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EPYC 7F52 Mon

AMD EPYC 7F52 16-Core testing with a Supermicro H11DSi-NT v2.00 (2.1 BIOS) and llvmpipe on Ubuntu 20.04 via the Phoronix Test Suite.

Automated Executive Summary

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

Based on the geometric mean of all complete results, the fastest (3) was 1.003x the speed of the slowest (1). 2 was 0.998x the speed of 3 and 1 was 0.999x the speed of 2.

Test Systems:

1

2

3

Processor: AMD EPYC 7F52 16-Core @ 3.50GHz (16 Cores / 32 Threads), Motherboard: Supermicro H11DSi-NT v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 64GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe, Monitor: VE228

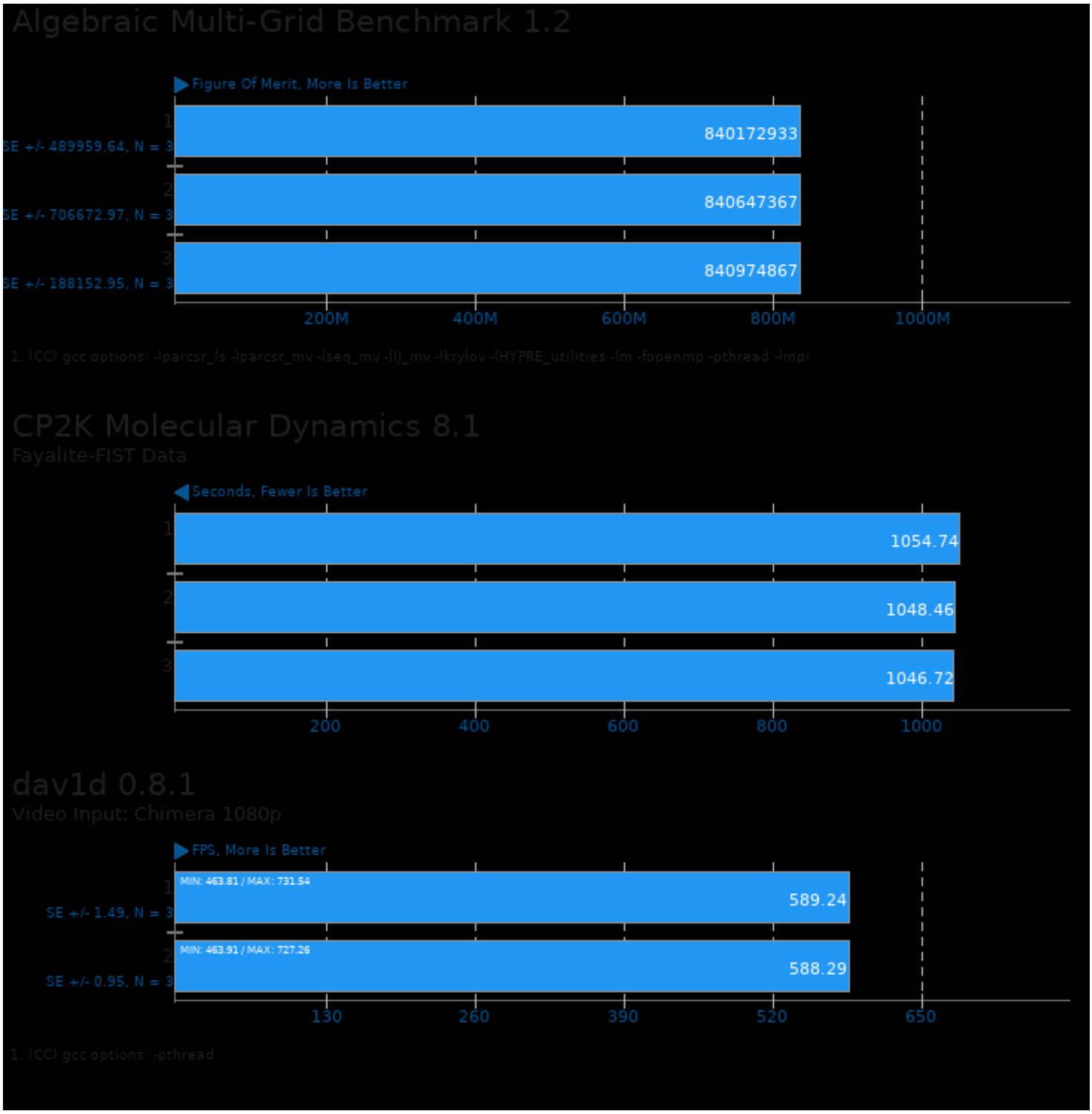
OS: Ubuntu 20.04, Kernel: 5.10.3-051003-generic (x86_64), Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, OpenGL: 3.3 Mesa 20.0.4 (LLVM 9.0.1 128 bits), Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

