

ONVIF® Analytics Client Test Specification

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REVISION HISTORY

Vers.	Date	Description	
19.06	Jun 17, 2019	The following was done according to #309:	
		'Validated Feature' section for each feature updated to be synchronized with feature ID used in feature list.	
		'Feature Under Test' section for each test case updated to be synchronized with sub-feature ID used in feature list.	
		'Validated Feature List' test case section removed.	
18.12	Aug 10, 2018	DELETE MOTION REGION DETECTOR RULE added according to #275	
18.06	Jun 21, 2018	Reformatting document using new template	
18.06	Apr 05, 2018	'Required Number of Devices Summary' Annex added according to #241	
18.06	Feb 14, 2018	The following were updated in the scope of #241:	
		Feature Level Requirement (updated with new rules)	
		Each Feature Level Requirement (updated with Check Condition based on Device Features and Required Number of Devices)	
17.06	Jun 15, 2017	The following test cases added accoring to #201:	
		Motion Detection Test Cases	
17.06	Jun 14, 2017	First issue of Analytics Client Test Specification.	
		The following test cases added accoring to #201:	
		Get Supported Rules Test Cases	
		Get Rules Test Cases	



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

This particular document defines test cases required for testing Analytics features of a Client application e.g. Get Supported Rules, Get Rules, Create Rules, Motion Region Detector rule configuration and Motion Region Detecto event notification. It also describes the test framework, test setup, prerequisites, test policies needed for the execution of the described test cases.

1.1 Scope

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

The principal intended purposes are:

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

This specification does not address the following:

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

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

1.2 Get Supported Rules

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Get Supported Rules section specifies Client ability to retrieve supported rules.



1.3 Get Rules

Get Rules section specifies Client ability to retrieve available rules.

1.4 Motion Detection

Motion Detection section specifies Client ability to create Motion Region Detector rules and to receive notifications of Motion Region Detector events.

2 Normative references

· ONVIF Conformance Process Specification:

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

· ONVIF Profile Policy:

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

ONVIF Core Specifications:

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

· ONVIF Core Client Test Specification:

https://www.onvif.org/profiles/conformance/client-test/

• ONVIF Profile T Specification:

https://www.onvif.org/profiles/profile-t/

· ONVIF Analytics Service Specification:

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

ISO/IEC Directives, Part 2, Annex H:

www.iso.org/directives

• ISO 16484-5:2014-09 Annex P:

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

W3C SOAP 1.2, Part 1, Messaging Framework:

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

W3C XML Schema Part 1: Structures Second Edition:

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

W3C XML Schema Part 2: Datatypes Second Edition:

"http://www.w3.org/TR/xmlschema-2/ [http://www.w3.org/TR/xmlschema-2/]

• W3C Web Services Addressing 1.0 – Core:

http://www.w3.org/TR/ws-addr-core/

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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.

Address An address refers to a URI.

Profile See ONVIF Profile Policy.

ONVIF Device Computer appliance or software program that exposes one or

multiple ONVIF Web Services.

ONVIF Client Computer appliance or software program that uses ONVIF

Web Services.

Conversation A Conversation is all exchanges between two MAC

addresses that contains SOAP request and response.

Network A network is an interconnected group of devices

communicating using the Internet protocol.

Network Trace Capture file Data file created by a network protocol analyzer software

(such as Wireshark). Contains network packets data recorded

during a live network communications.

Media Profile A media profile maps a video and/or audio source to a video

and/or an audio encoder, PTZ and analytics configurations.

SOAP is a lightweight protocol intended for exchanging

structured information in a decentralized, distributed environment. It uses XML technologies to define an extensible messaging framework providing a message construct that can be exchanged over a variety of underlying

protocols.

Client Test Tool ONVIF Client Test Tool that tests ONVIF Client

implementation towards the ONVIF Test Specification set.

Valid Device Response Device has responded to specific request with code HTTP or

RTSP 200 OK and SOAP fault message has not appeared.

3.3 Abbreviations

This section describes abbreviations used in this document.

HTTP Hyper Text Transport Protocol.

HTTPS Hyper Text Transport Protocol over Secure Socket Layer.



URI Uniform Resource Identifier.

WSDL Web Services Description Language.

XML eXtensible Markup Language.

