Driving IP-based physical security through global standardization

ONVIF™

ONVIF Specification Version 16.06
Release Notes

1. Summary

The ONVIF 16.06 release incorporates a number of major enhancements and minor clarifications for better interoperability among ONVIF conformant clients and devices. The changes themselves are described in details in the list below chapters 2 and 3.
From this release onwards all updated document versions have been renumbered to use a year and month format instead of major and minor. The versions are now encoded as yy.mm.

2. Additions

2.1 Thermal Configuration

A new service has been introduced to support configuration of thermal imaging sensors.

2.2 Imaging Presets

The imaging presets interface has been added to the Imaging Service to provide easy configuration of imaging configuration parameters using vendor provided presets.

3. Changes

Find below all errata from Version 16.03 to 16.06 in order to improve interoperability. The numbers correspond to the Change Request ticket numbers and are not necessarily continuously ascending.

If not noted otherwise the changes refer to the Core specification.

1695 Add Invalid Filter Fault

Add a specific fault code as following into *Table 16: Recording Search service specific fault codes* in Recording Search Service.

env:Sender	ter:InvalidArgVal Ter:InvalidFilterFault	Invalid Search filter	Provided Search filter expression was not understood or supported by the device.

1717 Clarify RTSP over HTTP for Audio Backchannel

Remove a following paragraph from Section 5.3 in Streaming Specification.

> When the backchannel data stream is sent via RTSP/HTTP/TCP, a client shall use HTTP GET connection which is defined for sending the data stream without base64 encoding (see 5.1.1.4).

1725 Clarify RTP payload for AAC

Insert an additional reference RFC3640 into Section 2: Normative references

> IETF RFC 3640, RTP Payload Format for Transport of MPEG-4 Elementary Streams <http://www.ietf.org/rfc/rfc3640.txt>

Replace a clarification for Media Transport RTP in Section 5.1.2.1 RTP in Streaming Specification

> All media streams transferred by the RTP protocol shall conform to [RFC 3550], [RFC 3551], [RFC 3984], [RFC 3016] and JPEG over RTP (see Section 5.1.3).

With

> All media streams transferred by the RTP protocol shall conform to [RFC 3550], [RFC 3551], [RFC 3984], [RFC 3016] or [RFC 3640], and JPEG over RTP (see Section 5.1.3).

1743 Add note in case of lacking default gateway and multicast

Insert additional clarification about default route in Section 6:*IP configuration* in ONVIF_Core

As replace

> When a device is connected to an IPv4 network, address assignment priorities (link local versus routable address) should be done as recommended in [RFC3927].
>
> Further details regarding how the IP connectivity is achieved are outside the scope of this standard.

With

> When a device is connected to an IPv4 network, address assignment priorities (link local versus routable address) should be done as recommended in [RFC3927].
>
> Note that the network interface should set up an explicit IPv4 route for multicast traffic to ensure that WS-Discovery is successful, whether a default route is present or not. In a linux environment, this can be done with a command line like:
>
> ```
> /sbin/route add -net 224.0.0.0 netmask 240.0.0.0 dev eth0
> ```
>
> Further details regarding how the IP connectivity is achieved are outside the scope of this standard.

1760 Correct strange paragraph in 8.3.7 Set system date and time

Remove the following paragraph from Section *8.3.7:Set system date and time* in ONVIF_Core.

> If system time and date are set manually, the client shall include UTCDateTime or LocalDateTime in the request.

1761 Clarify LastReboot event

Replace a description of topic *tns1:Monitoring/OperatingTime/LastReboot* in Section *8.8.4:Operating Time* in ONVIF_Core

> The following event specifies when the device has been rebooted the last time.

With

> The following event specifies when the device was last booted.

1762 Clarify that time for LastXXX events should be in UTC

Insert an additional clarification in Section *8.8.4:Operating time* in ONVIF_Core

As replace

> The set of events defined in this section relates to operating time. A device supporting operation time events should provide the following events.

