

# ONVIF™ Video Analytics Device Service Specification

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## 1 Scope

This document defines the web service interface to control in- and outputs of a video analytics device.

Web service usage is outside of the scope of this document. Please refer to the ONVIF core specification.

## 2 Normative references

ONVIF Core Specification

<<http://www.onvif.org/specs/core/ONVIF-Core-Spec-v210.pdf>>

ONVIF Media Service Specification

<<http://www.onvif.org/specs/srv/media/ONVIF-Media-Service-Spec-v210.pdf>>

ONVIF Streaming Specification

<<http://www.onvif.org/specs/stream/ONVIF-Streaming-Spec-v210.pdf>>

ONVIF Video Analytics Specification

<<http://www.onvif.org/specs/srv/analytics/ONVIF-VideoAnalytics-Service-Spec-v210.pdf>>

## 3 Terms and Definitions

### 3.1 Definitions

<b>Metadata</b>	All streaming data except video and audio, including video analytics results, PTZ position data and other metadata (such as textual data from POS applications).
<b>Media stream</b>	Streamed video and / or audio data
<b>Scene Description</b>	Metadata output by video analytics describing object location and behaviour.
<b>Video Analytics</b>	Algorithms or programs used to analyze video data and to generate data describing object location and behaviour.

### 3.2 Abbreviations

ONVIF	Open Network Video Interface Forum
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## 4 Overview

The Analytics Device Service has to be used for stand alone analytics devices (Network Video Analytics – NVA) which perform evaluation processes on media streams or metadata enhanced media streams. Evaluations may involve more than one media stream or metadata enhanced media stream at a time.

The Analytics Device Service receives media streams or metadata enhanced media streams from live-generating or storing devices. It could comprise decoder capabilities if analysis is being performed on uncompressed data.

The Analytics Device Service is being used by a Client to configure properties and functionality of a stand alone analytics device.

Backchannel capabilities are not provided by stand alone analytics devices.

The output of the Analytics Device Service can be obtained using the Event Service (ONVIF Core Specification), additionally the GetStreamUri command is supported.

WSDL for this service is specified in <http://www.onvif.org/ver10/analyticsdevice.wsdl>.

## 5 Analytics Device Service

The Analytics Device Service relies on the ONVIF Receiver Service for receiving the data from other devices through receiver objects identified by ReceiverTokens. Mechanisms have to be provided to assign different tracks in the received RTSP stream to the appropriate AnalyticsEngine.

The central element in the configuration of an Analytics Device Service is the AnalyticsEngineControl. It comprises necessary tokens and descriptions for the service as well as the possibility of activation/deactivation for the particular AnalyticsEngineControl. AnalyticsEngineControl assembles the AnalyticsEngine with that configuration of analytics modules the AnalyticsEngine is composed of in effect and input streams on which the analysis will be applied. Additional elements allow for configuration of multicast parameter and subscriptions. The latter may be used to provide information about outputs being generated by the particular AnalyticsEngineControl.

An AnalyticsEngine could be either a single algorithm or a complete application, e.g. lost baggage. ONVIF Video Analytics Specification provides further details. Several parameter sets (VideoAnalyticsConfiguration) can exist in parallel for an AnalyticsEngine to allow for switching between e.g. day and night configurations. Additionally, a structure is provided (AnalyticsEngineInputInfo) to describe input configuration requirements for the particular AnalyticsEngine.

In order to enable adaptation of the AnalyticsEngine to different input data the description of the input being feed into the AnalyticsEngine has to be provided in the AnalyticsEngineInput element.

Changes of e.g. camera parameters while analysis is being performed may influence results of the analysis. Therefore, input parameter changes have to be reflected in the AnalyticsEngineInput structure.

All structures have to exist at least once when the service is started and could be filled in with default values where appropriate.

### 5.1 Analytics Engine Input

The AnalyticsEngineInput structure describes the video and metadata input provided to a particular AnalyticsEngine. If more than one input source is being used there has to be an AnalyticsEngineInput element for each of the sources.

SourceIdentification: identifies the source the input is coming from (e.g. identification of the camera cluster, the particular camera and the profile being used)

VideoSource: information about the video source, in particular about the compression parameters being used

MetadataInput: describes the source metadata provisioning to be used for analysis

#### 5.1.1 GetAnalyticsEngineInputs

This operation lists all available analytics engine inputs for the device. The Analytics Device Service shall support the listing of available analytics engine inputs through the GetAnalyticsEngineInputs command.

