

# **ONVIF**<sup>®</sup>

# **Profile S Specification**

Version 1.3

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## REVISION HISTORY

Vers.	Date	Description
1.0	Dec. 2011	Original release version 1.0
1.1	Dec. 2015	<p>[EDITORIAL UPDATE, NO TECHNICAL CHANGE]            Clarifications following ONVIF Client Test Specification introduction. Clarification reflecting the Device Test Specification 'Availability of at least one ready-to-use Media Profile for Video Streaming' (7.8.1) as always tested by the DTT.</p> <p>Updated document style based on latest ONVIF templates.</p> <ul style="list-style-type: none"> <li>- Mandatory and Conditional Features have been separated in their own sections.</li> <li>- Requirement Tables split between Device and Client requirements.</li> <li>- Features have been re-ordered into a more intuitive order.</li> </ul>
1.1.1	Mar. 2016	<p>[EDITORIAL UPDATE to revision history only, amending missing information under Vers. 1.1]            'Event Handling Function List for Client' (7.7.4): Changed Unsubscribe and SetSynchronizationPoint from Mandatory to Optional. Neither function is required by clients as part of the normal event subscription and notification process. Unsubscribe is not used by most clients as they expect the event stream to last for the duration of the session. It is not a normal use case for a client implementation to close event notifications on-demand. SetSynchronizationPoint is not required in order to subscribe to or query events. While it allows for retrieving the initial state of Property events, this information is also sent from the device upon receiving the first PullMessage request.</p>
1.2	July 2018	<p>[EDITORIAL UPDATE, NO TECHNICAL CHANGE]</p> <ul style="list-style-type: none"> <li>• Document format &amp; URL updates</li> <li>• Amended for clarification Device / Client requirements listed in clauses 7.9, 8.1, 8.2 to respective tables</li> </ul>
1.3	November 2019	<p>[EDITORIAL UPDATE, NO TECHNICAL CHANGE]            #2653:</p> <ul style="list-style-type: none"> <li>• Due to update of section 9 Event handling of ONVIF_core specification, clarification has been made to 7.7.1 Device Requirements that WS-BaseNotification and Event and pull point operations shall be supported.</li> </ul>

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# 1 Scope

This document defines the mandatory and conditional features required by an ONVIF Device and ONVIF Client that support the Profile S.

## 2 Normative references

This section defines the normative references applicable to this specification.

- **ONVIF Profile Policy**  
< <https://www.onvif.org/profiles/> >
- **ONVIF Network Interface Specifications**  
< <https://www.onvif.org/profiles/specifications/> >

## 3 Terms and Definitions

This section provides common terms and definitions used in this specification.

<b>Profile</b>	See [ONVIF Profile Policy].
<b>ONVIF Device</b>	networked hardware appliance or software program that exposes one or multiple ONVIF Web Services
<b>ONVIF Client</b>	networked hardware appliance or software program that uses ONVIF Web Services

## 4 Technical Specification Version Requirement

Implementation of ONVIF Network Interface Specifications, version 1.02 or later is required for conformance to Profile S.

## 5 Requirement Levels

Each feature in this document has a requirement level for Device and Client that claim conformance to Profile S and contains a Function List that states the functions requirement level for Device and Client that implement that feature.

The requirement levels for features are:

- **Mandatory = Feature that shall be implemented by an ONVIF device or ONVIF client.**
- **Conditional = Feature that shall be implemented by an ONVIF device or ONVIF client if it supports that functionality in any way, including any proprietary way. Features that are conditional are marked with “if supported” in a profile specification.**

The requirement levels for functions are:

- **Mandatory = Function that shall be implemented by an ONVIF device or ONVIF client.**
- **Conditional = Function that shall be implemented by an ONVIF device or ONVIF client if it supports that functionality.**
- **Optional = Function that may be implemented by an ONVIF device or ONVIF client.**

Function Lists use the following abbreviations:

- **M = Mandatory**
- **C = Conditional**
- **O = Optional**

All functions shall be implemented as described in the corresponding [ONVIF Network Interface Specifications].

## 6 Overview

An ONVIF device compliant to the Profile S is an ONVIF device that sends video data over an IP network to a client. The Profile S also includes support for PTZ, audio and metadata streaming, and relay outputs if those features are present on the device. For example, a device compliant to the Profile S may be an IP network camera or an encoder device.

An ONVIF client compliant to the Profile S is an ONVIF client that can configure, request, and control streaming of video data over an IP network from an ONVIF device compliant to the Profile S. The Profile S also includes support for control of PTZ, receiving audio and metadata stream, and relay outputs if those features are supported by the client.

An ONVIF profile is described by a fixed set of functionalities through a number of services that are provided by the ONVIF standard. A number of services and functionalities are mandatory for each type of ONVIF profile. An ONVIF device and client may support any combination of profiles and other optional services and functionalities.



## 7 Profile Mandatory Features (normative)

Devices and Clients conformant to Profile S shall support the following features.

