ONVIF
Profile G Specification

RELEASE CANDIDATE

Version 2.0
March 2014

Revision History

Ver.	Date	Description
1.0 RC	4 August 2013	
1.1 RC	21 August 2013	Updated version to 1.0 RC and date to February 2014 Clarified requirement for SetTrackConfiguration (#264) Added “(If Supported)” to section headings as appropriate (#294)
1.2 RC	21 November 2013	#1275 Added Conditional Requirement for Audio Recording #1284 Removed requirement for type NetworkVideoTransmitter
1.3 RC	19 February 2014	The Requirement Level for PTZ Search and Metadata Search features have been changed to Optional and are longer included in this Profile Specification Clarify Media Streaming for Receiver#1293 - RecordingJobStateChange event Requirement Level changed to Mandatory
1.3-1 RC	21 February 2014	Include the full Topic path in the function tables Remove Media Streaming from the receiver source recording control function list Editorial updates
1.3-2 RC	24 February 2014	Clarification to Section 7.2.1
2.0 RC	12. March 2014	Release Candidate version 2.0

CONTENTS

1 Scope

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

2 Normative references

ONVIF Profile Policy
http://www.onvif.org/Documents/Specifications.aspx >
ONVIF Network Interface Specification Set
< http://www.onvif.org/Documents/Specifications.aspx >
ONVIF Core Specification
< http://www.onvif.org/Documents/Specifications.aspx >
ONVIF Recording Search Specification
< http://www.onvif.org/Documents/Specifications.aspx >
ONVIF Replay Control Specification
< http://www.onvif.org/Documents/Specifications.aspx >
ONVIF Media Specification
< http://www.onvif.org/Documents/Specifications.aspx >
ONVIF Receiver Specification
< http://www.onvif.org/Documents/Specifications.aspx >
ONVIF Recording Control Specification
< http://www.onvif.org/Documents/Specifications.aspx >
ONVIF Streaming Specification
< http://www.onvif.org/Documents/Specifications.aspx >

3 Terms and Definitions

Profile	See ONVIF Profile Policy.
ONVIF Device	computer appliance or software program that exposes one or multiple ONVIF Web Services
ONVIF Client	computer appliance or software program that uses ONVIF Web Services
Feature	specified distinguishing characteristic or functionality of a device
Metadata	streaming data except video and audio, including video analytics results, PTZ position data and other metadata (such as textual data from POS applications)
Recording	Represents the currently stored media (if any) and metadata on the NVS from a single data source. A recording comprises one or more tracks. A recording can have more than one track of the same type e.g. two different video tracks recorded in parallel with different settings
Recording Event	event associated with a Recording, represented by a notification message
Recording Job	job associated with the transfer of data from a data source to a particular media using a particular configuration
Track	individual data channel consisting of video, audio, or metadata (This definition is consistent with the definition of track in [RFC 2326])

4 Overview

An ONVIF device compliant to the Profile G is an ONVIF device that records video data over an IP network or on the device itself. For example, a device compliant to the Profile G may be an IP network camera or an encoder device.

An ONVIF client compliant to the Profile G is an ONVIF client that can configure, request, and control recording of video data over an IP network from an ONVIF device compliant to the Profile G. The Profile G also includes support for receiving audio and metadata stream if the client supports those features.

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.

5 Technical Specification Version Requirement

Implementation of ONVIF Network Interface Specification Set v2.4 or later is required for conformance to Profile G.

6 Requirement Levels

Each feature in this document has a requirement level for Device and Client that claim conformance to the Profile G 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 a device or client. All features listed in this specification are mandatory unless they are marked with “if supported”
- Conditional = Feature that shall be implemented by devices and clients if they support that functionality in any way, including any proprietary way. Features that are conditional are marked with “if supported” in this specification.

The requirement levels for functions are:

- Mandatory = Function that shall be implemented by a device or client.
- Optional = Function that may be implemented by a device or client
- Conditional = Function that shall be implemented by devices and clients if they support that functionality.

Function Lists use the following abbreviations:

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

All functions shall be implemented as described in corresponding ONVIF service specification document.

7 Profile Mandatory Features (normative)

The Profile Mandatory Features section lists the features that are guaranteed to be supported between a device and client that are both conformant to the profile:

7.1 Security

- HTTP Digest is used for user authentication.

