

www.phoronix-test-suite.com

3950X Wednesday

AMD Ryzen 9 3950X 16-Core testing with a ASUS ROG CROSSHAIR VIII HERO (WI-FI) (1302 BIOS) and ASUS NVIDIA GeForce GTX 1660 6GB on Ubuntu 20.04 via the Phoronix Test Suite.

Automated Executive Summary

2 had the most wins, coming in first place for 46% of the tests.

Based on the geometric mean of all complete results, the fastest (2) was 1.004x the speed of the slowest (1). 3 was 0.998x the speed of 2 and 1 was 0.997x the speed of 3.

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

Hierarchical INTegration (Test: FLOAT) at 1.061x
BYTE Unix Benchmark (Computational Test: Dhrystone 2) at 1.052x
Mlpack Benchmark (Benchmark: scikit_qda) at 1.037x
Dolfyn (Computational Fluid Dynamics) at 1.032x
LeelaChessZero (Backend: BLAS) at 1.029x
Apache CouchDB (Bulk Size: 100 - Inserts: 1000 - Rounds: 24) at 1.027x
FFTE (N=256, 3D Complex FFT Routine) at 1.023x
Mlpack Benchmark (Benchmark: scikit_linearridgeregression) at 1.021x
Timed MAFFT Alignment (Multiple Sequence Alignment - LSU RNA) at 1.02x

Mlpack Benchmark (Benchmark: scikit_ica) at 1.015x.

Test Systems:

1

2

Processor: AMD Ryzen 9 3950X 16-Core @ 3.50GHz (16 Cores / 32 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (1302 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 2000GB Corsair Force MP600 + 2000GB, Graphics: ASUS NVIDIA GeForce GTX 1660 6GB (1530/4001MHz), Audio: NVIDIA TU116 HD Audio, Monitor: DELL P2415Q, Network: Realtek RTL8125 2.5GbE + Intel I211 + Intel Wi-Fi 6 AX200

OS: Ubuntu 20.04, Kernel: 5.4.0-48-generic (x86_64), Desktop: GNOME Shell 3.36.4, Display Server: X Server 1.20.8, Display Driver: NVIDIA 450.66, OpenGL: 4.6.0, OpenCL: OpenCL 2.0 AMD-APP (3182.0) + OpenCL 1.2 CUDA 11.0.228, Vulkan: 1.2.133, Compiler: GCC 9.3.0 + CUDA 11.0, 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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,hsa --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=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0x8701013
OpenCL Notes: GPU Compute Cores: 1408
Python Notes: Python 3.8.2
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional STIBP: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

3

Processor: AMD Ryzen 9 3950X 16-Core @ 3.50GHz (16 Cores / 32 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (1302 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 2000GB Corsair Force MP600 + 2000GB, Graphics: ASUS NVIDIA GeForce GTX 1660 6GB (405/405MHz), Audio: NVIDIA TU116 HD Audio, Monitor: DELL P2415Q, Network: Realtek RTL8125 2.5GbE + Intel I211 + Intel Wi-Fi 6 AX200

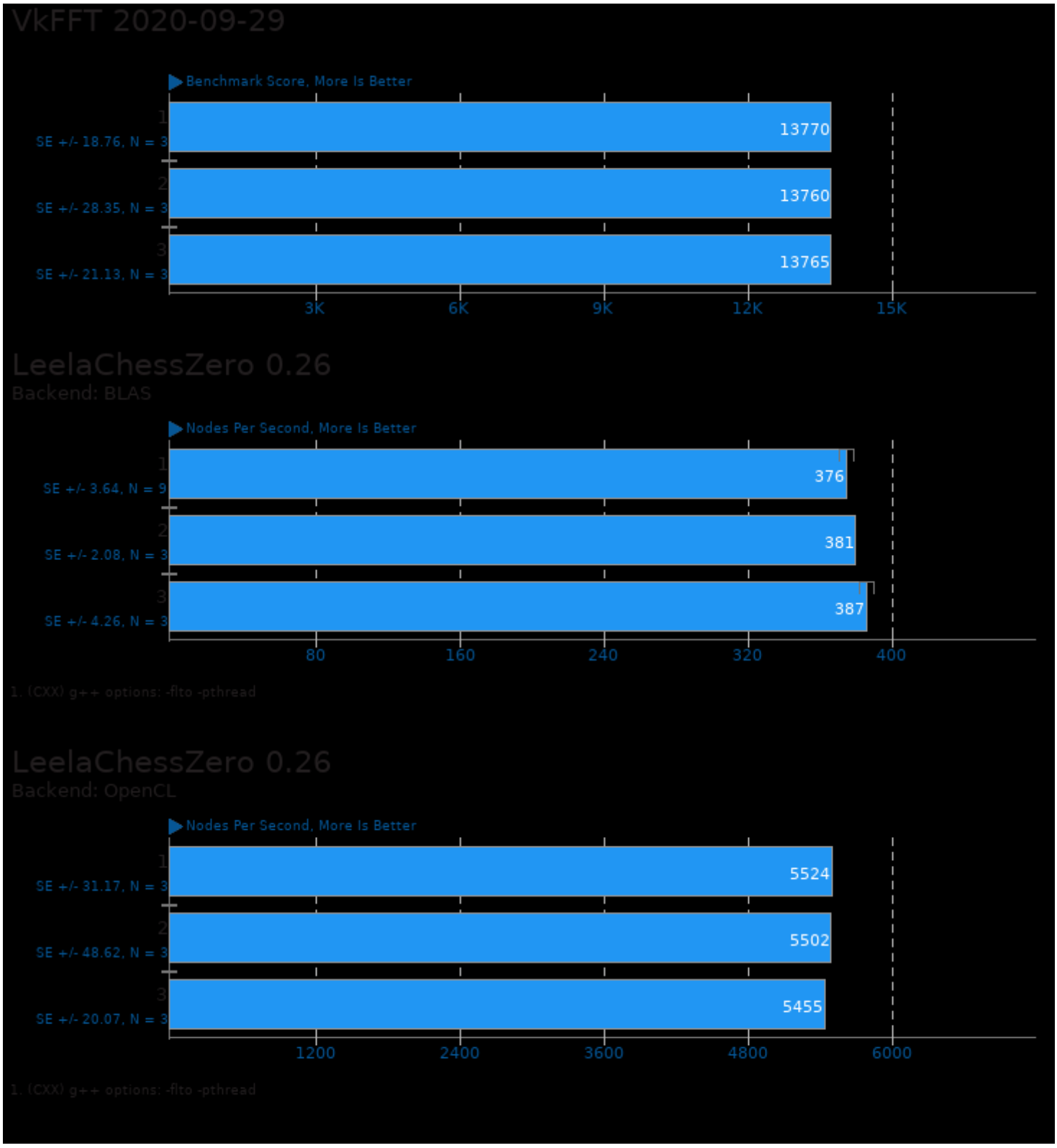
OS: Ubuntu 20.04, Kernel: 5.4.0-48-generic (x86_64), Desktop: GNOME Shell 3.36.4, Display Server: X Server 1.20.8, Display Driver: NVIDIA 450.66, OpenGL: 4.6.0, OpenCL: OpenCL 2.0 AMD-APP (3182.0) + OpenCL 1.2 CUDA 11.0.228, Vulkan: 1.2.133, Compiler: GCC 9.3.0 + CUDA 11.0, File-System: ext4, Screen Resolution: 3840x2160

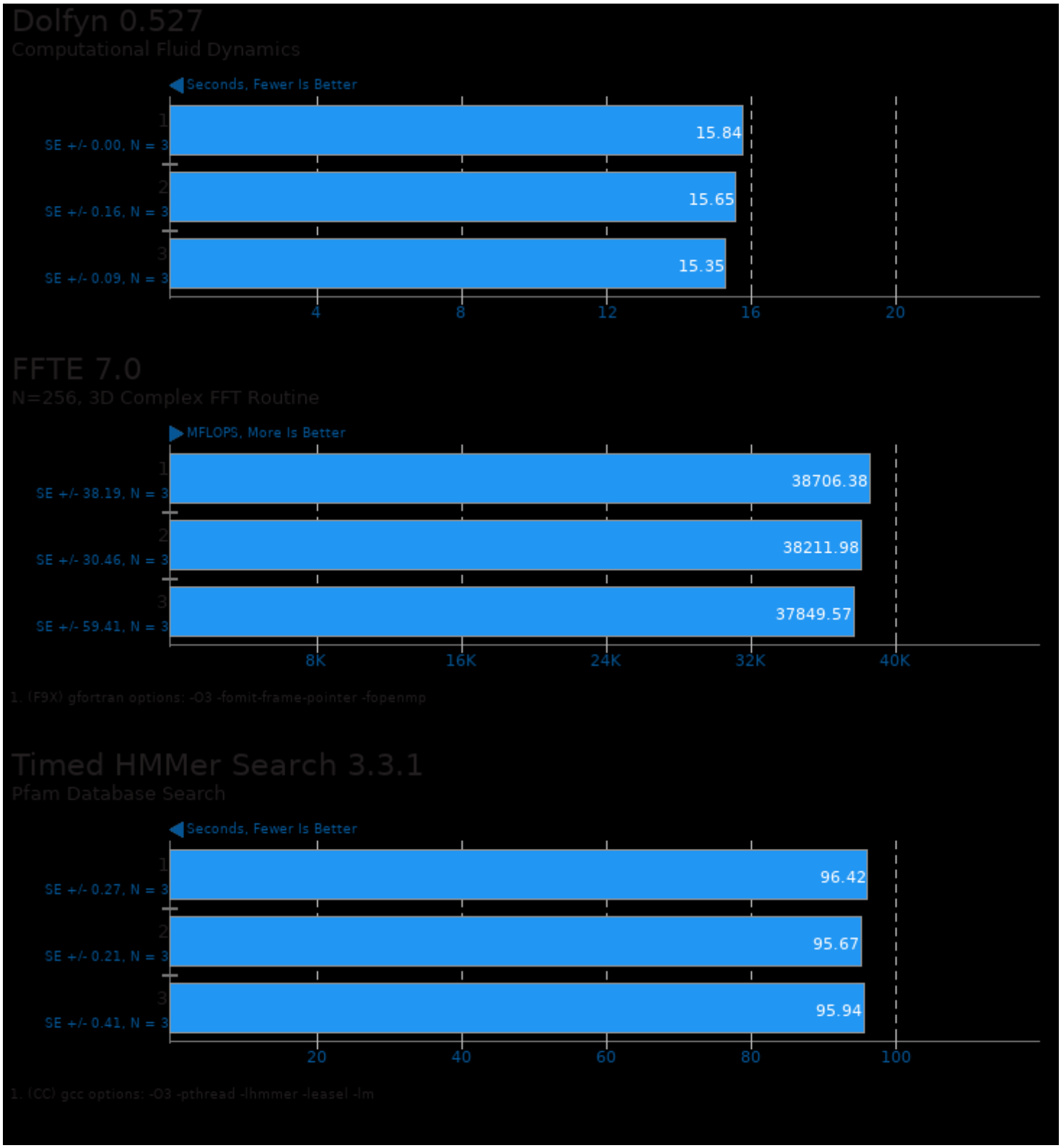
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,hsa --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=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0x8701013
OpenCL Notes: GPU Compute Cores: 1408
Python Notes: Python 3.8.2
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional STIBP: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

