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AMD EPYC 7003 EO 2021 Linux Comparison

2 x AMD EPYC 75F3 32-Core testing with a ASRockRack ROME2D16-2T (P3.10 BIOS) and ASPEED on AlmaLinux 8.4 via the Phoronix Test Suite.

Automated Executive Summary

Clear Linux 35150 had the most wins, coming in first place for 45% of the tests.

Based on the geometric mean of all complete results, the fastest (Clear Linux 35150) was 1.157x the speed of the slowest (AlmaLinux 8.4). Ubuntu 21.10 was 0.893x the speed of Clear Linux 35150, CentOS Stream was 0.973x the speed of Ubuntu 21.10, AlmaLinux 8.4 was 0.994x the speed of CentOS Stream.

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

GEGL (Operation: Scale) at 6.11x
Zstd Compression (Compression Level: 8, Long Mode - Compression Speed) at 4.979x
GEGL (Operation: Crop) at 4.921x
Redis Memtier / Redis Benchmark (Test: GET) at 3.285x
Redis Memtier / Redis Benchmark (Test: MIX) at 2.814x
Kvazaar (Video Input: Bosphorus 4K - Video Preset: Very Fast) at 2.17x
Timed LLVM Compilation (Build System: Unix Makefiles) at 2.127x
Timed LLVM Compilation (Build System: Ninja) at 2.116x

GEGL (Operation: Color Enhance) at 1.706x
Redis Memtier / Redis Benchmark (Test: LPUSH and LPOP: lpop) at 1.671x.

Test Systems:

Ubuntu 21.10

Processor: 2 x AMD EPYC 75F3 32-Core @ 2.95GHz (64 Cores / 128 Threads), Motherboard: ASRockRack ROME2D16-2T (P3.10 BIOS), Chipset: AMD Starship/Matisse, Memory: 16 x 8 GB DDR4-3200MT/s HMA81GR7CJR8N-XN, Disk: 1000GB Western Digital WD_BLACK SN850 1TB, Graphics: ASPEED, Audio: AMD Starship/Matisse, Network: 2 x Intel 10G X550T

OS: Ubuntu 21.10, Kernel: 5.13.0-20-generic (x86_64), Desktop: GNOME Shell 40.5, Display Server: X Server, Vulkan: 1.1.182, Compiler: GCC 11.2.0, File-System: ext4, Screen Resolution: 1024x768

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-gcn/usr --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq schedutil (Boost: Enabled) - CPU Microcode: 0xa001114
Python Notes: Python 3.9.7
Security Notes: itlb_multihit: Not affected + 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 Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

Clear Linux 35150

Processor: 2 x AMD EPYC 75F3 32-Core @ 2.95GHz (64 Cores / 128 Threads), Motherboard: ASRockRack ROME2D16-2T (P3.10 BIOS), Chipset: AMD Starship/Matisse, Memory: 126GB, Disk: 1000GB Western Digital WD_BLACK SN850 1TB, Graphics: ASPEED, Audio: AMD Starship/Matisse, Monitor: VE228, Network: 2 x Intel 10G X550T

OS: Clear Linux OS 35150, Kernel: 5.14.13-1083.native (x86_64), Desktop: GNOME Shell 41.0, Display Server: X Server 1.20.11, Compiler: GCC 11.2.1 20211015 releases/gcc-11.2.0-353-g6a936be4ad + Clang 11.1.0 + LLVM 11.1.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: always
Environment Notes: FFLAGS="-g -O3 -feliminate-unused-debug-types -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -m64 -fasynchronous-unwind-tables -Wp,-D_REENTRANT -ftree-loop-distribute-patterns -Wl,-z -Wl,now -Wl,-z -Wl,relro -malign-data=abi -fno-semantic-interposition -ftree-vectorize -ftree-loop-vectorize -Wl,--enable-new-dtags" CXXFLAGS="-g -O3 -feliminate-unused-debug-types -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -Wformat -Wformat-security -m64 -fasynchronous-unwind-tables -Wp,-D_REENTRANT -ftree-loop-distribute-patterns -Wl,-z -Wl,now -Wl,-z -Wl,relro -fno-semantic-interposition -ffat-lto-objects -fno-trapping-math -Wl,-sort-common -Wl,--enable-new-dtags -mtune=skylake -fvisibility-inlines-hidden -Wl,--enable-new-dtags" FCFLAGS="-g -O3 -feliminate-unused-debug-types -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -m64 -fasynchronous-unwind-tables -Wp,-D_REENTRANT -ftree-loop-distribute-patterns -Wl,-z -Wl,now -Wl,-z -Wl,relro -malign-data=abi -fno-semantic-interposition -ftree-vectorize -ftree-loop-vectorize -Wl,-sort-common -Wl,--enable-new-dtags" CFLAGS="-g -O3 -feliminate-unused-debug-types -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -Wformat -Wformat-security -m64 -fasynchronous-unwind-tables -Wp,-D_REENTRANT -ftree-loop-distribute-patterns -Wl,-z -Wl,now -Wl,-z -Wl,relro -fno-semantic-interposition -ffat-lto-objects -fno-trapping-math -Wl,-sort-common -Wl,--enable-new-dtags -mtune=skylake" THEANO_FLAGS="floatX=float32,openmp=true,gcc.cxxflags="-ftree-vectorize -mavx""
Compiler Notes: --build=x86_64-generic-linux --disable-libmpx --disable-libunwind-exceptions --disable-multiarch --disable-vtable-verify --disable-werror --enable-__cxa_atexit --enable-bootstrap --enable-cet --enable-clocale=gnu --enable-default-pie --enable-gnu-indirect-function --enable-languages=c,c++,fortran,go --enable-ld=default --enable-libstdcxx-pch --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --exec-prefix=/usr --includedir=/usr/include --target=x86_64-generic-linux --with-arch=x86-64-v3 --with-gcc-major-version-only --with-glibc-version=2.19 --with-gnu-ld --with-isl --with-ppl=yes --with-tune=skylake-avx512
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa001114

Python Notes: Python 3.9.7
Security Notes: itlb_multihit: Not affected + 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 Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

CentOS Stream

Processor: 2 x AMD EPYC 75F3 32-Core @ 2.95GHz (64 Cores / 128 Threads), Motherboard: ASRockRack ROME2D16-2T (P3.10 BIOS), Chipset: AMD Starship/Matisse, Memory: 126GB, Disk: 1000GB Western Digital WD_BLACK SN850 1TB, Graphics: ASPEED, Audio: AMD Starship/Matisse, Monitor: VE228, Network: 2 x Intel 10G X550T

OS: CentOS Stream 8, Kernel: 4.18.0-348.el8.x86_64 (x86_64), Desktop: GNOME Shell 3.32.2, Display Server: X Server, Compiler: GCC 8.5.0 20210514, File-System: xfs, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: always
Compiler Notes: --build=x86_64-redhat-linux --disable-libmpx --disable-libunwind-exceptions --enable-__cxa_atexit --enable-bootstrap --enable-cet --enable-checking=release --enable-gnu-indirect-function --enable-gnu-unique-object --enable-initfini-array --enable-languages=c,c++,fortran,lto --enable-multilib --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --mandir=/usr/share/man --with-arch_32=x86-64 --with-gcc-major-version-only --with-isl --with-linker-hash-style=gnu --with-tune=generic --without-cuda-driver
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa001114
Python Notes: Python 3.6.8
Security Notes: SELinux + itlb_multihit: Not affected + 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 Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

AlmaLinux 8.4

Processor: 2 x AMD EPYC 75F3 32-Core @ 2.95GHz (64 Cores / 128 Threads), Motherboard: ASRockRack ROME2D16-2T (P3.10 BIOS), Chipset: AMD Starship/Matisse, Memory: 126GB, Disk: 1000GB Western Digital WD_BLACK SN850 1TB, Graphics: ASPEED, Audio: AMD Starship/Matisse, Monitor: VE228, Network: 2 x Intel 10G X550T

OS: AlmaLinux 8.4, Kernel: 4.18.0-305.el8.x86_64 (x86_64), Desktop: GNOME Shell 3.32.2, Display Server: X Server, Compiler: GCC 8.4.1 20200928, File-System: xfs, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: always
Compiler Notes: --build=x86_64-redhat-linux --disable-libmpx --disable-libunwind-exceptions --enable-__cxa_atexit --enable-bootstrap --enable-cet --enable-checking=release --enable-gnu-indirect-function --enable-gnu-unique-object --enable-initfini-array --enable-languages=c,c++,fortran,lto --enable-multilib --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --mandir=/usr/share/man --with-arch_32=x86-64 --with-gcc-major-version-only --with-isl --with-linker-hash-style=gnu --with-tune=generic --without-cuda-driver
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa001114
Python Notes: Python 3.6.8
Security Notes: SELinux + itlb_multihit: Not affected + 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 Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

	Ubuntu 21.10	Clear Linux 35150	CentOS Stream	AlmaLinux 8.4
WireGuard + Linux Networking Stack Stress Test (sec)	**404.996**	**323.807**		
Normalized	79.95%	100%		
Standard Deviation	2.5%	3.7%		
High Performance Conjugate Gradient (GFLOP/s)	**34.8293**	33.2841	25.8894	**25.0306**
Normalized	100%	95.56%	74.33%	71.87%

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Standard Deviation	0.7%	7.1%	8.4%	1.5%
NAMD - ATPase Simulation - 327,506 Atoms (days/ns)	0.30411	0.30547	0.30533	0.30595
Normalized	100%	99.55%	99.6%	99.4%
Standard Deviation	0.1%	0.1%	0.1%	0.3%
NWChem - C240 Buckyball (sec)	1859	1812		
Normalized	97.47%	100%		
Quantum ESPRESSO - AUSURF112 (sec)	243.14		299.48	288.35
Normalized	100%		81.19%	84.32%
Standard Deviation	0.2%		0.5%	0.1%
Zstd Compression - 3 - Compression Speed (MB/s)	5872	8082	10117	10094
Normalized	58.04%	79.88%	100%	99.78%
Standard Deviation	9.6%	1.7%	1%	1.3%
Zstd Compression - 3 - D.S (MB/s)	3717	4224	3872	
Normalized	87.99%	100%	91.65%	
Standard Deviation		0%	0.1%	
Zstd Compression - 8 - Compression Speed (MB/s)	3228	4783	3538	3584
Normalized	66.81%	98.97%	73.22%	74.17%
Standard Deviation	4.2%	1.3%	1.2%	0.9%
Zstd Compression - 8 - D.S (MB/s)	3829		4057	4059
Normalized	94.32%		99.96%	100%
Standard Deviation			0.3%	0.1%
Zstd Compression - 19 - Compression Speed (MB/s)	78.1	98.1	82.1	83.1
Normalized	79.61%	100%	83.69%	84.71%
Standard Deviation	2%	1.4%	0.9%	1%
Zstd Compression - 19 - D.S (MB/s)	3560	3864	3804	3786
Normalized	92.14%	100%	98.45%	98%
Standard Deviation	0.8%	0.2%	0.3%	0.1%
Zstd Compression - 3, Long Mode - Compression Speed (MB/s)	163.7	971.1	327.3	342.4
Normalized	16.86%	100%	33.7%	35.26%
Standard Deviation	1.5%	0.1%	2.4%	7.3%
Zstd Compression - 3, Long Mode - D.S (MB/s)	3938	4594	4212	4199
Normalized	85.73%	100%	91.69%	91.4%
Standard Deviation	1.7%		0.2%	0.2%
Zstd Compression - 8, Long Mode - Compression Speed (MB/s)	184.4	918.2	323.7	322.0
Normalized	20.08%	100%	35.25%	35.07%
Standard Deviation	1.4%	4.7%	2.8%	3.2%
Zstd Compression - 8, Long Mode - D.S (MB/s)	4087	4758	4404	4387
Normalized	85.9%	100%	92.55%	92.21%
Standard Deviation	1%	0.3%	0.3%	0.5%
Zstd Compression - 19, Long Mode - Compression Speed (MB/s)	38.7	41.5	14.1	14.3
Normalized	93.25%	100%	33.98%	34.46%
Standard Deviation	4.8%	1.5%	7.9%	5.4%

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Zstd Compression - 19, Long Mode - D.S (MB/s)	3628	3923	3893	3855
Normalized	92.49%	100%	99.25%	98.27%
Standard Deviation	1.1%	0.2%	1%	1%
GNU Radio - F.B.t.B.F.F (MiB/s)	739.5		629.9	744.4
Normalized	99.34%		84.62%	100%
Standard Deviation	0.7%		11.1%	5.2%
GNU Radio - S.S.C (MiB/s)	3738		3293	3441
Normalized	100%		88.1%	92.07%
Standard Deviation	0.8%		7%	4.5%
GNU Radio - FIR Filter (MiB/s)	790.5		803.9	804.4
Normalized	98.27%		99.94%	100%
Standard Deviation	1.1%		2.8%	2.5%
GNU Radio - IIR Filter (MiB/s)	708.8		679.6	684.9
Normalized	100%		95.88%	96.63%
Standard Deviation	0.1%		2.3%	1.9%
GNU Radio - F.D.F (MiB/s)	881.2		743.0	753.0
Normalized	100%		84.32%	85.45%
Standard Deviation	1.2%		1.8%	2%
GNU Radio - Hilbert Transform (MiB/s)	438.7		442.5	445.0
Normalized	98.58%		99.44%	100%
Standard Deviation	0.4%		2.2%	1.6%
OSPray - San Miguel - SciVis (FPS)	83.33	83.33	83.33	83.33
Standard Deviation	0%	0%	0%	0%
OSPray - XFrog Forest - SciVis (FPS)	17.44	17.24	17.24	17.34
Normalized	100%	98.85%	98.85%	99.43%
Standard Deviation	1%	0%	0%	1%
OSPray - NASA Streamlines - SciVis (FPS)	111.11	111.11	111.11	111.11
Standard Deviation	0%	0%	0%	0%
OSPray - M.R - SciVis (FPS)	55.56	55.56	55.56	55.56
Standard Deviation	0%	0%	0%	0%
AOM AV1 - Speed 8 Realtime - Bosphorus 4K (FPS)	26.05			
Standard Deviation	2.5%			
AOM AV1 - Speed 9 Realtime - Bosphorus 4K (FPS)	35.97			
Standard Deviation	0.4%			
AOM AV1 - Speed 10 Realtime - Bosphorus 4K (FPS)	39.62			
Standard Deviation	2.1%			
Embree - Pathtracer - Crown (FPS)	73.2477	73.2610	73.1342	72.3266
Normalized	99.98%	100%	99.83%	98.72%
Standard Deviation	0.2%	0.3%	0.2%	0.2%
Embree - Pathtracer ISPC - Crown (FPS)	67.5017	67.3627	67.3076	67.2641
Normalized	100%	99.79%	99.71%	99.65%
Standard Deviation	0.1%	0.1%	0.3%	0.2%
Kvazaar - Bosphorus 4K - Very Fast (FPS)	26.27	57.00	49.53	49.16
Normalized	46.09%	100%	86.89%	86.25%
Standard Deviation	0.4%	0.2%	0.6%	1%

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Kvazaar - Bosphorus 4K - Ultra Fast (FPS)	50.24	65.93	65.27	65.37
Normalized	76.2%	100%	99%	99.15%
Standard Deviation	0.3%	0.7%	1.4%	2.3%
SVT-AV1 - Preset 8 - Bosphorus 4K (FPS)	61.561	66.847	60.063	57.497
Normalized	92.09%	100%	89.85%	86.01%
Standard Deviation	0.7%	0.2%	0.7%	1.4%
SVT-HEVC - 7 - Bosphorus 1080p	355.53	366.03	343.03	335.92
Normalized	97.13%	100%	93.72%	91.77%
Standard Deviation	1.8%	1%	1.4%	2.1%
SVT-HEVC - 10 - Bosphorus 1080p (FPS)	539.63	571.97	559.53	500.01
Normalized	94.35%	100%	97.83%	87.42%
Standard Deviation	1.3%	2.5%	2.3%	2.1%
SVT-VP9 - P.S.O - Bosphorus 1080p (FPS)	404.95	433.62	401.72	375.97
Normalized	93.39%	100%	92.64%	86.7%
Standard Deviation	4.6%	4.4%	3.7%	2.3%
SVT-VP9 - V.Q.O - Bosphorus 1080p (FPS)	350.95	359.67	333.29	311.16
Normalized	97.58%	100%	92.67%	86.51%
Standard Deviation	2.4%	2.4%	3.1%	0.7%
VP9 libvpx Encoding - Speed 5 - Bosphorus 4K (FPS)	14.69	18.81	13.57	13.20
Normalized	78.1%	100%	72.14%	70.18%
Standard Deviation	11.8%	0.5%	1.2%	10.9%
x265 - Bosphorus 4K (FPS)	22.30	26.00	24.73	27.03
Normalized	82.5%	96.19%	91.49%	100%
Standard Deviation	2.3%	0.9%	1.4%	2.2%
ACES DGEMM - S.F.P.R (GFLOP/s)	22.449526	29.451390	29.126152	20.253004
Normalized	76.23%	100%	98.9%	68.77%
Standard Deviation	5.2%	5.6%	2.8%	0.7%
Intel Open Image Denoise - RT.hdr_alb_nrm.3840x2160 (Images / Sec)	1.80	1.82	1.82	1.47
Normalized	98.9%	100%	100%	80.77%
Standard Deviation	0.1%	0.2%	0.5%	0.3%
Timed Godot Game Engine Compilation - Time To Compile (sec)	43.522			
Standard Deviation	1.3%			
Timed Linux Kernel Compilation - Time To Compile (sec)	19.990		19.929	31.954
Normalized	99.69%		100%	62.37%
Standard Deviation	2.4%		2.4%	2.4%
Timed LLVM Compilation - Ninja (sec)	115.998	228.699	113.041	108.082
Normalized	93.18%	47.26%	95.61%	100%
Standard Deviation	0.6%	1.5%	2.3%	4.8%
Timed LLVM Compilation - Unix Makefiles (sec)	172.692	329.020	160.600	154.699
Normalized	89.58%	47.02%	96.33%	100%
Standard Deviation	0.1%	0.4%	0.9%	0.5%

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Timed Node.js Compilation - Time To Compile (sec)	80.253		76.395	76.117
Normalized	94.85%		99.64%	100%
Standard Deviation	0.6%		0.7%	0.7%
POV-Ray - Trace Time (sec)	8.505	8.121	7.894	8.279
Normalized	92.82%	97.2%	100%	95.35%
Standard Deviation	0.3%	0.4%	0.3%	1%
Numpy Benchmark (Score)	437.03	556.66	480.38	474.73
Normalized	78.51%	100%	86.3%	85.28%
Standard Deviation	0.4%	0.3%	0.6%	0.3%
Timed Wasmer Compilation - Time To Compile (sec)	43.898		37.013	39.830
Normalized	84.32%		100%	92.93%
Standard Deviation	1.1%		1%	0.7%
OpenSSL - SHA256 (byte/s)	98548642883	103218599120	89907498373	91671791993
Normalized	95.48%	100%	87.1%	88.81%
Standard Deviation	0.1%	0.3%	2.2%	0.1%
OpenSSL - RSA4096 (sign/s)	17027	17010	16990	16983
Normalized	100%	99.9%	99.78%	99.74%
Standard Deviation	0.2%	0%	0.1%	0%
OpenSSL - RSA4096 (verify/s)	1114764	1113280	1114117	1112587
Normalized	100%	99.87%	99.94%	99.8%
Standard Deviation	0.1%	0%	0%	0%
OpenSSL (sign/s)	17090	17025	17077	16922
Normalized	100%	99.62%	99.92%	99.02%
Standard Deviation	0.1%	0%	0.1%	1.1%
OpenSSL (verify/s)	1104066	1116180	1107524	1107864
Normalized	98.91%	100%	99.22%	99.26%
Standard Deviation	0.1%	0%	0.2%	0.1%
GROMACS - MPI CPU - water_GMX50_bare (Ns/Day)	7.389	7.448	7.037	7.332
Normalized	99.21%	100%	94.48%	98.44%
Standard Deviation	0.7%	0.7%	0.9%	0.3%
PostgreSQL pgbench - 100 - 250 - Read Only (TPS)	1726319	2053666	2000971	2022285
Normalized	84.06%	100%	97.43%	98.47%
Standard Deviation	2.2%	1.7%	0.4%	0.3%
PostgreSQL pgbench - 100 - 250 - Read Only - Average Latency (ms)	0.145	0.122	0.125	0.124
Normalized	84.14%	100%	97.6%	98.39%
Standard Deviation	1.8%	1.7%	0.5%	0.5%
PostgreSQL pgbench - 100 - 500 - Read Only (TPS)	1719142	2003553	1922547	1962346
Normalized	85.8%	100%	95.96%	97.94%
Standard Deviation	0.6%	0.6%	0.5%	0.5%
PostgreSQL pgbench - 100 - 500 - Read Only - Average Latency (ms)	0.291	0.250	0.260	0.255
Normalized	85.91%	100%	96.15%	98.04%
Standard Deviation	0.5%	0.6%	0.4%	0.5%
PostgreSQL pgbench - 100 - 250 - Read Write (TPS)	52720	54550	65500	65075
Normalized	80.49%	83.28%	100%	99.35%
Standard Deviation	15%	11.6%	4.2%	3%

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PostgreSQL pgbench - 100 - 250 - Read Write - Average Latency (ms)	4.882	4.643	3.823	3.845
Normalized	78.31%	82.34%	100%	99.43%
Standard Deviation	21.1%	12.5%	4.1%	3%
PostgreSQL pgbench - 100 - 500 - Read Write (TPS)	58900	56007	65089	61262
Normalized	90.49%	86.05%	100%	94.12%
Standard Deviation	2.4%	1.7%	1.1%	1.2%
PostgreSQL pgbench - 100 - 500 - Read Write - Average Latency (ms)	8.492	8.929	7.683	8.162
Normalized	90.47%	86.05%	100%	94.13%
Standard Deviation	2.4%	1.7%	1.1%	1.2%
ASTC Encoder - Thorough (sec)	5.0476	4.9429	4.8542	5.5325
Normalized	96.17%	98.21%	100%	87.74%
Standard Deviation	0.2%	0.4%	0.3%	1%
ASTC Encoder - Exhaustive (sec)	9.3335	9.0497	9.4231	9.3084
Normalized	96.96%	100%	96.04%	97.22%
Standard Deviation	0%	0.6%	0.8%	0%
GEGL - Crop (sec)	7.770	6.003	29.542	29.271
Normalized	77.26%	100%	20.32%	20.51%
Standard Deviation	0.7%	1%	0.7%	0.4%
GEGL - Scale (sec)	6.858	4.804	29.354	29.221
Normalized	70.05%	100%	16.37%	16.44%
Standard Deviation	1.1%	1.8%	0.2%	0.1%
GEGL - Reflect (sec)	27.902	23.369	29.337	29.218
Normalized	83.75%	100%	79.66%	79.98%
Standard Deviation	0.1%	0%	0.3%	0.1%
GEGL - Color Enhance (sec)	49.840	35.913	29.414	29.217
Normalized	58.62%	81.35%	99.33%	100%
Standard Deviation	0.1%	0%	0.2%	0.1%
GEGL - Rotate 90 Degrees (sec)	36.275	31.163	29.291	29.212
Normalized	80.53%	93.74%	99.73%	100%
Standard Deviation	0.5%	0.1%	0.1%	0.1%
Hugin - P.P.A.S.T (sec)	45.791			
Standard Deviation	1.5%			
Inkscape - SVG Files To PNG (sec)			24.884	22.874
Normalized			91.92%	100%
Standard Deviation			2.3%	1.3%
OCRMyPDF - P.6.P.P.D (sec)	11.604			
Standard Deviation	1.8%			
GNU Octave Benchmark (sec)	6.040			
Standard Deviation	1.8%			
RawTherapee - T.B.T (sec)	49.937	40.833		
Normalized	81.77%	100%		
Standard Deviation	0.5%	0.4%		
Redis Memtier / Redis Benchmark - L.a.L.l (Reqs/sec)	1189084	1358711	812969	822492
Normalized	87.52%	100%	59.83%	60.53%
Standard Deviation	0.9%	2.3%	0.3%	1.6%
Redis Memtier / Redis Benchmark - L.a.L.l (Reqs/sec)	1291673	1300265	845538	817562
Normalized	99.34%	100%	65.03%	62.88%
Standard Deviation	4.7%	2.1%	1.9%	2.5%

AMD EPYC 7003 EO 2021 Linux Comparison

Redis Memtier / Redis Benchmark - GET (Operations/sec)	309981	1018406	538356	521237
Normalized	30.44%	100%	52.86%	51.18%
Standard Deviation	1.7%	3.4%	2.4%	1.2%
Redis Memtier / Redis Benchmark - MIX (Operations/sec)	318222	895410	499066	483248
Normalized	35.54%	100%	55.74%	53.97%
Standard Deviation	1.2%	5.2%	1.5%	2.9%
Redis Memtier / Redis Benchmark - SET (Operations/sec)	383802	683056	438577	447109
Normalized	56.19%	100%	64.21%	65.46%
Standard Deviation	17.6%	2.6%	11.5%	13.5%
NCNN - CPU - mobilenet (ms)	59.86	45.46	71.38	58.72
Normalized	75.94%	100%	63.69%	77.42%
Standard Deviation	24.7%	50.8%	32.9%	51%
NCNN - CPU-v2-v2 - mobilenet-v2 (ms)	32.84	31.25	37.76	48.33
Normalized	95.16%	100%	82.76%	64.66%
Standard Deviation	9.1%	15.5%	20.1%	31.7%
NCNN - CPU-v3-v3 - mobilenet-v3 (ms)	31.07	29.99	34.50	36.14
Normalized	96.52%	100%	86.93%	82.98%
Standard Deviation	9.3%	16.1%	21.4%	19.3%
NCNN - CPU - shufflenet-v2 (ms)	25.85	25.89	27.88	27.51
Normalized	100%	99.85%	92.72%	93.97%
Standard Deviation	13.7%	6.4%	16.3%	21.9%
NCNN - CPU - mnasnet (ms)	32.34	29.49	37.60	35.88
Normalized	91.19%	100%	78.43%	82.19%
Standard Deviation	11.5%	10.4%	24.3%	26.7%
NCNN - CPU - efficientnet-b0 (ms)	38.36	37.63	43.85	43.09
Normalized	98.1%	100%	85.82%	87.33%
Standard Deviation	10.9%	6.6%	16.8%	23.2%
NCNN - CPU - blazeface (ms)	13.01	11.09	13.27	13.25
Normalized	85.24%	100%	83.57%	83.7%
Standard Deviation	18.6%	6.3%	17.3%	26.6%
NCNN - CPU - googlenet (ms)	53.49	69.01	65.57	55.57
Normalized	100%	77.51%	81.58%	96.26%
Standard Deviation	15.2%	18.9%	24.5%	40.1%
NCNN - CPU - vgg16 (ms)	36.63	45.50	44.89	43.46
Normalized	100%	80.51%	81.6%	84.28%
Standard Deviation	6.3%	8.8%	11.1%	14.4%
NCNN - CPU - resnet18 (ms)	29.10	31.99	35.17	24.67
Normalized	84.78%	77.12%	70.15%	100%
Standard Deviation	23.3%	27.1%	45.9%	28.2%
NCNN - CPU - alexnet (ms)	13.01	14.50	13.92	15.03
Normalized	100%	89.72%	93.46%	86.56%
Standard Deviation	22.3%	16.2%	17.2%	31%
NCNN - CPU - resnet50 (ms)	67.78	50.85	53.47	63.27
Normalized	75.02%	100%	95.1%	80.37%
Standard Deviation	26.9%	48.4%	33.8%	33.2%
NCNN - CPU - yolov4-tiny (ms)	40.84	42.02	45.37	46.19
Normalized	100%	97.19%	90.02%	88.42%
Standard Deviation	17.9%	30.1%	15.5%	19.2%
NCNN - CPU - squeezenet_ssd (ms)	58.79	64.34	78.68	80.72
Normalized	100%	91.37%	74.72%	72.83%
Standard Deviation	12.3%	17.6%	37.9%	41.3%

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NCNN - CPU - regnety_400m (ms)	67.12	**64.98**	**78.87**	77.96
Normalized	96.81%	100%	82.39%	83.35%
Standard Deviation	9.6%	8.4%	12.5%	27%
TNN - CPU - DenseNet (ms)	2842	**3325**	2736	**2651**
Normalized	93.28%	79.72%	96.91%	100%
Standard Deviation	0.3%	0%	0.6%	0%
TNN - CPU - MobileNet v2 (ms)	302.520	**320.664**	**288.433**	302.937
Normalized	95.34%	89.95%	100%	95.21%
Standard Deviation	1.9%	0.2%	0.1%	0.9%
TNN - CPU - SqueezeNet v2 (ms)	62.076	**64.599**	**58.701**	62.224
Normalized	94.56%	90.87%	100%	94.34%
Standard Deviation	0.3%	0.8%	2.3%	0.4%
TNN - CPU - SqueezeNet v1.1 (ms)	251.700	**319.412**	**249.486**	257.386
Normalized	99.12%	78.11%	100%	96.93%
Standard Deviation	0.1%	0%	0.1%	0.2%
PlaidML - No - Inference - VGG16 - CPU (FPS)	**33.98**	47.07	**47.10**	46.86
Normalized	72.14%	99.94%	100%	99.49%
Standard Deviation	2.6%	0.6%	2.1%	2.4%
PlaidML - No - Inference - VGG19 - CPU (FPS)	**30.36**	41.42	**41.73**	40.88
Normalized	72.75%	99.26%	100%	97.96%
Standard Deviation	1.4%	0%	1.2%	2%
PlaidML - No - Inference - ResNet 50 - CPU (FPS)	**8.53**	8.39	**8.14**	8.16
Normalized	100%	98.36%	95.43%	95.66%
Standard Deviation	0.8%	0.3%	1%	0.3%
Blender - BMW27 - CPU-Only (sec)	**26.24**	**25.76**	26.04	25.90
Normalized	98.17%	100%	98.92%	99.46%
Standard Deviation	0.6%	0.3%	1.3%	0.4%
Blender - Pabellon Barcelona - CPU-Only (sec)	**76.98**	**75.10**	75.96	75.55
Normalized	97.56%	100%	98.87%	99.4%
Standard Deviation	0.2%	0.2%	0.4%	0.4%
ONNX Runtime - yolov4 - OpenMP CPU (Inferences/min)	**271**		**194**	245
Normalized	100%		71.59%	90.41%
Standard Deviation	5.2%		8.9%	9.5%
ONNX Runtime - bertsquad-10 - OpenMP CPU (Inferences/min)	**448**		**417**	**417**
Normalized	100%		93.08%	93.08%
Standard Deviation	2.5%		10.3%	10.7%
ONNX Runtime - fcn-resnet101-11 - OpenMP CPU (Inferences/min)	**191**		**160**	163
Normalized	100%		83.77%	85.34%
Standard Deviation	2.5%		7%	8.1%
ONNX Runtime - shufflenet-v2-10 - OpenMP CPU (Inferences/min)	**5038**		**4060**	4668
Normalized	100%		80.59%	92.66%
Standard Deviation	10.7%		21.5%	36.5%
ONNX Runtime - super-resolution-10 - OpenMP CPU (Inferences/min)	**5292**		4783	**4363**
Normalized	100%		90.38%	82.45%
Standard Deviation	8.9%		14.7%	26%

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PyBench - T.F.A.T.T (Milliseconds)	**866**	881	990	**992**
Normalized	100%	98.3%	87.47%	87.3%
Standard Deviation	0.3%	0.7%	0.2%	0.7%
PyPerformance - go (Milliseconds)	**220**	221	**254**	251
Normalized	100%	99.55%	86.61%	87.65%
Standard Deviation	0.3%	0%		0.4%
PyPerformance - float (Milliseconds)	98.4	**98.3**	**106**	**106**
Normalized	99.9%	100%	92.74%	92.74%
Standard Deviation	0%	0.3%		
PyPerformance - nbody (Milliseconds)	**109**	111	**117**	113
Normalized	100%	98.2%	93.16%	96.46%
Standard Deviation	0.5%	0.5%		0.5%
PyPerformance - pathlib	15.2	**13.5**	**17.5**	17.1
Normalized	88.82%	100%	77.14%	78.95%
Standard Deviation	0.4%	0.4%	0.3%	0.3%
PyPerformance - raytrace	414	**409**	**513**	511
Normalized	98.79%	100%	79.73%	80.04%
Standard Deviation	0.4%	0.1%	0.2%	0.1%
PyPerformance - json_loads (Milliseconds)	**20.3**	21.3	**22.9**	21.9
Normalized	100%	95.31%	88.65%	92.69%
Standard Deviation	0.3%	0%	0.7%	0%
PyPerformance - crypto_pyaes (Milliseconds)	**89.1**	**89.1**	**94.7**	92.7
Normalized	100%	100%	94.09%	96.12%
Standard Deviation	0.2%	0.2%	0.2%	0.1%
PyPerformance - regex_compile (Milliseconds)	151	**146**	**180**	178
Normalized	96.69%	100%	81.11%	82.02%
Standard Deviation	0%	0%		
PyPerformance - python_startup (Milliseconds)	**7.31**	8.45	**10.4**	10.1
Normalized	100%	86.51%	70.29%	72.38%
Standard Deviation	0.3%	0.2%	0%	0%
PyPerformance - django_template (Milliseconds)	**41.4**	41.6	64.9	**65.1**
Normalized	100%	99.52%	63.79%	63.59%
Standard Deviation	0.1%	0.1%	0.2%	0.2%
PyPerformance - pickle_pure_python (Milliseconds)	388	**376**	470	**472**
Normalized	96.91%	100%	80%	79.66%
Standard Deviation	0.1%	0.3%	0.2%	0.4%
Nginx - Long Connection - 500 (Reqs/sec)	170341			
Standard Deviation	0.9%			
Nginx - Long Connection - 1000 (Reqs/sec)	180786			
Standard Deviation	0.4%			
Nginx - Short Connection - 500 (Reqs/sec)	42142			
Standard Deviation	0.1%			

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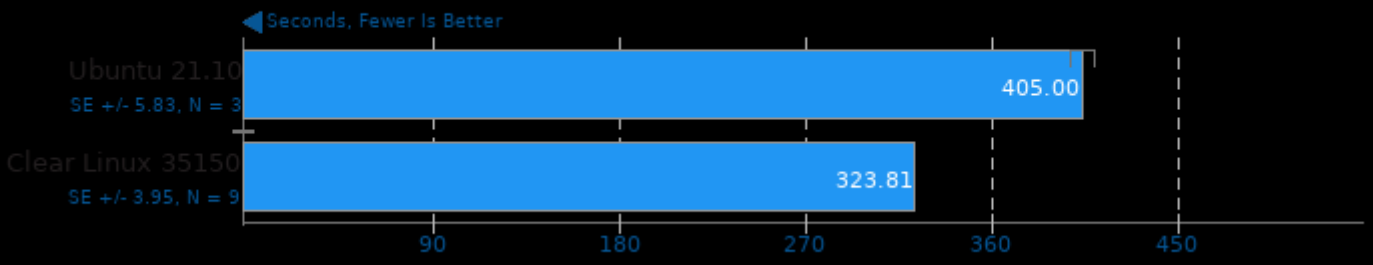
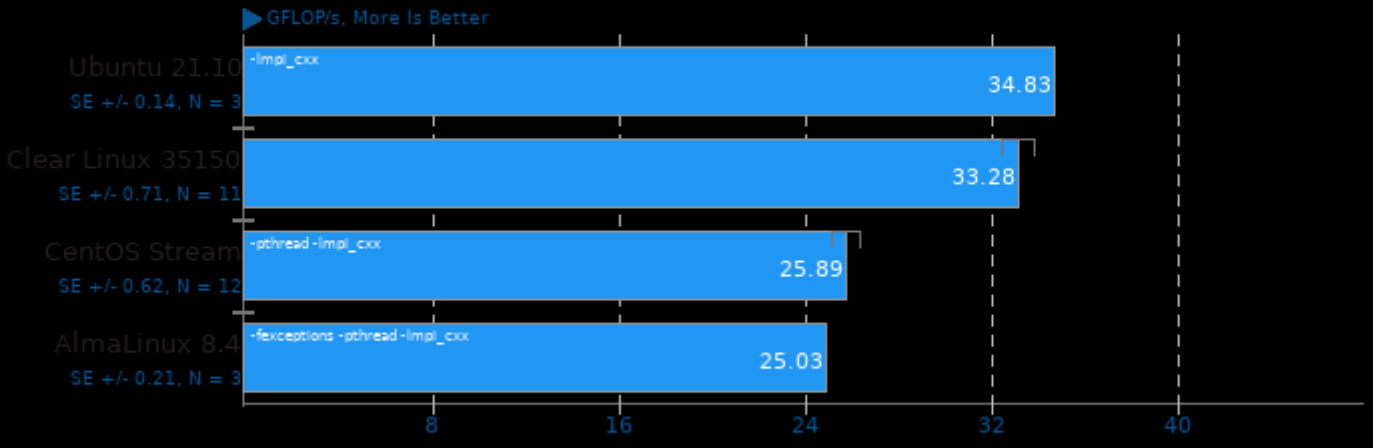
Nginx - Short Connection - 1000 (Reqs/sec)	35836			
Standard Deviation	0.2%			
Appleseed - Disney Material (sec)	**48.475275**	**45.927436**	46.741895	47.376638
Normalized	94.74%	100%	98.26%	96.94%
Appleseed - Material Tester (sec)	329.486118	333.786072	**334.758156**	**303.120296**
Normalized	92%	90.81%	90.55%	100%
Chaos Group V-RAY - CPU (vsamples)	**64272**	66785	66119	**67572**
Normalized	95.12%	98.84%	97.85%	100%
Standard Deviation	9.5%	6.7%	1.9%	1%
GNU Octave Benchmark (sec)		4.002		
Standard Deviation		0.6%		
PlaidML - No - Inference - IMDB LSTM - CPU (FPS)		703.76		
Standard Deviation		0.4%		
PlaidML - No - Inference - Mobilenet - CPU (FPS)		16.53		
Standard Deviation		2%		
PlaidML - No - Inference - DenseNet 201 - CPU (FPS)		4.64		
Standard Deviation		0.3%		
PlaidML - No - Inference - NASNer Large - CPU (FPS)		1.59		
Standard Deviation		0.6%		
GNU Octave Benchmark (sec)			**4.930**	**4.929**
Normalized			99.76%	99.78%
Standard Deviation			0.8%	0.5%

WireGuard + Linux Networking Stack Stress Test



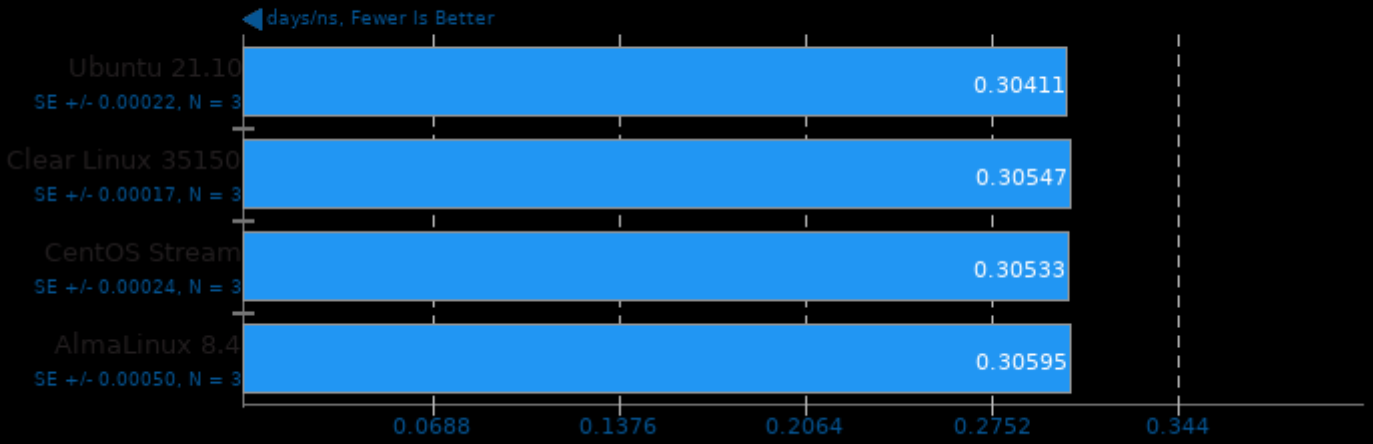
High Performance Conjugate Gradient 3.1



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

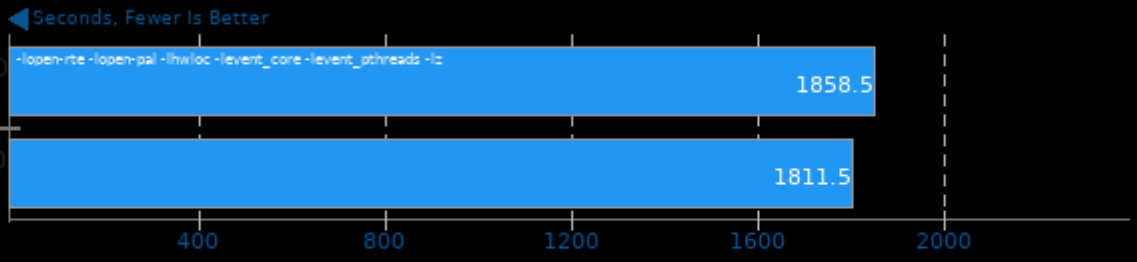
NAMD 2.14

ATPase Simulation - 327,506 Atoms



NWChem 7.0.2

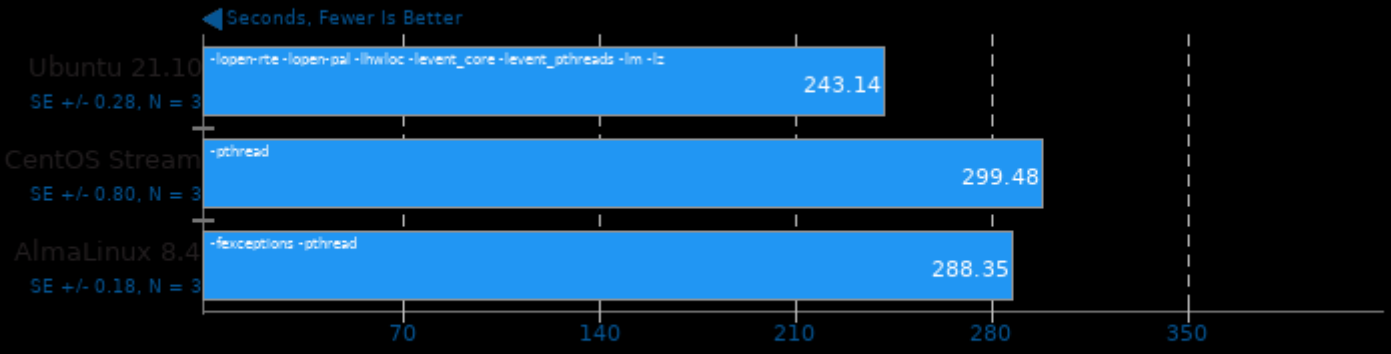
Input: C240 Buckyball



1. (F9X) gfortran options: -lnwctask -lccsd -lmcscf -lselci -lmp2 -lmoints -lstepper -ldriver -loptim -lnwdft -lgradients -lcphf -lesp -lddscf -ldangchang -lgue

