

www.phoronix-test-suite.com

2022-06-17-0310

microsoft testing on Ubuntu 18.04 via the Phoronix Test Suite.

Automated Executive Summary

D16dsv5-X64 had the most wins, coming in first place for 88% of the tests.

Based on the geometric mean of all complete results, the fastest (D16dsv5-X64) was 1.756x the speed of the slowest (D16pdsv5-ARM64).

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

NAS Parallel Benchmarks (Test / Class: LU.C) at 6.643x
NAS Parallel Benchmarks (Test / Class: SP.B) at 4.518x
NAS Parallel Benchmarks (Test / Class: SP.C) at 4.163x
NAS Parallel Benchmarks (Test / Class: MG.C) at 4.138x
ACES DGEMM (Sustained Floating-Point Rate) at 3.953x
NAS Parallel Benchmarks (Test / Class: CG.C) at 2.823x
NAS Parallel Benchmarks (Test / Class: IS.D) at 2.786x
NAS Parallel Benchmarks (Test / Class: FT.C) at 2.745x
Botan (Test: ChaCha20Poly1305 - Decrypt) at 2.312x
Botan (Test: ChaCha20Poly1305) at 2.309x.

Test Systems:

D16pdsv5-ARM64

Processor: ARMv8 Neoverse-N1 (16 Cores), Motherboard: Microsoft Virtual Machine (Hyper-V UEFI v4.1 BIOS), Memory: 64GB, Disk: 275GB Virtual Disk + 644GB Virtual Disk, Graphics: hyperv_fb, Network: Mellanox MT27800

OS: Ubuntu 18.04, Kernel: 5.4.0-1083-azure (aarch64), Compiler: GCC 7.5.0 + Clang 6.0.0-1ubuntu2, File-System: ext4, Screen Resolution: 1152x864, System Layer: microsoft

Kernel Notes: Transparent Huge Pages: always
Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only -v
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Mitigation of PTI + spec_store_bypass: Vulnerable + spectre_v1: Mitigation of __user pointer sanitization + spectre_v2: Vulnerable + srbds: Not affected + tsx_async_abort: Not affected

D16dsv5-X64

Processor: Intel Xeon Platinum 8370C @ 2.80GHz (8 Cores / 16 Threads), Motherboard: Microsoft Virtual Machine (Hyper-V UEFI v4.1 BIOS), Memory: 64GB, Disk: 275GB Virtual Disk + 644GB Virtual Disk, Graphics: hyperv_fb, Network: Mellanox MT27800

OS: Ubuntu 18.04, Kernel: 5.4.0-1085-azure (x86_64), Compiler: GCC 7.5.0 + Clang 6.0.0-1ubuntu2, File-System: ext4, Screen Resolution: 1152x864, System Layer: microsoft

Kernel Notes: Transparent Huge Pages: always
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --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 performance - CPU Microcode: 0xffffffff
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + mmio_stale_data: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + spec_store_bypass: Vulnerable + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Retpolines STIBP: disabled RSB filling + srbds: Not affected + tsx_async_abort: Not affected

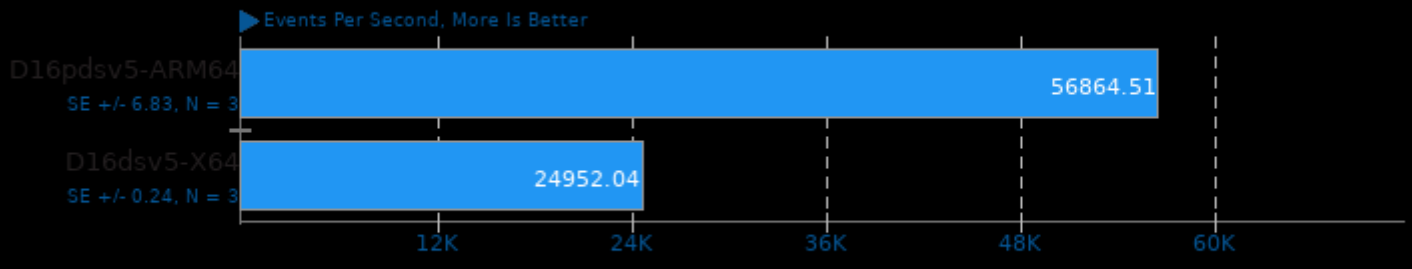
	D16pdsv5-ARM64	D16dsv5-X64
Sysbench - CPU (Events/sec)	**56865**	**24952**
Normalized	100%	43.88%
Standard Deviation	0%	0%
ACES DGEMM - S.F.P.R (GFLOP/s)	**1.899565**	**7.508870**
Normalized	25.3%	100%
Standard Deviation	0.7%	2.4%
Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec)	**93475**	**113245**
Normalized	82.54%	100%
Standard Deviation	0.1%	0.1%
Fhourstones - C.C.4.S (Kpos / sec)	**8870**	**12267**
Normalized	72.3%	100%
Standard Deviation	0.4%	0%
BYTE Unix Benchmark - Dhrystone 2 (LPS)	**27430780**	**38479586**
Normalized	71.29%	100%

Standard Deviation	0.1%	0%
Botan - KASUMI (MiB/s)	**67.506**	**78.555**
Normalized	85.93%	100%
Standard Deviation	0%	0%
Botan - KASUMI - Decrypt (MiB/s)	**64.906**	**75.315**
Normalized	86.18%	100%
Standard Deviation	0%	0%
Botan - AES-256 (MiB/s)	**2764**	**5651**
Normalized	48.91%	100%
Standard Deviation	0.1%	0.1%
Botan - AES-256 - Decrypt (MiB/s)	**2763**	**5644**
Normalized	48.95%	100%
Standard Deviation	0.1%	0.2%
Botan - Twofish (MiB/s)	**230.582**	**300.167**
Normalized	76.82%	100%
Standard Deviation	0%	0%
Botan - Twofish - Decrypt (MiB/s)	**245.903**	**296.457**
Normalized	82.95%	100%
Standard Deviation	0%	0%
Botan - Blowfish (MiB/s)	**290.020**	**373.427**
Normalized	77.66%	100%
Standard Deviation	0%	0%
Botan - Blowfish - Decrypt (MiB/s)	**292.125**	**372.585**
Normalized	78.4%	100%
Standard Deviation	0%	0%
Botan - CAST-256 (MiB/s)	**112.781**	**117.649**
Normalized	95.86%	100%
Standard Deviation	0%	0.4%
Botan - CAST-256 - Decrypt (MiB/s)	**112.395**	**117.686**
Normalized	95.5%	100%
Standard Deviation	0%	0.4%
Botan - ChaCha20Poly1305 (MiB/s)	**291.205**	**672.326**
Normalized	43.31%	100%
Standard Deviation	0.3%	0.1%
Botan - ChaCha20Poly1305 - Decrypt (MiB/s)	**288.871**	**667.894**
Normalized	43.25%	100%
Standard Deviation	0.3%	0.1%
Sysbench - RAM / Memory (MiB/sec)	**7764**	**12438**
Normalized	62.42%	100%
Standard Deviation	1.7%	0.5%
Stockfish - Total Time (Nodes/s)	**21556145**	**20832386**
Normalized	100%	96.64%
Standard Deviation	2.3%	1%
Swet - Average (Operations/sec)	**380524539**	**629437823**
Normalized	60.45%	100%
Standard Deviation	1.1%	2.3%
NAS Parallel Benchmarks - BT.C (Mop/s)	**7475**	**16037**
Normalized	46.61%	100%
Standard Deviation	0.2%	0.1%
NAS Parallel Benchmarks - CG.C (Mop/s)	**3944**	**11133**
Normalized	35.43%	100%
Standard Deviation	1.4%	1.4%
NAS Parallel Benchmarks - EP.C (Mop/s)	**497.17**	**424.11**
Normalized	100%	85.3%
Standard Deviation	0.2%	0.3%

NAS Parallel Benchmarks - EP.D (Mop/s)	**499.01**	**425.13**
Normalized	100%	85.19%
Standard Deviation	0.2%	0.4%
NAS Parallel Benchmarks - FT.C (Mop/s)	**7081**	**19436**
Normalized	36.43%	100%
Standard Deviation	0.2%	0.1%
NAS Parallel Benchmarks - IS.D (Mop/s)	**350.58**	**976.65**
Normalized	35.9%	100%
Standard Deviation	1%	1.1%
NAS Parallel Benchmarks - LU.C (Mop/s)	**6079**	**40381**
Normalized	15.05%	100%
Standard Deviation	0.4%	0.3%
NAS Parallel Benchmarks - MG.C (Mop/s)	**7747**	**32055**
Normalized	24.17%	100%
Standard Deviation	0.2%	0.9%
NAS Parallel Benchmarks - SP.B (Mop/s)	**2506**	**11322**
Normalized	22.13%	100%
Standard Deviation	0.6%	0.3%
NAS Parallel Benchmarks - SP.C (Mop/s)	**2509**	**10445**
Normalized	24.02%	100%
Standard Deviation	0.1%	0.1%
OSBench - Memory Allocations (Ns/Event)	**133.673668**	**79.648336**
Normalized	59.58%	100%
Standard Deviation	0.3%	1.6%
OSBench - Create Files (us/Event)	**24.051170**	**15.440138**
Normalized	64.2%	100%
Standard Deviation	0.2%	1.4%
OSBench - Create Threads (us/Event)	**38.759390**	**17.067750**
Normalized	44.04%	100%
Standard Deviation	28.6%	14%
OSBench - Launch Programs (us/Event)	**77.423255**	**34.239292**
Normalized	44.22%	100%
Standard Deviation	0.2%	1.6%
OSBench - Create Processes (us/Event)	**51.320553**	**29.546420**
Normalized	57.57%	100%
Standard Deviation	5%	1.2%

