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Intel Xeon E5-2687W v3 testing with a MSI X99S SLI PLUS (MS-7885) v1.0 (1.E0 BIOS) and NVIDIA GeForce GTX 770 on Ubuntu 20.04 via the Phoronix Test Suite.

Automated Executive Summary

1 had the most wins, coming in first place for 42% of the tests.

Based on the geometric mean of all complete results, the fastest (1) was 1.002x the speed of the slowest (2). 3 was 0.999x the speed of 1 and 2 was 1x the speed of 3.

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

SVT-VP9 (Tuning: VMAF Optimized - Input: Bosphorus 1080p) at 1.174x
srsLTE (Test: OFDM_Test) at 1.152x
ViennaCL (Test: CPU BLAS - dAXPY) at 1.144x
VOSK Speech Recognition Toolkit at 1.099x
KTX-Software toktx (Settings: Zstd Compression 9) at 1.081x
Helsing (Digit Range: 14 digit) at 1.047x
QMCPACK (Input: simple-H2O) at 1.047x
Embree (Binary: Pathtracer - Model: Crown) at 1.046x
AOM AV1 (Encoder Mode: Speed 0 Two-Pass - Input: Bosphorus 1080p) at 1.04x

Stockfish (Total Time) at 1.038x.

Test Systems:

1

2

3

Processor: Intel Xeon E5-2687W v3 @ 3.50GHz (10 Cores / 20 Threads), Motherboard: MSI X99S SLI PLUS (MS-7885) v1.0 (1.E0 BIOS), Chipset: Intel Xeon E7 v3/Xeon, Memory: 32GB, Disk: 80GB INTEL SSDSCKGW08, Graphics: NVIDIA GeForce GTX 770, Audio: Realtek ALC892, Monitor: LG Ultra HD, Network: Intel I218-V

OS: Ubuntu 20.04, Kernel: 5.9.0-050900rc7daily20200928-generic (x86_64) 20200927, Desktop: GNOME Shell 3.36.4, Display Server: X Server 1.20.9, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-9-HskZEa/gcc-9-9.3.0/debian/tmp-nvptx/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_cpufreq ondemand - CPU Microcode: 0x44
Python Notes: Python 3.8.5
Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + l1tf: Mitigation of PTE Inversion; VMX: conditional cache flushes SMT vulnerable + mds: Mitigation of Clear buffers; SMT vulnerable + meltdown: Mitigation of PTI + 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 generic retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

	1	2	3
toyBrot Fractal Generator - OpenMP (ms)	66314	**66391**	**66299**
Normalized	99.98%	99.86%	100%
Standard Deviation	0.1%		
toyBrot Fractal Generator - C++ Tasks (ms)	**66632**	66341	**66331**
Normalized	99.55%	99.98%	100%
Standard Deviation	0.5%		
toyBrot Fractal Generator - C++ Threads	66253	**66336**	**66224**
Normalized	99.96%	99.83%	100%
Standard Deviation	0.1%		
Timed MrBayes Analysis - P.P.A (sec)	187.452	**184.004**	**187.497**
Normalized	98.16%	100%	98.14%
Standard Deviation	2.5%		
QMCPACK - simple-H2O (Execution Time - sec)	**52.540**	52.487	**50.184**
Normalized	95.52%	95.61%	100%
Standard Deviation	3%		