With

> The set of events defined in this section relates to operating time. A device supporting operation time events should provide the following events. A device shall report times specified in the following events as UTC using the 'Z' indicator.

1763 Clarify 5.4 GetRecordingSummary if no recordings is present

Add a clarification into Section *5.4 GetRecordingSummary* in Recording Search Service Specification

> If a device returns NumberRecordings as zero, both DataFrom and DataUntil can be safely ignored.

1773 Maintain consistency due to removed Remote Discovery

Add Annex D into the specification called **Deprecated Interfaces** and shift the Revision History as Annex E.

Add chapter **Remote Discovery Proxy** to Annex D stating:

> The definition and interfaces for the Remote Discovery Proxy have been deprecated with release 2.6.1. The following interfaces have been removed from the specification:
> - GetRemoteDiscoveryMode
> - SetRemoteDiscoveryMode
> - GetDPAddresses
> - SetDPAddresses
>
> The definitions are available via the link http://www.onvif.org/specs/core/ONVIF-Core-Specification-v260.pdf.

Remove the 4th paragraph at section 7.1

> The Discovery Proxy role as described in [WS-Discovery] shall not be supported by a device or a client.
> A device that implements the client role ignores the interaction scheme with the Discovery Proxy as described in Section 3 in [WS-Discovery].
> Instead, this specification defines a new Discovery Proxy role that allows remote discovery.

The remote discovery relies on the presence of a Discovery Proxy and a system provider that would like to offer remote discovery in the system should implement the Discovery Proxy role.

Remove the reference from Description of *Remote Discovery* at section 8.1.2.3 Table 12.

as specified in Section 7.4

Move section *8.3.20 Get remote discovery* and *8.3.21 Set remote discovery* to Annex D with removing a sentence below from the each description.

See Section 7.4 for the definition of remote discovery extensions.

Move section *8.3.22 Get remote DP addresses* and *8.3.23 Set remote DP addresses* to Annex D with removing a reference below from the each description.

as specified in Section 7.4,

Remove the reference from Description of Remote Discovery at Annex A. Capability List of GetCapabilities.

as specified in Section 7.4

Remove the reference RFC 2782 from section *2.Normative references*.

IETF RFC 2782, A DNS RR for specifying the location of services (DNS SRV) <http://www.ietf.org/rfc/rfc2782.txt>

1782 Correct element name in core documentation

Replace the parameter for GetServicesResponse in *Table 10: Get Services command* in ONVIF_Core

tt:ServiceList [1][unbounded]

with

tds:Service [1][unbounded]

1786 Correct inconsistency of OSD between WSDL and Specification

Replace a parameter name for CreateOSDResponse at Section 5.9.2 CreateOSD Table 18 CreateOSD command in Media2 service specification

xs:string Token[1][1]

with

xs:string OSDToken[1][1]

Replace a parameter name for GetOSDsResponse at Section 5.9.4 GetOSDs Table 20 GetOSDs command in Media2 service specification

tt:OSDConfiguration OSD[0][unbounded]

with

tt:OSDConfiguration OSDs[0][unbounded]

Replace a parameter name for GetOSDOptionsResponse at Section 5.9.6 GetOSDOptions Table 22 GetOSDOptions command in Media2 service specification

tt:OSDConfigurationOptions Options[1][1]

with

tt:OSDConfigurationOptions OSDOptions[1][1]

1795 Error in Media2 specification (Get<Entity>ConfigurationOptions)

Replace a description of *Get<entity>ConfigurationOptionsResponse* in *Section 5.3.4 Get configuration options Table 9 Get<entity>ConfigurationOptions command* in Media2 Service specification.

This message contains configuration options.
tt:<entity>ConfigurationOptions Options [1][1]

with

This message contains configuration options. Depending on the
structure of tr2:Get<entity>ConfigurationOptionsResponse, the
options will return one or more elements:
tt:<entity>ConfigurationOptions Options [1][unbounded]
Note: entities AudioOutput, AudioSource, Metadata, and VideoSource return just one element.