Sysbench 1.0.20

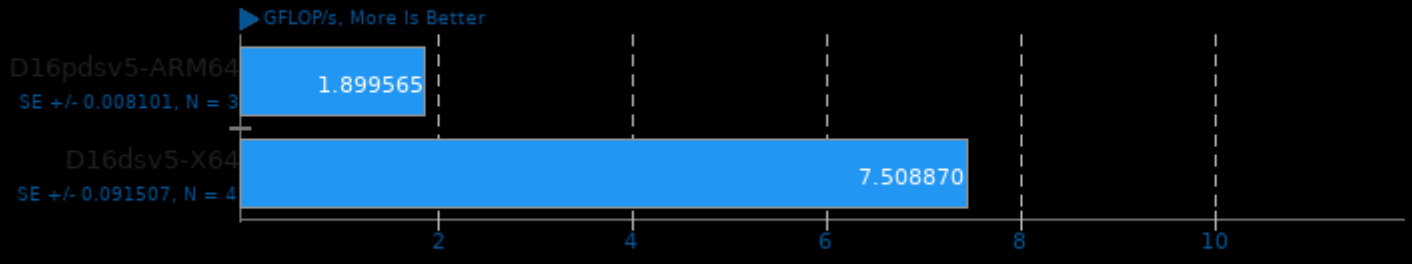
Test: CPU



1. (CC) gcc options: -pthread -O2 -funroll-loops -rdynamic -ldl -laio -lm

ACES DGEMM 1.0

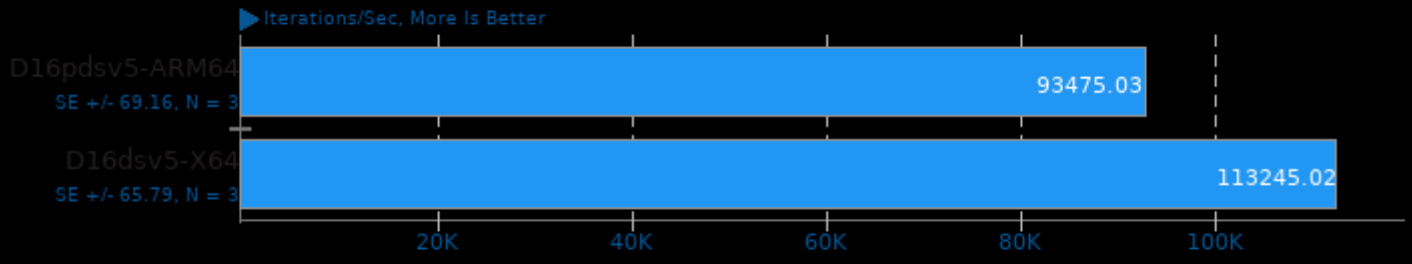
Sustained Floating-Point Rate



1. (CC) gcc options: -O3 -march=native -fopenmp

Coremark 1.0

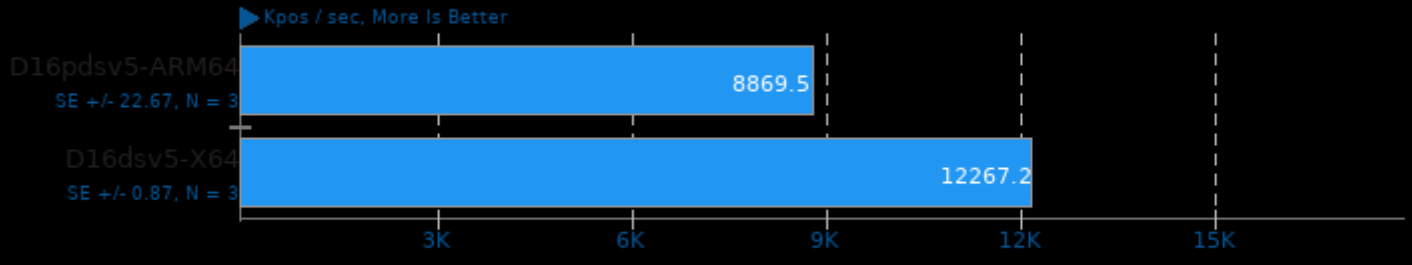
CoreMark Size 666 - Iterations Per Second