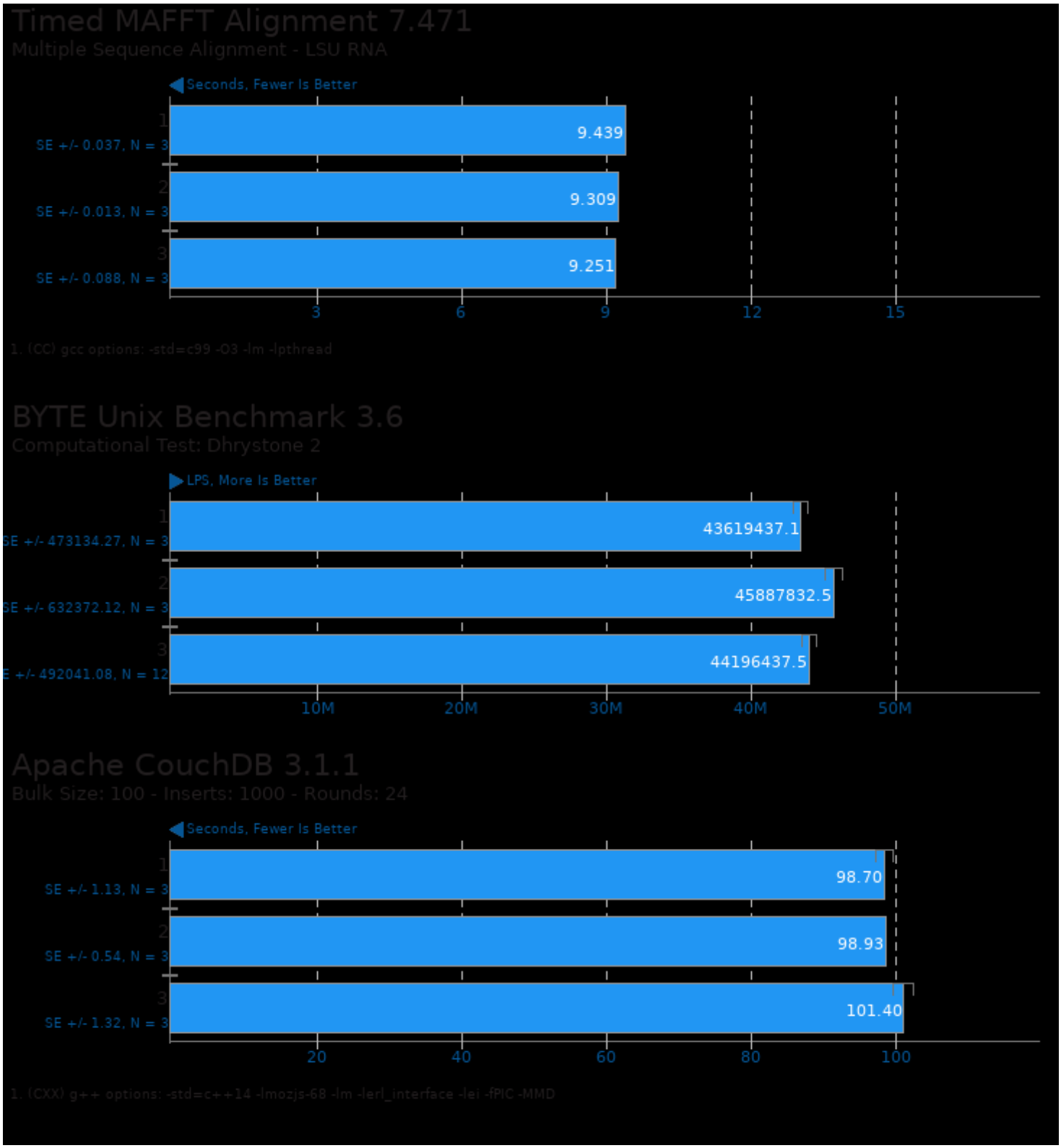
3950X Wednesday

	1	2	3
VkFFT (Benchmark Score)	13770	13760	13765
Normalized	100%	99.93%	99.96%
Standard Deviation	0.2%	0.4%	0.3%
LeelaChessZero - BLAS (Nodes/s)	376	381	387
Normalized	97.16%	98.45%	100%
Standard Deviation	2.9%	0.9%	1.9%
LeelaChessZero - OpenCL (Nodes/s)	5524	5502	5455
Normalized	100%	99.6%	98.75%
Standard Deviation	1%	1.5%	0.6%
Dolfyn - C.F.D (sec)	15.843	15.646	15.347
Normalized	96.87%	98.09%	100%
Standard Deviation	0.1%	1.8%	1%
FFTE - N.2.3.C.F.R (MFLOPS)	38706	38212	37850
Normalized	100%	98.72%	97.79%
Standard Deviation	0.2%	0.1%	0.3%
Timed HMMer Search - P.D.S (sec)	96.420	95.670	95.936
Normalized	99.22%	100%	99.72%
Standard Deviation	0.5%	0.4%	0.7%
Timed MAFFT Alignment - M.S.A - LSU RNA (sec)	9.439	9.309	9.251
Normalized	98.01%	99.38%	100%
Standard Deviation	0.7%	0.2%	1.6%
BYTE Unix Benchmark - Dhrystone 2 (LPS)	43619437	45887833	44196438
Normalized	95.06%	100%	96.31%
Standard Deviation	1.9%	2.4%	3.9%
Apache CouchDB - 100 - 1000 - 24 (sec)	98.696	98.925	101.402
Normalized	100%	99.77%	97.33%
Standard Deviation	2%	0.9%	2.2%
KeyDB (Ops/sec)	618020	616287	618340
Normalized	99.95%	99.67%	100%
Standard Deviation	0.5%	0.2%	0.3%
GROMACS - Water Benchmark (Ns/Day)	1.245	1.240	1.228
Normalized	100%	99.6%	98.63%
Standard Deviation	0.3%	0.3%	0.1%
Caffe - AlexNet - CPU - 100 (ms)	51841	51594	51475
Normalized	99.29%	99.77%	100%
Standard Deviation	0.9%	0.2%	0.6%
Caffe - AlexNet - CPU - 200 (ms)	103424	103265	103395
Normalized	99.85%	100%	99.87%
Standard Deviation	0.1%	0.5%	0.6%
Caffe - AlexNet - CPU - 1000 (ms)	519585	515176	517377
Normalized	99.15%	100%	99.57%
Standard Deviation	0.6%	0.2%	0.2%
Caffe - GoogleNet - CPU - 100 (ms)	128065	127916	127980
Normalized	99.88%	100%	99.95%
Standard Deviation	0.5%	0.3%	0.3%
Caffe - GoogleNet - CPU - 200 (ms)	257992	256819	257231
Normalized	99.55%	100%	99.84%
Standard Deviation	0.2%	0.4%	0.4%
Caffe - GoogleNet - CPU - 1000 (ms)	1276520	1280710	1285423
Normalized	100%	99.67%	99.31%
Standard Deviation	0.2%	0.4%	0.2%
Caffe - AlexNet - NVIDIA CUDA - 100 (ms)	2318	2318	2318
Normalized	99.98%	100%	99.99%

Standard Deviation	0.3%	0.2%	0.3%
Caffe - AlexNet - NVIDIA CUDA - 200 (ms)	4621	**4618**	**4621**
Normalized	99.94%	100%	99.93%
Standard Deviation	0.2%	0.1%	0.1%
Caffe - AlexNet - NVIDIA CUDA - 1000 (ms)	**23157**	23140	**23123**
Normalized	99.85%	99.93%	100%
Standard Deviation	0.1%	0.2%	0.3%
Caffe - GoogleNet - NVIDIA CUDA - 100 (ms)	**5869**	**5832**	5869
Normalized	99.36%	100%	99.37%
Standard Deviation	0.1%	0.1%	0.1%
Caffe - GoogleNet - NVIDIA CUDA - 200 (ms)	**11729**	**11707**	11716
Normalized	99.81%	100%	99.92%
Standard Deviation	0.2%	0.1%	0.1%
Caffe - GoogleNet - NVIDIA CUDA - 1000	**58778**	**58563**	58667
Normalized	99.63%	100%	99.82%
Standard Deviation	0.1%	0.3%	0.2%
Hierarchical INTegration - FLOAT (QUIPs)	**382793512**	402390671	**406002767**
Normalized	94.28%	99.11%	100%
Standard Deviation	0.3%	1.6%	1.5%
Mlpack Benchmark - scikit_ica (sec)	**54.07**	**53.27**	53.97
Normalized	98.52%	100%	98.7%
Standard Deviation	0.6%	1.7%	1.6%
Mlpack Benchmark - scikit_qda (sec)	66.27	**68.63**	**66.19**
Normalized	99.88%	96.44%	100%
Standard Deviation	1.8%	1%	2.1%
Mlpack Benchmark - scikit_svm (sec)	18.67	**18.56**	**18.76**
Normalized	99.41%	100%	98.93%
Standard Deviation	1.8%	2.6%	2.6%
Mlpack Benchmark - scikit_linearridgeregression (sec)	**1.95**	**1.99**	1.98
Normalized	100%	97.99%	98.48%
Standard Deviation	1.6%	2.9%	1.7%

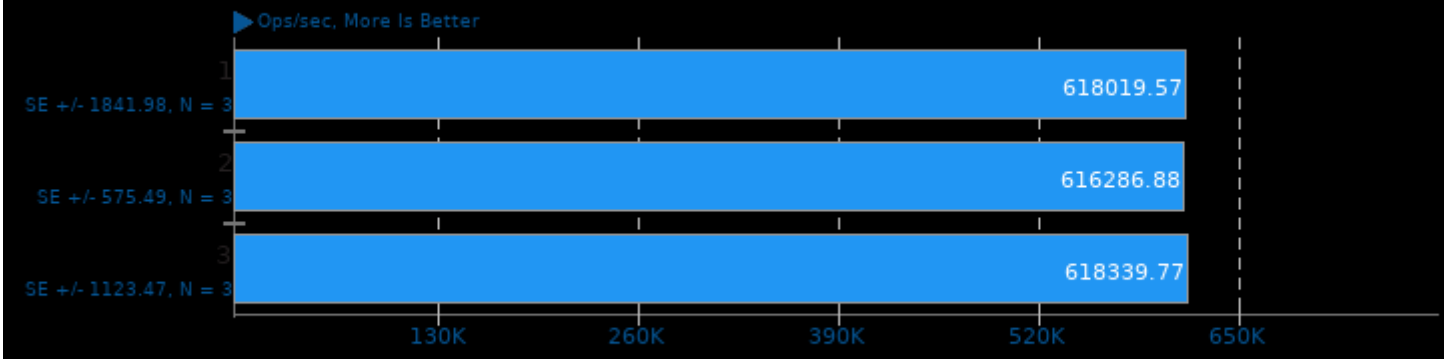

VkFFT 2020-09-29
Benchmark Score, More Is Better
1
SE +/- 18.76, N = 3
13770
2
SE +/- 28.35, N = 3
13760
3
SE +/- 21.13, N = 3
13765
3K
6K
9K
12K
15K
LeelaChessZero 0.26
Backend: BLAS
Nodes Per Second, More Is Better
1
SE +/- 3.64, N = 9
376
2
SE +/- 2.08, N = 3
381
3
SE +/- 4.26, N = 3
387
80
160
240
320
400
1. (CXX) g++ options: -flto -pthread
LeelaChessZero 0.26
Backend: OpenCL
Nodes Per Second, More Is Better
1
SE +/- 31.17, N = 3
5524
2
SE +/- 48.62, N = 3
5502
3
SE +/- 20.07, N = 3
5455
1200
2400
3600
4800
6000
1. (CXX) g++ options: -flto -pthread