1796 Typo in Media specification

Replace the description of *GetGuaranteedNumberOfEncoderInstancesResponse* in *Table 35: GetGuaranteedNumberOfVideoEncoderInstances command* in Media Service Specification

This message contains the minimum guaranteed TotalNumber of encoder instances (applications) per VideoSourceConfiguration. If a device limits the number of instances for respective Video Codecs the response contains the information how many Jpeg, H264 and Mpeg4 can be set up at the same time. In all other cases the device is able to deliver the TotalNumber of streams independend from the configured VideoCodec at the same time.

With

This message contains the minimum guaranteed TotalNumber of encoder instances (applications) per VideoSourceConfiguration. If a device limits the number of instances for respective Video Codecs the response contains the information how many Jpeg, H264 and Mpeg4 can be set up at the same time. In all other cases the device is able to deliver the TotalNumber of streams independent from the configured VideoCodec at the same time.

1799 MediaService2.0: GetProfiles : WSDL and Specification NOT matching

Replace an parameter name of *GetProfilesResponse* at Table 3 in Media2 Service Specification.

tt: Profile Profiles [0][unbounded]

with

tr2:MediaProfile Profiles [0][unbounded]

1801 Media2.0: MetadataConfiguration: Schema and Specification NOT matching

In Media2 Service Specification Section *5.12.24 MetadataConfiguration*, add missing element after Multicast element and before CompressionType attribute:

<xs:element name="SessionTimeout" type="xs:duration"/>

And add explanatory bullet item after Multicast bullet and before CompressionType bullet:

• SessionTimeout

Deprecated for Media2, and ignored.

In onvif.xsd MetadataConfiguration/complexType definition replace SessionTimeout xs:documentation string:

The rtsp session timeout for the related audio stream

with:

The rtsp session timeout for the related audio stream (when using Media2 Service, this value is deprecated and ignored)

1802 "DigitalInputOptions" missing in DeviceIO Capabilities list in Specification

Add a capability into the description at Section *5.12 Capabilities* in Device IO Service Specification in order to consist the schema.

DigitalInputOptions: Indicates support for DigitalInput configuration of the idle state (defaults to false)

1803 Implement editorial changes from IEC TC79 WG11 60839-11-32 to Access Control Spec

Some notable changes:

- IEC wants to avoid overuse of initial uppercase letters. Reserve use for when referring to data structure names.
- In figures and tables, the old version used "." (dot) for figures, and ":" for command tables. IEC uses "-" (dash). Examples:
  Figure 1. Xyz -> Figure 1 - Xyz
  Table 1: Xyz -> Table 1 - Xyz.
- Some commands state "A device shall support this command". This is superfluous because it is specified by the profiles.
- When referring to normative references, the reference should be surrounded by square brackets.
- Previous version had 10 pt font size in command tables. IEC uses 8 pt (with 0,4 pt expanded character spacing). This improves readability and gives an easier overview, especially if there is a lot of information.

Some notes on terms:

- "Access controller" should be changed to "access control unit" to be the same as IEC's definition.
- "Credential" was previously defined as a physical/tangible object. This is called "token" in IEC. What we mean is rather the logical entity stored in the access control unit, not the physical thing.
- We still need a definition of the physical thing (the "token"). The term"token" is not good since

we use it as the identity of entities. Maybe we can use the term "credential token"? Input on this one is very appreciated.

1819 Media2.0: GetProfiles: Requirement clarification and paraphrasing for clarity

Add a following sentence to the end of first paragraph of Section *5.1.2 Get media profiles* in Media2 Service Specification.

The token parameter controls which profiles are returned:

Replace clarifications about *Type* parameter

The Type parameter controls which configurations are returned and has no effect on the number of profiles returned. A device shall return all configurations that match the provided Type parameters. In case the value All is provided the device shall report all available configurations.

with

The Type parameter controls which configurations are returned and has no effect on the number of profiles returned:

- If no Type is provided the returned profiles shall contain no configuration information.
- If a single Type with value 'All' is provided the returned profiles shall include all associated configurations.
- Otherwise the requested list of configurations shall for each profile include the configurations present as Type.

