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Coffeelake Beignet vs. OpenCL NEO Intel

Intel Core i7-8700K testing of OpenCL Linux drivers by Michael Larabel for a future article.

Automated Executive Summary

Intel OpenCL NEO had the most wins, coming in first place for 53% of the tests.

Based on the geometric mean of all complete results, the fastest (Intel OpenCL NEO) was 1.449x the speed of the slowest (Beignet Git).

The results with the greatest spread from best to worst included:

SHOC Scalable HeterOgeneous Computing (Target: OpenCL - Benchmark: Max SP Flops) at 3.161x
SHOC Scalable HeterOgeneous Computing (Target: OpenCL - Benchmark: Bus Speed Download) at 1.441x
SHOC Scalable HeterOgeneous Computing (Target: OpenCL - Benchmark: Bus Speed Readback) at 1.335x
Parboil (Test: OpenCL LBM) at 1.136x
Blender (Blend File: BMW27 - Compute: OpenCL) at 1.116x
SHOC Scalable HeterOgeneous Computing (Target: OpenCL - Benchmark: FFT SP) at 1.105x
clpeak (OpenCL Test: Kernel Latency) at 1.098x
Parboil (Test: OpenCL BFS) at 1.083x
Darktable (Test: Server Rack - Acceleration: OpenCL) at 1.056x
SHOC Scalable HeterOgeneous Computing (Target: OpenCL - Benchmark: MD5 Hash) at 1.054x.

Coffeelake Beignet vs. OpenCL NEO Intel

Test Systems:

Beignet Git

Processor: Intel Core i7-8700K @ 4.70GHz (6 Cores / 12 Threads), Motherboard: ASUS TUF Z370-PLUS GAMING (1802 BIOS), Chipset: Intel 8th Gen Core, Memory: 16384MB, Disk: 128GB THNSN5128GPU7 TOSHIBA, Graphics: inteldrmfb (1200MHz), Audio: Realtek ALC887-VD, Monitor: DELL P2415Q, Network: Intel I219-V

OS: Ubuntu 18.04, Kernel: 4.18.0-18-generic (x86_64), Desktop: GNOME Shell 3.28.3, Display Server: X Server 1.20.1, Display Driver: modesetting 1.20.1, OpenGL: 4.5 Mesa 18.2.8, OpenCL: OpenCL 2.0 beignet 1.4 (git-fc5f430c), Compiler: GCC 7.4.0 + Clang 6.0.0-1ubuntu2 + LLVM 6.0.0, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave
Python Notes: Python 2.7.15rc1 + Python 3.6.7
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling + SSB disabled via prctl and seccomp + PTE Inversion

Intel OpenCL NEO

Processor: Intel Core i7-8700K @ 4.70GHz (6 Cores / 12 Threads), Motherboard: ASUS TUF Z370-PLUS GAMING (1802 BIOS), Chipset: Intel 8th Gen Core, Memory: 16384MB, Disk: 128GB THNSN5128GPU7 TOSHIBA, Graphics: Intel UHD 630 3GB (1200MHz), Audio: Realtek ALC887-VD, Monitor: DELL P2415Q, Network: Intel I219-V

OS: Ubuntu 18.04, Kernel: 4.18.0-18-generic (x86_64), Desktop: GNOME Shell 3.28.3, Display Server: X Server 1.20.1, Display Driver: modesetting 1.20.1, OpenGL: 4.5 Mesa 18.2.8, OpenCL: OpenCL 2.1, Compiler: GCC 7.4.0 + Clang 6.0.0-1ubuntu2 + LLVM 6.0.0, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave
Python Notes: Python 2.7.15rc1 + Python 3.6.7
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling + SSB disabled via prctl and seccomp + PTE Inversion

	Beignet Git	Intel OpenCL NEO
SHOC Scalable HeterOgeneous Computing - OpenCL - Triad (GB/s)	**9.20**	**13.91**
Normalized	66.14%	100%
Standard Deviation	17.7%	0.8%
SHOC Scalable HeterOgeneous Computing - OpenCL - FFT SP (GFLOPS)	**15.98**	**17.65**
Normalized	90.54%	100%
Standard Deviation	0%	0.3%

