Driving IP-based physical security through global standardization

ONVIF™

ONVIF Real Time Streaming Specification

Version 17.01

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Revision History

Ver.	Date	Description
13.06	June, 2013	First issue. Was created by splitting Media Test Specification. The following test cases were added or updated with ID change: MEDIA CONTROL – RTSP/TCP MEDIA STREAMING – RTSP KEEPALIVE (SET_PARAMETER) MEDIA STREAMING - RTSP KEEPALIVE (OPTIONS) MEDIA STREAMING – JPEG (RTP-Unicast / UDP) MEDIA STREAMING – JPEG (RTP-Unicast/RTSP/HTTP/TCP) MEDIA STREAMING – JPEG (RTP/RTSP/TCP) MEDIA STREAMING – MPEG4 (RTP-Unicast/ UDP) MEDIA STREAMING – MPEG4 (RTP-Unicast/RTSP/HTTP/TCP) MEDIA STREAMING – MPEG4 (RTP/RTSP/TCP) SET SYNCHRONIZATION POINT – MPEG4 MEDIA STREAMING – H.264 (RTP-Unicast/ UDP) MEDIA STREAMING – H.264 (RTP-Unicast/RTSP/HTTP/TCP) MEDIA STREAMING – H.264 (RTP/RTSP/TCP) SET SYNCHRONIZATION POINT – H.264 MEDIA STREAMING – RTP-Unicast/RTSP/HTTP/TCP (LINE BREAKS IN BASE64 ENCODING) VIDEO ENCODER CONFIGURATION – JPEG RESOLUTION VIDEO ENCODER CONFIGURATION – MPEG4 RESOLUTION VIDEO ENCODER CONFIGURATION – H.264 RESOLUTION VIDEO ENCODER CONFIGURATION – JPEG RESOLUTION (ALL RESOLUTIONS) VIDEO ENCODER CONFIGURATION – MPEG4 RESOLUTION (ALL RESOLUTIONS) VIDEO ENCODER CONFIGURATION – H.264

		RESOLUTION (ALL RESOLUTIONS) MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP-Unicast/UDP) (ALL VIDEO SOURCE CONFIGURATIONS) MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP-Unicast/RTSP/HTTP/TCP) (ALL VIDEO SOURCE CONFIGURATIONS) MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP/RTSP/TCP) (ALL VIDEO SOURCE CONFIGURATIONS) MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (MIX OF TRANSPORT TYPES) (ALL VIDEO SOURCE CONFIGURATIONS) MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP-Unicast/UDP) MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP-Unicast/RTSP/HTTP/TCP) MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP/RTSP/TCP) MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (MIX OF TRANSPORT TYPES) MEDIA STREAMING – JPEG (VALIDATING RTP HEADER EXTENSION) MEDIA STREAMING – JPEG (RTP-Multicast/UDP, IPv4) MEDIA STREAMING – MPEG4 (RTP-Multicast/UDP, IPv4) MEDIA STREAMING – H.264 (RTP-Multicast/UDP, IPv4) MEDIA STREAMING – JPEG (RTP-Multicast/UDP, IPv6) MEDIA STREAMING – MPEG4 (RTP-Multicast/UDP, IPv6) MEDIA STREAMING – H.264 (RTP-Multicast/UDP, IPv6) VIDEO ENCODER CONFIGURATION – MULTICAST PORT (IPv4) VIDEO ENCODER CONFIGURATION – MULTICAST

		ADDRESS (IPv4) VIDEO ENCODER CONFIGURATION – MULTICAST ADDRESS AND PORT IN RTSP SETUP (IPv4) VIDEO ENCODER CONFIGURATION – MULTICAST ADDRESS AND PORT IN RTSP SETUP (IPv6) MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP-Multicast/UDP) (ALL VIDEO SOURCE CONFIGURATIONS) MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP-Multicast/UDP) MEDIA STREAMING – G.711 (RTP-Unicast/UDP) MEDIA STREAMING – G.711 (RTP-Unicast/RTSP/HTTP/TCP) MEDIA STREAMING – G.711 (RTP/RTSP/TCP) MEDIA STREAMING – G.726 (RTP-Unicast/UDP) MEDIA STREAMING – G.726 (RTP-Unicast/RTSP/HTTP/TCP) MEDIA STREAMING – G.726 (RTP/RTSP/TCP) MEDIA STREAMING – AAC (RTP-Unicast/UDP) MEDIA STREAMING – AAC (RTP-Unicast/RTSP/HTTP/TCP) MEDIA STREAMING – AAC (RTP/RTSP/TCP) AUDIO STREAMING – G.711 (RTP-Unicast/UDP) AUDIO STREAMING – G.711 (RTP-Unicast/RTSP/HTTP/TCP) AUDIO STREAMING – G.711 (RTP/RTSP/TCP) AUDIO STREAMING – G.726 (RTP-Unicast/UDP) AUDIO STREAMING – G.726 (RTP-Unicast/RTSP/HTTP/TCP) AUDIO STREAMING – G.726 (RTP/RTSP/TCP) AUDIO STREAMING – AAC (RTP-Unicast/UDP) AUDIO STREAMING – AAC (RTP-Unicast/RTSP/HTTP/TCP) AUDIO STREAMING – AAC (RTP/RTSP/TCP) AUDIO ENCODER CONFIGURATION – MULTICAST PORT (IPv4) AUDIO ENCODER CONFIGURATION – MULTICAST

Driving IP-based physical security through global standardization

		ADDRESS (IPv4) MEDIA STREAMING – G.711 (RTP-Multicast/UDP, IPv4) MEDIA STREAMING – G.711 (RTP-Multicast/UDP, IPv6) MEDIA STREAMING – G.726 (RTP-Multicast/UDP, IPv4) MEDIA STREAMING – G.726 (RTP-Multicast/UDP, IPv6) MEDIA STREAMING – AAC (RTP-Multicast/UDP, IPv4) MEDIA STREAMING – AAC (RTP-Multicast/UDP, IPv6) MEDIA STREAMING – JPEG/G.711 (RTP-Unicast/ UDP) MEDIA STREAMING – JPEG/G.711 (RTP-Unicast/RTSP/HTTP/TCP) MEDIA STREAMING – JPEG/G.711 (RTP/RTSP/TCP) MEDIA STREAMING – JPEG/G.726 (RTP-Unicast/ UDP) MEDIA STREAMING – JPEG/G.726 (RTP-Unicast/RTSP/HTTP/TCP) MEDIA STREAMING – JPEG/G.726 (RTP/RTSP/TCP) MEDIA STREAMING – JPEG/AAC (RTP-Unicast/ UDP) MEDIA STREAMING – JPEG/AAC (RTP-Unicast/RTSP/HTTP/TCP) MEDIA STREAMING – JPEG/AAC (RTP/RTSP/TCP) MEDIA STREAMING – JPEG/G.711 (RTP-Multicast/UDP, IPv4) MEDIA STREAMING – JPEG/G.711 (RTP-Multicast/UDP, IPv6) MEDIA STREAMING – JPEG/G.726 (RTP-Multicast/UDP, IPv4) MEDIA STREAMING – JPEG/G.726 (RTP-Multicast/UDP, IPv6) MEDIA STREAMING – JPEG/AAC (RTP-Multicast/UDP, IPv4) MEDIA STREAMING – JPEG/AAC (RTP-

		Multicast/UDP, IPv6) VIDEO AND AUDIO ENCODER CONFIGURATION – DIFFERENT PORTS VIDEO AND AUDIO ENCODER CONFIGURATION – DIFFERENT ADDRESS NOTIFICATION STREAMING START AND STOP MULTICAST STREAMING – JPEG (IPv4) START AND STOP MULTICAST STREAMING – G.711 (IPv4) START AND STOP MULTICAST STREAMING – JPEG/G.711 (IPv4) START AND STOP MULTICAST STREAMING – G.711 (IPv4, ONLY AUDIO PROFILE) START AND STOP MULTICAST STREAMING – G.726 (IPv4, ONLY AUDIO PROFILE) START AND STOP MULTICAST STREAMING – AAC (IPv4, ONLY AUDIO PROFILE) The following Annexes were added or updated: Annex A.9 Create Empty Profile Annex A.10 Find or Create Media Profile Containing Specified Audio Encoder Configuration Annex A.11 Configure Multicast Settings for Configurations that are Included in Profile Annex A.12 Find or Create Media Profile Containing Specified Video Encoder Configuration Annex A.13 Find or Create Media Profile Containing Specified Video Encoder Configuration with Possibility to Set Specified Encoding Annex A.14 Find or Create Specified Number of Profiles that Contains Specified Video Source Configuration and Video Encoder Configuration Annex A.20 Media Profile Select or Creation for Audio and Video Streaming Annex A.21 Media Profile Creation for Video Streaming Annex A.22 Name and Token Parameters Maximum Length

Driving IP-based physical security through global standardization

13.12	December, 2013	The following test cases were added: MEDIA STREAMING – JPEG (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – JPEG (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – JPEG (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – MPEG4 (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – MPEG4 (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – MPEG4 (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – H.264 (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – H.264 (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – H.264 (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – G.711 (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – G.711 (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – G.711 (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – G.726 (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – G.726 (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – G.726 (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – AAC (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – AAC (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – AAC (RTP/RTSP/TCP, IPv6) AUDIO STREAMING – G.711 (RTP-Unicast/UDP, IPv6) AUDIO STREAMING – G.711 (RTP-Unicast/RTSP/HTTP/TCP, IPv6) AUDIO STREAMING – G.711 (RTP/RTSP/TCP, IPv6) AUDIO STREAMING – G.726 (RTP-Unicast/UDP, IPv6)

		AUDIO STREAMING – G.726 (RTP-Unicast/RTSP/HTTP/TCP, IPv6) AUDIO STREAMING – G.726 (RTP/RTSP/TCP, IPv6) AUDIO STREAMING – AAC (RTP-Unicast/UDP, IPv6) AUDIO STREAMING – AAC (RTP-Unicast/RTSP/HTTP/TCP, IPv6) AUDIO STREAMING – AAC (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – JPEG/G.711 (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – JPEG/G.711 (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – JPEG/G.711 (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – JPEG/G.726 (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – JPEG/G.726 (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – JPEG/G.726 (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – JPEG/AAC (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – JPEG/AAC (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – JPEG/AAC (RTP/RTSP/TCP, IPv6) The following Annexes were added: A.23 Turn on IPv6 network interface A.24 Restore Network Settings
13.12	Dec, 2013	The pre-requisites were updated for all test cases. The following test cases were added or changed: VIDEO ENCODER CONFIGURATION – JPEG RESOLUTION VIDEO ENCODER CONFIGURATION – MPEG4 RESOLUTION VIDEO ENCODER CONFIGURATION – H.264 RESOLUTION MEDIA STREAMING – JPEG (RTP-Unicast/UDP,

		IPv6) MEDIA STREAMING – JPEG (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – JPEG (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – MPEG4 (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – MPEG4 (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – MPEG4 (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – H.264 (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – H.264 (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – H.264 (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – G.711 (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – G.711 (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – G.711 (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – G.726 (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – G.726 (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – G.726 (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – AAC (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – AAC (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – AAC (RTP/RTSP/TCP, IPv6) AUDIO STREAMING – G.711 (RTP-Unicast/UDP, IPv6) AUDIO STREAMING – G.711 (RTP-Unicast/RTSP/HTTP/TCP, IPv6) AUDIO STREAMING – G.711 (RTP/RTSP/TCP, IPv6) AUDIO STREAMING – G.726 (RTP-Unicast/UDP, IPv6) AUDIO STREAMING – G.726 (RTP-Unicast/RTSP/HTTP/TCP, IPv6)

		AUDIO STREAMING – G.726 (RTP/RTSP/TCP, IPv6) AUDIO STREAMING – AAC (RTP-Unicast/UDP, IPv6) AUDIO STREAMING – AAC (RTP-Unicast/RTSP/HTTP/TCP, IPv6) AUDIO STREAMING – AAC (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – JPEG/G.711 (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – JPEG/G.711 (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – JPEG/G.711 (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – JPEG/G.726 (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – JPEG/G.726 (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – JPEG/G.726 (RTP/RTSP/TCP, IPv6) MEDIA STREAMING – JPEG/AAC (RTP-Unicast/UDP, IPv6) MEDIA STREAMING – JPEG/AAC (RTP-Unicast/RTSP/HTTP/TCP, IPv6) MEDIA STREAMING – JPEG/AAC (RTP/RTSP/TCP, IPv6)
15.06	June, 2015	The following test cases were added: BACKCHANNEL – G.711 (RTP-Unicast/UDP) IPv4 BACKCHANNEL – G.711 (RTP-Unicast/RTSP/HTTP/TCP) IPv4 BACKCHANNEL – G.711 (RTP/RTSP/TCP) IPv4 BACKCHANNEL – G.726 (RTP- Unicast /UDP) IPv4 BACKCHANNEL – G.726 (RTP-Unicast/RTSP/HTTP/TCP) IPv4 BACKCHANNEL – G.726 (RTP/RTSP/TCP) IPv4 BACKCHANNEL – AAC (RTP-Unicast/UDP) IPv4 BACKCHANNEL – AAC (RTP-Unicast/RTSP/HTTP/TCP) IPv4 BACKCHANNEL – AAC (RTP/RTSP/TCP) IPv4 BACKCHANNEL – G.711 (RTP-Multicast/UDP) IPv4

Driving IP-based physical security through global standardization

		BACKCHANNEL – G.726 (RTP-Multicast/UDP) IPv4 BACKCHANNEL – AAC (RTP-Multicast/UDP) IPv4 A.25 Media Profile Configuration for Backchannel Audio Streaming
16.01	January 2016	The note to take into account the optional elements (number of profiles for JPEG, H264 or MPEG) has been removed from A.14
17.01	December 2017	Minor changes: references to Annexes were updated MEDIA CONTROL – RTSP/TCP test case was updated

Driving IP-based physical security through global standardization

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 Network Interface Specs] and [ONVIF Conformance] requirements. And also the test cases are to be basic inputs for some Profile specification requirements. It also describes the test framework, test setup, pre-requisites, test policies needed for the execution of the described test cases.

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

1.1 Scope

This ONVIF Media Test Specification defines and regulates the conformance testing procedure for the ONVIF conformant devices. Conformance testing is meant to be functional black-box testing. The objective of this specification to provide test cases to test individual requirements of ONVIF devices according to ONVIF Media Service and the Realtime Streaming Specification which is defined in [ONVIF Network Interface Specs].

The principal intended purposes are:

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

This specification does not address the following.

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

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

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

1.1.1 Real Time Streaming

Real Time Streaming covers the test cases needed for the verification of Real time streaming features as mentioned in [ONVIF Network Interface Specs]. Real time streaming section defines

different media streaming options based on RTP for video, audio and metadata streams. Media control is done using RTSP protocol.

The scope of this specification to cover the following real time streaming options for JPEG, MPEG4 and H.264 video streams, and JPEG/ G.711, JPEG/ G.726 and JPEG/ AAC Audio & Video streams.

- RTSP control requests
- RTP Unicast over UDP
- RTP over RTSP over TCP
- RTP over RTSP over HTTP over TCP
- RTCP

2 Terms and Definitions

1.2 Definitions

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

Configuration Entity	A network video device media abstract component that is used to produce a media stream on the network, i.e. video and/or audio stream.
Media Profile	A media profile maps a video and/or audio source to a video and/or an audio encoder, PTZ and analytics configurations.

1.3 Abbreviations

This section describes abbreviations used in this document.

AAC	Advanced Audio Coding
JPEG	Joint Photographic Experts Group
MPEG-4	Moving Pictures Experts Group-4
QVGA	Quarter Video Graphics Array
TTL	Time To Live

3 Test Overview

This section describes about the test setup and prerequisites needed, and the test policies that should be followed for test case execution.

1.4 Test Setup

1.4.1 Network Configuration for DUT

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

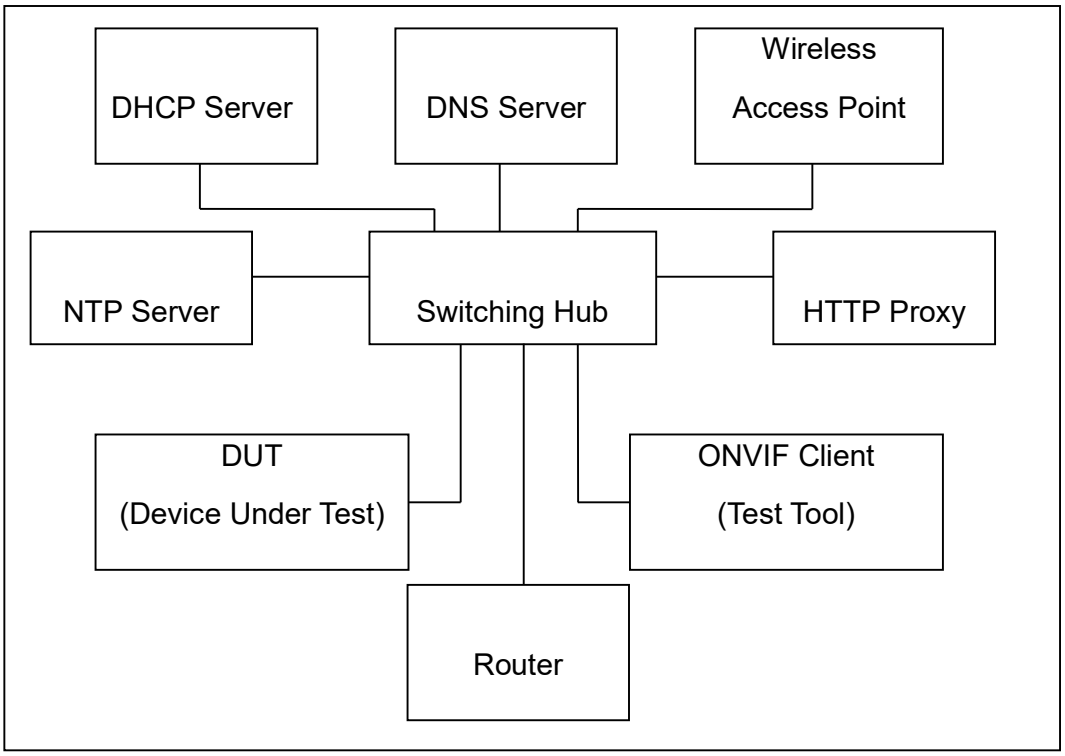

Figure 1: Test Configuration for DUT

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.

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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.

Router: provides router advertisements for IPv6 configuration.

1.5 Prerequisites

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

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

1.6 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.

1.6.1 Real Time Streaming

Real time streaming test case execution would need the successful execution of some of the Media Configuration test cases. So, Media Configuration features shall be implemented successfully in order to execute the Real Time Streaming test cases.

ONVIF Client shall explicitly specify the optional transport protocols supported by DUT.

ONVIF Client and DUT time should be synchronized for media streaming.

Real time streaming testing will test only one media stream at a time.

Poor streaming test is outside the scope of the ONVIF Test Specification

Please refer Annex A.2 for the correct interpretation of StreamSetup syntax

Please refer Section 0

Real Time Streaming Test Cases for Real Time Streaming Test Cases.

4 Real Time Streaming Test Cases

4.1 Video Streaming

4.1.1 VIDEO ENCODER CONFIGURATION – JPEG RESOLUTION (ALL RESOLUTIONS)

Test Label: Set all Resolution for all video encoder configurations Verification (JPEG).

Test Case ID: RTSS-1-1-24

ONVIF Core Specification Coverage: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, GetStreamUri, Live Streaming

Command Under Test: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, GetStreamUri

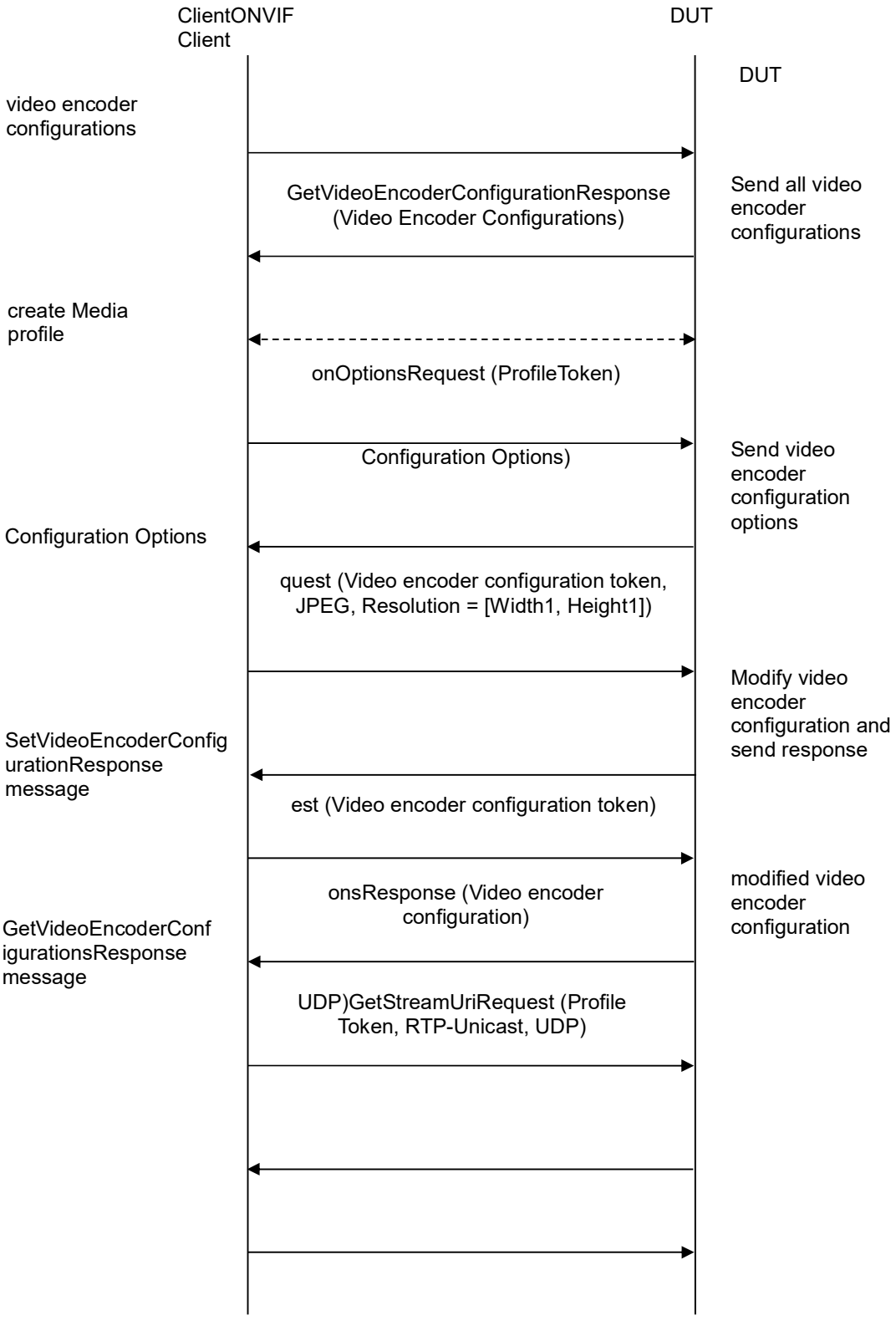
WSDL Reference: media.wsdl

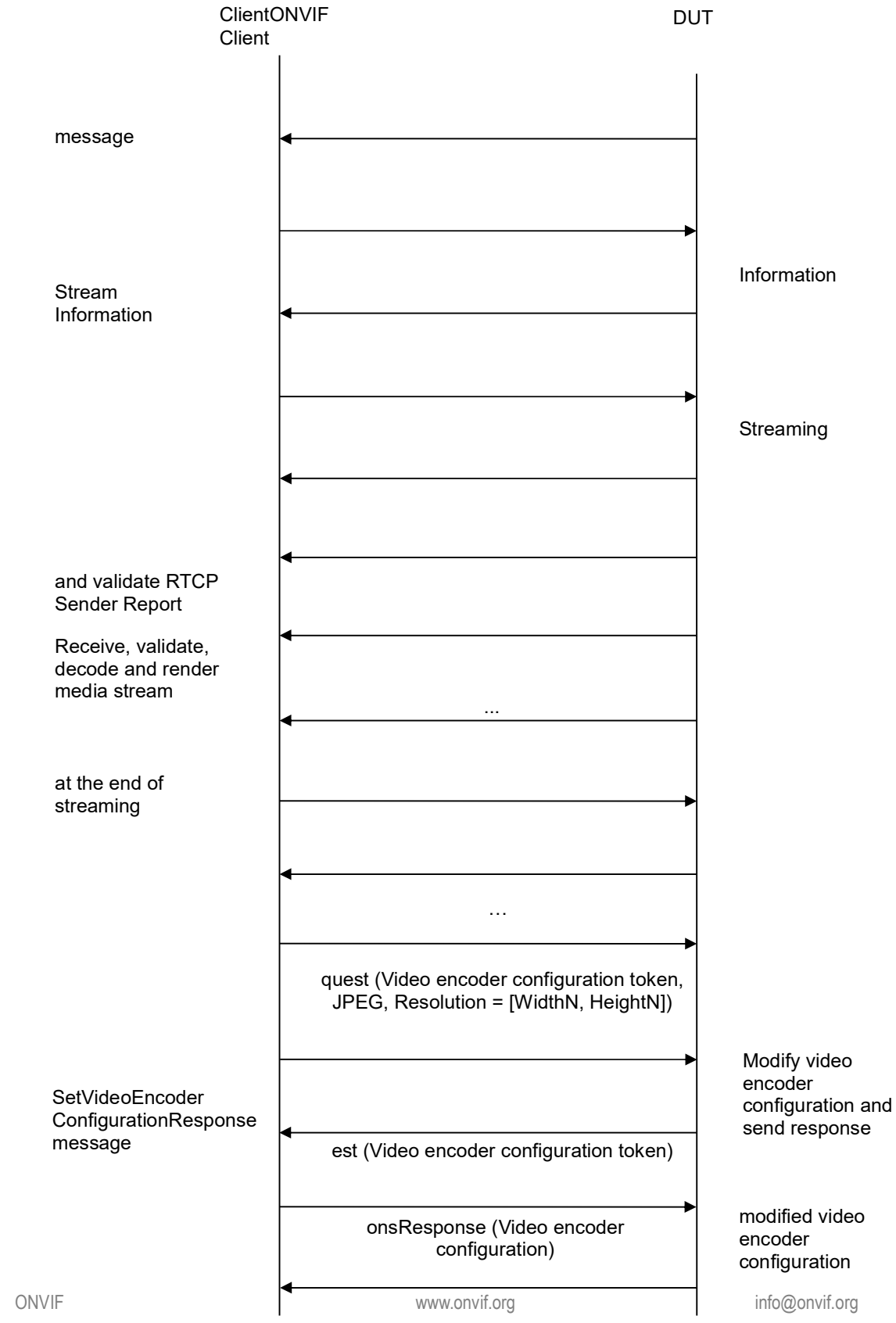
Test Purpose: To verify changing and applying of all different Resolutions for video encoder configuration and video stream.

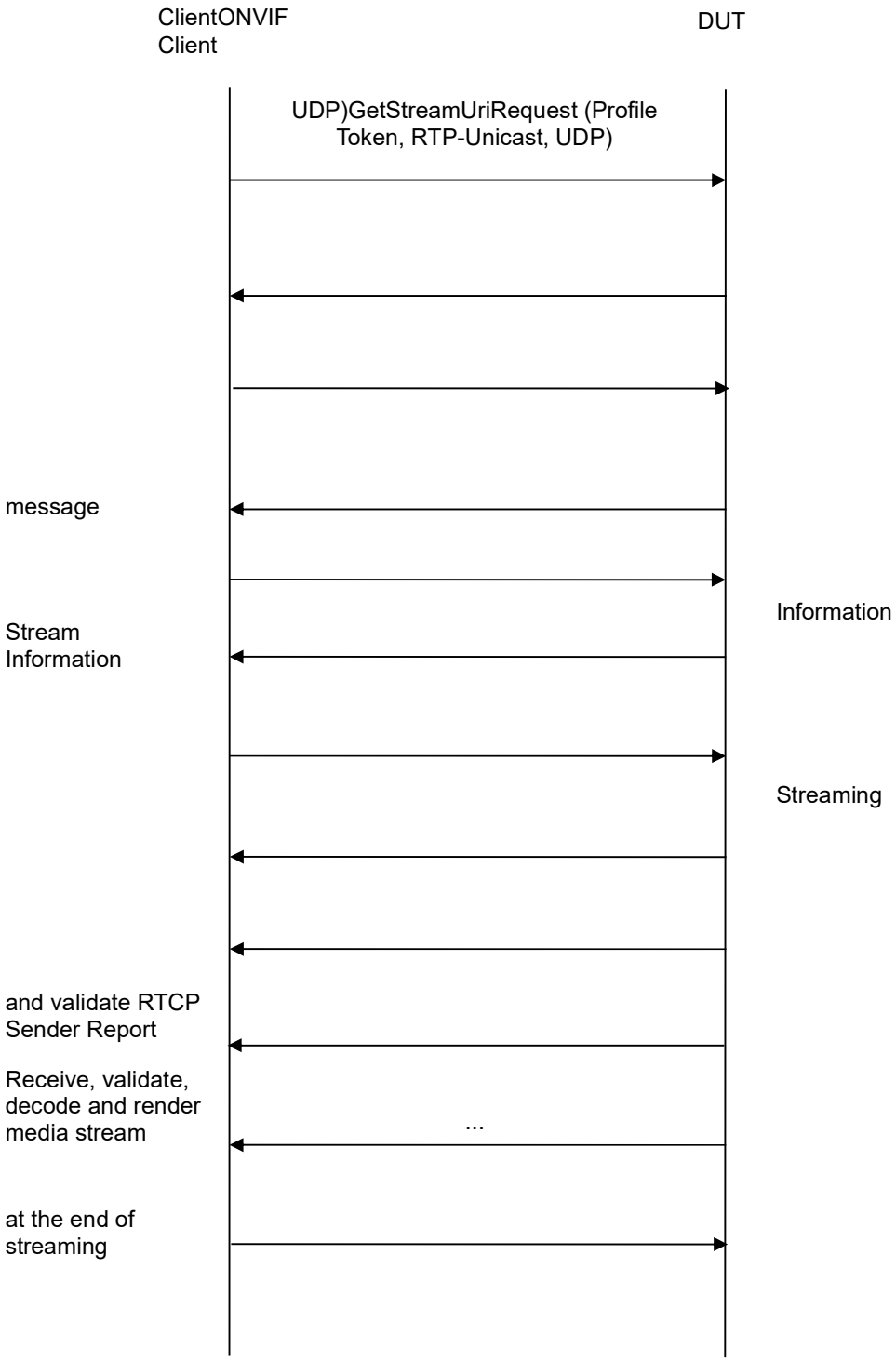
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT.

Test Sequence:


ClientONVIF Client
DUT
DUT
video encoder configurations
GetVideoEncoderConfigurationResponse (Video Encoder Configurations)
Send all video encoder configurations
create Media profile
onOptionsRequest (ProfileToken)
Configuration Options)
Send video encoder configuration options
Configuration Options
quest (Video encoder configuration token, JPEG, Resolution = [Width1, Height1])
Modify video encoder configuration and send response
SetVideoEncoderConfigurationResponse message
est (Video encoder configuration token)
onsResponse (Video encoder configuration)
modified video encoder configuration
GetVideoEncoderConfigurationsResponse message
UDP)GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)


ClientONVIF Client
DUT
message
Information
Stream Information
Streaming
and validate RTCP Sender Report
Receive, validate, decode and render media stream
...
at the end of streaming
…
quest (Video encoder configuration token, JPEG, Resolution = [WidthN, HeightN])
Modify video encoder configuration and send response
SetVideoEncoder ConfigurationResponse message
est (Video encoder configuration token)
onsResponse (Video encoder configuration)
modified video encoder configuration



Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.
3. ONVIF Client invokes GetVideoEncoderConfigurationsRequest message to retrieve video configuration list.
4. Verify the GetVideoEncoderConfigurationsResponse message.
5. Find or create media profile with Video Source Configuration and Video Encoder Configuration with token VECToken1 and supporting of JPEG encoding, where VECToken1 is first video encoder configuration token from GetVideoEncoderConfigurationsResponse message (see Annex A.13). If it is not possible skip steps 6-26 and go to the step 27.
6. ONVIF Client invokes GetVideoEncoderConfigurationOptionsRequest message (ProfileToken = “Profile1”, where “Profile1” is profile token from the step 5) to get video encoder configuration options.
7. Verify the GetVideoEncoderConfigurationOptionsResponse message from the DUT.
8. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = JPEG, where [Width1, Height1] is the first resolution from the Options.JPEG.ResolutionsAvailable) to change video encoder configuration.
9. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
10. ONVIF Client invokes GetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1) to get video encoder configuration.
11. Verify the GetVideoEncoderConfigurationResponse message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = JPEG) from the DUT. Check that new setting for Resolution and Encoding was applied.
12. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
13. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
14. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
15. ONVIF Client invokes RTSP DESCRIBE request.
16. DUT sends 200 OK message and SDP information.
17. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
18. DUT sends 200 OK message and the media stream information.
19. ONVIF Client invokes RTSP PLAY request.
20. DUT sends 200 OK message and starts media streaming.
21. DUT sends JPEG RTP media stream to ONVIF Client over UDP. Verify that stream has JPEG encoding and [Width1, Height1] resolution. (**Note:** if stream Height resolution is between Height1 – 8 and Height1 + 8 it is assumed as valid; if stream Width resolution is between Width1 – 8 and Width1 + 8 it is assumed as valid.)
22. DUT sends RTCP sender report to ONVIF Client.
23. DUT validates the received RTP and RTCP packets, decodes and renders them.

24. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
25. DUT sends 200 OK Response and terminates the RTSP Session.
26. Repeat 8-25 steps for the rest JPEG Resolutions supported by selected configuration.
27. Repeat steps 5-26 for the rest Video Encoder configurations supported by the DUT.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not sent valid video stream with JPEG encoding and specified resolution or sent it in another encoding or resolution.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.2 VIDEO ENCODER CONFIGURATION – MPEG4 RESOLUTION (ALL RESOLUTIONS)

Test Label: Set all Resolution for all video encoder configurations Verification (MPEG4).

Test Case ID: RTSS-1-1-25

ONVIF Core Specification Coverage: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, GetStreamUri, Live Streaming

Command Under Test: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, GetStreamUri

WSDL Reference: media.wsdl

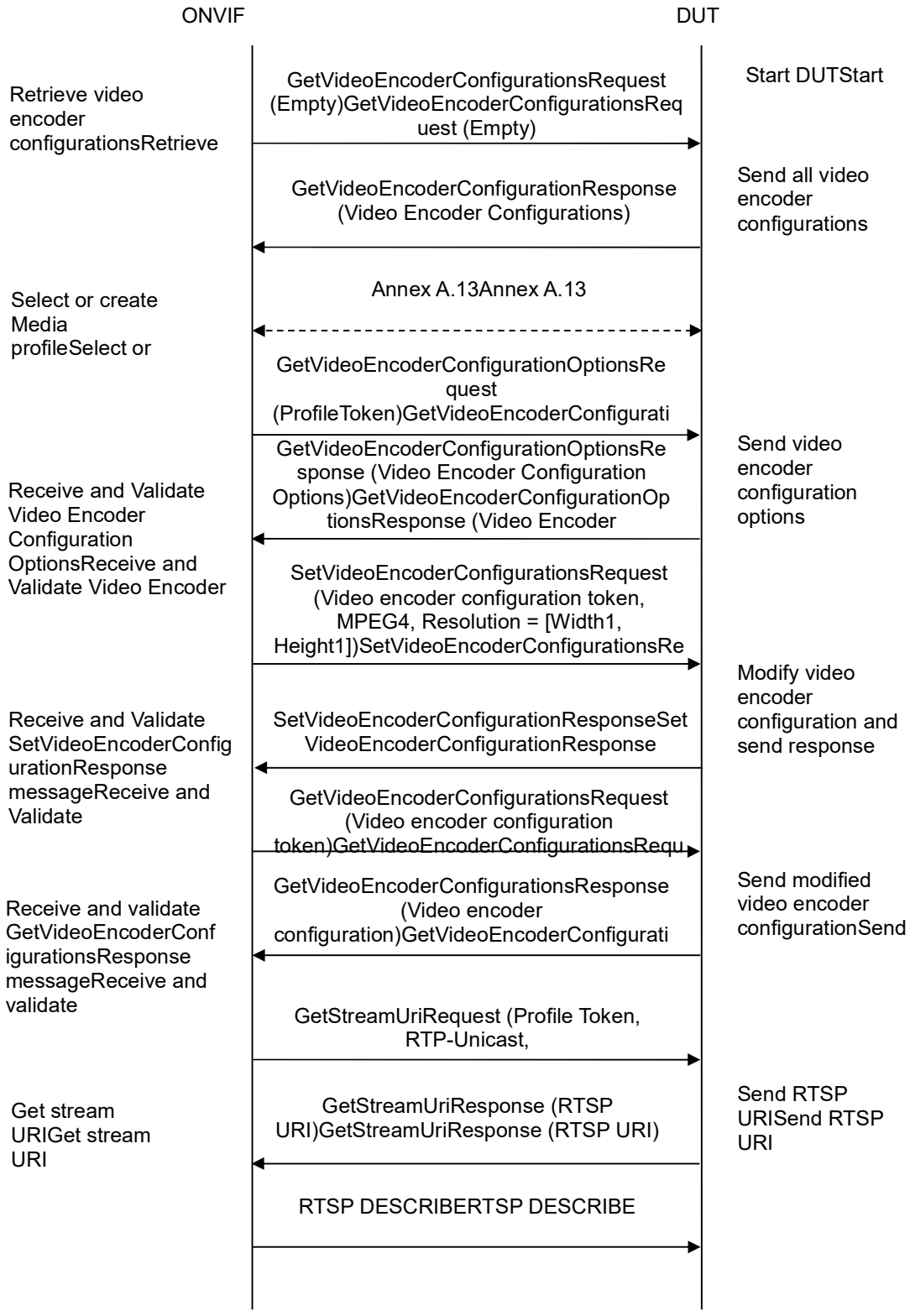
Test Purpose: To verify changing and applying of all different Resolutions for video encoder configuration and video stream.

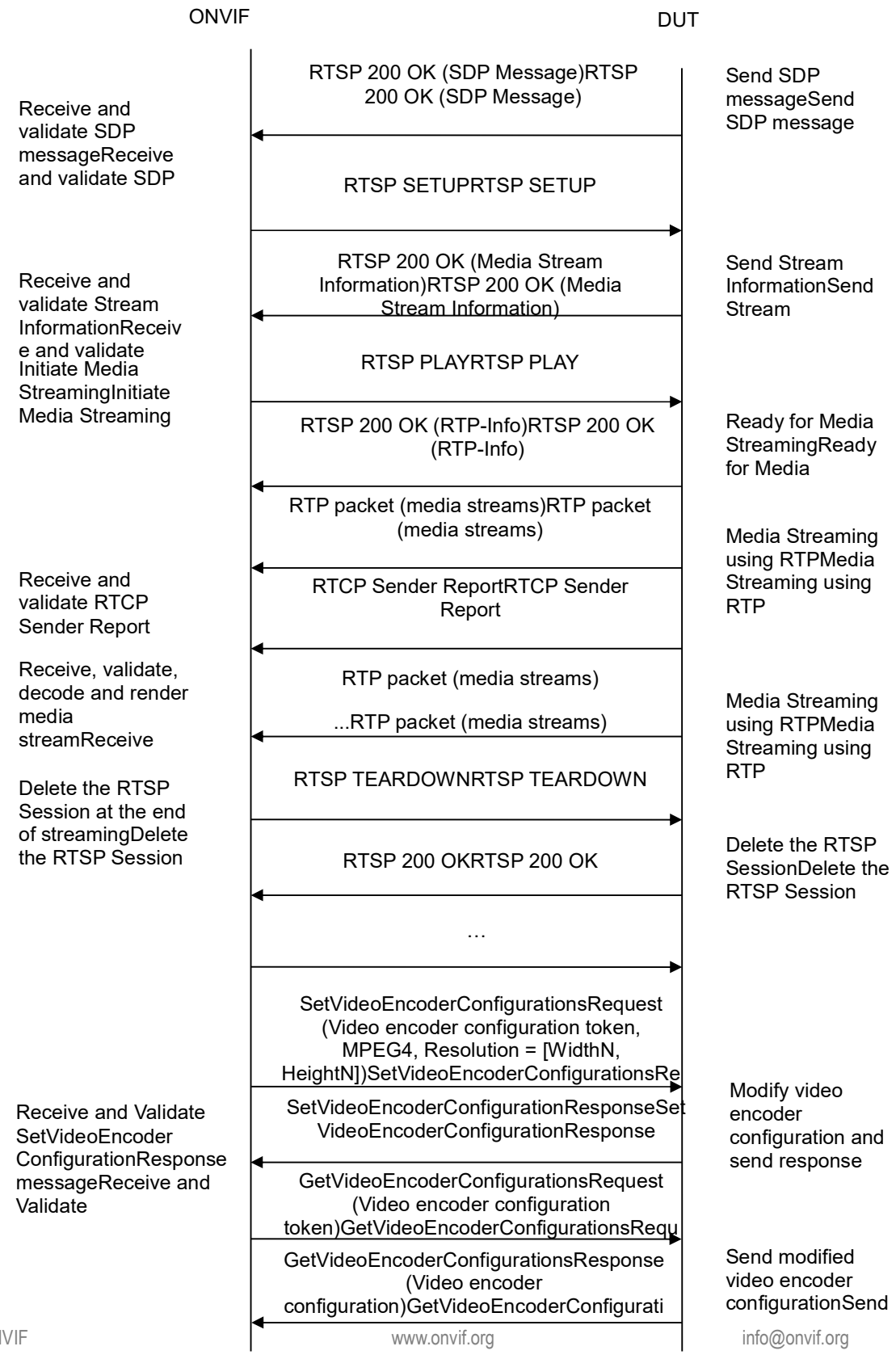
Driving IP-based physical security through global standardization

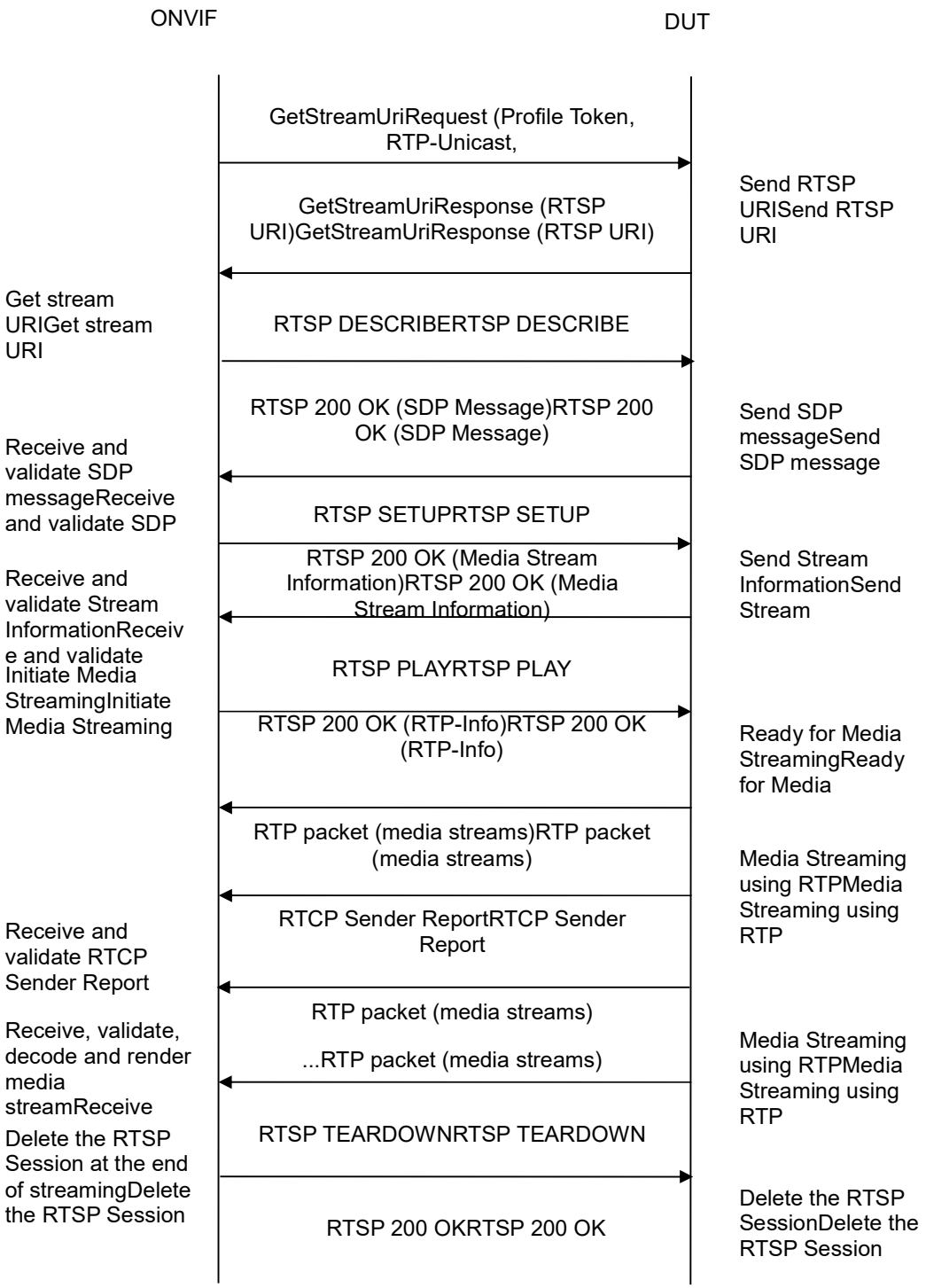
Pre-Requisite: Media is supported by DUT, MPEG4 is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT.

Test Sequence:


ONVIF
DUT
Retrieve video encoder configurationsRetrieve
GetVideoEncoderConfigurationsRequest (Empty)GetVideoEncoderConfigurationsRequest (Empty)
Start DUTStart
GetVideoEncoderConfigurationResponse (Video Encoder Configurations)
Send all video encoder configurations
Select or create Media profileSelect or
Annex A.13Annex A.13
GetVideoEncoderConfigurationOptionsRequest (ProfileToken)GetVideoEncoderConfigurati
GetVideoEncoderConfigurationOptionsResponse (Video Encoder Configuration Options)GetVideoEncoderConfigurationOptionsResponse (Video Encoder
Send video encoder configuration options
Receive and Validate Video Encoder Configuration OptionsReceive and Validate Video Encoder
SetVideoEncoderConfigurationsRequest (Video encoder configuration token, MPEG4, Resolution = [Width1, Height1])SetVideoEncoderConfigurationsRe
Modify video encoder configuration and send response
Receive and Validate SetVideoEncoderConfigurationResponse messageReceive and Validate
SetVideoEncoderConfigurationResponseSetVideoEncoderConfigurationResponse
GetVideoEncoderConfigurationsRequest (Video encoder configuration token)GetVideoEncoderConfigurationsRequ
Send modified video encoder configurationSend
Receive and validate GetVideoEncoderConfigurationsResponse messageReceive and validate
GetVideoEncoderConfigurationsResponse (Video encoder configuration)GetVideoEncoderConfigurati
GetStreamUriRequest (Profile Token, RTP-Unicast,
Get stream URIGet stream URI
GetStreamUriResponse (RTSP URI)GetStreamUriResponse (RTSP URI)
Send RTSP URISend RTSP URI
RTSP DESCRIBERTSP DESCRIBE


ONVIF
DUT
RTSP 200 OK (SDP Message)RTSP 200 OK (SDP Message)
Send SDP messageSend SDP message
Receive and validate SDP messageReceive and validate SDP
RTSP SETUPRTSP SETUP
RTSP 200 OK (Media Stream Information)RTSP 200 OK (Media Stream Information)
Send Stream InformationSend Stream
Receive and validate Stream InformationReceive and validate
Initiate Media StreamingInitiate Media Streaming
RTSP PLAYRTSP PLAY
RTSP 200 OK (RTP-Info)RTSP 200 OK (RTP-Info)
Ready for Media StreamingReady for Media
RTP packet (media streams)RTP packet (media streams)
Media Streaming using RTPMedia Streaming using RTP
Receive and validate RTCP Sender Report
RTCP Sender ReportRTCP Sender Report
Receive, validate, decode and render media streamReceive
RTP packet (media streams)
...RTP packet (media streams)
Media Streaming using RTPMedia Streaming using RTP
Delete the RTSP Session at the end of streamingDelete the RTSP Session
RTSP TEARDOWNRTSP TEARDOWN
RTSP 200 OKRTSP 200 OK
Delete the RTSP SessionDelete the RTSP Session
...
SetVideoEncoderConfigurationsRequest (Video encoder configuration token, MPEG4, Resolution = [WidthN, HeightN])SetVideoEncoderConfigurationsRe
Modify video encoder configuration and send response
SetVideoEncoderConfigurationResponseSet VideoEncoderConfigurationResponse
Receive and Validate SetVideoEncoder ConfigurationResponse messageReceive and Validate
GetVideoEncoderConfigurationsRequest (Video encoder configuration token)GetVideoEncoderConfigurationsRequ
GetVideoEncoderConfigurationsResponse (Video encoder configuration)GetVideoEncoderConfigurati
Send modified video encoder configurationSend



Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.
3. ONVIF Client invokes GetVideoEncoderConfigurationsRequest message to retrieve video configuration list.
4. Verify the GetVideoEncoderConfigurationsResponse message.
5. Find or create media profile with Video Source Configuration and Video Encoder Configuration with token VECToken1 and supporting of MPEG4 encoding, where VECToken1 is first video encoder configuration token from GetVideoEncoderConfigurationsResponse message (see Annex A.13). If it is not possible skip steps 6-26 and go to the step 27.
6. ONVIF Client invokes GetVideoEncoderConfigurationOptionsRequest message (ProfileToken = “Profile1”, where “Profile1” is profile token from the step 5) to get video encoder configuration options.
7. Verify the GetVideoEncoderConfigurationOptionsResponse message from the DUT.
8. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = MPEG4, where [Width1, Height1] is the first resolution from the Options.MPEG4.ResolutionsAvailable) to change video encoder configuration.
9. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
10. ONVIF Client invokes GetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1) to get video encoder configuration.
11. Verify the GetVideoEncoderConfigurationResponse message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = MPEG4) from the DUT. Check that new setting for Resolution and Encoding was applied.
12. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
13. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
14. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
15. ONVIF Client invokes RTSP DESCRIBE request.
16. DUT sends 200 OK message and SDP information.
17. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
18. DUT sends 200 OK message and the media stream information.
19. ONVIF Client invokes RTSP PLAY request.
20. DUT sends 200 OK message and starts media streaming.
21. DUT sends MPEG4 RTP media stream to ONVIF Client over UDP. Verify that stream has MPEG4 encoding and [Width1, Height1] resolution.
22. DUT sends RTCP sender report to ONVIF Client.
23. DUT validates the received RTP and RTCP packets, decodes and renders them.

24. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
25. DUT sends 200 OK Response and terminates the RTSP Session.
26. Repeat 8-25 steps for the rest MPEG4 Resolutions supported by selected configuration.
27. Repeat steps 5-26 for the rest Video Encoder configurations supported by the DUT.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not sent valid video stream with MPEG4 encoding and specified resolution or sent it in another encoding or resolution.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.3 VIDEO ENCODER CONFIGURATION – H.264 RESOLUTION (ALL RESOLUTIONS)

Test Label: Set all Resolution for all video encoder configurations Verification (H.264).

Test Case ID: RTSS-1-1-26

ONVIF Core Specification Coverage: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, GetStreamUri, Live Streaming

Command Under Test: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, GetStreamUri

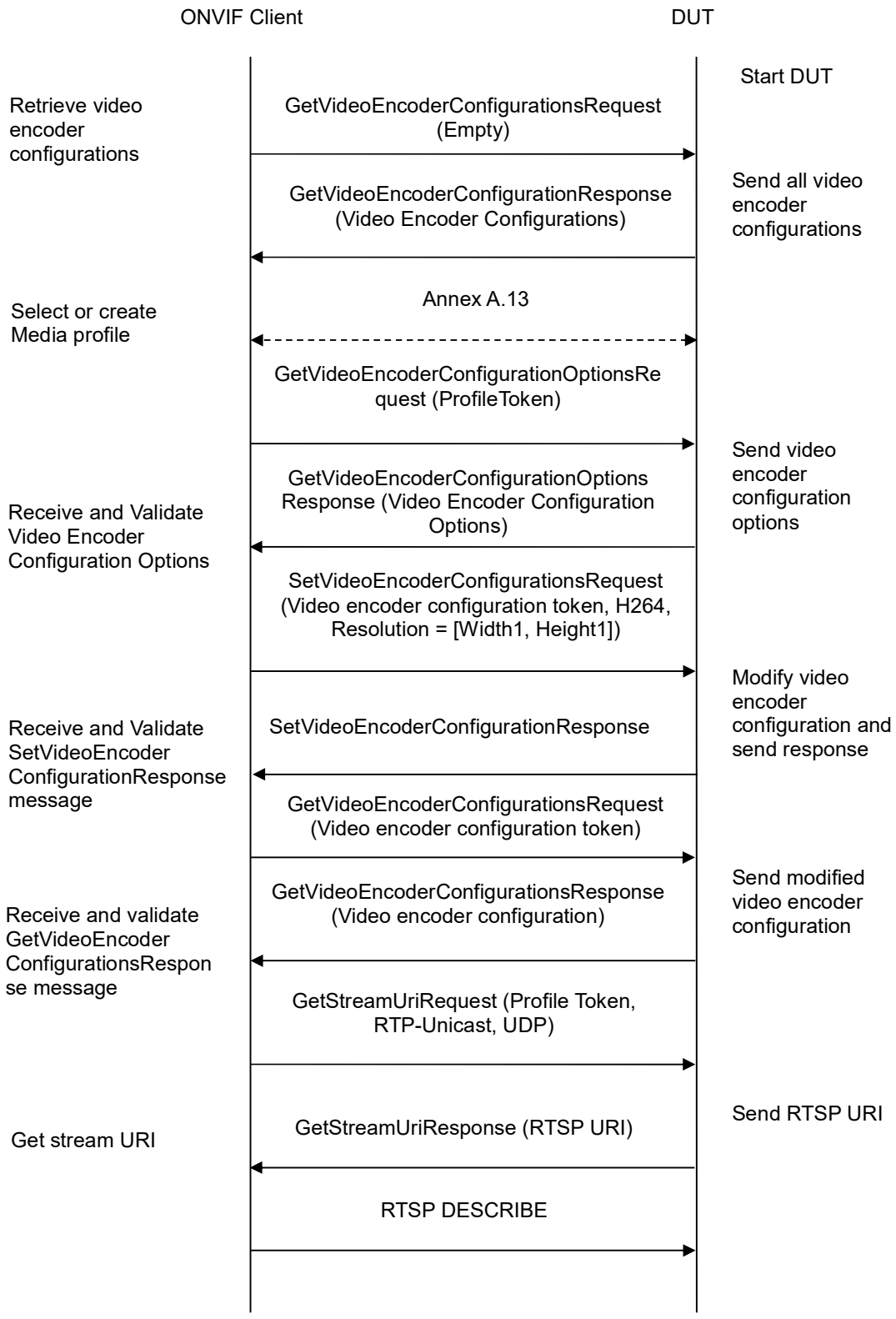
WSDL Reference: media.wsdl

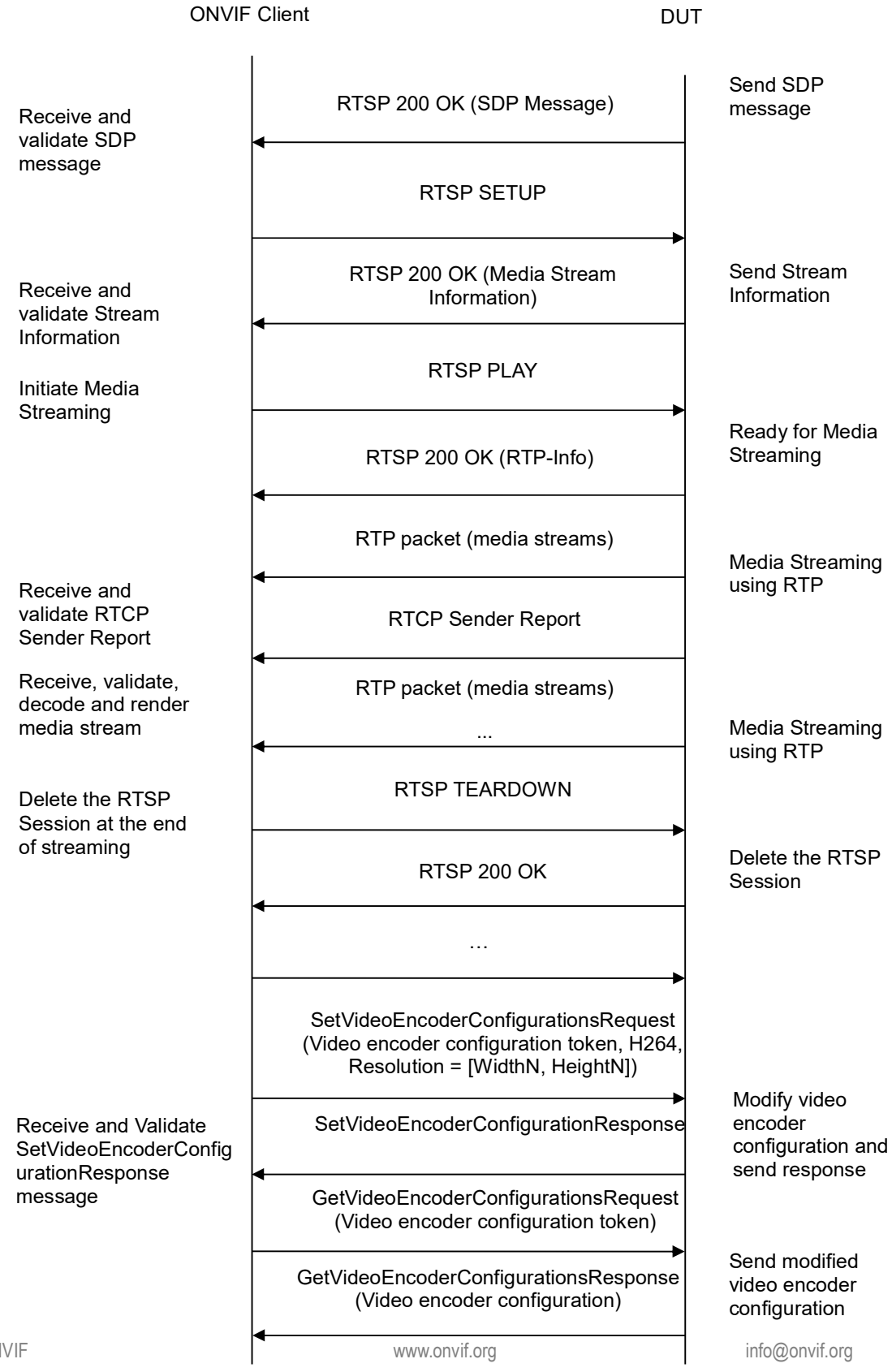
Test Purpose: To verify changing and applying of all different Resolutions for video encoder configuration and video stream.

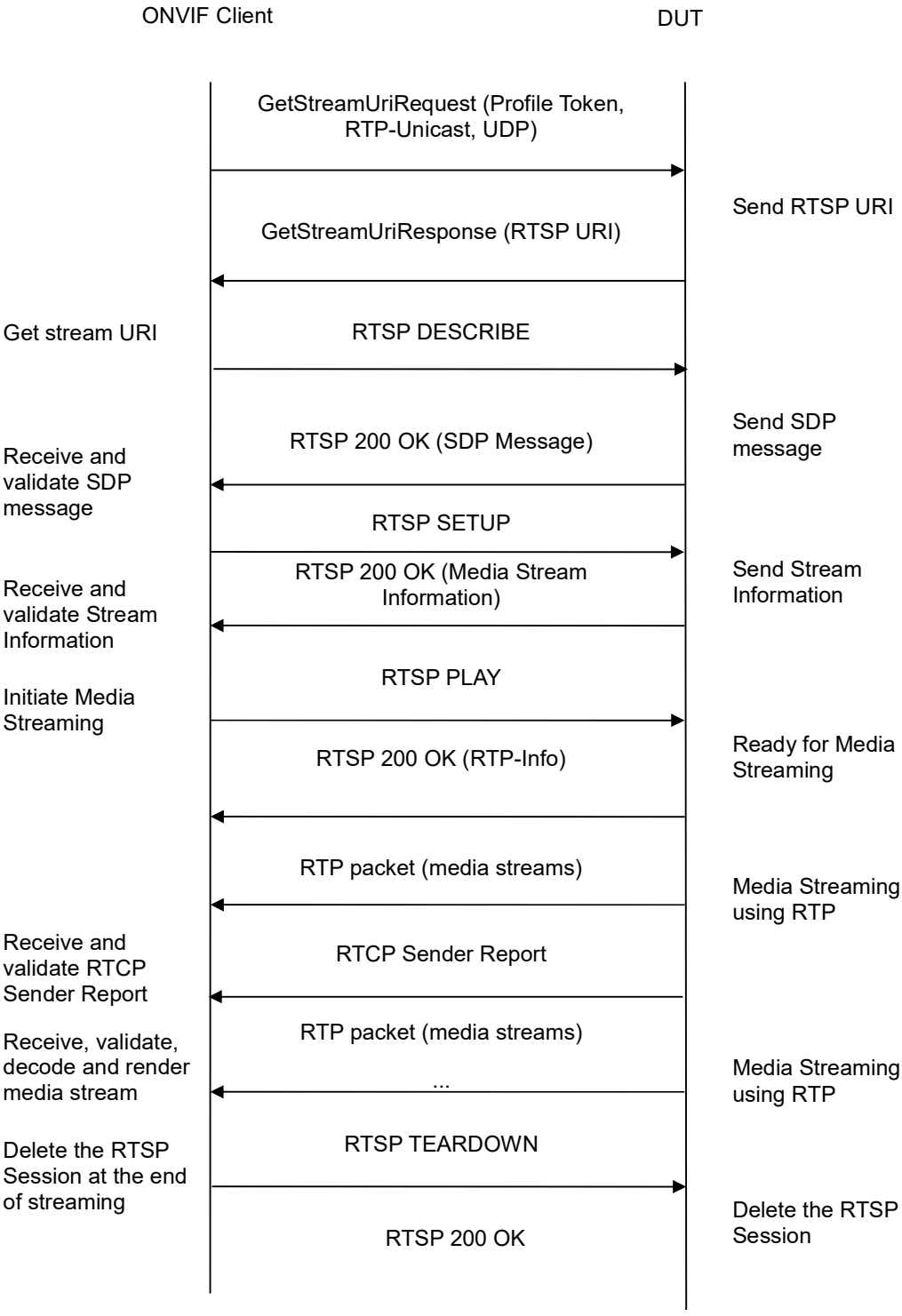
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.H.264 is supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT.

Test Sequence:


ONVIF Client
DUT
Start DUT
Retrieve video encoder configurations
GetVideoEncoderConfigurationsRequest (Empty)
GetVideoEncoderConfigurationResponse (Video Encoder Configurations)
Send all video encoder configurations
Select or create Media profile
Annex A.13
GetVideoEncoderConfigurationOptionsRequest (ProfileToken)
Send video encoder configuration options
Receive and Validate Video Encoder Configuration Options
GetVideoEncoderConfigurationOptionsResponse (Video Encoder Configuration Options)
SetVideoEncoderConfigurationsRequest (Video encoder configuration token, H264, Resolution = [Width1, Height1])
Modify video encoder configuration and send response
Receive and Validate SetVideoEncoderConfigurationResponse message
SetVideoEncoderConfigurationResponse
GetVideoEncoderConfigurationsRequest (Video encoder configuration token)
Send modified video encoder configuration
Receive and validate GetVideoEncoderConfigurationsResponse message
GetVideoEncoderConfigurationsResponse (Video encoder configuration)
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
Send RTSP URI
Get stream URI
GetStreamUriResponse (RTSP URI)
RTSP DESCRIBE


ONVIF Client
DUT
RTSP 200 OK (SDP Message)
Send SDP message
Receive and validate SDP message
RTSP SETUP
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP
Receive and validate RTCP Sender Report
RTCP Sender Report
Receive, validate, decode and render media stream
RTP packet (media streams)
...
Media Streaming using RTP
RTSP TEARDOWN
Delete the RTSP Session at the end of streaming
RTSP 200 OK
Delete the RTSP Session
…
SetVideoEncoderConfigurationsRequest (Video encoder configuration token, H264, Resolution = [WidthN, HeightN])
Modify video encoder configuration and send response
SetVideoEncoderConfigurationResponse
Receive and Validate SetVideoEncoderConfigurationResponse message
GetVideoEncoderConfigurationsRequest (Video encoder configuration token)
GetVideoEncoderConfigurationsResponse (Video encoder configuration)
Send modified video encoder configuration



Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.
3. ONVIF Client invokes GetVideoEncoderConfigurationsRequest message to retrieve video configuration list.
4. Verify the GetVideoEncoderConfigurationsResponse message.
5. Find or create media profile with Video Source Configuration and Video Encoder Configuration with token VECToken1 and supporting of H264 encoding, where VECToken1 is first video encoder configuration token from GetVideoEncoderConfigurationsResponse message (see Annex A.13). If it is not possible skip steps 6-26 and go to the step 27.
6. ONVIF Client invokes GetVideoEncoderConfigurationOptionsRequest message (ProfileToken = “Profile1”, where “Profile1” is profile token from the step 5) to get video encoder configuration options.
7. Verify the GetVideoEncoderConfigurationOptionsResponse message from the DUT.
8. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = H264, where [Width1, Height1] is the first resolution from the Options.H264.ResolutionsAvailable) to change video encoder configuration.
9. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
10. ONVIF Client invokes GetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1) to get video encoder configuration.
11. Verify the GetVideoEncoderConfigurationResponse message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = H264) from the DUT. Check that new setting for Resolution and Encoding was applied.
12. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
13. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
14. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
15. ONVIF Client invokes RTSP DESCRIBE request.
16. DUT sends 200 OK message and SDP information.
17. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
18. DUT sends 200 OK message and the media stream information.
19. ONVIF Client invokes RTSP PLAY request.
20. DUT sends 200 OK message and starts media streaming.
21. DUT sends H264 RTP media stream to ONVIF Client over UDP. Verify that stream has H264 encoding and [Width1, Height1] resolution.
22. DUT sends RTCP sender report to ONVIF Client.
23. DUT validates the received RTP and RTCP packets, decodes and renders them.

24. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
25. DUT sends 200 OK Response and terminates the RTSP Session.
26. Repeat 8-25 steps for the rest H264 Resolutions supported by selected configuration.
27. Repeat steps 5-26 for the rest Video Encoder configurations supported by the DUT.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not sent valid video stream with H264 encoding and specified resolution or sent it in another encoding or resolution.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.4 MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP-Unicast/UDP)

Test Label: Guaranteed Number Of Video Encoder Instances Verification (RTP-Unicast/UDP).

Test Case ID: RTSS-1-1-27

ONVIF Core Specification Coverage: GetGuaranteedNumberOfVideoEncoderInstances

Command Under Test: GetGuaranteedNumberOfVideoEncoderInstances

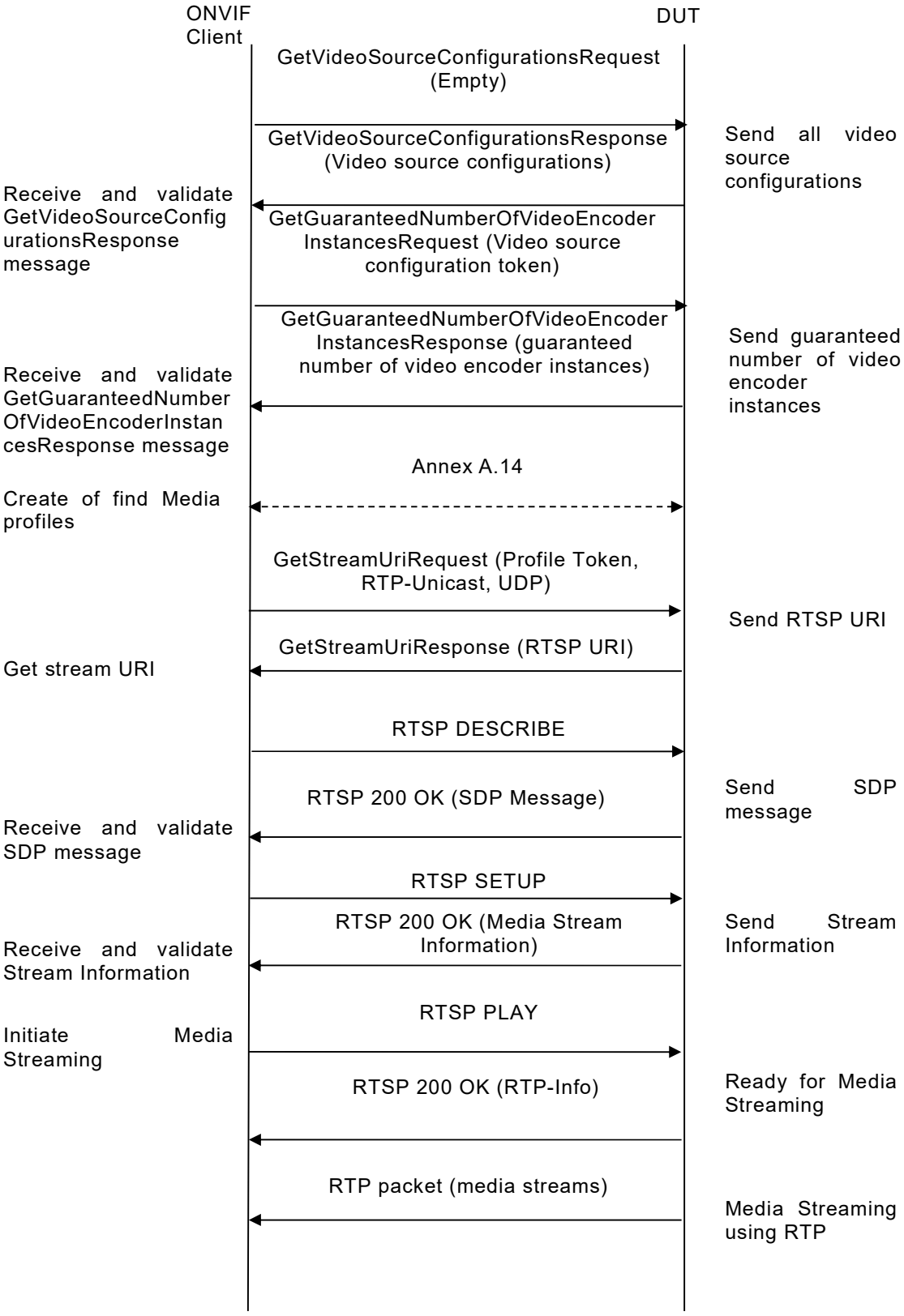
WSDL Reference: media.wsdl

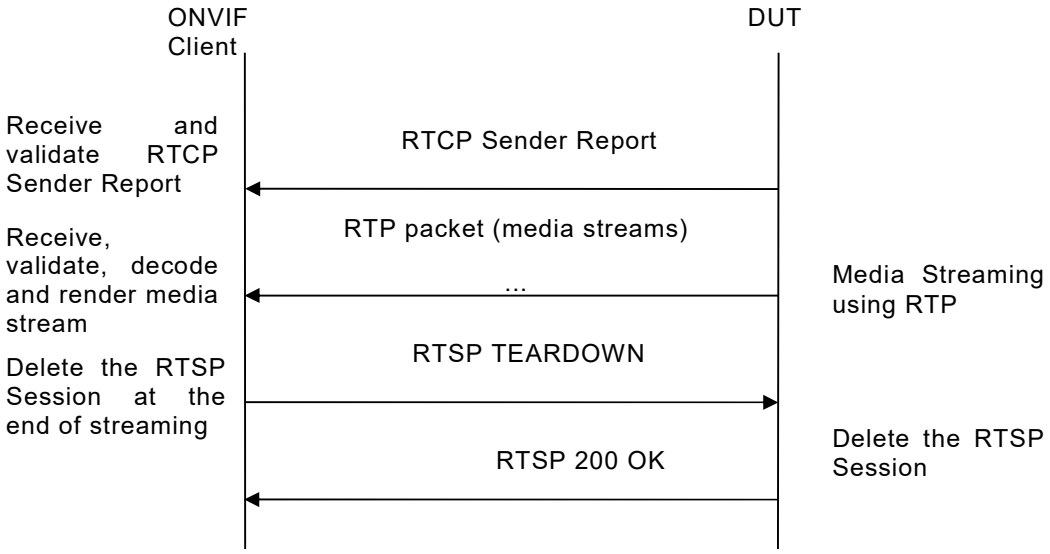
Test Purpose: To verify Guaranteed Number Of Video Encoder Instances (RTP-Unicast/UDP).

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
GetVideoSourceConfigurationsRequest (Empty)
GetVideoSourceConfigurationsResponse (Video source configurations)
Send all video source configurations
Receive and validate GetVideoSourceConfigurationsResponse message
GetGuaranteedNumberOfVideoEncoderInstancesRequest (Video source configuration token)
GetGuaranteedNumberOfVideoEncoderInstancesResponse (guaranteed number of video encoder instances)
Send guaranteed number of video encoder instances
Receive and validate GetGuaranteedNumberOfVideoEncoderInstancesResponse message
Annex A.14
Create of find Media profiles
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
RTSP 200 OK (SDP Message)
Send SDP message
Receive and validate SDP message
RTSP SETUP
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
RTSP 200 OK (RTP-Info)
Ready for Media Streaming
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will invoke GetVideoSourceConfigurationsRequest message to retrieve all DUT video source configurations.
4. Verify the GetVideoSourceConfigurationsResponse message from the DUT.
5. ONVIF Client will invoke GetGuaranteedNumberOfVideoEncoderInstancesRequest message (ConfigurationToken = “VSCToken1”, where “VSCToken1” is a first video source configuration token from GetVideoSourceConfigurationsResponse message) to retrieve guaranteed number of video encoder instances per first video source configuration.
6. Verify the GetGuaranteedNumberOfVideoEncoderInstancesResponse message from the DUT.
7. Create or find number of profiles equal to TotalNumber from GetGuaranteedNumberOfVideoEncoderInstancesResponse message that contains video source configuration with token “VSCToken1” and video encoder configuration (see Annex A.14).
8. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the first media profile from step 7.
9. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.

14. DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. DUT sends 200 OK message and starts media streaming.
17. DUT sends JPEG RTP media stream to ONVIF Client over UDP.
18. DUT sends RTCP sender report to ONVIF Client.
19. DUT validates the received RTP and RTCP packets, decodes and renders them.
20. Repeat steps 8-20 to start video streaming for all profiles from step 7.
21. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session for each started stream.
22. DUT sends 200 OK Response and terminates the RTSP Session.
23. If number of Video source configurations in GetVideoSourceConfigurationsResponse message is more than one, repeat steps 5-22 for the last video source configuration token from GetVideoEncoderConfigurationsResponse message.
24. If number of Video source configurations in GetVideoSourceConfigurationsResponse message is more than two, repeat steps 5-22 for the video source configuration token between the first and the last VSC tokens from GetVideoSourceConfigurationsResponse message.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not send valid video stream.

DUT does not provide possibility to create TotalNumber of profiles for step 7.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Driving IP-based physical security through global standardization

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.5 MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP-Unicast/RTSP/HTTP/TCP)

Test Label: Guaranteed Number Of Video Encoder Instances Verification (RTP-Unicast/RTSP/HTTP/TCP).

Test Case ID: RTSS-1-1-28

ONVIF Core Specification Coverage: GetGuaranteedNumberOfVideoEncoderInstances

Command Under Test: GetGuaranteedNumberOfVideoEncoderInstances

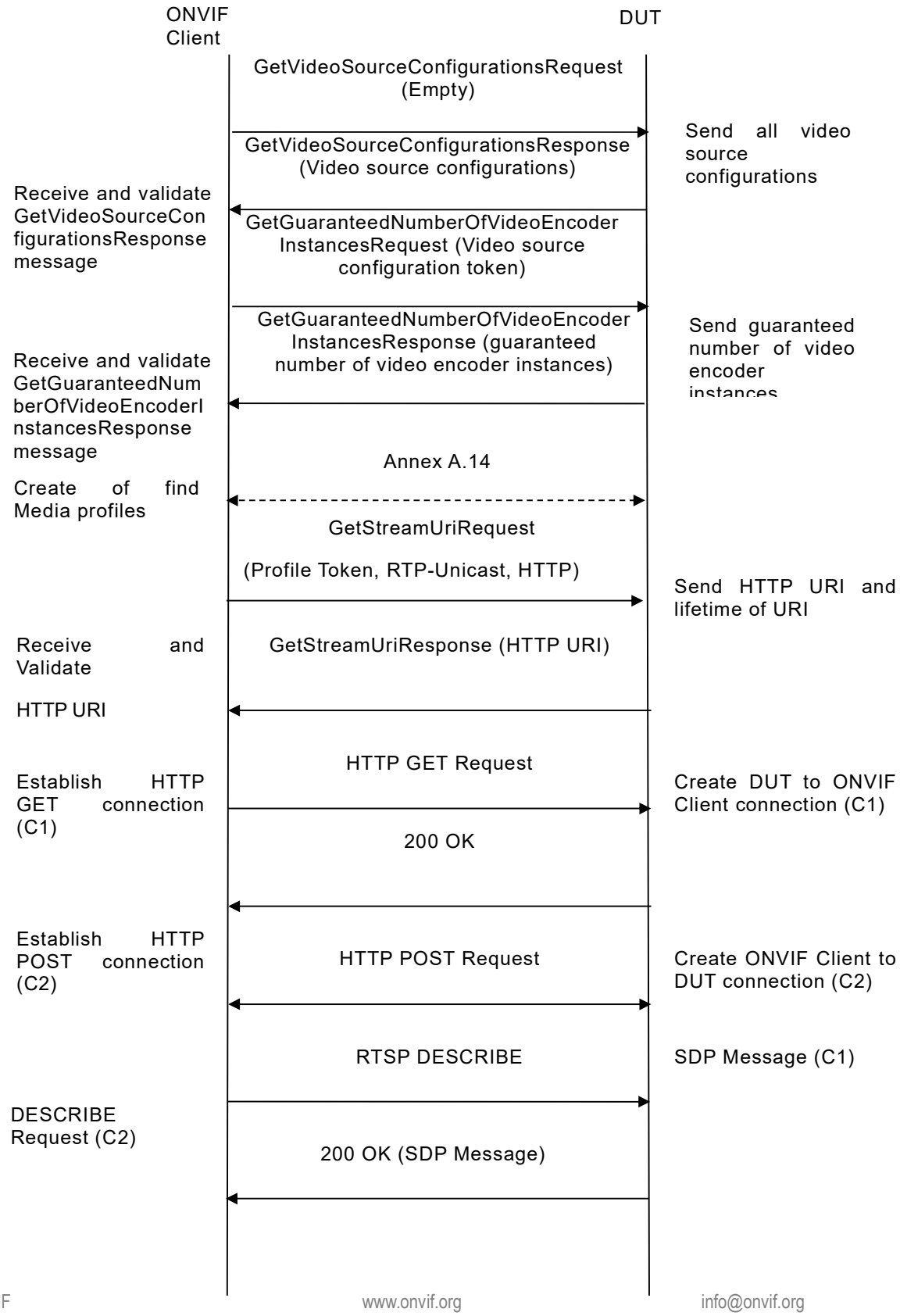
WSDL Reference: media.wsdl

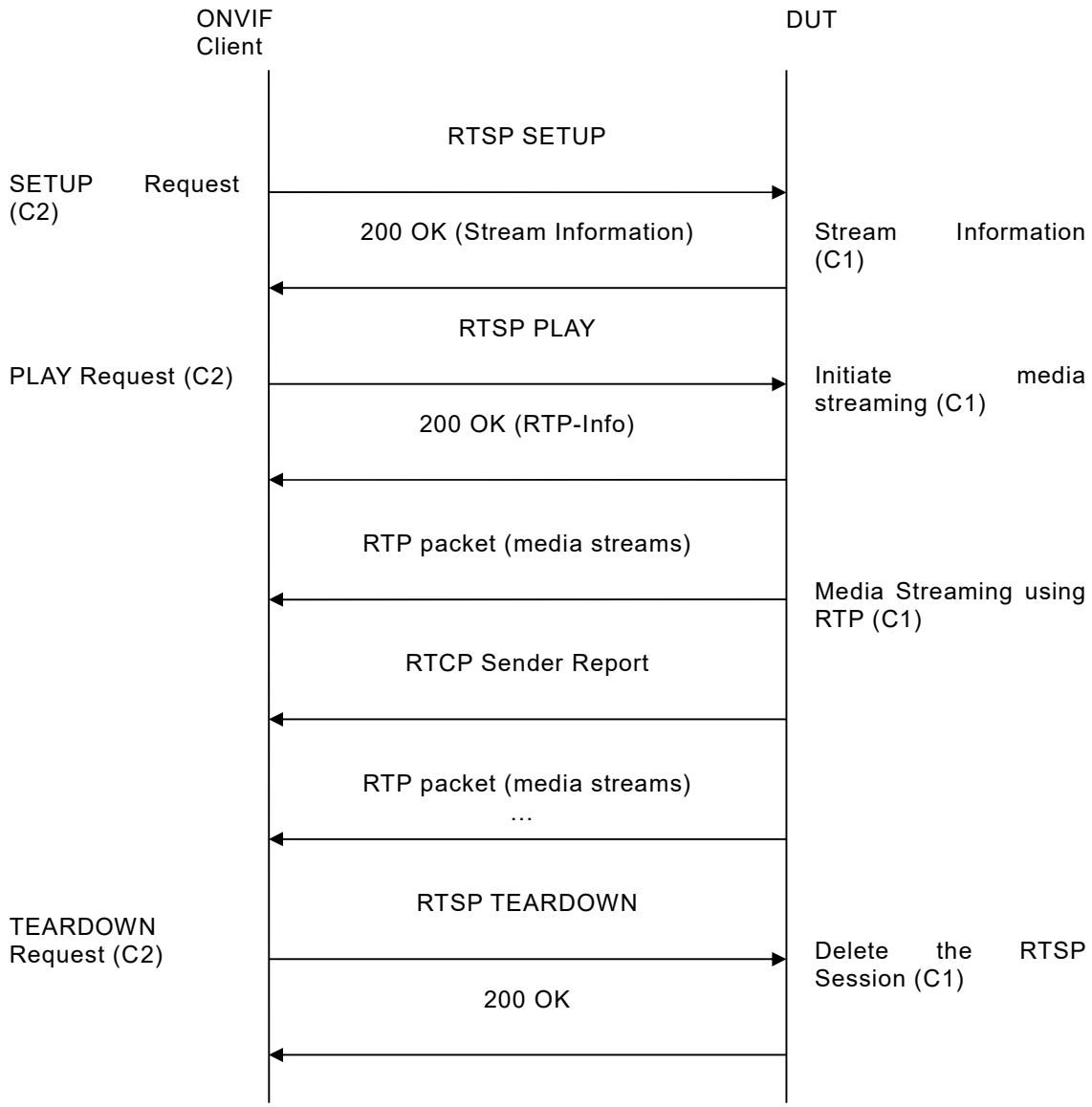
Test Purpose: To verify Guaranteed Number Of Video Encoder Instances (RTP-Unicast/RTSP/HTTP/TCP)

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
GetVideoSourceConfigurationsRequest (Empty)
GetVideoSourceConfigurationsResponse (Video source configurations)
Send all video source configurations
Receive and validate GetVideoSourceConfigurationsResponse message
GetGuaranteedNumberOfVideoEncoderInstancesRequest (Video source configuration token)
GetGuaranteedNumberOfVideoEncoderInstancesResponse (guaranteed number of video encoder instances)
Send guaranteed number of video encoder instances
Receive and validate GetGuaranteedNumberOfVideoEncoderInstancesResponse message
Annex A.14
Create of find Media profiles
GetStreamUriRequest
(Profile Token, RTP-Unicast, HTTP)
Send HTTP URI and lifetime of URI
Receive and Validate
GetStreamUriResponse (HTTP URI)
HTTP URI
HTTP GET Request
Establish HTTP GET connection (C1)
Create DUT to ONVIF Client connection (C1)
200 OK
Establish HTTP POST connection (C2)
HTTP POST Request
Create ONVIF Client to DUT connection (C2)
RTSP DESCRIBE
SDP Message (C1)
DESCRIBE Request (C2)
200 OK (SDP Message)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will invoke GetVideoSourceConfigurationsRequest message to retrieve all DUT video source configurations.
4. Verify the GetVideoSourceConfigurationsResponse message from the DUT.
5. ONVIF Client will invoke GetGuaranteedNumberOfVideoEncoderInstancesRequest message (ConfigurationToken = “VSCToken1”, where “VSCToken1” is a first video source

configuration token from GetVideoSourceConfigurationsResponse message) to retrieve guaranteed number of video encoder instances per first video source configuration.

6. Verify the GetGuaranteedNumberOfVideoEncoderInstancesResponse message from the DUT.
7. Create or find number of profiles equal to TotalNumber from GetGuaranteedNumberOfVideoEncoderInstancesResponse message that contains video source configuration with token “VSCToken1” and video encoder configuration (see Annex A.14).
8. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, HTTP transport) to retrieve media stream URI for the first media profile from step 7.
9. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
10. ONVIF Client verifies the HTTP media stream URI provided by the DUT.
11. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
12. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
13. ONVIF Client invokes RTSP DESCRIBE request on HTTP POST connection.
14. DUT sends 200 OK message and SDP information on HTTP GET connection.
15. ONVIF Client invokes RTSP SETUP request on HTTP POST connection with transport parameter as ‘RTP/TCP’ along with ‘interleaved’ parameter for both audio and video streams separately.
16. DUT sends 200 OK message and the media stream information on HTTP GET connection.
17. ONVIF Client invokes RTSP PLAY request on HTTP POST connection.
18. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
19. DUT transfers RTP media stream to ONVIF Client on HTTP GET connection.
20. DUT sends RTCP sender report to ONVIF Client on HTTP GET connection.
21. DUT validates the received RTP and RTCP packets, decodes and renders them.
22. Repeat steps 8-22 to start video streaming for all profiles from step 7.
23. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection and closes the HTTP POST connection.
24. DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.
25. If number of Video source configurations in GetVideoSourceConfigurationsResponse message is more than one, repeat steps 5-24 for the last video source configuration token from GetVideoEncoderConfigurationsResponse message.
26. If number of Video source configurations in GetVideoSourceConfigurationsResponse message is more than two, repeat steps 5-24 for the video source configuration token

between the first and the last VSC tokens from GetVideoSourceConfigurationsResponse message.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not send valid video stream.

DUT does not provide possibility to create TotalNumber of profiles for step 7.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.6 MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP/RTSP/TCP)

Test Label: Guaranteed Number Of Video Encoder Instances Verification (RTP/RTSP/TCP).

Test Case ID: RTSS-1-1-29

ONVIF Core Specification Coverage: GetGuaranteedNumberOfVideoEncoderInstances

Command Under Test: GetGuaranteedNumberOfVideoEncoderInstances

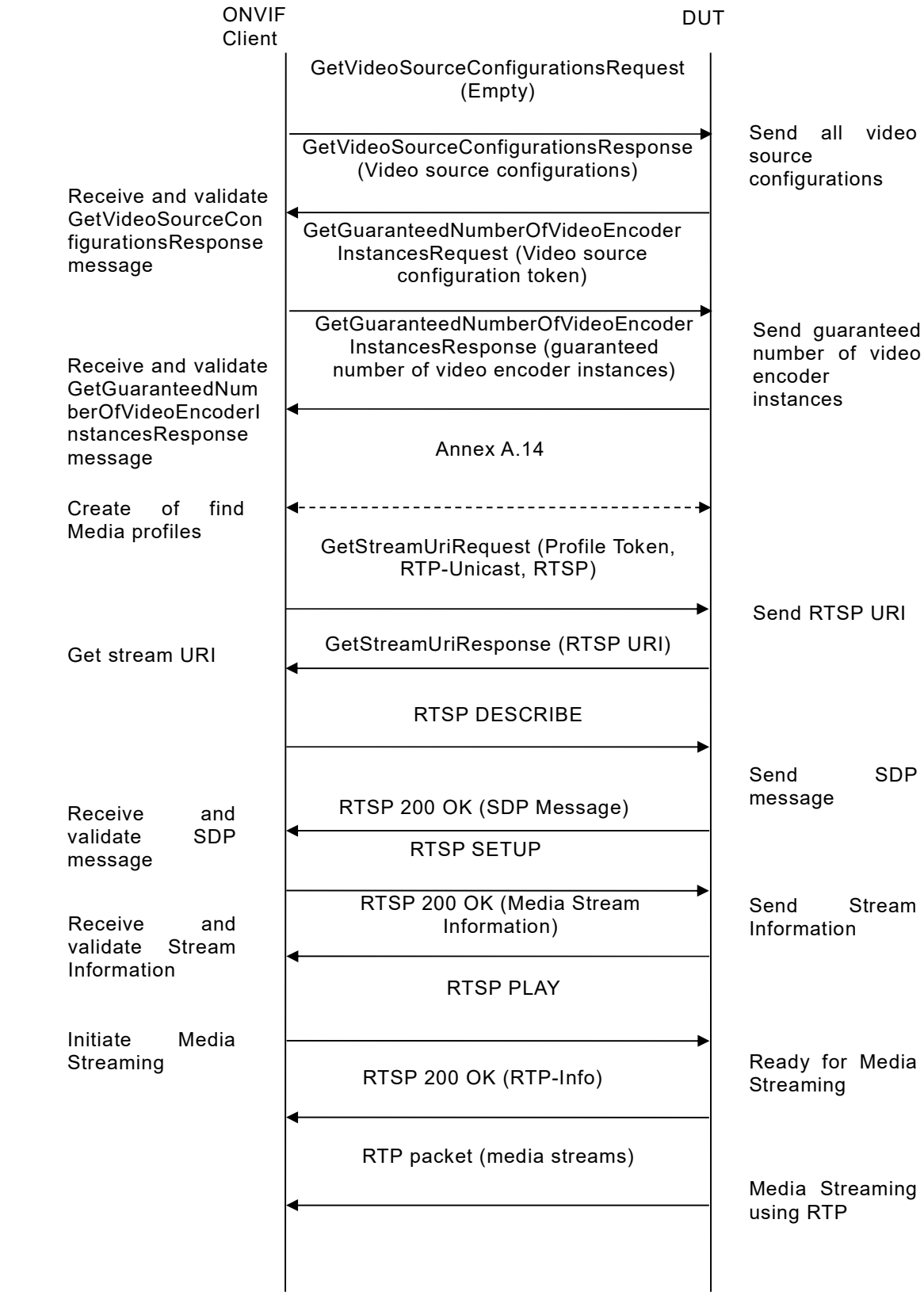
WSDL Reference: media.wsdl

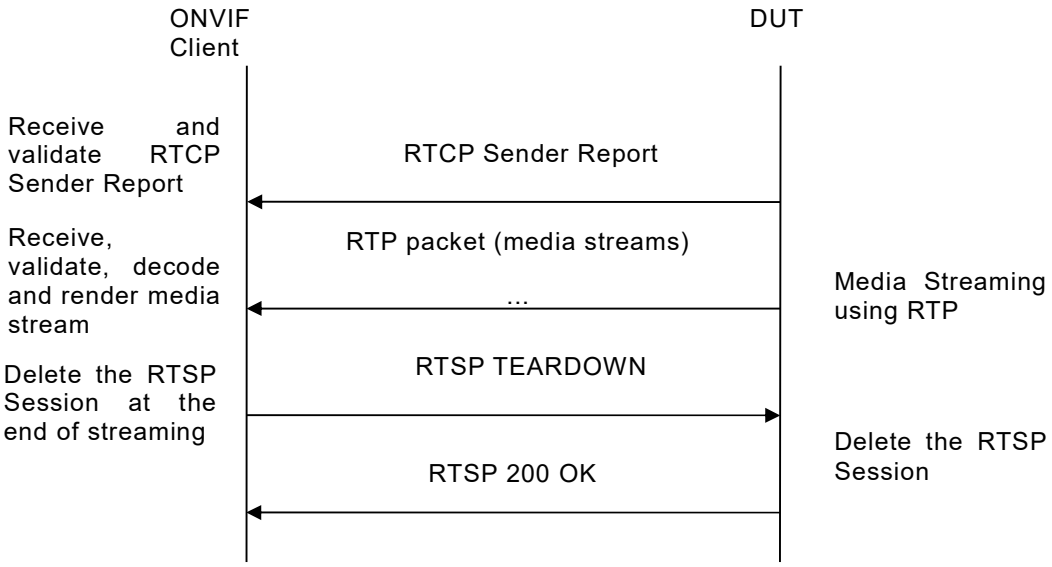
Test Purpose: To verify Guaranteed Number Of Video Encoder Instances (RTP/RTSP/TCP)

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT. RTP/RTSP/TCP media streaming is implemented by DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
GetVideoSourceConfigurationsRequest (Empty)
GetVideoSourceConfigurationsResponse (Video source configurations)
Send all video source configurations
Receive and validate GetVideoSourceConfigurationsResponse message
GetGuaranteedNumberOfVideoEncoderInstancesRequest (Video source configuration token)
GetGuaranteedNumberOfVideoEncoderInstancesResponse (guaranteed number of video encoder instances)
Send guaranteed number of video encoder instances
Receive and validate GetGuaranteedNumberOfVideoEncoderInstancesResponse message
Annex A.14
Create of find Media profiles
GetStreamUriRequest (Profile Token, RTP-Unicast, RTSP)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
RTSP 200 OK (RTP-Info)
Ready for Media Streaming
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will invoke GetVideoSourceConfigurationsRequest message to retrieve all DUT video source configurations.
4. Verify the GetVideoSourceConfigurationsResponse message from the DUT.
5. ONVIF Client will invoke GetGuaranteedNumberOfVideoEncoderInstancesRequest message (ConfigurationToken = “VSCToken1”, where “VSCToken1” is a first video source configuration token from GetVideoSourceConfigurationsResponse message) to retrieve guaranteed number of video encoder instances per first video source configuration.
6. Verify the GetGuaranteedNumberOfVideoEncoderInstancesResponse message from the DUT.
7. Create or find number of profiles equal to TotalNumber from GetGuaranteedNumberOfVideoEncoderInstancesResponse message that contains video source configuration with token “VSCToken1” and video encoder configuration (see Annex A.14).
8. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, RTSP transport) to retrieve media stream URI for the first media profile from step 7.
9. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/TCP.

14. DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. DUT sends 200 OK message and starts media streaming.
17. DUT sends RTP media stream to ONVIF Client over TCP.
18. DUT sends RTCP sender report to ONVIF Client.
19. DUT validates the received RTP and RTCP packets, decodes and renders them.
20. Repeat steps 8-20 to start video streaming for all profiles from step 7.
21. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session for each started stream.
22. DUT sends 200 OK Response and terminates the RTSP Session.
23. If number of Video source configurations in GetVideoSourceConfigurationsResponse message is more than one, repeat steps 5-22 for the last video source configuration token from GetVideoEncoderConfigurationsResponse message.
24. If number of Video source configurations in GetVideoSourceConfigurationsResponse message is more than two, repeat steps 5-22 for the video source configuration token between the first and the last VSC tokens from GetVideoSourceConfigurationsResponse message.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not send valid video stream.

DUT does not provide possibility to create TotalNumber of profiles for step 7.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Driving IP-based physical security through global standardization

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.7 MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (MIX OF TRANSPORT TYPES)

Test Label: Guaranteed Number Of Video Encoder Instances Verification (Mix Of Transport Types).

Test Case ID: RTSS-1-1-30

ONVIF Core Specification Coverage: GetGuaranteedNumberOfVideoEncoderInstances

Command Under Test: GetGuaranteedNumberOfVideoEncoderInstances

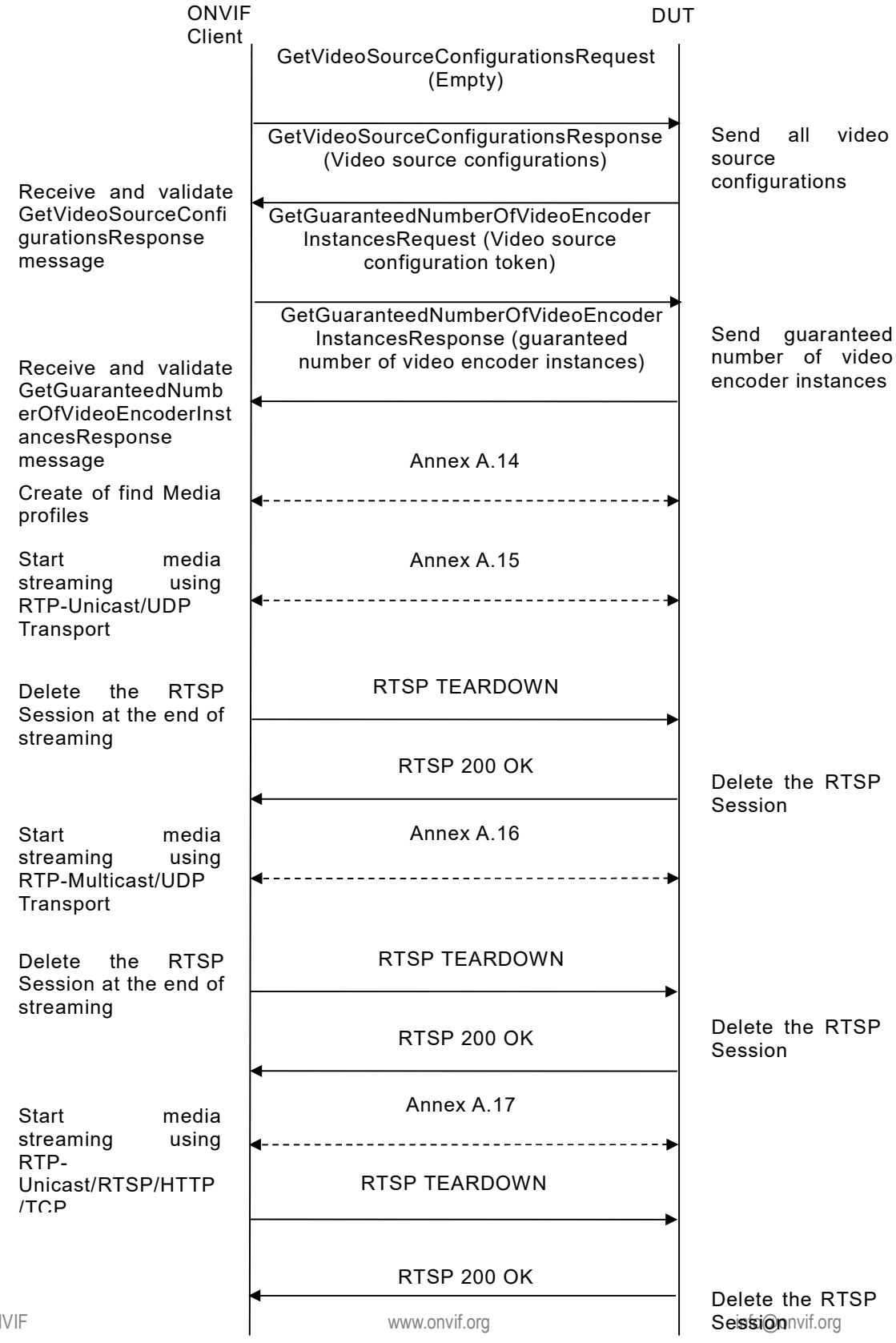
WSDL Reference: media.wsdl

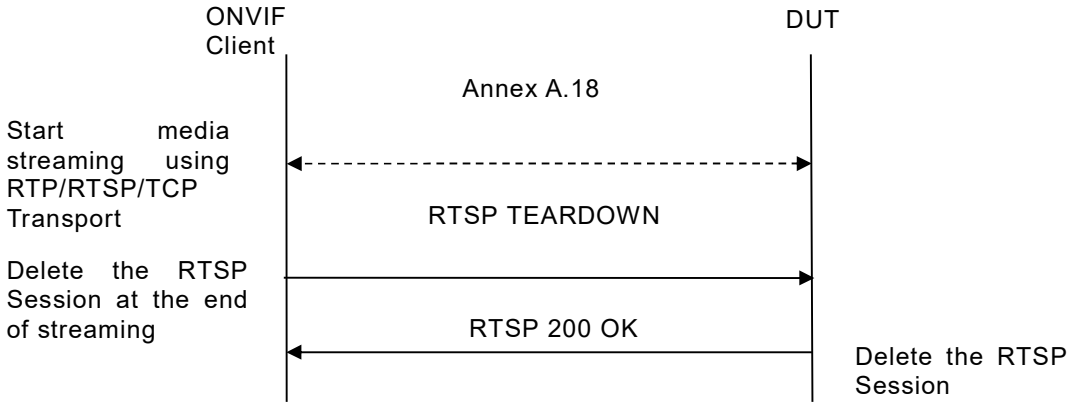
Test Purpose: To verify Guaranteed Number Of Video Encoder Instances (Mix Of Transport Types)

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT. RTP/RTSP/TCP media streaming is implemented by DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
GetVideoSourceConfigurationsRequest (Empty)
GetVideoSourceConfigurationsResponse (Video source configurations)
Send all video source configurations
Receive and validate GetVideoSourceConfigurationsResponse message
GetGuaranteedNumberOfVideoEncoderInstancesRequest (Video source configuration token)
GetGuaranteedNumberOfVideoEncoderInstancesResponse (guaranteed number of video encoder instances)
Send guaranteed number of video encoder instances
Receive and validate GetGuaranteedNumberOfVideoEncoderInstancesResponse message
Annex A.14
Create of find Media profiles
Annex A.15
Start media streaming using RTP-Unicast/UDP Transport
RTSP TEARDOWN
Delete the RTSP Session at the end of streaming
RTSP 200 OK
Delete the RTSP Session
Annex A.16
Start media streaming using RTP-Multicast/UDP Transport
RTSP TEARDOWN
Delete the RTSP Session at the end of streaming
RTSP 200 OK
Delete the RTSP Session
Annex A.17
Start media streaming using RTP-Unicast/RTSP/HTTP/TCP
RTSP TEARDOWN
RTSP 200 OK
Delete the RTSP Session



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will invoke GetVideoSourceConfigurationsRequest message to retrieve all DUT video source configurations.
4. Verify the GetVideoSourceConfigurationsResponse message from the DUT.
5. ONVIF Client will invoke GetGuaranteedNumberOfVideoEncoderInstancesRequest message (ConfigurationToken = “VSCToken1”, where “VSCToken1” is a first video source configuration token from GetVideoSourceConfigurationsResponse message) to retrieve guaranteed number of video encoder instances per first video source configuration.
6. Verify the GetGuaranteedNumberOfVideoEncoderInstancesResponse message from the DUT.
7. Create or find number of profiles equal to TotalNumber from GetGuaranteedNumberOfVideoEncoderInstancesResponse message that contains video source configuration with token “VSCToken1” and video encoder configuration (see Annex A.14).
8. ONVIF Client start media streaming for first profile to retrieve media stream URI for the first media profile from step 7. (To start media streaming Annex A.15, Annex A.16, Annex A.17, or Annex A.18 will be used in loop. Annex A.16 will be used if RTP-Multicast/UDP supported. Annex A.18 will be used if RTP/RTSP/TCP supported.)
9. Repeat step 8 to start video streaming for all profiles from step 7 (transport type should be altered for each iteration of the loop, see step 8 for more details).
10. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session for each started stream.
11. DUT sends 200 OK Response and terminates the RTSP Session.
12. If number of Video source configurations in GetVideoSourceConfigurationsResponse message is more than one, repeat steps 5-11 for the last video source configuration token from GetVideoEncoderConfigurationsResponse message.

13. If number of Video source configurations in GetVideoSourceConfigurationsResponse message is more than two, repeat steps 5-11 for the video source configuration token between the first and the last VSC tokens from GetVideoSourceConfigurationsResponse message.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not send valid video stream.

DUT does not provide possibility to create TotalNumber of profiles for step 7.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: In case if there are more than one Media Profiles with the same Video Encoder Configuration, multicast streaming will be started only for one of them

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.8 MEDIA CONTROL – RTSP/TCP

Test Label: Real Time Viewing DUT RTSP control messages.

Test Case ID: RTSS-1-1-31

ONVIF Core Specification Coverage: Stream control, RTSP.

Command Under Test: None

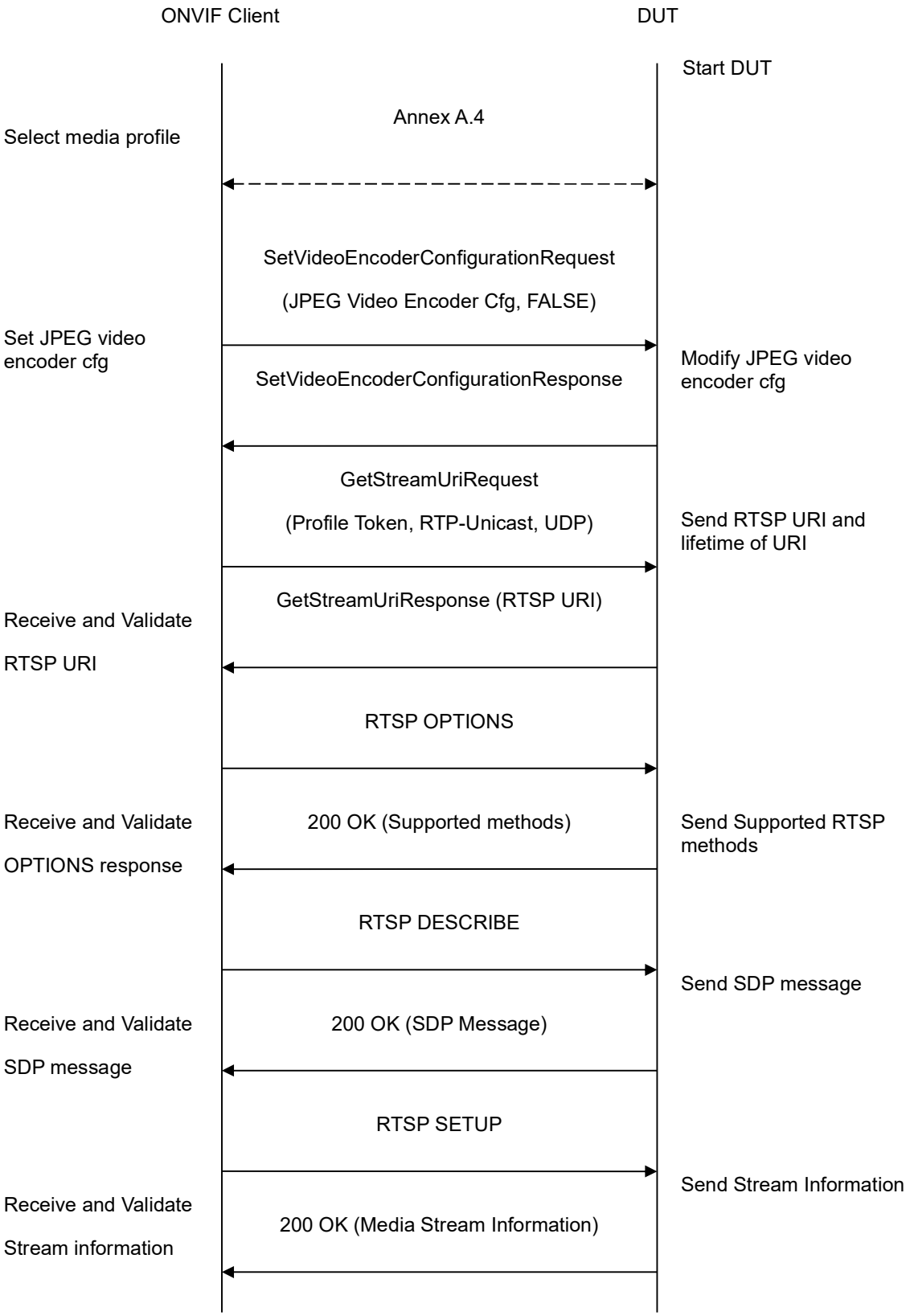
WSDL Reference: None

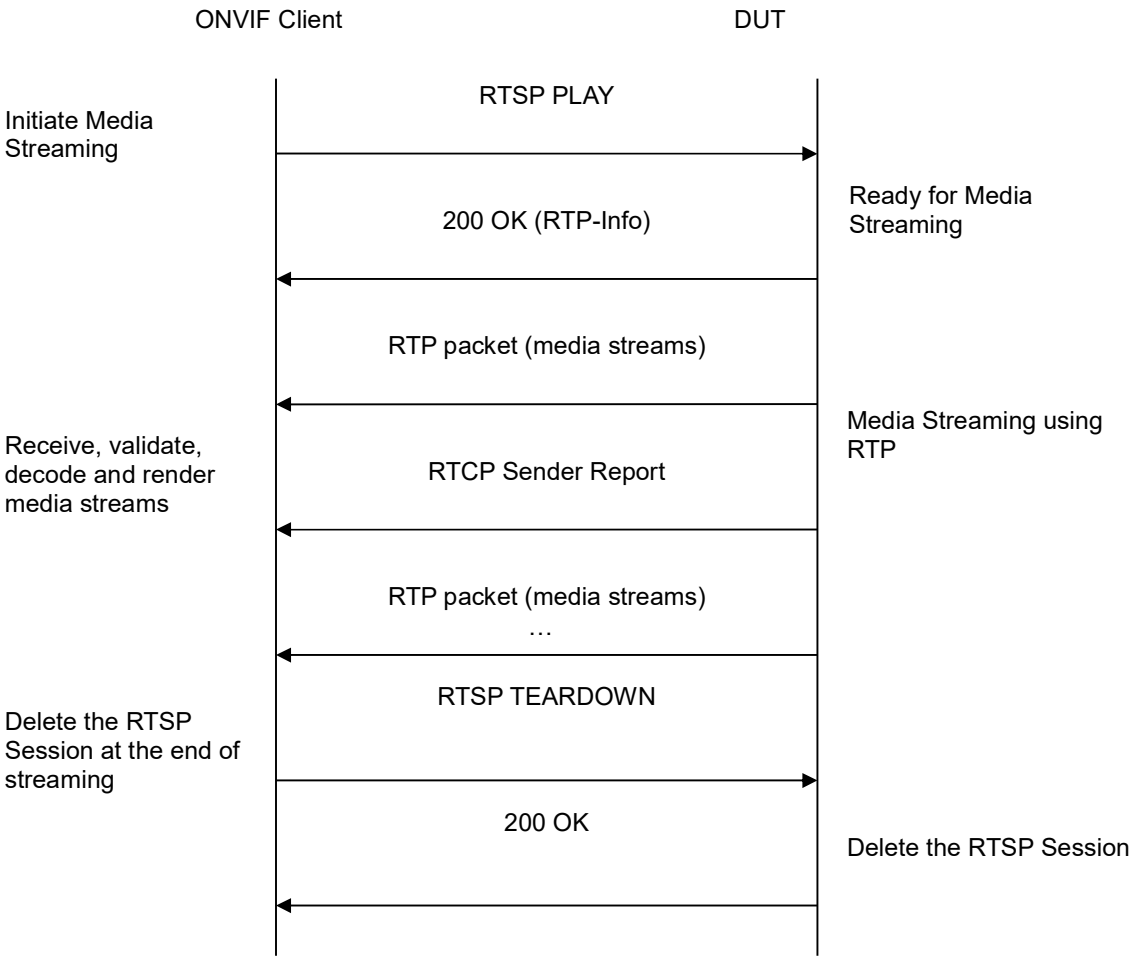
Test Purpose: To verify RTSP control messages of DUT.

Pre-Requisite: A media profile with JPEG video encoder configuration. Real-time streaming supported by DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
Modify JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP OPTIONS
Receive and Validate OPTIONS response
200 OK (Supported methods)
Send Supported RTSP methods
RTSP DESCRIBE
Send SDP message
Receive and Validate SDP message
200 OK (SDP Message)
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.

7. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client will invoke RTSP OPTIONS control request to understand the RTSP methods supported by DUT.
10. DUT sends 200 OK Response and list of supported RTSP methods.
11. ONVIF Client will invoke RTSP DESCRIBE control request to retrieve the media description information.
12. DUT sends 200 OK Response and SDP message.
13. ONVIF Client validates the session description information in the SDP message.
14. ONVIF Client will invoke RTSP SETUP control request to create a RTSP Session.
15. DUT sends 200 OK Response and Stream Information details.
16. ONVIF Client Verifies “Transport”, “Session” and “timeout” header fields in the SETUP response message.
17. ONVIF Client will invoke RTSP PLAY control request to initiate the media streaming.
18. DUT sends 200 OK Response and RTP protocol information.
19. ONVIF Client verifies “Session”, “RTP-Info”, “seq”, “uri” and “rtptime” header fields in the PLAY response message.
20. DUT transfers media streams over RTP/UDP.
21. DUT sends RTCP sender report to ONVIF Client.
22. ONVIF Client validates RTCP packets.
23. ONVIF Client validates RTP header for each media stream and render it after the validation.
24. ONVIF Client will invoke RTSP TEARDOWN control request to terminate the RTSP session at the end of the streaming.
25. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send mandatory RTSP commands DESCRIBE, SETUP, PLAY, TEARDOWN in OPTIONS response.

DUT did not send correct media stream information in the SDP message.

DUT did not send mandatory headers or fields in the SETUP response message.

DUT did not send mandatory headers or fields in the PLAY response message.

DUT did not send RTSP 200 OK response for RTSP OPTIONS, DESCRIBE, SETUP and PLAY requests.

RTSP Session is terminated by DUT during media streaming.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

Note: If DUT does not send SET_PARAMETER in OPTIONS response, the Device Test Tool provides warning.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.9 MEDIA STREAMING – RTSP KEEPALIVE (SET_PARAMETER)

Test Label: Real Time Viewing DUT RTSP Keep-alive.

Test Case ID: RTSS-1-1-32

ONVIF Core Specification Coverage: Keep-alive method for RTSP session.

Command Under Test: None

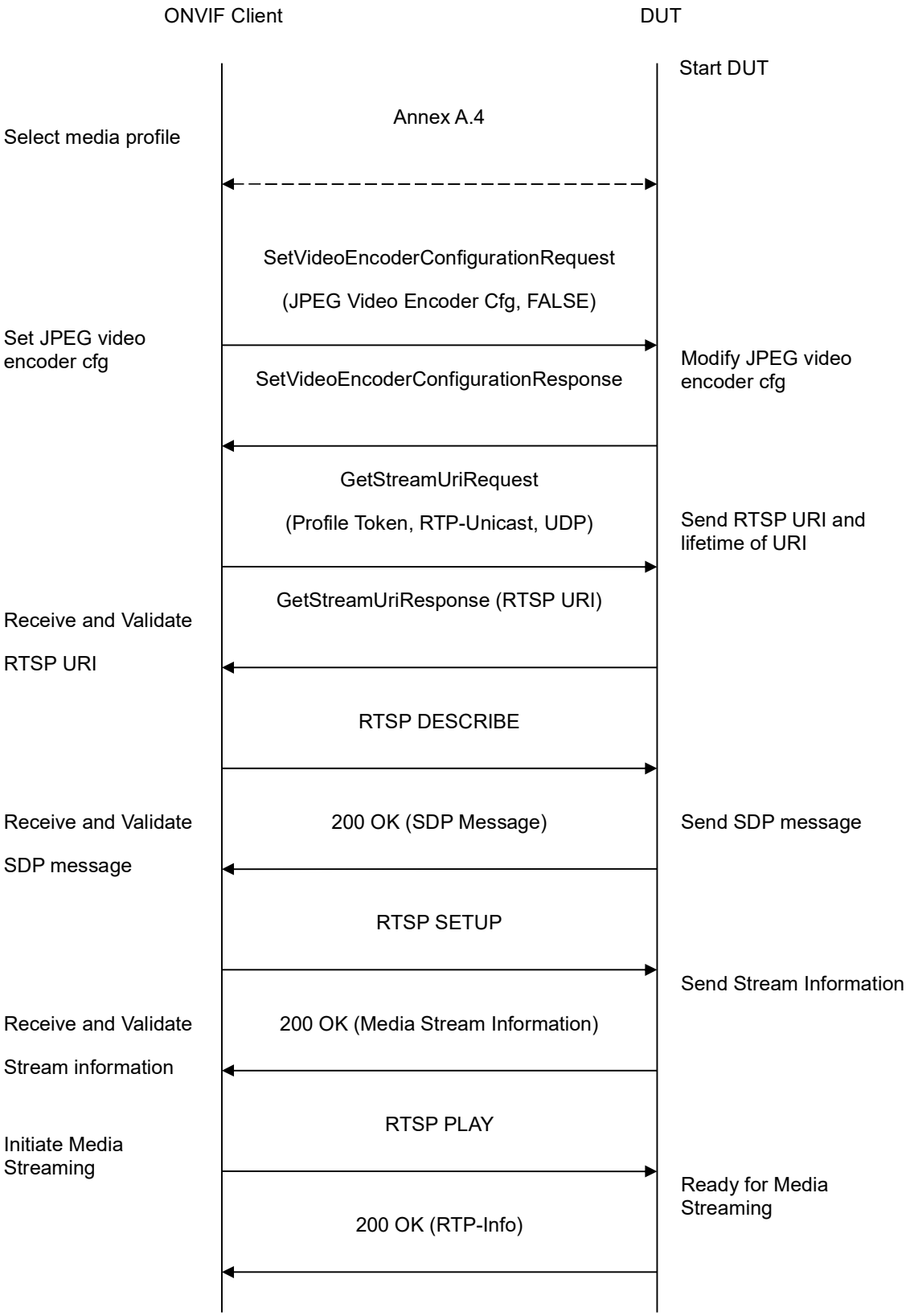
WSDL Reference: None

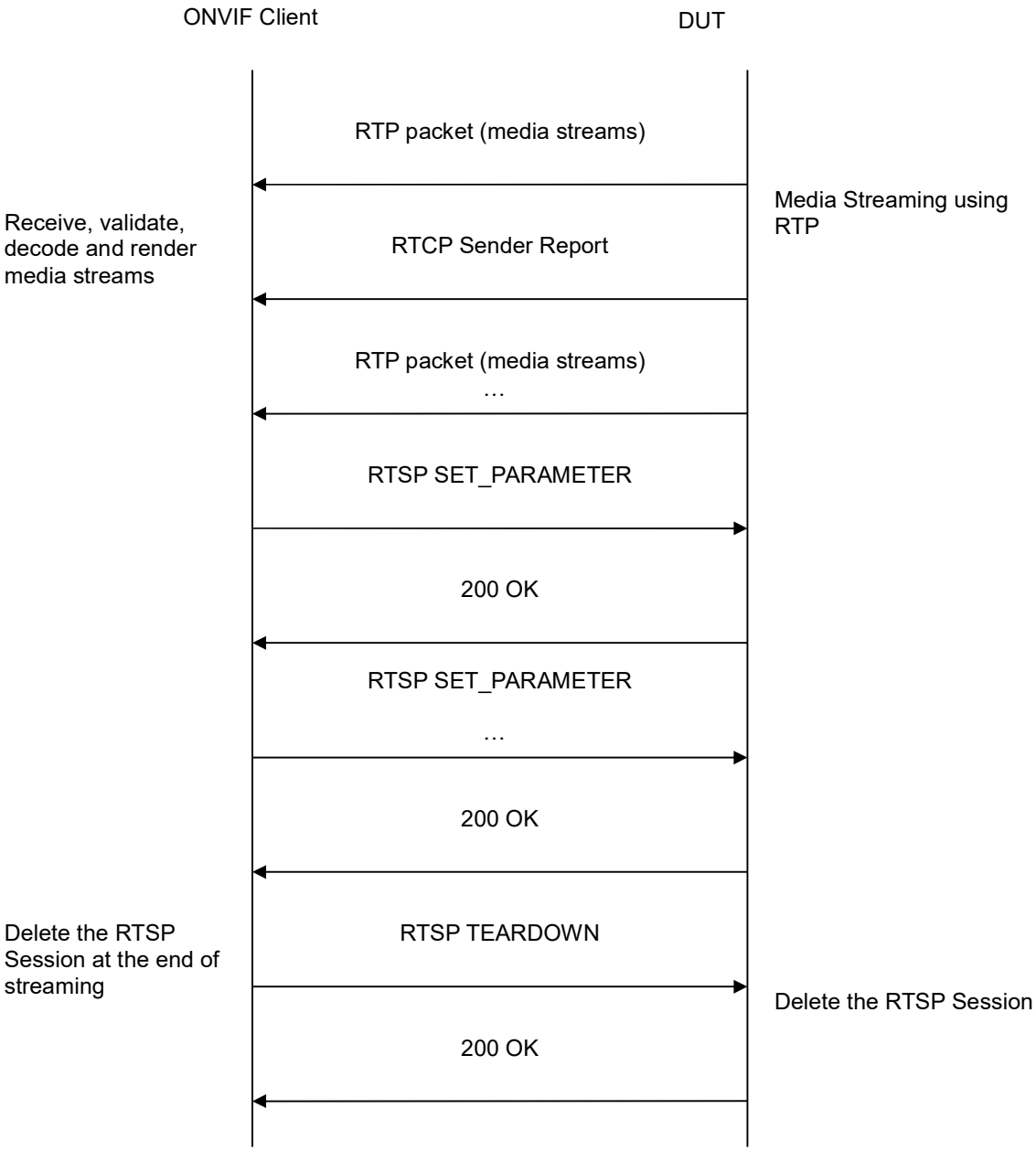
Test Purpose: To verify ONVIF Client and DUT exchange SET_PARAMETER messages during an active streaming session.

Pre-Requisite: A media profile with JPEG video encoder configuration. Real-time streaming supported by DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
Modify JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Receive and Validate SDP message
200 OK (SDP Message)
Send SDP message
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.4.

4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
7. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client will invoke RTSP control requests (DESCRIBE, SETUP and PLAY).
10. ONVIF Client will verify “Timeout” header in the SETUP Response from DUT.
11. Based on the “Timeout” value, ONVIF Client will invoke RTSP SET_PARAMETER messages.
12. DUT will respond with 200 OK for RTSP SET_PARAMETER request.
13. Verify that the ONVIF Client and DUT are exchanging periodic SET_PARAMETER messages while a stream is being delivered.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send Timeout header in RTSP SETUP RESPONSE.

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and SET_PARAMETER requests.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.10 MEDIA STREAMING - RTSP KEEPALIVE (OPTIONS)

Test Label: Real Time Viewing DUT RTSP Keep-alive with Options Command.

Test Case ID: RTSS-1-1-33

ONVIF Core Specification Coverage: Keep-alive method for RTSP session

Command Under Test: None

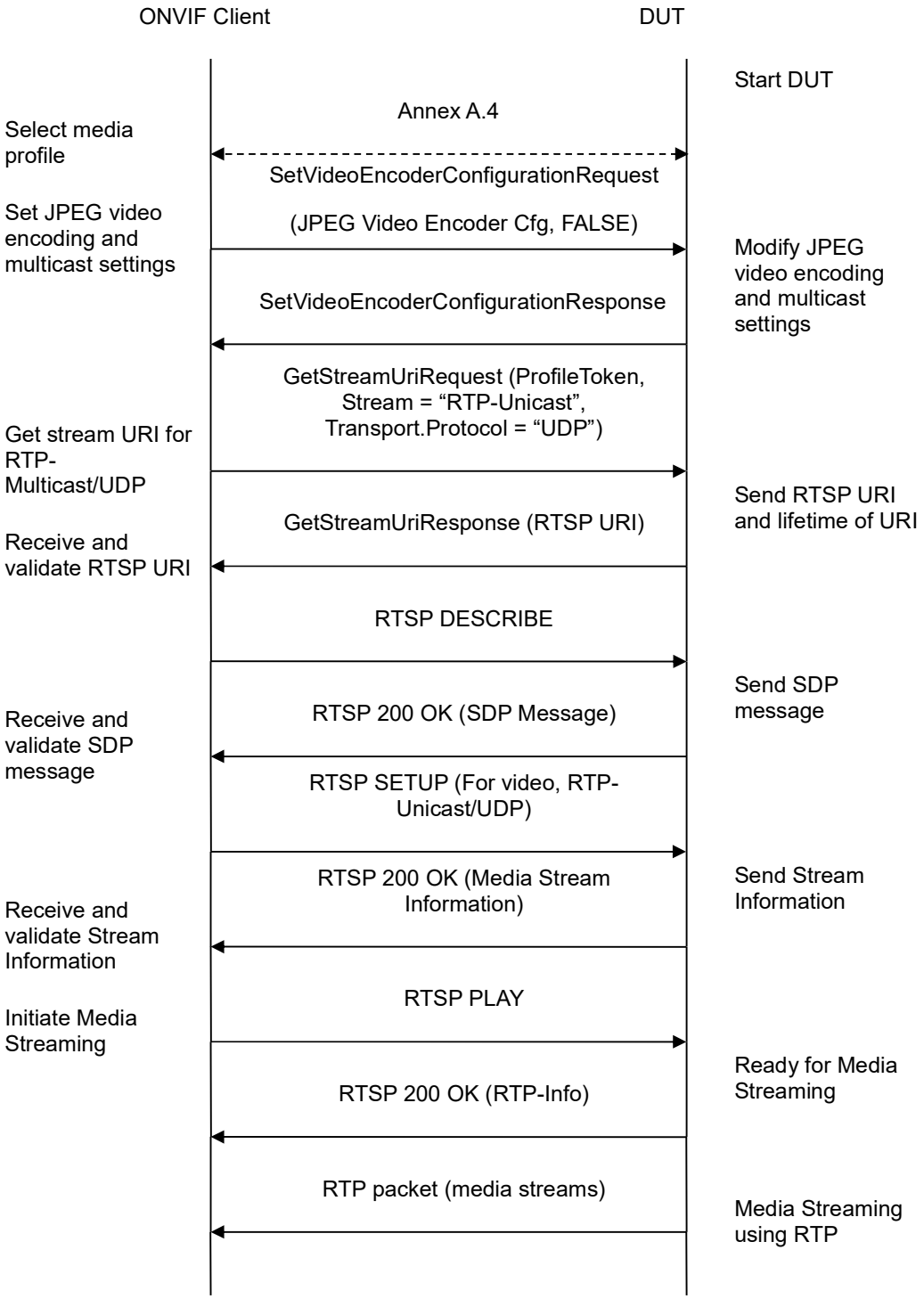
WSDL Reference: None

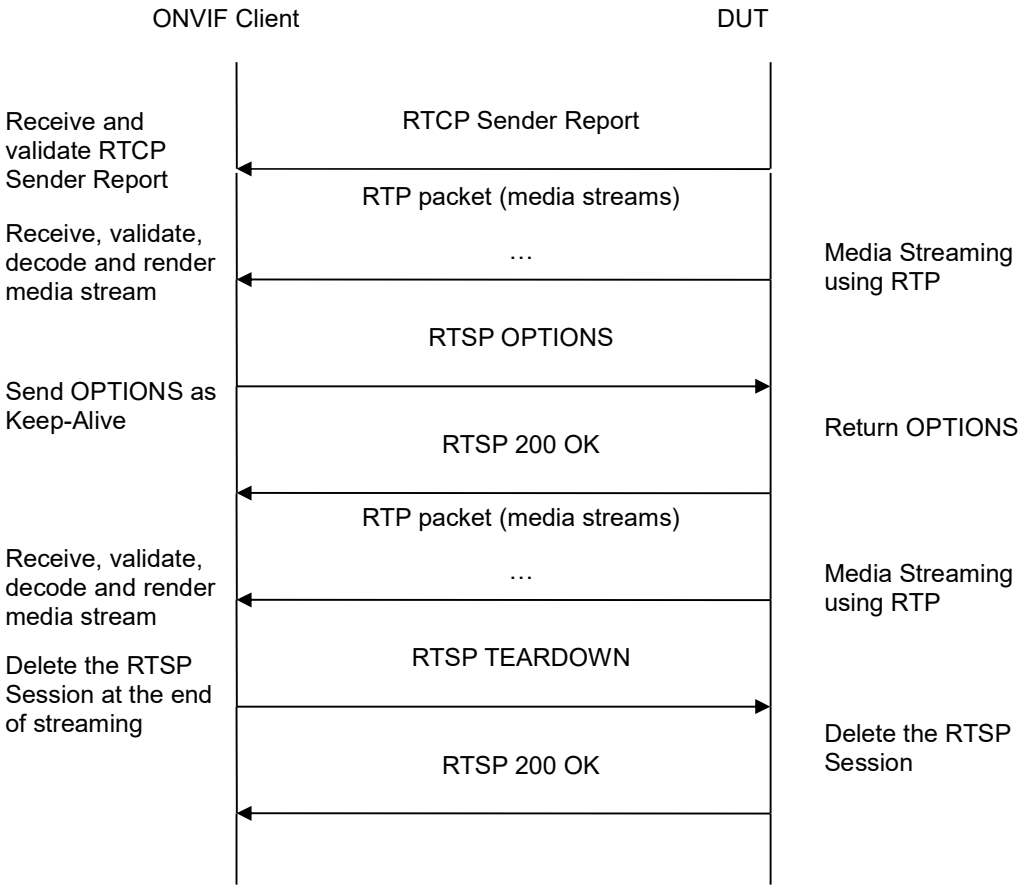
Test Propose: To verify ONVIF Client and DUT exchange OPTIONS messages during an active streaming session.

Test Configuration: ONVIF Client and DUT

Pre-Requisite: A media profile with JPEG video encoder configuration. Real-time streaming supported by DUT.

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoding and multicast settings
Modify JPEG video encoding and multicast settings
SetVideoEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “UDP”)
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For video, RTP-Unicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
7. Verify the GetStreamUriResponse message from the DUT.
8. Verify the RTSP media stream URI provided by the DUT.
9. ONVIF Client will invoke RTSP control requests (DESCRIBE, SETUP and PLAY).

10. Verify “Timeout” header in the SETUP Response from DUT.
11. Based on the “Timeout” value, ONVIF Client will invoke RTSP OPTIONS messages.
12. DUT will respond with 200 OK for RTSP OPTIONS request.
13. Verify that the ONVIF Client and DUT are exchanging periodic OPTIONS messages while a stream is being delivered.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send Timeout header in RTSP SETUP RESPONSE.

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and OPTIONS requests.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.11 MEDIA STREAMING – JPEG (RTP-Unicast/UDP)

Test Label: Real Time Viewing DUT JPEG media streaming using RTP-Unicast/UDP transport.

Test Case ID: RTSS-1-1-34

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

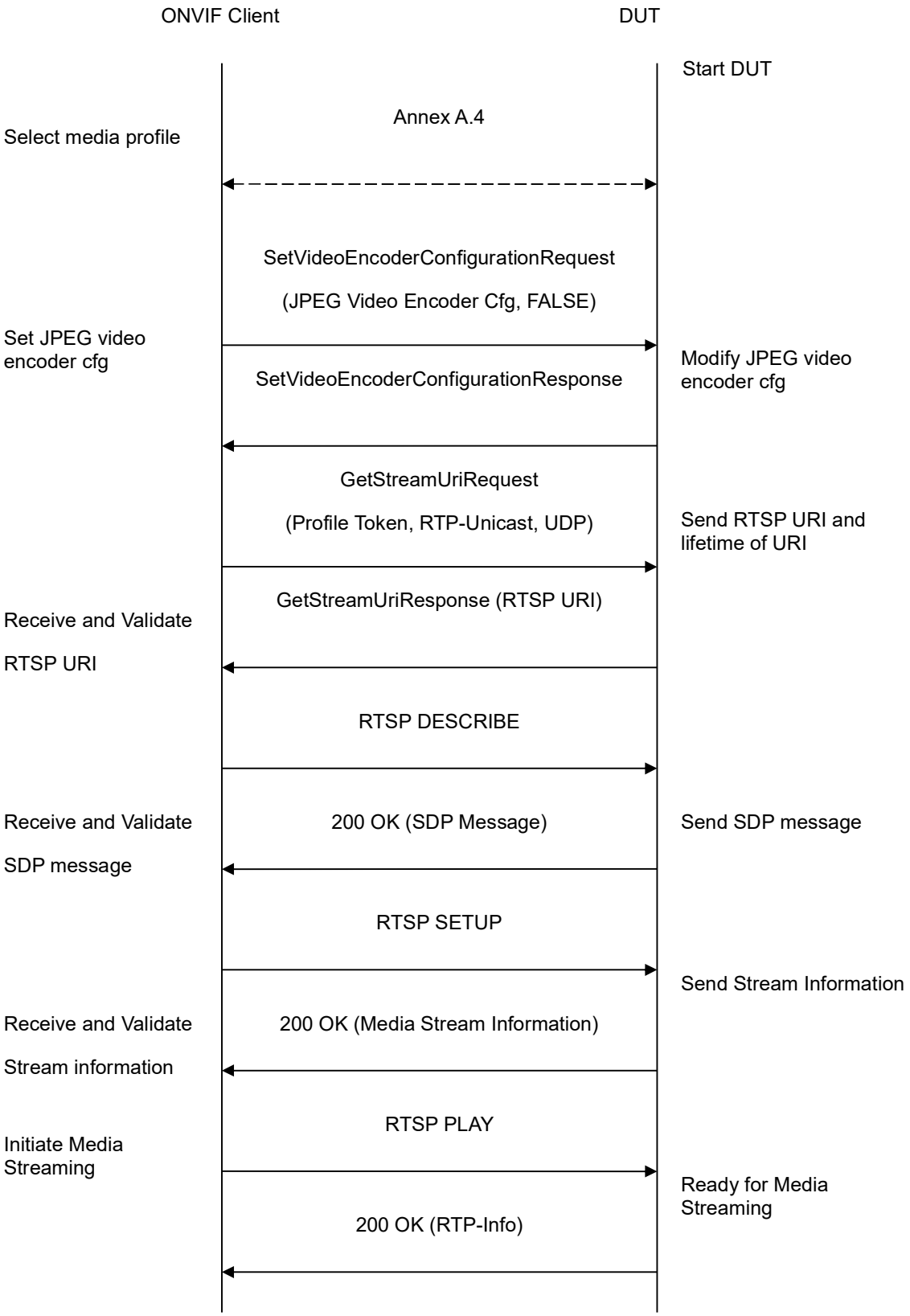
WSDL Reference: None

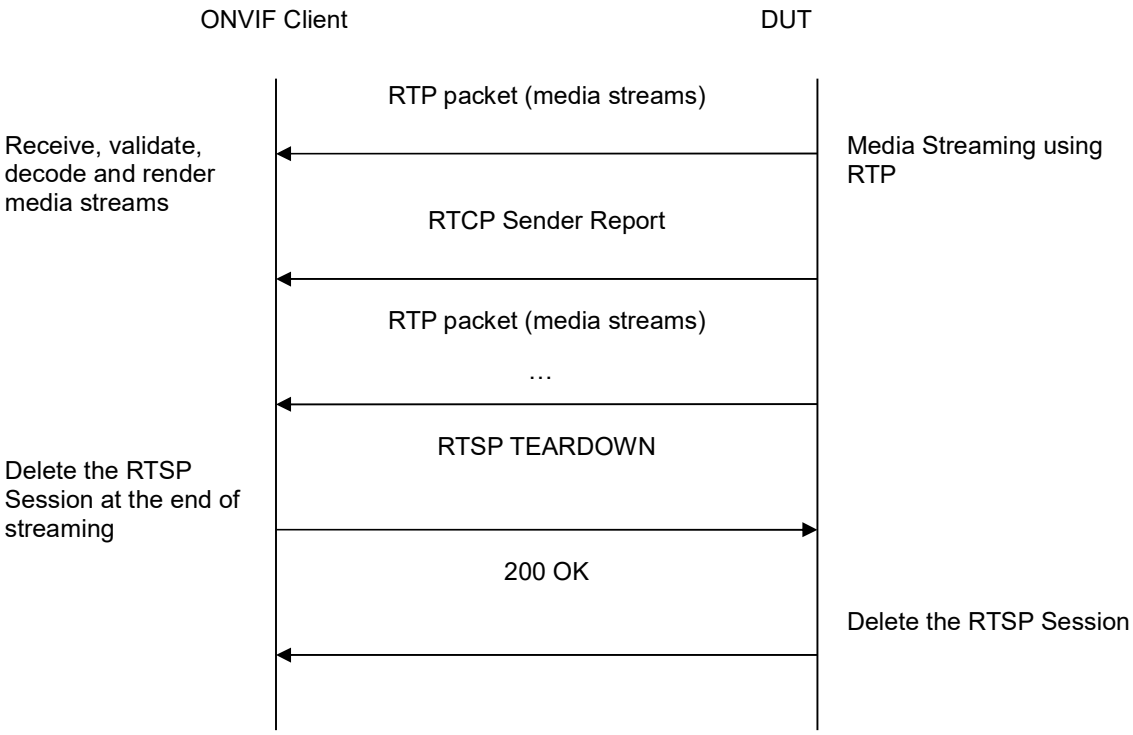
Test Purpose: To verify JPEG media streaming based on RTP/UDP Unicast Transport.

Pre-Requisite: A media profile with JPEG video encoder configuration. Real-time streaming supported by DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
Modify JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Receive and Validate SDP message
200 OK (SDP Message)
Send SDP message
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
7. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. DUT sends 200 OK message and SDP information.

11. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
12. DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. DUT sends 200 OK message and starts media streaming.
15. DUT sends JPEG RTP media stream to ONVIF Client over UDP.
16. DUT sends RTCP sender report to ONVIF Client.
17. DUT validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.12 MEDIA STREAMING – JPEG (RTP-Unicast/RTSP/HTTP/TCP)

Test Label: Real Time Viewing DUT JPEG media streaming using HTTP transport.

Test Case ID: RTSS-1-1-35

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP.

Command Under Test: None

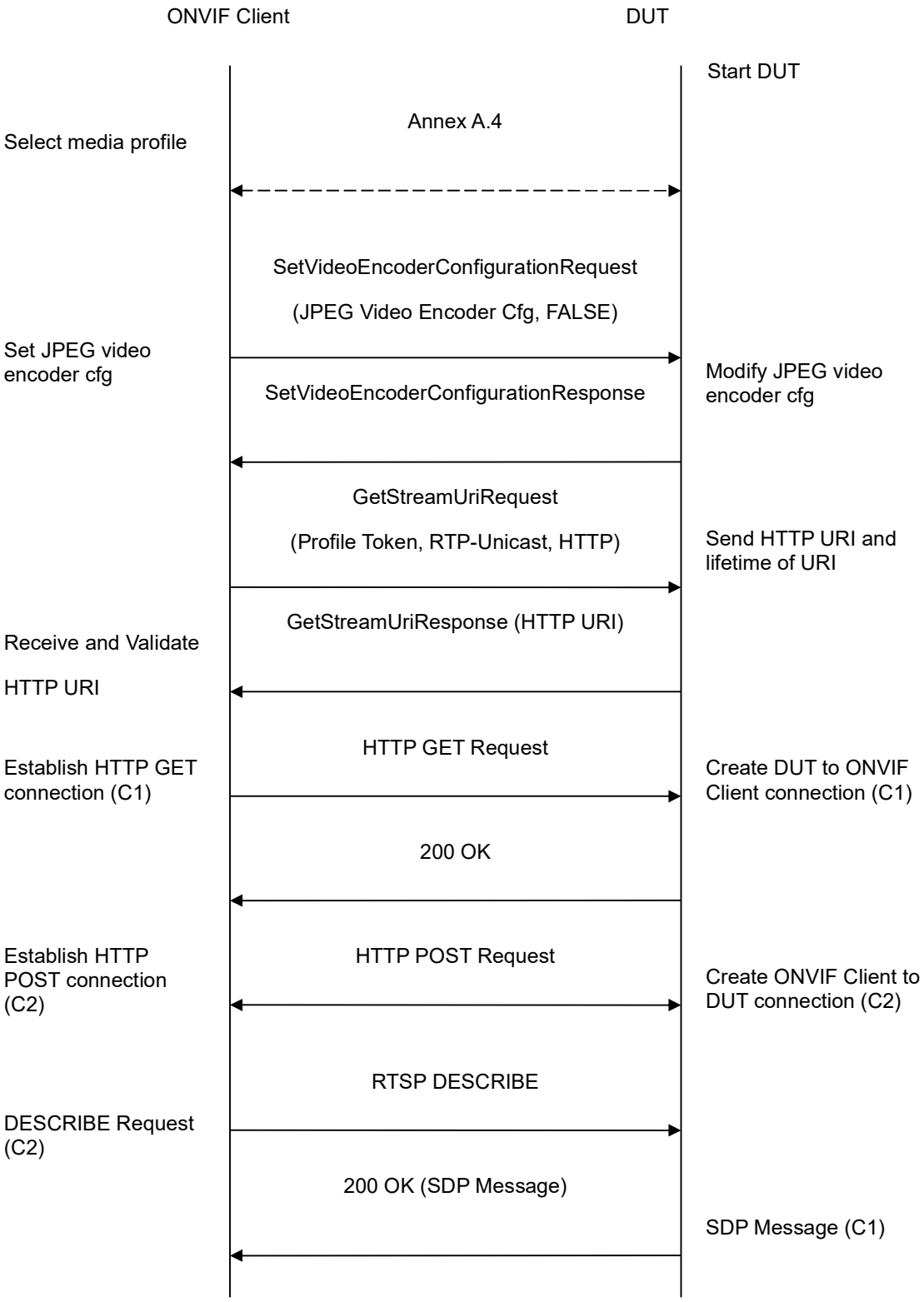
WSDL Reference: None

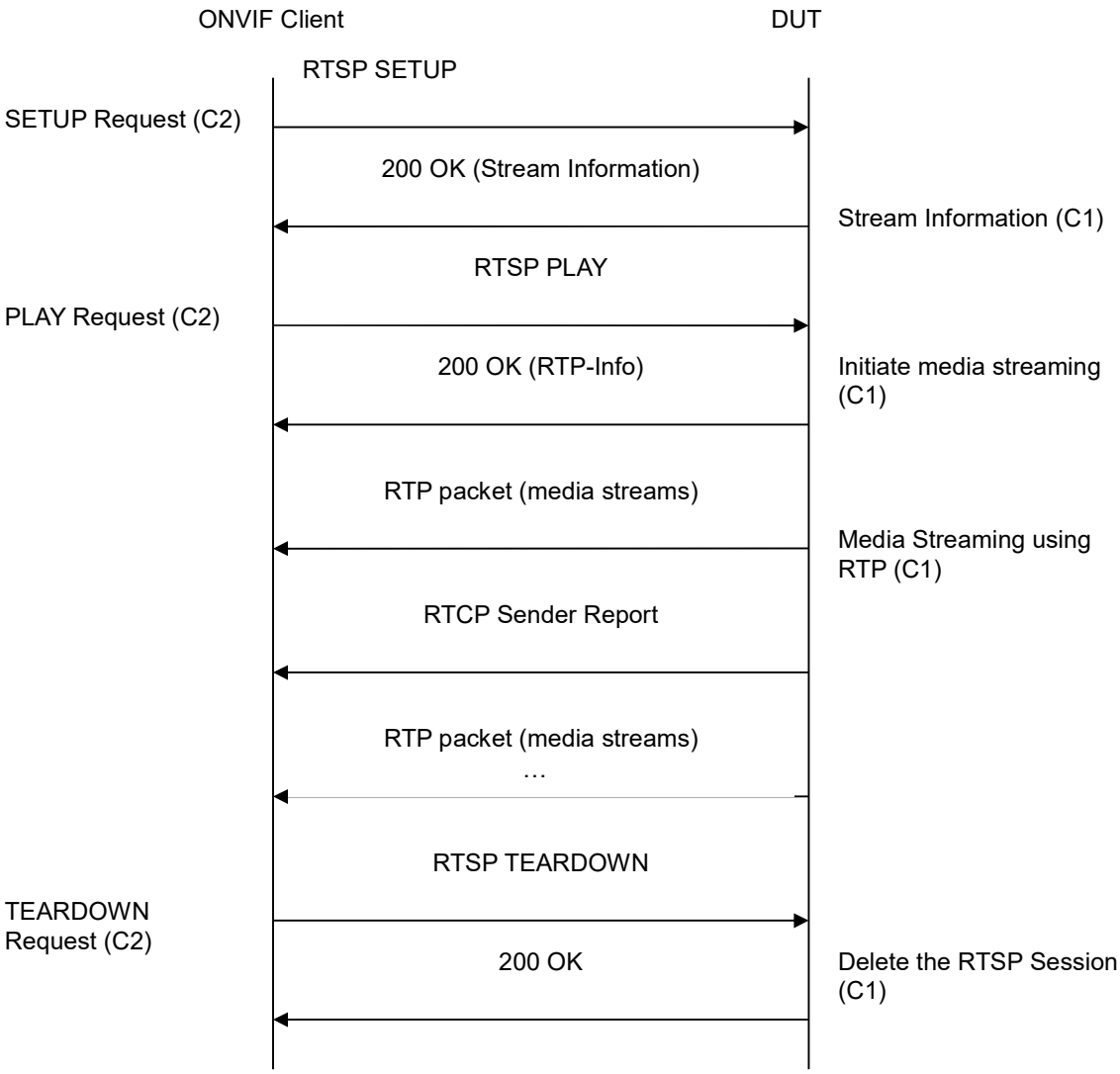
Test Purpose: To verify JPEG media streaming based on HTTP Transport.

Pre-Requisite: A media profile with JPEG video encoder configuration. Real-time streaming supported by DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
Modify JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, HTTP)
Send HTTP URI and lifetime of URI
GetStreamUriResponse (HTTP URI)
Receive and Validate HTTP URI
HTTP GET Request
Establish HTTP GET connection (C1)
Create DUT to ONVIF Client connection (C1)
200 OK
Establish HTTP POST connection (C2)
HTTP POST Request
Create ONVIF Client to DUT connection (C2)
RTSP DESCRIBE
DESCRIBE Request (C2)
200 OK (SDP Message)
SDP Message (C1)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.

6. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, HTTP transport) to retrieve media stream URI for the selected media profile.
7. DUT sends HTTP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
8. ONVIF Client verifies the HTTP media stream URI provided by the DUT.
9. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
10. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
11. ONVIF Client invokes RTSP DESCRIBE request on HTTP POST connection.
12. DUT sends 200 OK message and SDP information on HTTP GET connection.
13. ONVIF Client invokes RTSP SETUP request on HTTP POST connection with transport parameter as ‘RTP/TCP’ along with ‘interleaved’ parameter.
14. DUT sends 200 OK message and the media stream information on HTTP GET connection.
15. ONVIF Client invokes RTSP PLAY request on HTTP POST connection.
16. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
17. DUT transfers JPEG RTP media stream to ONVIF Client on HTTP GET connection.
18. DUT sends RTCP sender report to ONVIF Client on HTTP GET connection.
19. DUT validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection and closes the HTTP POST connection.
21. DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – HTTP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.13 MEDIA STREAMING – JPEG (RTP/RTSP/TCP)

Test Label: Real Time Viewing DUT JPEG media streaming using RTP/RTSP/TCP transport.

Test Case ID: RTSS-1-1-36

ONVIF Core Specification Coverage: RTP/RTSP/TCP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

WSDL Reference: None

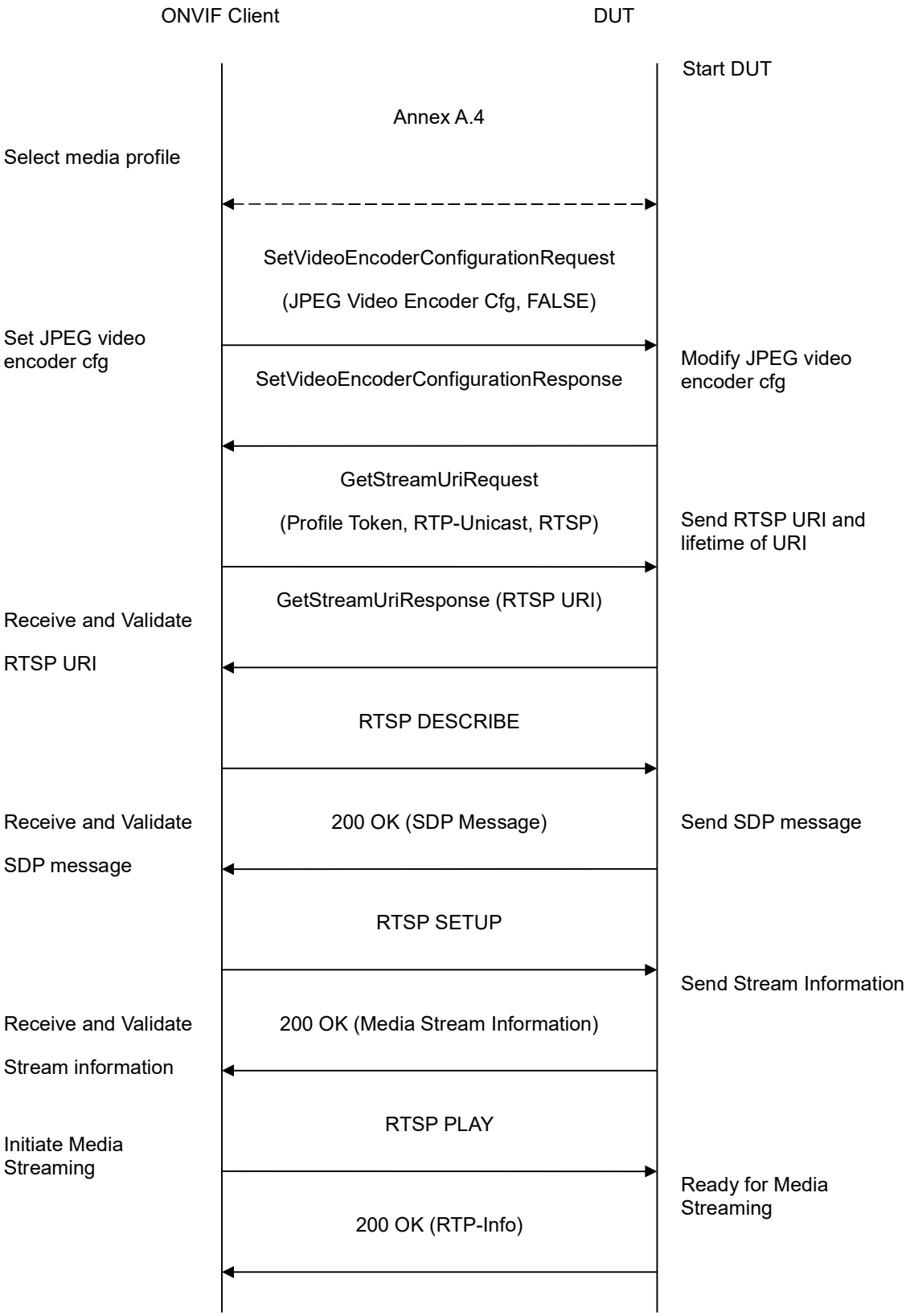
Test Purpose: To verify JPEG media streaming based on RTP/RTSP/TCP using RTSP tunnel.

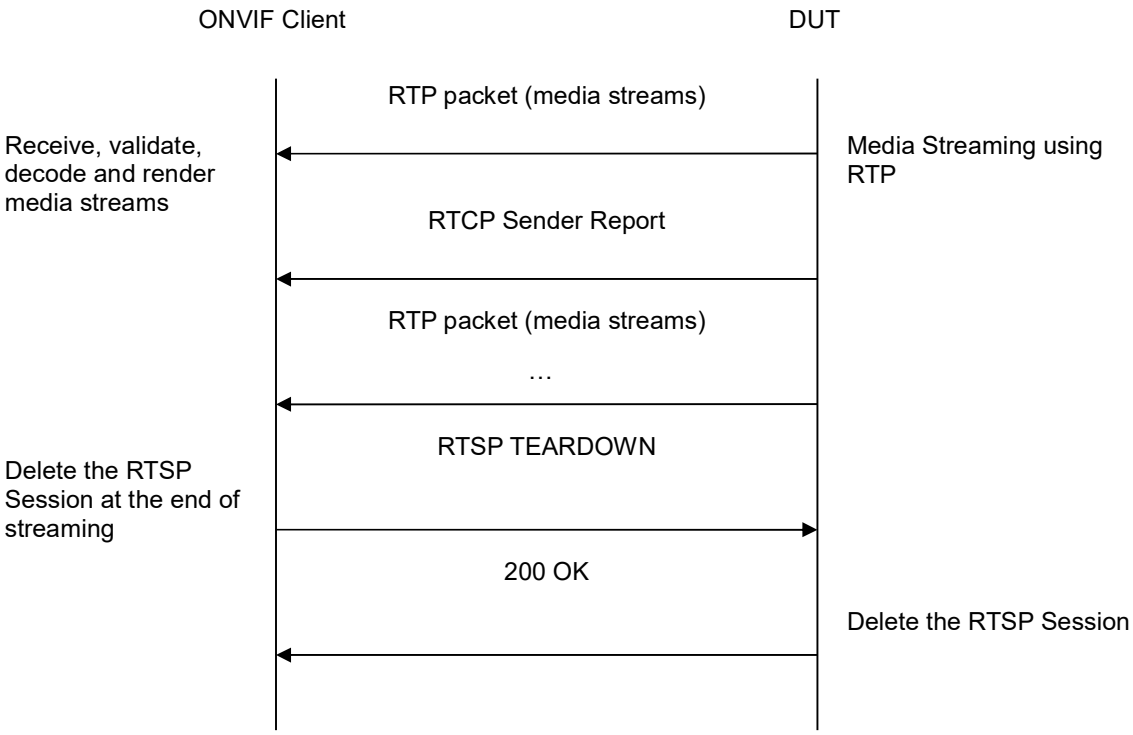
Pre-Requisite: RTP/RTSP/TCP media streaming is implemented by DUT.

A media profile with JPEG video encoder configuration. Real-time streaming supported by DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
Modify JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, RTSP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Receive and Validate SDP message
200 OK (SDP Message)
Send SDP message
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, RTSP transport) to retrieve media stream URI for the selected media profile.
7. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. DUT sends 200 OK message and SDP information.

11. ONVIF Client invokes RTSP SETUP request with transport parameter as 'RTP/TCP' along with 'interleaved' parameter.
12. DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. DUT sends 200 OK message and starts media streaming.
15. DUT interleaves RTP and RTCP packets, send them over RTSP control connection.
16. DUT validates the received RTP and RTCP packets, decodes and renders them.
17. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
18. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send RTP and RTCP packets as per [RFC 2326] section 10.12.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.14 MEDIA STREAMING – MPEG4 (RTP-Unicast/UDP)

Test Label: Real Time Viewing DUT MPEG4 media streaming using RTP-Unicast/UDP transport.

Test Case ID: RTSS-1-1-37

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

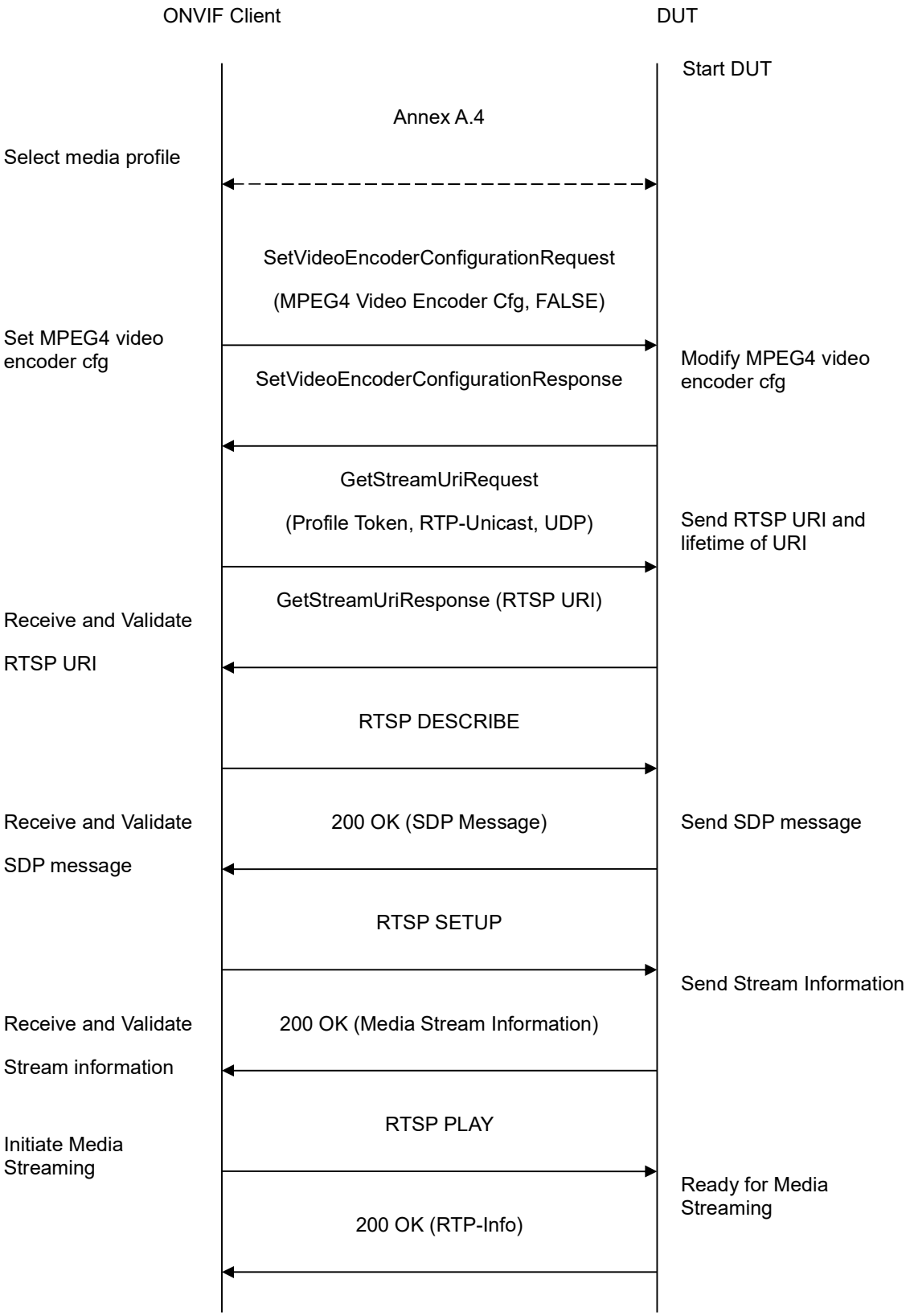
WSDL Reference: None

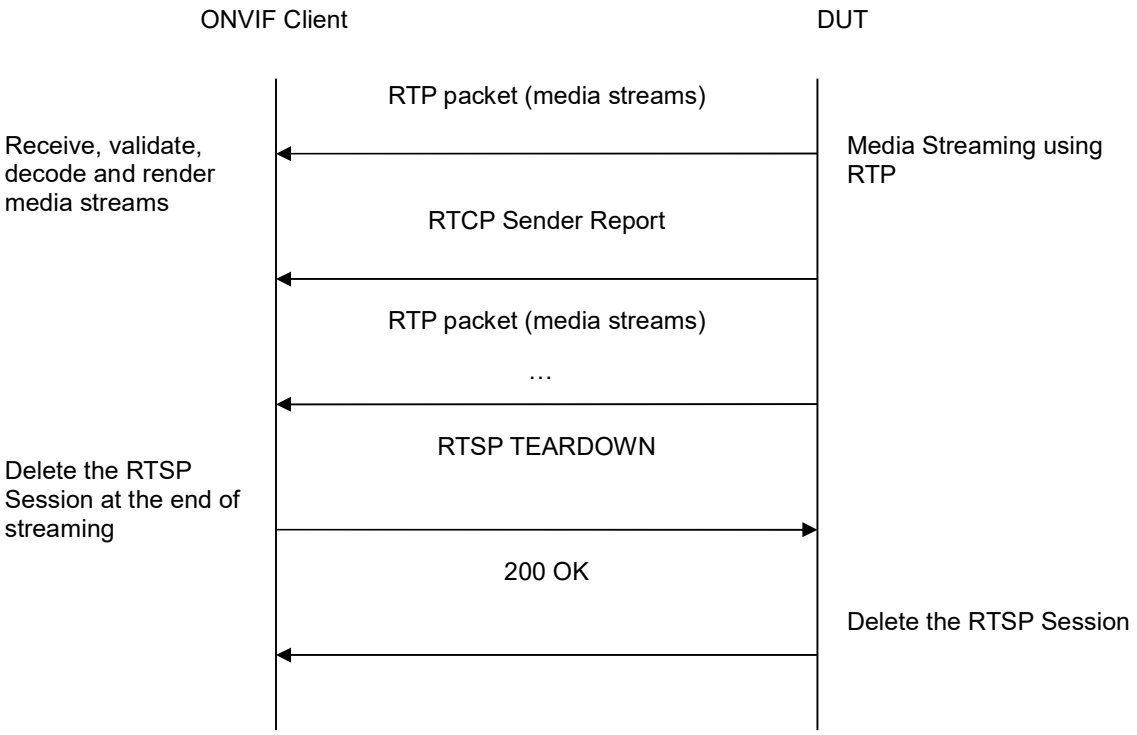
Test Purpose: To verify MPEG4 media streaming based on RTP/UDP Unicast Transport.

Pre-Requisite: MPEG4 is implemented by DUT. A media profile with MPEG4 video encoder configuration. Real-time streaming supported by DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(MPEG4 Video Encoder Cfg, FALSE)
Set MPEG4 video encoder cfg
Modify MPEG4 video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Receive and Validate SDP message
200 OK (SDP Message)
Send SDP message
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with MPEG4 video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “MPEG4”, Resolution = [“Width”, “Height”], Quality = q1, GovLength = g1, Mpeg4Profile = prof1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
7. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. DUT sends 200 OK message and SDP information.

11. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
12. DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. DUT sends 200 OK message and starts media streaming.
15. DUT sends MPEG4 RTP media stream to ONVIF Client over UDP.
16. DUT sends RTCP sender report to ONVIF Client.
17. DUT validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.15 MEDIA STREAMING – MPEG4 (RTP-Unicast/RTSP/HTTP/TCP)

Test Label: Real Time Viewing DUT MPEG4 media streaming using HTTP transport.

Test Case ID: RTSS-1-1-38

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP.

Command Under Test: None

WSDL Reference: None

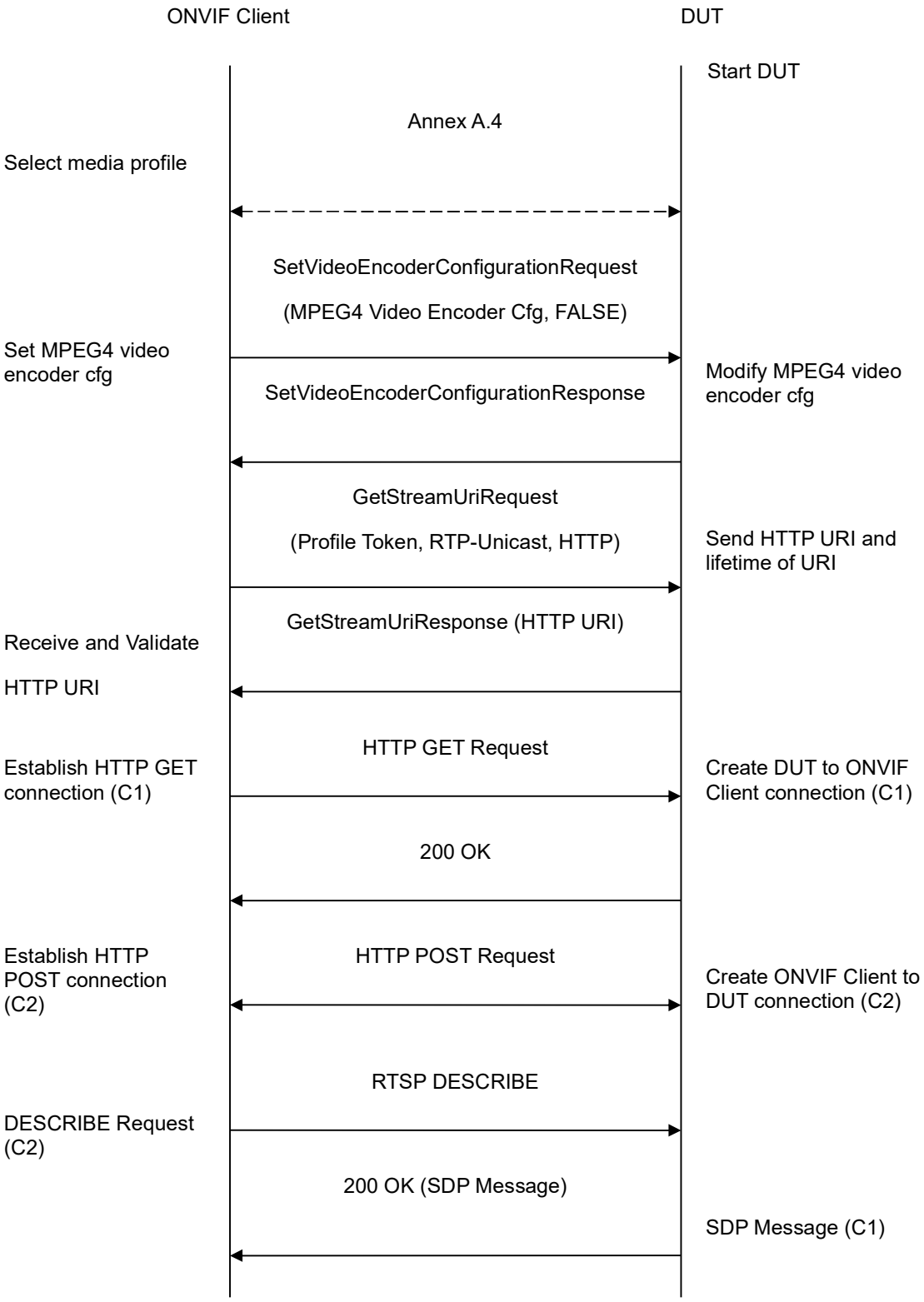
Test Purpose: To verify MPEG4 media streaming based on HTTP Transport.

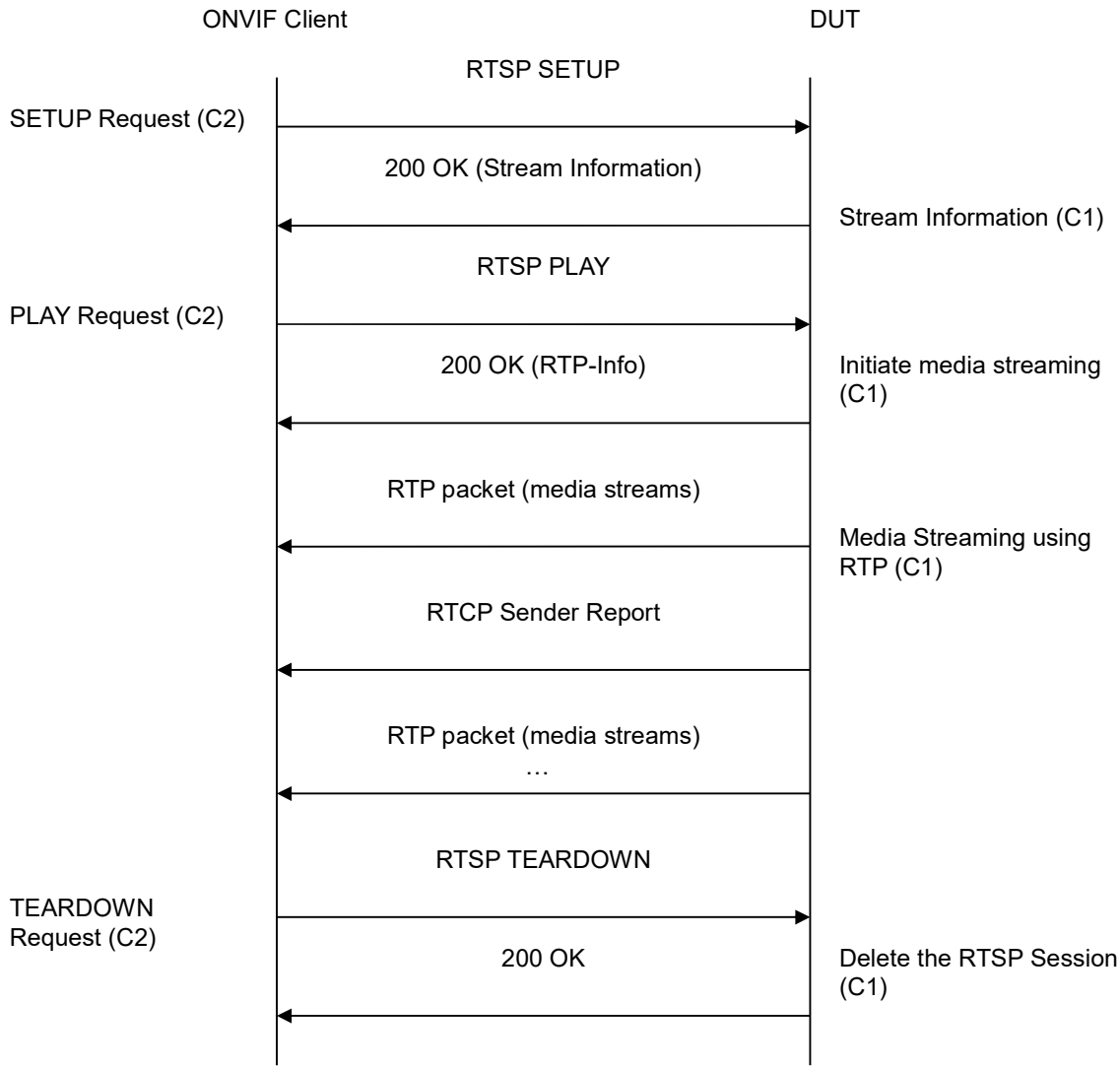
Pre-Requisite: MPEG4 is implemented by DUT.

A media profile with MPEG4 video encoder configuration. Real-time streaming supported by DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(MPEG4 Video Encoder Cfg, FALSE)
Set MPEG4 video encoder cfg
Modify MPEG4 video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, HTTP)
Send HTTP URI and lifetime of URI
GetStreamUriResponse (HTTP URI)
Receive and Validate HTTP URI
HTTP GET Request
Establish HTTP GET connection (C1)
Create DUT to ONVIF Client connection (C1)
200 OK
Establish HTTP POST connection (C2)
HTTP POST Request
Create ONVIF Client to DUT connection (C2)
RTSP DESCRIBE
DESCRIBE Request (C2)
200 OK (SDP Message)
SDP Message (C1)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with MPEG4 video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “MPEG4”, Resolution = [“Width”, “Height”], Quality = q1, GovLength = g1, Mpeg4Profile = prof1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.

6. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, HTTP transport) to retrieve media stream URI for the selected media profile.
7. DUT sends HTTP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
8. ONVIF Client verifies the HTTP media stream URI provided by the DUT.
9. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
10. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
11. ONVIF Client invokes RTSP DESCRIBE request on HTTP POST connection.
12. DUT sends 200 OK message and SDP information on HTTP GET connection.
13. ONVIF Client invokes RTSP SETUP request on HTTP POST connection with transport parameter as 'RTP/TCP' along with 'interleaved' parameter.
14. DUT sends 200 OK message and the media stream information on HTTP GET connection.
15. ONVIF Client invokes RTSP PLAY request on HTTP POST connection.
16. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
17. DUT transfers MPEG4 RTP media stream to ONVIF Client on HTTP GET connection.
18. DUT sends RTCP sender report to ONVIF Client on HTTP GET connection.
19. DUT validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection and closes the HTTP POST connection.
21. DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – HTTP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.16 MEDIA STREAMING – MPEG4 (RTP/RTSP/TCP)

Test Label: Real Time Viewing DUT MPEG4 media streaming using RTP/RTSP/TCP transport.

Test Case ID: RTSS-1-1-39

ONVIF Core Specification Coverage: RTP/RTSP/TCP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

WSDL Reference: None

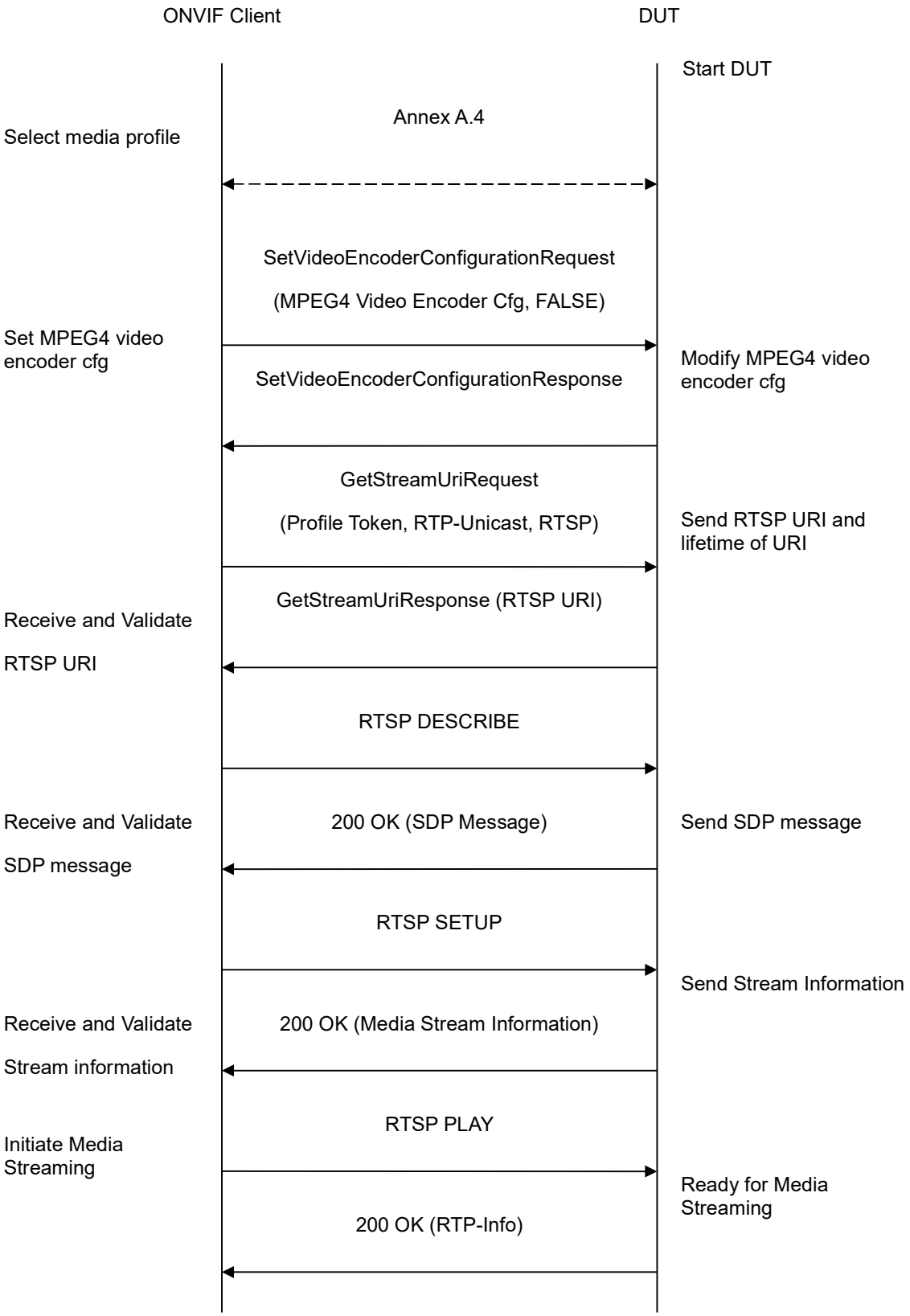
Test Purpose: To verify MPEG4 media streaming based on RTP/RTSP/TCP using RTSP tunnel.

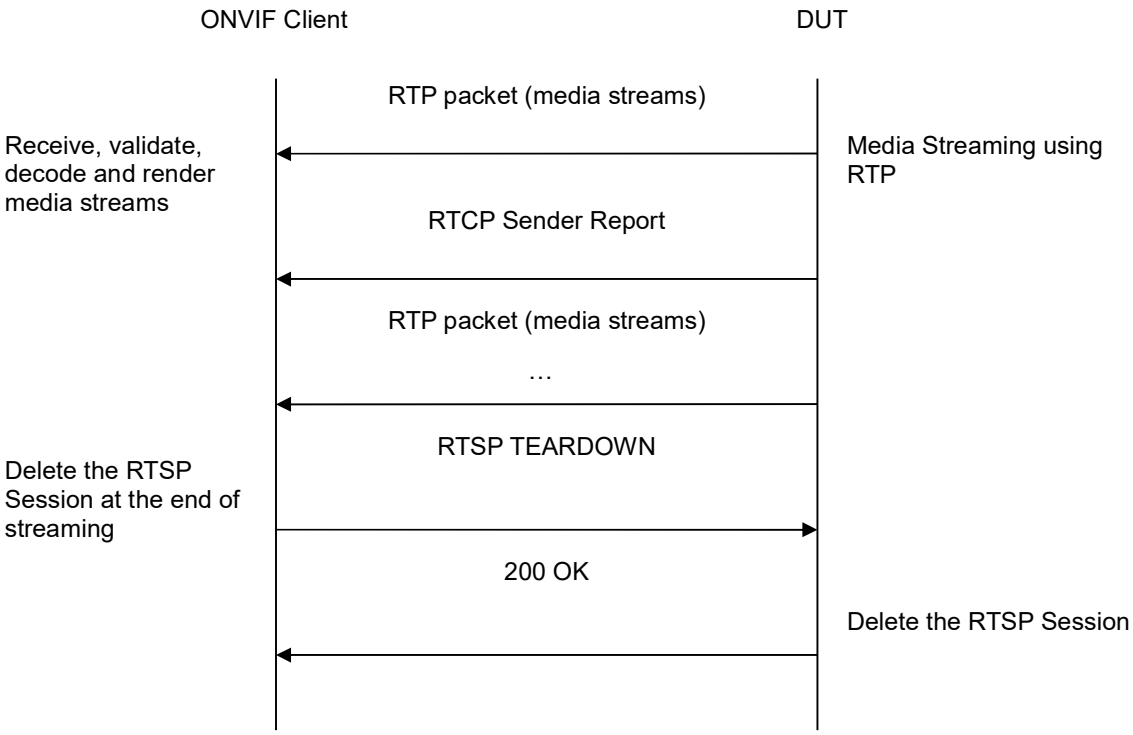
Pre-Requisite: MPEG4 and RTP/RTSP/TCP media streaming is implemented by DUT.

