



DirectX 11 Analysis with Parallel Nsight™ 2.1 Update

March 2012

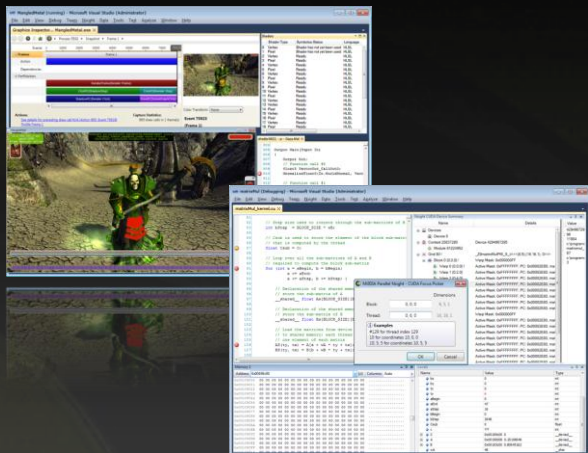
NVIDIA Parallel Nsight™



Visual Studio integrated development for GPU and CPU

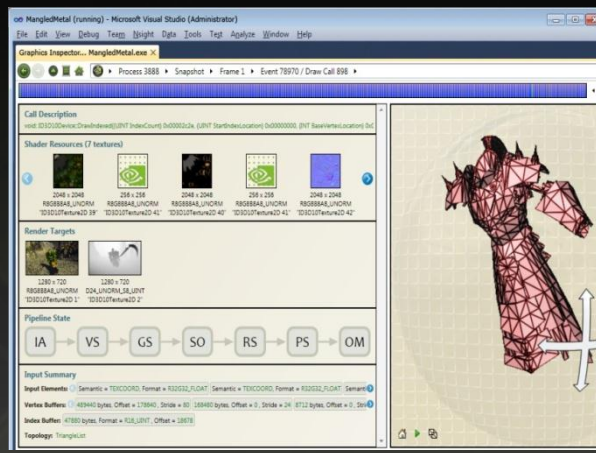


NVIDIA Parallel Nsight™



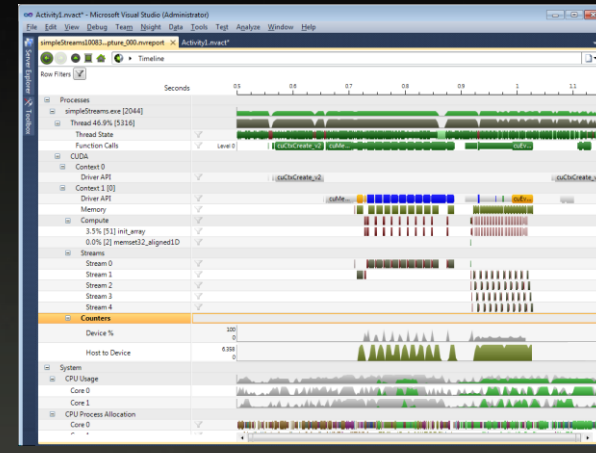
GPU Debugger

GPU native Compute and Graphics debugging
GPU breakpoints including complex conditionals
GPU memory views and exception reporting



Graphics Inspector

Real-time inspection of Direct3D API calls
Investigate GPU pipeline states
See contributing fragments with Pixel History
Profile frames to find GPU bottlenecks



System Analysis

View CPU & GPU events on a single timeline
Examine workload dependencies, memory transfers
CPU/OS, Compute, Direct3D and OpenGL Trace

Free License!

