ONVIF™

PTZ Using Media2 Device Test Specification

Version 17.01

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REVISION HISTORY

Vers.	Date	Description
16.07	Jun, 2016	First Issue
16.07	Jul, 2016	Comments from Canon have been implemented.
16.07	Jul 19, 2016	Comments from Canon and Axis have been implemented. Section 4.4 Predefined PTZ spaces with test 4.4.1.1 ABSOLUTE PAN/TILT POSITION SPACE 4.4.2.2 GENERIC ZOOM VELOCITY SPACE added.
17.01	Oct 12, 2016	Annex A.3 was updated. Annex A.4 was added.
17.01	Nov 01, 2016	Test IDs were updated with prefix MEDIA2_PTZ. Numbering started at 1-1-1.
17.01	Dec 01, 2016	MEDIA2_PTZ-4-1-1: space url was updated.
17.01	Dec 15, 2016	Format was updated. Test Specification logic was synchronized with implementation. Test Policy was updated to remove requirement to have Video Encoder Configuration in Media Profile for PTZ test cases. Minor typos fixes were done.
17.01	Dec 16, 2016	Test Policy was updated. Scope was updated was updated. Minor typos fixes were done.

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. In addition, the test cases are to be basic inputs for some Profile specification requirements. It also describes the test framework, test setup, pre-requisites, test policies needed for the execution of the described test cases.

This ONVIF PTZ Using Media2 Test Specification acts as a supplementary document to the [ONVIF Network Interface Specs], illustrating test cases need to be executed and passed. And this specification acts as an input document to the development of test tool, which will be used to test the ONVIF device implementation conformance towards ONVIF standard. This test tool is referred as ONVIF Client hereafter.

1.1 Scope

This ONVIF PTZ Using Media2 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 PTZ service(s) which is defined in [ONVIF Network Interface Specs].

The principal intended purposes are:

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

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

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

  Wi-Fi Conformance test

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

This ONVIF PTZ Using Media2 Test Specification covers PTZ Service and it interaction with Media2 Service, which is a functional block of [ONVIF Network Interface Specs]. The following section gives a brief overview of each functional block and its scope.

1.2 PTZ Control

PTZ Control covers the test cases for the verification of the PTZ Service as mentioned in [ONVIF Network Interface Specs].

Refer to Table 1.1 for PTZ Control Commands Under Test.

Table 1.1. PTZ Control Commands Under Test

Feature	Description
PTZ Node	GetNodes GetNode
PTZ Configuration	GetConfigurations GetConfigurationOptions
Move Operations	AbsoluteMove ContinuousMove Stop GetStatus
Preset Operations	SetPreset GetPresets GotoPreset RemovePreset
Home Position Operations	GotoHomePosition SetHomePosition
Predefined PTZ Spaces	http://www.onvif.org/ver10/tptz/PanTiltSpaces/VelocitySpaceDegrees http://www.onvif.org/ver10/tptz/PanTiltSpaces/SphericalPositionSpaceDegrees

Feature	Description
	http://www.onvif.org/ver10/tptz/ZoomSpaces/VelocityGenericSpace

2 Normative references

- ONVIF Conformance Process Specification:

  http://www.onvif.org/Documents/Specifications.aspx

- ONVIF Profile Policy:

  http://www.onvif.org/Documents/Specifications.aspx

- ONVIF Core Specifications:

  http://www.onvif.org/Documents/Specifications.aspx

- ONVIF Base Test Specification:

  http://www.onvif.org/Portals/0/documents/testspecs/v16_07/ONVIF_Base_Test_Specification_16.07.pdf

- ONVIF Media 2 Service Specificatio:

  http://www.onvif.org/specs/srv/media/ONVIF-Media2-Service-Spec-v1606.pdf

- ONVIF PTZ Service Specificatio:

  http://www.onvif.org/specs/srv/ptz/ONVIF-PTZ-Service-Spec-v261.pdf

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

  http://www.iso.org/directives

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

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

- W3C SOAP 1.2, Part 1, Messaging Framework:

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

- W3C XML Schema Part 1: Structures Second Edition:

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

- W3C XML Schema Part 2: Datatypes Second Edition:

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

3 Terms and Definitions

3.1 Conventions

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

3.2 Definitions

This section describes terms and definitions used in this document.

Profile	See ONVIF Profile Policy.
ONVIF Device	Computer appliance or software program that exposes one or multiple ONVIF Web Services.
ONVIF Client	Computer appliance or software program that uses ONVIF Web Services.
Media Profile	A media profile maps a video and/or audio source to a video and/or an audio encoder, PTZ and analytics configurations.
SOAP	SOAP is a lightweight protocol intended for exchanging structured information in a decentralized, distributed environment. It uses XML technologies to define an extensible messaging framework providing a message construct that can be exchanged over a variety of underlying protocols.
Device Test Tool	ONVIF Device Test Tool that tests ONVIF Device implementation towards the ONVIF Test Specification set.
Media 2 Service	Services to determine the streaming properties of requested media streams.
PTZ Service	Services to configure and control PTZ movement.
Pan	Horizontal movement or rotation of a camera or device.
Tilt	Vertical movement or rotation of a camera or device.
Zoom	Adjustment of the focal length of a zoom lens, causing the subject, scene to be brought closer or made to recede.
PTZ	The capability of a camera to pan, tilt, and zoom.
PTZ node	Low-level PTZ entity that maps to the PTZ device and its capabilities.

3.3 Abbreviations

This section describes abbreviations used in this document.

HTTP Hyper Text Transport Protocol.

WSDL Web Services Description Language.

XML eXtensible Markup Language.

PTZ Pan/Tilt/Zoom.

4 Test Overview

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

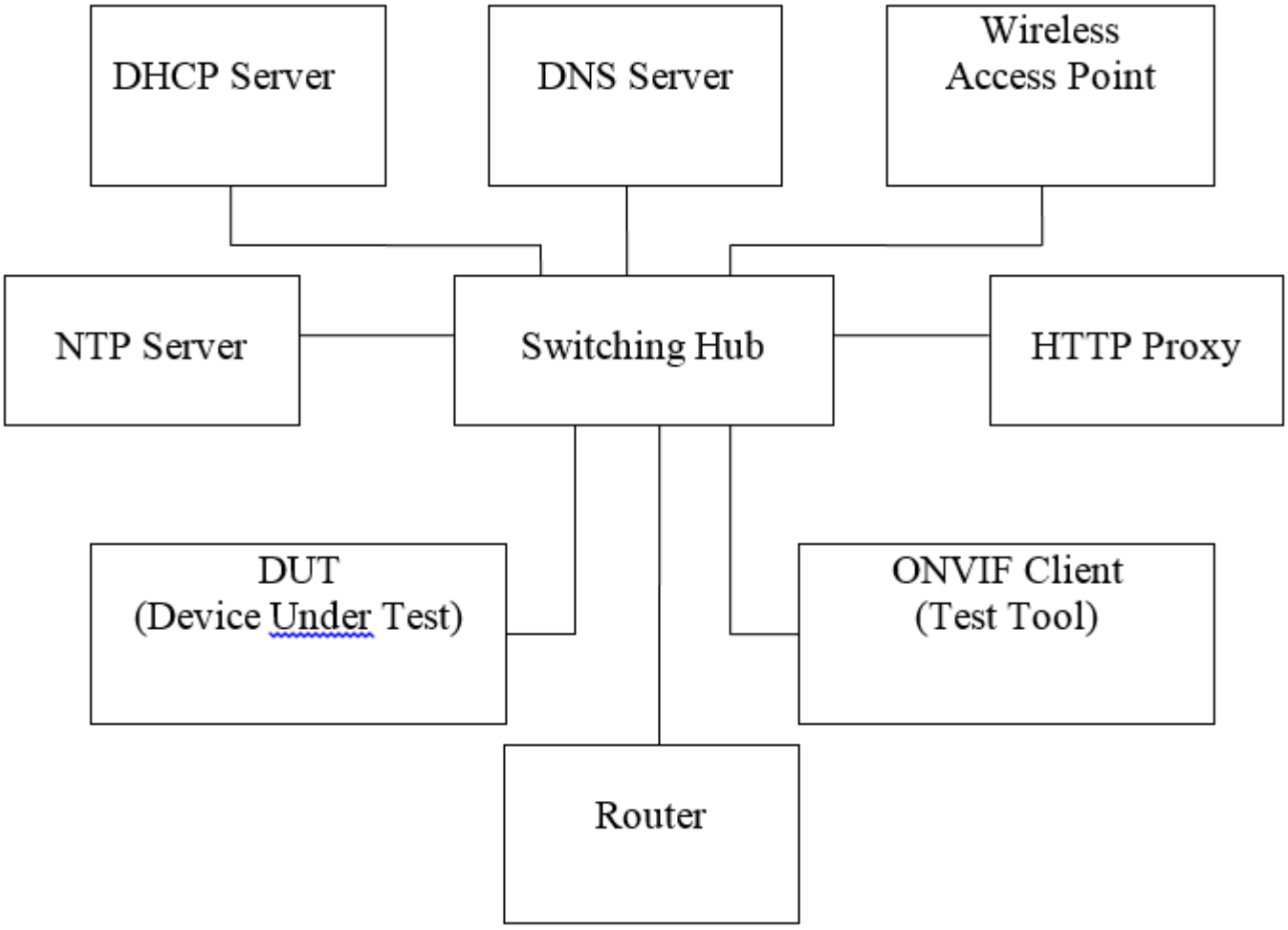
4.1 Test Setup

4.1.1 Network Configuration for DUT

The generic test configuration for the execution of test cases defined in this document is as shown below (Figure 1).

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

Figure 4.1. Test Configuration for DUT



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

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

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

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

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

DHCP Server: provides IPv4 Address to the connected devices.

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

Switching Hub: provides network connectivity among all the test equipments in the test environment. All devices should be connected to the Switching Hub.

Router: provides router advertisements for IPv6 configuration.

4.2 Prerequisites

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

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

4.3 Test Policy

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

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

4.3.1 Media Configuration

The test cases will be started only if PTZ Service and Media2 service is supported by the DUT (the DUT featres support are defined by the procedure mentioned in [ONVIF Feature Discovery]).

The device under test shall support at-least one media profile with PTZ configuration and Video Source Configuration. A PTZ configuration shall include a PTZ node.

Poor PTZ performance test is outside the scope of the ONVIF Test Specification.

In certain test cases, ONVIF Client may register new preset positions into PTZ configuration. In such cases, the test procedure will revertdelete theat changesmodified to this configuration at the end of the test procedure.

