ONVIF™

Profiles Conformance Test Specification

Version 17.12

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REVISION HISTORY

Vers.	Date	Description
17.01	Jan, 2017	First issue
17.12	Jul 24, 2017	Check Replay Service related features in Profile G support check section was updated according to #1377.
17.12	Aug 29, 2017	The document formating were updated.
17.12	Oct 19, 2017	Profile T Conformance section added according to #1450.

Table of Contents

1 Introduction

The goal of the ONVIF Profiles Conformance Test Specification document is to provide some details about logic of profiles' supporting check.

Profile S Conformance item focuses on ONVIF Profile S specification ([ONVIF Profile S]) as a referenced Profile by an ONVIF device implementation under test.

Profile G Conformance item focuses on ONVIF Profile G specification ([ONVIF Profile G]) as a referenced Profile by an ONVIF device implementation under test.

Profile C Conformance item focuses on ONVIF Profile C specification ([ONVIF Profile C]) as a referenced Profile by an ONVIF device implementation under test.

Profile Q Conformance item focuses on ONVIF Profile Q specification ([ONVIF Profile Q]) as a referenced Profile by an ONVIF device implementation under test.

Profile A Conformance item focuses on ONVIF Profile A specification ([ONVIF Profile A]) as a referenced Profile by an ONVIF device implementation under test.

Profile T Conformance item focuses on ONVIF Profile T specification ([ONVIF Profile T]) as a referenced Profile by an ONVIF device implementation under test.

1.1 Scope

This ONVIF Profiles Conformance Test Specification document defines and regulates the conformance testing procedure for the ONVIF conformant devices. The objective of this specification is to provide the logic of ONVIF Profiles detection according to ONVIF Profile S Specification, ONVIF Profile G Specification, ONVIF Profile C Specification, ONVIF Profile Q Specification, and ONVIF Profile A Specification.

1.2 Normative references

- [ONVIF Network Interface Specs] ONVIF Network Interface Specification documents:

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

- [ONVIF Conformance] ONVIF Conformance Process Specification:

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

1.3 Informative References

- [ONVIF Feature Discovery] ONVIF Feature Discovery Specification version 17.01, Jan 2017

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

1.4 Requirement by the Profile

The following define denotations to indicate the required level by the Profile towards ONVIF device implementation (DUT).

M = mandatory function that shall be SUPPORTED by DUT

C = conditional mandatory function that shall be SUPPORTED by DUT if they support that functionality. On the list of test cases such functionalities are described after C – the content of parenthesis.

2 Terms and Definitions

2.1 Definitions

Profile See ONVIF Profile Policy.

2.2 Abbreviations

This section describes abbreviations used in this document.

DHCP Dynamic Host Configuration Protocol

DNS Domain Name System

DUT Device Under Test

HTTP Hyper Text Transport Protocol

IP Internet Protocol

IPv4 Internet Protocol version 4

IPv6 Internet Protocol version 6

NTP Network Time Protocol

RTP Real-time Transport Protocol

RTSP Real Time Streaming Protocol

UDP User Datagram Protocol

URI Uniform Resource Identifier

UTC Coordinated Universal Time

3 Profile S Conformance

3.1 Feature category classification for ONVIF Profile S

In order for ONVIF Device Test Tool to conduct conformance testing toward [ONVIF Profile S], it would need to identify whether DUT implements the expected feature set.

This section classifies supported features as multiple categories that are related to [ONVIF Profile S] conformance. Those category classifications will be used to do some preliminary checking prior to the test case execution and also they will be used to determine whether DUT can be considered to be [ONVIF Profile S] conformant device.

The following discovery scope is defined as the scope that signals that DUT is [ONVIF Profile S] product.

Table 3.1. Profile S Discovery Scope

onvif://www.onvif.org/Profile/Streaming

The following table shows the classified feature categories based on commands and/or functional blocks that are referenced by DUT.

Table 3.2. Profile S Features Categories

Media Streaming	GetStreamUri
	SetSynchronizationPoint
	Media Streaming RTSP
	Media Streaming RTSP (JPEG RTP Header Extension)
Video Encoder Configuration	GetVideoEncoderConfiguration
	GetVideoEncoderConfigurations
	AddVideoEncoderConfiguration
	RemoveVideoEncoderConfiguration
	SetVideoEncoderConfiguration
	GetCompatibleVideoEncoderConfigurations
	GetVideoEncoderConfigurationOptions
	GetGuaranteedNumberOfVideoEncoderInstances
User Authentication	WS-UsernameToken Authentication
	HTTP Digest Authentication

Capabilities	GetCapabilities
	GetWsdlUrl
PTZ	AddPTZConfiguration
	RemovePTZConfiguration
	GetNodes
	GetNode
	GetConfigurations
	GetConfiguration
	GetConfigurationOptions
	SetConfiguration
	ContinuousMove
	Stop
	GetStatus
PTZ – Absolute Positioning	AbsoluteMove
PTZ – Relative Positioning	RelativeMove
PTZ – Presets	SetPreset
	GetPresets
	GotoPreset
	RemovePreset
PTZ – Home Position	GotoHomePosition
	SetHomePosition
PTZ – Auxiliary	Command SendAuxiliaryCommand
Audio Streaming	GetAudioSources
	GetAudioSourceConfiguration
	GetAudioSourceConfigurations
	AddAudioSourceConfiguration
	RemoveAudioSourceConfiguration
	SetAudioSourceConfiguration
	GetCompatibleAudioSourceConfigurations
	GetAudioSourceConfigurationOptions
	GetAudioEncoderConfiguration
	GetAudioEncoderConfigurations
	AddAudioEncoderConfiguration

	RemoveAudioEncoderConfiguration
	SetAudioEncoderConfiguration
	GetCompatibleAudioEncoderConfigurations
	GetAudioEncoderConfigurationOptions
Media Streaming - Multicast	StartMulticastStreaming
	StopMulticastStreaming
Relay Outputs	GetRelayOutputs
	SetRelayOutputSettings
	SetRelayOutputState
NTP	GetNTP
	SetNTP
Dynamic DNS	GetDynamicDNS
	SetDynamicDNS
Zero Configuration	GetZeroConfiguration
	SetZeroConfiguration
IP Address Filtering	GetIPAddressFilter
	SetIPAddressFilter
	AddIPAddressFilter
	RemoveIPAddressFilter
Discovery	WS-Discovery
	GetDiscoveryMode
	SetDiscoveryMode
	GetScopes
	SetScopes
	AddScopes
	RemoveScopes
Network Configuration	GetHostname
	SetHostname
	GetDNS
	SetDNS
	GetNetworkInterfaces
	SetNetworkInterfaces
	GetNetworkProtocols

	SetNetworkProtocols
	GetNetworkDefaultGateway
	SetNetworkDefaultGateway
System	GetDeviceInformation
	GetSystemDateAndTime
	SetSystemDateAndTime
	SetSystemFactoryDefault
	Reboot
User Handling	GetUsers
	CreateUsers
	DeleteUsers
	SetUser
Event Handling	Notify
	Subscribe
	Renew
	Unsubscribe
	SetSynchronizationPoint (Event Service)
	CreatePullPointSubscription
	PullMessage
	GetEventProperties
	TopicFilter
	MessageContentFilter
Media Profile Configuration	GetProfiles
	GetProfile
	CreateProfile
	DeleteProfile
Video Source Configuration	GetVideoSources
	GetVideoSourceConfiguration
	GetVideoSourceConfigurations
	AddVideoSourceConfiguration
	RemoveVideoSourceConfiguration
	SetVideoSourceConfiguration
	GetCompatibleVideoSourceConfigurations

	GetVideoSourceConfigurationOptions
Metadata Configuration	GetMetadataConfiguration
	GetMetadataConfigurations
	AddMetadataConfiguration
	RemoveMetadataConfiguration
	SetMetadataConfiguration
	GetCompatibleMetadataConfigurations
	GetMetadataConfigurationOptions

3.2 Profile S support check

Preliminary checking for feature discovery will be performed prior to the test execution. For the details of the preliminary feature discovery, refer to [ONVIF Feature Discovery].

According to the result of test case execution, final determination of [ONVIF Profile S] support toward DUT is performed based on the following procedure.

Procedure:

1. Check that scope list contains the scope given in Table 3.1. If there is no such scope in the scope list of the DUT, then it is determined that [ONVIF Profile S] is not supported.
2. Check Capabilities feature.
   a. Check that GetCapabilities command is supported by the DUT. If GetCapabilities is not supported by the DUT, then it is determined that [ONVIF Profile S] is not supported by DUT. Otherwise, it is determined that Capabilities category is supported.
3. Check Discovery feature. If Discovery feature is regarded as unsupported, then it is determined that [ONVIF Profile S] is not supported by DUT. This is mandatory feature for any of ONVIF device implementation.
4. Check Discovery Types support. If Discovery/Types/dn:NetworkVideoTransmitter feature is not supported by the DUT, then it is determined that [ONVIF Profile S] is not supported by DUT and certification will be failed.
5. Check Network Configuration feature of ONVIF profile support. If Network Configuration feature is regarded as unsupported, then it is determined that [ONVIF Profile S] is not supported by DUT. This is a mandatory feature for any of ONVIF device implementation.
6. Check System feature of ONVIF profile support. If System feature is regarded as unsupported by DUT, then it is determined that [ONVIF Profile S] is not supported by DUT. This feature is mandatory for any of ONVIF device implementation.

7. Check User Handling feature of ONVIF profile support. If User Handling feature is regarded as unsupported by DUT, then it is determined that [ONVIF Profile S] is not supported by DUT. This is a mandatory feature for any of ONVIF device implementation.
8. Check Event Handling feature of ONVIF profile support. If Event Handling feature is regarded as unsupported by DUT, then it is determined that [ONVIF Profile S] is not supported by DUT. This is a mandatory feature for any of ONVIF device implementation.
    a. Check that WS-BasicNotification is supported by the DUT. If WS-BasicNotification is not supported by the DUT, then it is determined that [ONVIF Profile S] is not supported by DUT. Otherwise, it is determined that WS-BasicNotification is supported.
9. Check NTP feature.
    a. Check that NTP is supported by the DUT. If NTP is regarded as supported, then it is determined that NTP feature category is supported by DUT.
10. Check Dynamic DNS feature.
    a. Check that Dynamic DNS is supported by the DUT. If Dynamic DNS is regarded as supported, then Dynamic DNS feature category is supported by DUT.
11. Check Zero Configuration feature.
    a. Check that Zero Configuration is supported by the DUT. If Zero Configuration is regarded as supported by DUT, then it is determined that Zero Configuration feature category is supported by DUT.
12. Check IP Address Filtering feature.
    a. Check that IP Address Filter is supported by the DUT. If IP Address Filter is regarded as supported, then it is determined that IP Address Filtering feature category is supported by DUT.
13. Check User Authentication feature.
    a. Check that WS-UsernameToken Authentication is supported by the DUT. If WS-UsernameToken is regarded as unsupported by DUT, then it is determined that [ONVIF Profile S] is not supported by DUT. Otherwise, it is determined that WS-UsernameToken Authentication feature is supported by DUT.
    b. Check that HTTP Digest Authentication is supported by the DUT.
14. Check Media Profile Configuration feature.
    a. Check that Media Service is supported by DUT. If Media Service is regarded as unsupported by DUT, then it is determined that [ONVIF Profile S] is not supported by

DUT. Otherwise, it is determined that Media Profile Configuration feature category is supported by DUT.

15. Check Media Streaming feature of ONVIF profile support.

    a. Check that Real-time Streaming is supported by DUT. If Real-time Streaming is regarded unsupported by DUT, then it is determined that [ONVIF Profile S] is not supported by DUT.Otherwise, it is determined that Media Streaming feature category is supported by DUT.

16. Check Video Source Configuration feature of ONVIF profile support.

    a. Check that Media Service is supported by DUT. If Media Service is regarded unsupported by DUT, then it is determined that [ONVIF Profile S] is not supported by DUT. Otherwise, it is determined that Video Source Configuration feature category is supported by DUT.

17. Check Video Encoder Configuration feature.

    a. Check that Media Service is supported by the DUT. If Media Service is regarded as unsupported by DUT, then it is determined that [ONVIF Profile S] is not supported by DUT. Otherwise, it is determined that Video Encoder Configuration feature category is supported by DUT.

18. Check Metadata Configuration feature.

    a. Check that Media Service is supported by the DUT. If Media Service is regarded as unsupported by DUT, then it is determined that [ONVIF Profile S] is not supported by DUT. Otherwise, it is determined that Metadata Configuration feature category is supported by DUT.

19. Check Media Streaming - Multicast feature.

    a. Check that RTP-Multicast/UDP is supported by the DUT. If RTP-Multicast/UDP is regarded as supported, then it is determined that Media Streaming - Multicast feature category is supported by DUT.

20. Check PTZ feature.

    a. Check that PTZ Service and Preset position are supported by DUT. If PTZ Service and Preset position are regarded as supported then, it is determined that PTZ - Presets feature category is supported by DUT.

21. Check PTZ – Home Position feature.

a. Check that PTZ Service and Home Position are supported by DUT. If PTZ Service and Home Position are regarded as supported, then it is determined that PTZ - Home Position feature category is supported by DUT.

22. Check PTZ – Absolute Positioning feature.

a. Check that PTZ Service and Absolute Move are supported by DUT. If PTZ Service and Absolute Move are regarded as supported, then it is determined that PTZ - Absolute Positioning feature category is supported by DUT.

23. Check PTZ – Relative Positioning feature.

a. Check that PTZ Service and Relative Move are supported by the DUT. If PTZ Service and Relative Move are regarded as supported, then it is determined that PTZ - Relative Positioning feature category is supported by DUT.

24. Check PTZ – Auxiliary Commands feature.

a. Check that PTZ Service and Auxiliary Commands are supported by DUT. If PTZ Service and Auxiliary Commands are regarded as supported, then it is determined that PTZ - Auxiliary Commands feature category is supported by DUT.

25. Check Audio Streaming feature.

a. Check that Audio feature is supported by DUT. If Audio feature is regarded as supported, then it is determined that Audio Streaming feature category is supported by DUT.

26. Check Relay Outputs feature.

a. Check that Relay Outputs from Device Service are supported by the DUT. If Relay Outputs are regarded as supported, then it is determined that Relay Outputs feature category is supported by DUT.

4 Profile G Conformance

4.1 Feature category classification for ONVIF Profile G

In order for ONVIF Device Test Tool to conduct conformance testing toward [ONVIF Profile G], it would need to identify whether DUT implements the expected feature set.

This section classifies supported features as multiple categories that are related to [ONVIF Profile G] conformance. Those category classifications will be used to do some preliminary checking prior to the test case execution and also they will be used to determine whether DUT can be considered to be [ONVIF Profile G] conformant device.

The following discovery scope is defined as the scope that signals that DUT is [ONVIF Profile G] product.

Table 4.1. Profile G Discovery Scope

onvif://www.onvif.org/Profile/G

The following table shows the classified feature categories based on commands and/or functional blocks that are referenced by DUT.

