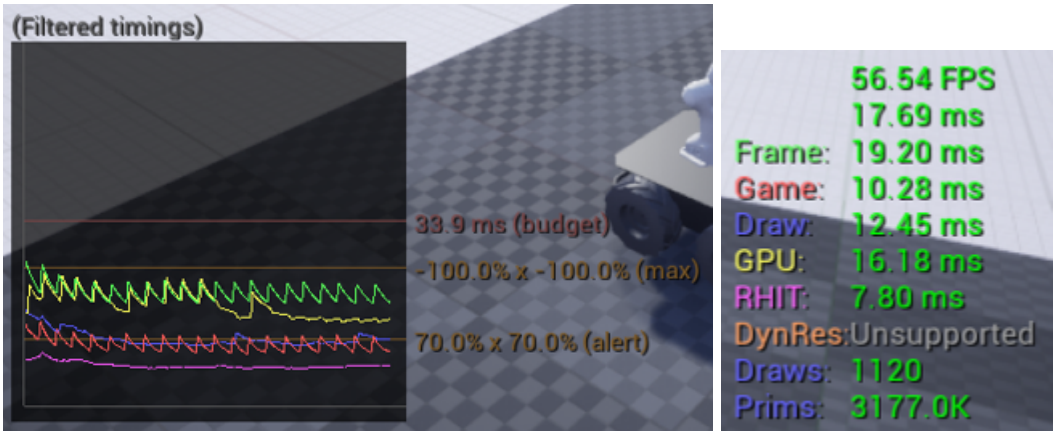
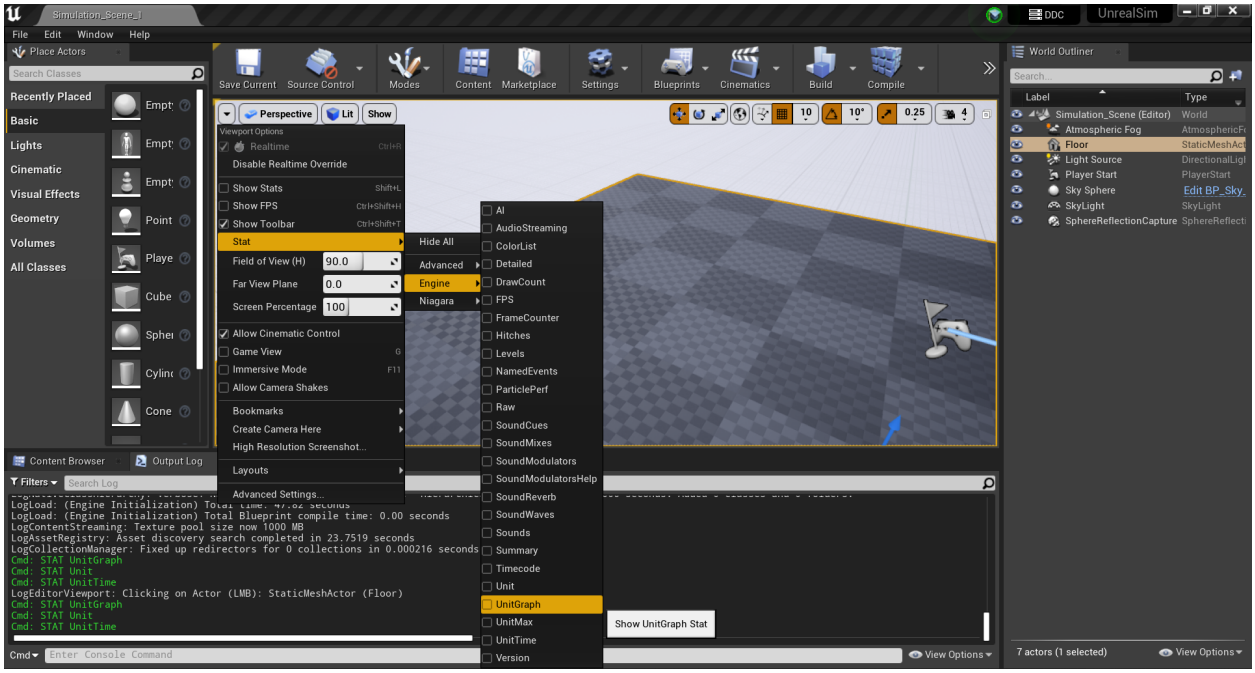
Unreal Engine Profiling Tools

