

www.phoronix-test-suite.com

2022-06-17-0443

microsoft testing on Ubuntu 18.04 via the Phoronix Test Suite.

Automated Executive Summary

D4dsv5 had the most wins, coming in first place for 88% of the tests.

Based on the geometric mean of all complete results, the fastest (D4dsv5) was 1.85x the speed of the slowest (D4pdsv5).

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

NAS Parallel Benchmarks (Test / Class: LU.C) at 7.019x
NAS Parallel Benchmarks (Test / Class: SP.C) at 5.638x
NAS Parallel Benchmarks (Test / Class: MG.C) at 5.448x
NAS Parallel Benchmarks (Test / Class: SP.B) at 5.104x
NAS Parallel Benchmarks (Test / Class: CG.C) at 4.231x
NAS Parallel Benchmarks (Test / Class: FT.C) at 3.135x
NAS Parallel Benchmarks (Test / Class: BT.C) at 2.433x
Botan (Test: ChaCha20Poly1305 - Decrypt) at 2.306x
Botan (Test: ChaCha20Poly1305) at 2.303x
Sysbench (Test: CPU) at 2.281x.

Test Systems:

D4pdsv5

Processor: ARMv8 Neoverse-N1 (4 Cores), Motherboard: Microsoft Virtual Machine (Hyper-V UEFI v4.1 BIOS), Memory: 16GB, Disk: 275GB Virtual Disk + 161GB 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

D4dsv5

Processor: Intel Xeon Platinum 8370C @ 2.80GHz (2 Cores / 4 Threads), Motherboard: Microsoft Virtual Machine (Hyper-V UEFI v4.1 BIOS), Memory: 16GB, Disk: 275GB Virtual Disk + 161GB Virtual Disk, Graphics: hyperv_fb, Network: Mellanox MT27800

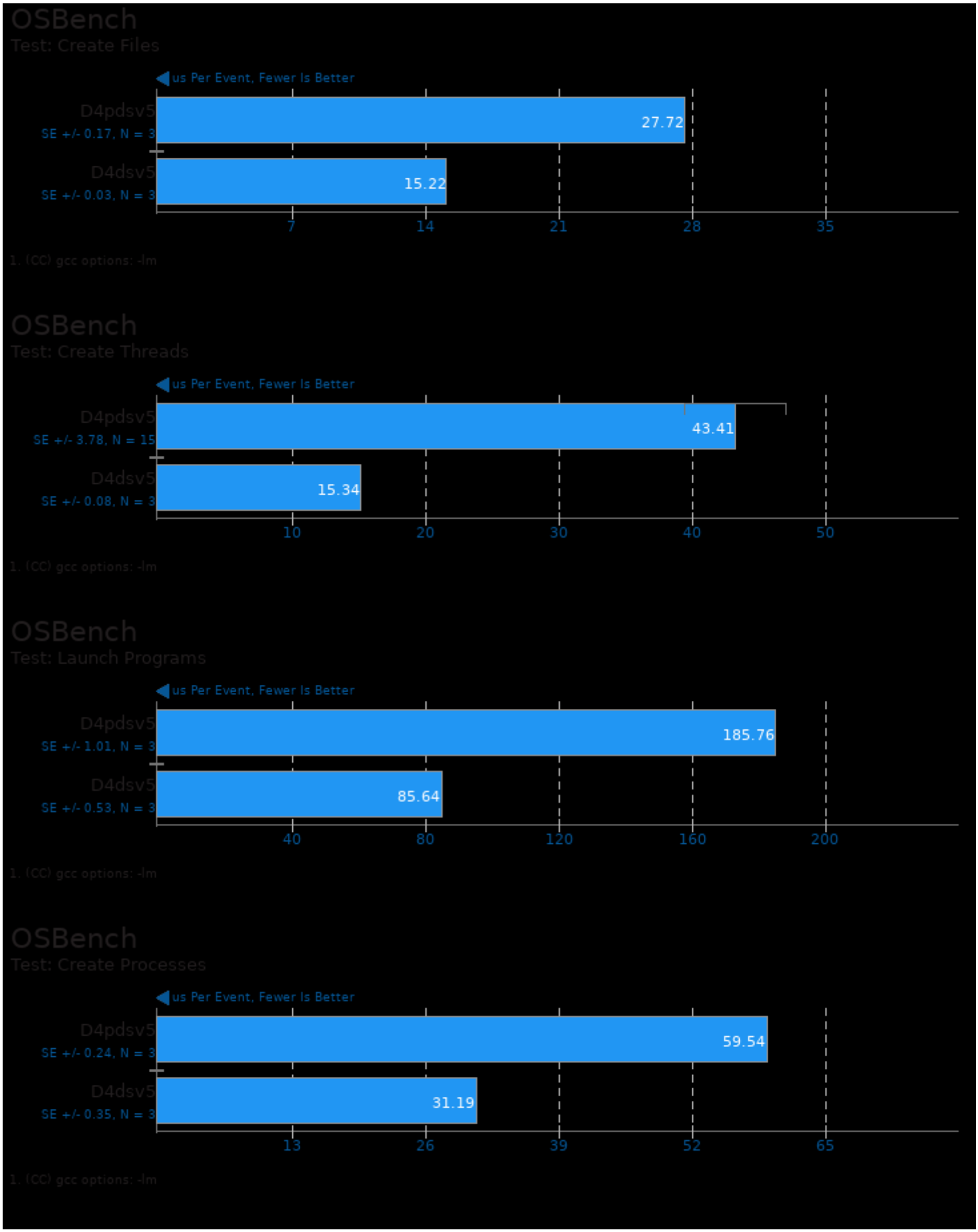
OS: Ubuntu 18.04, Kernel: 5.4.0-1085-azure (x86_64), Compiler: GCC 7.5.0 + Clang 6.0.0-1ubuntu2, File-System: ext4, Screen Resolution: 1152x864, System Layer: microsoft

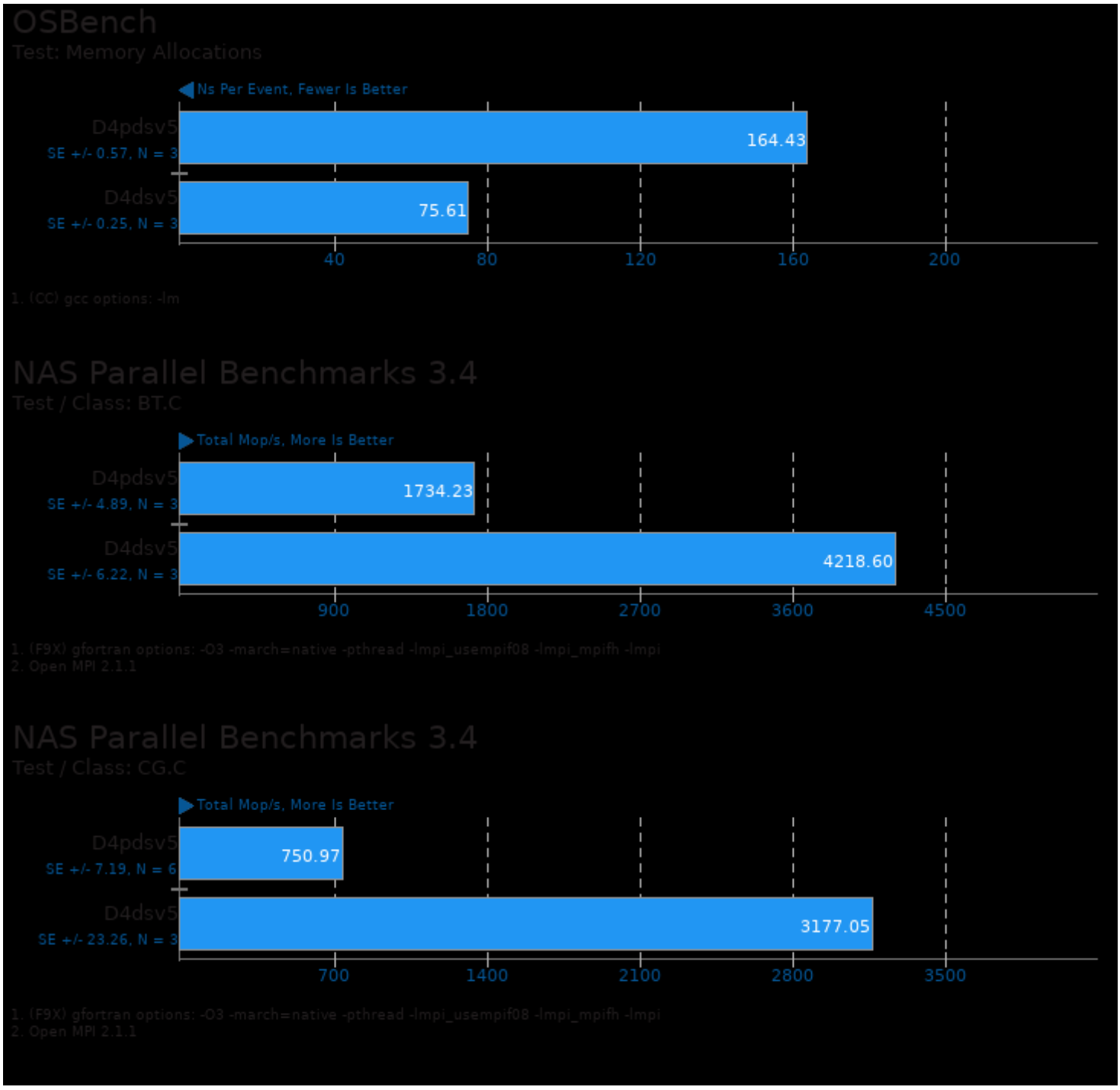
Kernel Notes: Transparent Huge Pages: always
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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