### 7.1 User Authentication

- **WS-Usenametoken using timestamps and nonce**
- **HTTP Digest**

#### 7.1.1 Device requirements

- **Device shall support WS-Usenametoken according to WS-Security as covered by the Core Specification.**

#### 7.1.2 Client requirements

- **Client shall implement WS-Usenametoken according to WS-security as covered by the core specification.**
- **Client shall implement HTTP Digest as covered by the core specification.**

#### 7.1.3 User authentication Function List for Devices

User Authentication		Device MANDATORY	
Function	Service	Requirement	
WS-Usenametoken Authentication	Core	M	
HTTP Digest	Core	O	

#### 7.1.4 User authentication Function List for Clients

User Authentication		Client MANDATORY	
Function	Service	Requirement	
WS-Usenametoken Authentication	Core	M	
HTTP Digest	Core	M	

## 7.2 Capabilities

- **Querying device for capabilities.**

### 7.2.1 Device requirements

- **Capabilities and WSDL URL operations as detailed in the Core Specification.**

### 7.2.2 Client requirements

- **Client shall be able to get Capabilities of a device using GetCapabilities.**

### 7.2.3 Capabilities Function List for Devices

Capabilities		Device MANDATORY	
Function	Service	Requirement	
GetCapabilities	Device	M	
GetWsdUrl	Device	M	

### 7.2.4 Capabilities Function List for Clients

Capabilities		Client MANDATORY	
Function	Service	Requirement	
GetCapabilities	Device	M	
GetWsdUrl	Device	O	

## 7.3 Discovery

- **Discovery of a device on the network.**
- **Setting of discovery mode.**
- **Listing, adding, modifying and removing of discovery scopes.**

### 7.3.1 Device requirements

- **WS-Discovery as covered by the core specification.**
- **Discovery configuration and scope operations as covered by the device service.**

### 7.3.2 Client requirements (if supported)

- **Client shall be able to discover a device using WS-Discovery as specified in the core specification.**

### 7.3.3 Discovery Function List for Devices

Discovery		Device MANDATORY	
Function	Service	Requirement	
WS-Discovery	Core	M	
GetDiscoveryMode	Device	M	
SetDiscoveryMode	Device	M	
GetScopes	Device	M	
SetScopes	Device	M	
AddScopes	Device	M	
RemoveScopes	Device	M	

### 7.3.4 Discovery Function List for Clients

Discovery		Client CONDITIONAL	
Function	Service	Requirement	
WS-Discovery	Core	M	
GetDiscoveryMode	Device	O	
SetDiscoveryMode	Device	O	
GetScopes	Device	O	
SetScopes	Device	O	
AddScopes	Device	O	
RemoveScopes	Device	O	

## 7.4 Network Configuration

- Configuration of network settings on the device.

### 7.4.1 Device requirements

- Device shall support Hostname, DNS, network interface, network protocol and network default gateway operations as covered by the device service.

### 7.4.2 Client requirements (if supported)

- If configuring a device’s network configuration is supported in any way by the client, the client shall be able to list and configure the device network interface using the **GetNetworkInterfaces** and **SetNetworkInterfaces** operations.
- If configuring a device’s network configuration is supported in any way by the client, the client shall be able to list and set the default gateway of the device using the **GetNetworkDefaultGateway** and **SetNetworkDefaultGateway** operations.

### 7.4.3 Network Configuration Function List for Devices

Network Configuration		Device MANDATORY	
Function	Service	Requirement	
GetHostname	Device	M	
SetHostname	Device	M	
GetDNS	Device	M	
SetDNS	Device	M	
GetNetworkInterfaces	Device	M	
SetNetworkInterfaces	Device	M	
GetNetworkProtocols	Device	M	
SetNetworkProtocols	Device	M	
GetNetworkDefaultGateway	Device	M	
SetNetworkDefaultGateway	Device	M	

### 7.4.4 Network Configuration Function List for Clients

Network Configuration		Client CONDITIONAL	
Function	Device	Requirement	
GetHostname	Device	O	
SetHostname	Device	O	
GetDNS	Device	O	
SetDNS	Device	O	
GetNetworkInterfaces	Device	M	
SetNetworkInterfaces	Device	M	
GetNetworkProtocols	Device	O	
SetNetworkProtocols	Device	O	
GetNetworkDefaultGateway	Device	M	
SetNetworkDefaultGateway	Device	M	

## 7.5 System

- Configuration of system settings.
- Device information.

### 7.5.1 Device requirements

- Device shall support get information, date and time, factory defaults and reboot operations as covered by the device service.

### 7.5.2 Client requirements (if supported)

- Client shall be able to get device information such as manufacturer, model and firmware version using the GetDeviceInformation operation.