If the DUT does not support PTZ Configuration commands (ex. GetConfigurations, AbsoluteMove) then it SHALL respond to the request with SOAP 1.2 fault message (ActionNotSupported).

Please refer to Section 5 for PTZ Control Test Cases.

5 PTZ Control Test Cases

5.1 Move Operation

5.1.1 PTZ ABSOLUTE MOVE USING MEDIA2 PROFILE

Test Label: PTZ Absolute Move Operation Using Media2 Profile.

Test Case ID: MEDIA2_PTZ-1-1-1

ONVIF Core Specification Coverage: None

Command Under Test: AbsoluteMove

WSDL Reference: ptz.wsdl

Test Purpose: To verify absolute Pan/Tilt or absolute Zoom movements using the DUT PTZ AbsoluteMove operation.

Pre-Requisite: Media2 Service is received from the DUT. PTZ Service is received from the DUT. Absolute movement is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client configures or selects a Media Profile with Video Source Configuration and PTZ Configuration by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - in *ptzNodeToken1* - token of the PTZ Node, with which Media Profile should be configured
   - out *profile* - Media Profile with Video Source Configuration and PTZ Configuration
4. ONVIF Client invokes **GetConfigurationOptions** request with parameters
   - ConfigurationToken := *profile*Configurations.PTZ.@token
5. The DUT responds with **GetConfigurationOptionsResponse** with parameters
   - PTZConfigurationOptions =: *ptzConfigurationOptions*
6. ONVIF Client verifies PTZ Configuration Options by following the procedure mentioned in Annex A.4 with the following input and output parameters

- in *ptzConfigurationOptions* - PTZ Configuration Options

7. If *ptzConfigurationOptions*.Spaces has no at least one of the AbsolutePanTiltPositionSpace element or AbsoluteZoomPositionSpace element, FAIL the test and skip other steps.
8. ONVIF Client configures Default Absolute Spaces by following the procedure mentioned in Annex A.5 with the following input and output parameters
   - in *ptzConfigurationOptions* - PTZ Configuration Options
   - in *profile* - Media Profile with PTZ Configuration
   - out *profile* - Media Profile with PTZ Configuration with configured Absolute Position Default Spaces
   - out *pantiltSpace* - Options for Absolute Pan/Tilt Position Default Space
   - out *zoomSpace* - Options for Absolute Zoom Position Default Space
9. ONVIF Client invokes **GetStatus** request with parameters
   - ProfileToken := *profile*.@token
10. The DUT responds with **GetStatusResponse** with parameters
    - PTZStatus =: *ptzStatus*
11. If the DUT supports Absolute Pan/Tilt Movement:
    11.1. ONVIF Client invokes **AbsoluteMove** request with parameters
    - ProfileToken := *profile*.@token
    - Position.PanTilt.x := *profile*.Configurations.PTZ.PanTiltLimits.Range.XRange.Max if it is specified, otherwise, *pantiltSpace*.XRange.Max
    - Position.PanTilt.y := *profile*.Configurations.PTZ.PanTiltLimits.Range.YRange.Max if it is specified, otherwise, *pantiltSpace*.YRange.Max
    - Position.PanTilt.space := *pantiltSpace*.URI
    - Position.Zoom skipped
    - If the DUT supports Speed for Pan/Tilt:
      - Speed.PanTilt.x := *ptzConfigurationOptions*.Spaces.PanTiltSpeedSpace[0].XRange.Max

- Speed.PanTilt.y := *ptzConfigurationOptions*.Spaces.PanTiltSpeedSpace[0].YRange.Max
- Speed.PanTilt.space := *ptzConfigurationOptions*.Spaces.PanTiltSpeedSpace[0].URI
- Speed.Zoom skipped

otherwise, Speed skipped.

11.2. The DUT responds with **AbsoluteMoveResponse** message.

12. If the DUT supports Absolute Zoom Movement:

12.1. ONVIF Client invokes **AbsoluteMove** request with parameters

- ProfileToken := *profile*.@token
- Position.PanTilt skipped
- Position.Zoom.x := *profile*.Configurations.PTZ.ZoomLimits.Range.XRange.Max if it is specified, otherwise, *zoomSpace*.XRange.Max
- Position.Zoom.space := *zoomSpace*.URI
- If the DUT supports Speed for Zoom:
  - Speed.PanTilt skipped
  - Speed.Zoom.x := *ptzConfigurationOptions*.Spaces.ZoomSpeedSpace[0].XRange.Max
  - Speed.Zoom.space := *ptzConfigurationOptions*.Spaces.ZoomSpeedSpace[0].URI

  otherwise, Speed skipped.

12.2. The DUT responds with **AbsoluteMoveResponse** message.

13. ONVIF Client invokes **GetStatus** request with parameters

- ProfileToken := *profile*.@token

14. The DUT responds with **GetStatusResponse** with parameters

- PTZStatus =: *ptzStatus*

15. If the DUT supports Absolute Pan/Tilt Movement and *ptzStatus*.Position.PanTilt is specified:

15.1. If differens between Position.PanTilt.x value from step 11.1 and *ptzStatus*.Position.PanTilt.x is more than 10% of full range, write WARNING.

15.2. If differens between Position.PanTilt.y value from step 11.1 and *ptzStatus*.Position.PanTilt.y is more than 10% of full range, write WARNING.

16. If the DUT supports Absolute Zoom Movement and *ptzStatus*.Position.Zoom is specified:

16.1. If differens between Position.Zoom.x value from step 12.1 and *ptzStatus*.Position.Zoom.x is more than 10% of full range, write WARNING.

17. If PTZ Configuration *profile*.Configurations.PTZ was changed at step 8, ONVIF Client restores PTZ Configuration.

18. If Media Profile *profile* was changed at step 3, ONVIF Client restores Media Profile.

Test Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **GetConfigurationOptionsResponse** message.
- DUT did not send **GetStatusResponse** message.
- DUT did not send **AbsoluteMoveResponse** message.

Note: PTZ accuracy is out of scope for this Test Specification. Therefore, the position reported by the DUT in the **GetStatusResponse** does not have to be exactly the same as the position requested by the ONVIF Client in the **AbsoluteMove** request.

Note: The DUT featres support are defined by the procedure mentioned in [ONVIF Feature Discovery].

Note: *ptzNodeToken1* will be taken from PTZ Node for test field of ONVIF Device Test Tool, if it is not defined the first PTZ Node at the list provided in the **GetNodesResponse** will be used.

5.1.2 PTZ CONTINUOUS MOVE USING MEDIA2 PROFILE

Test Label: PTZ Continuous Move Operation Using Media2 Profile.

Test Case ID: MEDIA2_PTZ-1-1-2

ONVIF Core Specification Coverage: None

Command Under Test: ContinuousMove, GetStatus

WSDL Reference: ptz.wsdl

Test Purpose: To verify continuous Pan/Tilt or continuous Zoom movements using the DUT PTZ ContinuousMove operation with timeout parameter.

Pre-Requisite: Media2 Service is received from the DUT. PTZ Service is received from the DUT. Continuous movement is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client configures or selects a Media Profile with Video Source Configuration and PTZ Configuration by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - in *ptzNodeToken1* - token of the PTZ Node, with which Media Profile should be configured
   - out *profile* - Media Profile with Video Source Configuration and PTZ Configuration
4. ONVIF Client invokes **GetConfigurationOptions** request with parameters
   - ConfigurationToken := *profile*Configurations.PTZ.@token
5. The DUT responds with **GetConfigurationOptionsResponse** with parameters
   - PTZConfigurationOptions =: *ptzConfigurationOptions*
6. ONVIF Client verifies PTZ Configuration Options by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - in *ptzConfigurationOptions* - PTZ Configuration Options
7. If *ptzConfigurationOptions*.Spaces has no at least one of the ContinuousPanTiltVelocitySpace element or ContinuousZoomVelocitySpace element, FAIL the test and skip other steps.
8. Set *moveTimeout* := MIN(MAX(PT60S, *ptzConfigurationOptions*.PTZTimeout.Min), *ptzConfigurationOptions*.PTZTimeout.Max)

9. If the DUT supports Continuous Pan/Tilt Movement:

   9.1. ONVIF Client invokes **ContinuousMove** request with parameters

   - ProfileToken := *profile*.@token
   - Velocity.PanTilt.x := *ptzConfigurationOptions*.Spaces.ContinuousPanTiltVelocitySpace[0].XRange.Max
   - Velocity.PanTilt.y := *ptzConfigurationOptions*.Spaces.ContinuousPanTiltVelocitySpace[0].YRange.Max
   - Velocity.PanTilt.space := *ptzConfigurationOptions*.Spaces.ContinuousPanTiltVelocitySpace[0].URI
   - Velocity.Zoom skipped
   - Timeout := *moveTimeout*

   9.2. The DUT responds with **ContinuousMoveResponse** message.

   9.3. Wait until *moveTimeout* timeout expires.

   9.4. Wait until *timeout1* timeout expires.

   9.5. ONVIF Client invokes **GetStatus** request with parameters

   - ProfileToken := *profile*.@token

   9.6. The DUT responds with **GetStatusResponse** with parameters

   - PTZStatus =: *ptzStatus*

   9.7. If *ptzStatus*.MoveStatus.PanTilt is specified:

      9.7.1. If *ptzStatus*.MoveStatus.PanTilt is other than IDLE or UNKNOWN, FAIL the test and skip other steps.

   9.8. If *ptzStatus*.MoveStatus.Zoom is specified:

      9.8.1. If *ptzStatus*.MoveStatus.Zoom is other than IDLE or UNKNOWN, FAIL the test and skip other steps.

10. If the DUT supports Continuous Zoom Movement:

   10.1. ONVIF Client invokes **ContinuousMove** request with parameters

   - ProfileToken := *profile*.@token

- Velocity.PanTilt skipped
- Velocity.Zoom.x := *ptzConfigurationOptions*.Spaces.ContinuousZoomVelocitySpace[0].XRange.Max
- Velocity.Zoom.space := *ptzConfigurationOptions*.Spaces.ContinuousZoomVelocitySpace[0].URI
- Timeout := *moveTimeout*

10.2. The DUT responds with **ContinuousMoveResponse** message.

10.3. Wait until *moveTimeout* timeout expires.

10.4. Wait until *timeout1* timeout expires.

10.5. ONVIF Client invokes **GetStatus** request with parameters

- ProfileToken := *profile*.@token

10.6. The DUT responds with **GetStatusResponse** with parameters

- PTZStatus =: *ptzStatus*

10.7. If *ptzStatus*.MoveStatus.PanTilt is specified:

10.7.1. If *ptzStatus*.MoveStatus.PanTilt is other than IDLE or UNKNOWN, FAIL the test and skip other steps.

10.8. If *ptzStatus*.MoveStatus.Zoom is specified:

10.8.1. If *ptzStatus*.MoveStatus.Zoom is other than IDLE or UNKNOWN, FAIL the test and skip other steps.

11. If Media Profile *profile* was changed at step 3, ONVIF Client restores Media Profile.

Test Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **GetConfigurationOptionsResponse** message.
- DUT did not send **GetStatusResponse** message.

