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Technical Information

How to use Bosch Video content Analysis via ONVIF Analytic Events and Metadata

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How to use the Bosch Video Analysis via ONVIF

1 Scope

This document describes the usage of the Bosch Video content analysis via the standard interface ONVIF. It is supported to receive Analysis Events based on the Intelligent Video analysis Rules and the metadata stream in the ONVIF format.

Further information on the Bosch Intelligent Video analysis <http://www.boschsecurity.com/hdsecurity/Default.aspx?language=en&tab=intelligent-video-analysis>

2 IVA Events via Onvif

Video analysis Events via Onvif are based on the analytic rules of the Bosch camera, it are up to eight rules supported. The configuration of the Rules needs to be done on the webpage of the device or the Bosch Configuration Manager

List of Supported IVA Rules

- Object In Field
- Crossing Line
- Loitering
- Condition Change
- Following Route
- Removed Object
- Idle Object
- Entering Field
- Leaving Field
- Similarity Search
- Crowd Detection
- Counter (Alarm event)

Other Analytic Events

- Motion
- Fire detected (Only supported by AVIOTEC Camera, min FW 6.20)
- Smoke detected (Only supported by AVIOTEC Camera, min FW 6.20)

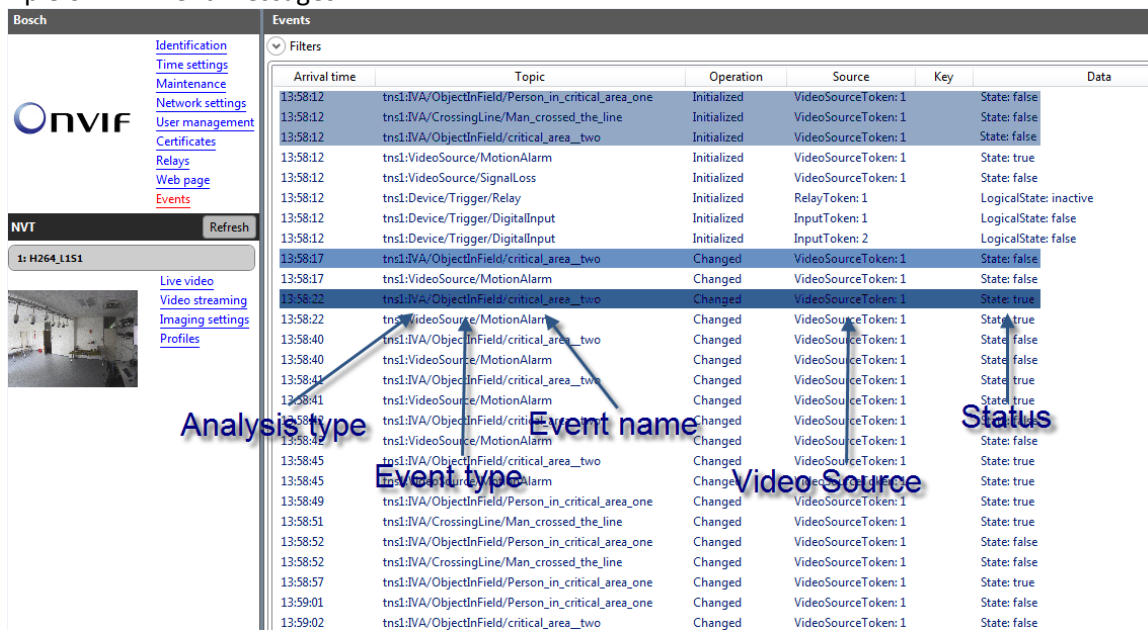
An ONVIF Analytic Event message includes the **Video source** the **event type** and the **rule name** (see screenshot on page 3).

All configured Analytic Events can be requested with the ONVIF request **GetEventProperties**. Furthermore it is supported to dynamically create new Analytic rules, in case a rule is created on the camera the **GetEventProperties** needs to request by the ONVIF client again. Changes of an existing rule rules (eg. Moving a crossing line etc.) do not require an update of the **GetEventProperties**.

