

Document: How to Connect to a Camera Using ONVIF Protocol

Introduction

ONVIF (Open Network Video Interface Forum) is an open industry forum that provides and promotes standardized interfaces for effective interoperability of IP-based physical security products. This document provides detailed instructions on how to communicate with an ONVIF-compliant camera by using specific APIs.

Requirements

1. ONVIF-compliant IP camera.
2. Network connection (wired or wireless).
3. ONVIF client software or custom application supporting ONVIF API calls.

Steps to Connect

1. **Network Setup:**
 - Ensure the camera is properly connected to the network.
 - Assign an IP address to the camera (either static or via DHCP).
2. **Discovering the Camera:**
 - Use the **GetServices** API to discover ONVIF services provided by the camera.
 - Send a request to the camera's IP address to get the list of services.
 - Example request:

```
php
Copy code
POST http://<camera-ip>/onvif/device_service
Content-Type: application/soap+xml; charset=utf-8

<soapenv:Envelope
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:tds="http://www.onvif.org/ver10/device/wsdl">
  <soapenv:Header/>
  <soapenv:Body>
    <tds:GetServices>
      <IncludeCapability>false</IncludeCapability>
    </tds:GetServices>
  </soapenv:Body>
</soapenv:Envelope>
```

3. **Retrieving Device Information:**
 - Use the **GetDeviceInformation** API to retrieve basic information about the device, such as manufacturer, model, firmware version, and serial number.
 - Example request:

```
php
Copy code
POST http://<camera-ip>/onvif/device_service
Content-Type: application/soap+xml; charset=utf-8
```

```

<soapenv:Envelope
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:tds="http://www.onvif.org/ver10/device/wsdl">
  <soapenv:Header/>
  <soapenv:Body>
    <tds:GetDeviceInformation/>
  </soapenv:Body>
</soapenv:Envelope>

```

4. Fetching Profiles:

- Use the **GetProfiles** API from the Media service to fetch available profiles.
- Profiles define configurations for video streams, including resolution, encoding, and frame rate.
- Example request:

```

php
Copy code
POST http://<camera-ip>/onvif/media_service
Content-Type: application/soap+xml; charset=utf-8

<soapenv:Envelope
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:trt="http://www.onvif.org/ver10/media/wsdl">
  <soapenv:Header/>
  <soapenv:Body>
    <trt:GetProfiles/>
  </soapenv:Body>
</soapenv:Envelope>

```

5. Obtaining Stream URI:

- Use the **GetStreamUri** API to obtain the RTSP stream URI for a given profile.
- This URI can be used to access the live video stream.
- Example request:

```

php
Copy code
POST http://<camera-ip>/onvif/media_service
Content-Type: application/soap+xml; charset=utf-8

<soapenv:Envelope
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:trt="http://www.onvif.org/ver10/media/wsdl">
  <soapenv:Header/>
  <soapenv:Body>
    <trt:GetStreamUri>
      <trt:StreamSetup>
        <tt:Stream>RTP-Unicast</tt:Stream>
        <tt:Transport>
          <tt:Protocol>RTSP</tt:Protocol>
        </tt:Transport>
      </trt:StreamSetup>
      <trt:ProfileToken>PROFILE_TOKEN</trt:ProfileToken>
    </trt:GetStreamUri>
  </soapenv:Body>
</soapenv:Envelope>

```

6. Controlling PTZ (Pan-Tilt-Zoom) Features:

- If the camera supports PTZ, use the **ContinuousMove** API to control the camera's pan, tilt, and zoom functions.
- Example request:

```
php
Copy code
POST http://<camera-ip>/onvif/ptz_service
Content-Type: application/soap+xml; charset=utf-8

<soapenv:Envelope
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ns="http://www.onvif.org/ver20/ptz/wsdl">
  <soapenv:Header/>
  <soapenv:Body>
    <ns:ContinuousMove>
      <ns:ProfileToken>PROFILE_TOKEN</ns:ProfileToken>
      <ns:Velocity>
        <ns:PanTilt x="1" y="1"/>
        <ns:Zoom x="1"/>
      </ns:Velocity>
    </ns:ContinuousMove>
  </soapenv:Body>
</soapenv:Envelope>
```

7. Handling Events:

- Use the **PullMessages** API to subscribe and receive notifications for events (like motion detection).
- Example request:

```
php
Copy code
POST http://<camera-ip>/onvif/event_service
Content-Type: application/soap+xml; charset=utf-8

<soapenv:Envelope
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:tev="http://www.onvif.org/ver10/events/wsdl">
  <soapenv:Header/>
  <soapenv:Body>
    <tev:PullMessages>
      <tev:SubscriptionReference>
        <wsa:Address
xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing">SUBSCRIPTION_ADDRESS</wsa:Address>
      </tev:SubscriptionReference>
      <tev:Timeout>PT10S</tev:Timeout>
      <tev:MessageLimit>1</tev:MessageLimit>
    </tev:PullMessages>
  </soapenv:Body>
</soapenv:Envelope>
```

Conclusion

Communicating with an ONVIF-compliant camera involves using specific SOAP-based APIs to discover the device, retrieve its information, access profiles, obtain stream URIs, control

PTZ functions, and handle events. Following the standardized ONVIF protocol ensures interoperability and ease of integration across different devices and platforms.