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Timed HMMer Search - P.D.S (sec)	187.834	**187.917**	**187.558**
Normalized	99.85%	99.81%	100%
Standard Deviation	0.2%		
Xcompact3d Incompact3d - i.i.1.C.P.D (sec)	**31.8818099**	31.7161522	**31.4801865**
Normalized	98.74%	99.26%	100%
Standard Deviation	1.3%		
Xcompact3d Incompact3d - i.i.1.C.P.D (sec)	**127.615463**	127.763268	**129.590805**
Normalized	100%	99.88%	98.48%
Standard Deviation	2%		
libgav1 - Chimera 1080p (FPS)	89.69	**89.52**	**90.08**
Normalized	99.57%	99.38%	100%
Standard Deviation	0.1%		
libgav1 - Summer Nature 4K (FPS)	**43.76**	**43.76**	**43.55**
Normalized	100%	100%	99.52%
Standard Deviation	0.5%		
libgav1 - S.N.1 (FPS)	126.28	**125.69**	**126.39**
Normalized	99.91%	99.45%	100%
Standard Deviation	0.4%		
libgav1 - C.1.1.b (FPS)	31.64	**31.66**	**31.55**
Normalized	99.94%	100%	99.65%
Standard Deviation	0.2%		
GNU GMP GMPbench - Total Time (GMPbench Score)	**3657**	**3645**	3654
Normalized	100%	99.67%	99.91%
Xmrig - Monero - 1M (H/s)	**3039**	**3013**	3033
Normalized	100%	99.13%	99.79%
Standard Deviation	0.8%		
Xmrig - Wownero - 1M (H/s)	**4762**	4805	**4845**
Normalized	98.3%	99.18%	100%
Standard Deviation	1%		
Chia Blockchain VDF - Square Plain C++	108100	108100	108100
Chia Blockchain VDF - S.A.O (IPS)	**119633**	117600	**116500**
Normalized	100%	98.3%	97.38%
Standard Deviation	0.6%		
Zstd Compression - 3 - Compression Speed (MB/s)	**1958**	1971	**1997**
Normalized	98.09%	98.71%	100%
Standard Deviation	1.5%		
Zstd Compression - 8 - Compression Speed (MB/s)	**355.1**	353.7	**350.4**
Normalized	100%	99.61%	98.68%
Standard Deviation	0.5%		
Zstd Compression - 8 - D.S (MB/s)	**2688**	**2693**	**2693**
Normalized	99.8%	100%	100%
Standard Deviation	0.4%		
Zstd Compression - 19 - Compression Speed (MB/s)	**32.1**	**32.4**	32.3
Normalized	99.07%	100%	99.69%
Standard Deviation	0.9%		
Zstd Compression - 19 - D.S (MB/s)	**2470**	**2478**	2472
Normalized	99.67%	100%	99.76%
Standard Deviation	1.6%		

Zstd Compression - 3, Long Mode - Compression Speed (MB/s)	609.1	**602.4**	**614.4**
Normalized	99.14%	98.05%	100%
Standard Deviation	0.3%		
Zstd Compression - 3, Long Mode - D.S	**2799**	**2820**	2816
Normalized	99.27%	100%	99.88%
Standard Deviation	0.6%		
Zstd Compression - 8, Long Mode - Compression Speed (MB/s)	**446.9**	**442.5**	443.4
Normalized	100%	99.02%	99.22%
Standard Deviation	0.6%		
Zstd Compression - 8, Long Mode - D.S	**2861**	2844	**2833**
Normalized	100%	99.4%	99.02%
Standard Deviation	0.1%		
Zstd Compression - 19, Long Mode - Compression Speed (MB/s)	**29.6**	**29.1**	**29.1**
Normalized	100%	98.31%	98.31%
Standard Deviation	2.7%		
Zstd Compression - 19, Long Mode - D.S (MB/s)	2478	**2476**	**2510**
Normalized	98.71%	98.64%	100%
Standard Deviation	1.2%		
srsLTE - OFDM_Test (Samples / Second)	72300000	**63100000**	**72700000**
Normalized	99.45%	86.8%	100%
srsLTE - PHY_DL_Test (eNb Mb/s)	173.6	**175.3**	**172.6**
Normalized	99.03%	100%	98.46%
Standard Deviation	0.3%		
srsLTE - PHY_DL_Test (UE Mb/s)	70.3	**70.8**	**69.8**
Normalized	99.29%	100%	98.59%
Standard Deviation	0.2%		
Botan - KASUMI (MiB/s)	**75.999**	**75.92**	75.936
Normalized	100%	99.9%	99.92%
Standard Deviation	0.1%		
Botan - KASUMI - Decrypt (MiB/s)	71.946	**71.885**	**71.948**
Normalized	100%	99.91%	100%
Standard Deviation	0.1%		
Botan - AES-256 (MiB/s)	3117	**3126**	**3106**
Normalized	99.71%	100%	99.38%
Standard Deviation	0.4%		
Botan - AES-256 - Decrypt (MiB/s)	**3104**	3101	**3097**
Normalized	100%	99.9%	99.77%
Standard Deviation	0.3%		
Botan - Twofish (MiB/s)	**288.183**	**288.542**	288.535
Normalized	99.88%	100%	100%
Standard Deviation	0.1%		
Botan - Twofish - Decrypt (MiB/s)	**286.169**	**286.613**	286.502
Normalized	99.85%	100%	99.96%
Standard Deviation	0.1%		
Botan - Blowfish (MiB/s)	**346.405**	346.287	**346.248**
Normalized	100%	99.97%	99.95%
Standard Deviation	0%		
Botan - Blowfish - Decrypt (MiB/s)	**345.055**	**344.851**	344.919
Normalized	100%	99.94%	99.96%
Standard Deviation	0%		