1821 Schema component in .doc file doesn't match onvif.xsd

Remove a line of element description from *5.2.2 Rule description language* in Analytics Service Specification

<xs:element name="RuleDescription" type="tt:ConfigDescription"/>

And, replace a type of *Name* attribute

<xs:attribute name="Name" type="xs:string" use="required"/>

With

<xs:attribute name="Name" type="xs:QName" use="required"/>

1824 Clarifying QName use for rule name

Replace two documentations of *Config* and *ConfigDescription* complex type for analytics in onvif.xsd as

> Type of the configuration represented by a unique QName. The Type characterizes a ConfigDescription defining the Parameters.

With

> The Type attribute specifies the type of rule and shall be equal to value of one of Name attributes of ConfigDescription elements returned by GetSupportedRules and GetSupportedAnalyticsModules command.

And

> XML Type of the Configuration (e.g. "tt::LineDetector").

With

> The Name attribute (e.g. "tt::LineDetector") uniquely identifies the type of rule, not a type definition in a schema.

1825 Remove requirement to include ONVIF schemas in ContentSchemaLocation elements

Replace a sentence about the references of schema at Section *5.2.3.1 Get Supported rules* in Analytics Service Specification

> If rule descriptions reference types or elements of the ONVIF schema file, the ONVIF schema file shall be explicitly listed.

With

> Rule descriptions that reference types or elements imported from any ONVIF defined schema files need not explicitly list those schema files.

And a sentence at Section *5.3.3.1 GetSupportedAnalyticsModules* in Analytics Service Specification

> If the analytics module descriptions reference types or elements of the ONVIF schema file, the ONVIF schema file shall be explicitly listed.

With

> Analytics module descriptions that reference types or elements imported from any ONVIF defined schema files need not explicitly list those schema files.

1841 Requirement statement for storage configuration is missing dependency on the capability

Clarify storage capable device at section *8.7 Storage Configuration* in ONVIF core specification.

Replace a sentence In *8.7.1 GetStorageConfigurations*

> The device shall support the listing of existing storage configurations through the GetStorageConfigurations command.

With

> A device indicating storage configuration capability shall support the listing of existing storage configurations through the GetStorageConfigurations command.

Replace a sentence In *8.7.2 CreateStorageConfiguration*

> A device shall support the creation of storage configurations as long as the number of existing storage configurations does not exceed the value of MaxStorageConfigurations capability.

With

> A device indicating storage configuration capability shall support the creation of storage configurations as long as the number of existing storage configurations does not exceed the value of MaxStorageConfigurations capability.

Replace a sentence In *8.7.3 GetStorageConfiguration*

> The device shall support retrieval of specific storage configuration through the GetStorageConfiguration command.

With

> A device indicating storage configuration capability shall support retrieval of specific storage configuration through the GetStorageConfiguration command.

Replace a sentence In *8.7.4 SetStorageConfiguration*

> The device shall support the modification of storage configuration through the SetStorageConfiguration command.

With

> A device indicating storage configuration capability shall support the modification of storage configuration through the SetStorageConfiguration command.

Replace a sentence In *8.7.5 DeleteStorageConfiguration*

> The device shall support the deletion of a storage configuration through the DeleteStorageConfiguration command.

With

A device indicating storage configuration capability shall support the deletion of a storage configuration through the DeleteStorageConfiguration command.

1842 MaximumNumberOfStorageConfigurations capability is missing

Add *MaxStorageConfigurations* attribute into *SystemCapabilities* complexType in devicemgmt.wsdl as

```
<xs:attribute name="MaxStorageConfigurations" type="xs:int">
  <xs:annotation>
        <xs:documentation>Indicates maximum number of storage configurations
supported.</xs:documentation>
  </xs:annotation>
</xs:attribute>
```

And revise the description at section *8.7.2 CreateStorageConfiguration*

This operation creates a new storage configuration. The configuration data shall be created in the device and shall be persistent (remains after a device reboots). A device shall support the creation of storage configurations as long as the number of existing storage configurations does not exceed the value of MaximumNumberOfStorageConfigurations capability.