A media profile with MPEG4 video encoder configuration. Real-time streaming supported by DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(MPEG4 Video Encoder Cfg, FALSE)
Set MPEG4 video encoder cfg
Modify MPEG4 video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, RTSP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Receive and Validate SDP message
200 OK (SDP Message)
Send SDP message
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with MPEG4 video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “MPEG4”, Resolution = [“Width”, “Height”], Quality = q1, GovLength = g1, Mpeg4Profile = prof1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, RTSP transport) to retrieve media stream URI for the selected media profile.
7. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. DUT sends 200 OK message and SDP information.

11. ONVIF Client invokes RTSP SETUP request with transport parameter as 'RTP/TCP' along with 'interleaved' parameter.
12. DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. DUT sends 200 OK message and starts media streaming.
15. DUT interleaves RTP and RTCP packets, send them over RTSP control connection.
16. DUT validates the received RTP and RTCP packets, decodes and renders them.
17. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
18. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not send GetProfilesResponse message.

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send RTP and RTCP packets as per [RFC 2326] section 10.12.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.17 SET SYNCHRONIZATION POINT – MPEG4

Test Label: Media Configuration DUT Synchronization Point – MPEG4

Test Case ID: RTSS-1-1-40

ONVIF Core Specification Coverage: Set synchronization point.

Command Under Test: SetSynchronizationPoint

WSDL Reference: media.wsdl

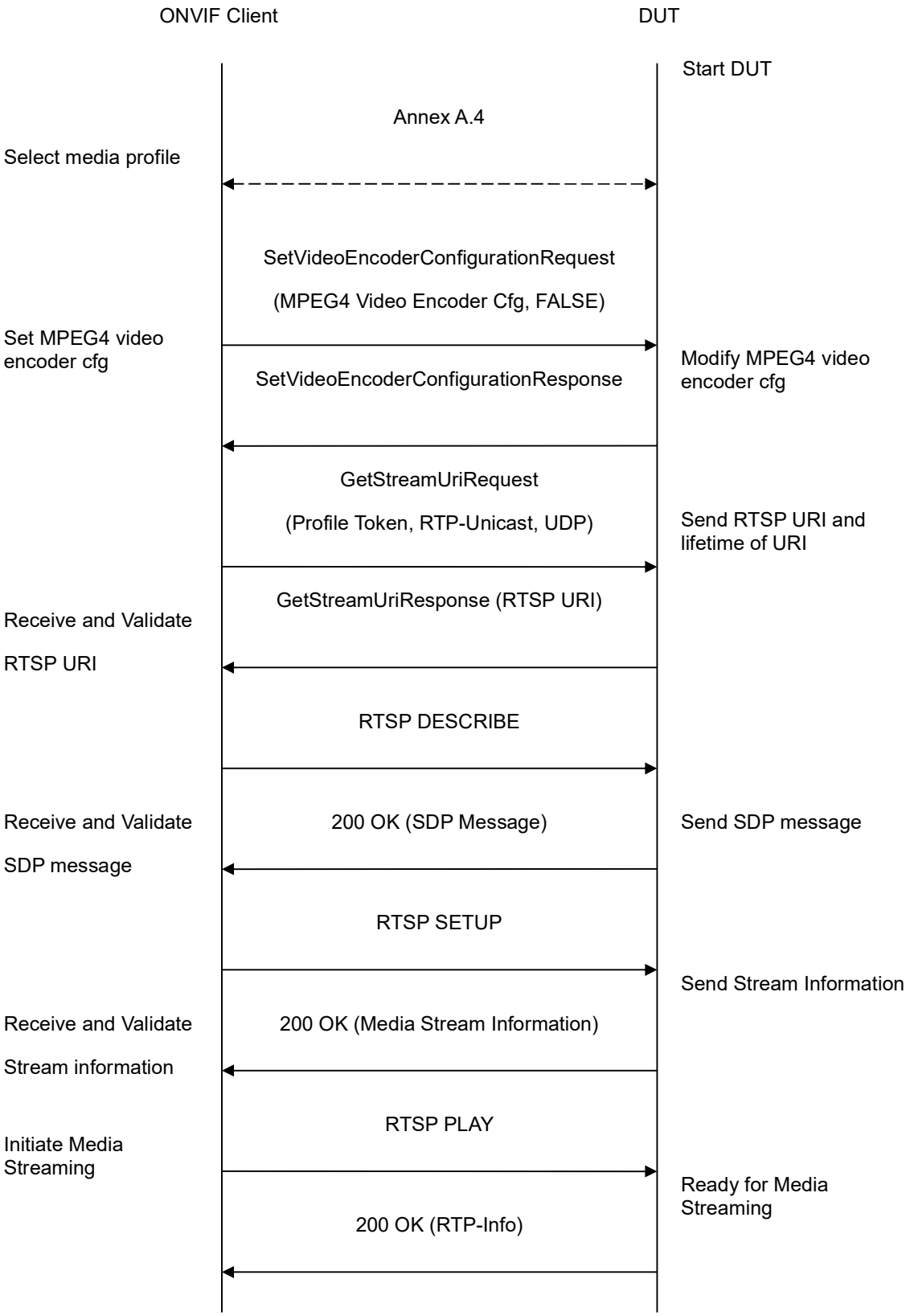
Test Purpose: To request synchronization point from DUT for MPEG4 media stream.

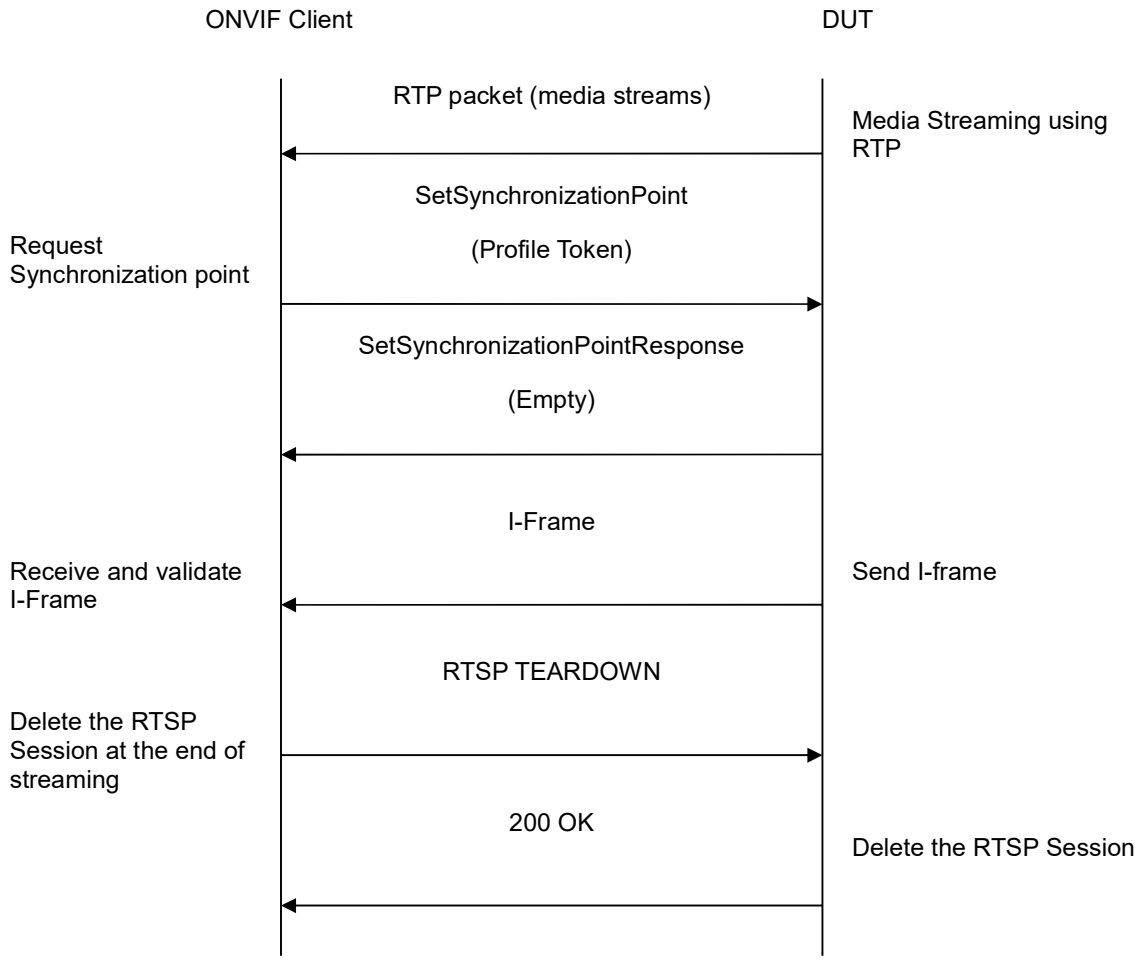
Pre-Requisite: MPEG4 is implemented by DUT. Real-time streaming supported by DUT.

A media profile with MPEG4 video encoder configuration.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(MPEG4 Video Encoder Cfg, FALSE)
Set MPEG4 video encoder cfg
Modify MPEG4 video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Receive and Validate SDP message
200 OK (SDP Message)
Send SDP message
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with MPEG4 video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “MPEG4”, Resolution = [“Width”, “Height”], Quality = q1, GovLength = g1, Mpeg4Profile = prof1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
7. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.

8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
12. DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. DUT sends 200 OK message and starts media streaming.
15. DUT sends MPEG4 RTP media stream to ONVIF Client over UDP.
16. DUT sends RTCP sender report to ONVIF Client.
17. DUT validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes SetSynchronizationPoint request on the selected media profile.
19. DUT sends the SetSynchronizationPoint response indicating success.
20. DUT inserts the I-frame in the ongoing media stream.
21. ONVIF Client verifies that I-frame is sent by DUT before the regular 'I-frame insertion time interval'.
22. ONVIF Client invokes RTSP TEARDOWN control request to terminate the RTSP session.
23. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send SetSynchronizationPointResponse message.

DUT did not send I-frame before the regular 'I-frame insertion time interval' upon invoking SetSynchronizationPoint request.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.3 for details on 'I-frame insertion time interval'.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.18 MEDIA STREAMING – H.264 (RTP-Unicast/UDP)

Test Label: Real Time Viewing DUT H.264 media streaming using RTP-Unicast/UDP transport.

Test Case ID: RTSS-1-1-41

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

WSDL Reference: None

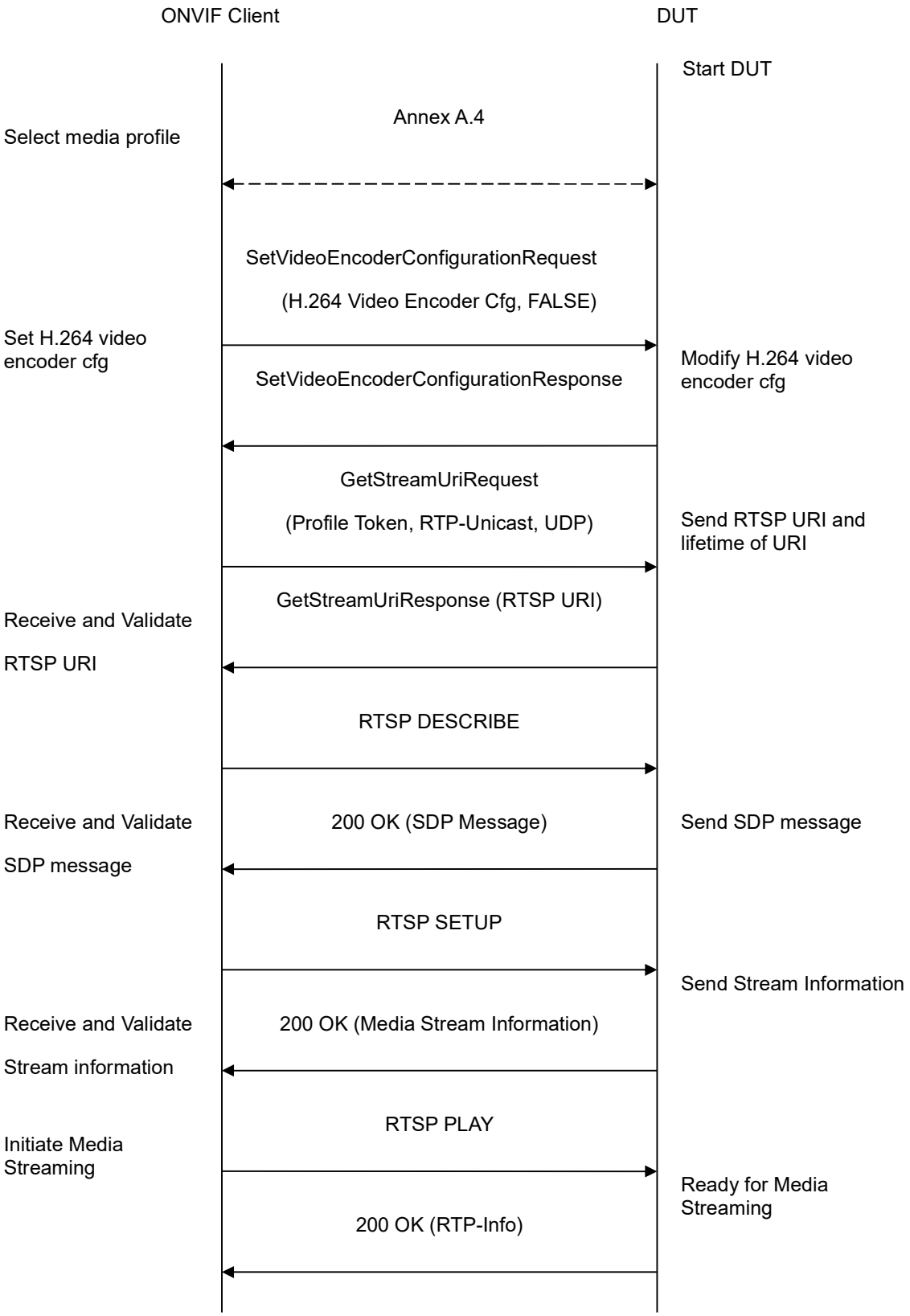
Test Purpose: To verify H.264 media streaming based on RTP/UDP Unicast Transport.

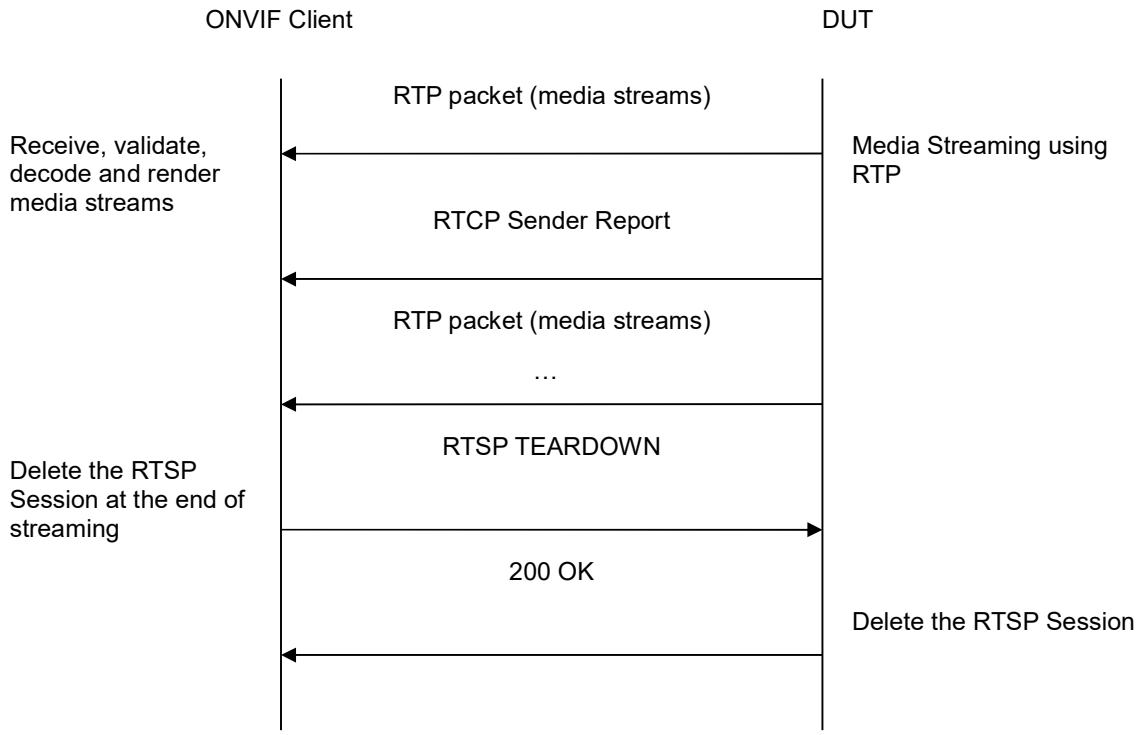
Pre-Requisite: H.264 is implemented by DUT. Real-time streaming supported by DUT.

A media profile with H.264 video encoder configuration.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(H.264 Video Encoder Cfg, FALSE)
Set H.264 video encoder cfg
Modify H.264 video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Receive and Validate SDP message
200 OK (SDP Message)
Send SDP message
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with H.264 video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “H.264”, Resolution = [“Width”, “Height”], Quality = q1, GovLength = g1, Session Timeout = t1 and force persistence = false). The parameter of H264Profile is set the highest value that DUT supports as the order is High/Extended/Main/Baseline. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
7. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. DUT sends 200 OK message and SDP information.

11. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
12. DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. DUT sends 200 OK message and starts media streaming.
15. DUT sends H.264 RTP media stream to ONVIF Client over UDP.
16. DUT sends RTCP sender report to ONVIF Client.
17. DUT validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.19 MEDIA STREAMING – H.264 (RTP-Unicast/RTSP/HTTP/TCP)

Test Label: Real Time Viewing DUT H.264 media streaming using HTTP transport.

Test Case ID: RTSS-1-1-42

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP.

Command Under Test: None

WSDL Reference: None

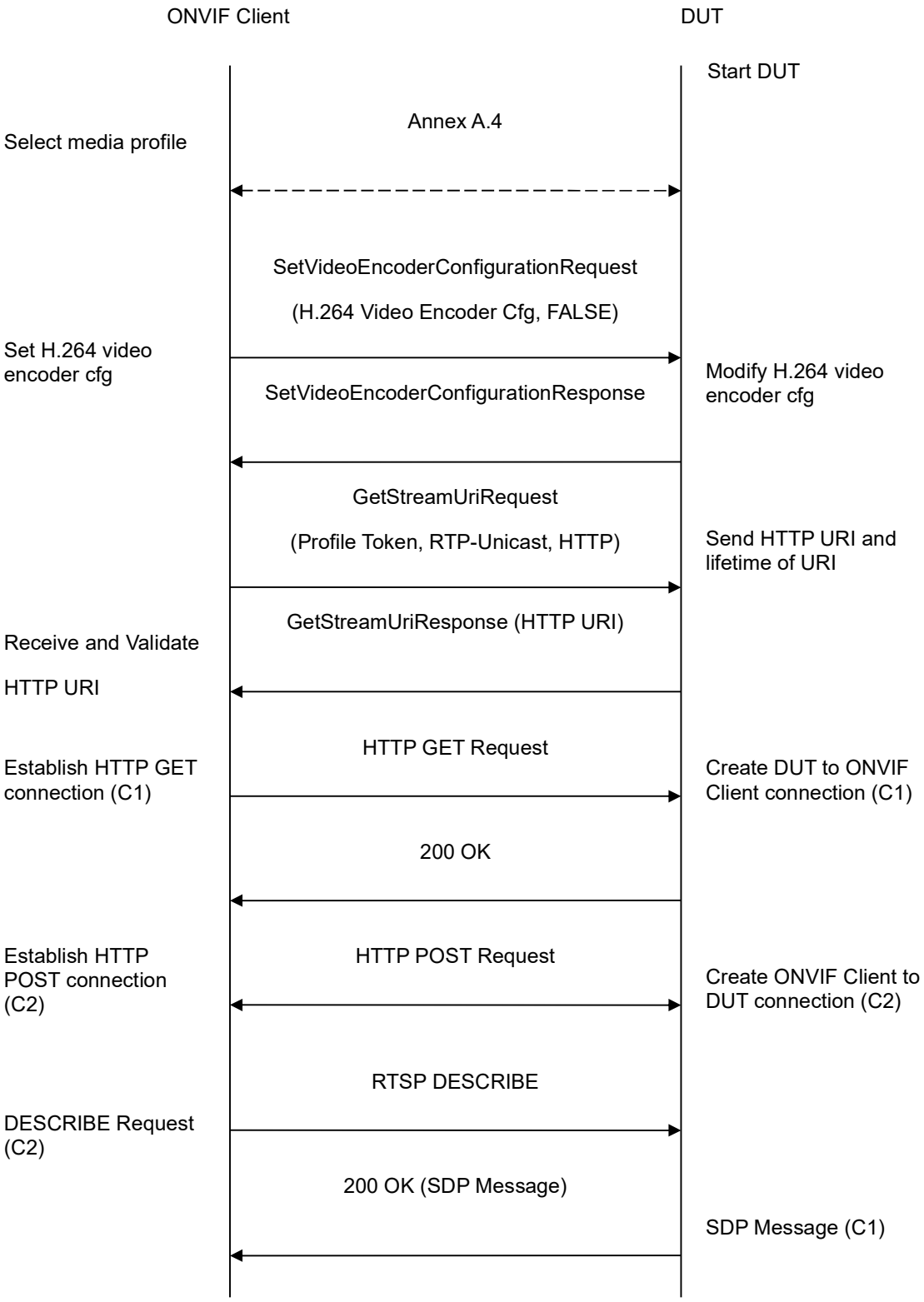
Test Purpose: To verify H.264 media streaming based on HTTP Transport.

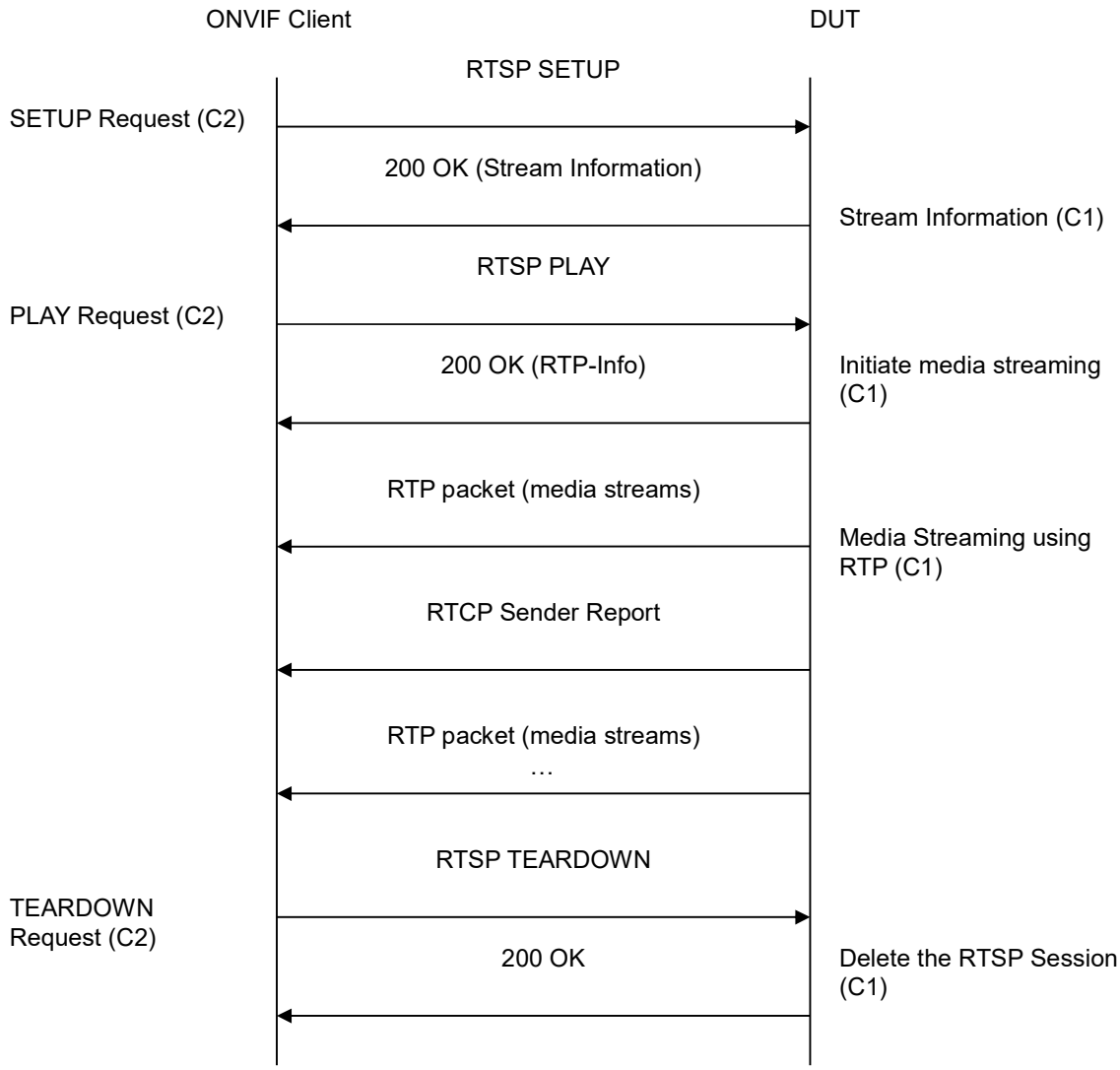
Pre-Requisite: H.264 is implemented by DUT. Real-time streaming supported by DUT.

A media profile with H.264 video encoder configuration.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(H.264 Video Encoder Cfg, FALSE)
Set H.264 video encoder cfg
Modify H.264 video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, HTTP)
Send HTTP URI and lifetime of URI
GetStreamUriResponse (HTTP URI)
Receive and Validate HTTP URI
HTTP GET Request
Establish HTTP GET connection (C1)
Create DUT to ONVIF Client connection (C1)
200 OK
Establish HTTP POST connection (C2)
HTTP POST Request
Create ONVIF Client to DUT connection (C2)
RTSP DESCRIBE
DESCRIBE Request (C2)
200 OK (SDP Message)
SDP Message (C1)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with H.264 video encoding support by following the procedure mentioned in Annex A.4**Error! Reference source not found.**.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “H.264”, Resolution = [“Width”, “Height”], Quality = q1, GovLength = g1, Session Timeout = t1 and force persistence = false). The parameter of H264Profile is set the highest value that DUT supports as the order is High/Extended/Main/Baseline. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.

6. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, HTTP transport) to retrieve media stream URI for the selected media profile.
7. DUT sends HTTP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
8. ONVIF Client verifies the HTTP media stream URI provided by the DUT.
9. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
10. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
11. ONVIF Client invokes RTSP DESCRIBE request on HTTP POST connection.
12. DUT sends 200 OK message and SDP information on HTTP GET connection.
13. ONVIF Client invokes RTSP SETUP request on HTTP POST connection with transport parameter as 'RTP/TCP' along with 'interleaved' parameter.
14. DUT sends 200 OK message and the media stream information on HTTP GET connection.
15. ONVIF Client invokes RTSP PLAY request on HTTP POST connection.
16. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
17. DUT transfers H.264 RTP media stream to ONVIF Client on HTTP GET connection.
18. DUT sends RTCP sender report to ONVIF Client on HTTP GET connection.
19. DUT validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection and closes the HTTP POST connection.
21. DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – HTTP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.20 MEDIA STREAMING – H.264 (RTP/RTSP/TCP)

Test Label: Real Time Viewing DUT H.264 media streaming using RTP/RTSP/TCP transport.

Test Case ID: RTSS-1-1-43

ONVIF Core Specification Coverage: RTP/RTSP/TCP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

WSDL Reference: None

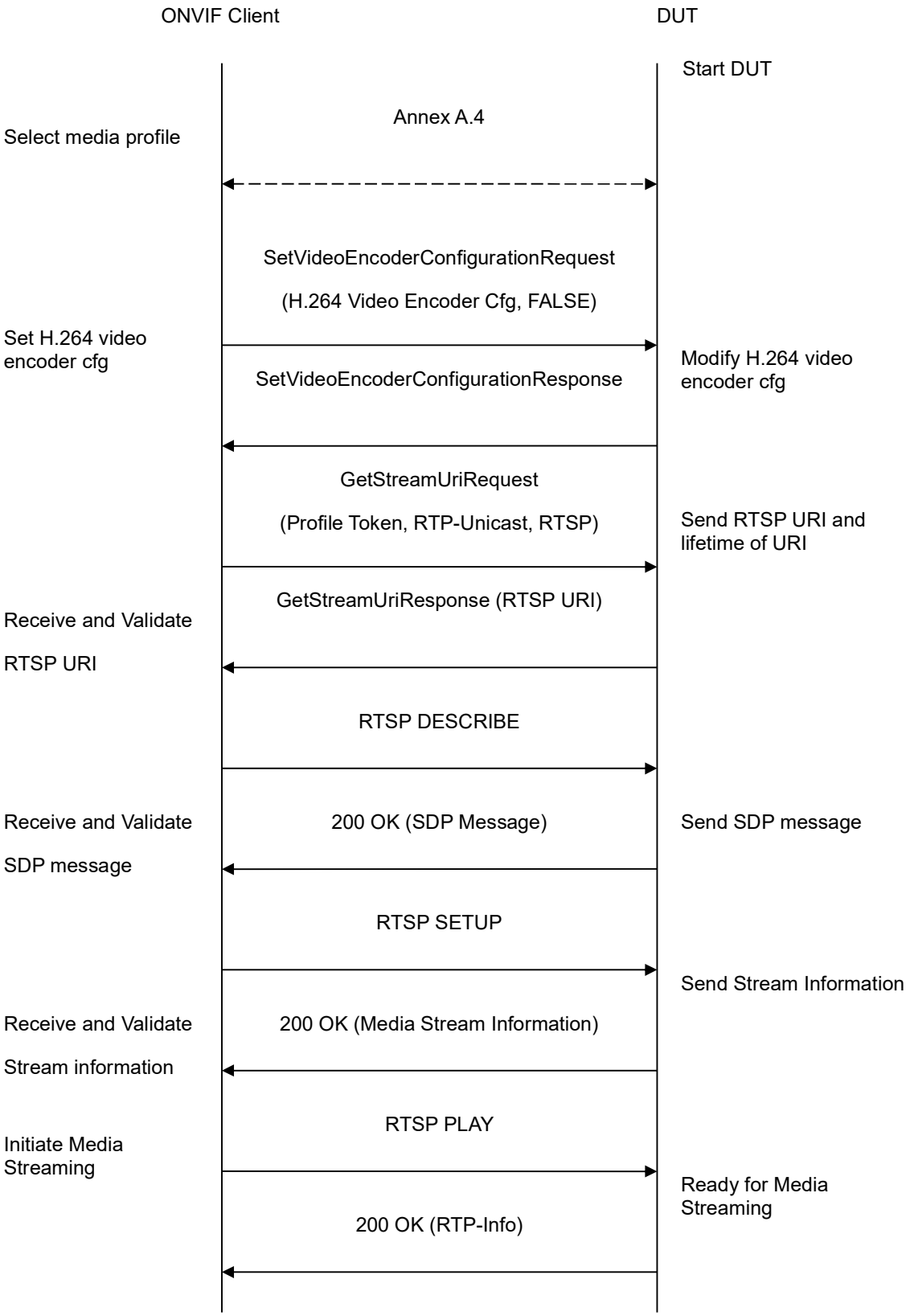
Test Purpose: To verify H.264 media streaming based on RTP/RTSP/TCP using RTSP tunnel.

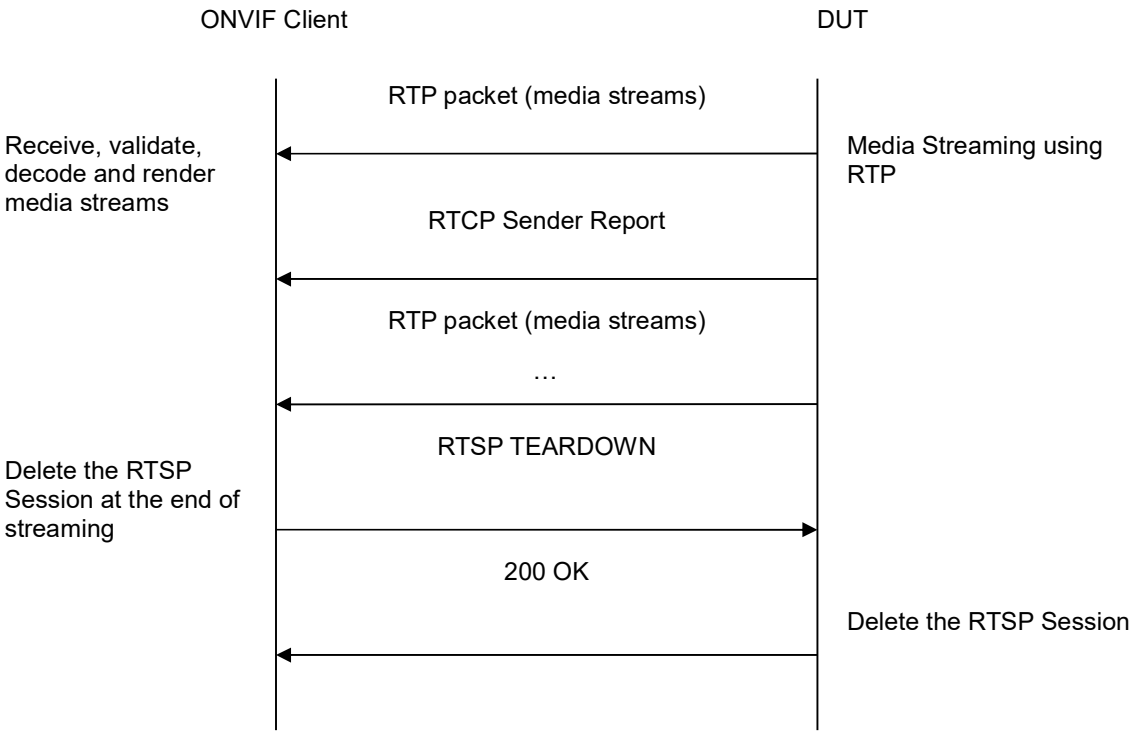
Pre-Requisite: H.264 and RTP/RTSP/TCP media streaming is implemented by DUT. Real-time streaming supported by DUT.

A media profile with H.264 video encoder configuration.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(H.264 Video Encoder Cfg, FALSE)
Set H.264 video encoder cfg
Modify H.264 video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, RTSP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Receive and Validate SDP message
200 OK (SDP Message)
Send SDP message
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with H.264 video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “H.264”, Resolution = [“Width”, “Height”], Quality = q1, GovLength = g1, Session Timeout = t1 and force persistence = false). The parameter of H264Profile is set the highest value that DUT supports as the order is High/Extended/Main/Baseline. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, RTSP transport) to retrieve media stream URI for the selected media profile.
7. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. DUT sends 200 OK message and SDP information.

11. ONVIF Client invokes RTSP SETUP request with transport parameter as 'RTP/TCP' along with '**interleaved'** parameter.
12. DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. DUT sends 200 OK message and starts media streaming.
15. DUT interleaves RTP and RTCP packets, send them over RTSP control connection.
16. DUT validates the received RTP and RTCP packets, decodes and renders them.
17. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
18. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send RTP and RTCP packets as per [RFC 2326] section 10.12.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.21 SET SYNCHRONIZATION POINT – H.264

Test Label: Media Configuration DUT Synchronization Point – H.264

Test Case ID: RTSS-1-1-44

ONVIF Core Specification Coverage: Set synchronization point.

Command Under Test: SetSynchronizationPoint

WSDL Reference: media.wsdl

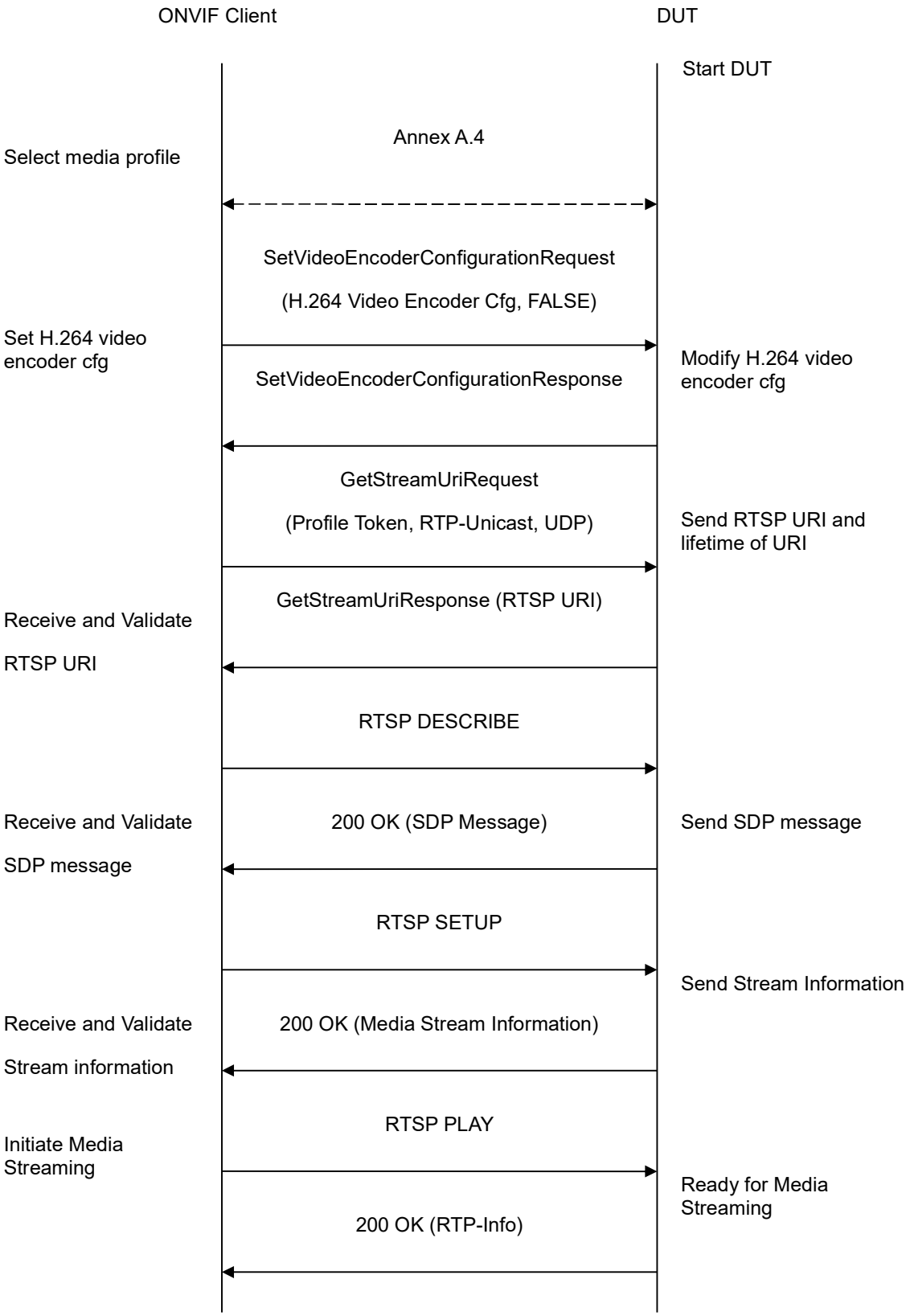
Test Purpose: To request synchronization point from DUT for H.264 media stream.

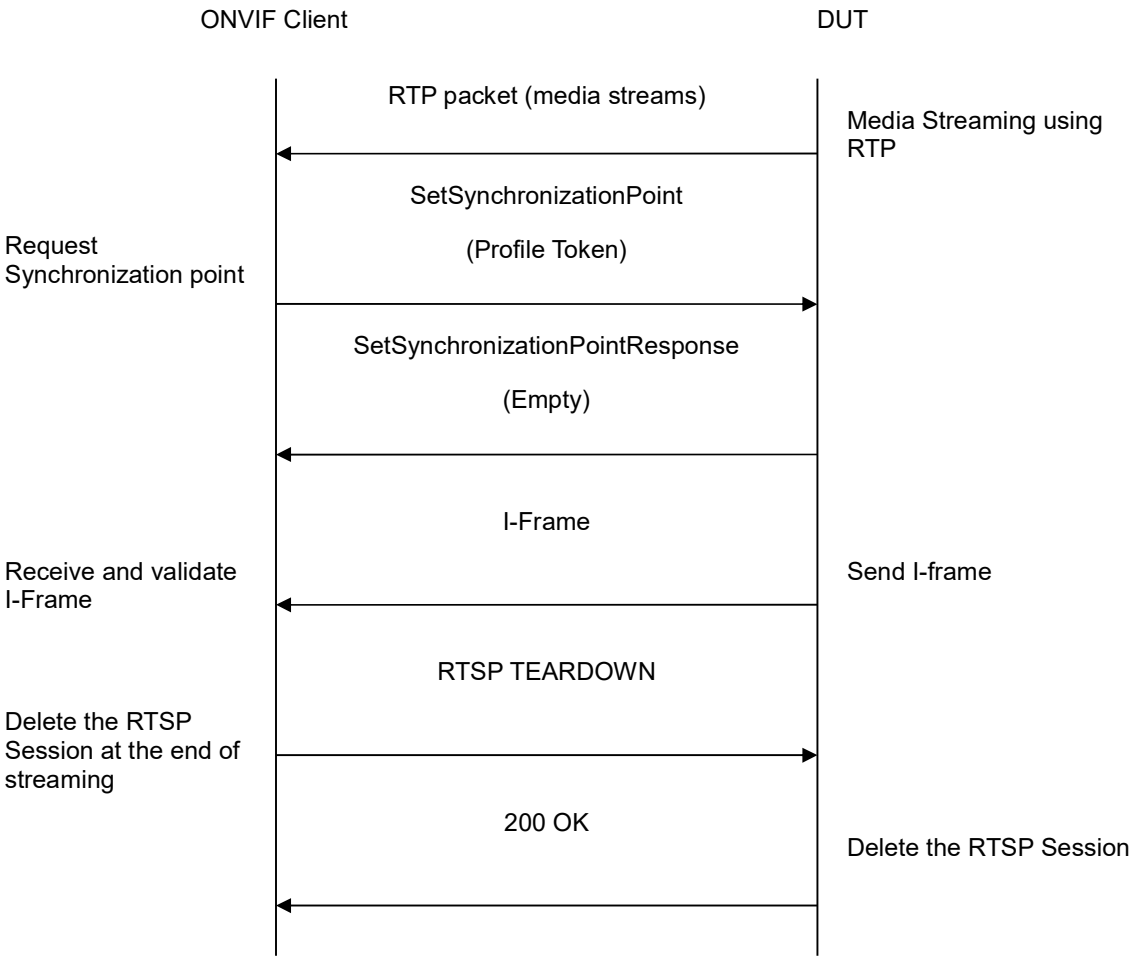
Pre-Requisite: H.264 is implemented by DUT. Real-time streaming supported by DUT.

A media profile with H.264 video encoder configuration.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(H.264 Video Encoder Cfg, FALSE)
Set H.264 video encoder cfg
Modify H.264 video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Receive and Validate SDP message
200 OK (SDP Message)
Send SDP message
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with H.264 video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “H.264”, Resolution = [“Width”, “Height”], Quality = q1, GovLength = g1, Session Timeout = t1 and force persistence = false). The parameter of H264Profile is set the highest value that DUT supports as the order is High/Extended/Main/Baseline. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes GetStreamUriRequest message (**Profile Token, RTP-Unicast, UDP transport**) to retrieve media stream URI for the selected media profile.

7. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter as **RTP/UDP**.
12. DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. DUT sends 200 OK message and starts media streaming.
15. DUT sends H.264 RTP media stream to ONVIF Client over UDP.
16. DUT sends RTCP sender report to ONVIF Client.
17. DUT validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes SetSynchronizationPoint request on the selected media profile.
19. DUT sends the SetSynchronizationPointResponse indicating success.
20. DUT inserts the I-frame in the ongoing media stream.
21. ONVIF Client verifies that I-frame is sent by DUT before the regular 'I-frame insertion time interval'.
22. ONVIF Client invokes RTSP TEARDOWN control request to terminate the RTSP session.
23. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send SetSynchronizationPointResponse message.

DUT did not send I-frame before the regular 'I-frame insertion time interval' upon invoking SetSynchronizationPoint request.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.3 for details on 'I-frame insertion time interval'.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.22 MEDIA STREAMING – RTP-Unicast/RTSP/HTTP/TCP (LINE BREAKS IN BASE64 ENCODING)

Test Label: Real Time Viewing DUT JPEG media streaming using HTTP transport with line breaks for Base64 encoding.

Test Case ID: RTSS-1-1-45

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP.

Command Under Test: None

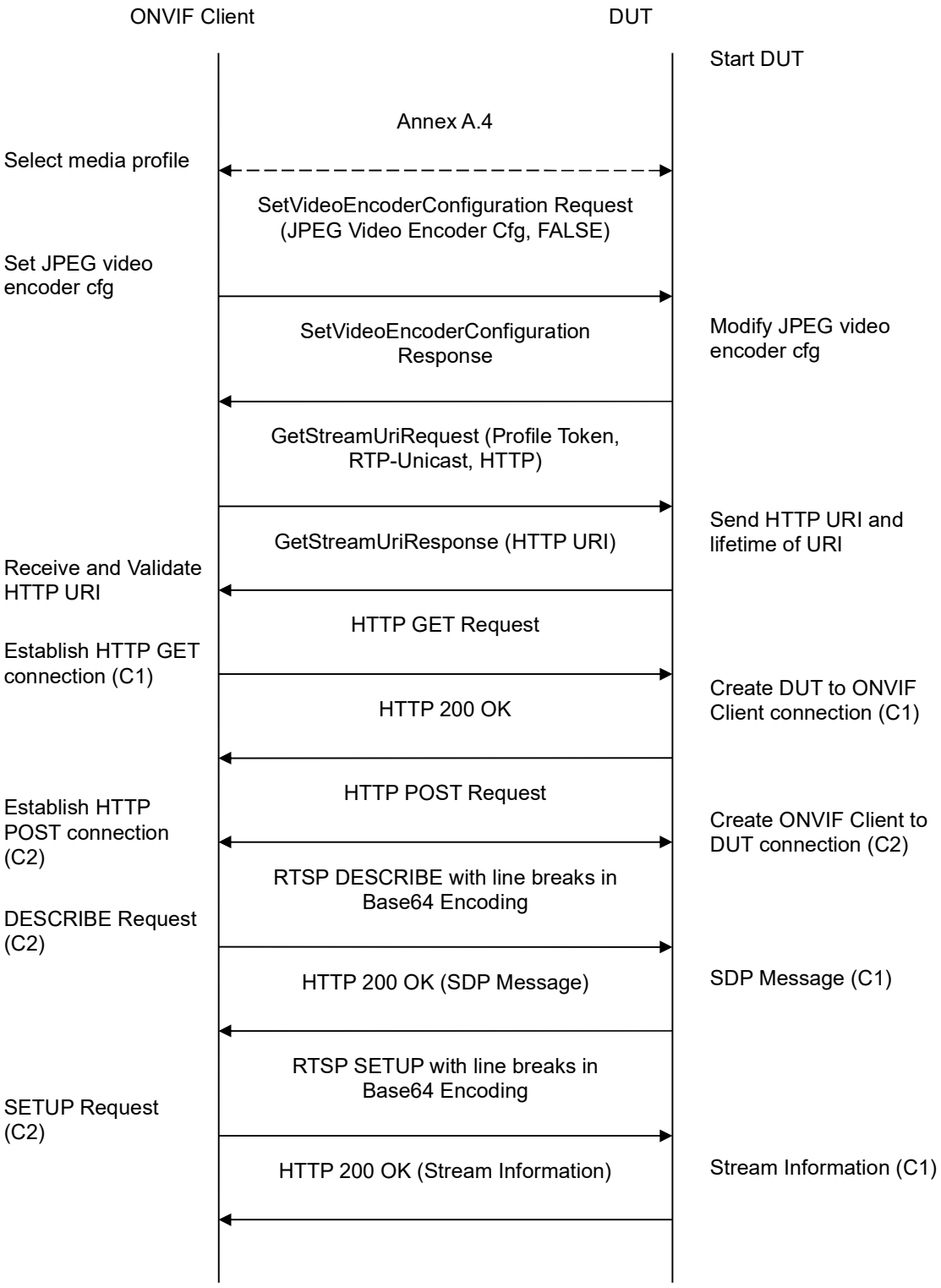
WSDL Reference: None

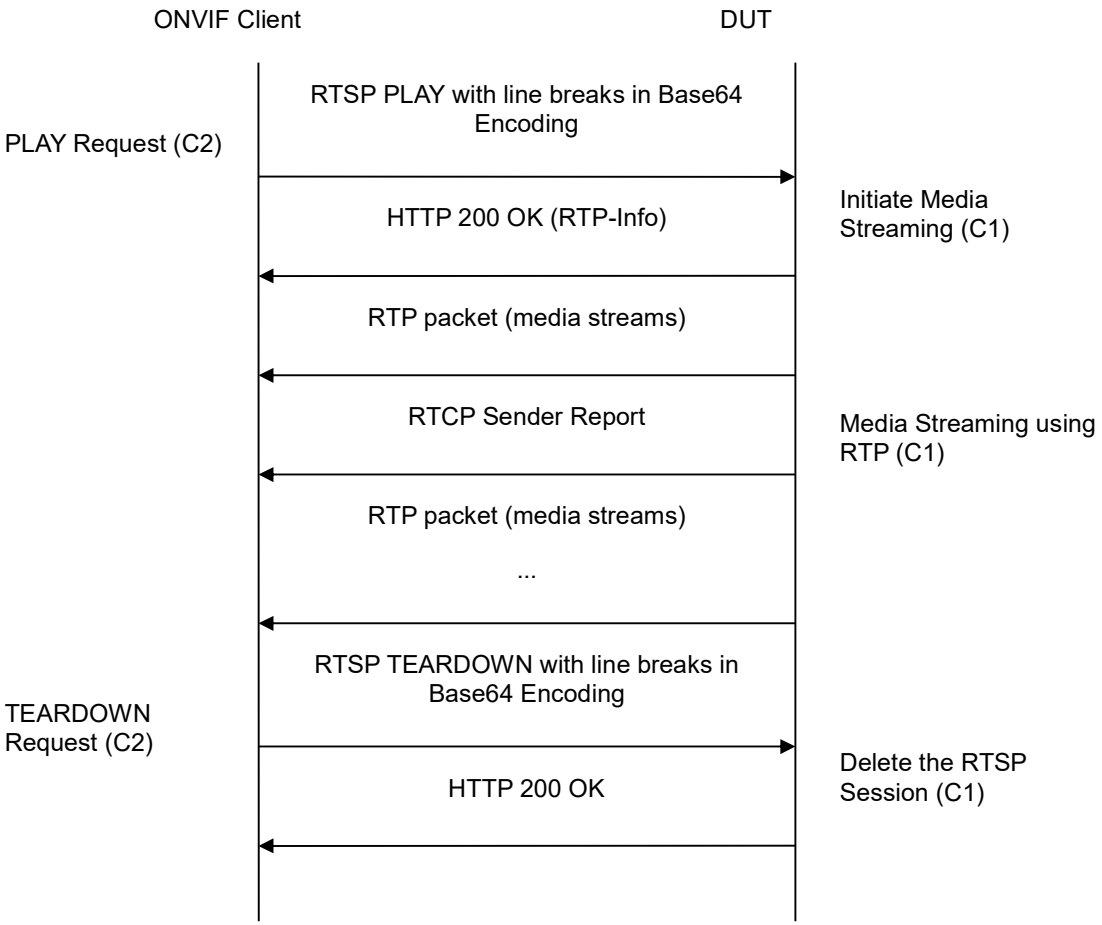
Test Purpose: To verify JPEG media streaming based on HTTP Transport with line breaks for Base64 encoding in RTSP requests.

Pre-Requisite: A media profile with JPEG video encoder configuration. Real-time streaming supported by DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfiguration Request
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
SetVideoEncoderConfiguration Response
Modify JPEG video encoder cfg
GetStreamUriRequest (Profile Token, RTP-Unicast, HTTP)
GetStreamUriResponse (HTTP URI)
Send HTTP URI and lifetime of URI
Receive and Validate HTTP URI
HTTP GET Request
Establish HTTP GET connection (C1)
HTTP 200 OK
Create DUT to ONVIF Client connection (C1)
HTTP POST Request
Establish HTTP POST connection (C2)
Create ONVIF Client to DUT connection (C2)
RTSP DESCRIBE with line breaks in Base64 Encoding
DESCRIBE Request (C2)
HTTP 200 OK (SDP Message)
SDP Message (C1)
RTSP SETUP with line breaks in Base64 Encoding
SETUP Request (C2)
HTTP 200 OK (Stream Information)
Stream Information (C1)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in Annex A.4.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, HTTP transport) to retrieve media stream URI for the selected media profile.
7. DUT sends HTTP URI and parameters defining the lifetime of the URI like ValidUntilReboot and Timeout in the GetStreamUriResponse message.

8. ONVIF Client verifies the HTTP media stream URI provided by the DUT (e.g. check that HTTP media stream URI have valid URI formatting).
9. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
10. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
11. ONVIF Client invokes RTSP DESCRIBE request with line breaks in Base64 encoding on HTTP POST connection.
12. DUT sends 200 OK message and SDP information on HTTP GET connection.
13. ONVIF Client invokes RTSP SETUP request with line breaks in Base64 encoding on HTTP POST connection with transport parameter as 'RTP/TCP' along with 'interleaved' parameter.
14. DUT sends 200 OK message and the media stream information on HTTP GET connection.
15. ONVIF Client invokes RTSP PLAY request with line breaks in Base64 encoding on HTTP POST connection.
16. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
17. DUT transfers JPEG RTP media stream to ONVIF Client on HTTP GET connection.
18. DUT sends RTCP sender report to ONVIF Client on HTTP GET connection.
19. DUT validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request with line breaks in Base64 encoding on HTTP POST connection and closes the HTTP POST connection.
21. DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – HTTP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests with line breaks in Base64 encoding.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

See Annex A.1 for Invalid RTP header definition.

RTSP requests for steps 11, 13, 15, and 20 will be sent with line breaks in RTSP in Base64 encoding (see http://tools.ietf.org/html/rfc1421#section-4.3.2.4 for more details). These line breaks shall be ignored by the DUT during request processing.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.23 VIDEO ENCODER CONFIGURATION – JPEG RESOLUTION

Test Label: Set different Resolution for all video encoder configurations Verification (JPEG).

Test Case ID: RTSS-1-1-46

ONVIF Core Specification Coverage: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, GetStreamUri, Live Streaming

Command Under Test: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, GetStreamUri

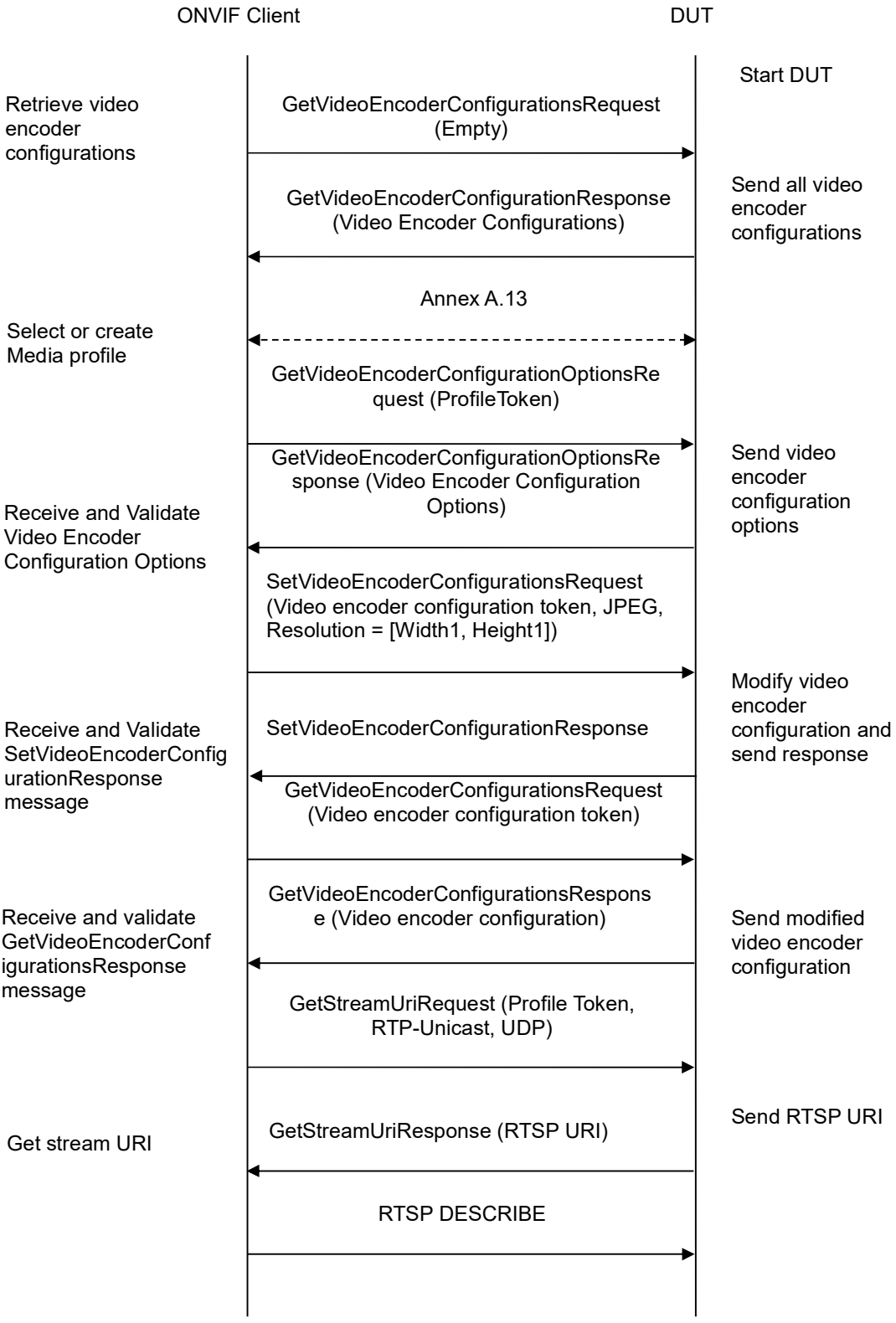
WSDL Reference: media.wsdl

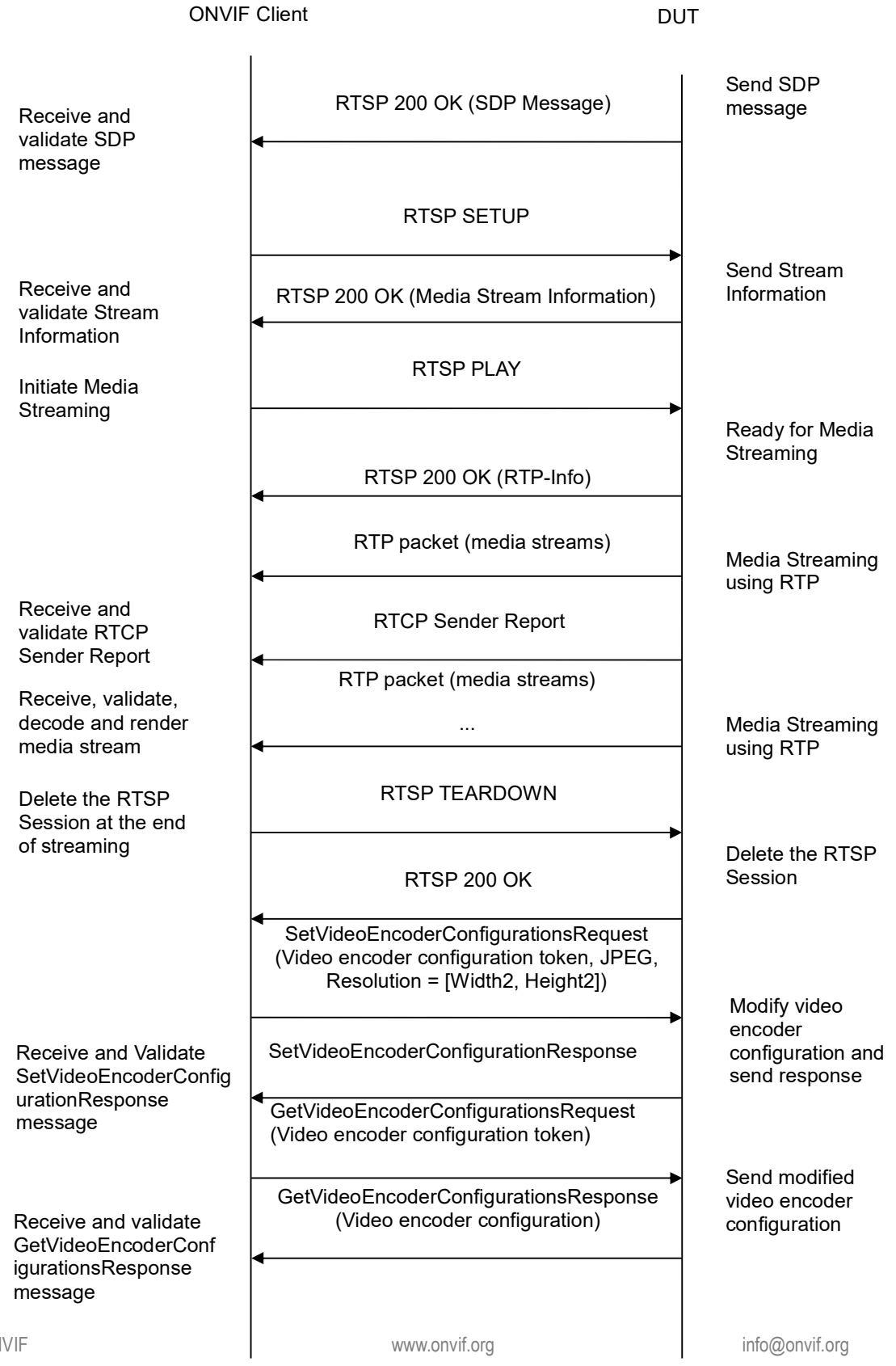
Test Purpose: To verify changing and applying of different Resolutions for video encoder configuration and video stream.

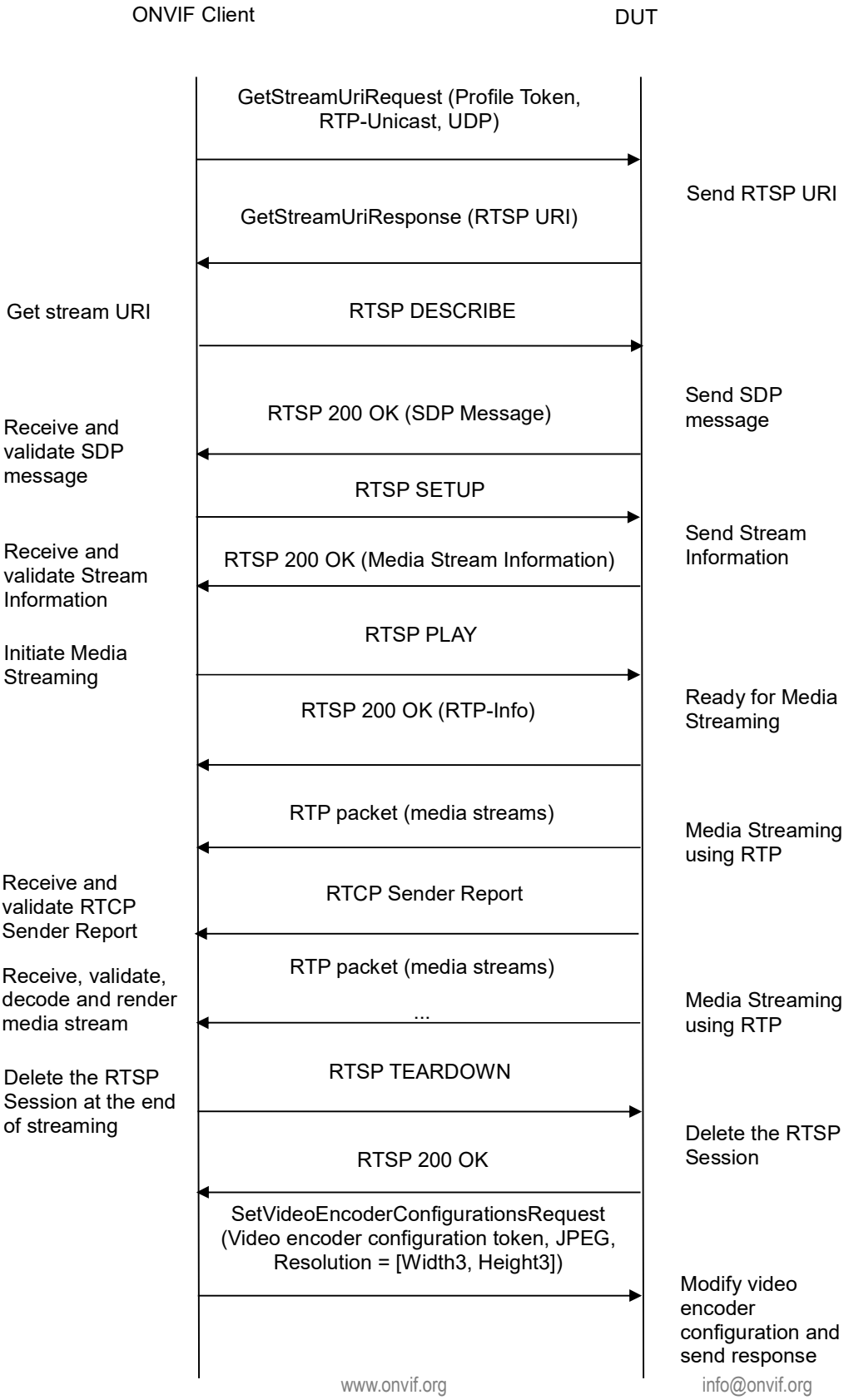
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT. There is Video Encoder Configuration which is either configured with JPEG or the DUT allows to change encoding of Video Encoder Configuration.

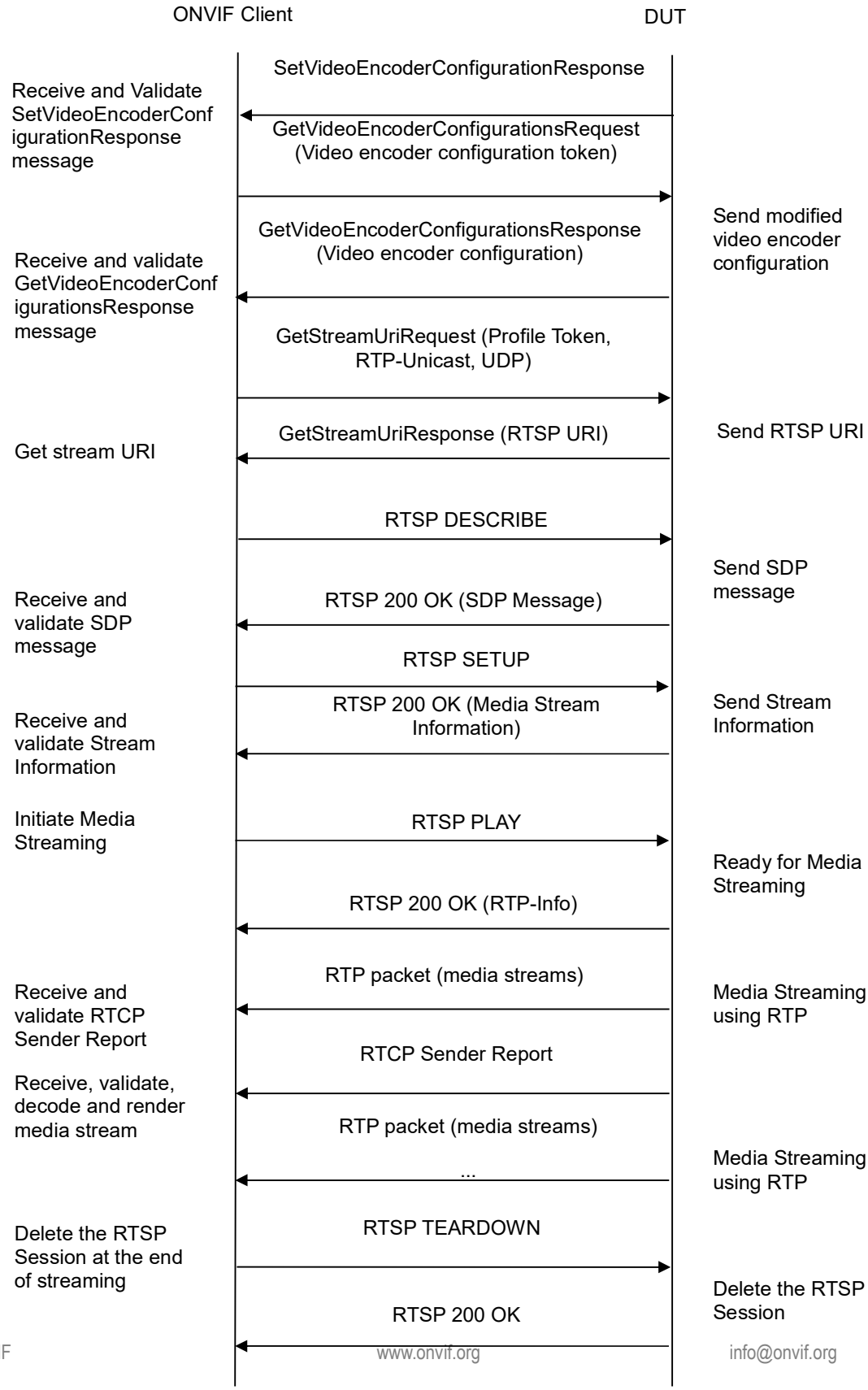
Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Retrieve video encoder configurations
GetVideoEncoderConfigurationsRequest (Empty)
GetVideoEncoderConfigurationResponse (Video Encoder Configurations)
Send all video encoder configurations
Annex A.13
Select or create Media profile
GetVideoEncoderConfigurationOptionsRequest (ProfileToken)
GetVideoEncoderConfigurationOptionsResponse (Video Encoder Configuration Options)
Send video encoder configuration options
Receive and Validate Video Encoder Configuration Options
SetVideoEncoderConfigurationsRequest (Video encoder configuration token, JPEG, Resolution = [Width1, Height1])
Modify video encoder configuration and send response
SetVideoEncoderConfigurationResponse
Receive and Validate SetVideoEncoderConfigurationResponse message
GetVideoEncoderConfigurationsRequest (Video encoder configuration token)
GetVideoEncoderConfigurationsResponse (Video encoder configuration)
Send modified video encoder configuration
Receive and validate GetVideoEncoderConfigurationsResponse message
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE


ONVIF Client
DUT
RTSP 200 OK (SDP Message)
Send SDP message
Receive and validate SDP message
RTSP SETUP
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP
Receive and validate RTCP Sender Report
RTCP Sender Report
RTP packet (media streams)
Receive, validate, decode and render media stream
...
Media Streaming using RTP
RTSP TEARDOWN
Delete the RTSP Session at the end of streaming
RTSP 200 OK
Delete the RTSP Session
SetVideoEncoderConfigurationsRequest (Video encoder configuration token, JPEG, Resolution = [Width2, Height2])
Modify video encoder configuration and send response
SetVideoEncoderConfigurationResponse
Receive and Validate SetVideoEncoderConfigurationResponse message
GetVideoEncoderConfigurationsRequest (Video encoder configuration token)
Send modified video encoder configuration
GetVideoEncoderConfigurationsResponse (Video encoder configuration)
Receive and validate GetVideoEncoderConfigurationsResponse message


ONVIF Client
DUT
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP
Send Stream Information
Receive and validate Stream Information
RTSP 200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP
Receive and validate RTCP Sender Report
RTCP Sender Report
RTP packet (media streams)
Receive, validate, decode and render media stream
...
Media Streaming using RTP
RTSP TEARDOWN
Delete the RTSP Session at the end of streaming
Delete the RTSP Session
RTSP 200 OK
SetVideoEncoderConfigurationsRequest (Video encoder configuration token, JPEG, Resolution = [Width3, Height3])
Modify video encoder configuration and send response


ONVIF Client
DUT
SetVideoEncoderConfigurationResponse
Receive and Validate SetVideoEncoderConfigurationResponse message
GetVideoEncoderConfigurationsRequest (Video encoder configuration token)
Send modified video encoder configuration
GetVideoEncoderConfigurationsResponse (Video encoder configuration)
Receive and validate GetVideoEncoderConfigurationsResponse message
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
GetStreamUriResponse (RTSP URI)
Send RTSP URI
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP
Receive and validate RTCP Sender Report
RTCP Sender Report
Receive, validate, decode and render media stream
RTP packet (media streams)
...
Media Streaming using RTP
RTSP TEARDOWN
Delete the RTSP Session at the end of streaming
Delete the RTSP Session
RTSP 200 OK

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes GetVideoEncoderConfigurationsRequest message to retrieve video configuration list.
4. Verify the GetVideoEncoderConfigurationsResponse message.
5. Find or create media profile with Video Source Configuration and Video Encoder Configuration with token VECToken1 and supporting of JPEG encoding, where VECToken1 is first video encoder configuration token from GetVideoEncoderConfigurationsResponse message (see Annex A.13). If it is not possible skip steps 6-61 and go to the step 62.
6. ONVIF Client invokes GetVideoEncoderConfigurationOptionsRequest message (ProfileToken = “Profile1”, where “Profile1” is profile token from the step 5) to get video encoder configuration options.
7. Verify the GetVideoEncoderConfigurationOptionsResponse message from the DUT.
8. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = JPEG, where [Width1, Height1] is maximum resolution from the Options.JPEG.ResolutionsAvailable) to change video encoder configuration.
9. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
10. ONVIF Client invokes GetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1) to get video encoder configuration.
11. Verify the GetVideoEncoderConfigurationResponse message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = JPEG) from the DUT. Check that new setting for Resolution and Encoding was applied.
12. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
13. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
14. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
15. ONVIF Client invokes RTSP DESCRIBE request.
16. DUT sends 200 OK message and SDP information.
17. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
18. DUT sends 200 OK message and the media stream information.
19. ONVIF Client invokes RTSP PLAY request.
20. DUT sends 200 OK message and starts media streaming.
21. DUT sends JPEG RTP media stream to ONVIF Client over UDP. Verify that stream has JPEG encoding and [Width1, Height1] resolution. (**Note:** if stream Height resolution is between Height1 – 8 and Height1 + 8 it is assumed as valid; if stream Width resolution is between Width1 – 8 and Width1 + 8 it is assumed as valid.)

22. DUT sends RTCP sender report to ONVIF Client.
23. DUT validates the received RTP and RTCP packets, decodes and renders them.
24. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
25. DUT sends 200 OK Response and terminates the RTSP Session.
26. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1, Resolution = [Width2, Height2], Encoding = JPEG, where [Width2, Height2] is minimum resolution from the Options.JPEG.ResolutionsAvailable) to change video encoder configuration.
27. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
28. ONVIF Client invokes GetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1) to get video encoder configuration.
29. Verify the GetVideoEncoderConfigurationResponse message (ConfigurationToken = VECToken1, Resolution = [Width2, Height2], Encoding = JPEG, where [Width2, Height2]) from the DUT. Check that new setting for Resolution and Encoding was applied.
30. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
31. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
32. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
33. ONVIF Client invokes RTSP DESCRIBE request.
34. DUT sends 200 OK message and SDP information.
35. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
36. DUT sends 200 OK message and the media stream information.
37. ONVIF Client invokes RTSP PLAY request.
38. DUT sends 200 OK message and starts media streaming.
39. DUT sends JPEG RTP media stream to ONVIF Client over UDP. Verify that stream has JPEG encoding and [Width2, Height2] resolution.
40. DUT sends RTCP sender report to ONVIF Client.
41. DUT validates the received RTP and RTCP packets, decodes and renders them.
42. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
43. DUT sends 200 OK Response and terminates the RTSP Session.
44. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1, Resolution = [Width3, Height3], Encoding = JPEG, where [Width3, Height3] is middle resolution from the Options.JPEG.ResolutionsAvailable) to change video encoder configuration.

45. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
46. ONVIF Client invokes GetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1) to get video encoder configuration.
47. Verify the GetVideoEncoderConfigurationResponse message (ConfigurationToken = VECToken1, Resolution = [Width3, Height3], Encoding = JPEG) from the DUT. Check that new setting for Resolution and Encoding was applied.
48. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
49. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
50. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
51. ONVIF Client invokes RTSP DESCRIBE request.
52. DUT sends 200 OK message and SDP information.
53. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
54. DUT sends 200 OK message and the media stream information.
55. ONVIF Client invokes RTSP PLAY request.
56. DUT sends 200 OK message and starts media streaming.
57. DUT sends JPEG RTP media stream to ONVIF Client over UDP. Verify that stream has JPEG encoding and [Width3, Height3] resolution.
58. DUT sends RTCP sender report to ONVIF Client.
59. DUT validates the received RTP and RTCP packets, decodes and renders them.
60. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
61. DUT sends 200 OK Response and terminates the RTSP Session.
62. Repeat steps 5-62 for the first, middle and last Video Encoder configurations supported by the DUT.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not sent valid video stream with JPEG encoding and specified resolution or sent it in another encoding or resolution.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: The following rule will be used to compare resolutions: Resolution1 (Width1, Height1) is greater than Resolution2 (Width2, Height2), if Width1*Height1 is greater than Width2*Height2. This rule will be used to define minimum, maximum and middle resolution.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

Note: If it is impossible to create profile for all three: the first, the middle and the last Video Encoder configurations on the 5th step, then Onvif Client will try selecting another Video Encoder configuration until a profile is created.

4.1.24 VIDEO ENCODER CONFIGURATION – MPEG4 RESOLUTION

Test Label: Set different Resolution for all video encoder configurations Verification (MPEG4).

Test Case ID: RTSS-1-1-47

ONVIF Core Specification Coverage: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, GetStreamUri, Live Streaming

Command Under Test: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, GetStreamUri

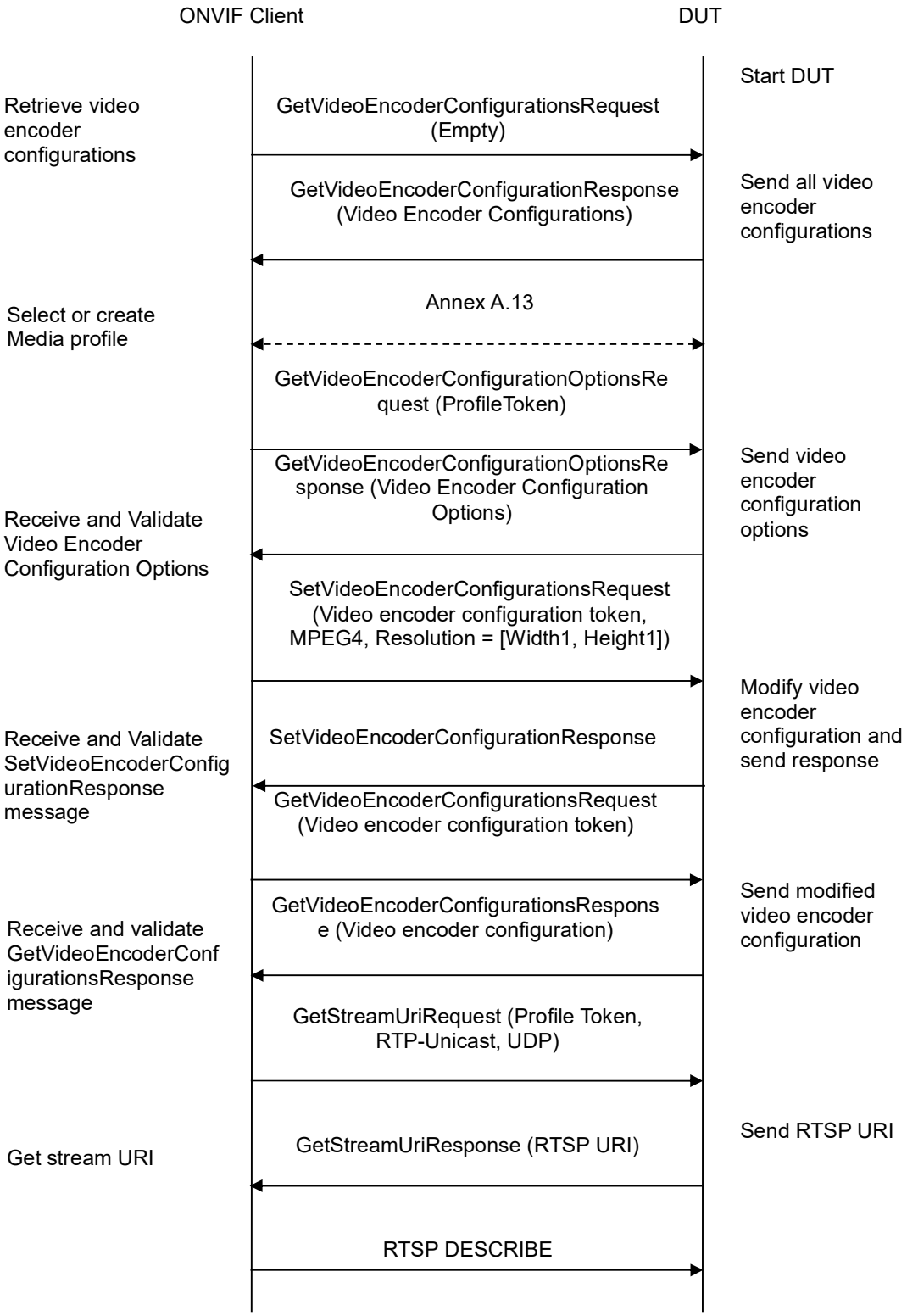
WSDL Reference: media.wsdl

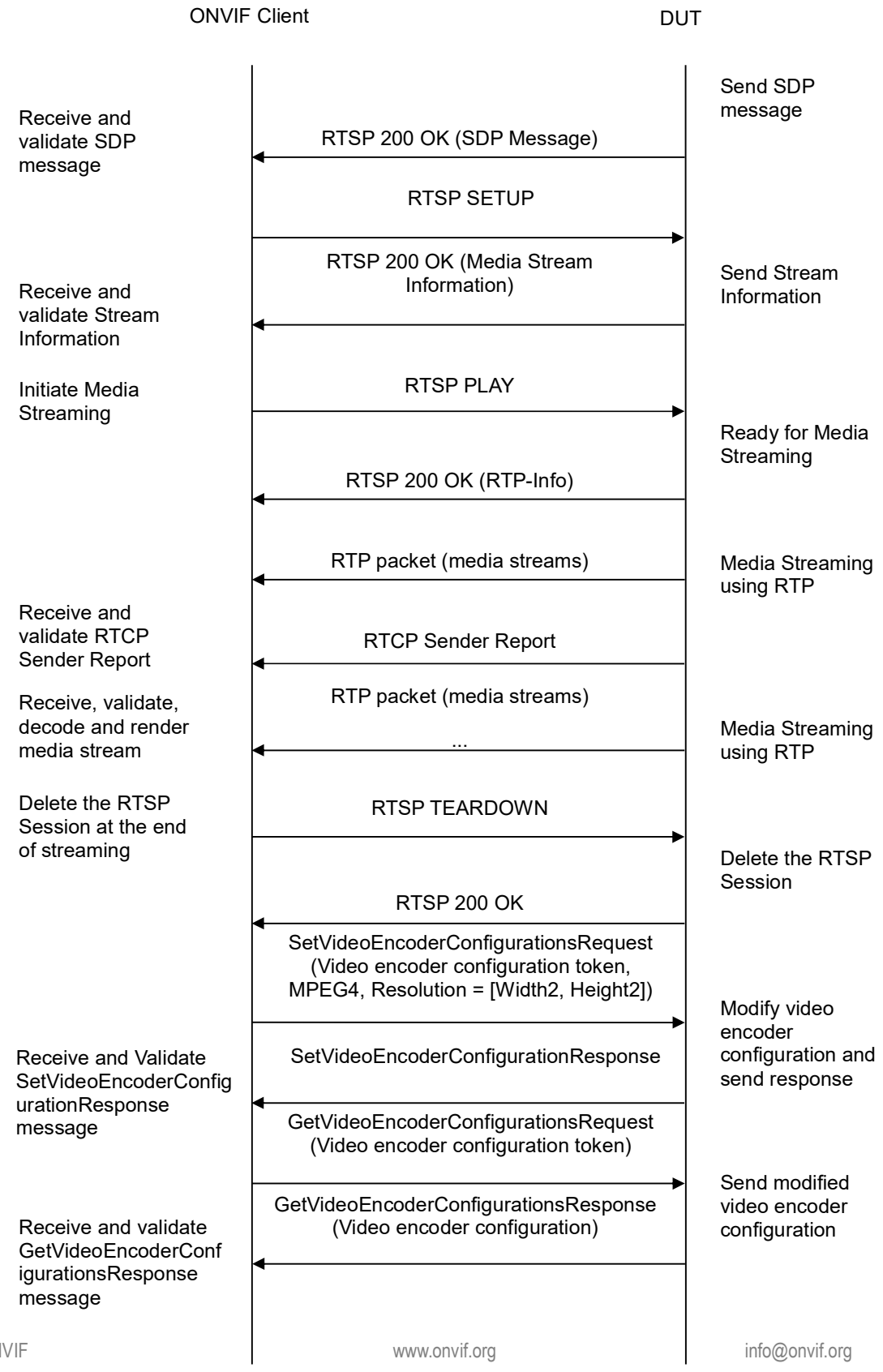
Test Purpose: To verify changing and applying of different Resolutions for video encoder configuration and video stream.

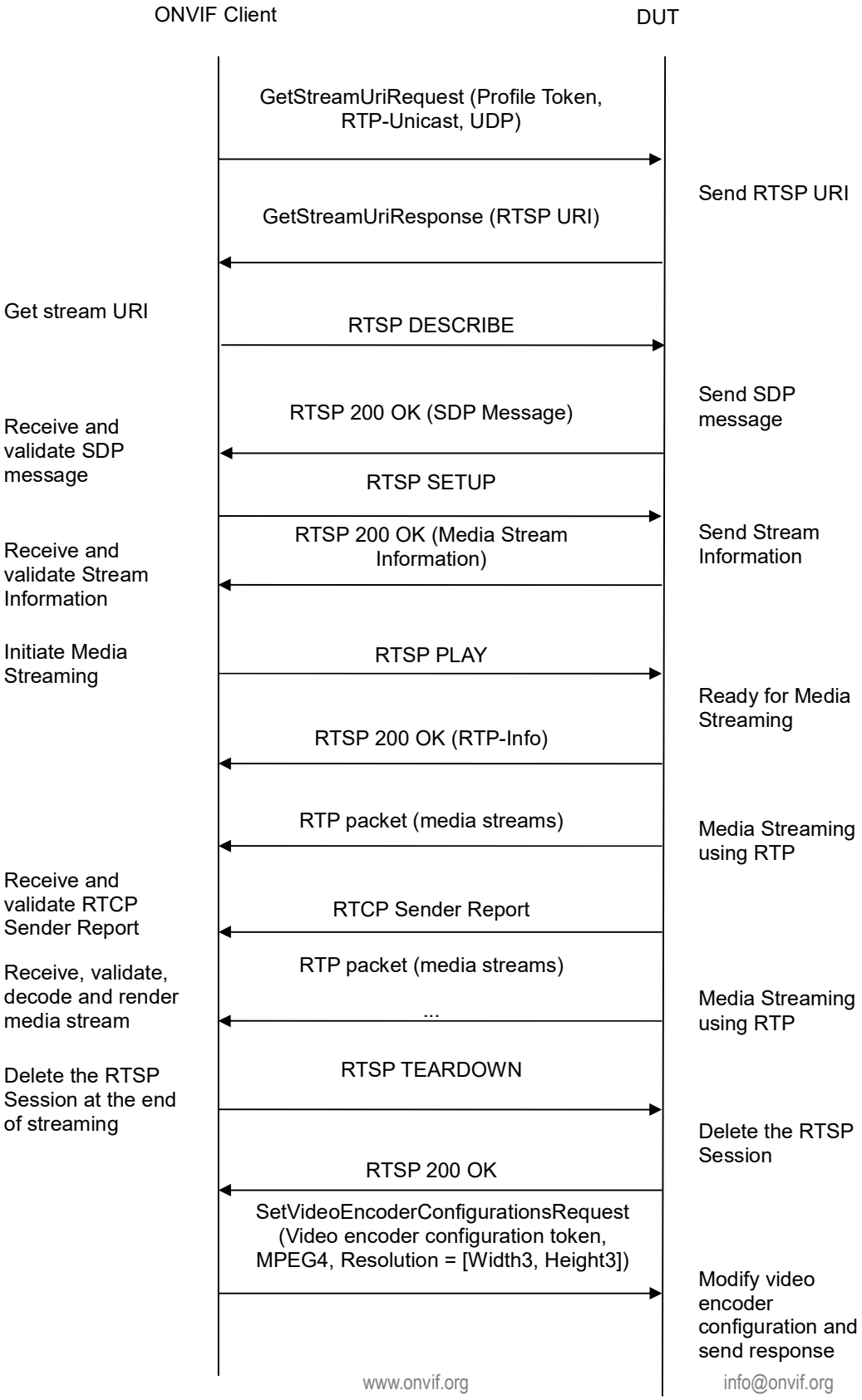
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT. MPEG4 is supported by the DUT. There is Video Encoder Configuration which is either configured with MPEG4 or the DUT allows to change encoding of Video Encoder Configuration.

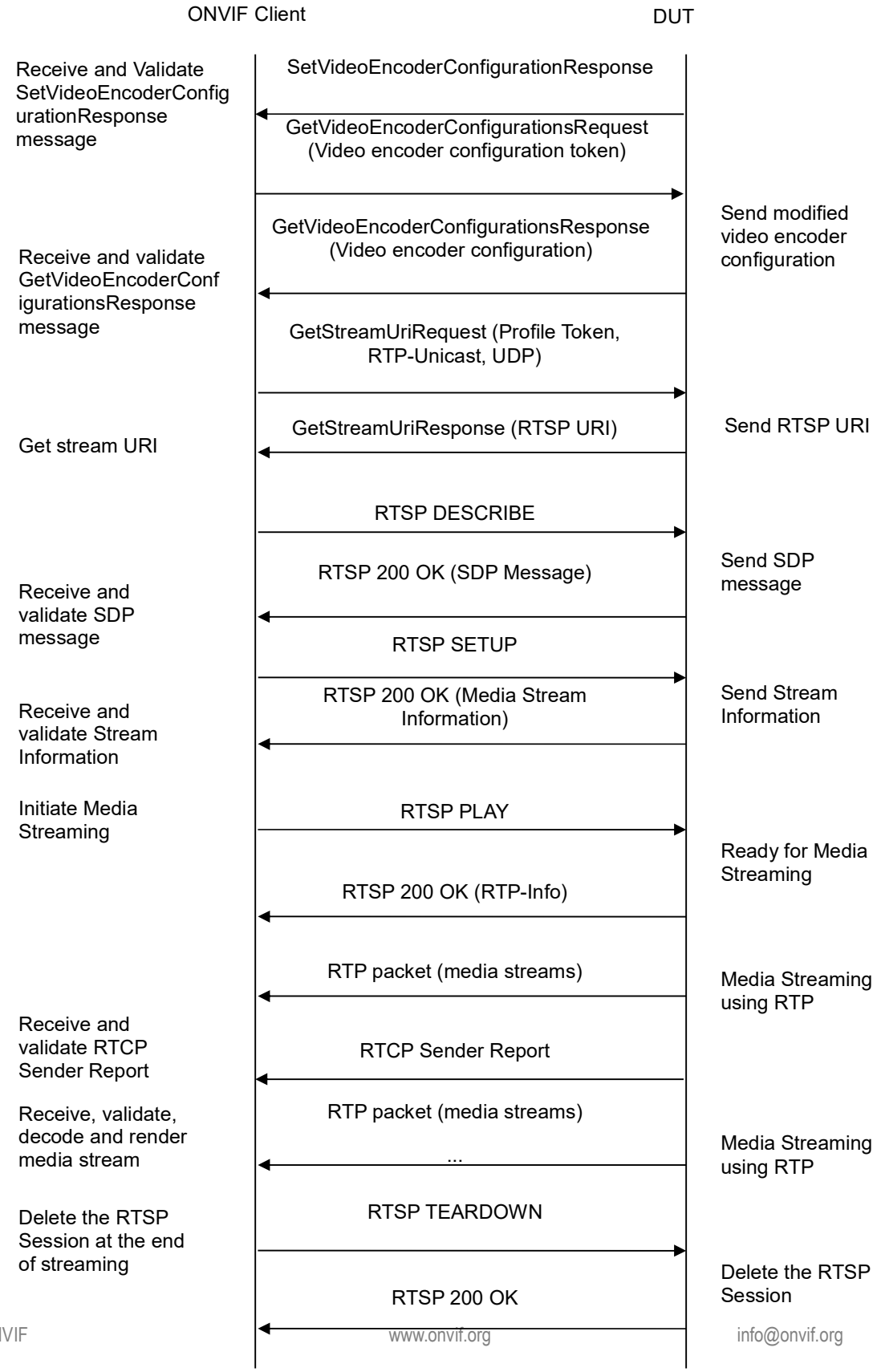
Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Retrieve video encoder configurations
GetVideoEncoderConfigurationsRequest (Empty)
GetVideoEncoderConfigurationResponse (Video Encoder Configurations)
Send all video encoder configurations
Annex A.13
Select or create Media profile
GetVideoEncoderConfigurationOptionsRequest (ProfileToken)
GetVideoEncoderConfigurationOptionsResponse (Video Encoder Configuration Options)
Send video encoder configuration options
Receive and Validate Video Encoder Configuration Options
SetVideoEncoderConfigurationsRequest (Video encoder configuration token, MPEG4, Resolution = [Width1, Height1])
Modify video encoder configuration and send response
SetVideoEncoderConfigurationResponse
Receive and Validate SetVideoEncoderConfigurationResponse message
GetVideoEncoderConfigurationsRequest (Video encoder configuration token)
GetVideoEncoderConfigurationsResponse (Video encoder configuration)
Send modified video encoder configuration
Receive and validate GetVideoEncoderConfigurationsResponse message
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
GetStreamUriResponse (RTSP URI)
Send RTSP URI
Get stream URI
RTSP DESCRIBE


ONVIF Client
DUT
Send SDP message
Receive and validate SDP message
RTSP 200 OK (SDP Message)
RTSP SETUP
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP
Receive and validate RTCP Sender Report
RTCP Sender Report
Receive, validate, decode and render media stream
RTP packet (media streams)
...
Media Streaming using RTP
Delete the RTSP Session at the end of streaming
RTSP TEARDOWN
Delete the RTSP Session
RTSP 200 OK
SetVideoEncoderConfigurationsRequest (Video encoder configuration token, MPEG4, Resolution = [Width2, Height2])
Modify video encoder configuration and send response
Receive and Validate SetVideoEncoderConfigurationResponse message
SetVideoEncoderConfigurationResponse
GetVideoEncoderConfigurationsRequest (Video encoder configuration token)
Send modified video encoder configuration
GetVideoEncoderConfigurationsResponse (Video encoder configuration)
Receive and validate GetVideoEncoderConfigurationsResponse message


ONVIF Client
DUT
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP
Receive and validate RTCP Sender Report
RTCP Sender Report
RTP packet (media streams)
Receive, validate, decode and render media stream
...
Media Streaming using RTP
RTSP TEARDOWN
Delete the RTSP Session at the end of streaming
Delete the RTSP Session
RTSP 200 OK
SetVideoEncoderConfigurationsRequest (Video encoder configuration token, MPEG4, Resolution = [Width3, Height3])
Modify video encoder configuration and send response


ONVIF Client
DUT
Receive and Validate SetVideoEncoderConfigurationResponse message
SetVideoEncoderConfigurationResponse
GetVideoEncoderConfigurationsRequest (Video encoder configuration token)
Send modified video encoder configuration
GetVideoEncoderConfigurationsResponse (Video encoder configuration)
Receive and validate GetVideoEncoderConfigurationsResponse message
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP
Receive and validate RTCP Sender Report
RTCP Sender Report
RTP packet (media streams)
Receive, validate, decode and render media stream
...
Media Streaming using RTP
RTSP TEARDOWN
Delete the RTSP Session at the end of streaming
Delete the RTSP Session
RTSP 200 OK

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes GetVideoEncoderConfigurationsRequest message to retrieve video configuration list.
4. Verify the GetVideoEncoderConfigurationsResponse message.
5. Find or create media profile with Video Source Configuration and Video Encoder Configuration with token VECToken1 and supporting of MPEG4 encoding, where VECToken1 is first video encoder configuration token from GetVideoEncoderConfigurationsResponse message (see Annex A.13). If it is not possible skip steps 6-25 and go to the step 26.
6. ONVIF Client invokes GetVideoEncoderConfigurationOptionsRequest message (ProfileToken = “Profile1”, where “Profile1” is profile token from the step 10) to get video encoder configuration options.
7. Verify the GetVideoEncoderConfigurationOptionsResponse message from the DUT.
8. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = MPEG4, where [Width1, Height1] is maximum resolution from the Options.MPEG4.ResolutionsAvailable) to change video encoder configuration.
9. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
10. ONVIF Client invokes GetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1) to get video encoder configuration.
11. Verify the GetVideoEncoderConfigurationResponse message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = MPEG4) from the DUT. Check that new setting for Resolution and Encoding was applied.
12. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
13. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
14. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
15. ONVIF Client invokes RTSP DESCRIBE request.
16. DUT sends 200 OK message and SDP information.
17. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
18. DUT sends 200 OK message and the media stream information.
19. ONVIF Client invokes RTSP PLAY request.
20. DUT sends 200 OK message and starts media streaming.
21. DUT sends MPEG4 RTP media stream to ONVIF Client over UDP. Verify that stream has MPEG4 encoding and [Width1, Height1] resolution.

22. DUT sends RTCP sender report to ONVIF Client.
23. DUT validates the received RTP and RTCP packets, decodes and renders them.
24. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
25. DUT sends 200 OK Response and terminates the RTSP Session.
26. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = MPEG4, where [Width2, Height2] is minimum resolution from the Options.MPEG4.ResolutionsAvailable) to change video encoder configuration.
27. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
28. ONVIF Client invokes GetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1) to get video encoder configuration.
29. Verify the GetVideoEncoderConfigurationResponse message (ConfigurationToken = VECToken1, Resolution = [Width2, Height2], Encoding = MPEG4, where [Width2, Height2]) from the DUT. Check that new setting for Resolution and Encoding was applied.
30. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
31. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
32. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
33. ONVIF Client invokes RTSP DESCRIBE request.
34. DUT sends 200 OK message and SDP information.
35. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
36. DUT sends 200 OK message and the media stream information.
37. ONVIF Client invokes RTSP PLAY request.
38. DUT sends 200 OK message and starts media streaming.
39. DUT sends MPEG4 RTP media stream to ONVIF Client over UDP. Verify that stream has MPEG4 encoding and [Width2, Height2] resolution.
40. DUT sends RTCP sender report to ONVIF Client.
41. DUT validates the received RTP and RTCP packets, decodes and renders them.
42. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
43. DUT sends 200 OK Response and terminates the RTSP Session.
44. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = MPEG4, where [Width3, Height3] is middle resolution from the Options.MPEG4.ResolutionsAvailable) to change video encoder configuration.

45. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
46. ONVIF Client invokes GetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1) to get video encoder configuration.
47. Verify the GetVideoEncoderConfigurationResponse message (ConfigurationToken = VECToken1, Resolution = [Width3, Height3], Encoding = MPEG4) from the DUT. Check that new setting for Resolution and Encoding was applied.
48. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
49. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
50. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
51. ONVIF Client invokes RTSP DESCRIBE request.
52. DUT sends 200 OK message and SDP information.
53. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
54. DUT sends 200 OK message and the media stream information.
55. ONVIF Client invokes RTSP PLAY request.
56. DUT sends 200 OK message and starts media streaming.
57. DUT sends MPEG4 RTP media stream to ONVIF Client over UDP. Verify that stream has MPEG4 encoding and [Width3, Height3] resolution.
58. DUT sends RTCP sender report to ONVIF Client.
59. DUT validates the received RTP and RTCP packets, decodes and renders them.
60. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
61. DUT sends 200 OK Response and terminates the RTSP Session.
62. Repeat steps 5-62 for the first, middle and last Video Encoder configurations supported by the DUT.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not sent valid video stream with MPEG4 encoding and specified resolution or sent it in another encoding or resolution.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: Following rule will be used to compare resolutions: Resolution1 (Width1, Height1) is greater than Resolution2 (Width2, Height2), if Width1*Height1 is greater than Width2*Height2. This rule will be used to define minimum, maximum and middle resolution.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

Note: If it is impossible to create profile for all three: the first, the middle and the last Video Encoder configurations on the 5th step, then Onvif Client will try selecting another Video Encoder configuration until a profile is created.

4.1.25 VIDEO ENCODER CONFIGURATION – H.264 RESOLUTION

Test Label: Set different Resolution for all video encoder configurations Verification (H.264).

Test Case ID: RTSS-1-1-48

ONVIF Core Specification Coverage: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, GetStreamUri, Live Streaming

Command Under Test: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, GetStreamUri

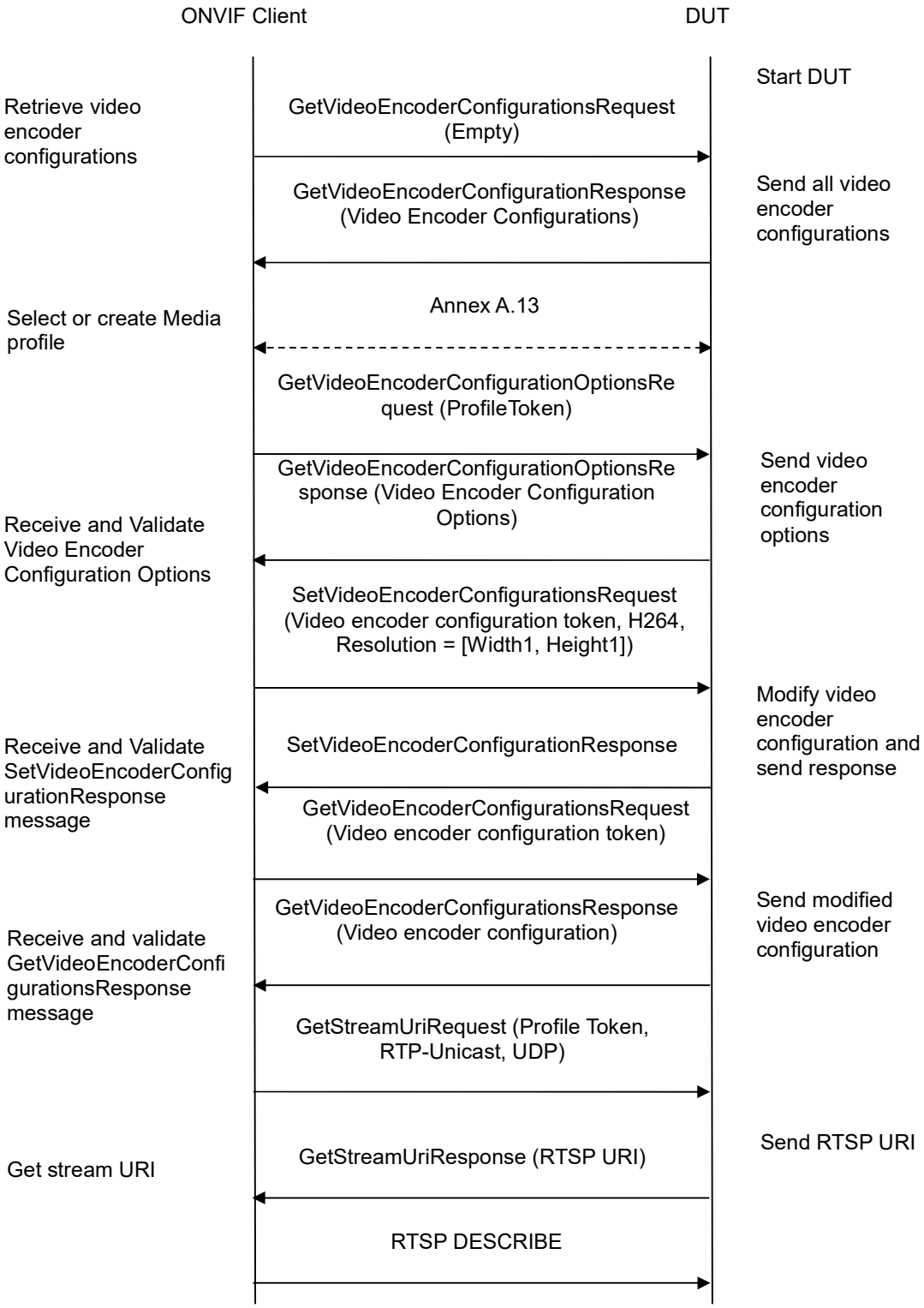
WSDL Reference: media.wsdl

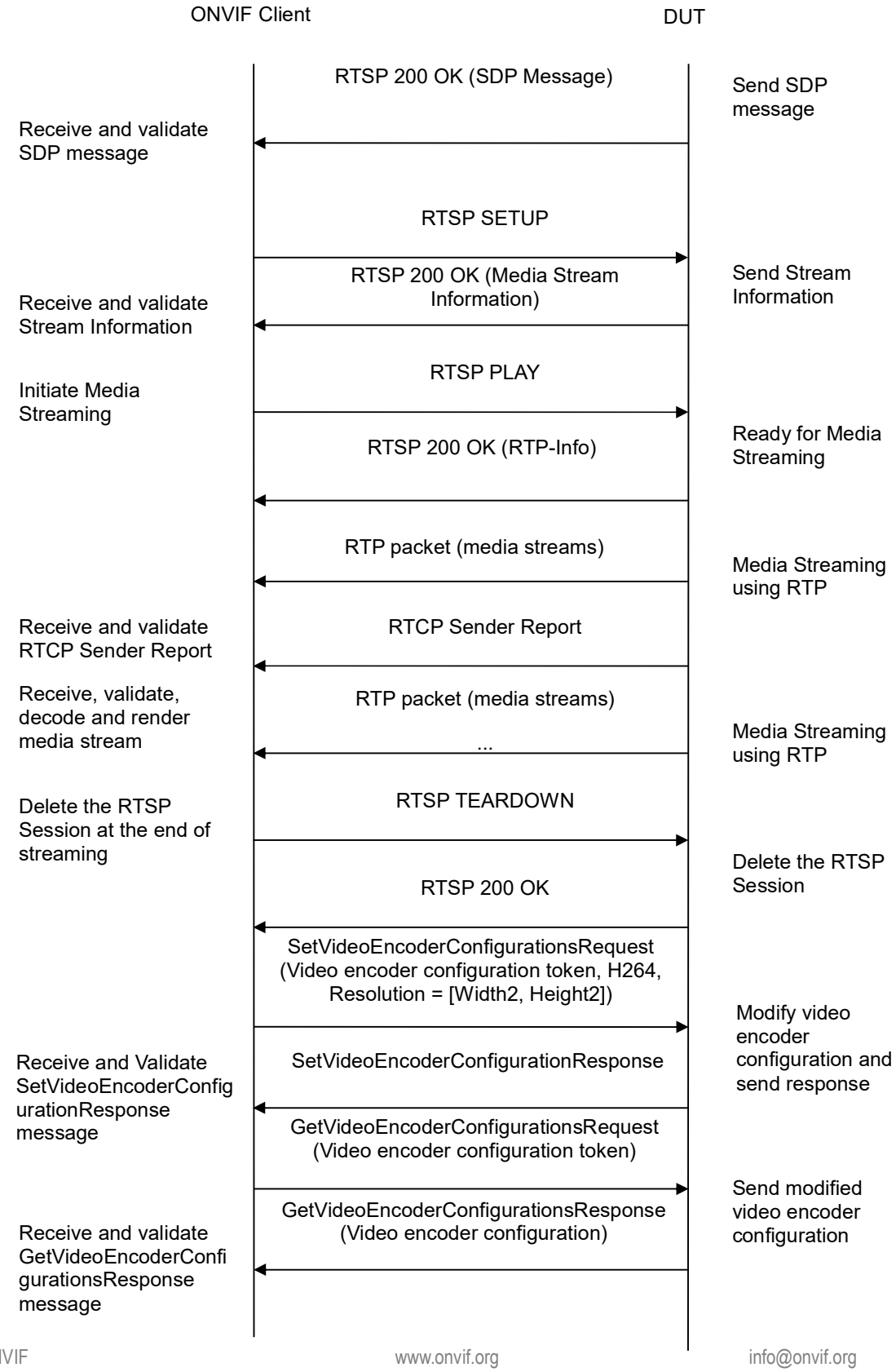
Test Purpose: To verify changing and applying of different Resolutions for video encoder configuration and video stream.

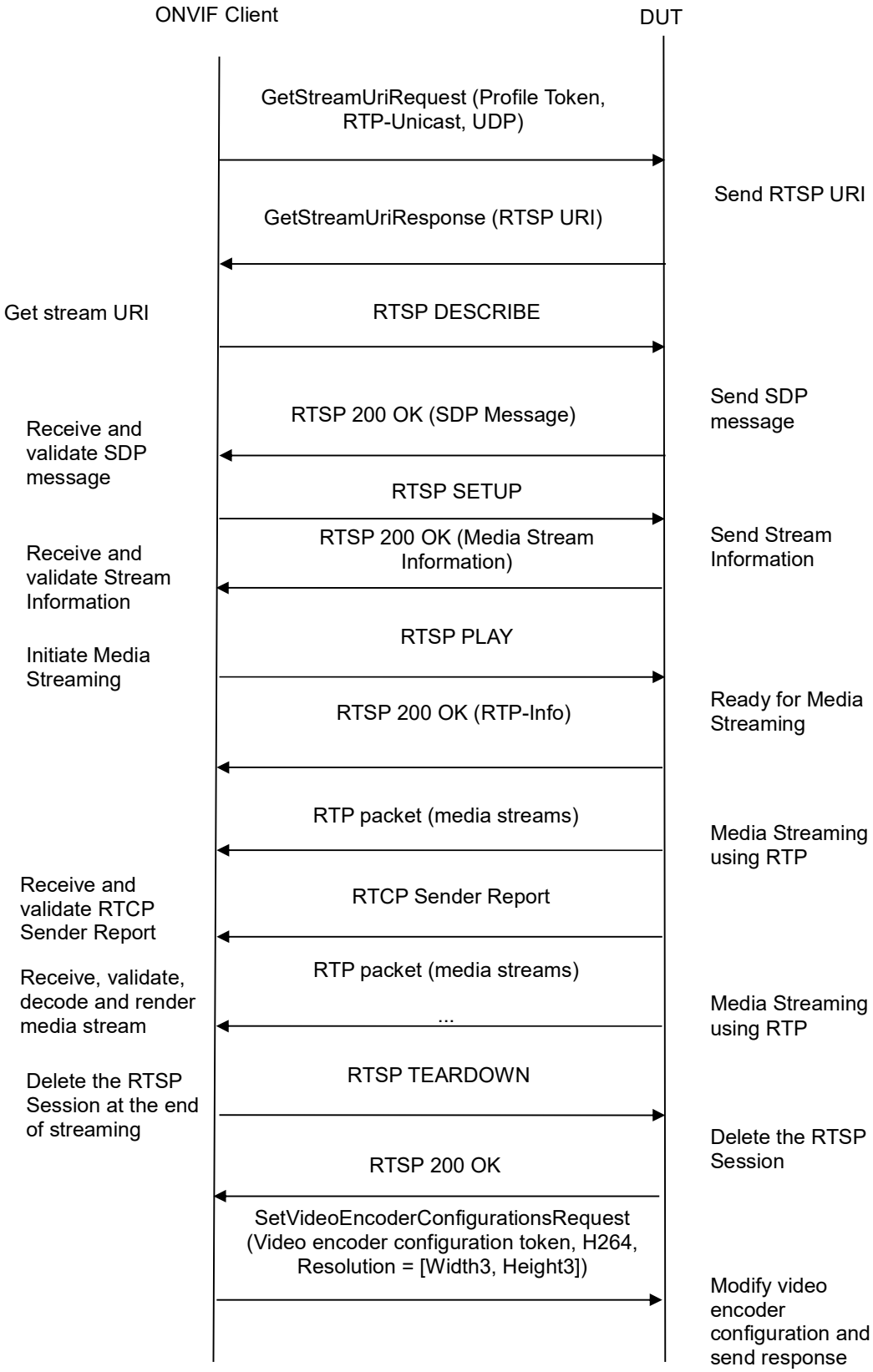
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT. H.264 is supported by the DUT. There is Video Encoder Configuration which is either configured with H.264 or the DUT allows to change encoding of Video Encoder Configuration.

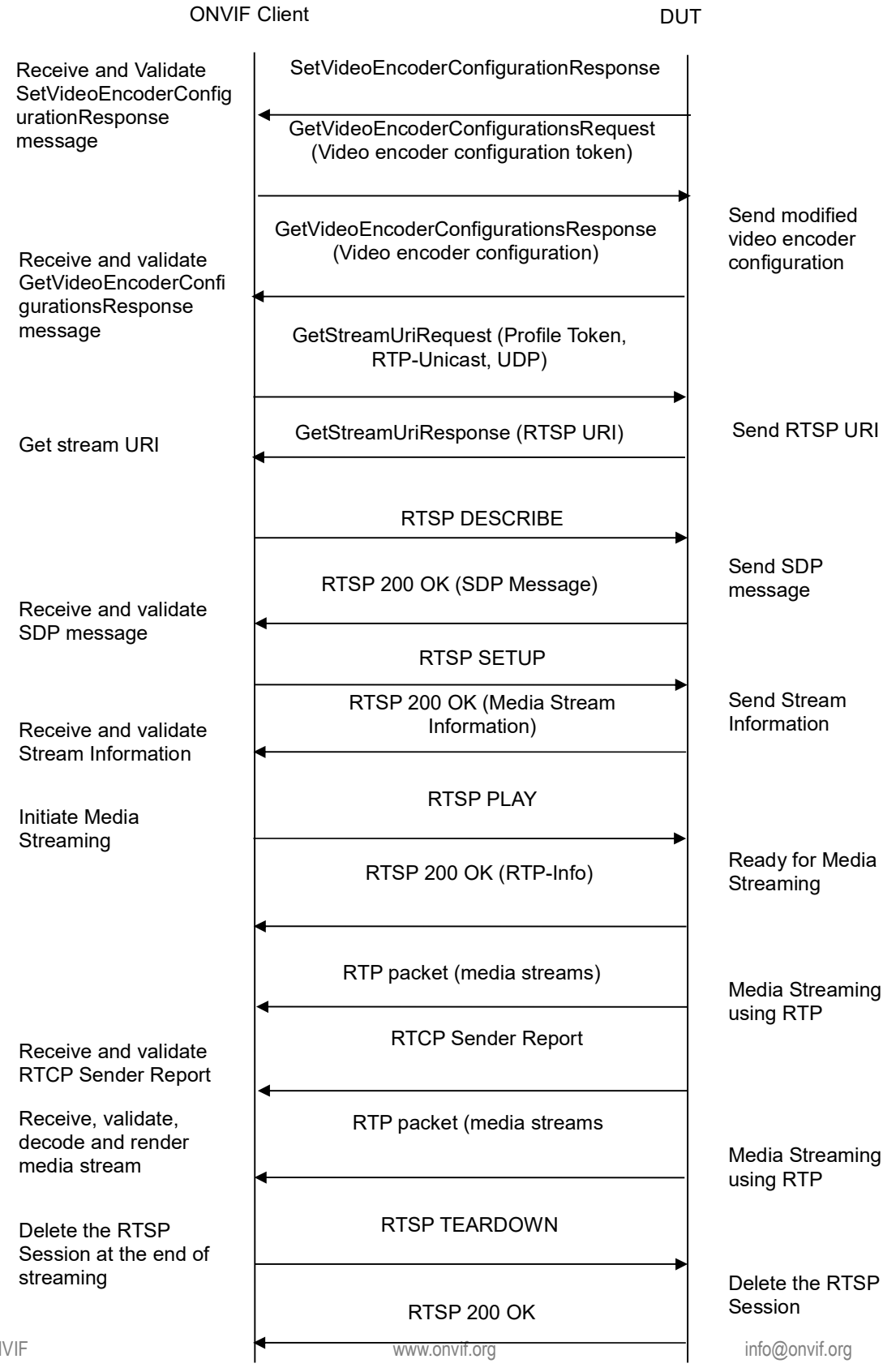
Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Retrieve video encoder configurations
GetVideoEncoderConfigurationsRequest (Empty)
GetVideoEncoderConfigurationResponse (Video Encoder Configurations)
Send all video encoder configurations
Select or create Media profile
Annex A.13
GetVideoEncoderConfigurationOptionsRequest (ProfileToken)
GetVideoEncoderConfigurationOptionsResponse (Video Encoder Configuration Options)
Send video encoder configuration options
Receive and Validate Video Encoder Configuration Options
SetVideoEncoderConfigurationsRequest (Video encoder configuration token, H264, Resolution = [Width1, Height1])
SetVideoEncoderConfigurationResponse
Modify video encoder configuration and send response
Receive and Validate SetVideoEncoderConfigurationResponse message
GetVideoEncoderConfigurationsRequest (Video encoder configuration token)
GetVideoEncoderConfigurationsResponse (Video encoder configuration)
Send modified video encoder configuration
Receive and validate GetVideoEncoderConfigurationsResponse message
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
GetStreamUriResponse (RTSP URI)
Send RTSP URI
Get stream URI
RTSP DESCRIBE


ONVIF Client
DUT
RTSP 200 OK (SDP Message)
Send SDP message
Receive and validate SDP message
RTSP SETUP
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
RTSP 200 OK (RTP-Info)
Ready for Media Streaming
RTP packet (media streams)
Media Streaming using RTP
Receive and validate RTCP Sender Report
RTCP Sender Report
Receive, validate, decode and render media stream
RTP packet (media streams)
...
Media Streaming using RTP
Delete the RTSP Session at the end of streaming
RTSP TEARDOWN
RTSP 200 OK
Delete the RTSP Session
SetVideoEncoderConfigurationsRequest (Video encoder configuration token, H264, Resolution = [Width2, Height2])
Modify video encoder configuration and send response
SetVideoEncoderConfigurationResponse
Receive and Validate SetVideoEncoderConfigurationResponse message
GetVideoEncoderConfigurationsRequest (Video encoder configuration token)
Send modified video encoder configuration
GetVideoEncoderConfigurationsResponse (Video encoder configuration)
Receive and validate GetVideoEncoderConfigurationsResponse message


ONVIF Client
DUT
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP
Receive and validate RTCP Sender Report
RTCP Sender Report
RTP packet (media streams)
Receive, validate, decode and render media stream
...
Media Streaming using RTP
RTSP TEARDOWN
Delete the RTSP Session at the end of streaming
Delete the RTSP Session
RTSP 200 OK
SetVideoEncoderConfigurationsRequest (Video encoder configuration token, H264, Resolution = [Width3, Height3])
Modify video encoder configuration and send response


ONVIF Client
DUT
Receive and Validate SetVideoEncoderConfigurationResponse message
SetVideoEncoderConfigurationResponse
GetVideoEncoderConfigurationsRequest (Video encoder configuration token)
Send modified video encoder configuration
GetVideoEncoderConfigurationsResponse (Video encoder configuration)
Receive and validate GetVideoEncoderConfigurationsResponse message
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
Get stream URI
GetStreamUriResponse (RTSP URI)
Send RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP
RTCP Sender Report
Receive and validate RTCP Sender Report
Receive, validate, decode and render media stream
RTP packet (media streams
Media Streaming using RTP
RTSP TEARDOWN
Delete the RTSP Session at the end of streaming
Delete the RTSP Session
RTSP 200 OK

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes GetVideoEncoderConfigurationsRequest message to retrieve video configuration list.
4. Verify the GetVideoEncoderConfigurationsResponse message.
5. Find or create media profile with Video Source Configuration and Video Encoder Configuration with token VECToken1 and supporting of H264 encoding, where VECToken1 is first video encoder configuration token from GetVideoEncoderConfigurationsResponse message (see Annex A.13). If it is not possible skip steps 6-25 and go to the step 26.
6. ONVIF Client invokes GetVideoEncoderConfigurationOptionsRequest message (ProfileToken = “Profile1”, where “Profile1” is profile token from the step 10) to get video encoder configuration options.
7. Verify the GetVideoEncoderConfigurationOptionsResponse message from the DUT.
8. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = H264, where [Width1, Height1] is maximum resolution from the Options.H264.ResolutionsAvailable) to change video encoder configuration.
9. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
10. ONVIF Client invokes GetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1) to get video encoder configuration.
11. Verify the GetVideoEncoderConfigurationResponse message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = H264) from the DUT. Check that new setting for Resolution and Encoding was applied.
12. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
13. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
14. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
15. ONVIF Client invokes RTSP DESCRIBE request.
16. DUT sends 200 OK message and SDP information.
17. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
18. DUT sends 200 OK message and the media stream information.
19. ONVIF Client invokes RTSP PLAY request.
20. DUT sends 200 OK message and starts media streaming.
21. DUT sends H264 RTP media stream to ONVIF Client over UDP. Verify that stream has H264 encoding and [Width1, Height1] resolution.
22. DUT sends RTCP sender report to ONVIF Client.

23. DUT validates the received RTP and RTCP packets, decodes and renders them.
24. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
25. DUT sends 200 OK Response and terminates the RTSP Session.
26. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = H264, where [Width2, Height2] is minimum resolution from the Options.H264.ResolutionsAvailable) to change video encoder configuration.
27. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
28. ONVIF Client invokes GetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1) to get video encoder configuration.
29. Verify the GetVideoEncoderConfigurationResponse message (ConfigurationToken = VECToken1, Resolution = [Width2, Height2], Encoding = H264, where [Width2, Height2]) from the DUT. Check that new setting for Resolution and Encoding was applied.
30. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
31. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
32. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
33. ONVIF Client invokes RTSP DESCRIBE request.
34. DUT sends 200 OK message and SDP information.
35. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
36. DUT sends 200 OK message and the media stream information.
37. ONVIF Client invokes RTSP PLAY request.
38. DUT sends 200 OK message and starts media streaming.
39. DUT sends H264 RTP media stream to ONVIF Client over UDP. Verify that stream has H264 encoding and [Width2, Height2] resolution.
40. DUT sends RTCP sender report to ONVIF Client.
41. DUT validates the received RTP and RTCP packets, decodes and renders them.
42. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
43. DUT sends 200 OK Response and terminates the RTSP Session.
44. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1, Resolution = [Width1, Height1], Encoding = H264, where [Width3, Height3] is middle resolution from the Options.H264.ResolutionsAvailable) to change video encoder configuration.
45. Verify the SetVideoEncoderConfigurationResponse message from the DUT.

46. ONVIF Client invokes GetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1) to get video encoder configuration.
47. Verify the GetVideoEncoderConfigurationResponse message (ConfigurationToken = VECToken1, Resolution = [Width3, Height3], Encoding = H264) from the DUT. Check that new setting for Resolution and Encoding was applied.
48. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
49. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
50. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
51. ONVIF Client invokes RTSP DESCRIBE request.
52. DUT sends 200 OK message and SDP information.
53. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
54. DUT sends 200 OK message and the media stream information.
55. ONVIF Client invokes RTSP PLAY request.
56. DUT sends 200 OK message and starts media streaming.
57. DUT sends H264 RTP media stream to ONVIF Client over UDP. Verify that stream has H264 encoding and [Width3, Height3] resolution.
58. DUT sends RTCP sender report to ONVIF Client.
59. DUT validates the received RTP and RTCP packets, decodes and renders them.
60. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
61. DUT sends 200 OK Response and terminates the RTSP Session.
62. Repeat steps 5-62 for the first, middle and last Video Encoder configurations supported by the DUT.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not sent valid video stream with H264 encoding and specified resolution or sent it in another encoding or resolution.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: Following rule will be used to compare resolutions: Resolution1 (Width1, Height1) is greater than Resolution2 (Width2, Height2), if Width1*Height1 is greater than Width2*Height2. This rule will be used to define minimum, maximum and middle resolution.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

Note: If it is impossible to create profile for all three: the first, the middle and the last Video Encoder configurations on the 5th step, then Onvif Client will try selecting another Video Encoder configuration until a profile is created.

4.1.26 MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP-Unicast/UDP) (ALL VIDEO SOURCE CONFIGURATIONS)

Test Label: Guaranteed Number Of Video Encoder Instances Verification (RTP-Unicast/UDP).

Test Case ID: RTSS-1-1-49

ONVIF Core Specification Coverage: GetGuaranteedNumberOfVideoEncoderInstances

Command Under Test: GetGuaranteedNumberOfVideoEncoderInstances

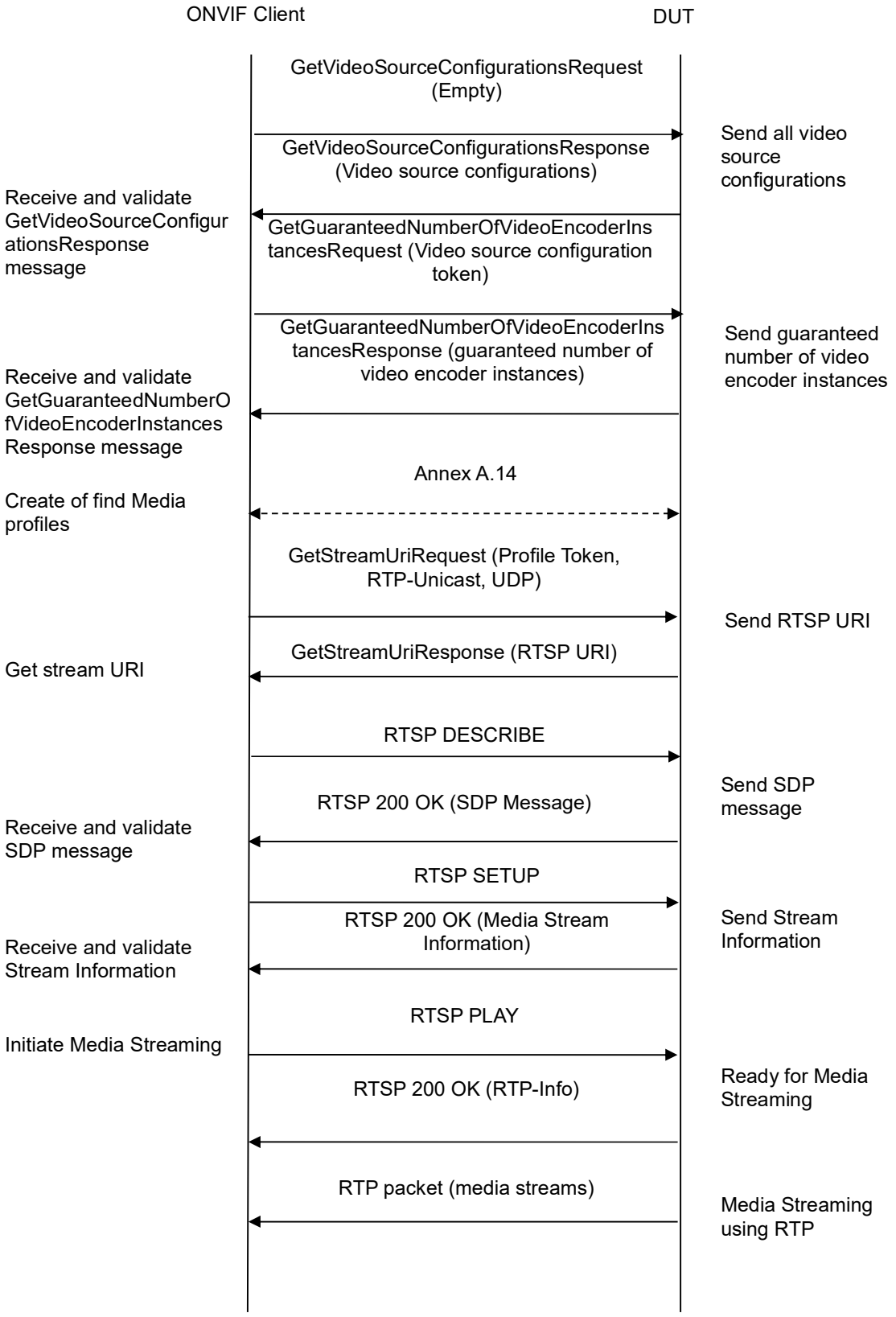
WSDL Reference: media.wsdl

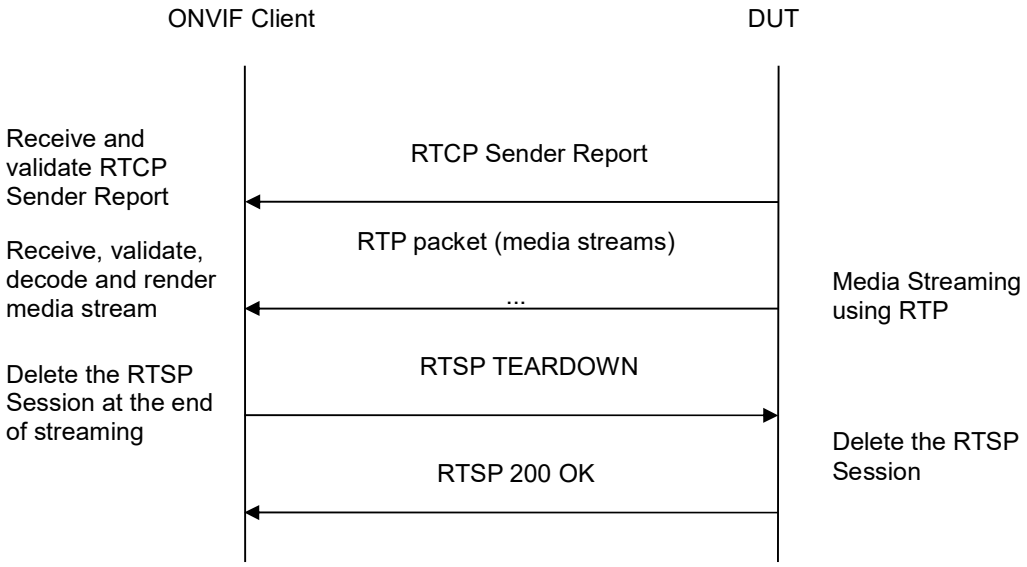
Test Purpose: To verify Guaranteed Number Of Video Encoder Instances (RTP-Unicast/UDP)

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
GetVideoSourceConfigurationsRequest (Empty)
GetVideoSourceConfigurationsResponse (Video source configurations)
Send all video source configurations
Receive and validate GetVideoSourceConfigurationsResponse message
GetGuaranteedNumberOfVideoEncoderInstancesRequest (Video source configuration token)
GetGuaranteedNumberOfVideoEncoderInstancesResponse (guaranteed number of video encoder instances)
Send guaranteed number of video encoder instances
Receive and validate GetGuaranteedNumberOfVideoEncoderInstancesResponse message
Annex A.14
Create of find Media profiles
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
RTSP 200 OK (SDP Message)
Send SDP message
Receive and validate SDP message
RTSP SETUP
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
RTSP 200 OK (RTP-Info)
Ready for Media Streaming
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will invoke GetVideoSourceConfigurationsRequest message to retrieve all DUT video source configurations.
4. Verify the GetVideoSourceConfigurationsResponse message from the DUT.
5. ONVIF Client will invoke GetGuaranteedNumberOfVideoEncoderInstancesRequest message (ConfigurationToken = “VSCToken1”, where “VSCToken1” is a first video source configuration token from GetVideoSourceConfigurationsResponse message) to retrieve guaranteed number of video encoder instances per first video source configuration.
6. Verify the GetGuaranteedNumberOfVideoEncoderInstancesResponse message from the DUT.
7. Create or find number of profiles equal to TotalNumber from GetGuaranteedNumberOfVideoEncoderInstancesResponse message that contains video source configuration with token “VSCToken1” and video encoder configuration (see Annex A.14).
8. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the first media profile from step 7.
9. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.

14. DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. DUT sends 200 OK message and starts media streaming.
17. DUT sends JPEG RTP media stream to ONVIF Client over UDP.
18. DUT sends RTCP sender report to ONVIF Client.
19. DUT validates the received RTP and RTCP packets, decodes and renders them.
20. Repeat steps 8-20 to start video streaming for all profiles from step 7.
21. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session for each started stream.
22. DUT sends 200 OK Response and terminates the RTSP Session.
23. Repeat steps 5-23 for the rest Video Source Configuration.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not send valid video stream.

DUT does not provide possibility to create TotalNumber of profiles for step 7.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.27 MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP-Unicast/RTSP/HTTP/TCP) (ALL VIDEO SOURCE CONFIGURATIONS)

Test Label: Guaranteed Number Of Video Encoder Instances Verification (RTP-

Unicast/RTSP/HTTP/TCP).

Test Case ID: RTSS-1-1-50

ONVIF Core Specification Coverage: GetGuaranteedNumberOfVideoEncoderInstances

Command Under Test: GetGuaranteedNumberOfVideoEncoderInstances

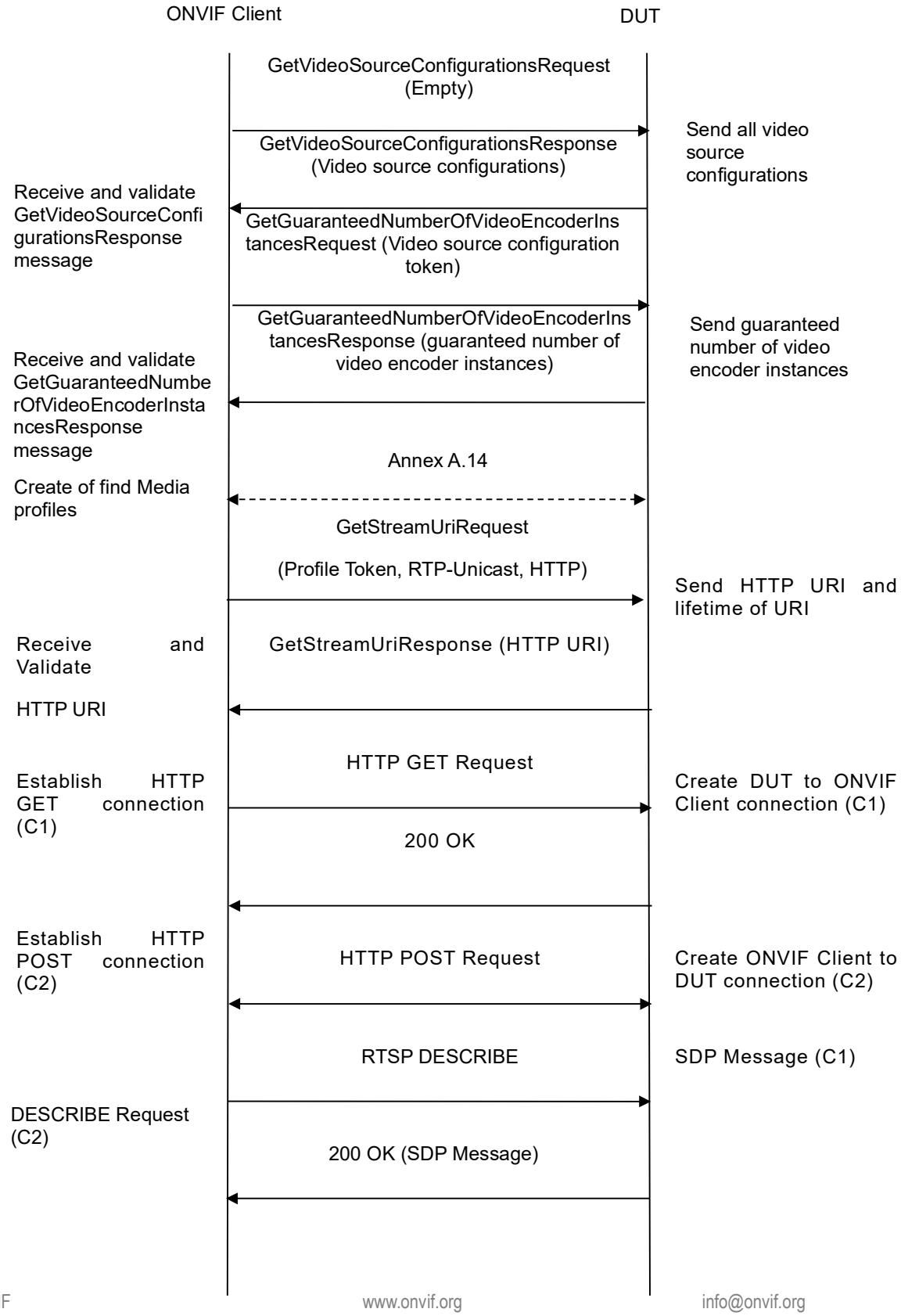
WSDL Reference: media.wsdl

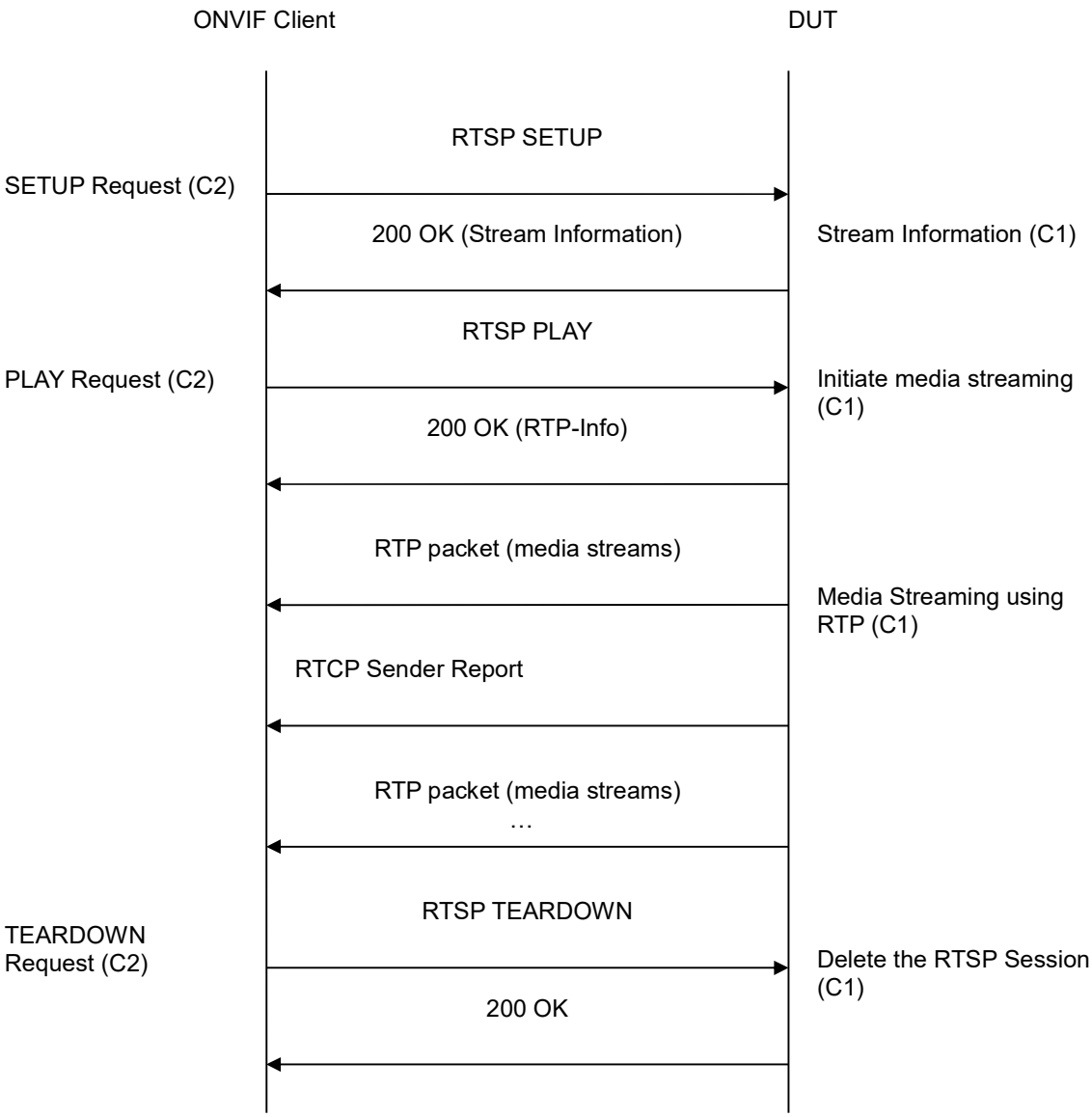
Test Purpose: To verify Guaranteed Number Of Video Encoder Instances (RTP-Unicast/RTSP/HTTP/TCP)

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
GetVideoSourceConfigurationsRequest (Empty)
GetVideoSourceConfigurationsResponse (Video source configurations)
Send all video source configurations
Receive and validate GetVideoSourceConfigurationsResponse message
GetGuaranteedNumberOfVideoEncoderInstancesRequest (Video source configuration token)
GetGuaranteedNumberOfVideoEncoderInstancesResponse (guaranteed number of video encoder instances)
Send guaranteed number of video encoder instances
Receive and validate GetGuaranteedNumberOfVideoEncoderInstancesResponse message
Annex A.14
Create of find Media profiles
GetStreamUriRequest
(Profile Token, RTP-Unicast, HTTP)
Send HTTP URI and lifetime of URI
Receive and Validate
GetStreamUriResponse (HTTP URI)
HTTP URI
HTTP GET Request
Establish HTTP GET connection (C1)
Create DUT to ONVIF Client connection (C1)
200 OK
Establish HTTP POST connection (C2)
HTTP POST Request
Create ONVIF Client to DUT connection (C2)
RTSP DESCRIBE
SDP Message (C1)
DESCRIBE Request (C2)
200 OK (SDP Message)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will invoke GetVideoSourceConfigurationsRequest message to retrieve all DUT video source configurations.
4. Verify the GetVideoSourceConfigurationsResponse message from the DUT.
5. ONVIF Client will invoke GetGuaranteedNumberOfVideoEncoderInstancesRequest message (ConfigurationToken = “VSCToken1”, where “VSCToken1” is a first video source

configuration token from GetVideoSourceConfigurationsResponse message) to retrieve guaranteed number of video encoder instances per first video source configuration.

6. Verify the GetGuaranteedNumberOfVideoEncoderInstancesResponse message from the DUT.
7. Create or find number of profiles equal to TotalNumber from GetGuaranteedNumberOfVideoEncoderInstancesResponse message that contains video source configuration with token “VSCToken1” and video encoder configuration (see Annex A.14).
8. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, HTTP transport) to retrieve media stream URI for the first media profile from step 7.
9. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
10. ONVIF Client verifies the HTTP media stream URI provided by the DUT.
11. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
12. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
13. ONVIF Client invokes RTSP DESCRIBE request on HTTP POST connection.
14. DUT sends 200 OK message and SDP information on HTTP GET connection.
15. ONVIF Client invokes RTSP SETUP request on HTTP POST connection with transport parameter as ‘RTP/TCP’ along with ‘interleaved’ parameter for both audio and video streams separately.
16. DUT sends 200 OK message and the media stream information on HTTP GET connection.
17. ONVIF Client invokes RTSP PLAY request on HTTP POST connection.
18. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
19. DUT transfers RTP media stream to ONVIF Client on HTTP GET connection.
20. DUT sends RTCP sender report to ONVIF Client on HTTP GET connection.
21. DUT validates the received RTP and RTCP packets, decodes and renders them.
22. Repeat steps 8-22 to start video streaming for all profiles from step 7.
23. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection and closes the HTTP POST connection.
24. DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.
25. Repeat steps 5-25 for the rest video source configuration.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not send valid video stream.

DUT does not provide possibility to create TotalNumber of profiles for step 7.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.28 MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP/RTSP/TCP) (ALL VIDEO SOURCE CONFIGURATIONS)

Test Label: Guaranteed Number Of Video Encoder Instances Verification (RTP/RTSP/TCP).

Test Case ID: RTSS-1-1-51

ONVIF Core Specification Coverage: GetGuaranteedNumberOfVideoEncoderInstances

Command Under Test: GetGuaranteedNumberOfVideoEncoderInstances

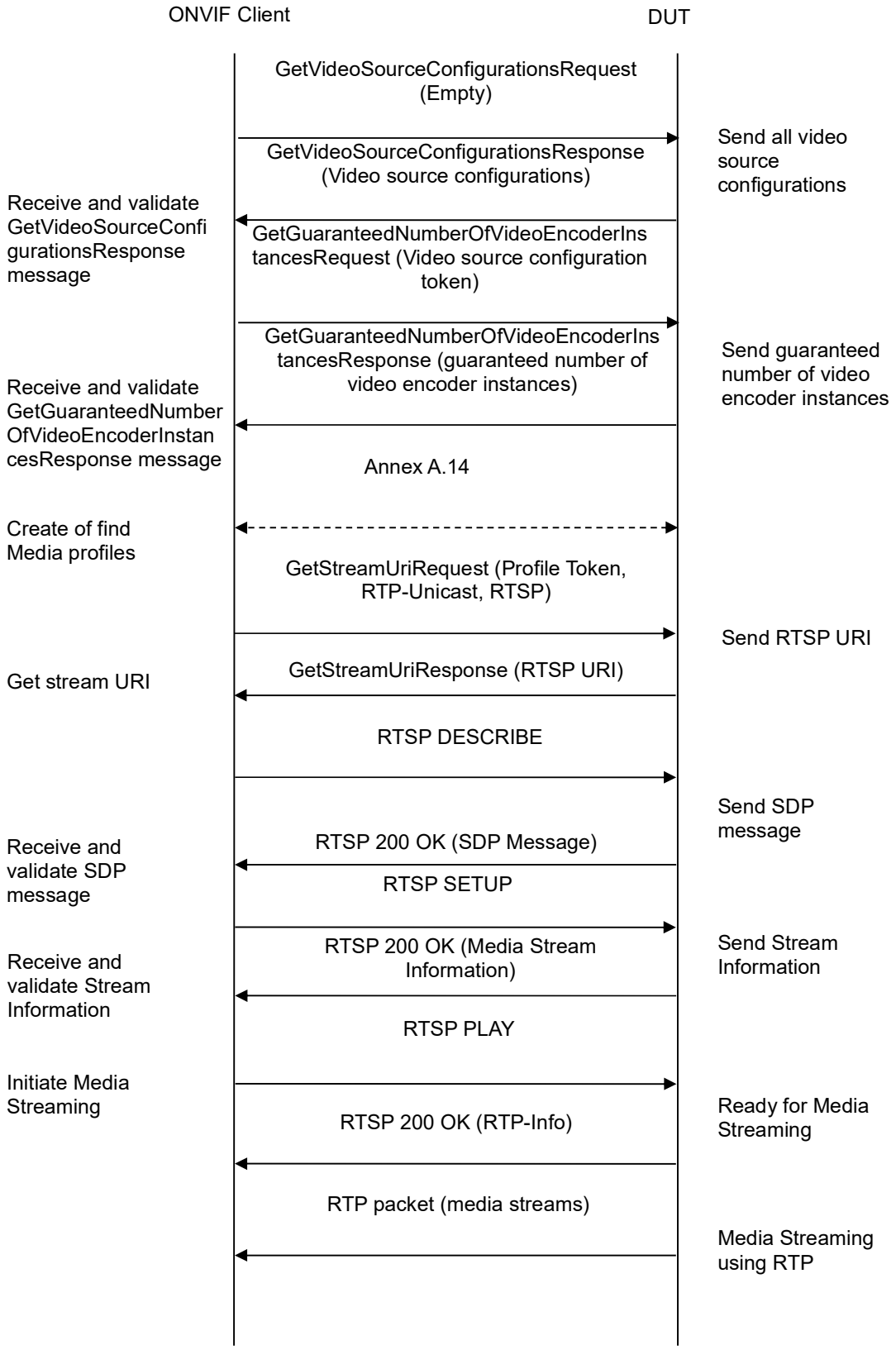
WSDL Reference: media.wsdl

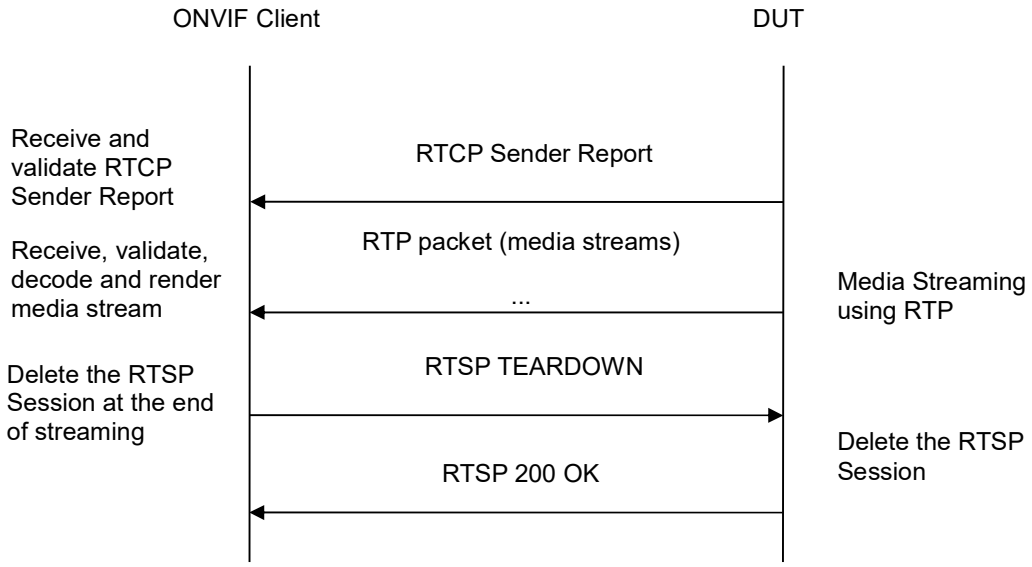
Test Purpose: To verify Guaranteed Number Of Video Encoder Instances (RTP/RTSP/TCP)

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT. RTP/RTSP/TCP media streaming is implemented by DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
GetVideoSourceConfigurationsRequest (Empty)
GetVideoSourceConfigurationsResponse (Video source configurations)
Send all video source configurations
Receive and validate GetVideoSourceConfigurationsResponse message
GetGuaranteedNumberOfVideoEncoderInstancesRequest (Video source configuration token)
GetGuaranteedNumberOfVideoEncoderInstancesResponse (guaranteed number of video encoder instances)
Send guaranteed number of video encoder instances
Receive and validate GetGuaranteedNumberOfVideoEncoderInstancesResponse message
Annex A.14
Create of find Media profiles
GetStreamUriRequest (Profile Token, RTP-Unicast, RTSP)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
RTSP 200 OK (RTP-Info)
Ready for Media Streaming
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will invoke GetVideoSourceConfigurationsRequest message to retrieve all DUT video source configurations.
4. Verify the GetVideoSourceConfigurationsResponse message from the DUT.
5. ONVIF Client will invoke GetGuaranteedNumberOfVideoEncoderInstancesRequest message (ConfigurationToken = “VSCToken1”, where “VSCToken1” is a first video source configuration token from GetVideoSourceConfigurationsResponse message) to retrieve guaranteed number of video encoder instances per first video source configuration.
6. Verify the GetGuaranteedNumberOfVideoEncoderInstancesResponse message from the DUT.
7. Create or find number of profiles equal to TotalNumber from GetGuaranteedNumberOfVideoEncoderInstancesResponse message that contains video source configuration with token “VSCToken1” and video encoder configuration (see Annex A.14).
8. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, RTSP transport) to retrieve media stream URI for the first media profile from step 7.
9. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/TCP.

14. DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. DUT sends 200 OK message and starts media streaming.
17. DUT sends RTP media stream to ONVIF Client over TCP.
18. DUT sends RTCP sender report to ONVIF Client.
19. DUT validates the received RTP and RTCP packets, decodes and renders them.
20. Repeat steps 8-20 to start video streaming for all profiles from step 7.
21. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session for each started stream.
22. DUT sends 200 OK Response and terminates the RTSP Session.
23. Repeat steps 5-23 for the rest video source configuration.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not send valid video stream.

DUT does not provide possibility to create TotalNumber of profiles for step 7.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.29 MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (MIX OF TRANSPORT TYPES) (ALL VIDEO SOURCE CONFIGURATIONS)

Test Label: Guaranteed Number Of Video Encoder Instances Verification (Mix Of Transport Types).

Driving IP-based physical security through global standardization

Test Case ID: RTSS-1-1-52

ONVIF Core Specification Coverage: GetGuaranteedNumberOfVideoEncoderInstances

Command Under Test: GetGuaranteedNumberOfVideoEncoderInstances

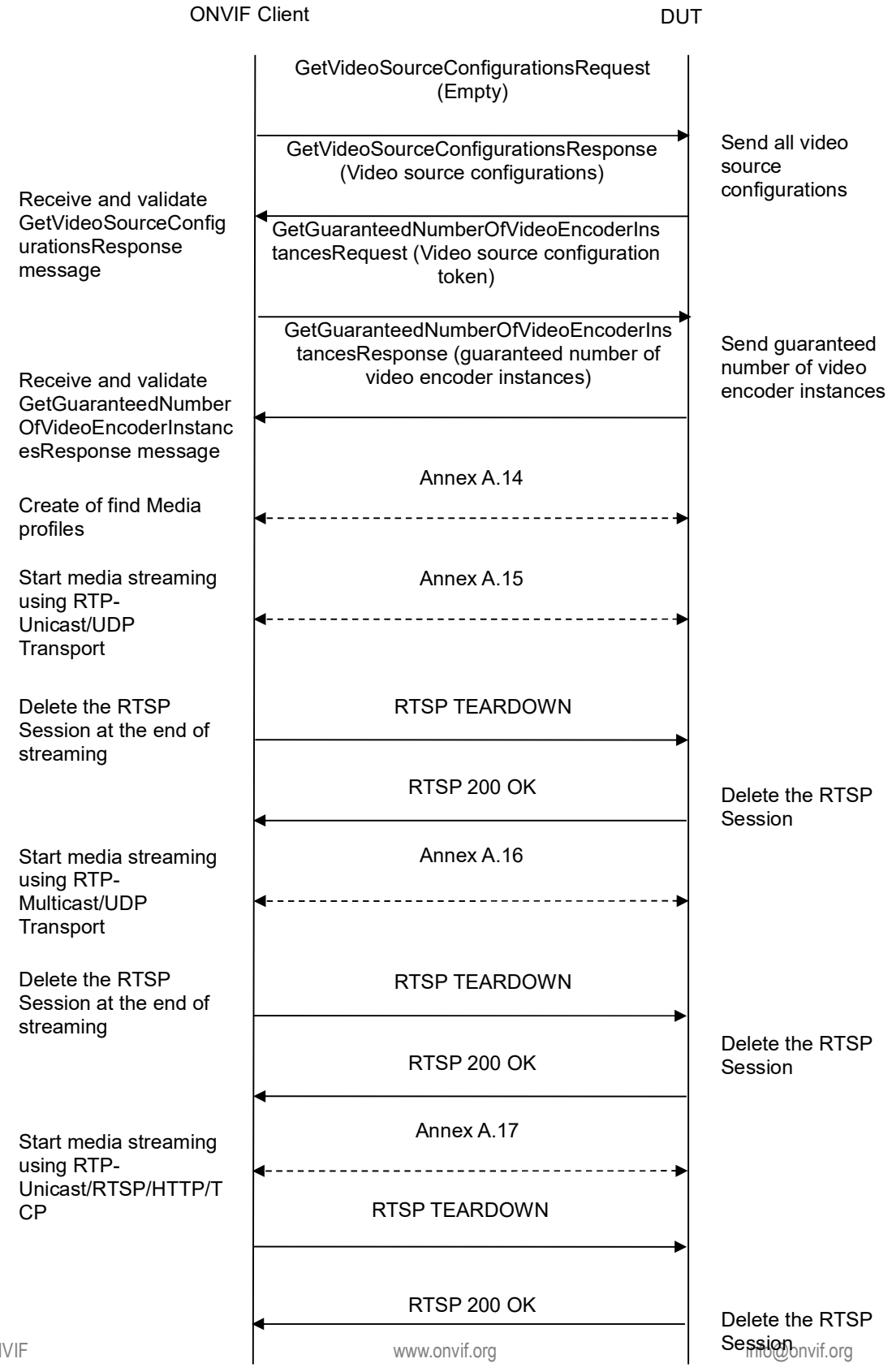
WSDL Reference: media.wsdl

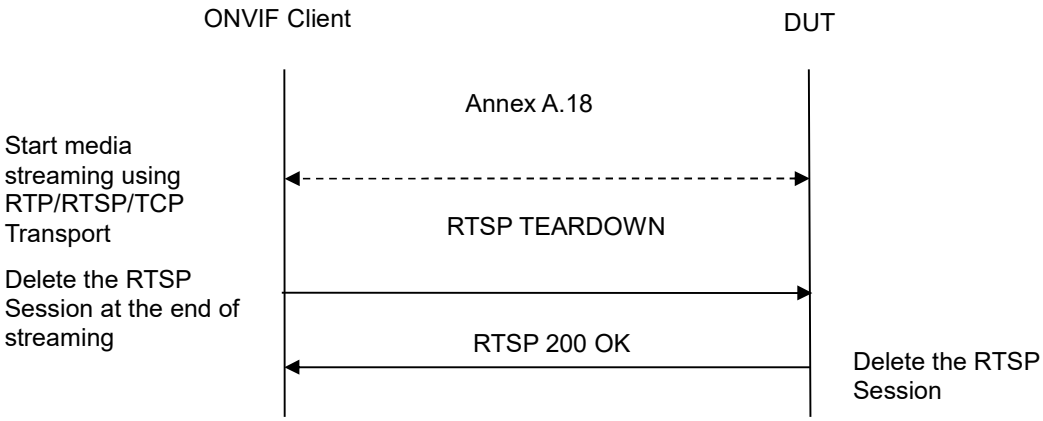
Test Purpose: To verify Guaranteed Number Of Video Encoder Instances (Mix Of Transport Types)

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT. RTP/RTSP/TCP media streaming is implemented by DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
GetVideoSourceConfigurationsRequest (Empty)
GetVideoSourceConfigurationsResponse (Video source configurations)
Send all video source configurations
Receive and validate GetVideoSourceConfigurationsResponse message
GetGuaranteedNumberOfVideoEncoderInstancesRequest (Video source configuration token)
GetGuaranteedNumberOfVideoEncoderInstancesResponse (guaranteed number of video encoder instances)
Send guaranteed number of video encoder instances
Receive and validate GetGuaranteedNumberOfVideoEncoderInstancesResponse message
Annex A.14
Create of find Media profiles
Start media streaming using RTP-Unicast/UDP Transport
Annex A.15
Delete the RTSP Session at the end of streaming
RTSP TEARDOWN
RTSP 200 OK
Delete the RTSP Session
Start media streaming using RTP-Multicast/UDP Transport
Annex A.16
Delete the RTSP Session at the end of streaming
RTSP TEARDOWN
RTSP 200 OK
Delete the RTSP Session
Start media streaming using RTP-Unicast/RTSP/HTTP/TCP
Annex A.17
RTSP TEARDOWN
RTSP 200 OK
Delete the RTSP Session



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will invoke GetVideoSourceConfigurationsRequest message to retrieve all DUT video source configurations.
4. Verify the GetVideoSourceConfigurationsResponse message from the DUT.
5. ONVIF Client will invoke GetGuaranteedNumberOfVideoEncoderInstancesRequest message (ConfigurationToken = “VSCToken1”, where “VSCToken1” is a first video source configuration token from GetVideoSourceConfigurationsResponse message) to retrieve guaranteed number of video encoder instances per first video source configuration.
6. Verify the GetGuaranteedNumberOfVideoEncoderInstancesResponse message from the DUT.
7. Create or find number of profiles equal to TotalNumber from GetGuaranteedNumberOfVideoEncoderInstancesResponse message that contains video source configuration with token “VSCToken1” and video encoder configuration (see Annex A.14).
8. ONVIF Client start media streaming for first profile to retrieve media stream URI for the first media profile from step 7. (To start media streaming Annex A.15, Annex A.16, Annex A.17, or Annex A.18 will be used in loop. Annex A.16 will be used if RTP-Multicast/UDP supported. Annex A.18 will be used if RTP/RTSP/TCP supported.)
9. Repeat step 8 to start video streaming for all profiles from step 7.
10. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session for each started stream.
11. DUT sends 200 OK Response and terminates the RTSP Session.
12. Repeat steps 5-12 for the rest video source configuration.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not send valid video stream.

DUT does not provide possibility to create TotalNumber of profiles for step 7.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: In case if there are more than one Media Profiles with the same Video Encoder Configuration, multicast streaming will be started only for one of them.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.30 MEDIA STREAMING – JPEG (VALIDATING RTP HEADER EXTENSION)

Test Label: Real Time Viewing DUT JPEG media streaming using RTP-Unicast/UDP transport with JPEG header extension.

Test Case ID: RTSS-1-1-53

ONVIF Core Specification Coverage: JPEG over RTP

Command Under Test: none

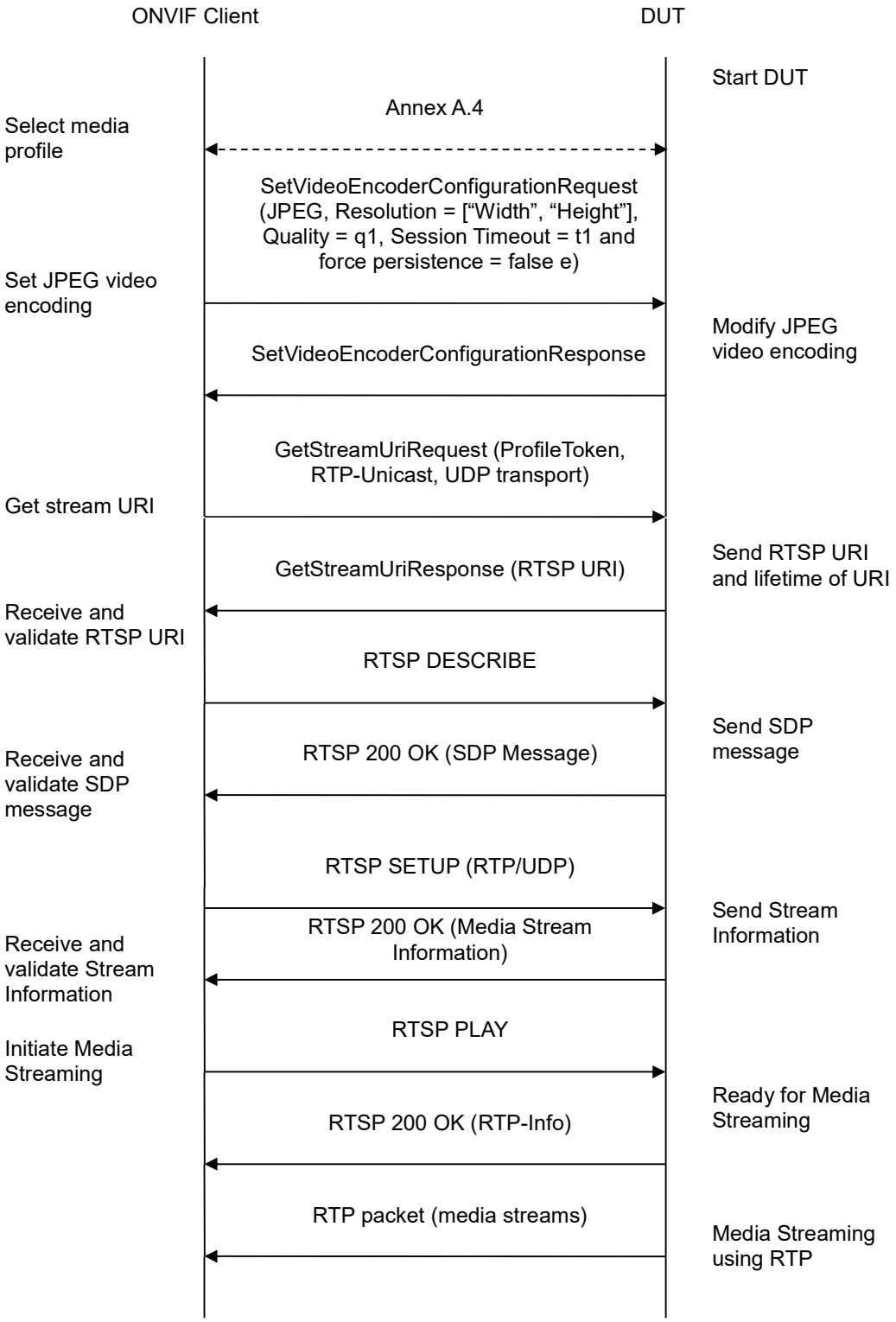
WSDL Reference: media.wsdl

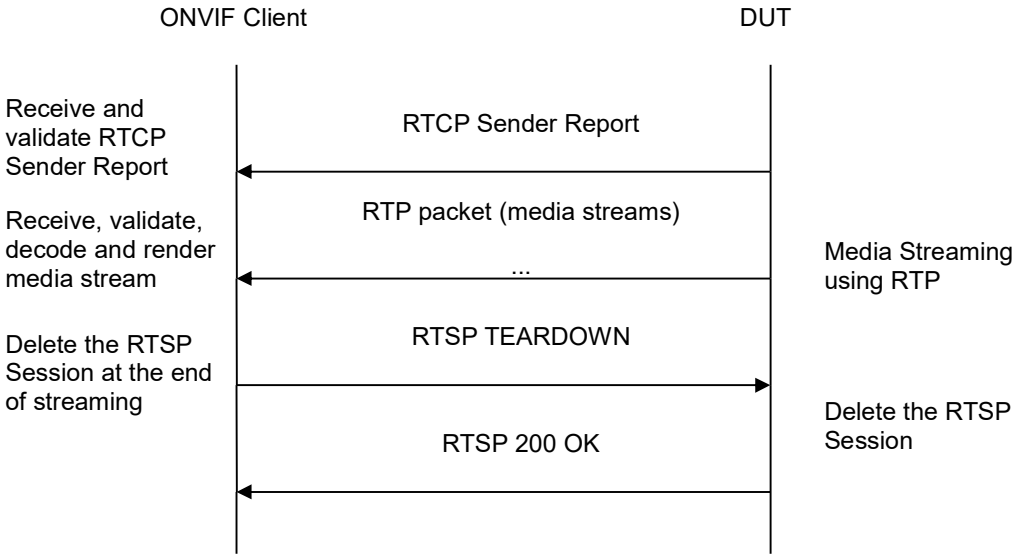
Test Purpose: To validate JPEG RTP header extension for devices supporting high resolutions for JPEG.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT. A media profile with JPEG video encoder configuration exists

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest (JPEG, Resolution = ["Width", "Height"], Quality = q1, Session Timeout = t1 and force persistence = false e)
Set JPEG video encoding
Modify JPEG video encoding
SetVideoEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, RTP-Unicast, UDP transport)
Get stream URI
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (RTP/UDP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4 and Resolution = [“Width”, “Height”] shall be enough to use JPEG header extension (greater than 2 MP). If there is no such resolutions use any Resolution.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
7. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
12. DUT sends 200 OK message and the media stream information.

13. ONVIF Client invokes RTSP PLAY request.
14. DUT sends 200 OK message and starts media streaming.
15. DUT sends JPEG RTP media stream to ONVIF Client over UDP.
16. DUT sends RTCP sender report to ONVIF Client.
17. DUT validates the received RTP and RTCP packets, decodes and renders them.
18. DUT validates RTP header extensions for each packet. If resolution was greater than 2MP check that JPEG header extension is present and valid. If resolution was less than 2MP check that JPEG header extension is valid if present.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not send valid RTP header extension in one or more media streams.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.31 MEDIA STREAMING – JPEG (RTP-Unicast/UDP, IPv6)

Test Label: Real Time Viewing DUT JPEG media streaming using RTP-Unicast/UDP transport for IPv6.

Test Case ID: RTSS-1-1-54

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

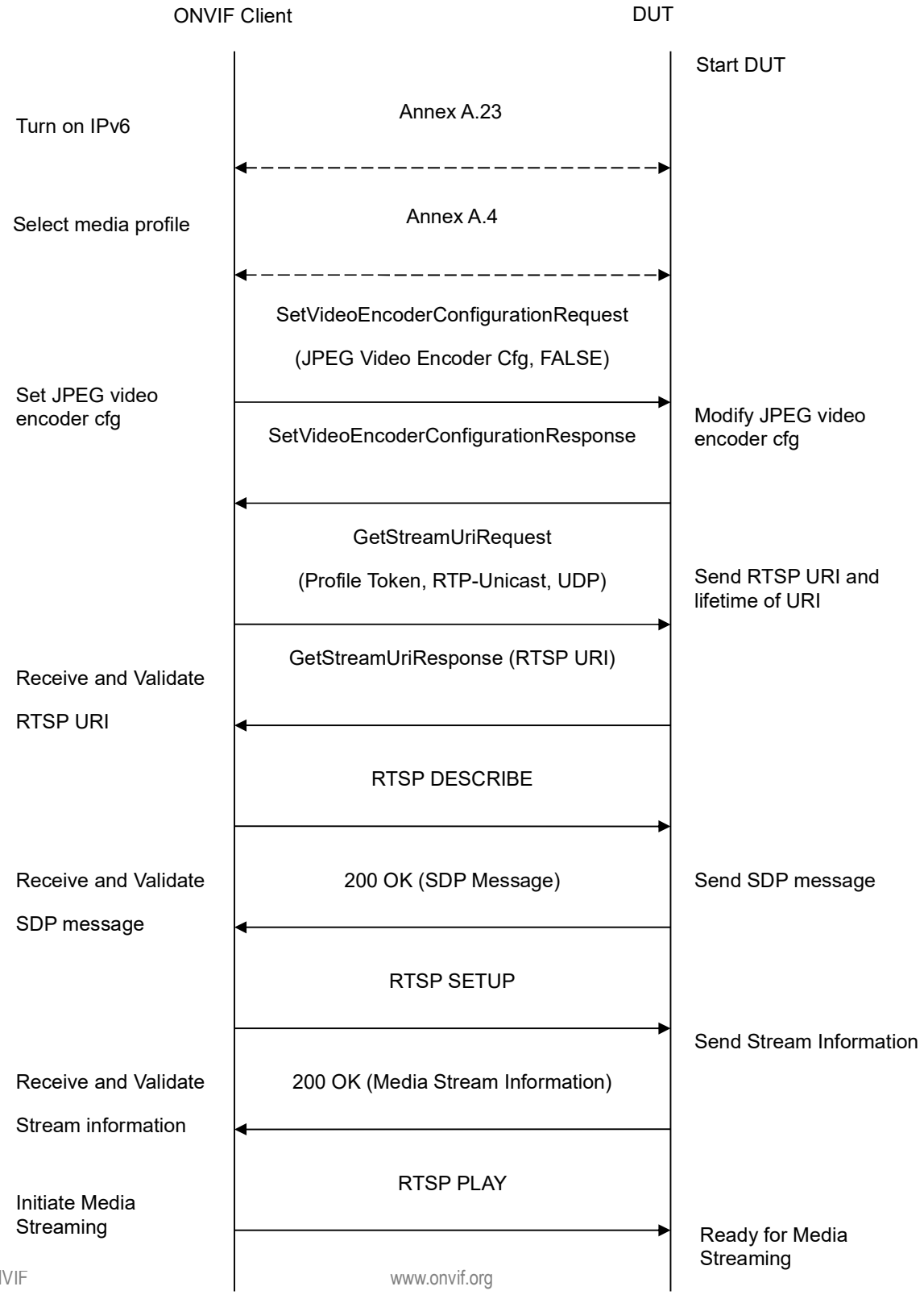
WSDL Reference: media.wsdl

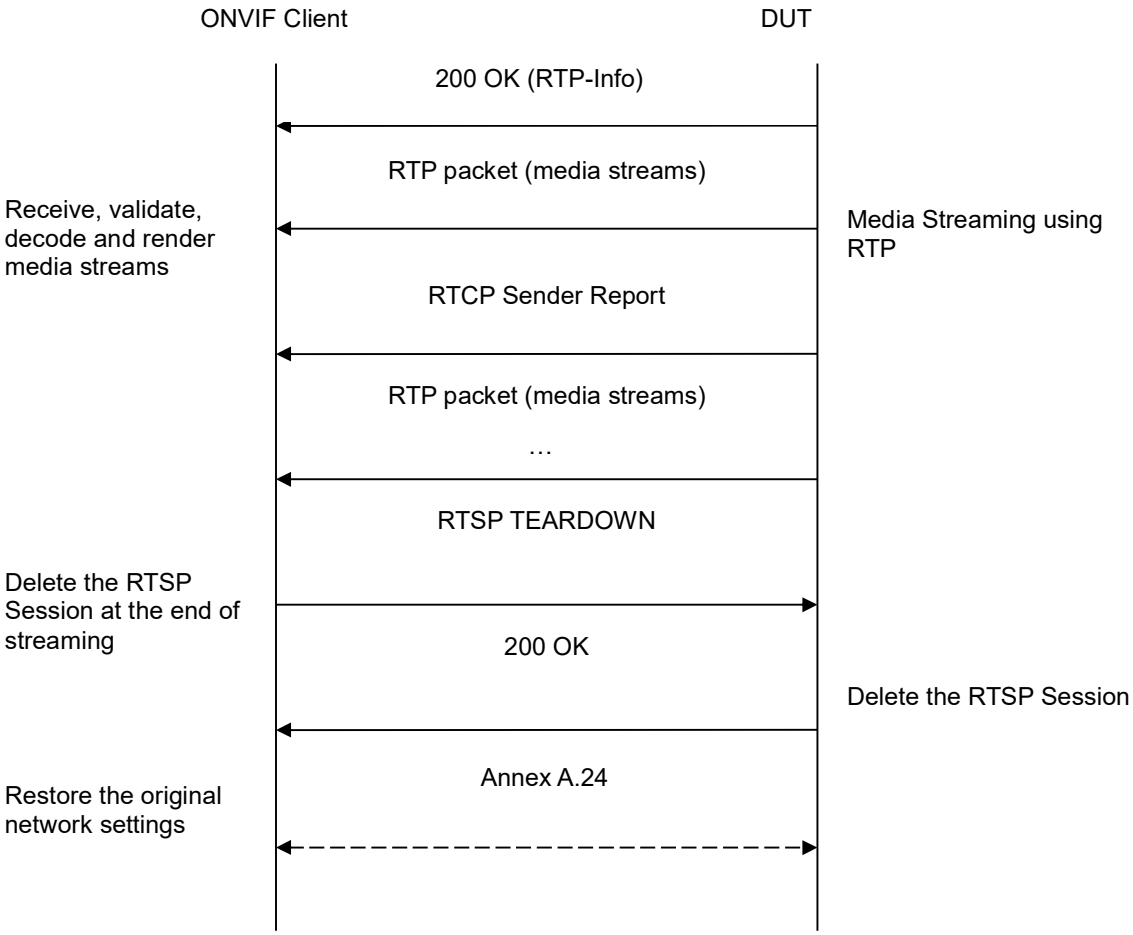
Test Purpose: To verify JPEG media streaming based on RTP/UDP Unicast Transport for IPv6.

Pre-Requisite: Media Service was received from the DUT. Real-time streaming supported by DUT. A media profile with JPEG video encoder configuration. IPv6 is turned ON for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
Turn on IPv6
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
Modify JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Receive and Validate SDP message
200 OK (SDP Message)
Send SDP message
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.4.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.

7. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
8. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
9. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
10. ONVIF Client invokes RTSP DESCRIBE request.
11. DUT sends 200 OK message and SDP information.
12. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
13. DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request.
15. DUT sends 200 OK message and starts media streaming.
16. DUT sends JPEG RTP media stream to ONVIF Client over UDP.
17. DUT sends RTCP sender report to ONVIF Client.
18. DUT validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. DUT sends 200 OK Response and terminates the RTSP Session.
21. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT sent SDP information to RTSP DESCRIBE request with not IPv6 address.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.32 MEDIA STREAMING – JPEG (RTP-Unicast/RTSP/HTTP/TCP, IPv6)

Test Label: Real Time Viewing DUT JPEG media streaming using HTTP transport for IPv6

Test Case ID: RTSS-1-1-55

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP.

