from the DUT. Rule Engine is supported by the DUT.

**Input:** Rule Type (ruleType).

**Returns:** List of Analytics Configuration that supports non-fixed Rules (analyticsConfListSupportsRules).

**Procedure:**

1. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out analyticsConfList - a list of Analytics Configuration that supports non-fixed Rules

2. For each Analytics Configuration analyticsConf in analyticsConfList repeat the following steps:
   
   2.1. ONVIF Client invokes GetSupportedRules request with parameters
       - ConfigurationToken := analyticsConf.@token

   2.2. DUT responds with GetSupportedRulesResponse message with parameters
       - SupportedRules := supportedRules

   2.3. If supportedRules.RuleDescription list contains at least one RuleDescription with
       @Name = ruleType and with @fixed != true, set analyticsConfListSupportsRules := analyticsConfListSupportsRules + analyticsConf.@token

**Procedure Result:**

**PASS –**
- DUT passes all assertions.

**FAIL –**
• DUT did not send **GetSupportedRulesResponse** message.

### A.37 Supported Parameter Types

ONVIF Client needs to generate values for parameter types Modify Module/Rule request. This table provides a list of rule/module parameter types supported by the ONVIF Client and logic of its values generation.

#### Table A.1. Supported Parameter Types

<table>
<thead>
<tr>
<th>Module/Rule Parameter Types</th>
<th>Module/Rule parameter Options Type</th>
<th>Module/Rule Parameter Value to be Generated</th>
</tr>
</thead>
<tbody>
<tr>
<td>xs:boolean (SimpleItemDescription)</td>
<td>skipped</td>
<td>true</td>
</tr>
<tr>
<td>xs:string (SimpleItemDescription)</td>
<td>skipped</td>
<td>&quot;test value&quot;</td>
</tr>
<tr>
<td>xs:int (SimpleItemDescription)</td>
<td>skipped</td>
<td>1</td>
</tr>
<tr>
<td>xs:float (SimpleItemDescription)</td>
<td>skipped</td>
<td>5.4</td>
</tr>
<tr>
<td>xs:duration (SimpleItemDescription)</td>
<td>skipped</td>
<td>PT60S</td>
</tr>
<tr>
<td>tt:IntRectangle (ElementItemDescription)</td>
<td>skipped</td>
<td>x = 0, y = 0, width = 250, height = 250</td>
</tr>
<tr>
<td>tt:StringList (SimpleItemDescription)</td>
<td>skipped</td>
<td>&quot;test&quot;</td>
</tr>
<tr>
<td>tt:StringItems (ElementItemDescription)</td>
<td>skipped</td>
<td>&quot;test&quot;</td>
</tr>
<tr>
<td>tt:Polyline (ElementItemDescription)</td>
<td>skipped</td>
<td>Point[0].@x=&quot;-0.9&quot;, Point[0].@y=&quot;0&quot;</td>
</tr>
<tr>
<td>Module/Rule Parameter Types</td>
<td>Module/Rule parameter Options Type</td>
<td>Module/Rule Parameter Value to be Generated</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------</td>
<td>-------------------------------------------</td>
</tr>
<tr>
<td>tt:Polygon (ElementItemDescription)</td>
<td>skipped</td>
<td>Point[1].@x=&quot;0&quot; Point[1].@y=&quot;0&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Point[0].@x=&quot;-0.5&quot; Point[0].@y=&quot;-0.5&quot; Point[1].@x=&quot;-0.5&quot; Point[1].@y=&quot;0&quot; Point[1].@y=&quot;0&quot; Point[2].@x=&quot;0&quot; Point[2].@y=&quot;0&quot;</td>
</tr>
<tr>
<td>xs:string (SimpleItemDescription)</td>
<td>tt:StringList</td>
<td>Random value from the list.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Random value from the list.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Random value from the list.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Random value from the range.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Random value from the list.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Random value from the range.</td>
</tr>
<tr>
<td>Module/Rule Parameter Types</td>
<td>Module/Rule parameter Options Type</td>
<td>Module/Rule Parameter Value to be Generated</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>xs:float (SimpleItemDescription)</td>
<td>tt:FloatList</td>
<td>Random value from the list.</td>
</tr>
<tr>
<td>xs:duration (SimpleItemDescription)</td>
<td>tt:DurationRange</td>
<td>Random value from the range.</td>
</tr>
<tr>
<td>tt:IntRectangle (ElementItemDescription)</td>
<td>tt:IntRectangleRange</td>
<td>Random value from the range for each value, with limitation that the rectangle in the borders of (XRange.Min, YRange.Min, XRange.Min + WidthRange.Min, YRange.Min + WidthRange.Min).</td>
</tr>
<tr>
<td>Module/Rule Parameter Types</td>
<td>Module/Rule parameter Options Type</td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------</td>
<td></td>
</tr>
<tr>
<td>tt:StringList (SimpleItemDescription)</td>
<td>tt:StringList</td>
<td></td>
</tr>
<tr>
<td>Random list with values from the list.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tt:StringItems (ElementItemDescription)</td>
<td>tt:StringItems</td>
<td></td>
</tr>
<tr>
<td>Random list with values from the list.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tt:Polyline (ElementItemDescription)</td>
<td>tt:IntRange</td>
<td></td>
</tr>
<tr>
<td>Random number (based on range) of points based on range with normalized coordinates.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tt:Polygon (ElementItemDescription)</td>
<td>tt:PolygonOptions</td>
<td></td>
</tr>
<tr>
<td>If RectangleOnly = true, random rectangle.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A.38 Select Analytics Module Description To Modify