3.4 Namespaces

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

Table 3.1. Defined namespaces in this specification

Prefix	Namespace URI	Description
soapenv	http://www.w3.org/2003/05/soap- envelope	Envelope namespace as defined by SOAP 1.2 [SOAP 1.2, Part 1]
tt	http://www.onvif.org/ver10/schema	ONVIF XML schema descriptions
axt	http://www.onvif.org/ver20/analytics/ wsdl	The namespace for the WSDL Analytics service
tns1	http://www.onvif.org/ver10/topics	The namespace for the ONVIF topic namespace



4 Test Overview

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

An ONVIF Client with Analytics features supports and with Motion Region Detector rule support can retrieve available Rules, create tt:MotionRegionDetector rule, and receive notifications of Motion Region Detector events.

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

4.1 General

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

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

4.1.1 Feature Level Requirement

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

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

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

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

4.1.2 Expected Scenarios Under Test

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



4.1.3 Test Cases

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

Each Test Case contains the following parts:

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

4.2 Test Setup

Collect Network traces files required by the test cases.

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

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

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

4.3 Prerequisites

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

The Device shall be configured with an IPv4 address.



The Device shall be able to be discovered by the Client.



5 Get Supported Rules Test Cases

5.1 Feature Level Requirement:

Validated Feature: Get Supported Rules (GetSupportedRules)

Check Condition based on Device Features: Media 2 Service and Rule Engine is supported by Device.

Required Number of Devices: 1

Profile T Requirement: Conditional

5.2 Expected Scenarios Under Test:

- 1. Client connects to Device to retrieve supported Rules using the **GetSupportedRules** operation.
- 2. Client is considered as supporting Get Supported Rules if the following conditions are met:
 - Client is able to retrieve supported Rules using the **GetSupportedRules** operation.
- 3. Client is considered as NOT supporting Get Supported Rules if ANY of the following is TRUE:
 - No valid device response to GetSupportedRules request.

5.3 GET SUPPORTED RULES

Test Label: Get Supported Rules

Test Case ID: GETSUPPORTEDRULES-1

Feature Under Test: Get Supported Rules (GetSupportedRules GetSupportedRulesRequest)

Profile T Normative Reference: Conditional

Test Purpose: To verify that Client is able to retrieve supported rules using the **GetSupportedRules** operation.

Pre-Requisite:

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



• Device supports Rule Engine (RuleEngine).

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

- Client invokes GetSupportedRules request message to retrieve supported Rules from the Device.
- 2. Device responds with code HTTP 200 OK and GetSupportedRulesResponse message.

Test Result:

PASS -

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

FAIL -

· The Client failed PASS criteria.



6 Get Rules Test Cases

6.1 Feature Level Requirement:

Validated Feature: Get Rules (GetRules)

Check Condition based on Device Features: Media 2 Service and Rule Engine is supported by

Device.

Required Number of Devices: 1

Profile T Requirement: Conditional

6.2 Expected Scenarios Under Test:

- 1. Client connects to Device to retrieve available Rules using the **GetRules** operation.
- 2. Client is considered as supporting Get Rules if the following conditions are met:
 - Client is able to retrieve available Rules using the **GetRules** operation.
- 3. Client is considered as NOT supporting Get Rules if ANY of the following is TRUE:
 - · No valid device response to GetRules request.

6.3 GET RULES

Test Label: Get Rules

Test Case ID: GETRULES-1

Feature Under Test: Get Rules (GetRules_GetRulesRequest)

Profile T Normative Reference: Conditional

Test Purpose: To verify that Client is able to retrieve available rules using the **GetRules** operation.

Pre-Requisite:

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- The Network Trace Capture files contains at least one conversation between Client and Device with GetRules operation present.
- · Device supports Rule Engine (RuleEngine).

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



- 1. Client invokes GetRules request message to retrieve available Rules from the Device.
- 2. Device responds with code HTTP 200 OK and **GetRulesResponse** message.

Test Result:

PASS -

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

FAIL -

· The Client failed PASS criteria.



7 Motion Detection Test Cases

7.1 Feature Level Requirement:

Validated Feature: Motion Detection (MotionDetection)

Check Condition based on Device Features: Media 2 Service and Rule Engine and Rule Options

and Motion Region Detector Rule is supported by Device.

Required Number of Devices: 1

Profile T Requirement: Conditional

7.2 Expected Scenarios Under Test:

- 1. Client connects to Device to retrieve available Rules using the **GetRules** and **GetSupportedRules** operations.
- 2. Client creates Rules of type **tt:MotionRegionDetector** using the **GetRuleOptions** and **CreateRules** operations.
- 3. Client deletes Rules of type tt:MotionRegionDetector using the DeleteRules operations.
- 4. Client subscribes to device messages using **CreatePullPointSubscription** operation to get **Motion Region Detector** notifications.
- 5. Client is considered as supporting Motion Detection if the following conditions are met:
 - Client supports Get Supported Rules feature AND
 - Client supports Get Rules feature AND
 - Client supports **EventHandling_Pullpoint** feature AND
 - Client is able to retrieve options of Rules of type tt:MotionRegionDetector using GetRuleOptions operation AND
 - Client is able to create Rules of type tt:MotionRegionDetector using CreateRules operation AND
 - Client is able to delete Rules of type tt:MotionRegionDetector using DeleteRules operation AND
 - Client is able to retrieve **tns1:RuleEngine/MotionRegionDetector/Motion** notifications about Motion Region Detector if device supports MotionRegionDetector Rule.



