ONVIF®

Profile M Specification

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CONTRIBUTORS

Company	Contributors
Axis Communications AB	Sriram Bhetanabottla (WG chair and Editor) Fredrik Svensson
Avigilon Corporation	Chris Monkiewicz
Bosch Security Systems	Hans Busch
Dahua	Weiming Mao
Hanwha Techwin	Sujith Raman
Hikvision	Haina Han Qianlin Cheng
Johnson Controls	Chan Nopporn
Sony Corporation	Hiroyuki Sano
Videotec	Davide Cristanelli

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1 Scope

This document defines the mandatory and conditional features required by an ONVIF device and ONVIF client that support Profile M.

2 Normative references

This section defines the normative references applicable to this specification.

2.1 Normative references

- **ONVIF Profile Policy**

  <http://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.

3.1 Definitions

profile	See [ONVIF Profile Policy]
ONVIF device	Networked hardware appliance or software program that exposes one or multiple ONVIF Web Services
ONVIF client	Networked hardware appliance or software program that uses ONVIF Web Services.
tns1	A prefix for the ONVIF topic namespace "http://www.onvif.org/ver10/topics". This prefix is not part of the standard and an implementation can use any prefix. See [ONVIF Network Interface Specifications] Core Specification description of Namespaces for details.
JSON	JavaScript Object Notation
MQTT	Message Queuing Telemetry Transport

4 Technical specification version requirement

Implementation of ONVIF Network Interface Specifications, version 21.06 or later is required for conformance to Profile M.

5 Requirement levels

Each feature in this document has a requirement level for device and client that claim conformance to Profile M 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 profile is described by a fixed set of functionalities through several services that are provided by the ONVIF standard. Several 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.

An ONVIF device conformant with Profile M is an ONVIF device that sends metadata over an IP network to a client. Profile M device also includes support for several features, including but not limited to: Metadata capability, Metadata configuration and Analytics Module configuration. Other features that may be supported on the device include Video Streaming, event handling, JSON events over MQTT, sending images in metadata, Vehicle and License Plate metadata, Human Face metadata, Human body metadata, Geolocation metadata, Face recognition event, License plate recognition event and Line crossing (Object counting) event and Rule configuration. For example, a device conformant with Profile M may be an IP network camera or an analytics device.

An ONVIF client conformant with Profile M is an ONVIF client that can configure, request, and control streaming of metadata over an IP network from an ONVIF device conformant with Profile M. Profile M also includes support for control of several features, including but not limited to receiving Images in metadata, Vehicle and License Plate metadata, Human Face metadata, Human body metadata, Geolocation metadata, Face recognition event, License plate recognition event and Line crossing (Object counting) event. Other features that may be supported by the client include Video Streaming, event handling, receiving JSON events over MQTT and Rule configuration. For example, a client conformant with Profile M may be a VMS or an analytics application.

7 Profile mandatory features (normative)

Devices and clients conformant to Profile M shall support the following features. The requirements represent the minimum functionality that must be implemented for conformance.

7.1 User authentication

This section describes the required method of user authentication.

7.1.1 Device requirements

- Device shall authenticate HTTP requests using Digest authentication as described by the **Core Specification**.

- Device shall authenticate RTSP requests using Digest authentication as described by the **Core Specification.**

- Device shall authenticate RTSP requests tunneled over HTTP using Digest authentication on the RTSP level as described by the **Core Specification**.

7.1.2 Client requirements

- Client shall support authenticating HTTP requests using Digest authentication as described by the **Core Specification**.

- Client shall support authenticating RTSP requests using Digest authentication as described by the **Core Specification**.

- Client shall support authenticating RTSP requests tunneled over HTTP using Digest authentication on the RTSP level as described by the **Core Specification**.

7.1.3 Function list for devices

User Authentication		Device MANDATORY
Function	**Service**	**Requirement**
Digest authentication	Core	M

7.1.4 Function list for clients

User Authentication		Client MANDATORY
Function	**Service**	**Requirement**
Digest authentication	Core	M

7.2   Get services

This section describes the operations related to obtaining the services of a device.

7.2.1   Device requirements

- Device shall support **GetServices** and **GetServiceCapabilities** as detailed in the **Core Specification**.

- Device shall support **GetServiceCapabilities** as detailed in the **Media2** and **Analytics Service Specifications**.

- If supported, 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.

