

linkingvision

H5STREAM

User Manual

Copyright © 2018 linkingvision, All rights reserved

Revision History

Revision	Date	Description
1.00	2018/04/03	First version
1.01	2018/04/26	r4.2 update
1.0.2	2018/05/05	r5.0
1.0.3	2018/07/09	r6.0 split the API document

Table of Contents

1.0	Release Notes	6
1.1	Version 1.00	6
2.0	Scope	6
3.0	References.....	6
4.0	Terms and Definitions.....	7
5.0	Specification overview	8
6.0	On premises	9
6.1	Video source support	9
6.2	Platform	9
6.3	Protocol.....	9
6.4	Video encryption	9
7.0	Cloud.....	11
8.0	Installing Software	12
8.1	Prepare	12
8.2	Install.....	12
8.3	Install license	15
9.0	Configure video source	16
9.1	File source.....	16
9.2	RTSP RTMP video source.....	18
9.3	ONVIF source.....	19
10.0	Cloud push mode configuration.....	20
10.1	Internal network H5STREAM config	20
10.2	Cloud H5STREAM config	20

1.0 Release Notes

1.1 Version 1.00

Initial version.

2.0 Scope

This specification defines live streaming scenario, and include install guide, development API interface. And introduce the best live streaming method for different browser, and then can achieve sub seconds low latency.

3.0 References

ONVIF <https://www.onvif.org/>

4.0 Terms and Definitions

5.0 Specification overview

Recently, as the Internet also the Mobile grow quickly, more and more Mobile APP based on HTML5, so the big challenge is the video streaming for browser, and Flash has a lot of problem, so most Browser has begin to stop flash by 2020. And all the browser has top the plugin. Currently IP Camera/NVR/VMS web browser only support IE11, so it is import to support video streaming in browser without plugin.

And the HTML5 native video streaming technology are very different. And the low latency is an important requirement, so how to achieve 1s or 500ms latency is a big challenge.

The cloud is very common now, remote cloud video streaming and video sharing with low latency is also important.

H5STREAM support the HTML5 native video streaming and cloud video streaming through WEBRTC WEBSOCKET RTMP FLV. Below is all the technology we used for different browser.

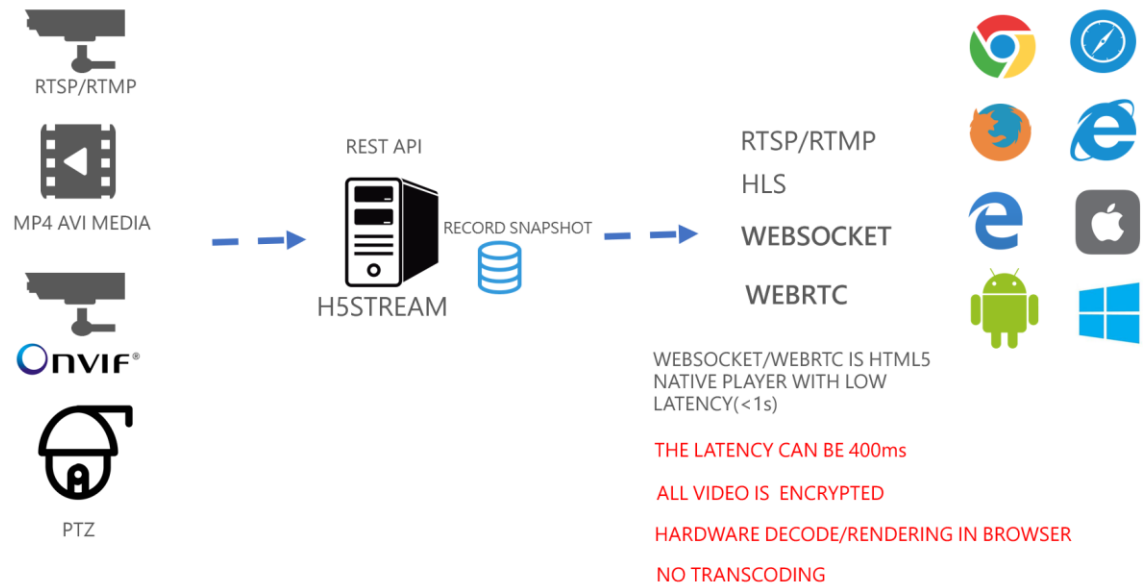
	Chrome	Firefox	IE11	Edge	Safari	WeChat
WIN7	WEBRTC WEBSOCKET	WEBRTC WEBSOCKET	RTMP	-	-	-
WIN 8/10	WEBRTC WEBSOCKET	WEBRTC WEBSOCKET	RTMP WEBSOCKET	WEBRTC	-	-
macOS	WEBRTC WEBSOCKET	WEBRTC WEBSOCKET	-	-	WEBRTC WEBSOCKET	-
iOS 11	HLS WEBRTC	HLS WEBRTC	-	-	HLS WEBRTC	HLS WEBRTC
iOS 8-10	HLS	HLS	-	-	HLS	HLS
Android	WEBSOCKET WEBRTC	WEBRTC WEBSOCKET	-	-	-	HLS

