# User manual

## （Onvif Server）

*Happytimesoft Technology Co., LTD*

# Declaration



Since the product version upgrade or other reasons, this manual will subsequently be updated. Unless otherwise agreed, this manual only as a guide, this manual all statements, information, recommendations do not constitute any express or implied warranties。

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# Chapter 1 Files Description

Windows version contains the following files:

| File name | Description |
|---|---|
| onvif.cfg | The onvif server default configuration file<br>(A runtime configuration file onvifrun.cfg will be generated when the onvif server stop) |
| happytime-rtsp-server | Happytime rtsp server. It can stream several kinds of media file.<br>(The rtsp server is a demo version, only for testing rtsp streams, the release version does not include rtsp server) |
| OnvifServer.exe | onvif server executable file |
| runme.bat | A batch file, run rtsp server and onvif server |
| snapshot.jpg | The default snapshot file, for onvif snapshot interface |
| User manual.pdf | This manual |
| libcrypto-1_1.dll | Openssl dynamic library |
| libssl-1_1.dll | Openssl dynamic library |
| zlibwapi.dll | Zlib dynamic library |
| ssl.ca | Openssl connection certificate<br>(For testing only, please apply for an official SSL certificate for use) |
| ssl.key | Openssl connection private key<br>(For testing only, please apply for an official SSL certificate for use) |

Linux version contains the following files:

(Tested on centos 7 and ubuntu 18.04 LTS)

| File name | Description |
|---|---|
| onvif.cfg | The onvif server default configuration file<br>(A runtime configuration file onvifrun.cfg will be generated when the onvif server stop) |
| happytime-rtsp-server | Happytime rtsp server. It can stream several kinds of media file<br>(The rtsp server is a demo version, only for testing rtsp streams, the release version does not include rtsp server) |
| onvifserver | onvif server executable file |
| runme.sh | A script file, run rtsp server and onvif server |
| snapshot.jpg | The default snapshot file, for onvif snapshot interface |
| User manual.pdf | This manual |
| libcrypto.so.1.1 | Openssl dynamic library |

| | |
|---|---|
| libssl.so.1.1 | Openssl dynamic library |
| libz.so.1.2.11 | Zlib dynamic library |
| ssl.ca | Openssl connection certificate<br>(For testing only, please apply for an official SSL certificate for use) |
| ssl.key | Openssl connection private key<br>(For testing only, please apply for an official SSL certificate for use) |

# Chapter 2 Configuration

## 2.1 Configuration Templates

```
<?xml version="1.0" encoding="utf-8"?>
<config>
    <server_ip></server_ip>
    <http_enable>1</http_enable>
    <http_port>8000</http_port>
    <https_enable>1</https_enable>
    <https_port>8443</https_port>
    <cert_file>ssl.ca</cert_file>
    <key_file>ssl.key</key_file>
    <http_max_users>16</http_max_users>
    <ipv6_enable>1</ipv6_enable>
    <need_auth>0</need_auth>
    <log_enable>1</log_enable>
    <log_level>1</log_level>
    <information>
        <Manufacturer>Happytimesoft</Manufacturer>
        <Model>IPCamera</Model>
        <FirmwareVersion>2.4</FirmwareVersion>
        <SerialNumber>123456</SerialNumber>
        <HardwareId>1.0</HardwareId>
    </information>
    <user>
        <username>admin</username>
        <password>admin</password>
        <userlevel>Administrator</userlevel>
    </user>
    <profile>
        <video_source>
            <width>1280</width>
            <height>720</height>
        </video_source>
```

```
        <video_encoder>
            <width>1280</width>
            <height>720</height>
            <quality>4</quality>
            <session_timeout>10</session_timeout>
            <framerate>25</framerate>
            <encoding_interval>1</encoding_interval>
            <bitrate_limit>2048</bitrate_limit>
            <encoding>H264</encoding>
            <h264>
                <gov_length>25</gov_length>
                <h264_profile>Main</h264_profile>
            </h264>
        </video_encoder>
        <audio_source></audio_source>
        <audio_encoder>
            <session_timeout>10</session_timeout>
            <sample_rate>8</sample_rate>
            <bitrate>64</bitrate>
            <encoding>G711</encoding>
        </audio_encoder>
        <stream_uri append_params="0"></stream_uri>
    </profile>
    <profile>
        <video_source>
            <width>1280</width>
            <height>720</height>
        </video_source>
        <video_encoder>
            <width>640</width>
            <height>480</height>
            <quality>4</quality>
            <session_timeout>10</session_timeout>
            <framerate>25</framerate>
```

```
            <encoding_interval>1</encoding_interval>
            <bitrate_limit>2048</bitrate_limit>
            <encoding>H264</encoding>
            <h264>
                <gov_length>25</gov_length>
                <h264_profile>Main</h264_profile>
            </h264>
        </video_encoder>
        <audio_source></audio_source>
        <audio_encoder>
            <session_timeout>10</session_timeout>
            <sample_rate>8</sample_rate>
            <bitrate>64</bitrate>
            <encoding>G711</encoding>
        </audio_encoder>
        <stream_uri append_params="0"></stream_uri>
    </profile>

    <scope>onvif://www.onvif.org/location/country/china</scope>
    <scope>onvif://www.onvif.org/name/IP-Camera</scope>
    <scope>onvif://www.onvif.org/hardware/HI3518C</scope>
    <event>
        <renew_interval>60</renew_interval>
        <simulate_enable>1</simulate_enable>
    </event>
</config>
```