7.2.3 Function list for devices

Capabilities		Device MANDATORY
Function	**Service**	**Requirement**
GetServices	Device Management	M
GetServiceCapabilities	Device Management	M
GetServiceCapabilities	Analytics	M
GetServiceCapabilities	Media 2	M
GetServiceCapabilities	Event	C

7.2.4 Function list for clients

Capabilities		Client MANDATORY
Function	**Service**	**Requirement**
GetServices	Device Management	M
GetServiceCapabilities	Device Management	O
GetServiceCapabilities	Analytics	O
GetServiceCapabilities	Media 2	O
GetServiceCapabilities	Event	O

7.3   Discovery

This section describes the operations related to device discovery.

7.3.1 Device requirements

- Device shall support listing scopes using the operations **GetScopes.**

- Device shall support the Profile M-specific scope parameter presented in 7.3.5 Scope parameters.

7.3.2 Client requirements

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

7.3.3 Function list for devices

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

7.3.4 Function list for clients

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

7.3.5 Scope parameters

Discovery		
Category	**Defined Values**	**Description**
Profile	M	The scope indicates if the device is conformant with Profile M. A device conformant with Profile M shall include a scope entry with this value in its scope list.

7.4   System

This section describes the operations related to obtaining device information and the configuration of device settings.

7.4.1   Device requirements

- Device shall support the listing of device information such as manufacturer, model and firmware version using the **GetDeviceInformation** operation.

- Device shall support listing the date and time on the device using the **GetSystemDateAndTime** operation.

- Device shall support rebooting using the **SystemReboot** operation.

7.4.2   Client requirements (if supported)

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

7.4.3 Function list for devices

System		Device MANDATORY
Function	**Service**	**Requirement**
GetDeviceInformation	Device Management	M
GetSystemDateAndTime	Device Management	M
SystemReboot	Device Management	M

7.4.4 Function list for clients

System		Client CONDITIONAL
Function	**Service**	**Requirement**
GetDeviceInformation	Device Management	M
GetSystemDateAndTime	Device Management	O
SystemReboot	Device Management	O

7.5   Metadata streaming

This section describes the operations related to metadata streaming.

7.5.1 Device requirements

- Device shall provide at least one ready-to-use **Media Profile** for streaming metadata.

- Device shall support listing of Media Profiles in response to the **GetProfiles** operation.

- Device shall return the stream URI in response to the **GetStreamUri** operation.

- Device shall support initiation of streaming sessions using RTSP according to the **Streaming Service Specification**.

- Device shall be able to stream metadata over protocol RTP/UDP using the selected **Media Profile**.

- Device shall be able to stream metadata over protocol RTP/RTSP/HTTP/TCP using the selected **Media Profile**.

- If supported, device shall be able to stream metadata over RTP/RTSP/HTTPS/TCP using the selected **Media Profile**.

- Device shall open a new XML document on-demand upon reception of the **SetSynchronizationPoint** operation when streaming metadata. The content of the document for the metadata stream depends on the filters configured/enabled in **MetadataConfiguration** such as **Property Events** and **Analytics frames**.

7.5.2 Client requirements

- Client shall be able to get the stream URI for the selected profile using the **GetProfiles** and **GetStreamURI** operations.

- Client shall initiate streaming sessions using RTSP according to the **Streaming Service Specification**.

- Client shall be able to receive a metadata stream over RTP/UDP or RTP/RTSP/HTTP/TCP using the selected **Media Profile**.

- If supported, client shall be able to receive a metadata stream over RTP/RTSP/HTTPS/TCP using the selected **Media Profile**.

7.5.3 Function list for devices

Metadata Streaming		Device MANDATORY
Function	Service	Requirement
GetProfiles	Media 2	M
GetStreamUri	Media 2	M
Metadata streaming using RTSP	Streaming	M
Streaming over RTP/UDP	Streaming	M
Streaming over RTP/RTSP/HTTP/TCP	Streaming	M
Streaming over RTP/RTSP/HTTPS/TCP	Streaming	C

	SetSynchronizationPoint	Media 2	M

7.5.4 Function list for clients

Metadata Streaming		Client MANDATORY	
Function	**Service**	**Requirement**	
GetProfiles	Media 2	M	
GetStreamUri	Media 2	M	
Metadata streaming using RTSP	Streaming	M	
Streaming over RTP/UDP	Streaming	M*	
Streaming over RTP/RTSP/HTTP/TCP	Streaming		
Streaming over RTP/RTSP/HTTPS/TCP	Streaming	C	
SetSynchronizationPoint	Media 2	O	

* Client shall support at least one of the listed transport methods.

7.6 Metadata information

This section describes the operations related to obtaining information about what kind of metadata a device can produce.

