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Linux 5.6 Intel Xeon Platinum 8280 x2

2 x Intel Xeon Platinum 8280 testing with a GIGABYTE MD61-SC2-00 v01000100 (T15 BIOS) and llvmpipe 377GB on Ubuntu 20.04 via the Phoronix Test Suite.

Automated Executive Summary

Linux 5.6-rc1 had the most wins, coming in first place for 65% of the tests.

Based on the geometric mean of all complete results, the fastest (Linux 5.6-rc1) was 1.007x the speed of the slowest (Linux 5.5).

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

Stress-NG (Test: System V Message Passing) at 1.282x
Hackbench (Count: 32 - Type: Process) at 1.102x
Facebook RocksDB (Test: Random Fill Sync) at 1.084x
Stress-NG (Test: Semaphores) at 1.046x
Flexible IO Tester (Type: Sequential Read - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 4KB - Disk Target: Default Test Directory) at 1.041x
Flexible IO Tester (Type: Sequential Read - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 4KB - Disk Target: Default Test Directory) at 1.041x
LAMMPS Molecular Dynamics Simulator (Model: Rhodopsin Protein) at 1.04x

Flexible IO Tester (Type: Random Write - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 2MB - Disk Target: Default Test Directory) at 1.036x
Flexible IO Tester (Type: Random Write - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 2MB - Disk Target: Default Test Directory) at 1.036x
PostgreSQL pgbench (Scaling: Buffer Test - Test: Normal Load - Mode: Read Only) at 1.036x.

Test Systems:

Linux 5.5

Processor: 2 x Intel Xeon Platinum 8280 @ 4.00GHz (56 Cores / 112 Threads), Motherboard: GIGABYTE MD61-SC2-00 v01000100 (T15 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 378GB, Disk: 280GB INTEL SSDPED1D280GA, Graphics: llvmpipe 377GB, Monitor: VE228, Network: 2 x Intel X722 for 1GbE + 2 x QLogic FastLinQ QL41000 10/25/40/50GbE

OS: Ubuntu 20.04, Kernel: 5.5.0-050500-generic (x86_64), Desktop: GNOME Shell 3.34.3, Display Server: X Server 1.20.7, Display Driver: modesetting 1.20.7, OpenGL: 3.3 Mesa 19.2.4 (LLVM 9.0 256 bits), Compiler: GCC 9.2.1 20200123, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-mutex --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Disk Notes: NONE / errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0x500002c
Java Notes: OpenJDK Runtime Environment (build 11.0.6+10-post-Ubuntu-1ubuntu1)
Python Notes: + Python 3.7.6
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + tsx_async_abort: Mitigation of TSX disabled

Linux 5.6-rc1

Processor: 2 x Intel Xeon Platinum 8280 @ 4.00GHz (56 Cores / 112 Threads), Motherboard: GIGABYTE MD61-SC2-00 v01000100 (T15 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 378GB, Disk: 280GB INTEL SSDPED1D280GA, Graphics: llvmpipe 377GB, Monitor: VE228, Network: 2 x Intel X722 for 1GbE + 2 x QLogic FastLinQ QL41000 10/25/40/50GbE

OS: Ubuntu 20.04, Kernel: 5.6.0-050600rc1-generic (x86_64) 20200209, Desktop: GNOME Shell 3.34.3, Display Server: X Server 1.20.7, Display Driver: modesetting 1.20.7, OpenGL: 3.3 Mesa 19.2.4 (LLVM 9.0 256 bits), Compiler: GCC 9.2.1 20200123, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-mutex --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Disk Notes: NONE / errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0x500002c
Java Notes: OpenJDK Runtime Environment (build 11.0.6+10-post-Ubuntu-1ubuntu1)
Python Notes: + Python 3.7.6
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + tsx_async_abort: Mitigation of TSX disabled

Linux 5.6 Intel Xeon Platinum 8280 x2

	Linux 5.5	Linux 5.6-rc1
Stress-NG - S.V.M.P (Bogo Ops/s)	**6270600**	**8035893**
Normalized	78.03%	100%
Standard Deviation	0.4%	0.4%
Hackbench - 32 - Process (sec)	**39.997**	**36.308**
Normalized	90.78%	100%
Standard Deviation	0.6%	0.5%
Facebook RocksDB - Rand Fill Sync (Op/s)	**164332**	**151536**
Normalized	100%	92.21%
Standard Deviation	0.3%	0.2%
Stress-NG - Semaphores (Bogo Ops/s)	**2192970**	**2096059**
Normalized	100%	95.58%
Standard Deviation	1.7%	2.8%
Flexible IO Tester - Seq Read - Linux AIO - Yes - No - 4KB (IOPS)	**430267**	**448000**
Normalized	96.04%	100%
Standard Deviation	3.8%	0.9%
Flexible IO Tester - Seq Read - Linux AIO - Yes - No - 4KB (MB/s)	**1681**	**1750**
Normalized	96.06%	100%
Standard Deviation	3.9%	1.1%
LAMMPS Molecular Dynamics Simulator - Rhodopsin Protein (ns/day)	**25.639**	**24.646**
Normalized	100%	96.13%
Standard Deviation	1.2%	1.5%
Flexible IO Tester - Rand Write - Linux AIO - Yes - No - 2MB (IOPS)	**440**	**456**
Normalized	96.49%	100%
Standard Deviation	0.5%	1.1%
Flexible IO Tester - Rand Write - Linux AIO - Yes - No - 2MB (MB/s)	**887**	**919**
Normalized	96.52%	100%
Standard Deviation	0.5%	1.1%
PostgreSQL pgbench - Buffer Test - Normal Load - Read Only (TPS)	**594973**	**616404**
Normalized	96.52%	100%
Standard Deviation	1.5%	2.1%
DaCapo Benchmark - Jython (msec)	**4673**	**4833**
Normalized	100%	96.69%
Standard Deviation	0.5%	1.2%
PostgreSQL pgbench - Buffer Test - Normal Load - Read Write (TPS)	**24017**	**24806**
Normalized	96.82%	100%
Standard Deviation	0.1%	0.8%
Flexible IO Tester - Rand Read - Linux AIO - Yes - No - 2MB (IOPS)	**497**	**513**
Normalized	96.88%	100%
Standard Deviation	1.9%	
OSBench - Create Files (us/Event)	**14.120497**	**14.572009**
Normalized	100%	96.9%
Standard Deviation	0.3%	1.7%
Apache Benchmark - S.W.P.S (Reqs/sec)	**25749**	**24957**
Normalized	100%	96.92%
Standard Deviation	0.3%	2.4%

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Flexible IO Tester - Rand Read - Linux AIO - Yes - No - 2MB (MB/s)	**1002**	**1033**
Normalized	97%	100%
Standard Deviation	1.9%	
Flexible IO Tester - Rand Read - Linux AIO - Yes - No - 4KB (MB/s)	**234**	**241**
Normalized	97.1%	100%
Standard Deviation	1.5%	2.9%
DaCapo Benchmark - Tradebeans (msec)	**14214**	**13810**
Normalized	97.16%	100%
Standard Deviation	2.6%	4.4%
Flexible IO Tester - Rand Read - Linux AIO - Yes - No - 4KB (IOPS)	**59600**	**61333**
Normalized	97.17%	100%
Standard Deviation	0.5%	3%
Facebook RocksDB - Seq Fill (Op/s)	**187219**	**192596**
Normalized	97.21%	100%
Standard Deviation	0.2%	0.3%
SQLite Speedtest - Timed Time - Size 1,000 (sec)	**68.361**	**66.503**
Normalized	97.28%	100%
Standard Deviation	0.4%	0.2%
Numpy Benchmark (Score)	**312.13**	**320.33**
Normalized	97.44%	100%
Standard Deviation	1%	0.5%
OSBench - Launch Programs (us/Event)	**42.626063**	**43.696463**
Normalized	100%	97.55%
Standard Deviation	1.6%	2.8%
Flexible IO Tester - Seq Write - Linux AIO - Yes - No - 4KB (IOPS)	**209667**	**213667**
Normalized	98.13%	100%
Standard Deviation	0.5%	1.5%
RawTherapee - T.B.T (sec)	**63.540**	**62.367**
Normalized	98.15%	100%
Standard Deviation	1.2%	0.7%
Stress-NG - Socket Activity (Bogo Ops/s)	**33138**	**32574**
Normalized	100%	98.3%
Standard Deviation	2.8%	2.9%
Flexible IO Tester - Seq Write - Linux AIO - Yes - No - 4KB (MB/s)	**820**	**833**
Normalized	98.44%	100%
Standard Deviation	0.6%	1.7%
SVT-AV1 - Enc Mode 8 - 1080p (FPS)	**55.589**	**56.422**
Normalized	98.52%	100%
Standard Deviation	1.4%	2.4%
OSBench - Create Processes (us/Event)	**32.726924**	**32.259623**
Normalized	98.57%	100%
Standard Deviation	0.7%	0.1%
John The Ripper - Blowfish (Real C/S)	**83957**	**85069**
Normalized	98.69%	100%
Standard Deviation	0.7%	0.8%
Timed MPlayer Compilation - Time To Compile (sec)	**11.626**	**11.494**
Normalized	98.86%	100%
Standard Deviation	1.3%	0%
Build2 - Time To Compile (sec)	**58.523**	**57.918**

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Normalized	98.97%	100%
Standard Deviation	0.4%	0.3%
Flexible IO Tester - Seq Read - Linux AIO - Yes - No - 2MB (MB/s)	**1894**	**1875**
Normalized	100%	99%
Standard Deviation	1.1%	2.9%
Flexible IO Tester - Seq Read - Linux AIO - Yes - No - 2MB (IOPS)	**943**	**934**
Normalized	100%	99.05%
Standard Deviation	1.2%	2.9%
Flexible IO Tester - Rand Write - Linux AIO - Yes - No - 4KB (IOPS)	**207667**	**209667**
Normalized	99.05%	100%
Standard Deviation	0.7%	0.2%
Timed Apache Compilation - Time To Compile (sec)	**25.010**	**24.774**
Normalized	99.06%	100%
Standard Deviation	0.3%	0.6%
NGINX Benchmark - S.W.P.S (Reqs/sec)	**32180**	**31889**
Normalized	100%	99.1%
Standard Deviation	2.4%	2.4%
PHPBench - P.B.S (Score)	**650576**	**656394**
Normalized	99.11%	100%
Standard Deviation	1%	0.1%
PostMark - D.T.P (TPS)	**5906**	**5952**
Normalized	99.23%	100%
Standard Deviation	1.4%	
Ethr - TCP - Connections/s - 1 (Connections/sec)	**6088**	**6133**
Normalized	99.27%	100%
Standard Deviation	2.5%	1.7%
Flexible IO Tester - Rand Write - Linux AIO - Yes - No - 4KB (MB/s)	**812**	**818**
Normalized	99.27%	100%
Standard Deviation	0.6%	0.3%
Himeno Benchmark - P.P.S (MFLOPS)	**3500**	**3522**
Normalized	99.38%	100%
Standard Deviation	0.2%	0.3%
NAS Parallel Benchmarks - EP.D (Mop/s)	**6562**	**6602**
Normalized	99.4%	100%
Standard Deviation	2.3%	2.2%
Timed GDB GNU Debugger Compilation - Time To Compile (sec)	**131.434**	**130.709**
Normalized	99.45%	100%
Standard Deviation	0.2%	0.2%
NAS Parallel Benchmarks - SP.B (Mop/s)	**70967**	**70578**
Normalized	100%	99.45%
Standard Deviation	0.1%	0.4%
Timed PHP Compilation - Time To Compile (sec)	**41.032**	**40.824**
Normalized	99.49%	100%
Standard Deviation	1%	0.7%
Flexible IO Tester - Seq Write - Linux AIO - Yes - No - 2MB (IOPS)	**443**	**445**
Normalized	99.55%	100%
Standard Deviation	2.2%	
MariaDB - 256 (Queries/sec)	**458**	**460**

Normalized	99.57%	100%
Standard Deviation	0.5%	0.1%
Renaissance - I.M.D.S (ms)	**17906**	**17829**
Normalized	99.57%	100%
Standard Deviation	2.2%	4.1%
NAS Parallel Benchmarks - FT.C (Mop/s)	**48097**	**47906**
Normalized	100%	99.6%
Standard Deviation	0.4%	0%
glibc bench - log2 (nanoseconds)	**7.75881**	**7.72838**
Normalized	99.61%	100%
Standard Deviation	0.1%	0.3%
John The Ripper - MD5 (Real C/S)	**8147000**	**8117000**
Normalized	100%	99.63%
Standard Deviation	0.1%	0.4%
NAS Parallel Benchmarks - BT.C (Mop/s)	**136685**	**136203**
Normalized	100%	99.65%
Standard Deviation	0.4%	0.3%
dav1d - C.1.1.b (FPS)	**66.44**	**66.66**
Normalized	99.67%	100%
Standard Deviation	0.5%	0.2%
NAS Parallel Benchmarks - LU.C (Mop/s)	**139285**	**139705**
Normalized	99.7%	100%
Standard Deviation	0.1%	0.3%
glibc bench - pthread_once (nanoseconds)	**1.69329**	**1.69752**
Normalized	100%	99.75%
Standard Deviation	0.3%	0.3%
rays1bench - Large Scene (mrays/s)	**254.15**	**254.77**
Normalized	99.76%	100%
Standard Deviation	0.4%	0.2%
Flexible IO Tester - Seq Write - Linux AIO - Yes - No - 2MB (MB/s)	**894**	**896**
Normalized	99.78%	100%
Standard Deviation	2.1%	0.5%
NAMD - ATPase Simulation - 327,506 Atoms (days/ns)	**0.36248**	**0.36170**
Normalized	99.78%	100%
Standard Deviation	0.8%	0.3%
NAS Parallel Benchmarks - MG.C (Mop/s)	**68588**	**68445**
Normalized	100%	99.79%
Standard Deviation	2.1%	2.4%
glibc bench - ffs (nanoseconds)	**1.68254**	**1.67914**
Normalized	99.8%	100%
Standard Deviation	0.1%	0.2%
Timed Linux Kernel Compilation - Time To Compile	**24.282**	**24.233**
Normalized	99.8%	100%
Standard Deviation	3.5%	3.6%
OSBench - Create Threads (us/Event)	**18.156370**	**18.119812**
Normalized	99.8%	100%
Standard Deviation	0.6%	1.4%
Blender - Barbershop - CPU-Only (sec)	**154.71**	**154.49**
Normalized	99.86%	100%
Standard Deviation	0.5%	0.1%
Timed FFmpeg Compilation - Time To Compile (sec)	**22.602**	**22.571**
Normalized	99.86%	100%
Standard Deviation	0.6%	0.7%
Timed LLVM Compilation - Time To Compile (sec)	**112.31**	**112.172**

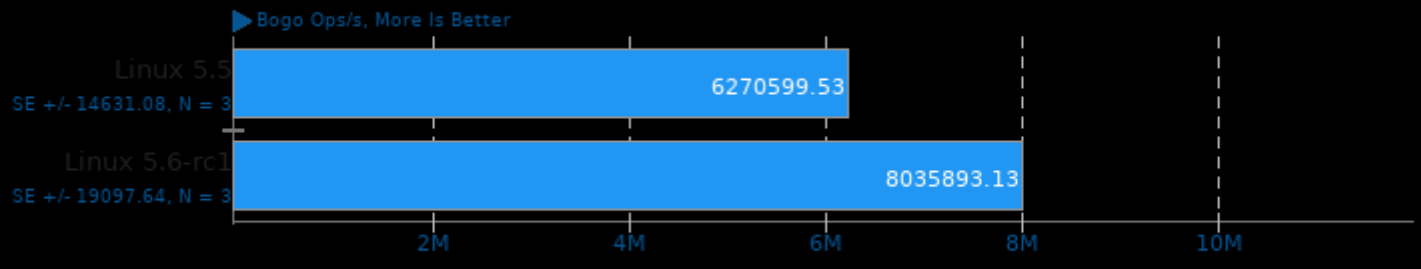
Normalized	99.88%	100%
High Performance Conjugate Gradient (GFLOP/s)	**29.0645**	**29.0295**
Normalized	100%	99.88%
Standard Deviation	0.6%	1.3%
PyBench - T.F.A.T.T (Milliseconds)	**1084**	**1085**
Normalized	100%	99.91%
Standard Deviation	0.2%	0.2%
dav1d - Summer Nature 4K (FPS)	**202.02**	**202.20**
Normalized	99.91%	100%
Standard Deviation	0.3%	1.6%
iPerf - 5201 - 30 Seconds - TCP - 20 (Mbits/s)	**32481**	**32456**
Normalized	100%	99.92%
Standard Deviation	0.5%	0.5%
Stress-NG - Forking (Bogo Ops/s)	**71729**	**71778**
Normalized	99.93%	100%
Standard Deviation	1.5%	4%
OSBench - Memory Allocations (Ns/Event)	**88.479678**	**88.452021**
Normalized	99.97%	100%
Standard Deviation	0.1%	0.5%
Blender - Classroom - CPU-Only (sec)	**100.07**	**100.10**
Normalized	100%	99.97%
Standard Deviation	0.2%	0.3%
iPerf - 5201 - 30 Seconds - UDP - 1000Mbit Objective - 20 (Mbits/s)	**20000**	**19999**
Normalized	100%	100%
Standard Deviation		0%
ctx_clock - C.S.T (Clocks)	135	135
Standard Deviation	0.9%	0.9%
BenchmarkMutex - S.R.A.A (ns)	17.1	17.1
Standard Deviation	0.3%	0%
BenchmarkMutex - M.L.U.s.m (ns)	20.2	20.2
Standard Deviation	0%	0.3%
iPerf - 5201 - 30 Seconds - UDP - 20 (Mbits/s)	21.0	21
Standard Deviation	0.3%	
Facebook RocksDB - Read While Writing (Op/s)	**6728329**	**6502739**
Normalized	100%	96.65%
Standard Deviation	11%	2.9%
Stress-NG - Context Switching (Bogo Ops/s)	**22556365**	**22651798**
Normalized	99.58%	100%
Standard Deviation	6.6%	7.7%
glibc bench - cos (nanoseconds)	**48.2170**	**49.4269**
Normalized	100%	97.55%
Standard Deviation	0.2%	8.7%
DeepSpeech - CPU (sec)	**140.87554**	**152.79637**
Normalized	100%	92.2%
Standard Deviation	13.4%	4.6%
Renaissance - A.U.C.T (ms)	**24119**	**22592**
Normalized	93.67%	100%
Standard Deviation	20.7%	4.1%
Renaissance - Savina Reactors.IO (ms)	**27801**	**28492**
Normalized	100%	97.58%
Standard Deviation	7.6%	8.1%
Ethr - HTTP - Bandwidth - 1 (Mbits/s)	**216547265842**	**217349843967**
Normalized	99.63%	100%
Standard Deviation	103.5%	103.5%

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Ethr - TCP - Latency - 1 (us)	**21.58**	**20.69**
Normalized	95.88%	100%
Standard Deviation	11.1%	13.5%