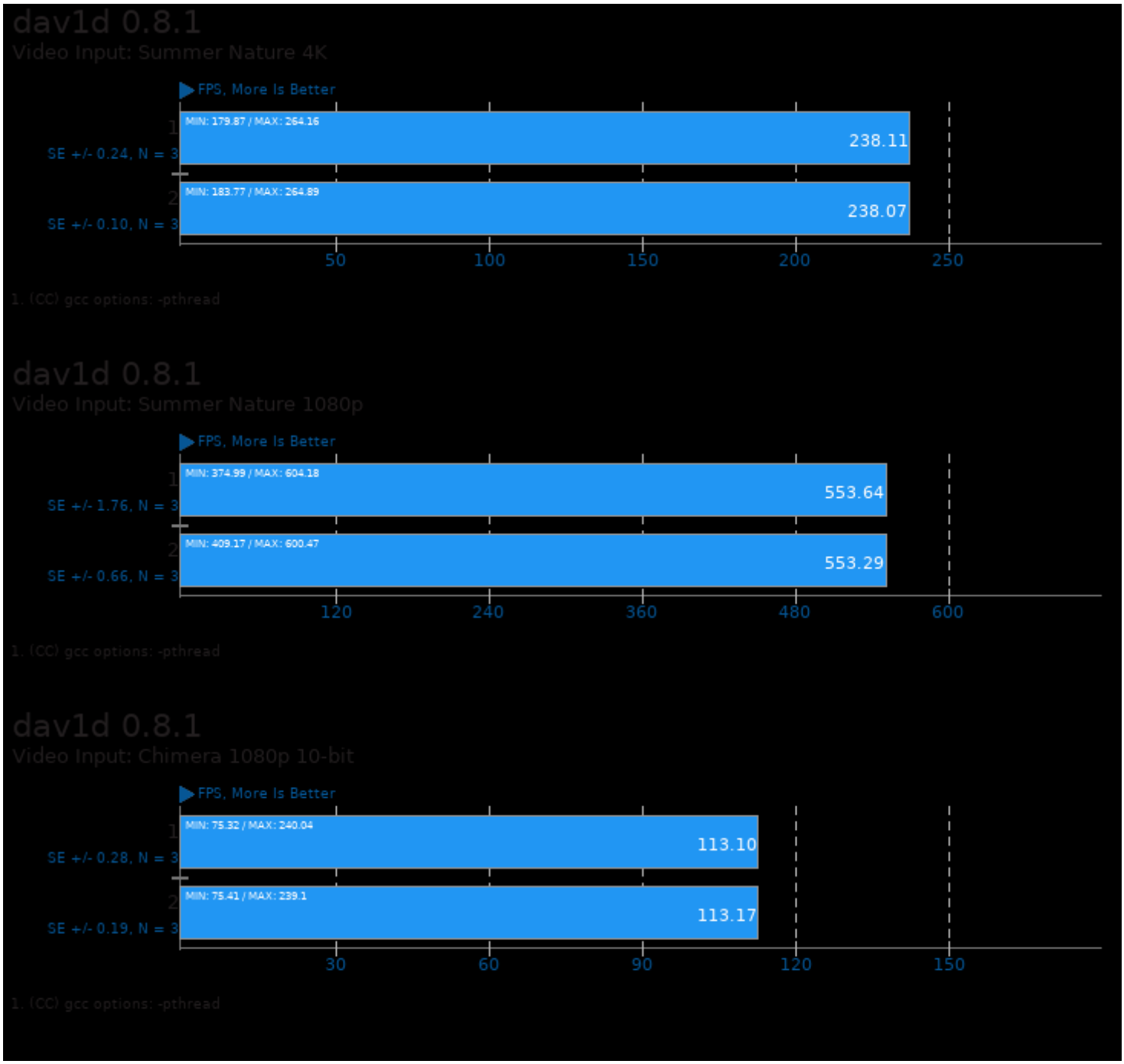
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --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 (Boost: Enabled) - CPU Microcode: 0x8301034
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 IBRS_FW STIBP: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