By

This operation creates a new storage configuration. The configuration data shall be created in the device and shall be persistent (remains after a device reboots). A device shall support the creation of storage configurations as long as the number of existing storage configurations does not exceed the value of MaxStorageConfigurations capability.

1844 Inconsistency of ConfigDescription element name

Replace ParameterDescription with Parameters at schema example and description in section *5.2.2 Rule description language* in Analytics Service Specification as

<xs:element name="ParameterDescription"

With

<xs:element name="Parameters"

And

The parameters of a certain rule type are listed below the ParameterDescription element. All parameters are either SimpleItems or ElementItems and can be described by either a SimpleItemDescription or an ElementItemDescription. Both

ItemDescriptions contain a name attribute to identify the parameter and a Type attribute to reference a specific XML schema type. In case of the SimpleItemDescription, the type attribute shall reference a SimpleType schema definition. In case of the ElementItemDescription, the Type attribute shall reference a global element declaration of an XML schema.

With

The parameters of a certain rule type are listed below the Parameters element. All parameters are either SimpleItems or ElementItems and can be described by either a SimpleItemDescription or an ElementItemDescription. Both ItemDescriptions contain a name attribute to identify the parameter and a Type attribute to reference a specific XML schema type. In case of the SimpleItemDescription, the type attribute shall reference a SimpleType schema definition. In case of the ElementItemDescription, the Type attribute shall reference a global element declaration of an XML schema.

Replace MessageDescription with Messages at schema example and description in section *5.2.2 Rule description language* as

<xs:element name="MessageDescription" minOccurs="0" maxOccurs="unbounded">

With

<xs:element name="Messages" minOccurs="0" maxOccurs="unbounded">

And

The output produced by this rule type is described in multiple MessageDescription elements. Each MessageDescription contains a description of the message payload according to the Message Description Language detailed in the ONVIF Core specification. Additionally, the MessageDescription shall contain a ParentTopic element naming the Topic a client has to subscribe to in order to receive this specific output. The topic shall be specified as a Concrete Topic Expression.

With

The output produced by this rule type is described in multiple Messages elements. Each Messages contains a description of the message payload according to the Message Description Language detailed in the ONVIF Core specification. Additionally, the Messages shall contain a ParentTopic element naming the Topic a client has to subscribe to in order to receive this specific output. The topic shall be specified as a Concrete Topic Expression.

And replace “<tt:MessageDescriotion” and “</tt:MessageDescription” with “<tt:Messages” and “</tt:Messages” at schema example (each 2 spots) in section *5.3.2 Analytics Module Description Language* and in *Annex A.1, A.2, A.3, A.4, A.5, A.6* and *B.1*.

1851 Add flicker free 50/60 hz presets to imaging presets

Add following enumerations into *ImagingPresetType* in ver20/imaging/wsdl/imaging.wsdl and section *5.2.50 Imaging Preset Type* in Imgaing Service Specification.

<xs:enumeration value="FlickerFree50"/>
<xs:enumeration value="FlickerFree60"/>

1852 Add H.265 to Streaming Spec

Add following references of HEVC into section *2 Normative references* in Streaming Specification

ISO/IEC 23008-2:2015, Information technology -- High efficiency coding and media delivery in heterogeneous environments -- Part 2: High efficiency video coding

IETF RFC 7798, RTP Payload Format for High Efficiency Video Coding (HEVC) <http://www.ietf.org/rfc/rfc7798.txt>

Add an abbreviation of HEVC into section *3.2 Abbreviations*

HEVC - High Efficiency Video Coding also coined H.265

Add an item of HEVC into list of video codecs in section *4 Overview*

HEVC [ISO23008-2]

Insert a HEVC reference into section *5.1.2.1 RTP* as replacing as

All media streams transferred by the RTP protocol shall conform to [RFC 3550], [RFC 3551], [RFC 3984], [RFC 3016] or [RFC 3640], and JPEG over RTP (see Section 5.1.3).