**Table 1: GetAnalyticsEngineInputs command**

<b>GetAnalyticsEngineInputs</b>		Access Class: READ_MEDIA
Message name	Description	
GetAnalyticsEngineInputsRequest	<i>This is an empty message.</i>	
GetAnalyticsEngineInputsResponse	<i>Contains a list of structures describing available AnalyticsEngineInputs.</i>  tt:AnalyticsEngineInput <b>Configuration</b> [1][unbounded]	
Fault codes	Description	
	<i>No command specific faults!</i>	

### 5.1.2 GetAnalyticsEngineInput

The GetAnalyticsEngineInput command fetches the input configuration if the analytics engine input configuration token is known. An Analytics Device Service shall support the listing of an analytics engine input configuration through the GetAnalyticsEngineInput command.

**Table 2: GetAnalyticsEngineInput command**

<b>GetAnalyticsEngineInput</b>		Access Class: READ_MEDIA
Message name	Description	
GetAnalyticsEngineInputRequest	<i>Contains the token of an existing analytics engine input configuration.</i>  tt:ReferenceToken <b>ConfigurationToken</b> [1][1]	
GetAnalyticsEngineInputResponse	<i>Contains the requested analytics engine input configuration.</i>  tt:AnalyticsEngineInput <b>Configuration</b> [1][1]	
Fault codes	Description	
env:Sender ter:InvalidArgVal ter:NoConfig	<i>The requested configuration indicated with <b>ConfigurationToken</b> does not exist.</i>	

### 5.1.3 SetAnalyticsEngineInput

This command changes the analytics engine input configuration. An Analytics Device Service shall support the modification of its analytics engine input configuration through this command.

**Table 3: SetAnalyticsEngineInput command**

<b>SetAnalyticsEngineInput</b>		Access Class: ACTUATE
Message name	Description	

SetAnalyticsEngineInput - Request	<p><i>The Configuration shall be the new configuration. The ForcePersistence element determines if the configuration changes shall be stored and remain after reboot. If true, changes shall be persistent. If false, changes MAY revert to previous values after reboot.</i></p> <p>tt:AnalyticsEngineInput <b>Configuration</b>[1][1] xs:boolean <b>ForcePersistence</b> [1][1]</p>
SetAnalyticsEngineInputResponse	<i>This message is empty</i>
<b>Fault codes</b>	<b>Description</b>
env:Sender ter:InvalidArgVal ter:invalidConfig	<i>The configuration is not possible to set</i>
env:Sender ter:InvalidArgVal ter:NoConfig	<i>The requested configuration indicated with <b>ConfigurationToken</b> does not exist.</i>

#### 5.1.4 CreateAnalyticsEngineInputs

This command generates analytics engine input configurations. An Analytics Device Service shall support the generation of analytics engine input configurations through this command.

**Table 4: CreateAnalyticsEngineInputs command**

<b>CreateAnalyticsEngineInputs</b>	Access Class: ACTUATE
<b>Message name</b>	<b>Description</b>
CreateAnalyticsEngineInputsRequest	<p><i>The Configuration shall be the new configuration. The ForcePersistence element determines if the configuration shall be stored and remain after reboot. If true, changes shall be persistent. If false, changes MAY revert to previous values after reboot.</i></p> <p>tt:AnalyticsEngineInput <b>Configuration</b>[1][unbounded] xs:boolean <b>ForcePersistence</b> [1][unbounded]</p>
CreateAnalyticsEngineInputsResponse	<p><i>Contains the configurations including generated tokens.</i></p> <p>tt:AnalyticsEngineInput <b>Configuration</b>[1][unbounded]</p>
<b>Fault codes</b>	<b>Description</b>
env:Sender ter:InvalidArgVal ter:invalidConfig	<i>The configurations are not possible to set</i>
env:Receiver ter:Action ter:MaxAnalyticsEngineInput	<i>The maximum number of supported AnalyticsEngineInput objects has been reached.</i>



### 5.1.5 DeleteAnalyticsEngineInputs

This command deletes analytics engine input configurations. An Analytics Device Service shall support the deletion of analytics engine input configurations through this command.