Browser Compatibility

6.0 On premises

H5STREAM is streaming platform which support Windows Linux(CentOS ubuntu) macOS.

ON-PREMISES



On Premises

6.1 Video source support

H5STREAM support use MP4/AVI file as video source, so it is very convenient to test without a real video source. Because most IP camera support RTSP, And old streaming system only support RTMP. So H5STREAM both support RTSP and RTMP. As a video surveillance standard, ONVIF has been supported in most of the video surveillance device and system, so H5STREAM support ONVIF directly. And user can use H5STREAM RESTFUL API to control ONVIF PTZ device.

6.2 Platform

H5STREAM is a cross platform video streaming including Windows 7/8/10, CentOS ubuntu macOS, and you also can run H5STREAM in Azure or AWS. And also you can run as cluster based on NGINX.

6.3 Protocol

RTMP/RTSP/HLS is the very common video streaming protocol, H5STREAM support all of them, and for new WEBSOCKET and WEBRTC, H5STREAM support them very well, so can use the hardware decoding and then achieve low latency.

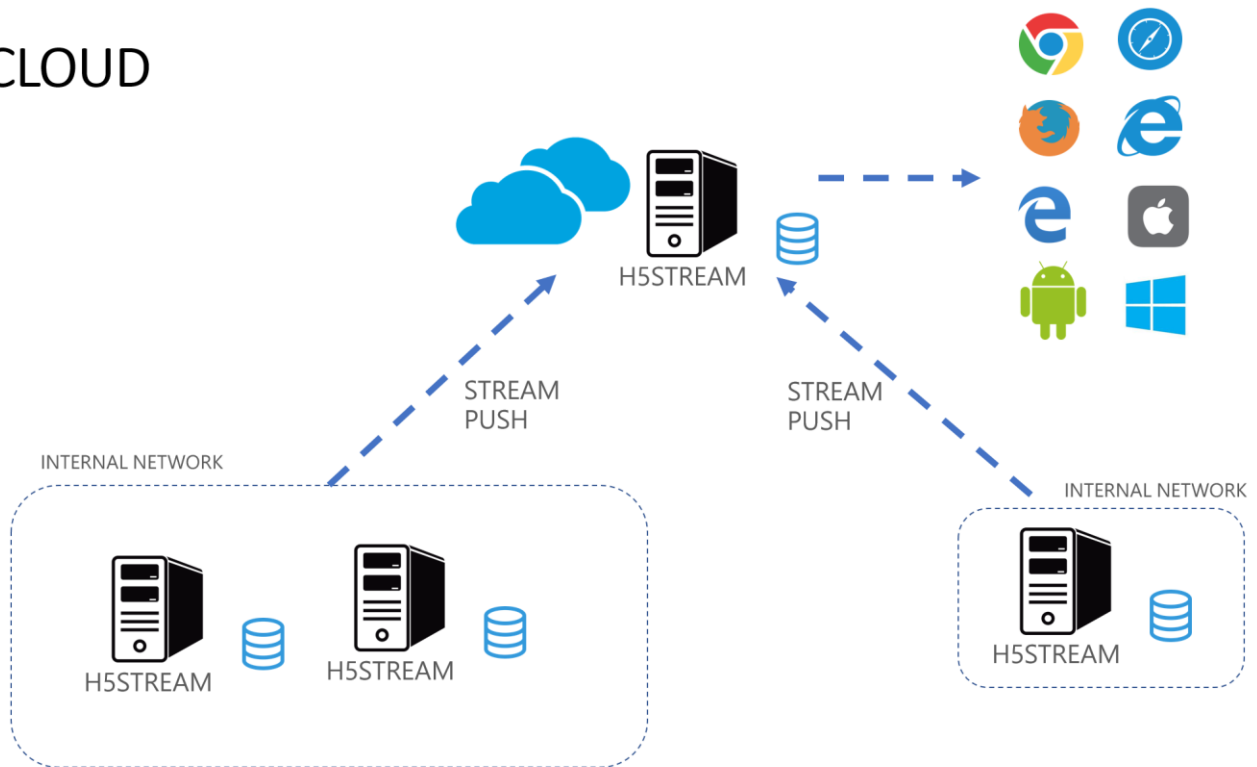
6.4 Video encryption

H5STREAM use native HTML5 video streaming, so all the video streaming will based on HTTPS or SSL/TLS for UDP.

7.0 Cloud

When user need access remote video, and maybe you need map NAT port or use DDNS, it is not easy to do this for end user. H5STREAM support video push mode, and all the video is encrypted, so make the communication safe.

CLOUD



Cloud video Streaming

8.0 Installing Software

8.1 Prepare

Windows 7/8/10 Centos ubuntu macOS 32bit (Only support Windows 32bit)/64bit system, 4G memory, 1 core CPU or above.

Download the package

Download the package you need from below link.

<https://www.linkingvision.com/download/>

Install vs2017 redistributable

32bit

https://download.visualstudio.microsoft.com/download/pr/100349138/88b50ce70017bf10f2d56d60fcba6ab1/VC_redist.x86.exe

64bit

https://download.visualstudio.microsoft.com/download/pr/11100230/15ccb3f02745c7b206ad10373cbca89b/VC_redist.x64.exe

8.2 Install

Manual running