Command Under Test: None

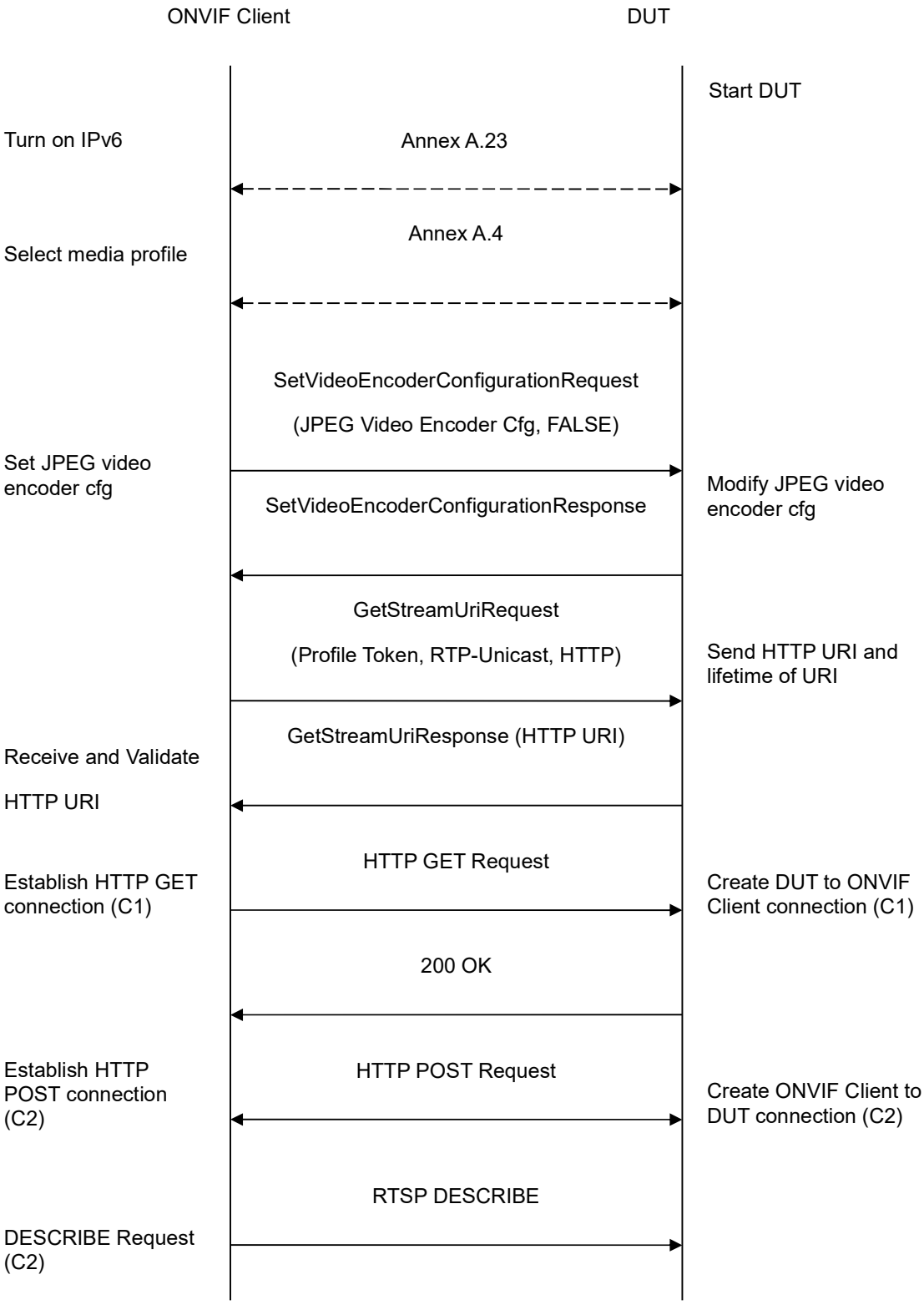
WSDL Reference: None

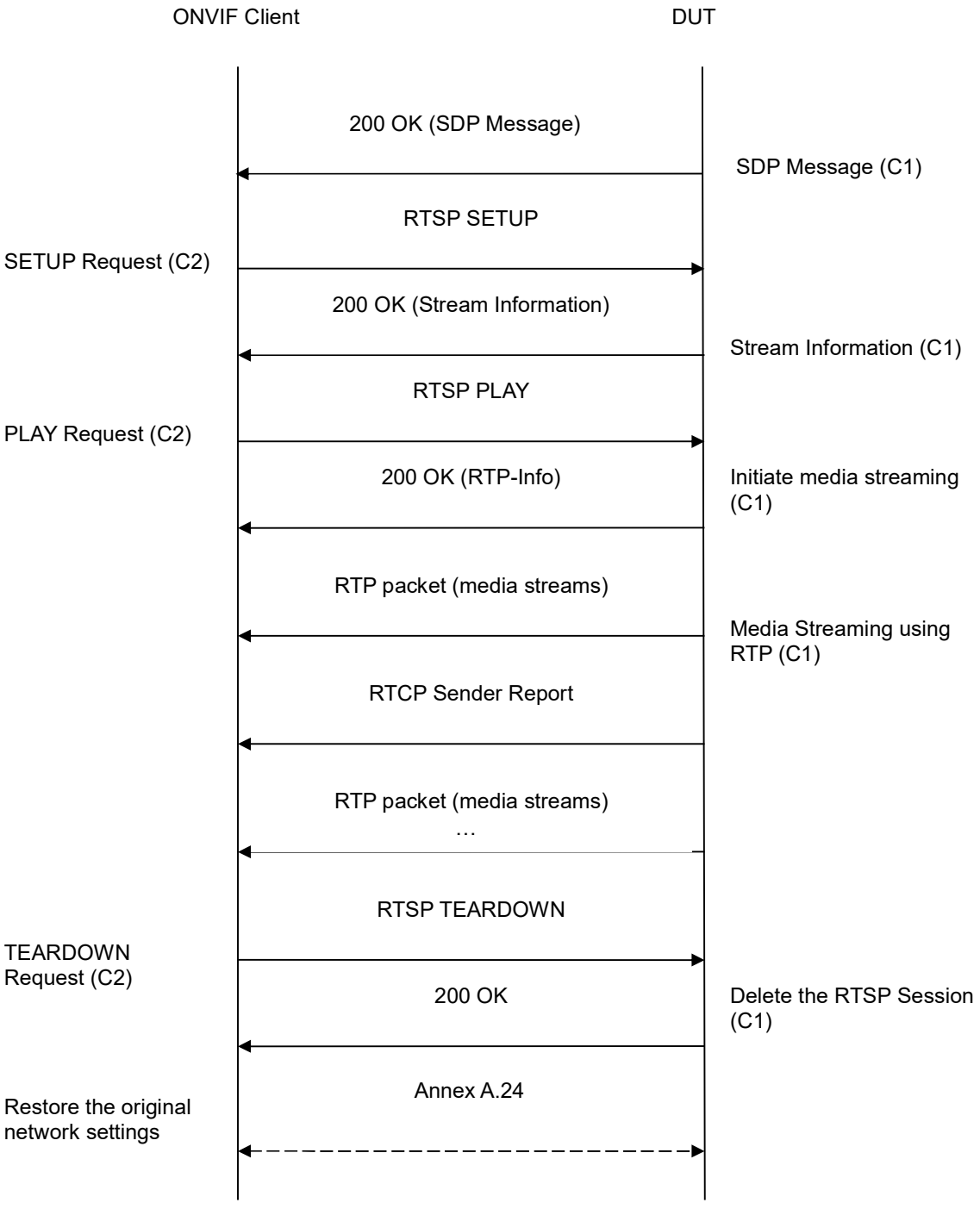
Test Purpose: To verify JPEG media streaming based on HTTP Transport for IPv6

Pre-Requisite: Media Service was received from the DUT. Real-time streaming supported by DUT. A media profile with JPEG video encoder configuration. IPv6 is turned ON for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Turn on IPv6
Annex A.23
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
Modify JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, HTTP)
Send HTTP URI and lifetime of URI
GetStreamUriResponse (HTTP URI)
Receive and Validate HTTP URI
HTTP GET Request
Establish HTTP GET connection (C1)
Create DUT to ONVIF Client connection (C1)
200 OK
Establish HTTP POST connection (C2)
HTTP POST Request
Create ONVIF Client to DUT connection (C2)
RTSP DESCRIBE
DESCRIBE Request (C2)



Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.4.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
7. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, HTTP transport) to retrieve media stream URI for the selected media profile.
8. DUT sends HTTP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
9. ONVIF Client verifies the HTTP media stream URI provided by the DUT.
10. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
11. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
12. ONVIF Client invokes RTSP DESCRIBE request on HTTP POST connection.
13. DUT sends 200 OK message and SDP information on HTTP GET connection.
14. ONVIF Client invokes RTSP SETUP request on HTTP POST connection with transport parameter as ‘RTP/TCP’ along with ‘interleaved’ parameter.
15. DUT sends 200 OK message and the media stream information on HTTP GET connection.
16. ONVIF Client invokes RTSP PLAY request on HTTP POST connection.
17. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
18. DUT transfers JPEG RTP media stream to ONVIF Client on HTTP GET connection.
19. DUT sends RTCP sender report to ONVIF Client on HTTP GET connection.
20. DUT validates the received RTP and RTCP packets, decodes and renders them.
21. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection and closes the HTTP POST connection.
22. DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.
23. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – HTTP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.33 MEDIA STREAMING – JPEG (RTP/RTSP/TCP, IPv6)

Test Label: Real Time Viewing DUT JPEG media streaming using RTP/RTSP/TCP transport for IPv6

Test Case ID: RTSS-1-1-56

ONVIF Core Specification Coverage: RTP/RTSP/TCP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

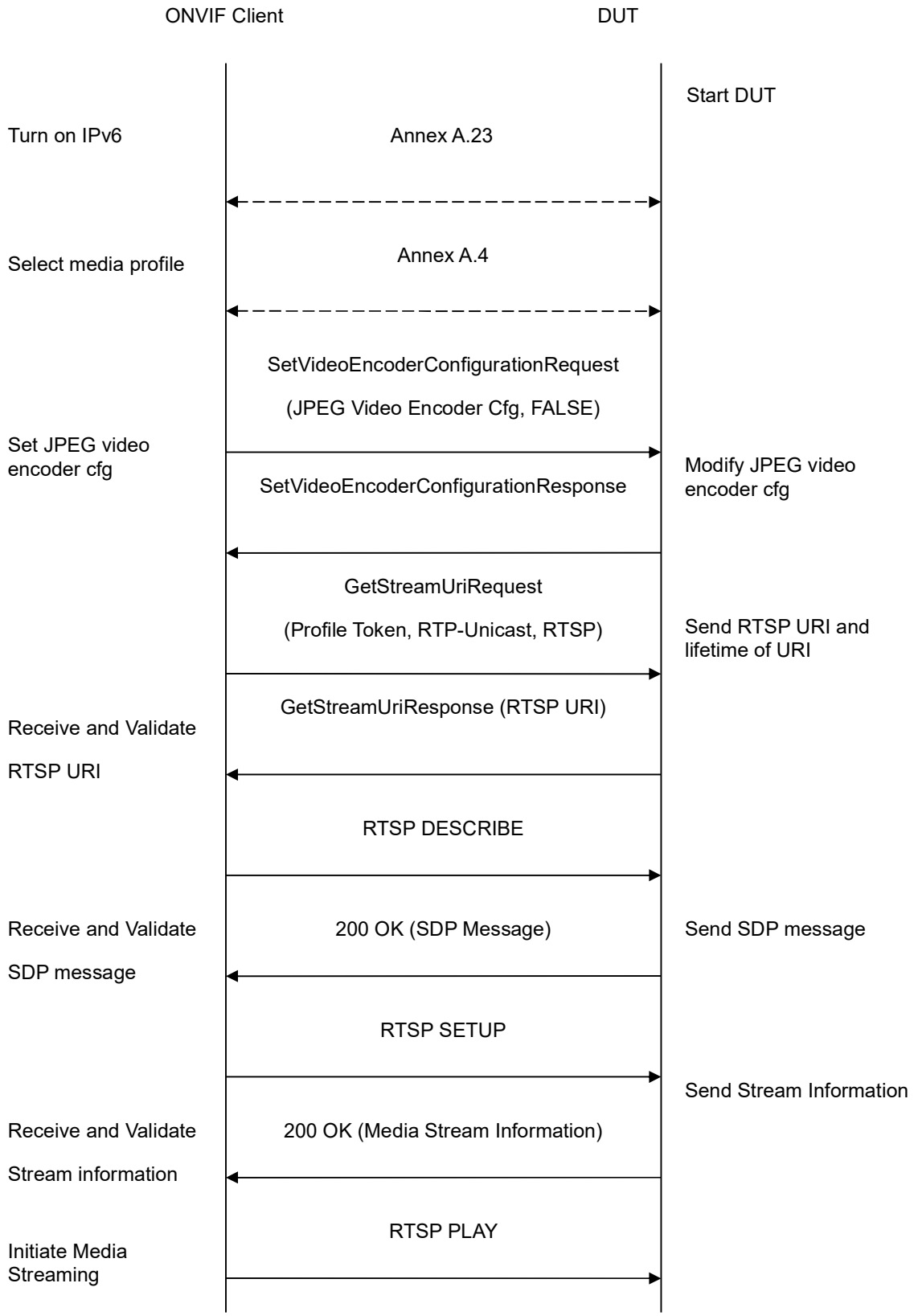
WSDL Reference: None

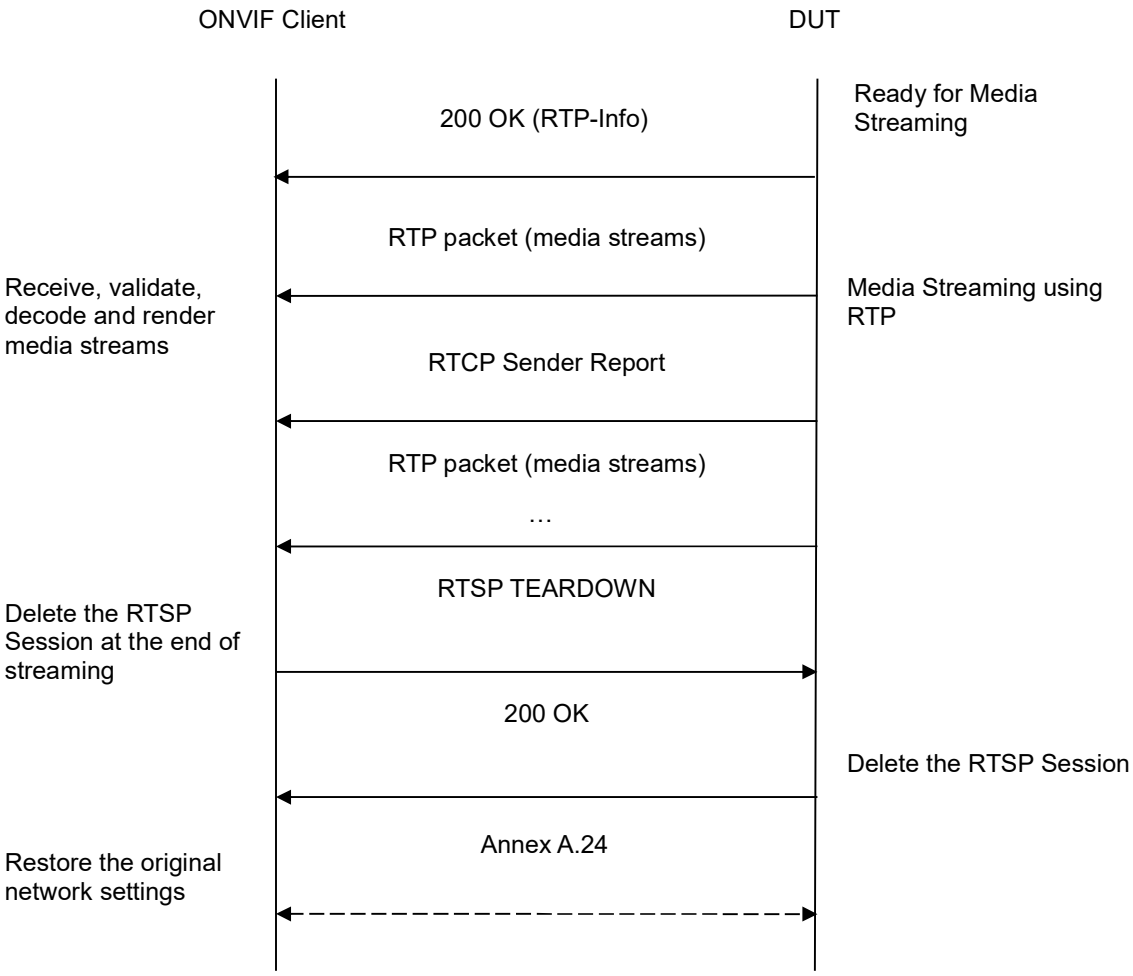
Test Purpose: To verify JPEG media streaming based on RTP/RTSP/TCP using RTSP tunnel for IPv6

Pre-Requisite: Media Service was received from the DUT. Real-time streaming supported by DUT. RTP/RTSP/TCP media streaming is implemented by DUT. A media profile with JPEG video encoder configuration. IPv6 is turned ON for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Turn on IPv6
Annex A.23
Select media profile
Annex A.4
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
Modify JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, RTSP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Receive and Validate SDP message
200 OK (SDP Message)
Send SDP message
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.4.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.

6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
7. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, RTSP transport) to retrieve media stream URI for the selected media profile.
8. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
9. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
10. ONVIF Client invokes RTSP DESCRIBE request.
11. DUT sends 200 OK message and SDP information.
12. ONVIF Client invokes RTSP SETUP request with transport parameter as 'RTP/TCP' along with 'interleaved' parameter.
13. DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request.
15. DUT sends 200 OK message and starts media streaming.
16. DUT interleaves RTP and RTCP packets, send them over RTSP control connection.
17. DUT validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. DUT sends 200 OK Response and terminates the RTSP Session.
20. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send RTP and RTCP packets as per [RFC 2326] section 10.12.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.34 MEDIA STREAMING – MPEG4 (RTP-Unicast/UDP, IPv6)

Test Label: Real Time Viewing DUT MPEG4 media streaming using RTP-Unicast/UDP transport for IPv6.

Test Case ID: RTSS-1-1-57

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

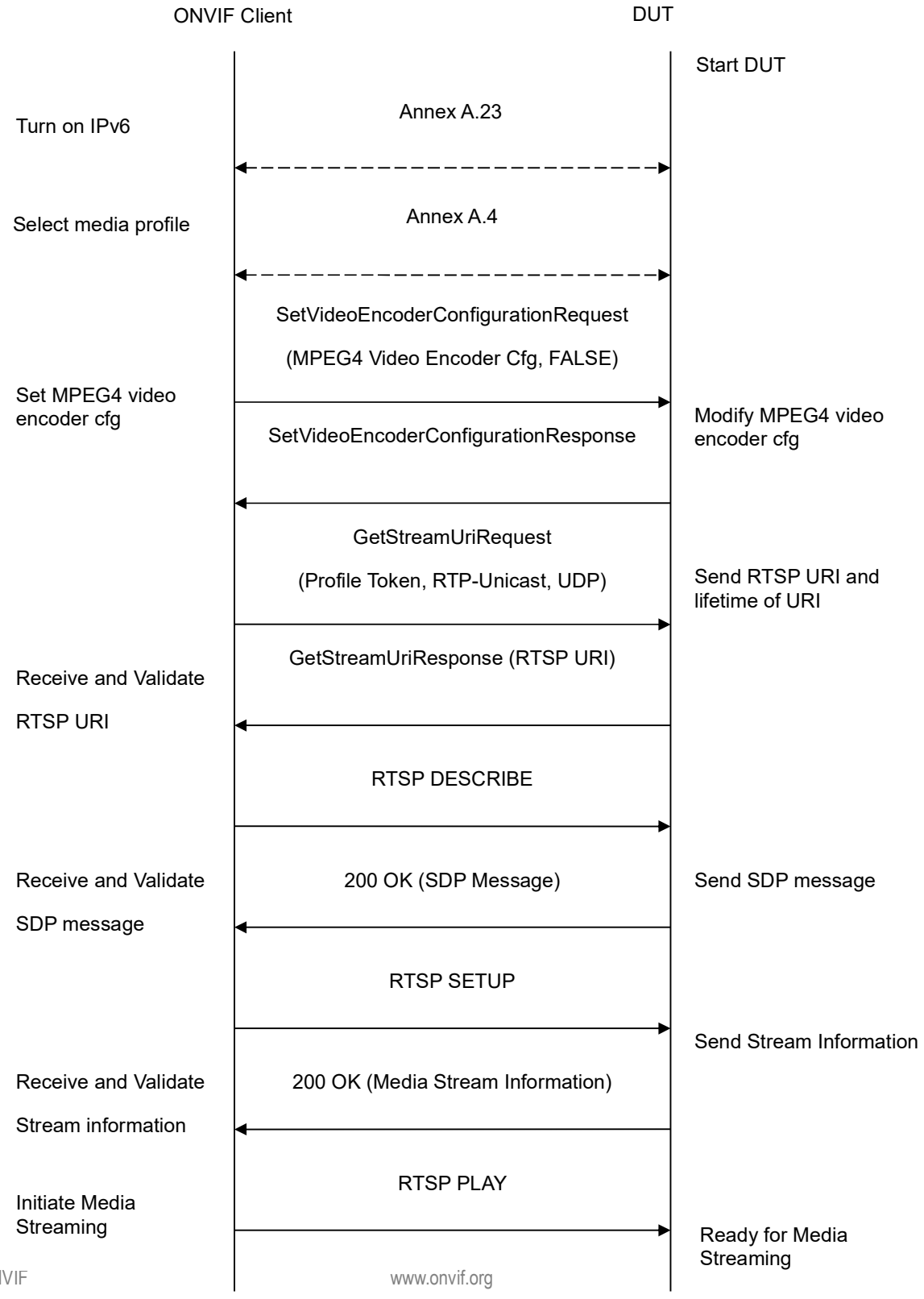
WSDL Reference: None

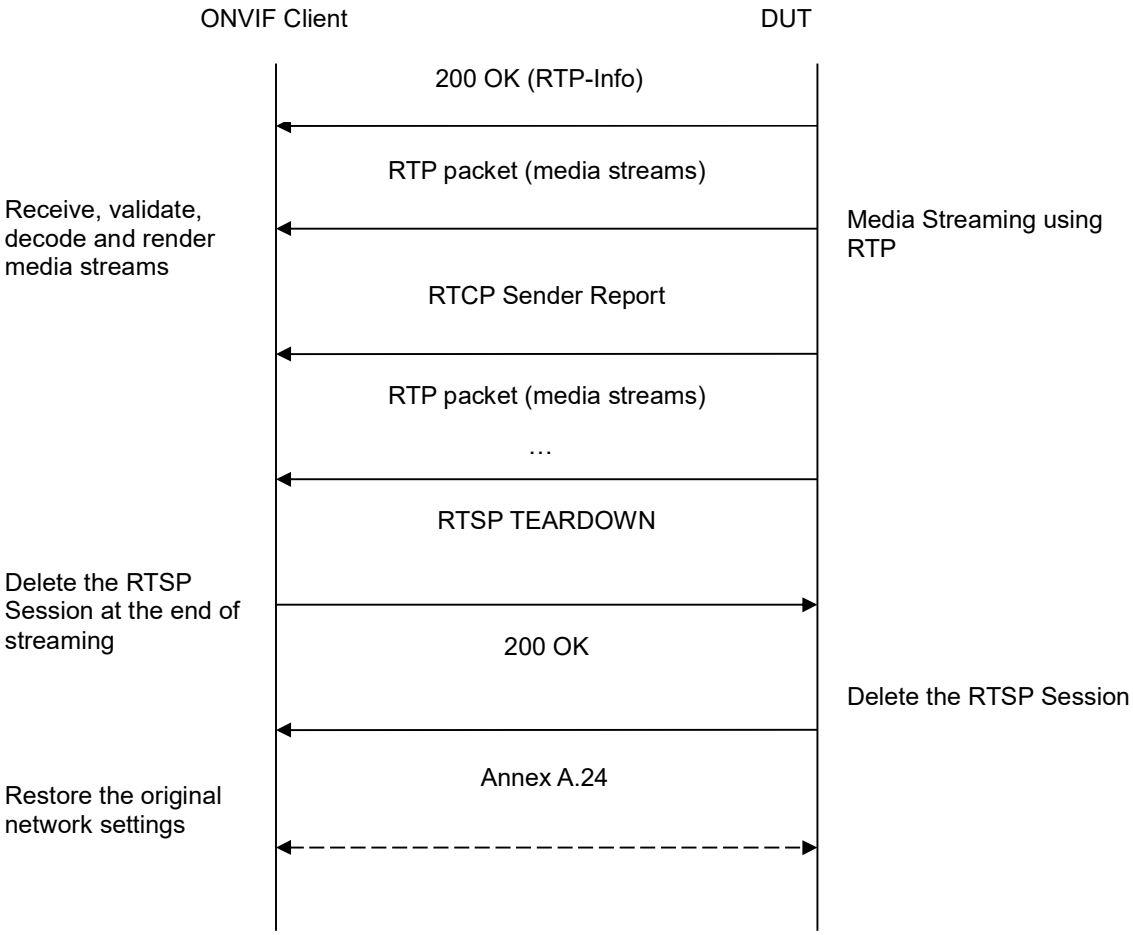
Test Purpose: To verify MPEG4 media streaming based on RTP/UDP Unicast Transport for IPv6.

Pre-Requisite: Media Service was received from the DUT. Real-time streaming supported by DUT. MPEG4 is implemented by DUT. A media profile with MPEG4 video encoder configuration. IPv6 is turned ON for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
Turn on IPv6
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(MPEG4 Video Encoder Cfg, FALSE)
Set MPEG4 video encoder cfg
Modify MPEG4 video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Receive and Validate SDP message
200 OK (SDP Message)
Send SDP message
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with MPEG4 video encoding support by following the procedure mentioned in Annex A.4.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “MPEG4”, Resolution = [“Width”, “Height”], Quality = q1, GovLength = g1, Mpeg4Profile = prof1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
7. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.

8. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
9. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
10. ONVIF Client invokes RTSP DESCRIBE request.
11. DUT sends 200 OK message and SDP information.
12. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
13. DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request.
15. DUT sends 200 OK message and starts media streaming.
16. DUT sends MPEG4 RTP media stream to ONVIF Client over UDP.
17. DUT sends RTCP sender report to ONVIF Client.
18. DUT validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. DUT sends 200 OK Response and terminates the RTSP Session.
21. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.35 MEDIA STREAMING – MPEG4 (RTP-Unicast/RTSP/HTTP/TCP, IPv6)

Test Label: Real Time Viewing DUT MPEG4 media streaming using HTTP transport for IPv6.

Test Case ID: RTSS-1-1-58

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP.

Command Under Test: None

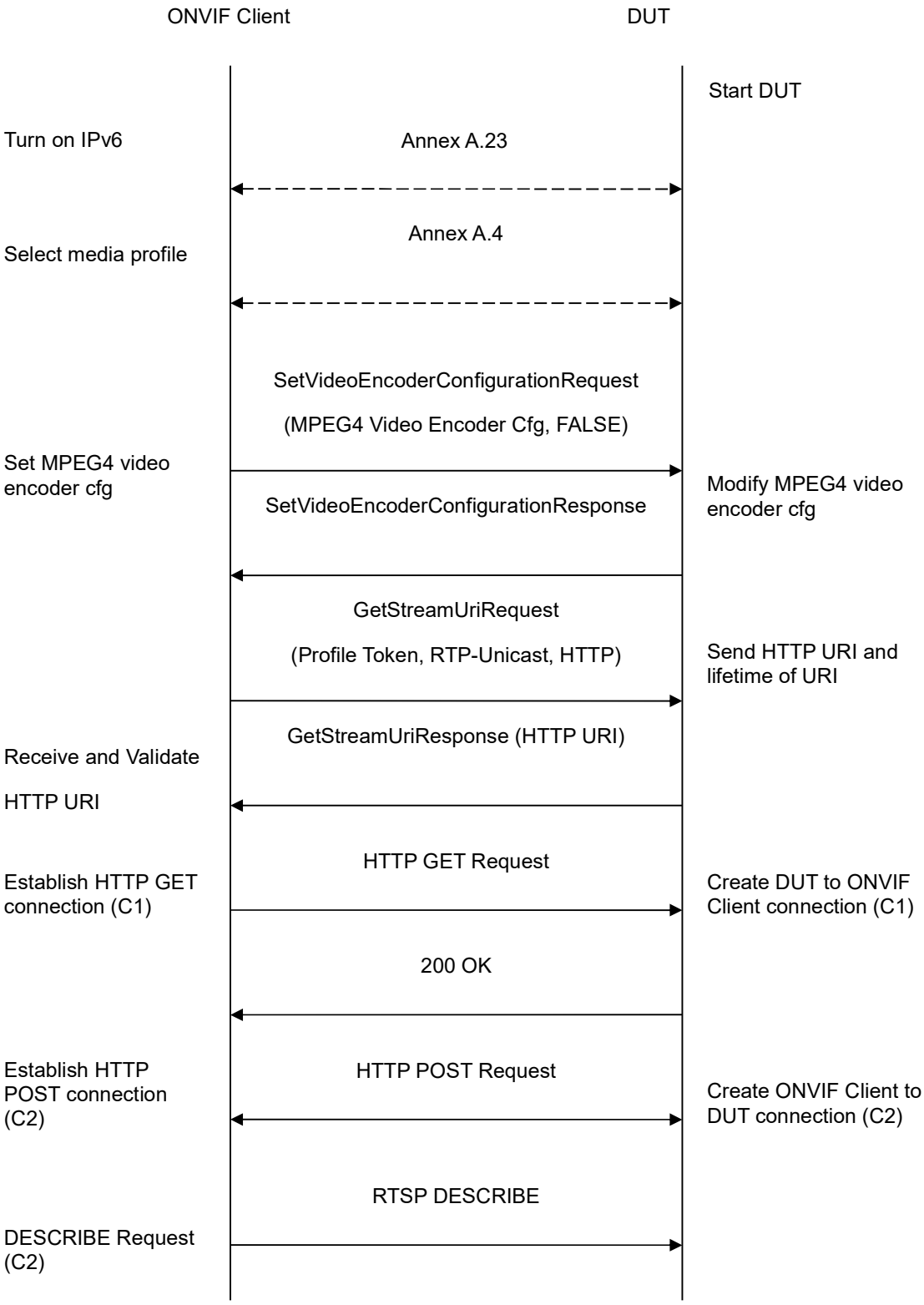
WSDL Reference: None

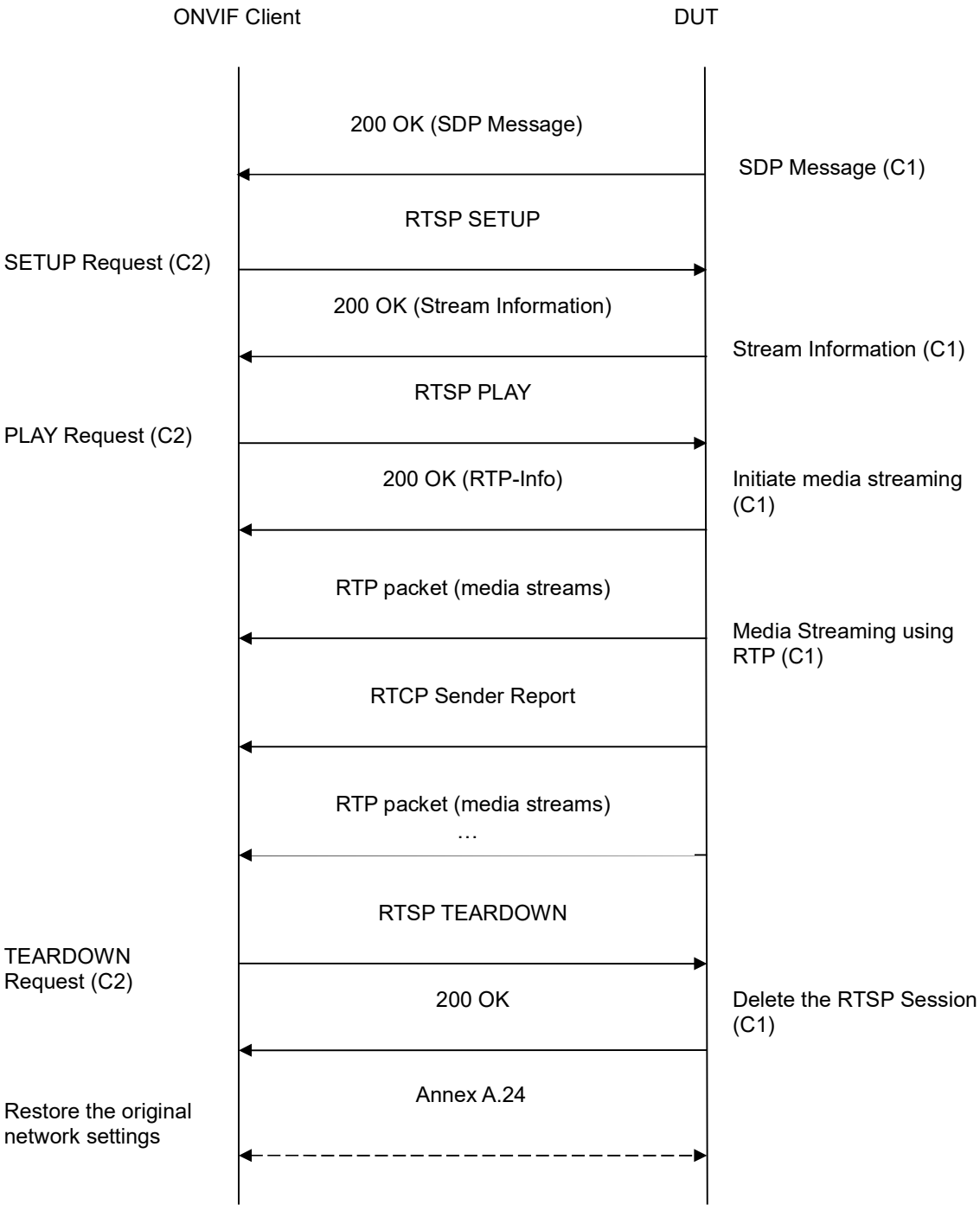
Test Purpose: To verify MPEG4 media streaming based on HTTP Transport for IPv6.

Pre-Requisite: Media Service was received from the DUT. Real-time streaming supported by DUT. MPEG4 is implemented by DUT. A media profile with MPEG4 video encoder configuration. IPv6 is turned ON for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Turn on IPv6
Annex A.23
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(MPEG4 Video Encoder Cfg, FALSE)
Set MPEG4 video encoder cfg
Modify MPEG4 video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, HTTP)
Send HTTP URI and lifetime of URI
GetStreamUriResponse (HTTP URI)
Receive and Validate HTTP URI
HTTP GET Request
Establish HTTP GET connection (C1)
Create DUT to ONVIF Client connection (C1)
200 OK
Establish HTTP POST connection (C2)
HTTP POST Request
Create ONVIF Client to DUT connection (C2)
RTSP DESCRIBE
DESCRIBE Request (C2)



Test Procedure:

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

3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with MPEG4 video encoding support by following the procedure mentioned in Annex A.4.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “MPEG4”, Resolution = [“Width”, “Height”], Quality = q1, GovLength = g1, Mpeg4Profile = prof1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
7. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, HTTP transport) to retrieve media stream URI for the selected media profile.
8. DUT sends HTTP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
9. ONVIF Client verifies the HTTP media stream URI provided by the DUT.
10. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
11. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
12. ONVIF Client invokes RTSP DESCRIBE request on HTTP POST connection.
13. DUT sends 200 OK message and SDP information on HTTP GET connection.
14. ONVIF Client invokes RTSP SETUP request on HTTP POST connection with transport parameter as ‘RTP/TCP’ along with ‘interleaved’ parameter.
15. DUT sends 200 OK message and the media stream information on HTTP GET connection.
16. ONVIF Client invokes RTSP PLAY request on HTTP POST connection.
17. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
18. DUT transfers MPEG4 RTP media stream to ONVIF Client on HTTP GET connection.
19. DUT sends RTCP sender report to ONVIF Client on HTTP GET connection.
20. DUT validates the received RTP and RTCP packets, decodes and renders them.
21. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection and closes the HTTP POST connection.
22. DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.
23. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – HTTP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.36 MEDIA STREAMING – MPEG4 (RTP/RTSP/TCP, IPv6)

Test Label: Real Time Viewing DUT MPEG4 media streaming using RTP/RTSP/TCP transport for IPv6.

Test Case ID: RTSS-1-1-59

ONVIF Core Specification Coverage: RTP/RTSP/TCP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

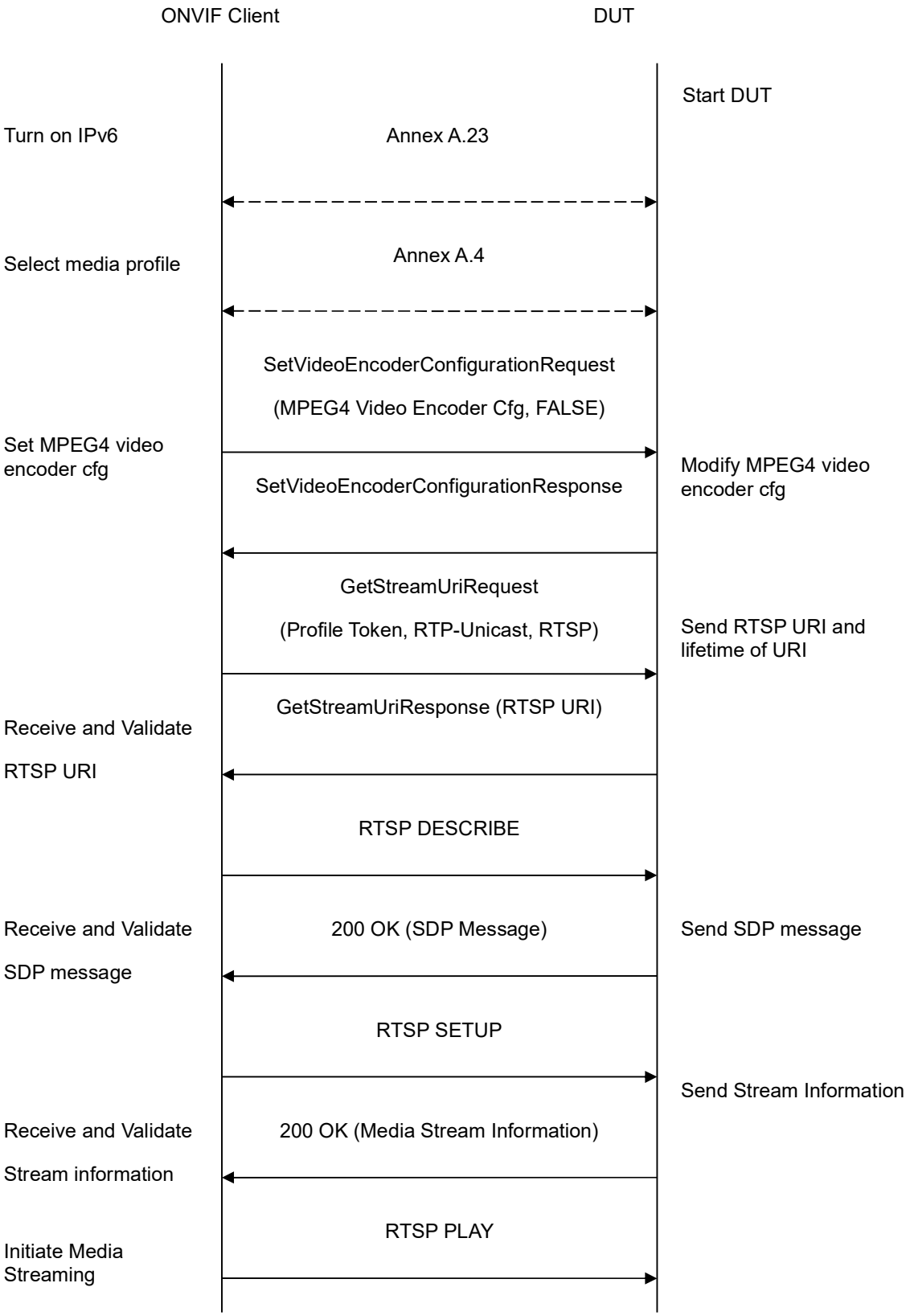
WSDL Reference: None

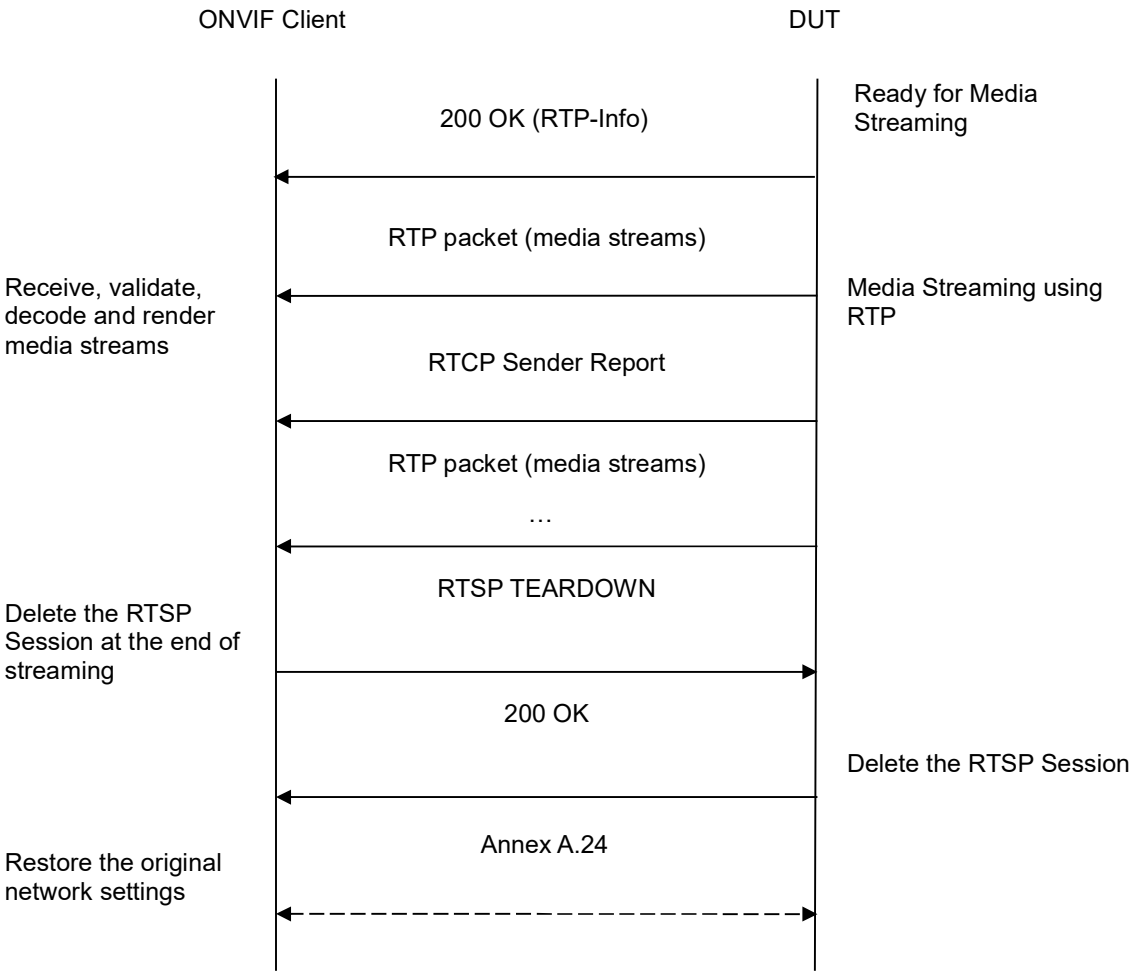
Test Purpose: To verify MPEG4 media streaming based on RTP/RTSP/TCP using RTSP tunnel for IPv6.

Pre-Requisite: Media Service was received from the DUT. Real-time streaming supported by DUT. MPEG4 and RTP/RTSP/TCP media streaming is implemented by DUT. A media profile with MPEG4 video encoder configuration. IPv6 is turned ON for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Turn on IPv6
Annex A.23
Select media profile
Annex A.4
SetVideoEncoderConfigurationRequest
(MPEG4 Video Encoder Cfg, FALSE)
Set MPEG4 video encoder cfg
Modify MPEG4 video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, RTSP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Receive and Validate SDP message
200 OK (SDP Message)
Send SDP message
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with MPEG4 video encoding support by following the procedure mentioned in Annex A.4.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “MPEG4”, Resolution = [“Width”, “Height”], Quality = q1, GovLength = g1, Mpeg4Profile = prof1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.

7. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, RTSP transport) to retrieve media stream URI for the selected media profile.
8. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
9. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
10. ONVIF Client invokes RTSP DESCRIBE request.
11. DUT sends 200 OK message and SDP information.
12. ONVIF Client invokes RTSP SETUP request with transport parameter as 'RTP/TCP' along with 'interleaved' parameter.
13. DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request.
15. DUT sends 200 OK message and starts media streaming.
16. DUT interleaves RTP and RTCP packets, send them over RTSP control connection.
17. DUT validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. DUT sends 200 OK Response and terminates the RTSP Session.
20. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not send GetProfilesResponse message.

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send RTP and RTCP packets as per [RFC 2326] section 10.12.

RTSP Session is terminated by DUT during media streaming.

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Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.37 MEDIA STREAMING – H.264 (RTP-Unicast/UDP, IPv6)

Test Label: Real Time Viewing DUT H.264 media streaming using RTP-Unicast/UDP transport for IPv6.

Test Case ID: DRAFT-RTSS-1-1-60

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

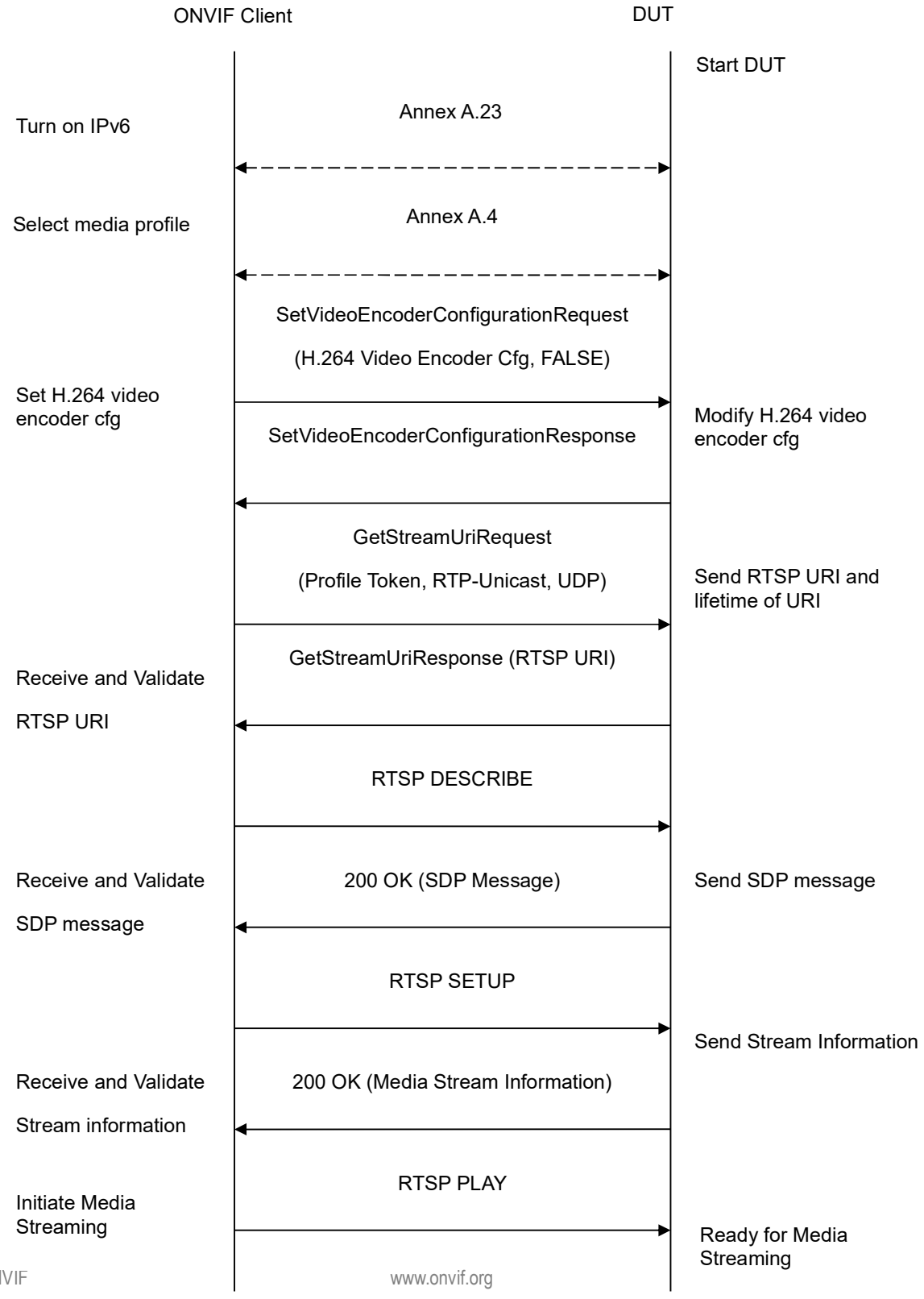
WSDL Reference: None

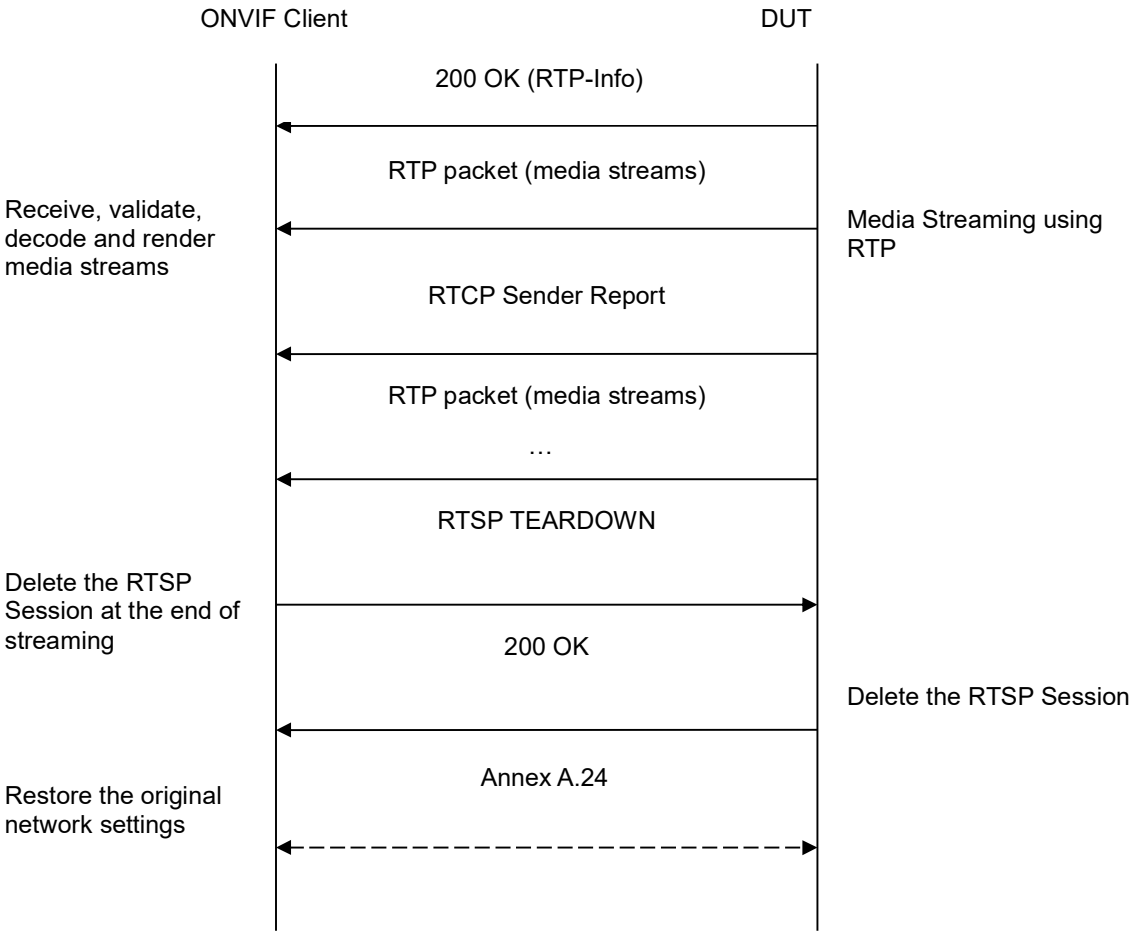
Test Purpose: To verify H.264 media streaming based on RTP/UDP Unicast Transport for IPv6.

Pre-Requisite: Media Service was received from the DUT. Real-time streaming supported by DUT. H.264 is implemented by DUT. A media profile with H.264 video encoder configuration. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
Turn on IPv6
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(H.264 Video Encoder Cfg, FALSE)
Set H.264 video encoder cfg
Modify H.264 video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Receive and Validate SDP message
200 OK (SDP Message)
Send SDP message
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with H.264 video encoding support by following the procedure mentioned in Annex A.4.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “H.264”, Resolution = [“Width”, “Height”], Quality = q1, GovLength = g1, Session Timeout = t1 and force persistence = false). The parameter of H264Profile is set the highest value that DUT supports as the order is High/Extended/Main/Baseline. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.

7. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
8. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
9. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
10. ONVIF Client invokes RTSP DESCRIBE request.
11. DUT sends 200 OK message and SDP information.
12. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
13. DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request.
15. DUT sends 200 OK message and starts media streaming.
16. DUT sends H.264 RTP media stream to ONVIF Client over UDP.
17. DUT sends RTCP sender report to ONVIF Client.
18. DUT validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. DUT sends 200 OK Response and terminates the RTSP Session.
21. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.38 MEDIA STREAMING – H.264 (RTP-Unicast/RTSP/HTTP/TCP, IPv6)

Test Label: Real Time Viewing DUT H.264 media streaming using HTTP transport for IPv6.

Test Case ID: DRAFT-RTSS-1-1-61

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP.

Command Under Test: None

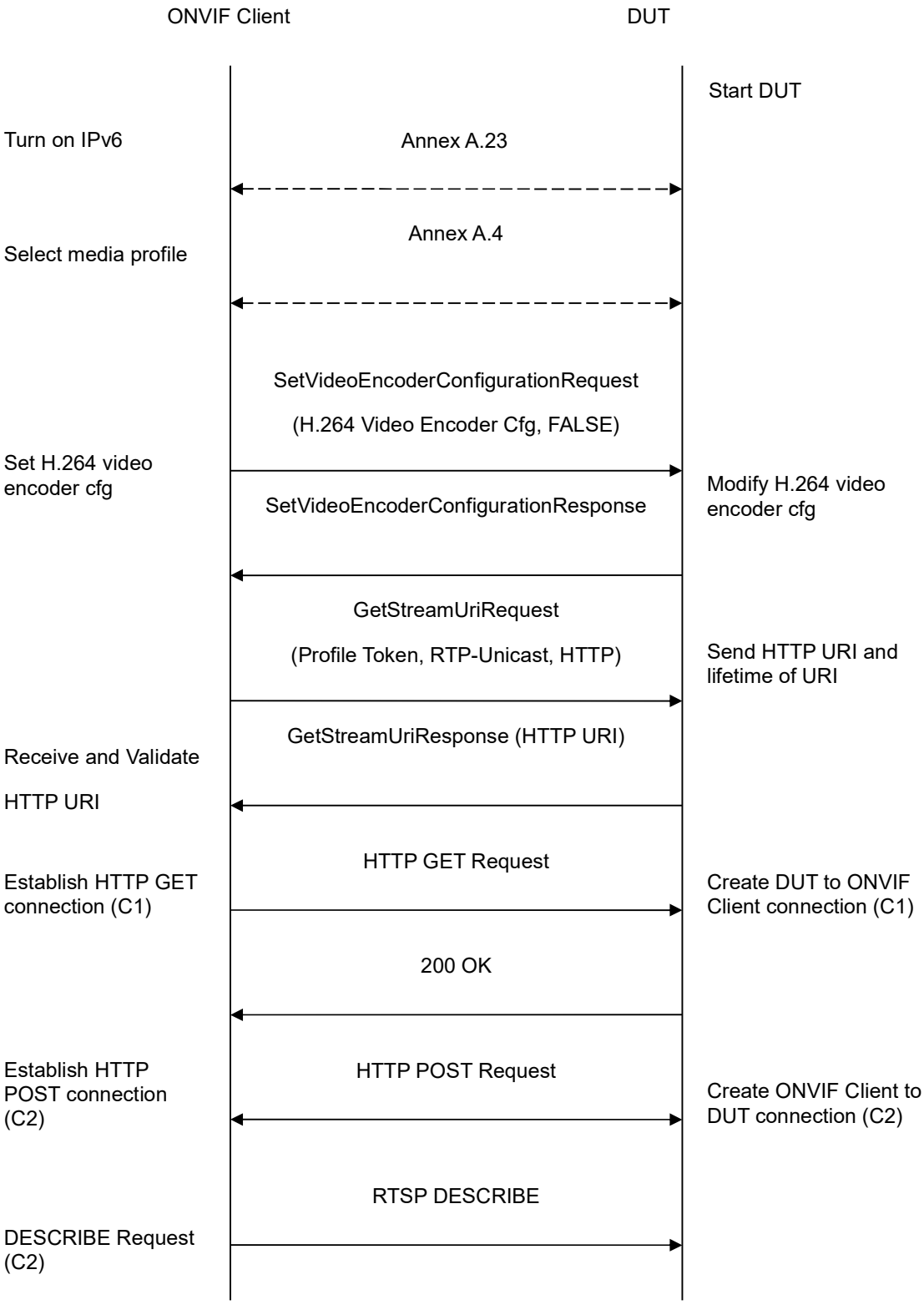
WSDL Reference: None

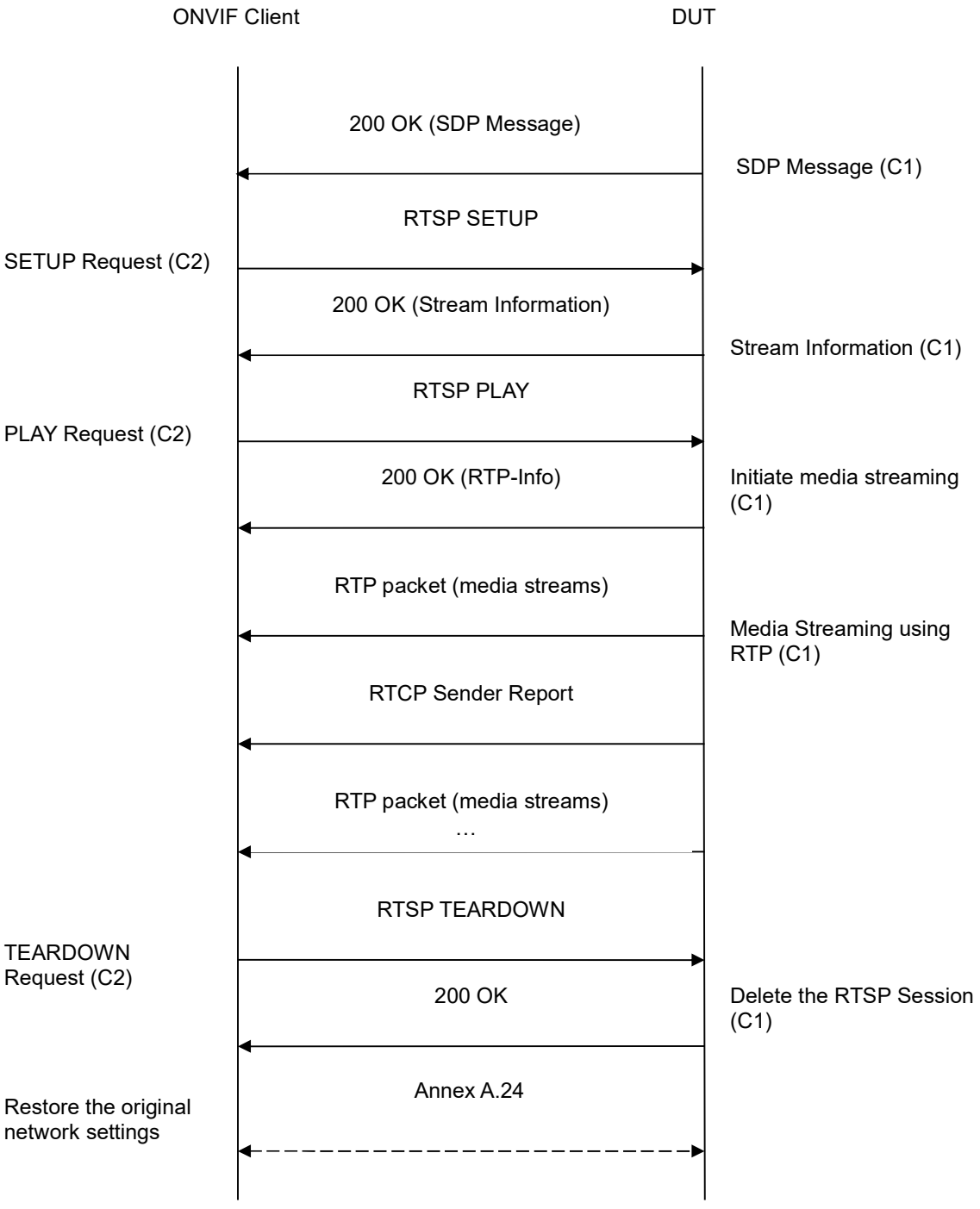
Test Purpose: To verify H.264 media streaming based on HTTP Transport for IPv6.

Pre-Requisite: Media Service was received from the DUT. Real-time streaming supported by DUT. H.264 is implemented by DUT. A media profile with H.264 video encoder configuration. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Turn on IPv6
Annex A.23
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest
(H.264 Video Encoder Cfg, FALSE)
Set H.264 video encoder cfg
Modify H.264 video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, HTTP)
Send HTTP URI and lifetime of URI
GetStreamUriResponse (HTTP URI)
Receive and Validate HTTP URI
HTTP GET Request
Establish HTTP GET connection (C1)
Create DUT to ONVIF Client connection (C1)
200 OK
Establish HTTP POST connection (C2)
HTTP POST Request
Create ONVIF Client to DUT connection (C2)
RTSP DESCRIBE
DESCRIBE Request (C2)



Test Procedure:

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

3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with H.264 video encoding support by following the procedure mentioned in Annex A.4**Error! Reference source not found.**.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “H.264”, Resolution = [“Width”, “Height”], Quality = q1, GovLength = g1, Session Timeout = t1 and force persistence = false). The parameter of H264Profile is set the highest value that DUT supports as the order is High/Extended/Main/Baseline. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
7. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, HTTP transport) to retrieve media stream URI for the selected media profile.
8. DUT sends HTTP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
9. ONVIF Client verifies the HTTP media stream URI provided by the DUT.
10. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
11. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
12. ONVIF Client invokes RTSP DESCRIBE request on HTTP POST connection.
13. DUT sends 200 OK message and SDP information on HTTP GET connection.
14. ONVIF Client invokes RTSP SETUP request on HTTP POST connection with transport parameter as ‘RTP/TCP’ along with ‘interleaved’ parameter.
15. DUT sends 200 OK message and the media stream information on HTTP GET connection.
16. ONVIF Client invokes RTSP PLAY request on HTTP POST connection.
17. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
18. DUT transfers H.264 RTP media stream to ONVIF Client on HTTP GET connection.
19. DUT sends RTCP sender report to ONVIF Client on HTTP GET connection.
20. DUT validates the received RTP and RTCP packets, decodes and renders them.
21. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection and closes the HTTP POST connection.
22. DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.
23. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – HTTP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.39 MEDIA STREAMING – H.264 (RTP/RTSP/TCP, IPv6)

Test Label: Real Time Viewing DUT H.264 media streaming using RTP/RTSP/TCP transport for IPv6.

Test Case ID: DRAFT-RTSS-1-1-62

ONVIF Core Specification Coverage: RTP/RTSP/TCP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

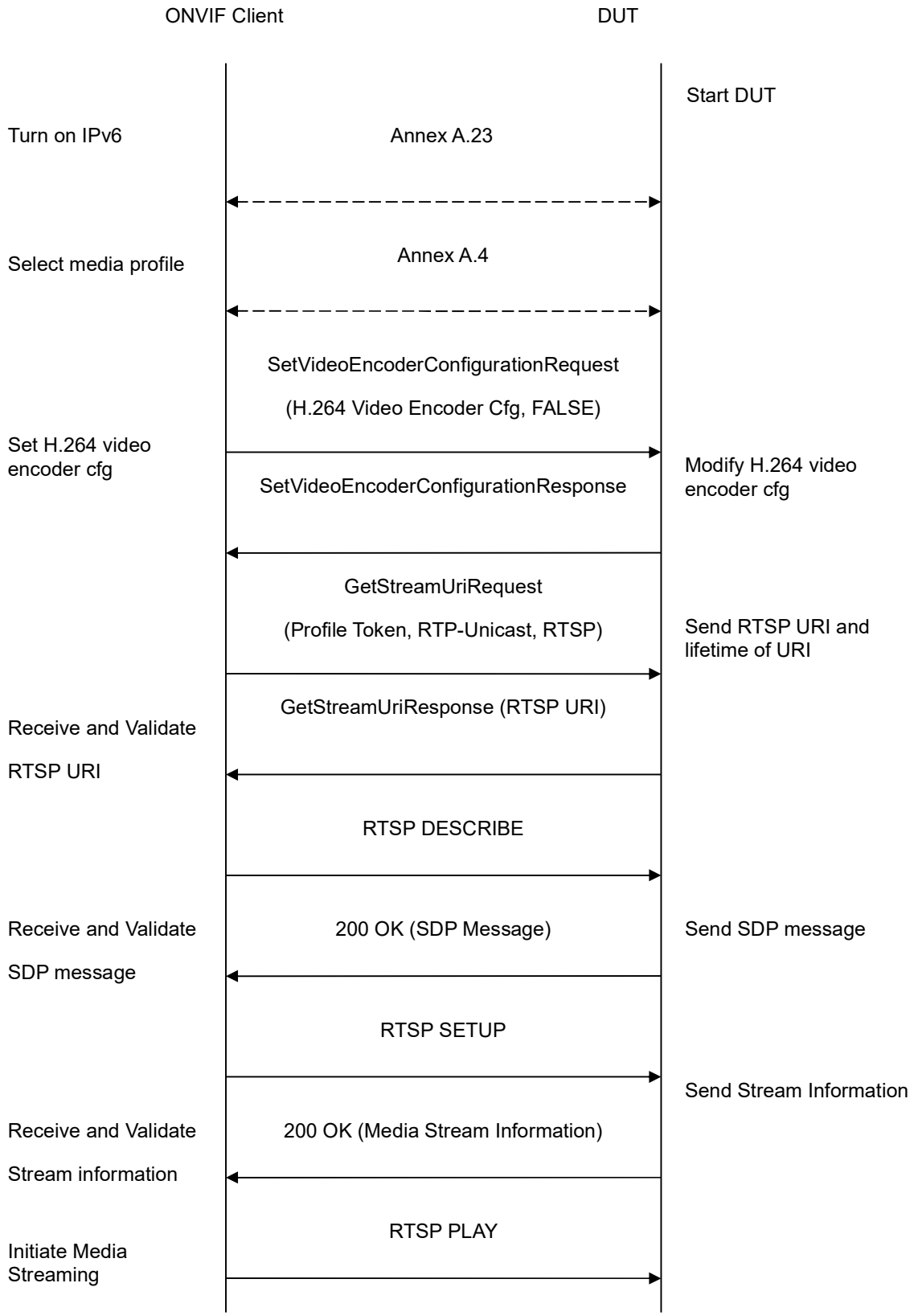
WSDL Reference: None

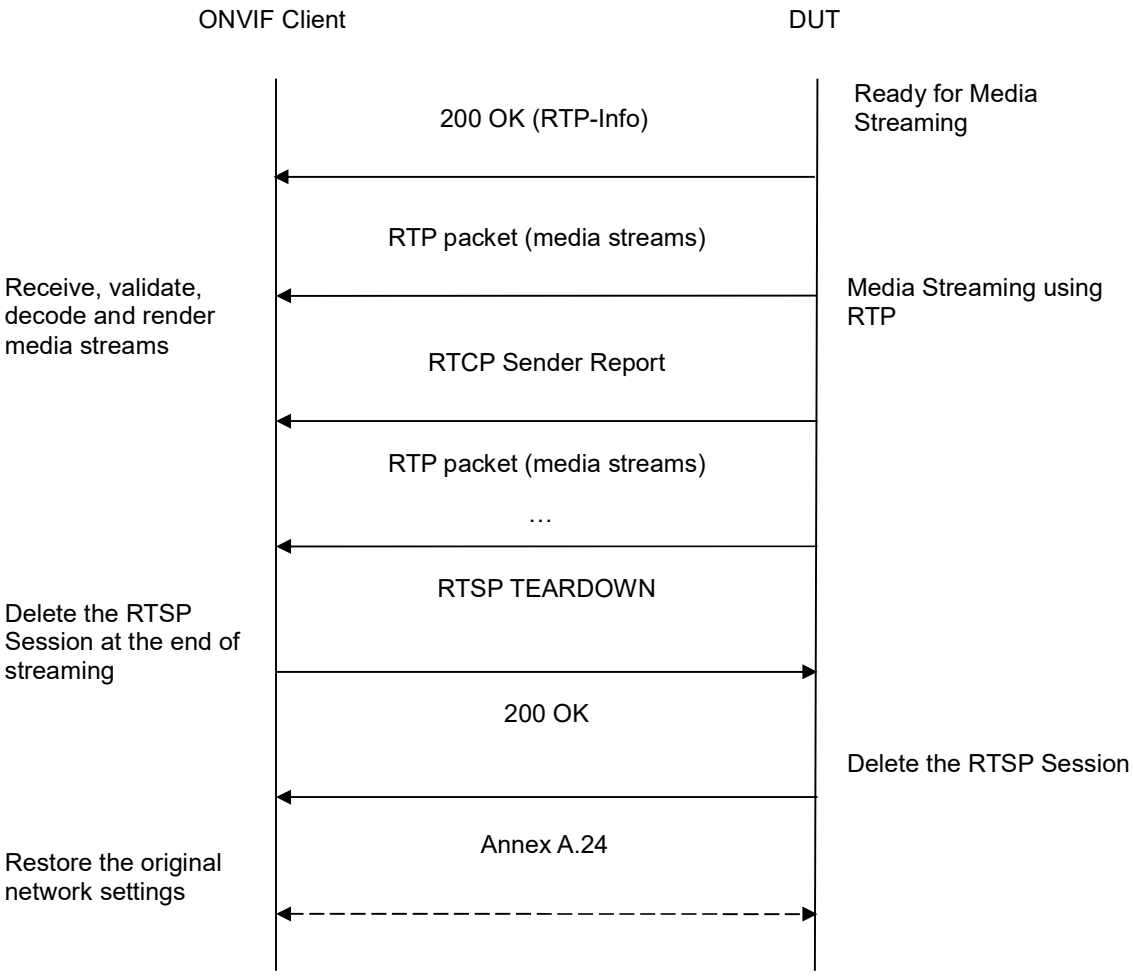
Test Purpose: To verify H.264 media streaming based on RTP/RTSP/TCP using RTSP tunnel for IPv6.

Pre-Requisite: Media Service was received from the DUT. Real-time streaming supported by DUT. H.264 and RTP/RTSP/TCP media streaming is implemented by DUT. A media profile with H.264 video encoder configuration. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Turn on IPv6
Annex A.23
Select media profile
Annex A.4
SetVideoEncoderConfigurationRequest
(H.264 Video Encoder Cfg, FALSE)
Set H.264 video encoder cfg
Modify H.264 video encoder cfg
SetVideoEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, RTSP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Receive and Validate SDP message
200 OK (SDP Message)
Send SDP message
RTSP SETUP
Send Stream Information
Receive and Validate Stream information
200 OK (Media Stream Information)
RTSP PLAY
Initiate Media Streaming



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with H.264 video encoding support by following the procedure mentioned in Annex A.4.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “H.264”, Resolution = [“Width”, “Height”], Quality = q1, GovLength = g1, Session Timeout = t1 and force persistence = false). The parameter of H264Profile is set the highest value that DUT supports as the order is High/Extended/Main/Baseline. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.

7. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, RTSP transport) to retrieve media stream URI for the selected media profile.
8. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
9. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
10. ONVIF Client invokes RTSP DESCRIBE request.
11. DUT sends 200 OK message and SDP information.
12. ONVIF Client invokes RTSP SETUP request with transport parameter as 'RTP/TCP' along with '**interleaved'** parameter.
13. DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request.
15. DUT sends 200 OK message and starts media streaming.
16. DUT interleaves RTP and RTCP packets, send them over RTSP control connection.
17. DUT validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. DUT sends 200 OK Response and terminates the RTSP Session.
20. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send RTP and RTCP packets as per [RFC 2326] section 10.12.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

Driving IP-based physical security through global standardization

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.40 MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP-Multicast/UDP)

Test Label: Guaranteed Number Of Video Encoder Instances Verification (RTP-Multicast/UDP).

Test Case ID: RTSS-1-2-12

ONVIF Core Specification Coverage: GetGuaranteedNumberOfVideoEncoderInstances

Command Under Test: GetGuaranteedNumberOfVideoEncoderInstances

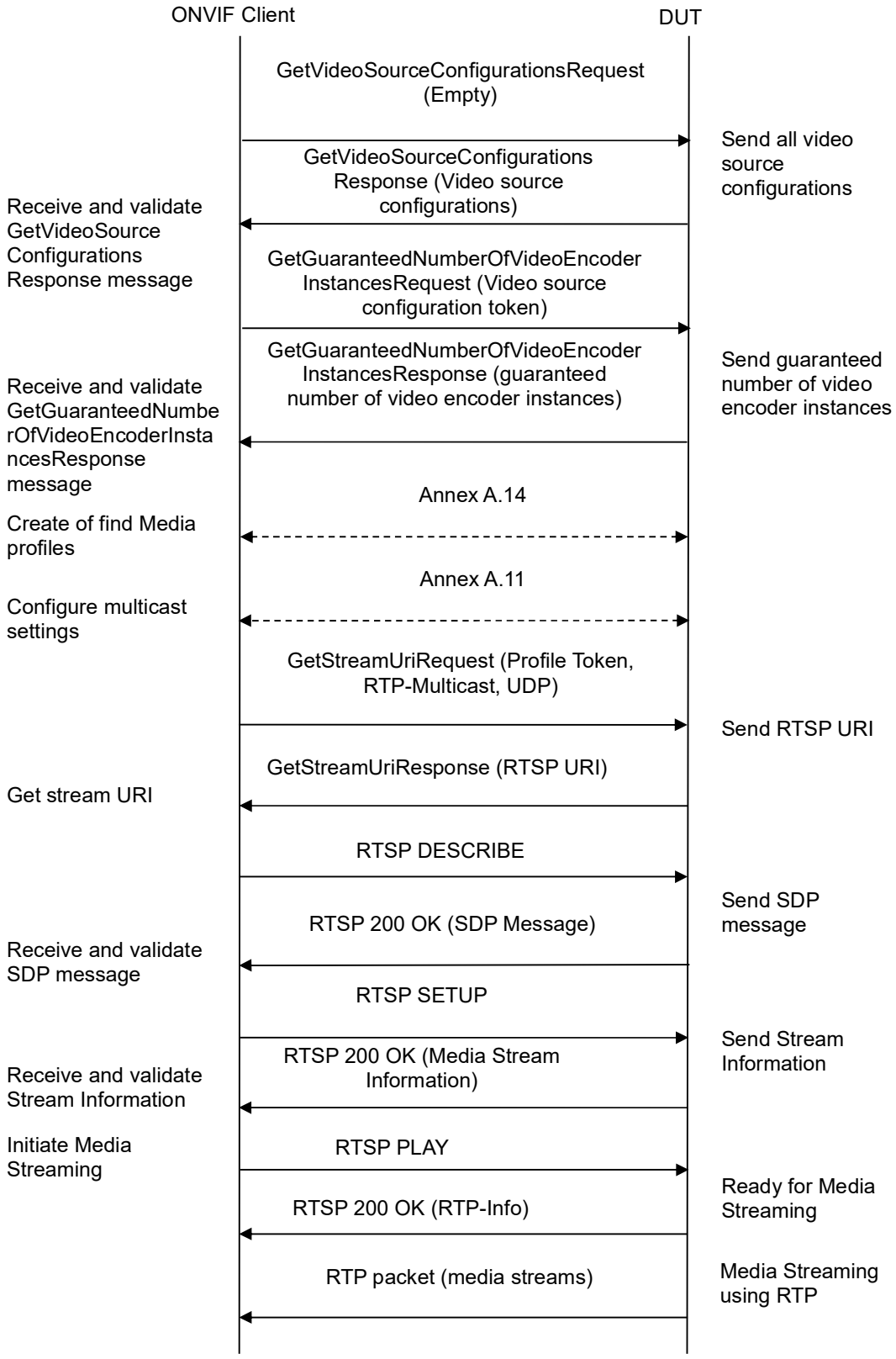
WSDL Reference: media.wsdl

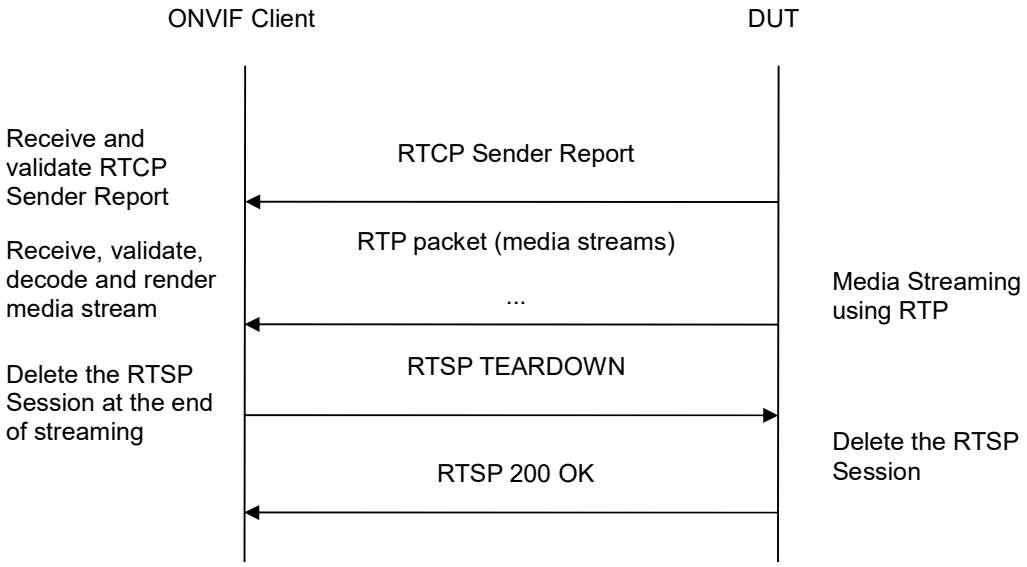
Test Purpose: To verify Guaranteed Number Of Video Encoder Instances (RTP-Multicast/UDP)

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
GetVideoSourceConfigurationsRequest (Empty)
Send all video source configurations
GetVideoSourceConfigurations Response (Video source configurations)
Receive and validate GetVideoSource Configurations Response message
GetGuaranteedNumberOfVideoEncoder InstancesRequest (Video source configuration token)
GetGuaranteedNumberOfVideoEncoder InstancesResponse (guaranteed number of video encoder instances)
Send guaranteed number of video encoder instances
Receive and validate GetGuaranteedNumberOfVideoEncoderInstancesResponse message
Annex A.14
Create of find Media profiles
Annex A.11
Configure multicast settings
GetStreamUriRequest (Profile Token, RTP-Multicast, UDP)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will invoke GetVideoSourceConfigurationsRequest message to retrieve all DUT video source configurations.
4. Verify the GetVideoSourceConfigurationsResponse message from the DUT.
5. ONVIF Client will invoke GetGuaranteedNumberOfVideoEncoderInstancesRequest message (ConfigurationToken = “VSCToken1”, where “VSCToken1” is a first video source configuration token from GetVideoSourceConfigurationsResponse message) to retrieve guaranteed number of video encoder instances per first video source configuration.
6. Verify the GetGuaranteedNumberOfVideoEncoderInstancesResponse message from the DUT.
7. Create or find number of profiles equal to TotalNumber from GetGuaranteedNumberOfVideoEncoderInstancesResponse message that contains video source configuration with token “VSCToken1” and video encoder configuration (see Annex A.14).
8. Configure multicast settings for Multicast Address from profile (see Annex A.11).
9. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Multicast, UDP transport) to retrieve media stream URI for the first media profile from step 7.
10. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
11. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
12. ONVIF Client invokes RTSP DESCRIBE request.
13. DUT sends 200 OK message and SDP information.

14. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP-Multicast/UDP.
15. DUT sends 200 OK message and the media stream information.
16. ONVIF Client invokes RTSP PLAY request.
17. DUT sends 200 OK message and starts media streaming.
18. DUT sends JPEG RTP multicast media stream to ONVIF Client over UDP.
19. DUT sends RTCP sender report to ONVIF Client.
20. DUT validates the received RTP and RTCP packets, decodes and renders them.
21. Repeat steps 8-20 to start video streaming for all profiles from step 7.
22. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session for each started stream.
23. DUT sends 200 OK Response and terminates the RTSP Session.
24. If number of Video source configurations in GetVideoSourceConfigurationsResponse message is more than one, repeat steps 5-23 for the last video source configuration token from GetVideoEncoderConfigurationsResponse message.
25. If number of Video source configurations in GetVideoSourceConfigurationsResponse message is more than two, repeat steps 5-23 for the video source configuration token between the first and the last VSC tokens from GetVideoSourceConfigurationsResponse message.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not send valid video stream.

DUT does not provide possibility to create TotalNumber of profiles for step 7.

Driving IP-based physical security through global standardization

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: In case if there are more than one Media Profiles with the same Video Encoder Configuration, multicast streaming will be started only for one of them.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.41 MEDIA STREAMING – JPEG (RTP-Multicast/UDP, IPv4)

Test Label: Real Time Viewing DUT JPEG Media Streaming Using RTP-Multicast/UDP Transport for IPv4.

Test Case ID: RTSS-1-2-13

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, JPEG over RTP, Stream control, RTSP

Command Under Test: None

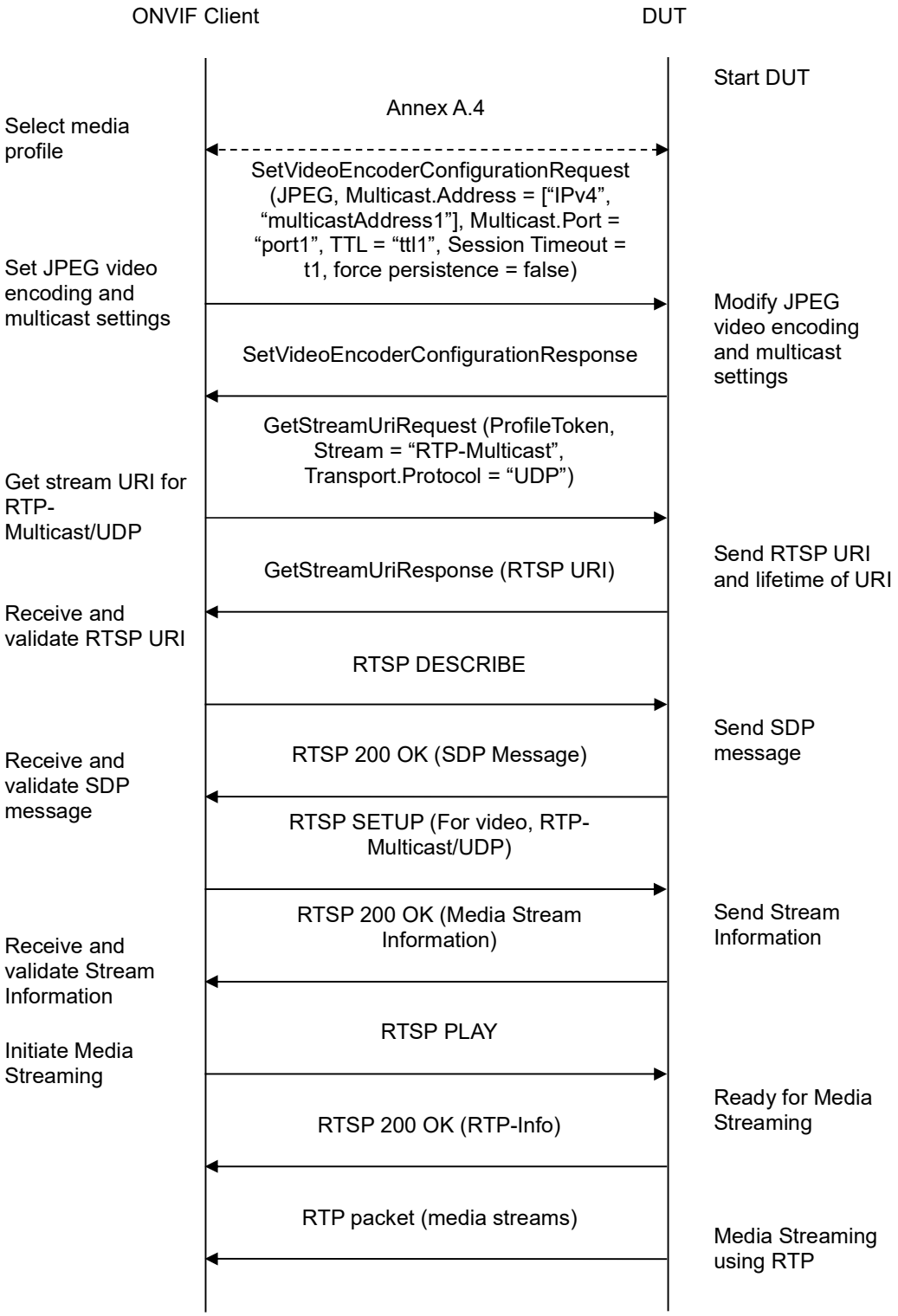
WSDL Reference: None

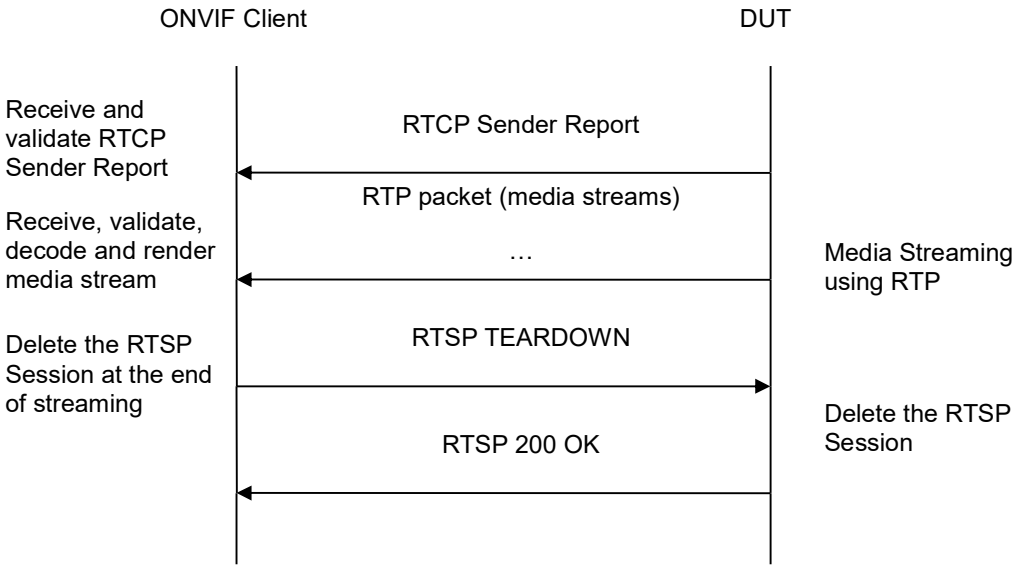
Test Propose: To verify JPEG media streaming based on RTP-Multicast/UDP Transport for IPv4.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. A media profile with JPEG video encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest (JPEG, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1, force persistence = false)
Set JPEG video encoding and multicast settings
Modify JPEG video encoding and multicast settings
SetVideoEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP”)
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For video, RTP-Multicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set JPEG encoding and Multicast settings.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP”**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Multicast/UDP**.
12. The DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.

15. The DUT sends JPEG RTP multicast media stream to multicast IPv4 address over UDP.
16. The DUT sends RTCP sender report to ONVIF Client.
17. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send JPEG RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.42 MEDIA STREAMING – MPEG4 (RTP-Multicast/UDP, IPv4)

Test Label: Real Time Viewing DUT MPEG4 Media Streaming Using RTP-Multicast/UDP Transport for IPv4.

Test Case ID: RTSS-1-2-14

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

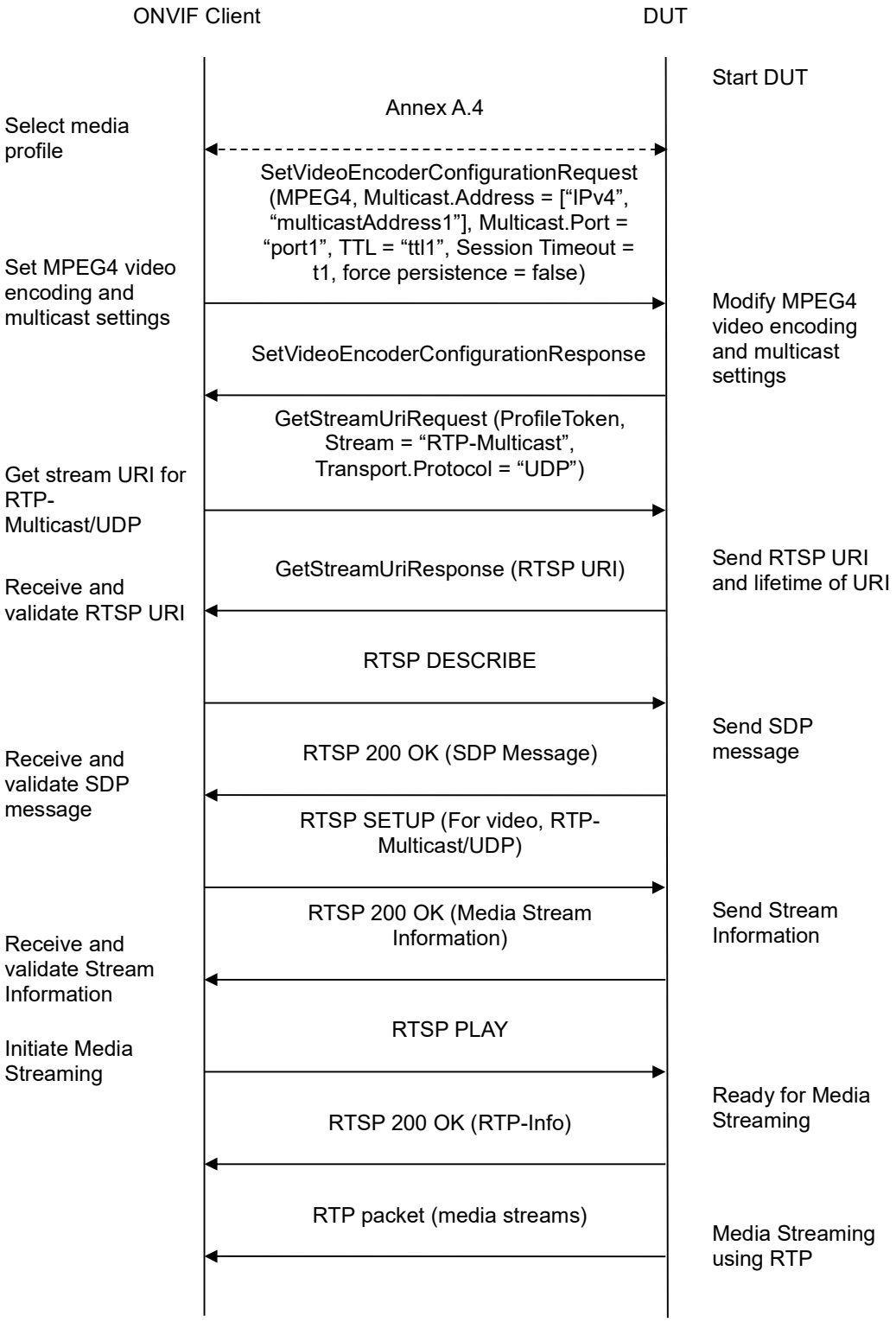
WSDL Reference: None

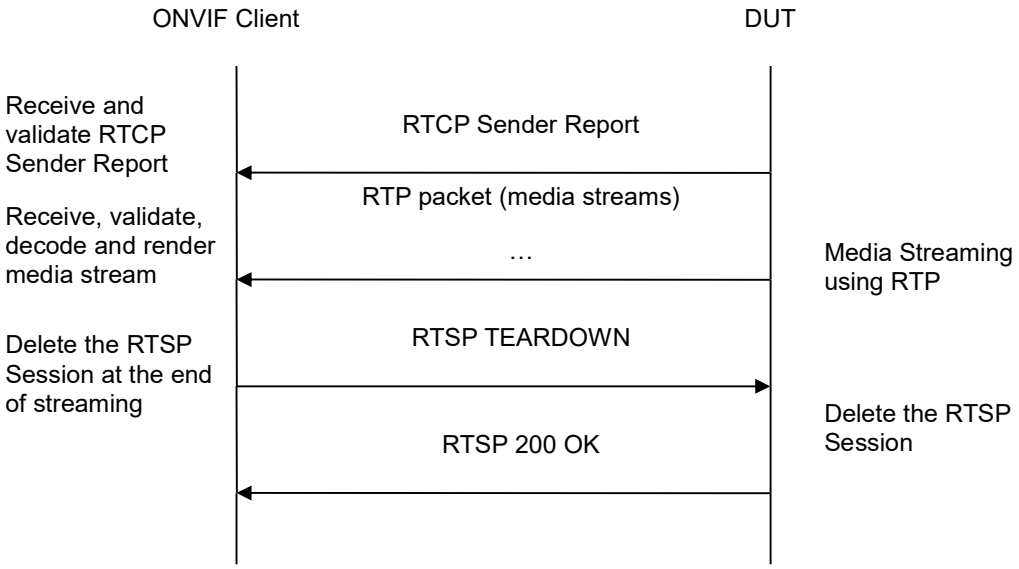
Test Propose: To verify MPEG4 media streaming based on RTP-Multicast/UDP Transport for IPv4.

Pre-Requisite: Media is supported by DUT and MPEG4 is implemented by DUT. Real-time streaming supported by DUT. A media profile with MPEG4 video encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest (MPEG4, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1, force persistence = false)
Set MPEG4 video encoding and multicast settings
Modify MPEG4 video encoding and multicast settings
SetVideoEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP")
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For video, RTP-Multicast/UDP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with MPEG4 video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (Encoding = “MPEG4”, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set MPEG4 encoding and Multicast settings.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP”**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Multicast/UDP**.
12. The DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.

15. The DUT sends MPEG4 RTP multicast media stream to multicast IPv4 address over UDP.
16. The DUT sends RTCP sender report to ONVIF Client.
17. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send MPEG4 RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.43 MEDIA STREAMING – H.264 (RTP-Multicast/UDP, IPv4)

Test Label: Real Time Viewing DUT H.264 Media Streaming Using RTP-Multicast/UDP Transport for IPv4.

Test Case ID: RTSS-1-2-15

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

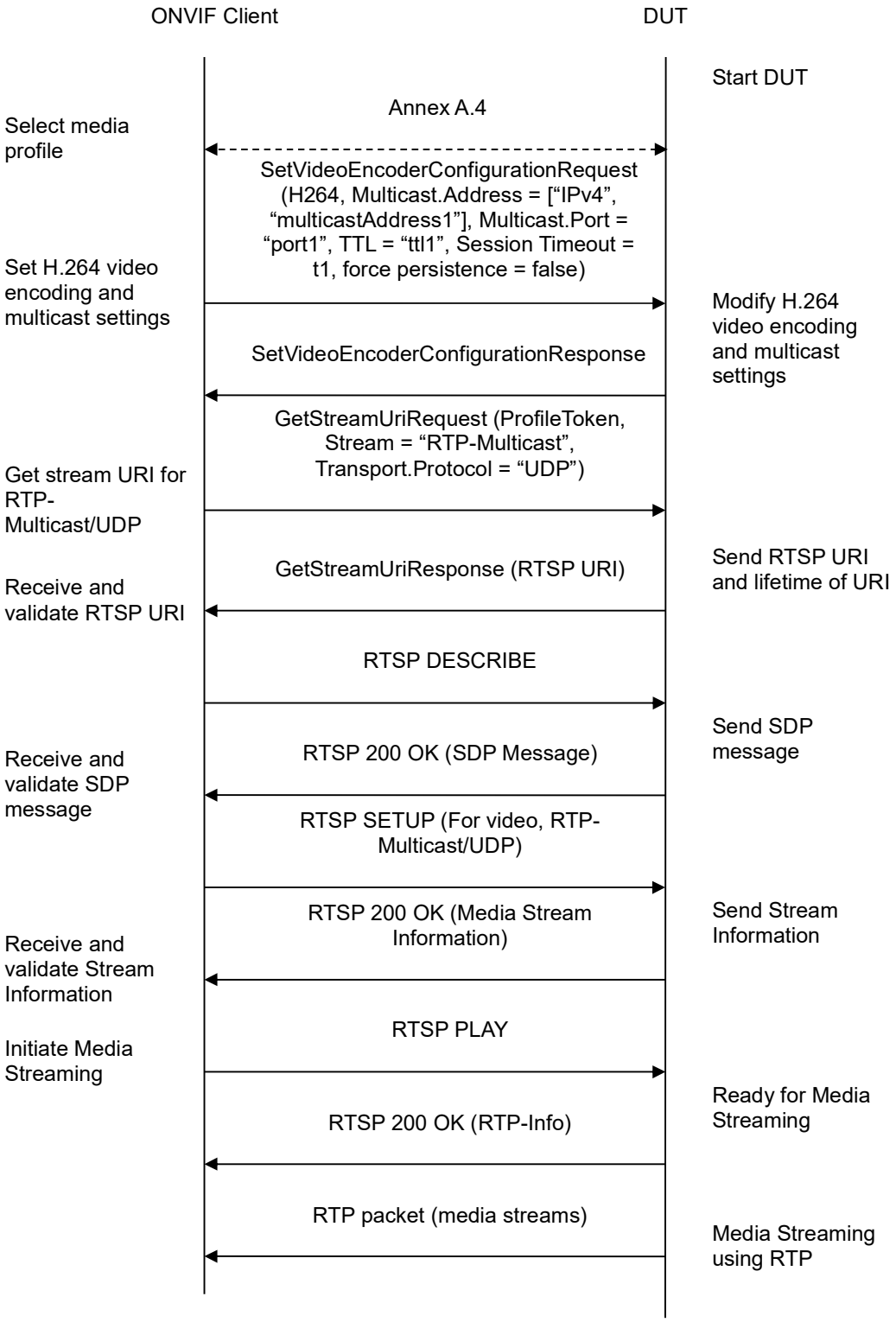
WSDL Reference: None

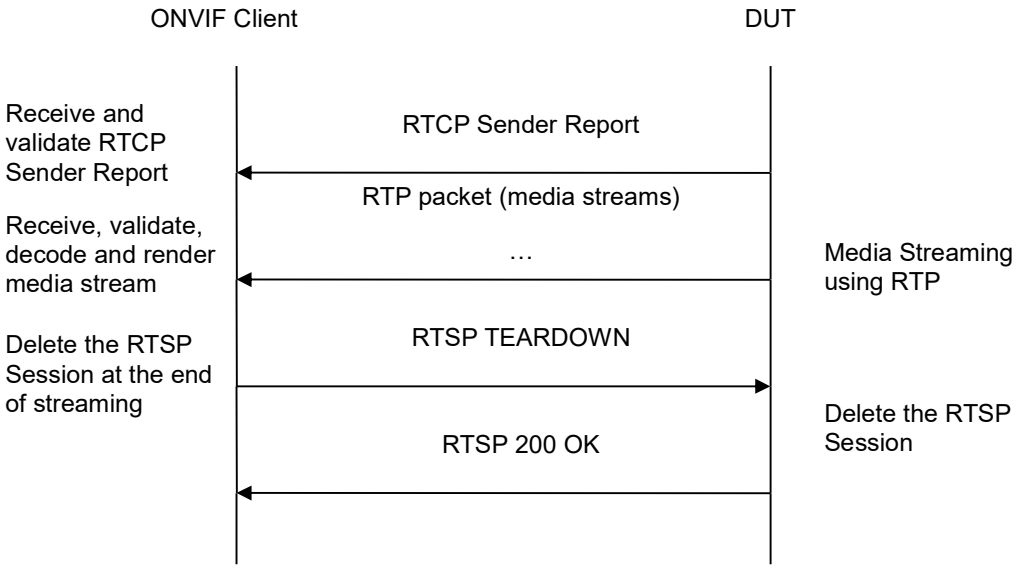
Test Propose: To verify H.264 media streaming based on RTP-Multicast/UDP Transport for IPv4.

Pre-Requisite: Media is supported by DUT and H.264 is implemented by DUT. Real-time streaming supported by DUT. A media profile with H.264 video encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest (H264, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1, force persistence = false)
Set H.264 video encoding and multicast settings
Modify H.264 video encoding and multicast settings
SetVideoEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP")
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For video, RTP-Multicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with H.264 video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = "H.264", Resolution = ["Width", "Height"], Quality = q1, GovLength = g1, Session Timeout = t1 and force persistence = false). The parameter of H264Profile is set the highest value that DUT supports as the order is High/Extended/Main/Baseline. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.4.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP"**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Multicast/UDP**.
12. The DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.

14. The DUT sends 200 OK message and starts media streaming.
15. The DUT sends H.264 RTP multicast media stream to multicast IPv4 address over UDP.
16. The DUT sends RTCP sender report to ONVIF Client.
17. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send H.264 RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.44 MEDIA STREAMING – JPEG (RTP-Multicast/UDP, IPv6)

Test Label: Real Time Viewing DUT JPEG Media Streaming Using RTP-Multicast/UDP Transport for IPv6.

Test Case ID: RTSS-1-2-16

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, JPEG over RTP, Stream control, RTSP

Command Under Test: None

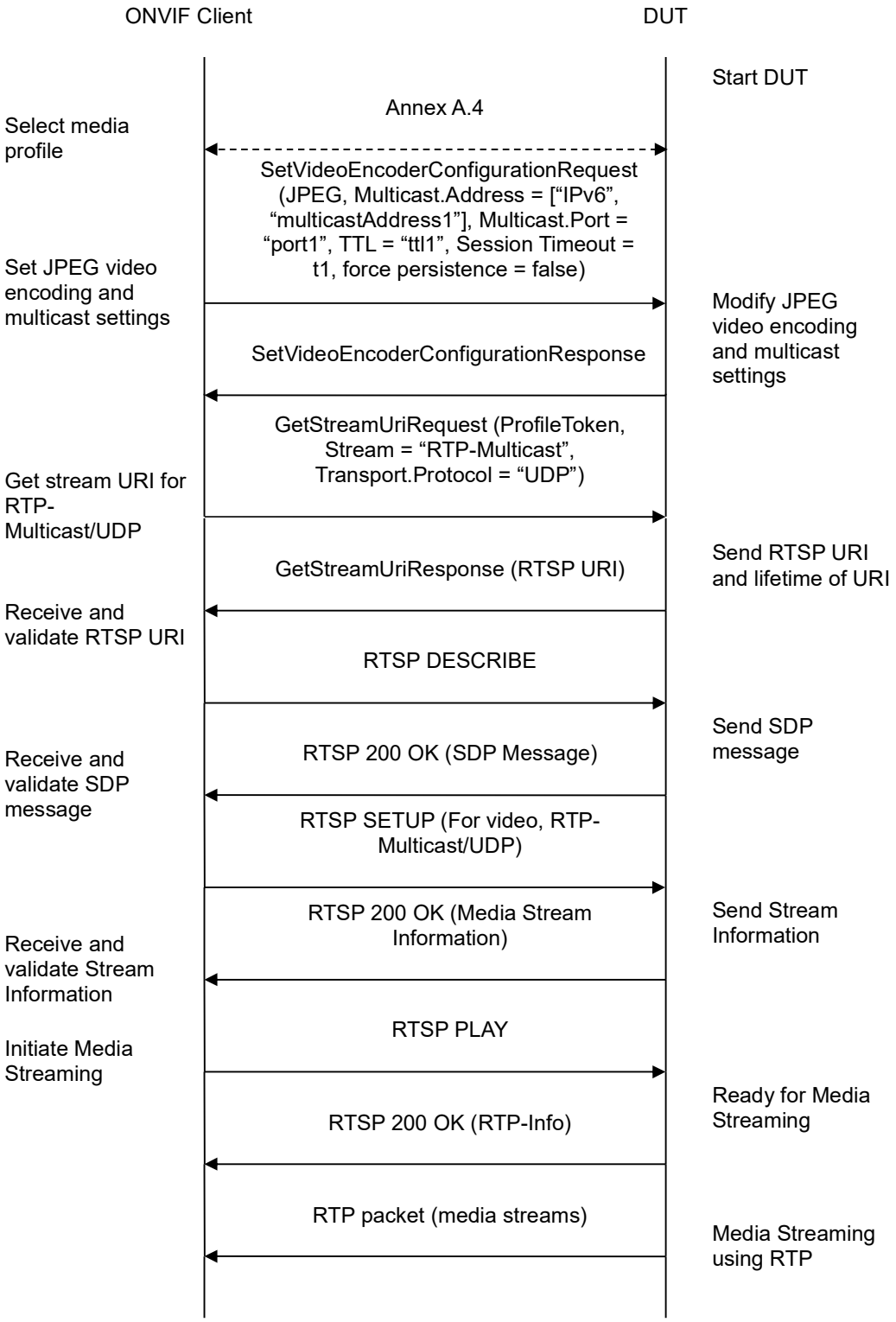
WSDL Reference: None

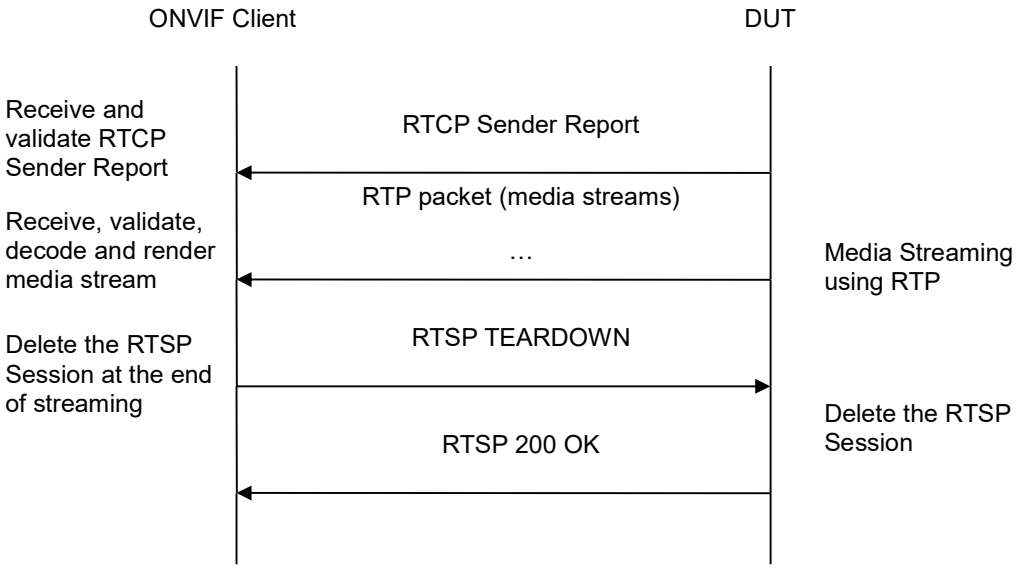
Test Propose: To verify JPEG media streaming based on RTP-Multicast/UDP Transport for IPv6.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. A media profile with JPEG video encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command. IPv6 network interface is turned on.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest (JPEG, Multicast.Address = ["IPv6", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1, force persistence = false)
Set JPEG video encoding and multicast settings
Modify JPEG video encoding and multicast settings
SetVideoEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP")
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For video, RTP-Multicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv6”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set JPEG encoding and Multicast settings.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP”**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Multicast/UDP**.
12. The DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.

15. The DUT sends JPEG RTP multicast media stream to multicast IPv6 address over UDP.
16. The DUT sends RTCP sender report to ONVIF Client.
17. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send JPEG RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.45 MEDIA STREAMING – MPEG4 (RTP-Multicast/UDP, IPv6)

Test Label: Real Time Viewing DUT MPEG4 Media Streaming Using RTP-Multicast/UDP Transport for IPv6.

Test Case ID: RTSS-1-2-17

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

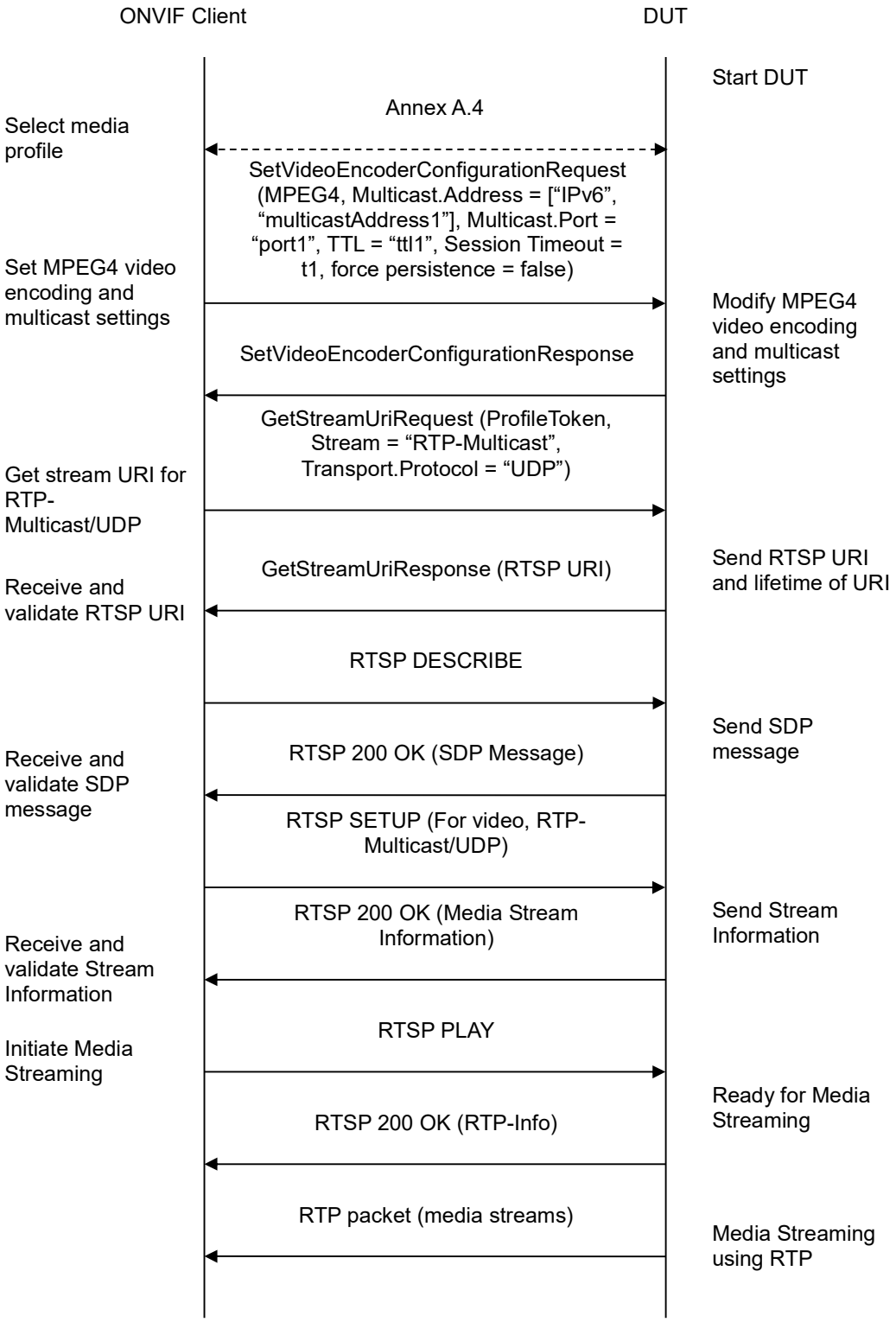
WSDL Reference: None

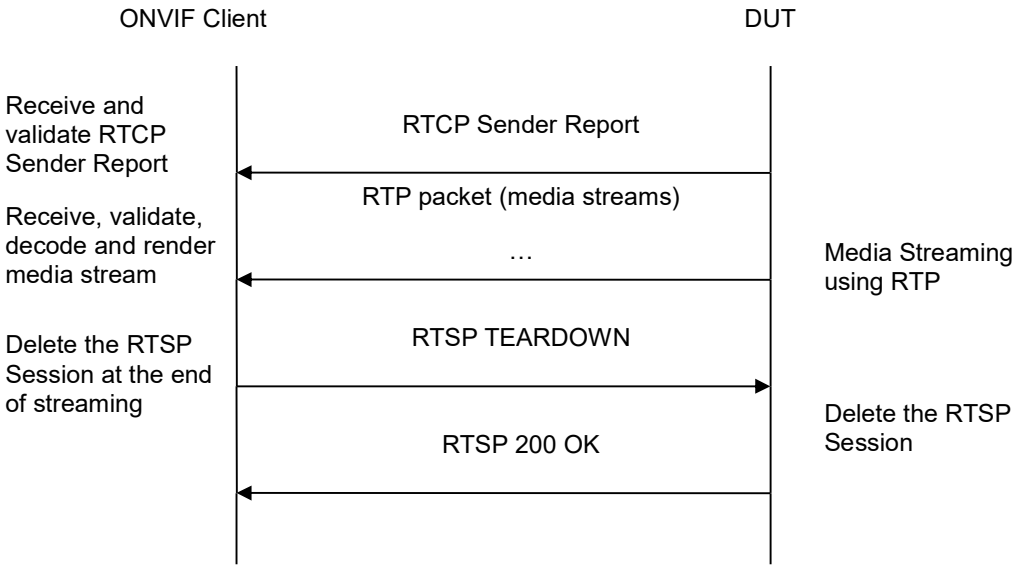
Test Propose: To verify MPEG4 media streaming based on RTP-Multicast/UDP Transport for IPv6.

Pre-Requisite: Media is supported by DUT and MPEG4 is implemented by DUT. Real-time streaming supported by DUT. A media profile with MPEG4 video encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest (MPEG4, Multicast.Address = [“IPv6”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1, force persistence = false)
Set MPEG4 video encoding and multicast settings
Modify MPEG4 video encoding and multicast settings
SetVideoEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP”)
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For video, RTP-Multicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with MPEG4 video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (Encoding = “MPEG4”, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv6”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set MPEG4 encoding and Multicast settings.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP”**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Multicast/UDP**.
12. The DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.

15. The DUT sends MPEG4 RTP multicast media stream to multicast IPv6 address over UDP.
16. The DUT sends RTCP sender report to ONVIF Client.
17. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send MPEG4 RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.46 MEDIA STREAMING – H.264 (RTP-Multicast/UDP, IPv6)

Test Label: Real Time Viewing DUT H.264 Media Streaming Using RTP-Multicast/UDP Transport for IPv6.

Test Case ID: RTSS-1-2-18

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

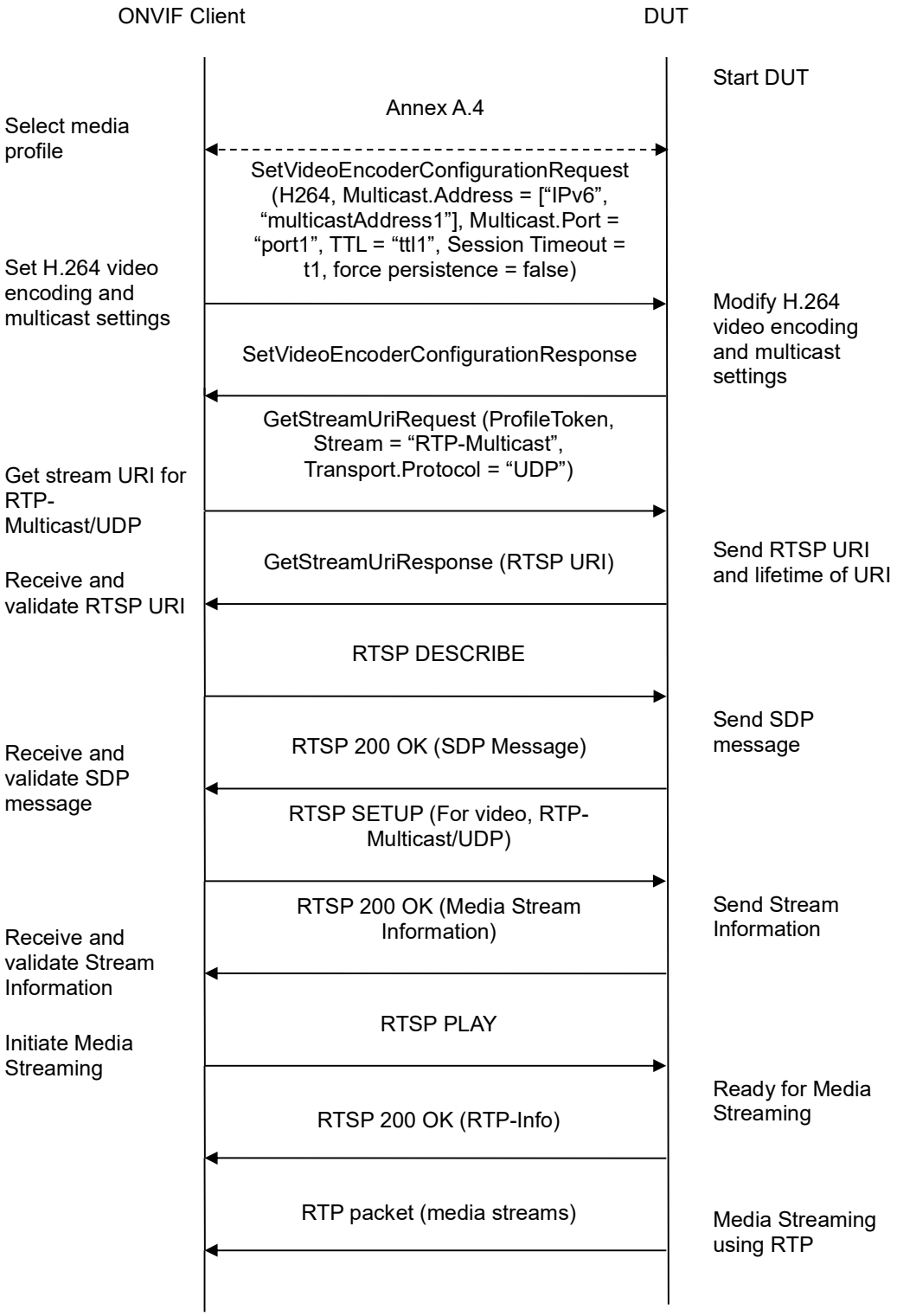
WSDL Reference: None

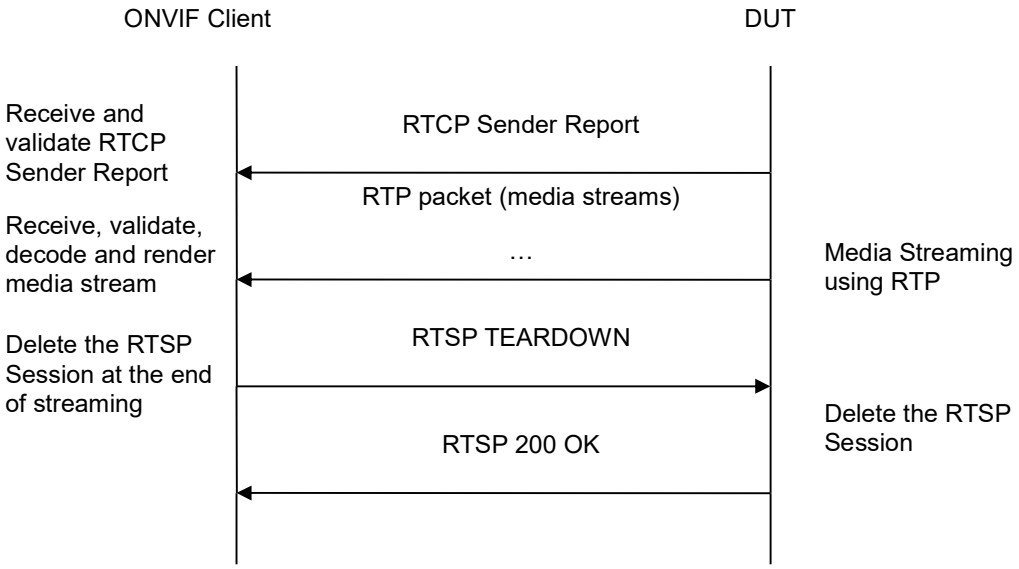
Test Propose: To verify H.264 media streaming based on RTP-Multicast/UDP Transport for IPv6.

Pre-Requisite: Media is supported by DUT and H.264 is implemented by DUT. Real-time streaming supported by DUT. A media profile with H.264 video encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.4
Select media profile
SetVideoEncoderConfigurationRequest (H264, Multicast.Address = ["IPv6", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1, force persistence = false)
Set H.264 video encoding and multicast settings
Modify H.264 video encoding and multicast settings
SetVideoEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP")
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For video, RTP-Multicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with H.264 video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (Encoding = “H264”, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv6”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set H.264 encoding and Multicast settings.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP”**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Multicast/UDP**.
12. The DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.

15. The DUT sends H.264 RTP multicast media stream to multicast IPv6 address over UDP.
16. The DUT sends RTCP sender report to ONVIF Client.
17. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send H.264 RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.47 VIDEO ENCODER CONFIGURATION – MULTICAST PORT (IPv4)

Test Label: Video Encoder Configuration - Multicast Port (IPv4).

Test Case ID: RTSS-1-2-19

ONVIF Core Specification Coverage: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, Start multicast streaming, Stop multicast streaming

Command Under Test: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, StartMulticastStreaming, StopMulticastStreaming

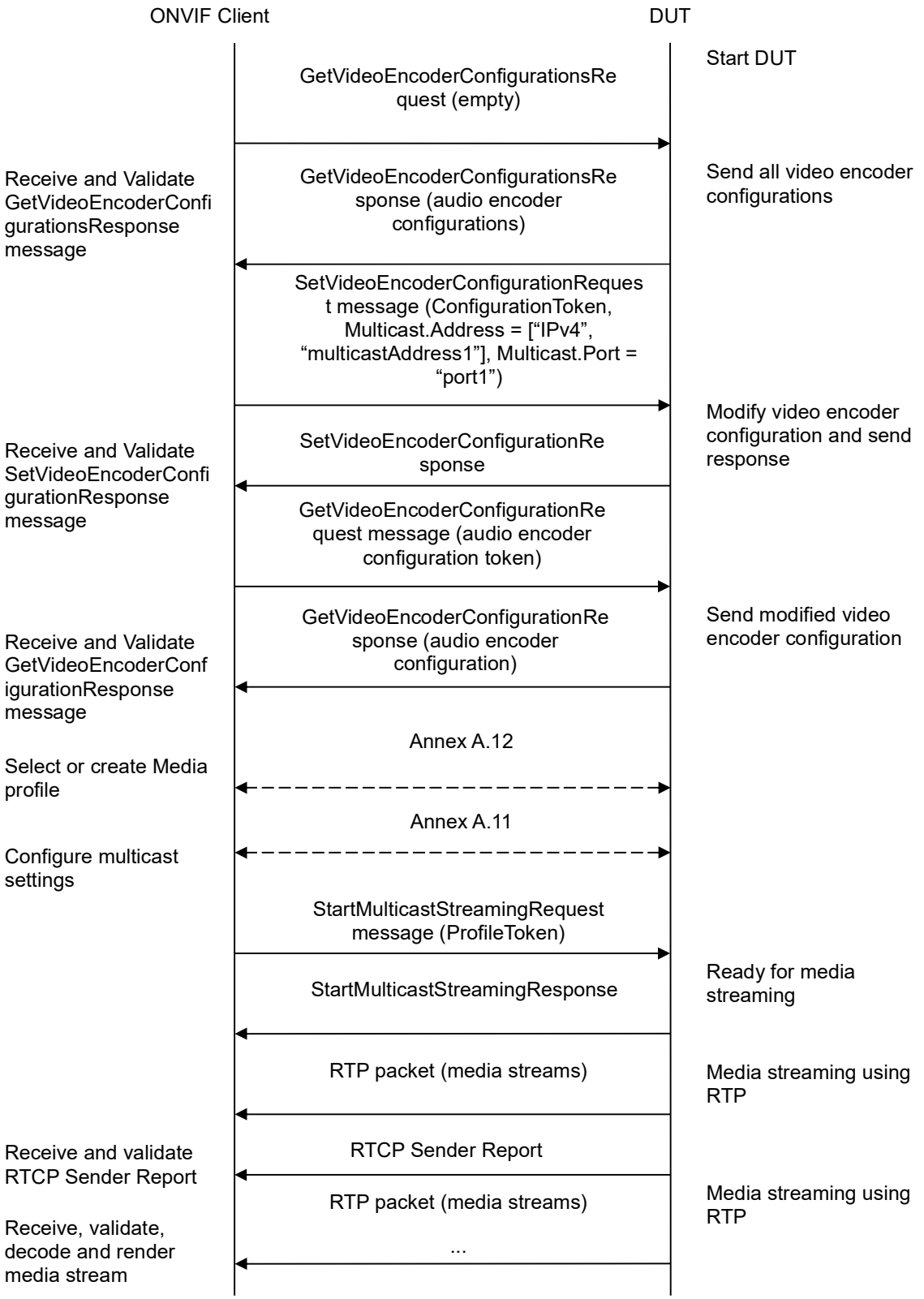
WSDL Reference: media.wsdl

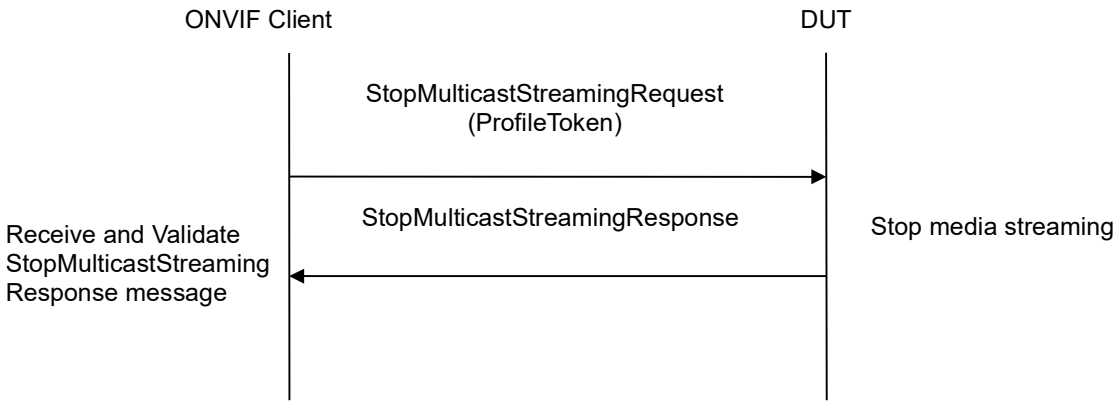
Test Purpose: To verify changing and applying of Multicast port and address for Video Encoder Configuration in case of the same Multicast addresses and different Multicast ports for all Video Encoder Configurations.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
GetVideoEncoderConfigurationsRequest (empty)
GetVideoEncoderConfigurationsResponse (audio encoder configurations)
Receive and Validate GetVideoEncoderConfigurationsResponse message
Send all video encoder configurations
SetVideoEncoderConfigurationRequest message (ConfigurationToken, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1")
Modify video encoder configuration and send response
SetVideoEncoderConfigurationResponse
Receive and Validate SetVideoEncoderConfigurationResponse message
GetVideoEncoderConfigurationRequest message (audio encoder configuration token)
GetVideoEncoderConfigurationResponse (audio encoder configuration)
Send modified video encoder configuration
Receive and Validate GetVideoEncoderConfigurationResponse message
Annex A.12
Select or create Media profile
Annex A.11
Configure multicast settings
StartMulticastStreamingRequest message (ProfileToken)
StartMulticastStreamingResponse
Ready for media streaming
RTP packet (media streams)
Media streaming using RTP
RTCP Sender Report
Receive and validate RTCP Sender Report
RTP packet (media streams)
Media streaming using RTP
Receive, validate, decode and render media stream
...



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes GetVideoEncoderConfigurationsRequest message to retrieve video configuration list.
4. Verify the GetVideoEncoderConfigurationsResponse message.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, where VECToken1 is first video encoder configuration token from GetVideoEncoderConfigurationsResponse message) to change multicast port and address for video encoder configuration.
6. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
7. ONVIF Client invokes GetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1) to get video encoder configuration.
8. Verify the GetVideoEncoderConfigurationResponse message (ConfigurationToken = Token1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”) from the DUT. Check that new setting for Multicast.Port and Multicast.Address was applied.
9. Repeat steps 5-8 for the rest Video Encoder configurations supported by the DUT with using different multicast ports and the same multicast addresses for Video Encoder Configurations.
10. Find or create media profile with Video Source Configuration and Video Encoder Configuration with token VECToken1 (see Annex A.12). If it is not possible skip steps 11-19 and go to the step 20.
11. Configure multicast settings for other entities from profile if required (see Annex A.11).
12. ONVIF Client invokes StartMulticastStreamingRequest message (ProfileToken = [profile token from the step 10]) to start multicast streaming.
13. Verify the StartMulticastStreamingResponse from the DUT.
14. The DUT sends video RTP multicast media stream to multicast IPv4 address over UDP.

15. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
16. ONVIF Client validates that specified multicast address and port are used.
17. ONVIF Client invokes StopMulticastStreamingRequest message (ConfigurationToken ProfileToken = [profile token from the step 10]) to stop multicast streaming from specified port.
18. Verify the StopMulticastStreamingResponse from the DUT.
19. Repeat steps 10-19 for the rest Video Encoder configuration supported by the DUT.
20. Restore Video Encoder Configurations settings.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

The DUT did not send valid GetVideoEncoderConfigurationsResponse message.

The DUT did not send valid SetVideoEncoderConfigurationResponse message.

The DUT did not send valid GetVideoEncoderConfigurationResponse message with new Multicast.Address and Multicast.Port values that were set during steps 5-6.

The DUT did not send valid StartMulticastStreamingResponse message.

The DUT did not send valid video stream to specified multicast address and port.

The DUT did not send valid StopMulticastStreamingResponse message.

It is not possible to find or create profile for all Video Encoder Configurations.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.48 VIDEO ENCODER CONFIGURATION – MULTICAST ADDRESS (IPv4)

Test Label: Video Encoder Configuration - Multicast Address (IPv4).

Test Case ID: RTSS-1-2-20

ONVIF Core Specification Coverage: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, Start multicast streaming, Stop multicast streaming

Command Under Test: SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, StartMulticastStreaming, StopMulticastStreaming

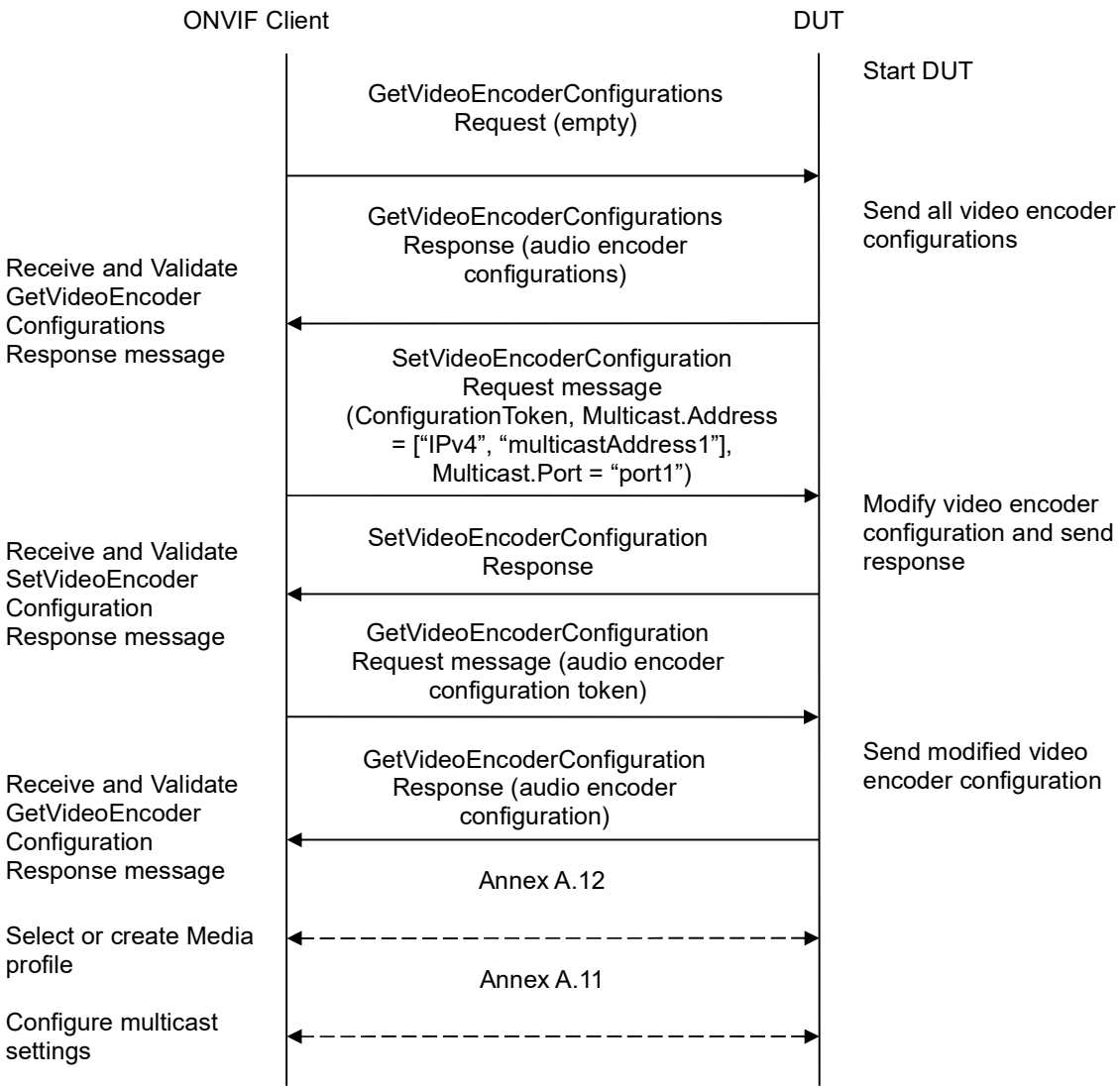
WSDL Reference: media.wsdl

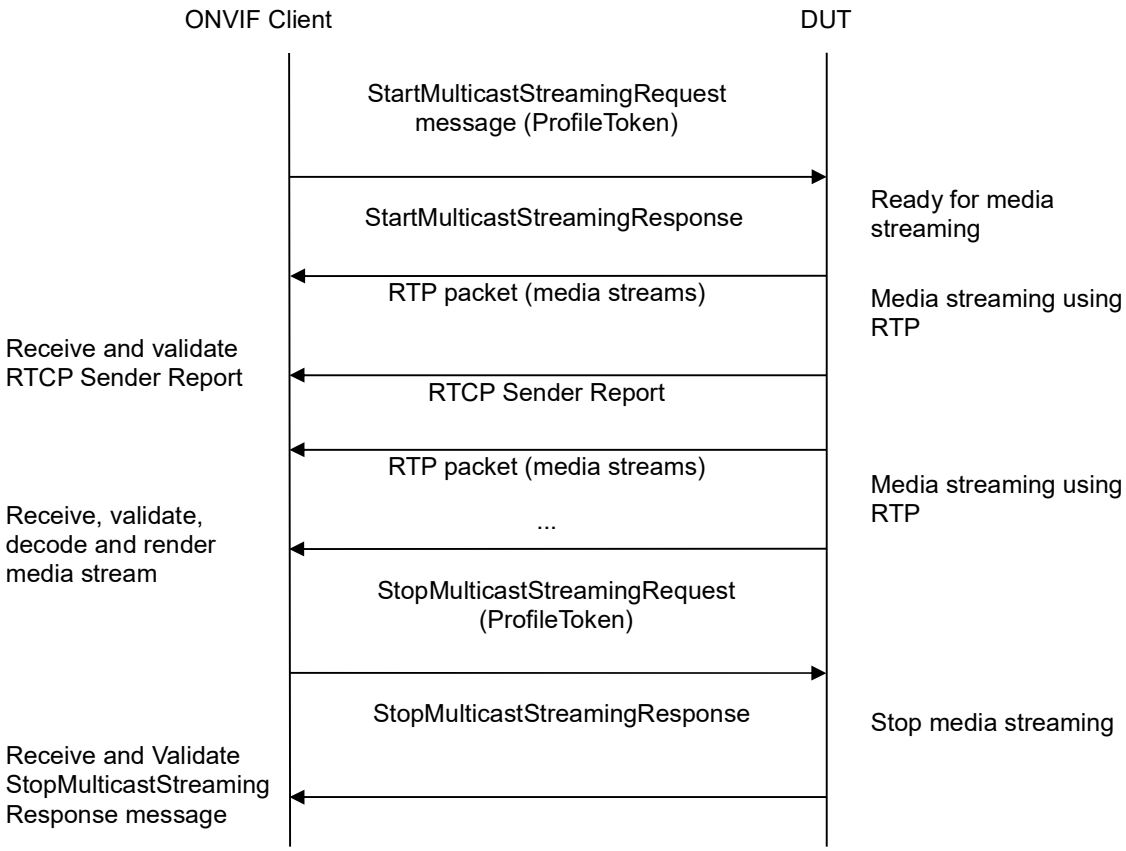
Test Purpose: To verify changing and applying of Multicast port and address for Video Encoder Configuration in case of the same Multicast port and different Multicast address for all Video Encoder Configurations.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:





Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes GetVideoEncoderConfigurationsRequest message to retrieve video configuration list.
4. Verify the GetVideoEncoderConfigurationsResponse message.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, where VECToken1 is first video encoder configuration token from GetVideoEncoderConfigurationsResponse message) to change multicast port and address for video encoder configuration.
6. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
7. ONVIF Client invokes GetVideoEncoderConfigurationRequest message (ConfigurationToken = VECToken1) to get video encoder configuration.
8. Verify the GetVideoEncoderConfigurationResponse message (ConfigurationToken = Token1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”) from the DUT. Check that new setting for Multicast.Port and Multicast.Address was applied.

9. Repeat steps 5-8 for the rest Video Encoder configurations supported by the DUT with using different multicast addresses and the same multicast port for Video Encoder Configurations.
10. Find or create media profile with Video Source Configuration and Video Encoder Configuration with token VECToken1 (see Annex A.12). If it is not possible skip steps 11-19 and go to the step 20.
11. Configure multicast settings for other entities from profile if required (see Annex A.11).
12. ONVIF Client invokes StartMulticastStreamingRequest message (ProfileToken = [profile token from the step 10]) to start multicast streaming.
13. Verify the StartMulticastStreamingResponse from the DUT.
14. The DUT sends video RTP multicast media stream to multicast IPv4 address over UDP.
15. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
16. ONVIF Client validates that specified multicast address and port are used.
17. ONVIF Client invokes StopMulticastStreamingRequest message (ConfigurationToken ProfileToken = [profile token from the step 10]) to stop multicast streaming from specified port.
18. Verify the StopMulticastStreamingResponse from the DUT.
19. Repeat steps 10-19 for the rest Video Encoder configuration supported by the DUT.
20. Restore Video Encoder Configurations settings.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

The DUT did not send valid GetVideoEncoderConfigurationsResponse message.

The DUT did not send valid SetVideoEncoderConfigurationResponse message.

The DUT did not send valid GetVideoEncoderConfigurationResponse message with new Multicast.Address and Multicast.Port values that were set during steps 5-6.

The DUT did not send valid StartMulticastStreamingResponse message.

The DUT did not send valid video stream to specified multicast address and port.

The DUT did not send valid StopMulticastStreamingResponse message.

It is not possible to find or create profile for all Video Encoder Configurations.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.49 VIDEO ENCODER CONFIGURATION – MULTICAST ADDRESS AND PORT IN RTSP SETUP (IPv4)

Test Label: Video Encoder Configuration – Multicast Address And Port In RTSP SETUP (IPv4).

Test Case ID: RTSS-1-2-21

ONVIF Core Specification Coverage: Multicast streaming

Command Under Test: none

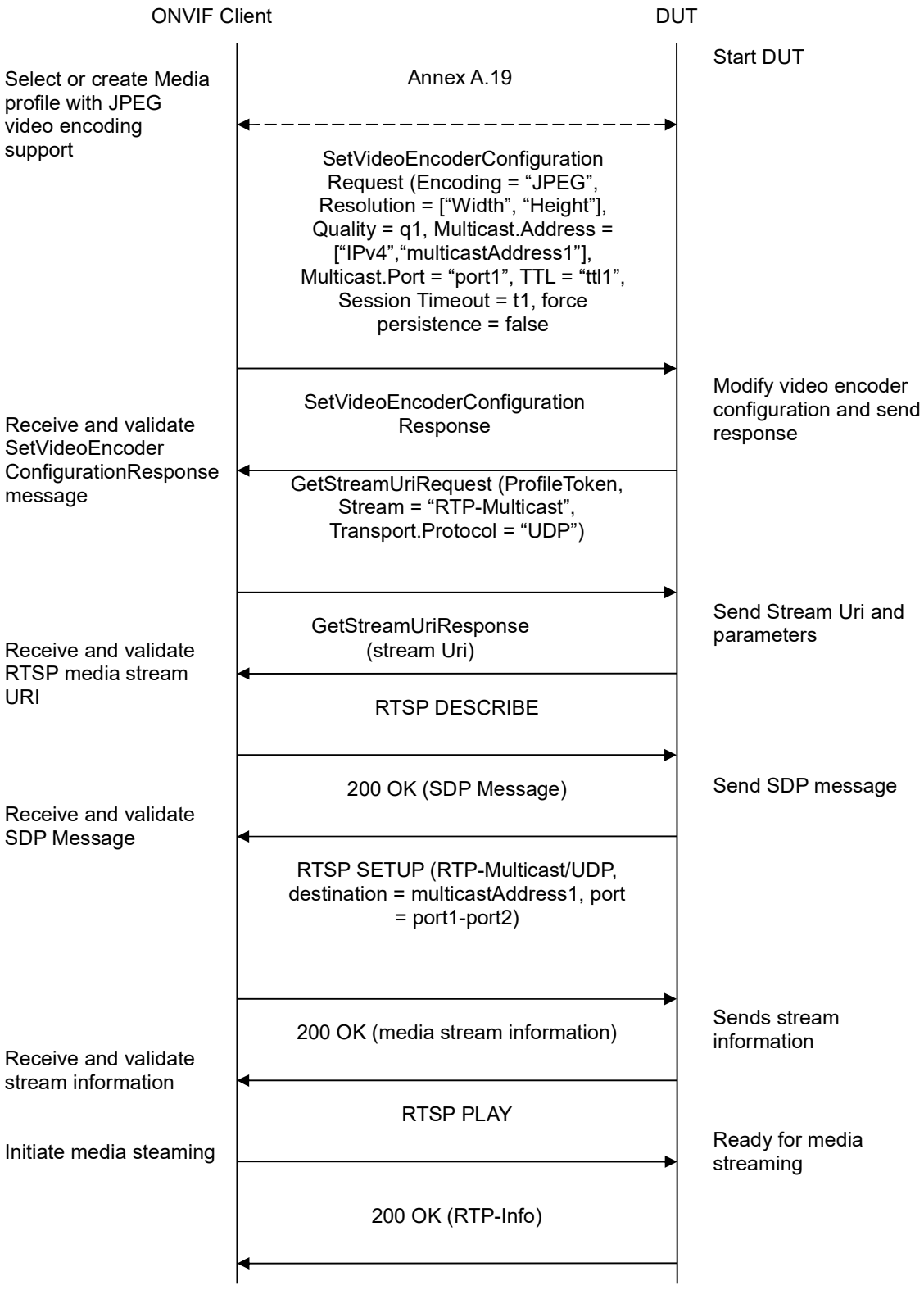
WSDL Reference: media.wsdl

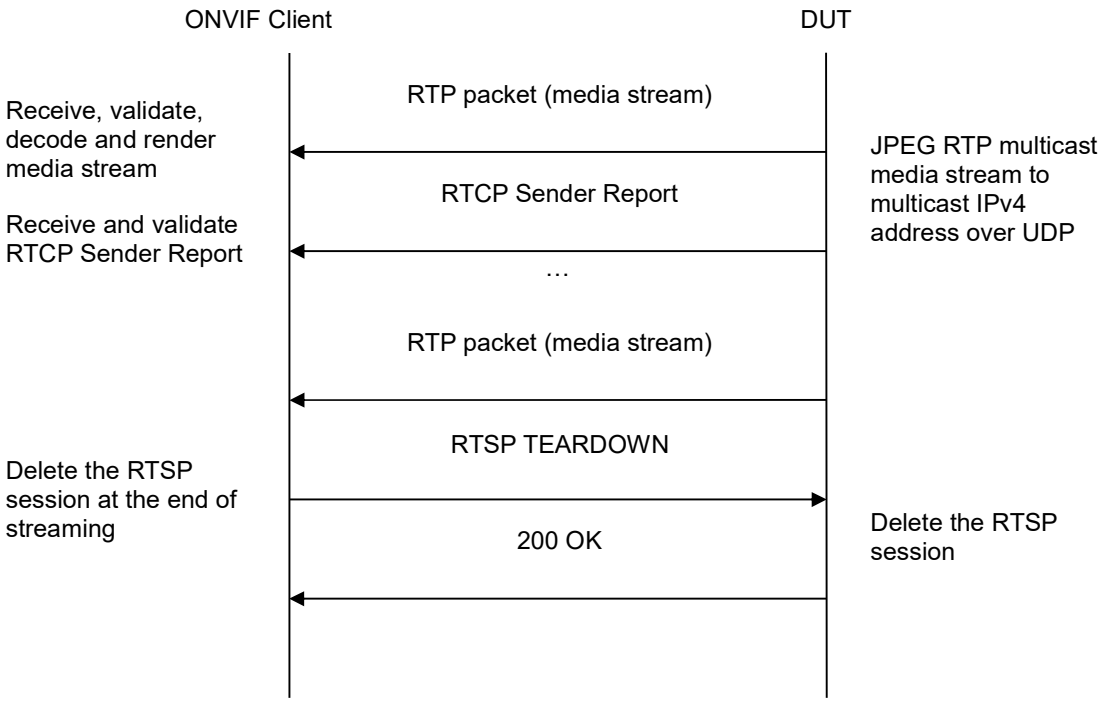
Test Purpose: To verify possibility to use multicast address and port during RTSP SETUP as set in Video Encoder Configuration (IPv4).

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT. RTP-Multicast/UDP transport protocol is supported by the DUT. A media profile with JPEG video encoder configuration exists.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Select or create Media profile with JPEG video encoding support
Annex A.19
SetVideoEncoderConfiguration Request (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv4”,“multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1, force persistence = false
Modify video encoder configuration and send response
SetVideoEncoderConfiguration Response
Receive and validate SetVideoEncoder ConfigurationResponse message
GetStreamUriRequest (ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP”)
Send Stream Uri and parameters
GetStreamUriResponse (stream Uri)
Receive and validate RTSP media stream URI
RTSP DESCRIBE
Send SDP message
200 OK (SDP Message)
Receive and validate SDP Message
RTSP SETUP (RTP-Multicast/UDP, destination = multicastAddress1, port = port1-port2)
Sends stream information
200 OK (media stream information)
Receive and validate stream information
RTSP PLAY
Ready for media streaming
Initiate media steaming
200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.19.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set JPEG encoding and Multicast settings.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP”) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Multicast/UDP and destination = multicastAddress1, port = port1-port2.

12. The DUT sends 200 OK message and the media stream information. Verify that destination = multicastAddress1, port = port1-port2 was received.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.
15. The DUT sends JPEG RTP multicast media stream to multicast IPv4 address over UDP.
16. Verify that specified multicast port and address are used for streaming.
17. The DUT sends RTCP sender report to ONVIF Client.
18. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid Multicast address in RTSP 200 OK response for RTSP SETUP requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send JPEG RTP multicast media streaming for corresponding multicast IP and port.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.50 VIDEO ENCODER CONFIGURATION – MULTICAST ADDRESS AND PORT IN RTSP SETUP (IPv6)

Test Label: Set Multicast Port and Address Verification.

Test Case ID: RTSS-1-2-22

ONVIF Core Specification Coverage: Multicast streaming

Command Under Test: none

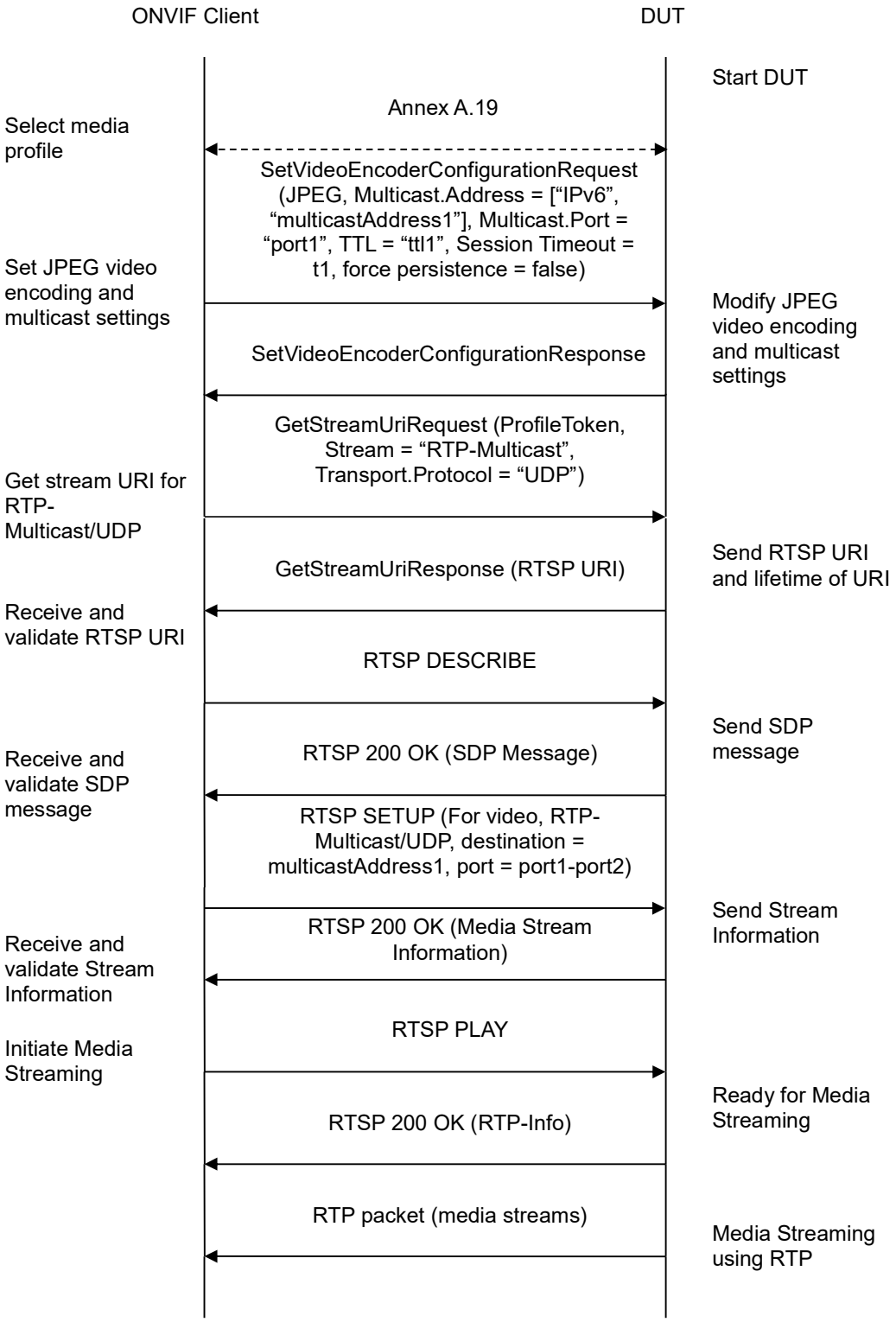
WSDL Reference: media.wsdl

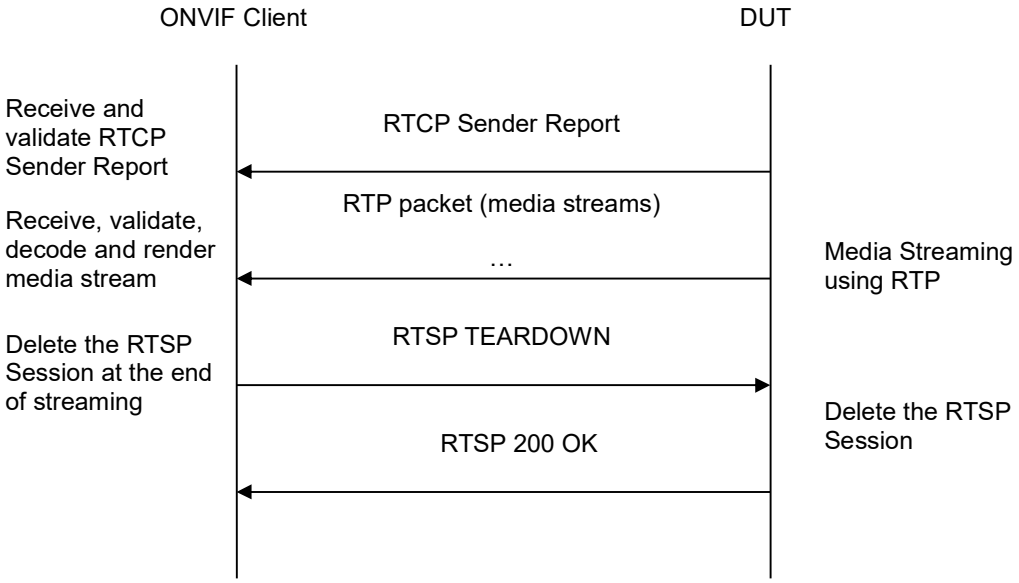
Test Purpose: To verify possibility to use multicast address and port during RTSP SETUP as set in Video Encoder Configuration (IPv6).

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT. RTP-Multicast/UDP transport protocol is supported by the DUT. A media profile with JPEG video encoder configuration exists. IPv6 is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.19
Select media profile
SetVideoEncoderConfigurationRequest (JPEG, Multicast.Address = [“IPv6”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1, force persistence = false)
Set JPEG video encoding and multicast settings
Modify JPEG video encoding and multicast settings
SetVideoEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP”)
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For video, RTP-Multicast/UDP, destination = multicastAddress1, port = port1-port2)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.19.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv6”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set JPEG encoding and Multicast settings.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP**”) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Multicast/UDP** and destination = multicastAddress1, port = port1-port2.

12. The DUT sends 200 OK message and the media stream information. Verify that destination = multicastAddress1, port = port1-port2 was received.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.
15. The DUT sends JPEG RTP multicast media stream to multicast IPv4 address over UDP.
16. Verify that specified multicast port and address are used for streaming.
17. The DUT sends RTCP sender report to ONVIF Client.
18. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid Multicast address in RTSP 200 OK response for RTSP SETUP requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send JPEG RTP multicast media streaming for corresponding multicast IP and port.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.1.51 MEDIA STREAMING – GUARANTEED NUMBER OF VIDEO ENCODER INSTANCES (RTP-Multicast/UDP) (ALL VIDEO SOURCE CONFIGURATIONS)

Test Label: Guaranteed Number Of Video Encoder Instances Verification (RTP-Multicast/UDP).

Driving IP-based physical security through global standardization

Test Case ID: RTSS-1-2-23

ONVIF Core Specification Coverage: GetGuaranteedNumberOfVideoEncoderInstances

Command Under Test: GetGuaranteedNumberOfVideoEncoderInstances

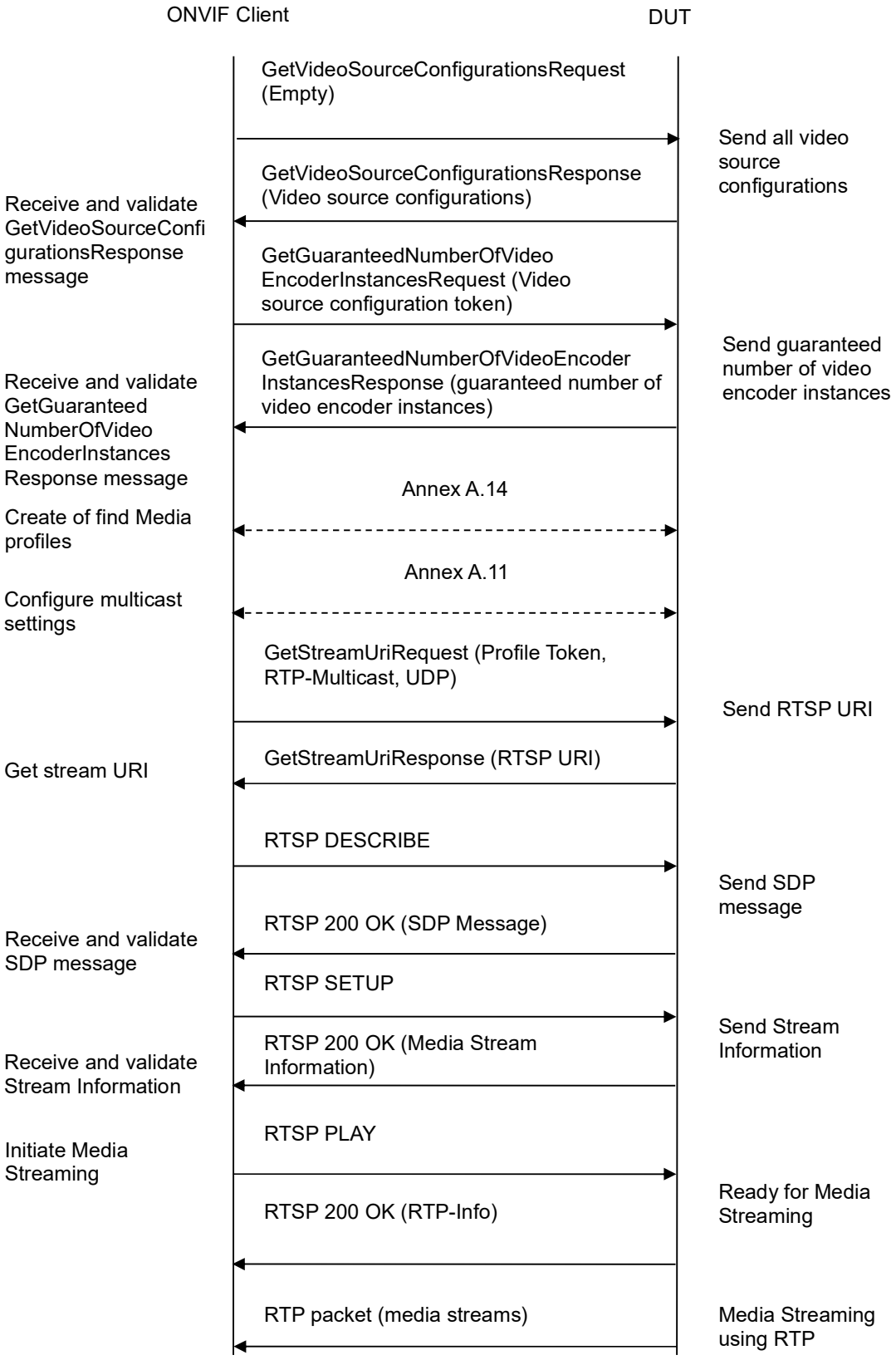
WSDL Reference: media.wsdl

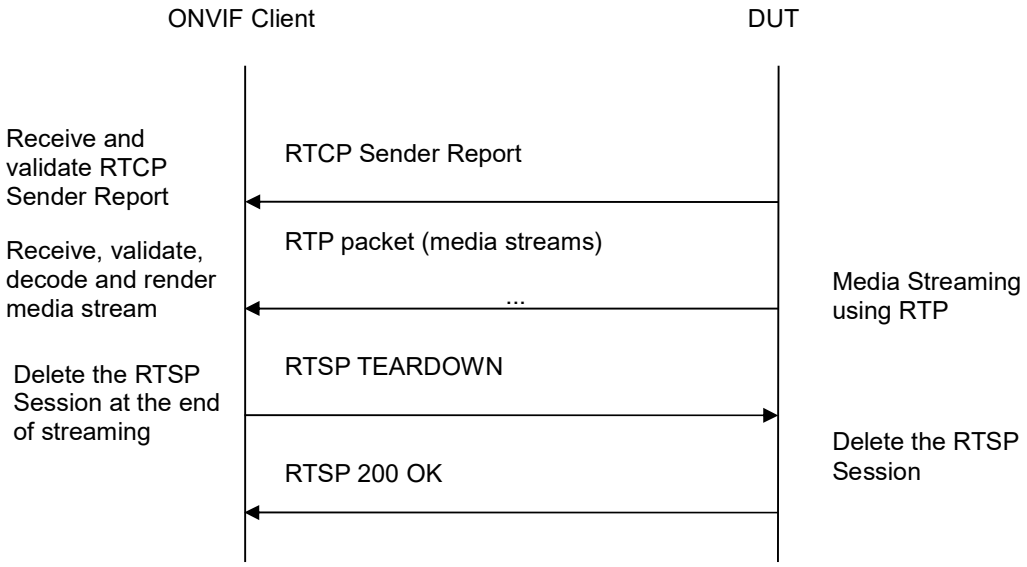
Test Purpose: To verify Guaranteed Number Of Video Encoder Instances (RTP-Multicast/UDP)

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
GetVideoSourceConfigurationsRequest (Empty)
Send all video source configurations
GetVideoSourceConfigurationsResponse (Video source configurations)
Receive and validate GetVideoSourceConfigurationsResponse message
GetGuaranteedNumberOfVideo EncoderInstancesRequest (Video source configuration token)
Send guaranteed number of video encoder instances
GetGuaranteedNumberOfVideoEncoder InstancesResponse (guaranteed number of video encoder instances)
Receive and validate GetGuaranteed NumberOfVideo EncoderInstances Response message
Annex A.14
Create of find Media profiles
Annex A.11
Configure multicast settings
GetStreamUriRequest (Profile Token, RTP-Multicast, UDP)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client will invoke GetVideoSourceConfigurationsRequest message to retrieve all DUT video source configurations.
4. Verify the GetVideoSourceConfigurationsResponse message from the DUT.
5. ONVIF Client will invoke GetGuaranteedNumberOfVideoEncoderInstancesRequest message (ConfigurationToken = “VSCToken1”, where “VSCToken1” is a first video source configuration token from GetVideoSourceConfigurationsResponse message) to retrieve guaranteed number of video encoder instances per first video source configuration.
6. Verify the GetGuaranteedNumberOfVideoEncoderInstancesResponse message from the DUT.
7. Create or find number of profiles equal to TotalNumber from GetGuaranteedNumberOfVideoEncoderInstancesResponse message that contains video source configuration with token “VSCToken1” and video encoder configuration (see Annex A.14).
8. Configure multicast settings for Multicast Address from profile (see Annex A.11).
9. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Multicast, UDP transport) to retrieve media stream URI for the first media profile from step 7.
10. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
11. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
12. ONVIF Client invokes RTSP DESCRIBE request.
13. DUT sends 200 OK message and SDP information.

14. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP-Multicast/UDP.
15. DUT sends 200 OK message and the media stream information.
16. ONVIF Client invokes RTSP PLAY request.
17. DUT sends 200 OK message and starts media streaming.
18. DUT sends JPEG RTP multicast media stream to ONVIF Client over UDP.
19. DUT sends RTCP sender report to ONVIF Client.
20. DUT validates the received RTP and RTCP packets, decodes and renders them.
21. Repeat steps 8-20 to start video streaming for all profiles from step 7.
22. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session for each started stream.
23. DUT sends 200 OK Response and terminates the RTSP Session.
24. Repeat steps 5-23 for the rest video source configuration.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

DUT did not send valid video stream.

DUT does not provide possibility to create TotalNumber of profiles for step 7.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: In case if there are more than one Media Profiles with the same Video Encoder Configuration, multicast streaming will be started only for one of them.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2 Audio Streaming

4.2.1 MEDIA STREAMING – G.711 (RTP-Unicast/UDP)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP-Unicast/UDP Transport.

Test Case ID: RTSS-2-1-19

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

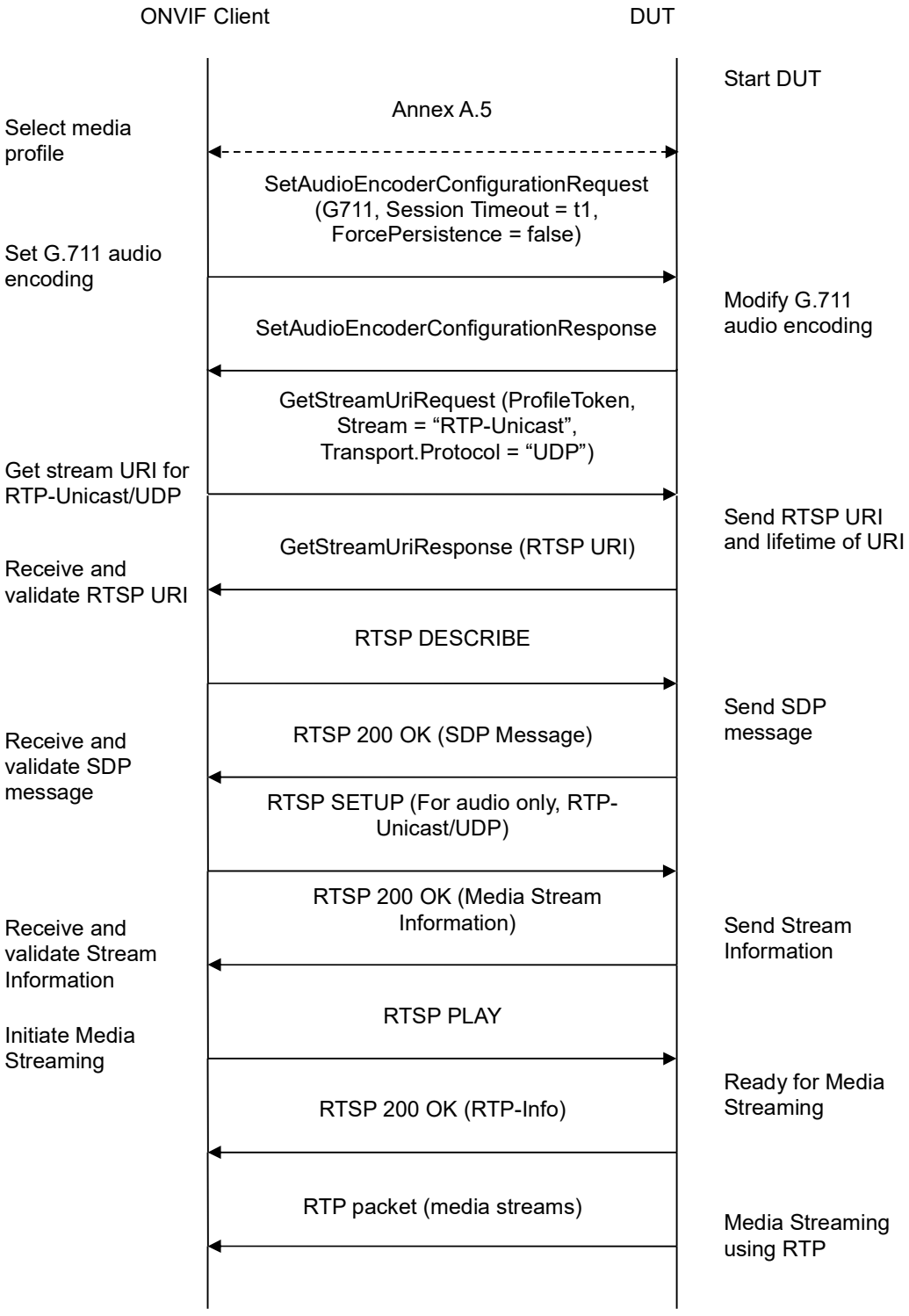
WSDL Reference: None

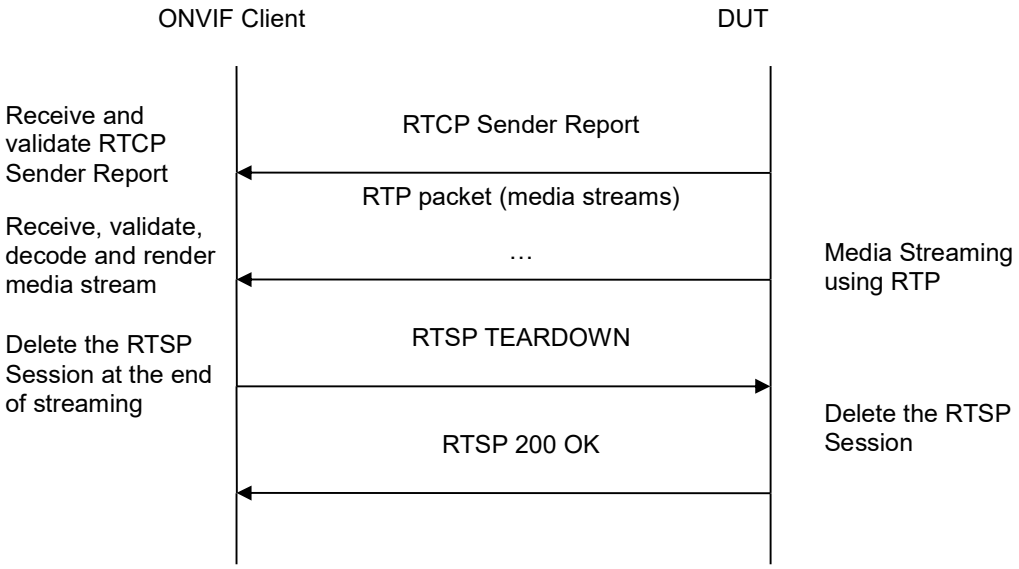
Test Propose: To verify G.711 media streaming based on RTP-Unicast/UDP Transport.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (G711, Session Timeout = t1, ForcePersistence = false)
Set G.711 audio encoding
Modify G.711 audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “UDP”)
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with G.711 encoding support.
4. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G711”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.711 encoding.
5. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “UDP”**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Unicast/UDP**.
12. The DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.
15. The DUT sends G.711 RTP media stream to ONVIF Client over UDP.

16. The DUT sends RTCP sender report to ONVIF Client.
17. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP media streaming to ONVIF Client.

The DUT sent not only G.711 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.2 MEDIA STREAMING – G.711 (RTP-Unicast/RTSP/HTTP/TCP)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP-Unicast/RTSP/HTTP/TCP Transport.

Test Case ID: RTSS-2-1-20

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP

Command Under Test: None

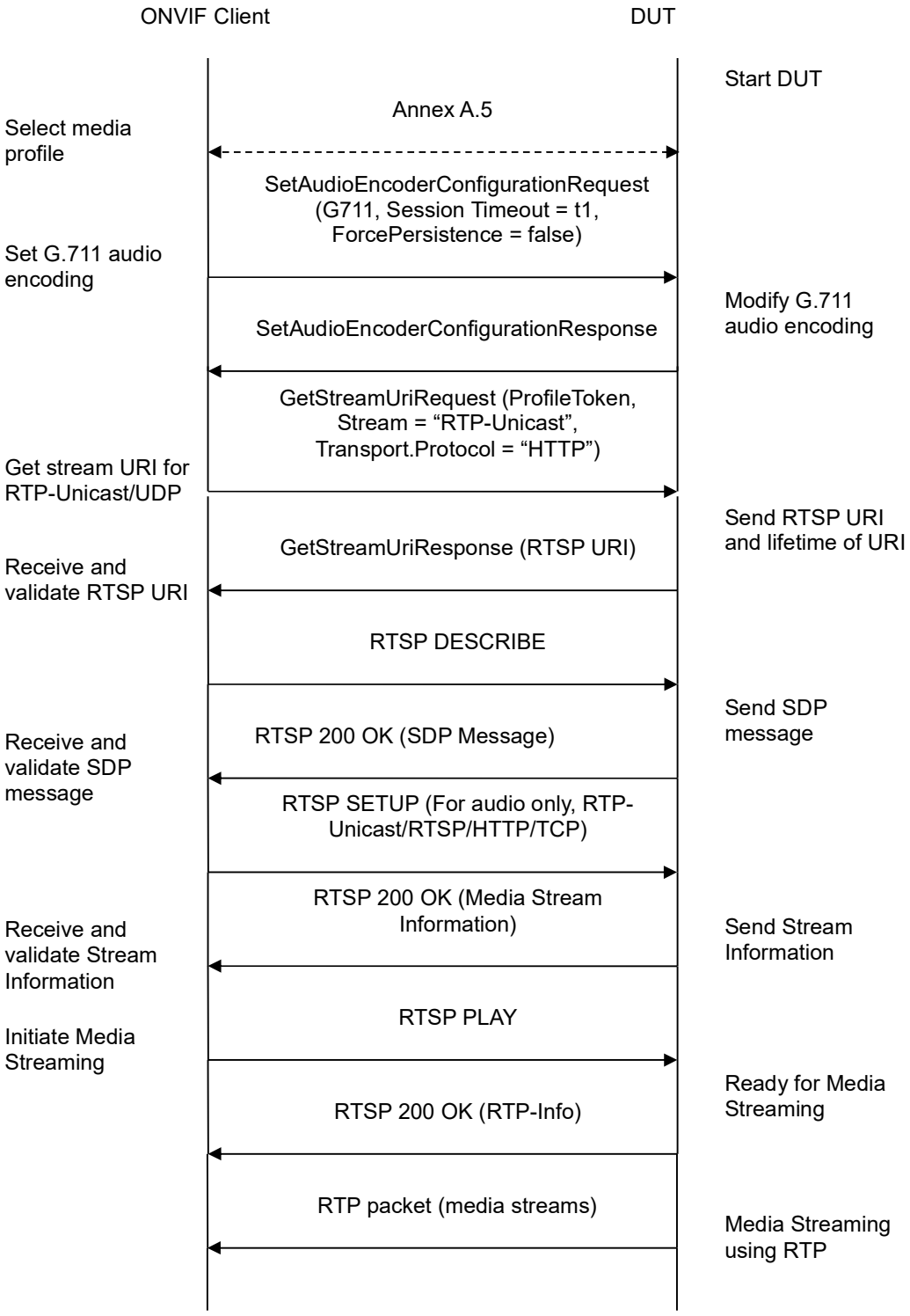
WSDL Reference: None

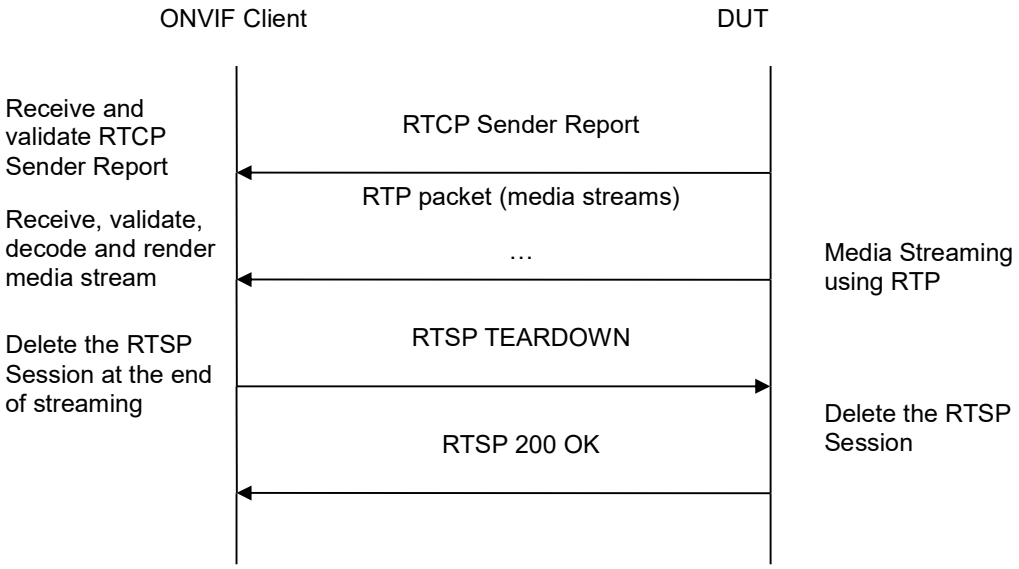
Test Propose: To verify G.711 media streaming based on RTP-Unicast/RTSP/HTTP/TCP Transport.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (G711, Session Timeout = t1, ForcePersistence = false)
Set G.711 audio encoding
Modify G.711 audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “HTTP”)
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/RTSP/HTTP/TCP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with G.711 encoding support.
4. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G711”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.711 encoding.
5. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “HTTP”**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Unicast/RTSP/HTTP/TCP.**
12. The DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.

15. The DUT sends G.711 RTP media stream to ONVIF Client over HTTP.
16. The DUT sends RTCP sender report to ONVIF Client.
17. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP media streaming to ONVIF Client.

The DUT sent not only G.711 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.3 MEDIA STREAMING – G.711 (RTP/RTSP/TCP)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP/RTSP/TCP Transport.