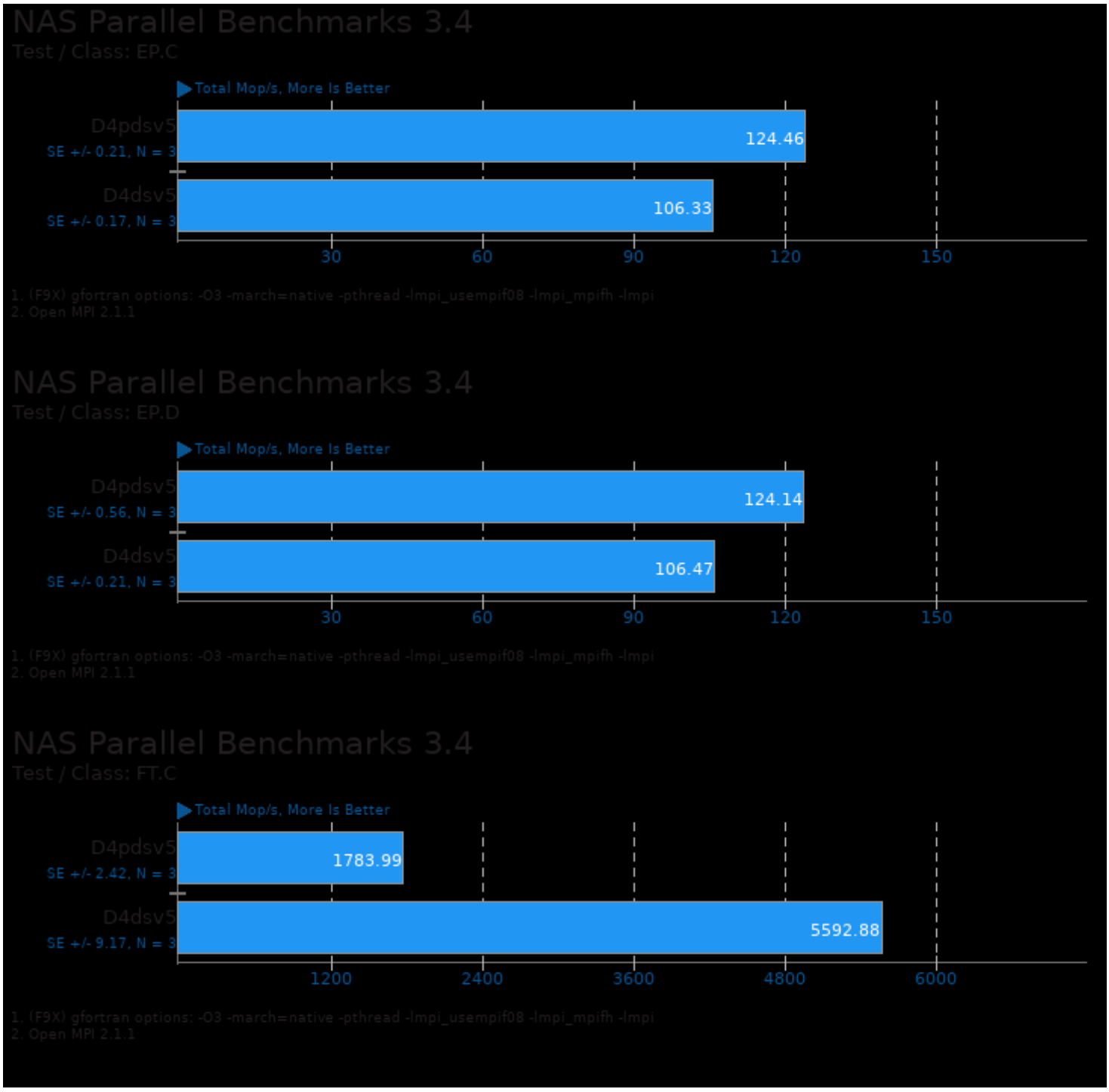
	D4pdsv5	D4dsv5
OSBench - Create Files (us/Event)	**27.724865**	**15.218015**
Normalized	54.89%	100%
Standard Deviation	1.1%	0.4%
OSBench - Create Threads (us/Event)	**43.412050**	**15.340646**
Normalized	35.34%	100%
Standard Deviation	33.7%	0.9%
OSBench - Launch Programs (us/Event)	**185.763836**	**85.636775**
Normalized	46.1%	100%
Standard Deviation	0.9%	1.1%
OSBench - Create Processes (us/Event)	**59.537888**	**31.185945**
Normalized	52.38%	100%
Standard Deviation	0.7%	2%
OSBench - Memory Allocations (Ns/Event)	**164.429347**	**75.611274**
Normalized	45.98%	100%