Quantum ESPRESSO 6.8

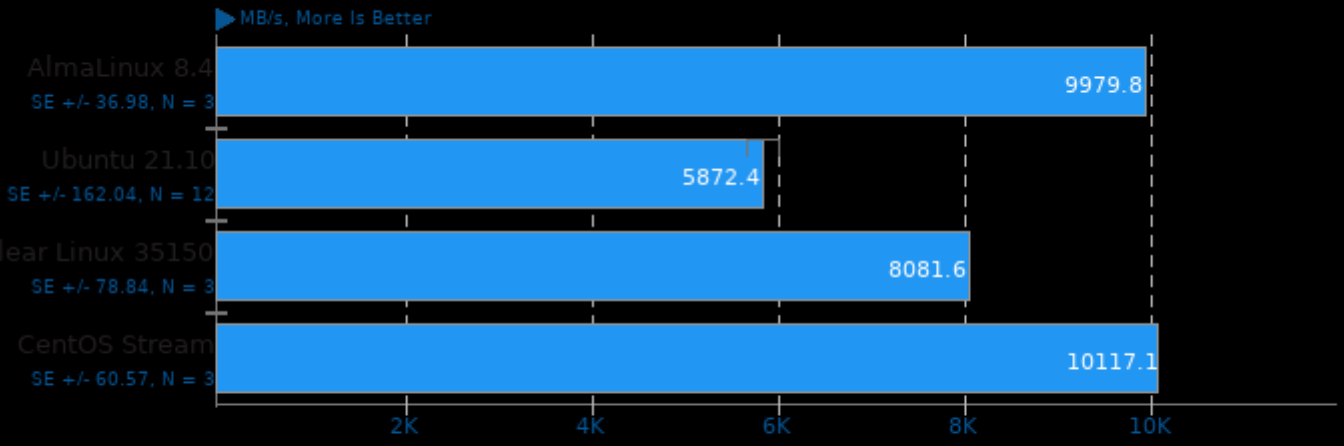
Input: AUSURF112



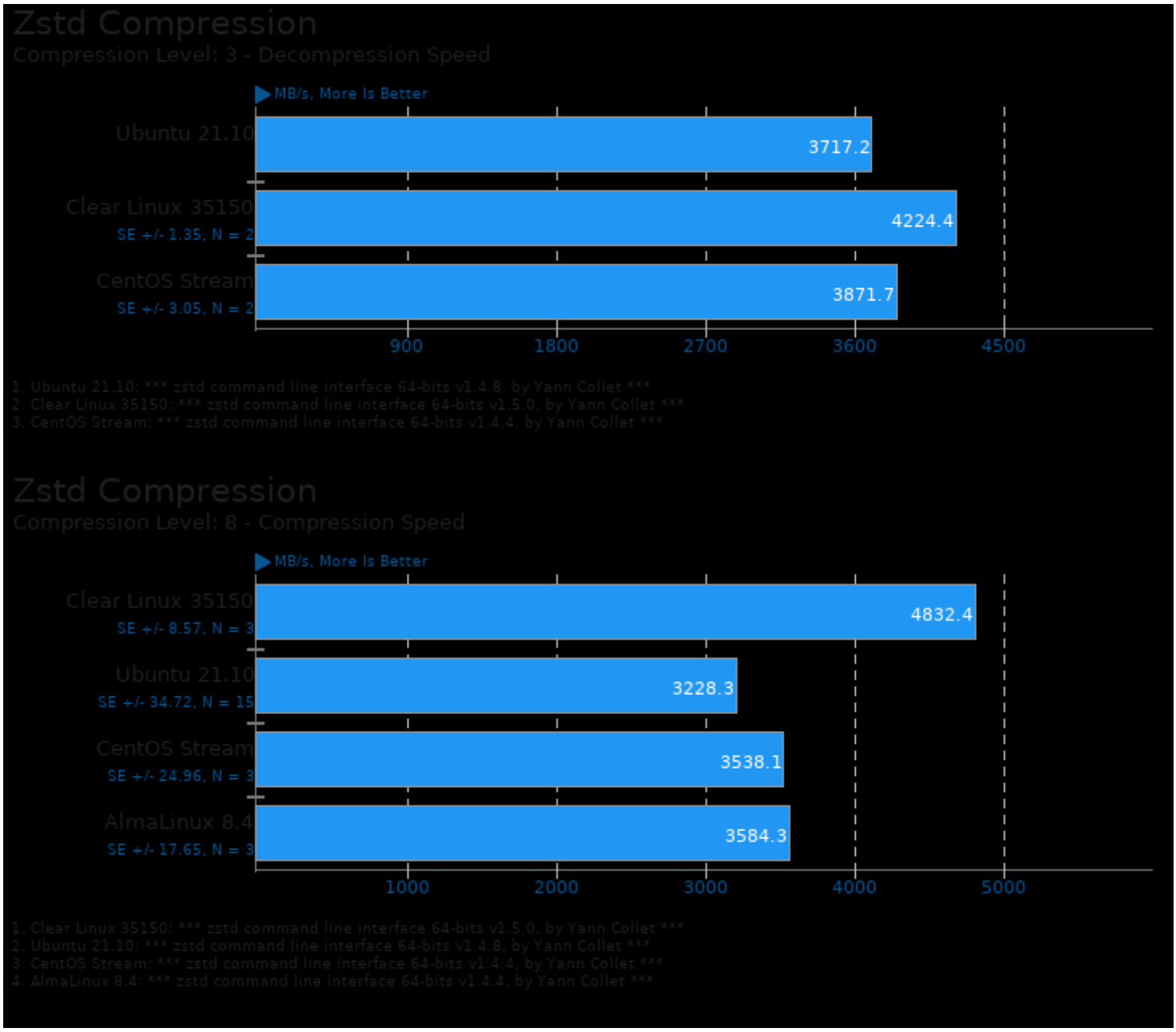
1. (F9X) gfortran options: -ldevXlib -lopenblas -lFoX_dom -lFoX_sax -lFoX_wxml -lFoX_common -lFoX_utils -lFoX_fsys -lfftw3 -lmpi_usempif08 -lmpi_mpifh -

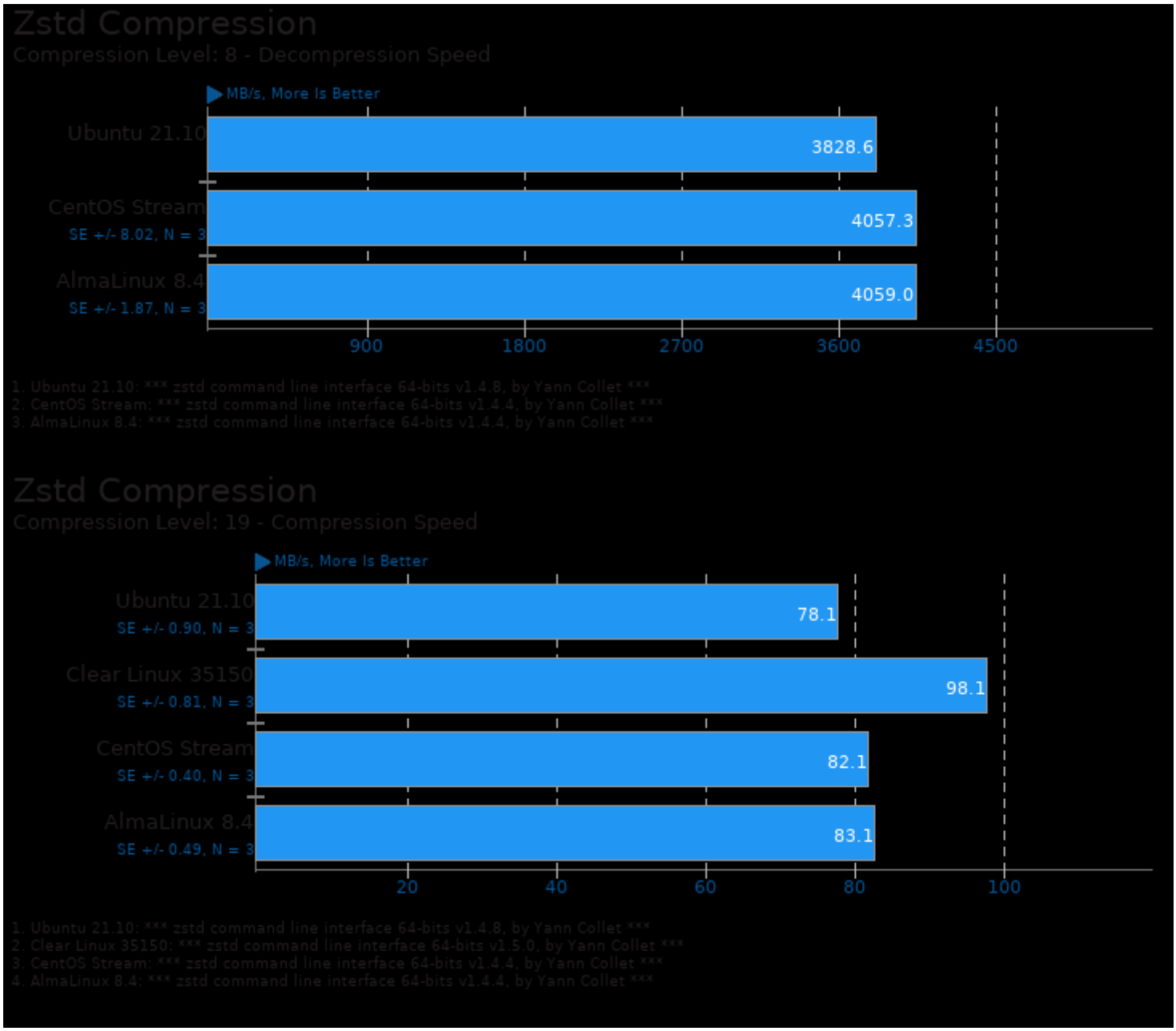
Zstd Compression

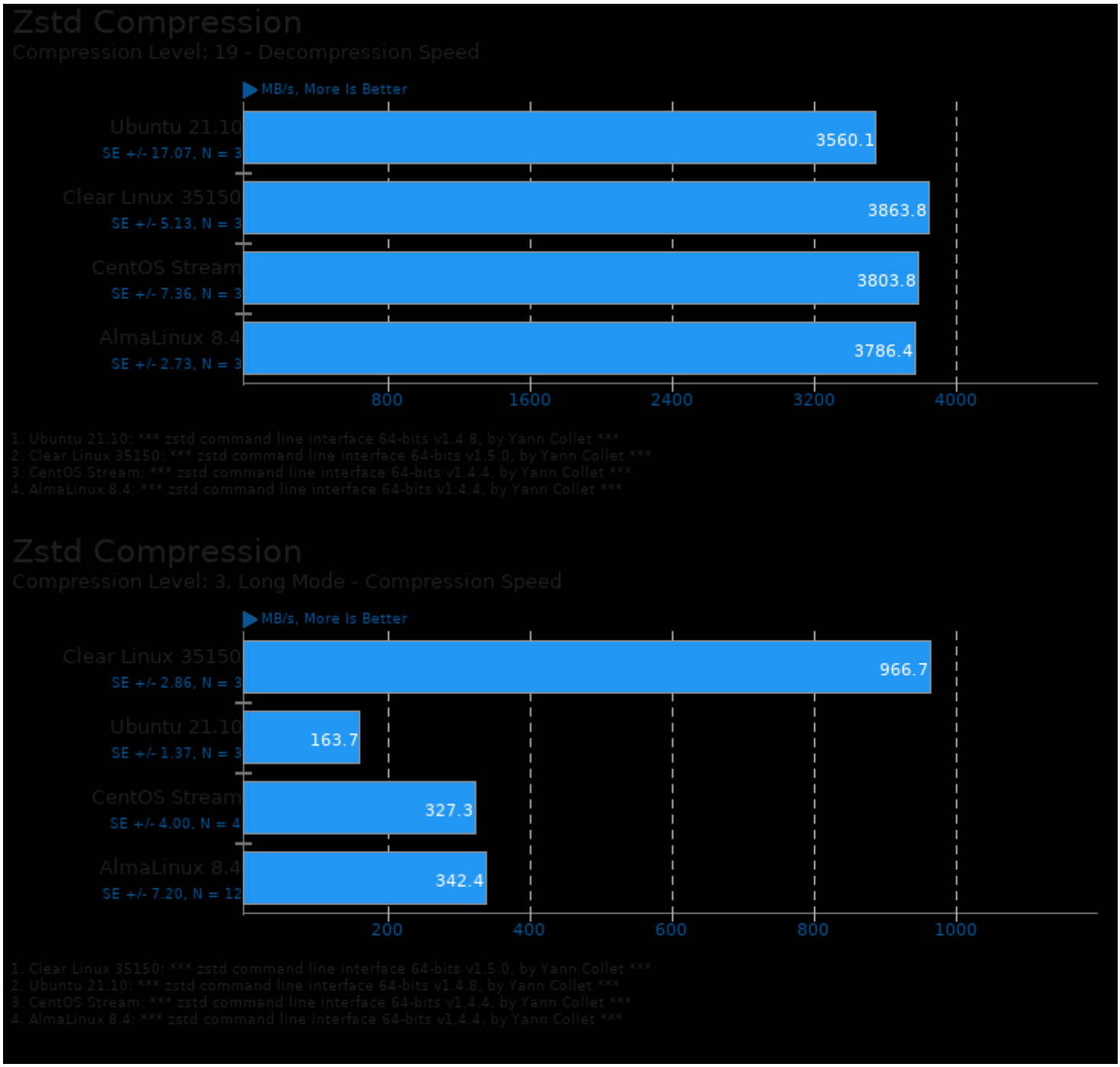
Compression Level: 3 - Compression Speed

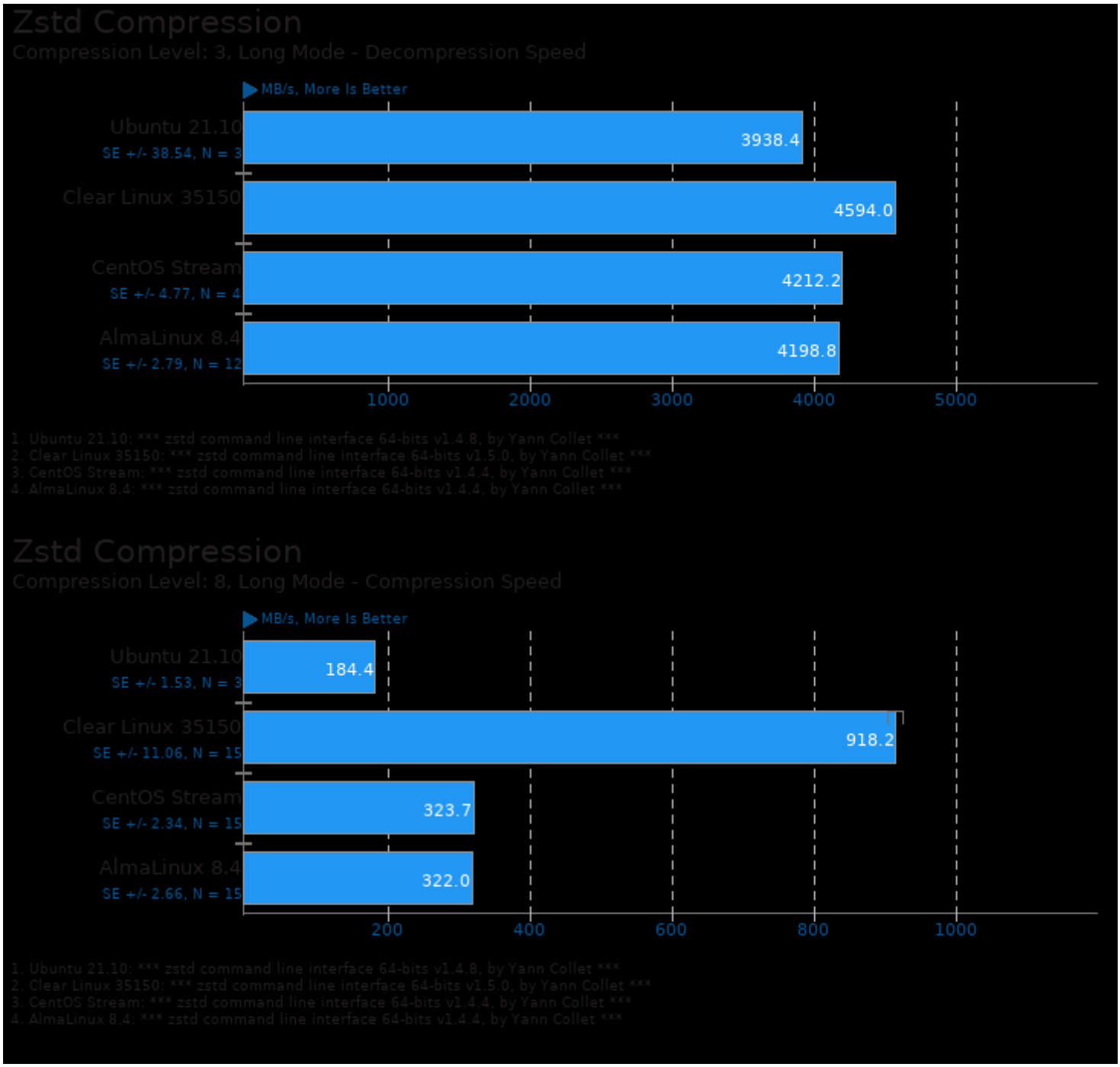


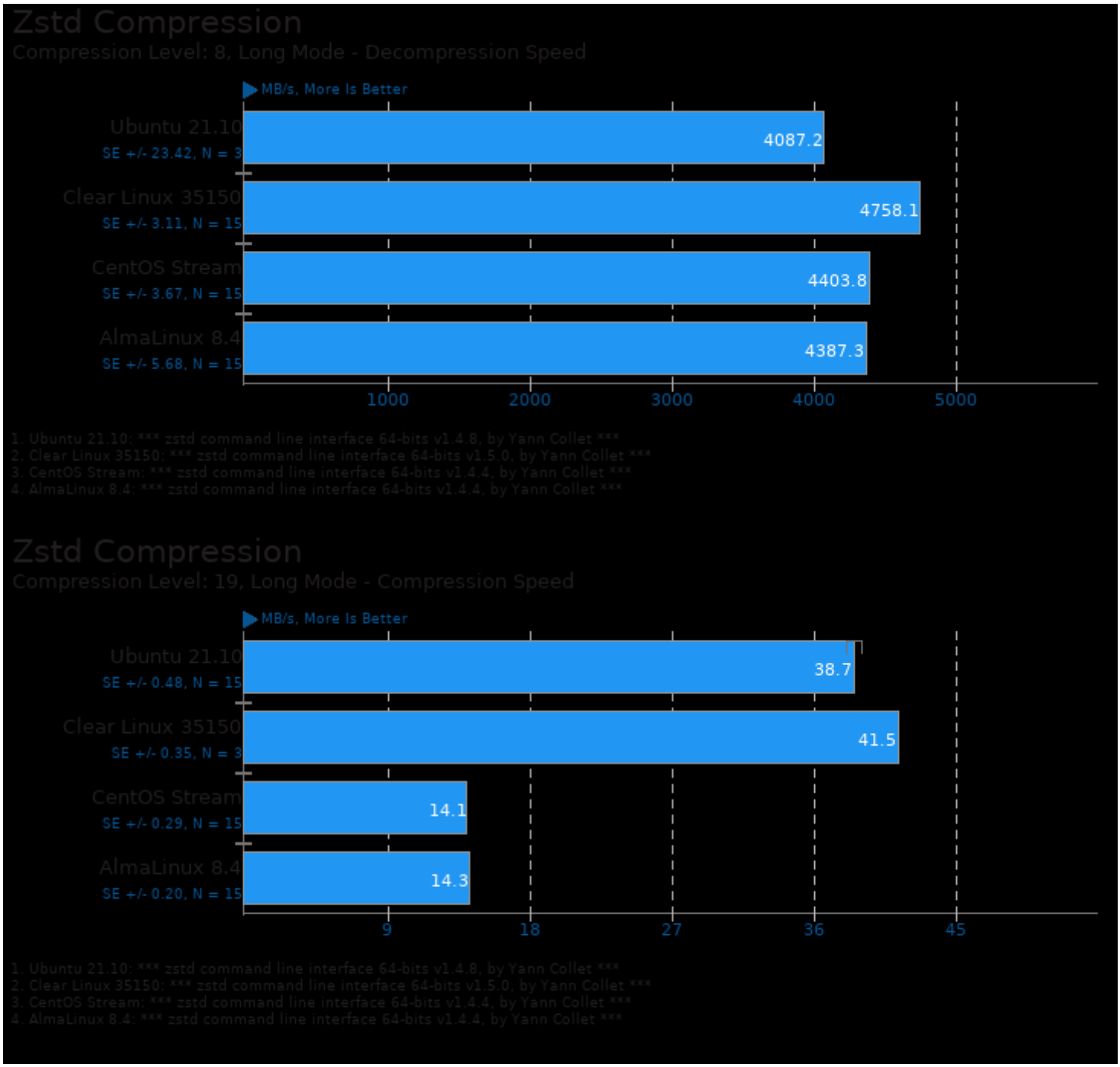
1. AlmaLinux 8.4: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
2. Ubuntu 21.10: *** zstd command line interface 64-bits v1.4.8, by Yann Collet ***
3. Clear Linux 35150: *** zstd command line interface 64-bits v1.5.0, by Yann Collet ***
4. CentOS Stream: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***


Zstd Compression
Compression Level: 3 - Decompression Speed
MB/s, More Is Better
Ubuntu 21.10
3717.2
Clear Linux 35150
SE +/- 1.35, N = 2
4224.4
CentOS Stream
SE +/- 3.05, N = 2
3871.7
900
1800
2700
3600
4500
1. Ubuntu 21.10: *** zstd command line interface 64-bits v1.4.8, by Yann Collet ***
2. Clear Linux 35150: *** zstd command line interface 64-bits v1.5.0, by Yann Collet ***
3. CentOS Stream: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
Zstd Compression
Compression Level: 8 - Compression Speed
MB/s, More Is Better
Clear Linux 35150
SE +/- 8.57, N = 3
4832.4
Ubuntu 21.10
SE +/- 34.72, N = 15
3228.3
CentOS Stream
SE +/- 24.96, N = 3
3538.1
AlmaLinux 8.4
SE +/- 17.65, N = 3
3584.3
1000
2000
3000
4000
5000
1. Clear Linux 35150: *** zstd command line interface 64-bits v1.5.0, by Yann Collet ***
2. Ubuntu 21.10: *** zstd command line interface 64-bits v1.4.8, by Yann Collet ***
3. CentOS Stream: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
4. AlmaLinux 8.4: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***


Zstd Compression
Compression Level: 8 - Decompression Speed
MB/s, More Is Better
Ubuntu 21.10
3828.6
CentOS Stream
SE +/- 8.02, N = 3
4057.3
AlmaLinux 8.4
SE +/- 1.87, N = 3
4059.0
900
1800
2700
3600
4500
1. Ubuntu 21.10: *** zstd command line interface 64-bits v1.4.8, by Yann Collet ***
2. CentOS Stream: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
3. AlmaLinux 8.4: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
Zstd Compression
Compression Level: 19 - Compression Speed
MB/s, More Is Better
Ubuntu 21.10
SE +/- 0.90, N = 3
78.1
Clear Linux 35150
SE +/- 0.81, N = 3
98.1
CentOS Stream
SE +/- 0.40, N = 3
82.1
AlmaLinux 8.4
SE +/- 0.49, N = 3
83.1
20
40
60
80
100
1. Ubuntu 21.10: *** zstd command line interface 64-bits v1.4.8, by Yann Collet ***
2. Clear Linux 35150: *** zstd command line interface 64-bits v1.5.0, by Yann Collet ***
3. CentOS Stream: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
4. AlmaLinux 8.4: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***

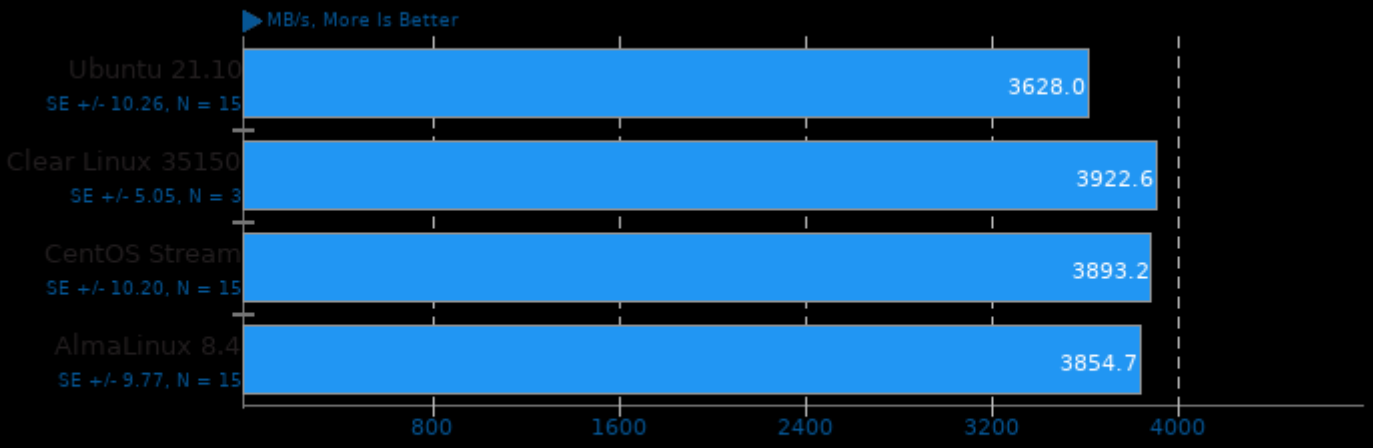

Zstd Compression
Compression Level: 19 - Decompression Speed
MB/s, More Is Better
Ubuntu 21.10
SE +/- 17.07, N = 3
3560.1
Clear Linux 35150
SE +/- 5.13, N = 3
3863.8
CentOS Stream
SE +/- 7.36, N = 3
3803.8
AlmaLinux 8.4
SE +/- 2.73, N = 3
3786.4
800
1600
2400
3200
4000
1. Ubuntu 21.10: *** zstd command line interface 64-bits v1.4.8, by Yann Collet ***
2. Clear Linux 35150: *** zstd command line interface 64-bits v1.5.0, by Yann Collet ***
3. CentOS Stream: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
4. AlmaLinux 8.4: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
Zstd Compression
Compression Level: 3, Long Mode - Compression Speed
MB/s, More Is Better
Clear Linux 35150
SE +/- 2.86, N = 3
966.7
Ubuntu 21.10
SE +/- 1.37, N = 3
163.7
CentOS Stream
SE +/- 4.00, N = 4
327.3
AlmaLinux 8.4
SE +/- 7.20, N = 12
342.4
200
400
600
800
1000
1. Clear Linux 35150: *** zstd command line interface 64-bits v1.5.0, by Yann Collet ***
2. Ubuntu 21.10: *** zstd command line interface 64-bits v1.4.8, by Yann Collet ***
3. CentOS Stream: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
4. AlmaLinux 8.4: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***


Zstd Compression
Compression Level: 3, Long Mode - Decompression Speed
MB/s, More Is Better
Ubuntu 21.10
SE +/- 38.54, N = 3
3938.4
Clear Linux 35150
4594.0
CentOS Stream
SE +/- 4.77, N = 4
4212.2
AlmaLinux 8.4
SE +/- 2.79, N = 12
4198.8
1000
2000
3000
4000
5000
1. Ubuntu 21.10: *** zstd command line interface 64-bits v1.4.8, by Yann Collet ***
2. Clear Linux 35150: *** zstd command line interface 64-bits v1.5.0, by Yann Collet ***
3. CentOS Stream: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
4. AlmaLinux 8.4: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
Zstd Compression
Compression Level: 8, Long Mode - Compression Speed
MB/s, More Is Better
Ubuntu 21.10
SE +/- 1.53, N = 3
184.4
Clear Linux 35150
SE +/- 11.06, N = 15
918.2
CentOS Stream
SE +/- 2.34, N = 15
323.7
AlmaLinux 8.4
SE +/- 2.66, N = 15
322.0
200
400
600
800
1000
1. Ubuntu 21.10: *** zstd command line interface 64-bits v1.4.8, by Yann Collet ***
2. Clear Linux 35150: *** zstd command line interface 64-bits v1.5.0, by Yann Collet ***
3. CentOS Stream: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
4. AlmaLinux 8.4: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***


Zstd Compression
Compression Level: 8, Long Mode - Decompression Speed
MB/s, More Is Better
Ubuntu 21.10
SE +/- 23.42, N = 3
4087.2
Clear Linux 35150
SE +/- 3.11, N = 15
4758.1
CentOS Stream
SE +/- 3.67, N = 15
4403.8
AlmaLinux 8.4
SE +/- 5.68, N = 15
4387.3
1000
2000
3000
4000
5000
1. Ubuntu 21.10: *** zstd command line interface 64-bits v1.4.8, by Yann Collet ***
2. Clear Linux 35150: *** zstd command line interface 64-bits v1.5.0, by Yann Collet ***
3. CentOS Stream: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
4. AlmaLinux 8.4: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
Zstd Compression
Compression Level: 19, Long Mode - Compression Speed
MB/s, More Is Better
Ubuntu 21.10
SE +/- 0.48, N = 15
38.7
Clear Linux 35150
SE +/- 0.35, N = 3
41.5
CentOS Stream
SE +/- 0.29, N = 15
14.1
AlmaLinux 8.4
SE +/- 0.20, N = 15
14.3
9
18
27
36
45
1. Ubuntu 21.10: *** zstd command line interface 64-bits v1.4.8, by Yann Collet ***
2. Clear Linux 35150: *** zstd command line interface 64-bits v1.5.0, by Yann Collet ***
3. CentOS Stream: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
4. AlmaLinux 8.4: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***

Zstd Compression

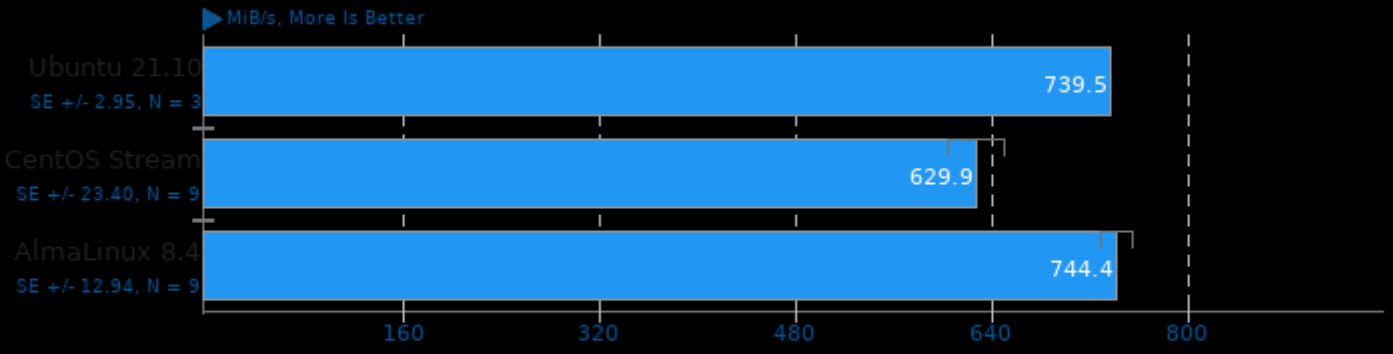
Compression Level: 19, Long Mode - Decompression Speed



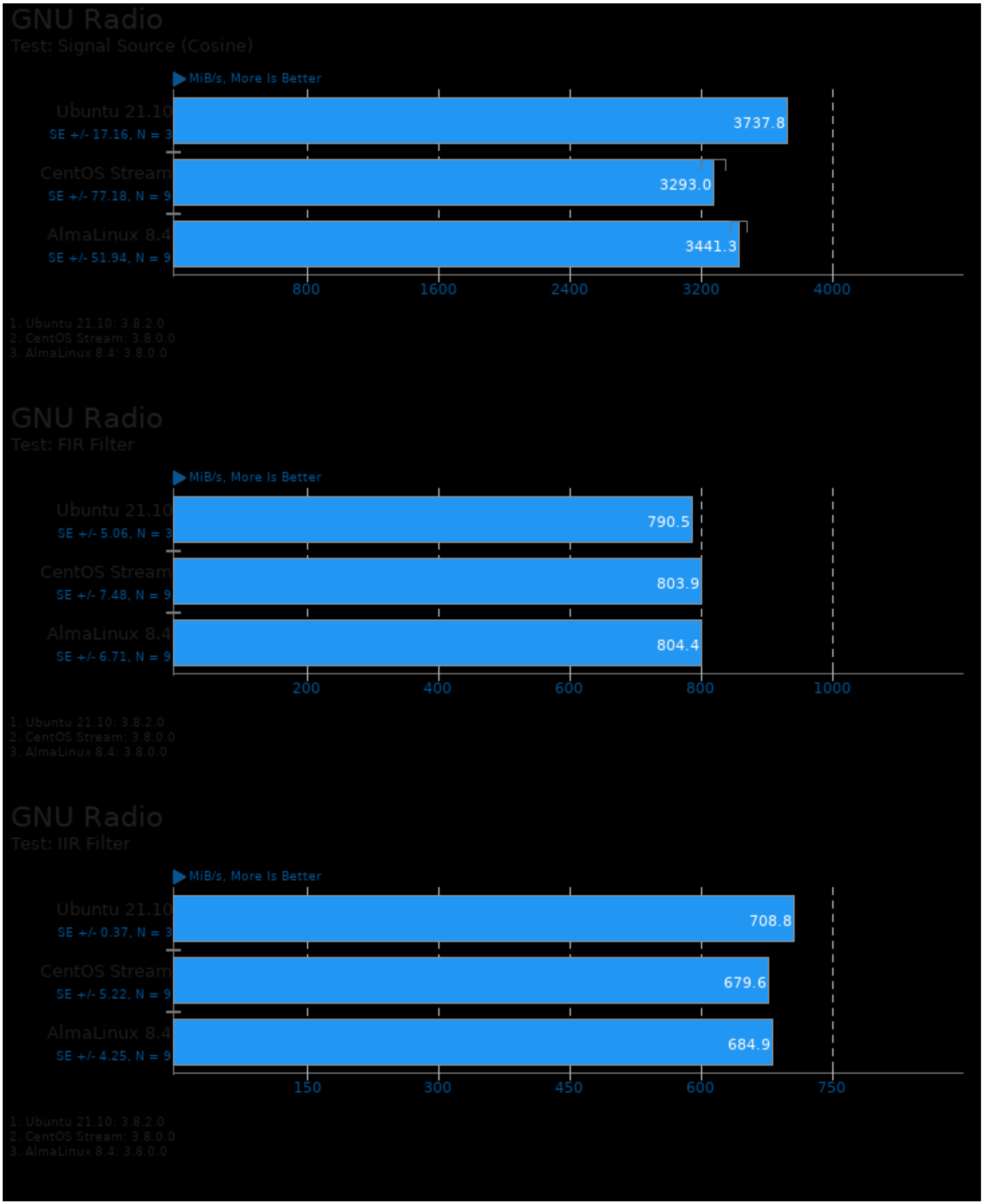
1. Ubuntu 21.10: *** zstd command line interface 64-bits v1.4.8, by Yann Collet ***
2. Clear Linux 35150: *** zstd command line interface 64-bits v1.5.0, by Yann Collet ***
3. CentOS Stream: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***
4. AlmaLinux 8.4: *** zstd command line interface 64-bits v1.4.4, by Yann Collet ***

GNU Radio

Test: Five Back to Back FIR Filters

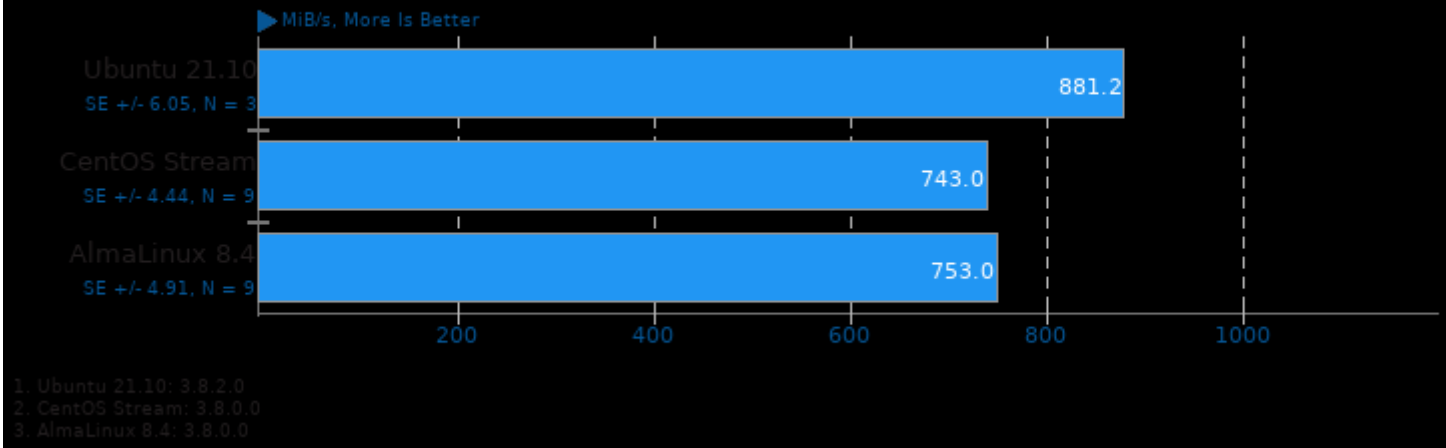


1. Ubuntu 21.10: 3.8.2.0
2. CentOS Stream: 3.8.0.0
3. AlmaLinux 8.4: 3.8.0.0


GNU Radio
Test: Signal Source (Cosine)
MiB/s, More Is Better
Ubuntu 21.10
SE +/- 17.16, N = 3
3737.8
CentOS Stream
SE +/- 77.18, N = 9
3293.0
AlmaLinux 8.4
SE +/- 51.94, N = 9
3441.3
800
1600
2400
3200
4000
1. Ubuntu 21.10: 3.8.2.0
2. CentOS Stream: 3.8.0.0
3. AlmaLinux 8.4: 3.8.0.0
GNU Radio
Test: FIR Filter
MiB/s, More Is Better
Ubuntu 21.10
SE +/- 5.06, N = 3
790.5
CentOS Stream
SE +/- 7.48, N = 9
803.9
AlmaLinux 8.4
SE +/- 6.71, N = 9
804.4
200
400
600
800
1000
1. Ubuntu 21.10: 3.8.2.0
2. CentOS Stream: 3.8.0.0
3. AlmaLinux 8.4: 3.8.0.0
GNU Radio
Test: IIR Filter
MiB/s, More Is Better
Ubuntu 21.10
SE +/- 0.37, N = 3
708.8
CentOS Stream
SE +/- 5.22, N = 9
679.6
AlmaLinux 8.4
SE +/- 4.25, N = 9
684.9
150
300
450
600
750
1. Ubuntu 21.10: 3.8.2.0
2. CentOS Stream: 3.8.0.0
3. AlmaLinux 8.4: 3.8.0.0

GNU Radio

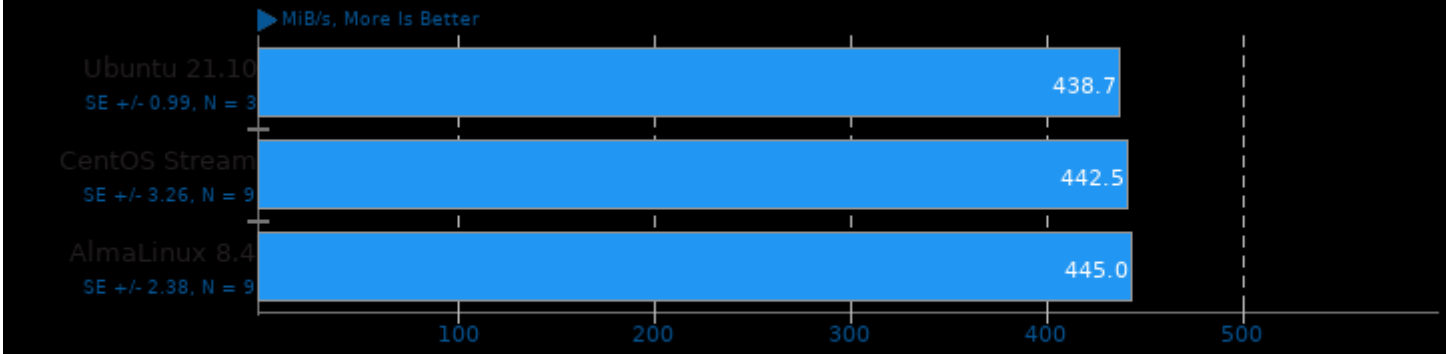
Test: FM Deemphasis Filter



1. Ubuntu 21.10: 3.8.2.0
2. CentOS Stream: 3.8.0.0
3. AlmaLinux 8.4: 3.8.0.0

GNU Radio

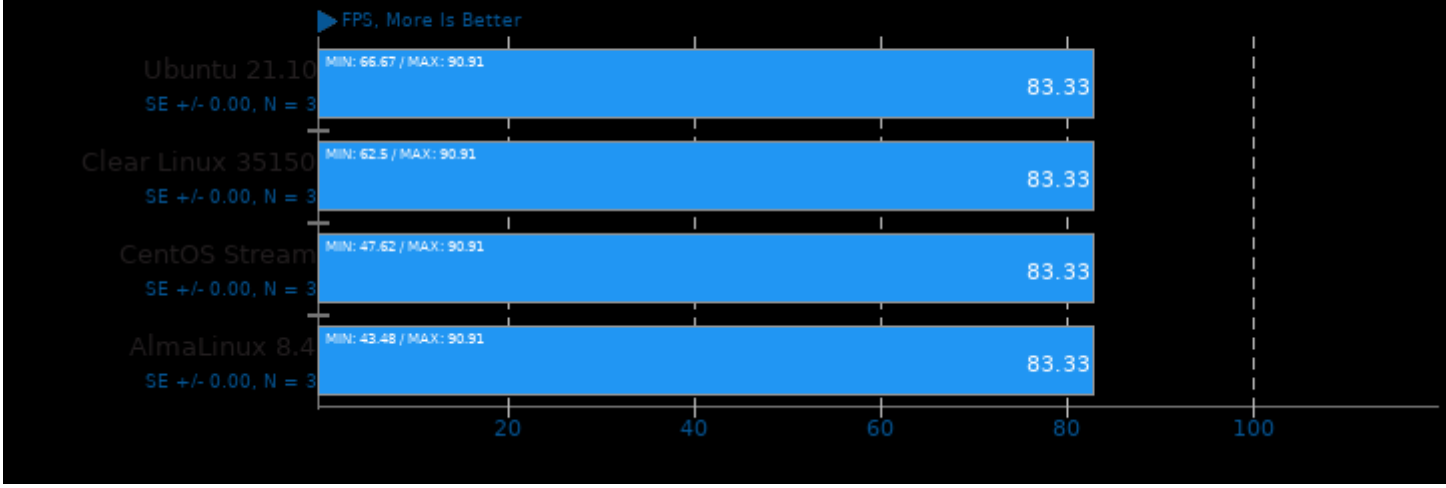
Test: Hilbert Transform

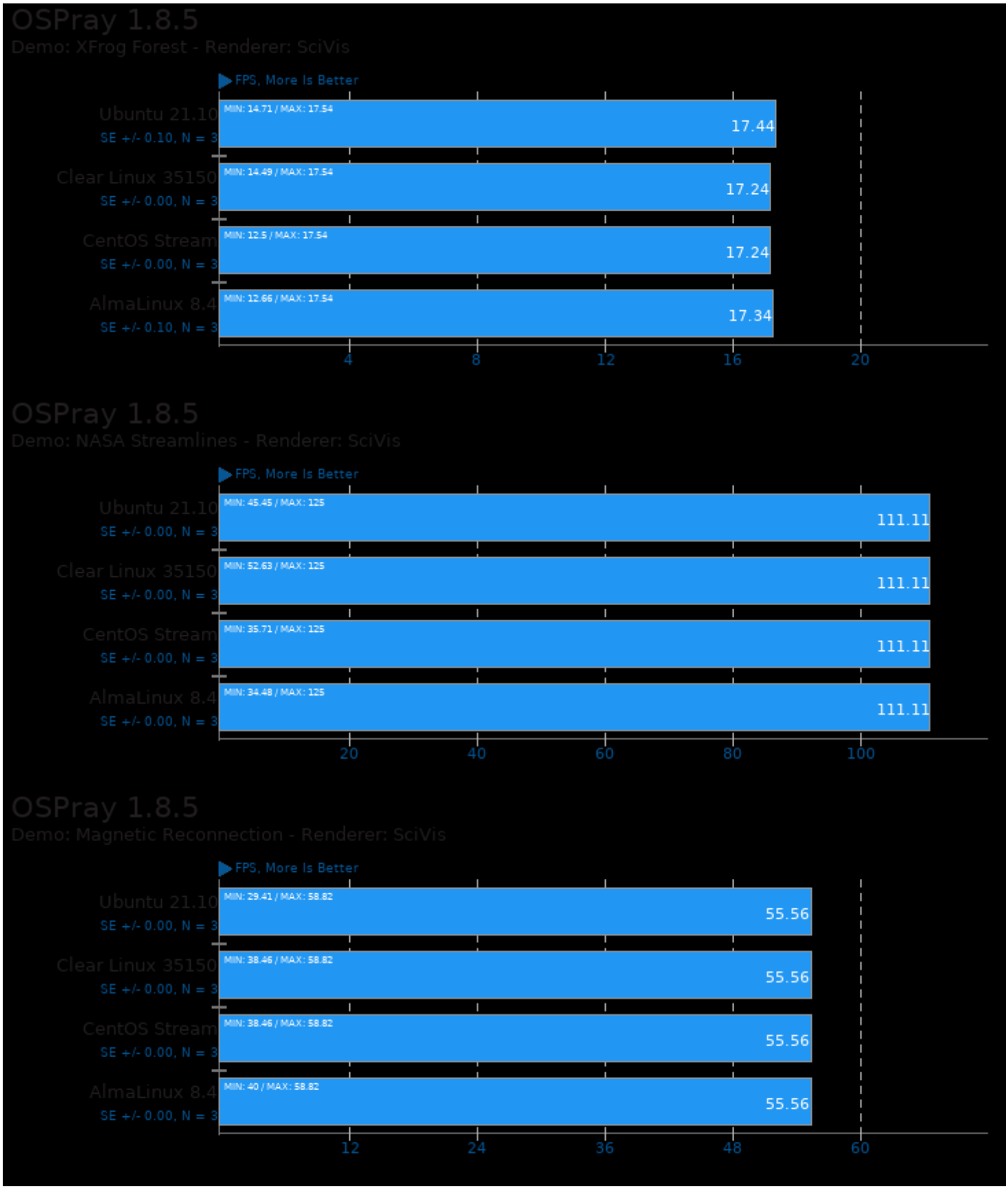


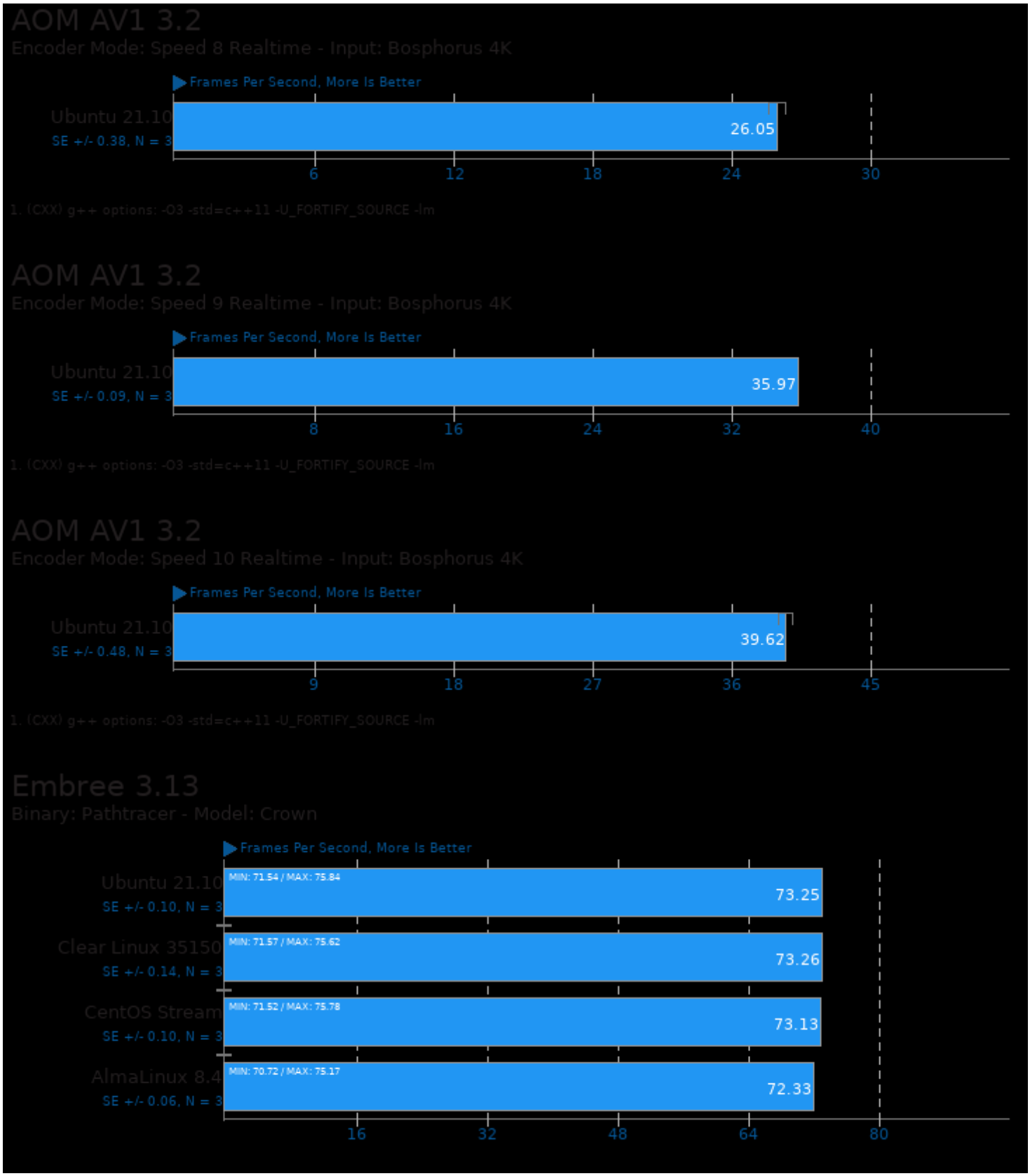
1. Ubuntu 21.10: 3.8.2.0
2. CentOS Stream: 3.8.0.0
3. AlmaLinux 8.4: 3.8.0.0