**Name:** HelperSelectAnalyticsModuleDescriptionToModify

**Procedure Purpose:** Helper procedure to select Analytics Modules Description that has parameter without corresponding option or that has parameter with corresponding option.

**Pre-requisite:** Media2 Service is received from the DUT. Analytics Modules is supported by the DUT. Analytics Module Options is supported by the DUT.

**Input:** Flag shows if parameters of selected Analytics Module have corresponding options `parametersWithOptions`.

**Returns:** (optional) Analytics Module Description (`analyticsModuleDescription`). (optional) Maximum number of concurrent modules per configuration (`limit`). (optional) Analytics Configurations token (`analyticsConfToken`). (optional) List of SimpleItemDescription/ElementItemDescription elements that do not have options (`itemListDescription`).

**Procedure:**

1. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters
   
   • `out analyticsConfList` - a list of Analytics configurations
2. For each Analytics Configuration `analyticsConf` in `analyticsConfList` repeat the following steps:

2.1. Set `analyticsConf.token` := `analyticsConfToken`.

2.2. ONVIF Client retrieves a list of supported analytics modules by following the procedure mentioned in Annex A.17 with the following input and output parameters

- in `analyticsConfToken` - a token of Analytics Configuration
- out `supportedAnalyticsModules` - supported analytics modules.

2.3. Set `supportedAnalyticsModules.AnalyticsModuleDescription list` := `analyticsModuleDescriptionList`.

2.4. For each analytics module description (`analyticsModuleDescription`) in `analyticsModuleDescriptionList` repeat the following steps:

2.4.1. ONVIF Client retrieves analytics module options by following the procedure mentioned in Annex A.39 with the following input and output parameters

- in `analyticsConfToken` - token of Analytics Configuration
- in `analyticsModuleDescription.@Name` - type of Analytics Module
- out `analyticsModuleOptionsList` - options list

2.4.2. For each SimpleItemDescription/ElementItemDescription element (`itemDescription`) in `analyticsModuleDescription.Parameters`

2.4.2.1. If `parametersWithOptions` = false

2.4.2.1.1. If `itemDescription.@Type` value corresponds to parameter type values provided in the Annex A.37 and `analyticsModuleOptionsList` does not contain option item with @Name = `itemDescription.@Name`, set `itemListDescription` := `itemListDescription` + `itemDescription`

2.4.2.2. If `parametersWithOptions` = true

2.4.2.2.1. If `itemDescription.@Type` value corresponds to parameter type values provided in the Annex A.37 and `analyticsModuleOptionsList` contains corresponding option item with @Name = `itemDescription.@Name` and its type corresponds to value provided in the Annex A.37, set `itemListDescription` := `itemListDescription` + `itemDescription`

2.4.3. If `itemListDescription` is not empty
2.4.3.1. If `analyticsModuleDescription` does not have `maxInstances` attribute, FAIL the test, restore the DUT state, and skip other steps.