Stress-NG 0.07.26

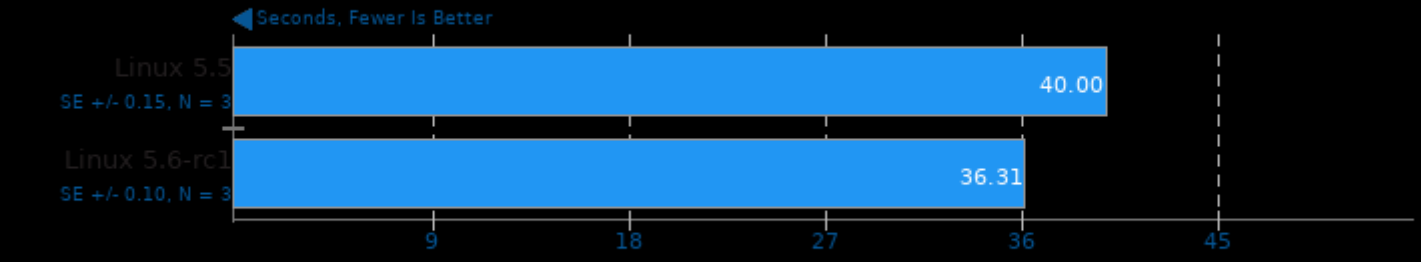
Test: System V Message Passing



1. (CC) gcc options: -O2 -std=gnu99 -lm -lz -lcrypt -lrt -lpthread -laio -lc

Hackbench

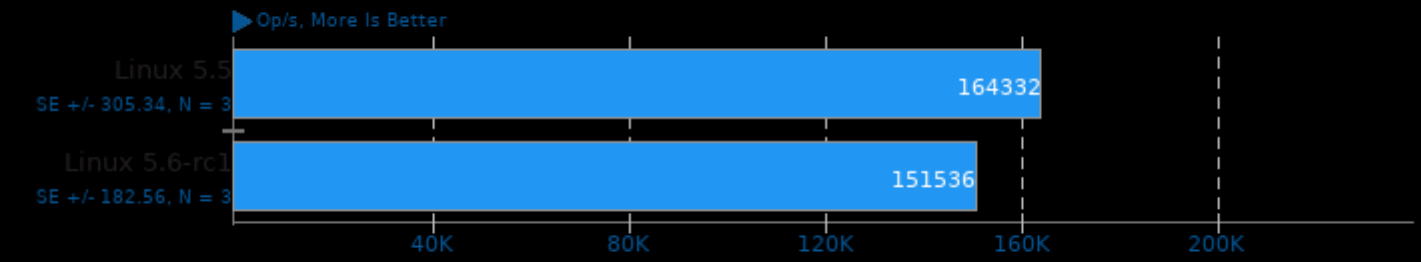
Count: 32 - Type: Process



1. (CC) gcc options: -lpthread

Facebook RocksDB 6.3.6

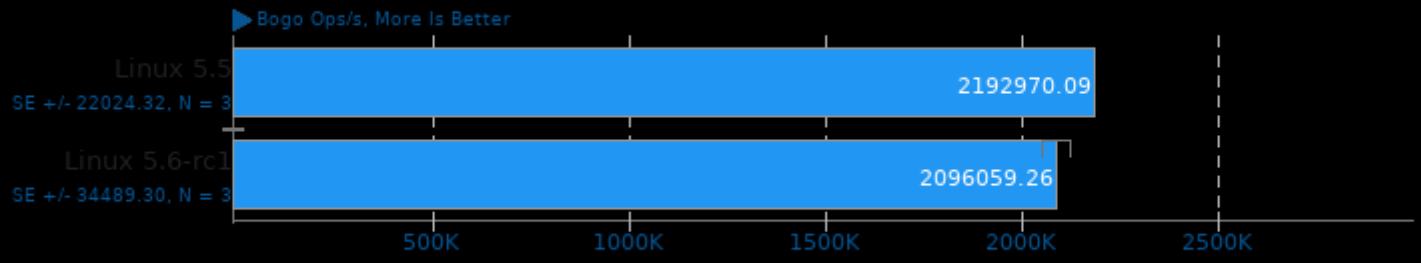
Test: Random Fill Sync



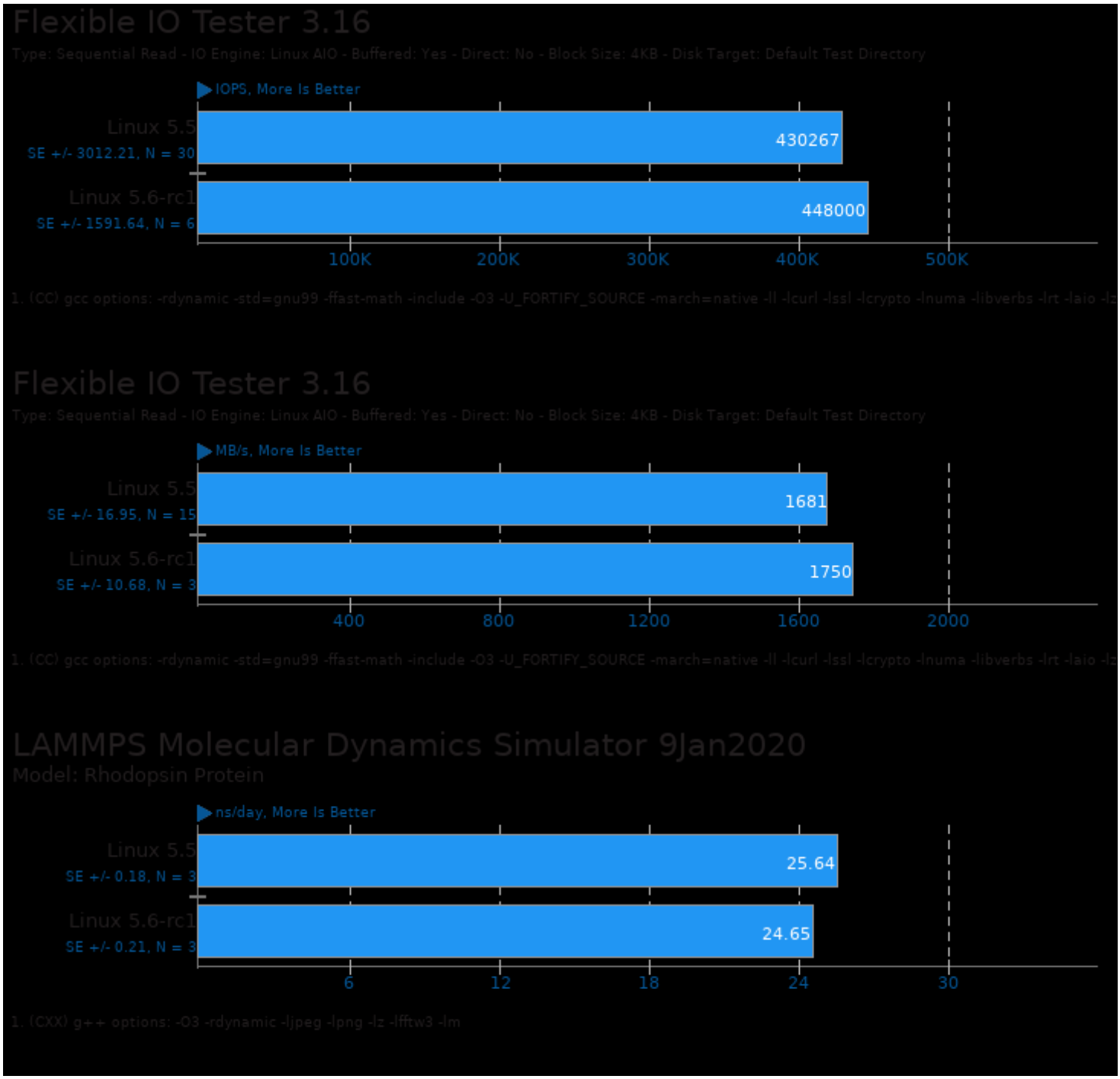
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fno-builtin-memcmp -fno-rtti -rdynamic -lpthread

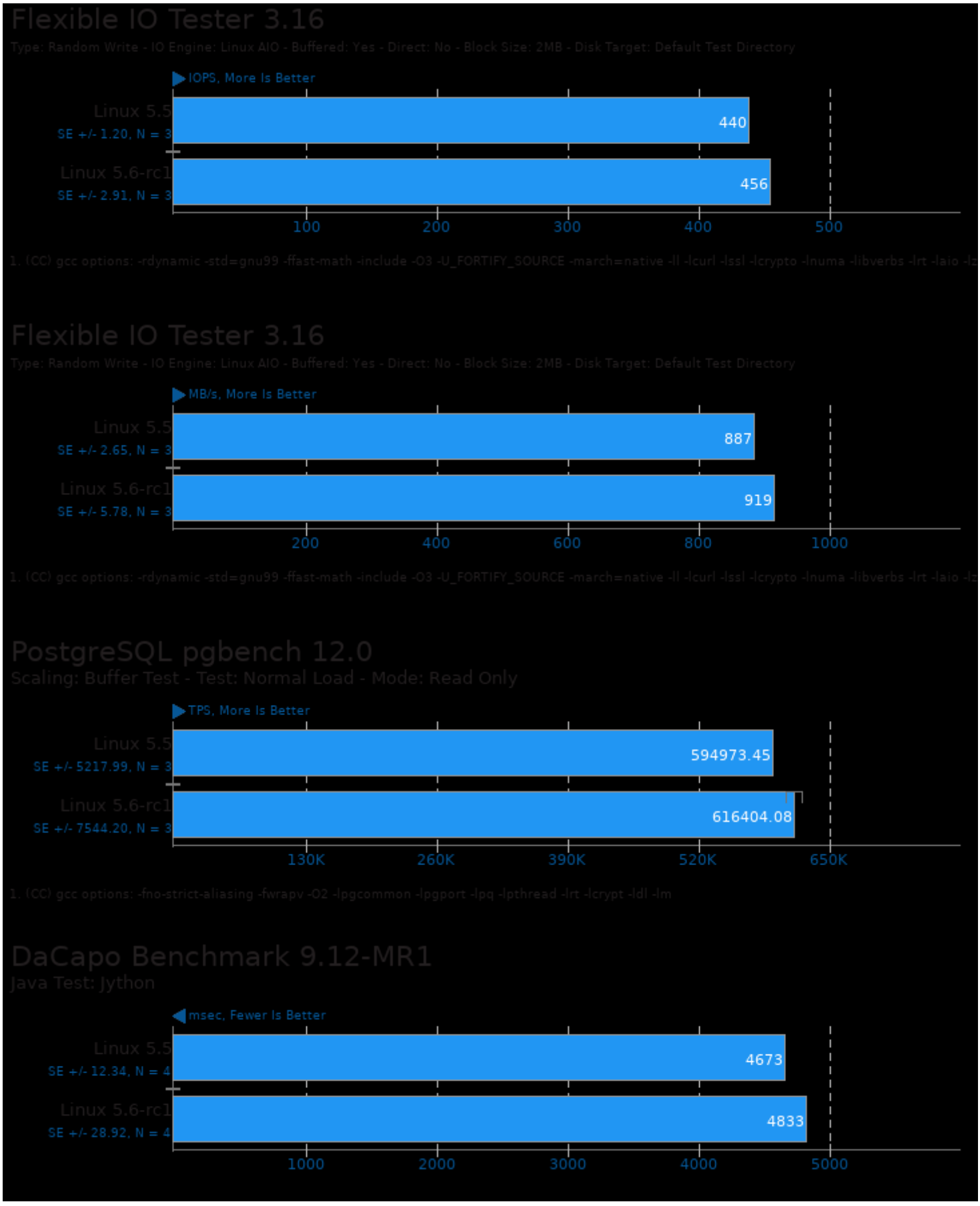
Stress-NG 0.07.26

Test: Semaphores



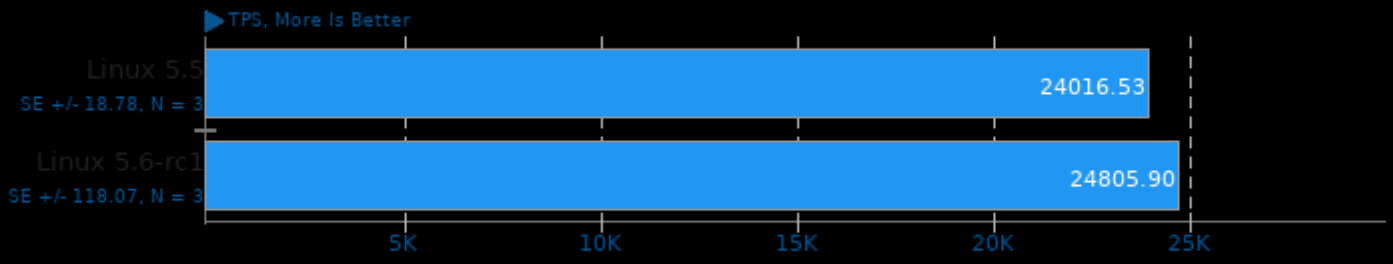
1. (CC) gcc options: -O2 -std=gnu99 -lm -lz -lcrypt -lrt -lpthread -laio -lc


Flexible IO Tester 3.16
Type: Sequential Read - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 4KB - Disk Target: Default Test Directory
IOPS, More Is Better
Linux 5.5
SE +/- 3012.21, N = 30
430267
Linux 5.6-rc1
SE +/- 1591.64, N = 6
448000
100K
200K
300K
400K
500K
1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio -l
Flexible IO Tester 3.16
Type: Sequential Read - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 4KB - Disk Target: Default Test Directory
MB/s, More Is Better
Linux 5.5
SE +/- 16.95, N = 15
1681
Linux 5.6-rc1
SE +/- 10.68, N = 3
1750
400
800
1200
1600
2000
1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio -l
LAMMPS Molecular Dynamics Simulator 9Jan2020
Model: Rhodopsin Protein
ns/day, More Is Better
Linux 5.5
SE +/- 0.18, N = 3
25.64
Linux 5.6-rc1
SE +/- 0.21, N = 3
24.65
6
12
18
24
30
1. (CXX) g++ options: -O3 -rdynamic -ljpeg -lpng -lz -lfftw3 -lm


Flexible IO Tester 3.16
Type: Random Write - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 2MB - Disk Target: Default Test Directory
IOPS, More Is Better
Linux 5.5
SE +/- 1.20, N = 3
440
Linux 5.6-rc1
SE +/- 2.91, N = 3
456
100
200
300
400
500
1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio -l
Flexible IO Tester 3.16
Type: Random Write - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 2MB - Disk Target: Default Test Directory
MB/s, More Is Better
Linux 5.5
SE +/- 2.65, N = 3
887
Linux 5.6-rc1
SE +/- 5.78, N = 3
919
200
400
600
800
1000
1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio -l
PostgreSQL pgbench 12.0
Scaling: Buffer Test - Test: Normal Load - Mode: Read Only
TPS, More Is Better
Linux 5.5
SE +/- 5217.99, N = 3
594973.45
Linux 5.6-rc1
SE +/- 7544.20, N = 3
616404.08
130K
260K
390K
520K
650K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -lcrypt -ldl -lm
DaCapo Benchmark 9.12-MR1
Java Test: Jython
msec, Fewer Is Better
Linux 5.5
SE +/- 12.34, N = 4
4673
Linux 5.6-rc1
SE +/- 28.92, N = 4
4833
1000
2000
3000
4000
5000

PostgreSQL pgbench 12.0

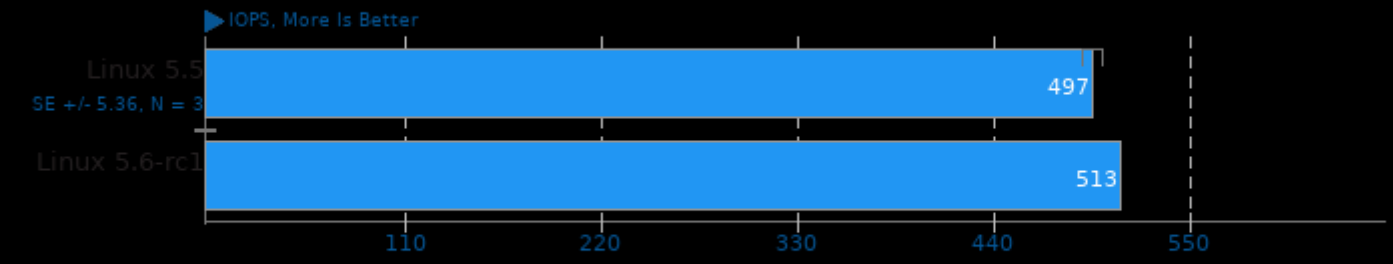
Scaling: Buffer Test - Test: Normal Load - Mode: Read Write



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

Flexible IO Tester 3.16

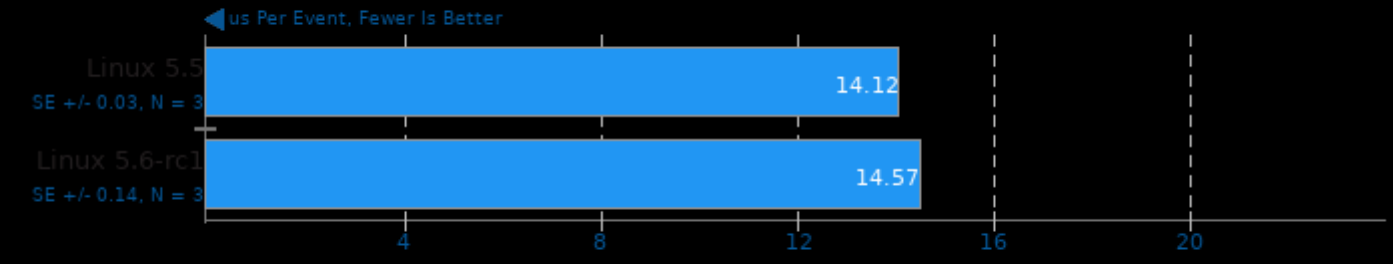
Type: Random Read - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 2MB - Disk Target: Default Test Directory



1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio -l

OSBench

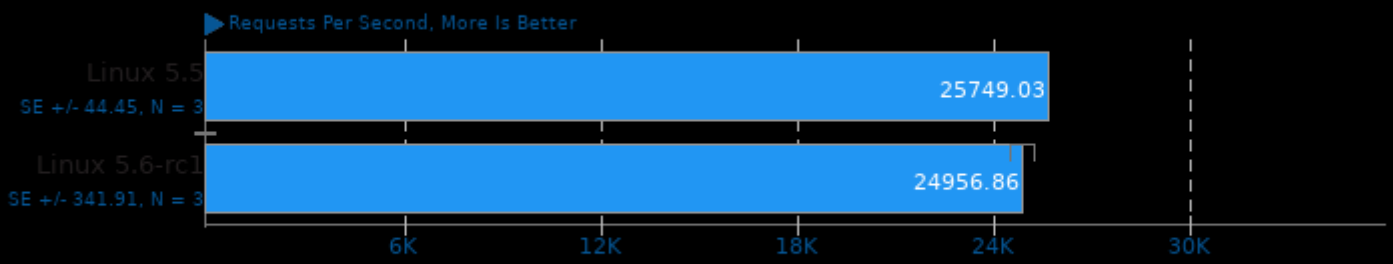
Test: Create Files



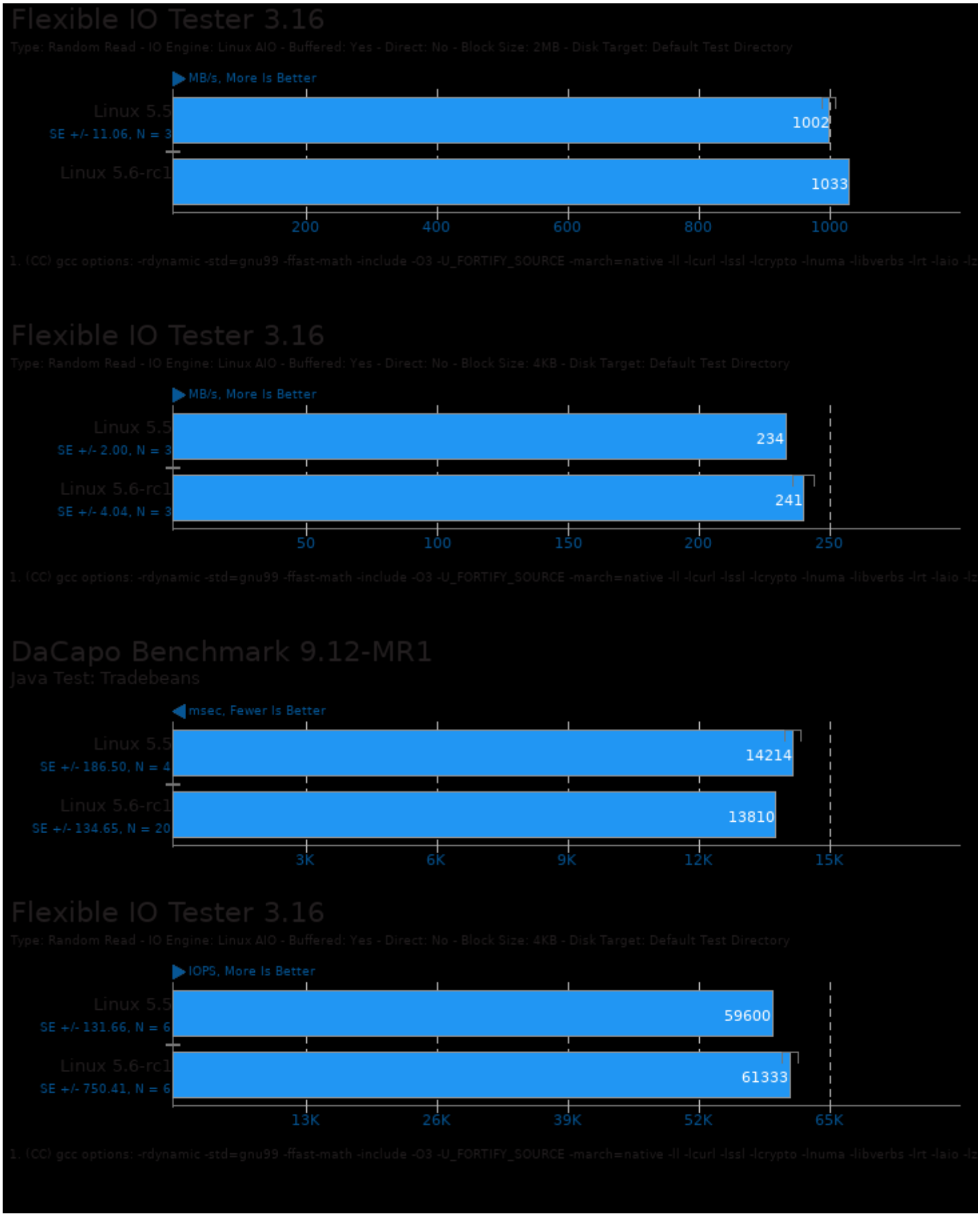
1. (CC) gcc options: -lm

Apache Benchmark 2.4.29

Static Web Page Serving

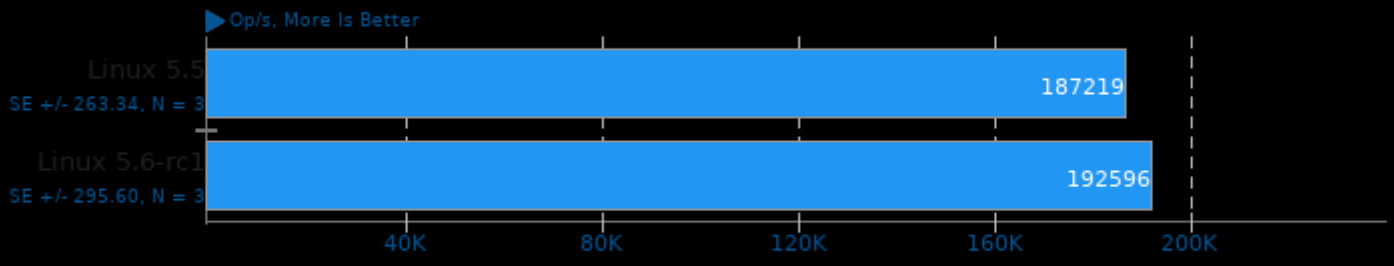


1. (CC) gcc options: -shared -fPIC -O2 -pthread


Flexible IO Tester 3.16
Type: Random Read - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 2MB - Disk Target: Default Test Directory
MB/s, More Is Better
Linux 5.5
SE +/- 11.06, N = 3
1002
Linux 5.6-rc1
1033
200
400
600
800
1000
1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio -l
Flexible IO Tester 3.16
Type: Random Read - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 4KB - Disk Target: Default Test Directory
MB/s, More Is Better
Linux 5.5
SE +/- 2.00, N = 3
234
Linux 5.6-rc1
SE +/- 4.04, N = 3
241
50
100
150
200
250
1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio -l
DaCapo Benchmark 9.12-MR1
Java Test: Tradebeans
msec, Fewer Is Better
Linux 5.5
SE +/- 186.50, N = 4
14214
Linux 5.6-rc1
SE +/- 134.65, N = 20
13810
3K
6K
9K
12K
15K
Flexible IO Tester 3.16
Type: Random Read - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 4KB - Disk Target: Default Test Directory
IOPS, More Is Better
Linux 5.5
SE +/- 131.66, N = 6
59600
Linux 5.6-rc1
SE +/- 750.41, N = 6
61333
13K
26K
39K
52K
65K
1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio -l