exec the h5ss.bat, or h5ss.sh.

certificate	3/14/2018 8:03 PM	File folder	
conf	3/23/2018 11:32 P...	File folder	
logs	3/23/2018 11:32 P...	File folder	
ssl	3/14/2018 8:03 PM	File folder	
www	3/17/2018 9:08 PM	File folder	
avcodec-57.dll	2/5/2018 8:39 PM	Application extens...	7,255 KB
avdevice-57.dll	2/5/2018 8:35 PM	Application extens...	152 KB
avfilter-6.dll	2/5/2018 8:35 PM	Application extens...	2,819 KB
avformat-57.dll	2/5/2018 8:39 PM	Application extens...	2,578 KB
avresample-3.dll	2/5/2018 8:35 PM	Application extens...	217 KB
avutil-55.dll	2/5/2018 8:39 PM	Application extens...	561 KB
cmnlib.dll	3/14/2018 7:35 PM	Application extens...	1,587 KB
gencertificate.bat	2/5/2018 7:07 PM	Windows Batch File	1 KB
h5ss.bat	2/5/2018 7:07 PM	Windows Batch File	1 KB
h5ss.exe	3/14/2018 7:35 PM	Application	1,334 KB
libeay32.dll	2/5/2018 8:29 PM	Application extens...	2,044 KB
libprotobuf.dll	2/5/2018 10:40 PM	Application extens...	2,364 KB
live555.dll	2/5/2018 8:27 PM	Application extens...	237 KB
nssm.exe	2/5/2018 8:03 PM	Application	324 KB
openssl.cnf	2/5/2018 7:07 PM	CNF File	11 KB
PocoFoundation64.dll	2/5/2018 10:37 PM	Application extens...	1,524 KB
PocoJSON64.dll	2/5/2018 10:37 PM	Application extens...	241 KB
PocoNet64.dll	2/5/2018 10:37 PM	Application extens...	979 KB
PocoUtil64.dll	2/5/2018 10:37 PM	Application extens...	417 KB
PocoXML64.dll	2/5/2018 10:18 PM	Application extens...	574 KB
regservice.bat	2/5/2018 8:03 PM	Windows Batch File	1 KB
ssleay32.dll	2/5/2018 8:27 PM	Application extens...	345 KB
swresample-2.dll	2/5/2018 8:39 PM	Application extens...	181 KB
swscale-4.dll	2/5/2018 8:35 PM	Application extens...	698 KB
unregservice.bat	2/5/2018 8:03 PM	Windows Batch File	1 KB

If you system is Centos 7, you need update libstdc++ to libstdc++.so.6.0.21

Download the libstdc++.so.6.0.21, and run below command.

```
cp libstdc++.so.6.0.21 /usr/lib64/libstdc++.so.6
```

if /lib64/libstdc++.so.6 exist, need below command

```
cp libstdc++.so.6.0.21 /lib64/libstdc++.so.6
```

Install As service

Windows

regservice.bat install service.

unregservice.bat remove the service.