7.6.1 Device requirements

- Device shall indicate supporting **GetSupportedMetadata** operation via **SupportedMetadata** in response to the **GetServiceCapabilities** operation.

- Device shall return corresponding metadata **SampleFrame** in response to the **GetSupportedMetadata** operation.

7.6.2 Client requirements

- Client shall be able to retrieve metadata **SampleFrame** using the **GetSupportedMetadata** operation.

7.6.3 Function list for devices

Metadata Capabilities		Device MANDATORY
Function	**Service**	**Requirement**
GetSupportedMetadata	Analytics	M

7.6.4 Function list for clients

Metadata Capabilities		Client MANDATORY
Function	**Service**	**Requirement**
GetSupportedMetadata	Analytics	M

7.7　Configuration of Metadata profile

This section describes the operations related to the configuration of **Media Profiles** for metadata streaming.

7.7.1　Device requirements

- Device shall return available **Media Profiles** in response to the **GetProfiles** operation.

- Device shall support adding a **Video Source Configuration** to a **Media Profile** using the **GetVideoSourceConfigurations** and **AddConfiguration** operations.

- Device shall support adding a **Metadata Configuration** to a **Media Profile** using the **GetMetadataConfigurations** and **AddConfiguration** operations.

- Device shall support removing a **Video Source Configuration** and/or a **Metadata Configuration** from a profile using the **RemoveConfiguration** operation.

- If supported, device shall be able to deliver event notifications when a **Video Source Configuration** and/or a **Metadata Configuration** is added or removed from a **Media Profile**.

7.7.2　Client requirements (if supported)

- Client shall be able to retrieve available **Media Profiles** using the **GetProfiles** operation.

- Client shall be able to add a **Video Source Configuration** to a **Media Profile** using the **GetVideoSourceConfigurations** and **AddConfiguration** operations.

- Client shall be able to add a **Metadata Configuration** to a **Media Profile** using the **GetMetadataConfigurations** and **AddConfiguration** operations.

7.7.3　Function list for devices

Configuration of Metadata Profile	Device MANDATORY	
Function	**Service**	**Requirement**
GetProfiles	Media 2	M
GetVideoSourceConfigurations	Media 2	M
GetMetadataConfigurations	Media 2	M
AddConfiguration	Media 2	M
RemoveConfiguration	Media 2	M
tns1:Media/ProfileChanged	Event	C*

* Device shall support this event If Event service is supported.

7.7.4　Function list for clients

Configuration of Metadata Profile	Client CONDITIONAL	
Function	**Service**	**Requirement**
GetProfiles	Media 2	M
GetVideoSourceConfigurations	Media 2	M

	GetMetadataConfigurations	Media 2	M
	AddConfiguration	Media 2	M
	RemoveConfiguration	Media 2	O
	tns1:Media/ProfileChanged	Event	O

7.8 Metadata configuration

This section describes the operations related to metadata configuration.

7.8.1 Device requirements

- Device shall provide the current **Metadata Configurations** in response to the **GetMetadataConfigurations** operation.

- Device shall support modifying a **Metadata Configuration** for Analytics using the **SetMetadataConfiguration** operation.

- If supported, Device shall support modifying a **Metadata Configuration** for Events using the **SetMetadataConfiguration** operation.

- If supported, Device shall support modifying **Metadata Configuration** for **CompressionType** and **GeoLocation** in response to **GetMetadataConfigurationOptions** and **SetMetadataConfiguration** operations.

- If supported, Device shall be able to deliver event notifications when a **Metadata Configuration** is changed.

7.8.2 Client requirements

- Client shall be able to retrieve the current **Metadata Configurations** using the **GetMetadataConfigurations** operation.

7.8.3 Function list for devices

Metadata Configuration		Device MANDATORY
Function	**Service**	**Requirement**
GetMetadataConfigurations	Media 2	M
GetMetadataConfigurationOptions	Media 2	M
SetMetadataConfiguration	Media 2	M
tns1:Media/ConfigurationChanged	Event	C*

* Device shall support this event If Event service is supported.

7.8.4 Function list for clients

Metadata Configuration		Client MANDATORY
Function	**Service**	**Requirement**
GetMetadataConfigurations	Media 2	M
GetMetadataConfigurationOptions	Media 2	O
SetMetadataConfiguration	Media 2	O
tns1:Media/ConfigurationChanged	Event	O

7.9 Configuration of Analytics profile

This section describes the operations related to the configuration of Media Profiles for streaming analytics metadata.

7.9.1 Device requirements

- Device shall return the set of available **Media Profiles** in response to the **GetProfiles** operation.