OSPray 1.8.5

Demo: San Miguel - Renderer: SciVis

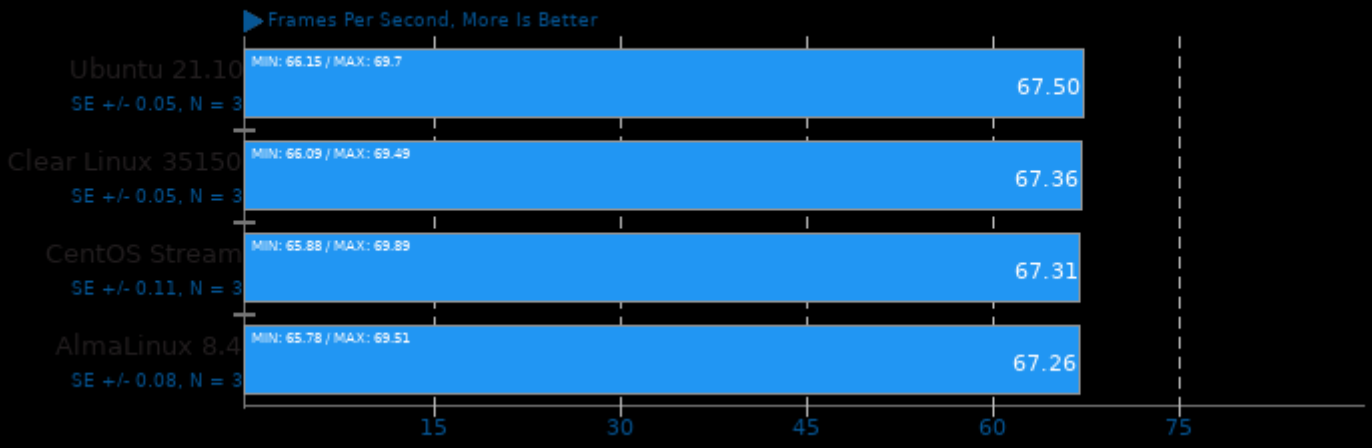



OSPray 1.8.5
Demo: XFrog Forest - Renderer: SciVis
FPS, More Is Better
Ubuntu 21.10
SE +/- 0.10, N = 3
MIN: 14.71 / MAX: 17.54
17.44
Clear Linux 35150
SE +/- 0.00, N = 3
MIN: 14.49 / MAX: 17.54
17.24
CentOS Stream
SE +/- 0.00, N = 3
MIN: 12.5 / MAX: 17.54
17.24
AlmaLinux 8.4
SE +/- 0.10, N = 3
MIN: 12.66 / MAX: 17.54
17.34
4
8
12
16
20
OSPray 1.8.5
Demo: NASA Streamlines - Renderer: SciVis
FPS, More Is Better
Ubuntu 21.10
SE +/- 0.00, N = 3
MIN: 45.45 / MAX: 125
111.11
Clear Linux 35150
SE +/- 0.00, N = 3
MIN: 52.63 / MAX: 125
111.11
CentOS Stream
SE +/- 0.00, N = 3
MIN: 35.71 / MAX: 125
111.11
AlmaLinux 8.4
SE +/- 0.00, N = 3
MIN: 34.48 / MAX: 125
111.11
20
40
60
80
100
OSPray 1.8.5
Demo: Magnetic Reconnection - Renderer: SciVis
FPS, More Is Better
Ubuntu 21.10
SE +/- 0.00, N = 3
MIN: 29.41 / MAX: 58.82
55.56
Clear Linux 35150
SE +/- 0.00, N = 3
MIN: 38.46 / MAX: 58.82
55.56
CentOS Stream
SE +/- 0.00, N = 3
MIN: 38.46 / MAX: 58.82
55.56
AlmaLinux 8.4
SE +/- 0.00, N = 3
MIN: 40 / MAX: 58.82
55.56
12
24
36
48
60


AOM AV1 3.2
Encoder Mode: Speed 8 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
Ubuntu 21.10
SE +/- 0.38, N = 3
26.05
6
12
18
24
30
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm
AOM AV1 3.2
Encoder Mode: Speed 9 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
Ubuntu 21.10
SE +/- 0.09, N = 3
35.97
8
16
24
32
40
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm
AOM AV1 3.2
Encoder Mode: Speed 10 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
Ubuntu 21.10
SE +/- 0.48, N = 3
39.62
9
18
27
36
45
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm
Embree 3.13
Binary: Pathtracer - Model: Crown
Frames Per Second, More Is Better
Ubuntu 21.10
SE +/- 0.10, N = 3
MIN: 71.54 / MAX: 75.84
73.25
Clear Linux 35150
SE +/- 0.14, N = 3
MIN: 71.57 / MAX: 75.62
73.26
CentOS Stream
SE +/- 0.10, N = 3
MIN: 71.52 / MAX: 75.78
73.13
AlmaLinux 8.4
SE +/- 0.06, N = 3
MIN: 70.72 / MAX: 75.17
72.33
16
32
48
64
80

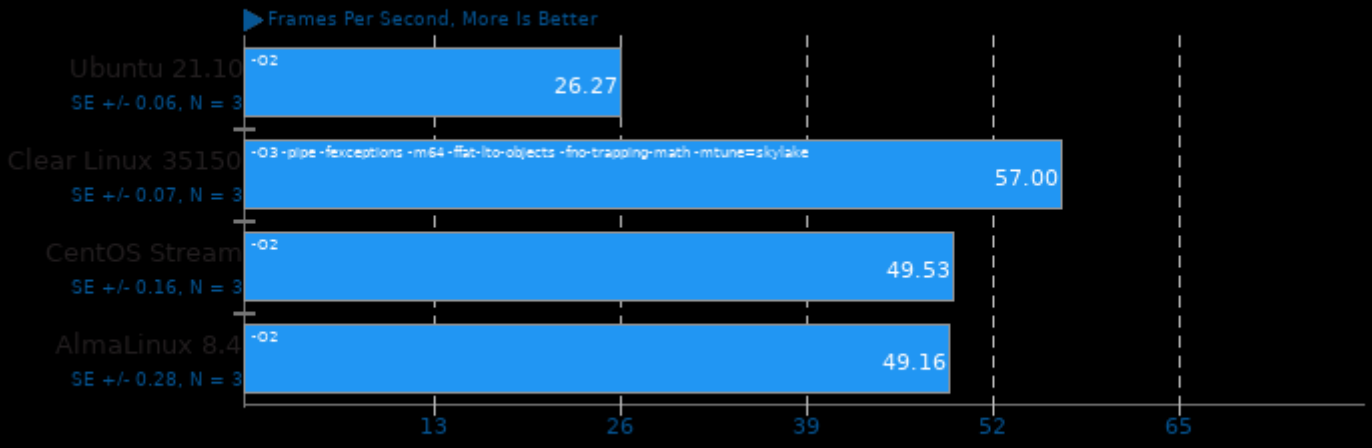
Embree 3.13

Binary: Pathtracer ISPC - Model: Crown



Kvazaar 2.1

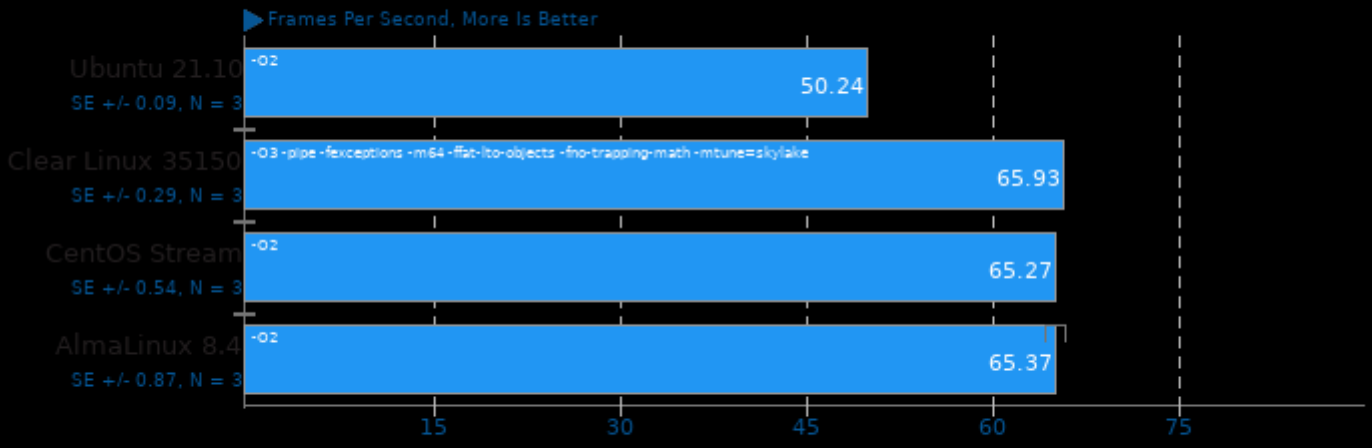
Video Input: Bosphorus 4K - Video Preset: Very Fast



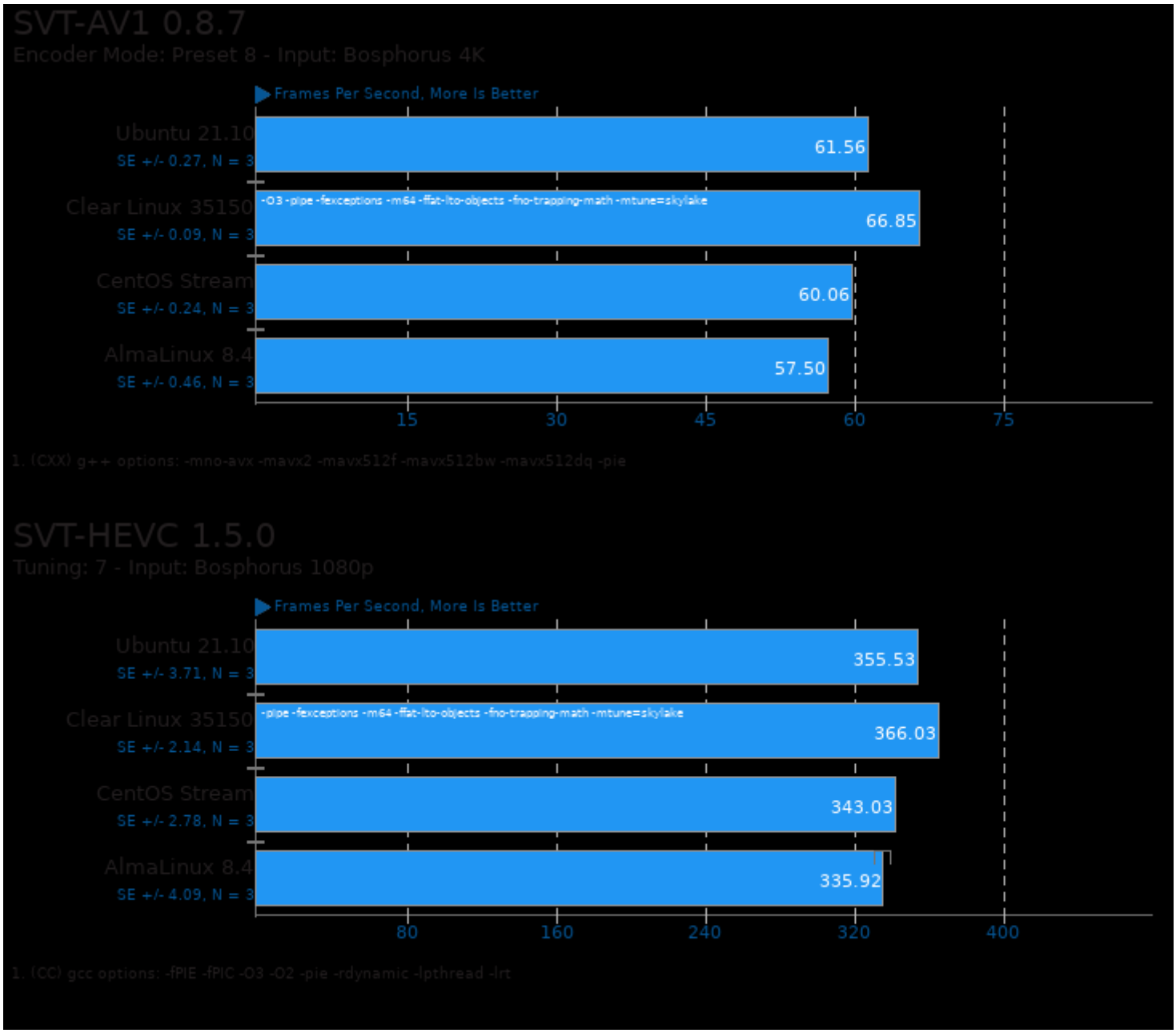
1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -lpthread -lm -lrt

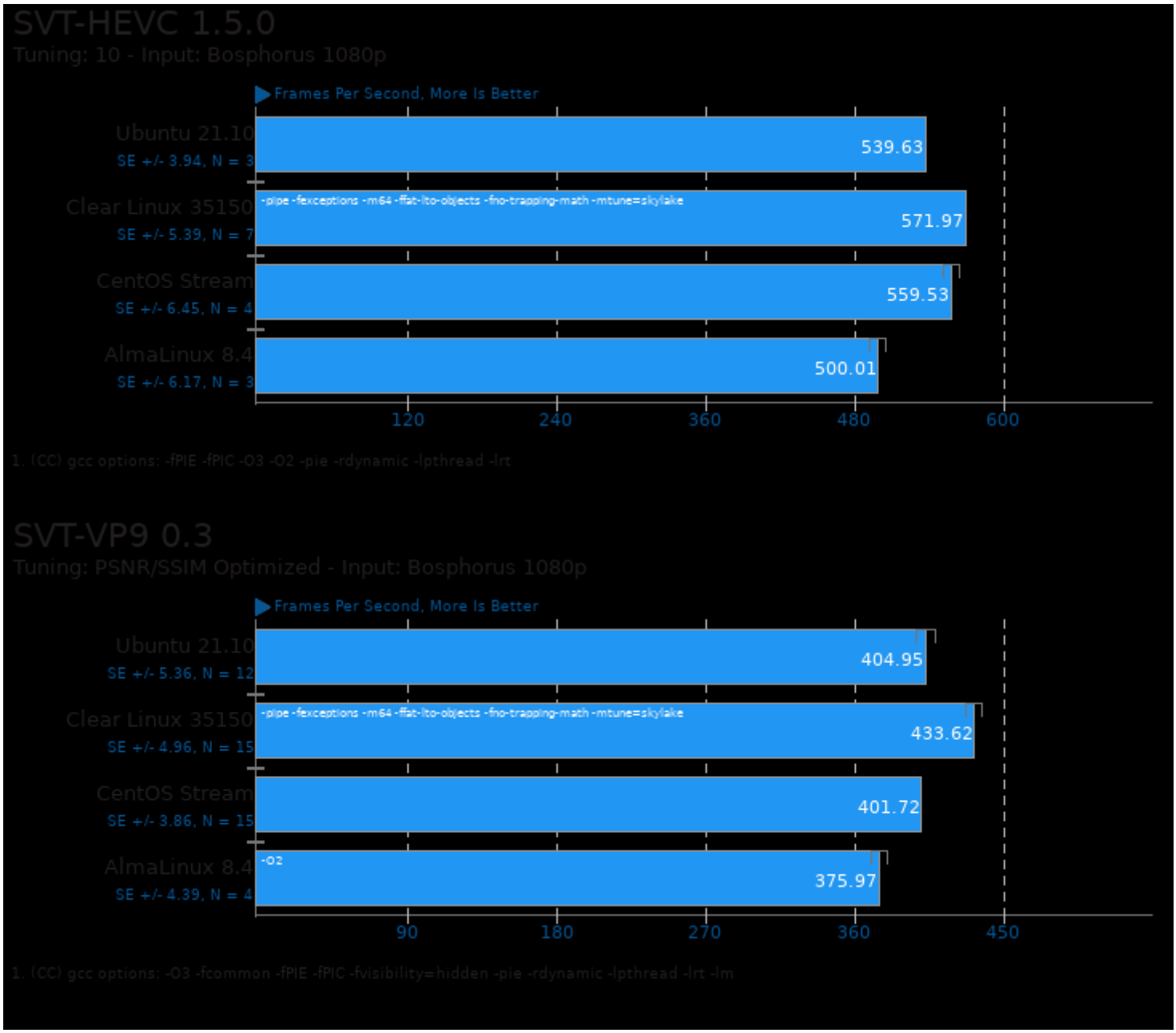
Kvazaar 2.1

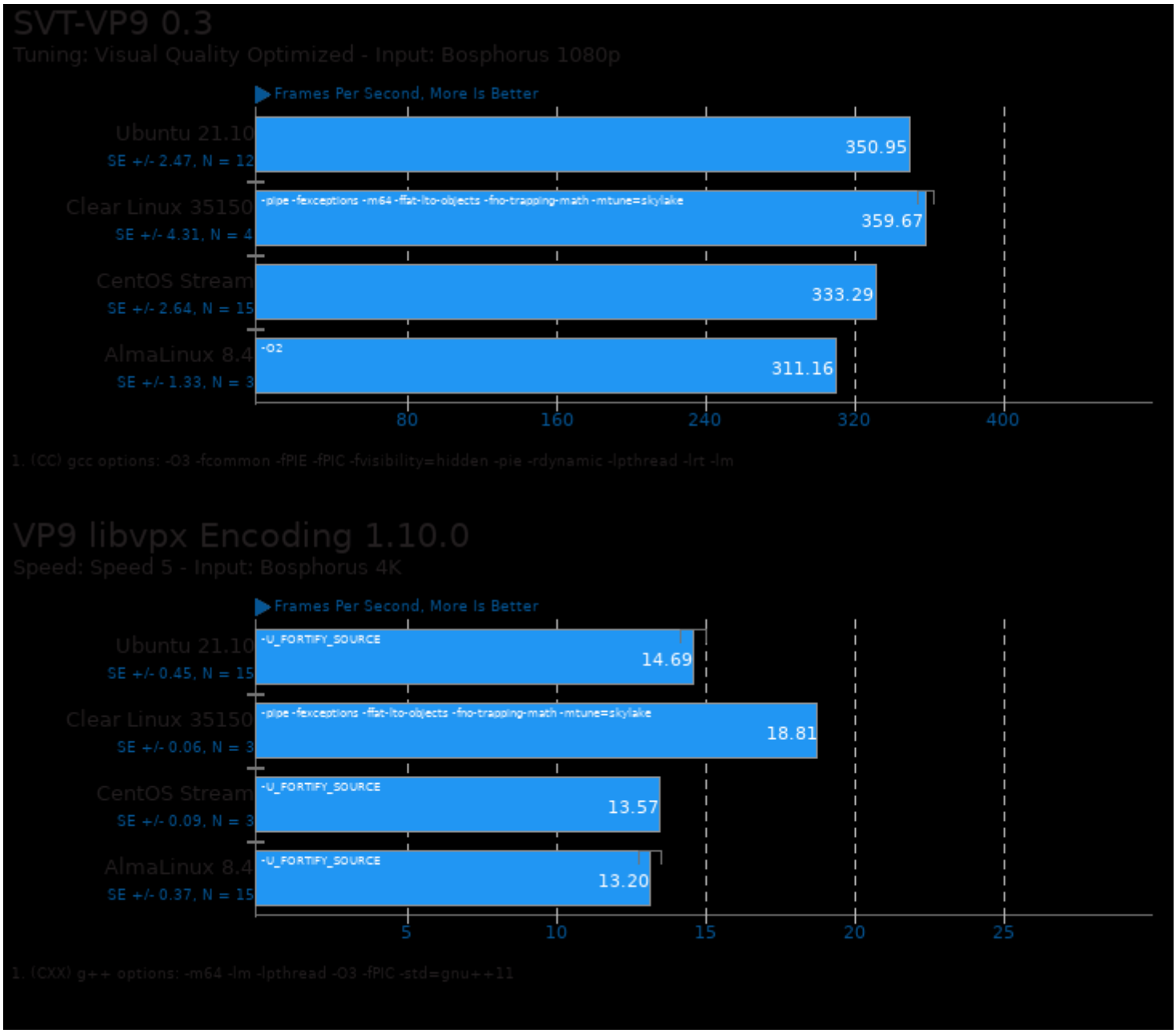
Video Input: Bosphorus 4K - Video Preset: Ultra Fast



1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -lpthread -lm -lrt

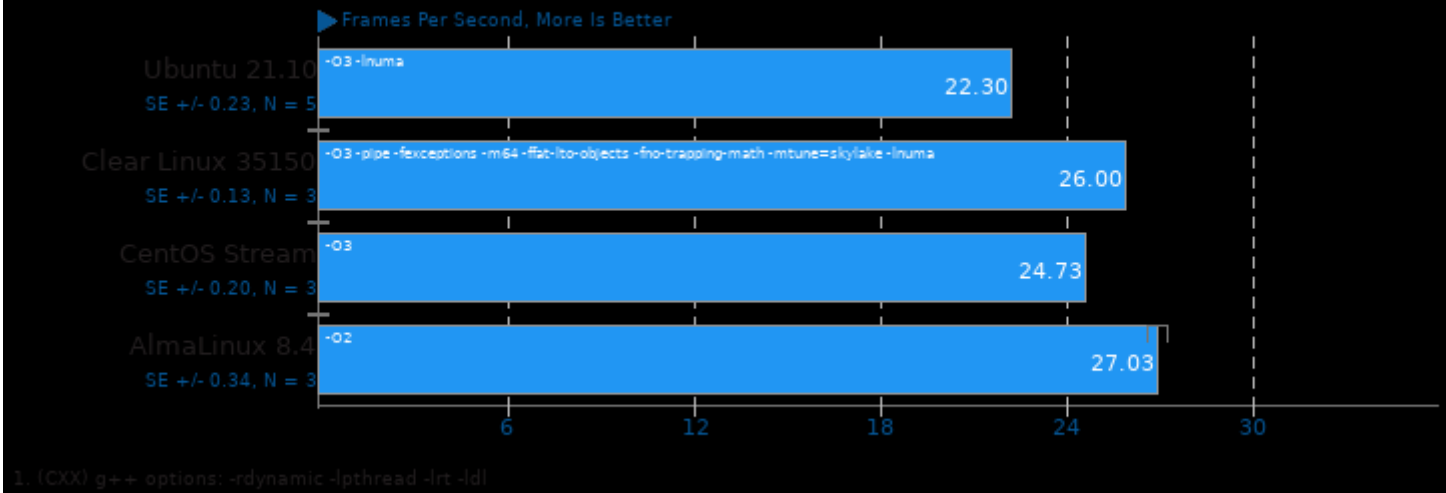

SVT-AV1 0.8.7
Encoder Mode: Preset 8 - Input: Bosphorus 4K
Frames Per Second, More Is Better
Ubuntu 21.10
SE +/- 0.27, N = 3
61.56
Clear Linux 35150
SE +/- 0.09, N = 3
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake
66.85
CentOS Stream
SE +/- 0.24, N = 3
60.06
AlmaLinux 8.4
SE +/- 0.46, N = 3
57.50
15
30
45
60
75
1. (CXX) g++ options: -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq -pie
SVT-HEVC 1.5.0
Tuning: 7 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
Ubuntu 21.10
SE +/- 3.71, N = 3
355.53
Clear Linux 35150
SE +/- 2.14, N = 3
-pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake
366.03
CentOS Stream
SE +/- 2.78, N = 3
343.03
AlmaLinux 8.4
SE +/- 4.09, N = 3
335.92
80
160
240
320
400
1. (CC) gcc options: -fPIE -fPIC -O3 -O2 -pie -rdynamic -lpthread -lrt


SVT-HEVC 1.5.0
Tuning: 10 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
Ubuntu 21.10
SE +/- 3.94, N = 3
539.63
Clear Linux 35150
SE +/- 5.39, N = 7
-pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake
571.97
CentOS Stream
SE +/- 6.45, N = 4
559.53
AlmaLinux 8.4
SE +/- 6.17, N = 3
500.01
120
240
360
480
600
1. (CC) gcc options: -fPIE -fPIC -O3 -O2 -pie -rdynamic -lpthread -lrt
SVT-VP9 0.3
Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
Ubuntu 21.10
SE +/- 5.36, N = 12
404.95
Clear Linux 35150
SE +/- 4.96, N = 15
-pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake
433.62
CentOS Stream
SE +/- 3.86, N = 15
401.72
AlmaLinux 8.4
SE +/- 4.39, N = 4
-O2
375.97
90
180
270
360
450
1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm


SVT-VP9 0.3
Tuning: Visual Quality Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
Ubuntu 21.10
SE +/- 2.47, N = 12
350.95
Clear Linux 35150
SE +/- 4.31, N = 4
-pipe -fexceptions -m64 -flat-lto-objects -fno-trapping-math -mtune=skylake
359.67
CentOS Stream
SE +/- 2.64, N = 15
333.29
AlmaLinux 8.4
SE +/- 1.33, N = 3
-O2
311.16
80
160
240
320
400
1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm
VP9 libvpx Encoding 1.10.0
Speed: Speed 5 - Input: Bosphorus 4K
Frames Per Second, More Is Better
Ubuntu 21.10
SE +/- 0.45, N = 15
-U_FORTIFY_SOURCE
14.69
Clear Linux 35150
SE +/- 0.06, N = 3
-pipe -fexceptions -flat-lto-objects -fno-trapping-math -mtune=skylake
18.81
CentOS Stream
SE +/- 0.09, N = 3
-U_FORTIFY_SOURCE
13.57
AlmaLinux 8.4
SE +/- 0.37, N = 15
-U_FORTIFY_SOURCE
13.20
5
10
15
20
25
1. (CXX) g++ options: -m64 -lm -lpthread -O3 -fPIC -std=gnu++11

x265 3.4

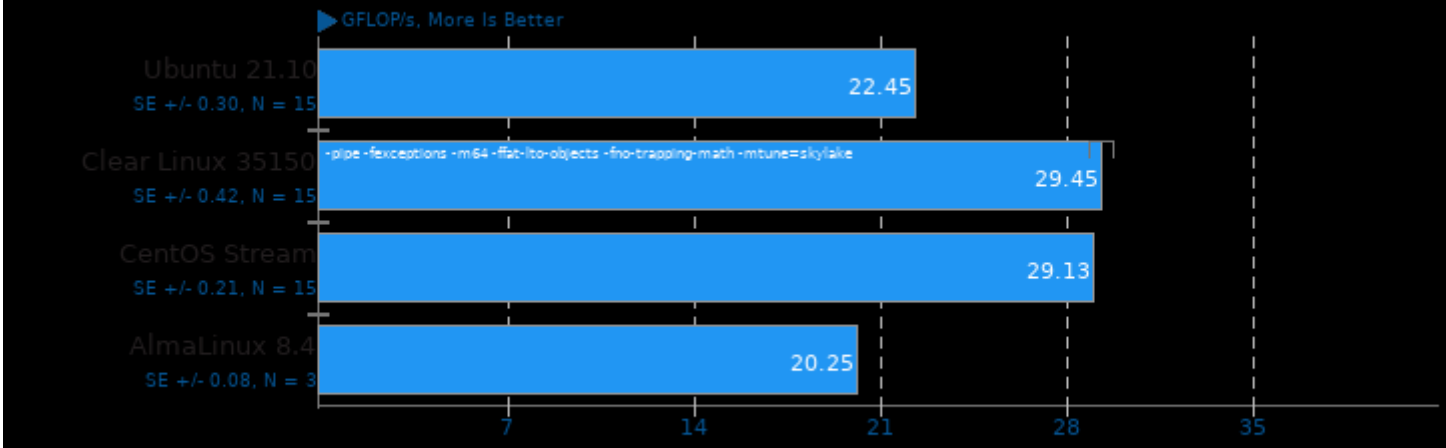
Video Input: Bosphorus 4K



1. (CXX) g++ options: -rdynamic -lpthread -lrt -ldl

ACES DGEMM 1.0

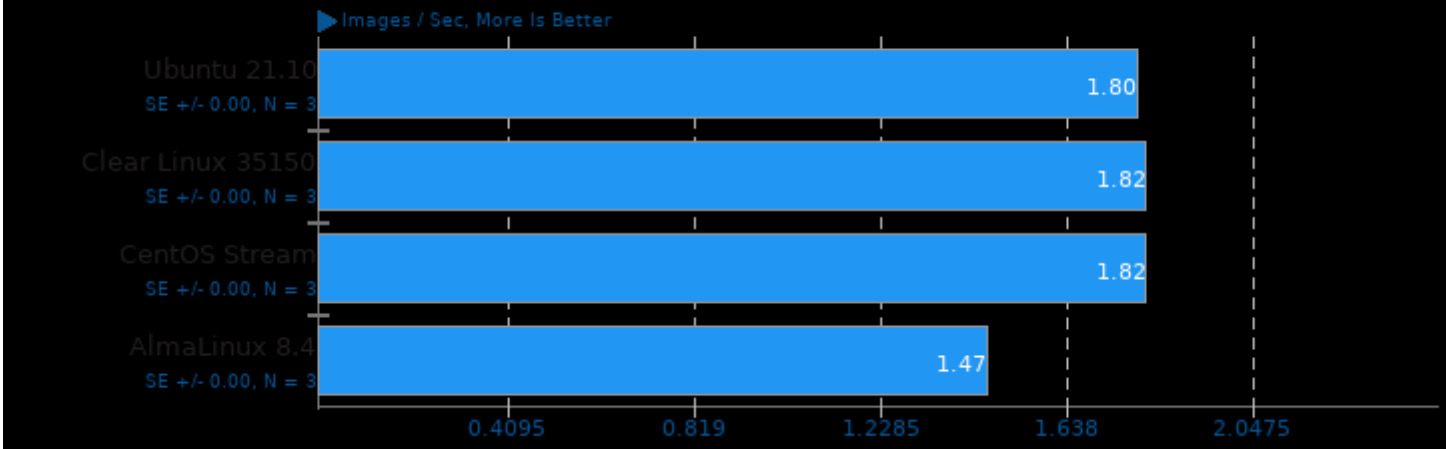
Sustained Floating-Point Rate

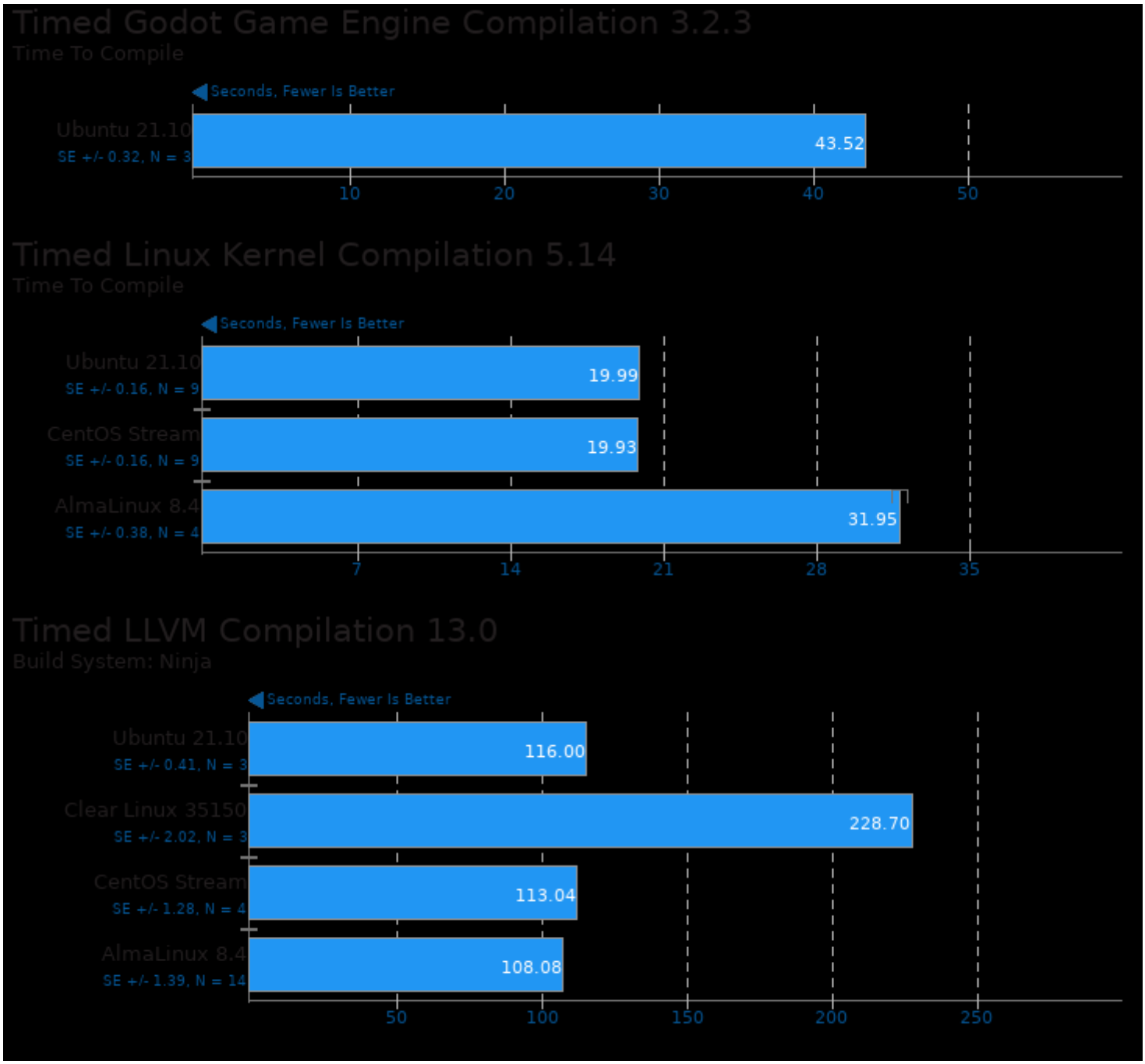


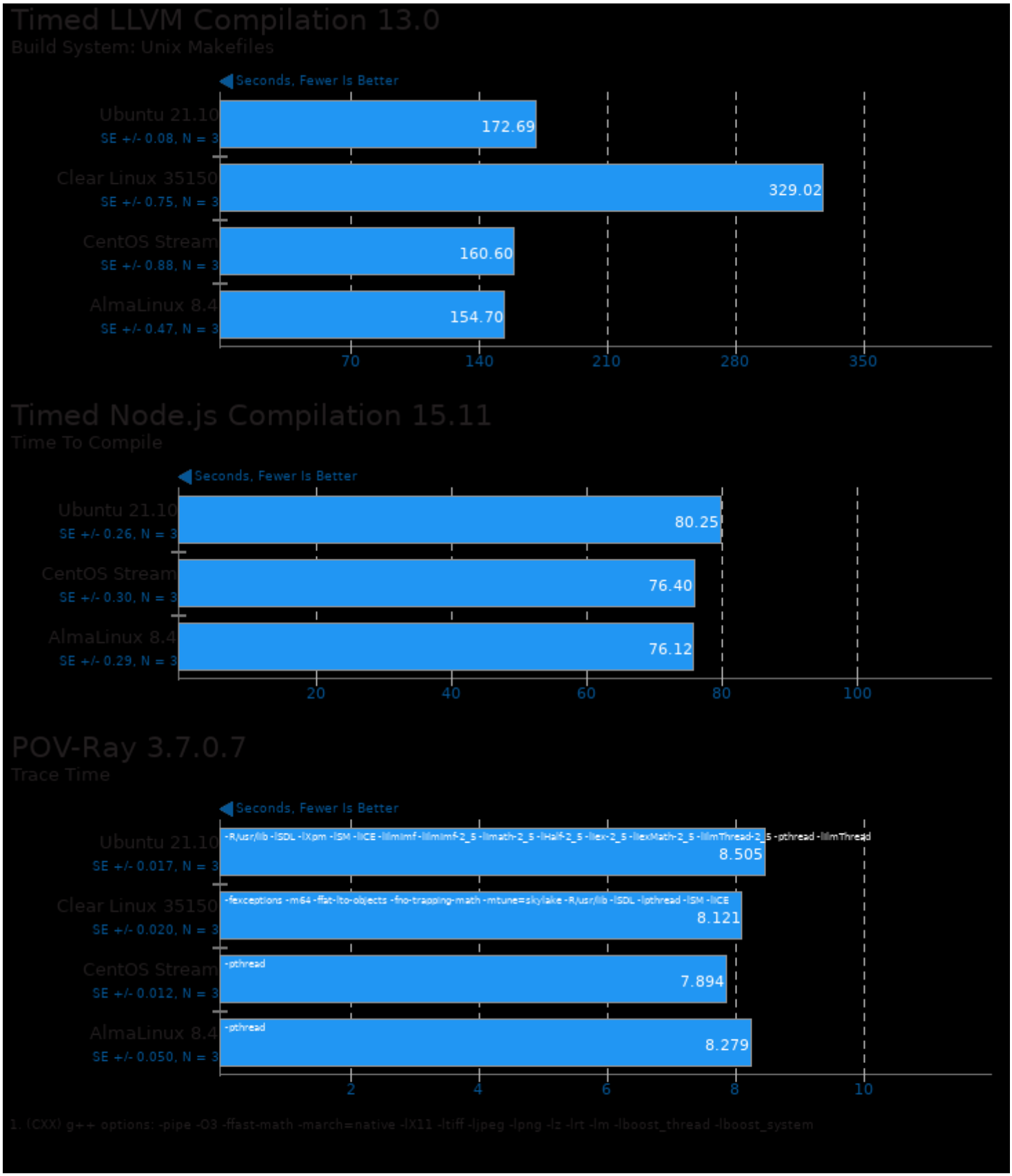
1. (CC) gcc options: -O3 -march=native -fopenmp

Intel Open Image Denoise 1.4.0

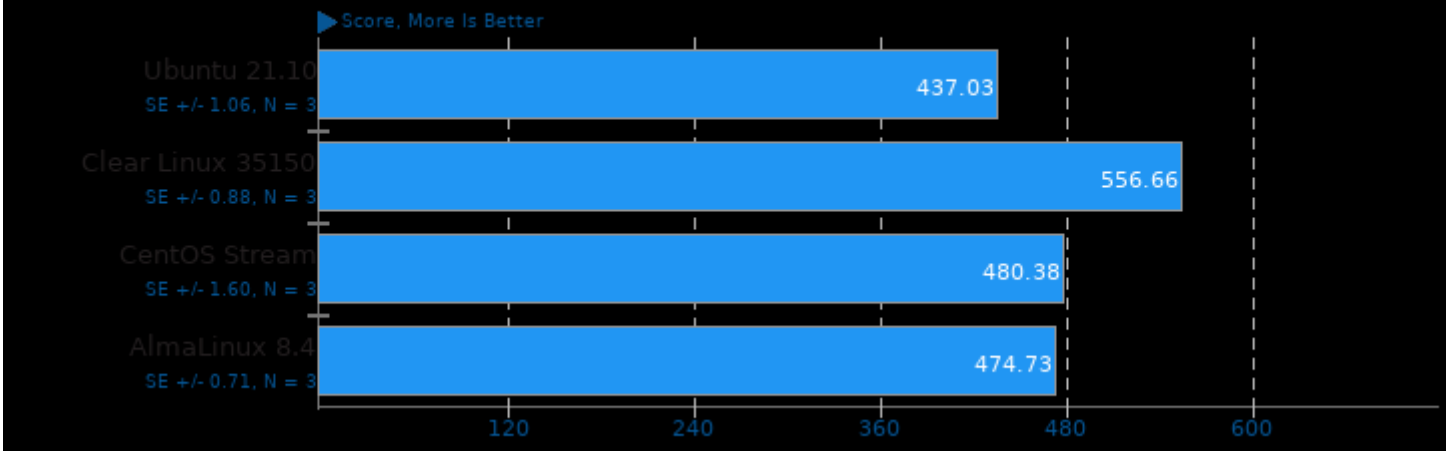
Run: RT.hdr_alb_nrm.3840x2160




Timed Godot Game Engine Compilation 3.2.3
Time To Compile
Seconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.32, N = 3
43.52
10
20
30
40
50
Timed Linux Kernel Compilation 5.14
Time To Compile
Seconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.16, N = 9
19.99
CentOS Stream
SE +/- 0.16, N = 9
19.93
AlmaLinux 8.4
SE +/- 0.38, N = 4
31.95
7
14
21
28
35
Timed LLVM Compilation 13.0
Build System: Ninja
Seconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.41, N = 3
116.00
Clear Linux 35150
SE +/- 2.02, N = 3
228.70
CentOS Stream
SE +/- 1.28, N = 4
113.04
AlmaLinux 8.4
SE +/- 1.39, N = 14
108.08
50
100
150
200
250

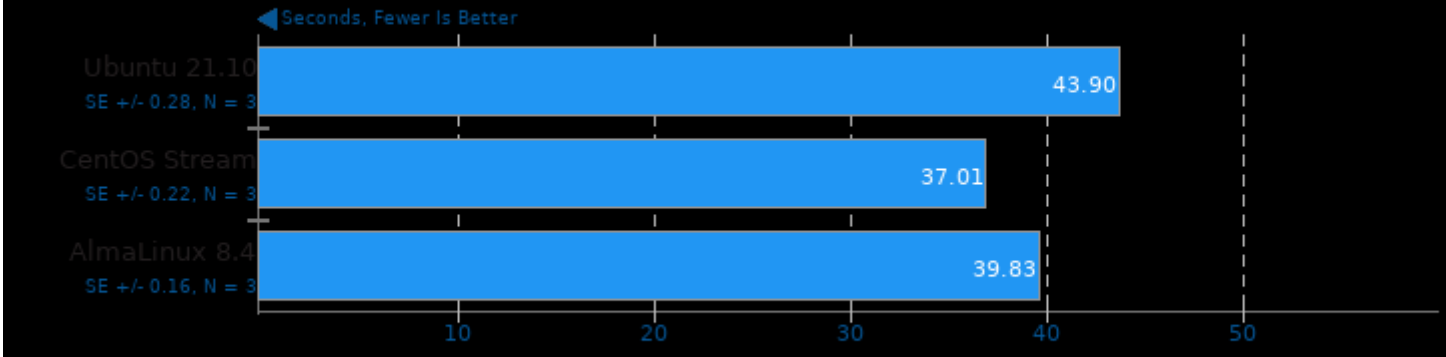

Timed LLVM Compilation 13.0
Build System: Unix Makefiles
Seconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.08, N = 3
172.69
Clear Linux 35150
SE +/- 0.75, N = 3
329.02
CentOS Stream
SE +/- 0.88, N = 3
160.60
AlmaLinux 8.4
SE +/- 0.47, N = 3
154.70
70
140
210
280
350
Timed Node.js Compilation 15.11
Time To Compile
Seconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.26, N = 3
80.25
CentOS Stream
SE +/- 0.30, N = 3
76.40
AlmaLinux 8.4
SE +/- 0.29, N = 3
76.12
20
40
60
80
100
POV-Ray 3.7.0.7
Trace Time
Seconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.017, N = 3
8.505
Clear Linux 35150
SE +/- 0.020, N = 3
8.121
CentOS Stream
SE +/- 0.012, N = 3
7.894
AlmaLinux 8.4
SE +/- 0.050, N = 3
8.279
2
4
6
8
10
1. (CXX) g++ options: -pipe -O3 -ffast-math -march=native -lX11 -ltiff -ljpeg -lpng -lz -lrt -lm -lboost_thread -lboost_system