- DUT did not send **ContinuousMoveResponse** message.

Note: *timeout1* will be taken from Operation Delay field of ONVIF Device Test Tool.

Note: The DUT featres support are defined by the procedure mentioned in [ONVIF Feature Discovery].

Note: *ptzNodeToken1* will be taken from PTZ Node for test field of ONVIF Device Test Tool, if it is not defined the first PTZ Node at the list provided in the **GetNodesResponse** will be used.

5.1.3 PTZ CONTINUOUS MOVE & STOP USING MEDIA2 PROFILE

Test Label: PTZ Continuous Move and Stop Operation Using Media2 Profile

Test Case ID: MEDIA2_PTZ-1-1-3

ONVIF Core Specification Coverage: None

Command Under Test: ContinuousMove, Stop, GetStatus

WSDL Reference: ptz.wsdl

Test Purpose: To verify continuous Pan/Tilt or continuous Zoom movements using the DUT PTZ ContinuousMove operation without timeout parameter and to stop all ongoing pan, tilt and zoom movements.

Pre-Requisite: Media2 Service is received from the DUT. PTZ Service is received from the DUT. Continuous movement is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client configures or selects a Media Profile with Video Source Configuration and PTZ Configuration by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - in *ptzNodeToken1* - token of the PTZ Node, with which Media Profile should be configured
   - out *profile* - Media Profile with Video Source Configuration and PTZ Configuration
4. ONVIF Client invokes **GetConfigurationOptions** request with parameters

- ConfigurationToken := *profile*Configurations.PTZ.@token

5. The DUT responds with **GetConfigurationOptionsResponse** with parameters
   - PTZConfigurationOptions =: *ptzConfigurationOptions*
6. ONVIF Client verifies PTZ Configuration Options by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - in *ptzConfigurationOptions* - PTZ Configuration Options
7. If *ptzConfigurationOptions*.Spaces has no at least one of the ContinuousPanTiltVelocitySpace element or ContinuousZoomVelocitySpace element, FAIL the test and skip other steps.
8. If the DUT supports Continuous Pan/Tilt Movement:
   8.1. ONVIF Client invokes **ContinuousMove** request with parameters
      - ProfileToken := *profile*.@token
      - Velocity.PanTilt.x := *ptzConfigurationOptions*.Spaces.ContinuousPanTiltVelocitySpace[0].XRange.Max
      - Velocity.PanTilt.y := *ptzConfigurationOptions*.Spaces.ContinuousPanTiltVelocitySpace[0].YRange.Max
      - Velocity.PanTilt.space := *ptzConfigurationOptions*.Spaces.ContinuousPanTiltVelocitySpace[0].URI
      - Velocity.Zoom skipped
      - Timeout skipped

   8.2. The DUT responds with **ContinuousMoveResponse** message.

   8.3. Wait until *timeout1* timeout expires.

   8.4. ONVIF Client invokes **Stop** request with parameters
      - ProfileToken := *profile*.@token
      - PanTilt skipped
      - Zoom skipped

   8.5. The DUT responds with **StopResponse** message.

8.6. Wait until *timeout1* timeout expires.

8.7. ONVIF Client invokes **GetStatus** request with parameters

- ProfileToken := *profile*.@token

8.8. The DUT responds with **GetStatusResponse** with parameters

- PTZStatus =: *ptzStatus*

8.9. If *ptzStatus*.MoveStatus.PanTilt is specified:

8.9.1. If *ptzStatus*.MoveStatus.PanTilt is other than IDLE or UNKNOWN, FAIL the test and skip other steps.

8.10. If *ptzStatus*.MoveStatus.Zoom is specified:

8.10.1. If *ptzStatus*.MoveStatus.Zoom is other than IDLE or UNKNOWN, FAIL the test and skip other steps.

9. If the DUT supports Continuous Zoom Movement:

9.1. ONVIF Client invokes **ContinuousMove** request with parameters

- ProfileToken := *profile*.@token
- Velocity.PanTilt skipped
- Velocity.Zoom.x := *ptzConfigurationOptions*.Spaces.ContinuousZoomVelocitySpace[0].XRange.Max
- Velocity.Zoom.space := *ptzConfigurationOptions*.Spaces.ContinuousZoomVelocitySpace[0].URI
- Timeout skipped

9.2. The DUT responds with **ContinuousMoveResponse** message.

9.3. Wait until *timeout1* timeout expires.

9.4. ONVIF Client invokes **Stop** request with parameters

- ProfileToken := *profile*.@token
- PanTilt skipped
- Zoom skipped

9.5. The DUT responds with **StopResponse** message.

9.6. Wait until *timeout1* timeout expires.

9.7. ONVIF Client invokes **GetStatus** request with parameters

- ProfileToken := *profile*.@token

9.8. The DUT responds with **GetStatusResponse** with parameters

- PTZStatus =: *ptzStatus*

9.9. If *ptzStatus*.MoveStatus.PanTilt is specified:

9.9.1. If *ptzStatus*.MoveStatus.PanTilt is other than IDLE or UNKNOWN, FAIL the test and skip other steps.

9.10. If *ptzStatus*.MoveStatus.Zoom is specified:

9.10.1. If *ptzStatus*.MoveStatus.Zoom is other than IDLE or UNKNOWN, FAIL the test and skip other steps.

10. If Media Profile *profile* was changed at step 3, ONVIF Client restores Media Profile.

Test Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **GetConfigurationOptionsResponse** message.
- DUT did not send **GetStatusResponse** message.
- DUT did not send **ContinuousMoveResponse** message.
- DUT did not send **StopResponse** message.

Note: *timeout1* will be taken from Operation Delay field of ONVIF Device Test Tool.

Note: *ptzNodeToken1* will be taken from PTZ Node for test field of ONVIF Device Test Tool, if it is not defined the first PTZ Node at the list provided in the **GetNodesResponse** will be used.

Note: The DUT featres support are defined by the procedure mentioned in [ONVIF Feature Discovery].

5.2 Preset Operations

5.2.1 PTZ SET AND GET PRESET USING MEDIA2 PROFILE

Test Label: PTZ Set and Get Preset Using Media2 Profile

Test Case ID: MEDIA2_PTZ-2-1-1

ONVIF Core Specification Coverage: None

Command Under Test: SetPreset, GetPresets

WSDL Reference: ptz.wsdl

Test Purpose: To verify that the DUT supports the setting of presets using the SetPreset operation and the retrieval of presets using the GetPresets operation.

Pre-Requisite: Media2 Service is received from the DUT. PTZ Service is received from the DUT. Absolute movement is supported by the DUT. Presets are supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. If the DUT does not supports Absolute Movement, FAIL the test and skip other steps.
4. ONVIF Client configures or selects a Media Profile with Video Source Configuration and PTZ Configuration by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - in *ptzNodeToken1* - token of the PTZ Node, with which Media Profile should be configured
   - out *profile* - Media Profile with Video Source Configuration and PTZ Configuration
5. ONVIF Client invokes **GetConfigurationOptions** request with parameters
   - ConfigurationToken := *profile*Configurations.PTZ.@token
6. The DUT responds with **GetConfigurationOptionsResponse** with parameters
   - PTZConfigurationOptions =: *ptzConfigurationOptions*

7. ONVIF Client verifies PTZ Configuration Options by following the procedure mentioned in Annex A.4 with the following input and output parameters

   - in *ptzConfigurationOptions* - PTZ Configuration Options

8. If the DUT supports Absolute Pan/Tilt Movement:

   8.1. Set *pantiltSpace* := *ptzConfigurationOptions*.Spaces.AbsolutePanTiltPositionSpace[*genericPanTiltSpace*], where *genericPanTiltSpace* is the index number of the first item on the *ptzConfigurationOptions*.Spaces.AbsolutePanTiltPositionSpace list that has URI = "http://www.onvif.org/ver10/tptz/PanTiltSpaces/PositionGenericSpace"

   8.2. If *profile*.Configurations.PTZ.PanTiltLimits is specified:

   - set *x1* := *profile*.Configurations.PTZ.PanTiltLimits.XRange.Min + (*profile*.Configurations.PTZ.PanTiltLimits.XRange.Max - *profile*.Configurations.PTZ.PanTiltLimits.XRange.Min)/3
   - set *y1* := *profile*.Configurations.PTZ.PanTiltLimits.YRange.Min + (*profile*.Configurations.PTZ.PanTiltLimits.YRange.Max - *profile*.Configurations.PTZ.PanTiltLimits.YRange.Min)/3

   otherwise:

   - set *x1* := *pantiltSpace*.XRange.Min + (*pantiltSpace*.XRange.Max - *pantiltSpace*.XRange.Min)/3
   - set *y1* := *pantiltSpace*.YRange.Min + (*pantiltSpace*.YRange.Max - *pantiltSpace*.YRange.Min)/3

9. If the DUT supports Absolute Zoom Movement:

   9.1. Set *zoomSpace* := *ptzConfigurationOptions*.Spaces.AbsoluteZoomPositionSpace[*genericZoomSpace*], where *genericZoomSpace* is the index number of the first item on the *ptzConfigurationOptions*.Spaces.AbsoluteZoomPositionSpace list that has URI = "http://www.onvif.org/ver10/tptz/ZoomSpaces/PositionGenericSpace"

   9.2. If *profile*.Configurations.PTZ.ZoomLimits is specified:

   - set *z1* := *profile*.Configurations.PTZ.ZoomLimits.XRange.Min

   otherwise:

