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Clear Linux vs Other Distros - Tiger Lake

Intel Core i7-1165G7 testing of Linux distributions for a future article.

Automated Executive Summary

Fedora Workstation 33 had the most wins, coming in first place for 50% of the tests.

Based on the geometric mean of all complete results, the fastest (Fedora Workstation 33) was 1.147x the speed of the slowest (Ubuntu 20.10). Clear Linux 34130 was 0.943x the speed of Fedora Workstation 33, Manjaro 20.2 was 0.942x the speed of Clear Linux 34130, Ubuntu 20.10 was 0.982x the speed of Manjaro 20.2.

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

Darktable (Test: Boat - Acceleration: CPU-only) at 1.664x
SVT-VP9 (Tuning: Visual Quality Optimized - Input: Bosphorus 1080p) at 1.636x
librsvg (Operation: SVG Files To PNG) at 1.44x
libavif avifenc (Encoder Speed: 10) at 1.417x
Timed Linux Kernel Compilation (Time To Compile) at 1.341x
SVT-AV1 (Encoder Mode: Enc Mode 0 - Input: 1080p) at 1.333x
Timed FFmpeg Compilation (Time To Compile) at 1.311x
ASTC Encoder (Preset: Thorough) at 1.309x
Selenium (Benchmark: Maze Solver - Browser: Firefox) at 1.3x

TensorFlow Lite (Model: Inception V4) at 1.281x.

Test Systems:

Clear Linux 34130

Processor: Intel Core i7-1165G7 @ 4.70GHz (4 Cores / 8 Threads), Motherboard: Dell 0GG9PT (1.0.3 BIOS), Chipset: Intel Tiger Lake-LP, Memory: 16GB, Disk: Kioxia KBG40ZNS256G NVMe 256GB, Graphics: Intel UHD 3GB (1300MHz), Audio: Intel Tiger Lake-LP Smart Sound Audio, Network: Intel Wi-Fi 6 AX201

OS: Clear Linux OS 34130, Kernel: 5.9.16-1009.native (x86_64), Desktop: GNOME Shell 3.38.2, Display Server: X Server 1.20.10, Display Driver: modesetting 1.20.10, OpenGL: 4.6 Mesa 20.3.1, OpenCL: OpenCL 2.1, Vulkan: 1.2.145, Compiler: GCC 10.2.1 20201222 releases/gcc-10.2.0-649-g03e2d83f59 + Clang 10.0.1 + LLVM 10.0.1, File-System: ext4, Screen Resolution: 1920x1200

Environment Notes: FFLAGS="-g -O3 -feliminate-unused-debug-types -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector --param=ssp-buffer-size=32 -m64 -fasynchronous-unwind-tables -Wp,-D_REENTRANT -ftree-loop-distribute-patterns -Wl,-z -Wl,now -Wl,-z -Wl,relro -malign-data=abi -fno-semantic-interposition -ftree-vectorize -ftree-loop-vectorize -Wl,--enable-new-dtags -Wa,-mbranches-within-32B-boundaries" CXXFLAGS="-g -O3 -feliminate-unused-debug-types -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector --param=ssp-buffer-size=32 -Wformat -Wformat-security -m64 -fasynchronous-unwind-tables -Wp,-D_REENTRANT -ftree-loop-distribute-patterns -Wl,-z -Wl,now -Wl,-z -Wl,relro -fno-semantic-interposition -ffat-lto-objects -fno-trapping-math -Wl,-sort-common -Wl,--enable-new-dtags -mtune=skylake -Wa,-mbranches-within-32B-boundaries -fvisibility-inlines-hidden -Wl,--enable-new-dtags" MESA_GLSL_CACHE_DISABLE=0 FCFLAGS="-g -O3 -feliminate-unused-debug-types -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector --param=ssp-buffer-size=32 -m64 -fasynchronous-unwind-tables -Wp,-D_REENTRANT -ftree-loop-distribute-patterns -Wl,-z -Wl,now -Wl,-z -Wl,relro -malign-data=abi -fno-semantic-interposition -ftree-vectorize -ftree-loop-vectorize -Wl,-sort-common -Wl,--enable-new-dtags" CFLAGS="-g -O3 -feliminate-unused-debug-types -pipe -Wall -Wp,-D_FORTIFY_SOURCE=2 -fexceptions -fstack-protector --param=ssp-buffer-size=32 -Wformat -Wformat-security -m64 -fasynchronous-unwind-tables -Wp,-D_REENTRANT -ftree-loop-distribute-patterns -Wl,-z -Wl,now -Wl,-z -Wl,relro -fno-semantic-interposition -ffat-lto-objects -fno-trapping-math -Wl,-sort-common -Wl,--enable-new-dtags -mtune=skylake -Wa,-mbranches-within-32B-boundaries" THEANO_FLAGS="floatX=float32,openmp=true,gcc.cxxflags="-ftree-vectorize -mavx""
Compiler Notes: --build=x86_64-generic-linux --disable-libmpx --disable-libunwind-exceptions --disable-multiarch --disable-vtable-verify --disable-werror --enable-__cxa_atexit --enable-bootstrap --enable-cet --enable-clocale=gnu --enable-default-pie --enable-gnu-indirect-function --enable-languages=c,c++,fortran,go --enable-ld=default --enable-libstdcxx-pch --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --exec-prefix=/usr --includedir=/usr/include --target=x86_64-generic-linux --with-arch=westmere --with-gcc-major-version-only --with-glibc-version=2.19 --with-gnu-ld --with-isl --with-ppl=yes --with-tune=haswell
Disk Notes: BFQ / relatime,rw,stripe=256 / Block Size: 4096
Processor Notes: Scaling Governor: intel_pstate performance - CPU Microcode: 0x60 - Thermald 2.4.1
Python Notes: Python 3.9.1
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 Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

Manjaro 20.2

Processor: Intel Core i7-1165G7 @ 4.70GHz (4 Cores / 8 Threads), Motherboard: Dell 0GG9PT (1.0.3 BIOS), Chipset: Intel Tiger Lake-LP, Memory: 16GB, Disk: Kioxia KBG40ZNS256G NVMe 256GB, Graphics: Intel UHD 3GB (1300MHz), Audio: Intel Tiger Lake-LP Smart Sound Audio, Network: Intel Wi-Fi 6 AX201

OS: ManjaroLinux 20.2, Kernel: 5.9.11-3-MANJARO (x86_64), Desktop: Xfce 4.14, Display Server: X Server 1.20.10, Display Driver: intel 2.99.917, OpenGL: 4.6 Mesa 20.2.3, Vulkan: 1.2.145, Compiler: GCC 10.2.0, File-System: ext4, Screen Resolution: 1920x1200

Compiler Notes: --disable-libssp --disable-libstdcxx-pch --disable-libunwind-exceptions --disable-werror --enable-__cxa_atexit --enable-cet=auto --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-default-ssp --enable-gnu-indirect-function --enable-gnu-unique-object --enable-install-libiberty --enable-languages=c,c++,ada,fortran,go,lto,objc,obj-c++,d --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --mandir=/usr/share/man --with-isl --with-linker-hash-style=gnu
Disk Notes: NONE / noatime,rw / Block Size: 4096
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0x60
Graphics Notes: SNA
Python Notes: Python 3.8.6
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 Enhanced IBRS IBPB: conditional RSB filling +

srbds: Not affected + tsx_async_abort: Not affected

Fedora Workstation 33

Processor: Intel Core i7-1165G7 @ 4.70GHz (4 Cores / 8 Threads), Motherboard: Dell 0GG9PT (1.0.3 BIOS), Chipset: Intel Tiger Lake-LP, Memory: 16GB, Disk: Kioxia KBG40ZNS256G NVMe 256GB, Graphics: Intel UHD 3GB (1300MHz), Audio: Intel Tiger Lake-LP Smart Sound Audio, Network: Intel Wi-Fi 6 AX201

OS: Fedora 33, Kernel: 5.8.15-301.fc33.x86_64 (x86_64), Desktop: GNOME Shell 3.38.2, Display Server: X Server + Wayland, OpenGL: 4.6 Mesa 20.2.6, Compiler: GCC 10.2.1 20201125 + Clang 11.0.0, File-System: btrfs, Screen Resolution: 1920x1200

Compiler Notes: --build=x86_64-redhat-linux --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,objc,obj-c++,ada,go,d,lto --enable-multilib --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --mandir=/usr/share/man --with-arch_32=i686 --with-gcc-major-version-only --with-isl --with-linker-hash-style=gnu --with-tune=generic --without-cuda-driver
Disk Notes: NONE / relatime,rw,seclabel,space_cache,ssd,subvol=/home,subvolid=256 / Block Size: 4096
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0x60
Python Notes: Python 3.9.1
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 Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

Ubuntu 20.10

Processor: Intel Core i7-1165G7 @ 4.70GHz (4 Cores / 8 Threads), Motherboard: Dell 0GG9PT (1.0.3 BIOS), Chipset: Intel Tiger Lake-LP, Memory: 16GB, Disk: Kioxia KBG40ZNS256G NVMe 256GB, Graphics: Intel UHD (1300MHz), Audio: Realtek ALC289, Network: Intel Wi-Fi 6 AX201

OS: Ubuntu 20.10, Kernel: 5.8.0-33-generic (x86_64), Desktop: GNOME Shell 3.38.1, Display Server: X Server 1.20.9, Display Driver: modesetting 1.20.9, OpenGL: 4.6 Mesa 20.2.1, Vulkan: 1.2.145, Compiler: GCC 10.2.0, File-System: ext4, Screen Resolution: 1920x1200

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-gcn/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Disk Notes: NONE / errors=remount-ro,relatime,rw / Block Size: 4096
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0x60 - Thermald 2.3
Python Notes: Python 3.8.6
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 Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

	Clear Linux 34130	Manjaro 20.2	Fedora Workstation 33	Ubuntu 20.10
Darktable - Boat - CPU-only (sec)	**10.254**	16.116	10.828	**17.065**
Normalized	100%	63.63%	94.7%	60.09%
Standard Deviation	1.8%	2.5%	1.4%	2.4%
SVT-VP9 - V.Q.O - Bosphorus 1080p (FPS)	**90.13**	58.51	84.66	**55.09**
Normalized	100%	64.92%	93.93%	61.12%

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Standard Deviation	1.9%	5.5%	1.5%	4.6%
librsvg - SVG Files To PNG (sec)	24.304	20.385	17.231	16.874
Normalized	69.43%	82.78%	97.93%	100%
Standard Deviation	0.1%	0.9%	0.6%	1.5%
libavif avifenc - 10 (sec)	4.679	6.411	6.512	6.631
Normalized	100%	72.98%	71.85%	70.56%
Standard Deviation	0.3%	3.8%	0.6%	5.5%
Timed Linux Kernel Compilation - Time To Compile (sec)	227.623	267.410	199.404	258.060
Normalized	87.6%	74.57%	100%	77.27%
Standard Deviation	1.9%	0.3%	2.2%	0.4%
SVT-AV1 - Enc Mode 0 - 1080p (FPS)	0.083	0.078	0.096	0.072
Normalized	86.46%	81.25%	100%	75%
Standard Deviation	3.8%	0%	1%	0.8%
Timed FFmpeg Compilation - Time To Compile (sec)	150.579	157.077	122.702	160.861
Normalized	81.49%	78.12%	100%	76.28%
Standard Deviation	4.8%	0.6%	4.7%	0.4%
ASTC Encoder - Thorough (sec)	78.42	85.70	68.05	89.11
Normalized	86.78%	79.4%	100%	76.37%
Standard Deviation	4.5%	1%	5.6%	1.2%
Selenium - Maze Solver - Firefox (sec)	4	5.2	5.1	5.2
Normalized	100%	76.92%	78.43%	76.92%
Standard Deviation		0%	0%	0%
TensorFlow Lite - Inception V4 (us)	7525253	8120123	6547940	8389730
Normalized	87.01%	80.64%	100%	78.05%
Standard Deviation	4.6%	0.1%	0.4%	0.1%
Tesseract - 1920 x 1200 (FPS)	156.5044	140.4887	165.3627	129.1598
Normalized	94.64%	84.96%	100%	78.11%
Standard Deviation	1.5%	0.8%	2.4%	0.9%
Perl Benchmarks - Interpreter (sec)	0.00083850	0.00093976	0.00088536	0.00074050
Normalized	88.31%	78.8%	83.64%	100%
Standard Deviation	1%	0.3%	1.5%	0.5%
TensorFlow Lite - I.R.V (us)	6849918	7362320	5986360	7589697
Normalized	87.39%	81.31%	100%	78.87%
Standard Deviation	4.3%	0.1%	1.4%	0%
LevelDB - Seq Fill (us/Op)	19.989	23.317	24.251	25.238
Normalized	100%	85.73%	82.43%	79.2%
Standard Deviation	0.7%	5%	0.3%	3.9%
LevelDB - Seq Fill (MB/s)	44.2	38.0	36.5	35.1
Normalized	100%	85.97%	82.58%	79.41%
Standard Deviation	0.7%	5.4%	0.4%	4.4%
GROMACS - Water Benchmark (Ns/Day)	0.424	0.421	0.512	0.408
Normalized	82.81%	82.23%	100%	79.69%
Standard Deviation	5.3%	1.4%	1.2%	0.6%
LevelDB - Rand Fill (us/Op)	20.933	20.563	25.436	21.905
Normalized	98.23%	100%	80.84%	93.87%
Standard Deviation	0.2%	1.1%	1.3%	1.7%
ASTC Encoder - Exhaustive (sec)	677.65	726.90	606.73	749.74
Normalized	89.53%	83.47%	100%	80.93%
Standard Deviation	0.6%	0.7%	1.1%	0.2%
LevelDB - Rand Fill (MB/s)	42.2	43.0	34.8	40.4
Normalized	98.14%	100%	80.93%	93.95%
Standard Deviation	0.1%	1%	1.3%	1.7%

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Numpy Benchmark (Score)	**510.34**	**416.37**	425.94	417.34
Normalized	100%	81.59%	83.46%	81.78%
Standard Deviation	1.8%	1.2%	0.5%	1.2%
WebP Image Encode - Q.1.L.H.C (Encode Time - sec)	**31.805**	37.562	33.493	**38.845**
Normalized	100%	84.67%	94.96%	81.88%
Standard Deviation	0.9%	2.2%	2%	1.8%
PyPerformance - python_startup (Milliseconds)	**6.31**	**7.65**	6.73	6.42
Normalized	100%	82.48%	93.76%	98.29%
Standard Deviation	0.3%	0.7%	0.2%	0.4%
x265 - Bosphorus 4K (FPS)	5.68	5.48	**6.31**	**5.28**
Normalized	90.02%	86.85%	100%	83.68%
Standard Deviation	4.8%	1.3%	4%	0.6%
asmFish - 1.H.M.2.D (Nodes/s)	8385784	8569639	**9718130**	**8171755**
Normalized	86.29%	88.18%	100%	84.09%
Standard Deviation	3%	1.6%	1.5%	2.4%
Basemark GPU - OpenGL - 1920 x 1200 - High (FPS)	**28.84**	30.81	**34.25**	29.74
Normalized	84.2%	89.96%	100%	86.83%
Standard Deviation	5.2%	0.8%	0.2%	0.6%
Selenium - Speedometer - Firefox (Runs/min)	**143**	**143**	131	**121**
Normalized	100%	100%	91.61%	84.62%
Standard Deviation	0.8%	2.4%		2.3%
Appleseed - Emily (sec)	1223	1230	**1079**	**1274**
Normalized	88.21%	87.66%	100%	84.68%
Perl Benchmarks - Pod2html (sec)	**0.07835017**	**0.09129946**	0.08869303	0.08976229
Normalized	100%	85.82%	88.34%	87.29%
Standard Deviation	1.3%	0.2%	0.5%	0.8%
Basis Universal - UASTC Level 2 (sec)	85.124	86.361	**77.355**	**89.670**
Normalized	90.87%	89.57%	100%	86.27%
Standard Deviation	2.2%	0.9%	4.5%	0.8%
Zstd Compression - 19 (MB/s)	**20.2**	22.9	**23.1**	22.2
Normalized	87.45%	99.13%	100%	96.1%
Standard Deviation	2.3%	0.5%	0%	1.2%
Basemark GPU - Vulkan - 1920 x 1200 - High (FPS)	**26.38**	28.51	**30.00**	27.68
Normalized	87.93%	95.03%	100%	92.27%
Standard Deviation	1%	0%	0.2%	0.4%
PyPerformance - pathlib	**12.4**	13.5	13.7	**14.1**
Normalized	100%	91.85%	90.51%	87.94%
Standard Deviation	0.5%	1.5%	0.8%	0.4%
SQLite Speedtest - Timed Time - Size 1,000 (sec)	**49.504**	52.294	**55.956**	52.219
Normalized	100%	94.66%	88.47%	94.8%
Standard Deviation	2.2%	0.2%	2.5%	1.3%
Timed Eigen Compilation - Time To Compile (sec)	**60.434**	66.728	61.024	**67.982**
Normalized	100%	90.57%	99.03%	88.9%
Standard Deviation	0.6%	0.6%	0.1%	0.6%

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PyPerformance - regex_compile (Milliseconds)	**132**	134	**147**	**132**
Normalized	100%	98.51%	89.8%	100%
Standard Deviation	0.4%	1.3%	0.4%	1.8%
Selenium - CanvasMark - Firefox	15348	**15578**	**14028**	14472
Normalized	98.52%	100%	90.05%	92.9%
Standard Deviation	0.9%	1.2%	0.6%	1.4%
PyPerformance - json_loads (Milliseconds)	**17.8**	**19.7**	19.0	18.6
Normalized	100%	90.36%	93.68%	95.7%
Standard Deviation	0.3%	0.9%	0.6%	0.3%
Selenium - Jetstream 2 - Firefox	**94.460**	89.261	88.606	**85.521**
Normalized	100%	94.5%	93.8%	90.54%
Standard Deviation	0.6%	0.8%	1.4%	1.4%
Selenium - ARES-6 - Firefox (ms)	**41.14**	41.71	43.01	**45.29**
Normalized	100%	98.63%	95.65%	90.84%
Standard Deviation	0.8%	0.7%	0.4%	0.2%
LZ4 Compression - 3 - Compression Speed (MB/s)	61.15	63.05	**64.85**	**59.81**
Normalized	94.29%	97.22%	100%	92.23%
Standard Deviation	0.9%	1.6%	0.5%	1.3%
RealSR-NCNN - 4x - Yes (sec)	520.294	541.255	**508.597**	**550.429**
Normalized	97.75%	93.97%	100%	92.4%
Standard Deviation	1.5%	0.2%	0.1%	0.2%
RealSR-NCNN - 4x - No (sec)	**65.038**	68.813	66.033	**69.984**
Normalized	100%	94.51%	98.49%	92.93%
Standard Deviation	0.3%	1%	0.1%	1%
Git - T.T.C.C.G.C (sec)	45.918	47.297	**45.227**	**48.096**
Normalized	98.5%	95.62%	100%	94.03%
Standard Deviation	1.3%	1.2%	1.1%	1.9%
Selenium - PSPDFKit WASM - Firefox (Score)	**2859**	2936	3005	**3035**
Normalized	100%	97.38%	95.14%	94.2%
Standard Deviation	0.5%	0.2%	0.1%	1%
LZ4 Compression - 1 - Compression Speed (MB/s)	8839	9147	**8686**	**9154**
Normalized	96.56%	99.93%	94.89%	100%
Standard Deviation	0.1%	0%	0.5%	0%
Selenium - Octane - Firefox (Geometric Mean)	23091	**23109**	22964	**21994**
Normalized	99.92%	100%	99.37%	95.18%
Standard Deviation	0.3%	1.4%	0.5%	1.9%
LevelDB - Hot Read (us/Op)	**3.701**	3.545	3.568	**3.525**
Normalized	95.24%	99.44%	98.79%	100%
Standard Deviation	2.3%	1.1%	0.6%	0.9%
LZ4 Compression - 1 - D.S (MB/s)	9655	9928	**9483**	**9934**
Normalized	97.2%	99.94%	95.46%	100%
Standard Deviation	0.1%	0.6%	0.3%	0.1%
Selenium - Jetstream - Firefox (Score)	**187.33**	185.99	187.26	**179.32**
Normalized	100%	99.28%	99.96%	95.72%
Standard Deviation	0.5%	0.3%	0.5%	0.2%
LevelDB - Rand Read (us/Op)	**3.663**	3.543	3.553	**3.507**
Normalized	95.74%	98.98%	98.71%	100%
Standard Deviation	0.7%	1.4%	0.8%	0.4%

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Selenium - Kraken - Firefox (ms)	**977.4**	992.4	**1018**	1017
Normalized	100%	98.49%	96%	96.09%
Standard Deviation	0.2%	0.1%	0.3%	0.5%
TNN - CPU - MobileNet v2 (ms)	**276.594**	284.107	**287.673**	285.357
Normalized	100%	97.36%	96.15%	96.93%
Standard Deviation	2.4%	0.2%	0.8%	0.5%
Waifu2x-NCNN Vulkan - 2x - 3 - No	**4.099**	**4.220**	4.198	4.203
Normalized	100%	97.13%	97.64%	97.53%
Standard Deviation	2.2%	1.4%	1.7%	2.1%
Dolfyn - C.F.D (sec)	16.409	**16.133**	16.153	**16.603**
Normalized	98.32%	100%	99.88%	97.17%
Standard Deviation	2.1%	0.5%	1.7%	2.1%
LZ4 Compression - 3 - D.S (MB/s)	9342	**9565**	**9295**	9505
Normalized	97.67%	100%	97.17%	99.37%
Standard Deviation	0%	0.2%	1.5%	0.1%
Selenium - W.i - Firefox (ms)	**28.8**	28.1	**28.0**	28.2
Normalized	97.22%	99.64%	100%	99.29%
Standard Deviation	2.3%	0.5%	2.3%	2.6%
AI Benchmark Alpha - D.T.S (Score)	620	**630**		**614**
Normalized	98.41%	100%		97.46%
AI Benchmark Alpha - Device AI Score (Score)	1152	**1170**		**1141**
Normalized	98.46%	100%		97.52%
LZ4 Compression - 9 - D.S (MB/s)	9352	9528	**9330**	**9563**
Normalized	97.79%	99.63%	97.56%	100%
Standard Deviation	0.1%	0.2%	1.2%	0.2%
AI Benchmark Alpha - D.I.S (Score)	532	**540**		**527**
Normalized	98.52%	100%		97.59%
Selenium - W.c - Firefox (ms)	339.8	**339.9**	332.5	**332.2**
Normalized	97.76%	97.73%	99.91%	100%
Standard Deviation	0.8%	0.5%	2.2%	1.7%
Waifu2x-NCNN Vulkan - 2x - 3 - Yes (sec)	**26.923**	27.325	**27.353**	27.250
Normalized	100%	98.53%	98.43%	98.8%
Standard Deviation	0.1%	0.2%	0.3%	0.1%
libjpeg-turbo tjbench - D.T (Megapixels/sec)	216.640954	**214.396587**	**217.594501**	216.579616
Normalized	99.56%	98.53%	100%	99.53%
Standard Deviation	0.7%	0.7%	0.2%	0.2%
TNN - CPU - SqueezeNet v1.1 (ms)	267.361	**266.285**	266.931	**267.695**
Normalized	99.6%	100%	99.76%	99.47%
Standard Deviation	0.6%	0.1%	0.1%	0.4%
Selenium - StyleBench - Firefox (Runs / Minute)	109.9	106	**113**	**100.5**
Normalized	97.26%	93.81%	100%	88.94%
Standard Deviation	11.2%		0.9%	1.3%
PyBench - T.F.A.T.T (Milliseconds)	769	786	**967**	**750**
Normalized	97.53%	95.42%	77.56%	100%
Standard Deviation	0.5%	0.8%	19%	0.5%
IndigoBench - CPU - Supercar (M samples/s)	1.404	1.200	**1.698**	**1.167**
Normalized	82.69%	70.67%	100%	68.73%
Standard Deviation	32.9%	0.4%	5.9%	0.1%

Clear Linux vs Other Distros - Tiger Lake

IndigoBench - CPU - Bedroom (M samples/s)	**0.681**	0.510	0.531	**0.496**
Normalized	100%	74.89%	77.97%	72.83%
Standard Deviation	28.3%	0.3%	13.5%	0.2%
Chaos Group V-RAY - CPU	5117	4634	**5666**	**4487**
Normalized	90.31%	81.79%	100%	79.19%
Standard Deviation	9.4%	2.4%	6.1%	1.7%
NCNN - Vulkan GPU - regnety_400m (ms)	**19.57**	16.88	**14.01**	17.53
Normalized	71.59%	83%	100%	79.92%
Standard Deviation	49.8%	11.8%	0.4%	5.8%
NCNN - Vulkan GPU - squeezenet_ssd (ms)	**44.27**	**32.99**	33.23	33.95
Normalized	74.52%	100%	99.28%	97.17%
Standard Deviation	42.6%	0.9%	16.4%	0.2%
NCNN - Vulkan GPU - resnet50 (ms)	**63.10**	49.73	**43.21**	50.78
Normalized	68.48%	86.89%	100%	85.09%
Standard Deviation	43.7%	0.4%	7.2%	0.1%
NCNN - Vulkan GPU - alexnet (ms)	**18.82**	18.30	**13.50**	18.65
Normalized	71.73%	73.77%	100%	72.39%
Standard Deviation	50.8%	0.7%	1.5%	0.3%
NCNN - Vulkan GPU - resnet18 (ms)	**22.15**	21.16	**14.87**	21.78
Normalized	67.13%	70.27%	100%	68.27%
Standard Deviation	60.3%	1%	2.2%	0.6%
NCNN - Vulkan GPU - vgg16 (ms)	**88.23**	69.20	**52.99**	71.81
Normalized	60.06%	76.58%	100%	73.79%
Standard Deviation	47%	0.2%	3.5%	0.1%
NCNN - CPU - squeezenet_ssd (ms)	**47.06**	32.88	**30.50**	34.14
Normalized	64.81%	92.76%	100%	89.34%
Standard Deviation	38.2%	0.7%	5%	0.6%
NCNN - CPU - resnet50 (ms)	**68.00**	49.65	**42.97**	50.87
Normalized	63.19%	86.55%	100%	84.47%
Standard Deviation	39.6%	0.1%	8.1%	0%
NCNN - CPU - vgg16 (ms)	**84.71**	69.06	**52.71**	72.06
Normalized	62.22%	76.32%	100%	73.15%
Standard Deviation	45.2%	0.6%	3.8%	0.4%
NCNN - CPU - efficientnet-b0 (ms)	8.23	11.46	**8.16**	**11.82**
Normalized	99.15%	71.2%	100%	69.04%
Standard Deviation	14%	1.4%	13.6%	1%
NCNN - CPU - mnasnet (ms)	**5.32**	7.80	5.45	**8.04**
Normalized	100%	68.21%	97.61%	66.17%
Standard Deviation	14.1%	1.2%	7.5%	1.5%
NCNN - CPU - shufflenet-v2 (ms)	7.10	9.93	**6.91**	**10.38**
Normalized	97.32%	69.59%	100%	66.57%
Standard Deviation	11.8%	0.8%	8.5%	1%
NCNN - CPU - mobilenet (ms)	24.87	30.25	**23.74**	**31.55**
Normalized	95.46%	78.48%	100%	75.25%
Standard Deviation	36.8%	0.9%	16%	1.2%
RawTherapee - T.B.T (sec)	88.746	99.518	**81.974**	**102.444**
Normalized	92.37%	82.37%	100%	80.02%
Standard Deviation	6.2%	1.3%	3.7%	0.5%
Darktable - Server Room - CPU-only (sec)	**4.586**	6.996	5.561	**7.581**
Normalized	100%	65.55%	82.47%	60.49%
Standard Deviation	0.4%	8.6%	0.3%	5%

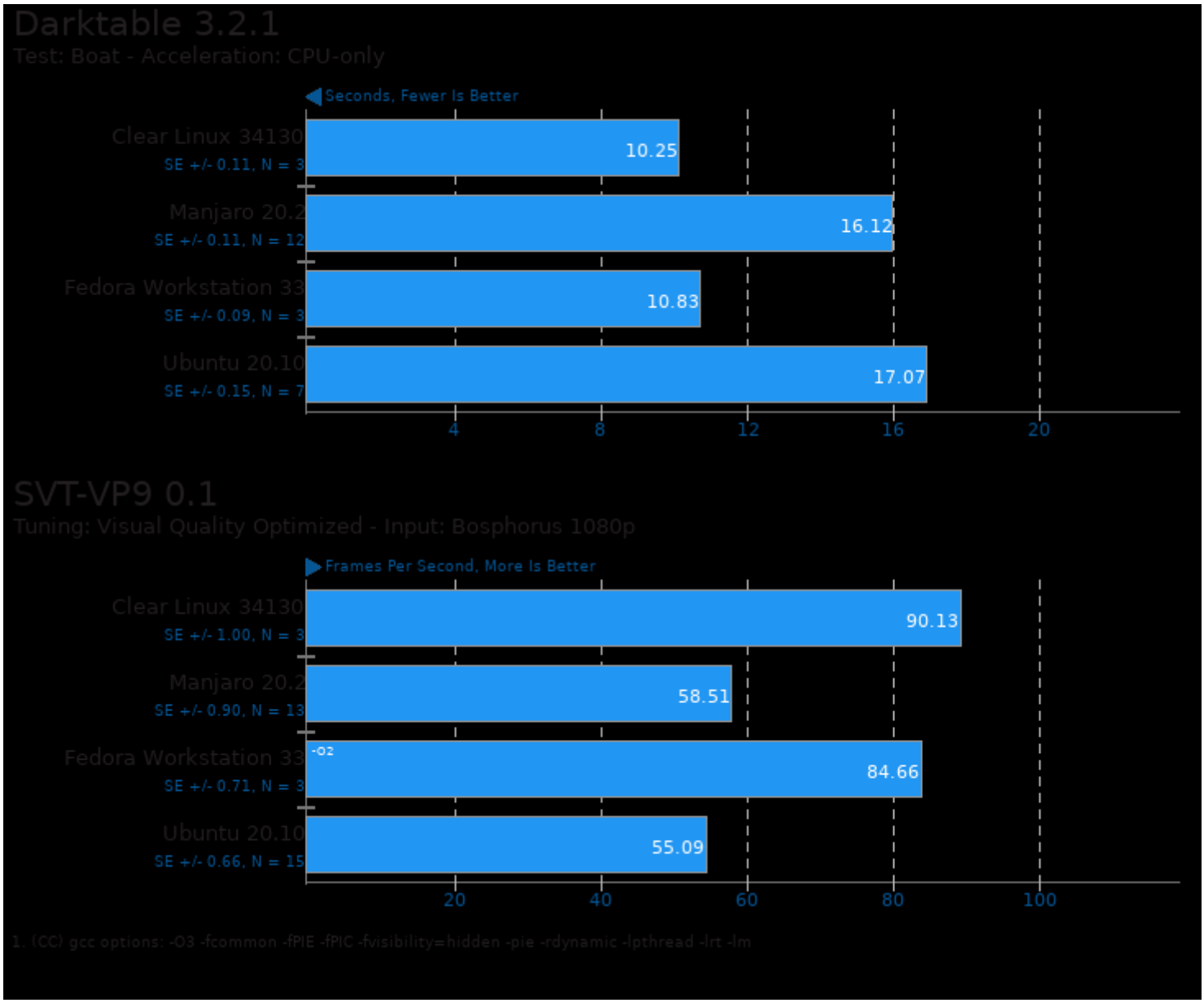
Clear Linux vs Other Distros - Tiger Lake

Darktable - Masskrug - CPU-only (sec)	7.882	8.990	**7.143**	**9.388**
Normalized	90.62%	79.45%	100%	76.09%
Standard Deviation	34.4%	5.3%	1%	3.9%
TensorFlow Lite - Mobilenet Quant	349703	368942	**299659**	**383271**
Normalized	85.69%	81.22%	100%	78.18%
Standard Deviation	9.8%	1.4%	1.8%	1.2%
TensorFlow Lite - Mobilenet Float (us)	354479	375484	**297656**	**388423**
Normalized	83.97%	79.27%	100%	76.63%
Standard Deviation	10.5%	1.5%	2.2%	1.2%
TensorFlow Lite - NASNet Mobile (us)	379325	402074	**318435**	**418846**
Normalized	83.95%	79.2%	100%	76.03%
Standard Deviation	8.5%	1.1%	2.1%	1.1%
TensorFlow Lite - SqueezeNet (us)	527761	559790	**430928**	**578303**
Normalized	81.65%	76.98%	100%	74.52%
Standard Deviation	9.1%	0.8%	1.1%	1.3%
DeepSpeech - CPU (sec)	**66.88168**	61.61175	63.87221	**61.49769**
Normalized	91.95%	99.81%	96.28%	100%
Standard Deviation	6.8%	1.1%	0.7%	0.5%
XZ Compression - C.u.1.0.3.s.i.i.C.L.9 (sec)	58.968	60.304	**51.378**	**63.053**
Normalized	87.13%	85.2%	100%	81.48%
Standard Deviation	16.3%	0.6%	1.1%	0.3%
Stockfish - Total Time (Nodes/s)	5705100	5764570	**7097119**	**5595920**
Normalized	80.39%	81.22%	100%	78.85%
Standard Deviation	6.8%	1.8%	2%	1.7%
x265 - Bosphorus 1080p (FPS)	29.03	25.56	**34.92**	**24.42**
Normalized	83.13%	73.2%	100%	69.93%
Standard Deviation	26.1%	2.5%	2.5%	2.4%
x264 - H.2.V.E (FPS)	40.13	34.41	**45.64**	**32.94**
Normalized	87.93%	75.39%	100%	72.17%
Standard Deviation	25%	2.5%	4.7%	2.4%
VP9 libvpx Encoding - Speed 5 (FPS)	23.01	19.48	**24.30**	**18.88**
Normalized	94.69%	80.16%	100%	77.7%
Standard Deviation	22.8%	2.1%	0.9%	2.5%
SVT-VP9 - P.S.O - Bosphorus 1080p (FPS)	**122.80**	79.94	107.87	**73.78**
Normalized	100%	65.1%	87.84%	60.08%
Standard Deviation	1.3%	7.1%	9%	5.8%
SVT-AV1 - Enc Mode 4 - 1080p (FPS)	1.462	1.345	**1.648**	**1.191**
Normalized	88.71%	81.61%	100%	72.27%
Standard Deviation	21.1%	1.5%	11.4%	1.1%
LibRaw - P.P.B (Mpix/sec)	**44.85**	27.97	33.64	**26.49**
Normalized	100%	62.36%	75.01%	59.06%
Standard Deviation	21.1%	2.1%	6%	4.4%
Zstd Compression - 3 (MB/s)	**3728**	4075	4080	**4142**
Normalized	90.02%	98.38%	98.5%	100%
Standard Deviation	15.4%	2.4%	0.8%	0.3%
LZ4 Compression - 9 - Compression Speed (MB/s)	59.99	59.22	**63.58**	**58.72**
Normalized	94.35%	93.14%	100%	92.36%
Standard Deviation	2.1%	6.1%	0.5%	0.6%
Timed MrBayes Analysis - P.P.A (sec)	102.931	102.904	**83.715**	**106.316**
Normalized	81.33%	81.35%	100%	78.74%
Standard Deviation	6.7%	0.8%	4%	0.6%

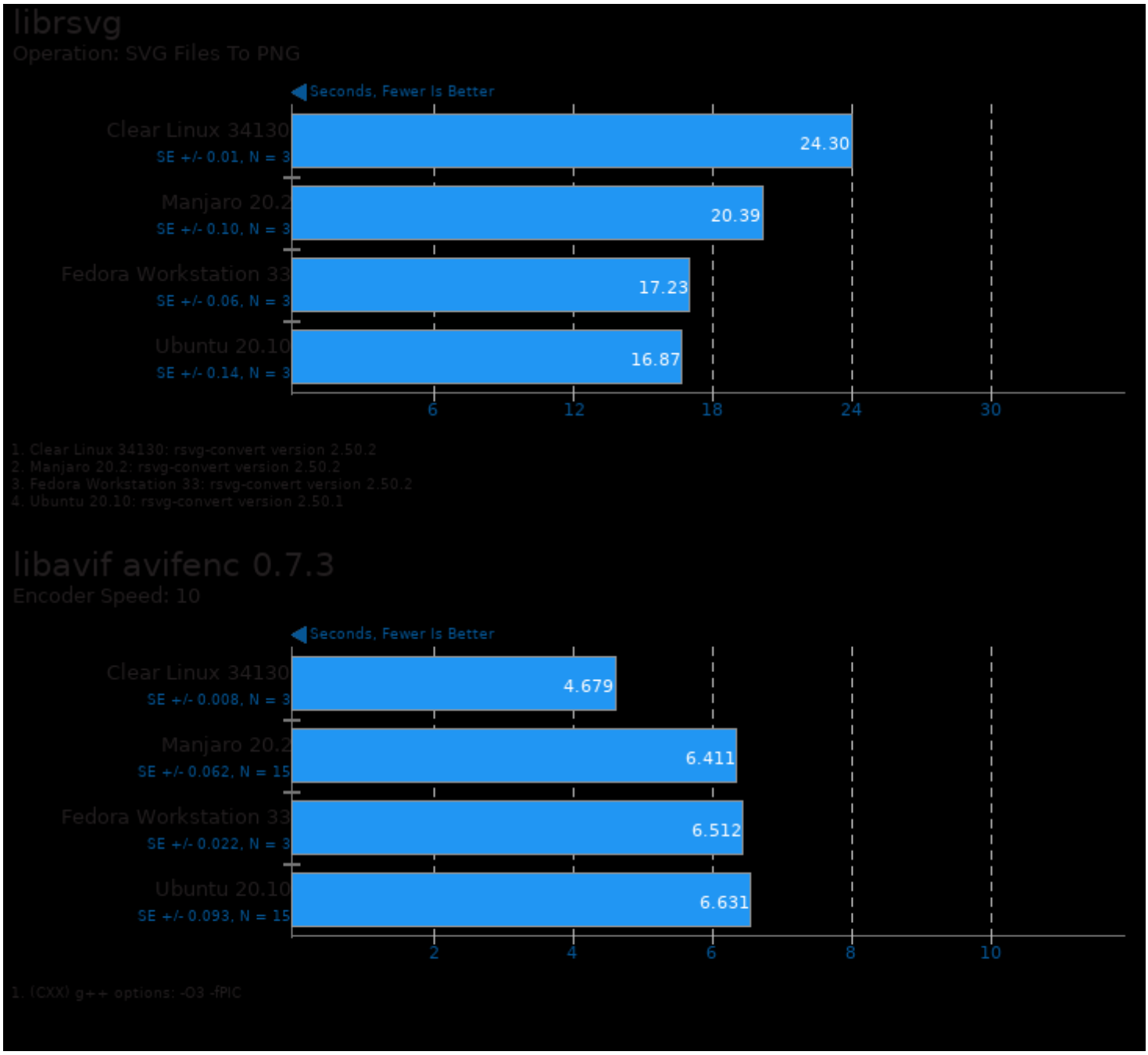
Clear Linux vs Other Distros - Tiger Lake

NAMD - ATPase Simulation - 327,506 Atoms (days/ns)	**6.72795**	5.50073	**4.62934**	5.96795
Normalized	68.81%	84.16%	100%	77.57%
Standard Deviation	9.4%	0.1%	19.4%	0.5%
CLOMP - Static OMP Speedup (Speedup)	**6.2**	4.9	6.1	**4.8**
Normalized	100%	79.03%	98.39%	77.42%
Standard Deviation	11.1%	0%	0%	1.2%
WireGuard + Linux Networking Stack Stress Test (sec)	**210.676**	**321.262**	215.535	280.530
Normalized	100%	65.58%	97.75%	75.1%
Standard Deviation	7%	0.7%	2.4%	1.1%
Xonotic - 1920 x 1200 - Ultimate (FPS)	**109.0371800**	114.6085590	**144.9669775**	119.6124110
Normalized	75.22%	79.06%	100%	82.51%
Standard Deviation	1.8%	0.3%	6.7%	0.6%
Xonotic - 1920 x 1200 - Ultra (FPS)	146.2895877	**146.2127324**	**198.3841854**	154.9343308
Normalized	73.74%	73.7%	100%	78.1%
Standard Deviation	6.9%	0.5%	7%	0.6%
Xonotic - 1920 x 1200 - High (FPS)	180.2490147	**171.4443729**	**241.8373006**	189.8508052
Normalized	74.53%	70.89%	100%	78.5%
Standard Deviation	13.3%	0.8%	0.2%	1%
Xonotic - 1920 x 1200 - Low (FPS)	354.7893429	**272.5520359**	**372.8174763**	318.0343367
Normalized	95.16%	73.11%	100%	85.31%
Standard Deviation	17%	2.2%	0.7%	2.3%
ET: Legacy - Renderer2 - 1920 x 1200 (FPS)	133.4	126.7	**151.8**	**126.0**
Normalized	87.88%	83.47%	100%	83%
Standard Deviation	18.2%	0.8%	1.2%	0.9%
LevelDB - Seek Rand (us/Op)	4.599	5.756	**4.459**	**5.802**
Normalized	96.96%	77.47%	100%	76.85%
Standard Deviation	0.9%	9.6%	0.4%	10%