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Botan - CAST-256 (MiB/s)	**109.393**	109.742	**109.754**
Normalized	99.67%	99.99%	100%
Standard Deviation	0.7%		
Botan - CAST-256 - Decrypt (MiB/s)	**109.251**	**109.567**	109.563
Normalized	99.71%	100%	100%
Standard Deviation	0.6%		
Botan - ChaCha20Poly1305 (MiB/s)	**578.937**	**577.483**	578.173
Normalized	100%	99.75%	99.87%
Standard Deviation	0.2%		
Botan - ChaCha20Poly1305 - Decrypt (MiB/s)	**572.534**	573.601	**574.418**
Normalized	99.67%	99.86%	100%
Standard Deviation	0.1%		
LuaRadio - F.B.t.B.F.F (MiB/s)	678.6	**662.4**	**682.5**
Normalized	99.43%	97.05%	100%
Standard Deviation	1.7%		
LuaRadio - F.D.F (MiB/s)	**328.2**	**328.2**	**330.9**
Normalized	99.18%	99.18%	100%
Standard Deviation	0.6%		
LuaRadio - Hilbert Transform (MiB/s)	77.9	**78.3**	**77.7**
Normalized	99.49%	100%	99.23%
Standard Deviation	0.5%		
LuaRadio - Complex Phase (MiB/s)	417.4	**417.3**	**418.7**
Normalized	99.69%	99.67%	100%
Standard Deviation	0%		
GNU Radio - F.B.t.B.F.F (MiB/s)	497.7	**493.3**	**499.6**
Normalized	99.62%	98.74%	100%
Standard Deviation	0.5%		
GNU Radio - S.S.C (MiB/s)	**1856**	1844	**1843**
Normalized	100%	99.4%	99.32%
Standard Deviation	1.2%		
GNU Radio - FIR Filter (MiB/s)	**474.6**	472.1	**471**
Normalized	100%	99.47%	99.24%
Standard Deviation	0.1%		
GNU Radio - IIR Filter (MiB/s)	**411.9**	**413.5**	413.1
Normalized	99.61%	100%	99.9%
Standard Deviation	0.4%		
GNU Radio - F.D.F (MiB/s)	**517.1**	517.9	**519.1**
Normalized	99.61%	99.77%	100%
Standard Deviation	0.6%		
GNU Radio - Hilbert Transform (MiB/s)	**264.7**	**264.3**	264.6
Normalized	100%	99.85%	99.96%
Standard Deviation	2%		
dav1d - Chimera 1080p (FPS)	**472.73**	475.88	**476.55**
Normalized	99.2%	99.86%	100%
Standard Deviation	0.9%		
dav1d - Summer Nature 4K (FPS)	**145.15**	144.78	**144.26**
Normalized	100%	99.75%	99.39%
Standard Deviation	0.5%		
dav1d - S.N.1 (FPS)	394.33	**395.79**	**392.01**
Normalized	99.63%	100%	99.04%
Standard Deviation	0.7%		
dav1d - C.1.1.b (FPS)	**88.68**	88.67	**88.65**
Normalized	100%	99.99%	99.97%
Standard Deviation	0%		