## 2.2 Configuring Node Description

**<server_ip>**

Specify the IP address of the onvif server, if not specified, the onvif server will listen to all network interfaces.

**<http_enable>**

Indicates whether enable http server, 0-disable, 1-enable.

<http_port>

Specify the http server port, providing onvif web service on this port, the default is 8000.

Note: On Linux systems, ports below 1024 are reserved by the system and require root privileges to be used.

<https_enable>

Indicates whether enable https server, 0-disable, 1-enable

<https_port>

Specify the https server port, providing onvif web service on this port, the default is 8443.

Note: On Linux systems, ports below 1024 are reserved by the system and require root privileges to be used.

<cert_file>

If HTTPS is enabled, specify the SSL certificate file.

<key_file>

If HTTPS is enabled, specify the SSL key file.

Note: The certificate file ssl.ca and key file ssl.key provided by default are self signed local hosts certificates, only for testing purposes (browsers may pop up untrusted certificate warnings), and cannot be used in formal deployment environments.

<http_max_users>

Maximum supported HTTP clients numbers, if both HTTP and HTTPS are enabled, they can support 2 * http_max_users connections in total.

The maximum number of HTTP connections is limited by the FD_SETSIZE size of the platform. The default value is 200 for Windows platforms and 1024 for Linux platforms.

<ipv6_enable>

Indicates whether IPv6 is enabled, 0-disable, 1-enable.

Note: If the device does not specify a server ip in <server_ip> and the <ipv6_enable> is 1, and the device has an IPv6 address, the client can connect to the device through the IPv6 address.

<need_auth>

Indicates whether authentication is required, 0 don't require, 1 require.

<log_enable>

Indicates whether logging is enabled, 0-disable, 1-enable.

<log_level>

The log level:

| | |
|---|---|
| TRACE | 0 |
| DEBUG | 1 |
| INFO | 2 |
| WARN | 3 |
| ERROR | 4 |
| FATAL | 5 |

<information> : Config the ONVIF device basic information

<Manufacturer>

The manufactor of the device.

<Model>

The device model.

<FirmwareVersion>

The firmware version of the device.

<SerialNumber>

The serial number of the device.

<HardwareId>

The hardware ID of the device.

<user> : Contains a list of the onvif users, it can configure multiple nodes

<username>

Username string.

<password>

Password string.

<userlevel>

User level string, The following values can be configured:

Administrator

Operator

User

Anonymous

<profile> : A media profile maps a video and audio source to a video and audio encoder configurations. It can configure multiple nodes.

Currently, a maximum of 8-10 profiles are supported, because too many profiles will result in too large GetProfiles response messages.

<video_source> : If the media profile contains video, the video source configuration.

<width>

The video source width.

<height>

The video source height.