Numpy Benchmark



Timed Wasmer Compilation 1.0.2

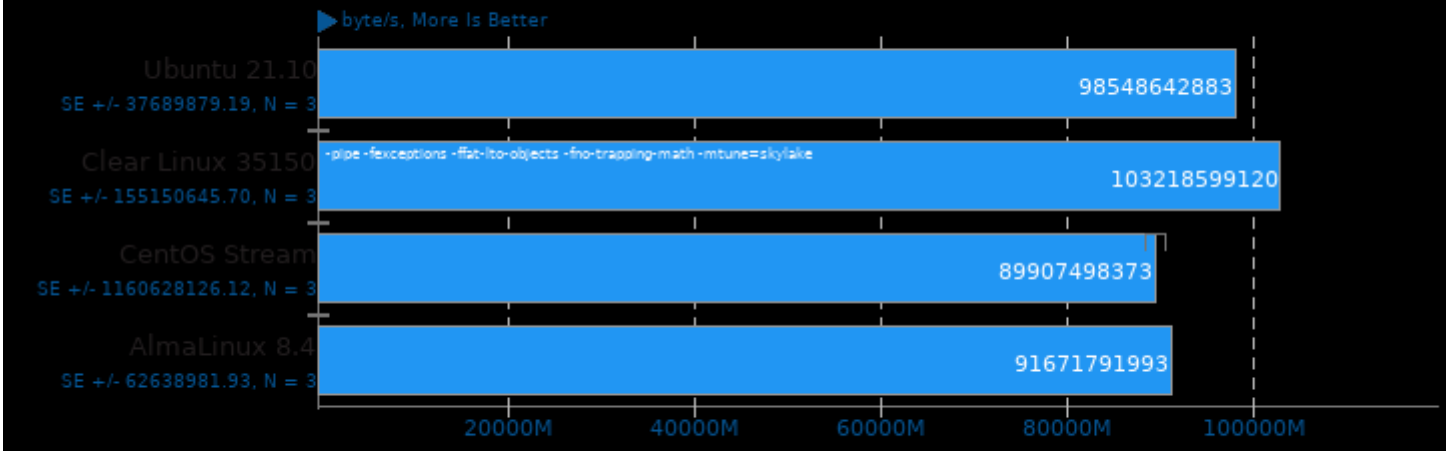
Time To Compile



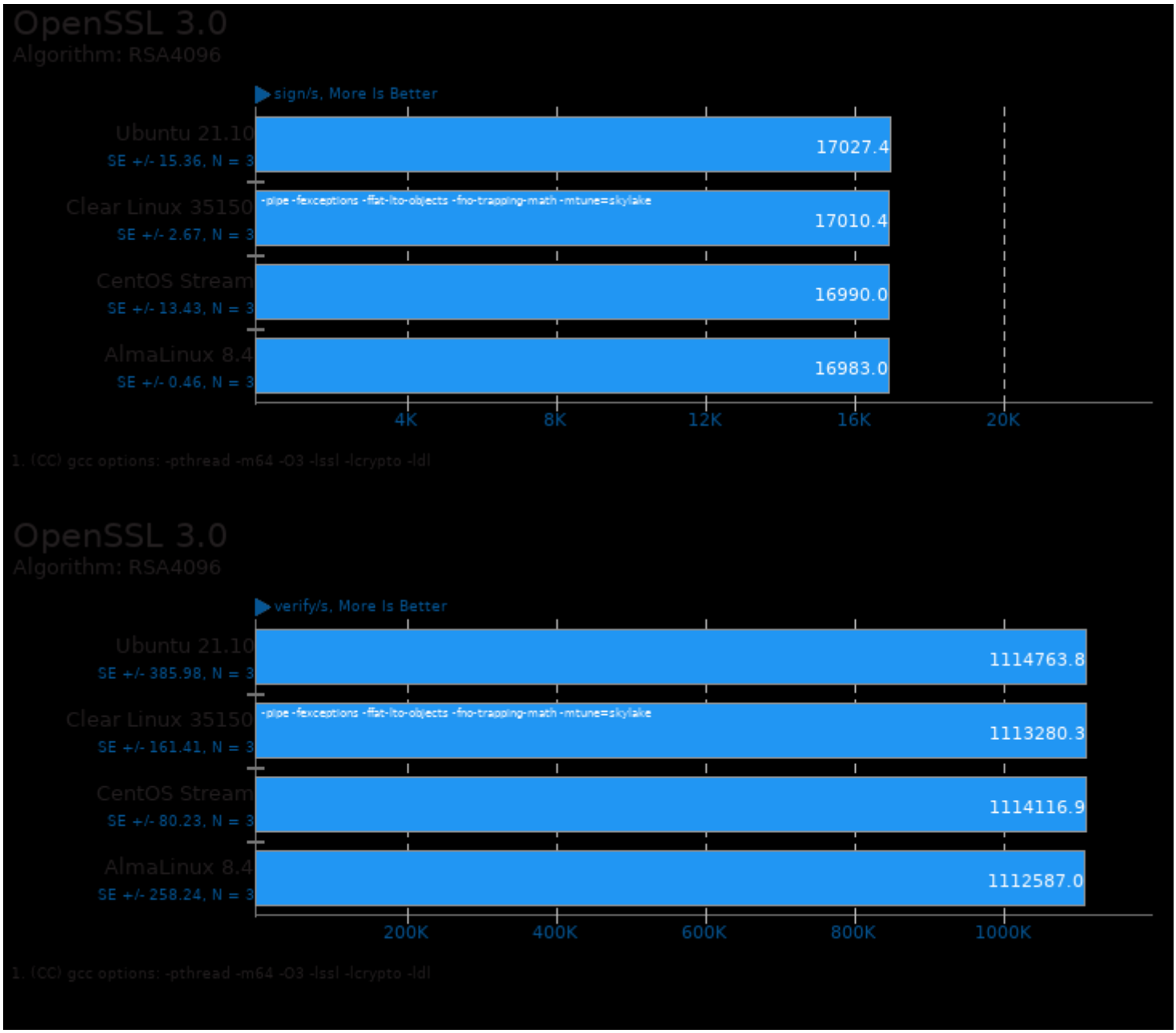
1. (CC) gcc options: -m64 -pie -nodefaultlibs -ldl -lgcc_s -lutil -lrt -lpthread -lm -lc

OpenSSL 3.0

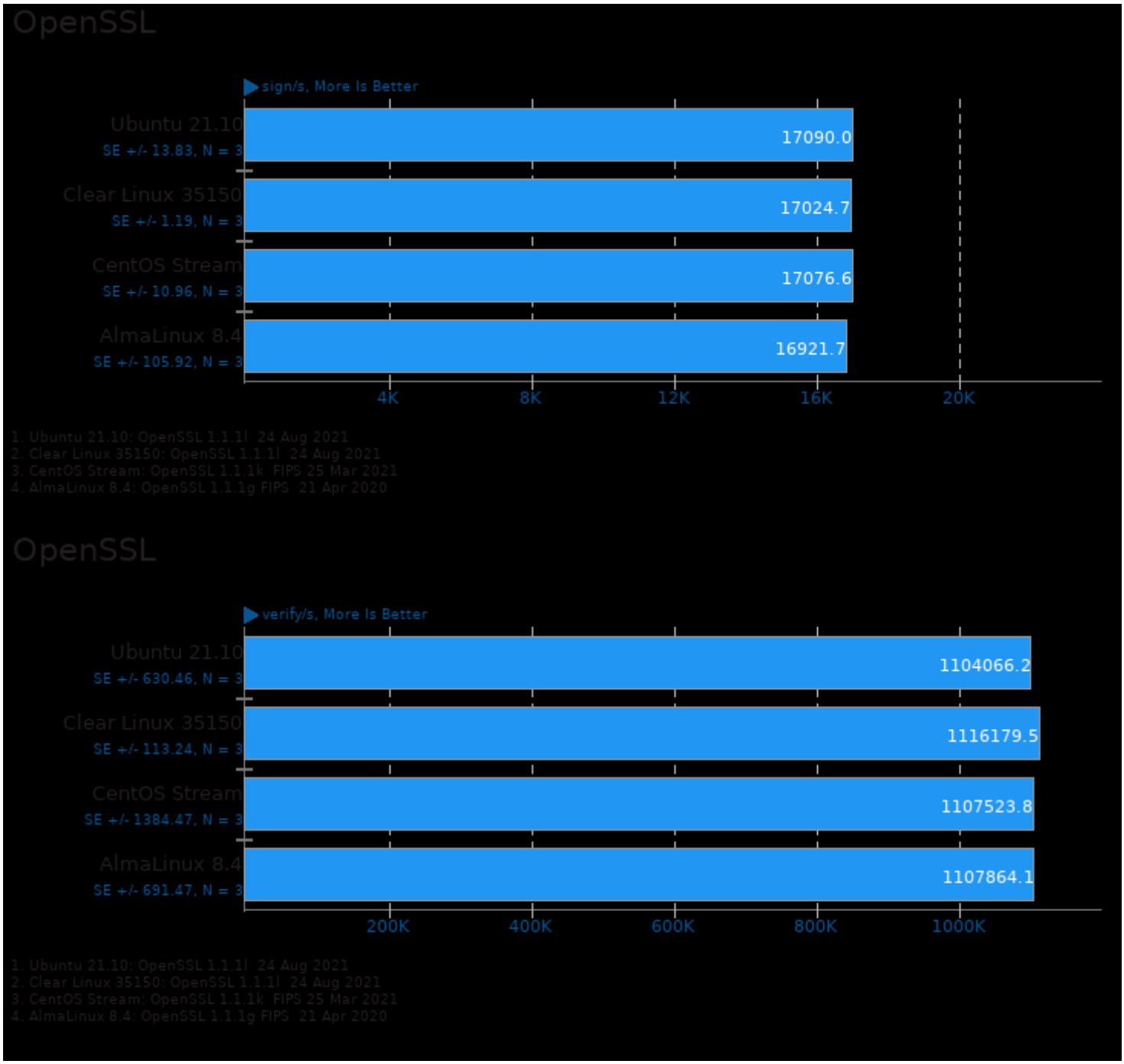
Algorithm: SHA256

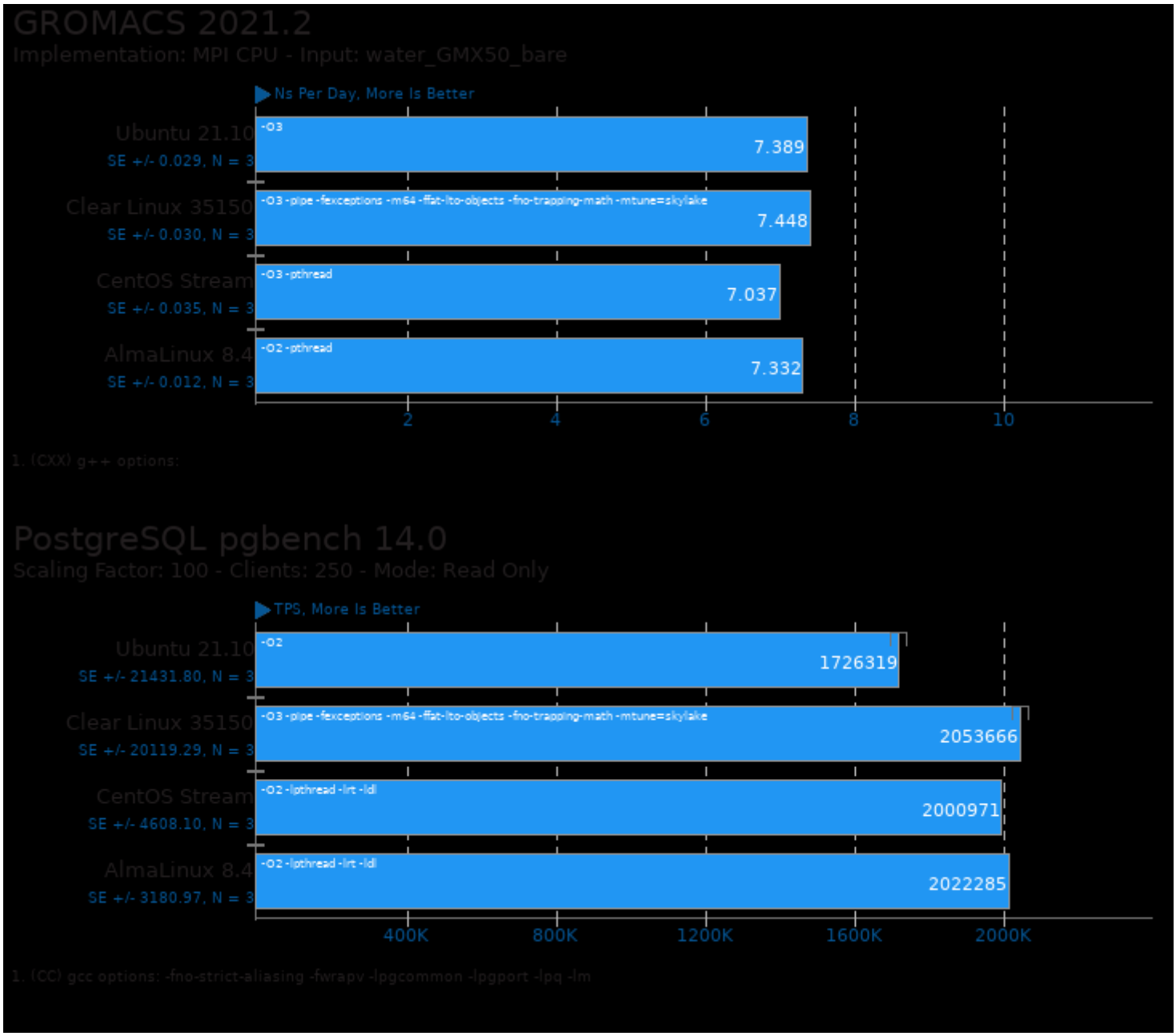


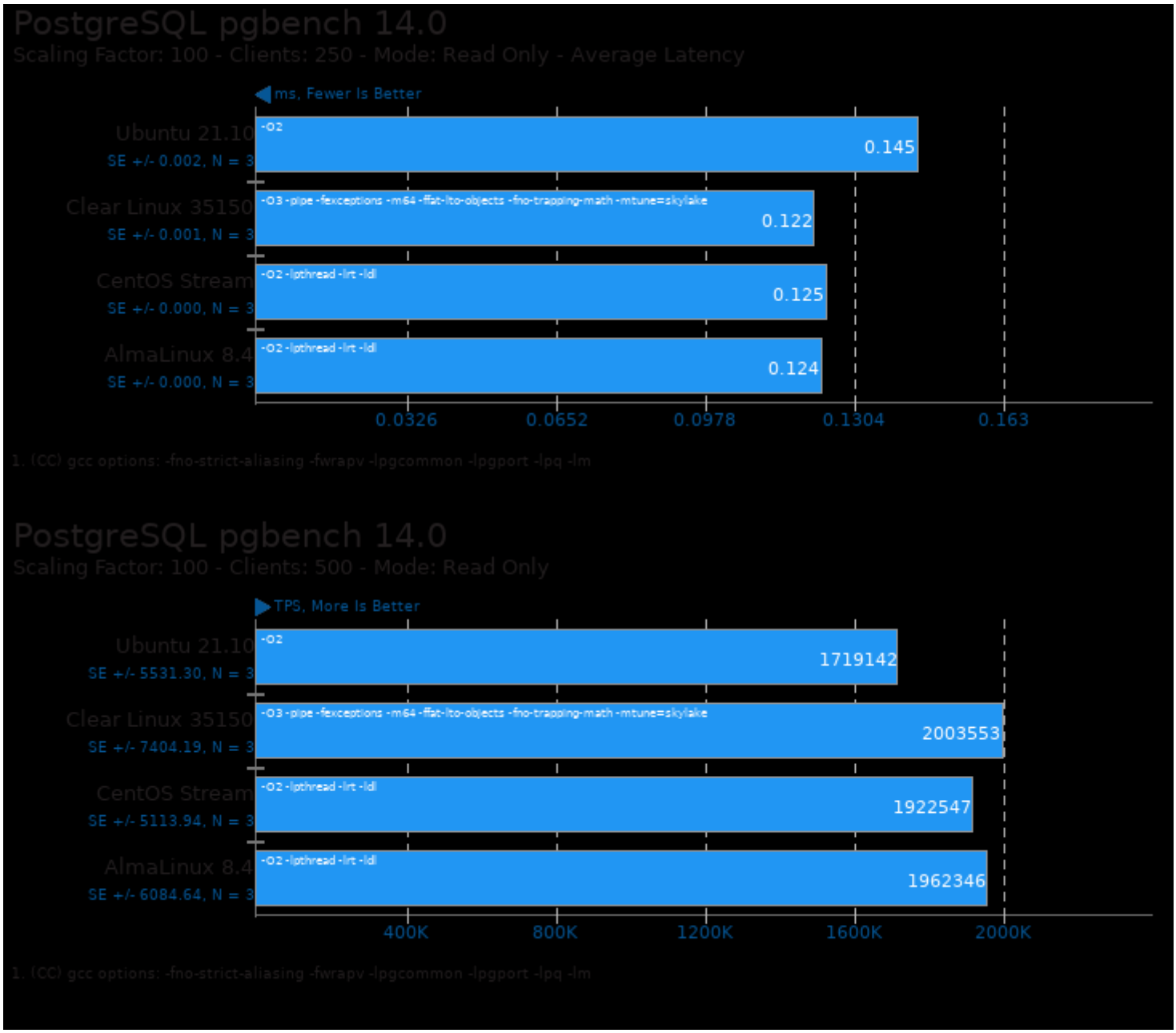
1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl

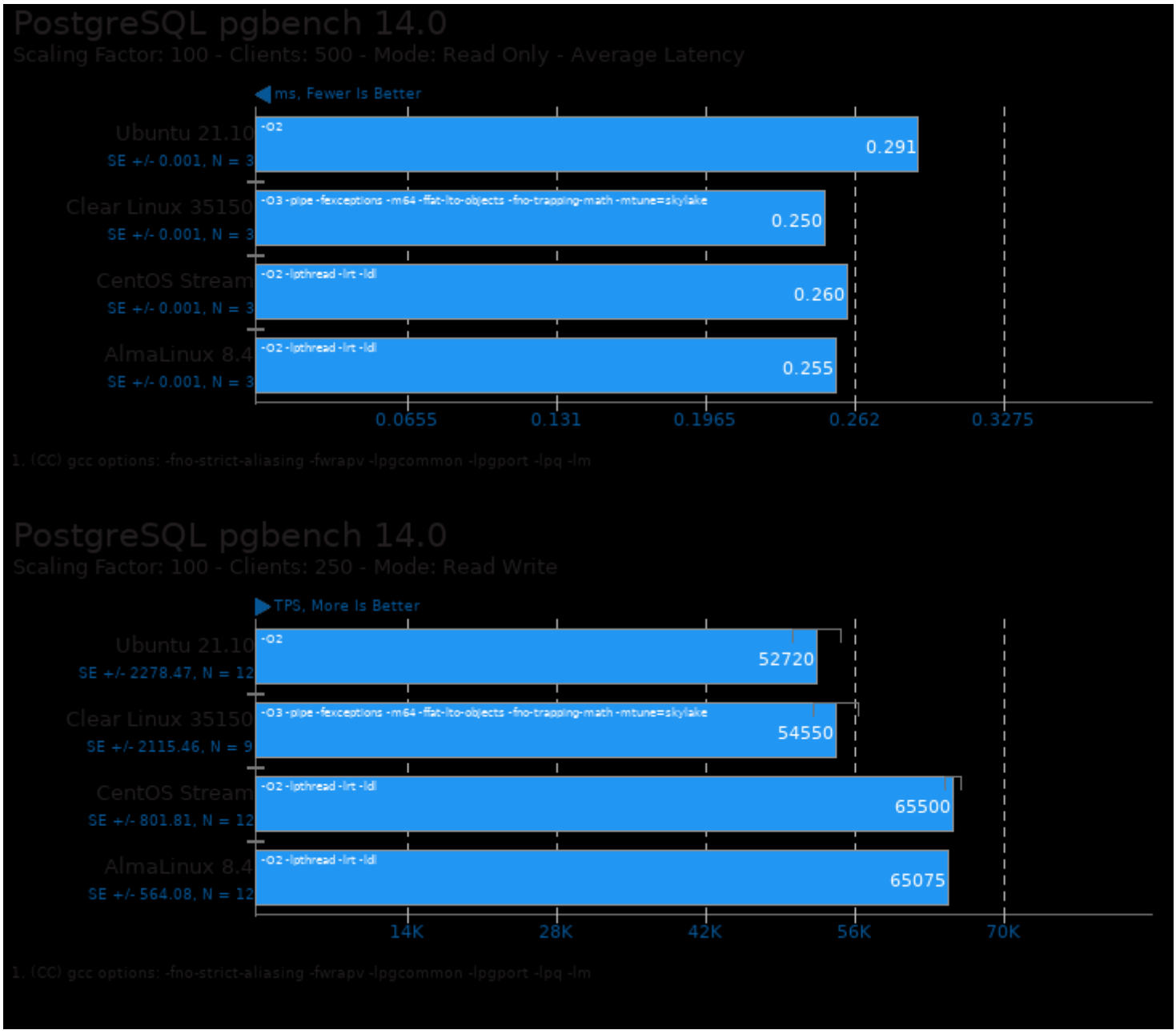

OpenSSL 3.0
Algorithm: RSA4096
sign/s, More Is Better
Ubuntu 21.10
SE +/- 15.36, N = 3
17027.4
Clear Linux 35150
SE +/- 2.67, N = 3
-pipe -fexceptions -ffat-lto-objects -fno-trapping-math -mtune=skylake
17010.4
CentOS Stream
SE +/- 13.43, N = 3
16990.0
AlmaLinux 8.4
SE +/- 0.46, N = 3
16983.0
4K
8K
12K
16K
20K
1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl
OpenSSL 3.0
Algorithm: RSA4096
verify/s, More Is Better
Ubuntu 21.10
SE +/- 385.98, N = 3
1114763.8
Clear Linux 35150
SE +/- 161.41, N = 3
-pipe -fexceptions -ffat-lto-objects -fno-trapping-math -mtune=skylake
1113280.3
CentOS Stream
SE +/- 80.23, N = 3
1114116.9
AlmaLinux 8.4
SE +/- 258.24, N = 3
1112587.0
200K
400K
600K
800K
1000K
1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl

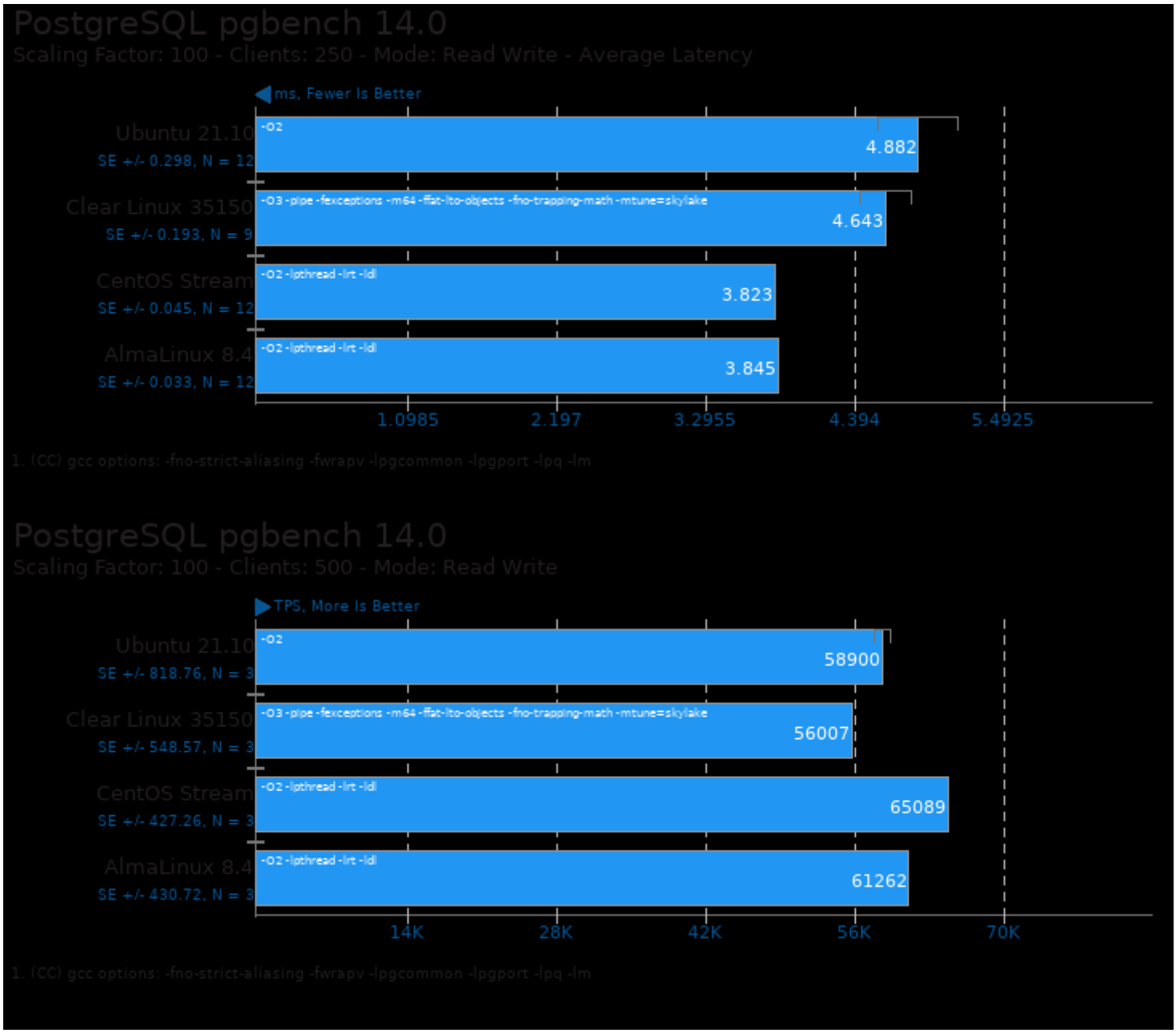
AMD EPYC 7003 EO 2021 Linux Comparison

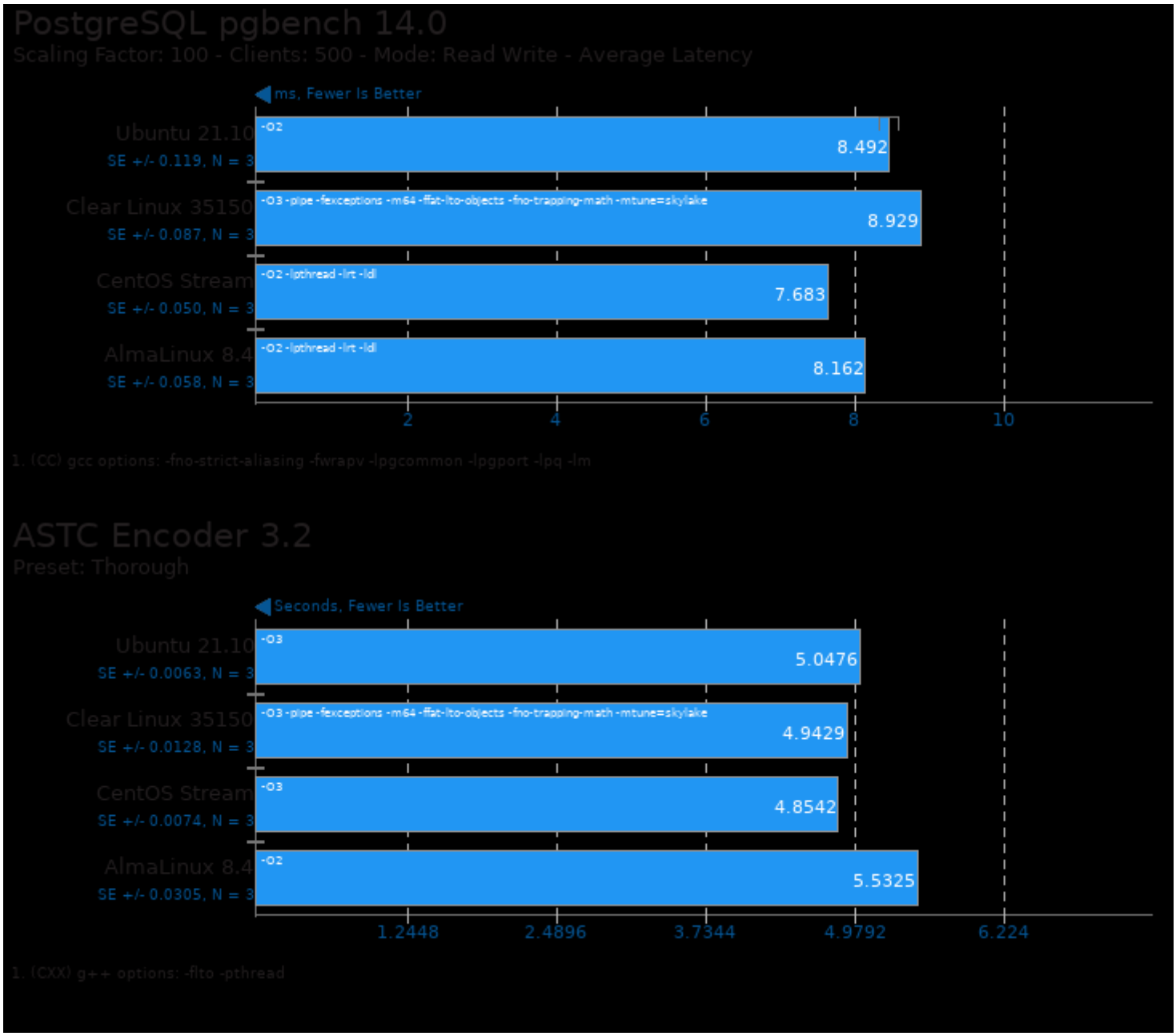



GROMACS 2021.2
Implementation: MPI CPU - Input: water_GMX50_bare
Ns Per Day, More Is Better
Ubuntu 21.10
SE +/- 0.029, N = 3
-O3
7.389
Clear Linux 35150
SE +/- 0.030, N = 3
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake
7.448
CentOS Stream
SE +/- 0.035, N = 3
-O3 -pthread
7.037
AlmaLinux 8.4
SE +/- 0.012, N = 3
-O2 -pthread
7.332
2
4
6
8
10
1. (CXX) g++ options:
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Only
TPS, More Is Better
Ubuntu 21.10
SE +/- 21431.80, N = 3
-O2
1726319
Clear Linux 35150
SE +/- 20119.29, N = 3
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake
2053666
CentOS Stream
SE +/- 4608.10, N = 3
-O2 -lpthread -lrt -ldl
2000971
AlmaLinux 8.4
SE +/- 3180.97, N = 3
-O2 -lpthread -lrt -ldl
2022285
400K
800K
1200K
1600K
2000K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -lpgcommon -lpgport -lpq -lm


PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Only - Average Latency
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 0.002, N = 3
-O2
0.145
Clear Linux 35150
SE +/- 0.001, N = 3
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake
0.122
CentOS Stream
SE +/- 0.000, N = 3
-O2 -lpthread -lrt -ldl
0.125
AlmaLinux 8.4
SE +/- 0.000, N = 3
-O2 -lpthread -lrt -ldl
0.124
0.0326
0.0652
0.0978
0.1304
0.163
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 500 - Mode: Read Only
TPS, More Is Better
Ubuntu 21.10
SE +/- 5531.30, N = 3
-O2
1719142
Clear Linux 35150
SE +/- 7404.19, N = 3
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake
2003553
CentOS Stream
SE +/- 5113.94, N = 3
-O2 -lpthread -lrt -ldl
1922547
AlmaLinux 8.4
SE +/- 6084.64, N = 3
-O2 -lpthread -lrt -ldl
1962346
400K
800K
1200K
1600K
2000K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -lpgcommon -lpgport -lpq -lm

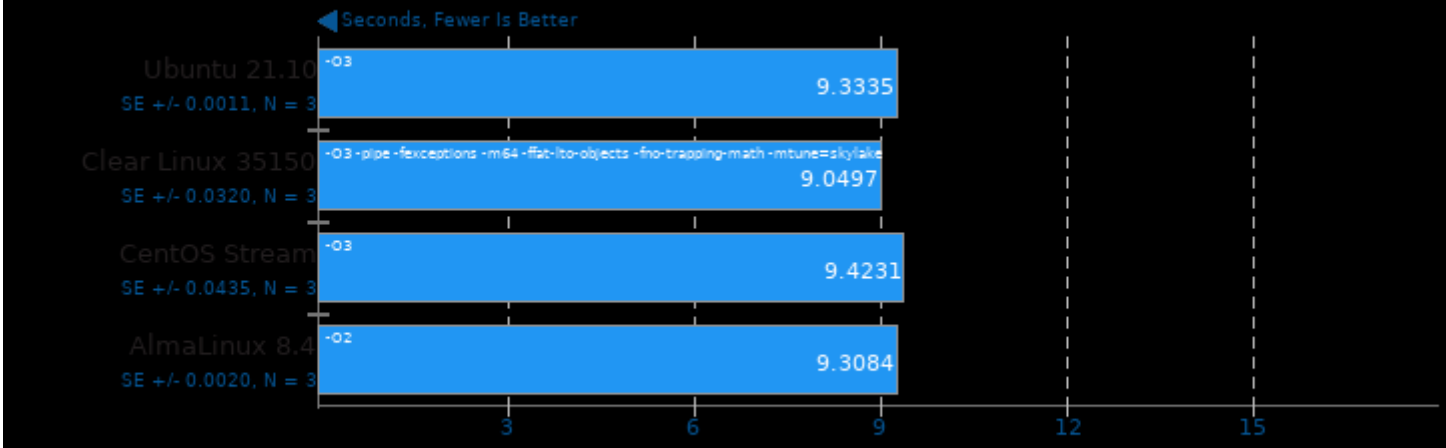

PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 500 - Mode: Read Only - Average Latency
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 0.001, N = 3
Clear Linux 35150
SE +/- 0.001, N = 3
CentOS Stream
SE +/- 0.001, N = 3
AlmaLinux 8.4
SE +/- 0.001, N = 3
-O2
0.291
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake
0.250
-O2 -lpthread -lrt -ldl
0.260
-O2 -lpthread -lrt -ldl
0.255
0.0655
0.131
0.1965
0.262
0.3275
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Write
TPS, More Is Better
Ubuntu 21.10
SE +/- 2278.47, N = 12
Clear Linux 35150
SE +/- 2115.46, N = 9
CentOS Stream
SE +/- 801.81, N = 12
AlmaLinux 8.4
SE +/- 564.08, N = 12
-O2
52720
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake
54550
-O2 -lpthread -lrt -ldl
65500
-O2 -lpthread -lrt -ldl
65075
14K
28K
42K
56K
70K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -lpgcommon -lpgport -lpq -lm


PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Write - Average Latency
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 0.298, N = 12
Clear Linux 35150
SE +/- 0.193, N = 9
CentOS Stream
SE +/- 0.045, N = 12
AlmaLinux 8.4
SE +/- 0.033, N = 12
-O2
4.882
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake
4.643
-O2 -lpthread -lrt -ldl
3.823
-O2 -lpthread -lrt -ldl
3.845
1.0985
2.197
3.2955
4.394
5.4925
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 500 - Mode: Read Write
TPS, More Is Better
Ubuntu 21.10
SE +/- 818.76, N = 3
Clear Linux 35150
SE +/- 548.57, N = 3
CentOS Stream
SE +/- 427.26, N = 3
AlmaLinux 8.4
SE +/- 430.72, N = 3
-O2
58900
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake
56007
-O2 -lpthread -lrt -ldl
65089
-O2 -lpthread -lrt -ldl
61262
14K
28K
42K
56K
70K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -lpgcommon -lpgport -lpq -lm


PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 500 - Mode: Read Write - Average Latency
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 0.119, N = 3
-O2
8.492
Clear Linux 35150
SE +/- 0.087, N = 3
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake
8.929
CentOS Stream
SE +/- 0.050, N = 3
-O2 -lpthread -lrt -ldl
7.683
AlmaLinux 8.4
SE +/- 0.058, N = 3
-O2 -lpthread -lrt -ldl
8.162
2
4
6
8
10
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -lpgcommon -lpgport -lpq -lm
ASTC Encoder 3.2
Preset: Thorough
Seconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.0063, N = 3
-O3
5.0476
Clear Linux 35150
SE +/- 0.0128, N = 3
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake
4.9429
CentOS Stream
SE +/- 0.0074, N = 3
-O3
4.8542
AlmaLinux 8.4
SE +/- 0.0305, N = 3
-O2
5.5325
1.2448
2.4896
3.7344
4.9792
6.224
1. (CXX) g++ options: -flto -pthread

ASTC Encoder 3.2

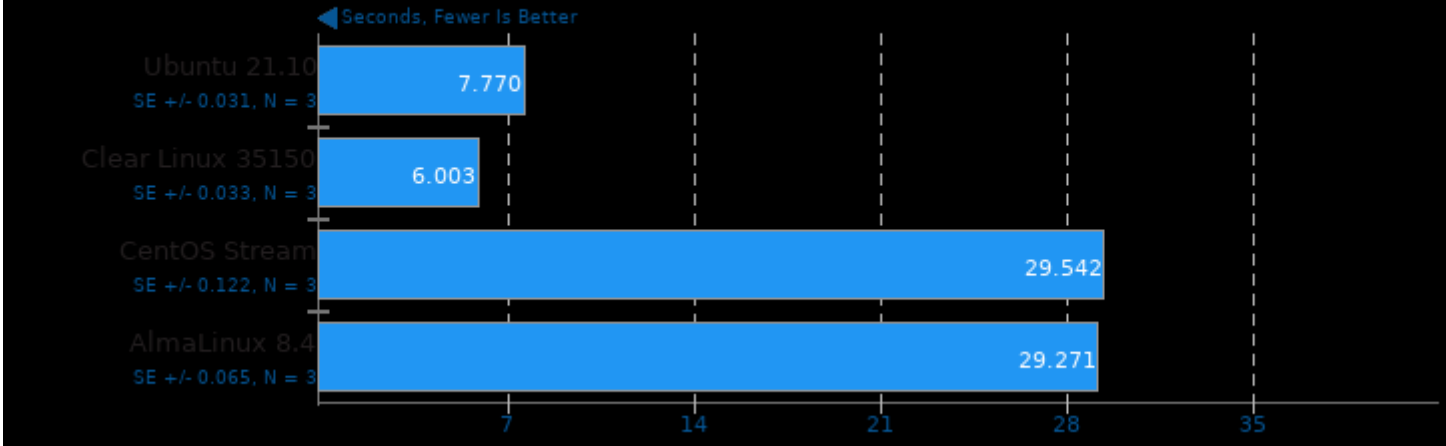
Preset: Exhaustive



1. (CXX) g++ options: -flto -pthread

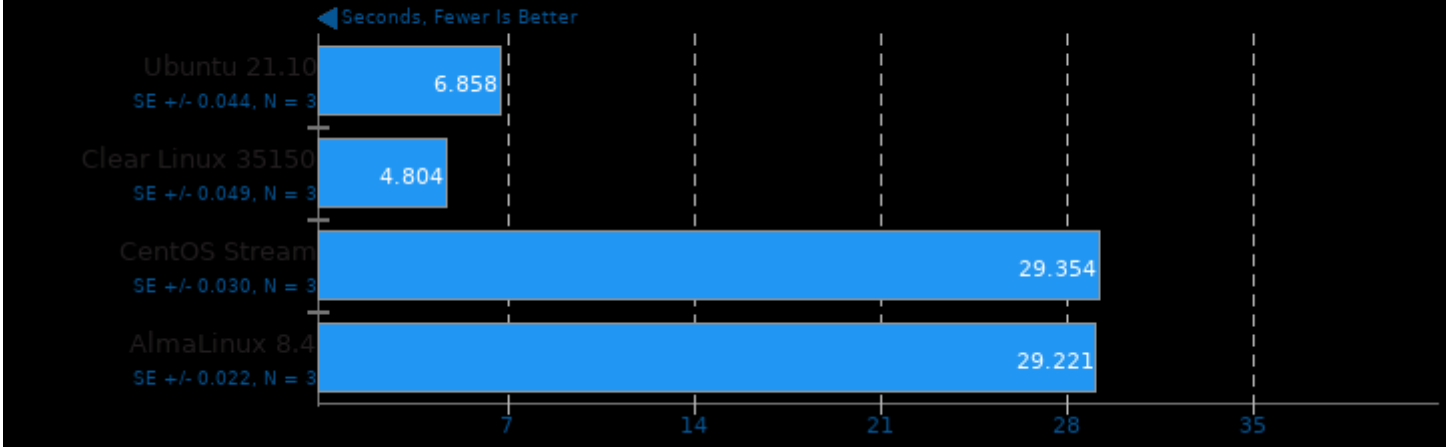
GEGL

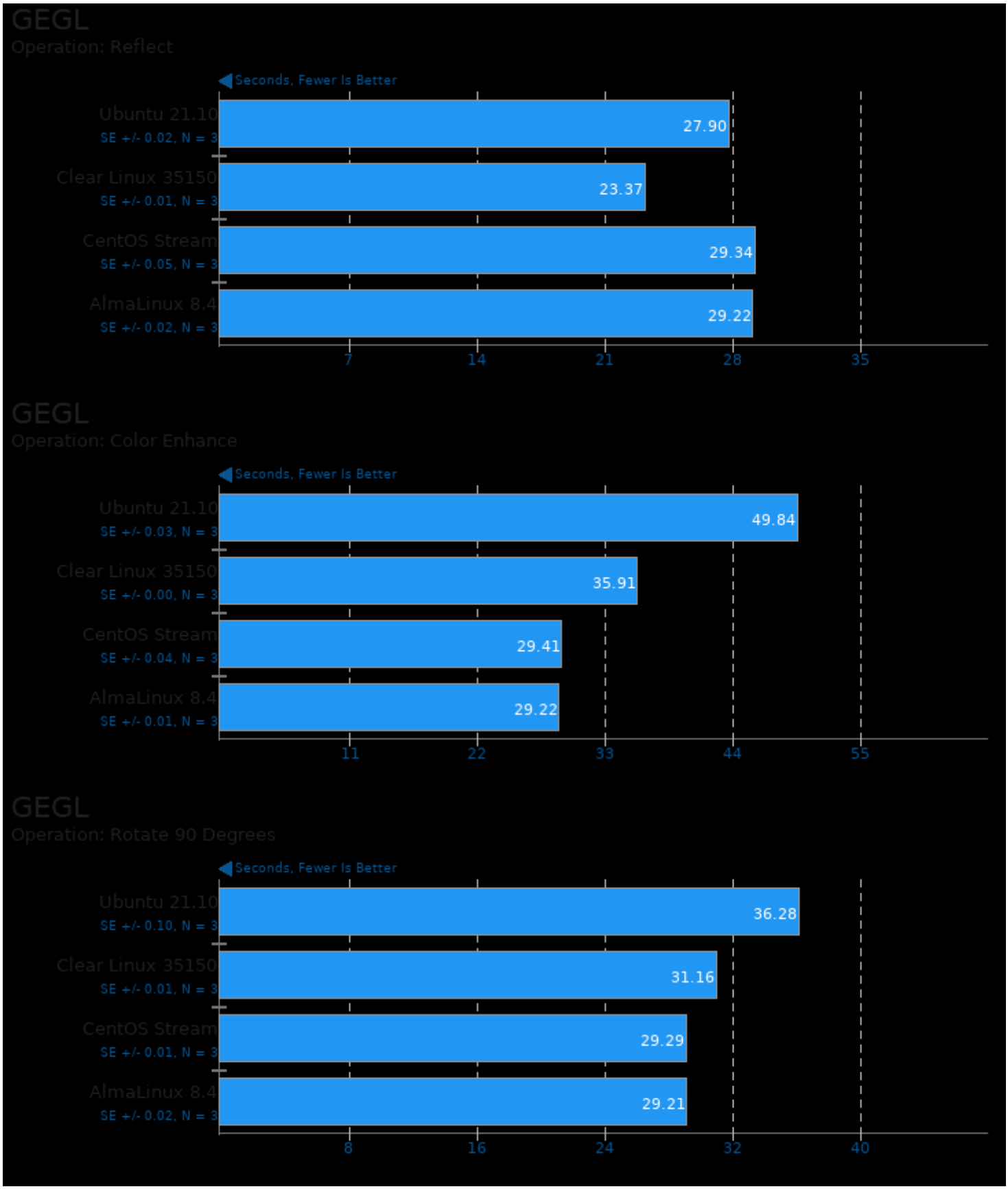
Operation: Crop



GEGL

Operation: Scale



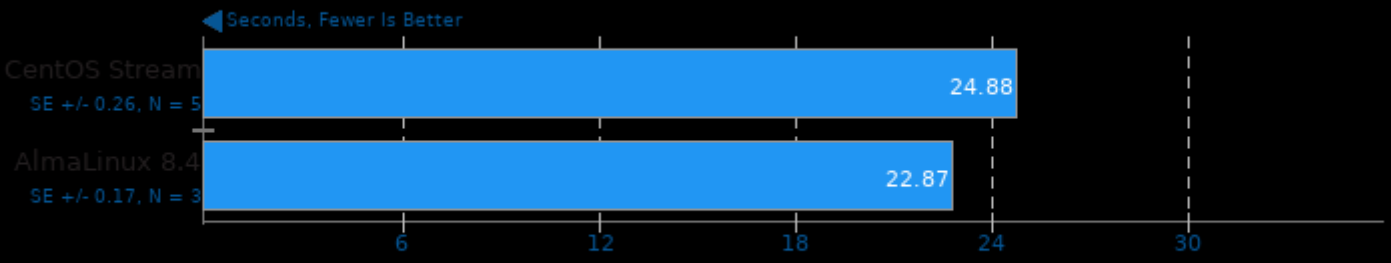

GEGL
Operation: Reflect
Seconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.02, N = 3
27.90
Clear Linux 35150
SE +/- 0.01, N = 3
23.37
CentOS Stream
SE +/- 0.05, N = 3
29.34
AlmaLinux 8.4
SE +/- 0.02, N = 3
29.22
7
14
21
28
35
GEGL
Operation: Color Enhance
Seconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.03, N = 3
49.84
Clear Linux 35150
SE +/- 0.00, N = 3
35.91
CentOS Stream
SE +/- 0.04, N = 3
29.41
AlmaLinux 8.4
SE +/- 0.01, N = 3
29.22
11
22
33
44
55
GEGL
Operation: Rotate 90 Degrees
Seconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.10, N = 3
36.28
Clear Linux 35150
SE +/- 0.01, N = 3
31.16
CentOS Stream
SE +/- 0.01, N = 3
29.29
AlmaLinux 8.4
SE +/- 0.02, N = 3
29.21
8
16
24
32
40