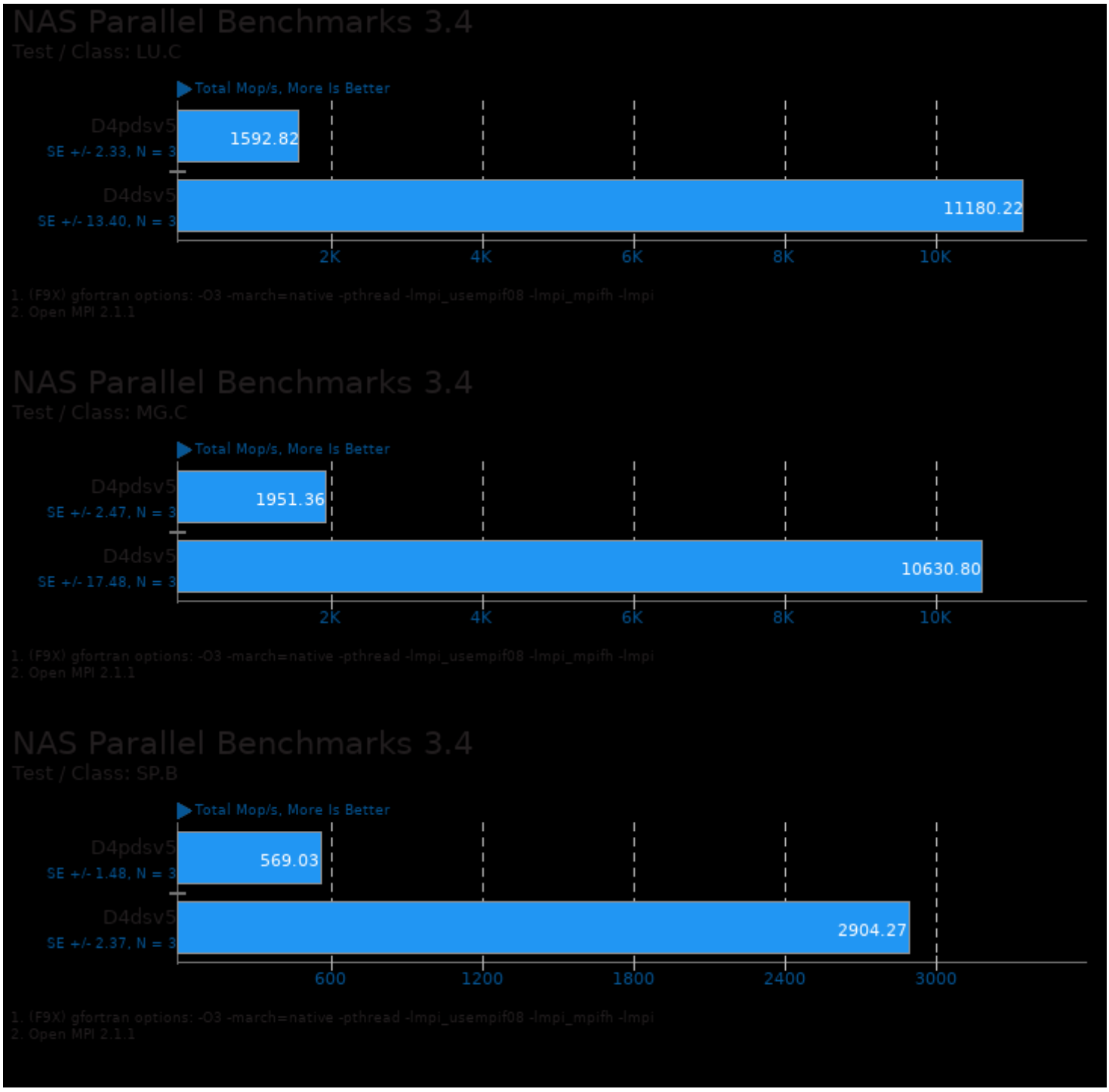
Standard Deviation	0.6%	0.6%
NAS Parallel Benchmarks - BT.C (Mop/s)	**1734**	**4219**
Normalized	41.11%	100%
Standard Deviation	0.5%	0.3%
NAS Parallel Benchmarks - CG.C (Mop/s)	**750.97**	**3177**
Normalized	23.64%	100%
Standard Deviation	2.3%	1.3%
NAS Parallel Benchmarks - EP.C (Mop/s)	**124.46**	**106.33**
Normalized	100%	85.43%
Standard Deviation	0.3%	0.3%
NAS Parallel Benchmarks - EP.D (Mop/s)	**124.14**	**106.47**
Normalized	100%	85.77%
Standard Deviation	0.8%	0.3%
NAS Parallel Benchmarks - FT.C (Mop/s)	**1784**	**5593**
Normalized	31.9%	100%
Standard Deviation	0.2%	0.3%
NAS Parallel Benchmarks - LU.C (Mop/s)	**1593**	**11180**
Normalized	14.25%	100%
Standard Deviation	0.3%	0.2%
NAS Parallel Benchmarks - MG.C (Mop/s)	**1951**	**10631**
Normalized	18.36%	100%
Standard Deviation	0.2%	0.3%
NAS Parallel Benchmarks - SP.B (Mop/s)	**569.03**	**2904**
Normalized	19.59%	100%
Standard Deviation	0.4%	0.1%
NAS Parallel Benchmarks - SP.C (Mop/s)	**547.75**	**3088**
Normalized	17.74%	100%
Standard Deviation	0.7%	1.7%
Fhourstones - C.C.4.S (Kpos / sec)	**7198**	**12464**
Normalized	57.75%	100%
Standard Deviation	0.8%	0.1%
BYTE Unix Benchmark - Dhrystone 2 (LPS)	**27428886**	**38333509**
Normalized	71.55%	100%
Standard Deviation	0.1%	0.5%
Botan - KASUMI (MiB/s)	**67.494**	**78.491**
Normalized	85.99%	100%
Standard Deviation	0%	0.1%
Botan - KASUMI - Decrypt (MiB/s)	**64.858**	**75.312**
Normalized	86.12%	100%
Standard Deviation	0.1%	0.1%
Botan - AES-256 (MiB/s)	**2764**	**5646**
Normalized	48.95%	100%
Standard Deviation	0.1%	0.2%
Botan - AES-256 - Decrypt (MiB/s)	**2767**	**5643**
Normalized	49.04%	100%
Standard Deviation	0.1%	0.3%
Botan - Twofish (MiB/s)	**230.327**	**300.167**
Normalized	76.73%	100%
Standard Deviation	0.1%	0%
Botan - Twofish - Decrypt (MiB/s)	**245.634**	**296.392**
Normalized	82.87%	100%
Standard Deviation	0.1%	0%
Botan - Blowfish (MiB/s)	**289.749**	**373.340**
Normalized	77.61%	100%
Standard Deviation	0.1%	0.1%

Botan - Blowfish - Decrypt (MiB/s)	**291.005**	**372.691**
Normalized	78.08%	100%
Standard Deviation	0.6%	0%
Botan - CAST-256 (MiB/s)	**112.842**	**117.917**
Normalized	95.7%	100%
Standard Deviation	0.1%	0%
Botan - CAST-256 - Decrypt (MiB/s)	**112.450**	**117.916**
Normalized	95.36%	100%
Standard Deviation	0.1%	0.1%
Botan - ChaCha20Poly1305 (MiB/s)	**291.244**	**670.712**
Normalized	43.42%	100%
Standard Deviation	0%	0.1%
Botan - ChaCha20Poly1305 - Decrypt (MiB/s)	**288.990**	**666.297**
Normalized	43.37%	100%
Standard Deviation	0.1%	0.1%
ACES DGEMM - S.F.P.R (GFLOP/s)	**0.438976**	**1.876669**
Normalized	23.39%	100%
Standard Deviation	3.2%	12.6%
Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec)	**93441**	**69492**
Normalized	100%	74.37%
Standard Deviation	0%	0.3%
Stockfish - Total Time (Nodes/s)	**4622524**	**5172713**
Normalized	89.36%	100%
Standard Deviation	1.3%	1.4%
Swet - Average (Operations/sec)	**363861708**	**631771984**
Normalized	57.59%	100%
Standard Deviation	0.2%	1.6%
Sysbench - RAM / Memory (MiB/sec)	**5647**	**10165**
Normalized	55.56%	100%
Standard Deviation	2.3%	2.3%
Sysbench - CPU (Events/sec)	**14232**	**6239**
Normalized	100%	43.84%
Standard Deviation	0%	0%


OSBench
Test: Create Files
us Per Event, Fewer Is Better
D4pdsv5
SE +/- 0.17, N = 3
27.72
D4dsv5
SE +/- 0.03, N = 3
15.22
7
14
21
28
35
1. (CC) gcc options: -lm
OSBench
Test: Create Threads
us Per Event, Fewer Is Better
D4pdsv5
SE +/- 3.78, N = 15
43.41
D4dsv5
SE +/- 0.08, N = 3
15.34
10
20
30
40
50
1. (CC) gcc options: -lm
OSBench
Test: Launch Programs
us Per Event, Fewer Is Better
D4pdsv5
SE +/- 1.01, N = 3
185.76
D4dsv5
SE +/- 0.53, N = 3
85.64
40
80
120
160
200
1. (CC) gcc options: -lm
OSBench
Test: Create Processes
us Per Event, Fewer Is Better
D4pdsv5
SE +/- 0.24, N = 3
59.54
D4dsv5
SE +/- 0.35, N = 3
31.19
13
26
39
52
65
1. (CC) gcc options: -lm