Centos 7

```
/opt/h5ss/
-- certificate
-- conf
-- gencertificate.sh
-- h5ss
-- h5ss.service
-- h5ss.service.sh
-- h5ss.sh
-- lib
-- logs
-- openssl
-- openssl.cnf
-- www
```

```
Copy the release package to /opt/h5ss
cp h5ss.service /usr/lib/systemd/system/
systemctl enable h5ss.service
systemctl start h5ss.service
```

Ubuntu 16.04

```
sudo mkdir -p /usr/lib/systemd/system/
sudo apt install system
```

```
Copy the release package to /opt/h5ss
cp h5ss.service /usr/lib/systemd/system/
systemctl enable h5ss.service
systemctl start h5ss.service
```

Linux performance tuning

```
#sudo vi /etc/security/limits.conf
```

add below 4 line at the end of the file.

```
root soft nofile 655350
```

```
root hard nofile 655350
```

```
* soft nofile 655350
```

```
* hard nofile 655350
```

```
##          soft    core    0
##          hard    rss     10000
#@student   hard    nproc    20
#@faculty   soft    nproc    20
#@faculty   hard    nproc    50
#ftp        hard    nproc    0
#@student   -       maxlogins 4

# End of file
root soft nofile 655350
root hard nofile 655350
* soft nofile 655350
* hard nofile 655350
```

```
#sudo vi /etc/sysctl.conf
```

add below 1 line at the end of the file.

```
fs.file-max = 655350
```

```
# sysctl settings are defined through files in
# /usr/lib/sysctl.d/, /run/sysctl.d/, and /etc/sysctl.d/.
#
# vendors settings live in /usr/lib/sysctl.d/.
# To override a whole file, create a new file with the same in
# /etc/sysctl.d/ and put new settings there. To override
# only specific settings, add a file with a lexically later
# name in /etc/sysctl.d/ and put new settings there.
#
# For more information, see sysctl.conf(5) and sysctl.d(5).
fs.file-max = 655350
~
~
~
#sudo sysctl -p
```

8.3 Install license

In logs/h5sslog.log and get Hostid, and then send the HostId to info@linkingvision.com, after receive the h5ss.lic license file, copy the h5ss.lic file to conf folder, and restart the h5ss.

9.0 Configure video source

In the release package there has one config file conf/h5ss.conf, you can change the file to add video source, and also you can use RESTFUL API to modify the video source. Below table list all the config item H5STREAM have.

CONFIGURATION FILE

conf/h5ss.conf	
HTTP	HTTP HTTPS server configuration
RTSP	RTSP server configuration, SSL is RTSP over TCP/TLS
RTMP	RTMP server configuration, SSL is RTMP over TCP/TLS
FLV	FLV server configuration, SSL is FLV over HTTPS
HLS	HLS version and parameter configuration
WEBRTC	WEBRTC configuration
SYSTEM	H5stream system configuration such as log and HTTP server thread
USER	User management configuration
SOURCE	Video source configuration, include File/RTSP/RTMP/ONVIF

