www.phoronix-test-suite.com

compiler-march-flags

KVM testing on Ubuntu 20.04 via the Phoronix Test Suite.

Automated Executive Summary

CLANG12 x86-64-v3 had the most wins, coming in first place for 68% of the tests.

Based on the geometric mean of all complete results, the fastest (CLANG12 x86-64-v3) was 1.026x the speed of the slowest (Ubuntu 20.04 default).

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

Hackbench (Count: 1 - Type: Process) at 1.319x
Hackbench (Count: 1 - Type: Thread) at 1.22x
Hackbench (Count: 2 - Type: Thread) at 1.2x
Hackbench (Count: 2 - Type: Process) at 1.191x
Ethr (Server Address: localhost - Protocol: TCP - Test: Latency - Threads: 1) at 1.176x
Ethr (Server Address: localhost - Protocol: TCP - Test: Latency - Threads: 32) at 1.169x
Ethr (Server Address: localhost - Protocol: TCP - Test: Latency - Threads: 64) at 1.156x
Ethr (Server Address: localhost - Protocol: TCP - Test: Latency - Threads: 8) at 1.135x
Tinymembench (Standard Memset) at 1.113x
Hackbench (Count: 4 - Type: Thread) at 1.106x.

Test Systems:

CLANG12 x86-64-v3

Processor: Intel Xeon E3-1230 v6 (4 Cores), Motherboard: QEMU Standard PC (Q35 + ICH9 2009) (rel-1.13.0-48-gd9c812dda519-prebuilt.qemu.org BIOS), Chipset: Intel 82G33/G31/P35/P31 + ICH9, Memory: 4096MB, Disk: 54GB QEMU HDD + 107GB QEMU HDD, Graphics: bochs-drmdrmfb, Audio: Intel 82801I, Monitor: QEMU Monitor, Network: Red Hat Virtio device

OS: Ubuntu 20.04, Kernel: 5.4.159-hdr (x86_64), Vulkan: 1.0.2, Compiler: GCC 9.3.0, File-System: xfs, Screen Resolution: 1024x768, System Layer: KVM

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-9-HskZEa/gcc-9-9.3.0/debian/tmp-nvptx/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-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
Disk Notes: MQ-DEADLINE / attr2,inode64,logbsize=32k,logbufs=8,noquota,relatime,rw / Block Size: 4096
Processor Notes: CPU Microcode: 0x1
Security Notes: itlb_multihit: Not affected + l1tf: Mitigation of PTE Inversion + mds: Vulnerable; SMT Host state unknown + meltdown: Vulnerable + spec_store_bypass: Vulnerable + spectre_v1: Vulnerable: __user pointer sanitization and usercopy barriers only; no swapgs barriers + spectre_v2: Vulnerable IBPB: disabled STIBP: disabled + srbds: Unknown: Dependent on hypervisor status + tsx_async_abort: Vulnerable

Ubuntu 20.04 default

Processor: Intel Xeon E3-1230 v6 (4 Cores), Motherboard: QEMU Standard PC (Q35 + ICH9 2009) (rel-1.13.0-48-gd9c812dda519-prebuilt.qemu.org BIOS), Chipset: Intel 82G33/G31/P35/P31 + ICH9, Memory: 4096MB, Disk: 54GB QEMU HDD + 107GB QEMU HDD, Graphics: bochs-drmdrmfb, Audio: Intel 82801I, Monitor: QEMU Monitor, Network: Red Hat Virtio device

OS: Ubuntu 20.04, Kernel: 5.4.0-90-generic (x86_64), Vulkan: 1.0.2, Compiler: GCC 9.3.0, File-System: xfs, Screen Resolution: 1024x768, System Layer: KVM

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-9-HskZEa/gcc-9-9.3.0/debian/tmp-nvptx/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-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
Disk Notes: MQ-DEADLINE / attr2,inode64,logbsize=32k,logbufs=8,noquota,relatime,rw / Block Size: 4096
Processor Notes: CPU Microcode: 0x1
Security Notes: itlb_multihit: Not affected + l1tf: Mitigation of PTE Inversion + mds: Vulnerable; SMT Host state unknown + meltdown: Vulnerable + spec_store_bypass: Vulnerable + spectre_v1: Vulnerable: __user pointer sanitization and usercopy barriers only; no swapgs barriers + spectre_v2: Vulnerable IBPB: disabled STIBP: disabled + srbds: Unknown: Dependent on hypervisor status + tsx_async_abort: Vulnerable

	CLANG12 x86-64-v3	Ubuntu 20.04 default
BenchmarkMutex - S.M.L.S (ns)	**30.8**	**30.5**
Normalized	99.03%	100%
Standard Deviation	0.3%	0.5%
BenchmarkMutex - M.L.U.s (ns)	**50.2**	**50.1**
Normalized	99.8%	100%
Standard Deviation	0.3%	0.6%
BenchmarkMutex - M.L.U.s.m (ns)	**24.8**	**24.9**

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Normalized	100%	99.6%
Standard Deviation	0.5%	0.2%
BenchmarkMutex - M.L.U.s.m (ns)	**34.8**	**34.9**
Normalized	100%	99.71%
Standard Deviation	1.4%	1.2%
BenchmarkMutex - S.R.A.A (ns)	20.4	20.4
Standard Deviation	0.3%	0.3%
BenchmarkMutex - M.L.U.s (ns)	**52.4**	**52.2**
Normalized	99.62%	100%
Standard Deviation	0.4%	0.4%
BenchmarkMutex - M.L.U.p (ns)	20.5	20.5
Standard Deviation	0.3%	0.3%
BenchmarkMutex - M.L.U.t (ns)	**34.7**	**34.8**
Normalized	100%	99.71%
Standard Deviation	0.3%	0.6%
ctx_clock - C.S.T (Clocks)	**182**	**180**
Normalized	98.9%	100%
Ethr - TCP - Latency - 1 (us)	**27.60**	**32.47**
Normalized	100%	85%
Standard Deviation	3.7%	1.6%
Ethr - TCP - Latency - 8 (us)	**27.84**	**31.59**
Normalized	100%	88.13%
Standard Deviation	1.6%	3.7%
Ethr - TCP - Latency - 32 (us)	**27.94**	**32.66**
Normalized	100%	85.55%
Standard Deviation	2.9%	2.4%
Ethr - TCP - Latency - 64 (us)	**27.69**	**32.01**
Normalized	100%	86.5%
Standard Deviation	2.5%	4%
Ethr - TCP - Bandwidth - 8 (Mbits/s)	**55219**	**52963**
Normalized	100%	95.91%
Standard Deviation	2.4%	1.4%
Ethr - UDP - Bandwidth - 8 (Mbits/s)	**79695**	**76912**
Normalized	100%	96.51%
Standard Deviation	0.3%	0.4%
Ethr - HTTP - Bandwidth - 1 (Mbits/s)	**810.72**	**794.24**
Normalized	100%	97.97%
Standard Deviation	2.2%	2.4%
Ethr - HTTP - Bandwidth - 8 (Mbits/s)	**2579**	**2523**
Normalized	100%	97.83%
Standard Deviation	0.9%	1%
Ethr - TCP - Bandwidth - 32 (Mbits/s)	**59625**	**59328**
Normalized	100%	99.5%
Standard Deviation	1%	2.2%
Ethr - TCP - Bandwidth - 64 (Mbits/s)	**58980**	**62893**
Normalized	93.78%	100%
Standard Deviation	7.1%	0.4%
Ethr - UDP - Bandwidth - 32 (Mbits/s)	**93055**	**89430**
Normalized	100%	96.1%
Standard Deviation	0.5%	1%
Ethr - UDP - Bandwidth - 64 (Mbits/s)	**93489**	**89019**
Normalized	100%	95.22%
Standard Deviation	1.7%	3.7%
Ethr - HTTP - Bandwidth - 32 (Mbits/s)	**2496**	**2415**
Normalized	100%	96.75%

Standard Deviation	1.2%	1.8%
Ethr - HTTP - Bandwidth - 64 (Mbits/s)	**2075**	**2060**
Normalized	100%	99.28%
Standard Deviation	2.2%	1.4%
Ethr - TCP - Connections/s - 1 (Connections/sec)	**12540**	**9928**
Normalized	100%	79.17%
Standard Deviation	4.8%	26.8%
Ethr - TCP - Connections/s - 8 (Connections/sec)	**34206**	**36709**
Normalized	93.18%	100%
Standard Deviation	27.9%	12.6%
Ethr - TCP - Connections/s - 32 (Connections/sec)	**39778**	**43215**
Normalized	92.05%	100%
Standard Deviation	36.3%	10.6%
Ethr - TCP - Connections/s - 64 (Connections/sec)	**39206**	**38005**
Normalized	100%	96.94%
Standard Deviation	29.8%	21%
Facebook RocksDB - Rand Fill (Op/s)	**225374**	**245767**
Normalized	91.7%	100%
Standard Deviation	12.3%	2.1%
Facebook RocksDB - Rand Read (Op/s)	**10278703**	**10325684**
Normalized	99.55%	100%
Standard Deviation	4.7%	0.3%
Facebook RocksDB - Update Rand (Op/s)	**136896**	**136550**
Normalized	100%	99.75%
Standard Deviation	0.5%	2%
Facebook RocksDB - Seq Fill (Op/s)	**468553**	**480254**
Normalized	97.56%	100%
Standard Deviation	3.7%	1%
Facebook RocksDB - Rand Fill Sync (Op/s)	**123**	**110**
Normalized	100%	89.43%
Standard Deviation	10.4%	
Facebook RocksDB - Read While Writing (Op/s)	**255250**	**262292**
Normalized	97.32%	100%
Standard Deviation	3.9%	0.6%
Facebook RocksDB - R.R.W.R (Op/s)	**407295**	**406196**
Normalized	100%	99.73%
Standard Deviation	2%	2.4%
Hackbench - 1 - Thread (sec)	**17.853**	**21.777**
Normalized	100%	81.98%
Standard Deviation	2.4%	3.3%
Hackbench - 2 - Thread (sec)	**33.888**	**40.669**
Normalized	100%	83.33%
Standard Deviation	0.2%	2.4%
Hackbench - 4 - Thread (sec)	**61.041**	**67.508**
Normalized	100%	90.42%
Standard Deviation	1.6%	1.5%
Hackbench - 8 - Thread (sec)	**122.833**	**128.613**
Normalized	100%	95.51%
Standard Deviation	5.5%	12.4%
Hackbench - 1 - Process (sec)	**14.683**	**19.362**
Normalized	100%	75.83%
Standard Deviation	4%	4%
Hackbench - 16 - Thread (sec)	**290.352**	**241.012**
Normalized	83.01%	100%
Standard Deviation	4.7%	15.7%

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Hackbench - 2 - Process (sec)	**28.212**	**33.607**
Normalized	100%	83.95%
Standard Deviation	4.3%	1.5%
Hackbench - 4 - Process (sec)	**52.512**	**56.221**
Normalized	100%	93.4%
Standard Deviation	2.2%	1.7%
Hackbench - 8 - Process (sec)	**98.676**	**101.295**
Normalized	100%	97.41%
Standard Deviation	1.2%	0.7%
Hackbench - 16 - Process (sec)	**198.729**	**194.541**
Normalized	97.89%	100%
Standard Deviation	4.1%	0.8%
Hackbench - 32 - Process (sec)	**338.177**	**312.123**
Normalized	92.3%	100%
Standard Deviation	6%	1.4%
IPC_benchmark - TCP Socket - 128 (Messages/sec)	**2556549**	**2364168**
Normalized	100%	92.47%
Standard Deviation	8%	11.4%
IPC_benchmark - TCP Socket - 256 (Messages/sec)	**2333713**	**2245341**
Normalized	100%	96.21%
Standard Deviation	5.8%	9.4%
IPC_benchmark - TCP Socket - 512 (Messages/sec)	**2056525**	**1977068**
Normalized	100%	96.14%
Standard Deviation	2.2%	4.2%
IPC_benchmark - TCP Socket - 1024 (Messages/sec)	**1766348**	**1664995**
Normalized	100%	94.26%
Standard Deviation	6.1%	3.5%
IPC_benchmark - TCP Socket - 2048 (Messages/sec)	**1377679**	**1320474**
Normalized	100%	95.85%
Standard Deviation	1.5%	4.1%
IPC_benchmark - TCP Socket - 4096 (Messages/sec)	**925836**	**912134**
Normalized	100%	98.52%
Standard Deviation	3.1%	1.8%
IPC_benchmark - Unnamed Pipe - 128 (Messages/sec)	**2747909**	**2488062**
Normalized	100%	90.54%
Standard Deviation	7.6%	2.4%
IPC_benchmark - Unnamed Pipe - 256 (Messages/sec)	**2550529**	**2414657**
Normalized	100%	94.67%
Standard Deviation	5.6%	4.8%
IPC_benchmark - Unnamed Pipe - 512 (Messages/sec)	**2346777**	**2266073**
Normalized	100%	96.56%
Standard Deviation	7.6%	0.9%
IPC_benchmark - Unnamed Pipe - 1024	**2100480**	**2028946**
Normalized	100%	96.59%
Standard Deviation	3.8%	3.4%
IPC_benchmark - Unnamed Pipe - 2048	**1844224**	**1843692**
Normalized	100%	99.97%
Standard Deviation	5.8%	4.2%
IPC_benchmark - Unnamed Pipe - 4096	**1489560**	**1598817**
Normalized	93.17%	100%
Standard Deviation	6.5%	1.9%
IPC_benchmark - FIFO Named Pipe - 128 (Messages/sec)	**2526378**	**2338400**
Normalized	100%	92.56%
Standard Deviation	5.3%	1.9%

IPC_benchmark - FIFO Named Pipe - 256 (Messages/sec)	**2360386**	**2299086**
Normalized	100%	97.4%
Standard Deviation	6.2%	3.5%
IPC_benchmark - FIFO Named Pipe - 512 (Messages/sec)	**2238241**	**2213266**
Normalized	100%	98.88%
Standard Deviation	1.6%	4.9%
IPC_benchmark - FIFO Named Pipe - 1024 (Messages/sec)	**1948684**	**2007024**
Normalized	97.09%	100%
Standard Deviation	2.8%	5.8%
IPC_benchmark - FIFO Named Pipe - 2048 (Messages/sec)	**1668704**	**1803917**
Normalized	92.5%	100%
Standard Deviation	6.1%	2.1%
IPC_benchmark - FIFO Named Pipe - 4096 (Messages/sec)	**1484882**	**1560703**
Normalized	95.14%	100%
Standard Deviation	2.3%	11.8%
IPC_benchmark - U.U.D.S - 128 (Messages/sec)	**1193108**	**1196515**
Normalized	99.72%	100%
Standard Deviation	4.4%	2%
IPC_benchmark - U.U.D.S - 256 (Messages/sec)	**1187151**	**1160776**
Normalized	100%	97.78%
Standard Deviation	4.4%	0.8%
IPC_benchmark - U.U.D.S - 512 (Messages/sec)	**1141526**	**1157324**
Normalized	98.63%	100%
Standard Deviation	1.9%	2.5%
IPC_benchmark - U.U.D.S - 1024 (Messages/sec)	**1111391**	**1081271**
Normalized	100%	97.29%
Standard Deviation	4.2%	2.9%
IPC_benchmark - U.U.D.S - 2048 (Messages/sec)	**901054**	**891512**
Normalized	100%	98.94%
Standard Deviation	3.6%	2.4%
IPC_benchmark - U.U.D.S - 4096 (Messages/sec)	**696178**	**669580**
Normalized	100%	96.18%
Standard Deviation	1.5%	1%
iPerf - 5201 - 10 Seconds - UDP - 100Mbit Objective - 1 (Mbits/s)	100	100
iPerf - 5201 - 10 Seconds - UDP - 1000Mbit Objective - 1 (Mbits/s)	1000	1000
iPerf - 5201 - 10 Seconds - UDP - 100Mbit Objective - 32 (Mbits/s)	**3200**	**3199**
Normalized	100%	99.97%
Standard Deviation		0.1%
iPerf - 5201 - 10 Seconds - UDP - 100Mbit Objective - 64 (Mbits/s)	6396	6396
Standard Deviation		0.1%
iPerf - 5201 - 10 Seconds - UDP - 1000Mbit Objective - 32 (Mbits/s)	**25311**	**26675**
Normalized	94.89%	100%
Standard Deviation	2.4%	1.5%

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iPerf - 5201 - 10 Seconds - UDP - 1000Mbit Objective - 64 (Mbits/s)	**44740**	**45142**
Normalized	99.11%	100%
Standard Deviation	3.9%	1.4%
iPerf - 5201 - 10 Seconds - TCP - 1 (Mbits/s)	**49051**	**46808**
Normalized	100%	95.43%
Standard Deviation	0.6%	2.4%
iPerf - 5201 - 10 Seconds - UDP - 1 (Mbits/s)	1.05	1.05
Standard Deviation	0%	0%
iPerf - 5201 - 10 Seconds - TCP - 32 (Mbits/s)	**47358**	**46871**
Normalized	100%	98.97%
Standard Deviation	0.9%	1.4%
iPerf - 5201 - 10 Seconds - TCP - 64 (Mbits/s)	**45606**	**44581**
Normalized	100%	97.75%
Standard Deviation	2.5%	2%
iPerf - 5201 - 10 Seconds - UDP - 32 (Mbits/s)	33.6	33.6
Standard Deviation	0%	0%
iPerf - 5201 - 10 Seconds - UDP - 64 (Mbits/s)	67.1	67.1
Standard Deviation	0%	0%
LevelDB - Hot Read (us/Op)	**1.404**	**1.400**
Normalized	99.72%	100%
Standard Deviation	5.7%	2.3%
LevelDB - Fill Sync (us/Op)	**30377**	**30369**
Normalized	99.97%	100%
Standard Deviation	6.9%	0.6%
LevelDB - Overwrite (MB/s)	**21.7**	**20.8**
Normalized	100%	95.85%
Standard Deviation	5.6%	9.2%
LevelDB - Overwrite (us/Op)	**19.637**	**20.751**
Normalized	100%	94.63%
Standard Deviation	7.1%	10.7%
LevelDB - Rand Fill (MB/s)	**21.5**	**22.1**
Normalized	97.29%	100%
Standard Deviation	6.8%	7.3%
LevelDB - Rand Fill (us/Op)	**19.791**	**19.455**
Normalized	98.3%	100%
Standard Deviation	7.3%	8.2%
LevelDB - Rand Read (us/Op)	**1.436**	**1.440**
Normalized	100%	99.72%
Standard Deviation	5.4%	7.2%
LevelDB - Seek Rand (us/Op)	**1.934**	**1.951**
Normalized	100%	99.13%
Standard Deviation	5%	1%
LevelDB - Rand Delete (us/Op)	**15.167**	**16.012**
Normalized	100%	94.72%
Standard Deviation	1%	2.2%
LevelDB - Seq Fill (MB/s)	**19.1**	**20.3**
Normalized	94.09%	100%
Standard Deviation	2%	4.1%
LevelDB - Seq Fill (us/Op)	**22.648**	**21.343**
Normalized	94.24%	100%
Standard Deviation	4.2%	4.2%
MBW - Memory Copy - 128 MiB (MiB/s)	**12866**	**12886**
Normalized	99.84%	100%
Standard Deviation	0.3%	0.5%

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MBW - Memory Copy - 512 MiB (MiB/s)	**12883**	**13178**
Normalized	97.76%	100%
Standard Deviation	0.2%	0.6%
MBW - Memory Copy - 1024 MiB (MiB/s)	**13060**	**13104**
Normalized	99.67%	100%
Standard Deviation	0.2%	1.3%
MBW - M.C.F.B.S - 128 MiB (MiB/s)	**9154**	**9058**
Normalized	100%	98.96%
Standard Deviation	0.2%	0.9%
MBW - M.C.F.B.S - 512 MiB (MiB/s)	**9085**	**9102**
Normalized	99.82%	100%
Standard Deviation	0.7%	0.4%
MBW - M.C.F.B.S - 1024 MiB (MiB/s)	**9063**	**8990**
Normalized	100%	99.2%
Standard Deviation	0.6%	0.8%
OpenSSL - SHA256 (byte/s)	**640563567**	**697945117**
Normalized	91.78%	100%
Standard Deviation	0.5%	0.7%
OpenSSL - RSA4096 (sign/s)	**529.7**	**555.7**
Normalized	95.32%	100%
Standard Deviation	0.2%	1.6%
OpenSSL - RSA4096 (verify/s)	**35030**	**36783**
Normalized	95.23%	100%
Standard Deviation	1.2%	0.9%
OSBench - Create Files (us/Event)	**31.889395**	**33.273131**
Normalized	100%	95.84%
Standard Deviation	15.6%	14.7%
OSBench - Create Threads (us/Event)	**14.564991**	**15.089910**
Normalized	100%	96.52%
Standard Deviation	2.4%	2.3%
OSBench - Launch Programs (us/Event)	**111.933549**	**117.367109**
Normalized	100%	95.37%
Standard Deviation	1.6%	1.4%
OSBench - Create Processes (us/Event)	**34.653346**	**35.986741**
Normalized	100%	96.29%
Standard Deviation	5.6%	7.1%
OSBench - Memory Allocations (Ns/Event)	**73.981524**	**74.490706**
Normalized	100%	99.32%
Standard Deviation	0.1%	0.3%
perf-bench - Epoll Wait (ops/sec)	**349832**	**338355**
Normalized	100%	96.72%
Standard Deviation	2.3%	0.3%
perf-bench - Futex Hash (ops/sec)	**5002390**	**5271674**
Normalized	94.89%	100%
Standard Deviation	0.3%	0.2%
perf-bench - Memcpy 1MB (GB/sec)	**27.889661**	**27.803229**
Normalized	100%	99.69%
Standard Deviation	1.1%	1.6%
perf-bench - Memset 1MB (GB/sec)	**42.750504**	**41.695987**
Normalized	100%	97.53%
Standard Deviation	1%	2.3%
perf-bench - Sched Pipe (ops/sec)	**265155**	**254052**
Normalized	100%	95.81%
Standard Deviation	3.4%	2.2%
perf-bench - Futex Lock-Pi (ops/sec)	**2884**	**2866**

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Normalized	100%	99.38%
Standard Deviation	2.2%	1.8%
perf-bench - Syscall Basic (ops/sec)	**19995092**	**20416840**
Normalized	97.93%	100%
Standard Deviation	2.4%	0.5%
pmbench - 1 - 50% (us - Page Latency)	**0.0971**	**0.0975**
Normalized	100%	99.59%
Standard Deviation	0.5%	0.2%
pmbench - 2 - 50% (us - Page Latency)	**0.0993**	**0.0996**
Normalized	100%	99.7%
Standard Deviation	0.2%	0.5%
pmbench - 4 - 50% (us - Page Latency)	**0.1116**	**0.1118**
Normalized	100%	99.82%
Standard Deviation	3.7%	1%
pmbench - 1 - 100% Reads (us - Page Latency)	**0.0442**	**0.0448**
Normalized	100%	98.66%
Standard Deviation	0.3%	0.9%
pmbench - 2 - 100% Reads (us - Page Latency)	**0.0464**	**0.0470**
Normalized	100%	98.72%
Standard Deviation	1.2%	1.5%
pmbench - 4 - 100% Reads (us - Page Latency)	**0.0587**	**0.0558**
Normalized	95.06%	100%
Standard Deviation	1.4%	8.3%
pmbench - 1 - 100% Writes (us - Page Latency)	**0.0585**	**0.0587**
Normalized	100%	99.66%
Standard Deviation	1.3%	1.2%
pmbench - 2 - 100% Writes (us - Page Latency)	**0.0594**	**0.0603**
Normalized	100%	98.51%
Standard Deviation	6.7%	0.6%
pmbench - 4 - 100% Writes (us - Page Latency)	**0.0736**	**0.0719**
Normalized	97.69%	100%
Standard Deviation	1.7%	1.7%
pmbench - 1 - 8.R.2.W (us - Page Latency)	**0.1177**	**0.1181**
Normalized	100%	99.66%
Standard Deviation	0.2%	0.1%
pmbench - 2 - 8.R.2.W (us - Page Latency)	**0.1212**	**0.1204**
Normalized	99.34%	100%
Standard Deviation	0.9%	0.3%
pmbench - 4 - 8.R.2.W (us - Page Latency)	**0.1310**	**0.1332**
Normalized	100%	98.35%
Standard Deviation	2.3%	0.6%
PostgreSQL pgbench - 1 - 1 - Read Only (TPS)	**18860**	**17464**
Normalized	100%	92.6%
Standard Deviation	2.3%	3%
PostgreSQL pgbench - 1 - 1 - Read Only - Average Latency (ms)	**0.053**	**0.057**
Normalized	100%	92.98%
Standard Deviation	2.2%	3.4%
PostgreSQL pgbench - 1 - 1 - Read Write (TPS)	**93**	**100**
Normalized	93%	100%
Standard Deviation	1.8%	4.2%
PostgreSQL pgbench - 1 - 1 - Read Write - Average Latency (ms)	**10.803**	**9.992**
Normalized	92.49%	100%
Standard Deviation	1.8%	4.1%

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PostgreSQL pgbench - 1 - 50 - Read Only (TPS)	**60182**	**56690**
Normalized	100%	94.2%
Standard Deviation	0.7%	0%
PostgreSQL pgbench - 1 - 50 - Read Only - Average Latency (ms)	**0.831**	**0.882**
Normalized	100%	94.22%
Standard Deviation	0.7%	0%
PostgreSQL pgbench - 1 - 100 - Read Only (TPS)	**57843**	**55489**
Normalized	100%	95.93%
Standard Deviation	0.5%	0.1%
PostgreSQL pgbench - 1 - 100 - Read Only - Average Latency (ms)	**1.729**	**1.802**
Normalized	100%	95.95%
Standard Deviation	0.5%	0.1%
PostgreSQL pgbench - 1 - 250 - Read Only (TPS)	**53769**	**51370**
Normalized	100%	95.54%
Standard Deviation	2.1%	2.3%
PostgreSQL pgbench - 1 - 250 - Read Only - Average Latency (ms)	**4.651**	**4.869**
Normalized	100%	95.52%
Standard Deviation	2.1%	2.2%
PostgreSQL pgbench - 1 - 50 - Read Write (TPS)	**93**	**100**
Normalized	93%	100%
Standard Deviation	0.9%	2.3%
PostgreSQL pgbench - 1 - 50 - Read Write - Average Latency (ms)	**537.086**	**499.693**
Normalized	93.04%	100%
Standard Deviation	0.9%	2.3%
PostgreSQL pgbench - 1 - 500 - Read Only (TPS)	**49536**	**47556**
Normalized	100%	96%
Standard Deviation	1.1%	2.3%
PostgreSQL pgbench - 1 - 500 - Read Only - Average Latency (ms)	**10.095**	**10.518**
Normalized	100%	95.98%
Standard Deviation	1.1%	2.3%
PostgreSQL pgbench - 100 - 1 - Read Only (TPS)	**8115**	**7641**
Normalized	100%	94.16%
Standard Deviation	4.3%	11.6%
PostgreSQL pgbench - 100 - 1 - Read Only - Average Latency (ms)	**0.124**	**0.133**
Normalized	100%	93.23%
Standard Deviation	4.4%	14.3%
PostgreSQL pgbench - 1 - 100 - Read Write (TPS)	**102**	**93**
Normalized	100%	91.18%
Standard Deviation	4.8%	1.6%
PostgreSQL pgbench - 1 - 100 - Read Write - Average Latency (ms)	**983.445**	**1074**
Normalized	100%	91.54%
Standard Deviation	5%	1.6%
PostgreSQL pgbench - 1 - 250 - Read Write (TPS)	**93**	**88**
Normalized	100%	94.62%
Standard Deviation	7.8%	1.2%

PostgreSQL pgbench - 1 - 250 - Read Write - Average Latency (ms)	**2717**	**2852**
Normalized	100%	95.27%
Standard Deviation	7.9%	1.2%
PostgreSQL pgbench - 1 - 500 - Read Write (TPS)	**87**	**83**
Normalized	100%	95.4%
Standard Deviation	4.4%	1%
PostgreSQL pgbench - 1 - 500 - Read Write - Average Latency (ms)	**5781**	**6058**
Normalized	100%	95.43%
Standard Deviation	4.3%	1%
PostgreSQL pgbench - 100 - 1 - Read Write (TPS)	**79**	**78**
Normalized	100%	98.73%
Standard Deviation	7.4%	5.2%
PostgreSQL pgbench - 100 - 1 - Read Write - Average Latency (ms)	**12.648**	**12.885**
Normalized	100%	98.16%
Standard Deviation	6.7%	4.9%
PostgreSQL pgbench - 100 - 50 - Read Only (TPS)	**43867**	**37590**
Normalized	100%	85.69%
Standard Deviation	10.2%	8.9%
PostgreSQL pgbench - 100 - 50 - Read Only - Average Latency (ms)	**1.151**	**1.339**
Normalized	100%	85.96%
Standard Deviation	10.5%	8.1%
PostgreSQL pgbench - 1000 - 1 - Read Only (TPS)	**1181**	**1021**
Normalized	100%	86.45%
Standard Deviation	15.1%	12.1%
PostgreSQL pgbench - 1000 - 1 - Read Only - Average Latency (ms)	**0.866**	**0.993**
Normalized	100%	87.21%
Standard Deviation	18%	12.2%
PostgreSQL pgbench - 100 - 100 - Read Only (TPS)	**39901**	**38741**
Normalized	100%	97.09%
Standard Deviation	9.9%	3.8%
PostgreSQL pgbench - 100 - 100 - Read Only - Average Latency (ms)	**2.529**	**2.585**
Normalized	100%	97.83%
Standard Deviation	9.9%	3.7%
PostgreSQL pgbench - 100 - 250 - Read Only (TPS)	**35109**	**33269**
Normalized	100%	94.76%
Standard Deviation	6.9%	0.9%
PostgreSQL pgbench - 100 - 250 - Read Only - Average Latency (ms)	**7.154**	**7.515**
Normalized	100%	95.2%
Standard Deviation	7.3%	0.9%
PostgreSQL pgbench - 100 - 50 - Read Write (TPS)	**389**	**362**
Normalized	100%	93.06%
Standard Deviation	1.9%	0.5%
PostgreSQL pgbench - 100 - 50 - Read Write - Average Latency (ms)	**128.585**	**137.935**
Normalized	100%	93.22%
Standard Deviation	1.9%	0.5%
PostgreSQL pgbench - 100 - 500 - Read Only (TPS)	**16846**	**17004**

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Normalized	99.07%	100%
Standard Deviation	2.5%	4.3%
PostgreSQL pgbench - 100 - 500 - Read Only - Average Latency (ms)	**29.696**	**29.457**
Normalized	99.2%	100%
Standard Deviation	2.5%	4.6%
PostgreSQL pgbench - 1000 - 1 - Read Write (TPS)	**66**	**71**
Normalized	92.96%	100%
Standard Deviation	1.9%	9.4%
PostgreSQL pgbench - 1000 - 1 - Read Write - Average Latency (ms)	**15.067**	**14.180**
Normalized	94.11%	100%
Standard Deviation	1.9%	10%
PostgreSQL pgbench - 1000 - 50 - Read Only (TPS)	**4424**	**4325**
Normalized	100%	97.76%
Standard Deviation	1.4%	2.3%
PostgreSQL pgbench - 1000 - 50 - Read Only - Average Latency (ms)	**11.303**	**11.566**
Normalized	100%	97.73%
Standard Deviation	1.4%	2.3%
PostgreSQL pgbench - 100 - 100 - Read Write (TPS)	**404**	**389**
Normalized	100%	96.29%
Standard Deviation	1.3%	2.1%
PostgreSQL pgbench - 100 - 100 - Read Write - Average Latency (ms)	**247.543**	**256.866**
Normalized	100%	96.37%
Standard Deviation	1.3%	2.1%
PostgreSQL pgbench - 100 - 250 - Read Write (TPS)	**415**	**369**
Normalized	100%	88.92%
Standard Deviation	14.8%	2%
PostgreSQL pgbench - 100 - 250 - Read Write - Average Latency (ms)	**610.635**	**678.023**
Normalized	100%	90.06%
Standard Deviation	10.6%	2%
PostgreSQL pgbench - 100 - 500 - Read Write (TPS)	**659**	**469**
Normalized	100%	71.17%
Standard Deviation	10.2%	35.1%
PostgreSQL pgbench - 100 - 500 - Read Write - Average Latency (ms)	**764.712**	**1174**
Normalized	100%	65.12%
Standard Deviation	8.8%	28.4%
PostgreSQL pgbench - 1000 - 100 - Read Only (TPS)	**4923**	**4826**
Normalized	100%	98.03%
Standard Deviation	1.3%	0.9%
PostgreSQL pgbench - 1000 - 100 - Read Only - Average Latency (ms)	**20.317**	**20.723**
Normalized	100%	98.04%
Standard Deviation	1.3%	1%
PostgreSQL pgbench - 1000 - 250 - Read Only (TPS)	**5205**	**5080**
Normalized	100%	97.6%
Standard Deviation	1.3%	1.5%
PostgreSQL pgbench - 1000 - 250 - Read Only - Average Latency (ms)	**48.033**	**49.222**
Normalized	100%	97.58%

Standard Deviation	1.3%	1.5%
PostgreSQL pgbench - 1000 - 50 - Read Write (TPS)	**401**	**421**
Normalized	95.25%	100%
Standard Deviation	8.1%	2.1%
PostgreSQL pgbench - 1000 - 50 - Read Write - Average Latency (ms)	**125.354**	**118.877**
Normalized	94.83%	100%
Standard Deviation	9%	2.1%
PostgreSQL pgbench - 1000 - 500 - Read Only (TPS)	**5040**	**4709**
Normalized	100%	93.43%
Standard Deviation	2.9%	0.8%
PostgreSQL pgbench - 1000 - 500 - Read Only - Average Latency (ms)	**99.288**	**106.174**
Normalized	100%	93.51%
Standard Deviation	3%	0.8%
PostgreSQL pgbench - 1000 - 100 - Read Write (TPS)	**501**	**487**
Normalized	100%	97.21%
Standard Deviation	9%	8.9%
PostgreSQL pgbench - 1000 - 100 - Read Write - Average Latency (ms)	**201.086**	**206.501**
Normalized	100%	97.38%
Standard Deviation	8.8%	9%
PostgreSQL pgbench - 1000 - 250 - Read Write (TPS)	**687**	**695**
Normalized	98.85%	100%
Standard Deviation	2.3%	1.6%
PostgreSQL pgbench - 1000 - 250 - Read Write - Average Latency (ms)	**363.985**	**359.763**
Normalized	98.84%	100%
Standard Deviation	2.3%	1.6%
PostgreSQL pgbench - 1000 - 500 - Read Write (TPS)	**748**	**745**
Normalized	100%	99.6%
Standard Deviation	2.2%	2%
PostgreSQL pgbench - 1000 - 500 - Read Write - Average Latency (ms)	**668.243**	**671.365**
Normalized	100%	99.53%
Standard Deviation	2.2%	2%
PostMark - D.T.P (TPS)	**5769**	**5791**
Normalized	99.62%	100%
Standard Deviation	1.3%	2.8%
Schbench - 8 - 4 (usec, 99.9th Latency Percentile)	**101350**	**78545**
Normalized	77.5%	100%
Standard Deviation	6.8%	9.8%
SQLite Speedtest - Timed Time - Size 1,000 (sec)	**84.763**	**84.480**
Normalized	99.67%	100%
Standard Deviation	2.8%	0.5%
Stress-NG - MMAP (Bogo Ops/s)	**0.12**	**0.06**
Normalized	100%	50%
Standard Deviation	38%	0%
Stress-NG - NUMA (Bogo Ops/s)	**49.40**	**48.20**
Normalized	100%	97.57%
Standard Deviation	0.9%	1.3%
Stress-NG - MEMFD (Bogo Ops/s)	**90.17**	**84.38**
Normalized	100%	93.58%
Standard Deviation	0.6%	2.1%