Table 4.2. Profile G Features Categories

Profile Mandatory Features	
Security	HTTP Digest
Capabilities	GetServices (Device)
	GetServiceCapabilities (Device)
	GetServiceCapabilities (Recording Control)
	GetServiceCapabilities (Replay)
	GetServiceCapabilities (Recording Search)
	GetServiceCapabilities (Receiver)
	GetServiceCapabilities (Event)
	MaxPullPoint capability is supported and value is not less than 2
	GetServiceCapabilities (Media)
	GetWsdlUrl (Device)
Recording Search – Media Search	FindRecordings (Recording Search)
	GetRecordingSearchResults (Recording Search)

	EndSearch (Recording Search)
	FindEvents (Recording Search)
	GetEventSearchResults (Recording Search)
	GetRecordingSummary (Recording Search)
	GetRecordingInformation (Recording Search)
	GetMediaAttributes (Recording Search)
	tns1:RecordingHistory/Track/State
	tns1:RecordingHistory/Recording/State
	XPath dialect filtering
Replay Control	RTP header extension
	“onvif-replay” RTSP feature tag
	Media Replay
	Reverse Replay
	GetReplayUri (Replay)
	SetReplayConfiguration (Replay)
	GetReplayConfiguration (Replay)
	Encodings (JPEG, H.264, or MPEG4)
Profile Conditional Features	
Recording Search – Metadata Search	FindMetadata (Recording Search)
	GetMetadataSearchResults (Recording Search)
Recording Control – Dynamic Recording	Create Recording (Recording Control)
	Delete Recording (Recording Control)
	tns1:RecordingConfig/CreateRecording
	tns1:RecordingConfig/DeleteRecording
	CreateTrack (Recording Control)
	DeleteTrack (Recording Control)
	tns1:RecordingConfig/CreateTrack
	tns1:RecordingConfig/DeleteTrack
Recording Search – PTZ Position Search	FindPTZPosition (Recording Search)
	GetPTZPositionSearchResults (Recording Search)
Device Mandatory Features	
Recording Control	GetRecordings (Recording Control)

	CreateRecordingJob (Recording Control)
	DeleteRecordingJob (Recording Control)
	GetRecordingJobs (Recording Control)
	GetRecordingJobState (Recording Control)
	SetRecordingJobMode (Recording Control)
	GetRecordingOptions (Recording Control)
	tns1:RecordingConfig/JobState
	tns1:RecordingConfig/DeleteTrackData
Recording Control – Using an on-board media source	GetProfiles (Media)
	GetProfile (Media)
	CreateProfile (Media)
	DeleteProfile (Media)
	GetVideoSources (Media)
	GetVideoSourceConfiguration (Media)
	GetVideoSourceConfigurations (Media)
	AddVideoSourceConfiguration (Media)
	RemoveVideoSourceConfiguration (Media)
	SetVideoSourceConfiguration (Media)
	GetCompatibleVideoSourceConfigurations (Media)
	GetVideoSourceConfigurationOptions (Media)
	GetVideoEncoderConfiguration (Media)
	GetVideoEncoderConfigurations (Media)
	AddVideoEncoderConfiguration (Media)
	RemoveVideoEncoderConfiguration (Media)
	SetVideoEncoderConfiguration (Media)
	GetCompatibleVideoEncoderConfigurations (Media)
	GetVideoEncoderConfigurationOptions (Media)
	GetGuaranteedNumberOfVideoEncoderInstances (Media)
	GetMetadataConfiguration (Media)
	GetMetadataConfigurations (Media)

	AddMetadataConfiguration (Media)
	RemoveMetadataConfiguration (Media)
	SetMetadataConfiguration (Media)
	GetCompatibleMetadataConfigurations (Media)
	GetMetadataConfigurationOptions (Media)
	GetAudioSources (Media)
	GetAudioSourceConfiguration (Media)
	GetAudioSourceConfigurations (Media)
	AddAudioSourceConfiguration (Media)
	RemoveAudioSourceConfiguration (Media)
	SetAudioSourceConfiguration (Media)
	GetCompatibleAudioSourceConfigurations (Media)
	GetAudioSourceConfigurationOptions (Media)
	GetAudioEncoderConfiguration (Media)
	GetAudioEncoderConfigurations (Media)
	AddAudioEncoderConfiguration (Media)
	RemoveAudioEncoderConfiguration (Media)
	SetAudioEncoderConfiguration (Media)
	GetCompatibleAudioEncoderConfigurations (Media)
	GetAudioEncoderConfigurationOptions (Media)
Recording Control – Using a Receiver as Source	GetReceivers (Receiver)
	GetReceiver (Receiver)
	CreateReceiver (Receiver)
	DeleteReceiver (Receiver)
	ConfigureReceiver (Receiver)
	SetReceiverMode (Receiver)
	GetReceiverState (Receiver)
	tns1:Receiver/ChangeState
	tns1:Receiver/ConnectionFailed
	Media Streaming using RTSP
Recording Configuration/Configuration of the Recording Source	SetRecordingConfiguration (Recording Control)

	GetRecordingConfiguration (Recording Control)
	GetTrackConfiguration (Recording Control)
	SetTrackConfiguration (Recording Control)
	SetRecordingJobConfiguration (Recording Control)
	GetRecordingJobConfiguration (Recording Control)
	tns1:RecordingConfig/RecordingConfiguration
	tns1:RecordingConfig/TrackConfiguration
	tns1:RecordingConfig/ RecordingJobConfiguration
Discovery	WS-Discovery
	GetDiscoveryMode (Device)
	SetDiscoveryMode (Device)
	GetScopes (Device)
	SetScopes (Device)
	AddScopes (Device)
	RemoveScopes (Device)
Network Configuration	GetHostname (Device)
	SetHostname (Device)
	GetDNS (Device)
	SetDNS (Device)
	GetNetworkInterfaces (Device)
	SetNetworkInterfaces (Device)
	GetNetworkProtocols (Device)
	SetNetworkProtocols (Device)
	GetNetworkDefaultGateway (Device)
	SetNetworkDefaultGateway (Device)
System	GetDeviceInformation (Device)
	GetSystemDateAndTime (Device)
	SetSystemDateAndTime (Device)
	SetSystemFactoryDefault (Device)
	Reboot (Device)

User Handling	GetUsers (Device)
	CreateUsers (Device)
	DeleteUsers (Device)
	SetUser (Device)
Event Handling	SetSynchronizationPoint (Event)
	CreatePullPointSubscription (Event)
	PullMessage (Event)
	GetEventProperties (Event)
	Renew (Event)
	Unsubscribe (Event)
	TopicFilter (Event)
	MessageContentFilter
	At least two PullPoint subscriptions

4.2 Profile G support check

Preliminary checking for feature discovery will be performed prior to the test execution. For the details of the preliminary feature discovery, refer to [ONVIF Feature Discovery].

According to the result of test case execution, final determination of [ONVIF Profile G] support toward DUT is performed based on the following procedure.

Procedure:

1. Check that scope list contains the scope given in Table 4.1. If there is no such scope in the scope list of the DUT, then it is determined that [ONVIF Profile G] is not supported.
2. Check Capabilities feature.
    a. Check that GetServices command is supported by the DUT. If **Device Service/ Capabilities/GetServices** is not supported by the DUT, then it is determined that [ONVIF Profile G] is not supported by DUT and certification will be failed. Otherwise, it is determined that Capabilities category is supported with the following features included:
        i. GetServices (Device Management Service)
        ii. GetServiceCapabilities (Device Management Service)
        iii. GetServiceCapabilities (Event Service)

3. Check Discovery feature category of ONVIF profile support. This is a mandatory feature for any of ONVIF device implementation. The following features are defined as supported:
   - WS-Discovery
   - GetDiscoveryMode (Device Management Service)
   - SetDiscoveryMode (Device Management Service)
   - GetScopes (Device Management Service)
   - SetScopes (Device Management Service)
   - AddScopes (Device Management Service)
   - RemoveScopes (Device Management Service)
4. Check Discovery Types support. If **Discovery/Types/tds:Device** is not supported by the DUT, then it is determined that [ONVIF Profile G] is not supported by DUT and certification will be failed.
5. Check Network Configuration feature category of ONVIF profile support. This is a mandatory feature for any of ONVIF device implementation. The following features are defined as supported:
   - GetHostname (Device Management Service)
   - SetHostname (Device Management Service)
   - GetDNS (Device Management Service)
   - SetDNS (Device Management Service)
   - GetNetworkInterfaces (Device Management Service)
   - SetNetworkInterfaces (Device Management Service)
   - GetNetworkProtocols (Device Management Service)
   - SetNetworkProtocols (Device Management Service)
   - GetNetworkDefaultGateway (Device Management Service)
   - SetNetworkDefaultGateway (Device Management Service)
6. Check System feature category of ONVIF profile support. This feature is a mandatory for any of ONVIF device implementation. The following features are defined as supported:

- GetDeviceInformation (Device Management Service)
- GetSystemDateAndTime (Device Management Service)
- SetSystemDateAndTime (Device Management Service)
- SetSystemFactoryDefault (Device Management Service)
- Reboot (Device Management Service)

7. Check User Handling feature category of ONVIF profile support. This is a mandatory feature for any of ONVIF device implementation. The following features are defined as supported:
   - GetUsers (Device Management Service)
   - CreateUsers (Device Management Service)
   - DeleteUsers (Device Management Service)
   - SetUser (Device Management Service)
8. Check Event Handling feature category of ONVIF profile support. This is a mandatory feature for any of ONVIF device implementation. The following features are defined as supported:
   - Renew (Event Service)
   - Unsubscribe (Event Service)
   - SetSynchronizationPoint (Event Service)
   - CreatePullPointSubscription (Event Service)
   - PullMessage (Event Service)
   - GetEventProperties (Event Service)
   - TopicFilter (Event Service)
   - MessageContentFilter (Event Service)
9. Check that at least two PullPoint subscriptions are supported by the DUT. If **Device Service/ Event/MaxPullPoints** is not supported by the DUT or it has value less than 2, then it is determined that [ONVIF Profile G] is not supported by DUT and certification will be failed. Otherwise, it is determined that Event Handling is supported with the following feature category included:
   a. At least two PullPoint subscriptions

10. Check Security feature category.

    a. Check that HTTP Digest Authentication is supported by the DUT. If Security\Digest is regarded as unsupported by DUT, then it is determined that [ONVIF Profile G] is not supported by DUT and certification will be failed. Otherwise, it is determined that HTTP Digest Authentication feature is supported by DUT.

11. Check Recording Search Service related features.

    a. Check that Recording Search Service is supported by DUT. If **Recording Search Service** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile G] is not supported by DUT and certification will be failed. Otherwise, it is determined that Recording Search related features are supported by DUT. Those features are:

        i. Capabilities feature category

            - GetServiceCapabilities (Recording Search Service)

        ii. Recording Control

            - FindRecordings (Recording Search)
            - GetRecordingSearchResults (Recording Search)
            - EndSearch (Recording Search)
            - FindEvents (Recording Search)
            - GetEventSearchResults (Recording Search)
            - GetRecordingSummary (Recording Search)
            - GetRecordingInformation (Recording Search)
            - GetMediaAttributes (Recording Search)
            - tns1:RecordingHistory/Track/State
            - tns1:RecordingHistory/Recording/State
            - XPath dialect filtering

    b. Check that Recording Search – Metadata Search feature category is supported by the DUT. If **Recording Search Service\Metadata Search** is regarded as supported by DUT, then it is determined that the following features are supported by the DUT:

        - FindMetadata (Recording Search)

- GetMetadataSearchResults (Recording Search)

c. Check that Recording Search – PTZ Position Search feature category is supported by the DUT. If **Recording Search Service\PTZ Position Search** is regarded as supported by DUT, then it is determined that the following features are supported by the DUT:

- FindPTZPosition (Recording Search)
- GetPTZPositionSearchResults (Recording Search)

12. Check Replay Service related features.

a. Check that Replay Service is supported by DUT. If **Replay Service** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile G] is not supported by DUT and certification will be failed. Otherwise, it is determined that Replay related features are supported by DUT. Those features are:

i. Capabilities feature category

- GetServiceCapabilities (Replay Service)

ii. Replay Control

- RTP header extension
- “onvif-replay” RTSP feature tag
- Media Replay
- GetReplayUri (Replay)
- SetReplayConfiguration (Replay)
- GetReplayConfiguration (Replay)

b. Check that at least one from **Recording Control Service\Encoding\JPEG**, **Recording Control Service\Encoding\H.264**, and **Recording Control Service \Encoding\MPEG4** features is supported by DUT. If **Recording Control Service \Encoding\JPEG**, **Recording Control Service\Encoding\H.264**, and **Recording Control Service\Encoding\MPEG4** features are regarded as unsupported by DUT, then it is determined that [ONVIF Profile G] is not supported by DUT and certification will be failed. Those features are:

i. Replay Control

- Encodings (JPEG, H.264, or MPEG4)

c. Check that Reverse Replay feature is supported by the DUT. If **Replay Service \Reverse Replay** is regarded as supported by DUT, then it is determined that Reverse Replay feature is supported by the DUT:

i. Replay Control

- Reverse Replay

13. Check Recording Control Service related features.

a. Check that Recording Service is supported by DUT. If **Recording Control Service** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile G] is not supported by DUT and certification will be failed. Otherwise, it is determined that Recording control related features are supported by DUT. Those features are:

i. Capabilities feature category

- GetServiceCapabilities (Recording Control Service)

ii. Recording Control

- GetRecordings (Recording Control)
- CreateRecordingJob (Recording Control)
- DeleteRecordingJob (Recording Control)
- GetRecordingJobs (Recording Control)
- GetRecordingJobState (Recording Control)
- SetRecordingJobMode (Recording Control)
- GetRecordingOptions (Recording Control)
- tns1:RecordingConfig/JobState

iii. Recording Configuration/Configuration of the Recording Source

- SetRecordingConfiguration (Recording Control)
- GetRecordingConfiguration (Recording Control)
- GetTrackConfiguration (Recording Control)

- SetRecordingJobConfiguration (Recording Control)
- GetRecordingJobConfiguration (Recording Control)

b. Check that tns1:RecordingConfig/DeleteTrackData event is supported by the DUT. If **Recording Control/Recording Control Events\RecordingConfig/ DeleteTrackData** is regarded as supported by DUT, then it is determined that the following feature is supported by the DUT:

- tns1:RecordingConfig/DeleteTrackData

c. Check that tns1:RecordingConfig/RecordingConfiguration event is supported by the DUT. If **Recording Control/Recording Control Events\RecordingConfig/ RecordingConfiguration** is regarded as supported by DUT, then it is determined that the following feature is supported by the DUT:

- tns1:RecordingConfig/RecordingConfiguration

d. Check that tns1:RecordingConfig/RecordingJobConfiguration event is supported by the DUT. If **Recording Control/Recording Control Events\RecordingConfig/ RecordingJobConfiguration** is regarded as supported by DUT, then it is determined that the following feature is supported by the DUT:

- tns1:RecordingConfig/RecordingJobConfiguration

e. Check that tns1:RecordingConfig/TrackConfiguration event is supported by the DUT. If **Recording Control/Recording Control Events\RecordingConfig/ TrackConfiguration** is regarded as supported by DUT, then it is determined that the following feature is supported by the DUT:

- tns1:RecordingConfig/TrackConfiguration

f. Check that GetRecordingOptions is supported by DUT. If **Recording Control Service/ Recording Options** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile G] is not supported by DUT and certification will be failed. Otherwise, it is determined that GetRecordingOptions is supported by DUT.