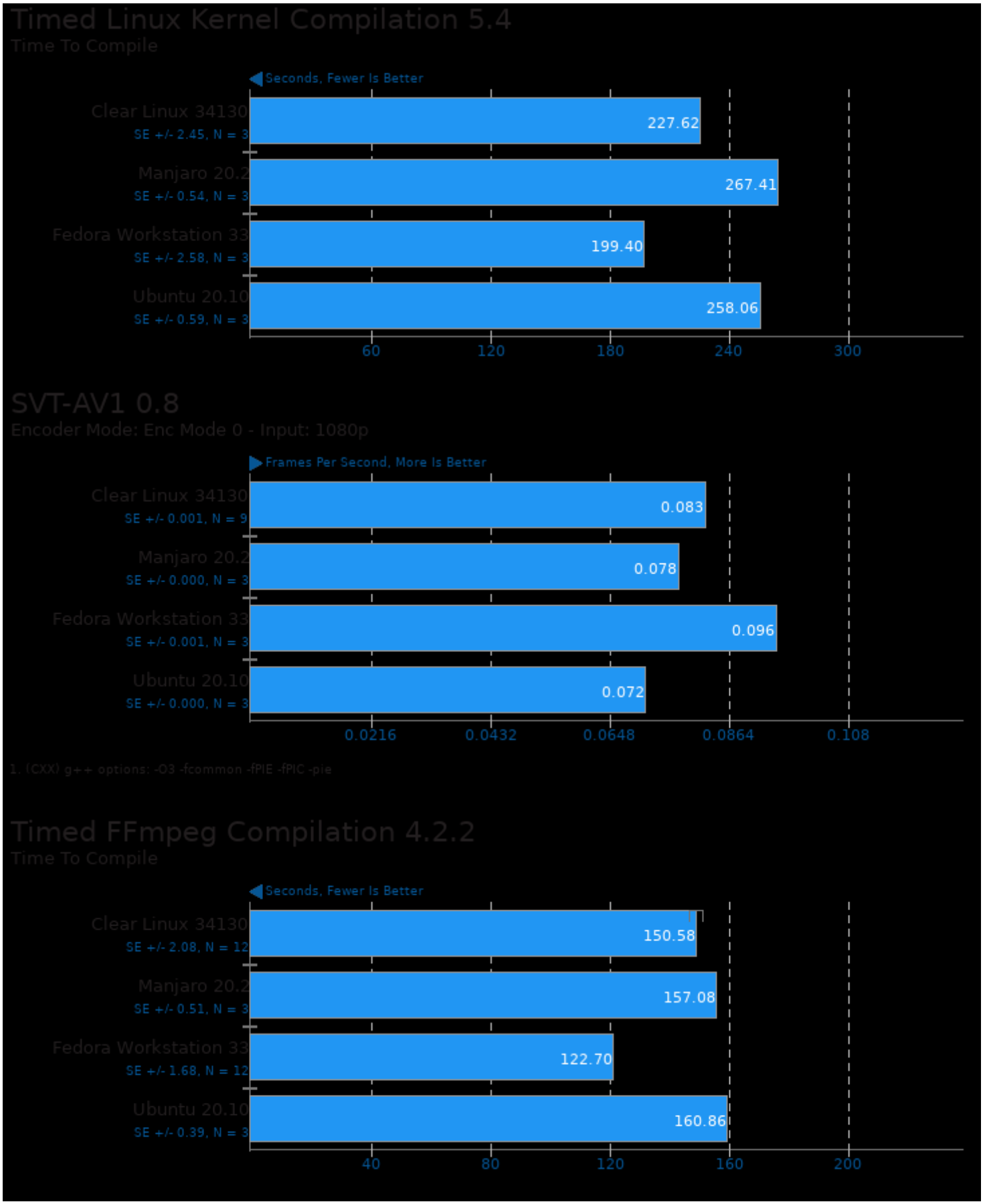
Clear Linux vs Other Distros - Tiger Lake



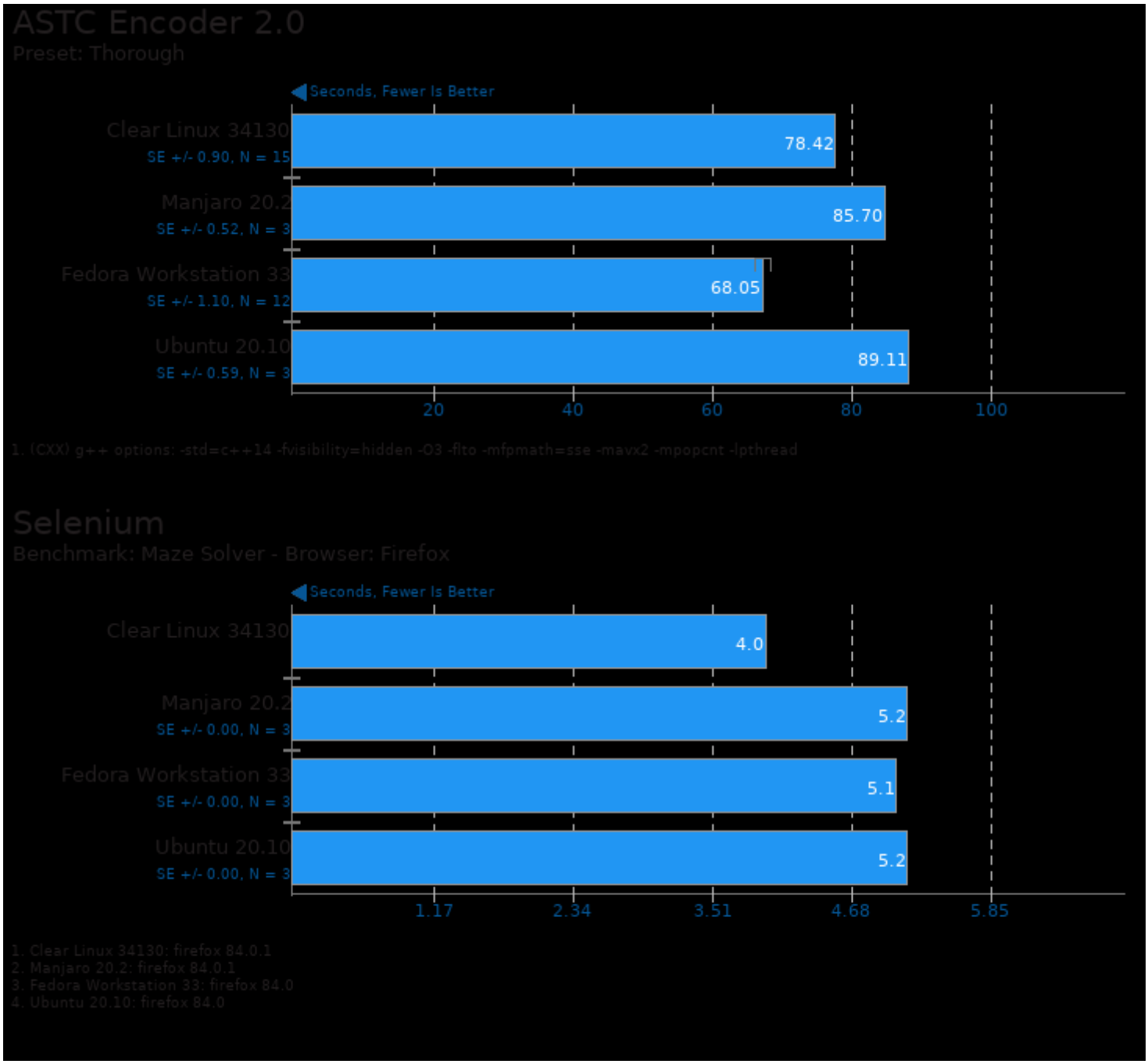
Clear Linux vs Other Distros - Tiger Lake



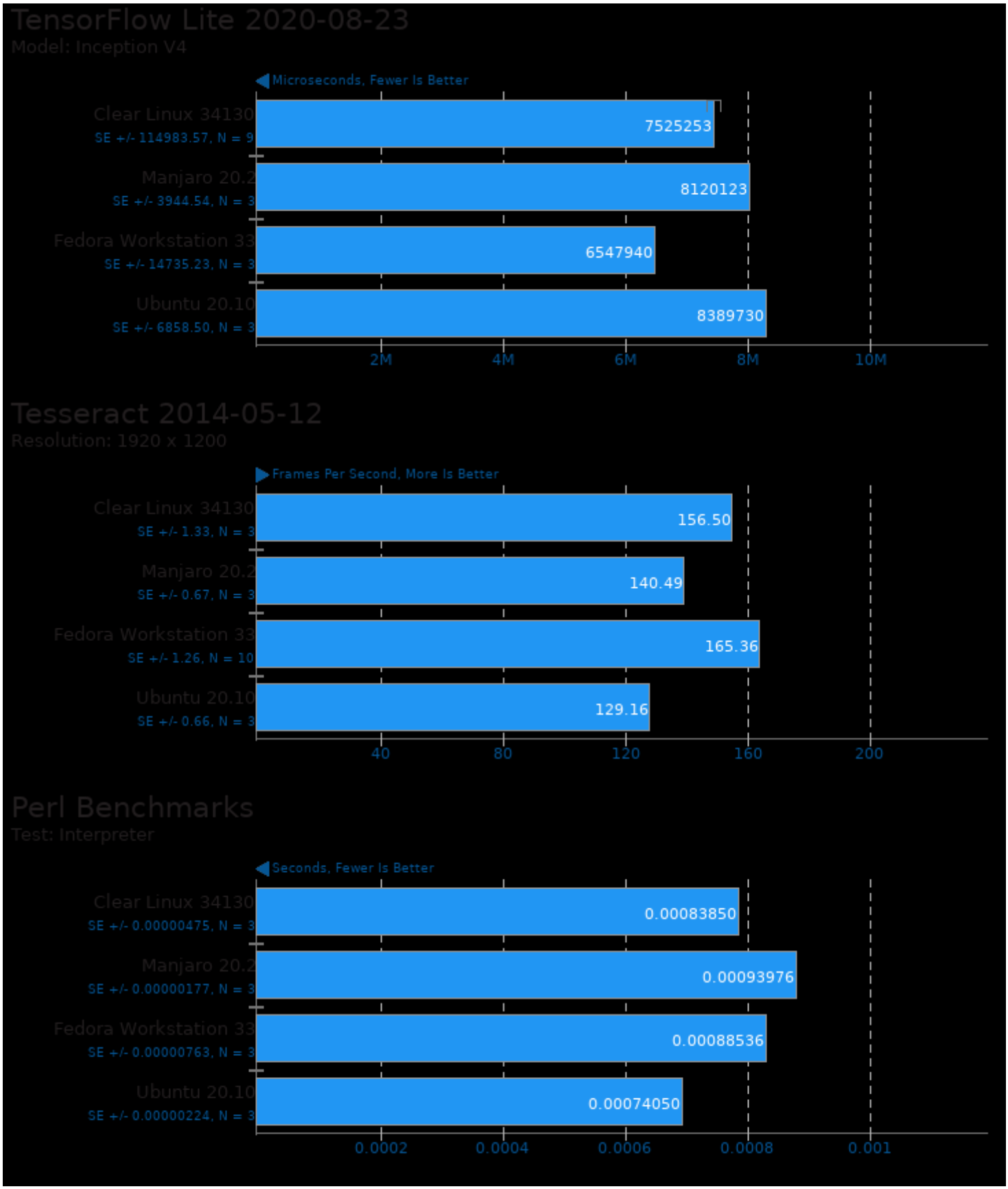
Clear Linux vs Other Distros - Tiger Lake



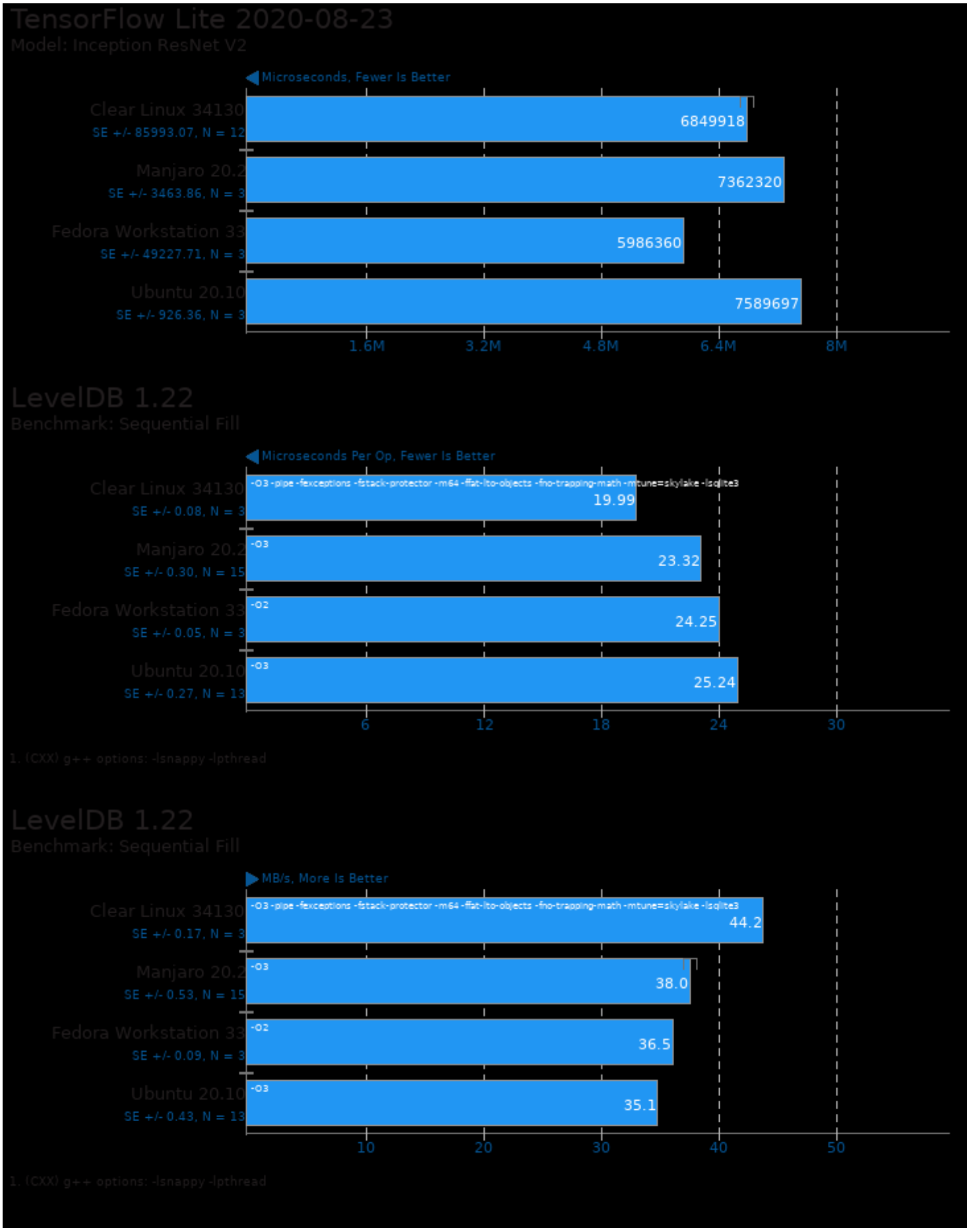
Clear Linux vs Other Distros - Tiger Lake



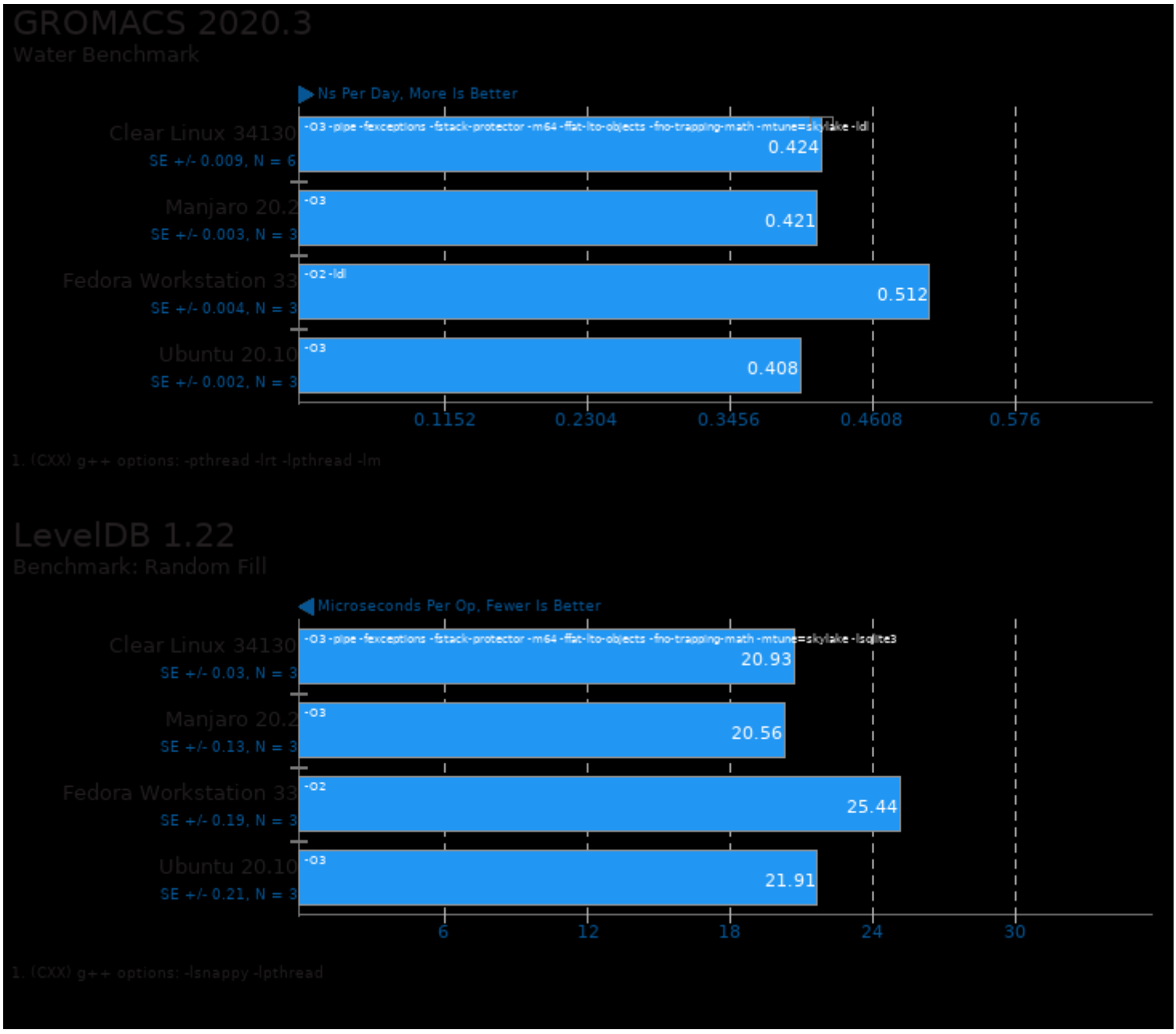
Clear Linux vs Other Distros - Tiger Lake



Clear Linux vs Other Distros - Tiger Lake



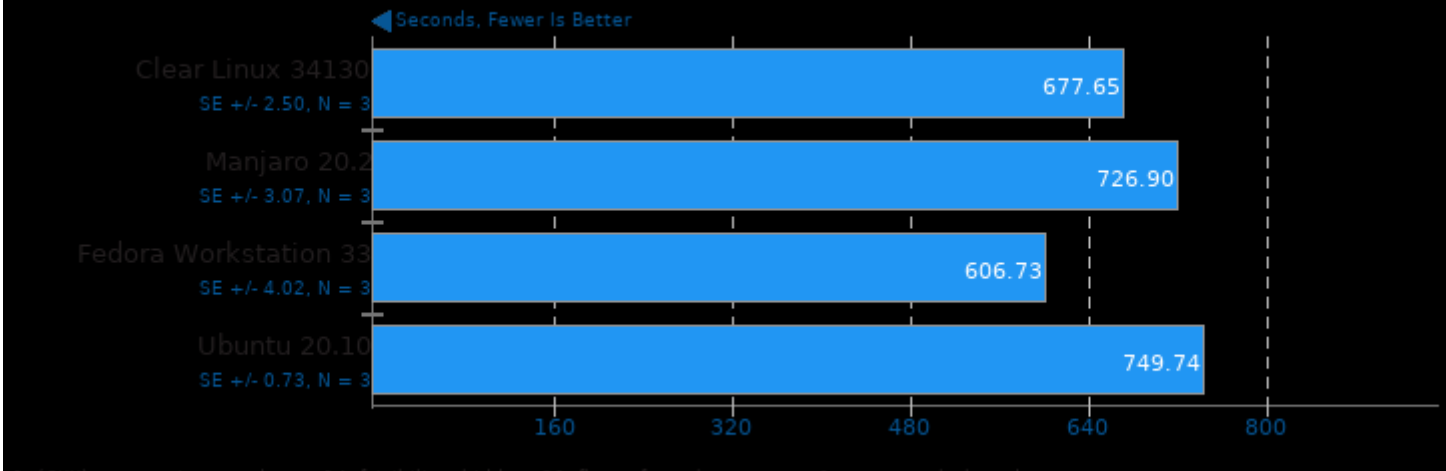
Clear Linux vs Other Distros - Tiger Lake



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ASTC Encoder 2.0

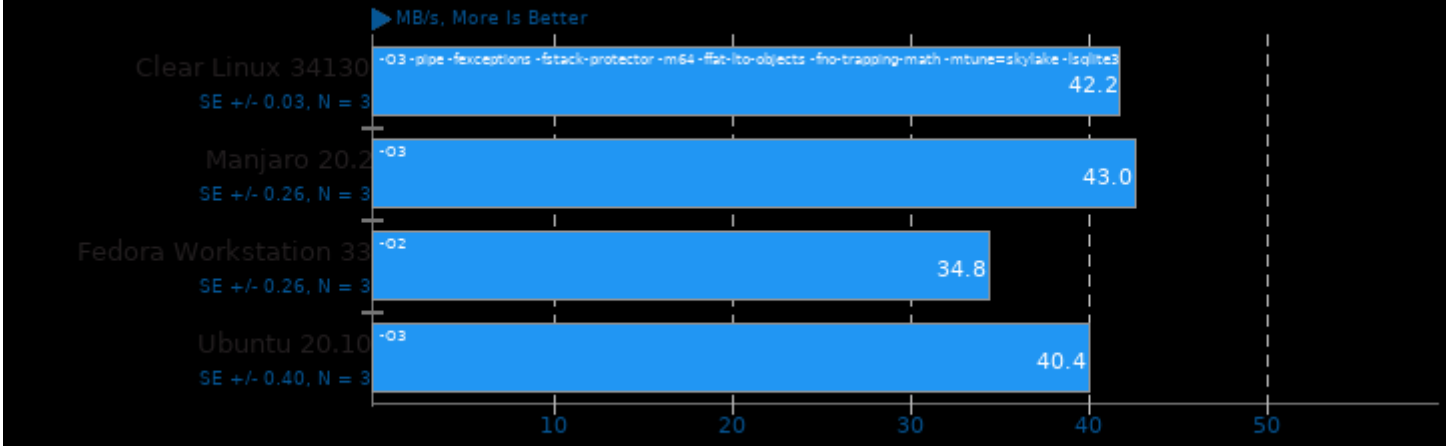
Preset: Exhaustive



1. (CXX) g++ options: -std=c++14 -fvisibility=hidden -O3 -flto -mfpmath=sse -mavx2 -mpopcnt -lpthread

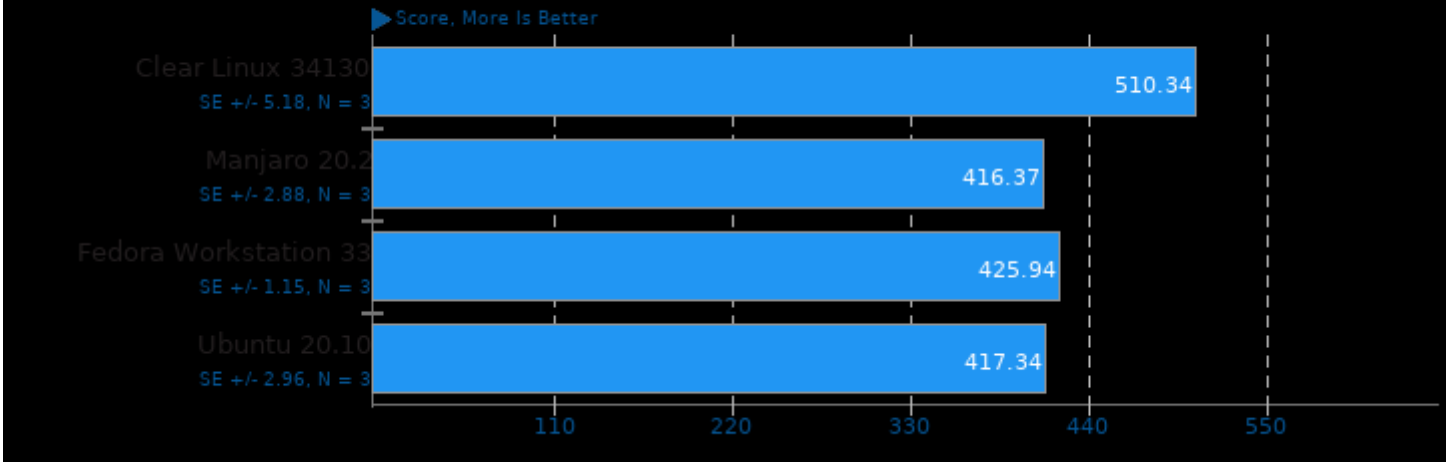
LevelDB 1.22

Benchmark: Random Fill



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

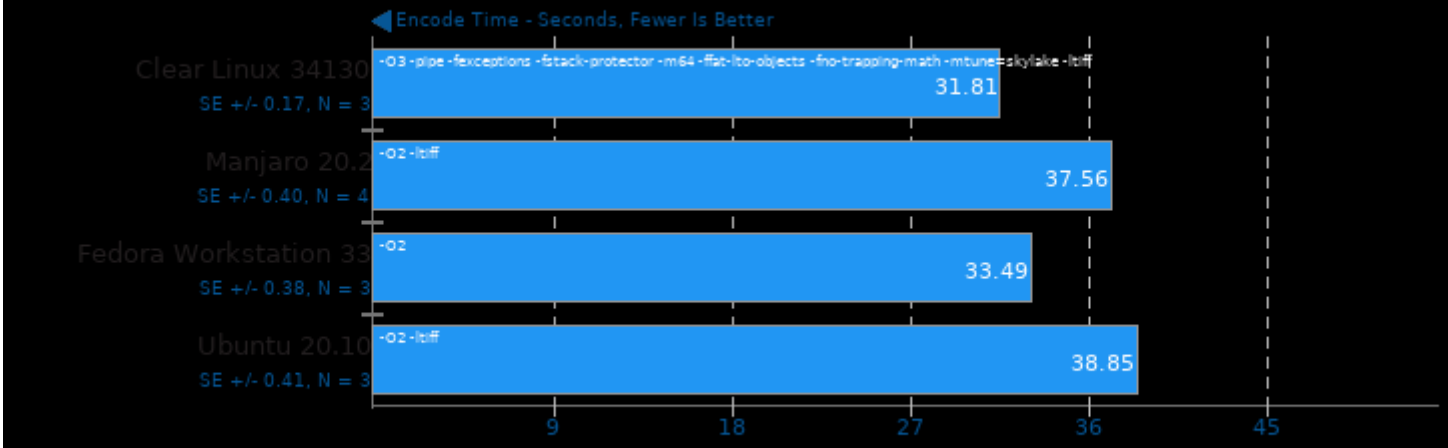
Numpy Benchmark



Clear Linux vs Other Distros - Tiger Lake

WebP Image Encode 1.1

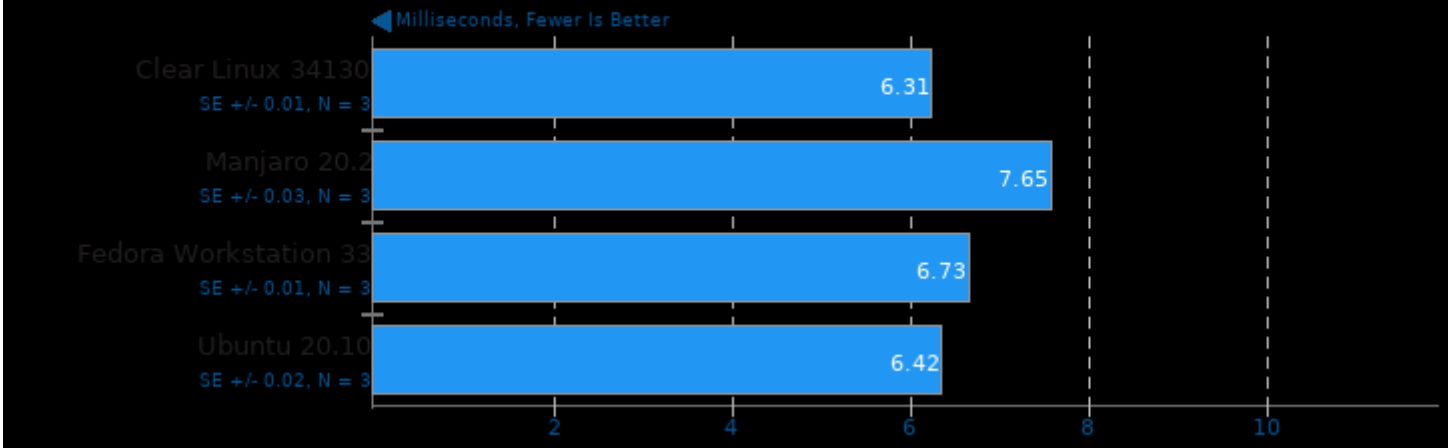
Encode Settings: Quality 100, Lossless, Highest Compression



1. (CC) gcc options: -fvisibility=hidden -pthread -lm -ljpeg -lpng16

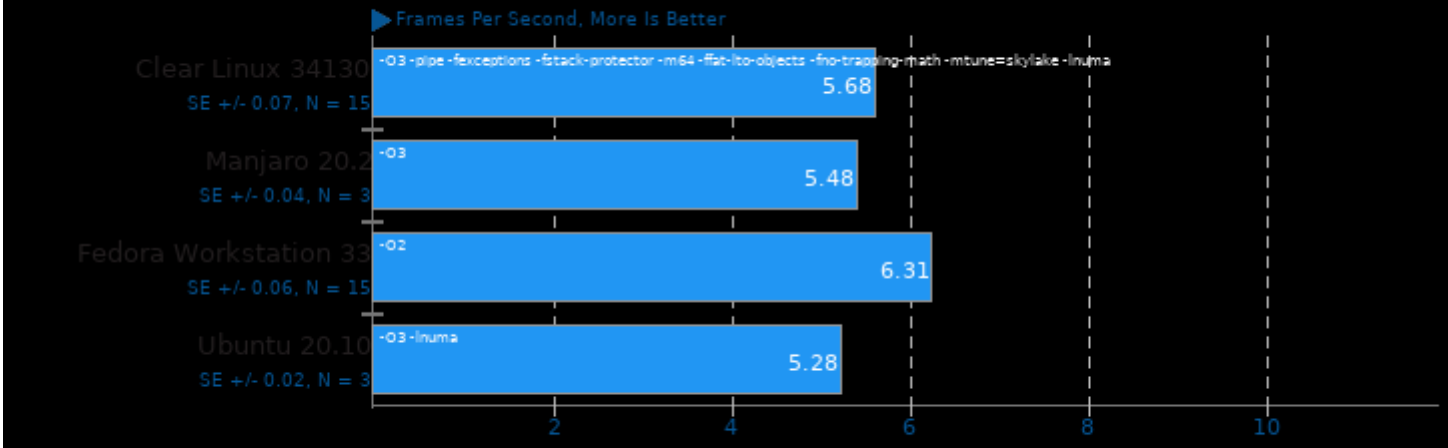
PyPerformance 1.0.0

Benchmark: python_startup



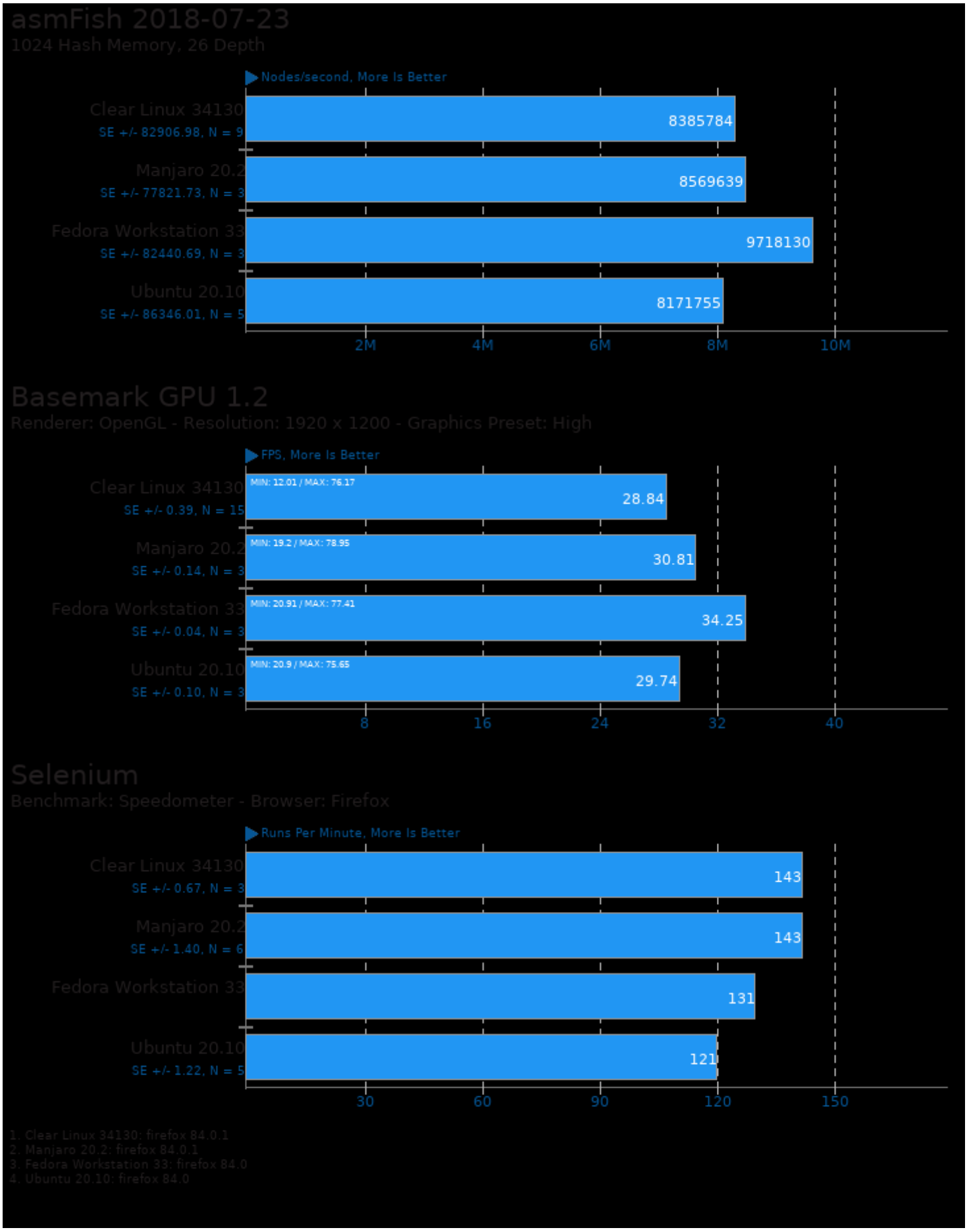
x265 3.4

Video Input: Bosphorus 4K



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

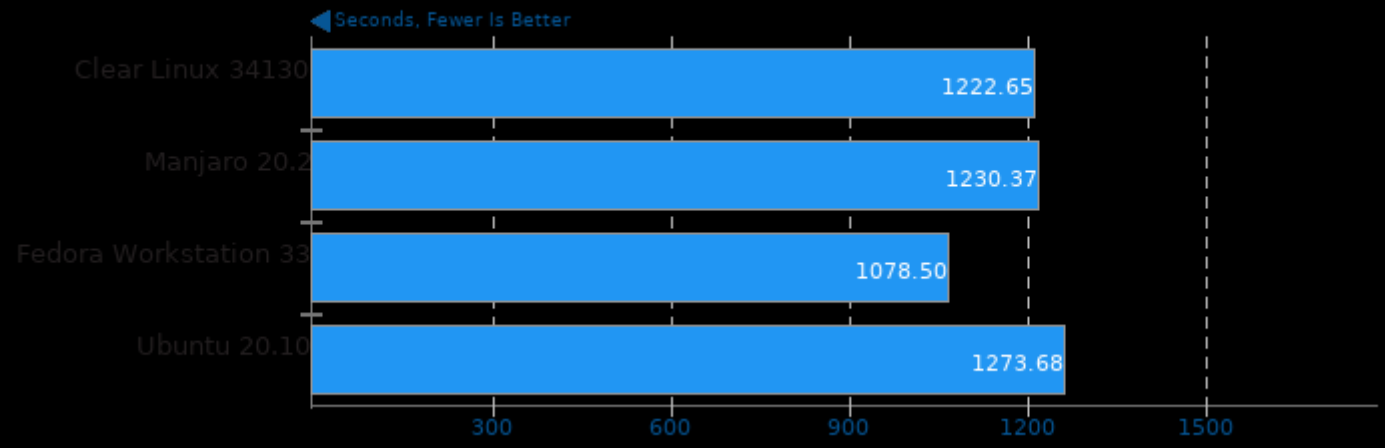
Clear Linux vs Other Distros - Tiger Lake



