ONVIF®

Receiver Device Test Specification

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REVISION HISTORY

Vers.	Date	Description
12.12	Dec 20, 2012	First issue of Receiver Test Specification
13.06	Jun, 2013	Update with spelling and typos fixes.
13.12	Dec, 2013	RECEIVER-2-1-14 CONFIGURE RECEIVER test was replaced with RECEIVER-2-1-20 CONFIGURE RECEIVER RECEIVER-2-1-15 CONFIGURE RECEIVER – PERSISTENCE test was replaced with RECEIVER-2-1-21 CONFIGURE RECEIVER – PERSISTENCE
18.06	Jun, 2018	Reformatting document using new template.
19.06	Mar, 2019	The following were updated in the scope of #1793: Test Sequences were removed from test cases. RECEIVER-2-1-6 CREATE RECEIVER (new pre-requisite was added) RECEIVER-2-1-7 CREATE RECEIVER – PERSISTENCE (new pre-requisite was added) RECEIVER-2-1-9 DELETE RECEIVER (new pre-requisite was added)
20.06	Dec 18, 2019	The following were updated in the scope of #1434: Reformatting document using new template and format.
20.06	May 13, 2020	Pre-Requisite of the following test cases updated with adding of Pull-Point Notification feature according to #1999: RECEIVER-2-1-16 CONFIGURE RECEIVER – (RTP-Unicast/UDP) RECEIVER-2-1-17 CONFIGURE RECEIVER – (RTP/RTSP/TCP) RECEIVER-2-1-18 CONFIGURE RECEIVER – INVALID MEDIA URIT

Table of Contents

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 DeviceIO Service Specs] and [ONVIF Conformance] requirements. It also describes the test framework, test setup, pre-requisites, test policies needed for the execution of the described test cases.

This ONVIF Receiver Test Specification acts as a supplementary document to the [ONVIF Network Interface Specs], illustrating test cases that need to be executed and passed. Also this specification acts as an input document to the development of a 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 Receiver Test Specification defines and regulates the conformance testing procedure for the ONVIF conformant devices. Conformance testing is meant to be functional black-box testing. The objective of this specification is to provide the test cases to test individual requirements of ONVIF devices according to ONVIF core services which are defined in [ONVIF Network Interface Specs].

The principal intended purposes are:

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

This specification does not address the following:

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

The set of ONVIF Test Specification will not cover the complete set of requirements as defined in [ONVIF Network Interface Specs]; instead it would cover subset of it. The scope of this specification is to derive all the normative requirements of [ONVIF DeviceIO Service Specs] which are related to ONVIF Device IO Service and some of the optional requirements.

This ONVIF Receiver Test Specification covers ONVIF Receiver service which is a functional block of [ONVIF Network Interface Specs]. The following sections describe the brief overview and scope of each functional block.

1.1.1 Capabilities

Capabilities test cases are covered for verification to get Receiver Service capabilities. It means that GetServices and GetServiceCapabilities commands are covered by this test case.

1.1.2 General

General covers the test cases needed for the verification of receiver features as mentioned in [ONVIF Network Interface Specs]. General section defines different receiver test for getting of information about current receivers configuration and basic configuration of receivers.

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 Specifications:

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

- [ONVIF Receiver Service Specs] ONVIF Receiver Specifications:

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

- [ONVIF Base Test] ONVIF Base Device Test Specification:

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

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

  http://www.iso.org/directives

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

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

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

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

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

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

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

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

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

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

3 Terms and Definitions

3.1 Conventions

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

3.2 Definitions

This section defines terms that are specific to the ONVIF Receiver Service and tests. For the list of applicable general terms and definitions, please see [ONVIF Base Test].

Metadata All streaming data except video and audio, including video analytics results, PTZ position data and other metadata (such as textual data from POS applications).

3.3 Abbreviations

This section describes abbreviations used in this document.

DUT	Device Under Test
HTTP	Hyper Text Transport Protocol
RTCP	RTP Control Protocol
RTSP	Real Time Streaming Protocol
RTP	Real-time Transport Protocol
SDP	Session Description Protocol
TCP	Transport Control Protocol
UTC	Coordinated Universal Time
UDP	User Datagram Protocol
URI	Uniform Resource Identifier
WSDL	Web Services Description Language
WS-I BP 2.0	Web Services Interoperability Basic Profile version 2.0
XML	eXtensible Markup Language

4 Test Overview

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

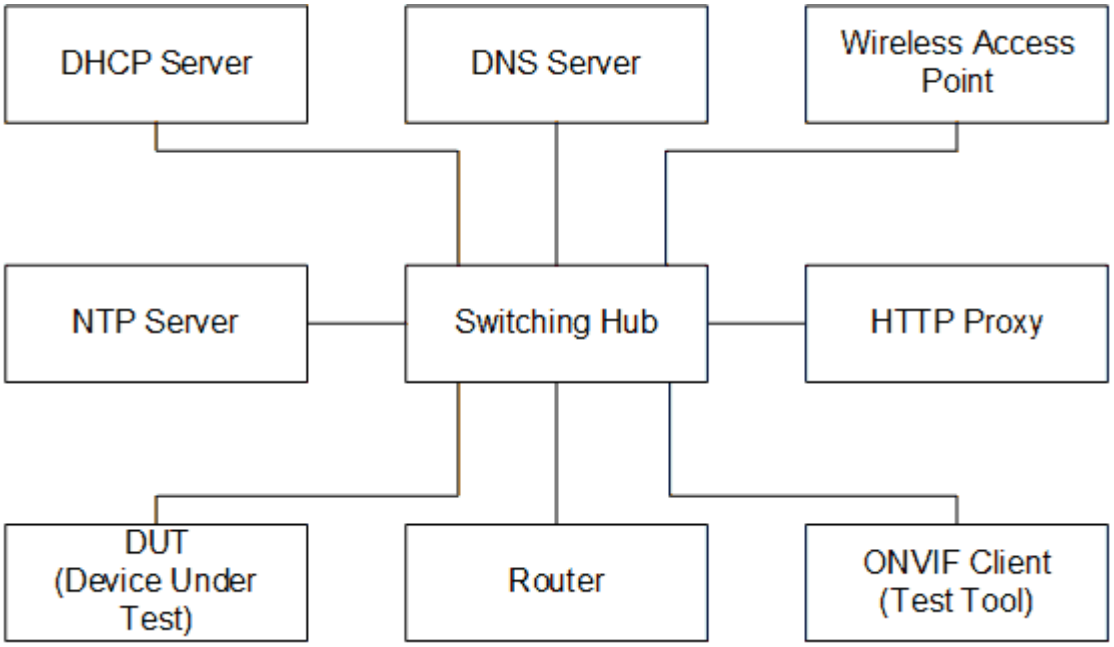
4.1 Test Setup

4.1.1 Network Configuration for DUT

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

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

Figure 4.1. Test Configuration for DUT



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

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

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

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

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

DHCP Server: provides IPv4 Address to the connected devices.

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

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

Router: provides router advertisements for IPv6 configuration.

4.2 Prerequisites

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

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 a common NTP server.
6. All receivers shall not be used or there shall be free space to create new receiver.

4.3 Test Policy

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

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

4.3.1 Capabilities

The device under test shall demonstrate receiver service capability in GetServices and GetServiceCapabilities responses. A DUT that does not display receiver service capability constitutes failure of test procedure.

Please refer to Section 5.1 for Capabilities Test Cases.