Dolfyn 0.527
Computational Fluid Dynamics
Seconds, Fewer Is Better
1
SE +/- 0.00, N = 3
15.84
2
SE +/- 0.16, N = 3
15.65
3
SE +/- 0.09, N = 3
15.35
4
8
12
16
20
FFTE 7.0
N=256, 3D Complex FFT Routine
MFLOPS, More Is Better
1
SE +/- 38.19, N = 3
38706.38
2
SE +/- 30.46, N = 3
38211.98
3
SE +/- 59.41, N = 3
37849.57
8K
16K
24K
32K
40K
1. (F9X) gfortran options: -O3 -fomit-frame-pointer -fopenmp
Timed HMMer Search 3.3.1
Pfam Database Search
Seconds, Fewer Is Better
1
SE +/- 0.27, N = 3
96.42
2
SE +/- 0.21, N = 3
95.67
3
SE +/- 0.41, N = 3
95.94
20
40
60
80
100
1. (CC) gcc options: -O3 -pthread -lhmmer -leasel -lm


Timed MAFFT Alignment 7.471
Multiple Sequence Alignment - LSU RNA
Seconds, Fewer Is Better
1
SE +/- 0.037, N = 3
9.439
2
SE +/- 0.013, N = 3
9.309
3
SE +/- 0.088, N = 3
9.251
3
6
9
12
15
1. (CC) gcc options: -std=c99 -O3 -lm -lpthread
BYTE Unix Benchmark 3.6
Computational Test: Dhrystone 2
LPS, More Is Better
1
SE +/- 473134.27, N = 3
43619437.1
2
SE +/- 632372.12, N = 3
45887832.5
3
E +/- 492041.08, N = 12
44196437.5
10M
20M
30M
40M
50M
Apache CouchDB 3.1.1
Bulk Size: 100 - Inserts: 1000 - Rounds: 24
Seconds, Fewer Is Better
1
SE +/- 1.13, N = 3
98.70
2
SE +/- 0.54, N = 3
98.93
3
SE +/- 1.32, N = 3
101.40
20
40
60
80
100
1. (CXX) g++ options: -std=c++14 -lmozjs-68 -lm -lerl_interface -lei -fPIC -MMD

3950X Wednesday

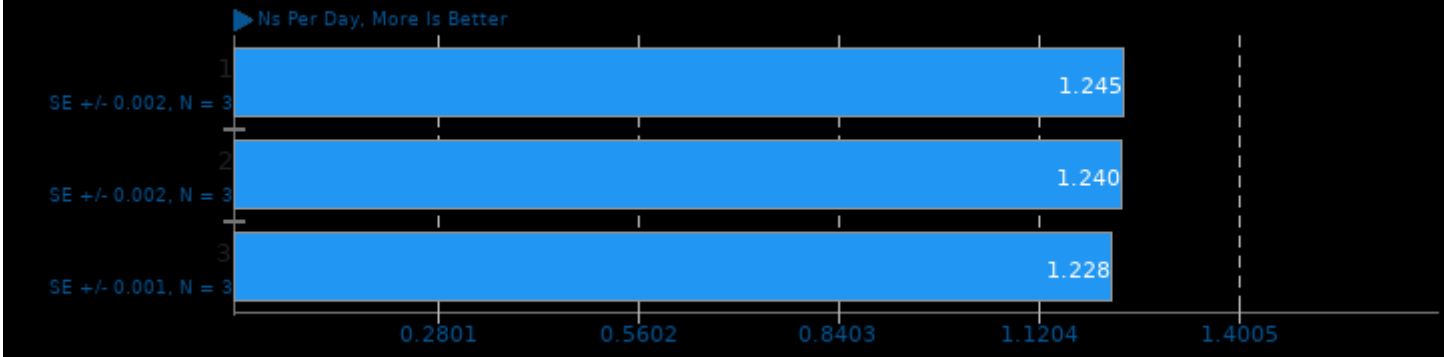
KeyDB 6.0.16



1. (CXX) g++ options: -O2 -levent_openssl -levent -lcrypto -lssl -lpthread -lz -lpcre

GROMACS 2020.3

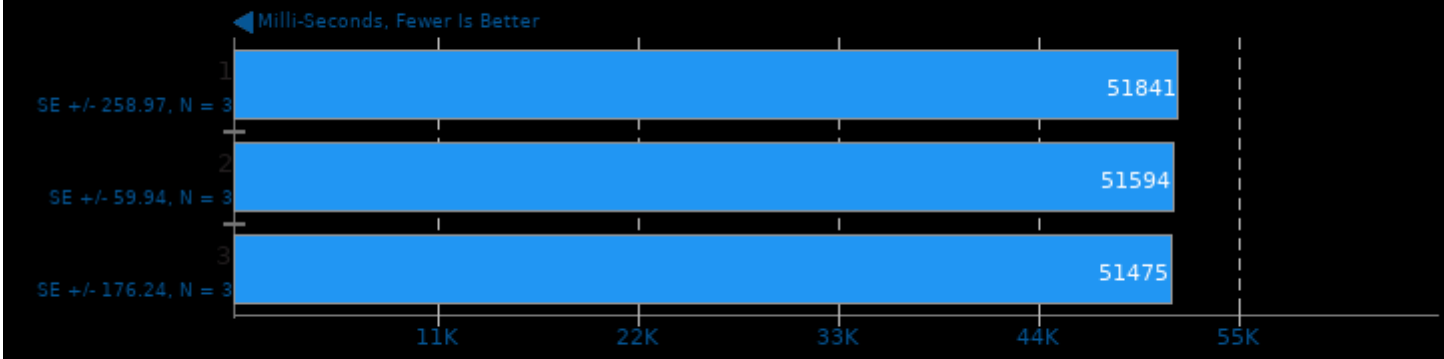
Water Benchmark



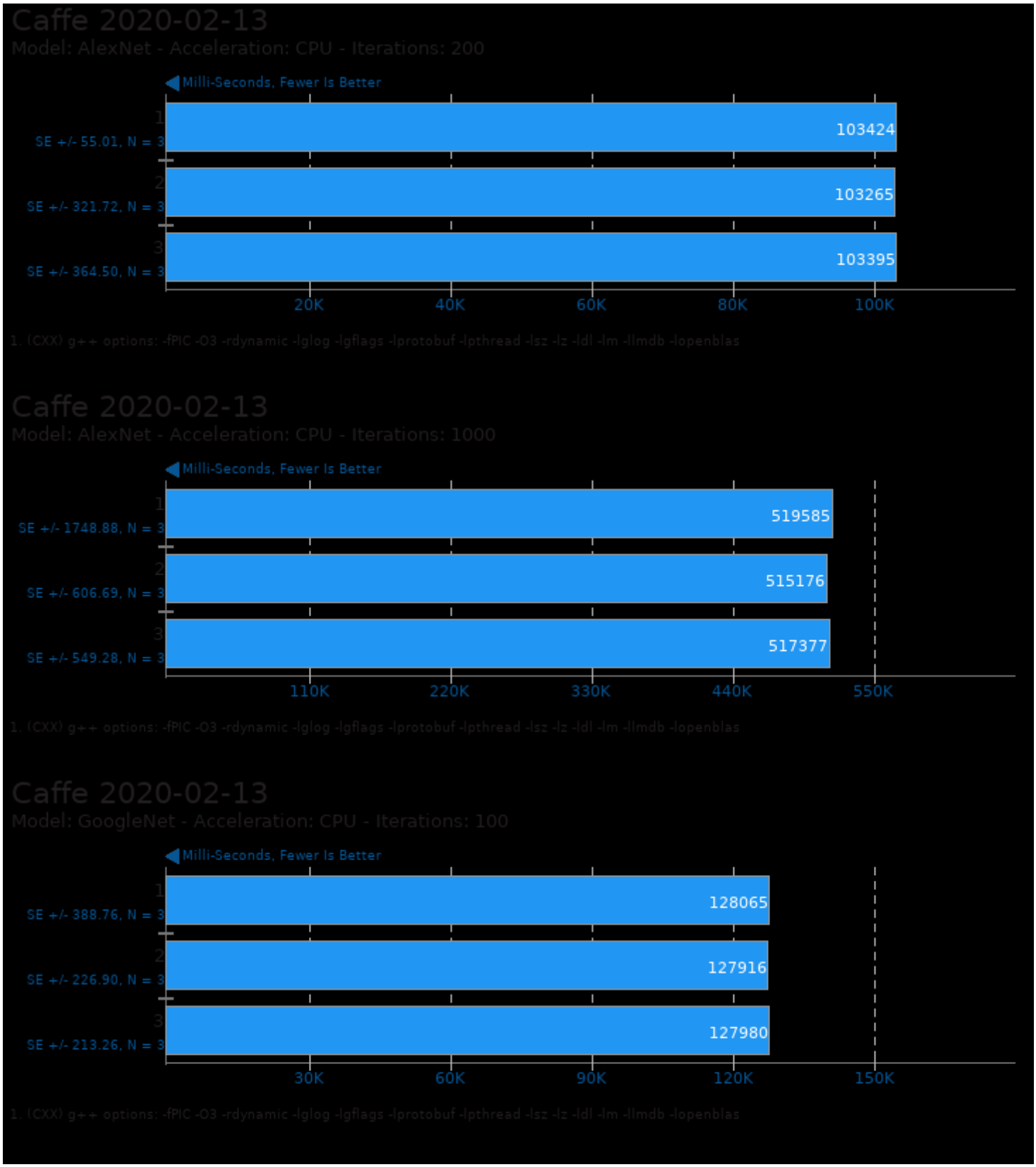
1. (CXX) g++ options: -O3 -pthread -lrt -lpthread -lm

