



www.phoronix-test-suite.com

default-kernel

KVM testing on Debian 11 via the Phoronix Test Suite.

Automated Executive Summary

default had the most wins, coming in first place for 64% of the tests.

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

OSBench (Test: Create Processes) at 1.2x

OSBench (Test: Create Files) at 1.185x

OSBench (Test: Launch Programs) at 1.058x

OSBench (Test: Memory Allocations) at 1.043x

BenchmarkMutex (Benchmark: Mutex Lock Unlock spinlock) at 1.042x

BenchmarkMutex (Benchmark: Mutex Lock Unlock spinlock_amd) at 1.034x

BenchmarkMutex (Benchmark: Mutex Lock Unlock pthread_mutex) at 1.014x

BenchmarkMutex (Benchmark: Semaphore Release And Acquire) at 1.007x

Timed GCC Compilation (Time To Compile) at 1.006x

OpenSSL (Algorithm: RSA4096) at 1.001x.

Test Systems:

0001

Processor: 16 x AMD Ryzen 9 5900X 12-Core (16 Cores), Motherboard: QEMU Standard PC (Q35 + ICH9 2009) (Arch Linux 1.16.0-3-3 BIOS), Chipset: Intel 82G33/G31/P35/P31 + ICH9, Memory: 16GB, Disk: 97GB, Graphics: Red Hat Virtio GPU, Audio: QEMU Generic, Monitor: QEMU Monitor, Network: Red Hat Virtio device

OS: Debian 11, Kernel: 5.10.0-18-amd64 (x86_64), Desktop: Xfce, Display Server: X Server 1.20.11, Vulkan: 1.0.2, Compiler: GCC 10.2.1 20210110, File-System: ext4, Screen Resolution: 1280x800, System Layer: KVM

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++,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-Km9U7s/gcc-10-10.2.1/debian/tmp-nvptx/usr,amdgn-amdhsa=/build/gcc-10-Km9U7s/gcc-10-10.2.1/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: CPU Microcode: 0xa201009

Security Notes: itlb_multithit: Not affected + I1tf: Not affected + mds: Not affected + meltdown: Not affected + mmio_stale_data: Not affected + rebleed: 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 Retpolines IBPB: conditional IBRS_FW STIBP: disabled RSB filling PBRSB-eIBRS: Not affected + srbds: Not affected + tsx_async_abort: Not affected

0002

0003

default

Processor: AMD Ryzen 9 5900X 12-Core (12 Cores), Motherboard: QEMU Standard PC (Q35 + ICH9 2009) (Arch Linux 1.16.0-3-3 BIOS), Chipset: Intel 82G33/G31/P35/P31 + ICH9, Memory: 16GB, Disk: 97GB, Graphics: Red Hat Virtio GPU, Audio: QEMU Generic, Monitor: QEMU Monitor, Network: Red Hat Virtio device

OS: Debian 11, Kernel: 5.10.0-18-amd64 (x86_64), Display Server: X Server 1.20.11, Vulkan: 1.0.2, Compiler: GCC 10.2.1 20210110, File-System: ext4, Screen Resolution: 1280x800, System Layer: KVM

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++,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-Km9U7s/gcc-10-10.2.1/debian/tmp-nvptx/usr,amdgn-amdhsa=/build/gcc-10-Km9U7s/gcc-10-10.2.1/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: CPU Microcode: 0xa201009

Security Notes: itlb_multithit: Not affected + I1tf: Not affected + mds: Not affected + meltdown: Not affected + mmio_stale_data: Not affected + rebleed: 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 Retpolines IBPB: conditional IBRS_FW STIBP: disabled RSB filling PBRSB-eIBRS: Not affected + srbds: Not affected + tsx_async_abort: Not affected

5.19-default

Processor: AMD Ryzen 9 5900X 12-Core (12 Cores), Motherboard: QEMU Standard PC (Q35 + ICH9 2009) (Arch Linux 1.16.0-3-3 BIOS), Chipset: Intel 82G33/G31/P35/P31 + ICH9, Memory: 16GB, Disk: 97GB, Graphics: Red Hat Virtio GPU, Audio: QEMU Generic, Monitor: QEMU Monitor, Network: Red Hat Virtio device

OS: Debian 11, Kernel: 5.19.8 (x86_64), Display Server: X Server 1.20.11, Vulkan: 1.0.2, Compiler: GCC 10.2.1 20210110, File-System: ext4, Screen Resolution: 1280x800, System Layer: KVM