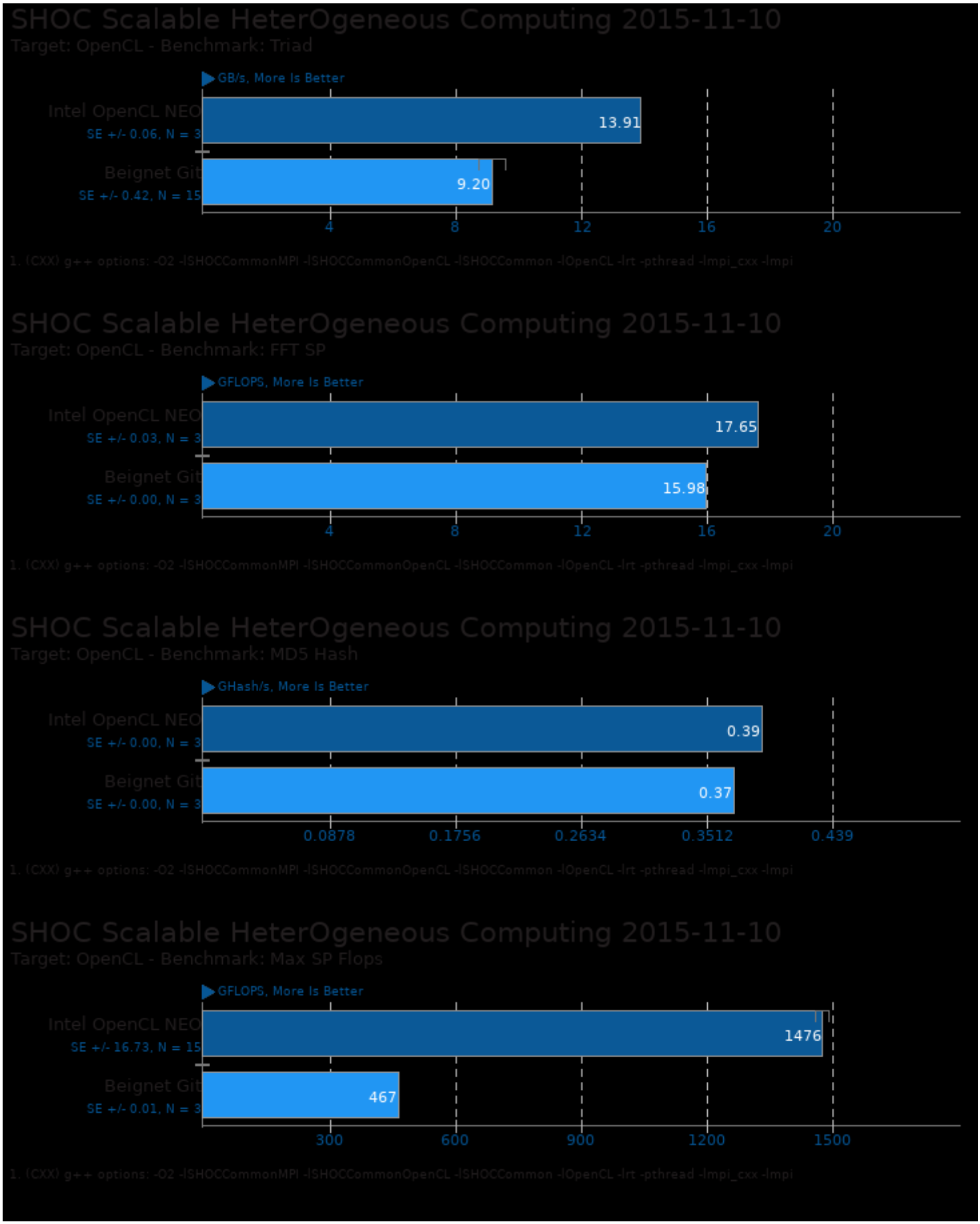
Coffeelake Beignet vs. OpenCL NEO Intel

SHOC Scalable HeterOgeneous Computing - OpenCL - MD5 Hash (GHash/s)	**0.37**	**0.39**
Normalized	94.87%	100%
Standard Deviation	0%	0%
SHOC Scalable HeterOgeneous Computing - OpenCL - Max SP Flops (GFLOPS)	**467**	**1476**
Normalized	31.64%	100%
Standard Deviation	0%	4.4%
SHOC Scalable HeterOgeneous Computing - OpenCL - Bus Speed Download (GB/s)	**20.48**	**29.51**
Normalized	69.4%	100%
Standard Deviation	0.8%	0.9%
SHOC Scalable HeterOgeneous Computing - OpenCL - Bus Speed Readback (GB/s)	**39.09**	**29.27**
Normalized	100%	74.88%
Standard Deviation	3%	2.9%
SHOC Scalable HeterOgeneous Computing - OpenCL - T.R.B (GB/s)	**59.74**	**57.09**
Normalized	100%	95.56%
Standard Deviation	0.9%	0%
ViennaCL - O.L.F (GFLOPS)	**8.52**	**21.23**
Normalized	40.13%	100%
Standard Deviation	17.1%	0.2%
LeelaChessZero - OpenCL (Nodes/s)	**52.21**	**105.73**
Normalized	49.38%	100%
Standard Deviation	17.8%	0.7%
Parboil - OpenCL BFS (sec)	**0.96**	**1.04**
Normalized	100%	92.31%
Standard Deviation	0.3%	1.8%
Parboil - OpenCL LBM (sec)	**78.56**	**69.15**
Normalized	88.02%	100%
Standard Deviation	0.1%	1%
Rodinia - OpenCL Heartwall (sec)	**35.17**	**9.16**
Normalized	26.04%	100%
Standard Deviation	24.1%	0.7%
Darktable - Boat - OpenCL (sec)	13.87	13.87
Standard Deviation	0.4%	0.6%
Darktable - Masskrug - OpenCL (sec)	6.48	6.48
Standard Deviation	0.3%	0.3%
Darktable - Server Rack - OpenCL (sec)	**0.18**	**0.19**
Normalized	100%	94.74%
Standard Deviation	0.9%	1.1%
Darktable - Server Room - OpenCL (sec)	**4.75**	**4.78**
Normalized	100%	99.37%
Standard Deviation	0.3%	0.4%
Blender - BMW27 - OpenCL (sec)	**413**	**461**
Normalized	100%	89.59%
Blender - Classroom - OpenCL (sec)	**676**	**678**
Normalized	100%	99.71%
Blender - Fishy Cat - OpenCL (sec)	**1014**	**971**
Normalized	95.76%	100%
Blender - Barbershop - OpenCL (sec)	**1355**	**1372**
Normalized	100%	98.76%
Blender - Pabellon Barcelona - OpenCL (sec)	**929**	**926**

Coffeelake Beignet vs. OpenCL NEO Intel

Normalized	99.68%	100%
Xsbench OpenCL (Lookups/s)	11455503	
Standard Deviation	0%	
LuxMark - GPU - Hotel (Score)	**16**	**613**
Normalized	2.61%	100%
Standard Deviation	255.6%	1.7%
clpeak - Kernel Latency (us)	**21.70**	**23.83**
Normalized	100%	91.06%
Standard Deviation	2%	0.8%
clpeak - S.P.F (GFLOPS)	**53.88**	**458.68**
Normalized	11.75%	100%
Standard Deviation	32.6%	0%
clpeak - G.M.B (GBPS)	**31.41**	**33.28**
Normalized	94.38%	100%
Standard Deviation	24.5%	0.5%
clpeak - T.B.e (GBPS)	**15.42**	**15.34**
Normalized	100%	99.48%
Standard Deviation	0.2%	2.8%
clpeak - T.B.e (GBPS)	**40.82**	**41.31**
Normalized	98.81%	100%
Standard Deviation	0.7%	0.4%
CoMD OpenCL - A.A.U.R (us/atom/task)	2.58	2.58
Standard Deviation	0.4%	0.2%

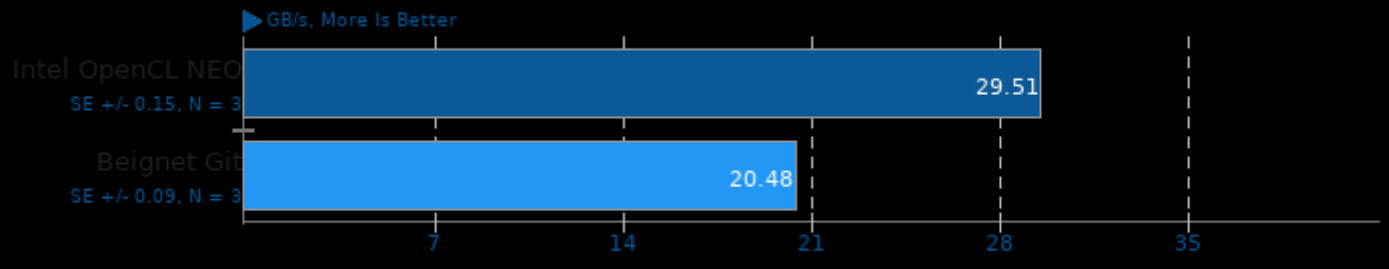
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Coffeelake Beignet vs. OpenCL NEO Intel

SHOC Scalable HeterOgeneous Computing 2015-11-10

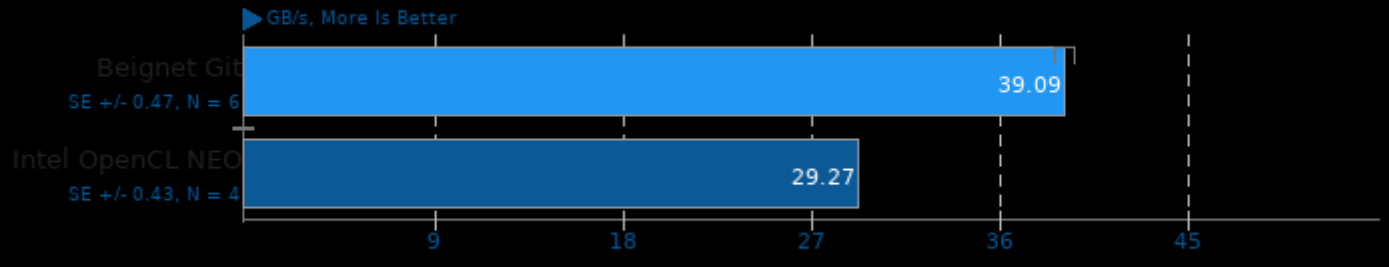
Target: OpenCL - Benchmark: Bus Speed Download



1. (CXX) g++ options: -O2 -lSHOCCommonMPI -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt -pthread -lmpi_cxx -lmpi

SHOC Scalable HeterOgeneous Computing 2015-11-10

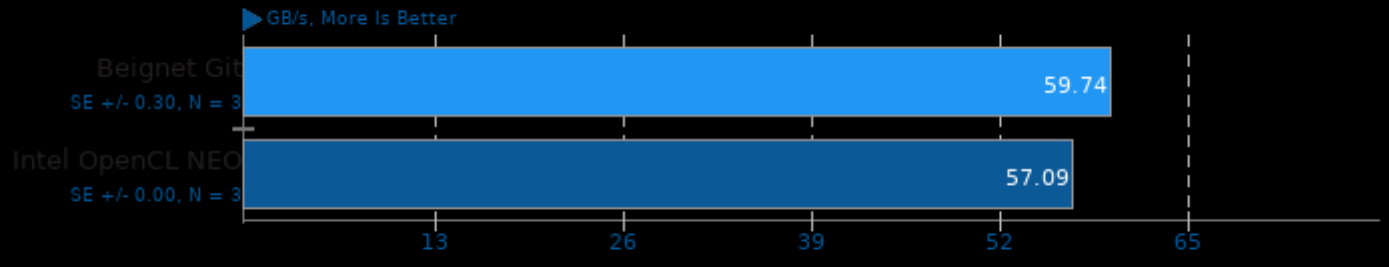
Target: OpenCL - Benchmark: Bus Speed Readback