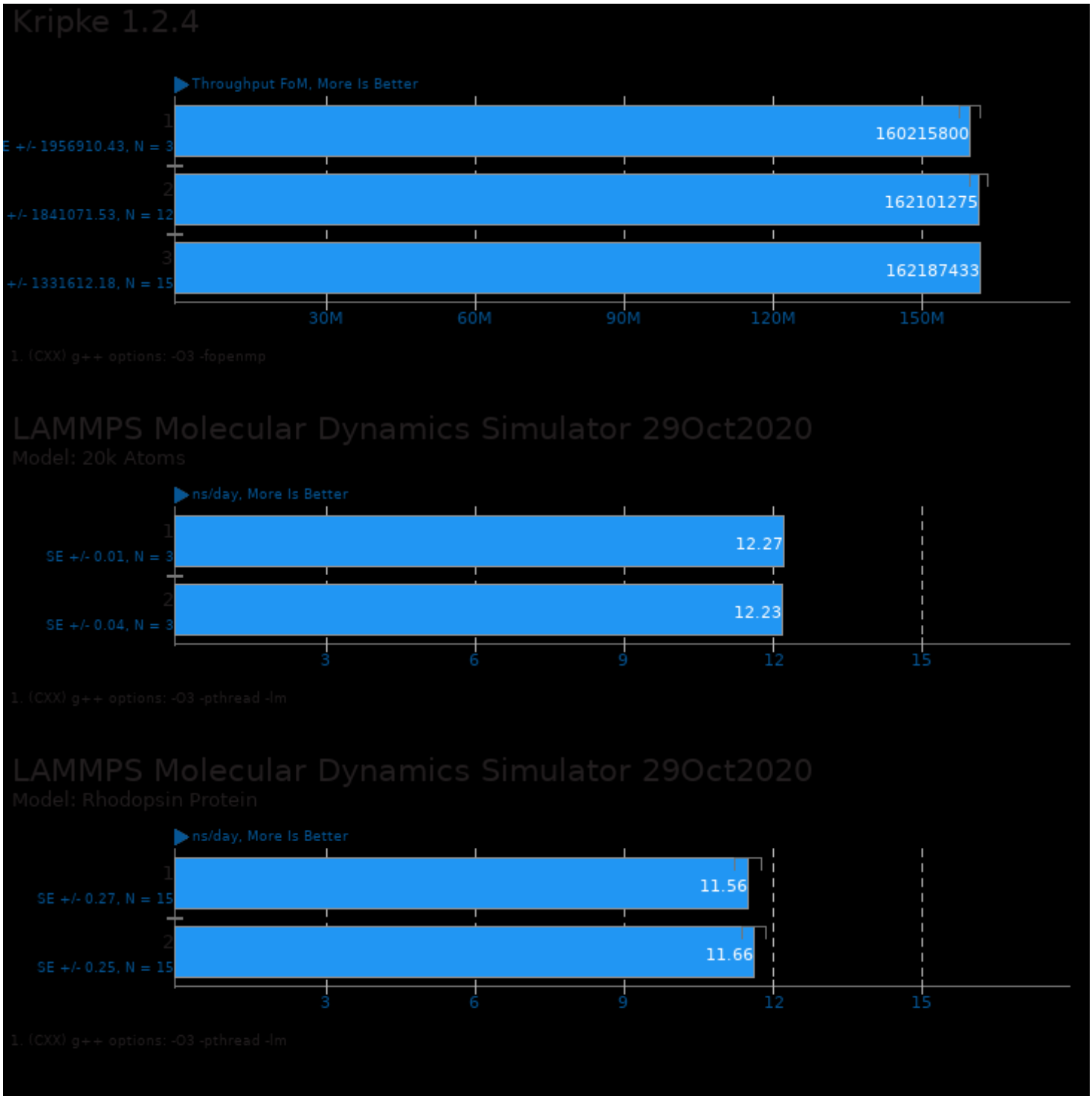
	1	2	3
Algebraic Multi-Grid Benchmark (Figure Of Merit)	**840172933**	840647367	**840974867**
Normalized	99.9%	99.96%	100%
Standard Deviation	0.1%	0.1%	0%
CP2K Molecular Dynamics - Fayalite-FIST Data (sec)	**1055**	1048	**1047**
Normalized	99.24%	99.83%	100%
dav1d - Chimera 1080p (FPS)	**589.24**	**588.29**	
Normalized	100%	99.84%	
Standard Deviation	0.4%	0.3%	
dav1d - Summer Nature 4K (FPS)	**238.11**	**238.07**	
Normalized	100%	99.98%	
Standard Deviation	0.2%	0.1%	
dav1d - S.N.1 (FPS)	**553.64**	**553.29**	
Normalized	100%	99.94%	
Standard Deviation	0.6%	0.2%	
dav1d - C.1.1.b (FPS)	**113.10**	**113.17**	
Normalized	99.94%	100%	
Standard Deviation	0.4%	0.3%	
Kripke (Throughput FoM)	**160215800**	162101275	**162187433**
Normalized	98.78%	99.95%	100%
Standard Deviation	2.1%	3.9%	3.2%
LAMMPS Molecular Dynamics Simulator - 20k Atoms (ns/day)	**12.270**	**12.232**	
Normalized	100%	99.69%	
Standard Deviation	0.1%	0.5%	
LAMMPS Molecular Dynamics Simulator - Rhodopsin Protein (ns/day)	**11.557**	**11.655**	
Normalized	99.16%	100%	
Standard Deviation	9%	8.4%	
LULESH (z/s)	**396.84667**	**396.87227**	