Facebook RocksDB 6.3.6

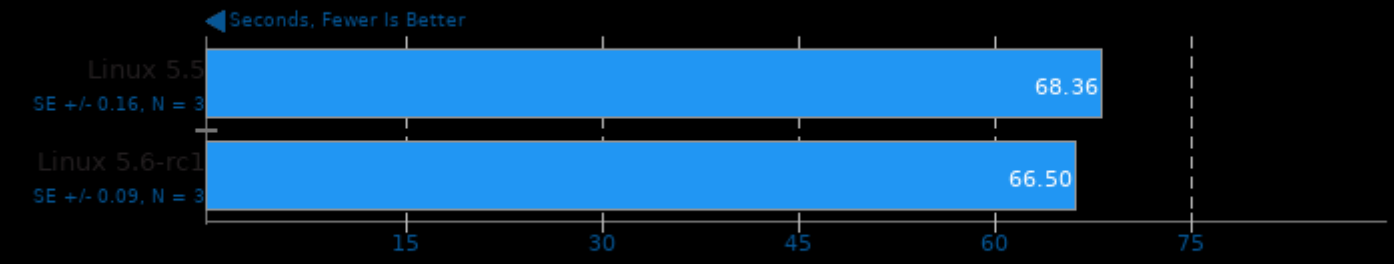
Test: Sequential Fill



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

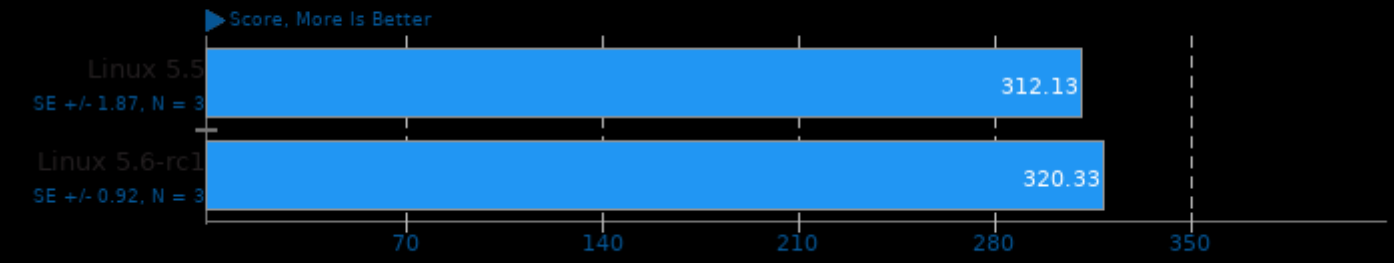
SQLite Speedtest 3.30

Timed Time - Size 1,000



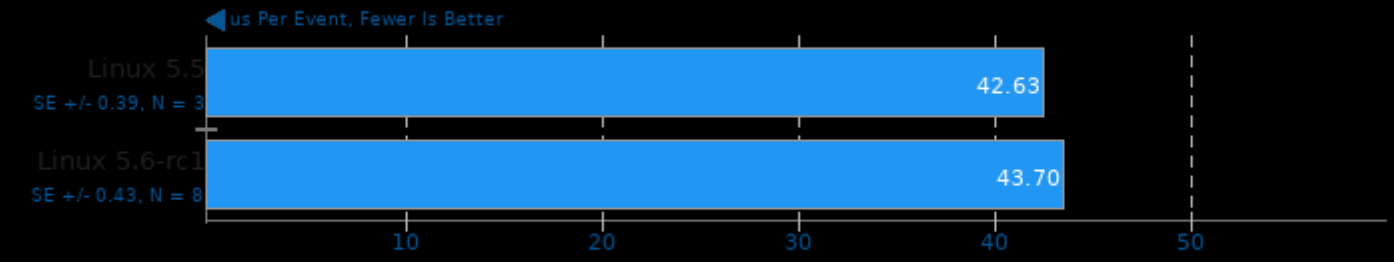
1. (CC) gcc options: -O2 -ldl -lz -lpthread

Numpy Benchmark

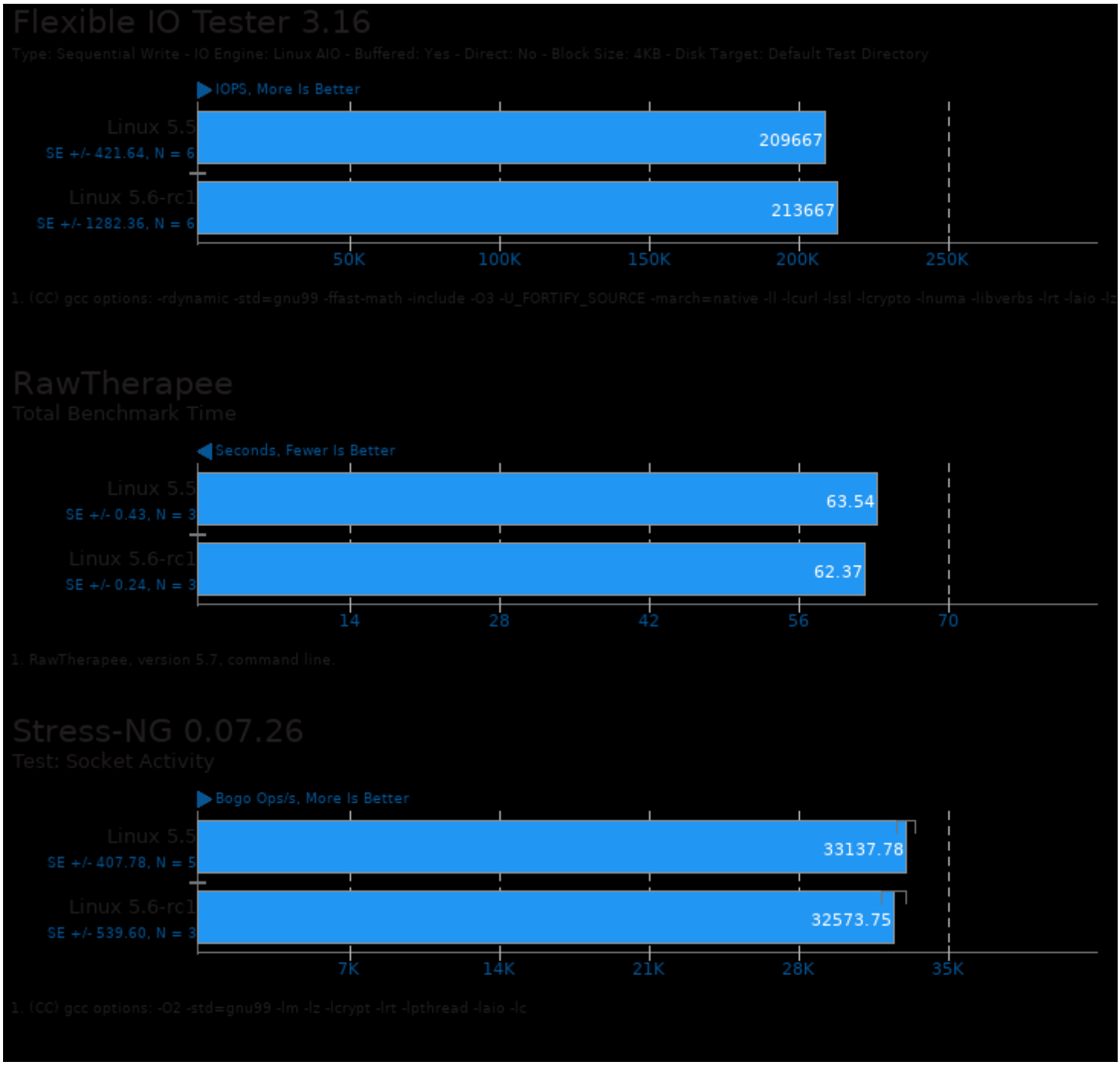


OSBench

Test: Launch Programs

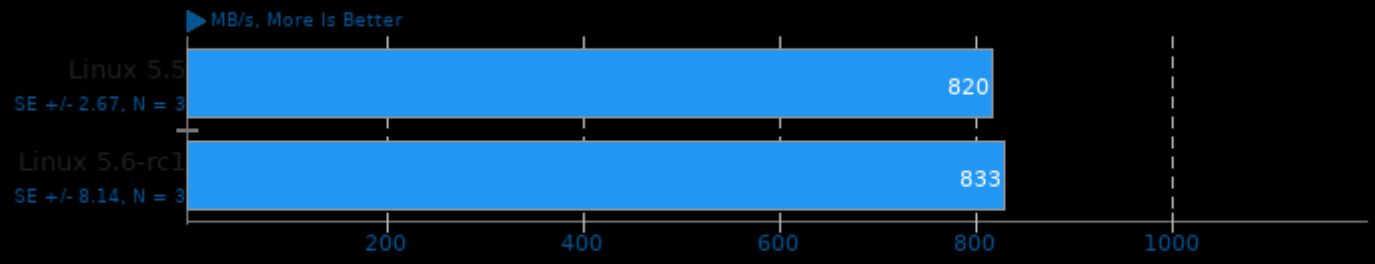


1. (CC) gcc options: -lm


Flexible IO Tester 3.16
Type: Sequential Write - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 4KB - Disk Target: Default Test Directory
IOPS, More Is Better
Linux 5.5
SE +/- 421.64, N = 6
209667
Linux 5.6-rc1
SE +/- 1282.36, N = 6
213667
50K
100K
150K
200K
250K
1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio -l
RawTherapee
Total Benchmark Time
Seconds, Fewer Is Better
Linux 5.5
SE +/- 0.43, N = 3
63.54
Linux 5.6-rc1
SE +/- 0.24, N = 3
62.37
14
28
42
56
70
1. RawTherapee, version 5.7, command line.
Stress-NG 0.07.26
Test: Socket Activity
Bogo Ops/s, More Is Better
Linux 5.5
SE +/- 407.78, N = 5
33137.78
Linux 5.6-rc1
SE +/- 539.60, N = 3
32573.75
7K
14K
21K
28K
35K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lz -lcrypt -lrt -lpthread -laio -lc

Flexible IO Tester 3.16

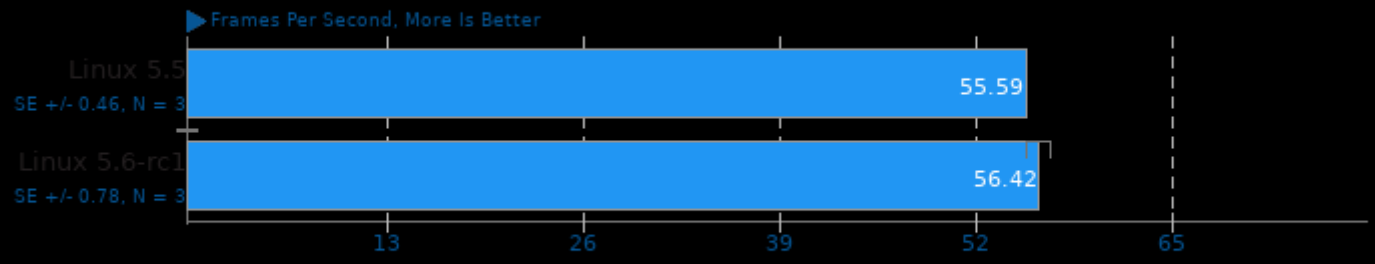
Type: Sequential Write - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 4KB - Disk Target: Default Test Directory



1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio -l

SVT-AV1 0.8

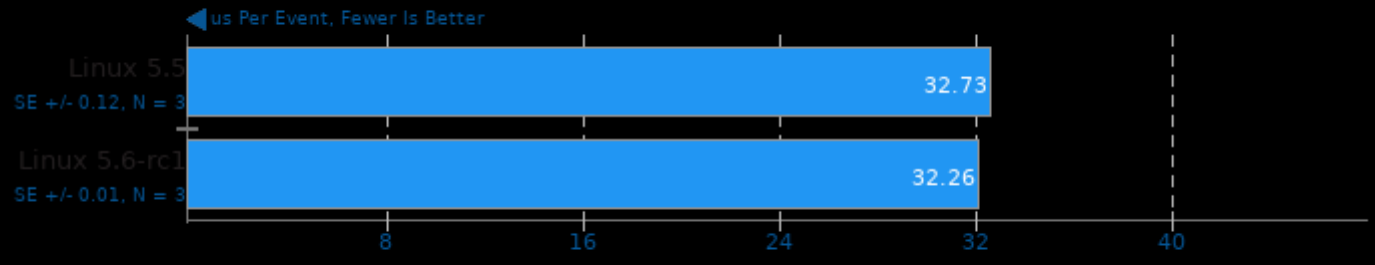
Encoder Mode: Enc Mode 8 - Input: 1080p



1. (CXX) g++ options: -fPIE -fPIC -pie

OSBench

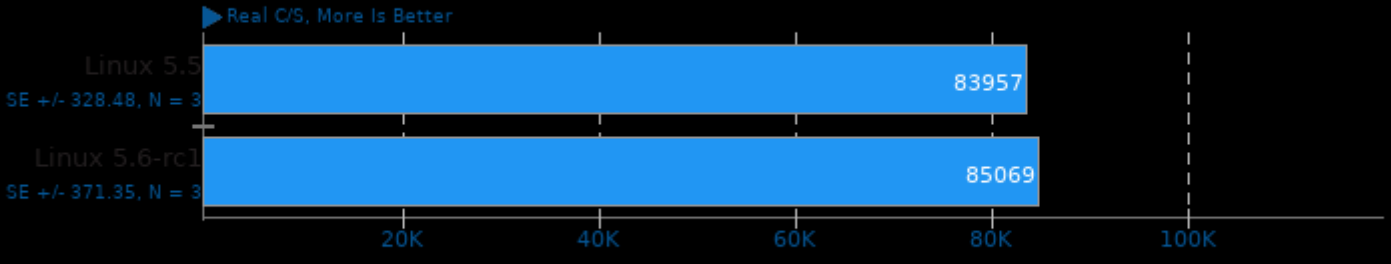
Test: Create Processes



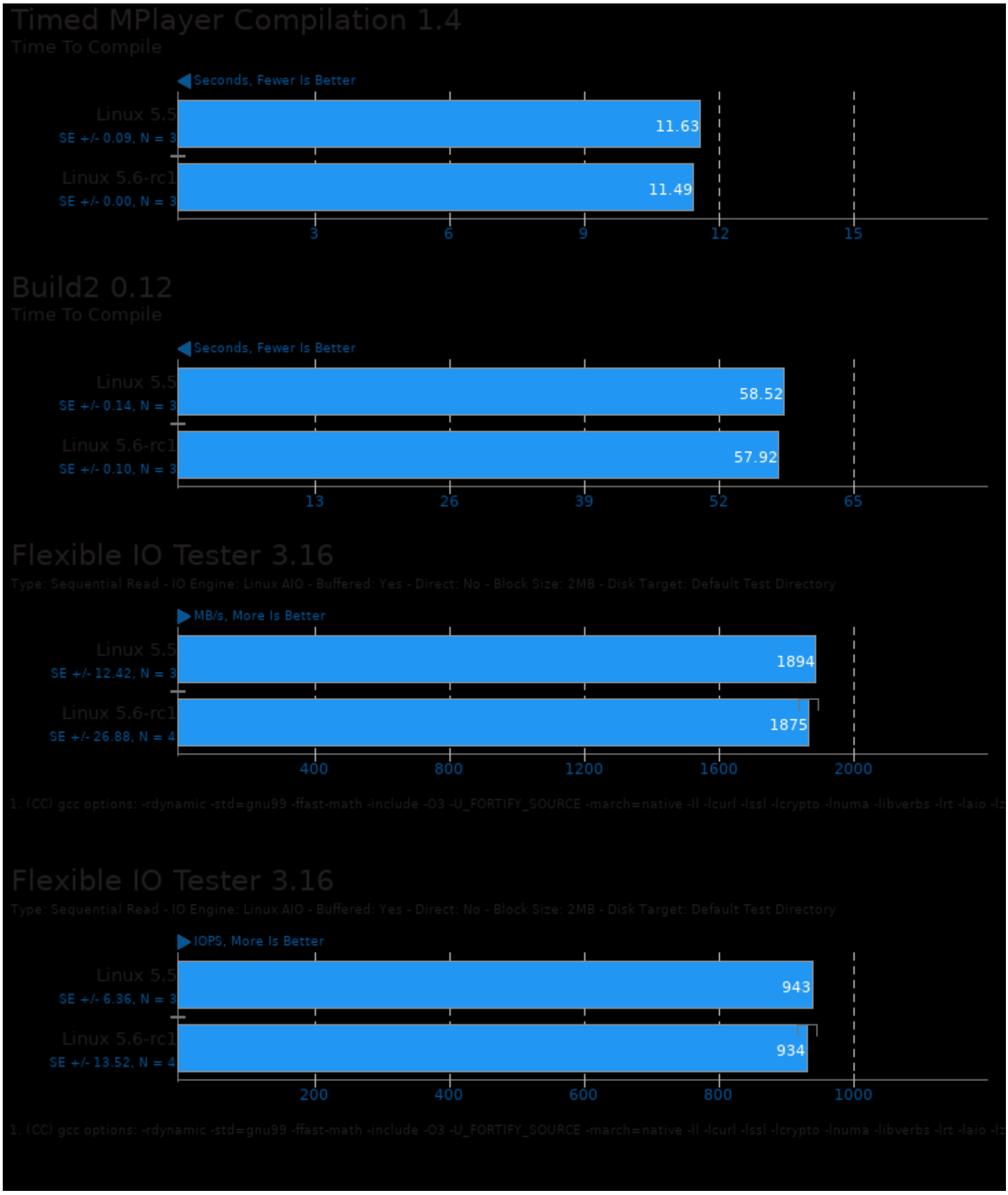
1. (CC) gcc options: -lm

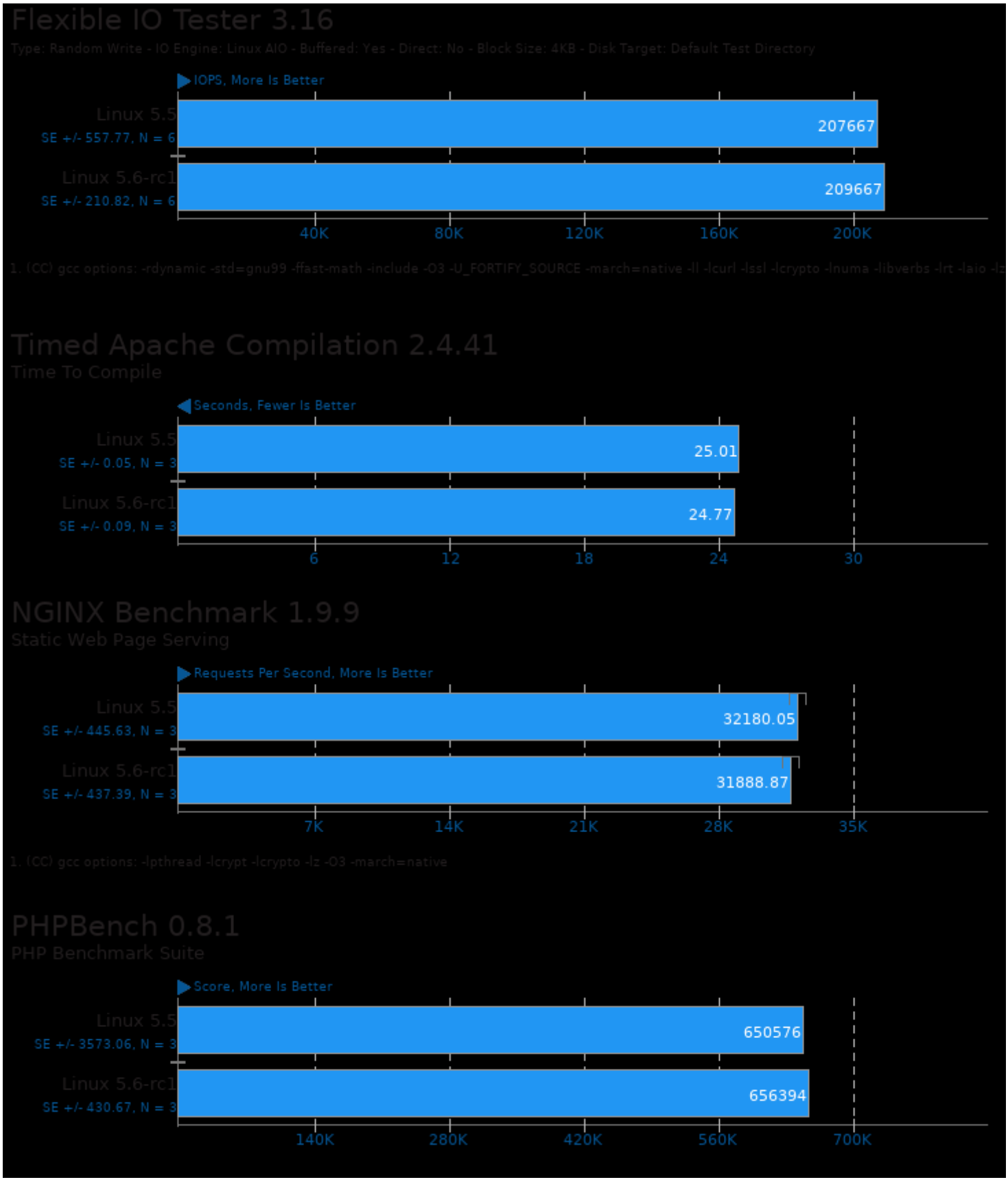
John The Ripper 1.9.0-jumbo-1

Test: Blowfish



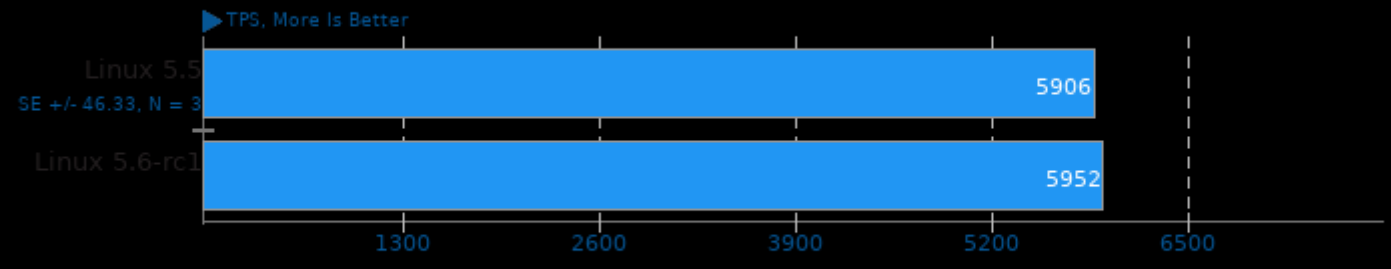
1. (CC) gcc options: -m64 -lssl -lcrypto -fopenmp -lgmp -pthread -lm -lz -ldl -lcrypt -lbz2