Hugin

Panorama Photo Assistant + Stitching Time

Inkscape

Operation: SVG Files To PNG



1. Inkscape 0.92.3 (2405546, 2018-03-11)

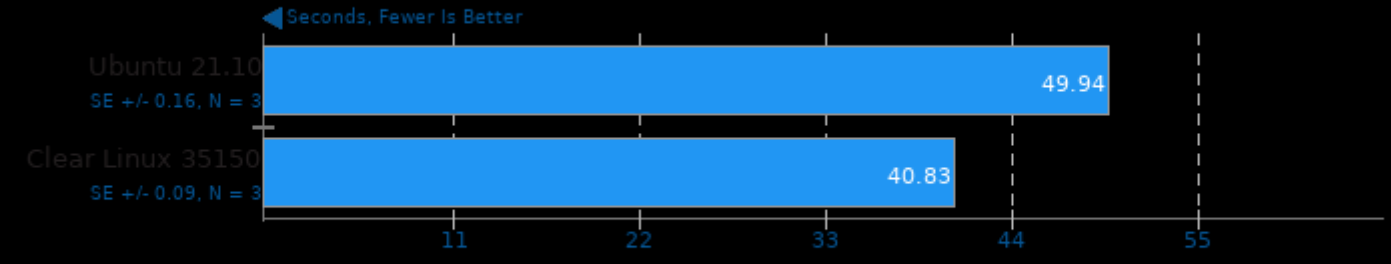
OCRMyPDF 10.3.1+dfsg

Processing 60 Page PDF Document

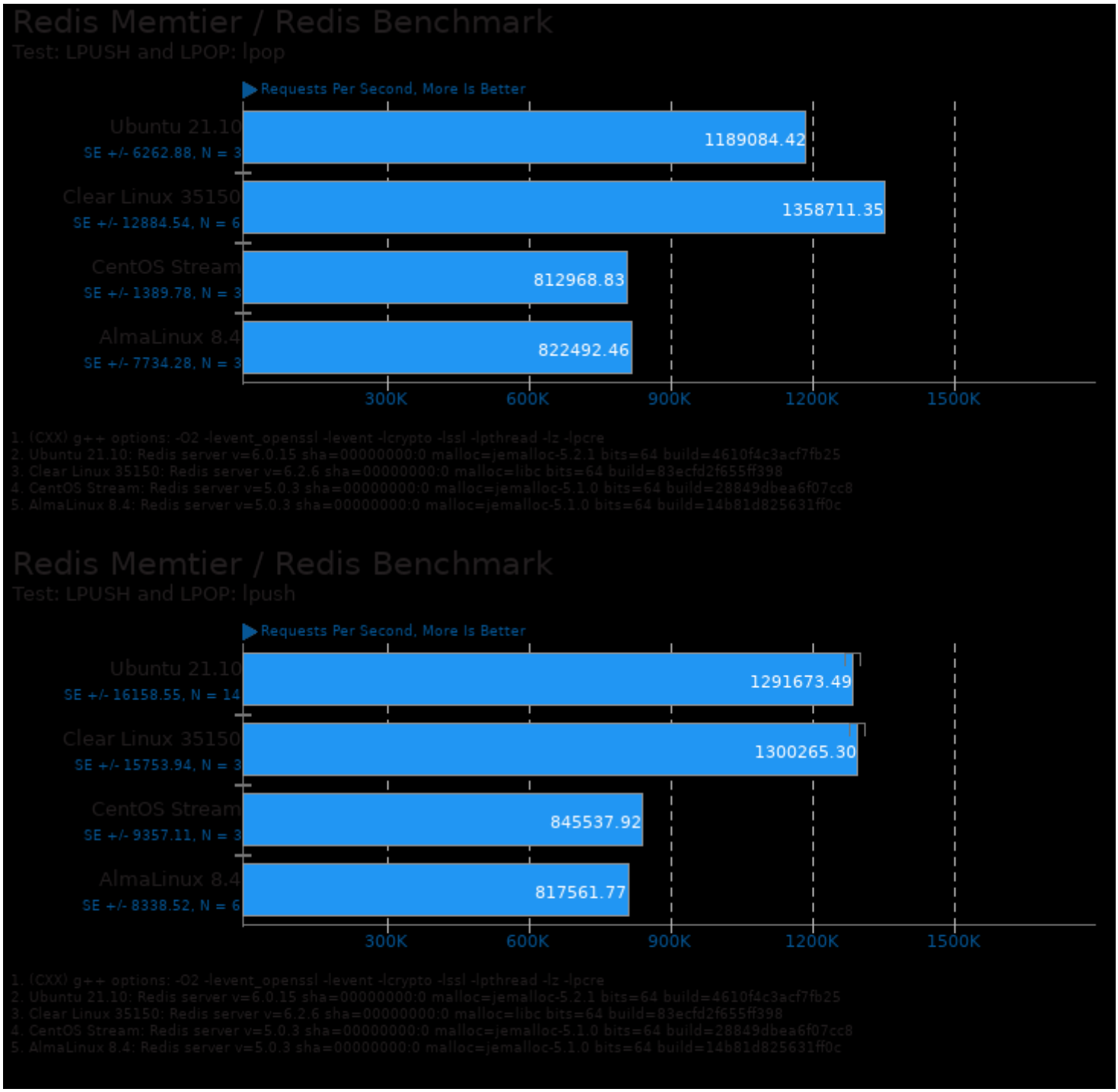
GNU Octave Benchmark 6.2.0

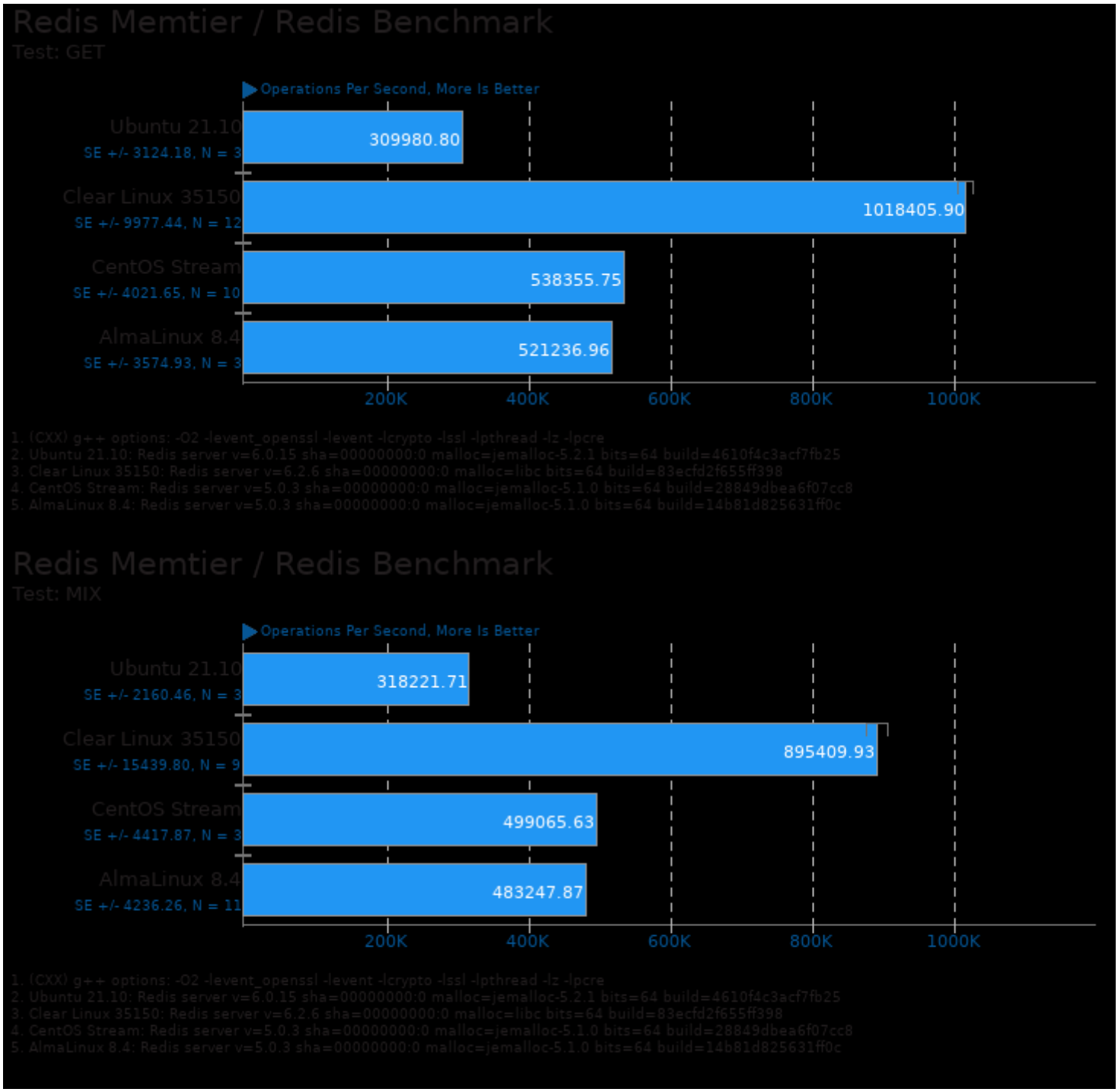
RawTherapee

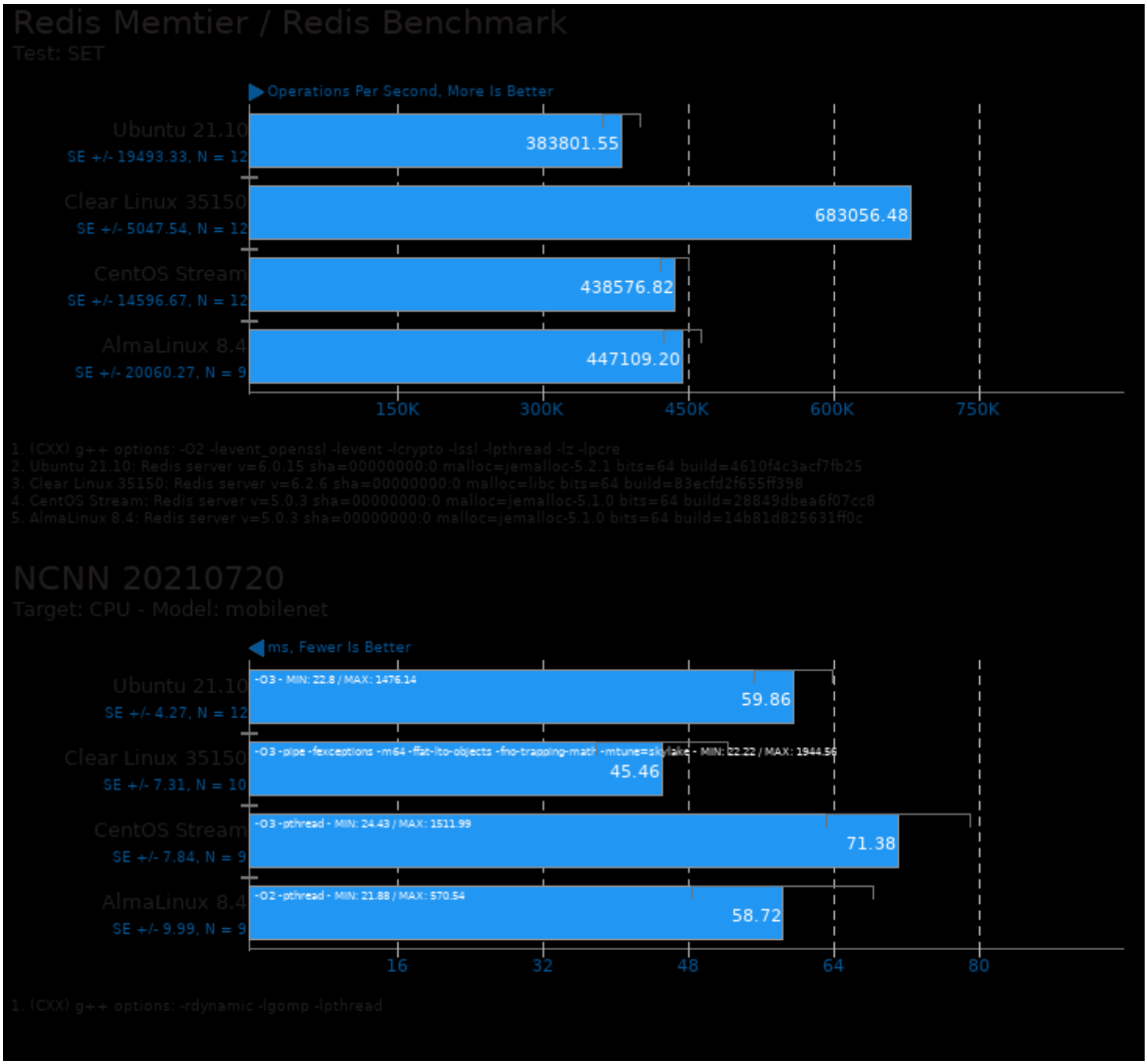
Total Benchmark Time

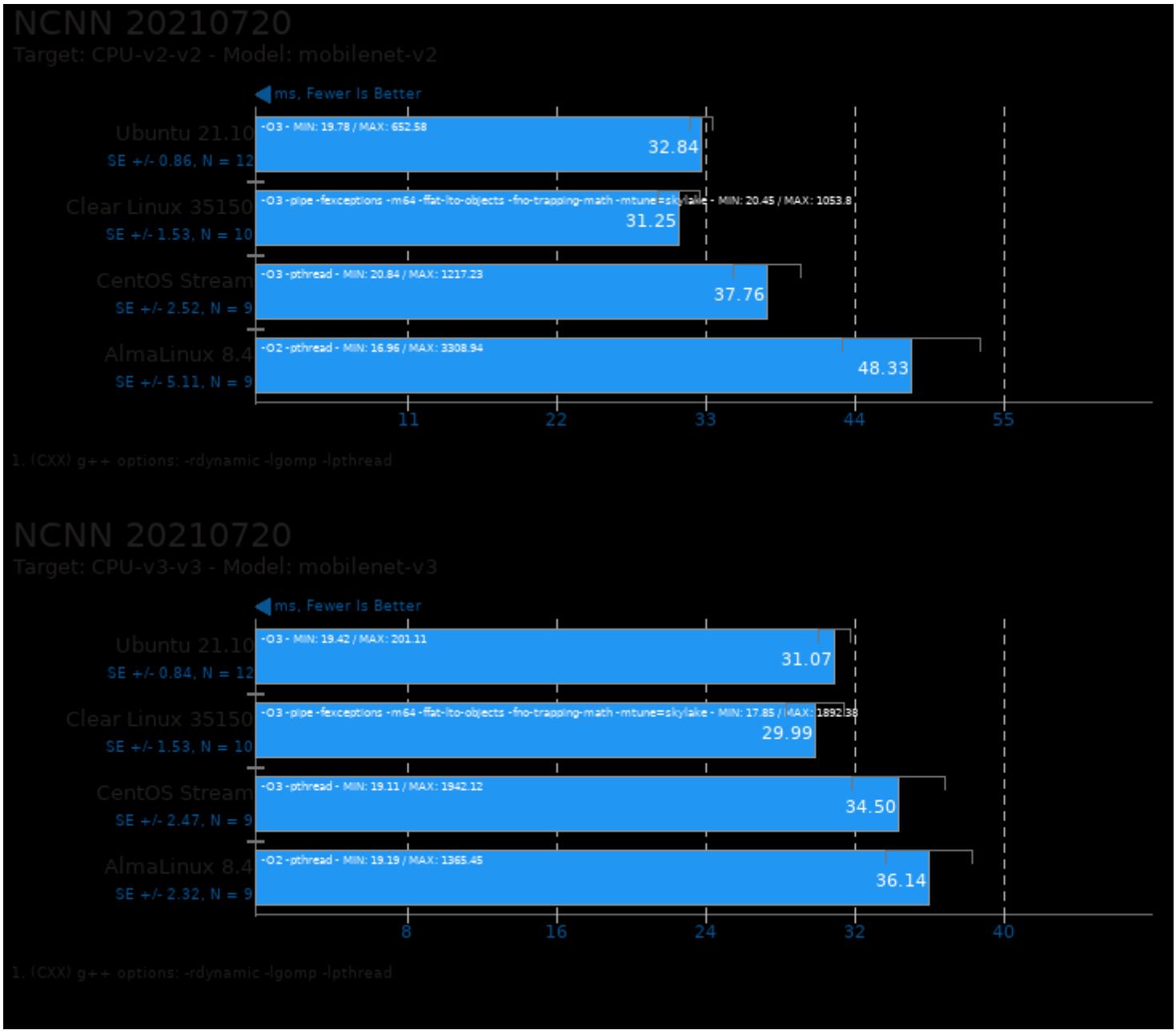


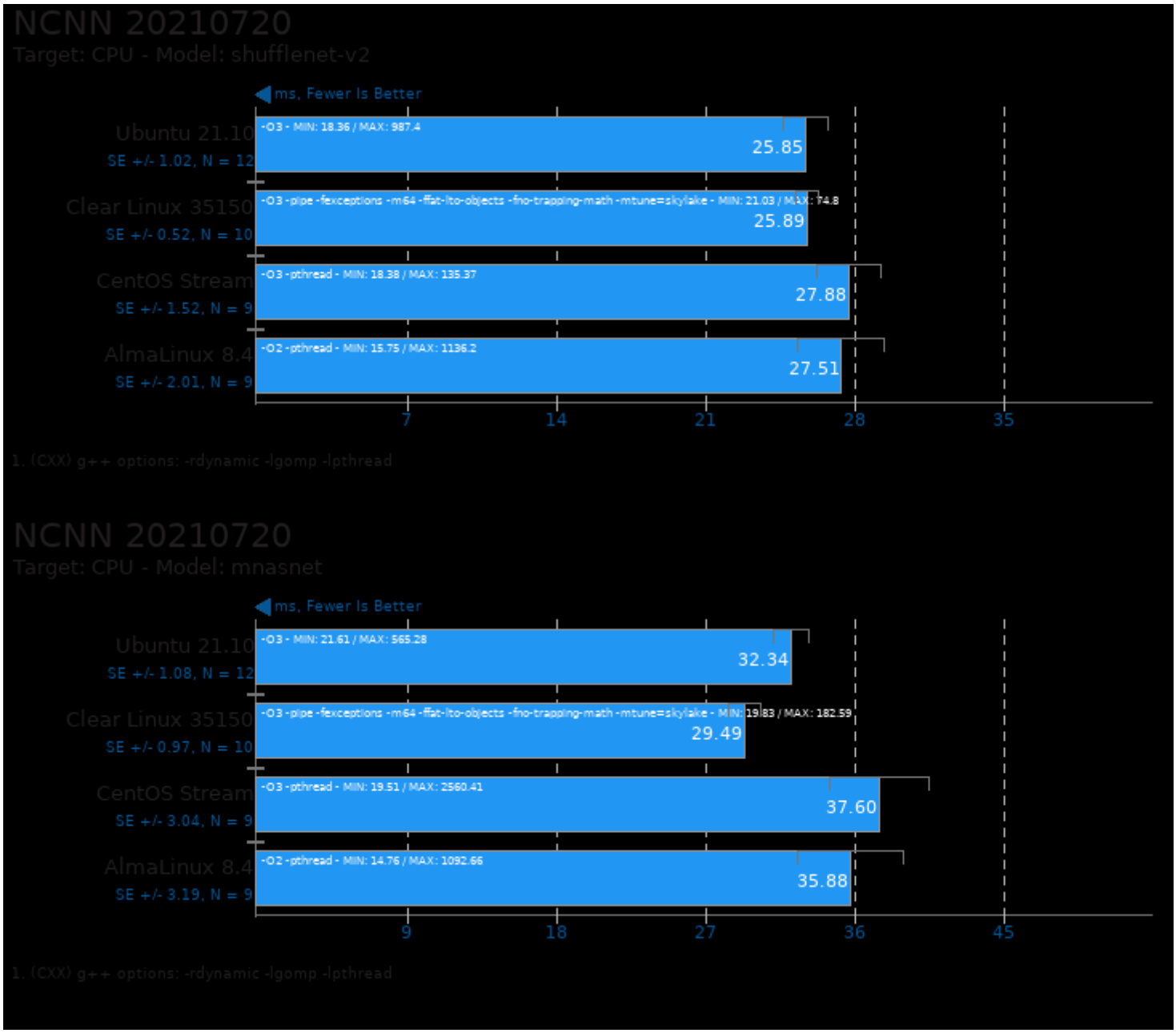
1. Ubuntu 21.10: RawTherapee, version 5.8, command line.
2. Clear Linux 35150: RawTherapee, version , command line.

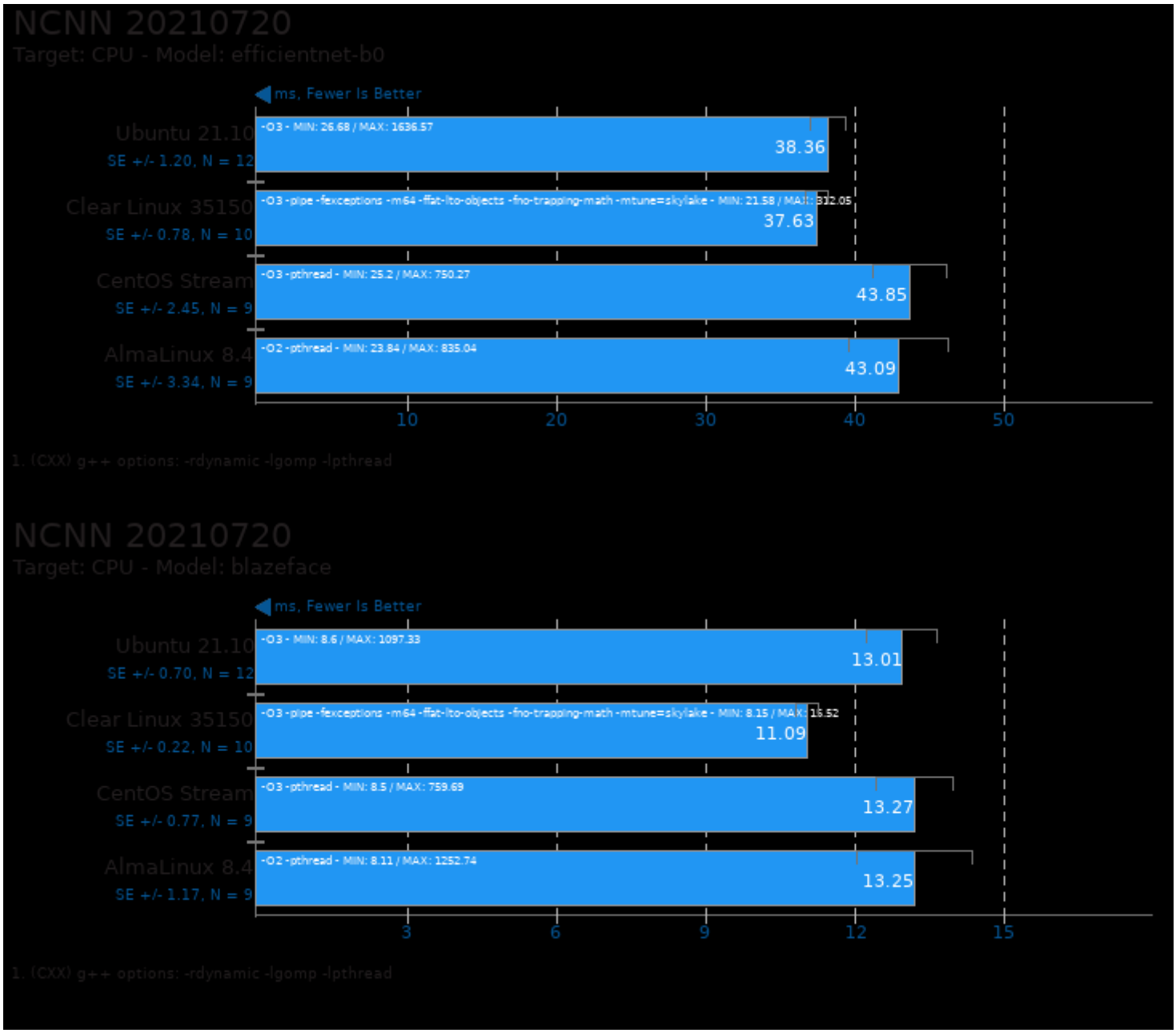

Redis Memtier / Redis Benchmark
Test: LPUSH and LPOP: lpop
Requests Per Second, More Is Better
Ubuntu 21.10
SE +/- 6262.88, N = 3
1189084.42
Clear Linux 35150
SE +/- 12884.54, N = 6
1358711.35
CentOS Stream
SE +/- 1389.78, N = 3
812968.83
AlmaLinux 8.4
SE +/- 7734.28, N = 3
822492.46
300K
600K
900K
1200K
1500K
1. (CXX) g++ options: -O2 -levent_openssl -levent -lcrypto -lssl -lpthread -lz -lpcre
2. Ubuntu 21.10: Redis server v=6.0.15 sha=00000000:0 malloc=jemalloc-5.2.1 bits=64 build=4610f4c3acf7fb25
3. Clear Linux 35150: Redis server v=6.2.6 sha=00000000:0 malloc=libc bits=64 build=83ecfd2f655ff398
4. CentOS Stream: Redis server v=5.0.3 sha=00000000:0 malloc=jemalloc-5.1.0 bits=64 build=28849dbea6f07cc8
5. AlmaLinux 8.4: Redis server v=5.0.3 sha=00000000:0 malloc=jemalloc-5.1.0 bits=64 build=14b81d825631ff0c
Redis Memtier / Redis Benchmark
Test: LPUSH and LPOP: lpush
Requests Per Second, More Is Better
Ubuntu 21.10
SE +/- 16158.55, N = 14
1291673.49
Clear Linux 35150
SE +/- 15753.94, N = 3
1300265.30
CentOS Stream
SE +/- 9357.11, N = 3
845537.92
AlmaLinux 8.4
SE +/- 8338.52, N = 6
817561.77
300K
600K
900K
1200K
1500K
1. (CXX) g++ options: -O2 -levent_openssl -levent -lcrypto -lssl -lpthread -lz -lpcre
2. Ubuntu 21.10: Redis server v=6.0.15 sha=00000000:0 malloc=jemalloc-5.2.1 bits=64 build=4610f4c3acf7fb25
3. Clear Linux 35150: Redis server v=6.2.6 sha=00000000:0 malloc=libc bits=64 build=83ecfd2f655ff398
4. CentOS Stream: Redis server v=5.0.3 sha=00000000:0 malloc=jemalloc-5.1.0 bits=64 build=28849dbea6f07cc8
5. AlmaLinux 8.4: Redis server v=5.0.3 sha=00000000:0 malloc=jemalloc-5.1.0 bits=64 build=14b81d825631ff0c

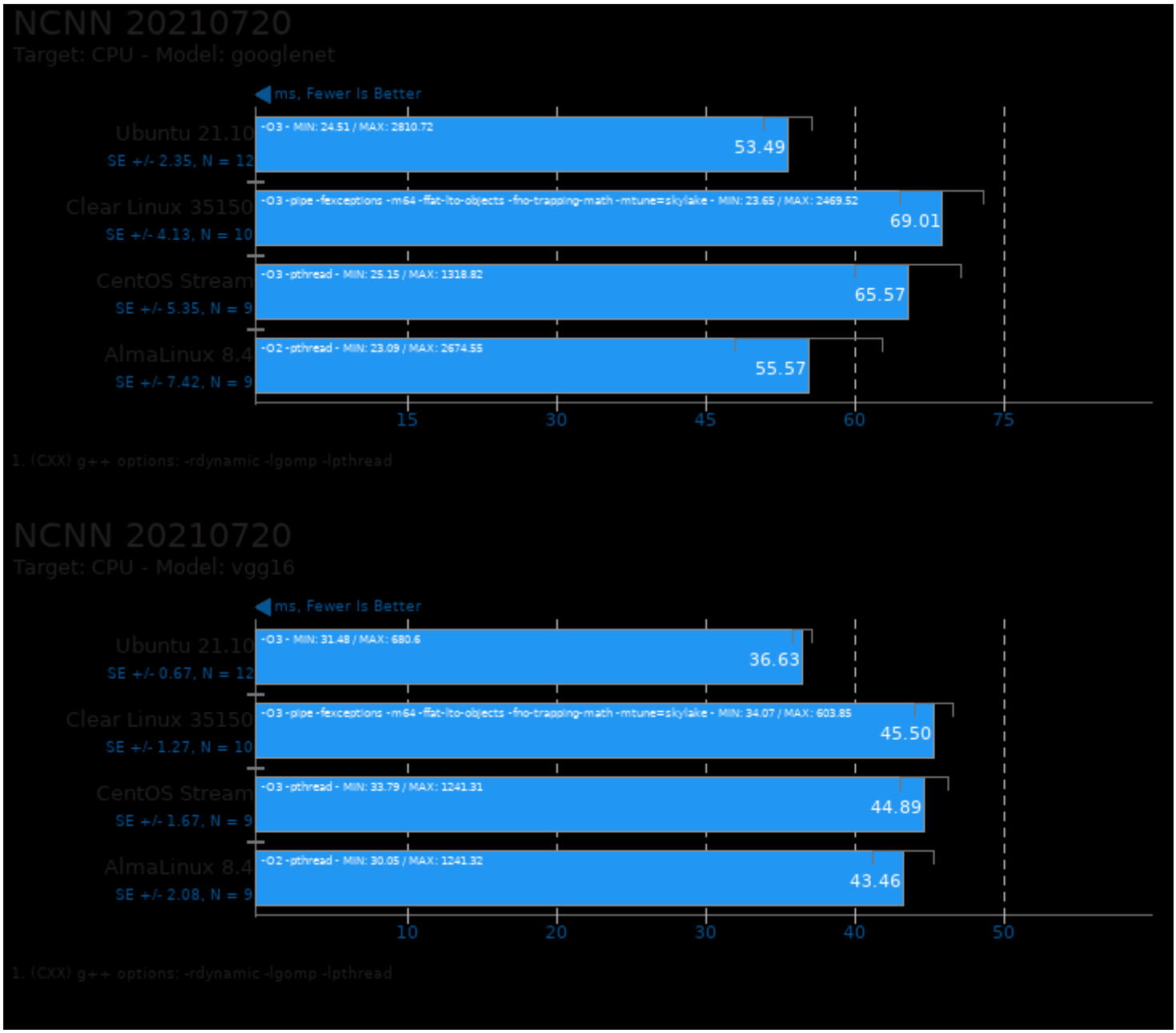

Redis Memtier / Redis Benchmark
Test: GET
Operations Per Second, More Is Better
Ubuntu 21.10
SE +/- 3124.18, N = 3
309980.80
Clear Linux 35150
SE +/- 9977.44, N = 12
1018405.90
CentOS Stream
SE +/- 4021.65, N = 10
538355.75
AlmaLinux 8.4
SE +/- 3574.93, N = 3
521236.96
200K
400K
600K
800K
1000K
1. (CXX) g++ options: -O2 -levent_openssl -levent -lcrypto -lssl -lpthread -lz -lpcre
2. Ubuntu 21.10: Redis server v=6.0.15 sha=00000000:0 malloc=jemalloc-5.2.1 bits=64 build=4610f4c3acf7fb25
3. Clear Linux 35150: Redis server v=6.2.6 sha=00000000:0 malloc=libc bits=64 build=83ecfd2f655ff398
4. CentOS Stream: Redis server v=5.0.3 sha=00000000:0 malloc=jemalloc-5.1.0 bits=64 build=28849dbea6f07cc8
5. AlmaLinux 8.4: Redis server v=5.0.3 sha=00000000:0 malloc=jemalloc-5.1.0 bits=64 build=14b81d825631ff0c
Redis Memtier / Redis Benchmark
Test: MIX
Operations Per Second, More Is Better
Ubuntu 21.10
SE +/- 2160.46, N = 3
318221.71
Clear Linux 35150
SE +/- 15439.80, N = 9
895409.93
CentOS Stream
SE +/- 4417.87, N = 3
499065.63
AlmaLinux 8.4
SE +/- 4236.26, N = 11
483247.87
200K
400K
600K
800K
1000K
1. (CXX) g++ options: -O2 -levent_openssl -levent -lcrypto -lssl -lpthread -lz -lpcre
2. Ubuntu 21.10: Redis server v=6.0.15 sha=00000000:0 malloc=jemalloc-5.2.1 bits=64 build=4610f4c3acf7fb25
3. Clear Linux 35150: Redis server v=6.2.6 sha=00000000:0 malloc=libc bits=64 build=83ecfd2f655ff398
4. CentOS Stream: Redis server v=5.0.3 sha=00000000:0 malloc=jemalloc-5.1.0 bits=64 build=28849dbea6f07cc8
5. AlmaLinux 8.4: Redis server v=5.0.3 sha=00000000:0 malloc=jemalloc-5.1.0 bits=64 build=14b81d825631ff0c

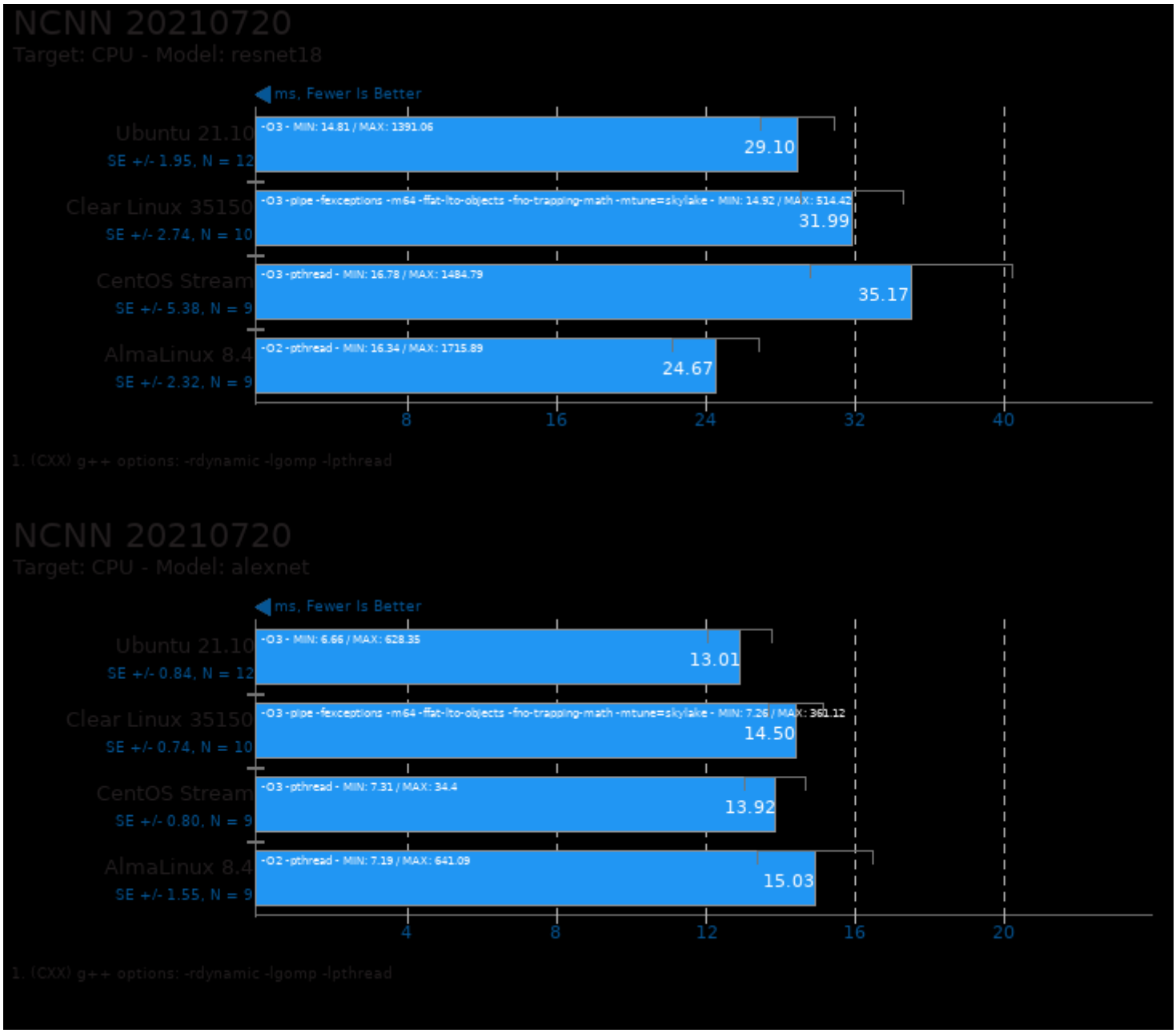

Redis Memtier / Redis Benchmark
Test: SET
Operations Per Second, More Is Better
Ubuntu 21.10
SE +/- 19493.33, N = 12
383801.55
Clear Linux 35150
SE +/- 5047.54, N = 12
683056.48
CentOS Stream
SE +/- 14596.67, N = 12
438576.82
AlmaLinux 8.4
SE +/- 20060.27, N = 9
447109.20
150K
300K
450K
600K
750K
1. (CXX) g++ options: -O2 -levent_openssl -levent -lcrypto -lssl -lpthread -lz -lpcre
2. Ubuntu 21.10: Redis server v=6.0.15 sha=00000000:0 malloc=jemalloc-5.2.1 bits=64 build=4610f4c3acf7fb25
3. Clear Linux 35150: Redis server v=6.2.6 sha=00000000:0 malloc=libc bits=64 build=83ecfd2f655ff398
4. CentOS Stream: Redis server v=5.0.3 sha=00000000:0 malloc=jemalloc-5.1.0 bits=64 build=28849dbea6f07cc8
5. AlmaLinux 8.4: Redis server v=5.0.3 sha=00000000:0 malloc=jemalloc-5.1.0 bits=64 build=14b81d825631ff0c
NCNN 20210720
Target: CPU - Model: mobilenet
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 4.27, N = 12
-O3 - MIN: 22.8 / MAX: 1476.14
59.86
Clear Linux 35150
SE +/- 7.31, N = 10
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 22.22 / MAX: 1944.56
45.46
CentOS Stream
SE +/- 7.84, N = 9
-O3 -pthread - MIN: 24.43 / MAX: 1511.99
71.38
AlmaLinux 8.4
SE +/- 9.99, N = 9
-O2 -pthread - MIN: 21.88 / MAX: 570.54
58.72
16
32
48
64
80
1. (CXX) g++ options: -rdynamic -lgomp -lpthread

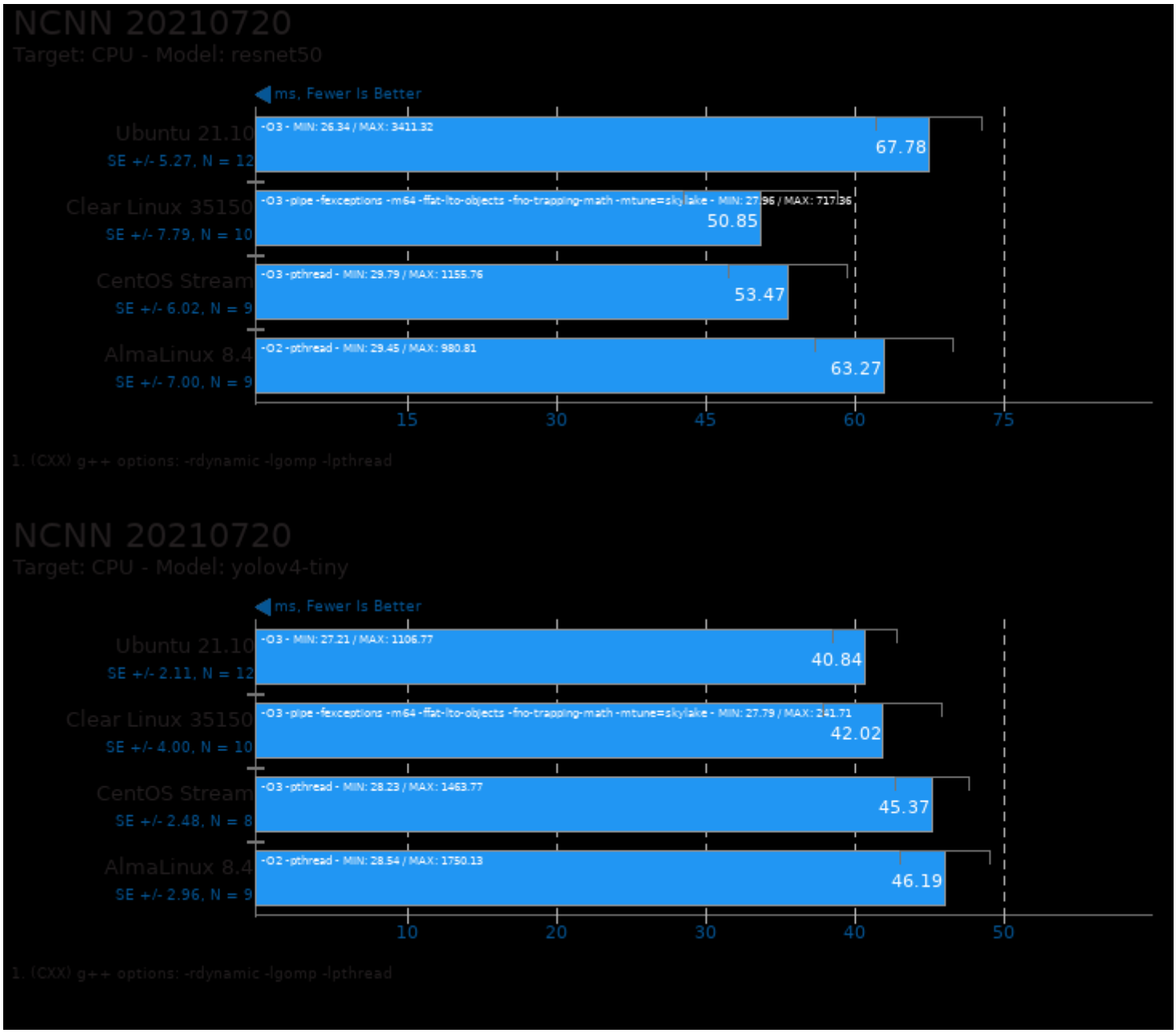

NCNN 20210720
Target: CPU-v2-v2 - Model: mobilenet-v2
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 0.86, N = 12
-O3 - MIN: 19.78 / MAX: 652.58
32.84
Clear Linux 35150
SE +/- 1.53, N = 10
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 20.45 / MAX: 1053.8
31.25
CentOS Stream
SE +/- 2.52, N = 9
-O3 -pthread - MIN: 20.84 / MAX: 1217.23
37.76
AlmaLinux 8.4
SE +/- 5.11, N = 9
-O2 -pthread - MIN: 16.96 / MAX: 3308.94
48.33
11
22
33
44
55
1. (CXX) g++ options: -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU-v3-v3 - Model: mobilenet-v3
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 0.84, N = 12
-O3 - MIN: 19.42 / MAX: 201.11
31.07
Clear Linux 35150
SE +/- 1.53, N = 10
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 17.85 / MAX: 1892.38
29.99
CentOS Stream
SE +/- 2.47, N = 9
-O3 -pthread - MIN: 19.11 / MAX: 1942.12
34.50
AlmaLinux 8.4
SE +/- 2.32, N = 9
-O2 -pthread - MIN: 19.19 / MAX: 1365.45
36.14
8
16
24
32
40
1. (CXX) g++ options: -rdynamic -lgomp -lpthread

