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multicore-result

ARMv8 rev 0 testing with a e3360_1099 and NVIDIA TEGRA on Ubuntu 20.04 via the Phoronix Test Suite.

Automated Executive Summary

mu_co_Maria had the most wins, coming in first place for 60% of the tests.

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

MariaDB (Clients: 1) at 1.04x

MariaDB (Clients: 8) at 1.024x

MariaDB (Clients: 64) at 1.02x

MariaDB (Clients: 32) at 1.015x

MariaDB (Clients: 16) at 1.008x

7-Zip Compression (Compress Speed Test) at 1x

ACES DGEMM (Sustained Floating-Point Rate) at 1x

AOBench (Size: 2048 x 2048 - Total Time) at 1x

ASKAP (Test: tConvolve MPI - Degridding) at 1x

ASKAP (Test: tConvolve MPI - Gridding) at 1x.

Test Systems:

mu_co_7zip

mu_co

mu_co_Maria

Processor: ARMv8 rev 0 @ 1.91GHz (8 Cores), Motherboard: e3360_1099, Memory: 32GB, Disk: 125GB DUTA42, Graphics: NVIDIA TEGRA

OS: Ubuntu 20.04, Kernel: 5.10.41-tegra (aarch64), Display Server: X Server, Vulkan: 1.2.186, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 4096x2160

Kernel Notes: Transparent Huge Pages: always
 Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc=auto --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 --with-target-system-zlib=auto -v
 Processor Notes: Scaling Governor: tegra194 performance
 Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Not affected + spectre_v1: Mitigation of __user pointer sanitization + spectre_v2: Mitigation of Branch predictor hardening + srbds: Not affected + tsx_async_abort: Not affected

	mu_co_7zip	mu_co	mu_co_Maria
7-Zip Compression - C.S.T (MIPS)	15335		
Standard Deviation	2.4%		
ACES DGEMM - S.F.P.R (GFLOP/s)		0.584248	
Standard Deviation		0.2%	
AOBench - 2048 x 2048 - Total Time (sec)		80.306	
Standard Deviation		4.5%	
ASKAP - tConvolve MPI - Degridding		1168	
Standard Deviation		0.9%	
ASKAP - tConvolve MPI - Gridding		1109	
Standard Deviation		1.5%	
Build2 - Time To Compile (sec)		1010	
Standard Deviation		2.2%	
C-Ray - Total Time - 4.1.R.P.P (sec)		195.825	
Standard Deviation		2.2%	
Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec)		124686	
Standard Deviation		1%	
FFmpeg - H.2.H.T.N.D (sec)		20.693	
Standard Deviation		2.4%	
GraphicsMagick - HWB Color Space (Iterations/min)		294	
Standard Deviation		1.4%	
High Performance Conjugate Gradient (GFLOP/s)		5.50072	
Standard Deviation		0.5%	

Intel MPI Benchmarks - IMB-P2P PingPong (Msg/sec)	1380584	
Standard Deviation	2%	
John The Ripper - MD5 (Real C/S)	208295	
Standard Deviation	1.4%	
m-queens - Time To Solve (sec)	222.068	
Standard Deviation	0.1%	
MariaDB - 1 (Queries/sec)	1561	1624
Normalized	96.12%	100%
Standard Deviation	2.2%	2.5%
MariaDB - 8 (Queries/sec)	825	845
Normalized	97.63%	100%
Standard Deviation	0.2%	0.3%
MariaDB - 16 (Queries/sec)	659	664
Normalized	99.25%	100%
Standard Deviation	0.6%	0.6%
MariaDB - 32 (Queries/sec)	399	393
Normalized	100%	98.5%
Standard Deviation	0.6%	0.3%
MariaDB - 64 (Queries/sec)	200	196
Normalized	100%	98%
Standard Deviation	0.1%	0.4%
oneDNN - C.B.S.A - f32 - CPU (ms)	118.931	
Standard Deviation	1.4%	
oneDNN - C.B.S.A - u8s8f32 - CPU (ms)	118.249	
Standard Deviation	1.8%	
Parallel BZIP2 Compression - 2.F.C (sec)	13.733	
Standard Deviation	7.3%	
Pennant - sedovbig (Hydro Cycle Time - sec)	143.4677	
Standard Deviation	0.8%	
Pennant - leblanchbig (Hydro Cycle Time - sec)	108.0833	
Standard Deviation	1.2%	
Rust Mandelbrot - T.T.C.S.P.M (sec)	137.630	
Standard Deviation	0.9%	
Rust Prime Benchmark - P.N.T.T.2.0.0 (sec)	39.804	
Standard Deviation	2.1%	
Smallpt - G.I.R.1.S (sec)	39.555	
Standard Deviation	1%	
Stockfish - Total Time (Nodes/s)	3854119	
Standard Deviation	0.4%	
Sysbench - CPU (Events/sec)	11916	
Standard Deviation	0.7%	
Timed Apache Compilation - Time To Compile (sec)	153.221	
Standard Deviation	0.6%	
Timed Eigen Compilation - Time To Compile (sec)	433.070	
Standard Deviation	2.4%	
Timed Erlang/OTP Compilation - Time To Compile (sec)	636.771	
Standard Deviation	0.7%	