14. Check Receiver Service related features.

a. Check that Receiver Service is supported by DUT. If Receiver Service is regarded as supported by DUT, then it is determined that Receiver related features are supported by DUT. Those features are:

i. Capabilities feature category

- GetServiceCapabilities (Receiver Service)

ii. Recording Control – Using a Receiver as Source

- GetReceivers (Receiver)
- GetReceiver (Receiver)
- CreateReceiver (Receiver)
- DeleteReceiver (Receiver)
- ConfigureReceiver (Receiver)
- SetReceiverMode (Receiver)
- GetReceiverState (Receiver)
- tns1:Receiver/ChangeState
- tns1:Receiver/ConnectionFailed
- Media Streaming using RTSP

15. Check Media Service related features.

a. Check that Media Service is supported by DUT. If **Media Service** is regarded as supported by DUT, then it is determined that Media related features are supported by DUT. Those features are:

i. Capabilities feature category

- GetServiceCapabilities (Media)

ii. Recording Control – Using an on-board media source

- GetProfiles (Media)
- GetProfile (Media)
- CreateProfile (Media)
- DeleteProfile (Media)
- GetVideoSourceConfigurations (Media)
- AddVideoSourceConfiguration (Media)

- RemoveVideoSourceConfiguration (Media)
- GetCompatibleVideoSourceConfigurations (Media)
- GetVideoEncoderConfiguration (Media)
- GetVideoEncoderConfigurations (Media)
- AddVideoEncoderConfiguration (Media)
- RemoveVideoEncoderConfiguration (Media)
- SetVideoEncoderConfiguration (Media)
- GetCompatibleVideoEncoderConfigurations (Media)
- GetVideoEncoderConfigurationOptions (Media)
- GetGuaranteedNumberOfVideoEncoderInstances (Media)
- GetMetadataConfiguration (Media)
- GetMetadataConfigurations (Media)
- AddMetadataConfiguration (Media)
- RemoveMetadataConfiguration (Media)
- SetMetadataConfiguration (Media)
- GetCompatibleMetadataConfigurations (Media)
- GetMetadataConfigurationOptions (Media)
- GetVideoSources (Media)
- GetVideoSourceConfiguration (Media)
- SetVideoSourceConfiguration (Media)
- GetVideoSourceConfigurationOptions (Media)

b. Check that Audio related features are supported by DUT. If **Media Service/Audio** is regarded as supported by DUT, then it is Audio related features related features are supported by DUT. Those features are:

- GetAudioSourceConfigurations (Media)

- AddAudioSourceConfiguration (Media)
- RemoveAudioSourceConfiguration (Media)
- GetCompatibleAudioSourceConfigurations (Media)
- GetAudioEncoderConfiguration (Media)
- GetAudioEncoderConfigurations (Media)
- AddAudioEncoderConfiguration (Media)
- RemoveAudioEncoderConfiguration (Media)
- SetAudioEncoderConfiguration (Media)
- GetCompatibleAudioEncoderConfigurations (Media)
- GetAudioEncoderConfigurationOptions (Media)
- GetAudioSources (Media)
- GetAudioSourceConfiguration (Media)
- SetAudioSourceConfiguration (Media)
- GetAudioSourceConfigurationOptions (Media)

16. Check that at least one from Recording Control – Using an on-board media source and Recording Control – Using a Receiver as Source is supported by DUT. If both **Media Service** and **Receiver Service** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile G] is not supported by DUT and certification will be failed.

5 Profile C Conformance

5.1 Feature category classification for ONVIF Profile C

In order for ONVIF Device Test Tool to conduct conformance testing toward [ONVIF Profile C], it would need to identify whether DUT implements the expected feature set.

This section classifies supported features as multiple categories that are related to [ONVIF Profile C] conformance. Those category classifications will be used to do some preliminary checking prior to the test case execution and also they will be used to determine whether DUT can be considered to be [ONVIF Profile C] conformant device.

The following discovery scope is defined as the scope that signals that DUT is [ONVIF Profile C] product.

Table 5.1. Profile C Discovery Scope

onvif://www.onvif.org/Profile/C

The following table shows the classified feature categories based on commands and/or functional blocks that are referenced by DUT.

Table 5.2. Profile C Features Categories

Profile Mandatory Features	
Capabilities	GetServices (Device)
	GetServiceCapabilities (Device)
	GetServiceCapabilities (Event)
	MaxPullPoint capability is supported and value is not less than 2
	GetServiceCapabilities (Access Control)
	GetServiceCapabilities (Door Control)
	GetWsdlUrl (Device)
System component information – Access points	GetAccessPointInfoList (Access Control)
	GetAccessPointInfo (Access Control)
System component information – Doors	GetDoorInfoList (Door Control)
	GetDoorInfo (Door Control)
System component information – Areas	GetAreaInfoList (Access Control)
	GetAreaInfo (Access Control)

Access point state	GetAccessPointState (Access Control)
	tns1:AccessPoint/State/Enabled
Door state	GetDoorState (Door Control)
	tns1:Door/State/DoorMode
	tns1:Door/State/DoorPhysicalState
	tns1:Door/State/LockPhysicalState
	tns1:Door/State/DoubleLockPhysicalState
	tns1:Door/State/DoorAlarm
	tns1:Door/State/DoorTamper
	tns1:Door/State/DoorFault
Door control	AccessDoor (Door Control)
	LockDoor (Door Control)
	UnlockDoor (Door Control)
	DoubleLockDoor (Door Control)
	BlockDoor (Door Control)
	LockDownDoor (Door Control)
	LockDownReleaseDoor (Door Control)
	LockOpenDoor (Door Control)
	LockOpenReleaseDoor (Door Control)
Access control decisions	tns1:AccessControl/AccessGranted/Credential
	tns1:AccessControl/AccessGranted/Anonymous
	tns1:AccessControl/Denied/Credential
	tns1:AccessControl/Denied/Anonymous
	tns1:AccessControl/Denied/CredentialNotFound/Card
	tns1:AccessControl/AccessTaken/Credential
	tns1:AccessControl/AccessTaken/Anonymous
	tns1:AccessControl/AccessNotTaken/Credential
	tns1:AccessControl/AccessNotTaken/Anonymous
Event Handling	Renew (Event)
	Unsubscribe (Event)
	SetSynchronizationPoint (Event)

	CreatePullPointSubscription (Event)
	PullMessage (Event)
	GetEventProperties (Event)
	TopicFilter (Event)
Profile Conditional Features	
Configuration change – Access points	tns1:Configuration/AccessPoint/Changed
	tns1:Configuration/AccessPoint/Removed
Configuration change – Doors	tns1:Configuration/Door/Changed
	tns1:Configuration/Door/Removed
Configuration change – Areas	tns1:Configuration/Area/Changed
	tns1:Configuration/Area/Removed
Access Point Control	EnableAccessPoint (Access Control)
	DisableAccessPoint (Access Control)
External authorization	ExternalAuthorization (Access Control)
	tns1:AccessControl/Request/Credential
	tns1:AccessControl/Request/Anonymous
	tns1:AccessControl/Request/Timeout
Duress	tns1:AccessControl/Duress
Persistent notification storage	Seek (Event)
IP Filtering	GetIPAddressFilter (Device)
	SetIPAddressFilter (Device)
	AddIPAddressFilter (Device)
	RemoveIPAddressFilter (Device)
Device Mandatory Features	
Discovery	WS-Discovery
	GetDiscoveryMode (Device)
	SetDiscoveryMode (Device)
	GetScopes (Device)
	SetScopes (Device)
	AddScopes (Device)
	RemoveScopes (Device)
Network Configuration	GetHostname (Device)
	SetHostname (Device)

	GetDNS (Device)
	SetDNS (Device)
	GetNetworkInterfaces (Device)
	SetNetworkInterfaces (Device)
	GetNetworkProtocols (Device)
	SetNetworkProtocols (Device)
	GetNetworkDefaultGateway (Device)
	SetNetworkDefaultGateway (Device)
System	GetDeviceInformation (Device)
	GetSystemDateAndTime (Device)
	SetSystemDateAndTime (Device)
	SetSystemFactoryDefault (Device)
	Reboot (Device)
User Handling	GetUsers (Device)
	CreateUsers (Device)
	DeleteUsers (Device)
	SetUser (Device)

5.2 Profile C support check

Preliminary checking for feature discovery will be performed prior to the test execution. For the details of the preliminary feature discovery, refer to [ONVIF Feature Discovery].

According to the result of test case execution, final determination of [ONVIF Profile C] support toward DUT is performed based on the following procedure.

Procedure:

1. Check that scope list contains the scope given in Table 5.1. If there is no such scope in the scope list of the DUT, then it is determined that [ONVIF Profile C] is not supported.
2. Check Capabilities feature.
   a. Check that GetServices command is supported by the DUT. If **Device Service/ Capabilities/GetServices** is not supported by the DUT, then it is determined that [ONVIF Profile C] is not supported by DUT and certification will be failed. Otherwise, it is determined that Capabilities category is supported with the following features included:
      - GetServices (Device Management Service)

- GetServiceCapabilities (Device Management Service)
- GetServiceCapabilities (Event Service)

3. Check Discovery feature category of ONVIF profile support. This is a mandatory feature for any of ONVIF device implementation. The following features are defined as supported:
   - WS-Discovery
   - GetDiscoveryMode (Device Management Service)
   - SetDiscoveryMode (Device Management Service)
   - GetScopes (Device Management Service)
   - SetScopes (Device Management Service)
   - AddScopes (Device Management Service)
   - RemoveScopes (Device Management Service)
4. Check Discovery Types support. If **Discovery/Types/tds:Device** is not supported by the DUT, then it is determined that [ONVIF Profile C] is not supported by DUT and certification will be failed.
5. Check Network Configuration feature category of ONVIF profile support. This is mandatory a feature for any of ONVIF device implementation. The following features are defined as supported:
   - GetHostname (Device Management Service)
   - SetHostname (Device Management Service)
   - GetDNS (Device Management Service)
   - SetDNS (Device Management Service)
   - GetNetworkInterfaces (Device Management Service)
   - SetNetworkInterfaces (Device Management Service)
   - GetNetworkProtocols (Device Management Service)
   - SetNetworkProtocols (Device Management Service)
   - GetNetworkDefaultGateway (Device Management Service)

- SetNetworkDefaultGateway (Device Management Service)

6. Check System feature category of ONVIF profile support. This feature is mandatory for any of ONVIF device implementation. The following features are defined as supported:
   - GetDeviceInformation (Device Management Service)
   - GetSystemDateAndTime (Device Management Service)
   - SetSystemDateAndTime (Device Management Service)
   - SetSystemFactoryDefault (Device Management Service)
   - Reboot (Device Management Service)
7. Check User Handling feature category of ONVIF profile support. This is a mandatory feature for any of ONVIF device implementation. The following features are defined as supported:
   - GetUsers (Device Management Service)
   - CreateUsers (Device Management Service)
   - DeleteUsers (Device Management Service)
   - SetUser (Device Management Service)
8. Check Event Handling feature category of ONVIF profile support. This is a mandatory feature for any of ONVIF device implementation. The following features are defined as supported:
   - Notify (Event Service)
   - Subscribe (Event Service)
   - Renew (Event Service)
   - Unsubscribe (Event Service)
   - SetSynchronizationPoint (Event Service)
   - CreatePullPointSubscription (Event Service)
   - PullMessage (Event Service)
   - GetEventProperties (Event Service)
   - TopicFilter (Event Service)

9. Check that at least two PullPoint subscriptions are supported by the DUT. If **Event Service/ Event/MaxPullPoint** is not supported by the DUT or it has value less than 2, then it is determined that [ONVIF Profile C] is not supported by DUT and certification will be failed. Otherwise, it is determined that Event Handling feature category is supported with the following feature included:

   - At least two PullPoint subscriptions

10. Check Security feature category.

    a. Check that HTTP Digest Authentication is supported by the DUT. If **Security\Digest** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile C] is not supported by DUT and certification will be failed. Otherwise, it is determined that HTTP Digest Authentication feature is supported by DUT.

11. Check Persistent notification storage feature category of ONVIF profile support. If **Event Service\Persistent notification storage** is regarded as supported by DUT, then it is determined that Store events feature category with Seek (Event Service) feature is supported by DUT.

12. Check Access Control Service related features.

    a. Check that Access Control Service is supported by DUT. If **Access Control Service** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile C] is not supported by DUT and certification will be failed. Otherwise, it is determined that Access Control related features are supported by DUT. Those features are:

       i. Capabilities feature category

          - GetServiceCapabilities (Access Control Service)

       ii. System component information – Access points feature category

          - GetAccessPointInfoList (Access Control Service)
          - GetAccessPointInfo (Access Control Service)

       iii. System component information – Areas feature category

          - GetAreaInfoList (Access Control Service)
          - GetAreaInfo (Access Control Service)

       iv. Access point state feature category

          - GetAccessPointState (Access Control Service)

- tns1:AccessPoint/State/Enabled

v. Access control decisions

- tns1:AccessControl/AccessGranted/Credential
- tns1:AccessControl/Denied/Credential

b. Check that Access point control feature category is supported by the DUT. If **Access Control Service\Access Point Entity\Enable/Disable Access Point** is regarded as supported by DUT, then it is determined that EnableAccessPoint (Access Control Service) and DisableAccessPoint (Access Control Service) features are supported by the DUT.

c. Check that tns1:AccessControl/AccessGranted/Anonymous feature is supported by the DUT. If **Access Control Service\Access Point Entity\Anonymous Access** is regarded as supported by DUT, then it is determined that tns1:AccessControl/AccessGranted/Anonymous features are supported by the DUT.

d. Check that tns1:AccessControl/Denied/Anonymous feature is supported by the DUT. If **Access Control Service\Access Point Entity\Anonymous Access** and **Access Control Service\Access Point Entity\External Authorization** is regarded as supported by DUT, then it is determined that tns1:AccessControl/Denied/Anonymous feature is supported by the DUT.

e. Check that tns1:AccessControl/AccessTaken/Credential and tns1:AccessControl/AccessNotTaken/Credential features are supported by the DUT. If **Access Control Service\Access Point Entity\Access Taken** is regarded as supported by DUT, then it is determined that tns1:AccessControl/AccessTaken/Credential and tns1:AccessControl/AccessNotTaken/Credential features are supported by the DUT.

f. Check that tns1:AccessControl/AccessTaken/Anonymous and tns1:AccessControl/AccessNotTaken/Anonymous features are supported by the DUT. If **Access Control Service\Access Point Entity\Access Taken** and **Access Control Service\Access Point Entity\Anonymous Access** are regarded as supported by DUT, then it is determined that tns1:AccessControl/AccessTaken/Anonymous and tns1:AccessControl/AccessNotTaken/Anonymous features are supported by the DUT.

g. Check that tns1:AccessControl/Denied/CredentialNotFound/Card feature are supported by the DUT. If **Access Control Service\Access Control Events \AccessControl/Denied/CredentialNotFound/Card** is regarded as supported by DUT, then it is determined that tns1:AccessControl/Denied/CredentialNotFound/Card feature is supported by the DUT.

h. Check that External authorization feature category is supported by the DUT. If **AccessControl\External Authorization** is regarded as supported by DUT, then it is determined that External authorization feature category is supported by DUT. Those features are:

- ExternalAuthorization (Access Control)
- tns1:AccessControl/Request/Credential
- tns1:AccessControl/Request/Timeout

i. Check that tns1:AccessControl/Request/Anonymous of External authorization feature category is supported by the DUT. If **AccessControl\External Authorization** and **Access Control Service\Access Point Entity\Anonymous Access** is regarded as supported by DUT, then it is determined that tns1:AccessControl/Request/Anonymous feature is supported by the DUT.

j. Check that tns1:Configuration/AccessPoint/Changed feature are supported by the DUT. If **Access Control Service\Access Control Events\Configuration/AccessPoint/Changed** is regarded as supported by DUT, then it is determined that tns1:Configuration/AccessPoint/Changed feature is supported by the DUT.

k. Check that tns1:Configuration/AccessPoint/Removed feature are supported by the DUT. If **Access Control Service\Access Control Events\Configuration/AccessPoint/Removed** is regarded as supported by DUT, then it is determined that tns1:Configuration/AccessPoint/Removed feature is supported by the DUT.

l. Check that tns1:Configuration/Area/Changed feature are supported by the DUT. If **Access Control Service\Access Control Events\Configuration/Area/Changed** is regarded as supported by DUT, then it is determined that tns1:Configuration/Area/Changed feature is supported by the DUT.

m. Check that tns1:Configuration/Area/Removed feature are supported by the DUT. If **Access Control Service\Access Control Events\Configuration/Area/Removed** is regarded as supported by DUT, then it is determined that tns1:Configuration/Area/Removed feature is supported by the DUT.

n. Check that Duress feature category is supported by the DUT. If **Access Control Service\Access Point Entity\Duress** is regarded as supported by DUT, then it is determined that tns1:AccessControl/Duress feature is supported by the DUT.