1. (CXX) g++ options: -O2 -lSHOCCommonMPI -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt -pthread -lmpi_cxx -lmpi

SHOC Scalable HeterOgeneous Computing 2015-11-10

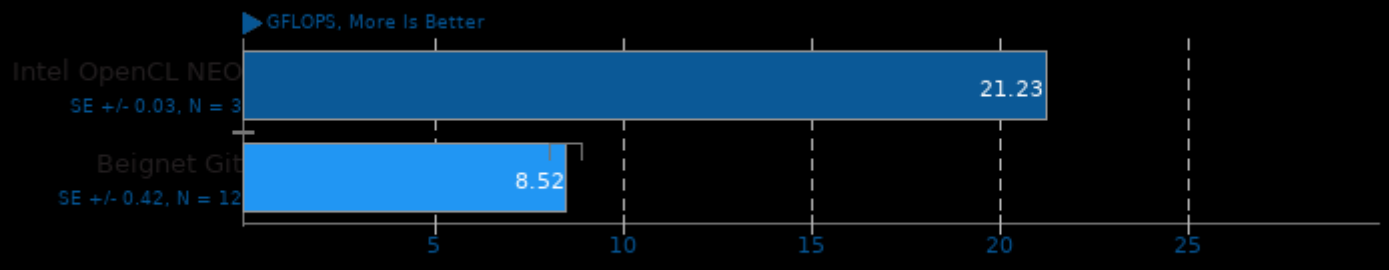
Target: OpenCL - Benchmark: Texture Read Bandwidth



1. (CXX) g++ options: -O2 -lSHOCCommonMPI -lSHOCCommonOpenCL -lSHOCCommon -lOpenCL -lrt -pthread -lmpi_cxx -lmpi