2.4.3.2. Set `limit := supportedAnalyticsModules.@Limit` (if specified).

2.4.3.3. Skip other steps and return to test procedure.

Procedure Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send `GetSupportedAnalyticsModulesResponse` message.

A.39 Get Analytics Module Options

Name: HelperGetAnalyticsModuleOptions

Procedure Purpose: Helper procedure to retrieve analytics module options.

Pre-requisite: Analytics Modules is supported by the DUT. Analytics Module Options is supported by the DUT.

Input: Token of Analytics Configuration (`analyticsConfToken`). (optional) Type of Analytics Module (`analyticsModuleType`).

Returns: Options list (`analyticsModuleOptionsList`).

Procedure:

1. ONVIF Client invokes `GetAnalyticsModuleOptions` request with parameters
   • Type := `analyticsModuleType` if specified, otherwise skipped.
   • ConfigurationToken := `analyticsConfToken`

2. DUT responds with `GetAnalyticsModuleOptionsResponse` message with parameters
   • Options list = `analyticsModuleOptionsList`

Procedure Result:

PASS –
DUT passes all assertions.

FAIL –

DUT did not send `GetAnalyticsModuleOptionsResponse` message.

A.40 Device Configuration For Modify Module

**Name:** HelperDeviceConfigurationForModifyModule

**Procedure Purpose:** Helper procedure to select or create analytics module with specified type.

**Pre-requisite:** Analytics Modules is supported by the DUT.

**Input:** Token of Analytics Configuration (`analyticsToken`), Analytics Module Description (`analyticsModuleDescription`).

**Returns:** Analytics Module with required type `analyticsModule1`.

**Procedure:**

1. ONVIF Client retrieves a set of analytics modules assigned of Analytics Configuration by following the procedure mentioned in Annex A.20 with the following input and output parameters

   - in `analyticsToken` - a token of Analytics Configuration
   - out `analyticsModuleList` - analytics module list

2. If `analyticsModuleList` contains AnalyticsModule item with @Type = `analyticsModuleDescription`.@Name

   2.1. Set `analyticsModule1 := AnalyticsModule item with @Type = analyticsModuleDescription.@Name from analyticsModuleList`
   
   2.2. Return to test procedure.

3. If `analyticsModuleList` does not contain AnalyticsModule item with @Type = `analyticsModuleDescription`.@Name and `analyticsModuleDescription`.fixed = true, FAIL the test and skip other steps.

4. ONVIF Client creates new analytics module with Type = `analyticsModuleDescription`.@Name:

   4.1. ONVIF Client prepares free space for adding of new analytics module with required type into the Analytics Configuration by following the procedure mentioned in Annex A.18 with the following input and output parameters
• in analyticsToken - a token of Analytics Configuration

• in analyticsModuleDescription.@Name - analytics module type

• in analyticsModuleDescription.@maxInstances - maximum number of instances per configuration

• in limit (optional) - maximum number of concurrent modules per configuration

• out moduleToRestore (optional) - analytics module to restore

4.2. Set moduleName := generated random string.

4.3. ONVIF Client creates new analytics module by following the procedure mentioned in Annex A.22 with the following input and output parameters

• in analyticsToken - a token of Analytics Configuration

• in moduleName - analytics module name

• in analyticsModuleDescription.@Name - analytics module type

4.4. ONVIF Client retrieves a set of analytics modules assigned of Analytics Configuration by following the procedure mentioned in Annex A.20 with the following input and output parameters

• in analyticsToken - a token of Analytics Configuration

• out analyticsModuleList - analytics module list

4.5. If analyticsModuleList does not contain AnalyticsModule with @Type = analyticsModuleDescription.@Name and with @Name = moduleName, FAIL the test.

4.6. Set analyticsModule1 := AnalyticsModule with @Type = analyticsModuleDescription.@Name and with @Name = moduleName from analyticsModuleList.

Procedure Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send GetAnalyticsModuleOptionsResponse message.
A.41 Select Rule Description To Modify

**Name:** HelperSelectRuleDescriptionToModify

**Procedure Purpose:** Helper procedure to select Rules Description that has parameter without corresponding option or that has parameter with corresponding option.

