VAPIX® VERSION 3

AXIS Video Motion Detection 2.1 API
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# AXIS Video Motion Detection 2.1 API

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AXIS Video Motion Detection 2.1 API

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1 Overview

1.1 Description

AXIS Video Motion Detection 2.1 is an application that detects moving objects within an area of interest. The application can be installed on Axis network video products with support for AXIS Camera Application Platform. The application allows an operator to configure a polygon in the camera view to define an area of interest. The application will monitor this area and detect moving objects within its boundaries. When a moving object is detected, the event system can be used to trigger actions. A client application can listen to the event data stream to trigger actions from the application.

1.2 Prerequisites

1.2.1 Identification

Embedded development version: 1.10 or later
Firmware: 5.40 or later
Software: AXIS Camera Application Platform (ACAP)

1.2.2 Dependencies

The application is uploaded and controlled using VAPIX® Application API.
The application is configured using VAPIX® Axis Application Configuration API.

1.3 References

All VAPIX® references are available at:
http://www.axis.com/vapix
AXIS Video Motion Detection 2.1 API

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2 Common Examples

Example 1:
Check if the Axis product supports AXIS Camera Application Platform.
Request:
```
```
Response:
```
Properties.EmbeddedDevelopment.Version=1.10
```

Example 2:
Upload AXIS Video Motion Detection 2.1.
Request:
```
POST /axis-cgi/applications/upload.cgi HTTP/1.1
Content-Type: multipart/form-data; boundary=fileboundary
Content-Length: 32422
fileboundary
Content-Disposition: form-data; name="packfil"; filename="AXISVideoMotionDetection.eap"
Content-Type: application/octet-stream
<application package data>
```

Example 3:
Start the application.
Request:
```
http://myserver/axis-cgi/applications/control.cgi?action=start&package=VideoMotionDetection
```

Example 4:
Retrieve the application configuration.
Request:
```
http://myserver/axis-cgi/xaconfig.cgi?action=get&name=VideoMotionDetection
```
Response:
```
<reply result="ok">
<config version="1.0">
<application name="VideoMotionDetection">
<ruleEngine>
<namedObjects>
<namedObject name="Detection Area">
<data knownNameType="geometry.polygon">
<polygon>
<point x="0.60" y="0.60"/>
<point x="0.60" y="-0.60"/>
<point x="-0.60" y="-0.60"/>
<point x="-0.60" y="0.60"/>
```

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Example 5:
Modify the application configuration. Only the named object Detection Area (the area of interest) is modified, all other settings should be kept as is. If required, an exclude area can also be defined, see Application Configuration, on page 9.

Request:

```xml
POST http://myserver/axis-cgi/vaconfig.cgi HTTP/1.0
Content-Type: application/x-www-form-urlencoded
Content-Length: <content-length>

action=modify&name=VideoMotionDetection&config
version="1.0"
,applicationEngine
<application name="VideoMotionDetection">
<ruleEngine>
<namedObjects>
<namedObject name="Detection Area">
<data knownNameType="geometry.polygon">
<polygon>
<point x="0.60" y="0.60"/>
<point x="0.60" y="0.60"/>
<point x="-0.60" y="0.60"/>
<point x="-0.60" y="0.60"/>
</polygon>
</data>
</namedObject>
</namedObjects>
<rules>
<rule name="detection 0" function="monitor_area">
<parameter name="Include" value="Detection Area"/>
</rule>
</rules>
</application>
</config>
</reply>
```
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```xml
<script encryption="1">detection.lua</script>
</scripts>
<events>
  <event name="motion">
    <attr key="areaid" nicename="Area ID" tag="source" value="0"/>
    <attr key="areapolygon" nicename="Polygon info" tag="data"/>
    <attr key="active" nicename="Motion detected" tag="property-state"/>
  </event>
</events>
<moteConfig>
  <option name="boundingBox" value="false"/>
  <option name="polygon" value="true"/>
  <option name="velocity" value="true"/>
</moteConfig>
</ruleEngine>
</application>
</config>

Example 6:
Retrieve the RTSP stream with event metadata.