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Stress-NG - Atomic (Bogo Ops/s)	**213799**	**209144**
Normalized	100%	97.82%
Standard Deviation	5%	5.8%
Stress-NG - Crypto (Bogo Ops/s)	**449.78**	**451.02**
Normalized	99.73%	100%
Standard Deviation	0.7%	1.5%
Stress-NG - Malloc (Bogo Ops/s)	**10130141**	**10216143**
Normalized	99.16%	100%
Standard Deviation	0.2%	0.9%
Stress-NG - RdRand (Bogo Ops/s)	**126155**	**126283**
Normalized	99.9%	100%
Standard Deviation	0.5%	0.4%
Stress-NG - Forking (Bogo Ops/s)	**12249**	**12134**
Normalized	100%	99.06%
Standard Deviation	0.7%	1.2%
Stress-NG - SENDFILE (Bogo Ops/s)	**34120**	**35375**
Normalized	96.45%	100%
Standard Deviation	1.4%	1.1%
Stress-NG - CPU Cache (Bogo Ops/s)	**33.19**	**32.35**
Normalized	100%	97.47%
Standard Deviation	2.4%	0.6%
Stress-NG - CPU Stress (Bogo Ops/s)	**3777**	**3786**
Normalized	99.76%	100%
Standard Deviation	0.3%	0.3%
Stress-NG - Semaphores (Bogo Ops/s)	**204402**	**194353**
Normalized	100%	95.08%
Standard Deviation	1.1%	1.2%
Stress-NG - Matrix Math (Bogo Ops/s)	**10821**	**10917**
Normalized	99.12%	100%
Standard Deviation	2.1%	0.6%
Stress-NG - Vector Math (Bogo Ops/s)	**6447**	**6469**
Normalized	99.65%	100%
Standard Deviation	0.5%	0.3%
Stress-NG - Memory Copying (Bogo Ops/s)	**1094**	**1094**
Normalized	100%	99.98%
Standard Deviation	1.2%	1.8%
Stress-NG - Socket Activity (Bogo Ops/s)	**2738**	**3021**
Normalized	90.65%	100%
Standard Deviation	1.3%	2.4%
Stress-NG - Context Switching (Bogo Ops/s)	**946024**	**891063**
Normalized	100%	94.19%
Standard Deviation	0.9%	0.5%
Stress-NG - G.C.S.F (Bogo Ops/s)	**272062**	**266474**
Normalized	100%	97.95%
Standard Deviation	0.7%	2%
Stress-NG - G.Q.D.S (Bogo Ops/s)	**36.85**	**36.87**
Normalized	99.95%	100%
Standard Deviation	0.5%	1%
Stress-NG - S.V.M.P (Bogo Ops/s)	**2943312**	**2669671**
Normalized	100%	90.7%
Standard Deviation	2.3%	1.2%
t-test1 - 1 (sec)	**25.089**	**25.193**
Normalized	100%	99.59%
Standard Deviation	2.3%	1%
t-test1 - 2 (sec)	**8.714**	**8.865**

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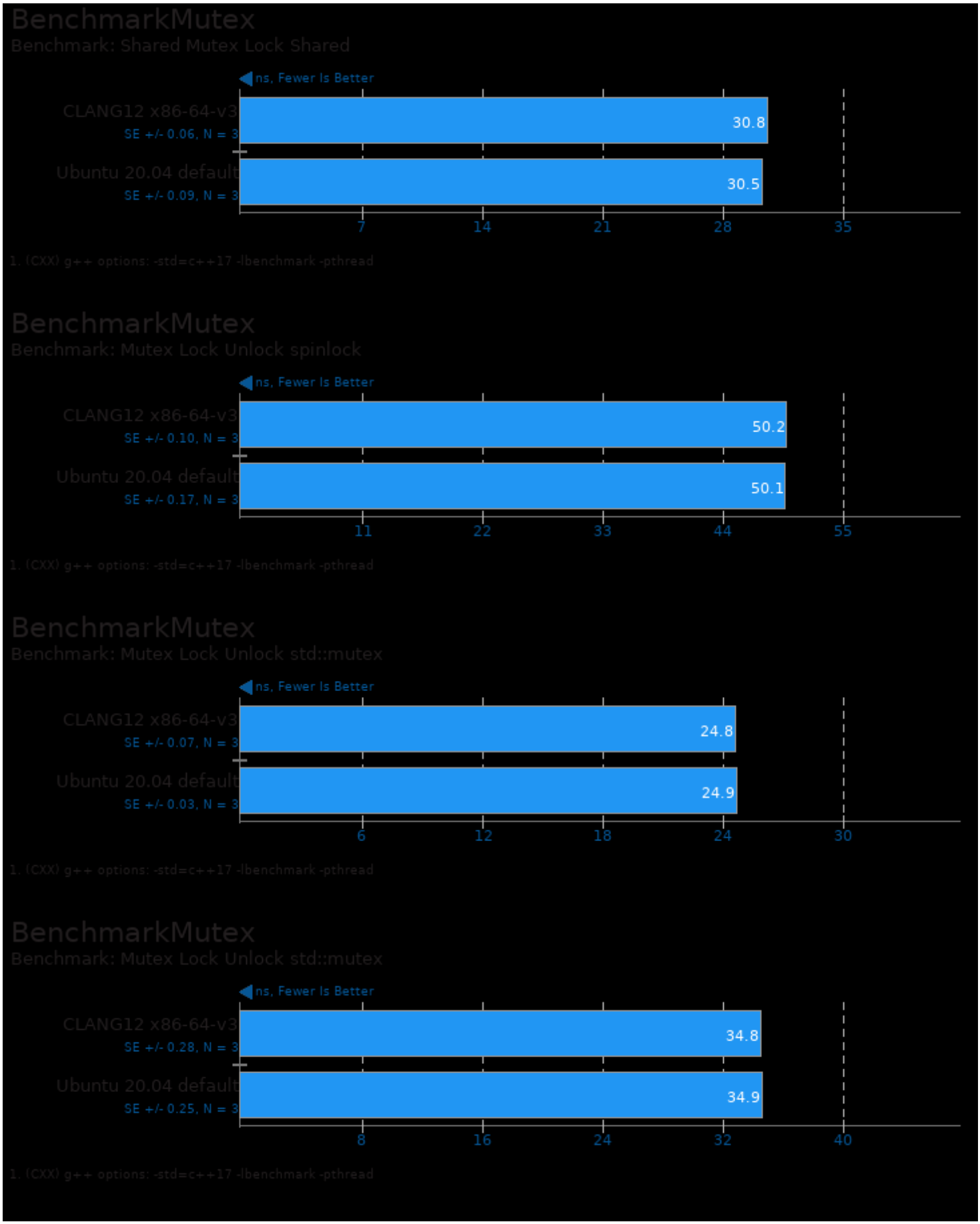
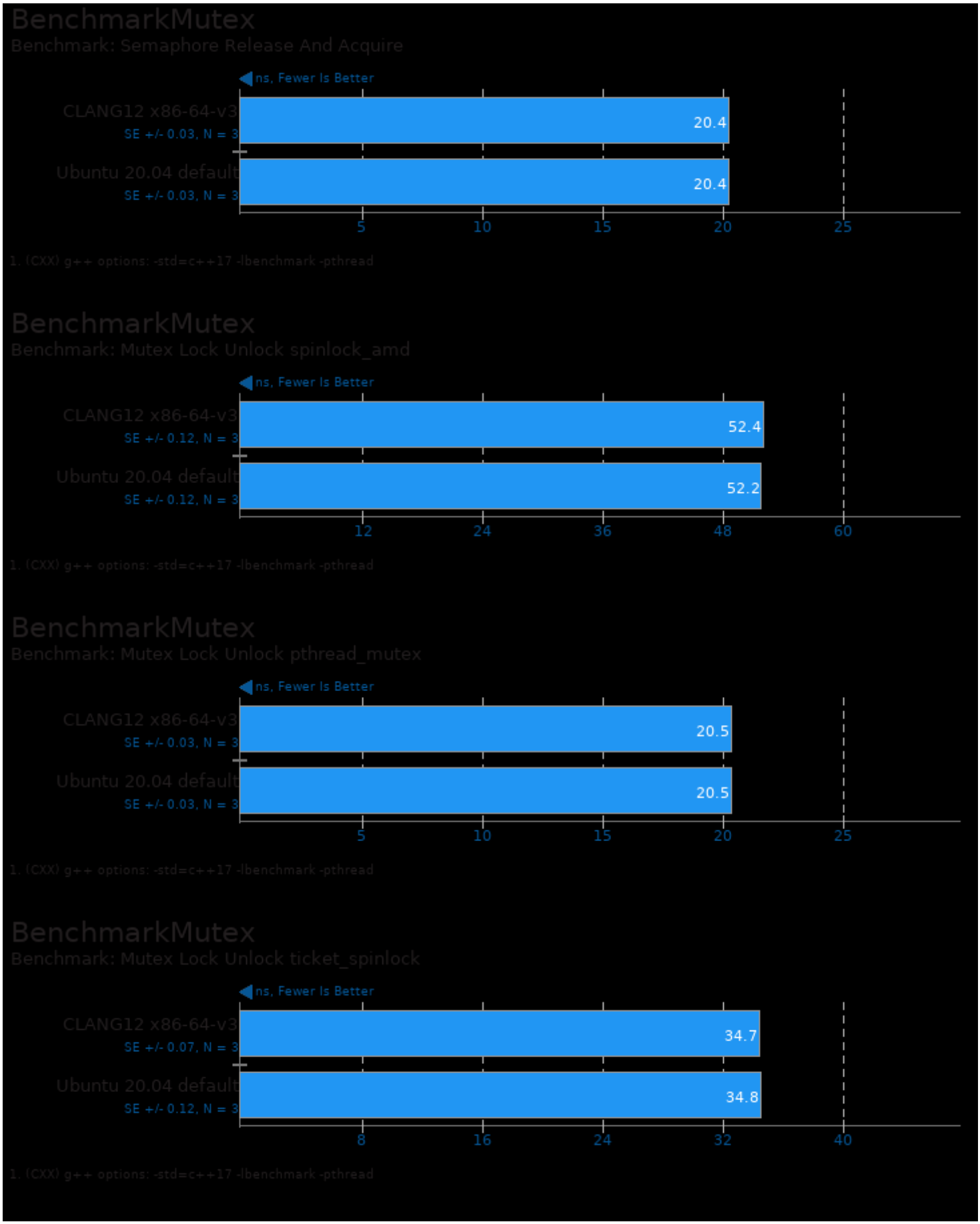
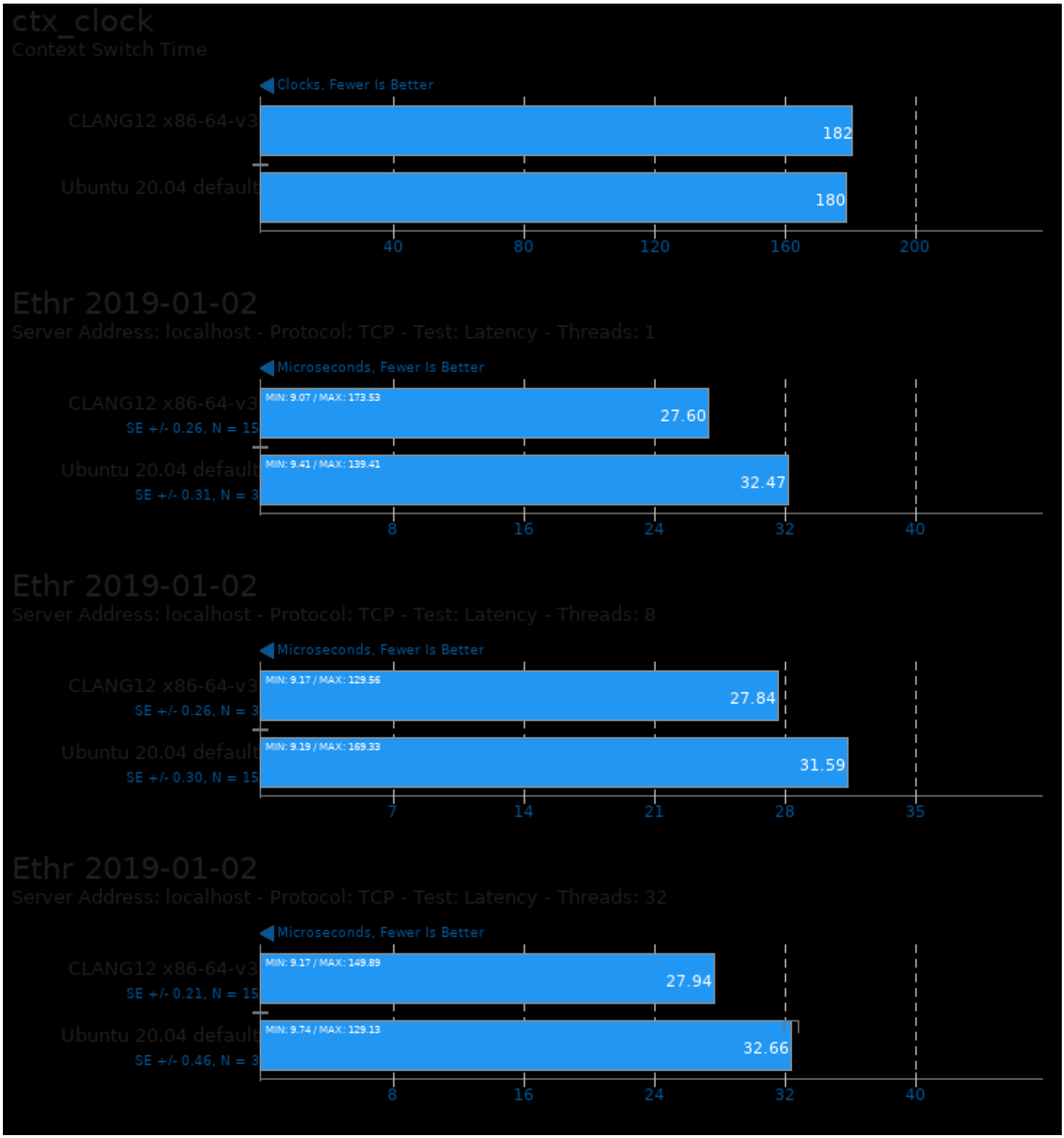
Normalized	100%	98.3%
Standard Deviation	2.1%	2.1%
Tinymembench - Standard Memcpy (MB/s)	**12979**	**13553**
Normalized	95.76%	100%
Standard Deviation	0.7%	0.9%
Tinymembench - Standard Memset (MB/s)	**24553**	**27337**
Normalized	89.82%	100%
Standard Deviation	0.5%	0.4%
WireGuard + Linux Networking Stack Stress Test		373.881
Standard Deviation		0.7%


BenchmarkMutex
Benchmark: Shared Mutex Lock Shared
ns, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.06, N = 3
30.8
Ubuntu 20.04 default
SE +/- 0.09, N = 3
30.5
7
14
21
28
35
1. (CXX) g++ options: -std=c++17 -lbenchmark -pthread
BenchmarkMutex
Benchmark: Mutex Lock Unlock spinlock
ns, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.10, N = 3
50.2
Ubuntu 20.04 default
SE +/- 0.17, N = 3
50.1
11
22
33
44
55
1. (CXX) g++ options: -std=c++17 -lbenchmark -pthread
BenchmarkMutex
Benchmark: Mutex Lock Unlock std::mutex
ns, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.07, N = 3
24.8
Ubuntu 20.04 default
SE +/- 0.03, N = 3
24.9
6
12
18
24
30
1. (CXX) g++ options: -std=c++17 -lbenchmark -pthread
BenchmarkMutex
Benchmark: Mutex Lock Unlock std::mutex
ns, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.28, N = 3
34.8
Ubuntu 20.04 default
SE +/- 0.25, N = 3
34.9
8
16
24
32
40
1. (CXX) g++ options: -std=c++17 -lbenchmark -pthread


BenchmarkMutex
Benchmark: Semaphore Release And Acquire
ns, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.03, N = 3
20.4
Ubuntu 20.04 default
SE +/- 0.03, N = 3
20.4
5
10
15
20
25
1. (CXX) g++ options: -std=c++17 -lbenchmark -pthread
BenchmarkMutex
Benchmark: Mutex Lock Unlock spinlock_amd
ns, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.12, N = 3
52.4
Ubuntu 20.04 default
SE +/- 0.12, N = 3
52.2
12
24
36
48
60
1. (CXX) g++ options: -std=c++17 -lbenchmark -pthread
BenchmarkMutex
Benchmark: Mutex Lock Unlock pthread_mutex
ns, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.03, N = 3
20.5
Ubuntu 20.04 default
SE +/- 0.03, N = 3
20.5
5
10
15
20
25
1. (CXX) g++ options: -std=c++17 -lbenchmark -pthread
BenchmarkMutex
Benchmark: Mutex Lock Unlock ticket_spinlock
ns, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.07, N = 3
34.7
Ubuntu 20.04 default
SE +/- 0.12, N = 3
34.8
8
16
24
32
40
1. (CXX) g++ options: -std=c++17 -lbenchmark -pthread


ctx_clock
Context Switch Time
Clocks, Fewer Is Better
CLANG12 x86-64-v3
182
Ubuntu 20.04 default
180
40
80
120
160
200
Ethr 2019-01-02
Server Address: localhost - Protocol: TCP - Test: Latency - Threads: 1
Microseconds, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.26, N = 15
MIN: 9.07 / MAX: 173.53
27.60
Ubuntu 20.04 default
SE +/- 0.31, N = 3
MIN: 9.41 / MAX: 139.41
32.47
8
16
24
32
40
Ethr 2019-01-02
Server Address: localhost - Protocol: TCP - Test: Latency - Threads: 8
Microseconds, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.26, N = 3
MIN: 9.17 / MAX: 129.56
27.84
Ubuntu 20.04 default
SE +/- 0.30, N = 15
MIN: 9.19 / MAX: 169.33
31.59
7
14
21
28
35
Ethr 2019-01-02
Server Address: localhost - Protocol: TCP - Test: Latency - Threads: 32
Microseconds, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.21, N = 15
MIN: 9.17 / MAX: 149.89
27.94
Ubuntu 20.04 default
SE +/- 0.46, N = 3
MIN: 9.74 / MAX: 129.13
32.66
8
16
24
32
40

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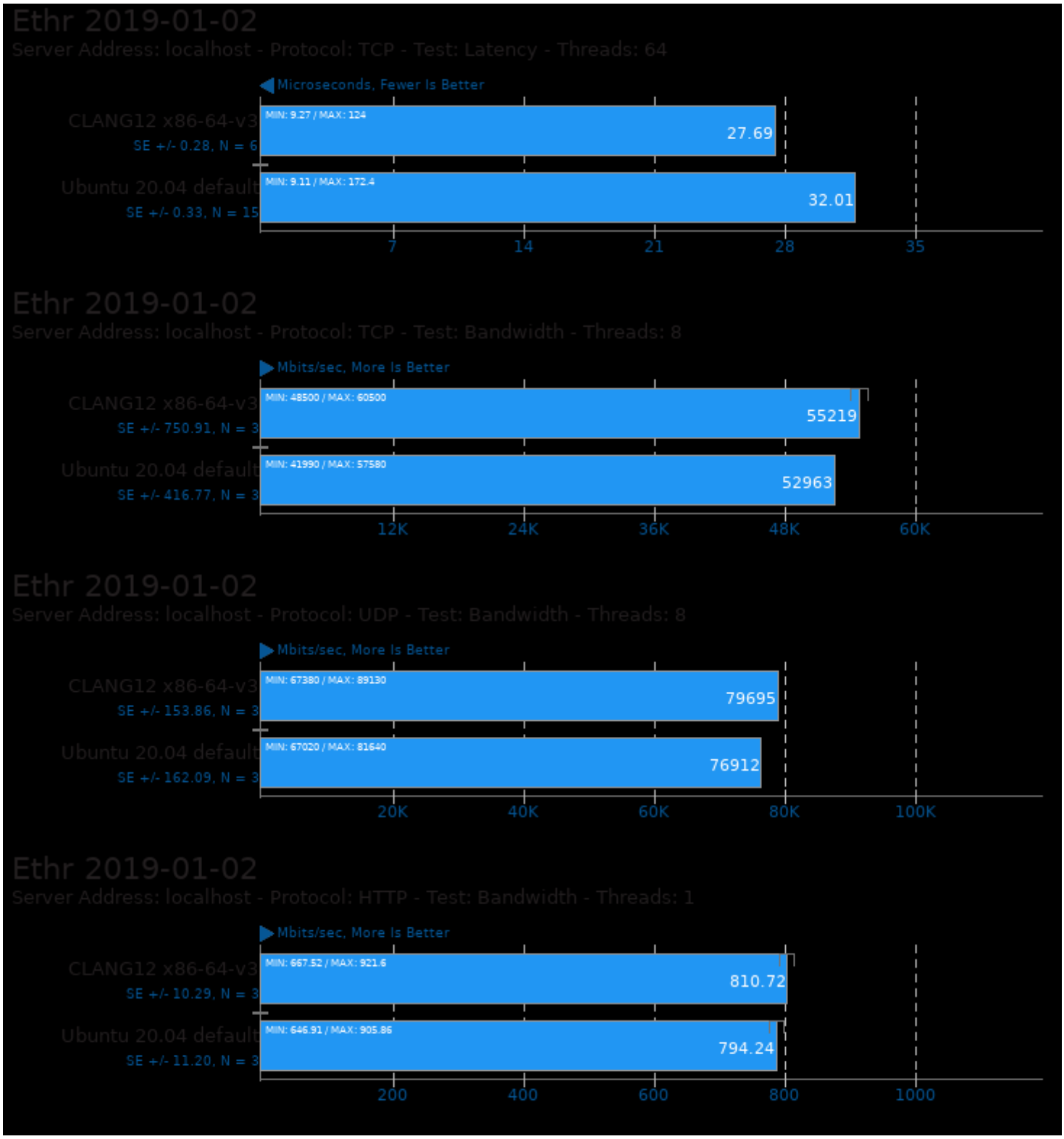
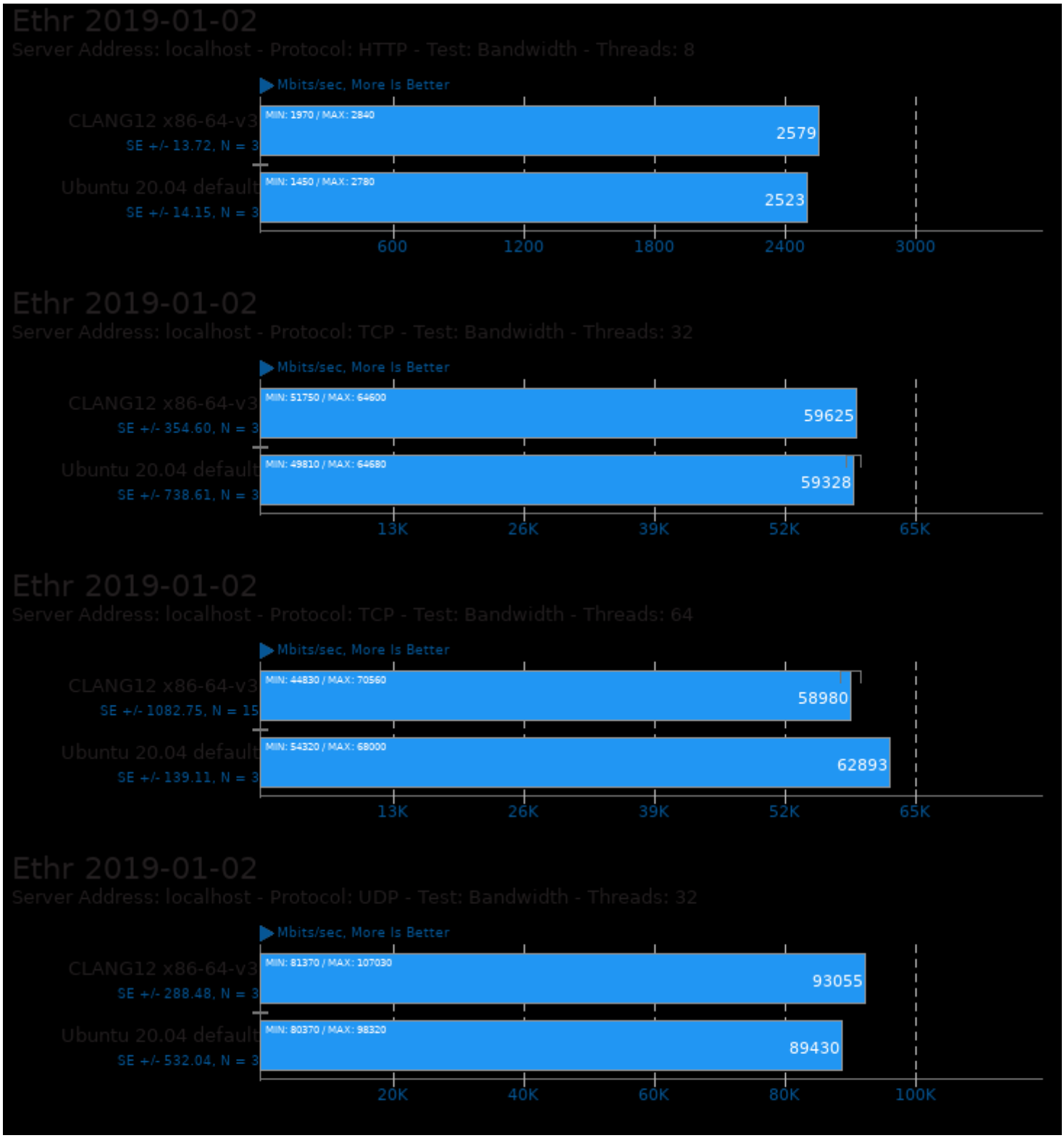
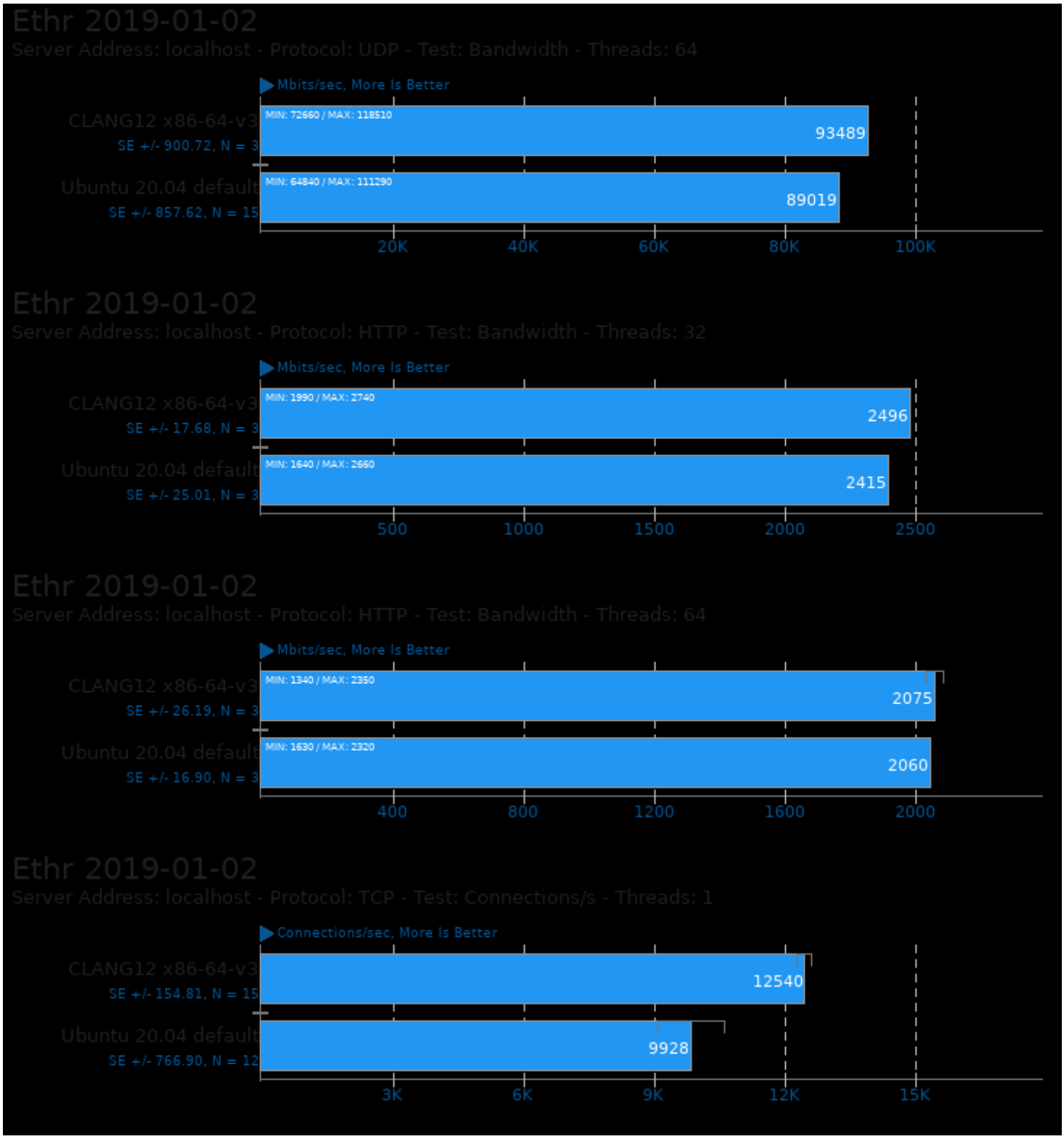


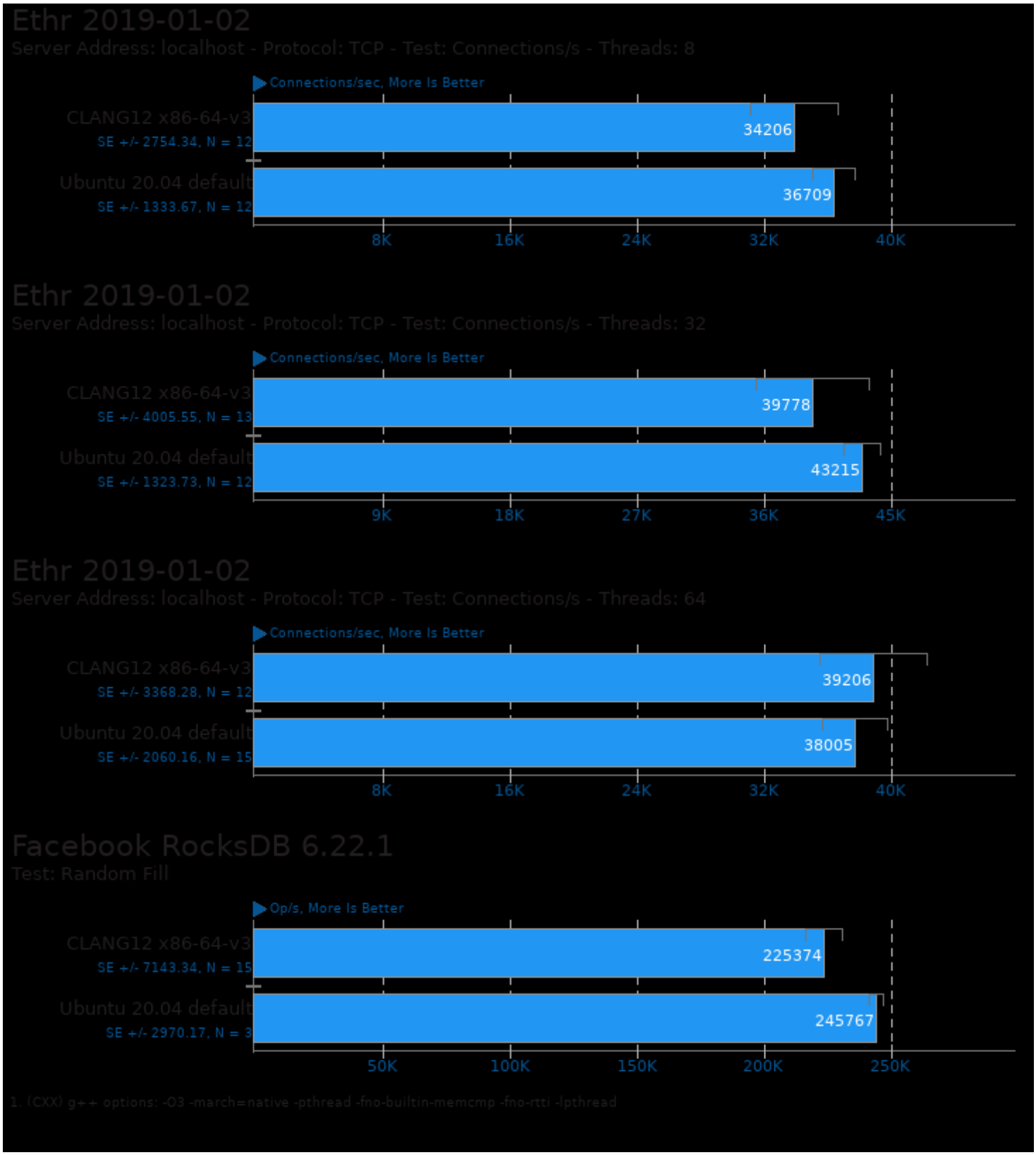
compiler-march-flags

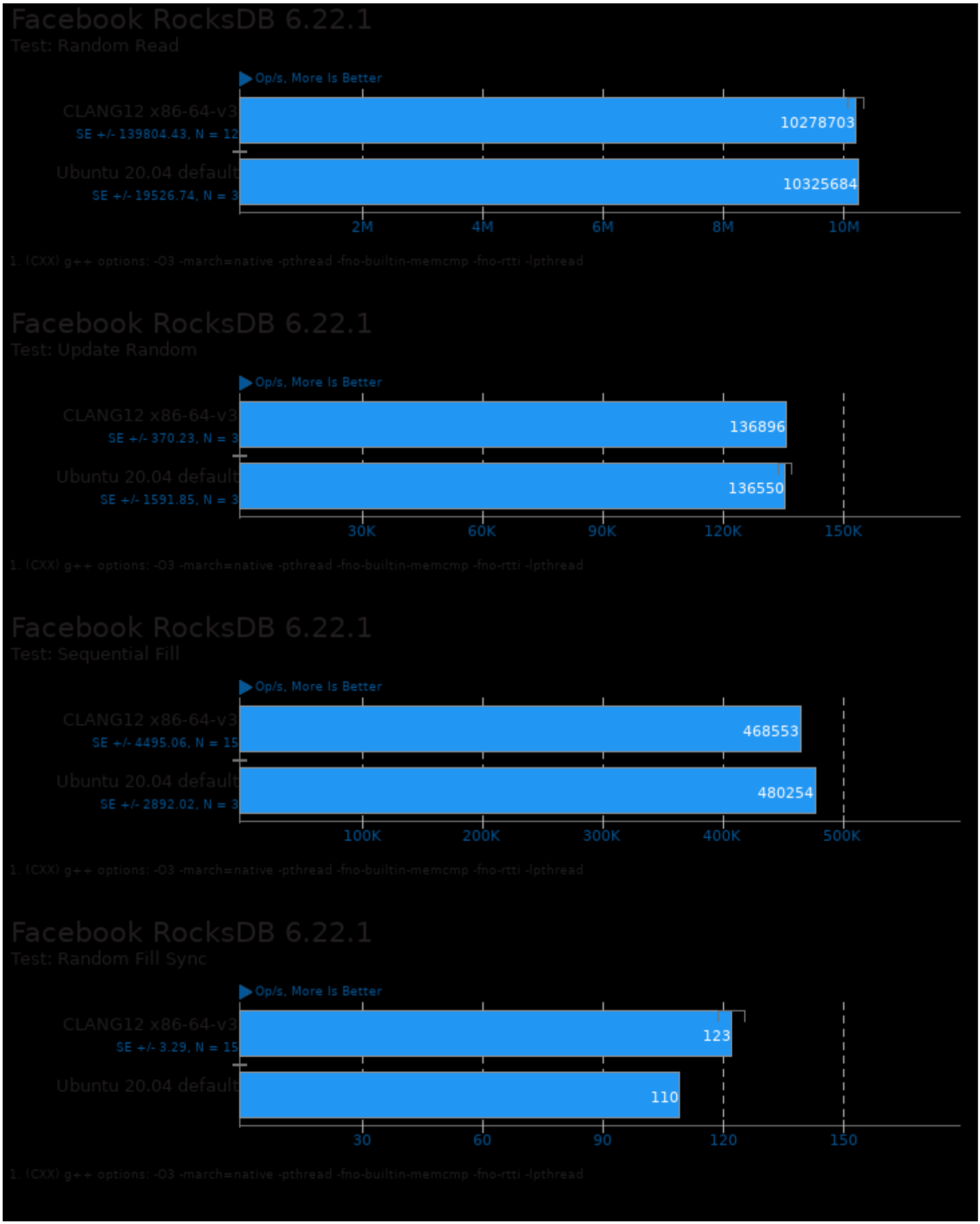


compiler-march-flags



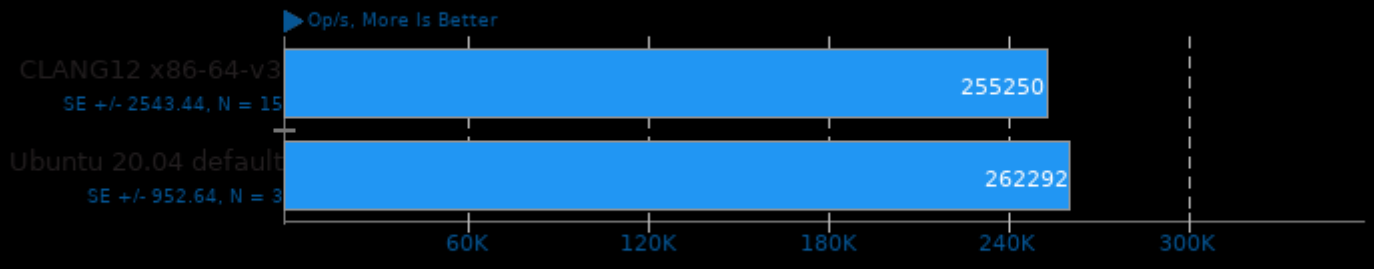
compiler-march-flags




Facebook RocksDB 6.22.1
Test: Random Read
Op/s, More Is Better
CLANG12 x86-64-v3
SE +/- 139804.43, N = 12
10278703
Ubuntu 20.04 default
SE +/- 19526.74, N = 3
10325684
2M
4M
6M
8M
10M
1. (CXX) g++ options: -O3 -march=native -pthread -fno-builtin-memcmp -fno-rtti -lpthread
Facebook RocksDB 6.22.1
Test: Update Random
Op/s, More Is Better
CLANG12 x86-64-v3
SE +/- 370.23, N = 3
136896
Ubuntu 20.04 default
SE +/- 1591.85, N = 3
136550
30K
60K
90K
120K
150K
1. (CXX) g++ options: -O3 -march=native -pthread -fno-builtin-memcmp -fno-rtti -lpthread
Facebook RocksDB 6.22.1
Test: Sequential Fill
Op/s, More Is Better
CLANG12 x86-64-v3
SE +/- 4495.06, N = 15
468553
Ubuntu 20.04 default
SE +/- 2892.02, N = 3
480254
100K
200K
300K
400K
500K
1. (CXX) g++ options: -O3 -march=native -pthread -fno-builtin-memcmp -fno-rtti -lpthread
Facebook RocksDB 6.22.1
Test: Random Fill Sync
Op/s, More Is Better
CLANG12 x86-64-v3
SE +/- 3.29, N = 15
123
Ubuntu 20.04 default
110
30
60
90
120
150
1. (CXX) g++ options: -O3 -march=native -pthread -fno-builtin-memcmp -fno-rtti -lpthread

