RADEON PRO

Solid State Graphics (SSG)

SDK Setup and Raw Video Player Guide

Radeon™ Pro SSG SDK Setup

To enable you to access the capabilities of the Radeon Pro SSG card, it comes with extensions for Microsoft® DirectX™ 11, OpenGL® and OpenCL™. Currently, these extensions are available under Windows only (Linux® is forthcoming). The interface is in the following directories:

- DirectX 11: **/Include/DirectX11/**
- Open CL: **/Include/OpenCL/**
- Open GL: **/Include/OpenGL/**

An included sample uncompressed images player shows how to use these extensions. The source code can be compiled using Microsoft® Visual Studio 2015®; the Visual Studio project is in the **/VisualStudio/** directory.

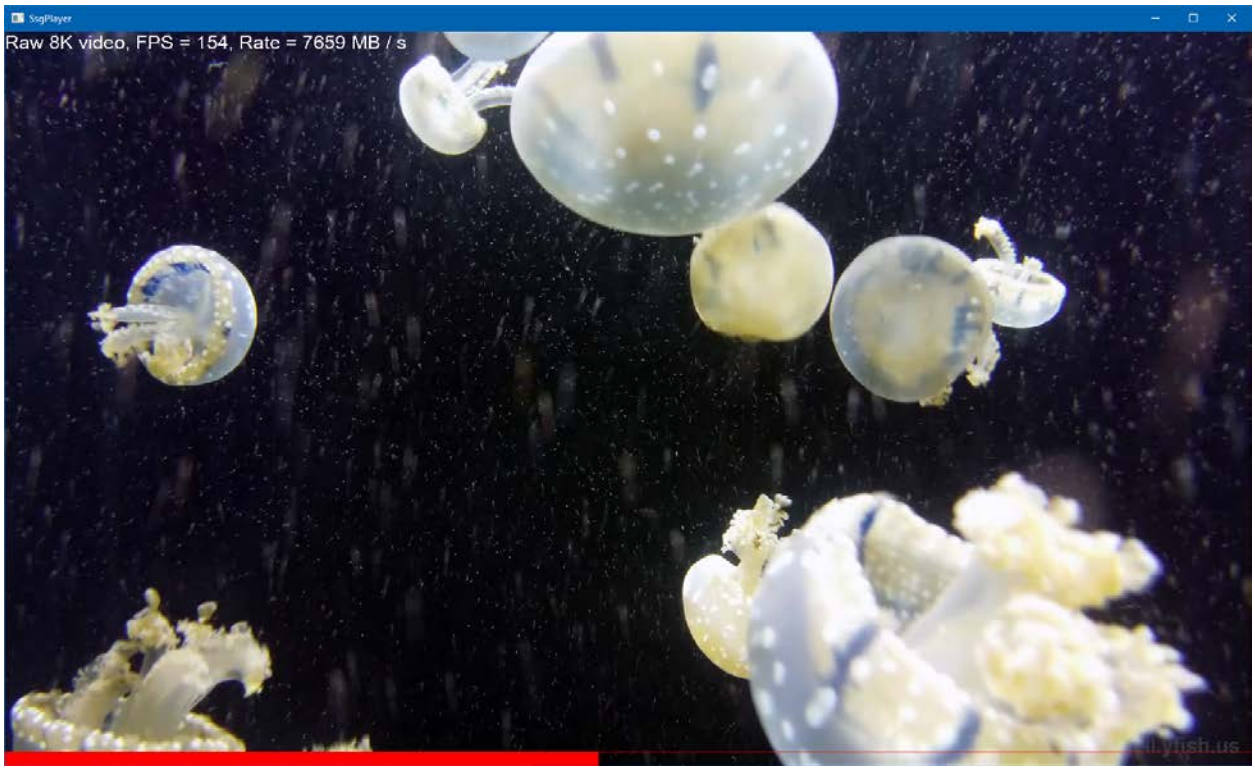
To compile the project, first install the OCL_SDK_Light or later (if not already installed), which can be downloaded from the following link:

https://github.com/GPUOpen-LibrariesAndSDKs/OCL-SDK/releases

The next section explains how to use this tool.