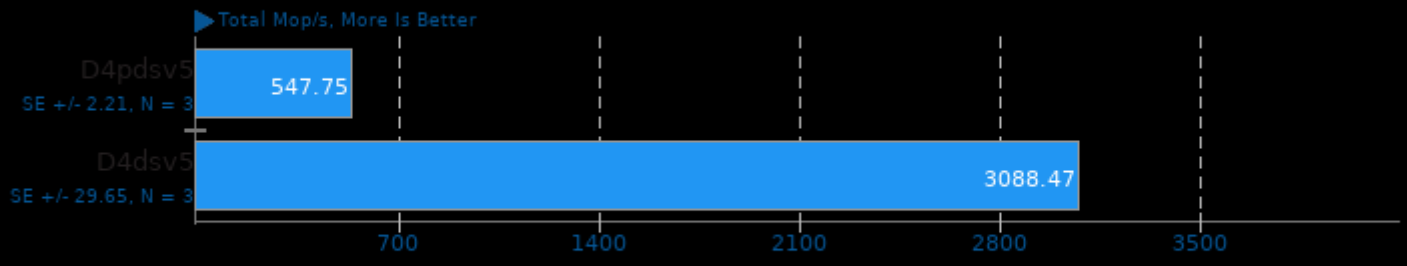

OSBench
Test: Memory Allocations
Ns Per Event, Fewer Is Better
D4pdsv5
SE +/- 0.57, N = 3
164.43
D4dsv5
SE +/- 0.25, N = 3
75.61
40
80
120
160
200
1. (CC) gcc options: -lm
NAS Parallel Benchmarks 3.4
Test / Class: BT.C
Total Mop/s, More Is Better
D4pdsv5
SE +/- 4.89, N = 3
1734.23
D4dsv5
SE +/- 6.22, N = 3
4218.60
900
1800
2700
3600
4500
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
D4pdsv5
SE +/- 7.19, N = 6
750.97
D4dsv5
SE +/- 23.26, N = 3
3177.05
700
1400
2100
2800
3500
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
D4pdsv5
SE +/- 0.21, N = 3
124.46
D4dsv5
SE +/- 0.17, N = 3
106.33
30
60
90
120
150
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
D4pdsv5
SE +/- 0.56, N = 3
124.14
D4dsv5
SE +/- 0.21, N = 3
106.47
30
60
90
120
150
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
D4pdsv5
SE +/- 2.42, N = 3
1783.99
D4dsv5
SE +/- 9.17, N = 3
5592.88
1200
2400
3600
4800
6000
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
D4pdsv5
SE +/- 2.33, N = 3
1592.82
D4dsv5
SE +/- 13.40, N = 3
11180.22
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: MG.C
Total Mop/s, More Is Better
D4pdsv5
SE +/- 2.47, N = 3
1951.36
D4dsv5
SE +/- 17.48, N = 3
10630.80
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.B
Total Mop/s, More Is Better
D4pdsv5
SE +/- 1.48, N = 3
569.03
D4dsv5
SE +/- 2.37, N = 3
2904.27
600
1200
1800
2400
3000
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 2.1.1