   - set *z1* := *zoomSpace*.XRange.Min

10. ONVIF Client invokes **AbsoluteMove** request with parameters
    - ProfileToken := *profile*.@token
    - Position.PanTilt.x := *x1*
    - Position.PanTilt.y := *y1*
    - Position.PanTilt.space := *pantiltSpace*.URI
    - Position.Zoom.x := *z1*
    - Position.Zoom.space := *zoomSpace*.URI
    - Speed skipped
11. The DUT responds with **AbsoluteMoveResponse** message.
12. Wait until *timeout1* timeout expires.
13. ONVIF Client invokes **SetPreset** request with parameters
    - ProfileToken := *profile*.@token
    - PresetName := "Test"
    - PresetToken skipped
14. The DUT responds with **SetPresetResponse** with parameters
    - PresetToken =: *presetToken1*
15. ONVIF Client invokes **GetPresets** request with parameters
    - ProfileToken := *profile*.@token
16. The DUT responds with **GetPresetsResponse** with parameters
    - Preset list =: *presetList1*
17. If *presetList1* does not contain item with @token = *presetToken1*, FAIL the test and skip other steps.
18. Set *preset* := item from *presetList1* with @token = *presetToken1*.
19. If *preset*.Name != "Test", FAIL the test and skip other steps.
20. If the DUT supports Absolute Pan/Tilt Movement:

    20.1. If *preset* does not contains PTZPosition.PanTilt, FAIL the test and skip other steps.

20.2. If differens between *preset*.PTZPosition.PanTilt.x and *x1* is more than 10% of full range, write WARNING.

20.3. If differens between *preset*.PTZPosition.PanTilt.y and *y1* is more than 10% of full range, write WARNING.

21. If the DUT supports Absolute Zoom Movement:

21.1. If *preset* does not contains PTZPosition.Zoom, FAIL the test and skip other steps.

21.2. If differens between *preset*.PTZPosition.Zoom.x and *z1* is more than 10% of full range, write WARNING.

22. If the DUT supports Absolute Pan/Tilt Movement:

22.1. If *profile*.Configurations.PTZ.PanTiltLimits is specified:

- set *x2* := *profile*.Configurations.PTZ.PanTiltLimits.XRange.Max - (*profile*.Configurations.PTZ.PanTiltLimits.XRange.Max - *profile*.Configurations.PTZ.PanTiltLimits.XRange.Min)/3
- set *y2* := *profile*.Configurations.PTZ.PanTiltLimits.YRange.Max - (*profile*.Configurations.PTZ.PanTiltLimits.YRange.Max - *profile*.Configurations.PTZ.PanTiltLimits.YRange.Min)/3

otherwise:

- set *x2* := *pantiltSpace*.XRange.Max - (*pantiltSpace*.XRange.Max - *pantiltSpace*.XRange.Min)/3
- set *y2* := *pantiltSpace*.YRange.Max - (*pantiltSpace*.YRange.Max - *pantiltSpace*.YRange.Min)/3

23. If the DUT supports Absolute Zoom Movement:

23.1. If *profile*.Configurations.PTZ.ZoomLimits is specified:

- set *z2* := *profile*.Configurations.PTZ.ZoomLimits.XRange.Max

otherwise:

- set *z2* := *zoomSpace*.XRange.Max

24. ONVIF Client invokes **AbsoluteMove** request with parameters

- ProfileToken := *profile*.@token

- Position.PanTilt.x := *x2*
- Position.PanTilt.y := *y2*
- Position.PanTilt.space := *pantiltSpace*.URI
- Position.Zoom.x := *z2*
- Position.Zoom.space := *zoomSpace*.URI
- Speed skipped

25. The DUT responds with **AbsoluteMoveResponse** message.
26. Wait until *timeout1* timeout expires.
27. ONVIF Client invokes **SetPreset** request with parameters
    - ProfileToken := *profile*.@token
    - PresetName := "Test"
    - PresetToken := *presetToken1*
28. The DUT responds with **SetPresetResponse** with parameters
    - PresetToken =: *presetToken2*
29. ONVIF Client invokes **GetPresets** request with parameters
    - ProfileToken := *profile*.@token
30. The DUT responds with **GetPresetsResponse** with parameters
    - Preset list =: *presetList2*
31. If *presetList2* does not contain item with @token = *presetToken1*, FAIL the test and skip other steps.
32. Set *preset* := item from *presetList2* with @token = *presetToken1*.
33. If *preset*.Name != "Test", FAIL the test and skip other steps.
34. If the DUT supports Absolute Pan/Tilt Movement:
    34.1. If *preset* does not contains PTZPosition.PanTilt, FAIL the test and skip other steps.
    34.2. If differens between *preset*.PTZPosition.PanTilt.x and *x2* is more than 10% of full range, write WARNING.

34.3. If differens between *preset*.PTZPosition.PanTilt.y and *y2* is more than 10% of full range, write WARNING.

35. If the DUT supports Absolute Zoom Movement:

35.1. If *preset* does not contains PTZPosition.Zoom, FAIL the test and skip other steps.

35.2. If differens between *preset*.PTZPosition.Zoom.x and *z2* is more than 10% of full range, write WARNING.

36. ONVIF Client invokes **RemovePreset** request with parameters

- ProfileToken := *profile*.@token
- PresetToken := *presetToken2*

37. The DUT responds with **RemovePresetResponse** message.

38. If Media Profile *profile* was changed at step 4, ONVIF Client restores Media Profile.

Test Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **GetConfigurationOptionsResponse** message.
- DUT did not send **RemovePresetResponse** message.
- DUT did not send **GetPresetsResponse** message.
- DUT did not send **SetPresetResponse** message.
- DUT did not send **AbsoluteMoveResponse** message.

Note: PTZ accuracy is out of scope for this Test Specification. Therefore, the position reported by the DUT in the **GetPresetsResponse** does not have to be exactly the same as the position requested by the ONVIF Client in the **AbsoluteMove** request.

Note: The DUT featres support are defined by the procedure mentioned in [ONVIF Feature Discovery].

Note: *timeout1* will be taken from Operation Delay field of ONVIF Device Test Tool.

Note: *ptzNodeToken1* will be taken from PTZ Node for test field of ONVIF Device Test Tool, if it is not defined the first PTZ Node at the list provided in the **GetNodesResponse** will be used.

5.2.2 PTZ GOTO PRESET USING MEDIA2 PROFILE

Test Label: PTZ GotoPreset Using Media2 Profile

Test Case ID: MEDIA2_PTZ-2-1-2

ONVIF Core Specification Coverage: None

Command Under Test: GotoPreset

WSDL Reference: ptz.wsdl

Test Purpose: To verify that it is possible to go to presets using the GotoPreset operation.

Pre-Requisite: Media2 Service is received from the DUT. PTZ Service is received from the DUT. Absolute movement is supported by the DUT. Presets are supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. If the DUT does not supports Absolute Movement, FAIL the test and skip other steps.
4. ONVIF Client configures or selects a Media Profile with Video Source Configuration and PTZ Configuration by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - in *ptzNodeToken1* - token of the PTZ Node, with which Media Profile should be configured
   - out *profile* - Media Profile with Video Source Configuration and PTZ Configuration
5. ONVIF Client invokes **GetConfigurationOptions** request with parameters
   - ConfigurationToken := *profile*Configurations.PTZ.@token
6. The DUT responds with **GetConfigurationOptionsResponse** with parameters
   - PTZConfigurationOptions =: *ptzConfigurationOptions*
7. ONVIF Client verifies PTZ Configuration Options by following the procedure mentioned in Annex A.4 with the following input and output parameters

- in *ptzConfigurationOptions* - PTZ Configuration Options

8. If the DUT supports Absolute Pan/Tilt Movement:

   8.1. Set *pantiltSpace* := *ptzConfigurationOptions*.Spaces.AbsolutePanTiltPositionSpace[*genericPanTiltSpace*], where *genericPanTiltSpace* is the index number of the first item on the *ptzConfigurationOptions*.Spaces.AbsolutePanTiltPositionSpace list that has URI = "http://www.onvif.org/ver10/tptz/PanTiltSpaces/PositionGenericSpace"

   8.2. If *profile*.Configurations.PTZ.PanTiltLimits is specified:

   - set *x1* := *profile*.Configurations.PTZ.PanTiltLimits.XRange.Min
   - set *y1* := *profile*.Configurations.PTZ.PanTiltLimits.YRange.Min

   otherwise:

   - set *x1* := *pantiltSpace*.XRange.Min
   - set *y1* := *pantiltSpace*.YRange.Min

9. If the DUT supports Absolute Zoom Movement:

   9.1. Set *zoomSpace* := *ptzConfigurationOptions*.Spaces.AbsoluteZoomPositionSpace[*genericZoomSpace*], where *genericZoomSpace* is the index number of the first item on the *ptzConfigurationOptions*.Spaces.AbsoluteZoomPositionSpace list that has URI = "http://www.onvif.org/ver10/tptz/ZoomSpaces/PositionGenericSpace"

   9.2. If *profile*.Configurations.PTZ.ZoomLimits is specified:

   - set *z1* := *profile*.Configurations.PTZ.ZoomLimits.XRange.Min

   otherwise:

   - set *z1* := *zoomSpace*.XRange.Min

10. ONVIF Client invokes **AbsoluteMove** request with parameters

- ProfileToken := *profile*.@token
- Position.PanTilt.x := *x1*
- Position.PanTilt.y := *y1*
- Position.PanTilt.space := *pantiltSpace*.URI

- Position.Zoom.x := *z1*
- Position.Zoom.space := *zoomSpace*.URI
- Speed skipped

11. The DUT responds with **AbsoluteMoveResponse** message.
12. Wait until *timeout1* timeout expires.
13. ONVIF Client invokes **SetPreset** request with parameters
    - ProfileToken := *profile*.@token
    - PresetName := "Test"
    - PresetToken skipped
14. The DUT responds with **SetPresetResponse** with parameters
    - PresetToken =: *presetToken1*
15. If the DUT supports Absolute Pan/Tilt Movement:
    15.1. If *profile*.Configurations.PTZ.PanTiltLimits is specified:
    - set *x2* := *profile*.Configurations.PTZ.PanTiltLimits.XRange.Max
    - set *y2* := *profile*.Configurations.PTZ.PanTiltLimits.YRange.Max

    otherwise:
    - set *x2* := *pantiltSpace*.XRange.Max
    - set *y2* := *pantiltSpace*.YRange.Max
16. If the DUT supports Absolute Zoom Movement:
    16.1. If *profile*.Configurations.PTZ.ZoomLimits is specified:
    - set *z2* := *profile*.Configurations.PTZ.ZoomLimits.XRange.Max

    otherwise:
    - set *z2* := *zoomSpace*.XRange.Max
17. ONVIF Client invokes **AbsoluteMove** request with parameters
    - ProfileToken := *profile*.@token