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++,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-Km9U7s/gcc-10-10.2.1/debian/tmp-nvptx/usr,amdgnn-amdhsa=/build/gcc-10-Km9U7s/gcc-10-10.2.1/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 --withabi=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: CPU Microcode: 0xa201009

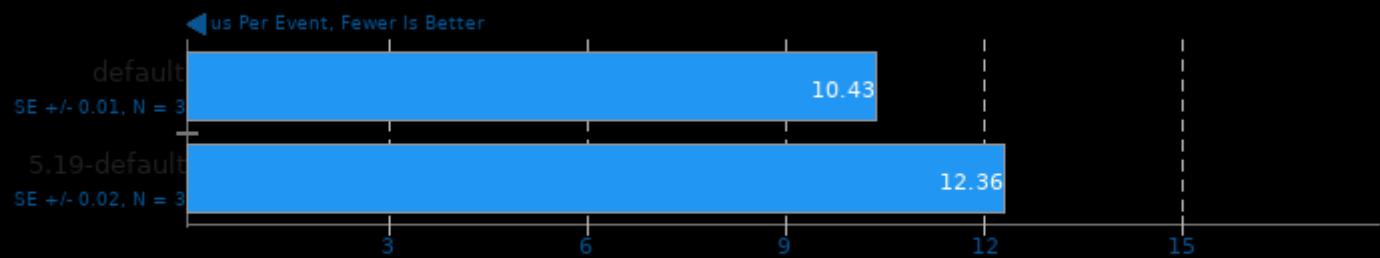
Security Notes: itlb_multihit: Not affected + I1tf: Not affected + mds: Not affected + meltdown: Not affected + mmio_stale_data: Not affected + rebleed: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Retpolines IBPB: conditional IBRS_FW STIBP: disabled RSB filling PBRSB-eIBRS: Not affected + srbs: Not affected + tsx_async_abort: Not affected

	0001	0002	0003	default	5.19-default
OSBench - Create Files				10.431546	12.361955
Normalized				100%	84.38%
Standard Deviation				0.2%	0.2%
OSBench - Create Threads				8.656502	10.662079
(us/Event)					
Normalized				100%	81.19%
Standard Deviation				5.7%	8.2%
OSBench - Launch Programs				27.035872	28.599898
(us/Event)					
Normalized				100%	94.53%
Standard Deviation				1.8%	0.7%
OSBench - Create Processes				16.504129	19.806226
(us/Event)					
Normalized				100%	83.33%
Standard Deviation				1.2%	0.4%
OSBench - Memory Allocations				54.947376	57.285309
(Ns/Event)					
Normalized				100%	95.92%
Standard Deviation				0.1%	0.1%
Timed GCC Compilation - Time To Compile (sec)				749.856	754.444
(sec)					
Normalized				100%	99.39%
Standard Deviation				0.3%	0.6%
Timed Linux Kernel Compilation - allmodconfig (sec)					800.228
(sec)					
Standard Deviation					
OpenSSL - RSA4096 (sign/s)				3749	3754
(sign/s)					
Normalized				99.87%	100%
Standard Deviation				0.1%	0%
OpenSSL - RSA4096 (verify/s)				248233	248369
(verify/s)					
Normalized				99.95%	100%
Standard Deviation				0.2%	0.1%
BenchmarkMutex - S.M.L.S (ns)				16.7	18.1
(ns)					
Normalized				100%	92.27%
Standard Deviation				0.6%	18.9%
BenchmarkMutex - M.L.U.s (ns)				19.7	18.9
(ns)					
Normalized				95.94%	100%
Standard Deviation				0.3%	1.7%
BenchmarkMutex - M.L.U.s.m (ns)				13.1	13.1
(ns)					

Standard Deviation	2.3%	1.9%
BenchmarkMutex - M.L.U.s.m	15.0	15.0
Standard Deviation	0.4%	0.8%
BenchmarkMutex - S.R.A.A (ns)	8.77	8.71
Normalized	99.32%	100%
Standard Deviation	1%	1.4%
BenchmarkMutex - M.L.U.s (ns)	21.4	20.7
Normalized	96.73%	100%
Standard Deviation	0.3%	0%
BenchmarkMutex - M.L.U.p (ns)	9.40	9.53
Normalized	100%	98.64%
Standard Deviation	0.3%	2%
BenchmarkMutex - M.L.U.t (ns)	8.33	8.33
Standard Deviation	2.4%	2.5%