Facebook RocksDB 6.22.1

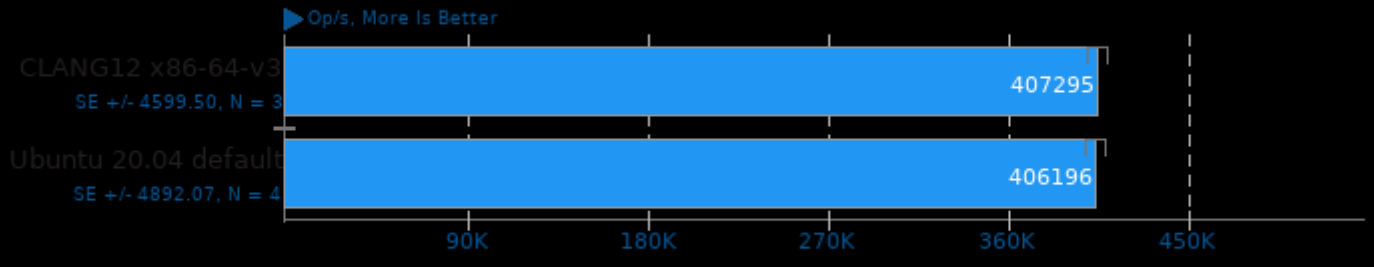
Test: Read While Writing



1. (CXX) g++ options: -O3 -march=native -pthread -fno-builtin-memcmp -fno-rtti -lpthread

Facebook RocksDB 6.22.1

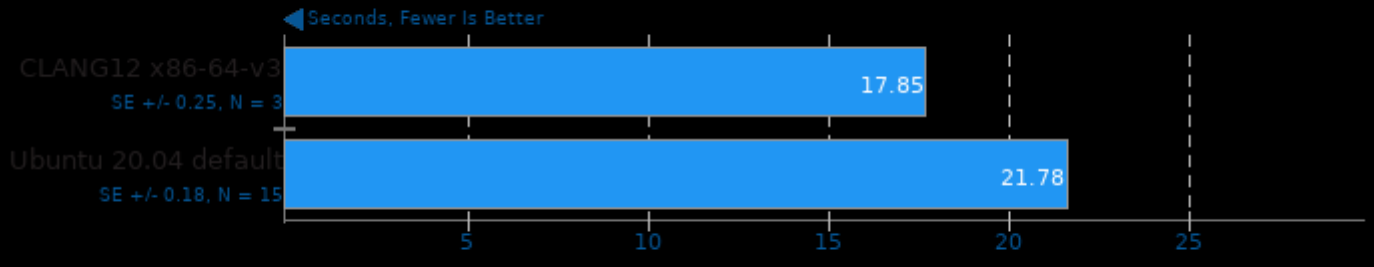
Test: Read Random Write Random



1. (CXX) g++ options: -O3 -march=native -pthread -fno-builtin-memcmp -fno-rtti -lpthread

Hackbench

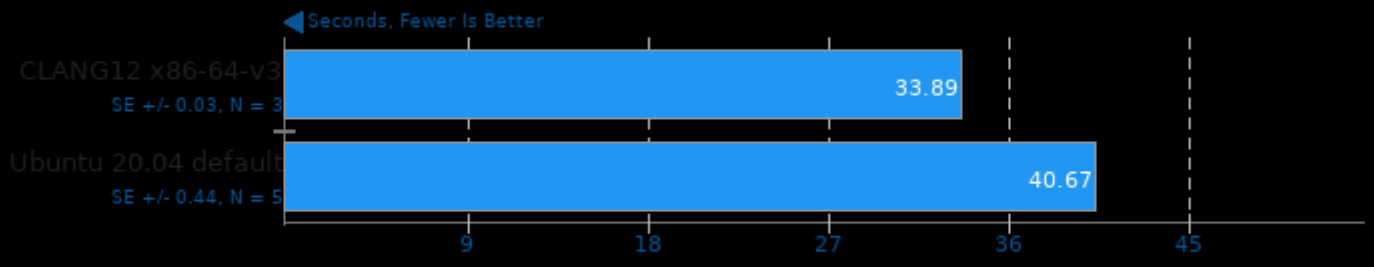
Count: 1 - Type: Thread



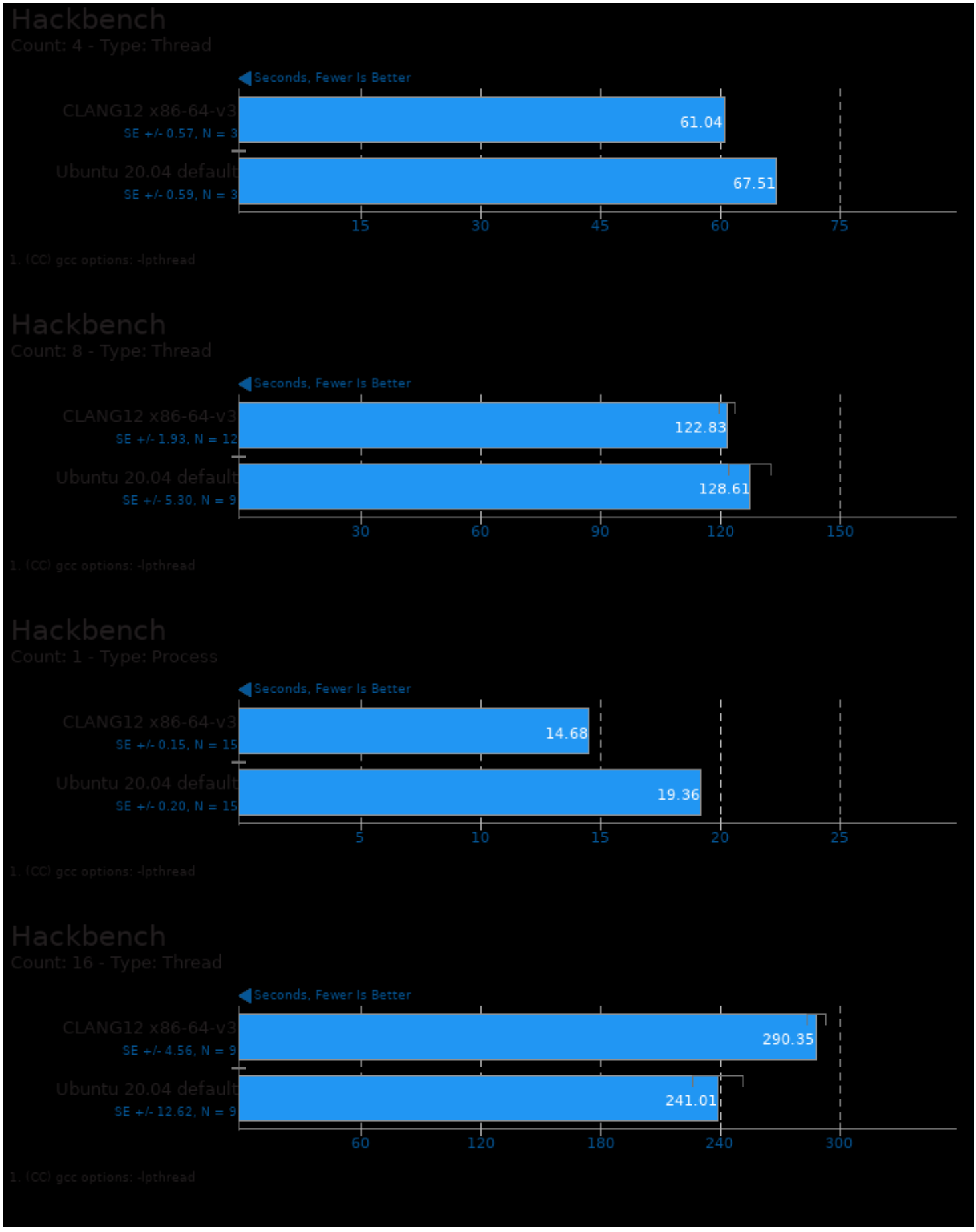
1. (CC) gcc options: -lpthread

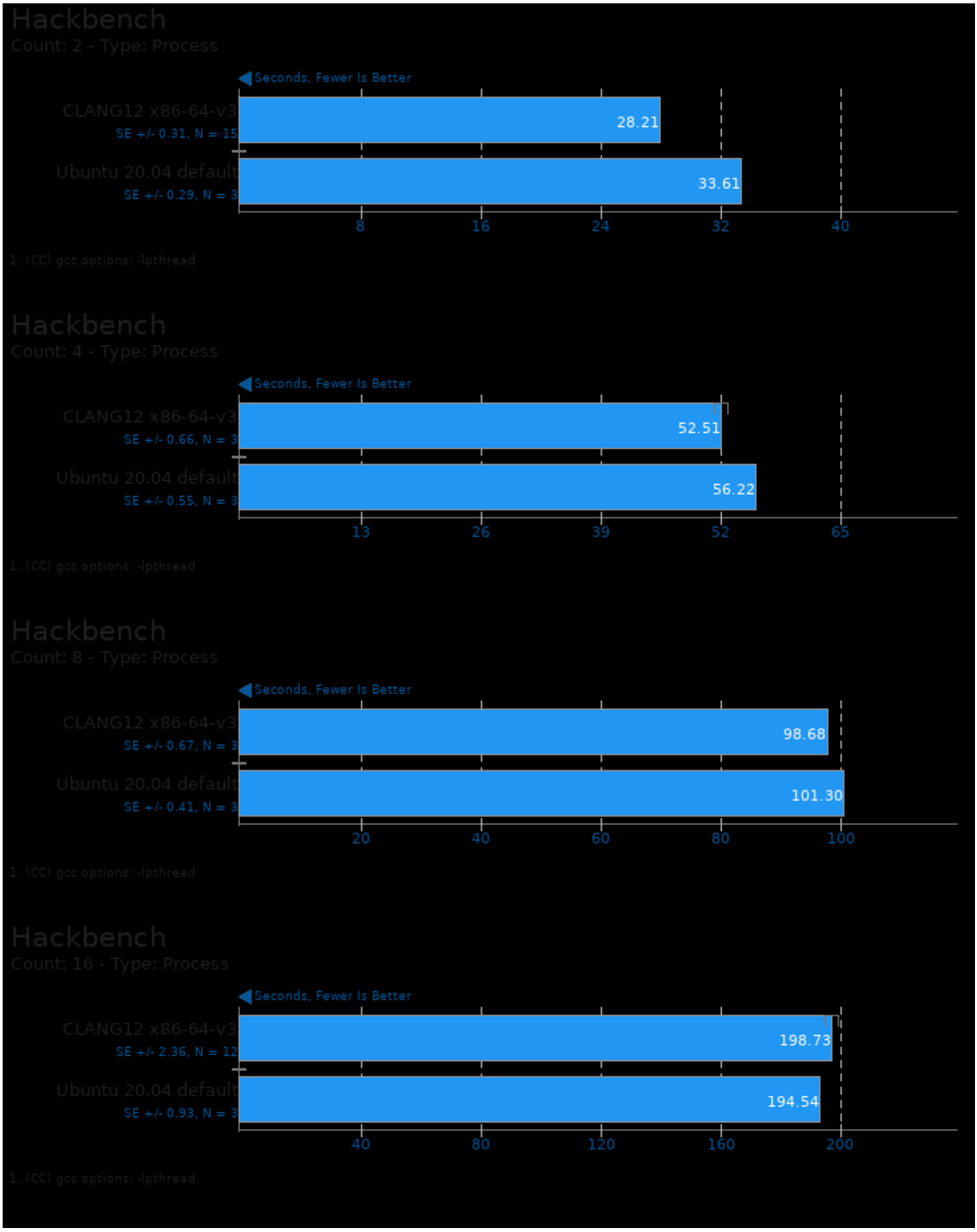
Hackbench

Count: 2 - Type: Thread

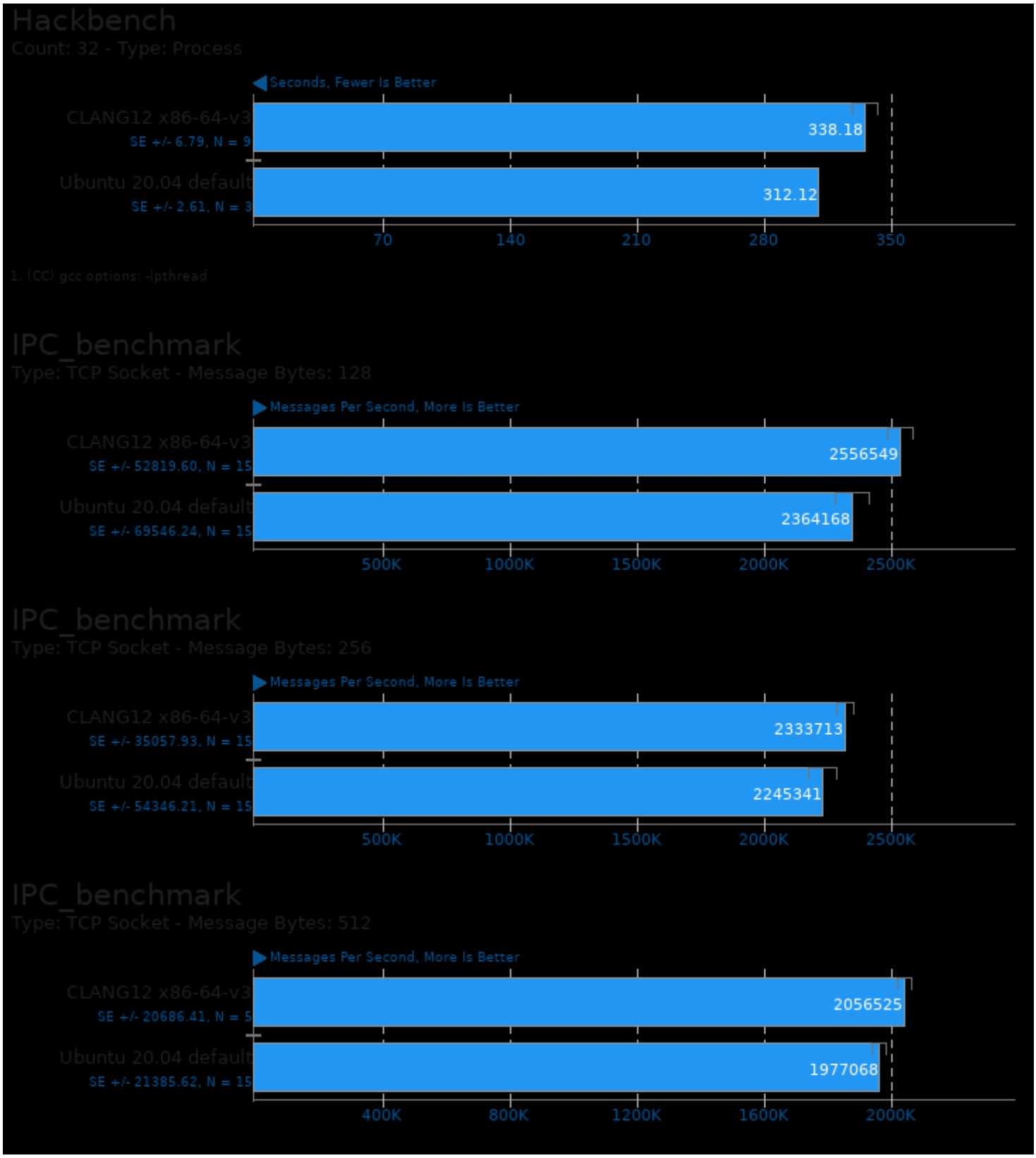


1. (CC) gcc options: -lpthread

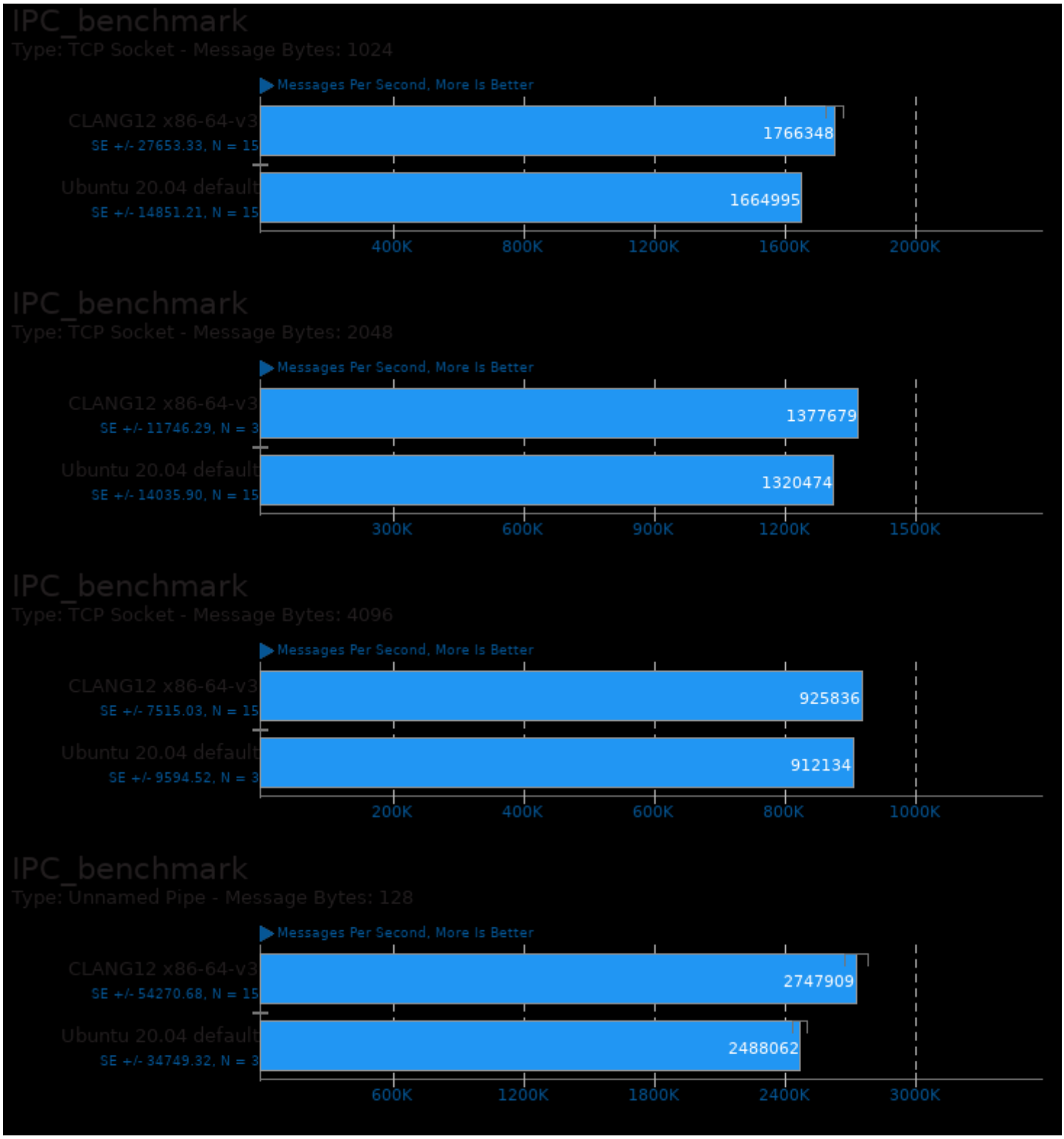

Hackbench
Count: 4 - Type: Thread
Seconds, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.57, N = 3
61.04
Ubuntu 20.04 default
SE +/- 0.59, N = 3
67.51
15
30
45
60
75
1. (CC) gcc options: -lpthread
Hackbench
Count: 8 - Type: Thread
Seconds, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 1.93, N = 12
122.83
Ubuntu 20.04 default
SE +/- 5.30, N = 9
128.61
30
60
90
120
150
1. (CC) gcc options: -lpthread
Hackbench
Count: 1 - Type: Process
Seconds, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.15, N = 15
14.68
Ubuntu 20.04 default
SE +/- 0.20, N = 15
19.36
5
10
15
20
25
1. (CC) gcc options: -lpthread
Hackbench
Count: 16 - Type: Thread
Seconds, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 4.56, N = 9
290.35
Ubuntu 20.04 default
SE +/- 12.62, N = 9
241.01
60
120
180
240
300
1. (CC) gcc options: -lpthread


Hackbench
Count: 2 - Type: Process
Seconds, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.31, N = 15
28.21
Ubuntu 20.04 default
SE +/- 0.29, N = 3
33.61
8
16
24
32
40
1. (CC) gcc options: -lpthread
Hackbench
Count: 4 - Type: Process
Seconds, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.66, N = 3
52.51
Ubuntu 20.04 default
SE +/- 0.55, N = 3
56.22
13
26
39
52
65
1. (CC) gcc options: -lpthread
Hackbench
Count: 8 - Type: Process
Seconds, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.67, N = 3
98.68
Ubuntu 20.04 default
SE +/- 0.41, N = 3
101.30
20
40
60
80
100
1. (CC) gcc options: -lpthread
Hackbench
Count: 16 - Type: Process
Seconds, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 2.36, N = 12
198.73
Ubuntu 20.04 default
SE +/- 0.93, N = 3
194.54
40
80
120
160
200
1. (CC) gcc options: -lpthread

