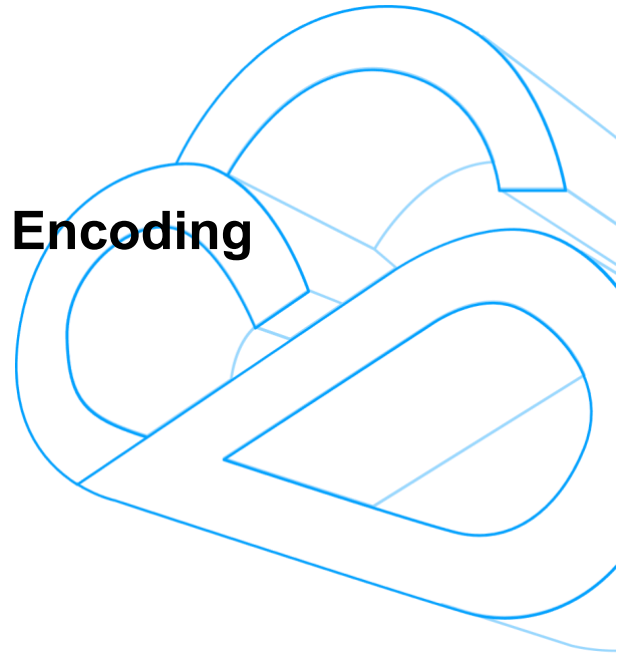


## **On-premises MPS sdk for Video Encoding**



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## Update Recoding

Version	Launch time	Owner	Comments
V1.0	2022-05-10	yankeetian@tencent.com	This is v1.0 version release, as new document

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# 1 Overview

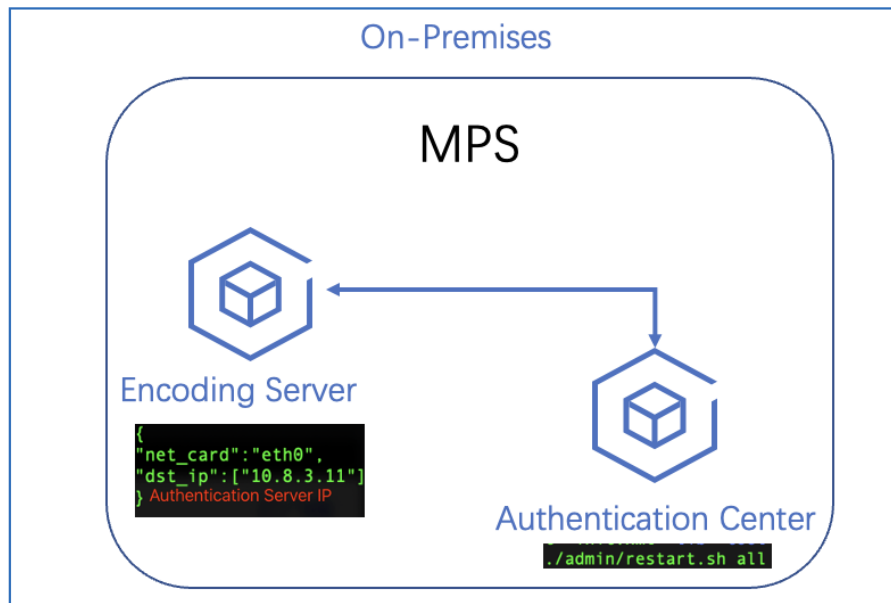
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## 1.1 About the Solution

Media Processing Service (MPS) is a multimedia transcoding and processing service, with cloud-based and on-premises sdk. It can handle vast amounts of multimedia data. MPS performs adaptive transcoding on demand for audio and video files. You can flexibly adjust bitrates and resolutions of multimedia data, making them suitable for OTT services or playback on PC and mobile devices. MPS also offers video processing services such as watermarking, screencapturing, intelligent cover generating, and intelligent editing.

In this guidance, we will introduce on-premises MPS sdk.

## 1.2 The Solution Architecture Diagram



## 2 Procedure Guidance

### 2.1 Preparations

#### Recommended configuration for deployment environment

✓ Authentication Center Server

CPU: 4 cores and above

Memory: 8GB and above

Disks: 100GB and above

✓ Encoding Server

CPU: recommend 16 cores and above, main frequency is greater than 2GHz

GPU: recommend Tesla T4

Memory: recommend 32GB and above

Disks: 1000GB and above

*Tips: the networks must interact between Authentication Center Server and Encoding Server*

### 2.2 Experiment Procedure

#### Step 1: Install Authentication Center

Login to the first server, and install lshw tool as follow:

```
10.13.38 get_server_info
[root@VM-3-11-centos mpscenter]# yum install lshw
已加载插件: fastestmirror, langpacks
Determining fastest mirrors
正在解决依赖关系
```

```
yum install lshw
```

Then get information about this server via 'get\_server\_info' tool, that can be downloaded from [this link](#), or contact us to get it.