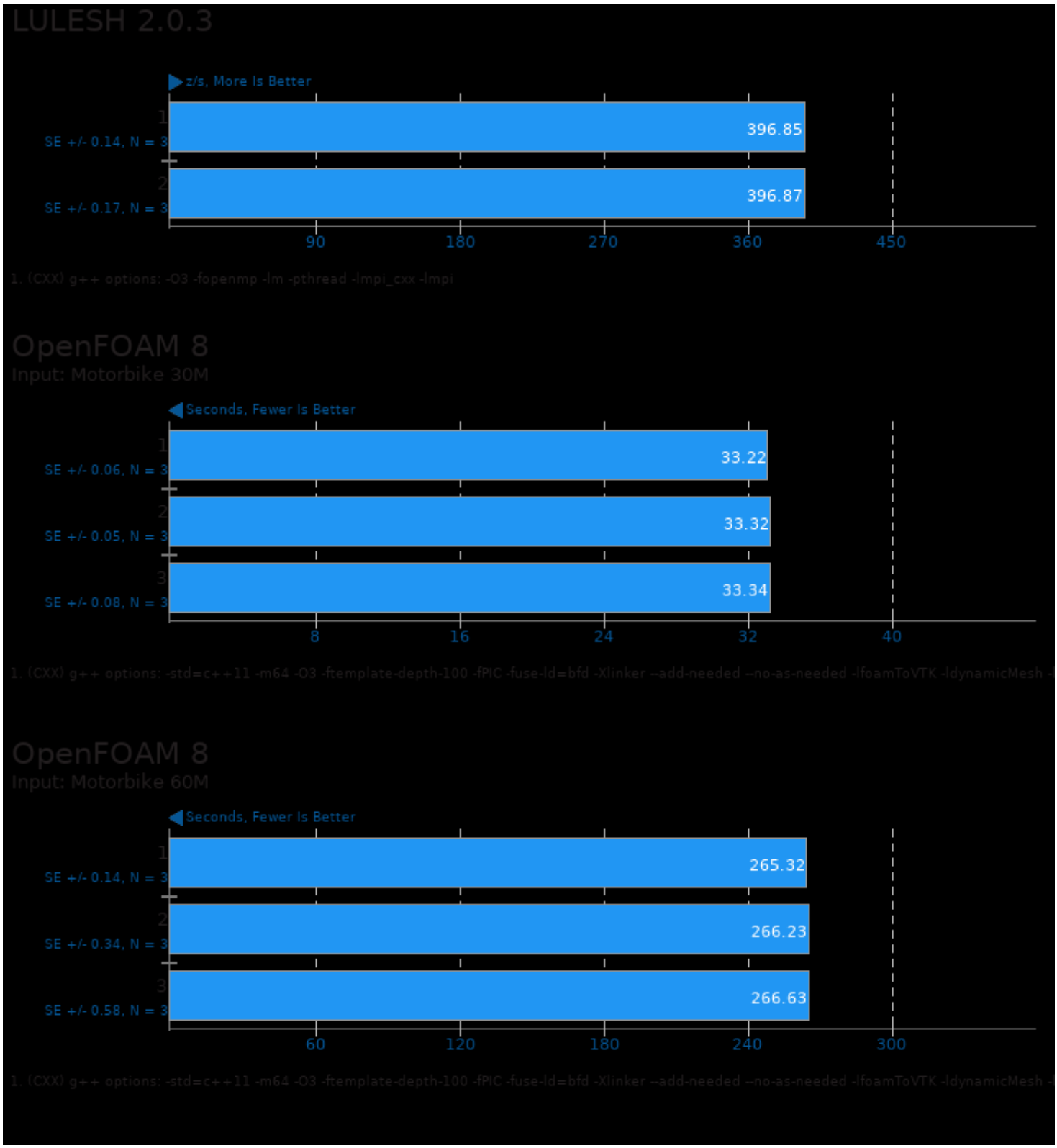
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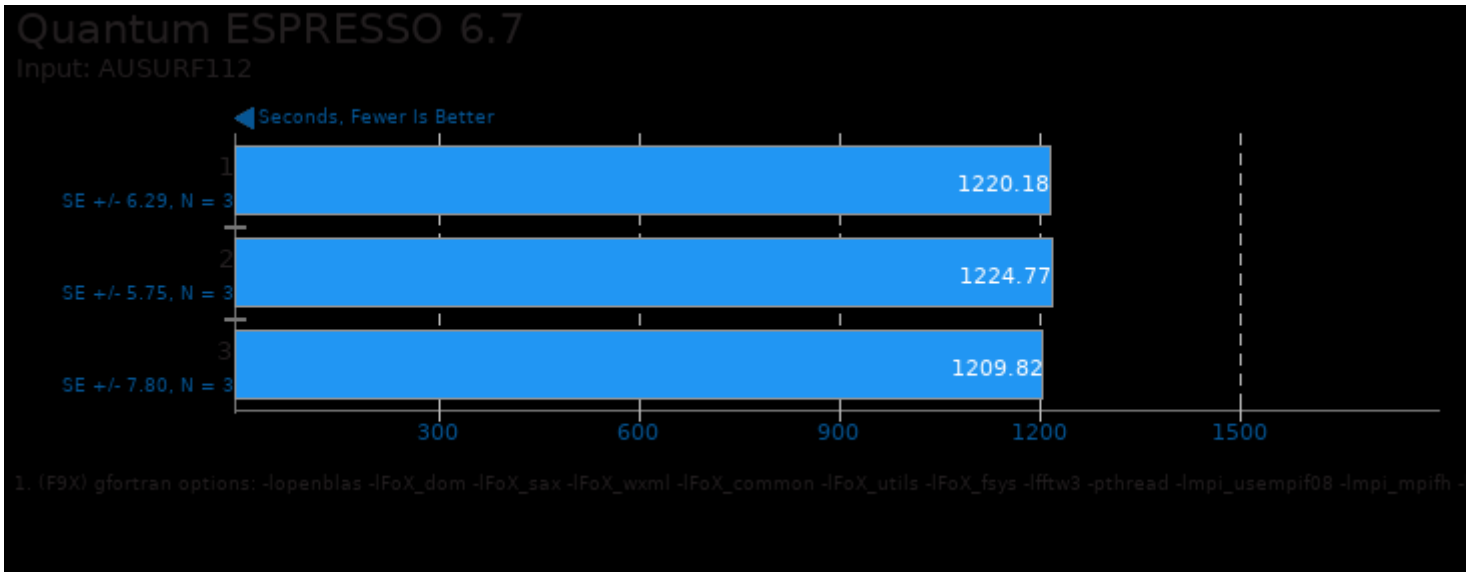
Normalized	99.99%	100%	
Standard Deviation	0.1%	0.1%	
OpenFOAM - Motorbike 30M (sec)	**33.22**	33.32	**33.34**
Normalized	100%	99.7%	99.64%
Standard Deviation	0.3%	0.3%	0.4%
OpenFOAM - Motorbike 60M (sec)	**265.32**	266.23	**266.63**
Normalized	100%	99.66%	99.51%
Standard Deviation	0.1%	0.2%	0.4%
Quantum ESPRESSO - AUSURF112 (sec)	1220	**1225**	**1210**
Normalized	99.15%	98.78%	100%
Standard Deviation	0.9%	0.8%	1.1%