OSBench

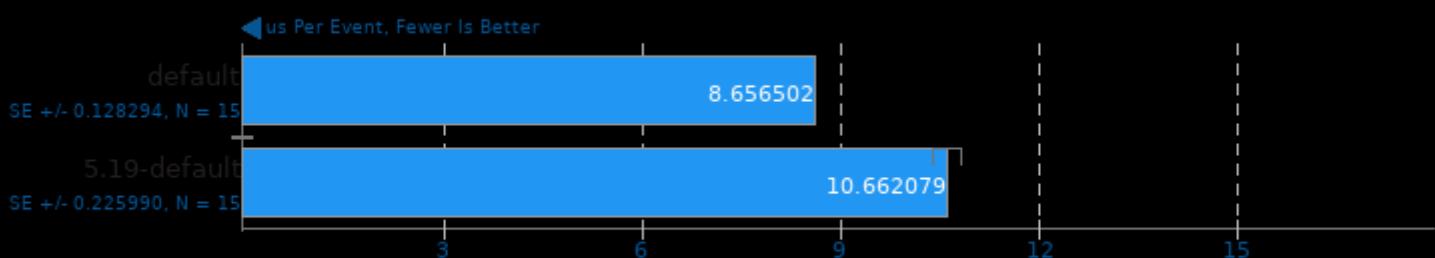
Test: Create Files



1. (CC) gcc options: -lm

OSBench

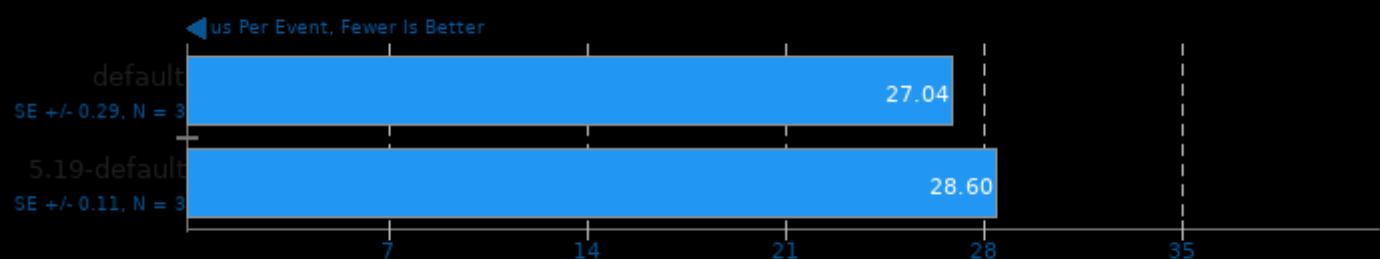
Test: Create Threads



1. (CC) gcc options: -lm

OSBench

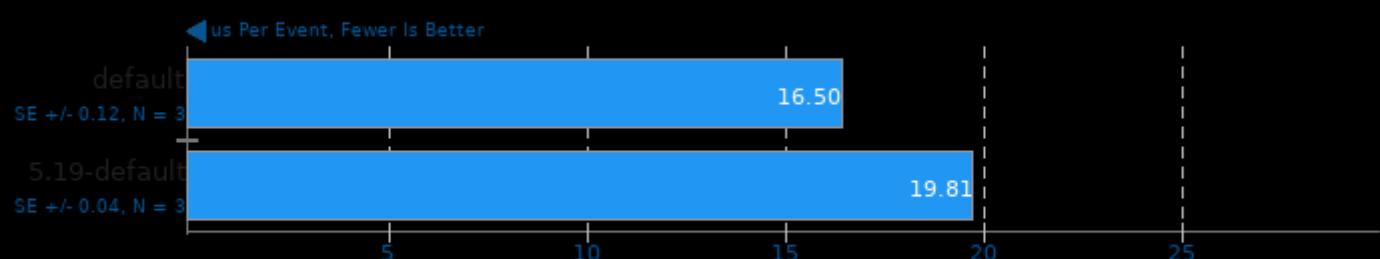
Test: Launch Programs



1. (CC) gcc options: -lm

OSBench

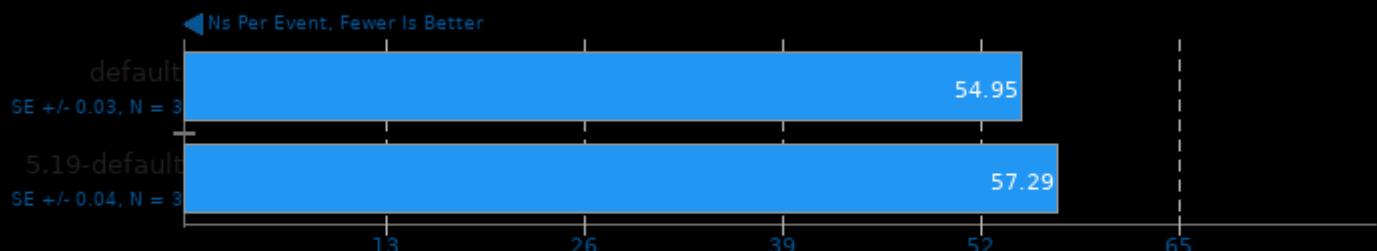
Test: Create Processes



1. (CC) gcc options: -lm

OSBench