Clear Linux vs Other Distros - Tiger Lake

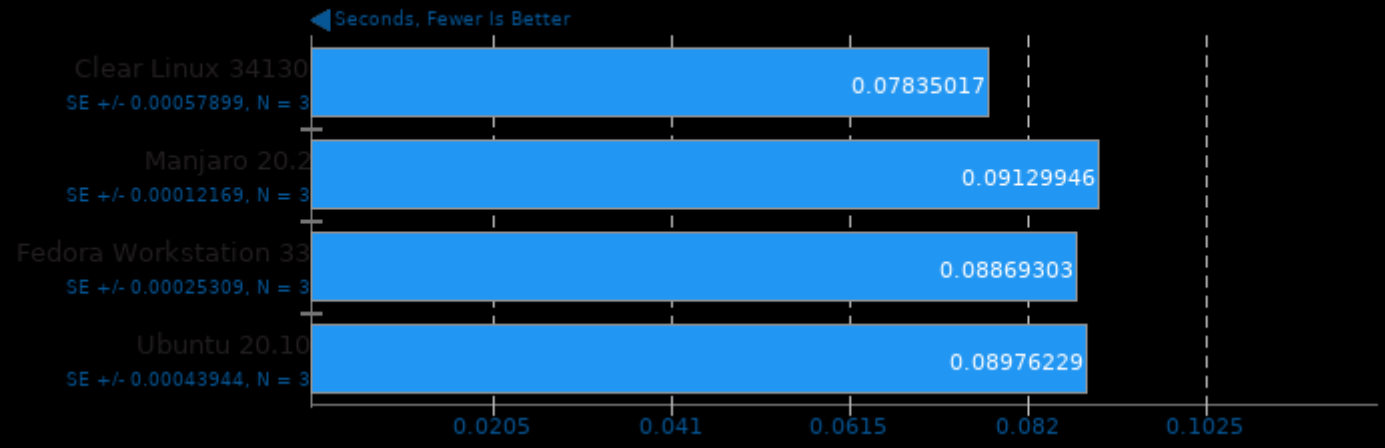
Appleseed 2.0 Beta

Scene: Emily



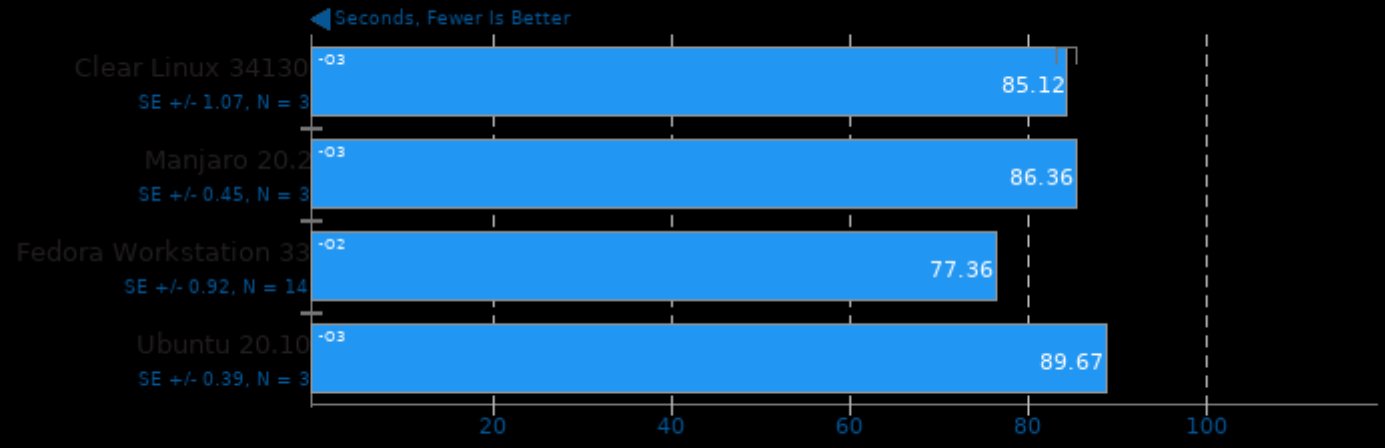
Perl Benchmarks

Test: Pod2html



Basis Universal 1.12

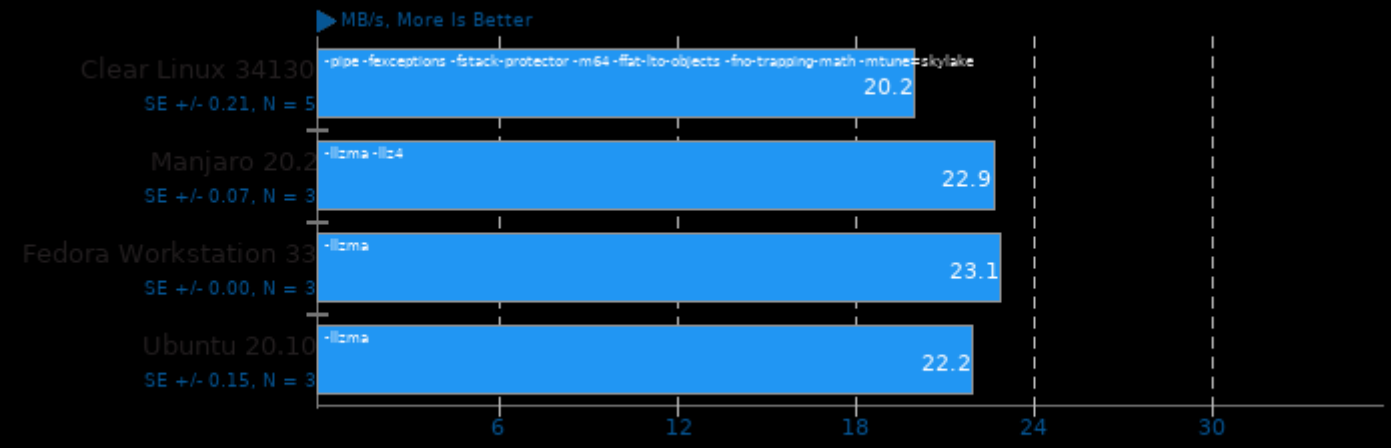
Settings: UASTC Level 2



1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -rdynamic -lm -lpthread

Zstd Compression 1.4.5

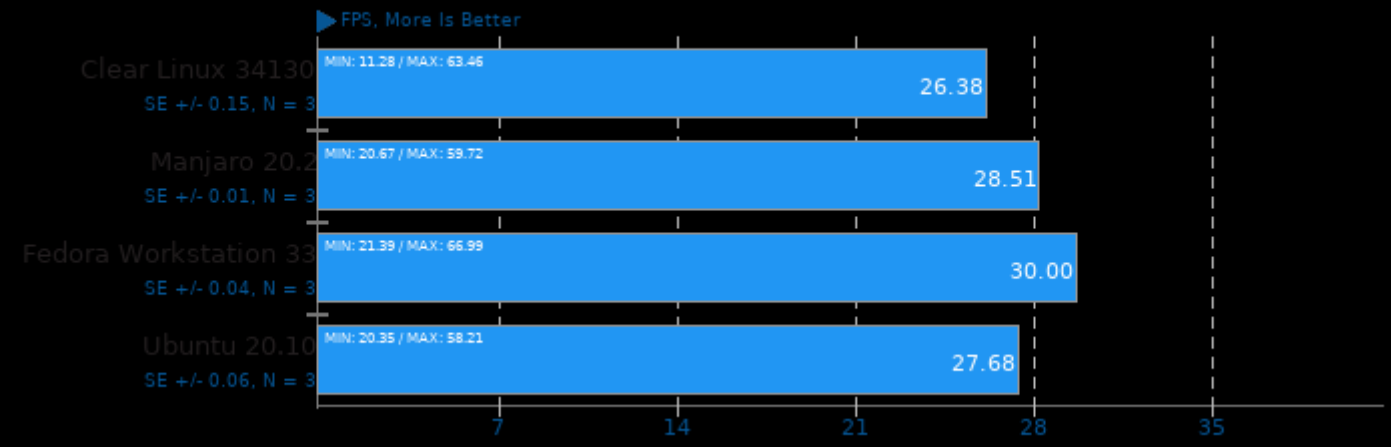
Compression Level: 19



1. (CC) gcc options: -O3 -pthread -lz

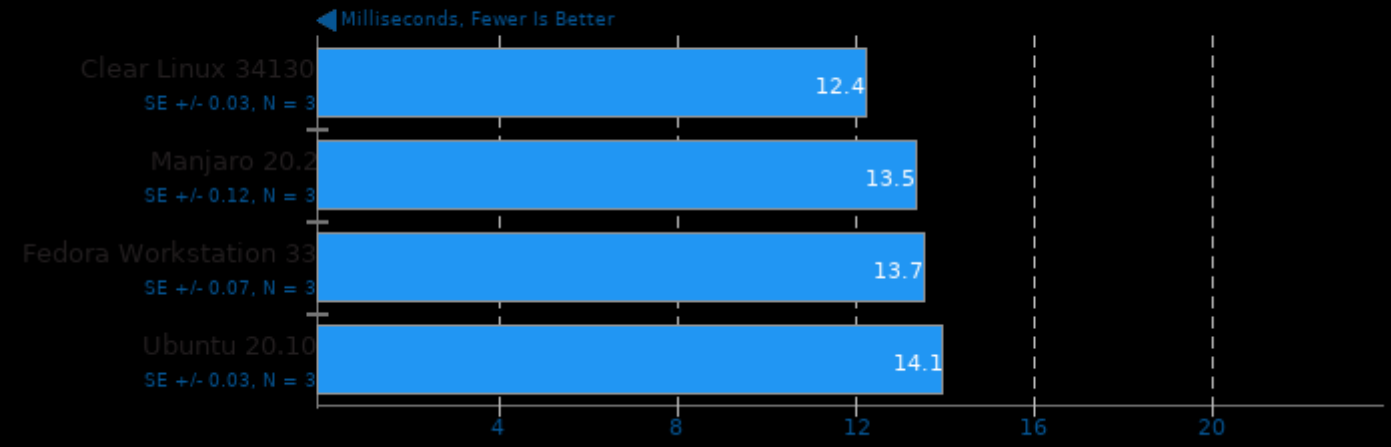
Basemark GPU 1.2

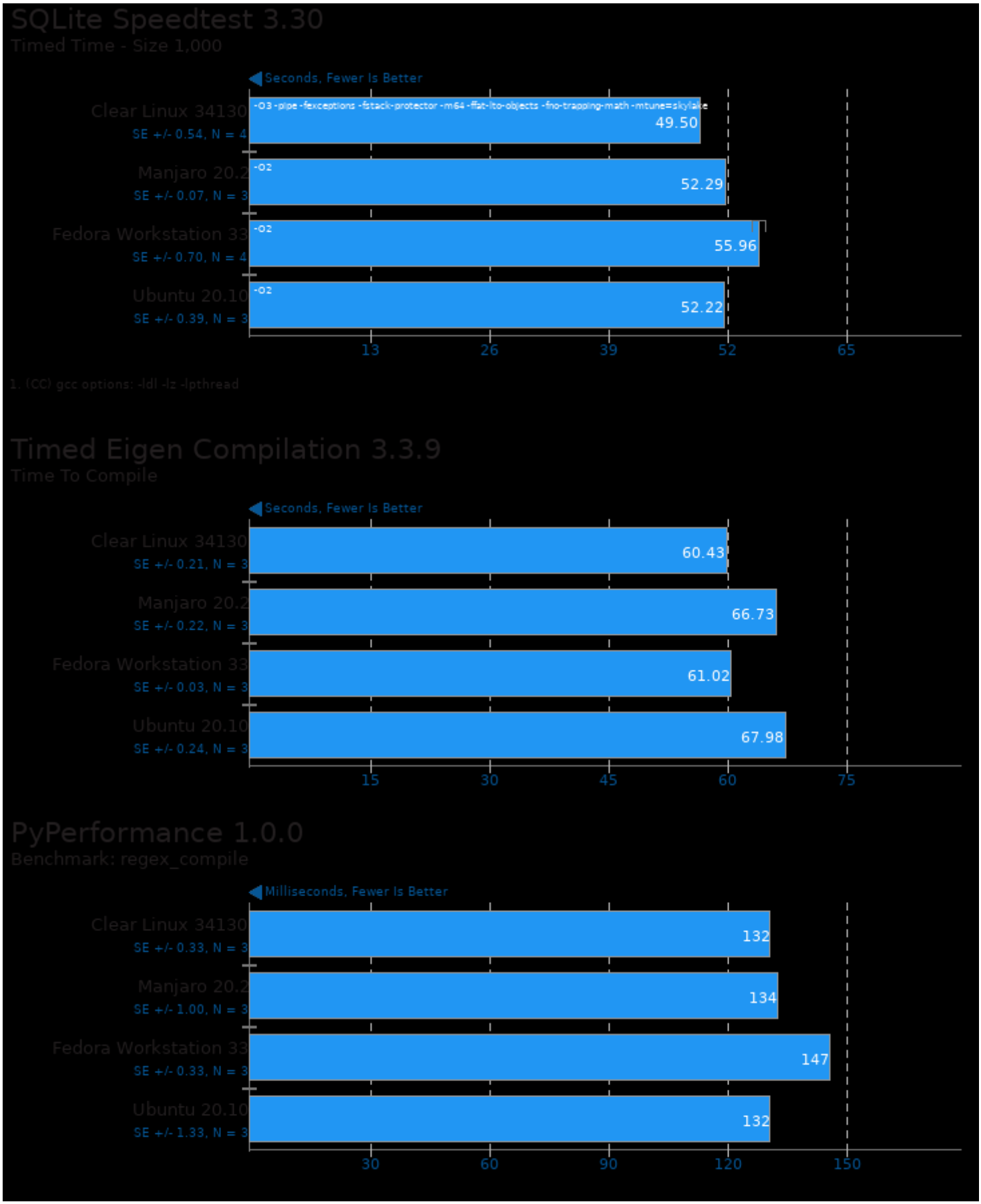
Renderer: Vulkan - Resolution: 1920 x 1200 - Graphics Preset: High



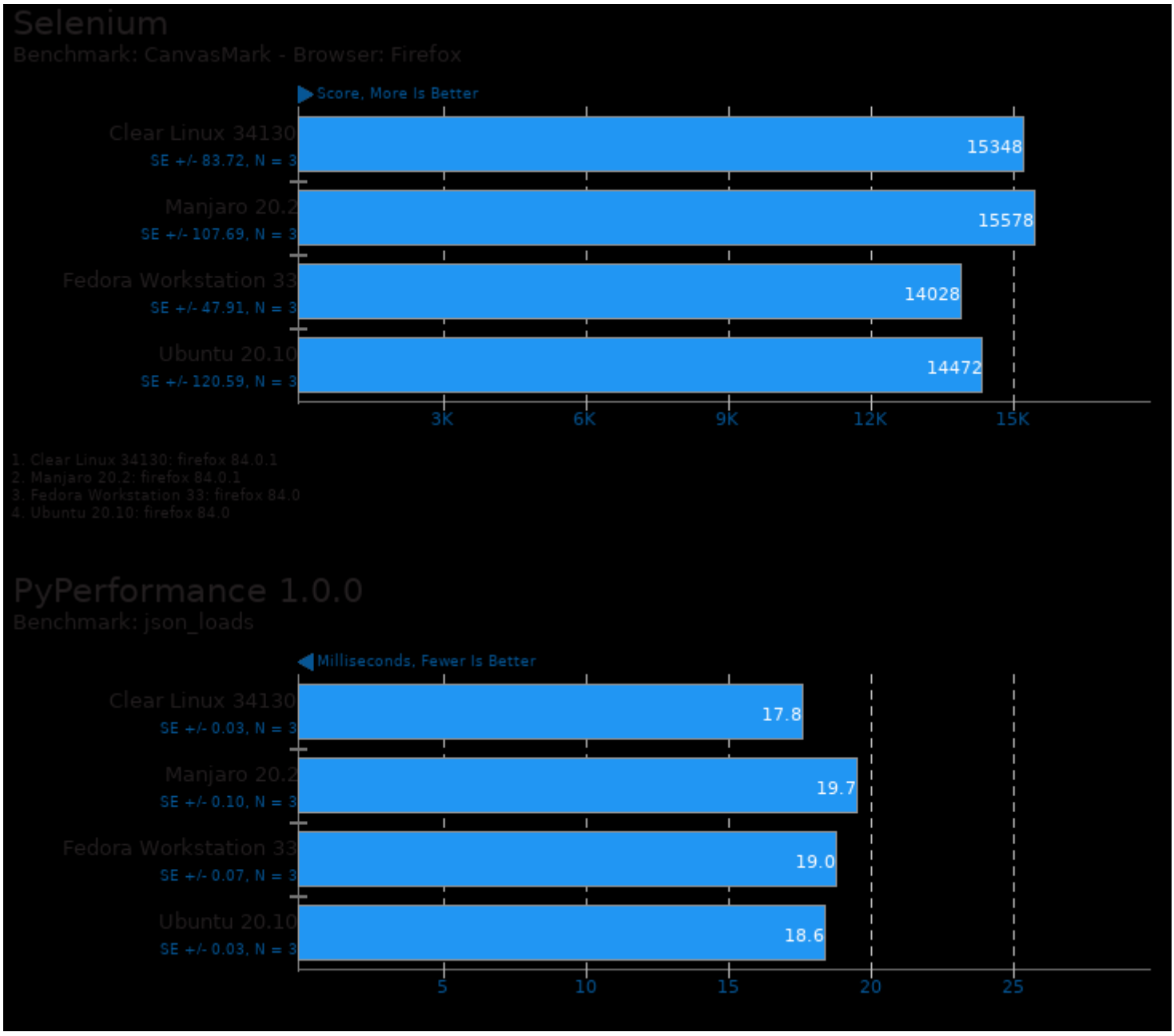
PyPerformance 1.0.0

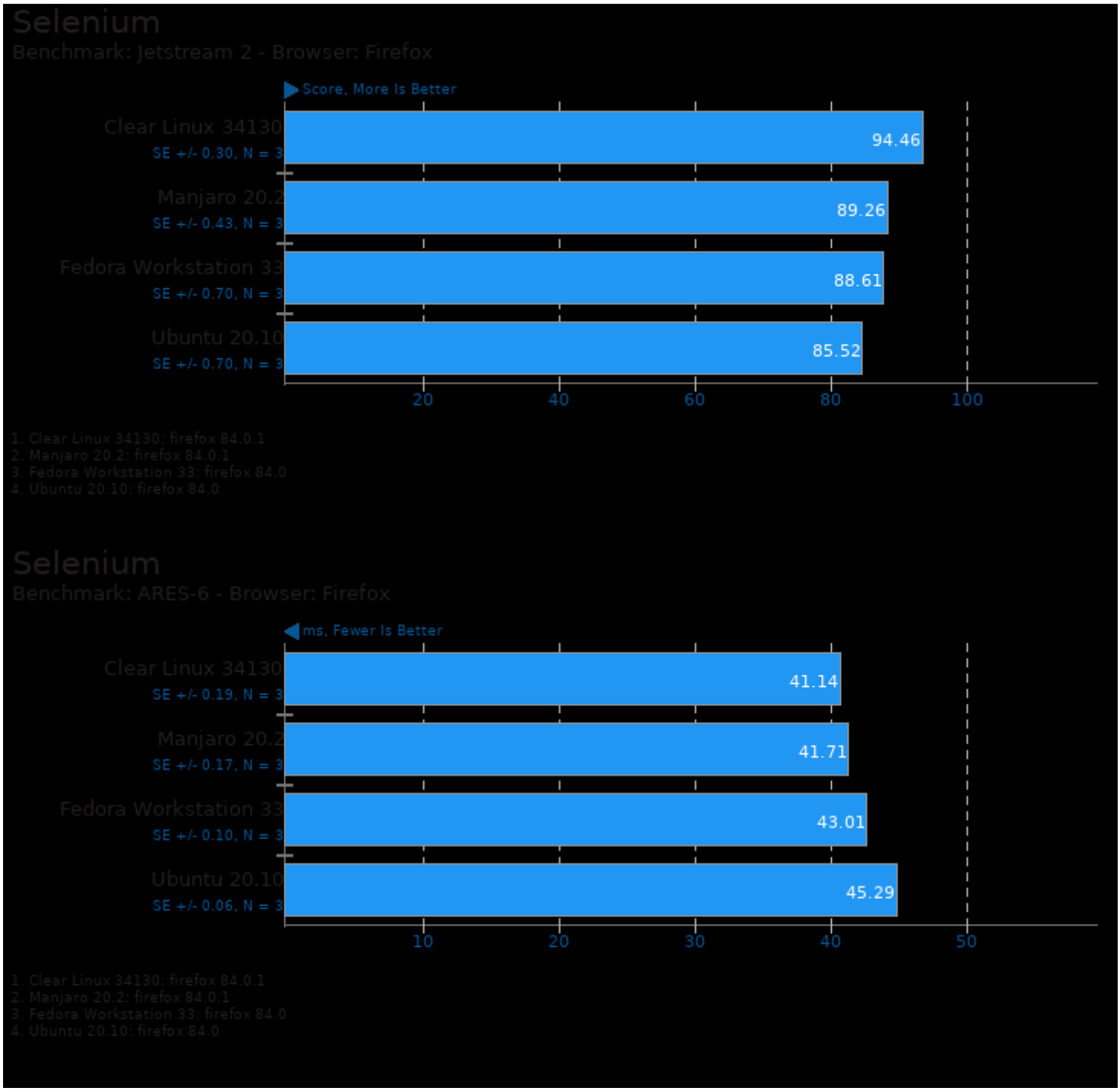
Benchmark: pathlib




SQLite Speedtest 3.30
Timed Time - Size 1,000
Seconds, Fewer Is Better
Clear Linux 34130
SE +/- 0.54, N = 4
-O3 -pipe -fexceptions -fstack-protector -m64 -flat-lto-objects -fno-trapping-math -mtune=skylake
49.50
Manjaro 20.2
SE +/- 0.07, N = 3
-O2
52.29
Fedora Workstation 33
SE +/- 0.70, N = 4
-O2
55.96
Ubuntu 20.10
SE +/- 0.39, N = 3
-O2
52.22
13
26
39
52
65
1. (CC) gcc options: -ldl -lz -lpthread
Timed Eigen Compilation 3.3.9
Time To Compile
Seconds, Fewer Is Better
Clear Linux 34130
SE +/- 0.21, N = 3
60.43
Manjaro 20.2
SE +/- 0.22, N = 3
66.73
Fedora Workstation 33
SE +/- 0.03, N = 3
61.02
Ubuntu 20.10
SE +/- 0.24, N = 3
67.98
15
30
45
60
75
PyPerformance 1.0.0
Benchmark: regex_compile
Milliseconds, Fewer Is Better
Clear Linux 34130
SE +/- 0.33, N = 3
132
Manjaro 20.2
SE +/- 1.00, N = 3
134
Fedora Workstation 33
SE +/- 0.33, N = 3
147
Ubuntu 20.10
SE +/- 1.33, N = 3
132
30
60
90
120
150

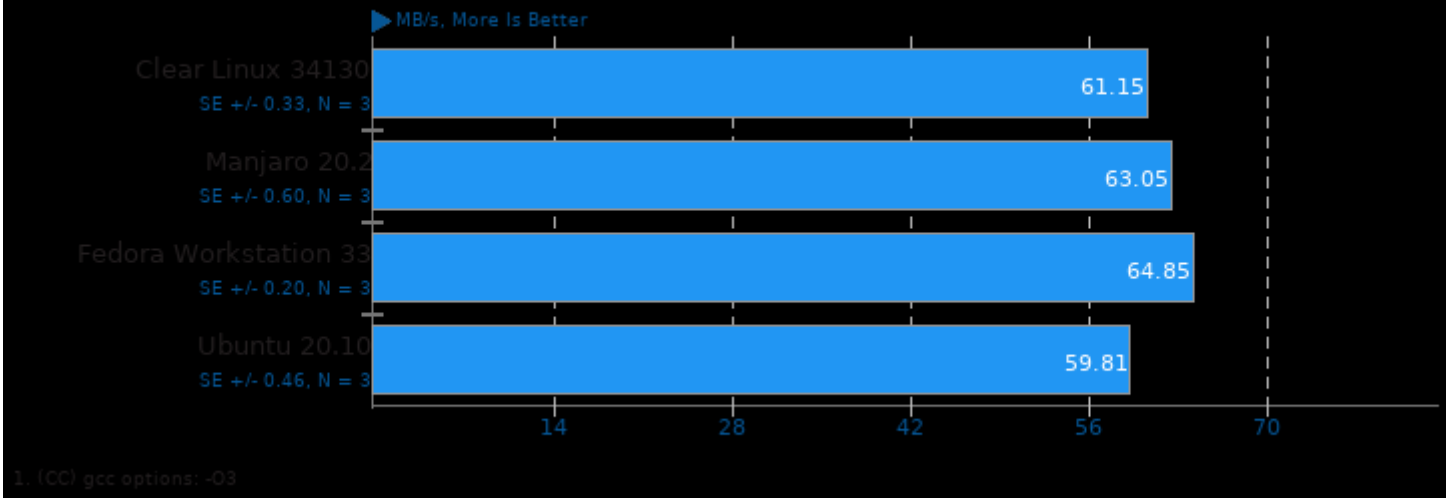
Clear Linux vs Other Distros - Tiger Lake




Selenium
Benchmark: Jetstream 2 - Browser: Firefox
Score, More Is Better
Clear Linux 34130
SE +/- 0.30, N = 3
94.46
Manjaro 20.2
SE +/- 0.43, N = 3
89.26
Fedora Workstation 33
SE +/- 0.70, N = 3
88.61
Ubuntu 20.10
SE +/- 0.70, N = 3
85.52
20
40
60
80
100
1. Clear Linux 34130: firefox 84.0.1
2. Manjaro 20.2: firefox 84.0.1
3. Fedora Workstation 33: firefox 84.0
4. Ubuntu 20.10: firefox 84.0
Selenium
Benchmark: ARES-6 - Browser: Firefox
ms, Fewer Is Better
Clear Linux 34130
SE +/- 0.19, N = 3
41.14
Manjaro 20.2
SE +/- 0.17, N = 3
41.71
Fedora Workstation 33
SE +/- 0.10, N = 3
43.01
Ubuntu 20.10
SE +/- 0.06, N = 3
45.29
10
20
30
40
50
1. Clear Linux 34130: firefox 84.0.1
2. Manjaro 20.2: firefox 84.0.1
3. Fedora Workstation 33: firefox 84.0
4. Ubuntu 20.10: firefox 84.0

LZ4 Compression 1.9.3

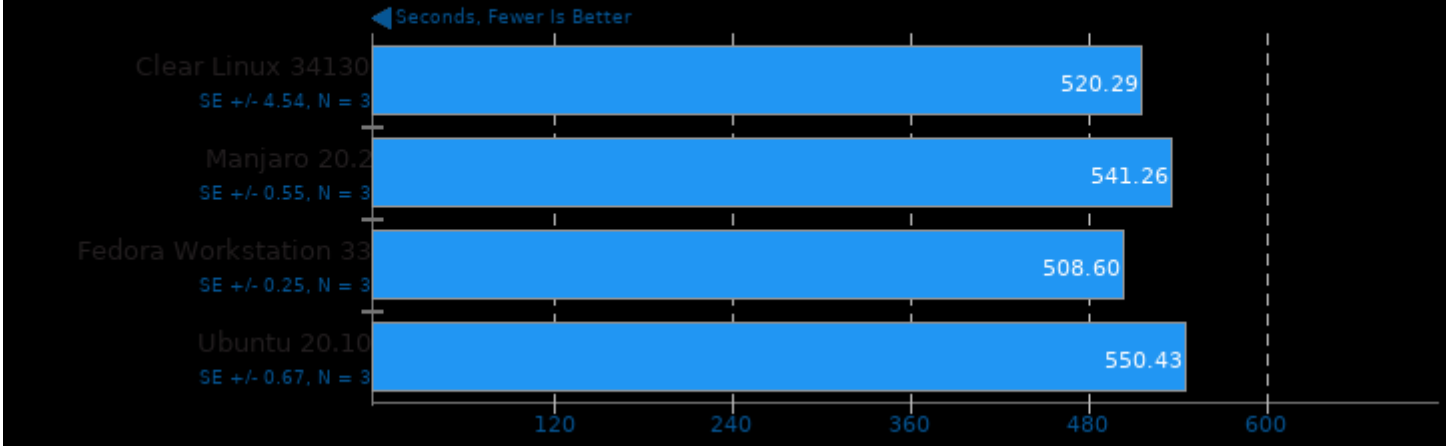
Compression Level: 3 - Compression Speed



1. (CC) gcc options: -O3

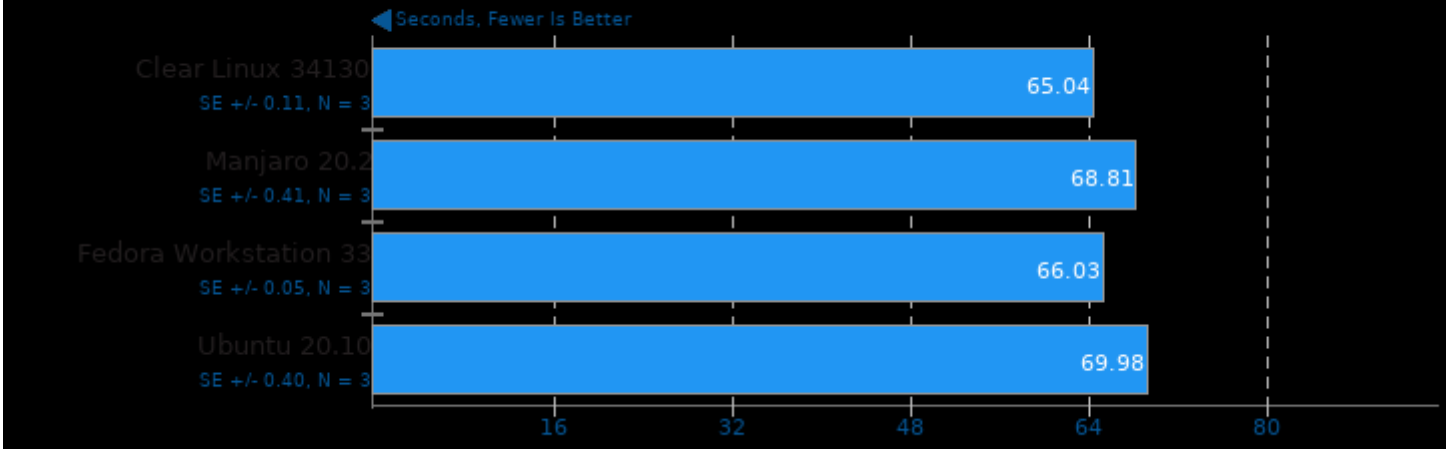
RealSR-NCNN 20200818

Scale: 4x - TAA: Yes

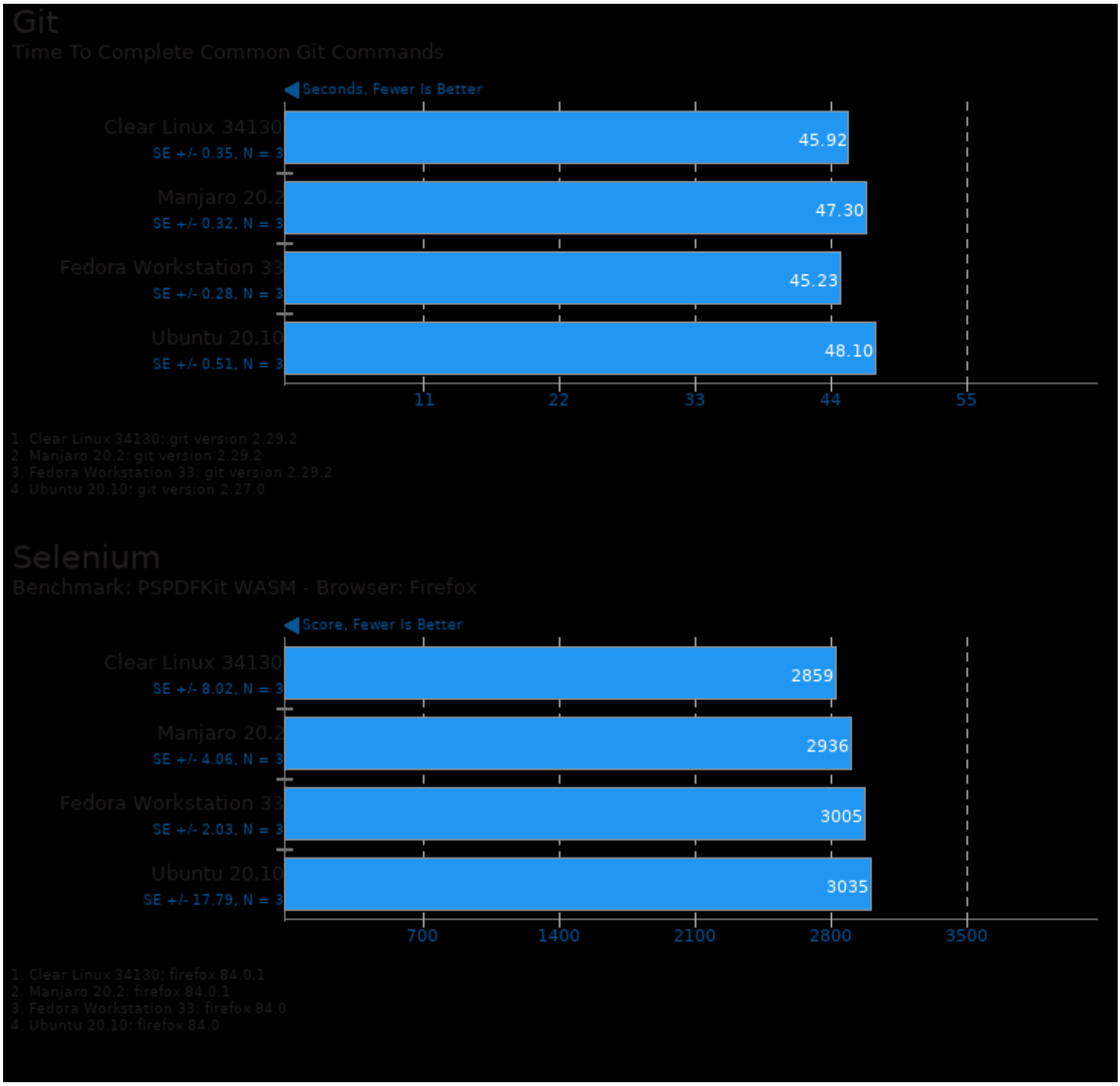


RealSR-NCNN 20200818

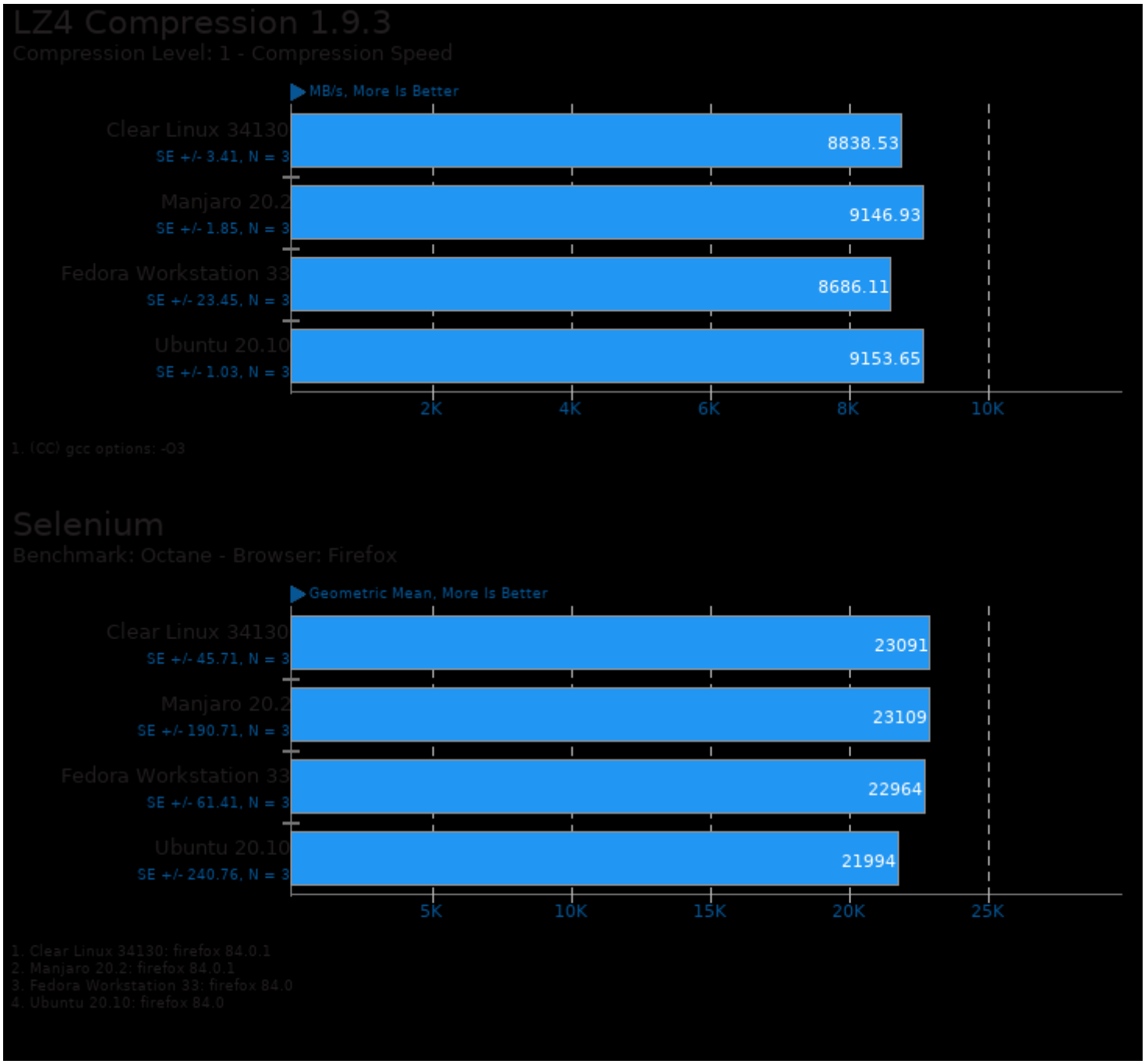
Scale: 4x - TAA: No



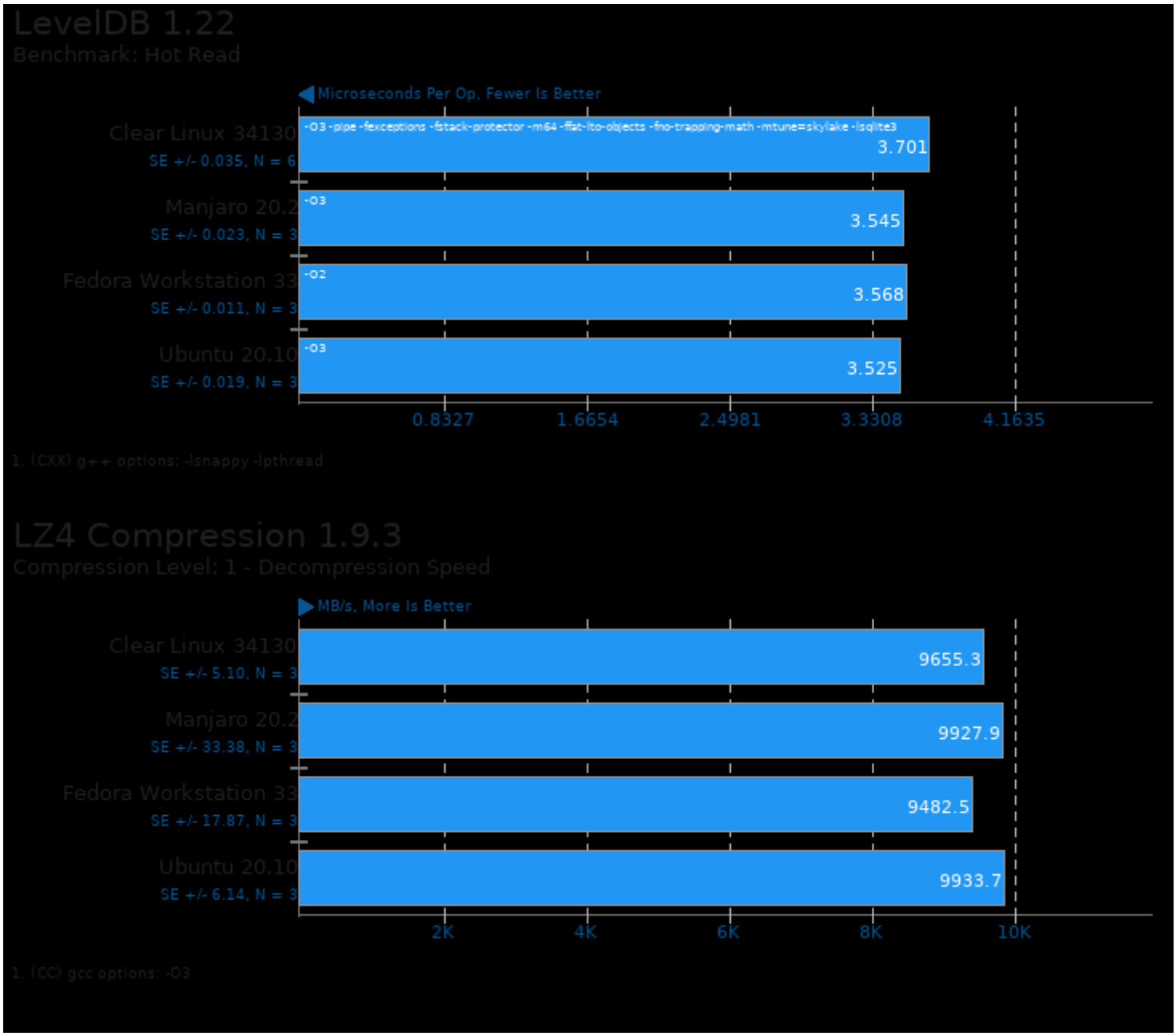
Clear Linux vs Other Distros - Tiger Lake



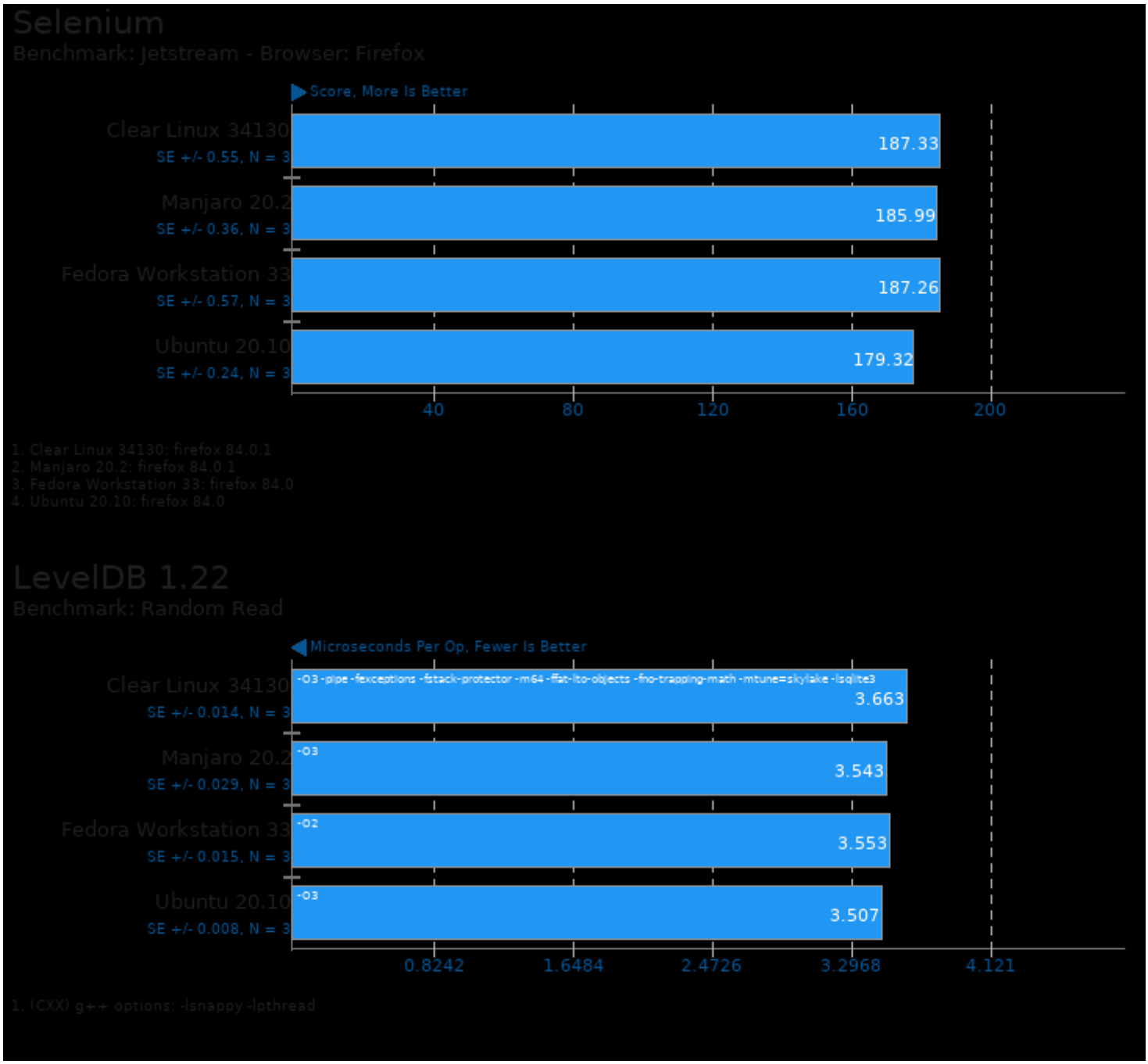
Clear Linux vs Other Distros - Tiger Lake