Algebraic Multi-Grid Benchmark 1.2
Figure Of Merit, More Is Better
1
840172933
SE +/- 489959.64, N = 3
2
840647367
SE +/- 706672.97, N = 3
3
840974867
SE +/- 188152.95, N = 3
200M
400M
600M
800M
1000M
1. (CC) gcc options: -lparcsr_ls -lparcsr_mv -lseq_mv -lIJ_mv -lkrylov -lHYPRE_utilities -lm -fopenmp -pthread -lmpi
CP2K Molecular Dynamics 8.1
Fayalite-FIST Data
Seconds, Fewer Is Better
1
1054.74
2
1048.46
3
1046.72
200
400
600
800
1000
dav1d 0.8.1
Video Input: Chimera 1080p
FPS, More Is Better
1
MIN: 463.81 / MAX: 731.54
589.24
SE +/- 1.49, N = 3
2
MIN: 463.91 / MAX: 727.26
588.29
SE +/- 0.95, N = 3
130
260
390
520
650
1. (CC) gcc options: -pthread


dav1d 0.8.1
Video Input: Summer Nature 4K
FPS, More Is Better
1
MIN: 179.87 / MAX: 264.16
238.11
SE +/- 0.24, N = 3
2
MIN: 183.77 / MAX: 264.89
238.07
SE +/- 0.10, N = 3
50
100
150
200
250
1. (CC) gcc options: -pthread
dav1d 0.8.1
Video Input: Summer Nature 1080p
FPS, More Is Better
1
MIN: 374.99 / MAX: 604.18
553.64
SE +/- 1.76, N = 3
2
MIN: 409.17 / MAX: 600.47
553.29
SE +/- 0.66, N = 3
120
240
360
480
600
1. (CC) gcc options: -pthread
dav1d 0.8.1
Video Input: Chimera 1080p 10-bit
FPS, More Is Better
1
MIN: 75.32 / MAX: 240.04
113.10
SE +/- 0.28, N = 3
2
MIN: 75.41 / MAX: 239.1
113.17
SE +/- 0.19, N = 3
30
60
90
120
150
1. (CC) gcc options: -pthread

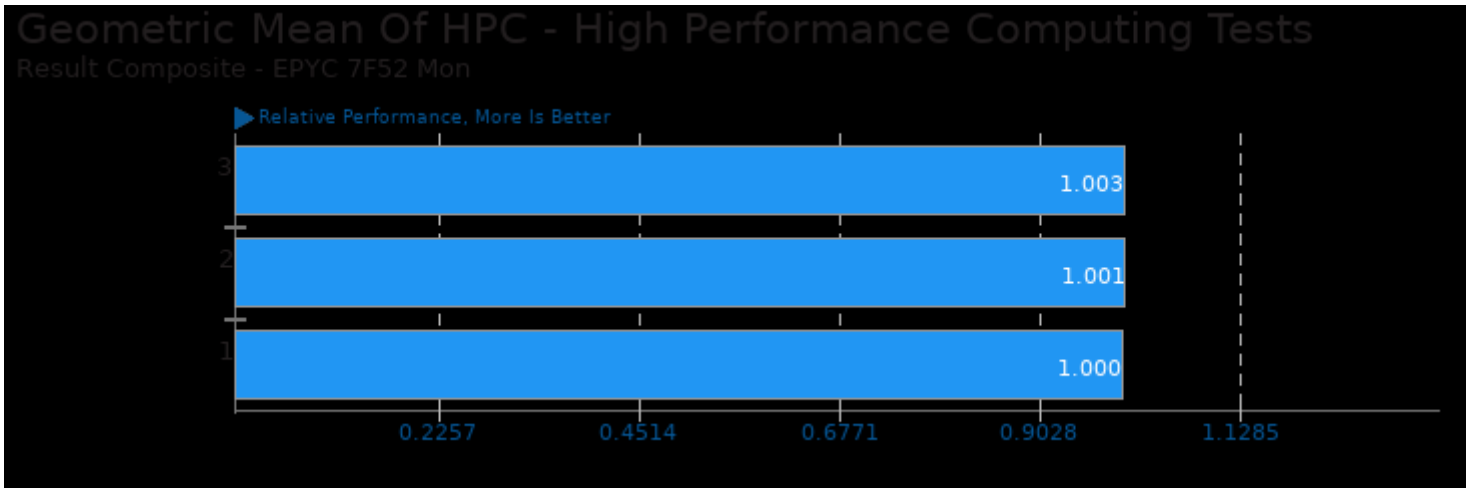

Kripke 1.2.4
Throughput FoM, More Is Better
1
E +/- 1956910.43, N = 3
160215800
2
+/- 1841071.53, N = 12
162101275
3
+/- 1331612.18, N = 15
162187433
30M
60M
90M
120M
150M
1. (CXX) g++ options: -O3 -fopenmp
LAMMPS Molecular Dynamics Simulator 29Oct2020
Model: 20k Atoms
ns/day, More Is Better
1
SE +/- 0.01, N = 3
12.27
2
SE +/- 0.04, N = 3
12.23
3
6
9
12
15
1. (CXX) g++ options: -O3 -pthread -lm
LAMMPS Molecular Dynamics Simulator 29Oct2020
Model: Rhodopsin Protein
ns/day, More Is Better
1
SE +/- 0.27, N = 15
11.56
2
SE +/- 0.25, N = 15
11.66
3
6
9
12
15
1. (CXX) g++ options: -O3 -pthread -lm