Test Case ID: RTSS-2-1-21

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

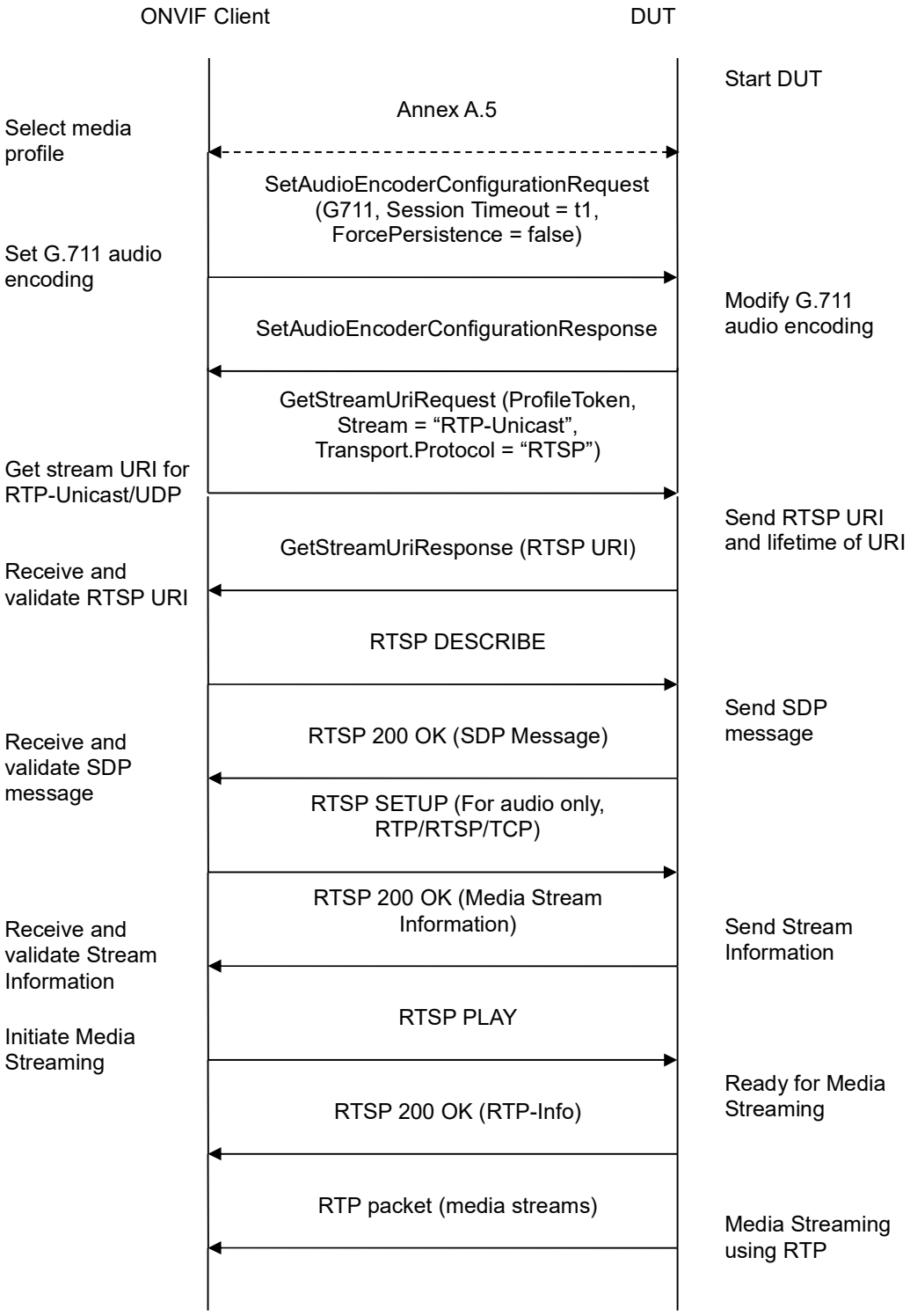
WSDL Reference: None

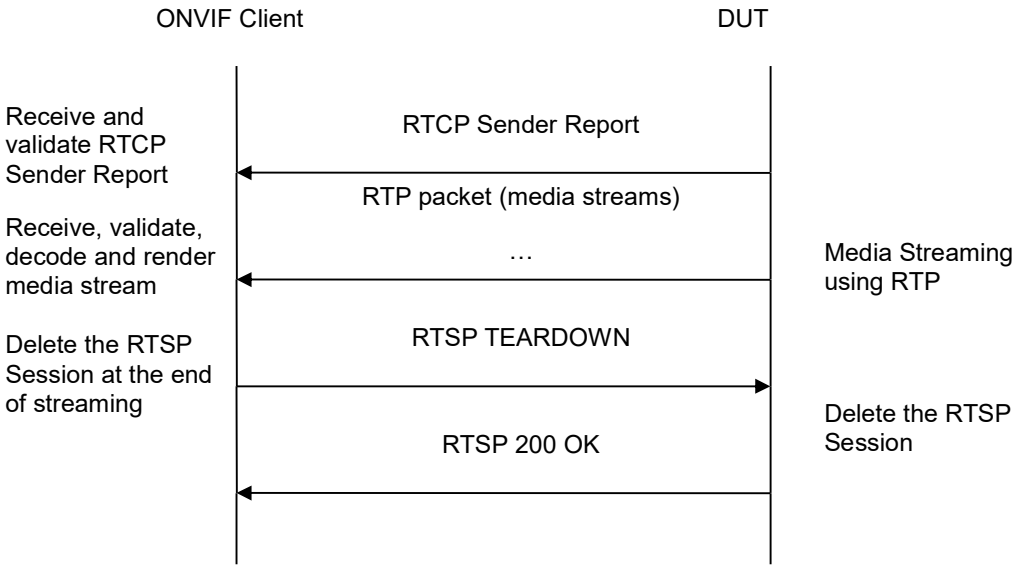
Test Propose: To verify G.711 media streaming based on RTP/RTSP/TCP Transport.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT. RTP/RTSP/TCP transport protocol is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (G711, Session Timeout = t1, ForcePersistence = false)
Set G.711 audio encoding
Modify G.711 audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “RTSP”)
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP/RTSP/TCP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with G.711 encoding support.
4. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G711”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.711 encoding.
5. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “RTSP”**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP/RTSP/TCP**.
12. The DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.
15. The DUT sends G.711 RTP media stream to ONVIF Client over RTSP.

16. The DUT sends RTCP sender report to ONVIF Client.
17. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP media streaming to ONVIF Client.

The DUT sent not only G.711 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.4 MEDIA STREAMING – G.726 (RTP-Unicast/UDP)

Test Label: Real Time Viewing DUT G.726 Media Streaming Using RTP-Unicast/UDP Transport.

Test Case ID: RTSS-2-1-22

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

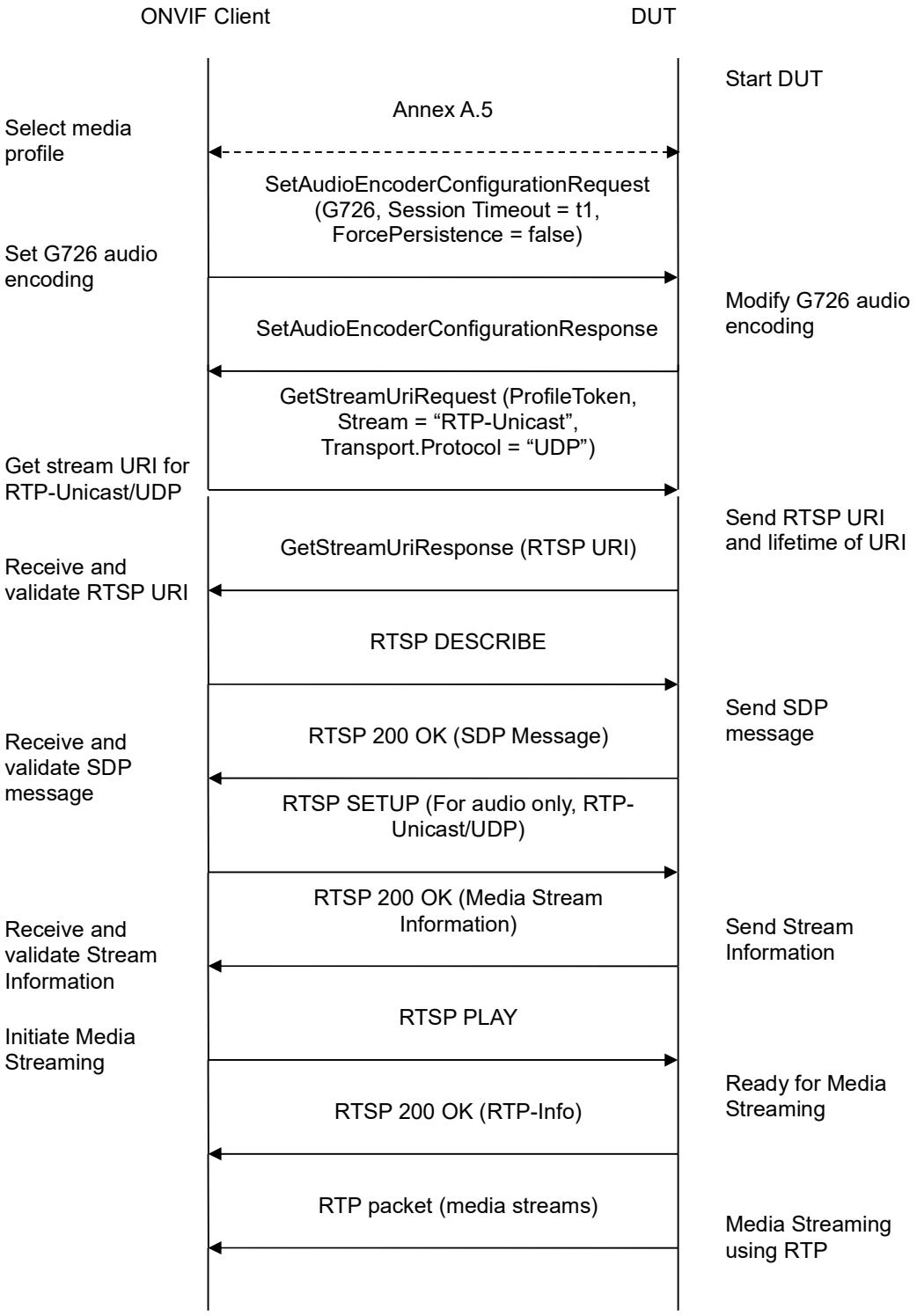
WSDL Reference: None

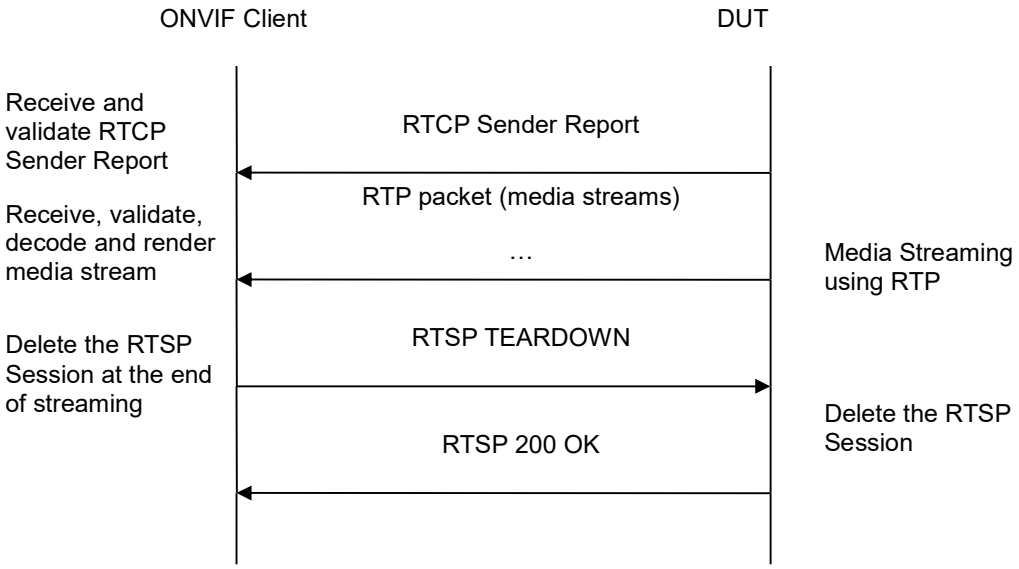
Test Propose: To verify G.726 media streaming based on RTP-Unicast/UDP Transport.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT and G.726 is implemented by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (G726, Session Timeout = t1, ForcePersistence = false)
Set G726 audio encoding
Modify G726 audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “UDP”)
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with G.726 encoding support.
4. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G726”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
5. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “UDP**”) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Unicast/UDP**.
12. The DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.
15. The DUT sends G.726 RTP media stream to ONVIF Client over UDP.

16. The DUT sends RTCP sender report to ONVIF Client.
17. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.726 RTP media streaming to ONVIF Client.

The DUT sent not only G.726 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.5 MEDIA STREAMING – G.726 (RTP-Unicast/RTSP/HTTP/TCP)

Test Label: Real Time Viewing DUT G.726 Media Streaming Using RTP-Unicast/RTSP/HTTP/TCP Transport.

Test Case ID: RTSS-2-1-23

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP

Command Under Test: None

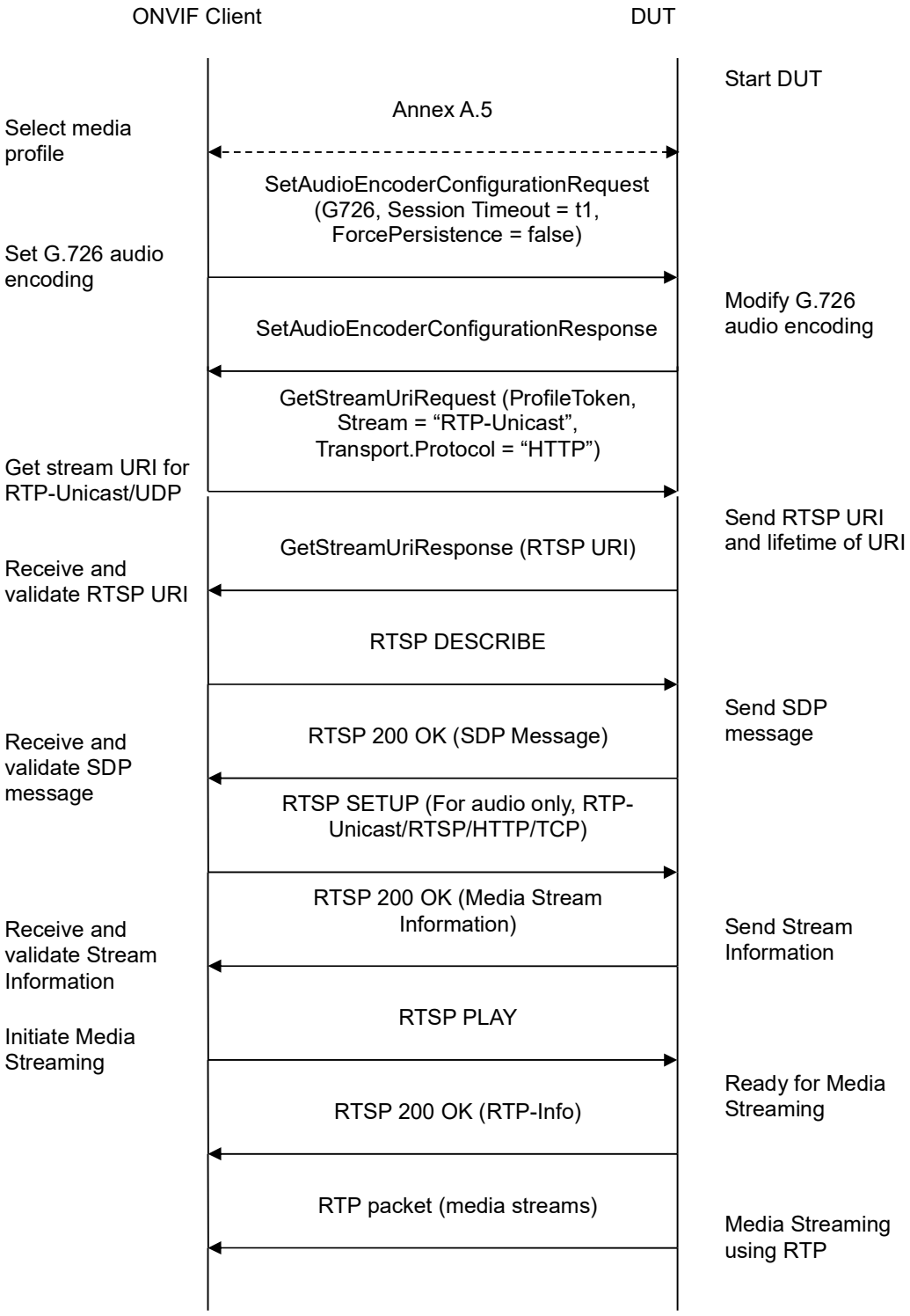
WSDL Reference: None

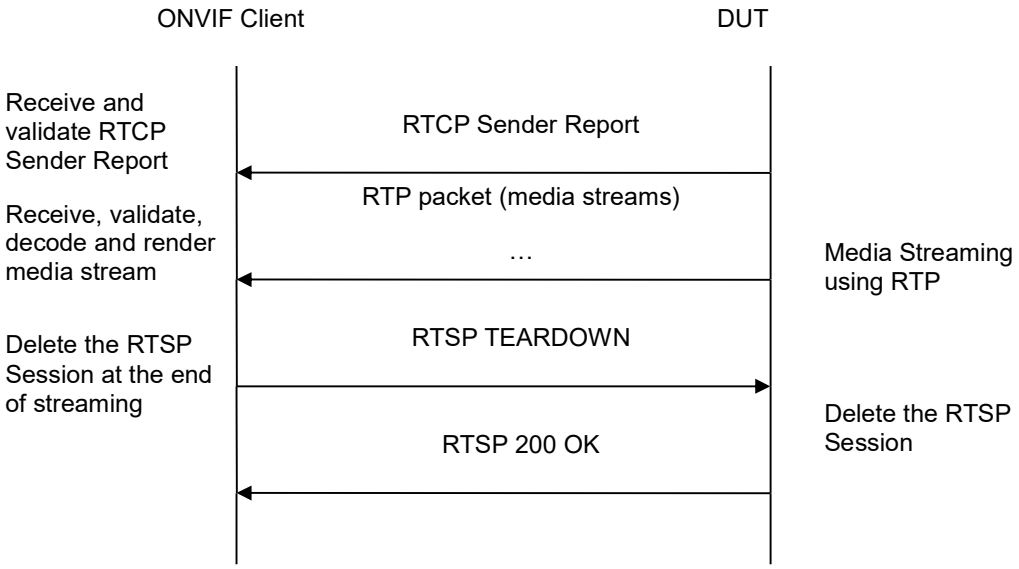
Test Propose: To verify G.726 media streaming based on RTP-Unicast/RTSP/HTTP/TCP Transport.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT and G.726 is implemented by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (G726, Session Timeout = t1, ForcePersistence = false)
Set G.726 audio encoding
Modify G.726 audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “HTTP”)
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/RTSP/HTTP/TCP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with G.726 encoding support.
4. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G726”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
5. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “HTTP”**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Unicast/RTSP/HTTP/TCP**.
12. The DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.

15. The DUT sends G.726 RTP media stream to ONVIF Client over HTTP.
16. The DUT sends RTCP sender report to ONVIF Client.
17. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.726 RTP media streaming to ONVIF Client.

The DUT sent not only G.726 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.6 MEDIA STREAMING – G.726 (RTP/RTSP/TCP)

Test Label: Real Time Viewing DUT G.726 Media Streaming Using RTP/RTSP/TCP Transport.

Test Case ID: RTSS-2-1-24

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

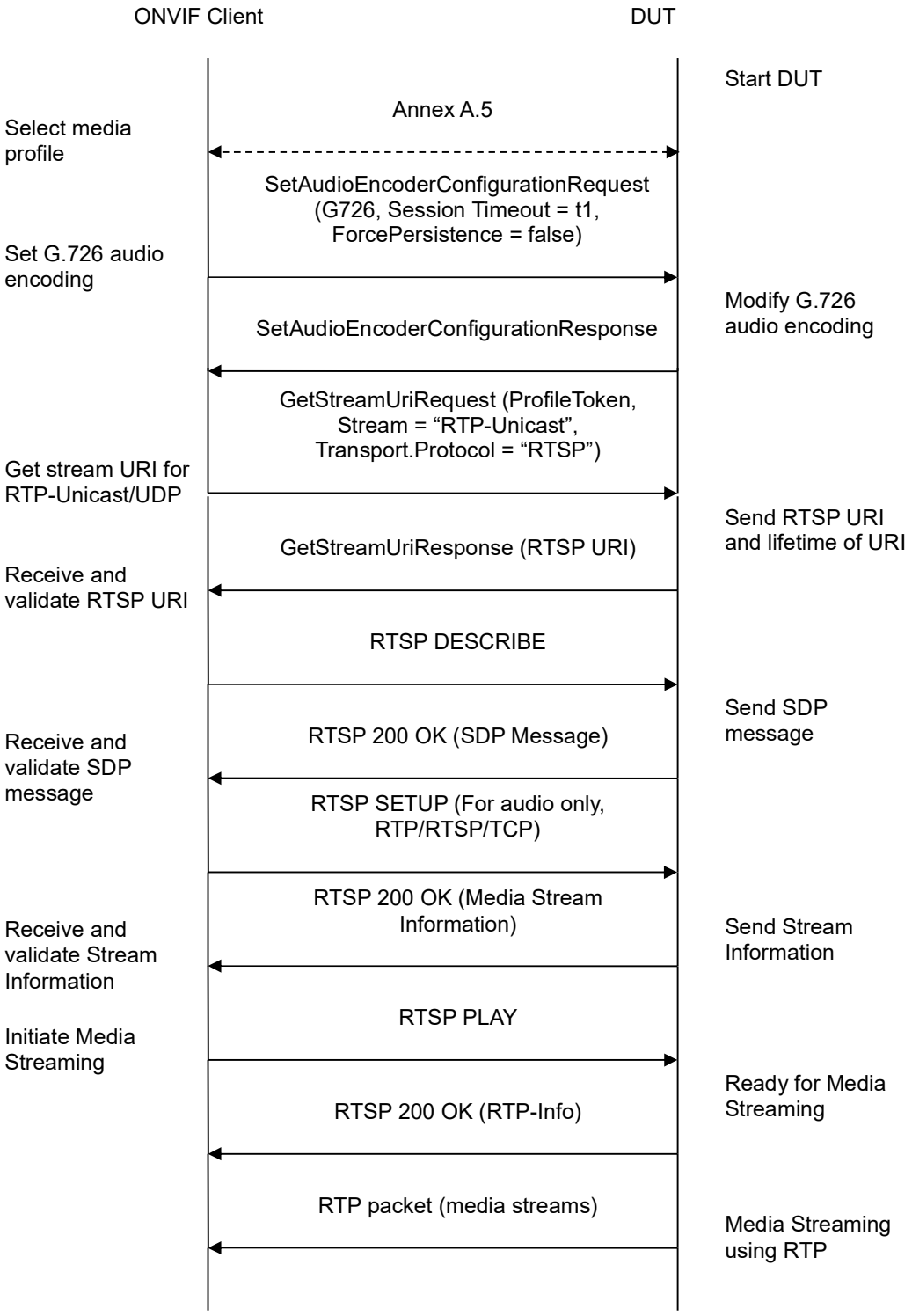
WSDL Reference: None

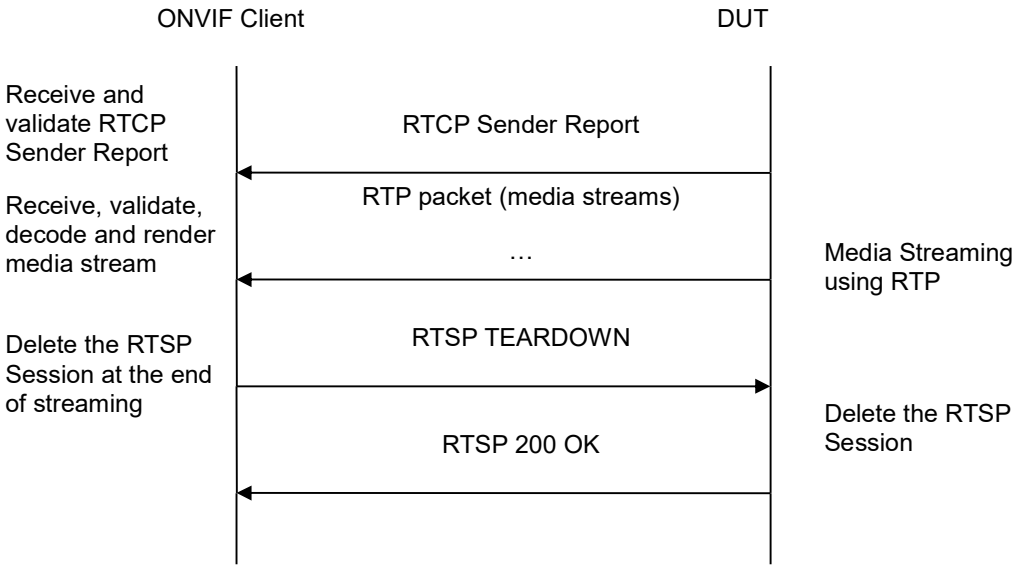
Test Propose: To verify G.726 media streaming based on RTP/RTSP/TCP Transport.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT and G.726 is implemented by DUT. RTP/RTSP/TCP transport protocol is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (G726, Session Timeout = t1, ForcePersistence = false)
Set G.726 audio encoding
Modify G.726 audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “RTSP”)
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP/RTSP/TCP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with G.726 encoding support.
4. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G726”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.726 encoding.
5. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “RTSP”**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP/RTSP/TCP**.
12. The DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.
15. The DUT sends G.726 RTP media stream to ONVIF Client over RTSP.

16. The DUT sends RTCP sender report to ONVIF Client.
17. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.726 RTP media streaming to ONVIF Client.

The DUT sent not only G.726 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.7 MEDIA STREAMING – AAC (RTP-Unicast/UDP)

Test Label: Real Time Viewing DUT AAC Media Streaming Using RTP-Unicast/UDP Transport.

Test Case ID: RTSS-2-1-25

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

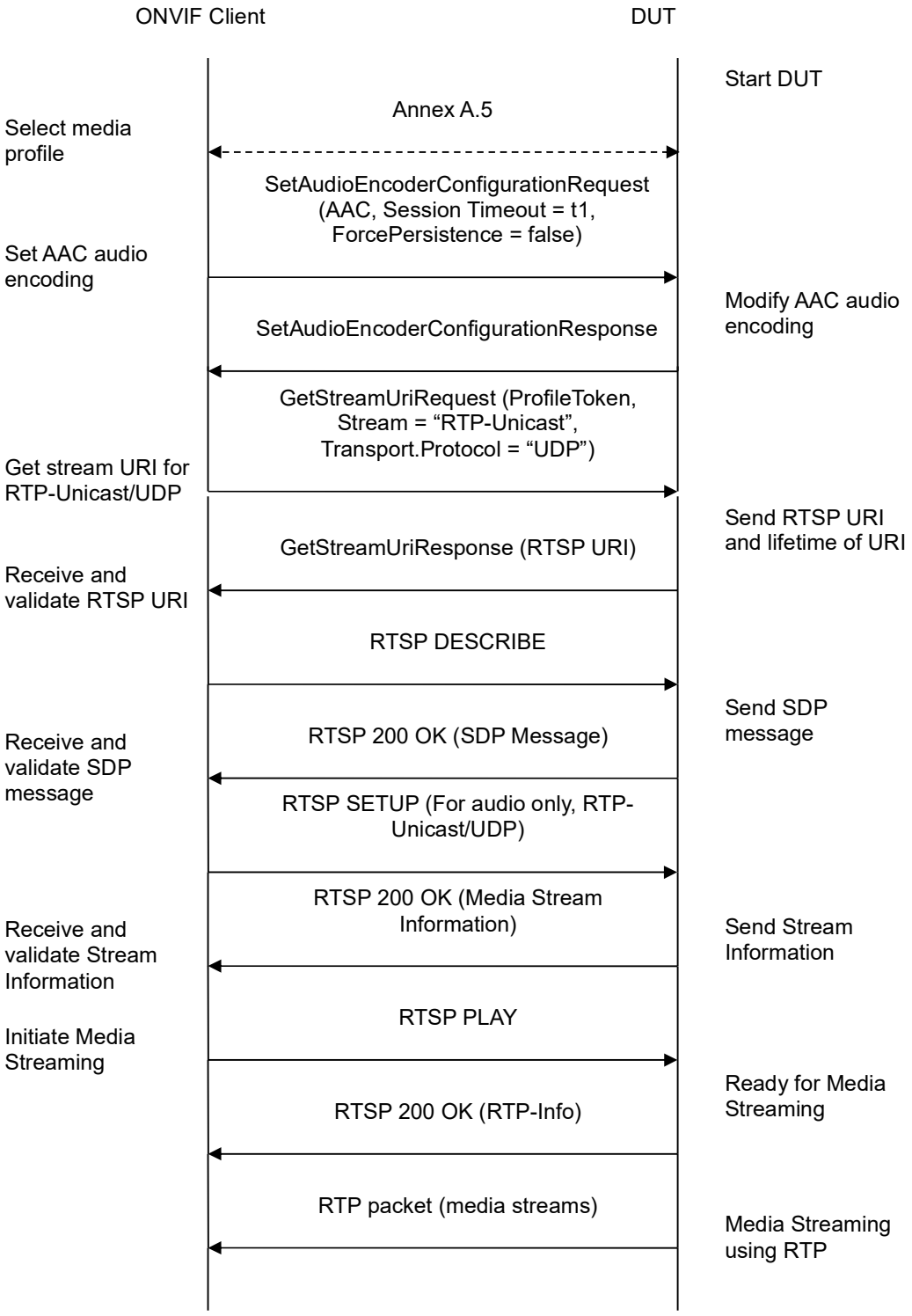
WSDL Reference: None

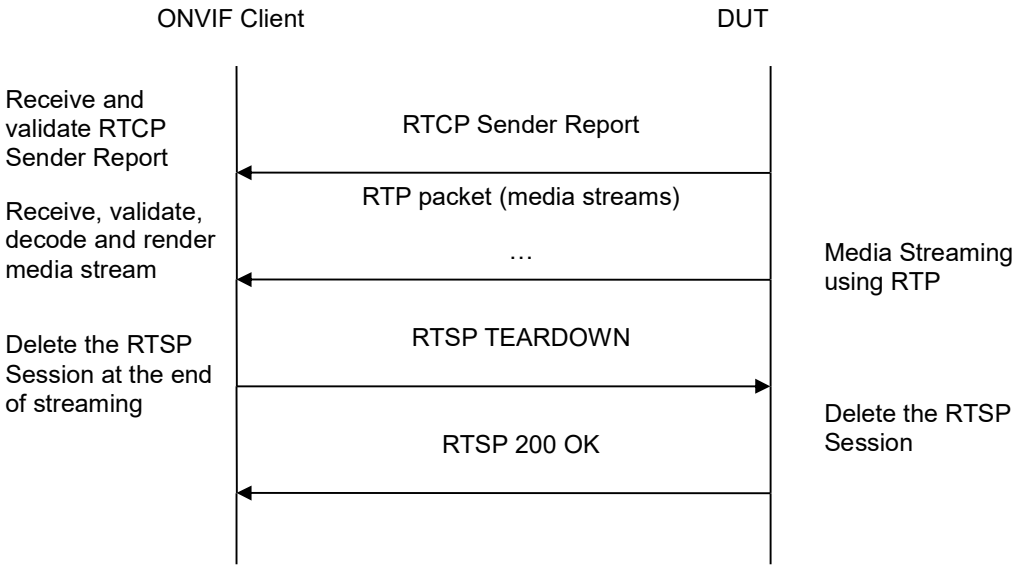
Test Propose: To verify AAC media streaming based on RTP-Unicast/UDP Transport.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT and AAC is implemented by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (AAC, Session Timeout = t1, ForcePersistence = false)
Set AAC audio encoding
Modify AAC audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “UDP”)
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with AAC encoding support.
4. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “AAC”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
5. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “UDP”**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Unicast/UDP**.
12. The DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.
15. The DUT sends AAC RTP media stream to ONVIF Client over UDP.

16. The DUT sends RTCP sender report to ONVIF Client.
17. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send AAC RTP media streaming to ONVIF Client.

The DUT sent not only AAC RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.8 MEDIA STREAMING – AAC (RTP-Unicast/RTSP/HTTP/TCP)

Test Label: Real Time Viewing DUT AAC Media Streaming Using RTP-Unicast/RTSP/HTTP/TCP Transport.

Test Case ID: RTSS-2-1-26

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP

Command Under Test: None

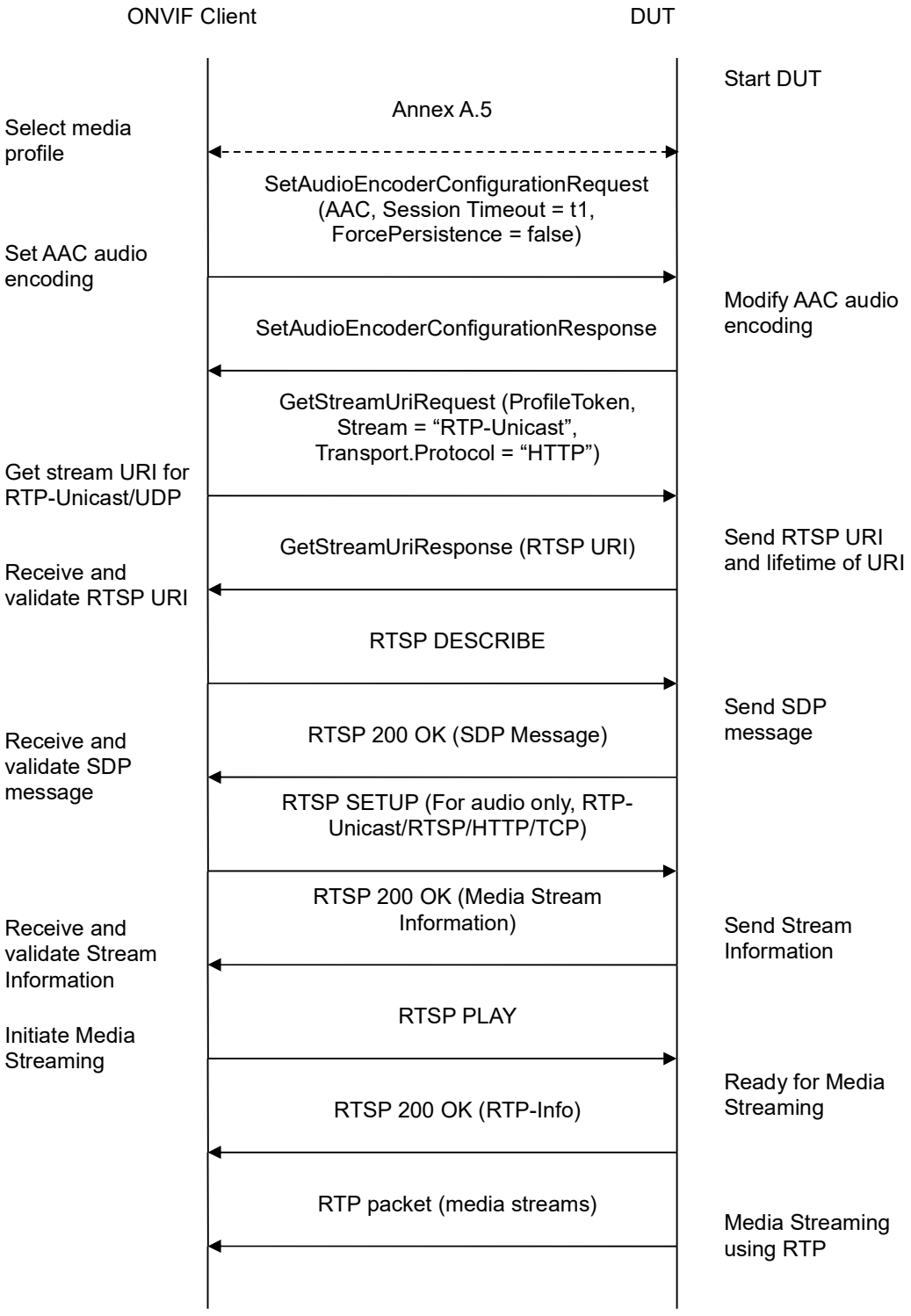
WSDL Reference: None

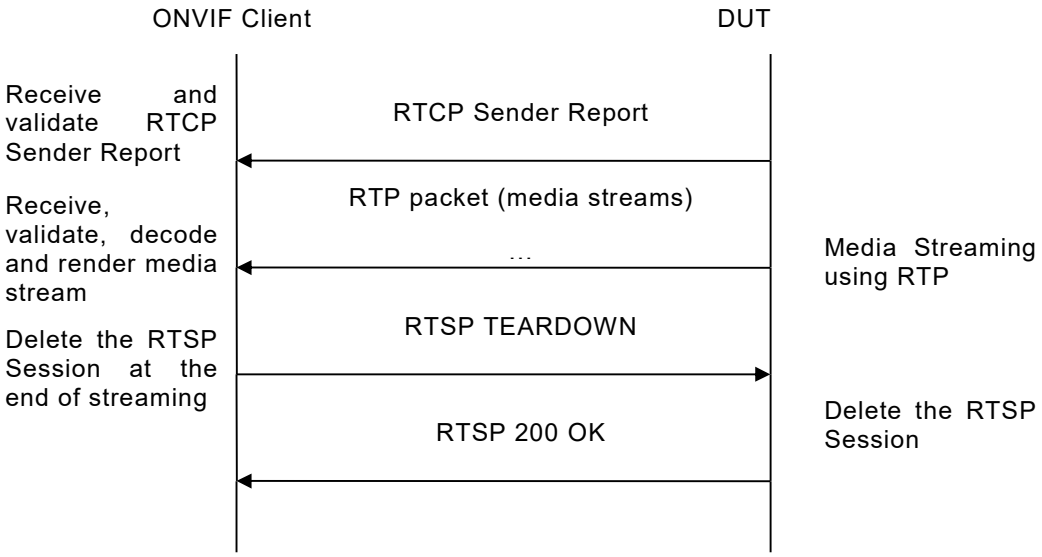
Test Propose: To verify AAC media streaming based on RTP-Unicast/RTSP/HTTP/TCP Transport.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT and AAC is implemented by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (AAC, Session Timeout = t1, ForcePersistence = false)
Set AAC audio encoding
Modify AAC audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “HTTP”)
Get stream URI for RTP-Unicast/UDP
GetStreamUriResponse (RTSP URI)
Send RTSP URI and lifetime of URI
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/RTSP/HTTP/TCP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with AAC encoding support.
4. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “AAC”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
5. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “HTTP”**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Unicast/RTSP/HTTP/TCP**.
12. The DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.

15. The DUT sends AAC RTP media stream to ONVIF Client over HTTP.
16. The DUT sends RTCP sender report to ONVIF Client.
17. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send AAC RTP media streaming to ONVIF Client.

The DUT sent not only AAC RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.9 MEDIA STREAMING – AAC (RTP/RTSP/TCP)

Test Label: Real Time Viewing DUT AAC Media Streaming Using RTP/RTSP/TCP Transport.

Test Case ID: RTSS-2-1-27

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, TCP, Stream control, RTSP

Command Under Test: None

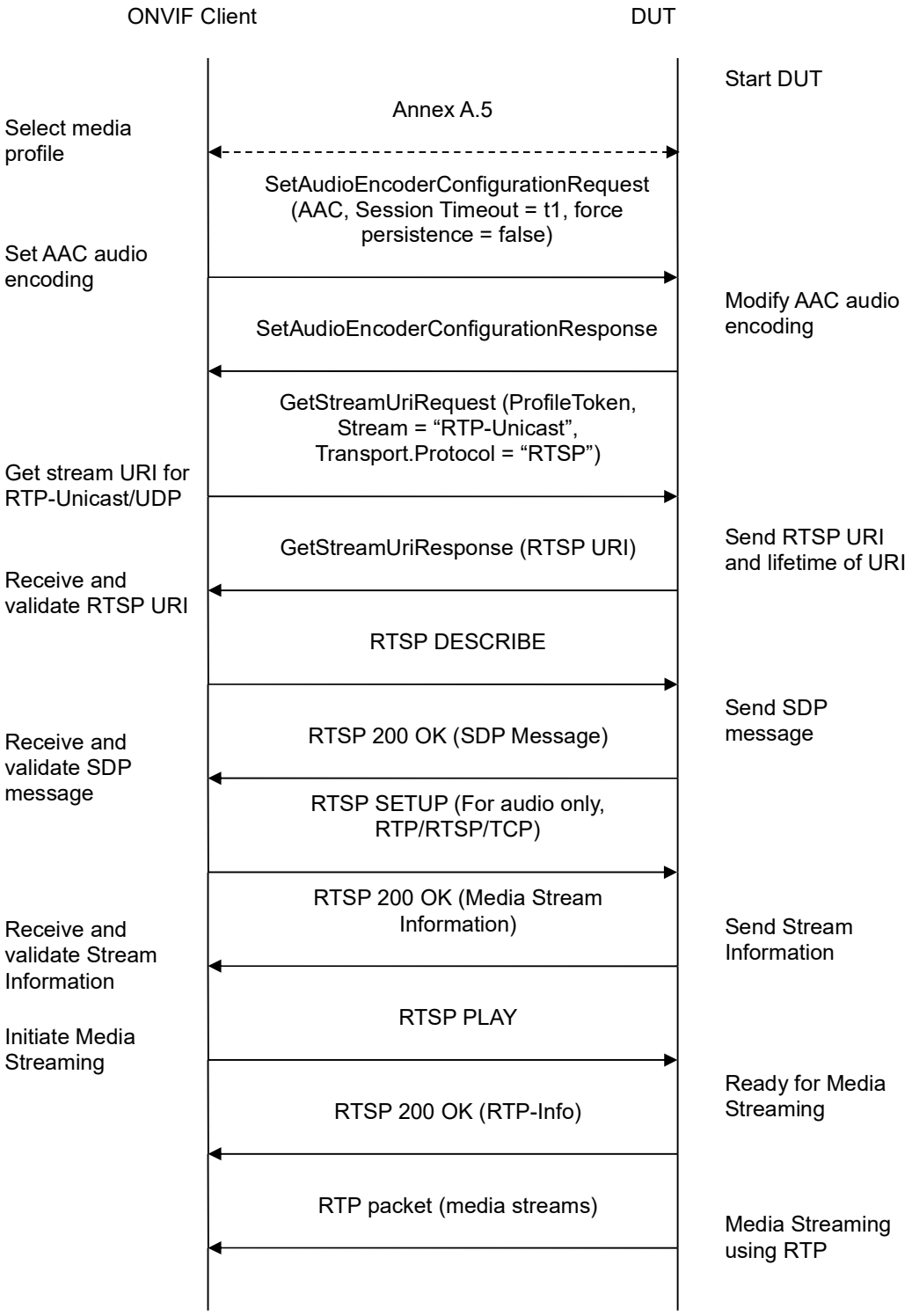
WSDL Reference: None

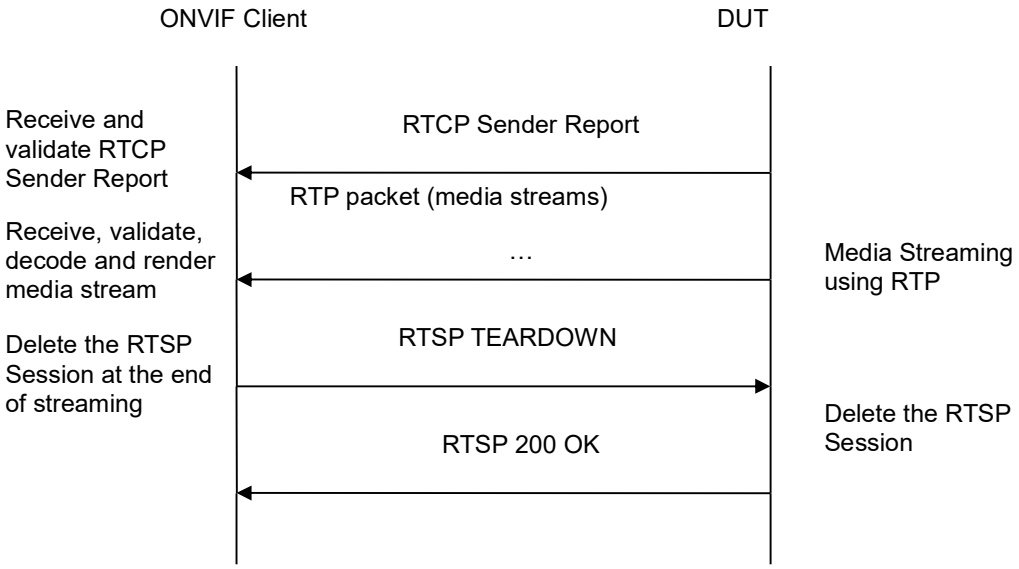
Test Propose: To verify AAC media streaming based on RTP/RTSP/TCP Transport.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT and AAC is implemented by DUT. RTP/RTSP/TCP transport protocol is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (AAC, Session Timeout = t1, force persistence = false)
Set AAC audio encoding
Modify AAC audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “RTSP”)
Get stream URI for RTP-Unicast/UDP
GetStreamUriResponse (RTSP URI)
Send RTSP URI and lifetime of URI
Receive and validate RTSP URI
RTSP DESCRIBE
RTSP 200 OK (SDP Message)
Send SDP message
Receive and validate SDP message
RTSP SETUP (For audio only, RTP/RTSP/TCP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
RTSP 200 OK (RTP-Info)
Ready for Media Streaming
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with AAC encoding support.
4. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “AAC”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
5. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “RTSP”) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request.
10. The DUT sends 200 OK message and SDP information.
11. ONVIF Client invokes RTSP SETUP request with transport parameter RTP/RTSP/TCP.
12. The DUT sends 200 OK message and the media stream information.
13. ONVIF Client invokes RTSP PLAY request.
14. The DUT sends 200 OK message and starts media streaming.
15. The DUT sends AAC RTP media stream to ONVIF Client over RTSP.

16. The DUT sends RTCP sender report to ONVIF Client.
17. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
18. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
19. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send AAC RTP media streaming to ONVIF Client.

The DUT sent not only AAC RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.10 AUDIO STREAMING – G.711 (RTP-Unicast/UDP)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP-Unicast/UDP Transport

Test Case ID: RTSS-2-1-28

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

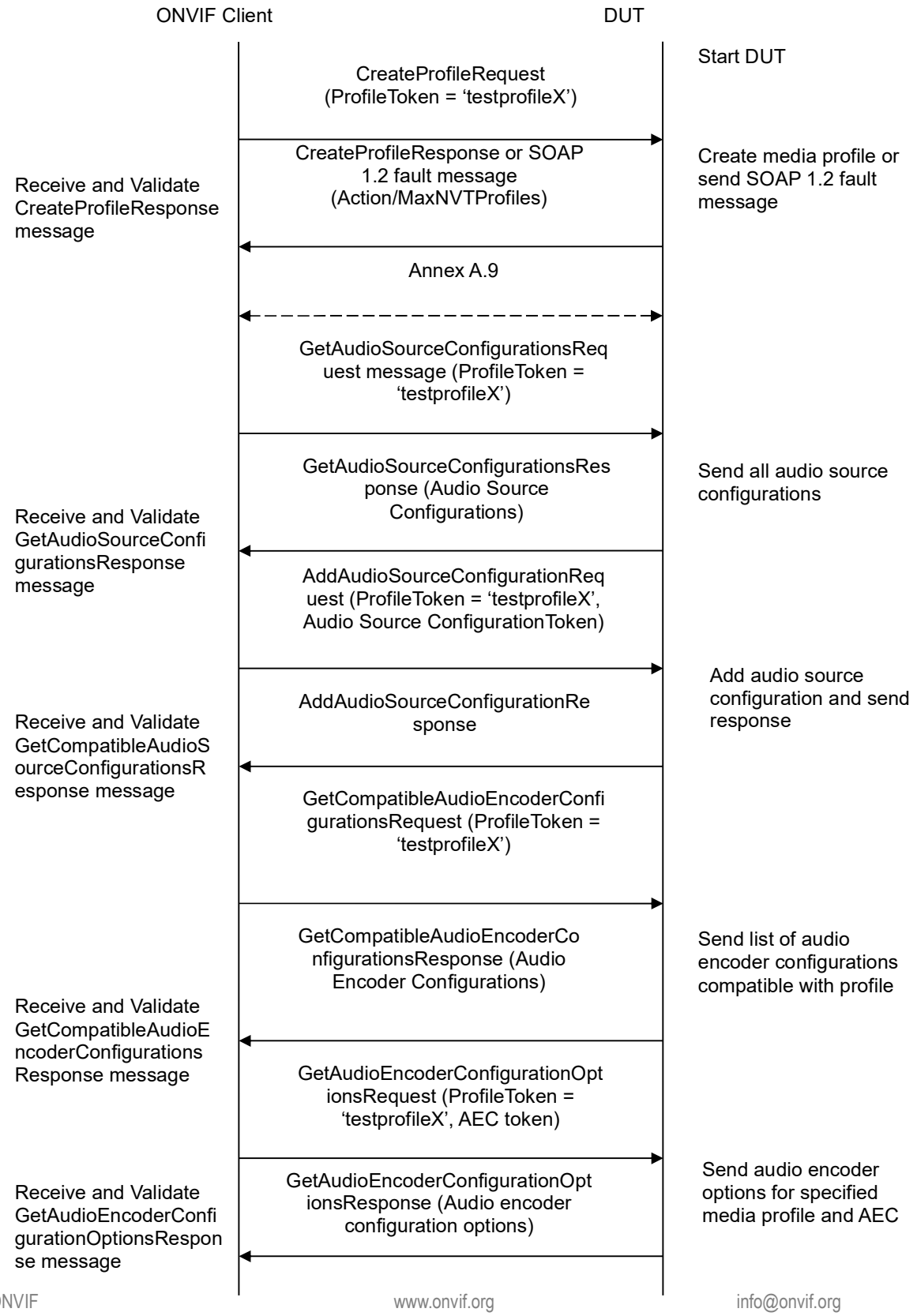
WSDL Reference: None

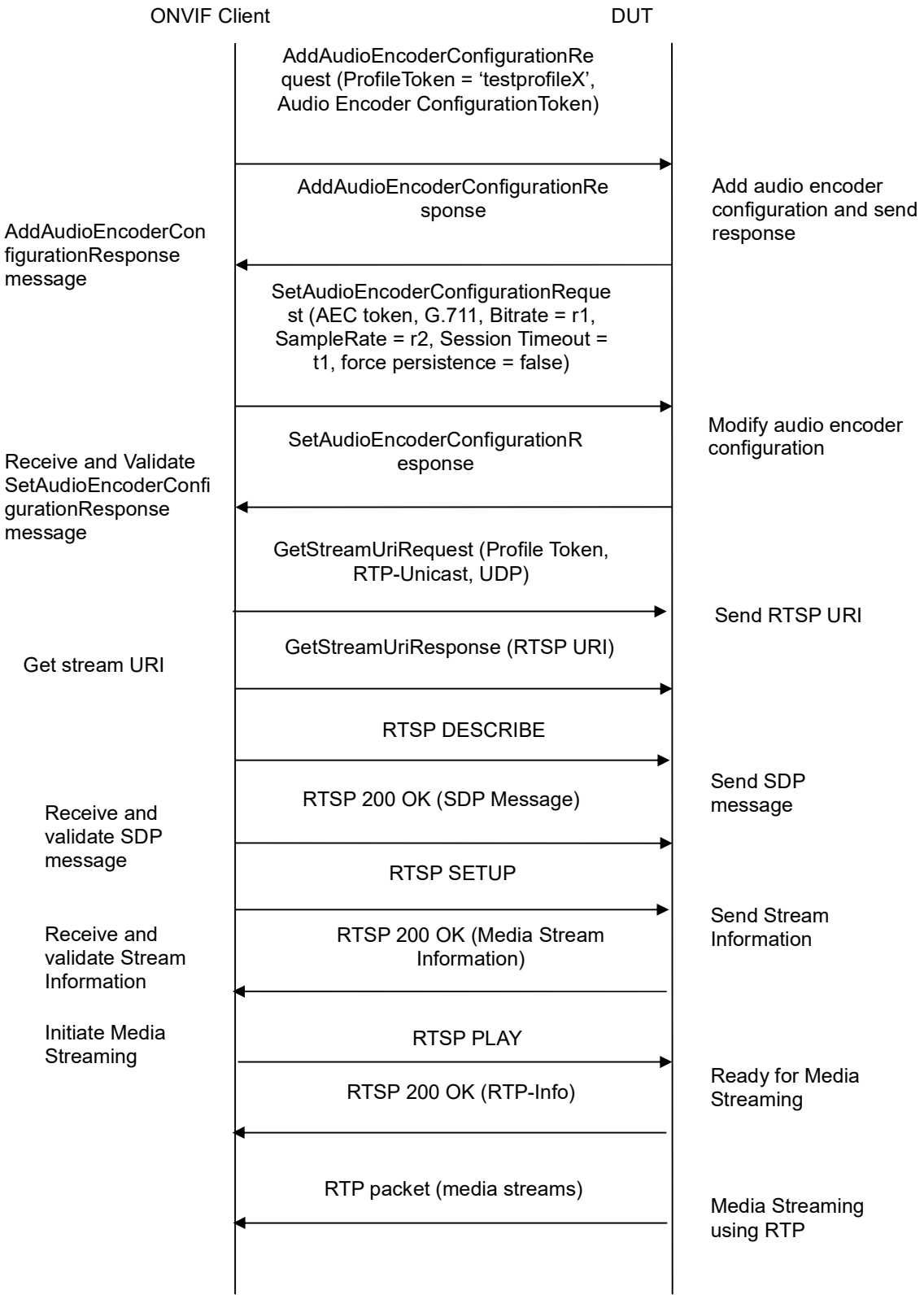
Test Purpose: To verify G.711 media streaming based on RTP-Unicast/UDP Transport for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

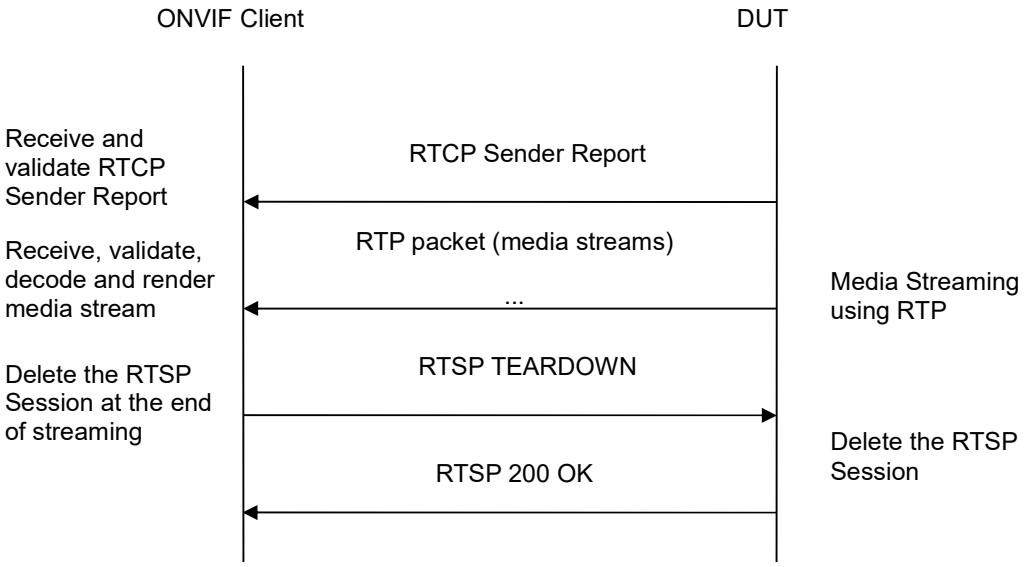
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
Add audio source configuration and send response
AddAudioSourceConfigurationResponse
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurationsResponse message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.711, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = 'testprofileX'.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = 'testprofileX' and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = 'testprofileX') to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio encoder configurations sent by DUT.
12. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

13. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 11-12 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.711 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.711 encoding skip this step and repeat steps 6-12 for other AudioSource.
14. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 12.
15. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G.711", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.711 encoding.
16. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
17. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "UDP") to retrieve media stream URI for the selected media profile.
18. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
19. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
20. ONVIF Client invokes RTSP DESCRIBE request.
21. The DUT sends 200 OK message and SDP information.
22. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Unicast/UDP.
23. The DUT sends 200 OK message and the media stream information.
24. ONVIF Client invokes RTSP PLAY request.
25. The DUT sends 200 OK message and starts media streaming.
26. The DUT sends G.711 RTP media stream to ONVIF Client over UDP
27. The DUT sends RTCP sender report to ONVIF Client.
28. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
29. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
30. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send AudioEncoderConfiguration which supports G.711 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP media streaming to ONVIF Client.

The DUT sent not only G.711 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.11 AUDIO STREAMING – G.711 (RTP-Unicast/RTSP/HTTP/TCP)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP-Unicast/RTSP/HTTP/TCP Transport

Test Case ID: RTSS-2-1-29

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP

Command Under Test: None

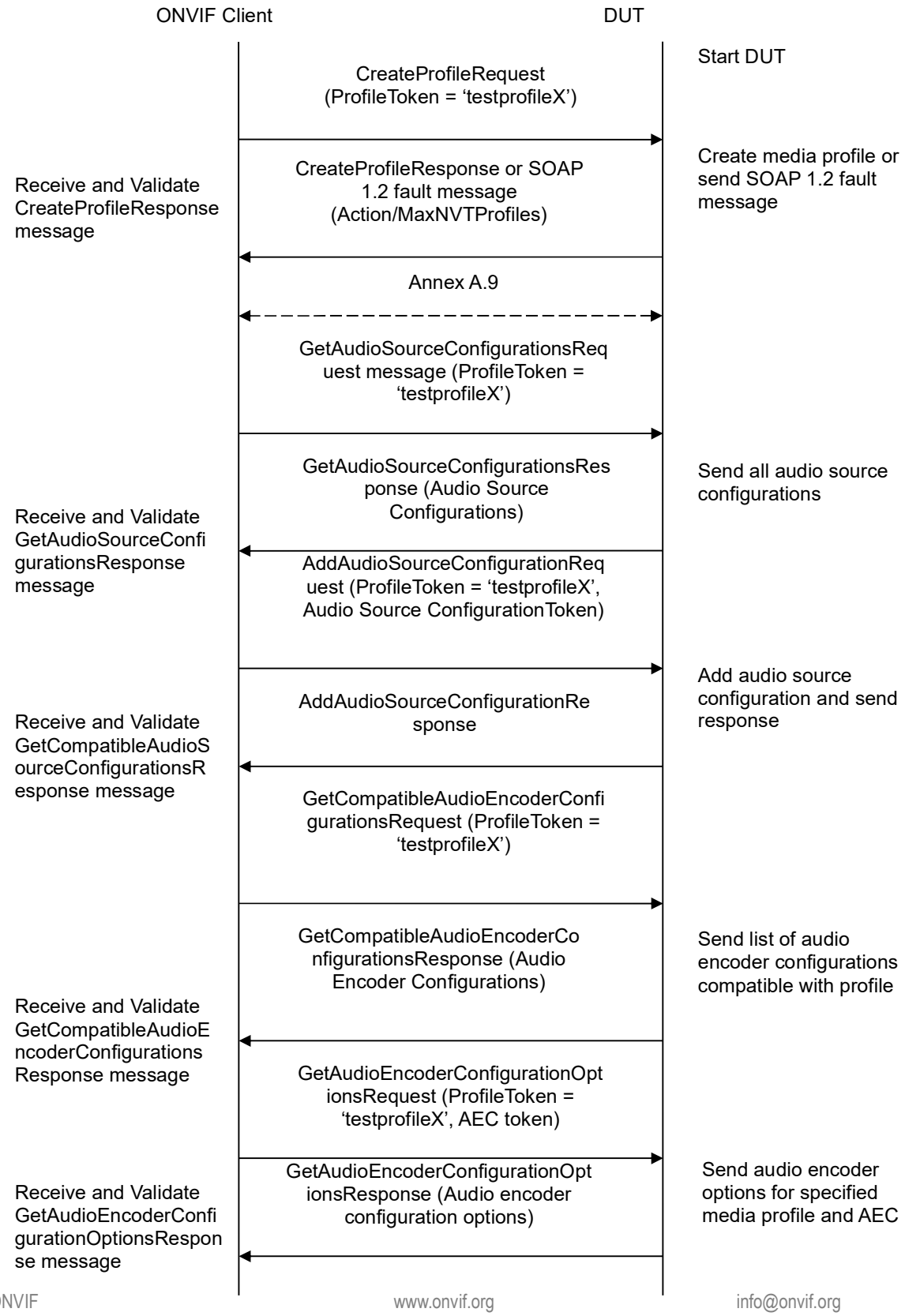
WSDL Reference: None

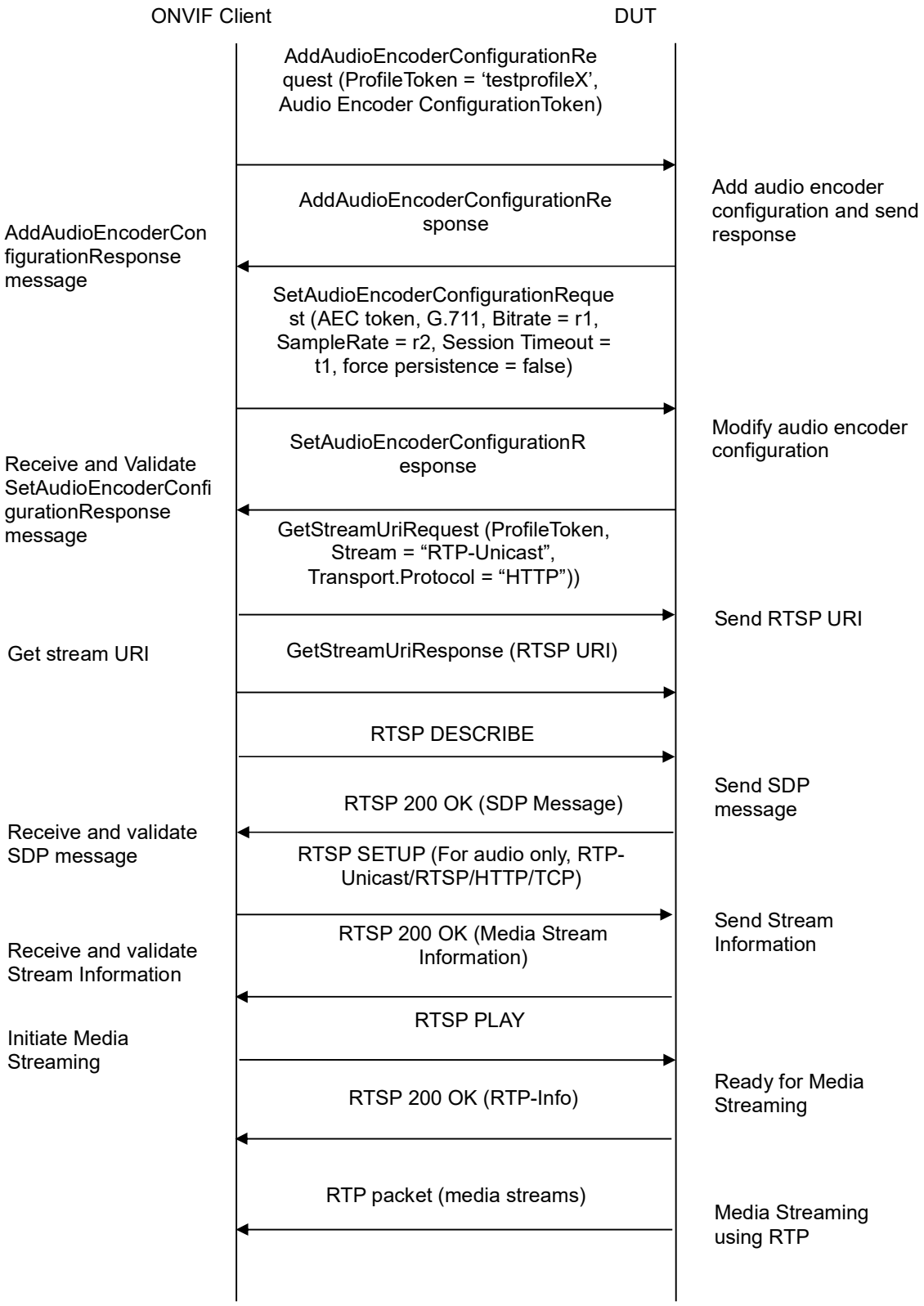
Test Purpose: To verify G.711 media streaming based on RTP-Unicast/RTSP/HTTP/TCP Transport for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

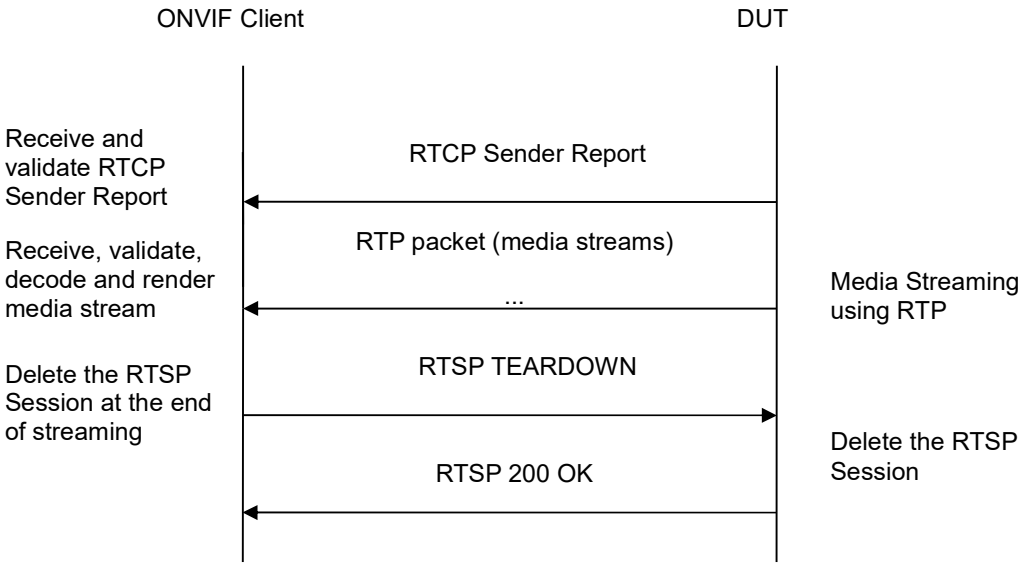
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
Create media profile or send SOAP 1.2 fault message
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
Send all audio source configurations
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
Add audio source configuration and send response
AddAudioSourceConfigurationResponse
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
Send list of audio encoder configurations compatible with profile
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
Send audio encoder options for specified media profile and AEC
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.711, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP"))
Send RTSP URI
Get stream URI
GetStreamUriResponse (RTSP URI)
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/RTSP/HTTP/TCP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = 'testprofileX'.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = 'testprofileX' and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = 'testprofileX') to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

13. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.711 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.711 encoding skip this step and repeat steps 7-13 for other AudioSource.
14. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
15. DUT adds the audio encoder configuration to the profile and sends the response.
16. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G711", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.711 encoding.
17. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
18. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP") to retrieve media stream URI for the selected media profile.
19. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
20. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
21. ONVIF Client invokes RTSP DESCRIBE request.
22. The DUT sends 200 OK message and SDP information.
23. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Unicast/RTSP/HTTP/TCP.
24. The DUT sends 200 OK message and the media stream information.
25. ONVIF Client invokes RTSP PLAY request.
26. The DUT sends 200 OK message and starts media streaming.
27. The DUT sends G.711 RTP media stream to ONVIF Client over HTTP.
28. The DUT sends RTCP sender report to ONVIF Client.
29. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
30. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
31. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports G.711 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP media streaming to ONVIF Client.

The DUT sent not only G.711 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.12 AUDIO STREAMING – G.711 (RTP/RTSP/TCP)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP/RTSP/TCP Transport

Test Case ID: RTSS-2-1-30

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

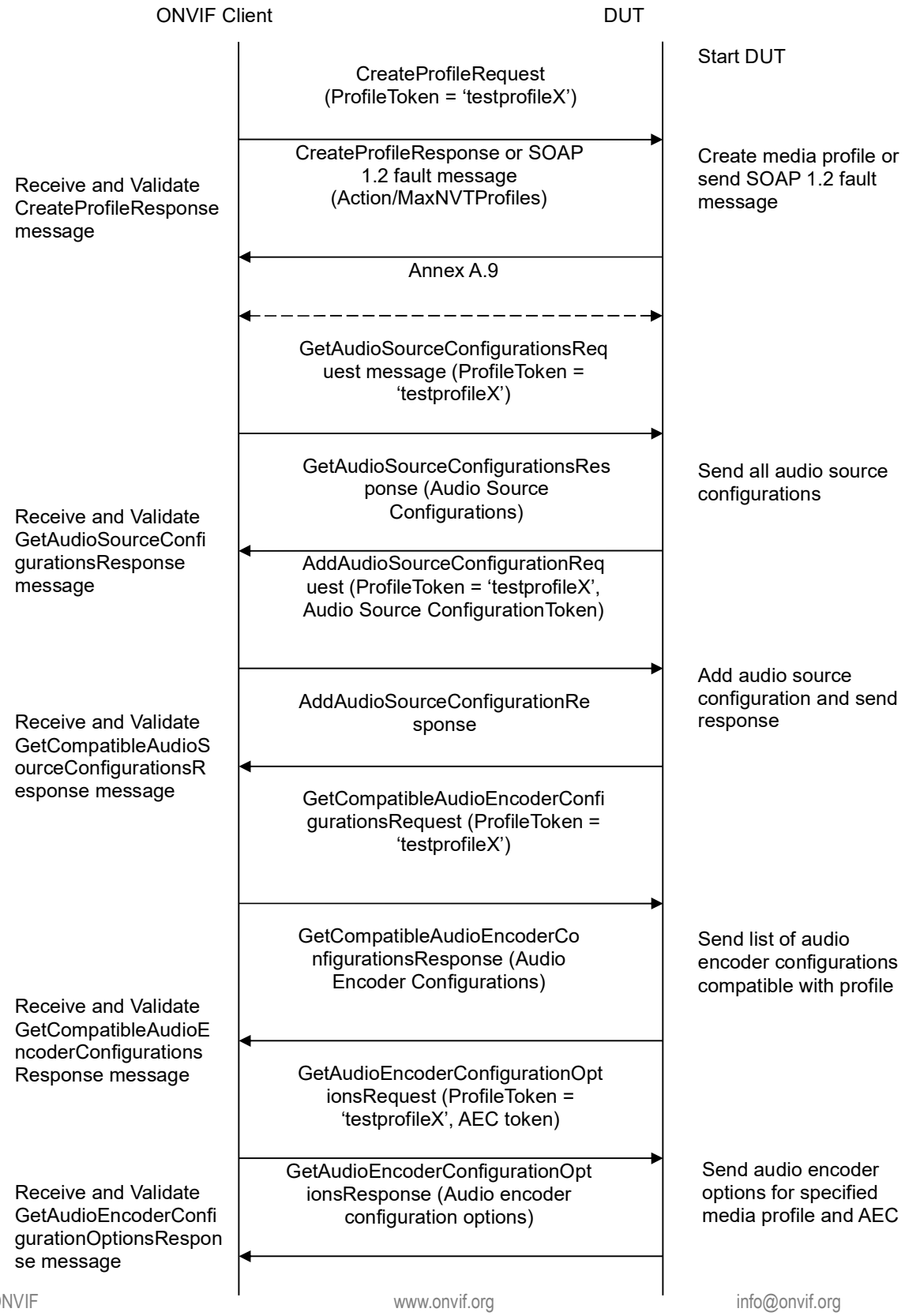
WSDL Reference: None

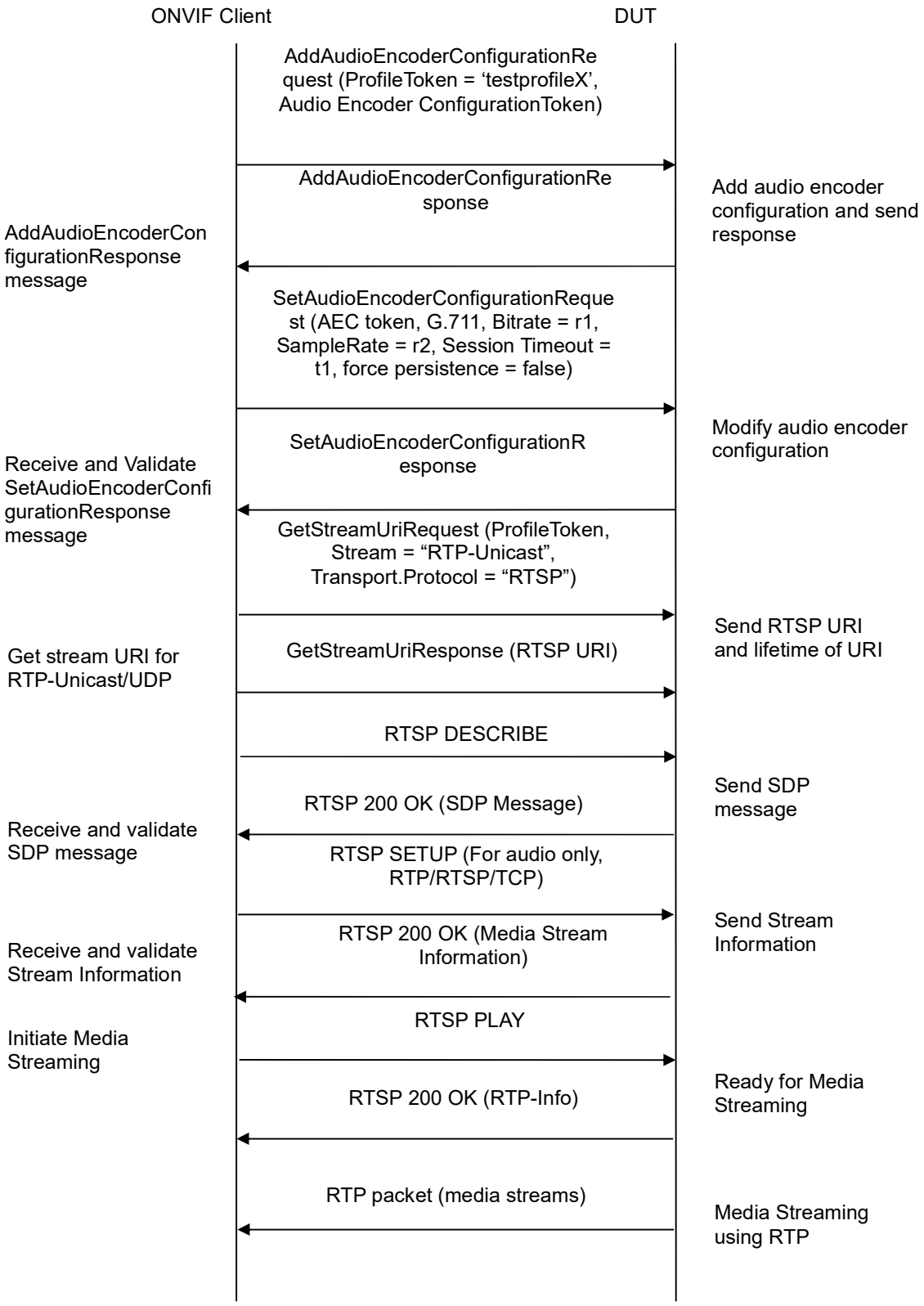
Test Purpose: To verify G.711 media streaming based on RTP/RTSP/TCP Transport for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

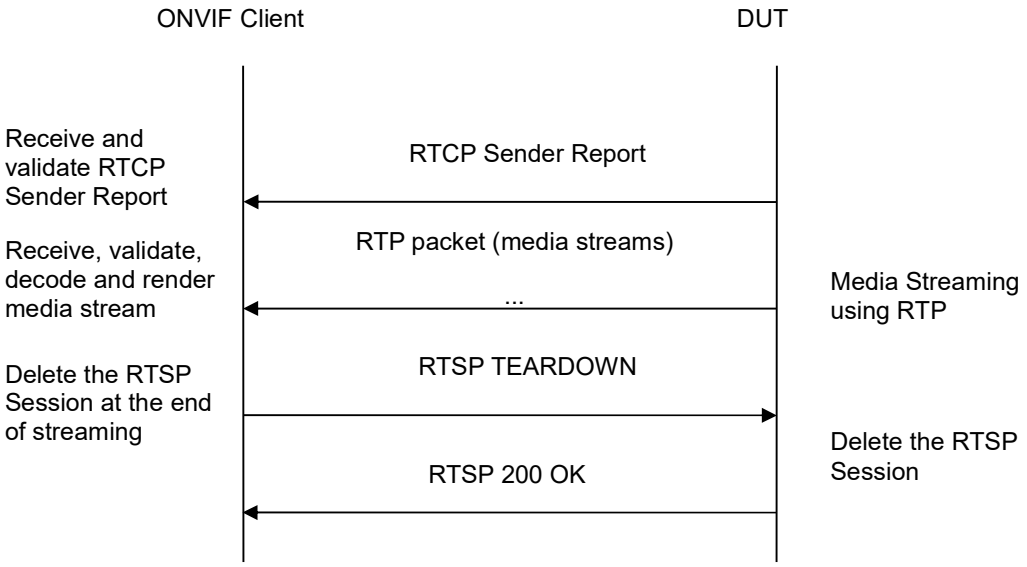
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT. RTP/RTSP/TCP transport protocol is supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
AddAudioSourceConfigurationResponse
Add audio source configuration and send response
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.711, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP")
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Get stream URI for RTP-Unicast/UDP
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP/RTSP/TCP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = 'testprofileX'.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = 'testprofileX' and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = 'testprofileX') to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

13. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.711 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.711 encoding skip this step and repeat steps 7-13 for other AudioSource.
14. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
15. DUT adds the audio encoder configuration to the profile and sends the response.
16. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G711", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.711 encoding.
17. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
18. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP") to retrieve media stream URI for the selected media profile.
19. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
20. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
21. ONVIF Client invokes RTSP DESCRIBE request.
22. The DUT sends 200 OK message and SDP information.
23. ONVIF Client invokes RTSP SETUP request with transport parameter RTP/RTSP/TCP.
24. The DUT sends 200 OK message and the media stream information.
25. ONVIF Client invokes RTSP PLAY request.
26. The DUT sends 200 OK message and starts media streaming.
27. The DUT sends G.711 RTP media stream to ONVIF Client over RTSP.
28. The DUT sends RTCP sender report to ONVIF Client.
29. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
30. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
31. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports G.711 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP media streaming to ONVIF Client.

The DUT sent not only G.711 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.13 AUDIO STREAMING – G.726 (RTP-Unicast/UDP)

Test Label: Real Time Viewing DUT G.726 Media Streaming Using RTP-Unicast/UDP Transport

Test Case ID: RTSS-2-1-31

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

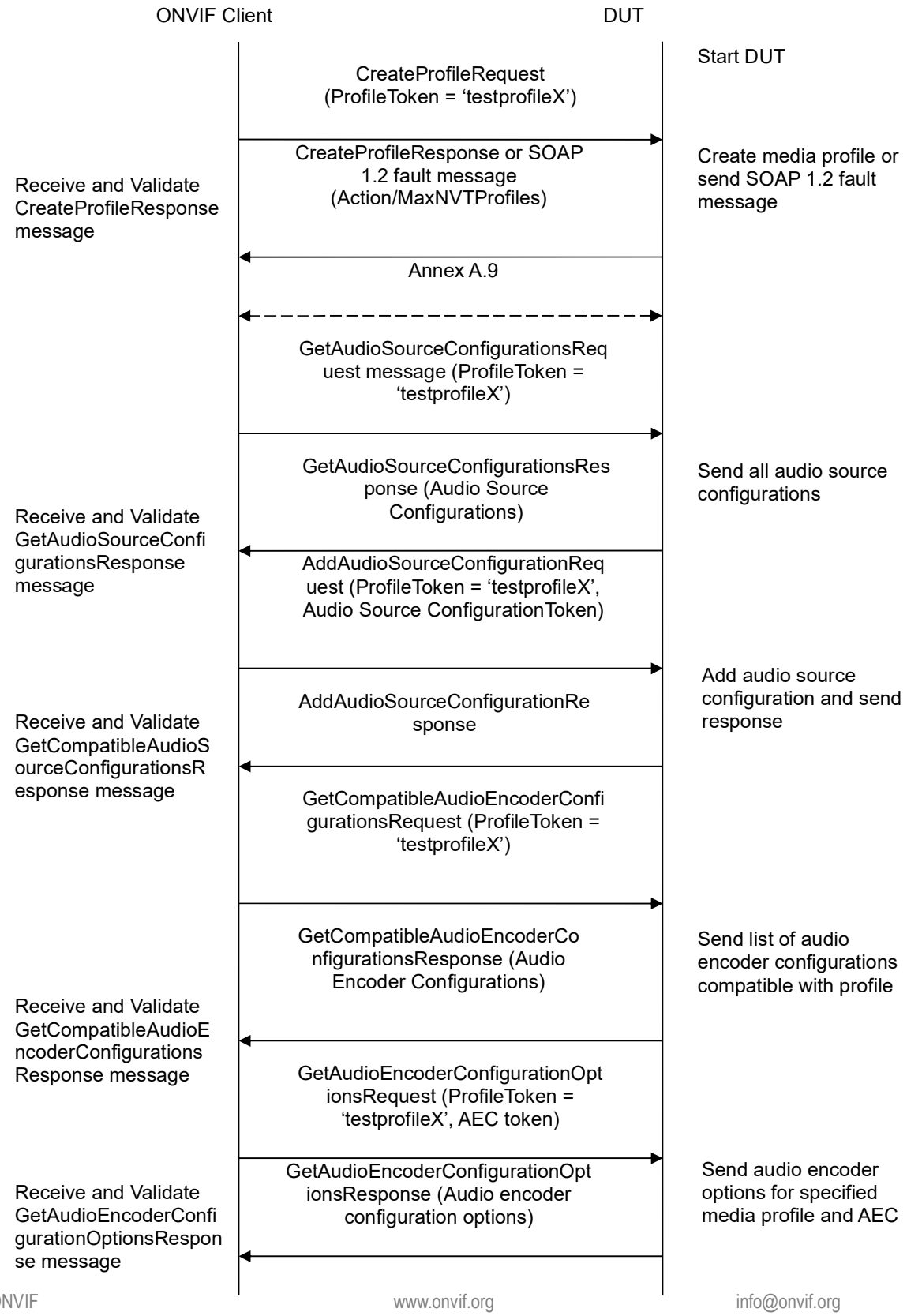
WSDL Reference: None

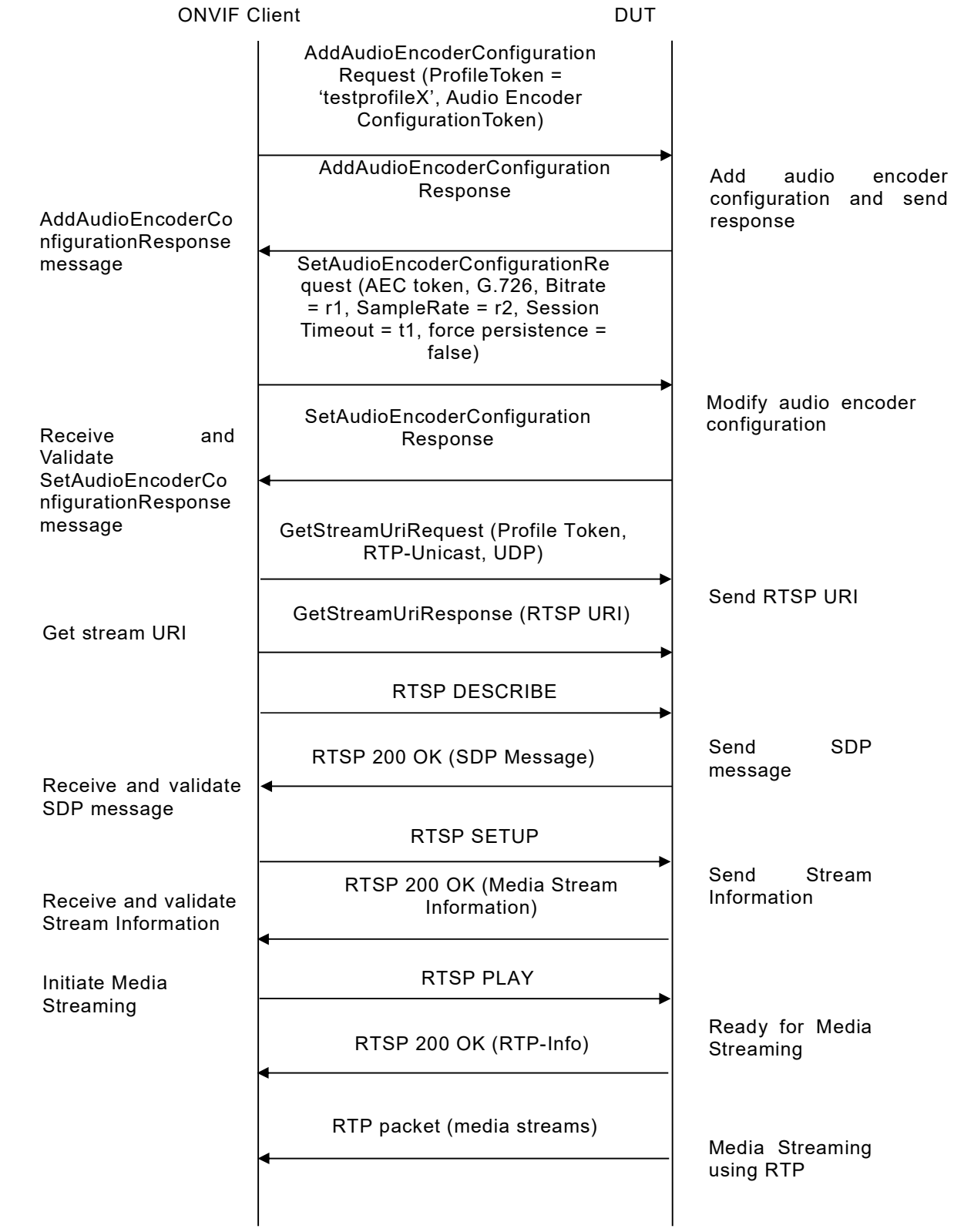
Test Purpose: To verify G.726 media streaming based on RTP-Unicast/UDP Transport for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

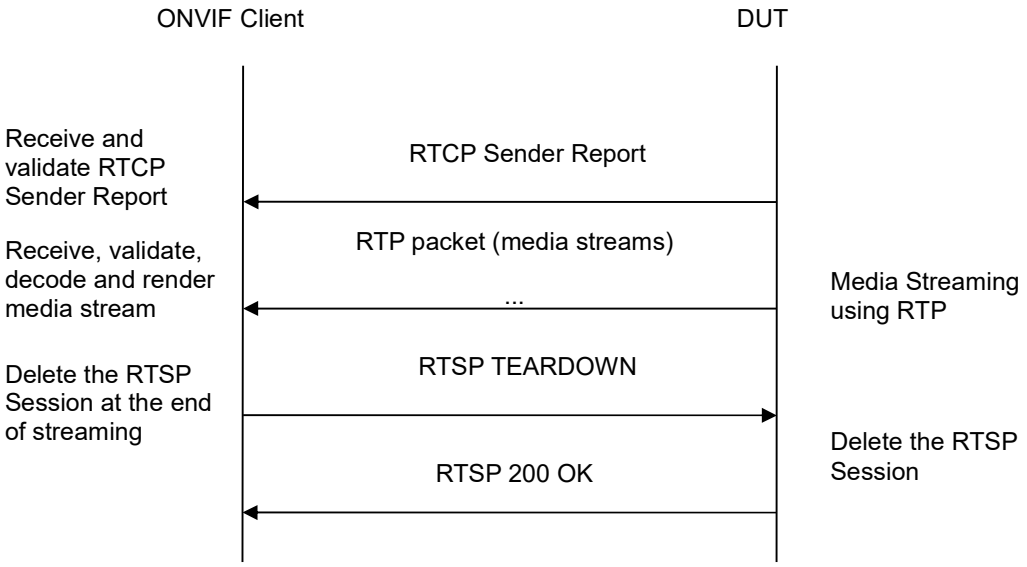
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT and G.726 is implemented by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
AddAudioSourceConfigurationResponse
Add audio source configuration and send response
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfiguration Request (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfiguration Response
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.726, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
SetAudioEncoderConfiguration Response
Modify audio encoder configuration
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
GetStreamUriResponse (RTSP URI)
Send RTSP URI
Get stream URI
RTSP DESCRIBE
RTSP 200 OK (SDP Message)
Send SDP message
Receive and validate SDP message
RTSP SETUP
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
RTSP 200 OK (RTP-Info)
Ready for Media Streaming
Initiate Media Streaming
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = 'testprofileX'.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = 'testprofileX' and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = 'testprofileX') to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

13. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.711 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.711 encoding skip this step and repeat steps 7-13 for other AudioSource.
14. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
15. DUT adds the audio encoder configuration to the profile and sends the response.
16. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G726", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
17. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
18. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "UDP") to retrieve media stream URI for the selected media profile.
19. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
20. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
21. ONVIF Client invokes RTSP DESCRIBE request.
22. The DUT sends 200 OK message and SDP information.
23. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Unicast/UDP.
24. The DUT sends 200 OK message and the media stream information.
25. ONVIF Client invokes RTSP PLAY request.
26. The DUT sends 200 OK message and starts media streaming.
27. The DUT sends G.726 RTP media stream to ONVIF Client over UDP.
28. The DUT sends RTCP sender report to ONVIF Client.
29. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
30. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
31. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports G.726 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.726 RTP media streaming to ONVIF Client.

The DUT sent not only G.726 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.14 AUDIO STREAMING – G.726 (RTP-Unicast/RTSP/HTTP/TCP)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP-Unicast/RTSP/HTTP/TCP Transport

Test Case ID: RTSS-2-1-32

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP

Command Under Test: None

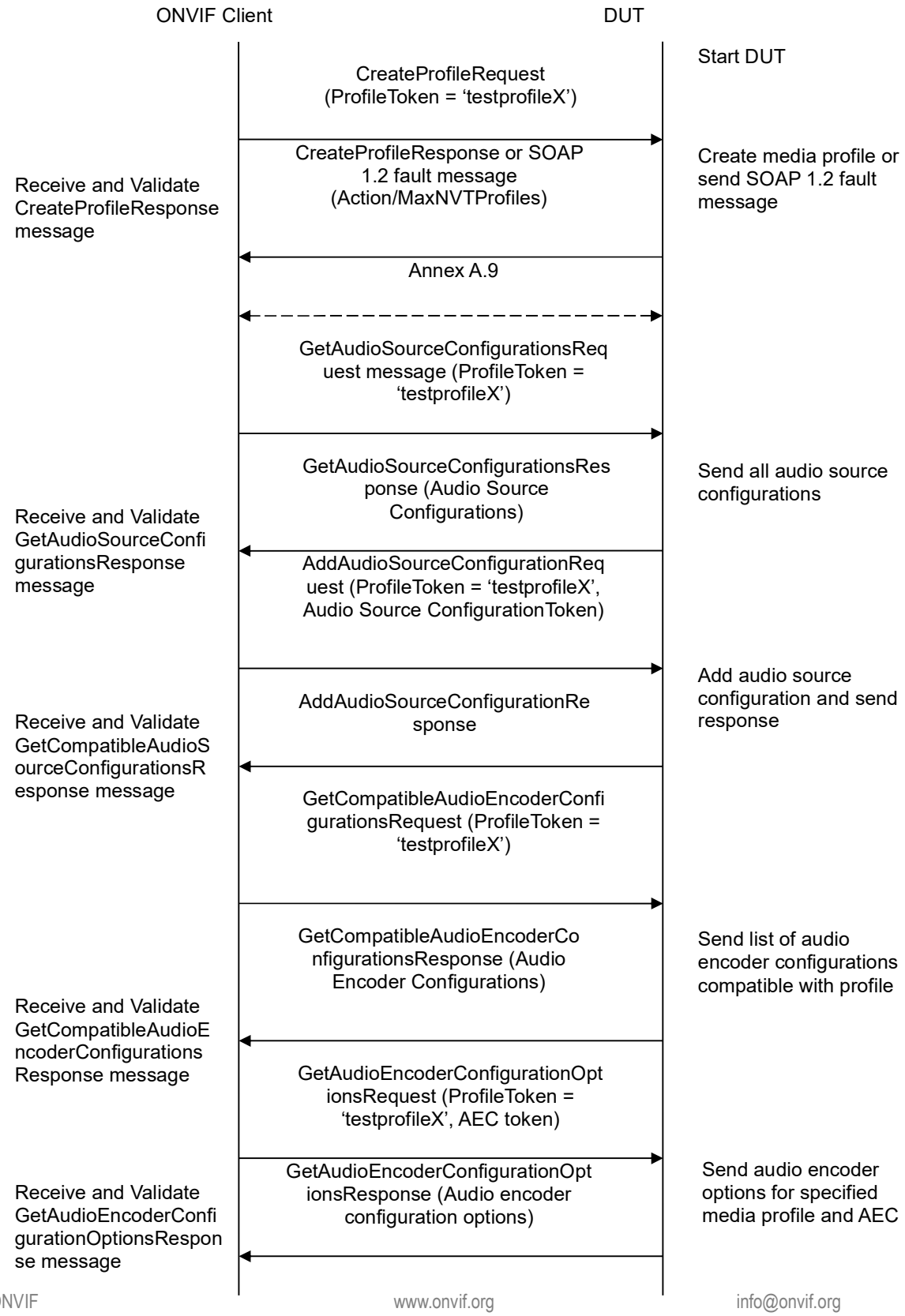
WSDL Reference: None

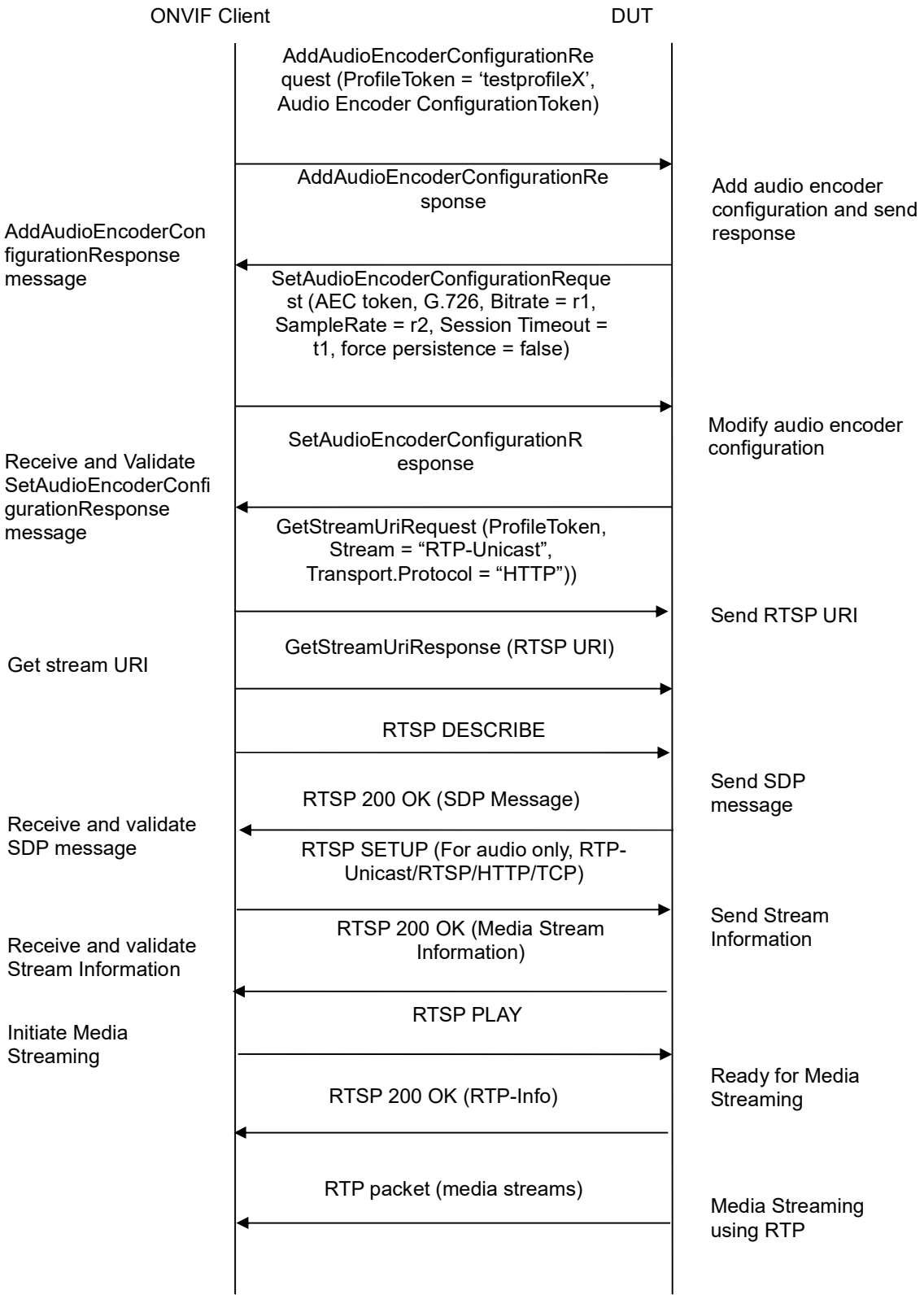
Test Purpose: To verify G.726 media streaming based on RTP-Unicast/RTSP/HTTP/TCP Transport for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

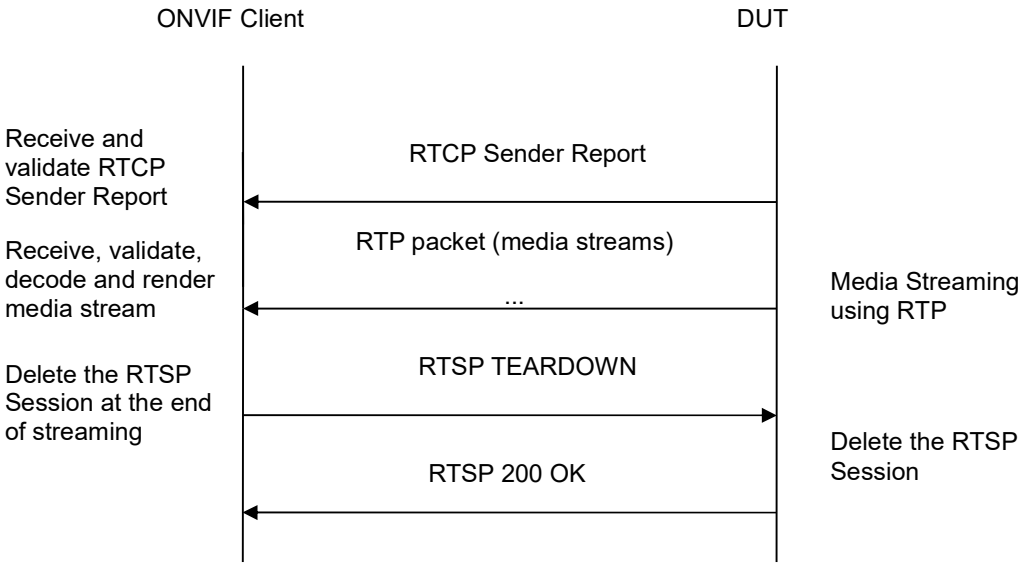
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT and G.726 is implemented by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
AddAudioSourceConfigurationResponse
Add audio source configuration and send response
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.726, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP"))
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/RTSP/HTTP/TCP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = 'testprofileX'.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = 'testprofileX' and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = 'testprofileX') to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

13. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.726 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.726 encoding skip this step and repeat steps 7-13 for other AudioSource.
14. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
15. DUT adds the audio encoder configuration to the profile and sends the response.
16. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G726", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G726 encoding.
17. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
18. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP") to retrieve media stream URI for the selected media profile.
19. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
20. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
21. ONVIF Client invokes RTSP DESCRIBE request.
22. The DUT sends 200 OK message and SDP information.
23. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Unicast/RTSP/HTTP/TCP.
24. The DUT sends 200 OK message and the media stream information.
25. ONVIF Client invokes RTSP PLAY request.
26. The DUT sends 200 OK message and starts media streaming.
27. The DUT sends G.726 RTP media stream to ONVIF Client over HTTP.
28. The DUT sends RTCP sender report to ONVIF Client.
29. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
30. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
31. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports G.726 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.726 RTP media streaming to ONVIF Client.

The DUT sent not only G.726 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.15 AUDIO STREAMING – G.726 (RTP/RTSP/TCP)

Test Label: Real Time Viewing DUT G.726 Media Streaming Using RTP/RTSP/TCP Transport

Test Case ID: RTSS-2-1-33

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

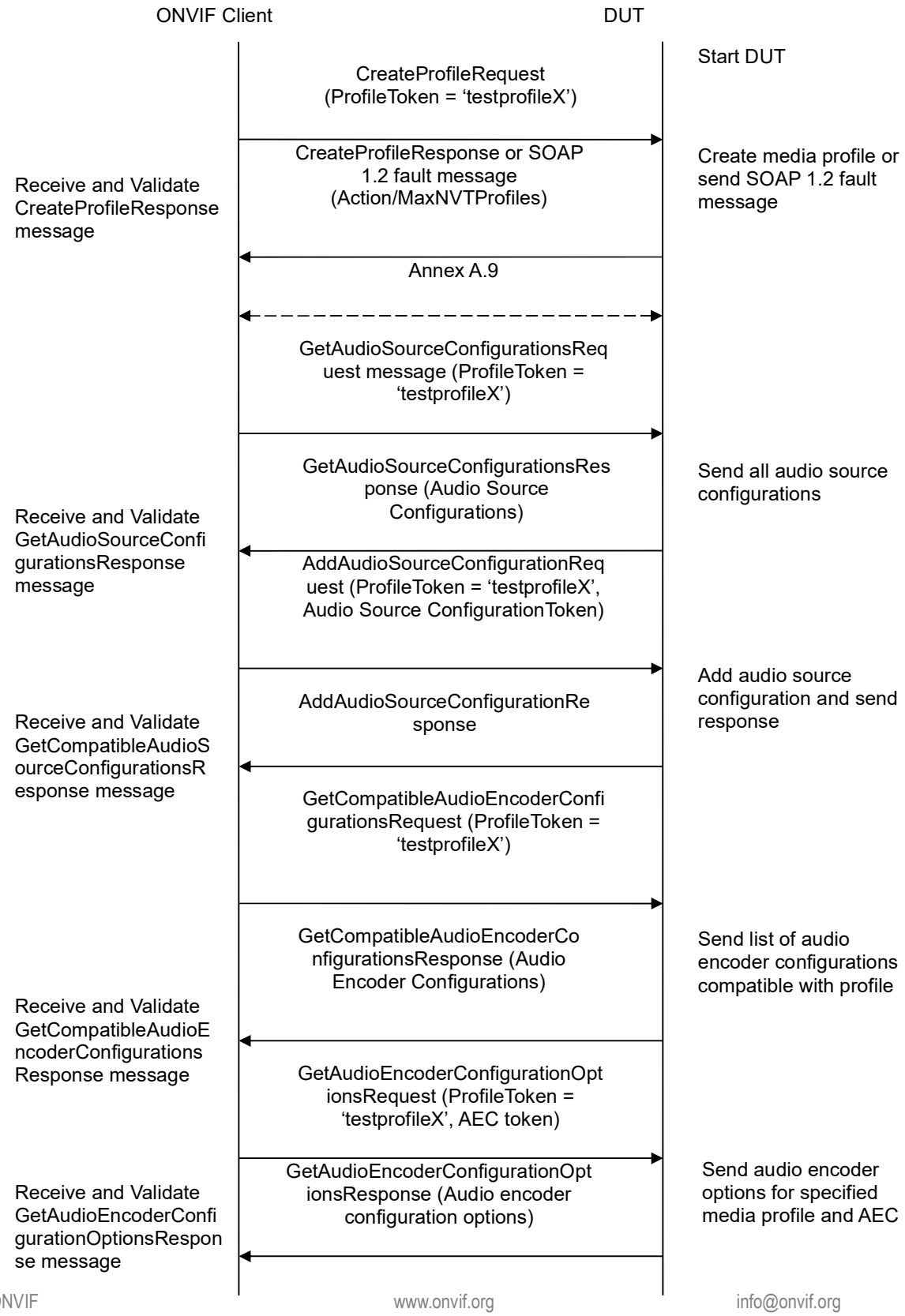
WSDL Reference: None

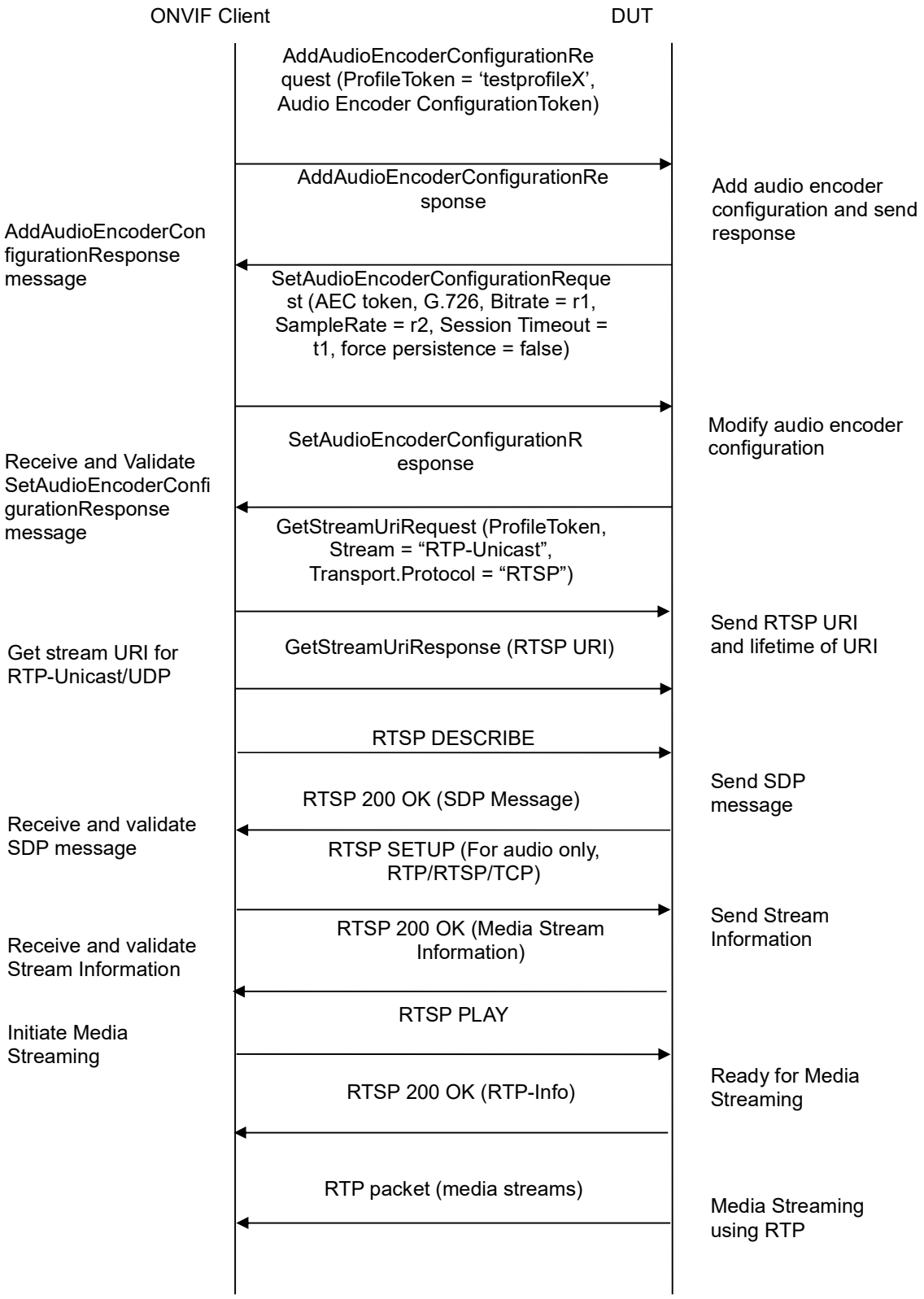
Test Purpose: To verify G.726 media streaming based on RTP/RTSP/TCP Transport for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

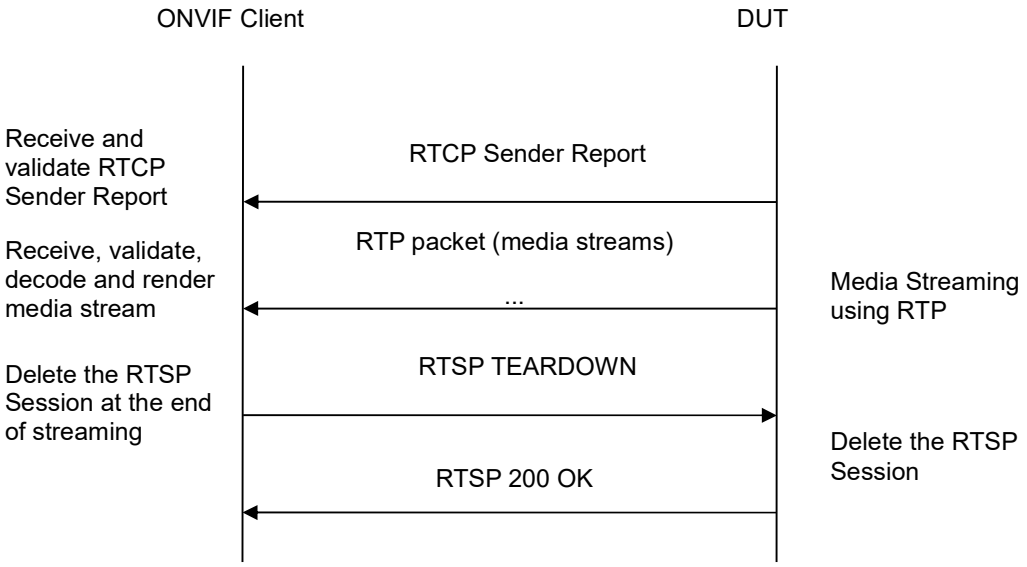
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT. RTP/RTSP/TCP transport protocol is supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
AddAudioSourceConfigurationResponse
Add audio source configuration and send response
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.726, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP")
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Get stream URI for RTP-Unicast/UDP
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP/RTSP/TCP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = 'testprofileX'.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = 'testprofileX' and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = 'testprofileX') to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

13. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.726 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.726 encoding skip this step and repeat steps 7-13 for other AudioSource.
14. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
15. DUT adds the audio encoder configuration to the profile and sends the response.
16. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G726", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.726 encoding.
17. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
18. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP") to retrieve media stream URI for the selected media profile.
19. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
20. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
21. ONVIF Client invokes RTSP DESCRIBE request.
22. The DUT sends 200 OK message and SDP information.
23. ONVIF Client invokes RTSP SETUP request with transport parameter RTP/RTSP/TCP.
24. The DUT sends 200 OK message and the media stream information.
25. ONVIF Client invokes RTSP PLAY request.
26. The DUT sends 200 OK message and starts media streaming.
27. The DUT sends G.726 RTP media stream to ONVIF Client over RTSP.
28. The DUT sends RTCP sender report to ONVIF Client.
29. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
30. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
31. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports G.726 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.726 RTP media streaming to ONVIF Client.

The DUT sent not only G.726 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.16 AUDIO STREAMING – AAC (RTP-Unicast/UDP)

Test Label: Real Time Viewing DUT AAC Media Streaming Using RTP-Unicast/UDP Transport

Test Case ID: RTSS-2-1-34

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

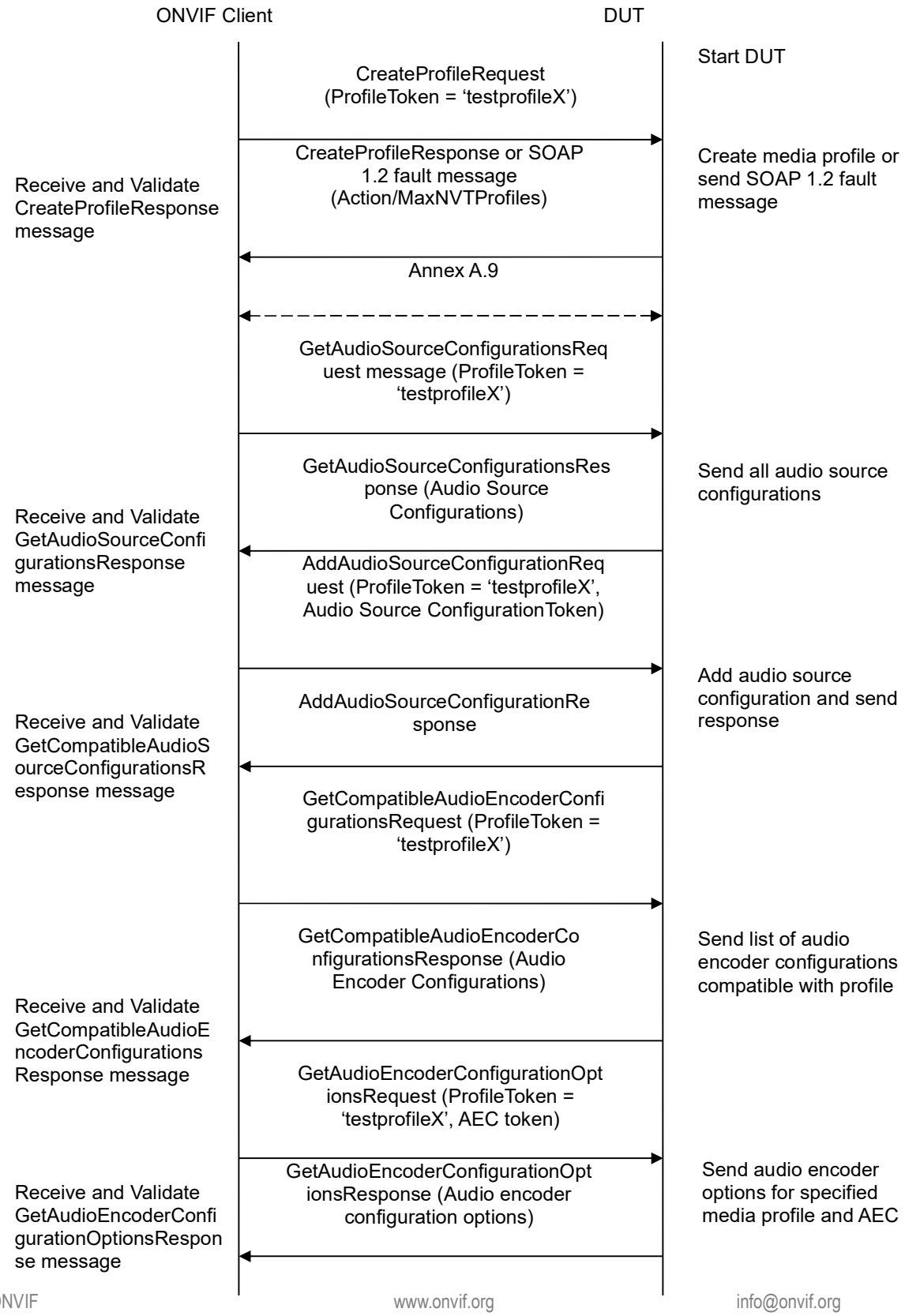
WSDL Reference: None

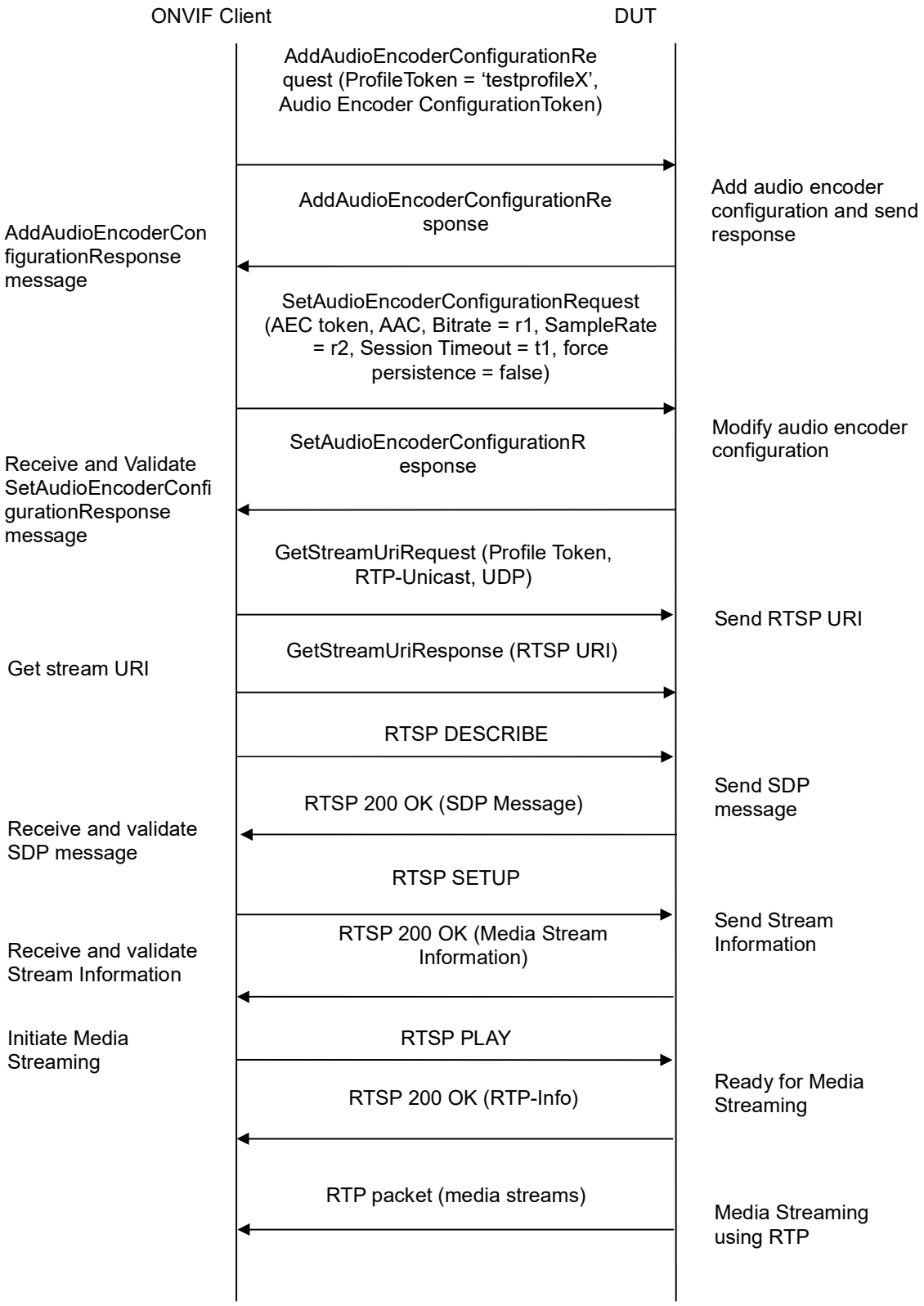
Test Purpose: To verify AAC media streaming based on RTP-Unicast/UDP Transport for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

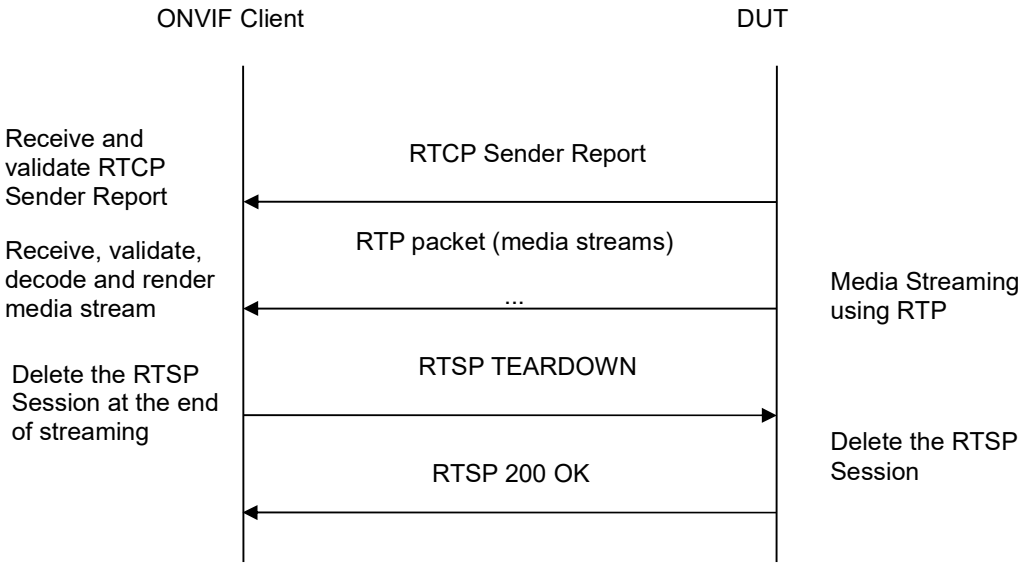
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT and AAC is implemented by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
AddAudioSourceConfigurationResponse
Add audio source configuration and send response
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
AddAudioEncoderConfigurationResponse
SetAudioEncoderConfigurationRequest (AEC token, AAC, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
Receive and Validate SetAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
Send RTSP URI
Get stream URI
GetStreamUriResponse (RTSP URI)
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = 'testprofileX'.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = 'testprofileX' and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = 'testprofileX') to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

13. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports AAC encoding go to the next step. If there is no AudioEncoderConfiguration which supports AAC encoding skip this step and repeat steps 7-13 for other AudioSource.
14. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
15. DUT adds the audio encoder configuration to the profile and sends the response.
16. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "AAC", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
17. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
18. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "UDP") to retrieve media stream URI for the selected media profile.
19. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
20. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
21. ONVIF Client invokes RTSP DESCRIBE request.
22. The DUT sends 200 OK message and SDP information.
23. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Unicast/UDP.
24. The DUT sends 200 OK message and the media stream information.
25. ONVIF Client invokes RTSP PLAY request.
26. The DUT sends 200 OK message and starts media streaming.
27. The DUT sends AAC RTP media stream to ONVIF Client over UDP.
28. The DUT sends RTCP sender report to ONVIF Client.
29. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
30. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
31. The DUT sends 200 OK Response and terminates the RTSP Session.
32. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports AAC encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send AAC RTP media streaming to ONVIF Client.

The DUT sent not only AAC RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.17 AUDIO STREAMING – AAC (RTP-Unicast/RTSP/HTTP/TCP)

Test Label: Real Time Viewing DUT AAC Media Streaming Using RTP-Unicast/RTSP/HTTP/TCP Transport

Test Case ID: RTSS-2-1-35

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP

Command Under Test: None

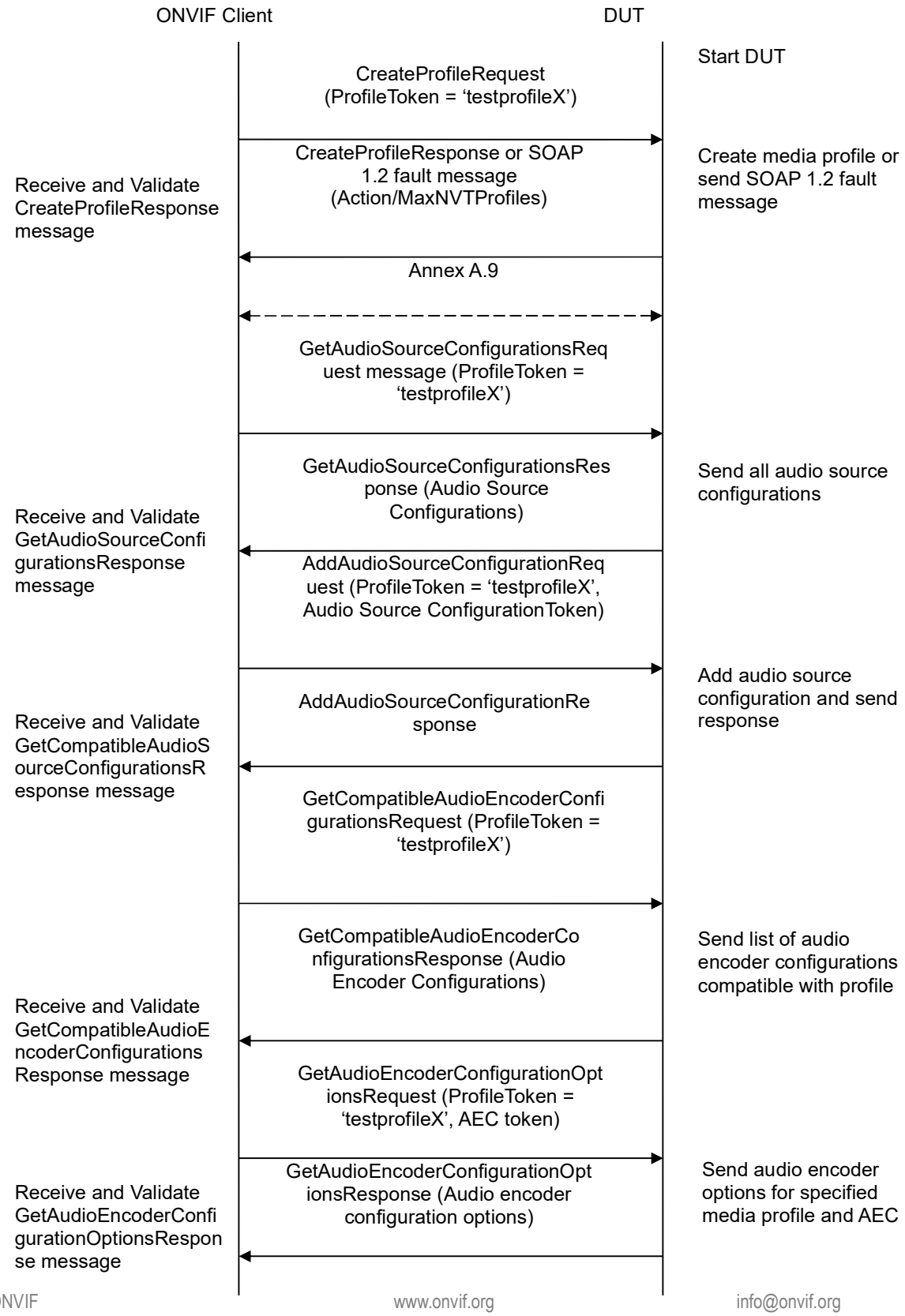
WSDL Reference: None

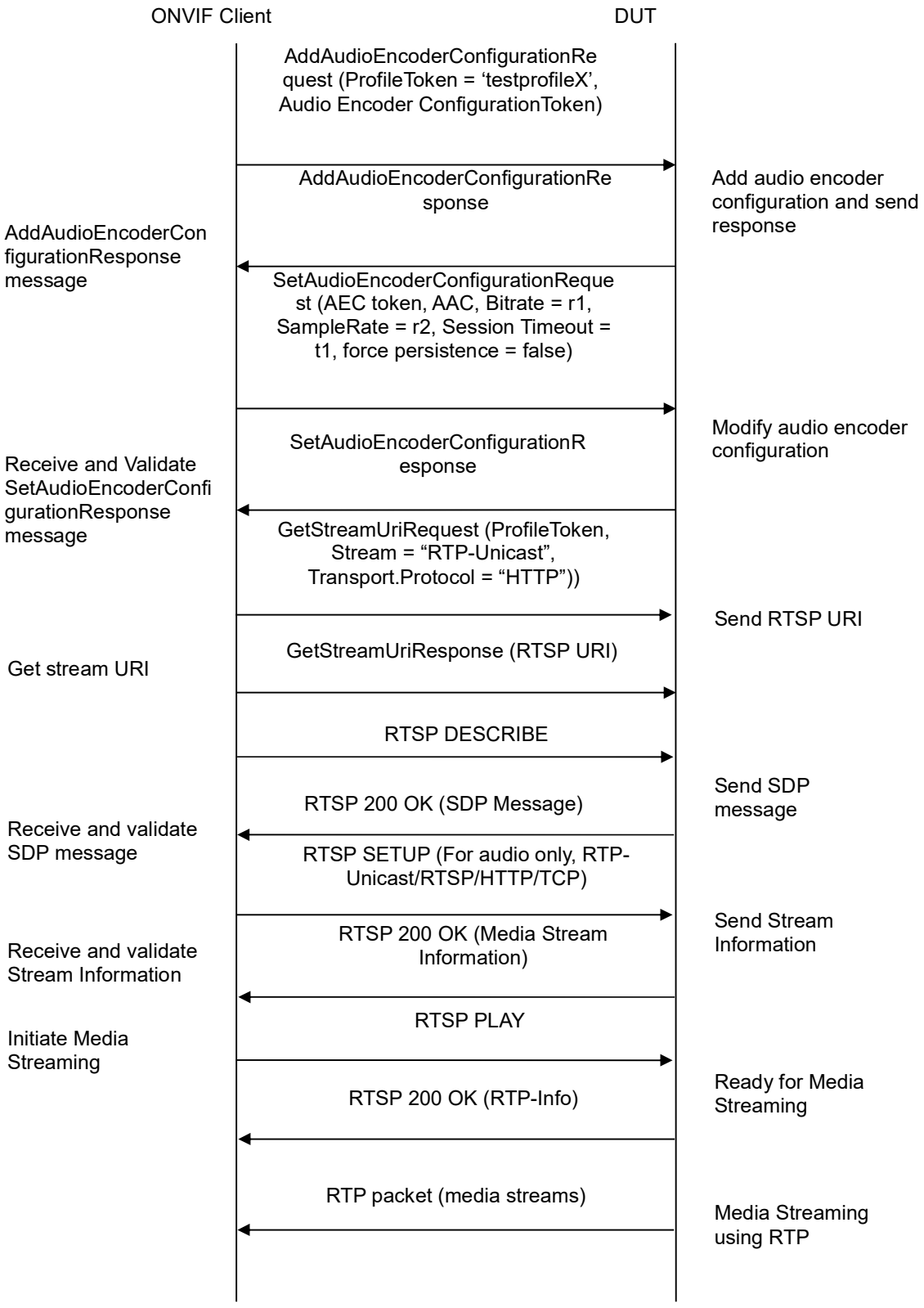
Test Purpose: To verify AAC media streaming based on RTP-Unicast/RTSP/HTTP/TCP Transport for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

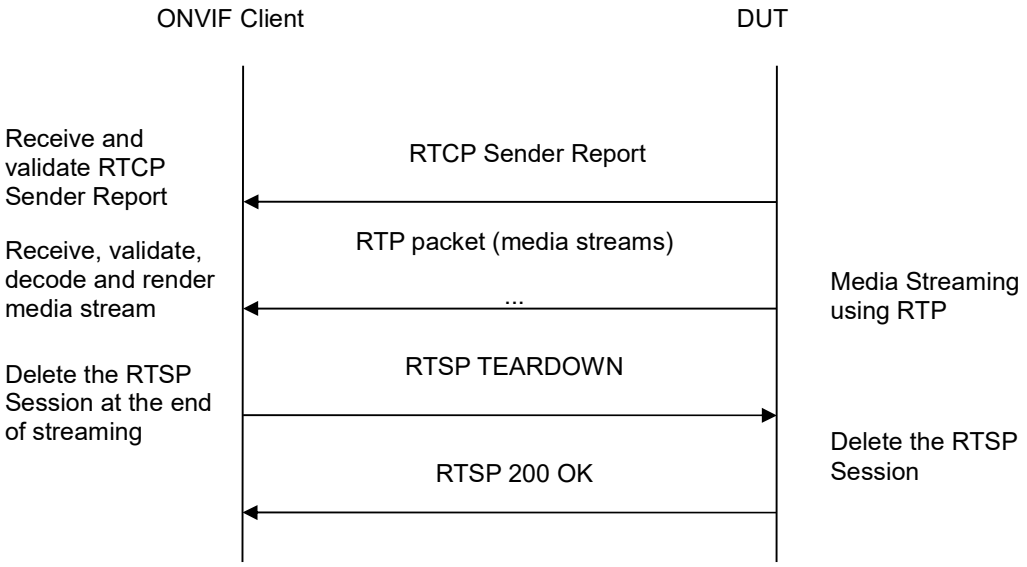
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT and AAC is implemented by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
AddAudioSourceConfigurationResponse
Add audio source configuration and send response
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, AAC, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP"))
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/RTSP/HTTP/TCP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = 'testprofileX'.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = 'testprofileX' and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = 'testprofileX') to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

13. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports AAC encoding go to the next step. If there is no AudioEncoderConfiguration which supports AAC encoding skip this step and repeat steps 7-13 for other AudioSource.
14. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
15. DUT adds the audio encoder configuration to the profile and sends the response.
16. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "AAC", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
17. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
18. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP") to retrieve media stream URI for the selected media profile.
19. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
20. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
21. ONVIF Client invokes RTSP DESCRIBE request.
22. The DUT sends 200 OK message and SDP information.
23. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Unicast/RTSP/HTTP/TCP.
24. The DUT sends 200 OK message and the media stream information.
25. ONVIF Client invokes RTSP PLAY request.
26. The DUT sends 200 OK message and starts media streaming.
27. The DUT sends AAC RTP media stream to ONVIF Client over HTTP.
28. The DUT sends RTCP sender report to ONVIF Client.
29. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
30. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
31. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports AAC encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send AAC RTP media streaming to ONVIF Client.

The DUT sent not only AAC RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.18 AUDIO STREAMING – AAC (RTP/RTSP/TCP)

Test Label: Real Time Viewing DUT AAC Media Streaming Using RTP/RTSP/TCP Transport

Test Case ID: RTSS-2-1-36

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

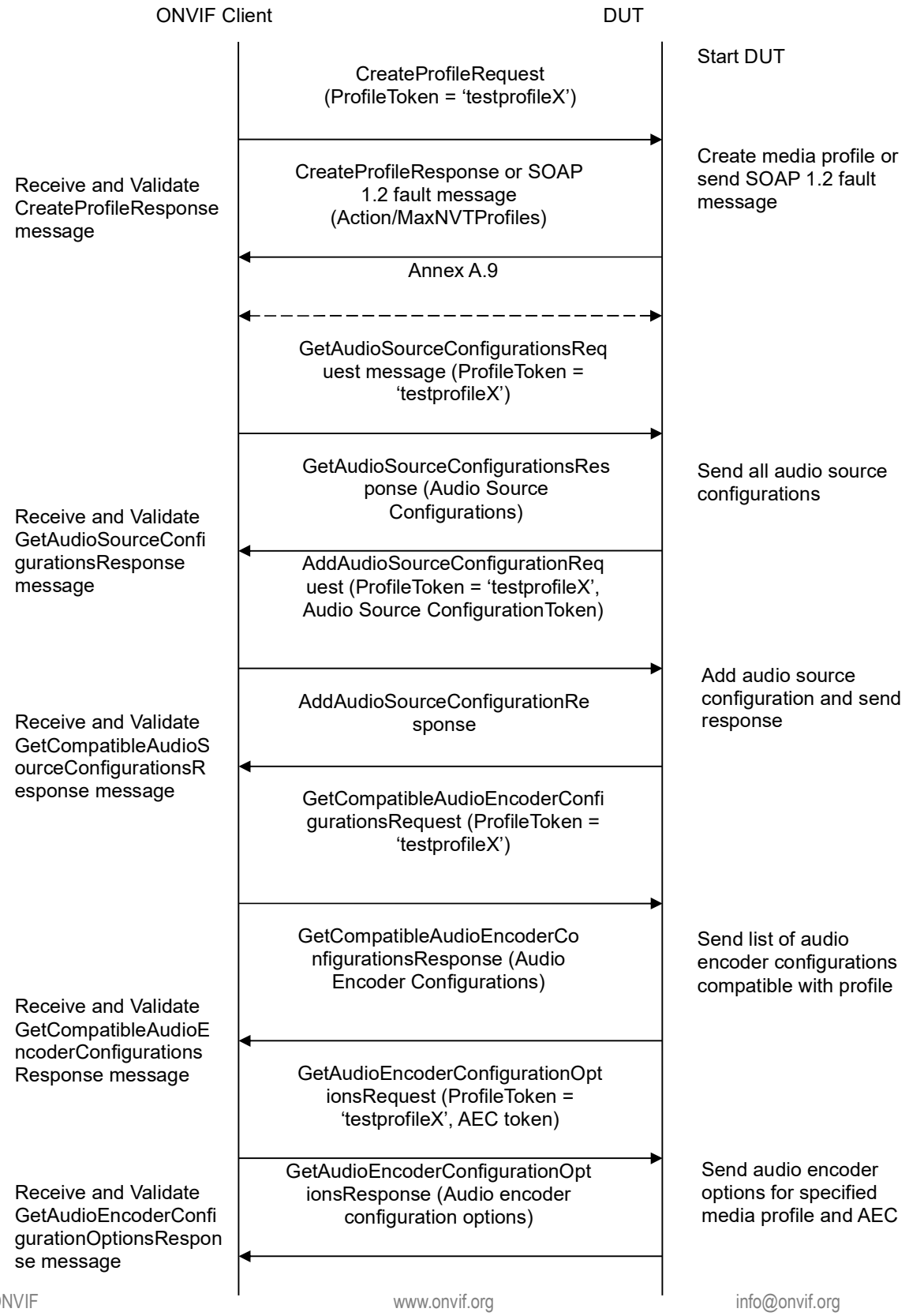
WSDL Reference: None

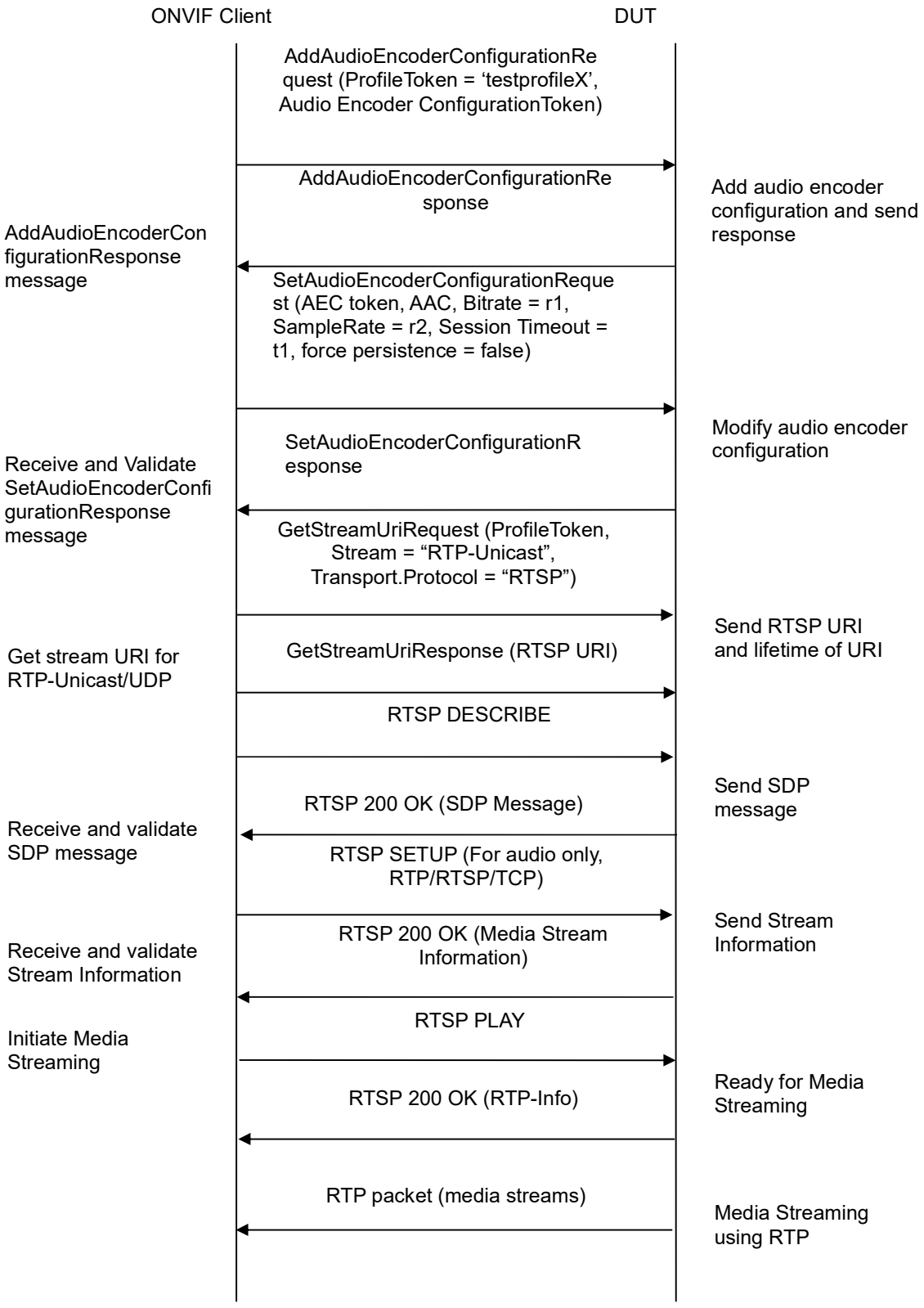
Test Purpose: To verify AAC media streaming based on RTP/RTSP/TCP Transport for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

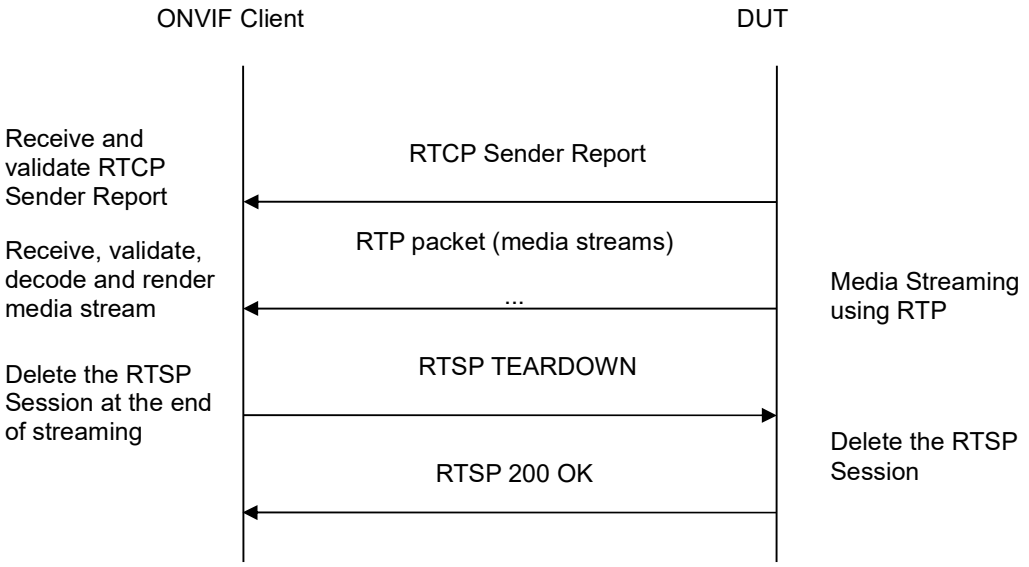
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT and AAC is implemented by DUT. RTP/RTSP/TCP transport protocol is supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
Create media profile or send SOAP 1.2 fault message
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
Send all audio source configurations
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
Add audio source configuration and send response
AddAudioSourceConfigurationResponse
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
Send list of audio encoder configurations compatible with profile
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
Send audio encoder options for specified media profile and AEC
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, AAC, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP")
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Get stream URI for RTP-Unicast/UDP
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP/RTSP/TCP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = 'testprofileX'.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = 'testprofileX' and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = 'testprofileX') to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

13. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports AAC encoding go to the next step. If there is no AudioEncoderConfiguration which supports AAC encoding skip this step and repeat steps 7-13 for other AudioSource.
14. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
15. DUT adds the audio encoder configuration to the profile and sends the response.
16. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "AAC", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
17. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
18. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP") to retrieve media stream URI for the selected media profile.
19. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
20. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
21. ONVIF Client invokes RTSP DESCRIBE request.
22. The DUT sends 200 OK message and SDP information.
23. ONVIF Client invokes RTSP SETUP request with transport parameter RTP/RTSP/TCP.
24. The DUT sends 200 OK message and the media stream information.
25. ONVIF Client invokes RTSP PLAY request.
26. The DUT sends 200 OK message and starts media streaming.
27. The DUT sends AAC RTP media stream to ONVIF Client over RTSP.
28. The DUT sends RTCP sender report to ONVIF Client.
29. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
30. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
31. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports AAC encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send AAC RTP media streaming to ONVIF Client.

The DUT sent not only AAC RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.19 MEDIA STREAMING – G.711 (RTP-Unicast/UDP, IPv6)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP-Unicast/UDP Transport for IPv6.

Test Case ID: DRAFT-RTSS-2-1-37

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

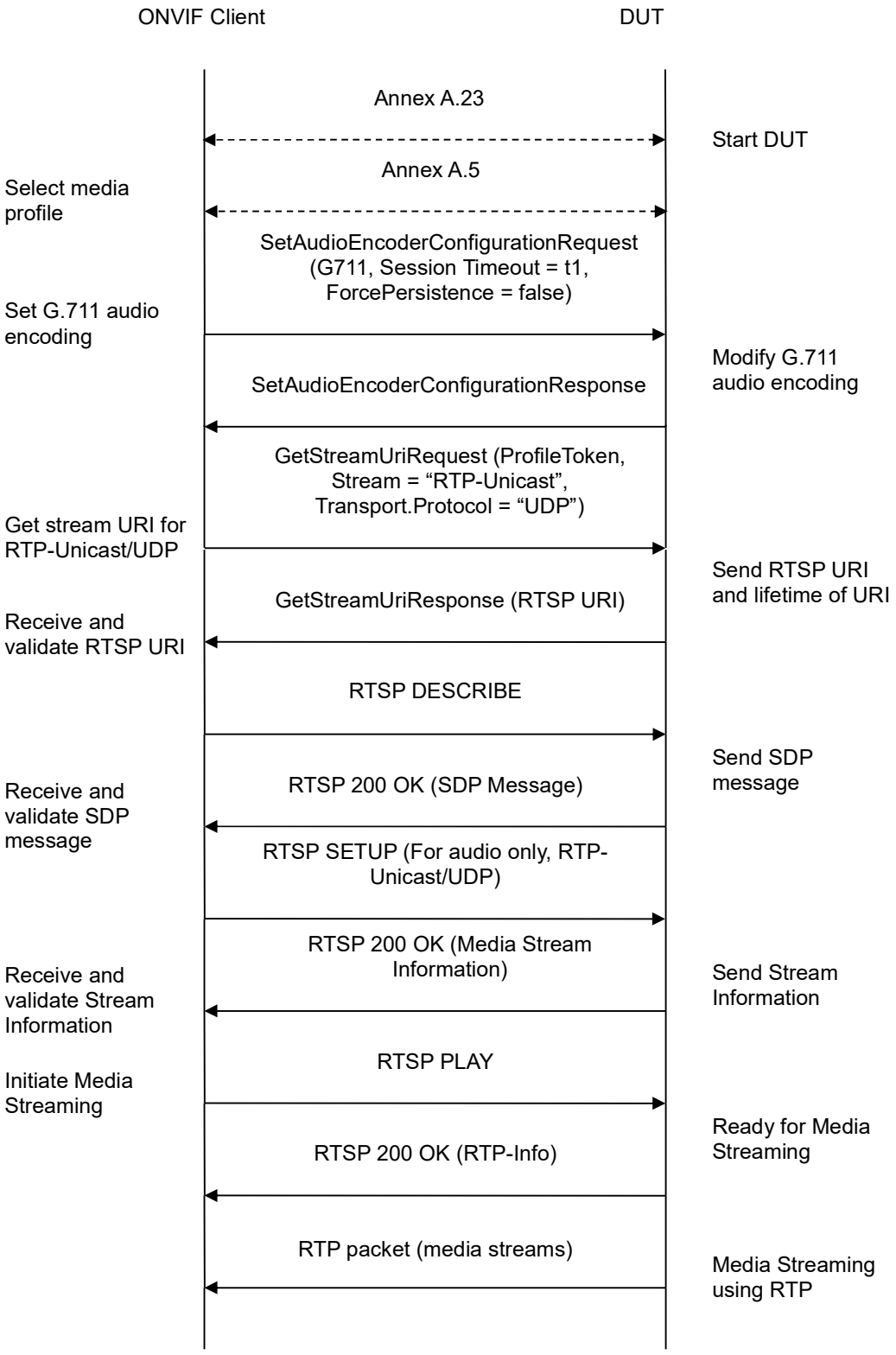
WSDL Reference: None

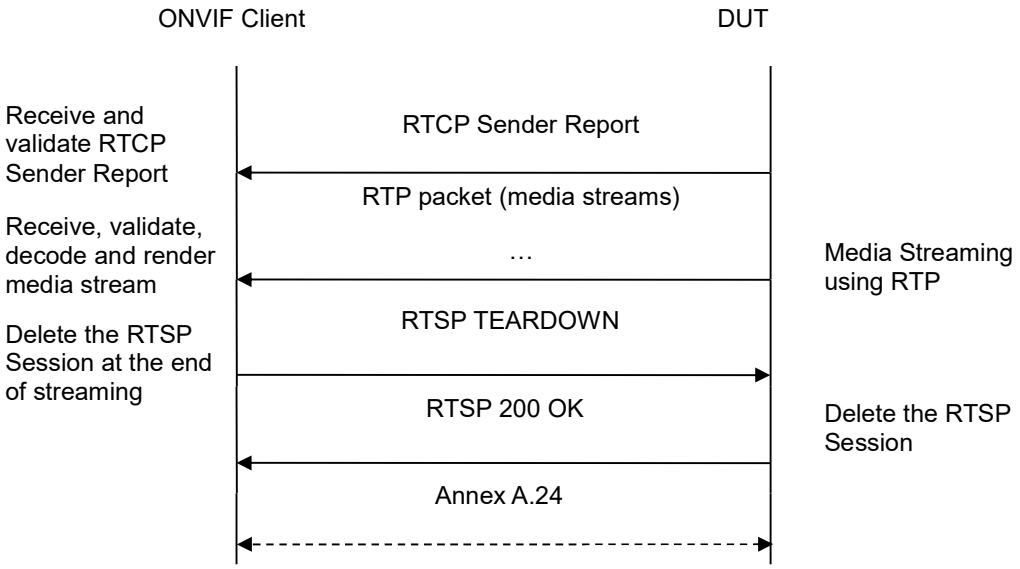
Test Propose: To verify G.711 media streaming based on RTP-Unicast/UDP Transport for IPv6.

Pre-Requisite: Media is supported by DUT. Audio is supported by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Annex A.23
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (G711, Session Timeout = t1, ForcePersistence = false)
Set G.711 audio encoding
Modify G.711 audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “UDP”)
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with G.711 encoding support.
5. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G711”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.711 encoding.
6. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
7. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “UDP”**) to retrieve media stream URI for the selected media profile.
8. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
9. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
10. ONVIF Client invokes RTSP DESCRIBE request.
11. The DUT sends 200 OK message and SDP information.
12. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Unicast/UDP**.
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request.

15. The DUT sends 200 OK message and starts media streaming.
16. The DUT sends G.711 RTP media stream to ONVIF Client over UDP.
17. The DUT sends RTCP sender report to ONVIF Client.
18. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. The DUT sends 200 OK Response and terminates the RTSP Session..
21. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports G.711 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP media streaming to ONVIF Client.

The DUT sent not only G.711 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.20 MEDIA STREAMING – G.711 (RTP-Unicast/RTSP/HTTP/TCP, IPv6)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP-Unicast/RTSP/HTTP/TCP Transport for IPv6.

Test Case ID: DRAFT-RTSS-2-1-38

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP

Command Under Test: None

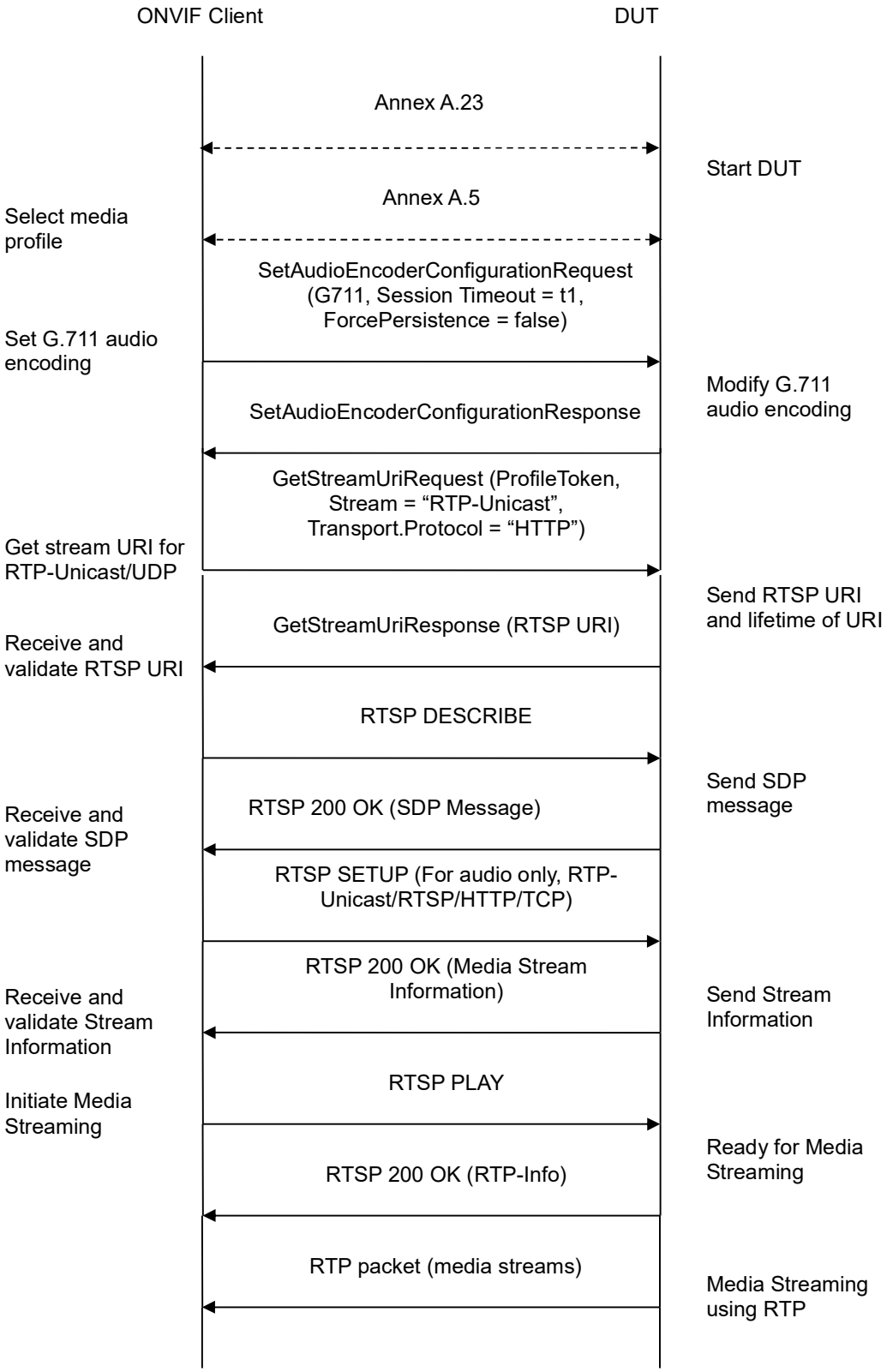
WSDL Reference: None

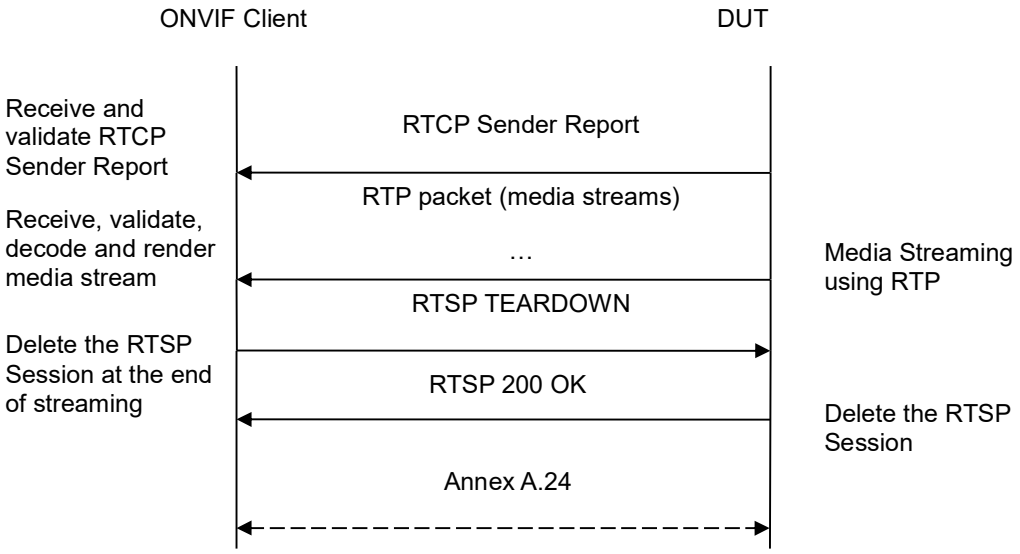
Test Propose: To verify G.711 media streaming based on RTP-Unicast/RTSP/HTTP/TCP Transport for IPv6.

Pre-Requisite: Media is supported by DUT. Audio is supported by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Annex A.23
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (G711, Session Timeout = t1, ForcePersistence = false)
Set G.711 audio encoding
Modify G.711 audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “HTTP”)
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/RTSP/HTTP/TCP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with G.711 encoding support.
5. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G711”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.711 encoding.
6. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
7. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “HTTP”**) to retrieve media stream URI for the selected media profile.
8. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
9. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
10. ONVIF Client invokes RTSP DESCRIBE request.
11. The DUT sends 200 OK message and SDP information.
12. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Unicast/RTSP/HTTP/TCP.**
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request.

15. The DUT sends 200 OK message and starts media streaming.
16. The DUT sends G.711 RTP media stream to ONVIF Client over HTTP.
17. The DUT sends RTCP sender report to ONVIF Client.
18. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. The DUT sends 200 OK Response and terminates the RTSP Session.
21. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP media streaming to ONVIF Client.

The DUT sent not only G.711 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.21 MEDIA STREAMING – G.711 (RTP/RTSP/TCP, IPv6)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP/RTSP/TCP Transport for IPv6.

Test Case ID: DRAFT-RTSS-2-1-39

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

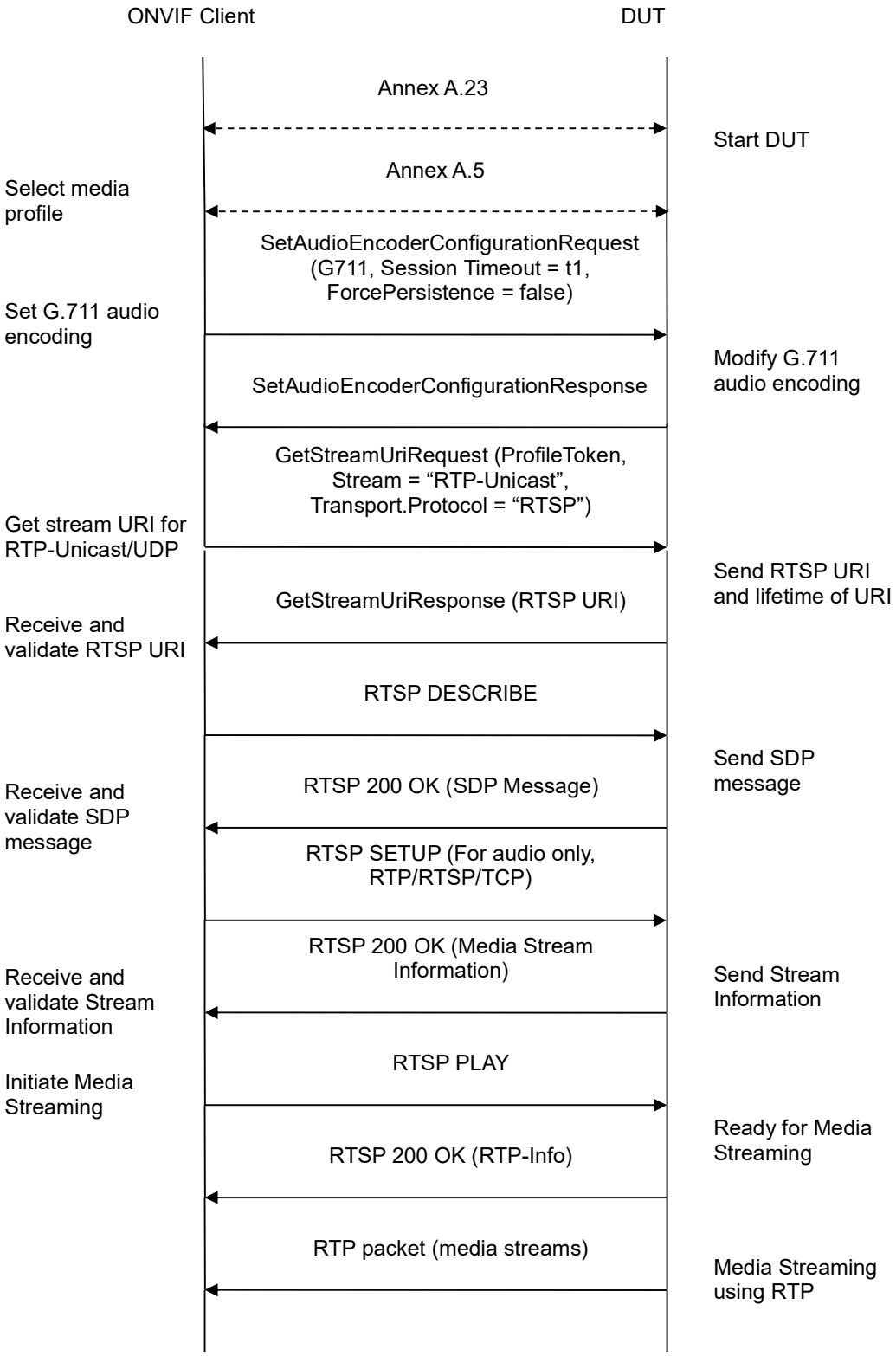
WSDL Reference: None

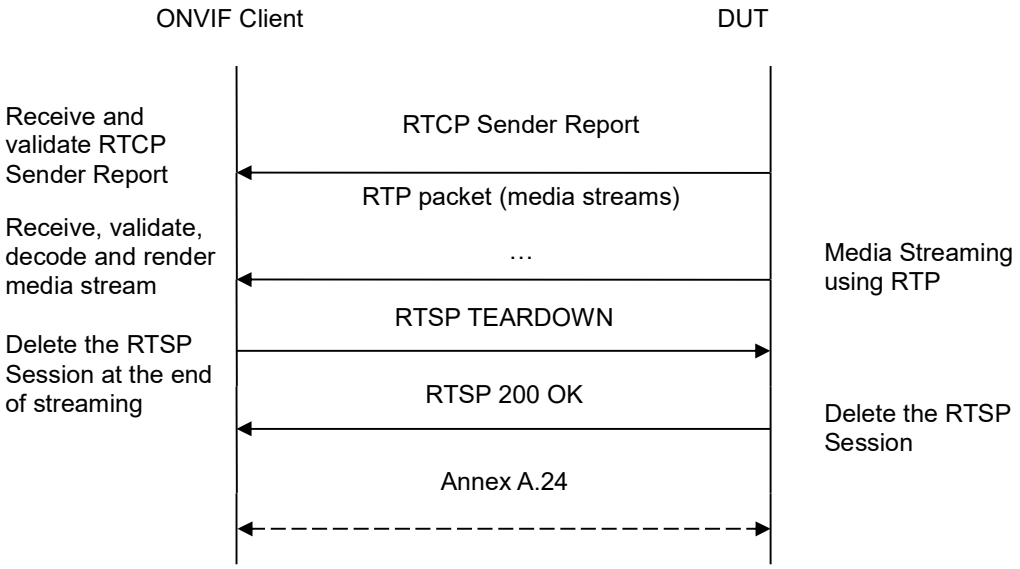
Test Propose: To verify G.711 media streaming based on RTP/RTSP/TCP Transport for IPv6.

Pre-Requisite: Media is supported by DUT. Audio is supported by DUT. RTP/RTSP/TCP transport protocol is supported by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Annex A.23
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (G711, Session Timeout = t1, ForcePersistence = false)
Set G.711 audio encoding
Modify G.711 audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “RTSP”)
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP/RTSP/TCP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with G.711 encoding support.
5. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G711”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.711 encoding.
6. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
7. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “RTSP”**) to retrieve media stream URI for the selected media profile.
8. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
9. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
10. ONVIF Client invokes RTSP DESCRIBE request.
11. The DUT sends 200 OK message and SDP information.
12. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP/RTSP/TCP**.
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request.

15. The DUT sends 200 OK message and starts media streaming.
16. The DUT sends G.711 RTP media stream to ONVIF Client over RTSP.
17. The DUT sends RTCP sender report to ONVIF Client.
18. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. The DUT sends 200 OK Response and terminates the RTSP Session.
21. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP media streaming to ONVIF Client.

The DUT sent not only G.711 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.22 MEDIA STREAMING – G.726 (RTP-Unicast/UDP, IPv6)

Test Label: Real Time Viewing DUT G.726 Media Streaming Using RTP-Unicast/UDP Transport for IPv6.

Test Case ID: DRAFT-RTSS-2-1-40

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

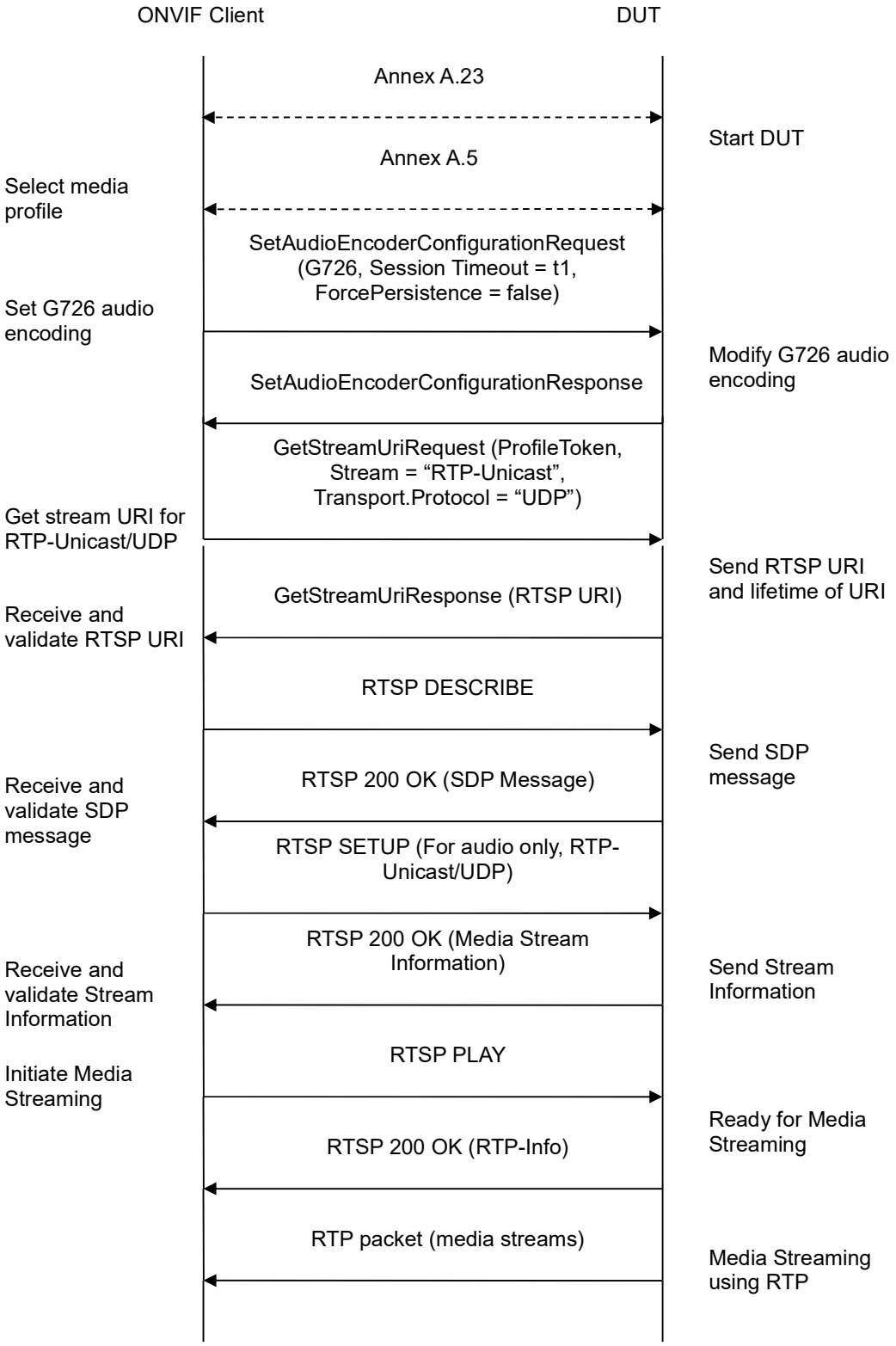
WSDL Reference: None

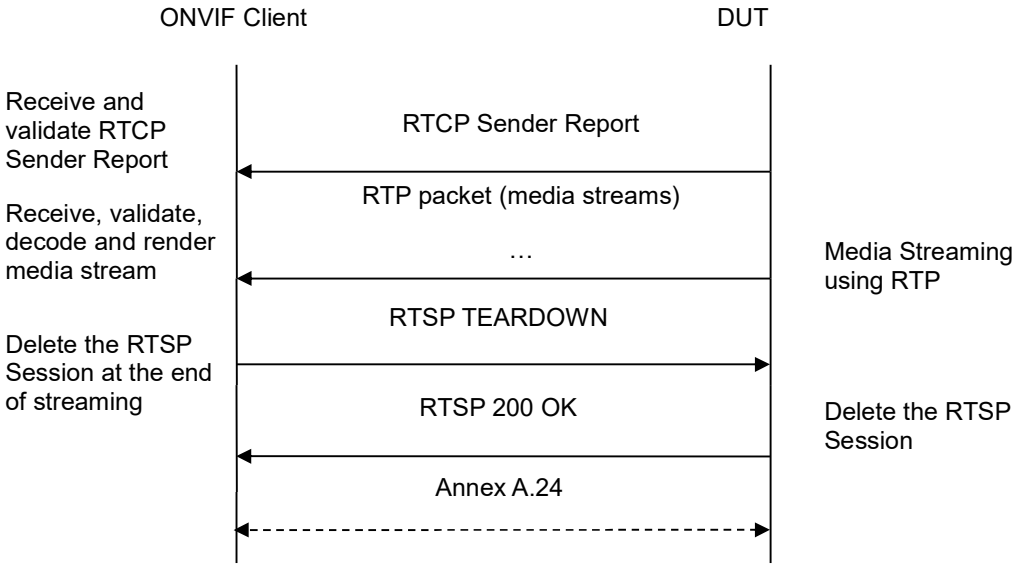
Test Propose: To verify G.726 media streaming based on RTP-Unicast/UDP Transport for IPv6.

Pre-Requisite: Media is supported by DUT. Audio is supported by DUT and G.726 is implemented by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Annex A.23
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (G726, Session Timeout = t1, ForcePersistence = false)
Set G726 audio encoding
Modify G726 audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “UDP”)
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with G.726 encoding support.
5. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G726”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
6. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
7. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “UDP**”) to retrieve media stream URI for the selected media profile.
8. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
9. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
10. ONVIF Client invokes RTSP DESCRIBE request.
11. The DUT sends 200 OK message and SDP information.
12. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Unicast/UDP**.
13. The DUT sends 200 OK message and the media stream information.

14. ONVIF Client invokes RTSP PLAY request.
15. The DUT sends 200 OK message and starts media streaming.
16. The DUT sends G.726 RTP media stream to ONVIF Client over UDP.
17. The DUT sends RTCP sender report to ONVIF Client.
18. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. The DUT sends 200 OK Response and terminates the RTSP Session.
21. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.726 RTP media streaming to ONVIF Client.

The DUT sent not only G.726 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.23 MEDIA STREAMING – G.726 (RTP-Unicast/RTSP/HTTP/TCP, IPv6)

Test Label: Real Time Viewing DUT G.726 Media Streaming Using RTP-Unicast/RTSP/HTTP/TCP Transport for IPv6.

Test Case ID: DRAFT-RTSS-2-1-41

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP

Command Under Test: None

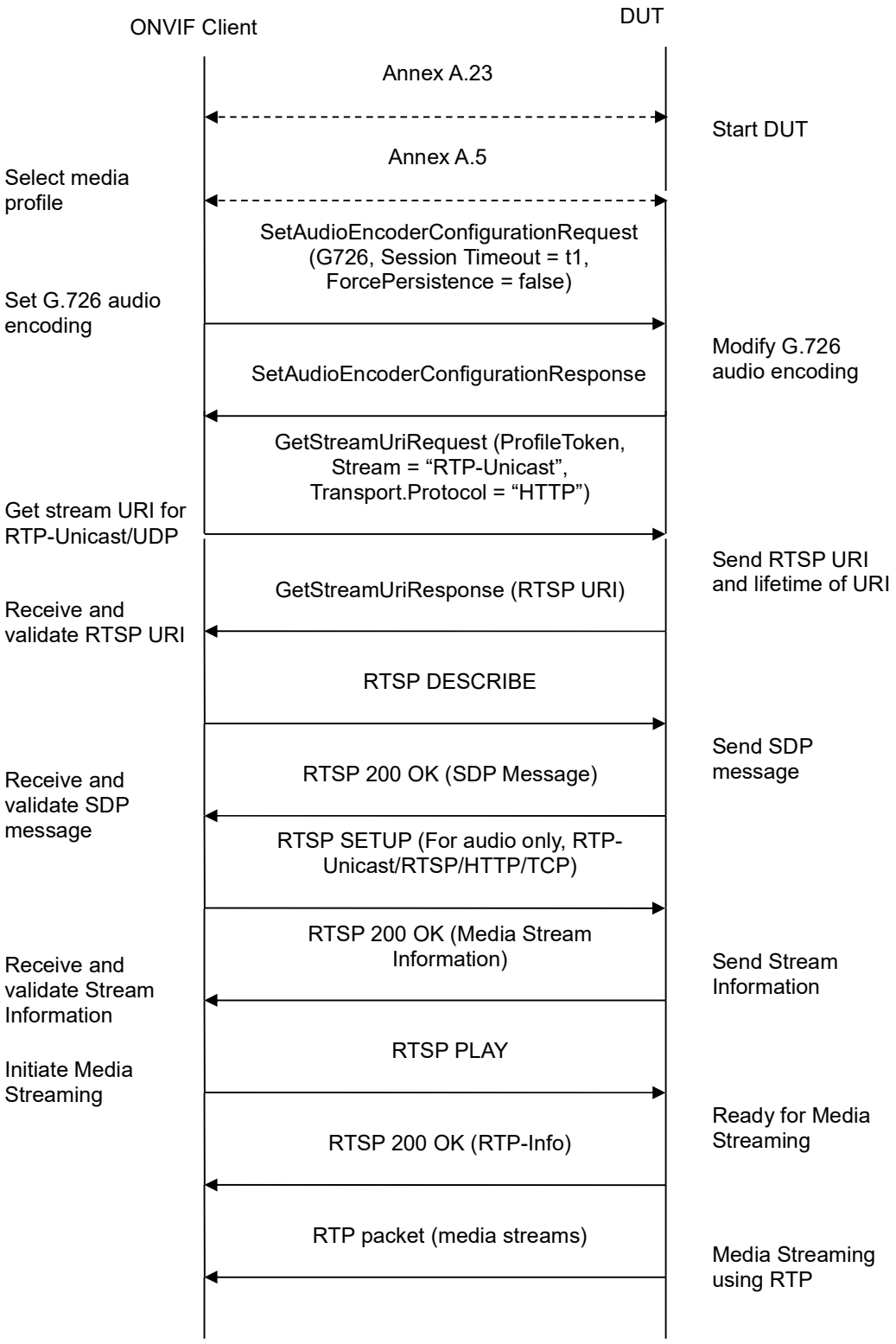
WSDL Reference: None

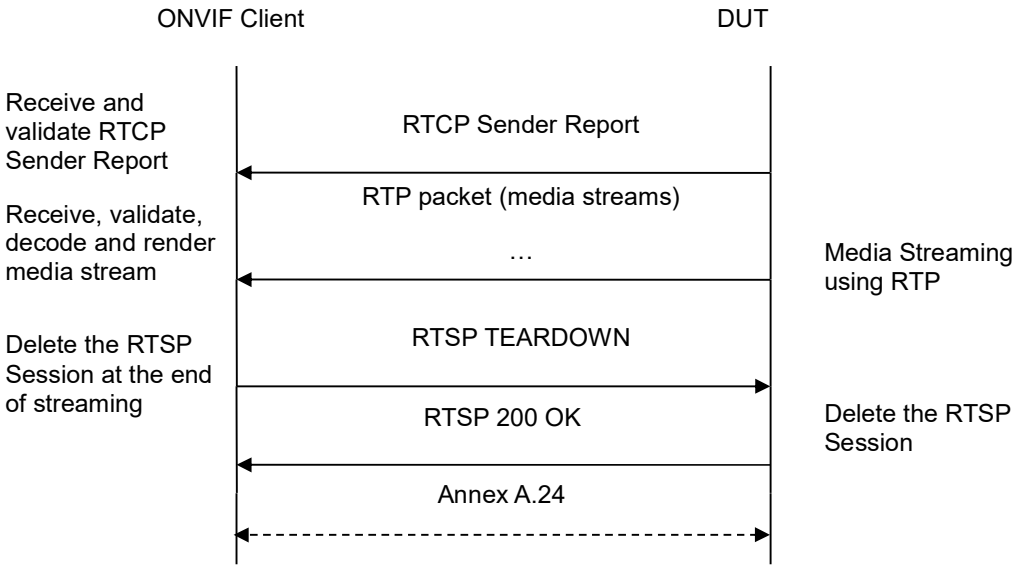
Test Propose: To verify G.726 media streaming based on RTP-Unicast/RTSP/HTTP/TCP Transport for IPv6.