### 7.5.3 System Function List for Devices

System		Device MANDATORY	
Function	Service	Requirement	
GetDeviceInformation	Device	M	
GetSystemDateAndTime	Device	M	
SetSystemDateAndTime	Device	M	
SetSystemFactoryDefault	Device	M	
Reboot	Device	M	

### 7.5.4 System Function List for Clients

System		Client CONDITIONAL	
Function	Service	Requirement	
GetDeviceInformation	Device	M	
GetSystemDateAndTime	Device	O	
SetSystemDateAndTime	Device	O	
SetSystemFactoryDefault	Device	O	
Reboot	Device	O	

## 7.6 User Handling

- **Manage users on the device.**

### 7.6.1 Device requirements

- **Device shall support user handling operations as covered by the device service.**

### 7.6.2 Client requirements (if supported)

- **Client shall be able to create, list, modify and delete users from the device using the CreateUsers, GetUsers, SetUser and DeleteUsers operations.**

### 7.6.3 User Handling Function List for Devices

User Handling		Device MANDATORY	
Function	Service	Requirement	
GetUsers	Device	M	
CreateUsers	Device	M	
DeleteUsers	Device	M	
SetUser	Device	M	

### 7.6.4 User Handling Function List for Clients

User Handling		Client CONDITIONAL	
Function	Service	Requirement	
GetUsers	Device	M	
CreateUsers	Device	M	
DeleteUsers	Device	M	
SetUser	Device	M	

## 7.7 Event handling

- **Retrieving and filtering of events from a device**

### 7.7.1 Device Requirements

- **WS-BaseNotification as covered by the event service shall be supported.**
- **Event and pull point operations as covered by the event service shall be supported.**

### 7.7.2 Client Requirements (if supported)

- **Client shall be able to use at least one way to retrieve events out of the following:**
  - **“Pull” using the CreatePullPointSubscription and PullMessage operations.**
  - **“Push” using Notify, Subscribe and Renew operations from WS-BaseNotification.**

### 7.7.3 Event Handling Function List for Devices

Event Handling		Device MANDATORY	
Function	Service	Requirement	
Notify	Event	M	
Subscribe	Event	M	
Renew	Event	M	
Unsubscribe	Event	M	
SetSynchronizationPoint	Event	M	
CreatePullPointSubscription	Event	M	
PullMessages	Event	M	
GetEventProperties	Event	M	
TopicFilter	Event	M	
MessageContentFilter	Event	M	

### 7.7.4 Event Handling Function List for Clients

Event Handling		Client Conditional	
Function	Service	Requirement	
Notify	Event	M*	
Subscribe	Event		
Renew	Event		
Unsubscribe	Event	O	
SetSynchronizationPoint	Event	O	
CreatePullPointSubscription	Event	M*	
PullMessages	Event		
GetEventProperties	Event	O	
TopicFilter	Event	O	
MessageContentFilter	Event	O	

\*Client shall implement one or both from PullPoint and Base-Notification to support Event Handling.



## 7.8 Video Streaming

- Listing of media profiles
- Streaming of video using RTSP

### 7.8.1 Device Requirements

- At least one ready-to-use Media Profile for Video Streaming
- Stream URI and profile operations as covered by the media service.
- Media streaming over RTSP as covered by the streaming specification.

### 7.8.2 Client Requirements

- Client shall be able to list media profiles from the device using the **GetProfiles** operation.
- Client shall be able to get the stream URI for the selected profile using the **GetStreamURI** operation.
- Client shall be able to stream video on RTP/UDP or RTP/RTSP/HTTP/TCP using the selected profile over RTSP.

### 7.8.3 Video Streaming Function List for Devices

Video Streaming		Device MANDATORY	
Function	Service	Requirement	
GetProfiles	Media	M	
GetStreamUri	Media	M	
Media Streaming using RTSP	Streaming	M	

### 7.8.4 Video Streaming Function List for Clients

Video Streaming		Client MANDATORY	
Function	Service	Requirement	
GetProfiles	Media	M	
GetStreamUri	Media	M	
Media Streaming using RTSP	Streaming	M	

## 7.9 Video Streaming – MJPEG

- Streaming of MJPEG video using RTSP.
- Sub-feature of 7.8 Video Streaming.

### 7.9.1 Device requirements

- Device shall declare MJPEG Option in VideoEncoderConfigurationOptions.
- Device shall be able to stream MJPEG according to the Streaming Specification.

### 7.9.2 Client requirements

- Client shall be able to receive a stream and decode MJPEG video using the selected profile over RTSP.
- Client shall be able to understand RTSP – JPEG RTP header extension.

### 7.9.3 Video Streaming – MJPEG Function List for Devices

Video Streaming – MJPEG		Device MANDATORY	
Function	Service	Requirement	
MJPEG Media streaming using RTSP	Streaming	M	
Media Streaming using RTSP - JPEG RTP header extension	Streaming	C	

### 7.9.4 Video Streaming – MJPEG Function List for Clients

Video Streaming – MJPEG		Client MANDATORY	
Function	Service	Requirement	
Receiving and decoding MJPEG Media stream using RTSP	Streaming	M	
Media Streaming using RTSP - JPEG RTP header extension	Streaming	M	

## 7.10 Video Encoder Configuration

- Listing and modification of video encoder configurations on the device.

### 7.10.1 Device requirements

- The device shall return its capabilities for the maximum number of concurrent streams in `GetGuaranteedNumberOfVideoEncoderInstances` response.
- Video encoder configuration operations as covered by the media service.

### 7.10.2 Client requirements

- Client shall be able to modify video encoder configurations using the `GetVideoEncoderConfigurationOptions` and `SetVideoEncoderConfiguration` operations.