- Device shall support adding an **Analytics Configuration** to a **Media Profile** using the **GetAnalyticsConfigurations** and **AddConfiguration** operations.

- Device shall support removing an **Analytics Configuration** from a profile using the **RemoveConfiguration** operation.

- If supported, device shall be able to deliver event notifications when an **Analytics Configuration** is added or removed from a **Media Profile**.

7.9.2 Client requirements (if supported)

- Client shall be able to retrieve available Media Profiles using the **GetProfiles** operation.

- Client shall be able to add an **Analytics Configuration** to a **Media Profile** using the **GetAnalyticsConfigurations** and **AddConfiguration** operations.

7.9.3 Function list for devices

Configuration of Analytics Profile	Device MANDATORY	
Function	**Service**	**Requirement**
GetProfiles	Media 2	M
GetAnalyticsConfigurations	Media 2	M
AddConfiguration	Media 2	M
RemoveConfiguration	Media 2	M
tns1:Media/ProfileChanged	Event	C*

* Device shall support this event If Event service is supported.

7.9.4 Function list for clients

Configuration of Analytics Profile	Client CONDITIONAL	
Function	**Service**	**Requirement**
GetProfiles	Media 2	M
GetAnalyticsConfigurations	Media 2	M
AddConfiguration	Media 2	M
RemoveConfiguration	Media 2	O
tns1:Media/ProfileChanged	Event	O

7.10 Analytics Module configuration

This section describes the operations related to analytics module configuration.

7.10.1 Device requirements

- Device shall provide analytics modules description in response to the **GetSupportedAnalyticsModules** operation.

- Device shall provide the assigned set of **Analytics Modules** of a **VideoAnalyticsConfiguration** in response to the **GetAnalyticsModules** operation.

- Device shall support adding one or more **Analytics Module** to an existing **VideoAnalyticsConfiguration** using **CreateAnalyticsModules**.

- Device shall support removing one or more **Analytics Module** from a **VideoAnalyticsConfiguration** using **DeleteAnalyticsModules**.

- If the device return **AnalyticsModuleOptionsSupported** capability, device shall support modifying one or more **Analytics Modules** of a **VideoAnalyticsConfiguration** using the **GetAnalyticsModuleOptions** and **ModifyAnalyticsModules operations**.

7.10.2 Client requirements (if supported)

- Client shall be able to retrieve supported **Analytics Module** description using the **GetSupportedAnalyticsModules** operation.

- Client shall be able to retrieve assigned **Analytics Module** Configurations using the **GetAnalyticsModules** operation.

- Client shall be able to add one or more **Analytics Modules** to an existing **VideoAnalyticsConfiguration** using **CreateAnalyticsModules**.

- Client shall support removing one or more **Analytics Module** from a **VideoAnalyticsConfiguration** using **DeleteAnalyticsModules**.

7.10.3 Function list for devices

Analytics Module Configuration		Device MANDATORY
Function	**Service**	**Requirement**
GetSupportedAnalyticsModules	Analytics	M
GetAnalyticsModules	Analytics	M
CreateAnalyticsModules	Analytics	M
DeleteAnalyticsModules	Analytics	M
GetAnalyticsModuleOptions	Analytics	C
ModifyAnalyticsModules	Analytics	C

7.10.4 Function list for clients

Analytics Module Configuration		Client CONDITIONAL
Function	**Service**	**Requirement**

	GetSupportedAnalyticsModules	Analytics	M
	GetAnalyticsModules	Analytics	M
	CreateAnalyticsModules	Analytics	M
	DeleteAnalyticsModules	Analytics	M
	GetAnalyticsModuleOptions	Analytics	O
	ModifyAnalyticsModules	Analytics	O

8 Profile conditional features (normative)

The Profile Conditional Features section lists the features that shall be implemented if the device or client supports the feature. The requirements represent the minimum functionality that must be implemented for conformance.

8.1 Media profile management

This section describes the operations related to the creation and deletion of Media Profiles.

8.1.1 Device requirements (if supported)

- If the number of existing profiles does not exceed the capability value **MaximumNumberOfProfiles**, Device shall support creation of **Media Profiles** using the **CreateProfile** operation.

- If '**fixed'** attribute on the existing Media Profiles is 'False', Device shall support deletion of **Media Profiles** using the **DeleteProfile** operation.

- If supported, device shall be able to deliver event notifications when a **Media Profile** is created or deleted.

8.1.2 Client requirements (if supported)

- Client shall be able to create **Media Profiles** using the **CreateProfile** operation.