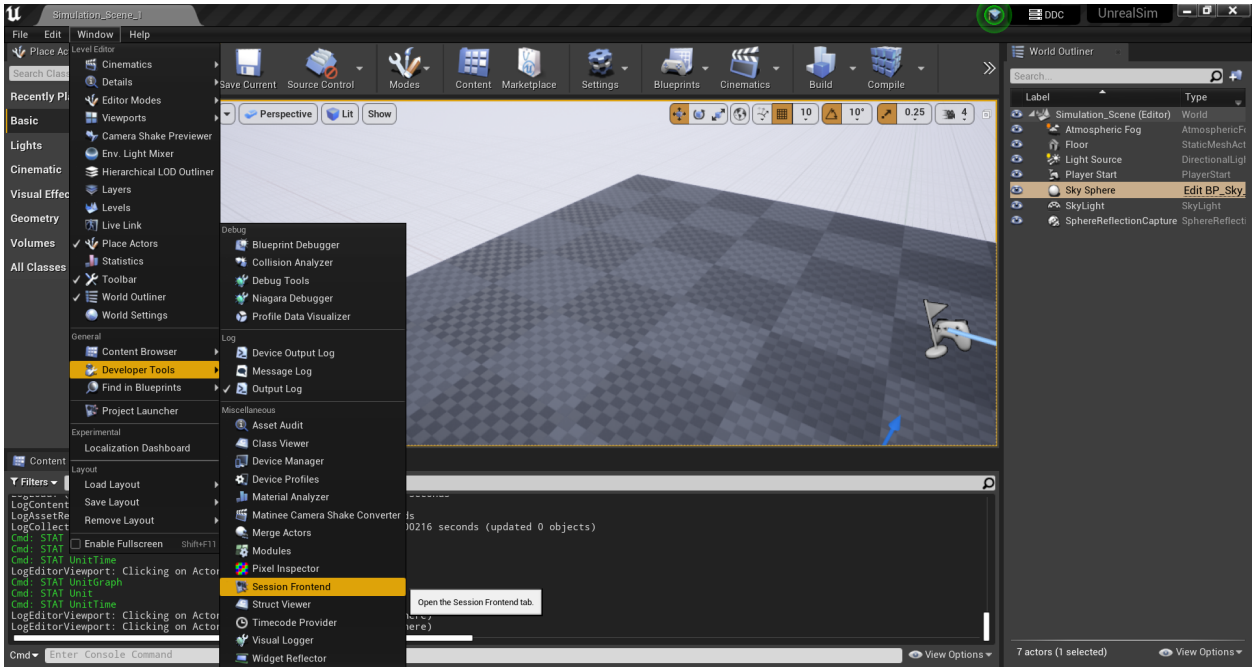
1. Stat Commands:
    - One of the preliminary profiling tools are the stat commands that can be entered in the console when in the Unreal engine editor.
    - The command **stat unitgraph** displays the time taken by different threads to generate each frame as a graph. Below is an example of the graph.