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Note: To be backward compatible all IVA Events are transmitted as **Motion Alarm** Event, too
 Example of IVA Event Messages:



Arrival time	Topic	Operation	Source	Key	Data
13:58:12	tns1:IVA/ObjectInField/Person_in_critical_area_one	Initialized	VideoSourceToken: 1	State: false	
13:58:12	tns1:IVA/CrossingLine/Man_crossed_the_line	Initialized	VideoSourceToken: 1	State: false	
13:58:12	tns1:IVA/ObjectInField/critical_area_two	Initialized	VideoSourceToken: 1	State: false	
13:58:12	tns1:VideoSource/MotionAlarm	Initialized	VideoSourceToken: 1	State: true	
13:58:12	tns1:VideoSource/SignalLoss	Initialized	VideoSourceToken: 1	State: false	
13:58:12	tns1:Device/Trigger/Relay	Initialized	RelayToken: 1	LogicalState: inactive	
13:58:12	tns1:Device/Trigger/DigitalInput	Initialized	InputToken: 1	LogicalState: false	
13:58:12	tns1:Device/Trigger/DigitalInput	Initialized	InputToken: 2	LogicalState: false	
13:58:17	tns1:IVA/ObjectInField/critical_area_two	Changed	VideoSourceToken: 1	State: false	
13:58:17	tns1:VideoSource/MotionAlarm	Changed	VideoSourceToken: 1	State: false	
13:58:22	tns1:IVA/ObjectInField/critical_area_two	Changed	VideoSourceToken: 1	State: true	
13:58:22	tns1:VideoSource/MotionAlarm	Changed	VideoSourceToken: 1	State: true	
13:58:40	tns1:IVA/ObjectInField/critical_area_two	Changed	VideoSourceToken: 1	State: false	
13:58:40	tns1:VideoSource/MotionAlarm	Changed	VideoSourceToken: 1	State: false	
13:58:41	tns1:IVA/ObjectInField/critical_area_two	Changed	VideoSourceToken: 1	State: true	
13:58:41	tns1:VideoSource/MotionAlarm	Changed	VideoSourceToken: 1	State: true	
13:58:42	tns1:IVA/ObjectInField/critical_area_two	Changed	VideoSourceToken: 1	State: false	
13:58:42	tns1:VideoSource/MotionAlarm	Changed	VideoSourceToken: 1	State: false	
13:58:45	tns1:IVA/ObjectInField/critical_area_two	Changed	VideoSourceToken: 1	State: true	
13:58:45	tns1:VideoSource/MotionAlarm	Changed	VideoSourceToken: 1	State: true	
13:58:49	tns1:IVA/ObjectInField/Person_in_critical_area_one	Changed	VideoSourceToken: 1	State: true	
13:58:51	tns1:IVA/CrossingLine/Man_crossed_the_line	Changed	VideoSourceToken: 1	State: true	
13:58:52	tns1:IVA/ObjectInField/Person_in_critical_area_one	Changed	VideoSourceToken: 1	State: false	
13:58:52	tns1:IVA/CrossingLine/Man_crossed_the_line	Changed	VideoSourceToken: 1	State: false	
13:58:57	tns1:IVA/ObjectInField/Person_in_critical_area_one	Changed	VideoSourceToken: 1	State: true	
13:59:01	tns1:IVA/ObjectInField/Person_in_critical_area_one	Changed	VideoSourceToken: 1	State: false	
13:59:02	tns1:IVA/ObjectInField/critical_area_two	Changed	VideoSourceToken: 1	State: false	