Configuration file

9.1 File source

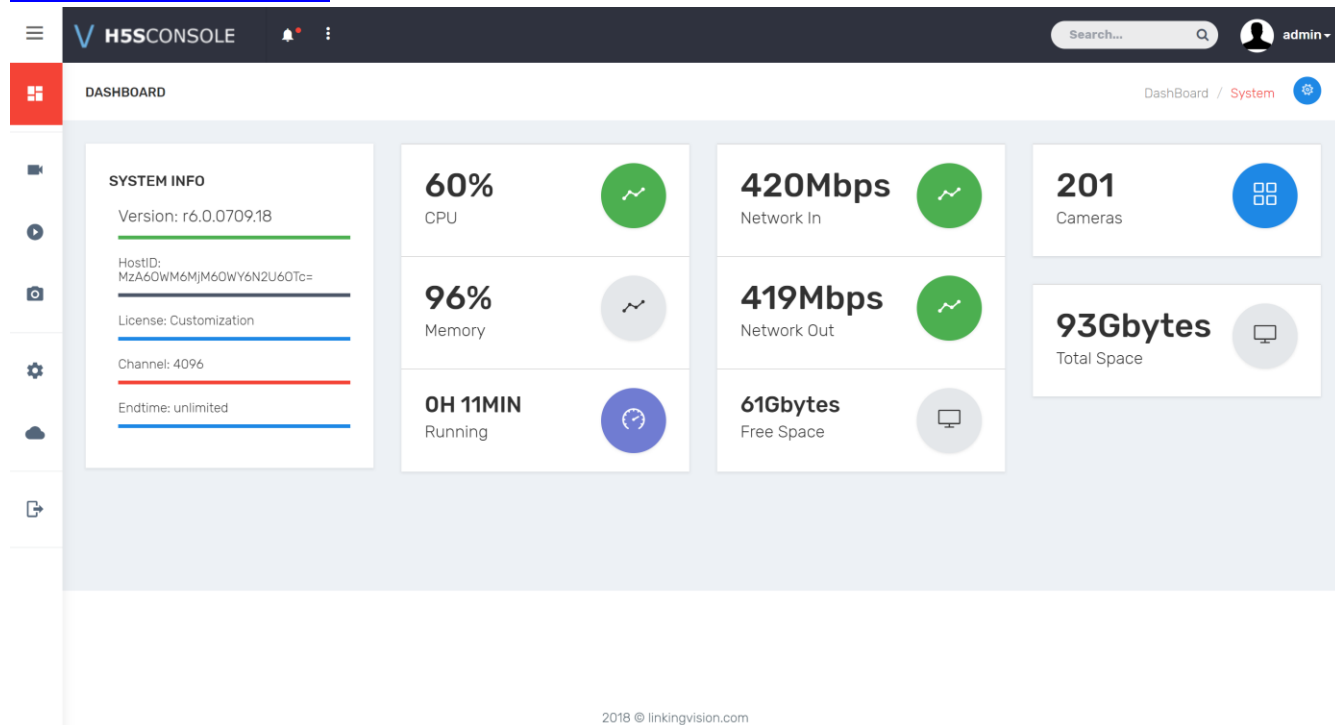
In the video source config, strToken is the unique for the source, please keep then different. And in the config file nType is H5_FILE, and strUrl is video file path, and linkingvision has testing video source for you use, you can download from here

<https://linkingvision.com/download/H5Stream/video/h5ssample.mp4>.

```
"strNameComment": "name for this stream",
"strName": "Stream 1",
"strTokenComment": "token for this stream, must unique, if same, only first will be available",
"strToken": "token1",
"nTypeComment": "source type H5_FILE/H5_STREAM/H5_ONVIF",
"nType": "H5_FILE",
"strUrlComment": "",
"strUrl": "c:\\h5ssample.mp4",
"strUserComment": "username",
"strUser": "admin",
"strPasswdComment": "password",
"strPasswd": "12345",
"bPasswdEncryptComment": "Password Encrypted",
"bPasswdEncrypt": false,
"bEnableAudioComment": "Enable Audio",
"bEnableAudio": false
```