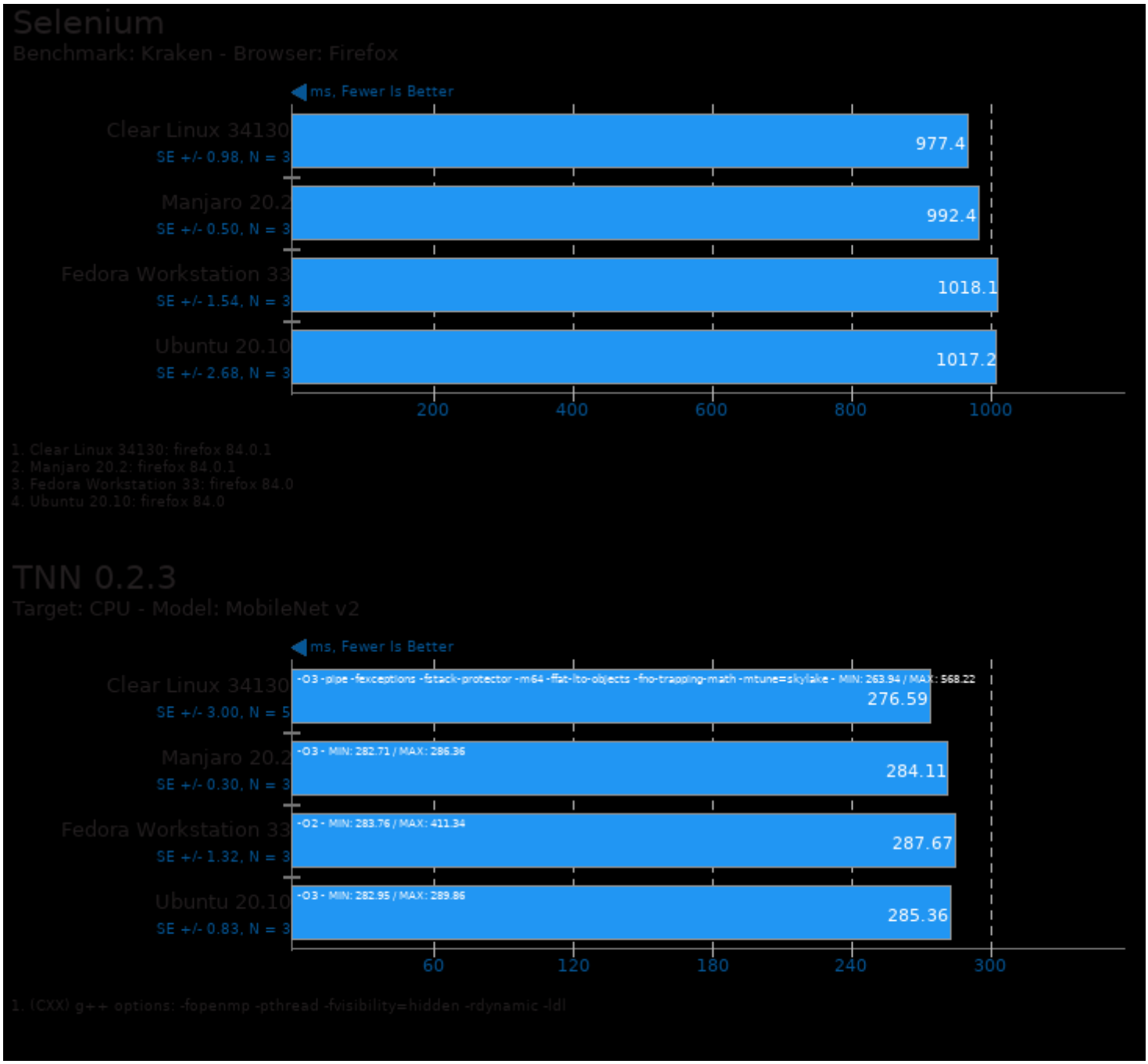


Clear Linux vs Other Distros - Tiger Lake

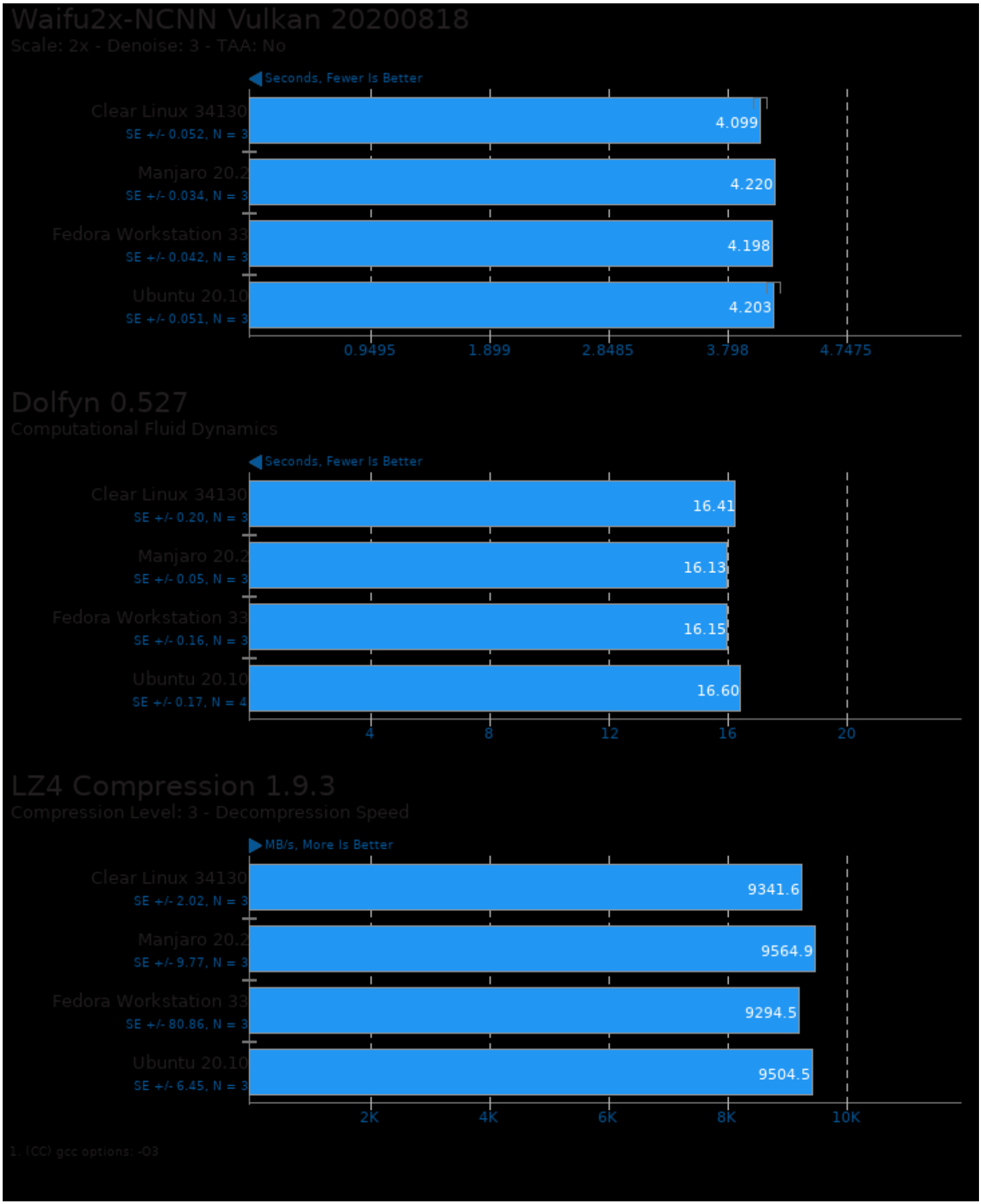


Clear Linux vs Other Distros - Tiger Lake



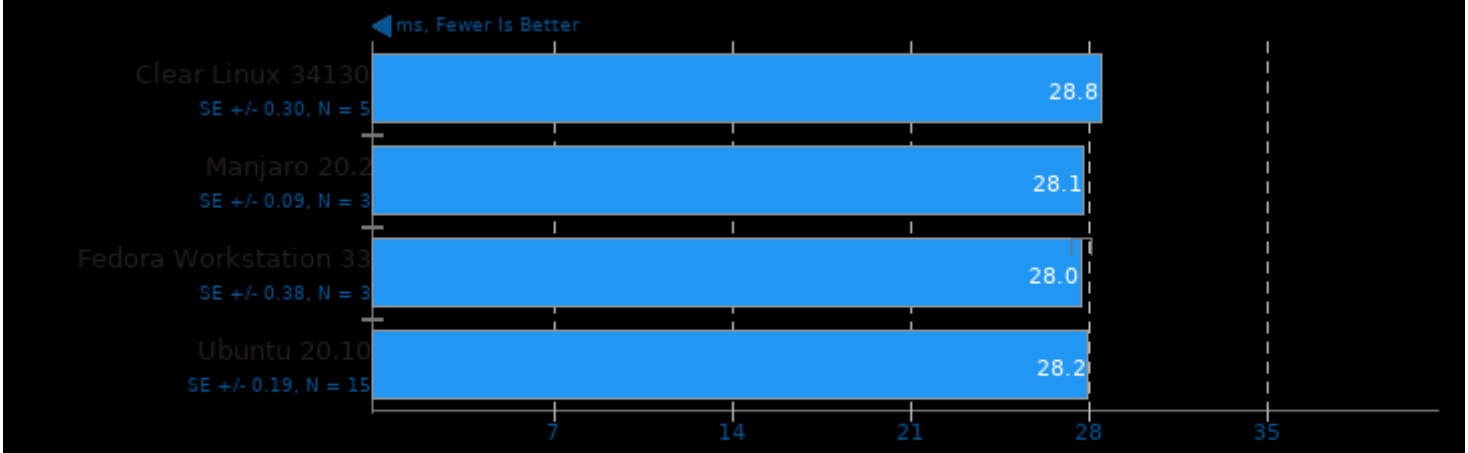

Selenium
Benchmark: Kraken - Browser: Firefox
ms, Fewer Is Better
Clear Linux 34130
SE +/- 0.98, N = 3
977.4
Manjaro 20.2
SE +/- 0.50, N = 3
992.4
Fedora Workstation 33
SE +/- 1.54, N = 3
1018.1
Ubuntu 20.10
SE +/- 2.68, N = 3
1017.2
200
400
600
800
1000
1. Clear Linux 34130: firefox 84.0.1
2. Manjaro 20.2: firefox 84.0.1
3. Fedora Workstation 33: firefox 84.0
4. Ubuntu 20.10: firefox 84.0
TNN 0.2.3
Target: CPU - Model: MobileNet v2
ms, Fewer Is Better
Clear Linux 34130
SE +/- 3.00, N = 5
-O3 -pipe -fexceptions -fstack-protector -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 263.94 / MAX: 568.22
276.59
Manjaro 20.2
SE +/- 0.30, N = 3
-O3 - MIN: 282.71 / MAX: 286.36
284.11
Fedora Workstation 33
SE +/- 1.32, N = 3
-O2 - MIN: 283.76 / MAX: 411.34
287.67
Ubuntu 20.10
SE +/- 0.83, N = 3
-O3 - MIN: 282.95 / MAX: 289.86
285.36
60
120
180
240
300
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -rdynamic -ldl

Clear Linux vs Other Distros - Tiger Lake



Selenium

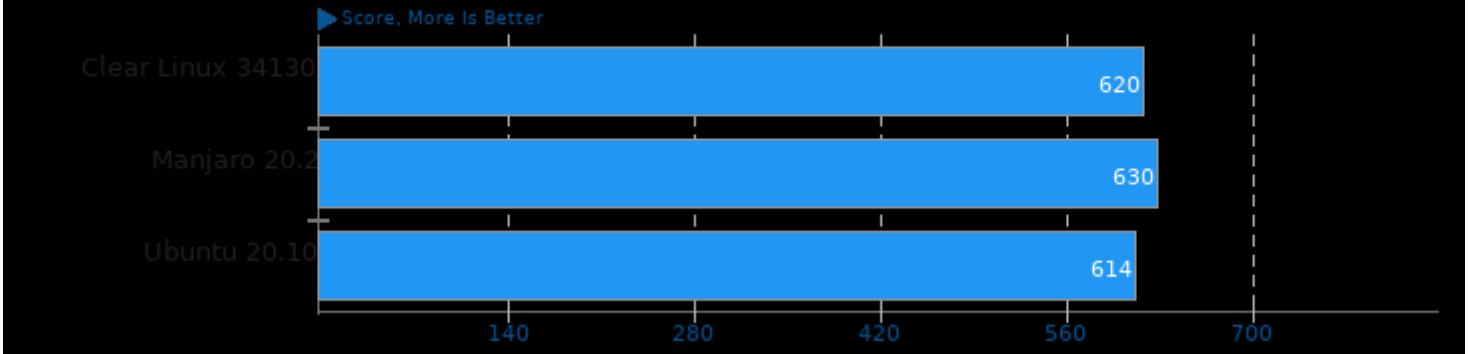
Benchmark: WASM imageConvolute - Browser: Firefox



1. Clear Linux 34130: firefox 84.0.1
2. Manjaro 20.2: firefox 84.0.1
3. Fedora Workstation 33: firefox 84.0
4. Ubuntu 20.10: firefox 84.0

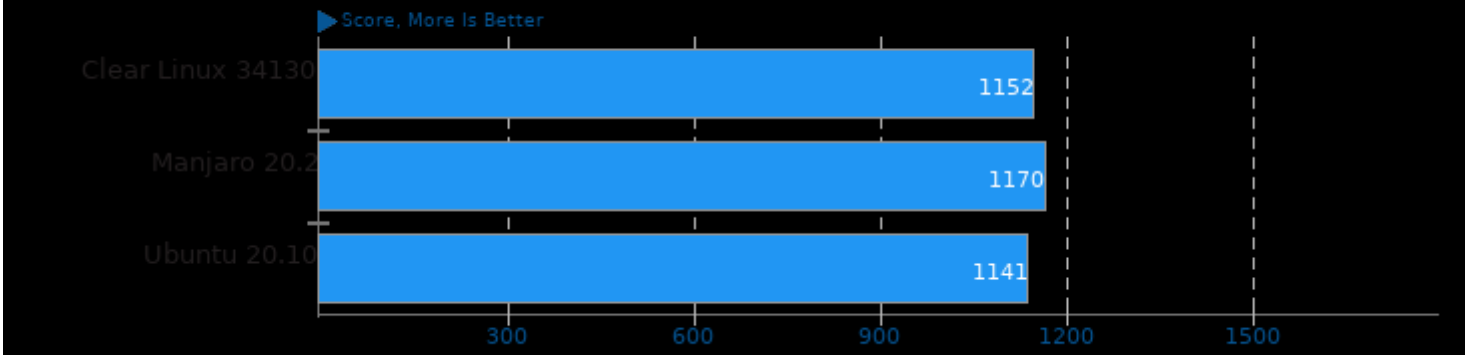
AI Benchmark Alpha 0.1.2

Device Training Score



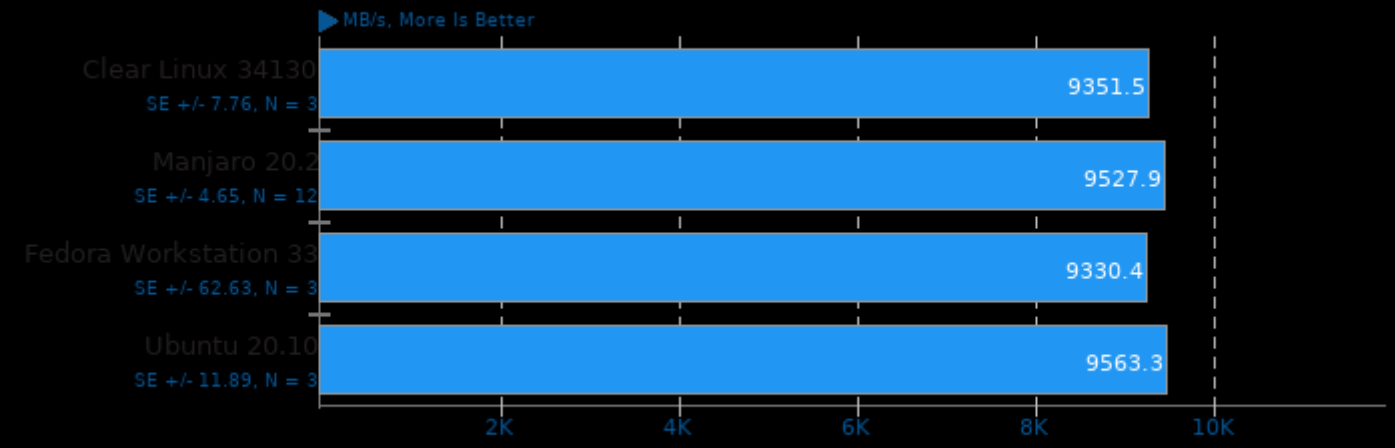
AI Benchmark Alpha 0.1.2

Device AI Score



LZ4 Compression 1.9.3

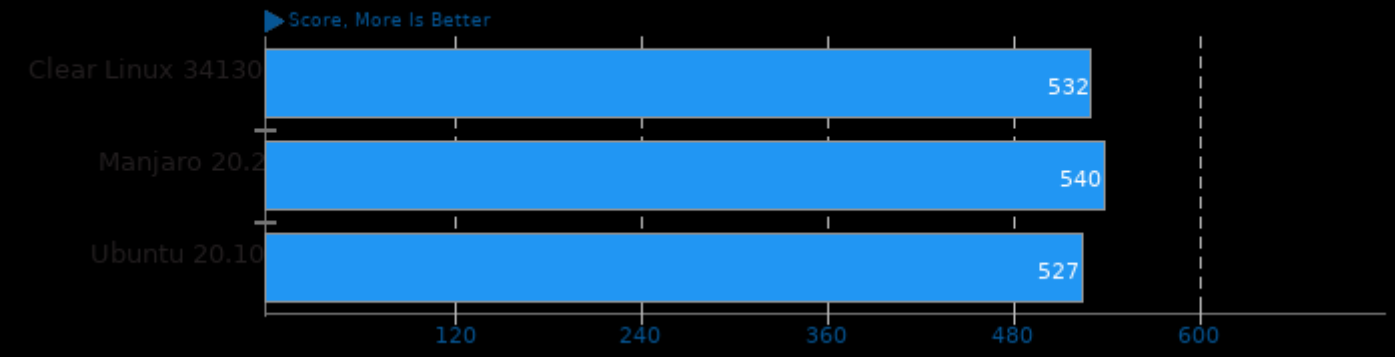
Compression Level: 9 - Decompression Speed



1. (CC) gcc options: -O3

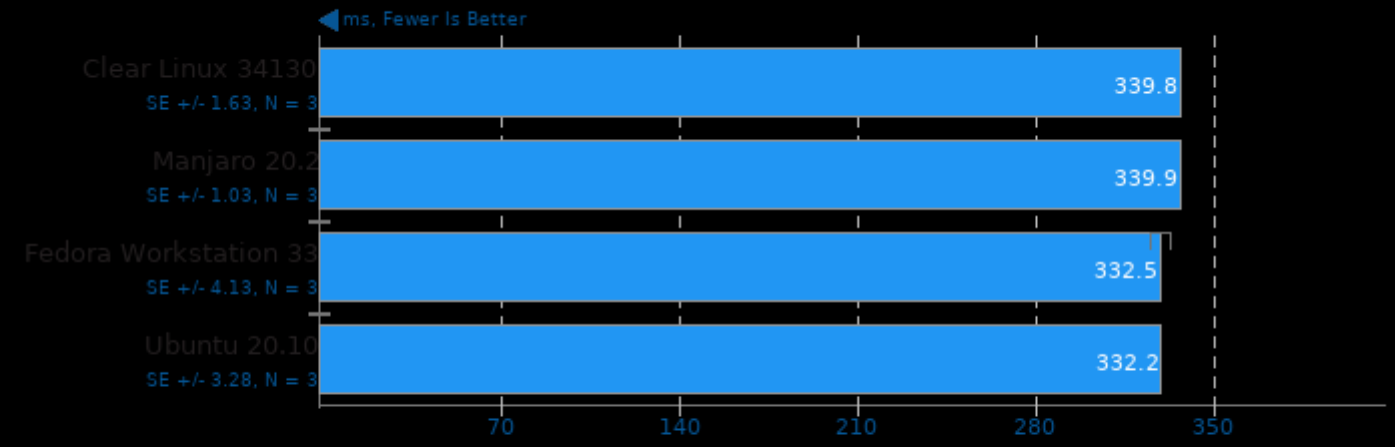
AI Benchmark Alpha 0.1.2

Device Inference Score



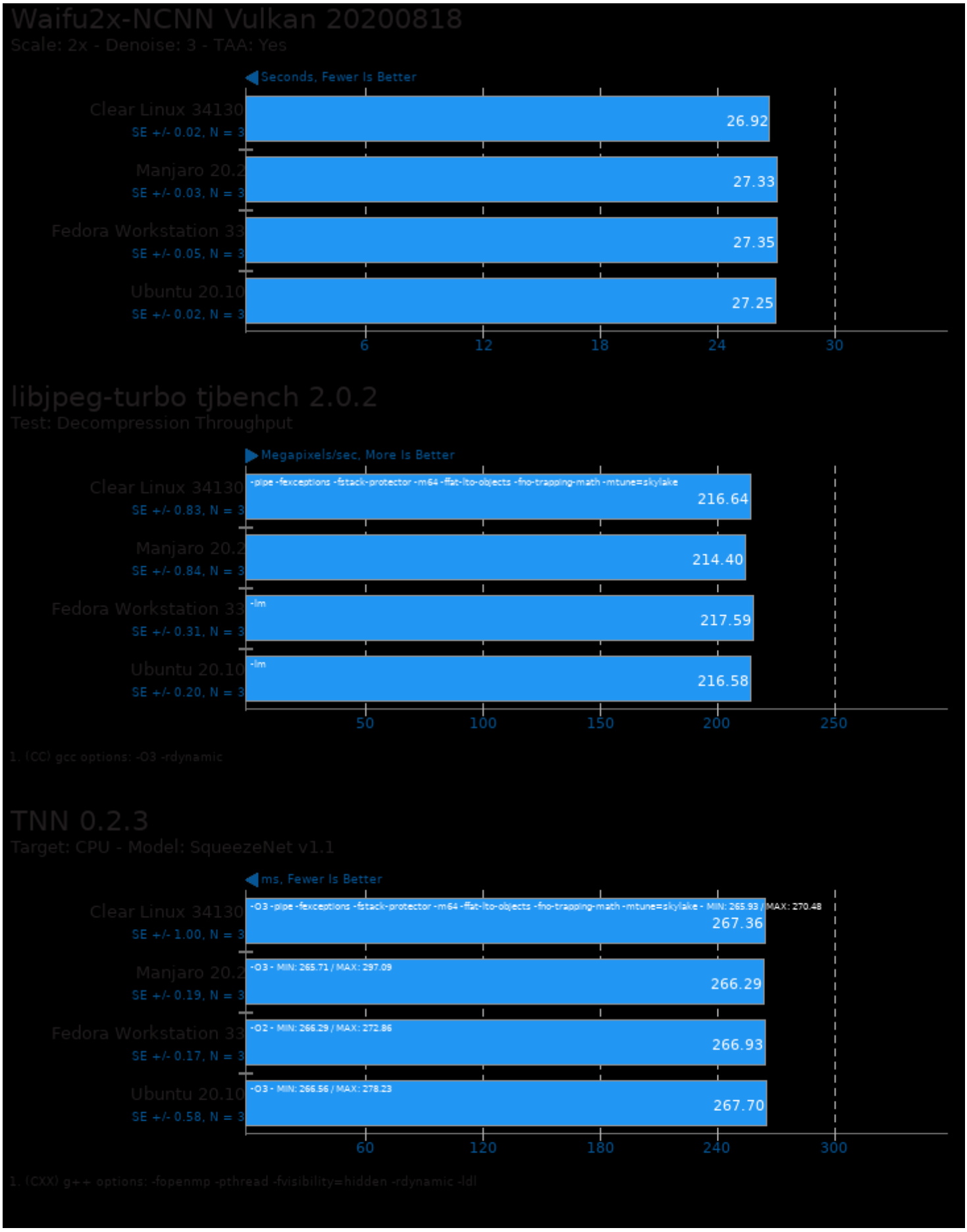
Selenium

Benchmark: WASM collisionDetection - Browser: Firefox



1. Clear Linux 34130: firefox 84.0.1
2. Manjaro 20.2: firefox 84.0.1
3. Fedora Workstation 33: firefox 84.0
4. Ubuntu 20.10: firefox 84.0

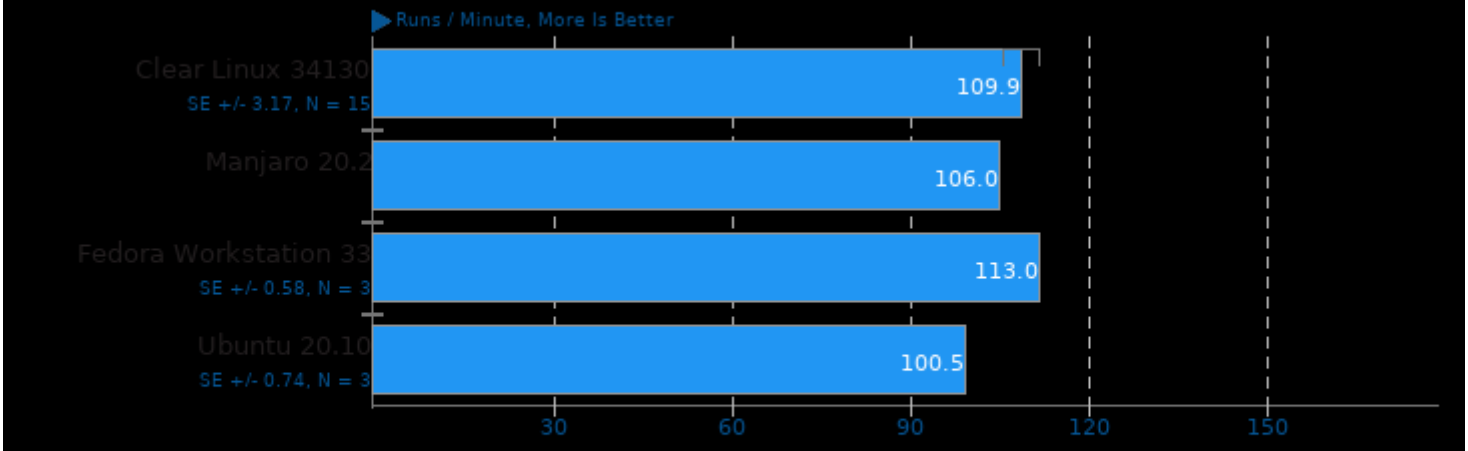
Clear Linux vs Other Distros - Tiger Lake



Clear Linux vs Other Distros - Tiger Lake

Selenium

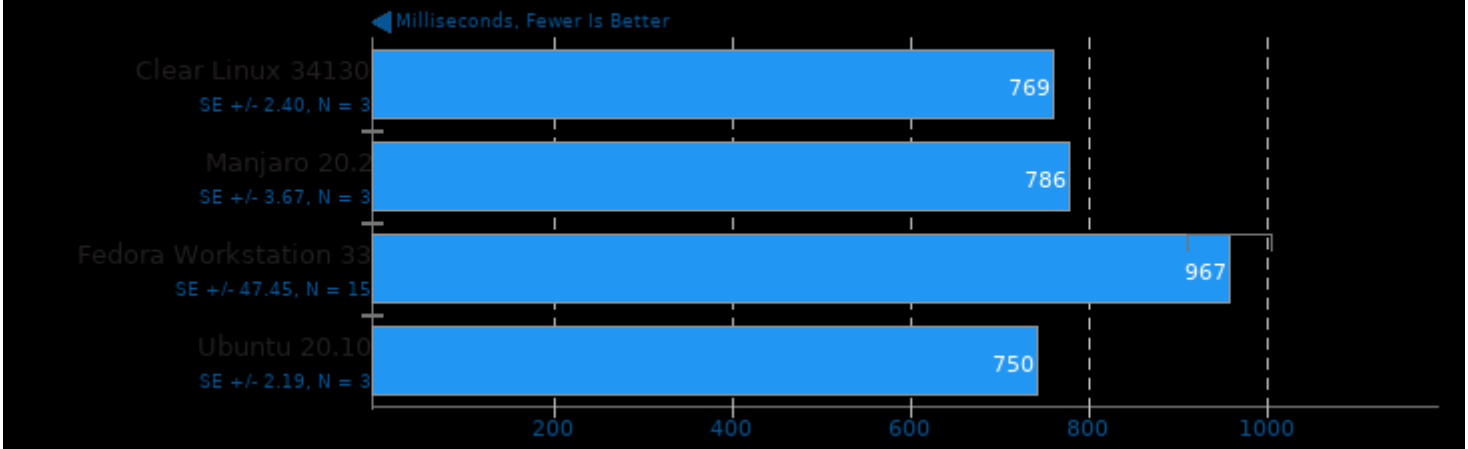
Benchmark: StyleBench - Browser: Firefox



1. Clear Linux 34130: firefox 84.0.1
2. Manjaro 20.2: firefox 84.0.1
3. Fedora Workstation 33: firefox 84.0
4. Ubuntu 20.10: firefox 84.0

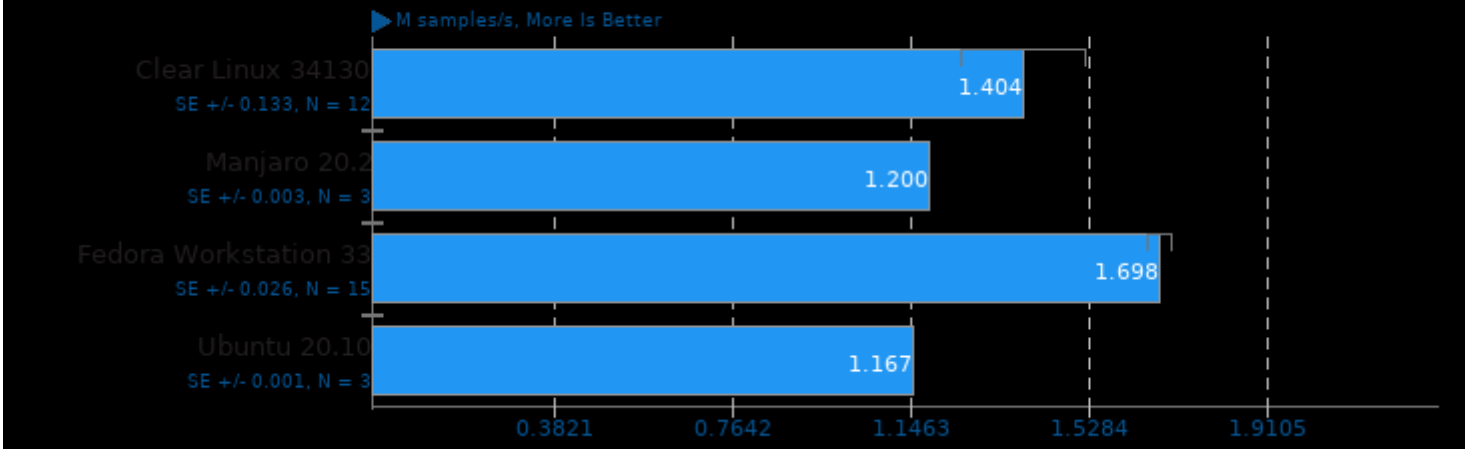
PyBench 2018-02-16

Total For Average Test Times



IndigoBench 4.4

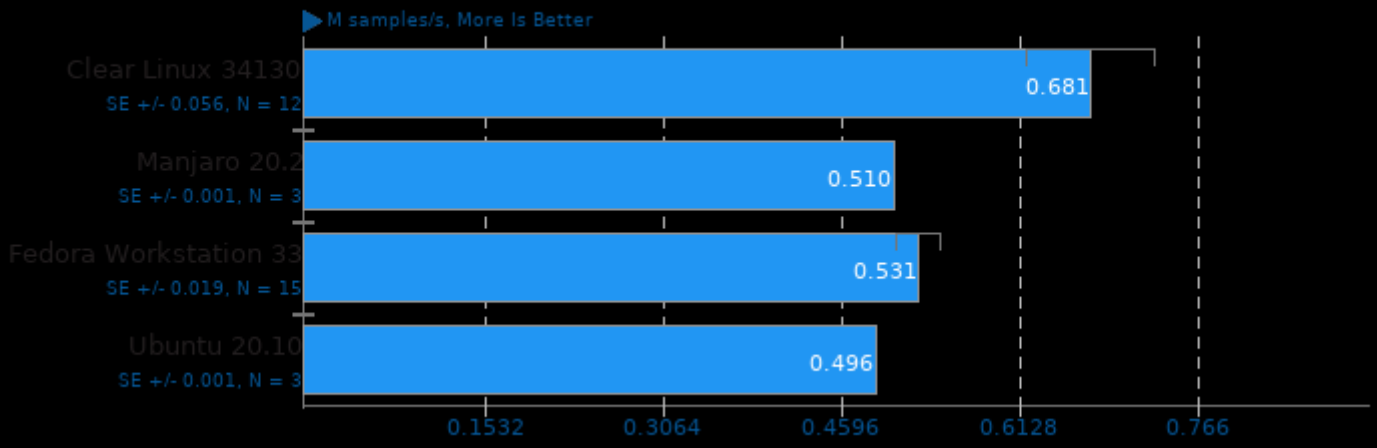
Acceleration: CPU - Scene: Supercar



Clear Linux vs Other Distros - Tiger Lake

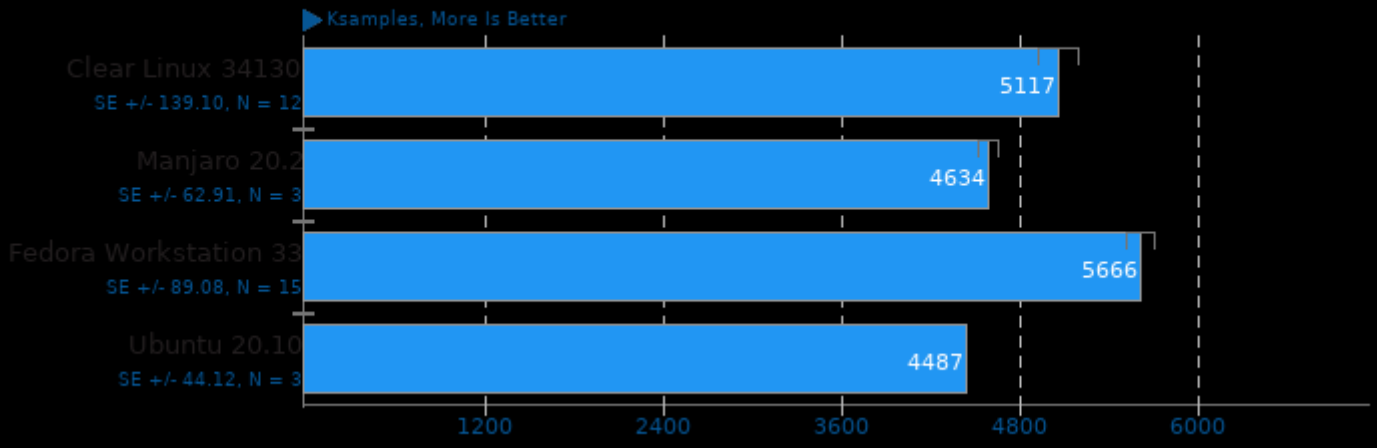
IndigoBench 4.4

Acceleration: CPU - Scene: Bedroom



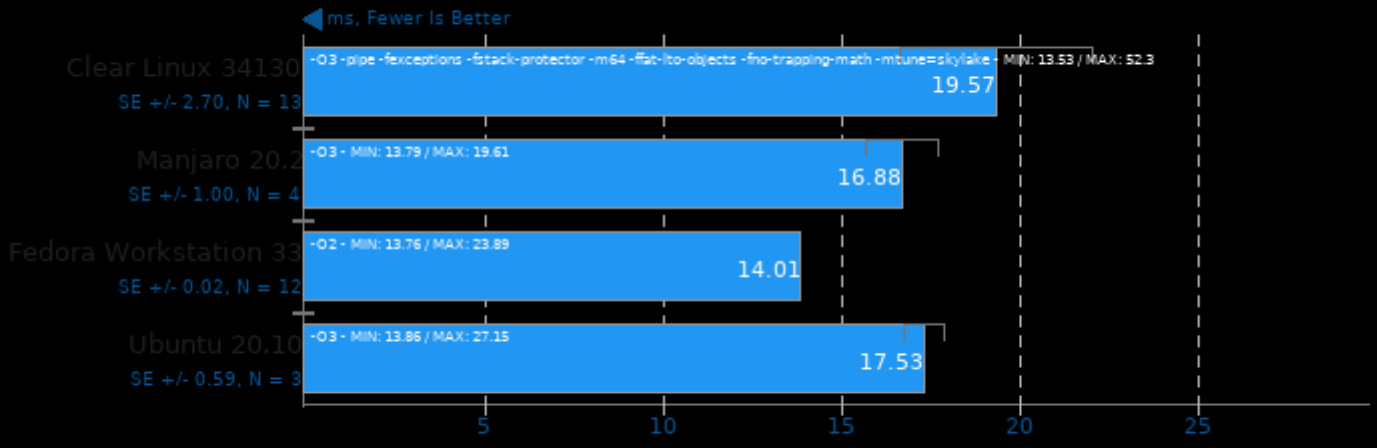
Chaos Group V-RAY 4.10.07

Mode: CPU

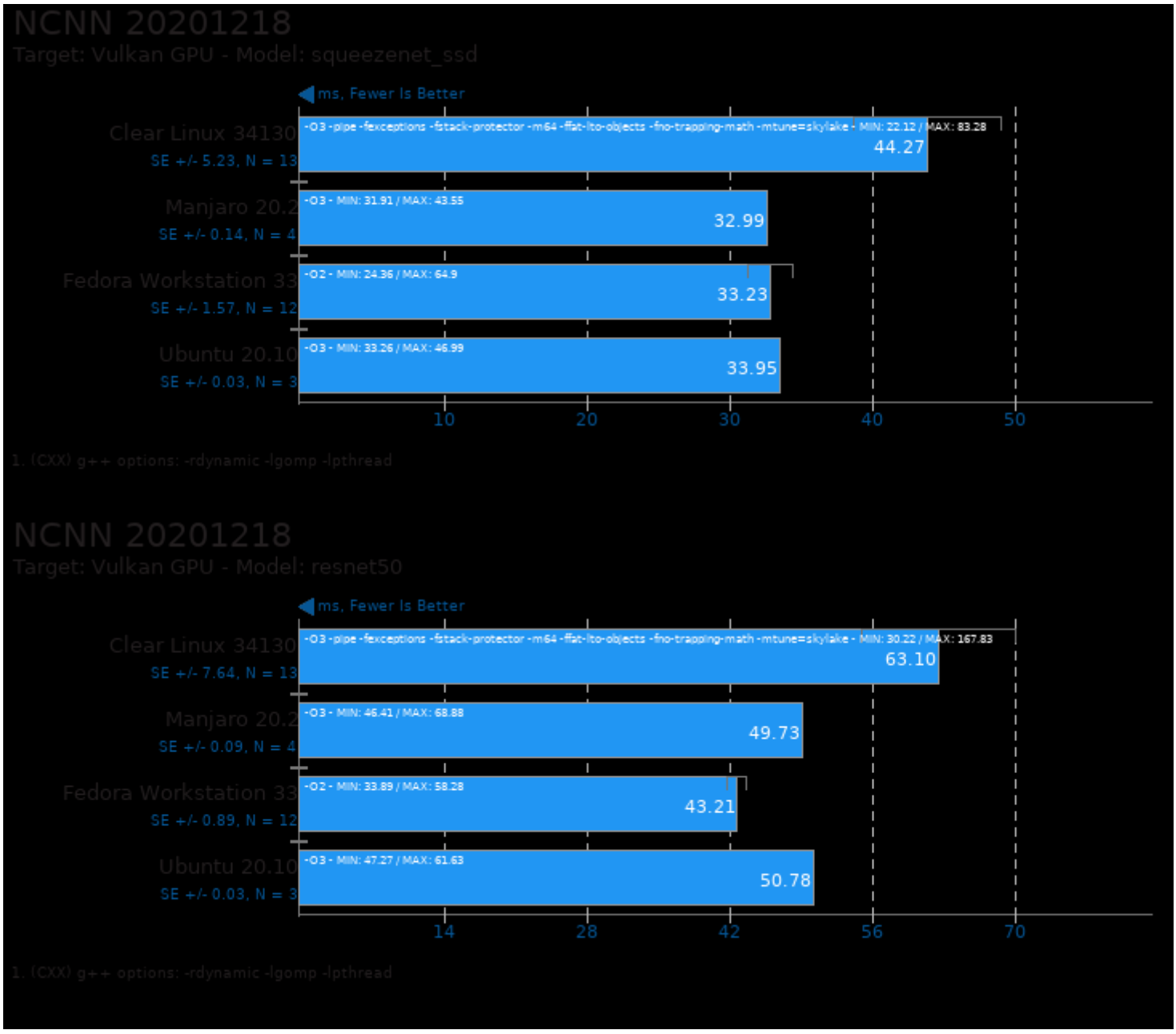


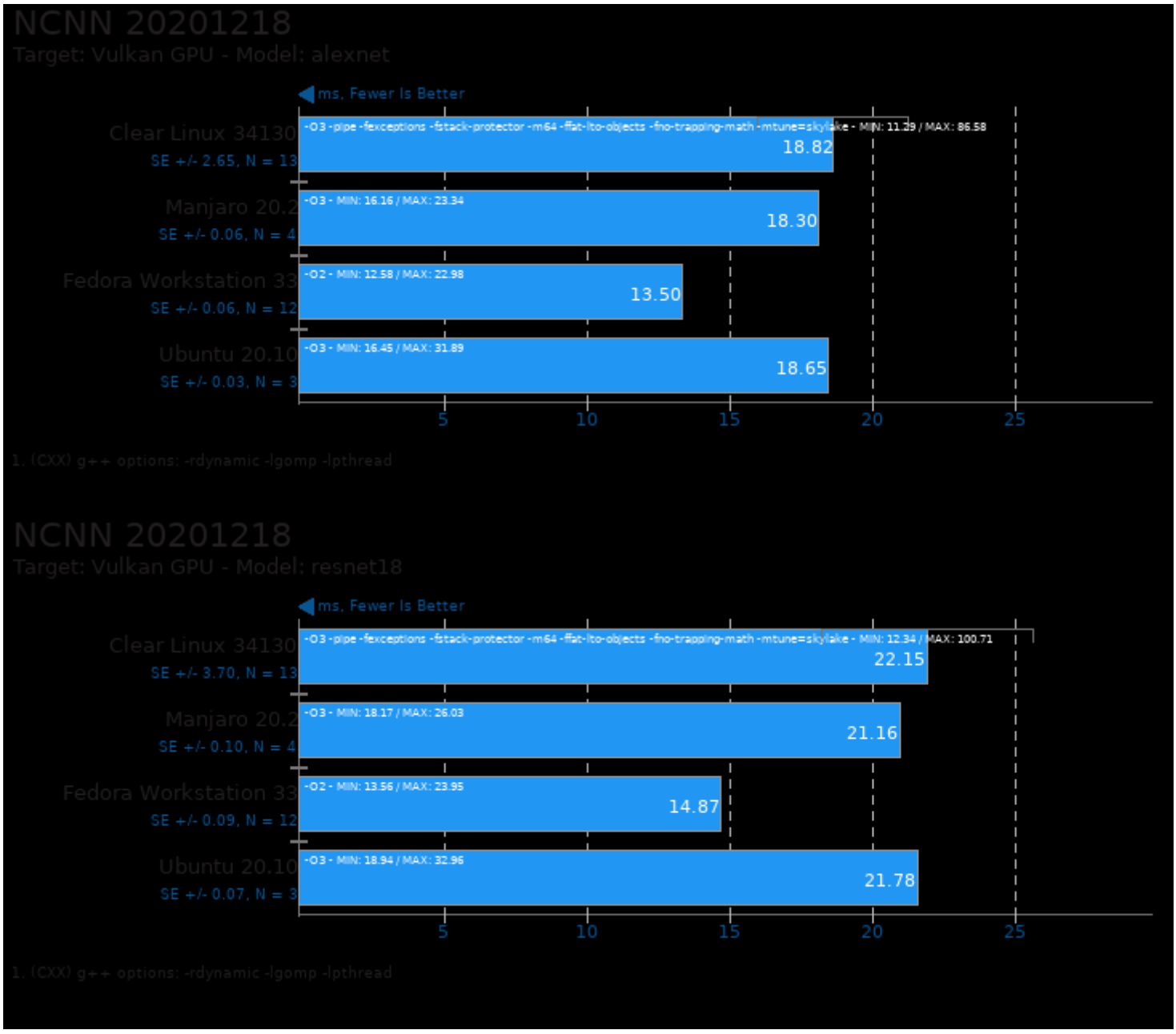
NCNN 20201218

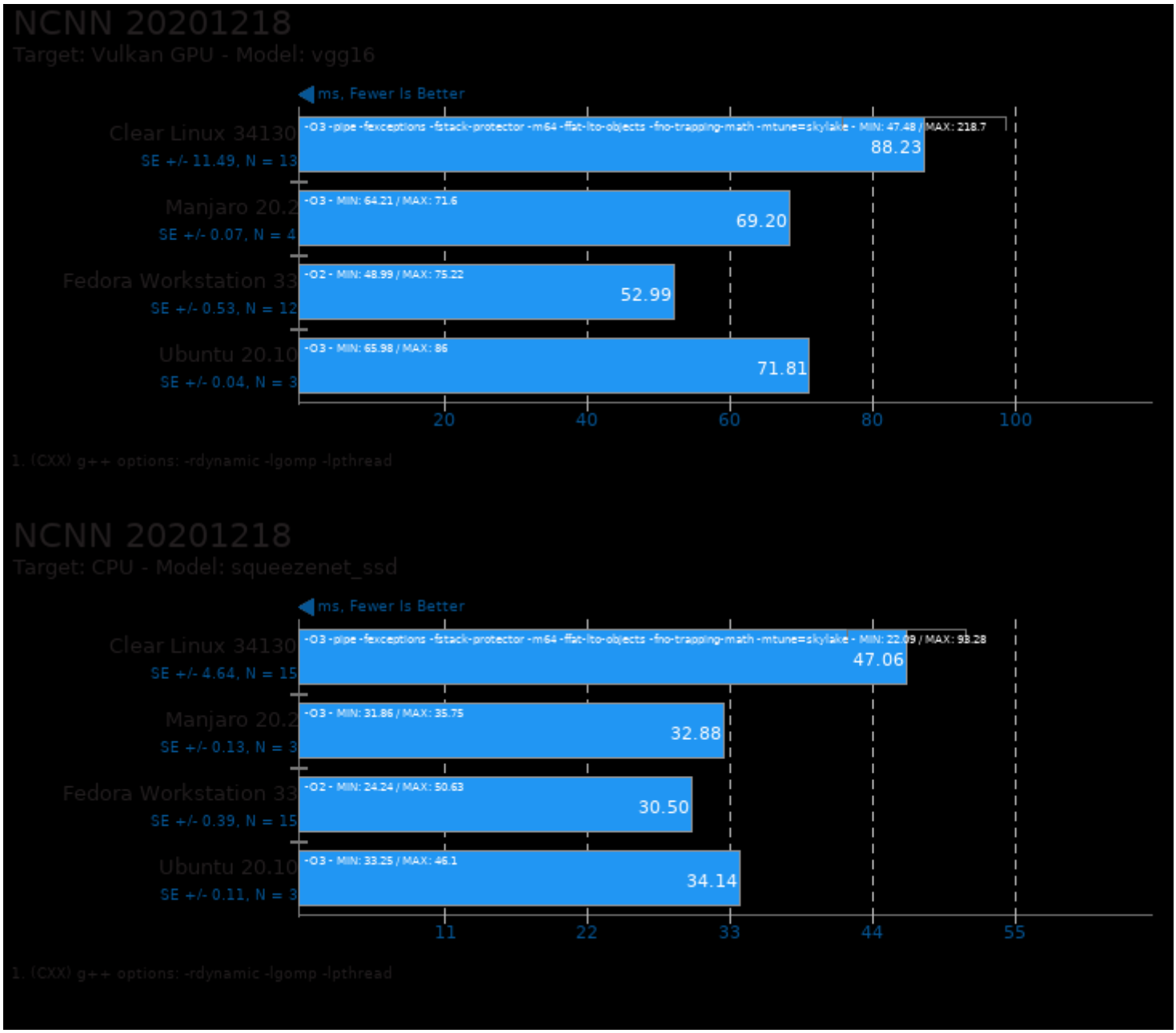
Target: Vulkan GPU - Model: regnety_400m