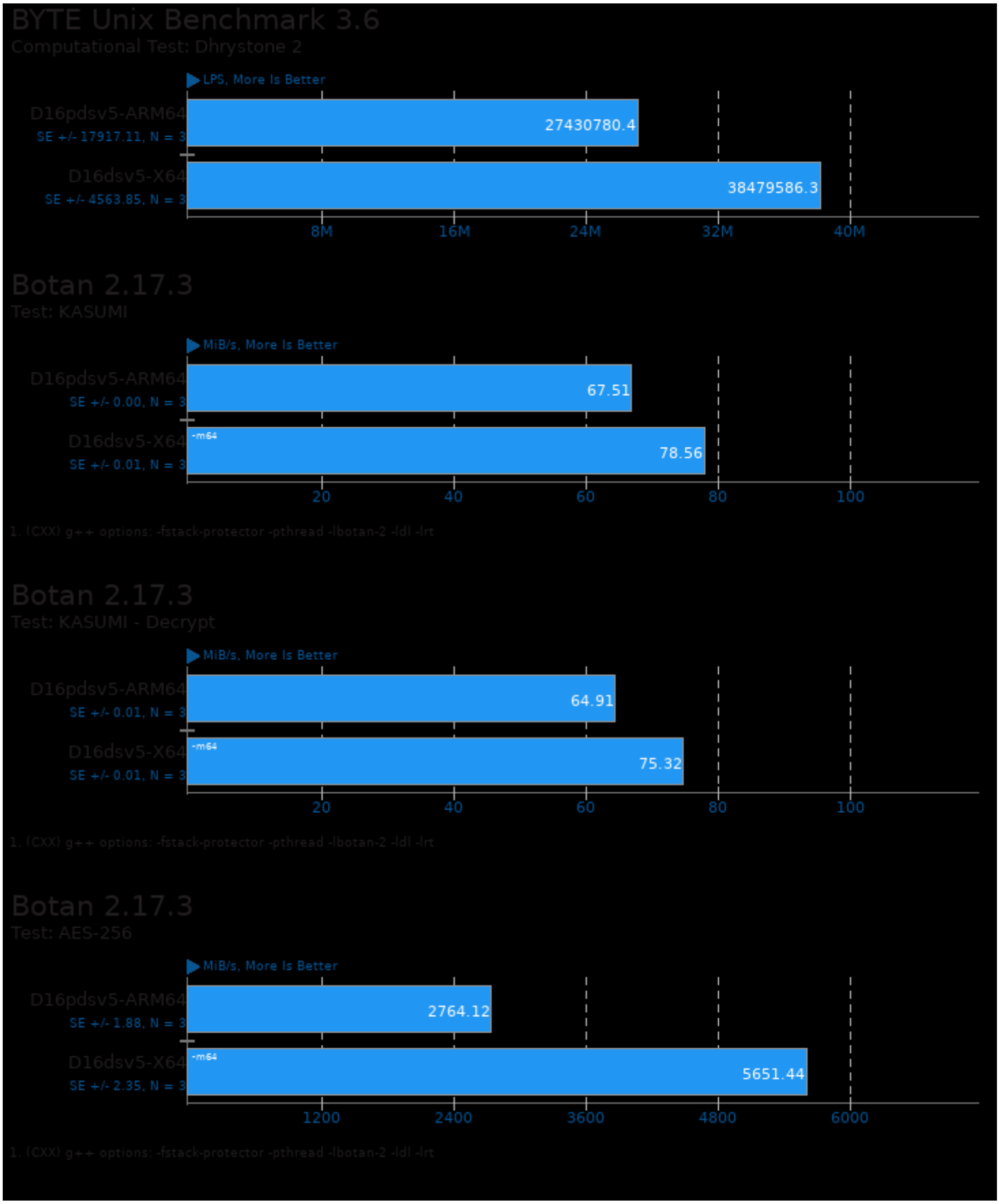
1. (CC) gcc options: -O2 -lrt" -lrt

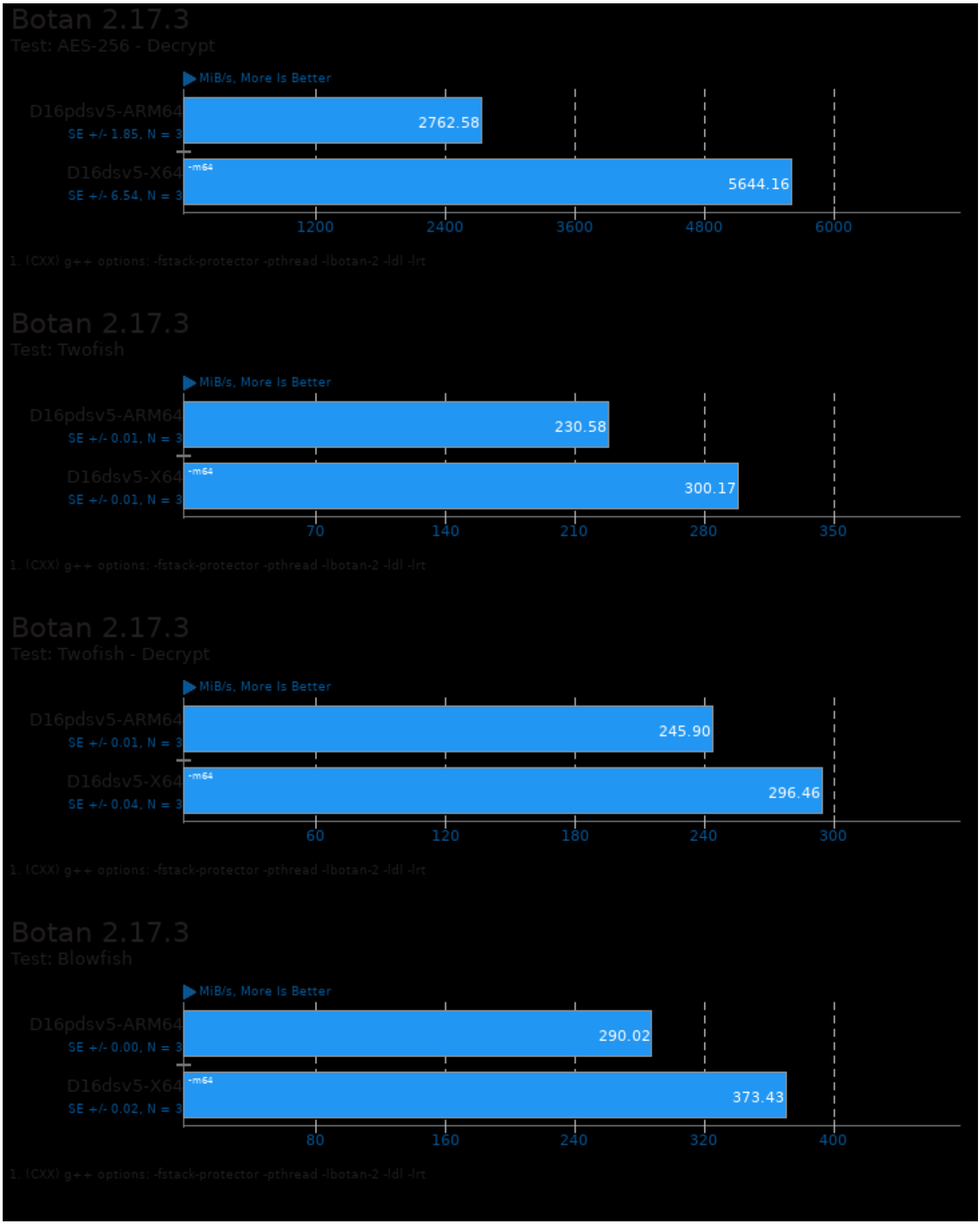
Fhourstones 3.1

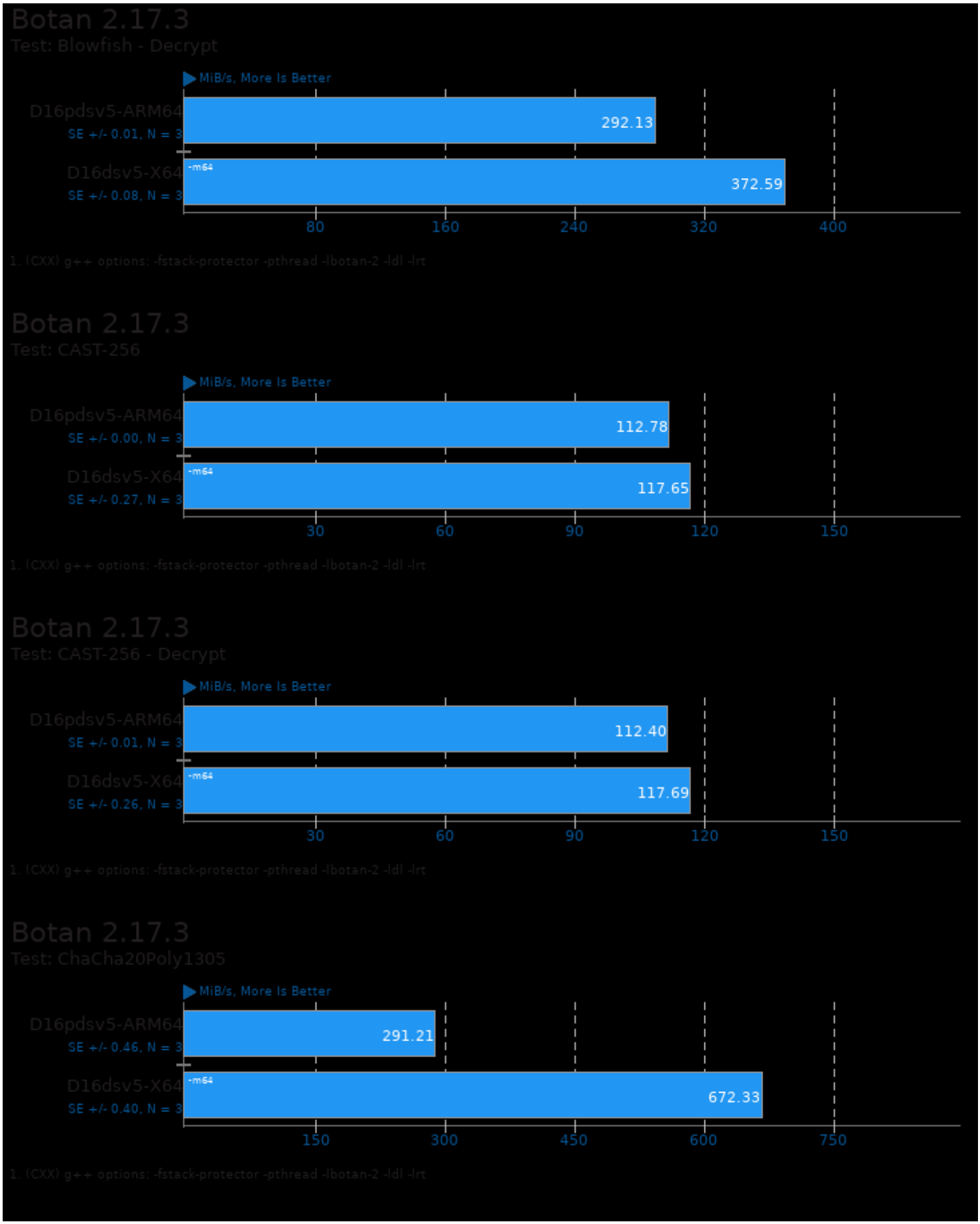
Complex Connect-4 Solving



1. (CC) gcc options: -O3

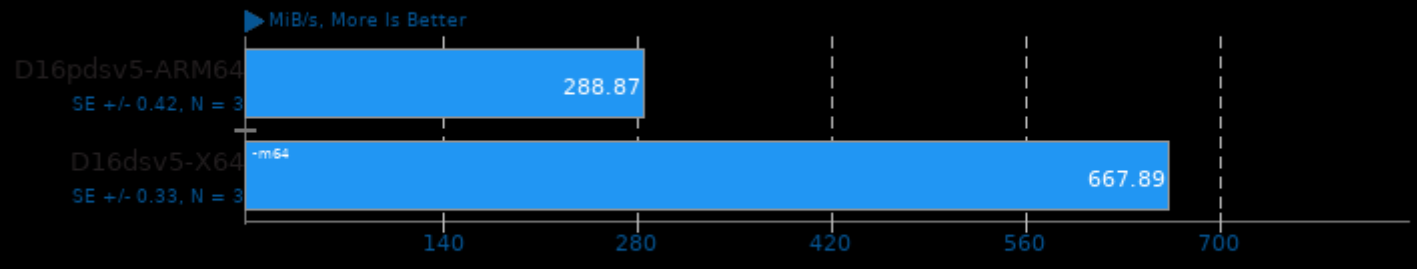

BYTE Unix Benchmark 3.6
Computational Test: Dhrystone 2
LPS, More Is Better
D16pdsv5-ARM64
SE +/- 17917.11, N = 3
27430780.4
D16dsv5-X64
SE +/- 4563.85, N = 3
38479586.3
8M
16M
24M
32M
40M
Botan 2.17.3
Test: KASUMI
MiB/s, More Is Better
D16pdsv5-ARM64
SE +/- 0.00, N = 3
67.51
D16dsv5-X64
-m64
SE +/- 0.01, N = 3
78.56
20
40
60
80
100
1. (CXX) g++ options: -fstack-protector -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: KASUMI - Decrypt
MiB/s, More Is Better
D16pdsv5-ARM64
SE +/- 0.01, N = 3
64.91
D16dsv5-X64
-m64
SE +/- 0.01, N = 3
75.32
20
40
60
80
100
1. (CXX) g++ options: -fstack-protector -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: AES-256
MiB/s, More Is Better
D16pdsv5-ARM64
SE +/- 1.88, N = 3
2764.12
D16dsv5-X64
-m64
SE +/- 2.35, N = 3
5651.44
1200
2400
3600
4800
6000
1. (CXX) g++ options: -fstack-protector -pthread -lbotan-2 -ldl -lrt