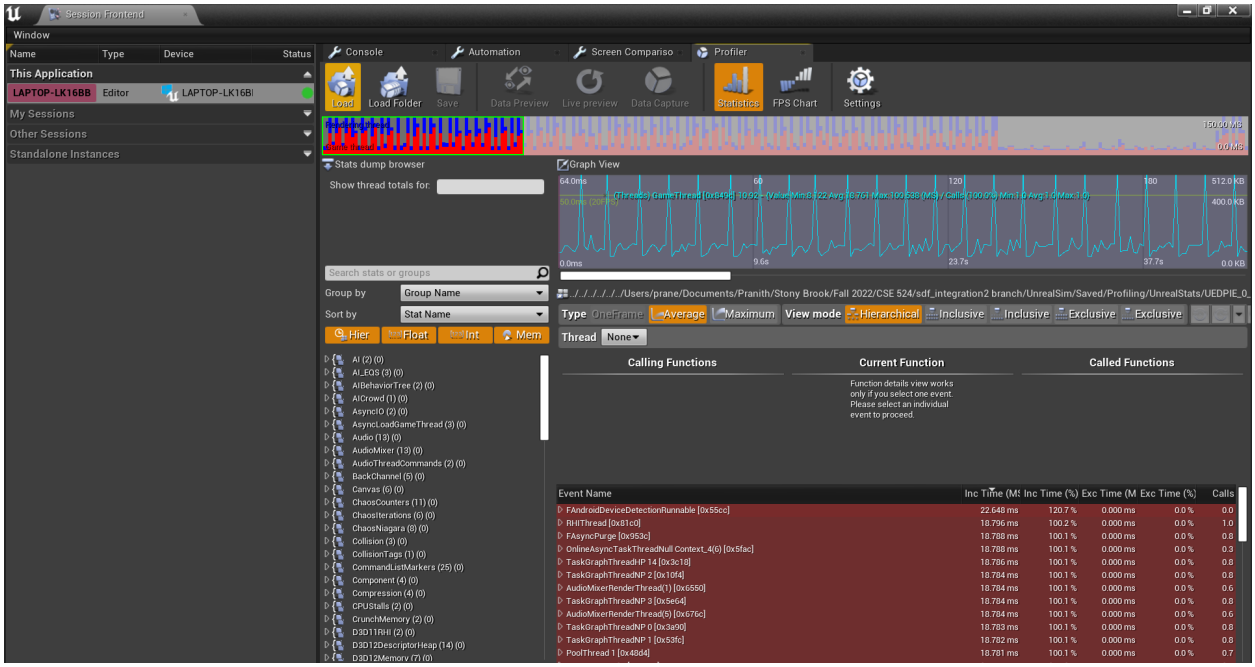
    - The stat commands can be located at the Editor's Stat menu as well. Select the dropdown arrow next to the Viewport Setting button to view the commands.



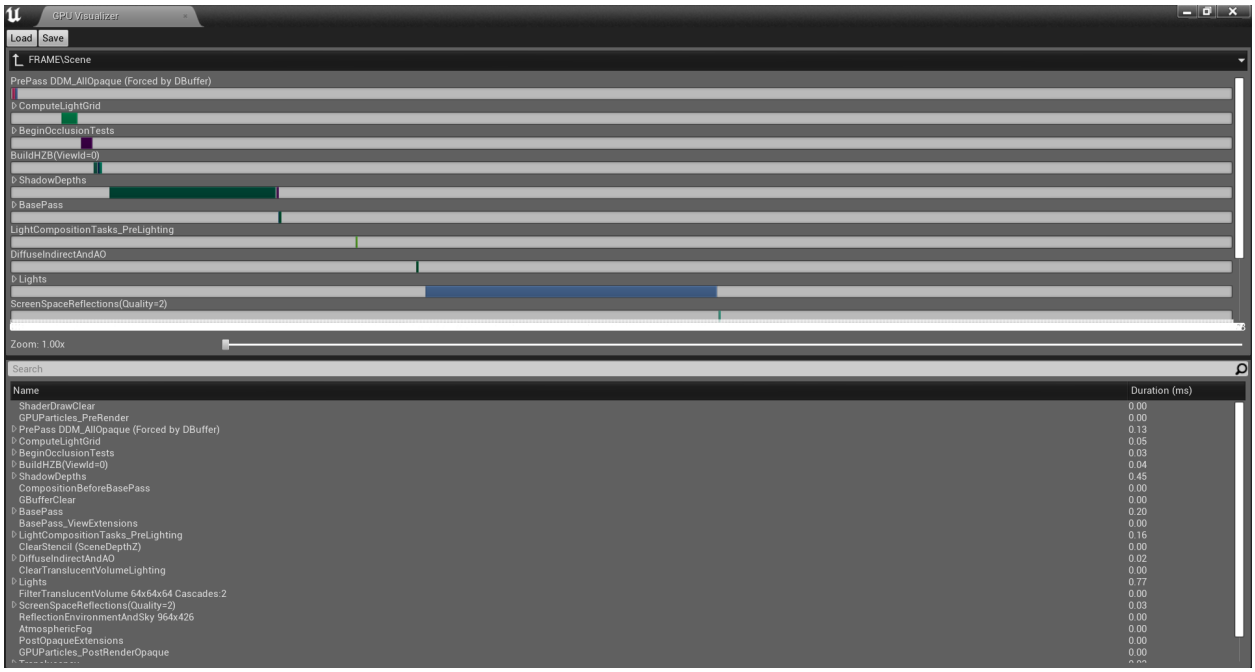
- The statistics can be captured and saved for analysis in future by using **stat startfile** and **stat stopfile** commands.
- The **stat startfile** starts a statistics capture and a new *.ue4stats file will be created in <ProjectDir>\Saved\Profiling\UnrealStats directory.
- The *.ue4stats files can be viewed in Session Frontend. In Unreal Editor, go to **Window > Developer Tools > Session Frontend** to open it.