Timed MPlayer Compilation 1.4
Time To Compile
Seconds, Fewer Is Better
Linux 5.5
SE +/- 0.09, N = 3
11.63
Linux 5.6-rc1
SE +/- 0.00, N = 3
11.49
3
6
9
12
15
Build2 0.12
Time To Compile
Seconds, Fewer Is Better
Linux 5.5
SE +/- 0.14, N = 3
58.52
Linux 5.6-rc1
SE +/- 0.10, N = 3
57.92
13
26
39
52
65
Flexible IO Tester 3.16
Type: Sequential Read - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 2MB - Disk Target: Default Test Directory
MB/s, More Is Better
Linux 5.5
SE +/- 12.42, N = 3
1894
Linux 5.6-rc1
SE +/- 26.88, N = 4
1875
400
800
1200
1600
2000
1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio -l
Flexible IO Tester 3.16
Type: Sequential Read - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 2MB - Disk Target: Default Test Directory
IOPS, More Is Better
Linux 5.5
SE +/- 6.36, N = 3
943
Linux 5.6-rc1
SE +/- 13.52, N = 4
934
200
400
600
800
1000
1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio -l


Flexible IO Tester 3.16
Type: Random Write - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 4KB - Disk Target: Default Test Directory
IOPS, More Is Better
Linux 5.5
SE +/- 557.77, N = 6
207667
Linux 5.6-rc1
SE +/- 210.82, N = 6
209667
40K
80K
120K
160K
200K
1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio
Timed Apache Compilation 2.4.41
Time To Compile
Seconds, Fewer Is Better
Linux 5.5
SE +/- 0.05, N = 3
25.01
Linux 5.6-rc1
SE +/- 0.09, N = 3
24.77
6
12
18
24
30
NGINX Benchmark 1.9.9
Static Web Page Serving
Requests Per Second, More Is Better
Linux 5.5
SE +/- 445.63, N = 3
32180.05
Linux 5.6-rc1
SE +/- 437.39, N = 3
31888.87
7K
14K
21K
28K
35K
1. (CC) gcc options: -lpthread -lcrypt -lcrypto -lz -O3 -march=native
PHPBench 0.8.1
PHP Benchmark Suite
Score, More Is Better
Linux 5.5
SE +/- 3573.06, N = 3
650576
Linux 5.6-rc1
SE +/- 430.67, N = 3
656394
140K
280K
420K
560K
700K

PostMark 1.51

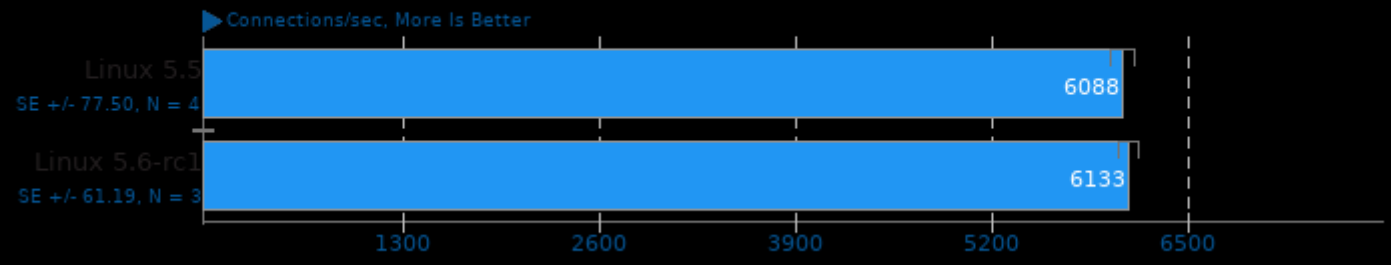
Disk Transaction Performance



1. (CC) gcc options: -O3

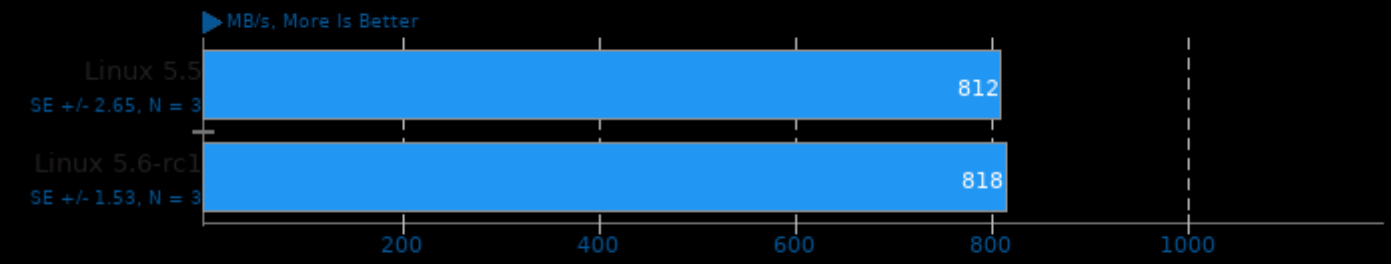
Ethr 2019-01-02

Server Address: localhost - Protocol: TCP - Test: Connections/s - Threads: 1



Flexible IO Tester 3.16

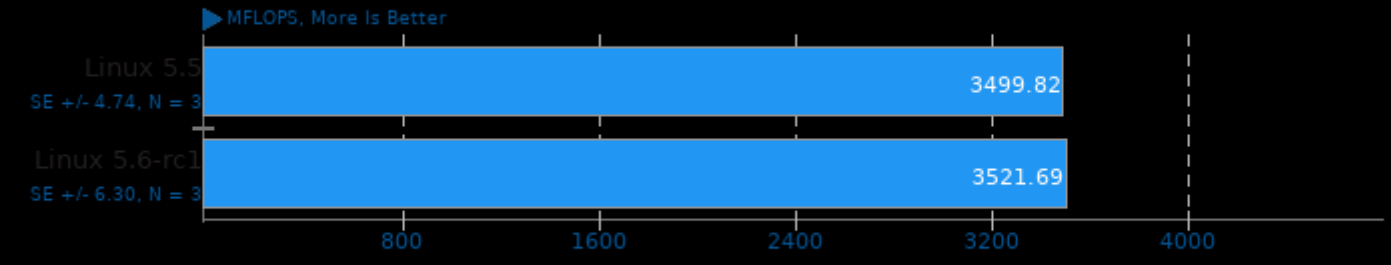
Type: Random Write - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 4KB - Disk Target: Default Test Directory



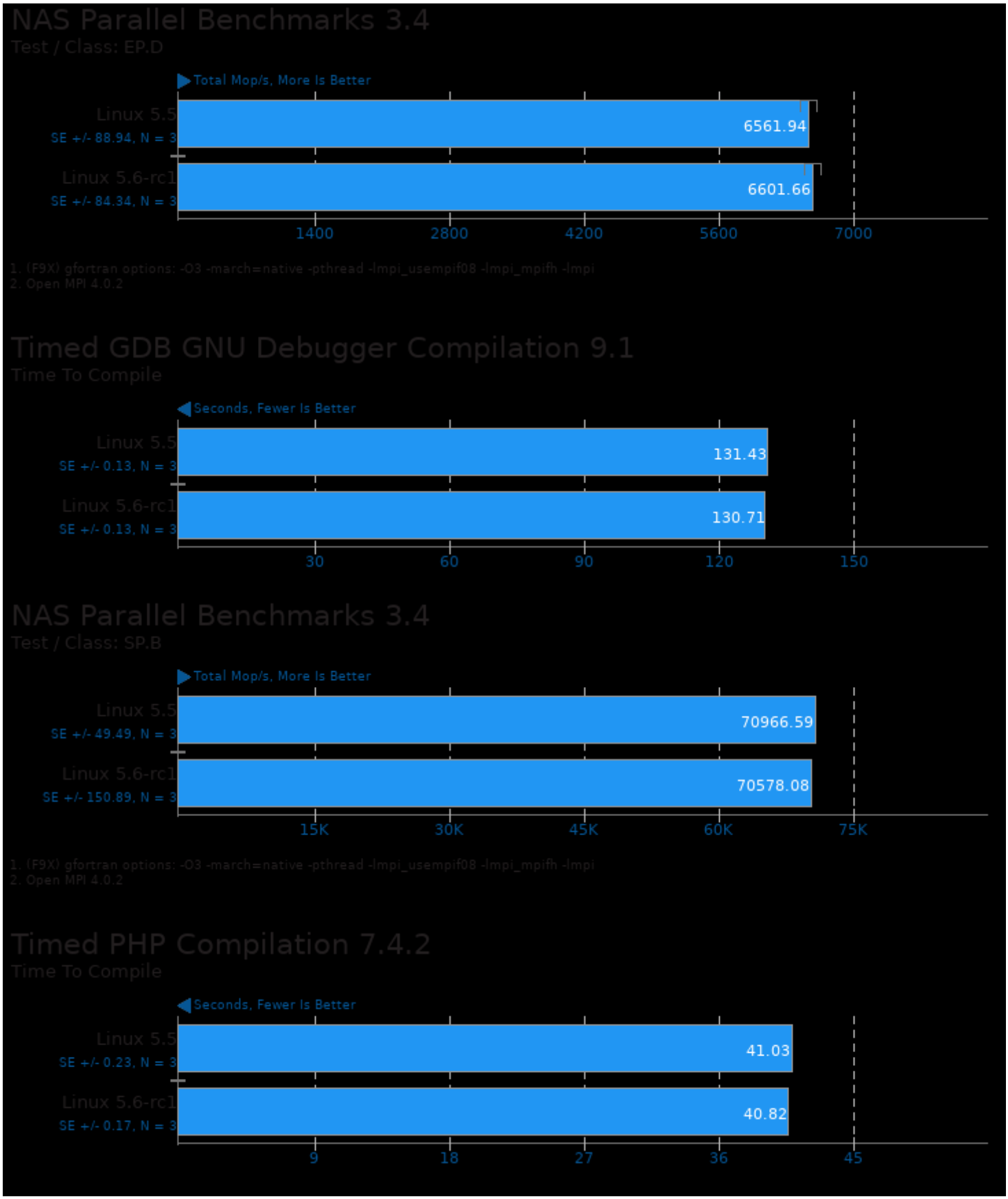
1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio -l

Himeno Benchmark 3.0

Poisson Pressure Solver

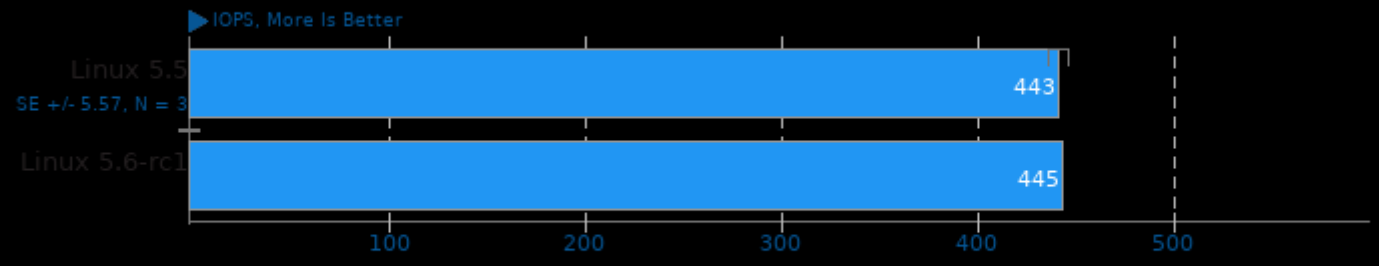


1. (CC) gcc options: -O3 -mavx2


NAS Parallel Benchmarks 3.4
Test / Class: EP.D
Total Mop/s, More Is Better
Linux 5.5
SE +/- 88.94, N = 3
6561.94
Linux 5.6-rc1
SE +/- 84.34, N = 3
6601.66
1400
2800
4200
5600
7000
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.2
Timed GDB GNU Debugger Compilation 9.1
Time To Compile
Seconds, Fewer Is Better
Linux 5.5
SE +/- 0.13, N = 3
131.43
Linux 5.6-rc1
SE +/- 0.13, N = 3
130.71
30
60
90
120
150
NAS Parallel Benchmarks 3.4
Test / Class: SP.B
Total Mop/s, More Is Better
Linux 5.5
SE +/- 49.49, N = 3
70966.59
Linux 5.6-rc1
SE +/- 150.89, N = 3
70578.08
15K
30K
45K
60K
75K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.2
Timed PHP Compilation 7.4.2
Time To Compile
Seconds, Fewer Is Better
Linux 5.5
SE +/- 0.23, N = 3
41.03
Linux 5.6-rc1
SE +/- 0.17, N = 3
40.82
9
18
27
36
45

Flexible IO Tester 3.16

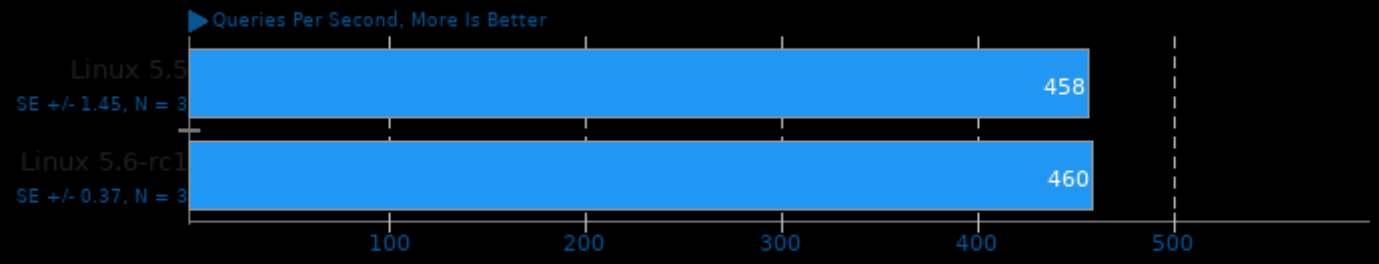
Type: Sequential Write - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 2MB - Disk Target: Default Test Directory



1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio -l

MariaDB 10.3.8

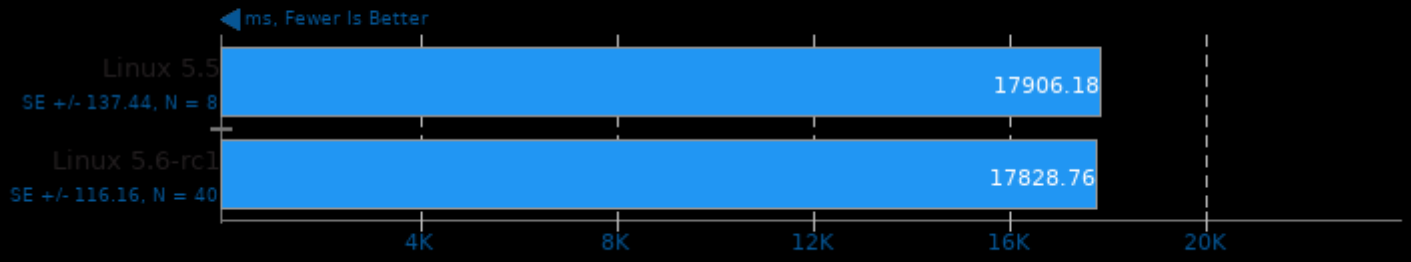
Clients: 256



1. (CXX) g++ options: -pie -fPIC -fstack-protector -fno-rtti -O2 -lpthread -llzma -lbz2 -laio -lnuma -lz -lm -lpcre -lcrypt -lssl -lcrypto -ldl

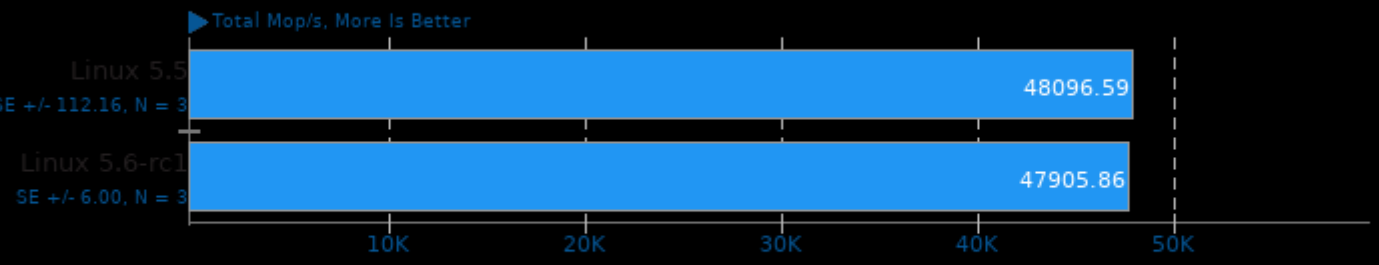
Renaissance 0.9.0

Test: In-Memory Database Shootout



NAS Parallel Benchmarks 3.4

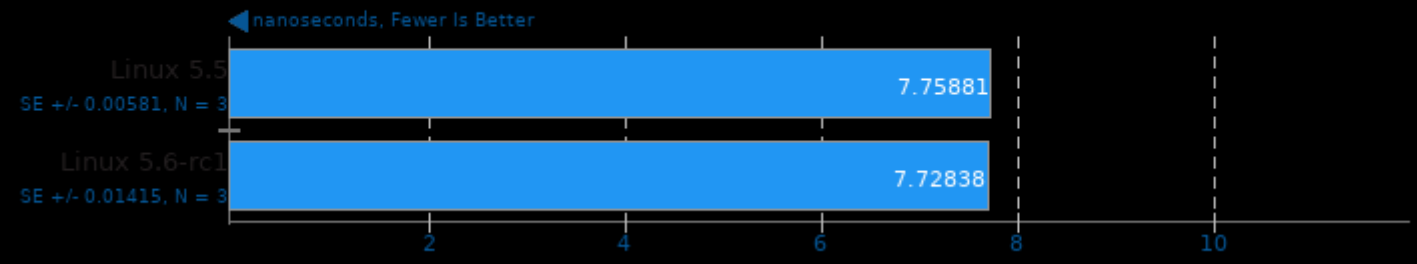
Test / Class: FT.C



1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.2

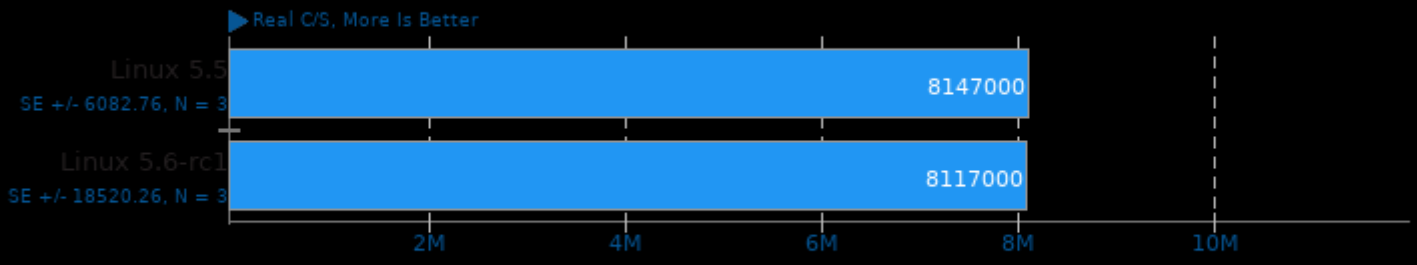
glibc bench 1.0

Benchmark: log2



John The Ripper 1.9.0-jumbo-1

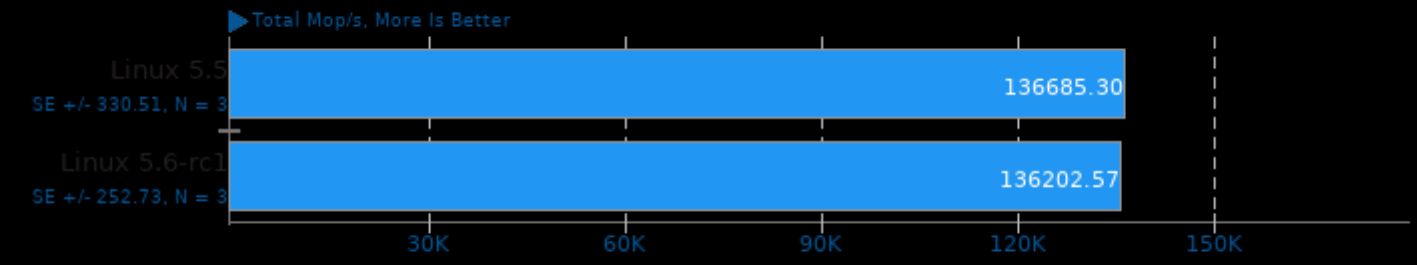
Test: MD5



1. (CC) gcc options: -m64 -lssl -lcrypto -fopenmp -lgmp -pthread -lm -lz -ldl -lcrypt -lbz2