Timed GCC Compilation - Time To Compile (sec)	6712
Standard Deviation	0.3%
Timed Godot Game Engine Compilation - Time To Compile (sec)	1095
Standard Deviation	0.3%
Timed LLVM Compilation - Ninja (sec)	7105
Standard Deviation	0.7%
Timed LLVM Compilation - Unix Makefiles	7278
Standard Deviation	1.7%
Timed PHP Compilation - Time To Compile (sec)	464.085
Standard Deviation	1.3%
Xsbench (Lookups/s)	2187135
Standard Deviation	2.5%
Timed GDB GNU Debugger Compilation - Time To Compile (sec)	572.667
Standard Deviation	0.8%
Timed Linux Kernel Compilation - Time To Compile (sec)	2438
Standard Deviation	1.7%
Timed FFmpeg Compilation - Time To Compile (sec)	414.280
Standard Deviation	0.5%
libgav1 - Chimera 1080p (FPS)	47.38
Standard Deviation	1.3%
libgav1 - Summer Nature 4K (FPS)	18.49
Standard Deviation	0.5%
libgav1 - S.N.1 (FPS)	61.11
Standard Deviation	0.7%
libgav1 - C.1.1.b (FPS)	24.04
Standard Deviation	2.1%
Rodinia - OpenMP CFD Solver (sec)	80.036
Standard Deviation	1.1%
Zstd Compression - 3 - Compression Speed (MB/s)	899.0
Standard Deviation	0.2%
Zstd Compression - 3 - D.S (MB/s)	1751
Standard Deviation	2.7%
Zstd Compression - 8 - Compression Speed (MB/s)	158.7
Standard Deviation	1.2%
Zstd Compression - 8 - D.S (MB/s)	1800
Standard Deviation	3.7%
Zstd Compression - 19 - Compression Speed (MB/s)	8.57
Standard Deviation	2.4%
Zstd Compression - 19 - D.S (MB/s)	1295
Standard Deviation	2.8%
Zstd Compression - 3, Long Mode - Compression Speed (MB/s)	437.0
Standard Deviation	2.4%

Zstd Compression - 3, Long Mode - D.S	1756
Standard Deviation	0.2%
Zstd Compression - 8, Long Mode -	179.7
Compression Speed (MB/s)	
Standard Deviation	1.6%
Zstd Compression - 8, Long Mode - D.S	1962
Standard Deviation	1%
Zstd Compression - 19, Long Mode -	6.64
Compression Speed (MB/s)	
Standard Deviation	2.2%
Zstd Compression - 19, Long Mode - D.S	1194
(MB/s)	
Standard Deviation	1.9%

