

GDC 2013 Benchmarks from Absolutely Zero Driver Overhead w/OpenGL

#AZDO on Linux

Benchmark: <https://github.com/michaelmarks/apitest>¹

Cmdline: ./apitest -a oglcore -b -t 15

apitest was created by John McDonald as part of the GDC 2013 presentation by AMD's Graham Sellers, Intel's Tim Foley, and Nvidia's Cass Everitt and John McDonald session on 'zero driver overhead' techniques. John McDonald is now with Valve Software and Cass now works for Oculus.

Benchmark	Nvidia 750 FPS \$119	AMD R9 270X FPS \$199	AMD vs Nvidia	2013 MacBook Air FPS running OS X
NullProblem-NullSolution	9692.2	1295.9	-647.0%	678.3
DynamicStreaming-GLBufferSubData	2.3	1.1	-110.0%	0.9
DynamicStreaming-GLMapUnsynchronized	2.0	1.0	-100.0%	16.6
DynamicStreaming-GLMapPersistent	96.7	26.8	-260.0%	
UntexturedObjects-GLUniform	34.8	9.0	-287.0%	7.9
UntexturedObjects-GLDrawLoop	48.3	20.4	-137.0%	
UntexturedObjects-GLMultiDraw-SDP	56.1	Driver Hang		
UntexturedObjects-GLMultiDraw-NoSDP	120.3	Driver Hang		
UntexturedObjects-GLMultiDrawBuffer-SDP	55.2	10.7	-416.0%	
UntexturedObjects-GLMultiDrawBuffer-NoSDP	116.9	10.6	-995.0%	
UntexturedObjects-GLBindless				
UntexturedObjects-GLBindlessIndirect				

¹fork of <https://github.com/nvMcJohn/apitest>

Benchmark	Nvidia 750 FPS \$119	AMD R9 270X FPS \$199	AMD vs Nvidia	2013 MacBook Air FPS running OS X
UntexturedObjects-GLBufferRange	14.3	7.8	-83.0%	5.0
UntexturedObjects-GLBufferStorage-SDP	55.6	7.3	-662.0%	
UntexturedObjects-GLBufferStorage-NoSDP	124.4	7.3	-1604.0%	
UntexturedObjects-GLDynamicBuffer	16.7	0.5	-3240.0%	3.1
UntexturedObjects-GLMapUnsynchronized	0.7	12.2	1642.0%	
UntexturedObjects-GLMapPersistent	50.4	21.7	-132.0%	
UntexturedObjects-GLTexCoord	36.9	9.0	-310.0%	11.9
TexturedQuadsProblem-GLBindless	632.6	171.2	-270.0%	
TexturedQuadsProblem-GLBindlessMultiDraw	1100.0	Driver Hang		
TexturedQuadsProblem-GLNaive	217.4	59.2	-267.0%	87.0
TexturedQuadsProblem-GLNaiveUniform	229.6	62.5	-267.0%	
TexturedQuadsProblem-GLNoTex	1256.2	511.0	-146.0%	
TexturedQuadsProblem-GLNoTexUniform	986.4	234.8	-320.0%	
TexturedQuadsProblem-GLSBTA	971.8			
TexturedQuadsProblem-GLSBTAMultiDraw-SDP	1058.5			
TexturedQuadsProblem-GLSBTAMultiDraw-NoSDP	2256.7			
TexturedQuadsProblem-GLTextureArray	1232.7	500.6	-146.3%	
TexturedQuadsProblem-GLTextureArrayUniform	1005.4	232.6	-332.0%	
TexturedQuadsProblem-GLTextureArrayMultiDraw-SDP	1053.3	Driver Hang		
TexturedQuadsProblem-GLTextureArrayMultiDraw-NoSDP	2236.8	Driver Hang		
TexturedQuadsProblem-GLTextureArrayMultiDrawBuffer-SDP	1003.9	543.9	-84.6%	
TexturedQuadsProblem-GLTextureArrayMultiDrawBuffer-NoSDP	2182.5	554.2	-293.8%	

Hopefully there is user error somewhere on my part to account for AMD's performance. Intel does not support OpenGL 4.x on Linux, so it went untested.

Linux Machine

Ubuntu 14.04 LTS

8GB RAM @ 1600Mhz

Samsung SSD 840 EVO 120GB

Intel(R) Core(TM) i3-4130 CPU @ 3.40GHz

Nvidia:

OpenGL version string: 4.4.0 NVIDIA 331.79

AMD:

OpenGL version string: 4.4.12967 Core Profile Context 14.20

MacBook Air is simply for comparison and demonstrates that OS X's 4.1 version of OpenGL can run only a small subset of the benchmarks.

Mid 2013, 13-inch

1.7 Ghz Intel i7

8GB 1600 MHz DDR3

Intel HD Graphics 5000

OS X 10.9.3 (13D65)