NAS Parallel Benchmarks 3.4

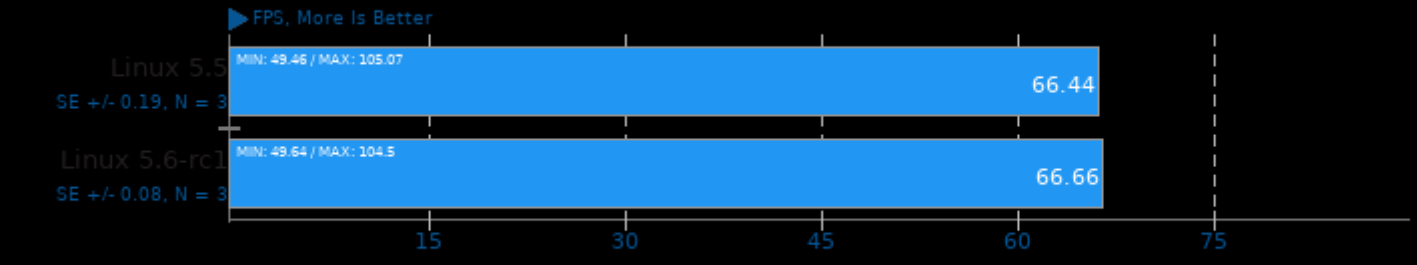
Test / Class: BT.C



1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.2

dav1d 0.5.0

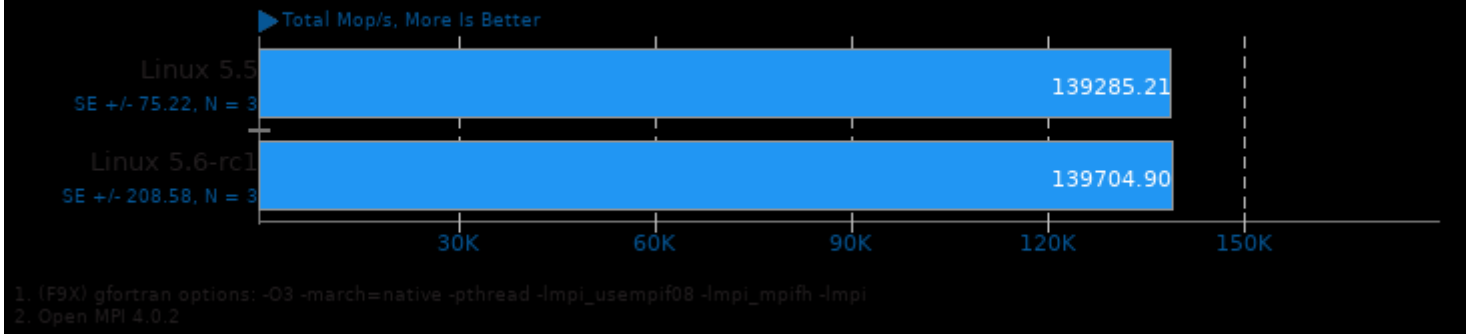
Video Input: Chimera 1080p 10-bit



1. (CC) gcc options: -pthread

NAS Parallel Benchmarks 3.4

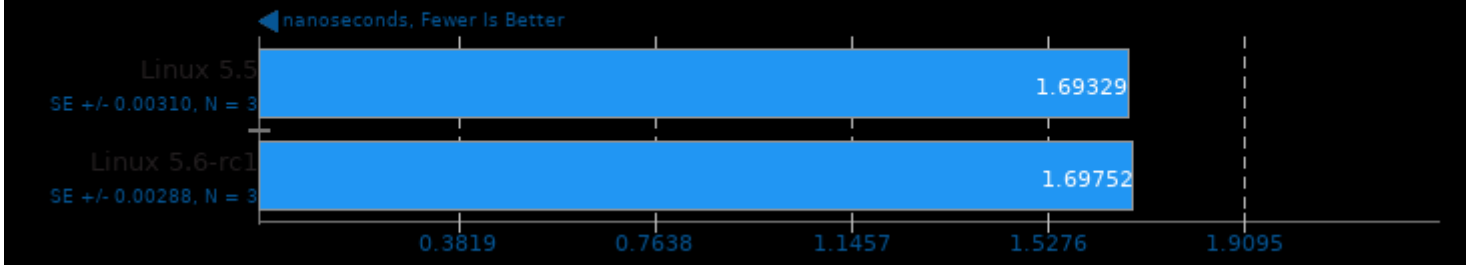
Test / Class: LU.C



1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.2

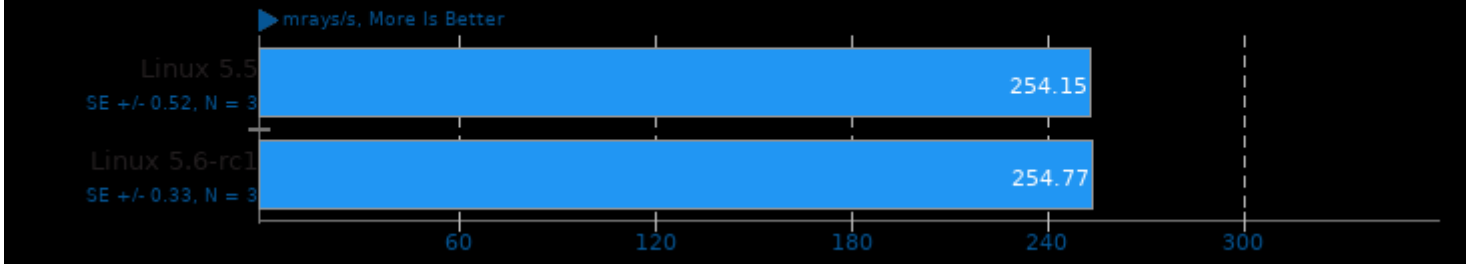
glibc bench 1.0

Benchmark: pthread_once



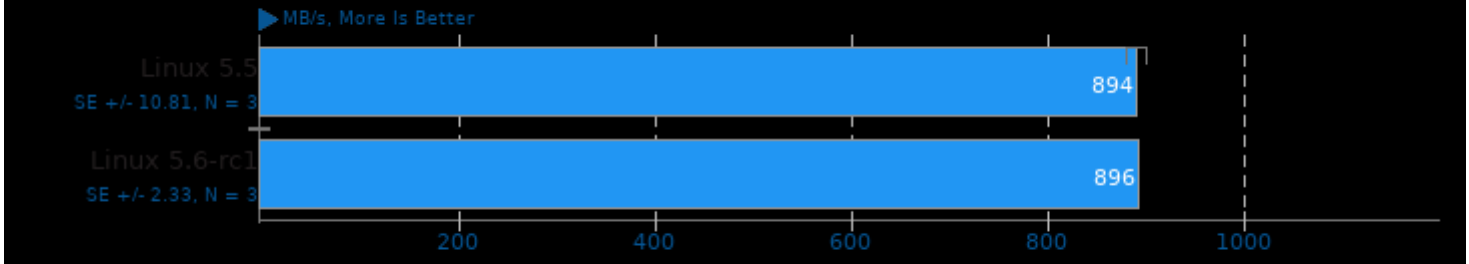
rays1bench 2020-01-09

Large Scene

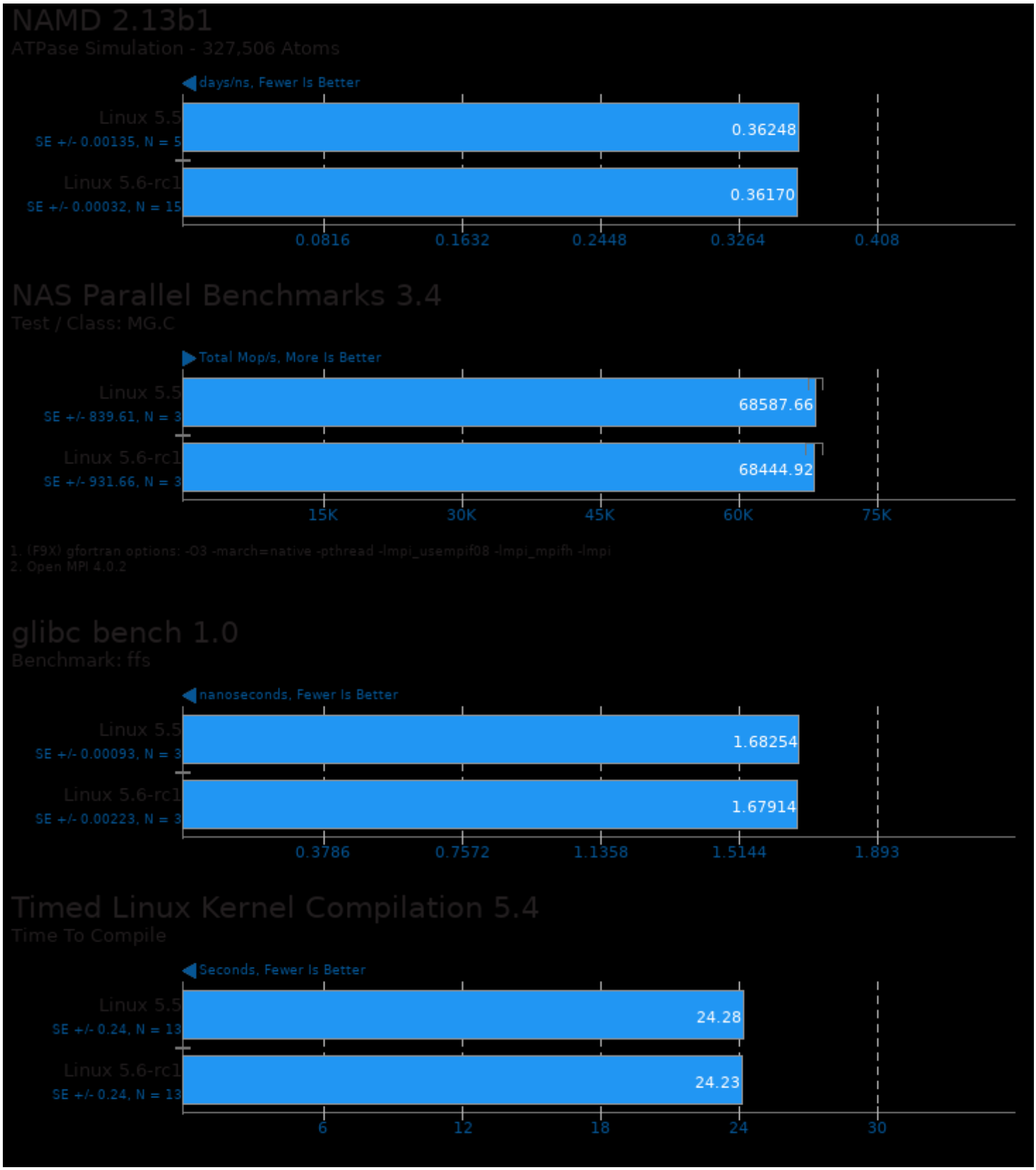


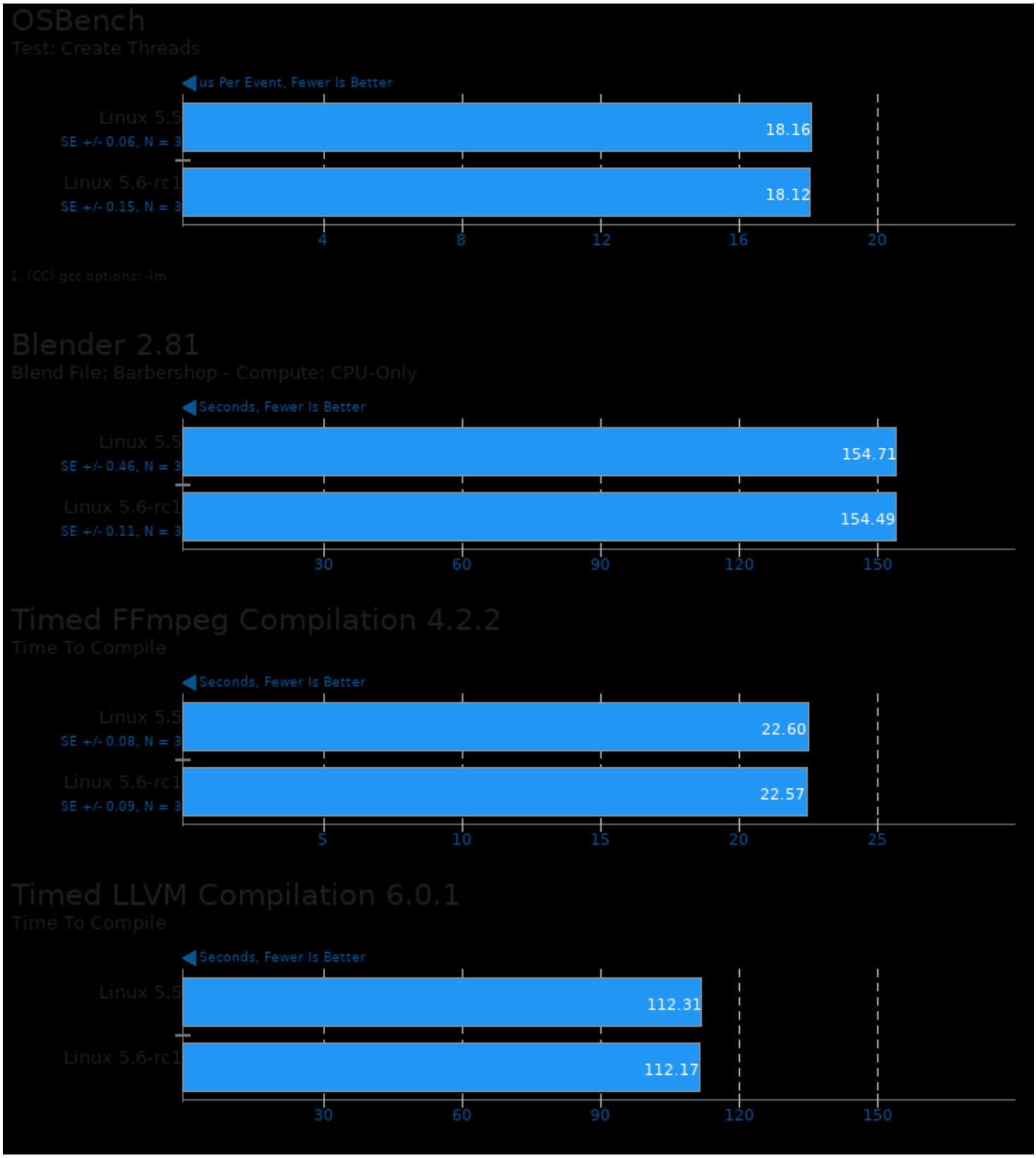
Flexible IO Tester 3.16

Type: Sequential Write - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 2MB - Disk Target: Default Test Directory

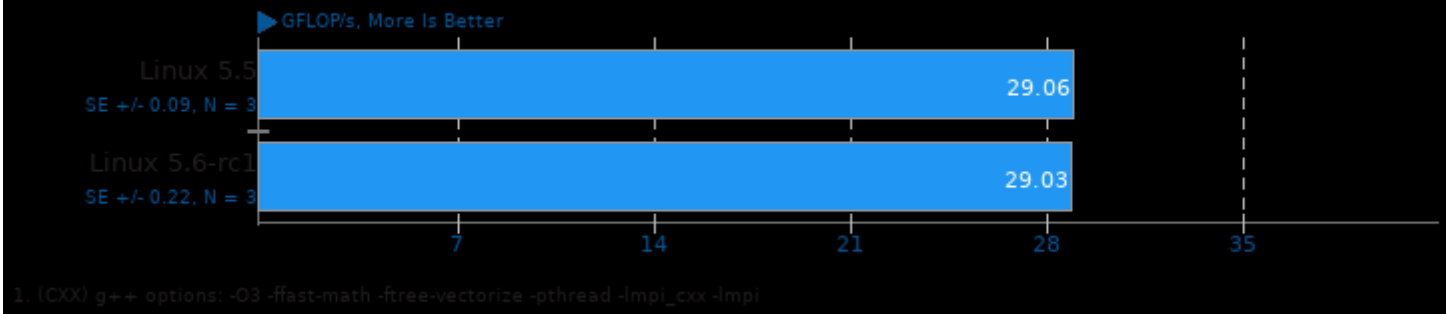


1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -march=native -ll -lcurl -lssl -lcrypto -lnuma -libverbs -lrt -laio -l


NAMD 2.13b1
ATPase Simulation - 327,506 Atoms
days/ns, Fewer Is Better
Linux 5.5
SE +/- 0.00135, N = 5
0.36248
Linux 5.6-rc1
SE +/- 0.00032, N = 15
0.36170
0.0816
0.1632
0.2448
0.3264
0.408
NAS Parallel Benchmarks 3.4
Test / Class: MG.C
Total Mop/s, More Is Better
Linux 5.5
SE +/- 839.61, N = 3
68587.66
Linux 5.6-rc1
SE +/- 931.66, N = 3
68444.92
15K
30K
45K
60K
75K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.2
glibc bench 1.0
Benchmark: ffs
nanoseconds, Fewer Is Better
Linux 5.5
SE +/- 0.00093, N = 3
1.68254
Linux 5.6-rc1
SE +/- 0.00223, N = 3
1.67914
0.3786
0.7572
1.1358
1.5144
1.893
Timed Linux Kernel Compilation 5.4
Time To Compile
Seconds, Fewer Is Better
Linux 5.5
SE +/- 0.24, N = 13
24.28
Linux 5.6-rc1
SE +/- 0.24, N = 13
24.23
6
12
18
24
30


OSBench
Test: Create Threads
us Per Event, Fewer Is Better
Linux 5.5
SE +/- 0.06, N = 3
18.16
Linux 5.6-rc1
SE +/- 0.15, N = 3
18.12
4
8
12
16
20
1. (CC) gcc options: -lm
Blender 2.81
Blend File: Barbershop - Compute: CPU-Only
Seconds, Fewer Is Better
Linux 5.5
SE +/- 0.46, N = 3
154.71
Linux 5.6-rc1
SE +/- 0.11, N = 3
154.49
30
60
90
120
150
Timed FFmpeg Compilation 4.2.2
Time To Compile
Seconds, Fewer Is Better
Linux 5.5
SE +/- 0.08, N = 3
22.60
Linux 5.6-rc1
SE +/- 0.09, N = 3
22.57
5
10
15
20
25
Timed LLVM Compilation 6.0.1
Time To Compile
Seconds, Fewer Is Better
Linux 5.5
112.31
Linux 5.6-rc1
112.17
30
60
90
120
150