7-Zip Compression 16.02

Compress Speed Test



1. (CXX) g++ options: -pipe -fthread

ACES DGEMM 1.0

Sustained Floating-Point Rate



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

AOBench

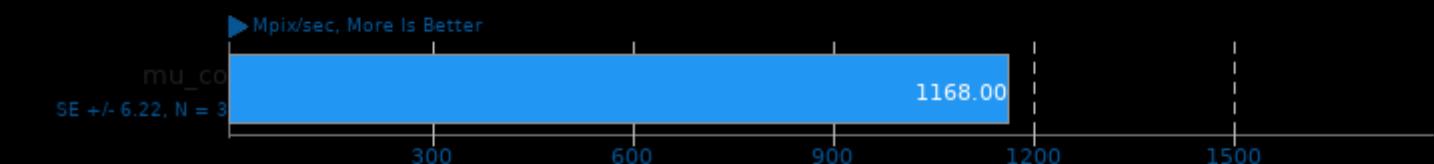
Size: 2048 x 2048 - Total Time



1. (CC) gcc options: -lm -O3

ASKAP 1.0

Test: tConvolve MPI - Degridding



1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp

ASKAP 1.0

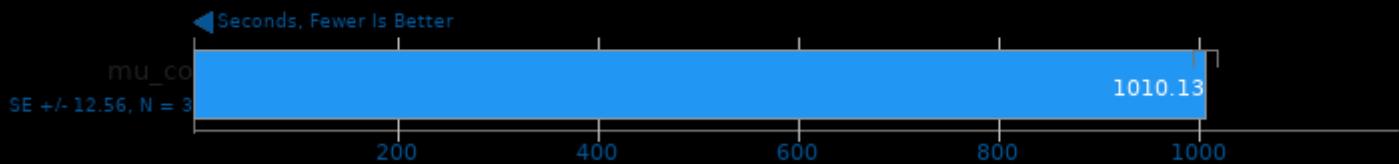
Test: tConvolve MPI - Gridding



1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp

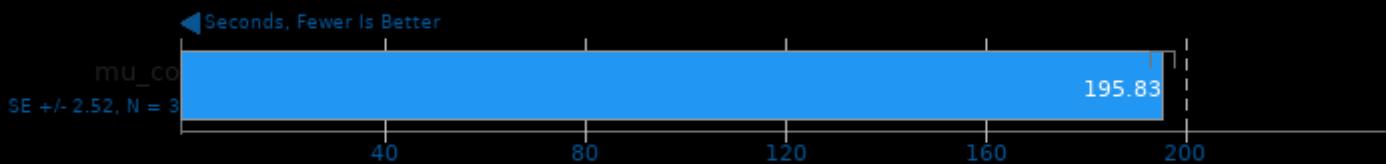
Build2 0.13

Time To Compile



C-Ray 1.1

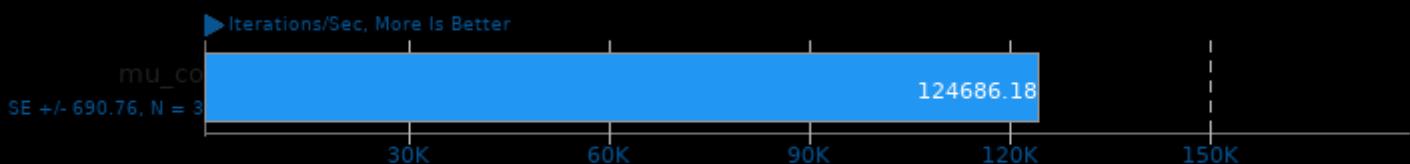
Total Time - 4K, 16 Rays Per Pixel



1. (CC) gcc options: -lm -lpthread -O3

Coremark 1.0

CoreMark Size 666 - Iterations Per Second



1. (CC) gcc options: -O2 -fintc -fint

FFmpeg 4.0.2

H.264 HD To NTSC DV



1. (CC) gcc options: -lavdevice -lavfilter -lavformat -lavcodec -lswresample -lswscale -lavutil -lm -lxcb -lasound -pthread -llzma -std=c11 -fomit-frame-pointer

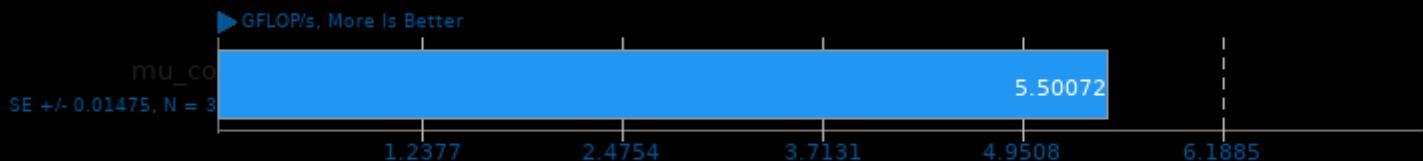
GraphicsMagick 1.3.33

Operation: HWB Color Space



1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -ljpeg -lXext -lSM -lICE -lX11 -llzma -lz -lm -lpthread