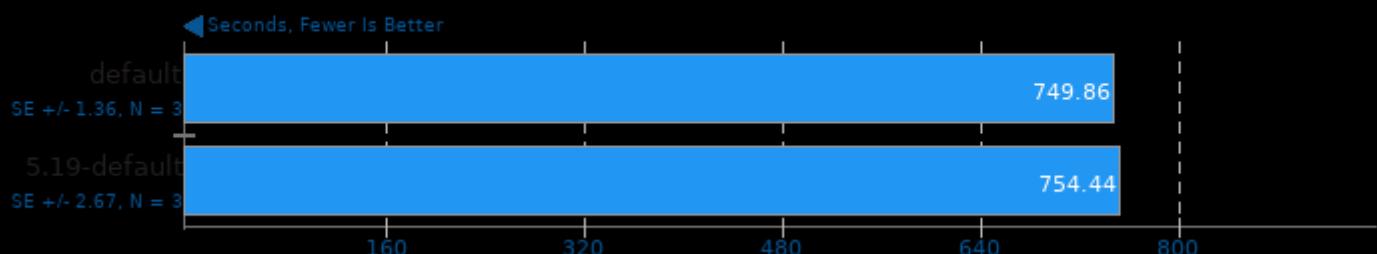
Test: Memory Allocations



1. (CC) gcc options: -lm

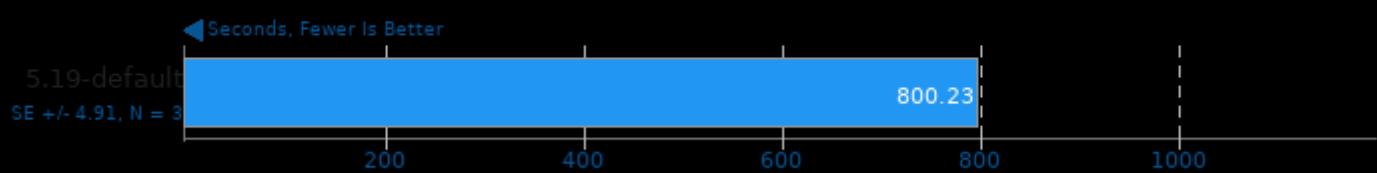
Timed GCC Compilation 11.2.0

Time To Compile



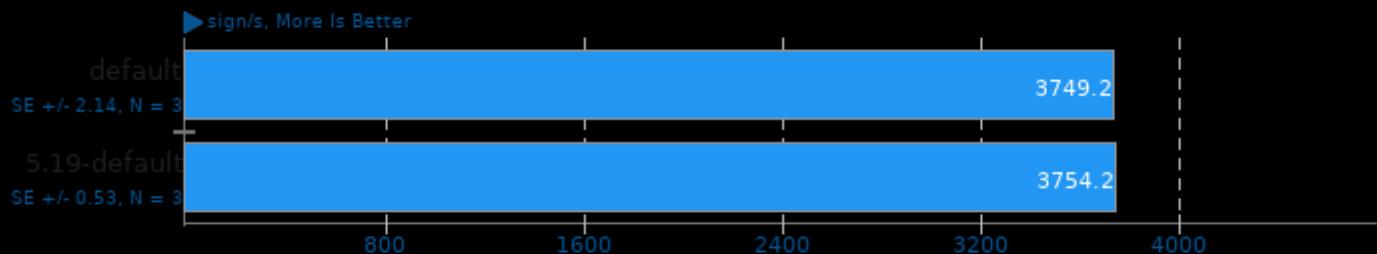
Timed Linux Kernel Compilation 5.18

Build: allmodconfig



OpenSSL 3.0

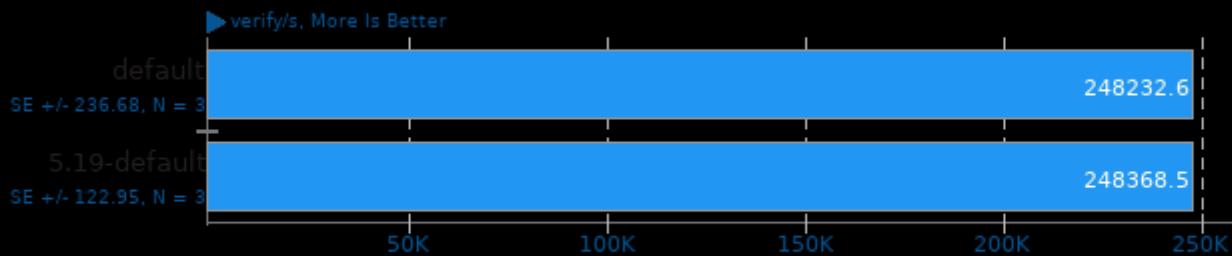
Algorithm: RSA4096



1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl

OpenSSL 3.0

