Unreal Engine* 4/ Intel® Graphics Performance Analyzers (Intel® GPA) Usage Guide

Intel® Graphics Performance Analyzers (Intel GPA) is a toolset that helps to find rendering performance bottlenecks. A game or other application can be invoked via Intel GPA, allowing you to see FPS, shader details, texture details, and draw call details. Now, with the Unreal Engine* 4 (UE4) plugin, you can capture a multi-frame stream directly while you are in Unreal Editor, then later analyze it in Graphics Frame Analyzer.

Intel GPA's multi-frame stream capturing feature allows developers to analyze problems that were virtually impossible to debug in single frame capture mode. These problems, including intermittent glitches, random hitches, and issues with multi-frame algorithms can be tracked down more easily because you can now toggle between frames in a single capture.

This guide shows the user how to enable the Intel GPA plugin in the UE4 Editor and gives a walkthrough of its usage.

Download UE4 from Unreal Engine.

Download Intel GPA from Intel Graphics Performance Analyzers (Intel GPA).

Download the GPAPlugin plugin from Github

Enabling Intel Graphics Performance Analyzers (Intel GPA) plugin in Unreal Engine 4

To be able to capture and analyze multi-frame streams it is necessary to install both Intel GPA Intel GPA Framework from the download page.

To get started, download GPAPlugin from the Github page and copy the *GPAPlugin* directory to *UnrealEngine**Engine**Plugins**Developer* in your Unreal Engine installation folder.

Run the UE4 Editor and select the project's settings (see figure 1). Open the Plugins menu *Settings->Plugins* and look up *GPAPlugin* using the search bar. Enable it using the check box (see figure 2). Follow the prompt and restart the UE4 Editor.

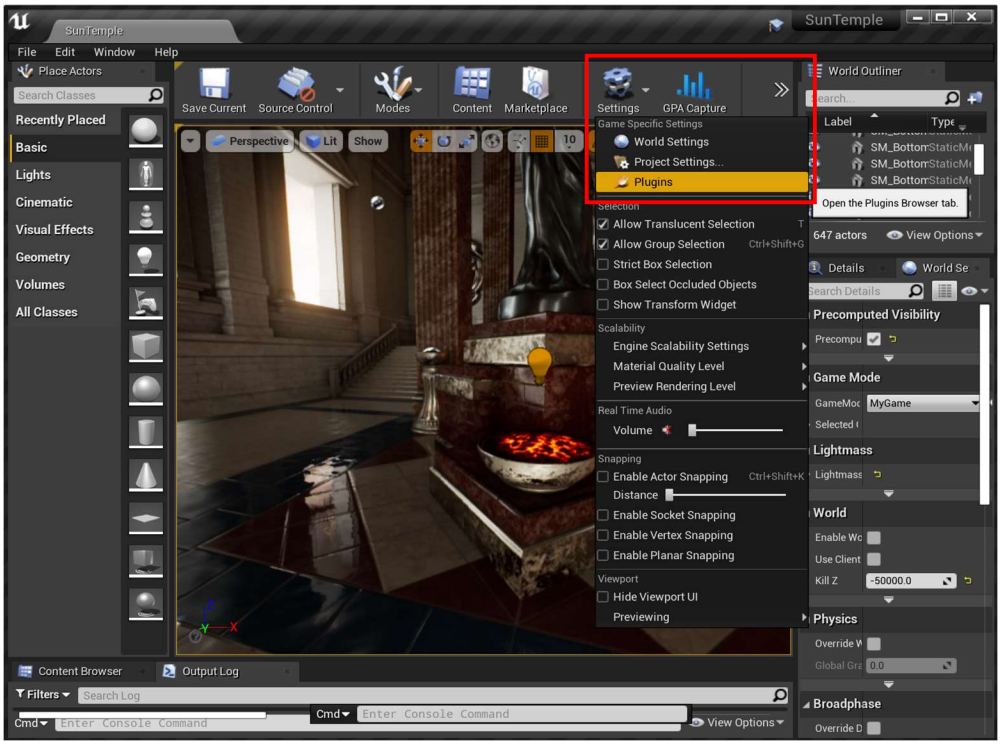

Figure 1. Configuring GPAPlugin settings in UE4 Editor.