### 7.10.3 Video Encoder Configuration Function List for Devices

Video Encoder Configuration		Device MANDATORY	
Function	Service	Requirement	
<code>GetVideoEncoderConfiguration</code>	Media	M	
<code>GetVideoEncoderConfigurations</code>	Media	M	
<code>AddVideoEncoderConfiguration</code>	Media	M	
<code>RemoveVideoEncoderConfiguration</code>	Media	M	
<code>SetVideoEncoderConfiguration</code>	Media	M	
<code>GetCompatibleVideoEncoderConfigurations</code>	Media	M	
<code>GetVideoEncoderConfigurationOptions</code>	Media	M	
<code>GetGuaranteedNumberOfVideoEncoderInstances</code>	Media	M	

### 7.10.4 Video Encoder Configuration Function List for Clients

Video Encoder Configuration		Client MANDATORY	
Function	Service	Requirement	
<code>GetVideoEncoderConfiguration</code>	Media	O	
<code>GetVideoEncoderConfigurations</code>	Media	O	
<code>AddVideoEncoderConfiguration</code>	Media	O	
<code>RemoveVideoEncoderConfiguration</code>	Media	O	
<code>SetVideoEncoderConfiguration</code>	Media	M	
<code>GetCompatibleVideoEncoderConfigurations</code>	Media	O	
<code>GetVideoEncoderConfigurationOptions</code>	Media	M	
<code>GetGuaranteedNumberOfVideoEncoderInstances</code>	Media	O	

## 7.11 Media Profile Configuration

- **Creation, retrieval and deletion of media profiles**

### 7.11.1 Device requirements

- **Media profile operations as covered by the media service**

### 7.11.2 Client requirements (if supported)

- **Client shall be able to list available profiles using the GetProfiles operation.**
- **Client shall be able to create a media profile using the CreateProfile operation.**

### 7.11.3 Media Profile Configuration Function List for Devices

Media Profile Configuration		Device <b>MANDATORY</b>	
Function	Service	Requirement	
GetProfiles	Media	M	
GetProfile	Media	M	
CreateProfile	Media	M	
DeleteProfile	Media	M	

### 7.11.4 Media Profile Configuration Function List for Clients

Media Profile Configuration		Client <b>CONDITIONAL</b>	
Function	Service	Requirement	
GetProfiles	Media	M	
GetProfile	Media	O	
CreateProfile	Media	M	
DeleteProfile	Media	O	

## 7.12 Video Source Configuration

- Listing and modification of video source configurations on the device.

### 7.12.1 Device requirements

- Video source and video source configuration operations as covered by the media service.

### 7.12.2 Client requirements (if supported)

- Client shall be able to modify and add video source configurations using the `GetCompatibleVideoSourceConfigurations`, `GetVideoSourceConfigurationOptions`, `SetVideoSourceConfiguration` and `AddVideoSourceConfiguration` operations.

### 7.12.3 Video Source Configuration Function List for Devices

Video Source Configuration		Device MANDATORY	
Function	Service	Requirement	
<code>GetVideoSources</code>	Media	M	
<code>GetVideoSourceConfiguration</code>	Media	M	
<code>GetVideoSourceConfigurations</code>	Media	M	
<code>AddVideoSourceConfiguration</code>	Media	M	
<code>RemoveVideoSourceConfiguration</code>	Media	M	
<code>SetVideoSourceConfiguration</code>	Media	M	
<code>GetCompatibleVideoSourceConfigurations</code>	Media	M	
<code>GetVideoSourceConfigurationOptions</code>	Media	M	

### 7.12.4 Video Source Configuration Function List for Clients

Video Source Configuration		Client CONDITIONAL	
Function	Service	Requirement	
<code>GetVideoSources</code>	Media	O	
<code>GetVideoSourceConfiguration</code>	Media	O	
<code>GetVideoSourceConfigurations</code>	Media	O	
<code>AddVideoSourceConfiguration</code>	Media	M	
<code>RemoveVideoSourceConfiguration</code>	Media	O	
<code>SetVideoSourceConfiguration</code>	Media	M	
<code>GetCompatibleVideoSourceConfigurations</code>	Media	M	
<code>GetVideoSourceConfigurationOptions</code>	Media	M	

## 7.13 Metadata Configuration

- Listing and modification of metadata configuration on the device.

### 7.13.1 Device requirements

- Metadata configuration operations as covered by the media service.

### 7.13.2 Client requirements (if supported)

- Client shall be able to modify metadata configurations using the, **GetMetaDataConfigurationOptions** and **SetMetaDataConfiguration** operations.