---



```

[root@VM-3-11-centos mpscenter]# ll
总用量 1416
-rw-r--r-- 1 root root 1447848 5月 10 13:56 get_server_info
[root@VM-3-11-centos mpscenter]# chmod +x get_server_info
[root@VM-3-11-centos mpscenter]# ll
总用量 1416
-rwxr-xr-x 1 root root 1447848 5月 10 13:56 get_server_info
[root@VM-3-11-centos mpscenter]# ./get_server_info
Get server info file (user.csr) success!
[root@VM-3-11-centos mpscenter]# ll -a
总用量 1428
drwxr-xr-x 2 root root 4096 5月 10 14:01 .
dr-xr-x--- 8 root root 4096 5月 10 14:01 ..
-rw-r--r-- 1 root root 956 5月 10 14:01 10.8.3.11.csr send it
-rwxr-xr-x 1 root root 1447848 5月 10 13:56 get_server_info
[root@VM-3-11-centos mpscenter]#

```

```

chmod +x get_server_info
./get_server_info

```

If the execution is successful, you will see a '[the IP of this server].csr' file, please send it to us, we will provide the installation package.

Install Authentication Center package, and start it.

```

[root@VM-3-11-centos mpscenter]# ls
10.8.3.11.csr  get_server_info  video_sls-1.0_10.8.3.11.tar.gz
[root@VM-3-11-centos mpscenter]# mkdir -p /usr/local/services/
[root@VM-3-11-centos mpscenter]# tar -zxvf video_sls-1.0_10.8.3.11.tar.gz -C /usr/local/services/
video_sls-1.0/
video_sls-1.0/lib/
video_sls-1.0/lib/libcrypto.so.10
video_sls-1.0/conf/
video_sls-1.0/conf/SLS.conf
video_sls-1.0/conf/user.crt
video_sls-1.0/dir_permissions.txt

```

```
[root@VM-3-11-centos services]# cd /usr/local/services/video_sls-1.0/
[root@VM-3-11-centos video_sls-1.0]# ls
admin bin conf _dir_permissions.txt init.xml lib tool
[root@VM-3-11-centos video_sls-1.0]# ./admin/restart.sh all
[2022-05-10 19:19:21,667] INFO: acquire pkg lock 'pkgadmin.video_sls'
[2022-05-10 19:19:21,667] INFO: restarting all
[2022-05-10 19:19:21,667] INFO: stopApp all
[2022-05-10 19:19:21,673] INFO: SLS already dead
[2022-05-10 19:19:21,673] INFO: stop all successfully
[2022-05-10 19:19:21,673] INFO: startApp all
[2022-05-10 19:19:21,673] INFO: add pkg cron
[2022-05-10 19:19:21,678] INFO: runConfigCode <start>
[2022-05-10 19:19:23,813] INFO: run script succeeded
[2022-05-10 19:19:23,814] INFO: output:
SLS: no process found
shmget 24555 12000: No such file or directory

[2022-05-10 19:19:23,814] INFO: sleep 2 seconds and check
[2022-05-10 19:19:25,820] INFO: start all successfully
[2022-05-10 19:19:25,820] INFO: restart all successfully
```

```
mkdir -p /usr/local/services/
tar -zxvf video_sls-1.0_10.8.3.11.tar.gz -C /usr/local/services/
cd /usr/local/services/video_sls-1.0/
./admin/restart.sh all
```

Check if the startup is successful

```
[root@VM-3-11-centos video_sls-1.0]# netstat -anp | grep 443
tcp        0      0 0.0.0.0:443          0.0.0.0:*            LISTEN
6946/./SLS
unix 3      [ ]          STREAM        CONNECTED      11443          1/systemd
/run/systemd/journal/stdout
[root@VM-3-11-centos video_sls-1.0]# ps -ef | grep -v grep | grep SLS
root      6946      1   0 19:19 ?        00:00:00 ./SLS ../conf/SLS.conf
```