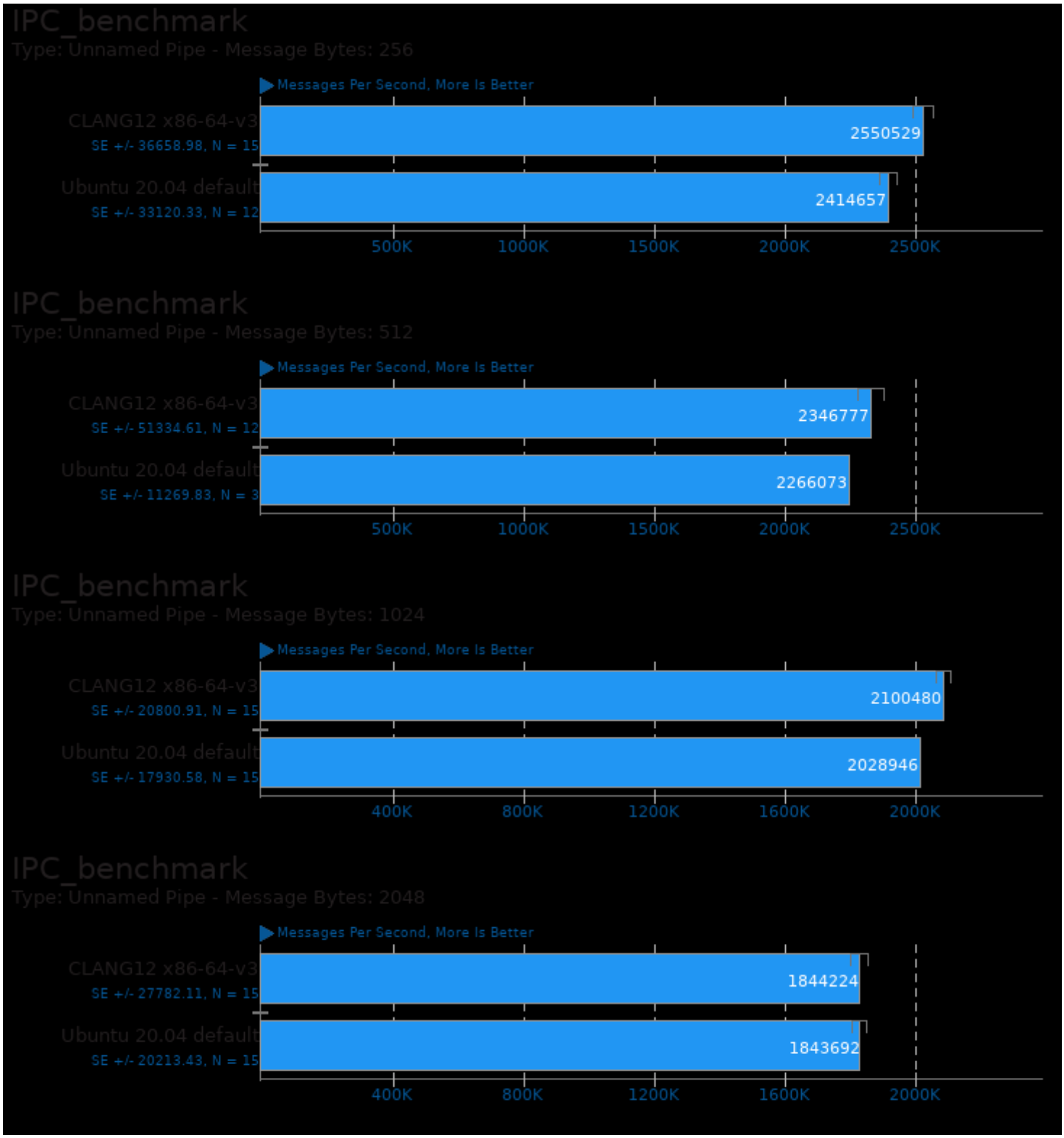
compiler-march-flags



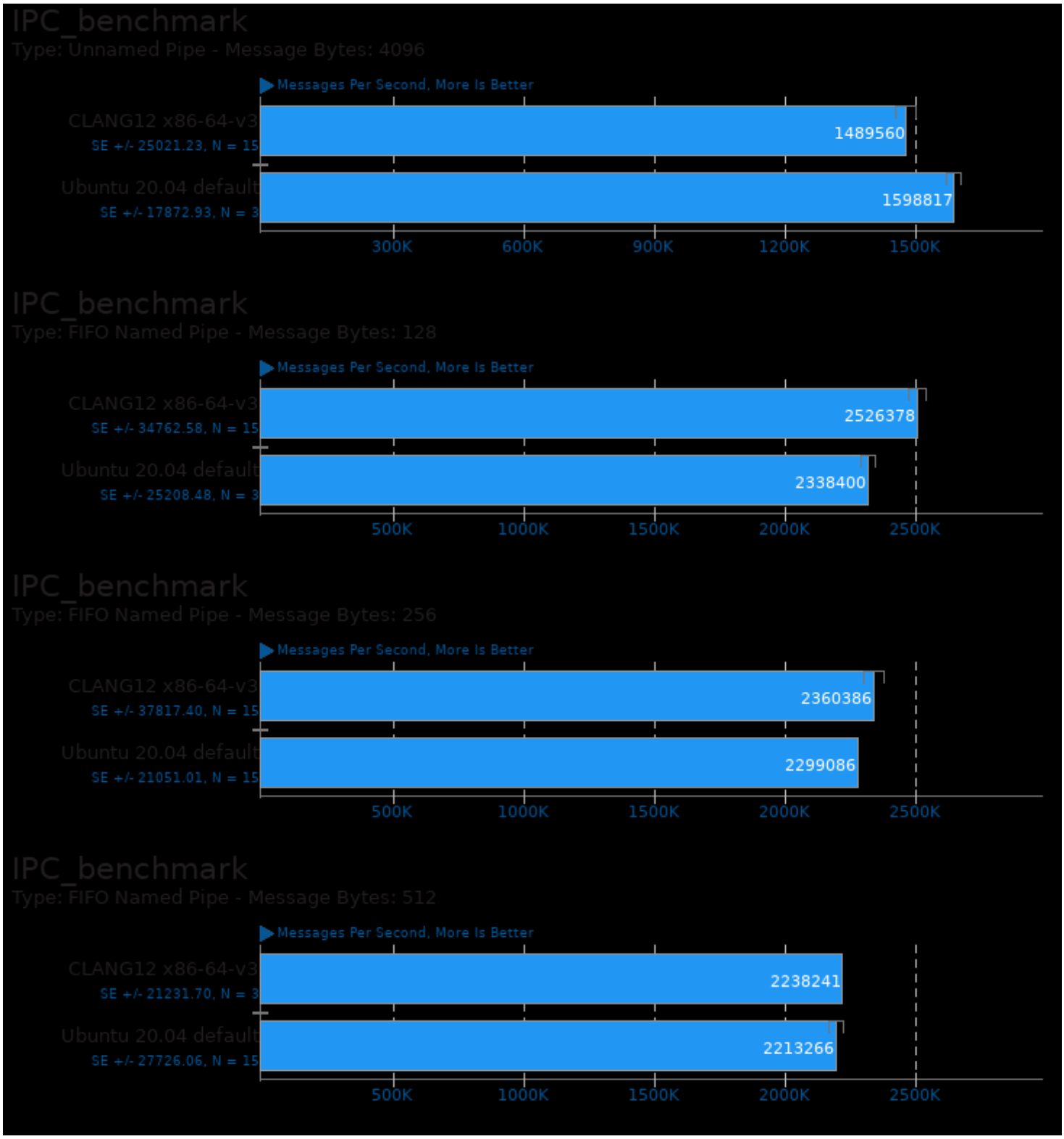
compiler-march-flags



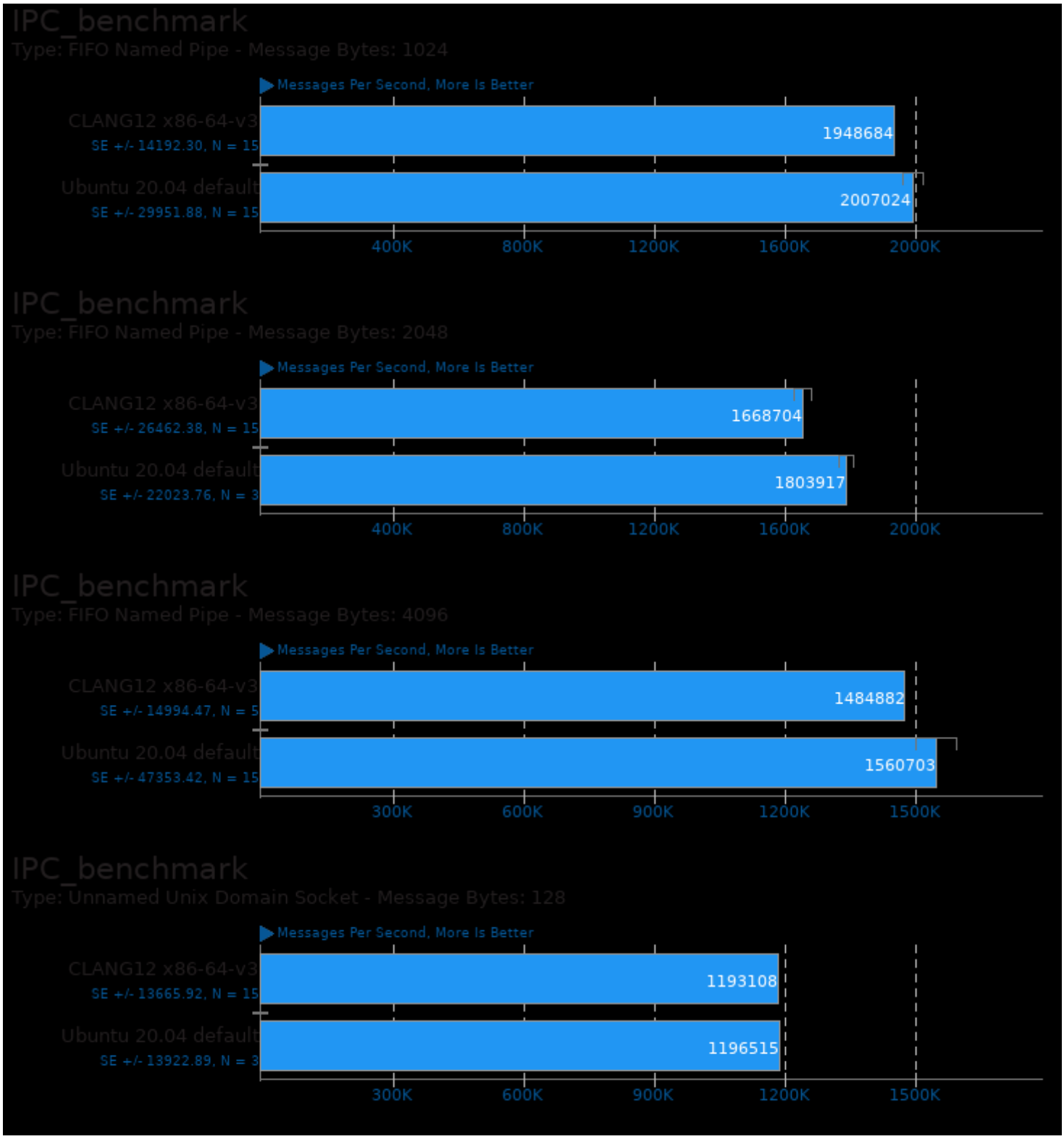
compiler-march-flags



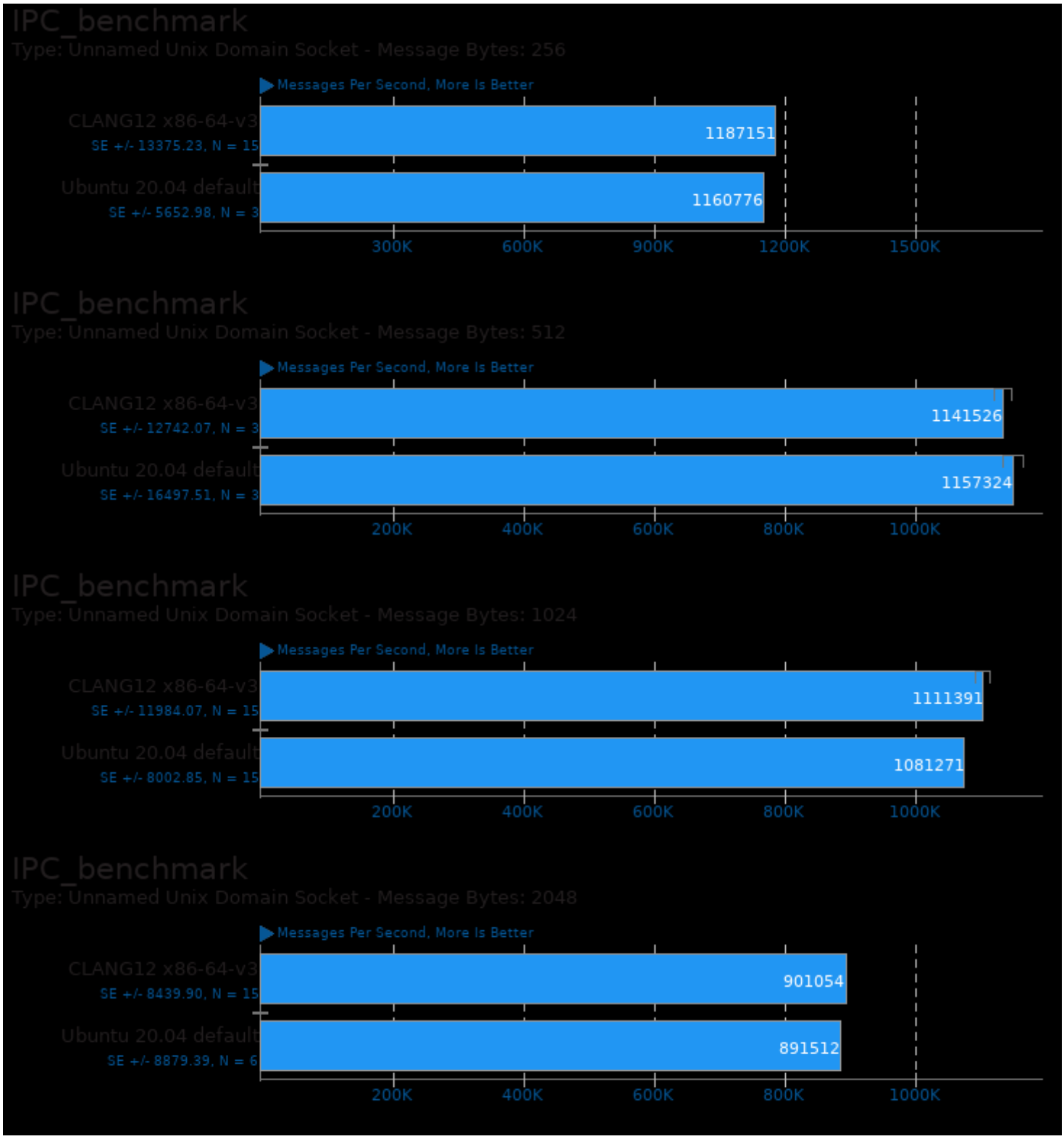
compiler-march-flags

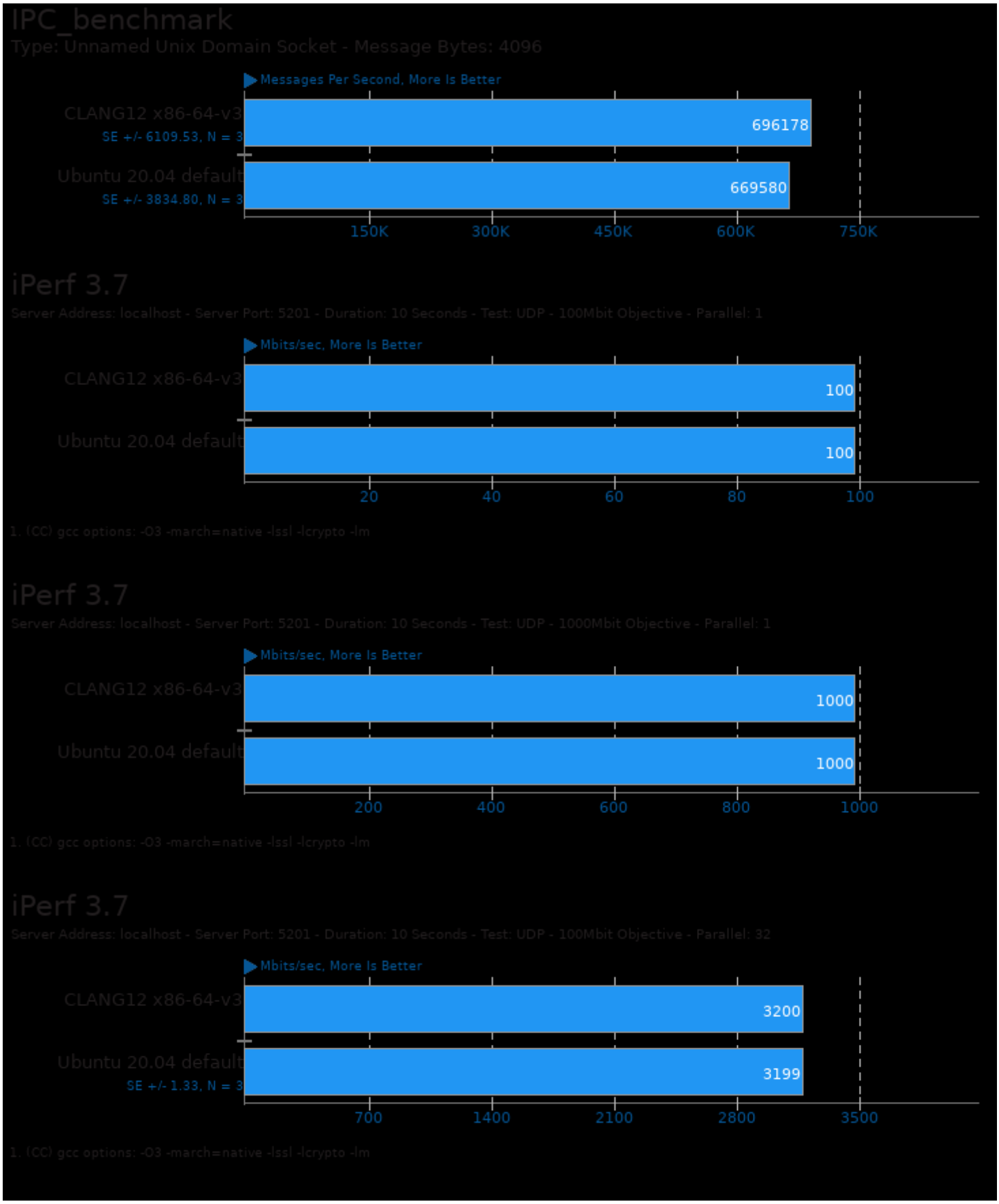


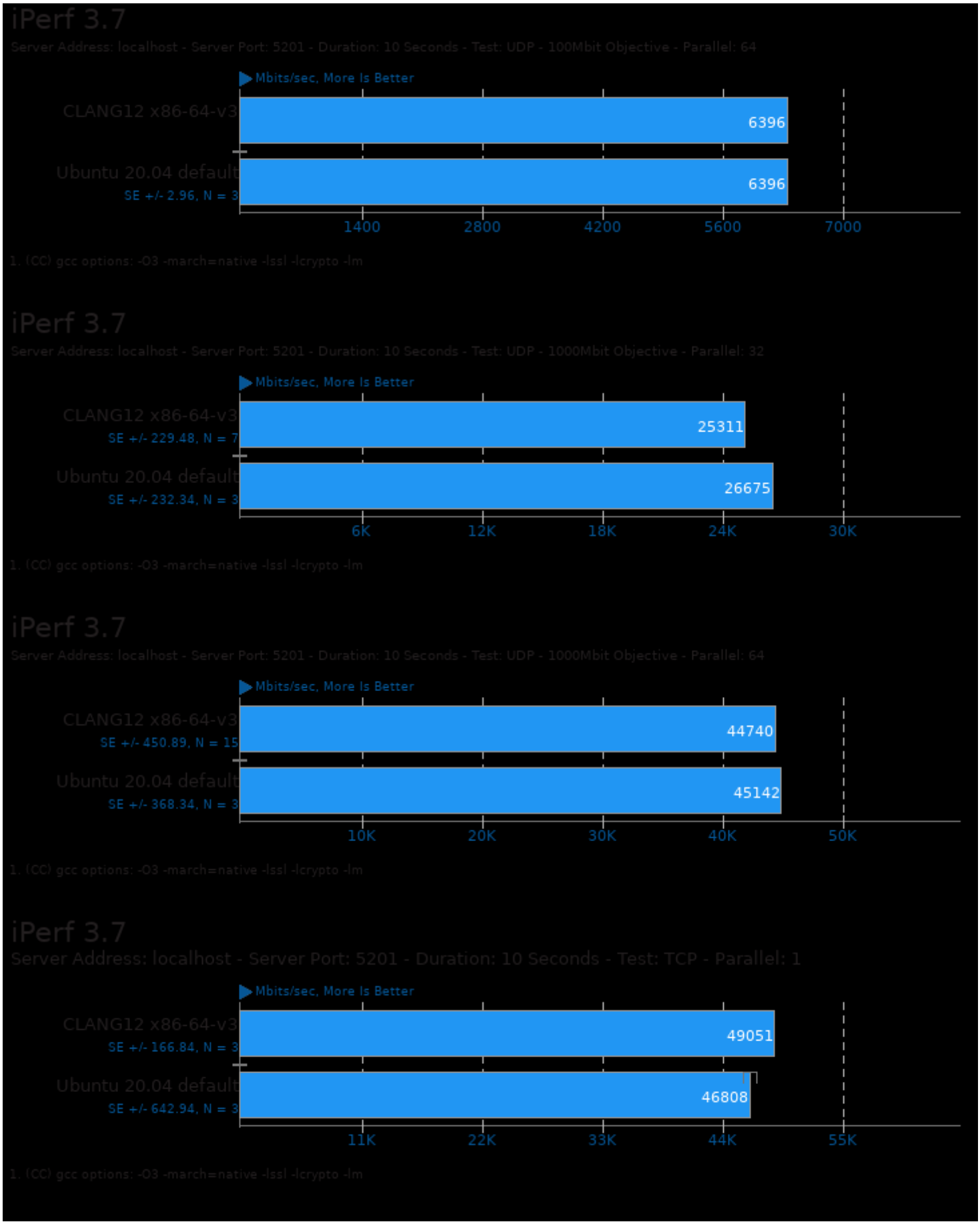
compiler-march-flags

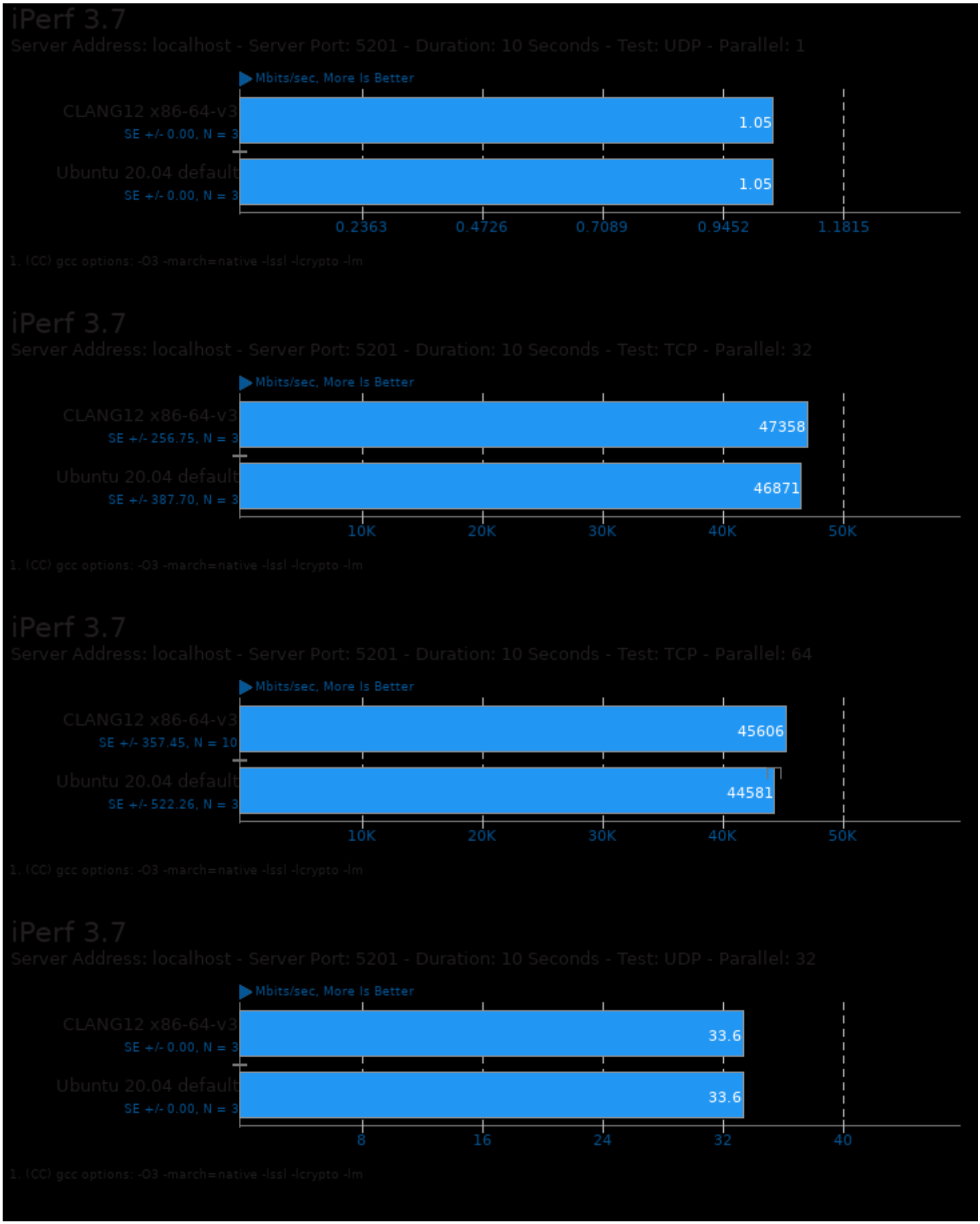


compiler-march-flags



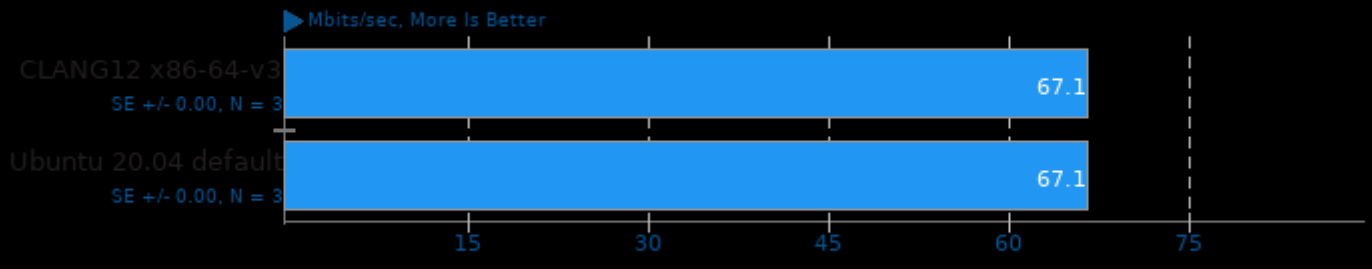

IPC_benchmark
Type: Unnamed Unix Domain Socket - Message Bytes: 4096
Messages Per Second, More Is Better
CLANG12 x86-64-v3
SE +/- 6109.53, N = 3
696178
Ubuntu 20.04 default
SE +/- 3834.80, N = 3
669580
150K
300K
450K
600K
750K
iPerf 3.7
Server Address: localhost - Server Port: 5201 - Duration: 10 Seconds - Test: UDP - 100Mbit Objective - Parallel: 1
Mbits/sec, More Is Better
CLANG12 x86-64-v3
100
Ubuntu 20.04 default
100
20
40
60
80
100
1. (CC) gcc options: -O3 -march=native -lssl -lcrypto -lm
iPerf 3.7
Server Address: localhost - Server Port: 5201 - Duration: 10 Seconds - Test: UDP - 1000Mbit Objective - Parallel: 1
Mbits/sec, More Is Better
CLANG12 x86-64-v3
1000
Ubuntu 20.04 default
1000
200
400
600
800
1000
1. (CC) gcc options: -O3 -march=native -lssl -lcrypto -lm
iPerf 3.7
Server Address: localhost - Server Port: 5201 - Duration: 10 Seconds - Test: UDP - 100Mbit Objective - Parallel: 32
Mbits/sec, More Is Better
CLANG12 x86-64-v3
3200
Ubuntu 20.04 default
SE +/- 1.33, N = 3
3199
700
1400
2100
2800
3500
1. (CC) gcc options: -O3 -march=native -lssl -lcrypto -lm


iPerf 3.7
Server Address: localhost - Server Port: 5201 - Duration: 10 Seconds - Test: UDP - 100Mbit Objective - Parallel: 64
Mbits/sec, More Is Better
CLANG12 x86-64-v3
6396
Ubuntu 20.04 default
SE +/- 2.96, N = 3
6396
1400
2800
4200
5600
7000
1. (CC) gcc options: -O3 -march=native -lssl -lcrypto -lm
iPerf 3.7
Server Address: localhost - Server Port: 5201 - Duration: 10 Seconds - Test: UDP - 1000Mbit Objective - Parallel: 32
Mbits/sec, More Is Better
CLANG12 x86-64-v3
SE +/- 229.48, N = 7
25311
Ubuntu 20.04 default
SE +/- 232.34, N = 3
26675
6K
12K
18K
24K
30K
1. (CC) gcc options: -O3 -march=native -lssl -lcrypto -lm
iPerf 3.7
Server Address: localhost - Server Port: 5201 - Duration: 10 Seconds - Test: UDP - 1000Mbit Objective - Parallel: 64
Mbits/sec, More Is Better
CLANG12 x86-64-v3
SE +/- 450.89, N = 15
44740
Ubuntu 20.04 default
SE +/- 368.34, N = 3
45142
10K
20K
30K
40K
50K
1. (CC) gcc options: -O3 -march=native -lssl -lcrypto -lm
iPerf 3.7
Server Address: localhost - Server Port: 5201 - Duration: 10 Seconds - Test: TCP - Parallel: 1
Mbits/sec, More Is Better
CLANG12 x86-64-v3
SE +/- 166.84, N = 3
49051
Ubuntu 20.04 default
SE +/- 642.94, N = 3
46808
11K
22K
33K
44K
55K
1. (CC) gcc options: -O3 -march=native -lssl -lcrypto -lm


iPerf 3.7
Server Address: localhost - Server Port: 5201 - Duration: 10 Seconds - Test: UDP - Parallel: 1
Mbits/sec, More Is Better
CLANG12 x86-64-v3
SE +/- 0.00, N = 3
1.05
Ubuntu 20.04 default
SE +/- 0.00, N = 3
1.05
0.2363
0.4726
0.7089
0.9452
1.1815
1. (CC) gcc options: -O3 -march=native -lssl -lcrypto -lm
iPerf 3.7
Server Address: localhost - Server Port: 5201 - Duration: 10 Seconds - Test: TCP - Parallel: 32
Mbits/sec, More Is Better
CLANG12 x86-64-v3
SE +/- 256.75, N = 3
47358
Ubuntu 20.04 default
SE +/- 387.70, N = 3
46871
10K
20K
30K
40K
50K
1. (CC) gcc options: -O3 -march=native -lssl -lcrypto -lm
iPerf 3.7
Server Address: localhost - Server Port: 5201 - Duration: 10 Seconds - Test: TCP - Parallel: 64
Mbits/sec, More Is Better
CLANG12 x86-64-v3
SE +/- 357.45, N = 10
45606
Ubuntu 20.04 default
SE +/- 522.26, N = 3
44581
10K
20K
30K
40K
50K
1. (CC) gcc options: -O3 -march=native -lssl -lcrypto -lm
iPerf 3.7
Server Address: localhost - Server Port: 5201 - Duration: 10 Seconds - Test: UDP - Parallel: 32
Mbits/sec, More Is Better
CLANG12 x86-64-v3
SE +/- 0.00, N = 3
33.6
Ubuntu 20.04 default
SE +/- 0.00, N = 3
33.6
8
16
24
32
40
1. (CC) gcc options: -O3 -march=native -lssl -lcrypto -lm

iPerf 3.7

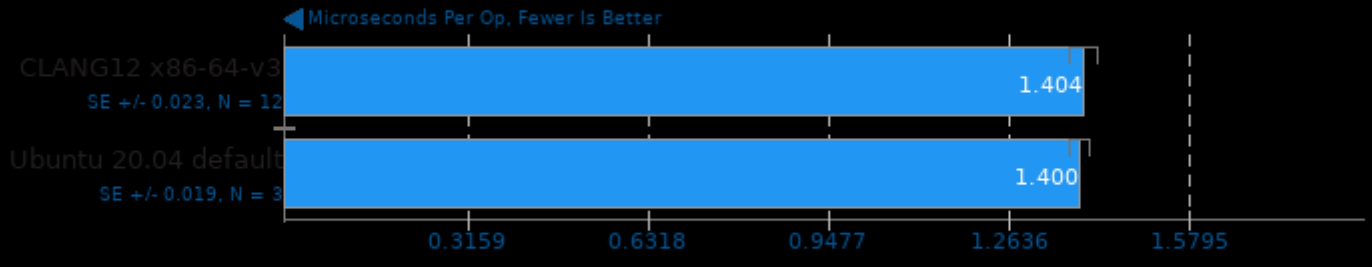
Server Address: localhost - Server Port: 5201 - Duration: 10 Seconds - Test: UDP - Parallel: 64



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

LevelDB 1.22

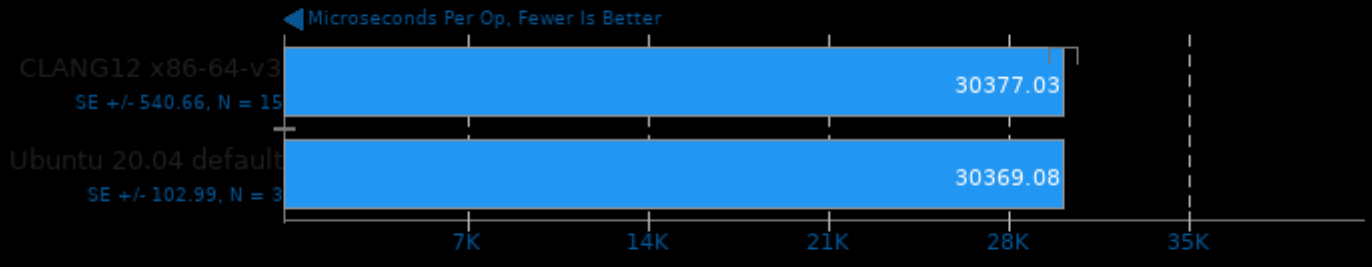
Benchmark: Hot Read



1. (CXX) g++ options: -O3 -lsnappy -lpthread

LevelDB 1.22

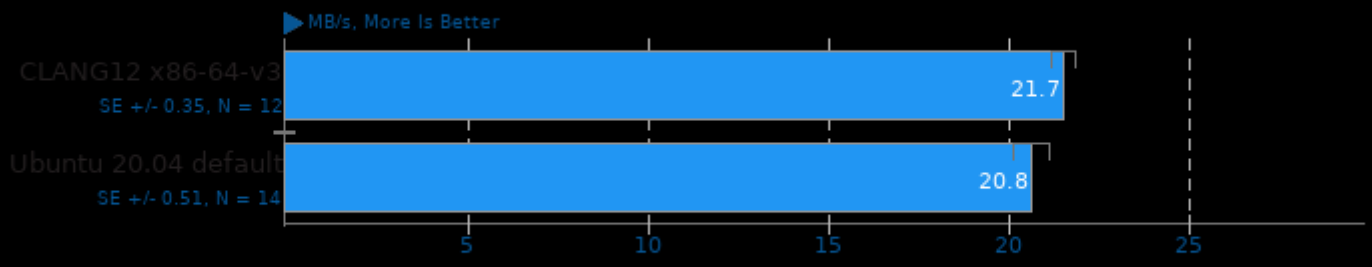
Benchmark: Fill Sync



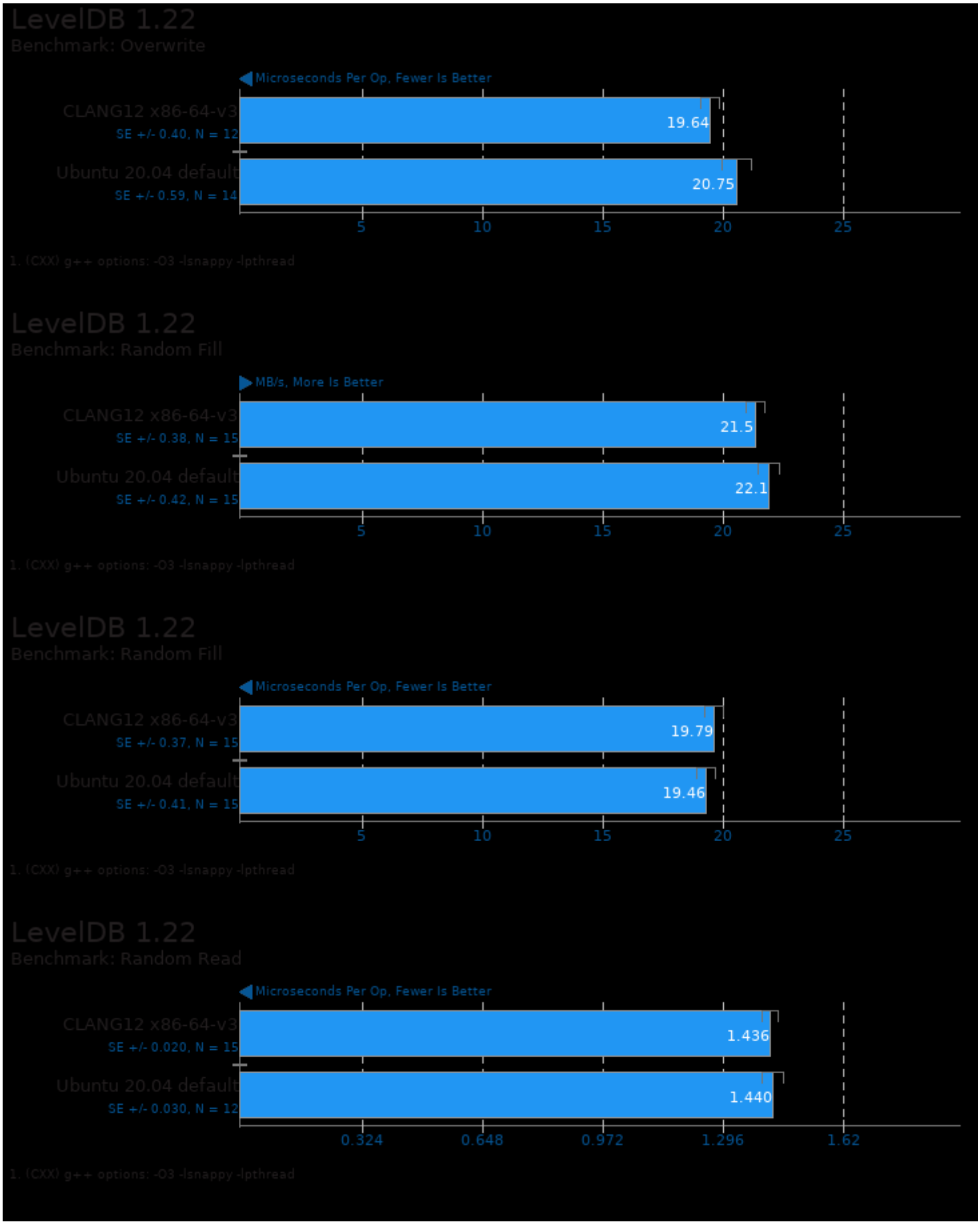
1. (CXX) g++ options: -O3 -lsnappy -lpthread

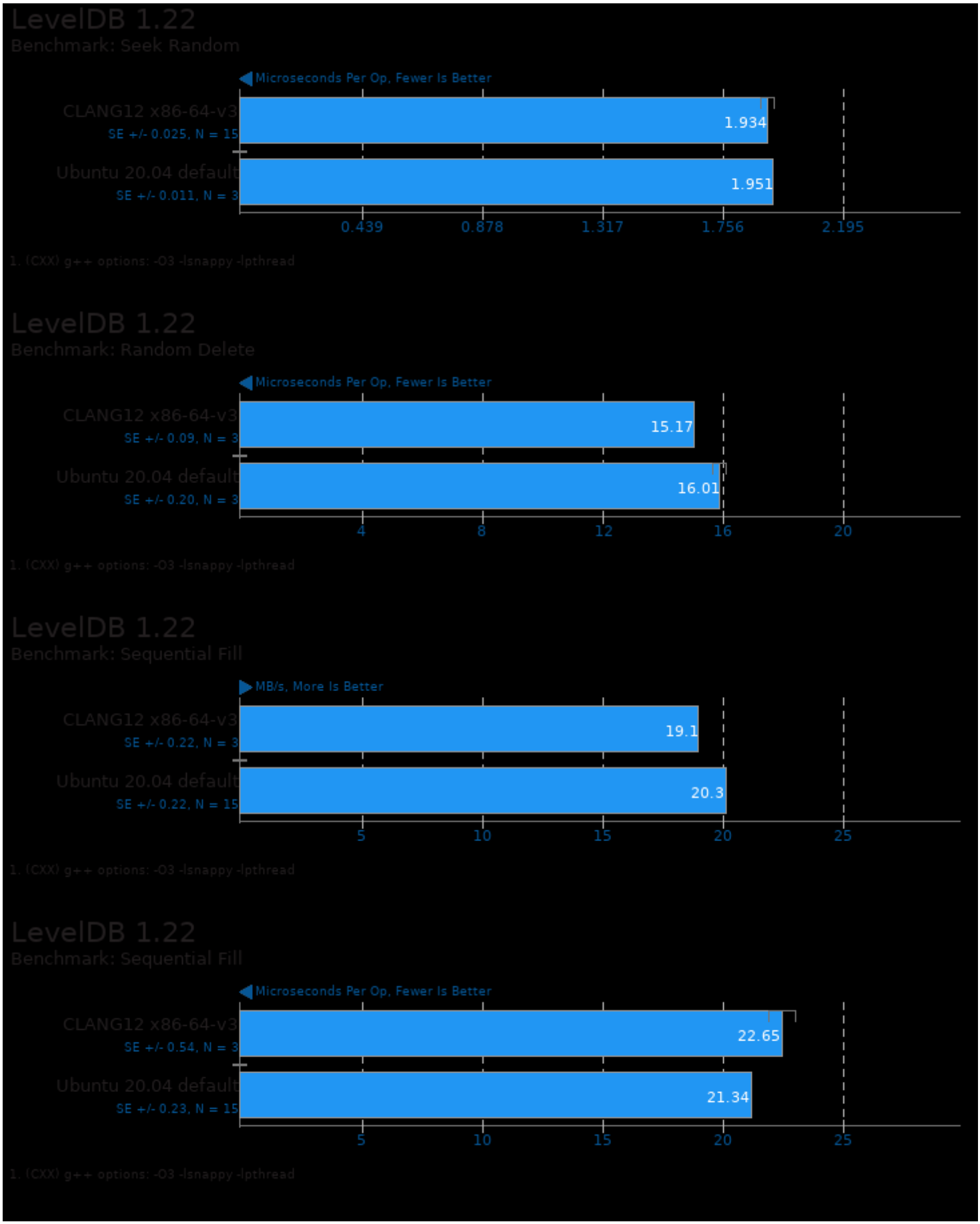
LevelDB 1.22

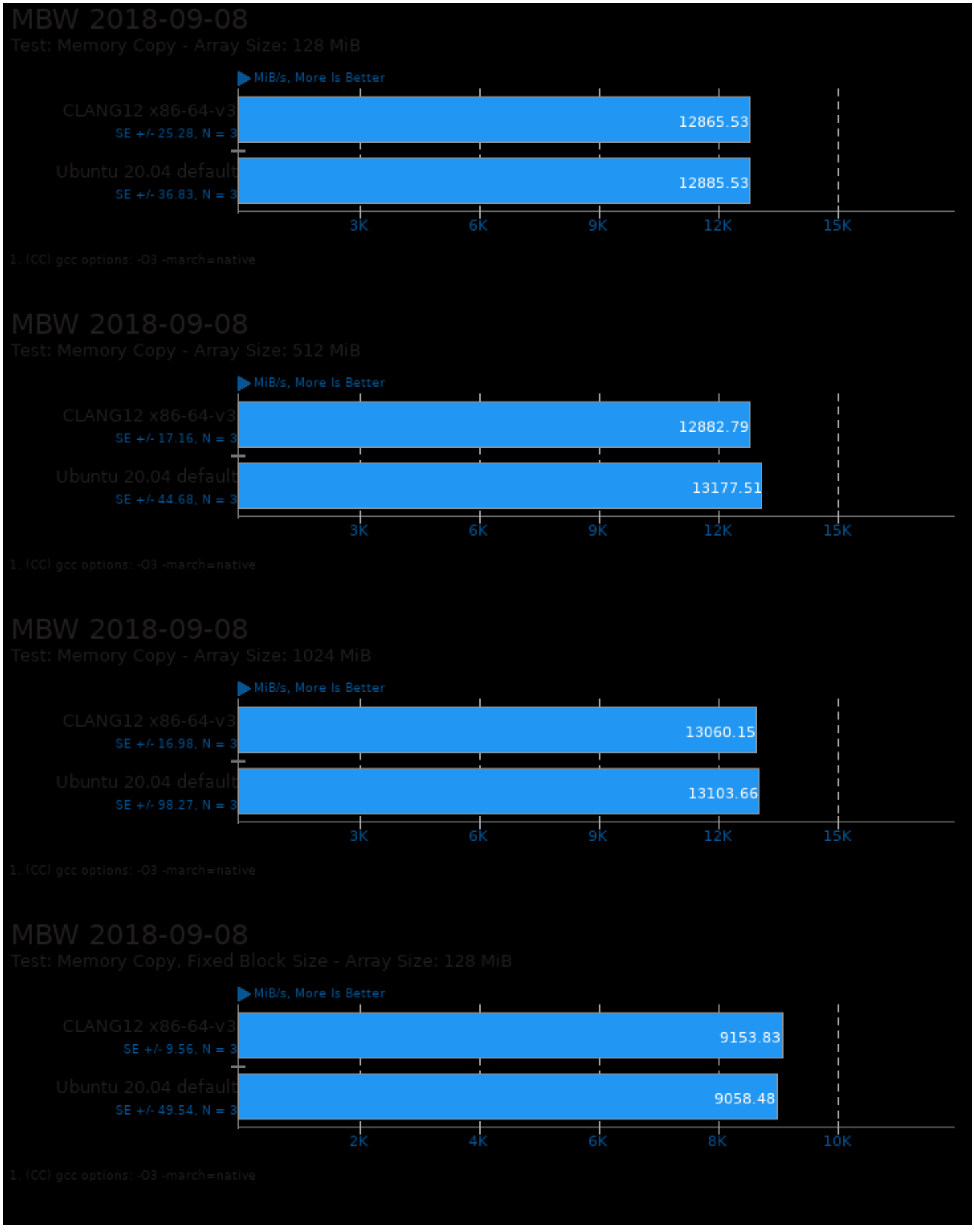
Benchmark: Overwrite



1. (CXX) g++ options: -O3 -lsnappy -lpthread

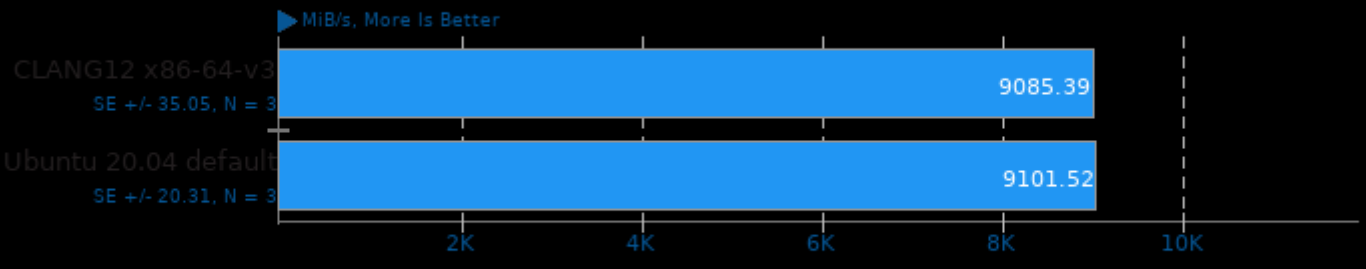

LevelDB 1.22
Benchmark: Overwrite
Microseconds Per Op, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.40, N = 12
19.64
Ubuntu 20.04 default
SE +/- 0.59, N = 14
20.75
5
10
15
20
25
1. (CXX) g++ options: -O3 -lsnappy -lpthread
LevelDB 1.22
Benchmark: Random Fill
MB/s, More Is Better
CLANG12 x86-64-v3
SE +/- 0.38, N = 15
21.5
Ubuntu 20.04 default
SE +/- 0.42, N = 15
22.1
5
10
15
20
25
1. (CXX) g++ options: -O3 -lsnappy -lpthread
LevelDB 1.22
Benchmark: Random Fill
Microseconds Per Op, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.37, N = 15
19.79
Ubuntu 20.04 default
SE +/- 0.41, N = 15
19.46
5
10
15
20
25
1. (CXX) g++ options: -O3 -lsnappy -lpthread
LevelDB 1.22
Benchmark: Random Read
Microseconds Per Op, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.020, N = 15
1.436
Ubuntu 20.04 default
SE +/- 0.030, N = 12
1.440
0.324
0.648
0.972
1.296
1.62
1. (CXX) g++ options: -O3 -lsnappy -lpthread


LevelDB 1.22
Benchmark: Seek Random
Microseconds Per Op, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.025, N = 15
1.934
Ubuntu 20.04 default
SE +/- 0.011, N = 3
1.951
0.439
0.878
1.317
1.756
2.195
1. (CXX) g++ options: -O3 -lsnappy -lpthread
LevelDB 1.22
Benchmark: Random Delete
Microseconds Per Op, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.09, N = 3
15.17
Ubuntu 20.04 default
SE +/- 0.20, N = 3
16.01
4
8
12
16
20
1. (CXX) g++ options: -O3 -lsnappy -lpthread
LevelDB 1.22
Benchmark: Sequential Fill
MB/s, More Is Better
CLANG12 x86-64-v3
SE +/- 0.22, N = 3
19.1
Ubuntu 20.04 default
SE +/- 0.22, N = 15
20.3
5
10
15
20
25
1. (CXX) g++ options: -O3 -lsnappy -lpthread
LevelDB 1.22
Benchmark: Sequential Fill
Microseconds Per Op, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.54, N = 3
22.65
Ubuntu 20.04 default
SE +/- 0.23, N = 15
21.34
5
10
15
20
25
1. (CXX) g++ options: -O3 -lsnappy -lpthread