<video_encoder>: If the media profile contains video, the video encoder configuration.

<width>

Encoded video width.

<height>

Encoded video height.

<quality>

Relative value for the video quantizers and the quality of the video. A high value within supported quality range means higher quality.

<session_timeout>

The rtsp session timeout for the related video stream.

<framerate>

Maximum output framerate in fps.

<encoding_interval>

Interval at which images are encoded and transmitted. (A value of 1 means that every frame is encoded, a value of 2 means that every 2nd frame is encoded ...).

<bitrate_limit>

The maximum output bitrate in kbps.

<encoding>

Used video codec, either JPEG, MPEG4, H264 or H265.

<h264>: Configure H.264 related parameters

<gov_length>

Group of Video frames length. Determines typically the interval in which the I-Frames will be coded. An entry of 1 indicates I-Frames are continuously generated. An entry of 2 indicates that every 2nd image is an I-Frame, and 3 only every 3rd frame, etc. The frames in between are coded as P or B Frames.

<h264_profile>

The H.264 profile, either Baseline, Main, Extended or High.

<h265>: Configure H.265 related parameters

<gov_length>

Group of Video frames length. Determines typically the interval in which the I-Frames will be coded. An entry of 1 indicates I-Frames are continuously generated. An entry of 2 indicates that every 2nd image is an I-Frame, and 3 only every 3rd frame, etc. The frames in between are coded as P or B Frames.

<h265_profile>

The H.265 profile, either Main or Main10.

<mpeg4>: Configure MPEG4 related parameters

<gov_length>

Determines the interval in which the I-Frames will be coded. An entry of 1 indicates I-Frames are continuously generated. An entry of 2 indicates that every 2nd image is an I-Frame, and 3 only every 3rd frame, etc. The frames in between are coded as P or B Frames.

<mpeg4_profile>

The Mpeg4 profile, either simple profile (SP) or advanced simple profile (ASP).

<audio_source> : If the media profile contains audio, the audio source configuration.

<audio_encoder>:If the media profile contains audio, the audio encoder configuration.

<session_timeout>

The rtsp session timeout for the related audio stream.

<sample_rate>

The output sample rate in kHz.

<bitrate>

The output bitrate in kbps.

<encoding>

Audio codec used for encoding the audio input (either G711, G726 or AAC).

<stream_uri append_params="0">

The RTSP stream address of the profile, if not specify, the default is: rtsp://yourip/test.mp4

The append_params attribute specifies whether to append audio and video encoding parameters to the end of the rtsp stream.If the stream_uri attribute does not specify an rtsp stream address, the default rtsp stream address will append audio and video encoding parameters regardless of whether append_params is 0 or 1.The format of the appended parameters is as follows:

&params=value

The supported params are as follows:

t, transmission mode, taking the value of unicast to represent unicast or multicast to represent multicast

p, transmission protocol, value udp, tcp, rtsp, http

ve, video encoding, value JPEG, MP4V-ES, H264, H265

w, video width

h, video height

ae, audio encoding, value PCMU, G726, MP4A-LATM (AAC)

sr, audio sample rate

For example:

rtsp://127.0.0.1/test.mp4&t=unicast&p=udp&ve=H264&w=1280&h=720&ae=PCMU&sr=8000

Indicates UDP unicast mode, video encoding is H264, video resolution is 1280*720, audio encoding is PCMU, sampling rate is 8K.

<scope>

Contains a list of URI defininig the device scopes.

All ONVIF defined scope URIs have the following format:

onvif://www.onvif.org/<path>

A device may have other scope URIs. These URIs are not restricted to ONVIF defined scopes.

A device shall include at least one fixed entry (defined by the device vendor)

of the profile, hardware and name categories respectively in the scopes list. A device may include any other additional scope attributes in the scopes list.

A device might include an arbitrary number of scopes in its scope list. This implies that one unit might for example define several different location scopes. A probe is matched against all scopes in the list.

<event> : Event Configuration parameters

<renew_interval>

Event renew interval.

The onvif client subscribes or creates an event polling point. If the renew or pullmessage request is not called within the renew_interval interval, the onvif server will delete the subscription or event polling point.