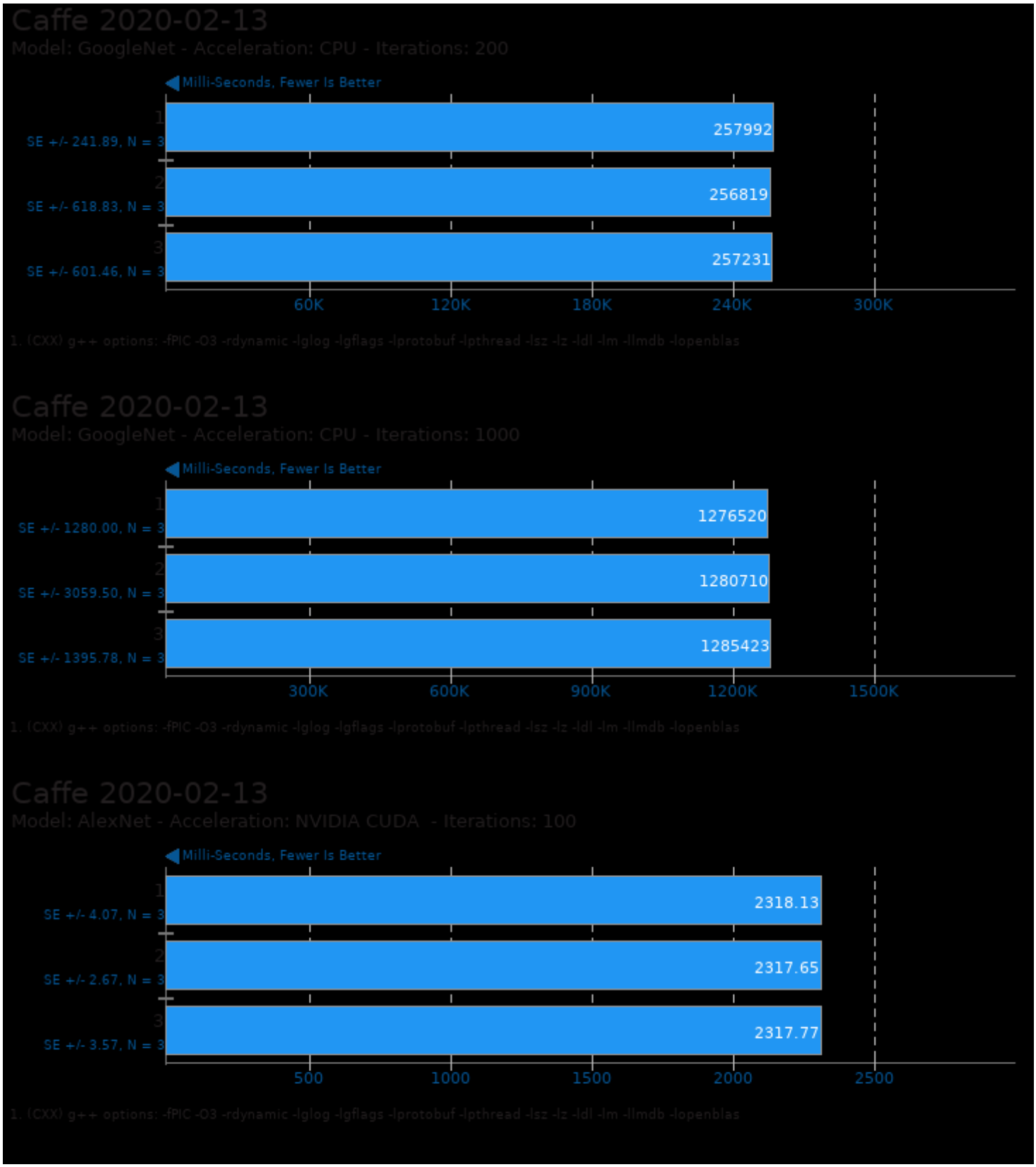
Caffe 2020-02-13

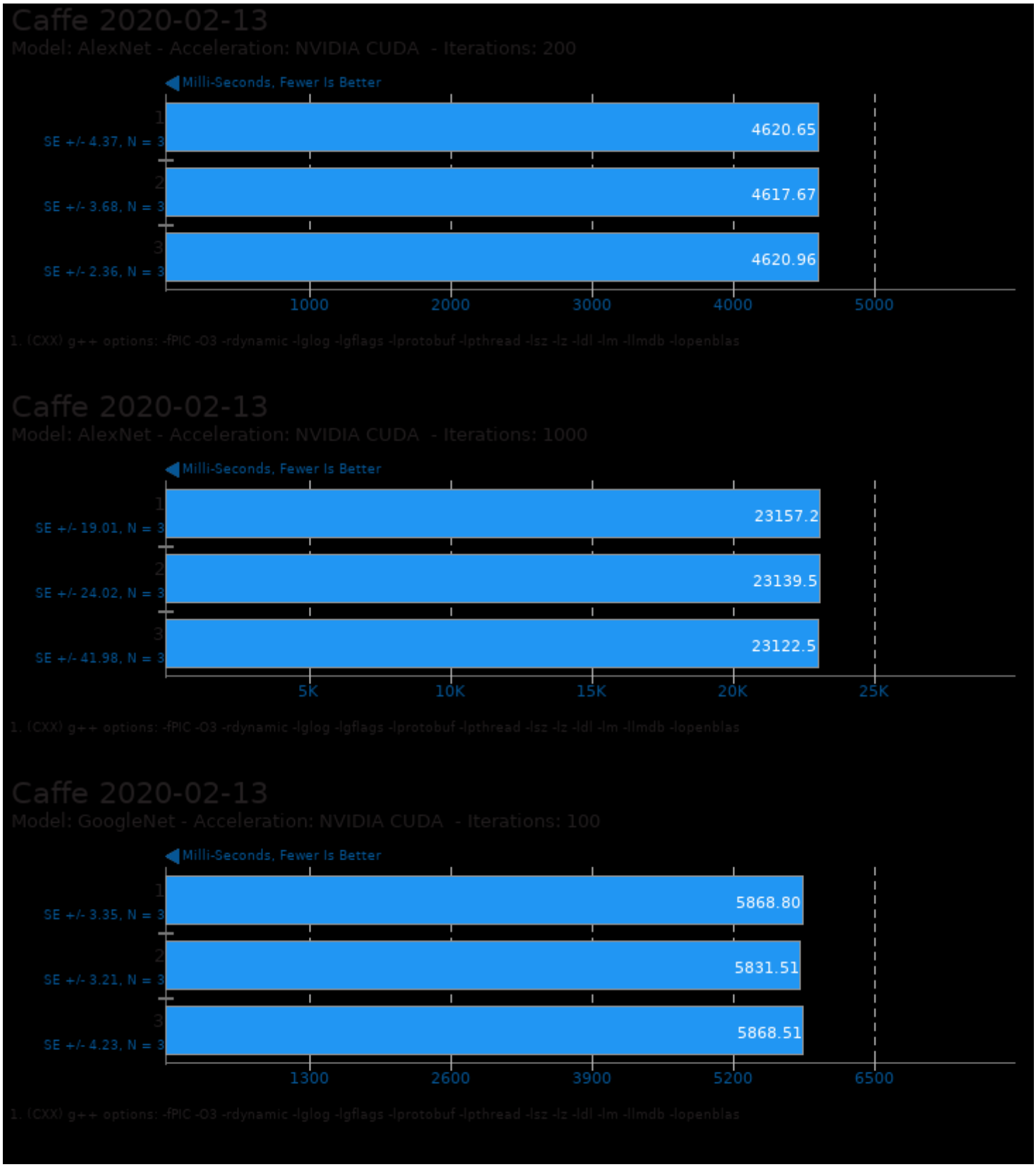
Model: AlexNet - Acceleration: CPU - Iterations: 100