7.1.1 Device Requirements

- A device shall support HTTP Digest as described in the Core Specifcation.

7.1.2 Client Requirements

- A client shall implement HTTP Digest as described in the Core Specifcation.

7.2 Capabilities

- GetServices and GetServiceCapabilities are used to query a device for its capabilities.

7.2.1 Device Requirements

- Device shall support GetServices and GetServiceCapabilities as detailed in the Core Specification.
- Device shall support pull point operations as described in the Core Specification (Event Service).
- Device shall support providing the WSDL using the GetWsdlUrl operation.
- Device shall indicate support for at least two pull point subscriptions by returning MaxPullPoints set to no less than two in the response to GetServiceCapabilities in the event service.

7.2.2 Client Requirements

- Client shall determine the available Services using the GetServices operation.
- Client may determine specific Capabilities of different Services using the GetServiceCapabilities operation.
- Client may retrieve the WSDL using the GetWsdlUrl operation.

7.2.3 Function list for Capabilities

Function	Service	Device	Client
GetServices	Device	M	M
GetServiceCapabilities	Device	M	O
GetWsdlUrl	Device	M	O
GetServiceCapabilities	Recording Control	M	O
GetServiceCapabilities	Replay	M	O
GetServiceCapabilities	Search	M	O
GetServiceCapabilities	Receiver	C	O
GetServiceCapabilities	Event	M	O
GetServiceCapabilities	Media	C	O

7.3 Recording Search – Media Search

- Start a search session, looking for recordings in the scope that matches the search filter defined in the request.
- Get the results from a recording search session previously initiated by a recording search. Response shall not include results already returned in previous requests for the same session.
- Start a search session, looking for events in the scope that matches the search filter defined in the request.
- Get the results from an event previously initiated search session. Response shall not include results already returned in previous requests for the same session.

- Terminate a search previously initiated by a recording or event search operation.
- The GetRecordingSummary operation returns a summary for all recordings, and can be used to provide the scale of a timeline.
- The GetRecordingInformation operation returns information about a single recording (i.e. start time, current status, etc.).
- The GetMediaAttributes operation returns the media attributes of a recording at a specific point in time.

7.3.1 Device Requirements

- Devices shall support recording search with the FindRecordings, GetRecordingSearchResults and EndSearch operations.
- Devices shall support event search with the FindEvents, GetEventSearchResults and EndSearch operations.
- Devices shall support retrieval of information related to recordings with the GetRecordingSummary, GetRecordingInformation and GetMediaAttributes operations.
- Devices shall deliver notifications for Recording and Track state changes.
- Devices shall support XPath dialect expressions as search filters.

7.3.2 Client Requirements

- Clients shall implement recording search using the FindRecordings, GetRecordingSearchResults and EndSearch operations.
- Clients shall implement event search using the FindEvents, GetEventSearchResults and EndSearch operations.
- Clients shall implement retrieval of information relates to recordings using the GetRecordingSummary, GetRecordingInformation and GetMediaAttributes operations if any information provided by those operations is provided by the client in any other way.
- Clients shall receive notifications of Recording state changes if recording control is supported
- Clients shall receive notifications of Track state changes if displaying the state of tracks in real time is supported.
- Clients shall implement XPath dialect expressions to be used as search filters if search filtering is supported.

7.3.3 Function List for Recording Search

Function	Service	Device	Client
GetRecordingSummary	Search	M	C
GetRecordingInformation	Search	M	C
GetMediaAttributes	Search	M	C
FindRecordings	Search	M	M
GetRecordingSearchResults	Search	M	M
FindEvents	Search	M	M
GetEventSearchResults	Search	M	M
EndSearch	Search	M	M
tns1:RecordingHistory/Recording/State	Event	M	C
tns1:RecordingHistory/Track/State	Event	M	C

XPath dialect	Search	M	C

7.4 Replay Control

- Capability to control replay of stored video, audio and metadata.

7.4.1 Device requirements

- Device shall support media replay using the GetReplayUri operation according to the ONVIF Streaming Specification v.2.2.1 or later.
- Device shall include RTP header extension as described in 6.2 RTP header extension of ONVIF Streaming Specification.
- Device shall support the “onvif-replay” feature tag as described in 6.3 RTSP Feature Tag of the ONVIF Streaming Specification.
- Device shall support the RTSP session timeout with the SetReplayConfiguration and GetReplayConfiguration operations.
- Device may support reverse replay.