- Position.PanTilt.x := *x2*
- Position.PanTilt.y := *y2*
- Position.PanTilt.space := *pantiltSpace*.URI
- Position.Zoom.x := *z2*
- Position.Zoom.space := *zoomSpace*.URI
- Speed skipped

18. The DUT responds with **AbsoluteMoveResponse** message.
19. Wait until *timeout1* timeout expires.
20. ONVIF Client invokes **GotoPreset** request with parameters
    - ProfileToken := *profile*.@token
    - PresetToken := *presetToken1*
    - Speed skipped
21. The DUT responds with **GotoPresetResponse** message.
22. ONVIF Client invokes **GetStatus** request with parameters
    - ProfileToken := *profile*.@token
23. The DUT responds with **GetStatusResponse** with parameters
    - PTZStatus =: *ptzStatus*
24. If the DUT supports Absolute Pan/Tilt Movement and *ptzStatus*.Position.PanTilt is specified:
    24.1. If differens between *x1* and *ptzStatus*.Position.PanTilt.x is more than 10% of full range, write WARNING.
    24.2. If differens between *y1* and *ptzStatus*.Position.PanTilt.y is more than 10% of full range, write WARNING.
25. If the DUT supports Absolute Zoom Movement and *ptzStatus*.Position.Zoom is specified:
    25.1. If differens between *z1* and *ptzStatus*.Position.Zoom.x is more than 10% of full range, write WARNING.
26. ONVIF Client invokes **RemovePreset** request with parameters

- ProfileToken := *profile*.@token
- PresetToken := *presetToken1*

27. The DUT responds with **RemovePresetResponse** message.
28. If Media Profile *profile* was changed at step 4, ONVIF Client restores Media Profile.

Test Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **GetConfigurationOptionsResponse** message.
- DUT did not send **RemovePresetResponse** message.
- DUT did not send **GotoPresetResponse** message.
- DUT did not send **SetPresetResponse** message.
- DUT did not send **AbsoluteMoveResponse** message.

Note: PTZ accuracy is out of scope for this Test Specification. Therefore, the position reported by the DUT in the **GetPresetsResponse** does not have to be exactly the same as the position requested by the ONVIF Client in the **AbsoluteMove** request.

Note: *ptzNodeToken1* will be taken from PTZ Node for test field of ONVIF Device Test Tool, if it is not defined the first PTZ Node at the list provided in the **GetNodesResponse** will be used.

Note: The DUT featres support are defined by the procedure mentioned in [ONVIF Feature Discovery].

Note: *timeout1* will be taken from Operation Delay field of ONVIF Device Test Tool.

5.2.3 PTZ REMOVE PRESET USING MEDIA2 PROFILE

Test Label: PTZ RemovePreset Using Media2 Profile

Test Case ID: MEDIA2_PTZ-2-1-3

ONVIF Core Specification Coverage: None

Command Under Test: RemovePreset

WSDL Reference: ptz.wsdl

Test Purpose: To verify that it is possible to remove presets using the RemovePreset operation.

Pre-Requisite: Media2 Service is received from the DUT. PTZ Service is received from the DUT. Presets are supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client configures or selects a Media Profile with Video Source Configuration and PTZ Configuration by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - in *ptzNodeToken1* - token of the PTZ Node, with which Media Profile should be configured
   - out *profile* - Media Profile with Video Source Configuration and PTZ Configuration
4. ONVIF Client invokes **SetPreset** request with parameters
   - ProfileToken := *profile*.@token
   - PresetName := "Test"
   - PresetToken skipped
5. The DUT responds with **SetPresetResponse** with parameters
   - PresetToken =: *presetToken1*
6. ONVIF Client invokes **GetPresets** request with parameters
   - ProfileToken := *profile*.@token
7. The DUT responds with **GetPresetsResponse** with parameters
   - Preset list =: *presetList1*
8. If *presetList1* does not contain item with @token = *presetToken1*, FAIL the test and skip other steps.
9. Set *preset* := item from *presetList1* with @token = *presetToken1*.
10. If *preset*.Name != "Test", FAIL the test and skip other steps.

11. ONVIF Client invokes **RemovePreset** request with parameters
    - ProfileToken := *profile*.@token
    - PresetToken := *presetToken1*
12. The DUT responds with **RemovePresetResponse** message.
13. ONVIF Client invokes **GetPresets** request with parameters
    - ProfileToken := *profile*.@token
14. The DUT responds with **GetPresetsResponse** with parameters
    - Preset list =: *presetList2*
15. If *presetList2* contains item with @token = *presetToken1*, FAIL the test and skip other steps.
16. If Media Profile *profile* was changed at step 3, ONVIF Client restores Media Profile.

Test Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **RemovePresetResponse** message.
- DUT did not send **GetPresetsResponse** message.
- DUT did not send **SetPresetResponse** message.

Note: *ptzNodeToken1* will be taken from PTZ Node for test field of ONVIF Device Test Tool, if it is not defined the first PTZ Node at the list provided in the **GetNodesResponse** will be used.

5.3 Home Position Operations

5.3.1 PTZ HOME POSITION OPERATIONS (CONFIGURABLE) USING MEDIA2 PROFILE

Test Label: PTZ Configurable Home Position Using Media2 Profile

Test Case ID: MEDIA2_PTZ-3-1-1

ONVIF Core Specification Coverage: None

Command Under Test: SetHomePosition, GotoHomePosition

WSDL Reference: ptz.wsdl

Test Purpose: To verify that the SetHomePosition and GotoHomePosition operations are correctly implemented.

Pre-Requisite: Media2 Service is received from the DUT. PTZ Service is received from the DUT. Absolute movement is supported by the DUT. Configurable Home Position is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. If the DUT does not supports Absolute Movement, FAIL the test and skip other steps.
4. ONVIF Client configures or selects a Media Profile with Video Source Configuration and PTZ Configuration by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - in *ptzNodeToken1* - token of the PTZ Node, with which Media Profile should be configured
   - out *profile* - Media Profile with Video Source Configuration and PTZ Configuration
5. ONVIF Client invokes **GetConfigurationOptions** request with parameters
   - ConfigurationToken := *profile*Configurations.PTZ.@token
6. The DUT responds with **GetConfigurationOptionsResponse** with parameters
   - PTZConfigurationOptions =: *ptzConfigurationOptions*
7. ONVIF Client verifies PTZ Configuration Options by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - in *ptzConfigurationOptions* - PTZ Configuration Options
8. If the DUT supports Absolute Pan/Tilt Movement:
   8.1. Set *pantiltSpace* := *ptzConfigurationOptions*.Spaces.AbsolutePanTiltPositionSpace[*genericPanTiltSpace*], where *genericPanTiltSpace* is the index number of the first item on the

ptzConfigurationOptions.Spaces.AbsolutePanTiltPositionSpace list that has URI = "http://www.onvif.org/ver10/tptz/PanTiltSpaces/PositionGenericSpace"

8.2. If *profile*.Configurations.PTZ.PanTiltLimits is specified:

- set *x1* := *profile*.Configurations.PTZ.PanTiltLimits.XRange.Min
- set *y1* := *profile*.Configurations.PTZ.PanTiltLimits.YRange.Min

otherwise:

- set *x1* := *pantiltSpace*.XRange.Min
- set *y1* := *pantiltSpace*.YRange.Min

9. If the DUT supports Absolute Zoom Movement:

9.1. Set *zoomSpace* := *ptzConfigurationOptions*.Spaces.AbsoluteZoomPositionSpace[*genericZoomSpace*], where *genericZoomSpace* is the index number of the first item on the *ptzConfigurationOptions*.Spaces.AbsoluteZoomPositionSpace list that has URI = "http://www.onvif.org/ver10/tptz/ZoomSpaces/PositionGenericSpace"

9.2. If *profile*.Configurations.PTZ.ZoomLimits is specified:

- set *z1* := *profile*.Configurations.PTZ.ZoomLimits.XRange.Min

otherwise:

- set *z1* := *zoomSpace*.XRange.Min

10. ONVIF Client invokes **AbsoluteMove** request with parameters

- ProfileToken := *profile*.@token
- Position.PanTilt.x := *x1*
- Position.PanTilt.y := *y1*
- Position.PanTilt.space := *pantiltSpace*.URI
- Position.Zoom.x := *z1*
- Position.Zoom.space := *zoomSpace*.URI
- Speed skipped

11. The DUT responds with **AbsoluteMoveResponse** message.

12. Wait until *timeout1* timeout expires.
13. ONVIF Client invokes **SetHomePosition** request with parameters
    - ProfileToken := *profile*.@token
14. The DUT responds with **SetHomePositionResponse** message.
15. If the DUT supports Absolute Pan/Tilt Movement:
    15.1. If *profile*.Configurations.PTZ.PanTiltLimits is specified:
        - set *x2* := *profile*.Configurations.PTZ.PanTiltLimits.XRange.Max
        - set *y2* := *profile*.Configurations.PTZ.PanTiltLimits.YRange.Max

        otherwise:
        - set *x2* := *pantiltSpace*.XRange.Max
        - set *y2* := *pantiltSpace*.YRange.Max
16. If the DUT supports Absolute Zoom Movement:
    16.1. If *profile*.Configurations.PTZ.ZoomLimits is specified:
        - set *z2* := *profile*.Configurations.PTZ.ZoomLimits.XRange.Max

        otherwise:
        - set *z2* := *zoomSpace*.XRange.Max
17. ONVIF Client invokes **AbsoluteMove** request with parameters
    - ProfileToken := *profile*.@token
    - Position.PanTilt.x := *x2*
    - Position.PanTilt.y := *y2*
    - Position.PanTilt.space := *pantiltSpace*.URI
    - Position.Zoom.x := *z2*
    - Position.Zoom.space := *zoomSpace*.URI
    - Speed skipped
18. The DUT responds with **AbsoluteMoveResponse** message.

19. Wait until *timeout1* timeout expires.
20. ONVIF Client invokes **GotoHomePosition** request with parameters
    - ProfileToken := *profile*.@token
    - Speed skipped
21. The DUT responds with **GotoHomePositionResponse** message.
22. Wait until *timeout1* timeout expires.
23. ONVIF Client invokes **GetStatus** request with parameters
    - ProfileToken := *profile*.@token
24. The DUT responds with **GetStatusResponse** with parameters
    - PTZStatus =: *ptzStatus*
25. If the DUT supports Absolute Pan/Tilt Movement and *ptzStatus*.Position.PanTilt is specified:
    25.1. If differens between *x1* and *ptzStatus*.Position.PanTilt.x is more than 10% of full range, write WARNING.
    25.2. If differens between *y1* and *ptzStatus*.Position.PanTilt.y is more than 10% of full range, write WARNING.
26. If the DUT supports Absolute Zoom Movement and *ptzStatus*.Position.Zoom is specified:
    26.1. If differens between *z1* and *ptzStatus*.Position.Zoom.x is more than 10% of full range, write WARNING.
27. If Media Profile *profile* was changed at step 4, ONVIF Client restores Media Profile.