LULESH 2.0.3
z/s, More Is Better
1
SE +/- 0.14, N = 3
396.85
2
SE +/- 0.17, N = 3
396.87
90
180
270
360
450
1. (CXX) g++ options: -O3 -fopenmp -lm -pthread -lmpi_cxx -lmpi
OpenFOAM 8
Input: Motorbike 30M
Seconds, Fewer Is Better
1
SE +/- 0.06, N = 3
33.22
2
SE +/- 0.05, N = 3
33.32
3
SE +/- 0.08, N = 3
33.34
8
16
24
32
40
1. (CXX) g++ options: -std=c++11 -m64 -O3 -ftemplate-depth-100 -fPIC -fuse-ld=bfd -Xlinker --add-needed --no-as-needed -lfoamToVTK -ldynamicMesh
OpenFOAM 8
Input: Motorbike 60M
Seconds, Fewer Is Better
1
SE +/- 0.14, N = 3
265.32
2
SE +/- 0.34, N = 3
266.23
3
SE +/- 0.58, N = 3
266.63
60
120
180
240
300
1. (CXX) g++ options: -std=c++11 -m64 -O3 -ftemplate-depth-100 -fPIC -fuse-ld=bfd -Xlinker --add-needed --no-as-needed -lfoamToVTK -ldynamicMesh

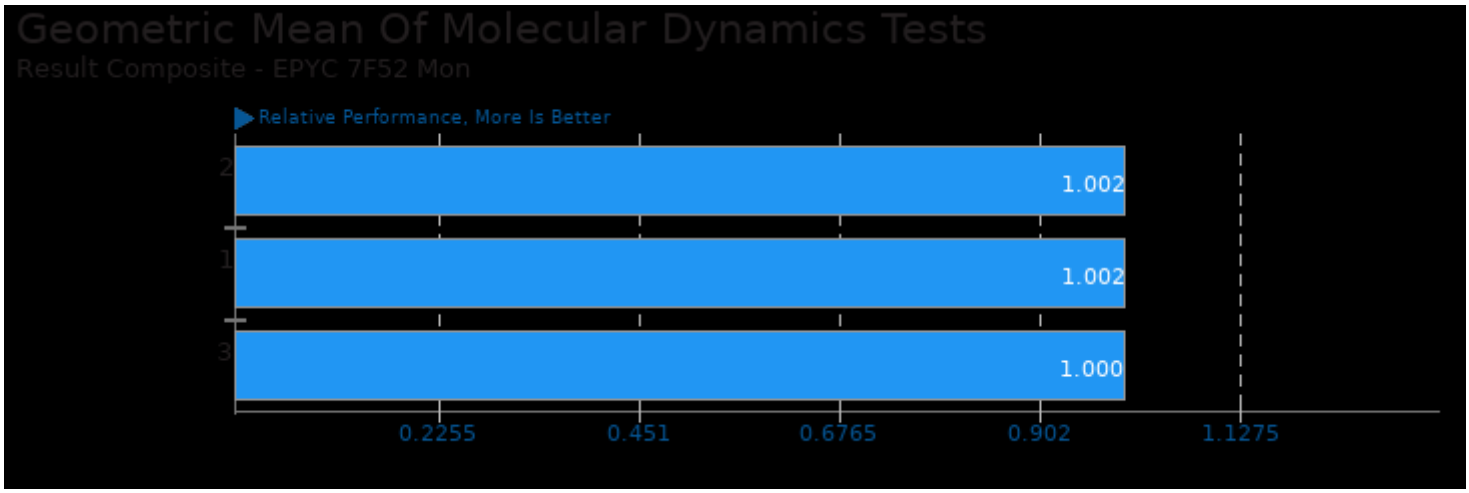

Quantum ESPRESSO 6.7
Input: AUSURF112
Seconds, Fewer Is Better
1
SE +/- 6.29, N = 3
1220.18
2
SE +/- 5.75, N = 3
1224.77
3
SE +/- 7.80, N = 3
1209.82
300
600
900
1200
1500
1. (F9X) gfortran options: -lopenblas -lFoX_dom -lFoX_sax -lFoX_wxml -lFoX_common -lFoX_utils -lFoX_fsys -lfftw3 -pthread -lmpi_usempif08 -lmpi_mpifh