7.4.2 Client requirements

- Client shall implement media replay using the GetReplayUri operation according to the ONVIF Streaming Specification v.2.2.1 or later.
- Client shall be able to understand the RTP header extension as described in 6.2 RTP header extension of ONVIF Streaming Specification.
- Client shall include the “onvif-replay” feature tag in RTSP requests as described in 6.3 RTSP Feature Tag of the ONVIF Streaming Specification.
- Clients shall implement decoding of all ONVIF supported formats (H.264, MPEG-4, M-JPEG).
- Client shall implement the RTSP session timeout using the SetReplayConfiguration and GetReplayConfiguration operations if the client allows a configurable timeout value for media streaming.
- Client may implement reverse replay.

7.4.3 Function List for Replay Control

Function	Service	Device	Client
GetReplayUri	Replay	M	M
SetReplayConfiguration	Replay	M	C
GetReplayConfiguration	Replay	M	C

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 capable of controlling recordings shall implement the ONVIF Recording Control interface and a client that has recording control support shall utilize the ONVIF Recording Control interface. The requirements represents the minimum required to be implemented for conformance.

8.1 Recording Control – Dynamic Recording (if supported)

- Dynamic configuration of Recordings and Tracks

8.1.1 Device Requirements (if supported)

- Device shall support dynamic recordings with the CreateRecording and DeleteRecording operations if dynamic creation and deletion of recordings is a feature of the device.
- Device shall support notification of created and deleted recordings if dynamic creation and deletion of recordings is a feature of the device.
- Device shall support dynamic tracks with the CreateTrack and DeleteTrack operations if dynamic creation and deletion of tracks is a feature of the device.
- Device shall support notification of created and deleted tracks if dynamic creation and deletion of tracks is a feature of the device.

8.1.2 Client Requirements (if supported)

- Client shall implement dynamic recordings using the CreateRecording and DeleteRecording operations if provisioning recordings is supported.
- Client shall receive notification of created and deleted recordings if provisioning recordings is supported.
- Client shall implement dynamic tracks using the CreateTrack and DeleteTrack operations if provisioning tracks is supported.
- Client shall receive notification of created and deleted tracks if provisioning tracks is supported.

8.1.3 Function List for Recording Control – Dynamic Recording (if supported)

Function	Service	Device	Client
CreateRecording	Recording	C	C
DeleteRecording	Recording	C	C
tns1:RecordingConfig/CreateRecording	Event	C	C
tns1:RecordingConfig/DeleteRecording	Event	C	C

8.1.4 Function List for Recording Control – Dynamic Tracks (if supported)

Function	Service	Device	Client
CreateTrack	Recording	C	C
DeleteTrack	Recording	C	C
tns1:RecordingConfig/CreateTrack	Event	C	C
tns1:RecordingConfig/DeleteTrack	Event	C	C

9 Device Mandatory Features (normative)

The Device Mandatory Features section list the features that are mandatory for the device and conditional for Client in order to be conformant.

9.1 Recording Control

- Starting and stopping recording on a device.
- Managing recording jobs on a device.
- A device shall support at least one of 9.1.4 Recording Control – Using an on-board media source (if supported) or 9.1.5 Recording Control – Using a Receiver as Source (if supported).

9.1.1 Device Requirements

- Device shall support retrieving a list of recordings with the GetRecordings operation.
- Device shall support retrieving information about a recording with the GetRecordingOptions operation.
- Device shall support managing recording jobs with the GetRecordingJobs, CreateRecordingJobs and DeleteRecordingJob operations.
- Device shall support managing the state of a recording job with the GetRecordingJobState and SetRecordingJobMode operations.
- Device shall support notification of the change in a recording job's state with the RecordingJobStateChange event.
- Device shall support notification of a change in a recording's content with the DataDeletion event if notification of recording removal is a feature of the device.