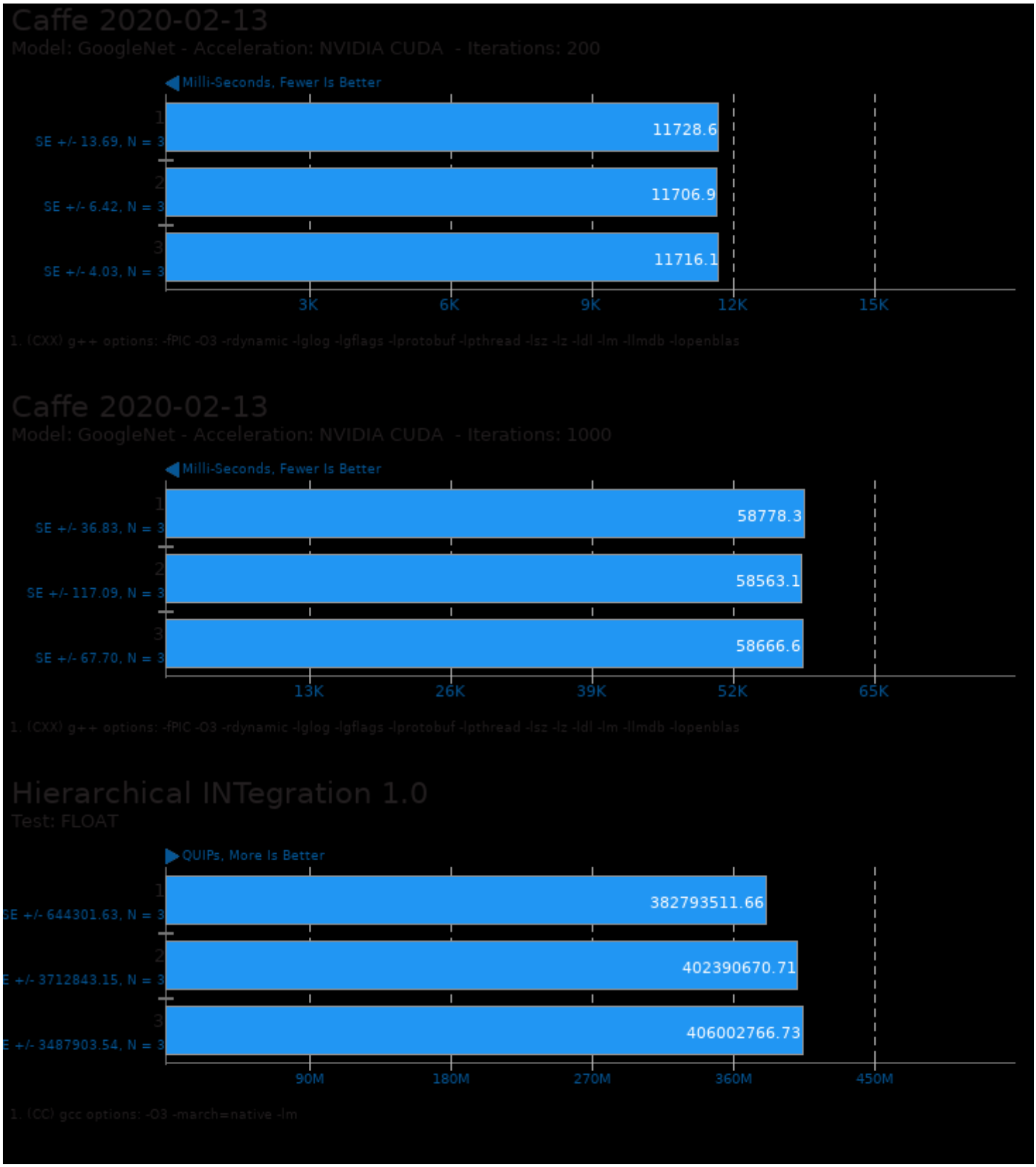


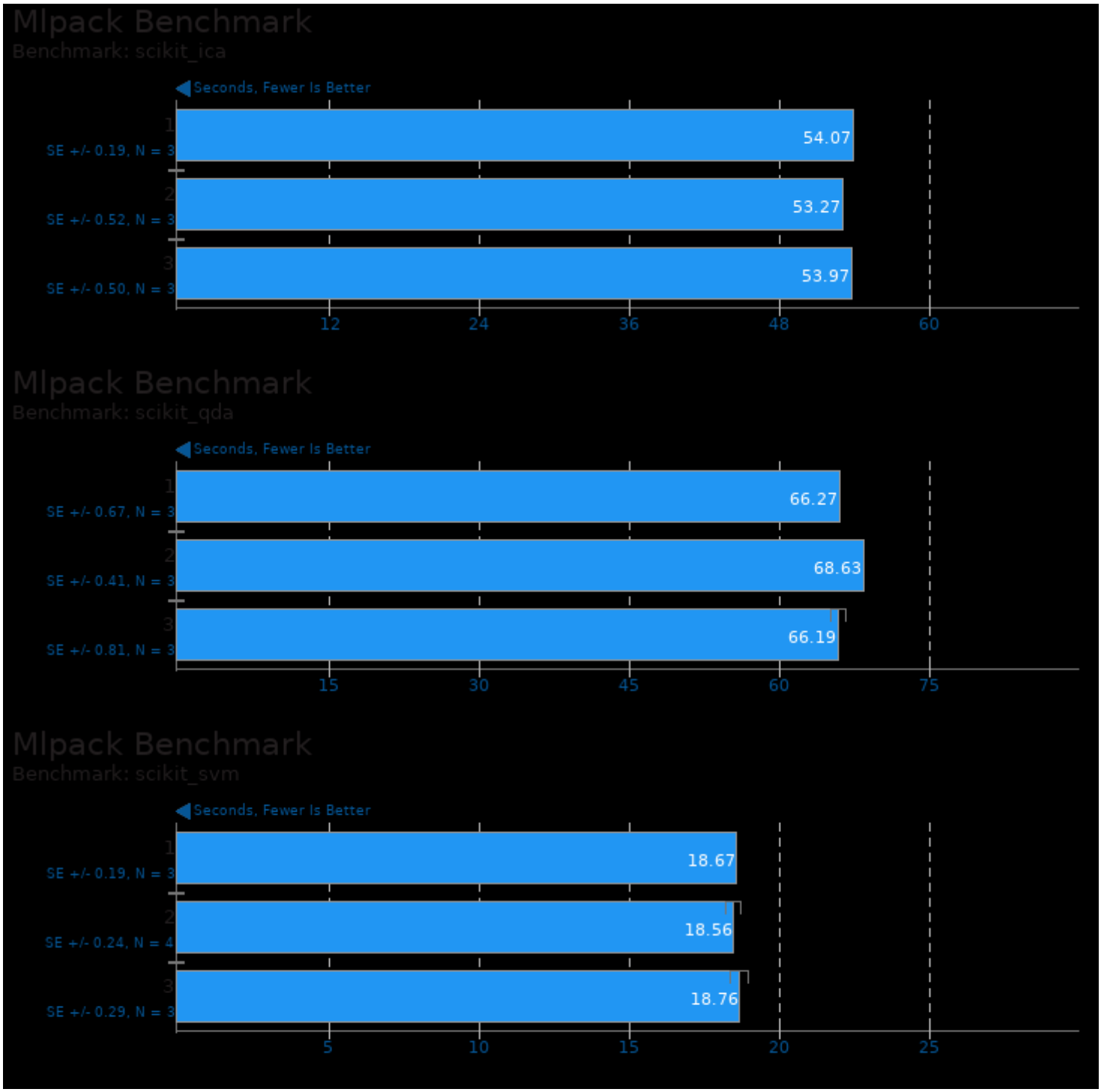
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas

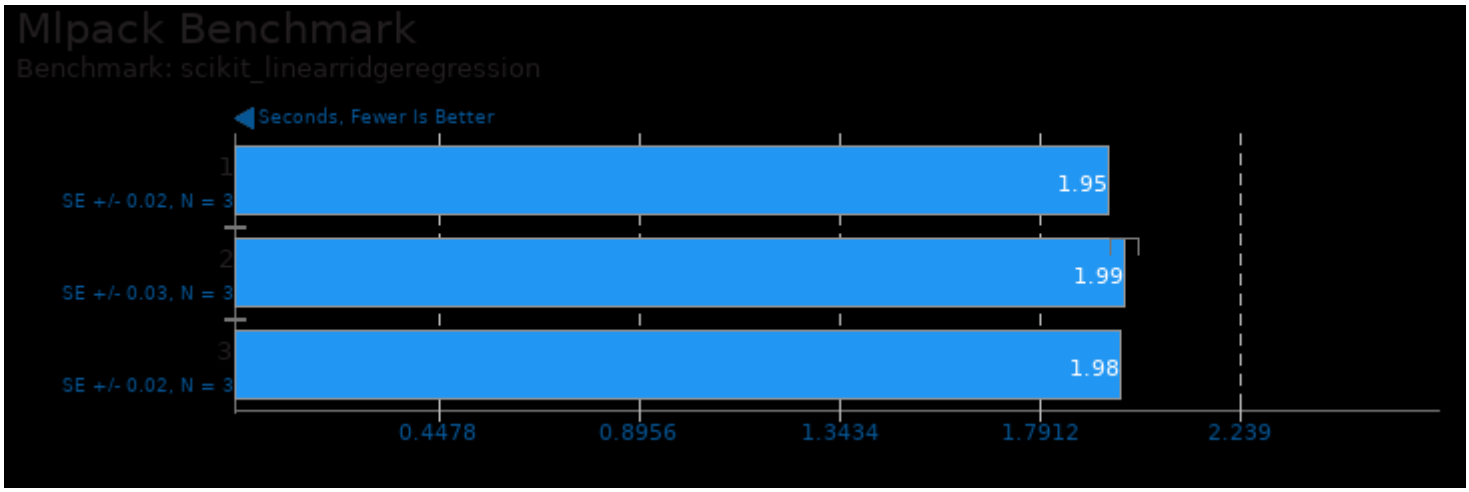

Caffe 2020-02-13
Model: AlexNet - Acceleration: CPU - Iterations: 200
Milli-Seconds, Fewer Is Better
1
SE +/- 55.01, N = 3
103424
2
SE +/- 321.72, N = 3
103265
3
SE +/- 364.50, N = 3
103395
20K
40K
60K
80K
100K
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas
Caffe 2020-02-13
Model: AlexNet - Acceleration: CPU - Iterations: 1000
Milli-Seconds, Fewer Is Better
1
SE +/- 1748.88, N = 3
519585
2
SE +/- 606.69, N = 3
515176
3
SE +/- 549.28, N = 3
517377
110K
220K
330K
440K
550K
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas
Caffe 2020-02-13
Model: GoogleNet - Acceleration: CPU - Iterations: 100
Milli-Seconds, Fewer Is Better
1
SE +/- 388.76, N = 3
128065
2
SE +/- 226.90, N = 3
127916
3
SE +/- 213.26, N = 3
127980
30K
60K
90K
120K
150K
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas


Caffe 2020-02-13
Model: GoogleNet - Acceleration: CPU - Iterations: 200
Milli-Seconds, Fewer Is Better
1
SE +/- 241.89, N = 3
257992
2
SE +/- 618.83, N = 3
256819
3
SE +/- 601.46, N = 3
257231
60K
120K
180K
240K
300K
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas
Caffe 2020-02-13
Model: GoogleNet - Acceleration: CPU - Iterations: 1000
Milli-Seconds, Fewer Is Better
1
SE +/- 1280.00, N = 3
1276520
2
SE +/- 3059.50, N = 3
1280710
3
SE +/- 1395.78, N = 3
1285423
300K
600K
900K
1200K
1500K
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas
Caffe 2020-02-13
Model: AlexNet - Acceleration: NVIDIA CUDA - Iterations: 100
Milli-Seconds, Fewer Is Better
1
SE +/- 4.07, N = 3
2318.13
2
SE +/- 2.67, N = 3
2317.65
3
SE +/- 3.57, N = 3
2317.77
500
1000
1500
2000
2500
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas


Caffe 2020-02-13
Model: AlexNet - Acceleration: NVIDIA CUDA - Iterations: 200
Milli-Seconds, Fewer Is Better
1
SE +/- 4.37, N = 3
4620.65
2
SE +/- 3.68, N = 3
4617.67
3
SE +/- 2.36, N = 3
4620.96
1000
2000
3000
4000
5000
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas
Caffe 2020-02-13
Model: AlexNet - Acceleration: NVIDIA CUDA - Iterations: 1000
Milli-Seconds, Fewer Is Better
1
SE +/- 19.01, N = 3
23157.2
2
SE +/- 24.02, N = 3
23139.5
3
SE +/- 41.98, N = 3
23122.5
5K
10K
15K
20K
25K
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas
Caffe 2020-02-13
Model: GoogleNet - Acceleration: NVIDIA CUDA - Iterations: 100
Milli-Seconds, Fewer Is Better
1
SE +/- 3.35, N = 3
5868.80
2
SE +/- 3.21, N = 3
5831.51
3
SE +/- 4.23, N = 3
5868.51
1300
2600
3900
5200
6500
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas


Caffe 2020-02-13
Model: GoogleNet - Acceleration: NVIDIA CUDA - Iterations: 200
Milli-Seconds, Fewer Is Better
1
SE +/- 13.69, N = 3
11728.6
2
SE +/- 6.42, N = 3
11706.9
3
SE +/- 4.03, N = 3
11716.1
3K
6K
9K
12K
15K
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas
Caffe 2020-02-13
Model: GoogleNet - Acceleration: NVIDIA CUDA - Iterations: 1000
Milli-Seconds, Fewer Is Better
1
SE +/- 36.83, N = 3
58778.3
2
SE +/- 117.09, N = 3
58563.1
3
SE +/- 67.70, N = 3
58666.6
13K
26K
39K
52K
65K
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas
Hierarchical INTegration 1.0
Test: FLOAT
QUIPs, More Is Better
1
SE +/- 644301.63, N = 3
382793511.66
2
E +/- 3712843.15, N = 3
402390670.71
3
E +/- 3487903.54, N = 3
406002766.73
90M
180M
270M
360M
450M
1. (CC) gcc options: -O3 -march=native -lm