One computer, one NVIDIA GPU



Host + Target (32/64 bit)



- ✓ Frame Debugger
- ✓ Frame Profiler
- ✓ Frame Timings
- ✓ System Analysis

- Install appropriate NVIDIA driver
- Install Parallel Nsight Host and Monitor

Two computers, one with NVIDIA GPUs



Host (32/64-bit)



Target (32/64-bit)



- ✓ Frame Debugger
- ✓ Frame Profiler
- ✓ Frame Timings
- ✓ System Analysis
- ✓ Shader Debugger
- ✓ Pixel History

- Install appropriate NVIDIA driver on the Target System
- Install Parallel Nsight Monitor on the Target System
- Install Parallel Nsight Host on the Development System

One computer, two NVIDIA GPUs



Host + Target (32/64-bit)



- ✓ Frame Debugger
- ✓ Frame Profiler
- ✓ Frame Timings
- ✓ System Analysis
- ✓ Shader Debugger
- ✓ Pixel History

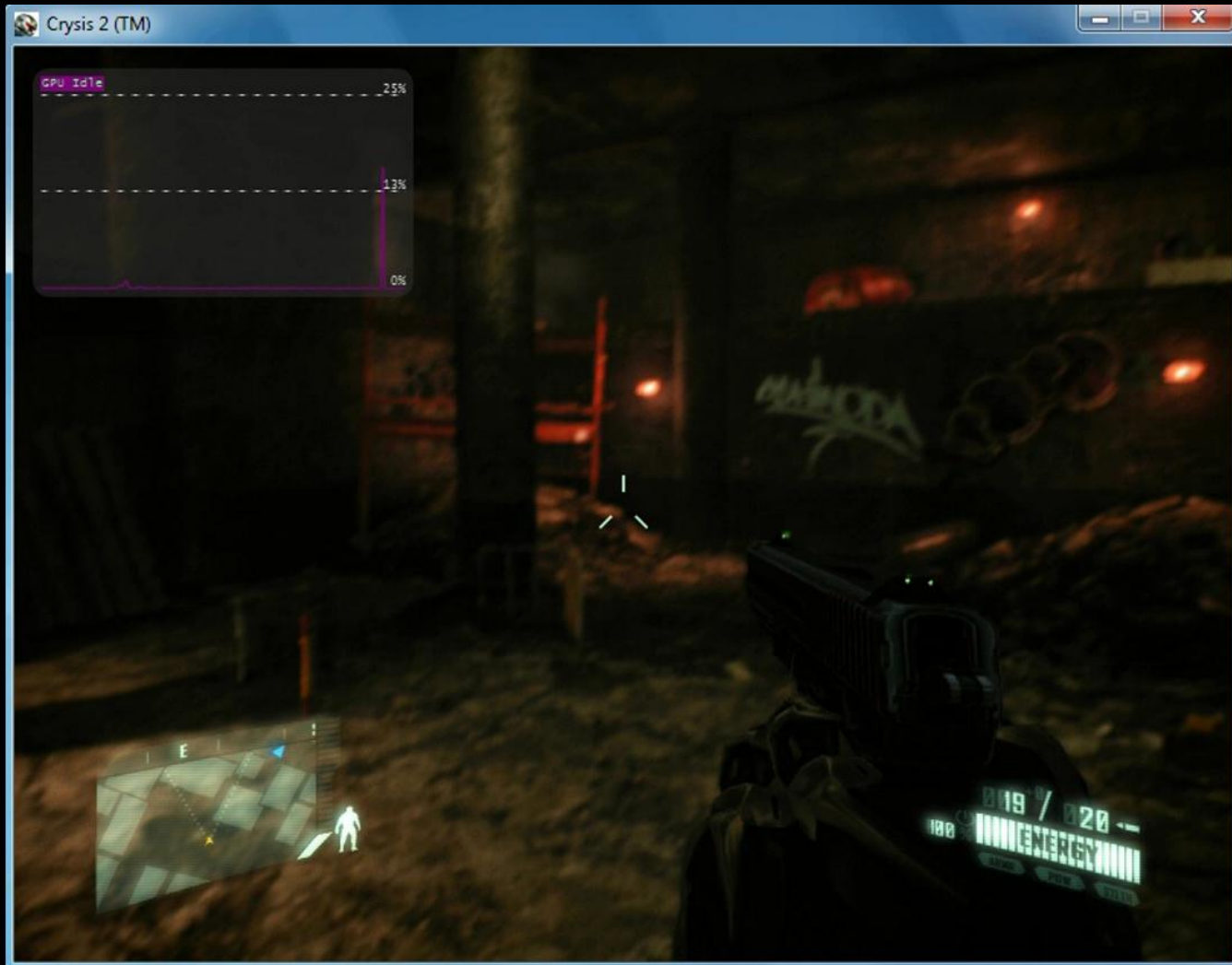
- Install appropriate NVIDIA driver
- Install Parallel Nsight Host and Monitor
- Configure Local Headless Debugging (see User's Manual)