9.1.2 Client Requirements (if supported)

- Client shall implement retrieving a list of recordings using the GetRecordings operation if provisioning recording jobs is supported.
- Client may implement retrieving information about a recording using the GetRecordingOptions operation.
- Client shall implement managing recording jobs using the GetRecordingJobs, CreateRecordingJobs and DeleteRecordingJob operations if provisioning recording jobs is supported.
- Client shall implement managing the state of a recording job using the GetRecordingJobState and SetRecordingJobMode operations if provisioning recording jobs is supported.
- Client shall receive notification of the change in a recording job's state with the RecordingJobStateChange event if provisioning recording jobs is supported.
- Client shall receive notification of a change in a recording's content with the DataDeletion event if dynamic update of track/recording content is supported (i.e. Timeline display).

9.1.3 Function List for Recording Control

Function	Service	Device	Client
GetRecordings	Recording	M	C
CreateRecordingJob	Recording	M	C
DeleteRecordingJob	Recording	M	C
GetRecordingJobs	Recording	M	C
GetRecordingJobState	Recording	M	C
SetRecordingJobMode	Recording	M	C
GetRecordingOptions	Recording	M	O
tns1:RecordingConfig/JobState	Event	M	C
tns1:RecordingConfig/DeleteTrackData	Event	C	C

9.1.4 Recording Control – Using an on-board media source (if supported)

- A device which supports both the Recording Control Service and VideoSources (Media Configuration) capabilities shall support configuring the video sources.
- A device which supports both the Recording Control Service and AudioSources (Media Configuration) capabilities shall support configuring the audio sources.

- A device which supports both the Recording Control Service and ProfileCapabilities (Media) shall support configuring video sources, video encoders, media profiles and metadata.

- A device which supports both the Recording Control Service and ProfileCapabilities (Media) shall support configuring audio sources and audio encoders if supported.

9.1.4.1 Device Requirements (if supported)

- A device shall support media profile configuration with the GetProfiles, GetProfile CreateProfile and DeleteProfile operations.

- A device shall support video source configuration with GetVideoSources, GetVideoSourceConfigurations, GetVideoSourceConfiguration, AddVideoSourceConfiguration, RemoveVideoSourceConfiguration, SetVideoSourceConfiguration, GetCompatibleVideoSourceConfigurations and GetVideoSourceConfiguration operations

- A device shall support video encoder configuration with the GetVideoEncoderConfiguration, GetVideoEncoderConfigurations, AddVideoEncoderConfiguration, RemoveVideoEncoderConfiguration, SetVideoEncoderConfiguration, GetCompatibleVideoEncoderConfigurations, GetVideoEncoderConfigurationOptions and GetGuaranteedNumberOfVideoEncoderInstances operations.

- A device maysupport metadata configuration with the GetMetadataConfiguration, GetMetadataConfigurations, AddMetadataConfiguration, RemoveMetadataConfiguration, SetMetadataConfiguration, GetCompatibleMetadataConfigurations and GetMetadataConfigurationOptions operations.

- A device may support audio source configuration with the GetAudioSources, GetAudioSourceConfiguration, GetAudioSourceConfigurations, AddAudioSourceConfiguration, RemoveAudioSourceConfiguration, SetAudioSourceConfiguration, GetCompatibleAudioSourceConfigurations and GetAudioSourceConfigurationOptions operations.

- A device may support audio encoder configuration with the GetAudioEncoderConfiguration, GetAudioEncoderConfigurations, AddAudioEncoderConfiguration, RemoveAudioEncoderConfiguration, SetAudioEncoderConfiguration, GetCompatibleAudioEncoderConfigurations and GetAudioEncoderConfigurationOptions operations.

9.1.4.2 Client Requirements (if supported)

- A client shall implement video encoder configuration using the GetVideoEncoderConfigurations, GetVideoEncoderConfiguration, SetVideoEncoderConfiguration and GetVideoEncoderConfigurationOptions operations.

- A client may implement media profile configuration using the GetProfiles, GetProfile CreateProfile and DeleteProfile operations.

- A client may implement video source configuration using GetVideoSources, GetVideoSourceConfigurations, GetVideoSourceConfiguration, AddVideoSourceConfiguration, RemoveVideoSourceConfiguration, SetVideoSourceConfiguration, GetCompatibleVideoSourceConfigurations and GetVideoSourceConfiguration operations

- A client may implement video encoder configuration using the AddVideoEncoderConfiguration, RemoveVideoEncoderConfiguration, GetCompatibleVideoEncoderConfigurations and GetGuaranteedNumberOfVideoEncoderInstances operations.

