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。

Table of Contents

Chapter 1 Files Description

Windows version contains the following files:

File name	Description
config.xml	The onvif server default configuration file (A runtime configuration file runconfig.xml will be generated when the onvif server stop)
happytime-rtsp-server	Happytime rtsp server. It can stream several kinds of media file. (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 (For testing only, please apply for an official SSL certificate for use)
ssl.key	Openssl connection private key (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
config.xml	The onvif server default configuration file (A runtime configuration file runconfig.xml will be generated when the onvif server stop)
happytime-rtsp-server	Happytime rtsp server. It can stream several kinds of media file (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 (For testing only, please apply for an official SSL certificate for use)
ssl.key	Openssl connection private key (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>
    <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>
    <user>
        <username>user</username>
        <password>123456</password>
        <userlevel>User</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/type/video_encoder</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 connection, 0-disable, 1-enable

<http_port>

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

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

<https_enable>

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

<https_port>

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

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

<cert_file>

If HTTPS is enabled, specify the SSL certificate file

<key_file>

If HTTPS is enabled, specify the SSL key file

<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.

<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 a video, the video source configuration

<width>

The video source width

<height>

The video source height

<video_encoder>: If the media profile contains a 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 a audio, the audio source configuration

<audio_encoder>:If the media profile contains a 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 definining 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 config.xml, which sets 2 profiles.

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

If you modify the default configuration file config.xml, you should stop the onvif server first, then delete the runtime configuration runconfig.xml, 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 config.xml and specify the <need_auth> value as 1.

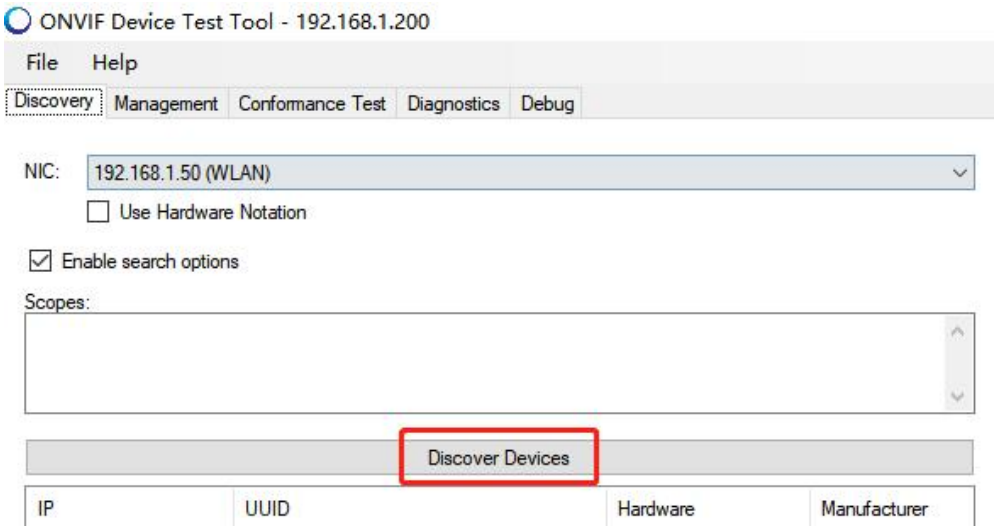
2. If there is an onvif runtime configuration file, delete the runtime configuration file runconfig.xml.