MBW 2018-09-08
Test: Memory Copy - Array Size: 128 MiB
MiB/s, More Is Better
CLANG12 x86-64-v3
SE +/- 25.28, N = 3
12865.53
Ubuntu 20.04 default
SE +/- 36.83, N = 3
12885.53
3K
6K
9K
12K
15K
1. (CC) gcc options: -O3 -march=native
MBW 2018-09-08
Test: Memory Copy - Array Size: 512 MiB
MiB/s, More Is Better
CLANG12 x86-64-v3
SE +/- 17.16, N = 3
12882.79
Ubuntu 20.04 default
SE +/- 44.68, N = 3
13177.51
3K
6K
9K
12K
15K
1. (CC) gcc options: -O3 -march=native
MBW 2018-09-08
Test: Memory Copy - Array Size: 1024 MiB
MiB/s, More Is Better
CLANG12 x86-64-v3
SE +/- 16.98, N = 3
13060.15
Ubuntu 20.04 default
SE +/- 98.27, N = 3
13103.66
3K
6K
9K
12K
15K
1. (CC) gcc options: -O3 -march=native
MBW 2018-09-08
Test: Memory Copy, Fixed Block Size - Array Size: 128 MiB
MiB/s, More Is Better
CLANG12 x86-64-v3
SE +/- 9.56, N = 3
9153.83
Ubuntu 20.04 default
SE +/- 49.54, N = 3
9058.48
2K
4K
6K
8K
10K
1. (CC) gcc options: -O3 -march=native

MBW 2018-09-08

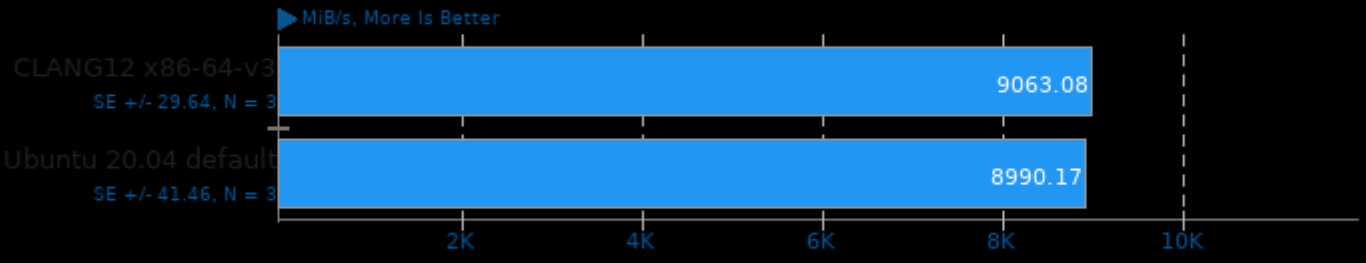
Test: Memory Copy, Fixed Block Size - Array Size: 512 MiB



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

MBW 2018-09-08

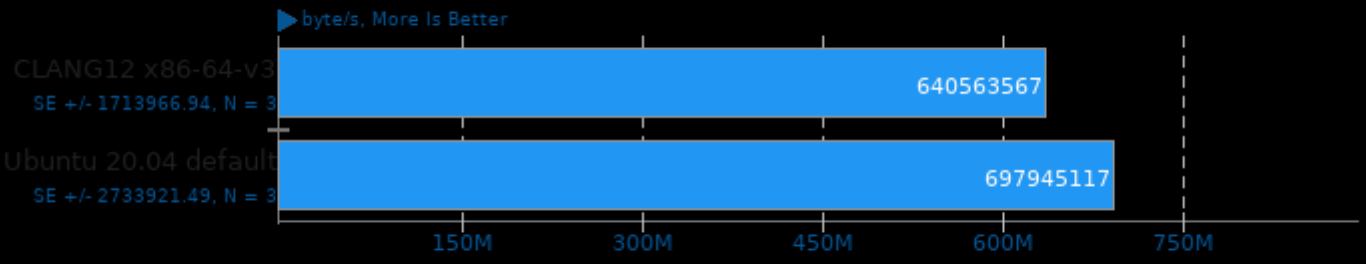
Test: Memory Copy, Fixed Block Size - Array Size: 1024 MiB



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

OpenSSL 3.0

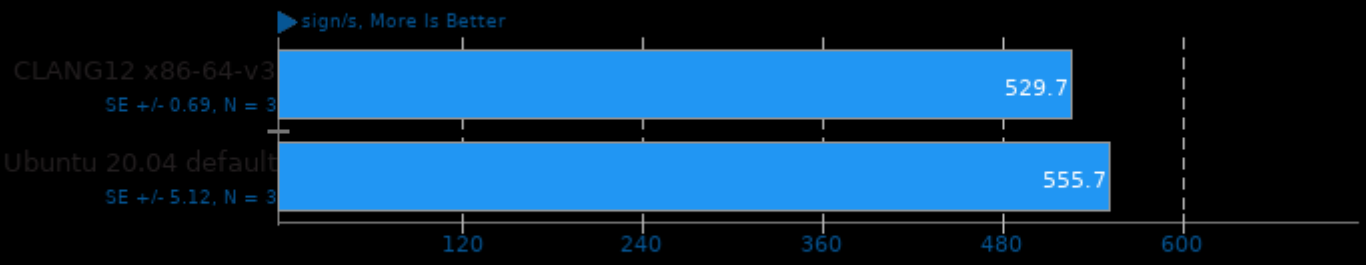
Algorithm: SHA256



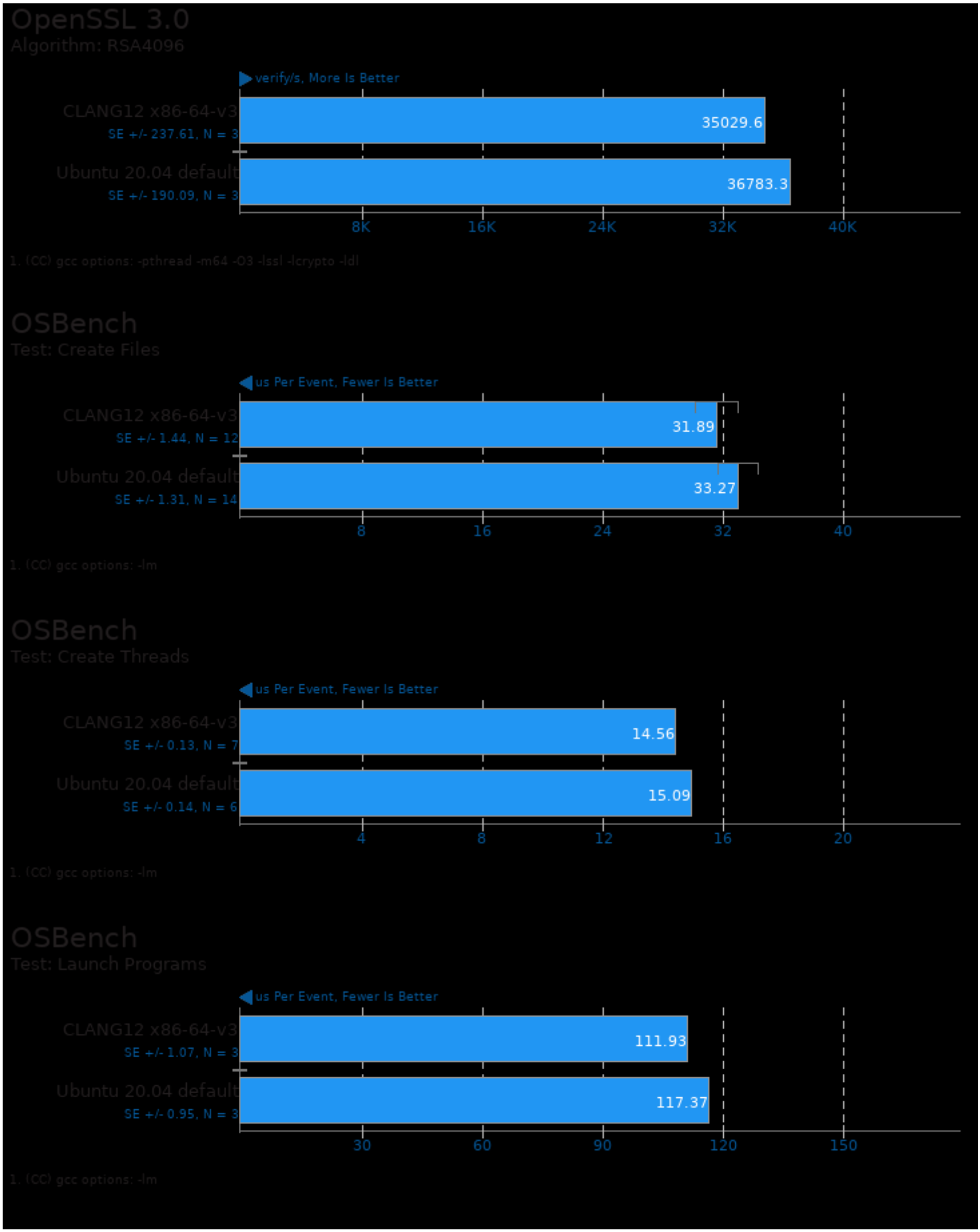
1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl

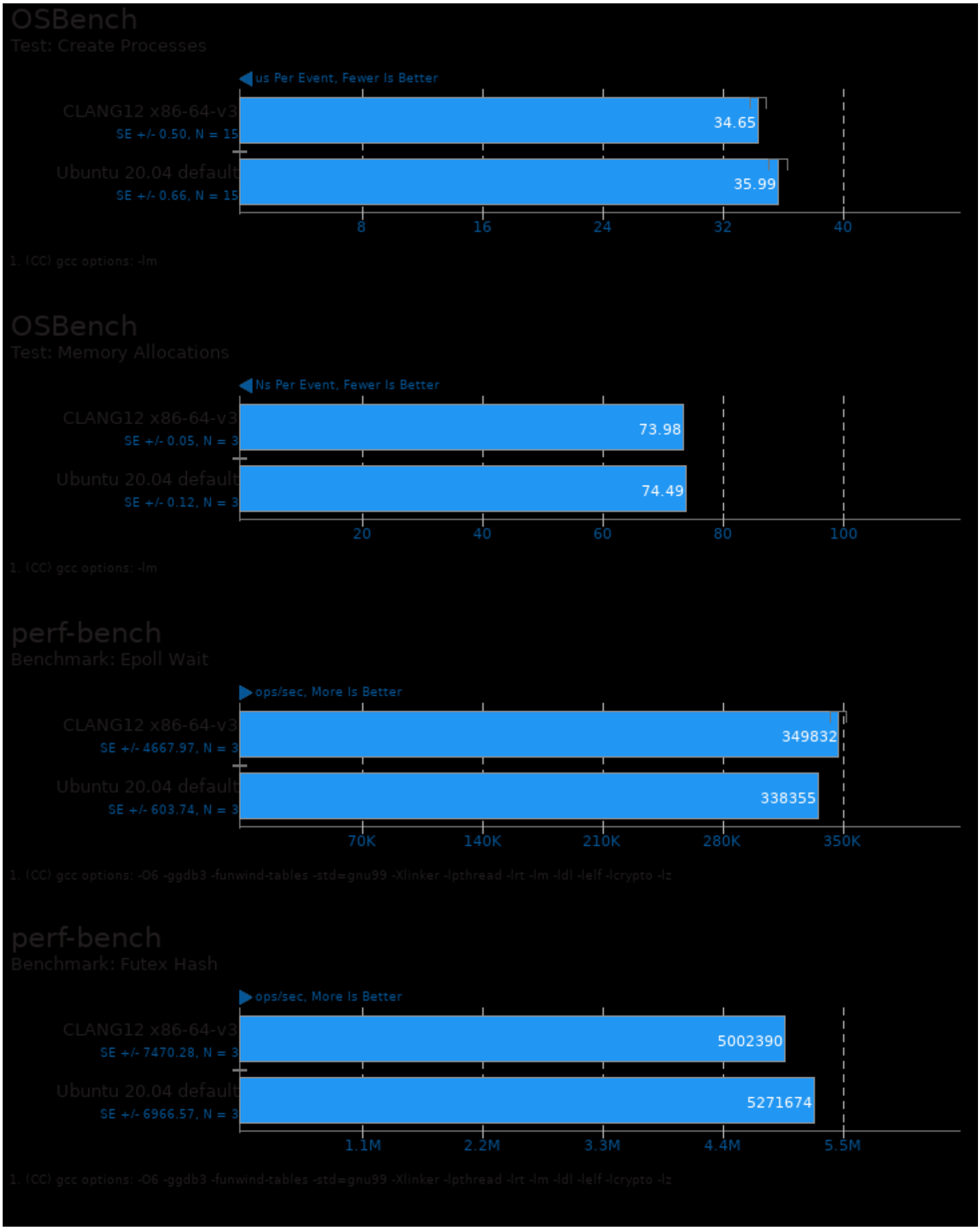
OpenSSL 3.0

Algorithm: RSA4096



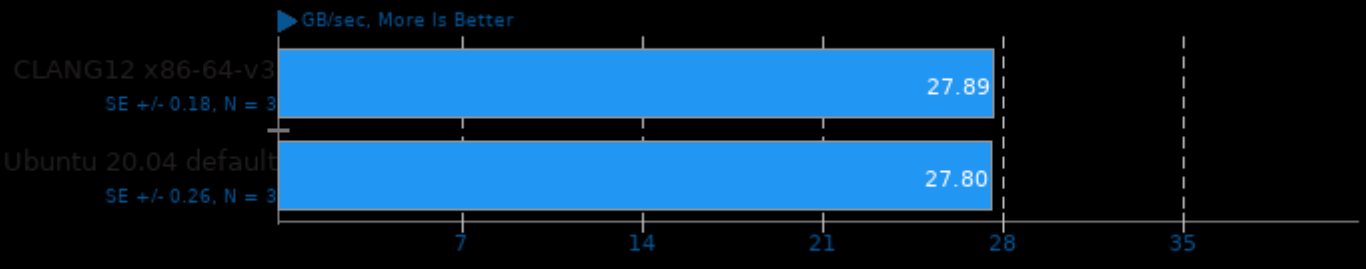
1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl


OpenSSL 3.0
Algorithm: RSA4096
verify/s, More Is Better
CLANG12 x86-64-v3
SE +/- 237.61, N = 3
35029.6
Ubuntu 20.04 default
SE +/- 190.09, N = 3
36783.3
8K
16K
24K
32K
40K
1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl
OSBench
Test: Create Files
us Per Event, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 1.44, N = 12
31.89
Ubuntu 20.04 default
SE +/- 1.31, N = 14
33.27
8
16
24
32
40
1. (CC) gcc options: -lm
OSBench
Test: Create Threads
us Per Event, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.13, N = 7
14.56
Ubuntu 20.04 default
SE +/- 0.14, N = 6
15.09
4
8
12
16
20
1. (CC) gcc options: -lm
OSBench
Test: Launch Programs
us Per Event, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 1.07, N = 3
111.93
Ubuntu 20.04 default
SE +/- 0.95, N = 3
117.37
30
60
90
120
150
1. (CC) gcc options: -lm


OSBench
Test: Create Processes
us Per Event, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.50, N = 15
34.65
Ubuntu 20.04 default
SE +/- 0.66, N = 15
35.99
8
16
24
32
40
1. (CC) gcc options: -lm
OSBench
Test: Memory Allocations
Ns Per Event, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.05, N = 3
73.98
Ubuntu 20.04 default
SE +/- 0.12, N = 3
74.49
20
40
60
80
100
1. (CC) gcc options: -lm
perf-bench
Benchmark: Epoll Wait
ops/sec, More Is Better
CLANG12 x86-64-v3
SE +/- 4667.97, N = 3
349832
Ubuntu 20.04 default
SE +/- 603.74, N = 3
338355
70K
140K
210K
280K
350K
1. (CC) gcc options: -O6 -ggdb3 -funwind-tables -std=gnu99 -Xlinker -lpthread -lrt -lm -ldl -lelf -lcrypto -lz
perf-bench
Benchmark: Futex Hash
ops/sec, More Is Better
CLANG12 x86-64-v3
SE +/- 7470.28, N = 3
5002390
Ubuntu 20.04 default
SE +/- 6966.57, N = 3
5271674
1.1M
2.2M
3.3M
4.4M
5.5M
1. (CC) gcc options: -O6 -ggdb3 -funwind-tables -std=gnu99 -Xlinker -lpthread -lrt -lm -ldl -lelf -lcrypto -lz

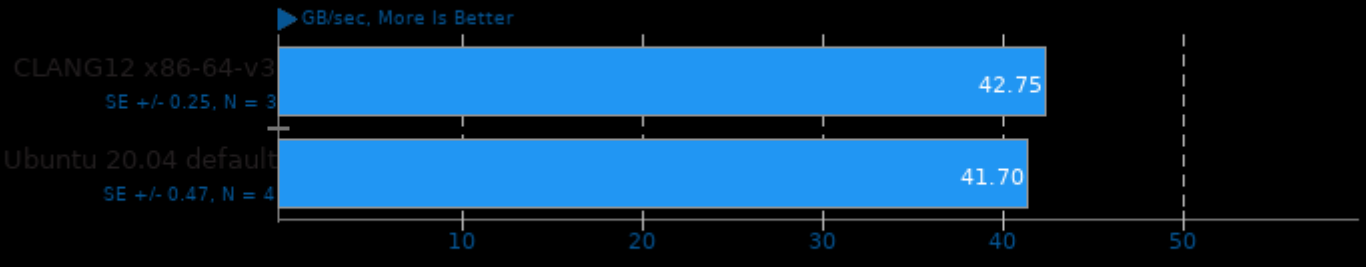
compiler-march-flags

perf-bench
Benchmark: Memcpy 1MB



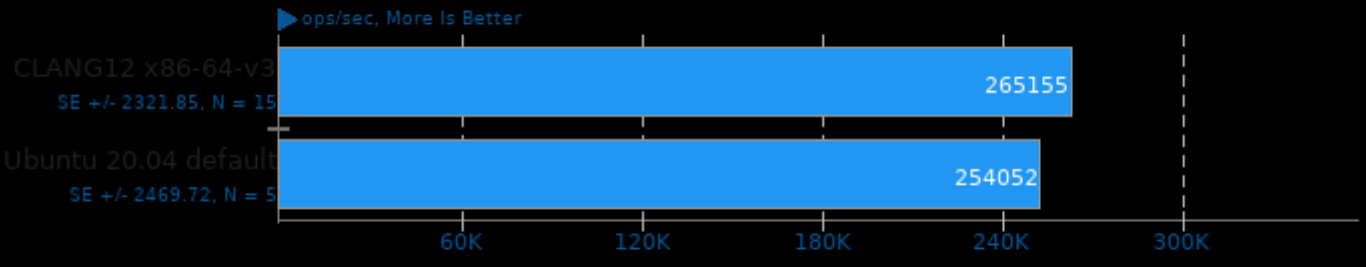
1. (CC) gcc options: -O6 -ggdb3 -funwind-tables -std=gnu99 -Xlinker -lpthread -lrt -lm -ldl -lelf -lcrypto -lz

perf-bench
Benchmark: Memset 1MB



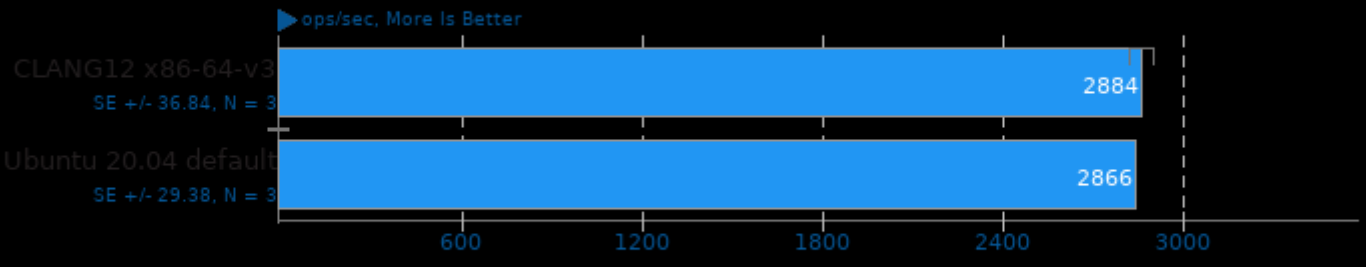
1. (CC) gcc options: -O6 -ggdb3 -funwind-tables -std=gnu99 -Xlinker -lpthread -lrt -lm -ldl -lelf -lcrypto -lz

perf-bench
Benchmark: Sched Pipe



1. (CC) gcc options: -O6 -ggdb3 -funwind-tables -std=gnu99 -Xlinker -lpthread -lrt -lm -ldl -lelf -lcrypto -lz

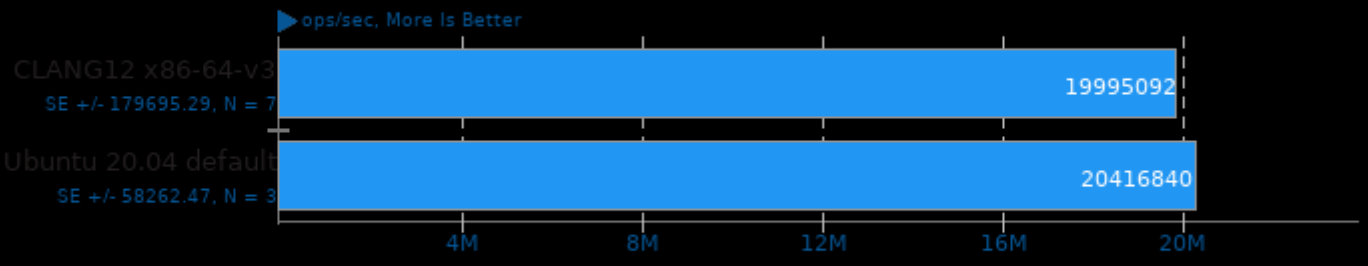
perf-bench
Benchmark: Futex Lock-Pi



1. (CC) gcc options: -O6 -ggdb3 -funwind-tables -std=gnu99 -Xlinker -lpthread -lrt -lm -ldl -lelf -lcrypto -lz

perf-bench

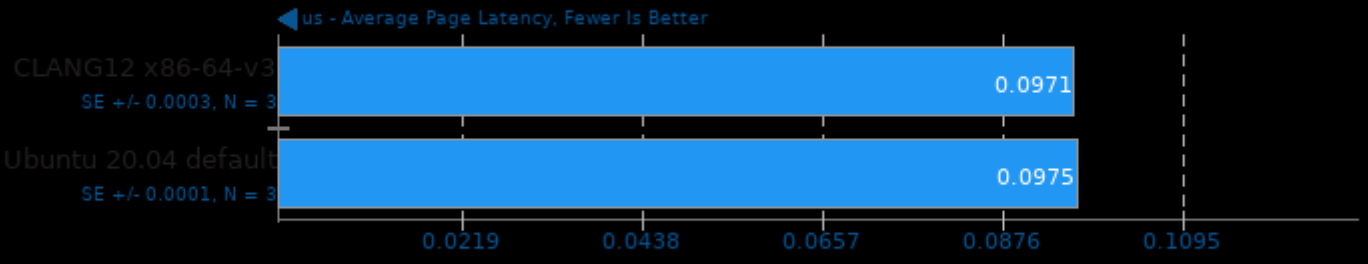
Benchmark: Syscall Basic



1. (CC) gcc options: -O6 -ggdb3 -funwind-tables -std=gnu99 -Xlinker -lpthread -lrt -lm -ldl -lelf -lcrypto -lz

pmbench

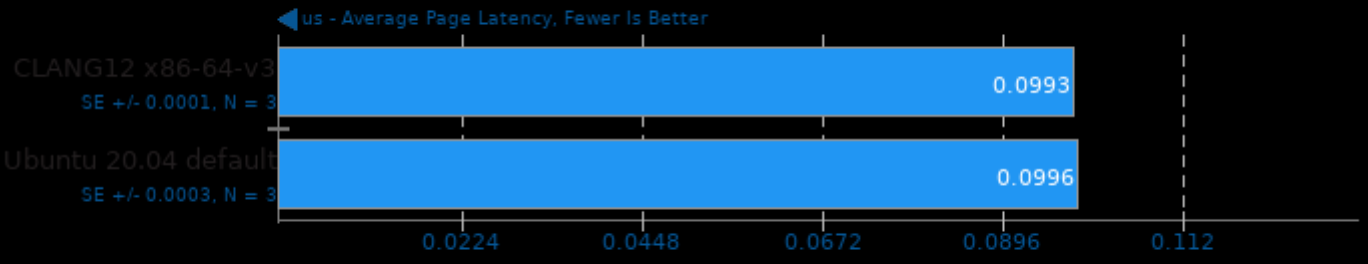
Concurrent Worker Threads: 1 - Read-Write Ratio: 50%



1. (CC) gcc options: -lm -luuid -lxml2 -m64 -pthread

pmbench

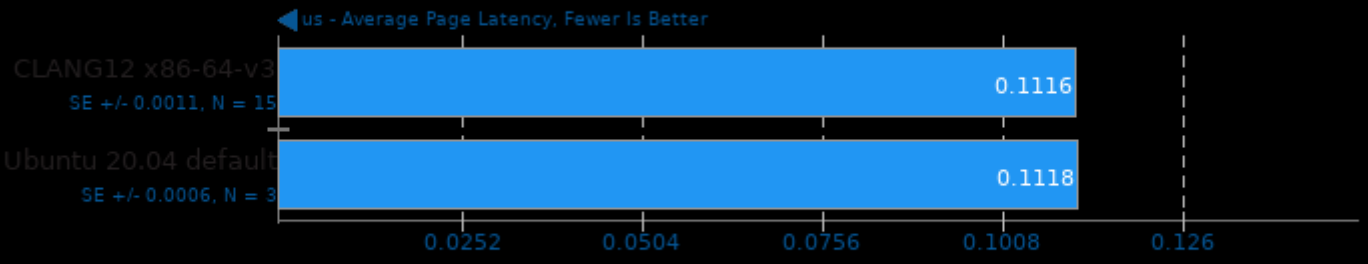
Concurrent Worker Threads: 2 - Read-Write Ratio: 50%



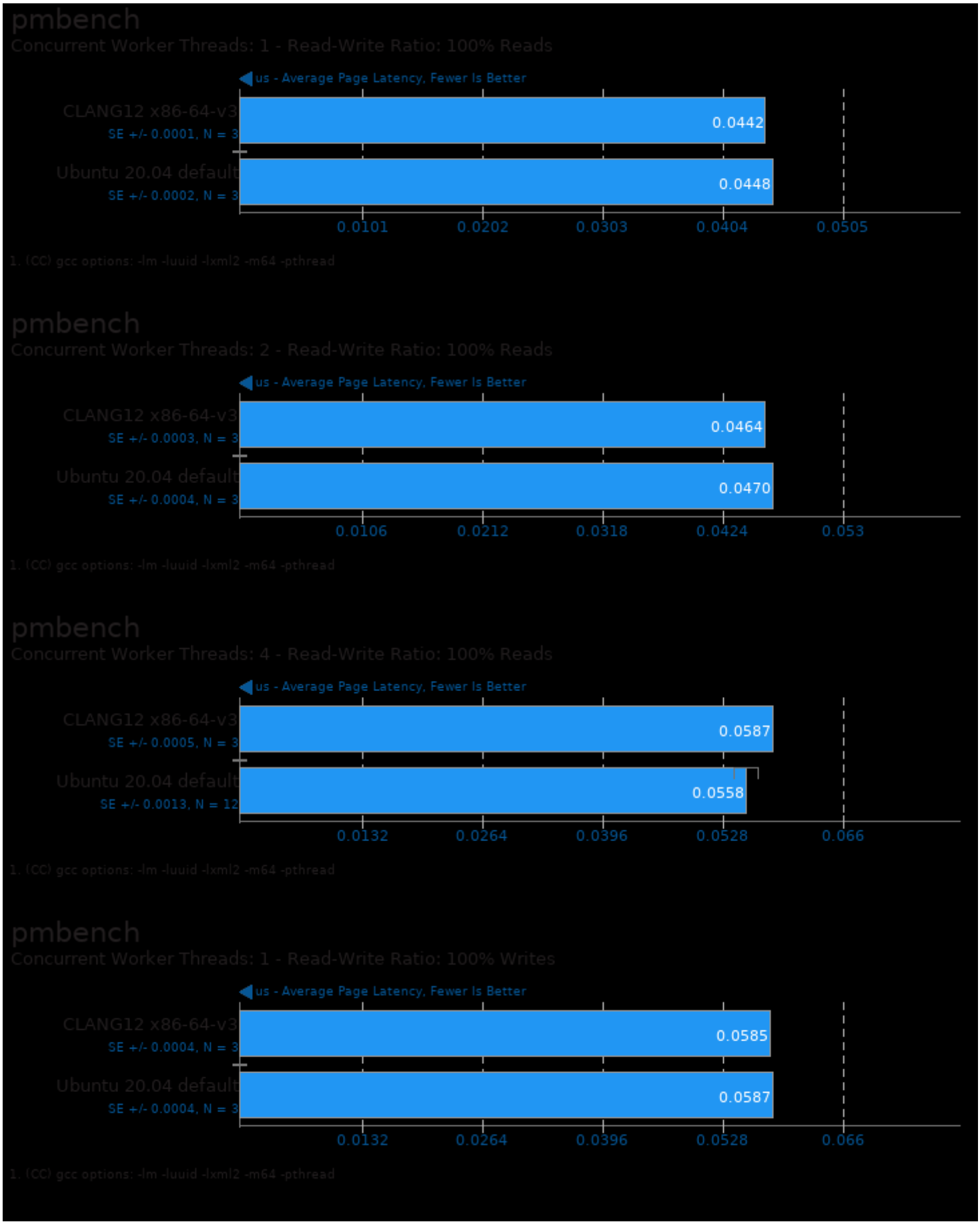
1. (CC) gcc options: -lm -luuid -lxml2 -m64 -pthread

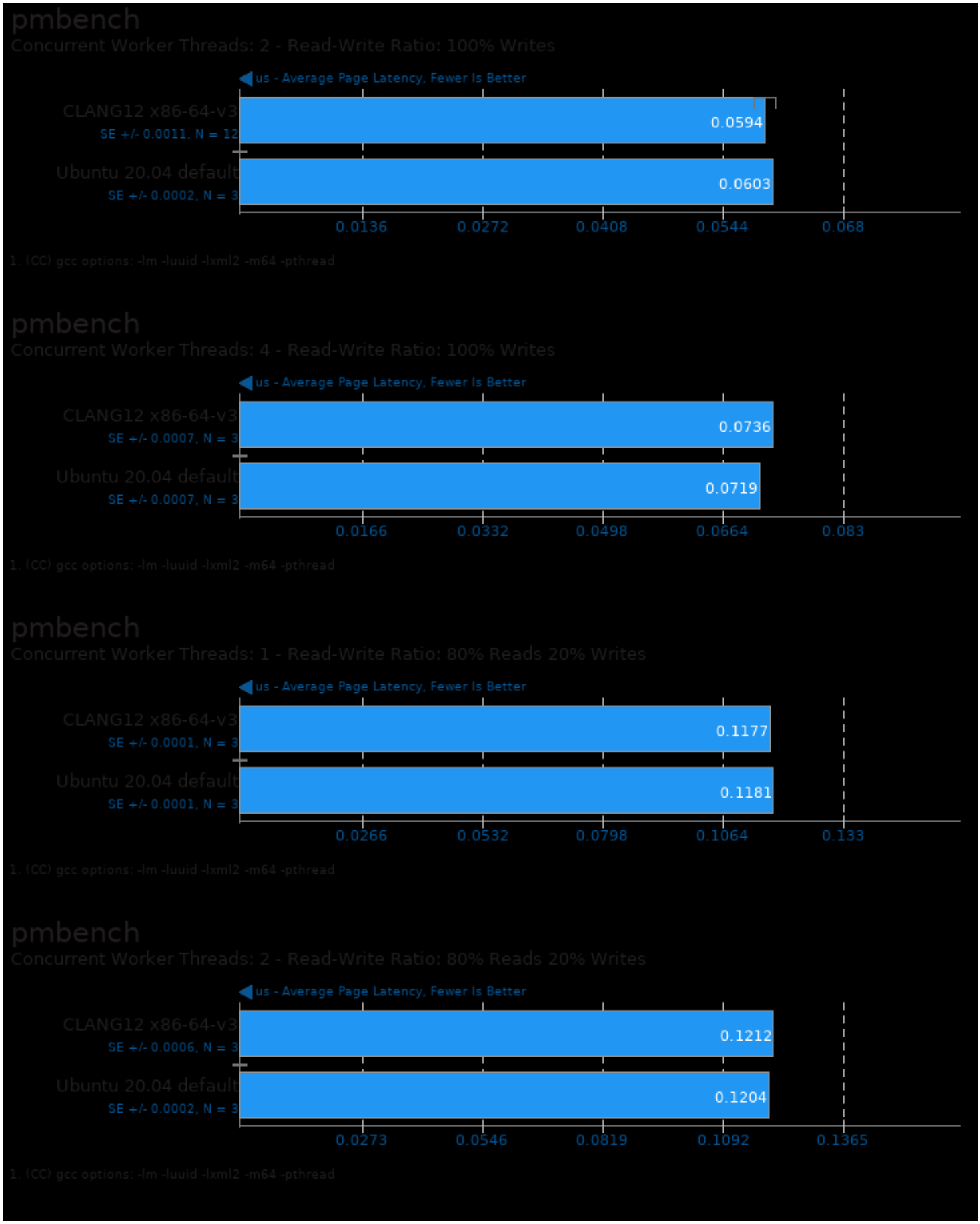
pmbench

Concurrent Worker Threads: 4 - Read-Write Ratio: 50%



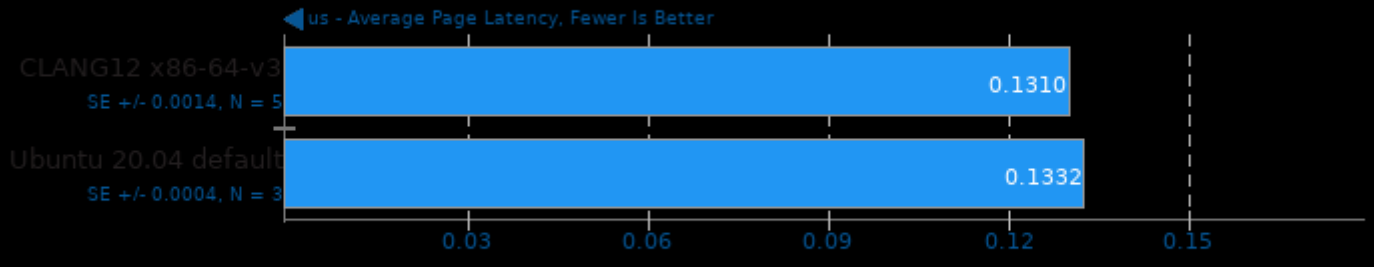
1. (CC) gcc options: -lm -luuid -lxml2 -m64 -pthread


pmbench
Concurrent Worker Threads: 1 - Read-Write Ratio: 100% Reads
us - Average Page Latency, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.0001, N = 3
0.0442
Ubuntu 20.04 default
SE +/- 0.0002, N = 3
0.0448
0.0101
0.0202
0.0303
0.0404
0.0505
1. (CC) gcc options: -lm -luuid -lxml2 -m64 -pthread
pmbench
Concurrent Worker Threads: 2 - Read-Write Ratio: 100% Reads
us - Average Page Latency, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.0003, N = 3
0.0464
Ubuntu 20.04 default
SE +/- 0.0004, N = 3
0.0470
0.0106
0.0212
0.0318
0.0424
0.053
1. (CC) gcc options: -lm -luuid -lxml2 -m64 -pthread
pmbench
Concurrent Worker Threads: 4 - Read-Write Ratio: 100% Reads
us - Average Page Latency, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.0005, N = 3
0.0587
Ubuntu 20.04 default
SE +/- 0.0013, N = 12
0.0558
0.0132
0.0264
0.0396
0.0528
0.066
1. (CC) gcc options: -lm -luuid -lxml2 -m64 -pthread
pmbench
Concurrent Worker Threads: 1 - Read-Write Ratio: 100% Writes
us - Average Page Latency, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.0004, N = 3
0.0585
Ubuntu 20.04 default
SE +/- 0.0004, N = 3
0.0587
0.0132
0.0264
0.0396
0.0528
0.066
1. (CC) gcc options: -lm -luuid -lxml2 -m64 -pthread


pmbench
Concurrent Worker Threads: 2 - Read-Write Ratio: 100% Writes
us - Average Page Latency, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.0011, N = 12
0.0594
Ubuntu 20.04 default
SE +/- 0.0002, N = 3
0.0603
0.0136
0.0272
0.0408
0.0544
0.068
1. (CC) gcc options: -lm -luuid -lxml2 -m64 -pthread
pmbench
Concurrent Worker Threads: 4 - Read-Write Ratio: 100% Writes
us - Average Page Latency, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.0007, N = 3
0.0736
Ubuntu 20.04 default
SE +/- 0.0007, N = 3
0.0719
0.0166
0.0332
0.0498
0.0664
0.083
1. (CC) gcc options: -lm -luuid -lxml2 -m64 -pthread
pmbench
Concurrent Worker Threads: 1 - Read-Write Ratio: 80% Reads 20% Writes
us - Average Page Latency, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.0001, N = 3
0.1177
Ubuntu 20.04 default
SE +/- 0.0001, N = 3
0.1181
0.0266
0.0532
0.0798
0.1064
0.133
1. (CC) gcc options: -lm -luuid -lxml2 -m64 -pthread
pmbench
Concurrent Worker Threads: 2 - Read-Write Ratio: 80% Reads 20% Writes
us - Average Page Latency, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.0006, N = 3
0.1212
Ubuntu 20.04 default
SE +/- 0.0002, N = 3
0.1204
0.0273
0.0546
0.0819
0.1092
0.1365
1. (CC) gcc options: -lm -luuid -lxml2 -m64 -pthread

pmbench

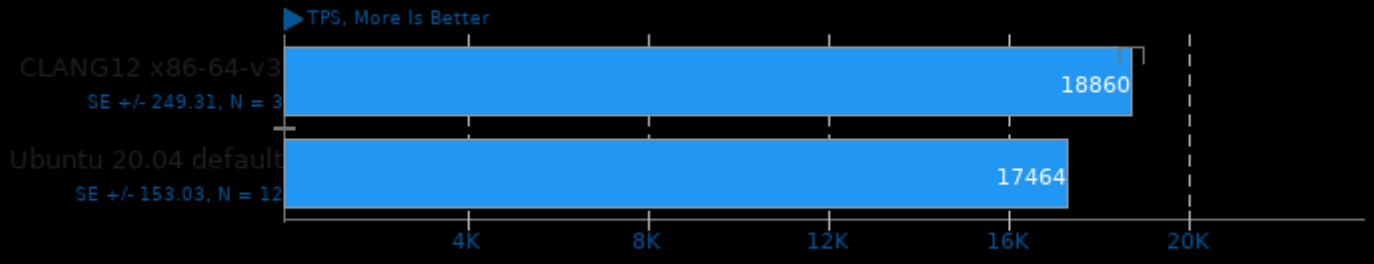
Concurrent Worker Threads: 4 - Read-Write Ratio: 80% Reads 20% Writes