AOM AV1 - Speed 0 Two-Pass - Bosphorus 4K (FPS)	0.09	0.09	0.09
Standard Deviation	5.2%		
AOM AV1 - Speed 4 Two-Pass - Bosphorus 4K (FPS)	**2.37**	**2.36**	**2.36**
Normalized	100%	99.58%	99.58%
Standard Deviation	0%		
AOM AV1 - Speed 6 Realtime - Bosphorus 4K (FPS)	**8.98**	**9.17**	9.11
Normalized	97.93%	100%	99.35%
Standard Deviation	2.1%		
AOM AV1 - Speed 6 Two-Pass - Bosphorus 4K (FPS)	**4.55**	4.63	**4.64**
Normalized	98.06%	99.78%	100%
Standard Deviation	0.3%		
AOM AV1 - Speed 8 Realtime - Bosphorus 4K (FPS)	**27.51**	27.45	**27.43**
Normalized	100%	99.78%	99.71%
Standard Deviation	0.2%		
AOM AV1 - Speed 9 Realtime - Bosphorus 4K (FPS)	**37.40**	**37.23**	37.3
Normalized	100%	99.55%	99.73%
Standard Deviation	0.3%		
AOM AV1 - Speed 0 Two-Pass - Bosphorus 1080p (FPS)	**0.26**	**0.26**	**0.25**
Normalized	100%	100%	96.15%
Standard Deviation	2.2%		
AOM AV1 - Speed 4 Two-Pass - Bosphorus 1080p (FPS)	**4.09**	**4.06**	**4.09**
Normalized	100%	99.27%	100%
Standard Deviation	0.3%		
AOM AV1 - Speed 6 Realtime - Bosphorus 1080p (FPS)	**15.19**	**15.37**	**15.37**
Normalized	98.83%	100%	100%
Standard Deviation	0.9%		
AOM AV1 - Speed 6 Two-Pass - Bosphorus 1080p (FPS)	**12.39**	**12.41**	**12.41**
Normalized	99.84%	100%	100%
Standard Deviation	0.2%		
AOM AV1 - Speed 8 Realtime - Bosphorus 1080p (FPS)	60.92	**61.77**	**60.85**
Normalized	98.62%	100%	98.51%
Standard Deviation	1.1%		
AOM AV1 - Speed 9 Realtime - Bosphorus 1080p (FPS)	72.30	**73.91**	**72.17**
Normalized	97.82%	100%	97.65%
Standard Deviation	0.8%		
Embree - Pathtracer - Crown (FPS)	9.8735	**9.5853**	**10.0219**
Normalized	98.52%	95.64%	100%
Standard Deviation	0.1%		
Embree - Pathtracer ISPC - Crown (FPS)	**10.9213**	10.9347	**10.989**
Normalized	99.38%	99.51%	100%
Standard Deviation	0.1%		