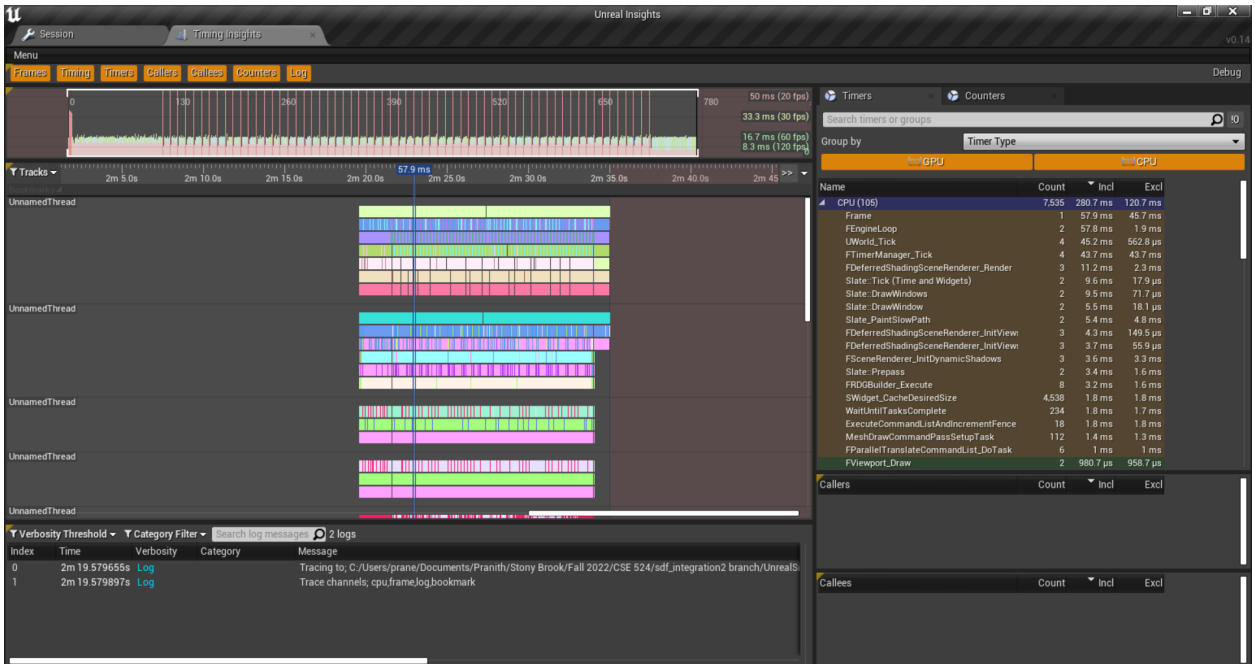
- In Session Frontend select the **Profiler** tab, click **Load** and load the desired *.ue4stats file.