Botan 2.17.3
Test: AES-256 - Decrypt
MiB/s, More Is Better
D16pdsv5-ARM64
SE +/- 1.85, N = 3
2762.58
D16dsv5-X64
-m64
SE +/- 6.54, N = 3
5644.16
1200
2400
3600
4800
6000
1. (CXX) g++ options: -fstack-protector -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: Twofish
MiB/s, More Is Better
D16pdsv5-ARM64
SE +/- 0.01, N = 3
230.58
D16dsv5-X64
-m64
SE +/- 0.01, N = 3
300.17
70
140
210
280
350
1. (CXX) g++ options: -fstack-protector -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: Twofish - Decrypt
MiB/s, More Is Better
D16pdsv5-ARM64
SE +/- 0.01, N = 3
245.90
D16dsv5-X64
-m64
SE +/- 0.04, N = 3
296.46
60
120
180
240
300
1. (CXX) g++ options: -fstack-protector -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: Blowfish
MiB/s, More Is Better
D16pdsv5-ARM64
SE +/- 0.00, N = 3
290.02
D16dsv5-X64
-m64
SE +/- 0.02, N = 3
373.43
80
160
240
320
400
1. (CXX) g++ options: -fstack-protector -pthread -lbotan-2 -ldl -lrt


Botan 2.17.3
Test: Blowfish - Decrypt
MiB/s, More Is Better
D16pdsv5-ARM64
SE +/- 0.01, N = 3
292.13
D16dsv5-X64
-m64
SE +/- 0.08, N = 3
372.59
80
160
240
320
400
1. (CXX) g++ options: -fstack-protector -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: CAST-256
MiB/s, More Is Better
D16pdsv5-ARM64
SE +/- 0.00, N = 3
112.78
D16dsv5-X64
-m64
SE +/- 0.27, N = 3
117.65
30
60
90
120
150
1. (CXX) g++ options: -fstack-protector -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: CAST-256 - Decrypt
MiB/s, More Is Better
D16pdsv5-ARM64
SE +/- 0.01, N = 3
112.40
D16dsv5-X64
-m64
SE +/- 0.26, N = 3
117.69
30
60
90
120
150
1. (CXX) g++ options: -fstack-protector -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: ChaCha20Poly1305
MiB/s, More Is Better
D16pdsv5-ARM64
SE +/- 0.46, N = 3
291.21
D16dsv5-X64
-m64
SE +/- 0.40, N = 3
672.33
150
300
450
600
750
1. (CXX) g++ options: -fstack-protector -pthread -lbotan-2 -ldl -lrt