**Table 5: DeleteAnalyticsEngineInputs command**

<b>DeleteAnalyticsEngineInputs</b>		Access Class: ACTUATE
<b>Message name</b>	<b>Description</b>	
DeleteAnalyticsEngineInputsRequest	<i>Contains ConfigurationTokens identifying the AnalyticsEngineInputs to be deleted.</i>  tt:ReferenceToken <b>ConfigurationToken</b> [1][unbounded]	
DeleteAnalyticsEngineInputsResponse	<i>This message is empty</i>	
<b>Fault codes</b>	<b>Description</b>	
env:Sender ter:InvalidArgVal ter:NoAnalyticsEngineInput	<i>The requested AnalyticsEngineInput indicated with <b>ConfigurationToken</b> does not exist.</i>	
env:Sender ter:Action ter:CannotDeleteEngineInput	<i>It is not possible to delete a specified AnalyticsEngineInput.</i>	

## 5.2 Video Analytics Configuration

### 5.2.1 GetVideoAnalyticsConfiguration

The GetVideoAnalyticsConfiguration command fetches the video analytics configuration if the video analytics configuration token is known. An Analytics Device Service shall support the listing of video analytics configuration through the GetVideoAnalyticsConfiguration command. All suitable video analytics configuration token can be found within available AnalyticsEngine configurations.

**Table 6: GetVideoAnalyticsConfiguration command**

<b>GetVideoAnalyticsConfiguration</b>		Access Class: READ_MEDIA
<b>Message name</b>	<b>Description</b>	
GetVideoAnalyticsConfigurationRequest	<i>Contains the token of an existing video analytics configuration.</i>  tt:ReferenceToken <b>ConfigurationToken</b> [1][1]	
GetVideoAnalyticsConfigurationResponse	<i>Contains the requested video analytics configuration.</i>  tt:VideoAnalyticsConfiguration <b>Configuration</b> [1][1]	
<b>Fault codes</b>	<b>Description</b>	
env:Sender ter:InvalidArgVal ter:NoConfig	<i>The requested configuration indicated with <b>ConfigurationToken</b> does not exist.</i>	

### 5.2.2 SetVideoAnalyticsConfiguration

This command changes the video analytics configuration. An Analytics Device Service shall support the modification of its analytics engine configuration through this command. If the SetVideoAnalyticsConfiguration command is being received by the Analytics Device Service the changes shall be applied also to the affected configuration if it is in active use.

**Table 7: SetVideoAnalyticsConfiguration command**

<b>SetVideoAnalyticsConfiguration</b>		Access Class: ACTUATE
<b>Message name</b>	<b>Description</b>	
SetVideoAnalyticsConfiguration – Request	<p><i>The Configuration shall be the new configuration. The ForcePersistence element determines if the configuration changes shall be stored and remain after reboot. If true, changes shall be persistent. If false, changes MAY revert to previous values after reboot.</i></p> <p>tt:VideoAnalyticsConfiguration <b>Configuration</b>[1][1] xs:boolean <b>ForcePersistence</b> [1][1]</p>	
SetVideoAnalyticsConfigurationResponse	<i>This message is empty</i>	
<b>Fault codes</b>	<b>Description</b>	
env:Sender ter:InvalidArgVal ter:invalidConfig	<i>The configuration is not possible to set</i>	
env:Sender ter:InvalidArgVal ter:NoConfig	<i>The requested configuration indicated with <b>ConfigurationToken</b> does not exist.</i>	

### 5.3 Analytics Engines

The structure returned by the commands defined herein contains a list of available VideoAnalyticsConfiguration for the particular AnalyticsEngine together with appropriate AnalyticsEngineInputInfo elements for each VideoAnalyticsConfiguration.

VideoAnalyticsConfiguration: description of configuration possibilities of the analytics engine

AnalyticsEngineInputInfo: information about input requirements of the analytics engine

#### 5.3.1 GetAnalyticsEngines

This operation lists all available analytics engines for the device. The Analytics Device Service shall support the listing of available analytics engines through the GetAnalyticsEngines command.