**Pre-requisite:** Media2 Service is received from the DUT. Rules is supported by the DUT. Rule Options is supported by the DUT.

**Input:** Flag shows if parameters of selected Rule have corresponding options parametersWithOptions.

**Returns:** (optional) Rule Description (ruleDescription). (optional) Maximum number of concurrent rules per configuration (limit). (optional) Analytics Configurations token (analyticsConfToken). (optional) List of SimpleItemDescription/ElementItemDescription elements that do not have options (itemListDescription).

**Procedure:**

1. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters
   - out analyticsConfList - a list of Analytics configurations

2. For each Analytics Configuration analyticsConf in analyticsConfList repeat the following steps:

   2.1. Set analyticsConf.token =: analyticsConfToken.

   2.2. ONVIF Client retrieves a list of supported rules by following the procedure mentioned in Annex A.29 with the following input and output parameters
       - in analyticsConfToken - a token of Analytics Configuration
       - out supportedRules - supported rules.

   2.3. Set supportedRules.RuleDescription list =: ruleDescriptionList

   2.4. For each rule description (ruleDescription) in ruleDescriptionList repeat the following steps:

       2.4.1. ONVIF Client retrieves rule options by following the procedure mentioned in Annex A.3 with the following input and output parameters
           - in analyticsConfToken - token of Analytics Configuration
2.4.2. For each `SimpleItemDescription/ElementItemDescription` element (itemDescription) in `ruleDescription.Parameters`

2.4.2.1. If `parametersWithOptions = false`

2.4.2.1.1. If `itemDescription.@Type` value corresponds to parameter type values provided in the Annex A.37 and `ruleOptionsList` does not contain option item with `@Name = itemDescription.@Name`, set `itemListDescription := itemListDescription + itemDescription`

2.4.2.2. If `parametersWithOptions = true`

2.4.2.2.1. If `itemDescription.@Type` value corresponds to parameter type values provided in the Annex A.37 and `ruleOptionsList` contains corresponding option item with `@Name = itemDescription.@Name` and its type corresponds to value provided in the Annex A.37, set `itemListDescription := itemListDescription + itemDescription`

2.4.3. If `itemListDescription` is not empty

2.4.3.1. If `ruleDescription` does not have `maxInstances` attribute, FAIL the test, restore the DUT state, and skip other steps.

2.4.3.2. Set `limit := supportedRules.@Limit (if specified)`.

2.4.3.3. Skip other steps and return to test procedure.

Procedure Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send `GetSupportedRulesResponse` message.

A.42 Device Configuration For Modify Rule

Name: HelperDeviceConfigurationForModifyRule

Procedure Purpose: Helper procedure to select or create rule with specified type.
**Pre-requisite:** Rules is supported by the DUT.

**Input:** Token of Analytics Configuration (analyticsToken). Rule Description (ruleDescription).

**Returns:** Rule with required type rule1.

**Procedure:**

1. ONVIF Client retrieves a set of rules assigned of Analytics Configuration by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - in analyticsToken - a token of Analytics Configuration
   - out ruleList - rule list
2. If ruleList contains Rule item with @Type = ruleDescription.@Name
   2.1. Set rule1 := Rule item with @Type = ruleDescription.@Name from ruleList
   2.2. Return to test procedure.
3. If ruleList does not contain Rule item with @Type = ruleDescription.@Name and ruleDescription.fixed = true, FAIL the test and skip other steps.
4. ONVIF Client creates new rule with Type = ruleDescription.@Name:
   4.1. ONVIF Client prepares free space for adding of new rule with required type into the Analytics Configuration by following the procedure mentioned in Annex A.30 with the following input and output parameters
      - in analyticsToken - a token of Analytics Configuration
      - in ruleDescription.@Name - rule type
      - in ruleDescription.@maxInstances - maximum number of instances per configuration
      - in limit (optional) - maximum number of concurrent rules per configuration
      - out ruleToRestore (optional) - rule to restore
   4.2. Set ruleName := generated random string.
   4.3. ONVIF Client creates new rule by following the procedure mentioned in Annex A.32 with the following input and output parameters
      - in analyticsToken - a token of Analytics Configuration
      - in ruleName - rule name
4.4. ONVIF Client retrieves a set of rules assigned of Analytics Configuration by following the procedure mentioned in Annex A.5 with the following input and output parameters

- in `analyticsToken` - a token of Analytics Configuration
- out `ruleList` - rule list

4.5. If `ruleList` does not contain Rule with `@Type = ruleDescription.@Name` and with `@Name = ruleName`, FAIL the test.