With

All media streams transferred by the RTP protocol shall conform to [RFC 3550], [RFC 3551], [RFC 3984], [RFC 7798], [RFC 3016] or [RFC 3640], and JPEG over RTP (see Section 5.1.3).

And, in order to apply a target of *Synchronization Point* for H.265 additionally, replace a sentence at section *5.1.3 Synchronization Point*

For H.264 and Video the SPS/PPS header shall be sent in-band if these have been changed during the transmission.

With

For H.264 and H.265 Video the SPS/PPS header shall be sent in-band if these have been changed during the transmission.

1853 Clarity required on interfaces dependent on "DigitalInputOptions"

Put a following sentence instead of existing second paragraph at section *5.10.1 GetDigitalInputs* in DeviceIO service specification.

> A device having one or more digital inputs shall support the GetDigitalInputs command.

Add a following sentence at the end of paragraph in section *5.10.2 GetDigitalInputConfigurationOptions*.

> A device shall support the GetDigitalInputConfigurationOptions command if the device signals capability of digital input configuration via DigitalInputOptions capability.

Add a following sentence at the end of paragraph in section *5.10.3 SetDigitalInputConfigurations*.

> A device shall support the SetDigitalInputConfigurations command if the device signals capability of digital input configuration via DigitalInputOptions capability.

1857 Odd soapAction lines

Insert the missing slash characters in http://www.onvif.org/ver20/media/wsdl/media.wsdl to

> <soap:operation soapAction="http://www.onvif.org/ver20/media/wsdl/GetAudioSourceConfigurations/"/>
> <soap:operation soapAction="http://www.onvif.org/ver20/media/wsdl/GetVideoSourceConfigurationOptions/"/>

1861 Media2.0: Clarification regarding GovLengthRange of VideoEncoder2ConfigurationOptions

Replace a sentence of GovLengthRange descriptioin at section *5.12.17 VideoEncoder2ConfigurationOptions* in Media2 Service specification as

> Supported group of Video frames length. This value typically corresponds to the I-frame distance With
>
> Lower and Upper bounds for the supported group of Video frames length. This value typically corresponds to the I-Frame distance.

1863 Media2.0: MinOccurs for ConfigurationSet element in MediaProfile should be 0

Add an attribute into <tr2:MediaProfile><Configurations> in Media2 WSDL in order to allow no configuration response, by replaceing as

```
<xs:element name="Configurations" type="tr2:ConfigurationSet">
```

With

```
<xs:element name="Configurations" type="tr2:ConfigurationSet" minOccurs="0">
```

1869 Inconsistency documents in Media2 section 5.12

Remove redundant *token* and *fixed* lines from schema example at section *5.12.1 MediaProfile* in Media2 Service Specification as replacing as

```
<xs:complexType name="MediaProfile">
  <xs:attribute name="token" type= "tt:ReferenceToken" use="required"/>
  <xs:attribute name="fixed" type="xs:boolean"/>
  <xs:element name="Name" type= "tt:Name"/>
  <xs:element name="Configurations" type="tr2: ConfigurationSet"/>
  <xs:attribute name="token" type= "tt:ReferenceToken" use="required"/>
  <xs:attribute name="fixed" type="xs:boolean"/>
</xs:complexType>
```

With

```
<xs:complexType name="MediaProfile">
  <xs:element name="Name" type= "tt:Name"/>
  <xs:element name="Configurations" type="tr2: ConfigurationSet" minOccurs="0"/>
  <xs:attribute name="token" type= "tt:ReferenceToken" use="required"/>
  <xs:attribute name="fixed" type="xs:boolean"/>
</xs:complexType>
```

Replace the descriptions

• VideoSourceConfiguration

Optional configuration of the Video input.