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Embree - Pathtracer - Asian Dragon (FPS)	**11.4729**	11.2554	**11.2491**
Normalized	100%	98.1%	98.05%
Standard Deviation	0.7%		
Embree - Pathtracer - Asian Dragon Obj	**10.5853**	**10.5473**	10.5545
Normalized	100%	99.64%	99.71%
Standard Deviation	0.3%		
Embree - Pathtracer ISPC - Asian Dragon (FPS)	13.1137	**13.1354**	**13.1041**
Normalized	99.83%	100%	99.76%
Standard Deviation	0.7%		
Embree - Pathtracer ISPC - Asian Dragon Obj (FPS)	**11.8105**	**11.7505**	11.7876
Normalized	100%	99.49%	99.81%
Standard Deviation	0.1%		
SVT-HEVC - 1 - Bosphorus 1080p (FPS)	**5.72**	**5.73**	**5.73**
Normalized	99.83%	100%	100%
Standard Deviation	0.1%		
SVT-HEVC - 7 - Bosphorus 1080p (FPS)	**82.79**	82.63	**82.37**
Normalized	100%	99.81%	99.49%
Standard Deviation	0.1%		
SVT-HEVC - 10 - Bosphorus 1080p (FPS)	**173.18**	**173.01**	173.06
Normalized	100%	99.9%	99.93%
Standard Deviation	0.3%		
SVT-VP9 - VMAF Optimized - Bosphorus 1080p (FPS)	**131.62**	**112.13**	113.45
Normalized	100%	85.19%	86.2%
Standard Deviation	4.3%		
SVT-VP9 - P.S.O - Bosphorus 1080p (FPS)	137.41	**137.02**	**137.66**
Normalized	99.82%	99.54%	100%
Standard Deviation	0.1%		
SVT-VP9 - V.Q.O - Bosphorus 1080p (FPS)	**108.08**	108.03	**108**
Normalized	100%	99.95%	99.93%
Standard Deviation	0.3%		
Stockfish - Total Time (Nodes/s)	**21549515**	**20756949**	20973440
Normalized	100%	96.32%	97.33%
Standard Deviation	2%		
PJSIP - INVITE (Responses/sec)	**3321**	**3320**	**3320**
Normalized	100%	99.97%	99.97%
Standard Deviation	0.2%		
PJSIP - OPTIONS, Stateful (Responses/sec)	5680	**5666**	**5689**
Normalized	99.84%	99.6%	100%
Standard Deviation	0.1%		
PJSIP - OPTIONS, Stateless (Responses/sec)	**36173**	**36043**	36169
Normalized	100%	99.64%	99.99%
Standard Deviation	0.8%		
libavif avifenc - 0 (sec)	**101.116**	**102.93**	101.731
Normalized	100%	98.24%	99.4%
Standard Deviation	1.4%		
libavif avifenc - 2 (sec)	**53.703**	**52.725**	53.514
Normalized	98.18%	100%	98.53%
Standard Deviation	1.1%		
libavif avifenc - 6 (sec)	18.928	**19.232**	**18.908**
Normalized	99.89%	98.32%	100%
Standard Deviation	0.5%		