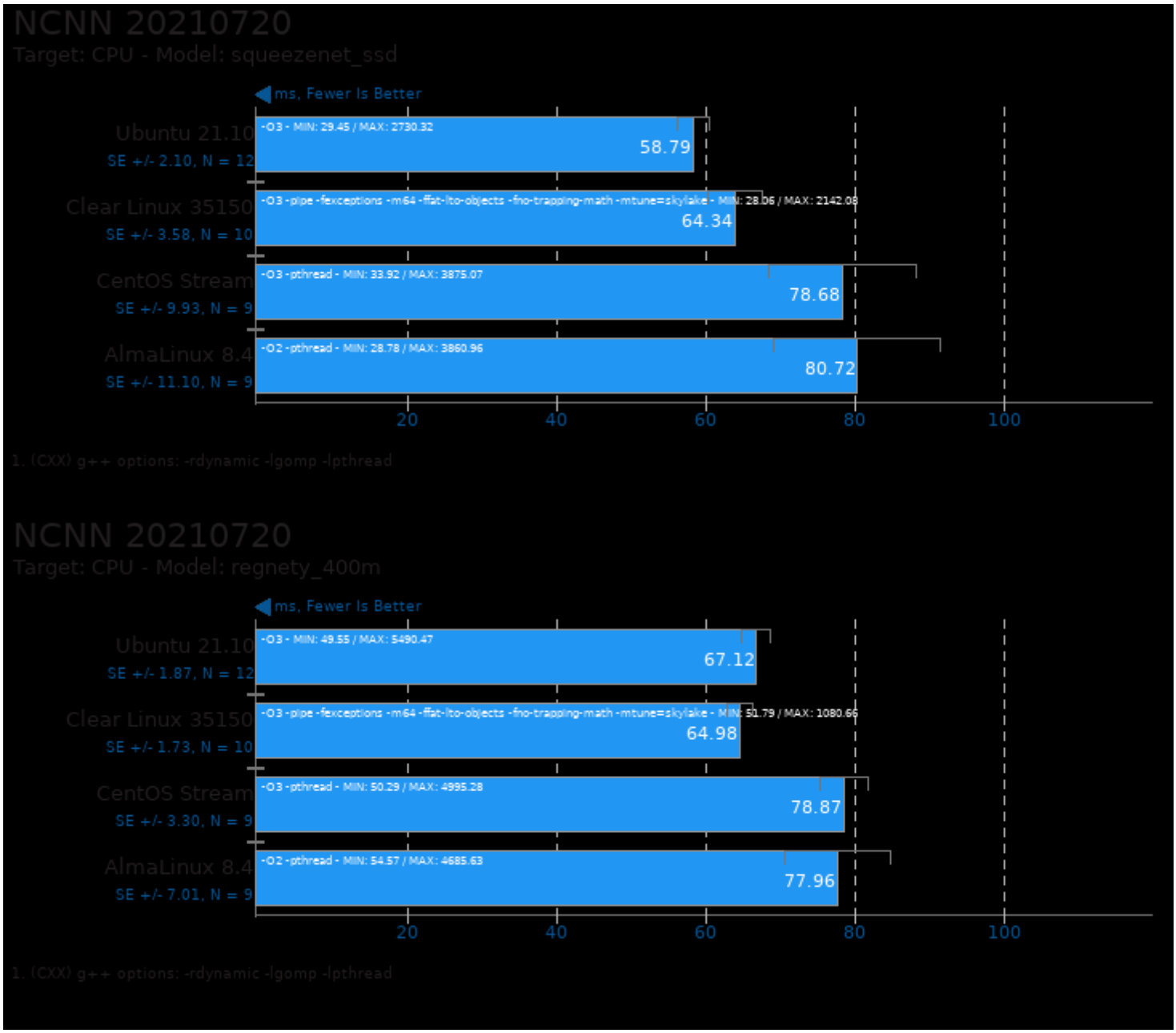

NCNN 20210720
Target: CPU - Model: shufflenet-v2
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 1.02, N = 12
-O3 - MIN: 18.36 / MAX: 987.4
25.85
Clear Linux 35150
SE +/- 0.52, N = 10
-O3 -pipe -fexceptions -m64 -flat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 21.03 / MAX: 74.8
25.89
CentOS Stream
SE +/- 1.52, N = 9
-O3 -pthread - MIN: 18.38 / MAX: 135.37
27.88
AlmaLinux 8.4
SE +/- 2.01, N = 9
-O2 -pthread - MIN: 15.75 / MAX: 1136.2
27.51
7
14
21
28
35
1. (CXX) g++ options: -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: mnasnet
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 1.08, N = 12
-O3 - MIN: 21.61 / MAX: 565.28
32.34
Clear Linux 35150
SE +/- 0.97, N = 10
-O3 -pipe -fexceptions -m64 -flat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 19.83 / MAX: 182.59
29.49
CentOS Stream
SE +/- 3.04, N = 9
-O3 -pthread - MIN: 19.51 / MAX: 2560.41
37.60
AlmaLinux 8.4
SE +/- 3.19, N = 9
-O2 -pthread - MIN: 14.76 / MAX: 1092.66
35.88
9
18
27
36
45
1. (CXX) g++ options: -rdynamic -lgomp -lpthread

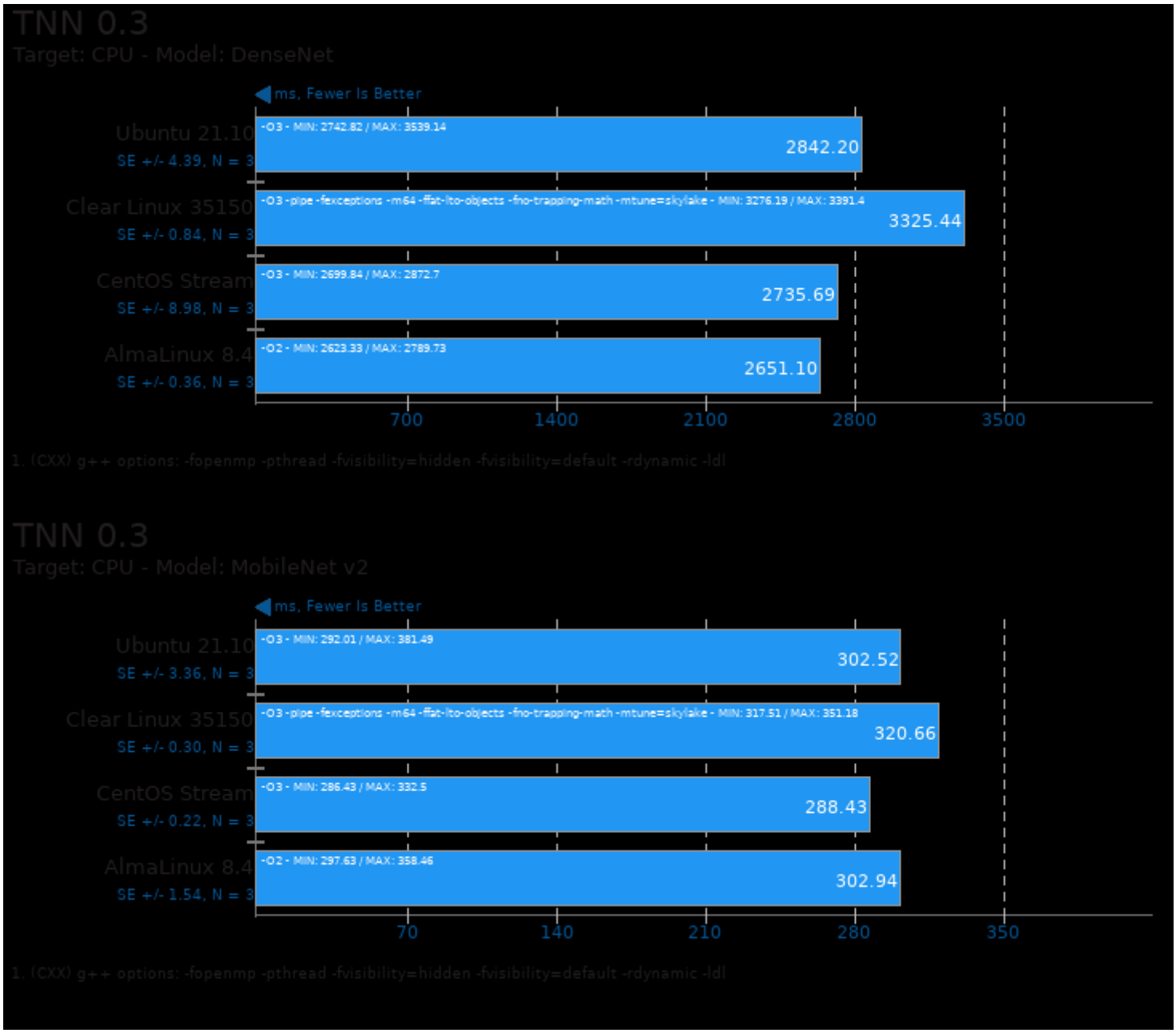

NCNN 20210720
Target: CPU - Model: efficientnet-b0
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 1.20, N = 12
-O3 - MIN: 26.68 / MAX: 1636.57
38.36
Clear Linux 35150
SE +/- 0.78, N = 10
-O3 -pipe -fexceptions -m64 -flat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 21.58 / MAX: 1312.05
37.63
CentOS Stream
SE +/- 2.45, N = 9
-O3 -pthread - MIN: 25.2 / MAX: 750.27
43.85
AlmaLinux 8.4
SE +/- 3.34, N = 9
-O2 -pthread - MIN: 23.84 / MAX: 835.04
43.09
10
20
30
40
50
1. (CXX) g++ options: -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: blazeface
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 0.70, N = 12
-O3 - MIN: 8.6 / MAX: 1097.33
13.01
Clear Linux 35150
SE +/- 0.22, N = 10
-O3 -pipe -fexceptions -m64 -flat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 8.15 / MAX: 15.52
11.09
CentOS Stream
SE +/- 0.77, N = 9
-O3 -pthread - MIN: 8.5 / MAX: 759.69
13.27
AlmaLinux 8.4
SE +/- 1.17, N = 9
-O2 -pthread - MIN: 8.11 / MAX: 1252.74
13.25
3
6
9
12
15
1. (CXX) g++ options: -rdynamic -lgomp -lpthread


NCNN 20210720
Target: CPU - Model: googlenet
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 2.35, N = 12
-O3 - MIN: 24.51 / MAX: 2810.72
53.49
Clear Linux 35150
SE +/- 4.13, N = 10
-O3 -pipe -fexceptions -m64 -flat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 23.65 / MAX: 2469.52
69.01
CentOS Stream
SE +/- 5.35, N = 9
-O3 -pthread - MIN: 25.15 / MAX: 1318.82
65.57
AlmaLinux 8.4
SE +/- 7.42, N = 9
-O2 -pthread - MIN: 23.09 / MAX: 2674.55
55.57
15
30
45
60
75
1. (CXX) g++ options: -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: vgg16
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 0.67, N = 12
-O3 - MIN: 31.48 / MAX: 680.6
36.63
Clear Linux 35150
SE +/- 1.27, N = 10
-O3 -pipe -fexceptions -m64 -flat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 34.07 / MAX: 603.85
45.50
CentOS Stream
SE +/- 1.67, N = 9
-O3 -pthread - MIN: 33.79 / MAX: 1241.31
44.89
AlmaLinux 8.4
SE +/- 2.08, N = 9
-O2 -pthread - MIN: 30.05 / MAX: 1241.32
43.46
10
20
30
40
50
1. (CXX) g++ options: -rdynamic -lgomp -lpthread


NCNN 20210720
Target: CPU - Model: resnet18
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 1.95, N = 12
-O3 - MIN: 14.81 / MAX: 1391.06
29.10
Clear Linux 35150
SE +/- 2.74, N = 10
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 14.92 / MAX: 514.42
31.99
CentOS Stream
SE +/- 5.38, N = 9
-O3 -pthread - MIN: 16.78 / MAX: 1484.79
35.17
AlmaLinux 8.4
SE +/- 2.32, N = 9
-O2 -pthread - MIN: 16.34 / MAX: 1715.89
24.67
8
16
24
32
40
1. (CXX) g++ options: -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: alexnet
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 0.84, N = 12
-O3 - MIN: 6.66 / MAX: 628.35
13.01
Clear Linux 35150
SE +/- 0.74, N = 10
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 7.26 / MAX: 361.12
14.50
CentOS Stream
SE +/- 0.80, N = 9
-O3 -pthread - MIN: 7.31 / MAX: 34.4
13.92
AlmaLinux 8.4
SE +/- 1.55, N = 9
-O2 -pthread - MIN: 7.19 / MAX: 641.09
15.03
4
8
12
16
20
1. (CXX) g++ options: -rdynamic -lgomp -lpthread

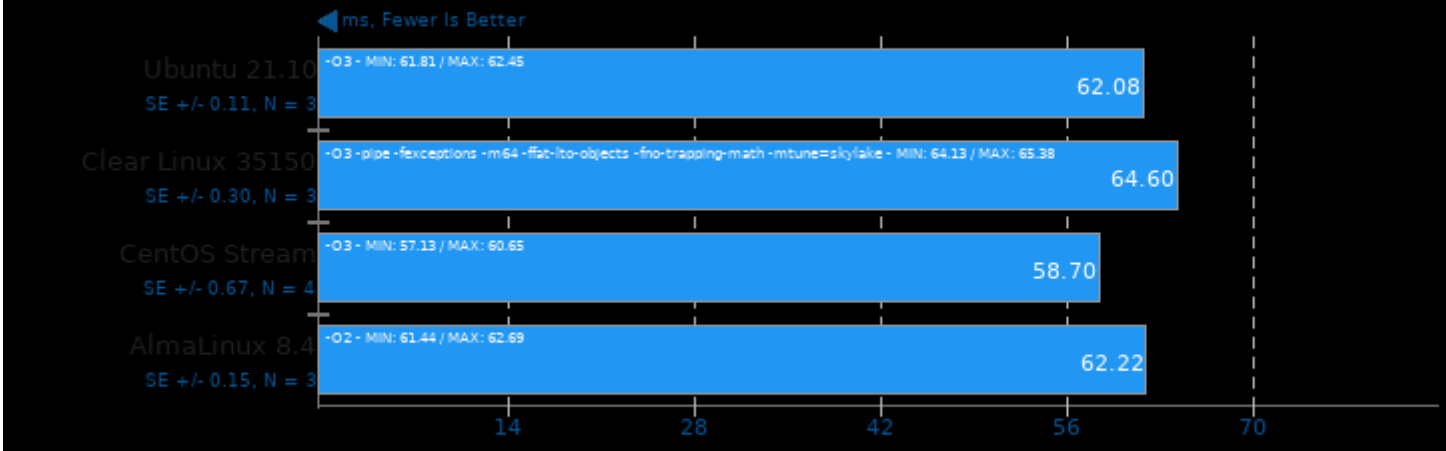

NCNN 20210720
Target: CPU - Model: resnet50
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 5.27, N = 12
-O3 - MIN: 26.34 / MAX: 3411.32
67.78
Clear Linux 35150
SE +/- 7.79, N = 10
-O3 -pipe -fexceptions -m64 -flat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 27.96 / MAX: 717.36
50.85
CentOS Stream
SE +/- 6.02, N = 9
-O3 -pthread - MIN: 29.79 / MAX: 1155.76
53.47
AlmaLinux 8.4
SE +/- 7.00, N = 9
-O2 -pthread - MIN: 29.45 / MAX: 980.81
63.27
15
30
45
60
75
1. (CXX) g++ options: -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: yolov4-tiny
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 2.11, N = 12
-O3 - MIN: 27.21 / MAX: 1106.77
40.84
Clear Linux 35150
SE +/- 4.00, N = 10
-O3 -pipe -fexceptions -m64 -flat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 27.79 / MAX: 241.71
42.02
CentOS Stream
SE +/- 2.48, N = 8
-O3 -pthread - MIN: 28.23 / MAX: 1463.77
45.37
AlmaLinux 8.4
SE +/- 2.96, N = 9
-O2 -pthread - MIN: 28.54 / MAX: 1750.13
46.19
10
20
30
40
50
1. (CXX) g++ options: -rdynamic -lgomp -lpthread


NCNN 20210720
Target: CPU - Model: squeezenet_ssd
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 2.10, N = 12
-O3 - MIN: 29.45 / MAX: 2730.32
58.79
Clear Linux 35150
SE +/- 3.58, N = 10
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 28.06 / MAX: 2142.08
64.34
CentOS Stream
SE +/- 9.93, N = 9
-O3 -pthread - MIN: 33.92 / MAX: 3875.07
78.68
AlmaLinux 8.4
SE +/- 11.10, N = 9
-O2 -pthread - MIN: 28.78 / MAX: 3860.96
80.72
20
40
60
80
100
1. (CXX) g++ options: -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: regnety_400m
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 1.87, N = 12
-O3 - MIN: 49.55 / MAX: 5490.47
67.12
Clear Linux 35150
SE +/- 1.73, N = 10
-O3 -pipe -fexceptions -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 51.79 / MAX: 1080.66
64.98
CentOS Stream
SE +/- 3.30, N = 9
-O3 -pthread - MIN: 50.29 / MAX: 4995.28
78.87
AlmaLinux 8.4
SE +/- 7.01, N = 9
-O2 -pthread - MIN: 54.57 / MAX: 4685.63
77.96
20
40
60
80
100
1. (CXX) g++ options: -rdynamic -lgomp -lpthread


TNN 0.3
Target: CPU - Model: DenseNet
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 4.39, N = 3
-O3 - MIN: 2742.82 / MAX: 3539.14
2842.20
Clear Linux 35150
SE +/- 0.84, N = 3
-O3 -pipe -fexceptions -m64 -flat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 3276.19 / MAX: 3391.4
3325.44
CentOS Stream
SE +/- 8.98, N = 3
-O3 - MIN: 2699.84 / MAX: 2872.7
2735.69
AlmaLinux 8.4
SE +/- 0.36, N = 3
-O2 - MIN: 2623.33 / MAX: 2789.73
2651.10
700
1400
2100
2800
3500
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -fvisibility=default -rdynamic -ldl
TNN 0.3
Target: CPU - Model: MobileNet v2
ms, Fewer Is Better
Ubuntu 21.10
SE +/- 3.36, N = 3
-O3 - MIN: 292.01 / MAX: 381.49
302.52
Clear Linux 35150
SE +/- 0.30, N = 3
-O3 -pipe -fexceptions -m64 -flat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 317.51 / MAX: 351.18
320.66
CentOS Stream
SE +/- 0.22, N = 3
-O3 - MIN: 286.43 / MAX: 332.5
288.43
AlmaLinux 8.4
SE +/- 1.54, N = 3
-O2 - MIN: 297.63 / MAX: 358.46
302.94
70
140
210
280
350
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -fvisibility=default -rdynamic -ldl

TNN 0.3

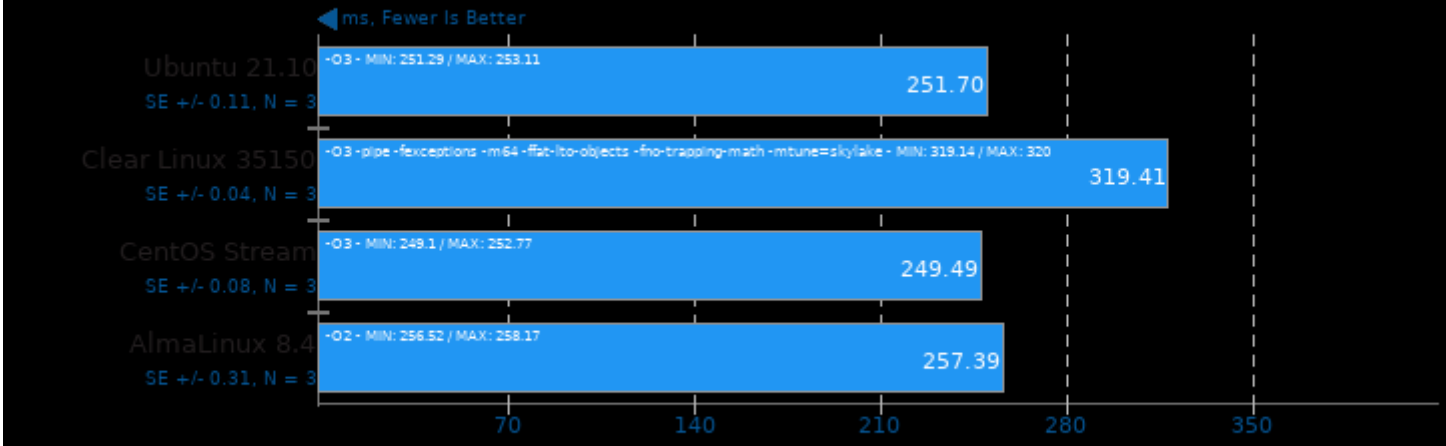
Target: CPU - Model: SqueezeNet v2



1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -fvisibility=default -rdynamic -ldl

TNN 0.3

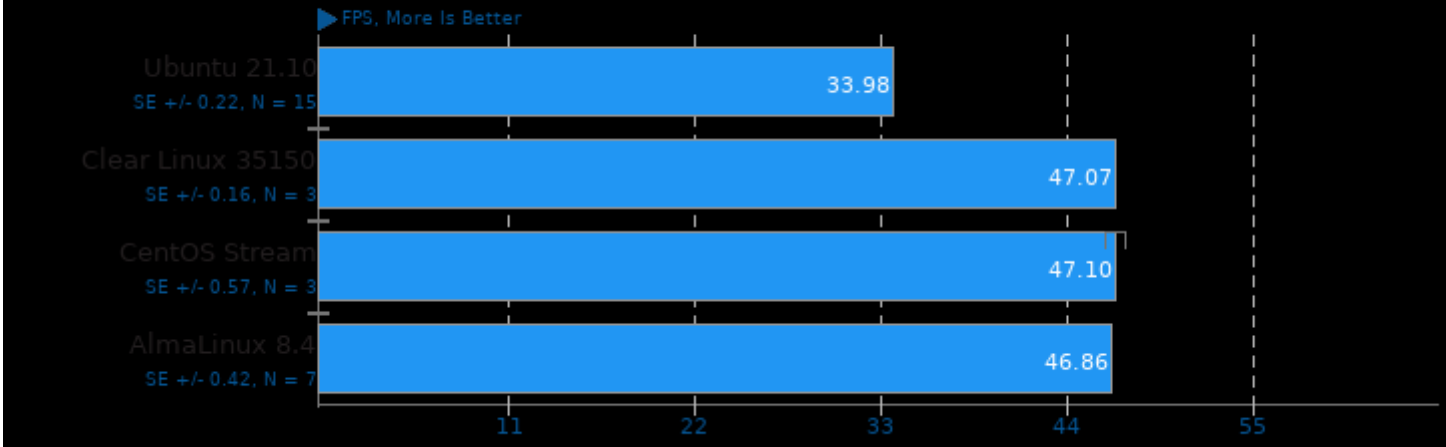
Target: CPU - Model: SqueezeNet v1.1

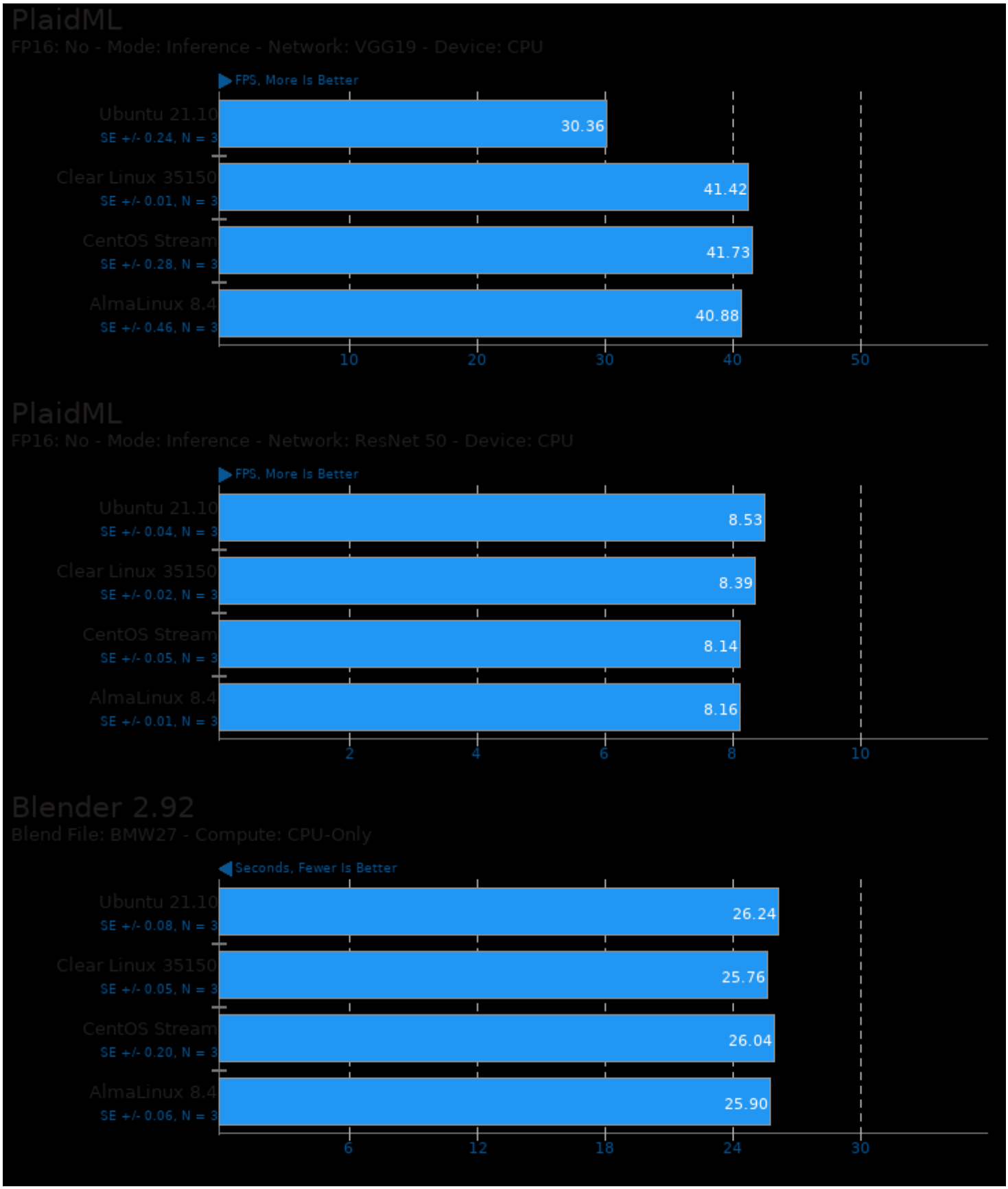


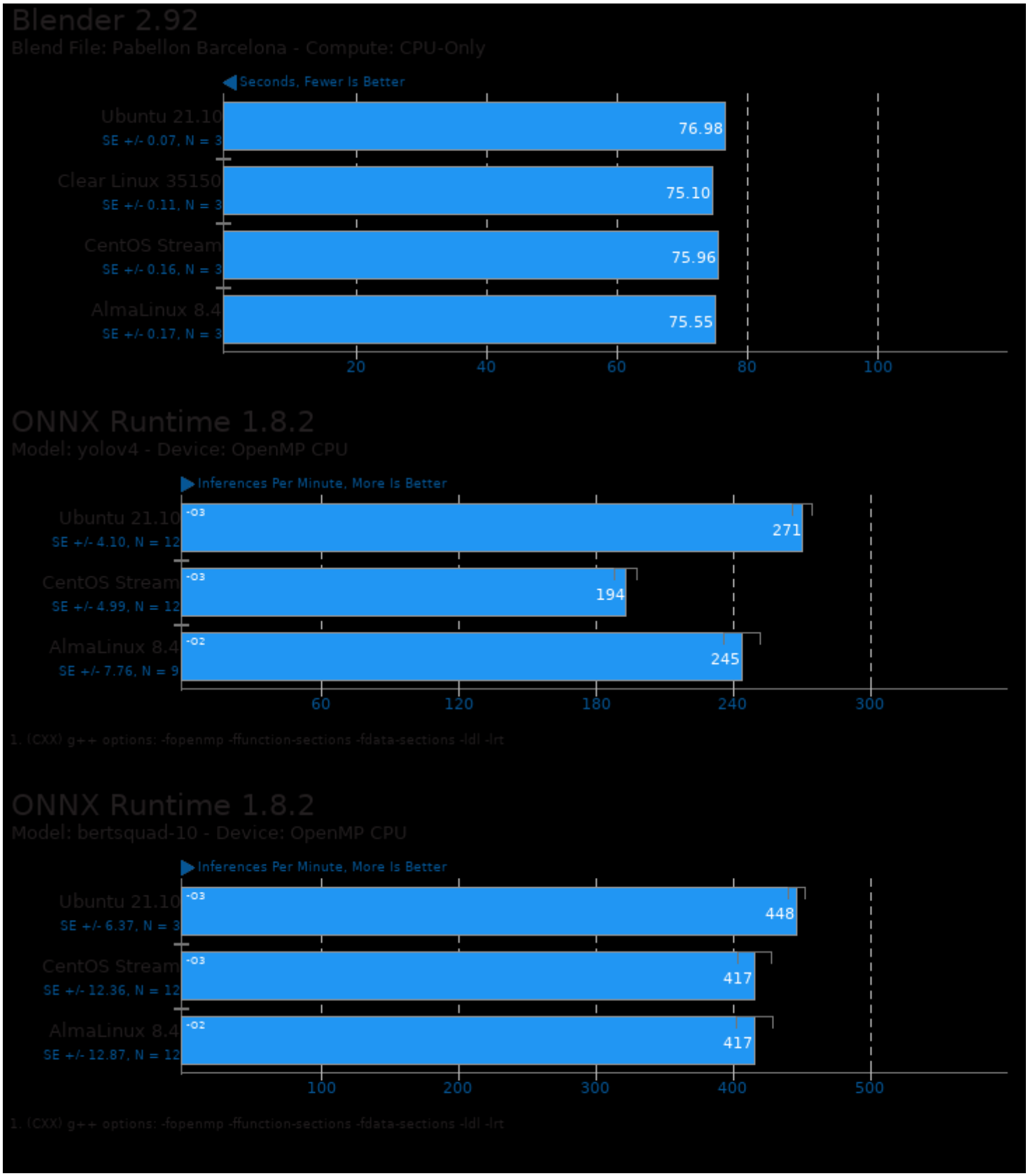
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -fvisibility=default -rdynamic -ldl

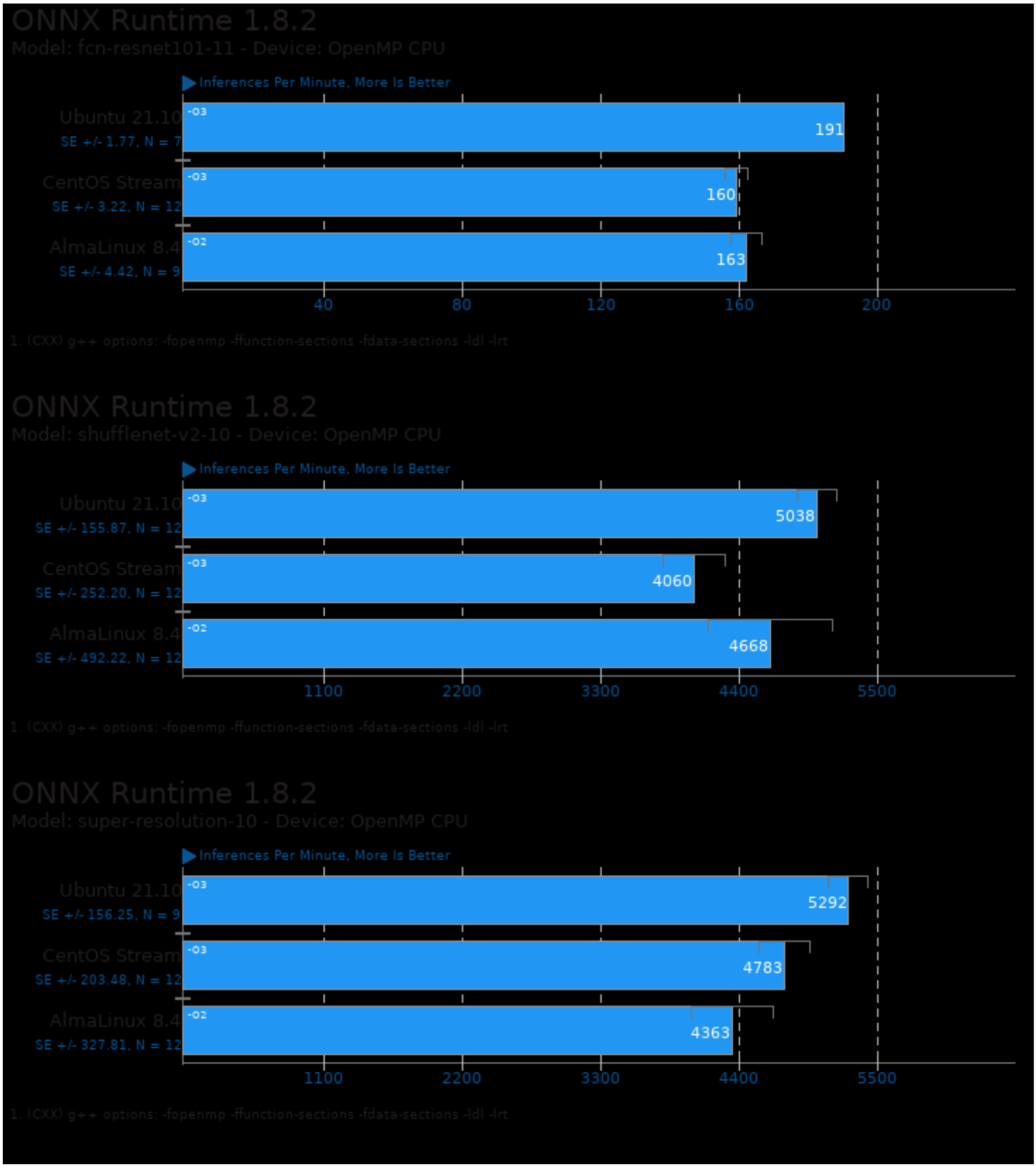
PlaidML

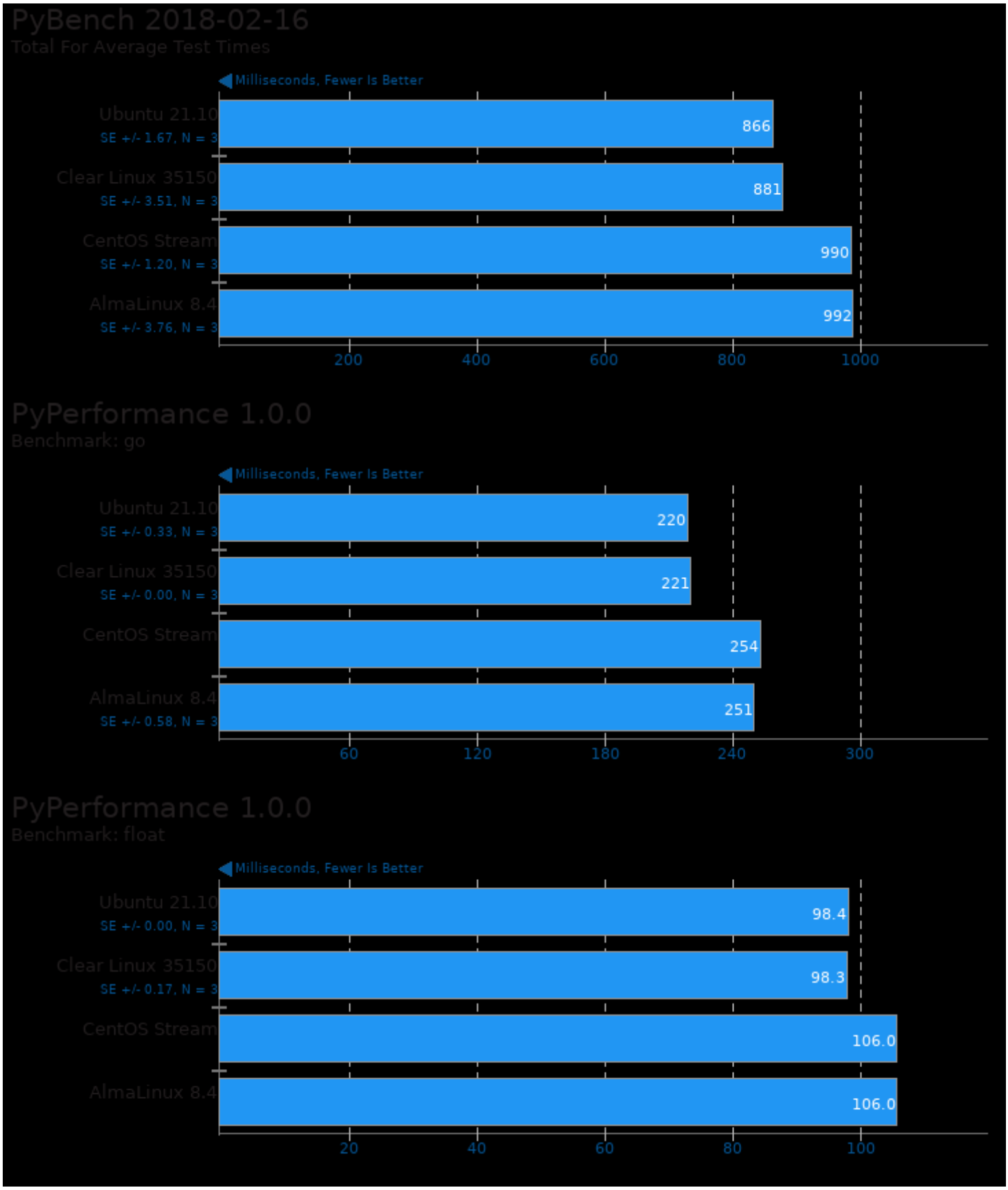
FP16: No - Mode: Inference - Network: VGG16 - Device: CPU

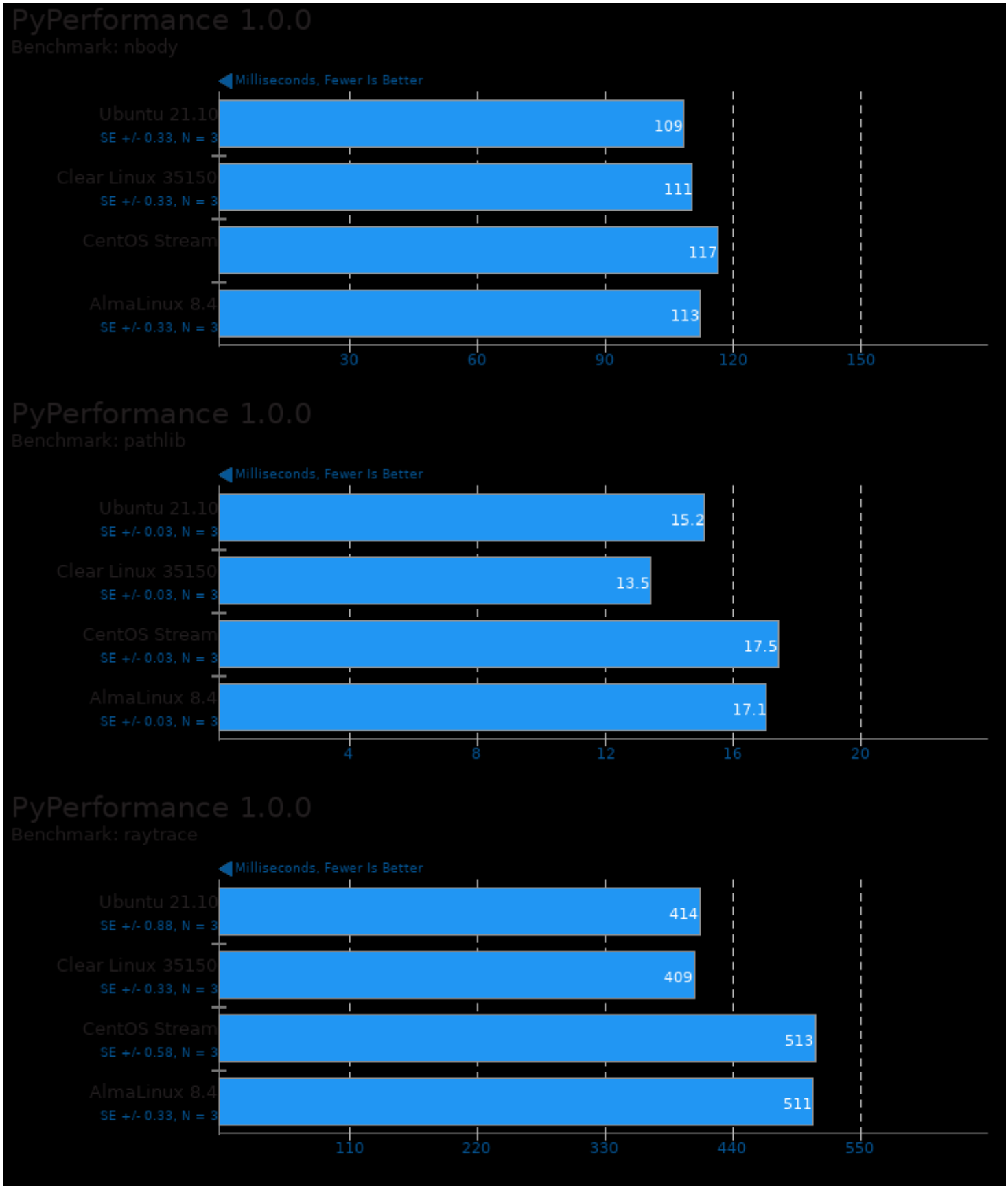


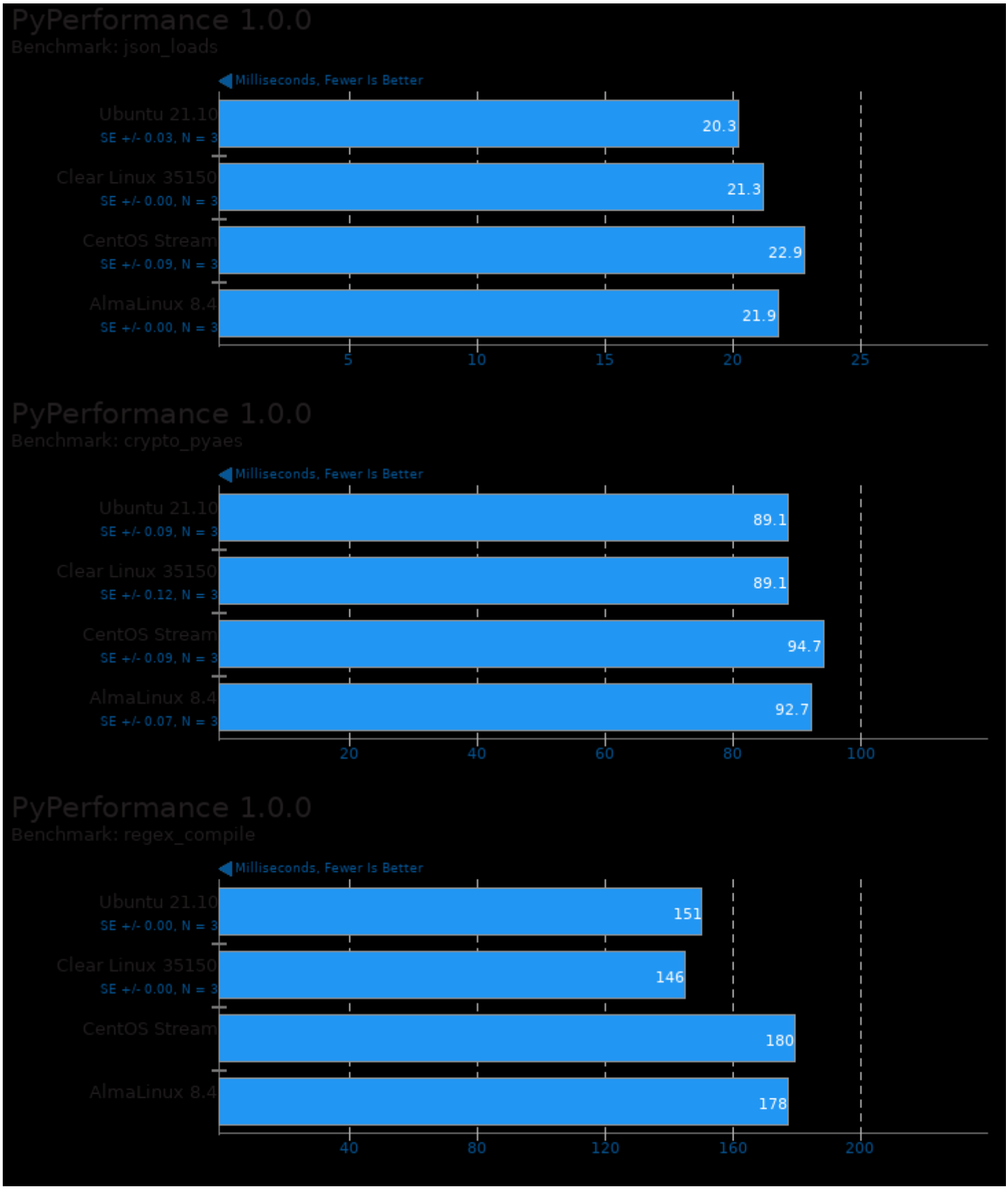

PlaidML
FP16: No - Mode: Inference - Network: VGG19 - Device: CPU
FPS, More Is Better
Ubuntu 21.10
SE +/- 0.24, N = 3
30.36
Clear Linux 35150
SE +/- 0.01, N = 3
41.42
CentOS Stream
SE +/- 0.28, N = 3
41.73
AlmaLinux 8.4
SE +/- 0.46, N = 3
40.88
10
20
30
40
50
PlaidML
FP16: No - Mode: Inference - Network: ResNet 50 - Device: CPU
FPS, More Is Better
Ubuntu 21.10
SE +/- 0.04, N = 3
8.53
Clear Linux 35150
SE +/- 0.02, N = 3
8.39
CentOS Stream
SE +/- 0.05, N = 3
8.14
AlmaLinux 8.4
SE +/- 0.01, N = 3
8.16
2
4
6
8
10
Blender 2.92
Blend File: BMW27 - Compute: CPU-Only
Seconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.08, N = 3
26.24
Clear Linux 35150
SE +/- 0.05, N = 3
25.76
CentOS Stream
SE +/- 0.20, N = 3
26.04
AlmaLinux 8.4
SE +/- 0.06, N = 3
25.90
6
12
18
24
30