High Performance Conjugate Gradient 3.1



Intel MPI Benchmarks 2019.3

Test: IMB-P2P PingPong



John The Ripper 1.9.0-jumbo-1

Test: MD5



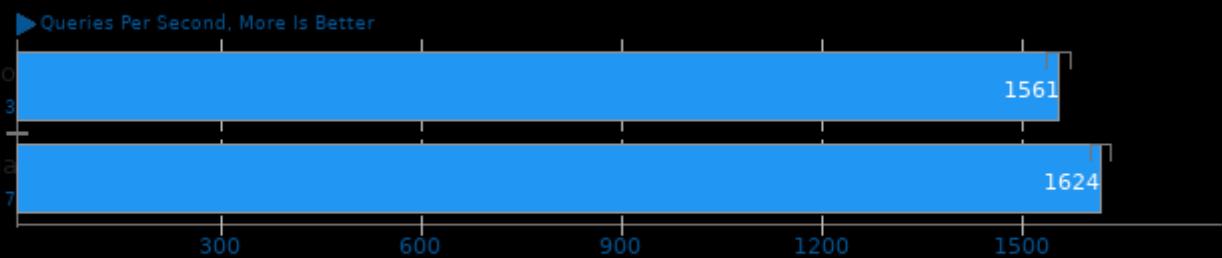
m-queens 1.2

Time To Solve



MariaDB 10.6.4

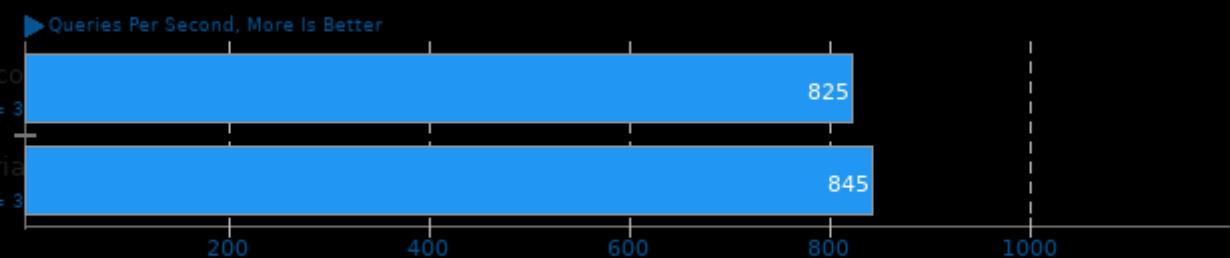
Clients: 1



1. (CXX) g++ options: -pie -fPIC -fstack-protector -foutline-atomics -O3 -pthread -llzma -lnuma -lpcre2-8 -lcrypt -laio -lz -lm -lssl -lcrypto -lpthread -ldl

MariaDB 10.6.4

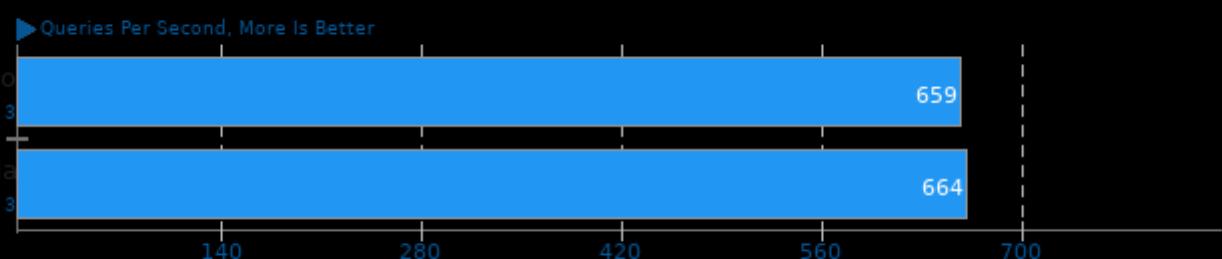
Clients: 8



1. (CXX) g++ options: -pie -fPIC -fstack-protector -foutline-atomics -O3 -pthread -l lzma -l numa -lpcre2-8 -lcrypt -laio -lz -lm -lssl -lcrypto -lpthread -ldl