Request:
```
rtsp://myserver/axis-media/media.amp?event=on&video=0
&eventtopic=onvif:RuleEngine/axis:VideoMotionDetection//motion
```

Example 7:
The AXIS Video Motion Detection 2.1 event. The prefix aev is a placeholder for the namespace http://www.axis.com/vapix/ws/event1
```
<tnsaxis:VideoMotionDetection aev:NiceName="VideoMotionDetection" xmlns:tnsaxis="http://www.axis.com/2009/event/topics">
  <motion wstop:topic="true" xmlns:wstop="http://docs.oasis-open.org/wsn/t-1">
    <aev:MessageInstance aev:isProperty="true">
      <aev:SourceInstance>
        <aev:SimpleItemInstance aev:NiceName="Area ID" Type="xsd:string" Name="areaid">
          <aev:Value>0</aev:Value>
        </aev:SimpleItemInstance>
      </aev:SourceInstance>
      <aev:DataInstance>
        <aev:SimpleItemInstance aev:NiceName="Polygon info" Type="xsd:string" Name="areapolygon" />
        <aev:SimpleItemInstance aev:NiceName="Motion detected" Type="xsd:boolean" Name="active" isPropertyState="true"/>
      </aev:DataInstance>
      </aev:MessageInstance>
  </motion>
</tnsaxis:VideoMotionDetection>
```
AXIS Video Motion Detection 2.1 API

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3 Application Configuration

The application configuration is in XML format. The XML schema is available at http://www.axis.com/vapix/http_cgi/

The application defines two named objects: The area of interest (required) and the exclude area (optional). The application will detect objects moving inside the area of interest. The exclude area is an area inside the area of interest in which moving objects are ignored.

The area of interest and the exclude area are polygons defined by 3–20 points describing the polygon corners. The line defining the polygon sides is drawn from point to point in the order the points are listed. Each point is a coordinate pair with one x coordinate and one y coordinate. The top right corner of the camera view is at x=1.0 and y=1.0.

To modify the application, update the following:

1. Modify the area of interest (named object Detection Area).
2. Optionally, add an exclude area (named object Exclude Area).
3. If using an exclude area, add the parameter Exclude.
4. All other settings must be kept as is.

Example 1:

```
<config version="1.0">
  <applicationEngine name="VideoMotionDetection">
    <namedObjects>
      <namedObject name="Detection Area">
        <data knownNameType="geometry.polygon">
          <polygon>
            <point x="0.60" y="0.60"/>
            <point x="0.60" y="-0.60"/>
            <point x="-0.60" y="-0.60"/>
            <point x="-0.60" y="0.60"/>
          </polygon>
        </data>
      </namedObject>
      <namedObject name="Exclude Area">
        <data knownNameType="geometry.polygon">
          <polygon>
            <point x="0.50" y="-0.20"/>
            <point x="-0.50" y="-0.20"/>
            <point x="-0.50" y="0.20"/>
            <point x="0.50" y="0.20"/>
          </polygon>
        </data>
      </namedObject>
    </namedObjects>
    <rules>
      <rule name="detection_0" function="monitor_area">
        <parameter name="Include" value="Detection Area"/>
        <parameter name="Exclude" value="Exclude Area"/>
      </rule>
    </rules>
    <scripts>
      <script encryption="1">detection.lua</script>
    </scripts>
    <events>
      <event name="motion">
        <attr key="areaid" nicename="Area ID" tag="source" value="0"/>
        <attr key="areapolygon" nicename="Polygon info" tag="data"/>
      </event>
    </events>
  </applicationEngine>
</config>
```
AXIS Video Motion Detection 2.1 API