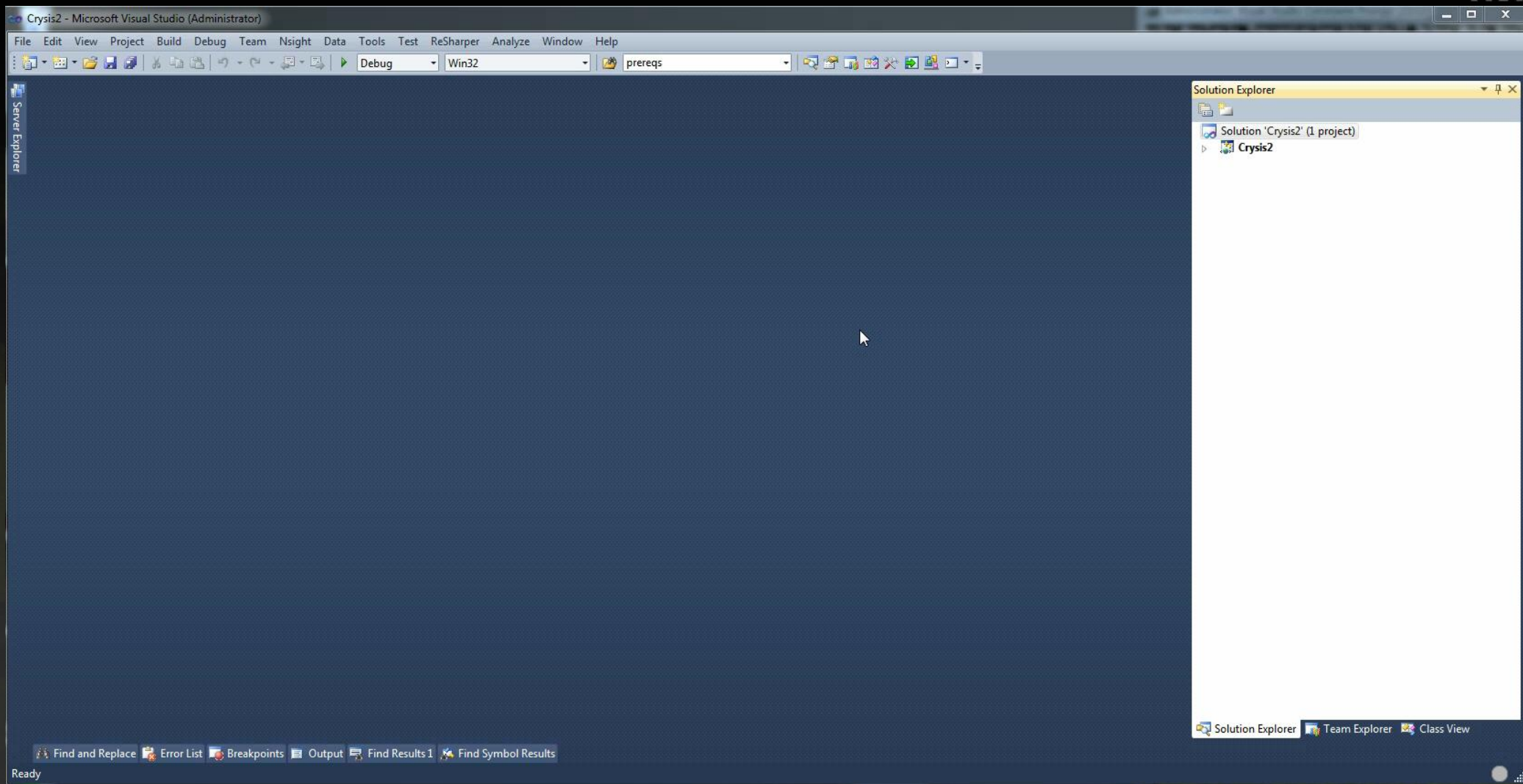
New in Parallel Nsight 2.1

- **Dynamic shader editing**
- **Show constant buffer with HLSL variable names**
- **Frame timings page**
- **Save and load profiler sessions**
- **Call stack trace capture**
- **Trace workload correlation**
- **5X trace overhead improvement**
- **New system information page**