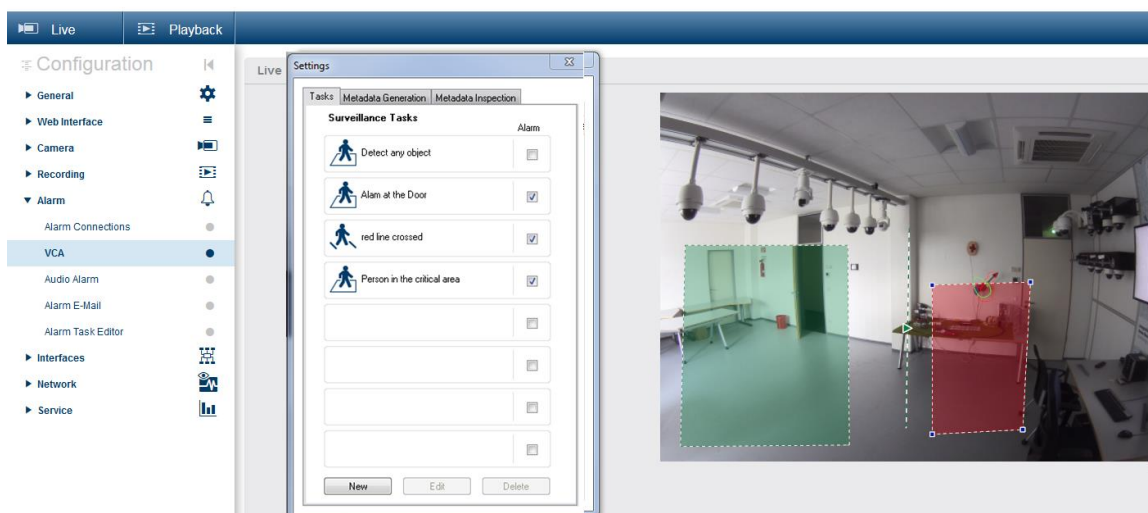
Annotations in the screenshot:

- Analysis type:** Points to the 'Topic' column.
- Event name:** Points to the 'Topic' column.
- Event type:** Points to the 'Operation' column.
- Video Source:** Points to the 'Source' column.
- Status:** Points to the 'Key' column.

Configuration of IVA rules via the Camera Website

Open with your Browser the Camera IP -> Configuration -> Alarm -> VCA -> Select Essential or Intelligent Video Analytics -> Configuration

DINION IP ultra 8000 MP



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3 Onvif Metadata

With FW 6.10 and higher it is possible to receive metadata in the ONVIF format from Bosch cameras. The metadata contain the **object coordinates** for Bounding Boxes, **Center of Gravity** and the **Object ID**.

Note: The Onvif Metadata (MetadataConfig1) must be added manually to the Onvif Profile.

Example of the Onvif Metadata stream:



The screenshot shows the Bosch ONVIF interface. On the left, there is a navigation menu with links for Identification, Time settings, Maintenance, Network settings, User management, Certificates, Relays, Web page, and Events. Below the menu, there is a section for NVT (Network Video Transport) with a Refresh button and a list of devices, including '1: H264_I151'. A small video thumbnail is visible below the device list. On the right, the 'Metadata' section is expanded to show 'Metadata details'. The metadata stream is displayed as XML code, showing a frame with a bounding box and center of gravity for an object with ID '5100'.

```

- <tt:MetadataStream>
- <tt:VideoAnalytics>
- <tt:Frame UtcTime="2015-02-18T09:26:33.73440">
- <tt:Object ObjectId="5100">
- <tt:Appearance>
- <tt:Shape>
  <tt:BoundingBox bottom="-0.044444" top="0.088889" right="0.368750" left="0.306250"/>
  <tt:CenterOfGravity x="0.331250" y="0.033333"/>
</tt:Shape>
</tt:Appearance>
</tt:Object>
</tt:Frame>
</tt:VideoAnalytics>
</tt:MetadataStream>
  
```

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4 Appendix

4.1 GetEventProperties Description

2. GetEventProperties

Description:

The WS-BaseNotification specification defines a set of OPTIONAL WS-ResourceProperties. This specification does not require the implementation of the WS-ResourceProperty interface. Instead, the subsequent direct interface shall be implemented by an OVNIF compliant device in order to provide information about the FilterDialects, Schema files and topics supported by the device.