Pre-Requisite: Media is supported by DUT. Audio is supported by DUT and G.726 is implemented by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Annex A.23
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (G726, Session Timeout = t1, ForcePersistence = false)
Set G.726 audio encoding
Modify G.726 audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “HTTP”)
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/RTSP/HTTP/TCP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with G.726 encoding support.
5. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G726”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
6. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
7. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “HTTP”**) to retrieve media stream URI for the selected media profile.
8. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
9. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
10. ONVIF Client invokes RTSP DESCRIBE request.
11. The DUT sends 200 OK message and SDP information.
12. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Unicast/RTSP/HTTP/TCP**.
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request.

15. The DUT sends 200 OK message and starts media streaming.
16. The DUT sends G.726 RTP media stream to ONVIF Client over HTTP.
17. The DUT sends RTCP sender report to ONVIF Client.
18. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. The DUT sends 200 OK Response and terminates the RTSP Session.
21. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.726 RTP media streaming to ONVIF Client.

The DUT sent not only G.726 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.24 MEDIA STREAMING – G.726 (RTP/RTSP/TCP, IPv6)

Test Label: Real Time Viewing DUT G.726 Media Streaming Using RTP/RTSP/TCP Transport for IPv6.

Test Case ID: DRAFT-RTSS-2-1-42

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

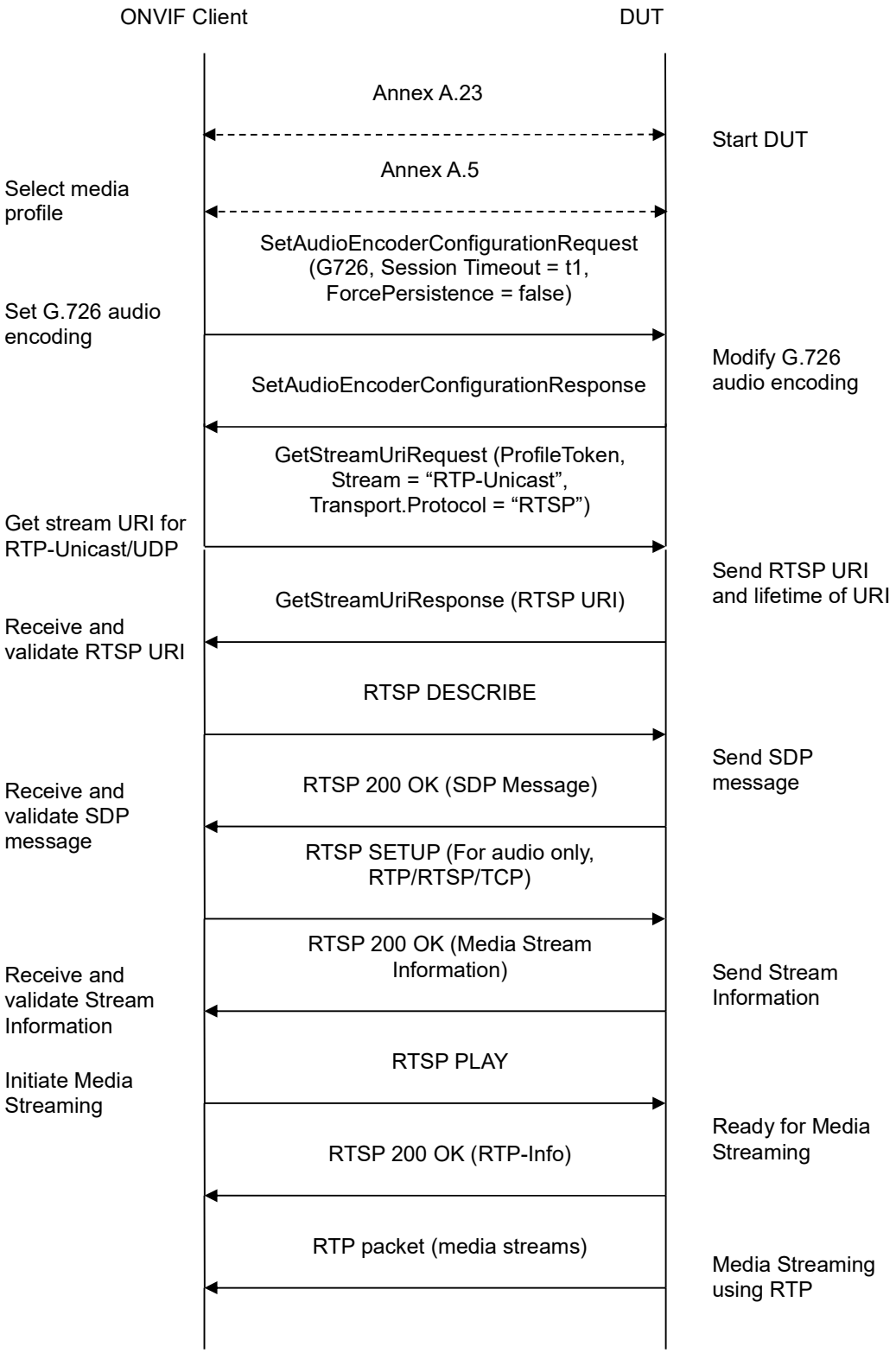
WSDL Reference: None

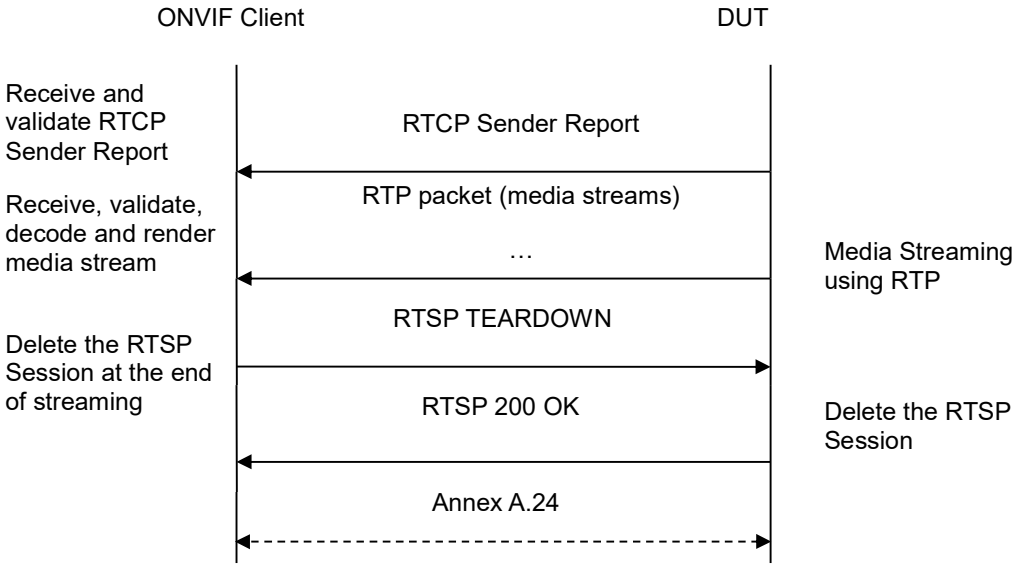
Test Propose: To verify G.726 media streaming based on RTP/RTSP/TCP Transport for IPv6.

Pre-Requisite: Media is supported by DUT. Audio is supported by DUT and G.726 is implemented by DUT. RTP/RTSP/TCP transport protocol is supported by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Annex A.23
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (G726, Session Timeout = t1, ForcePersistence = false)
Set G.726 audio encoding
Modify G.726 audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “RTSP”)
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP/RTSP/TCP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with G.726 encoding support.
5. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G726”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.726 encoding.
6. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
7. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “RTSP”**) to retrieve media stream URI for the selected media profile.
8. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
9. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
10. ONVIF Client invokes RTSP DESCRIBE request.
11. The DUT sends 200 OK message and SDP information.
12. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP/RTSP/TCP**.
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request.

15. The DUT sends 200 OK message and starts media streaming.
16. The DUT sends G.726 RTP media stream to ONVIF Client over RTSP.
17. The DUT sends RTCP sender report to ONVIF Client.
18. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. The DUT sends 200 OK Response and terminates the RTSP Session.
21. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.726 RTP media streaming to ONVIF Client.

The DUT sent not only G.726 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.25 MEDIA STREAMING – AAC (RTP-Unicast/UDP, IPv6)

Test Label: Real Time Viewing DUT AAC Media Streaming Using RTP-Unicast/UDP Transport for IPv6.

Test Case ID: DRAFT-RTSS-2-1-43

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

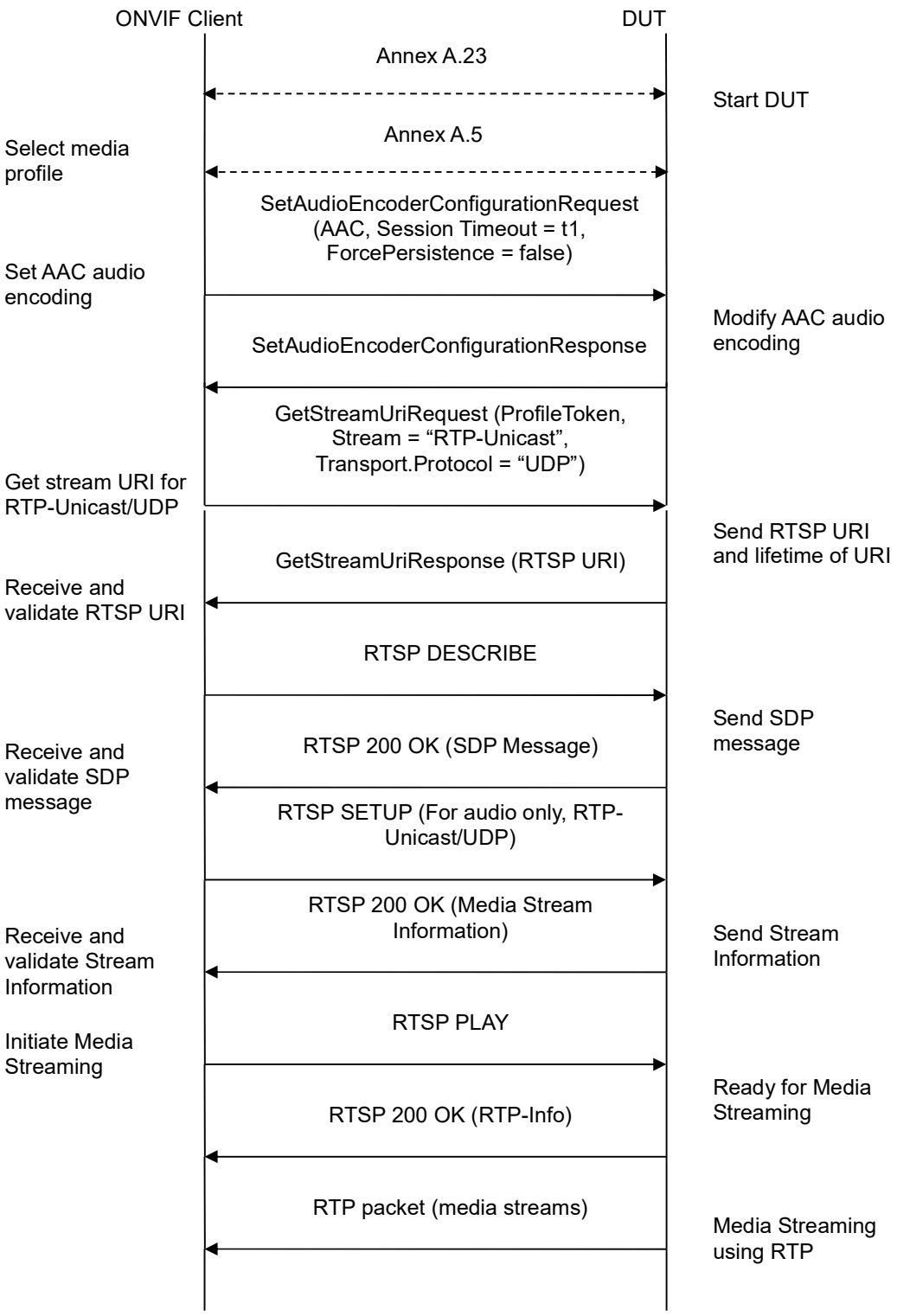
WSDL Reference: None

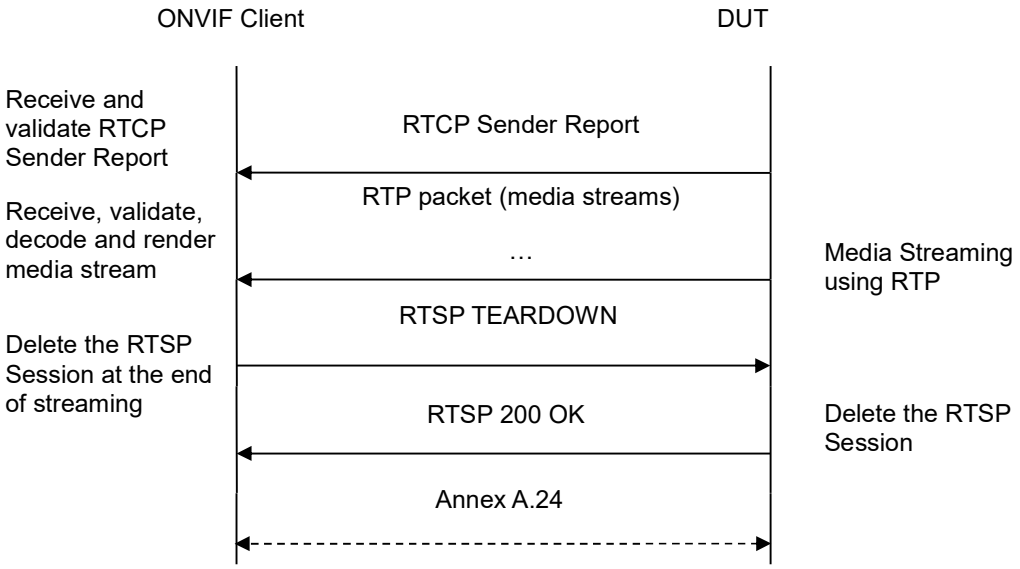
Test Propose: To verify AAC media streaming based on RTP-Unicast/UDP Transpor for IPv6.

Pre-Requisite: Media is supported by DUT. Audio is supported by DUT and AAC is implemented by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Annex A.23
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (AAC, Session Timeout = t1, ForcePersistence = false)
Set AAC audio encoding
Modify AAC audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “UDP”)
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with AAC encoding support.
5. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “AAC”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
6. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
7. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “UDP”**) to retrieve media stream URI for the selected media profile.
8. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
9. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
10. ONVIF Client invokes RTSP DESCRIBE request.
11. The DUT sends 200 OK message and SDP information.
12. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Unicast/UDP**.
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request.

15. The DUT sends 200 OK message and starts media streaming.
16. The DUT sends AAC RTP media stream to ONVIF Client over UDP.
17. The DUT sends RTCP sender report to ONVIF Client.
18. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. The DUT sends 200 OK Response and terminates the RTSP Session.
21. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send AAC RTP media streaming to ONVIF Client.

The DUT sent not only AAC RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.26 MEDIA STREAMING – AAC (RTP-Unicast/RTSP/HTTP/TCP, IPv6)

Test Label: Real Time Viewing DUT AAC Media Streaming Using RTP-Unicast/RTSP/HTTP/TCP Transport for IPv6.

Test Case ID: DRAFT-RTSS-2-1-44

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP

Command Under Test: None

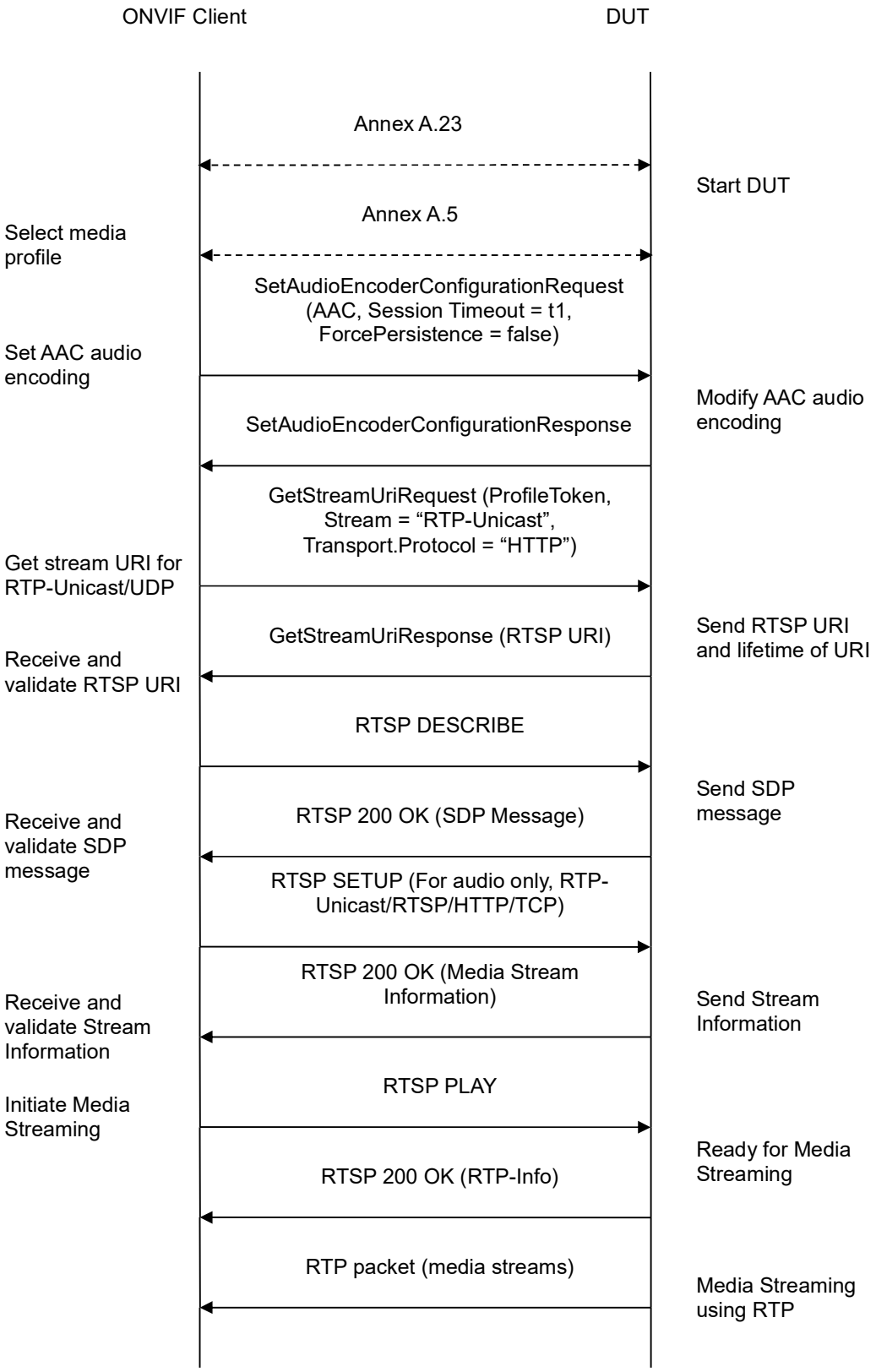
WSDL Reference: None

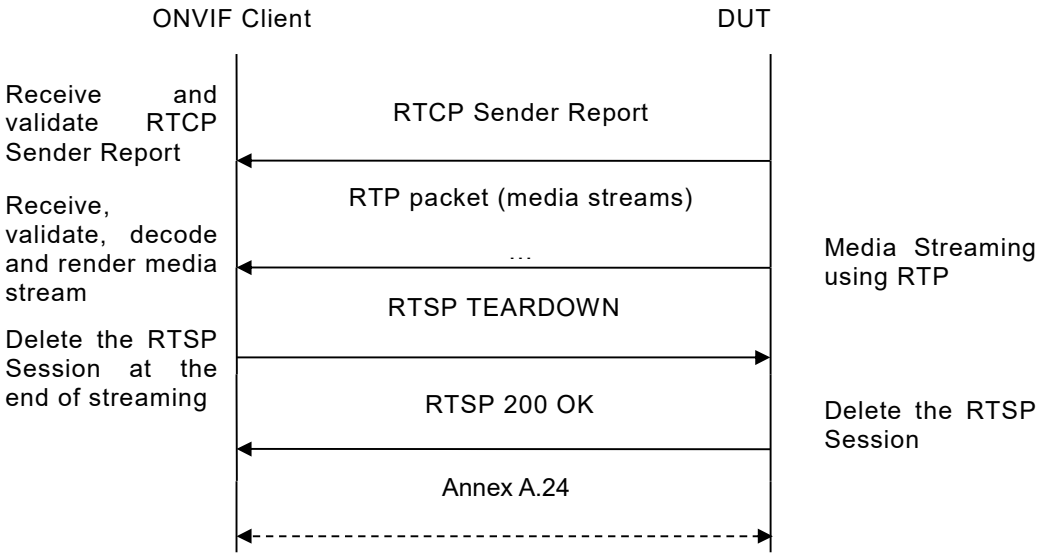
Test Propose: To verify AAC media streaming based on RTP-Unicast/RTSP/HTTP/TCP Transport for IPv6.

Pre-Requisite: Media is supported by DUT. Audio is supported by DUT and AAC is implemented by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Annex A.23
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (AAC, Session Timeout = t1, ForcePersistence = false)
Set AAC audio encoding
Modify AAC audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “HTTP”)
Get stream URI for RTP-Unicast/UDP
GetStreamUriResponse (RTSP URI)
Send RTSP URI and lifetime of URI
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/RTSP/HTTP/TCP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with AAC encoding support.
5. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “AAC”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
6. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
7. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “HTTP”**) to retrieve media stream URI for the selected media profile.
8. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
9. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
10. ONVIF Client invokes RTSP DESCRIBE request.
11. The DUT sends 200 OK message and SDP information.
12. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Unicast/RTSP/HTTP/TCP**.
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request.

15. The DUT sends 200 OK message and starts media streaming.
16. The DUT sends AAC RTP media stream to ONVIF Client over HTTP.
17. The DUT sends RTCP sender report to ONVIF Client.
18. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. The DUT sends 200 OK Response and terminates the RTSP Session.
21. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send AAC RTP media streaming to ONVIF Client.

The DUT sent not only AAC RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.27 MEDIA STREAMING – AAC (RTP/RTSP/TCP, IPv6)

Test Label: Real Time Viewing DUT AAC Media Streaming Using RTP/RTSP/TCP Transport for IPv6.

Test Case ID: DRAFT-RTSS-2-1-45

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, TCP, Stream control, RTSP

Command Under Test: None

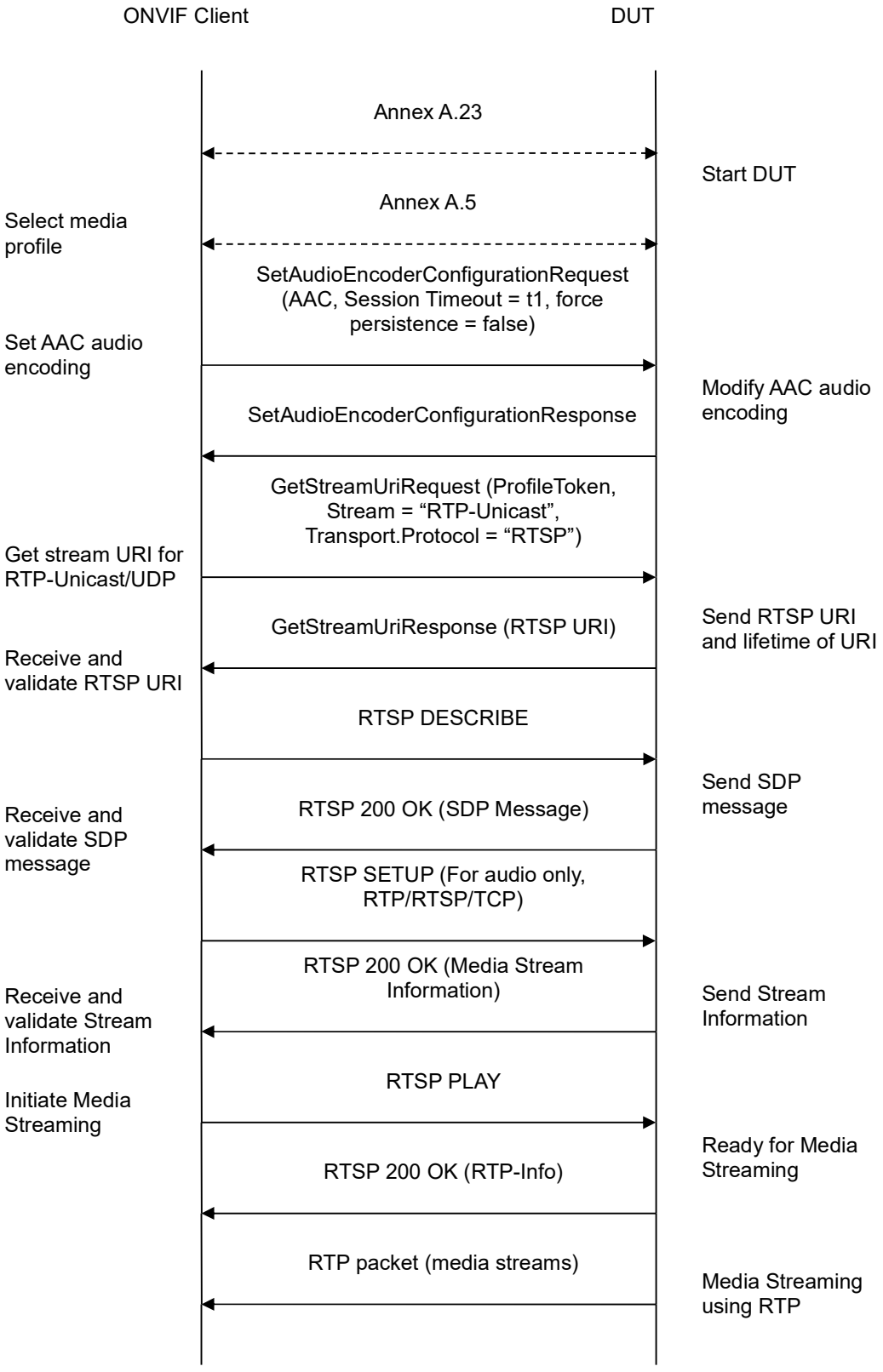
WSDL Reference: None

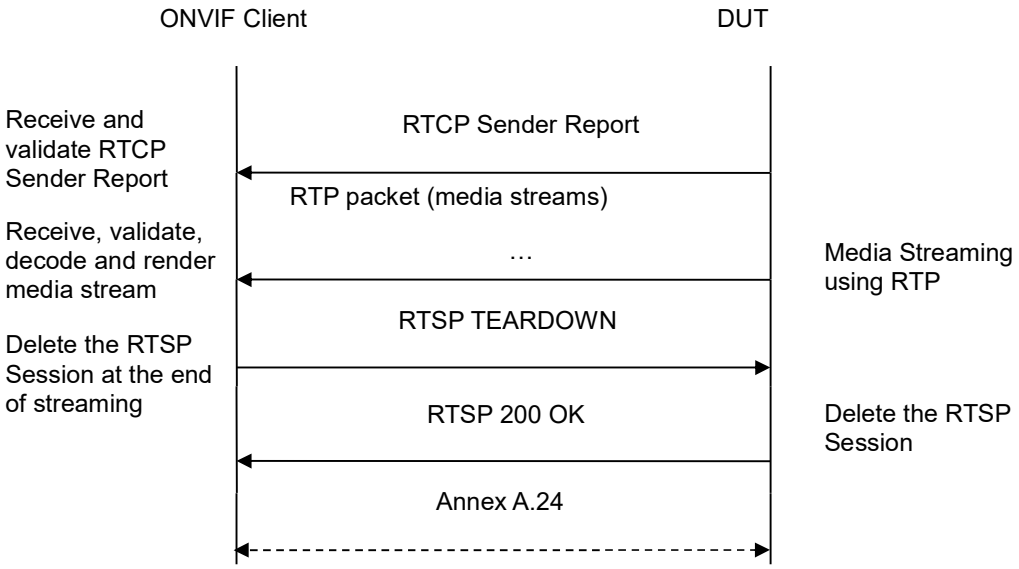
Test Propose: To verify AAC media streaming based on RTP/RTSP/TCP Transport for IPv6.

Pre-Requisite: Media is supported by DUT. Audio is supported by DUT and AAC is implemented by DUT. RTP/RTSP/TCP transport protocol is supported by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Annex A.23
Start DUT
Annex A.5
Select media profile
SetAudioEncoderConfigurationRequest (AAC, Session Timeout = t1, force persistence = false)
Set AAC audio encoding
Modify AAC audio encoding
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “RTSP”)
Get stream URI for RTP-Unicast/UDP
GetStreamUriResponse (RTSP URI)
Send RTSP URI and lifetime of URI
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP/RTSP/TCP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with AAC encoding support.
5. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “AAC”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
6. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
7. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “RTSP”) to retrieve media stream URI for the selected media profile.
8. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
9. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
10. ONVIF Client invokes RTSP DESCRIBE request.
11. The DUT sends 200 OK message and SDP information.
12. ONVIF Client invokes RTSP SETUP request with transport parameter RTP/RTSP/TCP.
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request.

15. The DUT sends 200 OK message and starts media streaming.
16. The DUT sends AAC RTP media stream to ONVIF Client over RTSP.
17. The DUT sends RTCP sender report to ONVIF Client.
18. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. The DUT sends 200 OK Response and terminates the RTSP Session.
21. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send AAC RTP media streaming to ONVIF Client.

The DUT sent not only AAC RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.28 AUDIO STREAMING – G.711 (RTP-Unicast/UDP, IPv6)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP-Unicast/UDP Transport for IPv6

Test Case ID: DRAFT-RTSS-2-1-46

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control,

RTSP

Command Under Test: None

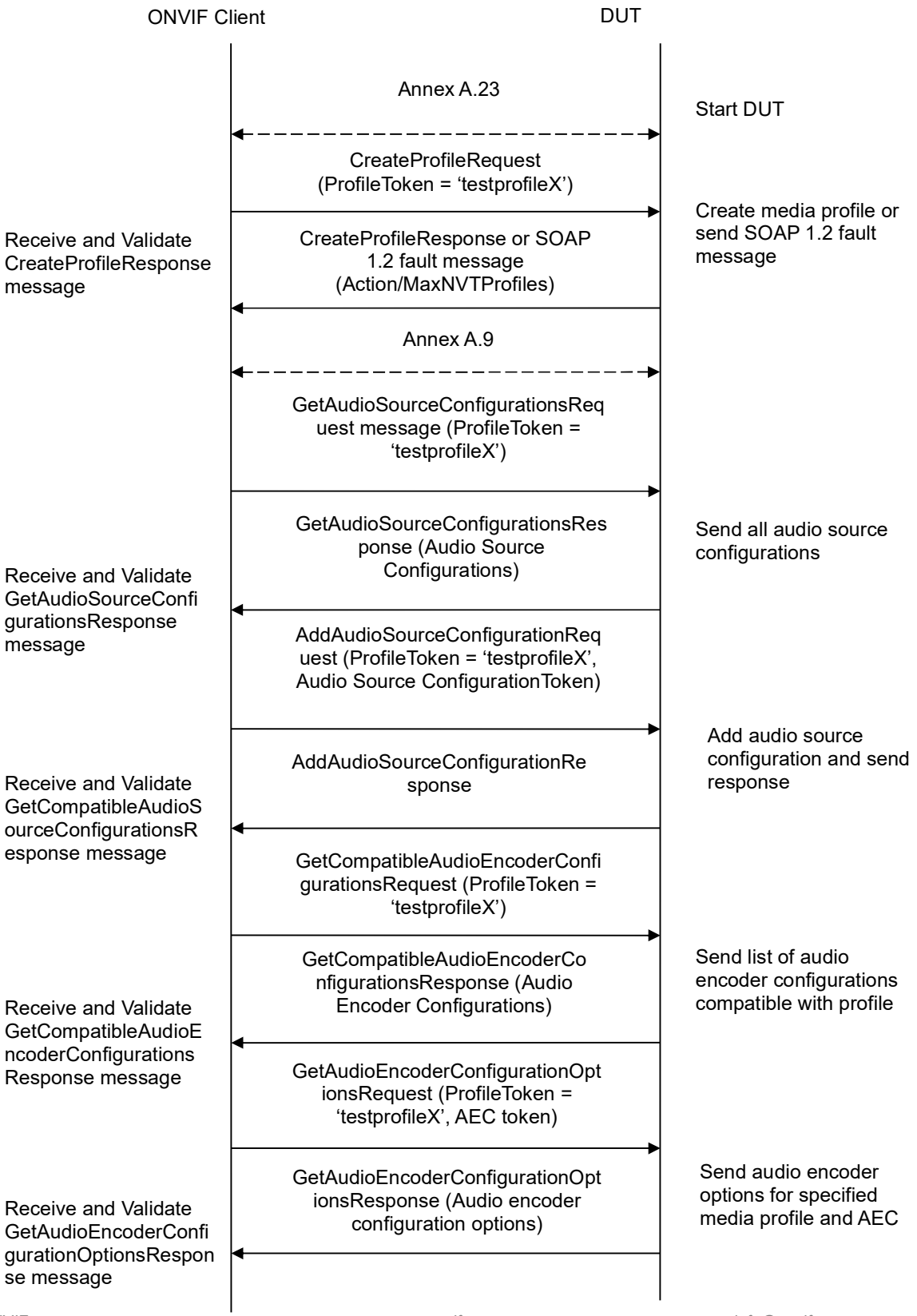
WSDL Reference: None

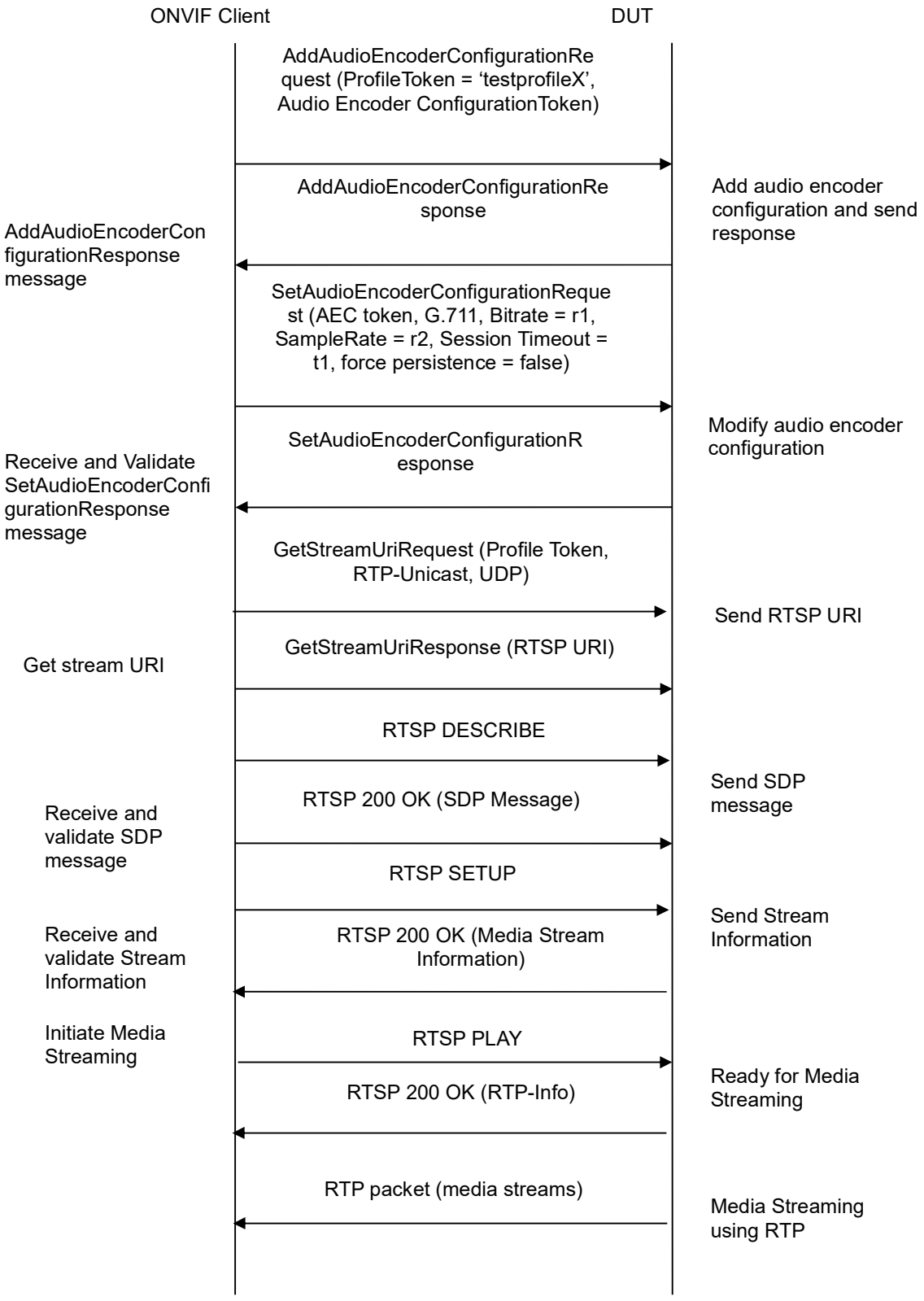
Test Purpose: To verify G.711 media streaming based on RTP-Unicast/UDP Transport for IPv6 for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

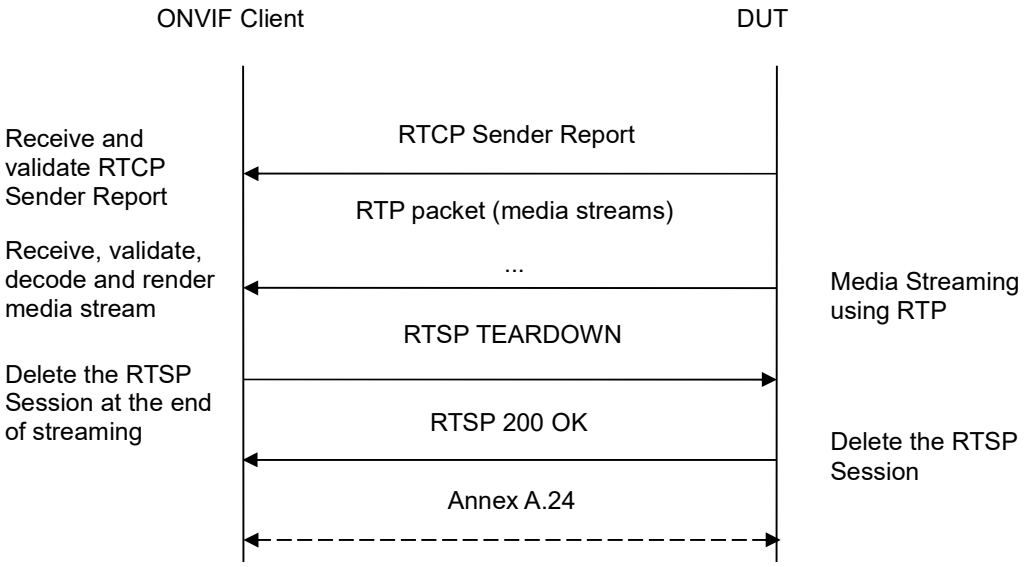
Pre-Requisite: Media is supported by DUT. Audio is supported by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Annex A.23
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
Add audio source configuration and send response
AddAudioSourceConfigurationResponse
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurationsResponse message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.711, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client invokes CreateProfileRequest message with ProfileToken = ‘testprofileX’.
5. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
6. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
7. Verify GetAudioSourceConfigurationsResponse message.
8. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = ‘testprofileX’ and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
9. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = ‘testprofileX’) to retrieve the list of audio encoder configurations compatible with profile.
10. DUT sends the list of audio encoder configurations compatible with the received media profile token.
11. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
12. ONVIF Client verifies the list of audio encoder configurations sent by DUT.
13. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from

GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

14. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 11-12 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.711 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.711 encoding skip this step and repeat steps 6-12 for other AudioSource.
15. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 12.
16. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G.711", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.711 encoding.
17. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
18. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "UDP") to retrieve media stream URI for the selected media profile.
19. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
20. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
21. ONVIF Client invokes RTSP DESCRIBE request.
22. The DUT sends 200 OK message and SDP information.
23. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Unicast/UDP.
24. The DUT sends 200 OK message and the media stream information.
25. ONVIF Client invokes RTSP PLAY request.
26. The DUT sends 200 OK message and starts media streaming.
27. The DUT sends G.711 RTP media stream to ONVIF Client over UDP
28. The DUT sends RTCP sender report to ONVIF Client.
29. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
30. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
31. The DUT sends 200 OK Response and terminates the RTSP Session.
32. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send AudioEncoderConfiguration which supports G.711 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP media streaming to ONVIF Client.

The DUT sent not only G.711 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.29 AUDIO STREAMING – G.711 (RTP-Unicast/RTSP/HTTP/TCP, IPv6)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP-Unicast/RTSP/HTTP/TCP Transport for IPv6

Test Case ID: DRAFT-RTSS-2-1-47

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP

Command Under Test: None

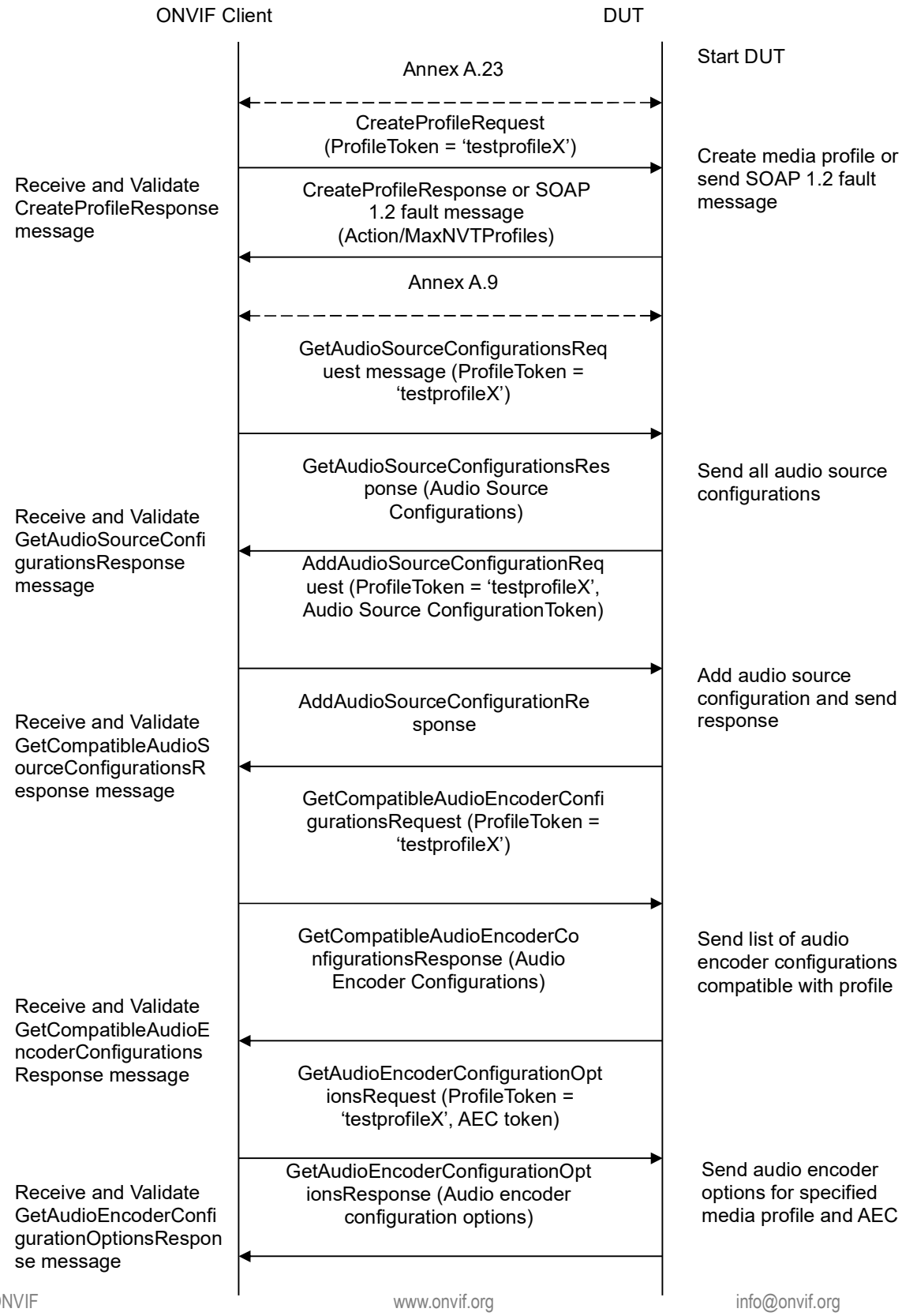
WSDL Reference: None

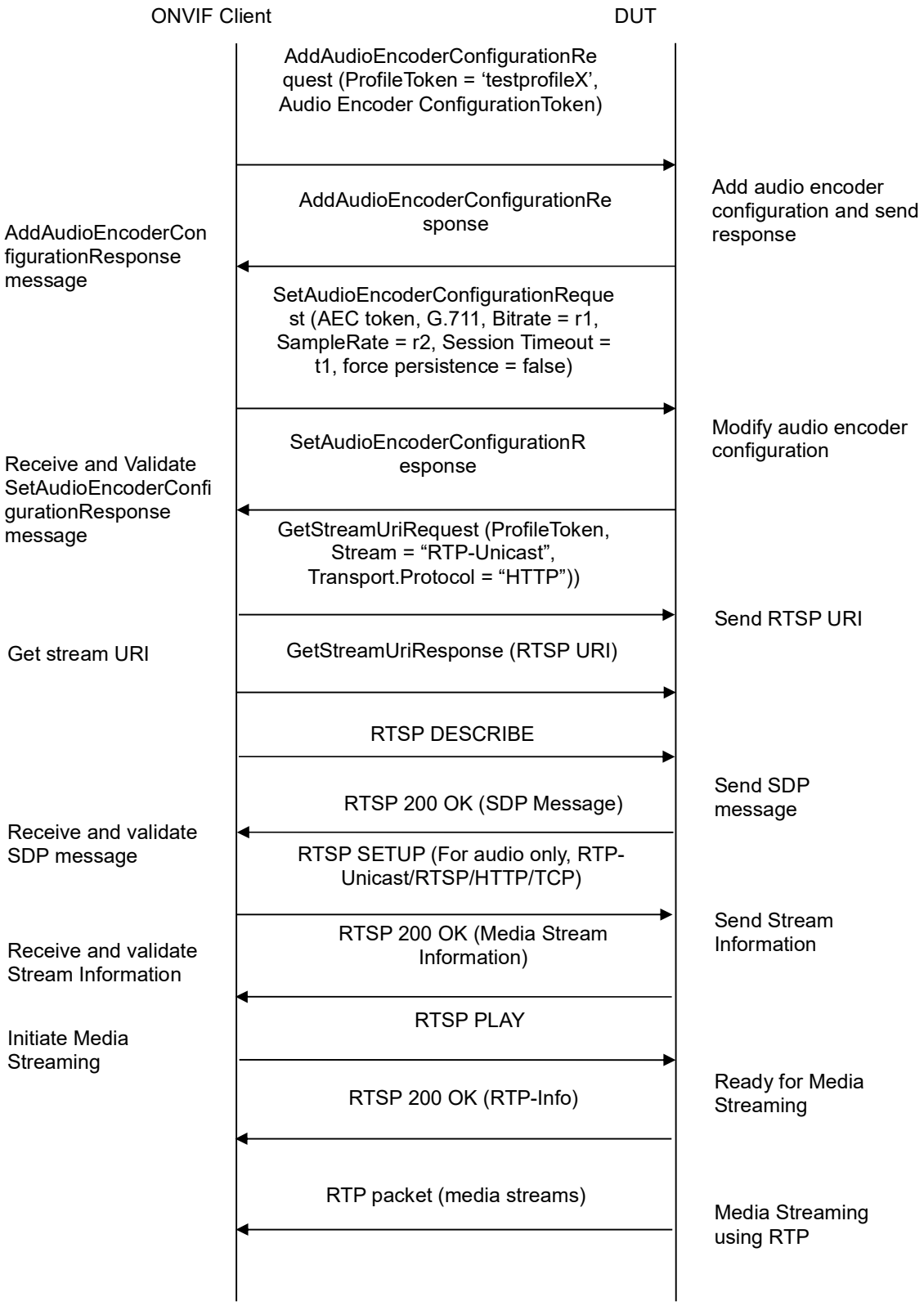
Test Purpose: To verify G.711 media streaming based on RTP-Unicast/RTSP/HTTP/TCP Transport for IPv6 for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

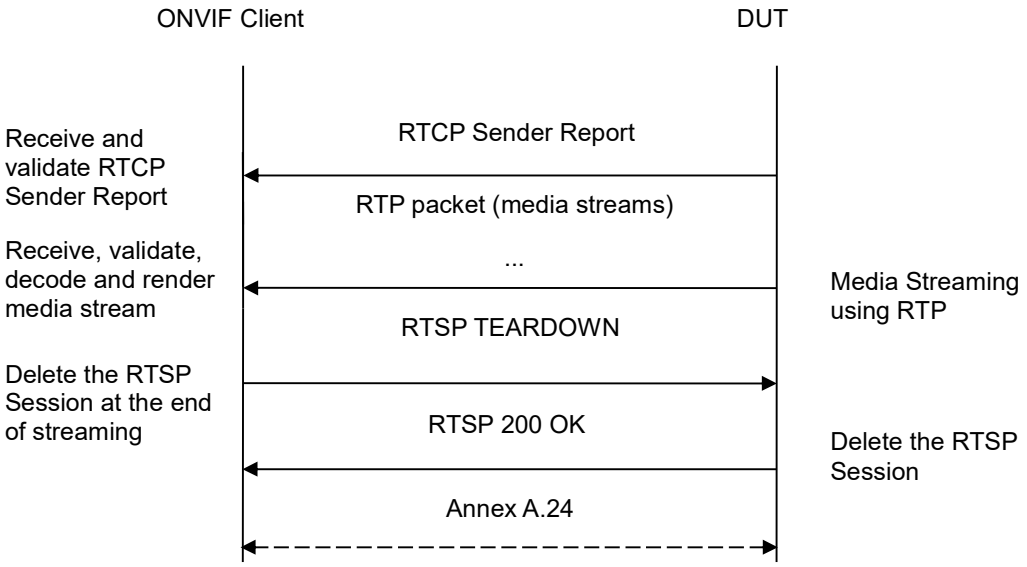
Pre-Requisite: Media is supported by DUT. Audio is supported by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
CreateProfileRequest (ProfileToken = 'testprofileX')
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
Add audio source configuration and send response
AddAudioSourceConfigurationResponse
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.711, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
SetAudioEncoderConfigurationResponse
Modify audio encoder configuration
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP"))
Send RTSP URI
Get stream URI
GetStreamUriResponse (RTSP URI)
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/RTSP/HTTP/TCP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client invokes CreateProfileRequest message with ProfileToken = ‘testprofileX’.
5. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
6. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
7. Verify GetAudioSourceConfigurationsResponse message.
8. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = ‘testprofileX’ and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
9. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = ‘testprofileX’) to retrieve the list of audio encoder configurations compatible with profile.
10. DUT sends the list of audio encoder configurations compatible with the received media profile token.
11. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
12. ONVIF Client verifies the list of audio source configurations sent by DUT.
13. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from

GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

14. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.711 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.711 encoding skip this step and repeat steps 7-13 for other AudioSource.
15. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
16. DUT adds the audio encoder configuration to the profile and sends the response.
17. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G711", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.711 encoding.
18. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
19. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP") to retrieve media stream URI for the selected media profile.
20. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
21. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
22. ONVIF Client invokes RTSP DESCRIBE request.
23. The DUT sends 200 OK message and SDP information.
24. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Unicast/RTSP/HTTP/TCP.
25. The DUT sends 200 OK message and the media stream information.
26. ONVIF Client invokes RTSP PLAY request.
27. The DUT sends 200 OK message and starts media streaming.
28. The DUT sends G.711 RTP media stream to ONVIF Client over HTTP.
29. The DUT sends RTCP sender report to ONVIF Client.
30. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
31. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
32. The DUT sends 200 OK Response and terminates the RTSP Session.
33. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports G.711 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP media streaming to ONVIF Client.

The DUT sent not only G.711 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.30 AUDIO STREAMING – G.711 (RTP/RTSP/TCP, IPv6)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP/RTSP/TCP Transport for IPv6

Test Case ID: DRAFT-RTSS-2-1-48

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

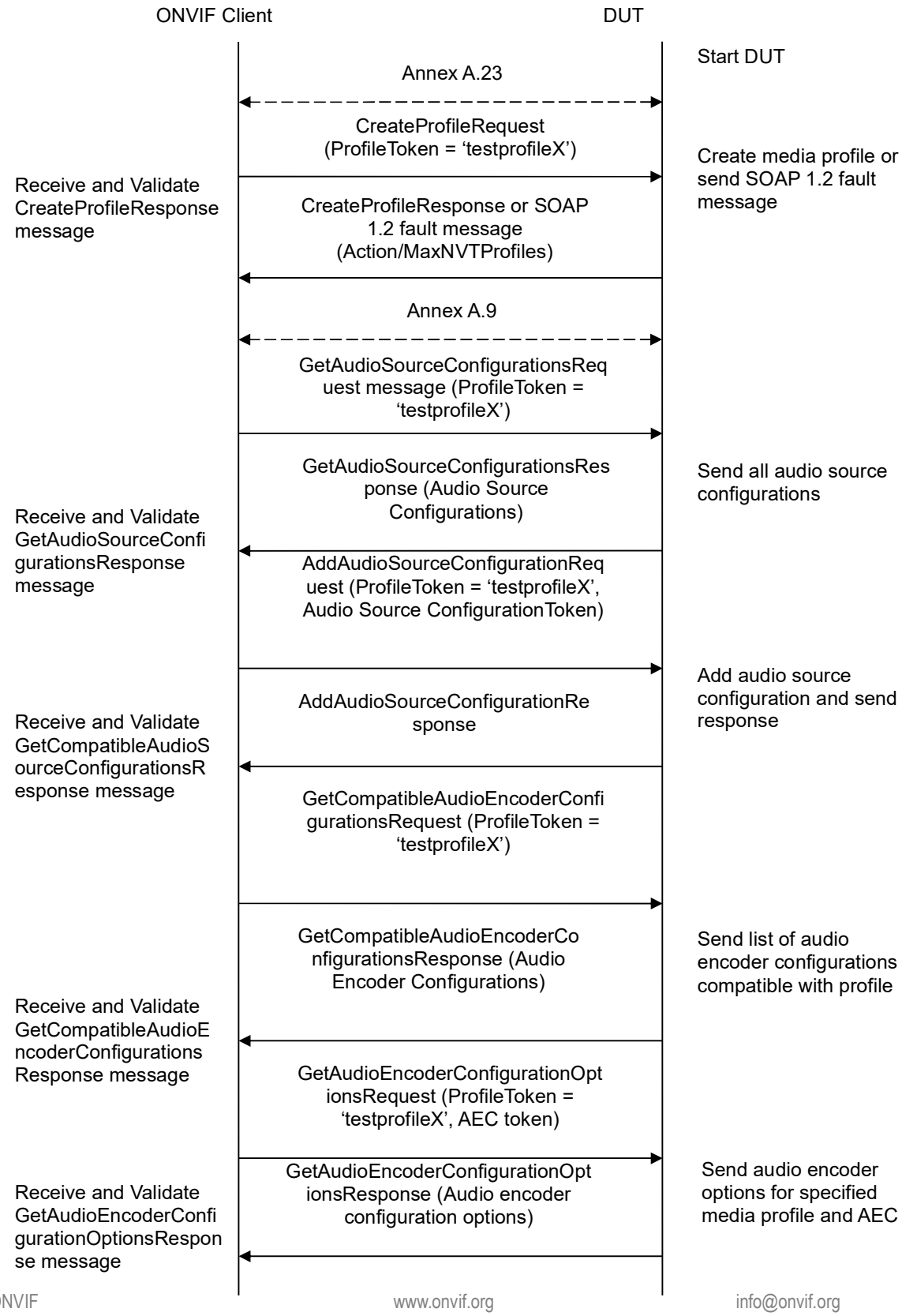
WSDL Reference: None

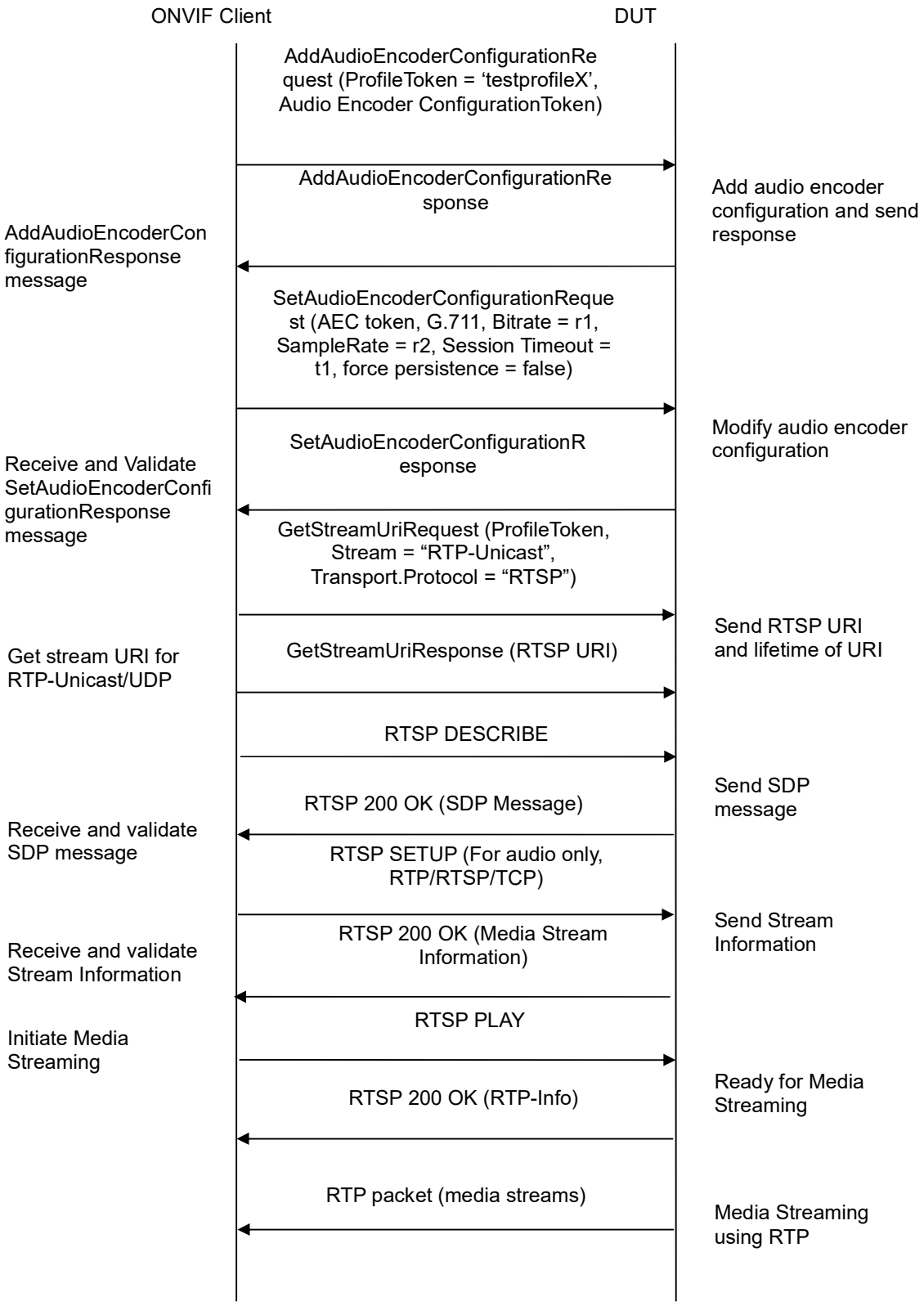
Test Purpose: To verify G.711 media streaming based on RTP/RTSP/TCP Transport for IPv6 for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

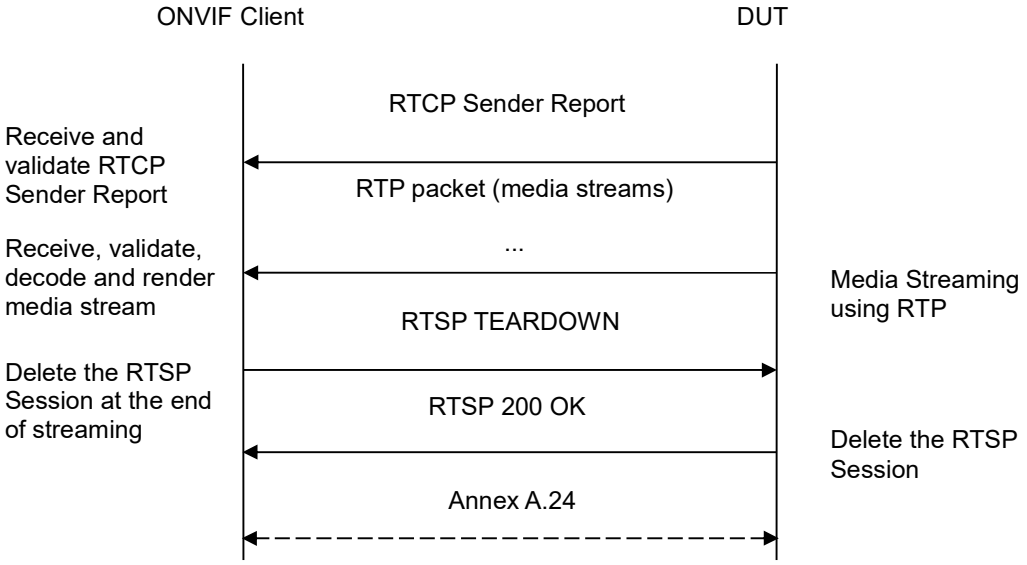
Pre-Requisite: Media is supported by DUT. Audio is supported by DUT. RTP/RTSP/TCP transport protocol is supported by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
CreateProfileRequest (ProfileToken = 'testprofileX')
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
Add audio source configuration and send response
AddAudioSourceConfigurationResponse
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.711, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP")
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Get stream URI for RTP-Unicast/UDP
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP/RTSP/TCP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client invokes CreateProfileRequest message with ProfileToken = ‘testprofileX’.
5. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
6. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
7. Verify GetAudioSourceConfigurationsResponse message.
8. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = ‘testprofileX’ and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
9. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = ‘testprofileX’) to retrieve the list of audio encoder configurations compatible with profile.
10. DUT sends the list of audio encoder configurations compatible with the received media profile token.
11. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
12. ONVIF Client verifies the list of audio source configurations sent by DUT.
13. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from

GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

14. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.711 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.711 encoding skip this step and repeat steps 7-13 for other AudioSource.
15. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
16. DUT adds the audio encoder configuration to the profile and sends the response.
17. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G711", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.711 encoding.
18. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
19. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP") to retrieve media stream URI for the selected media profile.
20. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
21. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
22. ONVIF Client invokes RTSP DESCRIBE request.
23. The DUT sends 200 OK message and SDP information.
24. ONVIF Client invokes RTSP SETUP request with transport parameter RTP/RTSP/TCP.
25. The DUT sends 200 OK message and the media stream information.
26. ONVIF Client invokes RTSP PLAY request.
27. The DUT sends 200 OK message and starts media streaming.
28. The DUT sends G.711 RTP media stream to ONVIF Client over RTSP.
29. The DUT sends RTCP sender report to ONVIF Client.
30. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
31. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
32. The DUT sends 200 OK Response and terminates the RTSP Session.
33. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports G.711 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP media streaming to ONVIF Client.

The DUT sent not only G.711 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.31 AUDIO STREAMING – G.726 (RTP-Unicast/UDP, IPv6)

Test Label: Real Time Viewing DUT G.726 Media Streaming Using RTP-Unicast/UDP Transport for IPv6

Test Case ID: DRAFT-RTSS-2-1-49

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

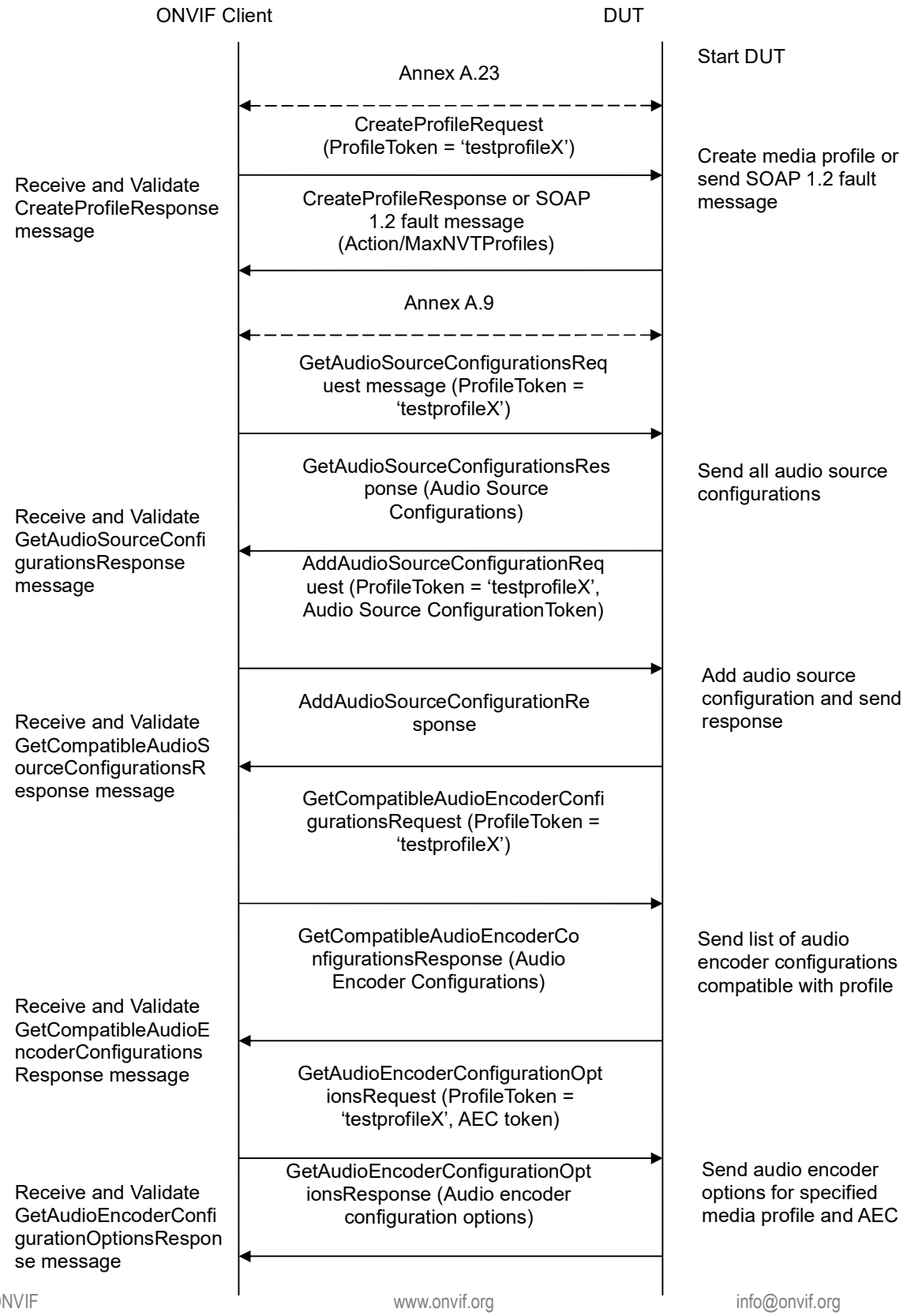
WSDL Reference: None

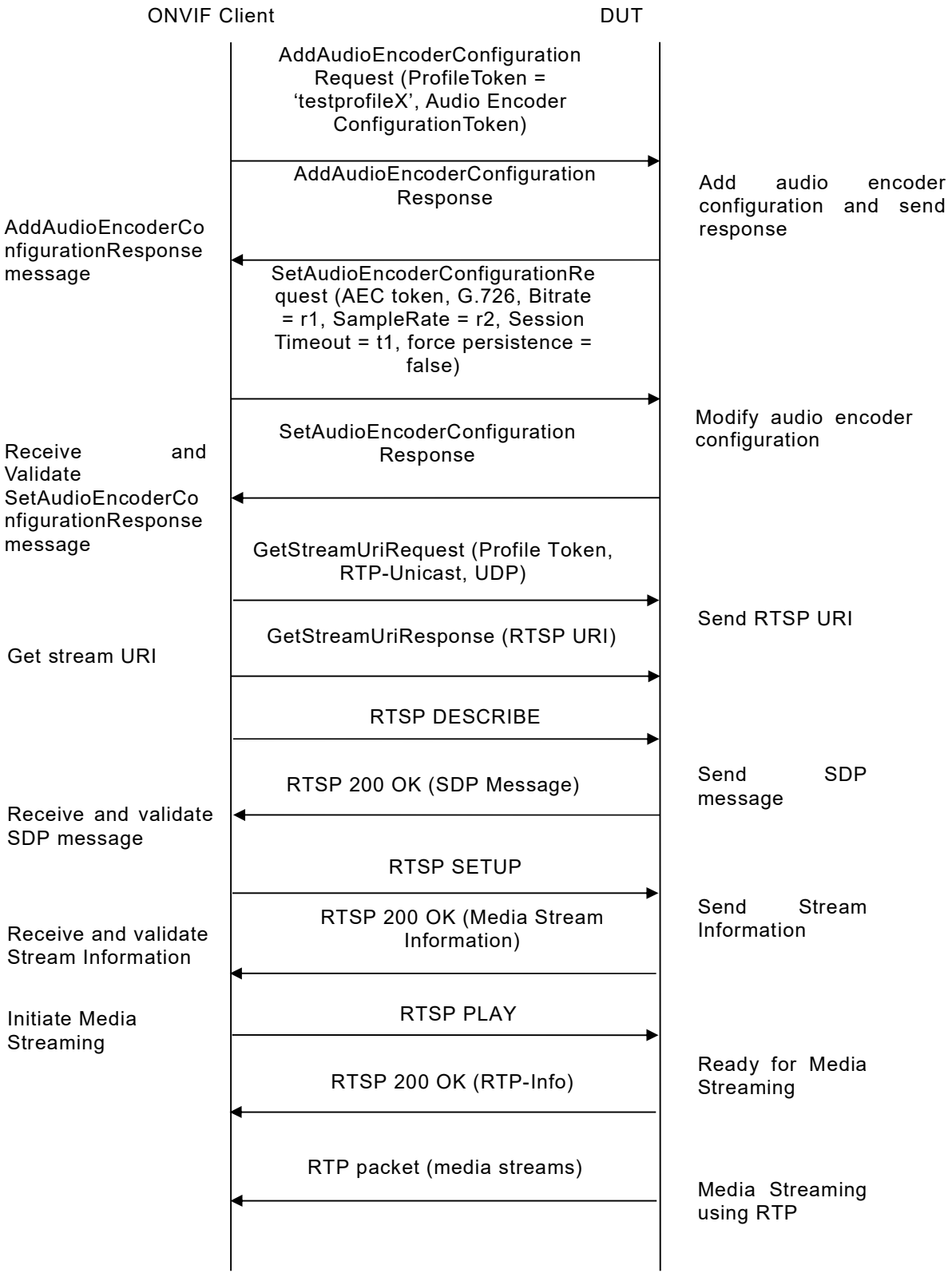
Test Purpose: To verify G.726 media streaming based on RTP-Unicast/UDP Transport for IPv6 for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

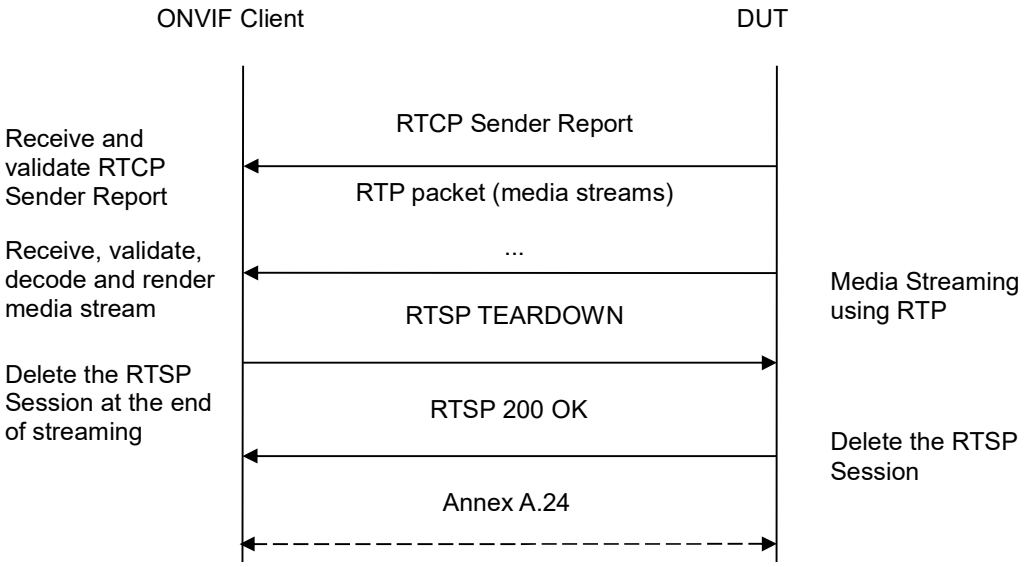
Pre-Requisite: Media is supported by DUT. Audio is supported by DUT and G.726 is implemented by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
CreateProfileRequest (ProfileToken = 'testprofileX')
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
Add audio source configuration and send response
AddAudioSourceConfigurationResponse
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfiguration Request (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfiguration Response
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.726, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
SetAudioEncoderConfiguration Response
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client invokes CreateProfileRequest message with ProfileToken = ‘testprofileX’.
5. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
6. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
7. Verify GetAudioSourceConfigurationsResponse message.
8. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = ‘testprofileX’ and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
9. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = ‘testprofileX’) to retrieve the list of audio encoder configurations compatible with profile.
10. DUT sends the list of audio encoder configurations compatible with the received media profile token.
11. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
12. ONVIF Client verifies the list of audio source configurations sent by DUT.
13. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from

GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

14. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.711 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.711 encoding skip this step and repeat steps 7-13 for other AudioSource.
15. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
16. DUT adds the audio encoder configuration to the profile and sends the response.
17. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G726", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
18. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
19. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "UDP") to retrieve media stream URI for the selected media profile.
20. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
21. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
22. ONVIF Client invokes RTSP DESCRIBE request.
23. The DUT sends 200 OK message and SDP information.
24. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Unicast/UDP.
25. The DUT sends 200 OK message and the media stream information.
26. ONVIF Client invokes RTSP PLAY request.
27. The DUT sends 200 OK message and starts media streaming.
28. The DUT sends G.726 RTP media stream to ONVIF Client over UDP.
29. The DUT sends RTCP sender report to ONVIF Client.
30. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
31. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
32. The DUT sends 200 OK Response and terminates the RTSP Session.
33. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports G.726 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.726 RTP media streaming to ONVIF Client.

The DUT sent not only G.726 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.32 AUDIO STREAMING – G.726 (RTP-Unicast/RTSP/HTTP/TCP, IPv6)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP-Unicast/RTSP/HTTP/TCP Transport for IPv6

Test Case ID: DRAFT-RTSS-2-1-50

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP

Command Under Test: None

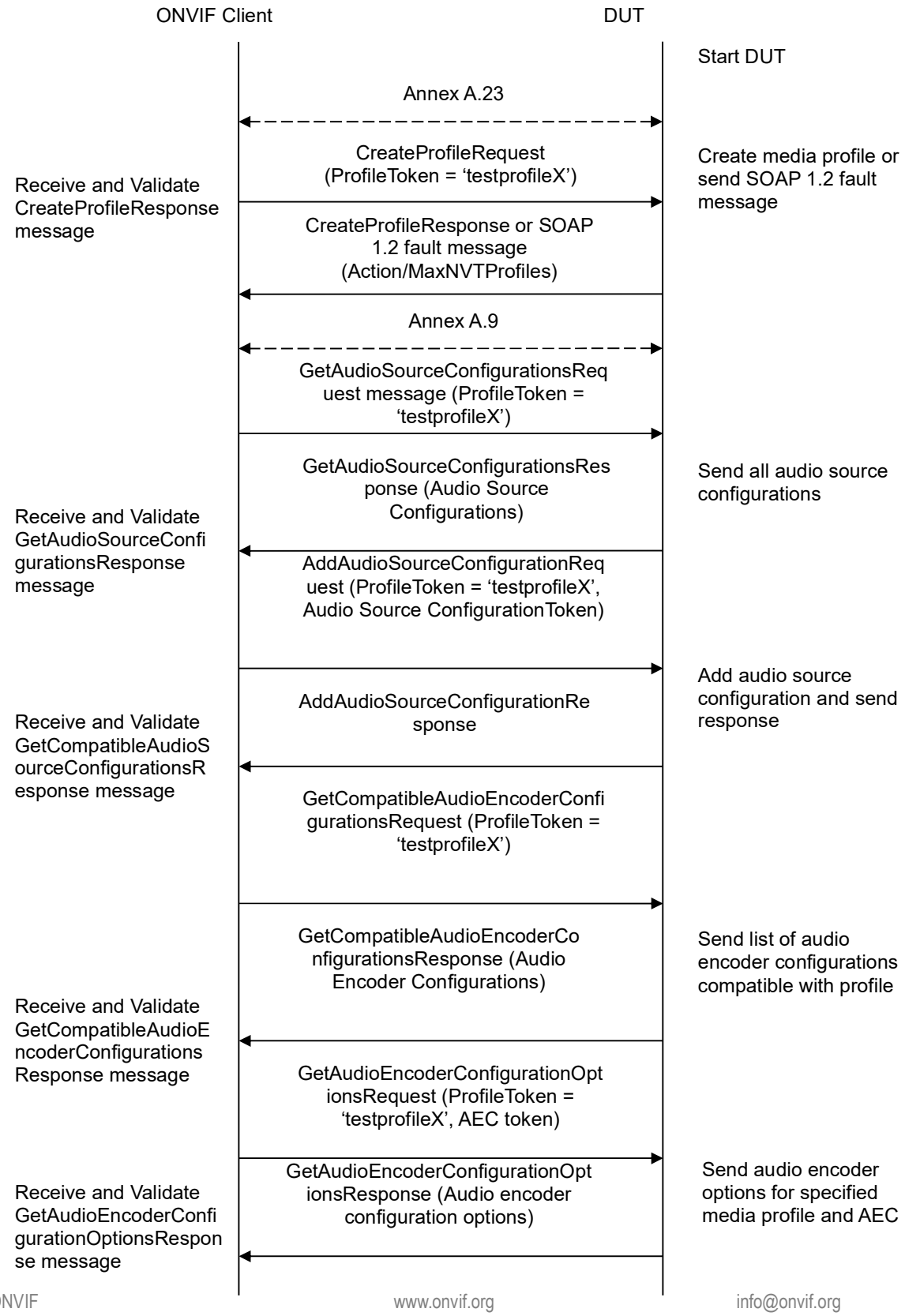
WSDL Reference: None

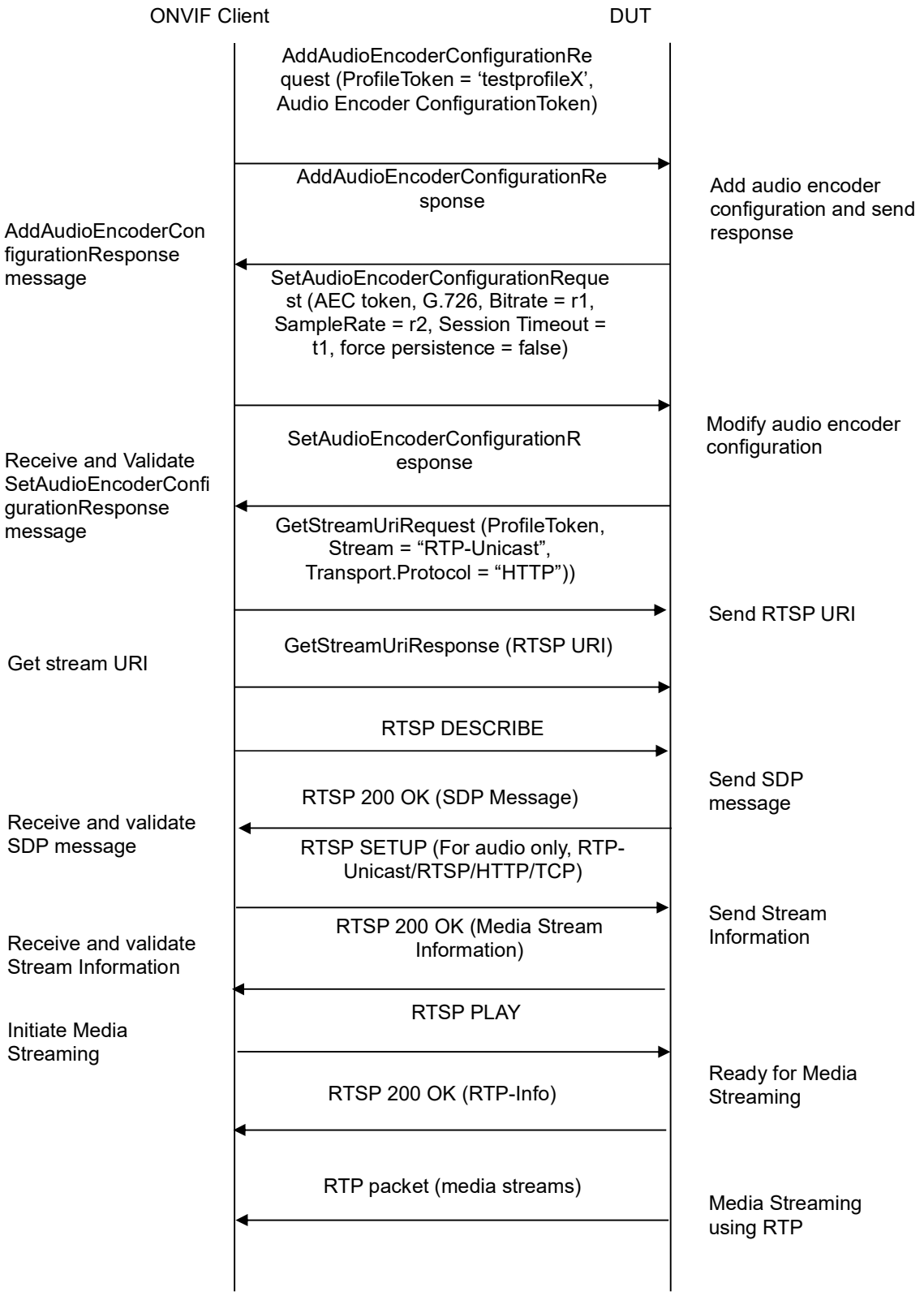
Test Purpose: To verify G.726 media streaming based on RTP-Unicast/RTSP/HTTP/TCP Transport for IPv6 for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

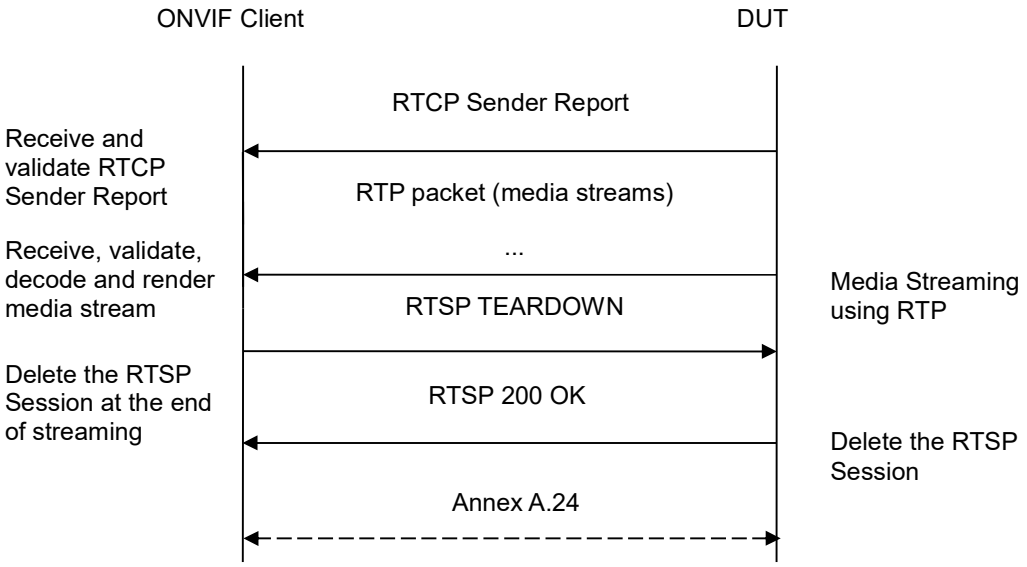
Pre-Requisite: Media is supported by DUT. Audio is supported by DUT and G.726 is implemented by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
CreateProfileRequest (ProfileToken = 'testprofileX')
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
Add audio source configuration and send response
AddAudioSourceConfigurationResponse
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.726, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP"))
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/RTSP/HTTP/TCP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client invokes CreateProfileRequest message with ProfileToken = ‘testprofileX’.
5. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
6. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
7. Verify GetAudioSourceConfigurationsResponse message.
8. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = ‘testprofileX’ and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
9. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = ‘testprofileX’) to retrieve the list of audio encoder configurations compatible with profile.
10. DUT sends the list of audio encoder configurations compatible with the received media profile token.
11. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
12. ONVIF Client verifies the list of audio source configurations sent by DUT.
13. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from

GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

14. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.726 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.726 encoding skip this step and repeat steps 7-13 for other AudioSource.
15. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
16. DUT adds the audio encoder configuration to the profile and sends the response.
17. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G726", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G726 encoding.
18. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
19. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP") to retrieve media stream URI for the selected media profile.
20. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
21. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
22. ONVIF Client invokes RTSP DESCRIBE request.
23. The DUT sends 200 OK message and SDP information.
24. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Unicast/RTSP/HTTP/TCP.
25. The DUT sends 200 OK message and the media stream information.
26. ONVIF Client invokes RTSP PLAY request.
27. The DUT sends 200 OK message and starts media streaming.
28. The DUT sends G.726 RTP media stream to ONVIF Client over HTTP.
29. The DUT sends RTCP sender report to ONVIF Client.
30. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
31. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
32. The DUT sends 200 OK Response and terminates the RTSP Session.
33. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports G.726 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.726 RTP media streaming to ONVIF Client.

The DUT sent not only G.726 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.33 AUDIO STREAMING – G.726 (RTP/RTSP/TCP, IPv6)

Test Label: Real Time Viewing DUT G.726 Media Streaming Using RTP/RTSP/TCP Transport for IPv6

Test Case ID: DRAFT-RTSS-2-1-51

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

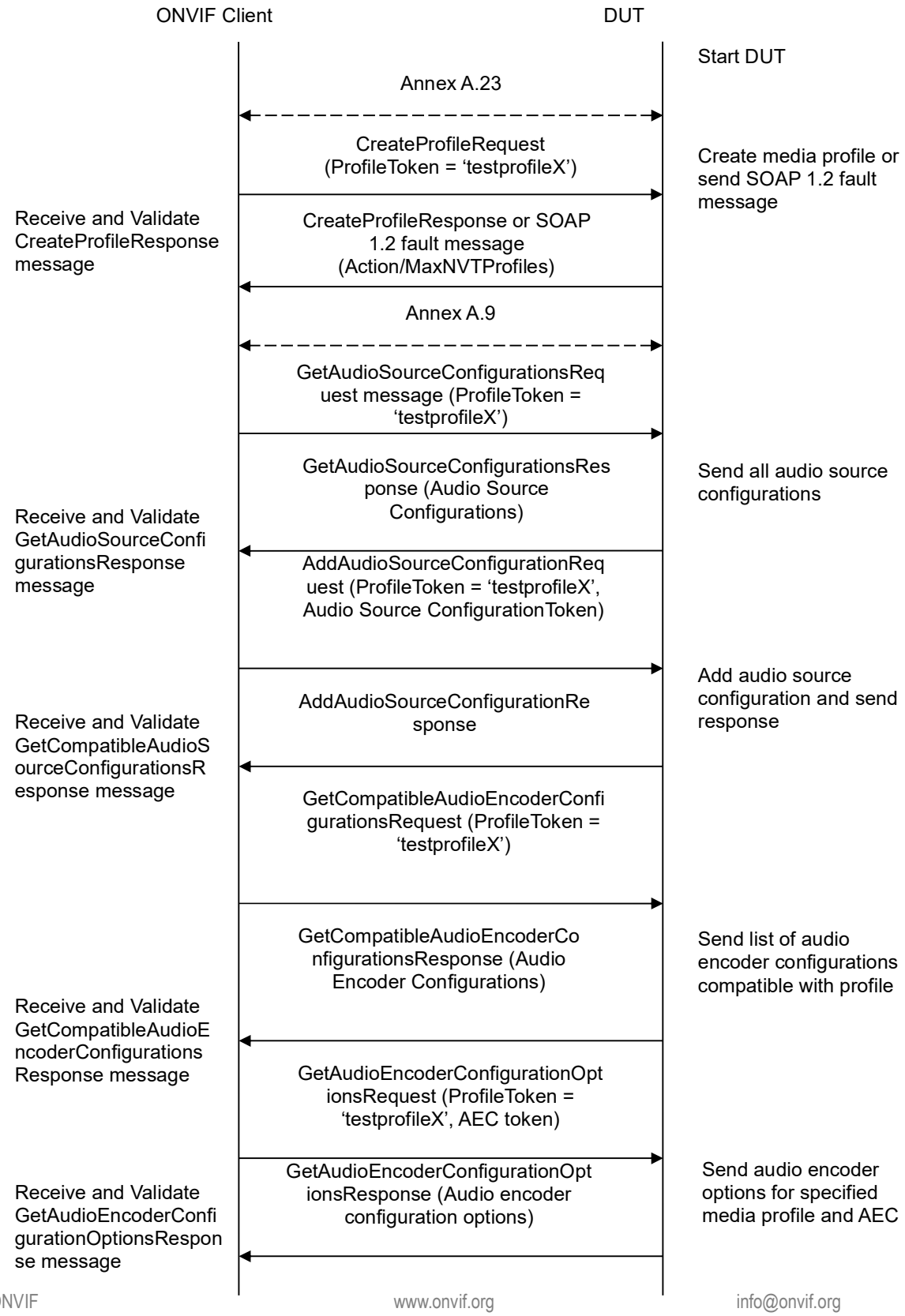
WSDL Reference: None

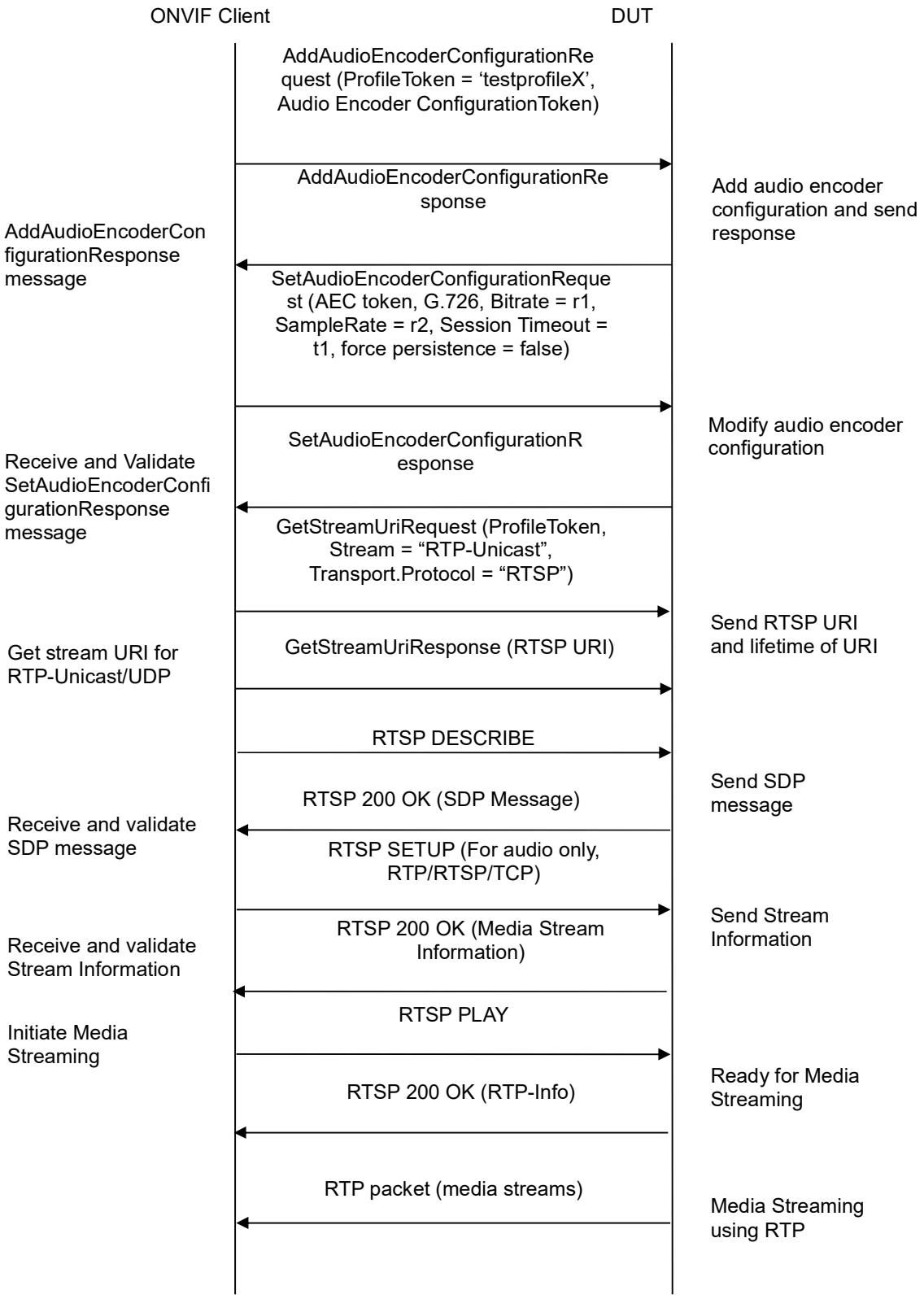
Test Purpose: To verify G.726 media streaming based on RTP/RTSP/TCP Transport for IPv6 for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

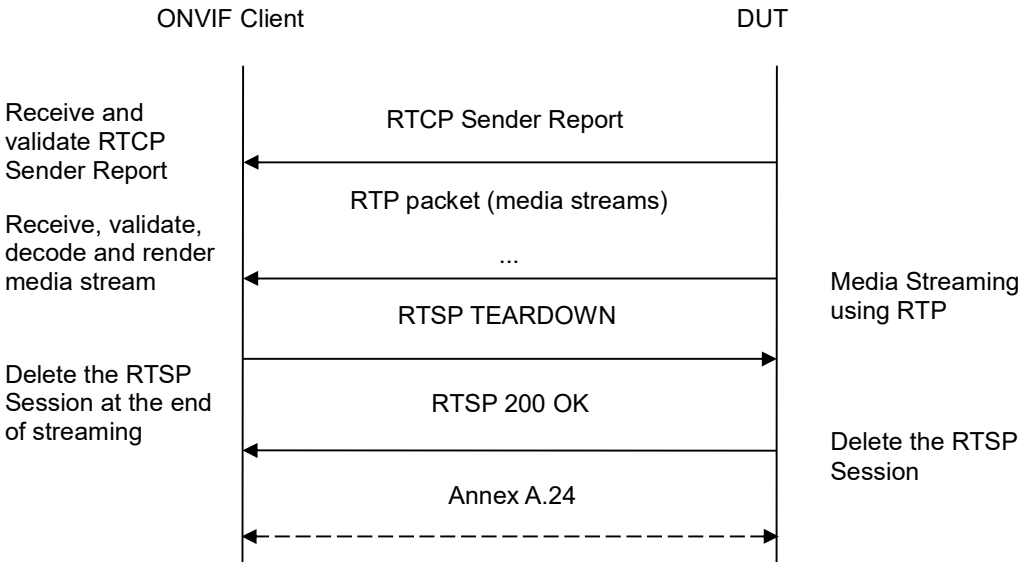
Pre-Requisite: Media is supported by DUT. Audio is supported by DUT. RTP/RTSP/TCP transport protocol is supported by DUT. Media Service was received from the DUT. Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
CreateProfileRequest (ProfileToken = 'testprofileX')
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
Add audio source configuration and send response
AddAudioSourceConfigurationResponse
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.726, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP")
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Get stream URI for RTP-Unicast/UDP
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP/RTSP/TCP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client invokes CreateProfileRequest message with ProfileToken = ‘testprofileX’.
5. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
6. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
7. Verify GetAudioSourceConfigurationsResponse message.
8. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = ‘testprofileX’ and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
9. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = ‘testprofileX’) to retrieve the list of audio encoder configurations compatible with profile.
10. DUT sends the list of audio encoder configurations compatible with the received media profile token.
11. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
12. ONVIF Client verifies the list of audio source configurations sent by DUT.
13. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from

GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

14. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.726 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.726 encoding skip this step and repeat steps 7-13 for other AudioSource.
15. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
16. DUT adds the audio encoder configuration to the profile and sends the response.
17. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G726", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set G.726 encoding.
18. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
19. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP") to retrieve media stream URI for the selected media profile.
20. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
21. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
22. ONVIF Client invokes RTSP DESCRIBE request.
23. The DUT sends 200 OK message and SDP information.
24. ONVIF Client invokes RTSP SETUP request with transport parameter RTP/RTSP/TCP.
25. The DUT sends 200 OK message and the media stream information.
26. ONVIF Client invokes RTSP PLAY request.
27. The DUT sends 200 OK message and starts media streaming.
28. The DUT sends G.726 RTP media stream to ONVIF Client over RTSP.
29. The DUT sends RTCP sender report to ONVIF Client.
30. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
31. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
32. The DUT sends 200 OK Response and terminates the RTSP Session.
33. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports G.726 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.726 RTP media streaming to ONVIF Client.

The DUT sent not only G.726 RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.34 AUDIO STREAMING – AAC (RTP-Unicast/UDP, IPv6)

Test Label: Real Time Viewing DUT AAC Media Streaming Using RTP-Unicast/UDP Transport for IPv6

Test Case ID: DRAFT-RTSS-2-1-52

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

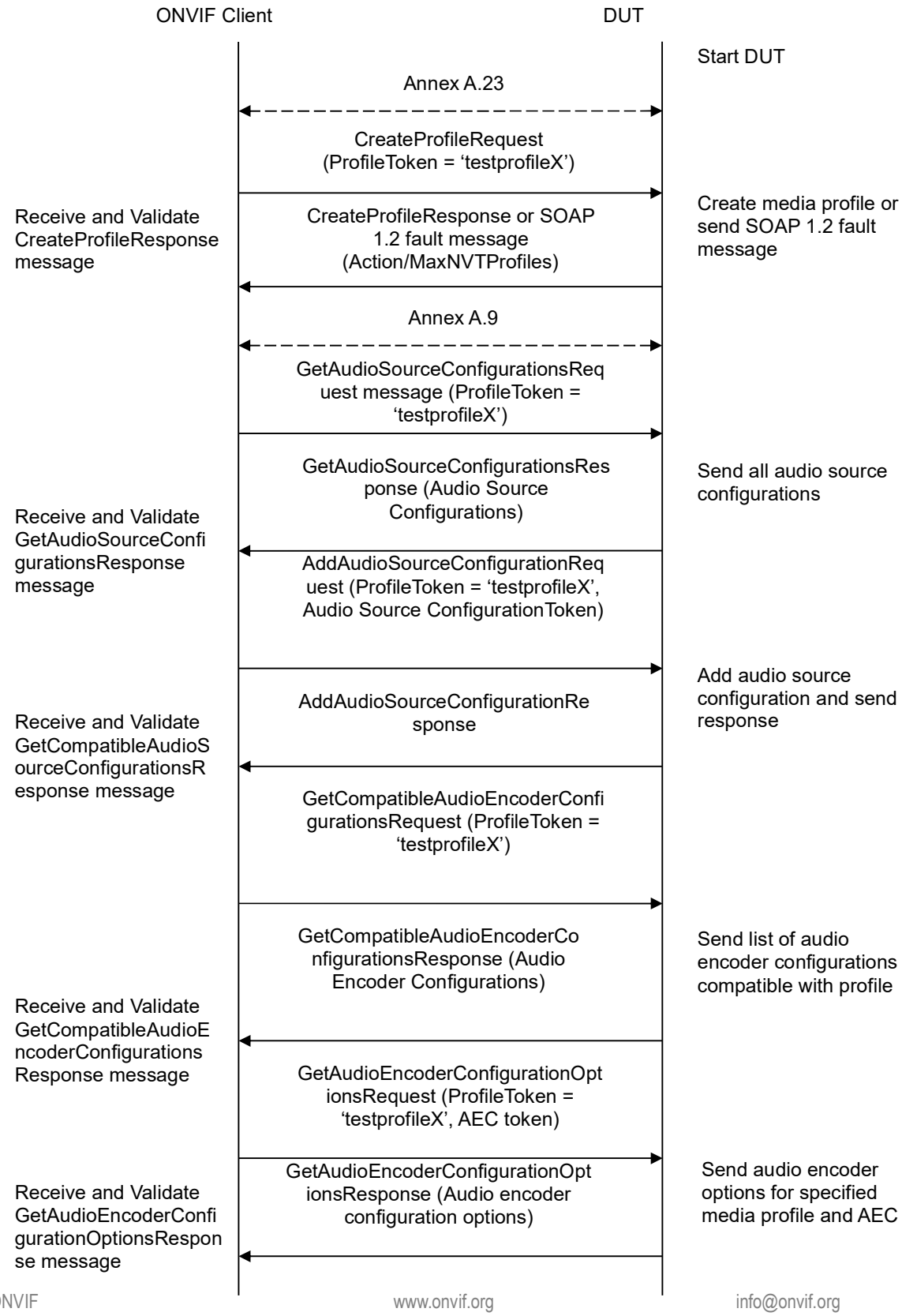
WSDL Reference: None

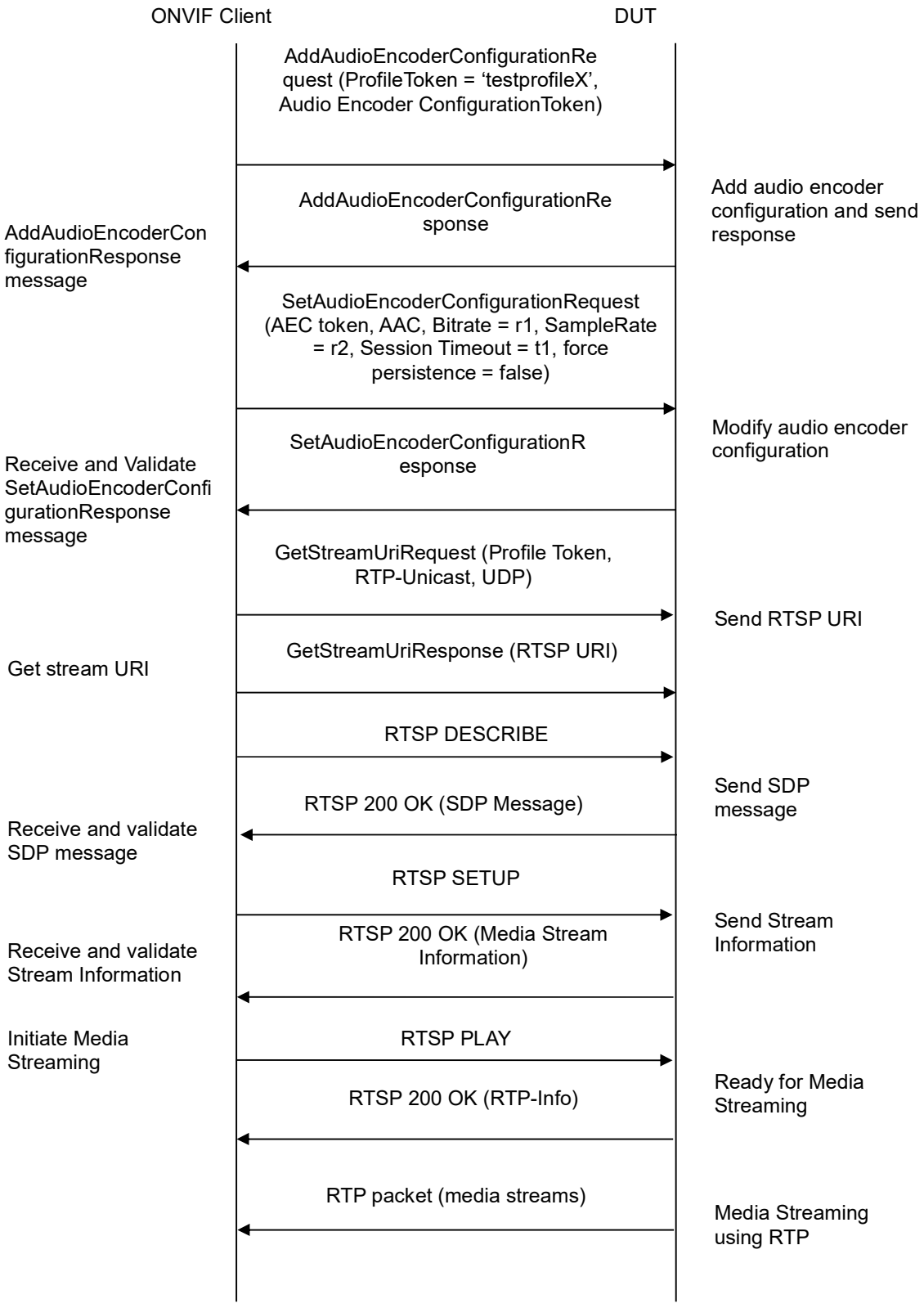
Test Purpose: To verify AAC media streaming based on RTP-Unicast/UDP Transport for IPv6 for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

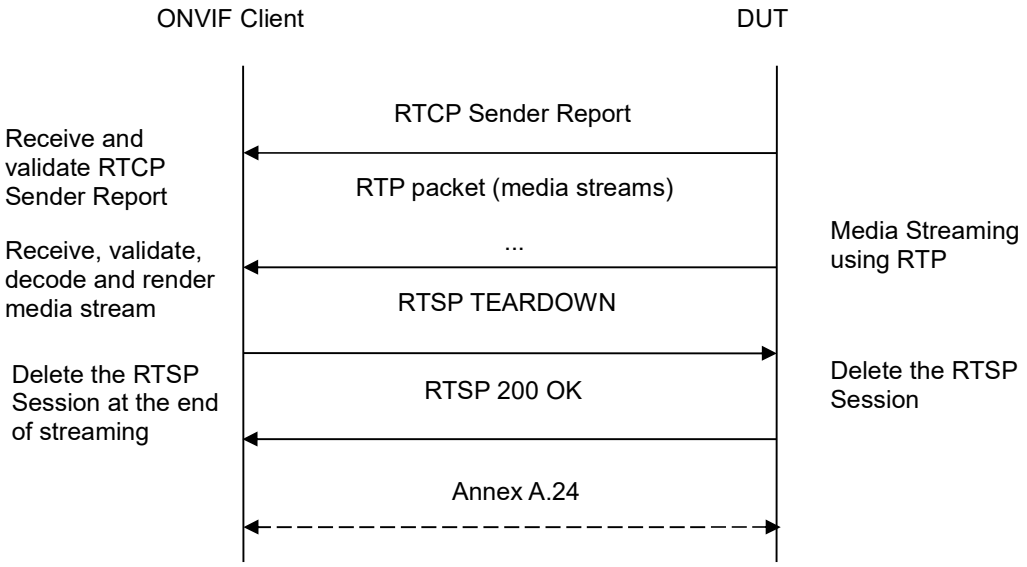
Pre-Requisite: Media is supported by DUT. Audio is supported by DUT and AAC is implemented by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
CreateProfileRequest (ProfileToken = 'testprofileX')
Receive and Validate CreateProfileResponse message
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Create media profile or send SOAP 1.2 fault message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
AddAudioSourceConfigurationResponse
Add audio source configuration and send response
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
AddAudioEncoderConfigurationResponse
SetAudioEncoderConfigurationRequest (AEC token, AAC, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
Receive and Validate SetAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (Profile Token, RTP-Unicast, UDP)
Send RTSP URI
Get stream URI
GetStreamUriResponse (RTSP URI)
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client invokes CreateProfileRequest message with ProfileToken = ‘testprofileX’.
5. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
6. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
7. Verify GetAudioSourceConfigurationsResponse message.
8. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = ‘testprofileX’ and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
9. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = ‘testprofileX’) to retrieve the list of audio encoder configurations compatible with profile.
10. DUT sends the list of audio encoder configurations compatible with the received media profile token.
11. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
12. ONVIF Client verifies the list of audio source configurations sent by DUT.
13. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from

GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

14. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports AAC encoding go to the next step. If there is no AudioEncoderConfiguration which supports AAC encoding skip this step and repeat steps 7-13 for other AudioSource.
15. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
16. DUT adds the audio encoder configuration to the profile and sends the response.
17. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "AAC", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
18. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
19. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "UDP") to retrieve media stream URI for the selected media profile.
20. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
21. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
22. ONVIF Client invokes RTSP DESCRIBE request.
23. The DUT sends 200 OK message and SDP information.
24. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Unicast/UDP.
25. The DUT sends 200 OK message and the media stream information.
26. ONVIF Client invokes RTSP PLAY request.
27. The DUT sends 200 OK message and starts media streaming.
28. The DUT sends AAC RTP media stream to ONVIF Client over UDP.
29. The DUT sends RTCP sender report to ONVIF Client.
30. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
31. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
32. The DUT sends 200 OK Response and terminates the RTSP Session.
33. The DUT sends 200 OK Response and terminates the RTSP Session.
34. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports AAC encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send AAC RTP media streaming to ONVIF Client.

The DUT sent not only AAC RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.35 AUDIO STREAMING – AAC (RTP-Unicast/RTSP/HTTP/TCP, IPv6)

Test Label: Real Time Viewing DUT AAC Media Streaming Using RTP-Unicast/RTSP/HTTP/TCP Transport for IPv6

Test Case ID: DRAFT-RTSS-2-1-53

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP

Command Under Test: None

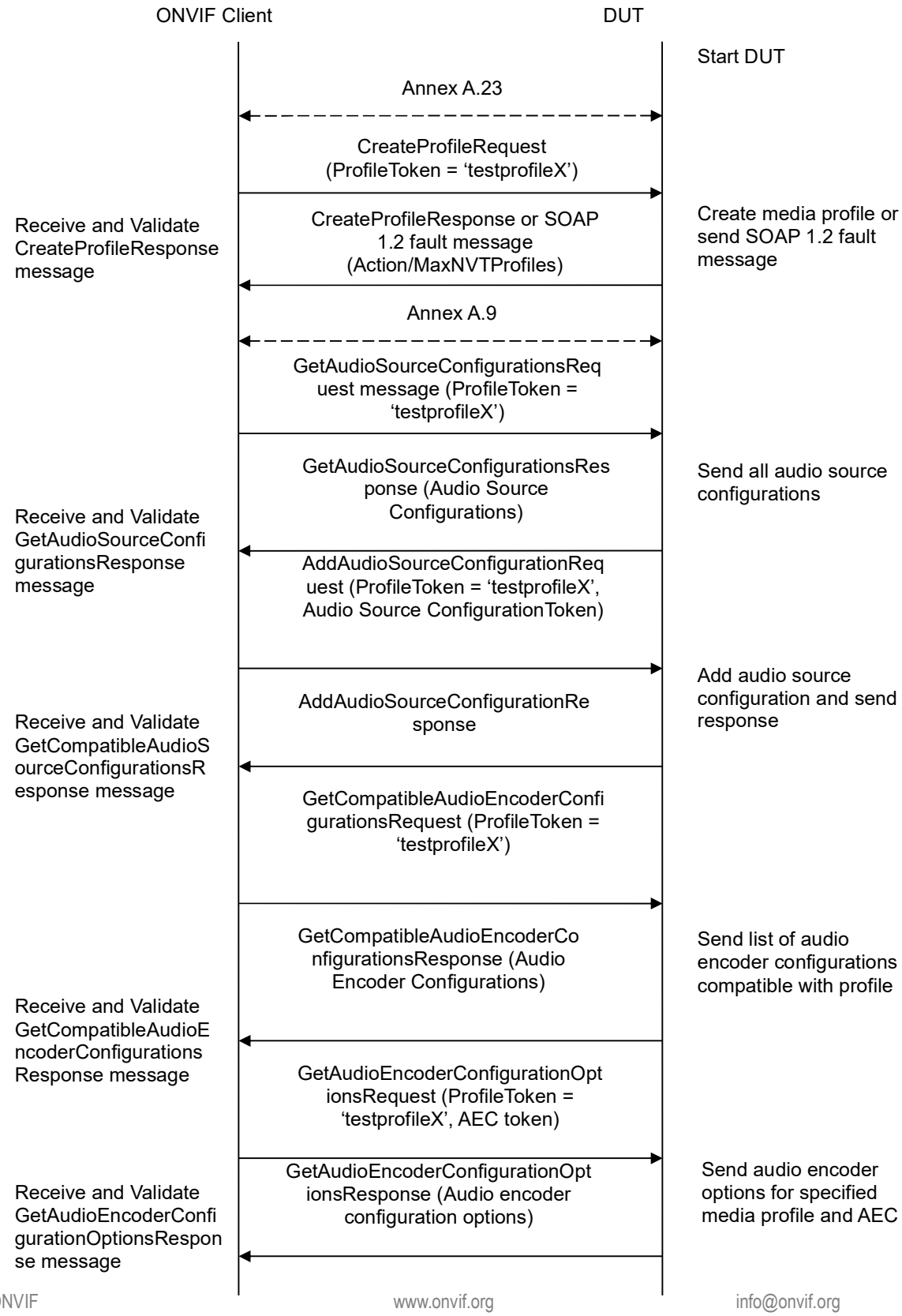
WSDL Reference: None

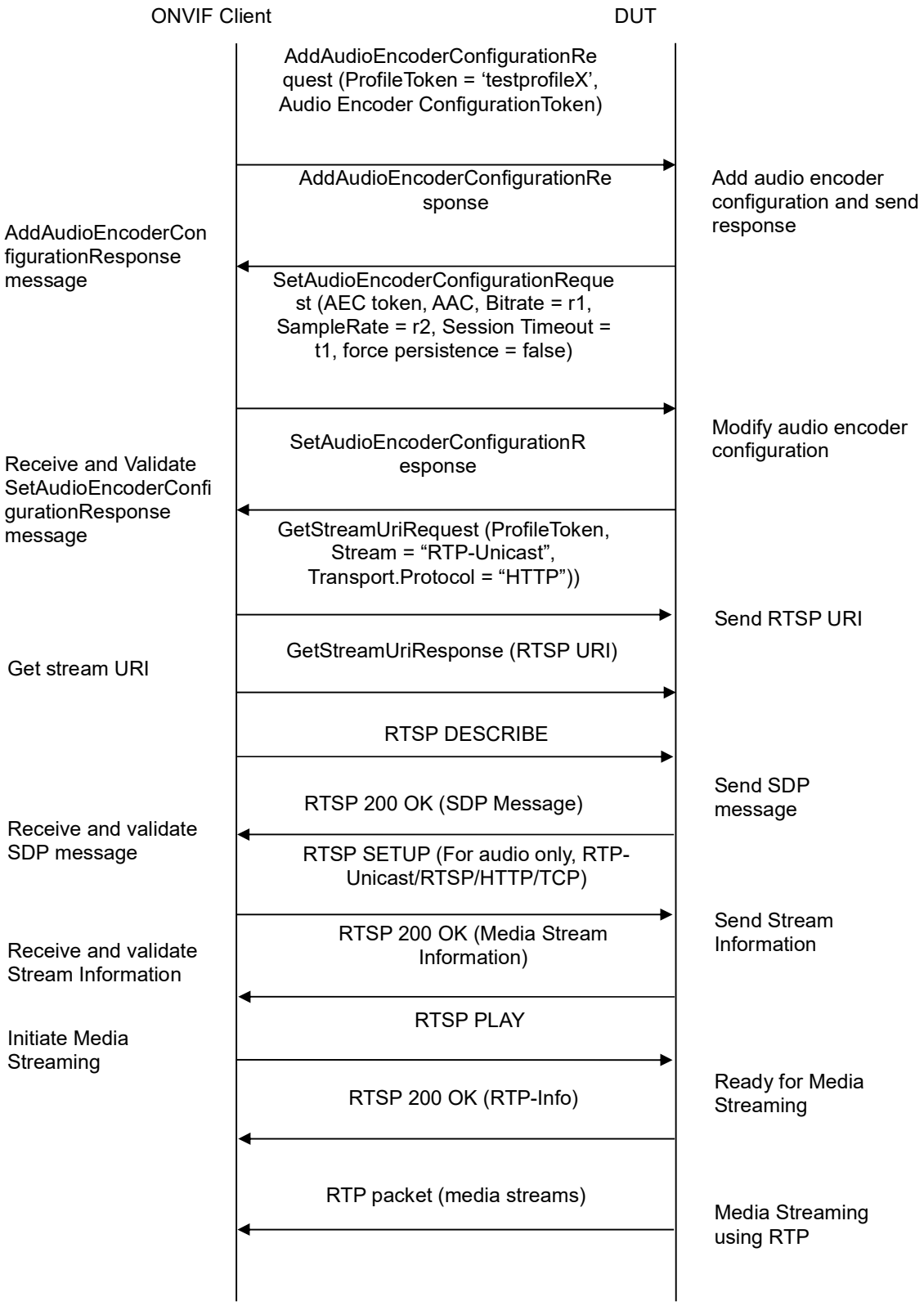
Test Purpose: To verify AAC media streaming based on RTP-Unicast/RTSP/HTTP/TCP Transport for IPv6 for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

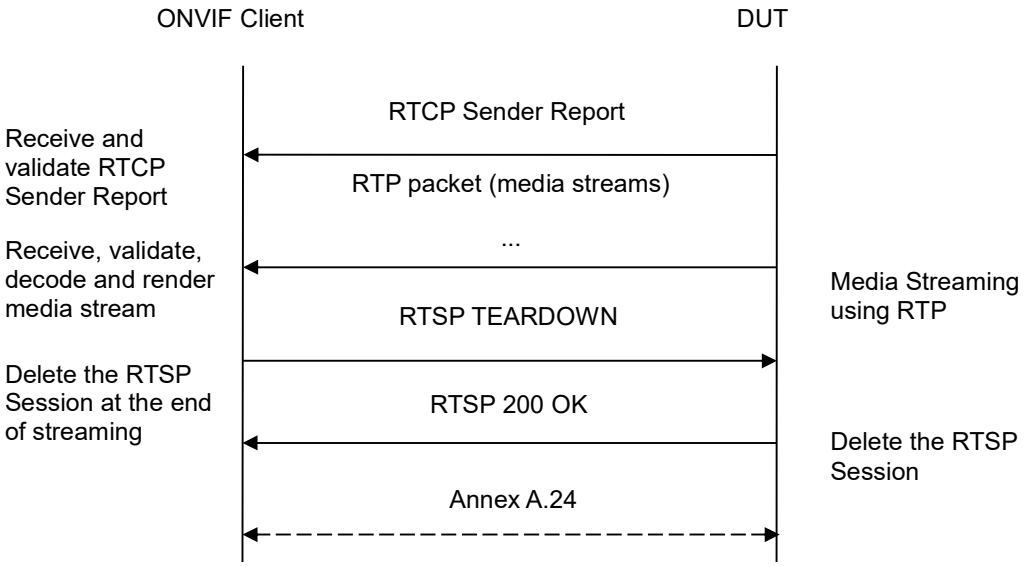
Pre-Requisite: Media is supported by DUT. Audio is supported by DUT and AAC is implemented by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
CreateProfileRequest (ProfileToken = 'testprofileX')
Receive and Validate CreateProfileResponse message
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Create media profile or send SOAP 1.2 fault message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
Add audio source configuration and send response
AddAudioSourceConfigurationResponse
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, AAC, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP"))
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP-Unicast/RTSP/HTTP/TCP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client invokes CreateProfileRequest message with ProfileToken = ‘testprofileX’.
5. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
6. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
7. Verify GetAudioSourceConfigurationsResponse message.
8. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = ‘testprofileX’ and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
9. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = ‘testprofileX’) to retrieve the list of audio encoder configurations compatible with profile.
10. DUT sends the list of audio encoder configurations compatible with the received media profile token.
11. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
12. ONVIF Client verifies the list of audio source configurations sent by DUT.
13. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from

GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

14. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports AAC encoding go to the next step. If there is no AudioEncoderConfiguration which supports AAC encoding skip this step and repeat steps 7-13 for other AudioSource.
15. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
16. DUT adds the audio encoder configuration to the profile and sends the response.
17. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "AAC", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
18. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
19. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP") to retrieve media stream URI for the selected media profile.
20. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
21. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
22. ONVIF Client invokes RTSP DESCRIBE request.
23. The DUT sends 200 OK message and SDP information.
24. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Unicast/RTSP/HTTP/TCP.
25. The DUT sends 200 OK message and the media stream information.
26. ONVIF Client invokes RTSP PLAY request.
27. The DUT sends 200 OK message and starts media streaming.
28. The DUT sends AAC RTP media stream to ONVIF Client over HTTP.
29. The DUT sends RTCP sender report to ONVIF Client.
30. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
31. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
32. The DUT sends 200 OK Response and terminates the RTSP Session.
33. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports AAC encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send AAC RTP media streaming to ONVIF Client.

The DUT sent not only AAC RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.36 AUDIO STREAMING – AAC (RTP/RTSP/TCP, IPv6)

Test Label: Real Time Viewing DUT AAC Media Streaming Using RTP/RTSP/TCP Transport for IPv6

Test Case ID: DRAFT-RTSS-2-1-54

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP

Command Under Test: None

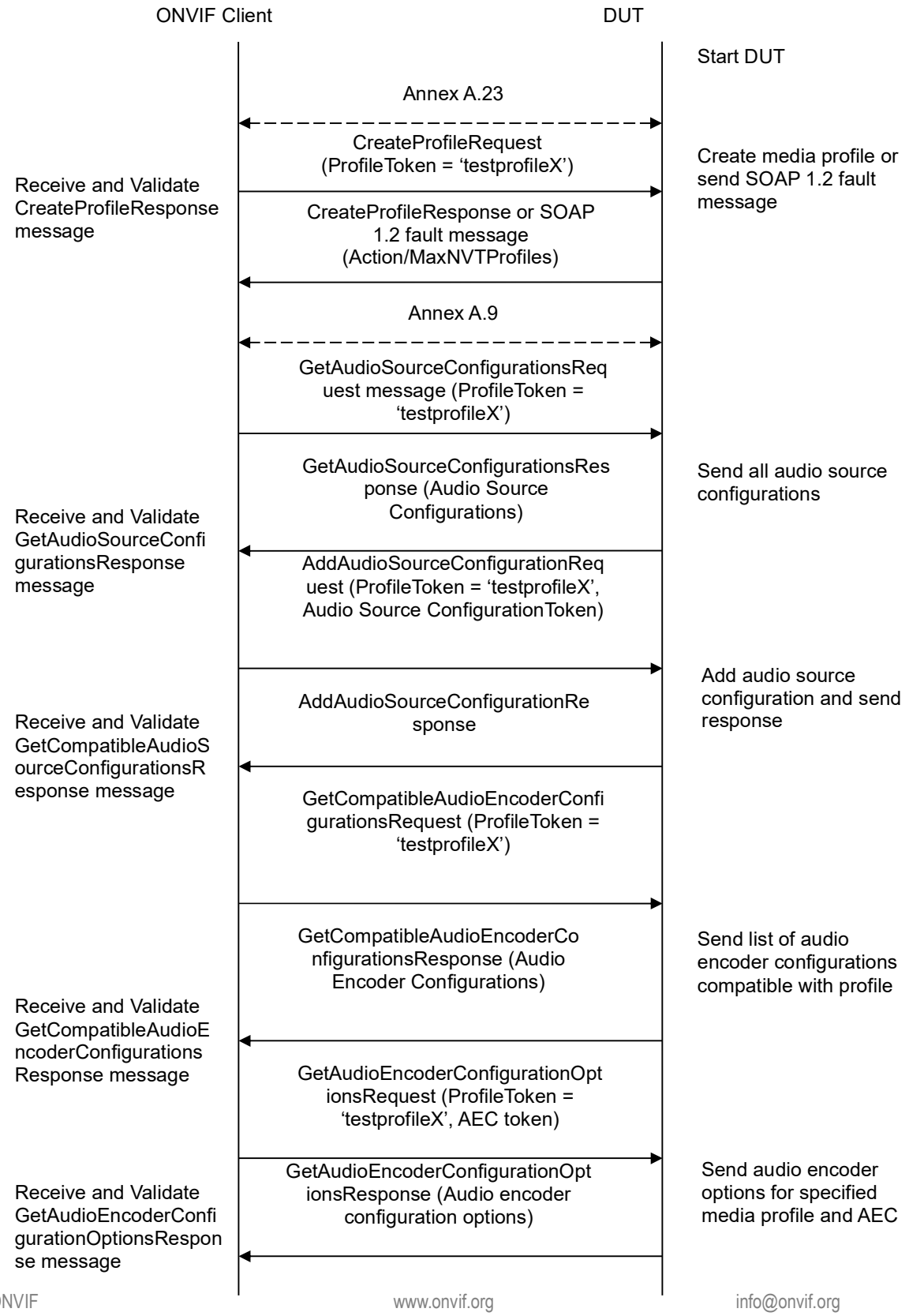
WSDL Reference: None

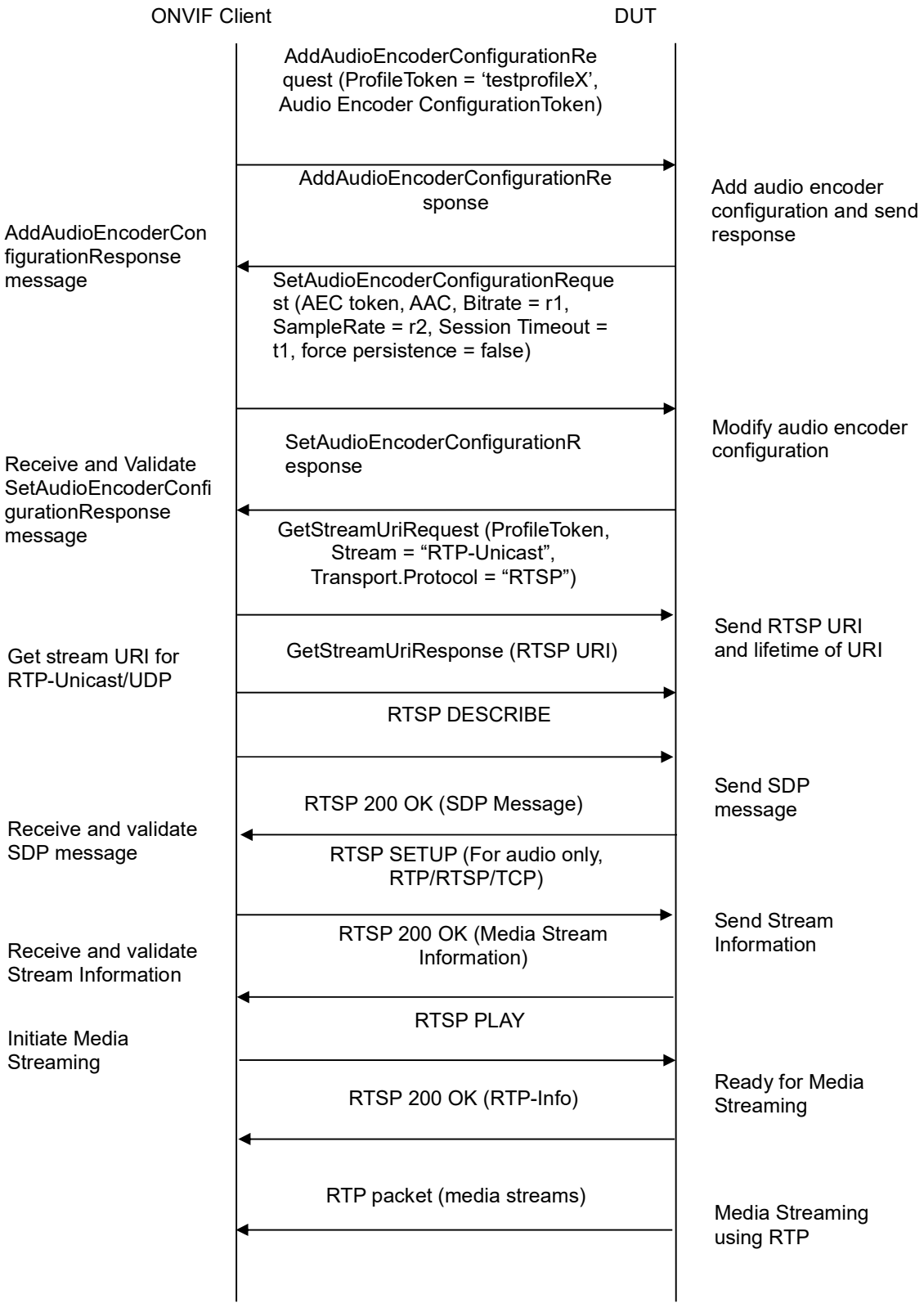
Test Purpose: To verify AAC media streaming based on RTP/RTSP/TCP Transport for IPv6 for case if there is only Audio Source Configuration and Audio encoder Configuration in Media Profile.

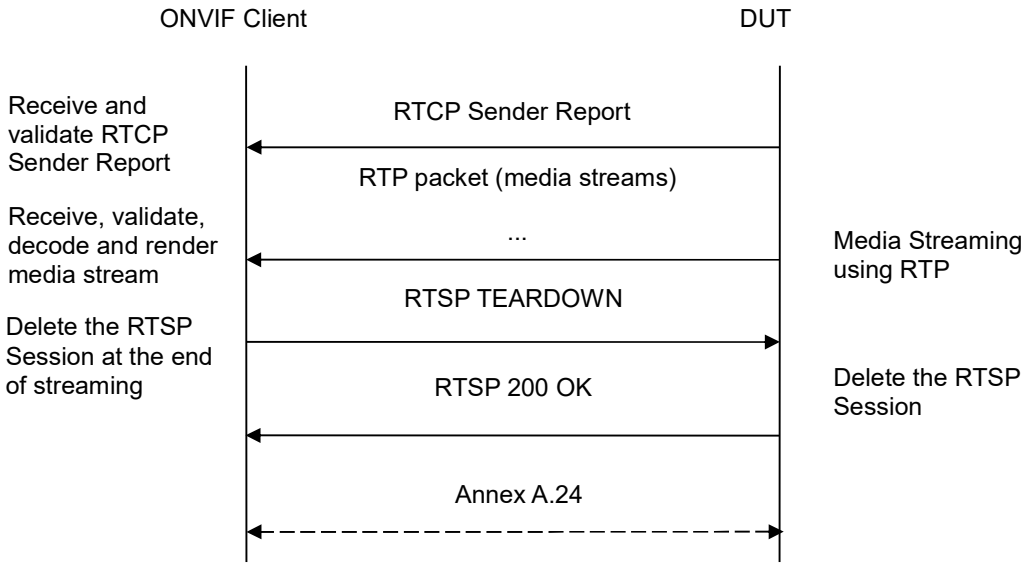
Pre-Requisite: Media is supported by DUT. Audio is supported by DUT and AAC is implemented by DUT. RTP/RTSP/TCP transport protocol is supported by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
CreateProfileRequest (ProfileToken = 'testprofileX')
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
Add audio source configuration and send response
AddAudioSourceConfigurationResponse
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, AAC, Bitrate = r1, SampleRate = r2, Session Timeout = t1, force persistence = false)
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP")
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Get stream URI for RTP-Unicast/UDP
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For audio only, RTP/RTSP/TCP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client invokes CreateProfileRequest message with ProfileToken = ‘testprofileX’.
5. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
6. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
7. Verify GetAudioSourceConfigurationsResponse message.
8. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = ‘testprofileX’ and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
9. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = ‘testprofileX’) to retrieve the list of audio encoder configurations compatible with profile.
10. DUT sends the list of audio encoder configurations compatible with the received media profile token.
11. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
12. ONVIF Client verifies the list of audio source configurations sent by DUT.
13. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from

GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

14. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports AAC encoding go to the next step. If there is no AudioEncoderConfiguration which supports AAC encoding skip this step and repeat steps 7-13 for other AudioSource.
15. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13.
16. DUT adds the audio encoder configuration to the profile and sends the response.
17. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "AAC", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false) to set AAC encoding.
18. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
19. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP") to retrieve media stream URI for the selected media profile.
20. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
21. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
22. ONVIF Client invokes RTSP DESCRIBE request.
23. The DUT sends 200 OK message and SDP information.
24. ONVIF Client invokes RTSP SETUP request with transport parameter RTP/RTSP/TCP.
25. The DUT sends 200 OK message and the media stream information.
26. ONVIF Client invokes RTSP PLAY request.
27. The DUT sends 200 OK message and starts media streaming.
28. The DUT sends AAC RTP media stream to ONVIF Client over RTSP.
29. The DUT sends RTCP sender report to ONVIF Client.
30. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
31. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
32. The DUT sends 200 OK Response and terminates the RTSP Session.
33. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send AudioEncoderConfiguration which supports AAC encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send AAC RTP media streaming to ONVIF Client.

The DUT sent not only AAC RTP media streaming to ONVIF Client.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.37 AUDIO ENCODER CONFIGURATION – MULTICAST PORT (IPv4)

Test Label: Audio Encoder Configuration - Multicast Port (IPv4).

Test Case ID: RTSS-2-2-9

ONVIF Core Specification Coverage: SetAudioEncoderConfiguration, GetAudioEncoderConfiguration, Start multicast streaming, Stop multicast streaming

Command Under Test: SetAudioEncoderConfiguration, GetAudioEncoderConfiguration, StartMulticastStreaming, StopMulticastStreaming

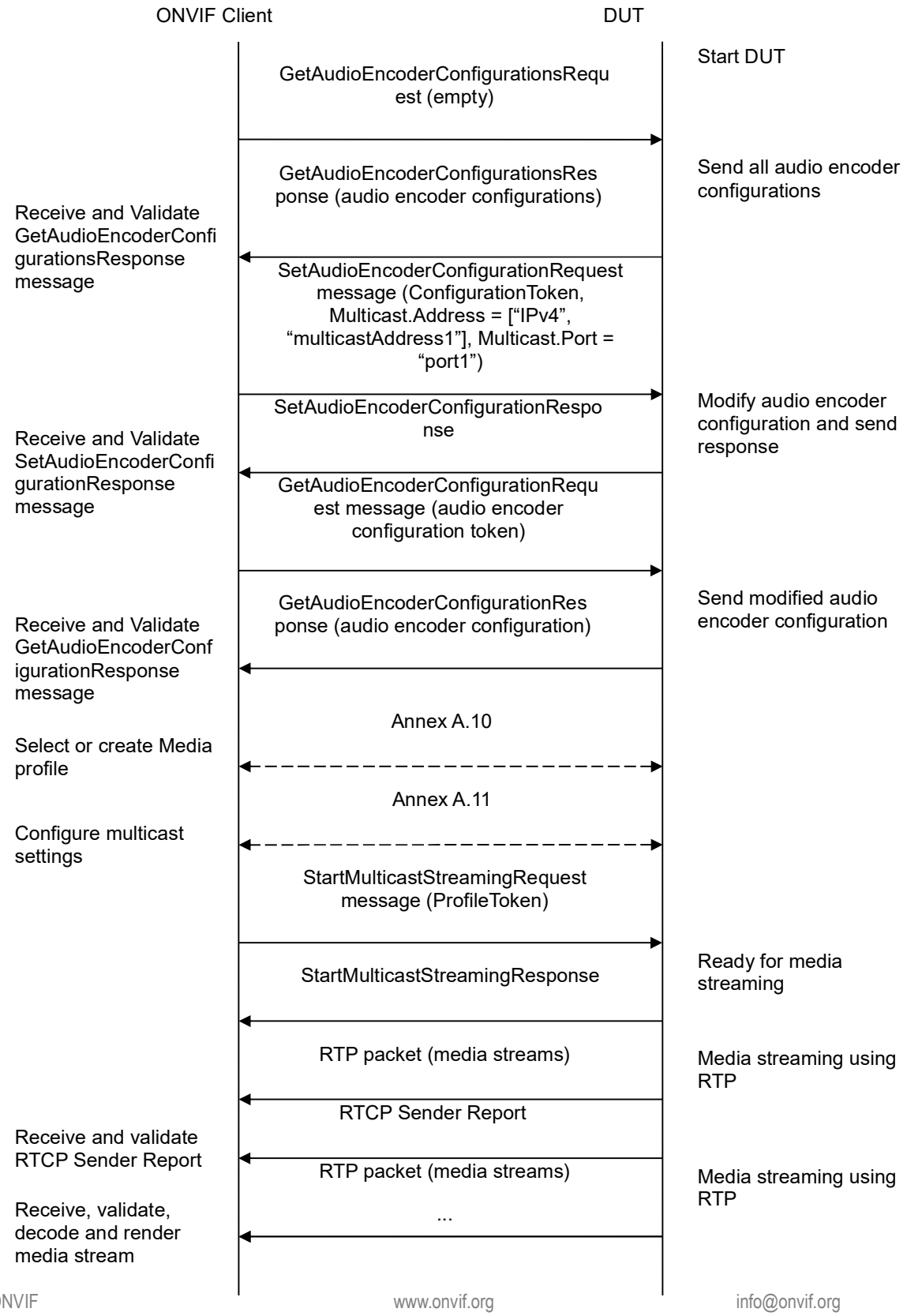
WSDL Reference: media.wsdl

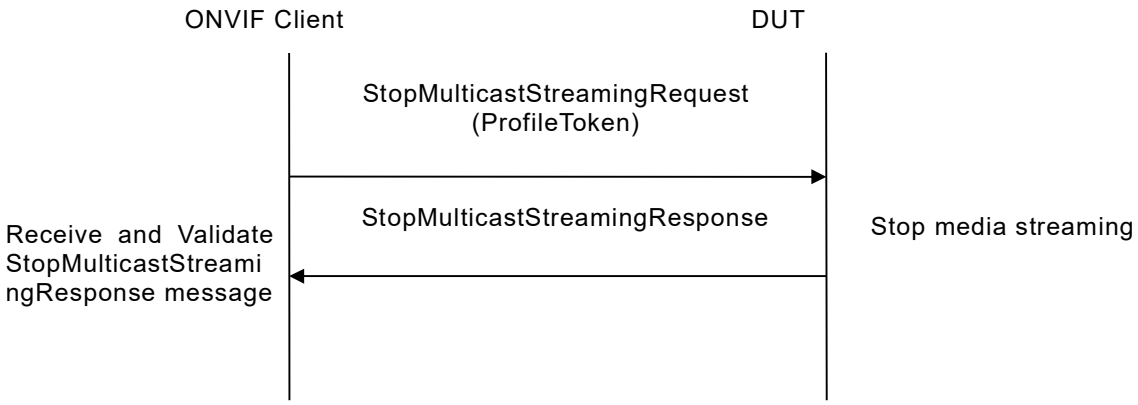
Test Purpose: To verify changing and applying of Multicast port for Audio Encoder Configuration in case of the same Multicast address for all Audio Encoder Configurations.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT. At least one Audio Encoder is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
GetAudioEncoderConfigurationsRequest (empty)
GetAudioEncoderConfigurationsResponse (audio encoder configurations)
Send all audio encoder configurations
Receive and Validate GetAudioEncoderConfigurationsResponse message
SetAudioEncoderConfigurationRequest message (ConfigurationToken, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1")
SetAudioEncoderConfigurationResponse
Modify audio encoder configuration and send response
Receive and Validate SetAudioEncoderConfigurationResponse message
GetAudioEncoderConfigurationRequest message (audio encoder configuration token)
GetAudioEncoderConfigurationResponse (audio encoder configuration)
Send modified audio encoder configuration
Receive and Validate GetAudioEncoderConfigurationResponse message
Annex A.10
Select or create Media profile
Annex A.11
Configure multicast settings
StartMulticastStreamingRequest message (ProfileToken)
StartMulticastStreamingResponse
Ready for media streaming
RTP packet (media streams)
Media streaming using RTP
RTCP Sender Report
Receive and validate RTCP Sender Report
RTP packet (media streams)
Media streaming using RTP
Receive, validate, decode and render media stream
...



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes GetAudioEncoderConfigurationsRequest message to retrieve audio configuration list.
4. Verify the GetAudioEncoderConfigurationsResponse message.
5. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (ConfigurationToken = AECToken1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, where AECToken1 is first audio encoder configuration token from GetAudioEncoderConfigurationsResponse message) to change multicast port and address for audio encoder configuration.
6. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
7. ONVIF Client invokes GetAudioEncoderConfigurationRequest message (ConfigurationToken = AECToken1) to get audio encoder configuration.
8. Verify the GetAudioEncoderConfigurationResponse message (ConfigurationToken = Token1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”) from the DUT. Check that new setting for Multicast.Port and Multicast.Address was applied.
9. Repeat steps 5-8 for the rest Audio Encoder configurations supported by the DUT with using different multicast ports and the same multicast addresses for Audio Encoder Configurations.
10. Find or create media profile with Audio Source Configuration and Audio Encoder Configuration with token AECToken1 (see Annex A.10). If it is not possible skip steps 11-18 and go to the step 19.
11. Configure multicast settings for other entities from profile if required (see Annex A.11).
12. ONVIF Client invokes StartMulticastStreamingRequest message (ProfileToken = [profile token from the step 10]) to start multicast streaming.
13. Verify the StartMulticastStreamingResponse from the DUT.
14. The DUT sends audio RTP multicast media stream to multicast IPv4 address over UDP.

15. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
16. ONVIF Client validates that specified multicast address and port are used.
17. ONVIF Client invokes StopMulticastStreamingRequest message (ProfileToken = [profile token from the step 10]) to stop multicast streaming from specified port.
18. Verify the StopMulticastStreamingResponse from the DUT.
19. Repeat steps 10-18 for the rest Audio Encoder configuration supported by the DUT.
20. Restore Audio Encoder Configurations settings.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

The DUT did not send valid GetAudioEncoderConfigurationsResponse message.

The DUT did not send valid SetAudioEncoderConfigurationResponse message.

The DUT did not send valid GetAudioEncoderConfigurationResponse message with new Multicast.Address and Multicast.Port values that were set during steps 5-6.

The DUT did not send valid StartMulticastStreamingResponse message.

The DUT did not send valid audio stream to specified multicast address and port.

The DUT did not send valid StopMulticastStreamingResponse message.

It is not possible to find or create profile for all Audio Encoder Configurations.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.38 AUDIO ENCODER CONFIGURATION – MULTICAST ADDRESS (IPv4)

Test Label: Audio Encoder Configuration - Multicast Address (IPv4).

Test Case ID: RTSS-2-2-10

ONVIF Core Specification Coverage: SetAudioEncoderConfiguration, GetAudioEncoderConfiguration, Start multicast streaming, Stop multicast streaming

Command Under Test: SetAudioEncoderConfiguration, GetAudioEncoderConfiguration, StartMulticastStreaming, StopMulticastStreaming

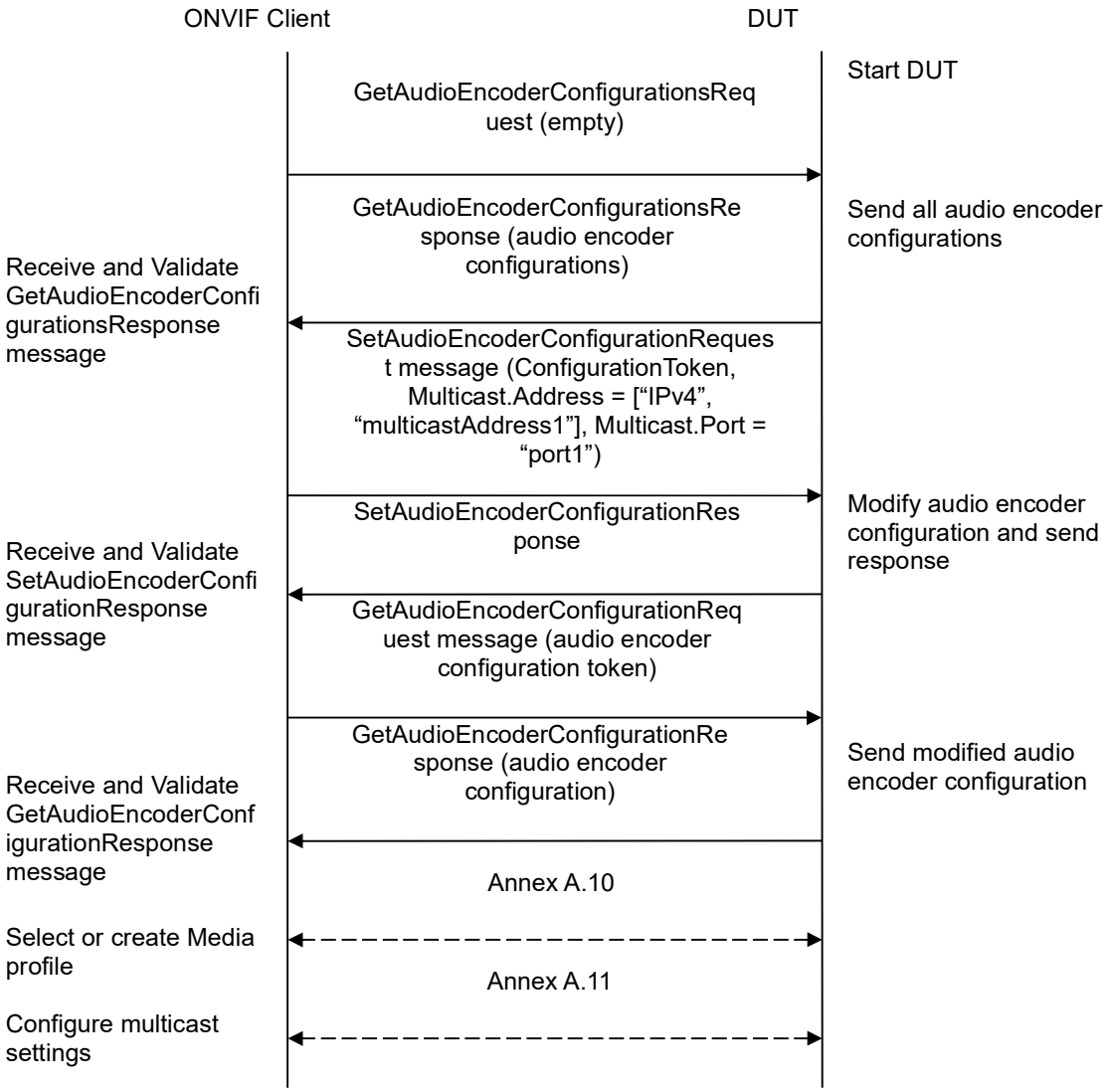
WSDL Reference: media.wsdl

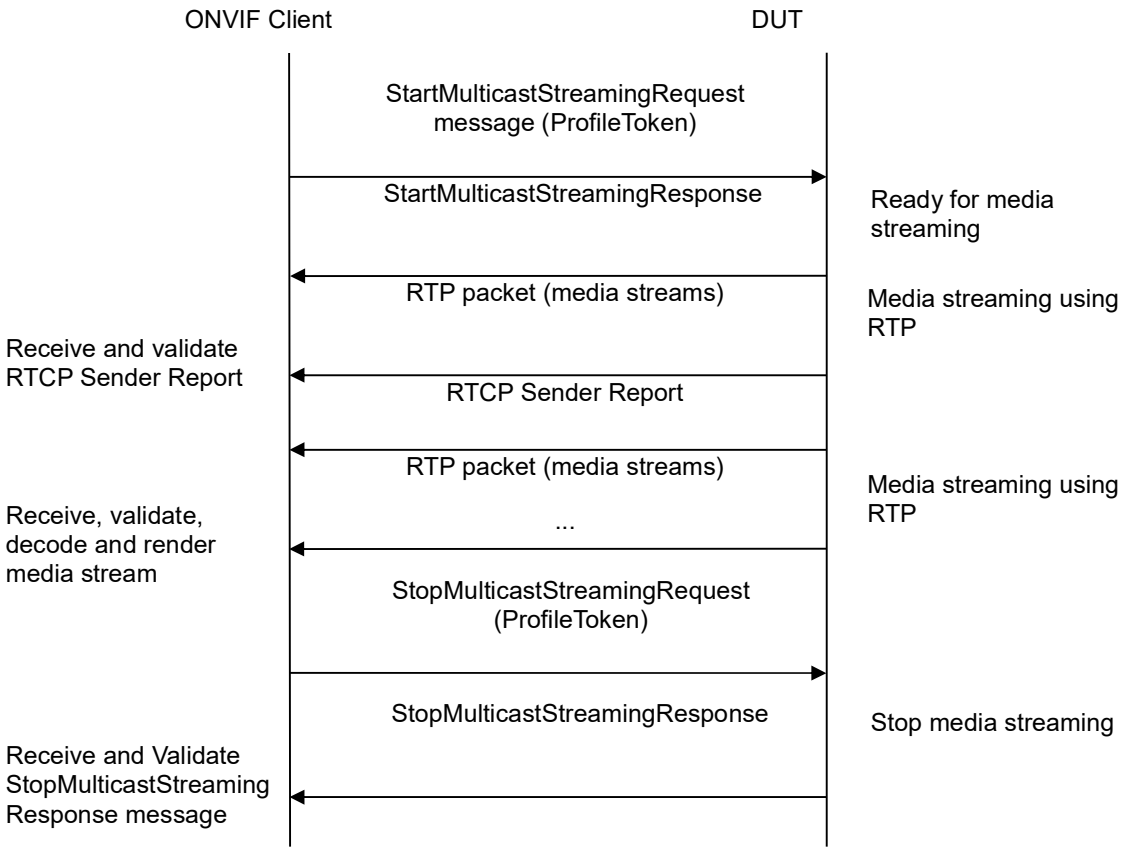
Test Purpose: To verify changing and applying of Multicast address for Audio Encoder Configuration in case of the same Multicast port for all Audio Encoder Configurations.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT. At least one Audio Encoder is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:





Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes GetAudioEncoderConfigurationsRequest message to retrieve audio configuration list.
4. Verify the GetAudioEncoderConfigurationsResponse message.
5. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (ConfigurationToken = AECToken1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, where AECToken1 is first audio encoder configuration token from GetAudioEncoderConfigurationsResponse message) to change multicast port and address for audio encoder configuration.
6. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
7. ONVIF Client invokes GetAudioEncoderConfigurationRequest message (ConfigurationToken = AECToken1) to get audio encoder configuration.
8. Verify the GetAudioEncoderConfigurationResponse message (ConfigurationToken = Token1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”) from the DUT. Check that new setting for Multicast.Port and Multicast.Address was applied.

9. Repeat steps 5-8 for the rest Audio Encoder configurations supported by the DUT with using different multicast address and the same multicast port for Audio Encoder Configurations.
10. Find or create media profile with Audio Source Configuration and Audio Encoder Configuration with token AECToken1 (see Annex A.10). If it is not possible skip steps 11-18 and go to the step 19.
11. Configure multicast settings for other entities from profile if required (see Annex A.11).
12. ONVIF Client invokes StartMulticastStreamingRequest message (ProfileToken = [profile token from the step 10]) to start multicast streaming.
13. Verify the StartMulticastStreamingResponse from the DUT.
14. The DUT sends audio RTP multicast media stream to multicast IPv4 address over UDP.
15. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
16. ONVIF Client validates that specified multicast address and port are used.
17. ONVIF Client invokes StopMulticastStreamingRequest message (ProfileToken = [profile token from the step 10]) to stop multicast streaming from specified port.
18. Verify the StopMulticastStreamingResponse from the DUT.
19. Repeat steps 10-18 for the rest Audio Encoder configuration supported by the DUT.
20. Restore Audio Encoder Configurations settings.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

The DUT did not send valid GetAudioEncoderConfigurationsResponse message.

The DUT did not send valid SetAudioEncoderConfigurationResponse message.

The DUT did not send valid GetAudioEncoderConfigurationResponse message with new Multicast.Address and Multicast.Port values that were set during steps 5-6.

The DUT did not send valid StartMulticastStreamingResponse message.

The DUT did not send valid audio stream to specified multicast address and port.

The DUT did not send valid StopMulticastStreamingResponse message.

It is not possible to find or create profile for all Audio Encoder Configurations.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.39 MEDIA STREAMING – G.711 (RTP-Multicast/UDP, IPv4)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP-Multicast/UDP Transport for IPv4

Test Case ID: RTSS-2-2-11

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, G.711 over RTP, Stream control, RTSP

Command Under Test: None

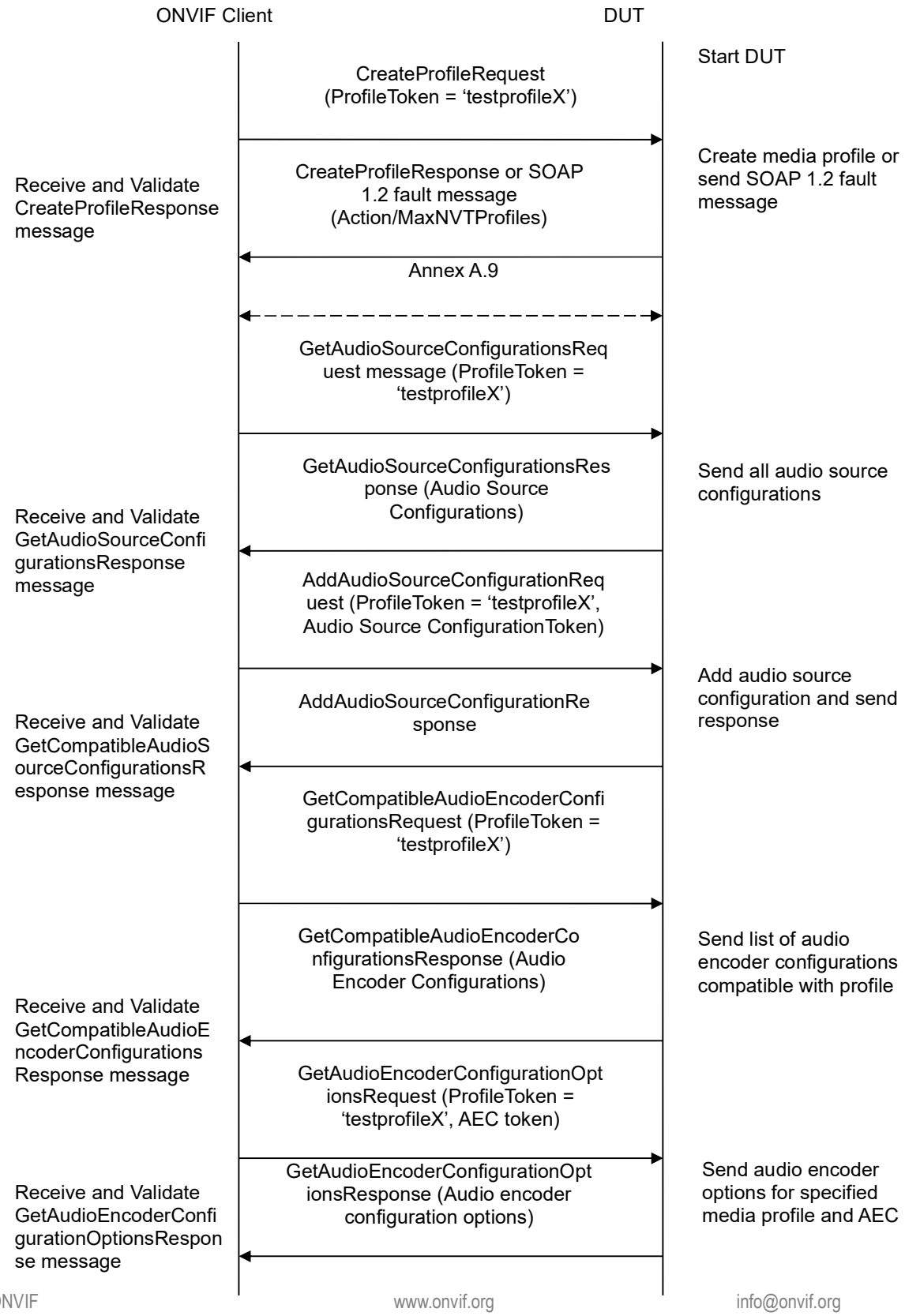
WSDL Reference: None

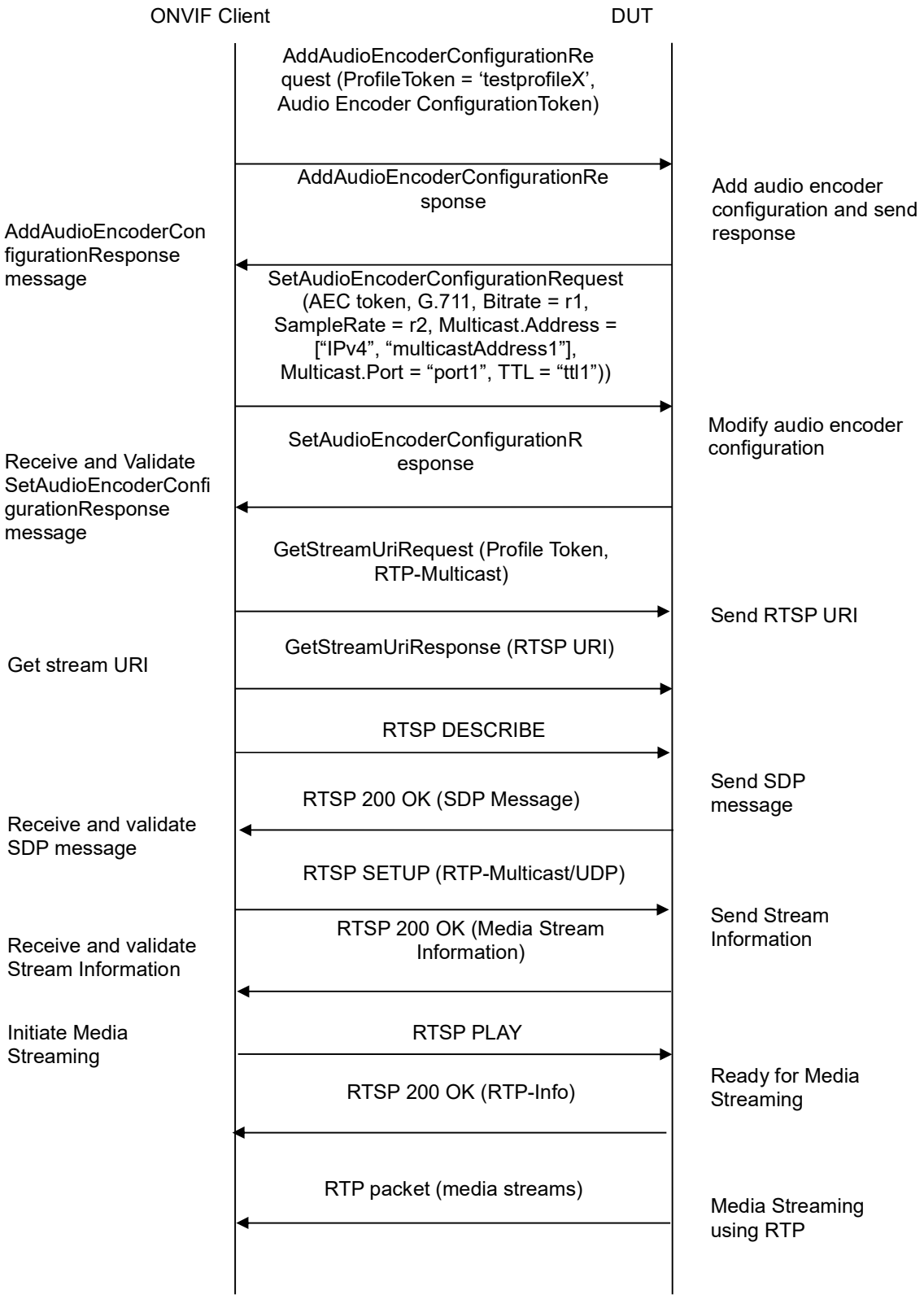
Test Purpose: To verify G.711 media streaming based on RTP-Multicast/UDP Transport for IPv4.

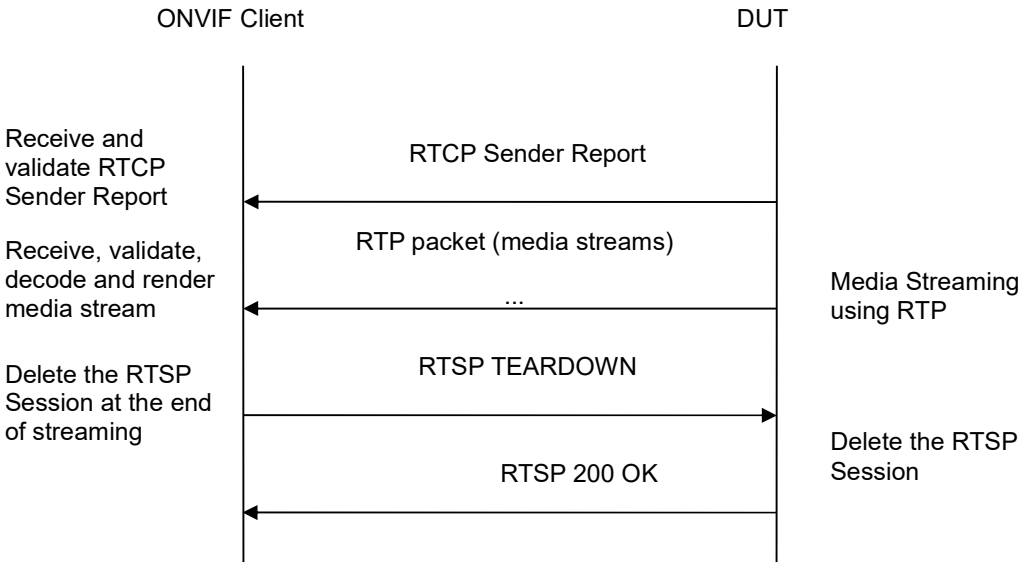
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT. A media profile with G.711 audio encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. Media Service was received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
Create media profile or send SOAP 1.2 fault message
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
Send all audio source configurations
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
Add audio source configuration and send response
AddAudioSourceConfigurationResponse
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
Send list of audio encoder configurations compatible with profile
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
Send audio encoder options for specified media profile and AEC
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.711, Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1"))
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (Profile Token, RTP-Multicast)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (RTP-Multicast/UDP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = 'testprofileX'.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = 'testprofileX' and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = 'testprofileX') to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

13. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.711 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.711 encoding skip this step and repeat steps 7-13 for other AudioSource.
14. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13
15. DUT adds the audio encoder configuration to the profile and sends the response.
16. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G711", Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1 and force persistence = false) to set G.711 encoding and Multicast settings.
17. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
18. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP") to retrieve media stream URI for the selected media profile.
19. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
20. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
21. ONVIF Client invokes RTSP DESCRIBE request.
22. The DUT sends 200 OK message and SDP information.
23. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Multicast/UDP.
24. The DUT sends 200 OK message and the media stream information.
25. ONVIF Client invokes RTSP PLAY request.
26. The DUT sends 200 OK message and starts media streaming.
27. The DUT sends G.711 RTP multicast media stream to multicast IPv4 address over UDP.
28. The DUT sends RTCP sender report to ONVIF Client.
29. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
30. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
31. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send AudioEncoderConfiguration which supports G.711 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.40 MEDIA STREAMING – G.711 (RTP-Multicast/UDP, IPv6)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP-Multicast/UDP Transport for IPv6

Test Case ID: RTSS-2-2-12

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, G.711 over RTP, Stream control, RTSP

Command Under Test: None

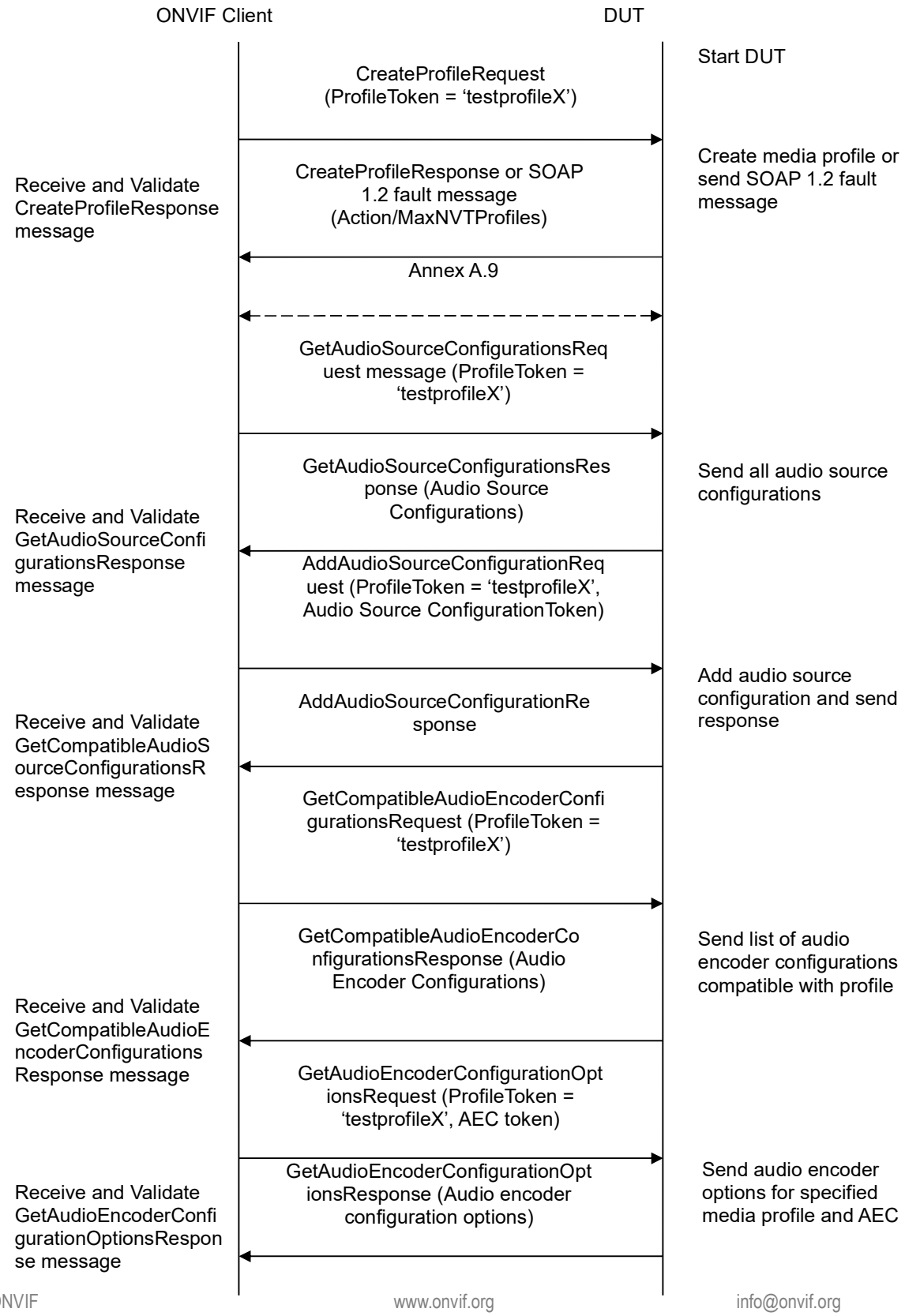
WSDL Reference: None

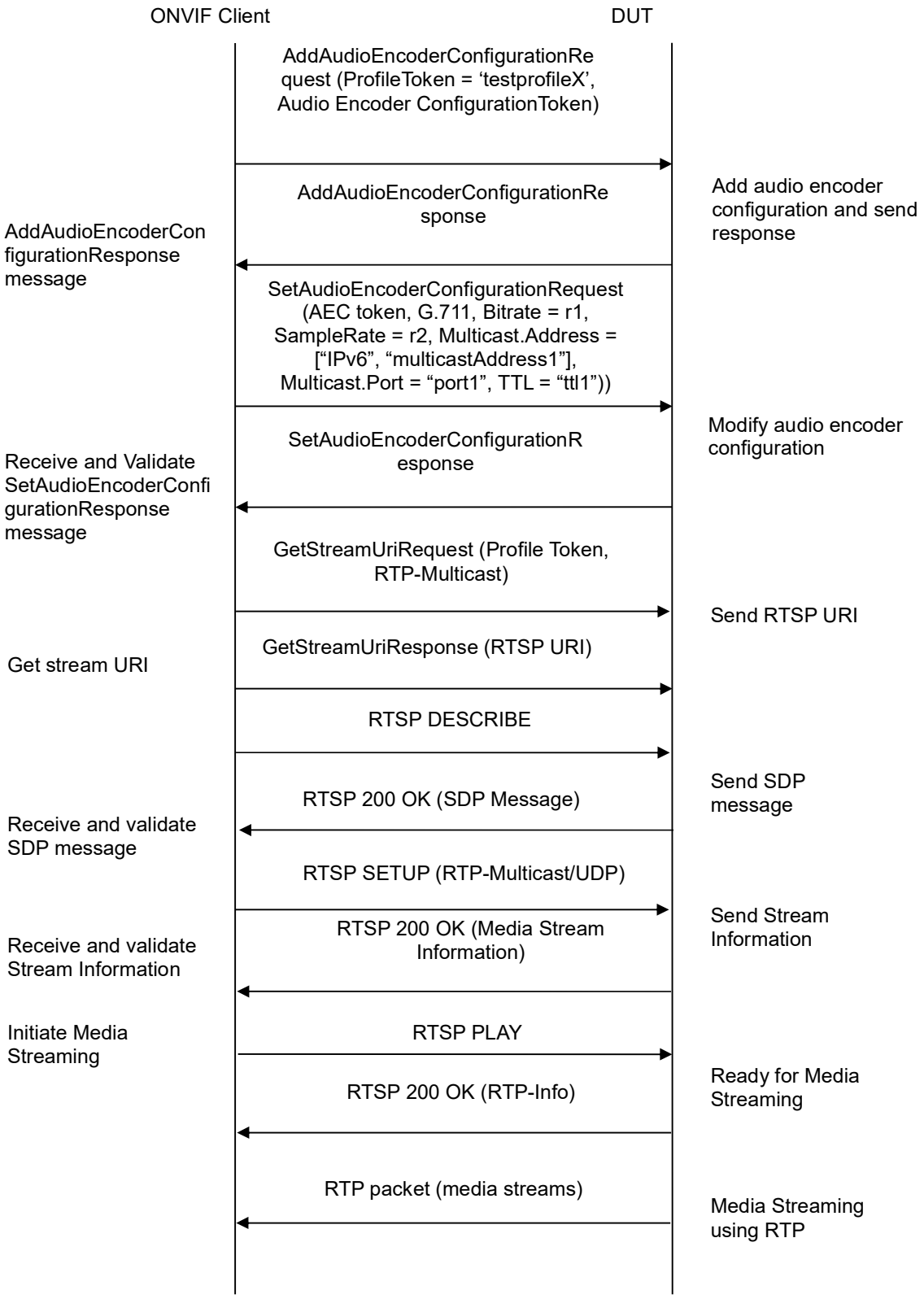
Test Purpose: To verify G.711 media streaming based on RTP-Multicast/UDP Transport for IPv6

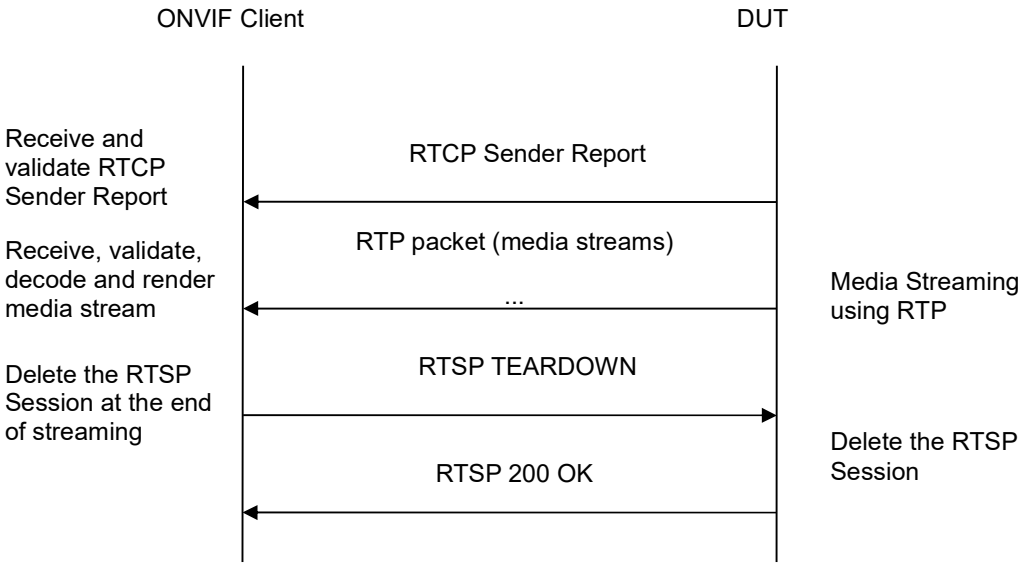
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT. A media profile with G.711 audio encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
Create media profile or send SOAP 1.2 fault message
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
Send all audio source configurations
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
Add audio source configuration and send response
AddAudioSourceConfigurationResponse
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
Send list of audio encoder configurations compatible with profile
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
Send audio encoder options for specified media profile and AEC
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.711, Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv6", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1"))
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (Profile Token, RTP-Multicast)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (RTP-Multicast/UDP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = 'testprofileX'.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = 'testprofileX' and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = 'testprofileX') to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

13. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.711 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.711 encoding skip this step and repeat steps 7-13 for other AudioSource.
14. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13
15. DUT adds the audio encoder configuration to the profile and sends the response.
16. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G711", Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv6", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1 and force persistence = false) to set G.711 encoding and Multicast settings.
17. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
18. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP") to retrieve media stream URI for the selected media profile.
19. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
20. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
21. ONVIF Client invokes RTSP DESCRIBE request.
22. The DUT sends 200 OK message and SDP information.
23. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Multicast/UDP.
24. The DUT sends 200 OK message and the media stream information.
25. ONVIF Client invokes RTSP PLAY request.
26. The DUT sends 200 OK message and starts media streaming.
27. The DUT sends G.711 RTP multicast media stream to multicast IPv6 address over UDP.
28. The DUT sends RTCP sender report to ONVIF Client.
29. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
30. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
31. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send AudioEncoderConfiguration which supports G.711 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.41 MEDIA STREAMING – G.726 (RTP-Multicast/UDP, IPv4)

Test Label: Real Time Viewing DUT G.726 Media Streaming Using RTP-Multicast/UDP Transport for IPv4

Test Case ID: RTSS-2-2-13

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, G.726 over RTP, Stream control, RTSP

Command Under Test: None

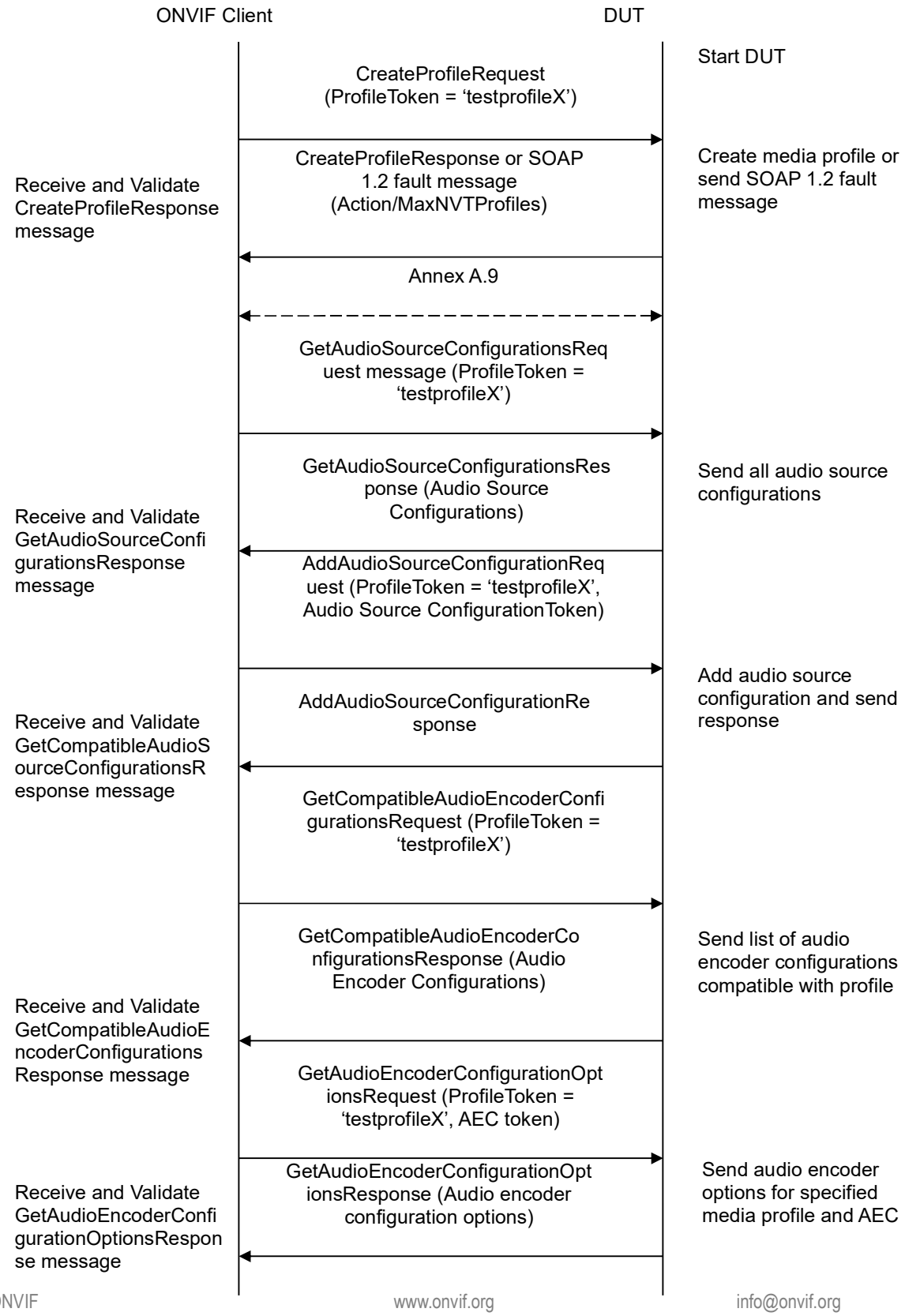
WSDL Reference: None

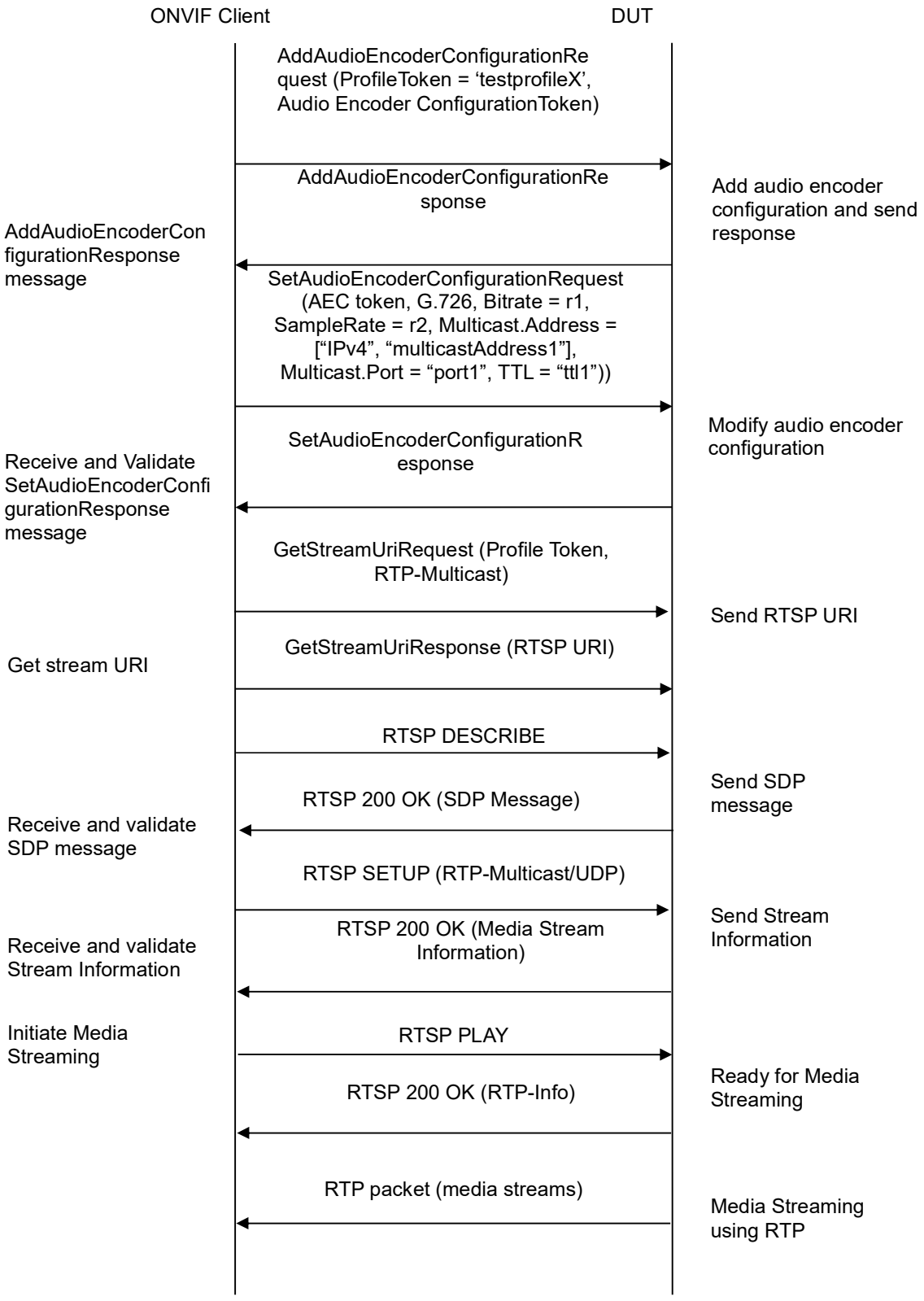
Test Purpose: To verify G.726 media streaming based on RTP-Multicast/UDP Transport for IPv4.