**Table 8: GetAnalyticsEngines command**

<b>GetAnalyticsEngines</b>		Access Class: READ_MEDIA
Message name	Description	
GetAnalyticsEnginesRequest	<i>This is an empty message.</i>	
GetAnalyticsEnginesResponse	<i>Contains a list of structures describing available AnalyticsEngines.</i>  tt:AnalyticsEngine <b>Configuration</b> [1][unbounded]	
Fault codes	Description	
	<i>No command specific faults!</i>	

### 5.3.2 GetAnalyticsEngine

The GetAnalyticsEngine command fetches the analytics engine if the analytics engine token is known. An Analytics Device Service shall support the listing of an analytics engine configuration through the GetAnalyticsEngine command.

**Table 9: GetAnalyticsEngine command**

<b>GetAnalyticsEngine</b>		Access Class: READ_MEDIA
Message name	Description	
GetAnalyticsEngineRequest	<i>Contains the token of an existing analytics engine.</i>  tt:ReferenceToken <b>ConfigurationToken</b> [1][1]	
GetAnalyticsEngineResponse	<i>Contains the requested AnalyticsEngine configuration.</i>  tt:AnalyticsEngine <b>Configuration</b> [1][1]	
Fault codes	Description	
env:Sender ter:InvalidArgVal ter:NoConfig	<i>The requested configuration indicated with <b>ConfigurationToken</b> does not exist.</i>	

## 5.4 Analytics Engine Control

The AnalyticsEngineControl structure shall be used to exercise control through the commands defined in the following.

Name: friendly description

EngineToken: Token of the analytics engine (AnalyticsEngine) being controlled

EngineConfigToken: Token of the analytics engine configuration (VideoAnalyticsConfiguration) in effect

InputToken: Tokens of the input (AnalyticsEngineInput) configuration applied

ReceiverToken: Tokens of the receiver providing media input data. The order of ReceiverToken shall exactly match the order of InputToken.

Multicast: parameter for multicast used to configure and control multicast of the metadata stream

Subscription: Description of Topics the controlled engine is reacting on

Mode: indicating the actual status for the controlled analysis (shall be either "Idle" or "Active")

#### 5.4.1 GetAnalyticsEngineControls

This operation lists all available analytics engine controls for the device. The Analytics Device Service shall support the listing of available analytics engine controls through the GetAnalyticsEngineControls command.

**Table 10: GetAnalyticsEngineControls command**

<b>GetAnalyticsEngineControls</b>		Access Class: READ_MEDIA
<b>Message name</b>	<b>Description</b>	
GetAnalyticsEngineControlsRequest	<i>This is an empty message.</i>	
GetAnalyticsEngineControlsResponse	<i>Contains a list of structures describing available AnalyticsEngineControls.</i>  tt:AnalyticsEngineControl <b>AnalyticsEngineControls</b> [1][unbounded]	
<b>Fault codes</b>	<b>Description</b>	
	<i>No command specific faults!</i>	

#### 5.4.2 GetAnalyticsEngineControl

The GetAnalyticsEngineControl command fetches the analytics engine control if the analytics engine control token is known. An Analytics Device Service shall support the listing of analytics engine control configuration through the GetAnalyticsEngineControl command.

**Table 11: GetAnalyticsEngineControl command**

<b>GetAnalyticsEngineControl</b>		Access Class: READ_MEDIA
Message name	Description	
GetAnalyticsEngineControlRequest	<i>Contains the token of an existing AnalyticsEngineControl.</i> tt:ReferenceToken <b>ConfigurationToken</b> [1][1]	
GetAnalyticsEngineControlResponse	<i>Contains the requested AnalyticsEngineControl configuration.</i> tt:AnalyticsEngineControl <b>Configuration</b> [1][1]	
Fault codes	Description	
env:Sender ter:InvalidArgVal ter:NoConfig	<i>The requested configuration indicated with <b>ConfigurationToken</b> does not exist.</i>	

### 5.4.3 SetAnalyticsEngineControl

This command changes the AnalyticsEngineControl configuration. An Analytics Device Service shall support the modification of its analytics engine control configuration through this command.