Botan 2.17.3

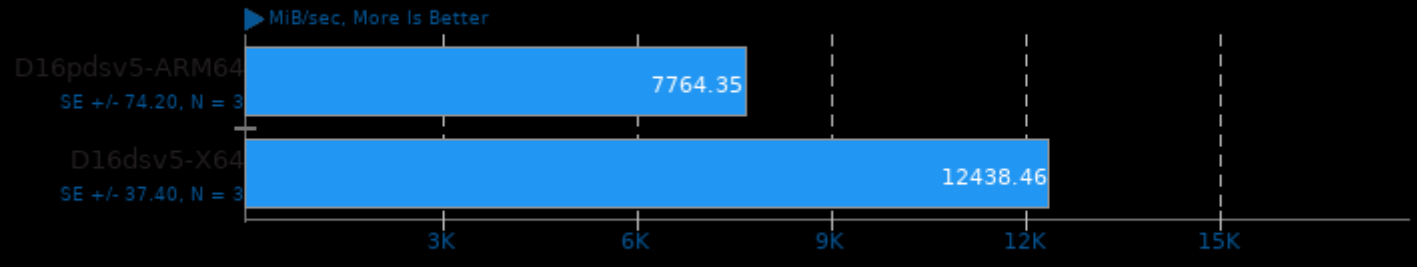
Test: ChaCha20Poly1305 - Decrypt



1. (CXX) g++ options: -fstack-protector -pthread -lbotan-2 -ldl -lrt

Sysbench 1.0.20

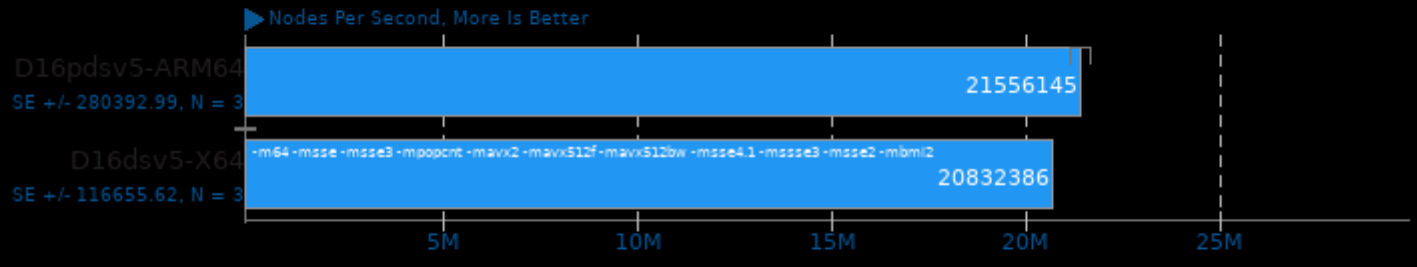
Test: RAM / Memory



1. (CC) gcc options: -pthread -O2 -funroll-loops -rdynamic -ldl -laio -lm

Stockfish 13

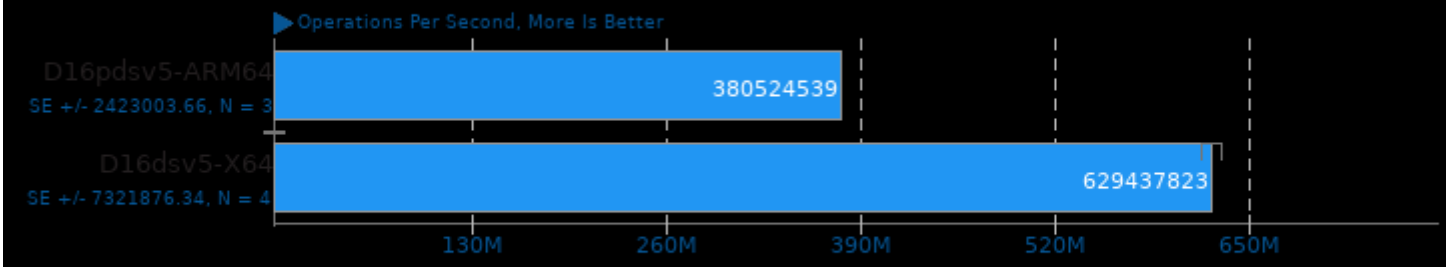
Total Time



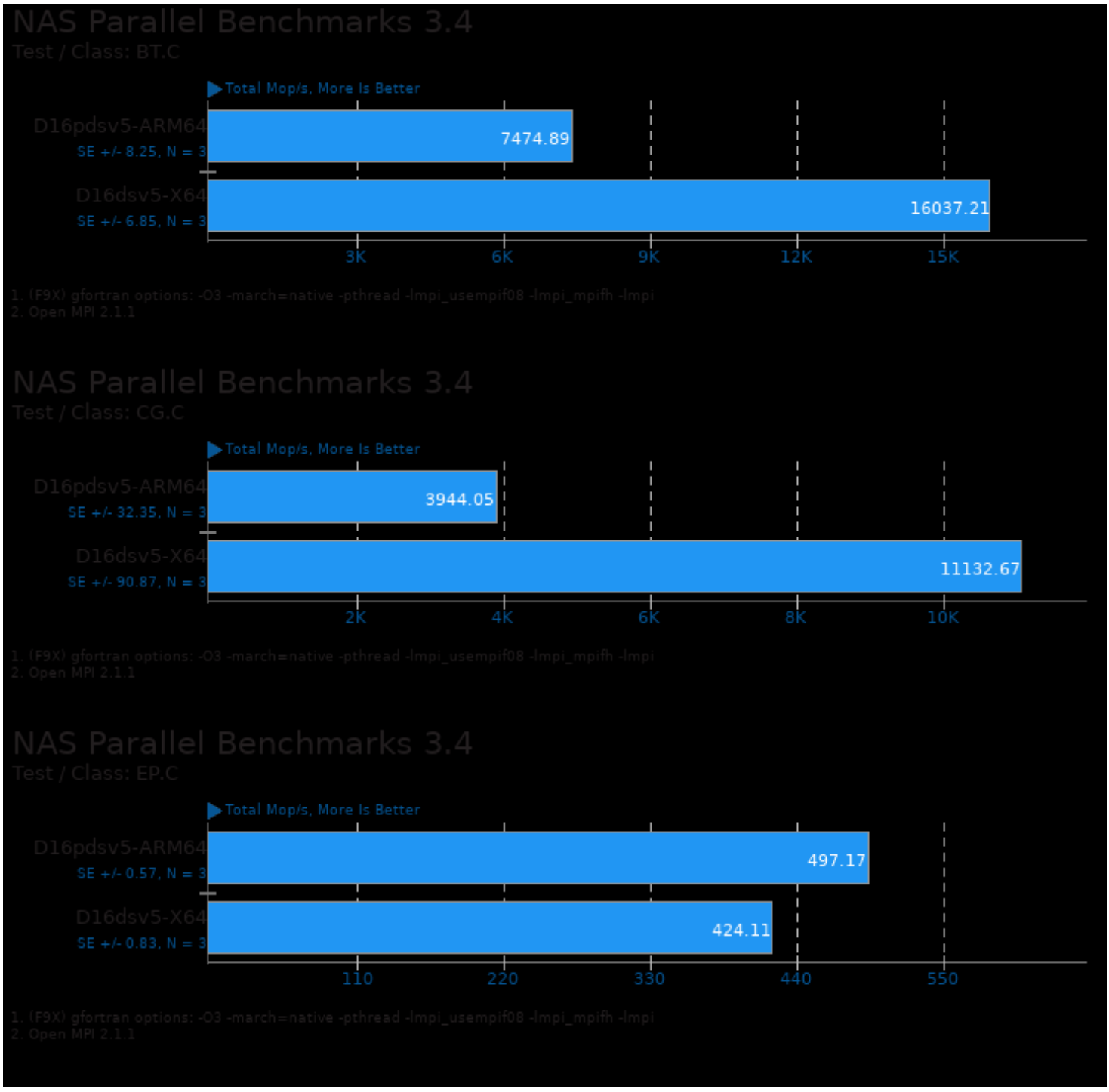
1. (CXX) g++ options: -lgcov -lpthread -fno-exceptions -std=c++17 -fprofile-use -fno-peel-loops -fno-tracer -pedantic -O3 -flto -flto=jobserver