13. Check Door Control Service related features.

a. Check that Door Control Service is supported by DUT. If **Door Control Service** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile C] is not supported by DUT and certification will be failed. Otherwise, it is determined that Door Control related features are supported by DUT. Those features are:

   i. Capabilities feature category

      • GetServiceCapabilities (Door Control Service)

   ii. System component information – Doors feature category

      • GetDoorInfoList (Door Control Service)

      • GetDoorInfo (Door Control Service)

   iii. Door state feature category

      • GetDoorState (Door Control Service)

      • tns1:Door/State/DoorMode

b. Check that AccessDoor (Door Control Service) feature is supported by the DUT. If **Door Control Service\Door Entity\Access Door** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile C] is not supported by DUT and certification will be failed. Otherwise, it is determined that AccessDoor (Door Control Service) feature is supported by the DUT.

c. Check that LockDoor (Door Control Service) feature is supported by the DUT. If **Door Control Service\Door Entity\Lock Door** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile C] is not supported by DUT and certification will be failed. Otherwise, it is determined that LockDoor (Door Control Service) feature is supported by the DUT.

d. Check that UnlockDoor (Door Control Service) feature is supported by the DUT. If **Door Control Service\Door Entity\Unlock Door** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile C] is not supported by DUT and certification will be failed. Otherwise, it is determined that UnlockDoor (Door Control Service) feature is supported by the DUT.

e. Check that DoubleLockDoor (Door Control Service) feature is supported by the DUT. If **Door Control Service\Door Entity\Double Lock Door** is regarded as supported by DUT, then it is determined that DoubleLockDoor (Door Control Service) feature is supported by the DUT.

f. Check that BlockDoor (Door Control Service) feature is supported by the DUT. If **Door Control Service\Door Entity\Block Door** is regarded as supported by DUT, then it is determined that BlockDoor (Door Control Service) feature is supported by the DUT.

g. Check that LockDownDoor (Door Control Service) and LockDownReleaseDoor (Door Control Service) features are supported by the DUT. If **Door Control Service\Door Entity\Lock Down Door** is regarded as supported by DUT, then it is determined that LockDownDoor (Door Control Service) and LockDownReleaseDoor (Door Control Service) features are supported by the DUT.

h. Check that LockOpenDoor (Door Control Service) and LockOpenReleaseDoor (Door Control Service) features are supported by the DUT. If **Door Control Service\Door Entity\Lock Open Door** is regarded as supported by DUT, then it is determined that LockOpenDoor (Door Control Service) and LockOpenReleaseDoor (Door Control Service) features are supported by the DUT.

i. Check that tns1:Door/State/DoorPhysicalState feature are supported by the DUT. If **Door Control Service\Door Entity\Door Monitor** is regarded as supported by DUT, then it is determined that tns1:Door/State/DoorPhysicalState feature is supported by the DUT.

j. Check that tns1:Door/State/LockPhysicalState feature are supported by the DUT. If **Door Control Service\Door Entity\Lock Monitor** is regarded as supported by DUT, then it is determined that tns1:Door/State/LockPhysicalState feature is supported by the DUT.

k. Check that tns1:Door/State/DoubleLockPhysicalState feature are supported by the DUT. If **Door Control Service\Door Entity\Double Lock Monitor** is regarded as supported by DUT, then it is determined that tns1:Door/State/DoubleLockPhysicalState feature is supported by the DUT.

l. Check that tns1:Door/State/DoorAlarm feature are supported by the DUT. If **Door Control Service\Door Entity\Alarm** is regarded as supported by DUT, then it is determined that tns1:Door/State/DoorAlarm feature is supported by the DUT.

m. Check that tns1:Door/State/DoorTamper feature are supported by the DUT. If **Door Control Service\Door Entity\Tamper** is regarded as supported by DUT, then it is determined that tns1:Door/State/DoorTamper feature is supported by the DUT.

n. Check that tns1:Door/State/DoorFault feature are supported by the DUT. If **Door Control Service\Door Entity\Fault** is regarded as supported by DUT, then it is determined that tns1:Door/State/DoorFault feature is supported by the DUT.

o. Check that tns1:Configuration/Door/Changed feature are supported by the DUT. If **Access Control Service\Access Control Events\Configuration/Door/Changed** is regarded as supported by DUT, then it is determined that tns1:Configuration/Door/Changed feature is supported by the DUT.

p. Check that tns1:Configuration/Door/Removed feature are supported by the DUT. If **Access Control Service\Access Control Events\Configuration/Door/Removed** is regarded as supported by DUT, then it is determined that tns1:Configuration/Door/Removed feature is supported by the DUT.

6 Profile Q Conformance

6.1 Feature category classification for ONVIF Profile Q

In order for ONVIF Device Test Tool to conduct conformance testing toward [ONVIF Profile Q], it would need to identify whether DUT implements the expected feature set.

This section classifies supported features as multiple categories that are related to [ONVIF Profile Q] conformance. Those category classifications will be used to do some preliminary checking prior to the test case execution and also they will be used to determine whether DUT can be considered to be [ONVIF Profile Q] conformant device.

The following discovery scope is defined as the scope that signals that DUT is [ONVIF Profile Q] product.

Table 6.1. Profile Q Discovery Scope

onvif://www.onvif.org/Profile/Q/FactoryDefault
onvif://www.onvif.org/Profile/Q/Operational

The following table shows the classified feature categories based on commands and/or functional blocks that are referenced by DUT.

Table 6.2. Profile Q Features Categories

Profile Mandatory Features	
Capabilities	GetServices (Device)
	GetServiceCapabilities (Device)
	GetServiceCapabilities (Event)
	MaxUsernameLength capability is supported
	MaxPasswordLength capability is supported
Network Configuration	GetHostname (Device)
	SetHostname (Device)
	GetDNS (Device)
	SetDNS (Device)
	GetNetworkInterfaces (Device)
	SetNetworkInterfaces (Device)
	GetNetworkProtocols (Device)
	SetNetworkProtocols (Device)

	GetNetworkDefaultGateway (Device)
	SetNetworkDefaultGateway (Device)
	GetZeroConfiguration (Device)
	SetZeroConfiguration (Device)
System	GetDeviceInformation (Device)
	GetSystemDateAndTime (Device)
	SetSystemDateAndTime (Device)
	GetNTP (Device)
	SetNTP (Device)
	SetSystemFactoryDefault (Device)
	Reboot (Device)
User Handling	MaxUsers capability is supported
	GetUsers (Device)
	CreateUsers (Device)
	DeleteUsers (Device)
	SetUser (Device)
Standard Events for Monitoring	tns1:Monitoring/ProcessorUsage
	tns1:Monitoring/OperatingTime/LastReset
	tns1:Monitoring/OperatingTime/LastReboot
	tns1:Monitoring/OperatingTime/ LastClockSynchronization
Event Handling	MaxPullPoint capability is supported and value is not less than 2
	SetSynchronizationPoint (Event)
	CreatePullPointSubscription (Event)
	PullMessages (Event)
	GetEventProperties (Event)
	Renew (Event)
	Unsubscribe (Event)
	TopicFilter (Event)
Profile Conditional Features	
Remote User Management	GetRemoteUser (Device)
	SetRemoteUser (Device)

Firmware Upgrade	StartFirmwareUpgrade (Device)
Backup and Restore	GetSystemUris (Device)
	StartSystemRestore (Device)
TLS Configuration - Keystore	CreateCertificationPath (Advanced Security)
	CreatePKCS10CSR (Advanced Security)
	CreateRSAKeyPair (Advanced Security)
	CreateSelfSignedCertificate (Advanced Security)
	DeleteCertificate (Advanced Security)
	DeleteCertificationPath (Advanced Security)
	DeleteKey (Advanced Security)
	DeletePassphrase (Advanced Security)
	GetAllCertificates (Advanced Security)
	GetAllCertificationPaths (Advanced Security)
	GetAllKeys (Advanced Security)
	GetAllPassphrases (Advanced Security)
	GetCertificate (Advanced Security)
	GetCertificationPath (Advanced Security)
	GetKeyStatus (Advanced Security)
	UploadCertificate (Advanced Security)
	UploadCertificateWithPrivateKeyInPKCS12 (Advanced Security)
	UploadKeyPairInPKCS8 (Advanced Security)
	UploadPassphrase (Advanced Security)
TLS Configuration - TLS Server	AddServerCertificateAssignment (Advanced Security)
	GetAssignedServerCertificates (Advanced Security)
	RemoveServerCertificateAssignment (Advanced Security)
	ReplaceServerCertificateAssignment (Advanced Security)
Media Service	GetProfiles (Media)
	GetStreamUri (Media)
	GetServiceCapabilities (Media)

	Media Streaming using RTSP
Standard Events for Device Management	tns1:Device/HardwareFailure/FanFailure
	tns1:Device/HardwareFailure/ PowerSupplyFailure
	tns1:Device/HardwareFailure/StorageFailure
	tns1:Device/HardwareFailure/ TemperatureCritical
	tns1:Monitoring/Backup/Last
Factory Default State	
Factory Default State	Factory Default State is signaled by the scope value onvif://www.onvif.org/Profile/Q/ FactoryDefault
	Anonymous access in Factory Default State
	User configuration in Factory Default State
Device Discovery	WS-Discovery
	GetScopes (Device)
ZeroConfiguration Network Configuration	Dynamic IP configuration enabled in Factory Default State
Automatic IP Assignment	IPv4 DHCP enabled in Factory Default State
	IP v6 stateless autoconfiguration enabled in Factory Default State
Operational State	
Operational State	Operational State is signaled by the scope value onvif://www.onvif.org/Profile/Q/Operational
Authentication	HTTP digest authentication
Default Access Policy	Default Access Policy

6.2 Profile Q support check

Preliminary checking for feature discovery will be performed prior to the test execution. For the details of the preliminary feature discovery, refer to [ONVIF Feature Discovery].

According to the result of test case execution, final determination of [ONVIF Profile Q] support toward DUT is performed based on the following procedure.

Procedure:

1. Check that scope list contains at least one scope given in Table 6.1. If there is no such scope on the scope list of the DUT, then it is determined that [ONVIF Profile Q] is not supported.

2. Check Discovery Types support. If **Discovery/Types/tds:Device** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed.

3. Check Capabilities feature category of ONVIF profile support:

   a. Check that GetServices command is supported by the DUT. If **Device Service/ Capabilities/GetServices** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that Capabilities category is supported with the following features included:

      • GetServices (Device Management Service)

      • GetServiceCapabilities (Device Management Service)

      • GetServiceCapabilities (Event Service)

   b. Check that MaxUsernameLength capability is supported by the DUT. If **Device Service/Security/MaxUsernameLength capability** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that Capabilities category is supported with the following features included:

      • MaxUsernameLength capability is supported

   c. Check that MaxPasswordLength capability is supported by the DUT. If **Device Service/ Security/MaxPasswordLength capability** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that Capabilities category is supported with the following features included:

      • MaxPasswordLength capability is supported

4. Check Network feature category of ONVIF profile support:

   a. The following features are a mandatory features for any of ONVIF device implementation and are defined as supported:

      • GetHostname (Device Management Service)

      • SetHostname (Device Management Service)

- GetDNS (Device Management Service)
- SetDNS (Device Management Service)
- GetNetworkInterfaces (Device Management Service)
- SetNetworkInterfaces (Device Management Service)
- GetNetworkProtocols (Device Management Service)
- SetNetworkProtocols (Device Management Service)
- GetNetworkDefaultGateway (Device Management Service)
- SetNetworkDefaultGateway (Device Management Service)

b. Check that ZeroConfiguration capability is supported by the DUT. If **Device Service/ Network/Zero Configuration** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that Network feature category is supported with the following features included:

- GetZeroConfiguration (Device)
- SetZeroConfiguration (Device)

5. Check System feature category of ONVIF profile support:

a. This feature is mandatory for any of ONVIF device implementation. The following features are defined as supported:

- GetDeviceInformation (Device Management Service)
- GetSystemDateAndTime (Device Management Service)
- SetSystemDateAndTime (Device Management Service)
- SetSystemFactoryDefault (Device Management Service)
- Reboot (Device Management Service)

b. Check that NTP capability is supported by the DUT. If **Device Management/Network/ NTP** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that System category is supported with the following features included:

- GetNTP (Device)
- SetNTP (Device)

6. Check User Handling feature category of ONVIF profile support:

   a. The following features are a mandatory features for any of ONVIF device implementation and are defined as supported:

      - GetUsers (Device Management Service)
      - CreateUsers (Device Management Service)
      - DeleteUsers (Device Management Service)
      - SetUser (Device Management Service)

   b. Check that MaxUsers capability is supported by the DUT. If **Device Service/Security/ Maximum Users** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that User Handling category is supported with the following features included:

      - MaxUsers capability is supported

7. Check Standard Events for Monitoring feature category of ONVIF profile support:

   a. Check that tns1:Monitoring/ProcessorUsage feature is supported by the DUT. If **Monitoring events\Monitoring/ProcessorUsage** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that tns1:Monitoring/ProcessorUsage feature is supported by the DUT.

   b. Check that tns1:Monitoring/OperatingTime/LastReset feature is supported by the DUT. If **Monitoring events\Monitoring/OperatingTime/LastReset** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that tns1:Monitoring/ OperatingTime/LastReset feature is supported by the DUT.

   c. Check that tns1:Monitoring/OperatingTime/LastReboot feature is supported by the DUT. If **Monitoring events\Monitoring/OperatingTime/LastReboot** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that tns1:Monitoring/ OperatingTime/LastReboot feature is supported by the DUT.

d. Check that tns1:Monitoring/OperatingTime/LastClockSynchronization feature is supported by the DUT. If **Monitoring events\Monitoring/OperatingTime/ LastClockSynchronization** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that tns1:Monitoring/OperatingTime/LastClockSynchronization feature is supported by the DUT.