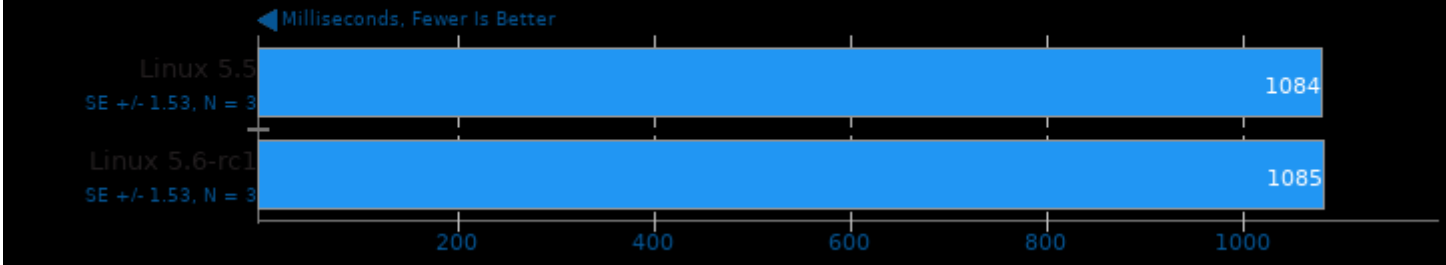
High Performance Conjugate Gradient 3.1



1. (CXX) g++ options: -O3 -ffast-math -ftree-vectorize -pthread -lmpi_cxx -lmpi

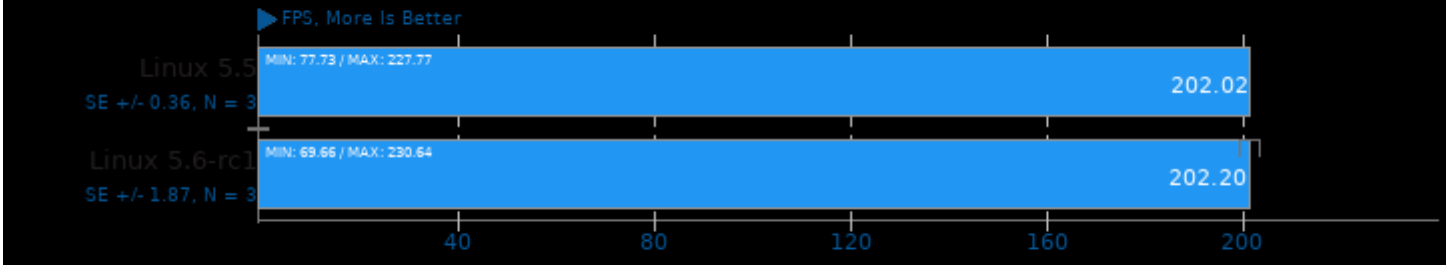
PyBench 2018-02-16

Total For Average Test Times



dav1d 0.5.0

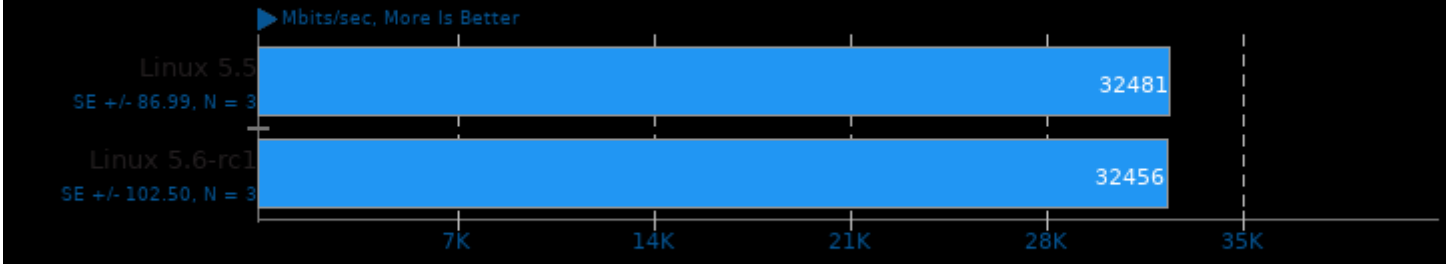
Video Input: Summer Nature 4K



1. (CC) gcc options: -pthread

iPerf 3.7

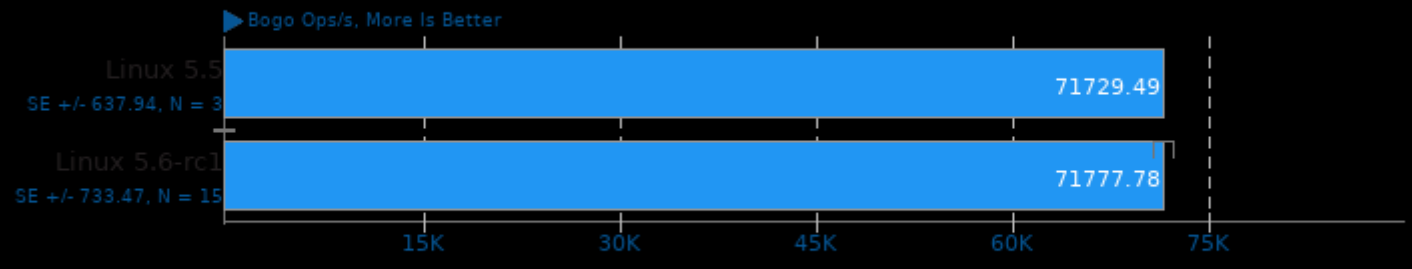
Server Address: localhost - Server Port: 5201 - Duration: 30 Seconds - Test: TCP - Parallel: 20



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

Stress-NG 0.07.26

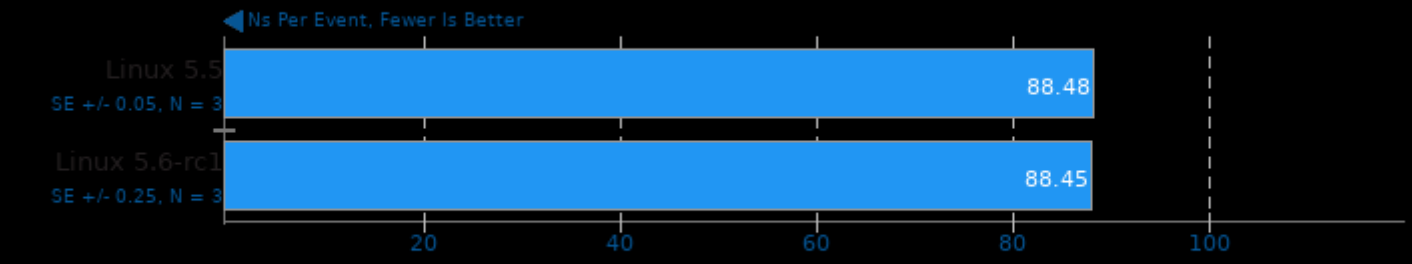
Test: Forking



1. (CC) gcc options: -O2 -std=gnu99 -lm -lz -lcrypt -lrt -lpthread -laio -lc

OSBench

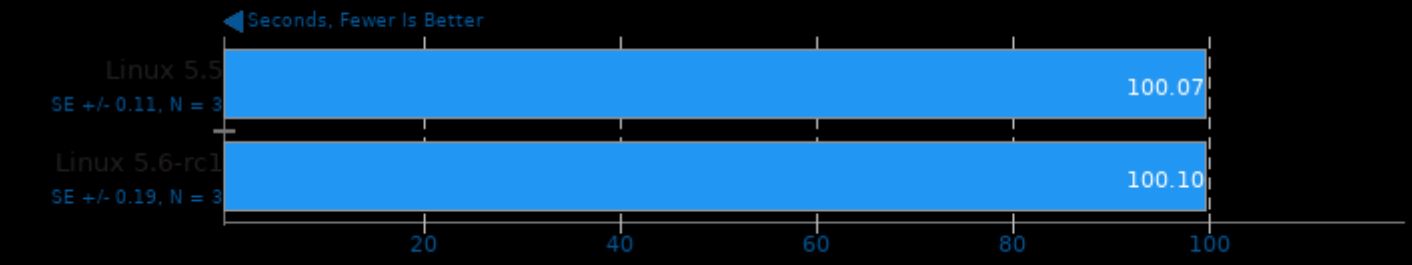
Test: Memory Allocations



1. (CC) gcc options: -lm

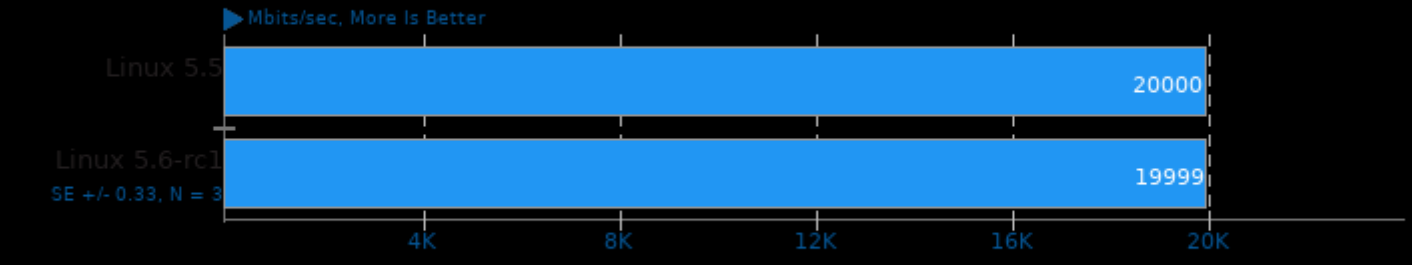
Blender 2.81

Blend File: Classroom - Compute: CPU-Only

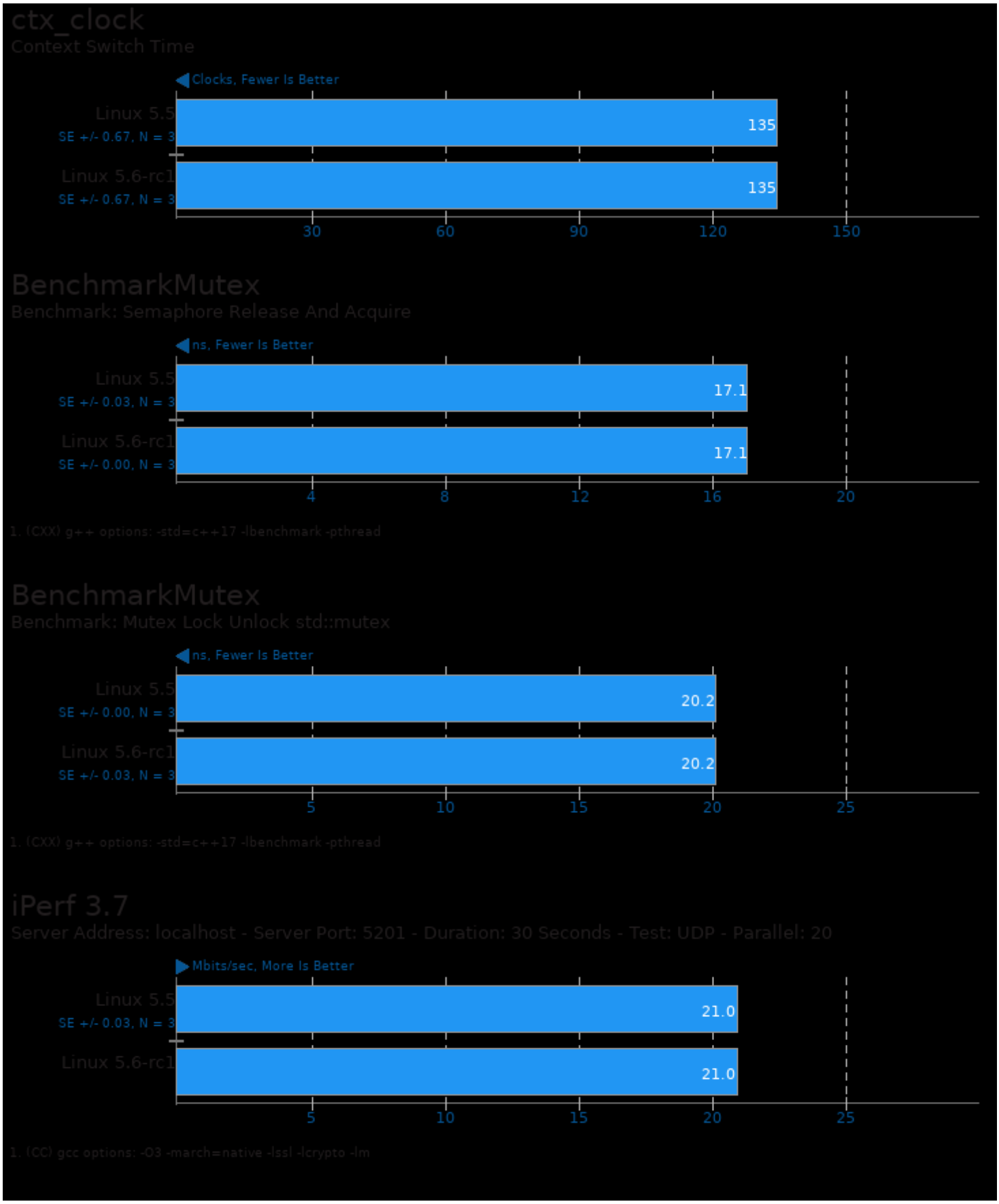


iPerf 3.7

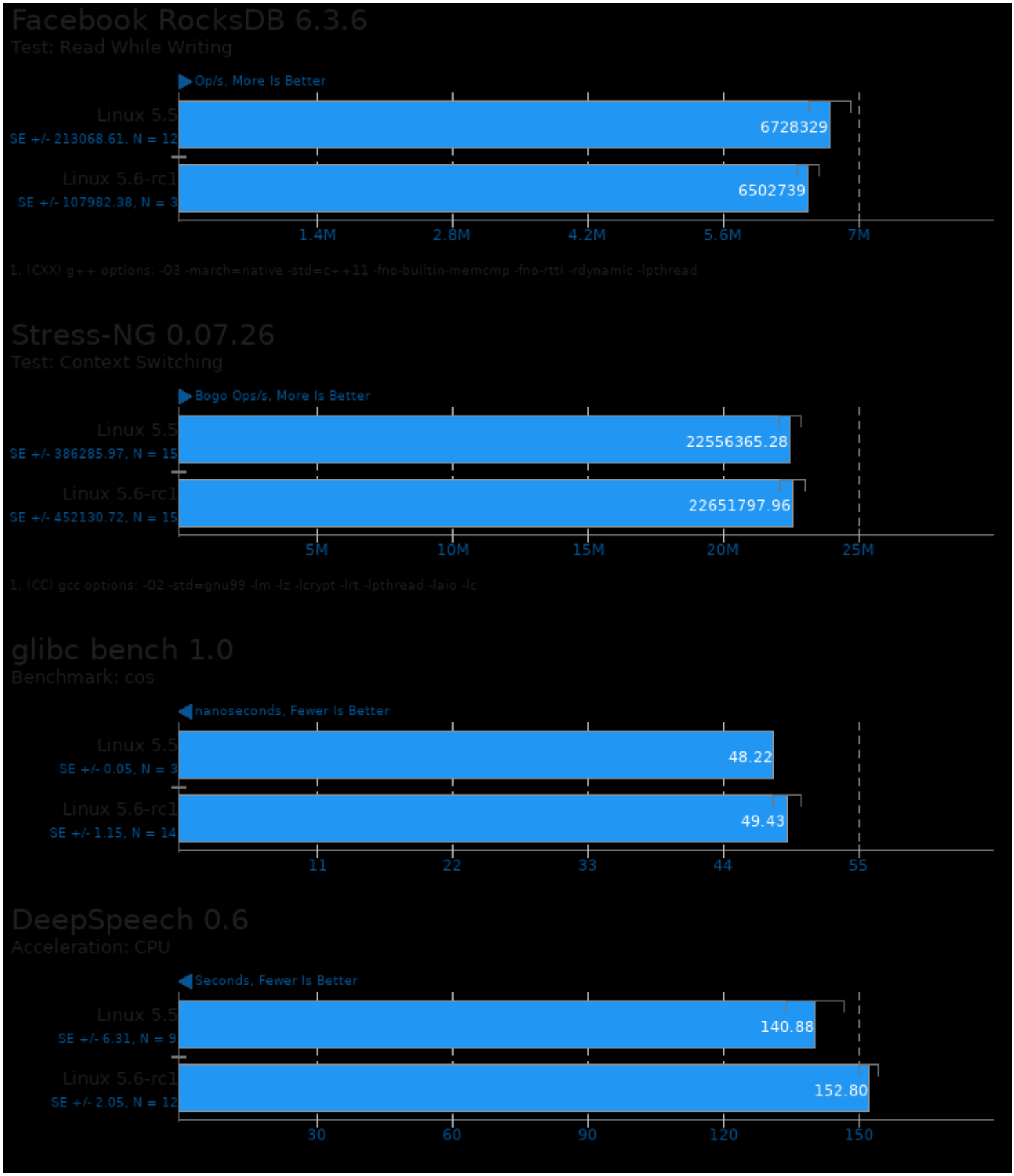
Server Address: localhost - Server Port: 5201 - Duration: 30 Seconds - Test: UDP - 1000Mbit Objective - Parallel: 20



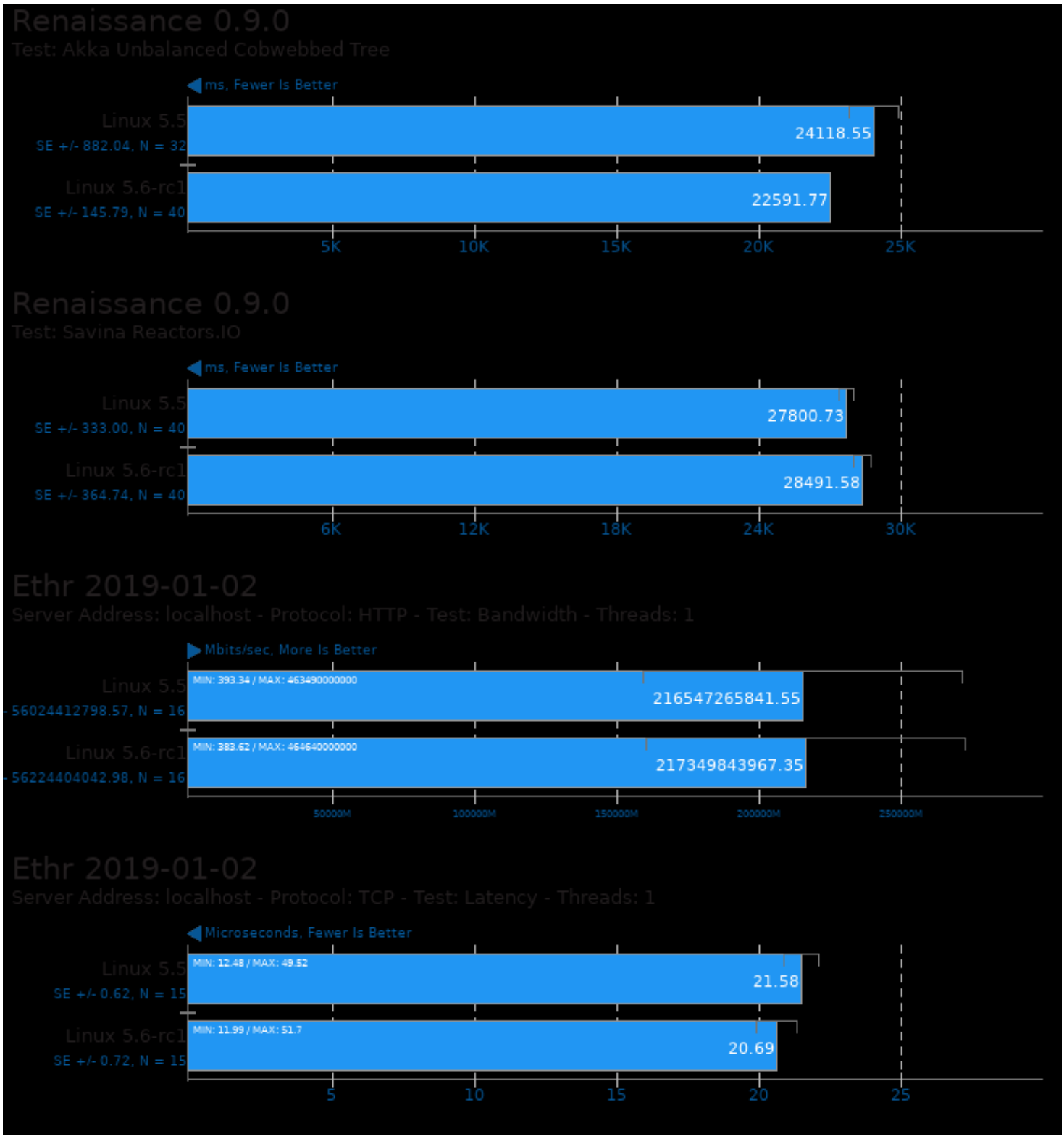
1. (CC) gcc options: -O3 -march=native -lssl -lcrypto -lm


ctx_clock
Context Switch Time
Clocks, Fewer Is Better
Linux 5.5
SE +/- 0.67, N = 3
135
Linux 5.6-rc1
SE +/- 0.67, N = 3
135
30
60
90
120
150
BenchmarkMutex
Benchmark: Semaphore Release And Acquire
ns, Fewer Is Better
Linux 5.5
SE +/- 0.03, N = 3
17.1
Linux 5.6-rc1
SE +/- 0.00, N = 3
17.1
4
8
12
16
20
1. (CXX) g++ options: -std=c++17 -lbenchmark -pthread
BenchmarkMutex
Benchmark: Mutex Lock Unlock std::mutex
ns, Fewer Is Better
Linux 5.5
SE +/- 0.00, N = 3
20.2
Linux 5.6-rc1
SE +/- 0.03, N = 3
20.2
5
10
15
20
25
1. (CXX) g++ options: -std=c++17 -lbenchmark -pthread
iPerf 3.7
Server Address: localhost - Server Port: 5201 - Duration: 30 Seconds - Test: UDP - Parallel: 20
Mbits/sec, More Is Better
Linux 5.5
SE +/- 0.03, N = 3
21.0
Linux 5.6-rc1
21.0
5
10
15
20
25
1. (CC) gcc options: -O3 -march=native -lssl -lcrypto -lm