- A client may implement metadata configuration using the GetMetadataConfiguration, GetMetadataConfigurations, AddMetadataConfiguration, RemoveMetadataConfiguration, SetMetadataConfiguration, GetCompatibleMetadataConfigurations and GetMetadataConfigurationOptions operations.

- A client may implement audio source configuration using the GetAudioSources, GetAudioSourceConfiguration, GetAudioSourceConfigurations, AddAudioSourceConfiguration, RemoveAudioSourceConfiguration, SetAudioSourceConfiguration, GetCompatibleAudioSourceConfigurations and GetAudioSourceConfigurationOptions operations.

- A client may implement audio encoder configuration using the GetAudioEncoderConfiguration, GetAudioEncoderConfigurations, AddAudioEncoderConfiguration, RemoveAudioEncoderConfiguration, SetAudioEncoderConfiguration, GetCompatibleAudioEncoderConfigurations and GetAudioEncoderConfigurationOptions operations.

9.1.4.3 Function List for Recording Control – Using an on-board media source (if supported)

Feature	Function	Service	ONVIF Device	ONVIF Client
Media Profile Configuration	CreateProfile	Media	M*	C
	DeleteProfile	Media	M*	C
	GetProfiles	Media	M*	C
	GetProfile	Media	M*	C
Video Source Configuration	GetVideoSources	Media	M*	C
	GetVideoSourceConfiguration	Media	M*	C
	GetVideoSourceConfigurations	Media	M*	C
	AddVideoSourceConfiguration	Media	M*	C
	RemoveVideoSourceConfiguration	Media	M*	C
	SetVideoSourceConfiguration	Media	M*	C
	GetCompatibleVideoSourceConfigurations	Media	M*	C
	GetVideoSourceConfigurationOptions	Media	M*	C
Video Encoder Configuration	GetVideoEncoderConfiguration	Media	M*	M
	GetVideoEncoderConfigurations	Media	M*	M
	AddVideoEncoderConfiguration	Media	M*	O
	RemoveVideoEncoderConfiguration	Media	M*	O
	SetVideoEncoderConfiguration	Media	M*	M
	GetCompatibleVideoEncoderConfigurations	Media	M*	O
	GetVideoEncoderConfigurationOptions	Media	M*	M
	GetGuaranteedNumberOfVideoEncoderInstances	Media	M*	O
Metadata Configuration	GetMetadataConfiguration	Media	M*	C
	GetMetadataConfigurations	Media	M*	C
	AddMetadataConfiguration	Media	M*	C
	RemoveMetadataConfiguration	Media	M*	C
	SetMetadataConfiguration	Media	M*	C
	GetCompatibleMetadataConfigurations	Media	M*	C
	GetMetadataConfigurationOptions	Media	M*	C
Audio Source Configuration	GetAudioSources	Media	M**	C
	GetAudioSourceConfiguration	Media	M**	C

Feature	Function	Service	ONVIF Device	ONVIF Client
	GetAudioSourceConfigurations	Media	M**	C
	AddAudioSourceConfiguration	Media	M**	C
	RemoveAudioSourceConfiguration	Media	M**	C
	SetAudioSourceConfiguration	Media	M**	C
	GetCompatibleAudioSourceConfigurations	Media	M**	C
	GetAudioSourceConfigurationOptions	Media	M**	C
Audio Encoder Configuration	GetAudioEncoderConfiguration	Media	M**	C
	GetAudioEncoderConfigurations	Media	M**	C
	AddAudioEncoderConfiguration	Media	M**	C
	RemoveAudioEncoderConfiguration	Media	M**	C
	SetAudioEncoderConfiguration	Media	M**	C
	GetCompatibleAudioEncoderConfigurations	Media	M**	C
	GetAudioEncoderConfigurationOptions	Media	M**	C

*If the device has any on-board media sources
**If the device has any on-board audio sources

9.1.5 Recording Control – Using a Receiver as Source (if supported)

- A device which supports both the Recording Control Service and the Receiver Service such as a Networked Video Recorder (NVR) or a hybrid recorder, shall support configuring receivers as the source for recordings..