8. Check Event Handling feature category of ONVIF profile support. This is a mandatory feature for any of ONVIF device implementation. The following features are defined as supported:
   - Notify (Event Service)
   - Subscribe (Event Service)
   - Renew (Event Service)
   - Unsubscribe (Event Service)
   - SetSynchronizationPoint (Event Service)
   - CreatePullPointSubscription (Event Service)
   - PullMessage (Event Service)
   - GetEventProperties (Event Service)
   - TopicFilter (Event Service)
9. Check Remote User Management feature category of ONVIF profile support. If **Device Service\Security\Remote User Handling** is regarded as supported by DUT, then it is determined that Remote User Management feature category with the following features is supported by DUT:
   - GetRemoteUser (Device)
   - SetRemoteUser (Device)
10. Check Firmware Upgrade feature category of ONVIF profile support. If **Device Service \System\HTTP Firmware Upgrade** is regarded as supported by DUT, then it is determined that Firmware Upgrade feature category with the following features is supported by DUT:
    - StartFirmwareUpgrade (Device)
11. Check Backup and Restore feature category of ONVIF profile support. If **Device Service \System\HTTP System Backup** is regarded as supported by DUT, then it is determined that Backup and Restore feature category with the following features is supported by DUT:

- GetSystemUris (Device)
- StartSystemRestore (Device)

12. If **Advanced Security Service** is regarded as supported:

a. Check TLS Configuration - Keystore feature category of ONVIF profile support:

i. If **Advanced Security Service\Keystore features support\RSA Key Pair Generation** is not supported by the DUT and **Advanced Security Service \Keystore features support\PKCS#12 Container Upload** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by the DUT and certification will be failed. Otherwise, it is determined that feature is supported by the DUT:

1. If **Advanced Security Service\Keystore features support\RSA Key Pair Generation** is regarded as supported by the DUT:

- CreateRSAKeyPair (Advanced Security)
- GetKeyStatus (Advanced Security)
- GetAllKeys (Advanced Security)
- DeleteKey (Advanced Security)

2. If **Advanced Security Service\Keystore features support \PKCS#12 Container Upload** is regarded as supported by the DUT:

- DeleteCertificate (Advanced Security)
- DeleteCertificationPath (Advanced Security)
- DeleteKey (Advanced Security)
- DeletePassphrase (Advanced Security)
- GetAllCertificates (Advanced Security)
- GetAllCertificationPaths (Advanced Security)
- GetAllKeys (Advanced Security)
- GetAllPassphrases (Advanced Security)
- GetCertificate (Advanced Security)

- GetCertificationPath (Advanced Security)
- GetKeyStatus (Advanced Security)
- UploadPassphrase (Advanced Security)

ii. If **Advanced Security Service\Keystore features support\RSA Key Pair Generation** is supported by the DUT:

1. If **Advanced Security Service\Keystore features support\Self-Signed Certificate Creation With RSA** is not supported by the DUT or **Advanced Security Service\Keystore features support \PKCS10 External Certification With RSA** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that feature is supported by the DUT:

- CreatePKCS10CSR (Advanced Security)
- CreateSelfSignedCertificate (Advanced Security)
- DeleteCertificate (Advanced Security)
- GetAllCertificates (Advanced Security)
- GetCertificate (Advanced Security)
- UploadCertificate (Advanced Security)

iii. If **Advanced Security Service\Keystore features support\PKCS#8 Container Upload** is regarded as supported by the DUT, then it is determined that the following feature is supported by the DUT:

- UploadKeyPairInPKCS8 (Advanced Security)

iv. If DUT returns MaximumNumberOfKeys less than 16, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed.

v. If DUT returns MaximumNumberOfCertificates less than 16, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed.

b. Check TLS Configuration - TLS server feature category of ONVIF profile support:

i. If **Advanced Security Service\TLS features support\TLS Server Support** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that feature is supported by the DUT:

- CreateCertificationPath (Advanced Security)
- GetCertificationPath (Advanced Security)
- GetAllCertificationPaths (Advanced Security)
- DeleteCertificationPath (Advanced Security)
- AddTLSServerCertificateAssignment (Advanced Security)
- RemoveTLSServerCertificateAssignment (Advanced Security)
- ReplaceTLSServerCertificateAssignment (Advanced Security)
- GetAssignedServerCertificates (Advanced Security)

13. Check Media Service feature category of ONVIF profile support:

a. If **Media Service** is regarded as supported by DUT, then it is determined that the following features is supported by DUT:

- GetProfiles (Media)

b. If **Media Service** is regarded as supported by DUT and **Device Service/Capabilities/ GetServices** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that the following features is supported by DUT:

- GetServiceCapabilities (Media)

c. If **Media Service** is regarded as supported by DUT and **Media Service/Real-time Streaming** is not supported by the DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that the following features is supported by DUT:

- GetStreamUri (Media)
- Media Streaming using RTSP

14. Check Standard events for Device Management feature category of ONVIF profile support:

a. Check that tns1:Device/HardwareFailure/FanFailure feature is supported by the DUT. If **Monitoring events\Device/HardwareFailure/FanFailure** is regarded as supported by DUT, then it is determined that tns1:Device/HardwareFailure/FanFailure feature is supported by the DUT.

b. Check that tns1:Device/HardwareFailure/PowerSupplyFailure feature is supported by the DUT. If **Monitoring events\Device/HardwareFailure/PowerSupplyFailure** is regarded as supported by DUT, then it is determined that tns1:Device/HardwareFailure/PowerSupplyFailure feature is supported by the DUT.

c. Check that tns1:Device/HardwareFailure/StorageFailure feature is supported by the DUT. If **Monitoring events\Device/HardwareFailure/StorageFailure** is regarded as supported by DUT, then it is determined that tns1:Device/HardwareFailure/StorageFailure feature is supported by the DUT.

d. Check that tns1:Device/HardwareFailure/TemperatureCritical feature is supported by the DUT. If **Monitoring events\Device/HardwareFailure/TemperatureCritical** is regarded as supported by DUT, then it is determined that tns1:Device/HardwareFailure/TemperatureCritical feature is supported by the DUT.

e. Check that tns1:Monitoring/Backup/Last feature is supported by the DUT. If **Monitoring events\Monitoring/Backup/Last** is regarded as supported by DUT, then it is determined that tns1:Monitoring/Backup/Last feature is supported by the DUT.

15. Check Device Discovery feature category of ONVIF profile support:

    a. The following features are a mandatory features for any of ONVIF device implementation and are defined as supported:

        - WS-Discovery
        - GetScopes (Device)

16. If **Profile Q** is regarded as supported by DUT the following feature categories and related features will be regarded as supported:

    a. Factory Default State feature category:

        i. Factory Default State is signalled by the scope value onvif://www.onvif.org/Profile/Q/FactoryDefault

        ii. Anonymous access in Factory Default State

        iii. User configuration in Factory Default State

b. ZeroConfiguration Network Configuration feature category:

i. Dynamic IP configuration enabled in Factory Default State

c. Automatic IP Assignment feature category:

i. IPv4 DHCP enabled in Factory Default State

d. Operational State feature category:

i. Operational State is signaled by the scope value onvif://www.onvif.org/Profile/Q/Operational

17. If **Profile Q** is regarded as supported by DUT and **Device Service\Network\IPv6** is regarded as supported by DUT the following related features will be regarded as supported:

a. IPv6 stateless autoconfiguration enabled in Factory Default State

18. Check Default Access Policy feature category.

a. Check that Default Access Policy is supported by the DUT. If **Device Service\Security \Default Access Policy** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that Default Access Policy feature is supported by DUT.

19. Check Authentication feature category.

a. Check that HTTP Digest Authentication is supported by the DUT. If **Security\Digest** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile Q] is not supported by DUT and certification will be failed. Otherwise, it is determined that HTTP Digest Authentication feature is supported by DUT.

6.3 Profile Q testing preparation

If a DUT has Profile Q scope, the test tool prepares a DUT to Quick Install test cases during conformance procedure following the procedure of Profile Q testing preparation test case:

Procedure:

1. ONVIF Client invokes **SetSystemFactoryDefault** with parameters
   - FactoryDefault := Hard
2. The DUT responds with a **SetSystemFactoryDefaultResponse** message.
3. Until *timeout1* timeout expires repeat the following steps:

a. The DUT will send Multicast Hello message after it is successfully rebooted with parameters:

- EndpointReference.Address equal to unique endpoint reference of the DUT
- Types list
- Scopes list := scopesList
- XAddrs list := xaddrsList
- MetadataVersion

b. If xaddrsList contains URI address with not a LinkLocal IPv4 address from ONVIF Client subnet, go to step 6.

4. If *timeout1* timeout expires for step 3 without Hello with URI address with not a LinkLocal IPv4 address from ONVIF Client subnet, FAIL the test and skip other steps.
5. ONVIF client waits for 5 seconds after Hello was received.
6. ONVIF Client invokes **SetNTP** without any authentication with parameters
   - FromDHCP := true
   - NTPManual skipped
7. The DUT responds with a **SetNTPResponse** message.
8. ONVIF client invokes **GetSystemDateAndTime** without any authentication.
9. The DUT responds with **GetSystemDateAndTimeResponse** message with parameters
   - SystemDateAndTime := *dateAndTimeSettings*
10. ONVIF Client invokes **SetSystemDateAndTime** without any authentication with parameters
    - DateTimeType := NTP
    - DaylightSavings := *dateAndTimeSettings*.DaylightSavings
    - TimeZone := *dateAndTimeSettings*.TimeZone
    - UTCDateTime skipped
11. The DUT responds with a **SetSystemDateAndTime** message.
12. ONVIF Client invokes **GetServiceCapabilities**.

13. The DUT responds with a **GetServiceCapabilitiesResponse** message with parameters
    - Capabilities =: *cap*
14. If *cap* does not contain Security.MaxPasswordLength or Security.MaxUserNameLength, FAIL the test and skip other steps.
15. ONVIF Client invokes **GetUsers** without any authentication.
16. The DUT responds with a **GetUsersResponse** message with parameters.
    - User list =: *userList*
17. If *userList* contains user with user level Administrator:
    a. Set the following:
       - *passwordLength* := *cap*.Security.MaxPasswordLength
       - *userLogin* := Username of user with user level equal to Administrator from *userList*
       - *password* := random string, contains *passwordLength* ASCII characters
    b. ONVIF Client invokes **SetUser** with parameters
       - User[0].Username := *userLogin*
       - User[0].Password := *password*
       - User[0].UserLevel := Administrator
       - Extension skipped
    c. If the DUT responds with **SetUserResponse** message, skip other steps.
    d. If the DUT returns **env:Sender\ter:OperationProhibited\ter:Password** SOAP 1.2 fault:
       d.a. Set the following:
            - *password* := random string, contains *passwordLength* ASCII characters
       d.b. Go to the step b.
    e. If the DUT returns other SOAP 1.2 fault, FAIL the test and skip other steps.
18. If *userList* does not contain user with user level Administrator:
    a. Set the following:

- *userLoginLength* := *cap*.Security.MaxUserNameLength
- *passwordLength* := *cap*.Security.MaxPasswordLength
- *userLogin* := random string, contains *userLoginLength* low case alphabet characters, differs from usernames listed in userList
- *password* := random string, contains *passwordLength* ASCII characters

b. ONVIF Client invokes **CreateUsers** with parameters

- User[0].Username := *userLogin*
- User[0].Password := *password*
- User[0].UserLevel := Administrator
- Extension skipped

c. If the DUT responds with **CreateUsersResponse** message, skip other steps.

d. If the DUT returns **env:Sender\ter:OperationProhibited\ter:Password** SOAP 1.2 fault:

d.a. Set the following:

- *password* := random string, contains *passwordLength* ASCII characters

d.b. Go to the step b.

d.c. If the DUT returns other SOAP 1.2 fault, FAIL the test.

Test Result:

PASS –

- DUT passes all assertions.

FAIL –

- The DUT did not send **SetSystemFactoryDefaultResponse** message.
- The DUT did not send **GetServiceCapabilitiesResponse** message.
- The DUT did not send **GetUsersResponse** message.
- The DUT did not send **SetUsersResponse** message.
- The DUT did not send **CreateUsersResponse** message.

- The DUT did not send **SetNTPResponse** message.
- The DUT did not send **GetSystemDateAndTimeResponse** message.
- The DUT did not send **SetSystemDateAndTimeResponse** message.

Note: User with username *userLogin* and password *password* shall be used for further test cases.

Note: *timeout1* will be taken from Reboot Timeout field of ONVIF Device Test Tool.

Note: IPv4 address from Hello shall be used for further test cases.

7 Profile A Conformance

7.1 Feature category classification for ONVIF Profile A

In order for ONVIF Device Test Tool to conduct conformance testing toward [ONVIF Profile A], it would need to identify whether DUT implements the expected feature set.

This section classifies supported features as multiple categories that are related to [ONVIF Profile A] conformance. Those category classifications will be used to do some preliminary checking prior to the test case execution and they will be used to determine whether DUT can be considered [ONVIF Profile A] conformant device.

The following discovery scope is defined as the scope that signals that DUT is [ONVIF Profile A] product.

Table 7.1. Profile A Discovery Scope

onvif://www.onvif.org/Profile/A

The following table shows the classified feature categories based on commands and/or functional blocks that are referenced by DUT.