Radeon Pro SSG – Raw Video Player

The Radeon Pro SSG SDK includes a sample application that implements the SSG API to playback uncompressed videos, with support for up to 8K resolution (7680x4320). It is designed to showcase the I/O performance capability of SSG technology used in a real-world scenario.



The raw video player is a simple command-line application that accepts a raw RGB or YUV video input, and plays back the frames at an unconstrained speed to benchmark the sustained frame rate and data rate.

Generating Raw Video Clips

Raw RGB or YUV video clips can be created by decoding common compressed formats, such as HEVC, using FFmpeg and outputting the raw data into a file. The SSG Raw Video Player package already contains a 64-bit binary of FFmpeg for Windows operating systems. Optionally, other builds of FFmpeg are available at www.ffmpeg.org.

Decompressing an encoded video into raw format can be done using the following FFmpeg command:

```
ffmpeg.exe -i input_video -pix_fmt <format> output_video.yuv
```

The following options are allowed for `-pix_fmt`:

yuv420p YUV 4:2:0
rgba64be RGB 10-bit

"yuv420p" format clips generated by ffmpeg can be directly loaded by the raw video player.

For "rgba64be" format from ffmpeg, additional processing is required for compatibility with the raw video player. The convscript.exe tool is provided to convert the output file from ffmpeg into a compatible format using the following command:

```
convscript.exe output_video.yuv output_video_rgb10.rgb
```

The Radeon Pro SSG graphics card is equipped with 2TB of onboard storage. The table below shows a few examples of input video size constraints for caching using the SSG storage:

Resolution	Output Format	Max Duration
1920 x 1080 60 FPS	YUV 4:2:0	186m 59s
	RGB 10-bit	70m 7s
3840 x 2160 60 FPS	YUV 4:2:0	46m 44s
	RGB 10-bit	17m 31s
7680 x 4320 60 FPS	YUV 4:2:0	11m 41s
	RGB 10-bit	4m 22s

Raw Video Player Usage

The raw video player can be launched using the following command:

```
RadeonProSsgPlayer.exe <options> inputfile
```

In order to use the fast SSG API for reading the raw clip, `inputfile` must reside on the SSG drive volume.

Command-line options for **`RadeonProSsgPlayer.exe`** are specified in the format “-name” or “-name=value”. Available options:

`-w, -width`	Specify the width of the input video (in pixels)
`-h, -height`	Specify the height of the input video (in pixels)
`-4k`	Preset for 4K (3840x2160) input video
`-8k`	Preset for 8K (7680x4320) input video
`-f, -framerate`	Artificial frame rate limit for playback (default is 9999)
`-d, -dataformat`	Format of the input video. Available options: `-d=rgb10` for 10-bit RGB `-d=yuv420_8` for 8-bit YUV 4:2:0 (default)
`-b, -buffers`	Number of buffers for single/double/triple/n buffering (default is 2)
`-t, -slices`	Number of parallel requests to split each frame into (default is 2)
`-l, -loop`	Number of times to repeat playback (default is 1)
`-n, -nosync`	Run without resource synchronization
`-v, -vsync`	Enable VSync for playback; overrides `–framerate` setting
`-api`	Set the API for data buffering `-api=dx` for DirectX (default on Windows) `-api=ogl` for OpenGL (default on Linux) `-api=ocl` for OpenCL

Examples

Basic – Play an 8K YUV 4:2:0 clip looped 100 times rendered with the DirectX API:

```
RadeonProSsgPlayer.exe -8k -l=100 YUV_clip.yuv
```

Advanced – Play a 1080p 10-bit RGB clip with Vsync on, looped 10 times, using the OpenCL API with quadruple buffering:

```
RadeonProSsgPlayer.exe -w=1920 -h=1080 -d=rgb10 -v -l=10 –b=4 -api=ocl
RGB_clip.rgb
```

Runtime GUI Controls

The raw video player supports several hotkey commands during playback:

T	Toggle the frame rate and data rate overlay (only applicable to DirectX and OpenCL API modes)
F	Toggle between fullscreen and windowed mode
SPACEBAR	Pause/resume playback
ESC	Exit the program

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