Real-time HUD graphs



Launching an Analysis job



Summary Page and Timeline



Crysis2 - Microsoft Visual Studio (Administrator)

File Edit View Project Build Debug Team Nsight Data Tools Test ReSharper Analyze Window Help

Debug Win32 prereqs

Crysis2120229_003_Capture_000.nvreport

Target Process: Crysis2.exe [5732] Clear

Session Summary

ActivityType	SystemTrace
ConnectionName	evans-w7-4
Application	c:\games\crysis2_2\bin32\Crysis2.exe
Arguments	
WorkingDirectory	c:\games\crysis2_2\bin32
Process ID	5732
Capture Time	2/29/2012 2:56:51 PM
Capture Duration	3.954 secs

Report c:\temp\Crysis2120229_003\Crysis2120229_003_Capture_000

File	Size (bytes)	Collection Status	Load Status
Crysis2120229_003_Capture_000.nvact	7,328	OK	OK
Crysis2120229_003_Capture_000.nvreport	418	OK	OK
Crysis2120229_003_Capture_000.etl	6,881,280	OK	OK
Crysis2120229_003_Capture_000.nvevents	11,954,445	OK	OK

Target Process

Process Name	Crysis2.exe
Process ID	5732
Command Line	"c:\games\crysis2_2\bin32\Crysis2.exe"
Process Tree	<ul style="list-style-type: none">Nsight.Monitor.exe [2144]<ul style="list-style-type: none">Crysis2.exe [5732]<ul style="list-style-type: none">Nvda.Events.Daemon.Native.100.exe [516]
# Threads	60

DirectX Summary

Find and Replace Breakpoints Output Find Results 1 Find Symbol Results

Ready

Data tables: API Calls, Frames, PerfMarkers



Crysis2 - Microsoft Visual Studio (Administrator)

File Edit View Project Build Debug Team Nsight Data Tools Test ReSharper Analyze Window Help

Debug Win32 prereqs

Crysis2120229_003_Capture_000.nvreport

DirectX API Call Summary

Target Process: Crysis2.exe [5732] Clear

Filter Viewing: 7 / 7

Drag a column header and drop it here to group by that column

	Name	Count	Capture Time %	Total Time (μs)	Min (μs)	Avg (μs)	Max (μs)
1	Unmap	30984	28.08	1,110,336.518	1.674	35.835	1,004,059.523
2	Map	30982	2.45	96,865.950	1.753	3.126	134.658
3	DrawIndexed	8713	17.01	672,469.170	50.529	77.179	4,165.500
4	Draw	2419	5.49	216,947.157	53.071	89.684	851.771
5	ClearRenderTargetView	290	0.13	5,235.555	3.357	18.053	650.046
6	Present	48	7.15	282,547.895	5,484.664	5,886.414	6,537.440
7	ClearDepthStencilView	144	0.06	2,288.299	3.317	15.890	726.376

Unmap [API Function]

Drag a column header and drop it here to group by that column

	Name	Start	End	Duration	Device Context ID	Draw Call ID	Dispatch ID	Process Name	Process ID	Thread Name	Thread ID
1	Unmap	1093667.567	1093674.174	6.607	0x1D94C58			Crysis2.exe	5732		1804
2	Unmap	1093839.664	1093842.781	3.117	0x1D94C58			Crysis2.exe	5732		1804
3	Unmap	1093845.484	1093847.979	2.495	0x1D94C58			Crysis2.exe	5732		1804
4	Unmap	1093908.387	1093910.836	2.449	0x1D94C58			Crysis2.exe	5732		1804
5	Unmap	1093913.229	1093915.332	2.103	0x1D94C58			Crysis2.exe	5732		1804
6	Unmap	1093983.188	1093985.488	2.3	0x1D94C58			Crysis2.exe	5732		1804
7	Unmap	1093987.806	1093990.013	2.207	0x1D94C58			Crysis2.exe	5732		1804
8	Unmap	1094040.302	1094042.703	2.401	0x1D94C58			Crysis2.exe	5732		1804