8.1.3 Function list for devices

Media Profile Management	Device CONDITIONAL	
Function	**Service**	**Requirement**
CreateProfile	Media 2	M
DeleteProfile	Media 2	M
tns1:Media/ProfileChanged	Event	C*

* Device shall support this event If Event service is supported.

8.1.4 Function list for clients

Media Profile Management	Client CONDITIONAL	
Function	**Service**	**Requirement**
CreateProfile	Media 2	M
DeleteProfile	Media 2	O
tns1:Media/ProfileChanged	Event	O

8.2 Video streaming

This section describes the operations related to the setup and control of video streaming.

8.2.1 Device requirements (if supported)

- Device shall provide at least one ready-to-use **Media Profile** for video streaming.

- Device shall support listing of **Media Profiles** in response to the **GetProfiles** operation.

- Device shall return the stream URI in response to the **GetStreamUri** operation.

- Device shall support streaming of at least one of the H.264 and H.265 encoding formats.

- Device shall support initiation of streaming sessions using RTSP according to the **Streaming Service Specification**.

- Device shall be able to stream video over protocol RTP/UDP using the selected **Media Profile**.

- Device shall be able to stream video over protocol RTP/RTSP/HTTP/TCP using the selected **Media Profile**.

- If supported, device shall be able to stream video over RTP/RTSP/HTTPS/TCP using the selected **Media Profile**.

- Device shall send a key frame on-demand upon reception of the **SetSynchronizationPoint** operation when streaming H.264 or H.265.

8.2.2 Client requirements (if supported)

- Client shall be able to request the stream URI for the selected **Media Profile** using the **GetProfiles** and **GetStreamURI** operations.

- Client shall be able to initiate streaming sessions using **RTSP** according to the **Streaming Service Specification**.

- Client shall be able to receive a stream and decode H.264 video using the selected **Media Profile**.

- Client shall be able to receive a stream and decode H.265 video using the selected **Media Profile**.

- Client shall be able to receive a video stream over RTP/UDP or RTP/RTSP/HTTP/TCP using the selected **Media Profile**.

- If supported, client shall be able to receive a video stream over RTP/RTSP/HTTPS/TCP using the selected **Media Profile**.

8.2.3 Function list for devices

Video Streaming		Device CONDITIONAL
Function	**Service**	**Requirement**
GetProfiles	Media 2	M
GetStreamUri	Media 2	M
Video Streaming using RTSP	Streaming	M
H.264 Encoding	Media 2	M*
H.265 Encoding	Media 2	
Streaming over RTP/UDP	Streaming	M
Streaming over RTP/RTSP/HTTP/TCP	Streaming	M

	Streaming over RTP/RTSP/HTTPS/TCP	Streaming	C
	SetSynchronizationPoint	Media 2	M

* Device shall support at least one of the listed encoding formats. H.264 and H.265 are conditionally required.

8.2.4 Function list for clients

Video Streaming		Client CONDITIONAL
Function	**Service**	**Requirement**
GetProfiles	Media 2	M
GetStreamUri	Media 2	M
Video Streaming using RTSP	Streaming	M
H.264	Media 2	M
H.265	Media 2	M
Streaming over RTP/UDP	Streaming	M*
Streaming over RTP/RTSP/HTTP/TCP	Streaming	
Streaming over RTP/RTSP/HTTPS/TCP	Streaming	C
SetSynchronizationPoint	Media 2	O

* Client shall support at least one of the listed transport methods.

8.3 Image sending

This section describes the operations related to image sending.

8.3.1 Device requirements (if supported)

- Device should support at least one of the two approaches to send images, sending **image URI** or sending **base64 encoding** data.

8.3.2 Client requirements (if supported)

- Client shall be able to get event or metadata image via the **image URI**.

- Client shall be able to receive **base64 encoding** image data.

8.3.3 Function list for devices

Image Sending		Device CONDITIONAL
Function	**Service**	**Requirement**
Sending image via image URI	Analytics	M*
Sending base64 encoding image data	Analytics	

* Device shall support at least one of the two approaches to send images, sending image URI or sending base64 encoding data.

8.3.4 Function list for clients

Image Sending		Client CONDITIONAL
Function	**Service**	**Requirement**
Get image via image URI	Media 2	M
Receive base64 encoding image data	Media 2	M

8.4   Event handling using pull points

This section describes the operations related to retrieving and filtering events using ONVIF realtime pullpoints.

8.4.1 Device requirements (if supported)

- Device shall support event handling with a pull point using the **SetSynchronizationPoint**, **CreatePullPointSubscription** and **PullMessage** operations.

- Device shall support retrieval of supported filter dialects and topics using the **GetEventProperties** operation.

