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Lenovo Kernel

Intel Core i3-3110M testing with a LENOVO (78CN25WWV2.03 BIOS) and Intel HD 4000 on VoidLinux rolling via the Phoronix Test Suite.

Automated Executive Summary

Ubuntu 21.04 -miti GCC 10.3 had the most wins, coming in first place for 33% of the tests.

Test Systems:

Ubuntu 21.04 -miti GCC 10.3

Processor: Intel Core i3-3110M @ 2.40GHz (2 Cores / 4 Threads), Motherboard: LENOVO (78CN25WWV2.03 BIOS), Chipset: Intel 3rd Gen Core DRAM, Memory: 8GB, Disk: 1000GB Samsung SSD 860, Graphics: Intel HD 4000 2GB (1000MHz), Audio: Conexant CX20757, Network: Qualcomm Atheros QCA8172 + Intel Centrino-N 135

OS: Ubuntu 21.04, Kernel: 5.11.0-16-generic (x86_64), Desktop: MATE 1.24.1, Display Server: X Server 1.20.11, OpenGL: 4.2 Mesa 21.0.1, Vulkan: 1.2.145, Compiler: GCC 10.3.0 + Clang 12.0.0-1ubuntu1 + LLVM 12.0.0,

File-System: zfs, Screen Resolution: 1366x768

Kernel Notes: Transparent Huge Pages: madvise
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++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-mutex --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-gDeRY6/gcc-10-10.3.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-gDeRY6/gcc-10-10.3.0/debian/tmp-gcn/usr, 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-build-config=bootstrap-lto-lean --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: intel_cpufreq performance - CPU Microcode: 0x21 - Thermald 2.4.3
Disk Scheduler Notes: NONE
Python Notes: Python 3.9.4
Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + l1tf: Mitigation of PTE Inversion; VMX: conditional cache flushes SMT vulnerable + mds: Mitigation of Clear buffers; SMT vulnerable + meltdown: Mitigation of PTI + 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 generic retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

ClearLinux 34600 miti GCC 11.1

Processor: Intel Core i3-3110M @ 2.40GHz (2 Cores / 4 Threads), Motherboard: LENOVO (78CN25WWV2.03 BIOS), Chipset: Intel 3rd Gen Core DRAM, Memory: 8GB, Disk: 1000GB Samsung SSD 860, Graphics: Intel HD 4000 2GB (1000MHz), Audio: Conexant CX20757, Network: Qualcomm Atheros QCA8172 + Intel Centrino-N 135

OS: Clear Linux OS 34600, Kernel: 5.12.2-1038.native (x86_64), Desktop: GNOME Shell 40.0, Display Server: X Server 1.20.11, OpenGL: 4.2 Mesa 21.1.0, Vulkan: 1.2.168, Compiler: GCC 11.1.1 20210507 releases/gcc-11.1.0-76-g3068b39d12 + Clang 11.1.0 + LLVM 11.1.0, File-System: ext4, Screen Resolution: 1366x768