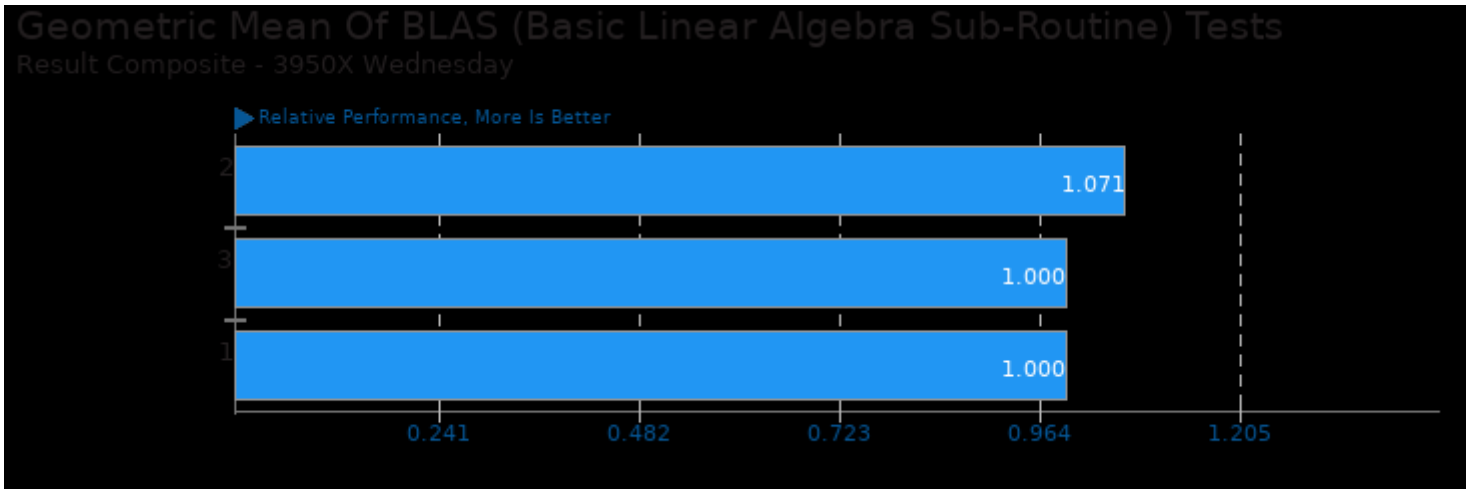

Mlpack Benchmark
Benchmark: scikit_ica
Seconds, Fewer Is Better
1
SE +/- 0.19, N = 3
54.07
2
SE +/- 0.52, N = 3
53.27
3
SE +/- 0.50, N = 3
53.97
12
24
36
48
60
Mlpack Benchmark
Benchmark: scikit_qda
Seconds, Fewer Is Better
1
SE +/- 0.67, N = 3
66.27
2
SE +/- 0.41, N = 3
68.63
3
SE +/- 0.81, N = 3
66.19
15
30
45
60
75
Mlpack Benchmark
Benchmark: scikit_svm
Seconds, Fewer Is Better
1
SE +/- 0.19, N = 3
18.67
2
SE +/- 0.24, N = 4
18.56
3
SE +/- 0.29, N = 3
18.76
5
10
15
20
25


Mlpack Benchmark
Benchmark: scikit_linearridgeregression
Seconds, Fewer Is Better
1
SE +/- 0.02, N = 3
1.95
2
SE +/- 0.03, N = 3
1.99
3
SE +/- 0.02, N = 3
1.98
0.4478
0.8956
1.3434
1.7912
2.239

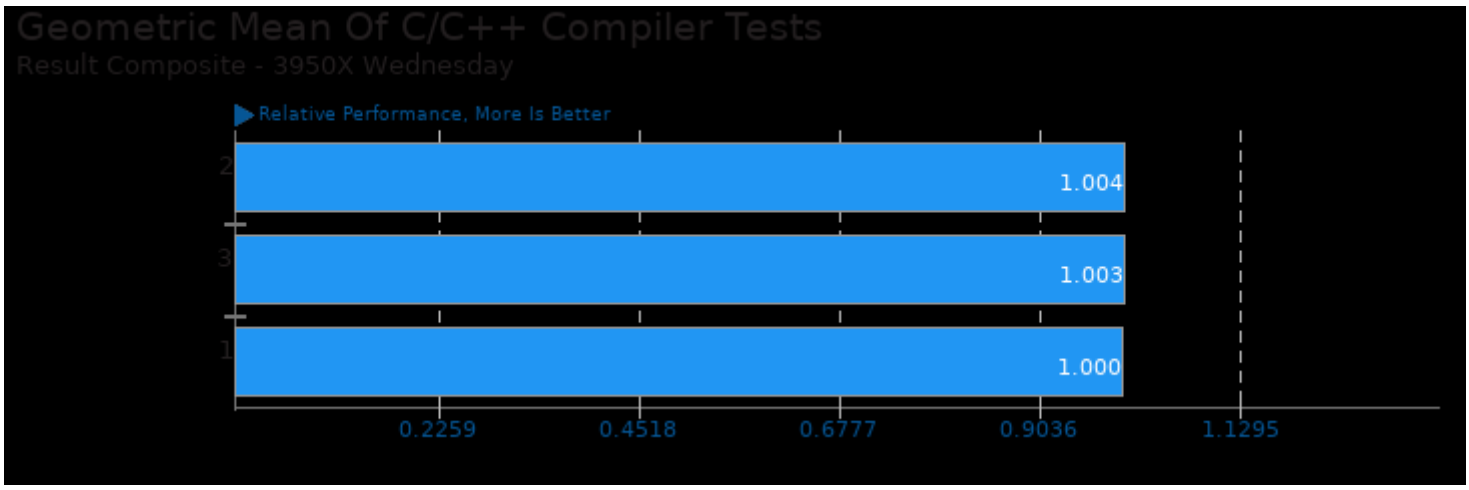
These geometric means are based upon test groupings / test suites for this result file.



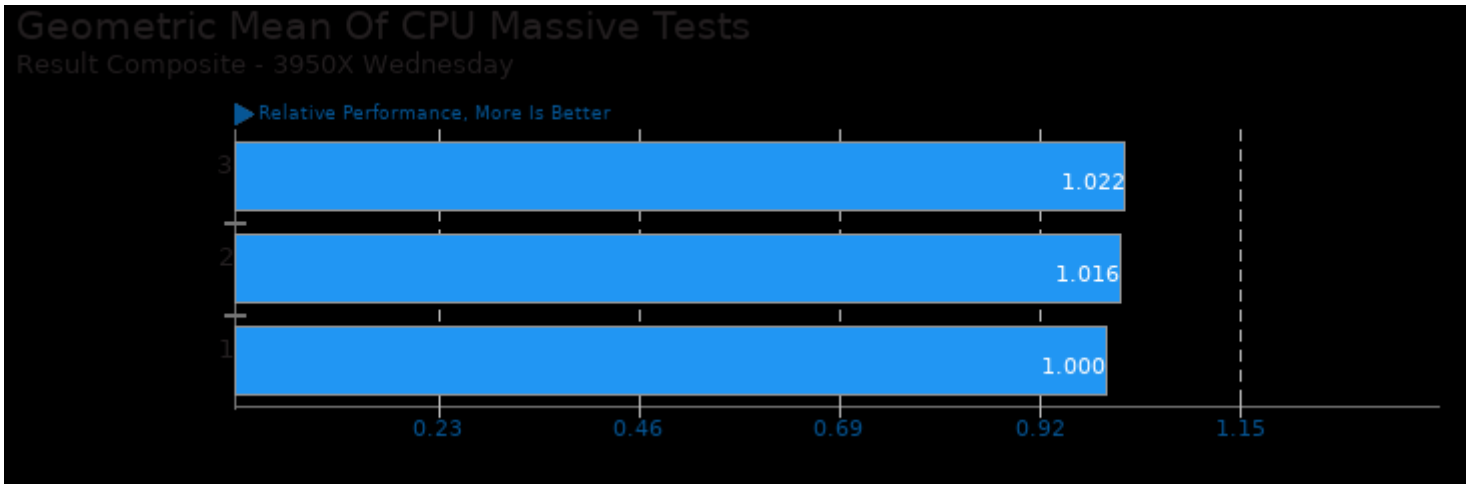
Geometric mean based upon tests: pts/hmmer and pts/mafft



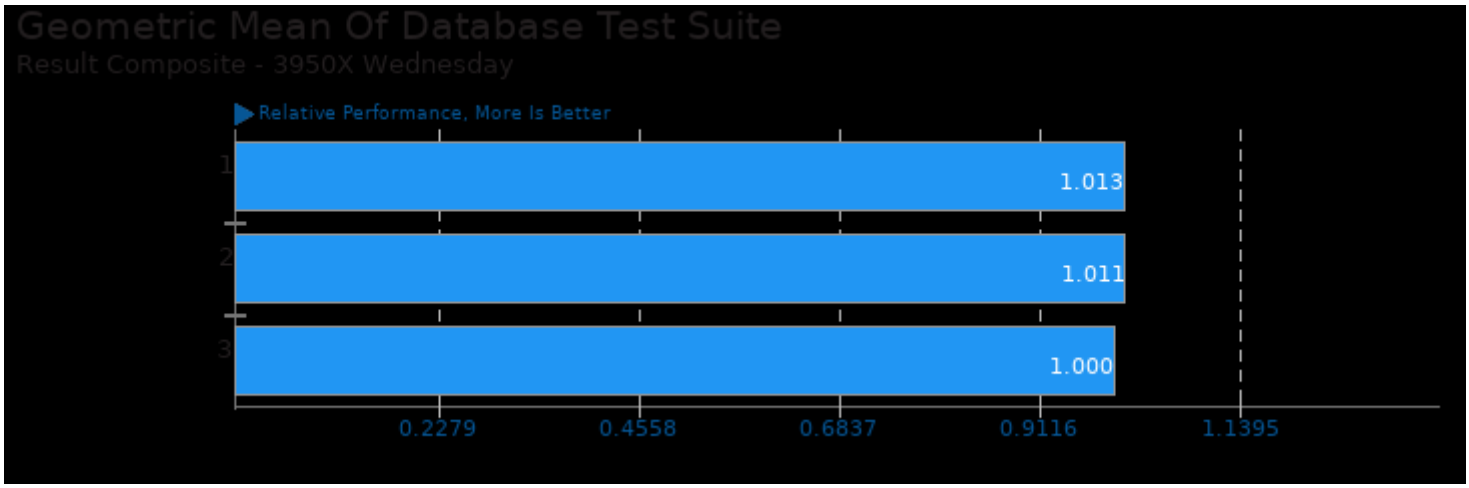
Geometric mean based upon tests: pts/lczero and pts/caffe