Table 7.2. Profile A Features Categories

Profile Mandatory Features	
Security	HTTP Digest Authentication
Capabilities	GetServices (Device)
	GetServiceCapabilities (Device)
	GetServiceCapabilities (Event)
	GetServiceCapabilities (Access Rules)
	GetServiceCapabilities (Credential)
	GetServiceCapabilities (Schedule)
	GetWsdlUrl (Device)
	MaxPullPoint capability is supported and value is not less than 2
Access Profiles	GetAccessProfiles (Access Rules)
	GetAccessProfileList (Access Rules)
	GetAccessProfileInfo (Access Rules)
	GetAccessProfileInfoList (Access Rules)

	CreateAccessProfile (Access Rules)
	ModifyAccessProfile (Access Rules)
	DeleteAccessProfile (Access Rules)
	tns1:Configuration/AccessProfile/Changed
	tns1:Configuration/AccessProfile/Removed
Credentials	GetCredentials (Credential)
	GetCredentialList (Credential)
	GetCredentialInfo (Credential)
	GetCredentialInfoList (Credential)
	CreateCredential (Credential)
	ModifyCredential (Credential)
	DeleteCredential (Credential)
	GetCredentialAccessProfiles (Credential)
	SetCredentialAccessProfiles (Credential)
	DeleteCredentialAccessProfiles (Credential)
	GetCredentialIdentifiers (Credential)
	SetCredentialIdentifier (Credential)
	DeleteCredentialIdentifier (Credential)
	EnableCredential (Credential)
	DisableCredential (Credential)
	GetCredentialState (Credential)
	GetSupportedFormatTypes (Credential)
	tns1:Configuration/Credential/Changed
	tns1:Configuration/Credential/Removed
Schedules	GetSchedules (Schedule)
	GetScheduleList (Schedule)
	GetScheduleInfo (Schedule)
	GetScheduleInfoList (Schedule)
	CreateSchedule (Schedule)
	ModifySchedule (Schedule)
	DeleteSchedule (Schedule)
	GetScheduleState (Schedule)
	tns1:Configuration/Schedule/Changed

	tns1:Configuration/ Schedule /Removed
	tns1:Schedule/State/Active
Event Handling	Renew (Event)
	Unsubscribe (Event)
	SetSynchronizationPoint (Event)
	CreatePullPointSubscription (Event)
	PullMessage (Event)
	GetEventProperties (Event)
	TopicFilter (Event)
Discovery	WS-Discovery
	GetDiscoveryMode (Device)
	SetDiscoveryMode (Device)
	GetScopes (Device)
	SetScopes (Device)
	AddScopes (Device)
	RemoveScopes (Device)
Network Configuration	GetHostname (Device)
	SetHostname (Device)
	GetDNS (Device)
	SetDNS (Device)
	GetNetworkInterfaces (Device)
	SetNetworkInterfaces (Device)
	GetNetworkProtocols (Device)
	SetNetworkProtocols (Device)
	GetNetworkDefaultGateway (Device)
	SetNetworkDefaultGateway (Device)
	SetNetworkDefaultGateway (Device)
System	GetDeviceInformation (Device)
	GetSystemDateAndTime (Device)
	SetSystemDateAndTime (Device)
	SetSystemFactoryDefault (Device)
	Reboot (Device)
User Handling	GetUsers (Device)

	CreateUsers (Device)
	DeleteUsers (Device)
	SetUser (Device)
Profile Conditional Features	
Reset Antipassback Violations	ResetAntipassbackViolation (Credential)
	tns1:Credential/State/ApbViolation
Special Days Schedule	GetSpecialDayGroups (Schedule)
	GetSpecialDayGroupList (Schedule)
	GetSpecialDayGroupInfo (Schedule)
	GetSpecialDayGroupInfoList (Schedule)
	CreateSpecialDayGroup (Schedule)
	ModifySpecialDayGroup (Schedule)
	DeleteSpecialDayGroup (Schedule)
	tns1:Configuration/SpecialDays/Changed
	tns1:Configuration/SpecialDays/Removed
Persistent notification storage	Seek (Event)
IP Filtering	GetIPAddressFilter (Device)
	SetIPAddressFilter (Device)
	AddIPAddressFilter (Device)
	RemoveIPAddressFilter (Device)

7.2 Profile A support check

Preliminary checking for feature discovery will be performed prior to the test execution. For the details of the preliminary feature discovery, refer to [ONVIF Feature Discovery].

According to the result of test case execution, final determination of [ONVIF Profile A] support toward DUT is performed based on the following procedure.

Procedure:

1. Check that scope list contains the scope given in Table 7.1. If there is no such scope in the scope list of the DUT, then it is determined that [ONVIF Profile A] is not supported.
2. Check Discovery Types support. If **Discovery/Types/tds:Device** is not supported by the DUT, then it is determined that [ONVIF Profile A] is not supported by DUT and certification will be failed.

3. Check Security feature category:

    a. Check that HTTP Digest Authentication is supported by the DUT. If **Security\Digest** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile A] is not supported by DUT and certification will be failed. Otherwise, it is determined that HTTP Digest Authentication feature is supported by DUT.

4. Check Capabilities feature category:

    a. Check that GetServices command is supported by the DUT. If **Device Service/ Capabilities/GetServices** is not supported by the DUT, then it is determined that [ONVIF Profile A] is not supported by DUT and certification will be failed. Otherwise, it is determined that Capabilities category is supported with the following features included:

    - GetServices (Device Management Service)
    - GetServiceCapabilities (Device Management Service)
    - GetServiceCapabilities (Event Service)

    b. The following features are defined as supported, because this is a mandatory feature for any of ONVIF device implementation:

    - GetWsdlUrl (Device)

    c. Check that at least two PullPoint subscriptions are supported by the DUT. If **Event Service/Event/MaxPullPoint** is not supported by the DUT or it has value less than two, then it is determined that [ONVIF Profile A] is not supported by DUT and certification will be failed. Otherwise, it is determined that Event Handling feature category is supported with the following feature included:

    - At least two PullPoint subscriptions

5. Check Access Rules Service related features:

    a. Check that Access Rules Service is supported by DUT. If **Access Rules Service** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile A] is not supported by DUT and certification will be failed. Otherwise, it is determined that Access Rules Service related features are supported by DUT. Those features are:

    i. Capabilities feature category:

    - GetServiceCapabilities (Access Rules)

    ii. Access Profiles feature category:

- GetAccessProfiles (Access Rules)
- GetAccessProfileList (Access Rules)
- GetAccessProfileInfo (Access Rules)
- GetAccessProfileInfoList (Access Rules)
- CreateAccessProfile (Access Rules)
- ModifyAccessProfile (Access Rules)
- DeleteAccessProfile (Access Rules)
- tns1:Configuration/AccessProfile/Changed
- tns1:Configuration/AccessProfile/Removed

6. Check Credential Service related features:

   a. Check that Credential Service is supported by DUT. If **Credential Service** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile A] is not supported by DUT and certification will be failed. Otherwise, it is determined that Credential Service related features are supported by DUT. Those features are:

      i. Capabilities feature category:

      - GetServiceCapabilities (Credential)

      ii. Credentials feature category:

      - GetCredentials (Credential)
      - GetCredentialList (Credential)
      - GetCredentialInfo (Credential)
      - GetCredentialInfoList (Credential)
      - CreateCredential (Credential)
      - ModifyCredential (Credential)
      - DeleteCredential (Credential)
      - GetCredentialAccessProfiles (Credential)
      - SetCredentialAccessProfiles (Credential)

- DeleteCredentialAccessProfiles (Credential)
- GetCredentialIdentifiers (Credential)
- SetCredentialIdentifier (Credential)
- DeleteCredentialIdentifier (Credential)
- EnableCredential (Credential)
- DisableCredential (Credential)
- GetCredentialState (Credential)
- GetSupportedFormatTypes (Credential)
- tns1:Configuration/Credential/Changed
- tns1:Configuration/Credential/Removed

b. Check that Reset Antipassback Violations feature category is supported by the DUT. If **Credential Service\Reset Antipassback Violation** is regarded as supported by DUT, it is determined that Reset Antipassback Violations feature category are supported by DUT. The following features are defined as supported:

- ResetAntipassbackViolation (Credential)
- tns1:Credential/State/ApbViolation

7. Check Schedule Service related features:

a. Check that Schedule Service is supported by DUT. If **Schedule Service** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile A] is not supported by DUT and certification will be failed. Otherwise, it is determined that Schedule Service related features are supported by DUT. Those features are:

i. Capabilities feature category:

- GetServiceCapabilities (Schedule)

ii. Schedules feature category:

- GetSchedules (Schedule)
- GetScheduleList (Schedule)
- GetScheduleInfo (Schedule)

- GetScheduleInfoList (Schedule)
- CreateSchedule (Schedule)
- ModifySchedule (Schedule)
- DeleteSchedule (Schedule)
- tns1:Configuration/Schedule/Changed
- tns1:Configuration/ Schedule /Removed

b. Check that GetScheduleState (Schedule) feature and tns1:Schedule/State/Active feature are supported by the DUT. If **Schedule Service\State Reporting** is regarded as supported by DUT, it is determined that the following features are defined as supported:

i. GetScheduleState (Schedule)

ii. tns1:Schedule/State/Active

c. Check that Special Days Schedule feature category is supported by the DUT. If **Schedule Service\Spcial Days** is regarded as supported by DUT, it is determined that Special Days Schedule feature category are supported by DUT. The following features are defined as supported:

- GetSpecialDayGroups (Schedule)
- GetSpecialDayGroupList (Schedule)
- GetSpecialDayGroupInfo (Schedule)
- GetSpecialDayGroupInfoList (Schedule)
- CreateSpecialDayGroup (Schedule)
- ModifySpecialDayGroup (Schedule)
- DeleteSpecialDayGroup (Schedule)
- tns1:Configuration/SpecialDays/Changed
- tns1:Configuration/SpecialDays/Removed

8. Check Discovery feature category of ONVIF profile support. This is a mandatory feature for any of ONVIF device implementation. The following features are defined as supported:

- WS-Discovery
- GetDiscoveryMode (Device Management Service)
- SetDiscoveryMode (Device Management Service)
- GetScopes (Device Management Service)
- SetScopes (Device Management Service)
- AddScopes (Device Management Service)
- RemoveScopes (Device Management Service)

9. Check Network Configuration feature category of ONVIF profile support. This is mandatory a feature for any of ONVIF device implementation. The following features are defined as supported:
   - GetHostname (Device Management Service)
   - SetHostname (Device Management Service)
   - GetDNS (Device Management Service)
   - SetDNS (Device Management Service)
   - GetNetworkInterfaces (Device Management Service)
   - SetNetworkInterfaces (Device Management Service)
   - GetNetworkProtocols (Device Management Service)
   - SetNetworkProtocols (Device Management Service)
   - GetNetworkDefaultGateway (Device Management Service)
   - SetNetworkDefaultGateway (Device Management Service)
10. Check System feature category of ONVIF profile support. This feature is mandatory for any of ONVIF device implementation. The following features are defined as supported:
    - GetDeviceInformation (Device Management Service)
    - GetSystemDateAndTime (Device Management Service)
    - SetSystemDateAndTime (Device Management Service)
    - SetSystemFactoryDefault (Device Management Service)

- Reboot (Device Management Service)

11. Check User Handling feature category of ONVIF profile support. This is a mandatory feature for any of ONVIF device implementation. The following features are defined as supported:
    - GetUsers (Device Management Service)
    - CreateUsers (Device Management Service)
    - DeleteUsers (Device Management Service)
    - SetUser (Device Management Service)
12. Check Event Handling feature category of ONVIF profile support. This is a mandatory feature for any of ONVIF device implementation. The following features are defined as supported:
    - Notify (Event Service)
    - Subscribe (Event Service)
    - Renew (Event Service)
    - Unsubscribe (Event Service)
    - SetSynchronizationPoint (Event Service)
    - CreatePullPointSubscription (Event Service)
    - PullMessage (Event Service)
    - GetEventProperties (Event Service)
    - TopicFilter (Event Service)
13. Check Persistent notification storage feature category of ONVIF profile support. If **Event Service\Persistent notification storage** is regarded as supported by DUT, then it is determined that Persistent notification storage feature category feature category is supported by DUT. The following features are defined as supported:
    - Seek (Event)
14. Check IP Filtering of ONVIF profile support. If **Device Service\Network\IP Filter** is regarded as supported by DUT, then it is determined that IP Filtering feature category is supported by DUT. The following features are defined as supported:
    - GetIPAddressFilter (Device)

- SetIPAddressFilter (Device)
- AddIPAddressFilter (Device)
- RemoveIPAddressFilter (Device)

8 Profile T Conformance

8.1 Feature category classification for ONVIF Profile T

In order for ONVIF Device Test Tool to conduct conformance testing toward [ONVIF Profile T], it would need to identify whether DUT implements the expected feature set.

This section classifies supported features as multiple categories that are related to [ONVIF Profile T] conformance. Those category classifications will be used to do some preliminary checking prior to the test case execution and they will be used to determine whether DUT can be considered [ONVIF Profile T] conformant device.

The following discovery scope is defined as the scope that signals that DUT is [ONVIF Profile T] product.

Table 8.1. Profile T Discovery Scope

onvif://www.onvif.org/Profile/T

The following table shows the classified feature categories based on commands and/or functional blocks that are referenced by DUT.

Table 8.2. Profile T Features Categories

Profile Mandatory Features	
User authentication	HTTP Digest Authentication
	RTSP Digest Authentication
Capabilities	GetServices (Device)
	GetServiceCapabilities (Device)
	GetServiceCapabilities (Event)
	GetServiceCapabilities (Media2)
	GetServiceCapabilities (Imaging)
	GetServiceCapabilities (PTZ)
	GetServiceCapabilities (Analytics)
	GetServiceCapabilities (DeviceIO)
	GetWsdlUrl (Device)
	MaximumNumberOfProfiles Caoability (Media 2)
	MaxPullPoint capability is supported and value is not less than 2 (Event)

Discovery	WS-Discovery
	GetDiscoveryMode (Device)
	SetDiscoveryMode (Device)
	GetScopes (Device)
	SetScopes (Device)
	AddScopes (Device)
	RemoveScopes (Device)
Network Configuration	GetHostname (Device)
	SetHostname (Device)
	GetDNS (Device)
	SetDNS (Device)
	GetNetworkInterfaces (Device)
	SetNetworkInterfaces (Device)
	GetNetworkProtocols (Device)
	SetNetworkProtocols (Device)
	GetNetworkDefaultGateway (Device)
	SetNetworkDefaultGateway (Device)
System	GetDeviceInformation (Device)
	GetSystemDateAndTime (Device)
	SetSystemDateAndTime (Device)
	SetSystemFactoryDefault (Device)
	Reboot (Device)
User Handling	GetUsers (Device)
	CreateUsers (Device)
	DeleteUsers (Device)
	SetUser (Device)
Event Handling	SetSynchronizationPoint (Event)
	CreatePullPointSubscription (Event)
	PullMessage (Event)
	GetEventProperties (Event)
	Unsubscribe (Event)
	TopicFilter (Event)
	MessageContentFilter (Event)

	At least two PullPoint subscriptions
Media Profile Management	CreateProfile (Media 2)
	DeleteProfile (Media 2)
	GetVideoSourceConfigurations (Media 2)
	GetVideoEncoderInstances (Media 2)
	tns1:Media/ProfileChanged (Event)
Video Streaming	Ready-to-use Media Profile for streaming H.264 or H.265 video per video source (Media 2)
	GetProfiles (Media 2)
	GetStreamUri (Media 2)
	Video Streaming using RTSP (Streaming)
	H.264 Encoding (Media 2)
	H.265 Encoding (Media 2)
	Streaming over RTP/UDP (Streaming)
	Streaming over RTP/RTSP/HTTP/TCP (Streaming)
	Streaming over RTP/RTSP/HTTPS/TCP (Streaming)
	Streaming over RTP/UDP Multicast (Streaming)
	Streaming over RTP/RTSP/TCP/WebSocket (Streaming)
	SetSynchronizationPoint (Media 2)
Configuration of Video Profile	GetProfiles (Media 2)
	GetVideoSources (DeviceIO)
	GetVideoSourceConfigurations (Media 2)
	AddConfiguration (Video Source Configuration) (Media 2)
	AddConfiguration (Video Encoder Configuration) (Media 2)
	GetVideoEncoderConfigurations (Media 2)
	RemoveConfiguration (Video Source Configuration) (Media 2)
	RemoveConfiguration (Video Encoder Configuration) (Media 2)
	tns1:Media/ProfileChanged (Event)