Kernel Notes: Transparent Huge Pages: always
Environment Notes: FFLAGS="-g -O3 -feliminate-unused-debug-types -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector --param=ssp-buffer-size=32 -m64 -fasynchronous-unwind-tables -Wp,-D_REENTRANT -ftree-loop-distribute-patterns -Wl,-z -Wl,now -Wl,-z -Wl,relro -malign-data=abi -fno-semantic-interposition -ftree-vectorize -ftree-loop-vectorize -Wl,--enable-new-dtags -Wa,-mbranches-within-32B-boundaries" CXXFLAGS="-g -O3 -feliminate-unused-debug-types -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector --param=ssp-buffer-size=32 -Wformat -Wformat-security -m64 -fasynchronous-unwind-tables -Wp,-D_REENTRANT -ftree-loop-distribute-patterns -Wl,-z -Wl,now -Wl,-z -Wl,relro -fno-semantic-interposition -ffat-lto-objects -fno-trapping-math -Wl,-sort-common -Wl,--enable-new-dtags -mtune=skylake -Wa,-mbranches-within-32B-boundaries -fvisibility-inlines-hidden -Wl,--enable-new-dtags" MESA_GLSL_CACHE_DISABLE=0 FCFLAGS="-g -O3 -feliminate-unused-debug-types -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector --param=ssp-buffer-size=32 -m64 -fasynchronous-unwind-tables -Wp,-D_REENTRANT -ftree-loop-distribute-patterns -Wl,-z -Wl,now -Wl,-z -Wl,relro -malign-data=abi -fno-semantic-interposition -ftree-vectorize -ftree-loop-vectorize -Wl,-sort-common -Wl,--enable-new-dtags" CFLAGS="-g -O3 -feliminate-unused-debug-types -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector --param=ssp-buffer-size=32 -Wformat -Wformat-security -m64 -fasynchronous-unwind-tables -Wp,-D_REENTRANT -ftree-loop-distribute-patterns -Wl,-z -Wl,now -Wl,-z -Wl,relro -fno-semantic-interposition -ffat-lto-objects -fno-trapping-math -Wl,-sort-common -Wl,--enable-new-dtags -mtune=skylake -Wa,-mbranches-within-32B-boundaries" THEANO_FLAGS="floatX=float32,openmp=true,gcc.cxxflags="-ftree-vectorize -mavx""
Compiler Notes: --build=x86_64-generic-linux --disable-libmpx --disable-libunwind-exceptions --disable-multiarch --disable-vtable-verify --disable-werror --enable-__cxa_atexit --enable-bootstrap --enable-cet --enable-clocale=gnu --enable-default-pie --enable-gnu-indirect-function --enable-languages=c,c++,fortran,go --enable-ld=default --enable-libstdcxx-pch --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --exec-prefix=/usr --includedir=/usr/include --target=x86_64-generic-linux --with-arch=westmere --with-gcc-major-version-only --with-glibc-version=2.19 --with-gnu-ld --with-isl --with-ppl=yes --with-tune=skylake-avx512
Processor Notes: Scaling Governor: intel_cpufreq performance - CPU Microcode: 0x21 - Thermald 2.4.4
Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + l1tf: Mitigation of PTE Inversion; VMX: conditional cache flushes SMT vulnerable + mds: Mitigation of Clear buffers; SMT vulnerable + meltdown: Mitigation of PTI + 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 generic retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

VoidLinux Musl miti GCC 10.2

pluma /.phoronix-test-suite/installed-tests/pts/mutex-1.0.0/install-failed.log

VoidLinux Musl miti GCC 10.2 v2

Processor: Intel Core i3-3110M @ 2.40GHz (2 Cores / 4 Threads), Motherboard: LENOVO (78CN25WWV2.03 BIOS), Chipset: Intel 3rd Gen Core DRAM, Memory: 8GB, Disk: 1000GB Samsung SSD 860, Graphics: Intel HD 4000 (1000MHz), Audio: Conexant CX20757, Network: Qualcomm Atheros QCA8172 + Intel Centrino-N 135

OS: VoidLinux rolling, Kernel: 5.11.21_1 (x86_64), Display Server: X Server 1.20.11, Display Driver: intel 2.99.917, Compiler: GCC 10.2.1 20201203 + Clang 11.0.0 + LLVM 11.0.0, File-System: f2fs, Screen Resolution: 1366x768