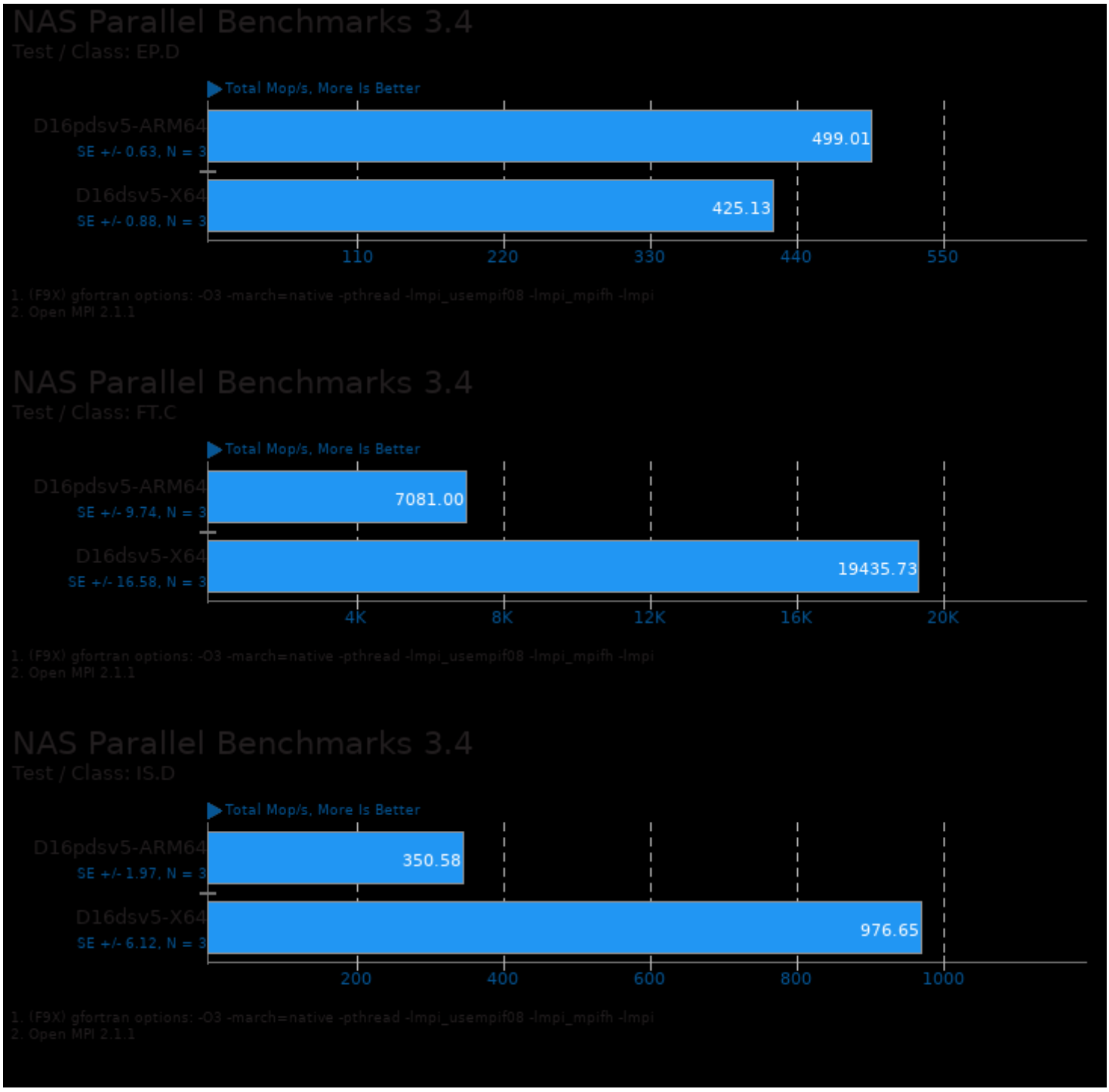
Swet 1.5.16

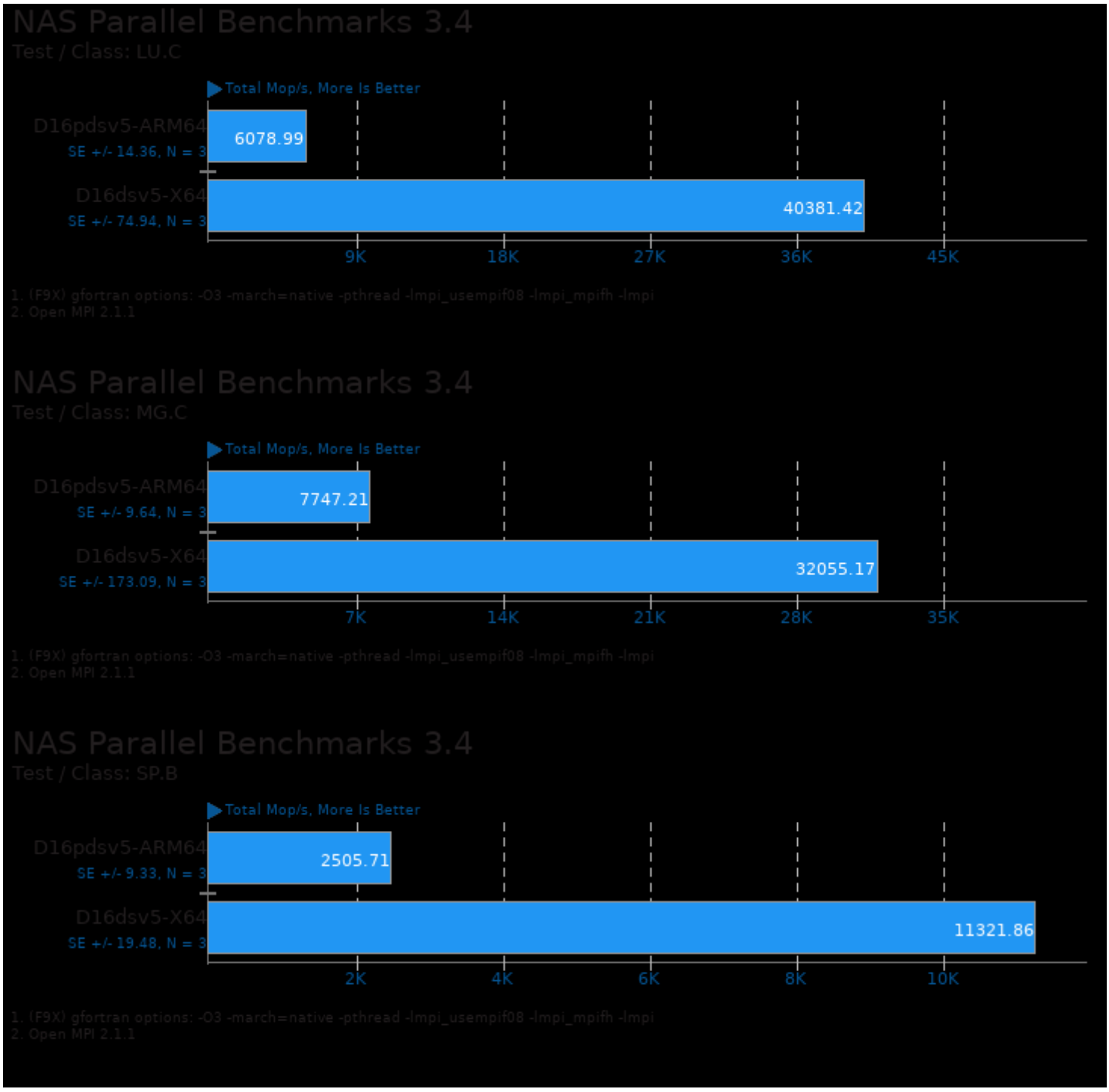
Average



1. (CC) gcc options: -lm -lpthread -lcurses -lrt

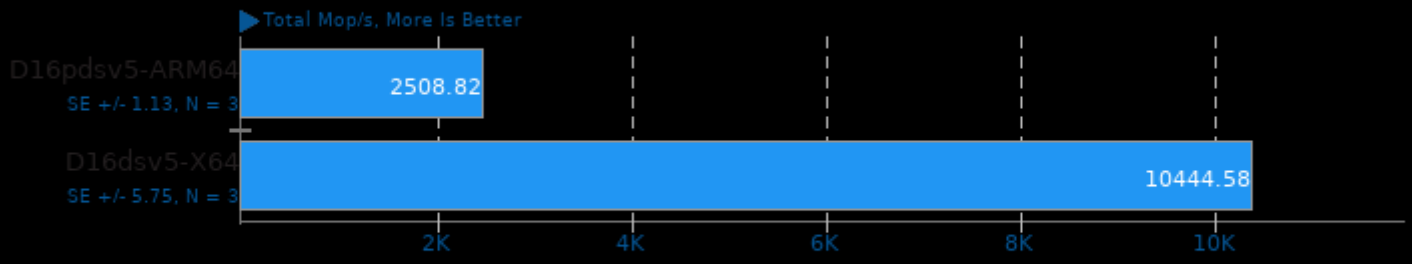

NAS Parallel Benchmarks 3.4
Test / Class: BT.C
Total Mop/s, More Is Better
D16pdsv5-ARM64
SE +/- 8.25, N = 3
7474.89
D16dsv5-X64
SE +/- 6.85, N = 3
16037.21
3K
6K
9K
12K
15K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 2.1.1
NAS Parallel Benchmarks 3.4
Test / Class: CG.C
Total Mop/s, More Is Better
D16pdsv5-ARM64
SE +/- 32.35, N = 3
3944.05
D16dsv5-X64
SE +/- 90.87, N = 3
11132.67
2K
4K
6K
8K
10K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 2.1.1
NAS Parallel Benchmarks 3.4
Test / Class: EP.C
Total Mop/s, More Is Better
D16pdsv5-ARM64
SE +/- 0.57, N = 3
497.17
D16dsv5-X64
SE +/- 0.83, N = 3
424.11
110
220
330
440
550
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 2.1.1


NAS Parallel Benchmarks 3.4
Test / Class: EP.D
Total Mop/s, More Is Better
D16pdsv5-ARM64
SE +/- 0.63, N = 3
499.01
D16dsv5-X64
SE +/- 0.88, N = 3
425.13
110
220
330
440
550
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 2.1.1
NAS Parallel Benchmarks 3.4
Test / Class: FT.C
Total Mop/s, More Is Better
D16pdsv5-ARM64
SE +/- 9.74, N = 3
7081.00
D16dsv5-X64
SE +/- 16.58, N = 3
19435.73
4K
8K
12K
16K
20K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 2.1.1
NAS Parallel Benchmarks 3.4
Test / Class: IS.D
Total Mop/s, More Is Better
D16pdsv5-ARM64
SE +/- 1.97, N = 3
350.58
D16dsv5-X64
SE +/- 6.12, N = 3
976.65
200
400
600
800
1000
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 2.1.1


NAS Parallel Benchmarks 3.4
Test / Class: LU.C
Total Mop/s, More Is Better
D16pdsv5-ARM64
SE +/- 14.36, N = 3
6078.99
D16dsv5-X64
SE +/- 74.94, N = 3
40381.42
9K
18K
27K
36K
45K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 2.1.1
NAS Parallel Benchmarks 3.4
Test / Class: MG.C
Total Mop/s, More Is Better
D16pdsv5-ARM64
SE +/- 9.64, N = 3
7747.21
D16dsv5-X64
SE +/- 173.09, N = 3
32055.17
7K
14K
21K
28K
35K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 2.1.1
NAS Parallel Benchmarks 3.4
Test / Class: SP.B
Total Mop/s, More Is Better
D16pdsv5-ARM64
SE +/- 9.33, N = 3
2505.71
D16dsv5-X64
SE +/- 19.48, N = 3
11321.86
2K
4K
6K
8K
10K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 2.1.1