### 7.13.3 Metadata Configuration Function List for Devices

Metadata Configuration		Device MANDATORY	
Function	Service	Requirement	
GetMetadataConfiguration	Media	M	
GetMetadataConfigurations	Media	M	
AddMetadataConfiguration	Media	M	
RemoveMetadataConfiguration	Media	M	
SetMetadataConfiguration	Media	M	
GetCompatibleMetadataConfigurations	Media	M	
GetMetadataConfigurationOptions	Media	M	

### 7.13.4 Metadata Configuration Function List for Clients

Metadata Configuration		Client CONDITIONAL	
Function	Service	Requirement	
GetMetadataConfiguration	Media	O	
GetMetadataConfigurations	Media	O	
AddMetadataConfiguration	Media	O	
RemoveMetadataConfiguration	Media	O	
SetMetadataConfiguration	Media	M	
GetCompatibleMetadataConfigurations	Media	O	
GetMetadataConfigurationOptions	Media	M	

## 8 Profile Conditional Features (normative)

The Profile Conditional Features section list the features that shall be implemented if the device or client supports the feature. For instance a device implementing Firmware Update in the native API shall also implement the ONVIF Firmware Update interface as specified in the [ONVIF Network Interface Specifications]. The requirements represent the minimum functionality that must be implemented for conformance.

### 8.1 Video Streaming – MPEG4 (if supported)

- **Streaming of MPEG4 video using RTSP.**
- **Sub-feature of Video Streaming.**

#### 8.1.1 Device requirements (if supported)

- **Device shall declare MPEG4 option in VideoEncoderConfigurationOptions.**
- **Device shall be able to stream MPEG4 according to the Streaming Specification.**
- **Device shall send a key frame on-demand upon reception of SetSynchronizationPoint request when streaming MPEG4.**

#### 8.1.2 Client requirements (if supported)

- **Client shall be able to receive a stream and decode MPEG4 video using the selected profile over RTSP.**

#### 8.1.3 Video Streaming – MPEG4 Function List for Devices

Video Streaming – MPEG4		Device CONDITIONAL	
Function	Service	Requirement	
MPEG4 Media streaming	Streaming	M	
SetSynchronizationPoint	Media	M	

#### 8.1.4 Video Streaming – MPEG4 Function List for Clients

Video Streaming – MPEG4		Client CONDITIONAL	
Function	Service	Requirement	
Receiving and decoding of MPEG4 Media stream	Streaming	M	
SetSynchronizationPoint	Media	O	

## 8.2 Video Streaming – H264 (if supported)

- Streaming of H264 video using RTSP
- Sub-feature of Video Streaming

### 8.2.1 Device requirements (if supported)

- Device shall declare H264 option in VideoEncoderConfigurationOptions.
- Device shall be able to stream H264 according to the Streaming Specification.
- Device shall send a key frame on-demand upon reception of SetSynchronizationPoint request when streaming H264.

### 8.2.2 Client requirements (if supported)

- Client shall be able to receive a stream and decode H264 video using the selected profile over RTSP.

### 8.2.3 Video Streaming – H264 Function List for Devices

Video Streaming – H264		Device CONDITIONAL	
Function	Service	Requirement	
H264 Media streaming	Streaming	M	
SetSynchronizationPoint	Media	M	

### 8.2.4 Video Streaming – H264 Function List for Clients

Video Streaming – H264		Client CONDITIONAL	
Function	Service	Requirement	
Receiving and decoding H264 Media stream	Streaming	M	
SetSynchronizationPoint	Media	O	



## 8.3 PTZ (if supported)

- **Moving and stopping a PTZ device using continuous move.**

### 8.3.1 Device requirements (if supported)

- **Device shall return PTZ capabilities in GetCapabilities response.**
- **Device shall return its PTZ status in GetStatus response.**
- **Continuous Move and Stop operations, and Continuous Velocity Spaces as covered by the PTZ service.**
- **Device shall expose all its PTZ Nodes via the GetNodes and GetNode operation.**
- **PTZ configuration operations as covered by the media service and the PTZ service.**

### 8.3.2 Client requirements (if supported)

- **Client shall be able to read PTZ capabilities from a PTZ node using GetNodes or GetNode operations.**
- **Client shall be able to add a PTZ configuration to a profile using GetConfigurations and AddPTZConfiguration.**
- **Client shall be able to move a PTZ device using the ContinuousMove operation.**
- **Client shall be able to stop a PTZ device using the Stop operation.**

### 8.3.3 PTZ Function List for Devices

PTZ		Device CONDITIONAL	
Function	Service	Requirement	
AddPTZConfiguration	Media	M	
RemovePTZConfiguration	Media	M	
GetNodes	PTZ	M	
GetNode	PTZ	M	
GetConfigurations	PTZ	M	
GetConfiguration	PTZ	M	
GetConfigurationOptions	PTZ	M	
SetConfiguration	PTZ	M	
ContinuousMove	PTZ	M	
Stop	PTZ	M	
GetStatus	PTZ	M	

### 8.3.4 PTZ Function List for Clients

<b>PTZ</b>		<b>Client CONDITIONAL</b>	
<b>Function</b>	<b>Service</b>	<b>Requirement</b>	
AddPTZConfiguration	Media	M	
RemovePTZConfiguration	Media	O	
GetNodes	PTZ	M	
GetNode	PTZ	M	
GetConfigurations	PTZ	M	
GetConfiguration	PTZ	O	
GetConfigurationOptions	PTZ	O	
SetConfiguration	PTZ	O	
ContinuousMove	PTZ	M	
Stop	PTZ	M	
GetStatus	PTZ	O	