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```xml
<attr key="active" nicename="Motion detected" tag="property-state"/>
</event>
</events>
<moteConfig>
<option name="boundingBox" value="false"/>
<option name="polygon" value="true"/>
<option name="velocity" value="true"/>
</moteConfig>
</ruleEngine>
</application>
</config>
```

XML User Configuration Data Description

The application is configured by defining the area of interest and the exclude area as named objects.

The XML node semi xpaths not listed here define how the application shall run in AXIS Camera Application Platform. These values must not be changed.

<table>
<thead>
<tr>
<th>XML Node Semi XPath</th>
<th>Attribute</th>
<th>Valid values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>application</td>
<td>name</td>
<td>VideoMotionDetection</td>
<td>Name of the application.</td>
</tr>
<tr>
<td>application/ruleEngine/namedObjects</td>
<td></td>
<td></td>
<td>Section with all named objects used by the application. The application can have two objects: Area of interest (Required) Exclude area (Optional)</td>
</tr>
<tr>
<td>application/ruleEngine/namedObjects/namedObject</td>
<td>name</td>
<td>Detection Area Exclude Area</td>
<td>Name of the video motion detection object. Detection Area = Area of interest Exclude Area = Exclude area</td>
</tr>
<tr>
<td>application/ruleEngine/namedObjects/namedObject/data</td>
<td>knownTypeName</td>
<td>geometry.polygon</td>
<td>The supported object type. geometry.polygon = polygon</td>
</tr>
<tr>
<td>application/ruleEngine/namedObjects/namedObject/data/polygon</td>
<td></td>
<td>XML node with points</td>
<td>The polygon is defined by 3–20 points describing the polygon corners. The line defining the polygon sides is drawn from point to point in the order the points are listed. Each point is a coordinate pair with one x coordinate and one y coordinate. The top right corner of the camera view is at x=1.0 and y=1.0</td>
</tr>
<tr>
<td>application/ruleEngine/namedObjects/namedObject/data/polygon/point</td>
<td>x</td>
<td>-1.0 ... 1.0</td>
<td>The x coordinate.</td>
</tr>
<tr>
<td></td>
<td>y</td>
<td>-1.0 ... 1.0</td>
<td>The y coordinate.</td>
</tr>
<tr>
<td>application/ruleEngine/rules/rule/parameter</td>
<td>value</td>
<td>Detection Area Exclude Area</td>
<td>The parameter value specifying the named object for the Include parameter. The parameter value specifying the named object for the Exclude parameter.</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>application/ruleEngine/rules/rule/parameter</th>
<th>Include</th>
<th>The parameter that specifies the area of interest.</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>Exclude</td>
<td>Optional. The parameter that specifies the exclude area.</td>
</tr>
</tbody>
</table>
4 HTTP API

4.1 Upload, Control and Modify the Application

To upload, control and configure the application, use VAPIX® Axis Application Configuration API and VAPIX® Application API.
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5 RTSP API

5.1 Get RTSP Stream with Event Topic Filter

Retrieve an RTSP stream with an event topic filter.

Access control: admin, operator
Method: GET

Syntax:

```
rtsp://<servername>/axis-media/media.amp?<argument>=<value>
[&<argument>=<value>...]
```

<table>
<thead>
<tr>
<th>Argument</th>
<th>Valid values</th>
<th>Description</th>
</tr>
</thead>
</table>
| video    | 0, 1         | Specify whether video should be available in the stream.  
0 = no video  
1 = video |
| event    | on, off      | Specify whether event metadata should be available in the stream.  
on = event metadata is included  
off = event metadata is not included |
| eventtopic | String       | The event topic filter to include.  
For AXIS Video Motion Detection 2.1 use  
onvif:RuleEngine/axis:VideoMotionDetection//motion |

For additional arguments, see the VAPIX® Video Streaming API available on www.axis.com/vapix
6 Event Declarations

6.1 AXIS Video Motion Detection 2.1 Event Declaration

The AXIS Video Motion Detection 2.1 event is true when motion is detected in the area of interest.

areaid is the Area ID defining the area of interest.
areapolygon is a string with the coordinates defining the area of interest.
active is true if the application has detected motion in the area of interest.

**Topic**

- Name: tns1:RuleEngine/tnsaxis:VideoMotionDetection/tnsaxis:motion
- Type: Stateful
- Nice name: VideoMotionDetection

**Source instance**

- Nice name: Area ID
- Type: string
- Name: areaid

<table>
<thead>
<tr>
<th>Value</th>
<th>Nice name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Data instance**

- Nice name: Polygon info
- Type: string
- Name: areapolygon

- Nice name: Motion detected
- Type: boolean
- Name: active
- isPropertyState: true