• AudioSourceConfiguration

Optional configuration of the Audio input.

• VideoEncoderConfiguration

Optional configuration of the Video encoder.

• AudioEncoderConfiguration

Optional configuration of the Audio encoder.

• VideoAnalyticsConfiguration

Optional configuration of the video analytics module and rule engine.

• PTZConfiguration

Optional configuration of the pan tilt zoom unit.

• MetadataConfiguration

Optional configuration of the metadata stream.

• Extension

Extensions defined in ONVIF 2.0

With

• Configurations

The configurations assigned to the profile.

Correct the title of section 5.12.15 as

5.12.15 VideoResolution

By

5.12.15 VideoResolution2

Replace *GuaranteedInstaces* attribute in VideoEncoder2ConfigurationOptions at section *5.12.17 VideoEncoder2ConfigurationOptions* as

```
<xs:complexType name="VideoEncoder2ConfigurationOptions">
  <xs:element name="Encoding" type="xs:string"/>
  <xs:element name="QualityRange" type= "tt:IntRange"/>
  <xs:element name="ResolutionsAvailable" type="tt:VideoResolution2"/>
  <xs:element name="BitrateRange" type="tt:IntRange"/>
  <xs:attribute name="GovLengthRange" type="tt:IntAttrList"/>
  <xs:attribute name="FrameRatesSupported" type="tt:FloatAttrList"/>
  <xs:attribute name="ProfilesSupported" type="tt:StringAttrList"/>
  <xs:attribute name="GuaranteedInstances" type="xs:int"/>
</xs:complexType>
```

With

```
<xs:complexType name="VideoEncoder2ConfigurationOptions">
  <xs:element name="Encoding" type="xs:string"/>
  <xs:element name="QualityRange" type= "tt:IntRange"/>
  <xs:element name="ResolutionsAvailable" type="tt:VideoResolution2"/>
  <xs:element name="BitrateRange" type="tt:IntRange"/>
  <xs:attribute name="GovLengthRange" type="tt:IntAttrList"/>
  <xs:attribute name="FrameRatesSupported" type="tt:FloatAttrList"/>
  <xs:attribute name="ProfilesSupported" type="tt:StringAttrList"/>
  <xs:attribute name="ConstantBitRateSupported" type="xs:boolean">
</xs:complexType>
```

And

- GuaranteedInstances

The minimum guaranteed number of encoder instances using this encoding for the associated VideoSourceConfiguration.

With

- ConstantBitRateSupported

Signal whether enforcing constant bitrate is supported.

Change order of *Multicast* element at section *5.12.22 AudioEncoder2Configuration* schema example as

```
<xs:complexType name="AudioEncoder2Configuration">
  <xs:extension base= "tt:ConfigurationEntity"/>
  <xs:element name="Encoding" type="xs:string"/>
  <xs:element name="Bitrate" type="xs:int"/>
  <xs:element name="SampleRate" type="xs:int"/>
  <xs:element name="Multicast" type="tt:MulticastConfiguration"/>
</xs:complexType>
```

With

```
<xs:complexType name="AudioEncoder2Configuration">
  <xs:extension base= "tt:ConfigurationEntity"/>
  <xs:element name="Encoding" type="xs:string"/>
  <xs:element name="Multicast" type="tt:MulticastConfiguration" minOccurs="0"/>
  <xs:element name="Bitrate" type="xs:int"/>
  <xs:element name="SampleRate" type="xs:int"/>
</xs:complexType>
```