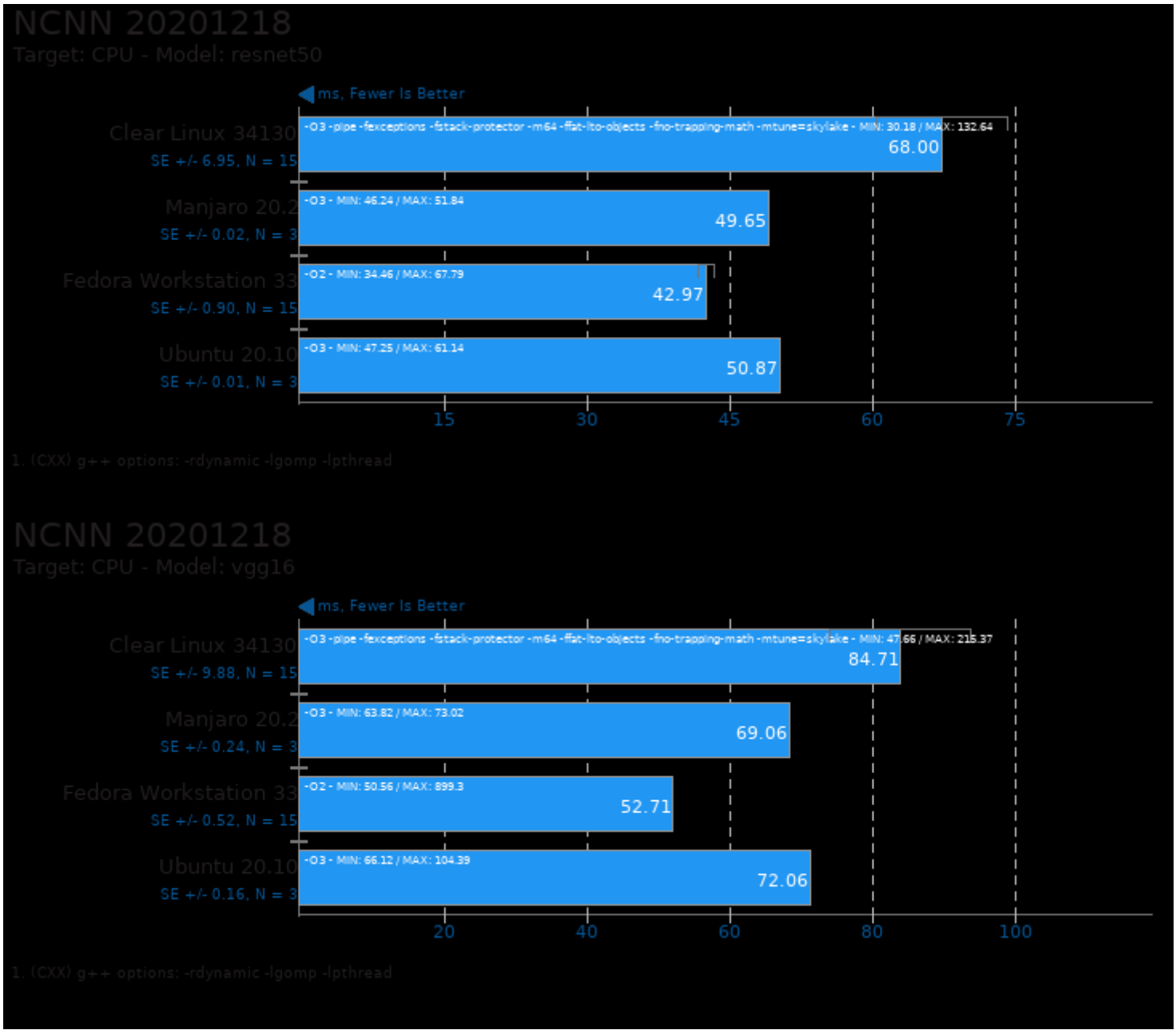


1. (CXX) g++ options: -rdynamic -lgomp -lpthread

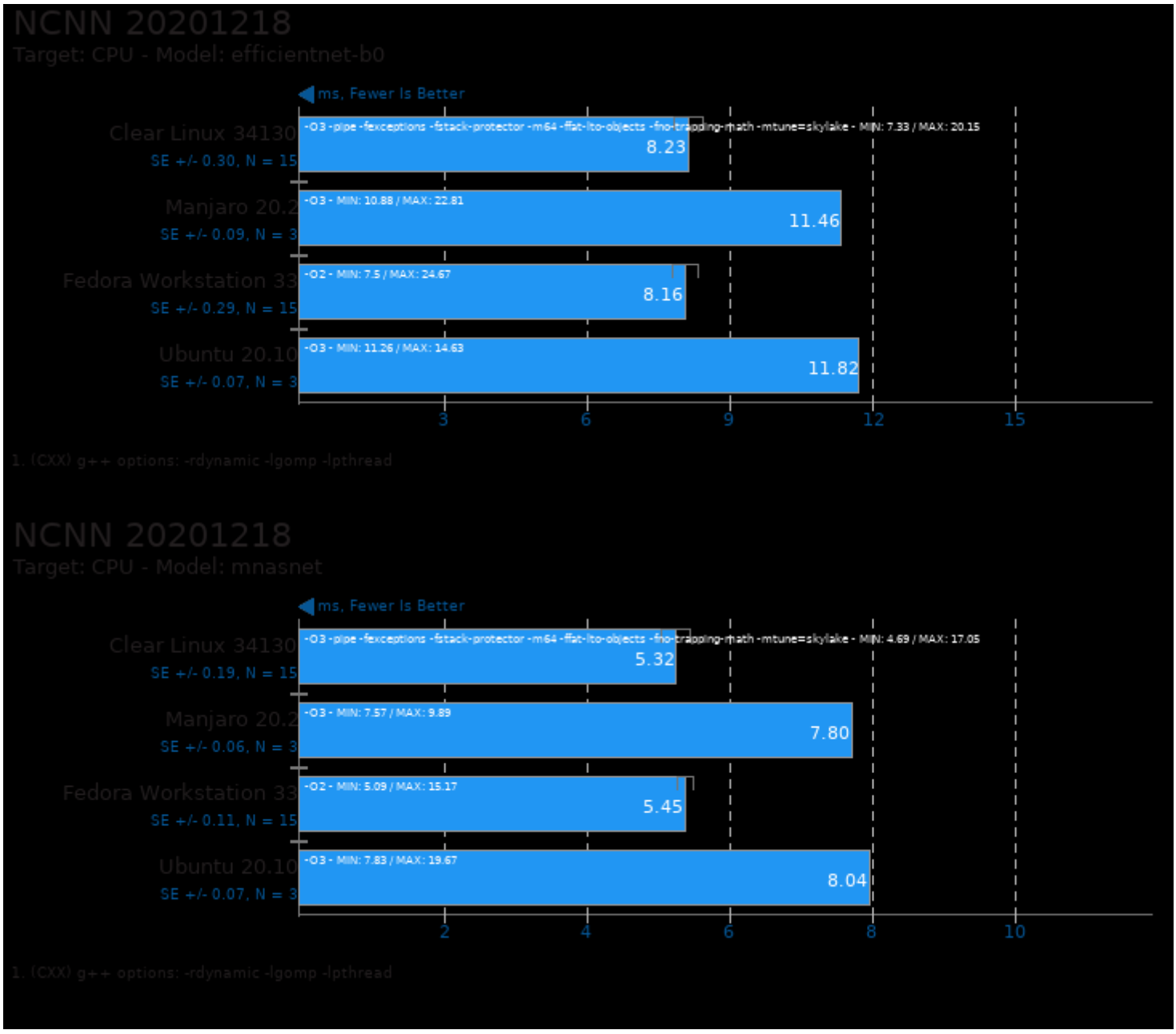

NCNN 20201218
Target: Vulkan GPU - Model: squeezenet_ssd
ms, Fewer Is Better
Clear Linux 34130
SE +/- 5.23, N = 13
-O3 -pipe -fexceptions -fstack-protector -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 22.12 / MAX: 83.28
44.27
Manjaro 20.2
SE +/- 0.14, N = 4
-O3 - MIN: 31.91 / MAX: 43.55
32.99
Fedora Workstation 33
SE +/- 1.57, N = 12
-O2 - MIN: 24.36 / MAX: 64.9
33.23
Ubuntu 20.10
SE +/- 0.03, N = 3
-O3 - MIN: 33.26 / MAX: 46.99
33.95
10
20
30
40
50
1. (CXX) g++ options: -rdynamic -lgomp -lpthread
NCNN 20201218
Target: Vulkan GPU - Model: resnet50
ms, Fewer Is Better
Clear Linux 34130
SE +/- 7.64, N = 13
-O3 -pipe -fexceptions -fstack-protector -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 30.22 / MAX: 167.83
63.10
Manjaro 20.2
SE +/- 0.09, N = 4
-O3 - MIN: 46.41 / MAX: 68.88
49.73
Fedora Workstation 33
SE +/- 0.89, N = 12
-O2 - MIN: 33.89 / MAX: 58.28
43.21
Ubuntu 20.10
SE +/- 0.03, N = 3
-O3 - MIN: 47.27 / MAX: 61.63
50.78
14
28
42
56
70
1. (CXX) g++ options: -rdynamic -lgomp -lpthread

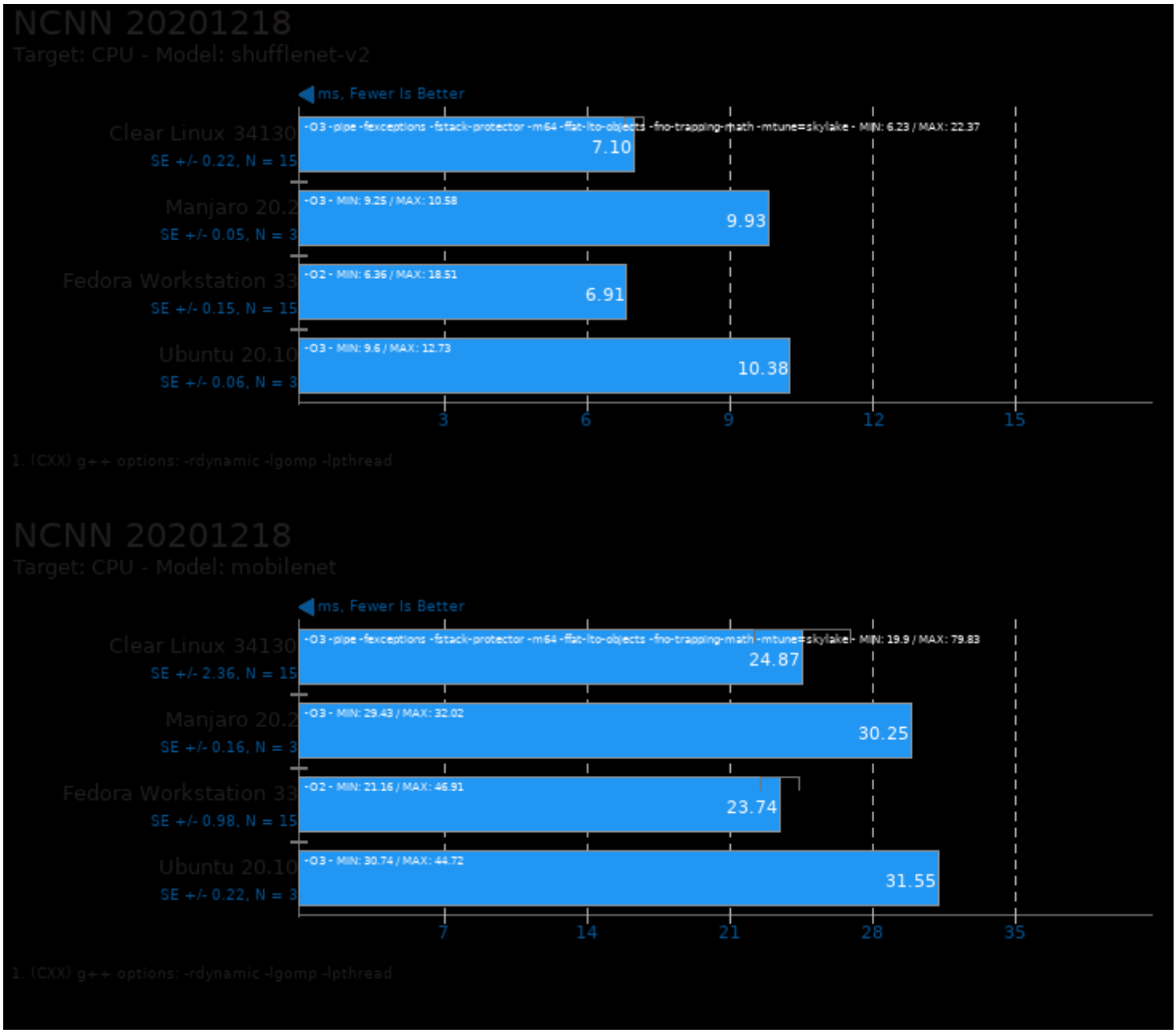

NCNN 20201218
Target: Vulkan GPU - Model: alexnet
ms, Fewer Is Better
Clear Linux 34130
SE +/- 2.65, N = 13
-O3 -pipe -fexceptions -fstack-protector -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 11.39 / MAX: 86.58
18.82
Manjaro 20.2
SE +/- 0.06, N = 4
-O3 - MIN: 16.16 / MAX: 23.34
18.30
Fedora Workstation 33
SE +/- 0.06, N = 12
-O2 - MIN: 12.58 / MAX: 22.98
13.50
Ubuntu 20.10
SE +/- 0.03, N = 3
-O3 - MIN: 16.45 / MAX: 31.89
18.65
5
10
15
20
25
1. (CXX) g++ options: -rdynamic -lgomp -lpthread
NCNN 20201218
Target: Vulkan GPU - Model: resnet18
ms, Fewer Is Better
Clear Linux 34130
SE +/- 3.70, N = 13
-O3 -pipe -fexceptions -fstack-protector -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 12.34 / MAX: 100.71
22.15
Manjaro 20.2
SE +/- 0.10, N = 4
-O3 - MIN: 18.17 / MAX: 26.03
21.16
Fedora Workstation 33
SE +/- 0.09, N = 12
-O2 - MIN: 13.56 / MAX: 23.95
14.87
Ubuntu 20.10
SE +/- 0.07, N = 3
-O3 - MIN: 18.94 / MAX: 32.96
21.78
5
10
15
20
25
1. (CXX) g++ options: -rdynamic -lgomp -lpthread


NCNN 20201218
Target: Vulkan GPU - Model: vgg16
ms, Fewer Is Better
Clear Linux 34130
SE +/- 11.49, N = 13
-O3 -pipe -fexceptions -fstack-protector -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 47.48 / MAX: 218.7
88.23
Manjaro 20.2
SE +/- 0.07, N = 4
-O3 - MIN: 64.21 / MAX: 71.6
69.20
Fedora Workstation 33
SE +/- 0.53, N = 12
-O2 - MIN: 48.99 / MAX: 75.22
52.99
Ubuntu 20.10
SE +/- 0.04, N = 3
-O3 - MIN: 65.98 / MAX: 86
71.81
20
40
60
80
100
1. (CXX) g++ options: -rdynamic -lgomp -lpthread
NCNN 20201218
Target: CPU - Model: squeezenet_ssd
ms, Fewer Is Better
Clear Linux 34130
SE +/- 4.64, N = 15
-O3 -pipe -fexceptions -fstack-protector -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 22.09 / MAX: 98.28
47.06
Manjaro 20.2
SE +/- 0.13, N = 3
-O3 - MIN: 31.86 / MAX: 35.75
32.88
Fedora Workstation 33
SE +/- 0.39, N = 15
-O2 - MIN: 24.24 / MAX: 50.63
30.50
Ubuntu 20.10
SE +/- 0.11, N = 3
-O3 - MIN: 33.25 / MAX: 46.1
34.14
11
22
33
44
55
1. (CXX) g++ options: -rdynamic -lgomp -lpthread


NCNN 20201218
Target: CPU - Model: resnet50
ms, Fewer Is Better
Clear Linux 34130
SE +/- 6.95, N = 15
-O3 -pipe -fexceptions -fstack-protector -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 30.18 / MAX: 132.64
68.00
Manjaro 20.2
SE +/- 0.02, N = 3
-O3 - MIN: 46.24 / MAX: 51.84
49.65
Fedora Workstation 33
SE +/- 0.90, N = 15
-O2 - MIN: 34.46 / MAX: 67.79
42.97
Ubuntu 20.10
SE +/- 0.01, N = 3
-O3 - MIN: 47.25 / MAX: 61.14
50.87
15
30
45
60
75
1. (CXX) g++ options: -rdynamic -lgomp -lpthread
NCNN 20201218
Target: CPU - Model: vgg16
ms, Fewer Is Better
Clear Linux 34130
SE +/- 9.88, N = 15
-O3 -pipe -fexceptions -fstack-protector -m64 -ffat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 47.66 / MAX: 215.37
84.71
Manjaro 20.2
SE +/- 0.24, N = 3
-O3 - MIN: 63.82 / MAX: 73.02
69.06
Fedora Workstation 33
SE +/- 0.52, N = 15
-O2 - MIN: 50.56 / MAX: 899.3
52.71
Ubuntu 20.10
SE +/- 0.16, N = 3
-O3 - MIN: 66.12 / MAX: 104.39
72.06
20
40
60
80
100
1. (CXX) g++ options: -rdynamic -lgomp -lpthread

Clear Linux vs Other Distros - Tiger Lake

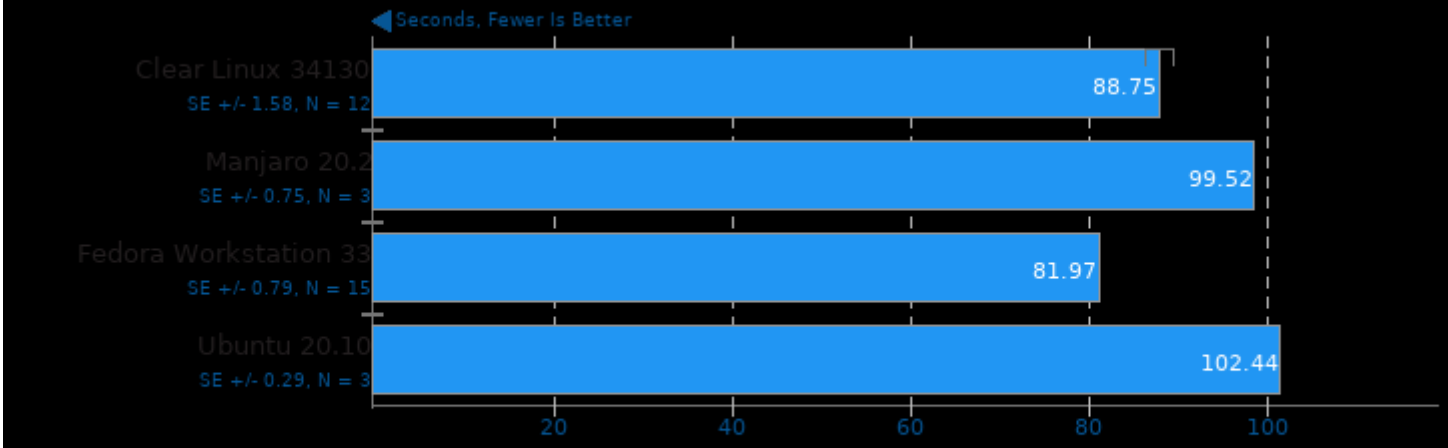



NCNN 20201218
Target: CPU - Model: shufflenet-v2
ms, Fewer Is Better
Clear Linux 34130
SE +/- 0.22, N = 15
-O3 -pipe -fexceptions -fstack-protector -m64 -flat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 6.23 / MAX: 22.37
7.10
Manjaro 20.2
SE +/- 0.05, N = 3
-O3 - MIN: 9.25 / MAX: 10.58
9.93
Fedora Workstation 33
SE +/- 0.15, N = 15
-O2 - MIN: 6.36 / MAX: 18.51
6.91
Ubuntu 20.10
SE +/- 0.06, N = 3
-O3 - MIN: 9.6 / MAX: 12.73
10.38
3
6
9
12
15
1. (CXX) g++ options: -rdynamic -lgomp -lpthread
NCNN 20201218
Target: CPU - Model: mobilenet
ms, Fewer Is Better
Clear Linux 34130
SE +/- 2.36, N = 15
-O3 -pipe -fexceptions -fstack-protector -m64 -flat-lto-objects -fno-trapping-math -mtune=skylake - MIN: 19.9 / MAX: 79.83
24.87
Manjaro 20.2
SE +/- 0.16, N = 3
-O3 - MIN: 29.43 / MAX: 32.02
30.25
Fedora Workstation 33
SE +/- 0.98, N = 15
-O2 - MIN: 21.16 / MAX: 46.91
23.74
Ubuntu 20.10
SE +/- 0.22, N = 3
-O3 - MIN: 30.74 / MAX: 44.72
31.55
7
14
21
28
35
1. (CXX) g++ options: -rdynamic -lgomp -lpthread

Clear Linux vs Other Distros - Tiger Lake

RawTherapee

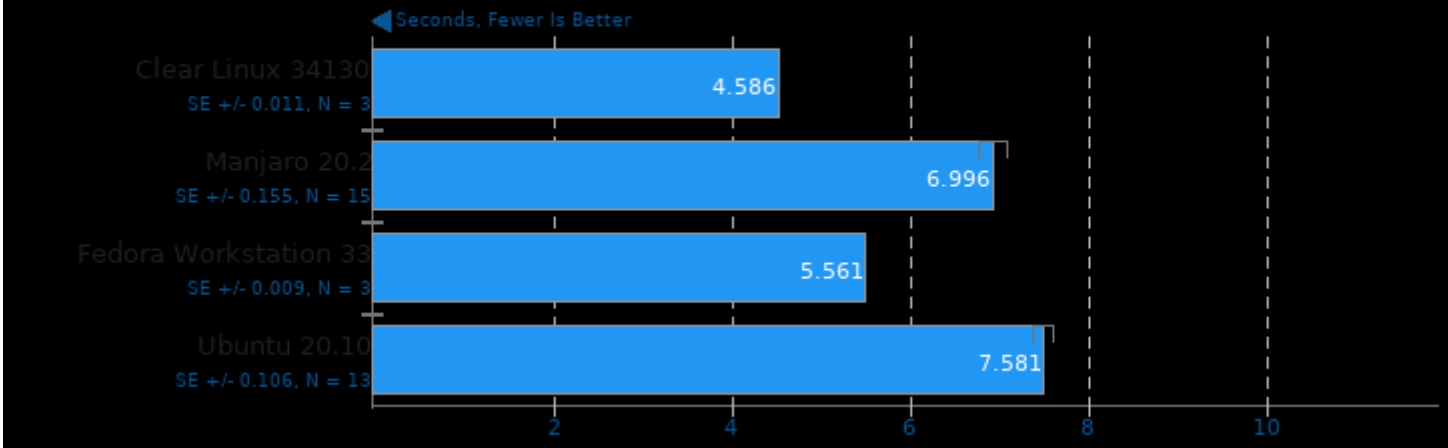
Total Benchmark Time



1. Clear Linux 34130: RawTherapee, version , command line.
2. Manjaro 20.2: RawTherapee, version 5.8, command line.
3. Fedora Workstation 33: RawTherapee, version 5.8, command line.
4. Ubuntu 20.10: RawTherapee, version 5.8, command line.

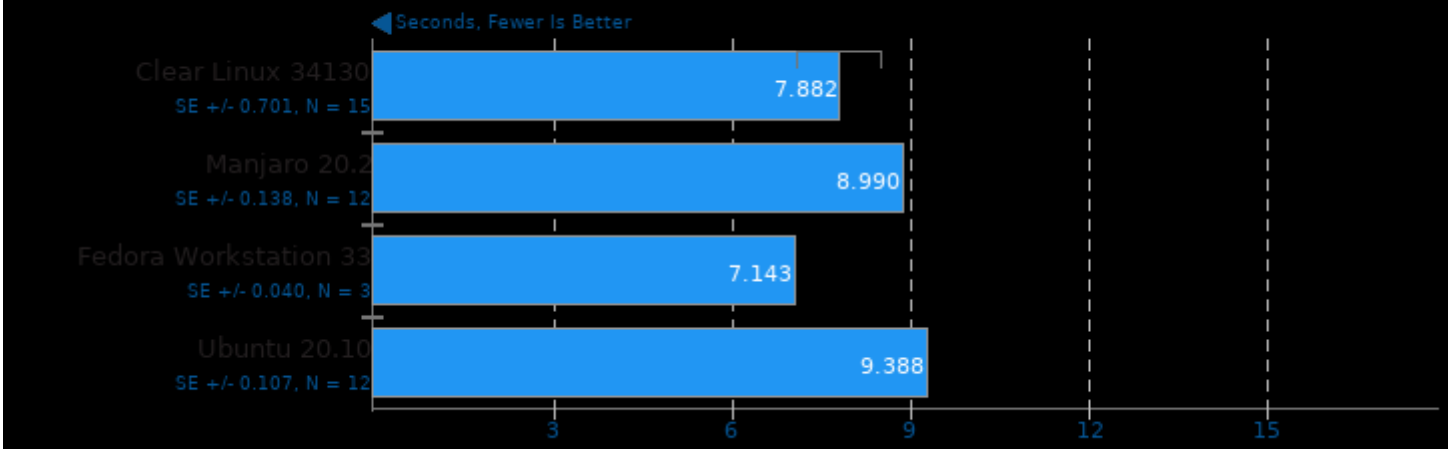
Darktable 3.2.1

Test: Server Room - Acceleration: CPU-only

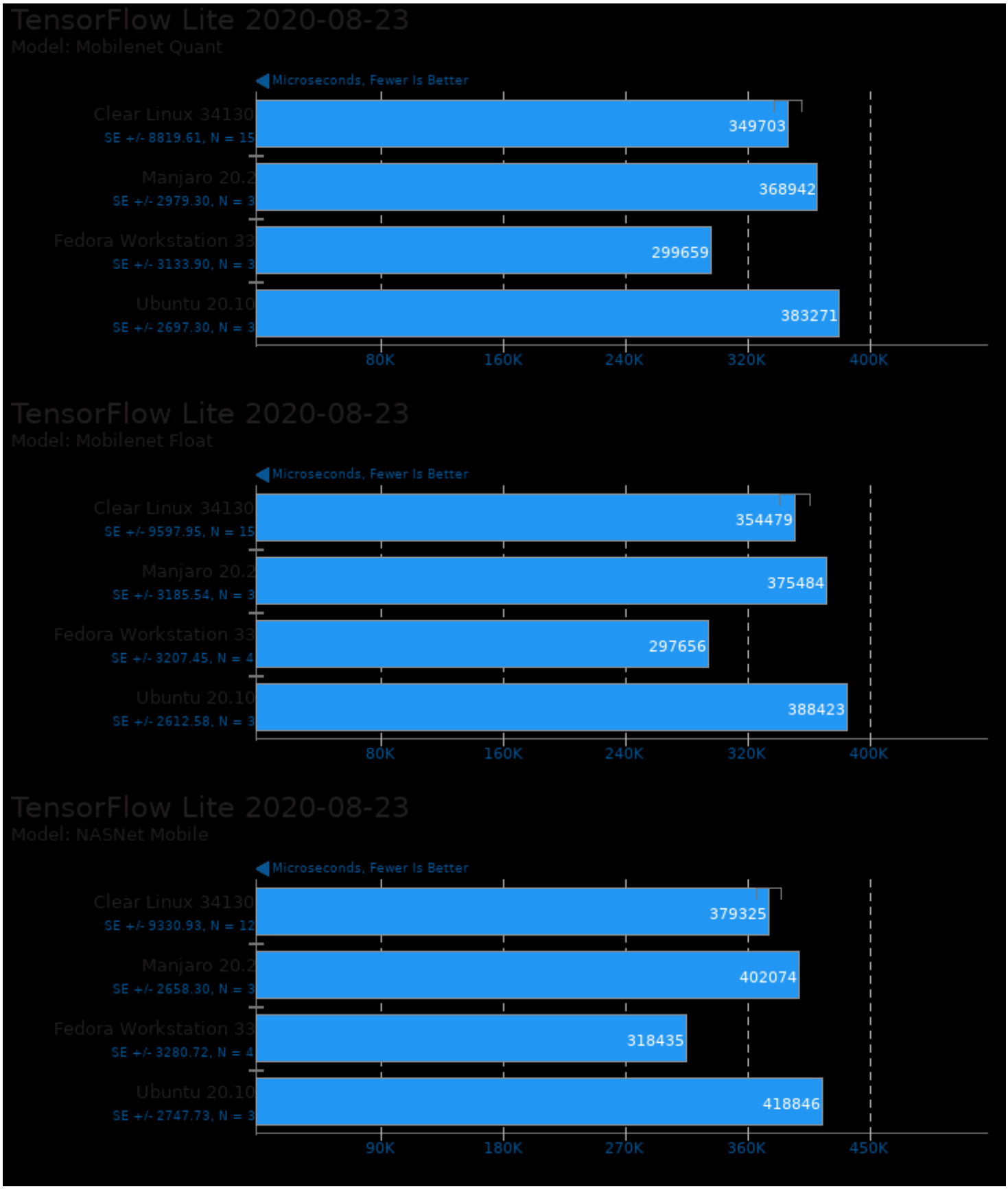


Darktable 3.2.1

Test: Masskrug - Acceleration: CPU-only



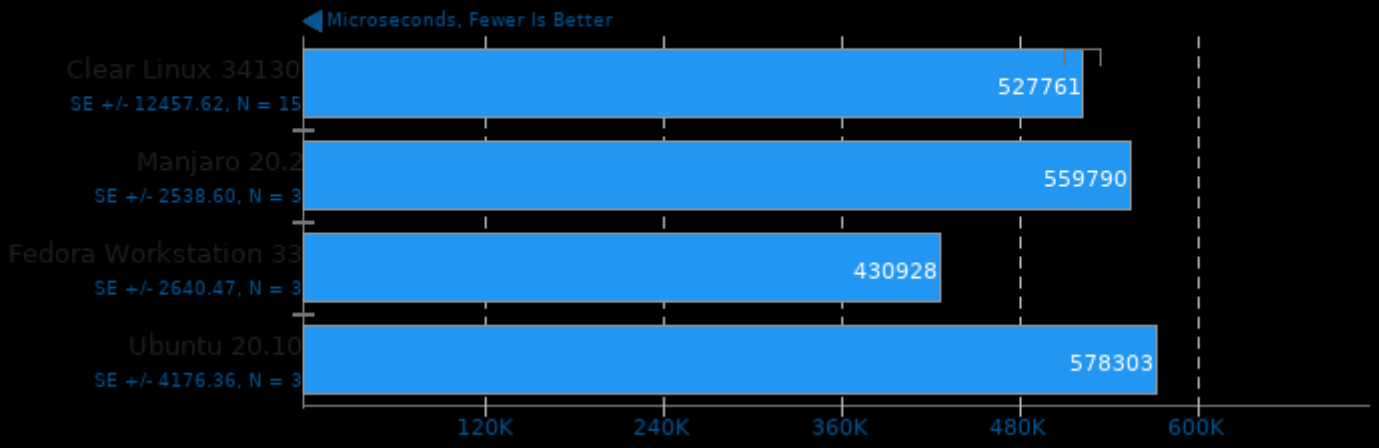
Clear Linux vs Other Distros - Tiger Lake