1. (CC) gcc options: -lm -luuid -lxml2 -m64 -pthread

PostgreSQL pgbench 14.0

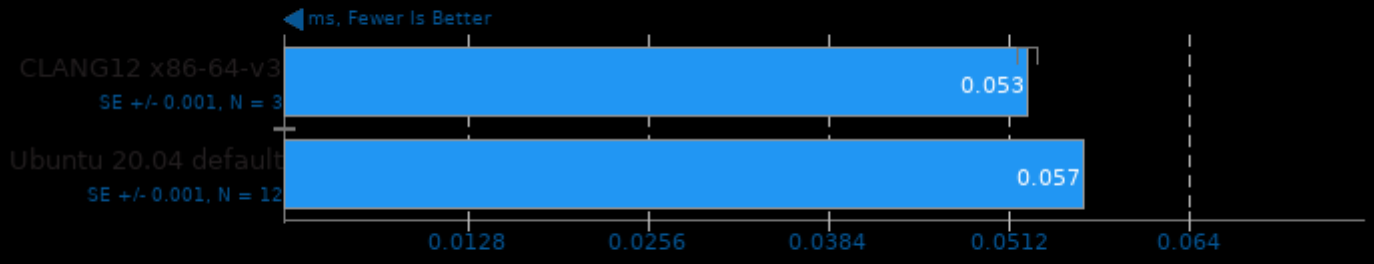
Scaling Factor: 1 - Clients: 1 - Mode: Read Only



1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

PostgreSQL pgbench 14.0

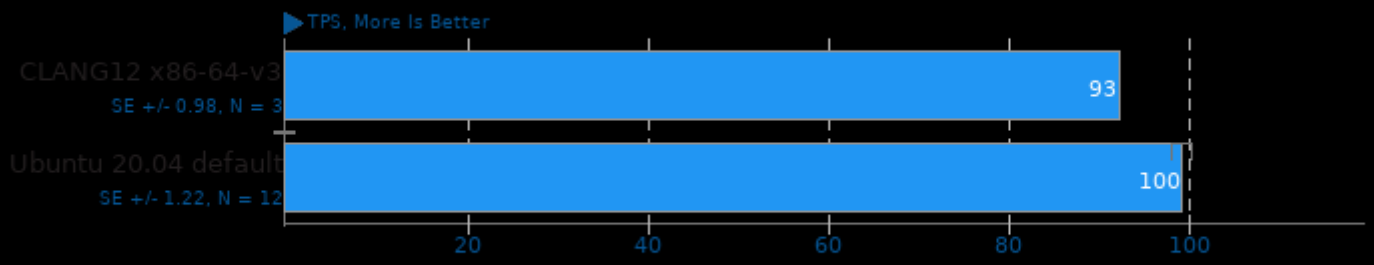
Scaling Factor: 1 - Clients: 1 - Mode: Read Only - Average Latency



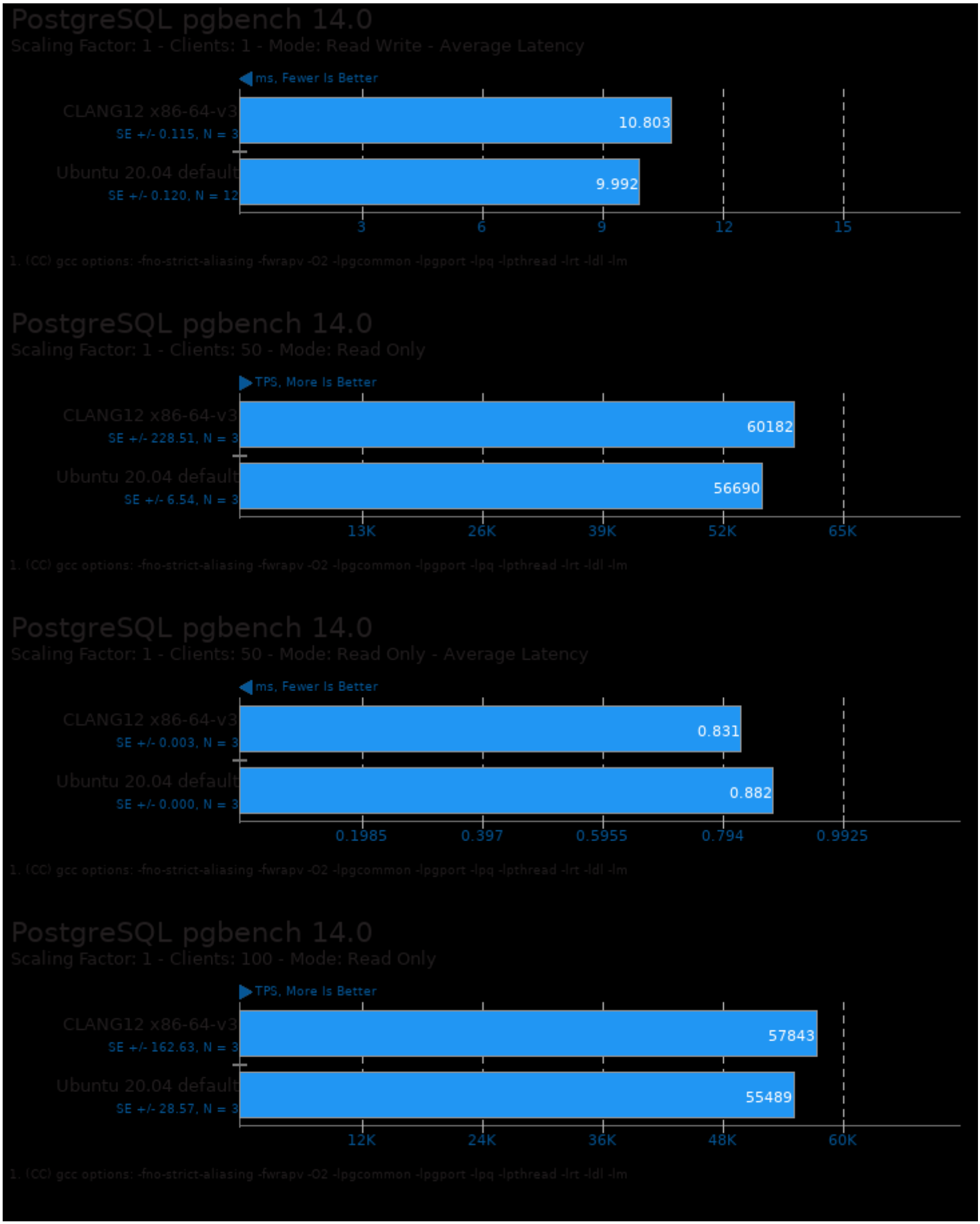
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

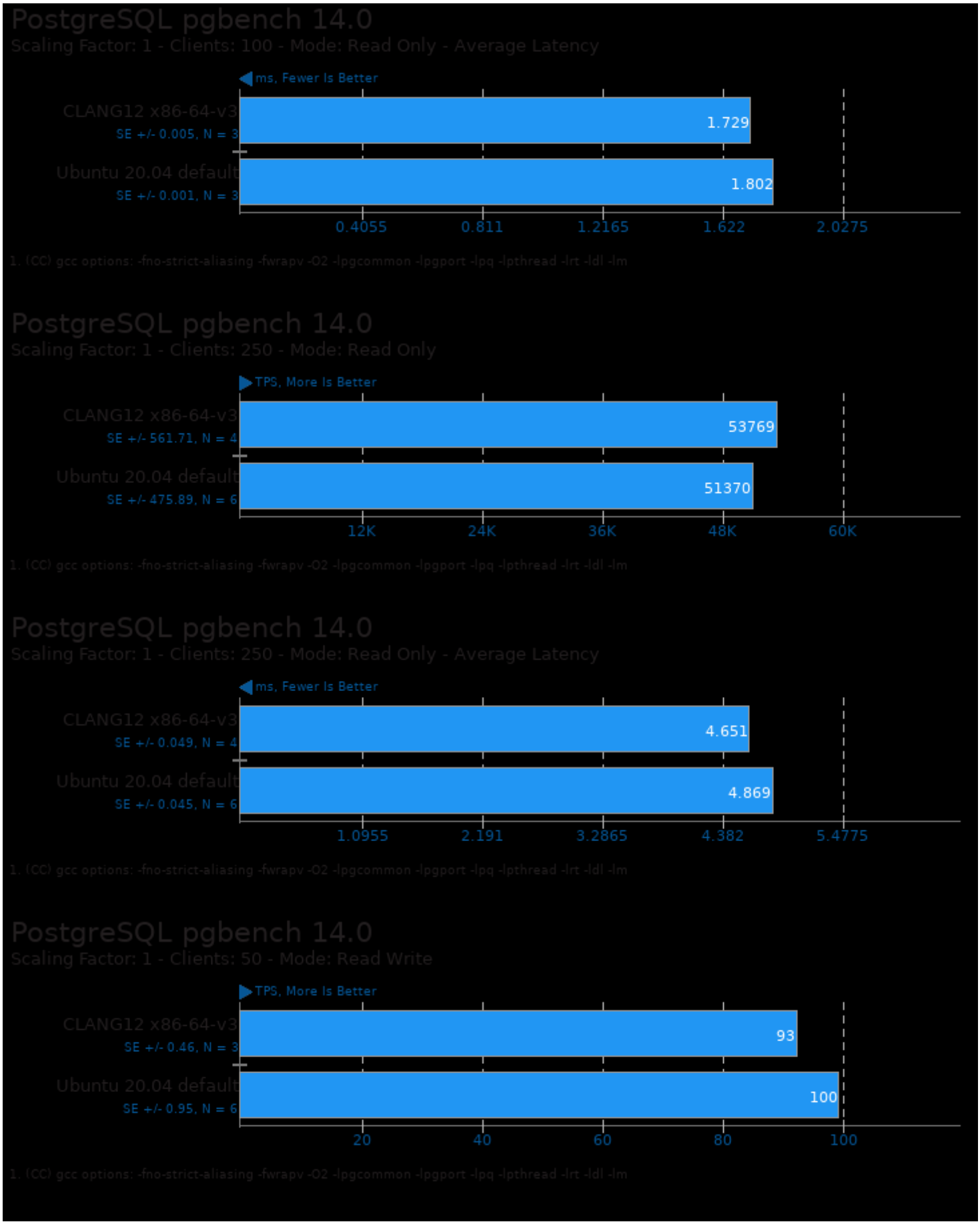
PostgreSQL pgbench 14.0

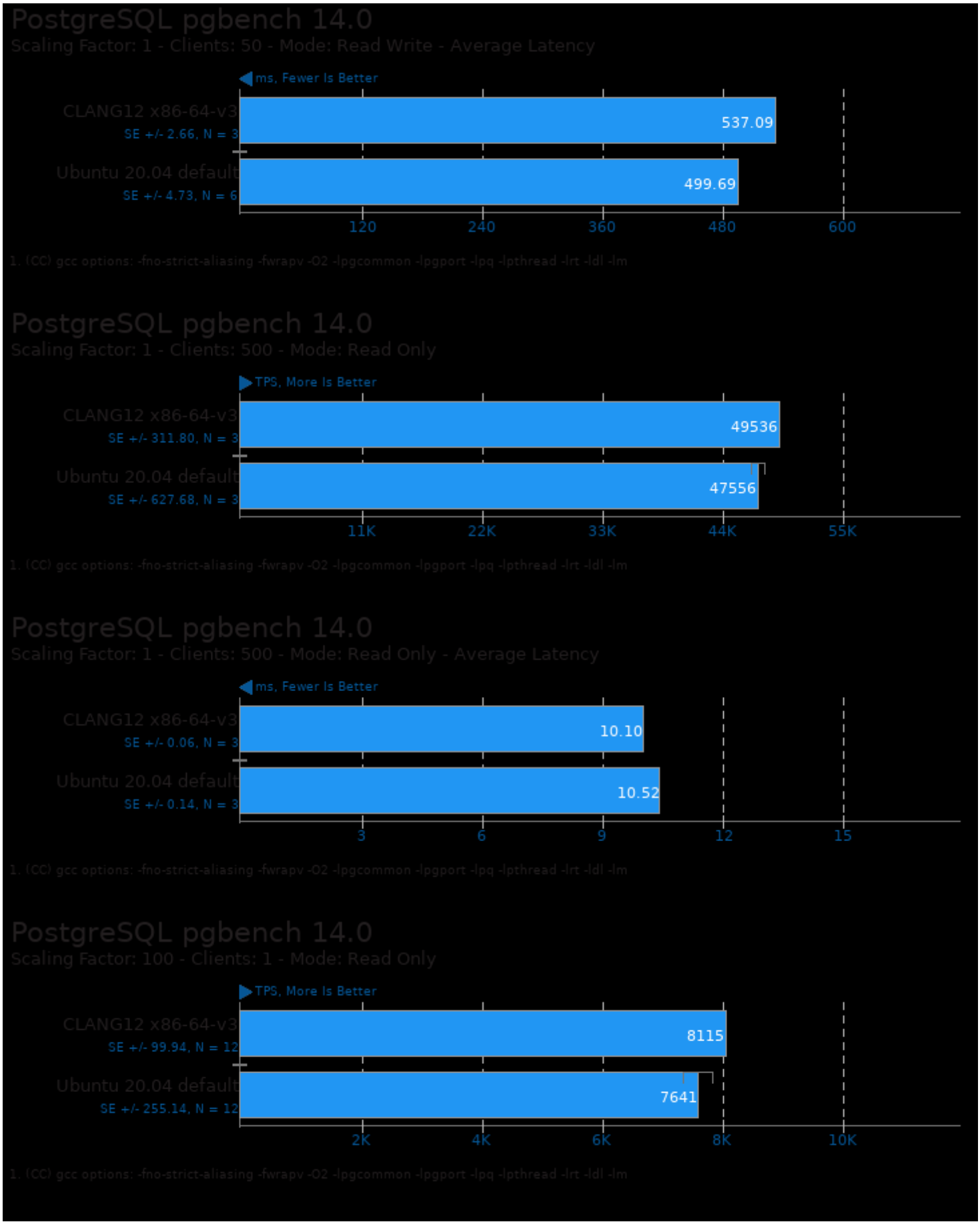
Scaling Factor: 1 - Clients: 1 - Mode: Read Write

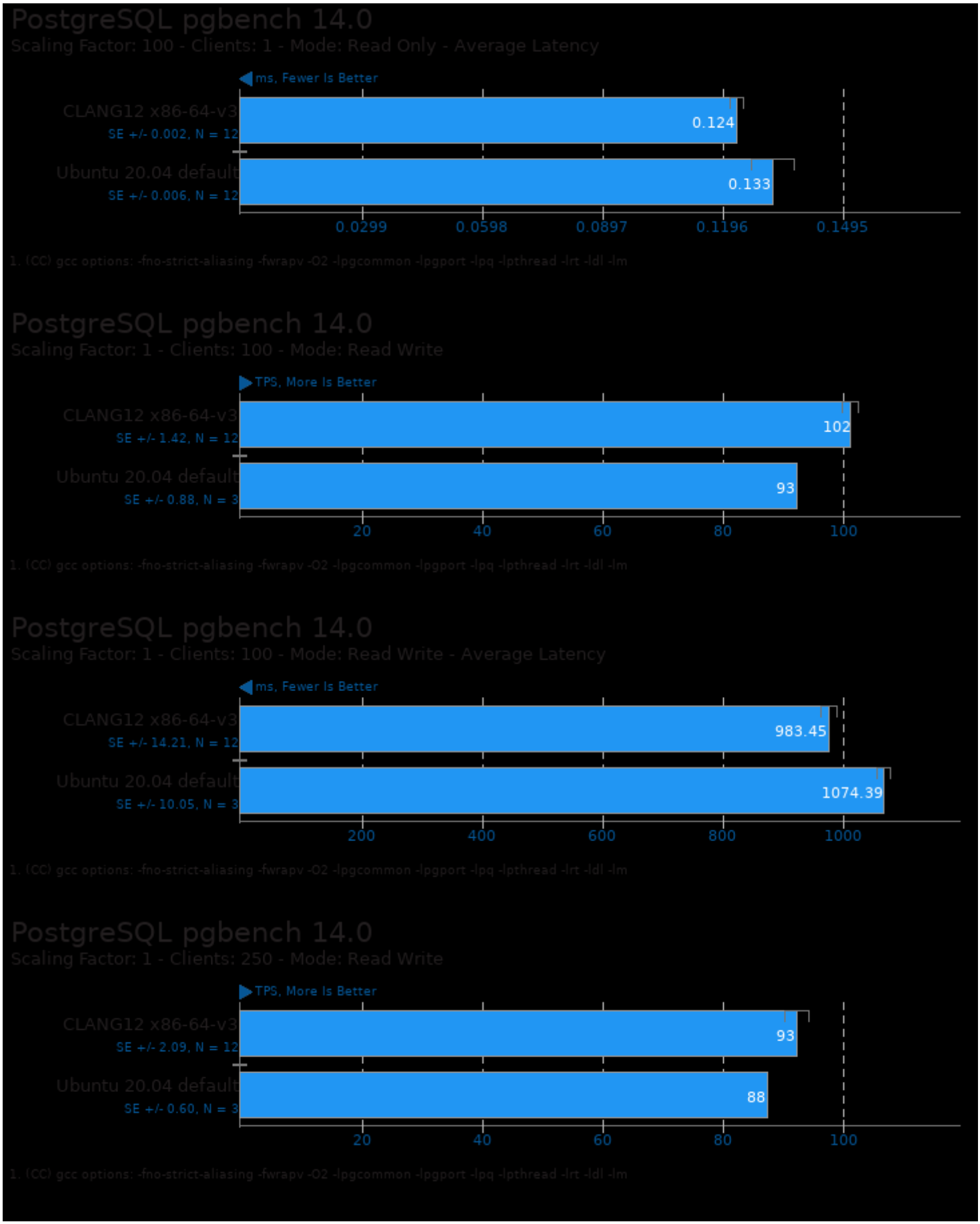


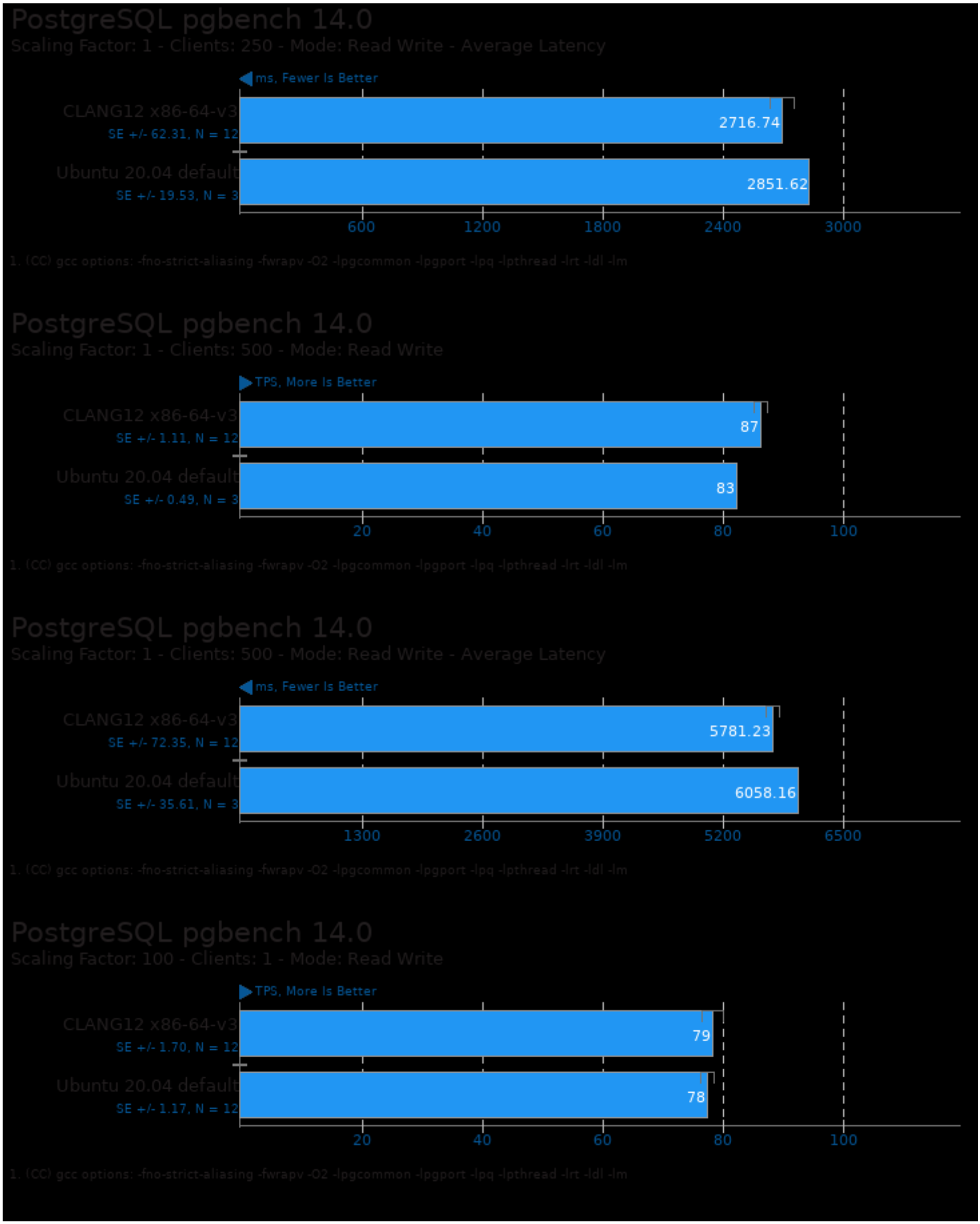
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

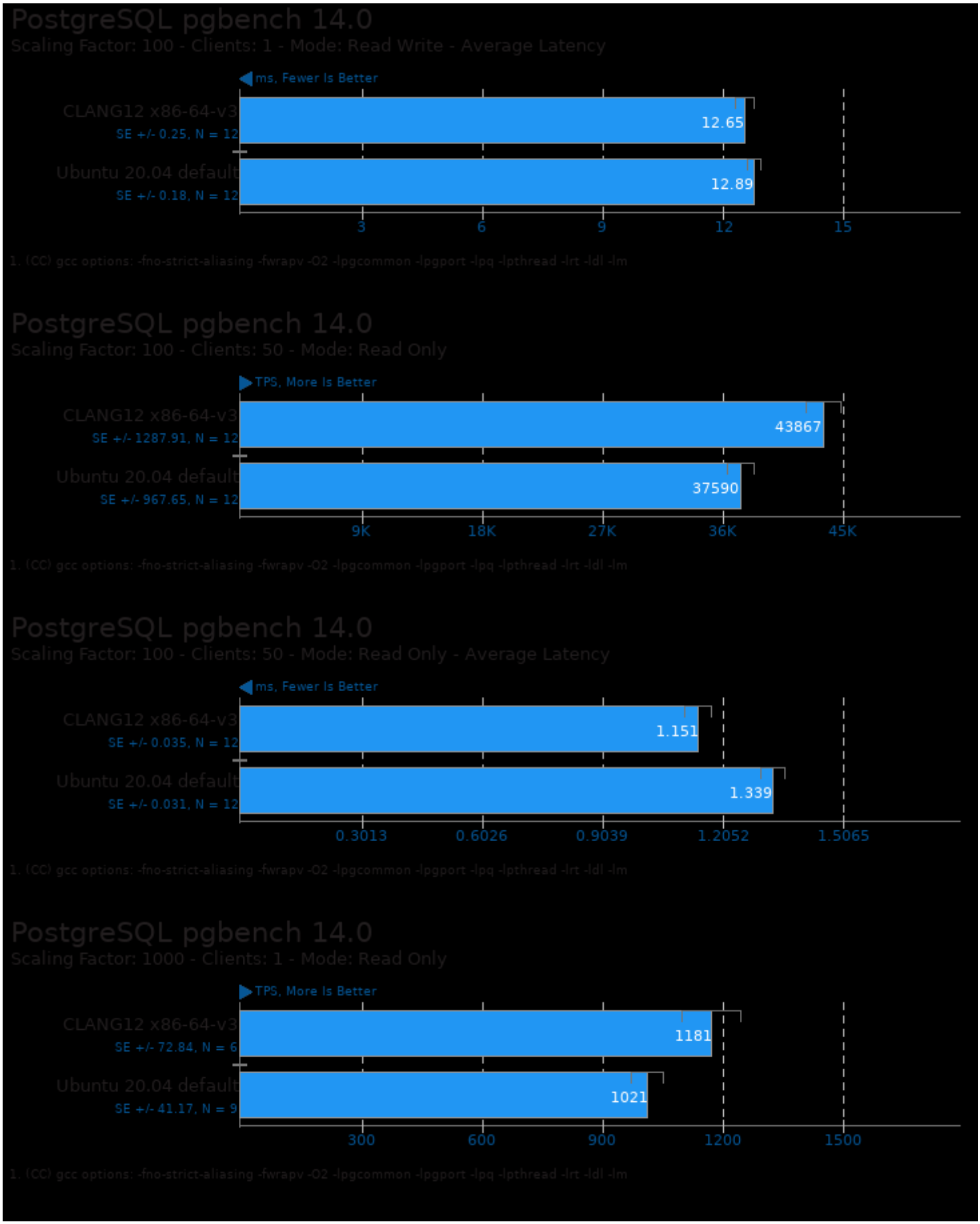

PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 1 - Mode: Read Write - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.115, N = 3
10.803
Ubuntu 20.04 default
SE +/- 0.120, N = 12
9.992
3
6
9
12
15
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 50 - Mode: Read Only
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 228.51, N = 3
60182
Ubuntu 20.04 default
SE +/- 6.54, N = 3
56690
13K
26K
39K
52K
65K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 50 - Mode: Read Only - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.003, N = 3
0.831
Ubuntu 20.04 default
SE +/- 0.000, N = 3
0.882
0.1985
0.397
0.5955
0.794
0.9925
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 100 - Mode: Read Only
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 162.63, N = 3
57843
Ubuntu 20.04 default
SE +/- 28.57, N = 3
55489
12K
24K
36K
48K
60K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

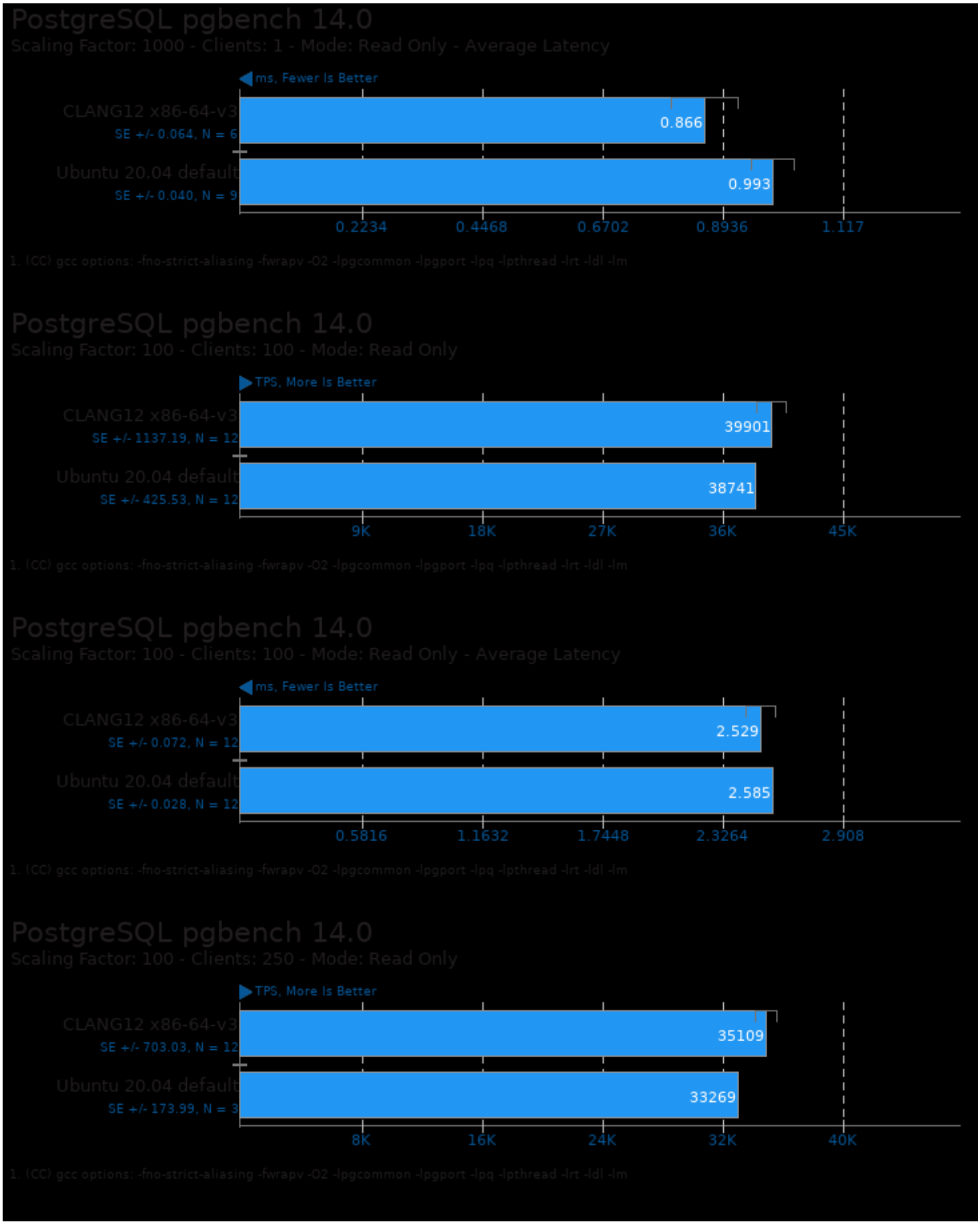

PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 100 - Mode: Read Only - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.005, N = 3
1.729
Ubuntu 20.04 default
SE +/- 0.001, N = 3
1.802
0.4055
0.811
1.2165
1.622
2.0275
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 250 - Mode: Read Only
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 561.71, N = 4
53769
Ubuntu 20.04 default
SE +/- 475.89, N = 6
51370
12K
24K
36K
48K
60K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 250 - Mode: Read Only - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.049, N = 4
4.651
Ubuntu 20.04 default
SE +/- 0.045, N = 6
4.869
1.0955
2.191
3.2865
4.382
5.4775
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 50 - Mode: Read Write
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 0.46, N = 3
93
Ubuntu 20.04 default
SE +/- 0.95, N = 6
100
20
40
60
80
100
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

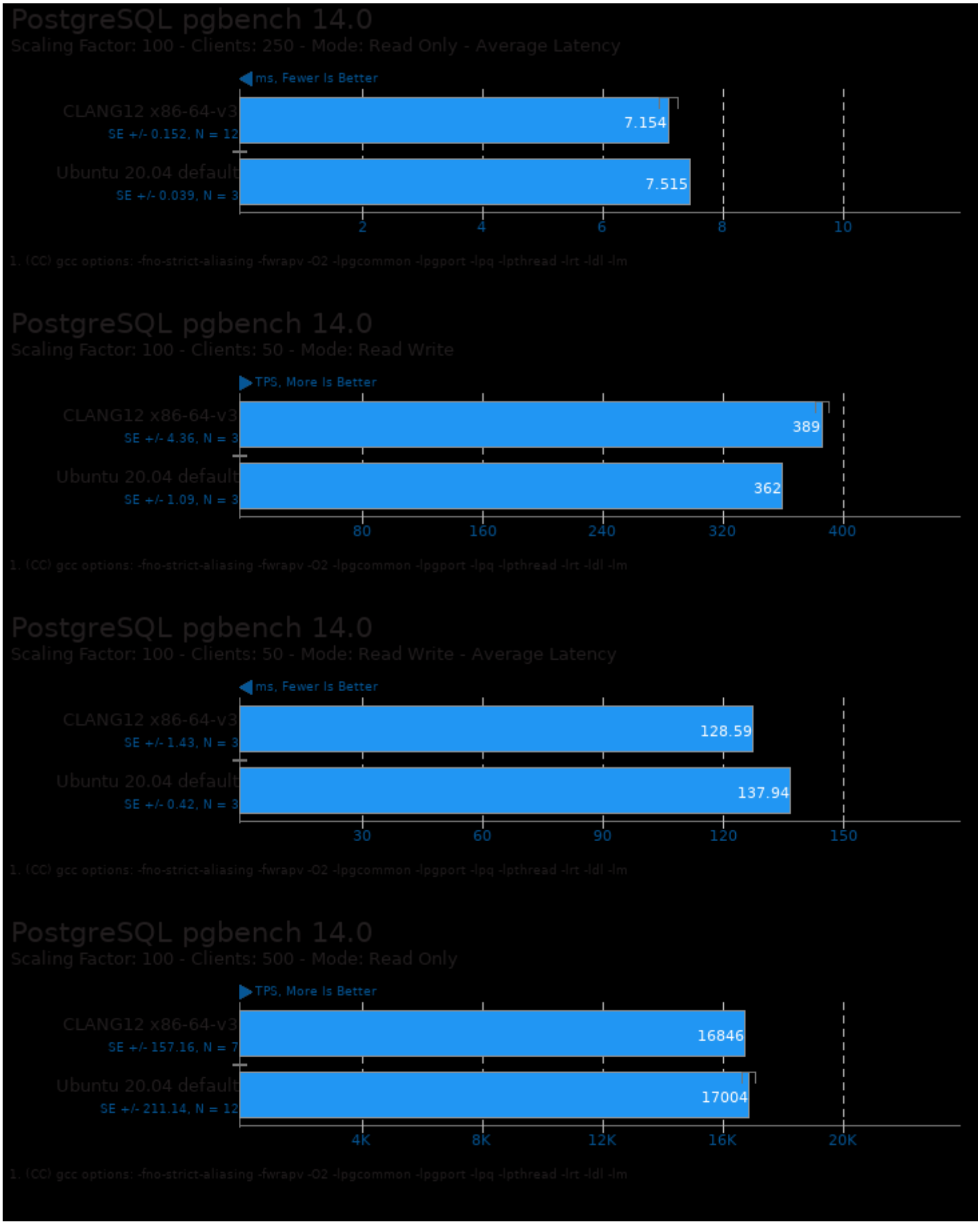

PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 50 - Mode: Read Write - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 2.66, N = 3
537.09
Ubuntu 20.04 default
SE +/- 4.73, N = 6
499.69
120
240
360
480
600
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 500 - Mode: Read Only
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 311.80, N = 3
49536
Ubuntu 20.04 default
SE +/- 627.68, N = 3
47556
11K
22K
33K
44K
55K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 500 - Mode: Read Only - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.06, N = 3
10.10
Ubuntu 20.04 default
SE +/- 0.14, N = 3
10.52
3
6
9
12
15
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 1 - Mode: Read Only
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 99.94, N = 12
8115
Ubuntu 20.04 default
SE +/- 255.14, N = 12
7641
2K
4K
6K
8K
10K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