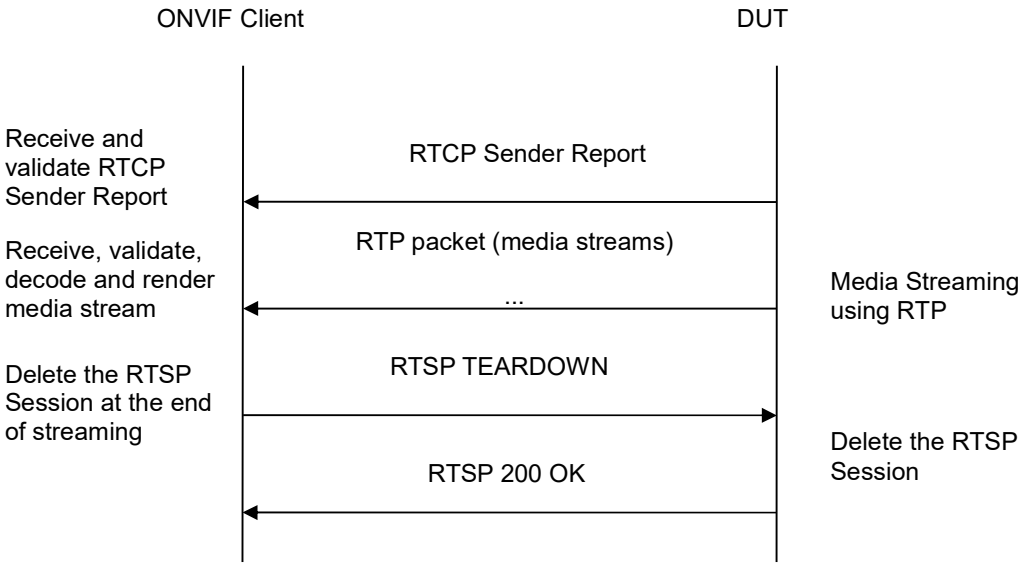
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT and G.726 is implemented by DUT. A media profile with G.726 audio encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. Media Service was received from the DUT

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
AddAudioSourceConfigurationResponse
Add audio source configuration and send response
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.726, Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1"))
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (Profile Token, RTP-Multicast)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (RTP-Multicast/UDP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = 'testprofileX'.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = 'testprofileX' and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = 'testprofileX') to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

13. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.726 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.726 encoding skip this step and repeat steps 7-13 for other AudioSource.
14. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13
15. DUT adds the audio encoder configuration to the profile and sends the response.
16. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G726", Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1 and force persistence = false) to set G.711 encoding and Multicast settings.
17. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
18. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP") to retrieve media stream URI for the selected media profile.
19. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
20. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
21. ONVIF Client invokes RTSP DESCRIBE request.
22. The DUT sends 200 OK message and SDP information.
23. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Multicast/UDP.
24. The DUT sends 200 OK message and the media stream information.
25. ONVIF Client invokes RTSP PLAY request.
26. The DUT sends 200 OK message and starts media streaming.
27. The DUT sends G.726 RTP multicast media stream to multicast IPv4 address over UDP.
28. The DUT sends RTCP sender report to ONVIF Client.
29. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
30. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
31. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send AudioEncoderConfiguration which supports G.726 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.726 RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.42 MEDIA STREAMING – G.726 (RTP-Multicast/UDP, IPv6)

Test Label: Real Time Viewing DUT G.726 Media Streaming Using RTP-Multicast/UDP Transport for IPv6

Test Case ID: RTSS-2-2-14

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, G.726 over RTP, Stream control, RTSP

Command Under Test: None

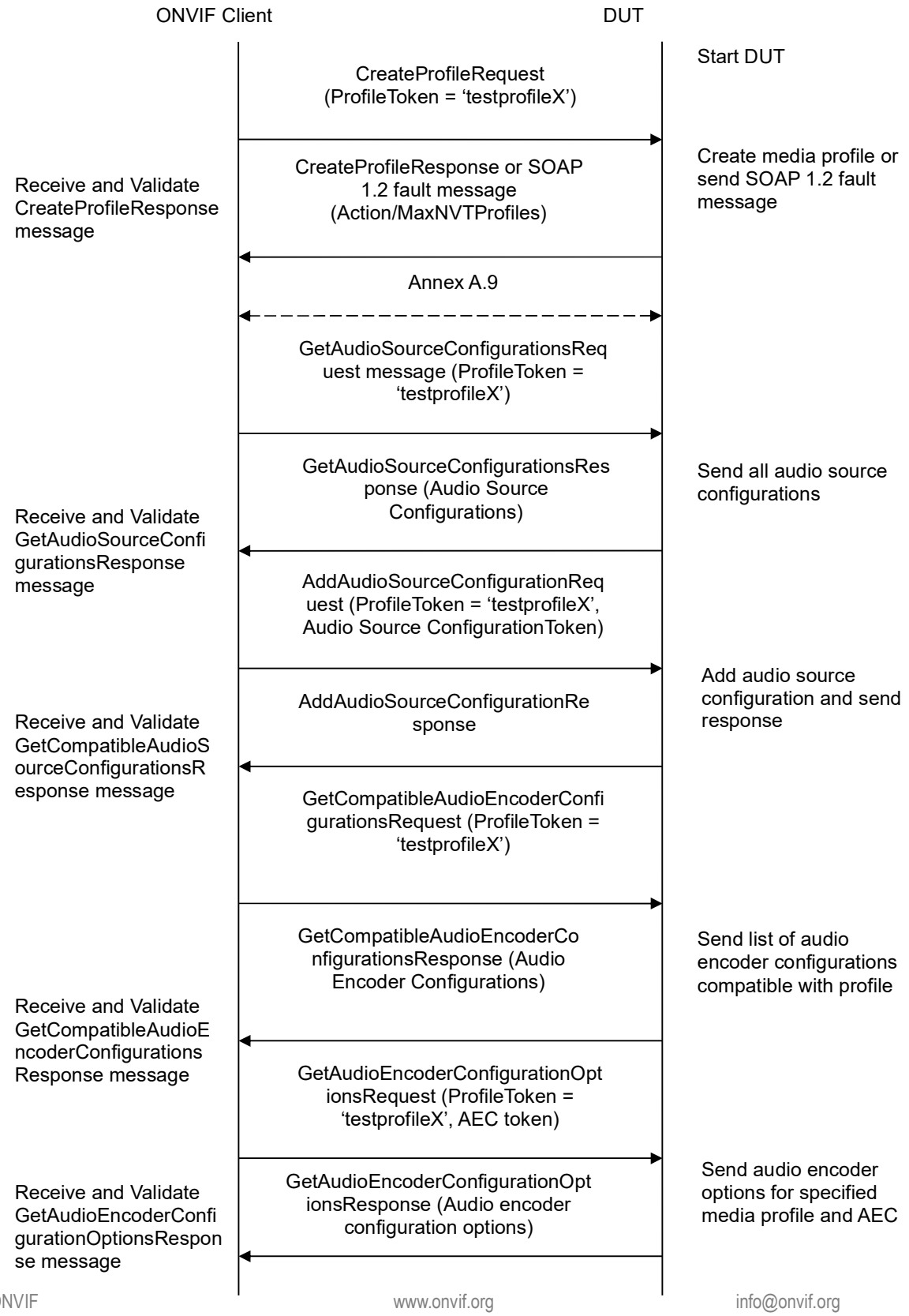
WSDL Reference: None

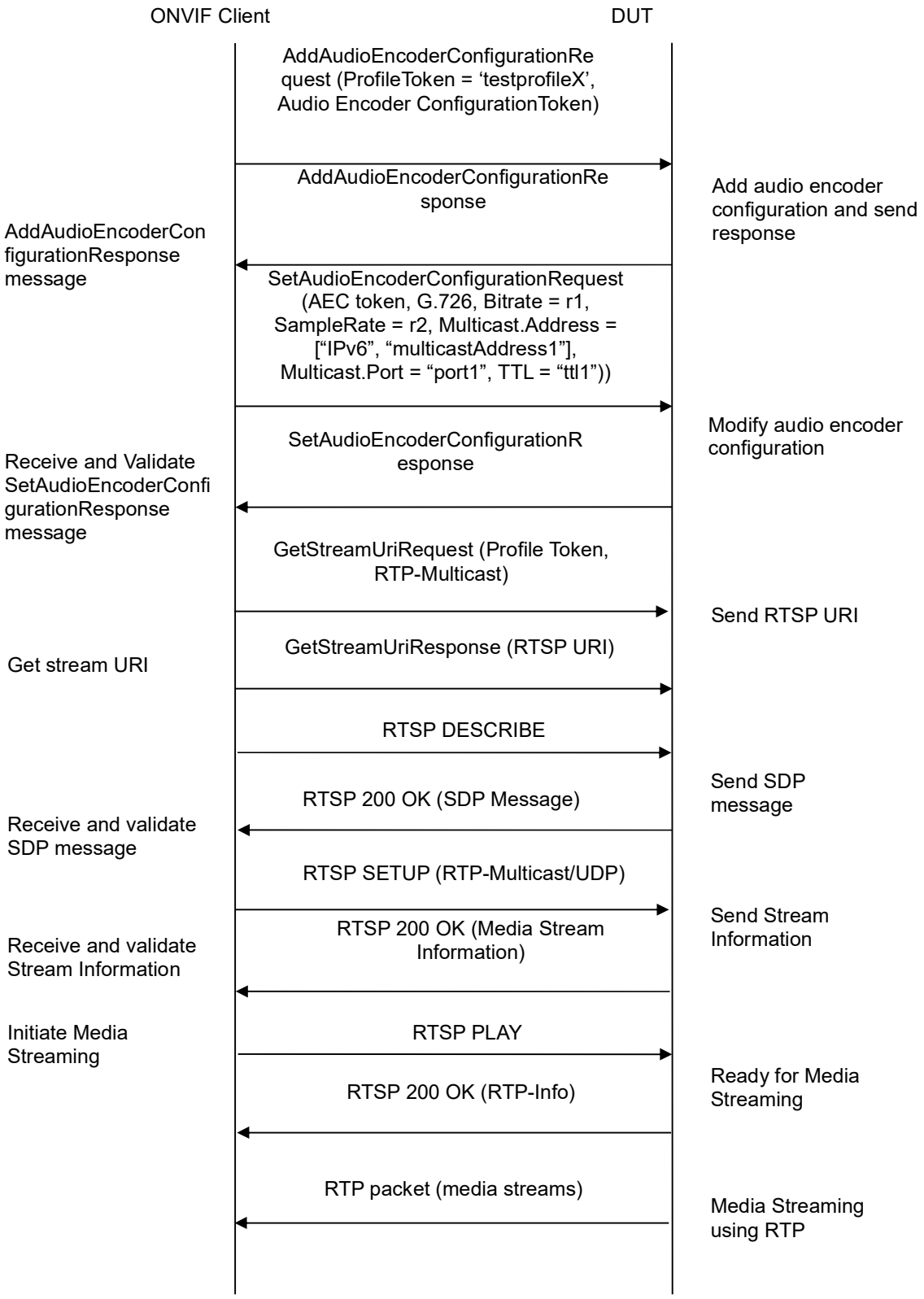
Test Purpose: To verify G.726 media streaming based on RTP-Multicast/UDP Transport for IPv6

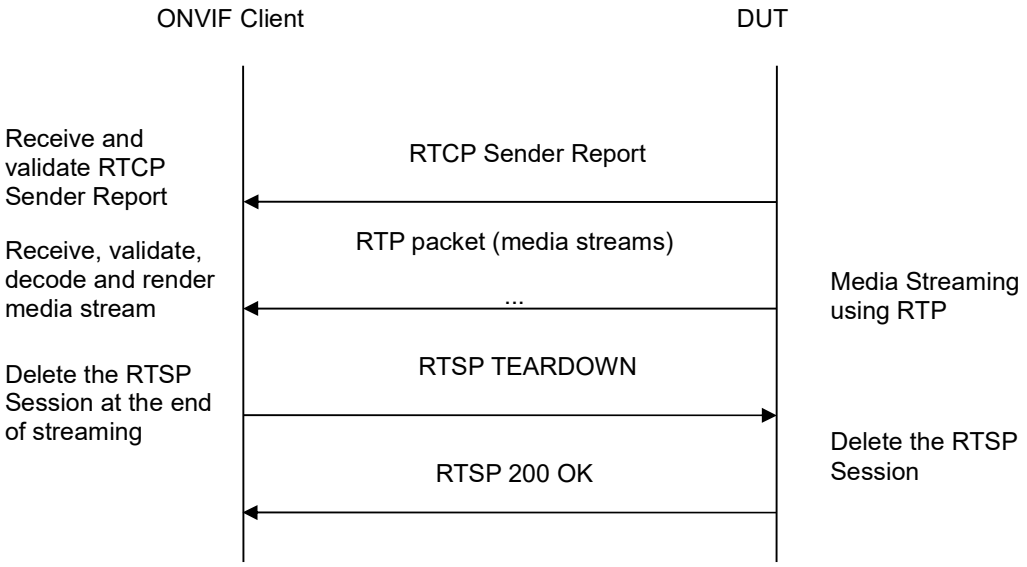
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT and G.726 is implemented by DUT. A media profile with G.726 audio encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
Create media profile or send SOAP 1.2 fault message
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
Send all audio source configurations
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
Add audio source configuration and send response
AddAudioSourceConfigurationResponse
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
Send list of audio encoder configurations compatible with profile
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
Send audio encoder options for specified media profile and AEC
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.726, Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv6", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1"))
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (Profile Token, RTP-Multicast)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (RTP-Multicast/UDP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = 'testprofileX'.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = 'testprofileX' and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = 'testprofileX') to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

13. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports G.726 encoding go to the next step. If there is no AudioEncoderConfiguration which supports G.726 encoding skip this step and repeat steps 7-13 for other AudioSource.
14. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13
15. DUT adds the audio encoder configuration to the profile and sends the response.
16. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G711", Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv6", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1 and force persistence = false) to set G.726 encoding and Multicast settings.
17. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
18. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP") to retrieve media stream URI for the selected media profile.
19. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
20. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
21. ONVIF Client invokes RTSP DESCRIBE request.
22. The DUT sends 200 OK message and SDP information.
23. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Multicast/UDP.
24. The DUT sends 200 OK message and the media stream information.
25. ONVIF Client invokes RTSP PLAY request.
26. The DUT sends 200 OK message and starts media streaming.
27. The DUT sends G.726 RTP multicast media stream to multicast IPv6 address over UDP.
28. The DUT sends RTCP sender report to ONVIF Client.
29. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
30. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
31. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send AudioEncoderConfiguration which supports G.726 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.726 RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.43 MEDIA STREAMING – AAC (RTP-Multicast/UDP, IPv4)

Test Label: Real Time Viewing DUT AAC Media Streaming Using RTP-Multicast/UDP Transport for IPv4

Test Case ID: RTSS-2-2-15

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, AAC over RTP, Stream control, RTSP

Command Under Test: None

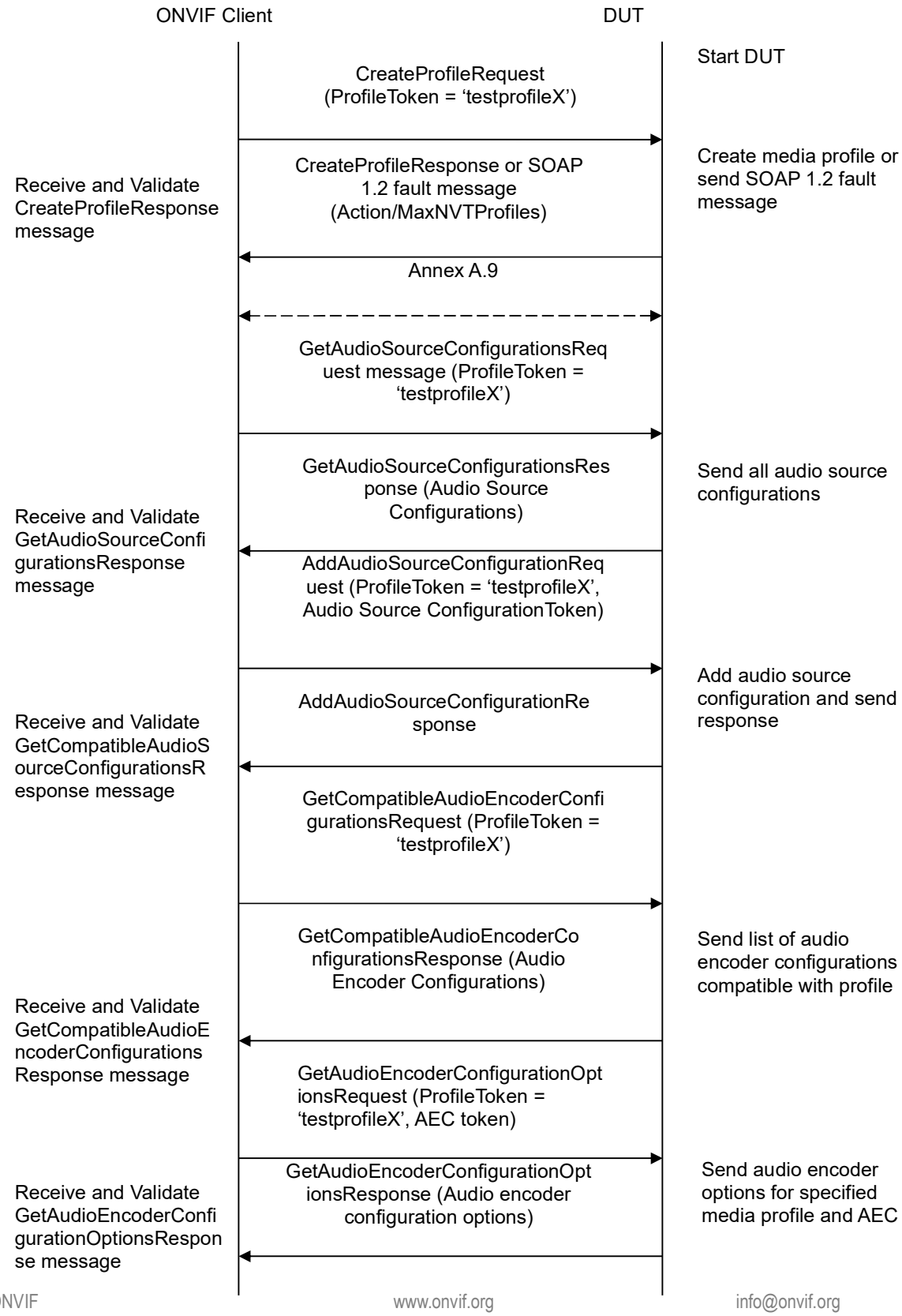
WSDL Reference: None

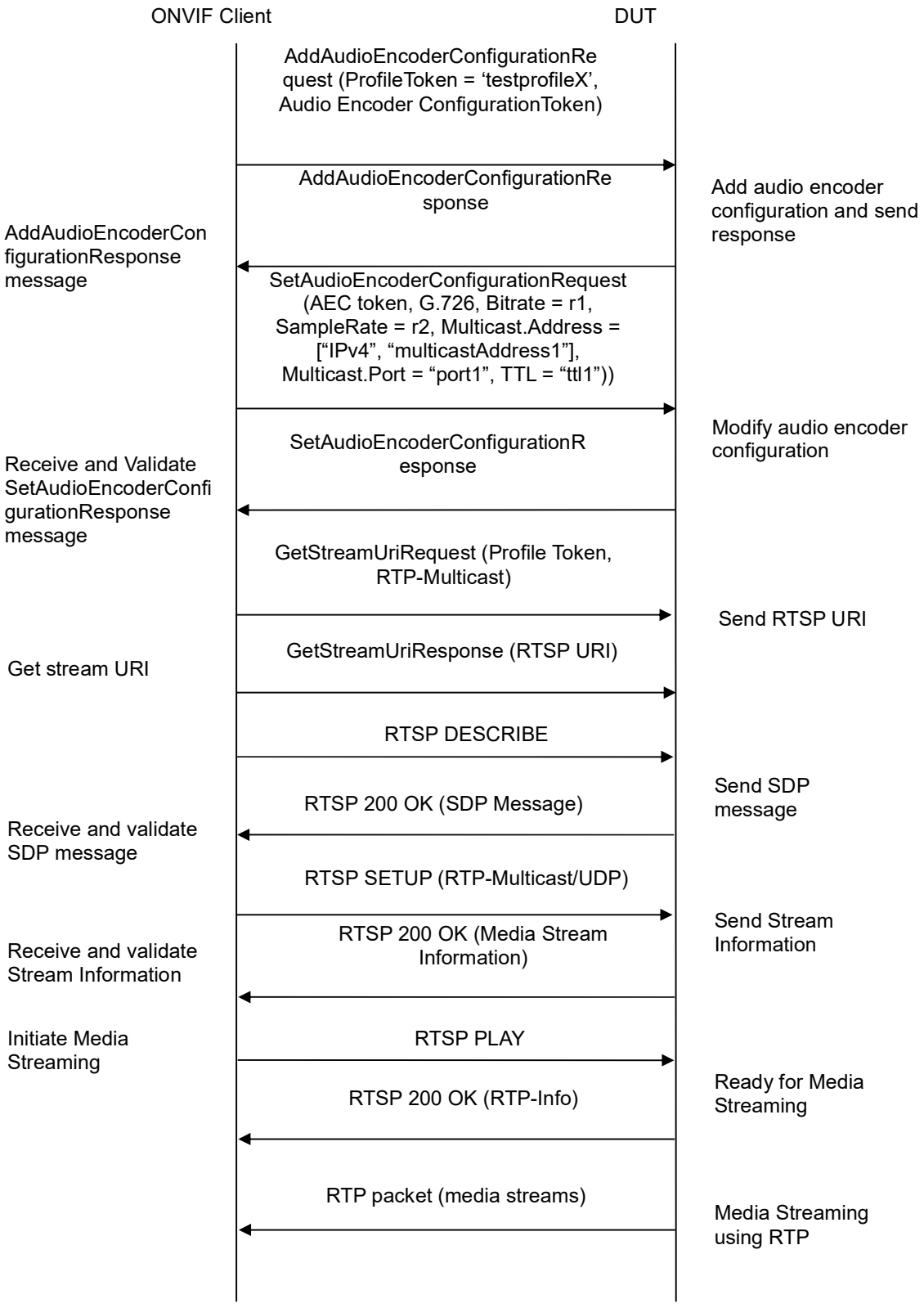
Test Purpose: To verify AAC media streaming based on RTP-Multicast/UDP Transport for IPv4.

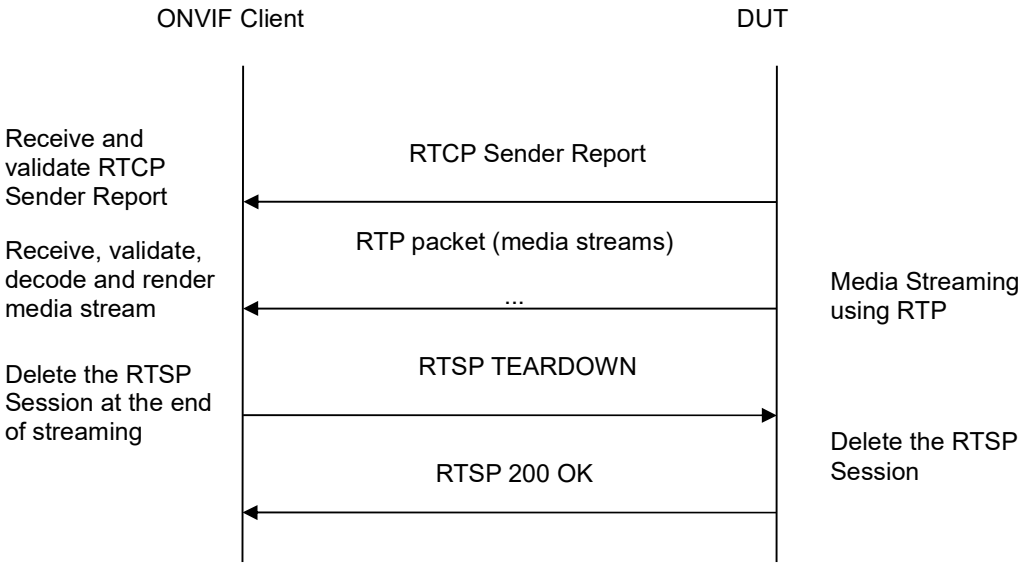
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT and AAC is implemented by DUT. A media profile with AAC audio encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. Media Service was received from the DUT

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
AddAudioSourceConfigurationResponse
Add audio source configuration and send response
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, G.726, Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1"))
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (Profile Token, RTP-Multicast)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (RTP-Multicast/UDP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = 'testprofileX'.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = 'testprofileX' and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = 'testprofileX') to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

13. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports AAC encoding go to the next step. If there is no AudioEncoderConfiguration which supports AAC encoding skip this step and repeat steps 7-13 for other AudioSource.
14. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13
15. DUT adds the audio encoder configuration to the profile and sends the response.
16. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "AAC", Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1 and force persistence = false) to set AAC encoding and Multicast settings.
17. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
18. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP") to retrieve media stream URI for the selected media profile.
19. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
20. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
21. ONVIF Client invokes RTSP DESCRIBE request.
22. The DUT sends 200 OK message and SDP information.
23. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Multicast/UDP.
24. The DUT sends 200 OK message and the media stream information.
25. ONVIF Client invokes RTSP PLAY request.
26. The DUT sends 200 OK message and starts media streaming.
27. The DUT sends AAC RTP multicast media stream to multicast IPv4 address over UDP.
28. The DUT sends RTCP sender report to ONVIF Client.
29. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
30. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
31. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send AudioEncoderConfiguration which supports AAC encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send AAC RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.2.44 MEDIA STREAMING – AAC (RTP-Multicast/UDP, IPv6)

Test Label: Real Time Viewing DUT AAC Media Streaming Using RTP-Multicast/UDP Transport for IPv6

Test Case ID: RTSS-2-2-16

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, AAC over RTP, Stream control, RTSP

Command Under Test: None

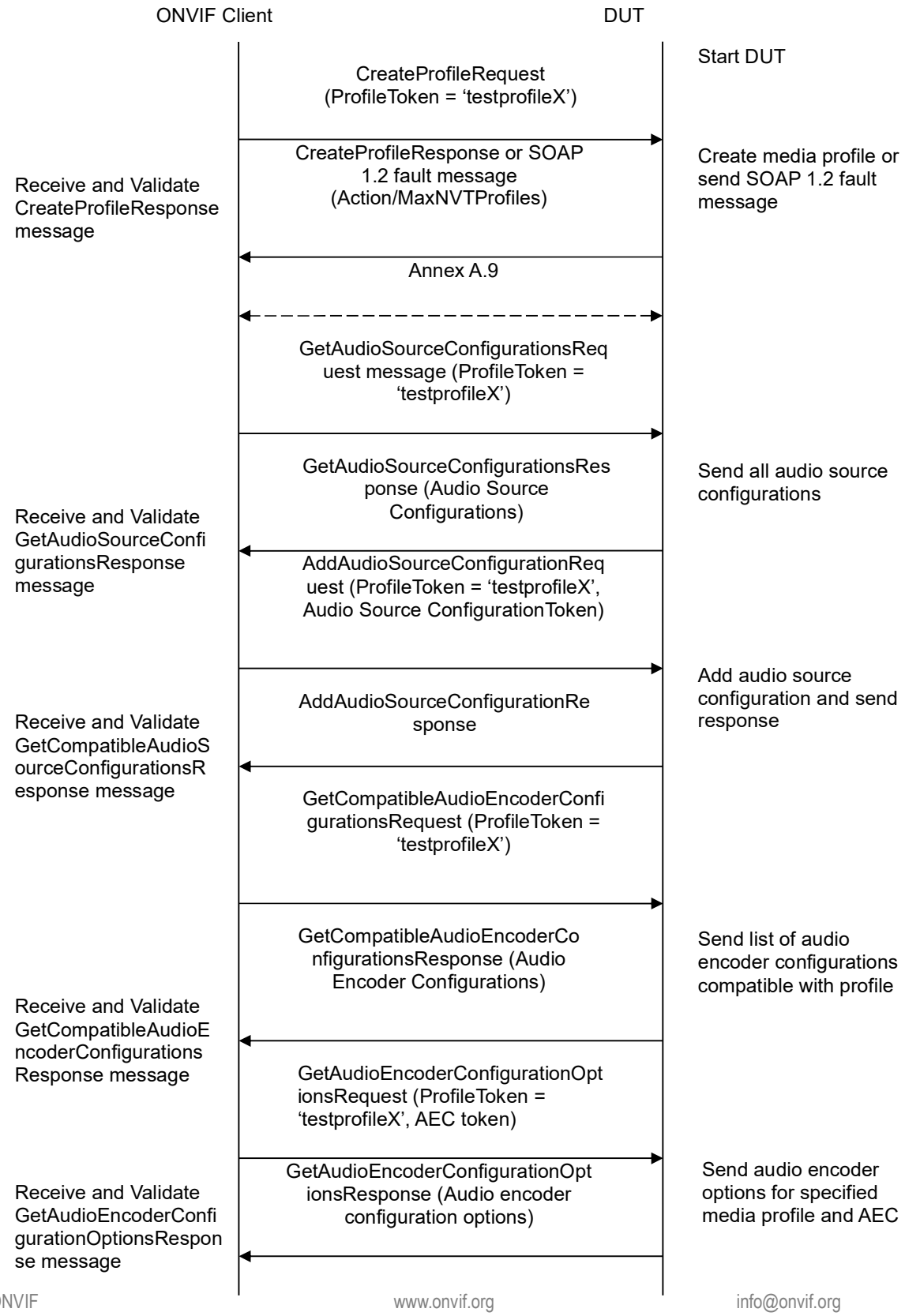
WSDL Reference: None

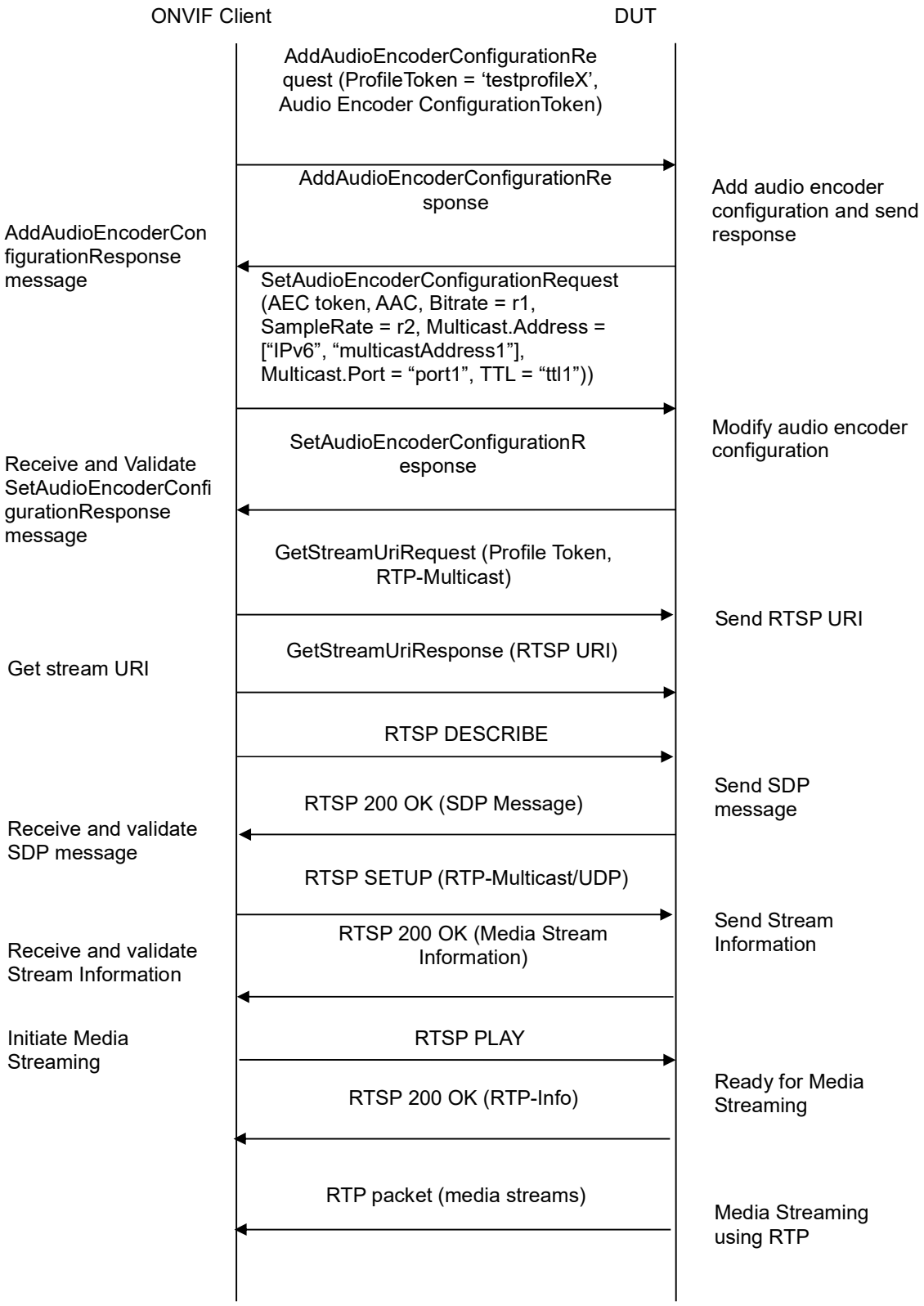
Test Purpose: To verify AAC media streaming based on RTP-Multicast/UDP Transport for IPv6

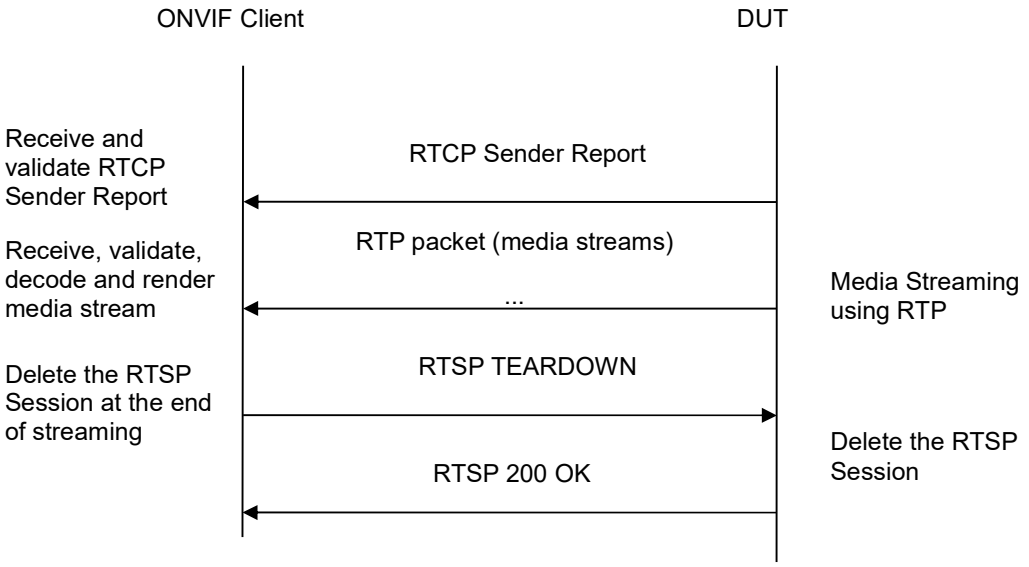
Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT and AAC is implemented by DUT. A media profile with AAC audio encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. Media Service was received from the DUT. IPv6 is turned on for network interface

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
AddAudioSourceConfigurationResponse
Add audio source configuration and send response
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message


ONVIF Client
DUT
AddAudioEncoderConfigurationRequest (ProfileToken = 'testprofileX', Audio Encoder ConfigurationToken)
AddAudioEncoderConfigurationResponse
Add audio encoder configuration and send response
AddAudioEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest (AEC token, AAC, Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv6", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1"))
Modify audio encoder configuration
SetAudioEncoderConfigurationResponse
Receive and Validate SetAudioEncoderConfigurationResponse message
GetStreamUriRequest (Profile Token, RTP-Multicast)
Send RTSP URI
GetStreamUriResponse (RTSP URI)
Get stream URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (RTP-Multicast/UDP)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
Initiate Media Streaming
RTSP PLAY
Ready for Media Streaming
RTSP 200 OK (RTP-Info)
RTP packet (media streams)
Media Streaming using RTP



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = 'testprofileX'.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = 'testprofileX' and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = 'testprofileX') to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client will invoke GetAudioEncoderConfigurationOptionsRequest message (MediaProfile token, VECToken1, where VECToken1 is the token of the first VEC from GetCompatibleAudioEncoderConfigurationsResponse message) to retrieve audio encoder configuration options from the DUT

13. DUT sends GetAudioEncoderConfigurationOptionsResponse message. If GetAudioEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 12-13 for other VECs from GetCompatibleAudioEncoderConfigurationsResponse message. If there is AudioEncoderConfiguration which supports AAC encoding go to the next step. If there is no AudioEncoderConfiguration which supports AAC encoding skip this step and repeat steps 7-13 for other AudioSource.
14. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as 'testprofileX' and ConfigurationToken = ConfigurationToken1, where ConfigurationToken1 is token of AudioEncoderConfiguration found in step 13
15. DUT adds the audio encoder configuration to the profile and sends the response.
16. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = "G711", Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv6", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1 and force persistence = false) to set AAC encoding and Multicast settings.
17. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
18. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP") to retrieve media stream URI for the selected media profile.
19. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
20. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
21. ONVIF Client invokes RTSP DESCRIBE request.
22. The DUT sends 200 OK message and SDP information.
23. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Multicast/UDP.
24. The DUT sends 200 OK message and the media stream information.
25. ONVIF Client invokes RTSP PLAY request.
26. The DUT sends 200 OK message and starts media streaming.
27. The DUT sends AAC RTP multicast media stream to multicast IPv6 address over UDP.
28. The DUT sends RTCP sender report to ONVIF Client.
29. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
30. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
31. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send AudioEncoderConfiguration which supports AAC encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send AAC RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3 Audio & Video Streaming

4.3.1 MEDIA STREAMING – JPEG/G.711 (RTP-Unicast/UDP)

Test Label: Real Time Viewing DUT JPEG/G.711 Audio and Video streaming using RTP-Unicast/UDP transport.

Test Case ID: RTSS-3-1-10

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

WSDL Reference: None

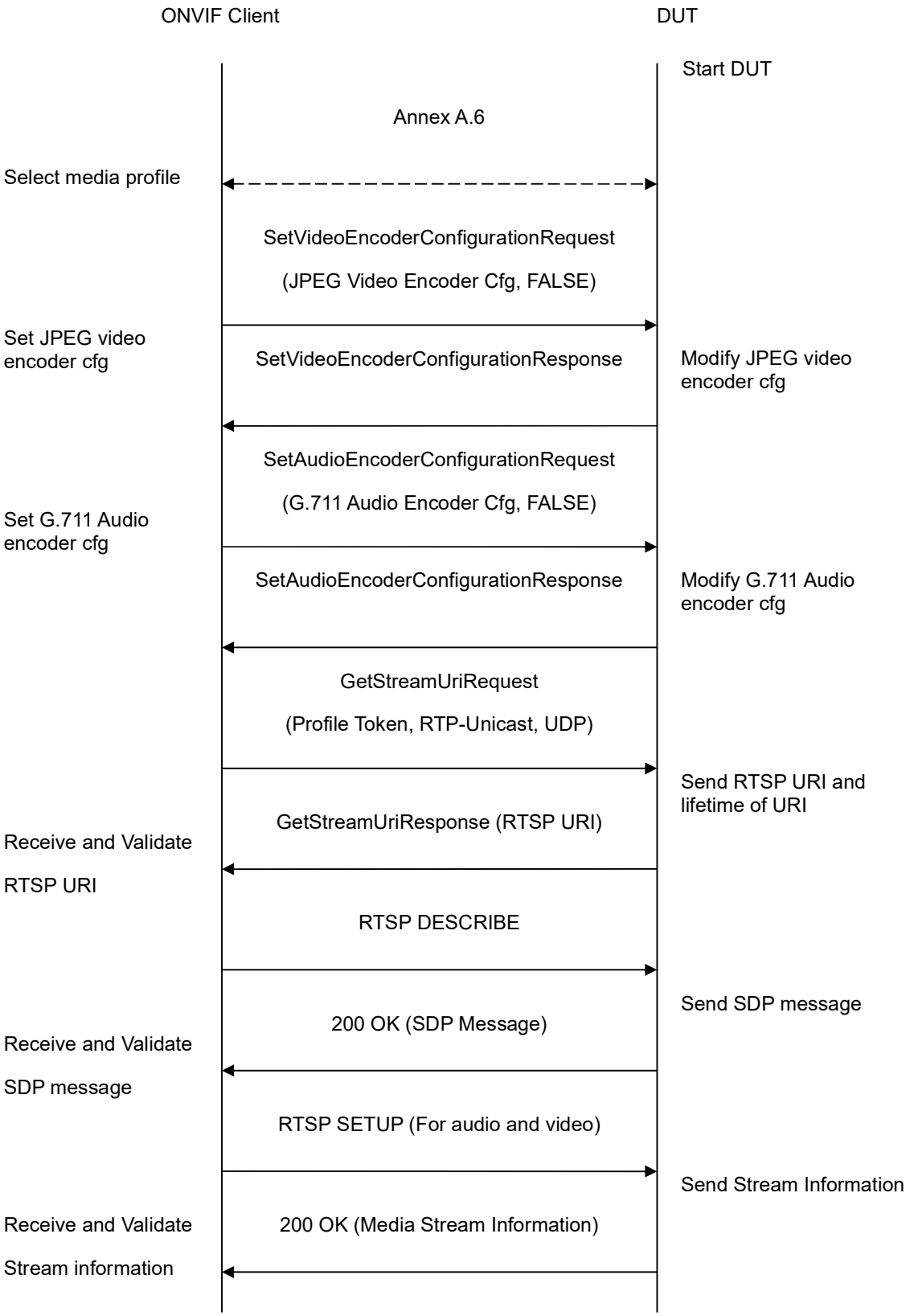
Test Purpose: To verify JPEG/G.711 Audio and Video streaming based on RTP/UDP Unicast Transport.

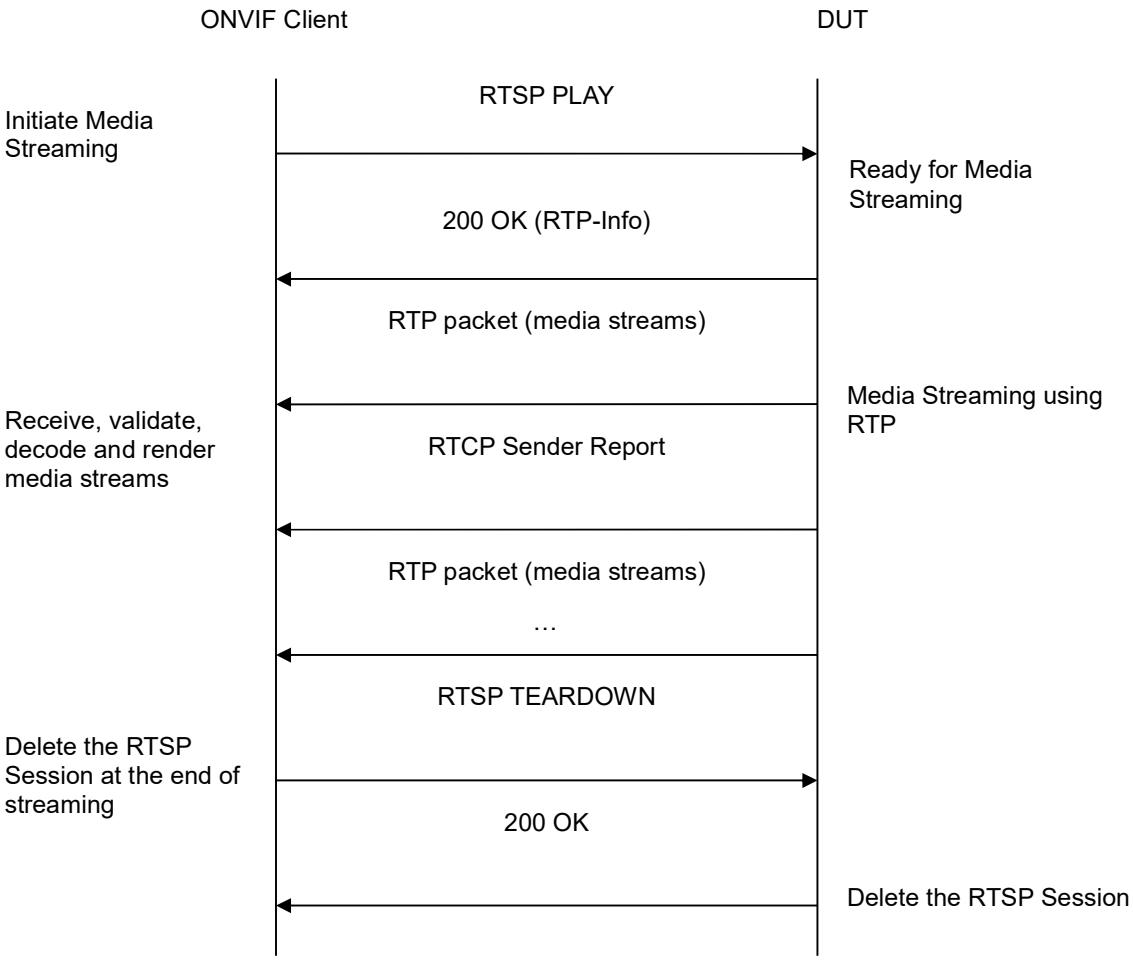
Pre-Requisite: Audio is supported by DUT. Real-time streaming supported by DUT.

A media profile with JPEG video encoder configuration and G.711 audio encoder configuration

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
Modify JPEG video encoder cfg
SetAudioEncoderConfigurationRequest
(G.711 Audio Encoder Cfg, FALSE)
Set G.711 Audio encoder cfg
SetAudioEncoderConfigurationResponse
Modify G.711 Audio encoder cfg
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Send SDP message
200 OK (SDP Message)
Receive and Validate SDP message
RTSP SETUP (For audio and video)
Send Stream Information
200 OK (Media Stream Information)
Receive and Validate Stream information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with both JPEG video encoding support and G.711 audio encoding support by following the procedure mentioned in Annex A.6.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest (**Encoding = "G711", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.

7. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
8. ONVIF Client invokes GetStreamUriRequest message (**Profile Token, RTP-Unicast, UDP transport**) to retrieve media stream URI for the selected media profile.
9. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP request with transport parameter as **RTP/UDP** for both audio and video streams separately.
14. DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. DUT sends 200 OK message and starts media streaming.
17. DUT sends Audio/Video RTP media stream to ONVIF Client over UDP.
18. DUT sends Audio/Video RTCP sender report to ONVIF Client.
19. DUT validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
21. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.2 MEDIA STREAMING – JPEG/G.711 (RTP-Unicast/RTSP/HTTP/TCP)

Test Label: Real Time Viewing DUT JPEG/G.711 Audio and Video streaming using HTTP transport.

Test Case ID: RTSS-3-1-11

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP.

Command Under Test: None

WSDL Reference: None

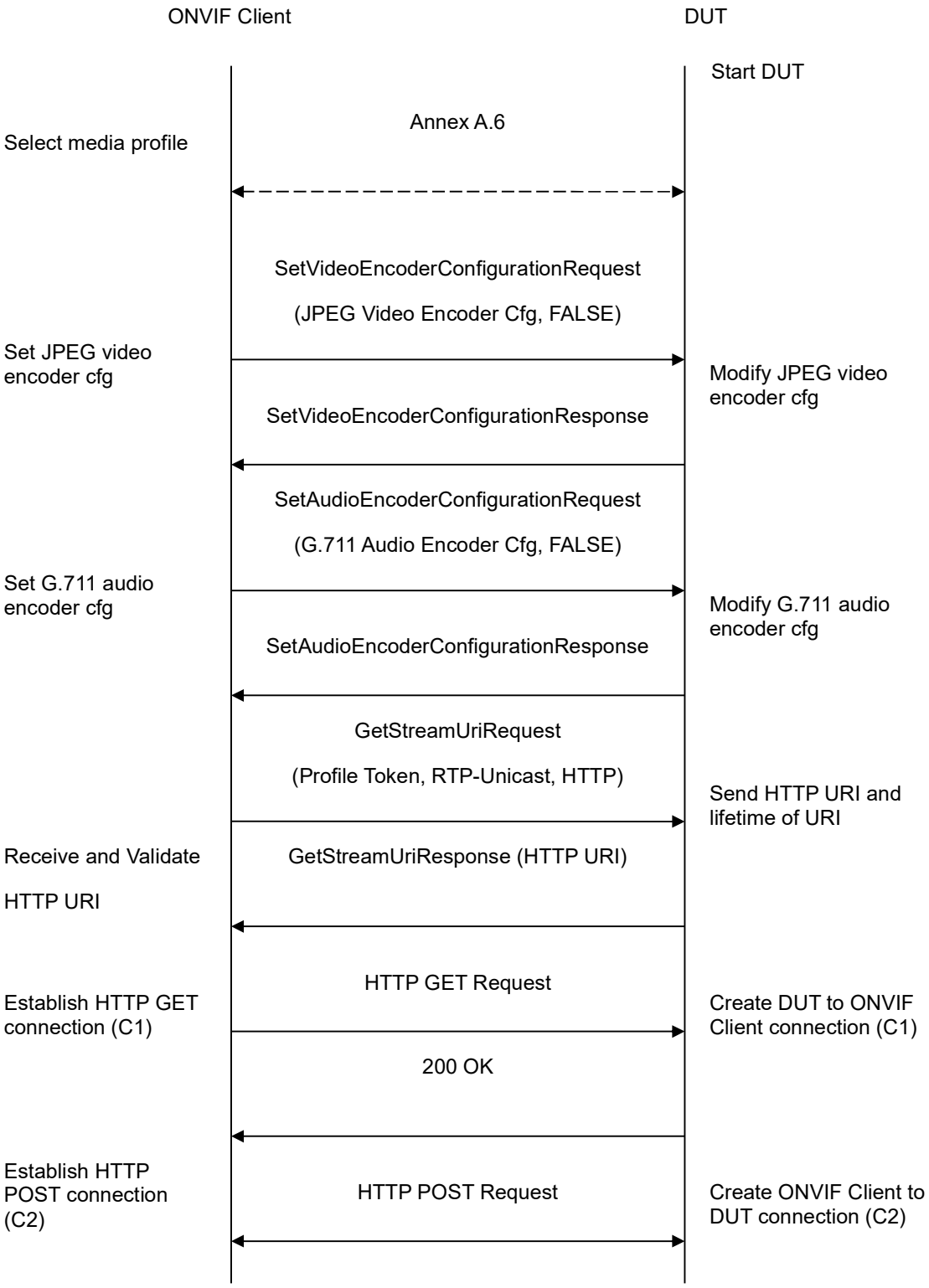
Test Purpose: To verify JPEG/G.711 Audio and Video streaming based on HTTP Transport.

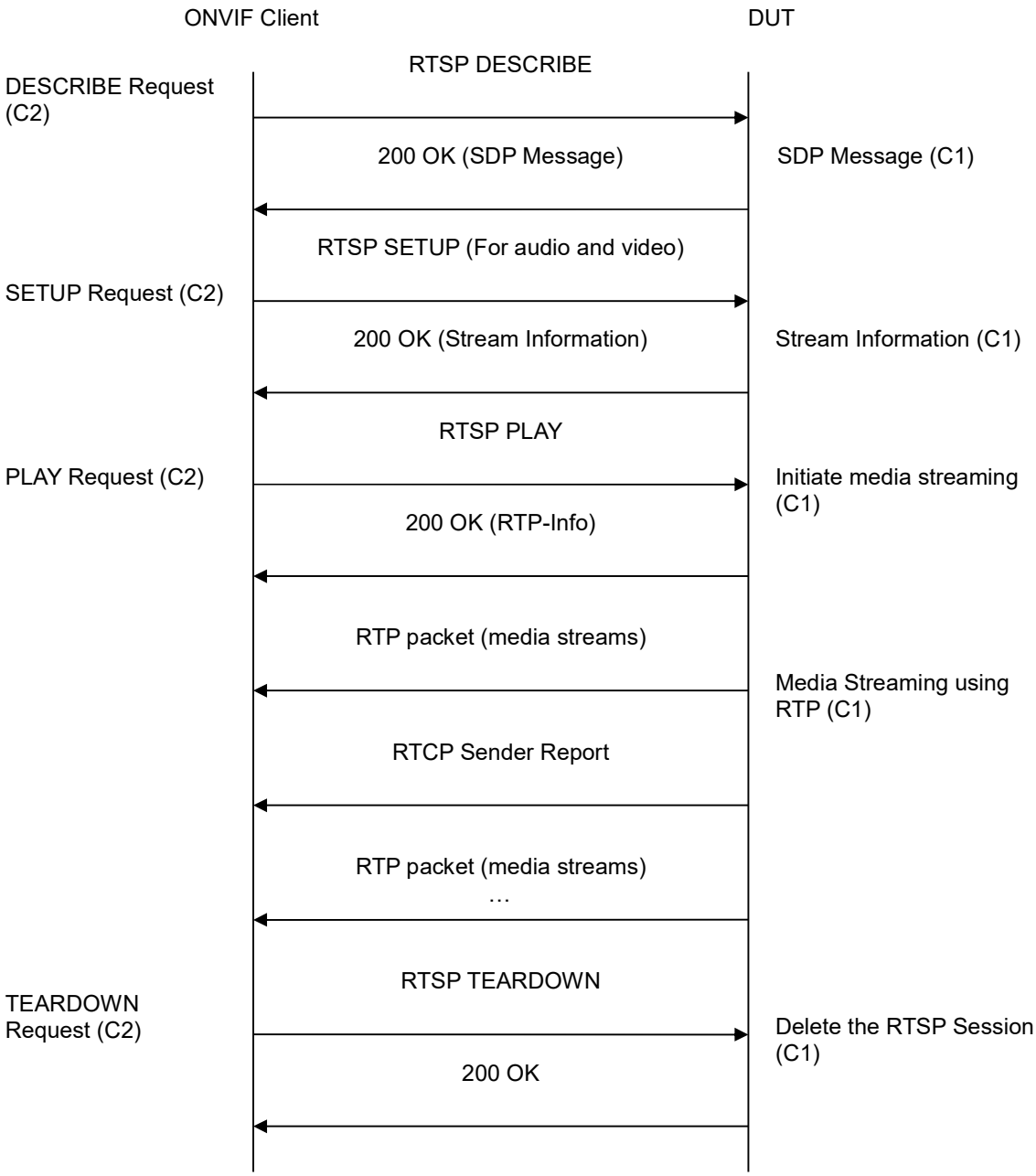
Pre-Requisite: Audio is supported by DUT. Real-time streaming supported by DUT.

A media profile with JPEG video encoder configuration and G.711 audio encoder configuration

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
Modify JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
SetAudioEncoderConfigurationRequest
(G.711 Audio Encoder Cfg, FALSE)
Set G.711 audio encoder cfg
Modify G.711 audio encoder cfg
SetAudioEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, HTTP)
Send HTTP URI and lifetime of URI
Receive and Validate HTTP URI
GetStreamUriResponse (HTTP URI)
HTTP GET Request
Establish HTTP GET connection (C1)
Create DUT to ONVIF Client connection (C1)
200 OK
Establish HTTP POST connection (C2)
HTTP POST Request
Create ONVIF Client to DUT connection (C2)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with both JPEG video encoding support and G.711 audio encoding support by following the procedure mentioned in Annex A.6.

4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest (Encoding = “G711”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.
7. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
8. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, HTTP transport) to retrieve media stream URI for the selected media profile.
9. DUT sends HTTP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
10. ONVIF Client verifies the HTTP media stream URI provided by the DUT.
11. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
12. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
13. ONVIF Client invokes RTSP DESCRIBE request on HTTP POST connection.
14. DUT sends 200 OK message and SDP information on HTTP GET connection.
15. ONVIF Client invokes RTSP SETUP requests on HTTP POST connection with transport parameter as ‘RTP/TCP’ along with ‘interleaved’ parameter for both audio and video streams separately.
16. DUT sends 200 OK message and the media stream information on HTTP GET connection.
17. ONVIF Client invokes RTSP PLAY request on HTTP POST connection.
18. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
19. DUT transfers Audio/Video RTP media stream to ONVIF Client on HTTP GET connection.
20. DUT sends Audio/Video RTCP sender report to ONVIF Client on HTTP GET connection.
21. DUT validates the received RTP and RTCP packets, decodes and renders them.
22. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection and closes the HTTP POST connection.
23. DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.3 MEDIA STREAMING – JPEG/G.711 (RTP/RTSP/TCP)

Test Label: Real Time Viewing DUT JPEG/G.711 Audio and Video streaming using RTP/RTSP/TCP transport.

Test Case ID: RTSS-3-1-12

ONVIF Core Specification Coverage: RTP/RTSP/TCP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

WSDL Reference: None

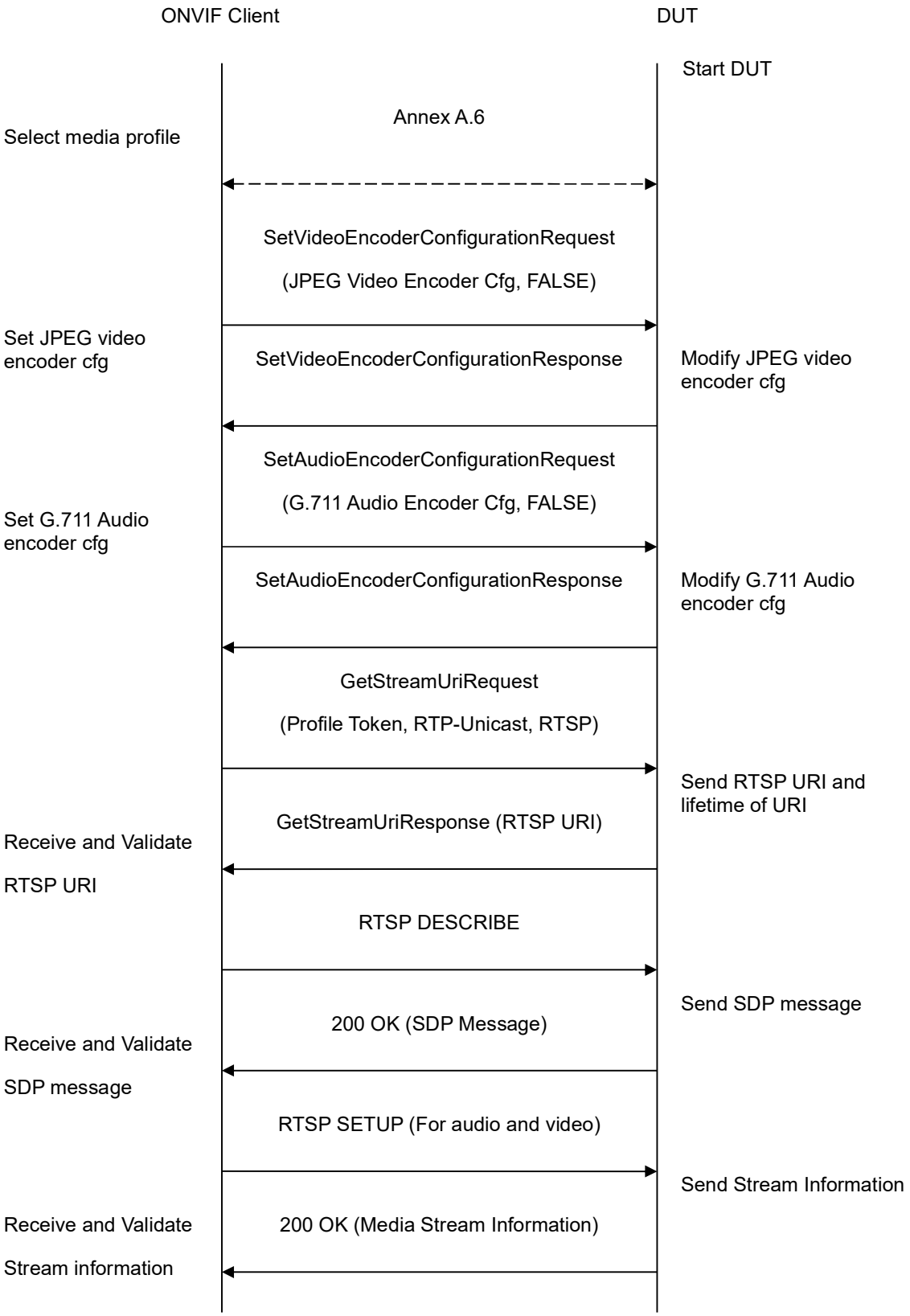
Test Purpose: To verify JPEG/G.711 Audio and Video streaming based on RTP/RTSP/TCP using RTSP tunnel.

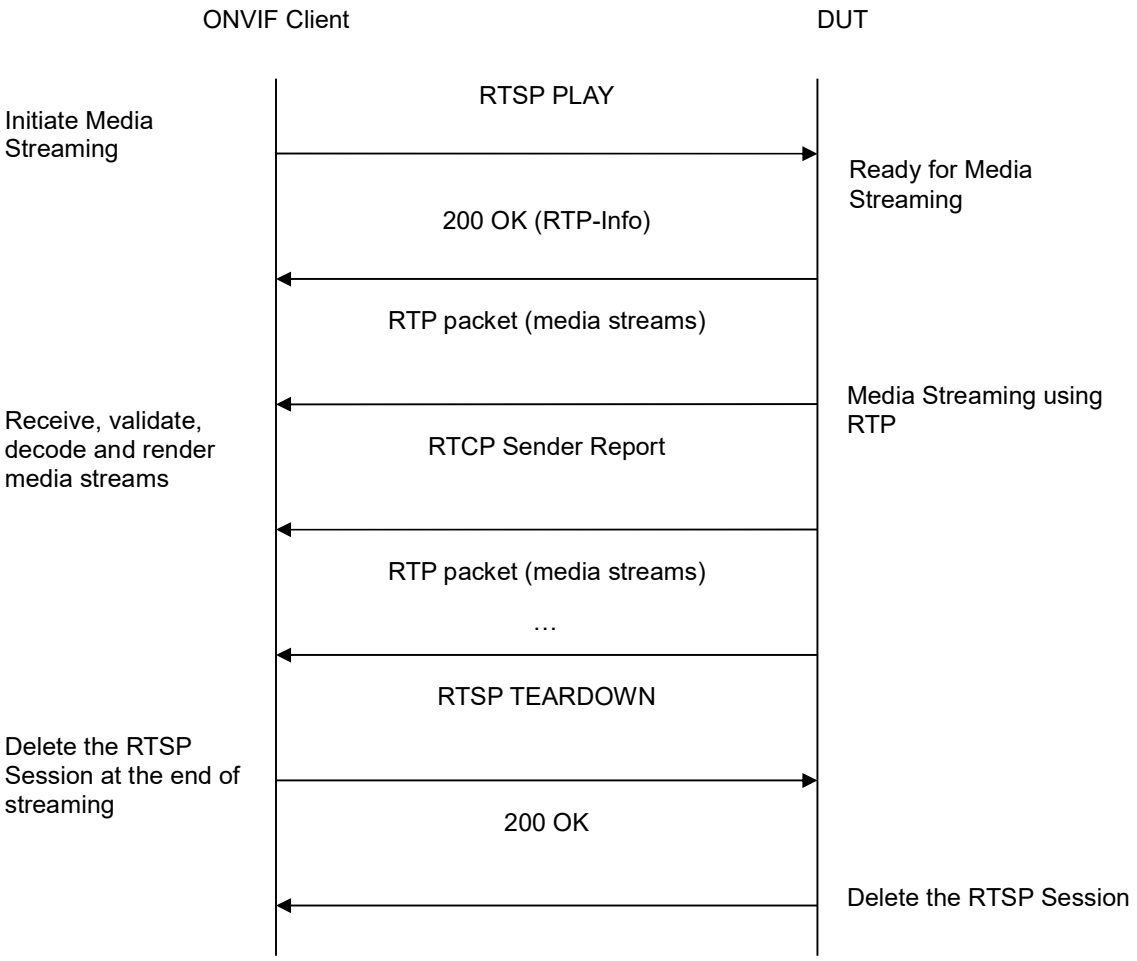
Pre-Requisite: Audio is supported by DUT and RTP/RTSP/TCP media streaming is implemented by DUT. Real-time streaming supported by DUT.

A media profile with JPEG video encoder configuration and G.711 audio encoder configuration

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
Modify JPEG video encoder cfg
SetAudioEncoderConfigurationRequest
(G.711 Audio Encoder Cfg, FALSE)
Set G.711 Audio encoder cfg
SetAudioEncoderConfigurationResponse
Modify G.711 Audio encoder cfg
GetStreamUriRequest
(Profile Token, RTP-Unicast, RTSP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Send SDP message
200 OK (SDP Message)
Receive and Validate SDP message
RTSP SETUP (For audio and video)
Send Stream Information
200 OK (Media Stream Information)
Receive and Validate Stream information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with both JPEG video encoding support and G.711 audio encoding support by following the procedure mentioned in Annex A.6.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest (Encoding = “G711”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.

7. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
8. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, RTSP transport) to retrieve media stream URI for the selected media profile.
9. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP request with transport parameter as 'RTP/TCP' along with 'interleaved' parameter for both audio and video streams separately.
14. DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. DUT sends 200 OK message and starts media streaming.
17. DUT interleaves RTP and RTCP packets, send them over RTSP control connection.
18. DUT validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.4 MEDIA STREAMING – JPEG/G.726 (RTP-Unicast/UDP)

Test Label: Real Time Viewing DUT JPEG/G.726 Audio and Video streaming using RTP-Unicast/UDP transport.

Test Case ID: RTSS-3-1-13

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

WSDL Reference: None

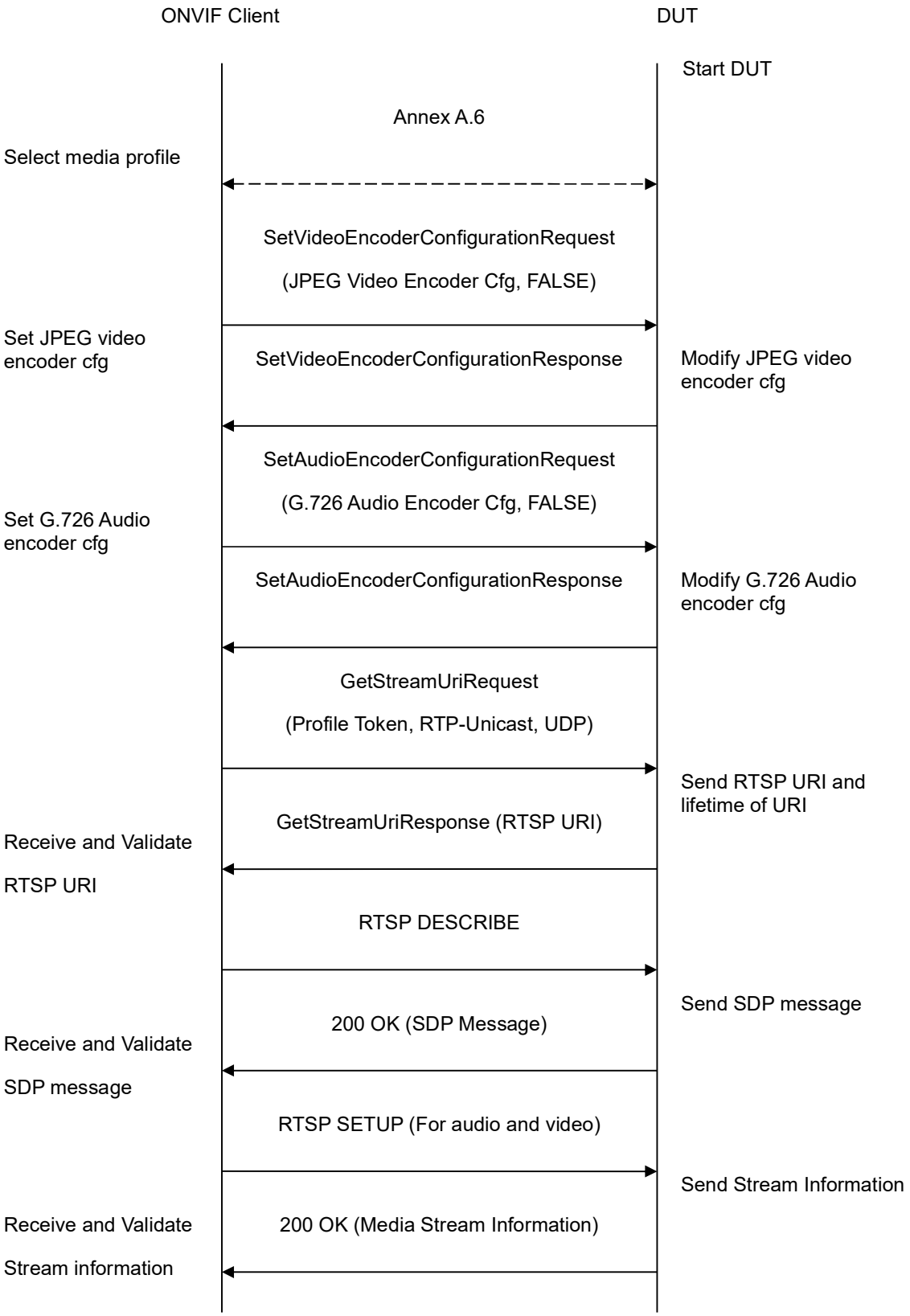
Test Purpose: To verify JPEG/G.726 Audio and Video streaming based on RTP/UDP Unicast Transport.

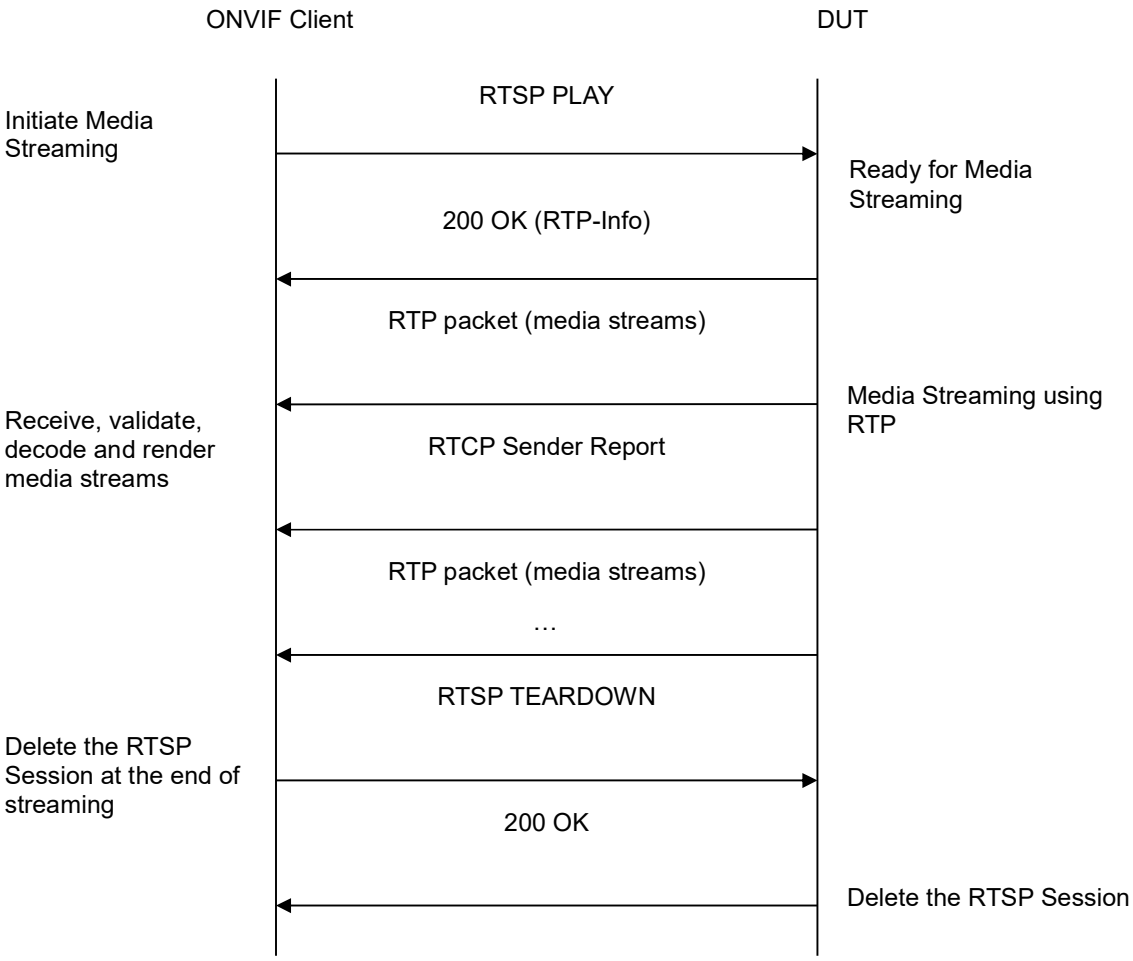
Pre-Requisite: Audio is supported by DUT and G.726 is implemented by DUT. Real-time streaming supported by DUT.

A media profile with JPEG video encoder configuration and G.726 audio encoder configuration.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
Modify JPEG video encoder cfg
SetAudioEncoderConfigurationRequest
(G.726 Audio Encoder Cfg, FALSE)
Set G.726 Audio encoder cfg
SetAudioEncoderConfigurationResponse
Modify G.726 Audio encoder cfg
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Send SDP message
200 OK (SDP Message)
Receive and Validate SDP message
RTSP SETUP (For audio and video)
Send Stream Information
200 OK (Media Stream Information)
Receive and Validate Stream information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with both JPEG video encoding support and G.726 audio encoding support by following the procedure mentioned in Annex A.6.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest (Encoding = “G726”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.

7. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
8. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
9. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP for both audio and video streams separately.
14. DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. DUT sends 200 OK message and starts media streaming.
17. DUT sends Audio/Video RTP media stream to ONVIF Client over UDP.
18. DUT sends Audio/Video RTCP sender report to ONVIF Client.
19. DUT validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
21. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.5 MEDIA STREAMING – JPEG/G.726 (RTP-Unicast/RTSP/HTTP/TCP)

Test Label: Real Time Viewing DUT JPEG/G.726 Audio and Video streaming using HTTP transport.

Test Case ID: RTSS-3-1-14

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP.

Command Under Test: None

WSDL Reference: None

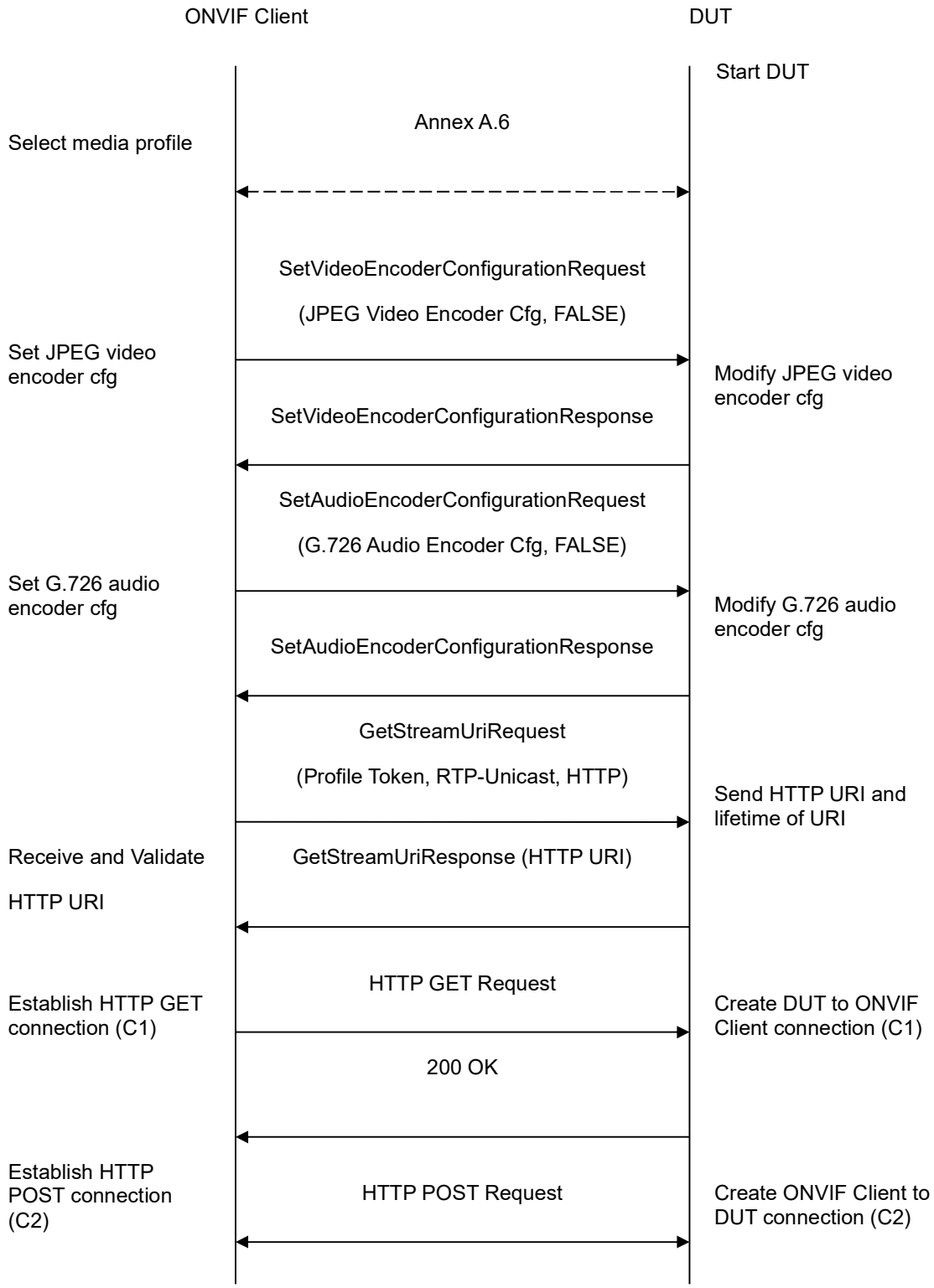
Test Purpose: To verify JPEG/G.726 Audio and Video streaming based on HTTP Transport.

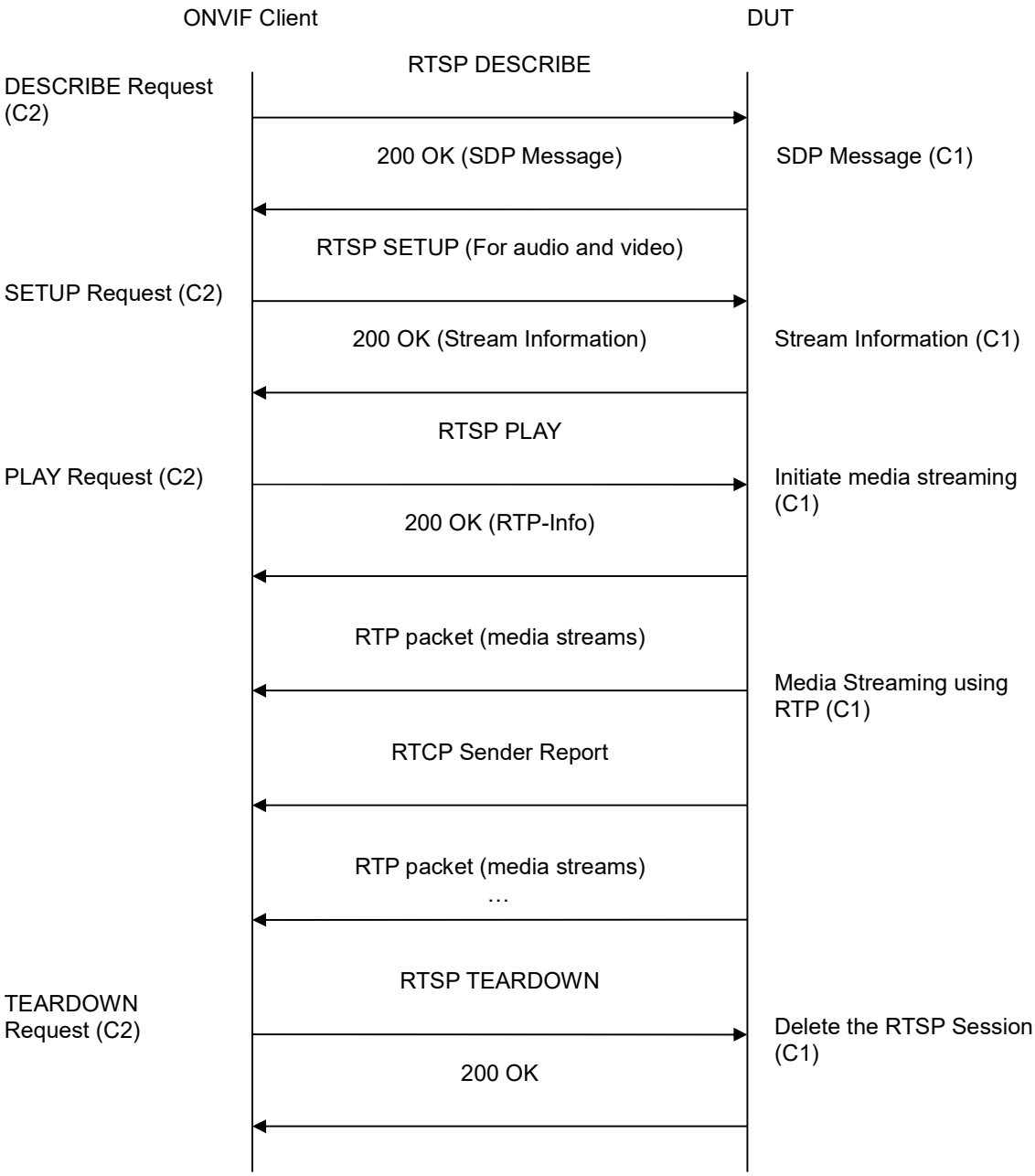
Pre-Requisite: Audio is supported by DUT and G.726 is implemented by DUT. Real-time streaming supported by DUT.

A media profile with JPEG video encoder configuration and G.726 audio encoder configuration.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
Modify JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
SetAudioEncoderConfigurationRequest
(G.726 Audio Encoder Cfg, FALSE)
Set G.726 audio encoder cfg
Modify G.726 audio encoder cfg
SetAudioEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, HTTP)
Send HTTP URI and lifetime of URI
Receive and Validate HTTP URI
GetStreamUriResponse (HTTP URI)
HTTP GET Request
Establish HTTP GET connection (C1)
Create DUT to ONVIF Client connection (C1)
200 OK
Establish HTTP POST connection (C2)
HTTP POST Request
Create ONVIF Client to DUT connection (C2)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with both JPEG video encoding support and G.726 audio encoding support by following the procedure mentioned in Annex A.6.

4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest (**Encoding = "G726", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.
7. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
8. ONVIF Client invokes GetStreamUriRequest message (**Profile Token, RTP-Unicast, HTTP transport**) to retrieve media stream URI for the selected media profile.
9. DUT sends HTTP URI and parameters defining the lifetime of the URI like **ValidUntilConnect**, **ValidUntilReboot** and Timeout in the **GetStreamUriResponse** message.
10. ONVIF Client verifies the HTTP media stream URI provided by the DUT.
11. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
12. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
13. ONVIF Client invokes RTSP DESCRIBE request on HTTP POST connection.
14. DUT sends 200 OK message and SDP information on HTTP GET connection.
15. ONVIF Client invokes RTSP SETUP requests on HTTP POST connection with transport parameter as '**RTP/TCP**' along with '**interleaved'** parameter for both audio and video streams separately.
16. DUT sends 200 OK message and the media stream information on HTTP GET connection.
17. ONVIF Client invokes RTSP PLAY request on HTTP POST connection.
18. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
19. DUT transfers Audio/Video RTP media stream to ONVIF Client on HTTP GET connection.
20. DUT sends Audio/Video RTCP sender report to ONVIF Client on HTTP GET connection.
21. DUT validates the received RTP and RTCP packets, decodes and renders them.
22. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection and closes the HTTP POST connection.
23. DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.6 MEDIA STREAMING – JPEG/G.726 (RTP/RTSP/TCP)

Test Label: Real Time Viewing DUT JPEG/G.726 Audio and Video streaming using RTP/RTSP/TCP transport.

Test Case ID: RTSS-3-1-15

ONVIF Core Specification Coverage: RTP/RTSP/TCP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

WSDL Reference: None

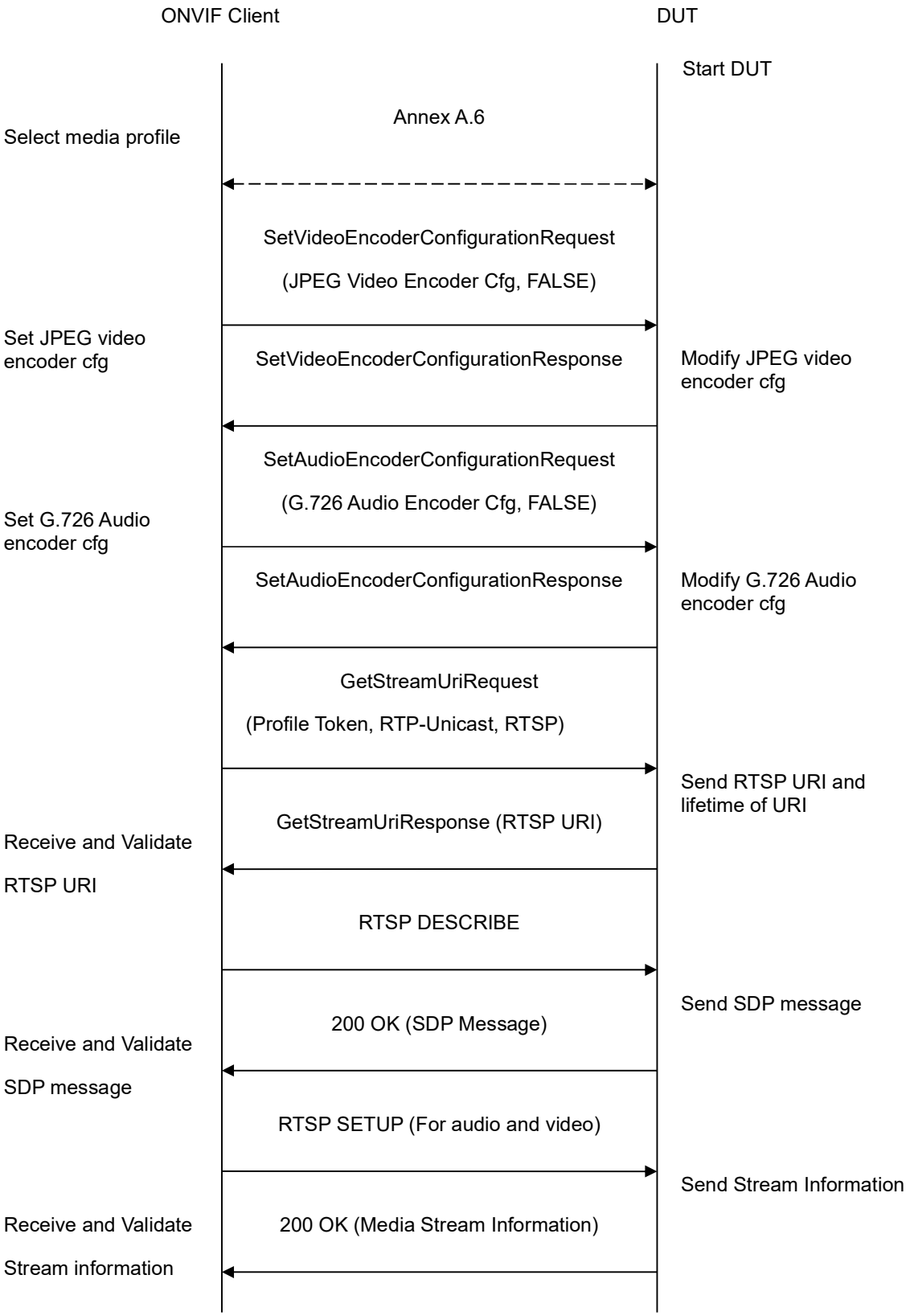
Test Purpose: To verify JPEG/G.726 Audio and Video streaming based on RTP/RTSP/TCP using RTSP tunnel.

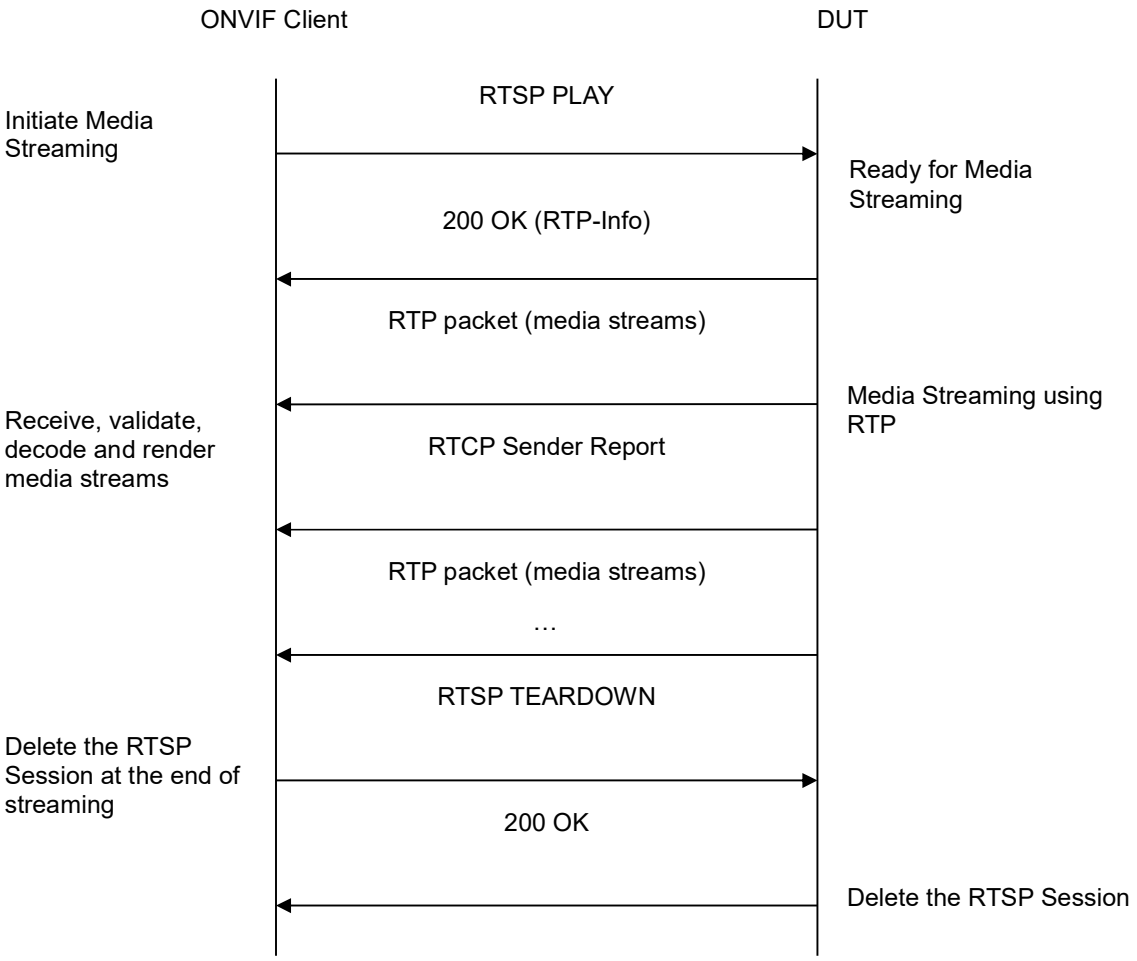
Pre-Requisite: Audio is supported by DUT, G.726 and RTP/RTSP/TCP media streaming is implemented by DUT. Real-time streaming supported by DUT.

A media profile with JPEG video encoder configuration and G.726 audio encoder configuration.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
Modify JPEG video encoder cfg
SetAudioEncoderConfigurationRequest
(G.726 Audio Encoder Cfg, FALSE)
Set G.726 Audio encoder cfg
SetAudioEncoderConfigurationResponse
Modify G.726 Audio encoder cfg
GetStreamUriRequest
(Profile Token, RTP-Unicast, RTSP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Send SDP message
200 OK (SDP Message)
Receive and Validate SDP message
RTSP SETUP (For audio and video)
Send Stream Information
200 OK (Media Stream Information)
Receive and Validate Stream information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with both JPEG video encoding support and G.726 audio encoding support by following the procedure mentioned in Annex A.6.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest (**Encoding = "G726", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.

7. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
8. ONVIF Client invokes GetStreamUri request (**Profile Token, RTP-Unicast, RTSP transport**) to retrieve media stream URI for the selected media profile.
9. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP request with transport parameter as '**RTP/TCP**' along with '**interleaved'** parameter for both audio and video streams separately.
14. DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. DUT sends 200 OK message and starts media streaming.
17. DUT interleaves RTP and RTCP packets, send them over RTSP control connection.
18. DUT validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.7 MEDIA STREAMING – JPEG/AAC (RTP-Unicast/UDP)

Test Label: Real Time Viewing DUT JPEG/AAC Audio and Video streaming using RTP-Unicast/UDP transport.

Test Case ID: RTSS-3-1-16

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

WSDL Reference: None

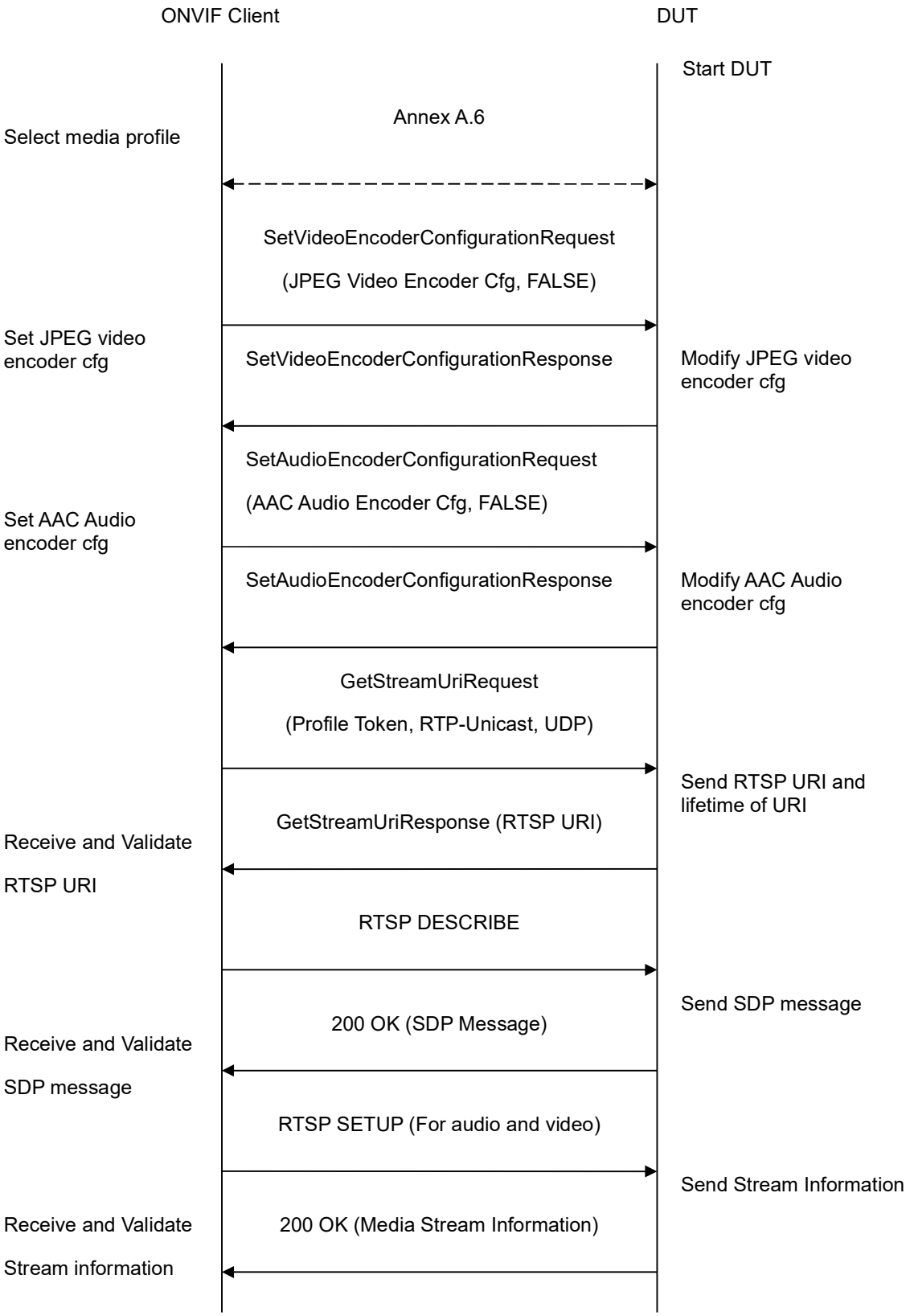
Test Purpose: To verify JPEG/AAC Audio and Video streaming based on RTP/UDP Unicast Transport.

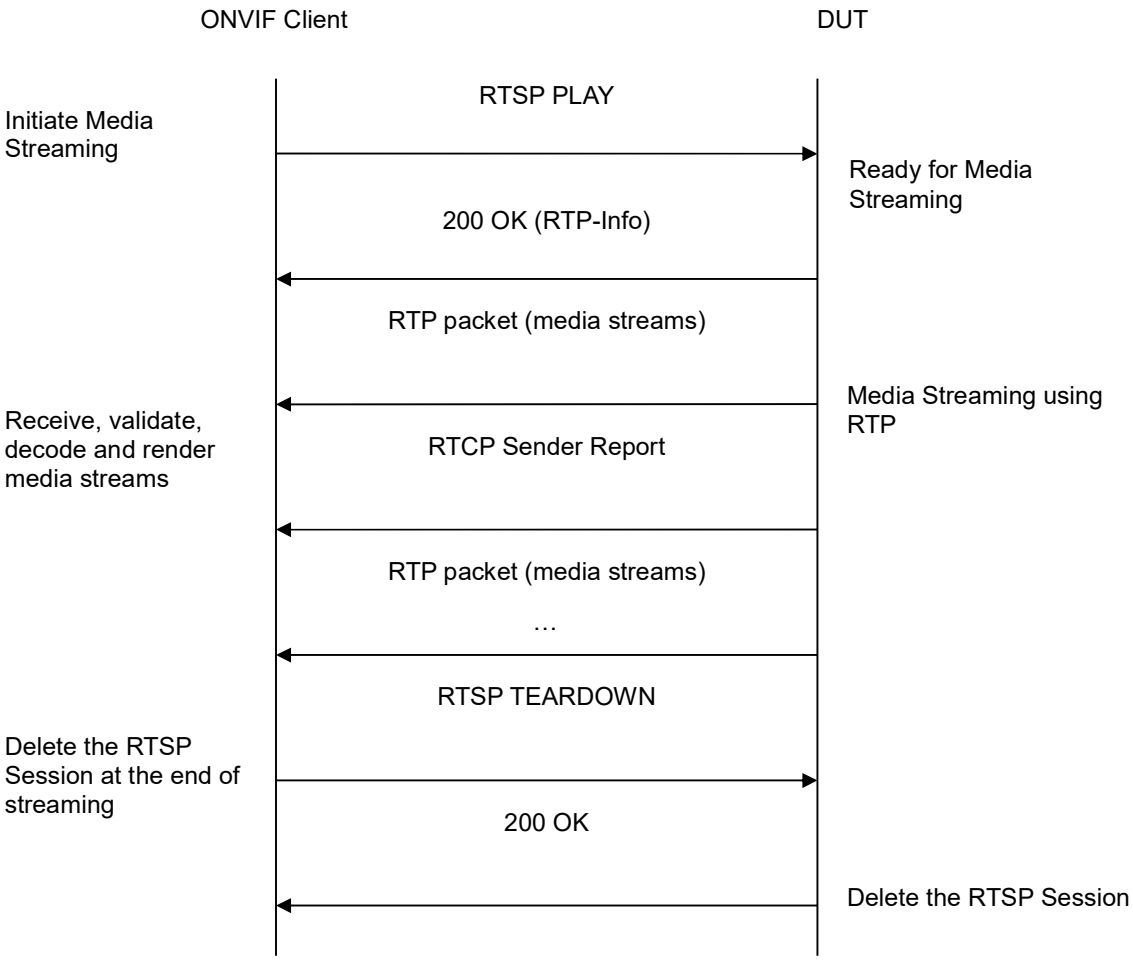
Pre-Requisite: Audio is supported by DUT and AAC is implemented by DUT. Real-time streaming supported by DUT.

A media profile with JPEG video encoder configuration and AAC audio encoder configuration.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
Modify JPEG video encoder cfg
SetAudioEncoderConfigurationRequest
(AAC Audio Encoder Cfg, FALSE)
Set AAC Audio encoder cfg
SetAudioEncoderConfigurationResponse
Modify AAC Audio encoder cfg
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Send SDP message
200 OK (SDP Message)
Receive and Validate SDP message
RTSP SETUP (For audio and video)
Send Stream Information
200 OK (Media Stream Information)
Receive and Validate Stream information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with both JPEG video encoding support and AAC audio encoding support by following the procedure mentioned in Annex A.6.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest (**Encoding = "AAC", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.

7. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
8. ONVIF Client invokes GetStreamUriRequest message (**Profile Token, RTP-Unicast, UDP transport**) to retrieve media stream URI for the selected media profile.
9. DUT sends RTSP URI and parameters defining the lifetime of the URI like **ValidUntilConnect**, **ValidUntilReboot** and Timeout in the **GetStreamUriResponse** message.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP requests for audio and video streams separately with transport parameter as **RTP/UDP** for both audio and video streams separately.
14. DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. DUT sends 200 OK message and starts media streaming.
17. DUT sends Audio/Video RTP media stream to ONVIF Client over UDP.
18. DUT sends Audio/Video RTCP sender report to ONVIF Client.
19. DUT validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
21. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.8 MEDIA STREAMING – JPEG/AAC (RTP-Unicast/RTSP/HTTP/TCP)

Test Label: Real Time Viewing DUT JPEG/AAC Audio and Video streaming using HTTP transport.

Test Case ID: RTSS-3-1-17

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP.

Command Under Test: None

WSDL Reference: None

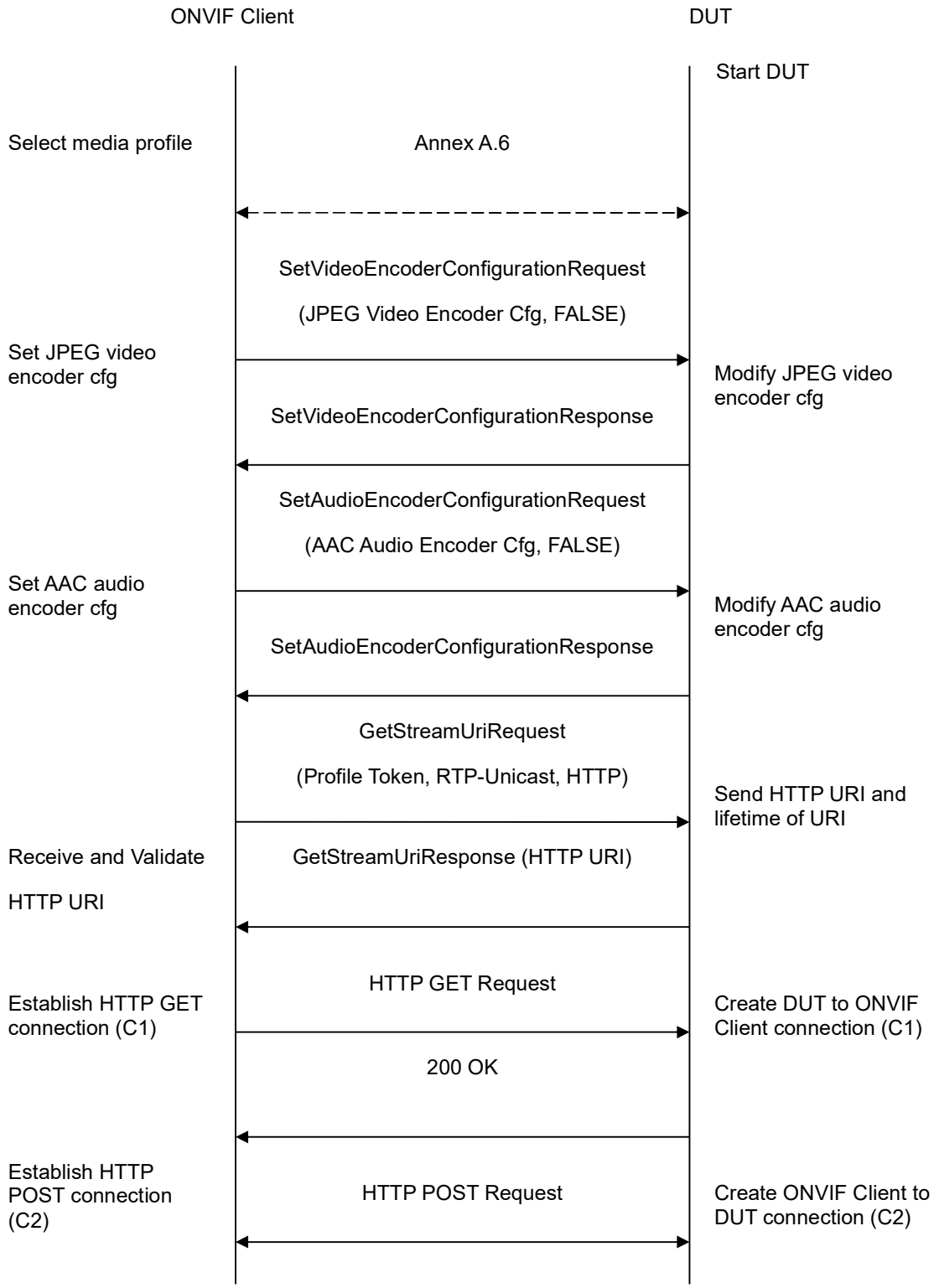
Test Purpose: To verify JPEG/AAC Audio and Video streaming based on HTTP Transport.

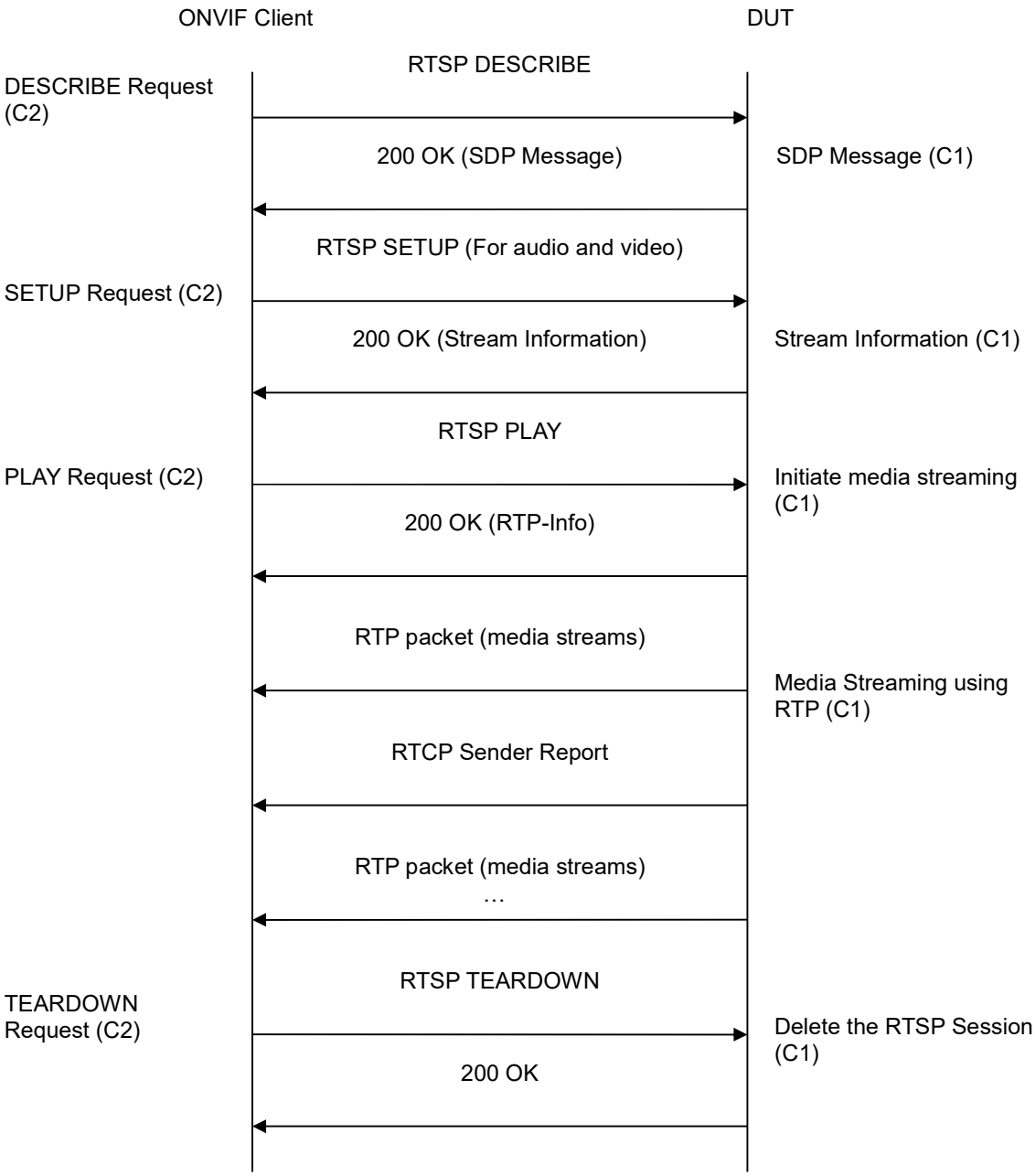
Pre-Requisite: Audio is supported by DUT and AAC is implemented by DUT. Real-time streaming supported by DUT.

A media profile with JPEG video encoder configuration and AAC audio encoder configuration.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Select media profile
Annex A.6
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
Modify JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
SetAudioEncoderConfigurationRequest
(AAC Audio Encoder Cfg, FALSE)
Set AAC audio encoder cfg
Modify AAC audio encoder cfg
SetAudioEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, HTTP)
Send HTTP URI and lifetime of URI
Receive and Validate HTTP URI
GetStreamUriResponse (HTTP URI)
HTTP GET Request
Establish HTTP GET connection (C1)
Create DUT to ONVIF Client connection (C1)
200 OK
Establish HTTP POST connection (C2)
HTTP POST Request
Create ONVIF Client to DUT connection (C2)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with both JPEG video encoding support and AAC audio encoding support by following the procedure mentioned in Annex A.6.

4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest (**Encoding = "AAC", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.
7. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
8. ONVIF Client invokes GetStreamUriRequest message (**Profile Token, RTP-Unicast, HTTP transport**) to retrieve media stream URI for the selected media profile.
9. DUT sends HTTP URI and parameters defining the lifetime of the URI like **ValidUntilConnect**, **ValidUntilReboot** and Timeout in the **GetStreamUriResponse** message.
10. ONVIF Client verifies the HTTP media stream URI provided by the DUT.
11. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
12. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
13. ONVIF Client invokes RTSP DESCRIBE request on HTTP POST connection.
14. DUT sends 200 OK message and SDP information on HTTP GET connection.
15. ONVIF Client invokes RTSP SETUP request on HTTP POST connection with transport parameter as '**RTP/TCP**' along with '**interleaved'** parameter for both audio and video streams separately.
16. DUT sends 200 OK message and the media stream information on HTTP GET connection.
17. ONVIF Client invokes RTSP PLAY request on HTTP POST connection.
18. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
19. DUT transfers Audio/Video RTP media stream to ONVIF Client on HTTP GET connection.
20. DUT sends Audio/Video RTCP sender report to ONVIF Client on HTTP GET connection.
21. DUT validates the received RTP and RTCP packets, decodes and renders them.
22. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection and closes the HTTP POST connection.
23. DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.9 MEDIA STREAMING – JPEG/AAC (RTP/RTSP/TCP)

Test Label: Real Time Viewing DUT JPEG/AAC Audio and Video streaming using RTP/RTSP/TCP transport.

Test Case ID: RTSS-3-1-18

ONVIF Core Specification Coverage: RTP/RTSP/TCP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

WSDL Reference: None

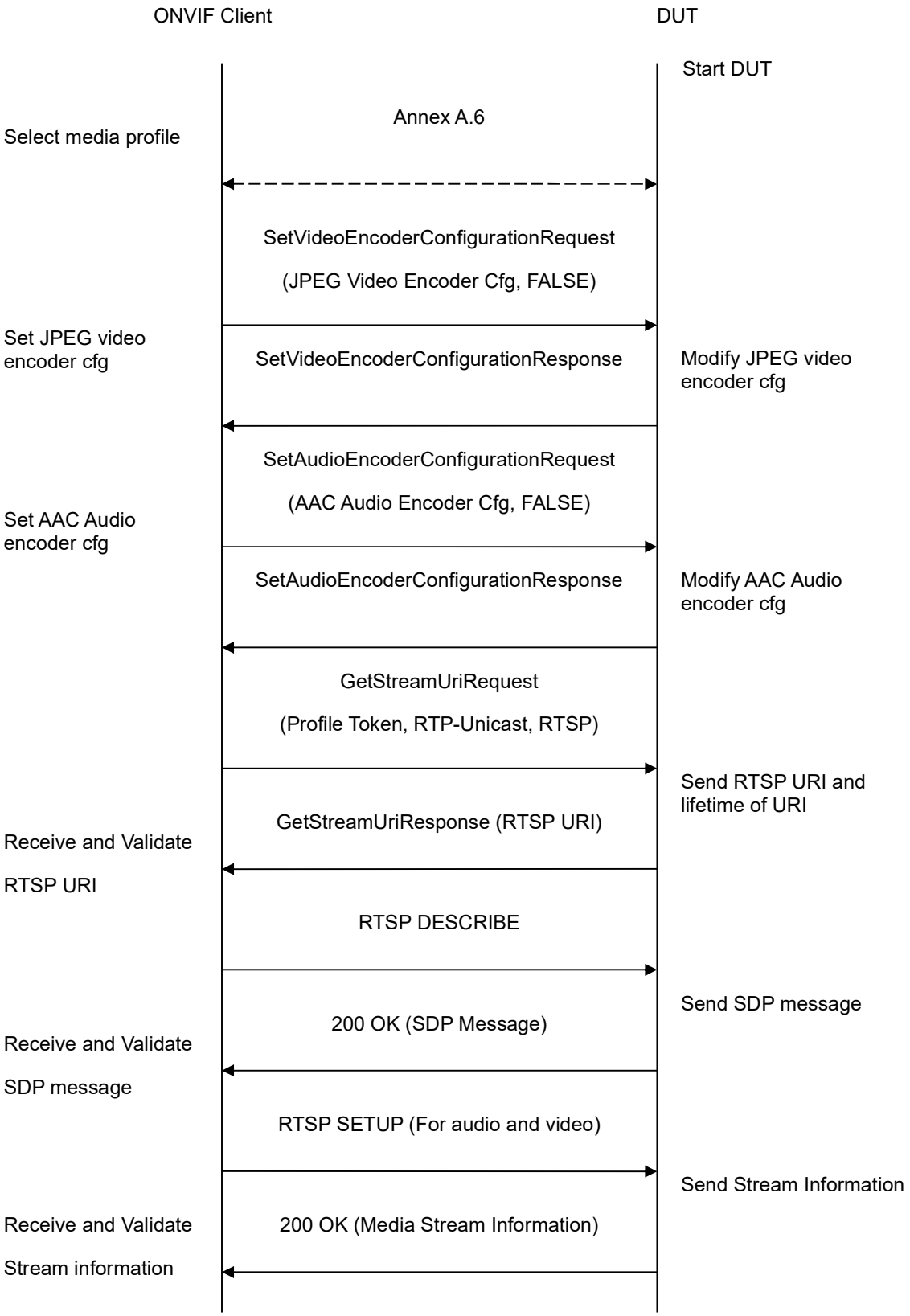
Test Purpose: To verify JPEG/AAC Audio and Video streaming based on RTP/RTSP/TCP using RTSP tunnel.

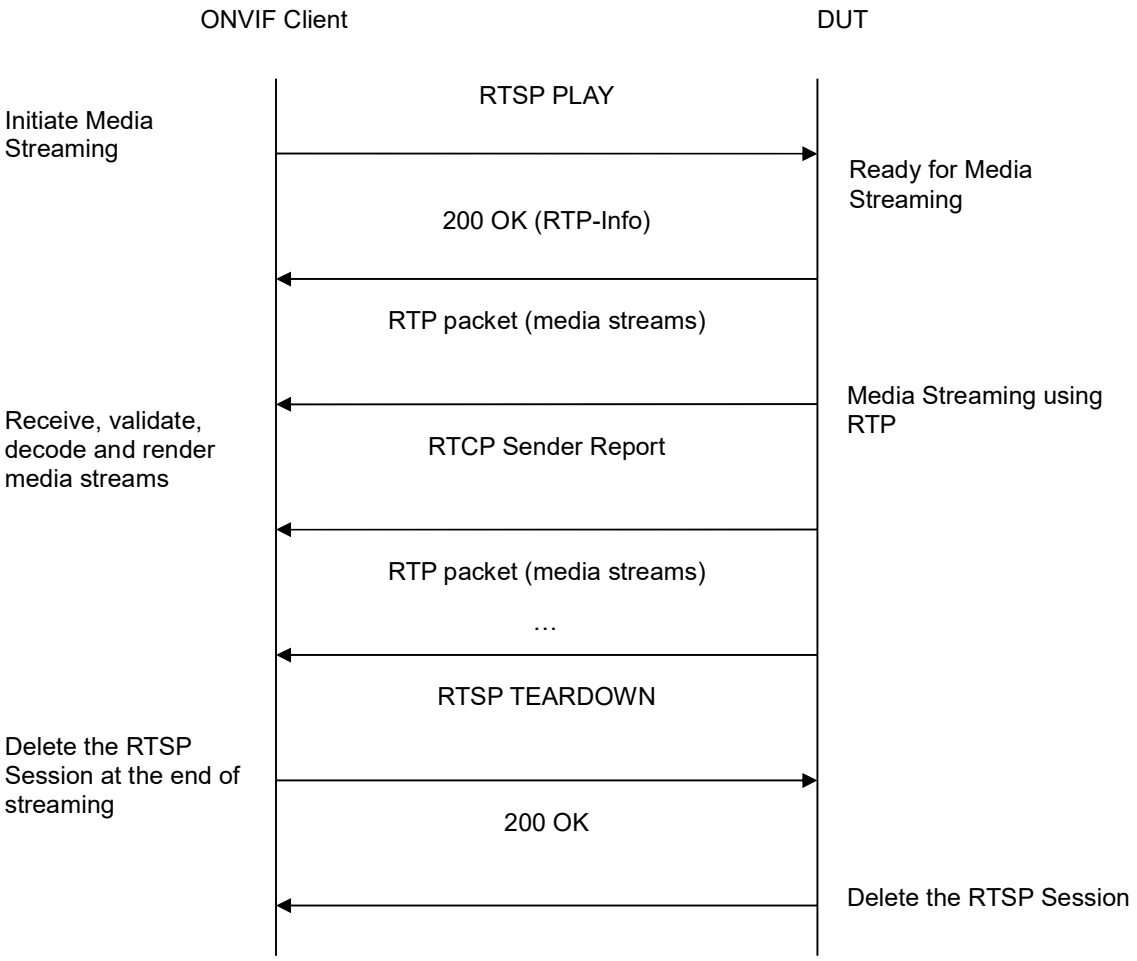
Pre-Requisite: Audio is supported by DUT, AAC and RTP/RTSP/TCP media streaming is implemented by DUT. Real-time streaming supported by DUT.

A media profile with JPEG video encoder configuration and AAC audio encoder configuration.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
Modify JPEG video encoder cfg
SetAudioEncoderConfigurationRequest
(AAC Audio Encoder Cfg, FALSE)
Set AAC Audio encoder cfg
SetAudioEncoderConfigurationResponse
Modify AAC Audio encoder cfg
GetStreamUriRequest
(Profile Token, RTP-Unicast, RTSP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Send SDP message
200 OK (SDP Message)
Receive and Validate SDP message
RTSP SETUP (For audio and video)
Send Stream Information
200 OK (Media Stream Information)
Receive and Validate Stream information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with both JPEG video encoding support and AAC audio encoding support by following the procedure mentioned in Annex A.6.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
5. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest (**Encoding = "AAC", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.

7. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
8. ONVIF Client invokes GetStreamUriRequest message (**Profile Token, RTP-Unicast, RTSP transport**) to retrieve media stream URI for the selected media profile.
9. DUT sends RTSP URI and parameters defining the lifetime of the URI like **ValidUntilConnect**, **ValidUntilReboot** and Timeout in the **GetStreamUriResponse** message.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP request with transport parameter as '**RTP/TCP**' along with '**interleaved'** parameter for both audio and video streams separately.
14. DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. DUT sends 200 OK message and starts media streaming.
17. DUT interleaves RTP and RTCP packets, send them over RTSP control connection.
18. DUT validates the received RTP and RTCP packets, decodes and renders them.
19. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
20. DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send RTP and RTCP packets as per [RFC 2326] section 10.12.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.10 MEDIA STREAMING – JPEG/G.711 (RTP-Unicast/UDP, IPv6)

Test Label: Real Time Viewing DUT JPEG/G.711 Audio and Video streaming using RTP-Unicast/UDP transport for IPv6.

Test Case ID: DRAFT-RTSS-3-1-19

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

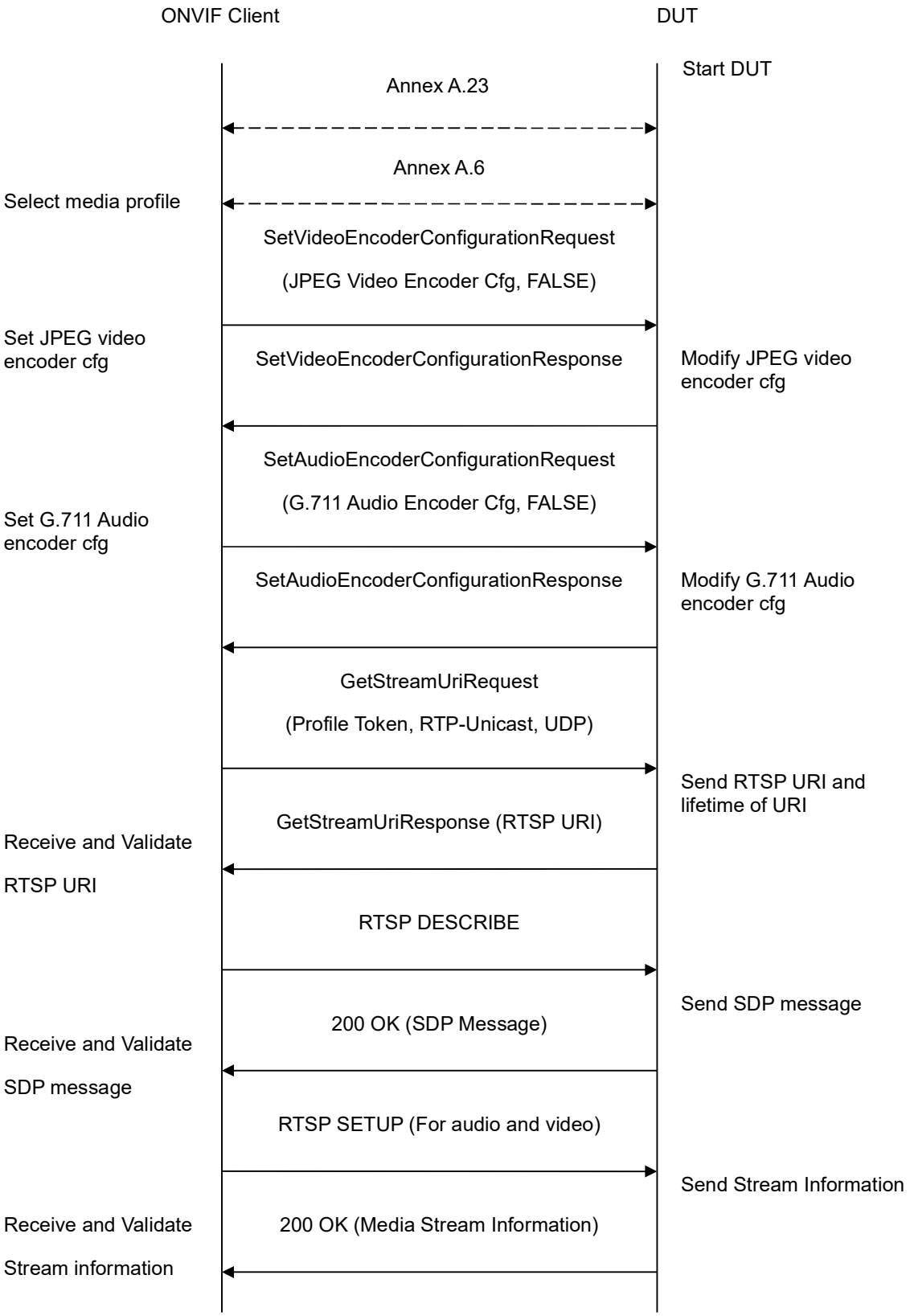
WSDL Reference: None

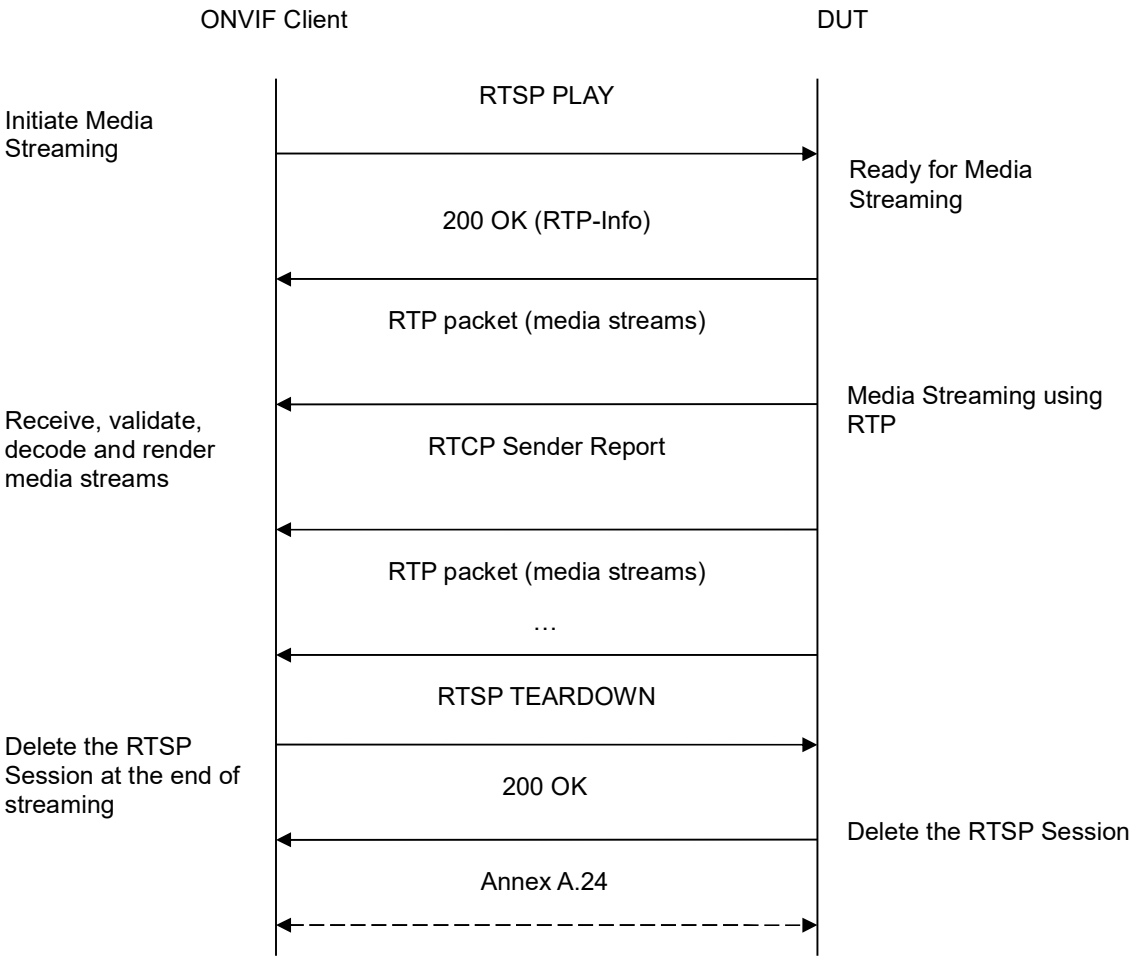
Test Purpose: To verify JPEG/G.711 Audio and Video streaming based on RTP/UDP Unicast Transport for IPv6.

Pre-Requisite: Audio is supported by DUT. A media profile with JPEG video encoder configuration and G.711 audio encoder configuration. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
Modify JPEG video encoder cfg
SetAudioEncoderConfigurationRequest
(G.711 Audio Encoder Cfg, FALSE)
Set G.711 Audio encoder cfg
SetAudioEncoderConfigurationResponse
Modify G.711 Audio encoder cfg
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Send SDP message
200 OK (SDP Message)
Receive and Validate SDP message
RTSP SETUP (For audio and video)
Send Stream Information
200 OK (Media Stream Information)
Receive and Validate Stream information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with both JPEG video encoding support and G.711 audio encoding support by following the procedure mentioned in Annex A.6.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.

7. ONVIF Client invokes SetAudioEncoderConfigurationRequest (**Encoding = "G711", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.
8. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
9. ONVIF Client invokes GetStreamUriRequest message (**Profile Token, RTP-Unicast, UDP transport**) to retrieve media stream URI for the selected media profile.
10. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
11. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
12. ONVIF Client invokes RTSP DESCRIBE request.
13. DUT sends 200 OK message and SDP information.
14. ONVIF Client invokes RTSP SETUP request with transport parameter as **RTP/UDP** for both audio and video streams separately.
15. DUT sends 200 OK message and the media stream information.
16. ONVIF Client invokes RTSP PLAY request.
17. DUT sends 200 OK message and starts media streaming.
18. DUT sends Audio/Video RTP media stream to ONVIF Client over UDP.
19. DUT sends Audio/Video RTCP sender report to ONVIF Client.
20. DUT validates the received RTP and RTCP packets, decodes and renders them.
21. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
22. DUT sends 200 OK Response and terminates the RTSP Session.
23. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.11 MEDIA STREAMING – JPEG/G.711 (RTP-Unicast/RTSP/HTTP/TCP, IPv6)

Test Label: Real Time Viewing DUT JPEG/G.711 Audio and Video streaming using HTTP transport for IPv6.

Test Case ID: DRAFT-RTSS-3-1-20

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP.

Command Under Test: None

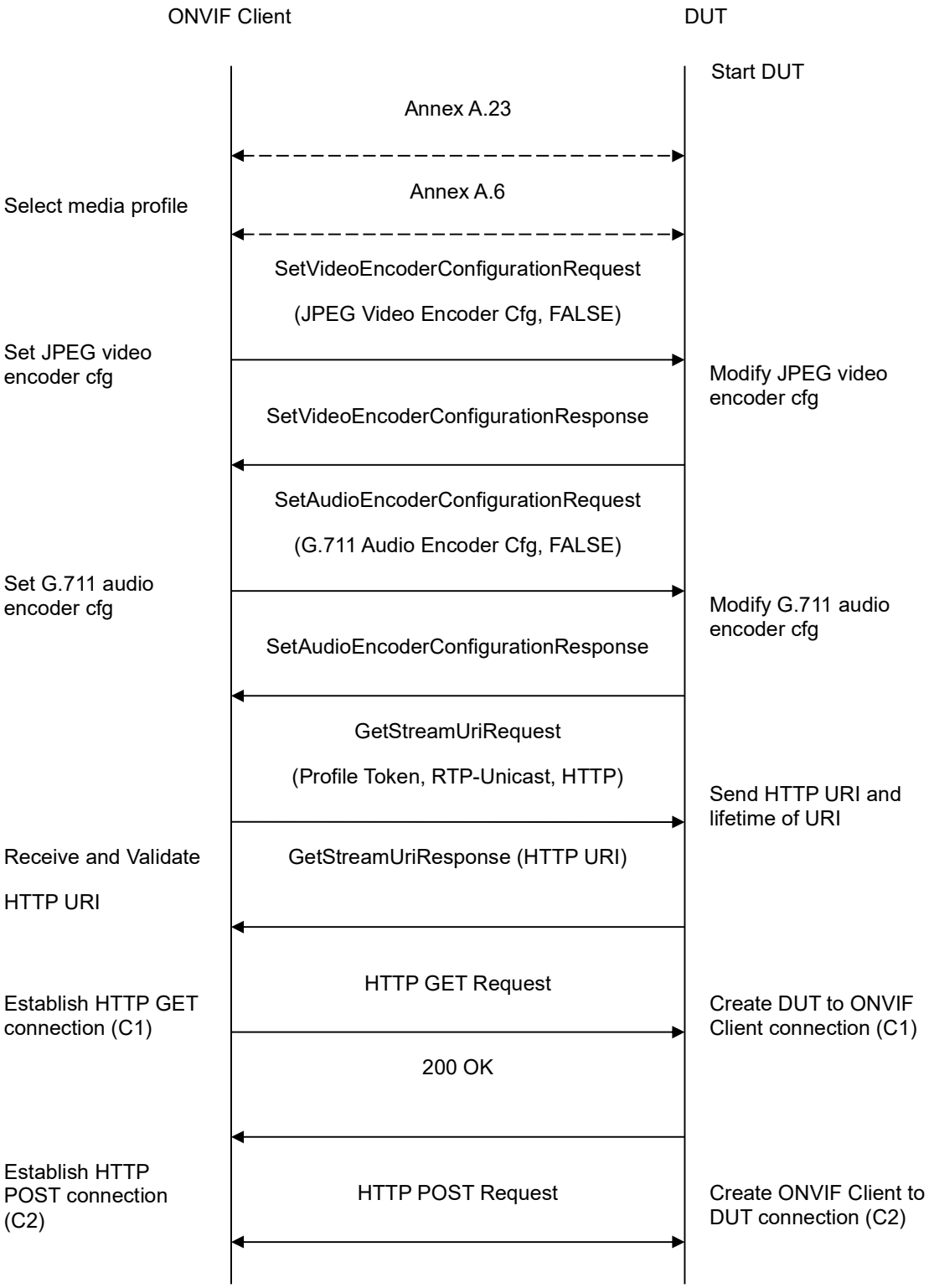
WSDL Reference: None

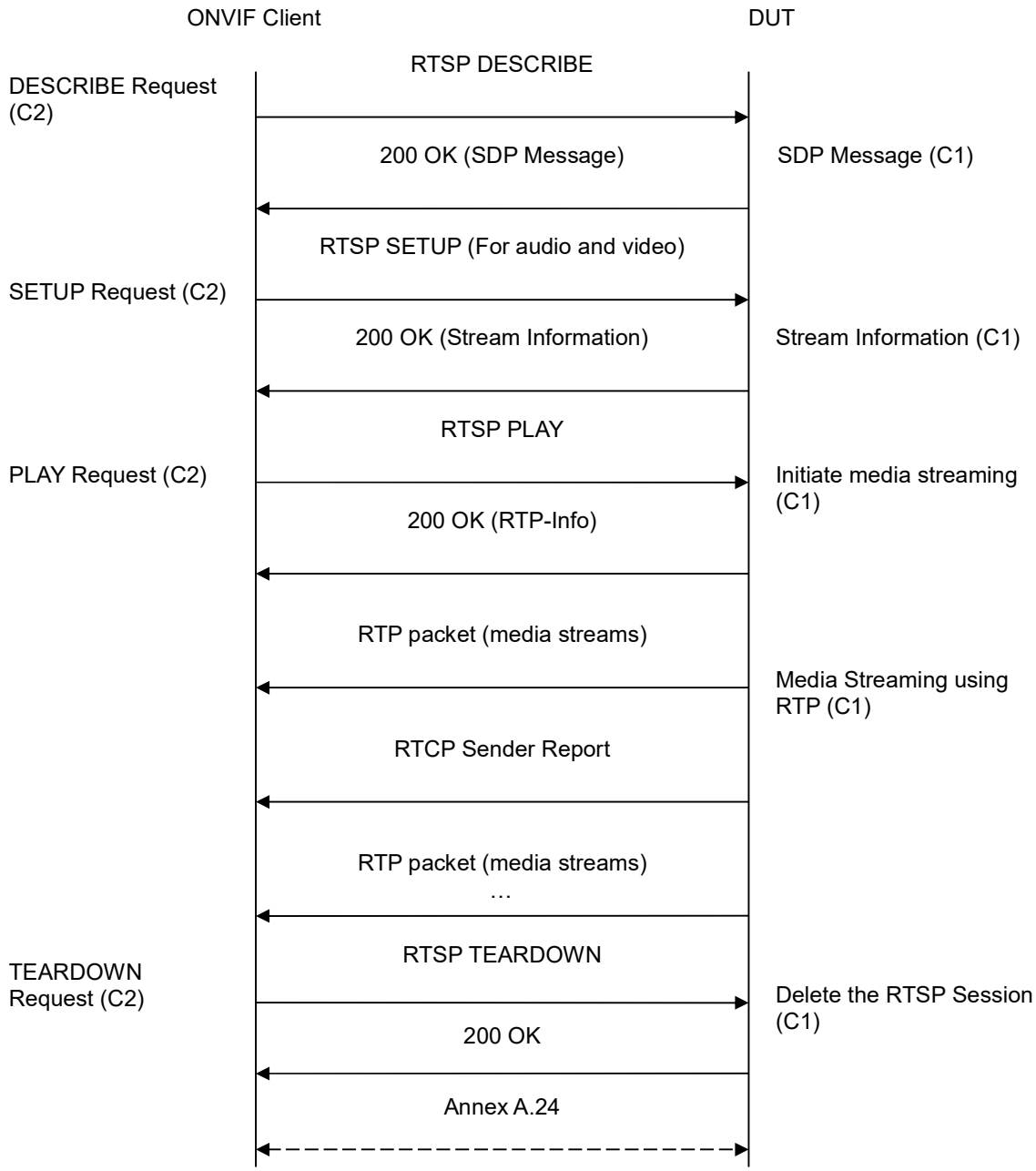
Test Purpose: To verify JPEG/G.711 Audio and Video streaming based on HTTP Transport for IPv6.

Pre-Requisite: Audio is supported by DUT. A media profile with JPEG video encoder configuration and G.711 audio encoder configuration. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
Modify JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
SetAudioEncoderConfigurationRequest
(G.711 Audio Encoder Cfg, FALSE)
Set G.711 audio encoder cfg
Modify G.711 audio encoder cfg
SetAudioEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, HTTP)
Send HTTP URI and lifetime of URI
Receive and Validate HTTP URI
GetStreamUriResponse (HTTP URI)
HTTP GET Request
Establish HTTP GET connection (C1)
Create DUT to ONVIF Client connection (C1)
200 OK
Establish HTTP POST connection (C2)
HTTP POST Request
Create ONVIF Client to DUT connection (C2)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.

4. ONVIF Client selects a media profile with both JPEG video encoding support and G.711 audio encoding support by following the procedure mentioned in Annex A.6.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
7. ONVIF Client invokes SetAudioEncoderConfigurationRequest (Encoding = “G711”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.
8. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
9. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, HTTP transport) to retrieve media stream URI for the selected media profile.
10. DUT sends HTTP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
11. ONVIF Client verifies the HTTP media stream URI provided by the DUT.
12. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
13. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
14. ONVIF Client invokes RTSP DESCRIBE request on HTTP POST connection.
15. DUT sends 200 OK message and SDP information on HTTP GET connection.
16. ONVIF Client invokes RTSP SETUP requests on HTTP POST connection with transport parameter as ‘RTP/TCP’ along with ‘interleaved’ parameter for both audio and video streams separately.
17. DUT sends 200 OK message and the media stream information on HTTP GET connection.
18. ONVIF Client invokes RTSP PLAY request on HTTP POST connection.
19. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
20. DUT transfers Audio/Video RTP media stream to ONVIF Client on HTTP GET connection.
21. DUT sends Audio/Video RTCP sender report to ONVIF Client on HTTP GET connection.
22. DUT validates the received RTP and RTCP packets, decodes and renders them.
23. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection and closes the HTTP POST connection.
24. DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.
25. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.12 MEDIA STREAMING – JPEG/G.711 (RTP/RTSP/TCP, IPv6)

Test Label: Real Time Viewing DUT JPEG/G.711 Audio and Video streaming using RTP/RTSP/TCP transport for IPv6.

Test Case ID: DRAFT-RTSS-3-1-21

ONVIF Core Specification Coverage: RTP/RTSP/TCP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

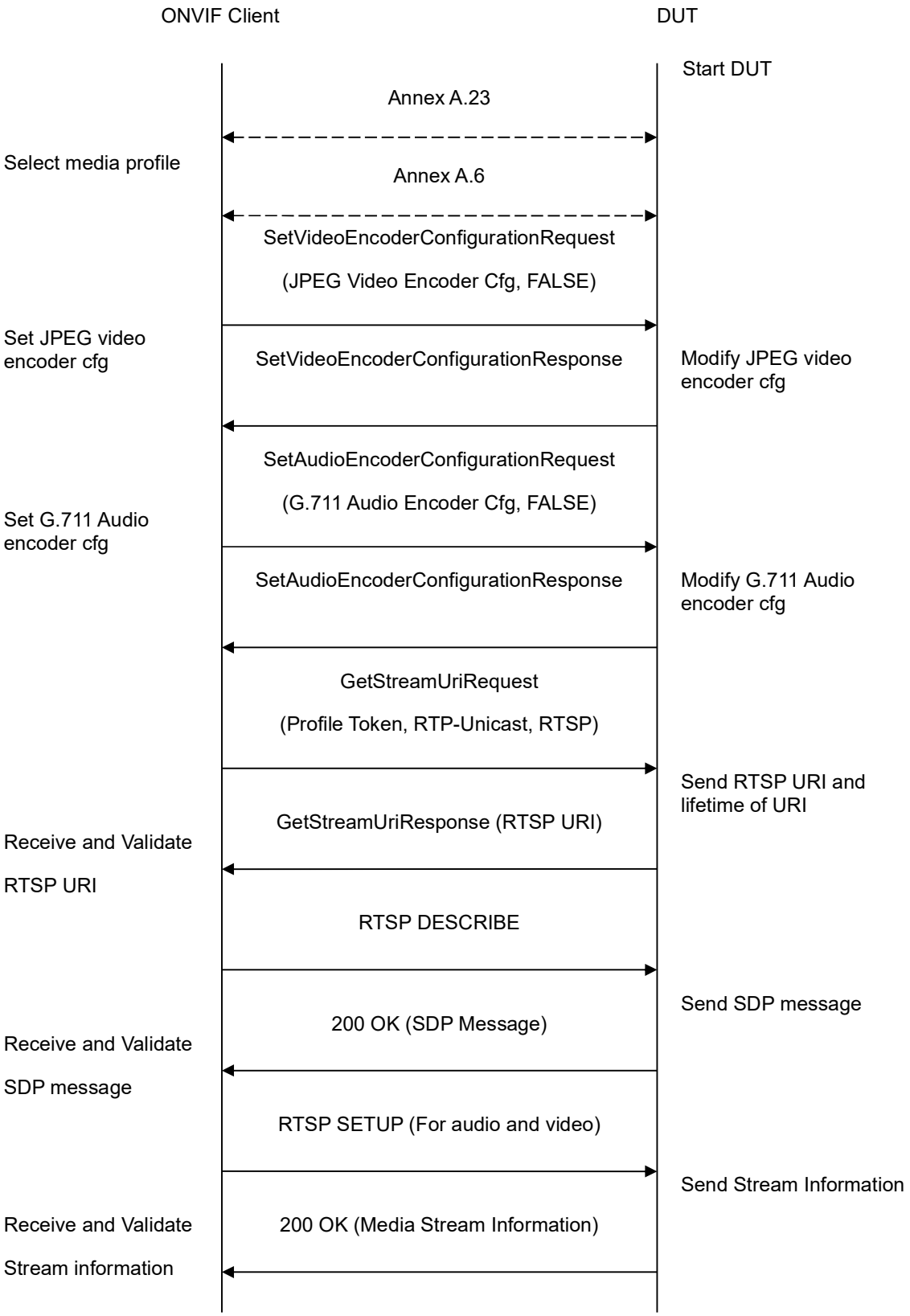
WSDL Reference: None

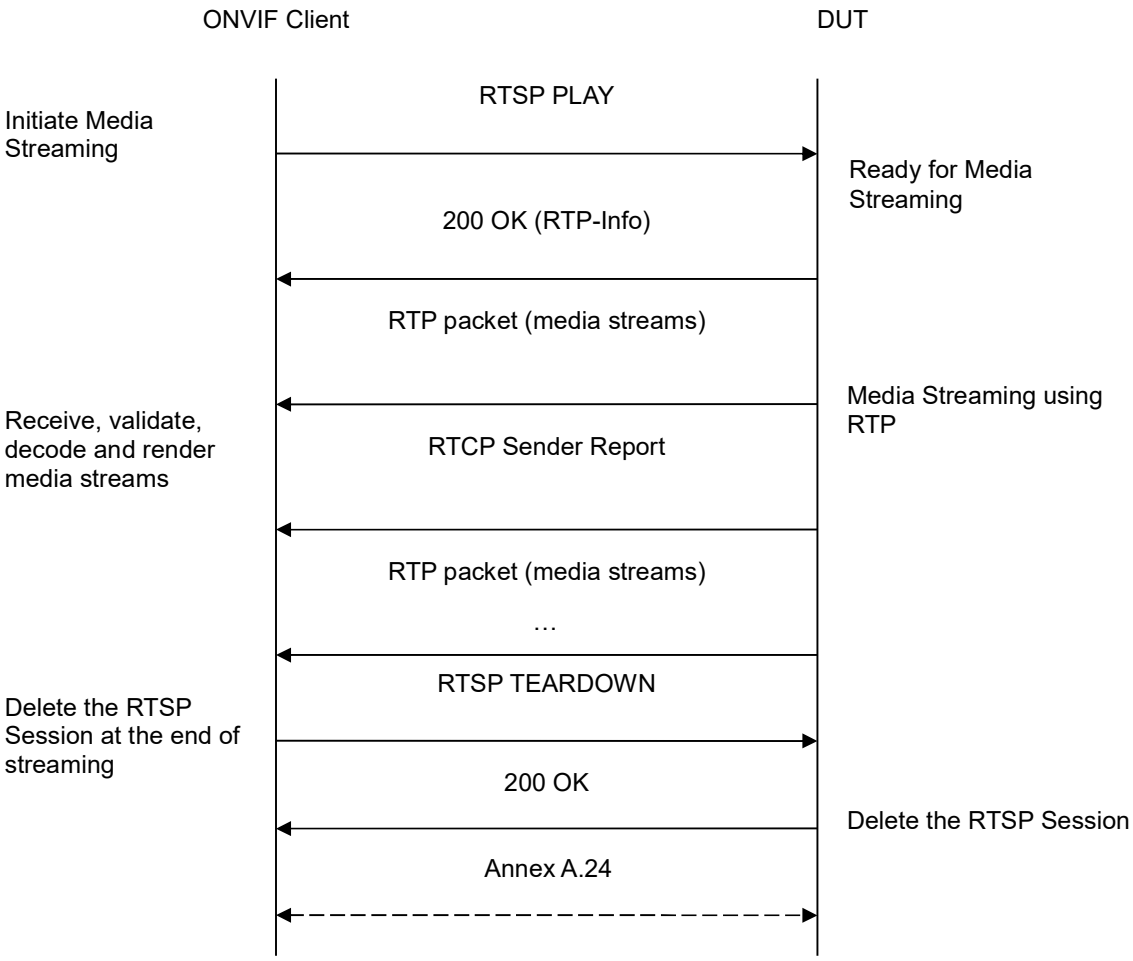
Test Purpose: To verify JPEG/G.711 Audio and Video streaming based on RTP/RTSP/TCP using RTSP tunnel for IPv6.

Pre-Requisite: Audio is supported by DUT and RTP/RTSP/TCP media streaming is implemented by DUT. A media profile with JPEG video encoder configuration and G.711 audio encoder configuration. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
Select media profile
Annex A.6
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
Modify JPEG video encoder cfg
SetAudioEncoderConfigurationRequest
(G.711 Audio Encoder Cfg, FALSE)
Set G.711 Audio encoder cfg
SetAudioEncoderConfigurationResponse
Modify G.711 Audio encoder cfg
GetStreamUriRequest
(Profile Token, RTP-Unicast, RTSP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Send SDP message
200 OK (SDP Message)
Receive and Validate SDP message
RTSP SETUP (For audio and video)
Send Stream Information
200 OK (Media Stream Information)
Receive and Validate Stream information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with both JPEG video encoding support and G.711 audio encoding support by following the procedure mentioned in Annex A.6.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.

7. ONVIF Client invokes SetAudioEncoderConfigurationRequest (Encoding = “G711”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.
8. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
9. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, RTSP transport) to retrieve media stream URI for the selected media profile.
10. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
11. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
12. ONVIF Client invokes RTSP DESCRIBE request.
13. DUT sends 200 OK message and SDP information.
14. ONVIF Client invokes RTSP SETUP request with transport parameter as ‘RTP/TCP’ along with ‘interleaved’ parameter for both audio and video streams separately.
15. DUT sends 200 OK message and the media stream information.
16. ONVIF Client invokes RTSP PLAY request.
17. DUT sends 200 OK message and starts media streaming.
18. DUT interleaves RTP and RTCP packets, send them over RTSP control connection.
19. DUT validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
21. DUT sends 200 OK Response and terminates the RTSP Session.
22. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.13 MEDIA STREAMING – JPEG/G.726 (RTP-Unicast/UDP, IPv6)

Test Label: Real Time Viewing DUT JPEG/G.726 Audio and Video streaming using RTP-Unicast/UDP transport for IPv6.

Test Case ID: RDAFT-RTSS-3-1-22

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

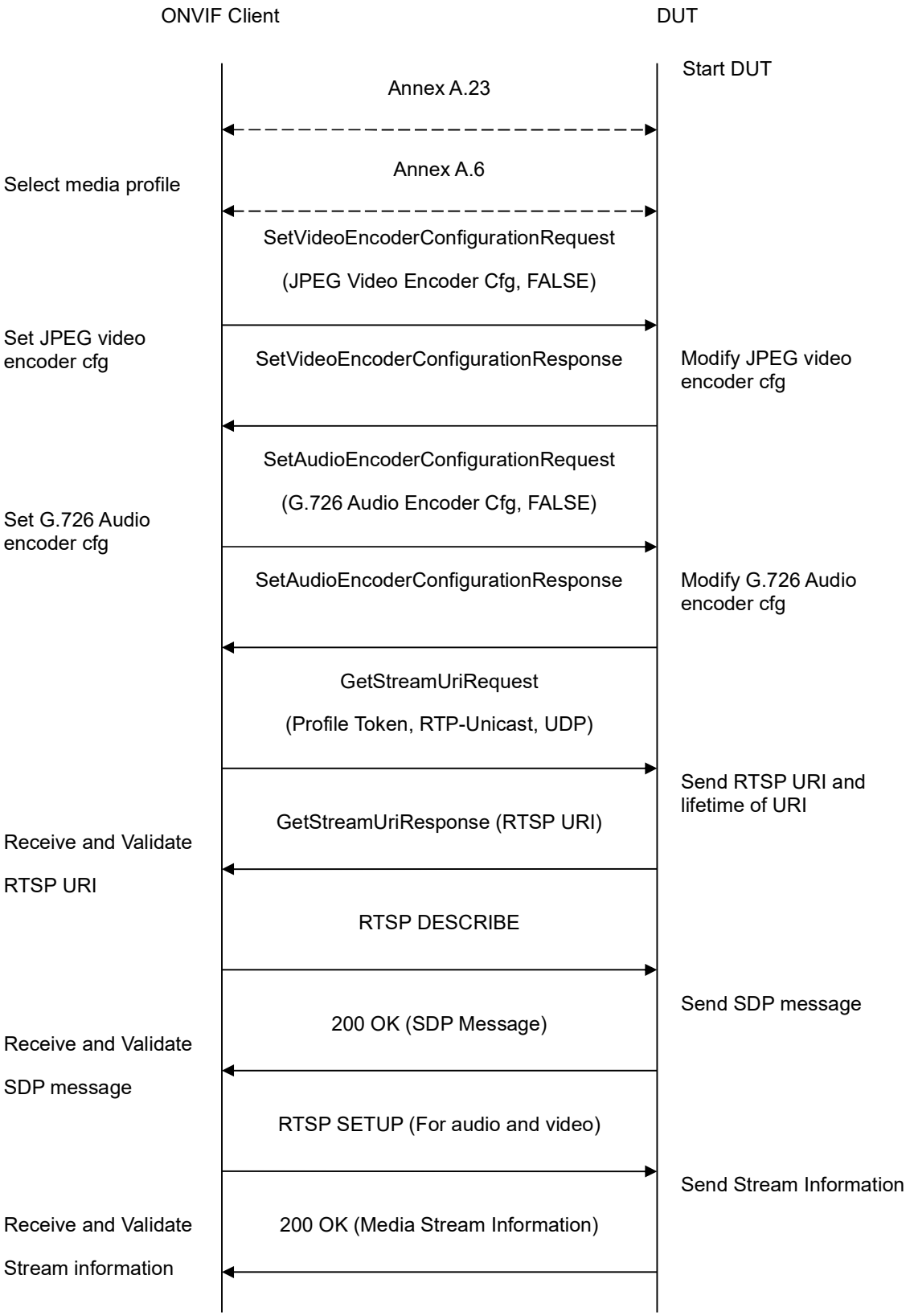
WSDL Reference: None

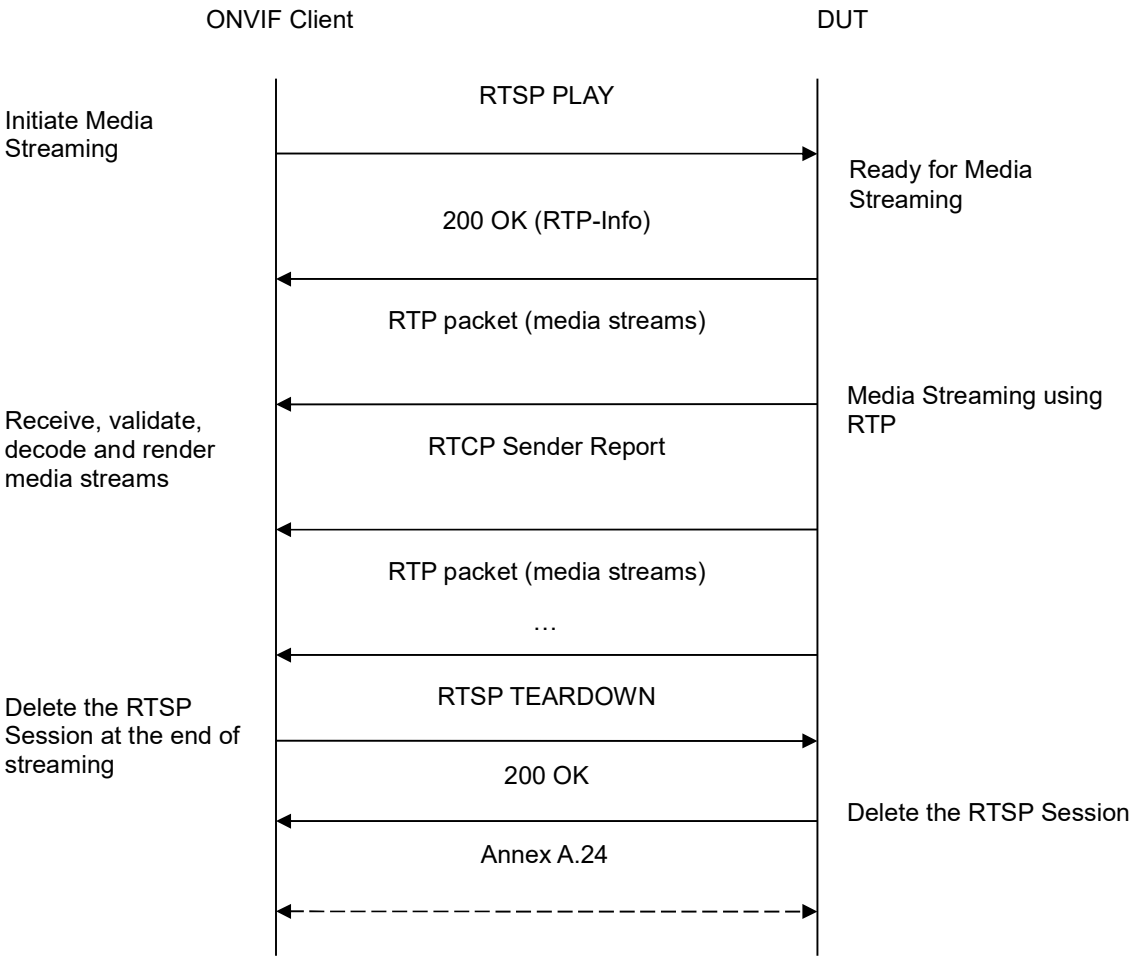
Test Purpose: To verify JPEG/G.726 Audio and Video streaming based on RTP/UDP Unicast Transport for IPv6.

Pre-Requisite: Audio is supported by DUT and G.726 is implemented by DUT. A media profile with JPEG video encoder configuration and G.726 audio encoder configuration. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
Modify JPEG video encoder cfg
SetAudioEncoderConfigurationRequest
(G.726 Audio Encoder Cfg, FALSE)
Set G.726 Audio encoder cfg
SetAudioEncoderConfigurationResponse
Modify G.726 Audio encoder cfg
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Send SDP message
200 OK (SDP Message)
Receive and Validate SDP message
RTSP SETUP (For audio and video)
Send Stream Information
200 OK (Media Stream Information)
Receive and Validate Stream information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with both JPEG video encoding support and G.726 audio encoding support by following the procedure mentioned in Annex A.6.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Session Timeout = t1 and force persistence = false). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.

7. ONVIF Client invokes SetAudioEncoderConfigurationRequest (Encoding = “G726”, Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.
8. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
9. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the selected media profile.
10. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
11. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
12. ONVIF Client invokes RTSP DESCRIBE request.
13. DUT sends 200 OK message and SDP information.
14. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP for both audio and video streams separately.
15. DUT sends 200 OK message and the media stream information.
16. ONVIF Client invokes RTSP PLAY request.
17. DUT sends 200 OK message and starts media streaming.
18. DUT sends Audio/Video RTP media stream to ONVIF Client over UDP.
19. DUT sends Audio/Video RTCP sender report to ONVIF Client.
20. DUT validates the received RTP and RTCP packets, decodes and renders them.
21. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
22. DUT sends 200 OK Response and terminates the RTSP Session.
23. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.14 MEDIA STREAMING – JPEG/G.726 (RTP-Unicast/RTSP/HTTP/TCP, IPv6)

Test Label: Real Time Viewing DUT JPEG/G.726 Audio and Video streaming using HTTP transport for IPv6.

Test Case ID: DRAFT-RTSS-3-1-23

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP.

Command Under Test: None

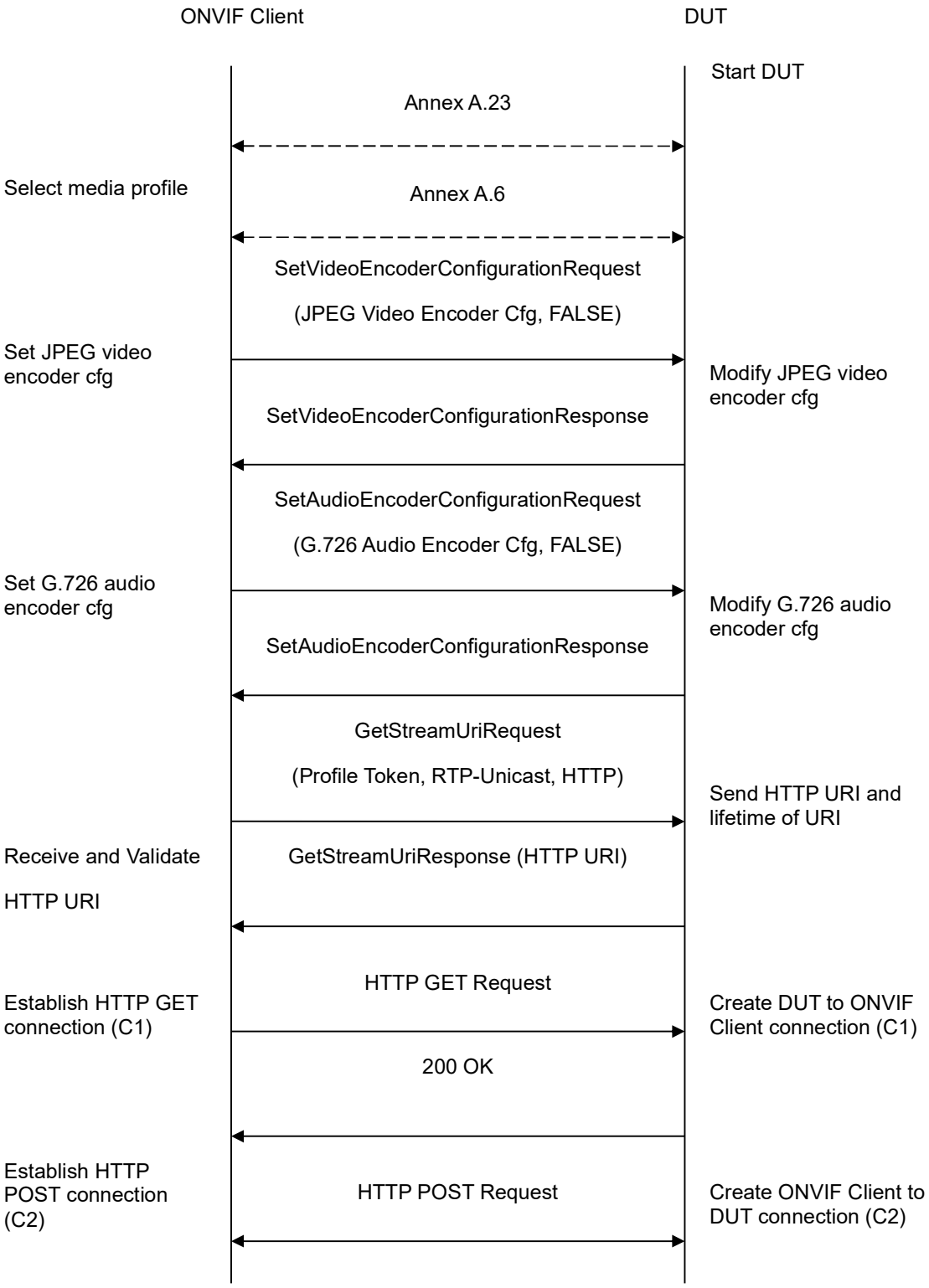
WSDL Reference: None

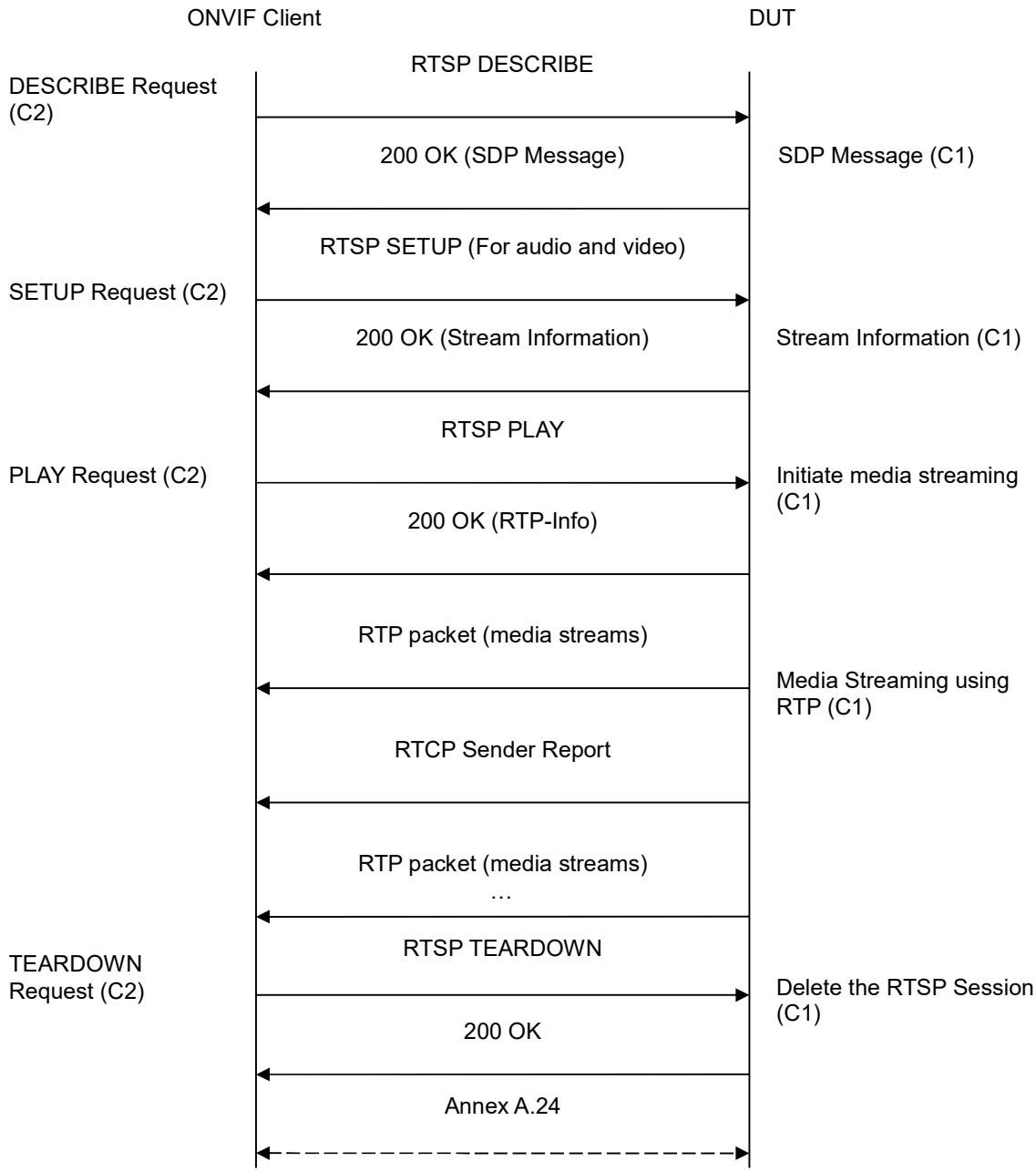
Test Purpose: To verify JPEG/G.726 Audio and Video streaming based on HTTP Transport for IPv6.

Pre-Requisite: Audio is supported by DUT and G.726 is implemented by DUT. A media profile with JPEG video encoder configuration and G.726 audio encoder configuration. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
Select media profile
Annex A.6
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
Modify JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
SetAudioEncoderConfigurationRequest
(G.726 Audio Encoder Cfg, FALSE)
Set G.726 audio encoder cfg
Modify G.726 audio encoder cfg
SetAudioEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, HTTP)
Send HTTP URI and lifetime of URI
Receive and Validate HTTP URI
GetStreamUriResponse (HTTP URI)
HTTP GET Request
Establish HTTP GET connection (C1)
Create DUT to ONVIF Client connection (C1)
200 OK
Establish HTTP POST connection (C2)
HTTP POST Request
Create ONVIF Client to DUT connection (C2)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.

4. ONVIF Client selects a media profile with both JPEG video encoding support and G.726 audio encoding support by following the procedure mentioned in Annex A.6.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
7. ONVIF Client invokes SetAudioEncoderConfigurationRequest (**Encoding = "G726", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.
8. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
9. ONVIF Client invokes GetStreamUriRequest message (**Profile Token, RTP-Unicast, HTTP transport**) to retrieve media stream URI for the selected media profile.
10. DUT sends HTTP URI and parameters defining the lifetime of the URI like **ValidUntilConnect**, **ValidUntilReboot** and Timeout in the **GetStreamUriResponse** message.
11. ONVIF Client verifies the HTTP media stream URI provided by the DUT.
12. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
13. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
14. ONVIF Client invokes RTSP DESCRIBE request on HTTP POST connection.
15. DUT sends 200 OK message and SDP information on HTTP GET connection.
16. ONVIF Client invokes RTSP SETUP requests on HTTP POST connection with transport parameter as '**RTP/TCP**' along with '**interleaved'** parameter for both audio and video streams separately.
17. DUT sends 200 OK message and the media stream information on HTTP GET connection.
18. ONVIF Client invokes RTSP PLAY request on HTTP POST connection.
19. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
20. DUT transfers Audio/Video RTP media stream to ONVIF Client on HTTP GET connection.
21. DUT sends Audio/Video RTCP sender report to ONVIF Client on HTTP GET connection.
22. DUT validates the received RTP and RTCP packets, decodes and renders them.
23. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection and closes the HTTP POST connection.
24. DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.

25. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.15 MEDIA STREAMING – JPEG/G.726 (RTP/RTSP/TCP, IPv6)

Test Label: Real Time Viewing DUT JPEG/G.726 Audio and Video streaming using RTP/RTSP/TCP transport for IPv6.