Clear Linux vs Other Distros - Tiger Lake

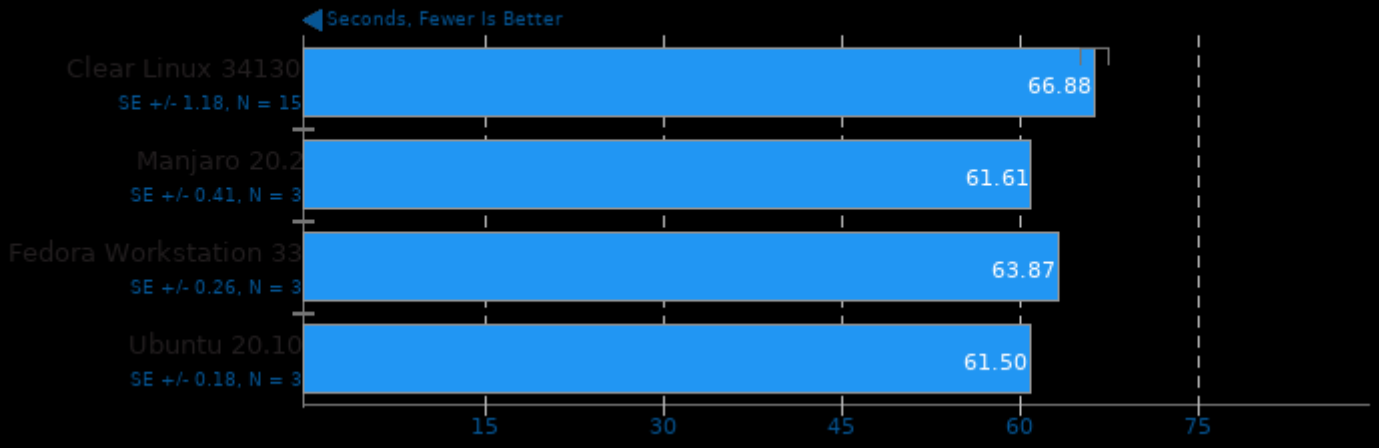
TensorFlow Lite 2020-08-23

Model: SqueezeNet



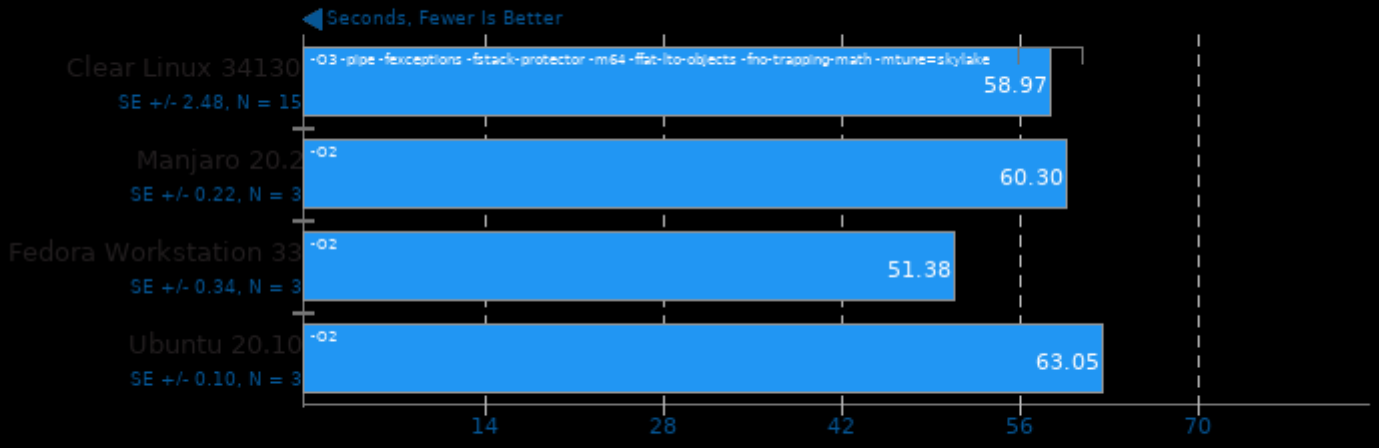
DeepSpeech 0.6

Acceleration: CPU



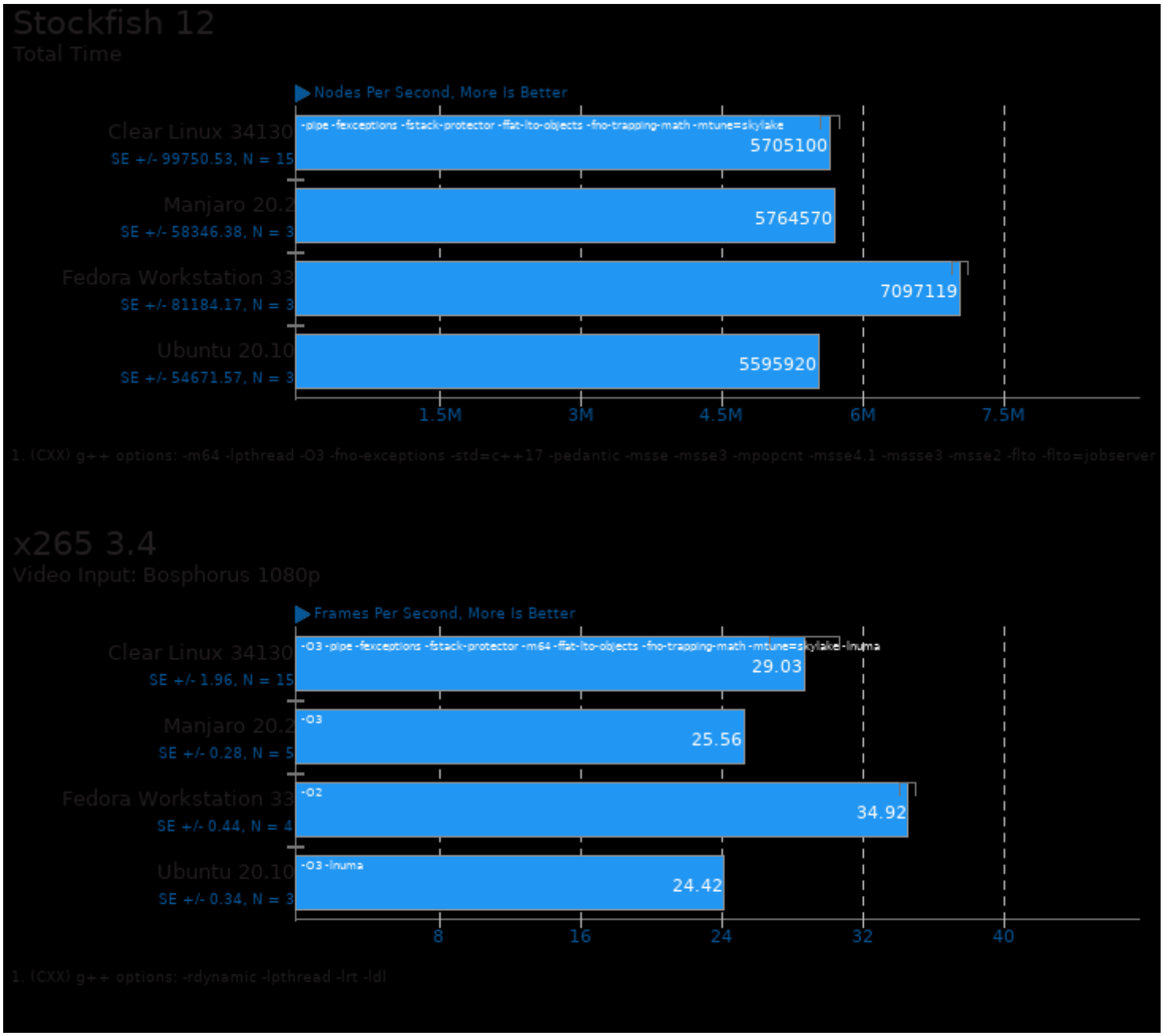
XZ Compression 5.2.4

Compressing ubuntu-16.04.3-server-i386.img, Compression Level 9

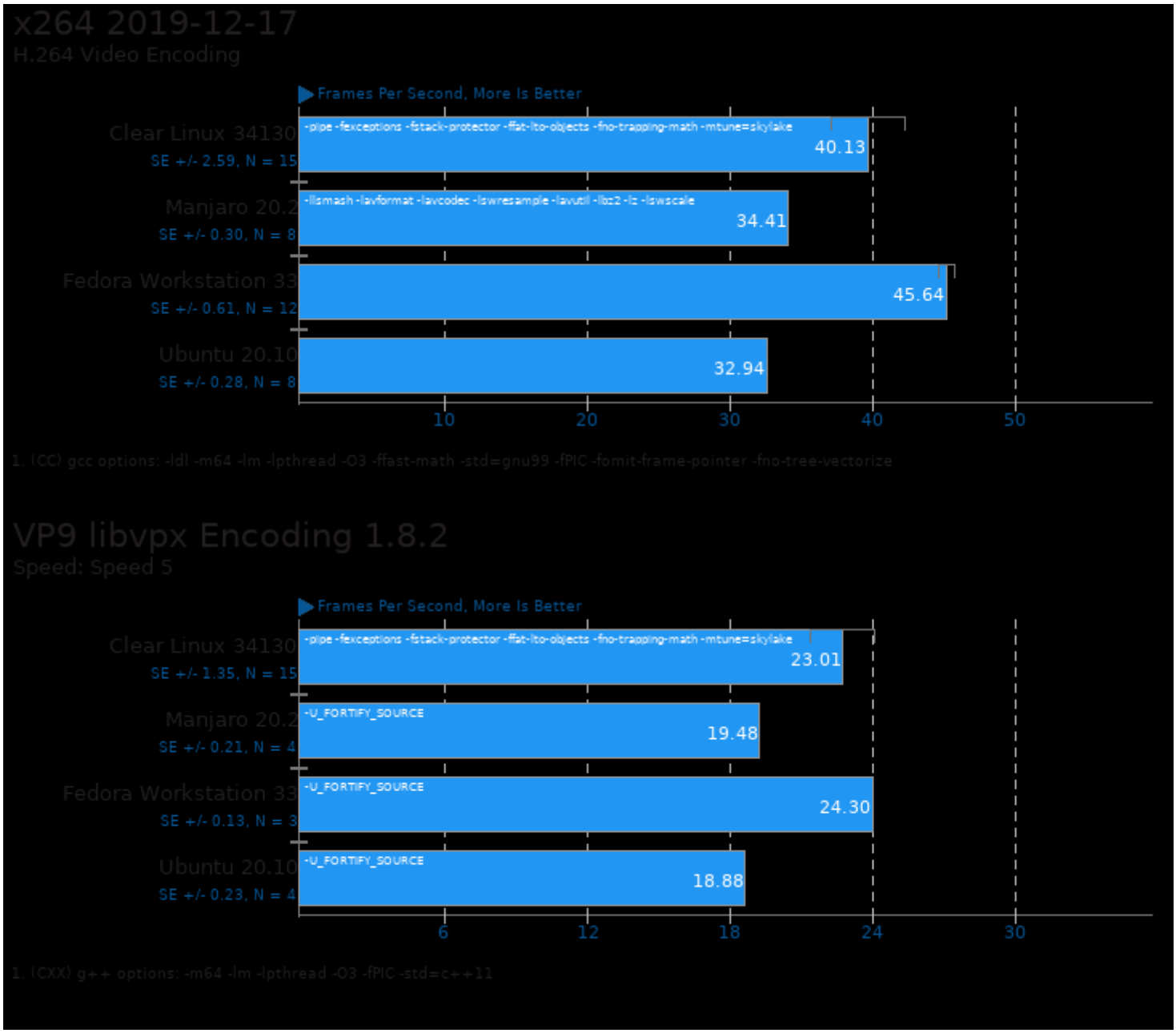


1. (CC) gcc options: -pthread -fvisibility=hidden

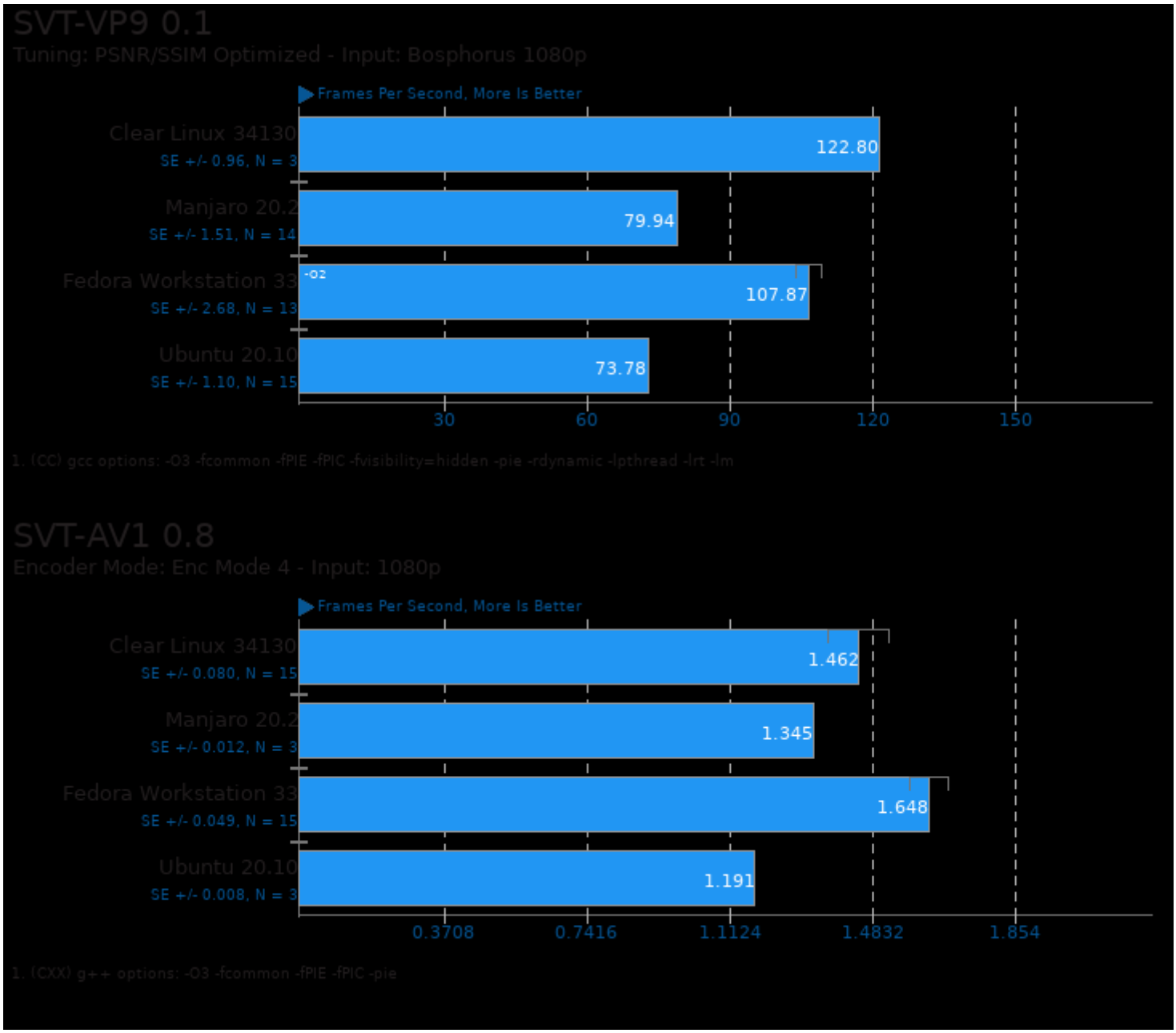
Clear Linux vs Other Distros - Tiger Lake

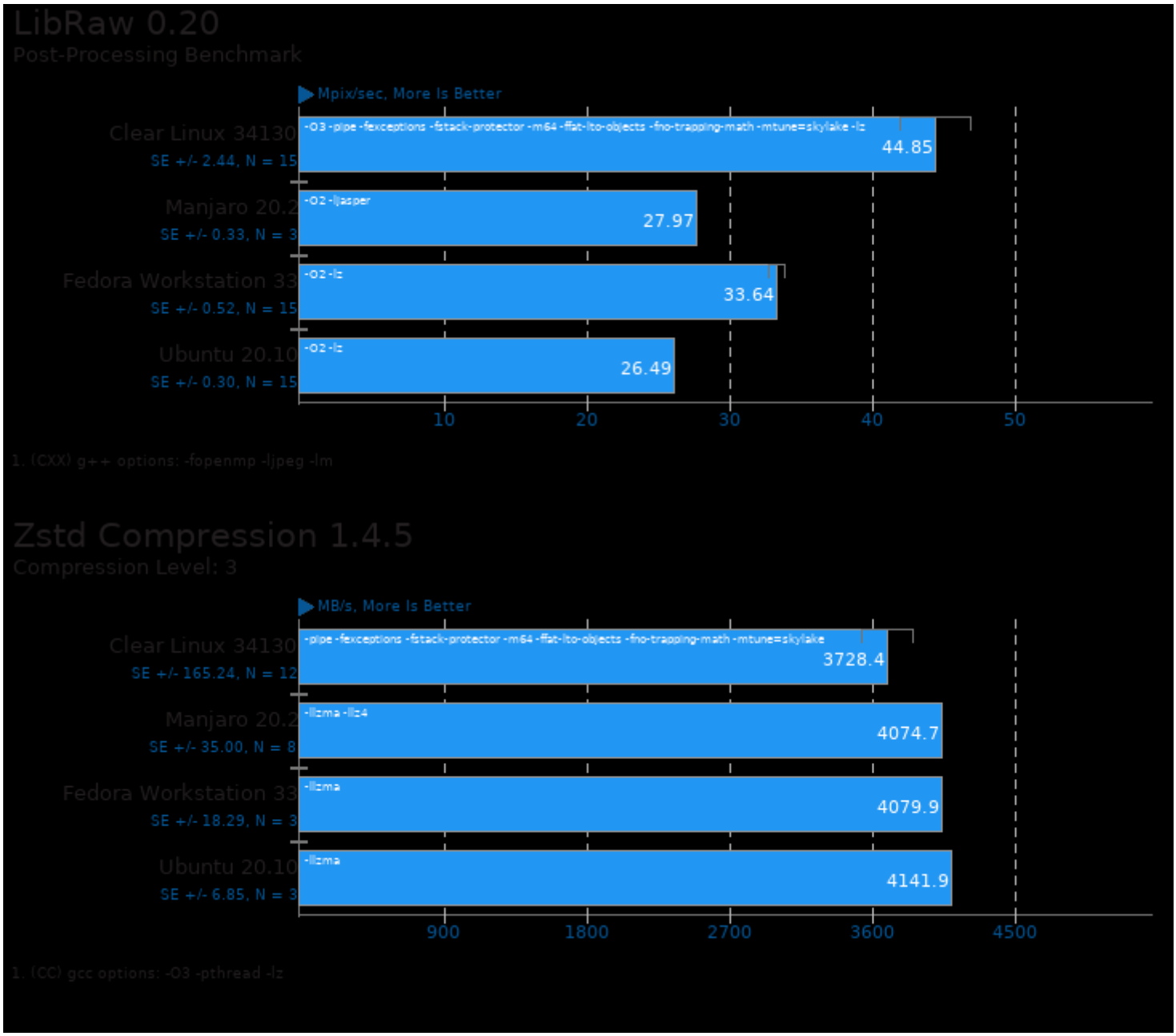


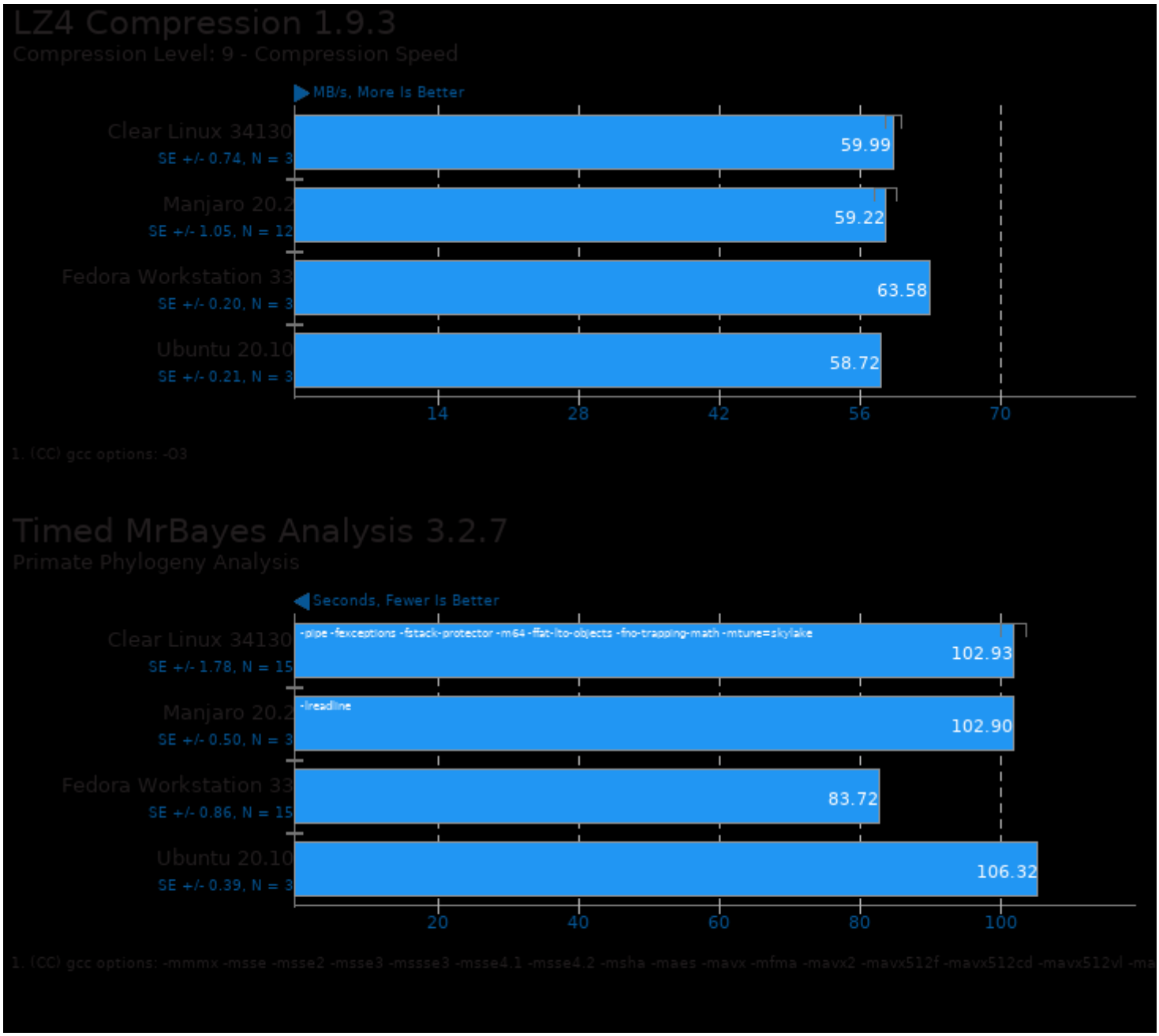
Clear Linux vs Other Distros - Tiger Lake



Clear Linux vs Other Distros - Tiger Lake



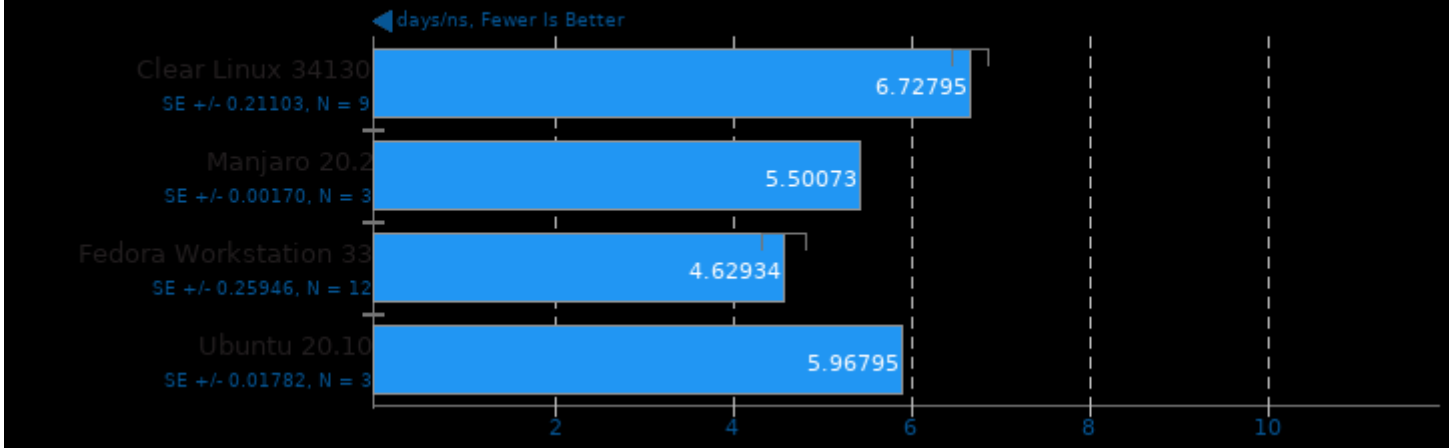

LibRaw 0.20
Post-Processing Benchmark
Mpix/sec, More Is Better
Clear Linux 34130
SE +/- 2.44, N = 15
-O3 -pipe -fexceptions -fstack-protector -m64 -flto-objects -fno-trapping-math -mtune=skylake -lz
44.85
Manjaro 20.2
SE +/- 0.33, N = 3
-O2 -ljasper
27.97
Fedora Workstation 33
SE +/- 0.52, N = 15
-O2 -lz
33.64
Ubuntu 20.10
SE +/- 0.30, N = 15
-O2 -lz
26.49
10
20
30
40
50
1. (CXX) g++ options: -fopenmp -ljpeg -lm
Zstd Compression 1.4.5
Compression Level: 3
MB/s, More Is Better
Clear Linux 34130
SE +/- 165.24, N = 12
-pipe -fexceptions -fstack-protector -m64 -flto-objects -fno-trapping-math -mtune=skylake
3728.4
Manjaro 20.2
SE +/- 35.00, N = 8
-llzma -llz4
4074.7
Fedora Workstation 33
SE +/- 18.29, N = 3
-llzma
4079.9
Ubuntu 20.10
SE +/- 6.85, N = 3
-llzma
4141.9
900
1800
2700
3600
4500
1. (CC) gcc options: -O3 -pthread -lz


LZ4 Compression 1.9.3
Compression Level: 9 - Compression Speed
MB/s, More Is Better
Clear Linux 34130
SE +/- 0.74, N = 3
59.99
Manjaro 20.2
SE +/- 1.05, N = 12
59.22
Fedora Workstation 33
SE +/- 0.20, N = 3
63.58
Ubuntu 20.10
SE +/- 0.21, N = 3
58.72
14
28
42
56
70
1. (CC) gcc options: -O3
Timed MrBayes Analysis 3.2.7
Primate Phylogeny Analysis
Seconds, Fewer Is Better
Clear Linux 34130
-pipe -fexceptions -fstack-protector -m64 -flat-lto-objects -fno-trapping-math -mtune=skylake
SE +/- 1.78, N = 15
102.93
Manjaro 20.2
-lreadline
SE +/- 0.50, N = 3
102.90
Fedora Workstation 33
SE +/- 0.86, N = 15
83.72
Ubuntu 20.10
SE +/- 0.39, N = 3
106.32
20
40
60
80
100
1. (CC) gcc options: -mmmx -msse -msse2 -msse3 -mssse3 -msse4.1 -msse4.2 -msha -maes -mavx -mfma -mavx2 -mavx512f -mavx512cd -mavx512vl

Clear Linux vs Other Distros - Tiger Lake

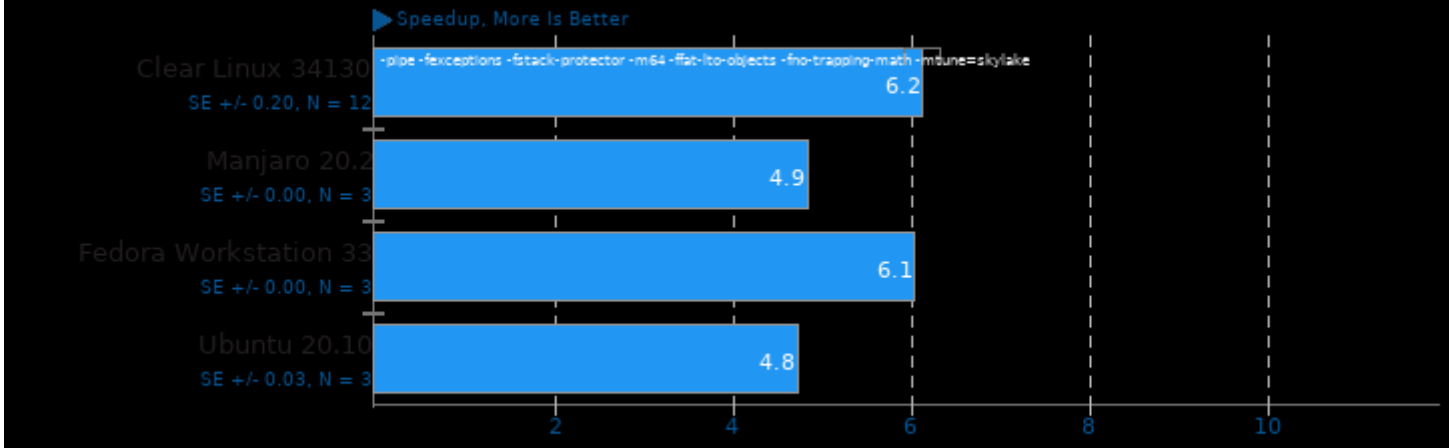
NAMD 2.14

ATPase Simulation - 327,506 Atoms



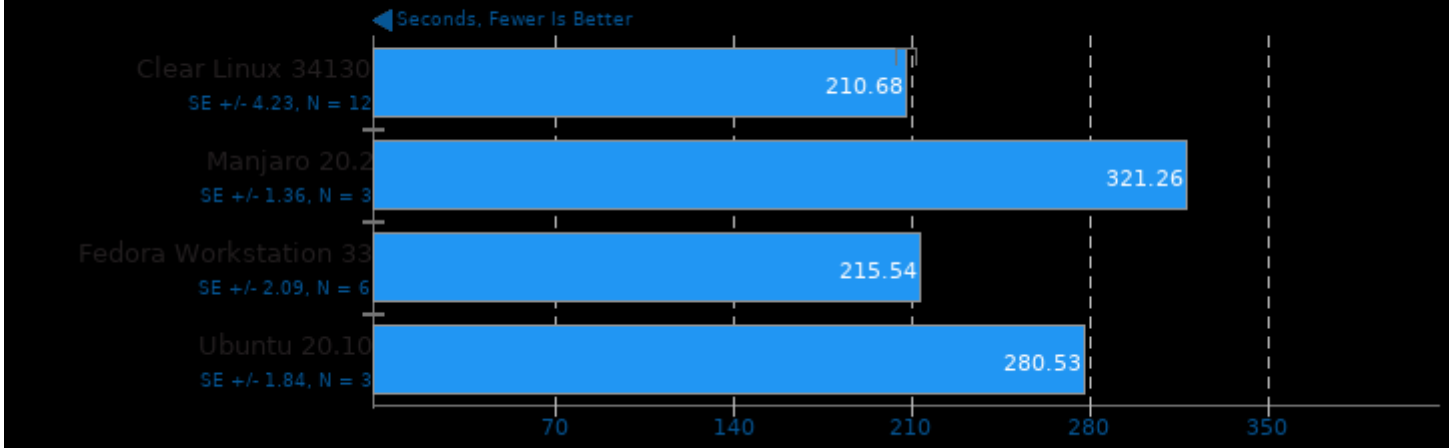
CLOMP 1.2

Static OMP Speedup

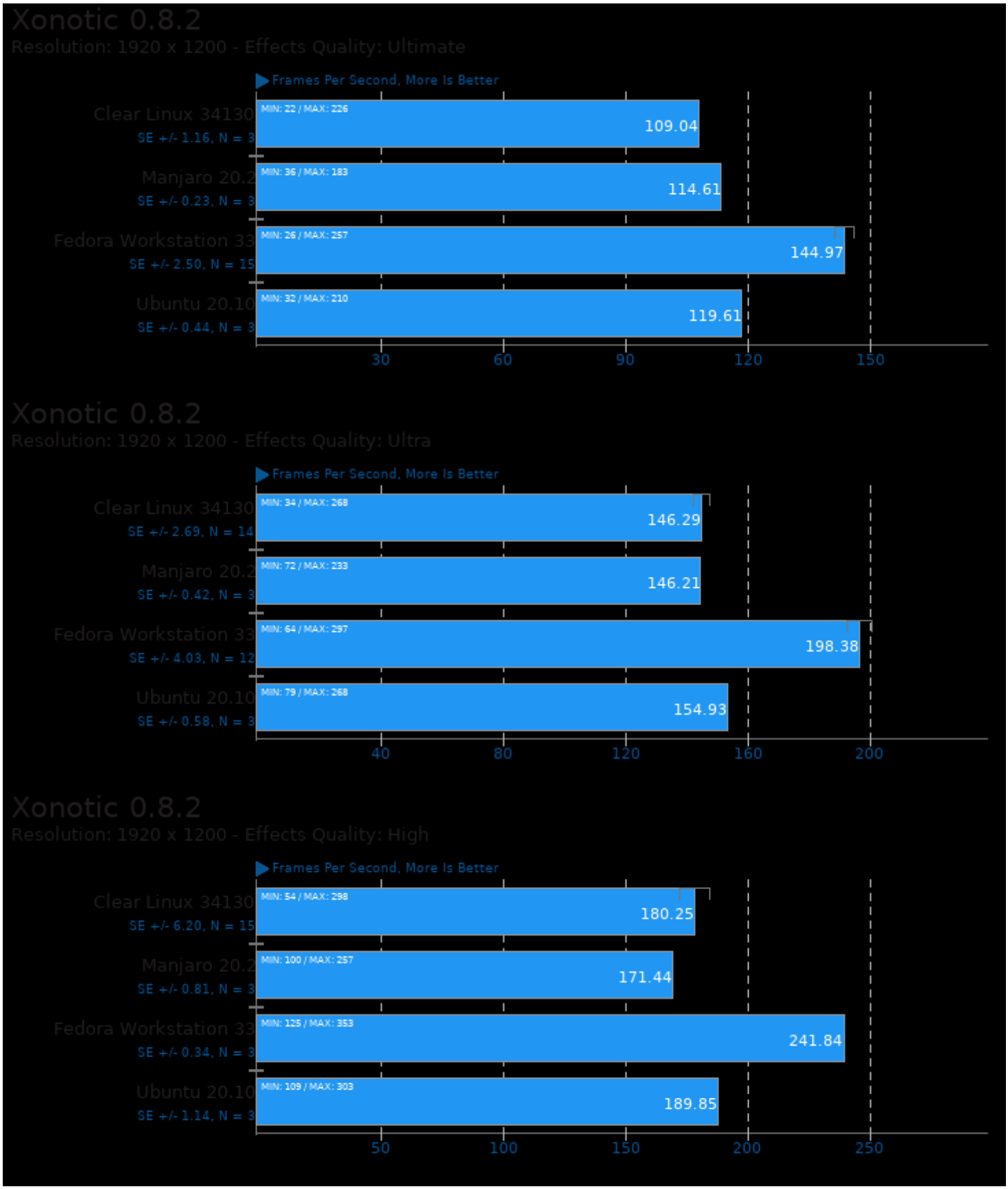


1. (CC) gcc options: -fopenmp -O3 -lm

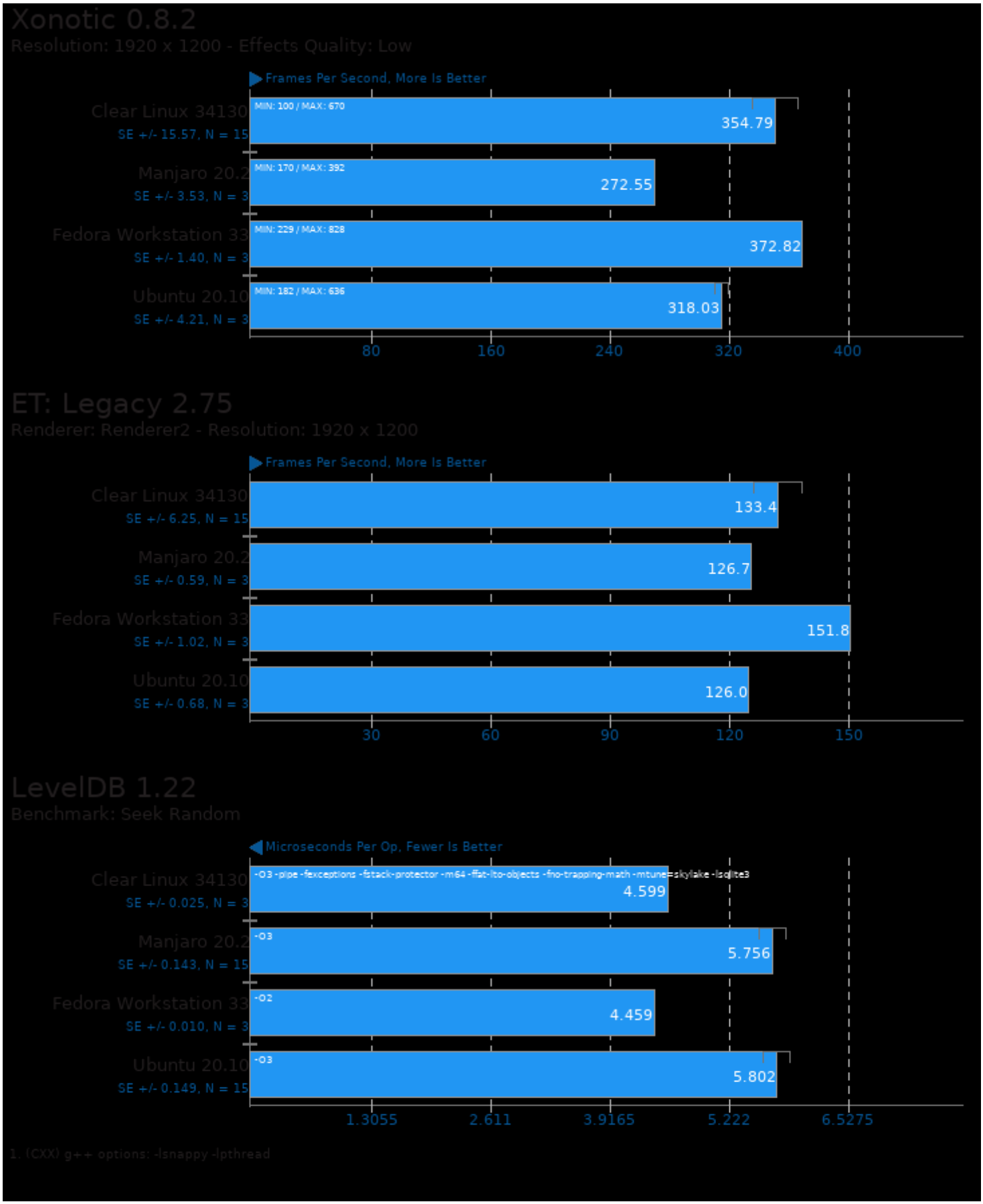
WireGuard + Linux Networking Stack Stress Test



