Render + Encode Pipeline User Guide

1. Setup the environment

1.1. Install SG1 release package

```
$ ./install-sg1.sh
```

Enter “**y**” when asked “**Do you want to install Mesa? 'y/n' default is n:**” during the process.

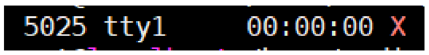
1.2. Stop gdm

```
$ systemctl stop gdm
```

1.3. Check whether X service is stopped

```
$ ps -e | grep X
```

If you see something like the image below, it means X service is still on.



```
5025 tty1     00:00:00 X
```

Please kill it:

```
$ kill -9 pid_of_X
```

1.4. Export environmental variables

Make sure X service is stopped before this step.

For **CentOS**:

```
$ export LD_LIBRARY_PATH=/opt/intel/mediasdk/lib64/:/usr/local/lib:/usr/local/lib64/:/usr/local/lib64/dri/:/usr/lib64/:/usr/lib64/dri/:/opt/intel/mediasdk/share/mfx/samples/_bin/x64/:$LD_LIBRARY_PATH
```

For **Debian** & **Ubuntu**:

```
$ export LD_LIBRARY_PATH=/opt/intel/mediasdk/lib64/:/usr/local/lib:/usr/local/lib/x86_64-linux-gnu/:/usr/local/lib/x86_64-linux-gnu/dri/:/usr/lib64/:/usr/lib64/dri/:/opt/intel/mediasdk/share/mfx/samples/_bin/x64/:$LD_LIBRARY_PATH
```

For **all OS**:

```
$ export DISPLAY=:0.0
```

```
$ export MESA_LOADER_DRIVER_OVERRIDE=iris
```

```
$ export LIBVA_DRIVER_NAME=iHD
$ export LIBVA_DRIVERS_PATH=/opt/intel/mediasdk/lib64
```

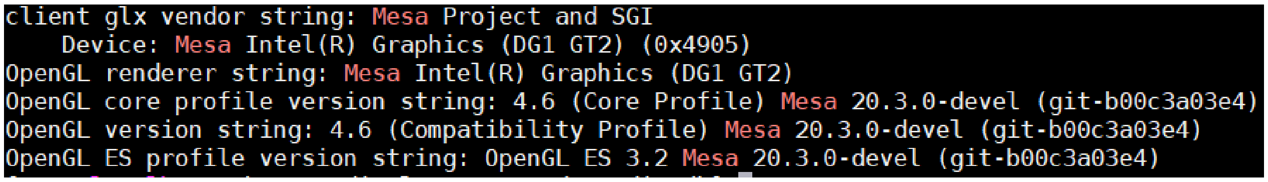
```
$ export PKG_CONFIG_PATH=/opt/intel/mediasdk/lib64/pkgconfig:$PKG_CONFIG_PATH
```

1.5. Restart X service and check the mesa version

```
$ xinit&
```

```
$ glxinfo | grep Mesa
```

You should see the information below. Otherwise, the environment is not set properly, and you need to check the above steps again.



```
client glx vendor string: Mesa Project and SGI
    Device: Mesa Intel(R) Graphics (DG1 GT2) (0x4905)
OpenGL renderer string: Mesa Intel(R) Graphics (DG1 GT2)
OpenGL core profile version string: 4.6 (Core Profile) Mesa 20.3.0-devel (git-b00c3a03e4)
OpenGL version string: 4.6 (Compatibility Profile) Mesa 20.3.0-devel (git-b00c3a03e4)
OpenGL ES profile version string: OpenGL ES 3.2 Mesa 20.3.0-devel (git-b00c3a03e4)
```

Please be aware that X service is only required for “glxinfo”. You can turn is off again after checking the mesa version because the pipeline has no dependency on it.

2. Build MediaSDK

2.1. Check CMake version

CMake 3.6 or higher is required to build MediaSDK. You can check it with:

```
$ cmake --version
```

If your CMake doesn’t meet the requirement, please remove the old version then install a new one (version 3.8.2 is recommended).

```
$ wget https://github.com/Kitware/CMake/releases/download/v3.8.2/cmake-3.8.2.tar.gz
```

```
$ tar -xzvf cmake-3.8.2.tar.gz
```

```
$ cd cmake-3.8.2
```

```
$ ./bootstrap
```

```
$ make -j$(nproc)
```

```
$ make install
```

Check cmake version after installation. Assume your cmake is installed in “/usr/local/bin”:

```
$ /usr/local/bin/cmake --version
```

2.2. Build MediaSDK source code with OpenGL enabled

```
$ cd /opt/intel/mediasdk/share/mfx/samples
$ mkdir build && cd build
$ /usr/local/bin/cmake .. -DENABLE_OPENGL=ON
$ make -j$(nproc)
$ cd __bin/release
```

2.3. *(optional) Solve X11 header files issue*

Should you encounter the error: "/usr/local/include/EGL/eglplatform.h:134:10: fatal error: X11/Xlib.h: No such file or directory" during the building process, it happens because the "USE_X11" macro in eglplatform.h is defined for some reason, but X11 header files are not found.

For **CentOS**:

```
$ yum install libX11-devel.x86_64
```

For **Debian** & **Ubuntu**:

```
$ apt install libx11-dev
```

3. Run the pipeline

Only h264 is supported for now, the command line to run the pipeline is:

```
$ ./sample_encode h264 -o out.h264 -w 1920 -h 1080 -hw -vaapi -opengl -lowpower:on -n 1000 -device /dev/dri/renderD128
```

Parameters marked in bold can't be changed in order to run the pipeline properly.

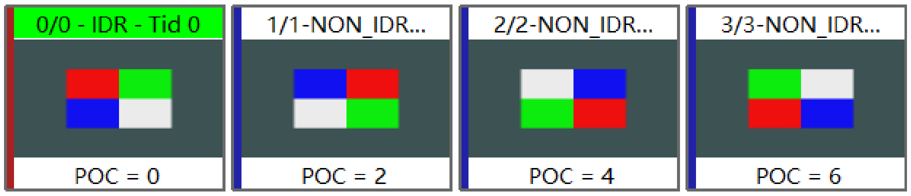
If "-device" is not specified, it will run on device "/dev/dri/renderD128" as default.

If "-o" is not specified, no output file will be produced.

If "-n" is not specified, it will continue running until manually stopped.

4. Check the output file

The output file can be opened with tools like VQAnalyzer. Currently, the result is the rotation of a rectangle divided into 4 parts, as the image below shows.


0/0 - IDR - Tid 0
POC = 0
1/1-NON_IDR...
POC = 2
2/2-NON_IDR...
POC = 4
3/3-NON_IDR...
POC = 6