3. Run the rtspserver and onvif server.

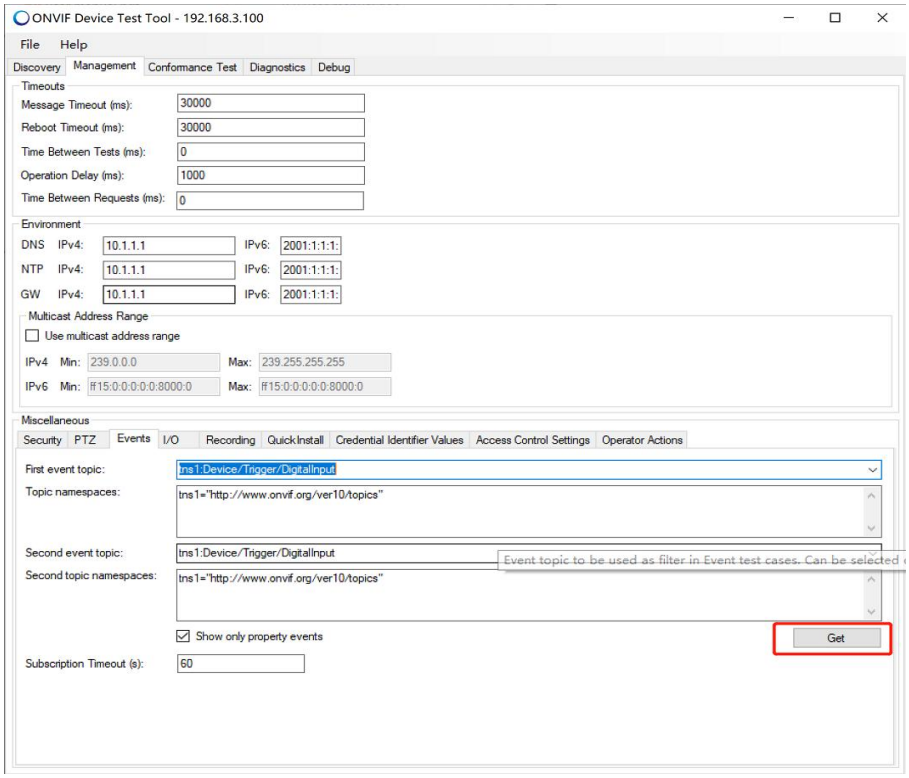
4. Run the ONVIF Device Test Tool.

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

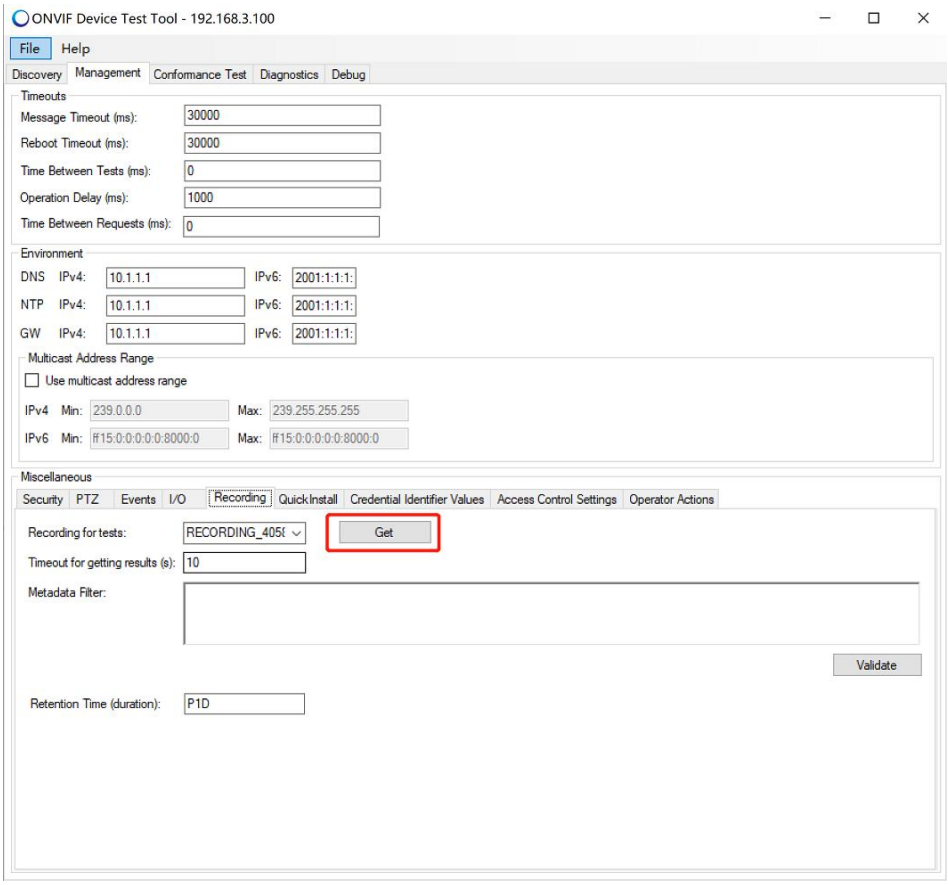
5. Click "Discover Devices" button, as the following:



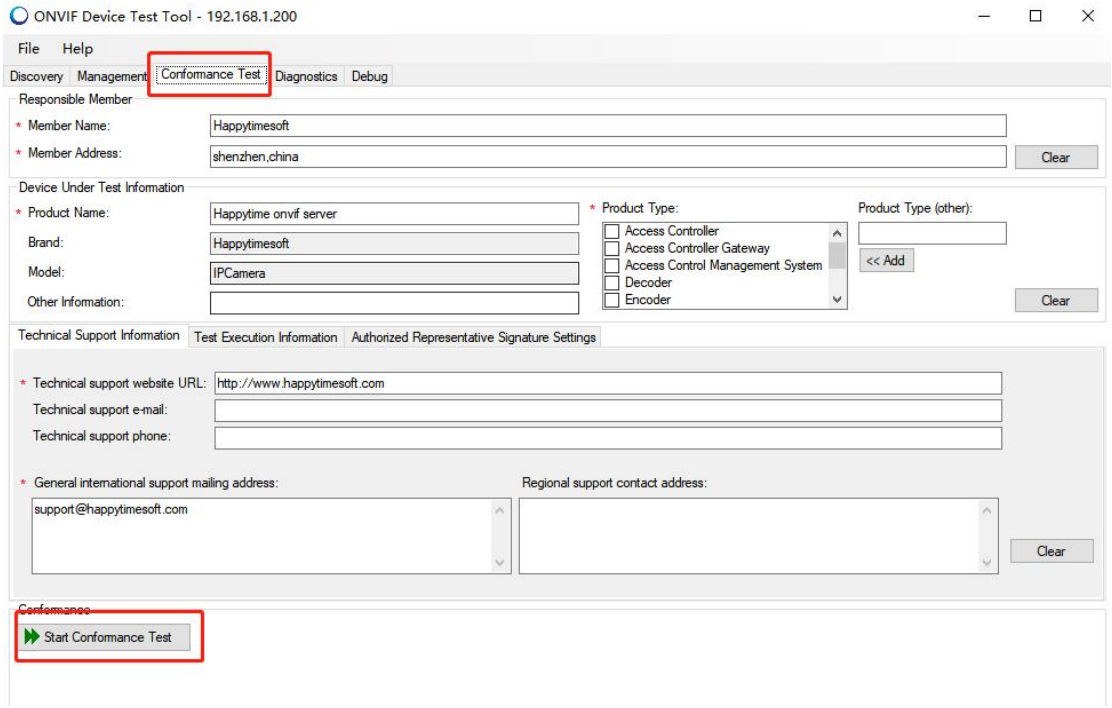
5. Switch to "Management" tab, select "Events" tab, then click "Get" button, as the following:



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



7. 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.

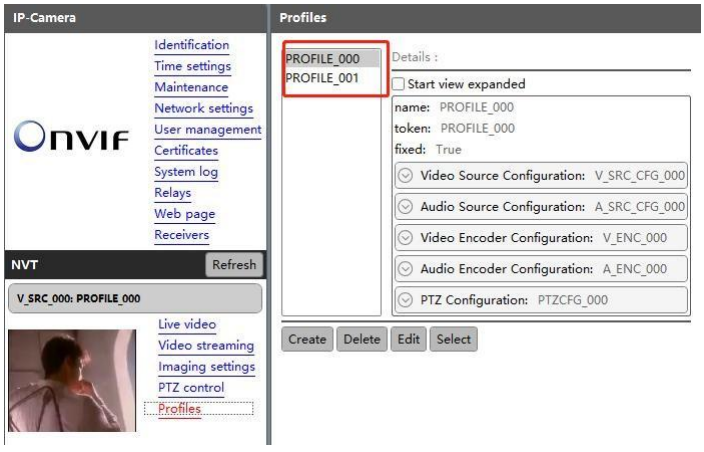
The default configuration file supports 2 channels, you can add <profile> tag to support more channels.

Note : If <video_source>.width and <video_source>.height of multiple <profile> tags are the same, 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, 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