ViennaCL 1.4.2

OpenCL LU Factorization

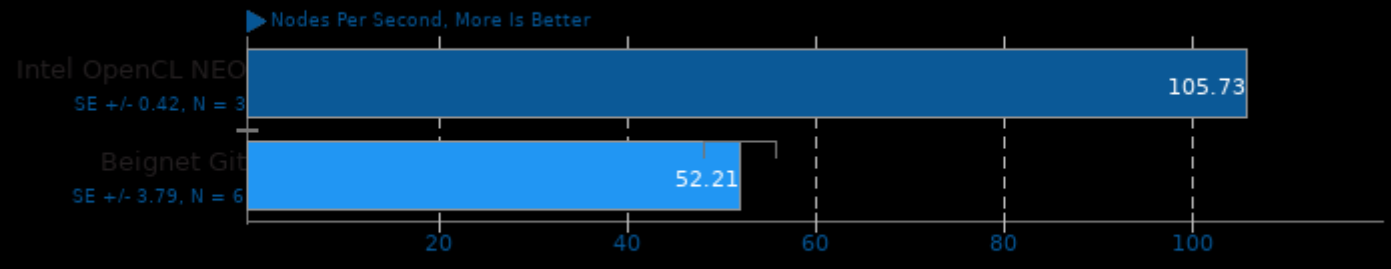


1. (CXX) g++ options: -rdynamic -lOpenCL

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LeelaChessZero 0.20.1

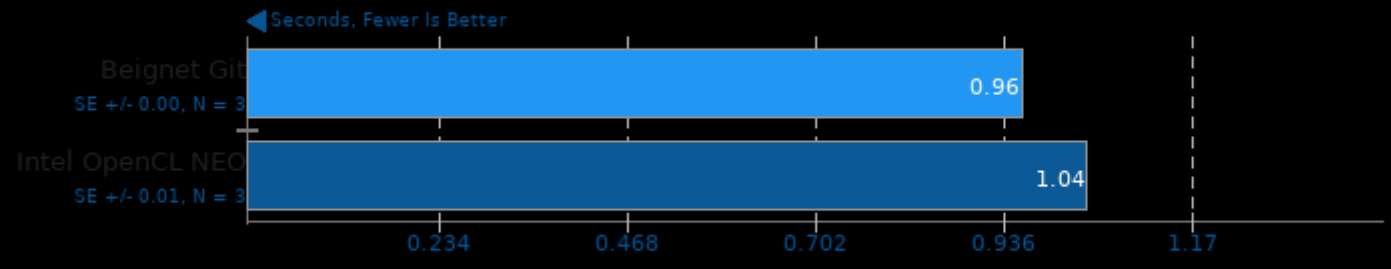
Backend: OpenCL



1. (CXX) g++ options: -lpthread -lOpenCL -lz

Parboil 2.5

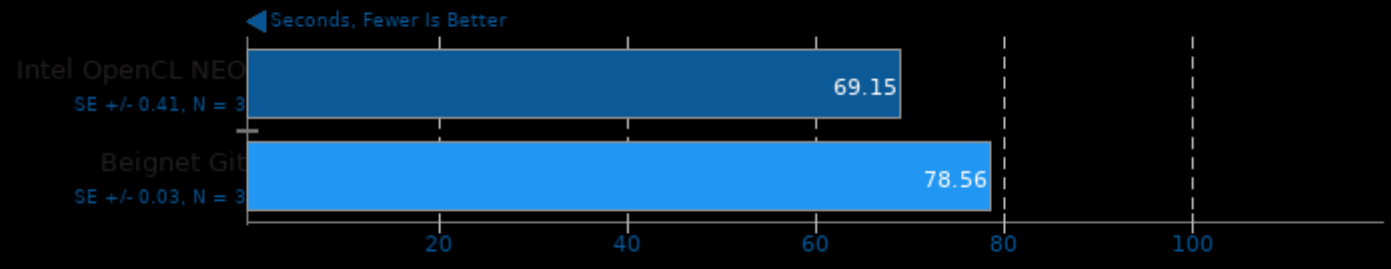
Test: OpenCL BFS



1. (CXX) g++ options: -lm -lpthread -lgomp -O3 -ffast-math -fopenmp