## Step 2: Deploy Encoding Server

Please contact us to get the TSC SDK package. Upload and decompress the installation package, then enter TSC SDK dir, configure environment variables.

```
[root@VM-3-2-centos mps2]# ls
tscsdk-center-4.2 tscsdk-center-4.2.tar.gz
[root@VM-3-2-centos mps2]# cd tscsdk-center-4.2/
[root@VM-3-2-centos tscsdk-center-4.2]# ls
fflib_gpu ffmpeg lib sdk_config src tenmodel
[root@VM-3-2-centos tscsdk-center-4.2]# ll
总用量 19684
drwxr-xr-x 2 root root    4096 4月 29 20:25 fflib_gpu
-rwxr-xr-x 1 root root 20134944 4月 29 20:23 ffmpeg
drwxr-xr-x 2 root root    4096 4月 29 20:25 lib
-rw-r--r-- 1 root root     55 4月 28 13:39 sdk_config
drwxr-xr-x 2 root root    4096 2月 24 22:21 src
drwxr-xr-x 2 root root    4096 4月 28 22:21 tenmodel
[root@VM-3-2-centos tscsdk-center-4.2]# export LD_LIBRARY_PATH=./fflib_gpu/:$LD_
LIBRARY_PATH
[root@VM-3-2-centos tscsdk-center-4.2]#
```

```
export LD_LIBRARY_PATH=./fflib_gpu/:$LD_LIBRARY_PATH
```

Edit 'sdk\_config' file, update the "net\_card" and "dst\_ip", save And quit.

```
{
  "net_card": "eth0",
  "dst_ip": ["10.8.3.11"] Authentication Server IP
}
```

Use 'ffmpeg' command to check the status, If the command can be executed normally, the deployment is successful. If an error message appears, it is recommended to first confirm whether the environment variable configuration is loaded. If the issue has not been resolved, please contact us directly.



```

ffmpeg -i sdk_config tenmodel test-1080-video.mp4
[root@VM-3-2-centos tscsdk-center-4.2]# ./ffmpeg -i test-720-video.mp4 -sdk_conf
ig ./sdk_config
ffmpeg version 4.2 Copyright (c) 2000-2019 the FFmpeg developers
  built with gcc 4.8.5 (GCC) 20150623 (Red Hat 4.8.5-39)
  configuration: --enable-cross-compile --enable-openssl --disable-autodetect --
extra-cflags=-I./lib --extra-ldflags='-L./fflib_gpu/ -L./lib/ -L./ssl_static_tmp
/' --extra-cflags=-I./lib/ --extra-libs='-lssl -lcrypto -ltscsdk_center -ltvp -l
stdc++ -lm -ldl -lrt -lpthread -lz'
  libavutil      56. 31.100 / 56. 31.100
  libavcodec     58. 54.100 / 58. 54.100
  libavformat    58. 29.100 / 58. 29.100
  libavdevice    58.  8.100 / 58.  8.100
  libavfilter    7. 57.100 /  7. 57.100
  libswscale     5.  5.100 /  5.  5.100
  libswresample  3.  5.100 /  3.  5.100
Trailing options were found on the commandline.
Input #0, mov,mp4,m4a,3gp,3g2,mj2, from 'test-720-video.mp4':
  Metadata:
    major_brand      : isom
    minor_version    : 512
    compatible_brands: isomiso2mp41
    encoder          : Lavf58.29.100
  Duration: 00:00:34.06, start: 0.000000, bitrate: 834 kb/s
    Stream #0:0(und): Video: mpeg4 (Simple Profile) (mp4v / 0x7634706D), yuv420p
, 1280x720 [SAR 1:1 DAR 16:9], 705 kb/s, 28.33 fps, 28.33 tbr, 10880 tbn, 85 tbc
(default)
      Metadata:
        handler_name      : VideoHandler
    Stream #0:1(und): Audio: aac (LC) (mp4a / 0x6134706D), 32000 Hz, mono, fltp,
126 kb/s (default)
      Metadata:
        handler_name      : SoundHandler
./ffmpeg -i test-720-video.mp4

```

### Step 3: Start testing

Prepare test video files, then start testing. Such as the source video file(testvideo-1080-30.mp4), output video file(test-sharp.mp4).

```

./ffmpeg -i testvideo-1080-30.mp4 -vf
tenfilter=unsharp_size=7:unsharp_amount=0.5 -c:v libten265 -crf 28
-preset 2 ./test-sharp.mp4