4.6. Set `rule1 := Rule with @Type = ruleDescription.@Name` and with `@Name = ruleName` from `ruleList`.

Procedure Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send `GetRuleOptionsResponse` message.

A.43 Profile Configuration With Specific Rule Type

**Name:** HelperProfileConfigurationWithSpecificRuleType

**Procedure Purpose:** Helper procedure to select or configure media profile with Analytics Configuration that contains rule with specified type.

**Pre-requisite:** Media2 Service is supported by the DUT. Rules is supported by the DUT.

**Input:** Rule Type (`ruleType`).

**Returns:** Token of the video source (`videoSourceToken`). Name of the rule present in the media profile (`ruleName`). Analytics Configuration token present in the media profile (`analyticsToken`). Removed rule to restore (`ruleToRestore`). Created rule to restore (`ruleNameToDelete`).

**Procedure:**

1. ONVIF Client tries to find media profile that contains rule with Type = `ruleType` by following the procedure mentioned in Annex A.44 with the following input and output parameters

- in `ruleType` - required Rule Type
2. If profile was returned at step 1.

2.1. Set $\text{videoSourceToken} := \text{profile}.\text{Configurations}.\text{VideoSource}.@\text{token}$. 

2.2. Set $\text{ruleName} := \text{profile}.\text{Configurations}.\text{Analytics}.\text{RuleEngineConfiguration}.\text{Rule}[N].@\text{Name}$, where Rule$[N]$ is the 1st Rule with @Type = $\text{ruleType}$. 

2.3. Set $\text{analyticsToken} := \text{profile}.\text{Configurations}.\text{Analytics}.@\text{token}$. 

2.4. Return to test procedure.

3. ONVIF Client tries to find existing rule with Type = $\text{ruleType}$ by following the procedure mentioned in Annex A.45 with the following input and output parameters

- in $\text{ruleType}$ - required Rule Type
- (optional) out $\text{rule}$ - Rule
- (optional) $\text{analyticsToken}$ - Analytics Configuration token

4. If $\text{rule}$ was returned at step 3.

4.1. ONVIF Client configures media profile with Analytics Configuration by following the procedure mentioned in Annex A.4 with the following input and output parameters

- in $\text{analyticsToken}$ - token of Analytics configuration.
- out $\text{profile}$ - media profile.

4.2. Set $\text{videoSourceToken} := \text{profile}.\text{Configurations}.\text{VideoSource}.@\text{token}$. 

4.3. Set $\text{ruleName} := \text{profile}.\text{Configurations}.\text{Analytics}.\text{RuleEngineConfiguration}.\text{Rule}[N].@\text{Name}$, where Rule$[N]$ is the 1st Rule with @Type = $\text{ruleType}$. 

4.4. Return to test procedure.

5. ONVIF Client configures device for adding of new rule with required type by following the procedure mentioned in Annex A.34 with the following input and output parameters

- in $\text{ruleType}$ - Rule type
- out $\text{nonFixedRuleSupported}$ - Indication of non-fixed Rule support
• out analyticsToken - a token of Analytics Configuration

• out ruleToRestore - a rule to restore, if it was removed

• out profile - media profile with Analytics Configuration

6. If nonFixedRuleSupported = false, FAIL the test and skip other steps.


9. Set ruleName := generated random string.

10. ONVIF Client creates new rule by following the procedure mentioned in Annex A.32 with the following input and output parameters

   • in analyticsToken - a token of Analytics Configuration

   • in ruleName - rule name

   • in ruleType - rule type

11. Set ruleNameToDelete := ruleName.

Procedure Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send GetRuleOptionsResponse message.