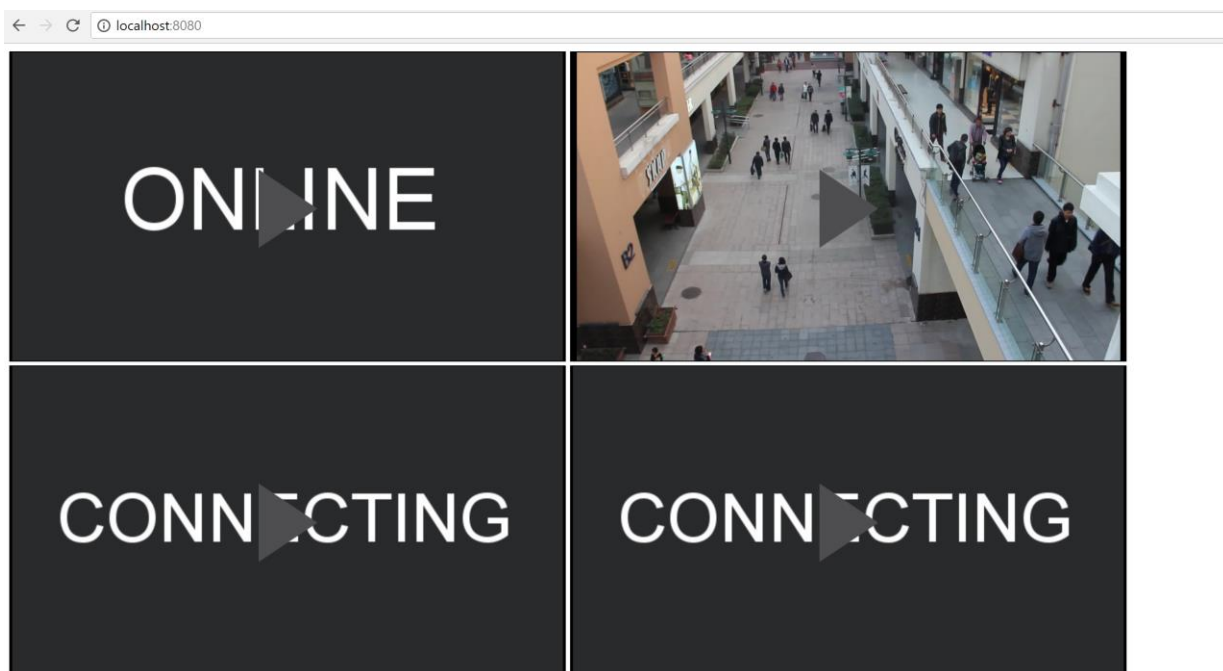
File source configuration

After change and save the config file, restart h5ss.bat, In Chrome input <http://localhost:8080/> or <https://localhost:8443/>

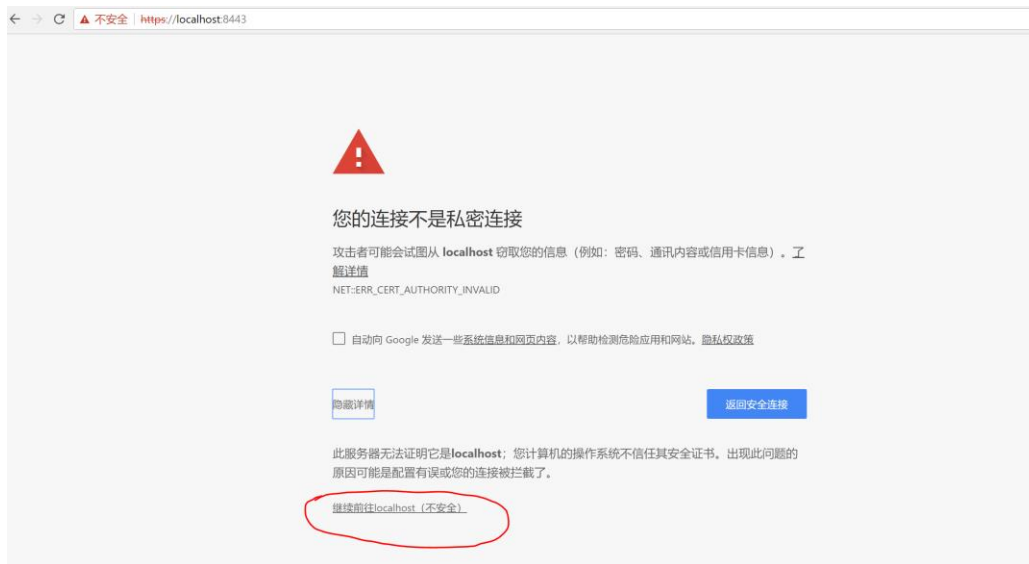


h5stream console

Or input <http://localhost:8080/demo.html> or <https://localhost:8443/demo.html> , as the https server is self signed certificate, so need click and then go to site.



HTTP Video



HTTPS Video(There has some Chinese, I think you can find the button 😊)

If you want to use ws/rtc/rtmp/hls to access the video, you can use below command.