NAS Parallel Benchmarks 3.4

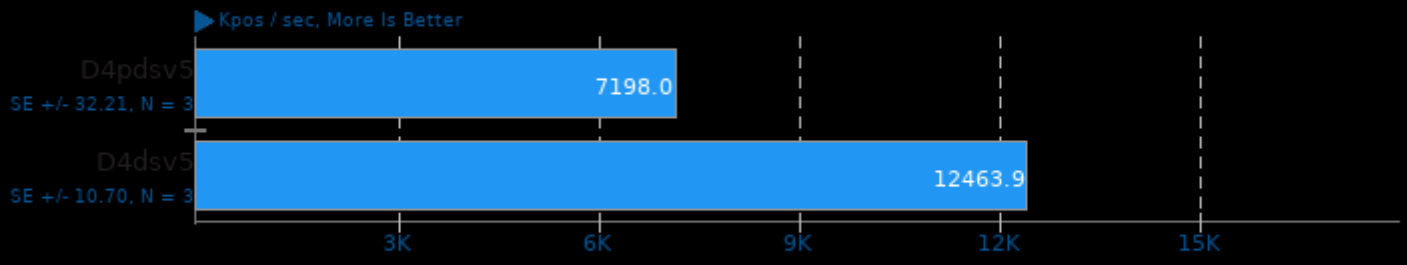
Test / Class: SP.C



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

Fhourstones 3.1

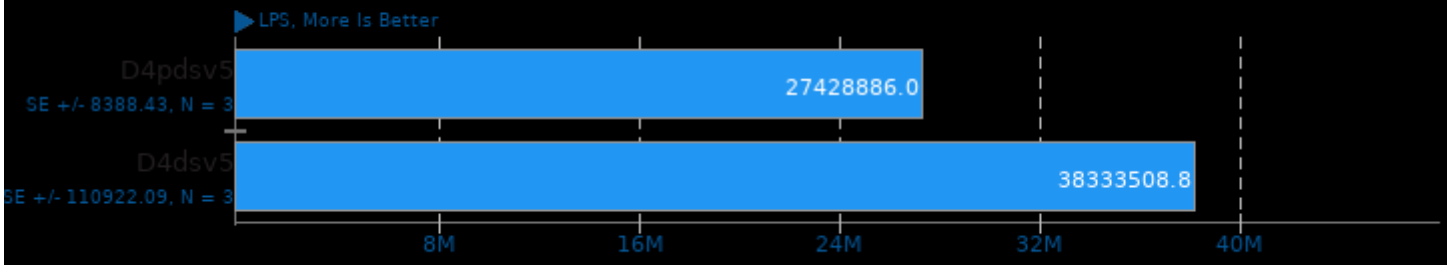
Complex Connect-4 Solving



1. (CC) gcc options: -O3

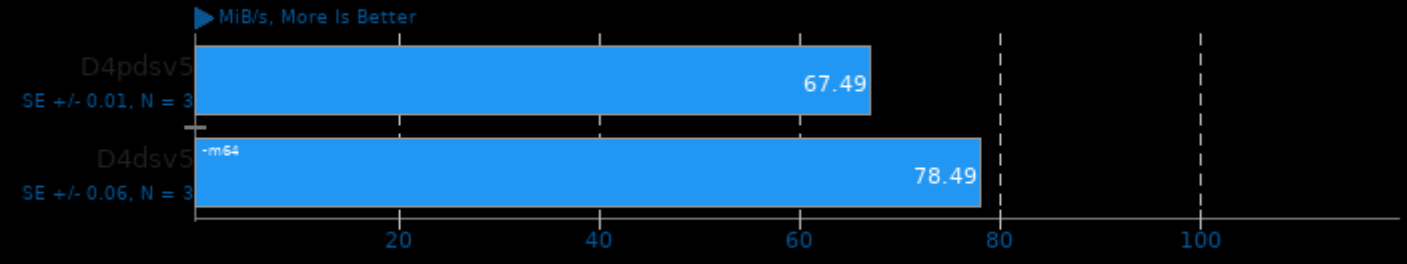
BYTE Unix Benchmark 3.6

Computational Test: Dhrystone 2

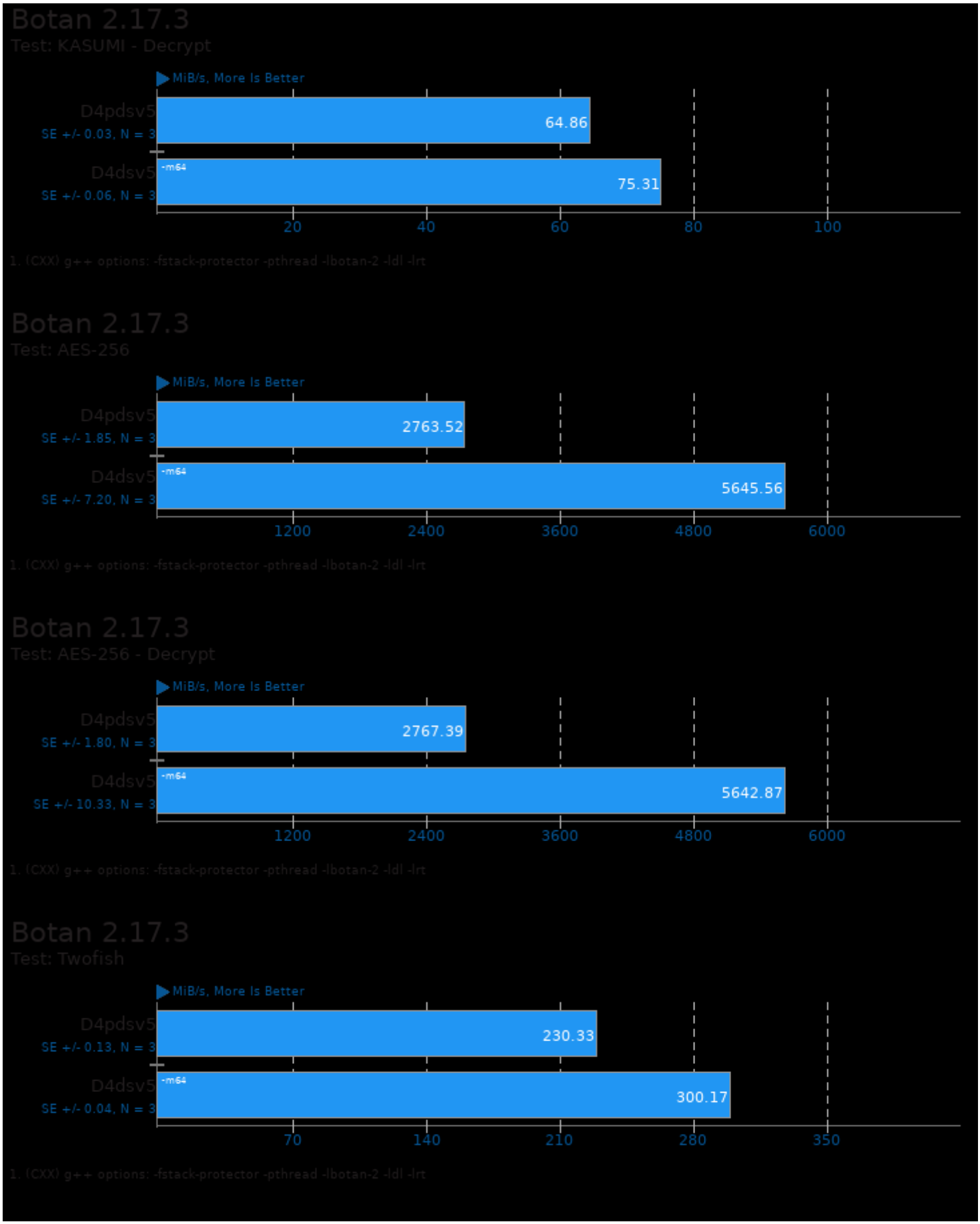


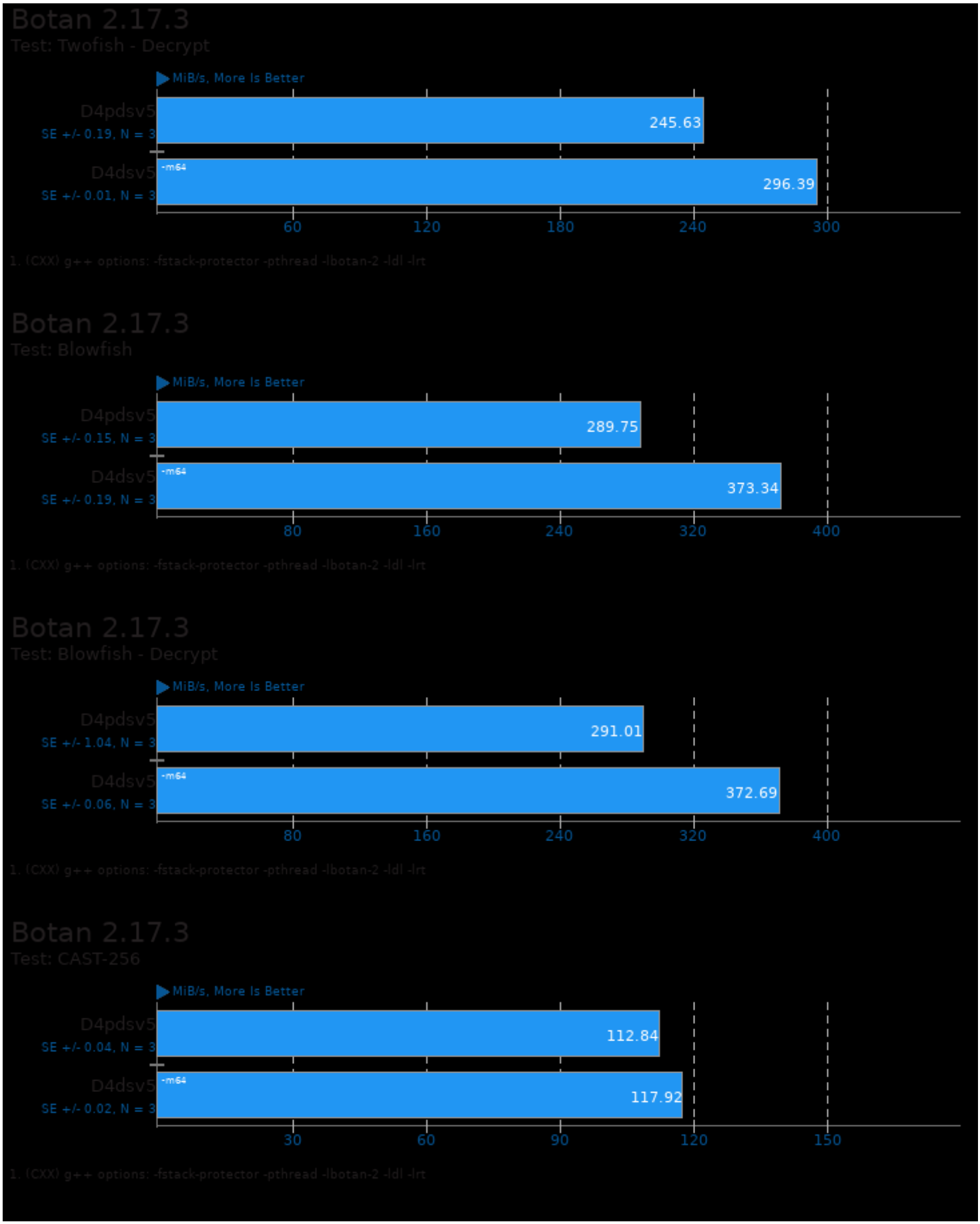
Botan 2.17.3

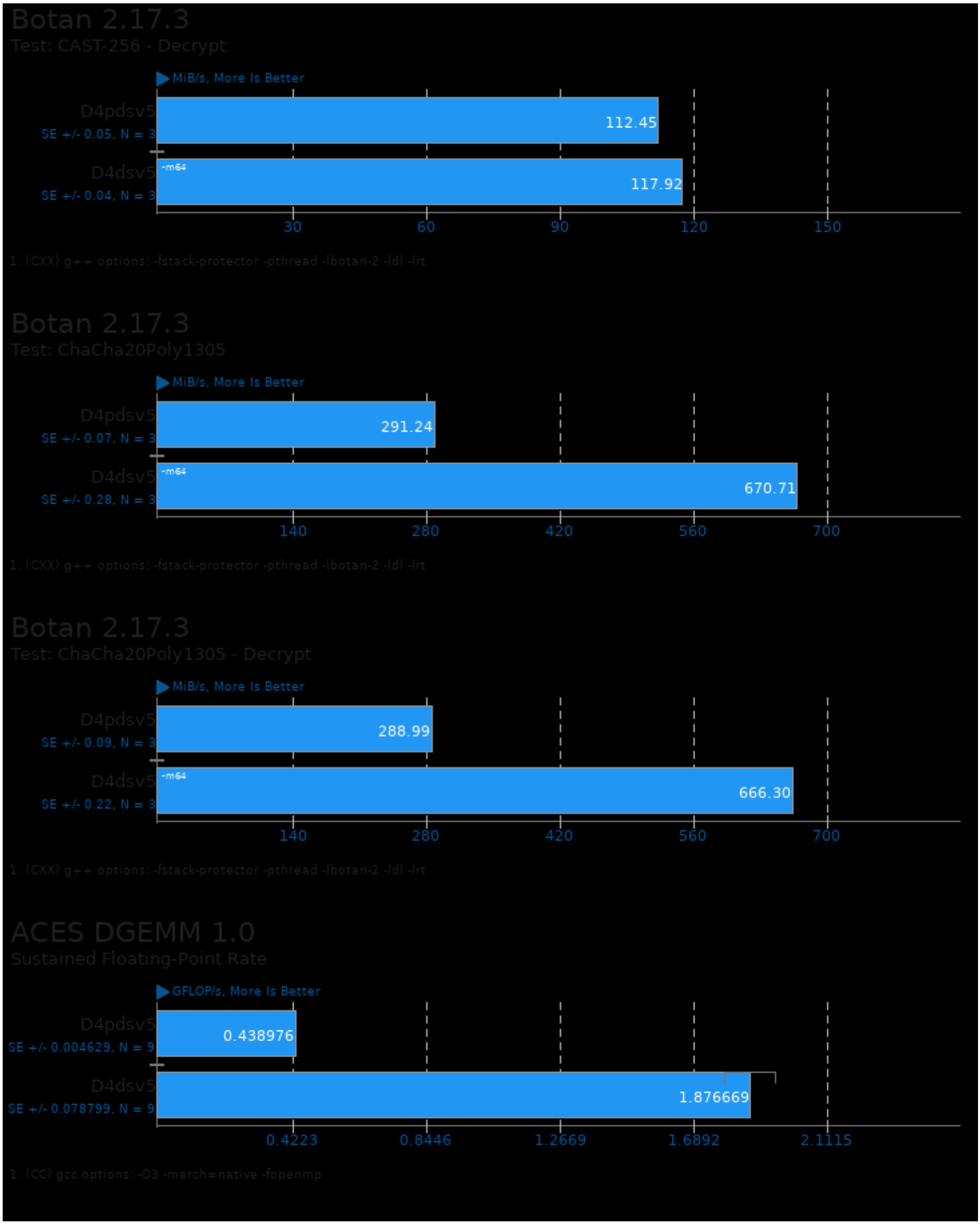
Test: KASUMI



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

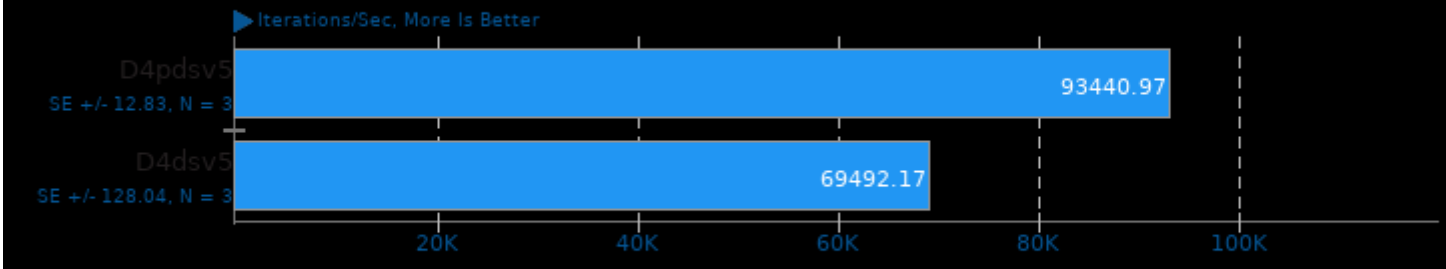

Botan 2.17.3
Test: KASUMI - Decrypt
MiB/s, More Is Better
D4pdsv5
SE +/- 0.03, N = 3
64.86
D4dsv5
-m64
SE +/- 0.06, N = 3
75.31
20
40
60
80
100
1. (CXX) g++ options: -fstack-protector -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: AES-256
MiB/s, More Is Better
D4pdsv5
SE +/- 1.85, N = 3
2763.52
D4dsv5
-m64
SE +/- 7.20, N = 3
5645.56
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
D4pdsv5
SE +/- 1.80, N = 3
2767.39
D4dsv5
-m64
SE +/- 10.33, N = 3
5642.87
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
D4pdsv5
SE +/- 0.13, N = 3
230.33
D4dsv5
-m64
SE +/- 0.04, 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
D4pdsv5
SE +/- 0.19, N = 3
245.63
D4dsv5
-m64