SOAP action:

http://www.onvif.org/ver10/events/wsd/EventPortType/GetEventPropertiesRequest

Input:

```
[GetEventProperties]
```

Output:

```
[GetEventPropertiesResponse]
```

- **TopicNamespaceLocation** - unbounded; [anyURI]
List of topic namespaces supported.
- **FixedTopicSet** [FixedTopicSet]
True when topicset is fixed for all times.
- **TopicSet** [TopicSet]
Set of topics supported.
- **TopicExpressionDialect** - unbounded; [TopicExpressionDialect]
Defines the XPath expression syntax supported for matching topic expressions.
The following TopicExpressionDialects are mandatory for an OVNIF compliant device :
 - http://docs.oasis-open.org/wsn/t-1/TopicExpression/Concrete
 - http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet.
- **MessageContentFilterDialect** - unbounded; [anyURI]
Defines the XPath function set supported for message content filtering.
The following MessageContentFilterDialects should be returned if a device supports the message content filtering:
 - http://www.onvif.org/ver10/tev/messageContentFilter/ItemFilter.
 A device that does not support any MessageContentFilterDialect returns a single empty url.
- **ProducerPropertiesFilterDialect** - optional, unbounded; [anyURI]
Optional ProducerPropertiesDialects. Refer to [Web Services Base Notification 1.3 \(WS-BaseNotification\)](#) for advanced filtering.
- **MessageContentSchemaLocation** - unbounded; [anyURI]
The Message Content Description Language allows referencing of vendor-specific types. In order to ease the integration of such types into a client application, the GetEventPropertiesResponse shall list all URI locations to schema files whose types are used in the description of notifications, with MessageContentSchemaLocation elements.
This list shall at least contain the URI of the OVNIF schema file.
- xsd:any

False => IVA Rules can be changed dynamically

4.2 Example PullMessages Response of a line cross event

```
<tev:PullMessagesResponse>
  <tev:CurrentTime>2015-02-20T10:10:12Z</tev:CurrentTime>
  <tev:TerminationTime>2015-02-20T10:11:12Z</tev:TerminationTime>
  <wsnt:NotificationMessage>
    <wsnt:Topic Dialect="http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet">tns1:IVA/CrossingLine/Red_Line</wsnt:Topic>
    <wsnt:Message>
      <tt:Message UtcTime="2015-02-20T10:10:11.952" PropertyOperation="Changed">
        <tt:Source>
          <tt:SimpleItem Name="Source" Value="1"></tt:SimpleItem>
        </tt:Source>
        <tt:Data>
          <tt:SimpleItem Name="State" Value="true"></tt:SimpleItem>
        </tt:Data>
      </tt:Message>
    </wsnt:Message>
  </wsnt:NotificationMessage>
</tev:PullMessagesResponse>
```

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4.3 Example of *GetEventPropertiesResponse* of a IVA Event