4.3.2 General

The DUT shall give the Receiver Service entry point by GetServices command.

Please refer to Section 5.2 for General Test Cases.

4.4 Authentication Method Selection as a Testing Framework

According to later version of [ONVIF Network Interface Specs], it requires ONVIF client to support both HTTP digest and WS-UsernameToken functionality as authentication functionality. Therefore, ONVIF Client (ONVIF Device Test Tool in this context) as a testing framework shall properly select authentication method between the two based on the response from DUT toward specific request. The following is the deterministic procedure on which authentication method is to be selected.

Procedure:

1. ONVIF Client invokes a specific command which is under testing without any user credentials (no WS-UsernameToken, no HTTP digest authentication header).
2. If DUT returns correct response, then ONVIF Client determines that DUT does not require any user authentication toward the command according to the configured security policy.
3. If DUT returns HTTP 401 Unauthorized error along with WWW-Authentication: Digest header, then ONVIF Client determines that DUT supports HTTP digest authentication. ONVIF Client shall provide with the proper level of user credential to continue the test procedure.
4. If the DUT returns SOAP fault (Sender/NotAuthorized) message, then ONVIF Client determines that WS-UsernameToken is supported by DUT. ONVIF Client shall provide with the proper level of user credential to continue the test procedure.

5 Receiver Test Cases

5.1 Capabilities

5.1.1 RECEIVER SERVICE CAPABILITIES

Test Case ID: RECEIVER-1-1-1

Specification Coverage: Capability exchange (ONVIF Core Specification), GetServiceCapabilities (ONVIF Receiver Service Specification), Service (ONVIF Receiver Service Specification)

Feature Under Test: GetServiceCapabilities (for Receiver Service)

WSDL Reference: receiver.wsdl

Test Purpose: To verify DUT Receiver Service Capabilities.

Pre-Requisite: Receiver 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 will invoke **GetServiceCapabilitiesRequest** message to retrieve receiver service capabilities of the DUT.
4. Verify the **GetServiceCapabilitiesResponse** from the DUT.

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetServiceCapabilitiesResponse**.
- The DUT sent Capabitites.MaximumRTSPURILength less than 128.
- The DUT sent Capabitites.SupportedReceivers less than 1.

5.1.2 GET SERVICES AND GET RECEIVER SERVICE CAPABILITIES CONSISTENCY

Test Case ID: RECEIVER-1-1-2

Specification Coverage: Capability exchange (ONVIF Core Specification), GetServiceCapabilities (ONVIF Receiver Service Specification)

Feature Under Test: GetServices, GetServiceCapabilities (for Receiver Service)

WSDL Reference: devicemgmt.wsdl, receiver.wsdl

Test Purpose: To verify Get Services and Receiver Service Capabilities consistency.

Pre-Requisite: None.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will invoke **GetServicesRequest** message (IncludeCapability = true) to retrieve all services of the DUT with service capabilities.
4. Verify the **GetServicesResponse** message from the DUT.
5. ONVIF Client will invoke **GetServiceCapabilitiesRequest** message to retrieve Receiver service capabilities of the DUT.
6. Verify the **GetServiceCapabilitiesResponse** message from the DUT.

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetServicesResponse** message.
- The DUT did not send a valid **GetServiceCapabilitiesResponse** message.
- The DUT sent different Capabilities in **GetServicesResponse** message and in **GetServiceCapabilitiesResponse** message.

Note: Service will be defined as Receiver service if it has Namespace element that is equal to "http://www.onvif.org/ver10/receiver/wsdl".

Note: Capabilities in **GetServicesResponse** message and in **GetServiceCapabilitiesResponse** message will be assumed as different in the following cases:

- RTP_Multicast attribute is skipped only for **GetServicesResponse** message or only for **GetServiceCapabilitiesResponse** message.
- RTP_Multicast attribute values are different.
- RTP_TCP attribute is skipped only for **GetServicesResponse** message or only for **GetServiceCapabilitiesResponse** message.
- RTP_TCP attribute values are different.
- RTP_RTSP_TCP attribute is skipped only for **GetServicesResponse** message or only for **GetServiceCapabilitiesResponse** message.
- RTP_RTSP_TCP attribute values are different.
- SupportedReceivers attribute values are different.
- MaximumRTSPURILength attribute is skipped only for **GetServicesResponse** message or only for **GetServiceCapabilitiesResponse** message.
- MaximumRTSPURILength attribute values are different.

5.2 General

5.2.1 GET RECEIVERS

Test Case ID: RECEIVER-2-1-1

Specification Coverage: GetReceivers (ONVIF Receiver Service Specification)

Feature Under Test: GetReceivers

WSDL Reference: receiver.wsdl

Test Purpose: To verify Get Receivers.

Pre-Requisite: Receiver 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 will invoke **GetReceiversRequest** message to retrieve a complete receivers list.
4. Verify the **GetReceiversResponse** message from the DUT.

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT sent at least two Receivers with the same Receivers.Token in the **GetReceiversResponse** message.

5.2.2 GET RECEIVER

Test Case ID: RECEIVER-2-1-2

Specification Coverage: GetReceiver (ONVIF Receiver Service Specification)

Feature Under Test: GetReceiver

WSDL Reference: receiver.wsdl

Test Purpose: To verify Get Receiver.

Pre-Requisite: Receiver 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 will retrieve a complete receivers list from the DUT and create a new Receiver if the list is empty (see Annex A.2).

4. ONVIF Client will invoke **GetReceiverRequest** message (ReceiverToken = "ReceiverToken1", where ReceiverToken1 is the first Receivers.Token from the **GetReceiversResponse** message at step at step 3) to retrieve receiver configuration.
5. Verify the **GetReceiverResponse** message from the DUT.
6. Repeat steps 5-6 for all other receivers from the **GetReceiversResponse** message at step at step 3.

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT did not send a valid **GetReceiverResponse** message.
- The DUT returned different parameter values for the same receiver in **GetReceiversResponse** message and in **GetReceiverResponse** message (see Annex A.1).

Note: Two Receivers with the same token shall have the same properties.

5.2.3 GET RECEIVER WITH INVALID TOKEN

Test Case ID: RECEIVER-2-1-3

Specification Coverage: GetReceiver (ONVIF Receiver Service Specification)

Feature Under Test: GetReceiver

WSDL Reference: receiver.wsdl

Test Purpose: To verify Get Receiver with invalid Token.

Pre-Requisite: Receiver 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 will retrieve a complete receivers list from the DUT and create a new Receiver if the list is empty (see Annex A.2).
4. ONVIF Client will invoke **GetReceiverRequest** message (invalid ReceiverToken).
5. The DUT will generate SOAP 1.2 fault message (InvalidArgVal/UnknownToken).

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT did not send SOAP 1.2 fault message.
- The DUT sent an incorrect SOAP 1.2 fault message (fault code, namespace, etc.).

Note: Other faults than specified in the test are acceptable, though the specified are preferable.

5.2.4 GET RECEIVER STATE

Test Case ID: RECEIVER-2-1-4

Specification Coverage: GetReceiverState (ONVIF Receiver Service Specification)

Feature Under Test: GetReceiverState

WSDL Reference: receiver.wsdl

Test Purpose: To verify Get Receiver State.