<http://localhost:8080/ws.html?token=token2>

<http://localhost:8080/rtc.html?token=token2>

<http://localhost:8080/rtmp.html?token=token2>

<http://localhost:8080/hls.html?token=token2>

9.2 RTSP RTMP video source

Change nType to H5_STREAM, strUrl is the RTSP RTMP, is the RTSP source need user and password, input user and password to strUser and strPasswd, the user and password in the RTSP URL is not valid.

```
"strNameComment": "name for this stream",
"strName": "Stream 1",
"strTokenComment": "token for this stream, must unique, if same, only first will be available",
"strToken": "token1",
"nTypeComment": "source type H5_FILE/H5_STREAM/H5_ONVIF",
"nType": "H5_STREAM",
"strUrlComment": "",
"strUrl": "rtsp://192.168.0.1/stream",
"strUserComment": "username",
"strUser": "admin",
"strPasswdComment": "password",
"strPasswd": "12345",
```

RTSP/RTMP video source

9.3 ONVIF source

ONVIF has a lot option need config, but most can be default, you can only change the item marked in below picture including nType strUser strPasswd strSrcIPAddress strSrcPort.

```
{
  "strNameComment": "name for this stream",
  "strName": "Stream 1",
  "strTokenComment": "token for this stream, must unique, if same, only first will be available",
  "strToken": "token1",
  "nTypeComment": "source type H5_FILE/H5_STREAM/H5_ONVIF",
  "nType": "H5_ONVIF",
  "strUrlComment": "",
  "strUrl": "rtsp://192.168.0.1/stream",
  "strUserComment": "username",
  "strUser": "admin",
  "strPasswdComment": "password",
  "strPasswd": "12345",
  "bPasswdEncryptComment": "Password Encrypted",
  "bPasswdEncrypt": false,
  "bEnableAudioComment": "Enable Audio",
  "bEnableAudio": false,
  "nConnectTypeComment": "H5_ONDEMAND/H5_ALWAYS/H5_AUTO",
  "nConnectType": "H5_AUTO",
  "nRTSPTypeComment": "RTSP Connect protocol H5_RTSP_TCP/H5_RTSP_UDP/H5_RTSP_HTTP/H5_RTSP_HTTPS/H5_RTSP_AUTO",
  "nRTSPType": "H5_RTSP_AUTO",
  "strSrcIpAddressComment": "Ip Address for the device",
  "strSrcIpAddress": "192.168.0.1",
  "strSrcPortComment": "Port for the device",
  "strSrcPort": "80",
  "nChannelNumberComment": "Channel number (1-512)",
  "nChannelNumber": 1,
  "bOnvifProfileAutoComment": "ONVIF Auto select the video profile",
  "bOnvifProfileAuto": true,
  "strOnvifAddrComment": "",
  "strOnvifAddr": "/onvif/device_service",
  "strOnvifProfileMainComment": "ONVIF Main stream profile name",
  "strOnvifProfileMain": "Profile_1",
  "strOnvifProfileSubComment": "ONVIF Sub stream profile name",
  "strOnvifProfileSub": "Profile_2"
},
```

ONVIF source

10.0 Cloud push mode configuration

10.1 Internal network H5STREAM config

In the cloud part of the configuration, if you want enable cloud push mode, you set the bEnable to true, and config the port. If the cloud H5STREAM use the default config, just input the strCloudIp is OK, you also can use Domain name of the cloud.

```
"cloud": {  
  "strServerNameComment": "Server name",  
  "strServerName": "Server 1",  
  "strServerTokenComment": "Server token",  
  "strServerToken": "servertoken1",  
  "bEnableComment": "Enable connect",  
  "bEnable": true,  
  "strCloudIpComment": "Cloud ip address or domain name",  
  "strCloudIp": "47.75.117.15",  
  "strCloudPortComment": "Cloud port",  
  "strCloudPort": "8080",  
  "bSSLComment": "Enable SSL for cloud connect",  
  "bSSL": false,  
  "strUserComment": "User for cloud connect",  
  "strUser": "admin",  
  "strPasswdComment": "Password MD5 hashed, default 12345",  
  "strPasswd": "827ccb0eea8a706c4c34a16891f84e7b"  
},
```

10.2 Cloud H5STREAM config

If working as cloud mode, and most cloud vm doesn't has public IP, if you want use WebRTC, you need enable the bCloudMode and set the public IP.

```
"webrtc": {  
  "bWebRTCSinkComment": "Enable WebRTC sink",  
  "bWebRTCSink": true,  
  "bCloudModeComment": "Cloud mode for public IP is mapped",  
  "bCloudMode": true,  
  "strRelatedPublicIpComment": "Cloud Public IP",  
  "strRelatedPublicIp": "47.75.117.15"  
},
```