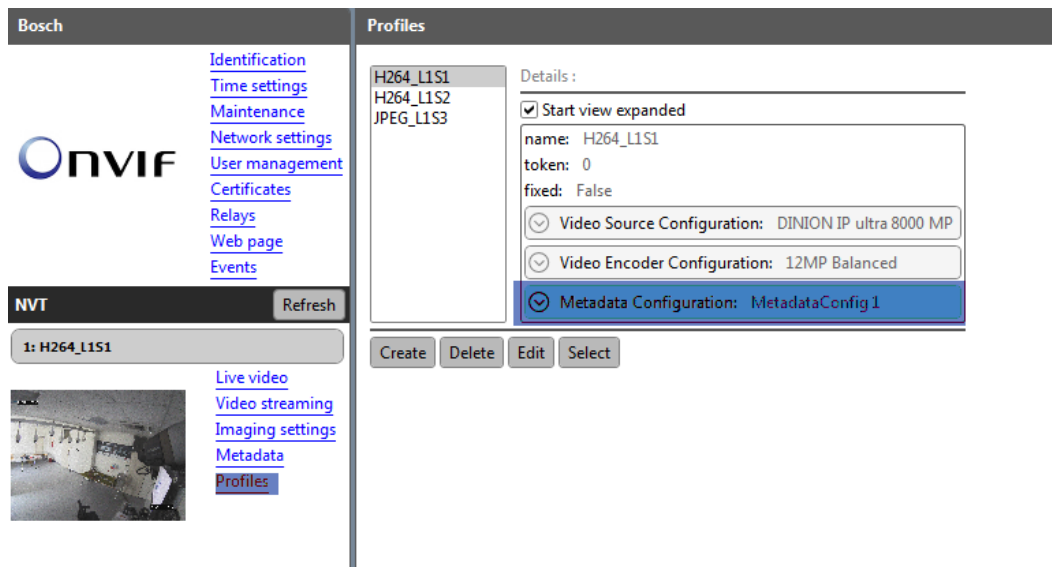
```

<tev:GetEventPropertiesResponse>
  <tev:TopicNamespaceLocation>http://www.onvif.org/onvif/ver10/topics/topicns.xml</tev:TopicNamespaceLocation>
  <wsnt:FixedTopicSet>>false</wsnt:FixedTopicSet>
  <wstop:TopicSet>
    <tns1:VideoSource>
      ...
    <tns1:Device>
      ...
    </tns1:Device>
    <tns1:IVA>
      <ObjectInField>
        <Detect_any_object wstop:topic="true">
          <tt:MessageDescription IsProperty="true">
            <tt:Source>
              <tt:SimpleItemDescription Name="Source" Type="tt:ReferenceToken"/>
            </tt:Source>
            <tt:Data>
              <tt:SimpleItemDescription Name="State" Type="xs:boolean"/>
            </tt:Data>
          </tt:MessageDescription>
        </Detect_any_object>
      </ObjectInField>
      <ObjectInField>
        <Alarm_at_the_Door wstop:topic="true">
          <tt:MessageDescription IsProperty="true">
            <tt:Source>
              <tt:SimpleItemDescription Name="Source" Type="tt:ReferenceToken"/>
            </tt:Source>
            <tt:Data>
              <tt:SimpleItemDescription Name="State" Type="xs:boolean"/>
            </tt:Data>
          </tt:MessageDescription>
        </Alarm_at_the_Door>
      </ObjectInField>
      <CrossingLine>
        <Red_line_crossed wstop:topic="true">
          <tt:MessageDescription IsProperty="true">
            <tt:Source>
              <tt:SimpleItemDescription Name="Source" Type="tt:ReferenceToken"/>
            </tt:Source>
            <tt:Data>
              <tt:SimpleItemDescription Name="State" Type="xs:boolean"/>
            </tt:Data>
          </tt:MessageDescription>
        </Red_line_crossed>
      </CrossingLine>
      <ObjectInField>
        <Person_in_critical_area wstop:topic="true">
          <tt:MessageDescription IsProperty="true">
            <tt:Source>
              <tt:SimpleItemDescription Name="Source" Type="tt:ReferenceToken"/>
            </tt:Source>
            <tt:Data>
              <tt:SimpleItemDescription Name="State" Type="xs:boolean"/>
            </tt:Data>
          </tt:MessageDescription>
        </Person_in_critical_area>
      </ObjectInField>
    </tns1:IVA>
  </wstop:TopicSet>
  <wsnt:TopicExpressionDialect>http://www.onvif.org/ver10/tev/topicExpression/ConcreteSet</wsnt:TopicExpressionDialect>
  
```

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4.4 Add Metadata Configuration to Onvif Profile



The screenshot displays the Bosch ONVIF web interface. On the left, there is a navigation menu with the ONVIF logo and various settings options: Identification, Time settings, Maintenance, Network settings, User management, Certificates, Relays, Web page, and Events. Below the menu, there is a section for 'NVT' with a 'Refresh' button and a list of profiles, currently showing '1: H264_L1S1'. A small video thumbnail is visible below the profile list.

The main area is titled 'Profiles' and shows a list of profiles: H264_L1S1, H264_L1S2, and JPEG_L1S3. The 'H264_L1S1' profile is selected, and its details are shown in a form. The details include:

- Start view expanded
- name: H264_L1S1
- token: 0
- fixed: False
- Video Source Configuration: DINION IP ultra 8000 MP
- Video Encoder Configuration: 12MP Balanced
- Metadata Configuration: MetadataConfig1** (highlighted in blue)

 At the bottom of the details form, there are buttons for 'Create', 'Delete', 'Edit', and 'Select'.