Pre-Requisite: Receiver 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 will retrieve a complete receivers list from the DUT and create a new Receiver if the list is empty (see Annex A.2).
4. ONVIF Client will invoke **GetReceiverStateRequest** message (ReceiverToken = "Token1", where Token1 is the first Receivers.Token from the **GetReceiversResponse** message at step at step 3) to retrieve receiver state.
5. Verify the **GetReceiverStateResponse** message from the DUT.
6. Repeat steps 5-6 for all other receivers from the **GetReceiversResponse** message at step at step 3.

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT did not send a valid **GetReceiverStateResponse** message.

5.2.5 GET RECEIVER STATE WITH INVALID TOKEN

Test Case ID: RECEIVER-2-1-5

Specification Coverage: GetReceiverState (ONVIF Receiver Service Specification)

Feature Under Test: GetReceiverState

WSDL Reference: receiver.wsdl

Test Purpose: To verify Get Receiver State with invalid Token.

Pre-Requisite: Receiver 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 will retrieve a complete receivers list from the DUT and create a new Receiver if the list is empty (see Annex A.2).
4. ONVIF Client will invoke **GetReceiverStateRequest** message (invalid ReceiverToken).
5. The DUT will generate SOAP 1.2 fault message (InvalidArgVal/UnknownToken).

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT did not send SOAP 1.2 fault message.
- The DUT sent an incorrect SOAP 1.2 fault message (fault code, namespace, etc.).

Note: Other faults than specified in the test are acceptable, though the specified are preferable.

5.2.6 CREATE RECEIVER

Test Case ID: RECEIVER-2-1-6

Specification Coverage: GetReceiver (ONVIF Receiver Service Specification), GetReceivers (ONVIF Receiver Service Specification), CreateReceiver (ONVIF Receiver Service Specification)

Feature Under Test: GetReceiver, CreateReceiver, GetReceivers

WSDL Reference: receiver.wsdl

Test Purpose: To verify Create Receiver.

Pre-Requisite: Receiver Service was received from the DUT. All receivers shall not be used or there shall be free space to create new receiver.

Test Configuration: ONVIF Client and DUT

Test Procedure:

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

3. ONVIF Client will invoke **GetServiceCapabilitiesRequest** message to retrieve receiver service capabilities of the DUT.
4. Verify the **GetServiceCapabilitiesResponse** message (Capabilities.SupportedReceivers) from the DUT.
5. ONVIF Client will invoke **GetReceiversRequest** message to retrieve a complete receivers list.
6. Verify the **GetReceiversResponse** message from the DUT.
7. If number of Receivers from **GetReceiversResponse** message is less than specified in Capabilities.SupportedReceivers then skip steps 8-9 and go to step 10
8. ONVIF Client will invoke **DeleteReceiverRequest** message (ReceiverToken = ReceiverToken1) to delete Receiver.
9. Verify the **DeleteReceiverResponse** message from the DUT.
10. ONVIF Client will invoke **CreateReceiverRequest** message (Configuration.Mode = "NeverConnect", Configuration.MediaUri = validUri, Configuration.StreamSetup.Stream = 'RTP-Unicast', Configuration.StreamSetup.Transport.Protocol = 'UDP') to create new Receiver.
11. Verify the **CreateReceiverResponse** message (Token = token2, Configuration.Mode = "NeverConnect", Configuration.MediaUri = validUri, Configuration.StreamSetup.Stream = 'RTP-Unicast', Configuration.StreamSetup.Transport.Protocol = 'UDP') from the DUT. Check that **CreateReceiverResponse** message contains the same parameters values as was sent in **CreateReceiverRequest** message.
12. ONVIF Client will invoke **GetReceiversRequest** message to retrieve a complete receivers list.
13. Verify the **GetReceiversResponse** message (receivers list with new receiver) from the DUT. Check that Receiver was created with specified parameters.
14. ONVIF Client will invoke **GetReceiverRequest** message (Token = token2) to retrieve receiver configuration.
15. Verify the **GetReceiverResponse** message (Token = token2, Configuration.Mode = "NeverConnect", Configuration.MediaUri = validUri, Configuration.StreamSetup.Stream = 'RTP-Unicast', Configuration.StreamSetup.Transport.Protocol = 'UDP') from the DUT. Check that Receiver was created with the specified parameters.

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetServiceCapabilitiesResponse** message.
- The DUT did not send a valid **DeleteReceiverResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT did not send a valid **GetReceiverResponse** message.
- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT sent **GetReceiverResponse** message without created Receiver for step 13.
- The DUT returned Receiver parameters in **GetReceiversResponse** message that differ from the specified during Receiver creation.
- The DUT returned Receiver parameters in **GetReceiverResponse** message that differ from the specified during Receiver creation.
- The DUT returned Receiver parameters in **CreateReceiverResponse** message that differ from the specified during Receiver creation.

Note: If the fault (Action/CannotDeleteReceiver) was received during receiver deletion for step 8, try to delete some other Receiver. If there are no Receivers that could not be deleted, skip steps 10-15 and go to the next test.

5.2.7 CREATE RECEIVER – PERSISTENCE

Test Case ID: RECEIVER-2-1-7

Specification Coverage: CreateReceiver (ONVIF Receiver Service Specification), Persistence (ONVIF Receiver Service Specification)

Feature Under Test: CreateReceiver

WSDL Reference: receiver.wsdl

Test Purpose: To verify Create Receiver Persistence.

Pre-Requisite: Receiver Service was received from the DUT. All receivers shall not be used or there shall be free space to create new receiver.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will invoke **GetServiceCapabilitiesRequest** message to retrieve receiver service capabilities of the DUT.
4. Verify the **GetServiceCapabilitiesResponse** message (Capabilities.SupportedReceivers) from the DUT.
5. ONVIF Client will invoke **GetReceiversRequest** message to retrieve a complete receivers list.
6. Verify the **GetReceiversResponse** message from the DUT.
7. If number of Receivers from **GetReceiversResponse** message is less than specified in Capabilities.SupportedReceivers, then skip steps 8-9 and go to step 10
8. ONVIF Client will invoke **DeleteReceiverRequest** message (ReceiverToken = ReceiverToken1) to delete Receiver.
9. Verify the **DeleteReceiverResponse** message from the DUT.
10. ONVIF Client will invoke **CreateReceiverRequest** message (Configuration.Mode = "NeverConnect", Configuration.MediaUri = validUri, Configuration.StreamSetup.Stream = 'RTP-Unicast', Configuration.StreamSetup.Transport.Protocol = 'UDP') to create new Receiver.
11. Verify the **CreateReceiverResponse** message (Token = token2, Configuration.Mode = "NeverConnect", Configuration.MediaUri = validUri, Configuration.StreamSetup.Stream = 'RTP-Unicast', Configuration.StreamSetup.Transport.Protocol = 'UDP') from the DUT. Check that **CreateReceiverResponse** message contains the same parameters values as was sent in **CreateReceiverRequest** message.
12. ONVIF Client will invoke **SystemReboot** message to reset the DUT.
13. Verify that DUT sends **SystemRebootResponse** message (example message string = "Rebooting in x seconds").
14. DUT will send Multicast **HELLO** message after it is successfully rebooted.
15. ONVIF Client will verify the **HELLO** message sent by DUT.
16. ONVIF Client will invoke **GetReceiversRequest** message to retrieve a complete receivers list.