SE +/- 0.01, N = 3
296.39
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
D4pdsv5
SE +/- 0.15, N = 3
289.75
D4dsv5
-m64
SE +/- 0.19, N = 3
373.34
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
D4pdsv5
SE +/- 1.04, N = 3
291.01
D4dsv5
-m64
SE +/- 0.06, N = 3
372.69
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
D4pdsv5
SE +/- 0.04, N = 3
112.84
D4dsv5
-m64
SE +/- 0.02, N = 3
117.92
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
D4pdsv5
SE +/- 0.05, N = 3
112.45
D4dsv5
-m64
SE +/- 0.04, N = 3
117.92
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
D4pdsv5
SE +/- 0.07, N = 3
291.24
D4dsv5
-m64
SE +/- 0.28, N = 3
670.71
140
280
420
560
700
1. (CXX) g++ options: -fstack-protector -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: ChaCha20Poly1305 - Decrypt
MiB/s, More Is Better
D4pdsv5
SE +/- 0.09, N = 3
288.99
D4dsv5
-m64
SE +/- 0.22, N = 3
666.30
140
280
420
560
700
1. (CXX) g++ options: -fstack-protector -pthread -lbotan-2 -ldl -lrt
ACES DGEMM 1.0
Sustained Floating-Point Rate
GFLOP/s, More Is Better
D4pdsv5
SE +/- 0.004629, N = 9
0.438976
D4dsv5
SE +/- 0.078799, N = 9
1.876669
0.4223
0.8446
1.2669
1.6892
2.1115
1. (CC) gcc options: -O3 -march=native -fopenmp

Coremark 1.0

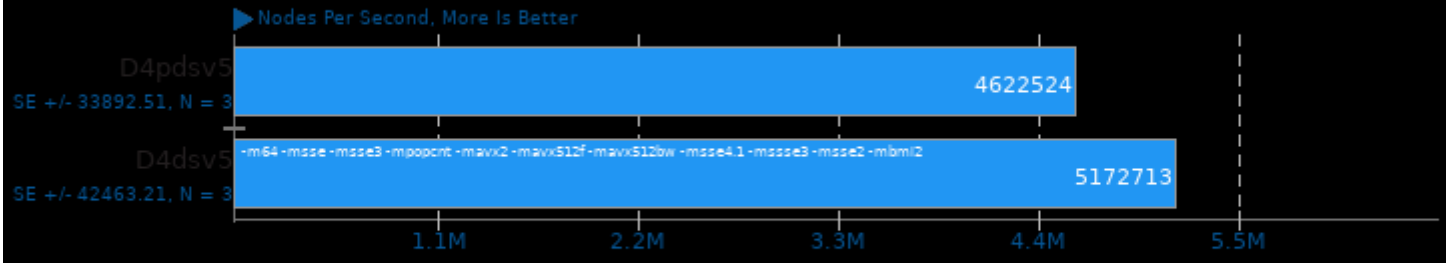
CoreMark Size 666 - Iterations Per Second