Parboil 2.5

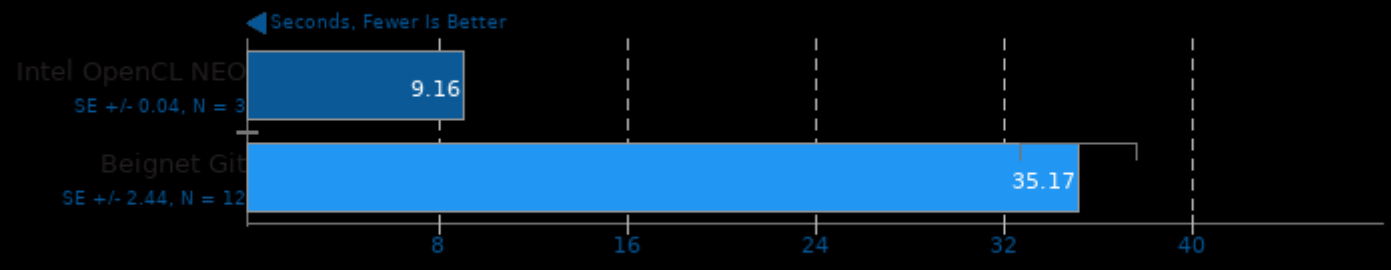
Test: OpenCL LBM



1. (CXX) g++ options: -lm -lpthread -lgomp -O3 -ffast-math -fopenmp

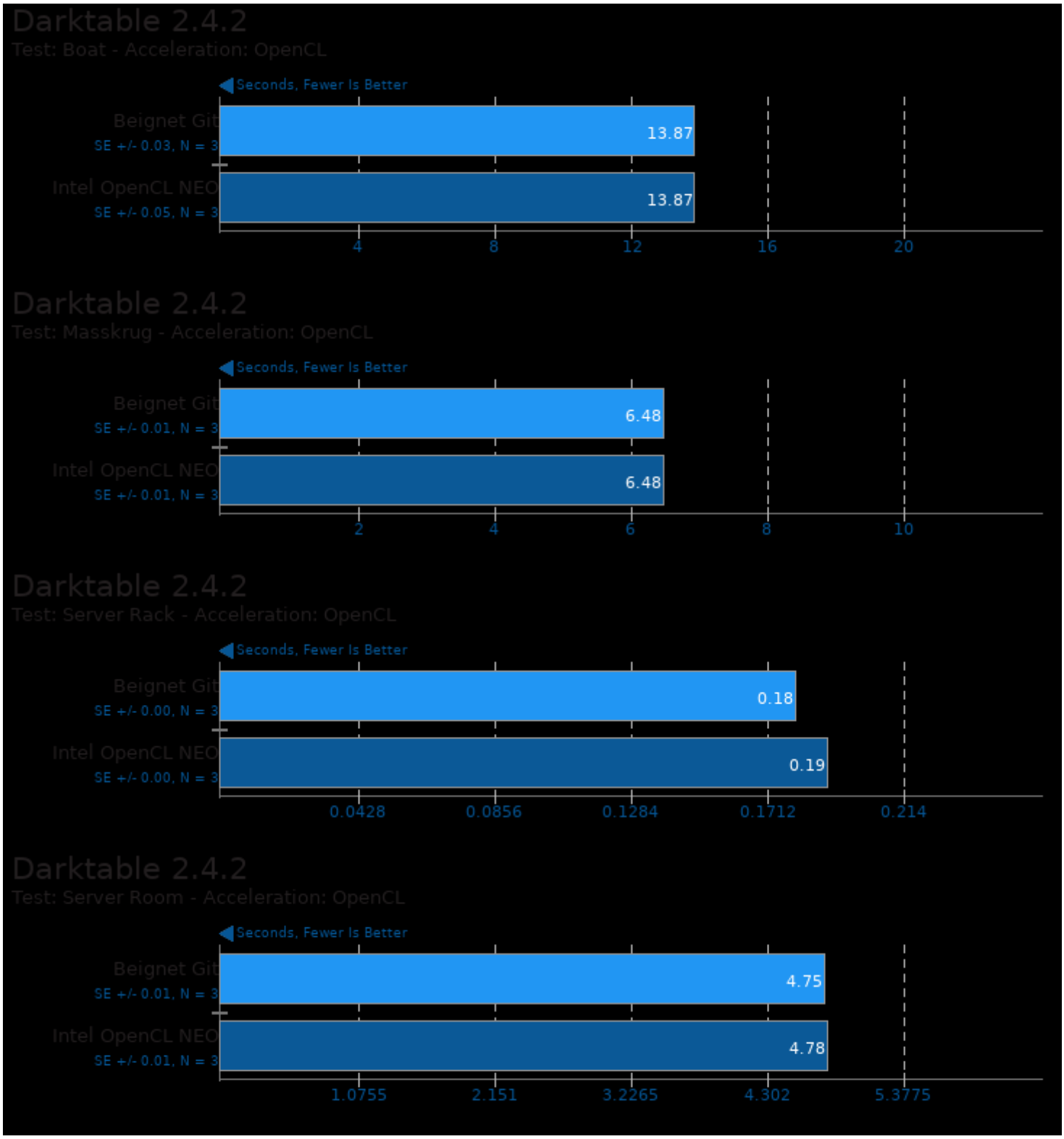
Rodinia 2.4

Test: OpenCL Heartwall

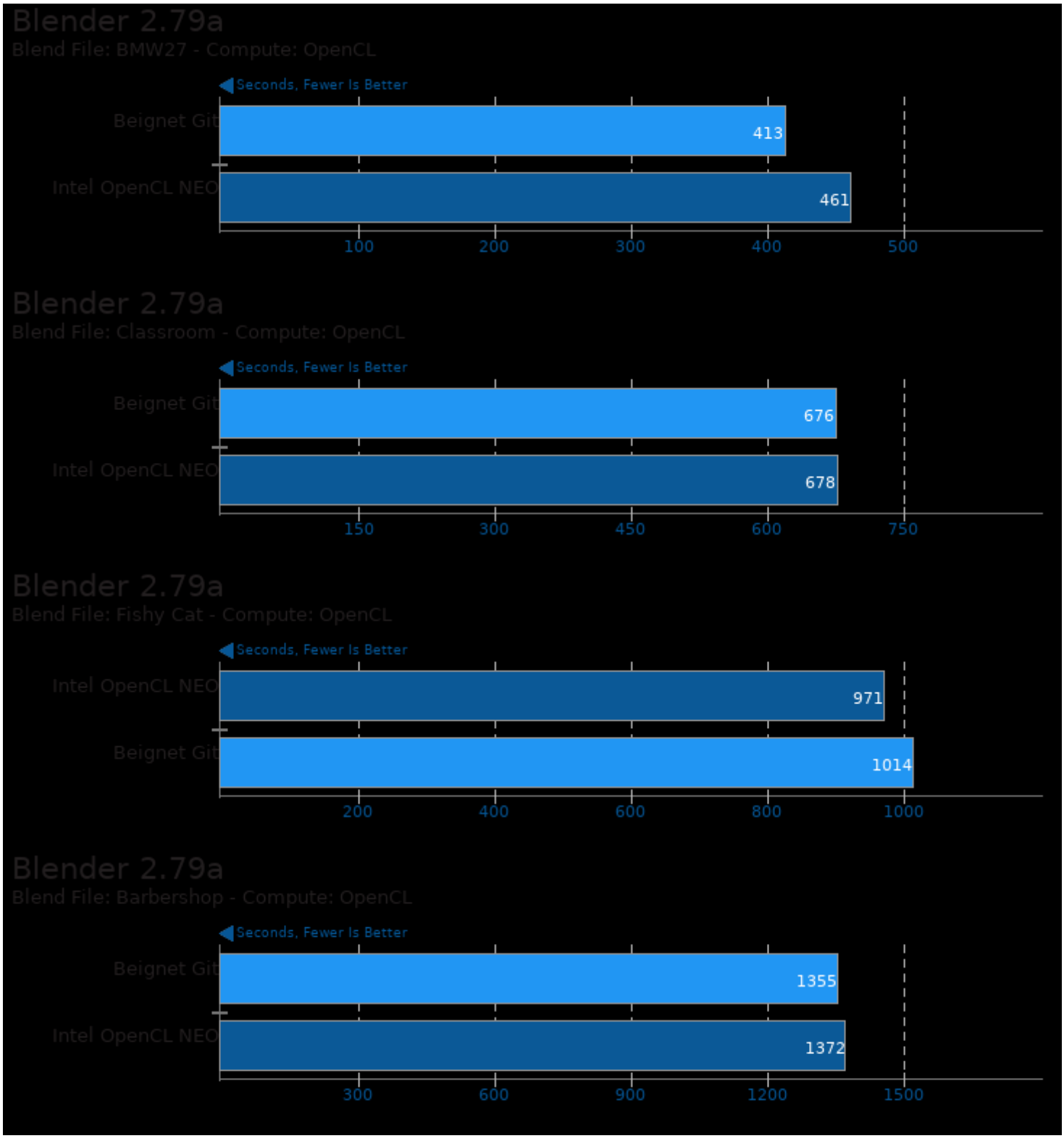


1. (CXX) g++ options: -O2 -lOpenCL

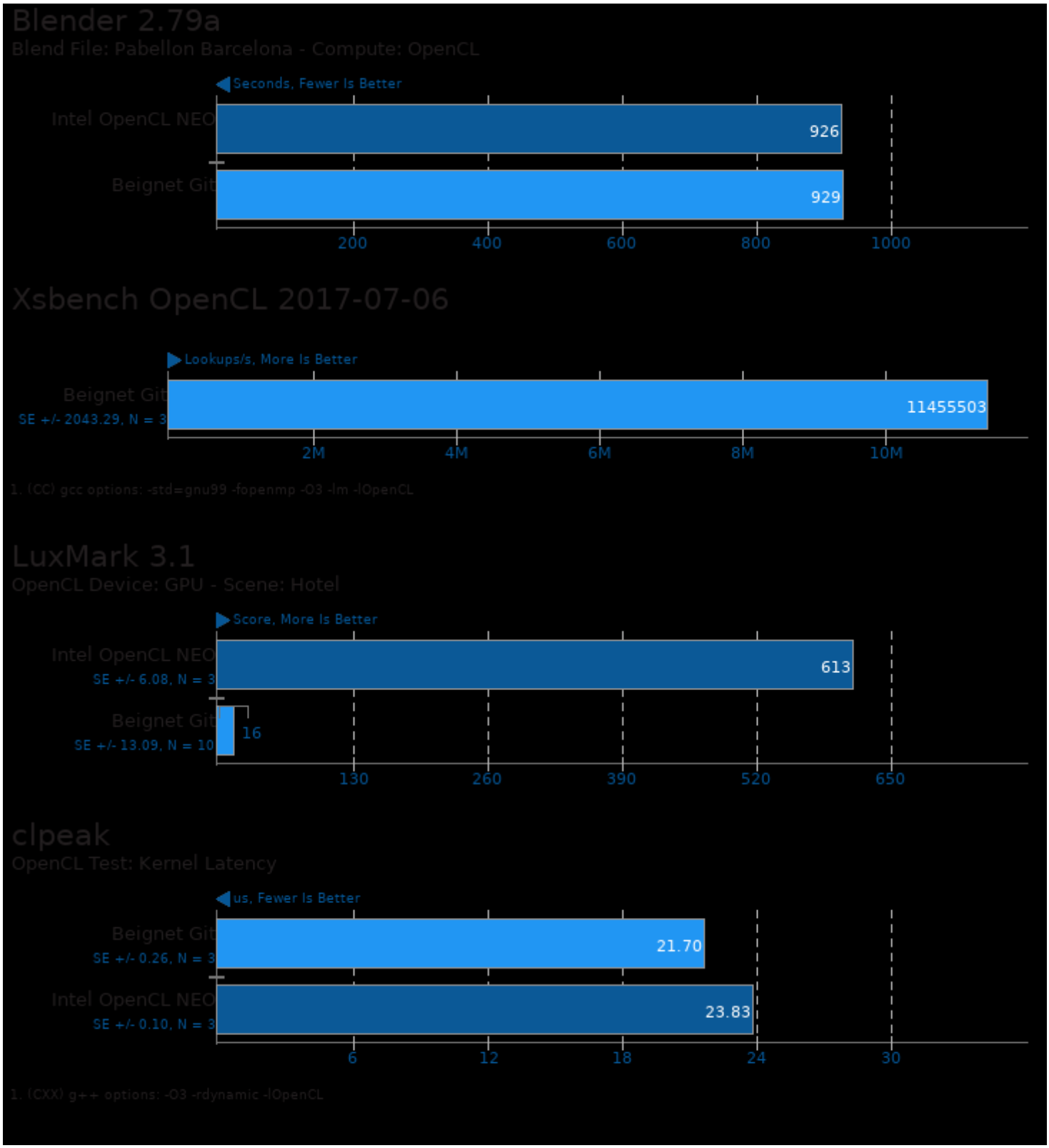
Coffeelake Beignet vs. OpenCL NEO Intel



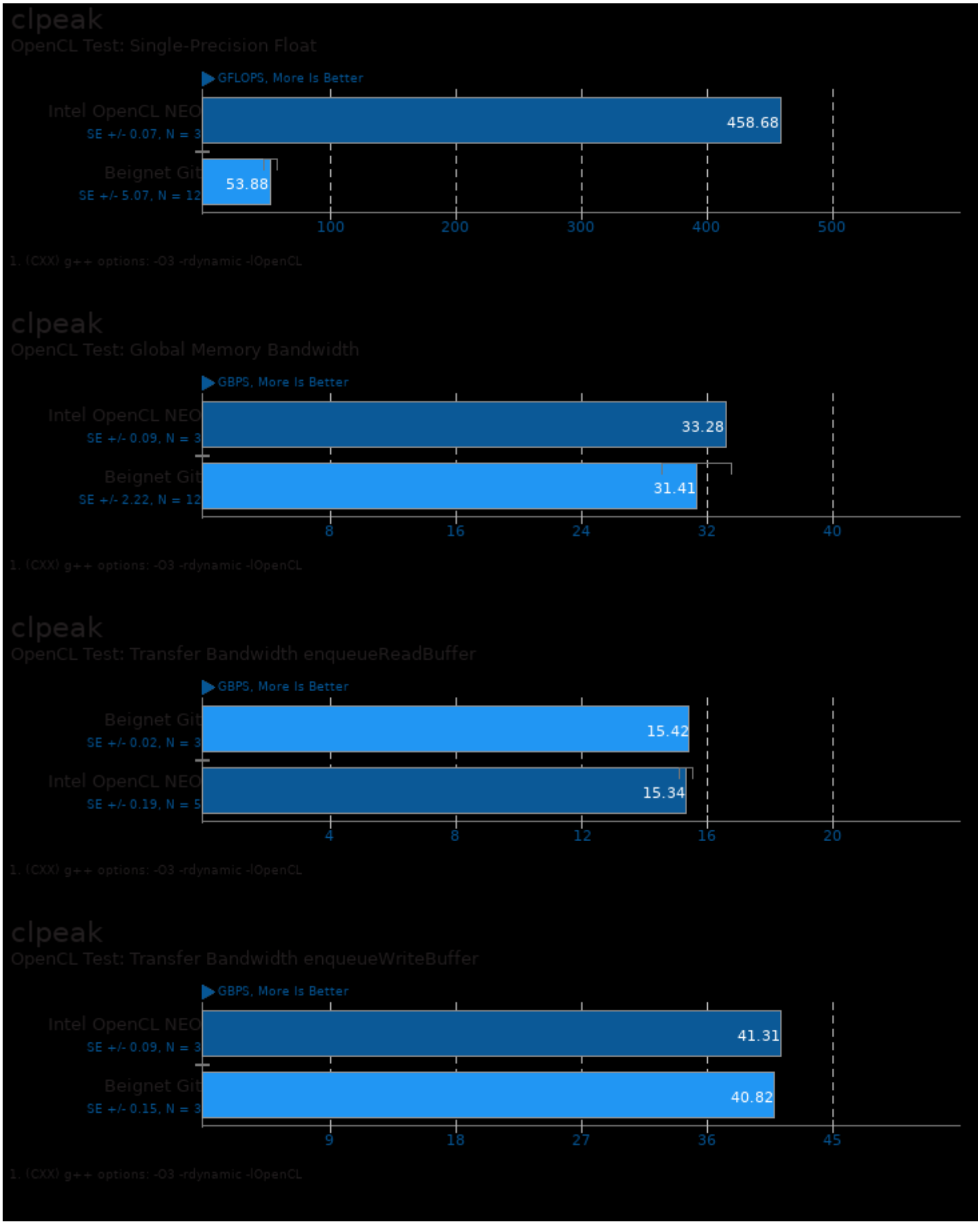