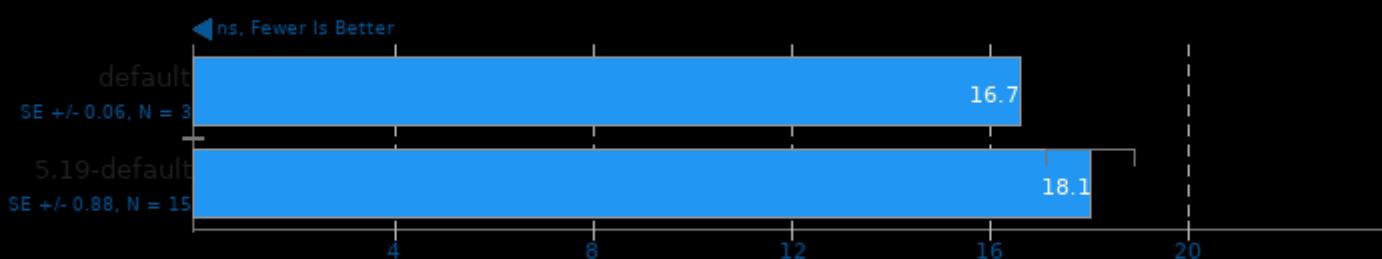
Algorithm: RSA4096



1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl

BenchmarkMutex

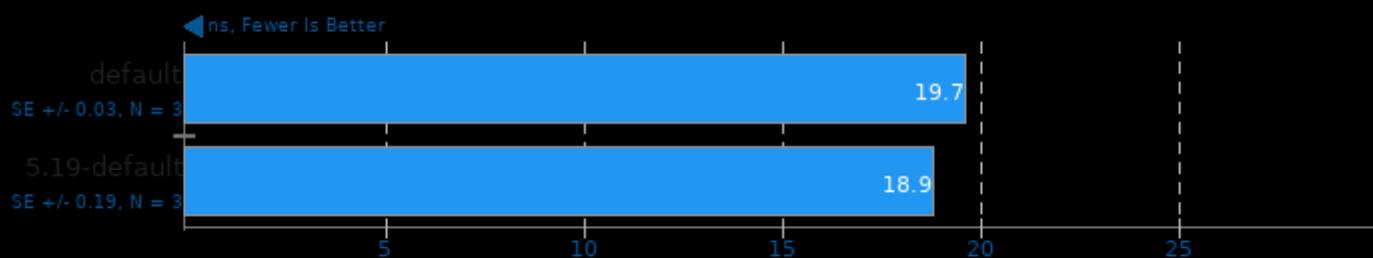
Benchmark: Shared Mutex Lock Shared



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

BenchmarkMutex

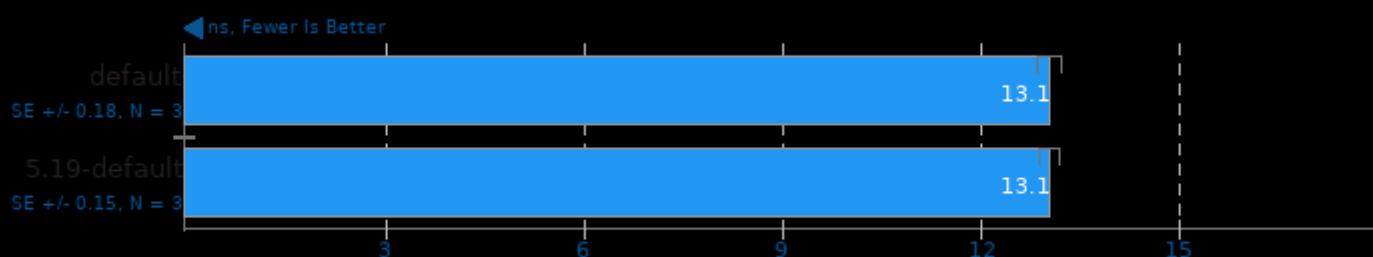
Benchmark: Mutex Lock Unlock spinlock



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