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libavif avifenc - 10 (sec)	5.375	**5.41**	**5.368**
Normalized	99.87%	99.22%	100%
Standard Deviation	0.5%		
libavif avifenc - 6, Lossless (sec)	**81.115**	**80.642**	80.774
Normalized	99.42%	100%	99.84%
Standard Deviation	0.8%		
libavif avifenc - 10, Lossless (sec)	9.080	**9.289**	**9.065**
Normalized	99.83%	97.59%	100%
Standard Deviation	0.2%		
Timed Linux Kernel Compilation - Time To Compile (sec)	**121.584**	122.873	**123.825**
Normalized	100%	98.95%	98.19%
Standard Deviation	1.8%		
Timed LLVM Compilation - Ninja (sec)	**925.475**	925.736	**927.025**
Normalized	100%	99.97%	99.83%
Standard Deviation	0%		
Timed LLVM Compilation - Unix Makefiles	**964.590**	964.077	**951.556**
Normalized	98.65%	98.7%	100%
Standard Deviation	1.9%		
Timed Mesa Compilation - Time To Compile (sec)	75.847	**75.824**	**76.334**
Normalized	99.97%	100%	99.33%
Standard Deviation	0.4%		
Timed Node.js Compilation - Time To Compile (sec)	**595.295**	**593.248**	593.916
Normalized	99.66%	100%	99.89%
Standard Deviation	0.1%		
oneDNN - IP Shapes 1D - f32 - CPU (ms)	4.12581	**4.13077**	**4.11242**
Normalized	99.68%	99.56%	100%
Standard Deviation	0.6%		
oneDNN - IP Shapes 3D - f32 - CPU (ms)	**7.46460**	7.50073	**7.5126**
Normalized	100%	99.52%	99.36%
Standard Deviation	0.1%		
oneDNN - IP Shapes 1D - u8s8f32 - CPU (ms)	**2.78165**	**2.76679**	2.76696
Normalized	99.47%	100%	99.99%
Standard Deviation	0.2%		
oneDNN - IP Shapes 3D - u8s8f32 - CPU (ms)	2.44319	**2.44752**	**2.43904**
Normalized	99.83%	99.65%	100%
Standard Deviation	0.1%		
oneDNN - C.B.S.A - f32 - CPU (ms)	**13.7665**	13.7675	**13.7742**
Normalized	100%	99.99%	99.94%
Standard Deviation	0%		
oneDNN - D.B.s - f32 - CPU (ms)	6.55061	**6.56384**	**6.52527**
Normalized	99.61%	99.41%	100%
Standard Deviation	0.2%		
oneDNN - D.B.s - f32 - CPU (ms)	**8.39311**	8.39791	**8.40666**
Normalized	100%	99.94%	99.84%
Standard Deviation	0.3%		
oneDNN - C.B.S.A - u8s8f32 - CPU (ms)	**12.7023**	**12.6855**	12.6892
Normalized	99.87%	100%	99.97%
Standard Deviation	0.1%		
oneDNN - D.B.s - u8s8f32 - CPU (ms)	**3.55190**	3.54188	**3.53866**
Normalized	99.63%	99.91%	100%
Standard Deviation	0.6%		

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oneDNN - D.B.s - u8s8f32 - CPU (ms)	**5.66569**	**5.65039**	5.66558
Normalized	99.73%	100%	99.73%
Standard Deviation	0.5%		
oneDNN - R.N.N.T - f32 - CPU (ms)	**4054**	**4050**	4051
Normalized	99.92%	100%	99.98%
Standard Deviation	0.2%		
oneDNN - R.N.N.I - f32 - CPU (ms)	**2215**	**2218**	2217
Normalized	100%	99.9%	99.95%
Standard Deviation	0.1%		
oneDNN - R.N.N.T - u8s8f32 - CPU (ms)	**4050**	4054	**4058**
Normalized	100%	99.9%	99.79%
Standard Deviation	0.1%		
oneDNN - R.N.N.I - u8s8f32 - CPU (ms)	**2228**	2217	**2217**
Normalized	99.51%	99.98%	100%
Standard Deviation	1.3%		
oneDNN - M.M.B.S.T - f32 - CPU (ms)	**3.35073**	**3.36355**	3.35822
Normalized	100%	99.62%	99.78%
Standard Deviation	0.1%		
oneDNN - R.N.N.T - bf16bf16bf16 - CPU (ms)	**4052**	**4052**	4052
Normalized	100%	99.98%	100%
Standard Deviation	0.1%		
oneDNN - R.N.N.I - bf16bf16bf16 - CPU (ms)	2214	**2214**	**2216**
Normalized	100%	100%	99.89%
Standard Deviation	0.1%		
oneDNN - M.M.B.S.T - u8s8f32 - CPU (ms)	**3.48130**	3.4953	**3.55843**
Normalized	100%	99.6%	97.83%
Standard Deviation	0.3%		
Timed Erlang/OTP Compilation - Time To Compile (sec)	**168.766**	**166.64**	167.352
Normalized	98.74%	100%	99.57%
Standard Deviation	1%		
Helsing - 12 digit (sec)	**6.450**	**6.446**	6.447
Normalized	99.94%	100%	99.98%
Standard Deviation	0.1%		
Helsing - 14 digit (sec)	**599.723**	601.194	**627.965**
Normalized	100%	99.76%	95.5%
Standard Deviation	0.2%		
VOSK Speech Recognition Toolkit (sec)	**26.641**	**29.277**	29.207
Normalized	100%	91%	91.21%
Standard Deviation	3%		
SecureMark - SecureMark-TLS (marks)	**191107**	**191158**	191151
Normalized	99.97%	100%	100%
Standard Deviation	0.1%		
Liquid-DSP - 1 - 256 - 57 (samples/s)	49054667	**49056000**	**49052000**
Normalized	100%	100%	99.99%
Standard Deviation	0%		
Liquid-DSP - 2 - 256 - 57 (samples/s)	93297000	**93119000**	**94009000**
Normalized	99.24%	99.05%	100%
Standard Deviation	0.7%		
Liquid-DSP - 4 - 256 - 57 (samples/s)	**168710000**	**167210000**	168540000
Normalized	100%	99.11%	99.9%
Standard Deviation	0%		
Liquid-DSP - 8 - 256 - 57 (samples/s)	**343806667**	343480000	**342790000**
Normalized	100%	99.9%	99.7%
Standard Deviation	0.1%		