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

Stockfish 13

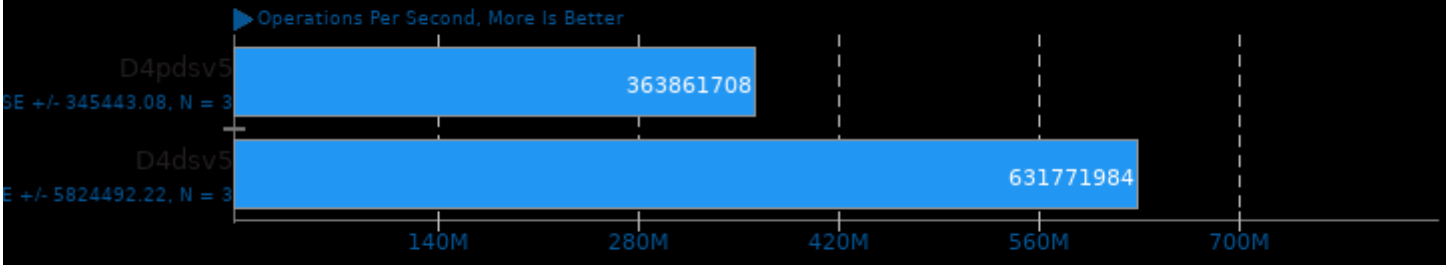
Total Time



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

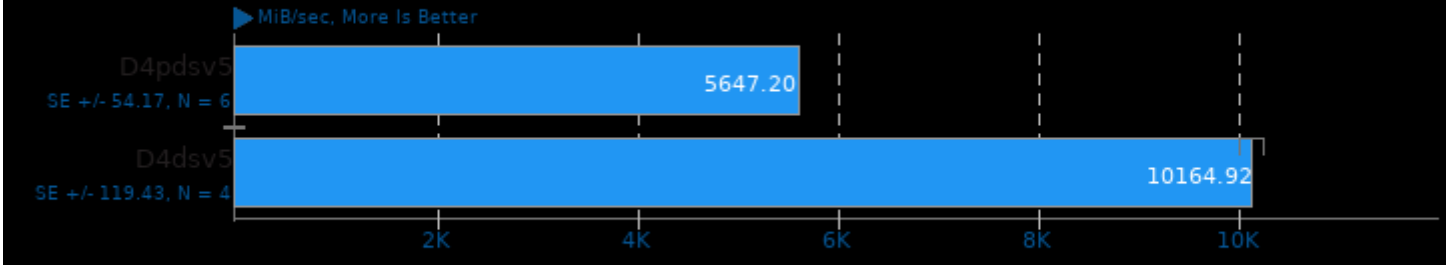
Average



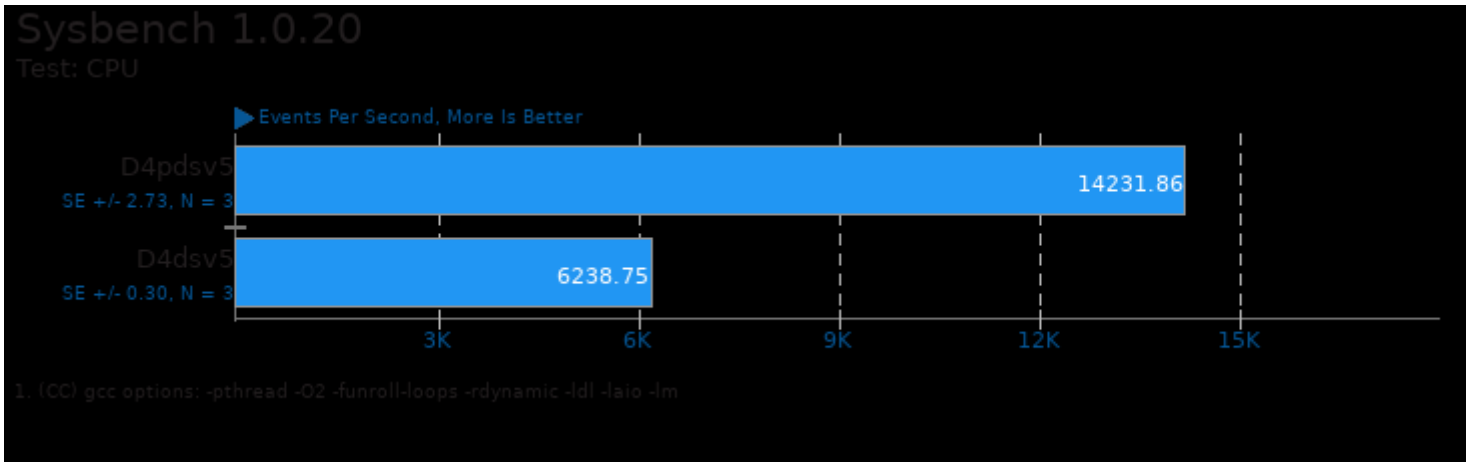
1. (CC) gcc options: -lm -lpthread -lcurses -lrt

Sysbench 1.0.20

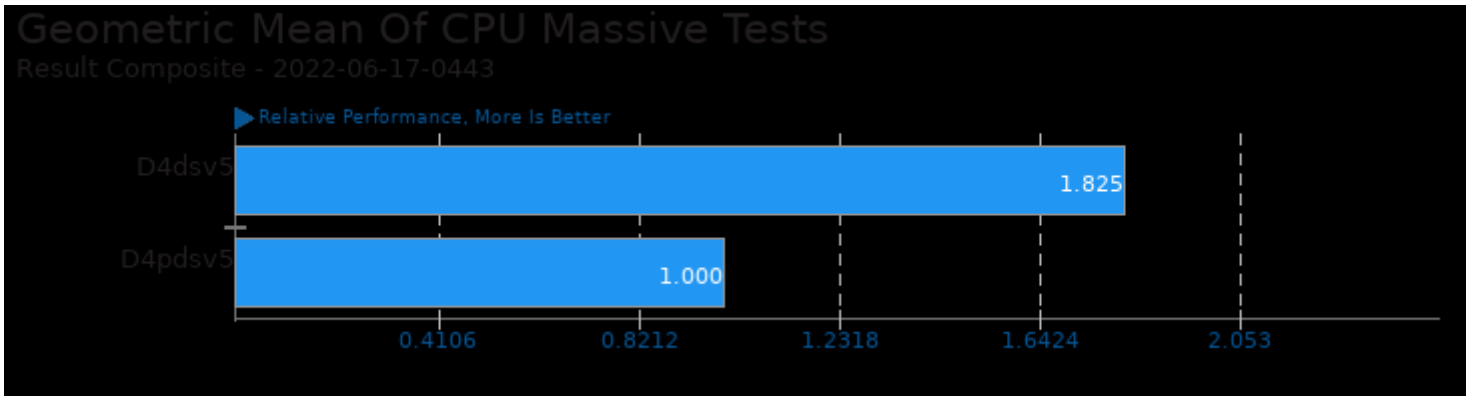
Test: RAM / Memory



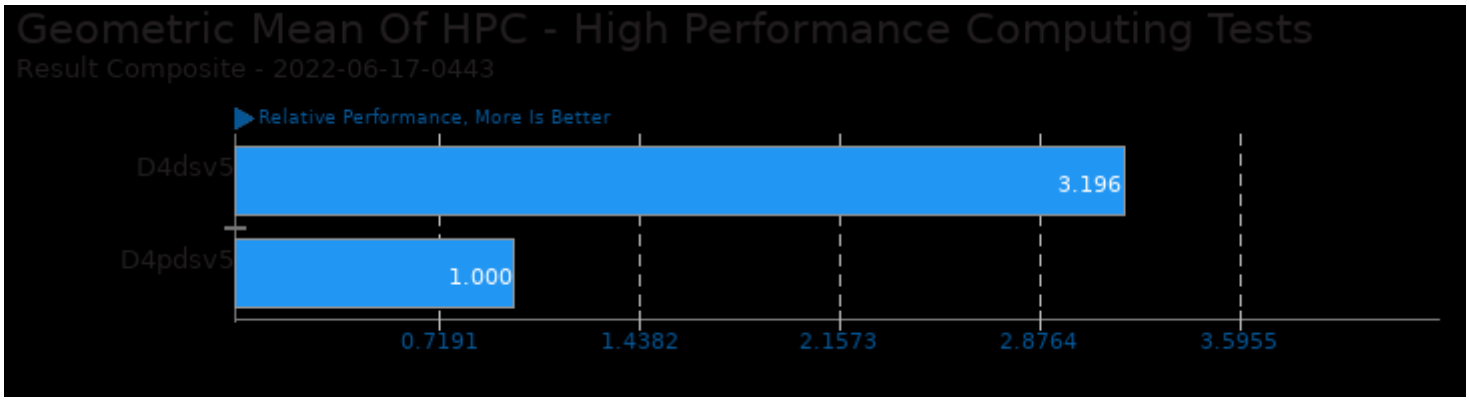
1. (CC) gcc options: -pthread -O2 -funroll-loops -rdynamic -ldl -laio -lm


Sysbench 1.0.20
Test: CPU
Events Per Second, More Is Better
D4pdsv5
SE +/- 2.73, N = 3
14231.86
D4dsv5
SE +/- 0.30, N = 3
6238.75
3K
6K
9K
12K
15K
1. (CC) gcc options: -pthread -O2 -funroll-loops -rdynamic -ldl -laio -lm