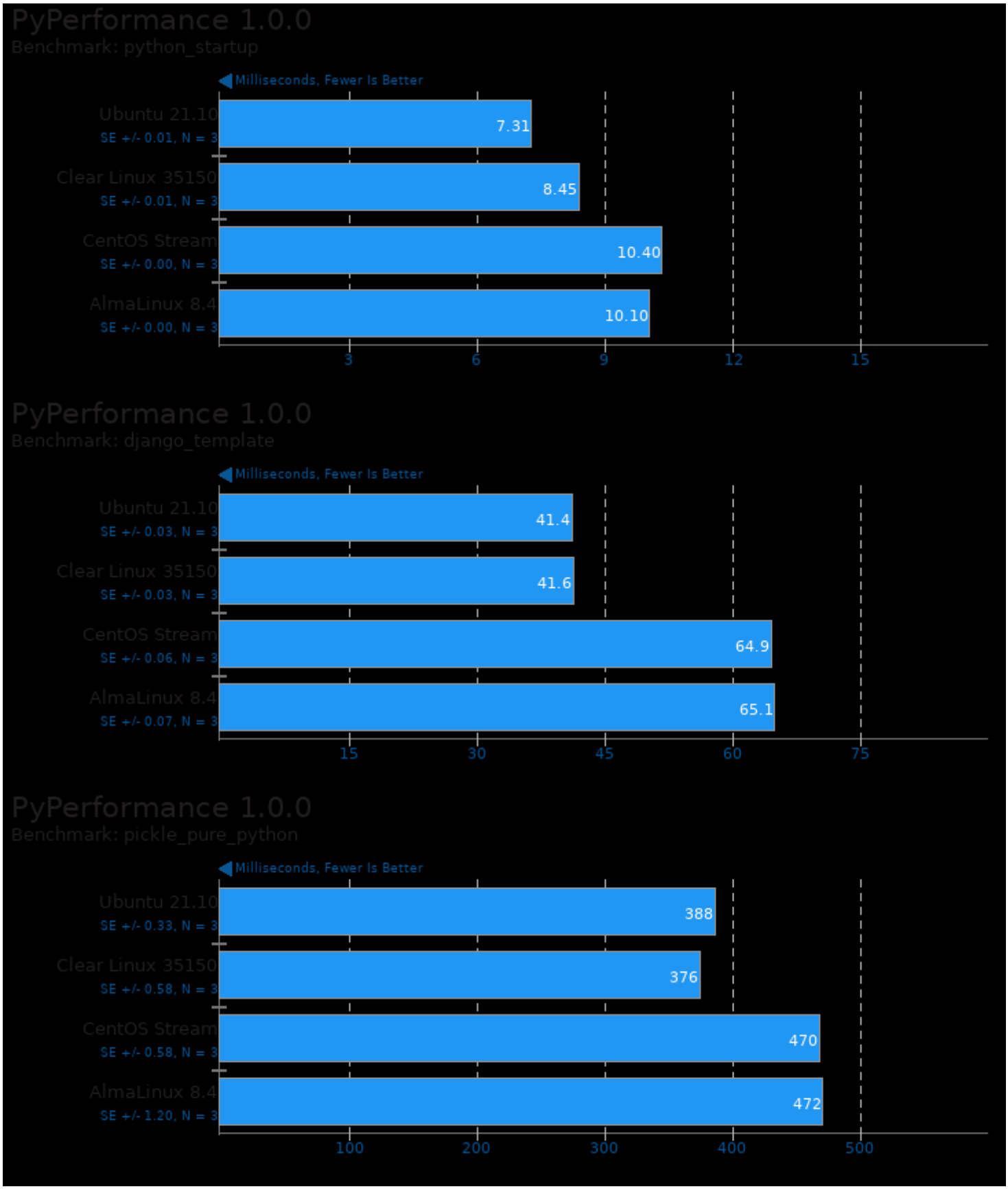

Blender 2.92
Blend File: Pabellon Barcelona - Compute: CPU-Only
Seconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.07, N = 3
76.98
Clear Linux 35150
SE +/- 0.11, N = 3
75.10
CentOS Stream
SE +/- 0.16, N = 3
75.96
AlmaLinux 8.4
SE +/- 0.17, N = 3
75.55
20
40
60
80
100
ONNX Runtime 1.8.2
Model: yolov4 - Device: OpenMP CPU
Inferences Per Minute, More Is Better
Ubuntu 21.10
SE +/- 4.10, N = 12
-O3
271
CentOS Stream
SE +/- 4.99, N = 12
-O3
194
AlmaLinux 8.4
SE +/- 7.76, N = 9
-O2
245
60
120
180
240
300
1. (CXX) g++ options: -fopenmp -ffunction-sections -fdata-sections -ldl -lrt
ONNX Runtime 1.8.2
Model: bertsquad-10 - Device: OpenMP CPU
Inferences Per Minute, More Is Better
Ubuntu 21.10
SE +/- 6.37, N = 3
-O3
448
CentOS Stream
SE +/- 12.36, N = 12
-O3
417
AlmaLinux 8.4
SE +/- 12.87, N = 12
-O2
417
100
200
300
400
500
1. (CXX) g++ options: -fopenmp -ffunction-sections -fdata-sections -ldl -lrt

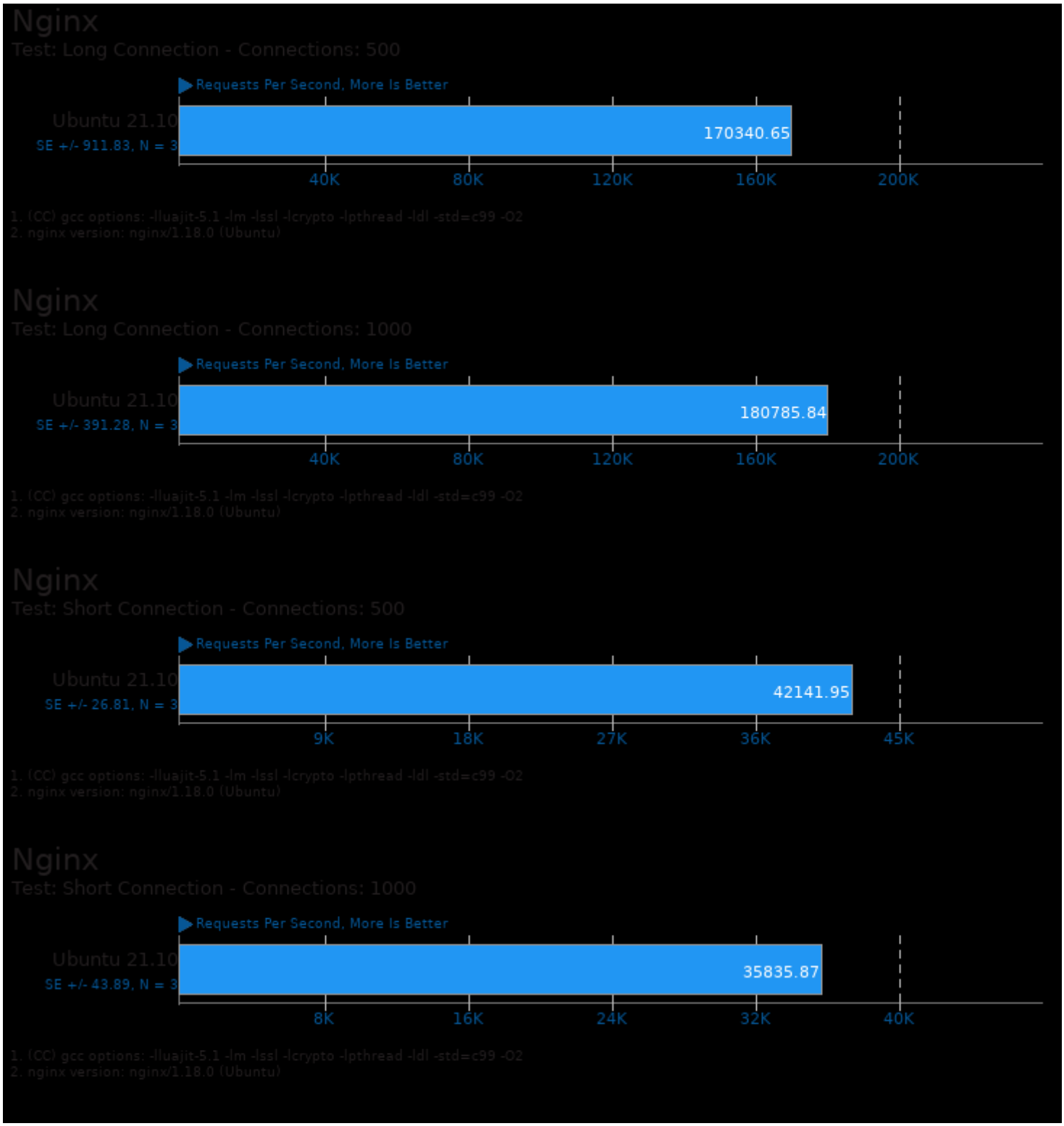

ONNX Runtime 1.8.2
Model: fcn-resnet101-11 - Device: OpenMP CPU
Inferences Per Minute, More Is Better
Ubuntu 21.10
SE +/- 1.77, N = 7
-O3
191
CentOS Stream
SE +/- 3.22, N = 12
-O3
160
AlmaLinux 8.4
SE +/- 4.42, N = 9
-O2
163
40
80
120
160
200
1. (CXX) g++ options: -fopenmp -ffunction-sections -fdata-sections -ldl -lrt
ONNX Runtime 1.8.2
Model: shufflenet-v2-10 - Device: OpenMP CPU
Inferences Per Minute, More Is Better
Ubuntu 21.10
SE +/- 155.87, N = 12
-O3
5038
CentOS Stream
SE +/- 252.20, N = 12
-O3
4060
AlmaLinux 8.4
SE +/- 492.22, N = 12
-O2
4668
1100
2200
3300
4400
5500
1. (CXX) g++ options: -fopenmp -ffunction-sections -fdata-sections -ldl -lrt
ONNX Runtime 1.8.2
Model: super-resolution-10 - Device: OpenMP CPU
Inferences Per Minute, More Is Better
Ubuntu 21.10
SE +/- 156.25, N = 9
-O3
5292
CentOS Stream
SE +/- 203.48, N = 12
-O3
4783
AlmaLinux 8.4
SE +/- 327.81, N = 12
-O2
4363
1100
2200
3300
4400
5500
1. (CXX) g++ options: -fopenmp -ffunction-sections -fdata-sections -ldl -lrt

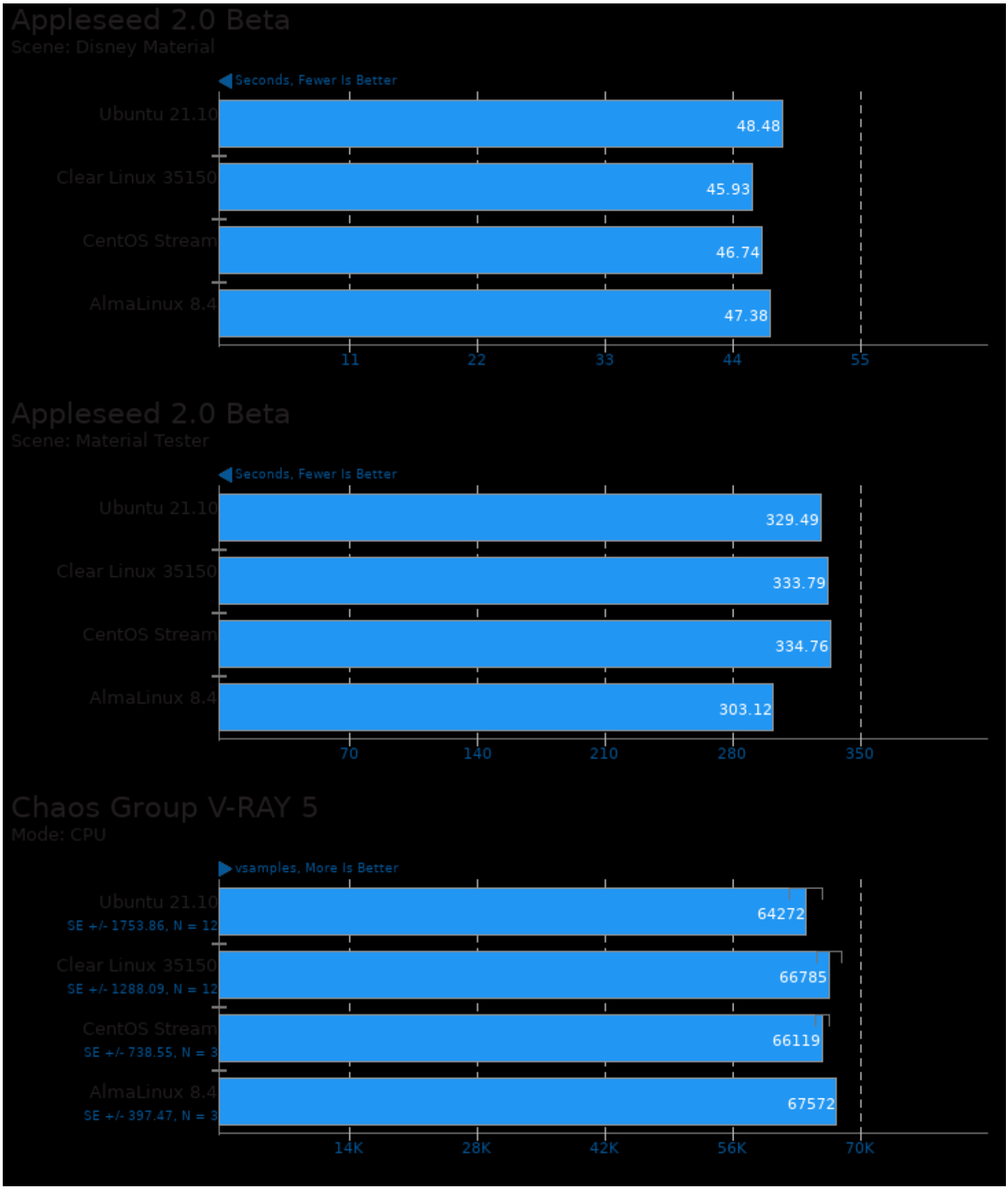

PyBench 2018-02-16
Total For Average Test Times
Milliseconds, Fewer Is Better
Ubuntu 21.10
SE +/- 1.67, N = 3
866
Clear Linux 35150
SE +/- 3.51, N = 3
881
CentOS Stream
SE +/- 1.20, N = 3
990
AlmaLinux 8.4
SE +/- 3.76, N = 3
992
200
400
600
800
1000
PyPerformance 1.0.0
Benchmark: go
Milliseconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.33, N = 3
220
Clear Linux 35150
SE +/- 0.00, N = 3
221
CentOS Stream
254
AlmaLinux 8.4
SE +/- 0.58, N = 3
251
60
120
180
240
300
PyPerformance 1.0.0
Benchmark: float
Milliseconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.00, N = 3
98.4
Clear Linux 35150
SE +/- 0.17, N = 3
98.3
CentOS Stream
106.0
AlmaLinux 8.4
106.0
20
40
60
80
100

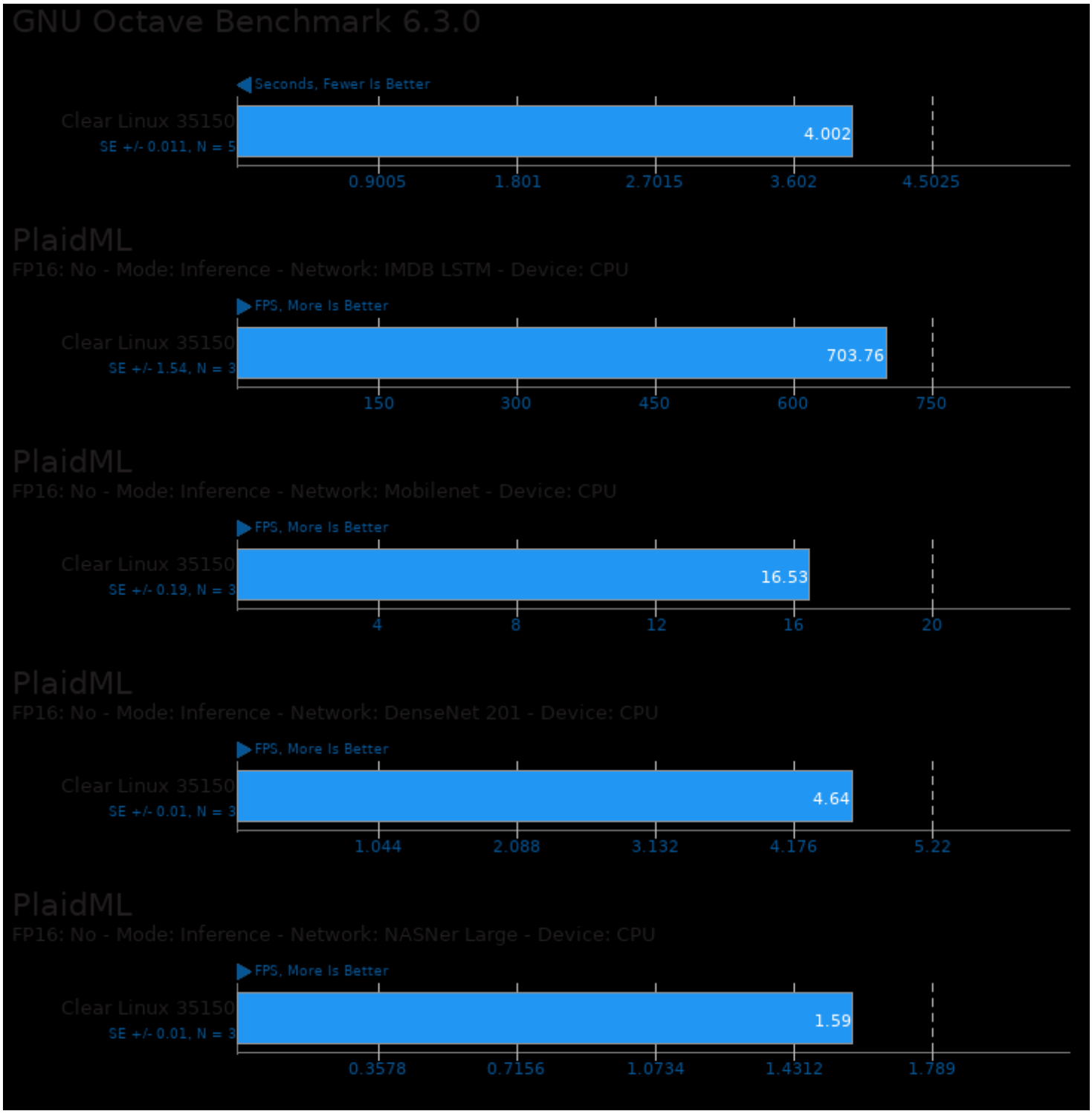

PyPerformance 1.0.0
Benchmark: nbody
Milliseconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.33, N = 3
109
Clear Linux 35150
SE +/- 0.33, N = 3
111
CentOS Stream
117
AlmaLinux 8.4
SE +/- 0.33, N = 3
113
30
60
90
120
150
PyPerformance 1.0.0
Benchmark: pathlib
Milliseconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.03, N = 3
15.2
Clear Linux 35150
SE +/- 0.03, N = 3
13.5
CentOS Stream
SE +/- 0.03, N = 3
17.5
AlmaLinux 8.4
SE +/- 0.03, N = 3
17.1
4
8
12
16
20
PyPerformance 1.0.0
Benchmark: raytrace
Milliseconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.88, N = 3
414
Clear Linux 35150
SE +/- 0.33, N = 3
409
CentOS Stream
SE +/- 0.58, N = 3
513
AlmaLinux 8.4
SE +/- 0.33, N = 3
511
110
220
330
440
550

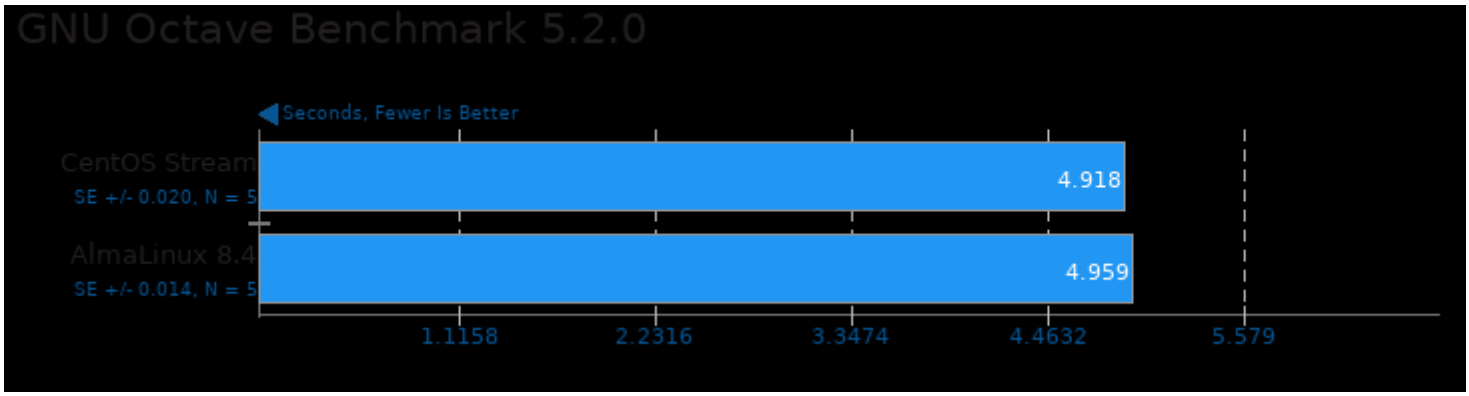

PyPerformance 1.0.0
Benchmark: json_loads
Milliseconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.03, N = 3
20.3
Clear Linux 35150
SE +/- 0.00, N = 3
21.3
CentOS Stream
SE +/- 0.09, N = 3
22.9
AlmaLinux 8.4
SE +/- 0.00, N = 3
21.9
5
10
15
20
25
PyPerformance 1.0.0
Benchmark: crypto_pyaes
Milliseconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.09, N = 3
89.1
Clear Linux 35150
SE +/- 0.12, N = 3
89.1
CentOS Stream
SE +/- 0.09, N = 3
94.7
AlmaLinux 8.4
SE +/- 0.07, N = 3
92.7
20
40
60
80
100
PyPerformance 1.0.0
Benchmark: regex_compile
Milliseconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.00, N = 3
151
Clear Linux 35150
SE +/- 0.00, N = 3
146
CentOS Stream
180
AlmaLinux 8.4
178
40
80
120
160
200


PyPerformance 1.0.0
Benchmark: python_startup
Milliseconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.01, N = 3
7.31
Clear Linux 35150
SE +/- 0.01, N = 3
8.45
CentOS Stream
SE +/- 0.00, N = 3
10.40
AlmaLinux 8.4
SE +/- 0.00, N = 3
10.10
3
6
9
12
15
PyPerformance 1.0.0
Benchmark: django_template
Milliseconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.03, N = 3
41.4
Clear Linux 35150
SE +/- 0.03, N = 3
41.6
CentOS Stream
SE +/- 0.06, N = 3
64.9
AlmaLinux 8.4
SE +/- 0.07, N = 3
65.1
15
30
45
60
75
PyPerformance 1.0.0
Benchmark: pickle_pure_python
Milliseconds, Fewer Is Better
Ubuntu 21.10
SE +/- 0.33, N = 3
388
Clear Linux 35150
SE +/- 0.58, N = 3
376
CentOS Stream
SE +/- 0.58, N = 3
470
AlmaLinux 8.4
SE +/- 1.20, N = 3
472
100
200
300
400
500

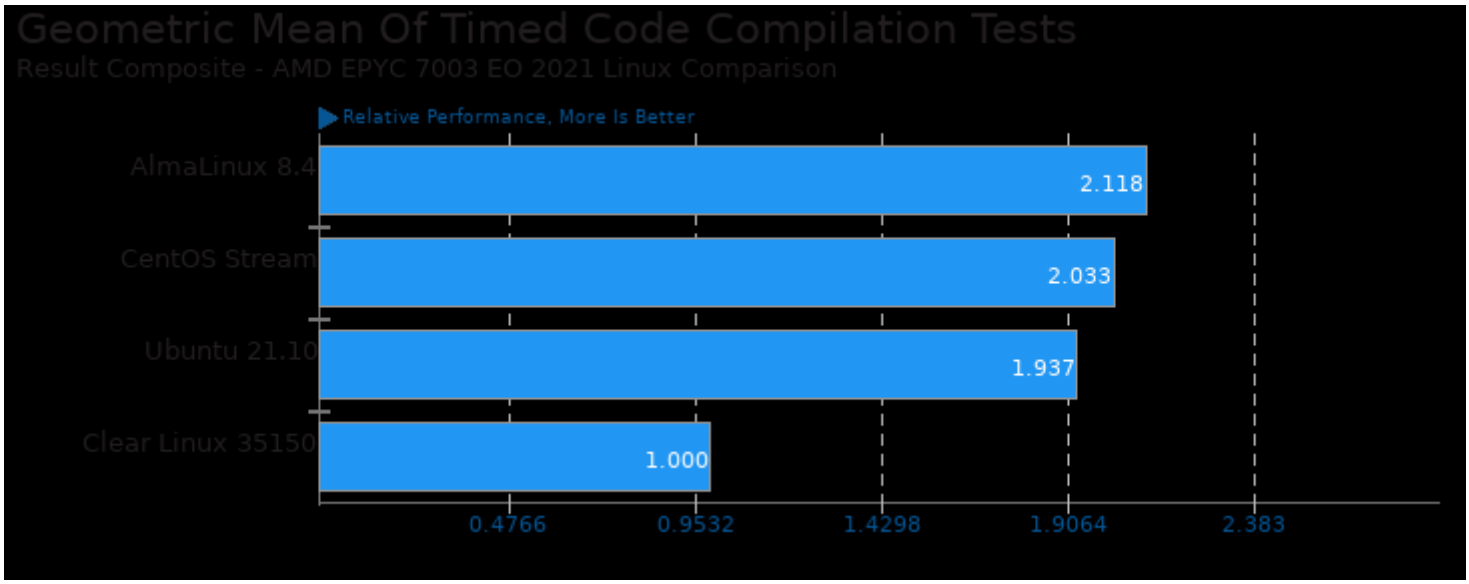

Nginx
Test: Long Connection - Connections: 500
Requests Per Second, More Is Better
Ubuntu 21.10
SE +/- 911.83, N = 3
170340.65
40K
80K
120K
160K
200K
1. (CC) gcc options: -lluajit-5.1 -lm -lssl -lcrypto -lpthread -ldl -std=c99 -O2
2. nginx version: nginx/1.18.0 (Ubuntu)
Nginx
Test: Long Connection - Connections: 1000
Requests Per Second, More Is Better
Ubuntu 21.10
SE +/- 391.28, N = 3
180785.84
40K
80K
120K
160K
200K
1. (CC) gcc options: -lluajit-5.1 -lm -lssl -lcrypto -lpthread -ldl -std=c99 -O2
2. nginx version: nginx/1.18.0 (Ubuntu)
Nginx
Test: Short Connection - Connections: 500
Requests Per Second, More Is Better
Ubuntu 21.10
SE +/- 26.81, N = 3
42141.95
9K
18K
27K
36K
45K
1. (CC) gcc options: -lluajit-5.1 -lm -lssl -lcrypto -lpthread -ldl -std=c99 -O2
2. nginx version: nginx/1.18.0 (Ubuntu)
Nginx
Test: Short Connection - Connections: 1000
Requests Per Second, More Is Better
Ubuntu 21.10
SE +/- 43.89, N = 3
35835.87
8K
16K
24K
32K
40K
1. (CC) gcc options: -lluajit-5.1 -lm -lssl -lcrypto -lpthread -ldl -std=c99 -O2
2. nginx version: nginx/1.18.0 (Ubuntu)


Appleseed 2.0 Beta
Scene: Disney Material
Seconds, Fewer Is Better
Ubuntu 21.10
48.48
Clear Linux 35150
45.93
CentOS Stream
46.74
AlmaLinux 8.4
47.38
11
22
33
44
55
Appleseed 2.0 Beta
Scene: Material Tester
Seconds, Fewer Is Better
Ubuntu 21.10
329.49
Clear Linux 35150
333.79
CentOS Stream
334.76
AlmaLinux 8.4
303.12
70
140
210
280
350
Chaos Group V-RAY 5
Mode: CPU
vsamples, More Is Better
Ubuntu 21.10
SE +/- 1753.86, N = 12
64272
Clear Linux 35150
SE +/- 1288.09, N = 12
66785
CentOS Stream
SE +/- 738.55, N = 3
66119
AlmaLinux 8.4
SE +/- 397.47, N = 3
67572
14K
28K
42K
56K
70K

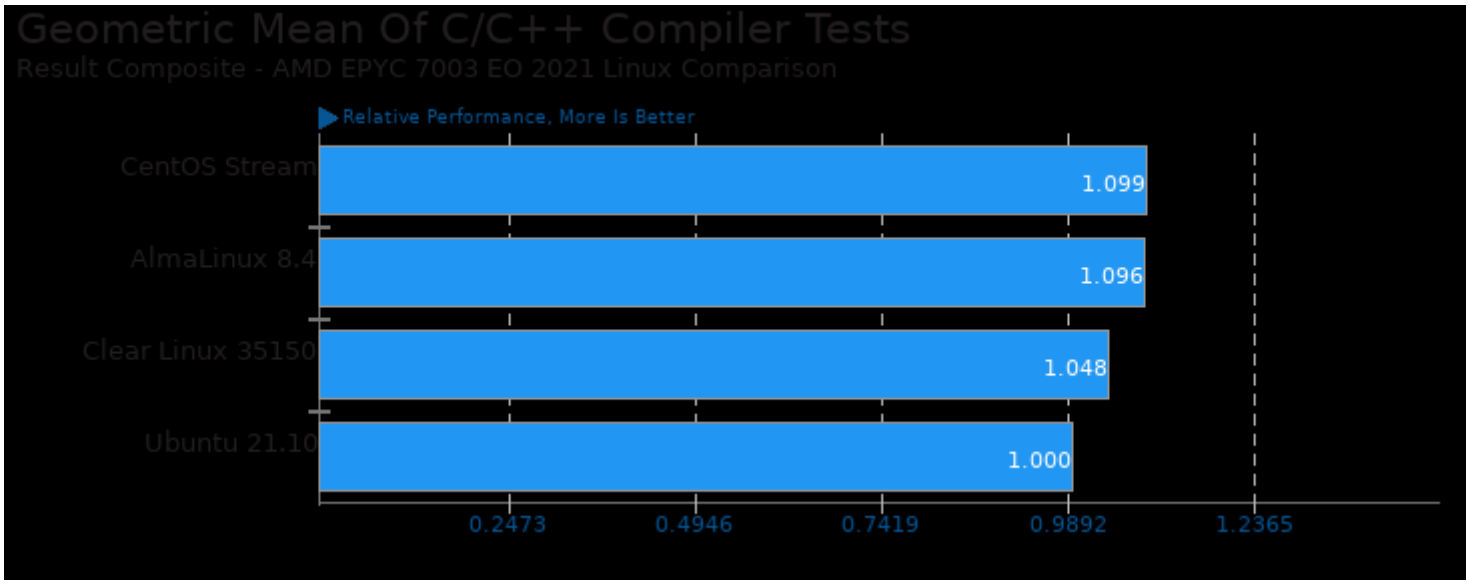

GNU Octave Benchmark 6.3.0
Seconds, Fewer Is Better
Clear Linux 35150
SE +/- 0.011, N = 5
4.002
0.9005
1.801
2.7015
3.602
4.5025
PlaidML
FP16: No - Mode: Inference - Network: IMDB LSTM - Device: CPU
FPS, More Is Better
Clear Linux 35150
SE +/- 1.54, N = 3
703.76
150
300
450
600
750
PlaidML
FP16: No - Mode: Inference - Network: Mobilenet - Device: CPU
FPS, More Is Better
Clear Linux 35150
SE +/- 0.19, N = 3
16.53
4
8
12
16
20
PlaidML
FP16: No - Mode: Inference - Network: DenseNet 201 - Device: CPU
FPS, More Is Better
Clear Linux 35150
SE +/- 0.01, N = 3
4.64
1.044
2.088
3.132
4.176
5.22
PlaidML
FP16: No - Mode: Inference - Network: NASNet Large - Device: CPU
FPS, More Is Better
Clear Linux 35150
SE +/- 0.01, N = 3
1.59
0.3578
0.7156
1.0734
1.4312
1.789


GNU Octave Benchmark 5.2.0
Seconds, Fewer Is Better
CentOS Stream
SE +/- 0.020, N = 5
4.918
AlmaLinux 8.4
SE +/- 0.014, N = 5
4.959
1.1158
2.2316
3.3474
4.4632
5.579

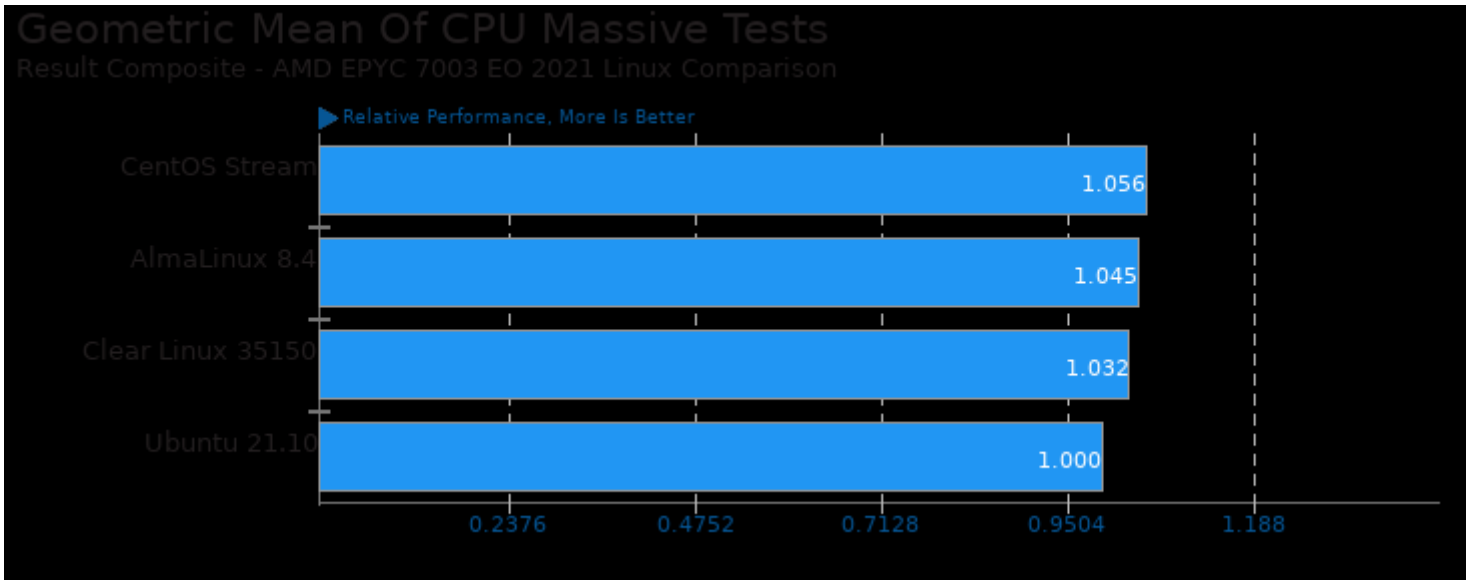
These geometric means are based upon test groupings / test suites for this result file.



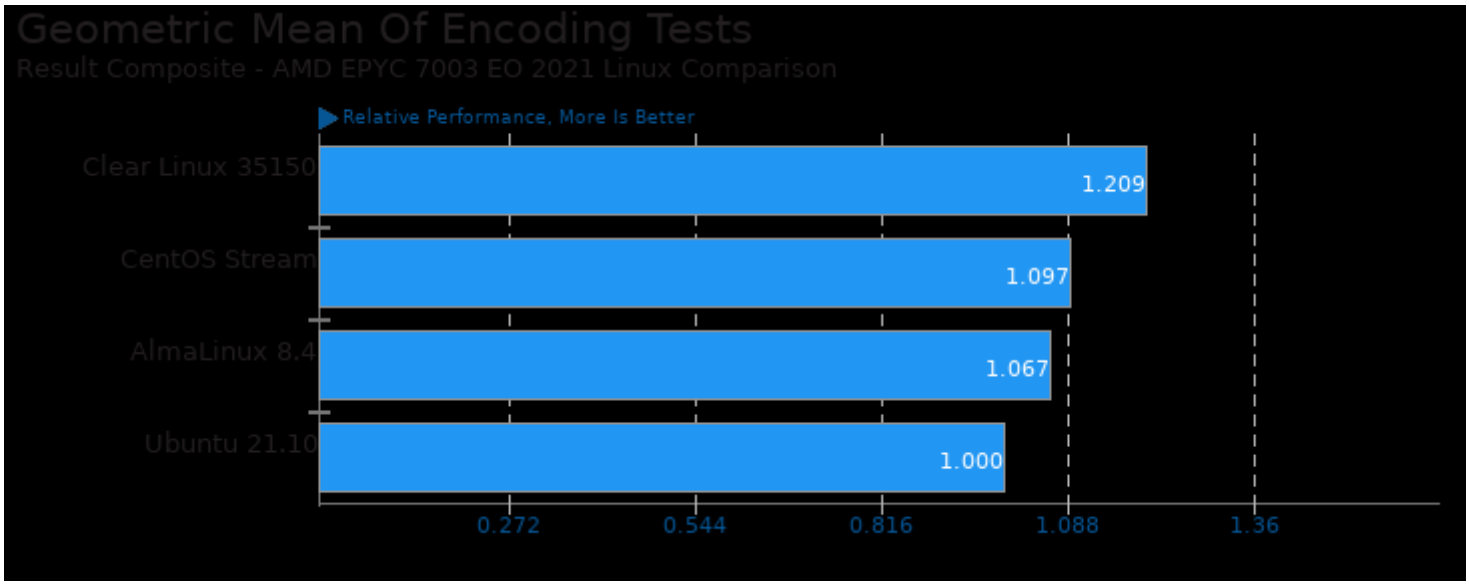
Geometric mean based upon tests: pts/build-linux-kernel, pts/build-llvm, pts/build-godot, pts/build-wasmer and pts/build-nodejs



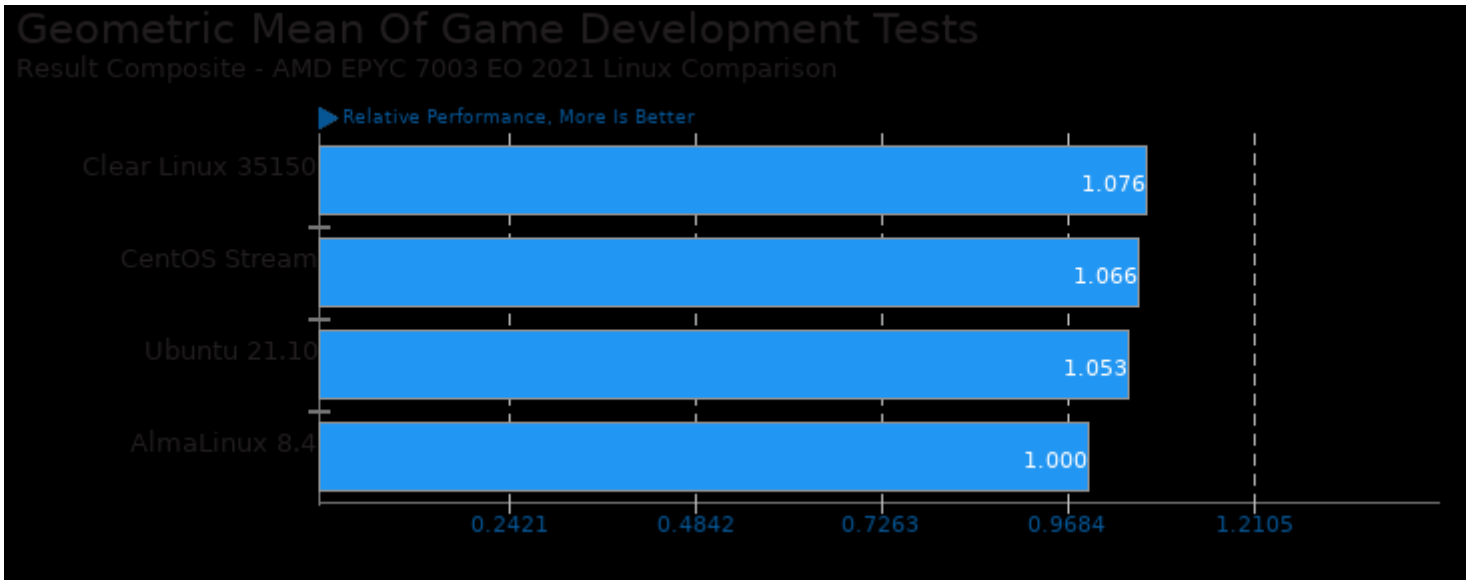
Geometric mean based upon tests: pts/vpxenc, pts/build-llvm, pts/pgbench, pts/x265, pts/kvazaar, pts/openssl, pts/aom-av1, pts/svt-av1, pts/svt-vp9 and pts/gromacs



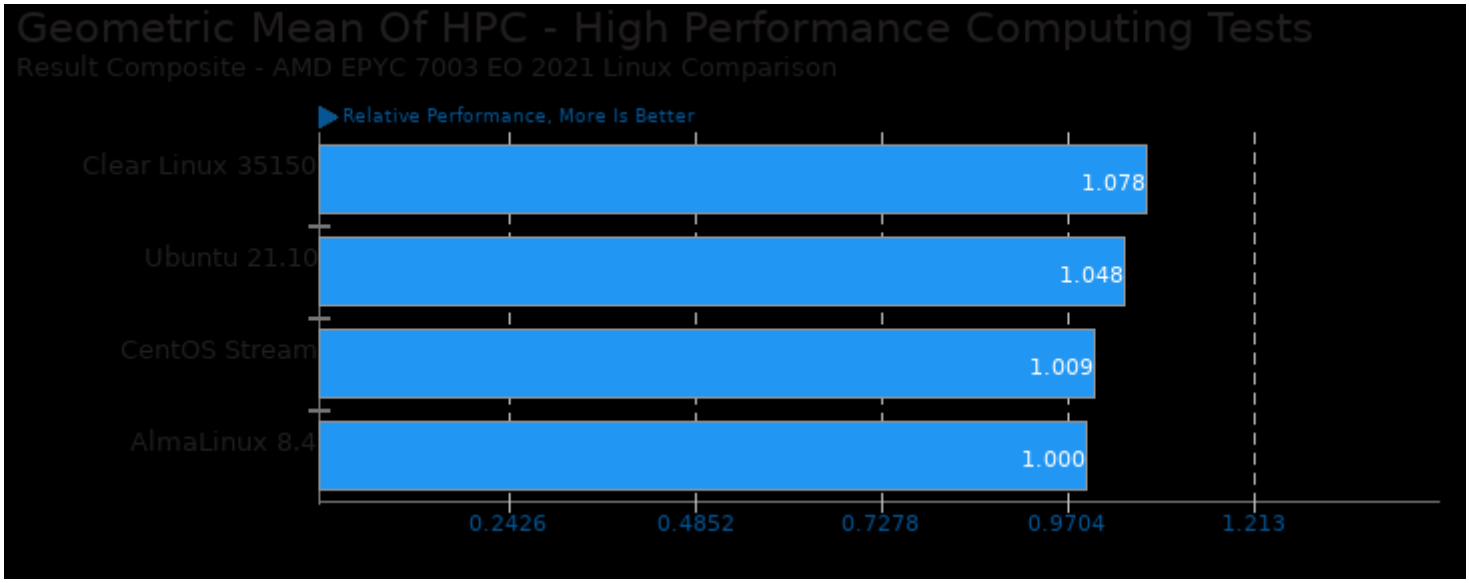
Geometric mean based upon tests: pts/build-llvm, pts/build-linux-kernel, pts/svt-av1, pts/svt-hevc, pts/svt-vp9, pts/vpxenc, pts/x265, pts/hpcg, pts/openssl, pts/namd, pts/numpy, pts/pgbench, pts/plaidml, pts/povray, pts/v-ray, pts/blender and system/octave-benchmark



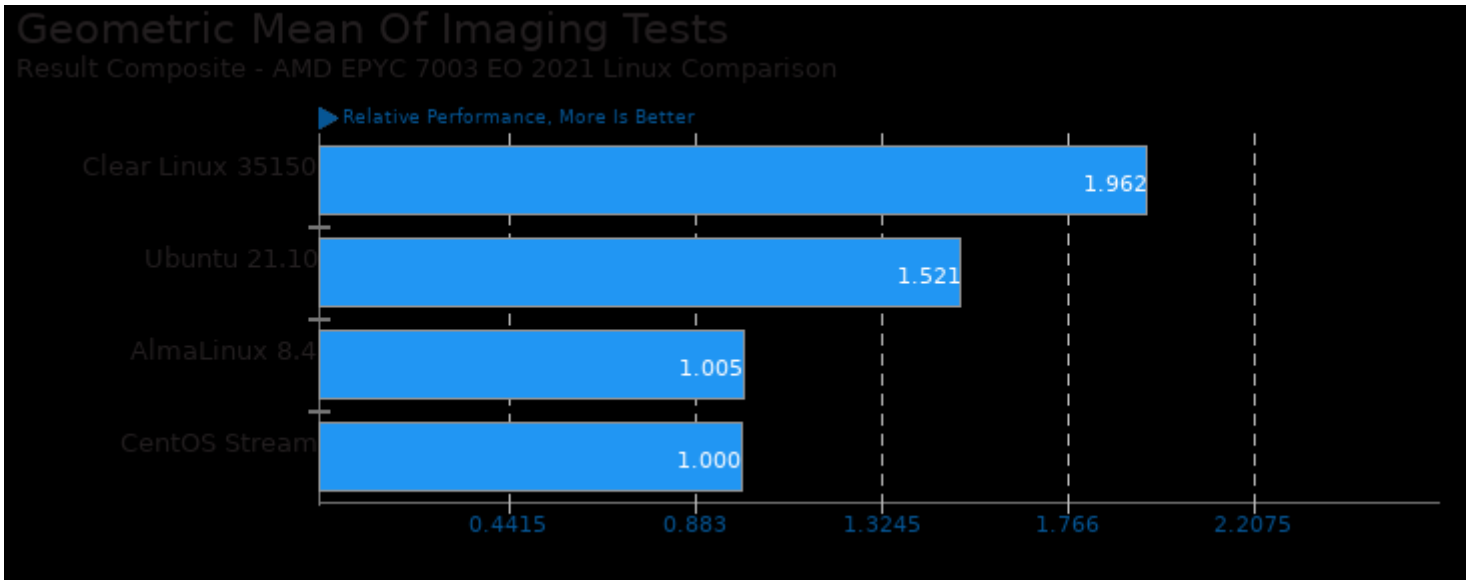
Geometric mean based upon tests: pts/svt-vp9, pts/svt-hevc, pts/x265, pts/kvazaar, pts/vpxenc, pts/aom-av1 and pts/svt-av1