Test Case ID: DRAFT-RTSS-3-1-24

ONVIF Core Specification Coverage: RTP/RTSP/TCP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

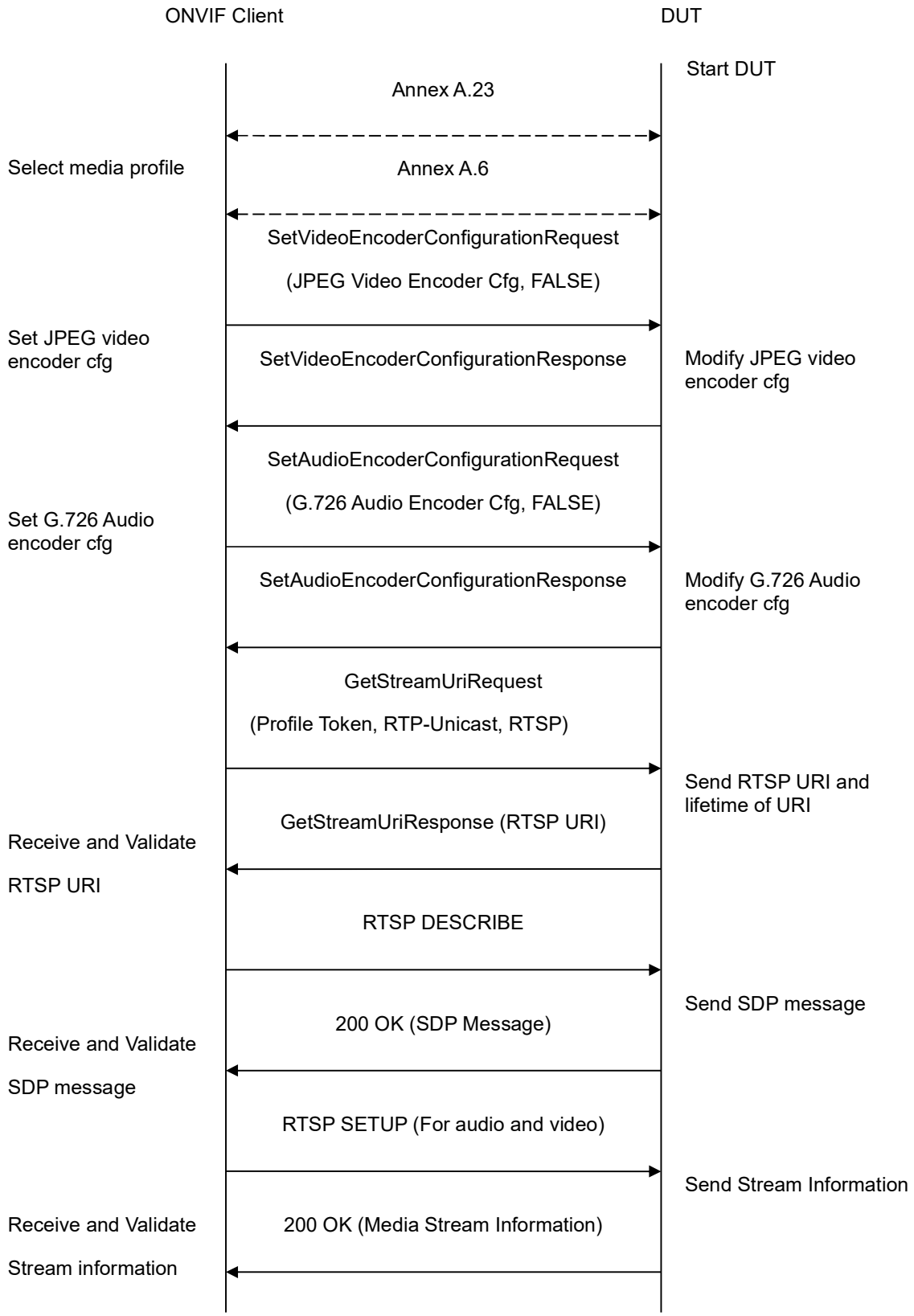
WSDL Reference: None

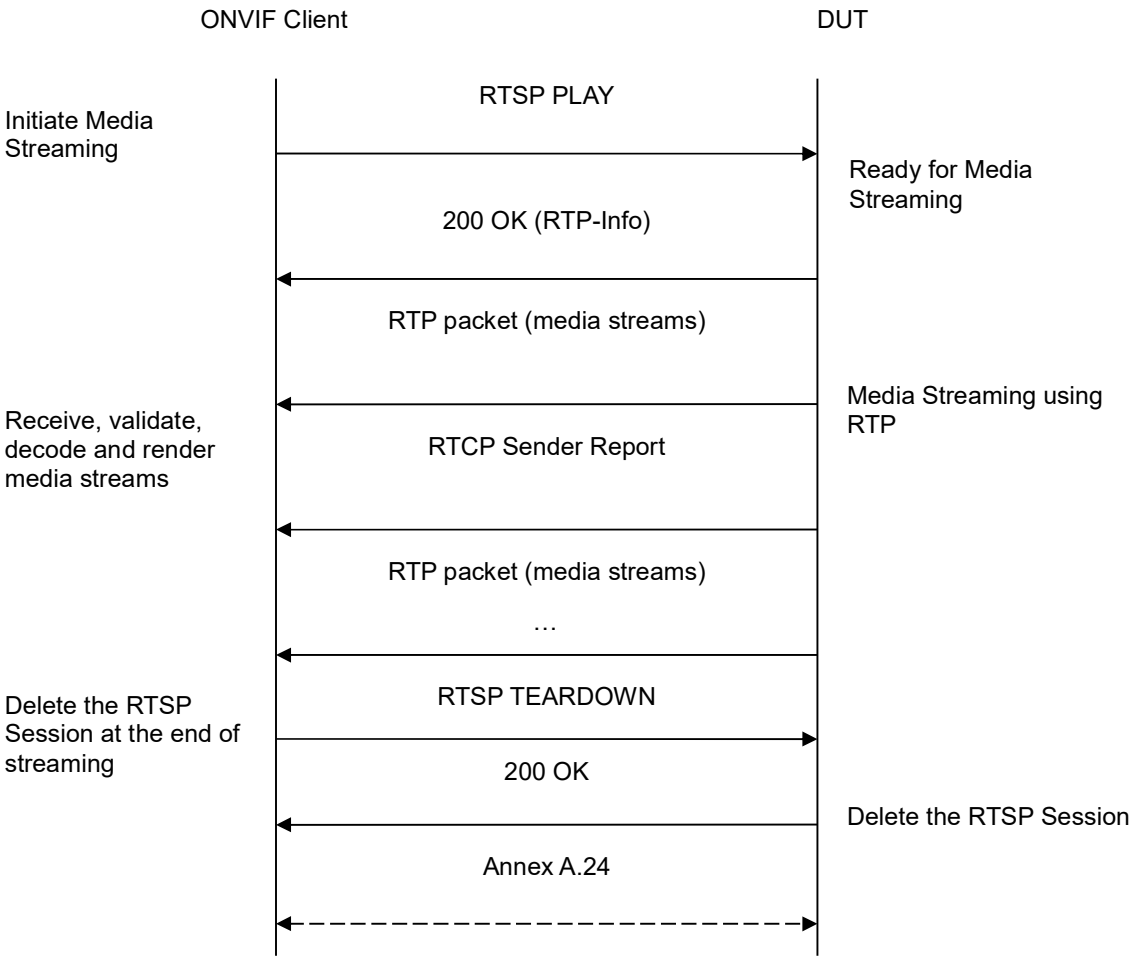
Test Purpose: To verify JPEG/G.726 Audio and Video streaming based on RTP/RTSP/TCP using RTSP tunnel for IPv6.

Pre-Requisite: Audio is supported by DUT, G.726 and RTP/RTSP/TCP media streaming is implemented by DUT. A media profile with JPEG video encoder configuration and G.726 audio encoder configuration. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
Select media profile
Annex A.6
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
Modify JPEG video encoder cfg
SetAudioEncoderConfigurationRequest
(G.726 Audio Encoder Cfg, FALSE)
Set G.726 Audio encoder cfg
SetAudioEncoderConfigurationResponse
Modify G.726 Audio encoder cfg
GetStreamUriRequest
(Profile Token, RTP-Unicast, RTSP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Send SDP message
200 OK (SDP Message)
Receive and Validate SDP message
RTSP SETUP (For audio and video)
Send Stream Information
200 OK (Media Stream Information)
Receive and Validate Stream information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with both JPEG video encoding support and G.726 audio encoding support by following the procedure mentioned in Annex A.6.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.

7. ONVIF Client invokes SetAudioEncoderConfigurationRequest (**Encoding = "G726", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.
8. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
9. ONVIF Client invokes GetStreamUri request (**Profile Token, RTP-Unicast, RTSP transport**) to retrieve media stream URI for the selected media profile.
10. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
11. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
12. ONVIF Client invokes RTSP DESCRIBE request.
13. DUT sends 200 OK message and SDP information.
14. ONVIF Client invokes RTSP SETUP request with transport parameter as '**RTP/TCP**' along with '**interleaved'** parameter for both audio and video streams separately.
15. DUT sends 200 OK message and the media stream information.
16. ONVIF Client invokes RTSP PLAY request.
17. DUT sends 200 OK message and starts media streaming.
18. DUT interleaves RTP and RTCP packets, send them over RTSP control connection.
19. DUT validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
21. DUT sends 200 OK Response and terminates the RTSP Session.
22. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.16 MEDIA STREAMING – JPEG/AAC (RTP-Unicast/UDP, IPv6)

Test Label: Real Time Viewing DUT JPEG/AAC Audio and Video streaming using RTP-Unicast/UDP transport for IPv6.

Test Case ID: DRAFT-RTSS-3-1-25

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

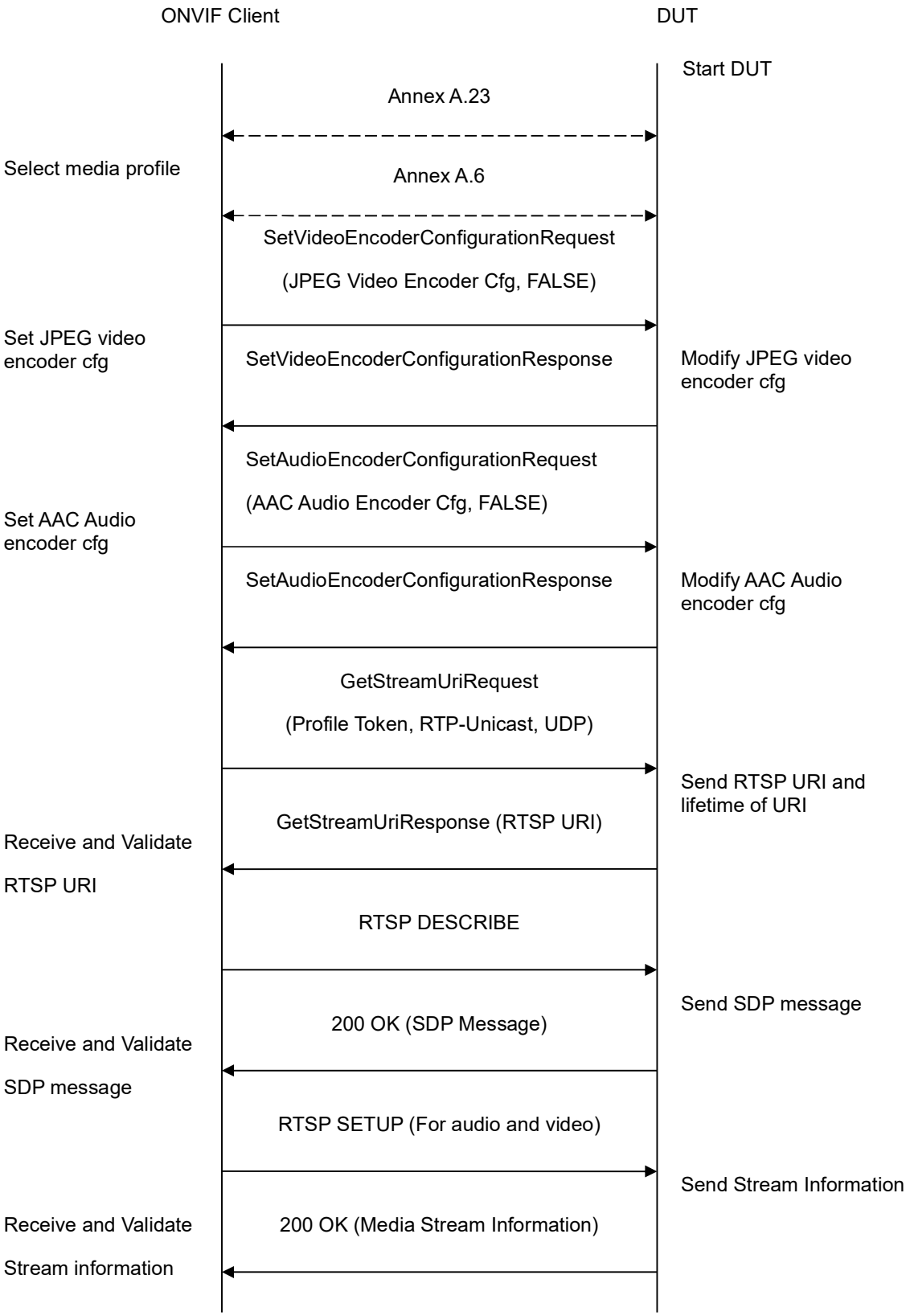
WSDL Reference: None

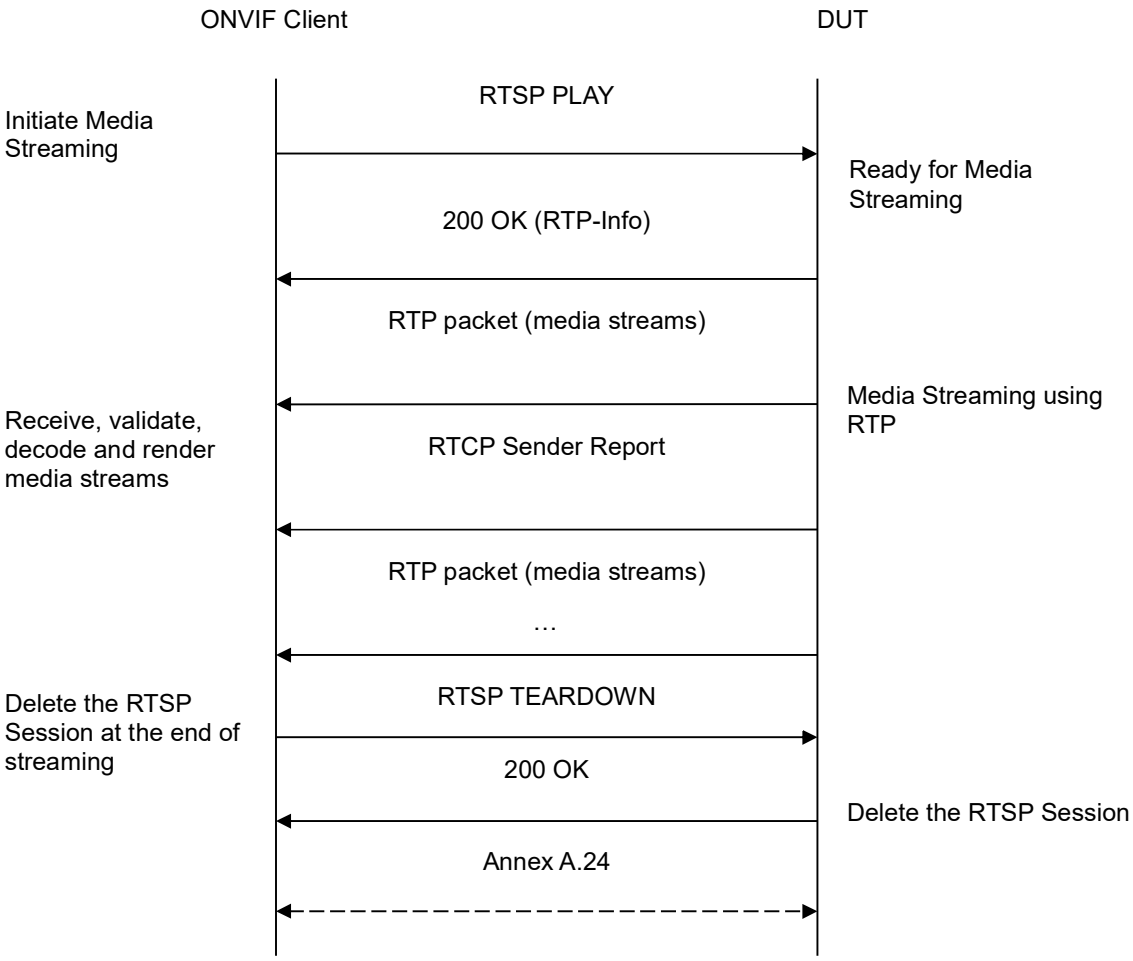
Test Purpose: To verify JPEG/AAC Audio and Video streaming based on RTP/UDP Unicast Transport for IPv6.

Pre-Requisite: Audio is supported by DUT and AAC is implemented by DUT. A media profile with JPEG video encoder configuration and AAC audio encoder configuration. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
Select media profile
Annex A.6
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
Modify JPEG video encoder cfg
SetAudioEncoderConfigurationRequest
(AAC Audio Encoder Cfg, FALSE)
Set AAC Audio encoder cfg
SetAudioEncoderConfigurationResponse
Modify AAC Audio encoder cfg
GetStreamUriRequest
(Profile Token, RTP-Unicast, UDP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Send SDP message
200 OK (SDP Message)
Receive and Validate SDP message
RTSP SETUP (For audio and video)
Send Stream Information
200 OK (Media Stream Information)
Receive and Validate Stream information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with both JPEG video encoding support and AAC audio encoding support by following the procedure mentioned in Annex A.6.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.

7. ONVIF Client invokes SetAudioEncoderConfigurationRequest (**Encoding = "AAC", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.
8. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
9. ONVIF Client invokes GetStreamUriRequest message (**Profile Token, RTP-Unicast, UDP transport**) to retrieve media stream URI for the selected media profile.
10. DUT sends RTSP URI and parameters defining the lifetime of the URI like **ValidUntilConnect**, **ValidUntilReboot** and Timeout in the **GetStreamUriResponse** message.
11. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
12. ONVIF Client invokes RTSP DESCRIBE request.
13. DUT sends 200 OK message and SDP information.
14. ONVIF Client invokes RTSP SETUP requests for audio and video streams separately with transport parameter as **RTP/UDP** for both audio and video streams separately.
15. DUT sends 200 OK message and the media stream information.
16. ONVIF Client invokes RTSP PLAY request.
17. DUT sends 200 OK message and starts media streaming.
18. DUT sends Audio/Video RTP media stream to ONVIF Client over UDP.
19. DUT sends Audio/Video RTCP sender report to ONVIF Client.
20. DUT validates the received RTP and RTCP packets, decodes and renders them.
21. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
22. DUT sends 200 OK Response and terminates the RTSP Session.
23. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.17 MEDIA STREAMING – JPEG/AAC (RTP-Unicast/RTSP/HTTP/TCP, IPv6)

Test Label: Real Time Viewing DUT JPEG/AAC Audio and Video streaming using HTTP transport for IPv6.

Test Case ID: DRAFT-RTSS-3-1-26

ONVIF Core Specification Coverage: RTP/RTSP/HTTP/TCP, RTP, RTCP, Stream control, RTSP, RTSP over HTTP.

Command Under Test: None

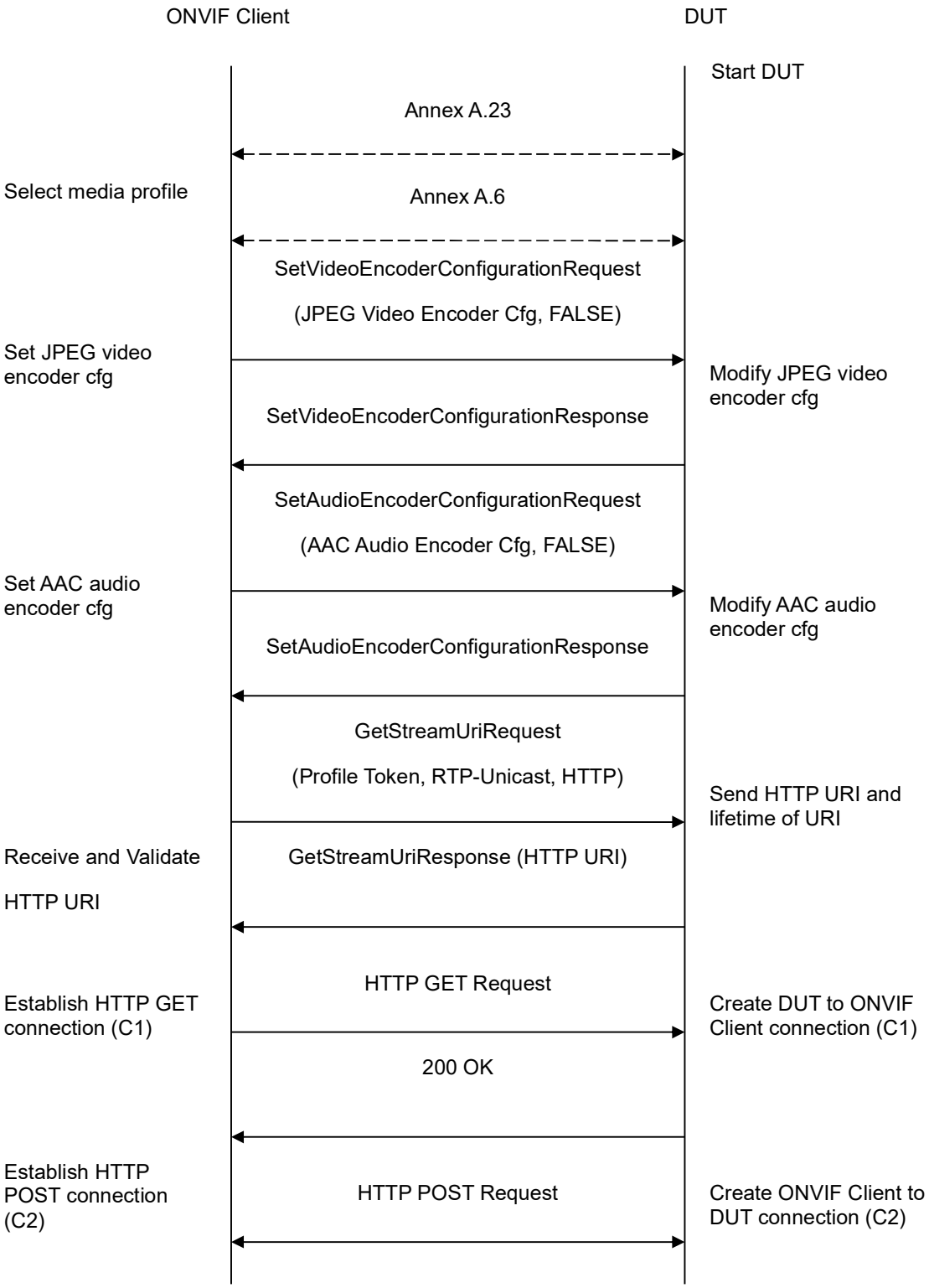
WSDL Reference: None

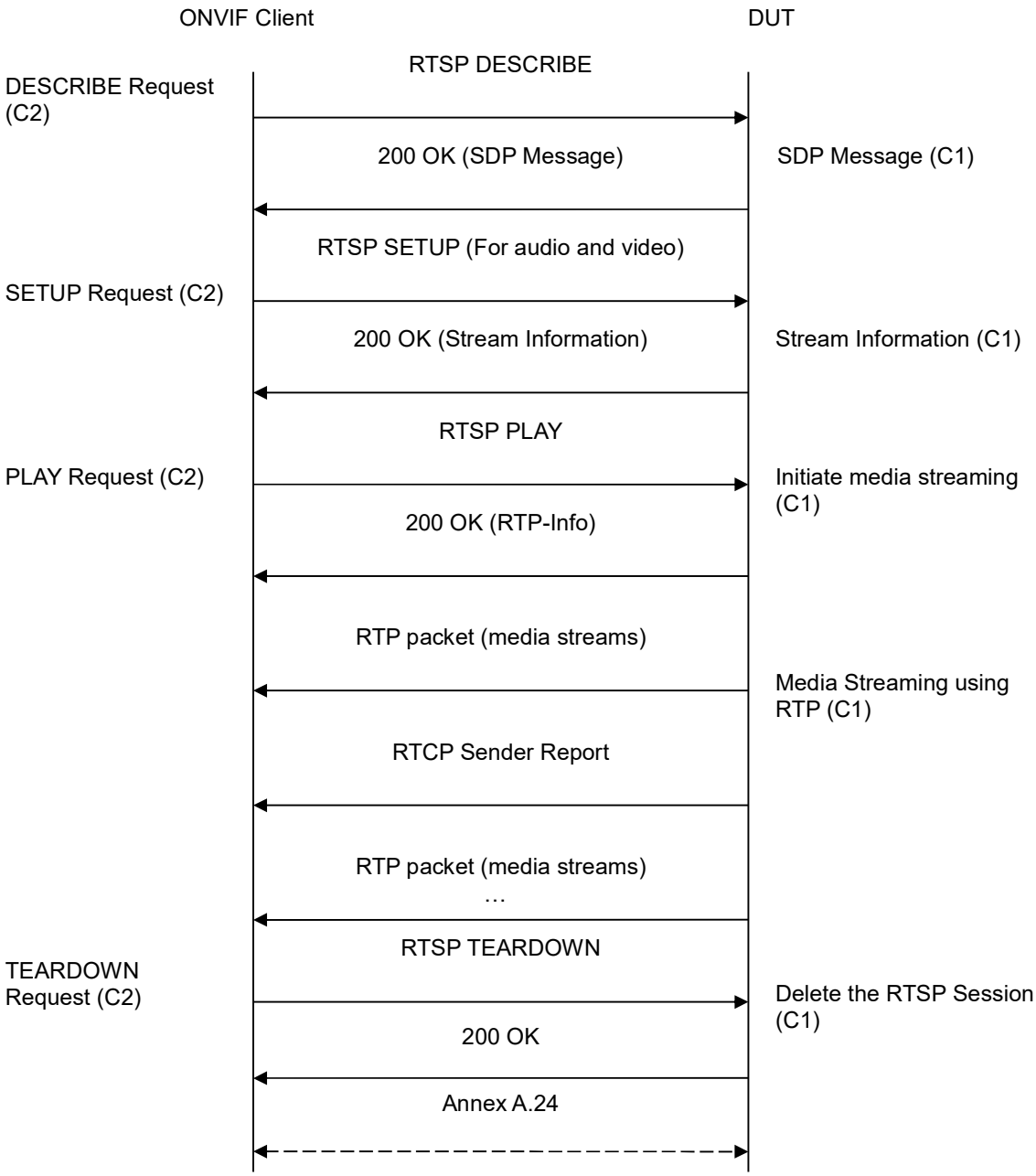
Test Purpose: To verify JPEG/AAC Audio and Video streaming based on HTTP Transport for IPv6.

Pre-Requisite: Audio is supported by DUT and AAC is implemented by DUT. A media profile with JPEG video encoder configuration and AAC audio encoder configuration. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
Select media profile
Annex A.6
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
Modify JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
SetAudioEncoderConfigurationRequest
(AAC Audio Encoder Cfg, FALSE)
Set AAC audio encoder cfg
Modify AAC audio encoder cfg
SetAudioEncoderConfigurationResponse
GetStreamUriRequest
(Profile Token, RTP-Unicast, HTTP)
Send HTTP URI and lifetime of URI
Receive and Validate HTTP URI
GetStreamUriResponse (HTTP URI)
HTTP GET Request
Establish HTTP GET connection (C1)
Create DUT to ONVIF Client connection (C1)
200 OK
Establish HTTP POST connection (C2)
HTTP POST Request
Create ONVIF Client to DUT connection (C2)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.

4. ONVIF Client selects a media profile with both JPEG video encoding support and AAC audio encoding support by following the procedure mentioned in Annex A.6.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.
7. ONVIF Client invokes SetAudioEncoderConfigurationRequest (**Encoding = "AAC", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.
8. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
9. ONVIF Client invokes GetStreamUriRequest message (**Profile Token, RTP-Unicast, HTTP transport**) to retrieve media stream URI for the selected media profile.
10. DUT sends HTTP URI and parameters defining the lifetime of the URI like **ValidUntilConnect**, **ValidUntilReboot** and Timeout in the **GetStreamUriResponse** message.
11. ONVIF Client verifies the HTTP media stream URI provided by the DUT.
12. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
13. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
14. ONVIF Client invokes RTSP DESCRIBE request on HTTP POST connection.
15. DUT sends 200 OK message and SDP information on HTTP GET connection.
16. ONVIF Client invokes RTSP SETUP request on HTTP POST connection with transport parameter as '**RTP/TCP**' along with '**interleaved'** parameter for both audio and video streams separately.
17. DUT sends 200 OK message and the media stream information on HTTP GET connection.
18. ONVIF Client invokes RTSP PLAY request on HTTP POST connection.
19. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
20. DUT transfers Audio/Video RTP media stream to ONVIF Client on HTTP GET connection.
21. DUT sends Audio/Video RTCP sender report to ONVIF Client on HTTP GET connection.
22. DUT validates the received RTP and RTCP packets, decodes and renders them.
23. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection and closes the HTTP POST connection.
24. DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.

25. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send valid RTP header in one or more media streams.

DUT did not send RTCP sender report correctly.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.18 MEDIA STREAMING – JPEG/AAC (RTP/RTSP/TCP, IPv6)

Test Label: Real Time Viewing DUT JPEG/AAC Audio and Video streaming using RTP/RTSP/TCP transport for IPv6.

Test Case ID: DRAFT-RTSS-3-1-27

ONVIF Core Specification Coverage: RTP/RTSP/TCP, RTP, RTCP, Stream control, RTSP.

Command Under Test: None

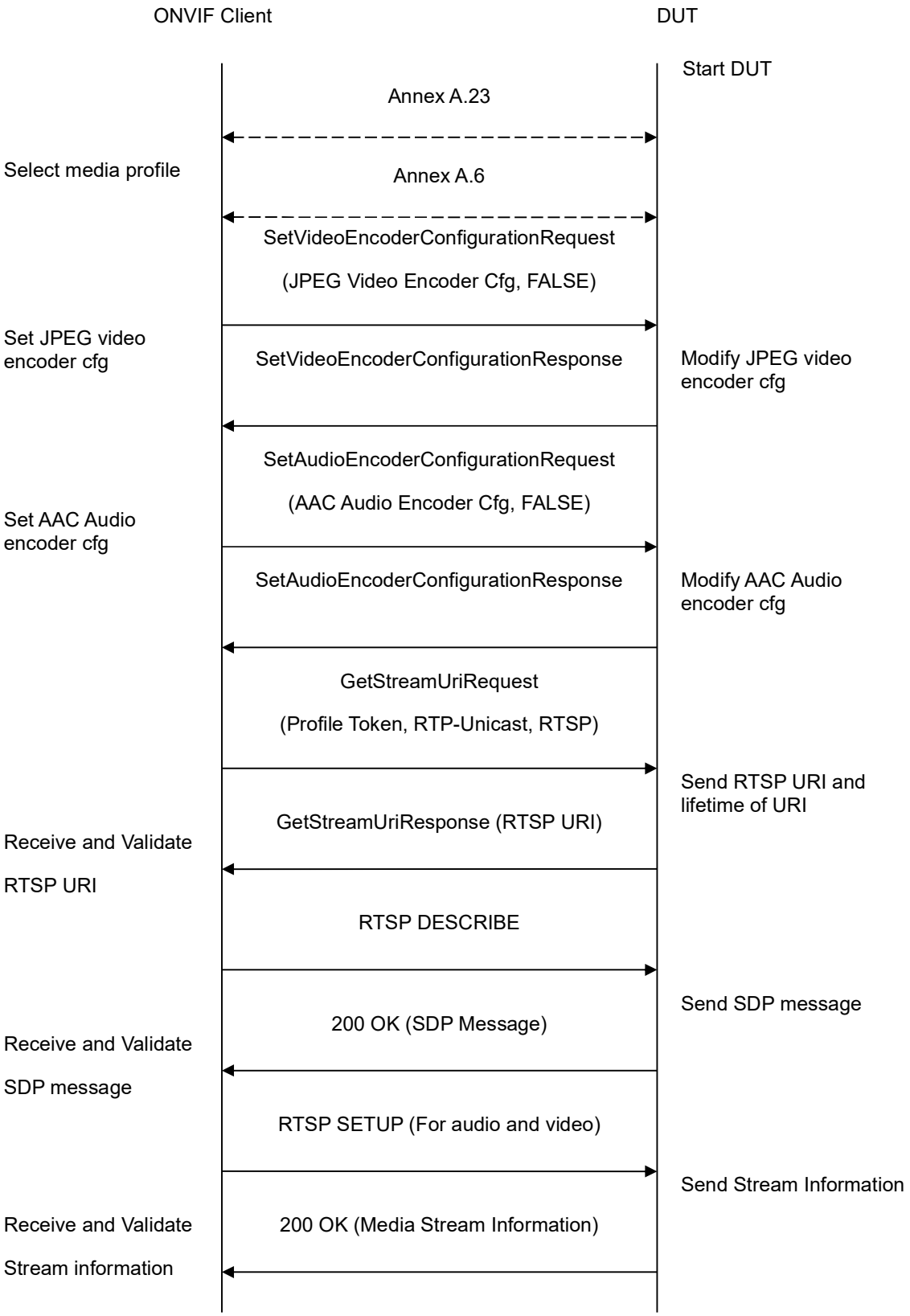
WSDL Reference: None

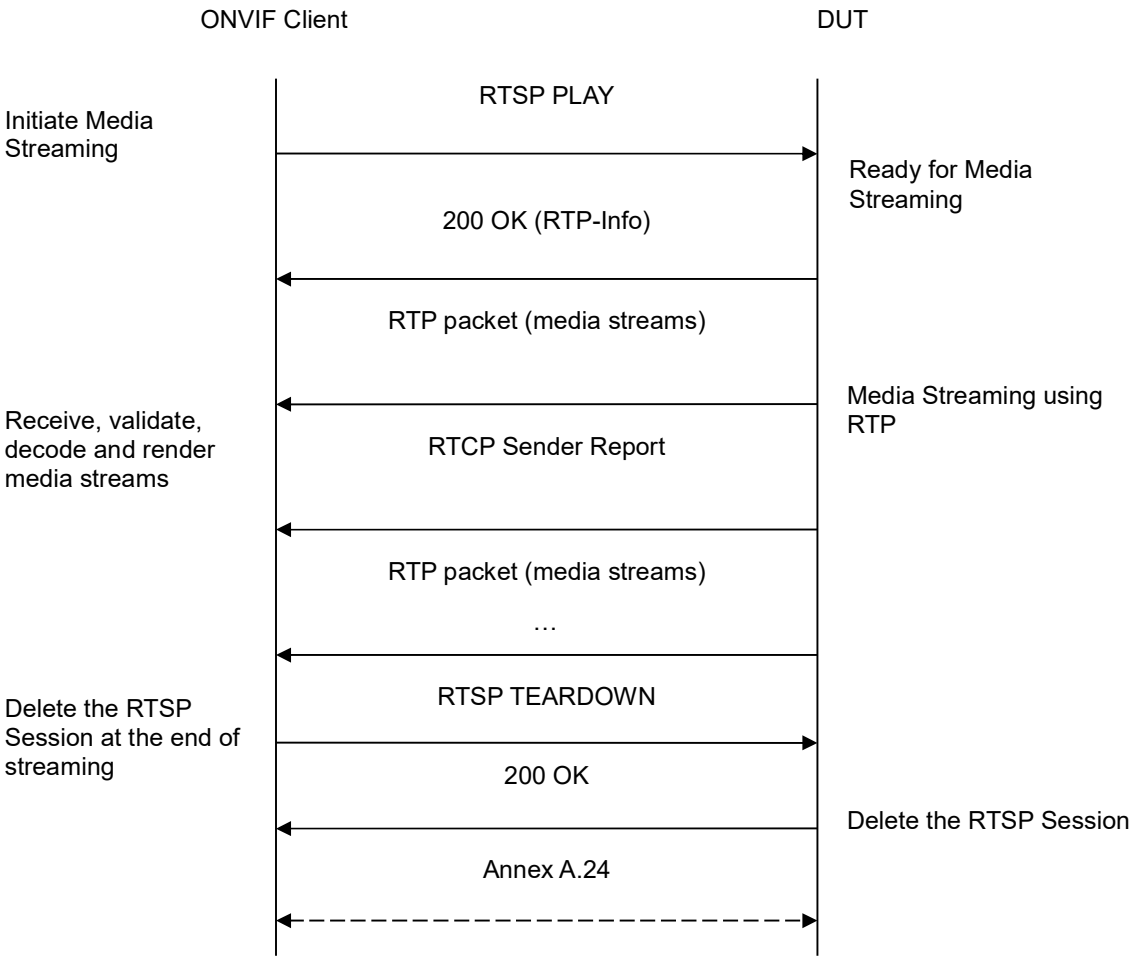
Test Purpose: To verify JPEG/AAC Audio and Video streaming based on RTP/RTSP/TCP using RTSP tunnel for IPv6.

Pre-Requisite: Audio is supported by DUT, AAC and RTP/RTSP/TCP media streaming is implemented by DUT. A media profile with JPEG video encoder configuration and AAC audio encoder configuration. Media Service was received from the DUT. IPv6 is turned on for network interface. The DUT is configured with Manual IPv6 or LinkLocal IPv6 address.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.23
Select media profile
Annex A.6
SetVideoEncoderConfigurationRequest
(JPEG Video Encoder Cfg, FALSE)
Set JPEG video encoder cfg
SetVideoEncoderConfigurationResponse
Modify JPEG video encoder cfg
SetAudioEncoderConfigurationRequest
(AAC Audio Encoder Cfg, FALSE)
Set AAC Audio encoder cfg
SetAudioEncoderConfigurationResponse
Modify AAC Audio encoder cfg
GetStreamUriRequest
(Profile Token, RTP-Unicast, RTSP)
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and Validate RTSP URI
RTSP DESCRIBE
Send SDP message
200 OK (SDP Message)
Receive and Validate SDP message
RTSP SETUP (For audio and video)
Send Stream Information
200 OK (Media Stream Information)
Receive and Validate Stream information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client turns on IPv6 nework interface by following the procedure mentioned in Annex A.23.
4. ONVIF Client selects a media profile with both JPEG video encoding support and AAC audio encoding support by following the procedure mentioned in Annex A.6.
5. ONVIF Client invokes SetVideoEncoderConfigurationRequest (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
6. DUT modifies video encoder configuration and responds with SetVideoEncoderConfigurationResponse message indicating success.

7. ONVIF Client invokes SetAudioEncoderConfigurationRequest (**Encoding = "AAC", Bitrate = r1, SampleRate = r2, Session Timeout = t1 and force persistence = false**). These values will be taken from the GetAudioEncoderConfigurationOptions response in A.6.
8. DUT modifies audio encoder configuration and responds with SetAudioEncoderConfigurationResponse message indicating success.
9. ONVIF Client invokes GetStreamUriRequest message (**Profile Token, RTP-Unicast, RTSP transport**) to retrieve media stream URI for the selected media profile.
10. DUT sends RTSP URI and parameters defining the lifetime of the URI like **ValidUntilConnect**, **ValidUntilReboot** and Timeout in the **GetStreamUriResponse** message.
11. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
12. ONVIF Client invokes RTSP DESCRIBE request.
13. DUT sends 200 OK message and SDP information.
14. ONVIF Client invokes RTSP SETUP request with transport parameter as '**RTP/TCP**' along with '**interleaved'** parameter for both audio and video streams separately.
15. DUT sends 200 OK message and the media stream information.
16. ONVIF Client invokes RTSP PLAY request.
17. DUT sends 200 OK message and starts media streaming.
18. DUT interleaves RTP and RTCP packets, send them over RTSP control connection.
19. DUT validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
21. DUT sends 200 OK Response and terminates the RTSP Session.
22. ONVIF Client will restore the original settings by following the procedure mentioned in Annex A.24A.24.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

DUT did not have valid media profile which has both audio and video encoder configurations.

DUT did not send SetVideoEncoderConfigurationResponse message.

DUT did not send SetAudioEncoderConfigurationResponse message.

DUT did not send GetStreamUriResponse message.

DUT did not send one or more mandatory parameters in the GetStreamUriResponse message (mandatory parameters – RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout).

DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

DUT did not send RTP and RTCP packets as per [RFC 2326] section 10.12.

RTSP Session is terminated by DUT during media streaming.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.19 MEDIA STREAMING – JPEG/G.711 (RTP-Multicast/UDP, IPv4)

Test Label: Real Time Viewing DUT JPEG/G.711 Media Streaming Using RTP-Multicast/UDP Transport for IPv4.

Test Case ID: RTSS-3-2-16

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, JPEG over RTP, Stream control, RTSP

Command Under Test: None

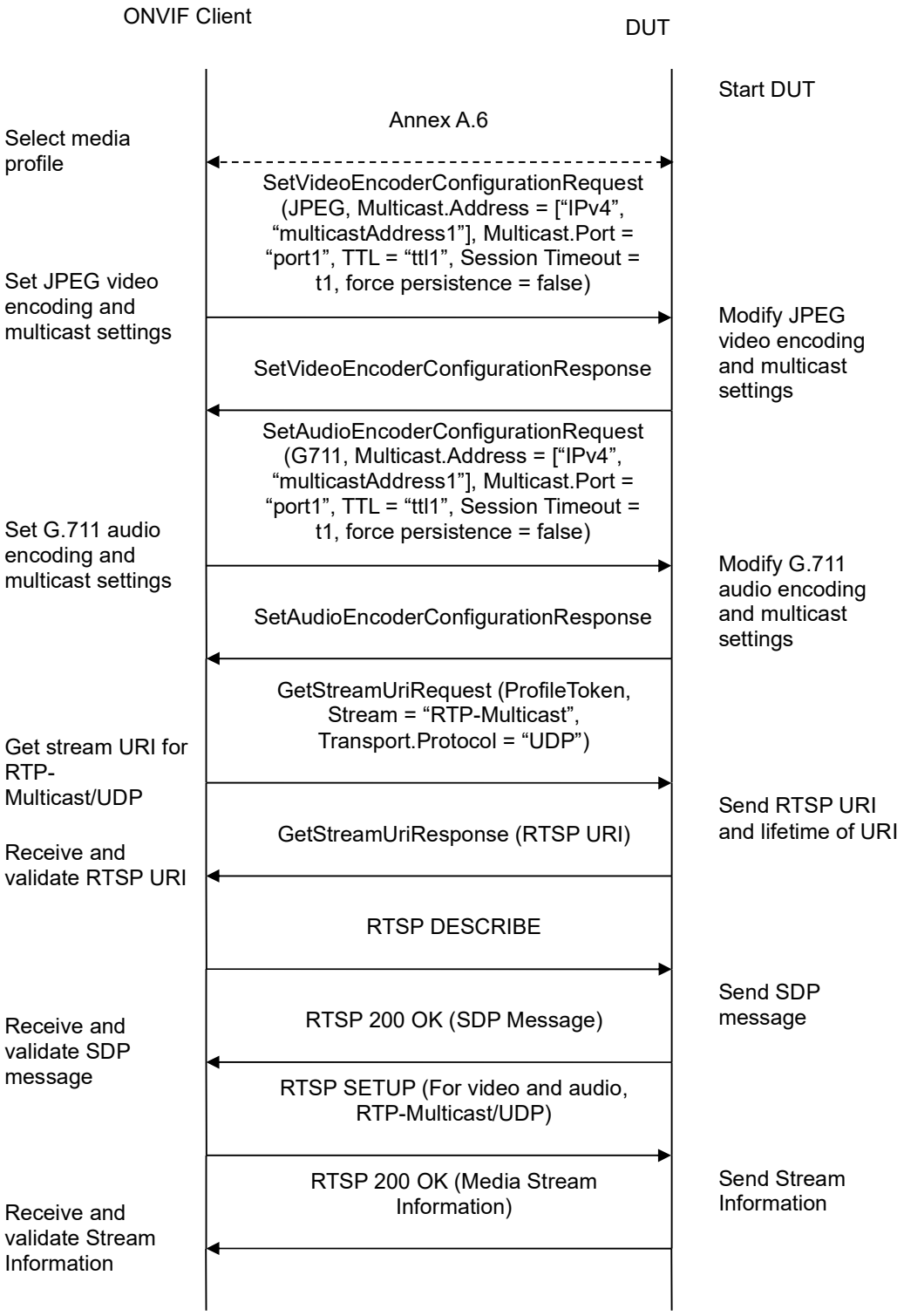
WSDL Reference: None

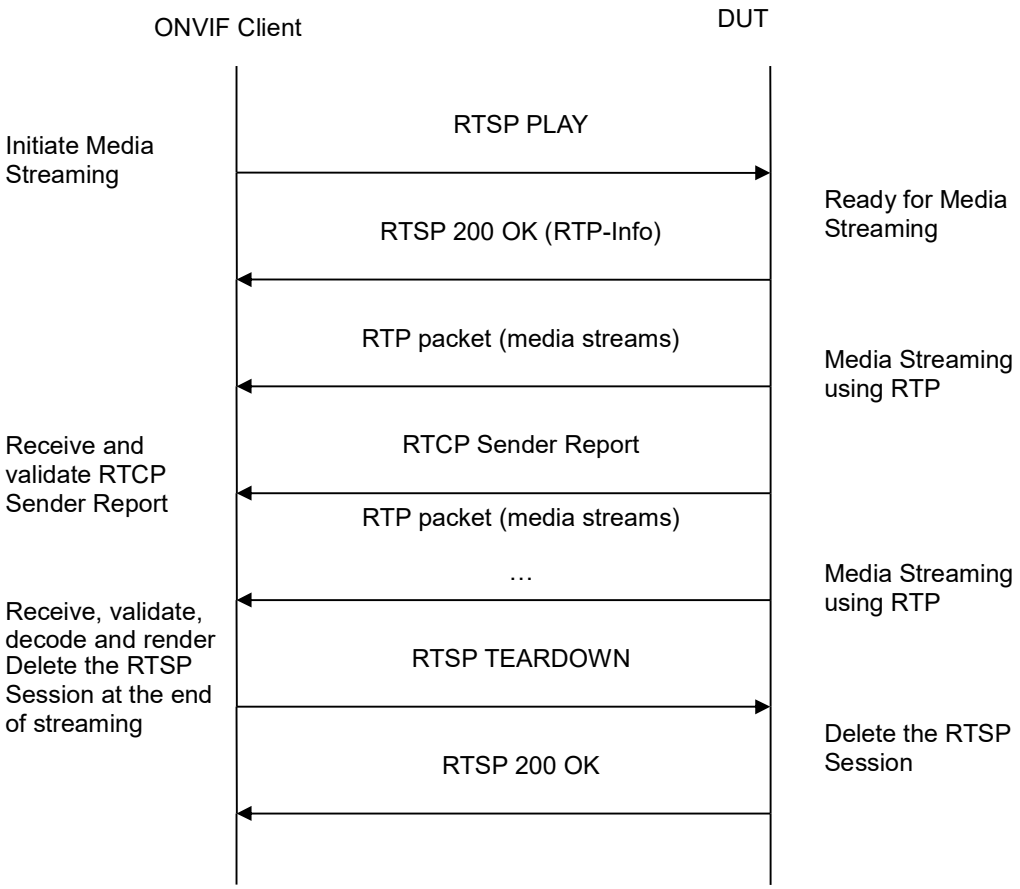
Test Propose: To verify JPEG/G.711 media streaming based on RTP-Multicast/UDP Transport for IPv4.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT. A media profile with JPEG video encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest (JPEG, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1, force persistence = false)
Set JPEG video encoding and multicast settings
Modify JPEG video encoding and multicast settings
SetVideoEncoderConfigurationResponse
SetAudioEncoderConfigurationRequest (G711, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1, force persistence = false)
Set G.711 audio encoding and multicast settings
Modify G.711 audio encoding and multicast settings
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP")
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For video and audio, RTP-Multicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support and with G.711 encoding support by following the procedure mentioned in Annex A.6.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1 and force persistence = false**) to set JPEG encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (**Encoding = "G711", Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1 and force persistence = false**) to set G.711 encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
7. Verify the SetAudioEncoderConfigurationResponse message from the DUT.

8. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP"**) to retrieve media stream URI for the selected media profile.
9. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like **ValidUntilConnect**, **ValidUntilReboot** and **Timeout**.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. The DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Multicast/UDP.
14. The DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. The DUT sends 200 OK message and starts media streaming.
17. The DUT sends JPEG/G.711 RTP multicast media stream to multicast IPv4 address over UDP.
18. The DUT sends RTCP sender report to ONVIF Client.
19. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
21. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send JPEG/G.711 RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.20 MEDIA STREAMING – JPEG/G.711 (RTP-Multicast/UDP, IPv6)

Test Label: Real Time Viewing DUT JPEG/G.711 Media Streaming Using RTP-Multicast/UDP Transport for IPv6.

Test Case ID: RTSS-3-2-17

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, JPEG over RTP, Stream control, RTSP

Command Under Test: None

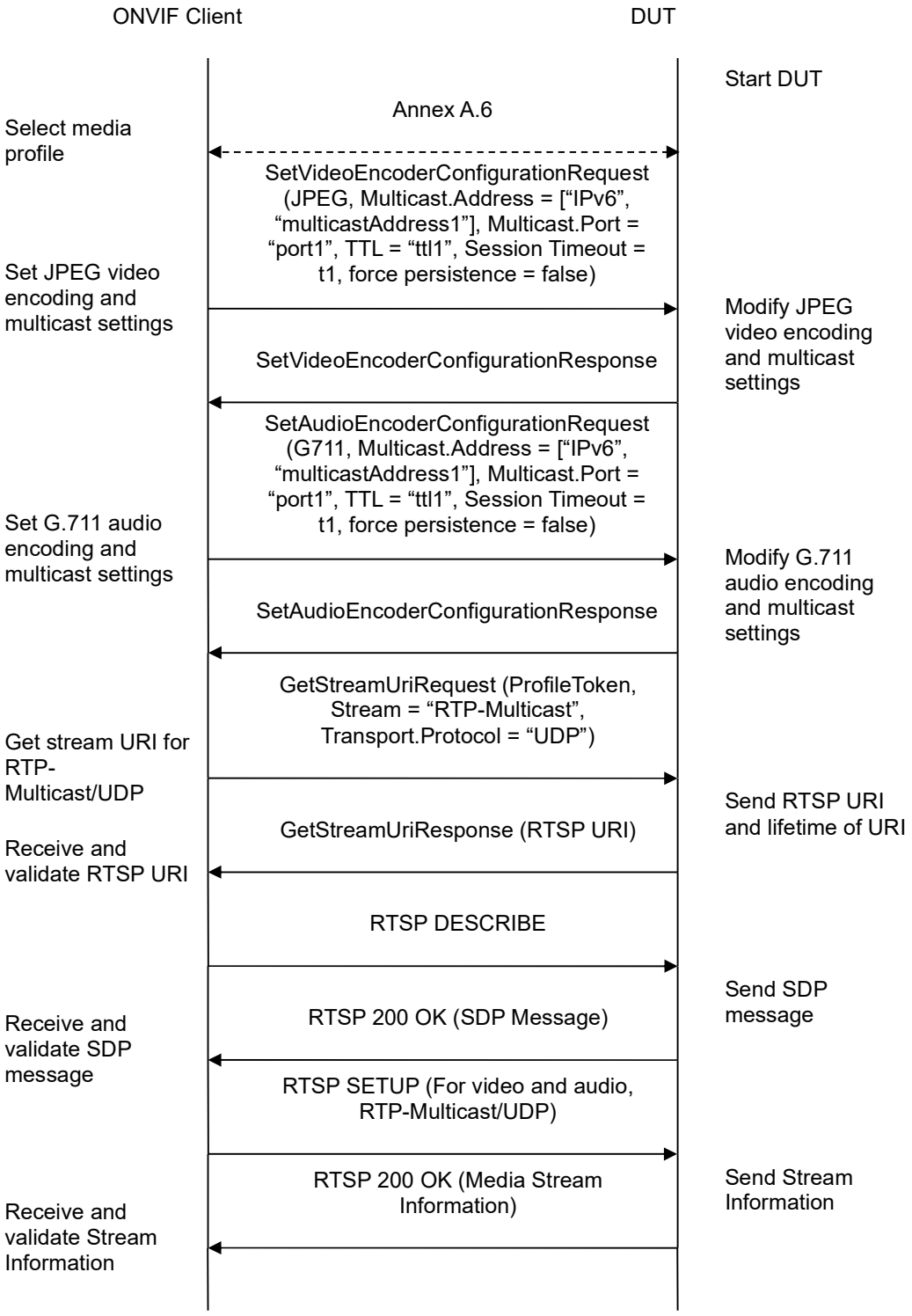
WSDL Reference: None

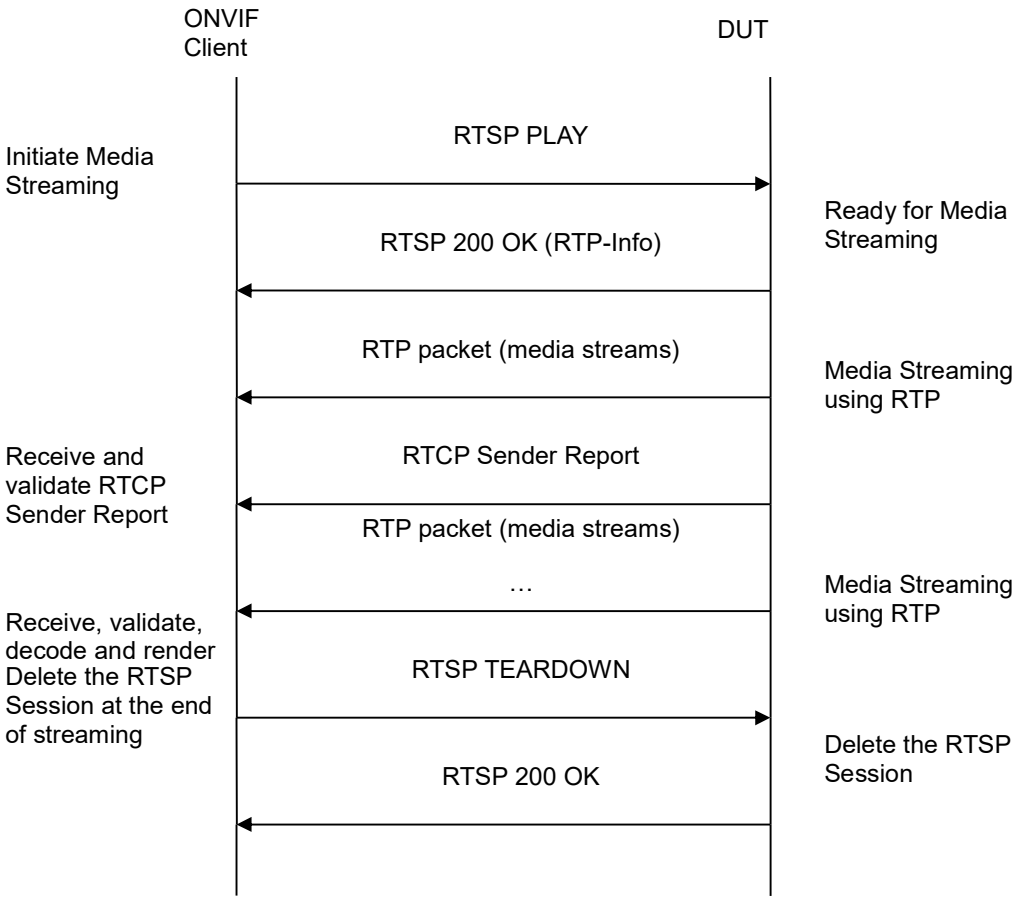
Test Propose: To verify JPEG/G.711 media streaming based on RTP-Multicast/UDP Transport for IPv6.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT. A media profile with JPEG video encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command. IPv6 is turned on for network interface.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest (JPEG, Multicast.Address = ["IPv6", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1, force persistence = false)
Set JPEG video encoding and multicast settings
Modify JPEG video encoding and multicast settings
SetVideoEncoderConfigurationResponse
SetAudioEncoderConfigurationRequest (G711, Multicast.Address = ["IPv6", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1, force persistence = false)
Set G.711 audio encoding and multicast settings
Modify G.711 audio encoding and multicast settings
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP")
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For video and audio, RTP-Multicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support and with G.711 encoding support by following the procedure mentioned in Annex A.6.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv6”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set JPEG encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (**Encoding = “G711”, Bitrate = r1, SampleRate = r2, Multicast.Address = [“IPv6”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false**) to set G.711 encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
7. Verify the SetAudioEncoderConfigurationResponse message from the DUT.

8. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP"**) to retrieve media stream URI for the selected media profile.
9. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. The DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Multicast/UDP**.
14. The DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. The DUT sends 200 OK message and starts media streaming.
17. The DUT sends JPEG/G.711 RTP multicast media stream to multicast IPv4 address over UDP.
18. The DUT sends RTCP sender report to ONVIF Client.
19. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
21. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send JPEG/G.711 RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.21 MEDIA STREAMING – JPEG/G.726 (RTP-Multicast/UDP, IPv4)

Test Label: Real Time Viewing DUT JPEG/G.726 Media Streaming Using RTP-Multicast/UDP Transport for IPv4.

Test Case ID: RTSS-3-2-18

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, JPEG over RTP, Stream control, RTSP

Command Under Test: None

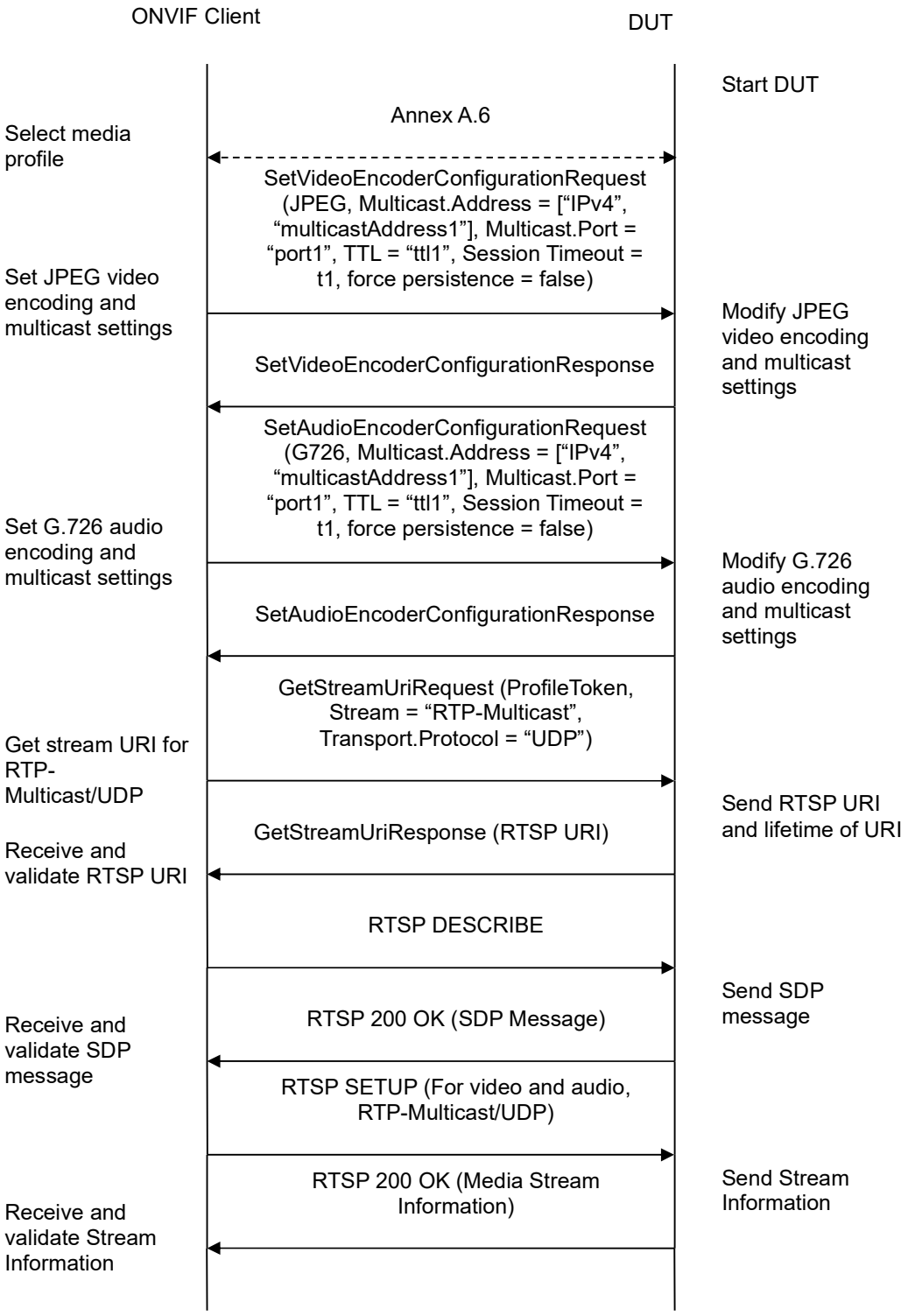
WSDL Reference: None

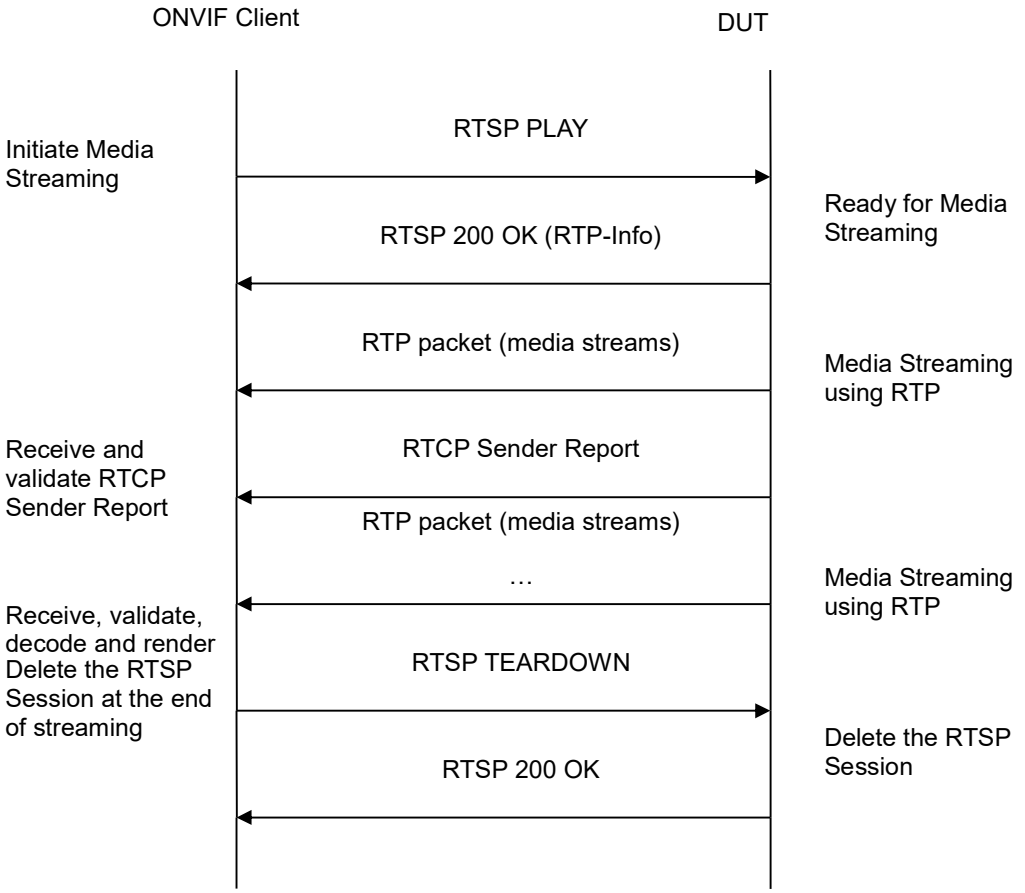
Test Propose: To verify JPEG/G.726 media streaming based on RTP-Multicast/UDP Transport for IPv4.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT. A media profile with JPEG video encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest (JPEG, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1, force persistence = false)
Set JPEG video encoding and multicast settings
Modify JPEG video encoding and multicast settings
SetVideoEncoderConfigurationResponse
SetAudioEncoderConfigurationRequest (G726, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1, force persistence = false)
Set G.726 audio encoding and multicast settings
Modify G.726 audio encoding and multicast settings
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP”)
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For video and audio, RTP-Multicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support and with G.726 encoding support by following the procedure mentioned in Annex A.6.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set JPEG encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (**Encoding = “G726”, Bitrate = r1, SampleRate = r2, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false**) to set G.726 encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
7. Verify the SetAudioEncoderConfigurationResponse message from the DUT.

8. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP"**) to retrieve media stream URI for the selected media profile.
9. The DUT sends the **GetStreamUriResponse** message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. The DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Multicast/UDP**.
14. The DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. The DUT sends 200 OK message and starts media streaming.
17. The DUT sends JPEG/G.711 RTP multicast media stream to multicast IPv4 address over UDP.
18. The DUT sends RTCP sender report to ONVIF Client.
19. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
21. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send JPEG/G.726 RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.22 MEDIA STREAMING – JPEG/G.726 (RTP-Multicast/UDP, IPv6)

Test Label: Real Time Viewing DUT JPEG/G.726 Media Streaming Using RTP-Multicast/UDP Transport for IPv6.

Test Case ID: RTSS-3-2-19

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, JPEG over RTP, Stream control, RTSP

Command Under Test: None

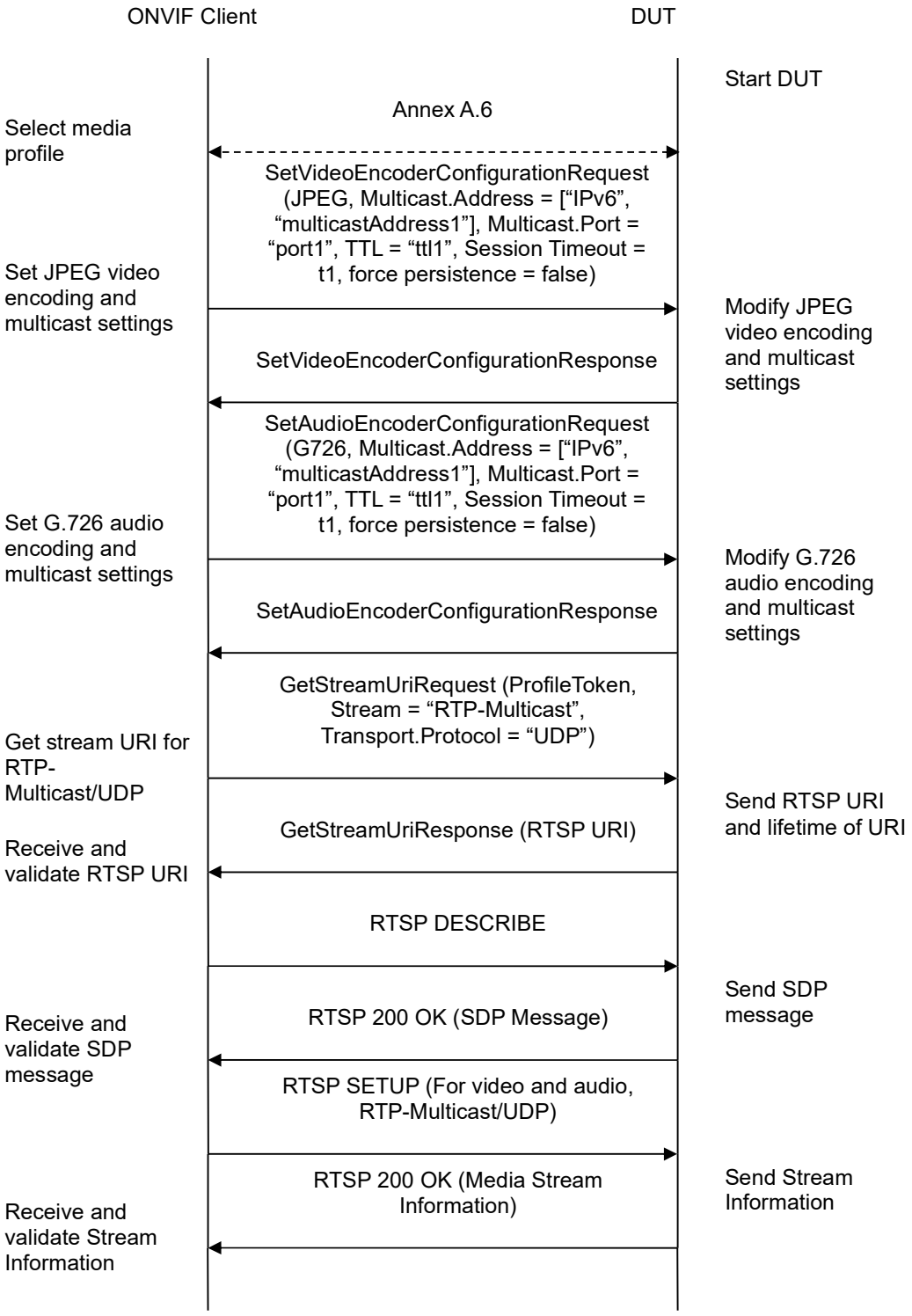
WSDL Reference: None

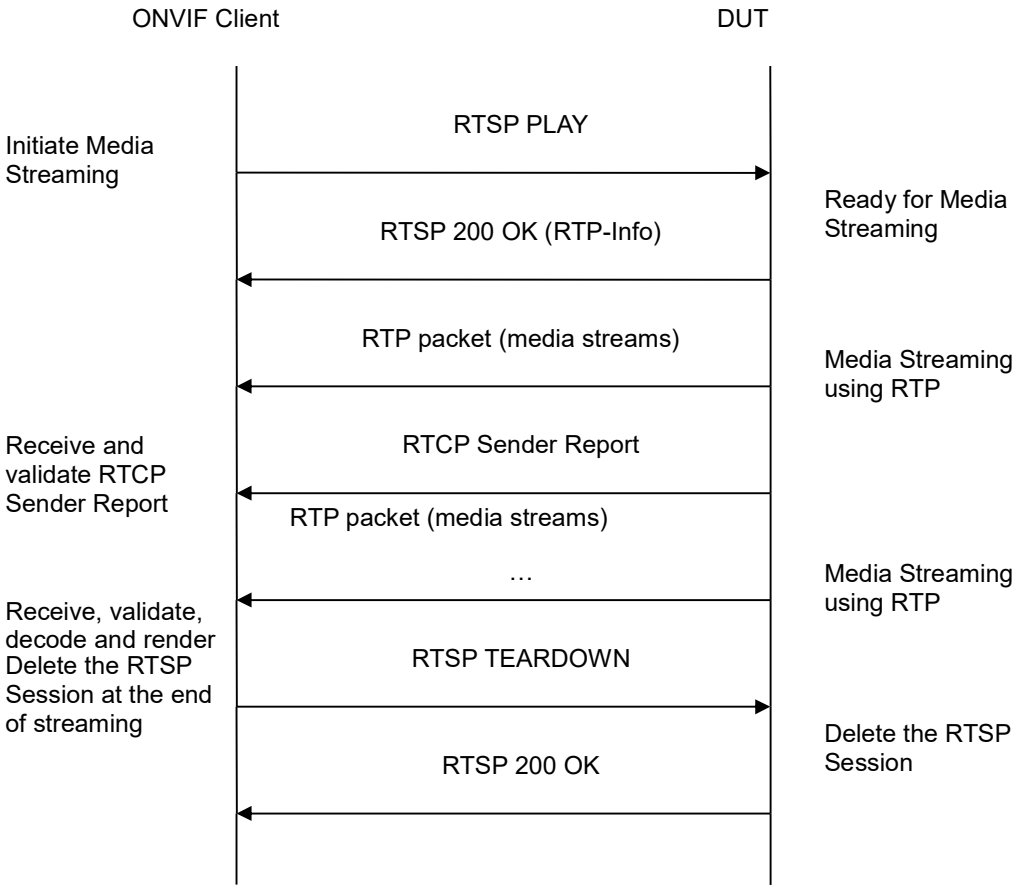
Test Propose: To verify JPEG/G.726 media streaming based on RTP-Multicast/UDP Transport for IPv6.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT. A media profile with JPEG video encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command. IPv6 is turned on for network interface.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest (JPEG, Multicast.Address = [“IPv6”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1, force persistence = false)
Set JPEG video encoding and multicast settings
Modify JPEG video encoding and multicast settings
SetVideoEncoderConfigurationResponse
SetAudioEncoderConfigurationRequest (G726, Multicast.Address = [“IPv6”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1, force persistence = false)
Set G.726 audio encoding and multicast settings
Modify G.726 audio encoding and multicast settings
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP”)
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For video and audio, RTP-Multicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support and with G.726 encoding support by following the procedure mentioned in Annex A.6.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Multicast.Address = ["IPv6", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1 and force persistence = false**) to set JPEG encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (**Encoding = "G711", Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv6", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1 and force persistence = false**) to set G.726 encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
7. Verify the SetAudioEncoderConfigurationResponse message from the DUT.

8. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP"**) to retrieve media stream URI for the selected media profile.
9. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. The DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Multicast/UDP**.
14. The DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. The DUT sends 200 OK message and starts media streaming.
17. The DUT sends JPEG/G.711 RTP multicast media stream to multicast IPv4 address over UDP.
18. The DUT sends RTCP sender report to ONVIF Client.
19. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
21. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send JPEG/G.726 RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.23 MEDIA STREAMING – JPEG/AAC (RTP-Multicast/UDP, IPv4)

Test Label: Real Time Viewing DUT JPEG/AAC Media Streaming Using RTP-Multicast/UDP Transport for IPv4.

Test Case ID: RTSS-3-2-20

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, JPEG over RTP, Stream control, RTSP

Command Under Test: None

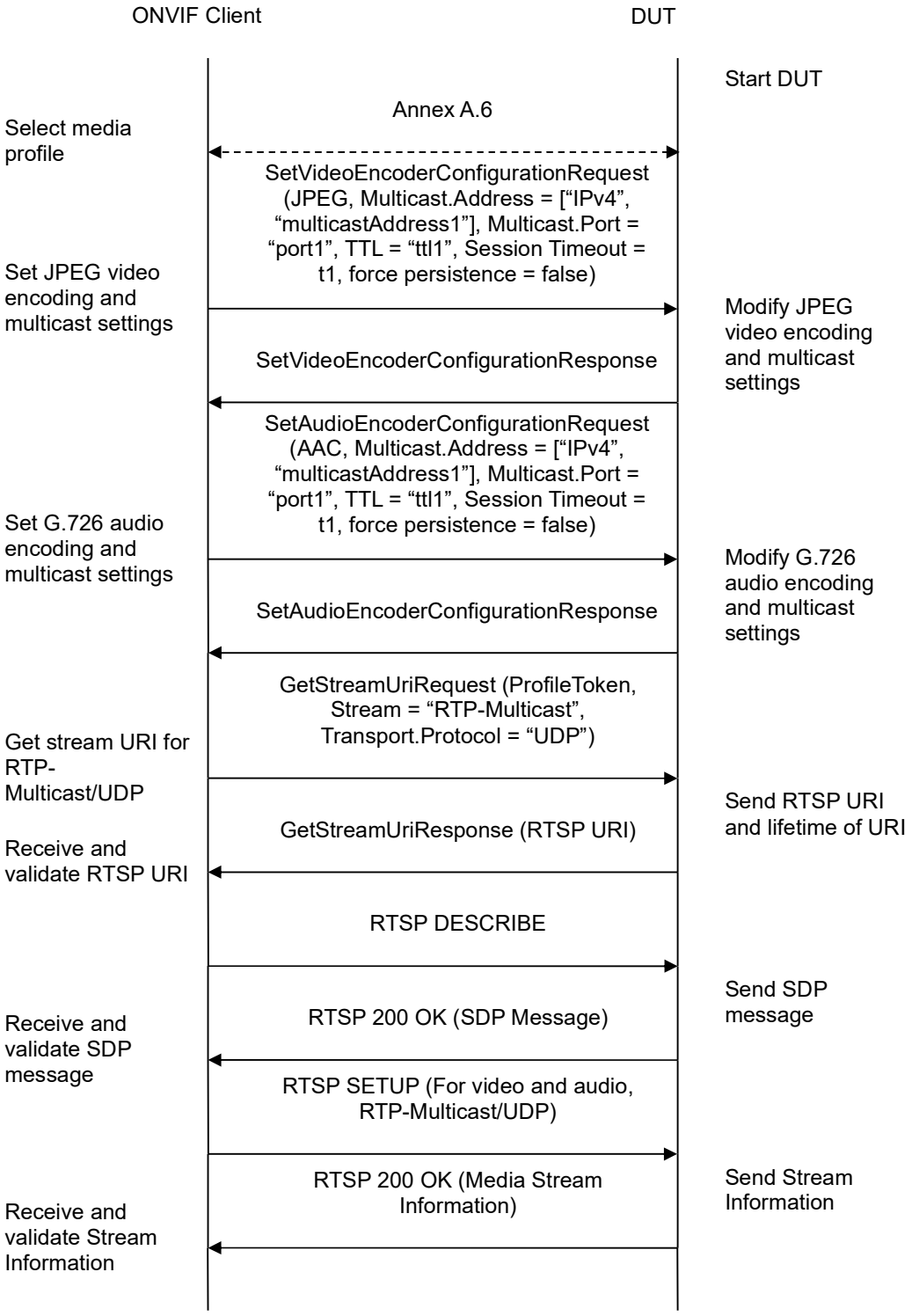
WSDL Reference: None

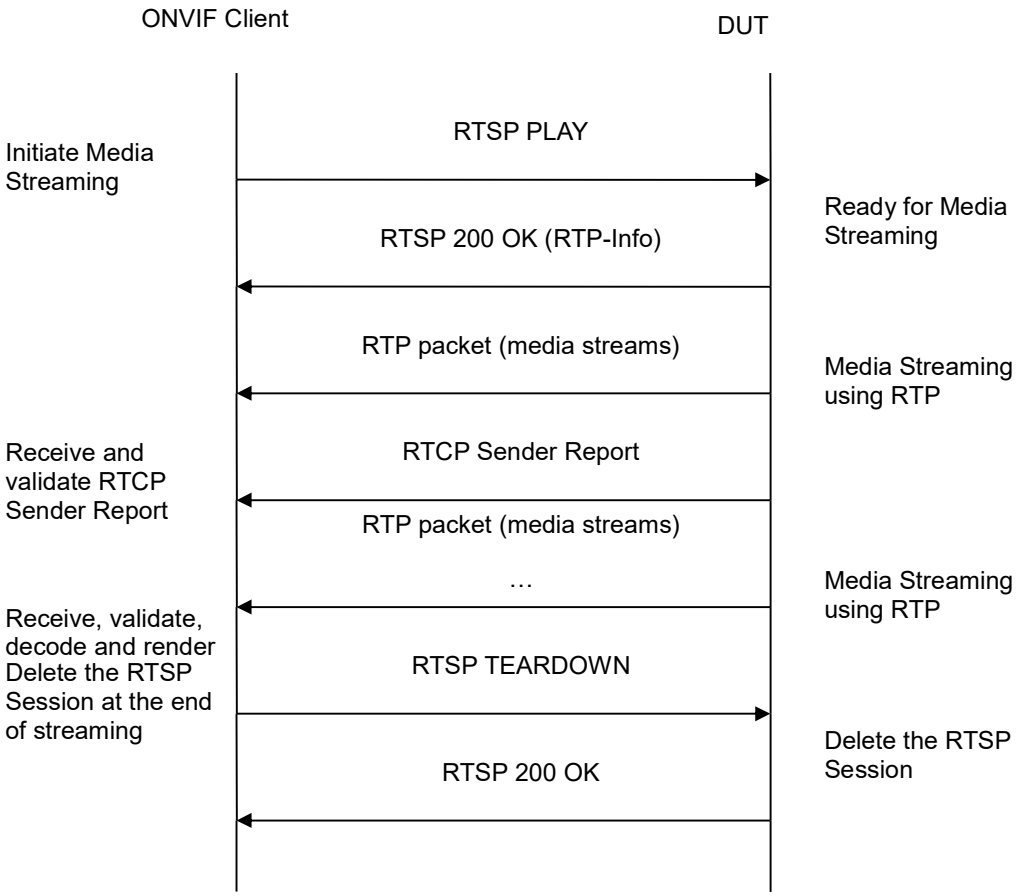
Test Propose: To verify JPEG/AAC media streaming based on RTP-Multicast/UDP Transport for IPv4.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT. A media profile with JPEG video encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest (JPEG, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1, force persistence = false)
Set JPEG video encoding and multicast settings
Modify JPEG video encoding and multicast settings
SetVideoEncoderConfigurationResponse
SetAudioEncoderConfigurationRequest (AAC, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1, force persistence = false)
Set G.726 audio encoding and multicast settings
Modify G.726 audio encoding and multicast settings
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP”)
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For video and audio, RTP-Multicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support and with AAC encoding support by following the procedure mentioned in Annex A.6.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set JPEG encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “AAC”, Bitrate = r1, SampleRate = r2, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set G.726 encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
7. Verify the SetAudioEncoderConfigurationResponse message from the DUT.

8. ONVIF Client invokes GetStreamUriRequest message (ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP”) to retrieve media stream URI for the selected media profile.
9. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. The DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP request with transport parameter RTP-Multicast/UDP.
14. The DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. The DUT sends 200 OK message and starts media streaming.
17. The DUT sends JPEG/AAC RTP multicast media stream to multicast IPv4 address over UDP.
18. The DUT sends RTCP sender report to ONVIF Client.
19. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
21. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send JPEG/AAC RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.24 MEDIA STREAMING – JPEG/AAC (RTP-Multicast/UDP, IPv6)

Test Label: Real Time Viewing DUT JPEG/AAC Media Streaming Using RTP-Multicast/UDP Transport for IPv6.

Test Case ID: RTSS-3-2-21

ONVIF Core Specification Coverage: RTP data transfer via UDP, RTP, RTCP, JPEG over RTP, Stream control, RTSP

Command Under Test: None

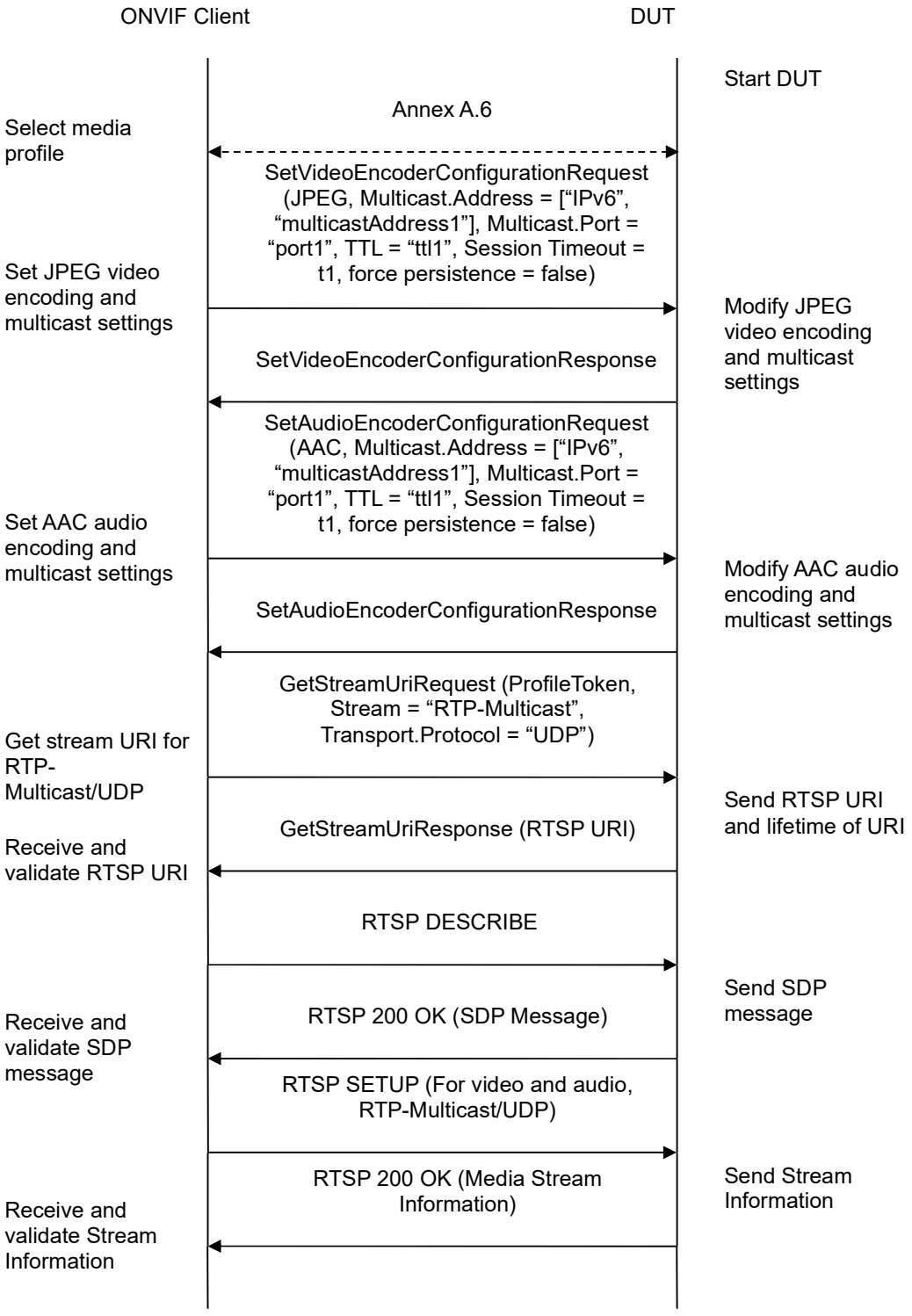
WSDL Reference: None

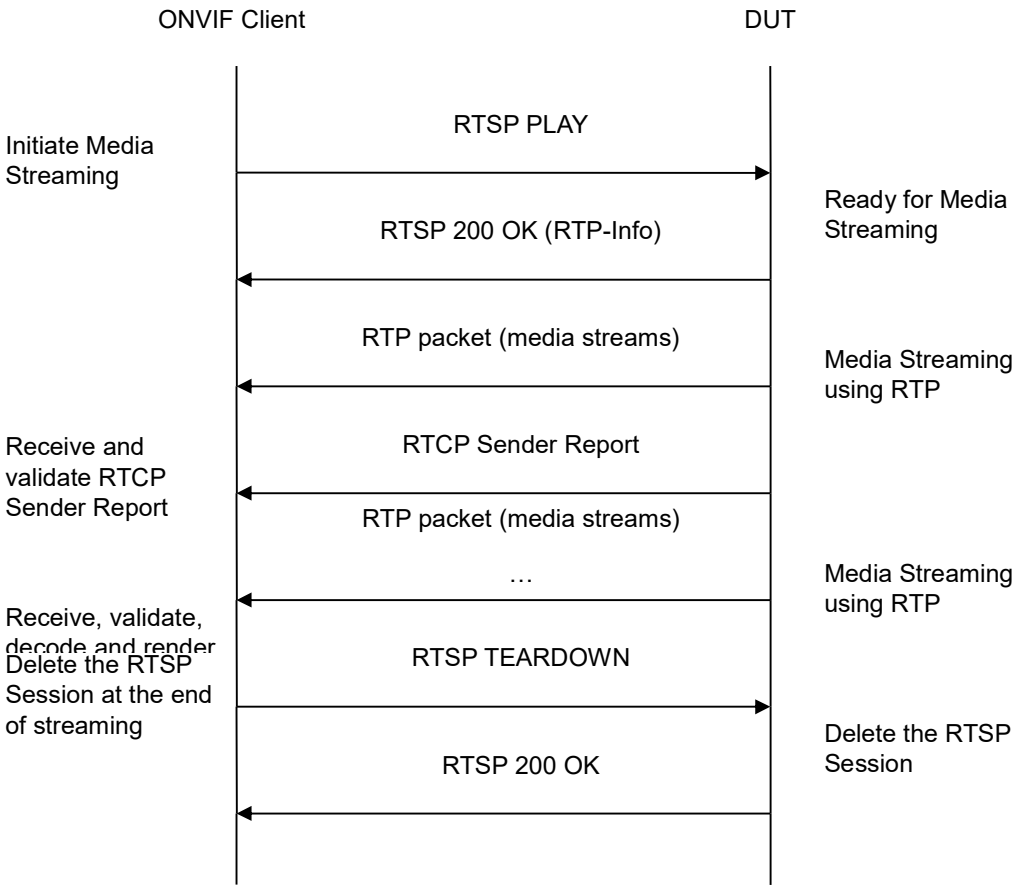
Test Propose: To verify JPEG/AAC media streaming based on RTP-Multicast/UDP Transport for IPv6.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio is supported by DUT. A media profile with JPEG video encoder configuration exists. RTP-Multicast/UDP transport protocol is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command. IPv6 is turned on for network interface.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest (JPEG, Multicast.Address = [“IPv6”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1, force persistence = false)
Set JPEG video encoding and multicast settings
Modify JPEG video encoding and multicast settings
SetVideoEncoderConfigurationResponse
SetAudioEncoderConfigurationRequest (AAC, Multicast.Address = [“IPv6”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1, force persistence = false)
Set AAC audio encoding and multicast settings
Modify AAC audio encoding and multicast settings
SetAudioEncoderConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = “RTP-Multicast”, Transport.Protocol = “UDP”)
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For video and audio, RTP-Multicast/UDP)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG video encoding support and with AAC encoding support by following the procedure mentioned in Annex A.6.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Multicast.Address = ["IPv6", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1 and force persistence = false**) to set JPEG encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (**Encoding = "AAC", Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv6", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1 and force persistence = false**) to set G.726 encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.6.
7. Verify the SetAudioEncoderConfigurationResponse message from the DUT.

8. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP"**) to retrieve media stream URI for the selected media profile.
9. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
10. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
11. ONVIF Client invokes RTSP DESCRIBE request.
12. The DUT sends 200 OK message and SDP information.
13. ONVIF Client invokes RTSP SETUP request with transport parameter **RTP-Multicast/UDP**.
14. ONVIF Client DUT sends 200 OK message and the media stream information.
15. ONVIF Client invokes RTSP PLAY request.
16. The DUT sends 200 OK message and starts media streaming.
17. The DUT sends JPEG/AAC RTP multicast media stream to multicast IPv4 address over UDP.
18. The DUT sends RTCP sender report to ONVIF Client.
19. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
20. ONVIF Client invokes RTSP TEARDOWN control request at the end of media streaming to terminate the RTSP session.
21. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetVideoEncoderConfigurationResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUntilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send JPEG/AAC RTP multicast media streaming for corresponding multicast IP.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.3.25 VIDEO AND AUDIO ENCODER CONFIGURATION – DIFFERENT PORTS

Test Label: Audio and Video Encoder Configuration - Multicast Port (IPv4).

Test Case ID: RTSS-3-2-22

ONVIF Core Specification Coverage: SetAudioEncoderConfiguration, GetAudioEncoderConfiguration, SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, Start multicast streaming, Stop multicast streaming

Command Under Test: SetAudioEncoderConfiguration, GetAudioEncoderConfiguration, SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, StartMulticastStreaming, StopMulticastStreaming

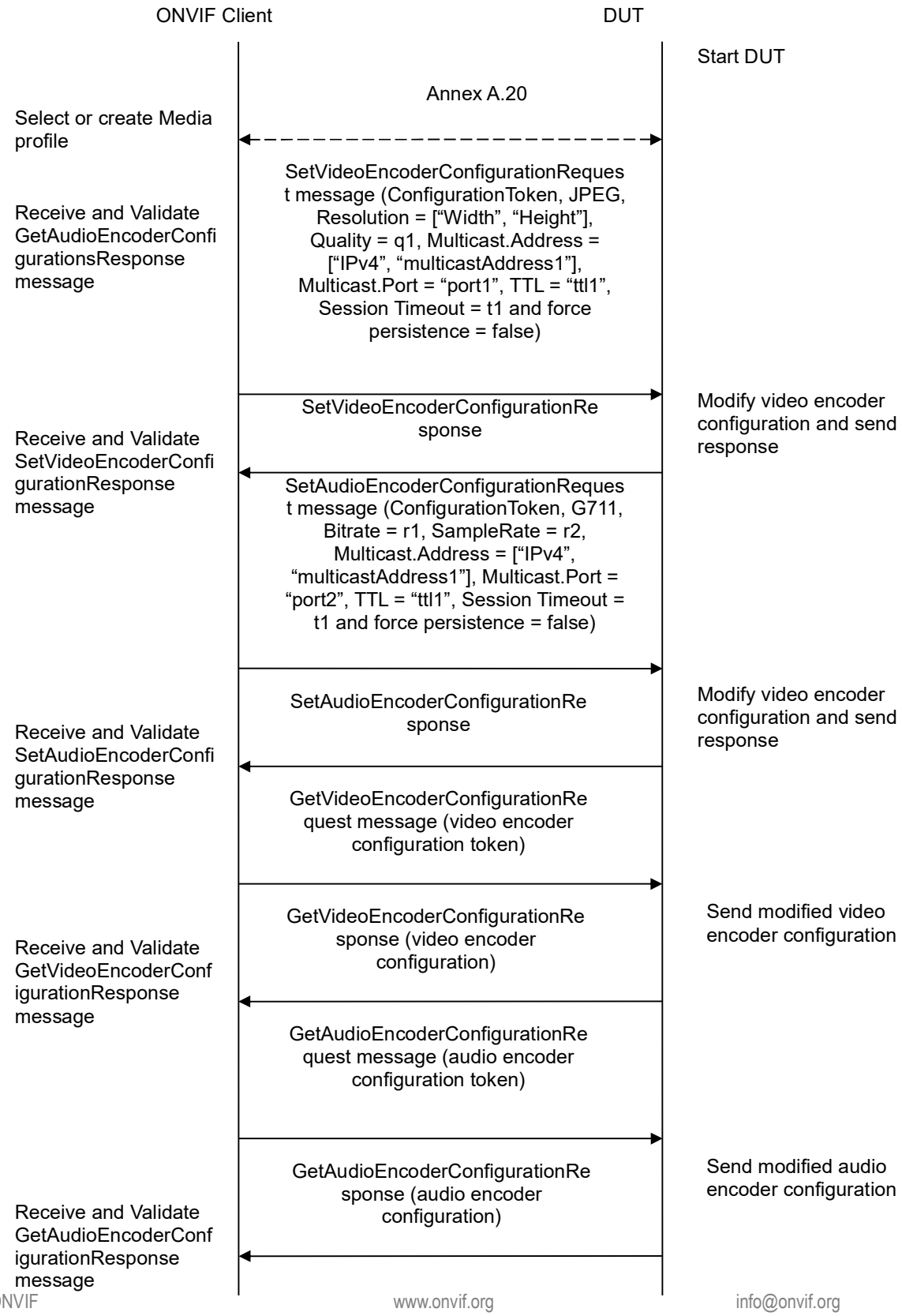
WSDL Reference: media.wsdl

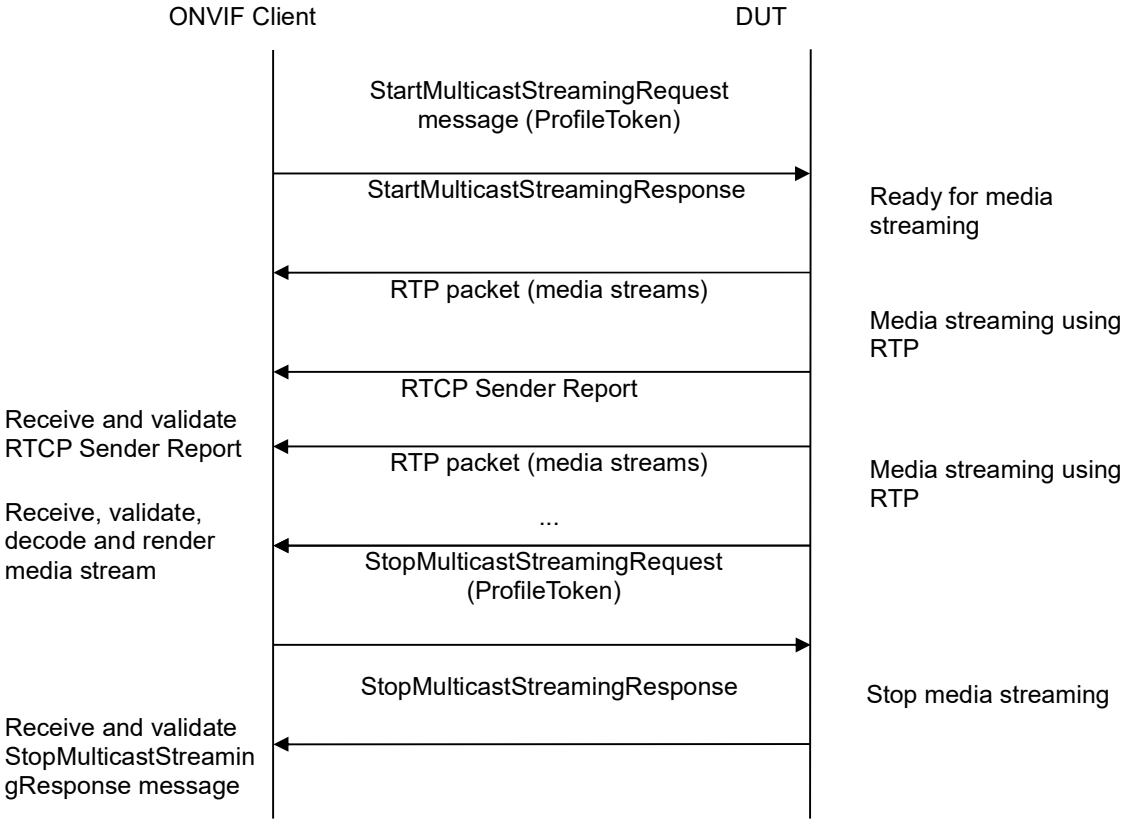
Test Purpose: To verify changing and applying of Multicast port for Audio Encoder Configuration in case of the same Multicast addresses for Audio Encoder Configuration and Video Encoder Configuration in the same profile.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT. At least one Audio Encoder is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.20
Select or create Media profile
SetVideoEncoderConfigurationRequest message (ConfigurationToken, JPEG, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false)
Receive and Validate GetAudioEncoderConfigurationsResponse message
SetVideoEncoderConfigurationResponse
Modify video encoder configuration and send response
Receive and Validate SetVideoEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest message (ConfigurationToken, G711, Bitrate = r1, SampleRate = r2, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port2”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false)
SetAudioEncoderConfigurationResponse
Modify video encoder configuration and send response
Receive and Validate SetAudioEncoderConfigurationResponse message
GetVideoEncoderConfigurationRequest message (video encoder configuration token)
GetVideoEncoderConfigurationResponse (video encoder configuration)
Send modified video encoder configuration
Receive and Validate GetVideoEncoderConfigurationResponse message
GetAudioEncoderConfigurationRequest message (audio encoder configuration token)
GetAudioEncoderConfigurationResponse (audio encoder configuration)
Send modified audio encoder configuration
Receive and Validate GetAudioEncoderConfigurationResponse message



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG and G.711 encoding support (see Annex A.20).
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (**Encoding = "JPEG", Resolution = ["Width", "Height"], Quality = q1, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1 and force persistence = false**) to set JPEG encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.20.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (**Encoding = "G711", Bitrate = r1, SampleRate = r2, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port2", TTL = "ttl1", Session Timeout = t1 and force persistence = false**) to set G.711 encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.20.
7. Verify the SetAudioEncoderConfigurationResponse message from the DUT.

8. ONVIF Client invokes GetVideoEncoderConfigurationRequest message to get audio encoder configuration.
9. Verify the GetVideoEncoderConfigurationResponse message (Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”) from the DUT. Check that new setting for Multicast.Port and Multicast.Address was applied.
10. ONVIF Client invokes GetAudioEncoderConfigurationRequest message (ConfigurationToken = AECToken1) to get audio encoder configuration.
11. Verify the GetAudioEncoderConfigurationResponse message (Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port2”) from the DUT. Check that new setting for Multicast.Port and Multicast.Address was applied.
12. ONVIF Client will invoke StartMulticastStreamingRequest message (ProfileToken) to start multicast streaming.
13. Verify the StartMulticastStreamingResponse message from the DUT.
14. The DUT sends JPEG/G.711 RTP multicast media stream to multicast IPv4 address over UDP.
15. The DUT sends RTCP sender report to ONVIF Client.
16. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
17. ONVIF Client validates that specified multicast address and port are used.
18. ONVIF Client will invoke StopMulticastStreamingRequest message (ProfileToken) to stop multicast streaming
19. Verify the StopMulticastStreamingResponse message from the DUT.
20. Verify that multicast stream is stopped by the DUT.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

The DUT did not send valid GetVideoEncoderConfigurationsResponse message.

The DUT did not send valid SetVideoEncoderConfigurationResponse message.

The DUT did not send valid GetVideoEncoderConfigurationResponse message with new Multicast.Address and Multicast.Port values that were set during steps 4-5.

The DUT did not send valid GetAudioEncoderConfigurationsResponse message.

The DUT did not send valid SetAudioEncoderConfigurationResponse message.

The DUT did not send valid GetAudioEncoderConfigurationResponse message with new Multicast.Address and Multicast.Port values that were set during steps 6-7.

The DUT did not send valid StartMulticastStreamingResponse message.

The DUT did not send valid audio and video stream to specified multicast address and port.

The DUT did not send valid StopMulticastStreamingResponse message.

4.3.26 VIDEO AND AUDIO ENCODER CONFIGURATION – DIFFERENT ADDRESS

Test Label: Audio and Video Encoder Configuration - Multicast Address (IPv4).

Test Case ID: RTSS-3-2-23

ONVIF Core Specification Coverage: SetAudioEncoderConfiguration, GetAudioEncoderConfiguration, SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, Start multicast streaming, Stop multicast streaming

Command Under Test: SetAudioEncoderConfiguration, GetAudioEncoderConfiguration, SetVideoEncoderConfiguration, GetVideoEncoderConfiguration, StartMulticastStreaming, StopMulticastStreaming

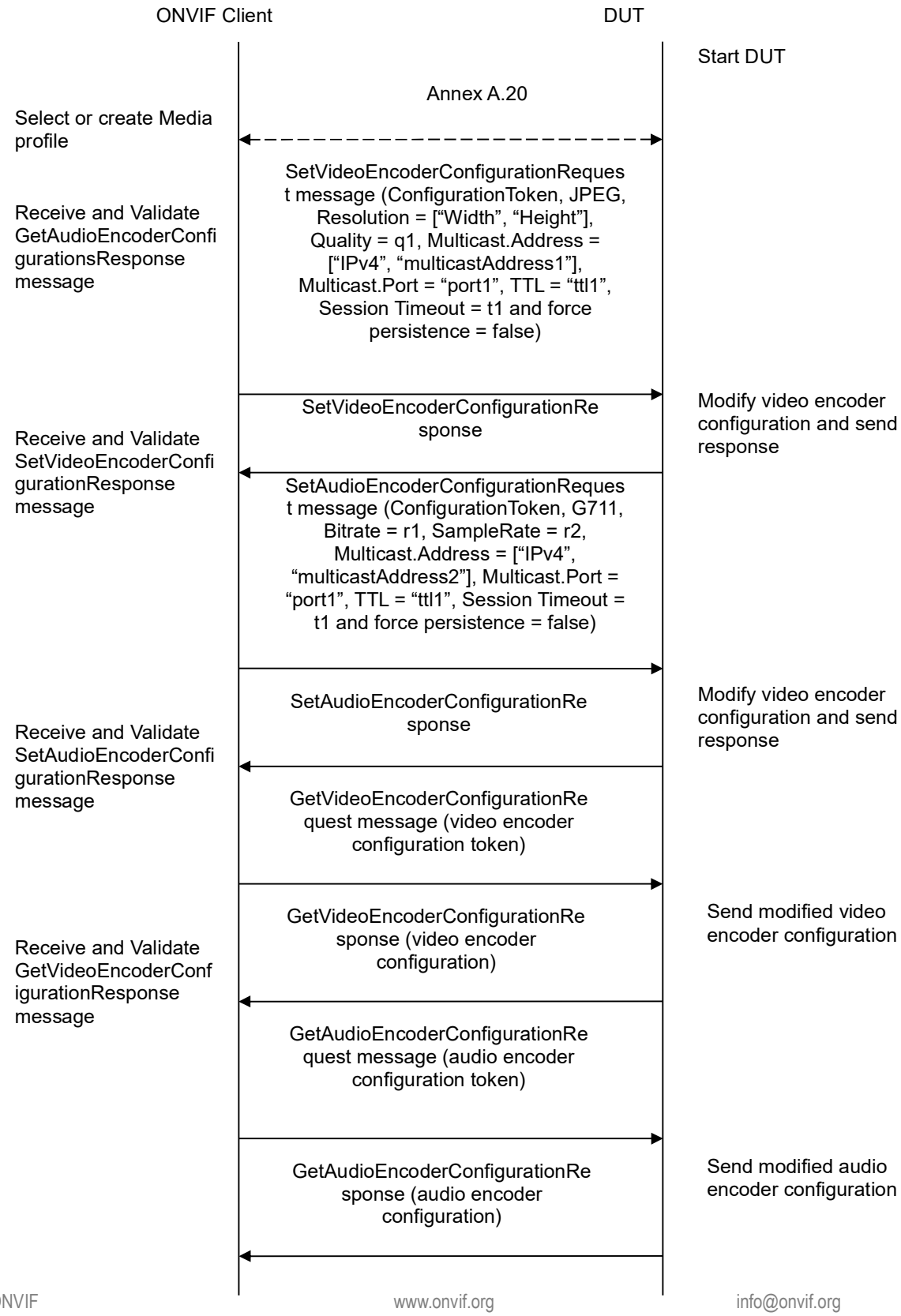
WSDL Reference: media.wsdl

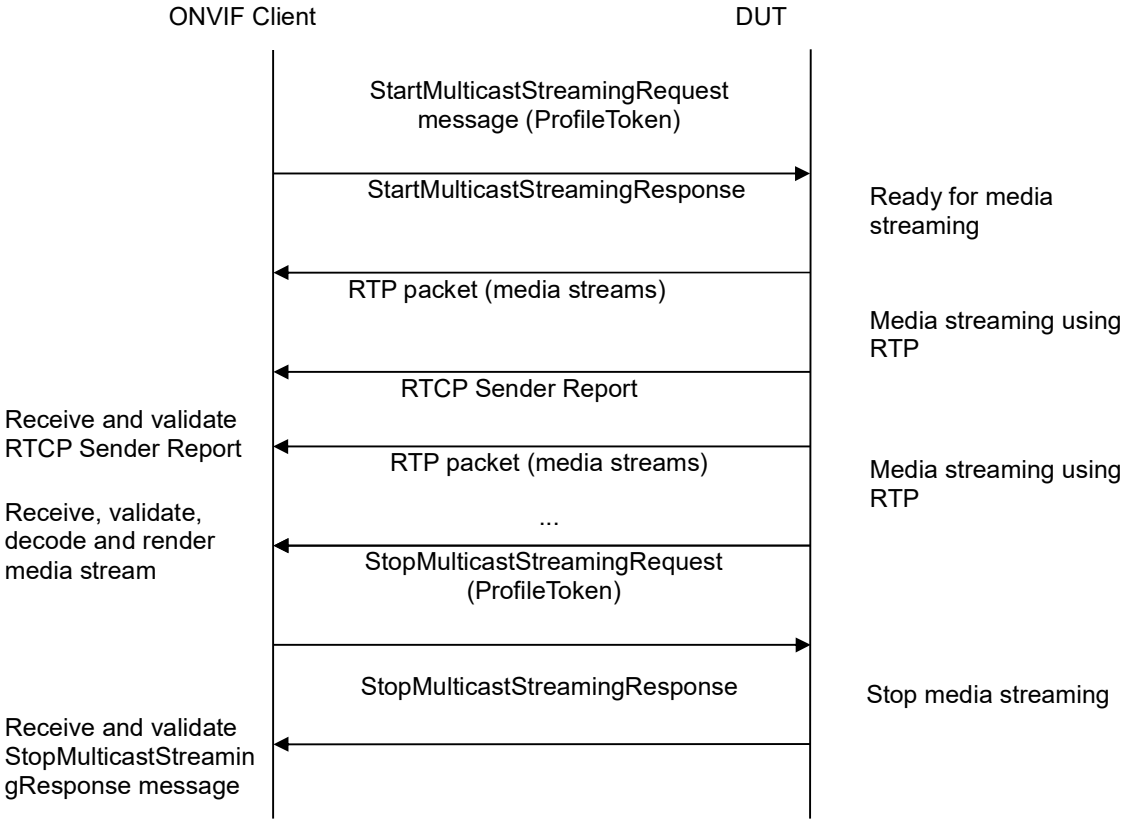
Test Purpose: To verify changing and applying of Multicast port for Audio Encoder Configuration in case of the same Multicast ports for Audio Encoder Configuration and Video Encoder Configuration in the same profile.

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT. Media Service was received from the DUT. At least one Audio Encoder is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.20
Select or create Media profile
SetVideoEncoderConfigurationRequest message (ConfigurationToken, JPEG, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false)
Receive and Validate GetAudioEncoderConfigurationsResponse message
SetVideoEncoderConfigurationResponse
Modify video encoder configuration and send response
Receive and Validate SetVideoEncoderConfigurationResponse message
SetAudioEncoderConfigurationRequest message (ConfigurationToken, G711, Bitrate = r1, SampleRate = r2, Multicast.Address = [“IPv4”, “multicastAddress2”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false)
SetAudioEncoderConfigurationResponse
Modify video encoder configuration and send response
Receive and Validate SetAudioEncoderConfigurationResponse message
GetVideoEncoderConfigurationRequest message (video encoder configuration token)
GetVideoEncoderConfigurationResponse (video encoder configuration)
Send modified video encoder configuration
Receive and Validate GetVideoEncoderConfigurationResponse message
GetAudioEncoderConfigurationRequest message (audio encoder configuration token)
GetAudioEncoderConfigurationResponse (audio encoder configuration)
Send modified audio encoder configuration



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG and G.711 encoding support (see Annex A.20).
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set JPEG encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.20.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G711”, Bitrate = r1, SampleRate = r2, Multicast.Address = [“IPv4”, “multicastAddress2”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set G.711 encoding and Multicast settings. These values will be taken from the GetVideoEncoderConfigurationOptions response in A.20.
7. Verify the SetAudioEncoderConfigurationResponse message from the DUT.

8. ONVIF Client invokes GetVideoEncoderConfigurationRequest message to get audio encoder configuration.
9. Verify the GetVideoEncoderConfigurationResponse message (Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”) from the DUT. Check that new setting for Multicast.Port and Multicast.Address was applied.
10. ONVIF Client invokes GetAudioEncoderConfigurationRequest message (ConfigurationToken = AECToken1) to get audio encoder configuration.
11. Verify the GetAudioEncoderConfigurationResponse message (Multicast.Address = [“IPv4”, “multicastAddress2”], Multicast.Port = “port1”) from the DUT. Check that new setting for Multicast.Port and Multicast.Address was applied.
12. ONVIF Client will invoke StartMulticastStreamingRequest message (ProfileToken) to start multicast streaming.
13. Verify the StartMulticastStreamingResponse message from the DUT.
14. The DUT sends JPEG/G.711 RTP multicast media stream to multicast IPv4 address over UDP.
15. The DUT sends RTCP sender report to ONVIF Client.
16. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
17. ONVIF Client validates that specified multicast address and port are used.
18. ONVIF Client will invoke StopMulticastStreamingRequest message (ProfileToken) to stop multicast streaming
19. Verify the StopMulticastStreamingResponse message from the DUT.
20. Verify that multicast stream is stopped by the DUT.

Test Result:

PASS –

The DUT passes all assertions.

FAIL –

The DUT did not send valid GetVideoEncoderConfigurationsResponse message.

The DUT did not send valid SetVideoEncoderConfigurationResponse message.

The DUT did not send valid GetVideoEncoderConfigurationResponse message with new Multicast.Address and Multicast.Port values that were set during steps 4-5.

The DUT did not send valid GetAudioEncoderConfigurationsResponse message.

The DUT did not send valid SetAudioEncoderConfigurationResponse message.

The DUT did not send valid GetAudioEncoderConfigurationResponse message with new Multicast.Address and Multicast.Port values that were set during steps 6-7.

The DUT did not send valid StartMulticastStreamingResponse message.

The DUT did not send valid audio and video stream to specified multicast address and port.

The DUT did not send valid StopMulticastStreamingResponse message.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.4 Notification Streaming Interface

4.4.1 NOTIFICATION STREAMING

Test Label: event handling Notification Streaming

Test Case ID: DRAFT-RTSS-4-1-3

ONVIF Core Specification Coverage: CreateProfile, GetVideoSourceConfigurations, GetMetadataConfigurations, AddVideoSourceConfiguration, AddMetadataConfiguration, SetMetadataConfiguration, GetStreamUri, SetSynchronizationPoint, DeleteProfile, Notification Streaming Interface

Command Under Test: CreateProfile, GetVideoSourceConfigurations, GetMetadataConfigurations, AddVideoSourceConfiguration, AddMetadataConfiguration, SetMetadataConfiguration, GetStreamUri, SetSynchronizationPoint, DeleteProfile

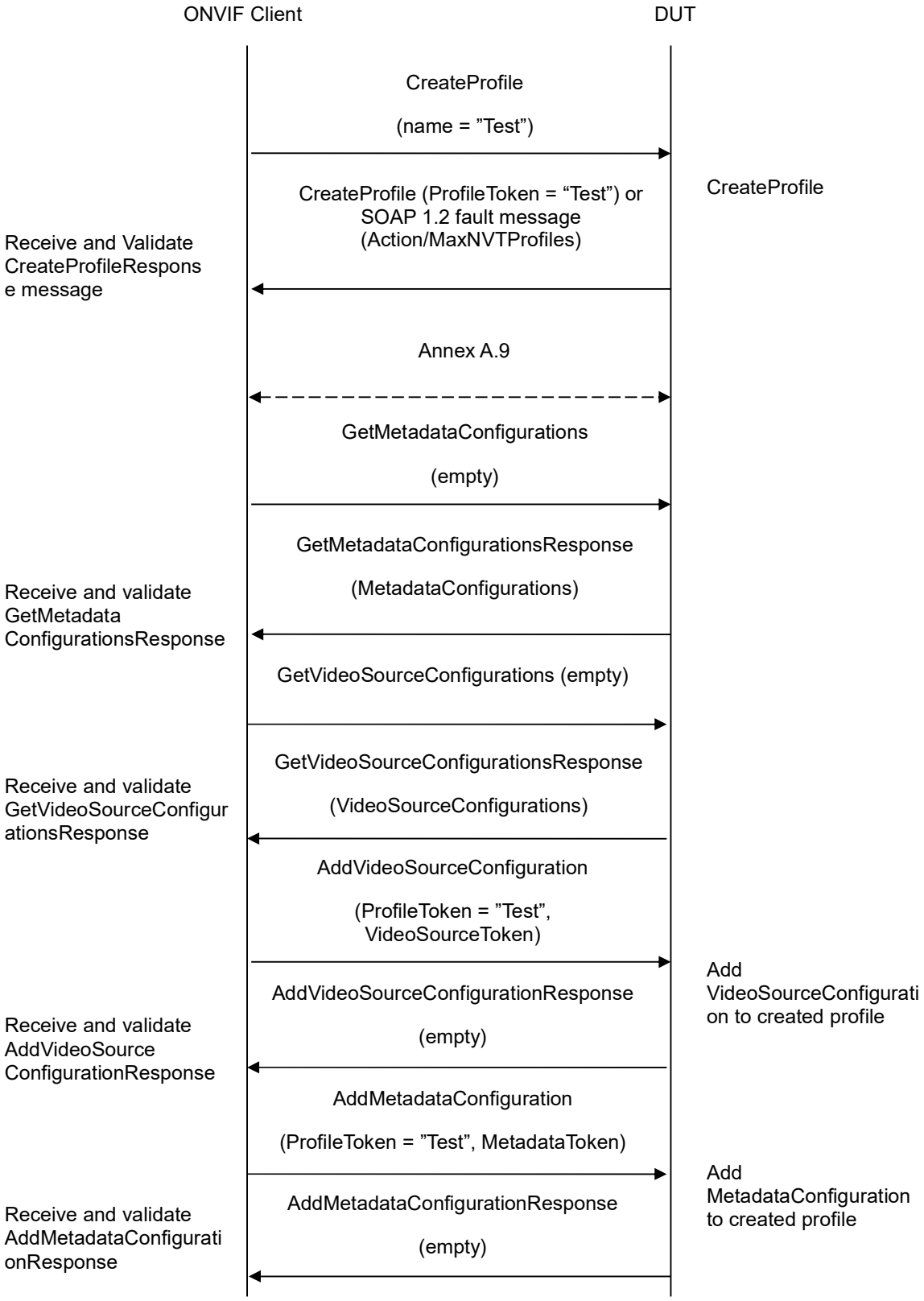
WSDL Reference: media.wsdl

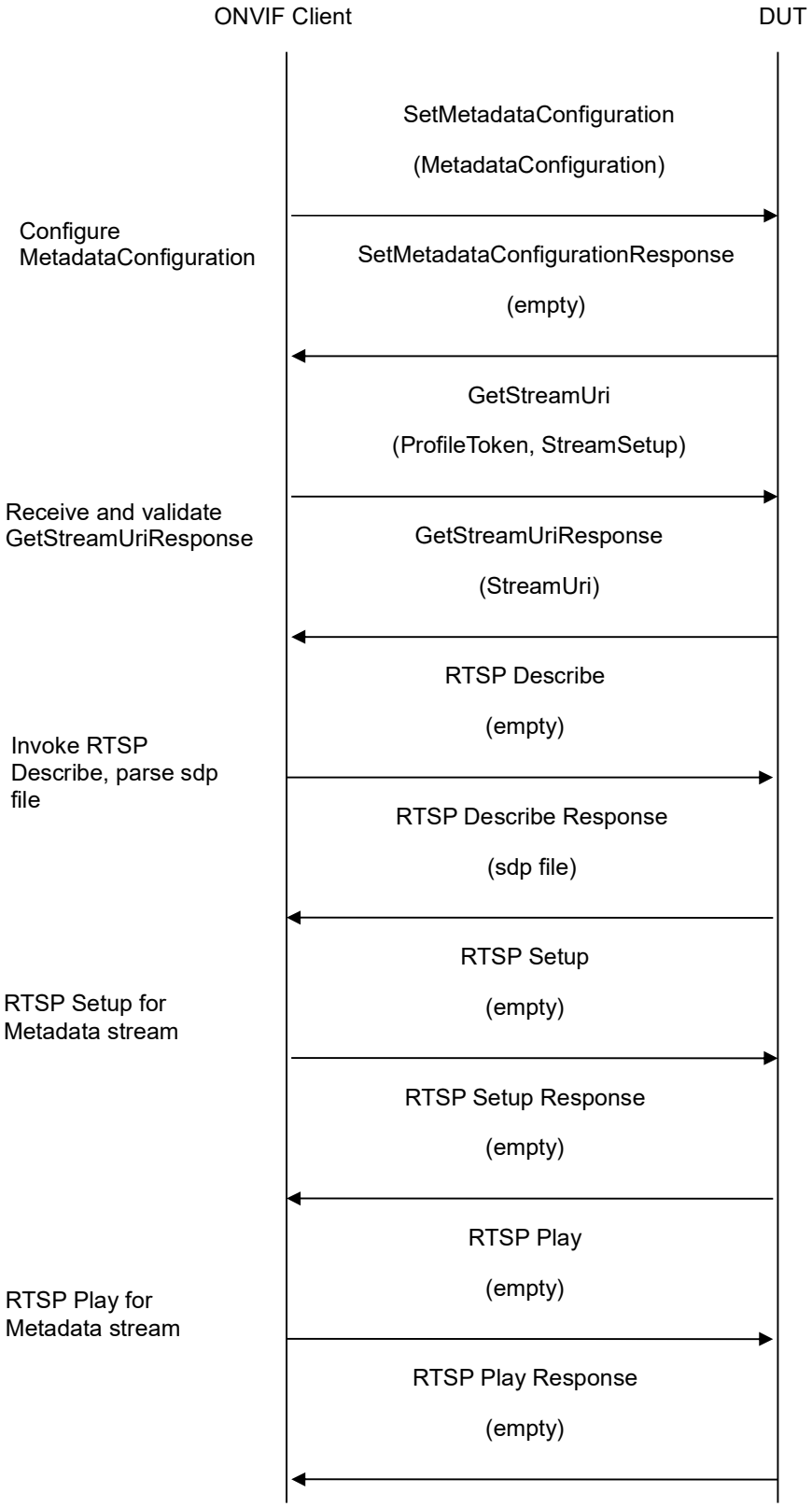
Test Purpose: To verify Notification Streaming

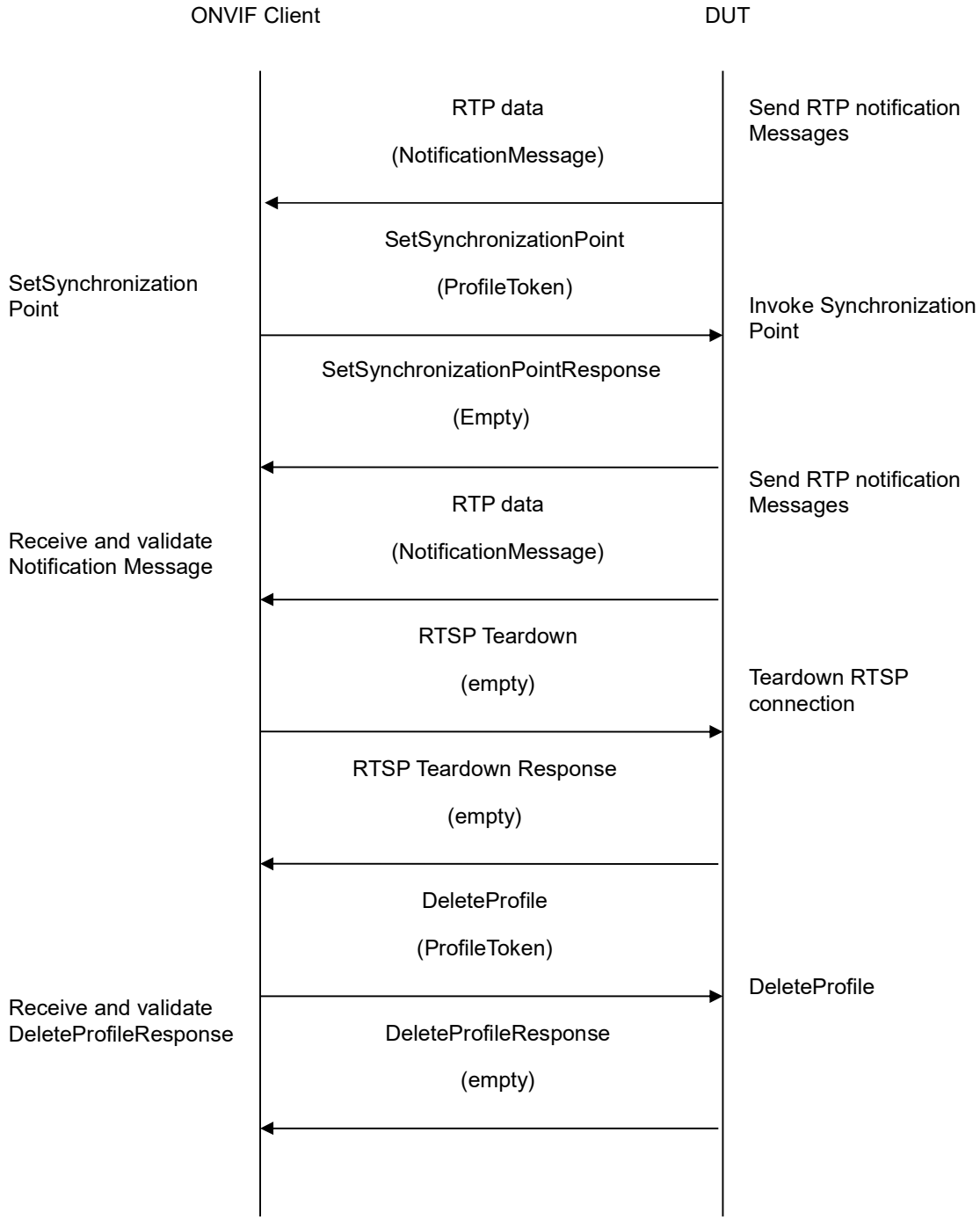
Pre-Requisite: The device needs to provide at least one topic representing a certain property. If the device does not support a property event the vendor SHALL make sure that another event is sent during testing. Real-time streaming supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
CreateProfile
(name = ”Test”)
CreateProfile (ProfileToken = “Test”) or SOAP 1.2 fault message (Action/MaxNVTProfiles)
CreateProfile
Receive and Validate CreateProfileRespons e message
Annex A.9
GetMetadataConfigurations
(empty)
GetMetadataConfigurationsResponse
(MetadataConfigurations)
Receive and validate GetMetadata ConfigurationsResponse
GetVideoSourceConfigurations (empty)
GetVideoSourceConfigurationsResponse
(VideoSourceConfigurations)
Receive and validate GetVideoSourceConfigur ationsResponse
AddVideoSourceConfiguration
(ProfileToken = ”Test”, VideoSourceToken)
AddVideoSourceConfigurationResponse
(empty)
Add VideoSourceConfigurati on to created profile
Receive and validate AddVideoSource ConfigurationResponse
AddMetadataConfiguration
(ProfileToken = ”Test”, MetadataToken)
AddMetadataConfigurationResponse
(empty)
Add MetadataConfiguration to created profile
Receive and validate AddMetadataConfigurati onResponse


ONVIF Client
DUT
SetMetadataConfiguration
(MetadataConfiguration)
Configure MetadataConfiguration
SetMetadataConfigurationResponse
(empty)
GetStreamUri
(ProfileToken, StreamSetup)
Receive and validate GetStreamUriResponse
GetStreamUriResponse
(StreamUri)
RTSP Describe
(empty)
Invoke RTSP Describe, parse sdp file
RTSP Describe Response
(sdp file)
RTSP Setup
(empty)
RTSP Setup for Metadata stream
RTSP Setup Response
(empty)
RTSP Play
(empty)
RTSP Play for Metadata stream
RTSP Play Response
(empty)



Test Procedure:

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

3. ONVIF Client invokes CreateProfile (name = ”Test”) to create a new empty profile that is used for this test scenario.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client will invoke GetMetadataConfigurations to retrieve all existing MetadataConfigurations of the device
6. Verify that the DUT sends a valid GetMetadataConfigurationResponse (that contains at least one MetadataConfiguration).
7. ONVIF Client will invoke GetVideoSourceConfigurations
8. Verify that the DUT sends a valid GetVideoSourceConfigurationResponse
9. ONVIF Client will select a VideoSourceConfiguration and add this configuration to the created profile
10. Verify that the DUT sends a valid AddVideoSourceConfigurationResponse
11. ONVIF Client will select a MetadataConfiguration and add this configuration to the created profile
12. Verify that the DUT sends a valid AddMetadataConfigurationResponse
13. ONVIF Client will invoke SetMetadataConfiguration(<Analytics>false</Analytics>,<Events/>) to configure the Metadata stream; The ONVIF Client is interested in receiving all events, therefore no Filter is applied. For details on the usage of the MetadataConfiguration elements, see Annex A.7.
14. Verify that the DUT sends a valid SetMetadataConfigurationResponse
15. ONVIF Client will invoke GetStreamUri (ProfileToken, RTP-Unicast)
16. Verify that the DUT sends a GetStreamUriResponse including a valid StreamUri
17. ONVIF Client will invoke RTSP Describe to retrieve the sdp file
18. Verify that DUT sends a 200 OK Response
19. Validate sdp file (sdp file contains only one media section; rtpmap = vnd.onvif.metadata)
20. ONVIF Client will invoke RTSP Setup for the Metadata stream
21. Verify that the DUT send a 200 OK Response
22. ONVIF Client will invoke RTSP Play
23. Verify that the DUT sends a 200 OK Response
24. Receive and validate RTP Notification messages
25. ONVIF Client will invoke the SetSynchronizationPoint command to trigger events; if the device does not support property events the vendor SHALL trigger the events manually.
26. Validate that DUT sends a valid SetSynchronizationPointResponse
27. Verify that at least one RTP Notification is sent.

28. Receive and validate RTP Notification messages and check that the PropertyOperation is ”Initialized” or “Changed” if it is an Property event.
29. ONVIF Client will invoke RTSP Teardown to terminate the RTSP session.
30. Verify that DUT sends a 200 OK Response.
31. If used created Media Profile, then ONVIF Client invokes DeleteProfile request. Otherwise ONVIF client skip rest steps and restore profile settings.
32. The DUT deletes the media profile and sends the response.

Test Result:

PASS –

The DUT passed all assertions.

FAIL –

The DUT did not send a CreateProfileResponse

The DUT did not send a valid CreateProfileResponse

The DUT did not send valid GetMetadataConfigurationsResponse; At least one MetadataConfiguration SHALL be present

The DUT did not send a valid GetVideoSourceConfigurationsResponse

The DUT did not send a valid AddVideoSourceConfigurationResponse

The DUT did not send a valid AddMetadataConfigurationResponse

The DUT did not send a valid SetMetadataConfigurationResponse

The DUT did not send a GetStreamUriResponse including a valid StreamUri

The DUT did not send a 200 OK RTSP DESCRIBE Response

The DUT did not send a valid sdp file

The DUT did not send a 200 OK RTSP SETUP Response

The DUT did not send a 200 OK RTSP PLAY Response

The DUT did not send RTP data

The DUT did not send a SetSynchronizationPointResponse

The DUT did not send at least one event

The DUT did not send RTP data with PropertyOperation = ”Initialized” or “Changed” if it is an property event

The DUT did not send a 200 OK RTSP TEARDOWN Response

The DUT did not send a DeleteProfileResponse

Note: See Annex A.22 for Name and Token Parameters Length limitations.

Note: If profile was deleted during Annex A.9 execution, ONVIF Client restores the deleted profile

and profile settings.

4.5 Start And Stop Multicast Streaming

4.5.1 START AND STOP MULTICAST STREAMING – JPEG (IPv4)

Test Label: Real Time Viewing DUT JPEG Media Streaming Using RTP-Multicast/UDP Transport for IPv4. Media DUT StartMulticastStreaming and StopMulticastStreaming Command Validation.

Test Case ID: RTSS-5-1-7

ONVIF Core Specification Coverage: Start multicast streaming, Stop multicast streaming

Command Under Test: StartMulticastStreaming, StopMulticastStreaming

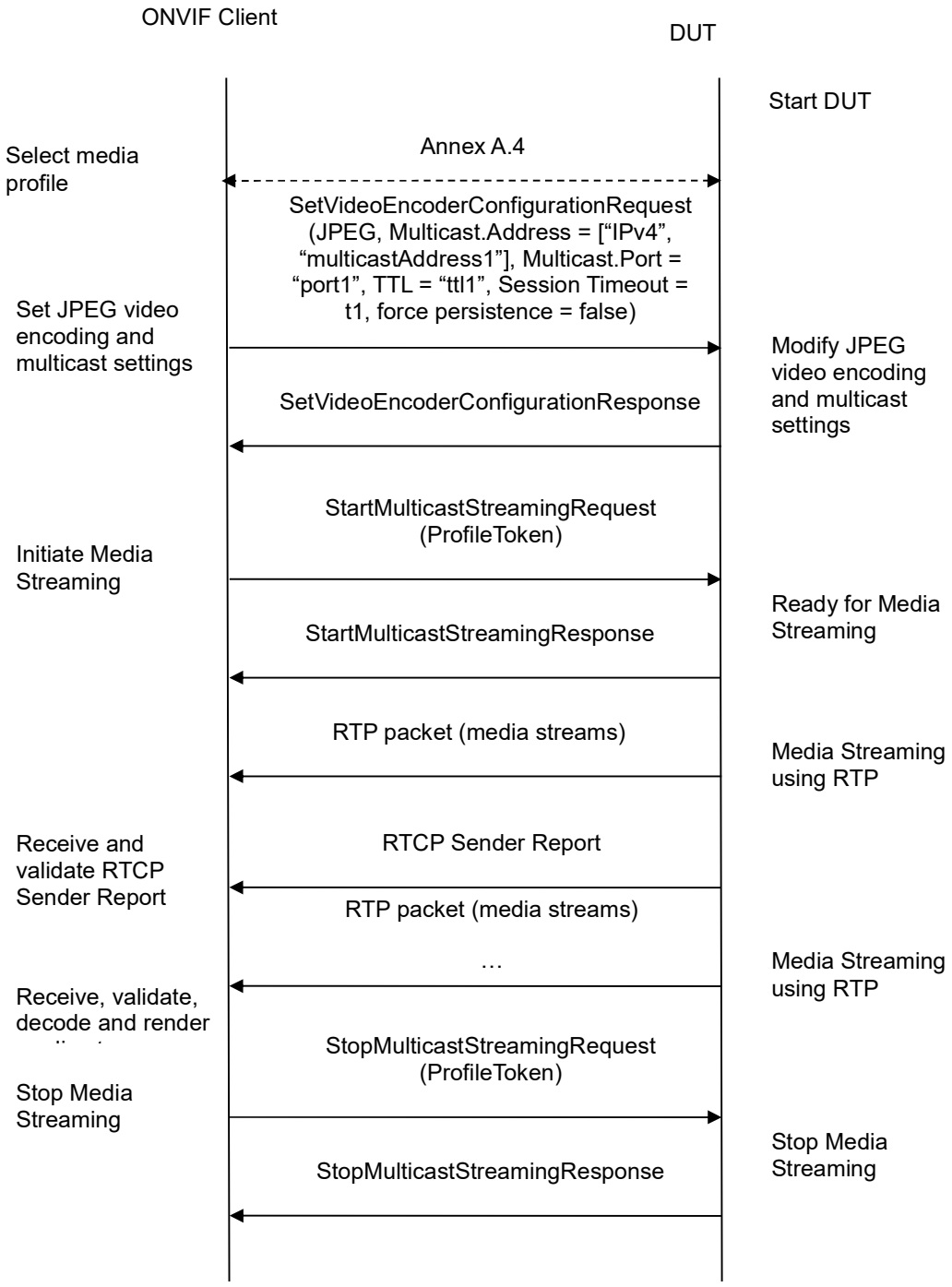
WSDL Reference: media.wsdl

Test Propose: To verify the behavior of StartMulticastStreaming command and StopMulticastStreaming in case of Video Streaming (JPEG).

Test Configuration: ONVIF Client and DUT

Pre-Requisite: Video Multicasting is supported by DUT. Real-time streaming supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command. A media profile with video source configuration and JPEG video encoder configuration.

Test Sequence:



Test Procedure:

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

3. ONVIF Client selects a media profile with JPEG video encoding support by following the procedure mentioned in Annex A.4.
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set JPEG encoding and Multicast settings.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client will invoke StartMulticastStreamingRequest message (ProfileToken) to start multicast streaming.
7. Verify the StartMulticastStreamingResponse message from the DUT.
8. The DUT sends JPEG RTP multicast media stream to multicast IPv4 address over UDP.
9. The DUT sends RTCP sender report to ONVIF Client.
10. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
11. ONVIF Client will invoke StopMulticastStreamingRequest message (ProfileToken) to stop multicast streaming
12. Verify the StopMulticastStreamingResponse message from the DUT.
13. Verify that multicast stream is stopped by the DUT.

Test Results:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send SetVideoEncoderConfigurationResponse.

The DUT sent invalid SetVideoEncoderConfigurationResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse.

The DUT sent invalid SetAudioEncoderConfigurationResponse message.

The DUT did not send SetMetadataConfigurationResponse.

The DUT sent invalid SetMetadataConfigurationResponse message.

The DUT did not send StartMulticastStreamingResponse message.

The DUT sent invalid StartMulticastStreamingResponse message.

The DUT did not send StopMulticastStreamingResponse message.

The DUT sent invalid StopMulticastStreamingResponse message.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send JPEG RTP multicast media streaming for corresponding multicast IP.

The DUT did not stop multicast streaming after StopMulticastStreamingResponse.

Note: See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.5.2 START AND STOP MULTICAST STREAMING – G.711 (IPv4)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP-Multicast/UDP Transport for IPv4. Media DUT StartMulticastStreaming and StopMulticastStreaming Command Validation.

Test Case ID: RTSS-5-1-8

ONVIF Core Specification Coverage: Start multicast streaming, Stop multicast streaming

Command Under Test: StartMulticastStreaming, StopMulticastStreaming

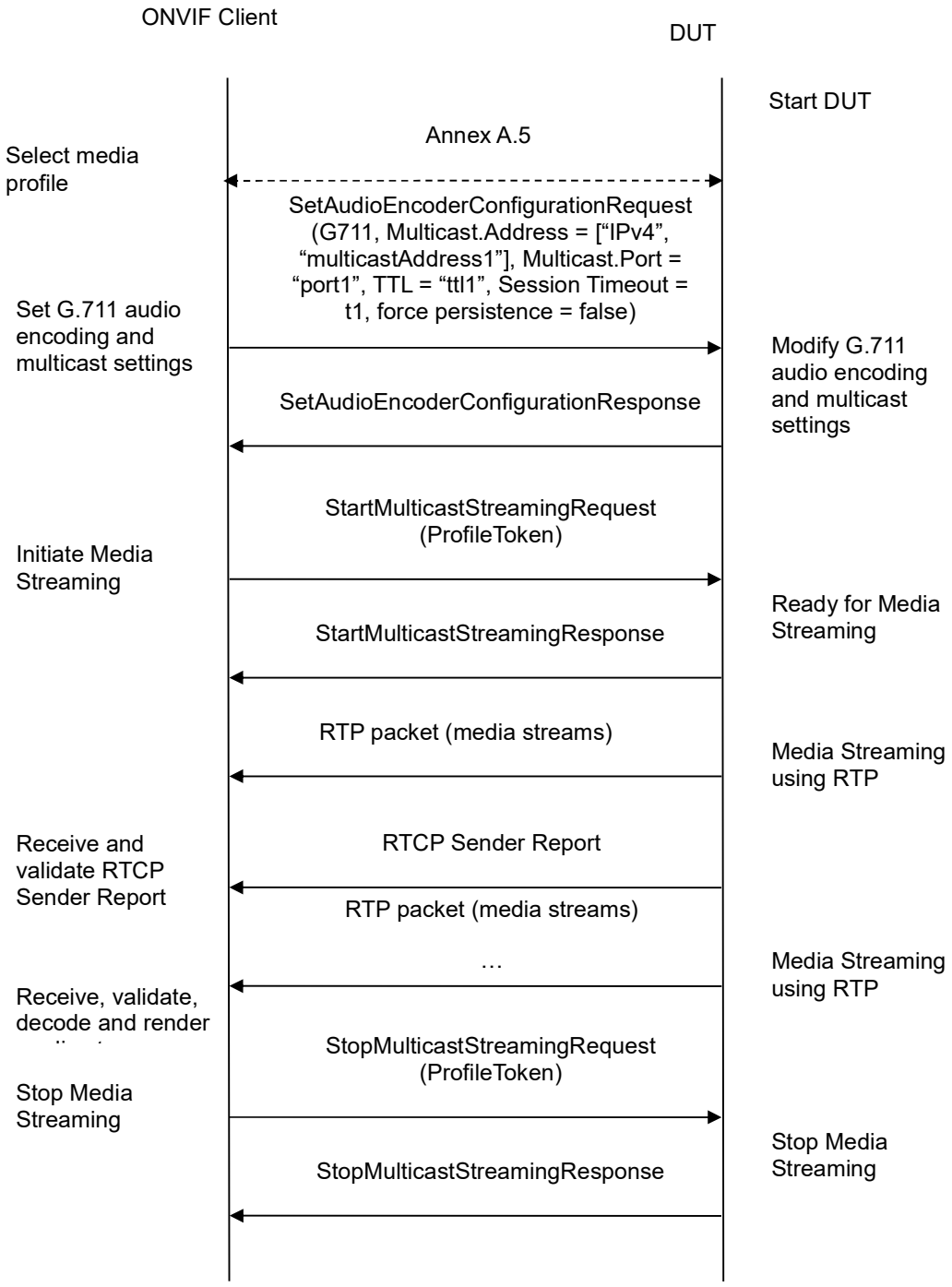
WSDL Reference: media.wsdl

Test Propose: To verify the behavior of StartMulticastStreaming command and StopMulticastStreaming in case of Audio Streaming (G.711).

Test Configuration: ONVIF Client and DUT

Pre-Requisite: Audio is supported by DUT. Real-time streaming supported by DUT. Audio Multicasting is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Sequence:



Test Procedure:

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

3. ONVIF Client selects a media profile with G.711 encoding support (see Annex A.5).
4. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G711”, Bitrate = r1, SampleRate = r2, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set G.711 encoding and Multicast settings.
5. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
6. ONVIF Client will invoke StartMulticastStreamingRequest message (ProfileToken) to start multicast streaming.
7. Verify the StartMulticastStreamingResponse message from the DUT.
8. The DUT sends G.711 RTP multicast media stream to multicast IPv4 address over UDP.
9. The DUT sends RTCP sender report to ONVIF Client.
10. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
11. ONVIF Client will invoke StopMulticastStreamingRequest message (ProfileToken) to stop multicast streaming
12. Verify the StopMulticastStreamingResponse message from the DUT.
13. Verify that multicast stream is stopped by the DUT.

Test Results:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send SetAudioEncoderConfigurationResponse.

The DUT sent invalid SetAudioEncoderConfigurationResponse message.

The DUT did not send StartMulticastStreamingResponse message.

The DUT sent invalid StartMulticastStreamingResponse message.

The DUT did not send StopMulticastStreamingResponse message.

The DUT sent invalid StopMulticastStreamingResponse message.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP multicast media streaming for corresponding multicast IP.

The DUT did not stop multicast streaming after StopMulticastStreamingResponse.

Note: See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

Driving IP-based physical security through global standardization

4.5.3 START AND STOP MULTICAST STREAMING – JPEG/G.711 (IPv4)

Test Label: Real Time Viewing DUT JPEG/G.711 Media Streaming Using RTP-Multicast/UDP Transport for IPv4. Media DUT StartMulticastStreaming and StopMulticastStreaming Command Validation.

Test Case ID: RTSS-5-1-9

ONVIF Core Specification Coverage: Start multicast streaming, Stop multicast streaming

Command Under Test: StartMulticastStreaming, StopMulticastStreaming

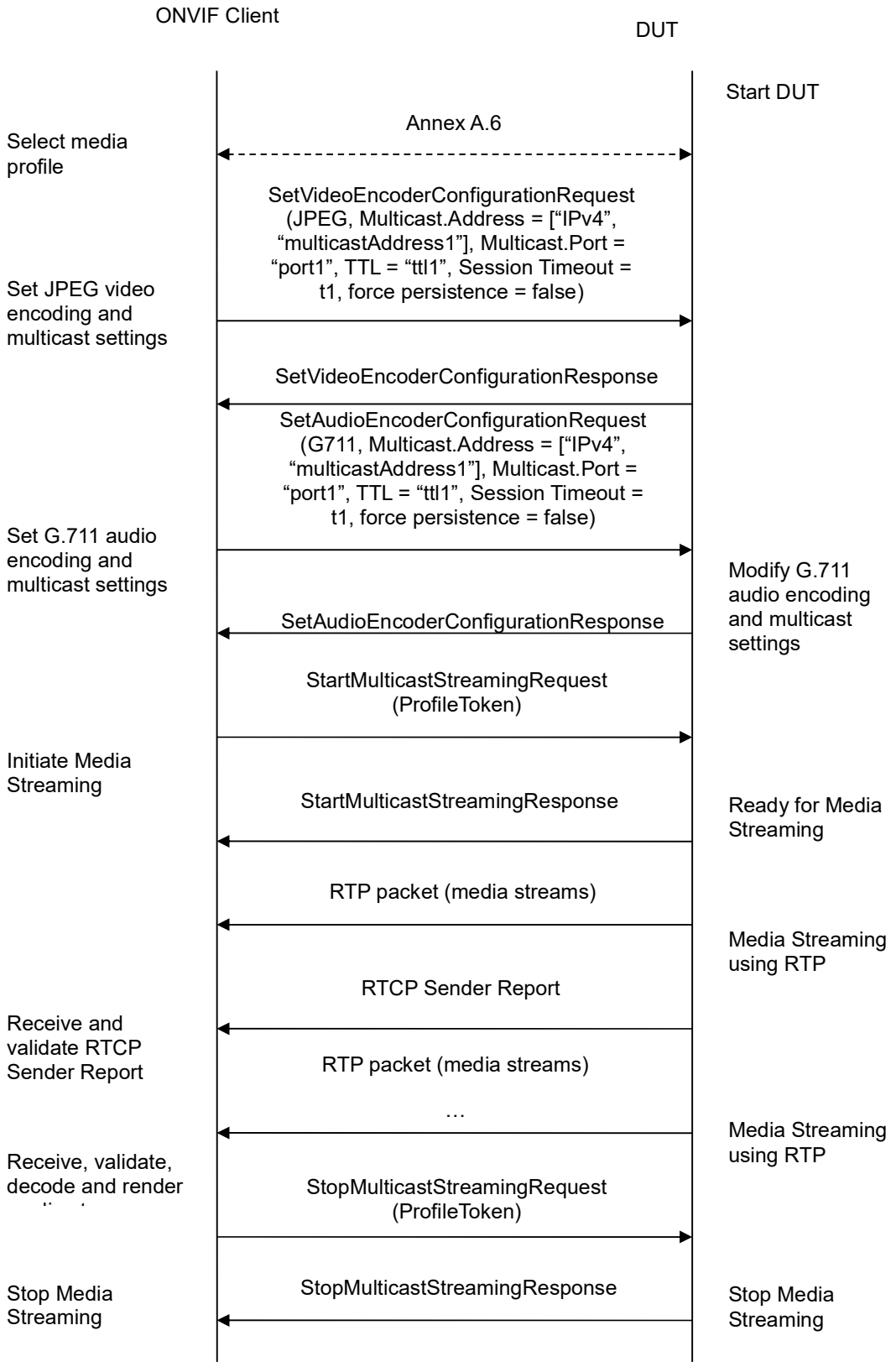
WSDL Reference: media.wsdl

Test Propose: To verify the behavior of StartMulticastStreaming command and StopMulticastStreaming in case of Video and Audio Streaming (JPEG/G.711).

Test Configuration: ONVIF Client and DUT

Pre-Requisite: Video Multicasting is supported by DUT. Real-time streaming supported by DUT. Audio is supported by DUT. Audio Multicasting is supported by DUT. ONVIF Client gets the Media Service entry point by GetCapabilities command.

Test Sequence:


ONVIF Client
DUT
Start DUT
Annex A.6
Select media profile
SetVideoEncoderConfigurationRequest (JPEG, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1, force persistence = false)
Set JPEG video encoding and multicast settings
SetVideoEncoderConfigurationResponse
SetAudioEncoderConfigurationRequest (G711, Multicast.Address = ["IPv4", "multicastAddress1"], Multicast.Port = "port1", TTL = "ttl1", Session Timeout = t1, force persistence = false)
Set G.711 audio encoding and multicast settings
Modify G.711 audio encoding and multicast settings
SetAudioEncoderConfigurationResponse
StartMulticastStreamingRequest (ProfileToken)
Initiate Media Streaming
StartMulticastStreamingResponse
Ready for Media Streaming
RTP packet (media streams)
Media Streaming using RTP
RTCP Sender Report
Receive and validate RTCP Sender Report
RTP packet (media streams)
...
Media Streaming using RTP
Receive, validate, decode and render
StopMulticastStreamingRequest (ProfileToken)
Stop Media Streaming
StopMulticastStreamingResponse
Stop Media Streaming

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with JPEG and G.711 encoding support (see Annex A.6).
4. ONVIF Client invokes SetVideoEncoderConfigurationRequest message (Encoding = “JPEG”, Resolution = [“Width”, “Height”], Quality = q1, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set JPEG encoding and Multicast settings.
5. Verify the SetVideoEncoderConfigurationResponse message from the DUT.
6. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G711”, Bitrate = r1, SampleRate = r2, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set G.711 encoding and Multicast settings.
7. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
8. ONVIF Client will invoke StartMulticastStreamingRequest message (ProfileToken) to start multicast streaming.
9. Verify the StartMulticastStreamingResponse message from the DUT.
10. The DUT sends JPEG/G.711 RTP multicast media stream to multicast IPv4 address over UDP.
11. The DUT sends RTCP sender report to ONVIF Client.
12. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
13. ONVIF Client will invoke StopMulticastStreamingRequest message (ProfileToken) to stop multicast streaming
14. Verify the StopMulticastStreamingResponse message from the DUT.
15. Verify that multicast stream is stopped by the DUT.

Test Results:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send SetVideoEncoderConfigurationResponse.

The DUT sent invalid SetVideoEncoderConfigurationResponse message.

The DUT did not send SetAudioEncoderConfigurationResponse.

The DUT sent invalid SetAudioEncoderConfigurationResponse message.

The DUT did not send StartMulticastStreamingResponse message.

The DUT sent invalid StartMulticastStreamingResponse message.

The DUT did not send StopMulticastStreamingResponse message.

The DUT sent invalid StopMulticastStreamingResponse message.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send JPEG/G.711 RTP multicast media streaming for corresponding multicast IP.

The DUT did not stop multicast streaming after StopMulticastStreamingResponse.

Note: See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.5.4 START AND STOP MULTICAST STREAMING – G.711 (IPv4, ONLY AUDIO PROFILE)

Test Label: Real Time Viewing DUT G.711 Media Streaming Using RTP-Multicast/UDP Transport for IPv4. Media DUT StartMulticastStreaming and StopMulticastStreaming Command Validation

Test Case ID: RTSS-5-1-10

ONVIF Core Specification Coverage: Start multicast streaming, Stop multicast streaming

Command Under Test: StartMulticastStreaming, StopMulticastStreaming

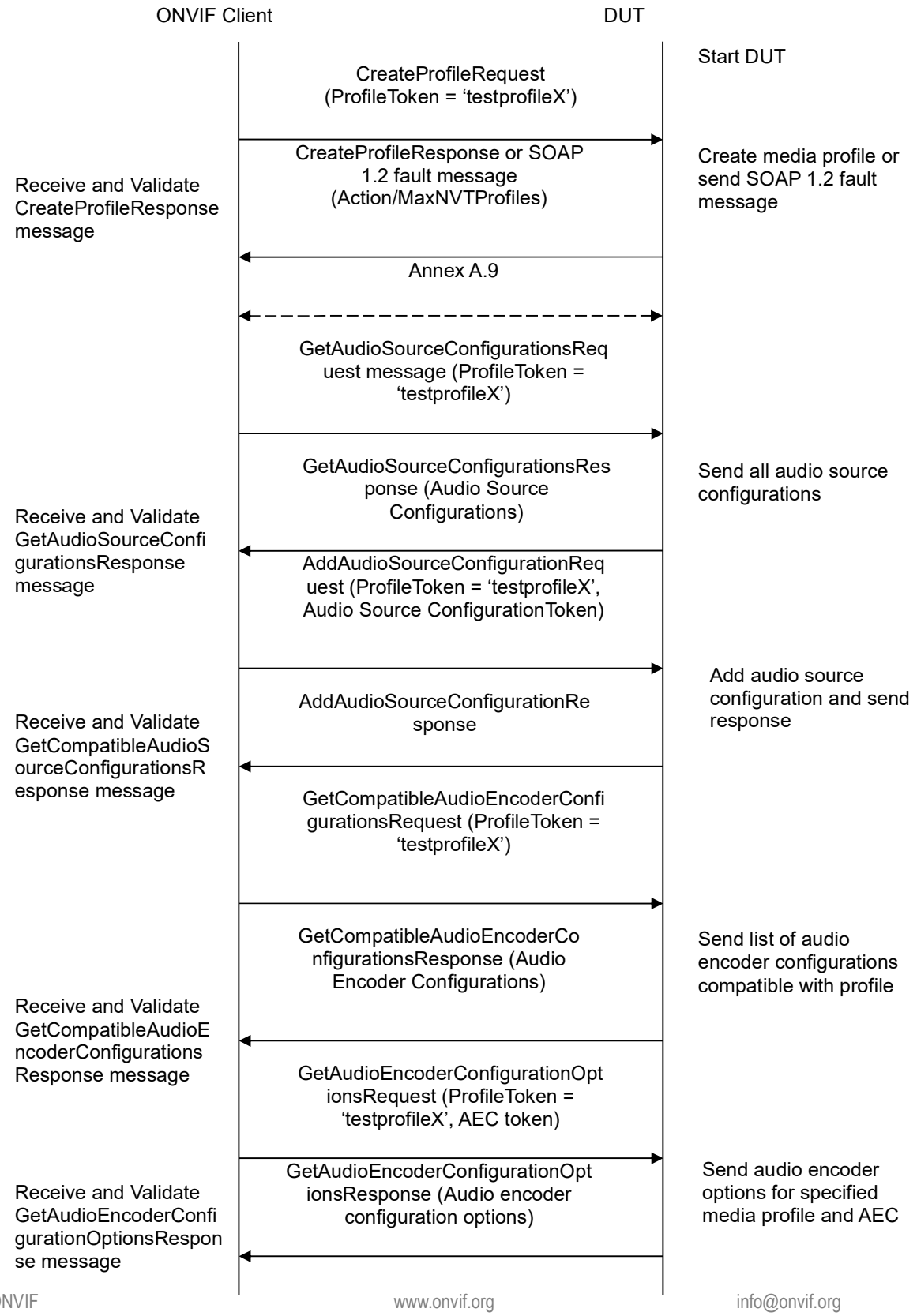
WSDL Reference: media.wsdl

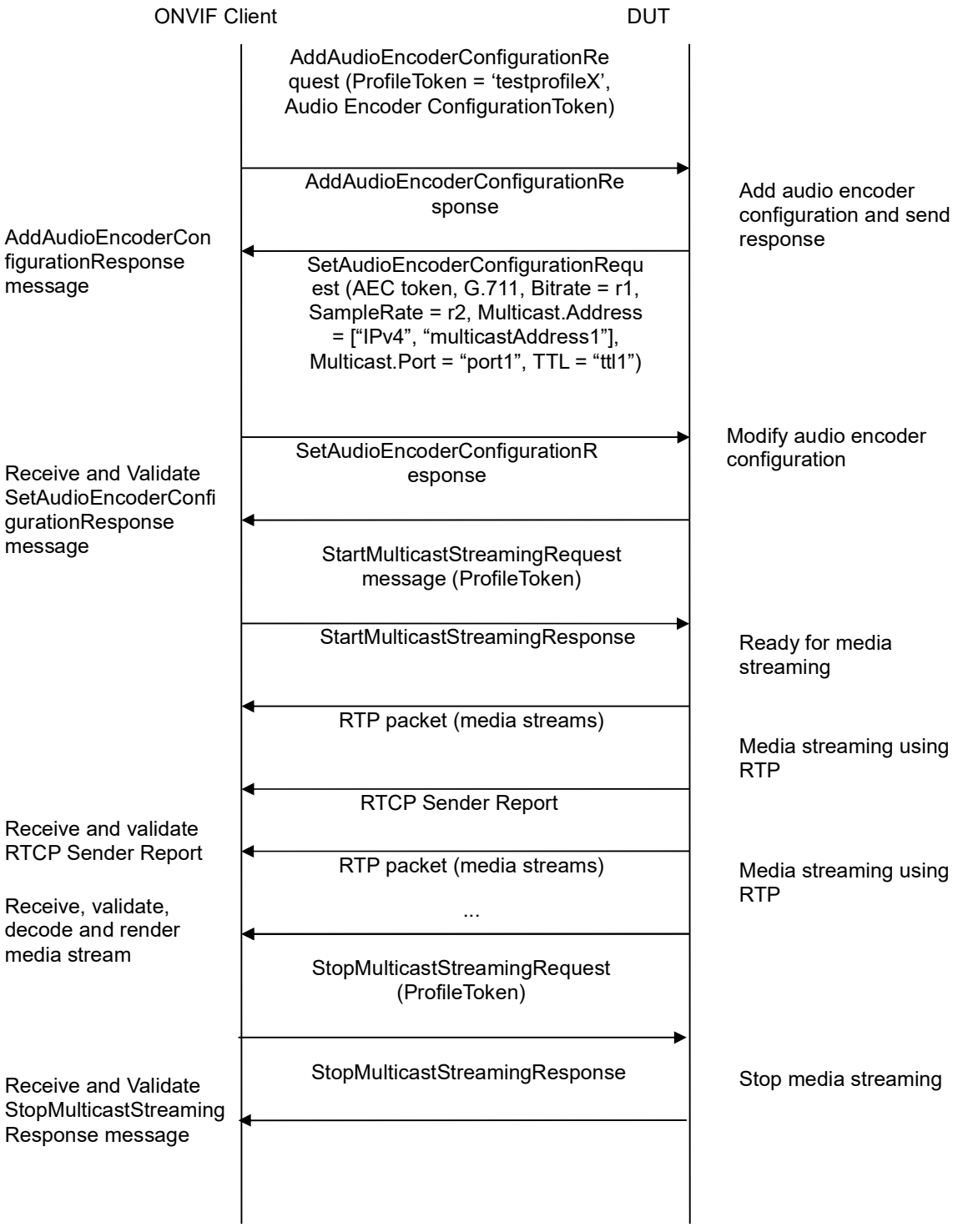
Test Purpose: To verify the behavior of StartMulticastStreaming command and StopMulticastStreaming in case of Audio Streaming (G.711)

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio Multicasting is supported by DUT. Media Service was received from the DUT

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
Add audio source configuration and send response
AddAudioSourceConfigurationResponse
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message



Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = ‘testprofileX’.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = ‘testprofileX’ and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = ‘testprofileX’) to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client invokes GetAudioEncoderConfigurationOptionsRequest message (ProfileToken = TestProfileX, ConfigurationToken = AECToken1), where AECToken1 is the token of the first AudioEncoderConfiguration from the GetCompatibleAudioEncoderConfigurationsResponse message.
13. Verify GetAudioEncoderConfigurationOptionsResponse from the DUT. Check supported Audio Codec. If G.711 is supported skip step 14.
14. Repeat steps 12-13 for others Audio Encoder Configurations from the GetCompatibleAudioEncoderConfigurationsResponse message. If there is no any others AudioEncoderConfiguration repeat steps 7-14 for other AudioSource from GetAudioSourceConfigurationsResponse message.
15. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as ‘testprofileX’ and ConfigurationToken = AECTokenX, where AECTokenX is token of AudioEncoderConfiguration found in the step 13.
16. DUT adds the audio encoder configuration to the profile and sends the response.
17. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G711”, Bitrate = r1, SampleRate = r2, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set G.711 encoding and Multicast settings.
18. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
19. ONVIF Client will invoke StartMulticastStreamingRequest message (ProfileToken) to start multicast streaming.
20. Verify the StartMulticastStreamingResponse message from the DUT.
21. The DUT sends G.711 RTP multicast media stream to multicast IPv4 address over UDP.

22. The DUT sends RTCP sender report to ONVIF Client.
23. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
24. ONVIF Client will invoke StopMulticastStreamingRequest message (ProfileToken) to stop multicast streaming
25. Verify the StopMulticastStreamingResponse message from the DUT.
26. Verify that multicast stream is stopped by the DUT.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send SetAudioEncoderConfigurationResponse.

The DUT did not send AudioEncoderConfiguration which supports G.711 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT sent invalid SetAudioEncoderConfigurationResponse message.

The DUT did not send StartMulticastStreamingResponse message.

The DUT sent invalid StartMulticastStreamingResponse message.

The DUT did not send StopMulticastStreamingResponse message.

The DUT sent invalid StopMulticastStreamingResponse message.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.711 RTP multicast media streaming for corresponding multicast IP.

The DUT did not stop multicast streaming after StopMulticastStreamingResponse.

Note: See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.5.5 START AND STOP MULTICAST STREAMING – G.726 (IPv4, ONLY AUDIO PROFILE)

Test Label: Real Time Viewing DUT G.726 Media Streaming Using RTP-Multicast/UDP Transport for IPv4. Media DUT StartMulticastStreaming and StopMulticastStreaming Command Validation

Test Case ID: RTSS-5-1-11

ONVIF Core Specification Coverage: Start multicast streaming, Stop multicast streaming

Command Under Test: StartMulticastStreaming, StopMulticastStreaming

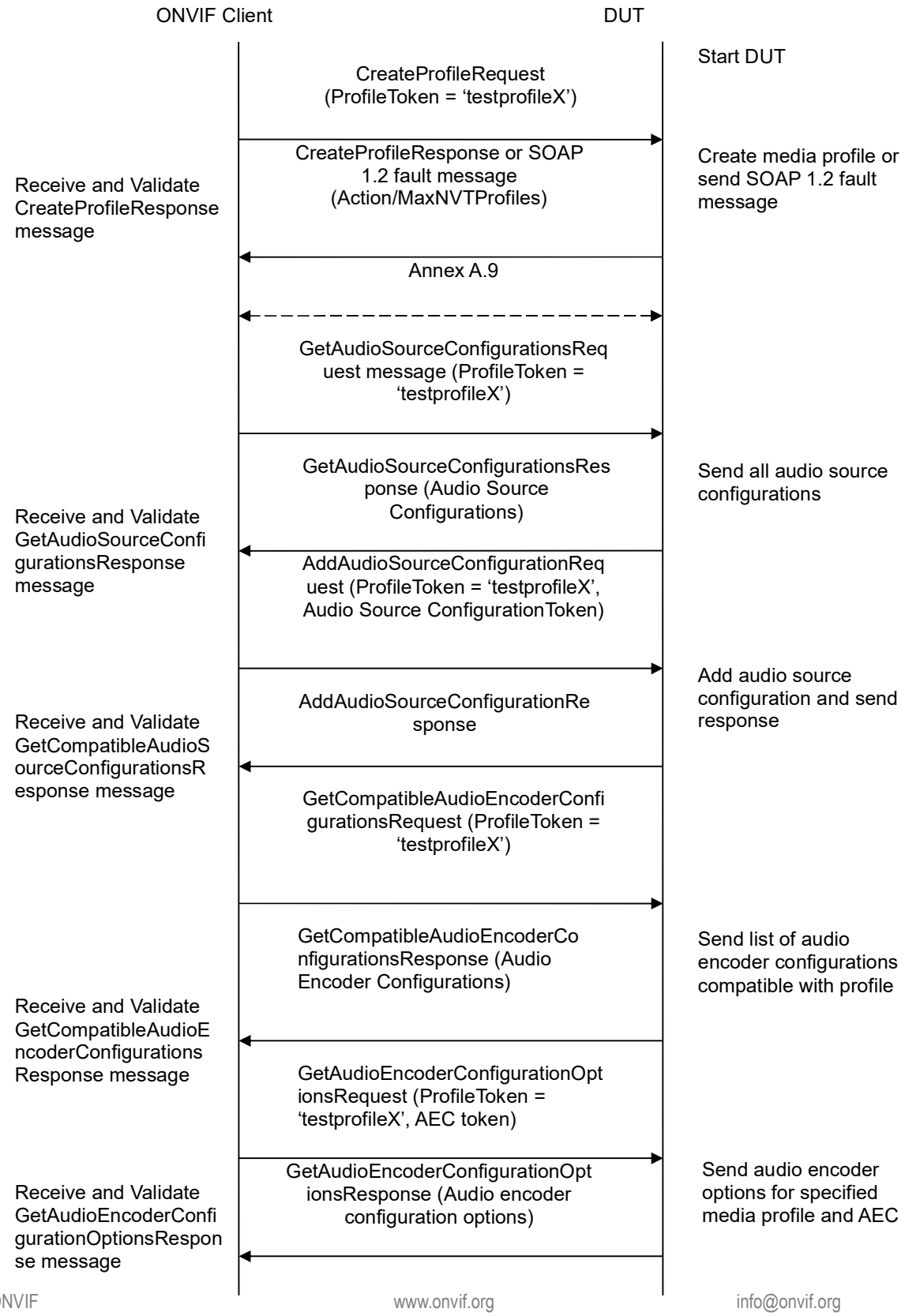
WSDL Reference: media.wsdl

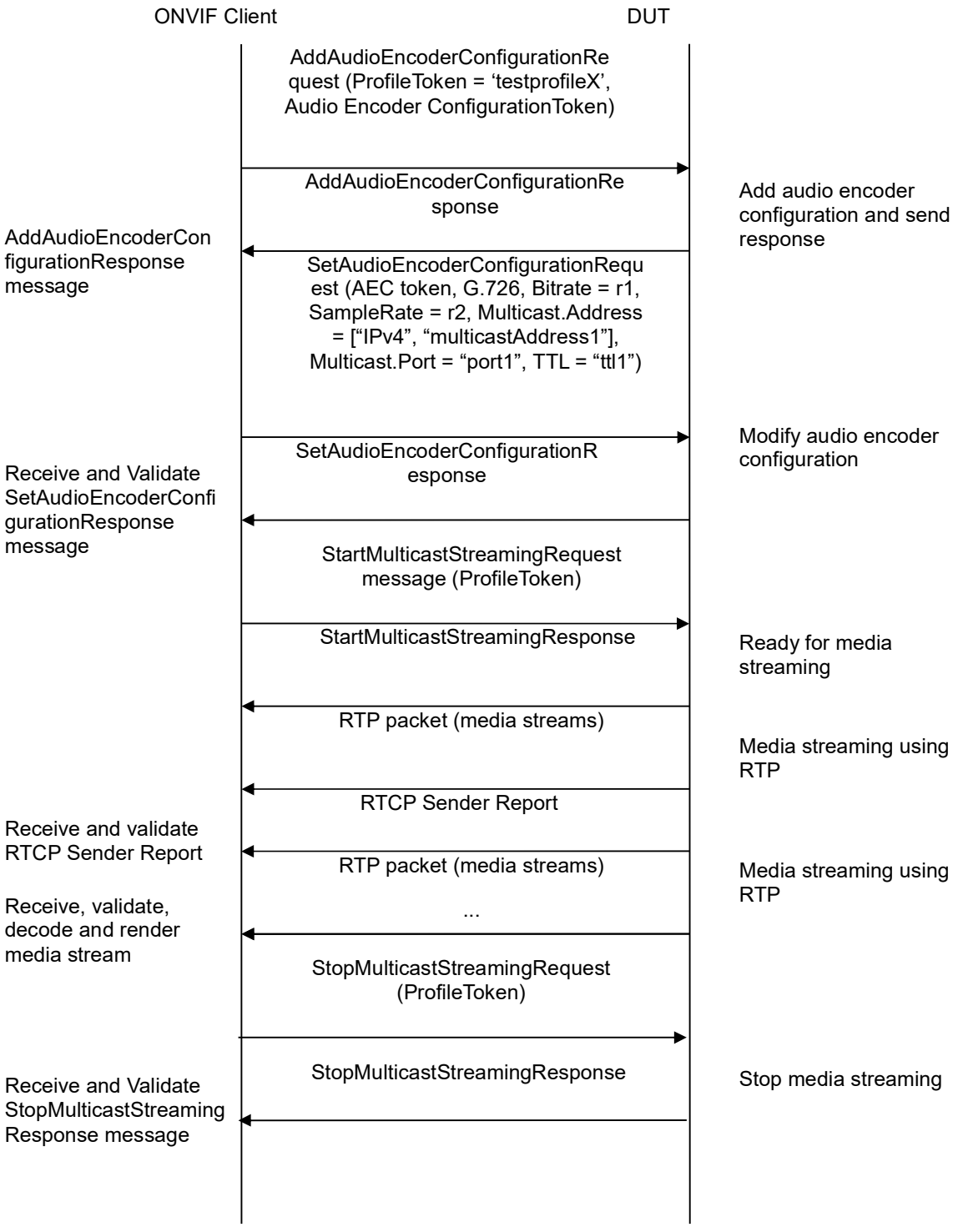
Test Purpose: To verify the behavior of StartMulticastStreaming command and StopMulticastStreaming in case of Audio Streaming (G.726)

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio Multicasting is supported by DUT and G.726 is implemented by DUT. Media Service was received from the DUT

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
AddAudioSourceConfigurationResponse
Add audio source configuration and send response
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message



Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = ‘testprofileX’.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = ‘testprofileX’ and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = ‘testprofileX’) to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client invokes GetAudioEncoderConfigurationOptionsRequest message (ProfileToken = TestProfileX, ConfigurationToken = AECToken1), where AECToken1 is the token of the first AudioEncoderConfiguration from the GetCompatibleAudioEncoderConfigurationsResponse message.
13. Verify GetAudioEncoderConfigurationOptionsResponse from the DUT. Check supported Audio Codec. If G.726 is supported skip step 14.
14. Repeat steps 12-13 for others Audio Encoder Configurations from the GetCompatibleAudioEncoderConfigurationsResponse message. If there is no any others AudioEncoderConfiguration repeat steps 7-14 for other AudioSource from GetAudioSourceConfigurationsResponse message.
15. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as ‘testprofileX’ and ConfigurationToken = AECTokenX, where AECTokenX is token of AudioEncoderConfiguration found in the step 13.
16. DUT adds the audio encoder configuration to the profile and sends the response.
17. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G726”, Bitrate = r1, SampleRate = r2, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set G.726 encoding and Multicast settings.
18. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
19. ONVIF Client will invoke StartMulticastStreamingRequest message (ProfileToken) to start multicast streaming.
20. Verify the StartMulticastStreamingResponse message from the DUT.
21. The DUT sends G.726 RTP multicast media stream to multicast IPv4 address over UDP.

22. The DUT sends RTCP sender report to ONVIF Client.
23. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
24. ONVIF Client will invoke StopMulticastStreamingRequest message (ProfileToken) to stop multicast streaming
25. Verify the StopMulticastStreamingResponse message from the DUT.
26. Verify that multicast stream is stopped by the DUT.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send SetAudioEncoderConfigurationResponse.

The DUT did not send AudioEncoderConfiguration which supports G.726 encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT sent invalid SetAudioEncoderConfigurationResponse message.

The DUT did not send StartMulticastStreamingResponse message.

The DUT sent invalid StartMulticastStreamingResponse message.

The DUT did not send StopMulticastStreamingResponse message.

The DUT sent invalid StopMulticastStreamingResponse message.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send G.726 RTP multicast media streaming for corresponding multicast IP.

The DUT did not stop multicast streaming after StopMulticastStreamingResponse.

Note: See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.5.6 START AND STOP MULTICAST STREAMING – AAC (IPv4, ONLY AUDIO PROFILE)

Test Label: Real Time Viewing DUT AAC Media Streaming Using RTP-Multicast/UDP Transport for IPv4. Media DUT StartMulticastStreaming and StopMulticastStreaming Command Validation

Test Case ID: RTSS-5-1-12

ONVIF Core Specification Coverage: Start multicast streaming, Stop multicast streaming

Command Under Test: StartMulticastStreaming, StopMulticastStreaming

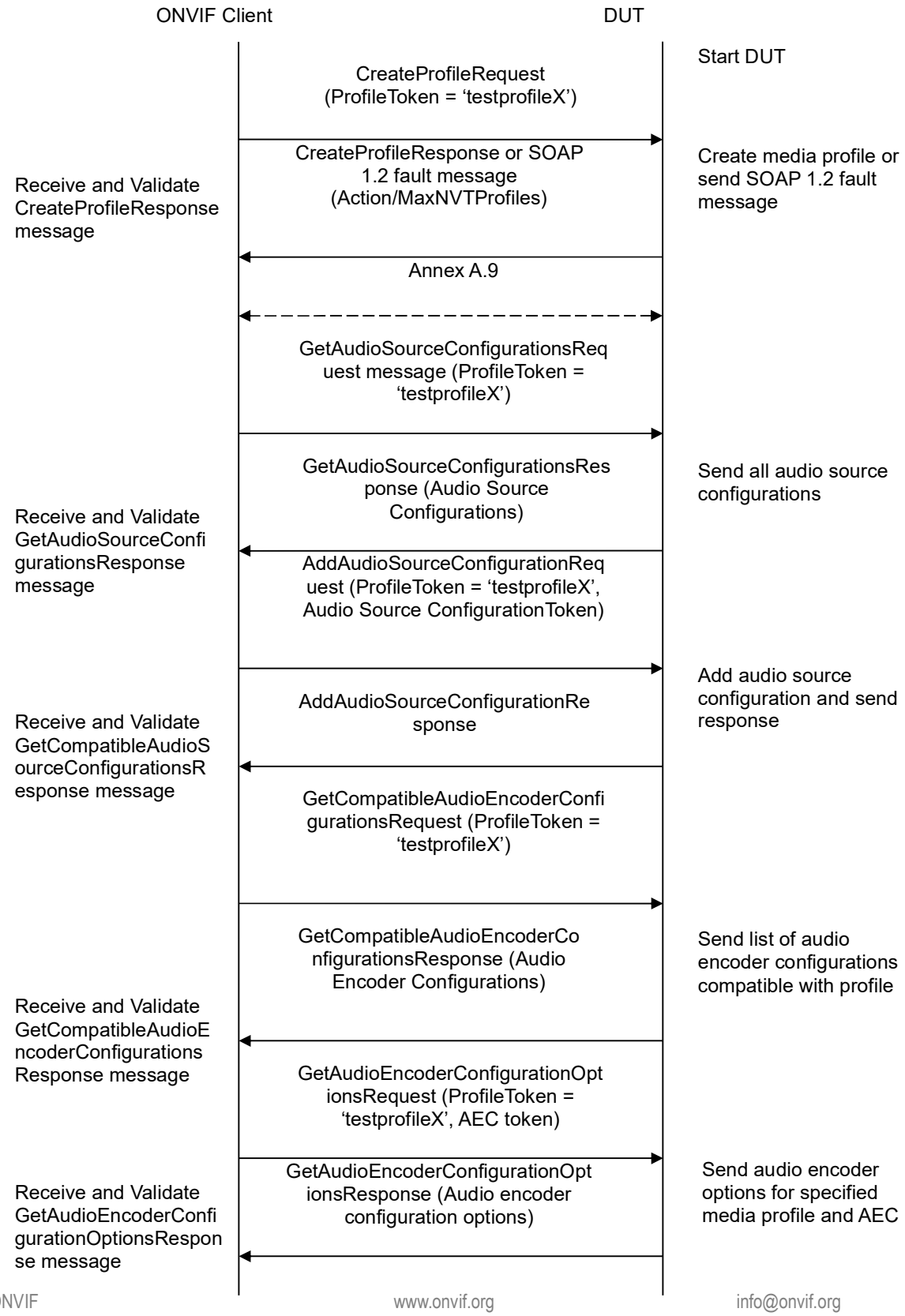
WSDL Reference: media.wsdl

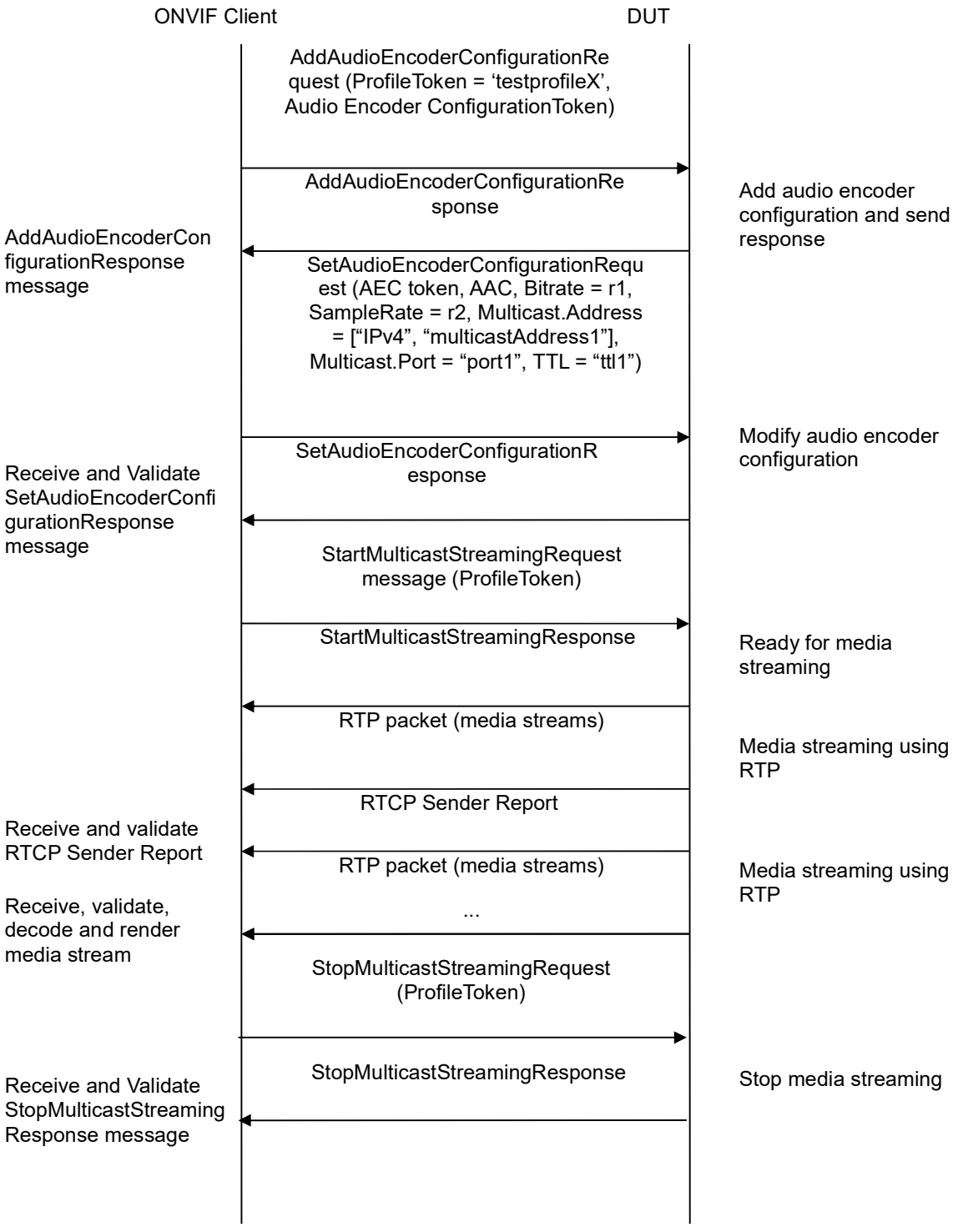
Test Purpose: To verify the behavior of StartMulticastStreaming command and StopMulticastStreaming in case of Audio Streaming (AAC)

Pre-Requisite: Media is supported by DUT. Real-time streaming supported by DUT.Audio Multicasting is supported by DUT and AAC is implemented by DUT. Media Service was received from the DUT

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
CreateProfileRequest (ProfileToken = 'testprofileX')
CreateProfileResponse or SOAP 1.2 fault message (Action/MaxNVTProfiles)
Create media profile or send SOAP 1.2 fault message
Receive and Validate CreateProfileResponse message
Annex A.9
GetAudioSourceConfigurationsRequest message (ProfileToken = 'testprofileX')
GetAudioSourceConfigurationsResponse (Audio Source Configurations)
Send all audio source configurations
Receive and Validate GetAudioSourceConfigurationsResponse message
AddAudioSourceConfigurationRequest (ProfileToken = 'testprofileX', Audio Source ConfigurationToken)
AddAudioSourceConfigurationResponse
Add audio source configuration and send response
Receive and Validate GetCompatibleAudioSourceConfigurationsResponse message
GetCompatibleAudioEncoderConfigurationsRequest (ProfileToken = 'testprofileX')
GetCompatibleAudioEncoderConfigurationsResponse (Audio Encoder Configurations)
Send list of audio encoder configurations compatible with profile
Receive and Validate GetCompatibleAudioEncoderConfigurations Response message
GetAudioEncoderConfigurationOptionsRequest (ProfileToken = 'testprofileX', AEC token)
GetAudioEncoderConfigurationOptionsResponse (Audio encoder configuration options)
Send audio encoder options for specified media profile and AEC
Receive and Validate GetAudioEncoderConfigurationOptionsResponse message



Test Procedure:

1. Start an ONVIF Client.

2. Start the DUT.
3. ONVIF Client invokes CreateProfileRequest message with ProfileToken = ‘testprofileX’.
4. Verify CreateProfileResponse message from the DUT. If the DUT sends a SOAP 1.2 fault message (Action/MaxNVTProfiles or other) execute Annex A.9.
5. ONVIF Client invokes GetAudioSourceConfigurationsRequest message to retrieve all existing audio source configurations of the DUT.
6. Verify GetAudioSourceConfigurationsResponse message.
7. ONVIF Client invokes AddAudioSourceConfigurationResponse message with ProfileToken = ‘testprofileX’ and ConfigurationToken = ConfigurationToken1 where ConfigurationToken1 is the first ConfigurationToken from the GetAudioSourceConfigurationsResponse message.
8. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = ‘testprofileX’) to retrieve the list of audio encoder configurations compatible with profile.
9. DUT sends the list of audio encoder configurations compatible with the received media profile token.
10. ONVIF Client verifies the GetCompatibleAudioEncoderConfigurationsResponse message.
11. ONVIF Client verifies the list of audio source configurations sent by DUT.
12. ONVIF Client invokes GetAudioEncoderConfigurationOptionsRequest message (ProfileToken = TestProfileX, ConfigurationToken = AECToken1), where AECToken1 is the token of the first AudioEncoderConfiguration from the GetCompatibleAudioEncoderConfigurationsResponse message.
13. Verify GetAudioEncoderConfigurationOptionsResponse from the DUT. Check supported Audio Codec. If AAC is supported skip step 14.
14. Repeat steps 12-13 for others Audio Encoder Configurations from the GetCompatibleAudioEncoderConfigurationsResponse message. If there is no any others AudioEncoderConfiguration repeat steps 7-14 for other AudioSource from GetAudioSourceConfigurationsResponse message.
15. ONVIF Client invokes AddAudioEncoderConfigurationRequest message with ProfileToken as ‘testprofileX’ and ConfigurationToken = AECTokenX, where AECTokenX is token of AudioEncoderConfiguration found in the step 13.
16. DUT adds the audio encoder configuration to the profile and sends the response.
17. ONVIF Client invokes SetAudioEncoderConfigurationRequest message (Encoding = “G711”, Bitrate = r1, SampleRate = r2, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”, TTL = “ttl1”, Session Timeout = t1 and force persistence = false) to set AAC encoding and Multicast settings.
18. Verify the SetAudioEncoderConfigurationResponse message from the DUT.
19. ONVIF Client will invoke StartMulticastStreamingRequest message (ProfileToken) to start multicast streaming.
20. Verify the StartMulticastStreamingResponse message from the DUT.
21. The DUT sends AAC RTP multicast media stream to multicast IPv4 address over UDP.