A.44 Select Profile With Specific Rule Type

Name: HelperSelectProfileWithSpecificRuleType

Procedure Purpose: Helper procedure to select existing Media Profile that contains Analytics Configuration with required rule type.

Pre-requisite: Media2 Service is received from the DUT. Analytics is supported by the DUT.

Input: Required Rule Type (ruleType).
Returns: Media Profile (profile) that contains Video Source Configuration, and Analytics Configuration with rule with required type.

Procedure:

1. ONVIF Client invokes GetProfiles request with parameters
   - Token skipped
   - Type[0] := VideoSource
   - Type[1] := Analytics

2. The DUT responds with GetProfilesResponse message with parameters
   - Profiles list =: profileList

3. For each Media Profile (profile) in profileList with Configuration.Analytics repeat the following steps:
   3.1. If profile.Configuration.Analytics contains RuleEngineConfiguration.Rule with @Type = ruleType
   3.1.1. If profile contains Configuration.VideoSource, skip other steps and return to test procedure.
   3.1.2. ONVIF Client invokes GetVideoSourceConfigurations request with parameters
         - ConfigurationToken skipped
         - ProfileToken := profile.@token
   3.1.3. The DUT responds with GetVideoSourceConfigurationsResponse message with parameters
         - Configurations list =: vscList
   3.1.4. If vscList is empty, FAIL the test and skip other steps.
   3.1.5. ONVIF Client invokes AddConfiguration request with parameters
         - ProfileToken := profile.@token
         - Name skipped
         - Configuration[0].Type := VideoSource
         - Configuration[0].Token := vscList[0].@token
3.1.6 The DUT responds with `AddConfigurationResponse` message.

3.1.7 Skip other steps and return to test procedure.

Procedure Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT did not send `GetProfilesResponse` message.
• DUT did not send `GetVideoSourceConfigurationsResponse` message.
• DUT did not send `AddConfigurationResponse` message.

A.45 Select Existing Rule With Specific Type

Name: HelperSelectExistingRuleWithSpecificType

Procedure Purpose: Helper procedure to find existing rule with required type.

Pre-requisite: Analytics Service is received from the DUT. Rule Engine is supported by the DUT.

Input: Rule Type (`ruleType`).


Procedure:

1. ONVIF Client retrieves a list of Analytics Configurations by following the procedure mentioned in Annex A.1 with the following input and output parameters
   • out `analyticsConfList` - a list of Analytics configurations

2. For each Analytics Configuration `analyticsConf` in `analyticsConfList` repeat the following steps:

   2.1. ONVIF Client retrieves a set of rules related to Analytics Configuration by following the procedure mentioned in Annex A.5 with the following input and output parameters
       • in `analyticsConf.@token` - a token of Analytics Configuration
       • out `ruleList` - rule list
2.2. If `ruleList` contains Rule with @Type = `ruleType`

   2.2.1. Set `rule` := Rule with @Type = `ruleType` from `ruleList`.

   2.2.2. Set `analyticsToken` := `analyticsConf`.@token.

   2.2.3. Skip other steps and return to the test procedure.

Procedure Result:

PASS –

   • DUT passes all assertions.

FAIL –

   • None.

A.46 Rule Engine Message Format Verification

Name: HelperRuleEngineMessageFormatVerification

Procedure Purpose: Helper procedure to verify rule engine message format.

Pre-requisite: None.

Input: Message to be verified (`message`).

Returns: None.

Procedure:

1. If `message` does not contain Source.SimpleItemDescription item with Name = "VideoSource", FAIL the test and skip other steps.

2. If `message`.Source.SimpleItemDescription with Name = "VideoSource" does not have Type = "tt:ReferenceToken", FAIL the test and skip other steps.

3. If `message`.Source contains SimpleItemDescription with Name = "AnalyticsConfiguration" and its Type != "tt:ReferenceToken", FAIL the test and skip other steps.

4. If `message` does not contain Source.SimpleItemDescription item with Name = "Rule", FAIL the test and skip other steps.

5. If `message`.Source.SimpleItemDescription with Name = "Rule" does not have Type = "xs:string", FAIL the test and skip other steps.
Procedure Result:

PASS –

• DUT passes all assertions.

FAIL –

• DUT does not pass all assertions.