17. Verify the **GetReceiversResponse** message (receivers list with new receiver) from the DUT. Check that Receiver was created with specified parameters.
18. ONVIF Client will invoke **GetReceiverRequest** message (Token = token2) to retrieve receiver configuration.
19. Verify the **GetReceiverResponse** message (Token = token2, Configuration.Mode = "NeverConnect", Configuration.MediaUri = validUri, Configuration.StreamSetup.Stream = 'RTP-Unicast', Configuration.StreamSetup.Transport.Protocol = 'UDP') from the DUT. Check that Receiver was created with the specified parameters.

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetServiceCapabilitiesResponse** message.
- The DUT did not send a valid **DeleteReceiverResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT did not send a valid **GetReceiverResponse** message.
- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT sent **GetReceiversResponse** message without created Receiver for step 13.
- The DUT returned Receiver parameters in **GetReceiversResponse** message that differ from the specified during Receiver creation.
- The DUT returned Receiver parameters in **GetReceiverResponse** message that differ from the specified during Receiver creation.
- The DUT returned Receiver parameters in **CreateReceiverResponse** message that differ from the specified during Receiver creation.
- The DUT did not send **SystemRebootResponse** message.
- The DUT did not send **HELLO** message.

Note: In case a fault (Action/CannotDeleteReceiver) was received during receiver deletion for step 8, try to delete other Receiver. If there are no Receivers that could not be deleted, skip steps 10-15 and go to the next test.

5.2.8 CREATE RECEIVER – RECEIVERS MAX NUMBER

Test Case ID: RECEIVER-2-1-8

Specification Coverage: GetServiceCapabilities (ONVIF Receiver Service Specification), CreateReceiver (ONVIF Receiver Service Specification)

Feature Under Test: CreateReceiver

WSDL Reference: receiver.wsdl

Test Purpose: To verify that the DUT supports specified maximum number of Receivers.

Pre-Requisite: Receiver 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 will invoke **GetServiceCapabilitiesRequest** message to retrieve receiver service capabilities of the DUT.
4. Verify the **GetServiceCapabilitiesResponse** message (Capabilities.SupportedReceivers) from the DUT.
5. ONVIF Client will invoke **GetReceiversRequest** message to retrieve a complete receivers list.
6. Verify the **GetReceiversResponse** message from the DUT.
7. If the number of Receivers from **GetReceiversResponse** message is equal to number that specified in Capabilities.SupportedReceivers then skip steps 8-9 and go to step 11
8. ONVIF Client will invoke **CreateReceiverRequest** message (Configuration.Mode = "NeverConnect", Configuration.MediaUri = validUri, Configuration.StreamSetup.Stream = 'RTP-Unicast', Configuration.StreamSetup.Transport.Protocol = 'UDP') to create new Receiver.
9. Verify the **CreateReceiverResponse** message (Token = token2, Configuration.Mode = "NeverConnect", Configuration.MediaUri = validUri, Configuration.StreamSetup.Stream = 'RTP-Unicast', Configuration.StreamSetup.Transport.Protocol = 'UDP') from the DUT. Check that **CreateReceiverResponse** message contains the same parameters values as was sent in **CreateReceiverRequest** message.

10. Repeat steps 7-9.
11. ONVIF Client will invoke **CreateReceiverRequest** message.
12. The DUT will generate SOAP 1.2 fault message (Action/MaxReceivers).

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetServiceCapabilitiesResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT did not send a valid **GetReceiverResponse** message.
- The DUT did not send SOAP 1.2 fault message.
- The DUT sent an incorrect SOAP 1.2 fault message (fault code, namespace, etc.).

Note: Other faults than specified in the test are acceptable, though the specified are preferable.

5.2.9 DELETE RECEIVER

Test Case ID: RECEIVER-2-1-9

Specification Coverage: GetReceiver (ONVIF Receiver Service Specification), GetReceivers (ONVIF Receiver Service Specification), DeleteReceiver (ONVIF Receiver Service Specification)

Feature Under Test: GetReceiver, DeleteReceiver, GetReceivers

WSDL Reference: receiver.wsdl

Test Purpose: To verify Delete Receiver.

Pre-Requisite: Receiver Service was received from the DUT. All receivers shall not be used or there shall be free space to create new receiver.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.
3. ONVIF Client will invoke **GetServiceCapabilitiesRequest** message to retrieve receiver service capabilities of the DUT.
4. Verify the **GetServiceCapabilitiesResponse** message (Capabilities.SupportedReceivers) from the DUT.
5. ONVIF Client will invoke **GetReceiversRequest** message to retrieve a complete receivers list.
6. Verify the **GetReceiversResponse** message from the DUT.
7. If the number of Receivers from **GetReceiversResponse** message is equal to what is specified in Capabilities.SupportedReceivers then skip steps 8-9 and go to step 10.
8. ONVIF Client will invoke **CreateReceiverRequest** message (Configuration.Mode = "NeverConnect", Configuration.MediaUri = validUri, Configuration.StreamSetup.Stream = 'RTP-Unicast', Configuration.StreamSetup.Transport.Protocol = 'UDP') to create new Receiver.
9. Verify the **CreateReceiverResponse** message (Token = ReceiverToken2, Configuration.Mode = "NeverConnect", Configuration.MediaUri = validUri, Configuration.StreamSetup.Stream = 'RTP-Unicast', Configuration.StreamSetup.Transport.Protocol = 'UDP') from the DUT. Check that **CreateReceiverResponse** message contains the same parameters values as was sent in **CreateReceiverRequest** message.
10. ONVIF Client will invoke **DeleteReceiverRequest** message (ReceiverToken = ReceiverToken2) to delete Receiver.
11. Verify the **DeleteReceiverResponse** message from the DUT.
12. ONVIF Client will invoke **GetReceiversRequest** message to retrieve a complete receivers list.
13. Verify the **GetReceiversResponse** message from the DUT. Check that Receiver (Token = Token2) was deleted and does not present in response message.
14. ONVIF Client will invoke **GetReceiverRequest** message (Token = ReceiverToken2).
15. The DUT will generate SOAP 1.2 fault message (InalidArgVal/UnknownToken).

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetServiceCapabilitiesResponse** message.
- The DUT did not send a valid **DeleteReceiverResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT did not send a valid **GetReceiverResponse** message.
- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT sent **GetReceiverResponse** message with created Receiver for step 14.
- The DUT did not send SOAP 1.2 fault message for step 15.
- The DUT sent an incorrect SOAP 1.2 fault message (fault code, namespace, etc.).

Note: Other faults than specified in the test are acceptable, though the specified are preferable.

5.2.10 DELETE RECEIVER WITH INVALID TOKEN

Test Case ID: RECEIVER-2-1-10

Specification Coverage: DeleteReceiver (ONVIF Receiver Service Specification)

Feature Under Test: DeleteReceiver

WSDL Reference: receiver.wsdl

Test Purpose: To verify Delete Receiver with invalid Token.

Pre-Requisite: Receiver Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. ONVIF Client will retrieve a complete receivers list from the DUT and create a new Receiver if the list is empty (see Annex A.2).
3. ONVIF Client will invoke **DeleteReceiverRequest** message (invalid ReceiverToken).
4. The DUT will generate SOAP 1.2 fault message (InvalidArgVal/UnknownToken).

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT did not send SOAP 1.2 fault message.
- The DUT sent an incorrect SOAP 1.2 fault message (fault code, namespace, etc.).

Note: Other faults than specified in the test are acceptable, though the specified are preferable.