NAS Parallel Benchmarks 3.4

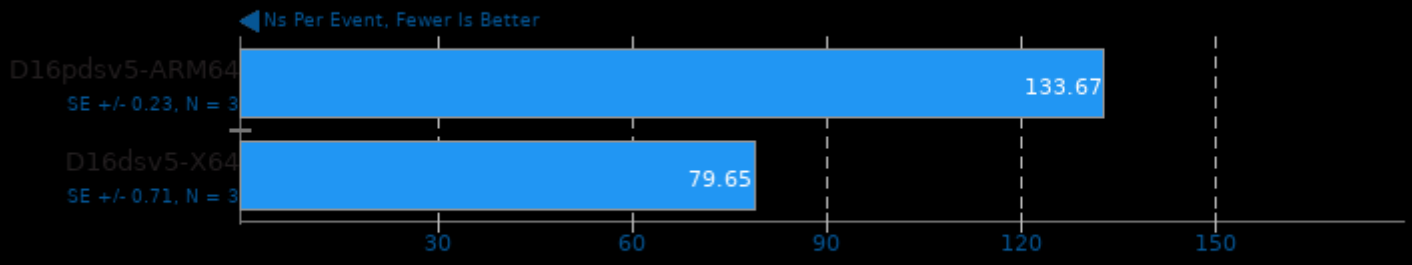
Test / Class: SP.C



1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 2.1.1

OSBench

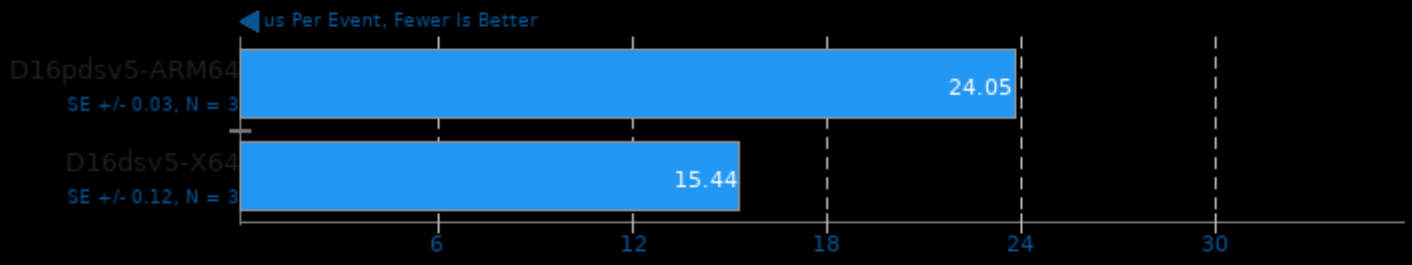
Test: Memory Allocations



1. (CC) gcc options: -lm

OSBench

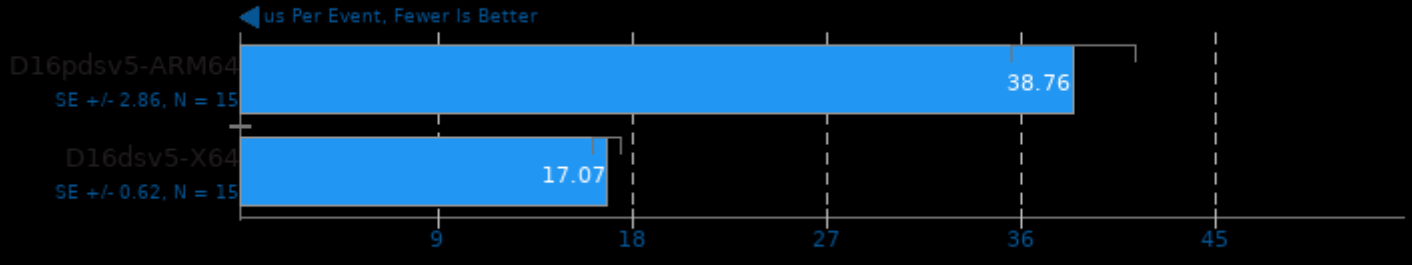
Test: Create Files



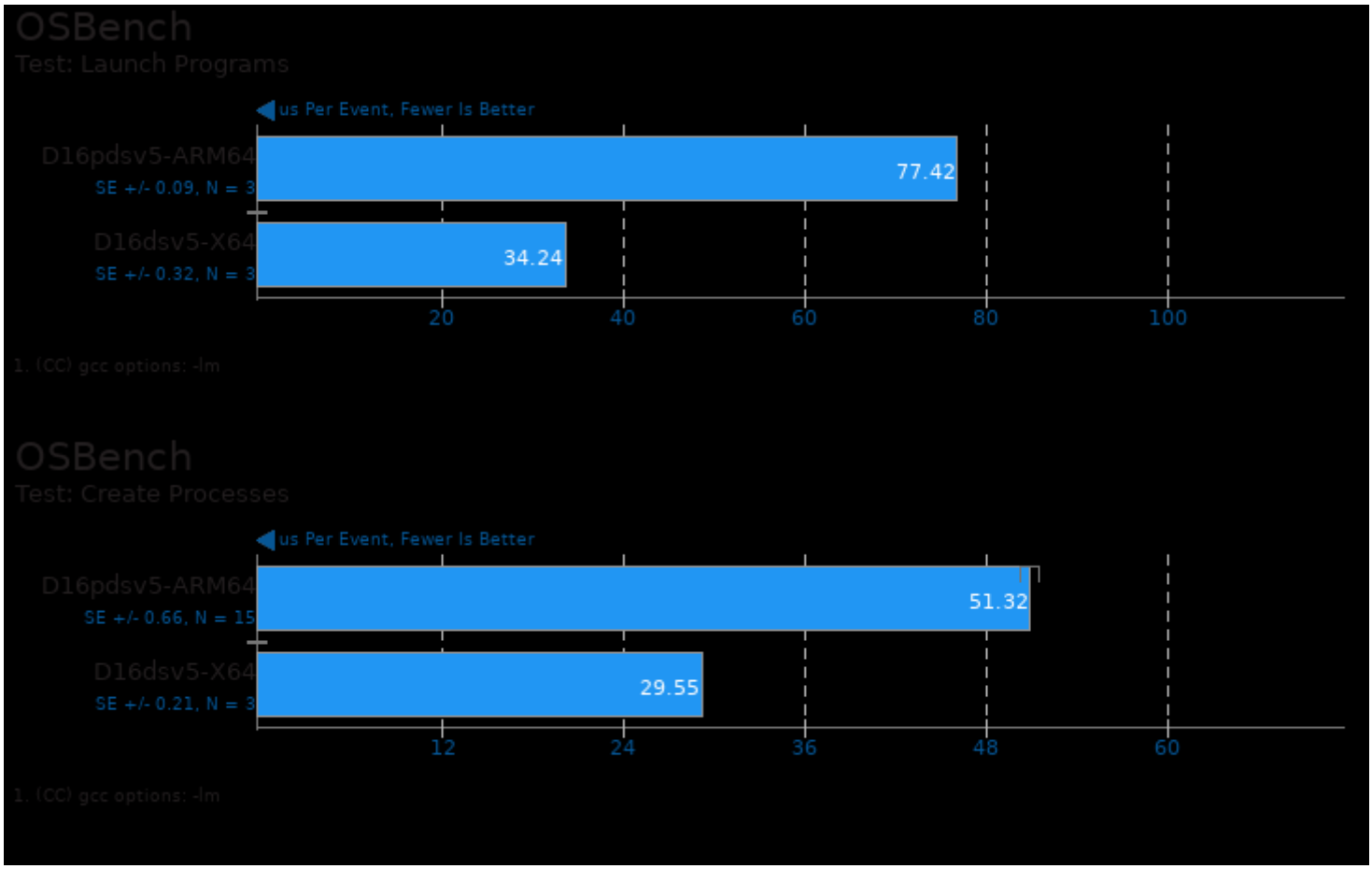
1. (CC) gcc options: -lm

OSBench

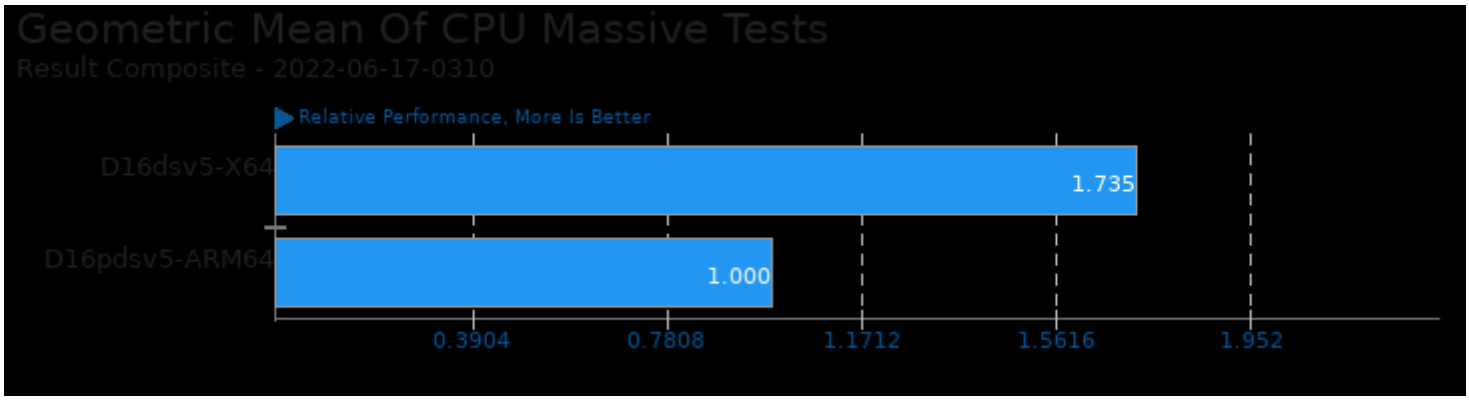
Test: Create Threads



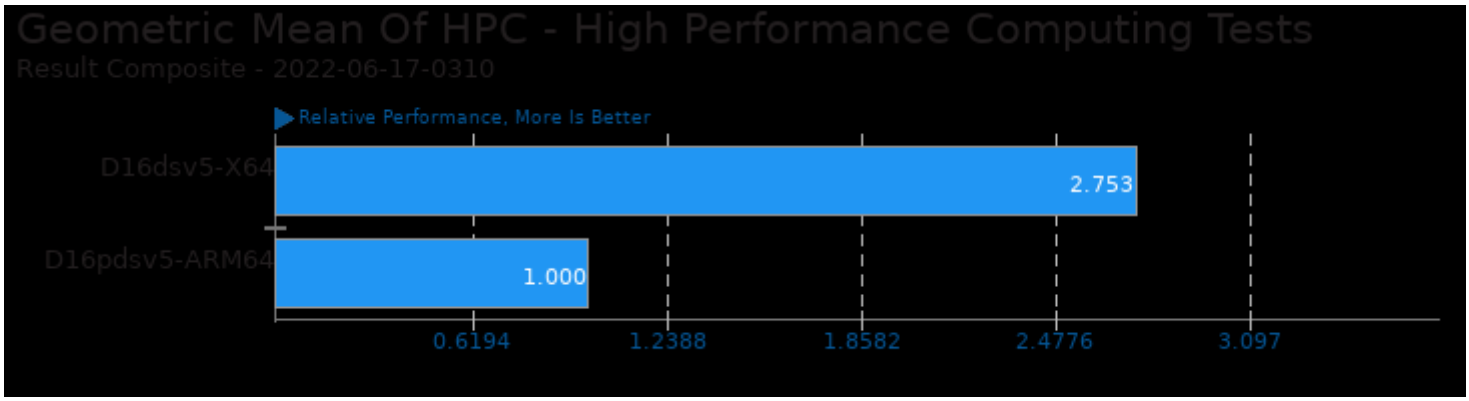
1. (CC) gcc options: -lm


OSBench
Test: Launch Programs
us Per Event, Fewer Is Better
D16pdsv5-ARM64
SE +/- 0.09, N = 3
77.42
D16dsv5-X64
SE +/- 0.32, N = 3
34.24
20
40
60
80
100
1. (CC) gcc options: -lm
OSBench
Test: Create Processes
us Per Event, Fewer Is Better
D16pdsv5-ARM64
SE +/- 0.66, N = 15
51.32
D16dsv5-X64
SE +/- 0.21, N = 3
29.55
12
24
36
48
60
1. (CC) gcc options: -lm