<simulate_enable>

Specifies whether to generate simulation event, 0-disable, 1-enable.

# Chapter 3 Configuration file

When running onvif server for the first time, use the default configuration file onvif.cfg, which sets 2 profiles.

When stop onvif server, it writes the runtime configuration into the onvifrun.cfg file, and the configuration in the onvifrun.cfg file will be load at the next time it runs.

If you modify the default configuration file onvif.cfg, you should stop the onvif server first, then delete the runtime configuration onvifrun.cfg, and run onvif server again to make the default configuration effective.

# Chapter 4 Compatibility test

ONVIF SERVER PROFILE S passed the compatibility test version

Windows version download from:

https://www.happytimesoft.com/downloads/happytime-onvif-server-profiles.zip

Linux version download from:

https://www.happytimesoft.com/downloads/happytime-onvif-server-profiles.tar.gz

Follow the steps below to perform compatibility testing.

1. Modify the ONVIF SERVER configuration file onvif.cfg and specify the <need_auth> value as 1.

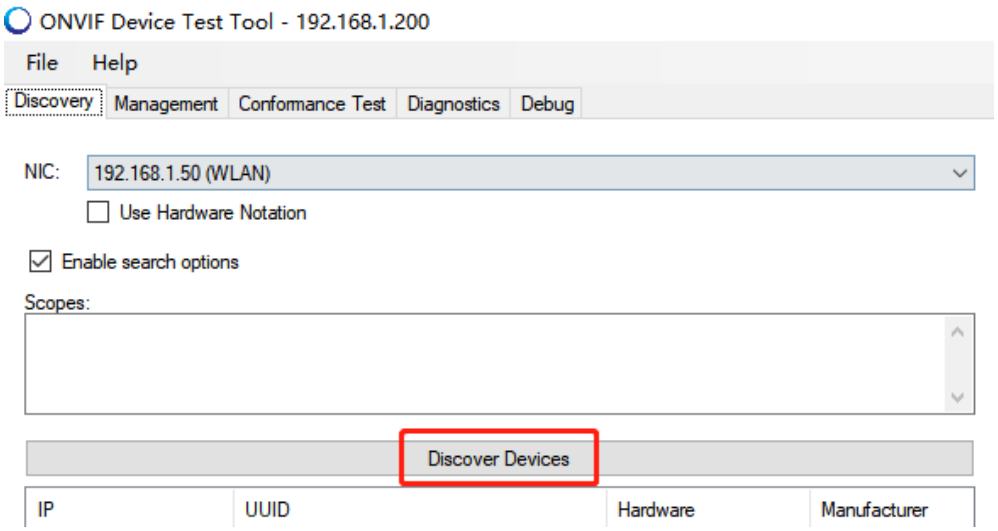
2. If there is an onvif runtime configuration file, delete the runtime configuration file onvifrun.cfg.

3. Run the rtspserver and onvif server.

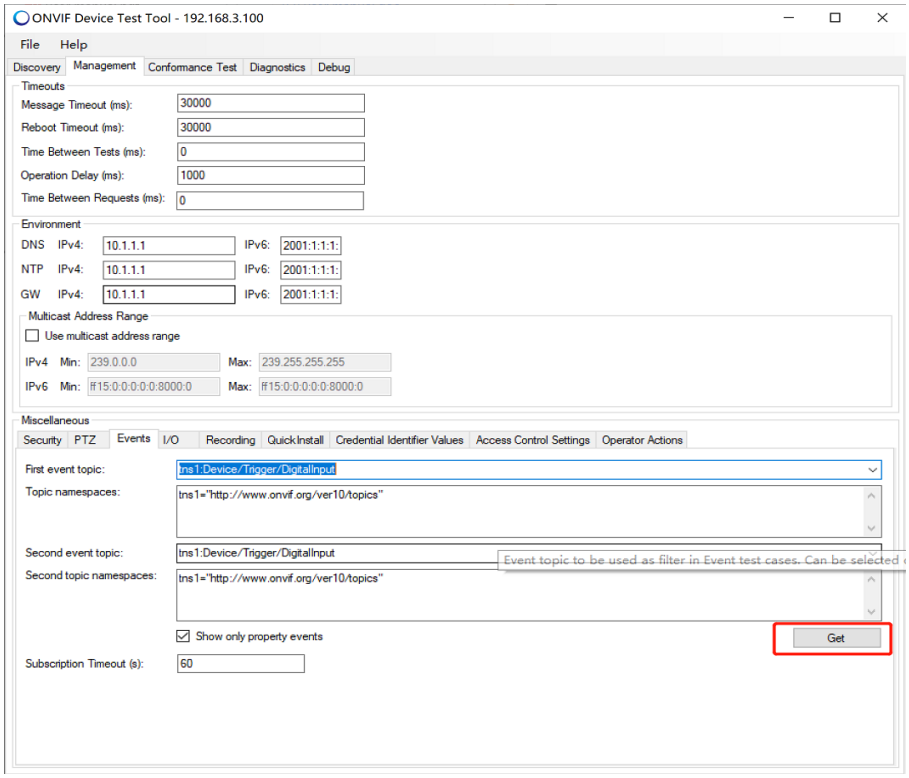
4. Run the ONVIF Device Test Tool.