- Client is considered as NOT supporting Motion Detection if ANY of the following is TRUE:
 - Client does not support Get Supported Rules feature OR
 - Client does not support Get Rules feature OR
 - Client does not support EventHandling_Pullpoint feature OR
 - No valid device response to GetRuleOptions request with RuleType value is equal to tt:MotionRegionDetector OR
 - No valid device response to CreateRules request with Rule Type value is equal to tt:MotionRegionDetector OR
 - No valid device response to **DeleteRules** request with Rule Type value is equal to tt:MotionRegionDetector OR
 - Client is not able to retrieve tns1:RuleEngine/MotionRegionDetector/Motion notifications about Motion Region Detector if device supports MotionRegionDetector Rule.

7.3 GET MOTION REGION DETECTOR RULE OPTIONS

Test Label: Get Rule Options

Test Case ID: MOTIONDETECTION-1

Feature Under Test: Get Rule Options (MotionDetection GetRuleOptions)

Profile T Normative Reference: Conditional

Test Purpose: To verify that Client is able to retrieve MotionRegionDetector rule options using the **GetRuleOptions** operation.

Pre-Requisite:

- The Network Trace Capture files contains at least one conversation between Client and Device with GetRuleOptions operation with RuleType value is equal to **tt:MotionRegionDetector** present.
- Device supports Rule Options (RuleOptions).

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

1. Client invokes **GetRuleOptions** request message with RuleType value is equal to **tt:MotionRegionDetector** to retrieve motion region detector rule options from the Device.



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

Test Result:

PASS -

- Client GetRuleOptions request messages are valid according to XML Schemas listed in Namespaces AND
- Client **GetRuleOptions** request in Test Procedure fulfills the following requirements:
 - [S1] soapenv:Body element has child element axt:GetRuleOptions AND
 - [S2] axt:GetRuleOptions element has child element axt:RuleType AND
 - [S3] axt:GetRuleOptions/axt:RuleType element value is equal to tt:MotionRegionDetector AND
- Device response on the **GetRuleOptions** request fulfills the following requirements:
 - [S2] It has HTTP 200 response code AND
 - [S3] soapenv:Body element has child element axt:GetRuleOptionsResponse.

FAIL -

· The Client failed PASS criteria.

7.4 CREATE MOTION REGION DETECTOR RULE

Test Label: Create Rules

Test Case ID: MOTIONDETECTION-2

Feature Under Test: Create Motion Region Detector Rule (MotionDetection CreateRules)

Profile T Normative Reference: Conditional

Test Purpose: To verify that Client is able to create MotionRegionDetector rule using the **CreateRules** operation.

Pre-Requisite:

- The Network Trace Capture files contains at least one conversation between Client and Device with **CreateRules** operation with Rule Type value is equal to **tt:MotionRegionDetector** present.
- Device supports Rule Engine (RuleEngine).

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

- 1. Client invokes **CreateRules** request message with Rule element that has Type value is equal to **tt:MotionRegionDetector** to create motion region detector rule on the Device.
- 2. Device responds with code HTTP 200 OK and CreateRules message.

Test Result:

PASS -

- Client CreateRules request messages are valid according to XML Schemas listed in Namespaces AND
- Client **CreateRules** request in Test Procedure fulfills the following requirements:
 - [S1] soapenv:Body element has child element axt:CreateRules AND
 - [S2] axt:CreateRules element has child element axt:Rule with @Type = tt:MotionRegionDetector AND
- Device response on the **CreateRules** request fulfills the following requirements:
 - [S3] It has HTTP 200 response code AND
 - [S4] soapenv:Body element has child element axt:CreateRulesResponse.

FAIL -

· The Client failed PASS criteria.

7.5 DELETE MOTION REGION DETECTOR RULE

Test Label: Delete Rules

Test Case ID: MOTIONDETECTION-3

Feature Under Test: Delete Rules (MotionDetection_DeleteRules)

Profile T Normative Reference: Conditional

Feature Under Test: Delete Rules

Test Purpose: To verify that Client is able to delete MotionRegionDetector rule using the

DeleteRules operation.