Clear Linux vs Other Distros - Tiger Lake

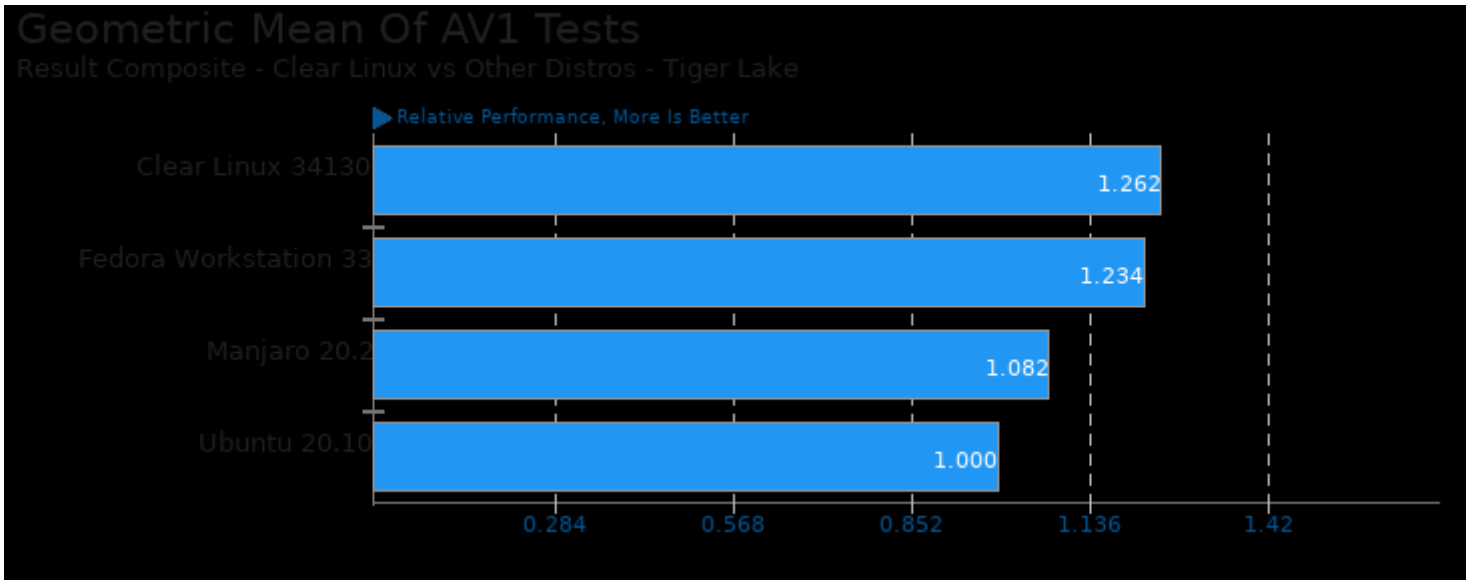


Clear Linux vs Other Distros - Tiger Lake

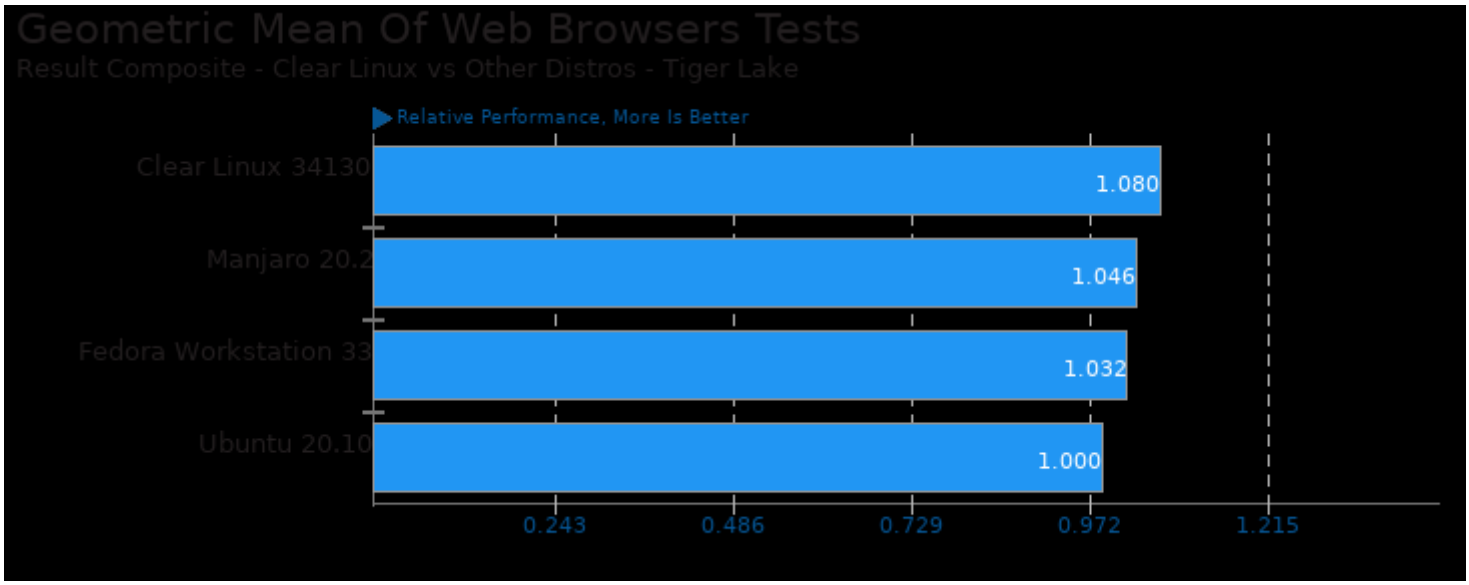


Clear Linux vs Other Distros - Tiger Lake

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

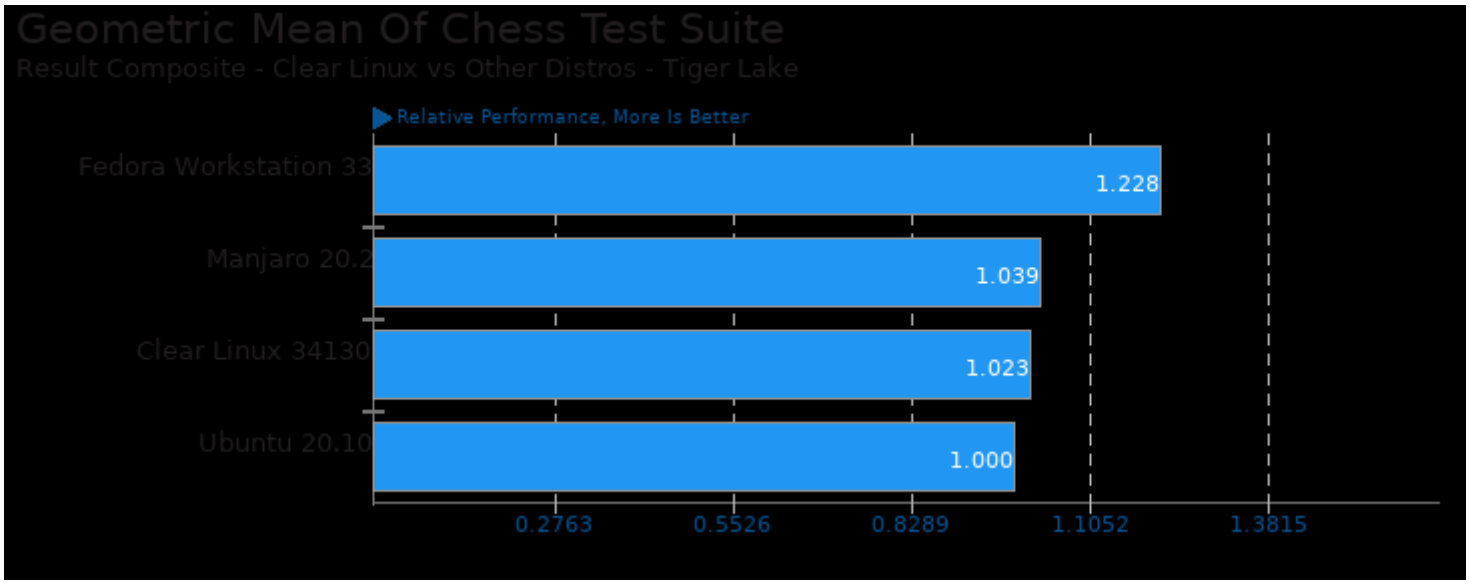


Geometric mean based upon tests: pts/svt-av1 and pts/avifenc

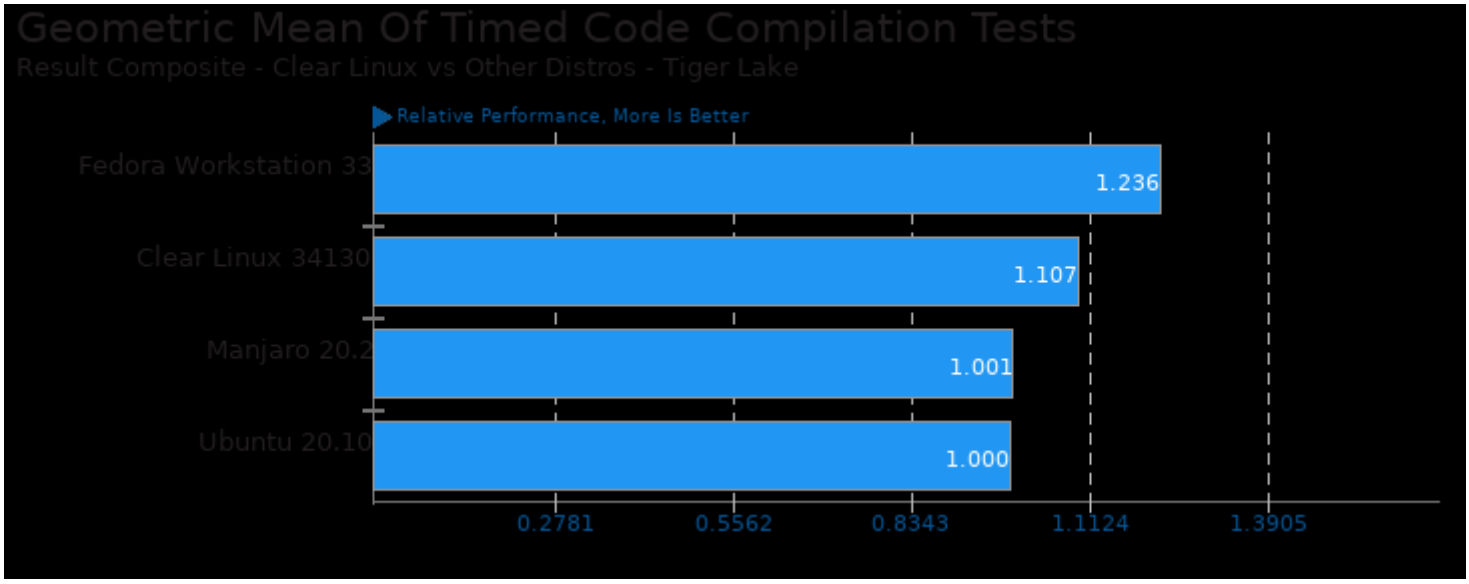


Geometric mean based upon tests: system/selenium

Clear Linux vs Other Distros - Tiger Lake

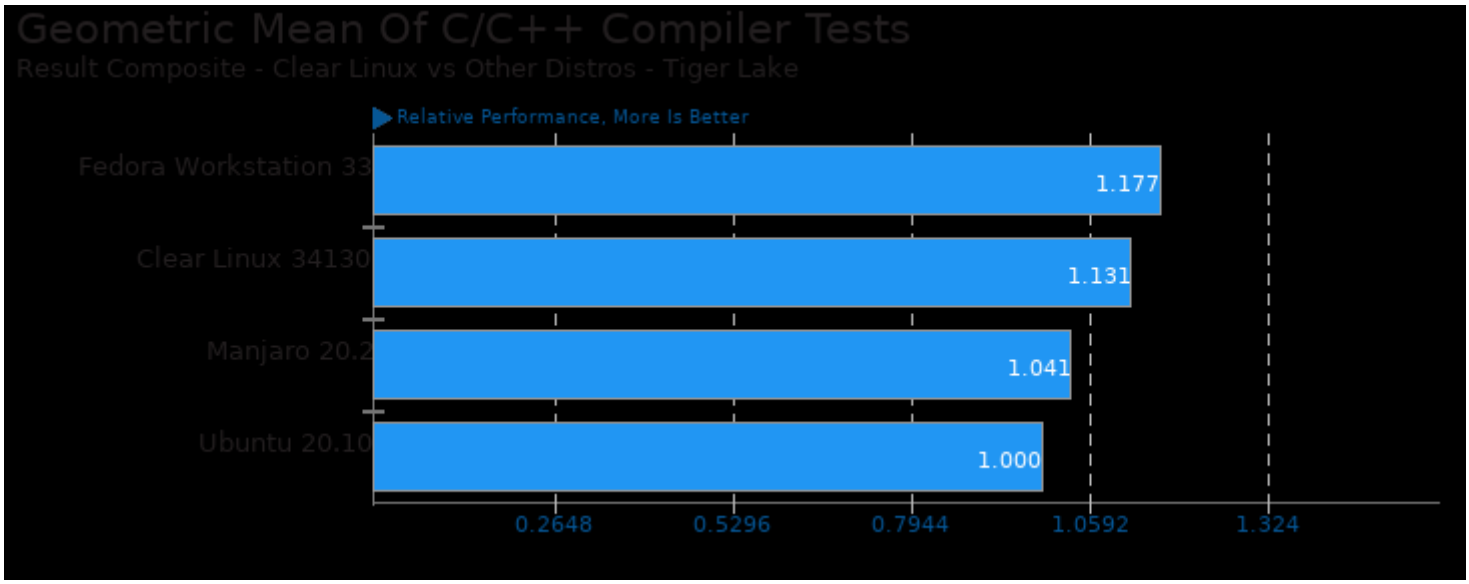


Geometric mean based upon tests: pts/stockfish and pts/asmfish

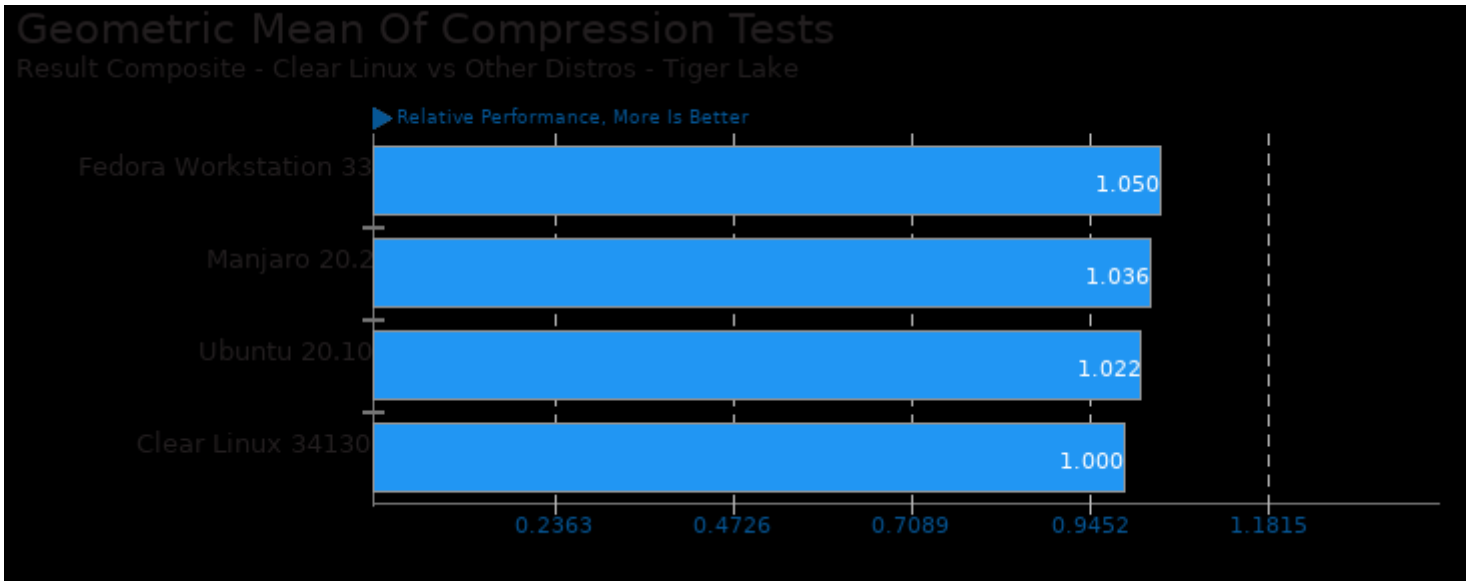


Geometric mean based upon tests: pts/build-eigen, pts/build-linux-kernel and pts/build-ffmpeg

Clear Linux vs Other Distros - Tiger Lake

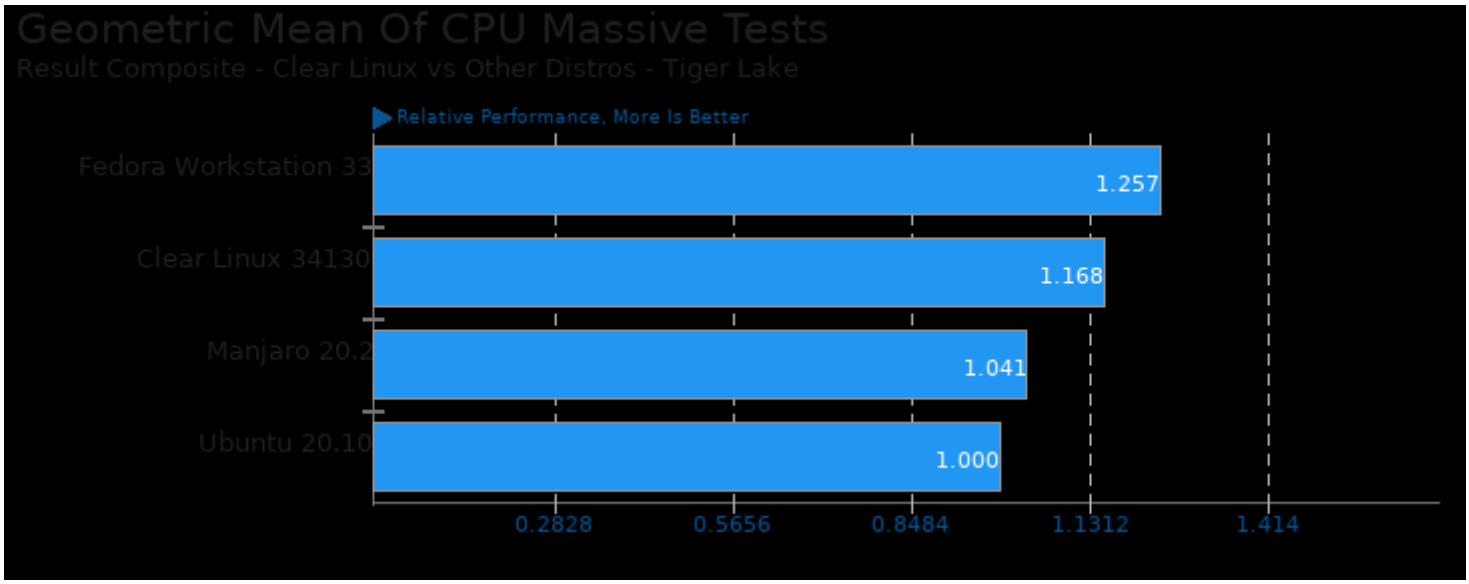


Geometric mean based upon tests: pts/vpxenc, pts/stockfish, pts/sqlite-speedtest, pts/mrbayes, pts/x264, pts/x265, pts/clomp, pts/compress-xz, pts/compress-zstd, pts/svt-av1, pts/svt-vp9, pts/gromacs, pts/build-ffmpeg, pts/leveldb and pts/basis

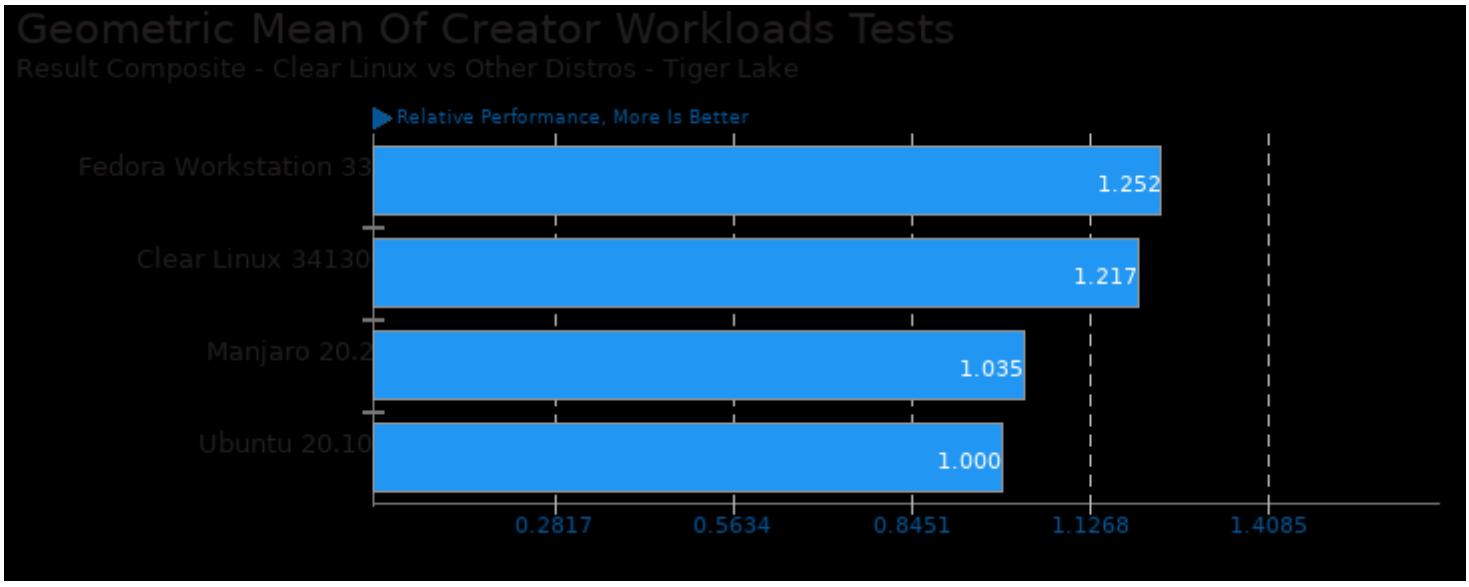


Geometric mean based upon tests: pts/compress-zstd, pts/compress-lz4 and pts/compress-xz

Clear Linux vs Other Distros - Tiger Lake

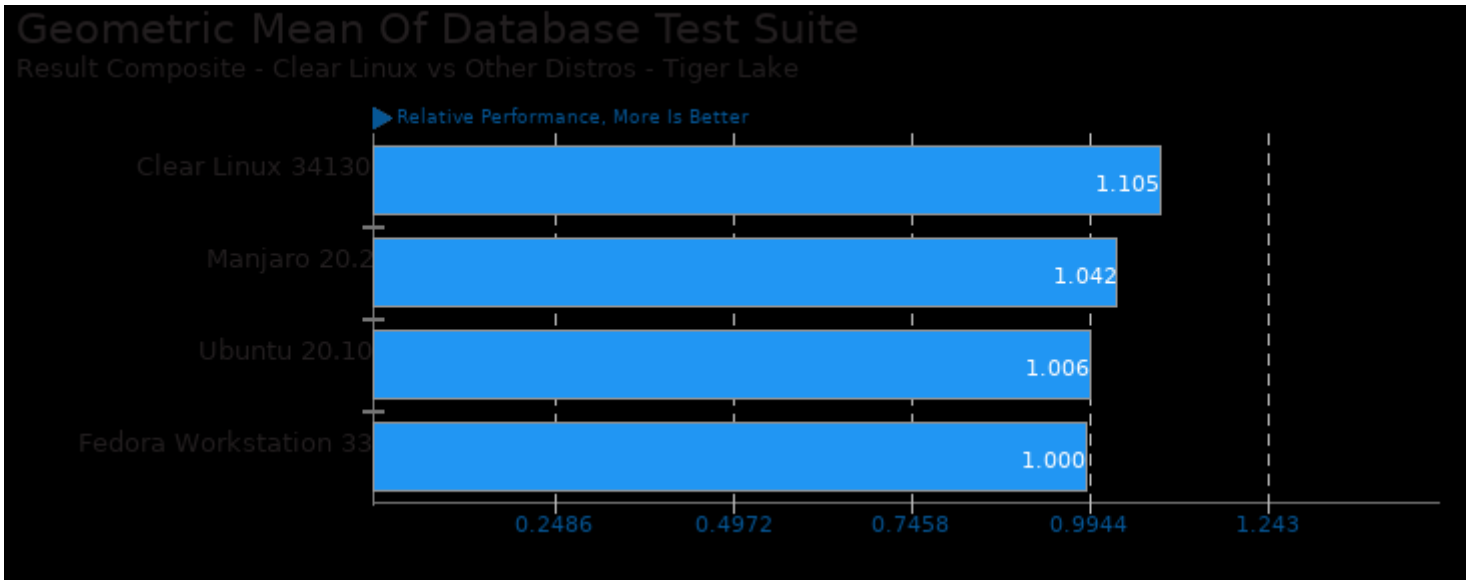


Geometric mean based upon tests: pts/asmfish, pts/build-linux-kernel, pts/compress-xz, pts/compress-zstd, pts/svt-av1, pts/svt-vp9, pts/vpxenc, pts/x264, pts/x265, pts/dolfyn, pts/mrbayes, pts/namd, pts/numpy, pts/stockfish, pts/v-ray, system/darktable, pts/clomp and pts/tjbench

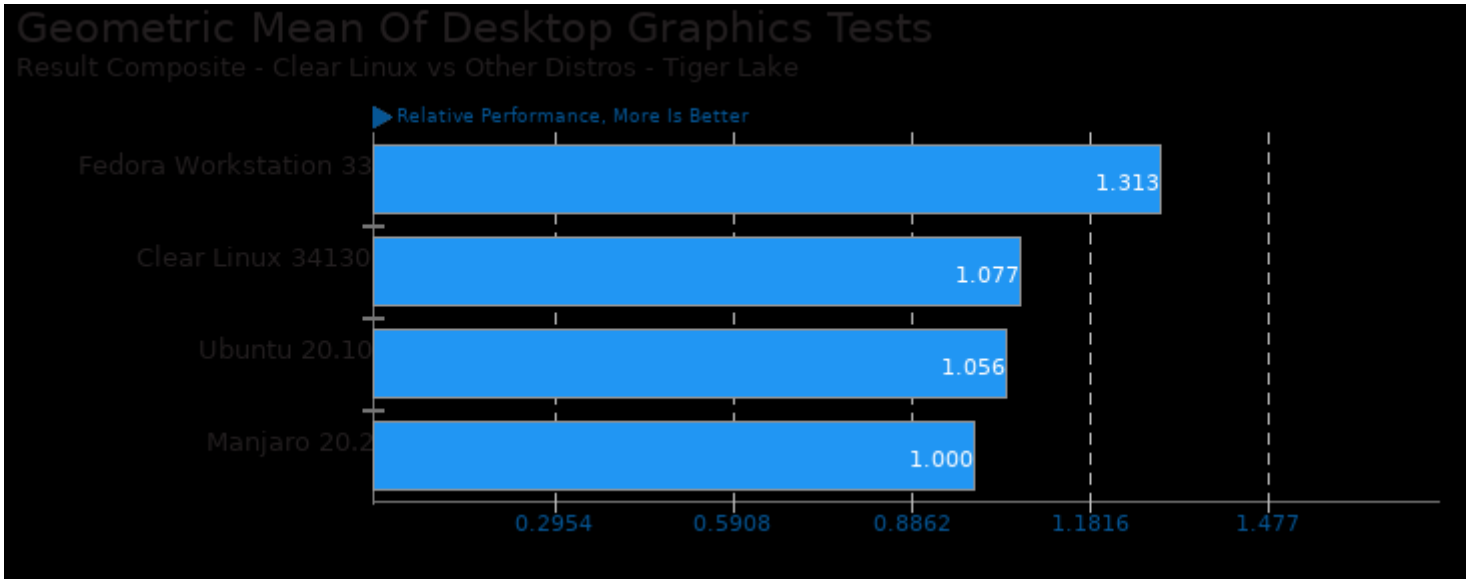


Geometric mean based upon tests: pts/appleseed, pts/v-ray, pts/indigobench, pts/svt-vp9, pts/x264, pts/x265, pts/vpxenc, pts/svt-av1, pts/avifenc, pts/libraw, pts/webp, system/rawtherapee, pts/tjbench, system/darktable, system/rsvg, pts/basis, pts/astcenc and pts/deepspeech

Clear Linux vs Other Distros - Tiger Lake

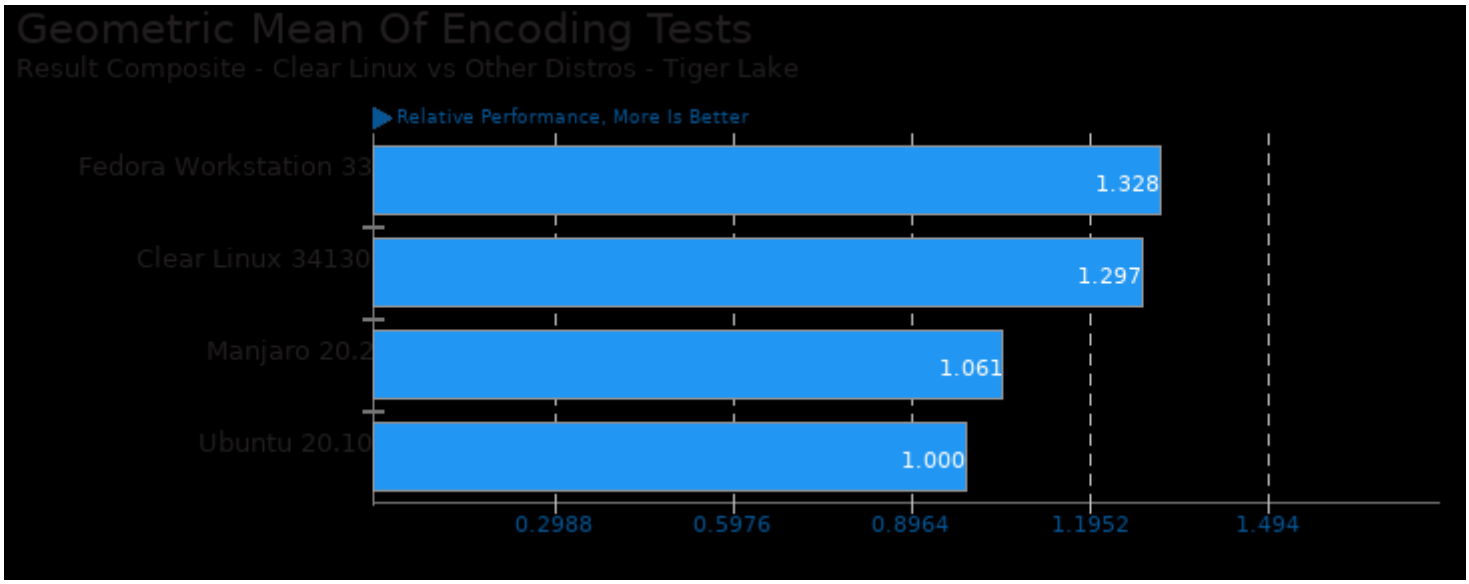


Geometric mean based upon tests: pts/sqlite-speedtest and pts/leveldb

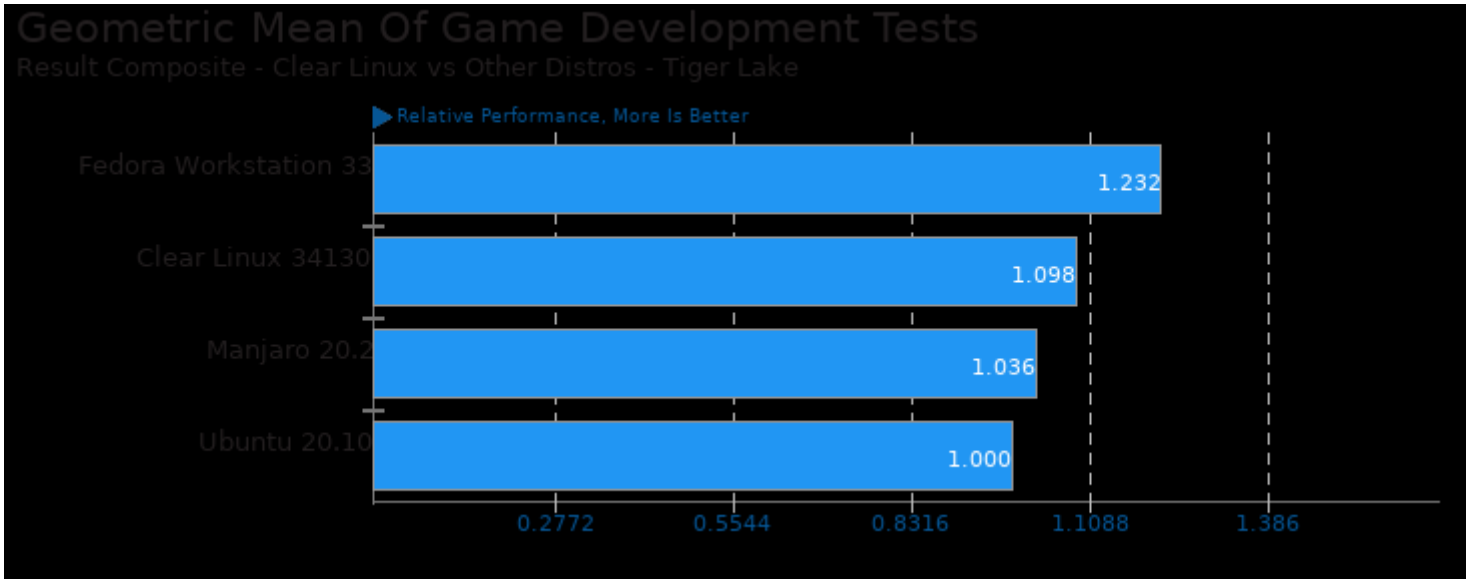


Geometric mean based upon tests: pts/xonotic and pts/tesseract

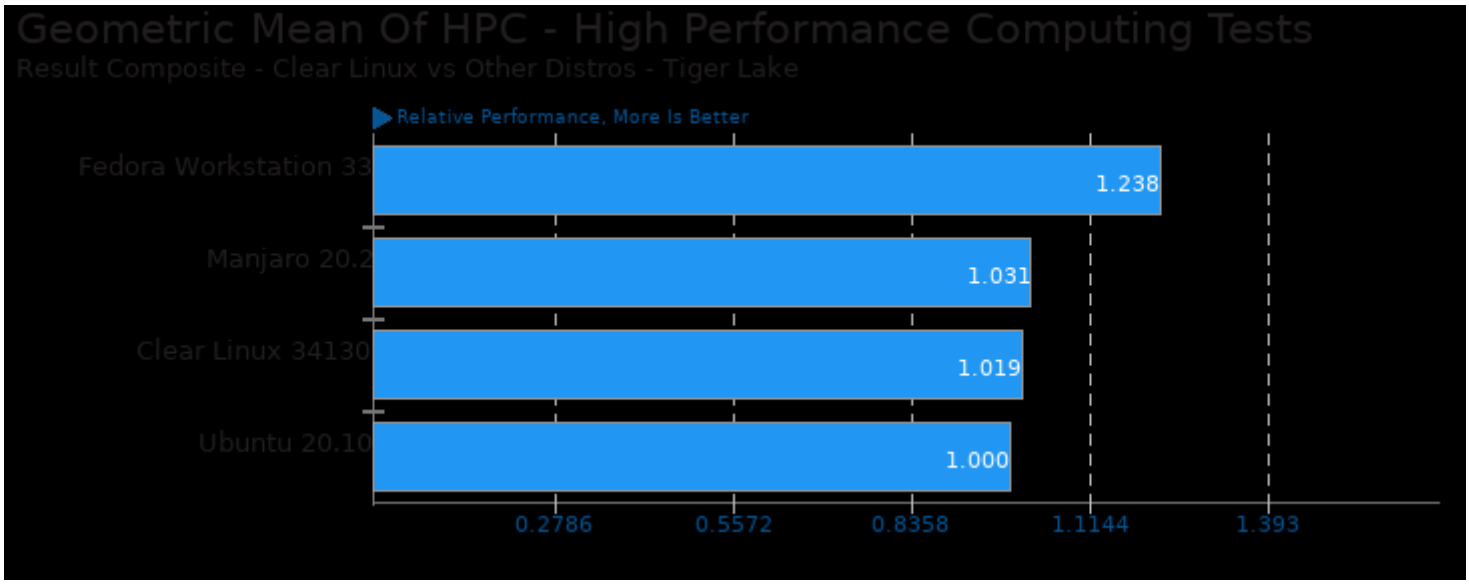
Clear Linux vs Other Distros - Tiger Lake



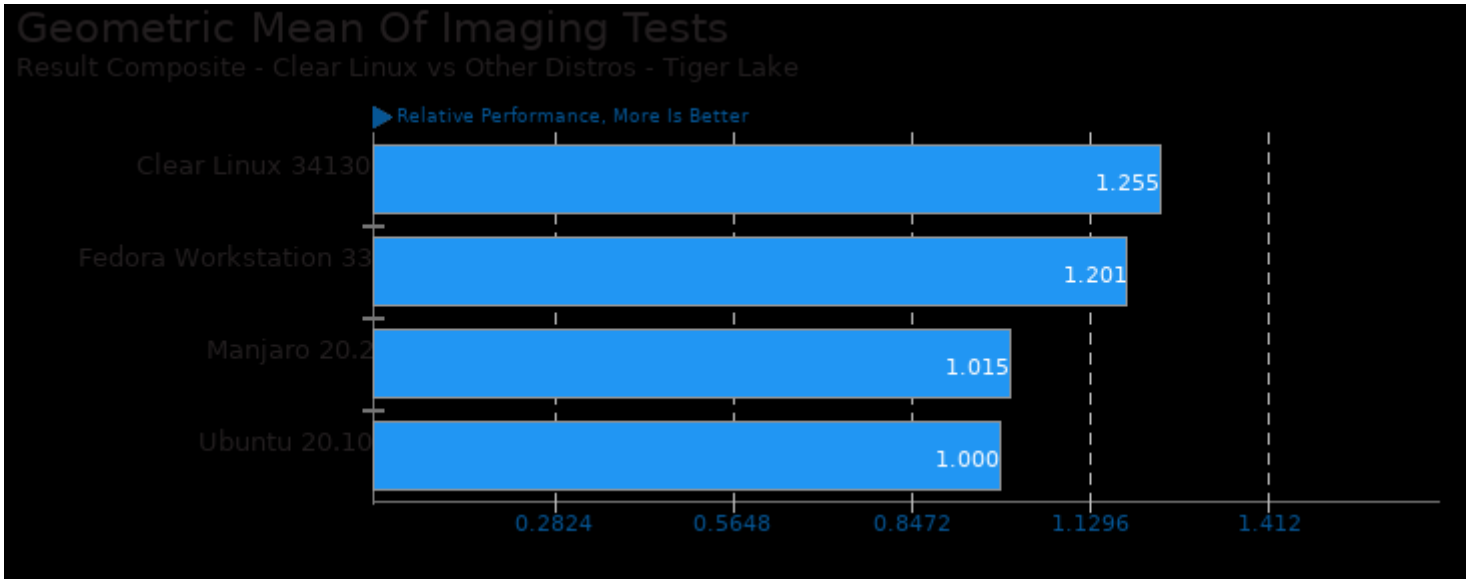
Geometric mean based upon tests: pts/svt-vp9, pts/x264, pts/x265, pts/vpxenc, pts/svt-av1 and pts/avifenc



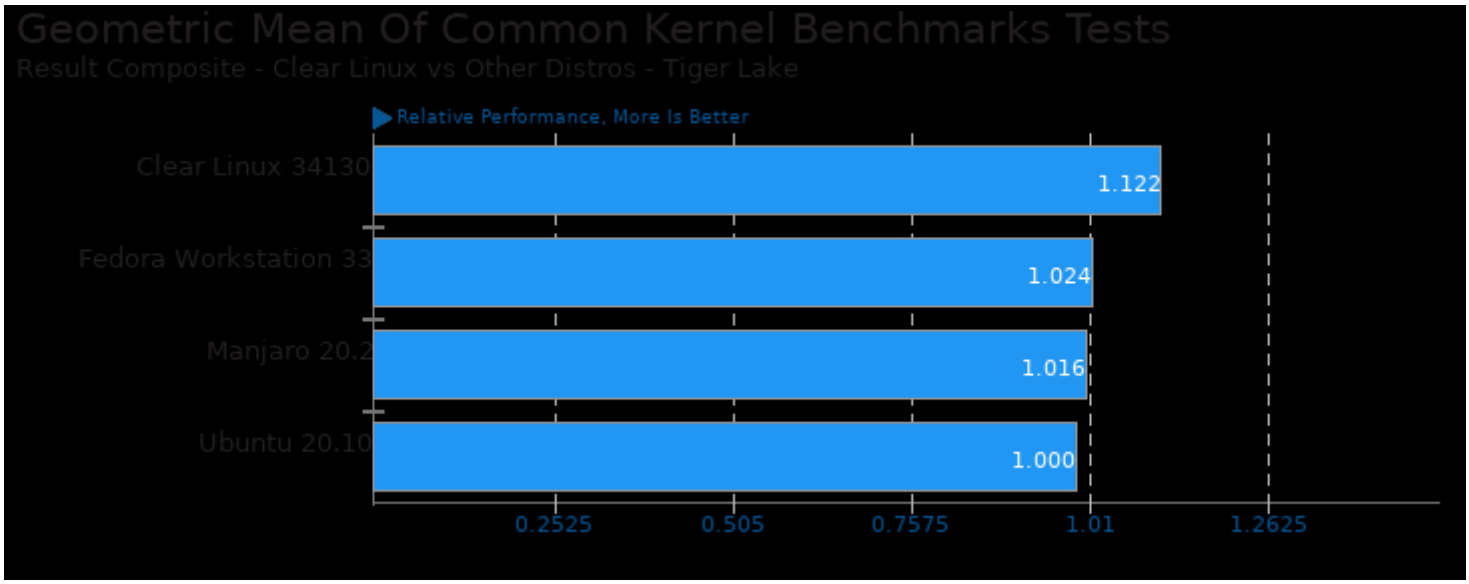
Geometric mean based upon tests: pts/basis and pts/astcenc



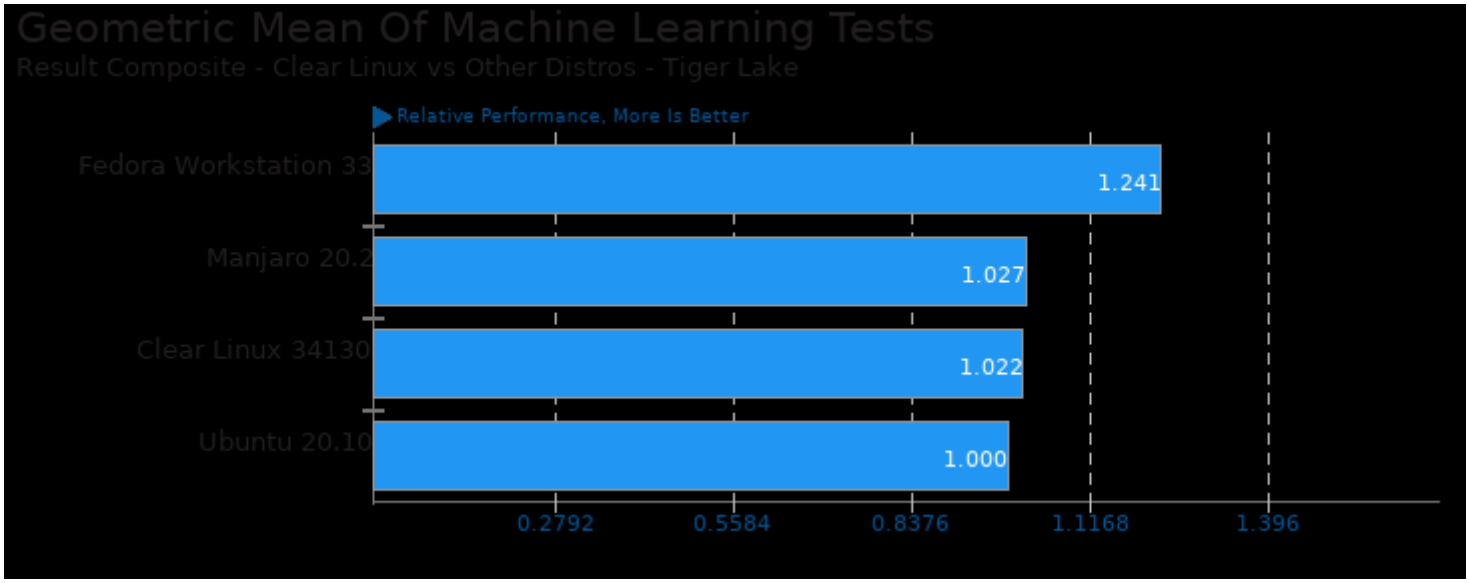
Geometric mean based upon tests: pts/namd, pts/gromacs, pts/dolfyn, pts/mrbayes, pts/ncnn, pts/tnn, pts/numpy, pts/ai-benchmark, pts/deepspeech and pts/tensorflow-lite



Geometric mean based upon tests: pts/libraw, pts/webp, system/rawtherapee, pts/tjbench, system/darktable, system/rsvg and pts/avifenc

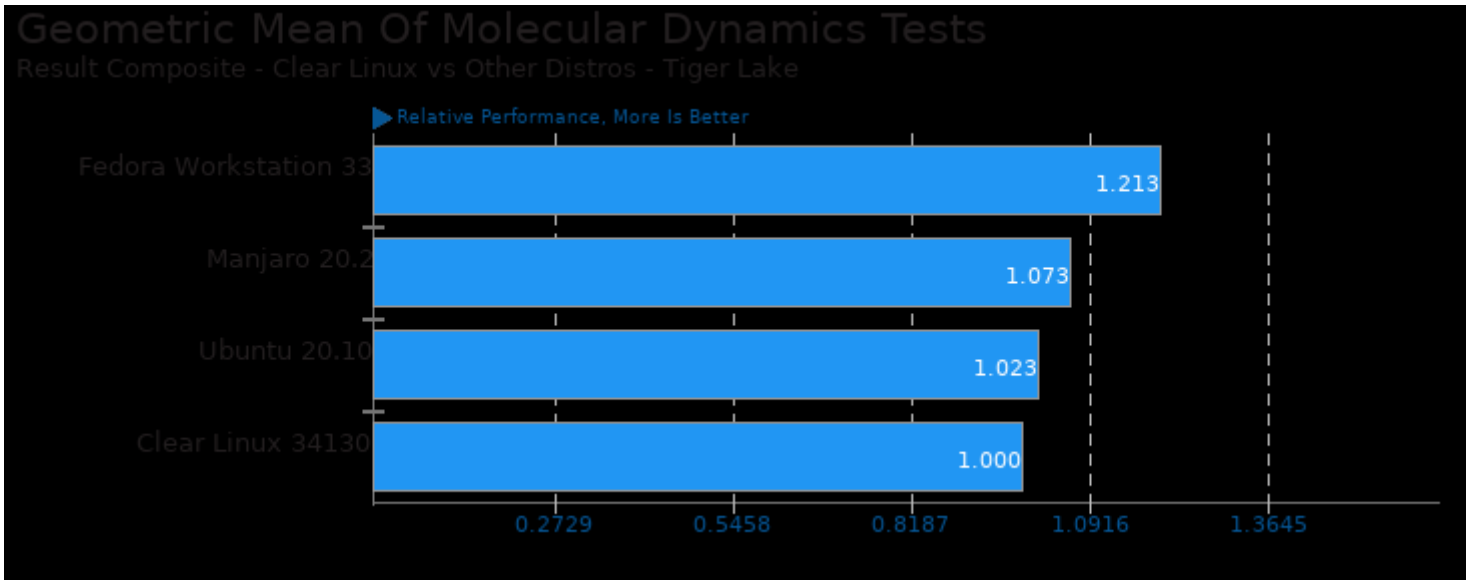


Geometric mean based upon tests: system/wireguard, pts/sqlite-speedtest and pts/leveldb