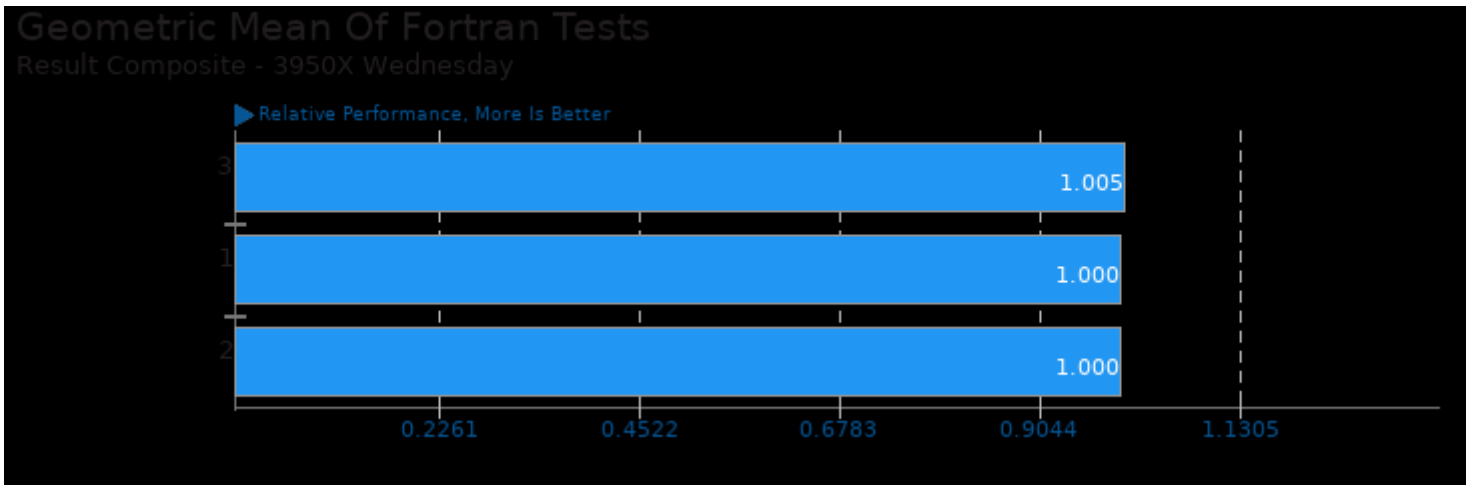
Geometric mean based upon tests: pts/mafft, pts/hmmer, pts/gromacs and pts/keydb



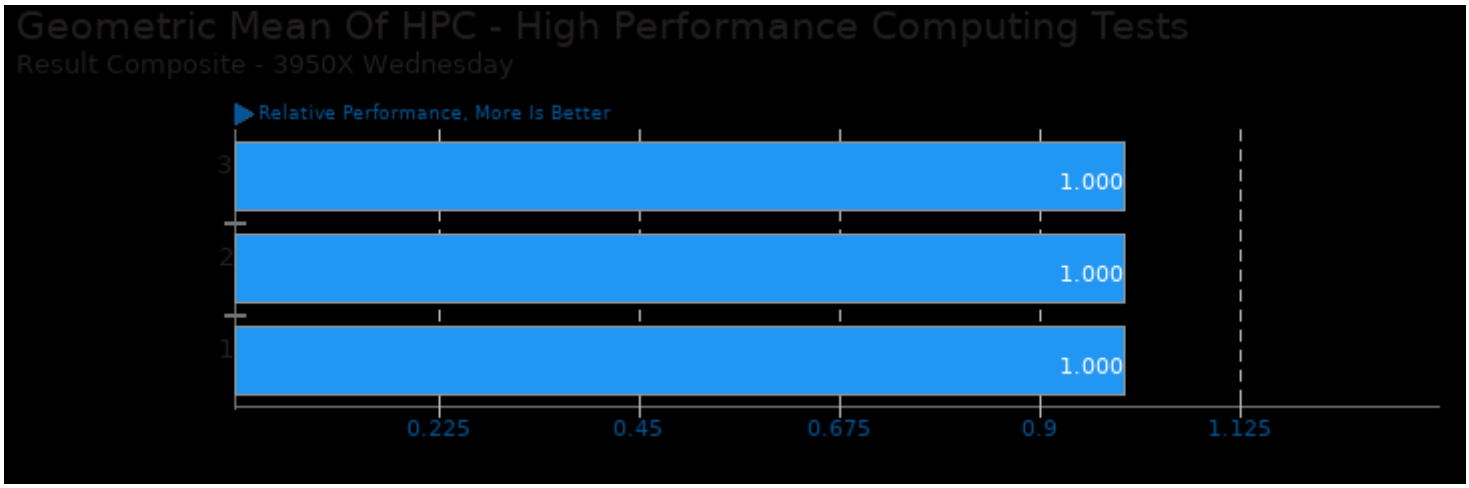
Geometric mean based upon tests: pts/dolfyn, pts/hint, pts/hmmer, pts/lczero and pts/mafft



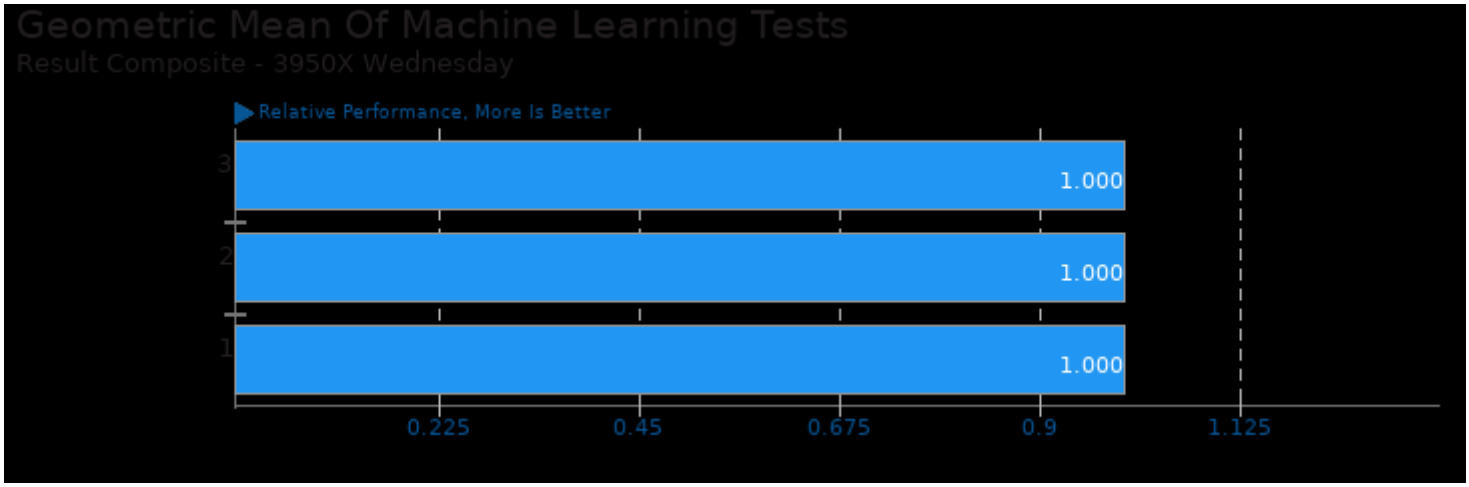
Geometric mean based upon tests: pts/keydb and pts/couchdb



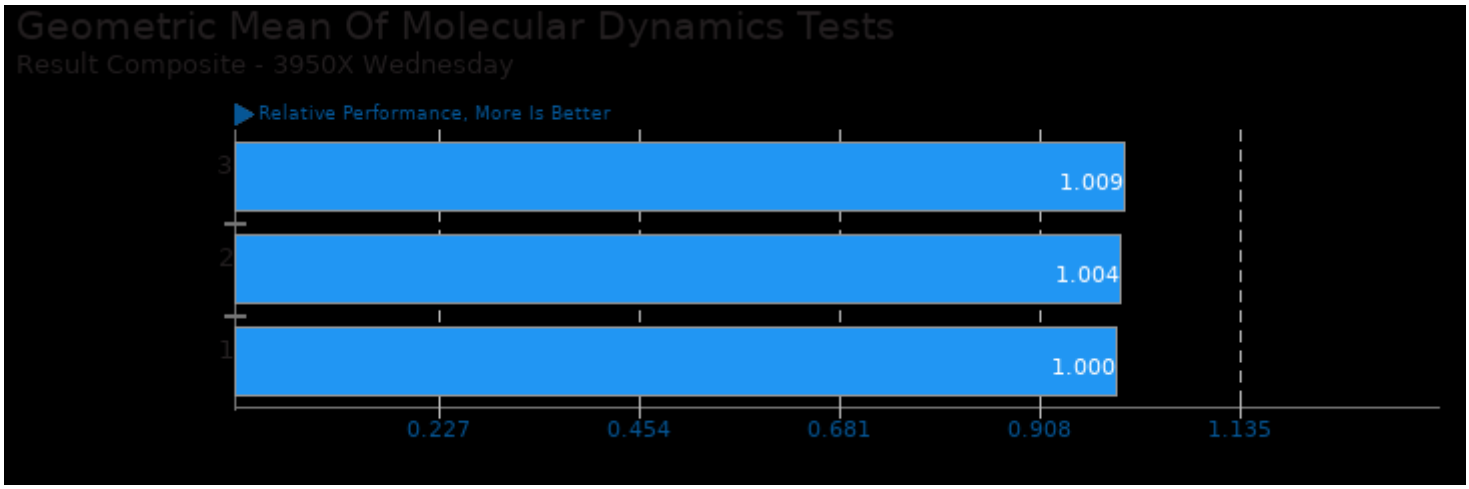
Geometric mean based upon tests: pts/dolfyn and pts/ffte



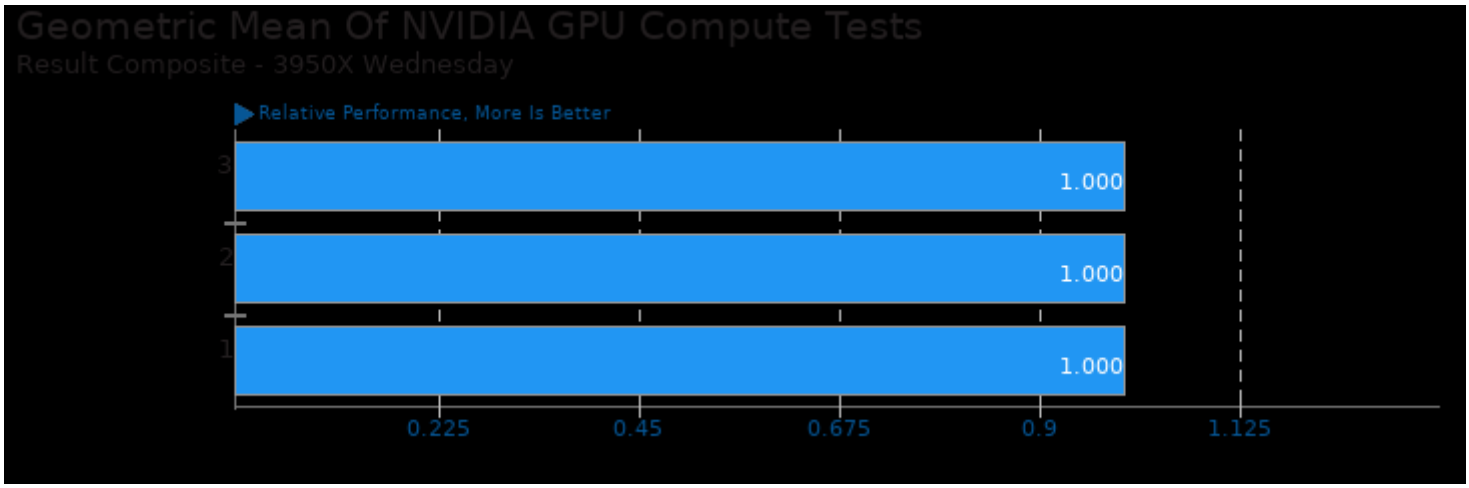
Geometric mean based upon tests: pts/ffte, pts/gromacs, pts/dolfyn, pts/hmmer, pts/mafft, pts/caffe, pts/mlpack and pts/lczero