5.2.11 SET RECEIVER MODE

Test Case ID: RECEIVER-2-1-11

Specification Coverage: GetReceivers (ONVIF Receiver Service Specification), GetReceiver (ONVIF Receiver Service Specification), SetReceiverMode (ONVIF Receiver Service Specification)

Feature Under Test: GetReceiver, SetReceiverMode

WSDL Reference: receiver.wsdl

Test Purpose: To verify Receiver Mode change.

Pre-Requisite: Receiver Service was received from the DUT. At least one Receiver exists on the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will retrieve a complete receivers list from the DUT and create a new Receiver if the list is empty (see Annex A.2).
4. ONVIF Client will invoke **SetReceiverModeRequest** message (ReceiverToken = ReceiverToken1, Mode = AutoConnect).

5. ONVIF Client will invoke **GetReceiversRequest** message to retrieve a complete receivers list.
6. Verify the **GetReceiversResponse** message (receivers list with changed receiver) from the DUT. Check that Receiver was changed with the specified mode.
7. ONVIF Client will invoke **GetReceiverRequest** message (Token = token1) to retrieve receiver configuration.
8. Verify the **GetReceiverResponse** message (Token = token1, Configuration.Mode = "AutoConnect") from the DUT. Check that Receiver was changed with the specified mode.
9. ONVIF Client will invoke **SetReceiverModeRequest** message (ReceiverToken = ReceiverToken1, Mode = AlwaysConnect).
10. ONVIF Client will invoke **GetReceiversRequest** message to retrieve a complete receivers list.
11. Verify the **GetReceiversResponse** message (receivers list with changed receiver) from the DUT. Check that Receiver was changed with the specified mode.
12. ONVIF Client will invoke **GetReceiverRequest** message (Token = token1) to retrieve receiver configuration.
13. Verify the **GetReceiverResponse** message (Token = token1, Configuration.Mode = "AlwaysConnect") from the DUT. Check that Receiver was changed with the specified mode.
14. ONVIF Client will invoke **SetReceiverModeRequest** message (ReceiverToken = ReceiverToken1, Mode = NeverConnect).
15. ONVIF Client will invoke **GetReceiversRequest** message to retrieve a complete receivers list.
16. Verify the **GetReceiversResponse** message (receivers list with changed receiver) from the DUT. Check that Receiver was changed with the specified mode.
17. ONVIF Client will invoke **GetReceiverRequest** message (Token = token1) to retrieve receiver configuration.
18. Verify the **GetReceiverResponse** message (Token = token1, Configuration.Mode = "NeverConnect") from the DUT. Check that Receiver was changed with the specified mode.

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **SetReceiverModeResponse** message.
- The DUT did not send a valid **GetReceiverResponse** message.
- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT returned Receiver mode in **GetReceiversResponse** message that differ from the specified during Receiver mode change.
- The DUT returned Receiver mode in **GetReceiverResponse** message that differ from the specified during Receiver mode change.

5.2.12 SET RECEIVER MODE – PERSISTENCE

Test Case ID: RECEIVER-2-1-12

Specification Coverage: Persistence (ONVIF Receiver Service Specification), SetReceiverMode (ONVIF Receiver Service Specification)

Feature Under Test: SetReceiverMode

WSDL Reference: receiver.wsdl

Test Purpose: To verify Receiver Mode change persistence.

Pre-Requisite: Receiver Service was received from the DUT. At least one Receiver exists on the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will retrieve a complete receivers list from the DUT and create a new Receiver if the list is empty (see Annex A.2).
4. ONVIF Client will invoke **SetReceiverModeRequest** message (ReceiverToken = ReceiverToken1, Mode = other than current).
5. ONVIF Client will invoke **SystemReboot** message to reset the DUT.

6. Verify that DUT sends **SystemRebootResponse** message (example message string = "Rebooting in x seconds").
7. DUT will send Multicast **HELLO** message after it is successfully rebooted.
8. ONVIF Client will verify the **HELLO** message sent by DUT.
9. ONVIF Client will invoke **GetReceiversRequest** message to retrieve a complete receivers list.
10. Verify the **GetReceiversResponse** message (receivers list with changed receiver) from the DUT. Check that Receiver was changed with the specified mode.
11. ONVIF Client will invoke **GetReceiverRequest** message (Token = token1) to retrieve receiver configuration.
12. Verify the **GetReceiverResponse** message (Token = token1, updated Configuration) from the DUT. Check that Receiver was changed with the specified mode.

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **SetReceiverModeResponse** message.
- The DUT did not send a valid **GetReceiverResponse** message.
- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT returned Receiver mode in **GetReceiversResponse** message that differ from the specified during Receiver mode change.
- The DUT returned Receiver mode in **GetReceiverResponse** message that differ from the specified during Receiver mode change.
- The DUT did not send **SystemRebootResponse** message.
- The DUT did not send **HELLO** message.

5.2.13 SET RECEIVER MODE WITH INVALID TOKEN

Test Case ID: RECEIVER-2-1-13

Specification Coverage: SetReceiverMode (ONVIF Receiver Service Specification)

Feature Under Test: SetReceiverMode

WSDL Reference: receiver.wsdl

Test Purpose: To verify Set Receiver Mode with invalid Token.

Pre-Requisite: Receiver 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 will retrieve a complete receivers list from the DUT and create a new Receiver if the list is empty (see Annex A.2).
4. ONVIF Client will invoke **SetReceiverModeRequest** message (invalid ReceiverToken).
5. The DUT will generate SOAP 1.2 fault message (InvalidArgVal/UnknownToken).

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT did not send SOAP 1.2 fault message.
- The DUT sent an incorrect SOAP 1.2 fault message (fault code, namespace, etc.).

Note: Other faults than specified in the test are acceptable, though the specified are preferable.

5.2.14 CONFIGURE RECEIVER – (RTP-Unicast/UDP)

Test Case ID: RECEIVER-2-1-16

Specification Coverage: ConfigureReceiver, GetReceivers (ONVIF Receiver Service Specification)

Feature Under Test: ConfigureReceiver, SetReceiverMode, GetReceiver

WSDL Reference: receiver.wsdl

Test Purpose: To check receiver functionality.

Pre-Requisite: Receiver Service was received from the DUT. Device supports Pull-Point Notification feature.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will retrieve a complete receivers list from the DUT and create a new Receiver if the list is empty (see Annex A.2).
4. ONVIF Client will invoke **CreatePullPointSubscriptionRequest** message with tns1:Receiver/ChangeState Topic as Filter and an InitialTerminationTime = Time1 to check Receiver state.
5. Verify that the DUT sends a **CreatePullPointSubscriptionResponse** message.
6. ONVIF Client will invoke **ConfigureReceiverRequest** message (ReceiverToken as Token of the first Receiver in the **GetReceiversResponse** message, Configuration.Mode = "AlwaysConnect", Configuration.MediaUri as stream_uri of RTSP Simulator, Configuration.StreamSetup.Stream = "RTP-Unicast", StreamSetup.Transport.Tunnel.Protocol = "UDP", no StreamSetup.Transport.Tunnel.Tunnel) to configure the receiver to receive media from RTSP Simulator.
7. Verify **ConfigureReceiverResponse** message from the DUT.
8. DUT invokes **RTSP DESCRIBE** request.
9. The RTSP SIMULATOR sends **200 OK** message and SDP information.
10. DUT invokes **RTSP SETUP** request with transport parameter as RTP/UDP.
11. The RTSP SIMULATOR sends **200 OK** message and the media stream information.