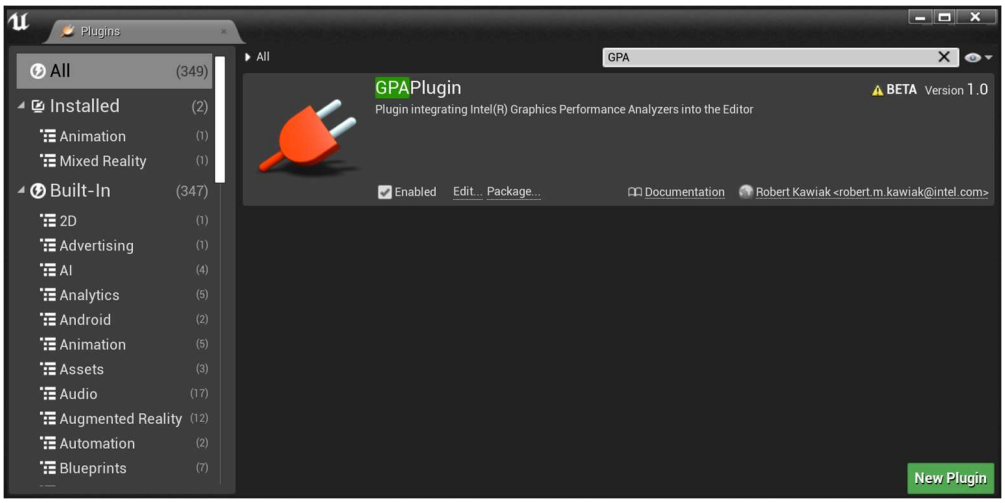

Figure 2. Searching for GPAPlugin and enabling it.

Once the editor is back up there will be an additional *GPA Capture* icon displayed in the toolbar. To start the capture of a sequence of frames simply click on the button. A pop-up window in the screen's lower

right corner will indicate that the capture has started (see figure 3). To end the capture, click the same button again, a message will show that the capture has ended.

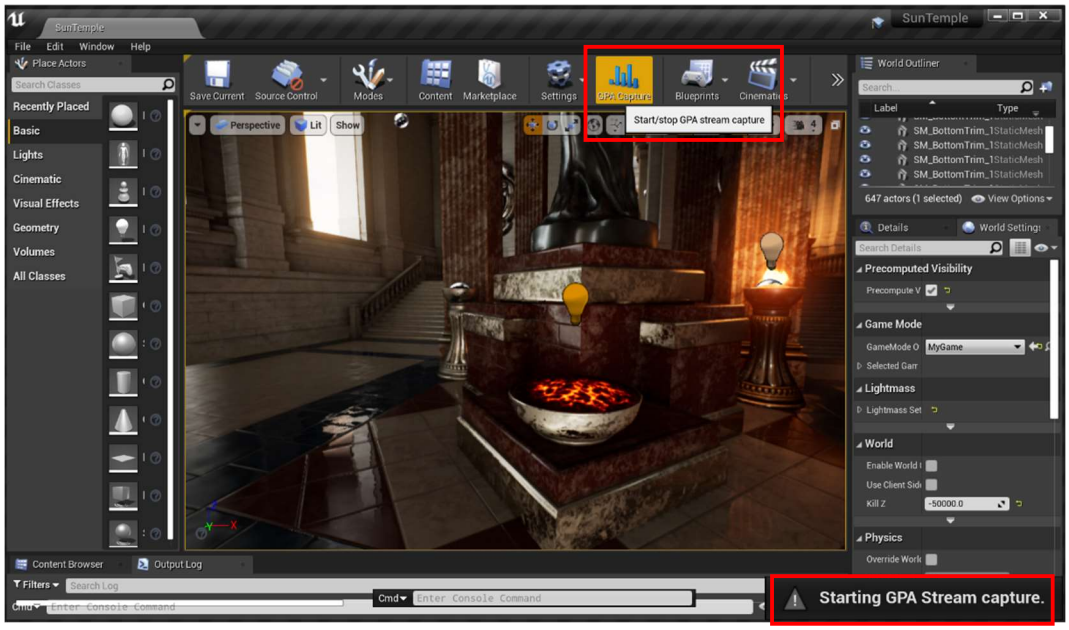

Figure 3. Starting and finishing a stream capture in UE4 Editor.