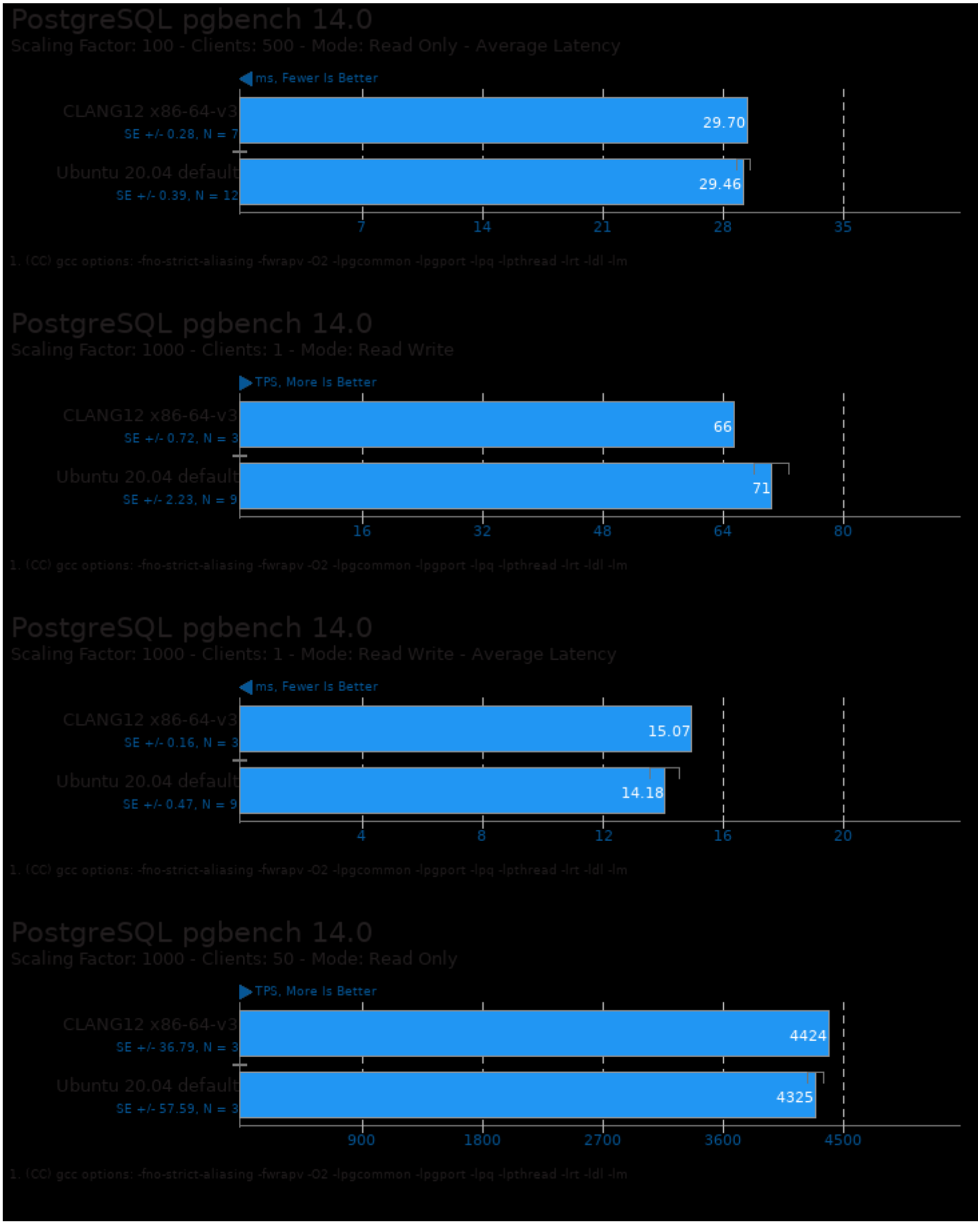

PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 1 - Mode: Read Only - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.002, N = 12
0.124
Ubuntu 20.04 default
SE +/- 0.006, N = 12
0.133
0.0299
0.0598
0.0897
0.1196
0.1495
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 100 - Mode: Read Write
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 1.42, N = 12
102
Ubuntu 20.04 default
SE +/- 0.88, N = 3
93
20
40
60
80
100
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 100 - Mode: Read Write - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 14.21, N = 12
983.45
Ubuntu 20.04 default
SE +/- 10.05, N = 3
1074.39
200
400
600
800
1000
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 250 - Mode: Read Write
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 2.09, N = 12
93
Ubuntu 20.04 default
SE +/- 0.60, N = 3
88
20
40
60
80
100
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

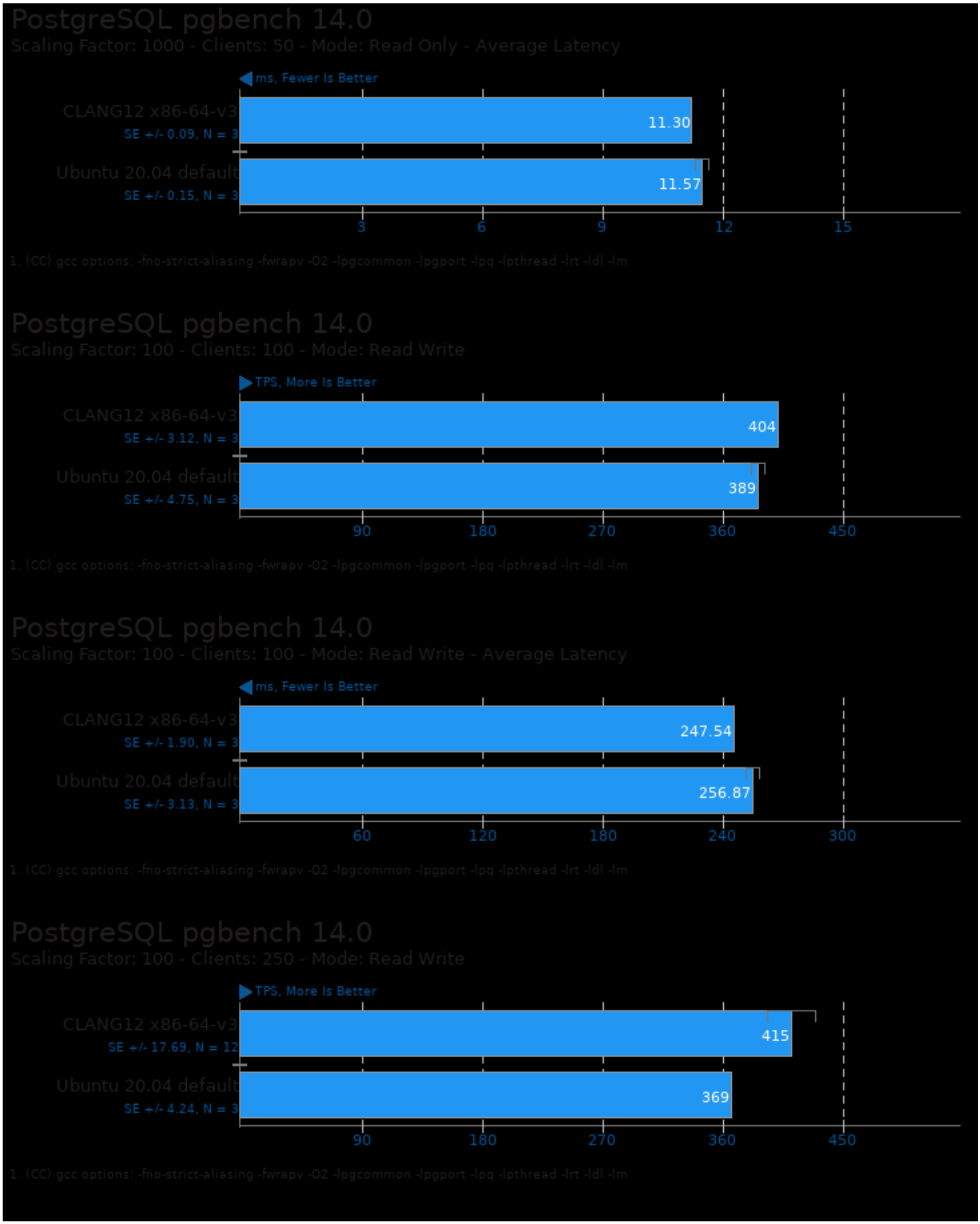

PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 250 - Mode: Read Write - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 62.31, N = 12
2716.74
Ubuntu 20.04 default
SE +/- 19.53, N = 3
2851.62
600
1200
1800
2400
3000
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 500 - Mode: Read Write
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 1.11, N = 12
87
Ubuntu 20.04 default
SE +/- 0.49, N = 3
83
20
40
60
80
100
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 500 - Mode: Read Write - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 72.35, N = 12
5781.23
Ubuntu 20.04 default
SE +/- 35.61, N = 3
6058.16
1300
2600
3900
5200
6500
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 1 - Mode: Read Write
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 1.70, N = 12
79
Ubuntu 20.04 default
SE +/- 1.17, N = 12
78
20
40
60
80
100
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

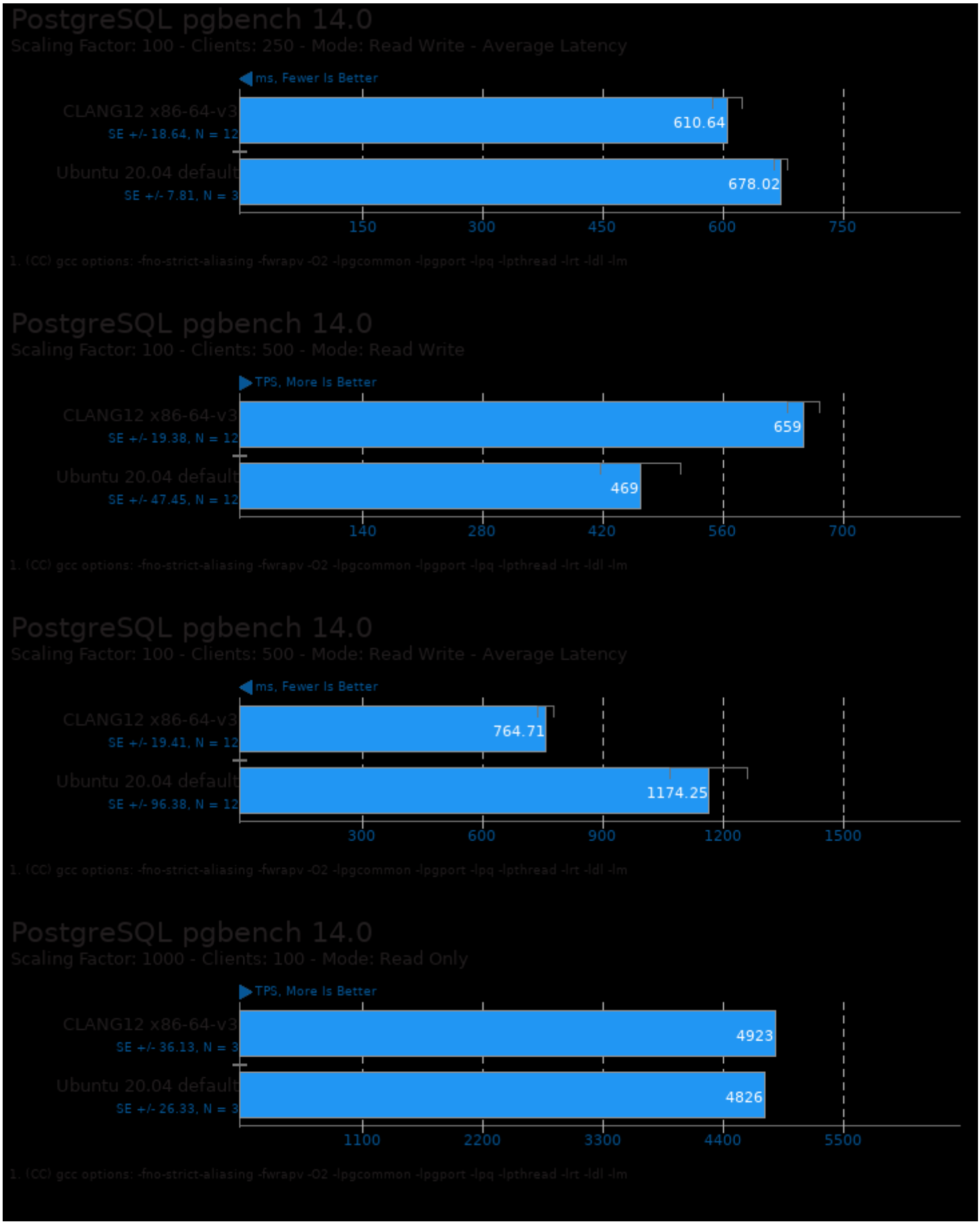

PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 1 - Mode: Read Write - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.25, N = 12
12.65
Ubuntu 20.04 default
SE +/- 0.18, N = 12
12.89
3
6
9
12
15
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 50 - Mode: Read Only
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 1287.91, N = 12
43867
Ubuntu 20.04 default
SE +/- 967.65, N = 12
37590
9K
18K
27K
36K
45K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 50 - Mode: Read Only - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.035, N = 12
1.151
Ubuntu 20.04 default
SE +/- 0.031, N = 12
1.339
0.3013
0.6026
0.9039
1.2052
1.5065
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 1 - Mode: Read Only
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 72.84, N = 6
1181
Ubuntu 20.04 default
SE +/- 41.17, N = 9
1021
300
600
900
1200
1500
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

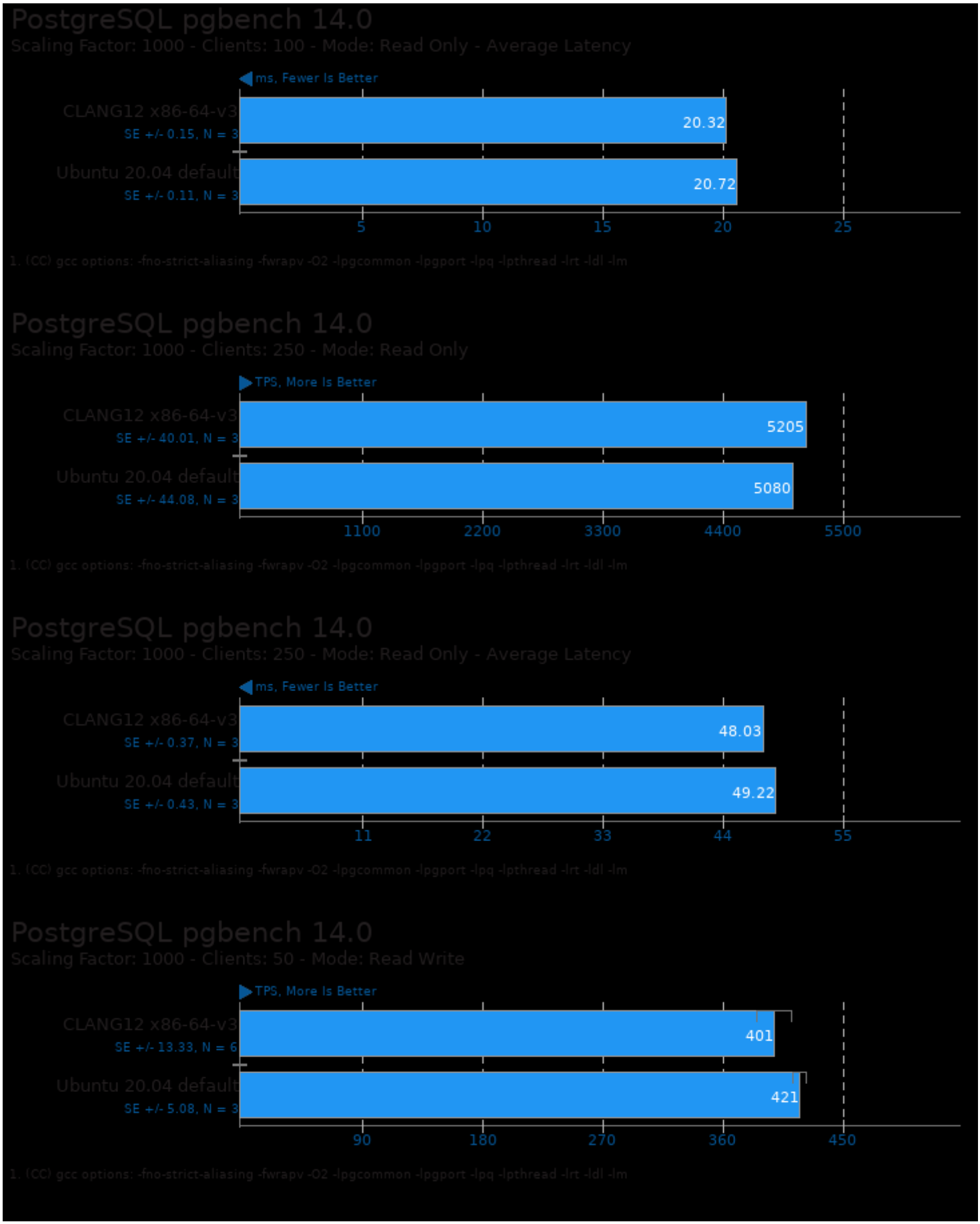

PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 1 - Mode: Read Only - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.064, N = 6
0.866
Ubuntu 20.04 default
SE +/- 0.040, N = 9
0.993
0.2234
0.4468
0.6702
0.8936
1.117
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 100 - Mode: Read Only
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 1137.19, N = 12
39901
Ubuntu 20.04 default
SE +/- 425.53, N = 12
38741
9K
18K
27K
36K
45K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 100 - Mode: Read Only - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.072, N = 12
2.529
Ubuntu 20.04 default
SE +/- 0.028, N = 12
2.585
0.5816
1.1632
1.7448
2.3264
2.908
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Only
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 703.03, N = 12
35109
Ubuntu 20.04 default
SE +/- 173.99, N = 3
33269
8K
16K
24K
32K
40K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

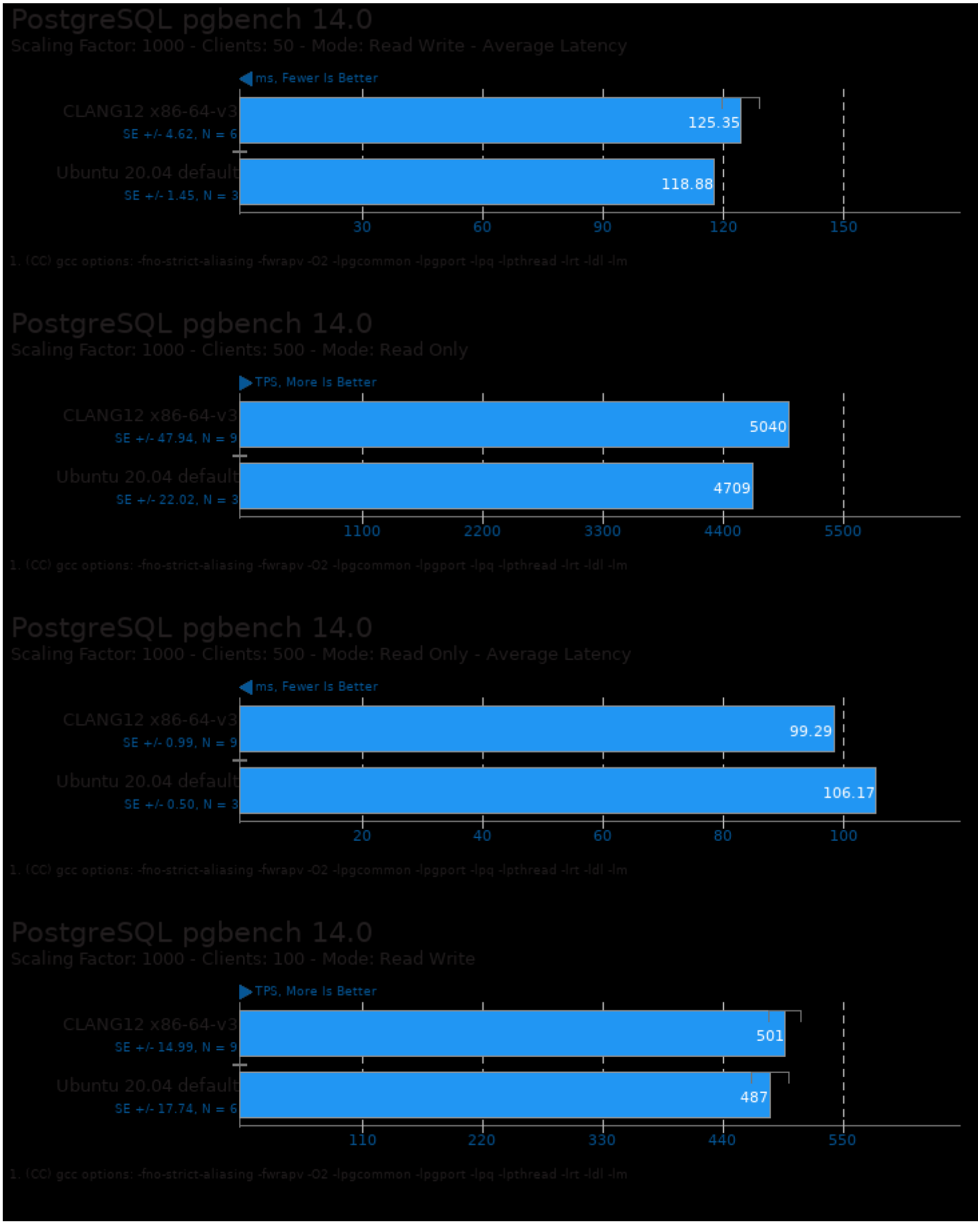

PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Only - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.152, N = 12
7.154
Ubuntu 20.04 default
SE +/- 0.039, N = 3
7.515
2
4
6
8
10
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 50 - Mode: Read Write
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 4.36, N = 3
389
Ubuntu 20.04 default
SE +/- 1.09, N = 3
362
80
160
240
320
400
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 50 - Mode: Read Write - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 1.43, N = 3
128.59
Ubuntu 20.04 default
SE +/- 0.42, N = 3
137.94
30
60
90
120
150
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 500 - Mode: Read Only
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 157.16, N = 7
16846
Ubuntu 20.04 default
SE +/- 211.14, N = 12
17004
4K
8K
12K
16K
20K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

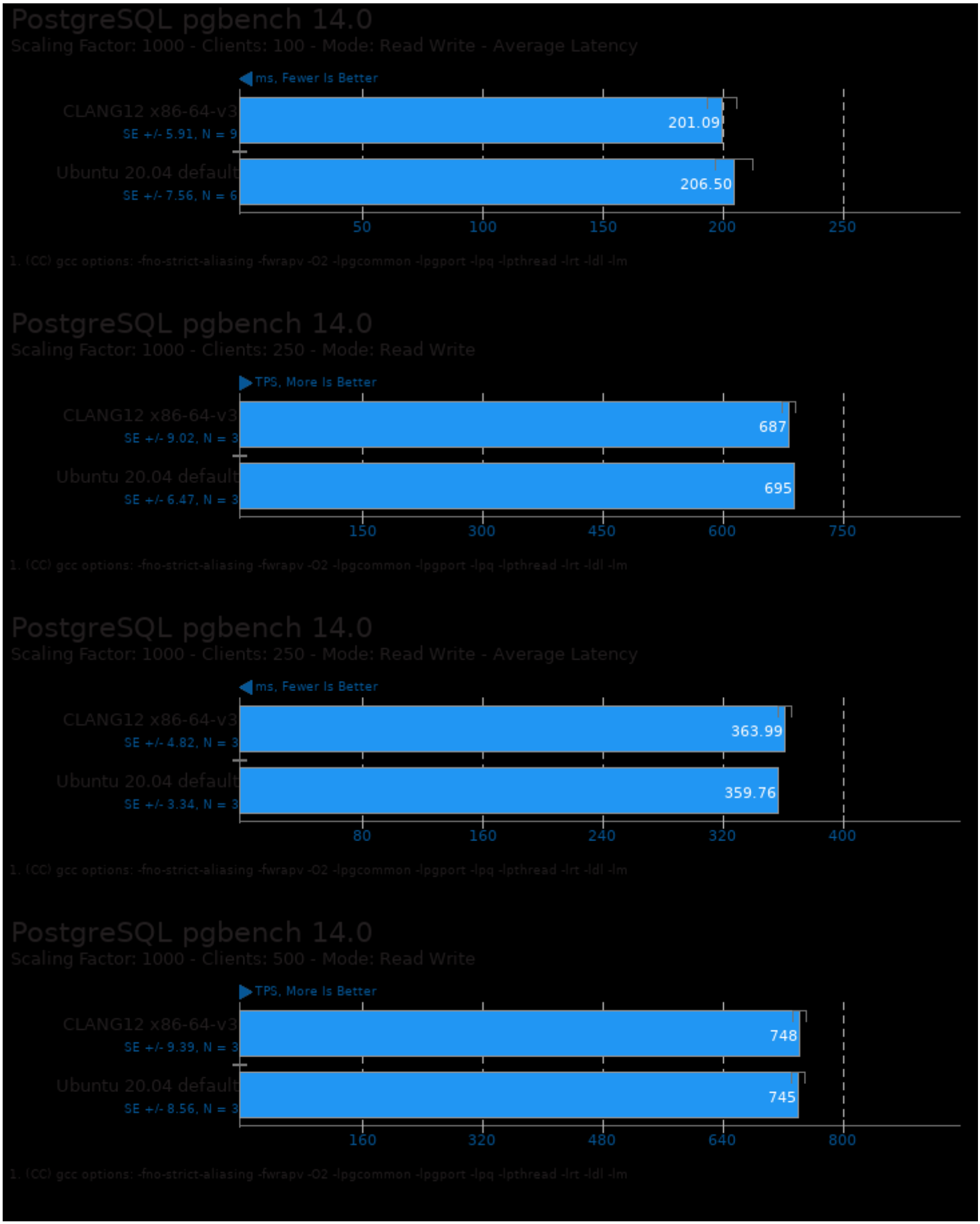

PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 500 - Mode: Read Only - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.28, N = 7
29.70
Ubuntu 20.04 default
SE +/- 0.39, N = 12
29.46
7
14
21
28
35
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 1 - Mode: Read Write
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 0.72, N = 3
66
Ubuntu 20.04 default
SE +/- 2.23, N = 9
71
16
32
48
64
80
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 1 - Mode: Read Write - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.16, N = 3
15.07
Ubuntu 20.04 default
SE +/- 0.47, N = 9
14.18
4
8
12
16
20
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 50 - Mode: Read Only
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 36.79, N = 3
4424
Ubuntu 20.04 default
SE +/- 57.59, N = 3
4325
900
1800
2700
3600
4500
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm


PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 50 - Mode: Read Only - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.09, N = 3
11.30
Ubuntu 20.04 default
SE +/- 0.15, N = 3
11.57
3
6
9
12
15
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 100 - Mode: Read Write
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 3.12, N = 3
404
Ubuntu 20.04 default
SE +/- 4.75, N = 3
389
90
180
270
360
450
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 100 - Mode: Read Write - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 1.90, N = 3
247.54
Ubuntu 20.04 default
SE +/- 3.13, N = 3
256.87
60
120
180
240
300
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Write
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 17.69, N = 12
415
Ubuntu 20.04 default
SE +/- 4.24, N = 3
369
90
180
270
360
450
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm


PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Write - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 18.64, N = 12
610.64
Ubuntu 20.04 default
SE +/- 7.81, N = 3
678.02
150
300
450
600
750
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 500 - Mode: Read Write
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 19.38, N = 12
659
Ubuntu 20.04 default
SE +/- 47.45, N = 12
469
140
280
420
560
700
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 500 - Mode: Read Write - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 19.41, N = 12
764.71
Ubuntu 20.04 default
SE +/- 96.38, N = 12
1174.25
300
600
900
1200
1500
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 100 - Mode: Read Only
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 36.13, N = 3
4923
Ubuntu 20.04 default
SE +/- 26.33, N = 3
4826
1100
2200
3300
4400
5500
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

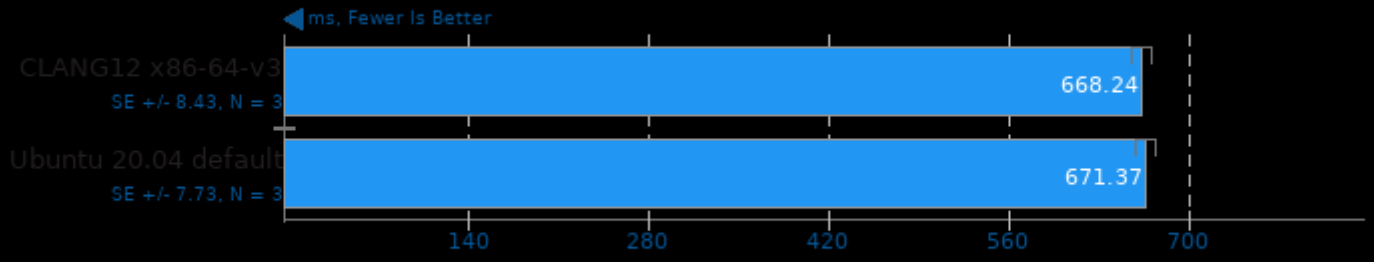

PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 100 - Mode: Read Only - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.15, N = 3
20.32
Ubuntu 20.04 default
SE +/- 0.11, N = 3
20.72
5
10
15
20
25
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 250 - Mode: Read Only
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 40.01, N = 3
5205
Ubuntu 20.04 default
SE +/- 44.08, N = 3
5080
1100
2200
3300
4400
5500
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 250 - Mode: Read Only - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.37, N = 3
48.03
Ubuntu 20.04 default
SE +/- 0.43, N = 3
49.22
11
22
33
44
55
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 50 - Mode: Read Write
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 13.33, N = 6
401
Ubuntu 20.04 default
SE +/- 5.08, N = 3
421
90
180
270
360
450
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm


PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 50 - Mode: Read Write - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 4.62, N = 6
125.35
Ubuntu 20.04 default
SE +/- 1.45, N = 3
118.88
30
60
90
120
150
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 500 - Mode: Read Only
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 47.94, N = 9
5040
Ubuntu 20.04 default
SE +/- 22.02, N = 3
4709
1100
2200
3300
4400
5500
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 500 - Mode: Read Only - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.99, N = 9
99.29
Ubuntu 20.04 default
SE +/- 0.50, N = 3
106.17
20
40
60
80
100
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 100 - Mode: Read Write
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 14.99, N = 9
501
Ubuntu 20.04 default
SE +/- 17.74, N = 6
487
110
220
330
440
550
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm


PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 100 - Mode: Read Write - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 5.91, N = 9
201.09
Ubuntu 20.04 default
SE +/- 7.56, N = 6
206.50
50
100
150
200
250
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 250 - Mode: Read Write
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 9.02, N = 3
687
Ubuntu 20.04 default
SE +/- 6.47, N = 3
695
150
300
450
600
750
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 250 - Mode: Read Write - Average Latency
ms, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 4.82, N = 3
363.99
Ubuntu 20.04 default
SE +/- 3.34, N = 3
359.76
80
160
240
320
400
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1000 - Clients: 500 - Mode: Read Write
TPS, More Is Better
CLANG12 x86-64-v3
SE +/- 9.39, N = 3
748
Ubuntu 20.04 default
SE +/- 8.56, N = 3
745
160
320
480
640
800
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

PostgreSQL pgbench 14.0

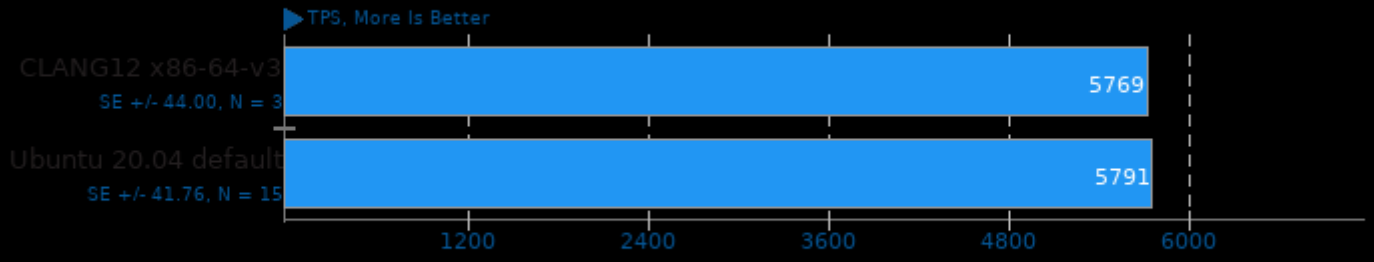
Scaling Factor: 1000 - Clients: 500 - Mode: Read Write - Average Latency



1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

PostMark 1.51

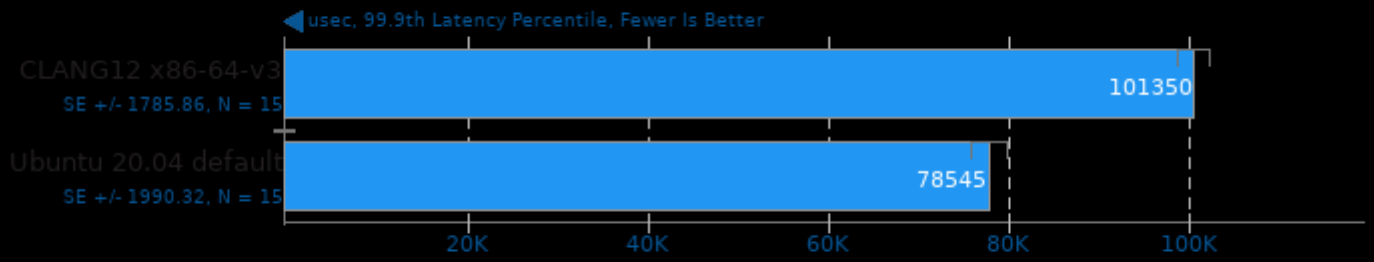
Disk Transaction Performance



1. (CC) gcc options: -O3

Schbench

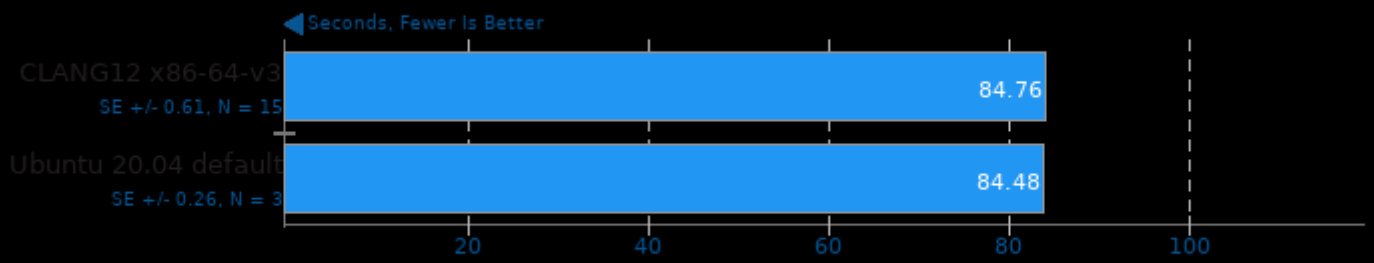
Message Threads: 8 - Workers Per Message Thread: 4