12. DUT invokes **RTSP PLAY** request.
13. The RTSP SIMULATOR sends **200 OK** message and starts media streaming.
14. The RTSP SIMULATOR sends JPEG RTP media stream to DUT over UDP.
15. The RTSP SIMULATOR sends RTCP sender report to DUT.
16. DUT processed the received RTP and RTCP packets.
17. Execute Annex A.3 for catching event with current state of the receiver.
18. Verify that there is Notification Message with Source.SimpleItemDescription Description item with Name = "ReceiverToken" and Value is equal to "ReceiverToken1", Data.SimpleItemDescription Description item with Name = "New State" and Value is equal to "Connected".
19. ONVIF Client will invoke **GetReceiverRequest** message with ReceiverToken = ReceiverToken1.
20. Verify **GetReceiverResponse** message from the DUT. Check that **GetReceiverResponse** message contains the same parameters values as were changed in **ConfigureReceiverRequest** message.
21. ONVIF Client will invoke **GetReceiverStateRequest** message to check Receiver State.
22. Verify **GetReceiverStateResponse** message from the DUT. Check that ReceiverState.State = "Connected".
23. ONVIF Client will invoke **CreatePullPointSubscriptionRequest** message with tns1:Receiver/ChangeState Topic as Filter and an InitialTerminationTime = Time1 to check Receiver state.
24. Verify that the DUT sends a **CreatePullPointSubscriptionResponse** message.
25. ONVIF Client will invoke **SetReceiverModeRequest** message (ReceiverToken = "ReceiverToken1", Mode = "NeverConnect") to stop recording.
26. Verify **SetReceiverModeResponse** message from the DUT.
27. DUT invokes **RTSP TEARDOWN** control request at the end of media streaming to terminate the RTSP session.
28. The RTSP SIMULATOR sends **200 OK** Response and terminates the RTSP Session.
29. Execute Annex A.3 for catching event with current state of the receiver.

30. Verify that there is Notification Message with Source.SimpleItemDescription Description item with Name = "ReceiverToken" and Value is equal to "ReceiverToken1", Data.SimpleItemDescription Description item with Name = "New State" and Value is equal to "NotConnected".
31. ONVIF Client will invoke **GetReceiverStateRequest** message to check Receiver State.
32. Verify **GetReceiverStateResponse** message from the DUT. Check that ReceiverState.State = "NotConnected".

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT did not send a valid **CreatePullPointSubscriptionResponse** message.
- The DUT did not send a valid **ConfigureReceiverResponse** message.
- The DUT did not send a valid **GetReceiverResponse** message.
- The DUT did not send a valid **GetReceiverStateResponse** message.
- The DUT did not send a valid **SetReceiverModeResponse** message.
- The DUT sent **GetReceiverResponse** message with parameters values differ from sent in **ConfigureReceiverRequest** message.
- The DUT did not send Notify message with Source.SimpleItemDescription Description item with Name = "ReceiverToken" and Value is equal to "ReceiverToken1", Data.SimpleItemDescription Description item with Name = "New State" and Value is equal to "Connected".
- The DUT did not send Notify message with Source.SimpleItemDescription Description item with Name = "ReceiverToken" and Value is equal to "ReceiverToken1", Data.SimpleItemDescription Description item with Name = "New State" and Value is equal to "NotConnected".
- The DUT sent **GetReceiverStateResponse** with ReceiverState.State not equal to "Connected" in the step 22.

- The DUT sent **GetReceiverStateResponse** with ReceiverState.State not equal to "NotConnected" in the step 32.

5.2.15 CONFIGURE RECEIVER – (RTP/RTSP/TCP)

Test Case ID: RECEIVER-2-1-17

Specification Coverage: ConfigureReceiver, GetReceivers (ONVIF Receiver Service Specification)

Feature Under Test: ConfigureReceiver, SetReceiverMode, GetReceiver

WSDL Reference: receiver.wsdl

Test Purpose: To check receiver functionality.

Pre-Requisite: Receiver Service was received from the DUT. Device supports Pull-Point Notification feature.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will retrieve a complete receivers list from the DUT and create a new Receiver if the list is empty (see Annex A.2).
4. ONVIF Client will invoke **CreatePullPointSubscriptionRequest** message with tns1:Receiver/ChangeState Topic as Filter and an InitialTerminationTime = Time1 to check Receiver state.
5. Verify that the DUT sends a **CreatePullPointSubscriptionResponse** message.
6. ONVIF Client will invoke **ConfigureReceiverRequest** message (ReceiverToken as Token of the first Receiver in the **GetReceiversResponse** message, Configuration.Mode = "AlwaysConnect", Configuration.MediaUri as stream_uri of RTSP Simulator, Configuration.StreamSetup.Stream = "RTP-Unicast", StreamSetup.Transport.Tunnel.Protocol = "RTSP", no StreamSetup.Transport.Tunnel.Tunnel) to configure the receiver to receive media from RTSP Simulator.
7. Verify **ConfigureReceiverResponse** message from the DUT.

8. DUT invokes **RTSP DESCRIBE** request.
9. The RTSP SIMULATOR sends **200 OK** message and SDP information.
10. DUT invokes **RTSP SETUP** request with transport parameter as RTP/TCP along with 'interleaved' parameter.
11. The RTSP SIMULATOR sends **200 OK** message and the media stream information.
12. DUT invokes **RTSP PLAY** request.
13. The RTSP SIMULATOR sends **200 OK** message and starts media streaming.
14. The RTSP SIMULATOR sends JPEG RTP media stream to DUT over UDP.
15. The RTSP SIMULATOR sends RTCP sender report to DUT.
16. DUT processed the received RTP and RTCP packets.
17. Execute Annex A.3 for catching event with current state of the receiver.
18. Verify that there is Notification Message with Source.SimpleItemDescription Description item with Name = "ReceiverToken" and Value is equal to "ReceiverToken1", Data.SimpleItemDescription Description item with Name = "New State" and Value is equal to "Connected".
19. ONVIF Client will invoke **GetReceiverRequest** message with ReceiverToken = ReceiverToken1.
20. Verify **GetReceiverResponse** message from the DUT. Check that **GetReceiverResponse** message contains the same parameters values as were changed in **ConfigureReceiverRequest** message.
21. ONVIF Client will invoke **GetReceiverStateRequest** message to check Receiver State.
22. Verify **GetReceiverStateResponse** message from the DUT. Check that ReceiverState.State = "Connected".
23. ONVIF Client will invoke **CreatePullPointSubscriptionRequest** message with tns1:Receiver/ChangeState Topic as Filter and an InitialTerminationTime = Time1 to check Receiver state.
24. Verify that the DUT sends a **CreatePullPointSubscriptionResponse** message.
25. ONVIF Client will invoke **SetReceiverModeRequest** message (ReceiverToken = "ReceiverToken1", Mode = "NeverConnect") to stop recording.

26. Verify **SetReceiverModeResponse** message from the DUT.
27. DUT invokes **RTSP TEARDOWN** control request at the end of media streaming to terminate the RTSP session.
28. The RTSP SIMULATOR sends **200 OK** Response and terminates the RTSP Session.
29. Execute Annex A.3 for catching event with current state of the receiver.
30. Verify that there is Notification Message with Source.SimpleItemDescription Description item with Name = "ReceiverToken" and Value is equal to "ReceiverToken1", Data.SimpleItemDescription Description item with Name = "New State" and Value is equal to "NotConnected".
31. ONVIF Client will invoke **GetReceiverStateRequest** message to check Receiver State.
32. Verify **GetReceiverStateResponse** message from the DUT. Check that ReceiverState.State = "NotConnected".