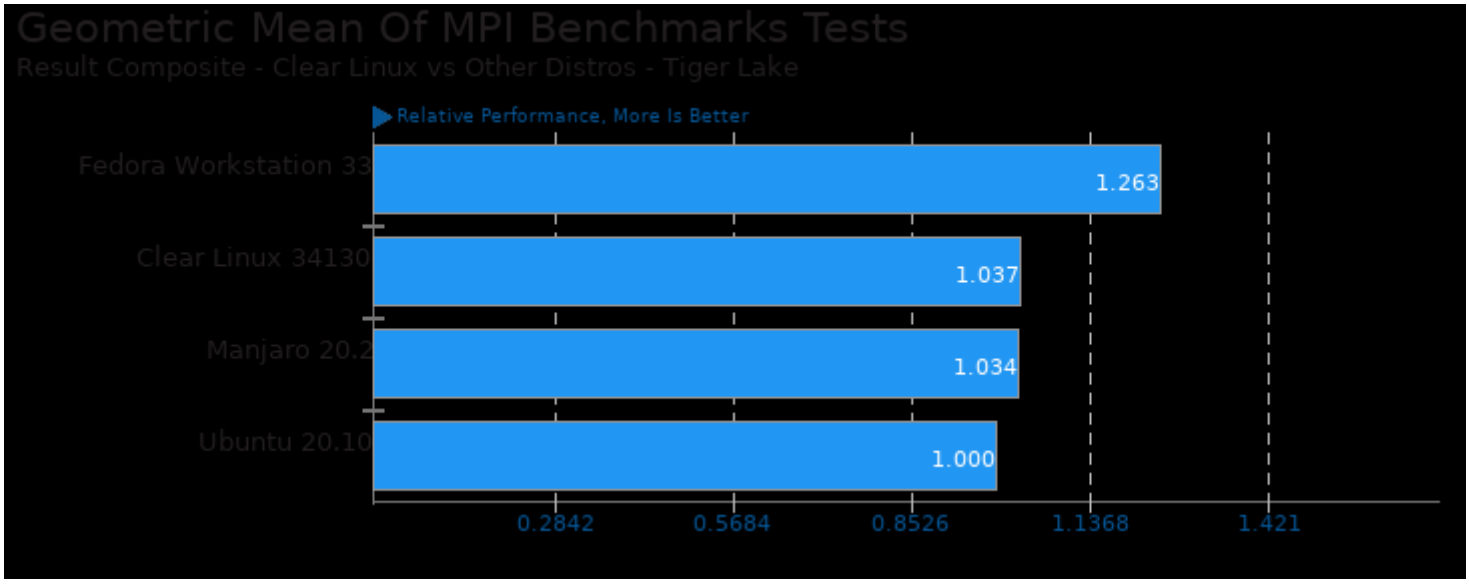


Geometric mean based upon tests: pts/ncnn, pts/tnn, pts/numpy, pts/ai-benchmark, pts/deepspeech and pts/tensorflow-lite

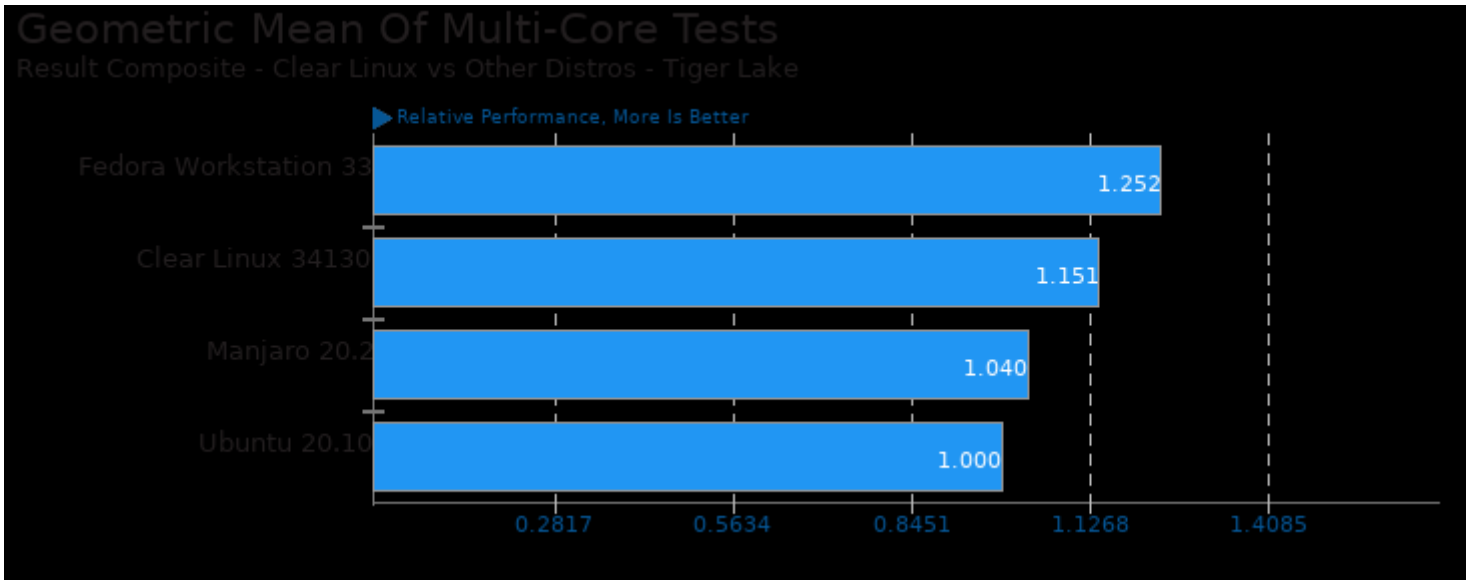
Clear Linux vs Other Distros - Tiger Lake



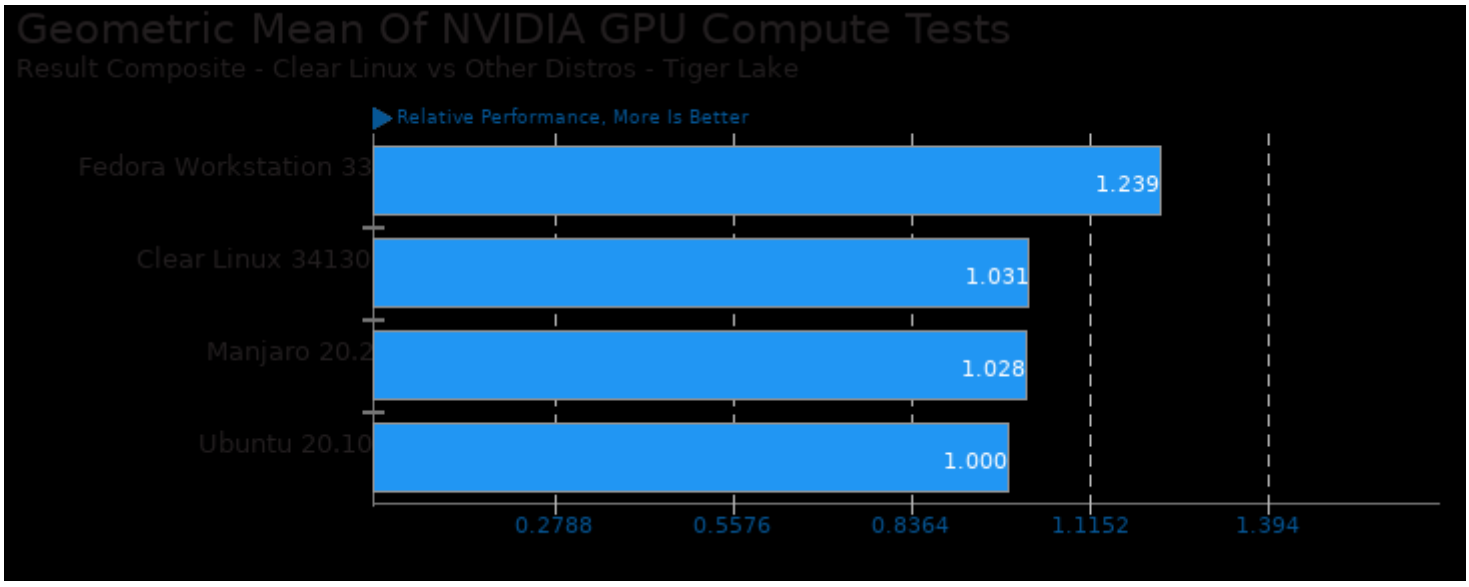
Geometric mean based upon tests: pts/namd, pts/gromacs and pts/dolfyn



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

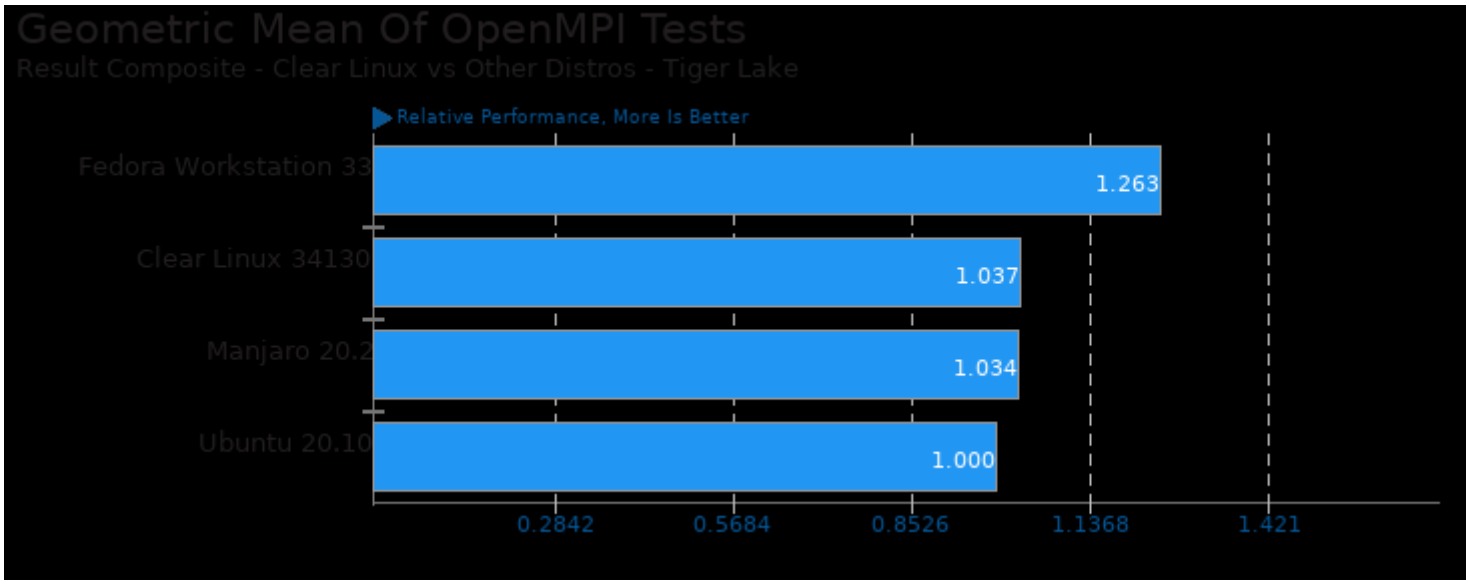


Geometric mean based upon tests: pts/stockfish, pts/svt-vp9, pts/x264, pts/x265, pts/vpxenc, pts/svt-av1, pts/avifenc, pts/namd, pts/asmfish, pts/gromacs, pts/compress-zstd, pts/build-eigen, pts/build-linux-kernel, pts/build-ffmpeg, pts/appleseed, pts/v-ray and pts/indigobench

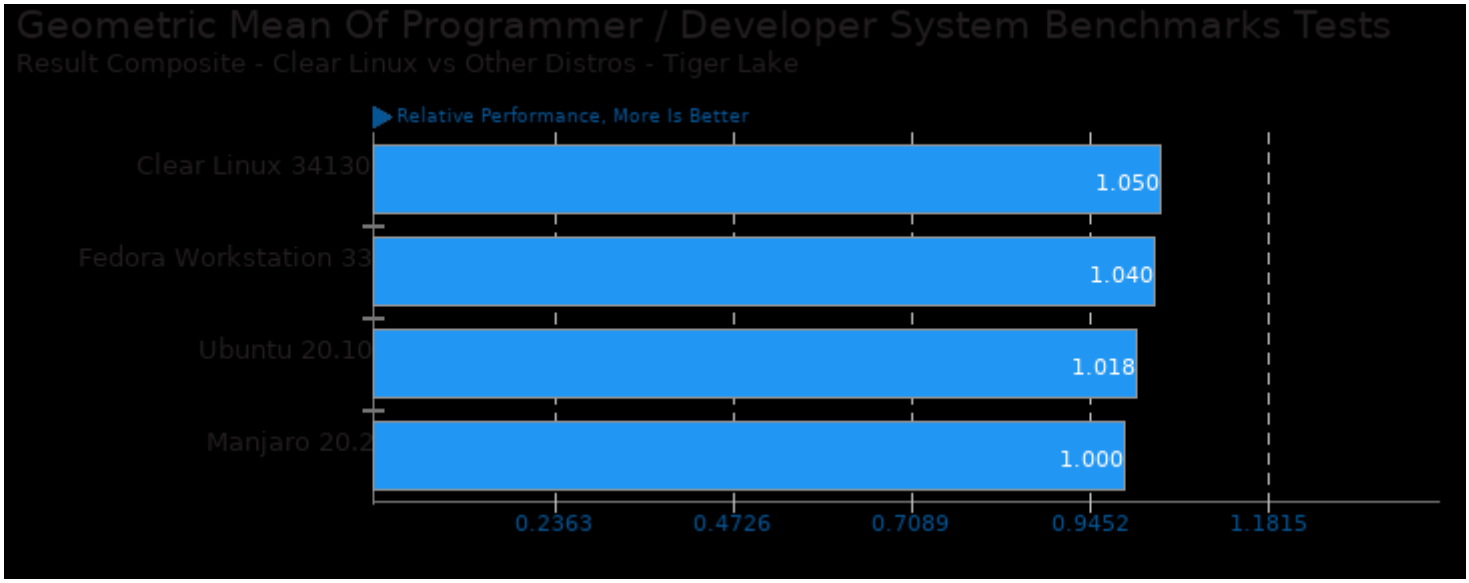


Geometric mean based upon tests: pts/gromacs, pts/indigobench, pts/v-ray, pts/ncnn, pts/realsr-ncnn and pts/waifu2x-ncnn

Clear Linux vs Other Distros - Tiger Lake

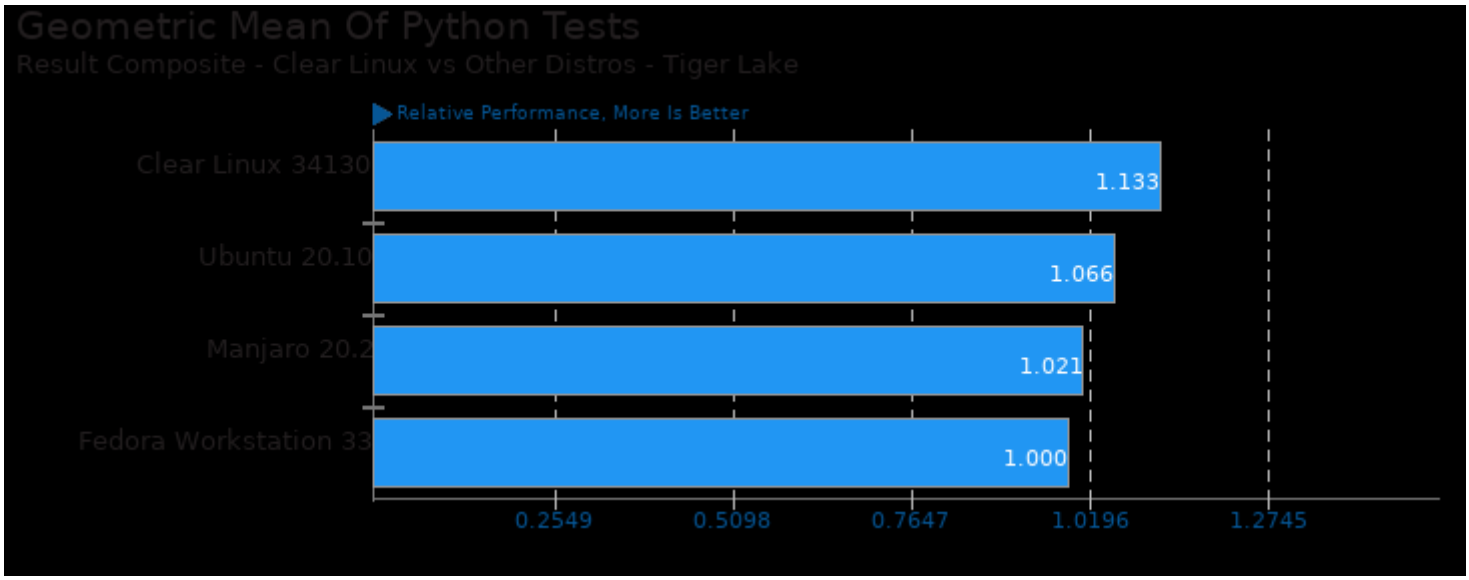


Geometric mean based upon tests: pts/gromacs and pts/mrbayes

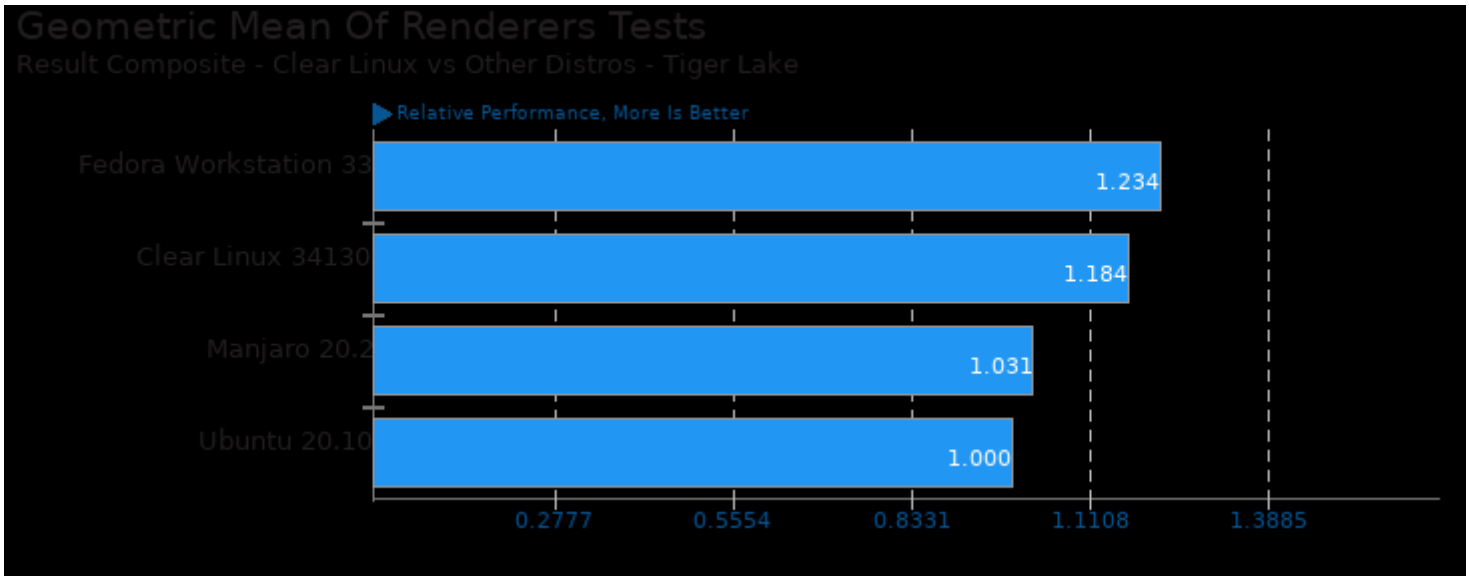


Geometric mean based upon tests: pts/sqlite-speedtest, pts/git, pts/compress-zstd, pts/pyperformance, pts/pybench, pts/build-eigen, pts/build-linux-kernel and pts/build-ffmpeg

Clear Linux vs Other Distros - Tiger Lake

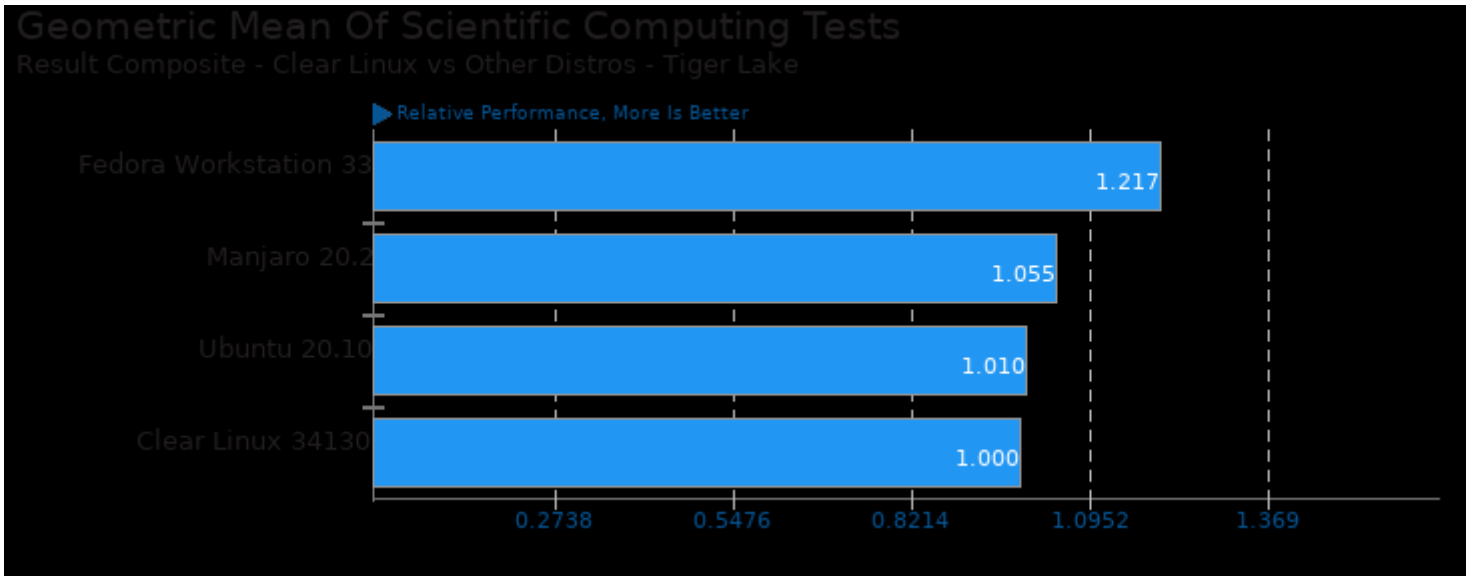


Geometric mean based upon tests: pts/pybench, pts/numpy and pts/pyperformance

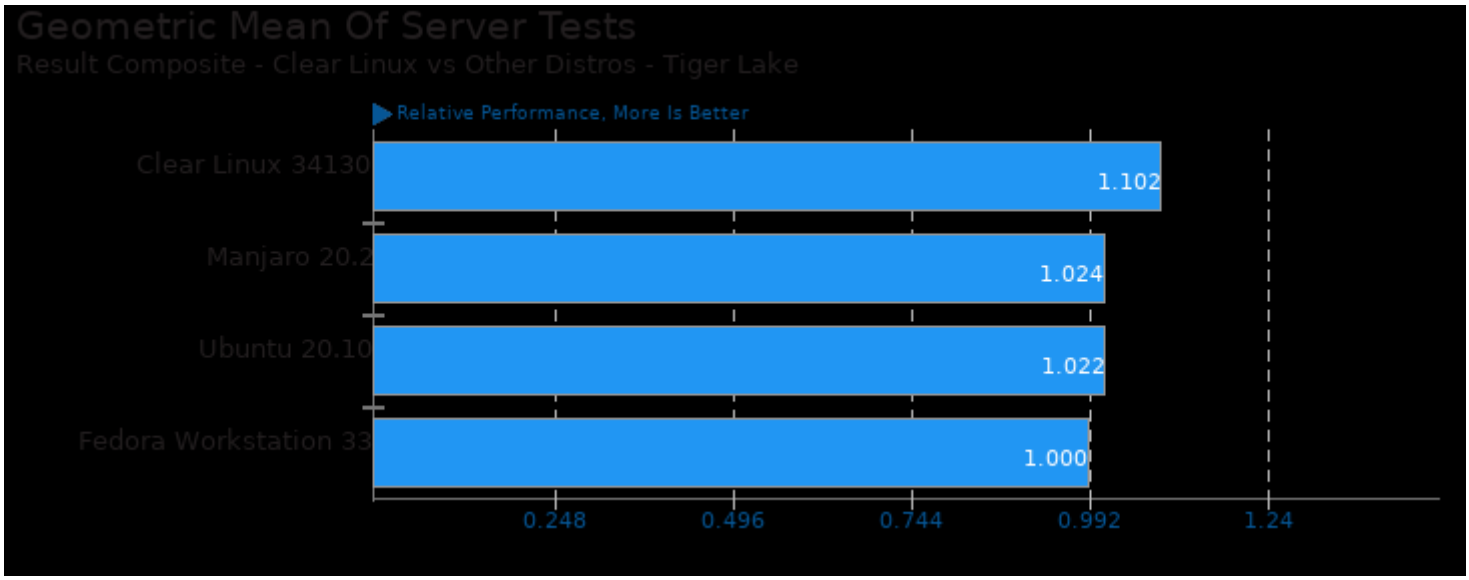


Geometric mean based upon tests: pts/appleseed, pts/v-ray and pts/indigobench

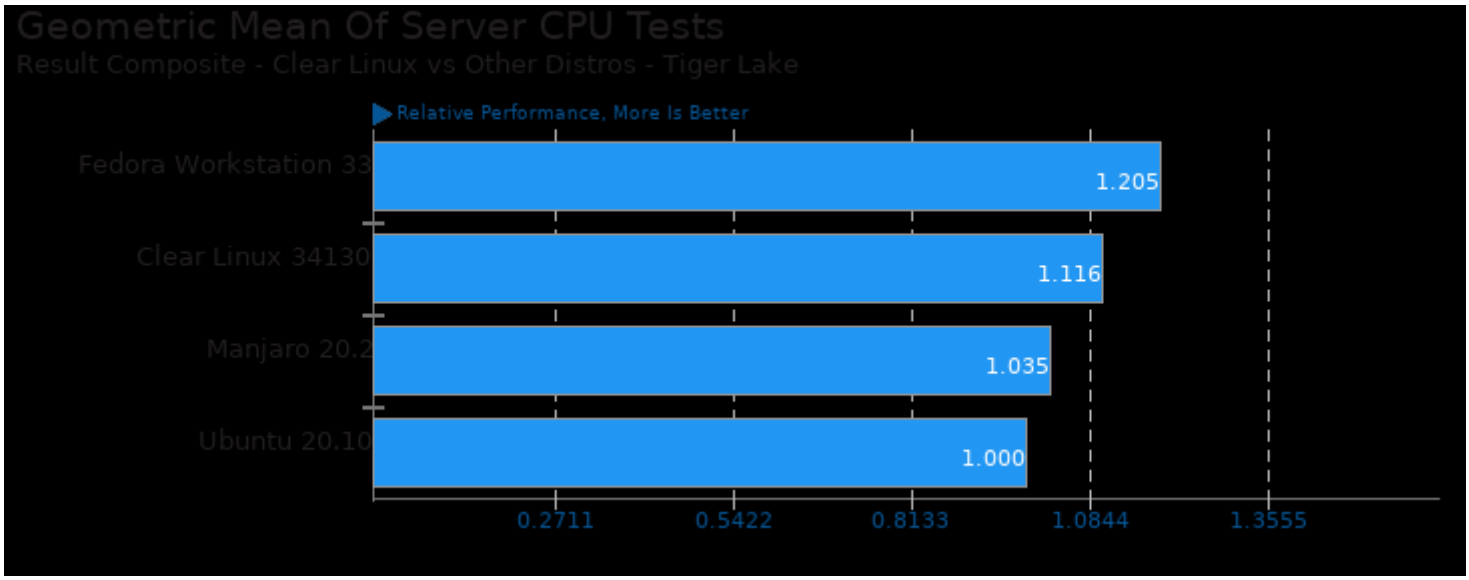
Clear Linux vs Other Distros - Tiger Lake



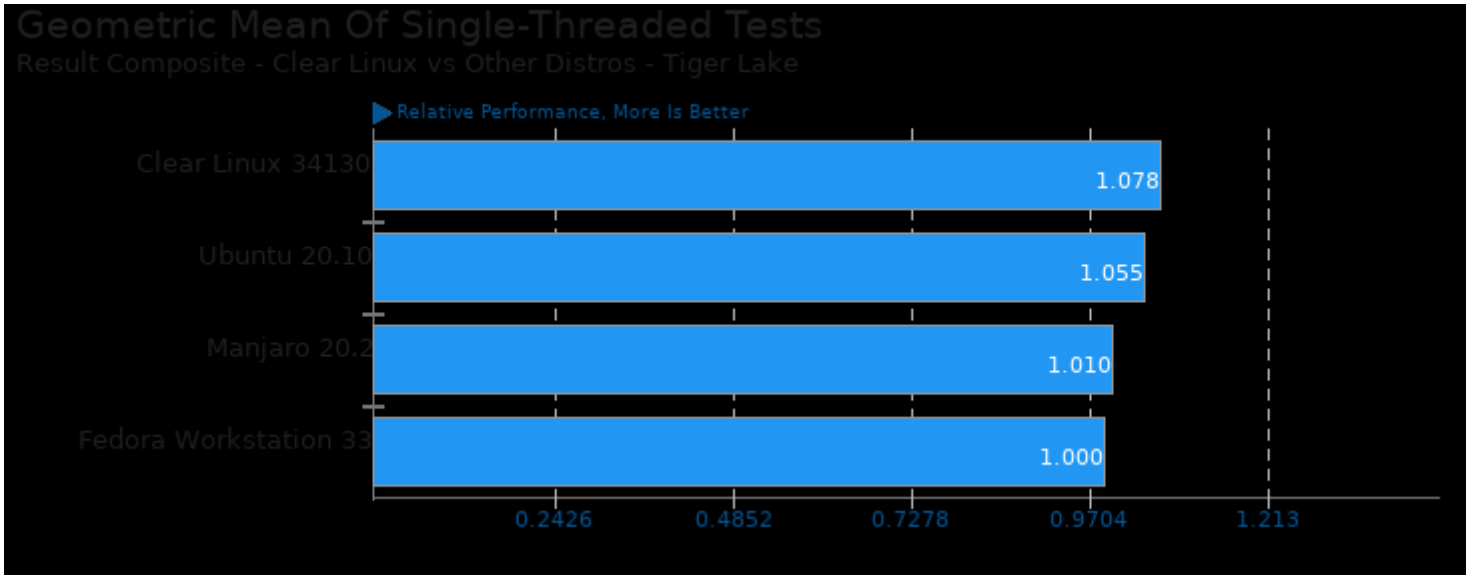
Geometric mean based upon tests: pts/namd, pts/gromacs, pts/dolfyn and pts/mrbayes



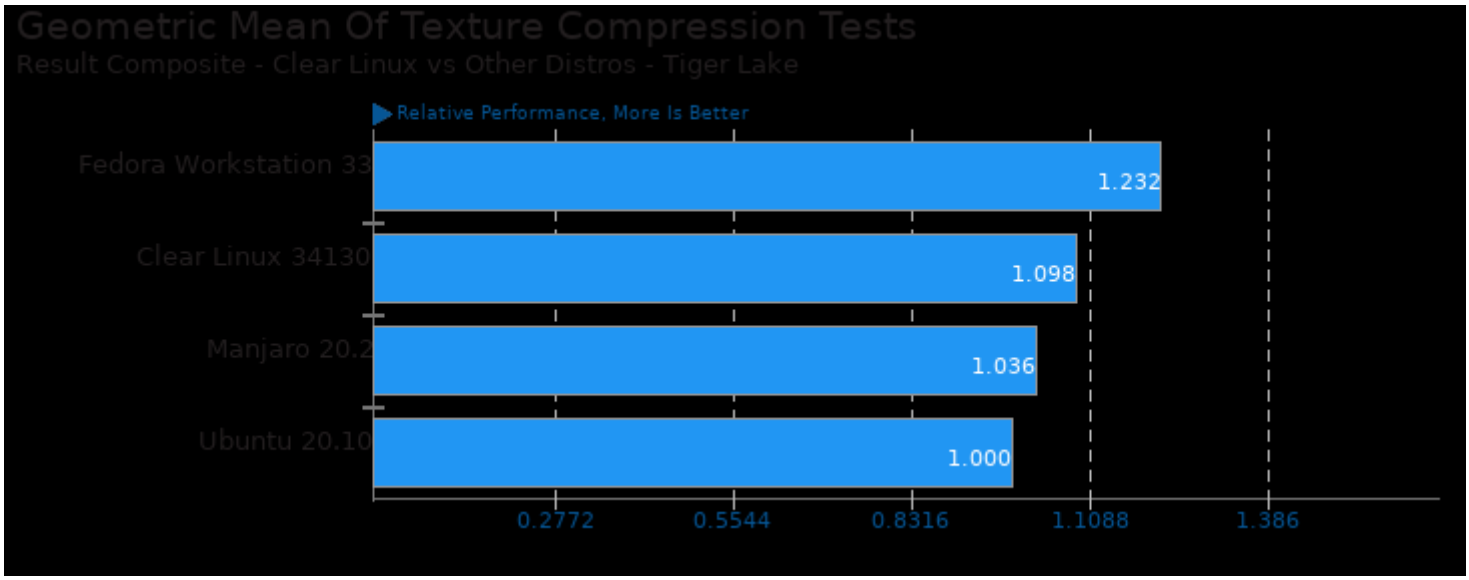
Geometric mean based upon tests: pts/perl-benchmark, pts/sqlite-speedtest and pts/leveldb



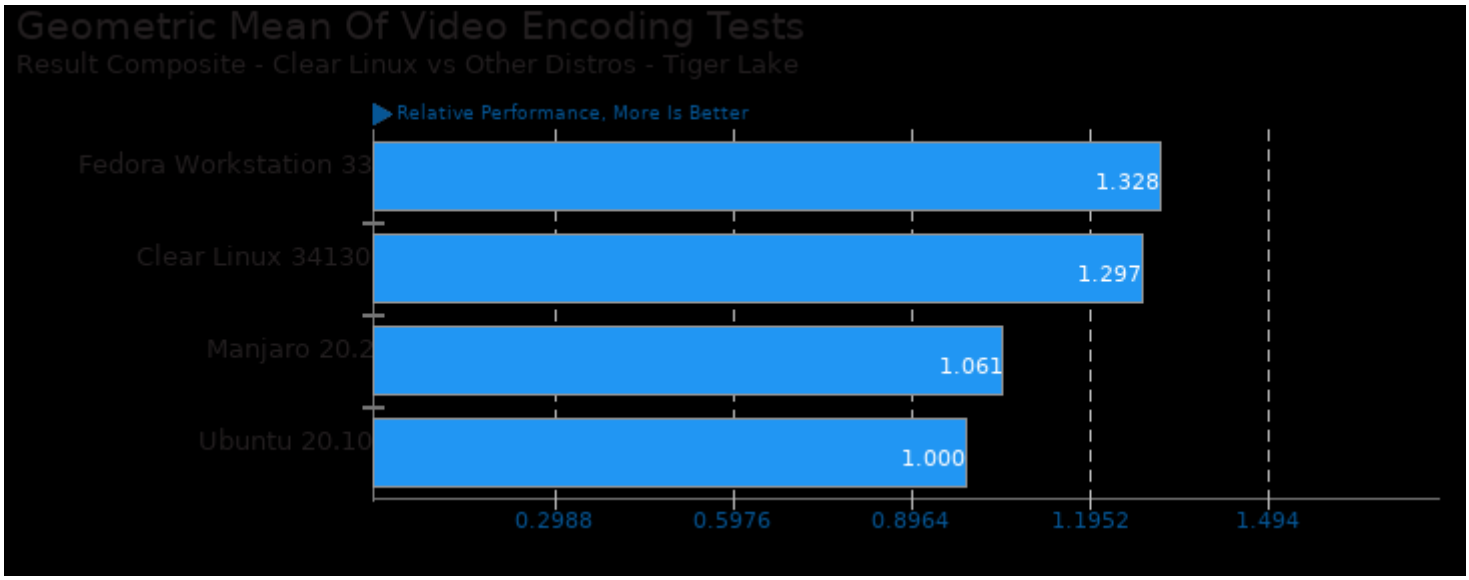
Geometric mean based upon tests: pts/namd, pts/svt-av1, pts/svt-vp9, pts/x264, pts/x265, pts/stockfish, pts/asmfish, pts/build-linux-kernel, pts/compress-zstd, pts/tjbench, pts/appleseed, pts/pybench and pts/numpy



Geometric mean based upon tests: pts/numpy, pts/deepspeech, pts/perl-benchmark, pts/tjbench, pts/pybench and pts/git

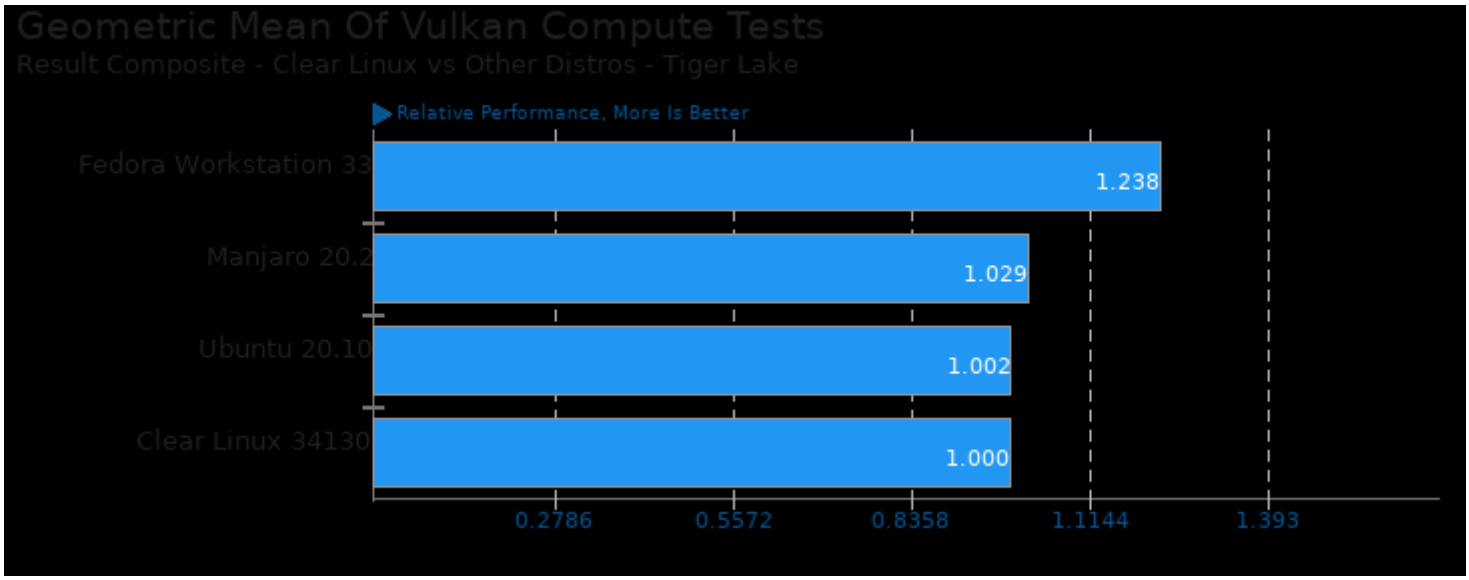


Geometric mean based upon tests: pts/basis and pts/astcenc

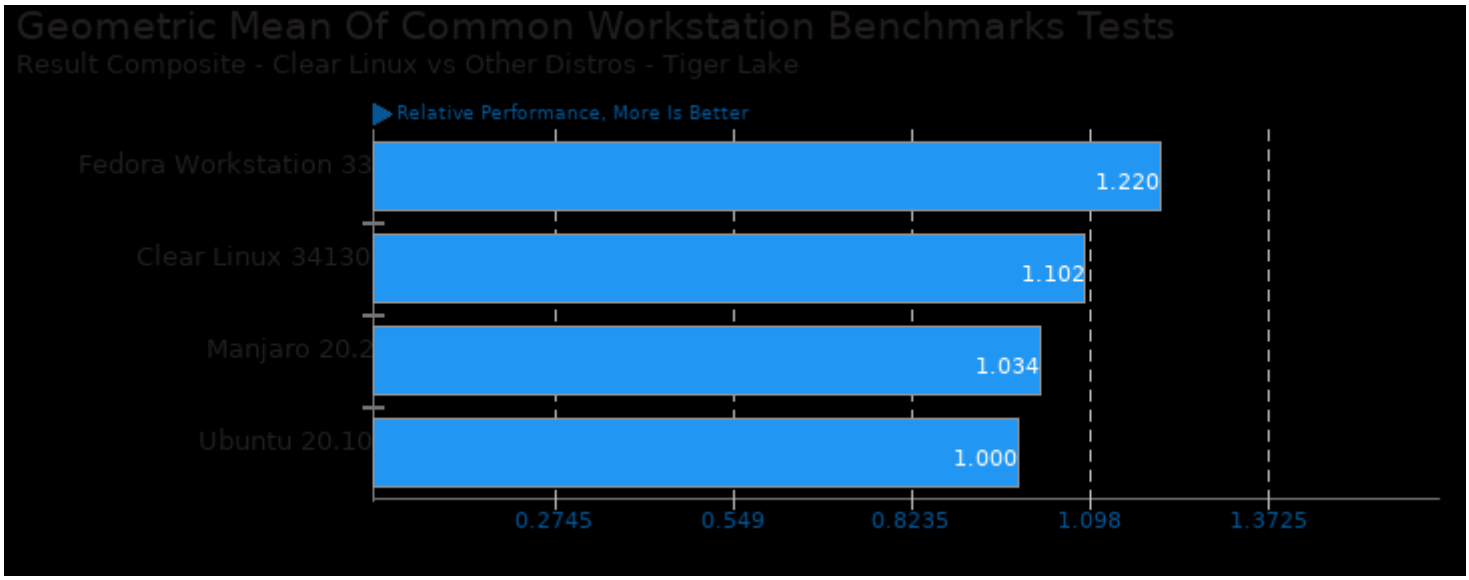


Geometric mean based upon tests: pts/svt-vp9, pts/x264, pts/x265, pts/vpxenc, pts/svt-av1 and pts/avifenc

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Geometric mean based upon tests: pts/ncnn, pts/realsr-ncnn and pts/waifu2x-ncnn



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

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