**Table 12: SetAnalyticsEngineControl command**

<b>SetAnalyticsEngineControl</b>		Access Class: ACTUATE
Message name	Description	
SetAnalyticsEngineControlRequest	<i>The Configuration shall be the new configuration. The ForcePersistence element determines if the configuration changes shall be stored and remain after reboot. If true, changes shall be persistent. If false, changes MAY revert to previous values after reboot.</i> tt:AnalyticsEngineControl <b>Configuration</b> [1][1] xs:boolean <b>ForcePersistence</b> [1][1]	
SetAnalyticsEngineControlResponse	<i>This message is empty</i>	
Fault codes	Description	
env:Sender ter:InvalidArgVal ter:invalidConfig	<i>The configuration is not possible to set</i>	
env:Sender ter:InvalidArgVal ter:NoConfig	<i>The requested configuration indicated with <b>ConfigurationToken</b> does not exist.</i>	

### 5.4.4 CreateAnalyticsEngineControl

CreateAnalyticsEngineControl shall create a new control object. Mode shall be set to "idle". To change the mode to "active" the SetAnalyticsEngineControl command can be used. An Analytics Device Service shall support the creation of control objects through this command.

**Table 13: CreateAnalyticsEngineControl command**

<b>CreateAnalyticsEngineControl</b>		Access Class: ACTUATE
Message name	Description	
CreateAnalyticsEngineControlRequest	<i>The Configuration shall be the new configuration.</i> . tt:AnalyticsEngineControl <b>Configuration</b> [1][1]	
CreateAnalyticsEngineControlResponse	<i>Contains the configuration including the generated token.</i> tt:AnalyticsEngineControl <b>Configuration</b> [1][1]	
Fault codes	Description	
env:Sender ter:InvalidArgVal ter:AnalyticsEngineControlExists	<i>An AnalyticsEngineControl with the token <b>ConfigurationToken</b> already exists.</i>	
env:Receiver ter:Action ter:MaxAnalyticsEngineControl	<i>The maximum number of supported AnalyticsEngineControl objects has been reached.</i>	
env:Sender ter:InvalidArgVal ter:invalidConfig	<i>The configuration is not possible to set</i>	

#### 5.4.5 DeleteAnalyticsEngineControl

DeleteAnalyticsEngineControl shall delete a control object. An Analytics Device Service shall support the deletion of control objects through this command.

**Table 14: DeleteAnalyticsEngineControl command**

<b>DeleteAnalyticsEngineControl</b>		Access Class: ACTUATE
Message name	Description	
DeleteAnalyticsEngineControlRequest	<i>Contains the <b>ConfigurationToken</b> of the AnalyticsEngineControl to be deleted.</i> tt:ReferenceToken <b>ConfigurationToken</b> [1][1]	
DeleteAnalyticsEngineControlResponse	<i>This message is empty.</i>	
Fault codes	Description	
env:Sender ter:InvalidArgVal ter:NoAnalyticsEngineControl	<i>The requested AnalyticsEngineControl indicated with <b>ConfigurationToken</b> does not exist.</i>	
env:Sender ter:Action ter:CannotDeleteControl	<i>It is not possible to delete the specified AnalyticsEngineControl.</i>	

## 5.5 GetAnalyticsState

GetAnalyticsState returns status information of the referenced AnalyticsEngineControl object. The structure AnalyticsStateInformation is expandable. The expansion shall be used to convey additional state information about substructures. E.g. an AnalyticsEngine is composed of different analytics algorithms for which state information should be provided. The state element of AnalyticsStateInformation always holds an aggregated state of all substructures.

An Analytics Device Service shall support state information provisioning through this command.

**ConfigurationToken** shall be the identification of the AnalyticsEngineControl for which the state information is requested

**State** shall hold the aggregated state over all substructures of the AnalyticsEngineControl. A device shall apply the following rules to compute aggregate state:

Idle	The state of all substructures is "Idle"
PartiallyActive	At least one of the substructures has state "Active", all other substructures have state "Idle".
Active	The state of all substructures is "Active"
Error	At least one of the substructures has state "Error"

**Error**, if present, shall hold an implementation defined string value that describes the error.

**Table 15: GetAnalyticsState**

GetAnalyticsState		Access Class: READ_MEDIA
Message name	Description	
GetAnalyticsStateRequest	Contains the <b>ConfigurationToken</b> of the AnalyticsEngineControl for which to get the state.  tt:ReferenceToken <b>ConfigurationToken</b> [1][1]	
GetAnalyticsStateResponse	The <b>State</b> shall hold the state of the AnalyticsEngineControl.  tt:AnalyticsStateInformation <b>State</b> [1][1]	
Fault codes	Description	
env:Sender ter:InvalidArgVal ter:NoAnalyticsEngineControl	The ConfigurationToken does not reference an existing <b>AnalyticsEngineControl</b> .	