- Device shall support event filtering using **Topic Filter** as described in the **Core Specification**.

- Device shall support subscription management using the Unsubscribe operation.

- Device shall support at least two concurrent pull point subscriptions.

8.4.2 Client requirements (if supported)

- Client shall implement event handling with a pull point using the **SetSynchronizationPoint**, **CreatePullPointSubscription** and **PullMessage** operations.

8.4.3 Function list for devices

Event Handling		Device CONDITIONAL
Function	**Service**	**Requirement**
SetSynchronizationPoint	Event	M
CreatePullPointSubscription	Event	M
PullMessages	Event	M
GetEventProperties	Event	M
Unsubscribe	Event	M
Filter parameter of CreatePullPointSubscriptionRequest	Event	M

8.4.4 Function list for clients

Event Handling		Client CONDITIONAL
Function	**Service**	**Requirement**
SetSynchronizationPoint	Event	M
CreatePullPointSubscription	Event	M
PullMessages	Event	M
GetEventProperties	Event	O
Unsubscribe	Event	O
Filter parameter of CreatePullPointSubscriptionRequest	Event	O

8.5 Event handling via MQTT

This section describes the operations related to retrieving and filtering events.

8.5.1 Device requirements (if supported)

- Device shall support publishing of events as MQTT events via protocols mqtt and mqtts.

- If supported, Device shall support publishing of events as MQTT events via protocols ws and wss.

- Device shall support retrieval of supported topics using the **GetEventProperties** operation.

- Device shall support event filtering **TopicFilter** as described in the **Core Specification**.

- Device shall support listing event-broker configurations via **GetEventBrokers**.

- Device shall support adding and changing configuration of MQTT broker via **AddEventBroker**.

- Device shall support removing an event broker via **DeleteEventBroker**.

- Device shall support a value of at least one for the **MaxEventBrokers** capability.

- Device shall support ONVIF event with JSON payload as described in the **Core Specification**.

8.5.2 Client requirements (if supported)

- Client shall support adding and changing configuration of MQTT broker via AddEventBroker.

- Client shall support retrieving event broker configuration via GetEventBrokers.

- Client shall support removing an event broker via DeleteEventBroker.

8.5.3 Function list for devices

Event Handling		Device CONDITIONAL
Function	**Service**	**Requirement**
GetEventBrokers	Event	M
AddEventBroker	Event	M
DeleteEventBroker	Event	M
GetEventProperties	Event	M
MQTT	Event	M

8.5.4 Function list for clients

Event Handling		Client CONDITIONAL
Function	**Service**	**Requirement**
GetEventBrokers	Event	M
AddEventBroker	Event	M
DeleteEventBroker	Event	M
GetEventProperties	Event	O

8.6   Rule configuration

This section describes the operations related to rule configuration.

8.6.1 Device requirements (if supported)

- Device shall provide rule description in response to the **GetSupportedRules** operation.

- Device shall provide the assigned set of rules of a **VideoAnalyticsConfiguration** in response to the **GetRules** operation.

- Device shall support adding one or more rules to an existing **VideoAnalyticsConfiguration** using **CreateRules**.

- Device shall support removing one or more rules from a **VideoAnalyticsConfiguration** using **DeleteRules**.

- If the device return **RuleOptionsSupported** capability, device shall support modifying one or more rules of a **VideoAnalyticsConfiguration** using the **GetRuleOptions** and **ModifyRules operations**.

8.6.2 Client requirements (if supported)

- Client shall be able to retrieve supported rule description using the **GetSupportedRules** operation.

- Client shall be able to retrieve assigned rule Configurations using the **GetRules** operation.

- Client shall be able to add one or more rules to an existing **VideoAnalyticsConfiguration** using **CreateRules**.

- Client shall support removing one or more rules from a **VideoAnalyticsConfiguration** using **DeleteRules**.

8.6.3 Function list for devices

Analytics Module Configuration		Device CONDITIONAL
Function	**Service**	**Requirement**
GetSupportedRules	Analytics	M
GetRules	Analytics	M
CreateRules	Analytics	M
DeleteRules	Analytics	M
GetRuleOptions	Analytics	C
ModifyRules	Analytics	C

8.6.4 Function list for clients

Analytics Module Configuration		Client CONDITIONAL
Function	**Service**®	**Requirement**
GetSupportedRules	Analytics	M

	GetRules	Analytics	M
	CreateRules	Analytics	M
	DeleteRules	Analytics	M
	GetRuleOptions	Analytics	O
	ModifyRules	Analytics	O

8.7   Object classification

This section describes the operations related to class type.