Test Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **GetConfigurationOptionsResponse** message.
- DUT did not send **GetStatusResponse** message.
- DUT did not send **SetHomePositionResponse** message.
- DUT did not send **GotoHomePositionResponse** message.

- DUT did not send **AbsoluteMoveResponse** message.

Note: PTZ accuracy is out of scope for this Test Specification. Therefore, the position reported by the DUT in the **GetStatusResponse** does not have to be exactly the same as the position requested by the ONVIF Client in the **AbsoluteMove** request.

Note: The DUT featres support are defined by the procedure mentioned in [ONVIF Feature Discovery].

Note: *ptzNodeToken1* will be taken from PTZ Node for test field of ONVIF Device Test Tool, if it is not defined the first PTZ Node at the list provided in the **GetNodesResponse** will be used.

Note: *timeout1* will be taken from Operation Delay field of ONVIF Device Test Tool.

5.3.2 PTZ HOME POSITION OPERATIONS (FIXED) USING MEDIA2 PROFILE

Test Label: PTZ Fixed Home Position Using Media2 Profile

Test Case ID: MEDIA2_PTZ-3-1-2

ONVIF Core Specification Coverage: None

Command Under Test: SetHomePosition, GotoHomePosition

WSDL Reference: ptz.wsdl

Test Purpose: To verify that the SetHomePosition and GotoHomePosition operations are correctly implemented.

Pre-Requisite: Media2 Service is received from the DUT. PTZ Service is received from the DUT. Absolute movement is supported by the DUT. Fixed Home Position is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. If the DUT does not supports Absolute Movement, FAIL the test and skip other steps.
4. ONVIF Client configures or selects a Media Profile with Video Source Configuration and PTZ Configuration by following the procedure mentioned in Annex A.2 with the following input and output parameters

- in *ptzNodeToken1* - token of the PTZ Node, with which Media Profile should be configured
- out *profile* - Media Profile with Video Source Configuration and PTZ Configuration

5. ONVIF Client invokes **GetConfigurationOptions** request with parameters
   - ConfigurationToken := *profile*Configurations.PTZ.@token
6. The DUT responds with **GetConfigurationOptionsResponse** with parameters
   - PTZConfigurationOptions =: *ptzConfigurationOptions*
7. ONVIF Client verifies PTZ Configuration Options by following the procedure mentioned in Annex A.4 with the following input and output parameters
   - in *ptzConfigurationOptions* - PTZ Configuration Options
8. ONVIF Client invokes **GotoHomePosition** request with parameters
   - ProfileToken := *profile*.@token
   - Speed skipped
9. The DUT responds with **GotoHomePositionResponse** message.
10. Wait until *timeout1* timeout expires.
11. If the DUT supports Absolute Pan/Tilt Movement:
    11.1. Set *pantiltSpace* := *ptzConfigurationOptions*.Spaces.AbsolutePanTiltPositionSpace[*genericPanTiltSpace*], where *genericPanTiltSpace* is the index number of the first item on the *ptzConfigurationOptions*.Spaces.AbsolutePanTiltPositionSpace list that has URI = "http://www.onvif.org/ver10/tptz/PanTiltSpaces/PositionGenericSpace"

    11.2. If *profile*.Configurations.PTZ.PanTiltLimits is specified:
    - set *x1* := *profile*.Configurations.PTZ.PanTiltLimits.XRange.Max
    - set *y1* := *profile*.Configurations.PTZ.PanTiltLimits.YRange.Max

    otherwise:
    - set *x1* := *pantiltSpace*.XRange.Max
    - set *y1* := *pantiltSpace*.YRange.Max
12. If the DUT supports Absolute Zoom Movement:

12.1. Set *zoomSpace* := *ptzConfigurationOptions*.Spaces.AbsoluteZoomPositionSpace[*genericZoomSpace*], where *genericZoomSpace* is the index number of the first item on the *ptzConfigurationOptions*.Spaces.AbsoluteZoomPositionSpace list that has URI = "http://www.onvif.org/ver10/tptz/ZoomSpaces/PositionGenericSpace"

12.2. If *profile*.Configurations.PTZ.ZoomLimits is specified:

- set *z1* := *profile*.Configurations.PTZ.ZoomLimits.XRange.Max

otherwise:

- set *z1* := *zoomSpace*.XRange.Max

13. ONVIF Client invokes **GetStatus** request with parameters

- ProfileToken := *profile*.@token

14. The DUT responds with **GetStatusResponse** with parameters

- PTZStatus =: *ptzStatus1*

15. If *ptzStatus1*.Position.PanTilt is specified and equal to vector x1, y1 and if *ptzStatus1*.Position.Zoom is specified and equal to vector z1:

15.1. If the DUT supports Absolute Pan/Tilt Movement:

15.1.1. If *profile*.Configurations.PTZ.PanTiltLimits is specified:

- set *x1* := *profile*.Configurations.PTZ.PanTiltLimits.XRange.Min

otherwise:

- set *x1* := 0

15.2. If the DUT supports Absolute Zoom Movement:

15.2.1. If *profile*.Configurations.PTZ.ZoomLimits is specified:

- set *z1* := *profile*.Configurations.PTZ.ZoomLimits.XRange.Min

otherwise:

- set *z1* := 0

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

- ProfileToken := *profile*.@token

- Position.PanTilt.x := *x1*
- Position.PanTilt.y := *y1*
- Position.PanTilt.space := *pantiltSpace*.URI
- Position.Zoom.x := *z1*
- Position.Zoom.space := *zoomSpace*.URI
- Speed skipped

17. The DUT responds with **AbsoluteMoveResponse** message.
18. Wait until *timeout1* timeout expires.
19. ONVIF Client invokes **SetHomePosition** request with parameters
    - ProfileToken := *profile*.@token
20. The DUT returns **env:Receiver/ter:Action/ter:CannotOverwriteHome** SOAP 1.2 fault.
21. ONVIF Client invokes **GotoHomePosition** request with parameters
    - ProfileToken := *profile*.@token
    - Speed skipped
22. The DUT responds with **GotoHomePositionResponse** message.
23. Wait until *timeout1* timeout expires.
24. ONVIF Client invokes **GetStatus** request with parameters
    - ProfileToken := *profile*.@token
25. The DUT responds with **GetStatusResponse** with parameters
    - PTZStatus =: *ptzStatus2*
26. If the DUT supports Absolute Pan/Tilt Movement and *ptzStatus*.Position.PanTilt is specified:
    26.1. If differens between *ptzStatus1*.Position.PanTilt.x and *ptzStatus2*.Position.PanTilt.x is more than 10% of full range, write WARNING.
    26.2. If differens between *ptzStatus1*.Position.PanTilt.y and *ptzStatus2*.Position.PanTilt.y is more than 10% of full range, write WARNING.

27. If the DUT supports Absolute Zoom Movement and *ptzStatus*.Position.Zoom is specified:

    27.1. If differens between *ptzStatus1*.Position.Zoom.x and *ptzStatus2*.Position.Zoom.x is more than 10% of full range, write WARNING.

28. If Media Profile *profile* was changed at step 4, ONVIF Client restores Media Profile.

Test Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **GetConfigurationOptionsResponse** message.
- DUT did not send **GetStatusResponse** message.
- DUT did not send the **env:Receiver/ter:Action/ter:CannotOverwriteHome** SOAP 1.2 fault message.
- DUT did not send **GotoHomePositionResponse** message.
- DUT did not send **AbsoluteMoveResponse** message.

Note: PTZ accuracy is out of scope for this Test Specification. Therefore, the position reported by the DUT in the first **GetStatusResponse** does not have to be exactly the same as the position in the second **GetStatusResponse**.

Note: The DUT featres support are defined by the procedure mentioned in [ONVIF Feature Discovery].

Note: *timeout1* will be taken from Operation Delay field of ONVIF Device Test Tool.

Note: *ptzNodeToken1* will be taken from PTZ Node for test field of ONVIF Device Test Tool, if it is not defined the first PTZ Node at the list provided in the **GetNodesResponse** will be used.

5.3.3 PTZ – HOME POSITION OPERATIONS (USAGE OF FIXEDHOMEPOSITION FLAG) USING MEDIA2 PROFILE

Test Label: PTZ Configurable Home Position with FixedHomePosition flag in PTZ Nodes Using Media2 Profile

Test Case ID: MEDIA2_PTZ-3-1-3

ONVIF Core Specification Coverage: None

Command Under Test: SetHomePosition

WSDL Reference: ptz.wsdl

Test Purpose: To verify that the SetHomePosition and GotoHomePosition operations are correctly implemented.

Pre-Requisite: Media2 Service is received from the DUT. PTZ Service is received from the DUT. Absolute movement is supported by the DUT. Home Position is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client configures or selects a Media Profile with Video Source Configuration and PTZ Configuration by following the procedure mentioned in Annex A.2 with the following input and output parameters
   - in *ptzNodeToken1* - token of the PTZ Node, with which Media Profile should be configured
   - out *profile* - Media Profile with Video Source Configuration and PTZ Configuration
4. ONVIF Client invokes **GetNode** request with parameters
   - NodeToken := *profile*.Configurations.PTZ.NodeToken
5. The DUT responds with **GetNodeResponse** with parameters
   - PTZNode =: *ptzNode*
6. If *ptzNode*.@FixedHomePosition is not specified, skip other steps.
7. ONVIF Client invokes **SetHomePosition** request with parameters
   - ProfileToken := *profile*.@token
8. The DUT returns **env:Receiver/ter:Action/ter:CannotOverwriteHome** or **env:Receiver/ter:ActionNotSupported** SOAP 1.2 fault or **SetHomePositionResponse** message.
9. If *ptzNode*.@FixedHomePosition = true and the DUT did not return **env:Receiver/ter:Action/ter:CannotOverwriteHome** or **env:Receiver/ter:ActionNotSupported** SOAP 1.2 fault at step 8, FAIL the test and skip other steps.

10. If *ptzNode*.@FixedHomePosition = false and the DUT did not return **SetHomePositionResponse** message at step 8, FAIL the test and skip other steps.
11. If Media Profile *profile* was changed at step 3, ONVIF Client restores Media Profile.