22. The DUT sends RTCP sender report to ONVIF Client.
23. ONVIF Client validates the received RTP and RTCP packets, decodes and renders them.
24. ONVIF Client will invoke StopMulticastStreamingRequest message (ProfileToken) to stop multicast streaming
25. Verify the StopMulticastStreamingResponse message from the DUT.
26. Verify that multicast stream is stopped by the DUT.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not send SetAudioEncoderConfigurationResponse.

The DUT did not send AudioEncoderConfiguration which supports AAC encoding in the GetCompatibleAudioEncoderConfigurationsResponse message.

The DUT sent invalid SetAudioEncoderConfigurationResponse message.

The DUT did not send StartMulticastStreamingResponse message.

The DUT sent invalid StartMulticastStreamingResponse message.

The DUT did not send StopMulticastStreamingResponse message.

The DUT sent invalid StopMulticastStreamingResponse message.

The DUT did not send valid RTP header in one or more media streams.

The DUT did not send RTCP sender report correctly.

The DUT did not send AAC RTP multicast media streaming for corresponding multicast IP.

The DUT did not stop multicast streaming after StopMulticastStreamingResponse.

Note: See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.6 Audio Backchannel Streaming

4.6.1 BACKCHANNEL – G.711 (RTP-Unicast/UDP, IPv4)

Test Label: DUT Backchannel for G.711 Audio Streaming Using RTP-Unicast/UDP Transport for IPv4.

Test Case ID: RTSS-6-1-1

ONVIF Core Specification Coverage: Back Channel Connection, RTSP Require- Tag, Connection setup for a bi-directional connection

Command Under Test:

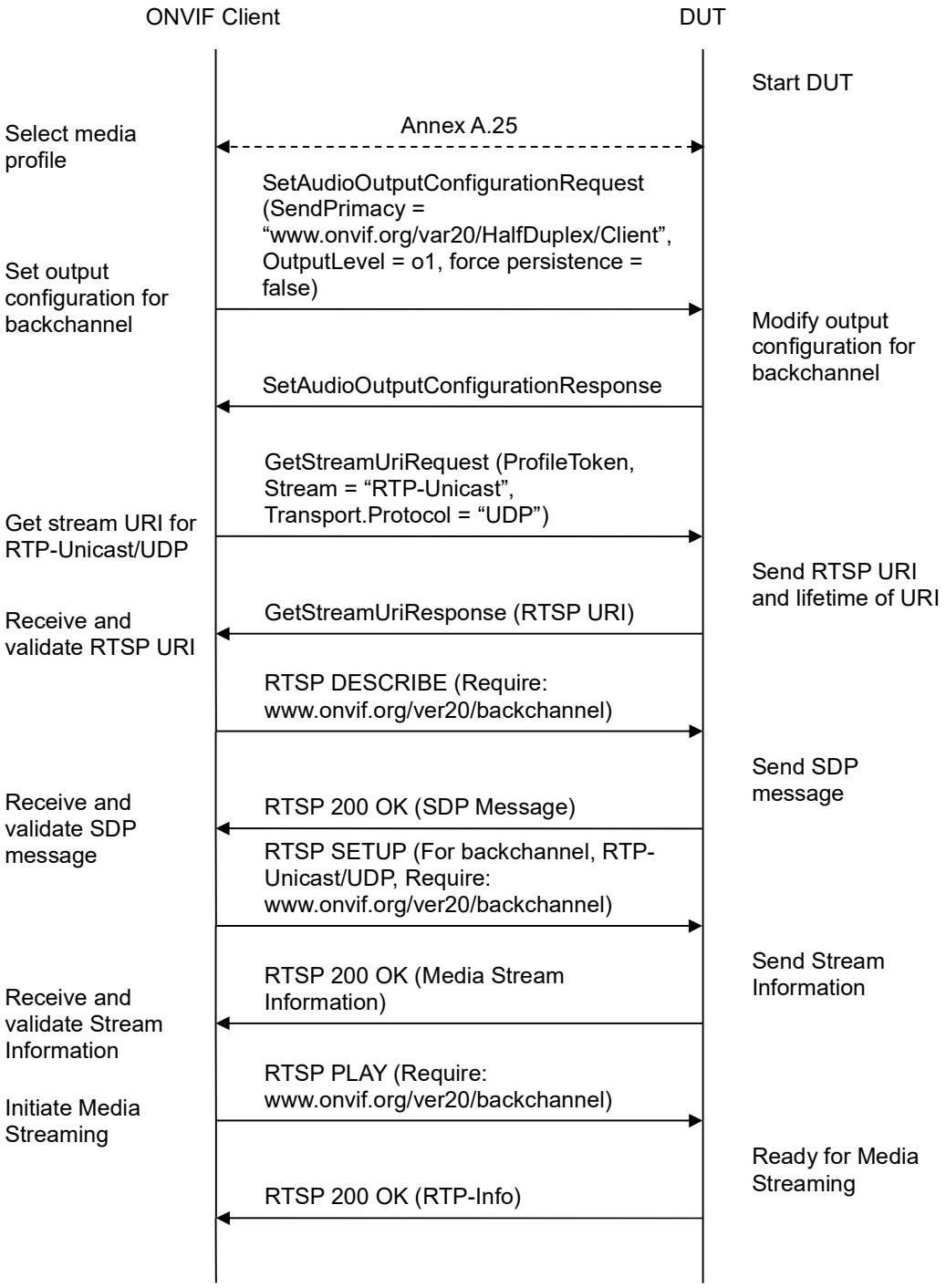
WSDL Reference: media.wsdl

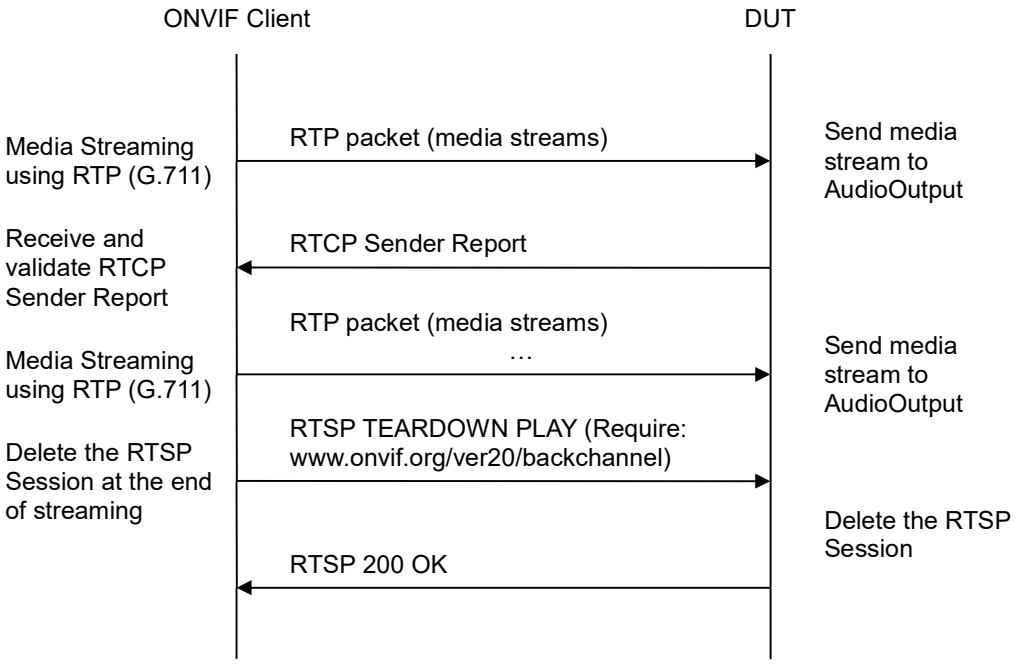
Test Purpose: To verify DUT Backchannel for G.711 audio streaming using RTP-Unicast/UDP transport for IPv4.

Pre-Requisite: Media is supported by the DUT. Audio backchannel is supported by the DUT and G.711 Decoder is implemented by DUT. Media Service entry point is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Select media profile
Annex A.25
SetAudioOutputConfigurationRequest (SendPrimacy = "www.onvif.org/var20/HalfDuplex/Client", OutputLevel = o1, force persistence = false)
Set output configuration for backchannel
Modify output configuration for backchannel
SetAudioOutputConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "UDP")
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
Receive and validate RTSP URI
GetStreamUriResponse (RTSP URI)
RTSP DESCRIBE (Require: www.onvif.org/ver20/backchannel)
Send SDP message
Receive and validate SDP message
RTSP 200 OK (SDP Message)
RTSP SETUP (For backchannel, RTP-Unicast/UDP, Require: www.onvif.org/ver20/backchannel)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY (Require: www.onvif.org/ver20/backchannel)
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with G.711 decoding and not only www.onvif.org/ver20/HalfDuplex/Client send primacy support by following the procedure mentioned in Annex A.25.
4. ONVIF Client invokes SetAudioOutputConfigurationRequest message (SendPrimacy = “www.onvif.org/ver20/HalfDuplex/Client”, OutputLevel = o1 and force persistence = false) to set output configuration for backchannel.
5. Verify the SetAudioOutputConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = “RTP-Unicast”, Transport.Protocol = “UDP”**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
10. The DUT sends 200 OK message and SDP information.
11. Verify SDP information from the DUT. Check that DUT return audio backchannel and G.711 on the list of supported codecs for backchannel.

12. ONVIF Client invokes RTSP SETUP request for backchannel with transport parameter **RTP-Unicast/UDP**, with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
15. The DUT sends 200 OK message.
16. ONVIF Client sends RTP Unicast G.711 audio stream to DUT over UDP.
17. The DUT processes a stream and send it to Output.
18. The DUT sends RTCP sender report to ONVIF Client.
19. ONVIF Client validates the received RTCP packets.
20. ONVIF Client invokes RTSP TEARDOWN control request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) at the end of media streaming to terminate the RTSP session.
21. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

The DUT passed all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send **SetAudioOutputConfigurationResponse** message.

The DUT did not send **GetStreamUriResponse** message.

The DUT did not send valid **GetStreamUriResponse** message.

The DUT did not send valid RTSP URI, ValidUnilConnect, ValidUntilReboot and Timeout in **GetStreamUriResponse** message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid SDP information:

- There is no backchannel (marked with a=sendonly attribute)
- There is no G.711 on the list of supported codecs for backchannel

The DUT did not send RTCP sender report correctly.

The DUT did not process G.711 RTP media streaming.

The DUT did not send G.711 RTP media streaming to Output from media profile.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.6.2 BACKCHANNEL – G.711 (RTP-Unicast/RTSP/HTTP/TCP, IPv4)

Test Label: DUT Backchannel for G.711 Audio Streaming Using RTP-Unicast/RTSP/HTTP/TCP, IPv4 Transport for IPv4.

Test Case ID: RTSS-6-1-2

ONVIF Core Specification Coverage: Back Channel Connection, RTSP Require- Tag, Connection setup for a bi-directional connection

Command Under Test:

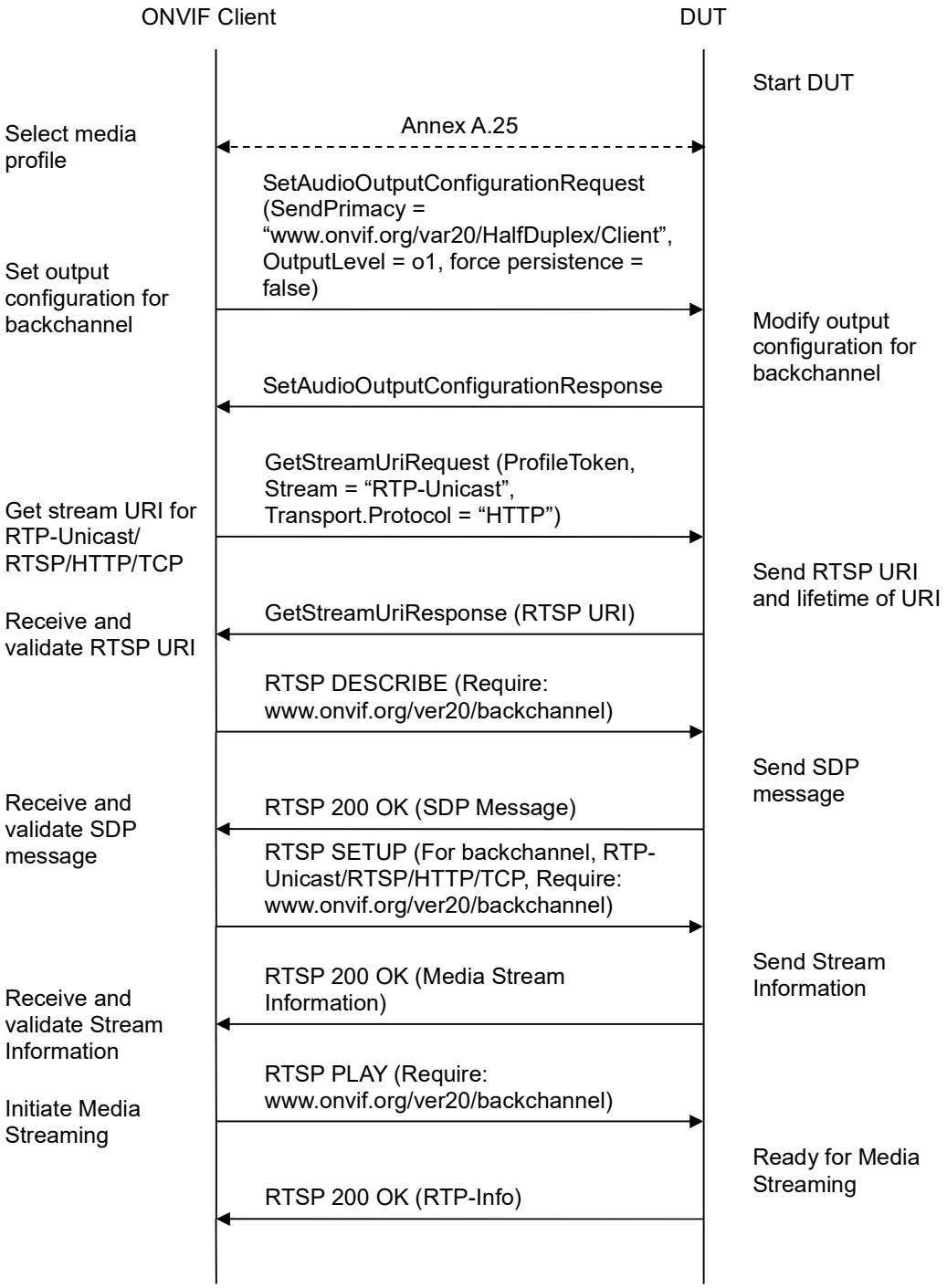
WSDL Reference: media.wsdl

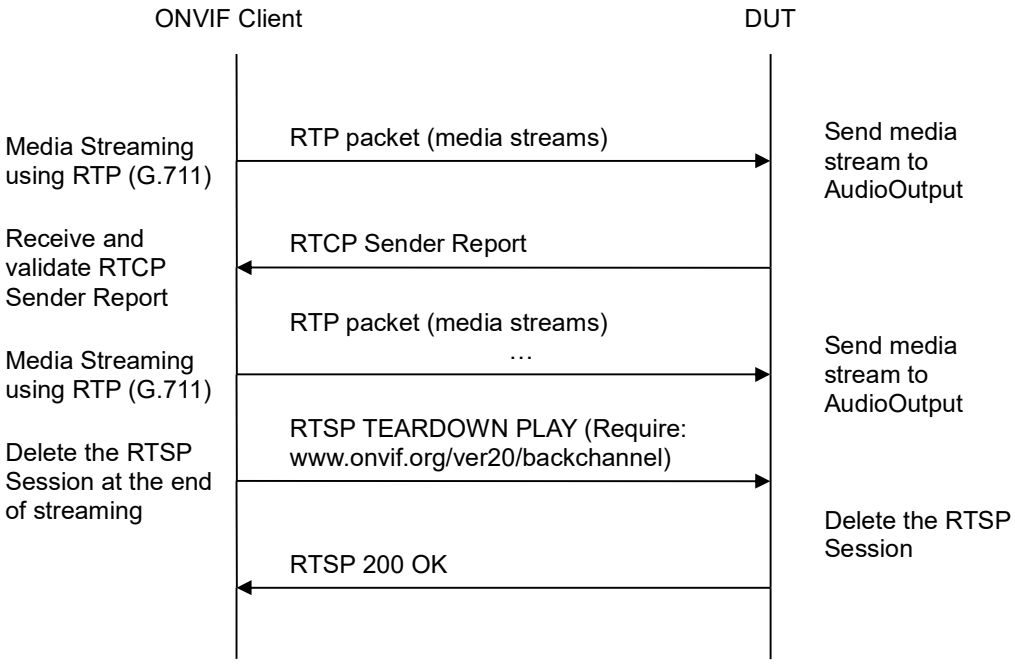
Test Purpose: To verify DUT Backchannel for G.711 audio streaming using RTP-Unicast/RTSP/HTTP/TCP, IPv4 transport for IPv4.

Pre-Requisite: Media is supported by the DUT. Audio backchannel is supported by the DUT and G.711 Decoder is implemented by DUT. Media Service entry point is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Select media profile
Annex A.25
SetAudioOutputConfigurationRequest (SendPrimacy = "www.onvif.org/var20/HalfDuplex/Client", OutputLevel = o1, force persistence = false)
Set output configuration for backchannel
Modify output configuration for backchannel
SetAudioOutputConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP")
Get stream URI for RTP-Unicast/ RTSP/HTTP/TCP
Send RTSP URI and lifetime of URI
Receive and validate RTSP URI
GetStreamUriResponse (RTSP URI)
RTSP DESCRIBE (Require: www.onvif.org/ver20/backchannel)
Send SDP message
Receive and validate SDP message
RTSP 200 OK (SDP Message)
RTSP SETUP (For backchannel, RTP-Unicast/RTSP/HTTP/TCP, Require: www.onvif.org/ver20/backchannel)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY (Require: www.onvif.org/ver20/backchannel)
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start a DUT.
3. ONVIF Client selects a media profile with G.711 decoding and not only www.onvif.org/ver20/HalfDuplex/Client send primacy support by following the procedure mentioned in Annex A.25.
4. ONVIF Client invokes SetAudioOutputConfigurationRequest message (**SendPrimacy = "www.onvif.org/ver20/HalfDuplex/Client", OutputLevel = o1 and force persistence = false**) to set output configuration for backchannel.
5. Verify the SetAudioOutputConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP"**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
10. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.

11. ONVIF Client invokes RTSP DESCRIBE request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) on HTTP POST connection.
12. The DUT sends 200 OK message and SDP information on HTTP GET connection.
13. Verify SDP information from the DUT. Check that DUT return audio backchannel and G.711 on the list of supported codecs for backchannel.
14. ONVIF Client invokes RTSP SETUP request on HTTP POST connection for backchannel with transport parameter **RTP-Unicast/RTSP/HTTP/TCP**, with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
15. The DUT sends 200 OK message and the media stream information on HTTP GET connection.
16. ONVIF Client invokes RTSP PLAY request on HTTP POST connection with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
17. The DUT sends 200 OK message on HTTP GET connection.
18. ONVIF Client sends RTP Unicast G.711 audio stream to DUT on HTTP POST connection.
19. The DUT processes a stream and send it to Output.
20. The DUT sends RTCP sender report to ONVIF Client.
21. ONVIF Client validates the received RTCP packets.
22. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) at the end of media streaming to terminate the RTSP session.
23. The DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.

Test Result:

PASS –

The DUT passed all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send SetAudioOutputConfigurationResponse message.

The DUT did not send GetStreamUriResponse message.

The DUT did not send valid GetStreamUriResponse message.

The DUT did not send valid RTSP URI, ValidUnilConnect, ValidUntilReboot and Timeout in GetStreamUriResponse message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid SDP information:

- There is no backchannel (marked with a=sendonly attribute)

- There is no G.711 on the list of supported codecs for backchannel

The DUT did not send RTCP sender report correctly.

The DUT did not process G.711 RTP media streaming.

The DUT did not send G.711 RTP media streaming to Output from media profile.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.6.3 BACKCHANNEL – G.711 (RTP/RTSP/TCP, IPv4)

Test Label: DUT Backchannel for G.711 Audio Streaming Using RTP/RTSP/TCP, IPv4 Transport for IPv4.

Test Case ID: RTSS-6-1-3

ONVIF Core Specification Coverage: Back Channel Connection, RTSP Require- Tag, Connection setup for a bi-directional connection

Command Under Test:

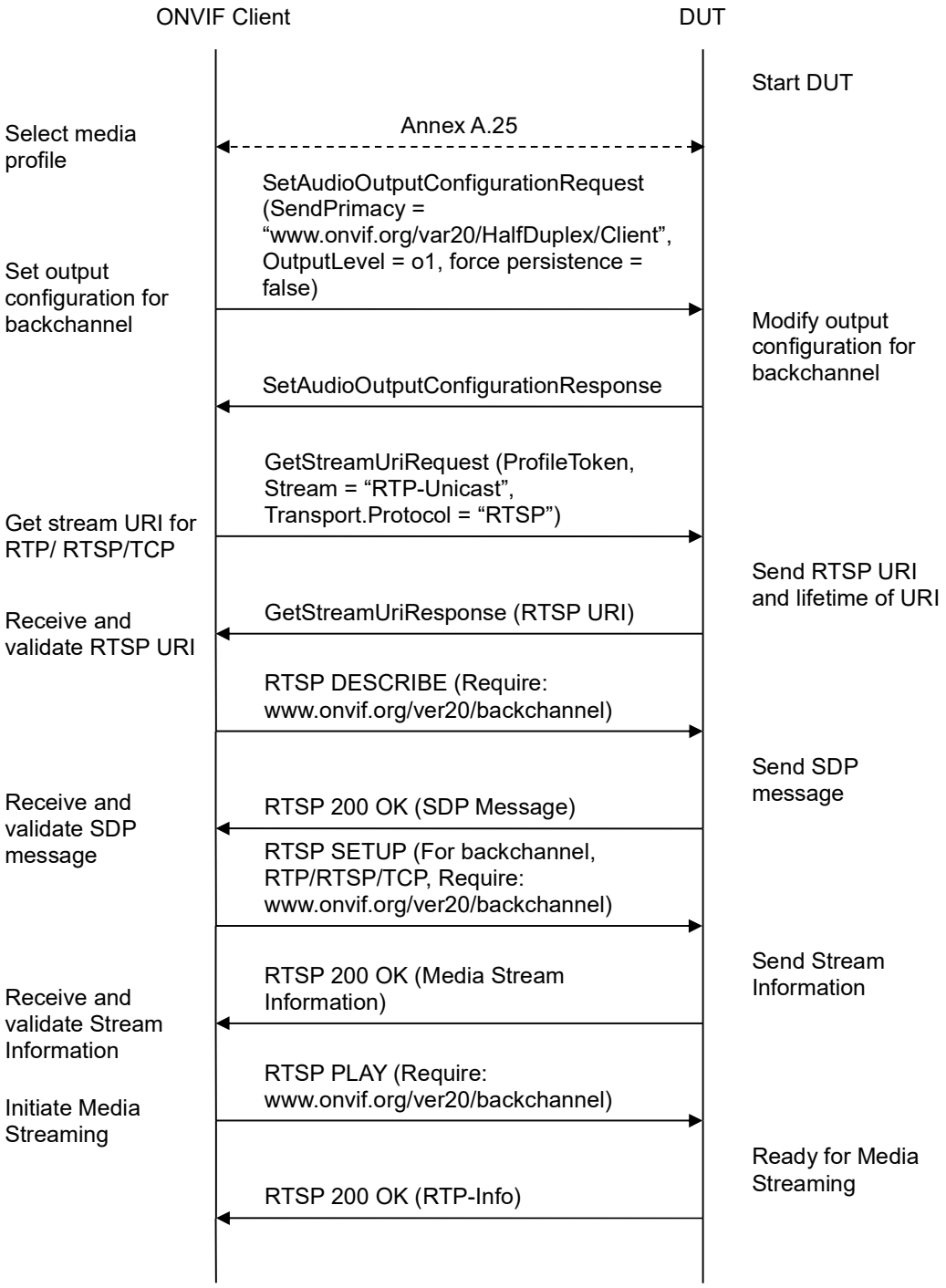
WSDL Reference: media.wsdl

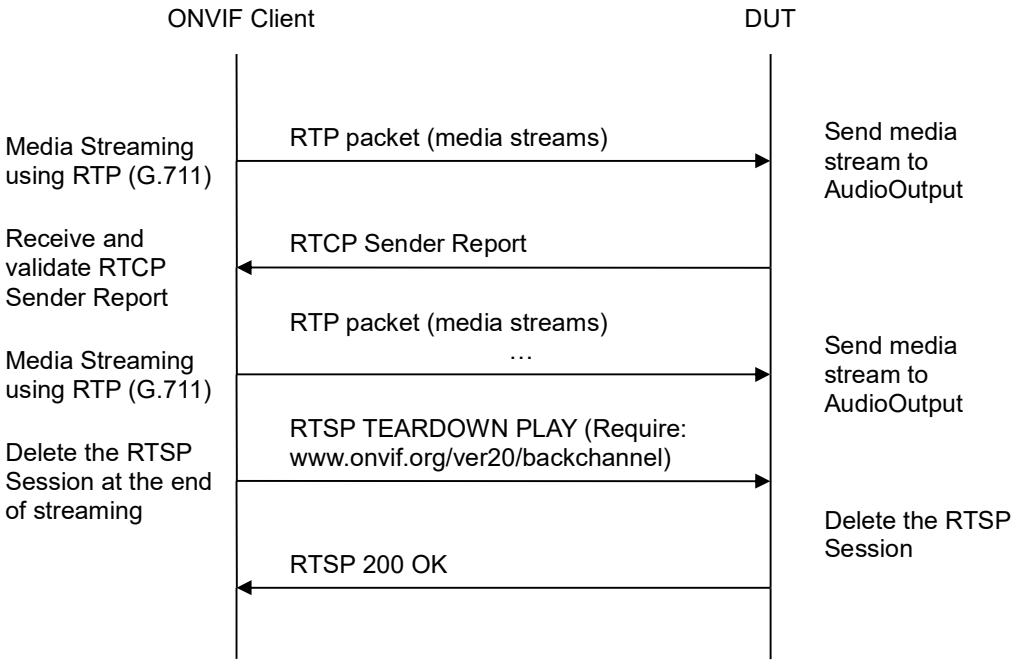
Test Purpose: To verify DUT Backchannel for G.711 audio streaming using RTP/RTSP/TCP, IPv4 transport for IPv4.

Pre-Requisite: Media is supported by the DUT. Audio backchannel is supported by the DUT and G.711 Decoder is implemented by DUT. Media Service entry point is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Select media profile
Annex A.25
SetAudioOutputConfigurationRequest (SendPrimacy = "www.onvif.org/var20/HalfDuplex/Client", OutputLevel = o1, force persistence = false)
Set output configuration for backchannel
Modify output configuration for backchannel
SetAudioOutputConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP")
Get stream URI for RTP/ RTSP/TCP
Send RTSP URI and lifetime of URI
Receive and validate RTSP URI
GetStreamUriResponse (RTSP URI)
RTSP DESCRIBE (Require: www.onvif.org/ver20/backchannel)
Send SDP message
Receive and validate SDP message
RTSP 200 OK (SDP Message)
RTSP SETUP (For backchannel, RTP/RTSP/TCP, Require: www.onvif.org/ver20/backchannel)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY (Require: www.onvif.org/ver20/backchannel)
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start a DUT.
3. ONVIF Client selects a media profile with G.711 decoding and not only **www.onvif.org/ver20/HalfDuplex/Client** send primacy support by following the procedure mentioned in Annex A.25.
4. ONVIF Client invokes SetAudioOutputConfigurationRequest message (**SendPrimacy = "www.onvif.org/ver20/HalfDuplex/Client", OutputLevel = o1 and force persistence = false**) to set output configuration for backchannel.
5. Verify the SetAudioOutputConfigurationResponse message from the DUT.
6. ONVIF Client invokes **GetStreamUriRequest** message (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP") to retrieve media stream URI for the selected media profile.
7. The DUT sends the **GetStreamUriResponse** message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
10. The DUT sends 200 OK message and SDP information.
11. Verify SDP information from the DUT. Check that DUT return audio backchannel and G.711 on the list of supported codecs for backchannel.

12. ONVIF Client invokes RTSP SETUP request for backchannel with transport parameter RTP/RTSP/TCP, with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
15. The DUT sends 200 OK message.
16. ONVIF Client sends RTP Unicast G.711 audio stream to DUT over UDP.
17. The DUT processes a stream and send it to Output.
18. The DUT sends RTCP sender report to ONVIF Client.
19. ONVIF Client validates the received RTCP packets.
20. ONVIF Client invokes RTSP TEARDOWN control request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) at the end of media streaming to terminate the RTSP session.
21. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

The DUT passed all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send **SetAudioOutputConfigurationResponse** message.

The DUT did not send **GetStreamUriResponse** message.

The DUT did not send valid **GetStreamUriResponse** message.

The DUT did not send valid RTSP URI, ValidUnilConnect, ValidUntilReboot and Timeout in **GetStreamUriResponse** message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid SDP information:

- There is no backchannel (marked with a=sendonly attribute)
- There is no G.711 on the list of supported codecs for backchannel

The DUT did not send RTCP sender report correctly.

The DUT did not process G.711 RTP media streaming.

The DUT did not send G.711 RTP media streaming to Output from media profile.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.6.4 BACKCHANNEL – G.726 (RTP-Unicast/UDP, IPv4)

Test Label: DUT Backchannel for G.726 Audio Streaming Using RTP-Unicast/UDP Transport for IPv4.

Test Case ID: RTSS-6-1-4

ONVIF Core Specification Coverage: Back Channel Connection, RTSP Require- Tag, Connection setup for a bi-directional connection

Command Under Test:

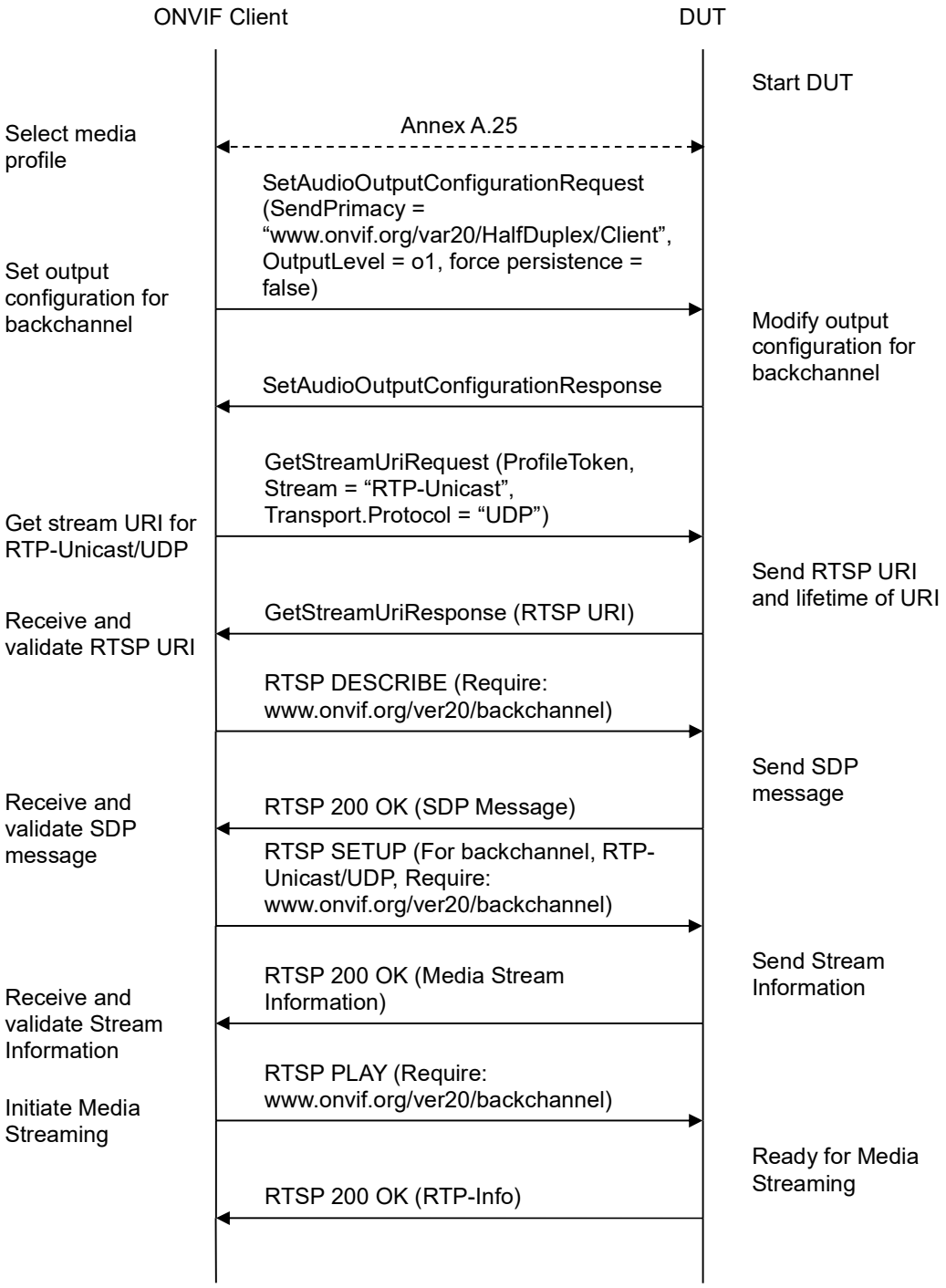
WSDL Reference: media.wsdl

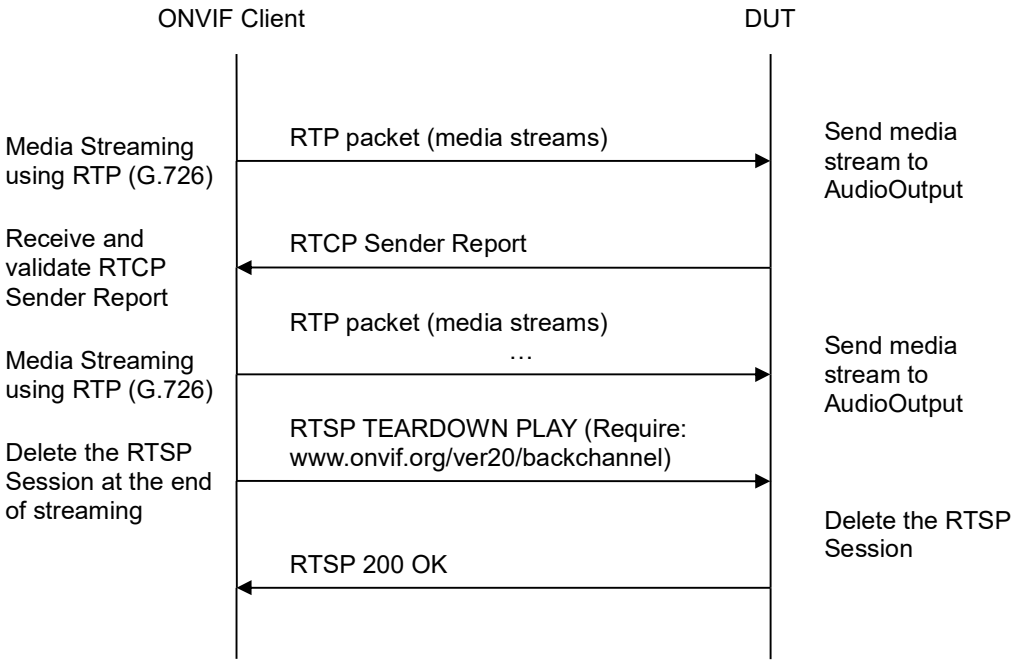
Test Purpose: To verify DUT Backchannel for G.726 audio streaming using RTP-Unicast/UDP transport for IPv4.

Pre-Requisite: Media is supported by the DUT. Audio backchannel is supported by the DUT and G.726 Decoder is implemented by DUT. Media Service entry point is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Select media profile
Annex A.25
SetAudioOutputConfigurationRequest (SendPrimacy = "www.onvif.org/var20/HalfDuplex/Client", OutputLevel = o1, force persistence = false)
Set output configuration for backchannel
Modify output configuration for backchannel
SetAudioOutputConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "UDP")
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
Receive and validate RTSP URI
GetStreamUriResponse (RTSP URI)
RTSP DESCRIBE (Require: www.onvif.org/ver20/backchannel)
Send SDP message
Receive and validate SDP message
RTSP 200 OK (SDP Message)
RTSP SETUP (For backchannel, RTP-Unicast/UDP, Require: www.onvif.org/ver20/backchannel)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY (Require: www.onvif.org/ver20/backchannel)
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with G.726 decoding and not only www.onvif.org/ver20/HalfDuplex/Client send primacy support by following the procedure mentioned in Annex A.25.
4. ONVIF Client invokes SetAudioOutputConfigurationRequest message (**SendPrimacy = "www.onvif.org/ver20/HalfDuplex/Client"**, **OutputLevel = o1** and **force persistence = false**) to set output configuration for backchannel.
5. Verify the SetAudioOutputConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "UDP"**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
10. The DUT sends 200 OK message and SDP information.
11. Verify SDP information from the DUT. Check that DUT return audio backchannel and G.726 on the list of supported codecs for backchannel.

12. ONVIF Client invokes RTSP SETUP request for backchannel with transport parameter **RTP-Unicast/UDP**, with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
15. The DUT sends 200 OK message.
16. ONVIF Client sends RTP Unicast G.726 audio stream to DUT over UDP.
17. The DUT processes a stream and send it to Output.
18. The DUT sends RTCP sender report to ONVIF Client.
19. ONVIF Client validates the received RTCP packets.
20. ONVIF Client invokes RTSP TEARDOWN control request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) at the end of media streaming to terminate the RTSP session.
21. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

The DUT passed all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send **SetAudioOutputConfigurationResponse** message.

The DUT did not send **GetStreamUriResponse** message.

The DUT did not send valid **GetStreamUriResponse** message.

The DUT did not send valid RTSP URI, ValidUnilConnect, ValidUntilReboot and Timeout in **GetStreamUriResponse** message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid SDP information:

- There is no backchannel (marked with a=sendonly attribute)
- There is no G.726 on the list of supported codecs for backchannel

The DUT did not send RTCP sender report correctly.

The DUT did not process G.726 RTP media streaming.

The DUT did not send G.726 RTP media streaming to Output from media profile.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Driving IP-based physical security through global standardization

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.6.5 BACKCHANNEL – G.726 (RTP-Unicast/RTSP/HTTP/TCP, IPv4)

Test Label: DUT Backchannel for G.726 Audio Streaming Using RTP-Unicast/RTSP/HTTP/TCP, IPv4 Transport for IPv4.

Test Case ID: RTSS-6-1-5

ONVIF Core Specification Coverage: Back Channel Connection, RTSP Require- Tag, Connection setup for a bi-directional connection

Command Under Test:

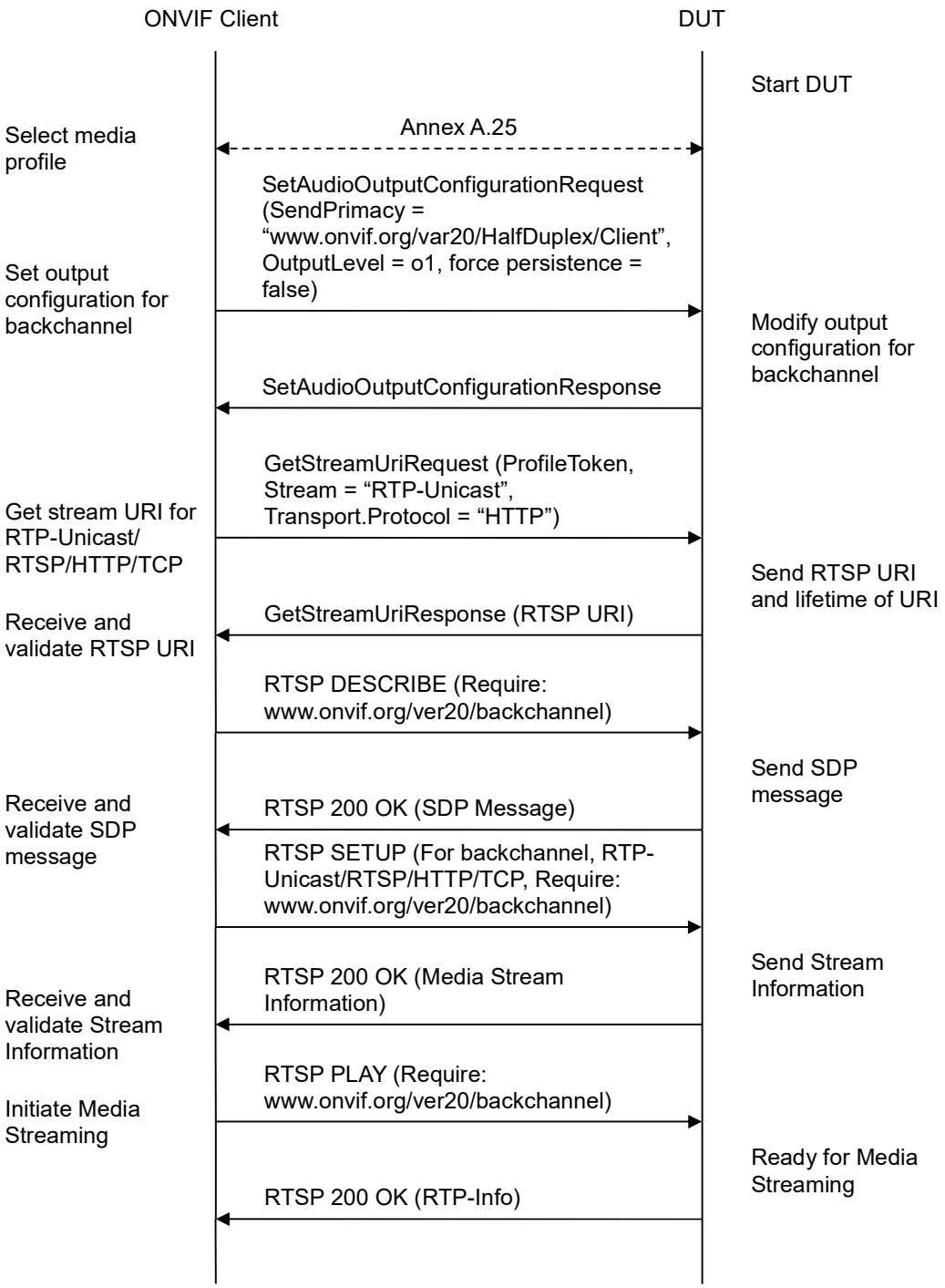
WSDL Reference: media.wsdl

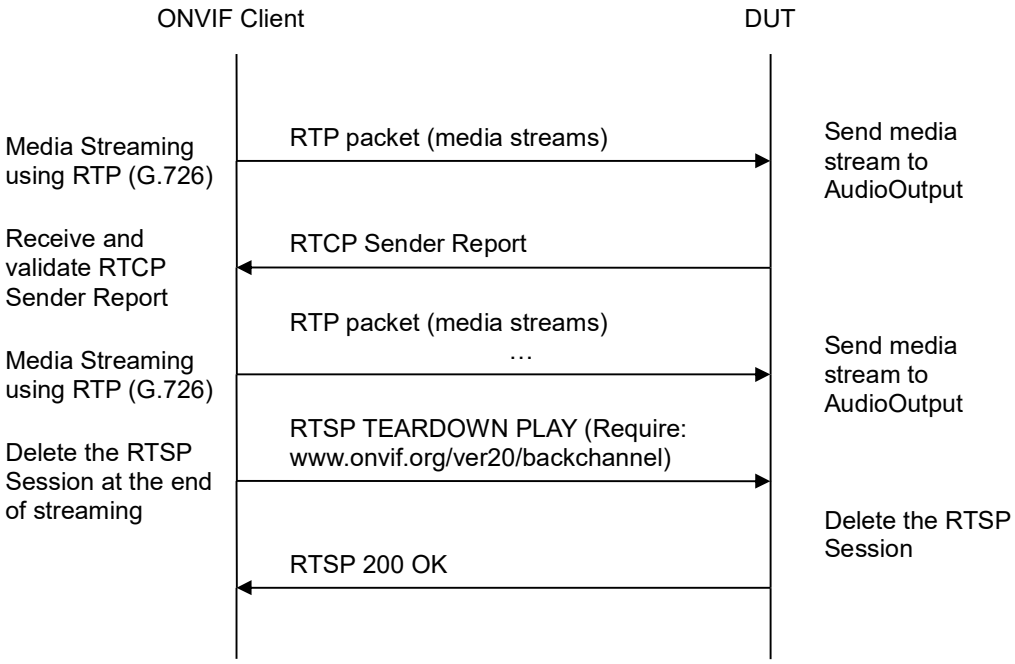
Test Purpose: To verify DUT Backchannel for G.726 audio streaming using RTP-Unicast/RTSP/HTTP/TCP, IPv4 transport for IPv4.

Pre-Requisite: Media is supported by the DUT. Audio backchannel is supported by the DUT and G.726 Decoder is implemented by DUT. Media Service entry point is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Select media profile
Annex A.25
SetAudioOutputConfigurationRequest (SendPrimacy = "www.onvif.org/var20/HalfDuplex/Client", OutputLevel = o1, force persistence = false)
Set output configuration for backchannel
Modify output configuration for backchannel
SetAudioOutputConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP")
Get stream URI for RTP-Unicast/ RTSP/HTTP/TCP
Send RTSP URI and lifetime of URI
Receive and validate RTSP URI
GetStreamUriResponse (RTSP URI)
RTSP DESCRIBE (Require: www.onvif.org/ver20/backchannel)
Send SDP message
Receive and validate SDP message
RTSP 200 OK (SDP Message)
RTSP SETUP (For backchannel, RTP-Unicast/RTSP/HTTP/TCP, Require: www.onvif.org/ver20/backchannel)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY (Require: www.onvif.org/ver20/backchannel)
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start a DUT.
3. ONVIF Client selects a media profile with G.726 decoding and not only www.onvif.org/ver20/HalfDuplex/Client send primacy support by following the procedure mentioned in Annex A.25.
4. ONVIF Client invokes SetAudioOutputConfigurationRequest message (**SendPrimacy = "www.onvif.org/ver20/HalfDuplex/Client", OutputLevel = o1 and force persistence = false**) to set output configuration for backchannel.
5. Verify the SetAudioOutputConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP"**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
10. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.

11. ONVIF Client invokes RTSP DESCRIBE request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) on HTTP POST connection.
12. The DUT sends 200 OK message and SDP information on HTTP GET connection.
13. Verify SDP information from the DUT. Check that DUT return audio backchannel and G.711 on the list of supported codecs for backchannel.
14. ONVIF Client invokes RTSP SETUP request on HTTP POST connection for backchannel with transport parameter **RTP-Unicast/RTSP/HTTP/TCP**, with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
15. The DUT sends 200 OK message and the media stream information on HTTP GET connection.
16. ONVIF Client invokes RTSP PLAY request on HTTP POST connection with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
17. The DUT sends 200 OK message on HTTP GET connection.
18. ONVIF Client sends RTP Unicast G.726 audio stream to DUT on HTTP POST connection.
19. The DUT processes a stream and send it to Output.
20. The DUT sends RTCP sender report to ONVIF Client.
21. ONVIF Client validates the received RTCP packets.
22. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) at the end of media streaming to terminate the RTSP session.
23. The DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.

Test Result:

PASS –

DUT passes all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send **SetAudioOutputConfigurationResponse** message.

The DUT did not send **GetStreamUriResponse** message.

The DUT did not send valid **GetStreamUriResponse** message.

The DUT did not send valid RTSP URI, ValidUnilConnect, ValidUntilReboot and Timeout in **GetStreamUriResponse** message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid SDP information:

- There is no backchannel (marked with a=sendonly attribute)

- There is no G.726 on the list of supported codecs for backchannel

The DUT did not send RTCP sender report correctly.

The DUT did not process G.726 RTP media streaming.

The DUT did not send G.726 RTP media streaming to Output from media profile.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.6.6 BACKCHANNEL – G.726 (RTP/RTSP/TCP, IPv4)

Test Label: DUT Backchannel for G.726 Audio Streaming Using RTP/RTSP/TCP, IPv4 Transport for IPv4.

Test Case ID: RTSS-6-1-6

ONVIF Core Specification Coverage: Back Channel Connection, RTSP Require- Tag, Connection setup for a bi-directional connection

Command Under Test:

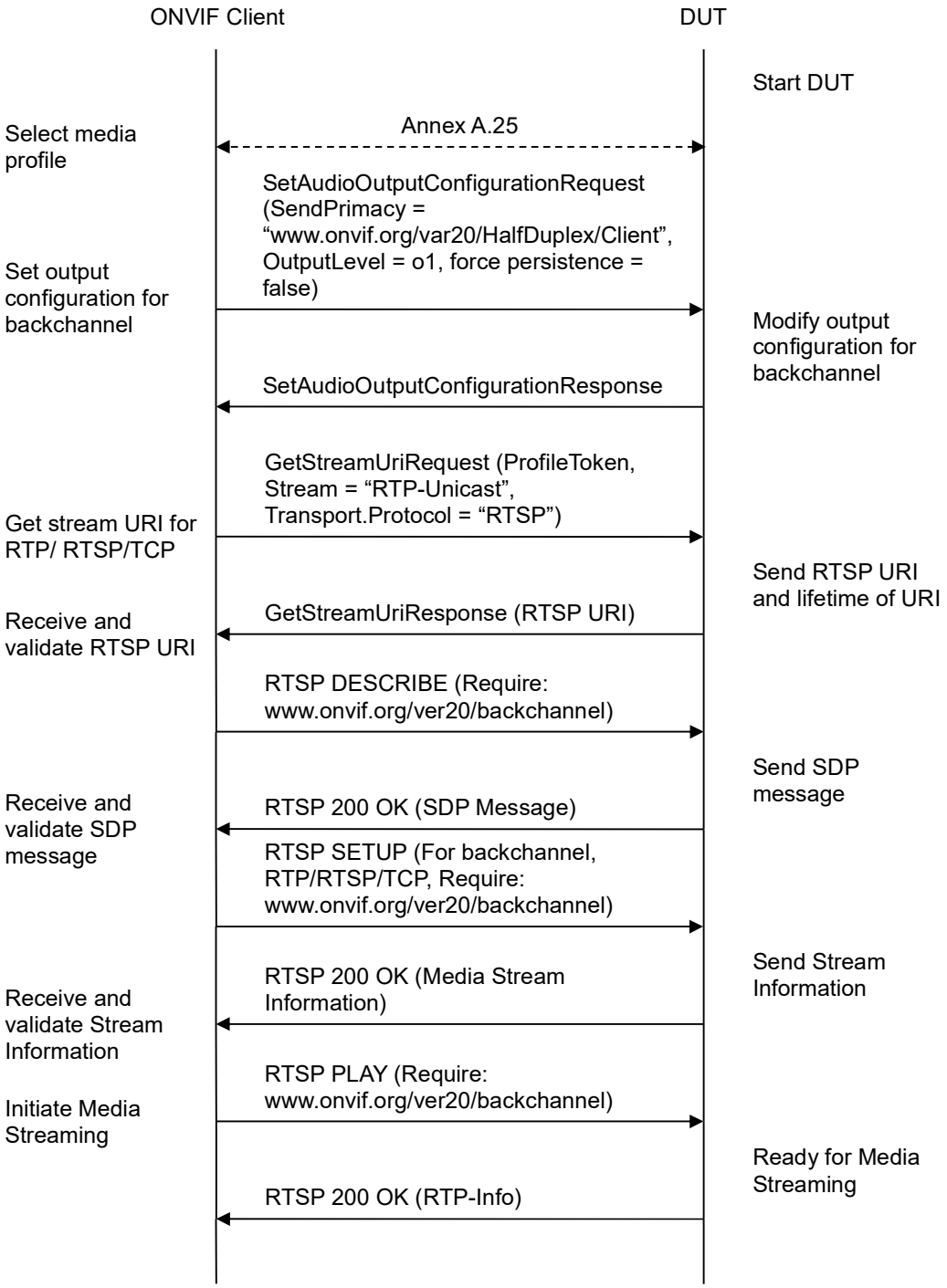
WSDL Reference: media.wsdl

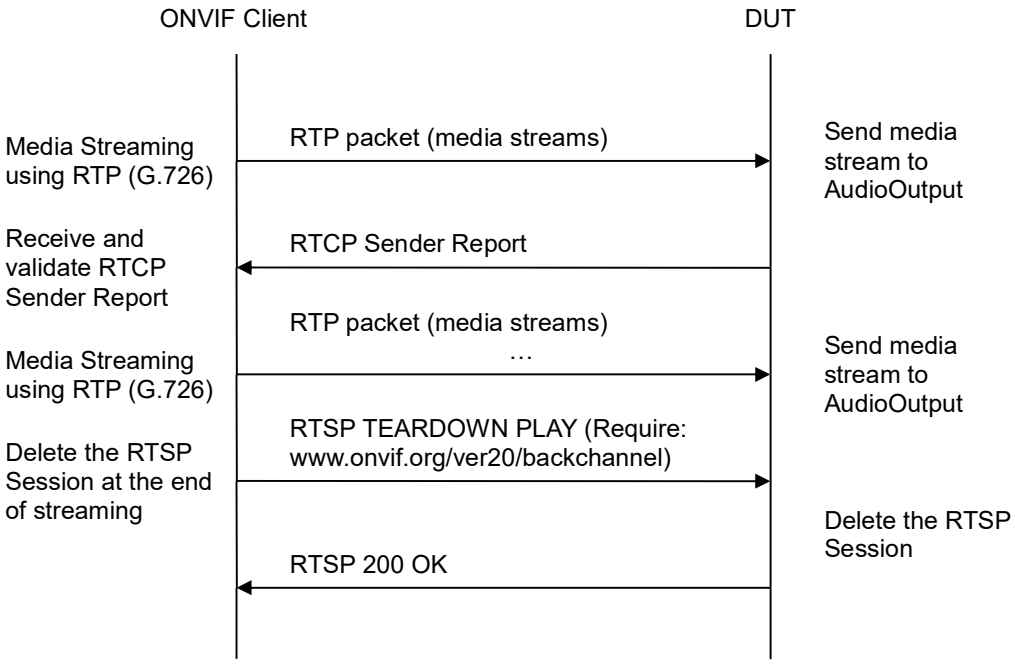
Test Purpose: To verify DUT Backchannel for G.726 audio streaming using RTP/RTSP/TCP, IPv4 transport for IPv4.

Pre-Requisite: Media is supported by the DUT. Audio backchannel is supported by the DUT and G.726 Decoder is implemented by the DUT. Media Service entry point is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Select media profile
Annex A.25
SetAudioOutputConfigurationRequest (SendPrimacy = "www.onvif.org/var20/HalfDuplex/Client", OutputLevel = o1, force persistence = false)
Set output configuration for backchannel
Modify output configuration for backchannel
SetAudioOutputConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP")
Get stream URI for RTP/ RTSP/TCP
Send RTSP URI and lifetime of URI
Receive and validate RTSP URI
GetStreamUriResponse (RTSP URI)
RTSP DESCRIBE (Require: www.onvif.org/ver20/backchannel)
Send SDP message
Receive and validate SDP message
RTSP 200 OK (SDP Message)
RTSP SETUP (For backchannel, RTP/RTSP/TCP, Require: www.onvif.org/ver20/backchannel)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY (Require: www.onvif.org/ver20/backchannel)
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start a DUT.
3. ONVIF Client selects a media profile with G.726 decoding and not only **www.onvif.org/ver20/HalfDuplex/Client** send primacy support by following the procedure mentioned in Annex A.25.
4. ONVIF Client invokes SetAudioOutputConfigurationRequest message (**SendPrimacy = "www.onvif.org/ver20/HalfDuplex/Client", OutputLevel = o1 and force persistence = false**) to set output configuration for backchannel.
5. Verify the SetAudioOutputConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP"**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request with additional Require-tag (**Require: www.onvif.org/ver20/backchanne**l).
10. The DUT sends 200 OK message and SDP information.
11. Verify SDP information from the DUT. Check that DUT return audio backchannel and G.726 on the list of supported codecs for backchannel.

12. ONVIF Client invokes RTSP SETUP request for backchannel with transport parameter **RTP/RTSP/TCP**, with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
15. The DUT sends 200 OK message.
16. ONVIF Client sends RTP Unicast G.726 audio stream to DUT over UDP.
17. The DUT processes a stream and send it to Output.
18. The DUT sends RTCP sender report to ONVIF Client.
19. ONVIF Client validates the received RTCP packets.
20. ONVIF Client invokes RTSP TEARDOWN control request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) at the end of media streaming to terminate the RTSP session.
21. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

The DUT passed all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send **SetAudioOutputConfigurationResponse** message.

The DUT did not send **GetStreamUriResponse** message.

The DUT did not send valid **GetStreamUriResponse** message.

The DUT did not send valid RTSP URI, ValidUnilConnect, ValidUntilReboot and Timeout in **GetStreamUriResponse** message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid SDP information:

- There is no backchannel (marked with a=sendonly attribute)
- There is no G.726 on the list of supported codecs for backchannel

The DUT did not send RTCP sender report correctly.

The DUT did not process G.726 RTP media streaming.

The DUT did not send G.726 RTP media streaming to Output from media profile.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Driving IP-based physical security through global standardization

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.6.7 BACKCHANNEL – AAC (RTP-Unicast/UDP, IPv4)

Test Label: DUT Backchannel for AAC Audio Streaming Using RTP-Unicast/UDP Transport for IPv4.

Test Case ID: RTSS-6-1-7

ONVIF Core Specification Coverage: Back Channel Connection, RTSP Require- Tag, Connection setup for a bi-directional connection

Command Under Test:

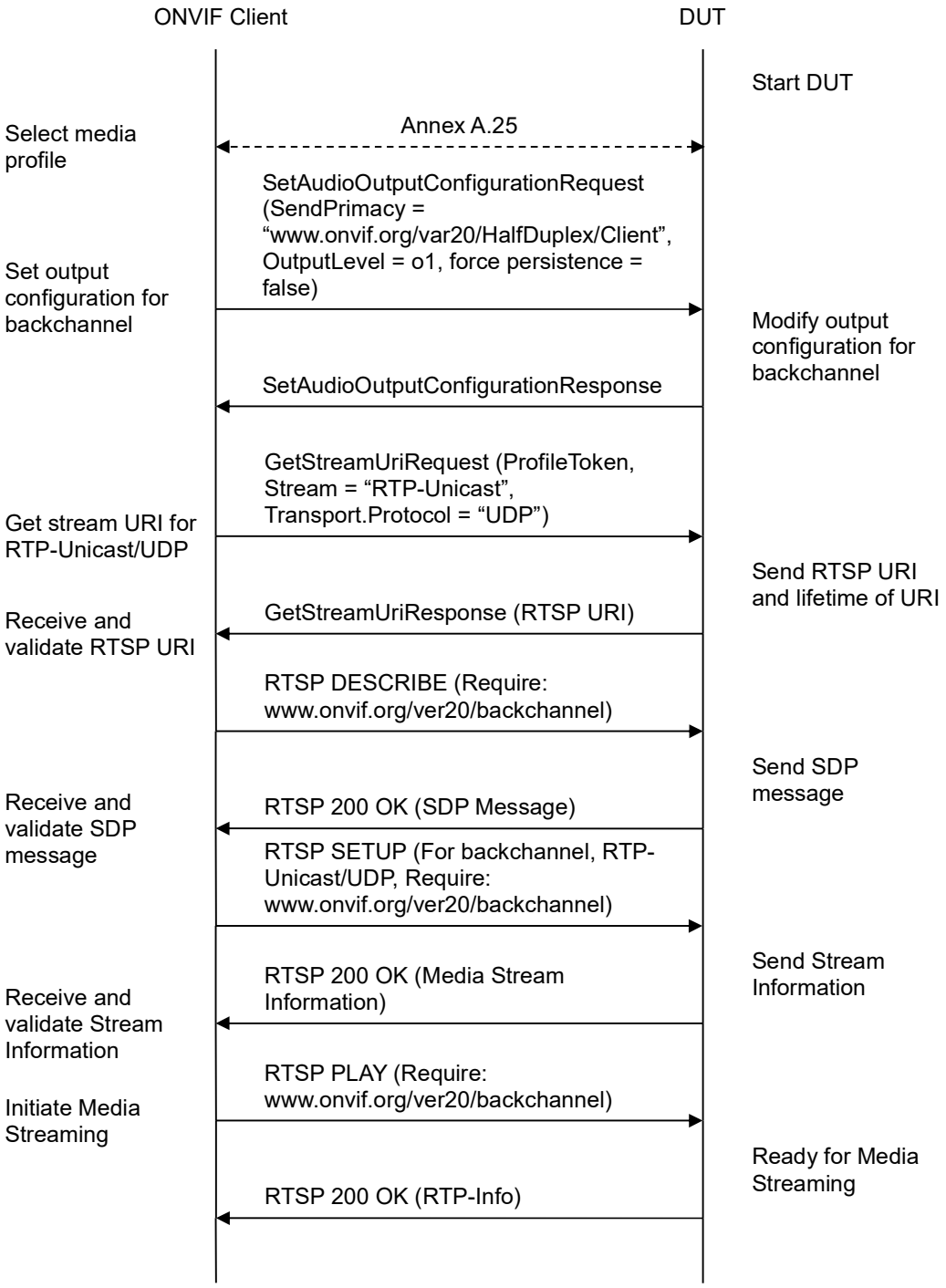
WSDL Reference: media.wsdl

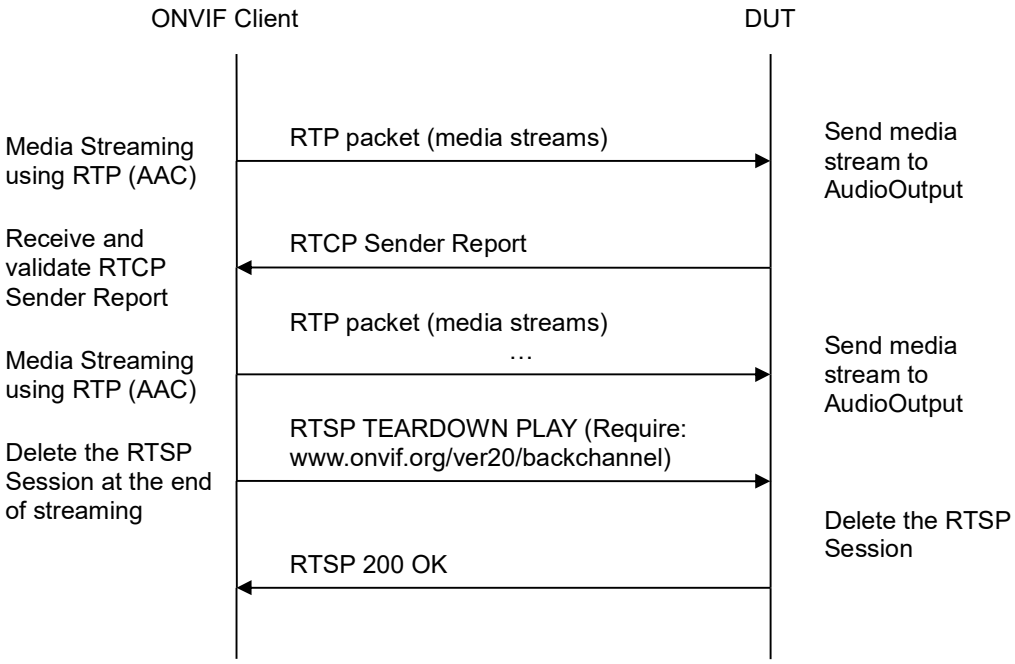
Test Purpose: To verify DUT Backchannel for AAC audio streaming using RTP-Unicast/UDP transport for IPv4.

Pre-Requisite: Media is supported by the DUT. Audio backchannel is supported by the DUT and AAC Decoder is implemented by the DUT. Media Service entry point is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Select media profile
Annex A.25
SetAudioOutputConfigurationRequest (SendPrimacy = "www.onvif.org/var20/HalfDuplex/Client", OutputLevel = o1, force persistence = false)
Set output configuration for backchannel
Modify output configuration for backchannel
SetAudioOutputConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "UDP")
Get stream URI for RTP-Unicast/UDP
Send RTSP URI and lifetime of URI
Receive and validate RTSP URI
GetStreamUriResponse (RTSP URI)
RTSP DESCRIBE (Require: www.onvif.org/ver20/backchannel)
Send SDP message
Receive and validate SDP message
RTSP 200 OK (SDP Message)
RTSP SETUP (For backchannel, RTP-Unicast/UDP, Require: www.onvif.org/ver20/backchannel)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY (Require: www.onvif.org/ver20/backchannel)
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client selects a media profile with AAC decoding and not only www.onvif.org/ver20/HalfDuplex/Client send primacy support by following the procedure mentioned in Annex A.25.
4. ONVIF Client invokes SetAudioOutputConfigurationRequest message (**SendPrimacy = "www.onvif.org/ver20/HalfDuplex/Client", OutputLevel = o1** and **force persistence = false**) to set output configuration for backchannel.
5. Verify the SetAudioOutputConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "UDP"**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
10. The DUT sends 200 OK message and SDP information.
11. Verify SDP information from the DUT. Check that DUT return audio backchannel and AAC on the list of supported codecs for backchannel.

12. ONVIF Client invokes RTSP SETUP request for backchannel with transport parameter **RTP-Unicast/UDP**, with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
15. The DUT sends 200 OK message.
16. ONVIF Client sends RTP Unicast AAC audio stream to DUT over UDP.
17. The DUT processes a stream and send it to Output.
18. The DUT sends RTCP sender report to ONVIF Client.
19. ONVIF Client validates the received RTCP packets.
20. ONVIF Client invokes RTSP TEARDOWN control request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) at the end of media streaming to terminate the RTSP session.
21. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

The DUT passed all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send **SetAudioOutputConfigurationResponse** message.

The DUT did not send **GetStreamUriResponse** message.

The DUT did not send valid **GetStreamUriResponse** message.

The DUT did not send valid RTSP URI, ValidUnilConnect, ValidUntilReboot and Timeout in **GetStreamUriResponse** message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid SDP information:

- There is no backchannel (marked with a=sendonly attribute)
- There is no AAC on the list of supported codecs for backchannel

The DUT did not send RTCP sender report correctly.

The DUT did not process AAC RTP media streaming.

The DUT did not send AAC RTP media streaming to Output from media profile.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.6.8 BACKCHANNEL – AAC (RTP-Unicast/RTSP/HTTP/TCP, IPv4)

Test Label: DUT Backchannel for AAC Audio Streaming Using RTP-Unicast/RTSP/HTTP/TCP, IPv4 Transport for IPv4.

Test Case ID: RTSS-6-1-8

ONVIF Core Specification Coverage: Back Channel Connection, RTSP Require- Tag, Connection setup for a bi-directional connection

Command Under Test:

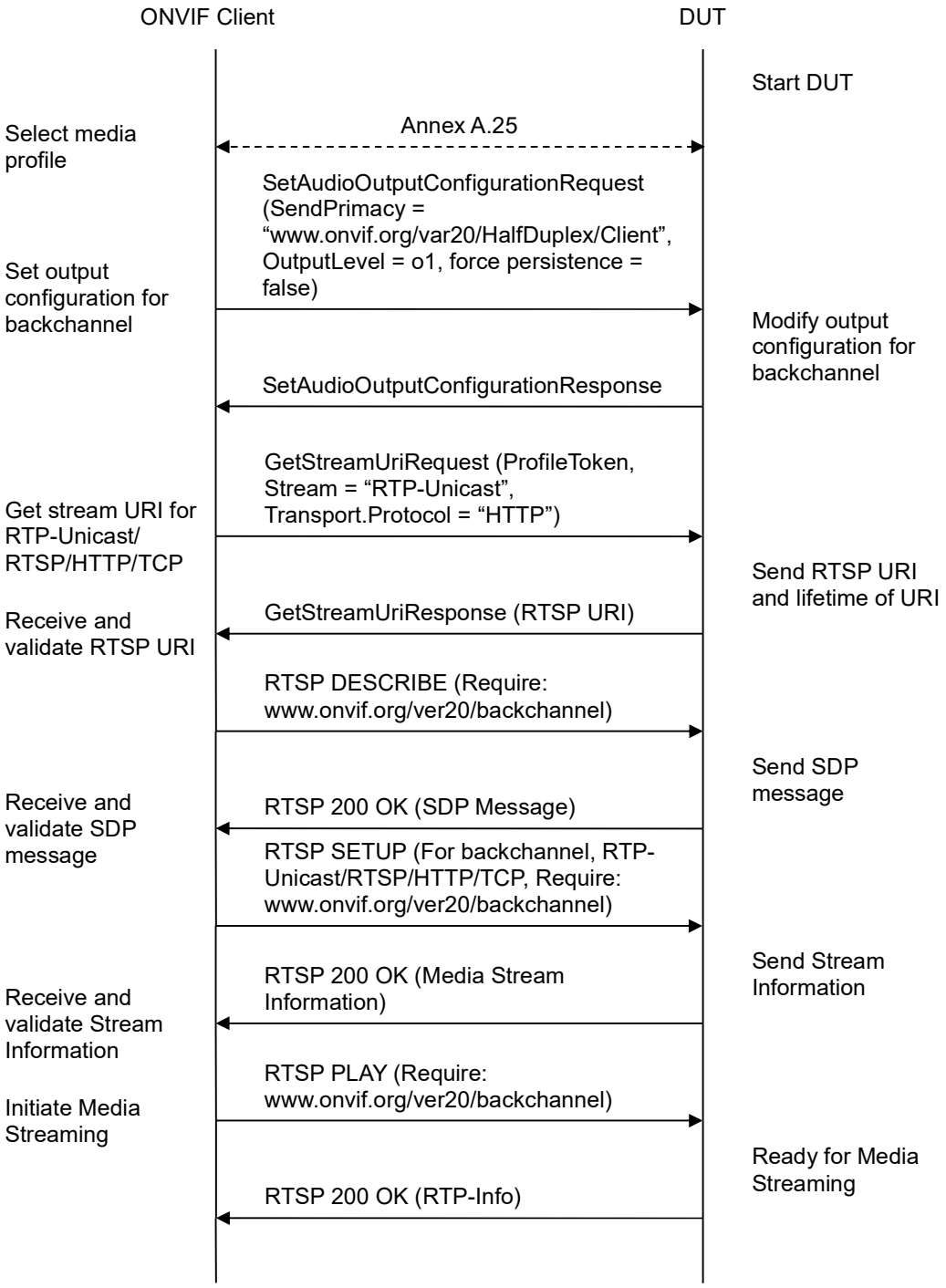
WSDL Reference: media.wsdl

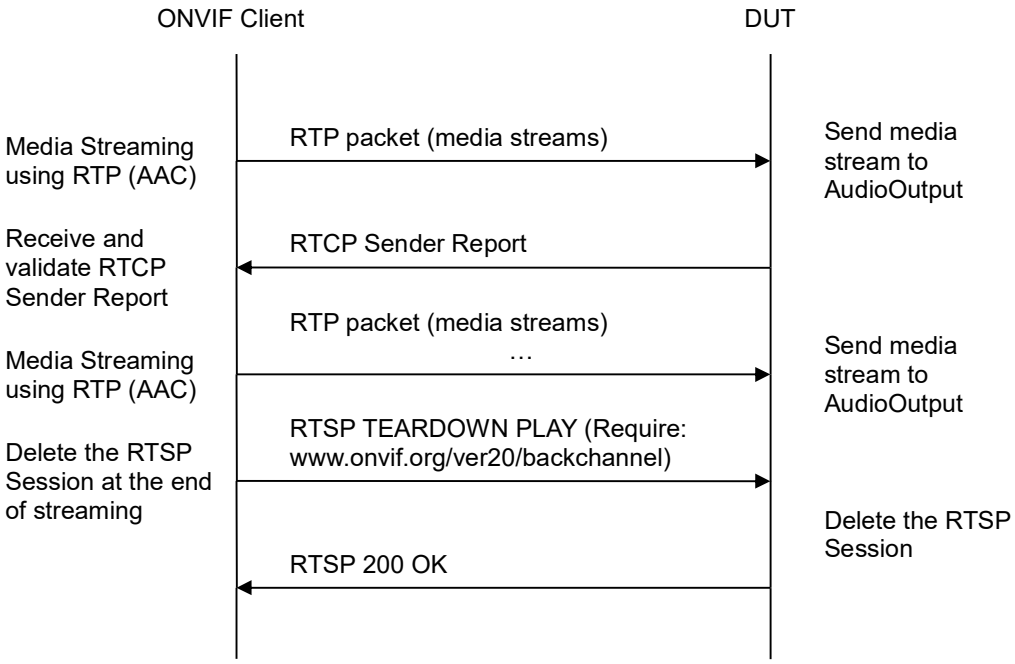
Test Purpose: To verify DUT Backchannel for AAC audio streaming using RTP-Unicast/RTSP/HTTP/TCP, IPv4 transport for IPv4.

Pre-Requisite: Media is supported by the DUT. Audio backchannel is supported by the DUT and AAC Decoder is implemented by the DUT. Media Service entry point is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Select media profile
Annex A.25
SetAudioOutputConfigurationRequest (SendPrimacy = "www.onvif.org/var20/HalfDuplex/Client", OutputLevel = o1, force persistence = false)
Set output configuration for backchannel
Modify output configuration for backchannel
SetAudioOutputConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP")
Get stream URI for RTP-Unicast/ RTSP/HTTP/TCP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE (Require: www.onvif.org/ver20/backchannel)
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For backchannel, RTP-Unicast/RTSP/HTTP/TCP, Require: www.onvif.org/ver20/backchannel)
RTSP 200 OK (Media Stream Information)
Send Stream Information
Receive and validate Stream Information
RTSP PLAY (Require: www.onvif.org/ver20/backchannel)
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start a DUT.
3. ONVIF Client selects a media profile with AAC decoding and not only www.onvif.org/ver20/HalfDuplex/Client send primacy support by following the procedure mentioned in Annex A.25.
4. ONVIF Client invokes SetAudioOutputConfigurationRequest message (**SendPrimacy = "www.onvif.org/ver20/HalfDuplex/Client", OutputLevel = o1** and **force persistence = false**) to set output configuration for backchannel.
5. Verify the SetAudioOutputConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "HTTP"**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
10. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.

11. ONVIF Client invokes RTSP DESCRIBE request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) on HTTP POST connection.
12. The DUT sends 200 OK message and SDP information on HTTP GET connection.
13. Verify SDP information from the DUT. Check that DUT return audio backchannel and G.711 on the list of supported codecs for backchannel.
14. ONVIF Client invokes RTSP SETUP request on HTTP POST connection for backchannel with transport parameter **RTP-Unicast/RTSP/HTTP/TCP**, with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
15. The DUT sends 200 OK message and the media stream information on HTTP GET connection.
16. ONVIF Client invokes RTSP PLAY request on HTTP POST connection with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
17. The DUT sends 200 OK message on HTTP GET connection.
18. ONVIF Client sends RTP Unicast AAC audio stream to DUT on HTTP POST connection.
19. The DUT process a stream and send it to Output.
20. The DUT sends RTCP sender report to ONVIF Client.
21. ONVIF Client validates the received RTCP packets.
22. ONVIF Client invokes RTSP TEARDOWN control request on HTTP POST connection with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) at the end of media streaming to terminate the RTSP session.
23. The DUT sends 200 OK Response on HTTP GET connection and closes the HTTP GET connection.

Test Result:

PASS –

The DUT passed all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send **SetAudioOutputConfigurationResponse** message.

The DUT did not send **GetStreamUriResponse** message.

The DUT did not send valid **GetStreamUriResponse** message.

The DUT did not send valid RTSP URI, ValidUnilConnect, ValidUntilReboot and Timeout in **GetStreamUriResponse** message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid SDP information:

- There is no backchannel (marked with a=sendonly attribute)

- There is no AAC on the list of supported codecs for backchannel

The DUT did not send RTCP sender report correctly.

The DUT did not process AAC RTP media streaming.

The DUT did not send AAC RTP media streaming to Output from media profile.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.6.9 BACKCHANNEL – AAC (RTP/RTSP/TCP, IPv4)

Test Label: DUT Backchannel for AAC Audio Streaming Using RTP/RTSP/TCP, IPv4 Transport for IPv4.

Test Case ID: RTSS-6-1-9

ONVIF Core Specification Coverage: Back Channel Connection, RTSP Require- Tag, Connection setup for a bi-directional connection

Command Under Test:

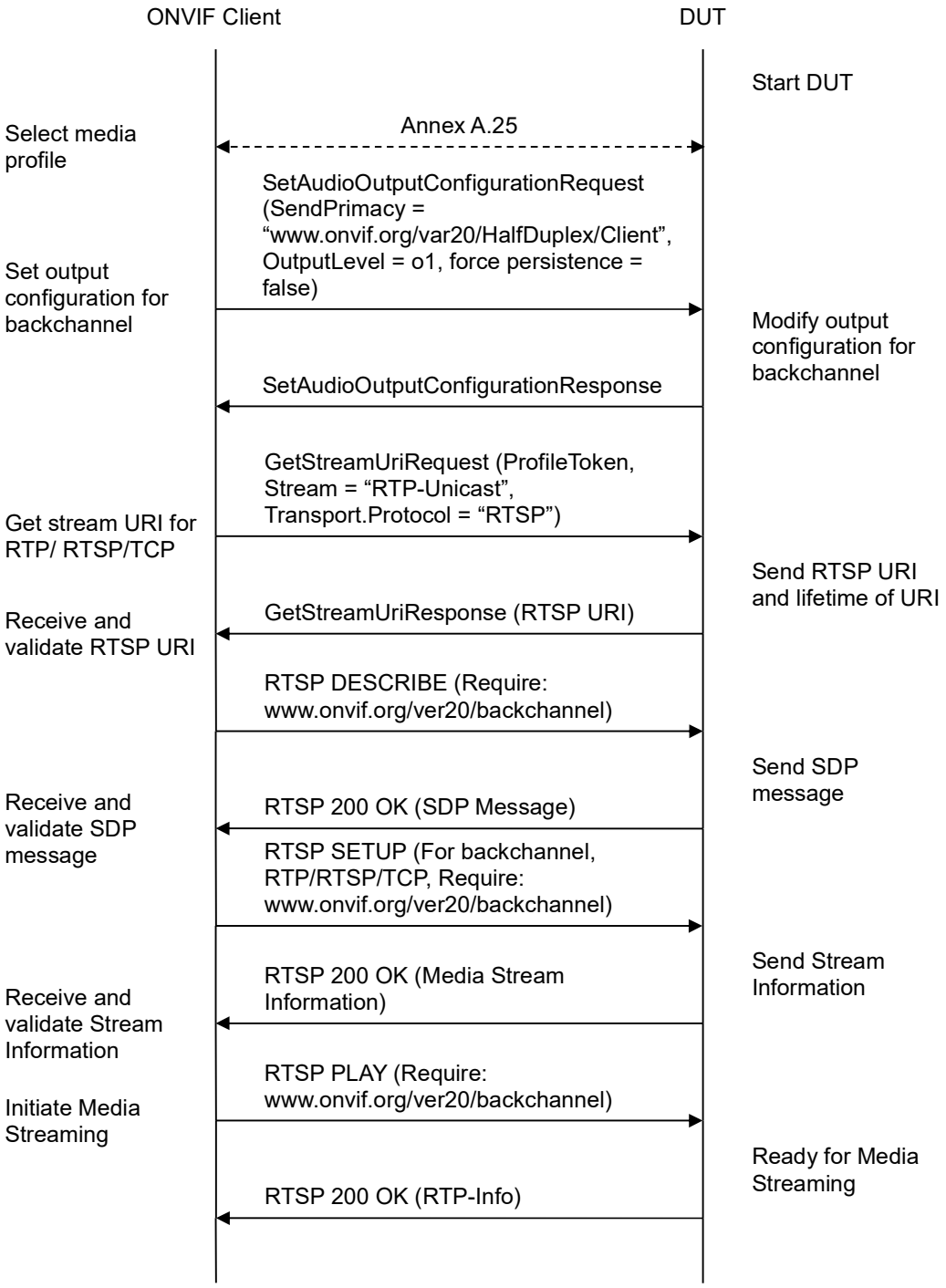
WSDL Reference: media.wsdl

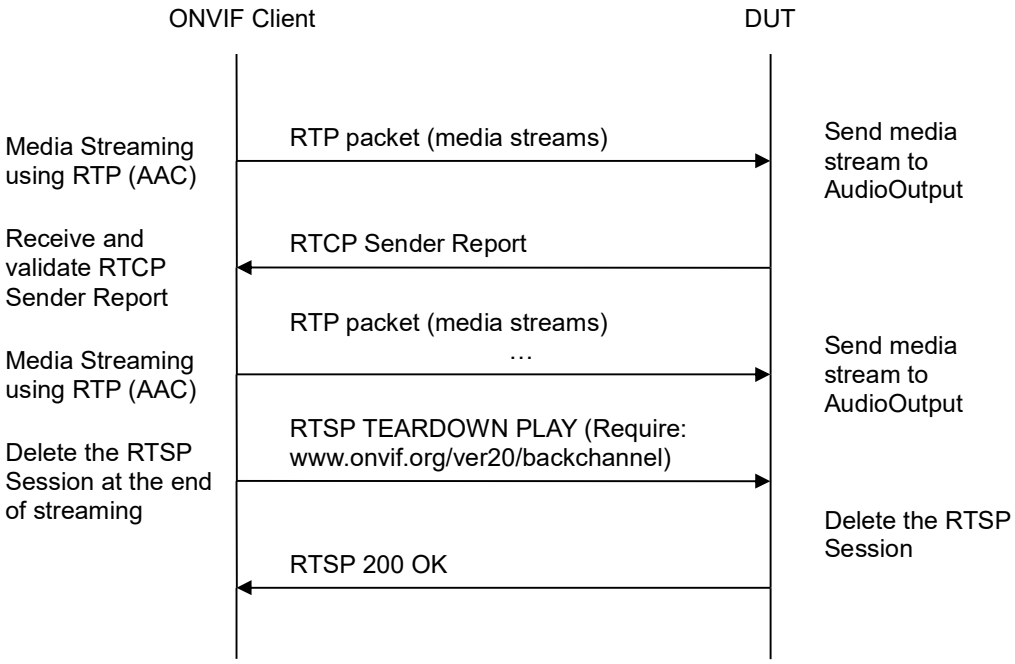
Test Purpose: To verify DUT Backchannel for AAC audio streaming using RTP/RTSP/TCP, IPv4 transport for IPv4.

Pre-Requisite: Media is supported by the DUT. Audio backchannel is supported by the DUT and AAC Decoder is implemented by the DUT. Media Service entry point is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Select media profile
Annex A.25
SetAudioOutputConfigurationRequest (SendPrimacy = "www.onvif.org/var20/HalfDuplex/Client", OutputLevel = o1, force persistence = false)
Set output configuration for backchannel
Modify output configuration for backchannel
SetAudioOutputConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP")
Get stream URI for RTP/ RTSP/TCP
Send RTSP URI and lifetime of URI
Receive and validate RTSP URI
GetStreamUriResponse (RTSP URI)
RTSP DESCRIBE (Require: www.onvif.org/ver20/backchannel)
Send SDP message
Receive and validate SDP message
RTSP 200 OK (SDP Message)
RTSP SETUP (For backchannel, RTP/RTSP/TCP, Require: www.onvif.org/ver20/backchannel)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY (Require: www.onvif.org/ver20/backchannel)
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start a DUT.
3. ONVIF Client selects a media profile with AAC decoding and not only www.onvif.org/ver20/HalfDuplex/Client send primacy support by following the procedure mentioned in Annex A.25.
4. ONVIF Client invokes SetAudioOutputConfigurationRequest message (**SendPrimacy = "www.onvif.org/ver20/HalfDuplex/Client", OutputLevel = o1 and force persistence = false**) to set output configuration for backchannel.
5. Verify the SetAudioOutputConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Unicast", Transport.Protocol = "RTSP"**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
10. The DUT sends 200 OK message and SDP information.
11. Verify SDP information from the DUT. Check that DUT return audio backchannel and AAC on the list of supported codecs for backchannel.

12. ONVIF Client invokes RTSP SETUP request for backchannel with transport parameter **RTP/RTSP/TCP**, with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
15. The DUT sends 200 OK message.
16. ONVIF Client sends RTP Unicast AAC audio stream to DUT over UDP.
17. The DUT processes a stream and send it to Output.
18. The DUT sends RTCP sender report to ONVIF Client.
19. ONVIF Client validates the received RTCP packets.
20. ONVIF Client invokes RTSP TEARDOWN control request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) at the end of media streaming to terminate the RTSP session.
21. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

The DUT passed all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send **SetAudioOutputConfigurationResponse** message.

The DUT did not send **GetStreamUriResponse** message.

The DUT did not send valid **GetStreamUriResponse** message.

The DUT did not send valid RTSP URI, ValidUnilConnect, ValidUntilReboot and Timeout in **GetStreamUriResponse** message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid SDP information:

- There is no backchannel (marked with a=sendonly attribute)
- There is no AAC on the list of supported codecs for backchannel

The DUT did not send RTCP sender report correctly.

The DUT did not process AAC RTP media streaming.

The DUT did not send AAC RTP media streaming to Output from media profile.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Driving IP-based physical security through global standardization

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.6.10 BACKCHANNEL – G.711 (RTP-Multicast/UDP, IPv4)

Test Label: DUT Backchannel for G.711 Audio Streaming Using RTP-Multicast/UDP, IPv4 Transport for IPv4.

Test Case ID: RTSS-6-2-1

ONVIF Core Specification Coverage: Back Channel Connection, RTSP Require- Tag, Connection setup for a bi-directional connection

Command Under Test:

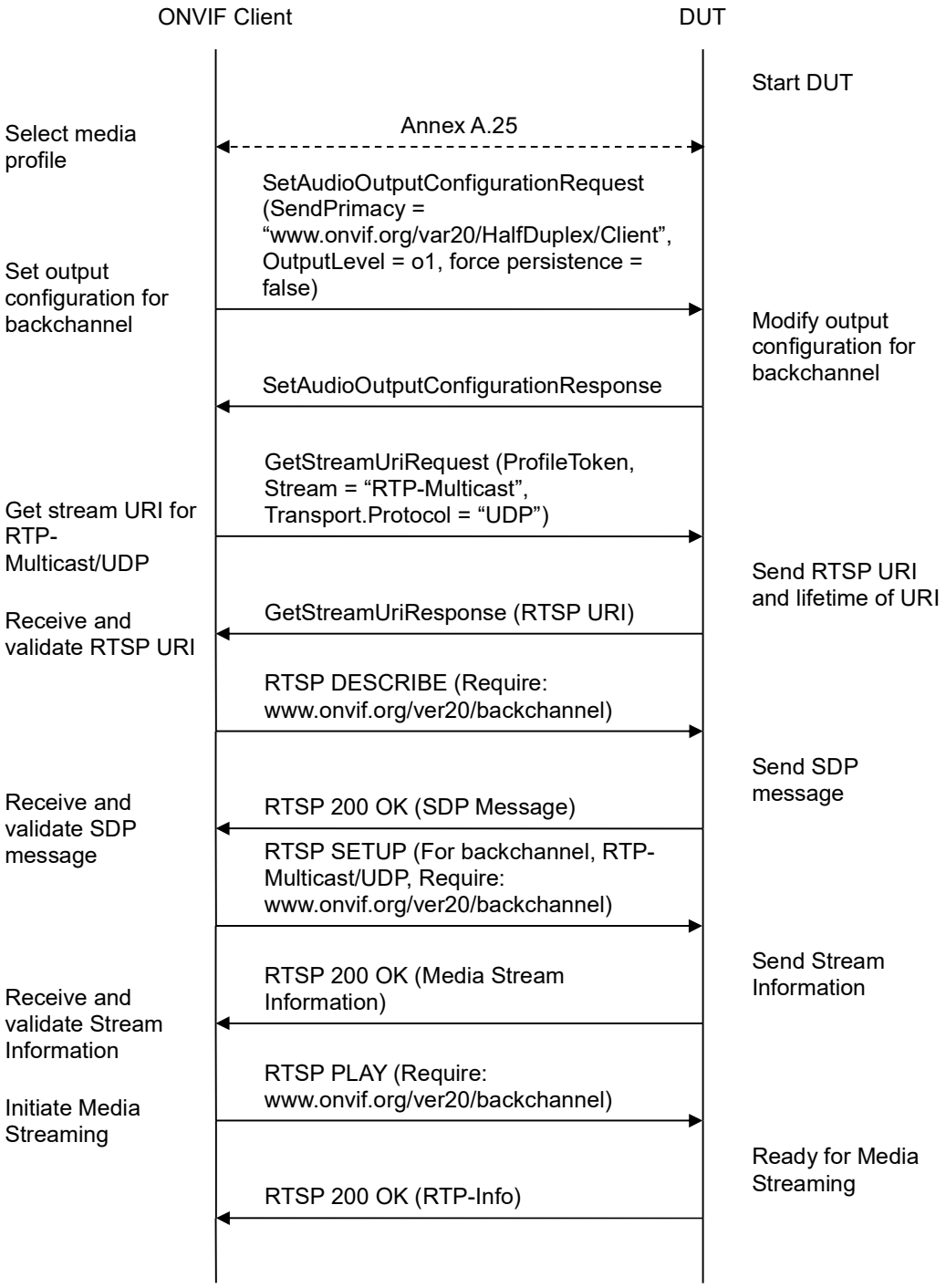
WSDL Reference: media.wsdl

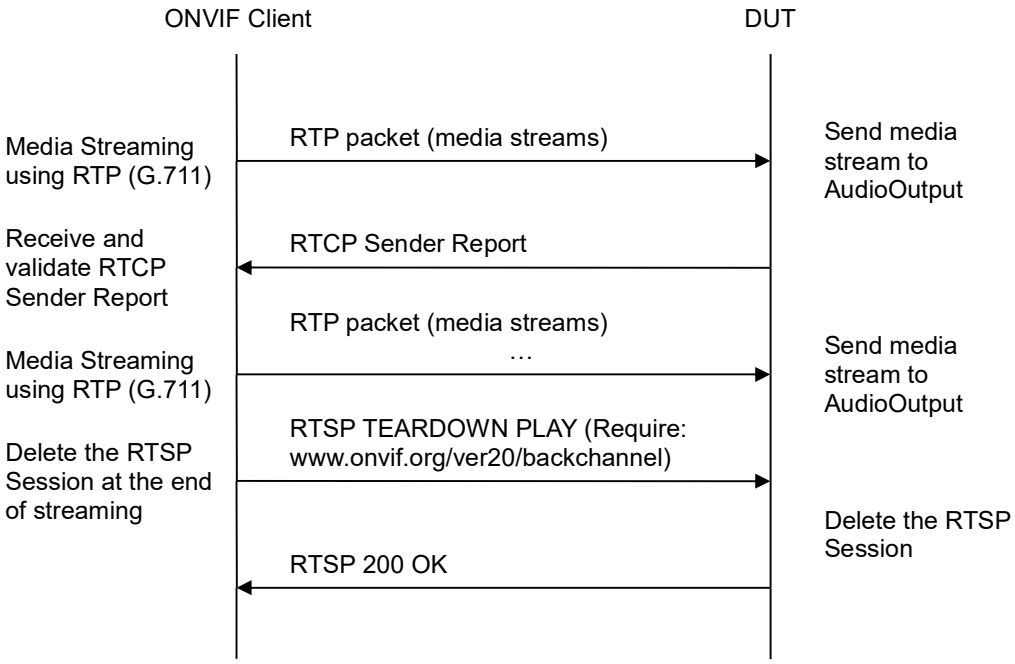
Test Purpose: To verify DUT Backchannel for G.711 audio streaming using RTP-Multicast/UDP, IPv4 transport for IPv4.

Pre-Requisite: Media is supported by the DUT. Audio backchannel is supported by the DUT and G.711 Decoder is implemented by the DUT. RTP-Multicast/UDP transport protocol is supported by the DUT. Media Service entry point is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Select media profile
Annex A.25
SetAudioOutputConfigurationRequest (SendPrimacy = "www.onvif.org/var20/HalfDuplex/Client", OutputLevel = o1, force persistence = false)
Set output configuration for backchannel
Modify output configuration for backchannel
SetAudioOutputConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP")
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE (Require: www.onvif.org/ver20/backchannel)
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For backchannel, RTP-Multicast/UDP, Require: www.onvif.org/ver20/backchannel)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY (Require: www.onvif.org/ver20/backchannel)
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start a DUT.
3. ONVIF Client selects a media profile with G.711 decoding and not only www.onvif.org/ver20/HalfDuplex/Client send primacy support by following the procedure mentioned in Annex A.25.
4. ONVIF Client invokes SetAudioOutputConfigurationRequest message (**SendPrimacy = "www.onvif.org/ver20/HalfDuplex/Client", OutputLevel = o1** and **force persistence = false**) to set output configuration for backchannel.
5. Verify the SetAudioOutputConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP"**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
10. The DUT sends 200 OK message and SDP information.

11. Verify SDP information from the DUT. Check that DUT return audio backchannel and G.711 on the list of supported codecs for backchannel.
12. ONVIF Client invokes RTSP SETUP request for backchannel with transport **parameter RTP-Multicast/UDP**, with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) and with IPv4 multicast parameters.
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
15. The DUT sends 200 OK message.
16. ONVIF Client sends RTP multicast G.711 audio stream to multicast IPv4 address over UDP.
17. The DUT processes a stream and send it to Output.
18. The DUT sends RTCP sender report to ONVIF Client.
19. ONVIF Client validates the received RTCP packets.
20. ONVIF Client invokes RTSP TEARDOWN control request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) at the end of media streaming to terminate the RTSP session.
21. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

The DUT passed all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send **SetAudioOutputConfigurationResponse** message.

The DUT did not send **GetStreamUriResponse** message.

The DUT did not send valid **GetStreamUriResponse** message.

The DUT did not send valid RTSP URI, ValidUnilConnect, ValidUntilReboot and Timeout in **GetStreamUriResponse** message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid SDP information:

- There is no backchannel (marked with a=sendonly attribute)
- There is no G.711 on the list of supported codecs for backchannel

The DUT did not send RTCP sender report correctly.

The DUT did not process G.711 RTP media streaming.

The DUT did not send G.711 RTP media streaming to Output from media profile.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.6.11 BACKCHANNEL – G.726 (RTP-Multicast/UDP, IPv4)

Test Label: DUT Backchannel for G.726 Audio Streaming Using RTP-Multicast/UDP, IPv4 Transport for IPv4.

Test Case ID: RTSS-6-2-2

ONVIF Core Specification Coverage: Back Channel Connection, RTSP Require- Tag, Connection setup for a bi-directional connection

Command Under Test:

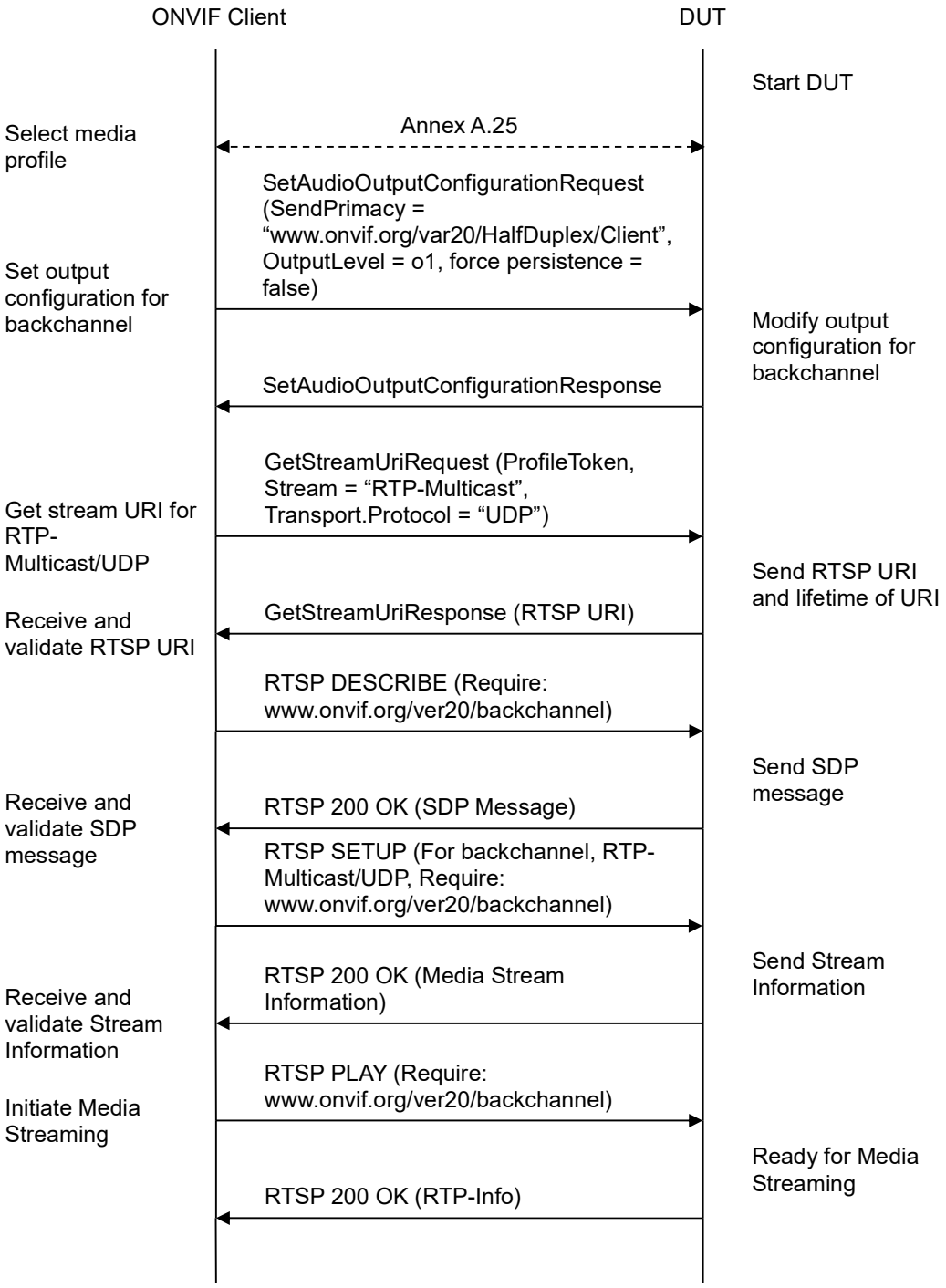
WSDL Reference: media.wsdl

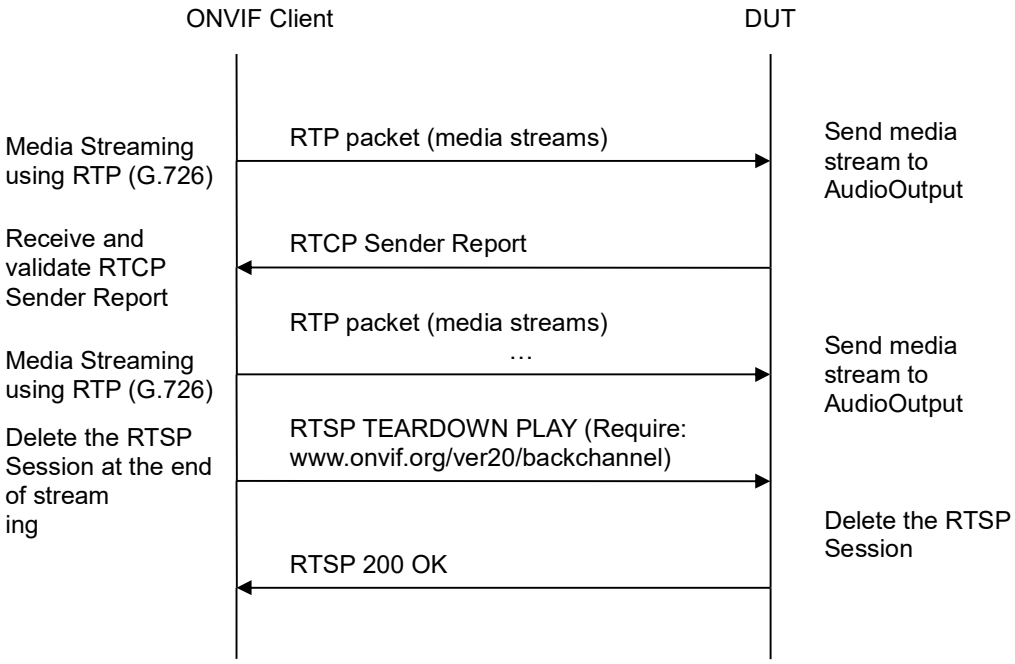
Test Purpose: To verify DUT Backchannel for G.726 audio streaming using RTP-Multicast/UDP, IPv4 transport for IPv4.

Pre-Requisite: Media is supported by the DUT. Audio backchannel is supported by the DUT and G.726 Decoder is implemented by the DUT. RTP-Multicast/UDP transport protocol is supported by the DUT. Media Service entry point is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Select media profile
Annex A.25
SetAudioOutputConfigurationRequest (SendPrimacy = "www.onvif.org/var20/HalfDuplex/Client", OutputLevel = o1, force persistence = false)
Set output configuration for backchannel
Modify output configuration for backchannel
SetAudioOutputConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP")
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE (Require: www.onvif.org/ver20/backchannel)
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For backchannel, RTP-Multicast/UDP, Require: www.onvif.org/ver20/backchannel)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY (Require: www.onvif.org/ver20/backchannel)
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start a DUT.
3. ONVIF Client selects a media profile with G.726 decoding and not only www.onvif.org/ver20/HalfDuplex/Client send primacy support by following the procedure mentioned in Annex A.25.
4. ONVIF Client invokes SetAudioOutputConfigurationRequest message (**SendPrimacy = "www.onvif.org/ver20/HalfDuplex/Client", OutputLevel = o1 and force persistence = false**) to set output configuration for backchannel.
5. Verify the SetAudioOutputConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP"**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
10. The DUT sends 200 OK message and SDP information.

11. Verify SDP information from the DUT. Check that DUT return audio backchannel and G.726 on the list of supported codecs for backchannel.
12. ONVIF Client invokes RTSP SETUP request for backchannel with transport parameter **RTP-Multicast/UDP**, with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) and with IPv4 multicast parameters.
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
15. The DUT sends 200 OK message.
16. ONVIF Client sends RTP multicast G.726 audio stream to multicast IPv4 address over UDP.
17. The DUT processes a stream and send it to Output.
18. The DUT sends RTCP sender report to ONVIF Client.
19. ONVIF Client validates the received RTCP packets.
20. ONVIF Client invokes RTSP TEARDOWN control request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) at the end of media streaming to terminate the RTSP session.
21. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

The DUT passed all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send **SetAudioOutputConfigurationResponse** message.

The DUT did not send **GetStreamUriResponse** message.

The DUT did not send valid **GetStreamUriResponse** message.

The DUT did not send valid RTSP URI, ValidUnilConnect, ValidUntilReboot and Timeout in **GetStreamUriResponse** message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid SDP information:

- There is no backchannel (marked with a=sendonly attribute)
- There is no G.726 on the list of supported codecs for backchannel

The DUT did not send RTCP sender report correctly.

The DUT did not process G.726 RTP media streaming.

The DUT did not send G.726 RTP media streaming to Output from media profile.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

4.6.12 BACKCHANNEL – AAC (RTP-Multicast/UDP, IPv4)

Test Label: DUT Backchannel for AAC Audio Streaming Using RTP-Multicast/UDP, IPv4 Transport for IPv4.

Test Case ID: RTSS-6-2-1

ONVIF Core Specification Coverage: Back Channel Connection, RTSP Require- Tag, Connection setup for a bi-directional connection

Command Under Test:

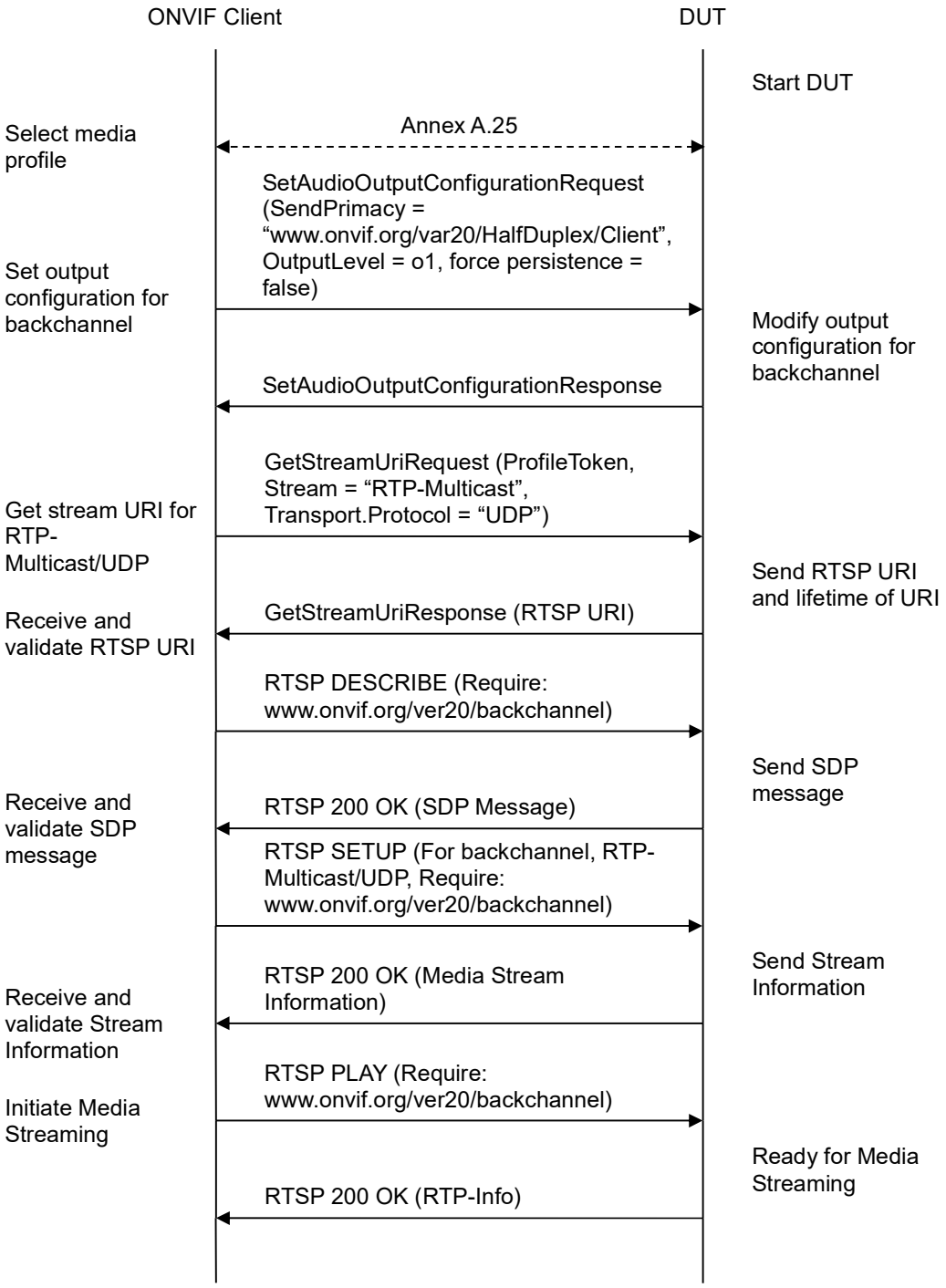
WSDL Reference: media.wsdl

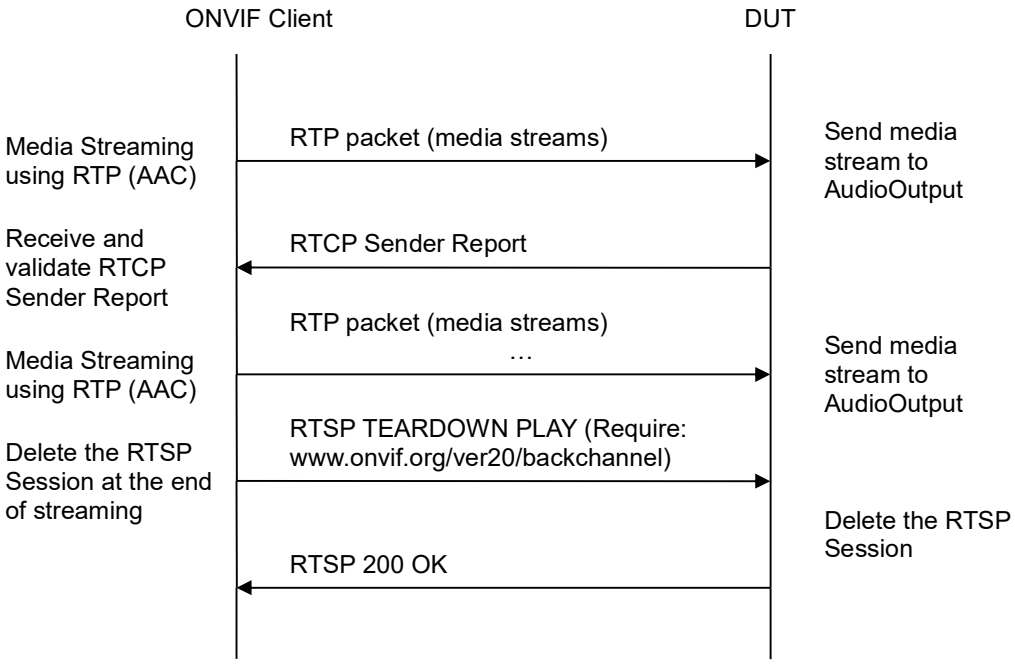
Test Purpose: To verify DUT Backchannel for AAC audio streaming using RTP-Multicast/UDP, IPv4 transport for IPv4.

Pre-Requisite: Media is supported by the DUT. Audio backchannel is supported by the DUT and AAC Decoder is implemented by the DUT. RTP-Multicast/UDP transport protocol is supported by the DUT. Media Service entry point is received from the DUT.

Test Configuration: ONVIF Client and DUT

Test Sequence:


ONVIF Client
DUT
Start DUT
Select media profile
Annex A.25
SetAudioOutputConfigurationRequest (SendPrimacy = "www.onvif.org/var20/HalfDuplex/Client", OutputLevel = o1, force persistence = false)
Set output configuration for backchannel
Modify output configuration for backchannel
SetAudioOutputConfigurationResponse
GetStreamUriRequest (ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP")
Get stream URI for RTP-Multicast/UDP
Send RTSP URI and lifetime of URI
GetStreamUriResponse (RTSP URI)
Receive and validate RTSP URI
RTSP DESCRIBE (Require: www.onvif.org/ver20/backchannel)
Send SDP message
RTSP 200 OK (SDP Message)
Receive and validate SDP message
RTSP SETUP (For backchannel, RTP-Multicast/UDP, Require: www.onvif.org/ver20/backchannel)
Send Stream Information
RTSP 200 OK (Media Stream Information)
Receive and validate Stream Information
RTSP PLAY (Require: www.onvif.org/ver20/backchannel)
Initiate Media Streaming
Ready for Media Streaming
RTSP 200 OK (RTP-Info)



Test Procedure:

1. Start an ONVIF Client.
2. Start a DUT.
3. ONVIF Client selects a media profile with AAC decoding and not only www.onvif.org/ver20/HalfDuplex/Client send primacy support by following the procedure mentioned in Annex A.25.
4. ONVIF Client invokes SetAudioOutputConfigurationRequest message (**SendPrimacy = "www.onvif.org/ver20/HalfDuplex/Client", OutputLevel = o1 and force persistence = false**) to set output configuration for backchannel.
5. Verify the SetAudioOutputConfigurationResponse message from the DUT.
6. ONVIF Client invokes GetStreamUriRequest message (**ProfileToken, Stream = "RTP-Multicast", Transport.Protocol = "UDP"**) to retrieve media stream URI for the selected media profile.
7. The DUT sends the GetStreamUriResponse message with RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout.
8. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
9. ONVIF Client invokes RTSP DESCRIBE request with additional Require-tag (Require: www.onvif.org/ver20/backchannel).
10. The DUT sends 200 OK message and SDP information.

11. Verify SDP information from the DUT. Check that DUT return audio backchannel and AAC on the list of supported codecs for backchannel.
12. ONVIF Client invokes RTSP SETUP request for backchannel with transport parameter **RTP-Multicast/UDP**, with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) and with IPv4 multicast parameters.
13. The DUT sends 200 OK message and the media stream information.
14. ONVIF Client invokes RTSP PLAY request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**).
15. The DUT sends 200 OK message.
16. ONVIF Client sends RTP multicast AAC audio stream to multicast IPv4 address over UDP.
17. The DUT processes a stream and send it to Output.
18. The DUT sends RTCP sender report to ONVIF Client.
19. ONVIF Client validates the received RTCP packets.
20. ONVIF Client invokes RTSP TEARDOWN control request with additional Require-tag (**Require: www.onvif.org/ver20/backchannel**) at the end of media streaming to terminate the RTSP session.
21. The DUT sends 200 OK Response and terminates the RTSP Session.

Test Result:

PASS –

The DUT passed all assertions.

FAIL –

The DUT did not have valid media profile.

The DUT did not send **SetAudioOutputConfigurationResponse** message.

The DUT did not send **GetStreamUriResponse** message.

The DUT did not send valid **GetStreamUriResponse** message.

The DUT did not send valid RTSP URI, ValidUnilConnect, ValidUntilReboot and Timeout in **GetStreamUriResponse** message.

The DUT did not send RTSP 200 OK response for RTSP DESCRIBE, SETUP, PLAY and TEARDOWN requests.

The DUT did not send valid SDP information:

- There is no backchannel (marked with a=sendonly attribute)
- There is no AAC on the list of supported codecs for backchannel

The DUT did not send RTCP sender report correctly.

The DUT did not process AAC RTP media streaming.

The DUT did not send AAC RTP media streaming to Output from media profile.

Note: See Annex A.2 for correct syntax for the StreamSetup element in GetStreamUri requests. See Annex A.1 for Invalid RTP header definition.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

Annex A

This section describes the meaning of the following definitions. These definitions are used in the test case description.

A.1 Invalid RTP Header

A RTP header which is not formed according to the header field format defined in the RFC 3550 Section 5.1 is considered as invalid RTP header.

A.2 StreamSetup syntax for GetStreamUri

The following media stream setups for GetStreamUri are covered in this Test Specification:

1. RTP Unicast over UDP
2. RTP over RTSP over HTTP over TCP
3. RTP over RTSP over TCP

The correct syntax for the StreamSetup element for these media stream setups are as follows:

1. RTP Unicast over UDP

```
<StreamSetup>
    <StreamType>RTP_unicast</StreamType>
    <Transport>
        <Protocol>UDP</Protocol>
    </Transport>
</StreamSetup>
```

2. RTP over RTSP over HTTP over TCP

```
<StreamSetup>
    <StreamType>RTP_unicast</StreamType>
    <Transport>
        <Protocol>HTTP</Protocol>
    </Transport>
</StreamSetup>
```

3. RTP over RTSP over TCP

```
<StreamSetup>
    <StreamType>RTP_unicast</StreamType>
```

```
    <Transport>
        <Protocol>RTSP</Protocol>
    </Transport>
</StreamSetup>
```

A.3 I-frame insertion time interval

'I-frame insertion time interval' is the time interval between two consecutive I-frames sent by DUT.

ONVIF Client calculates this value by using 'GovLength' parameter in the Video encoder configuration. ONVIF Client has to configure 'GovLength' to larger value so that there will be sufficient time difference between two I-frames.

In case of SetSynchronizationPoint test cases in "Real Time Streaming" section, ONVIF Client follows the following procedure to verify that I-frame is inserted as a result of "SetSynchronizationPointRequest".

ONVIF Client waits for an I-frame before invoking SetSynchronizationPointRequest.

After receiving I-frame, ONVIF Client starts a timer with time out period less than 'I-frame insertion time interval' and immediately invokes SetSynchronizationPointRequest.

ONVIF Client waits for the I-frame and verifies that it receives I-frame before the timeout period.

A.4 Media Profile Configuration for Video Streaming

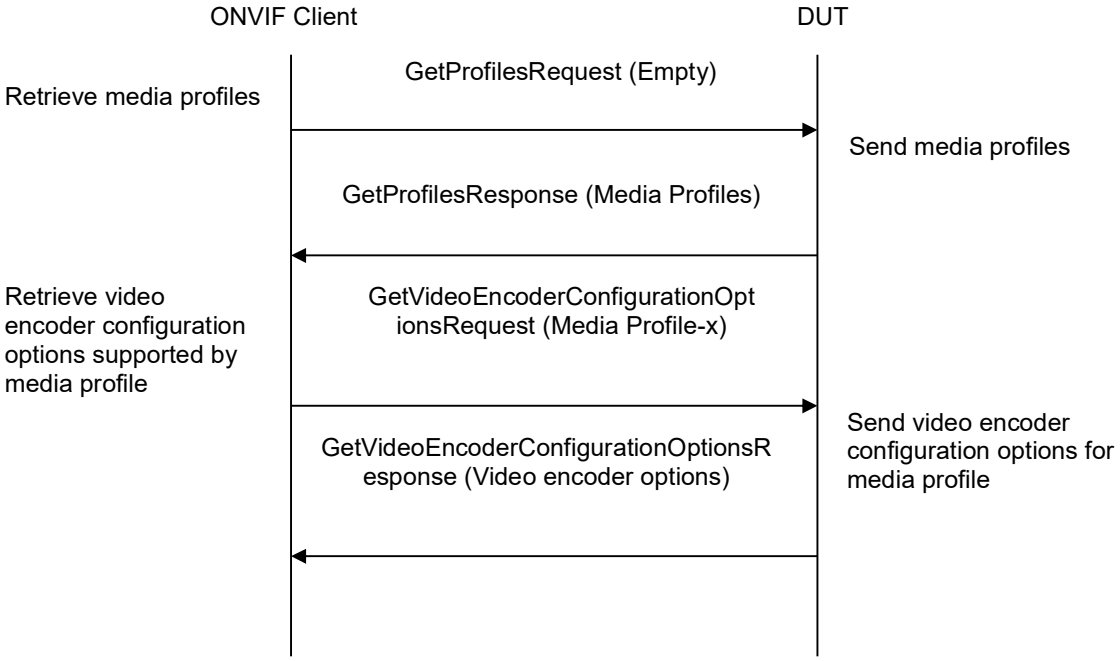
For the execution of real time streaming - video test cases, ONVIF Client has to select and configure the media profile based on the required video codec.

ONVIF Client follows the following procedure to configure the media profile.

Retrieve media profiles by invoking GetProfiles command.

Retrieve supported video encoder configuration options for a media profile by invoking GetVideoEncoderConfigurationOptions (media profile token) command. Check whether the selected media profile supports the required video codec.

Repeat test procedure-2 for all media profiles till a media profile with the required video codec support is found.



A.5 Media Profile Configuration for Audio Streaming

For the execution of real time streaming – Audio test cases, ONVIF Client has to select and configure the media profile based on the required audio codec.

ONVIF Client follows the following procedure to configure the media profile.

Retrieve media profiles by invoking GetProfiles command.

If the media profile includes audio source and audio encoder configurations

Retrieve supported audio encoder configuration options for the media profile by invoking GetAudioEncoderConfigurationOptions (media profile token) command. Check whether the selected media profile supports the required audio codec.

If the media profile doesn't have audio source and audio encoder configuration

Retrieve audio source configurations of DUT by invoking GetAudioSourceConfigurations command.

Add audio source configuration to the profile by invoking AddAudioSourceConfigurations command.

Retrieve audio encoder configurations of DUT by invoking GetAudioEncoderConfigurations command.

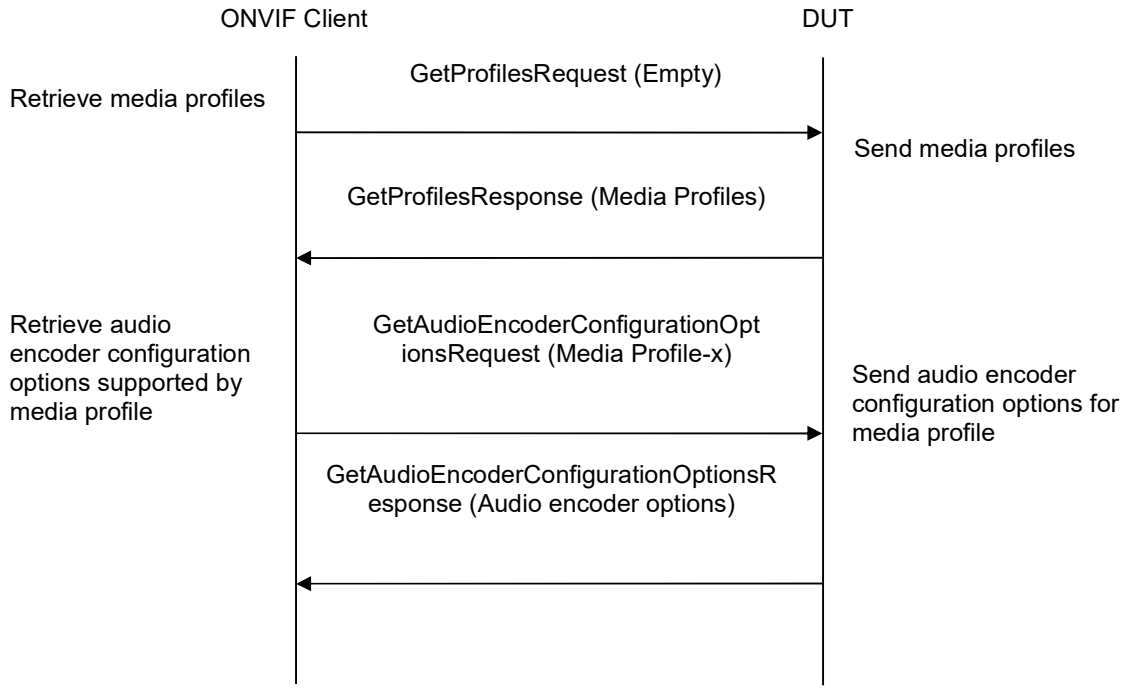
Retrieve audio encoder configuration options supported for an audio encoder configuration by invoking GetAudioEncoderConfigurationOptions (audio encoder config token) command. Check whether the selected audio encoder configuration supports the required audio codec.

Repeat test procedure – 4.d for all audio encoder configurations till a audio encoder configuration with the required audio codec is found.

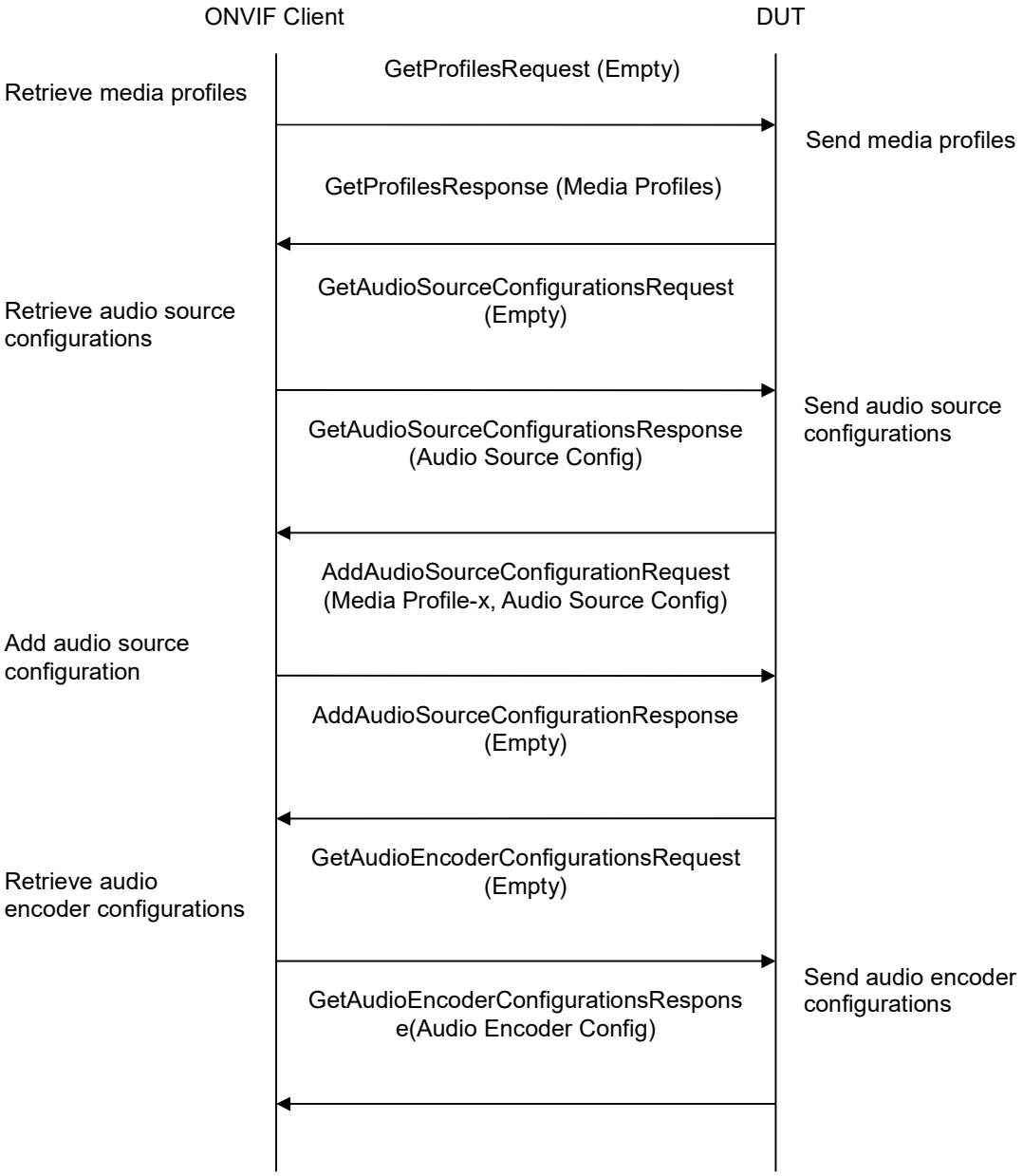
Add the corresponding audio encoder configuration to the media profile by invoking AddAudioEncoderConfiguration command.

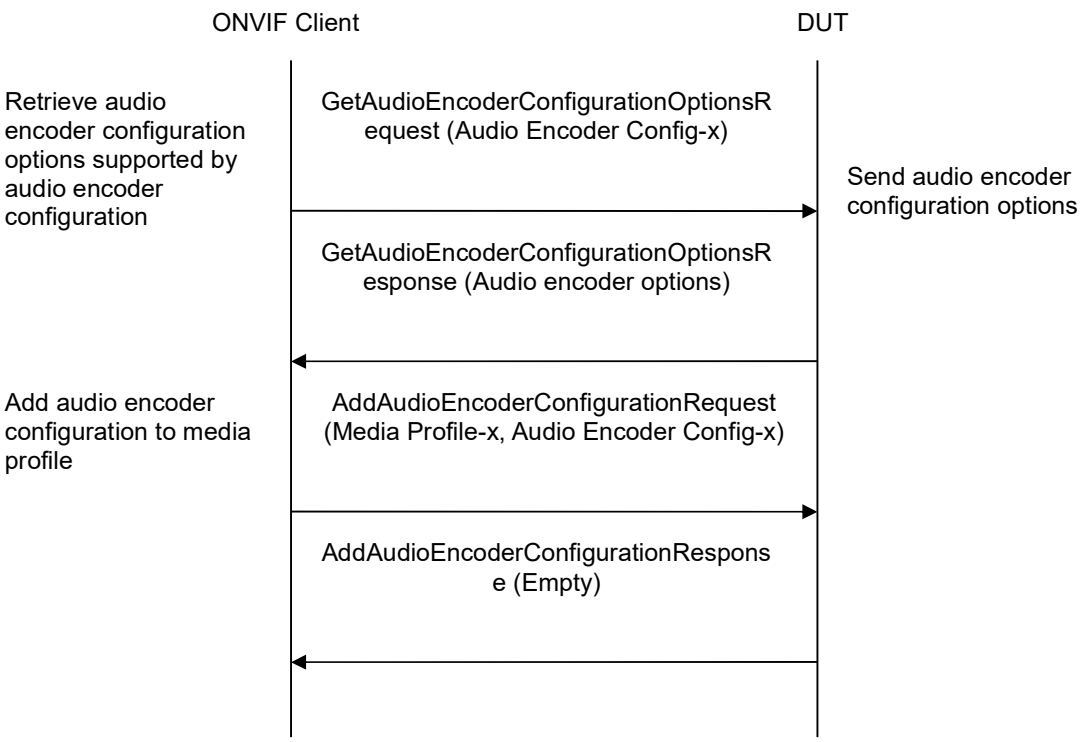
Repeat test procedure-2, 3 & 4 for all media profiles till a media profile with the required audio codec support is found.

Case 1: Media profile includes audio source and audio encoder configurations:



Case 2: Media profile without audio source and audio encoder configurations:




ONVIF Client
DUT
Retrieve audio encoder configuration options supported by audio encoder configuration
GetAudioEncoderConfigurationOptionsRequest (Audio Encoder Config-x)
Send audio encoder configuration options
GetAudioEncoderConfigurationOptionsResponse (Audio encoder options)
Add audio encoder configuration to media profile
AddAudioEncoderConfigurationRequest (Media Profile-x, Audio Encoder Config-x)
AddAudioEncoderConfigurationResponse (Empty)

A.6 Media Profile Configuration for Audio & Video Streaming

For the execution of real time streaming – Audio & Video test cases, ONVIF Client has to select and configure the media profile based on the required audio & video codec.

ONVIF Client follows the following procedure to configure the media profile.

Retrieve media profiles by invoking GetProfiles command.

Retrieve supported video encoder configuration options for a media profile by invoking GetVideoEncoderConfigurationOptions (media profile token) command. Check whether the selected media profile supports the required video codec.

If the media profile includes audio source and audio encoder configurations

Retrieve supported audio encoder configuration options for the media profile by invoking GetAudioEncoderConfigurationOptions (media profile token) command. Check whether the selected media profile supports the required audio codec.

If the media profile doesn't have audio source and audio encoder configuration

Retrieve audio source configurations of DUT by invoking GetAudioSourceConfigurations command.

Add audio source configuration to the profile by invoking AddAudioSourceConfigurations command.

Retrieve audio encoder configurations of DUT by invoking GetAudioEncoderConfigurations command.

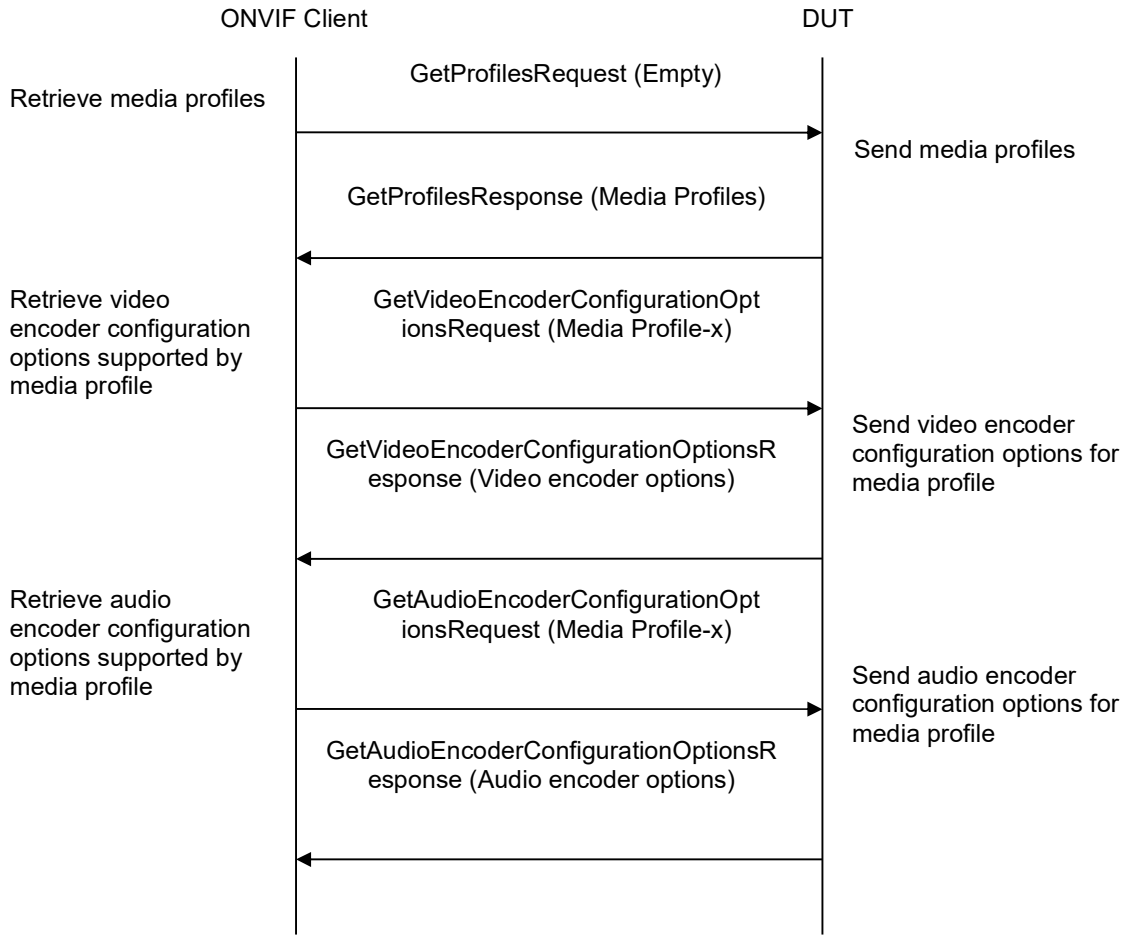
Retrieve audio encoder configuration options supported for an audio encoder configuration by invoking GetAudioEncoderConfigurationOptions (audio encoder config token) command. Check whether the selected audio encoder configuration supports the required audio codec.

Repeat test procedure – 4.d for all audio encoder configurations till a audio encoder configuration with the required audio codec is found.

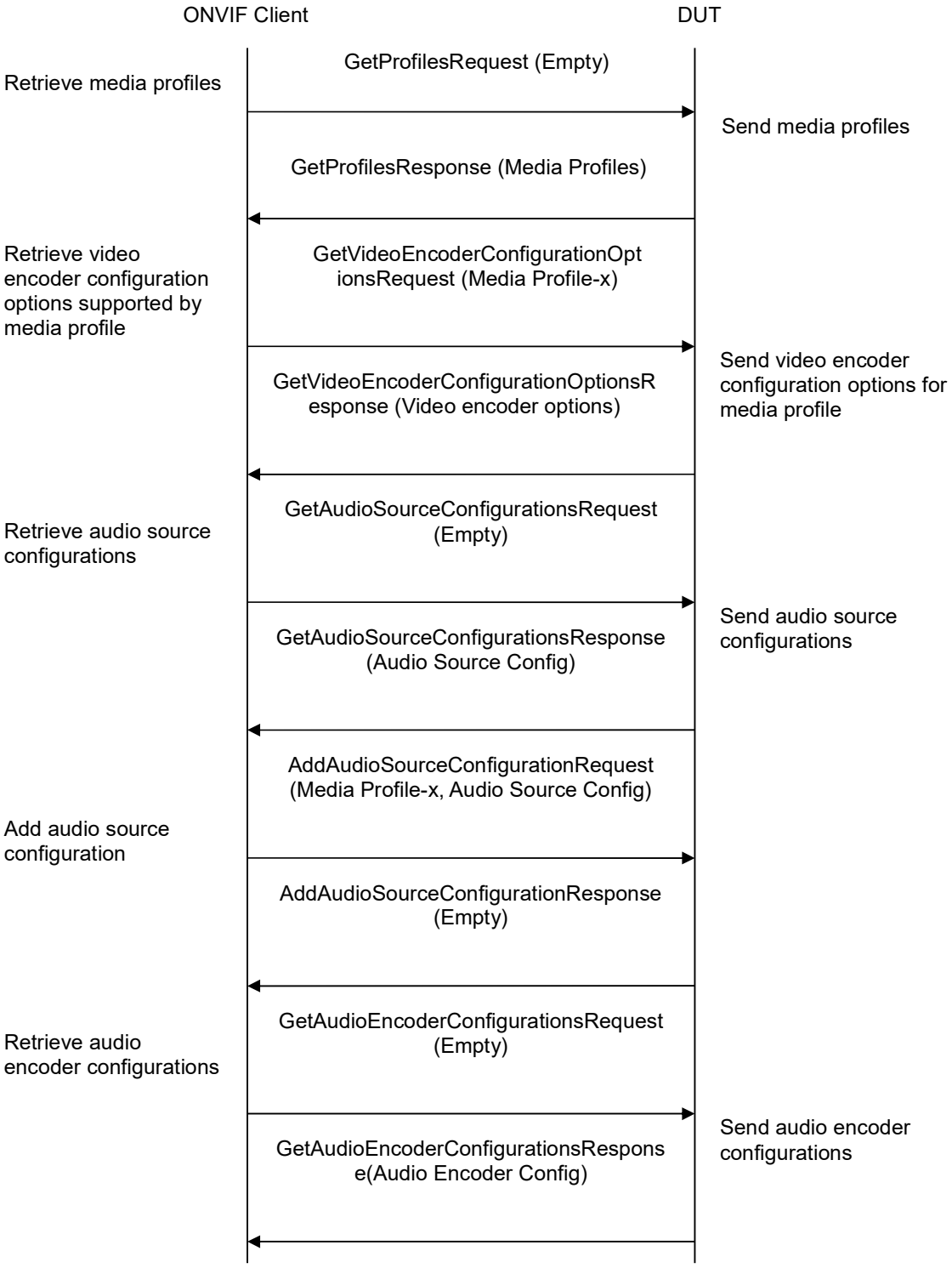
Add the corresponding audio encoder configuration to the media profile by invoking AddAudioEncoderConfiguration command.

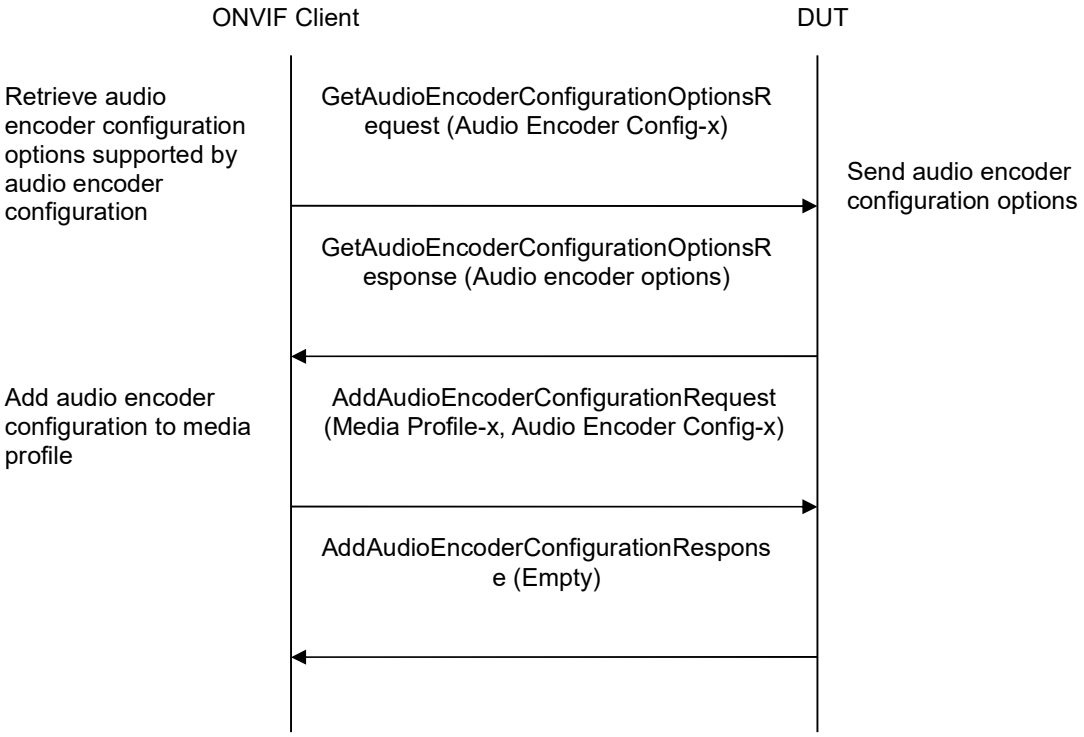
Repeat test procedure-2, 3 & 4 for all media profiles till a media profile with the required audio and video codec support is found.

Case 1: Media profile includes audio source and audio encoder configurations:



Case 2: Media profile without audio source and audio encoder configurations:




ONVIF Client
DUT
Retrieve audio encoder configuration options supported by audio encoder configuration
GetAudioEncoderConfigurationOptionsRequest (Audio Encoder Config-x)
Send audio encoder configuration options
GetAudioEncoderConfigurationOptionsResponse (Audio encoder options)
Add audio encoder configuration to media profile
AddAudioEncoderConfigurationRequest (Media Profile-x, Audio Encoder Config-x)
AddAudioEncoderConfigurationResponse (Empty)

A.7 MetadataConfiguration for receiving / not receiving events metadata

When receiving metadata an ONVIF Client might be interested in receiving all, none or some of the events produced by DUT. The basic rules for configuring a MetadataConfiguration to achieve this are:

- To get all events: Include the Events element but do not include a filter.
- To get no events: Do not include the Events element.
- To get only some events: Include the Events element and include a filter in the element.

This means that if an Events element is not included in a MetadataConfiguration, then no Events metadata shall be included in the metadata stream for that configuration. Similarly, if an "<Events>" tag without any sub-tags is included in a MetadataConfiguration it means that all available Events metadata shall be included in the metadata stream for that configuration.

Example:

The following SetMetadataConfigurationRequest can be used when the ONVIF Client is interested in a metadata stream that includes all Events, but nothing else. The PTZStatus element is not included in the configuration, so no PTZ metadata will be included in the metadata stream. The Events element is included, but without any filter, so all Events will be included in the metadata stream.

<SetMetadataConfiguration>

<Configuration token = "Test">

<Name>TestName</Name>

<UseCount>1</UseCount>

<Events/>

<Analytics>false</Analytics>

</Configuration>

<ForcePersistence>true</ForcePersistence>

</SetMetadataConfiguration>

A.8 Multicast specific field in SDP (RTSP DESCRIBE response)

In any case that multicast real-time streaming is involved in conjunction with RTSP, **c =** field should be included to clearly indicate the multicast address being used for streaming. Following is the example of how the **c =** field should be formed in the SDP (RTSP DESCRIBE response).

c = IN IP4 224.10.10.100

A.9 Create Empty Profile

For the execution of test cases with profile configurations, ONVIF Client has to find, create or configure empty media profile.

ONVIF Client follows the following procedure to find, create or configure empty media profile.

1. ONVIF Client will invoke GetProfilesRequest message to retrieve complete profiles list.

2. Verify the GetProfilesResponse message from the DUT.

If there is profile with fixed attribute equal to false, then follows the following procedure:

1. ONVIF Client will invoke DeleteProfileRequest message (ProfileToken = Token1, where Token1 is the first ProfileToken from the GetProfilesResponse with fixed = false) to delete Profile.
2. Verify the DeleteProfileResponse message from the DUT.
3. Return to step 3 of the test procedure.

If there are no profiles with fixed = ”false” remove all configurations from one fixed profile and use this profile for test. If there are no profiles skip other steps and fail test.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

A.10 Find or Create Media Profile Containing Specified Audio Encoder Configuration

For the execution of test cases with Audio configuration, ONVIF Client has to select or create the media profile contains specified Audio Encoder Configuration.

ONVIF Client follows the following procedure to select or create the media profile with specified audio encoder configuration:

1. ONVIF Client will invoke GetProfilesRequest message to retrieve complete profiles list.
2. Verify the GetProfilesResponse message from the DUT.
3. Try to find profile that contains Audio Encoder Configuration with specified token and Audio Source Configuration. If there is no such Profiles go to the next step, otherwise use one of profiles that fit to the requirements and skip other steps.
4. ONVIF Client will invoke CreateProfileRequest message (Name = “TestProfile1”) to create new profile.
5. Verify the CreateProfileResponse message (token = “ProfileToken1”, fixed = ”false”) or SOAP 1.2 fault message (Action/MaxNVTProfiles) from the DUT. If CreateProfileResponse message was received go to the step 10.
6. ONVIF Client will invoke DeleteProfileRequest message (ProfileToken = “Profile2”, where “Profile2” is token of profile with fixed = ”false”) to remove profile. If there are no profiles with fixed = ”false” remove all configurations from one fixed profile, skip steps 6-9 and use this profile as profile with ProfileToken = “ProfileToken1”. If there are no profiles skip other steps and fail test.
7. Verify the DeleteProfileResponse message from the DUT.
8. ONVIF Client will invoke CreateProfileRequest message (Name = “TestProfile1”) to create new profile.
9. Verify the CreateProfileResponse message (token = “ProfileToken1”, fixed = ”false”) from the DUT.
10. ONVIF Client will invoke GetCompatibleAudioSourceConfigurationsRequest message (ProfileToken = “ProfileToken1”) to retrieve compatible audio source configurations list.

11. Verify the GetCompatibleAudioSourceConfigurationsResponse message from the DUT. If GetCompatibleAudioSourceConfigurationsResponse message contains empty list skip other steps (this will means that it is not possible to fined or create profile for specified audio encoder configuration).

12. ONVIF Client will invoke AddAudioSourceConfigurationRequest message (ProfileToken = “ProfileToken1”, ConfigurationToken = “ASCToken1”, where “ASCToken1” is audio source configuration from GetCompatibleAudioSourceConfigurationsResponse message) to add audio source configuration to profile.

13. Verify the AddAudioSourceConfigurationResponse message from the DUT.

14. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (ProfileToken = “ProfileToken1”) to retrieve compatible audio encoder configurations list.

15. Verify the GetCompatibleAudioEncoderConfigurationsResponse message from the DUT. If GetCompatibleAudioEncoderConfigurationsResponse message does not contains specified audio encoder configuration repeat steps 12-15 for other audio source configuration from GetCompatibleAudioSourceConfigurationsResponse message. If there is no audio source configuration that was not used in steps 12-15, skip other steps (this will means that it is not possible to fined or create profile for specified audio encoder configuration).

16. ONVIF Client will invoke AddAudioEncoderConfigurationRequest message (ProfileToken = “ProfileToken1”, ConfigurationToken = “AECToken1”, where “AECToken1” is audio encoder configuration from GetCompatibleAudioEncoderConfigurationsResponse message) to add audio encoder configuration to profile. Use this profile as result of procedure.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

A.11 Configure Multicast Settings for Configurations that are Included in Profile

It is necessary to have Configuration with valid Multicast settings in Profile to use StartMulticastStreaming command. As pre-requisite ONVIF Client already has received profile from the DUT.

ONVIF Client follows the following procedure to set valid Multicast parameters:

1. If profile contains VideoEncoderConfiguration (token = “VECToken1”) verify that it has invalid multicast settings, otherwise skip steps 2-3 and go to the step 4.

2. ONVIF Client will invoke SetVideoEncoderConfigurationRequest message (token = “VECToken1”, Multicast.Address = [“IPv4”, “multicastAddress1”], Multicast.Port = “port1”) to change multicast settings for configuration.

3. Verify the SetVideoEncoderConfigurationResponse message from the DUT.

4. If profile contains AudioEncoderConfiguration (token = “AECToken1”) verify that it has invalid multicast settings, otherwise skip steps 5-6 and go to the step 7.

5. ONVIF Client will invoke SetAudioEncoderConfigurationRequest message (token = “AECToken1”, Multicast.Address = [“IPv4”, “multicastAddress2”], Multicast.Port = “port2”) to change multicast settings for configuration.

6. Verify the SetAudioEncoderConfigurationResponse message from the DUT.

7. If profile contains MetadataConfiguration (token = “MCToken1”) verify that it has invalid multicast settings, otherwise skip step 8-9 and finish procedure.

8. ONVIF Client will invoke SetMetadataConfigurationRequest message (token = “MCToken1”, Multicast.Address = [“IPv4”, “multicastAddress3”], Multicast.Port = “port3”) to change multicast settings for configuration.

9. Verify the SetMetadataConfigurationResponse message from the DUT.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

A.12 Find or Create Media Profile Containing Specified Video Encoder Configuration

For the execution of test cases with Video configuration, ONVIF Client has to select or create the media profile contains specified Video Encoder Configuration.

ONVIF Client follows the following procedure to select or create the media profile with specified video encoder configuration:

1. ONVIF Client will invoke GetProfilesRequest message to retrieve complete profiles list.

2. Verify the GetProfilesResponse message from the DUT.

3. Try to find profile that contains Video Encoder Configuration with specified token and Video Source Configuration. If there is no such Profiles go to the next step, otherwise use one of profiles that fit to the requirements and skip other steps.

4. ONVIF Client will invoke CreateProfileRequest message (Name = “TestProfile1”) to create new profile.

5. Verify the CreateProfileResponse message (token = “ProfileToken1”, fixed = ”false”) or SOAP 1.2 fault message (Action/MaxNVTProfiles) from the DUT. If CreateProfileResponse message was received go to the step 10.

6. ONVIF Client will invoke DeleteProfileRequest message (ProfileToken = “Profile2”, where “Profile2” is token of profile with fixed = ”false”) to remove profile. If there are no profiles with fixed = ”false” remove all configurations from one fixed profile, skip steps 6-9 and use this profile as profile with ProfileToken = “ProfileToken1”. If there are no profiles skip other steps and fail test.

7. Verify the DeleteProfileResponse message from the DUT.

8. ONVIF Client will invoke CreateProfileRequest message (Name = “TestProfile1”) to create new profile.

9. Verify the CreateProfileResponse message (token = “ProfileToken1”, fixed = ”false”) from the DUT.

10. ONVIF Client will invoke GetCompatibleVideoSourceConfigurationsRequest message (ProfileToken = “ProfileToken1”) to retrieve compatible video source configurations list.

11. Verify the GetCompatibleVideoSourceConfigurationsResponse message from the DUT. If GetCompatibleVideoSourceConfigurationsResponse message contains empty list skip other steps (this will means that it is not possible to fined or create profile for specified video encoder configuration).

12. ONVIF Client will invoke AddVideoSourceConfigurationRequest message (ProfileToken = “ProfileToken1”, ConfigurationToken = “VSCToken1”, where “VSCToken1” is video source configuration from GetCompatibleVideoSourceConfigurationsResponse message) to add video source configuration to profile.

13. Verify the AddVideoSourceConfigurationResponse message from the DUT.

14. ONVIF Client will invoke GetCompatibleVideoEncoderConfigurationsRequest message (ProfileToken = “ProfileToken1”) to retrieve compatible video encoder configurations list.

15. Verify the GetCompatibleVideoEncoderConfigurationsResponse message from the DUT. If GetCompatibleVideoEncoderConfigurationsResponse message does not contains specified video encoder configuration repeat steps 12-15 for other video source configuration from GetCompatibleVideoSourceConfigurationsResponse message. If there is no video source configuration that was not used in steps 12-15, skip other steps (this will means that it is not possible to fined or create profile for specified video encoder configuration).

16. ONVIF Client will invoke AddVideoEncoderConfigurationRequest message (ProfileToken = “ProfileToken1”, ConfigurationToken = “VECToken1”, where “VECToken1” is video encoder configuration from GetCompatibleVideoEncoderConfigurationsResponse message) to add video encoder configuration to profile. Use this profile as result of procedure.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

A.13 Find or Create Media Profile Containing Specified Video Encoder Configuration with Possibility to Set Specified Encoding

For the execution of test cases with Video configuration, ONVIF Client has to select or create the media profile contains specified Video Encoder Configuration with possibility to set specified encoding.

ONVIF Client follows the following procedure to select or create the media profile with specified video encoder configuration with possibility to set specified encoding:

1. ONVIF Client will invoke GetProfilesRequest message to retrieve complete profiles list.

2. Verify the GetProfilesResponse message from the DUT.

3. Try to find profile that contains Video Encoder Configuration with specified token and Video Source Configuration. If there is no such Profiles go to the step 6.

4. Try to invoke GetVideoEncoderConfigurationOptionsRequest message for first media profile found on step 3.

5. Verify the GetVideoEncoderConfigurationOptionsResponse message from the DUT. If GetVideoEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 4-5 for other profiles found on step 3. Otherwise use this profile as result of this procedure and skip other steps.

6. ONVIF Client will invoke CreateProfileRequest message (Name = “TestProfile1”) to create new profile.

7. Verify the CreateProfileResponse message (token = “ProfileToken1”, fixed = ”false”) or SOAP 1.2 fault message (Action/MaxNVTProfiles) from the DUT. If CreateProfileResponse message was received go to the step 12.

8. ONVIF Client will invoke DeleteProfileRequest message (ProfileToken = “Profile2”, where “Profile2” is token of profile with fixed = ”false”) to remove profile. If there are no profiles with fixed = ”false” skip other steps (this will means that it is not possible to fined or create profile for specified audio encoder configuration).

9. Verify the DeleteProfileResponse message from the DUT.

10. ONVIF Client will invoke CreateProfileRequest message (Name = “TestProfile1”) to create new profile.
11. Verify the CreateProfileResponse message (token = “ProfileToken1”, fixed = ”false”) from the DUT.
12. ONVIF Client will invoke GetCompatibleVideoSourceConfigurationsRequest message (ProfileToken = “ProfileToken1”) to retrieve compatible video source configurations list.
13. Verify the GetCompatibleVideoSourceConfigurationsResponse message from the DUT. If GetCompatibleVideoSourceConfigurationsResponse message contains empty list skip other steps (this will means that it is not possible to fined or create profile for specified video encoder configuration).
14. ONVIF Client will invoke AddVideoSourceConfigurationRequest message (ProfileToken = “ProfileToken1”, ConfigurationToken = “VSCToken1”, where “VSCToken1” is video source configuration from GetCompatibleVideoSourceConfigurationsResponse message) to add video source configuration to profile.
15. Verify the AddVideoSourceConfigurationResponse message from the DUT.
16. ONVIF Client will invoke GetCompatibleVideoEncoderConfigurationsRequest message (ProfileToken = “ProfileToken1”) to retrieve compatible video encoder configurations list.
17. Verify the GetCompatibleVideoEncoderConfigurationsResponse message from the DUT. If GetCompatibleVideoEncoderConfigurationsResponse message does not contains specified video encoder configuration repeat steps 14-17 for other video source configuration from GetCompatibleVideoSourceConfigurationsResponse message. If there is no video source configuration that was not used in steps 14-17, skip other steps (this will means that it is not possible to fined or create profile for specified video encoder configuration).
18. ONVIF Client will invoke AddVideoEncoderConfigurationRequest message (ProfileToken = “ProfileToken1”, ConfigurationToken = “VECToken1”, where “VECToken1” is video encoder configuration from GetCompatibleVideoEncoderConfigurationsResponse message) to add video encoder configuration to profile.
19. ONVIF Client invokes GetVideoEncoderConfigurationOptionsRequest message (ProfileToken = “ProfileToken1”) to get video encoder configuration options.
20. Verify the GetVideoEncoderConfigurationOptionsResponse message from the DUT. If GetVideoEncoderConfigurationOptionsResponse message does not contains specified video encoding repeat steps 14-20 for other video source configuration from GetCompatibleVideoSourceConfigurationsResponse message (previously remove video encoder configuration from the profile). If there is no video source configuration that was not used in steps 14-20, skip other steps (this will means that it is not possible to fined or create profile for specified video encoder configuration).
21. Use this profile as result of procedure.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

A.14 Find or Create Specified Number of Profiles that Contains Specified Video Source Configuration and different Video Encoder Configurations

For the execution of test cases with Video configuration, ONVIF Client has to select or create the media profile contains specified Video Encoder Source.

ONVIF Client follows the following procedure to select or create the media profile with specified video encoder configuration:

1. ONVIF Client will invoke GetProfilesRequest message to retrieve complete profiles list.
2. Verify the GetProfilesResponse message from the DUT.
3. Try to find profile that contains Video Source Configuration with specified token and different Video Encoder Configuration. If number of existing profiles less than required go to the next step, otherwise limit this profiles list to requested and use them as result list.
4. ONVIF Client will invoke CreateProfileRequest message (Name = “TestProfile1”) to create new profile.
5. Verify the CreateProfileResponse message (token = “ProfileToken1”, fixed = ”false”) or SOAP 1.2 fault message (Action/MaxNVTProfiles) from the DUT. If CreateProfileResponse message was received go to the step 10.
6. ONVIF Client will invoke DeleteProfileRequest message (ProfileToken = “Profile2”, where “Profile2” is token of profile with fixed = ”false” and without specified video source configuration and without video encoder configuration) to remove profile. If there are no such profiles skip other steps (this will means that it is not possible to find or create profile for specified requirements).
7. Verify the DeleteProfileResponse message from the DUT.
8. ONVIF Client will invoke CreateProfileRequest message (Name = “TestProfile1”) to create new profile.
9. Verify the CreateProfileResponse message (token = “ProfileToken1”, fixed = ”false”) from the DUT.
10. ONVIF Client will invoke GetCompatibleVideoSourceConfigurationsRequest message (ProfileToken = “ProfileToken1”) to retrieve compatible video source configurations list.
11. Verify the GetCompatibleVideoSourceConfigurationsResponse message from the DUT. If GetCompatibleVideoSourceConfigurationsResponse message does not contains required video source configuration skip other steps (this will means that it is not possible to find or create profile for specified requirements).
12. ONVIF Client will invoke AddVideoSourceConfigurationRequest message (ProfileToken = “ProfileToken1”, ConfigurationToken = “VSCToken1”, where “VSCToken1” is video source configuration from GetCompatibleVideoSourceConfigurationsResponse message) to add video source configuration to profile.
13. Verify the AddVideoSourceConfigurationResponse message from the DUT.
14. ONVIF Client will invoke GetCompatibleVideoEncoderConfigurationsRequest message (ProfileToken = “ProfileToken1”) to retrieve compatible video encoder configurations list.
15. Verify the GetCompatibleVideoEncoderConfigurationsResponse message from the DUT. If GetCompatibleVideoEncoderConfigurationsResponse message contains empty list, skip other steps (this will means that it is not possible to fined or create profile for specified requirements).
16. ONVIF Client will invoke AddVideoEncoderConfigurationRequest message (ProfileToken = “ProfileToken1”, ConfigurationToken = “VECToken1”, where “VECToken1” is video encoder configuration from GetCompatibleVideoEncoderConfigurationsResponse message which is

not present in already selected profiles) to add video encoder configuration to profile. Use this profile as result of procedure.

17. Repeat steps 4-17 to create required number of profiles.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

A.15 Start Media Stream Using RTP-Unicast/UDP Transport

ONVIF Client follows the following procedure to start media stream using RTP-Unicast/UDP Transport:

1. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, UDP transport) to retrieve media stream URI for the first media profile from step 7.
2. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
3. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
4. ONVIF Client invokes RTSP DESCRIBE request.
5. DUT sends 200 OK message and SDP information.
6. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/UDP.
7. DUT sends 200 OK message and the media stream information.
8. ONVIF Client invokes RTSP PLAY request.
9. DUT sends 200 OK message and starts media streaming.
10. DUT sends JPEG RTP media stream to ONVIF Client over UDP.
11. DUT sends RTCP sender report to ONVIF Client.
12. DUT validates the received RTP and RTCP packets, decodes and renders them.

A.16 Start Media Stream Using RTP-Multicast/UDP Transport

ONVIF Client follows the following procedure to start media stream using RTP-Multicast/UDP Transport:

1. Configure multicast settings for other entities from profile if required (see Annex A.11).
2. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Multicast, UDP transport) to retrieve media stream URI for the first media profile from step 7.
3. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
4. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
5. ONVIF Client invokes RTSP DESCRIBE request.
6. DUT sends 200 OK message and SDP information.

7. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP-Multicast/UDP.
8. DUT sends 200 OK message and the media stream information.
9. ONVIF Client invokes RTSP PLAY request.
10. DUT sends 200 OK message and starts media streaming.
11. DUT sends JPEG RTP multicast media stream to ONVIF Client over UDP.
12. DUT sends RTCP sender report to ONVIF Client.
13. DUT validates the received RTP and RTCP packets, decodes and renders them.

A.17 Start Media Stream Using RTP-Unicast/RTSP/HTTP/TCP Transport

ONVIF Client follows the following procedure to start media stream using RTP-Unicast/RTSP/HTTP/TCP Transport:

1. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, HTTP transport) to retrieve media stream URI for the first media profile from step 7.
2. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
3. ONVIF Client verifies the HTTP media stream URI provided by the DUT.
4. ONVIF Client invokes HTTP GET Request on DUT and establishes DUT to ONVIF Client connection for RTP data transfer.
5. ONVIF Client invokes HTTP POST Request and establishes ONVIF Client to DUT connection for RTSP control requests.
6. ONVIF Client invokes RTSP DESCRIBE request on HTTP POST connection.
7. DUT sends 200 OK message and SDP information on HTTP GET connection.
8. ONVIF Client invokes RTSP SETUP request on HTTP POST connection with transport parameter as ‘RTP/TCP’ along with ‘interleaved’ parameter for both audio and video streams separately.
9. DUT sends 200 OK message and the media stream information on HTTP GET connection.
10. ONVIF Client invokes RTSP PLAY request on HTTP POST connection.
11. DUT sends 200 OK message and starts media streaming on HTTP GET connection.
12. DUT transfers RTP media stream to ONVIF Client on HTTP GET connection.
13. DUT sends RTCP sender report to ONVIF Client on HTTP GET connection.
14. DUT validates the received RTP and RTCP packets, decodes and renders them.

A.18 Start Media Stream Using RTP/RTSP/TCP Transport

ONVIF Client follows the following procedure to start media stream using RTP/RTSP/TCP Transport:

1. ONVIF Client invokes GetStreamUriRequest message (Profile Token, RTP-Unicast, RTSP transport) to retrieve media stream URI for the first media profile from step 7.
2. DUT sends RTSP URI and parameters defining the lifetime of the URI like ValidUntilConnect, ValidUntilReboot and Timeout in the GetStreamUriResponse message.
3. ONVIF Client verifies the RTSP media stream URI provided by the DUT.
4. ONVIF Client invokes RTSP DESCRIBE request.
5. DUT sends 200 OK message and SDP information.
6. ONVIF Client invokes RTSP SETUP request with transport parameter as RTP/TCP.
7. DUT sends 200 OK message and the media stream information.
8. ONVIF Client invokes RTSP PLAY request.
9. DUT sends 200 OK message and starts media streaming.
10. DUT sends RTP media stream to ONVIF Client over TCP.
11. DUT sends RTCP sender report to ONVIF Client.
12. DUT validates the received RTP and RTCP packets, decodes and renders them.

A.19 Media Profile Select for JPEG Video Streaming

For the execution of real time streaming - video test cases, ONVIF Client has to select the media profile with Video Source Configuration and Video Encoder Configuration based on the JPEG video codec.

ONVIF Client follows the following procedure to select the media profile:

1. Retrieve media profiles by invoking GetProfiles command.
2. Select media profiles that contain Video Encoder Configuration and Video Source Configuration.
3. Retrieve supported video encoder configuration options for a media profile by invoking GetVideoEncoderConfigurationOptions (media profile token) command. Check whether the selected media profile supports the JPEG video codec.
4. Repeat step 3 for all media profiles selected on step 2 till a media profile with the JPEG video codec support is found.

A.20 Media Profile Select or Creation for Audio and Video Streaming

For the execution of real time streaming – Audio and Video test cases, ONVIF Client has to select or create the media profile based on the required audio and video codec.

ONVIF Client follows the following procedure to select or create the media profile:

1. Retrieve media profiles by invoking GetProfiles command.
2. Select media profiles that contain Video Encoder Configuration, Video Source Configuration, Audio Encoder Configuration and Audio Source Configuration.
3. Retrieve supported video encoder configuration options for a media profile by invoking GetVideoEncoderConfigurationOptions (media profile token) command. Check whether the selected media profile supports the required video codec. If there is no required codec in options skip next step and go to the step 5.
4. Retrieve supported audio encoder configuration options for a media profile by invoking GetAudioEncoderConfigurationOptions (media profile token) command. Check whether the selected media profile supports the required audio codec.
5. Repeat steps 3-4 for all media profiles selected on step 2 till a media profile with the required video and audio codec support is found. If such profile exists skip other steps and use selected profile.
6. Select media profiles that contain Video Encoder Configuration, Video Source Configuration. If there is no such profile, create profile with using procedure described in Annex A.21.
7. Retrieve supported video encoder configuration options for a media profile by invoking GetVideoEncoderConfigurationOptions (media profile token) command. Check whether the selected media profile supports the required video codec. If there is no required codec in options skip next step and go to the step 6. If there is no such profile, create profile with using procedure described in Annex A.21.
8. Remove audio encoder configuration with using RemoveAudioEncoderConfiguration command if it is included in profile.
9. Remove audio source configuration with using RemoveAudioSourceConfiguration command if it is included in profile.
10. ONVIF Client will invoke GetCompatibleAudioSourceConfigurationsRequest message (media profile token) to retrieve compatible audio source configurations list.
11. Verify the GetCompatibleAudioSourceConfigurationsResponse message from the DUT. If GetCompatibleVideoSourceConfigurationsResponse message contains empty list skip steps 12-20. It is not possible to create required profile in this case.
12. ONVIF Client will invoke AddAudioSourceConfigurationRequest message (media profile token, audio source configuration from GetCompatibleAudioSourceConfigurationsResponse message) to add audio source configuration to profile.
13. Verify the AddAudioSourceConfigurationResponse message from the DUT.
14. ONVIF Client will invoke GetCompatibleAudioEncoderConfigurationsRequest message (media profile token) to retrieve compatible audio encoder configurations list.
15. Verify the GetCompatibleAudioEncoderConfigurationsResponse message from the DUT. If GetCompatibleVideoEncoderConfigurationsResponse message contains empty list skip steps 16-19 and go to the step 20.
16. ONVIF Client will invoke AddAudioEncoderConfigurationRequest message (media profile token, audio encoder configuration from GetCompatibleAudioEncoderConfigurationsResponse message) to add audio encoder configuration to profile.
17. Verify the AddAudioEncoderConfigurationResponse message from the DUT.

18. Retrieve supported audio encoder configuration options for a media profile by invoking GetAudioEncoderConfigurationOptions (media profile token) command. Check whether the selected media profile supports the required audio codec.

19. Repeat steps 16-18 for all audio encoder configurations received on step 15 till a media profile with the required video and audio codec support is created (previously remove audio encoder configuration from the profile). If such profile was created skip other steps and use this profile.

20. Repeat steps 12-19 for all audio source configurations received on step 11 till a media profile with the required video and audio codec support is created (previously remove audio encoder configuration and audio source configuration from the profile). If such profile was created skip other steps and use this profile.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

A.21 Media Profile Creation for Video Streaming

For the execution of real time streaming – Video test cases, ONVIF Client has to select or create the media profile based on the required video codec.

ONVIF Client follows the following procedure to select or create the media profile:

1. ONVIF Client will invoke CreateProfileRequest message (Name = “TestProfile1”) to create new profile.

2. Verify the CreateProfileResponse message (token = “ProfileToken1”, fixed = ”false”) or SOAP 1.2 fault message (Action/MaxNVTProfiles) from the DUT. If CreateProfileResponse message was received go to the step 7.

3. ONVIF Client will invoke DeleteProfileRequest message (ProfileToken = “Profile2”, where “Profile2” is token of profile with fixed = ”false”) to remove profile. If there are no profiles with fixed = ”false” remove all configurations from one fixed profile, skip steps 3-6 and use this profile as profile with ProfileToken = “ProfileToken1”. If there are no profiles skip other steps and fail test.

4. Verify the DeleteProfileResponse message from the DUT.

5. ONVIF Client will invoke CreateProfileRequest message (Name = “TestProfile1”) to create new profile.

6. Verify the CreateProfileResponse message (token = “ProfileToken1”, fixed = ”false”) from the DUT.

7. ONVIF Client will invoke GetCompatibleVideoSourceConfigurationsRequest message (ProfileToken = “ProfileToken1”) to retrieve compatible video source configurations list.

8. Verify the GetCompatibleVideoSourceConfigurationsResponse message from the DUT. If GetCompatibleVideoSourceConfigurationsResponse message contains empty list skip other steps (this will means that it is not possible to fined or create profile for specified video encoder configuration).

9. ONVIF Client will invoke AddVideoSourceConfigurationRequest message (ProfileToken = “ProfileToken1”, ConfigurationToken = “VSCToken1”, where “VSCToken1” is video source configuration from GetCompatibleVideoSourceConfigurationsResponse message) to add video source configuration to profile.

10. Verify the AddVideoSourceConfigurationResponse message from the DUT.
11. ONVIF Client will invoke GetCompatibleVideoEncoderConfigurationsRequest message (ProfileToken = “ProfileToken1”) to retrieve compatible video encoder configurations list.
12. Verify the GetCompatibleVideoEncoderConfigurationsResponse message from the DUT. If GetCompatibleVideoEncoderConfigurationsResponse message does not contains specified video encoder configuration repeat steps 9-12 for other video source configuration from GetCompatibleVideoSourceConfigurationsResponse message. If there is no video source configuration that was not used in steps 9-12, skip other steps (this will means that it is not possible to fined or create profile for specified video encoder configuration).
13. ONVIF Client will invoke AddVideoEncoderConfigurationRequest message (ProfileToken = “ProfileToken1”, ConfigurationToken = “VECToken1”, where “VECToken1” is video encoder configuration from GetCompatibleVideoEncoderConfigurationsResponse message) to add video encoder configuration to profile.
14. Retrieve supported video encoder configuration options for a media profile by invoking GetVideoEncoderConfigurationOptions (media profile token) command. Check whether the selected media profile supports the required video codec.
15. Repeat steps 13-14 for all video encoder configurations received on step 12 till a media profile with the required video codec support is created (previously remove video encoder configuration from the profile). If such profile was created skip other steps and use this profile.
16. Repeat steps 9-15 for all video source configurations received on step 8 till a media profile with the required video codec support is created (previously remove video encoder configuration and video source configuration from the profile). If such profile was created skip other steps and use this profile.

Note: See Annex A.22 for Name and Token Parameters Length limitations.

A.22 Name and Token Parameters

There are following limitations on maximum length of Name and Token parameters that shall be used during tests by ONVIF Device Test Tool to prevent faults from DUT:

- Name shall be less than or equal to 64 characters (only readable characters accepted).
- Token shall be less than or equal to 64 characters (only readable characters accepted).

UTF-8 character set shall be used for Name and Token.

Note: These limitations will not be used, if ONVIF Device Test Tool reuses values that were received from the DUT.

A.23 Turn on IPv6 network interface

The following algorithm will be used to turn on IPv6 network interface:

1. ONVIF Client will invoke GetNetworkInterfacesRequest message to retrieve the original settings of the DUT.
2. ONVIF Client verifies GetNetworkInterfacesResponse message.

3. If GetNetworkInterfacesResponse message contains NetworkInterfaces.IPv6 and NetworkInterfaces.IPv6.Enabled=true, then ONVIF Client checks NetworkInterfaces.IPv6.Config.DHCP. Otherwise, go to step 10.
4. If NetworkInterfaces.IPv6.Config.DHCP=Off, then ONVIF Client checks NetworkInterfaces.IPv6.Config.Manual element. Otherwise, go to step 7.
5. If NetworkInterfaces.IPv6.Config.Manual element is present and not empty, then ONVIF Client skips other steps and run test using NetworkInterfaces.IPv6.Config.Manual value as device IP. Otherwise, ONVIF Client checks NetworkInterfaces.IPv6.Config.LinkLocal element.
6. If NetworkInterfaces.IPv6.Config. LinkLocal element is present and not empty, then ONVIF Client skips other steps and runs test using NetworkInterfaces.IPv6.Config.LinkLocal value as device IP. Otherwise, ONVIF Client skip other steps and failed test.
7. ONVIF Client will invoke SetNetworkInterfacesRequest message to turn off DHCP IPv6 (InterfaceToken = available network interface, NetworkInterfaces.IPv6.Config.DHCP=Off).
8. ONVIF Client gets current network interfaces via GetNetworkInterfacesRequest message.
9. ONVIF Client verifies GetNetworkInterfacesResponse message and checks that set settings were applied. Repeat steps 5-6.
10. If GetNetworkInterfacesResponse message does not contain NetworkInterfaces.IPv6 or NetworkInterfaces.IPv6.Enabled=false, then ONVIF Client will invoke SetNetworkInterfacesRequest message (InterfaceToken = available network interface, NetworkInterfaces.IPv6. Enabled=true) to turn on IPv6 configuration.
11. The DUT will return SetNetworkInterfacesResponse message.
12. If Reboot is required by DUT, invoke SystemReboot command.
13. ONVIF Client waits for HELLO message from the default network interface.
14. ONVIF Client gets current network interfaces via GetNetworkInterfacesRequest message.
15. ONVIF Client verifies GetNetworkInterfacesResponse message and checks that set settings were applaied. Execute steps 4-6.

A.24 Restore Network Settings

When the default network settings of the DUT are changed during the execution of test cases, ONVIF Client follows the following procedure to restore the original default settings at the end of actual test sequence:

1. Restore the default network settings by invoking SetNetworkInterfaces (**Default settings**) command.
2. If Reboot is required by DUT, invoke SystemReboot command.
3. If SystemReboot is invoked, wait for HELLO message from the default network interface.
4. Move to the next test case execution.

A.25 Media Profile Configuration for Backchannel Audio Streaming

For the execution of real time streaming – Audio Backchannel test cases, ONVIF Client has to select and configure the media profile based on the required audio decoder.

ONVIF Client follows the procedure to configure the media profile.

1. Retrieve media profiles by invoking GetProfiles command.
2. If media profile includes audio output and audio decoder configurations.
   2.1. Retrieve the supported audio decoder configuration options for the media profile by invoking GetAudioDecoderConfigurationOptions (**media profile token**) command. Check whether the selected media profile supports the required audio decoder.
   2.2. Retrieve the supported audio output configuration options for the media profile by invoking GetAudioOutputConfigurationOptions (**media profile token**) command. Check whether the selected media profile supports the required send primacy.
3. If the media profile does not have audio source and audio encoder configuration,
   3.1. Retrieve audio output configurations of the DUT by invoking GetAudioOutputConfigurations command.
   3.2. Retrieve audio output configuration options supported for an audio output configuration by invoking GetAudioOutputConfigurationOptions (**audio output configuration token**) command. Check whether the selected audio output configuration supports the required send primacy.
   3.3. Add audio output configuration to the profile by invoking AddAudioOutputConfigurations command.
   3.4. Repeat test procedure – 3.b for all audio output configurations till an audio output configuration with the required send primacy is found.
   3.5. Retrieve audio decoder configurations of the DUT by invoking GetAudioDecoderConfigurations command.
   3.6. Retrieve audio decoder configuration options supported for an audio decoder configuration by invoking GetAudioDecoderConfigurationOptions (**audio decoder configuration token**) command. Check whether the selected audio decoder configuration supports the required audio decoder.
   3.7. Repeat test procedure – 3.f for all audio decoder configurations till an audio decoder configuration with the required audio decoder is found.
   3.8. Add the corresponding audio decoder configuration to the media profile by invoking AddAudioDecoderConfiguration command.
4. Repeat test procedure – 2 and 3 for all media profiles till a media profile with the required audio output and audio decoder support is found.