**Note**: ONVIF SERVER and test tools should run on different computers

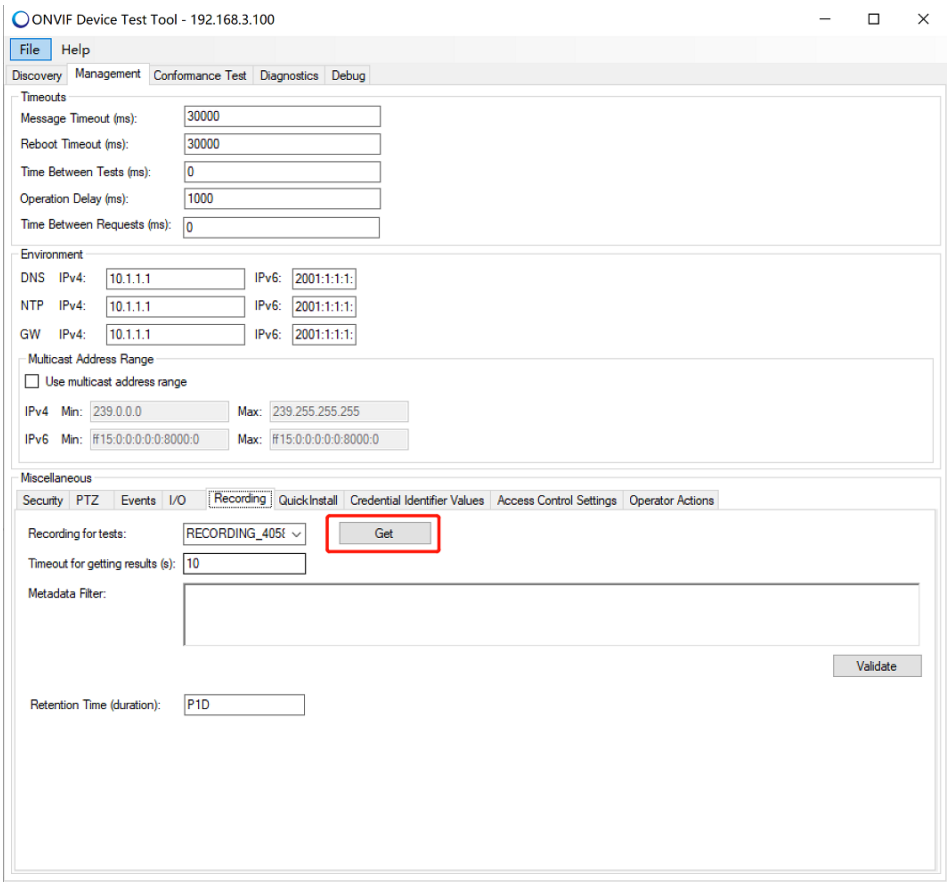
5. Click "Discover Devices" button, as the following:



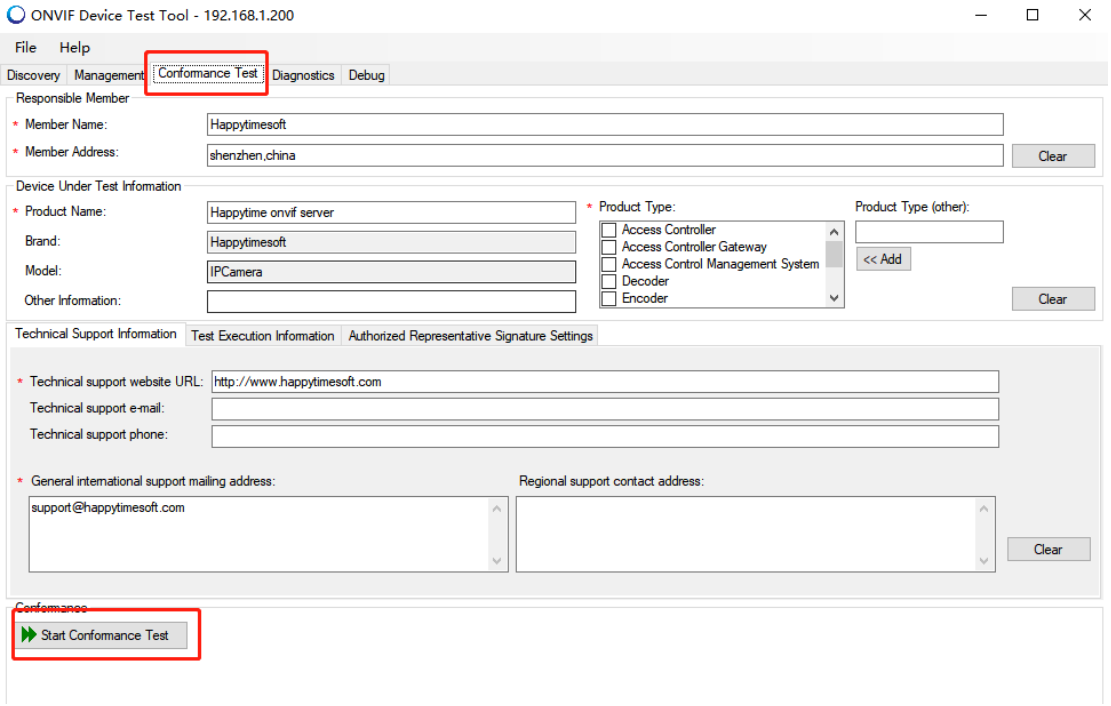

6. Switch to "Management" tab, select "Events" tab, then click "Get" button, as the following:




7. select “Recording” tab, then click “Get” button, as the following:



8. Switch to “Conformance Test” tab, click “Start Conformance Test” button:



# Chapter 5 ONVIF features

The onvif server supports the onvif features listed in the following table:

| Feature | | |
|---|---|---|
| Security | WS-Username Token | |
| | Digest | |
| Discovery | BYE Message | |
| | Types | tds:Device |
| | | dn:Network Video Transmitter |
| Device Service | Capabilities | GetCapabilities |
| | | GetService |
| | Network | Zero Configuration |
| | | NTP |
| | | Dynamic DNS |
| | | IP Filter |
| | | HTTPS |
| | System | System Logging |
| | | HTTP System Logging |
| | | HTTP Firmware Upgrade |
| | | HTTP Support Information |
| | | HTTP System Backup |
| | Security | Default Access Policy |
| | | Maximum Users |
| | | Remote User Handling |
| | | Maximum Username Length |
| | | Maximum Password Length |
| | I/O | Relay outputs |
| Event Service | WS Basic Notification | |
| | Message Content Filter | ONVIF Message Content Filter Dialect |
| | Get Service Capabilities | MaxPullPoints capability |
| | Pull-Point Notification | |
| Media Service | Video | JPEG |
| | | H.264 |
| | | MPEG4 |
| | Audio | G.711 |
| | | G.726 |