Coffeelake Beignet vs. OpenCL NEO Intel



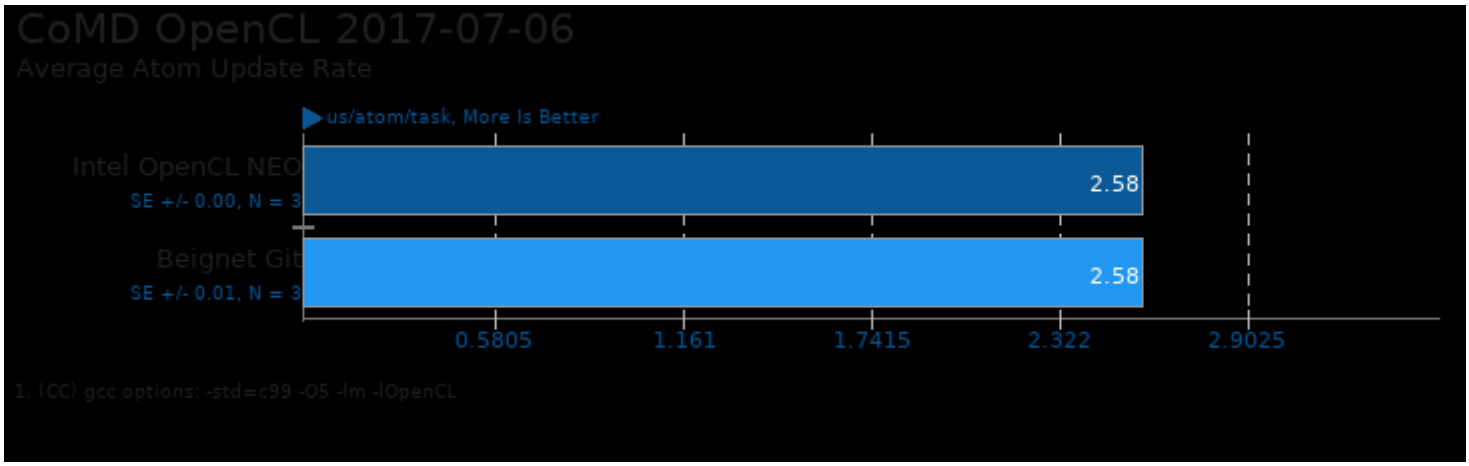
Coffeelake Beignet vs. OpenCL NEO Intel



Coffeelake Beignet vs. OpenCL NEO Intel

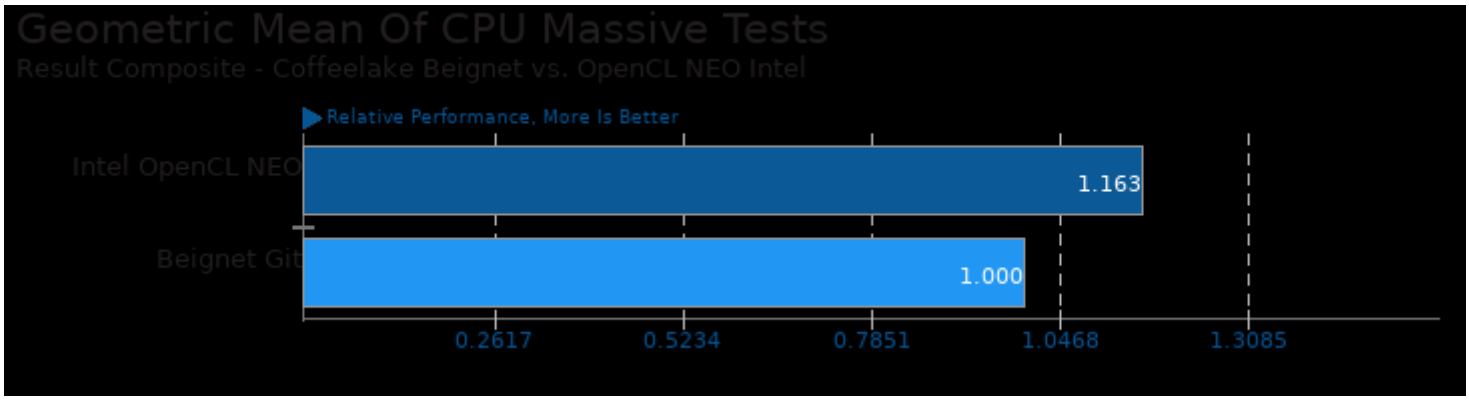


Coffeelake Beignet vs. OpenCL NEO Intel

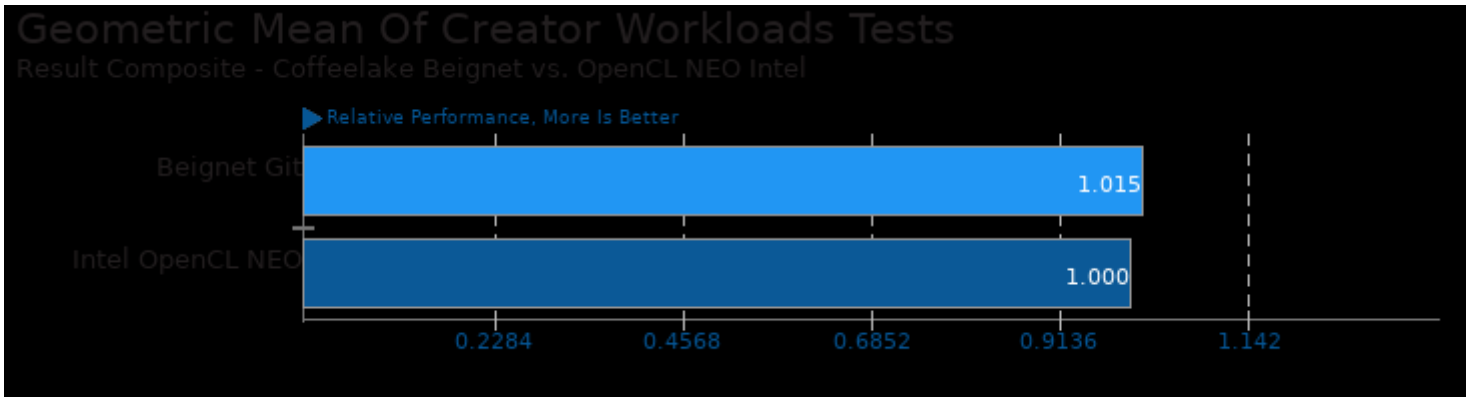


Coffeelake Beignet vs. OpenCL NEO Intel

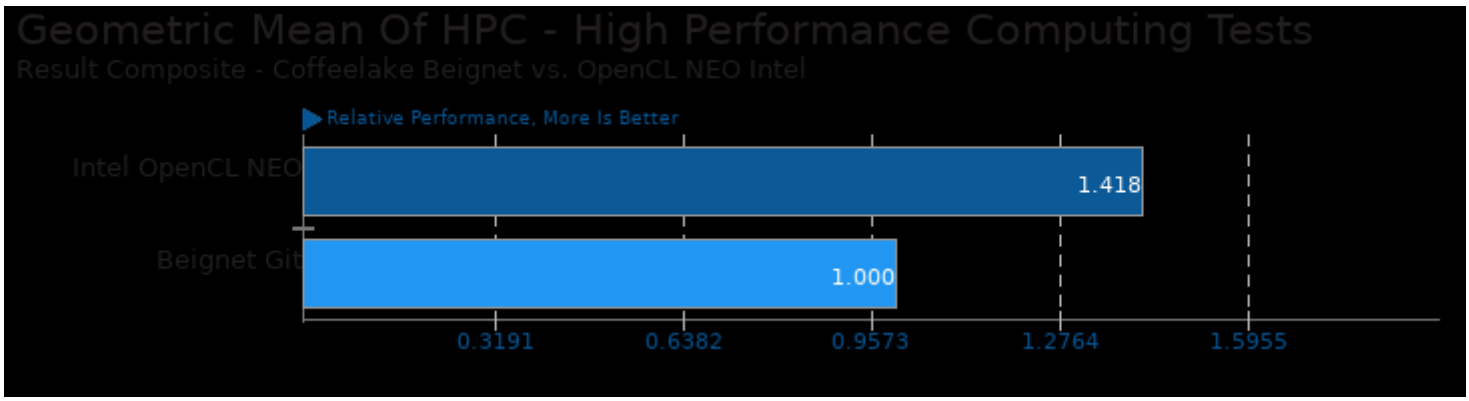
These geometric means are based upon test groupings / test suites for this result file.