## 5.6 Output streaming configuration

An Analytics Device Service provides a real-time streaming interface as specified in in the ONVIF Streaming Service Specification by acting as an RTSP server. Instead of the token identifying the profile being used in a Media Profile, the token identifying the AnalyticsEngineControl will be used on an Analytics Device Service.

### 5.6.1 Request stream URI

This operation requests a URI that can be used to initiate a live stream using RTSP as the control protocol. The URI is valid only as it is specified in the response or until the AnalyticsEngineControl is reconfigured. The Analytics Device Service shall support the retrieval of a stream URI for a specific analytics engine control through the GetAnalyticsDeviceStreamUri command.

**Table 16: GetAnalyticsDeviceStreamUri command**

GetAnalyticsDeviceStreamUri		Access Class: READ_MEDIA
Message name	Description	
GetAnalyticsDeviceStreamUriRequest	<p>The <b>StreamSetup</b> element contains two parts. <i>StreamType</i> defines if a unicast or multicast media stream is requested. <i>Transport</i> specifies a chain of transport protocols defining the tunneling of the media stream over different network protocols.</p> <p>The <b>AnalyticsEngineControlToken</b> element shall indicate the analytics engine control to use.</p> <p>tt:StreamSetup <b>StreamSetup</b> [1][1]            tt:ReferenceToken <b>AnalyticsEngineControlToken</b> [1][1]</p>	
GetAnalyticsDeviceStreamUriResponse	<p>Contains the <b>Uri</b> to be used for requesting the media stream</p> <p>xs:anyURI <b>Uri</b> [1][1]</p>	
Fault codes	Description	
env:Sender ter:InvalidArgVal ter:NoAnalyticsEngineControl	<p>The requested configuration indicated with <b>AnalyticsEngineControlToken</b> does not exist.</p>	
env:Sender ter:InvalidArgVal ter:InvalidStreamSetup	<p>Specification of <i>StreamType</i> or <i>Transport</i> part in <b>StreamSetup</b> is not supported.</p>	
env:Sender ter:OperationProhibited ter:StreamConflict	<p>Specification of <i>StreamType</i> or <i>Transport</i> part in <b>StreamSetup</b> causes conflict with other streams.</p>	

### 5.6.2 Capabilities

The capabilities reflect optional functions and functionality of a service. The information is static and does not change during device operation. Currently there are no capabilities defined for this service.



**Table 17: GetServiceCapabilities command**

GetServiceCapabilities		Access Class: PRE_AUTH
Message name	Description	
GetServiceCapabilitiesRequest	<i>This message contains a request for device capabilities.</i>	
GetServiceCapabilitiesResponse	<i>The capability response message contains the requested service capabilities using a hierarchical XML capability structure.</i>  tad:Capabilities <b>Capabilities</b> [1][1]	
Fault codes	Description	
	<i>No command specific faults!</i>	

## 5.7 Service specific data types

### 5.7.1 AnalyticsEngine

```
<xs:complexType name="AnalyticsEngine"/>
  <xs:extension base="tt:ConfigurationEntity"/>
  <xs:element name="name" type="xs:string"/>
  <xs:element name="AnalyticsEngineConfiguration" type="
    tt:AnalyticsDeviceEngineConfiguration/>
</xs:complexType>
```

- **name**  
Additional user friendly denomination.
- **AnalyticsEngineConfiguration**  
Contains information about engine configurations available.

### 5.7.2 AnalyticsDeviceEngineConfiguration

```
<xs:complexType name="AnalyticsDeviceEngineConfiguration"/>
  <xs:element name="EngineConfiguration" type="tt:EngineConfiguration
    maxOccurs="unbounded"/>
</xs:complexType>
```

- **EngineConfiguration**  
List of possible analytics engine configurations.