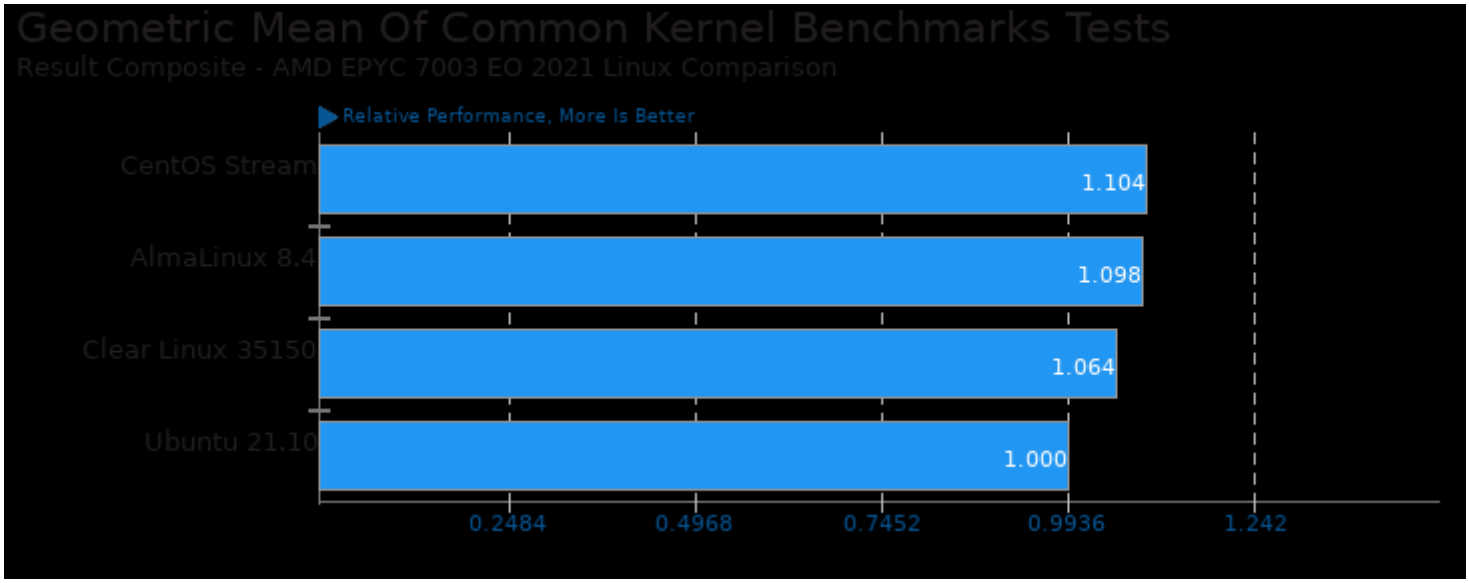
Geometric mean based upon tests: pts/astcenc, pts/build-godot, pts/blender and pts/oidn



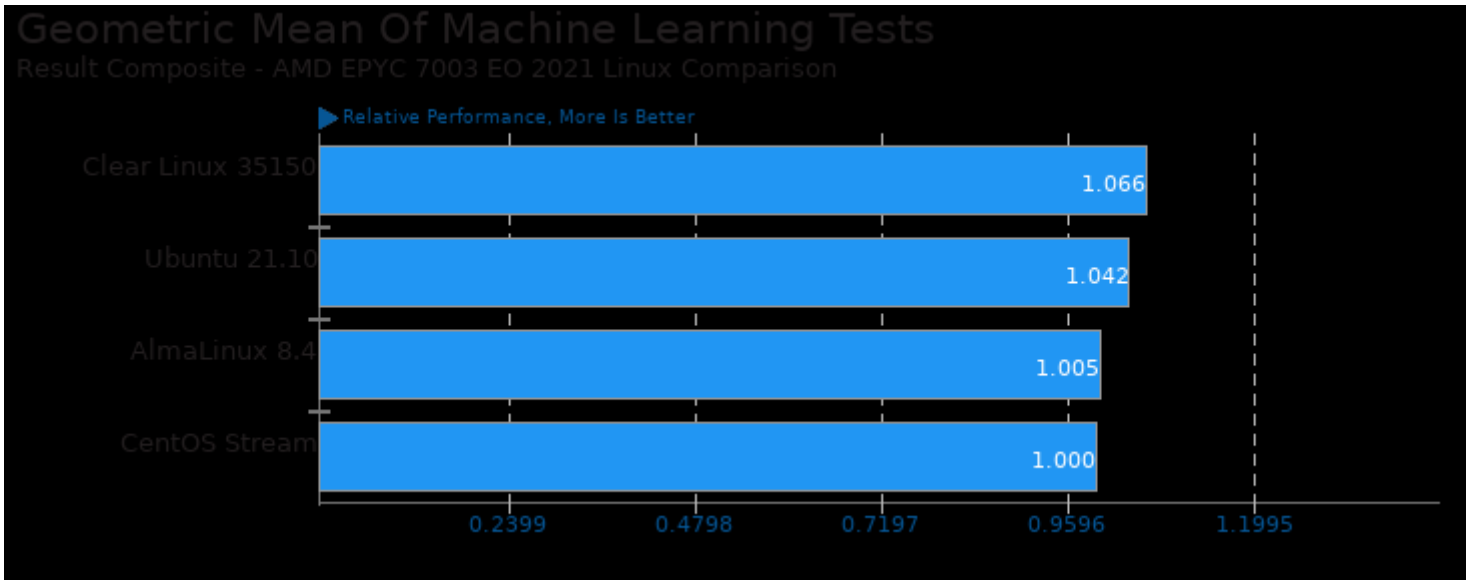
Geometric mean based upon tests: pts/hpcg, pts/qe, system/octave-benchmark, pts/mt-dgemm, pts/namd, pts/gromacs, pts/nwchem, pts/ncnn, pts/tnn, pts/numpy, pts/onnx and pts/plaidml



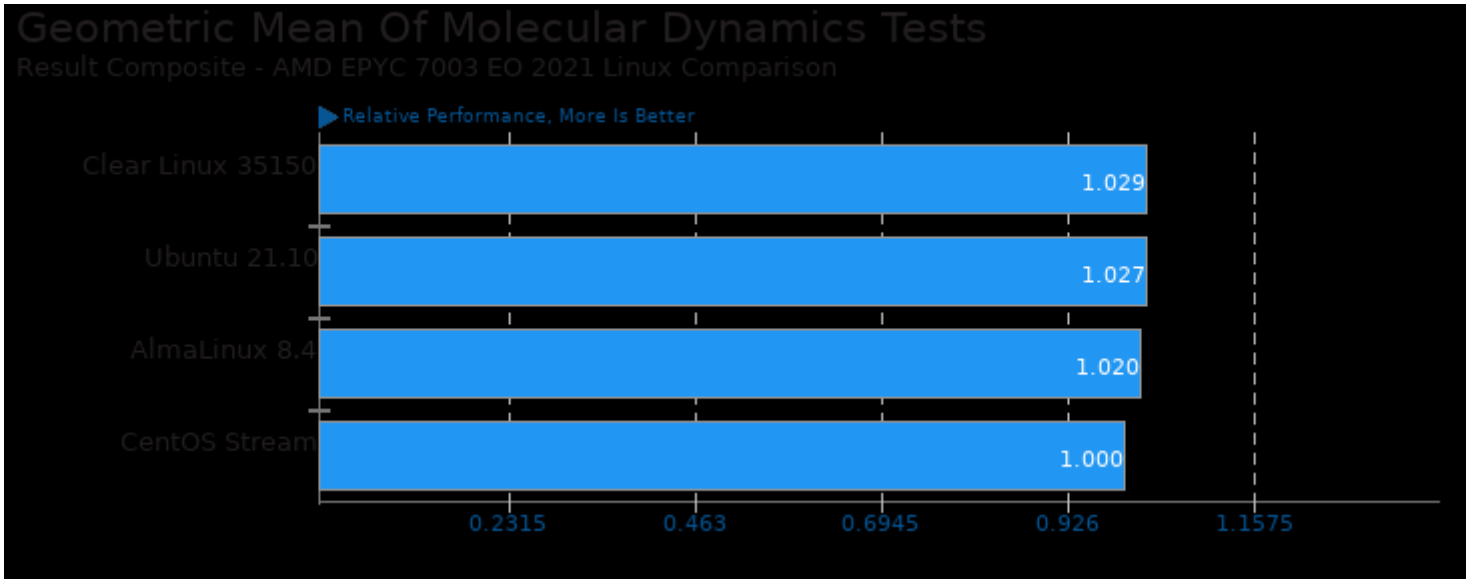
Geometric mean based upon tests: system/inkscape, system/rawtherapee, system/hugin and system/gegl



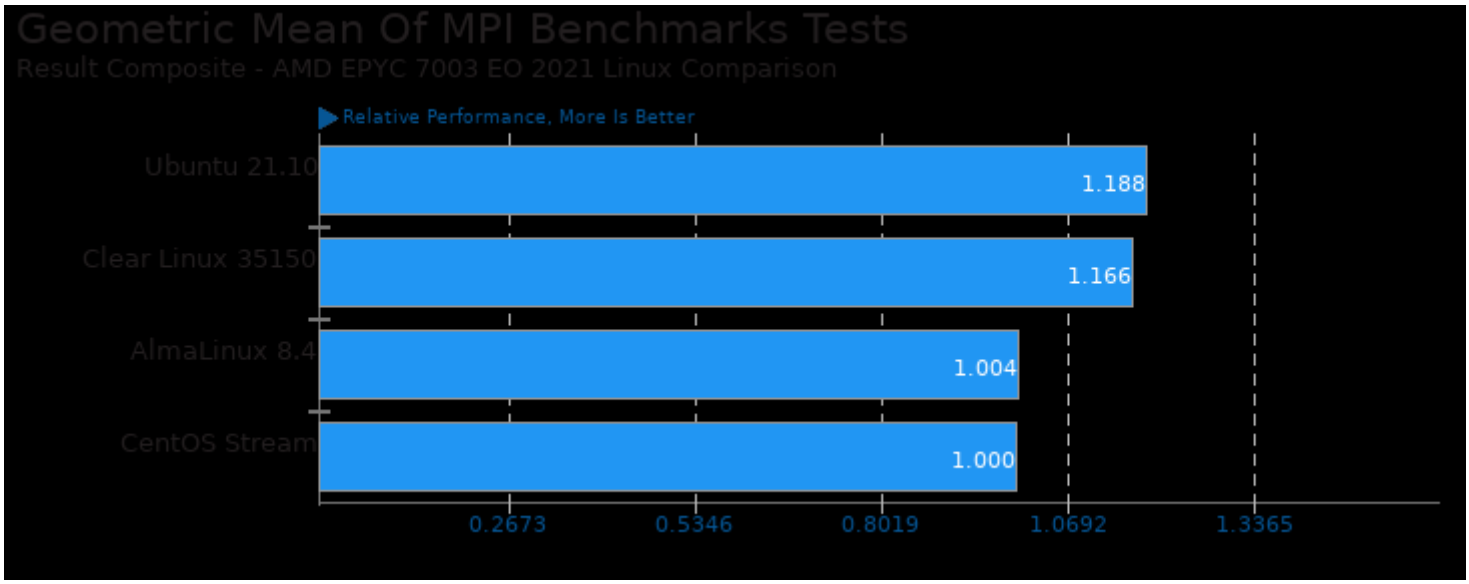
Geometric mean based upon tests: system/wireguard, pts/pgbench and pts/openssl



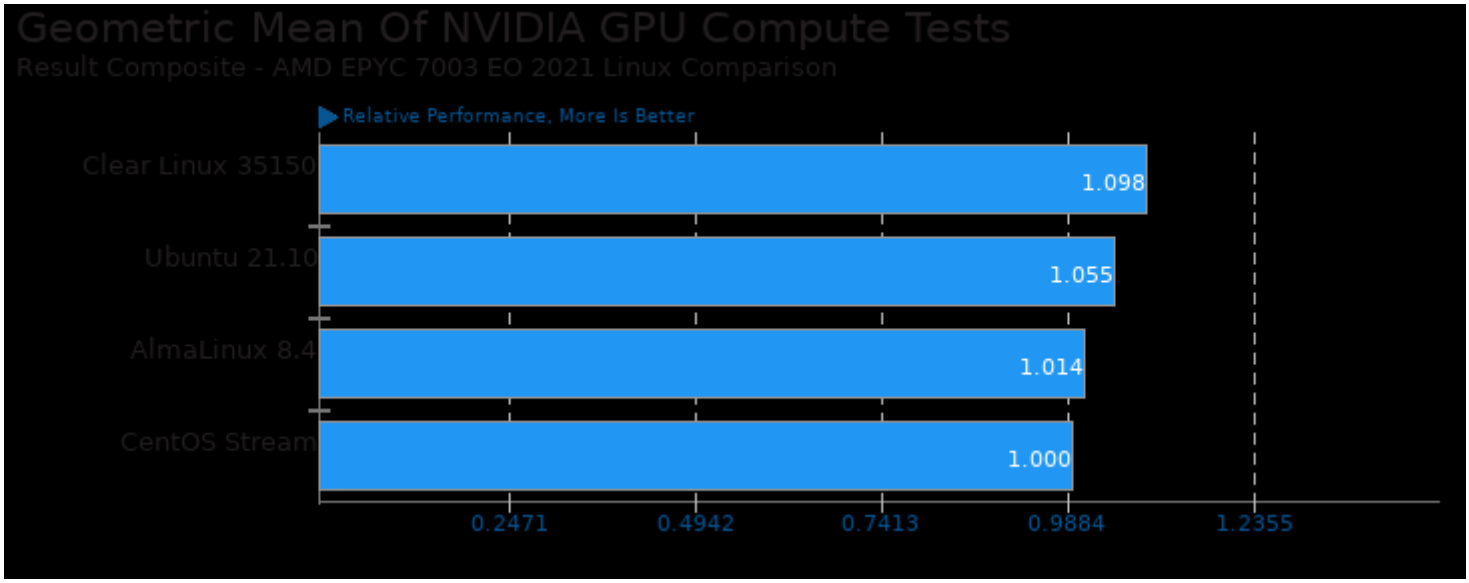
Geometric mean based upon tests: pts/ncnn, pts/tnn, pts/numpy, pts/onnx and pts/plaidml



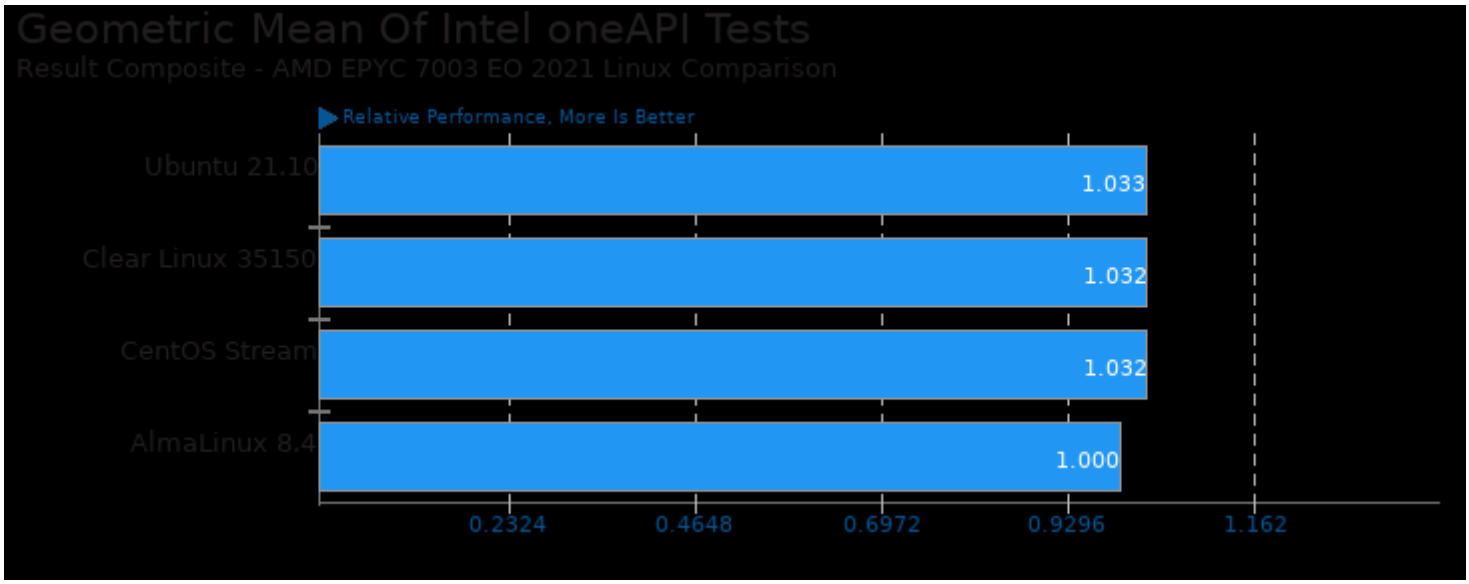
Geometric mean based upon tests: pts/namd, pts/gromacs and pts/nwchem



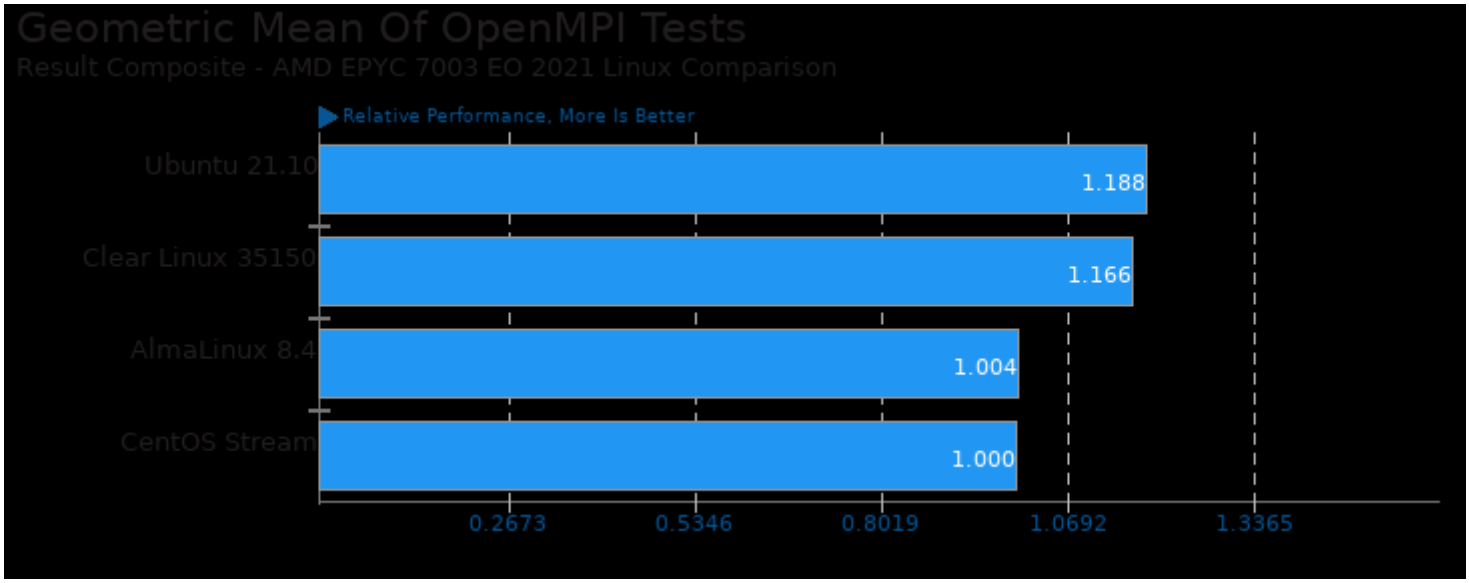
Geometric mean based upon tests: pts/gromacs and pts/hpcg



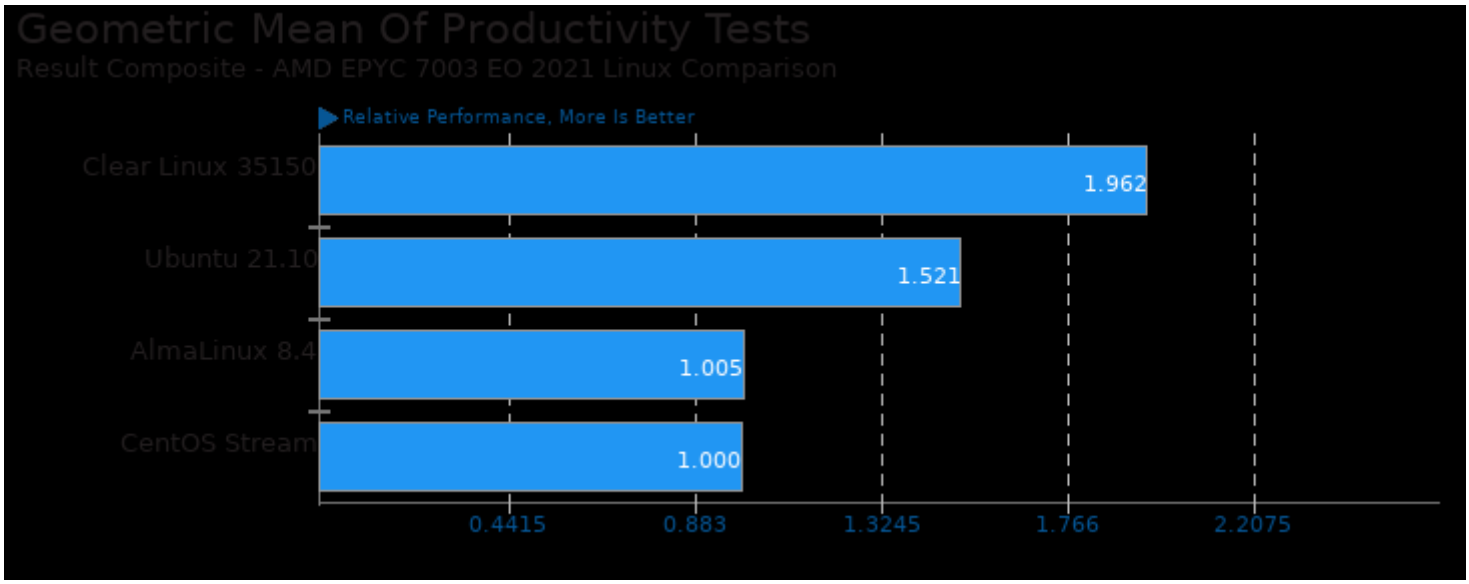
Geometric mean based upon tests: pts/gromacs, pts/plaidml, pts/v-ray, pts/blender and pts/ncnn



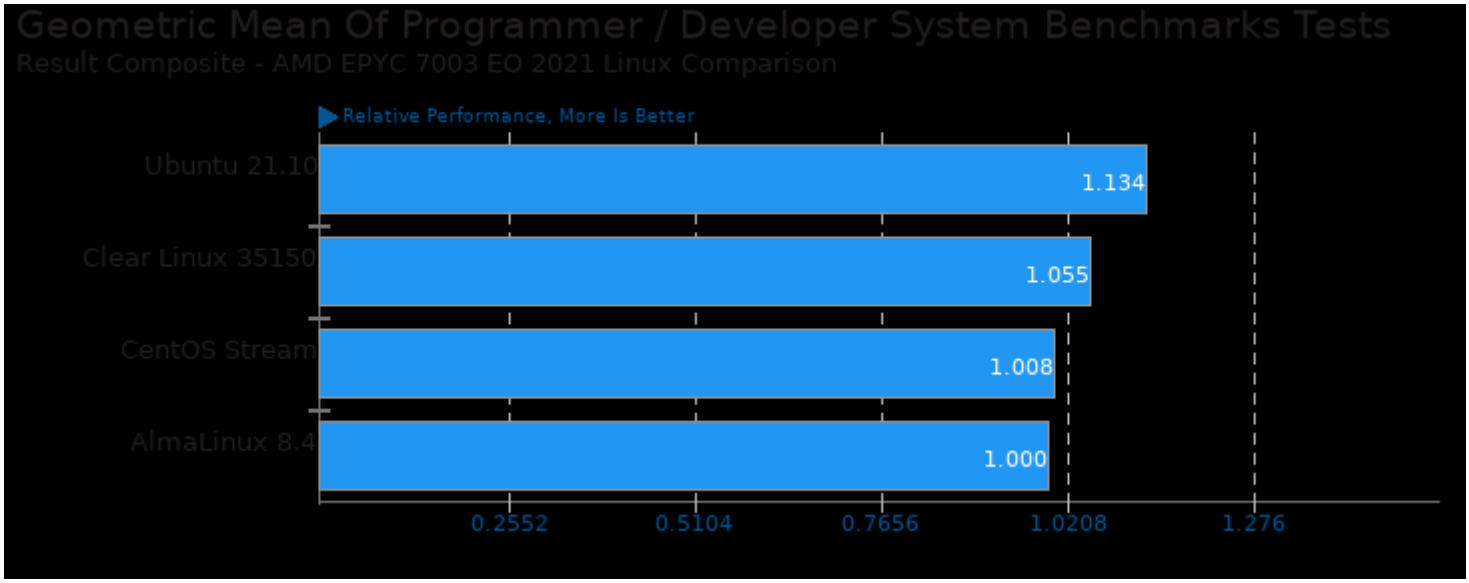
Geometric mean based upon tests: pts/embree, pts/oidn and pts/ospray



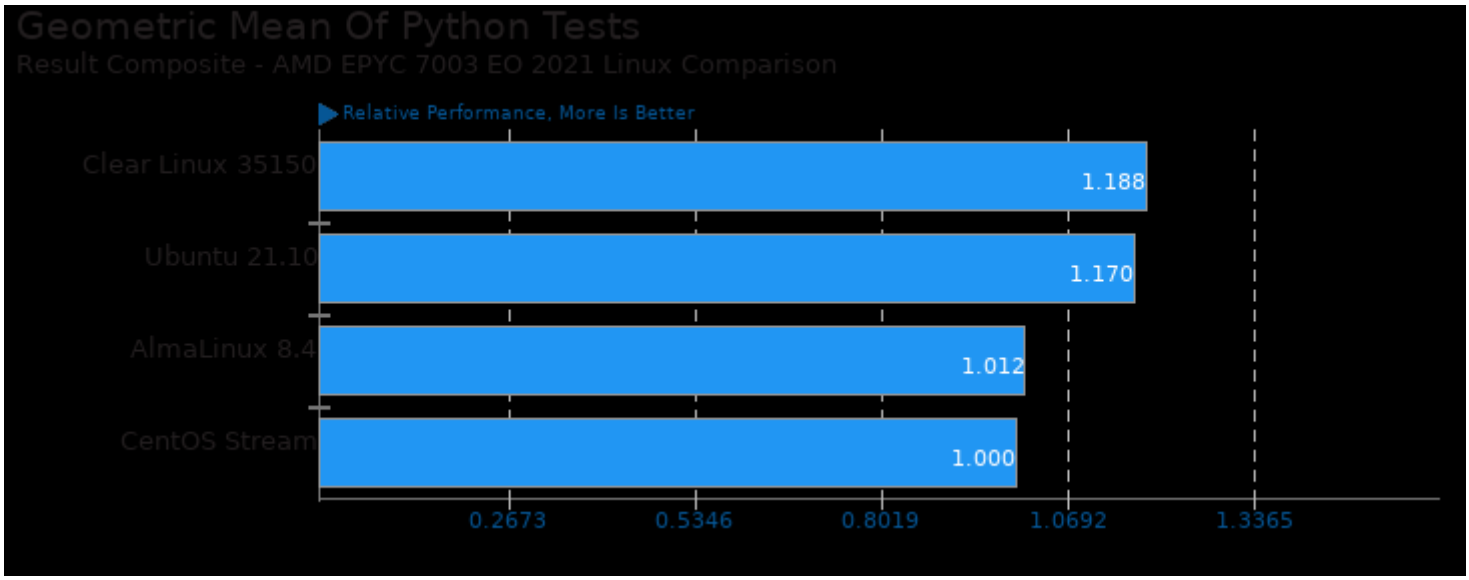
Geometric mean based upon tests: pts/hpcg, pts/nwchem, pts/qe and pts/gromacs



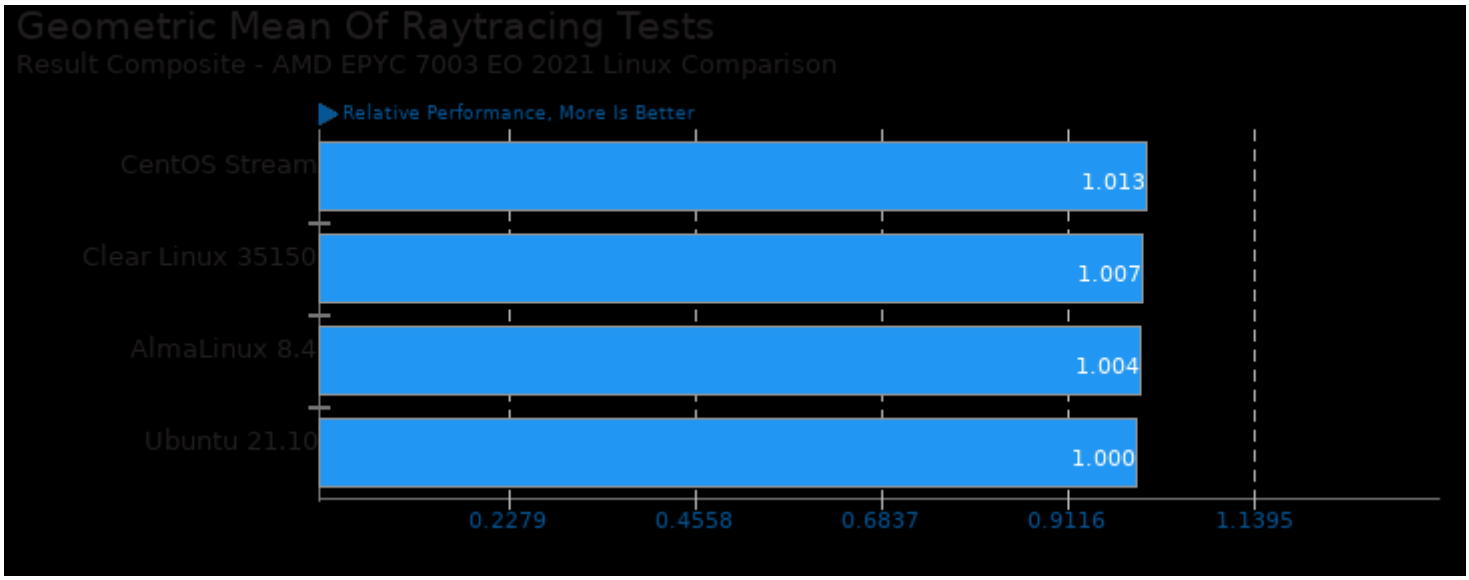
Geometric mean based upon tests: system/octave-benchmark, system/inkscape and system/gegl



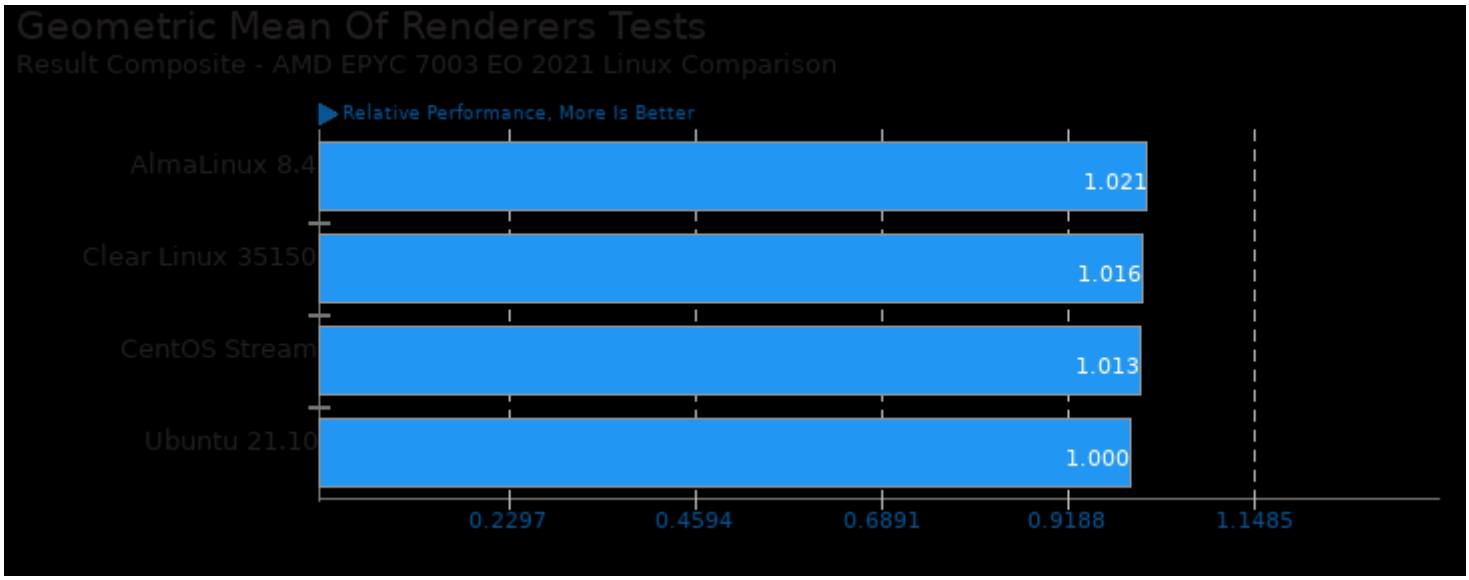
Geometric mean based upon tests: pts/pyperformance, pts/pybench, pts/build-linux-kernel, pts/build-llvm, pts/build-godot, pts/build-wasmer, pts/build-nodejs and pts/mt-dgemm



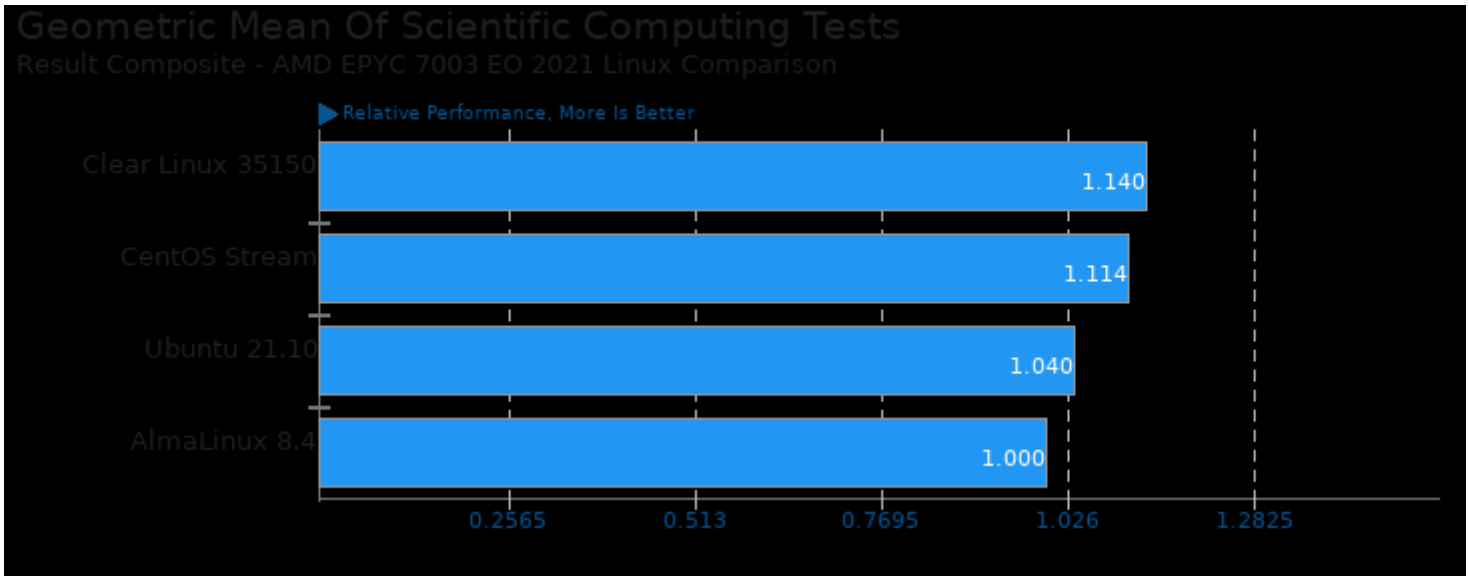
Geometric mean based upon tests: pts/pybench, pts/numpy and pts/pyperformance



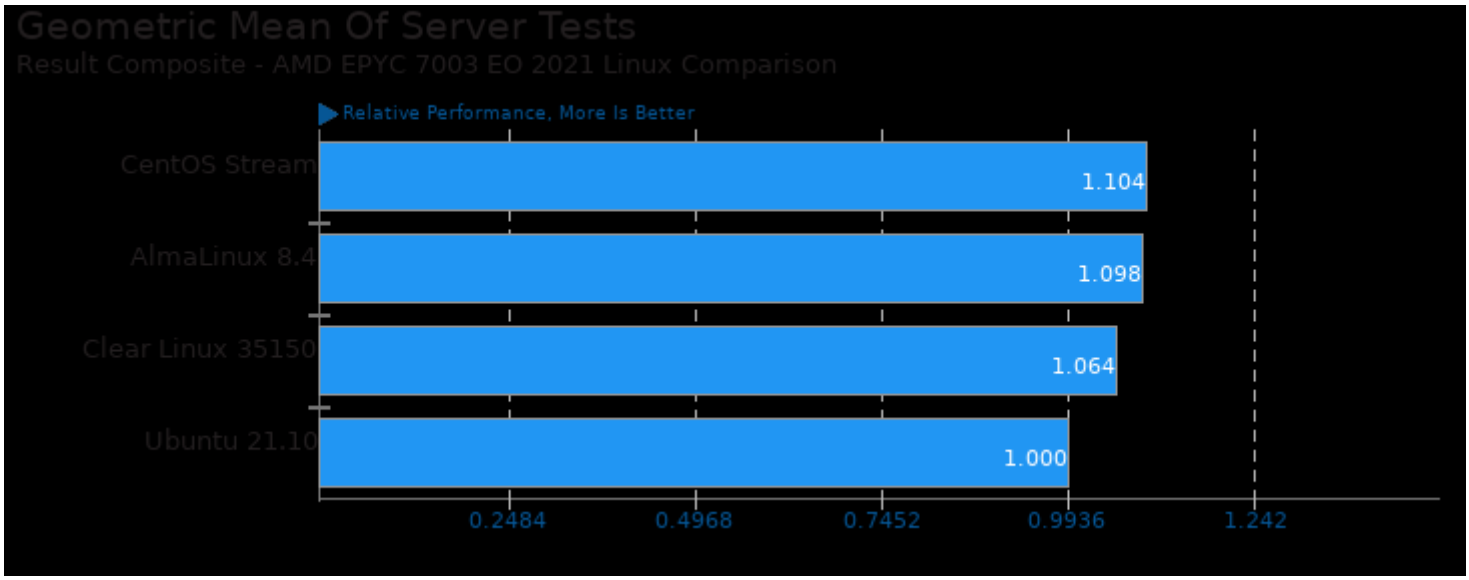
Geometric mean based upon tests: pts/ospray and pts/povray



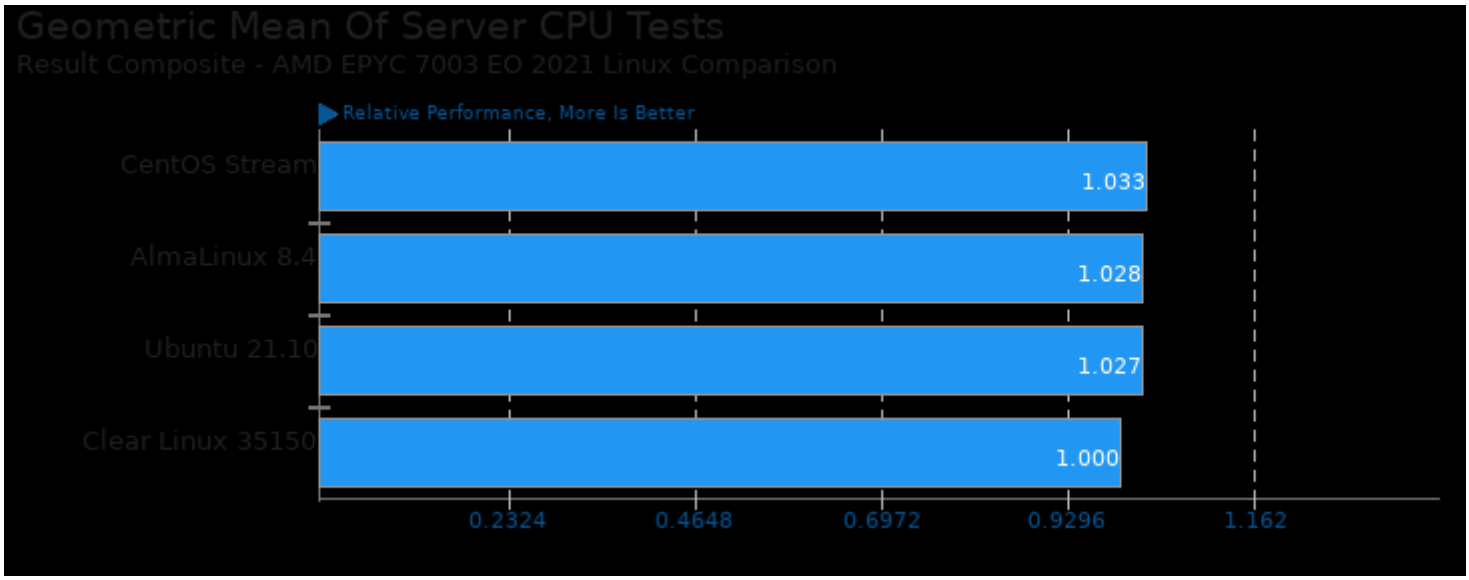
Geometric mean based upon tests: pts/ospray, pts/povray, pts/blender, pts/appleseed and pts/v-ray



Geometric mean based upon tests: system/octave-benchmark, pts/mt-dgemm, pts/namd, pts/gromacs, pts/nwchem and pts/qe

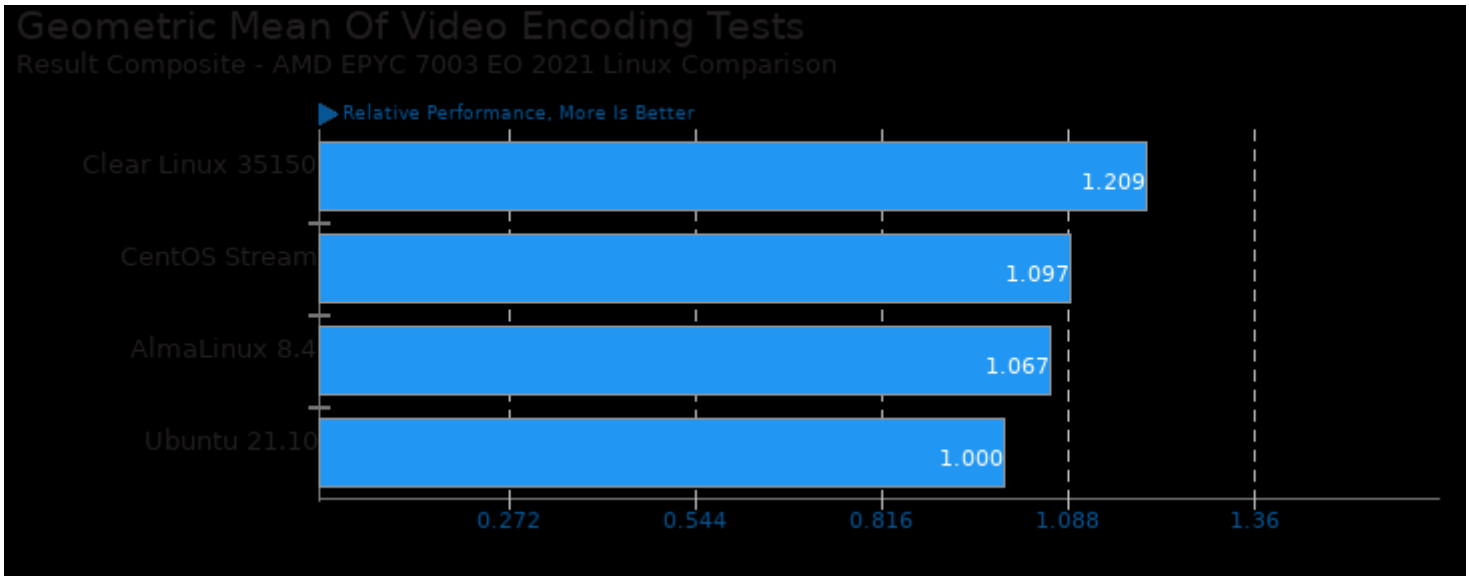


Geometric mean based upon tests: pts/pgbench and pts/openssl



Geometric mean based upon tests: pts/namd, pts/svt-av1, pts/svt-hevc, pts/svt-vp9, pts/x265, pts/build-linux-kernel, pts/build-llvm, pts/povray, pts/openssl, pts/blender, pts/appleseed, pts/pybench and pts/numpy

Geometric mean based upon tests: pts/numpy, system/inkscape and pts/pybench



Geometric mean based upon tests: pts/svt-vp9, pts/svt-hevc, pts/x265, pts/kvazaar, pts/vpxenc, pts/aom-av1 and pts/svt-av1

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Geometric mean based upon tests: pts/blender and pts/x265

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 14:19.