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Ready

Launching a FrameDebugger job



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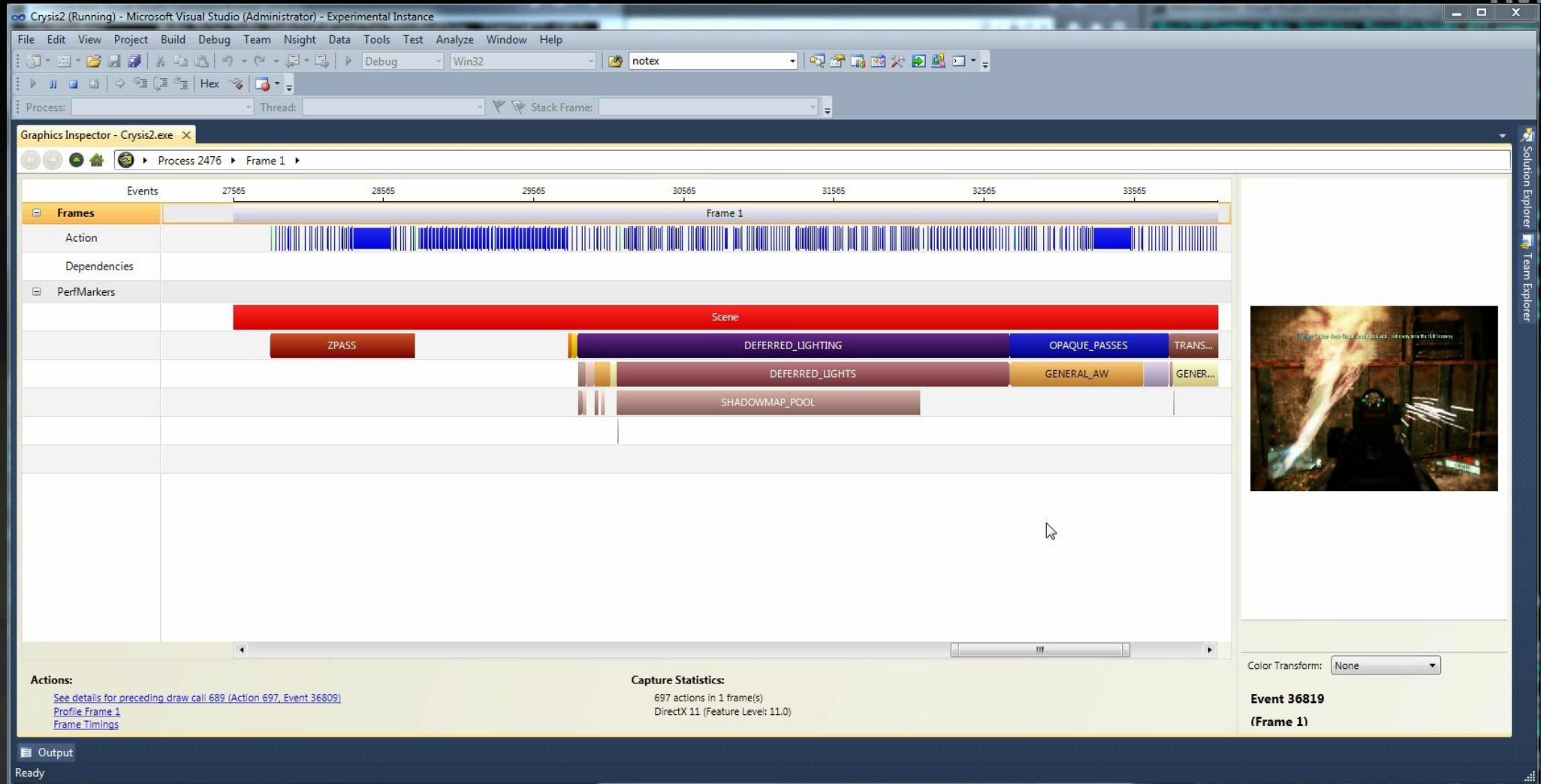