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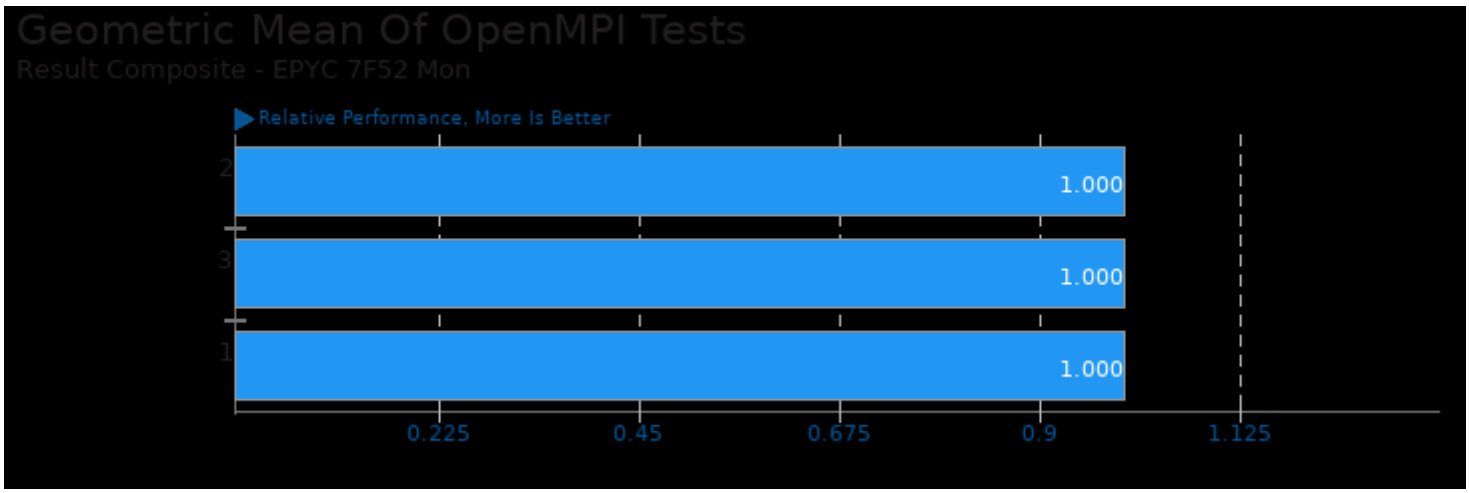
These geometric means are based upon test groupings / test suites for this result file.



Geometric mean based upon tests: pts/qe, pts/amg, pts/cp2k, pts/lammps, pts/lulesh, pts/openfoam and pts/kripke

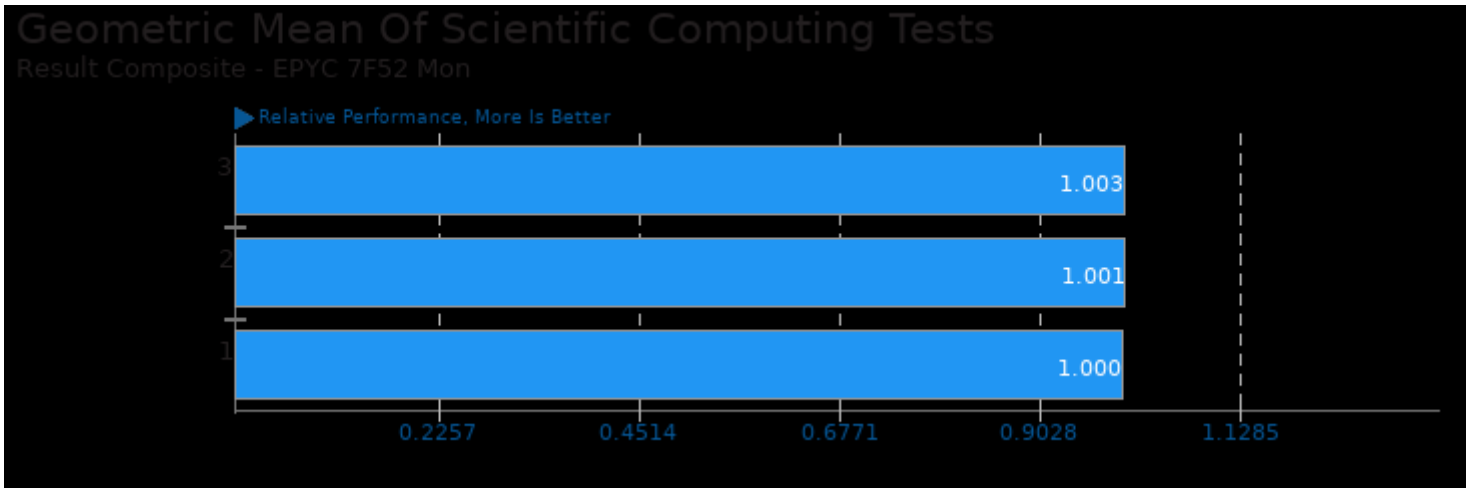


Geometric mean based upon tests: pts/cp2k, pts/lammps, pts/lulesh and pts/openfoam



Geometric mean based upon tests: pts/amg, pts/cp2k, pts/lammps, pts/lulesh and pts/openfoam

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Geometric mean based upon tests: pts/amg, pts/cp2k, pts/lammps, pts/lulesh, pts/openfoam, pts/qe and pts/kripke

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