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT did not send a valid **CreatePullPointSubscriptionResponse** message.
- The DUT did not send a valid **ConfigureReceiverResponse** message.
- The DUT did not send a valid **GetReceiverResponse** message.
- The DUT did not send a valid **GetReceiverStateResponse** message.
- The DUT did not send valid **SetReceiverModeResponse** message.
- The DUT sent **GetReceiverResponse** message with parameters values differ from sent in **ConfigureReceiverRequest** message.
- The DUT did not send Notify message with Source.SimpleItemDescription Description item with Name = "ReceiverToken" and Value is equal to "ReceiverToken1", Data.SimpleItemDescription Description item with Name = "New State" and Value is equal to "Connected".

- The DUT did not send Notify message with Source.SimpleItemDescription Description item with Name = "ReceiverToken" and Value is equal to "ReceiverToken1", Data.SimpleItemDescription Description item with Name = "New State" and Value is equal to "NotConnected".
- The DUT sent **GetReceiverStateResponse** with ReceiverState.State not equal to "Connected" in the step 22.
- The DUT sent **GetReceiverStateResponse** with ReceiverState.State not equal to "NotConnected" in the step 32.

5.2.16 CONFIGURE RECEIVER – INVALID MEDIA URI

Test Case ID: RECEIVER-2-1-18

Specification Coverage: ConfigureReceiver, GetReceivers (ONVIF Receiver Service Specification)

Feature Under Test: ConfigureReceiver, SetReceiverMode, GetReceiver

WSDL Reference: receiver.wsdl

Test Purpose: To check receiver functionality.

Pre-Requisite: Receiver Service was received from the DUT. Device supports Pull-Point Notification feature.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will retrieve a complete receivers list from the DUT and create a new Receiver if the list is empty (see Annex A.2).
4. ONVIF Client will invoke **CreatePullPointSubscriptionRequest** message with tns1: Receiver/ConnectionFailed Topic as Filter and an InitialTerminationTime = Time1 to check Receiver state.
5. Verify that the DUT sends a **CreatePullPointSubscriptionResponse** message.
6. ONVIF Client will invoke **ConfigureReceiverRequest** message (ReceiverToken as Token of the first Receiver in the **GetReceiversResponse**

message, Configuration.Mode = "AlwaysConnect", Configuration.MediaUri as invalid stream_uri of RTSP Simulator, Configuration.StreamSetup.Stream = "RTP-Unicast", StreamSetup.Transport.Tunnel.Protocol = "UDP", no StreamSetup.Transport.Tunnel.Tunnel) to configure the receiver to receive media from RTSP Simulator.

7. Verify **ConfigureReceiverResponse** message from the DUT.
8. Execute Annex A.4 for catching event with current state of the receiver.
9. Verify that there is Notification Message with TopicExpression = tns1:Receiver/ConnectionFailed, Source.SimpleItemDescription Description item with Name = "ReceiverToken" and Value is equal to "ReceiverToken1"
10. ONVIF Client will invoke **GetReceiverRequest** message with ReceiverToken = ReceiverToken1.
11. Verify **GetReceiverResponse** message from the DUT. Check that **GetReceiverResponse** message contains the same parameters values as were changed in **ConfigureReceiverRequest** message.
12. ONVIF Client will invoke **GetReceiverStateRequest** message to check Receiver State.
13. Verify **GetReceiverStateResponse** message from the DUT. Check that ReceiverState.State = "NotConnected".

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT did not send a valid **CreatePullPointSubscriptionResponse** message.
- The DUT did not send a valid **ConfigureReceiverResponse** message.
- The DUT did not send a valid **GetReceiverResponse** message.
- The DUT did not send a valid **GetReceiverStateResponse** message.
- The DUT sent **GetReceiverResponse** message with parameters values differ from sent in **ConfigureReceiverRequest** message.

- The DUT did not send Notify message with TopicExpression = tns1:Receiver/ConnectionFailed and Source.SimpleItemDescription Description item with Name = "ReceiverToken" and Value is equal to "ReceiverToken1".
- The DUT sent **GetReceiverStateResponse** with ReceiverState.State not equal to "NotConnected" at step 13.

5.2.17 CONFIGURE RECEIVER WITH INVALID TOKEN

Test Case ID: RECEIVER-2-1-19

Specification Coverage: ConfigureReceiver (ONVIF Receiver Service Specification)

Feature Under Test: ConfigureReceiver

WSDL Reference: receiver.wsdl

Test Purpose: To verify Configure Receiver with invalid Token.

Pre-Requisite: Receiver 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 will retrieve a complete receivers list from the DUT and create a new Receiver if the list is empty (see Annex A.2).
4. ONVIF Client will invoke **ConfigureReceiverRequest** message (invalid ReceiverToken).
5. The DUT will generate SOAP 1.2 fault message (InvalidArgVal/UnknownToken).

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT did not send SOAP 1.2 fault message.

- The DUT sent an incorrect SOAP 1.2 fault message (fault code, namespace, etc.).

Note: Other faults than specified in the test are acceptable, though the specified are preferable.

5.2.18 CONFIGURE RECEIVER

Test Case ID: RECEIVER-2-1-20

Specification Coverage: GetReceivers (ONVIF Receiver Service Specification), GetReceiver (ONVIF Receiver Service Specification), ConfigureReceiver (ONVIF Receiver Service Specification)

Feature Under Test: GetReceiver, ConfigureReceiver

WSDL Reference: receiver.wsdl

Test Purpose: To verify Receiver configuration.

Pre-Requisite: Receiver Service was received from the DUT. At least one Receiver exists on the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will retrieve a complete receivers list from the DUT and create a new Receiver if the list is empty (see Annex A.2).
4. ONVIF Client will invoke **GetServiceCapabilitiesRequest** message to retrieve the receiver service capabilities from the DUT.
5. Verify **GetServiceCapabilitiesResponse** message (Capabilities. RTP_Multicast).
6. ONVIF Client will invoke **ConfigureReceiverRequest** message (ReceiverToken = ReceiverToken1, Mode = other than current, MediaUri = other than current, StreamSetup.Stream = other than current if DUT capability is allow).
7. ONVIF Client will invoke **GetReceiversRequest** message to retrieve a complete receivers list.
8. Verify the **GetReceiversResponse** message (receivers list with changed receiver) from the DUT. Check that Receiver was changed with the specified configuration.

9. ONVIF Client will invoke **GetReceiverRequest** message (ReceiverToken = ReceiverToken1) to retrieve receiver configuration.
10. Verify the **GetReceiverResponse** message (ReceiverToken = ReceiverToken1, updated Configuration) from the DUT. Check that Receiver was changed with the specified configuration.

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **ConfigureReceiverResponse** message.
- The DUT did not send a valid **GetReceiverResponse** message.
- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT returned Receiver configuration in **GetReceiversResponse** message that differs from the specified during Receiver configuration change.
- The DUT returned Receiver configuration in **GetReceiverResponse** message that differs from the specified during Receiver configuration change.

Note: MediaURI in the **ConfigureReceiverRequest** message shall be not greater than 28 octet length.