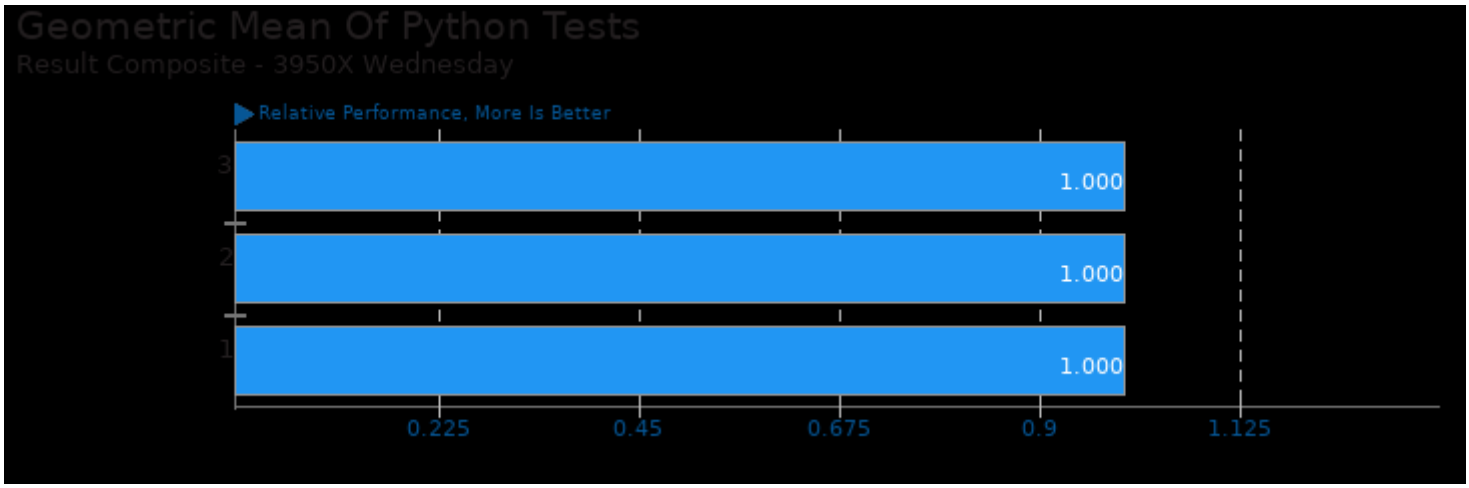
Geometric mean based upon tests: pts/caffe, pts/mlpack and pts/lczero



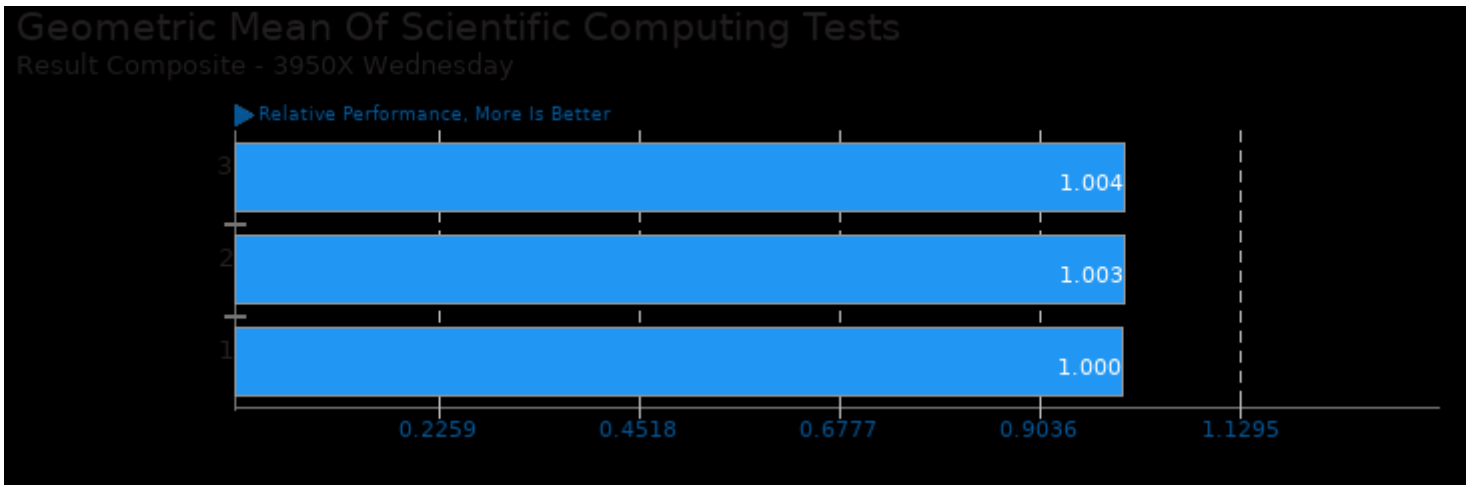
Geometric mean based upon tests: pts/gromacs and pts/dolfyn



Geometric mean based upon tests: pts/gromacs, pts/lczero, pts/caffe and pts/vkfft

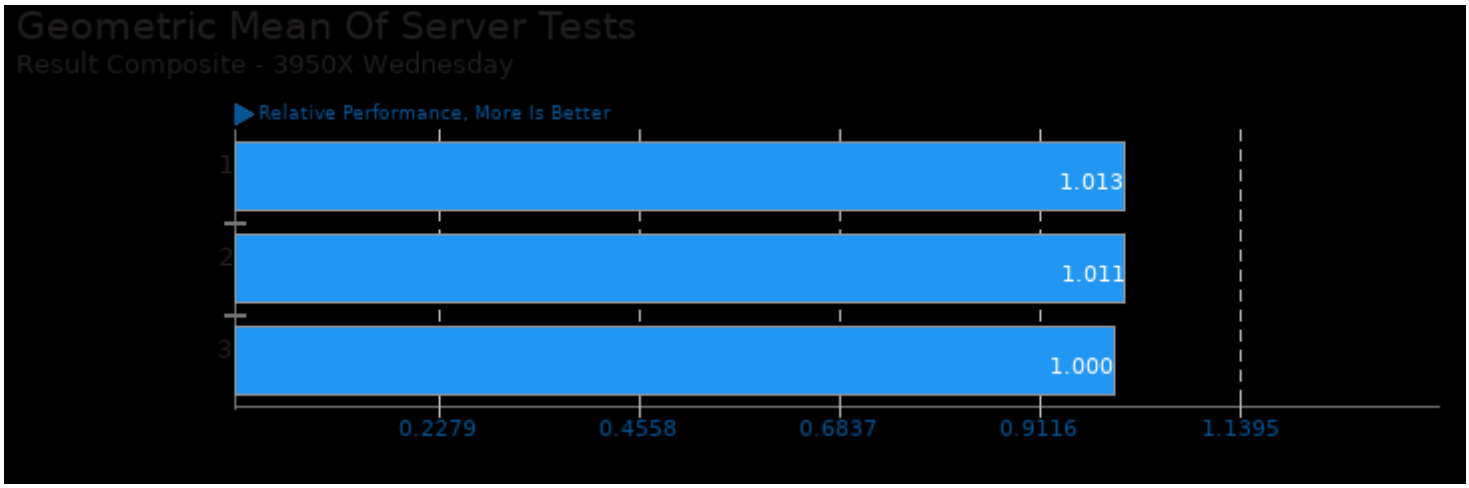


Geometric mean based upon tests: pts/caffe and pts/mlpack

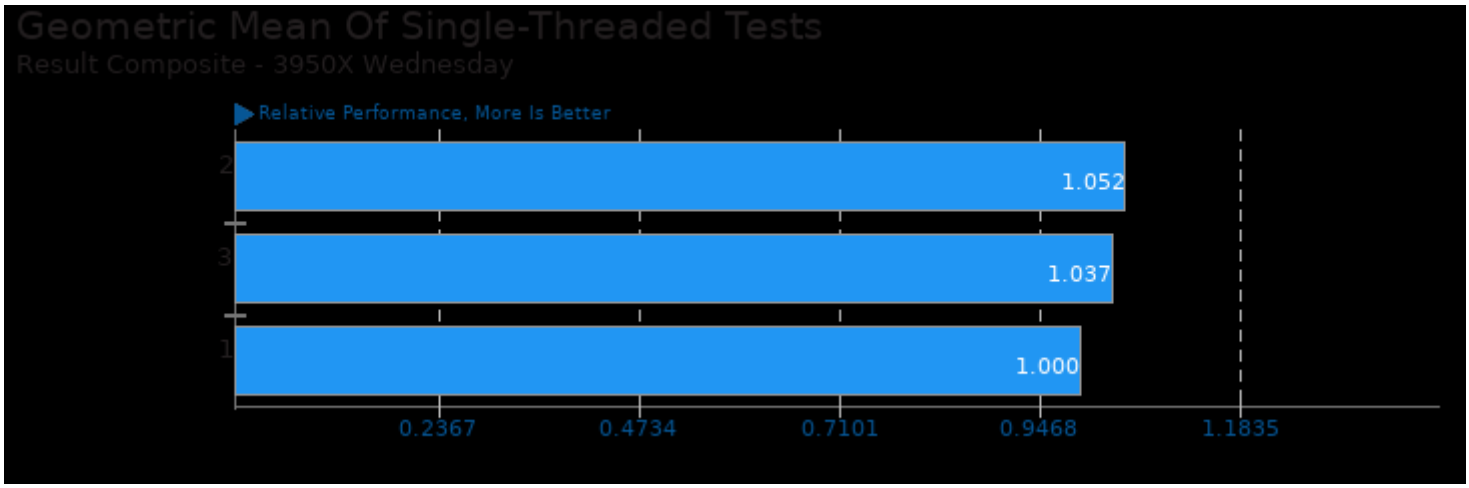


Geometric mean based upon tests: pts/ffte, pts/gromacs, pts/dolfyn, pts/hmmer and pts/mafft

3950X Wednesday



Geometric mean based upon tests: pts/keydb and pts/couchdb



Geometric mean based upon tests: pts/byte and pts/hint

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 20:30.