MariaDB 10.6.4

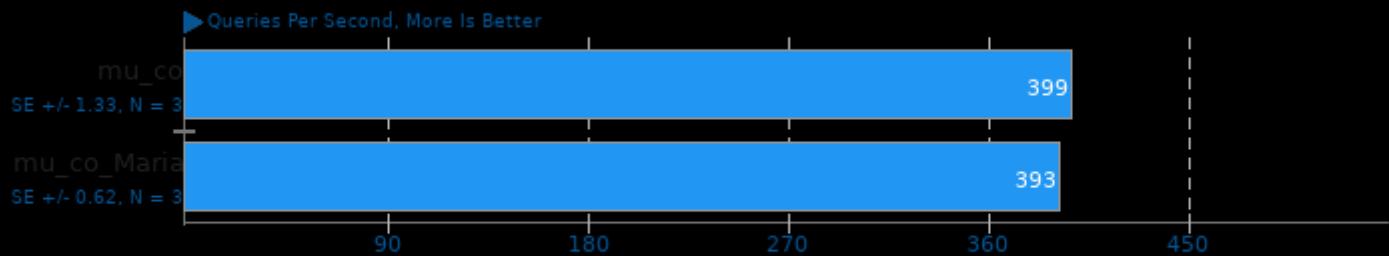
Clients: 16



1. (CXX) g++ options: -pie -fPIC -fstack-protector -foutline-atomics -O3 -pthread -l lzma -l numa -lpcre2-8 -lcrypt -laio -lz -lm -lssl -lcrypto -lpthread -ldl

MariaDB 10.6.4

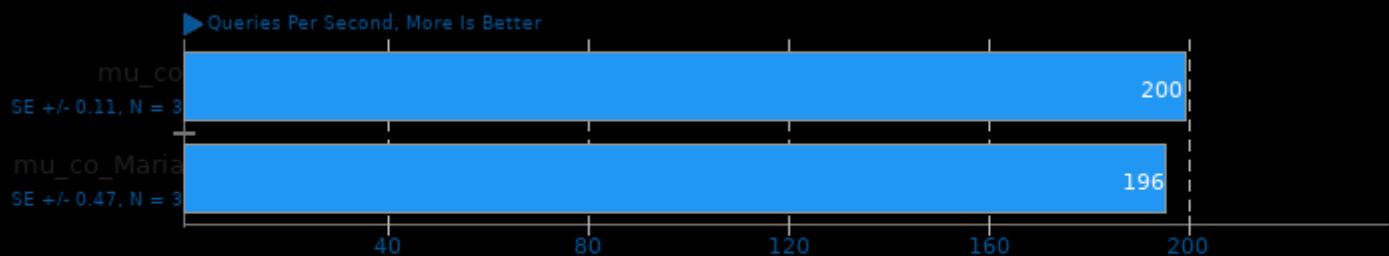
Clients: 32



1. (CXX) g++ options: -pie -fPIC -fstack-protector -foutline-atomics -O3 -pthread -llzma -lnuma -lpcres2-8 -lcrypt -laio -lz -lm -lssl -lcrypto -lpthread -ldl

MariaDB 10.6.4

Clients: 64



1. (CXX) g++ options: -pie -fPIC -fstack-protector -foutline-atomics -O3 -pthread -l lzma -lnuma -l pcres2-8 -lcrypt -laio -lz -lm -lssl -lcrypto -lpthread -ldl

oneDNN 2.1.2

Harness: Convolution Batch Shapes Auto - Data Type: f32 - Engine: CPU



1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread -ldl

oneDNN 2.1.2

Harness: Convolution Batch Shapes Auto - Data Type: u8s8f32 - Engine: CPU



1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread -ldl

Parallel BZIP2 Compression 1.1.12

256MB File Compression



1. (CXX) g++ options: -O2 -pthread -lbz2 -lpthread

Pennant 1.0.1

Test: sedovbig



1. (CXX) g++ options: -fopenmp -pthread -lmpi_cxx -lmpi

Pennant 1.0.1

Test: leblancbig



1. (CXX) g++ options: -fopenmp -pthread -lmpi_cxx -lmpi

Rust Mandelbrot

Time To Complete Serial/Parallel Mandelbrot



1. (CC) gcc options: -pie -nodefaultlibs -lgcc_s -lutil -lrt -lpthread -lm -ldl -lc

Rust Prime Benchmark

Prime Number Test To 200,000,000



1. (CC) gcc options: -pie -nodefaultlibs -lgcc_s -lutil -lrt -lpthread -lm -ldl -lc