## 8.4 PTZ – Absolute Positioning (if supported)

- **Moving a PTZ device to an absolute position.**
- **Sub-feature of PTZ.**

### 8.4.1 Device requirements (if supported)

- **AbsoluteMove operation, Absolute Position and Generic Speed Spaces as covered by the PTZ service.**

### 8.4.2 Client requirements (if supported)

- **Client shall be able to move a PTZ device using the AbsoluteMove operation.**

### 8.4.3 PTZ – Absolute Positioning Function List for Devices

PTZ – Absolute Positioning		Device <b>CONDITIONAL</b>	
Function	Service	Requirement	
AbsoluteMove	PTZ	M	

### 8.4.4 PTZ – Absolute Positioning Function List for Clients

PTZ – Absolute Positioning		Client <b>CONDITIONAL</b>	
Function	Service	Requirement	
AbsoluteMove	PTZ	M	

## 8.5 PTZ – Relative Positioning (if supported)

- Moving a PTZ device to a relative position.
- Sub-feature of PTZ.

### 8.5.1 Device requirements (if supported)

- RelativeMove operation, Relative Translation and Generic Speed Spaces as covered by the PTZ service.

### 8.5.2 Client requirements (if supported)

- Client shall be able to move a PTZ device using the RelativeMove operation.

### 8.5.3 PTZ – Relative Positioning Function List for Devices

PTZ – Relative Positioning		Device CONDITIONAL	
Function	Service	Requirement	
RelativeMove	PTZ	M	

### 8.5.4 PTZ – Relative Positioning Function List for Clients

PTZ – Relative Positioning		Client CONDITIONAL	
Function	Service	Requirement	
RelativeMove	PTZ	M	

## 8.6 PTZ – Presets (if supported)

- Listing of presets.
- Moving a PTZ device to a preset.
- Sub-feature of PTZ.

### 8.6.1 Device requirements (if supported)

- A PTZ node with the **MaximumNumberOfPresets** capability set to at least 1.
- Preset operations as covered by the PTZ service.

### 8.6.2 Client requirements (if supported)

- Client shall be able to list the presets using the **GetPresets** operation.
- Client shall be able to move a PTZ device to a specific preset using the **GotoPreset** operation.

### 8.6.3 PTZ – Presets Function List for Devices

PTZ – Presets		Device CONDITIONAL	
Function	Service	Requirement	
SetPreset	PTZ	M	
GetPresets	PTZ	M	
GotoPreset	PTZ	M	
RemovePreset	PTZ	M	

### 8.6.4 PTZ – Presets Function List for Clients

PTZ – Presets		Client CONDITIONAL	
Function	Service	Requirement	
SetPreset	PTZ	O	
GetPresets	PTZ	M	
GotoPreset	PTZ	M	
RemovePreset	PTZ	O	

## 8.7 PTZ – Home Position (if supported)

- Moving a PTZ device to its home position.
- Sub-feature of PTZ.

### 8.7.1 Device requirements (if supported)

- A PTZ node with the HomeSupported capability set to “true”.
- Home position operations as covered by the PTZ service.

### 8.7.2 Client requirements (if supported)

- Client shall be able to move a PTZ device to its home position using the GotoHomePosition operation.

### 8.7.3 PTZ – Home Position Function List for Devices

PTZ – Home Position		Device CONDITIONAL	
Function	Service	Requirement	
GotoHomePosition	PTZ	M	
SetHomePosition	PTZ	C	

### 8.7.4 PTZ – Home Position Function List for Clients

PTZ – Home Position		Client CONDITIONAL	
Function	Service	Requirement	
GotoHomePosition	PTZ	M	
SetHomePosition	PTZ	O	

## 8.8 PTZ – Auxiliary Command (if supported)

- Support for PTZ specific auxiliary commands.
- Sub-feature of PTZ.

### 8.8.1 Device requirements (if supported)

- A PTZ node containing a non-empty list of auxiliary commands in the **AuxiliaryCommands** capability.
- Auxiliary command operation as covered by the PTZ service.

### 8.8.2 Client requirements (if supported)

- Client shall be able to send auxiliary command to a PTZ device using the **SetAuxiliaryCommand** operation.

### 8.8.3 PTZ – Auxiliary Command Function List for Devices

PTZ – Auxiliary Command		Device <b>CONDITIONAL</b>	
Function	Service	Requirement	
SendAuxiliaryCommand	PTZ	M	

### 8.8.4 PTZ – Auxiliary Command Position Function List for Clients

PTZ – Auxiliary Command		Client <b>CONDITIONAL</b>	
Function	Service	Requirement	
SendAuxiliaryCommand	PTZ	M	

## 8.9 Audio Streaming (if supported)

- **Streaming of Audio.**

### 8.9.1 Device requirements (if supported)

- **Device shall declare G711 option in AudioEncoderConfigurationOptions.**
- **Device shall be able to stream G711 according to the Streaming Specification.**
- **Audio source, audio source configuration and audio encoder configuration operations as covered by the media service.**

### 8.9.2 Client requirements (if supported)

- **Client shall be able to receive a stream and playback audio in G.711  $\mu$  Law (Simplex-Camera Microphone Only, 1ch) codec.**
- **Client shall be able to configure a media profile for audio streaming using the GetCompatibleAudioSourceConfigurations, AddAudioSourceConfiguration, GetCompatibleAudioEncoderConfigurations, and AddAudioEncoderConfiguration operations.**