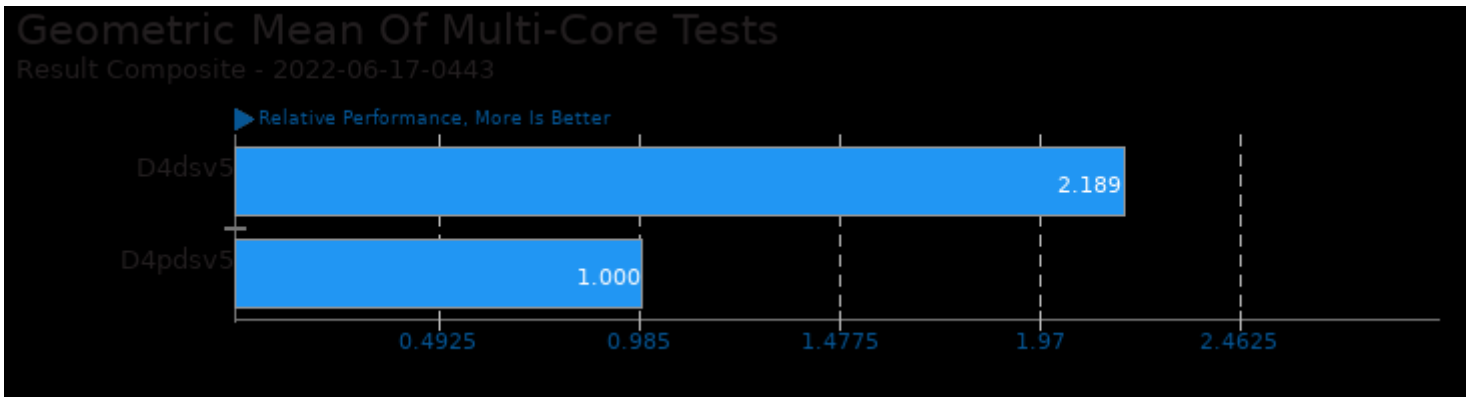
These geometric means are based upon test groupings / test suites for this result file.



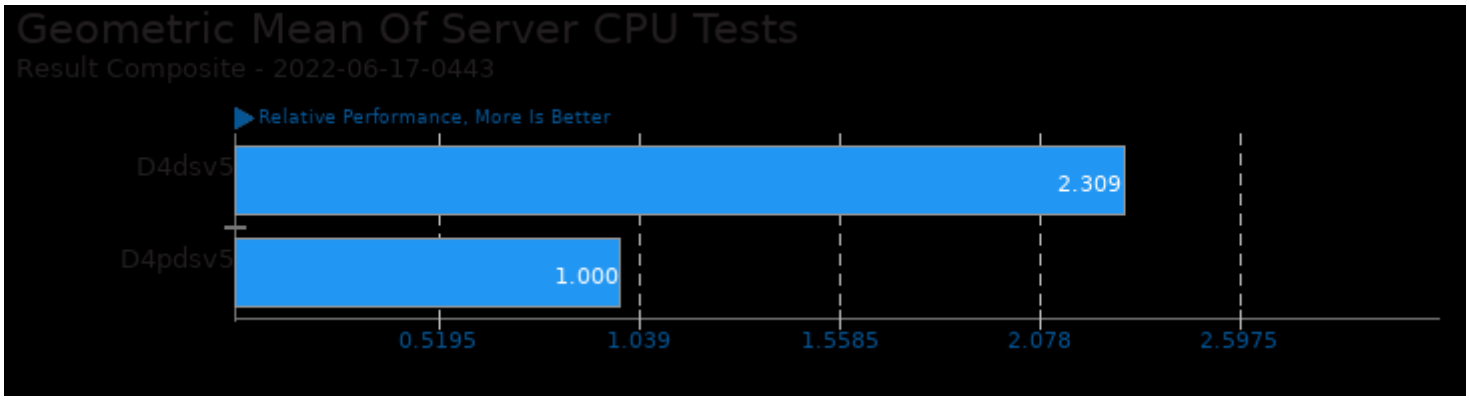
Geometric mean based upon tests: pts/npb, pts/stockfish, pts/swet, pts/sysbench and pts/botan



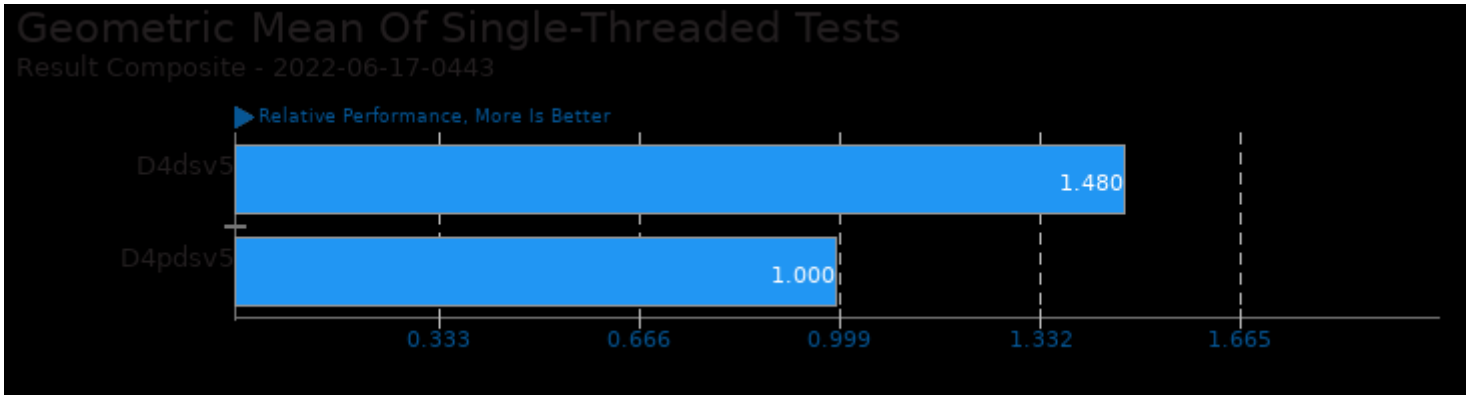
Geometric mean based upon tests: pts/npb and pts/mt-dgemm



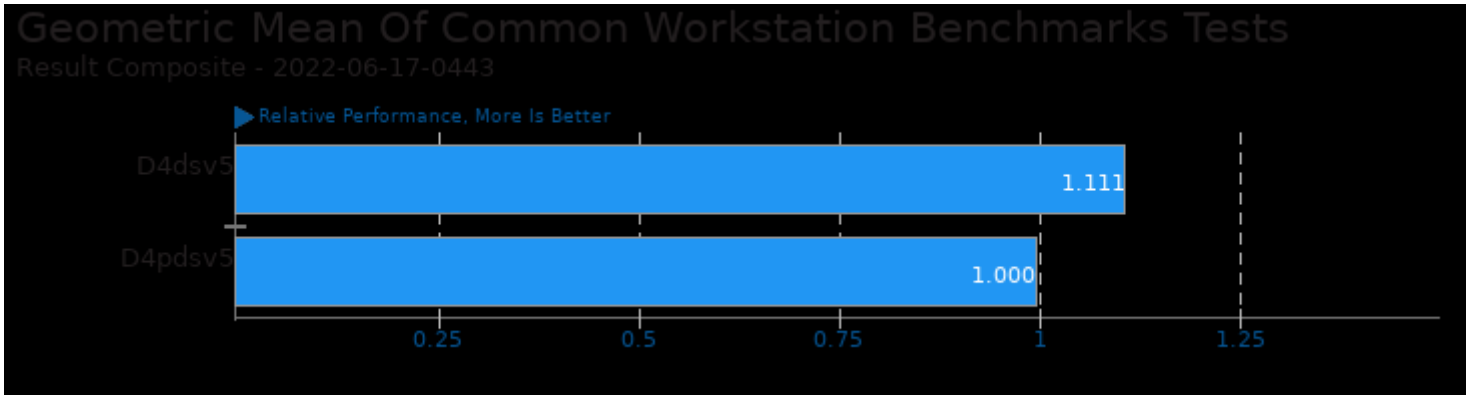
Geometric mean based upon tests: pts/sysbench, pts/stockfish, pts/coremark, pts/npb, pts/swet and pts/mt-dgemm



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 16:08.