Test Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **GetNodeResponse** message.
- DUT did not send the **env:Receiver/ter:Action/ter:CannotOverwriteHome** or **env:Receiver/ter:ActionNotSupported** SOAP 1.2 fault message **SetHomePositionResponse** message.

Note: *ptzNodeToken1* will be taken from PTZ Node for test field of ONVIF Device Test Tool, if it is not defined the first PTZ Node at the list provided in the **GetNodesResponse** will be used.

5.4 Predefined PTZ Spaces

5.4.1 Absolute Position Spaces

5.4.1.1 ABSOLUTE PAN/TILT POSITION SPACE

Test Label: PTZ Absolute Position Spaces Absolute Pan/Tilt

Test Case ID: MEDIA2_PTZ-4-1-1

ONVIF Core Specification Coverage: Absolute Pan/Tilt Position Space

Command Under Test: None

WSDL Reference: ptz.wsdl

Test Purpose: To verify that the node supports the "http://www.onvif.org/ver10/tptz/PanTiltSpaces/SphericalPositionSpaceDegrees" PTZ space.

Pre-Requisite: Media2 Service is received from the DUT. PTZ Service is received from the DUT. Profile T is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes **GetNodes** request.
4. The DUT responds with **GetNodesResponse** with parameters
   - PTZNode list =: *ptzNodeList*
5. For each PTZ Node *ptzNode* from *ptzNodeList* list, which contains SupportedPTZSpaces.AbsolutePanTiltPositionSpace.URI = "http://www.onvif.org/ver10/tptz/PanTiltSpaces/SphericalPositionSpaceDegrees", repeat the following steps:
   5.1. Set *sphericalSpace* := *ptzNode*.SupportedPTZSpaces.AbsolutePanTiltPositionSpace[*sphericalSpaceId*], where *sphericalSpaceId* is the index number of the first item on the *ptzNode*.SupportedPTZSpaces.AbsolutePanTiltPositionSpace list that has URI = "http://www.onvif.org/ver10/tptz/PanTiltSpaces/SphericalPositionSpaceDegrees"

   5.2. If *sphericalSpace*.XRange.Max < *sphericalSpace*.XRange.Min, FAIL the test and skip other steps.

   5.3. If *sphericalSpace*.YRange.Max < *sphericalSpace*.YRange.Min, FAIL the test and skip other steps.

   5.4. ONVIF Client configures or selects a Media Profile with Video Source Configuration and PTZ Configuration by following the procedure mentioned in Annex A.2 with the following input and output parameters
      - in *ptzNode*.@token - token of the PTZ Node, with which Media Profile should be configured
      - out *profile* - Media Profile with Video Source Configuration and PTZ Configuration

   5.5. ONVIF Client invokes **AbsoluteMove** request with parameters
      - ProfileToken := *profile*.@token
      - Position.PanTilt.x := *profile*.Configurations.PTZ.PanTiltLimits.Range.XRange.Min if it is specified, otherwise, *sphericalSpace*.XRange.Min
      - Position.PanTilt.y := *profile*.Configurations.PTZ.PanTiltLimits.Range.YRange.Min if it is specified, otherwise, *sphericalSpace*.YRange.Min

- Position.PanTilt.space := *sphericalSpace*.URI
- Position.Zoom skipped
- Position.Speed skipped

5.6. The DUT responds with **AbsoluteMoveResponse** message.

5.7. ONVIF Client invokes **AbsoluteMove** request with parameters

- ProfileToken := *profile*.@token
- Position.PanTilt.x := *profile*.Configurations.PTZ.PanTiltLimits.Range.XRange.Max if it is specified, otherwise, *sphericalSpace*.XRange.Max
- Position.PanTilt.y := *profile*.Configurations.PTZ.PanTiltLimits.Range.YRange.Max if it is specified, otherwise, *sphericalSpace*.YRange.Max
- Position.PanTilt.space := *sphericalSpace*.URI
- Position.Zoom skipped
- Position.Speed skipped

5.8. The DUT responds with **AbsoluteMoveResponse** message.

5.9. If Media Profile *profile* was changed at step 5.4, ONVIF Client restores Media Profile.

Test Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **GetNodesResponse** message.
- DUT did not send **AbsoluteMoveResponse** message.

5.4.2 Continuous Velocity Spaces

5.4.2.1 CONTINUOUS PAN/TILT VELOCITY SPACE

Test Label: PTZ – Continuous Velocity Spaces – Continuous Pan/Tilt

Test Case ID: MEDIA2_PTZ-4-2-1

ONVIF Core Specification Coverage: Continuous Pan/Tilt Velocity Space

Command Under Test: None

WSDL Reference: ptz.wsdl

Test Purpose: To verify that the node supports the "http://www.onvif.org/ver10/tptz/PanTiltSpaces/VelocitySpaceDegrees" PTZ space for Continuous Pan/Tilt movement.

Pre-Requisite: Media2 Service is received from the DUT. PTZ Service is received from the DUT. Profile T is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes **GetNodes** request.
4. The DUT responds with **GetNodesResponse** with parameters
   - PTZNode list =: *ptzNodeList*
5. For each PTZ Node *ptzNode* from *ptzNodeList* list, which contains SupportedPTZSpaces.ContinuousPanTiltVelocitySpace, repeat the following steps:
   5.1. If *ptzNode*.SupportedPTZSpaces.ContinuousPanTiltVelocitySpace list does not contain item with URI = "http://www.onvif.org/ver10/tptz/PanTiltSpaces/VelocitySpaceDegrees", FAIL the test and skip other steps.
   5.2. Set *velocitySpace* := *ptzNode*.SupportedPTZSpaces.ContinuousPanTiltVelocitySpace[*velocitySpaceId*], where *velocitySpaceId* is the index number of the first item on the *ptzNode*.SupportedPTZSpaces.ContinuousPanTiltVelocitySpace list that has URI = "http://www.onvif.org/ver10/tptz/PanTiltSpaces/VelocitySpaceDegrees"
   5.3. If *velocitySpace*.XRange.Max < *velocitySpace*.XRange.Min, FAIL the test and skip other steps.
   5.4. If *velocitySpace*.YRange.Max < *velocitySpace*.YRange.Min, FAIL the test and skip other steps.
   5.5. ONVIF Client configures or selects a Media Profile with Video Source Configuration and PTZ Configuration by following the procedure mentioned in Annex A.2 with the following input and output parameters

- in *ptzNode*.@token - token of the PTZ Node, with which Media Profile should be configured
- out *profile* - Media Profile with Video Source Configuration and PTZ Configuration

5.6. ONVIF Client invokes **ContinuousMove** request with parameters

- ProfileToken := *profile*.@token
- Velocity.PanTilt.x := *velocitySpace*.XRange.Min
- Velocity.PanTilt.y := *velocitySpace*.YRange.Min
- Velocity.PanTilt.space := *sphericalSpace*.URI
- Velocity.Zoom skipped
- Timeout skipped

5.7. The DUT responds with **ContinuousMoveResponse** message.

5.8. Wait until *timeout1* timeout expires.

5.9. ONVIF Client invokes **ContinuousMove** request with parameters

- ProfileToken := *profile*.@token
- Velocity.PanTilt.x := *velocitySpace*.XRange.Max
- Velocity.PanTilt.y := *velocitySpace*.YRange.Max
- Velocity.PanTilt.space := *sphericalSpace*.URI
- Velocity.Zoom skipped
- Timeout skipped

5.10. The DUT responds with **ContinuousMoveResponse** message.

5.11. Wait until 10 sec timeout expires.

5.12. ONVIF Client invokes **Stop** request with parameters

- ProfileToken := *profile*.@token
- PanTilt := true
- Zoom := false

5.13. The DUT responds with **StopResponse** message.

5.14. If Media Profile *profile* was changed at step 5.5, ONVIF Client restores Media Profile.

Test Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **GetNodesResponse** message.
- DUT did not send **ContinuousMoveResponse** message.

Note: *timeout1* will be taken from Operation Delay field of ONVIF Device Test Tool.

5.4.2.2 GENERIC ZOOM VELOCITY SPACE

Test Label: PTZ – Continuous Velocity Spaces – Generic Zoom

Test Case ID: MEDIA2_PTZ-4-2-2

ONVIF Core Specification Coverage: Generic Zoom Velocity Space

Command Under Test: None

WSDL Reference: ptz.wsdl

Test Purpose: To verify that the node supports the "http://www.onvif.org/ver10/tptz/ZoomSpaces/VelocityGenericSpace" PTZ space for Continuous Zoom movement.

Pre-Requisite: Media2 Service is received from the DUT. PTZ Service is received from the DUT. Profile T is supported by the DUT.

Test Configuration: ONVIF Client and DUT

Test Procedure:

1. Start an ONVIF Client.
2. Start the DUT.
3. ONVIF Client invokes **GetNodes** request.
4. The DUT responds with **GetNodesResponse** with parameters

- PTZNode list =: *ptzNodeList*

5. For each PTZ Node *ptzNode* from *ptzNodeList* list, which contains SupportedPTZSpaces.ContinuousZoomVelocitySpace, repeat the following steps:

   5.1. If *ptzNode*.SupportedPTZSpaces.ContinuousZoomVelocitySpace list does not contain item with URI = "http://www.onvif.org/ver10/tptz/ZoomSpaces/VelocityGenericSpace", FAIL the test and skip other steps.

   5.2. Set *velocitySpace* := *ptzNode*.SupportedPTZSpaces.ContinuousZoomVelocitySpace[*velocitySpaceId*], where *velocitySpaceId* is the index number of the first item on the *ptzNode*.SupportedPTZSpaces.ContinuousZoomVelocitySpace list that has URI = "http://www.onvif.org/ver10/tptz/ZoomSpaces/VelocityGenericSpace"

   5.3. If *velocitySpace*.XRange.Max < *velocitySpace*.XRange.Min, FAIL the test and skip other steps.

   5.4. ONVIF Client configures or selects a Media Profile with Video Source Configuration and PTZ Configuration by following the procedure mentioned in Annex A.2 with the following input and output parameters

   - in *ptzNode*.@token - token of the PTZ Node, with which Media Profile should be configured
   - out *profile* - Media Profile with Video Source Configuration and PTZ Configuration

   5.5. ONVIF Client invokes **ContinuousMove** request with parameters

   - ProfileToken := *profile*.@token
   - Velocity.PanTilt skipped
   - Velocity.Zoom.x := *velocitySpace*.XRange.Min
   - Velocity.Zoom.space := *sphericalSpace*.URI
   - Timeout skipped

   5.6. The DUT responds with **ContinuousMoveResponse** message.

   5.7. Wait until *timeout1* timeout expires.

   5.8. ONVIF Client invokes **ContinuousMove** request with parameters

   - ProfileToken := *profile*.@token

- Velocity.PanTilt skipped
- Velocity.Zoom.x := *velocitySpace*.XRange.Max
- Velocity.Zoom.space := *sphericalSpace*.URI
- Timeout skipped

5.9. The DUT responds with **ContinuousMoveResponse** message.

5.10. Wait until 10 sec timeout expires.

5.11. ONVIF Client invokes **Stop** request with parameters

- ProfileToken := *profile*.@token
- PanTilt := false
- Zoom := true

5.12. The DUT responds with **StopResponse** message.

5.13. If Media Profile *profile* was changed at step 5.4, ONVIF Client restores Media Profile.

Test Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **GetNodesResponse** message.
- DUT did not send **ContinuousMoveResponse** message.