8.7.1 Device requirements (if supported)

- Device shall support including **Class** element in analytics metadata stream

8.7.2 Client requirements (if supported)

- Client shall be capable to retrieve Class element in analytics metadata stream

8.7.3 Function list for devices

Object Classification		Device CONDITIONAL
Function	**Service**	**Requirement**
MetadataStream /VideoAnalyticsStream/Frame/Object/ Appearance/Class/Type	Analytics	M

8.7.4 Function list for clients

Object Classification		Client CONDITIONAL
Function	**Service**	**Requirement**
MetadataStream /VideoAnalyticsStream/Frame/Object/ Appearance/Class/Type	Analytics	M

8.8 Human face metadata

This section describes the operations related to human face metadata.

8.8.1 Device requirements (if supported)

- Device shall support including human face information in the response to **GetSupportedMetadata** operation on one of the supported analytics modules returned by **GetSupportedAnalyticModules**.

- Device shall support including human face information in analytics metadata stream.

8.8.2 Client requirements (if supported)

- Client shall be able to retrieve human face information from the response to **GetSupportedMetadata** operation on one of the supported analytics modules returned by **GetSupportedAnalyticModules**.

- Client shall be able to retrieve human face information in analytics metadata stream.

8.8.3 Function list for devices

Human Face Metadata	Device CONDITIONAL	
Function	**Service**	**Requirement**
MetadataStream /VideoAnalyticsStream/Frame/Object/ Appearance/HumanFace	Analytics	M

8.8.4 Function list for clients

Human Face Metadata	Client CONDITIONAL	
Function	**Service**	**Requirement**
MetadataStream /VideoAnalyticsStream/Frame/Object/ Appearance/HumanFace	Analytics	M

8.9 Human Body metadata

This section describes the operations related to human body metadata.

8.9.1 Device requirements (if supported)

- Device shall support including human body information in the response to **GetSupportedMetadata** operation on one of the supported analytics modules returned by **GetSupportedAnalyticModules**.

- Device shall support including human body information in analytics metadata stream.

8.9.2 Client requirements (if supported)

- Client shall be able to retrieve human body information in the response to **GetSupportedMetadata** operation on one of the supported analytics modules returned by **GetSupportedAnalyticModules**.

- Client shall be able to retrieve human body information in analytics metadata stream.

8.9.3 Function list for devices

Human Body Metadata	Device CONDITIONAL	
Function	**Service**	**Requirement**
MetadataStream /VideoAnalyticsStream/Frame/Object/ Appearance/HumanBody	Analytics	M

8.9.4 Function list for clients

Human Body Metadata	Client CONDITIONAL	
Function	**Service**	**Requirement**
MetadataStream /VideoAnalyticsStream/Frame/Object/ Appearance/HumanBody	Analytics	M

8.10 Vehicle metadata

This section describes the operations related to vehicle metadata.

8.10.1   Device requirements (if supported)

- Device shall support including vehicle information in response to **GetSupportedMetadata** operation on one of the supported analytics modules returned by **GetSupportedAnalyticModules**.

- Device shall support including vehicle information in analytics metadata stream.

8.10.2   Client requirements (if supported)

- Client shall be able to retrieve vehicle information in response to **GetSupportedMetadata** operation on one of the supported analytics modules returned by **GetSupportedAnalyticModules**.

- Client shall be able to retrieve vehicle information in analytics metadata stream.

8.10.3   Function list for devices

Vehicle Metadata	Device CONDITIONAL	
Function	**Service**	**Requirement**
MetadataStream /VideoAnalyticsStream/Frame/Object/ Appearance/VehicleInfo	Analytics	M

8.10.4   Function list for clients

Vehicle Metadata	Client CONDITIONAL	
Function	**Service**	**Requirement**
MetadataStream /VideoAnalyticsStream/Frame/Object/ Appearance/VehicleInfo	Analytics	M

8.11 License plate metadata

This section describes the operations related to license plate metadata.

8.11.1 Device requirements (if supported)

- Device shall support including license plate information in response to **GetSupportedMetadata** operation on one of the supported analytics modules returned by **GetSupportedAnalyticModules**.

- Device shall support including license plate information in analytics metadata stream.

8.11.2 Client requirements (if supported)

- Client shall be able to retrieve license plate information in response to **GetSupportedMetadata** operation on one of the supported analytics modules returned by **GetSupportedAnalyticModules**.

- Client shall be able to retrieve license plate information in analytics metadata stream.