9.1.5.1 Device Requirements (if supported)

- Device shall support configuring receivers with the GetReceivers, GetReceiver, CreateReceiver, DeleteReceiver, ConfigureReceiver and SetReceiverMode operations.
- Device shall support providing a receiver's state with the GetReceiverState operation.
- Device shall support notification of a change to a receiver's state.
- Device shall support notification of a failure of the connection between a receiver and its source.
- Device shall provide receiver(s) as an RTSP client endpoint.

9.1.5.2 ClientRequirements (if supported)

- Client shall implement configuring receivers using the GetReceivers, GetReceiver, CreateReceiver, DeleteReceiver, ConfigureReceiver and SetReceiverMode operations if configuring receivers for recording is a feature of the client.
- Client shall implement retrieving a receiver's state using the GetReceiverState operation if configuring receivers for recording is a feature of the client.
- Client shall receive notification of a change in a receiver's state if configuring receivers for recording is a feature of the client.
- Client shall receive notification of a failure of the connection between a receiver and its source if configuring receivers for recording is a feature of the client.

9.1.5.3 Function List for Recording Control – Using a Receiver as Source (if supported)

Feature	Function	Service	ONVIF Device	ONVIF Client
Receiver	GetReceivers	Receiver	M*	C

Feature	Function	Service	ONVIF Device	ONVIF Client
Configuration	GetReceiver	Receiver	M*	C
	CreateReceiver	Receiver	M*	C
	DeleteReceiver	Receiver	M*	C
	ConfigureReceiver	Receiver	M*	C
	SetReceiverMode	Receiver	M*	C
	GetReceiverState	Receiver	M*	C
	tns1:Receiver/ChangeState	Event	M*	C
	tns1:Receiver/ConnectionFailed	Event	M*	C

*If the device supports the Receiver Service

9.2 Configuration of Recordings and Recording Source

- Manage recording configuration on a device (encoder stream, media profile or video channel for the video source).
- Manage track configurations in a recording.
- Manage recording job configuration.

9.2.1 Device Requirements

- Device shall support managing a recording's configuration with the SetRecordingConfiguration and GetRecordingConfiguration operations.
- Device shall support getting a track's configuration with the GetTrackConfiguration operation.
- Device shall support updating a track's description with the SetTrackConfiguration operation if the device supports dynamic tracks.
- Device shall support managing a recording job's configuration with the GetRecordingJobConfiguration and SetRecordingJobConfiguration operations.
- Device shall support notification of a change in a recording's configuration, a track's configuration or a recording job's configuration with the ConfigurationChange event if notification of changes to a recording's configuration is a device feature.

9.2.2 Client Requirements (if supported)

- Client shall implement managing a recording's configuration with the SetRecordingConfiguration and GetRecordingConfiguration operations if provisioning recordings is supported.
- Client shall implement managing a track's configuration with the SetTrackConfiguration and GetTrackConfiguration operations if provisioning recordings and tracks is supported.
- Client shall implement managing a recording job's configuration with the GetRecordingJobConfiguration and SetRecordingJobConfiguration operations if provisioning recordings is supported.
- Client shall receive notification of a change in a recording's configuration, a track's configuration or a recording job's configuration with the ConfigurationChange event if provisioning recordings is supported.

9.2.3 Function List for Recording Source Configuration

Function	Service	Device	Client
SetRecordingConfiguration	Recording	M	C
GetRecordingConfiguration	Recording	M	C
GetTrackConfiguration	Recording	M	C
SetTrackConfiguration	Recording	M	C
SetRecordingJobConfiguration	Recording	M	C
GetRecordingJobConfiguration	Recording	M	C
tns1:RecordingConfig/RecordingConfiguration	Event	C	C
tns1:RecordingConfig/TrackConfiguration	Event	C	C

9.3 Discovery

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

9.3.1 Device requirements

- WS-Discovery as covered by the Core Specification.
- Discovery configuration and scope operations as covered by the device service.
- The specific scope parameter presented in 9.3.4 Scope Parameters

9.3.2 Client requirements (if supported)

- Client shall be able to discover a device using WS-Discovery as specified in the Core Specification.
- Client may be able to get and set discovery mode using the operations GetDiscoveryMode and SetDiscoveryMode.
- Client may be able to list, add, modify and remove discovery scopes using the operations GetScopes, AddScopes, SetScopes and RemoveScopes.