Pre-Requisite:

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- The Network Trace Capture files contains at least one conversation between Client and Device with **DeleteRules** operation present.
- · Device supports Rule Engine (RuleEngine).

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

- Client invokes **DeleteRules** request message with RuleName that corresponds to Rule with tt:MotionRegionDetector Type to delete motion region detector rule on the Device.
- 2. Device responds with code HTTP 200 OK and DeleteRules message.

Test Result:

PASS -

- Client **DeleteRules** request messages are valid according to XML Schemas listed in Namespaces AND
- Client **DeleteRules** request in Test Procedure fulfills the following requirements:
 - [S1] soapenv:Body element has child element axt:DeleteRules AND
 - [S2] axt:DeleteRules contains tr2:RuleName that corresponds to rule with tt:MotionRegionDetector type (see Annex A.2) AND
- Device response on the **DeleteRules** request fulfills the following requirements:
 - [S3] It has HTTP 200 response code AND
 - [S4] soapenv:Body element has child element axt:DeleteRulesResponse.

FAIL -

· The Client failed PASS criteria.



Annex A Test for Appendix A

A.1 Required Number of Devices Summary

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

Table A.1. Required Number of Devices Summary

Feature ID	Feature Name	Required Number of Devices	Check Condition based on Device Features	Check Condition based on Device Features ID
tc.GetSuppor tedRules	Get Supported Rules	1	Media 2 Service and Rule Engine is supported by Device.	Media2Service AND RuleEngine
tc.GetRules	Get Rules	1	Media 2 Service and Rule Engine is supported by Device.	Media2Service AND RuleEngine
tc.MotionDet ection	Motion Detection	1	Media 2 Service and Rule Engine and Rule Options and Motion Region Detector Rule is supported by Device.	Media2Servic e AND RuleEngine AND RuleOptions AND MotionRegion DetectorRule

A.2 Define rule type corresponding to Rule Name

Name: HelperDefineTypeCorrespondingToRuleName

Procedure Purpose: Define rule type corresponding to Rule Name.

Pre-requisite:

• The Network Trace Capture files contains at least one Conversation between Client and Device with **GetRules** or **CreateRules** operations present.

Input: Delete Rules request (deleteRules), Rule Name (ruleName)

Returns: Rule Type (ruleType).



Annex Procedure:

- The Client Test Tool checks that there is Client **CreateRules** request or Device **GetRulesResponse** in Test Procedure that fulfills the following requirements:
 - [S1] It is invoked before deleteRules request AND
 - If CreateRules request was found during previous steps:
 - [S2] axt:CreateRules/axt:ConfigurationToken value is equal to axt:ConfigurationToken value in deleteRules AND
 - [S3] CreateRules has axt:Rule element (rule1) with @Name value is equal to ruleName
 AND
 - Device response on the **CreateRules** request fulfills the following requirements:
 - [S4] It has HTTP 200 response code AND
 - [S5] soapenv:Body element has child element axt:CreateRulesResponse AND

If **GetRulesResponse** was found during previous steps:

- [S6] It has **tr2:Rule** element (rule2) with **@Name** value is equal to ruleName AND
- [S7] It has HTTP 200 response code AND
- [S8] soapenv:Body element has child element axt:GetRulesResponse AND
- [S9] **GetRules** request fulfills the following requirements:
 - [S10] axt:GetRules/axt:ConfigurationToken value is equal to axt:ConfigurationToken value in *deleteRules* AND
- [S11] It is the closest one preceding *deleteRules* request that fullfils ([S2] and [S3]) or ([S4] and [S5]) requirements AND
- The Client Test Tool checks if there is **ModifyRules** command that fulfills the following requirements:
 - [S12] It invoked after operation detected at previous steps (CreateRules OR GetRulesResponse) AND
 - [S13] It is the closest one preceding the deleteRules request AND
 - [S14] axt:ModifyRules/axt:ConfigurationToken value is equal to axt:ConfigurationToken value in deleteRules request AND



- [S15] ModifyRules has tr2:Rule element (rule3) with @Name value is equal to ruleName
 AND
- Device response on the **ModifyRules** request fulfills the following requirements:
 - [S16] It has HTTP 200 response code AND
 - [S17] soapenv:Body element has child element axt:ModifyRulesResponse AND
- [S18] IF **ModifyRules** command was detected during previous steps then *ruleType* = *rule3*.@Type
- [S19] ELSE IF **GetRulesResponse** response was found during previous steps then *ruleType* = *rule2*.@Type
- [S20] ELSE IF **CreateRules** request was found during previous steps then *ruleType* = *rule1*.@Type