It is possible to create multiple captures, each will be stored separately for later analysis. If you want to start the Intel GPA tools immediately after the capture completes, this can be configured in the plugin's settings. Go to *Settings->Project Settings*, scroll down to *Plugins* and enable the option to run Intel GPA after the capture completes (see figure 4).

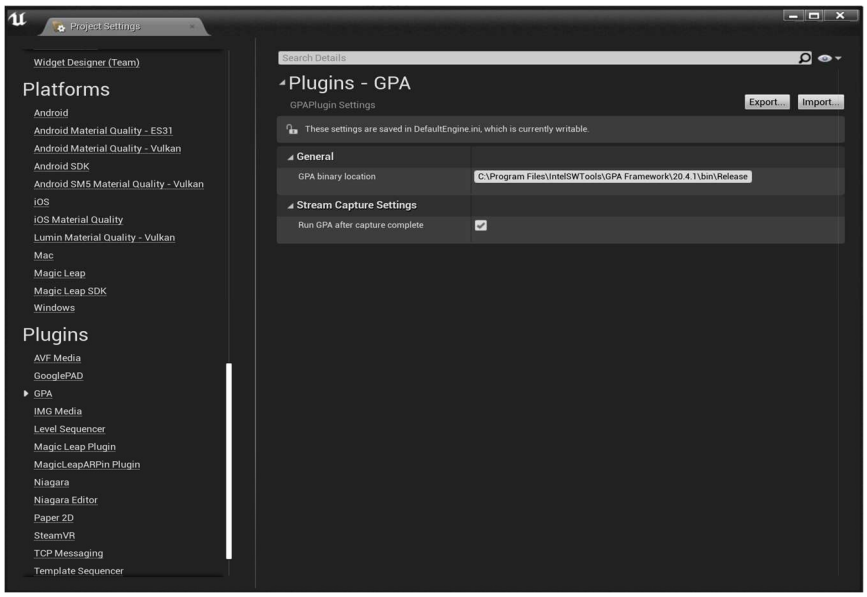

Figure 4. GPA Plugin settings.

GPA streams can also be captured when running the game. In this case use the console *gpa.StreamCapture start* and *gpa.StreamCapture stop* commands to trigger the start and end of the capture (see figure 5).