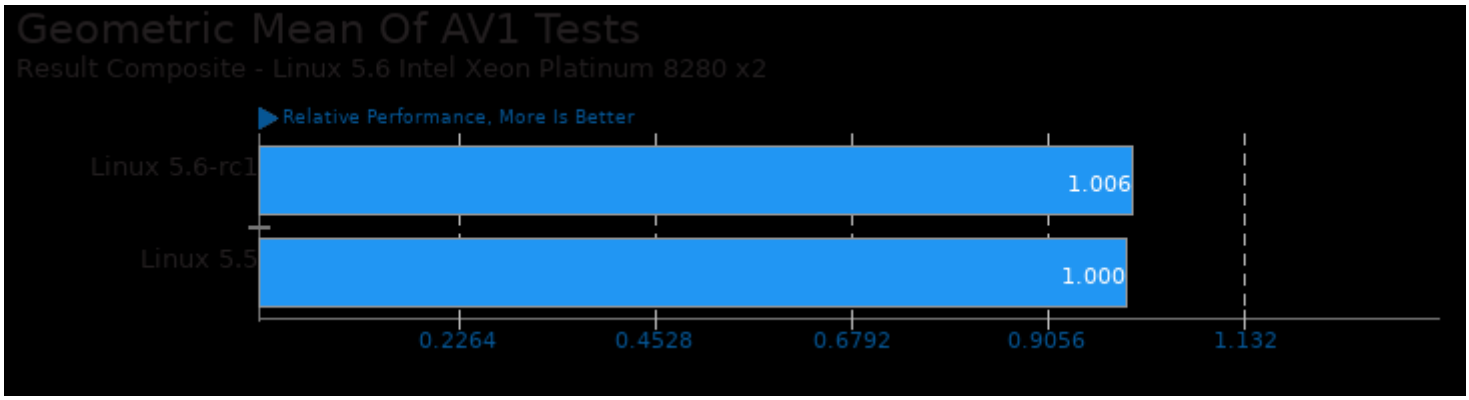
Linux 5.6 Intel Xeon Platinum 8280 x2



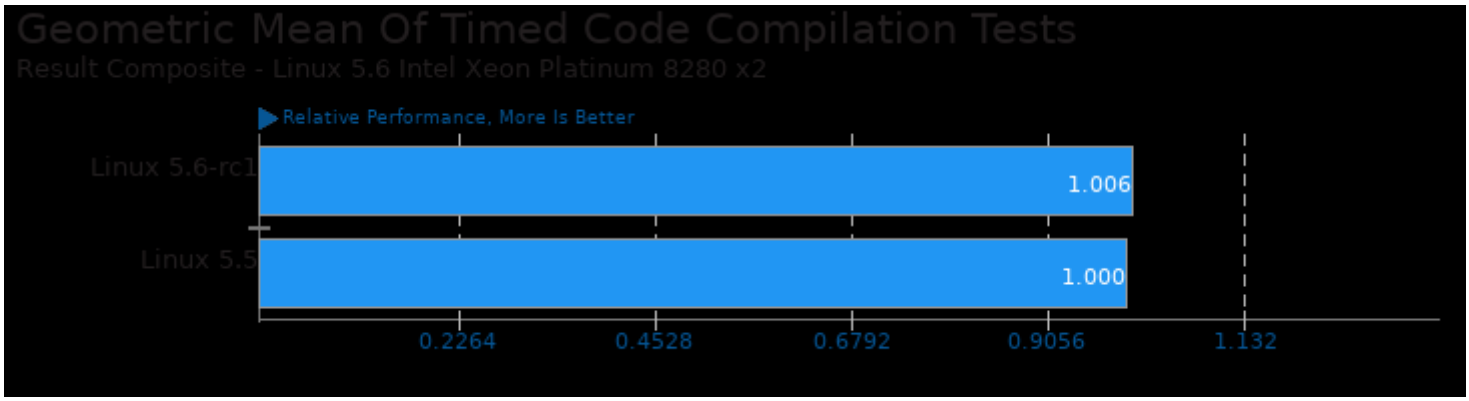
Linux 5.6 Intel Xeon Platinum 8280 x2



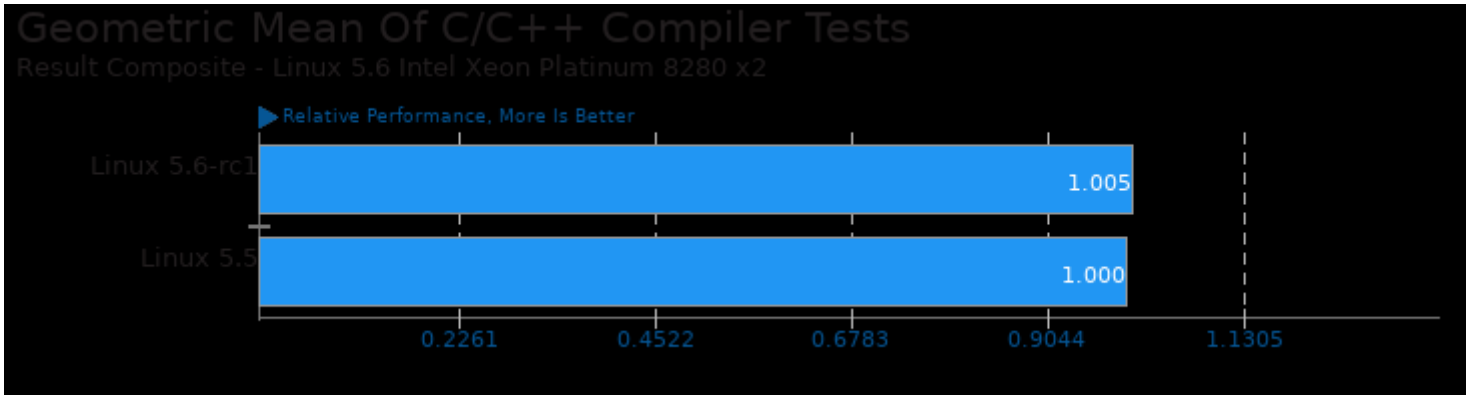
These geometric means are based upon test groupings / test suites for this result file.



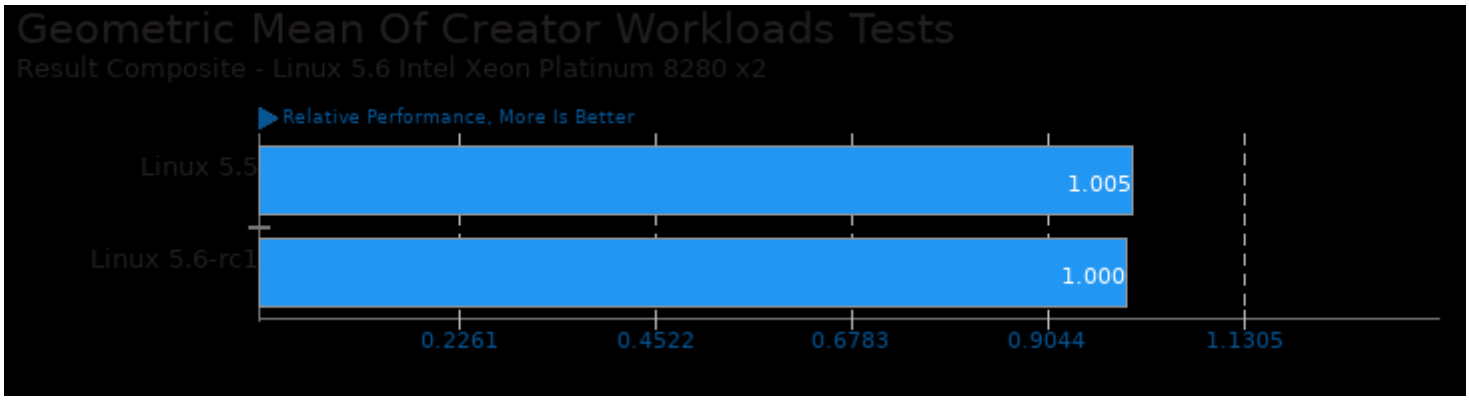
Geometric mean based upon tests: pts/dav1d and pts/svt-av1



Geometric mean based upon tests: pts/build-apache, pts/build-php, pts/build-linux-kernel, pts/build-gdb, pts/build-llvm, pts/build-ffmpeg, pts/build-mplayer and pts/build2



Geometric mean based upon tests: pts/himeno, pts/build-php, pts/build-llvm, pts/pgbench, pts/apache, pts/sqlite-speedtest, pts/john-the-ripper, pts/dav1d, pts/nginx, pts/lammps, pts/svt-av1, pts/build-gdb, pts/build-ffmpeg, pts/build-apache and pts/build-mplayer



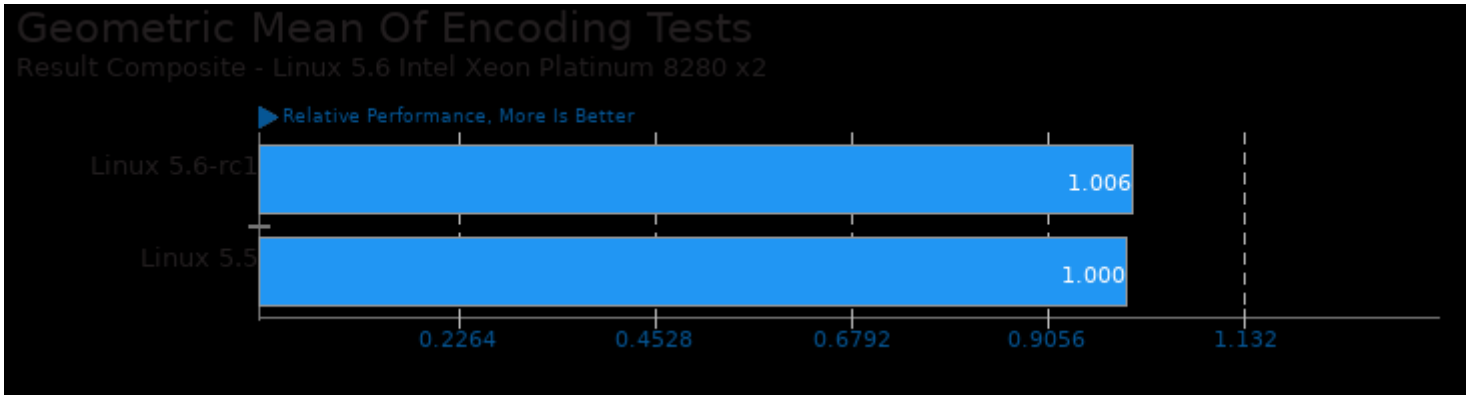
Geometric mean based upon tests: pts/rays1bench, pts/blender, pts/dav1d, pts/svt-av1, system/rawtherapee and pts/deepspeech



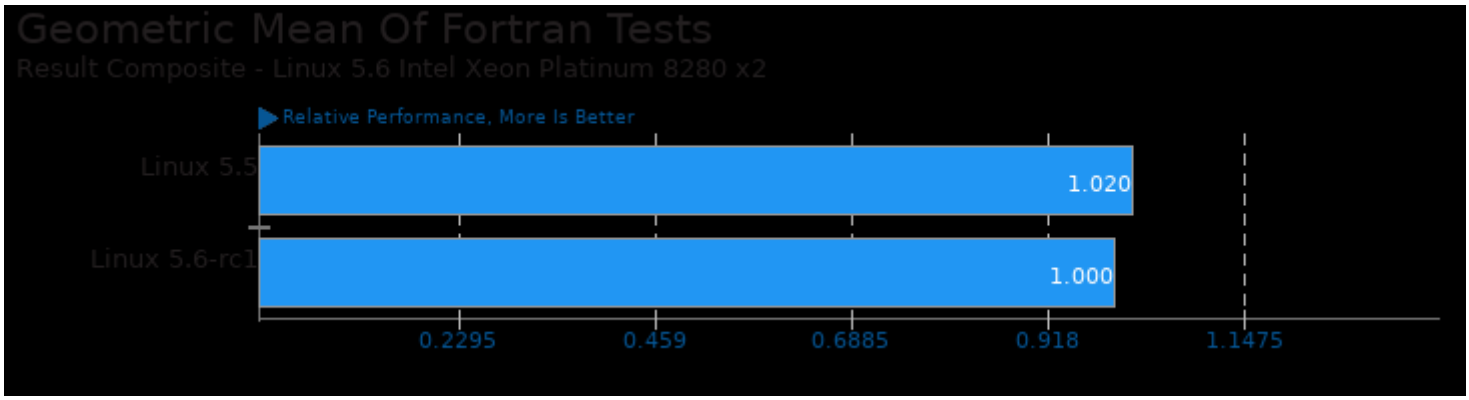
Geometric mean based upon tests: pts/sqlite-speedtest, pts/rocksdb, pts/pgbench and pts/mysqlslap



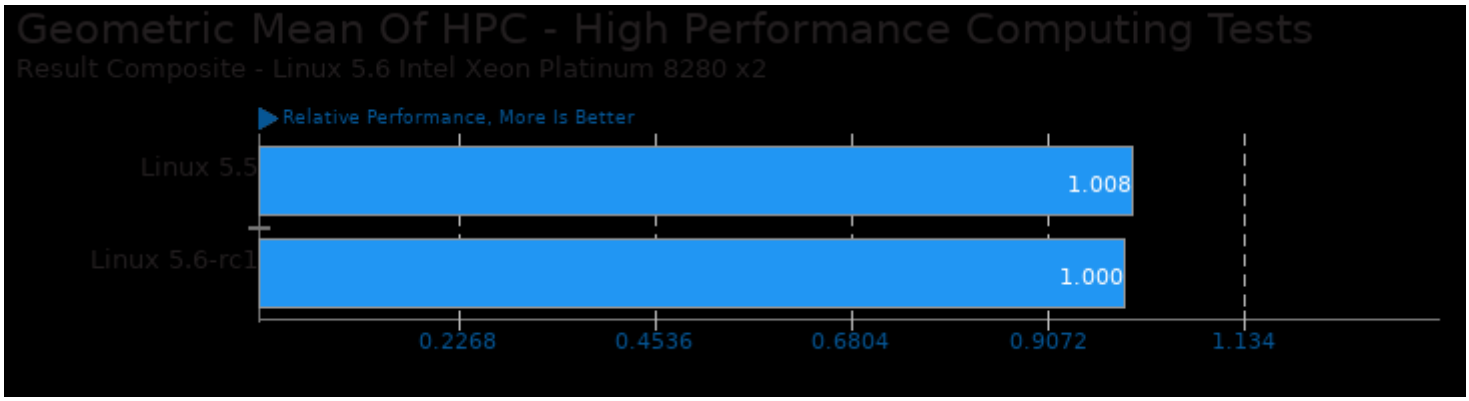
Geometric mean based upon tests: pts/postmark and pts/fio



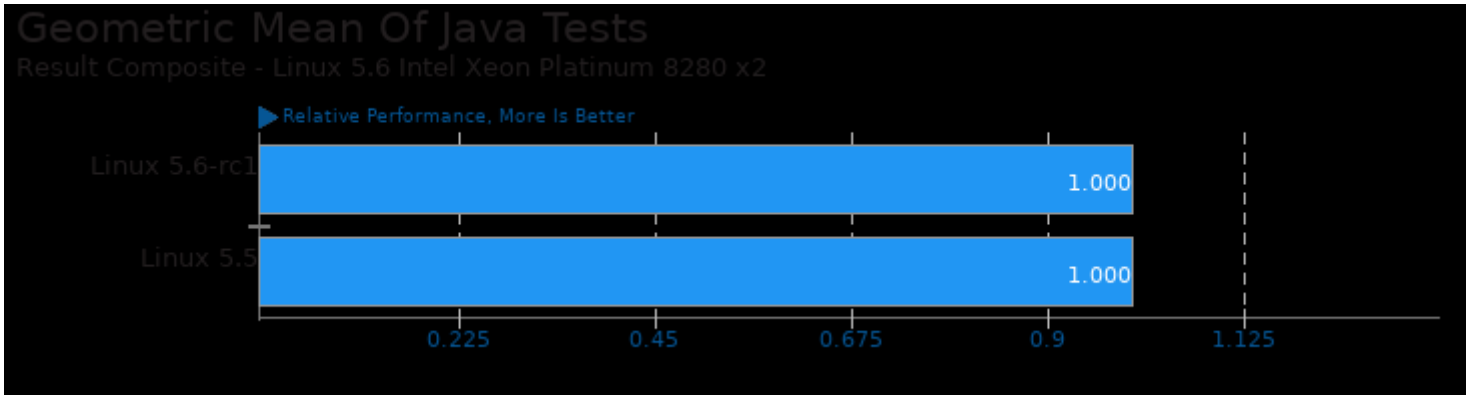
Geometric mean based upon tests: pts/dav1d and pts/svt-av1



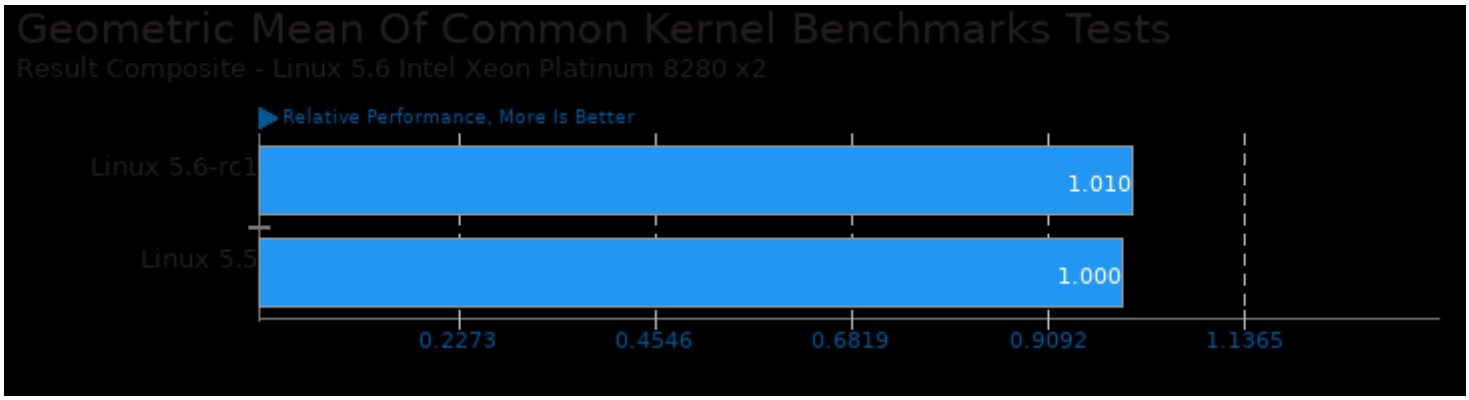
Geometric mean based upon tests: pts/lammps and pts/hpcg



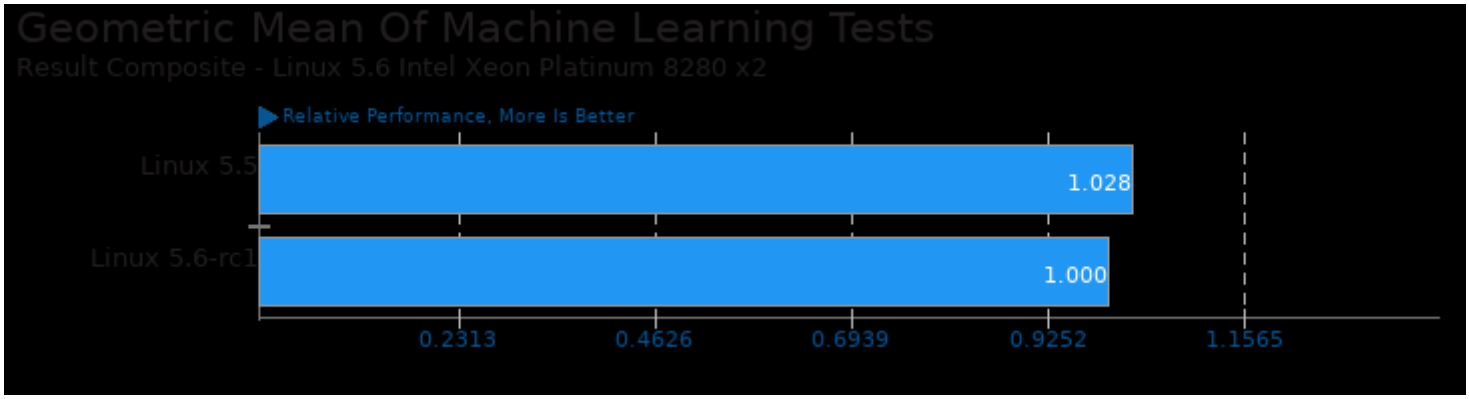
Geometric mean based upon tests: pts/npb, pts/hpcg, pts/namd, pts/lammps, pts/himeno, pts/numpy and pts/deepspeech



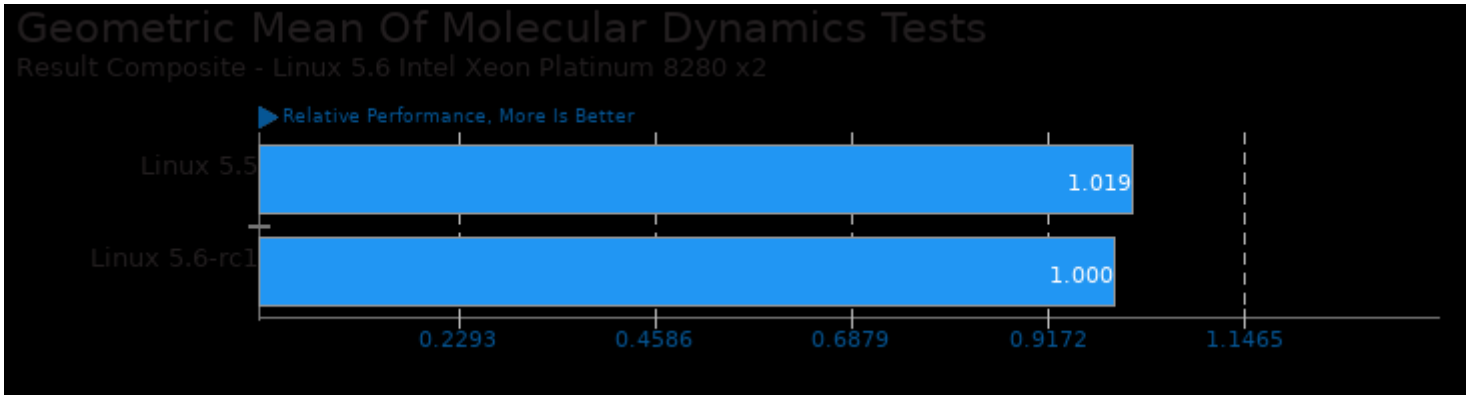
Geometric mean based upon tests: pts/dacapobench and pts/renaissance