Smallpt 1.0

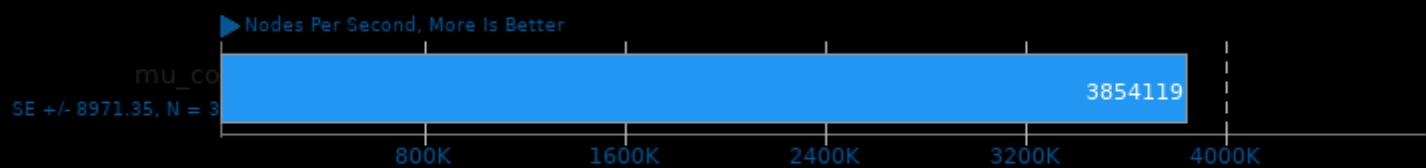
Global Illumination Renderer; 128 Samples



1. (CXX) g++ options: -fopenmp -O3

Stockfish 13

Total Time



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

Sysbench 1.0.20

Test: CPU



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

Timed Apache Compilation 2.4.41

Time To Compile



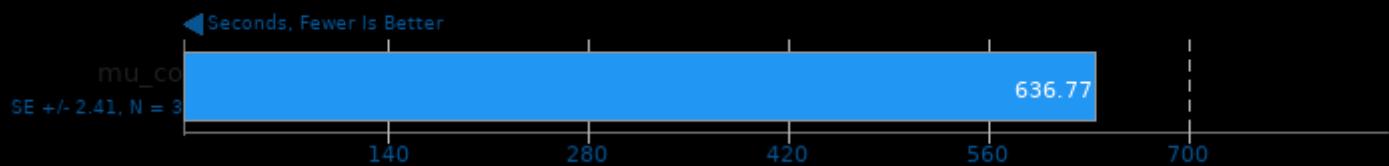
Timed Eigen Compilation 3.3.9

Time To Compile



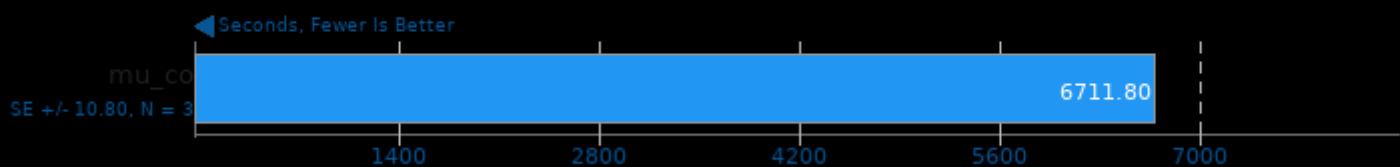
Timed Erlang/OTP Compilation 23.2

Time To Compile



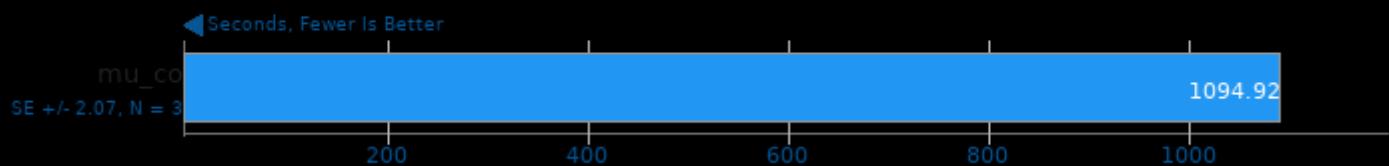
Timed GCC Compilation 11.2.0

Time To Compile



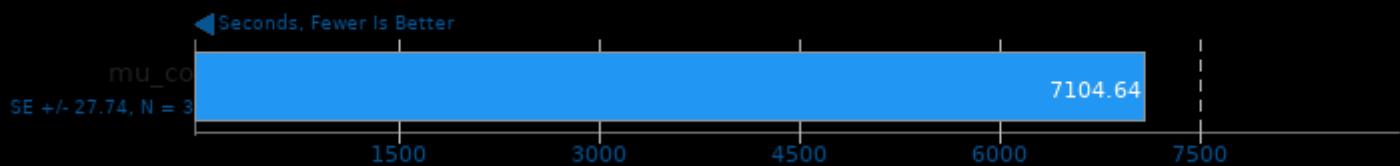
Timed Godot Game Engine Compilation 3.2.3