### 8.9.3 Audio Streaming Function List for Devices

Audio Streaming		Device	CONDITIONAL
Function	Service	Requirement	
GetAudioSources	Media	M	
GetAudioSourceConfiguration	Media	M	
GetAudioSourceConfigurations	Media	M	
AddAudioSourceConfiguration	Media	M	
RemoveAudioSourceConfiguration	Media	M	
SetAudioSourceConfiguration	Media	M	
GetCompatibleAudioSourceConfigurations	Media	M	
GetAudioSourceConfigurationOptions	Media	M	
GetAudioEncoderConfiguration	Media	M	
GetAudioEncoderConfigurations	Media	M	
AddAudioEncoderConfiguration	Media	M	
RemoveAudioEncoderConfiguration	Media	M	
SetAudioEncoderConfiguration	Media	M	
GetCompatibleAudioEncoderConfigurations	Media	M	
GetAudioEncoderConfigurationOptions	Media	M	



## 8.9.4 Audio Streaming Function List for Clients

Audio Streaming		Client CONDITIONAL	
Function	Service	Requirement	
GetAudioSources	Media	O	
GetAudioSourceConfiguration	Media	O	
GetAudioSourceConfigurations	Media	O	
AddAudioSourceConfiguration	Media	M	
RemoveAudioSourceConfiguration	Media	O	
SetAudioSourceConfiguration	Media	O	
GetCompatibleAudioSourceConfigurations	Media	M	
GetAudioSourceConfigurationOptions	Media	O	
GetAudioEncoderConfiguration	Media	O	
GetAudioEncoderConfigurations	Media	O	
AddAudioEncoderConfiguration	Media	M	
RemoveAudioEncoderConfiguration	Media	O	
SetAudioEncoderConfiguration	Media	O	
GetCompatibleAudioEncoderConfigurations	Media	M	
GetAudioEncoderConfigurationOptions	Media	O	

## 8.10 Audio Streaming – G726 (if supported)

- **Streaming of G726 audio using RTSP**
- **Sub-feature of Audio Streaming**

### 8.10.1 Device requirements (if supported)

- **Device shall declare G726 option in AudioEncoderConfigurationOptions.**
- **Device shall be able to stream G726 according to the Streaming Specification.**

### 8.10.2 Client requirements (if supported)

- **Client shall be able to receive a stream and decode G726 audio using the selected profile over RTSP.**

### 8.10.3 Audio Streaming – G726 Function List for Devices

**No specific function requirement in addition to those listed in 8.9.3.**

### 8.10.4 Audio Streaming – G726 Function List for Clients

**No specific function requirement in addition to those listed in 8.9.4.**

## 8.11 Audio Streaming – AAC (if supported)

- **Streaming of AAC audio using RTSP**
- **Sub-feature of Audio Streaming**

### 8.11.1 Device requirements (if supported)

- **Device shall declare AAC option in AudioEncoderConfigurationOptions.**
- **Device shall be able to stream AAC according to the Streaming Specification.**

### 8.11.2 Client requirements (if supported)

- **Client shall be able to receive a stream and decode AAC audio using the selected profile over RTSP.**

### 8.11.3 Audio Streaming – AAC Function List for Devices

**No specific function requirement in addition to those listed in 8.9.3.**

### 8.11.4 Audio Streaming – AAC Function List for Clients

**No specific function requirement in addition to those listed in 8.9.4.**

## 8.12 Multicast Streaming (if supported)

- Streaming video over multicast.
- Sub-feature of Video Streaming.

### 8.12.1 Device requirements (if supported)

- Device shall return Media->Streaming->RTPMulticast capability set to “true” in GetCapabilities response.
- Multicast streaming operations as covered by the media service.

### 8.12.2 Client requirements (if supported)

- Client shall be able to control multicast streaming using RTSP or the StartMultiCastStreaming and StopMultiCastStreaming operations.
- Client shall be able to receive a multicast stream sent by a device.

### 8.12.3 Multicast Streaming Function List for Devices

Multicast Streaming		Device <b>CONDITIONAL</b>	
Function	Service	Requirement	
StartMulticastStreaming	Media	M	
StopMulticastStreaming	Media	M	

### 8.12.4 Multicast Streaming Function List for Clients

Multicast Streaming		Client <b>CONDITIONAL</b>	
Function	Service	Requirement	
StartMulticastStreaming	Media	C	
StopMulticastStreaming	Media	C	

## 8.13 Relay Outputs (if supported)

- Listing, configuration and triggering of relay outputs

### 8.13.1 Device requirements (if supported)

- Device shall return Device->IO->RelayOutputs capability set to at least 1 in GetCapabilities response.
- Relay output operations as covered by the device service.

### 8.13.2 Client requirements (if supported)

- Client shall be able to list available relay outputs using the GetRelayOutputs operation.
- Client shall be able to set the settings of a relay output using the SetRelayOutputSettings operation.
- Client shall be able to trigger a relay output using the SetRelayOutputState operation.