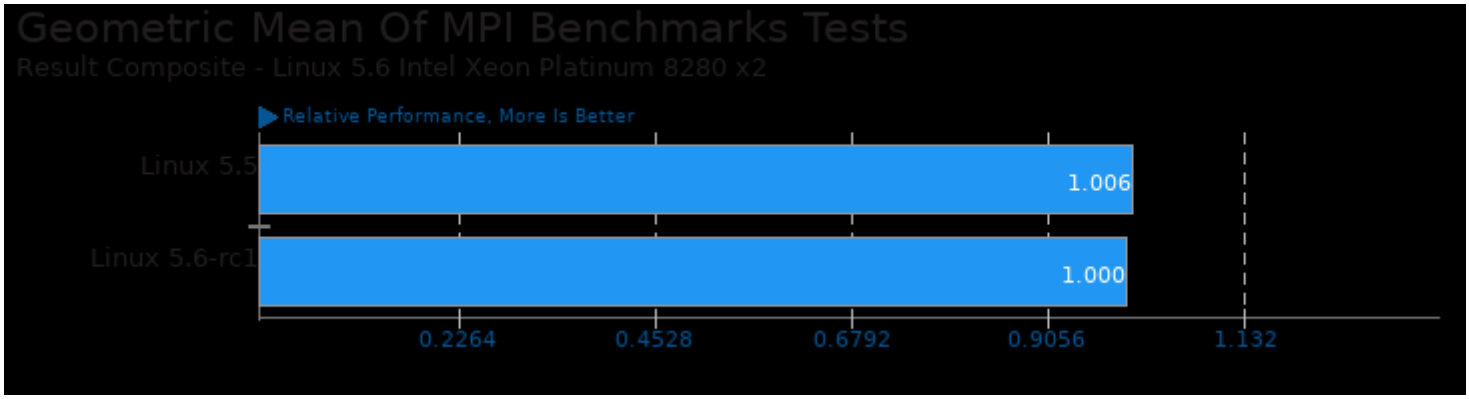
Geometric mean based upon tests: pts/apache, pts/postmark, pts/sqlite-speedtest, pts/pgbench, pts/ctx-clock, pts/hackbench, pts/mutex, pts/stress-ng, pts/osbench, pts/rocksdb, pts/ethr and pts/iperf



Geometric mean based upon tests: pts/numpy and pts/deepspeech



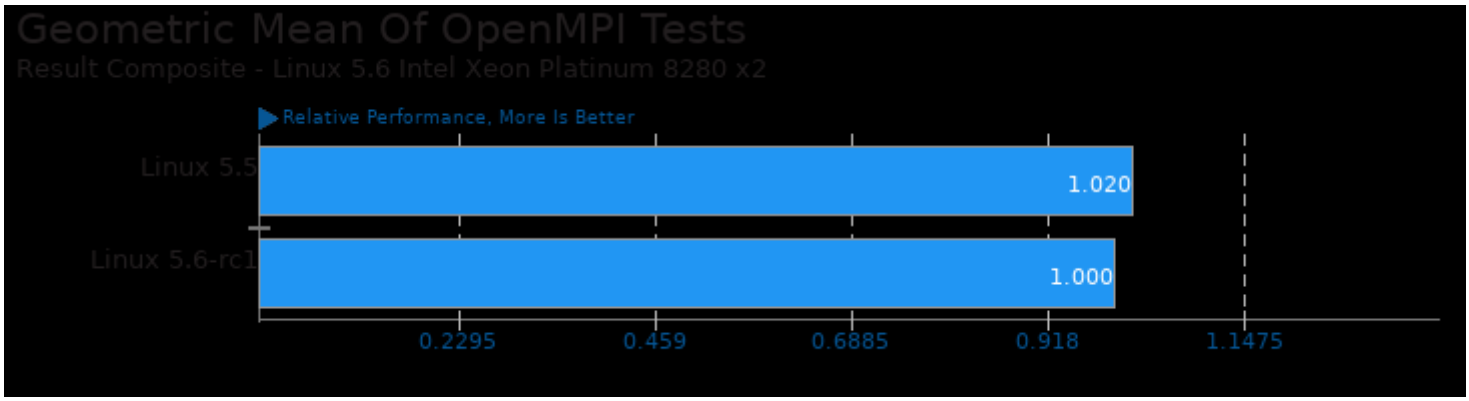
Geometric mean based upon tests: pts/namd and pts/lammps



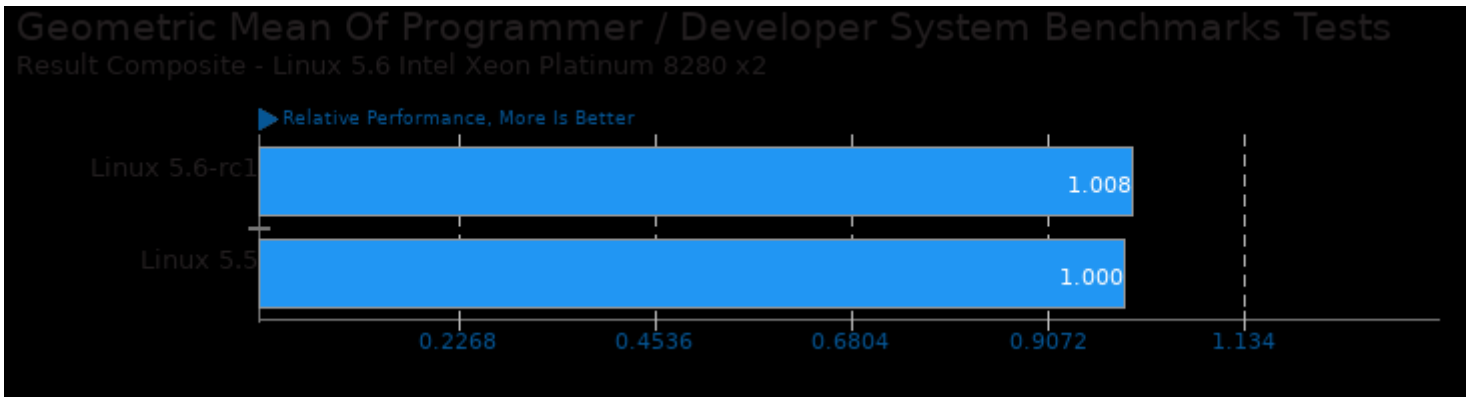
Geometric mean based upon tests: pts/lammps, pts/hpcg and pts/npb



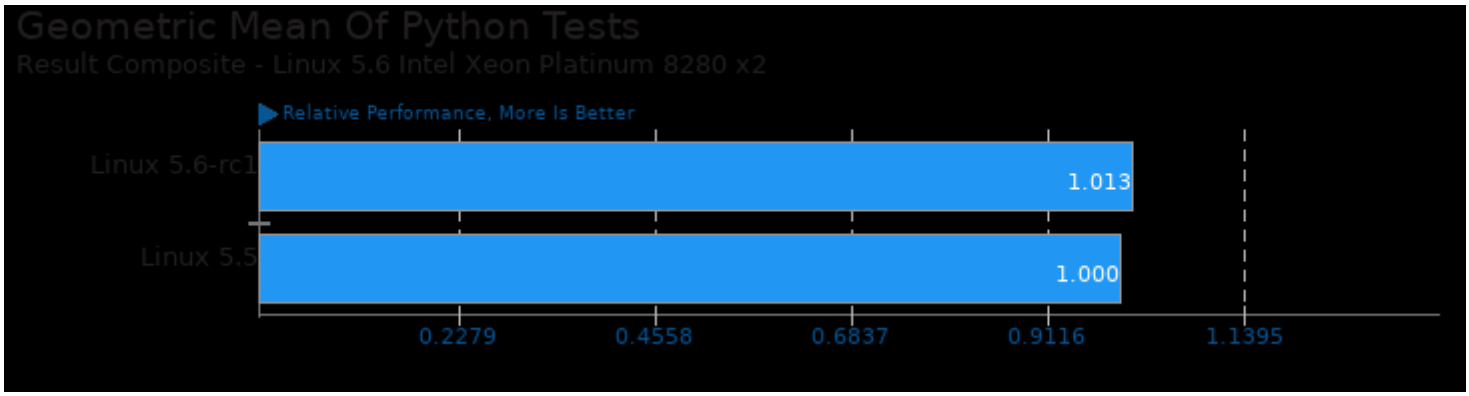
Geometric mean based upon tests: pts/ethr and pts/iperf



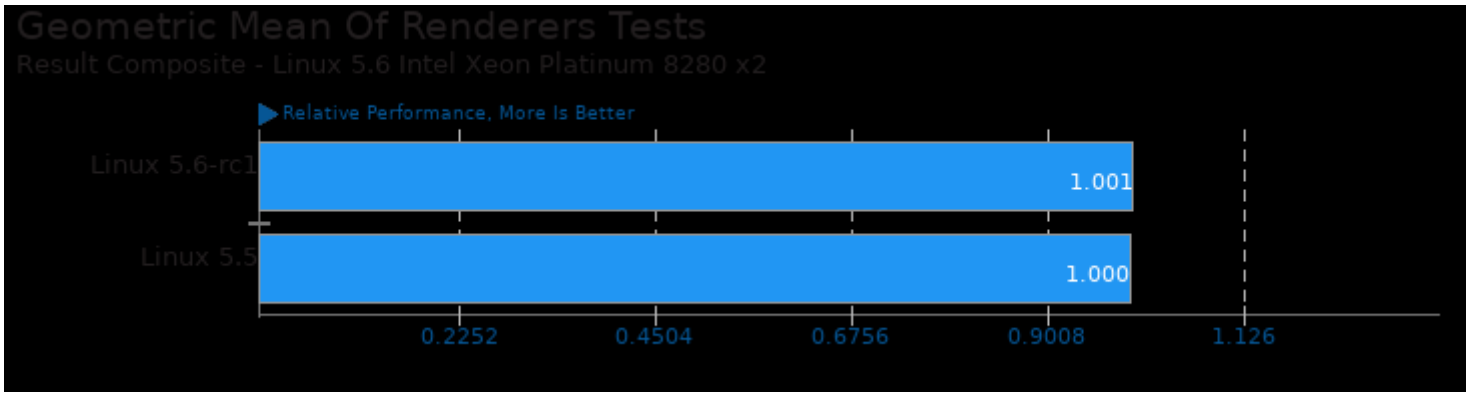
Geometric mean based upon tests: pts/lammps and pts/hpcg



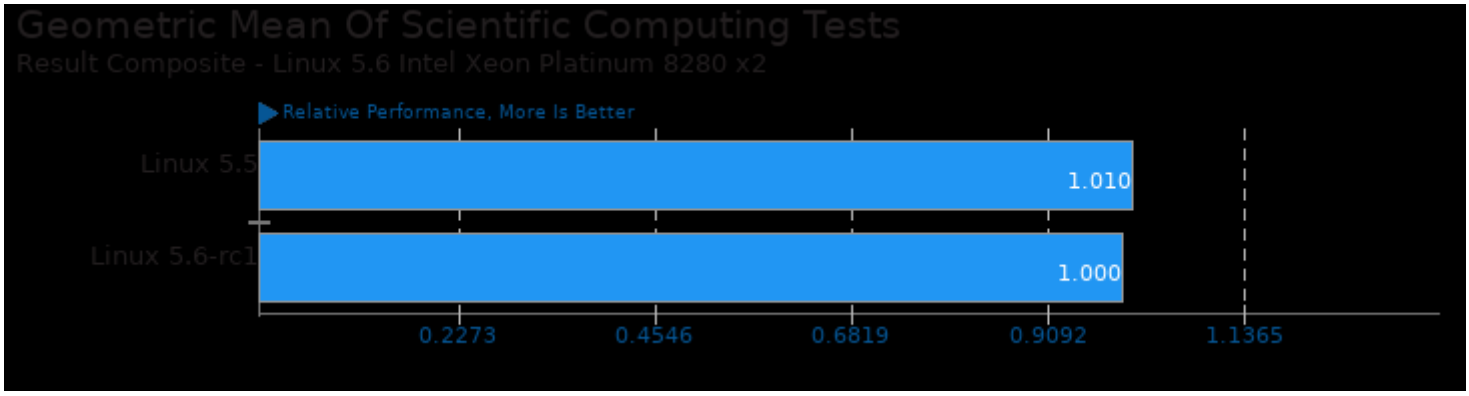
Geometric mean based upon tests: pts/sqlite-speedtest, pts/pybench, pts/build-apache, pts/build-php, pts/build-linux-kernel, pts/build-gdb, pts/build-llvm, pts/build-ffmpeg, pts/build-mplayer and pts/build2



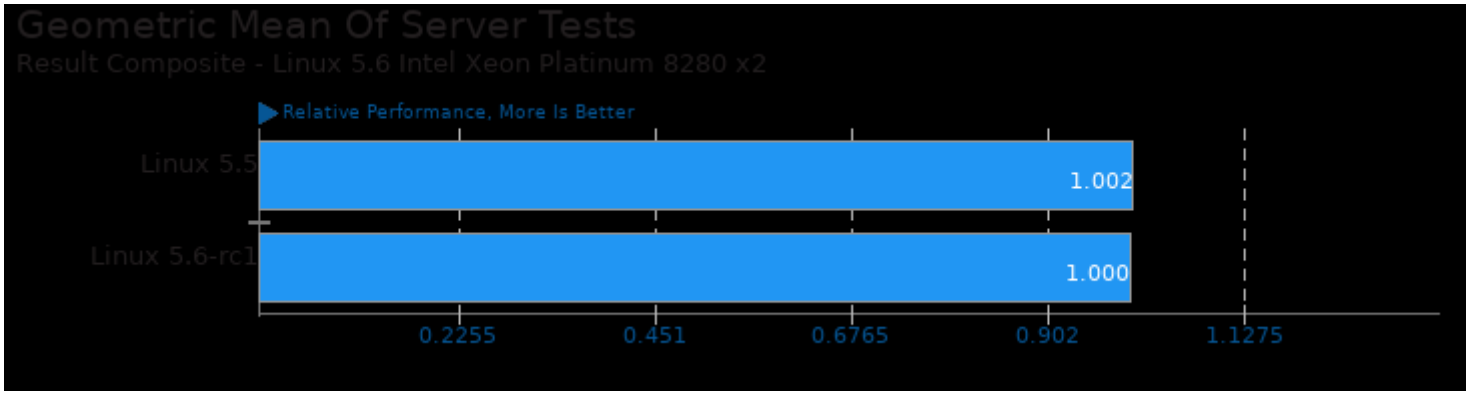
Geometric mean based upon tests: pts/pybench and pts/numpy



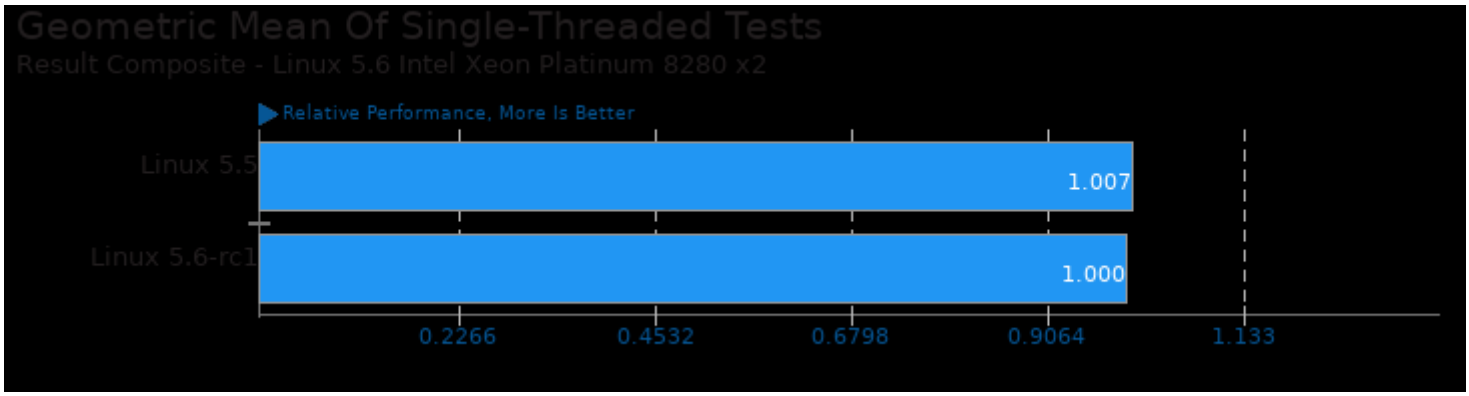
Geometric mean based upon tests: pts/rays1bench and pts/blender



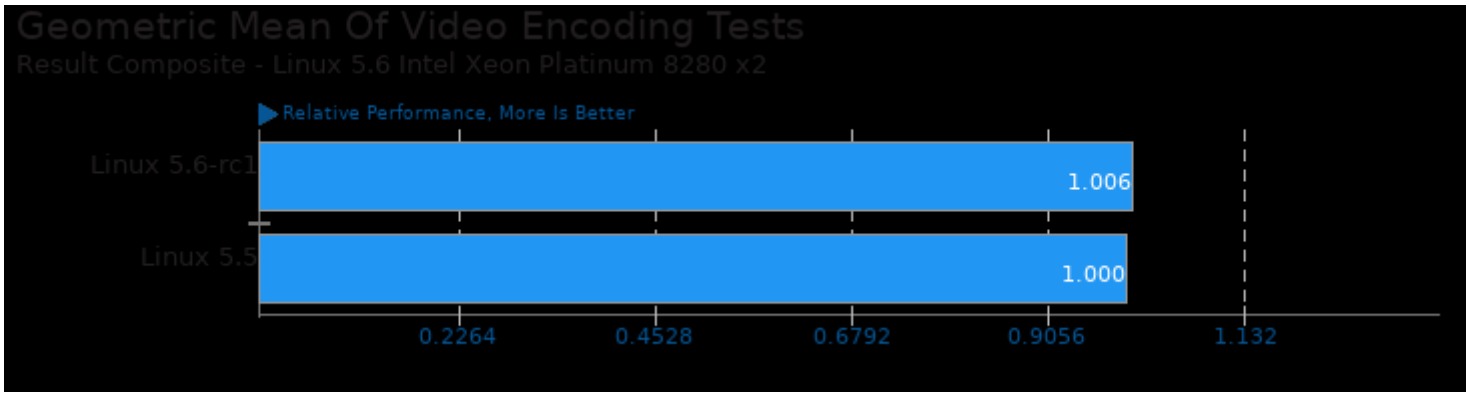
Geometric mean based upon tests: pts/namd, pts/lammps and pts/himeno



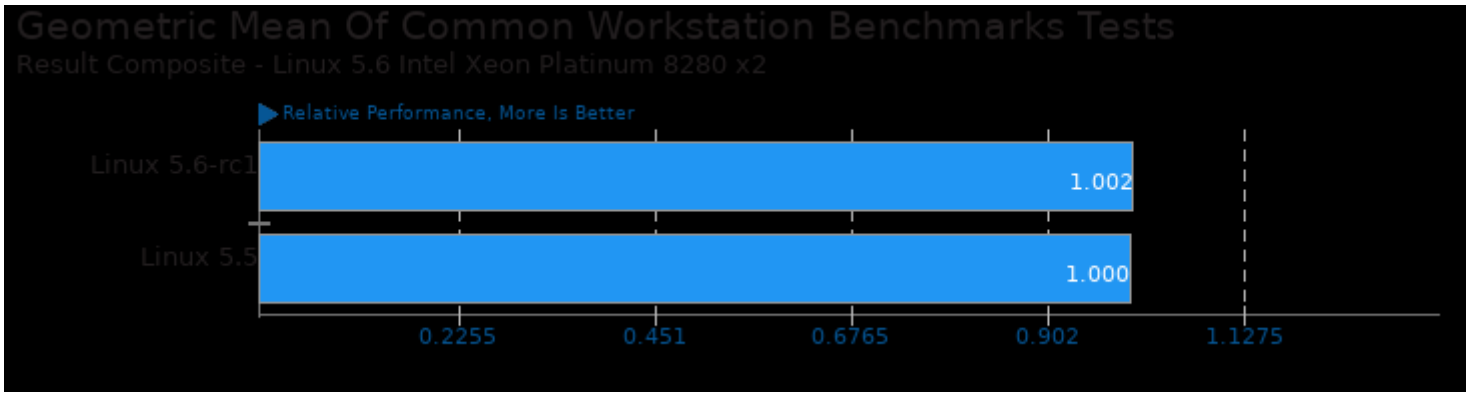
Geometric mean based upon tests: pts/apache, pts/nginx, pts/mysqlslap, pts/pgbench, pts/rocksdb, pts/phpbench and pts/sqlite-speedtest



Geometric mean based upon tests: pts/numpy, pts/deepspeech, pts/glibc-bench, pts/mutex, pts/pybench, pts/phpbench and pts/nginx



Geometric mean based upon tests: pts/dav1d and pts/svt-av1



Geometric mean based upon tests: pts/blender and pts/himeno

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