Add *AnalyticsEngineConfiguration* element into *5.12.24 MetadataConfiguration* in schema example as

```
<xs:complexType name="MetadataConfiguration">
  <xs:extension base= "tt:ConfigurationEntity"/>
  <xs:element name="PTZStatus" type= "tt:PTZFilter" minOccurs="0"/>
  <xs:element name="Events" type= "tt:EventSubscription" minOccurs="0"/>
  <xs:element name="Analytics" type="xs:boolean" minOccurs="0"/>
  <xs:element name="Multicast" type="tt:MulticastConfiguration"/>
  <xs:element name="SessionTimeout" type="xs:duration"/>
  <xs:element name="AnalyticsEngineConfiguration" type="tt:AnalyticsEngineConfiguration"
minOccurs="0"/>
  <xs:attribute name="CompressionType" type="xs:string"/>
</xs:complexType>
```

And in the description

• AnalyticsEngineConfiguration
Optional parameter to configure analytics engine.

Add *token* attribute at section *5.12.36 Video Source Mode* description

• token
Indicate token for video source mode.

Add *Total* attribute for the member of *MaximumNumberOfOSDs* into the schema example at section *5.12.44 OSDConfigurationOptions*

```
<xs:complexType name="OSDConfigurationOptions">
  <xs:element name=”MaximumNumberOfOSDs” type=”xs:int”>
    <xs:attribute name="Total" type="xs:int" use="required"/>
    <xs:attribute name="Image" type="xs:int"/>
    <xs:attribute name="PlainText" type="xs:int"/>
    <xs:attribute name="Date" type="xs:int"/>
    <xs:attribute name="Time" type="xs:int"/>
    <xs:attribute name="DateAndTime" type="xs:int"/>
  </element>
  <xs:element name="Type" type="tt:OSDType" maxOccurs="unbounded"/>
  <xs:element name="PositionOption" type="xs:string" maxOccurs="unbounded"/>
  <xs:element name="TextOption" type="tt:OSDTextOptions" minOccurs="0"/>
  <xs:element name="ImageOption" type="tt:OSDImgOptions" minOccurs="0"/>
</xs:complexType>
```

Add *AnalyticsEngineConfiguration* element into *5.23.31 MetadataConfiguration* in schema example in Media Service Specification, as

```
<xs:complexType name="MetadataConfiguration">
  <xs:extension base= "tt:ConfigurationEntity"/>
  <xs:element name="PTZStatus" type= "tt:PTZFilter" minOccurs="0"/>
  <xs:element name="Events" type= "tt:EventSubscription" minOccurs="0"/>
  <xs:element name="Analytics" type="xs:boolean" minOccurs="0"/>
  <xs:element name="Multicast" type="tt:MulticastConfiguration"/>
  <xs:element name="SessionTimeout" type="xs:duration"/>
  <xs:element name="AnalyticsEngineConfiguration" type="tt:AnalyticsEngineConfiguration"
minOccurs="0"/>
```

```
  <xs:attribute name="CompressionType" type="xs:string"/>
</xs:complexType>
```

And in the description

• AnalyticsEngineConfiguration
Optional parameter to configure analytics engine.

Add *token* attribute at section *5.23.55 Video Source Mode* description

• token
Indicate token for video source mode.

Add *Total* attribute for the member of *MaximumNumberOfOSDs* into the schema example at section *5.23.63 OSDConfigurationOptions*

```
<xs:complexType name="OSDConfigurationOptions">
  <xs:element name=”MaximumNumberOfOSDs” type=”xs:int”>
    <xs:attribute name="Total" type="xs:int" use="required"/>
    <xs:attribute name="Image" type="xs:int"/>
    <xs:attribute name="PlainText" type="xs:int"/>
    <xs:attribute name="Date" type="xs:int"/>
    <xs:attribute name="Time" type="xs:int"/>
    <xs:attribute name="DateAndTime" type="xs:int"/>
  </element>
  <xs:element name="Type" type="tt:OSDType" maxOccurs="unbounded"/>
  <xs:element name="PositionOption" type="xs:string" maxOccurs="unbounded"/>
  <xs:element name="TextOption" type="tt:OSDTextOptions" minOccurs="0"/>
  <xs:element name="ImageOption" type="tt:OSDImgOptions" minOccurs="0"/>
</xs:complexType>
```