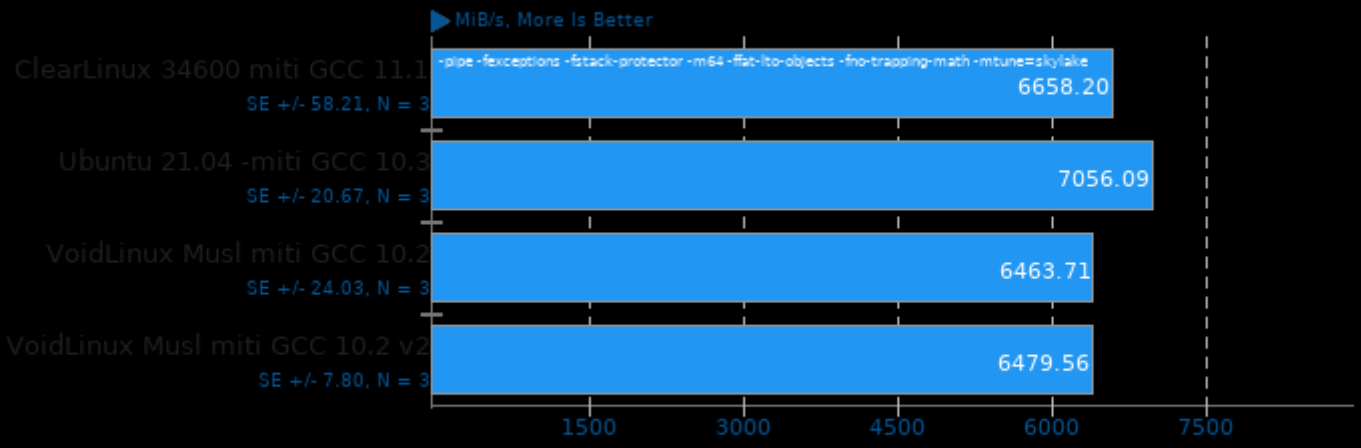
Lenovo Kernel

Compiler Notes: --build=x86_64-linux-musl --disable-gnu-unique-object --disable-libsanitizer --disable-libstdcxx-pch --disable-multilib --disable-nls --disable-sjlj-exceptions --disable-symvers --disable-target-libiberty --disable-werror --enable-__cxa_atexit --enable-checking=release --enable-default-pie --enable-default-ssp --enable-languages=c,c++,objc,obj-c++,fortran,lto,go,ada --enable-lto --enable-plugins --enable-shared --enable-threads=posix --enable-vtable-verify --mandir=/usr/share/man --with-isl --with-linker-hash-style=gnu
Processor Notes: Scaling Governor: intel_cpufreq schedutil - CPU Microcode: 0x21
Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + l1tf: Mitigation of PTE Inversion; VMX: conditional cache flushes SMT vulnerable + mds: Mitigation of Clear buffers; SMT vulnerable + meltdown: Mitigation of PTI + 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 generic retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

	Ubuntu 21.04 -miti GCC 10.3	ClearLinux 34600 miti GCC 11.1	VoidLinux Musl miti GCC 10.2	pluma /.phoronix-test-suite/installed-tests/pts/mutex-1.0.0/install-failed.log	VoidLinux Musl miti GCC 10.2 v2
MBW - Memory Copy - 1024 MiB (MiB/s)	7056	6658	6464		6480
Normalized	100%	94.36%	91.6%		91.83%
Standard Deviation	0.5%	1.5%	0.6%		0.2%
Facebook RocksDB - Rand Read (Op/s)	5618169				5870988
Normalized	95.69%				100%
Standard Deviation	0.5%				1.6%
ctx_clock - C.S.T (Clocks)	1169	1169	1185		1185
Normalized	100%	100%	98.65%		98.65%
Standard Deviation	2%	0.5%	0.2%		0.4%
BenchmarkMutex - M.L.U.s.m	40.4				
Standard Deviation	0.4%				
t-test1 - 2 (sec)	11.986	11.872	11.308		11.508
Normalized	94.34%	95.25%	100%		98.26%
Standard Deviation	0.1%	0.6%	6.2%		5.2%
Hackbench - 4 - Process (sec)	118.984	93.072	90.676		92.796
Normalized	76.21%	97.43%	100%		97.72%
Standard Deviation	0.7%	0.3%	0.5%		0.6%
Schbench - 4 - 4 (usec, 99.9th Latency Percentile)	40512	38640	40427		38848
Normalized	95.38%	100%	95.58%		99.46%
Standard Deviation	1.6%	2.5%	2.4%		1.8%