```

Comparison of indicators before and after compression as follows:

```

[root@VM-3-2-centos tscsdk-center-4.2]# ./ffmpeg -i testvideo-1080-30.mp4
ffmpeg version 4.2 Copyright (c) 2000-2019 the FFmpeg developers
  built with gcc 4.8.5 (GCC) 20150623 (Red Hat 4.8.5-39)
  configuration: --enable-cross-compile --enable-openssl --disable-autodetect --
extra-cflags=-I./lib --extra-ldflags='-L./fflib_gpu/ -L./lib/ -L./ssl_static_tmp
/' --extra-cflags=-I./lib/ --extra-libs='-lssl -lcrypto -ltscsdk_center -ltvp -l
stdc++ -lm -ldl -lrt -lpthread -lz'
  libavutil      56. 31.100 / 56. 31.100
  libavcodec     58. 54.100 / 58. 54.100
  libavformat    58. 29.100 / 58. 29.100
  libavdevice    58.  8.100 / 58.  8.100
  libavfilter     7. 57.100 /  7. 57.100
  libswscale     5.  5.100 /  5.  5.100
  libswresample  3.  5.100 /  3.  5.100
Input #0, mov,mp4,m4a,3gp,3g2,mj2, from 'testvideo-1080-30.mp4':
Metadata:
  major_brand      : mp42
  minor_version    : 0
  compatible_brands: isommp42
  creation_time    : 2022-05-11T02:15:37.000000Z
  location         : +22.5432+113.9297/
  location-eng     : +22.5432+113.9297/
  com.android.version: 10
Duration: 00:00:21.24, start: 0.000000, bitrate: 12449 kb/s
  Stream #0:0(eng): Video: h264 (High) (avc1 / 0x31637661), yuv420p(tv, bt709)
, 1920x1080, 11952 kb/s, SAR 1:1 DAR 16:9, 29.90 fps, 120 tbr, 90k tbn, 180k tbc
(default)

```

source video

```

[root@VM-3-2-centos tscsdk-center-4.2]# ./ffmpeg -i test-sharp.mp4
ffmpeg version 4.2 Copyright (c) 2000-2019 the FFmpeg developers
  built with gcc 4.8.5 (GCC) 20150623 (Red Hat 4.8.5-39)
  configuration: --enable-cross-compile --enable-openssl --disable-autodetect --
extra-cflags=-I./lib --extra-ldflags='-L./fflib_gpu/ -L./lib/ -L./ssl_static_tmp
/' --extra-cflags=-I./lib/ --extra-libs='-lssl -lcrypto -ltscsdk_center -ltvp -l
stdc++ -lm -ldl -lrt -lpthread -lz'
  libavutil      56. 31.100 / 56. 31.100
  libavcodec     58. 54.100 / 58. 54.100
  libavformat    58. 29.100 / 58. 29.100
  libavdevice    58.  8.100 / 58.  8.100
  libavfilter     7. 57.100 /  7. 57.100
  libswscale     5.  5.100 /  5.  5.100
  libswresample  3.  5.100 /  3.  5.100
Input #0, mov,mp4,m4a,3gp,3g2,mj2, from 'test-sharp.mp4':
Metadata:
  major_brand      : isom
  minor_version    : 512
  compatible_brands: isomiso2mp41
  encoder          : Lavf58.29.100
  location-eng     : +22.5432+113.9297/
  location         : +22.5432+113.9297/
Duration: 00:00:21.25, start: 0.000000, bitrate: 1361 kb/s
  Stream #0:0(eng): Video: hevc (Main) (hev1 / 0x31766568), yuv420p(tv, progre
ssive), 1920x1080 [SAR 1:1 DAR 16:9], 1214 kb/s, 120 fps, 120 tbr, 15360 tbn, 12
0 tbc (default)