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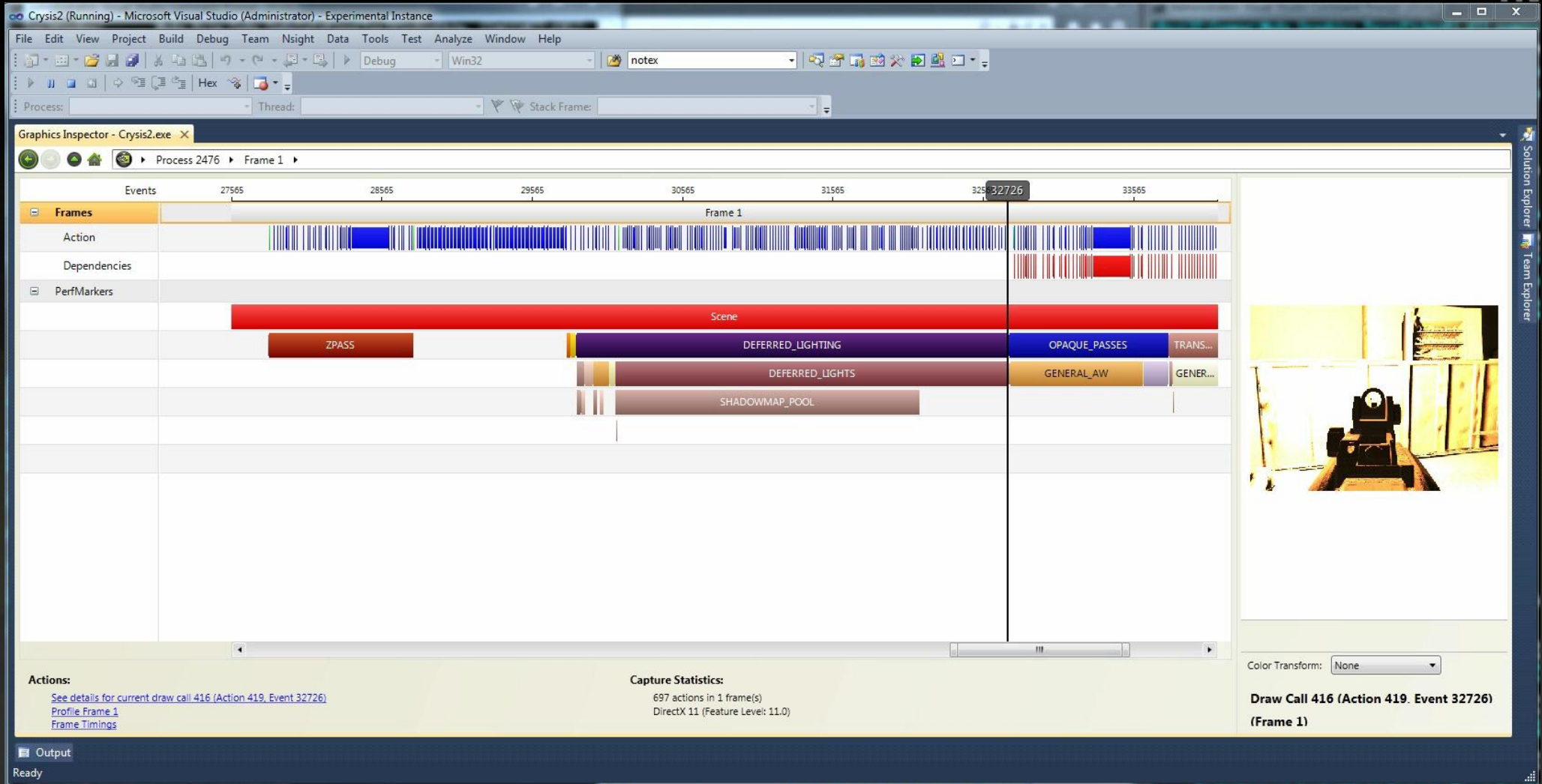
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Frame Profiler



Frame Timings



Questions?