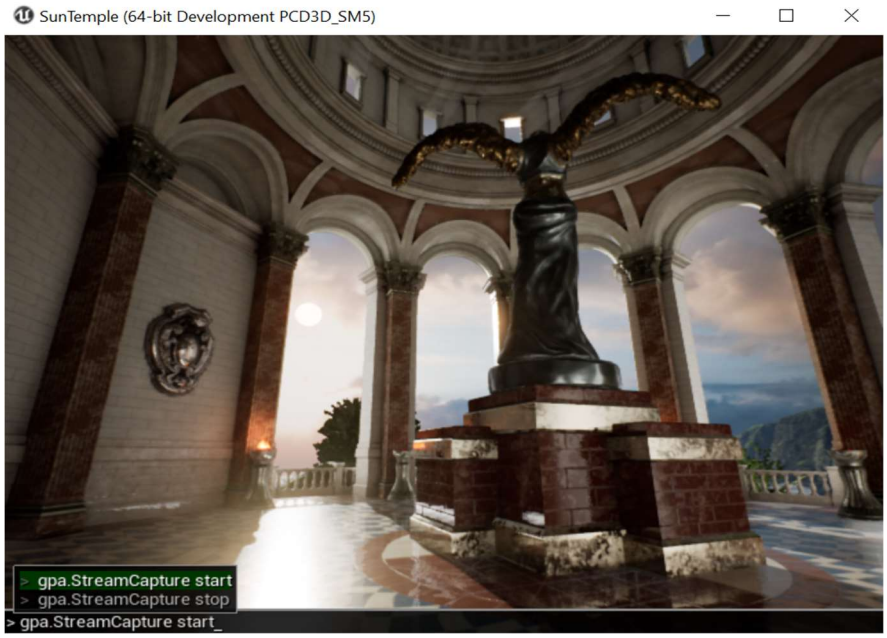

Figure 5. Capturing a stream using the console.

Note: Currently only UE4 DX12 captures are supported by the Intel GPA Plugin. Make sure to change the RHI to DX12 in *Settings->Project Settings->Platforms->Windows* and restart the Editor. DX11 and Vulkan support is planned in future Intel GPA releases.

Analyzing streams in Graphics Frame Analyzer

This section will only show the basic steps needed to view the captured stream. A full list of articles and tutorials on how to use Intel GPA can be found on the documentation page.

After a stream has been captured it can be opened in Graphics Monitor. Figure 6 shows the case when only one stream has been captured during a session with the UE4 Editor, if multiple captures have been completed, they will all be ready for analysis.

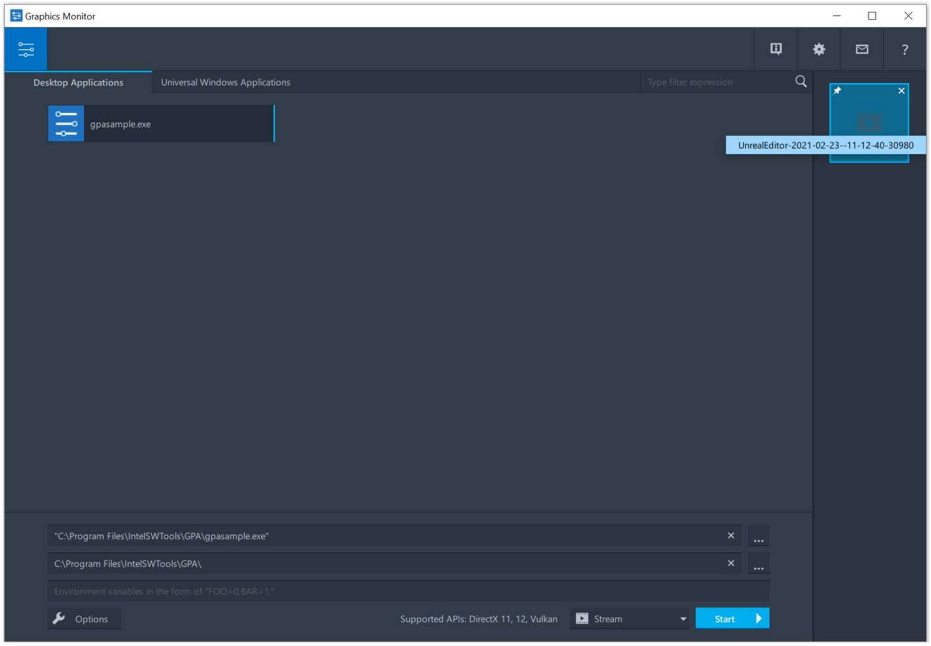

Figure 6. Selecting the captured stream in Graphics Monitor.

Double-click on the stream to open Graphics Frame Analyzer, which will show a list of captured frames (see figure 7). When analyzing streams with Raytracing enabled make sure that *Multi-Frame Profiling View* is turned on. This can be done in *General Settings* as shown in figure 7.