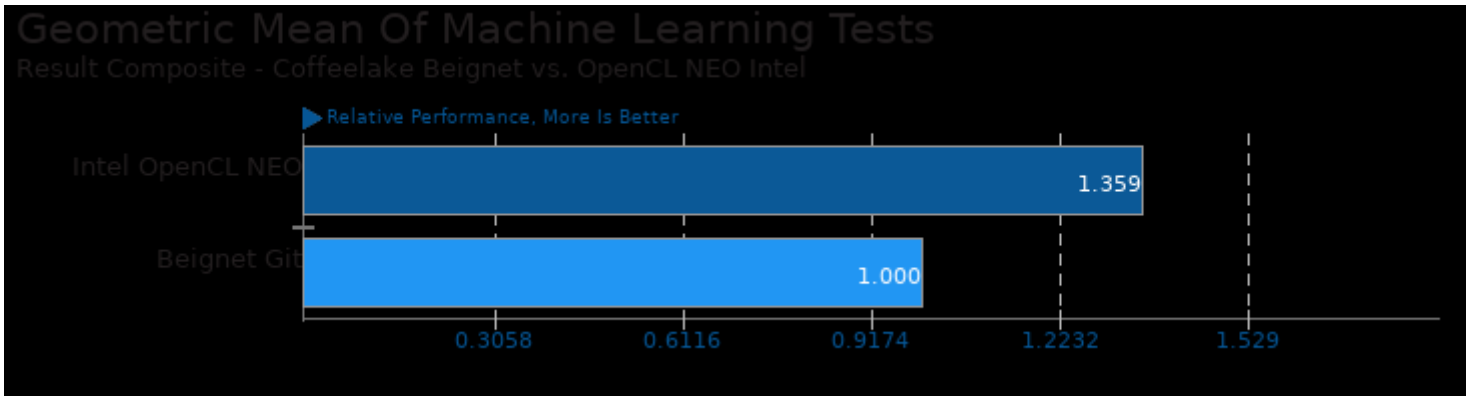
Geometric mean based upon tests: pts/lczero, pts/parboil, pts/rodinia, pts/blender and system/darktable



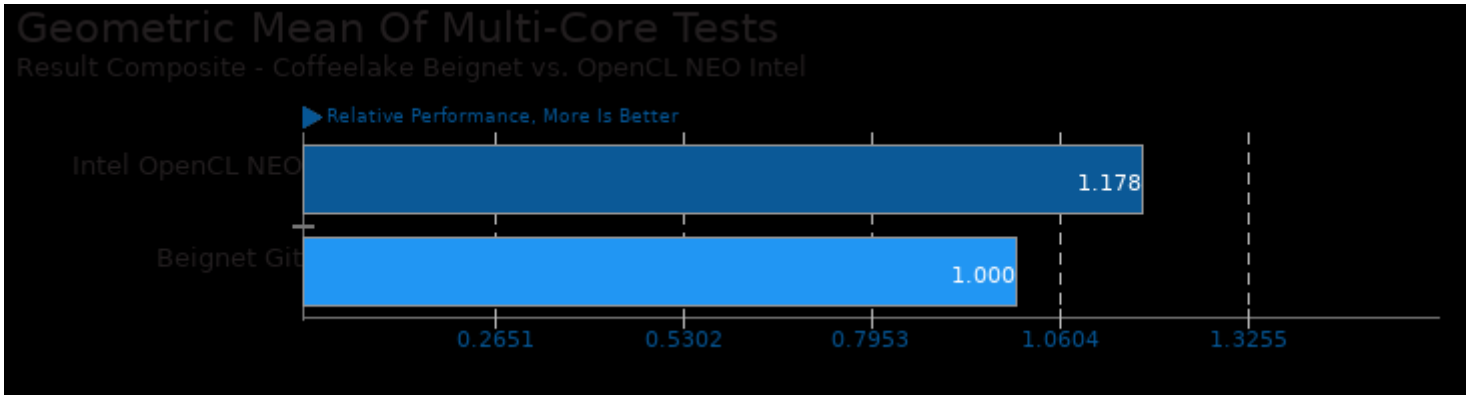
Geometric mean based upon tests: pts/blender and system/darktable



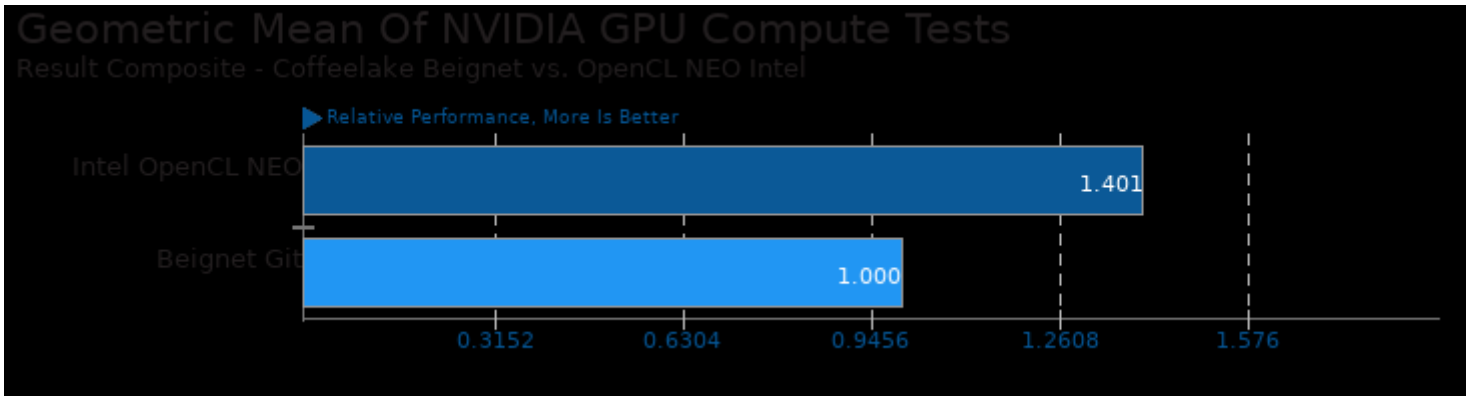
Geometric mean based upon tests: pts/rodinia, pts/parboil, pts/shoc and pts/lczero