| | | |
|---|---|---|
| | | AAC |
| | Audio Output | G.711 |
| | | AAC |
| | Real-time Streaming | RTP/UDP |
| | | RTP/RTSP/HTTP |
| | | RTP/RTSP/TCP |
| | | RTP-Multicast/UDP |
| | Snapshot URI | |
| Media2 Service | Video | H.265 |
| | | H.264 |
| | Audio | G.711 |
| | | AAC |
| | Audio outputs | G.711 |
| | | AAC |
| | Real-time Streaming | RTP/UDP |
| | | RTP/RTSP/HTTP |
| | | RTP/RTSP/TCP |
| | | RTP-Multicast/UDP |
| | RTSP WebSocket | |
| | Snapshot URI | |
| | Video Source Mode | |
| | OSD | |
| | Analytics | |
| | Metadata | |
| | Media2 Events | Media/ProfileChanged |
| | | Media/ConfigurationChanged |
| PTZ Service | Absolute move | Pan/Tilt movement |
| | | Zoom movement |
| | Relative move | Pan/Tilt movement |
| | | Zoom movement |
| | Continuous move | Pan/Tilt movement |
| | | Zoom movement |
| | Presets | |
| | Home position | Configuration |
| | Auxiliary operations | |
| | Speed | Speed for Pan/Tilt |
| | | Speed for Zoom |

| | | |
|---|---|---|
| | Move Status | |
| | Status Position | |
| | Get Compatible Configurations | |
| Device IO Service | Relay outputs | Bistable Mode |
| | | MonoStable Mode |
| | Digital Inputs | Digital Input Options |
| Imaging Service | IrCutfilter Configuration | |
| | Tampering Events | Image Too Blurry |
| | | Image Too Dark |
| | | Image Too Bright |
| | | Global Scene Change |
| | Motion Alarm | |
| | Focus Control | |
| Analytics Service | Rule Engine | Rule Options |
| | | Motion Region Detector Rule |
| | Analytics Modules | Analytics Module Options |
| Recording Control Service | Dynamic Recordings | |
| | Dynamic Tracks | |
| | Audio Recording | |
| | Recording Options | |
| | tns1:RecordingCofig/DeleteTrckData | |
| | Metadata Recording | |
| | Encoding | JPEG |
| | | H264 |
| | | MPEG4 |
| Recording Search Service | Metadata Search | |
| | PTZ Position Search | |
| Door Control Service | Door Entity | Access Door |
| | | Lock Door |
| | | Double Lock Door |
| | | Block Door |
| | | Lock Down Door |
| | | Lock Open Door |
| | | Door Monitor |
| | | Double Lock Monitor |
| | | Alarm |

| | | |
|---|---|---|
| | | Tamper |
| | | Fault |
| | Door Control Events | |
| | Door Management | |
| | Client Supplied Token | |
| Access Control Service | Area Entity | |
| | Access Point Entity | Enable/Disable Access Point |
| | | Duress |
| | | Access Taken |
| | | Anonymous Access |
| | Access Point Management | |
| | Area Management | |
| | Access Control Events | |
| Replay Service | RTP/RTSP/TCP | |
| Receiver Service | | |
| Credential Service | Credential Validity | |
| | Credential Access Profile Validity | |
| | pt:Card | |
| | pt:PIN | |
| | pt:Fingerprint | |
| | Reset Antipassback Violation | |
| | Client Supplied Token | |
| | Whitelist | |
| | Blacklist | |
| | Validity Supports Time Value | |
| Access Rules Service | Multiple Schedules Access Point | |
| | Client Supplied Token | |
| Schedule Service | | |
| Thermal Service | | |

# Chapter 6 ONVIF Version

The onvif server implements the following ONVIF service:

| ONVIF Service | Prefix | Url | version |
|---|---|---|---|
| device | tds | http://www.onvif.org/ver10/device/wsdl | 23.06 |
| event | tev | http://www.onvif.org/ver10/events/wsdl | 22.06 |
| media | trt | http://www.onvif.org/ver10/media/wsdl | 21.12 |
| media 2 | tr2 | http://www.onvif.org/ver20/media/wsdl | 23.06 |
| ptz | tptz | http://www.onvif.org/ver20/ptz/wsdl | 22.12 |
| image | timg | http://www.onvif.org/ver20/imaging/wsdl | 22.06 |
| analytics | tan | http://www.onvif.org/ver20/analytics/wsdl | 22.06 |
| recording control | trc | http://www.onvif.org/ver10/recording/wsdl | 23.06 |
| search | tse | http://www.onvif.org/ver10/search/wsdl | 22.06 |
| replay | trp | http://www.onvif.org/ver10/replay/wsdl | 21.12 |
| access control | tac | http://www.onvif.org/ver10/accesscontrol/wsdl | 21.06 |
| door control | tdc | http://www.onvif.org/ver10/doorcontrol/wsdl | 21.06 |
| device IO | tmd | http://www.onvif.org/ver10/deviceIO/wsdl | 22.06 |
| thermal | tth | http://www.onvif.org/ver10/thermal/wsdl | 22.06 |
| credential | tcr | http://www.onvif.org/ver10/credential/wsdl | 21.06 |
| access rules | tar | http://www.onvif.org/ver10/accessrules/wsdl | 19.06 |
| schedule | tsc | http://www.onvif.org/ver10/schedule/wsdl | 18.12 |
| receiver | trv | http://www.onvif.org/ver10/receiver/wsdl | 21.12 |
| provisioning | tpv | http://www.onvif.org/ver10/provisioning/wsdl | 18.12 |

# Chapter 7 Supports multiple channels

The onvif server supports multi channel. Each <profile> tag represents a channel in the configuration file.

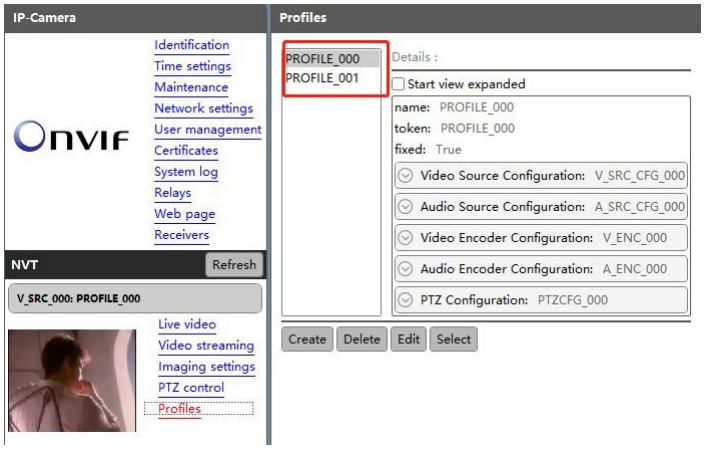
The default configuration file supports 2 channels, you can add <profile> tag to support more channels.

Note : If <video_source>.width and <video_source>.height of multiple <profile> tags are the same, it is considered that they are using the same video source, example:

```
<profile>
    <video_source>
    <width>1280</width>
    <height>720</height>
    </video_source>
    ....
</profile>

<profile>
    <video_source>
    <width>1280</width>
    <height>720</height>
    </video_source>
    ....
</profile>
```

The onvif device manager will show the profiles as the following:



If <video_source>.width and <video_source>.height of multiple <profile> tags are not the same, it is considered that they are using different video sources, example:

```
<profile>
    <video_source>
    <width>1280</width>
    <height>720</height>
    </video_source>
    ....
</profile>

<profile>
    <video_source>
    <width>640</width>
    <height>480</height>
    </video_source>
    ....
</profile>
```

The onvif device manager will show the profiles as the following:

# Chapter 8 Modify RTSP stream address

If the value of <stream_uri> in the <profile> tag in the onvif server configuration file is not modified, the RTSP stream address provided by the onvif server by default is rtsp://ip/test.mp4, you can modify the <stream_uri> in <profile> tag to specify the rtsp stream address provided by the onvif server. such as:

```
<profile>
    ...
    <stream_uri>rtsp://192.168.3.27/live</stream_uri>
</profile>
```

# Chapter 9 Run Onvif Server

Windows platform:

Run runme.bat, it will run rtspserver as RTSP server and onvif server.

Linux platform:

Run runme.sh, it will run rtspserver as RTSP server and onvif server.