5.2.19 CONFIGURE RECEIVER – PERSISTENCE

Test Case ID: RECEIVER-2-1-21

Specification Coverage: Persistence (ONVIF Receiver Service Specification), ConfigureReceiver (ONVIF Receiver Service Specification)

Feature Under Test: ConfigureReceiver

WSDL Reference: receiver.wsdl

Test Purpose: To verify Receiver configuration Persistence.

Pre-Requisite: Receiver Service was received from the DUT. At least one Receiver exists on the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will retrieve a complete receivers list from the DUT and create a new Receiver if the list is empty (see Annex A.2).
4. ONVIF Client will invoke **GetServiceCapabilitiesRequest** message to retrieve the receiver service capabilities from the DUT.
5. Verify **GetServiceCapabilitiesResponse** message (Capabilities. RTP_Multicast).
6. ONVIF Client will invoke **ConfigureReceiverRequest** message (ReceiverToken = ReceiverToken1, Mode = other than current, MediaUri = other than current, StreamSetup.Stream = other than current if DUT capability is allow).
7. ONVIF Client will invoke **SystemReboot** message to reset the DUT.
8. Verify that the DUT sends **SystemRebootResponse** message (example message string = "Rebooting in x seconds").
9. The DUT will send Multicast **HELLO** message after it is successfully rebooted.
10. ONVIF Client will verify the **HELLO** message sent by the DUT.
11. ONVIF Client will invoke **GetReceiversRequest** message to retrieve a complete receivers list.
12. Verify the **GetReceiversResponse** message (receivers list with changed receiver) from the DUT. Check that Receiver was changed with the specified configuration.
13. ONVIF Client will invoke **GetReceiverRequest** message (ReceiverToken = ReceiverToken1) to retrieve receiver configuration.
14. Verify the **GetReceiverResponse** message (ReceiverToken = ReceiverToken1, updated Configuration) from the DUT. Check that Receiver was changed with the specified configuration.

Test Result:

PASS –

- The DUT passes all assertions.

FAIL –

- The DUT did not send a valid **ConfigureReceiverResponse** message.
- The DUT did not send a valid **GetReceiverResponse** message.
- The DUT did not send a valid **GetReceiversResponse** message.
- The DUT did not send a valid **CreateReceiverResponse** message.
- The DUT returned Receiver configuration in **GetReceiversResponse** message that differs from the specified during Receiver configuration change.
- The DUT returned Receiver configuration in **GetReceiverResponse** message that differs from the specified during Receiver configuration change.
- The DUT did not send **SystemRebootResponse** message.
- The DUT did not send **HELLO** message.

Note: MediaURI in the **ConfigureReceiverRequest** message shall be not greater than 28 octet length.

Annex A Helper Procedures and Additional Notes

A.1 Comparison of Receivers in GetReceiverResponse and GetReceiversResponse messages

Receivers in **GetReceiversResponse** message and in **GetReceiverResponse** message will be assumed as different in the following cases:

1. Configuration.Mode element values are different.
2. Configuration.MediaUri element values are different.
3. Configuration.StreamSetup.Stream element values are different.
4. Configuration.StreamSetup.Transport.Protocol element values are different.
5. Configuration.StreamSetup.Transport.Tunnel element is skipped only for **GetReceiversResponse** message or only for **GetReceiverResponse** message.
6. Configuration.StreamSetup.Transport.Tunnel.Protocol element values are different.
7. Configuration.StreamSetup.Transport.Tunnel.[...].Tunnel (check recursively) element is skipped only for **GetReceiversResponse** message or only for **GetReceiverResponse** message.
8. Configuration.StreamSetup.Transport.Tunnel.[...].Tunnel.Protocol (check recursively) element values are different.

A.2 Get Complete Receivers List and Create a Receiver if the List is Empty

ONVIF Client follows the following procedure of Retrieving Receivers List and creation of a Receiver if the list is Empty:

1. ONVIF Client will invoke **GetReceiversRequest** message to retrieve a complete receivers list.
2. Verify that the **GetReceiversResponse** message contains at least one Receiver.
3. If there is at least one Receiver, then skip steps 4-5 and return to the Test Procedure.
4. ONVIF Client will invoke **CreateReceiverRequest** message (Configuration.Mode = "NeverConnect", Configuration.MediaUri = validUri, Configuration.StreamSetup.Stream = 'RTP-Unicast', Configuration.StreamSetup.Transport.Protocol = 'UDP') to create new Receiver.

5. Verify the **CreateReceiverResponse** message (ReceiverToken1, Configuration.Mode = "NeverConnect", Configuration.MediaUri = validUri, Configuration.StreamSetup.Stream = 'RTP-Unicast', Configuration.StreamSetup.Transport.Protocol = 'UDP') from the DUT. Check that **CreateReceiverResponse** message contains the same parameters values as were sent in **CreateReceiverRequest** message.

A.3 PullMessages algorithm for check Receiver State changing

If the receiver changes state, the device sends the correspond event. Algorithm of **PullMessages** sending for catching event with expected state.

1. ONVIF Client will invoke **PullMessages** command with a PullMessagesTimeout of 20s and a MessageLimit of 1 to find NotificationMessage containing event with required ReceiverState for used Recording.
2. Verify **PullMessagesResponse** message.
3. If no events are returned and CurrentTime of sending **PullMessages** is more than T1+delta, where delta is Operation delay time, skip other steps. If no events are returned and CurrentTime of sending **PullMessages** is less or equal than T1+delta go to the step 1.
4. If event is returned, check UTC Time of the received event. If UTC Time is more than T1+delta skip other steps.
5. Find event with Source.SimpleItemDescription Description item with Name = "ReceiverToken" and Value is equal to "ReceiverToken1", Data.SimpleItemDescription Description item with Name = "New State" and Value is equal to required receiver state.
6. If event is not found go to the step 1, otherwise, go to the next step.

Test will be assumed as failed in the case:

- The DUT did not send a valid **PullMessagesResponse** message.
- The DUT did not send NotificationMessage with event which has Source.SimpleItemDescription Description item with Name = "ReceiverToken" and Value is equal to "ReceiverToken1", Data.SimpleItemDescription Description item with Name = "New State" and Value is equal to required receiver state.

A.4 PullMessages algorithm for Receiver Connection Failed event

If the receiver cannot connect to source, the device sends the correspond event. Algorithm of **PullMessages** sending for catching event with expected state.

1. ONVIF Client will invoke **PullMessages** command with a PullMessagesTimeout of 20s and a MessageLimit of 1 to find NotificationMessage containing event with required ReceiverState for used Recording.
2. Verify **PullMessagesResponse** message.
3. If no events are returned and CurrentTime of sending **PullMessages** is more than T1+delta, where delta is Operation delay time, skip other steps. If no events are returned and CurrentTime of sending **PullMessages** is less or equal than T1+delta go to the step 1.
4. If event is returned, check UTC Time of the received event. If UTC Time is more than T1+delta skip other steps.
5. Find event with Source.SimpleItemDescription Description item with Name = "ReceiverToken" and Value is equal to "ReceiverToken1".
6. If event is not found, go to the step 1; otherwise go to the next step.

Test will be assumed as failed in the case:

- The DUT did not send valid **PullMessagesResponse** message.
- The DUT did not send NotificationMessage with event with topic tns1: Receiver/ConnectionFailed, which has Source.SimpleItemDescription Description item with Name = "ReceiverToken" and Value is equal to "ReceiverToken1.