Video Source Configuration	GetVideoSourceConfigurations (Media 2)
	GetVideoSourceConfigurationOptions (Media 2)
	SetVideoSourceConfiguration (Media 2)
	tns1:Media/ConfigurationChanged (Event)
Video Encoder Configuration	GetVideoEncoderConfigurations (Media 2)
	GetVideoEncoderConfigurationOptions (Media 2)
	SetVideoEncoderConfiguration (Media 2)
	tns1:Media/ConfigurationChanged (Event)
Metadata Streaming	GetProfiles (Media 2)
	GetStreamUri (Media 2)
	Metadata Streaming using RTSP (Streaming)
	Streaming over RTP/UDP (Streaming)
	Streaming over RTP/RTSP/HTTP/TCP (Streaming)
	Streaming over RTP/RTSP/HTTPS/TCP (Streaming)
	Streaming over RTP/UDP Multicast (Streaming)
	Streaming over RTP/RTSP/TCP/WebSocket (Streaming)
	SetSynchronizationPoint (Media 2)
Configuration of Metadata Profile	GetProfiles (Media 2)
	GetMetadataConfigurations (Media 2)
	AddConfiguration (Metadata Configuration) (Media 2)
	RemoveConfiguration (Metadata Configuration) (Media 2)
	tns1:Media/ProfileChanged (Event)
Metadata Configuration	GetMetadataConfigurations (Media 2)
	GetMetadataConfigurationOptions (Media 2)
	SetMetadataConfiguration (Media 2)
	tns1:Media/ConfigurationChanged (Event)
Imaging Settings	GetVideoSources (DeviceIO)
	GetImagingSettings (Imaging)
	GetOptions (Imaging)

	SetImagingSettings (Imaging)
Tampering	tns1:VideoSource/ImageTooBlurry (Event)
	tns1:VideoSource/ImageTooDark (Event)
	tns1:VideoSource/ImageTooBright (Event)
	tns1:VideoSource/GlobalSceneChange (Event)
Configuration of On-Screen Display (OSD)	CreateOSD, text (Media 2)
	CreateOSD, image (Media 2)
	DeleteOSD (Media 2)
	GetVideoSourceConfigurations (Media 2)
	GetOSDs (Media 2)
	GetOSDOptions (Media 2)
	SetOSD (Media 2)
JPEG Snapshot	GetSnapshotUri (Media 2)
Motion Alarm Events	tns1:VideoSource/MotionAlarm (Event)
Absolute PTZ Move	Ready-to-use Media Profile for PTZ control per PTZ node
	MoveStatus capability (PTZ)
	StatusPosition capability (PTZ)
	GetStatus (PTZ)
	AbsoluteMove (PTZ)
	http://www.onvif.org/ver10/tptz/PanTiltSpaces/SphericalPositionSpaceDegrees (PTZ)
	http://www.onvif.org/ver10/tptz/PanTiltSpaces/PositionGenericSpace (PTZ)
	http://www.onvif.org/ver10/tptz/ZoomSpaces/PositionGenericSpace (PTZ)
Continuous PTZ Move	Ready-to-use Media Profile for PTZ control per PTZ node
	MoveStatus capability (PTZ)
	GetStatus (PTZ)
	ContinuousMove (PTZ)
	Stop (PTZ)
	http://www.onvif.org/ver10/tptz/PanTiltSpaces/VelocityGenericSpace (PTZ)

	http://www.onvif.org/ver10/tptz/ZoomSpaces/VelocityGenericSpace (PTZ)
Profile Conditional Features	
Configuration of PTZ Profile	GetProfiles (Media 2)
	GetCompatibleConfigurations (PTZ)
	AddConfiguration, PTZ Configuration (Media 2)
	RemoveConfiguration, PTZ Configuration (Media 2)
	tns1:Media/ProfileChanged (Event)
PTZ Configuration	GetNodes (PTZ)
	GetNode (PTZ)
	GetConfigurationOptions (PTZ)
	SetConfiguration (PTZ)
	tns1:Media/ConfigurationChanged (Event)
PTZ Presets	MaximumNumberOfPresets capability is supported and value is not less than 1 (PTZ)
	GetPresets (PTZ)
	SetPreset (PTZ)
	GotoPreset (PTZ)
	RemovePreset (PTZ)
PTZ Home Position	HomeSupported capability = true (PTZ)
	SetHomePosition (PTZ)
	GotoHomePosition (PTZ)
Configuration of Analytics Profile	GetProfiles (Media 2)
	GetAnalyticsConfigurations (Media 2)
	AddConfiguration, Analytics Configuration (Media 2)
	RemoveConfiguration, Analytics Configuration (Media 2)
	tns1:Media/ProfileChanged (Event)
Motion Region Detector	GetSupportedRules (Analytics)
	GetRules (Analytics)
	GetRuleOptions (Analytics)
	CreateRules (Analytics)

	ModifyRules (Analytics)
	DeleteRules (Analytics)
	tns1:RuleEngine/MotionRegionDetector/Motion (Event)
Video Source Mode	GetVideoSources (DeviceIO)
	GetVideoSourceModes (Media 2)
	SetVideoSourceMode (Media 2)
NTP	GetNTP (Device Management)
	SetNTP (Device Management)
Audio Output Configuration	GetAudioOutputConfigurations (Media 2)
	GetAudioOutputConfigurationOptions (Media 2)
	SetAudioOutputConfiguration (Media 2)
	tns1:Media/ConfigurationChanged (Event)
Audio Streaming	GetProfiles (Media 2)
	GetStreamUri (Media 2)
	Audio Streaming using RTSP (Streaming)
	G.711 Encoding (Media 2)
	AAC Encoding (Media 2)
	Streaming over RTP/UDP (Streaming)
	Streaming over RTP/RTSP/HTTP/TCP (Streaming)
	Streaming over RTP/RTSP/HTTPS/TCP (Streaming)
	Streaming over RTP/UDP Multicast (Streaming)
	Streaming over RTP/RTSP/TCP/WebSocket (Streaming)
Configuration of Audio Profile	GetProfiles (Media 2)
	GetAudioSources (DeviceIO)
	GetAudioSourceConfigurations (Media 2)
	AddConfiguration, Audio Source Configuration (Media 2)
	AddConfiguration, Audio Encoder Configuration (Media 2)
	GetAudioEncoderConfigurations (Media 2)

	RemoveConfiguration, Audio Source Configuration (Media 2)
	RemoveConfiguration, Audio Encoder Configuration (Media 2)
	tns1:Media/ProfileChanged (Event)
Audio Encoder Configuration	GetAudioEncoderConfigurations (Media 2)
	GetAudioEncoderConfigurationOptions (Media 2)
	SetAudioEncoderConfiguration (Media 2)
	tns1:Media/ConfigurationChanged (Event)
Audio Output Streaming	GetProfiles (Media 2)
	GetStreamUri (Media 2)
	Streaming using RTSP – Back Channel (Streaming)
	G.711 Decoding (Media 2)
	AAC Decoding (Media 2)
	Streaming over RTP/UDP (Streaming)
	Streaming over RTP/RTSP/HTTP/TCP (Streaming)
	Streaming over RTP/RTSP/HTTPS/TCP (Streaming)
	Streaming over RTP/RTSP/TCP/WebSocket (Streaming)
Configuration of Audio Output Profile	GetProfiles (Media 2)
	GetAudioOutputs (DeviceIO)
	GetAudioOutputConfigurations (Media 2)
	GetAudioDecoderConfigurations (Media 2)
	AddConfiguration, Audio Output Configuration (Media 2)
	AddConfiguration, Audio Decoder Configuration (Media 2)
	RemoveConfiguration, Audio Output Configuration (Media 2)
	RemoveConfiguration, Audio Decoder Configuration (Media 2)
	tns1:Media/ProfileChanged (Event)

Focus Control	GetVideoSources (DeviceIO)
	GetMoveOptions (Imaging)
	Move (Imaging)
	Stop (Imaging)
	GetStatus (Imaging)
Relay Outputs	GetRelayOutputs (DeviceIO)
	GetRelayOutputOptions (DeviceIO)
	SetRelayOutputSettings (DeviceIO)
	SetRelayOutputState (DeviceIO)
	tns1:Device/Trigger/Relay (Event)
Digital Inputs	GetDigitalInputs (DeviceIO)
	GetDigitalInputConfigurationOptions (DeviceIO)
	SetDigitalInputConfigurations (DeviceIO)
	tns1:Device/Trigger/DigitalInput (Event)
Auxiliary Commands	SendAuxiliaryCommand (Device Management)
	tt:Wiper|On (Device Management)
	tt:Wiper|Off (Device Management)
	tt:Washer|On (Device Management)
	tt:Washer|Off (Device Management)
	tt:WashingProcedure|On (Device Management)
	tt:WashingProcedure|Off (Device Management)
	tt:IRLamp|On (Device Management)
	tt:IRLamp|Off (Device Management)
	tt:IRLamp|Auto(Device Management)

8.2 Profile T support check

Preliminary checking for feature discovery will be performed prior to the test execution. For the details of the preliminary feature discovery, refer to [ONVIF Feature Discovery].

According to the result of test case execution, final determination of [ONVIF Profile T] support toward DUT is performed based on the following procedure.

Procedure:

1. Check that scope list contains the scope given in Table 8.1. If there is no such scope in the scope list of the DUT, then it is determined that [ONVIF Profile T] is not supported.
2. Check Discovery Types support. If **Discovery\Types\tds:Device** is not supported by the DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed.
3. Check User Authentication feature category:
   a. Check that HTTP Digest Authentication is supported by the DUT. If **Security\Digest** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that HTTP Digest Authentication feature is supported by DUT.
   b. Check Digest Authentication for RTSP feature category of ONVIF profile support. This feature is mandatory for any of ONVIF device implementation. The following features are defined as supported:
      - RTSP Digest Authentication
4. Check Capabilities feature category:
   a. Check that GetServices command is supported by the DUT. If **Device Service \Capabilities\GetServices** is not supported by the DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that Capabilities category is supported with the following features included:
      - GetServices (Device Management Service)
      - GetServiceCapabilities (Device Management Service)
      - GetServiceCapabilities (Event Service)
   b. Check that Imaging Service is supported by the DUT. If **Imaging Service** is not supported by the DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that the following feature is supported:
      - GetServiceCapabilities (Imaging Service)
   c. Check that DeviceIO Service is supported by the DUT. If **DeviceIO Service** is not supported by the DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that the following feature is supported:
      - GetServiceCapabilities (DeviceIO Service)

d. Check that PTZ Service is supported by the DUT. If **PTZ Service** is supported by the DUT, then it is determined that the following feature is supported:

- GetServiceCapabilities (PTZ Service)

e. Check that Analytics Service is supported by the DUT. If **Analytics Service** is supported by the DUT, then it is determined that the following feature is supported:

- GetServiceCapabilities (Analytics Service)

f. The following features are defined as supported, because this is a mandatory feature for any of ONVIF device implementation:

- GetWsdlUrl (Device)

g. Check that at least two PullPoint subscriptions are supported by the DUT. If **Event Service/Event/MaxPullPoint** is not supported by the DUT or it has value less than two, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that Event Handling feature category is supported with the following feature included:

- At least two PullPoint subscriptions

5. Check Discovery feature category of ONVIF profile support. This is a mandatory feature for any of ONVIF device implementation. The following features are defined as supported:

- WS-Discovery
- GetDiscoveryMode (Device Management Service)
- SetDiscoveryMode (Device Management Service)
- GetScopes (Device Management Service)
- SetScopes (Device Management Service)
- AddScopes (Device Management Service)
- RemoveScopes (Device Management Service)

6. Check Network Configuration feature category of ONVIF profile support. This is mandatory a feature for any of ONVIF device implementation. The following features are defined as supported:

- GetHostname (Device Management Service)

- SetHostname (Device Management Service)
- GetDNS (Device Management Service)
- SetDNS (Device Management Service)
- GetNetworkInterfaces (Device Management Service)
- SetNetworkInterfaces (Device Management Service)
- GetNetworkProtocols (Device Management Service)
- SetNetworkProtocols (Device Management Service)
- GetNetworkDefaultGateway (Device Management Service)
- SetNetworkDefaultGateway (Device Management Service)

7. Check System feature category of ONVIF profile support. This feature is mandatory for any of ONVIF device implementation. The following features are defined as supported:
   - GetDeviceInformation (Device Management Service)
   - GetSystemDateAndTime (Device Management Service)
   - SetSystemDateAndTime (Device Management Service)
   - SetSystemFactoryDefault (Device Management Service)
   - Reboot (Device Management Service)
8. Check User Handling feature category of ONVIF profile support. This is a mandatory feature for any of ONVIF device implementation. The following features are defined as supported:
   - GetUsers (Device Management Service)
   - CreateUsers (Device Management Service)
   - DeleteUsers (Device Management Service)
   - SetUser (Device Management Service)
9. Check Event Handling feature category of ONVIF profile support. This is a mandatory feature for any of ONVIF device implementation. The following features are defined as supported:
   - SetSynchronizationPoint (Event Service)
   - CreatePullPointSubscription (Event Service)

- PullMessage (Event Service)
- Unsubscribe (Event Service)
- GetEventProperties (Event Service)
- TopicFilter (Event Service)
- MessageContentFilter (Event Service)
- At least two PullPoint subscriptions (Event Service)

10. Check Media2 Service related features:

    a. Check that Media2 Service is supported by the DUT. If **Media2 Service** is not supported by the DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that the following feature is supported:

        i. Capabilities feature category:

            - GetServiceCapabilities (Media 2 Service)

        ii. Media Profile Management feature category:

            - CreateProfile (Media 2)
            - DeleteProfile (Media 2)
            - GetVideoSourceConfigurations (Media 2)
            - GetVideoEncoderInstances (Media 2)
            - tns1:Media/ProfileChanged (Event)

        iii. Check Video Streaming feature category:

            - Ready-to-use Media Profile for streaming H.264 or H.265 video per video source (Media 2)
            - GetProfiles (Media 2)
            - If **Media2 Service\Real-time Streaming** is not supported by the DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that the following features is supported by DUT:

- GetStreamUri (Media 2)
- Video Streaming using RTSP

- If **Media2 Service\Video\H.264** is regarded as supported by DUT, it is determined that H.264 Encoding feature category is supported by DUT.
- If **Media2 Service\Video\H.265** is regarded as supported by DUT, it is determined that H.265 Encoding feature category is supported by DUT.
- If **Media2 Service\Video\H.264** and **Media2 Service\Video\H.265** are regarded as not supported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed.
- If **Media2 Service\Real-time Streaming\RTP/UDP** is not supported by the DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed.
- If **Media2 Service\Real-time Streaming\RTP/RTSP/HTTP** feature is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. It is mandatory functionality if Real-time Streaming supported.
- If **Media2 Service\Real-time Streaming\RTP/RTSP/HTTPS** feature is regarded as supported by DUT, it is determined that Streaming over RTP/RTSP/HTTPS feature category is supported by DUT.
- If **Media2 Service\Real-time Streaming\RTP-Multicast/UDP** feature is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that RTP-Multicast/UDP feature is supported by DUT.
- If **Media2 Service\RTSP Web Socket** is regarded as supported by DUT, it is determined that Streaming over RTP/RTSP/TCP/WebSocket feature category is supported by DUT.
- SetSynchronizationPoint (Media 2)

iv. Check Configuration of Video Profile feature category:

- GetProfiles (Media 2)
- GetVideoSources (DeviceIO)
- GetVideoSourceConfigurations (Media 2)

- AddConfiguration (Media 2)
- GetVideoEncoderConfigurations (Media 2)
- RemoveConfiguration (Media 2)
- tns1:Media/ProfileChanged

v. Check Video Source Configuration feature category:

- GetVideoSourceConfigurations (Media 2)
- GetVideoSourceConfigurationOptions (Media 2)
- SetVideoSourceConfiguration (Media 2)
- tns1:Media/ConfigurationChanged

vi. Check Video Encoder Configuration feature category:

- GetVideoEncoderConfigurations (Media 2)
- GetVideoEncoderConfigurationOptions (Media 2)
- SetVideoEncoderConfiguration (Media 2)
- tns1:Media/ConfigurationChanged

vii. Check Metadata Streaming feature category:

- GetProfiles (Media 2)
- If **Media2 Service\Real-time Streaming** is not supported by the DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that the following features is supported by DUT:
  - GetStreamUri (Media 2)
  - Metadata Streaming using RTSP
- If **Media2 Service\Real-time Streaming\RTP/UDP** is not supported by the DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed.
- If **Media2 Service\Real-time Streaming\RTP/RTSP/HTTP** feature is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not

supported by DUT and certification will be failed. It is mandatory functionality if Real-time Streaming supported.