Note: *timeout1* will be taken from Operation Delay field of ONVIF Device Test Tool.

Annex A Helper Procedures and Additional Notes

A.1 Name Parameters

There are the following limitations on maximum length of the Name 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 are accepted).
- UTF-8 character set shall be used for Name.

Note: these limitations will not be used, if ONVIF Device Test Tool reuses values that were received from the DUT.

A.2 Media Profile Configuration for PTZ Control

Name: HelperMediaProfileConfiguration

Procedure Purpose: Helper procedure to find, create or configure Media Profile with Video Source Configuration and PTZ Configuration.

Pre-requisite: Media2 Service is received from the DUT. PTZ Service is received from the DUT. GetCompatibleConfigurations is supported by Device as indicated by the GetCompatibleConfigurations = true capability.

Input: Token of the PTZ Node, with which Media Profile should be configured (*ptzNodeToken*).

Returns: Media Profile (*profile*) with Video Source Configuration and PTZ Configuration.

Procedure:

1. ONVIF Client invokes **GetProfiles** request with parameters
   - Token skipped
   - Type[0] := PTZ
   - Type[1] := VideoSource
2. The DUT responds with **GetProfilesResponse** message with parameters
   - Profiles list =: *profileList*
3. If *profileList* is empty, FAIL the test and skip other steps.

4. If *profileList* contains Media Profile, which includes Configurations.PTZ.NodeToken = *ptzNodeToken*:

   4.1. Set *profile* := item from *profileList* list, which includes Configurations.PTZ.NodeToken = *ptzNodeToken*

   4.2. If *profile* does not contain Configurations.VideoSource:

      4.2.1. ONVIF Client adds Video Source to Media Profile by following the procedure mentioned in Annex A.3 with the following input and output parameters

      - in *profile* - Media Profile
      - out *profile* - Media Profile with Video Source Configuration

   4.3. Skip other steps other procedure.

5. Set *profile* := *profileList*[0]
6. If *profile* does not contain Configurations.VideoSource:

   6.1. ONVIF Client adds Video Source to Media Profile by following the procedure mentioned in Annex A.3 with the following input and output parameters

   - in *profile* - Media Profile
   - out *profile* - Media Profile with Video Source Configuration

7. ONVIF Client invokes **GetConfigurations** request.
8. The DUT responds with **GetConfigurationsResponse** message with parameters

   - PTZConfiguration list =: *ptzConfigurationList*

9. If *ptzConfigurationList* does not contain item with NodeToken = *ptzNodeToken*, FAIL the test and skip other steps.
10. Set *ptzConfiguration* := item from *ptzConfigurationList* list with NodeToken = *ptzNodeToken*
11. ONVIF Client invokes **AddConfiguration** request with parameters

    - ProfileToken := *profile*.@token
    - Name skipped
    - Configuration[0].Type := PTZ
    - Configuration[0].Token := *ptzConfiguration*.@token

12. The DUT responds with **AddConfigurationResponse** message.

Procedure Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **GetProfilesResponse** message.
- DUT did not send **GetConfigurationsResponse** message.
- DUT did not send **AddConfigurationResponse** message.

A.3 Media Profile Configuration with Video Source Configuration

Name: HelperMediaProfileConfigurationVS

Procedure Purpose: Helper procedure to add Video Source Configuration to Media Profile.

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

Input: Media Profile (*profile*).

Returns: Media Profile (*profile*) with Video Source Configuration.

Procedure:

1. ONVIF Client invokes **GetVideoSourceConfigurations** request with parameters
   - ConfigurationToken skipped
   - ProfileToken = *profile*.@token
2. The DUT responds with **GetVideoSourceConfigurationsResponse** with parameters
   - Configurations list =: *videoSourceConfigurationList*
3. If *videoSourceConfigurationList* is empty, FAIL the test and skip other steps.
4. ONVIF Client invokes **AddConfiguration** request with parameters
   - ProfileToken := *profile*.@token
   - Name skipped

- Configuration[0].Type := VideoSource
- Configuration[0].Token := *videoSourceConfigurationList*[0]

5. The DUT responds with **AddConfigurationResponse** message.

Procedure Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **GetVideoSourceConfigurationsResponse** message.
- DUT did not send **AddConfigurationResponse** message.

A.4 Verify PTZ Configuration Options

Name: HelperValidatePTZConfOptions

Procedure Purpose: Helper procedure to verify PTZ Configuration Options.

Pre-requisite: None

Input: PTZ Configuration Options (*ptzConfigurationOptions*).

Returns: None

Procedure:

1. If *ptzConfigurationOptions*.Spaces is empty, FAIL the test and skip other steps.
2. If the DUT supports Absolute Pan/Tilt Movement:
   2.1. If *ptzConfigurationOptions*.Spaces.AbsolutePanTiltPositionSpace list does not contain item with URI = "http://www.onvif.org/ver10/tptz/PanTiltSpaces/PositionGenericSpace", FAIL the test and skip other steps.
3. If the DUT supports Absolute Zoom Movement:
   3.1. If *ptzConfigurationOptions*.Spaces.AbsoluteZoomPositionSpace list does not contain item with URI = "http://www.onvif.org/ver10/tptz/ZoomSpaces/PositionGenericSpace", FAIL the test and skip other steps.
4. If the DUT supports Continuous Pan/Tilt Movement:

4.1. If *ptzConfigurationOptions*.Spaces.ContinuousPanTiltVelocitySpace list does not contain item with URI = "http://www.onvif.org/ver10/tptz/PanTiltSpaces/VelocityGenericSpace", FAIL the test and skip other steps.

5. If the DUT supports Continuous Zoom Movement:

5.1. If *ptzConfigurationOptions*.Spaces.ContinuousZoomVelocitySpace list does not contain item with URI = "http://www.onvif.org/ver10/tptz/ZoomSpaces/VelocityGenericSpace", FAIL the test and skip other steps.

6. If the DUT supports Relative Pan/Tilt Movement:

6.1. If *ptzConfigurationOptions*.Spaces.RelativePanTiltTranslationSpace list does not contain item with URI = "http://www.onvif.org/ver10/tptz/PanTiltSpaces/TranslationGenericSpace", FAIL the test and skip other steps.

7. If the DUT supports Relative Zoom Movement:

7.1. If *ptzConfigurationOptions*.Spaces.RelativeZoomTranslationSpace list does not contain item with URI = "http://www.onvif.org/ver10/tptz/ZoomSpaces/TranslationGenericSpace", FAIL the test and skip other steps.

8. If the DUT supports Speed for Pan/Tilt:

8.1. If *ptzConfigurationOptions*.Spaces.PanTiltSpeedSpace list does not contain item with URI = "http://www.onvif.org/ver10/tptz/PanTiltSpaces/GenericSpeedSpace", FAIL the test and skip other steps.

9. If the DUT supports Speed for Zoom:

9.1. If *ptzConfigurationOptions*.Spaces.ZoomSpeedSpace list does not contain item with URI = "http://www.onvif.org/ver10/tptz/ZoomSpaces/ZoomGenericSpeedSpace", FAIL the test and skip other steps.

10. If *ptzConfigurationOptions*.PTZTimeout.Min > *ptzConfigurationOptions*.PTZTimeout.Max, FAIL the test and skip other steps.

Procedure Result:

PASS –

- DUT passes all assertions.

FAIL –

- None.

Note: The DUT featres support are defined by the procedure mentioned in [ONVIF Feature Discovery].

A.5 Configure Default Absolute Spaces

Name: HelperConfigureDefaultAbsoluteSpaces

Procedure Purpose: Helper procedure to configure Default Absolute Spaces.

Pre-requisite: None

Input: PTZ Configuration Options (*ptzConfigurationOptions*). Media Profile with PTZ Configuration (*profile*).

Returns: Media Profile with PTZ Configuration with configured Absolute Position Default Spaces (*profile*). Options for Absolute Pan/Tilt Position Default Space (*pantiltSpace*). Options for Absolute Zoom Position Default Space (*zoomSpace*).

Procedure:

1. If the DUT supports Absolute Pan/Tilt Movement:
    1.1. Set *pantiltSpace* := *ptzConfigurationOptions*.Spaces.AbsolutePanTiltPositionSpace[0].
    1.2. If *profile*.Configurations.PTZ.DefaultAbsolutePantTiltPositionSpace != pantiltSpace.URI:
        1.2.1. Set *profile*.Configurations.PTZ.DefaultAbsolutePantTiltPositionSpace := pantiltSpace.URI.
        1.2.2. Set *updateNeeded* := true.
2. If the DUT supports Absolute Zoom Movement:
    2.1. Set *zoomSpace* := *ptzConfigurationOptions*.Spaces.AbsoluteZoomPositionSpace[0].
    2.2. If *profile*.Configurations.PTZ.DefaultAbsoluteZoomPositionSpace != zoomSpace.URI:
        2.2.1. Set *profile*.Configurations.PTZ.DefaultAbsoluteZoomPositionSpace := zoomSpace.URI.
        2.2.2. Set *updateNeeded* := true.
3. If updateNeeded = true:
    3.1. ONVIF Client invokes **SetConfiguration** request with parameters

- PTZConfiguration := *profile*.Configurations.PTZ

3.2. DUT responds with **SetConfigurationResponse** message.

Procedure Result:

PASS –

- DUT passes all assertions.

FAIL –

- DUT did not send **SetConfigurationResponse** message.

Note: The DUT featres support are defined by the procedure mentioned in [ONVIF Feature Discovery].