9.3.3 Function List for Discovery

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

*If device discovery on a network is supported in any way by the client.

9.3.4 Scope Parameters

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

9.4 Network Configuration

- Configuration of network settings on the device

9.4.1 Device requirements

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

9.4.2 Client requirements (if supported)

- Client shall be able to list and configure the device network interface using the GetNetworkInterfaces and SetNetworkInterfaces operations.
- Client shall be able to list and set the default gateway of the device using the GetNetworkDefaultGateway and SetNetworkDefaultGateway operations.
- Client may be able to set the device hostname using the SetHostName operation.
- Client may be able to list and set the DNS using the GetDNS and SetDNS operations.
- Client may be able to list and configure supported network protocols on the device using the GetNetworkProtocols and SetNetworkProtocols operations.

9.4.3 Function List for Network Configuration

Function	Service	Device	Client
GetHostname	Device	M	O
SetHostname	Device	M	O
GetDNS	Device	M	O
SetDNS	Device	M	O
GetNetworkInterfaces	Device	M	M*
SetNetworkInterfaces	Device	M	M*
GetNetworkProtocols	Device	M	O
SetNetworkProtocols	Device	M	O
GetNetworkDefaultGateway	Device	M	M*
SetNetworkDefaultGateway	Device	M	M*

* If configuring a device's network configuration is supported in any way by the client only.

9.5 System

- Configuration of system settings.
- Device information.

9.5.1 Device requirements

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

9.5.2 Client requirements (if supported)

- Client shall be able to get device information such as manufacturer, model and firmware version using the GetDeviceInformation operation.
- Client may be able to get and set time of the device using the GetSystemDateAndTime and SetSystemDateAndTime operations.
- Client may be able to return the device to factory settings using the SetSystemFactoryDefault operation.
- Client may be able to reboot the device using the Reboot operation.

9.5.3 Function List for System

Function	Service	Device	Client
GetDeviceInformation	Device	M	M*
GetSystemDateAndTime	Device	M	O
SetSystemDateAndTime	Device	M	O
SetSystemFactoryDefault	Device	M	O
Reboot	Device	M	O

* If device information retrieval is supported in any way by the client.

9.6 User handling

- Manage users on the device.

9.6.1 Device requirements

- User handling operations as covered by the device service.

9.6.2 Client requirements (if supported)

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

9.6.3 Function List for User Handling

Function	Service	Device	Client
GetUsers	Device	M	M*
CreateUsers	Device	M	M*
DeleteUsers	Device	M	M*
SetUser	Device	M	M*

* If managing users on the device is supported in any way by the client.

9.7 Event handling

- Retrieving and filtering of events from a device

9.7.1 Profile requirements

- Event and pull point operations as covered by the event service are mandatory for devices and conditional for clients supporting any of the events described in the ONVIF Recording Control Service Specification v.2.2.1 or later and the ONVIF Recording Search Service Specification v.2.2.1 ot later.

- The Base Notification Interface of the WS-BaseNotification as described in the ONVIF Core Specification v2.4 or later, Section 9.1 is not mandatory for Profile G conformance. The Real-time Pull-Point Notification Interface described in section 9.2 is Mandatory for Profile G conformance.

9.7.2 Device Requirements

- Device shall support pull point operations as described by the Event Service.

- A device shall support at least two concurrent pull point subscriptions.

9.7.3 Client Requirements (if supported)

- Client shall implement event handling with a pull point using the SetSynchronizationPoint, CreatePullPointSubscription and PullMessage operations if any of the specific events described in this specification are supported.

- Client may determine information about what filter dialects and topics are supported by the device using the GetEventProperties operation.
- Client may implement event filtering from the device using MessageContentFilter and TopicFilter.

9.7.4 Function List for Event Handling

Function	Service	Device	Client
SetSynchronizationPoint	Event	M	C
CreatePullPointSubscription	Event	M	C
PullMessages	Event	M	C
GetEventProperties	Event	M	O
Renew	Event	M	C
Unsubscribe	Event	M	C
TopicFilter parameter of CreatePullPointSubscriptionRequest	Event	M	O
MessageContentFilter parameter of GetEventPropertiesResponse	Event	M	O