- If **Media2 Service\Real-time Streaming\RTP/RTSP/HTTPS** feature is regarded as supported by DUT, it is determined that Streaming over RTP/RTSP/HTTPS feature category is supported by DUT.
- If **Media2 Service\Real-time Streaming\RTP-Multicast/UDP** feature is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that RTP-Multicast/UDP feature is supported by DUT.
- If **Media2 Service\RTSP Web Socket** is regarded as supported by DUT, it is determined that Streaming over RTP/RTSP/TCP/WebSocket feature category is supported by DUT.
- SetSynchronizationPoint (Media 2)

viii. Check Configuration of Video Profile feature category:

- GetProfiles (Media 2)
- GetMetadataConfigurations (Media 2)
- AddConfiguration (Media 2)
- RemoveConfiguration (Media 2)
- tns1:Media/ProfileChanged

ix. Check Metadata Configuration feature category:

- GetMetadataConfigurations (Media 2)
- GetMetadataConfigurationOptions (Media 2)
- SetMetadataConfiguration (Media 2)
- tns1:Media/ConfigurationChanged

x. Check Configuration of On-Screen Display (OSD) feature category:

a. If **Media2 Service\OSD** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that OSD related features are supported by DUT. Those features are:

- CreateOSD (Media2)
- DeleteOSD (Media2)
- GetVideoSourceConfigurations (Media2)
- GetOSDs (Media2)
- GetOSDOptions (Media2)
- SetOSD (Media2)

b. If **Media2 Service\OSD\Text** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed.

c. If **Media2 Service\OSD\Image** is regarded supported by DUT, then it is determined that OSD Image feature is supported by DUT.

xi. Check JPEG Snapshot feature category:

a. If **Media2 Service\Snapshot URI** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that the following features is supported by DUT:

- GetSnapshotUri (Media 2)

xii. Check Video Source Mode feature category:

a. If **Media2 Service\Video Source Mode** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

- GetVideoSources (DeviceIO)
- GetVideoSourceModes (Media2)
- SetVideoSourceMode (Media2)

xiii. Check Audio Output Configuration feature category:

a. If **Media2 Service\Audio Output** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

- GetAudioOutputConfigurations (Media2)

- GetAudioOutputConfigurationOptions (Media2)
- SetAudioOutputConfiguration (Media2)
- tns1:Media/ConfigurationChanged

xiv. Check Audio Streaming feature category:

a. If **Media2 Service\Audio** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

- GetProfiles (Media 2)
- If **Media2 Service\Real-time Streaming** is not supported by the DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that the following features is supported by DUT:
  - GetStreamUri (Media 2)
  - Audio Streaming using RTSP
- If **Media2 Service\Audio\G.711** is regarded as supported by DUT, it is determined that G.711 Encoding feature category is supported by DUT.
- If **Media2 Service\Audio\AAC** is regarded as supported by DUT, it is determined that AAC Encoding feature category is supported by DUT.
- If **Media2 Service\Audio\G.711** and **Media2 Service\Audio\AAC** are regarded as not supported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed.
- If **Media2 Service\Real-time Streaming\RTP/UDP** is not supported by the DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed.
- If **Media2 Service\Real-time Streaming\RTP/RTSP/HTTP** feature is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. It is mandatory functionality if Real-time Streaming supported.
- If **Media2 Service\Real-time Streaming\RTP/RTSP/HTTPS** feature is regarded as supported by DUT, it is determined that Streaming over RTP/RTSP/HTTPS feature category is supported by DUT.

- If **Media2 Service\Real-time Streaming\RTP-Multicast/UDP** feature is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that RTP-Multicast/UDP feature is supported by DUT.
- If **Media2 Service\RTSP Web Socket** is regarded as supported by DUT, it is determined that Streaming over RTP/RTSP/TCP/WebSocket feature category is supported by DUT.

xv. Check Configuration of Audio Profile feature category:

a. If **Media2 Service\Audio** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

- GetProfiles (Media2)
- GetAudioSources (DeviceIO)
- GetAudioSourceConfigurations (Media2)
- AddConfiguration (Media2)
- GetAudioEncoderConfigurations (Media2)
- RemoveConfiguration (Media2)
- tns1:Media/ProfileChanged

xvi. Check Audio Encoder Configuration feature category:

a. If **Media2 Service\Audio** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

- GetAudioEncoderConfigurations (Media2)
- GetAudioEncoderConfigurationOptions (Media2)
- SetAudioEncoderConfiguration (Media2)
- tns1:Media/ConfigurationChanged

xvii. Check Audio Output Streaming feature category:

a. If **Media2 Service\Audio Output** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

- GetProfiles (Media 2)
- If **Media2 Service\Real-time Streaming** is not supported by the DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that the following features is supported by DUT:
  - GetStreamUri (Media 2)
  - Audio Output Streaming using RTSP
- If **Media2 Service\Audio outputs\G.711** is not supported by the DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that the G.711 decoding feature category is supported by DUT.
- If **Media2 Service\Audio outputs\AAC** is regarded as supported by DUT, it is determined that AAC decoding feature category is supported by DUT.
- If **Media2 Service\Real-time Streaming\RTP/UDP** is not supported by the DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed.
- If **Media2 Service\Real-time Streaming\RTP/RTSP/HTTP** feature is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. It is mandatory functionality if Real-time Streaming supported.
- If **Media2 Service\Real-time Streaming\RTP/RTSP/HTTPS** feature is regarded as supported by DUT, it is determined that Streaming over RTP/RTSP/HTTPS feature category is supported by DUT.
- If **Media2 Service\RTSP Web Socket** is regarded as supported by DUT, it is determined that Streaming over RTP/RTSP/TCP/WebSocket feature category is supported by DUT.

xviii. Check Configuration of Audio Output Profile feature category:

a. If **Media2 Service\Audio outputs** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

- GetProfiles (Media2)

- GetAudioOutputs (DeviceIO)
- GetAudioOutputConfigurations (Media2)
- AddConfiguration (Media2)
- GetAudioDecoderConfigurations (Media2)
- RemoveConfiguration (Media2)
- tns1:Media/ProfileChanged

11. Check Imaging Settings feature category:
    - GetVideoSources (DeviceIO)
    - GetImagingSettings (Imaging)
    - GetOptions (Imaging)
    - SetImagingSettings (Imaging)
12. Check Tampering feature category:
    a. If **Imaging Service\Tampering Events\Image Too Blurry** is regarded as supported by DUT, it is determined that Image Too Blurry feature category is supported by DUT.
    b. If **Imaging Service\Tampering Events\Image Too Dark** is regarded as supported by DUT, it is determined that Image Too Dark feature category is supported by DUT.
    c. If **Imaging Service\Tampering Events\Image Too Bright** is regarded as supported by DUT, it is determined that Image Too Bright feature category is supported by DUT.
    d. If **Imaging Service\Tampering Events\Global Scene Change** is regarded as supported by DUT, it is determined that Global Scene Change feature category is supported by DUT.
    e. If **Imaging Service\Tampering Events\Image Too Blurry** and **Imaging Service \Tampering Events\Image Too Dark** and **Imaging Service\Tampering Events\Image Too Bright** and **Imaging Service\Tampering Events\Global Scene Change** are regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed.
13. Check Motion Alarm Events feature category:

- If **Imagins Service\Motion Alarm** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that the following feature is supported by DUT:
  - tns1:VideoSource/MotionAlarm

14. Check Absolute PTZ Move feature.

a. If **PTZ Service** and **PTZ Service\Absolute Move** are regarded as supported by DUT, then it is determined that the following features are supported by DUT:

- Ready-to-use Media Profile for PTZ control per PTZ node.
- If **PTZ Service\Move Status** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined Move Status feature is supported by DUT.
- If **PTZ Service\Status Position** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined Status Position feature is supported by DUT.
- GetStatus (PTZ)
- AbsoluteMove (PTZ)

15. Check Continuous PTZ Move feature.

a. If **PTZ Service** and **PTZ Service\Continuous Move** are regarded as supported by DUT, then it is determined that the following features are supported by DUT:

- Ready-to-use Media Profile for PTZ control per PTZ node.
- If **PTZ Service\Move Status** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined Move Status feature is supported by DUT.
- GetStatus (PTZ)
- ContinuousMove (PTZ)
- Stop (PTZ)

16. Check Configuration of PTZ Profile feature category:

a. If **PTZ Service** is supported by DUT, then it is determined that the following features are supported by DUT:

- GetProfiles (Media 2)
- If **PTZ Service\Get Compatible Configurations** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that the following feature is supported by DUT:
  - GetCompatibleConfigurations (PTZ)
- AddConfiguration (Media 2)
- RemoveConfiguration (Media 2)
- tns1:Media/ProfileChanged

17. Check PTZ Configuration feature category:

    a. If **PTZ Service** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

    - GetNodes (PTZ)
    - GetNode (PTZ)
    - GetConfigurationOptions (PTZ)
    - SetConfiguration (PTZ)
    - tns1:Media/ConfigurationChanged

18. Check PTZ Presets feature category:

    a. If **PTZ Service\Presets** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

    - GetPresets (PTZ)
    - GotoPreset (PTZ)
    - SetPreset (PTZ)
    - RemovePreset (PTZ)

19. Check PTZ Home Position feature category:

    a. If **PTZ Service\Home Position** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

- SetHomePosition (PTZ)
- GotoHomePosition (PTZ)

20. Check Configuration of Analytics Profile feature category:

    a. If **Media2 Service\Analytics** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

    - GetProfiles (Media 2)
    - GetAnalyticsConfigurations (Media 2)
    - AddConfiguration (Media 2)
    - RemoveConfiguration (Media 2)
    - tns1:Media/ProfileChanged

21. Check Motion Region Detector Configuration feature category:

    a. If **Analytics Service\Rule Engine\Motion Region Detector Rule** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

    - GetSupportedRules (Analytics)
    - GetRules (Analytics)
    - If **Analytics Service\Rule Engine\Rule Options** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not supported by DUT and certification will be failed. Otherwise, it is determined that the following feature is supported by DUT:
        - GetRuleOptions (Analytics)
    - CreateRules (Analytics)
    - ModifyRules (Analytics)
    - DeleteRules (Analytics)
    - tns1:RuleEngine/MotionRegionDetector/Motion

22. Check NTP feature category:

a. If **Device Service\Network\NTP** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

- GetNTP (Device)
- SetNTP (Device)

23. Check Focus Control feature category:

a. If **Imaging Service** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

- GetVideoSources (DeviceIO)
- GetMoveOptions (Imaging)
- Move (Imaging)
- Stop (Imaging)
- GetStatus (Media2)

24. Check Relay Outputs feature category:

a. If **DeviceIO Service\Relay outputs** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

- GetRelayOutputs (DeviceIO)
- GetRelayOutputOptions (DeviceIO)
- SetRelayOutputSettings (DeviceIO)
- SetRelayOutputState (DeviceIO)
- tns1:Device/Trigger/Relay

25. Check Digital Inputs feature category:

a. If **DeviceIO Service\Digital Inputs** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

- GetDigitalInputs (DeviceIO)
- If **DeviceIO Service\Digital Inputs\Digital Input Options** is regarded as unsupported by DUT, then it is determined that [ONVIF Profile T] is not

supported by DUT and certification will be failed. Otherwise, it is determined that the following feature is supported by DUT:

- GetDigitalInputConfigurationOptions (DeviceIO)

- SetDigitalInputConfigurations (DeviceIO)
- tns1:Device/Trigger/DigitalInput

26. Check Auxiliary Commands feature category:

a. If **Device Service\Auxiliary Commands** is regarded as supported by DUT, then it is determined that the following features are supported by DUT:

- SendAuxiliaryCommand (Device)
- If **Device Service\Auxiliary Commands\tt:Wiper|On** is regarded as supported by DUT, then it is determined that the tt:Wiper|On features category is supported by DUT.
- If **Device Service\Auxiliary Commands\tt:Wiper|Off** is regarded as supported by DUT, then it is determined that the tt:Wiper|Off features category is supported by DUT.
- If **Device Service\Auxiliary Commands\tt:Washer|On** is regarded as supported by DUT, then it is determined that the tt:Washer|On features category is supported by DUT.
- If **Device Service\Auxiliary Commands\tt:Washer|Off** is regarded as supported by DUT, then it is determined that the tt:Washer|Off features category is supported by DUT.
- If **Device Service\Auxiliary Commands\tt:WashingProcedure|On** is regarded as supported by DUT, then it is determined that the tt:WashingProcedure|On features category is supported by DUT.
- If **Device Service\Auxiliary Commands\tt:WashingProcedure|Off** is regarded as supported by DUT, then it is determined that the tt:WashingProcedure|Off features category is supported by DUT.
- If **Device Service\Auxiliary Commands\tt:IRLamp|On** is regarded as supported by DUT, then it is determined that the tt:IRLamp|On features category is supported by DUT.

- If **Device Service\Auxiliary Commands\tt:IRLamp|Off** is regarded as supported by DUT, then it is determined that the tt:IRLamp|Off features category is supported by DUT.
- If **Device Service\Auxiliary Commands\tt:IRLamp|Auto** is regarded as supported by DUT, then it is determined that the tt:IRLamp|Auto features category is supported by DUT.