MBW 2018-09-08

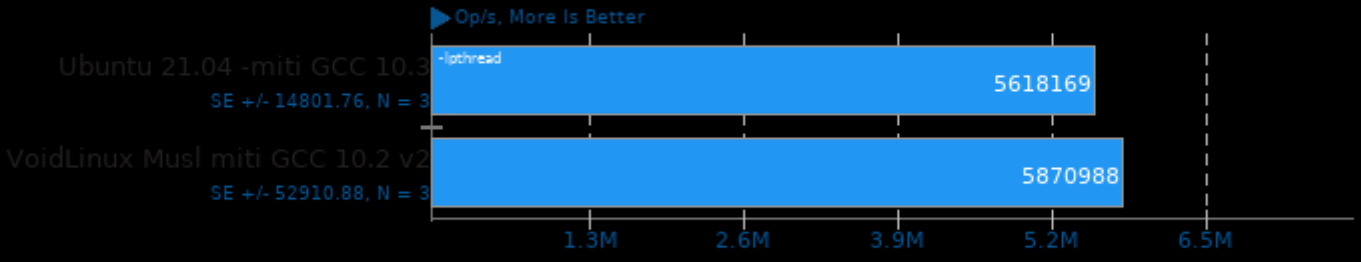
Test: Memory Copy - Array Size: 1024 MiB



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

Facebook RocksDB 6.3.6

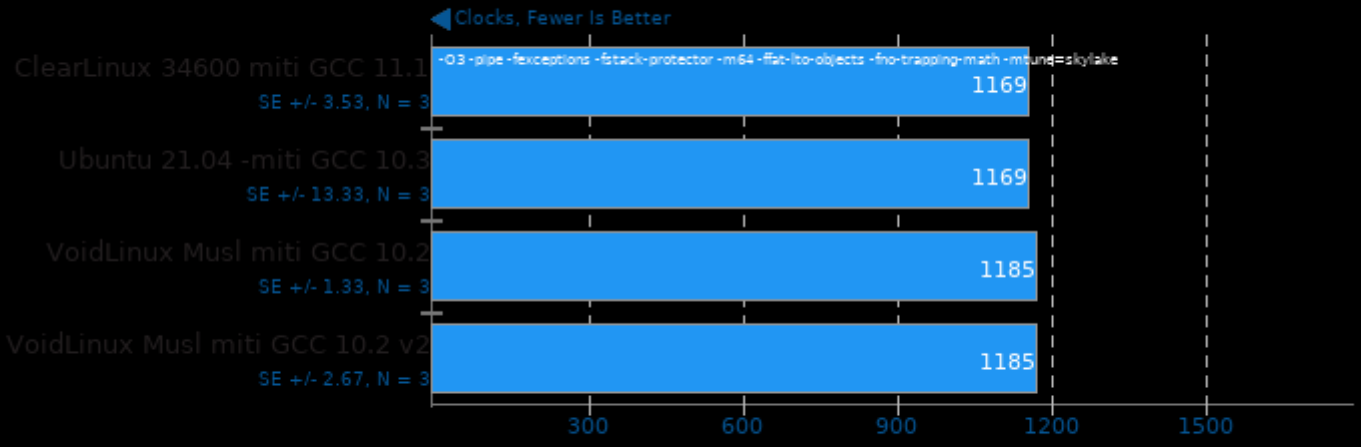
Test: Random Read



1. (CXX) g++ options: -O3 -march=native -std=c++11 -fno-builtin-memcmp -fno-rtti -rdynamic

ctx_clock

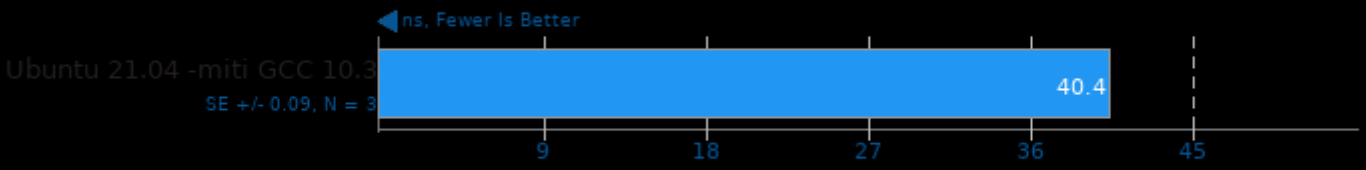
Context Switch Time



1. (CC) gcc options:

BenchmarkMutex

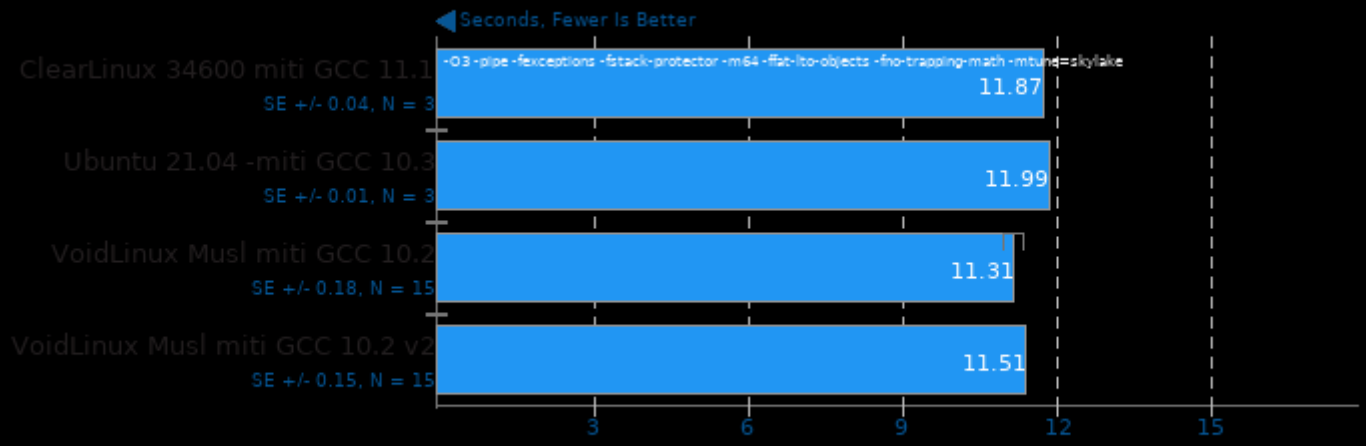
Benchmark: Mutex Lock Unlock std::mutex



1. (CXX) g++ options: -std=c++17 -lbenchmark -pthread

t-test1 2017-01-13

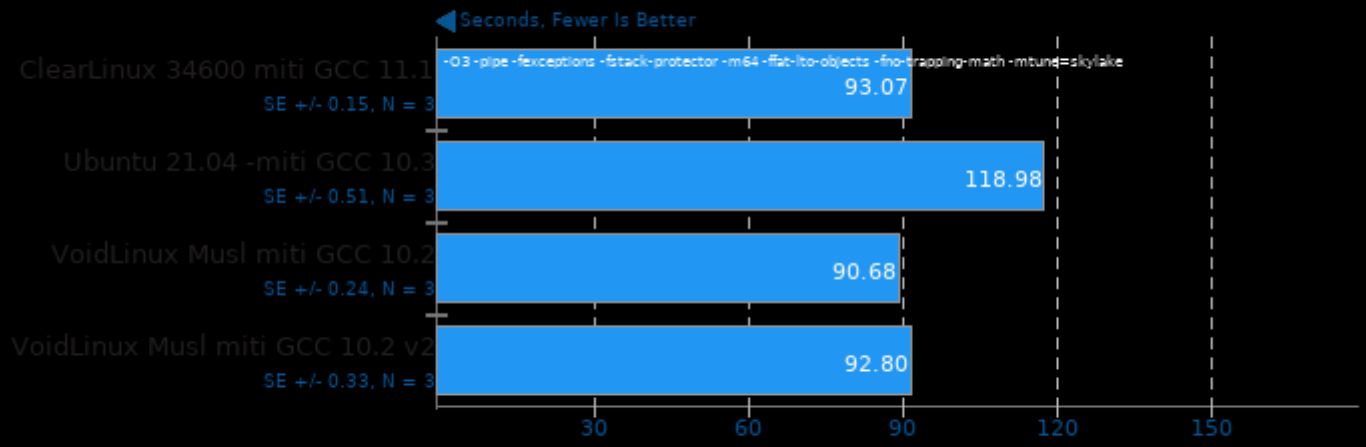