Time To Compile



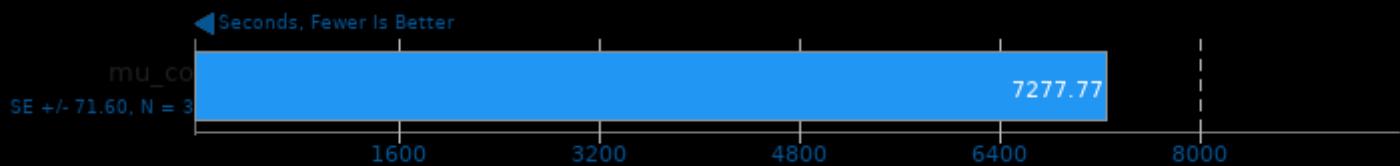
Timed LLVM Compilation 12.0

Build System: Ninja



Timed LLVM Compilation 12.0

Build System: Unix Makefiles

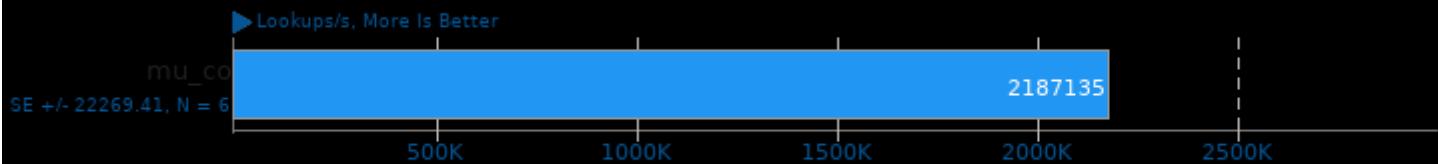


Timed PHP Compilation 7.4.2

Time To Compile



Xsbench 2017-07-06



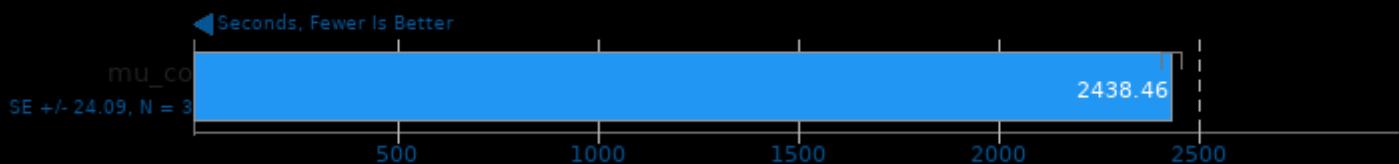
Timed GDB GNU Debugger Compilation 10.2

Time To Compile



Timed Linux Kernel Compilation 5.14

Time To Compile



Timed FFmpeg Compilation 4.4

Time To Compile



libgav1 0.16.3

Video Input: Chimera 1080p



libgavl 0.16.3

Video Input: Summer Nature 4K



libgavl 0.16.3

Video Input: Summer Nature 1080p



libgavl 0.16.3

Video Input: Chimera 1080p 10-bit



Rodinia 3.1

Test: OpenMP CFD Solver



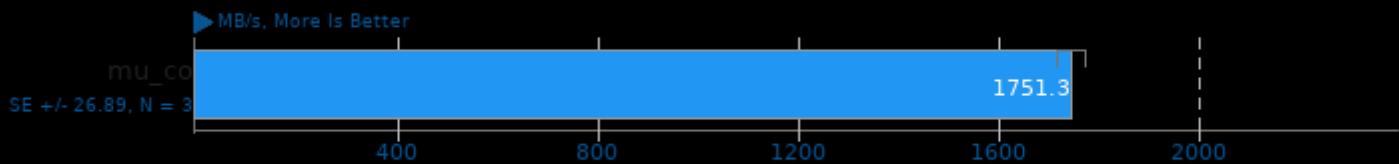
Zstd Compression 1.5.0

Compression Level: 3 - Compression Speed



Zstd Compression 1.5.0

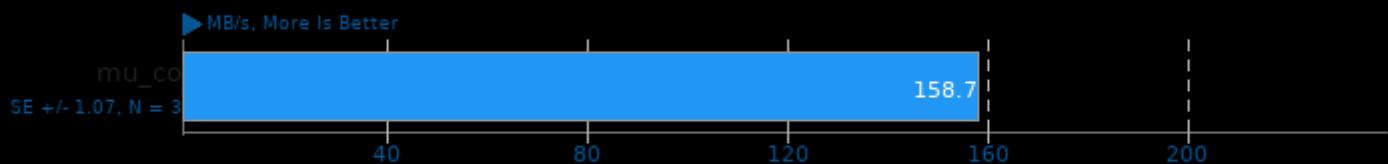
Compression Level: 3 - Decompression Speed