```

output video

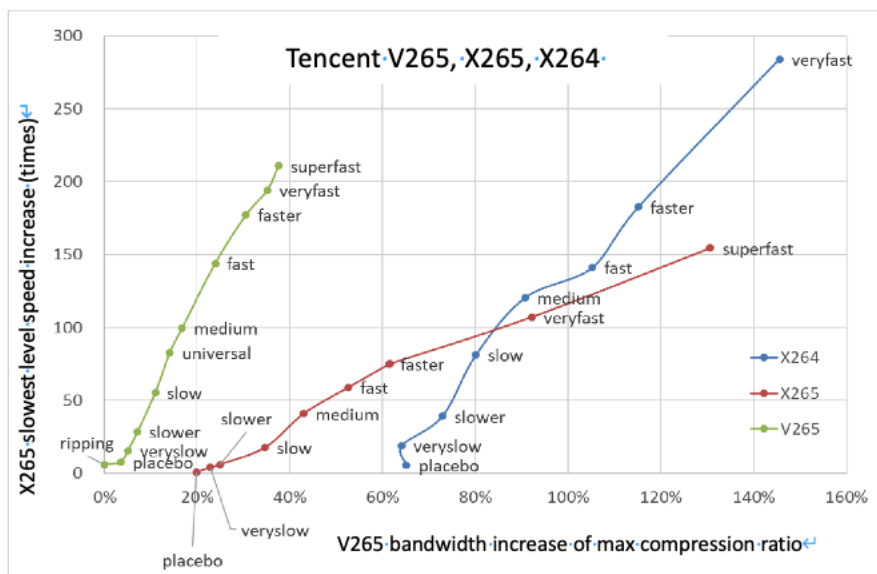
Video file size comparison before and after compression as follows:

```

[root@VM-3-2-centos tscsdk-center-4.2]# ll -a
总用量 66120
drwxr-xr-x 6 root root      4096 5月  11 10:22 .
drwxr-xr-x 3 root root      4096 5月  10 12:14 ..
drwxr-xr-x 2 root root      4096 4月  29 20:25 fflib_gpu
-rwxr-xr-x 1 root root 20134944 4月  29 20:23 ffmpeg
drwxr-xr-x 2 root root      4096 4月  29 20:25 lib
-rw-r--r-- 1 root root       50 5月  10 19:36 sdk_config
drwxr-xr-x 2 root root      4096 2月  24 22:21 src
drwxr-xr-x 2 root root      4096 4月  28 22:21 tenmodel
-rw-r--r-- 1 root root 5015256 5月  10 19:41 test-1080-28f-video.avi
-rw-r--r-- 1 root root 2301817 5月  10 19:41 test-1080-video.mp4
-rw-r--r-- 1 root root 3554548 5月  10 19:41 test-720-video.mp4
-rw-r--r-- 1 root root 3616418 5月  11 10:34 test-sharp.mp4
-rw----- 1 root root 33048951 5月  11 10:22 testvideo-1080-30.mp4
[root@VM-3-2-centos tscsdk-center-4.2]#

```

Using the same test method and the same test video sample file, it can be obtained the comparison test data with X265 and X264 encoding, as shown in the following figure:



## 2.3 Command reference

### Parameters

**--log\_level**

0-2,

**--gop\_size**

GOP size of the encoded frame structure (the default value is 8. Only values of 4, 8, and 16 have any effect. We generally recommend you not modify this value)

**--wpp**

Indicates whether to enable the WPP feature. 0: disabled; 1: enabled (it is enabled by default and we generally recommend you not modify this value)

**--preset**

Specifies the configuration of the encoder's encoding parameter set, which affects the encoding speed. -1: ripping; 0: placebo; 1: very slow; 2: slower; 3: slow; 4: universal; 5: medium; 6: fast; 7: faster; 8: very fast; 9: super fast; 10: ultra fast

**--crf**

CRF bitrate control method. Value range: [0-51]. The bitrates can roughly correspond to those of V265

**--vbv\_maxrate**

Maximum VBV bitrate (this value is the same as the configured bitrate by default)

**--vbv\_bufsize**

VBV buffer size (this value is four times the configured bitrate by default)

**--lag\_in\_frames**

Lookahead length (it can be any positive integer; the greater this value in the live streaming scenario, the higher the encoding delay)

**--enable\_scenecut**

Indicates whether to enable scene switch. 0: disabled; 1: enabled; 2: enabled for simple scenes (it is enabled by default and we generally recommend you keep it enabled)

**--scenecut\_threshold**

Scene switch threshold. Value range: [0,100] (0: disabled. It is enabled by default and we generally recommend you keep it enabled)

**--open\_gop**

Indicates whether to enable open GOP. 0: disabled; 1: enabled (it is enabled by default; in order to support random access in the live streaming scenario, we recommend you disable it)

**--keyint**

Maximum keyframe interval (it is 256 by default and can be configured according to actual business needs; it must be a multiple of 8 greater than 50)

---

### **--pool\_threads**

Number of threads in the thread pool used by WPP (it is the same as the number of CPU cores by default; if you want to reduce the CPU usage, lower this number)