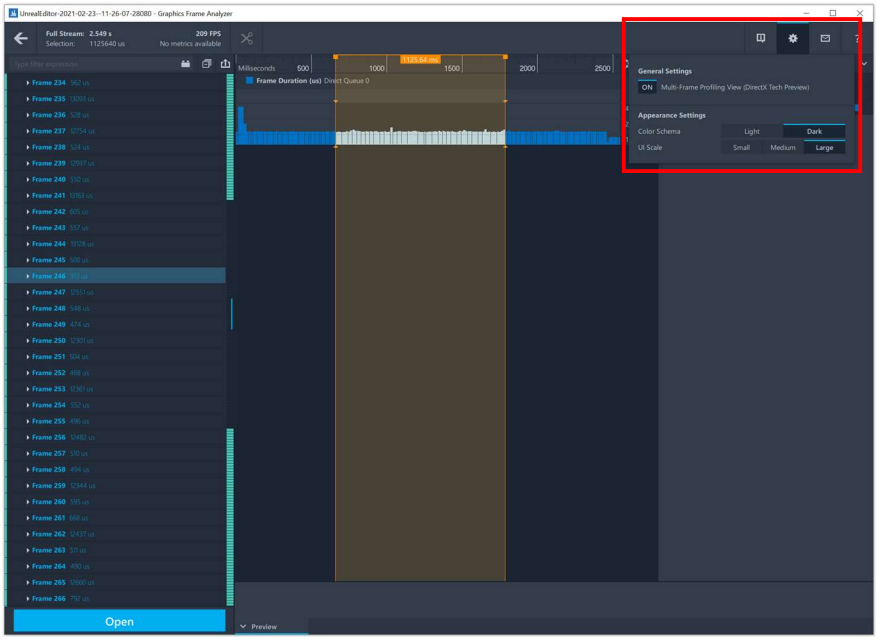

Figure 7. Viewing the captured frames in Graphics Frame Analyzer.

To go one level deeper and analyze an individual frame simply double-click it. This will open a new view that allows analysis of each rendering command, along with the associated resources such as the shaders, stage input and output textures, buffers, etc.

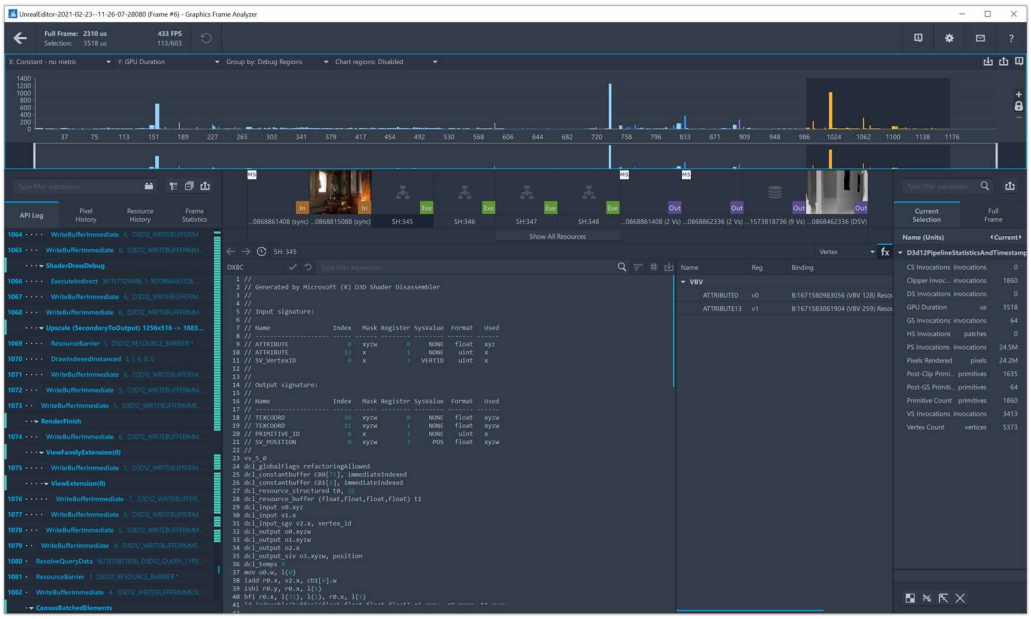

Figure 8. In depth analysis of a single frame