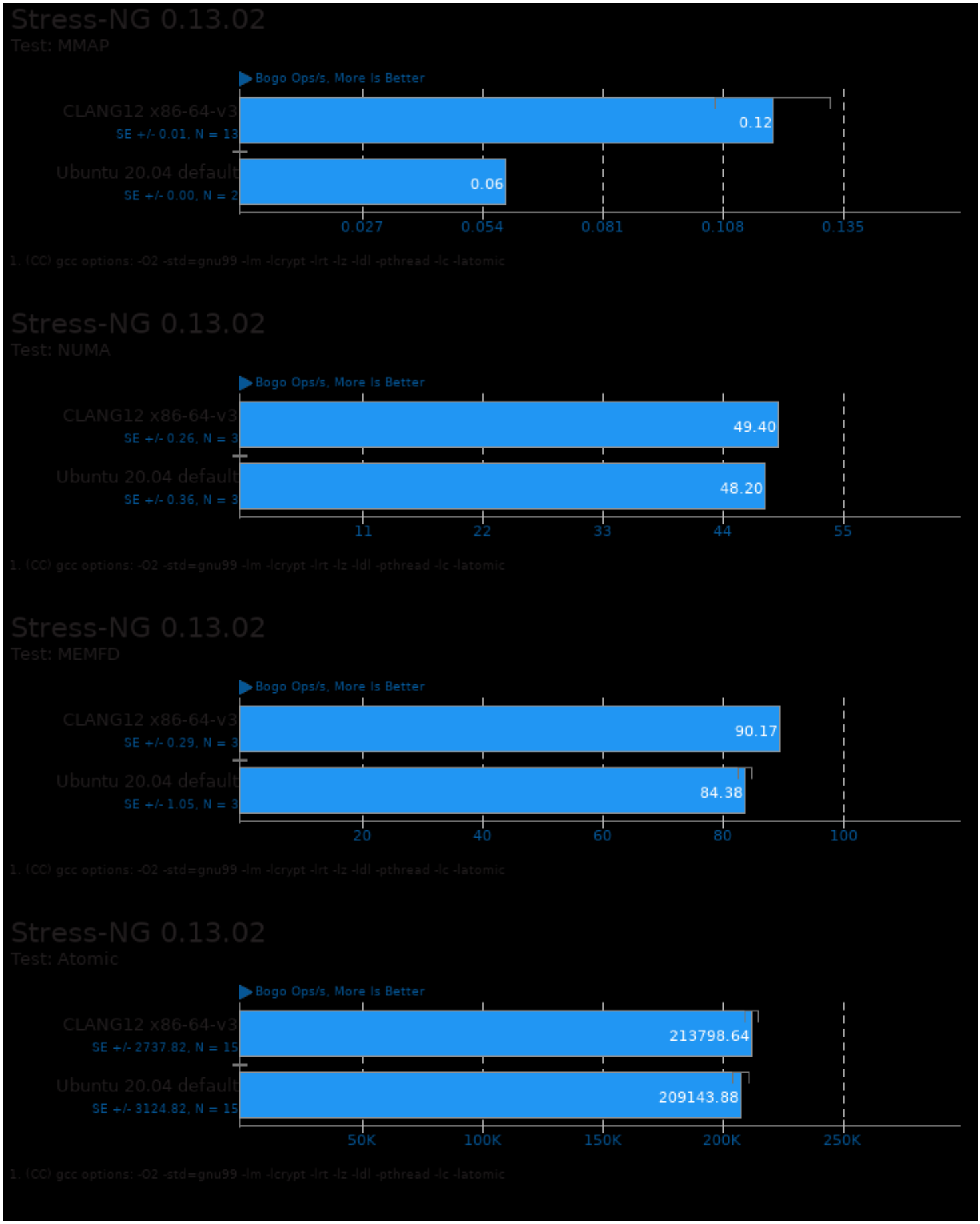
1. (CC) gcc options: -O2 -lpthread

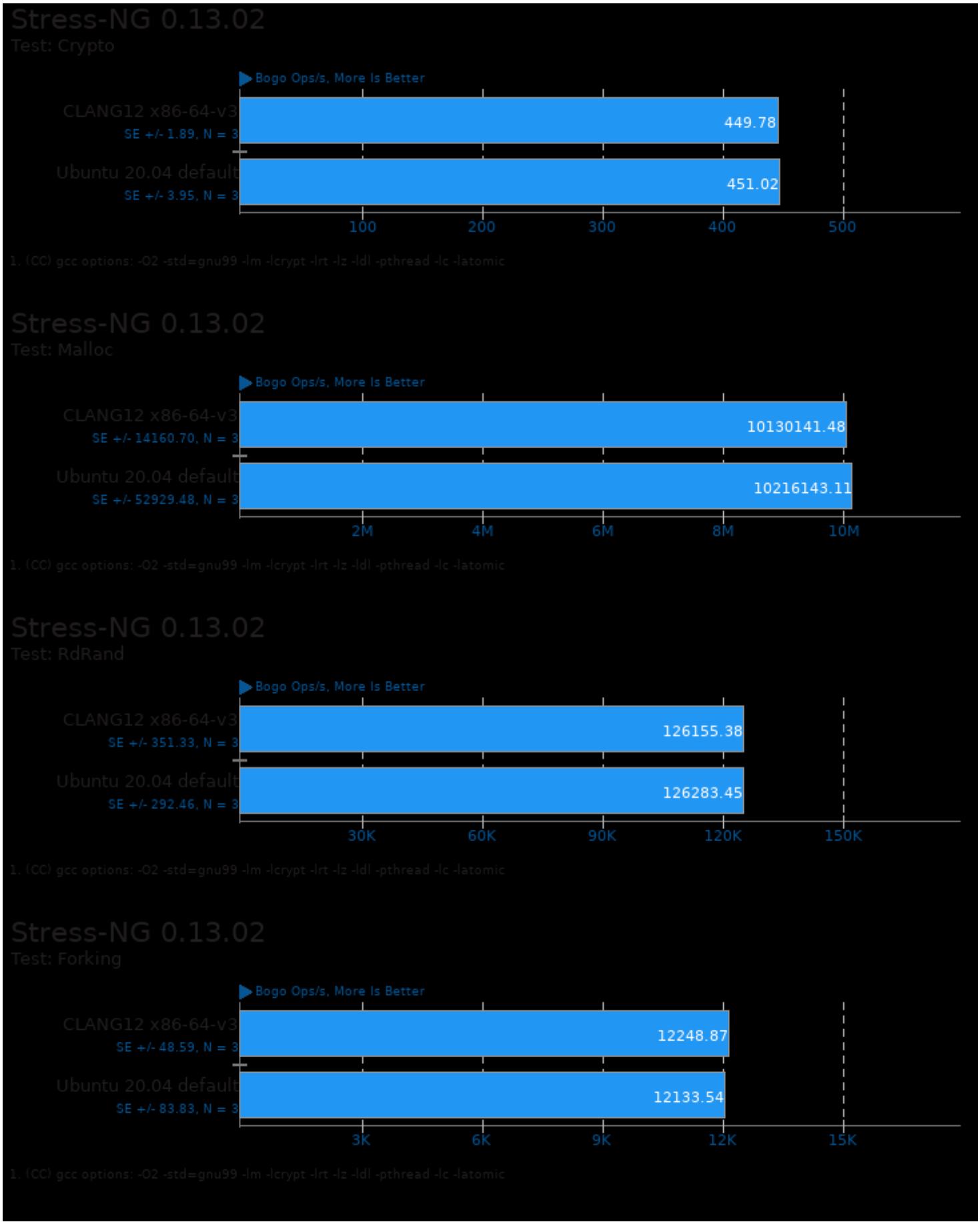
SQLite Speedtest 3.30

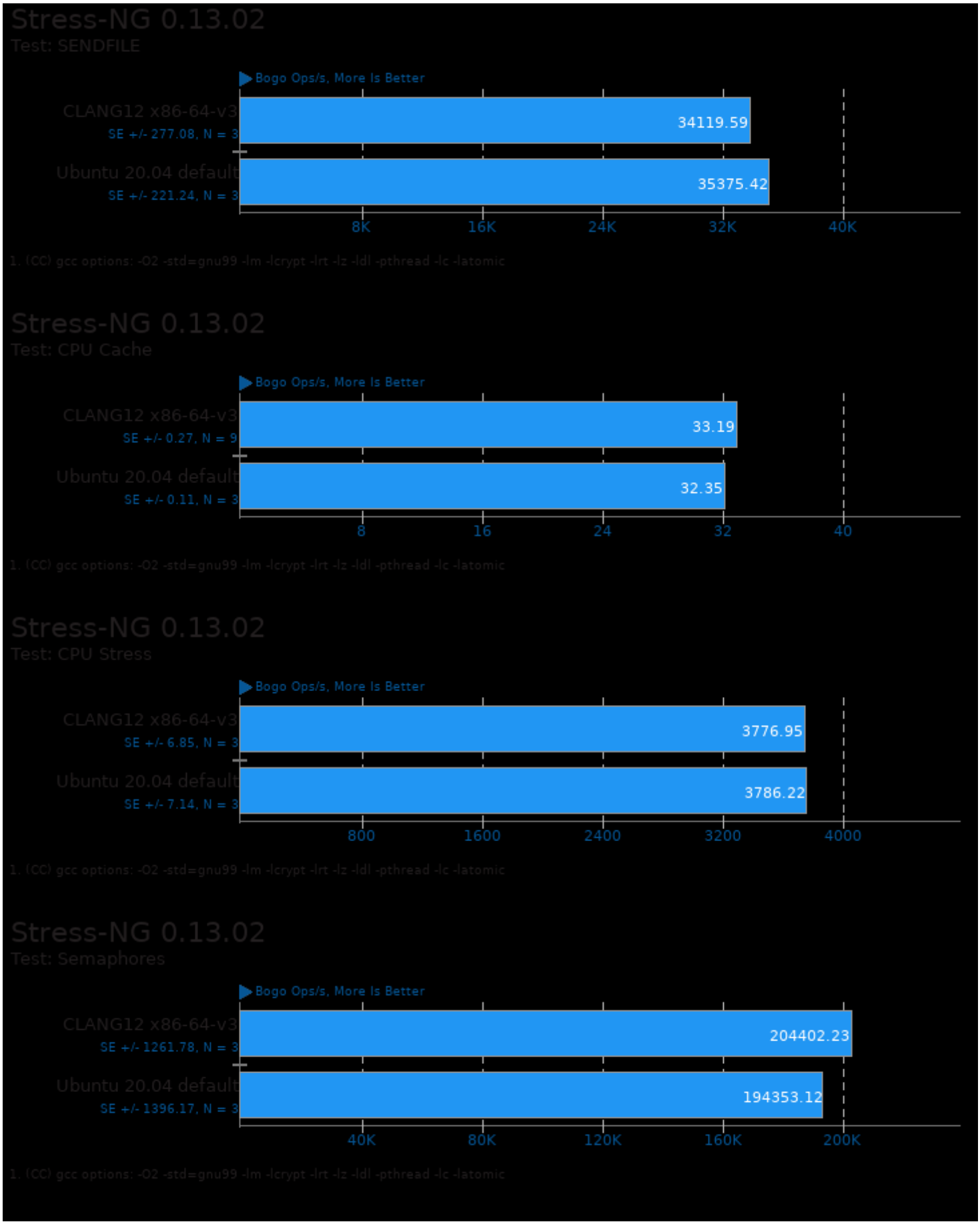
Timed Time - Size 1,000

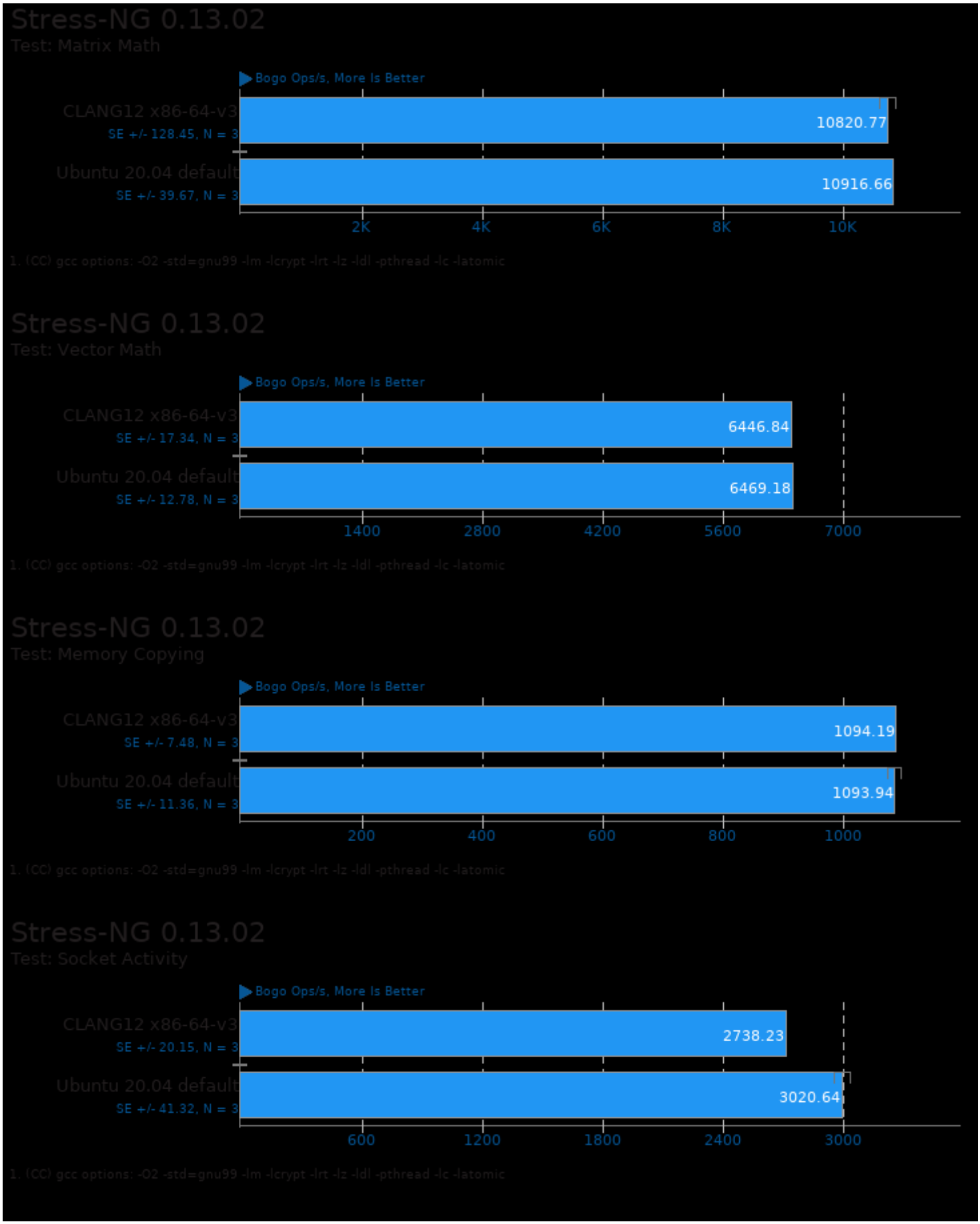


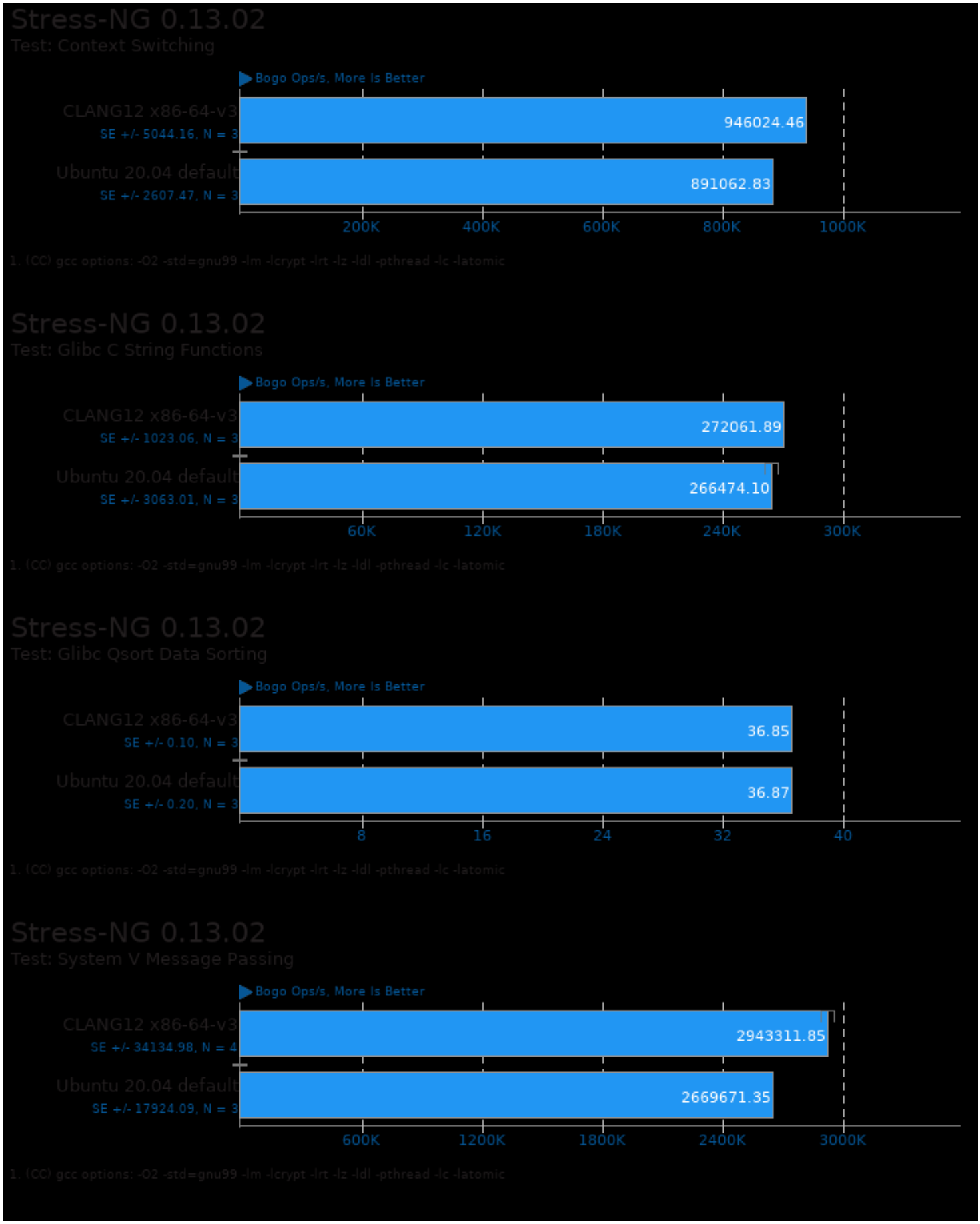
1. (CC) gcc options: -O2 -ldl -lz -lpthread

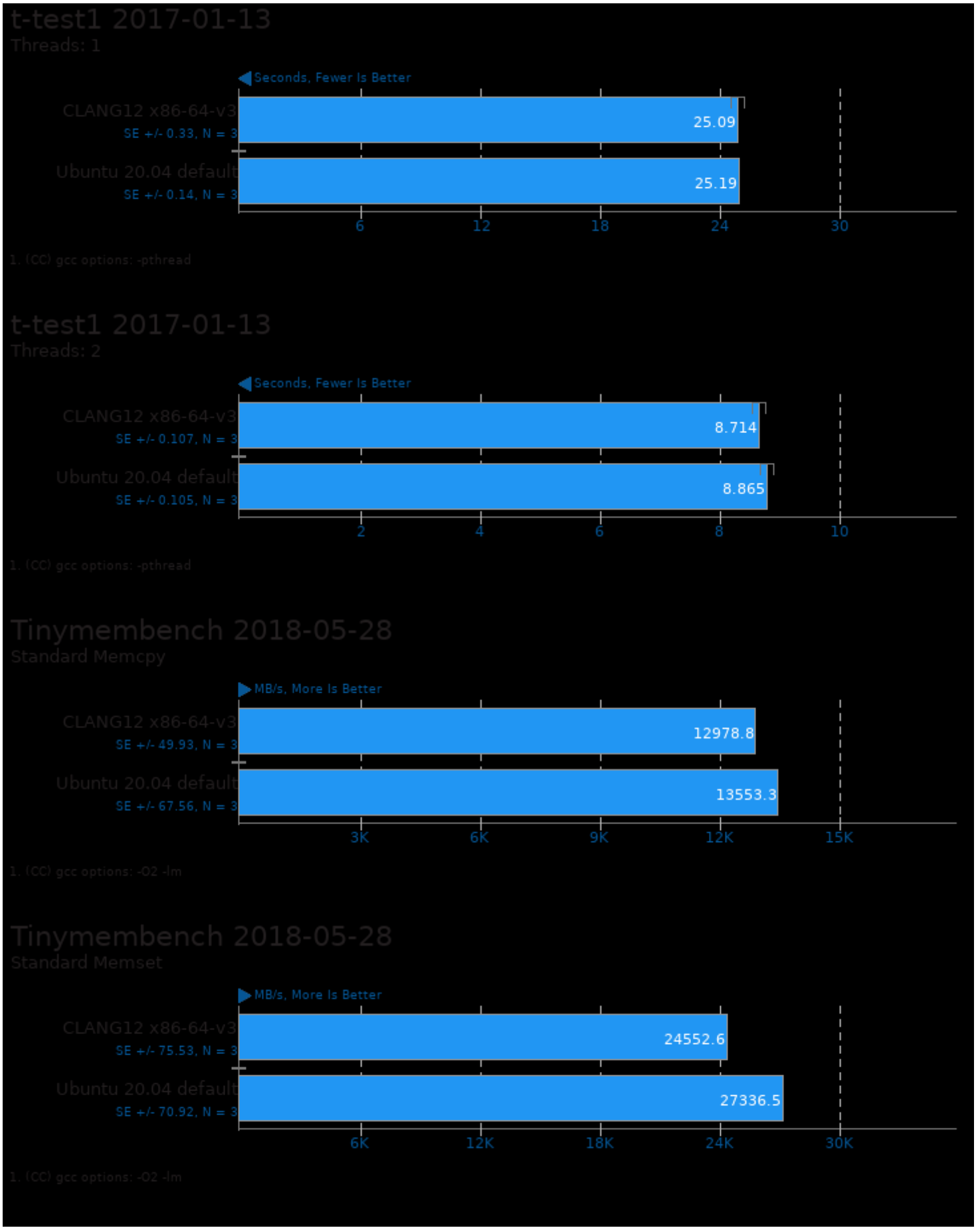

Stress-NG 0.13.02
Test: MMAP
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 0.01, N = 13
0.12
Ubuntu 20.04 default
SE +/- 0.00, N = 2
0.06
0.027
0.054
0.081
0.108
0.135
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: NUMA
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 0.26, N = 3
49.40
Ubuntu 20.04 default
SE +/- 0.36, N = 3
48.20
11
22
33
44
55
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: MEMFD
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 0.29, N = 3
90.17
Ubuntu 20.04 default
SE +/- 1.05, N = 3
84.38
20
40
60
80
100
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Atomic
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 2737.82, N = 15
213798.64
Ubuntu 20.04 default
SE +/- 3124.82, N = 15
209143.88
50K
100K
150K
200K
250K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic

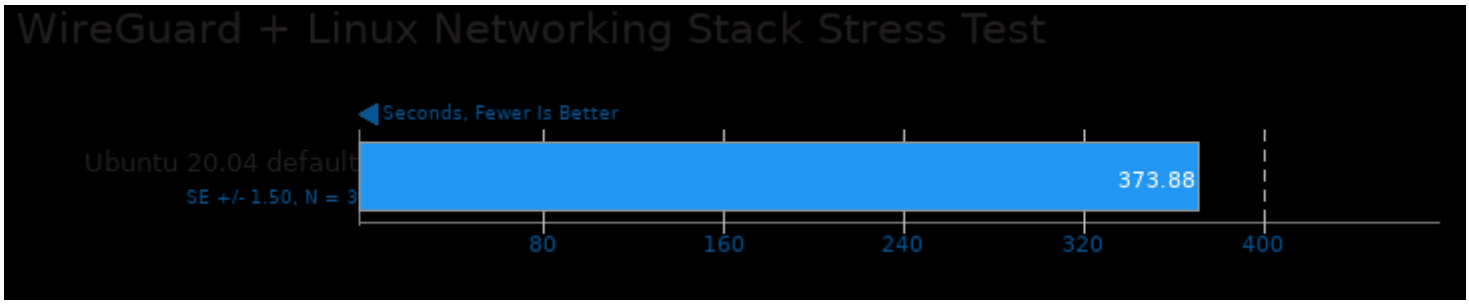

Stress-NG 0.13.02
Test: Crypto
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 1.89, N = 3
449.78
Ubuntu 20.04 default
SE +/- 3.95, N = 3
451.02
100
200
300
400
500
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Malloc
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 14160.70, N = 3
10130141.48
Ubuntu 20.04 default
SE +/- 52929.48, N = 3
10216143.11
2M
4M
6M
8M
10M
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: RdRand
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 351.33, N = 3
126155.38
Ubuntu 20.04 default
SE +/- 292.46, N = 3
126283.45
30K
60K
90K
120K
150K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Forking
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 48.59, N = 3
12248.87
Ubuntu 20.04 default
SE +/- 83.83, N = 3
12133.54
3K
6K
9K
12K
15K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic


Stress-NG 0.13.02
Test: SENDFILE
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 277.08, N = 3
34119.59
Ubuntu 20.04 default
SE +/- 221.24, N = 3
35375.42
8K
16K
24K
32K
40K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: CPU Cache
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 0.27, N = 9
33.19
Ubuntu 20.04 default
SE +/- 0.11, N = 3
32.35
8
16
24
32
40
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: CPU Stress
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 6.85, N = 3
3776.95
Ubuntu 20.04 default
SE +/- 7.14, N = 3
3786.22
800
1600
2400
3200
4000
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Semaphores
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 1261.78, N = 3
204402.23
Ubuntu 20.04 default
SE +/- 1396.17, N = 3
194353.12
40K
80K
120K
160K
200K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic


Stress-NG 0.13.02
Test: Matrix Math
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 128.45, N = 3
10820.77
Ubuntu 20.04 default
SE +/- 39.67, N = 3
10916.66
2K
4K
6K
8K
10K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Vector Math
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 17.34, N = 3
6446.84
Ubuntu 20.04 default
SE +/- 12.78, N = 3
6469.18
1400
2800
4200
5600
7000
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Memory Copying
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 7.48, N = 3
1094.19
Ubuntu 20.04 default
SE +/- 11.36, N = 3
1093.94
200
400
600
800
1000
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Socket Activity
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 20.15, N = 3
2738.23
Ubuntu 20.04 default
SE +/- 41.32, N = 3
3020.64
600
1200
1800
2400
3000
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic

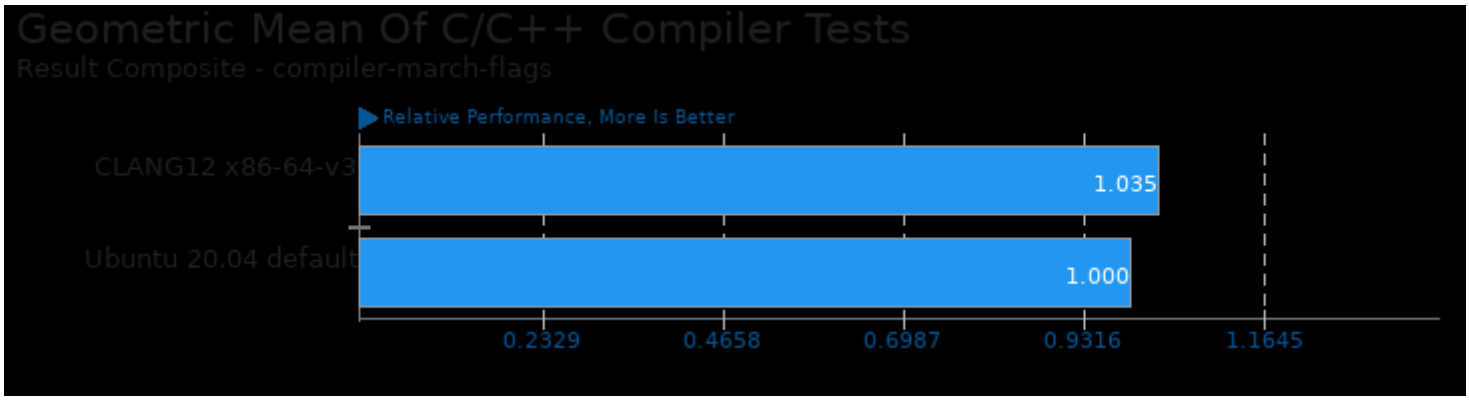

Stress-NG 0.13.02
Test: Context Switching
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 5044.16, N = 3
946024.46
Ubuntu 20.04 default
SE +/- 2607.47, N = 3
891062.83
200K
400K
600K
800K
1000K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Glibc C String Functions
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 1023.06, N = 3
272061.89
Ubuntu 20.04 default
SE +/- 3063.01, N = 3
266474.10
60K
120K
180K
240K
300K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Glibc Qsort Data Sorting
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 0.10, N = 3
36.85
Ubuntu 20.04 default
SE +/- 0.20, N = 3
36.87
8
16
24
32
40
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: System V Message Passing
Bogo Ops/s, More Is Better
CLANG12 x86-64-v3
SE +/- 34134.98, N = 4
2943311.85
Ubuntu 20.04 default
SE +/- 17924.09, N = 3
2669671.35
600K
1200K
1800K
2400K
3000K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -lz -ldl -pthread -lc -latomic


t-test1 2017-01-13
Threads: 1
Seconds, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.33, N = 3
25.09
Ubuntu 20.04 default
SE +/- 0.14, N = 3
25.19
6
12
18
24
30
1. (CC) gcc options: -pthread
t-test1 2017-01-13
Threads: 2
Seconds, Fewer Is Better
CLANG12 x86-64-v3
SE +/- 0.107, N = 3
8.714
Ubuntu 20.04 default
SE +/- 0.105, N = 3
8.865
2
4
6
8
10
1. (CC) gcc options: -pthread
Tinymembench 2018-05-28
Standard Memcpy
MB/s, More Is Better
CLANG12 x86-64-v3
SE +/- 49.93, N = 3
12978.8
Ubuntu 20.04 default
SE +/- 67.56, N = 3
13553.3
3K
6K
9K
12K
15K
1. (CC) gcc options: -O2 -lm
Tinymembench 2018-05-28
Standard Memset
MB/s, More Is Better
CLANG12 x86-64-v3
SE +/- 75.53, N = 3
24552.6
Ubuntu 20.04 default
SE +/- 70.92, N = 3
27336.5
6K
12K
18K
24K
30K
1. (CC) gcc options: -O2 -lm

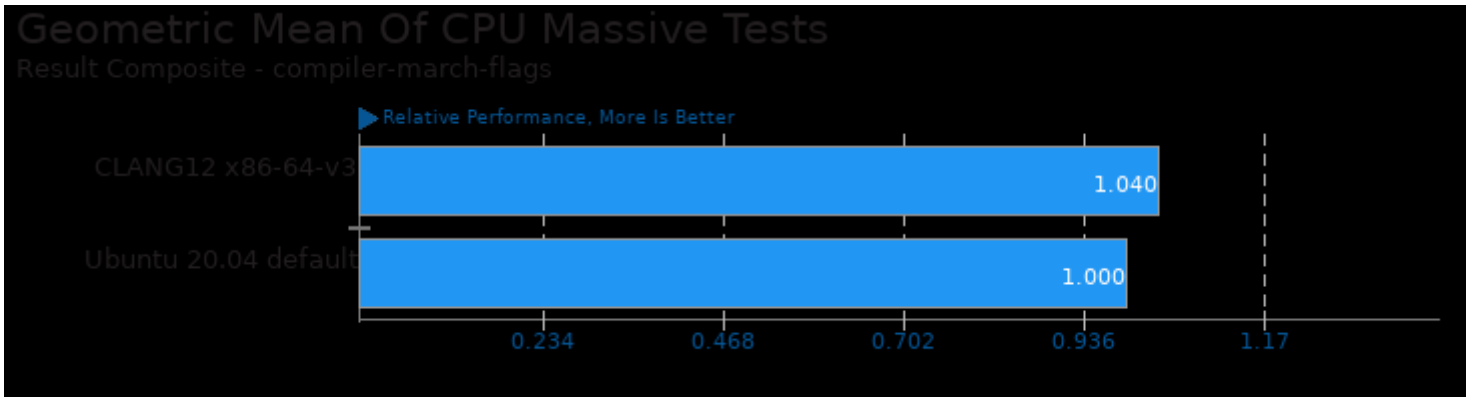

WireGuard + Linux Networking Stack Stress Test
Seconds, Fewer Is Better
Ubuntu 20.04 default
SE +/- 1.50, N = 3
373.88
80
160
240
320
400

compiler-march-flags

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

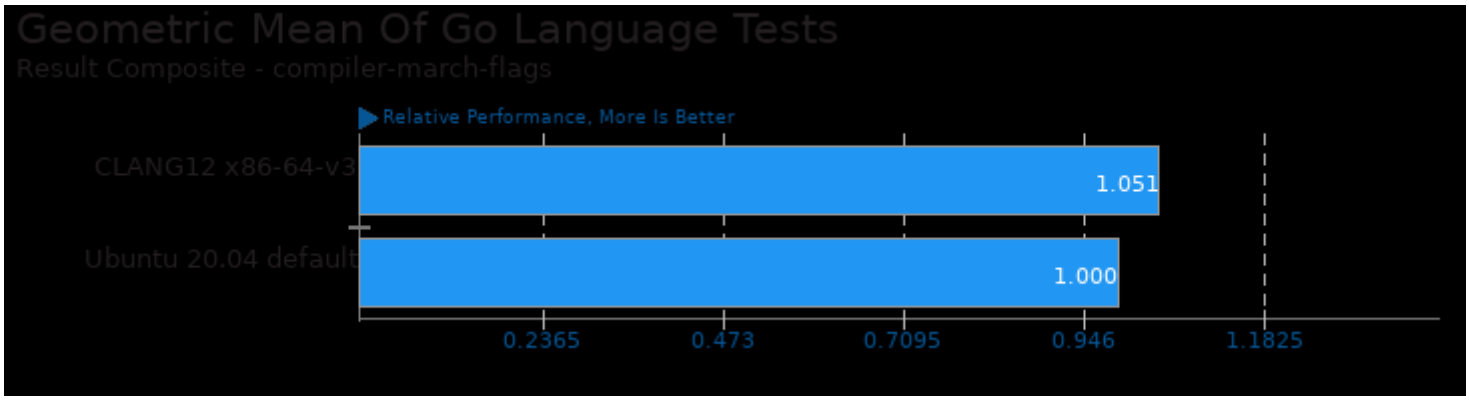


Geometric mean based upon tests: pts/pgbench, pts/apache, pts/sqlite-speedtest, pts/openssl and pts/leveldb



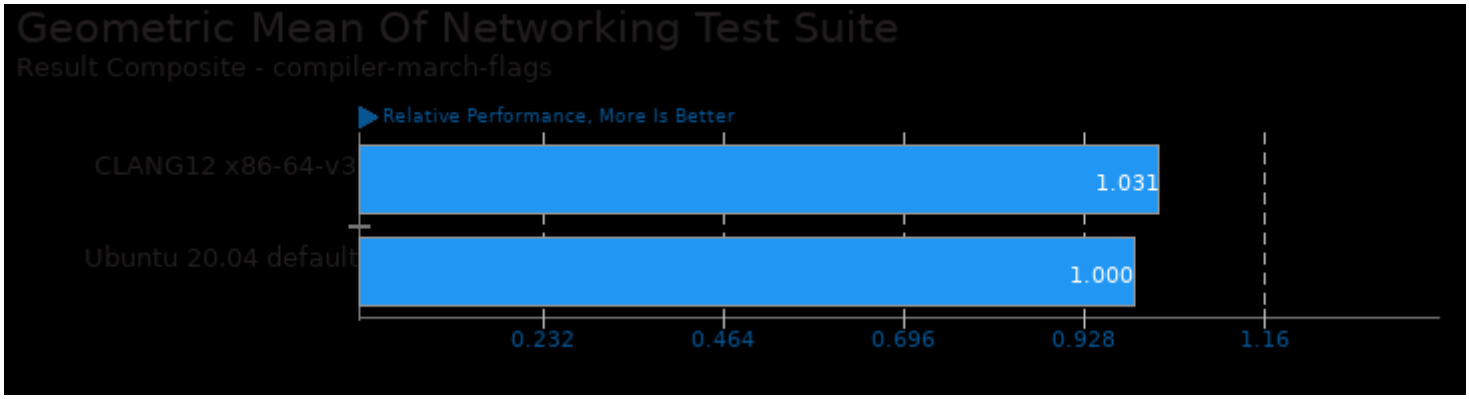
Geometric mean based upon tests: pts/apache, pts/ctx-clock, pts/hackbench, pts/openssl, pts/mbw, pts/pgbench, pts/stress-ng, pts/t-test1 and pts/tinymembench

Geometric mean based upon tests: pts/sqlite-speedtest, pts/leveldb, pts/rocksdb and pts/pgbench



Geometric mean based upon tests: pts/apache and pts/ethr

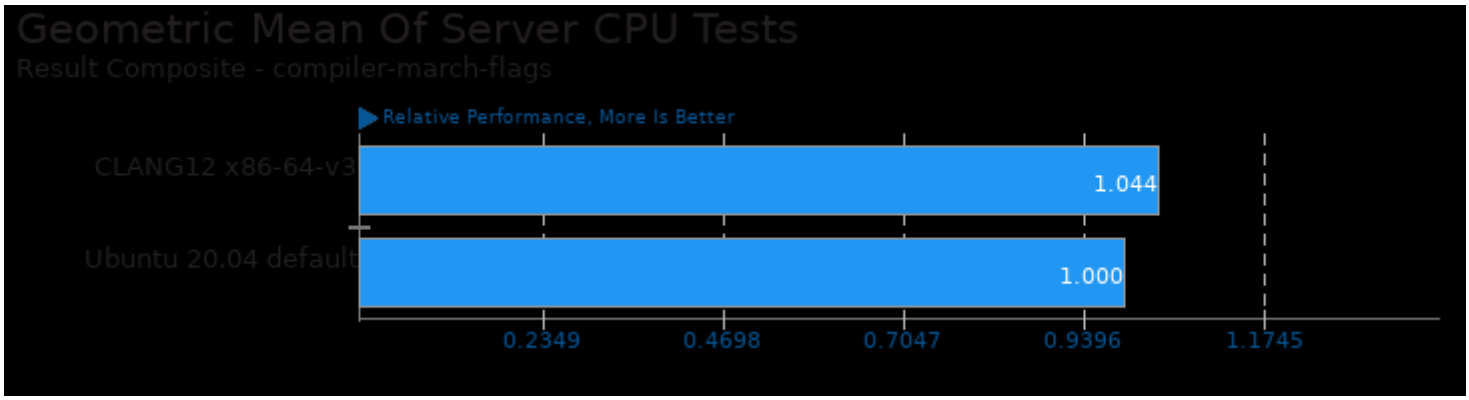
Geometric mean based upon tests: pts/t-test1, pts/tinymembench and pts/mbw



Geometric mean based upon tests: pts/ethr and pts/iperf

Geometric mean based upon tests: pts/apache, pts/pgbench, pts/rocksdb, pts/openssl, pts/sqlite-speedtest and

pts/leveldb



Geometric mean based upon tests: pts/hackbench, pts/openssl, pts/stress-ng and pts/ctx-clock

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 16:51.