BenchmarkMutex

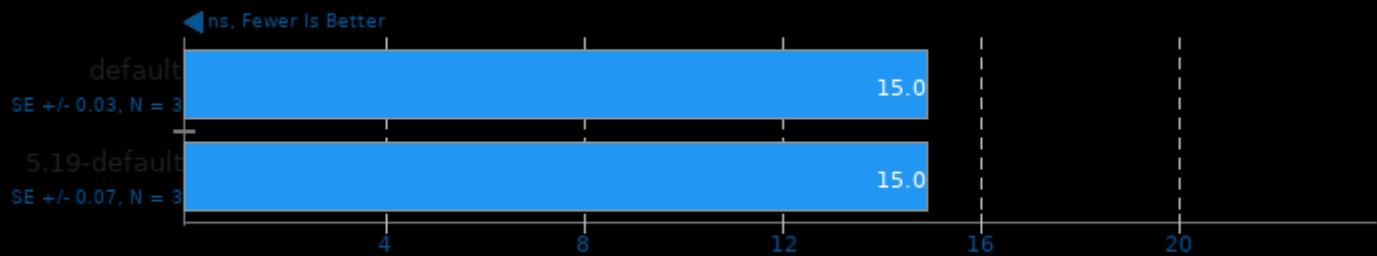
Benchmark: Mutex Lock Unlock std::mutex



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

BenchmarkMutex

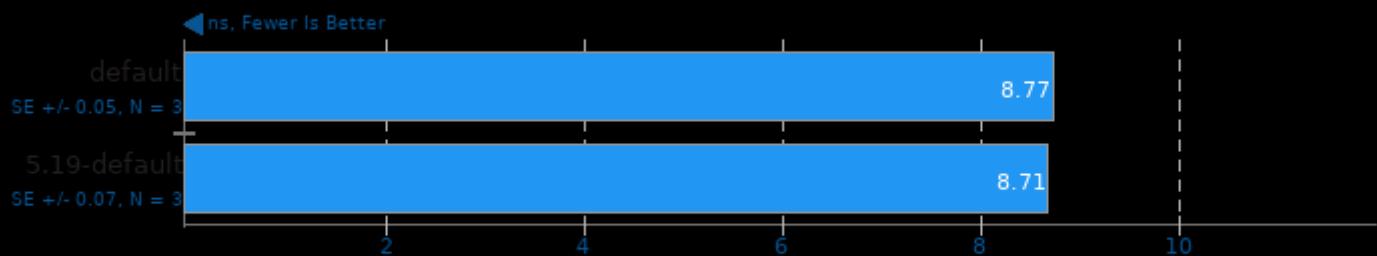
Benchmark: Mutex Lock Unlock std::mutex



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

BenchmarkMutex

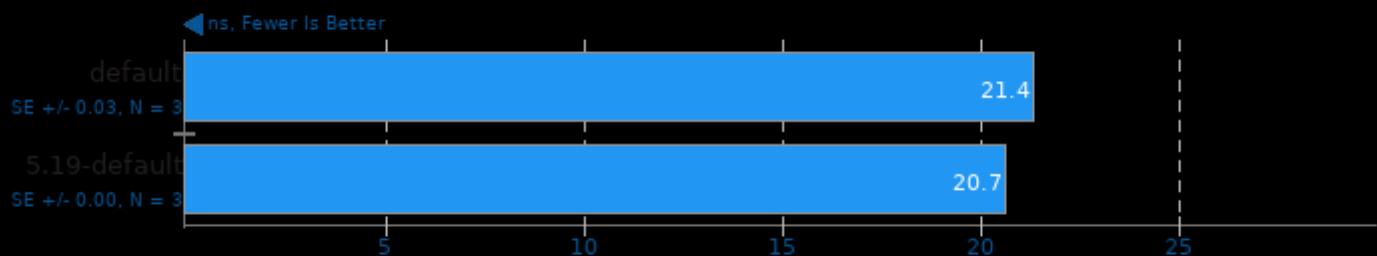
Benchmark: Semaphore Release And Acquire