1. (CC) gcc options: -O3 -pthread -lz -lizma

Zstd Compression 1.5.0

Compression Level: 8 - Compression Speed



1. (CC) gcc options: -O3 -pthread -lz -lizma

Zstd Compression 1.5.0

Compression Level: 8 - Decompression Speed



1. (CC) gcc options: -O3 -pthread -lz -lizma

Zstd Compression 1.5.0

Compression Level: 19 - Compression Speed



1. (CC) gcc options: -O3 -pthread -lz -lizma

Zstd Compression 1.5.0

Compression Level: 19 - Decompression Speed



1. (CC) gcc options: -O3 -pthread -lz -lizma

Zstd Compression 1.5.0

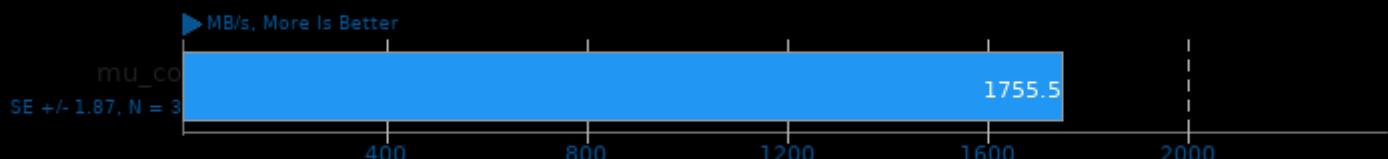
Compression Level: 3, Long Mode - Compression Speed



1. (CC) gcc options: -O3 -pthread -lz -lizma

Zstd Compression 1.5.0

Compression Level: 3, Long Mode - Decompression Speed



1. (CC) gcc options: -O3 -pthread -lz -lizma

Zstd Compression 1.5.0

Compression Level: 8, Long Mode - Compression Speed



1. (CC) gcc options: -O3 -pthread -lz -lizma

Zstd Compression 1.5.0

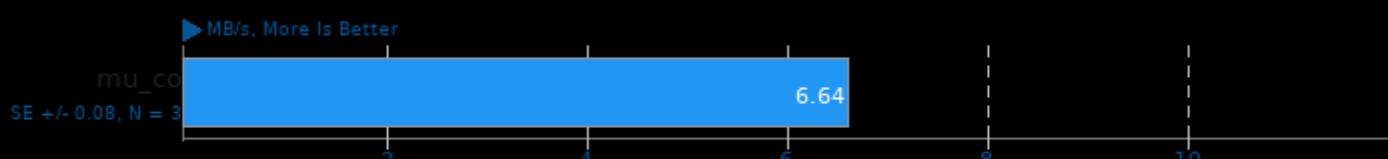
Compression Level: 8, Long Mode - Decompression Speed



1. (CC) gcc options: -O3 -pthread -lz -lizma

Zstd Compression 1.5.0

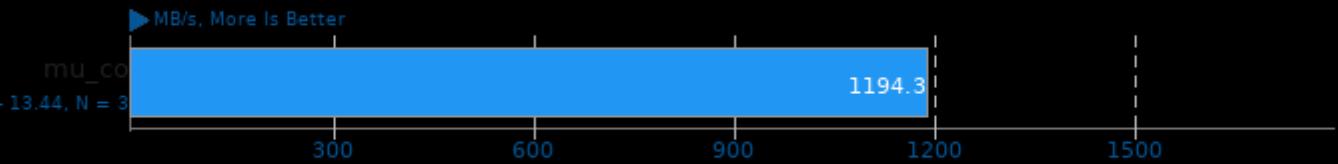
Compression Level: 19, Long Mode - Compression Speed



1. (CC) gcc options: -O3 -pthread -lz -lizma

Zstd Compression 1.5.0

Compression Level: 19, Long Mode - Decompression Speed



l. (CC) gcc options: -O3 -pthread -lz -lzma

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