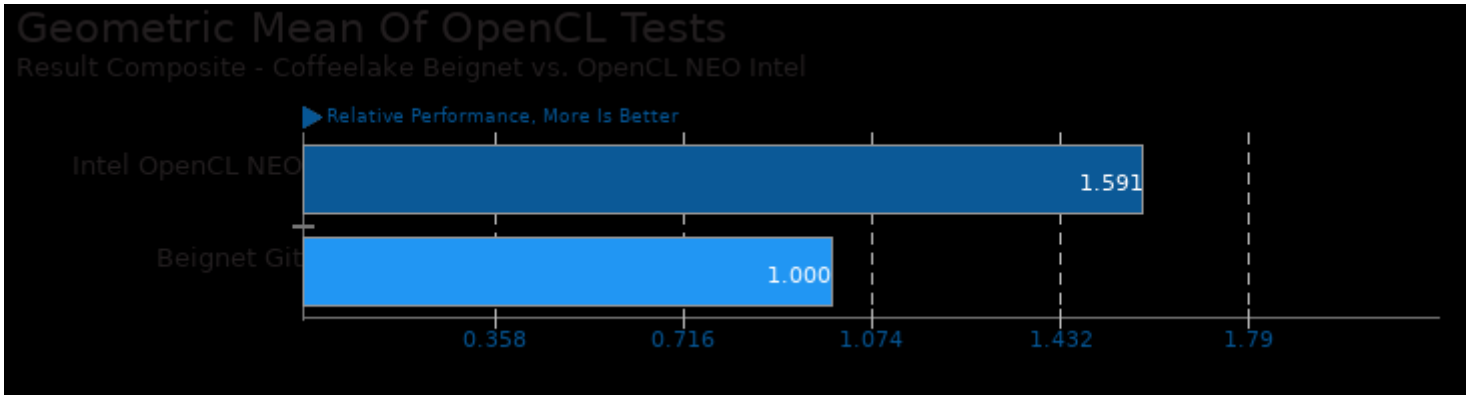
Geometric mean based upon tests: pts/shoc and pts/lczero



Geometric mean based upon tests: pts/blender, pts/rodinia and pts/parboil

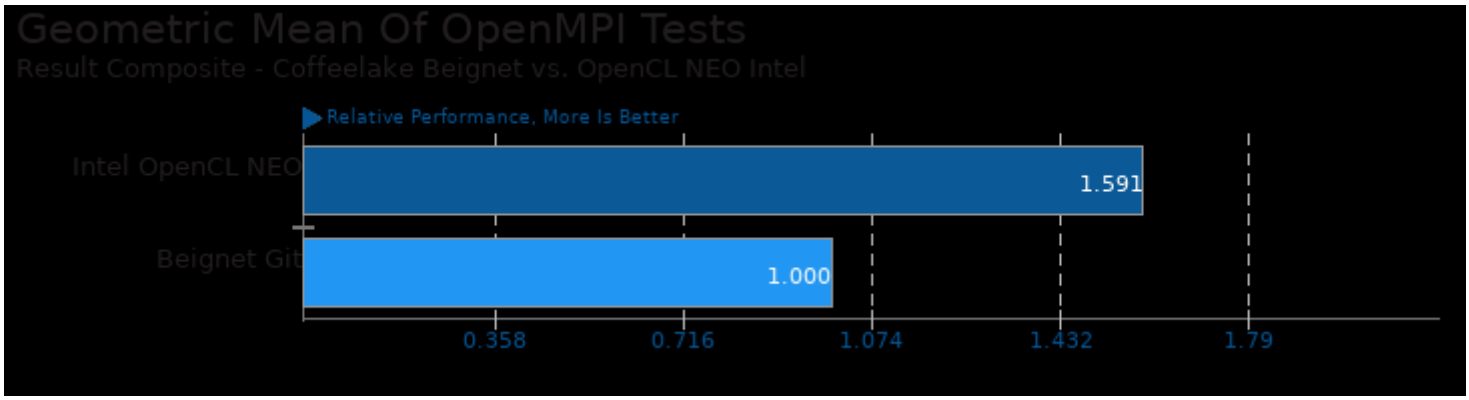


Geometric mean based upon tests: pts/rodinia, pts/clpeak, pts/lczero, pts/viennacl, pts/shoc and pts/blender

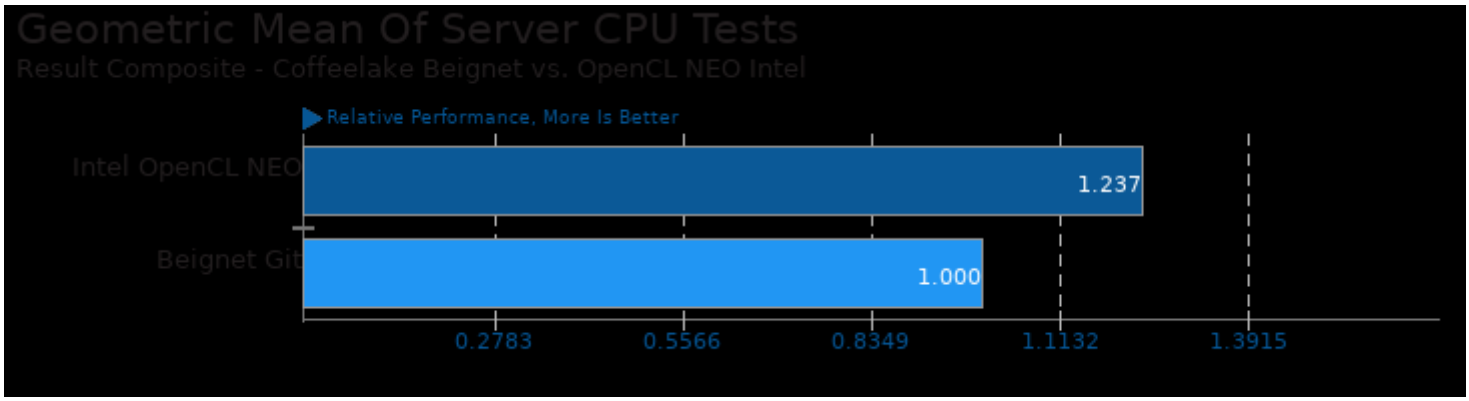


Geometric mean based upon tests: pts/luxmark, pts/shoc, pts/clpeak, pts/rodinia, pts/parboil, system/darktable,

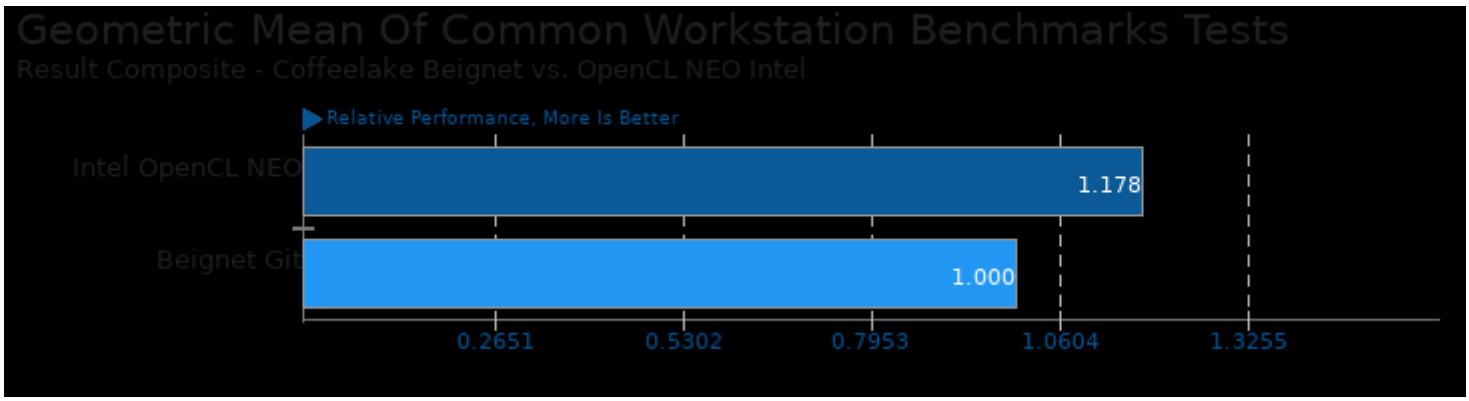
pts/xsbench-cl and pts/viennacl



Geometric mean based upon tests: pts/parboil and pts/rodinia



Geometric mean based upon tests: pts/rodinia and pts/blender



Geometric mean based upon tests: pts/blender, pts/rodinia and pts/parboil

This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 29 March 2024 04:42.