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

BenchmarkMutex

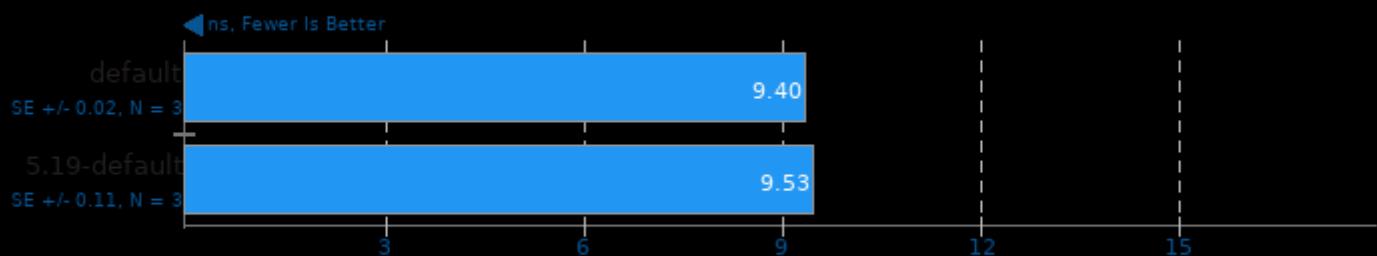
Benchmark: Mutex Lock Unlock spinlock_amd



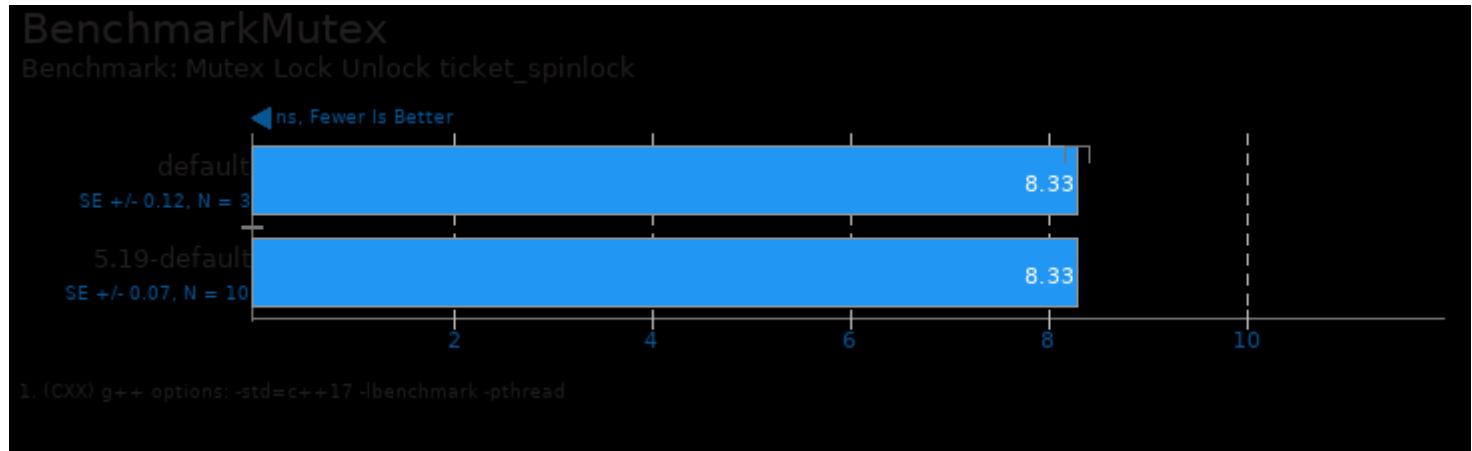
1. (CXX) g++ options: -std=c++17 -lbenchmark -pthread

BenchmarkMutex

Benchmark: Mutex Lock Unlock pthread_mutex



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



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