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Liquid-DSP - 16 - 256 - 57 (samples/s)	441220000	**444300000**	**437390000**
Normalized	99.31%	100%	98.44%
Standard Deviation	1.4%		
Liquid-DSP - 20 - 256 - 57 (samples/s)	**452546667**	**452770000**	452640000
Normalized	99.95%	100%	99.97%
Standard Deviation	0%		
ViennaCL - CPU BLAS - sCOPY (GB/s)	**27.5**	**27.5**	**27.4**
Normalized	100%	100%	99.64%
Standard Deviation	0%		
ViennaCL - CPU BLAS - sAXPY (GB/s)	**41.3**	**41.2**	**41.3**
Normalized	100%	99.76%	100%
Standard Deviation	0.1%		
ViennaCL - CPU BLAS - sDOT (GB/s)	**43.7**	**43.6**	**43.7**
Normalized	100%	99.77%	100%
Standard Deviation	0%		
ViennaCL - CPU BLAS - dAXPY (GB/s)	**36.2**	**41.4**	**41.4**
Normalized	87.44%	100%	100%
ViennaCL - CPU BLAS - dDOT (GB/s)	**38.8**	**43.8**	**43.8**
Normalized	88.58%	100%	100%
Standard Deviation	22.2%		
ViennaCL - CPU BLAS - dGEMV-N (GB/s)	**45.7**	45.6	**45.4**
Normalized	100%	99.78%	99.34%
Standard Deviation	0.1%		
ViennaCL - CPU BLAS - dGEMV-T (GB/s)	**49.2**	**48.9**	**48.9**
Normalized	100%	99.39%	99.39%
Standard Deviation	0.1%		
ViennaCL - CPU BLAS - dGEMM-NN (GFLOPs/s)	**27.6**	**28**	27.7
Normalized	98.57%	100%	98.93%
Standard Deviation	0.6%		
ViennaCL - CPU BLAS - dGEMM-NT (GFLOPs/s)	**26.9**	**26.6**	26.7
Normalized	100%	98.88%	99.26%
Standard Deviation	1.3%		
ViennaCL - CPU BLAS - dGEMM-TN (GFLOPs/s)	29.4	**29.2**	29.4
Normalized	98%	97.33%	98%
Standard Deviation	0%		
ViennaCL - CPU BLAS - dGEMM-TT (GFLOPs/s)	**27.9**	**27.7**	**27.7**
Normalized	100%	99.28%	99.28%
Standard Deviation	0.8%		
libjpeg-turbo tjbench - D.T (Megapixels/sec)	**158.053214**	**155.494139**	156.529497
Normalized	100%	98.38%	99.04%
Standard Deviation	0.2%		
ASTC Encoder - Medium (sec)	**7.9701**	**8.121**	8.1096
Normalized	100%	98.14%	98.28%
Standard Deviation	1.2%		
ASTC Encoder - Thorough (sec)	18.8220	**18.8103**	**18.8248**
Normalized	99.94%	100%	99.92%
Standard Deviation	0.1%		
ASTC Encoder - Exhaustive (sec)	**141.7632**	**141.9129**	141.7768
Normalized	100%	99.89%	99.99%
Standard Deviation	0%		