8.11.3 Function list for devices

License Plate Metadata		Device CONDITIONAL
Function	**Service**	**Requirement**
MetadataStream /VideoAnalyticsStream/Frame/Object/ Appearance/LicensePlateInfo	Analytics	M

8.11.4 Function list for clients

License Plate Metadata		Client CONDITIONAL
Function	**Service**	**Requirement**
MetadataStream /VideoAnalyticsStream/Frame/ Object/ Appearance/LicensePlateInfo	Analytics	M

8.12 GeoLocation metadata

This section describes the operations related to geolocation metadata.

8.12.1 Device requirements (if supported)

- Device shall support including geolocation information in the response to **GetSupportedMetadata** operation of one of the supported analytics modules returned by **GetSupportedAnalyticModules**.

- Device shall support including geolocation information in analytics metadata stream.

8.12.2 Client requirements (if supported)

- Client shall be able to retrieve geolocation information in the response to **GetSupportedMetadata** operation of one of the supported analytics modules returned by **GetSupportedAnalyticModules**.

- Client shall be able to retrieve geolocation information in analytics metadata stream.

8.12.3 Function list for devices

Geolocation Metadata		Device CONDITIONAL
Function	**Service**	**Requirement**
MetadataStream/VideoAnalyticsStream/Frame/Object/ Appearance/GeoLocation	Analytics	M

8.12.4 Function list for clients

Geolocation Metadata		Client CONDITIONAL
Function	**Service**	**Requirement**
MetadataStream/VideoAnalyticsStream/Frame/Object/ Appearance/GeoLocation	Analytics	M

8.13 Face recognition event

This section describes the operations related to face recognition event.

8.13.1　　Device requirements (if supported)

- Device shall support including face recognition topic in response to **GetEventProperties** operation.

- Device shall include **tt:FaceRecognition** in response to the **GetSupportedRules** operation.

- Device shall generate **Face Recognition events** according to the **Analytics Service Specification**.

8.13.2　　Client requirements (if supported)

- Clients shall receive notifications of **Face Recognition events** according to the **Analytics Service Specification**.

8.13.3　　Function list for devices

Event Handling		Device CONDITIONAL	
	Function	Service	Requirement
	GetEventProperties	Event	M
	GetSupportedRules	Analytics	M
	tns1:RuleEngine/Recognition/Face	Event	M

8.13.4　　Function list for clients

Event Handling		Device CONDITIONAL	
	Function	Service	Requirement
	GetEventProperties	Event	M
	GetSupportedRules	Analytics	M
	tns1:RuleEngine/Recognition/Face	Event	M

8.14 License plate recognition event

This section describes the operations related to face recognition event.

8.14.1 Device requirements (if supported)

- Device shall support including face recognition topic in response to **GetEventProperties** operation.

- Device shall include **tt:LicensePlateRecognition** in response to the **GetSupportedRules** operation.

- Device shall generate **License plate Recognition events** according to the **Analytics Service Specification**.

8.14.2 Client requirements (if supported)

- Clients shall receive notifications of **License plate Recognition events** according to the **Analytics Service Specification**.

8.14.3 Function list for devices

Event Handling	Device CONDITIONAL	
Function	**Service**	**Requirement**
GetEventProperties	Event	M
GetSupportedRules	Analytics	M
tns1:RuleEngine/Recognition/LicensePlate	Event	M

8.14.4 Function list for clients

Event Handling	Device CONDITIONAL	
Function	**Service**	**Requirement**
GetEventProperties	Event	M
GetSupportedRules	Analytics	M
tns1:RuleEngine/Recognition/LicensePlate	Event	M

8.15 Line crossing counter

This section describes the operations related to line crossing counter event.

8.15.1 Device requirements (if supported)

- Device shall support including the line crossing counter event topic in response to **GetEventProperties** operation.

- Device shall include **tt:LineCounting** in response to the **GetSupportedRules** operation.

- Device shall generate **counter events** according to the **Analytics Service Specification**.

8.15.2 Client requirements (if supported)

- Clients shall receive notifications of line crossing counter events according to the **Analytics Service Specification.**

8.15.3 Function list for devices

Line Crossing Counter		Device CONDITIONAL	
	Function	**Service**	**Requirement**
	GetEventProperties	Event	M
	GetSupportedRules	Analytics	M
	tns1:RuleEngine/CountAggregation/Counter	Analytics	M

8.15.4 Function list for clients

Line Crossing Counter		Client CONDITIONAL	
	Function	**Service**	**Requirement**
	GetEventProperties	Event	M
	GetSupportedRules	Analytics	M
	tns1:RuleEngine/CountAggregation/Counter	Analytics	M