### 5.7.3 EngineConfiguration

```
<xs:complexType name="EngineConfiguration"/>
  <xs:element name="VideoAnalyticsConfiguration" type="
    tt:VideoAnalyticsConfiguration/>
  <xs:element name="AnalyticsEngineInputInfo" type="
    tt:AnalyticsEngineInputInfo/>
</xs:complexType>
```

- **VideoAnalyticsConfiguration**  
List of assembled analytics modules and their respective configurations.
- **AnalyticsEngineInputInfo**  
Contains information about input formats and parameters required by the analytic modules used.

### 5.7.4 AnalyticsEngineInputInfo

```
<xs:complexType name="AnalyticsEngineInputInfo"/>
  <xs:element name="InputInfo" type="tt:Config minOccurs="0"/>
</xs:complexType>
```

- **InputInfo**  
List of input format and parameter requirements.

### 5.7.5 AnalyticsEngineInput

```
<xs:complexType name="AnalyticsEngineInput"/>
  <xs:extension base="tt:ConfigurationEntity"/>
  <xs:element name="SourceIdentification" type="tt:SourceIdentification"/>
  <xs:element name="VideoInput" type="tt:VideoEncoderConfiguration"/>
  <xs:element name="MetadataInput" type="tt:MetadataInput"/>
</xs:complexType>
```

- **SourceIdentification**  
Identification of the video source applied.
- **VideoInput**  
Actual configuration of the video encoder applied by the source.
- **MetadataInput**  
Description of metadata provided as input.

### 5.7.6 SourceIdentification

```
<xs:complexType name="SourceIdentification"/>
  <xs:element name="Name" type="xs:string"/>
  <xs:element name="Token" type="tt:ReferenceToken"
    minOccurs="0" maxOccurs="unbounded"/>
</xs:complexType>
```

- **Name**  
Denomination of the video source applied.
- **Token**  
Token of the video source applied.

### 5.7.7 MetadataInput

```
<xs:complexType name="MetadataInput"/>
  <xs:element name="MetadataConfig" type="tt:Config minOccurs="0"
    maxOccurs="unbounded"/>
</xs:complexType>
```

- **MetadataConfig**  
Description of metadata provided as input.

### 5.7.8 AnalyticsEngineControl

```
<xs:complexType name="AnalyticsEngineControl"/>
  <xs:extension base="tt:ConfigurationEntity"/>
  <xs:element name="EngineToken" type="tt:ReferenceToken"/>
  <xs:element name="EngineConfigToken" type="tt:ReferenceToken"/>
  <xs:element name="InputToken" type="tt:ReferenceToken"
    minOccurs="0" maxOccurs="unbounded"/>
  <xs:element name="ReceiverToken" type="tt:ReferenceToken"
    minOccurs="0" maxOccurs="unbounded"/>
  <xs:element name="Multicast" type="tt:MulticastConfiguration"
    minOccurs="0"/>
  <xs:element name="Subscription" type="tt:Config"/>
  <xs:element name="Mode" type="tt:ModeOfOperation"/>
```

```
</xs:complexType>
```

- **EngineToken**  
Token of the analytics engine (AnalyticsEngine) being controlled.
- **EngineConfigToken**  
Token of the analytics engine configuration (VideoAnalyticsConfiguration) in effect.
- **InputToken**  
Tokens of the input (AnalyticsEngineInput) configuration applied.
- **ReceiverToken**  
Tokens of the receiver providing media input data. The order of ReceiverToken shall exactly match the order of InputToken.
- **Multicast**  
Contains parameter for multicast delivery.
- **Subscription**  
Provides information about outputs being generated.
- **Mode**  
Specifies the mode of operation.

#### 5.7.9 AnalyticsStateInformation

```
<xs:complexType name="AnalyticsStateInformation"/>
  <xs:element name="AnalyticsEngineControlToken" type=
    "tt:ReferenceToken"/>
  <xs:element name="State" type="tt:AnalyticsState"/>
</xs:complexType>
```

- **AnalyticsEngineControlToken**  
Token of the control object whose status is requested.
- **State**  
Shall hold the aggregated state over all substructures referred to by the AnalyticsEngineControlToken.

#### 5.7.10 AnalyticsState

```
<xs:complexType name="AnalyticsState"/>
  <xs:element name="Error" type="xs:string" minOccurs="0"/>
  <xs:element name="State" type="xs:string"/>
</xs:complexType>
```

- **Error**  
If present, shall hold an implementation defined string value that describes the error.
- **State**  
Contains the aggregated state information.