### 8.13.3 Relay Outputs Function List for Devices

Relay Outputs		Device CONDITIONAL	
Function	Service	Requirement	
GetRelayOutputs	Device	M	
SetRelayOutputSettings	Device	M	
SetRelayOutputState	Device	M	

### 8.13.4 Relay Outputs Function List for Clients

Relay Outputs		Client CONDITIONAL	
Function	Service	Requirement	
GetRelayOutputs	Device	M	
SetRelayOutputSettings	Device	M	
SetRelayOutputState	Device	M	

## 8.14 NTP (if supported)

- Synchronization of time using NTP servers.

### 8.14.1 Device requirements (if supported)

- NTP operations as covered by the device service.

### 8.14.2 Client requirements (if supported)

- Client shall be able to configure NTP servers on a device using GetNTP and SetNTP operations.

### 8.14.3 NTP Function List for Devices

NTP		Device CONDITIONAL	
Function	Service	Requirement	
GetNTP	Device	M	
SetNTP	Device	M	

### 8.14.4 NTP Function List for Clients

NTP		Client CONDITIONAL	
Function	Service	Requirement	
GetNTP	Device	M	
SetNTP	Device	M	

## 8.15 Dynamic DNS (if supported)

- **Configuration of Dynamic DNS.**

### 8.15.1 Device requirements (if supported)

- **Device shall return Device->Network->DynDNS capability set to “true” in GetCapabilities response.**
- **Dynamic DNS operations as covered by the device service.**

### 8.15.2 Client requirements (if supported)

- **Client shall be able to configure Dynamic DNS on device using GetDynamicDNS and SetDynamicDNS operations.**

### 8.15.3 Dynamic DNS Function List for Devices

Dynamic DNS		Device CONDITIONAL	
Function	Service	Requirement	
GetDynamicDNS	Device	M	
SetDynamicDNS	Device	M	

### 8.15.4 Dynamic DNS Function List for Clients

Dynamic DNS		Client CONDITIONAL	
Function	Service	Requirement	
GetDynamicDNS	Device	M	
SetDynamicDNS	Device	M	

## 8.16 Zero Configuration (if supported)

- **Configuration of Zero Configuration.**

### 8.16.1 Device requirements (if supported)

- **Device shall return Device->Network->ZeroConfiguration capability set to “true” in GetCapabilities response.**
- **Zero Configuration operations as covered by the device service.**

### 8.16.2 Client requirements (if supported)

- **Client shall be able to configure Zero Configuration on device using GetZeroConfiguration and SetZeroConfiguration operations.**

### 8.16.3 Zero Configuration Function List for Devices

Zero Configuration		Device CONDITIONAL	
Function	Service	Requirement	
GetZeroConfiguration	Device	M	
SetZeroConfiguration	Device	M	

### 8.16.4 Zero Configuration Function List for Clients

Zero Configuration		Client CONDITIONAL	
Function	Service	Requirement	
GetZeroConfiguration	Device	M	
SetZeroConfiguration	Device	M	



## 8.17 IP Address Filtering (if supported)

- **Configuration of IP Address Filters.**

### 8.17.1 Device requirements (if supported)

- **Device shall return Device->Network->IPFilter capability set to “true” in GetCapabilities response.**
- **IP Address Filter operations as covered by the device service.**

### 8.17.2 Client requirements (if supported)

- **Client shall be able to configure, add and remove IP Address Filters on device using GetIPAddressFilter, SetIPAddressFilter, AddIPAddressFilter and RemoveIPAddressFilter operations.**

### 8.17.3 Relay Outputs Function List for Devices

Relay Outputs		Device <b>CONDITIONAL</b>	
Function	Service	Requirement	
GetIPAddressFilter	Device	M	
SetIPAddressFilter	Device	M	
AddIPAddressFilter	Device	M	
RemoveIPAddressFilter	Device	M	

### 8.17.4 Relay Outputs Function List for Clients

Relay Outputs		Client <b>CONDITIONAL</b>	
Function	Service	Requirement	
GetIPAddressFilter	Device	M	
SetIPAddressFilter	Device	M	
AddIPAddressFilter	Device	M	
RemoveIPAddressFilter	Device	M	

## 9 Device Discovery

### 9.1 Device Requirements

An ONVIF device shall implement device discovery as specified in the ONVIF Core Specification.

A device compliant to this specification shall additionally include the specific scope parameter as presented in Table 1: Scope parameters. Apart from this pre-defined parameter, it shall be possible to set any scope parameter as defined by the device owner. Scope parameters can be listed and set through the commands provided by the Device service, defined in the ONVIF Core Specification.

Table 1: Scope parameters

Category	Defined values	Description
Profile	Streaming	The Streaming scope indicates if the device is compliant to the Profile S. A device compliant to the Profile S shall include a scope entry with this value in its scope list.

### 9.2 Types

Section "Discovery definitions" of the ONVIF Core Specification defines a generic tds:Device for the <d:Types> declaration.

For backward compatibility reason a device compliant to this specification shall also include dn:NetworkVideoTransmitter in the <d:Types> declaration and it may omit tds:Device.