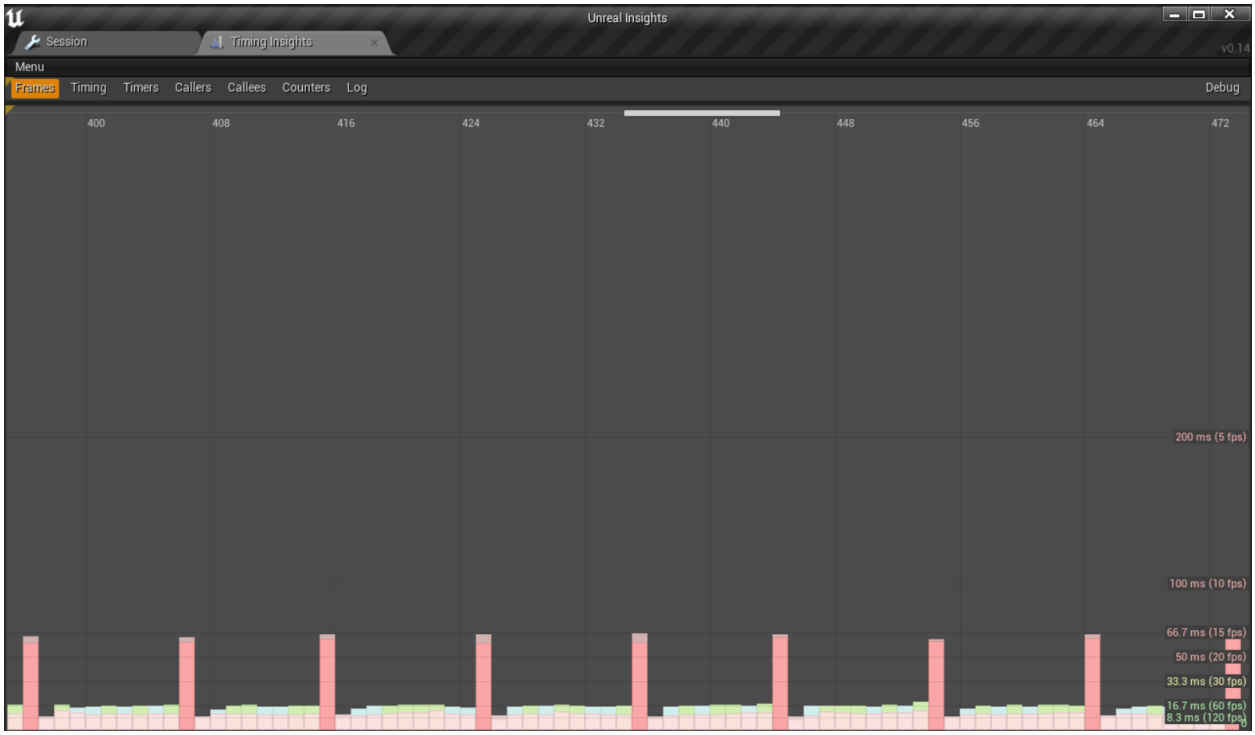


2. GPU Visualizer
    - The GPU Visualizer can be opened by the command **ProfileGPU** or by using the **Ctrl+Shift+,** shortcut while in unreal editor.
    - The GPU Visualizer provides the capability to view the time taken at various steps while generating each frame. This helps to identify any possible bottlenecks occurring in the GPU thread.



3. Unreal Insights
    - Unreal Insights is a standalone profiling system that integrates the Unreal Engine to collect, analyze, and visualize data emitted by the engine.
    - The **trace.start** and **trace.stop** commands are used to save the trace files in the Unreal Editor.
    - The trace files will be saved in <ProjectDir>\Saved\Profiling directory.
    - Run the Unreal Insights application from <UnrealEngineDir>\Engine\Binaries\Win64\UnrealInsights.exe and load the trace files to analyze further.


Unreal Insights
Session
Timing Insights
Menu
Frames
Timing
Timers
Callers
Callees
Counters
Log
Debug
Tracks
UnnamedThread
Timers
Counters
Group by
Timer Type
GPU
CPU
Name
Count
Incl
Excl
Callers
Callees
Verbosity Threshold
Category Filter
Search log messages
Index
Time
Verbosity
Category
Message


Unreal Insights
Session
Timing Insights
Menu
Frames
Timing
Timers
Callers
Callees
Counters
Log
Debug
200 ms (5 fps)
100 ms (10 fps)
66.7 ms (15 fps)
50 ms (20 fps)
33.3 ms (30 fps)
16.7 ms (60 fps)
8.3 ms (120 fps)