Threads: 2



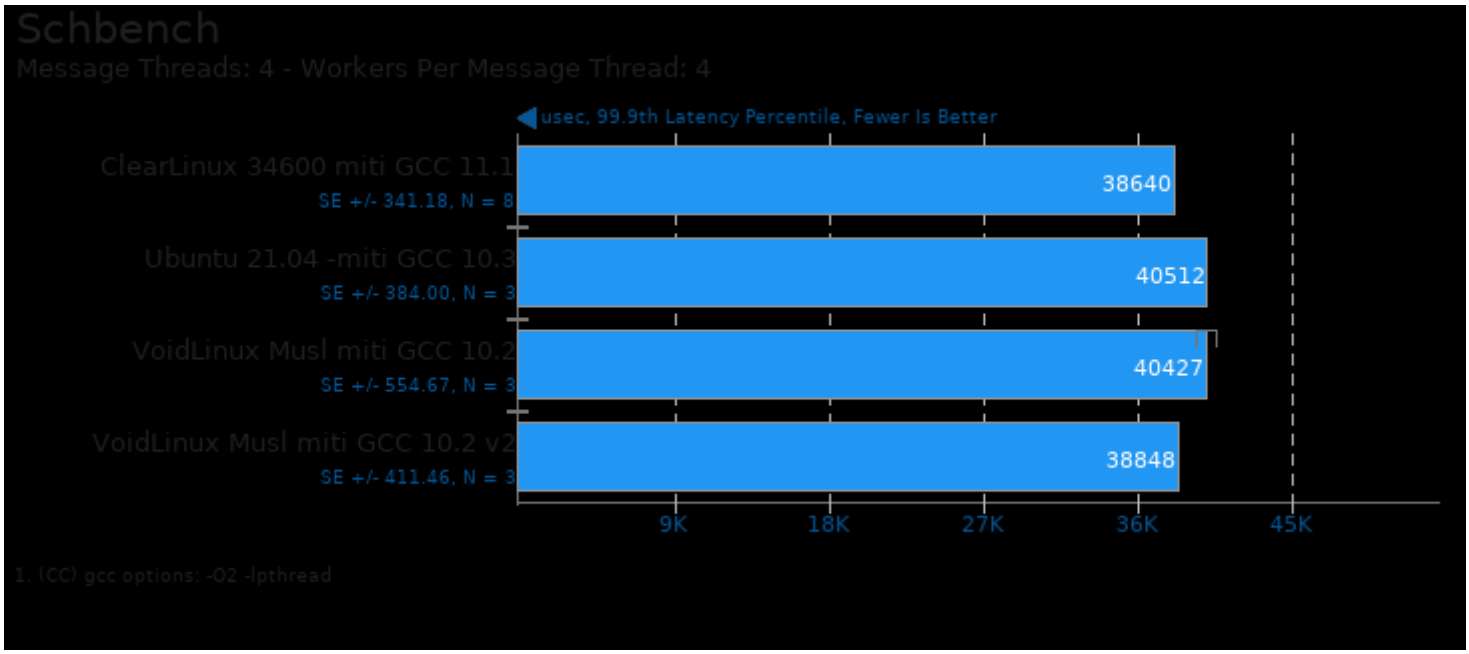
1. (CC) gcc options: -pthread

Hackbench

Count: 4 - Type: Process



1. (CC) gcc options: -lpthread



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