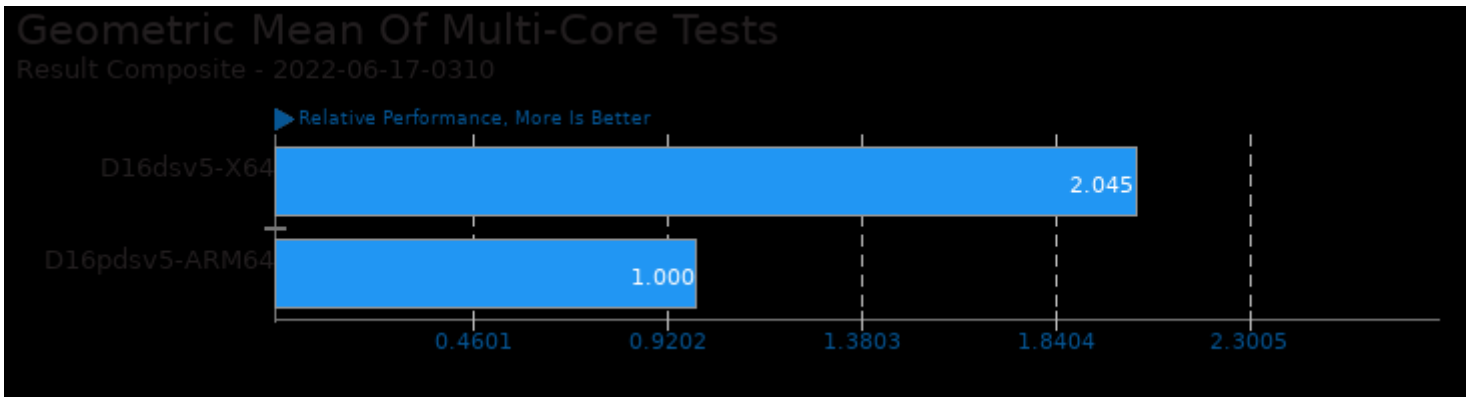
These geometric means are based upon test groupings / test suites for this result file.



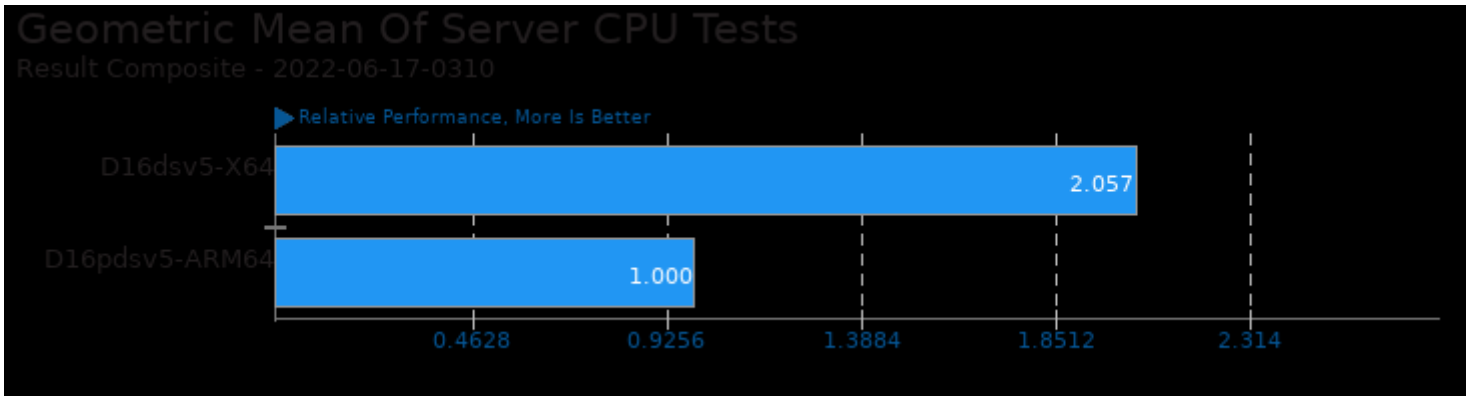
Geometric mean based upon tests: pts/npb, pts/stockfish, pts/swet, pts/sysbench and pts/botan



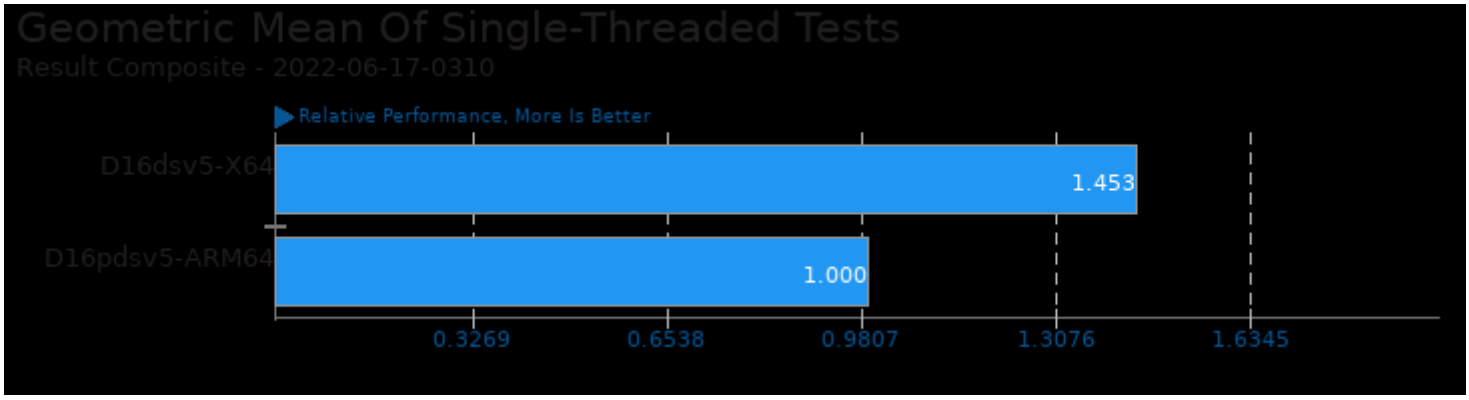
Geometric mean based upon tests: pts/npb and pts/mt-dgemm



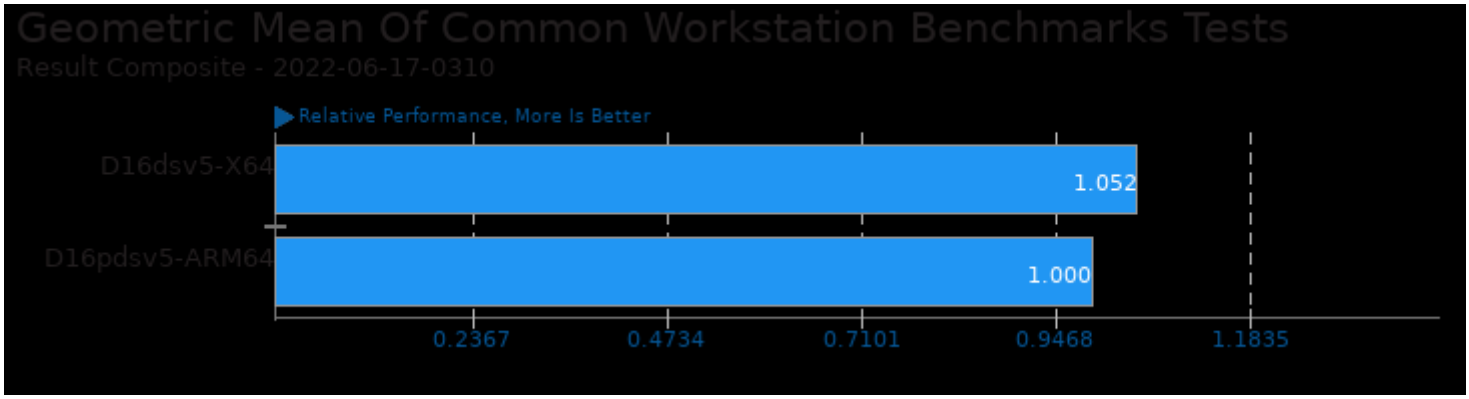
Geometric mean based upon tests: pts/sysbench, pts/stockfish, pts/coremark, pts/npb, pts/swet and pts/mt-dgemm



Geometric mean based upon tests: pts/npb, pts/stockfish and pts/sysbench



Geometric mean based upon tests: pts/fhourstones, pts/byte, pts/botan and pts/swet



Geometric mean based upon tests: pts/swet and pts/sysbench

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 04:13.