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Basis Universal - ETC1S (sec)	**34.099**	34.278	**34.387**
Normalized	100%	99.48%	99.16%
Standard Deviation	1%		
Basis Universal - UASTC Level 0 (sec)	11.079	**10.867**	**11.115**
Normalized	98.09%	100%	97.77%
Standard Deviation	0.8%		
Basis Universal - UASTC Level 2 (sec)	**43.769**	**43.677**	43.689
Normalized	99.79%	100%	99.97%
Standard Deviation	0.1%		
Basis Universal - UASTC Level 3 (sec)	**80.198**	**80.076**	80.104
Normalized	99.85%	100%	99.97%
Standard Deviation	0%		
KTX-Software toktx - UASTC 3 (sec)	**17.165**	17.263	**17.279**
Normalized	100%	99.43%	99.34%
Standard Deviation	1.3%		
KTX-Software toktx - Zstd Compression 9	4.174	**4.102**	**4.435**
Normalized	98.28%	100%	92.49%
Standard Deviation	2.9%		
KTX-Software toktx - Z.C.1 (sec)	23.367	**23.264**	**23.404**
Normalized	99.56%	100%	99.4%
Standard Deviation	0.6%		
KTX-Software toktx - U.3.Z.C.1 (sec)	23.681	**23.467**	**23.801**
Normalized	99.1%	100%	98.6%
Standard Deviation	0.3%		
KTX-Software toktx - U.4.Z.C.1 (sec)	**444.730**	**444.538**	444.664
Normalized	99.96%	100%	99.97%
Standard Deviation	0%		
Google Draco - Lion (ms)	**7235**	7316	**7335**
Normalized	100%	98.89%	98.64%
Standard Deviation	1.6%		
Google Draco - Church Facade (ms)	10529	**10468**	**10590**
Normalized	99.42%	100%	98.85%
Standard Deviation	0.5%		
Mobile Neural Network - SqueezeNetV1.0	**8.740**	**8.692**	8.701
Normalized	99.45%	100%	99.9%
Standard Deviation	0.2%		
Mobile Neural Network - resnet-v2-50 (ms)	**53.833**	53.942	**54.614**
Normalized	100%	99.8%	98.57%
Standard Deviation	0.3%		
Mobile Neural Network - MobileNetV2_224	5.116	**5.178**	**5.081**
Normalized	99.32%	98.13%	100%
Standard Deviation	0.9%		
Mobile Neural Network - mobilenet-v1-1.0	**6.133**	**6.106**	6.128
Normalized	99.56%	100%	99.64%
Standard Deviation	0.9%		
Mobile Neural Network - inception-v3 (ms)	**57.177**	56.812	**56.799**
Normalized	99.34%	99.98%	100%
Standard Deviation	0.4%		
Sysbench - RAM / Memory (MiB/sec)	16674	**16809**	**16460**
Normalized	99.2%	100%	97.92%
Standard Deviation	0.7%		
Sysbench - CPU (Events/sec)	**15805**	**15806**	15806
Normalized	99.99%	100%	100%
Standard Deviation	0%		
Blender - BMW27 - CPU-Only (sec)	**196.01**	195.56	**195.45**

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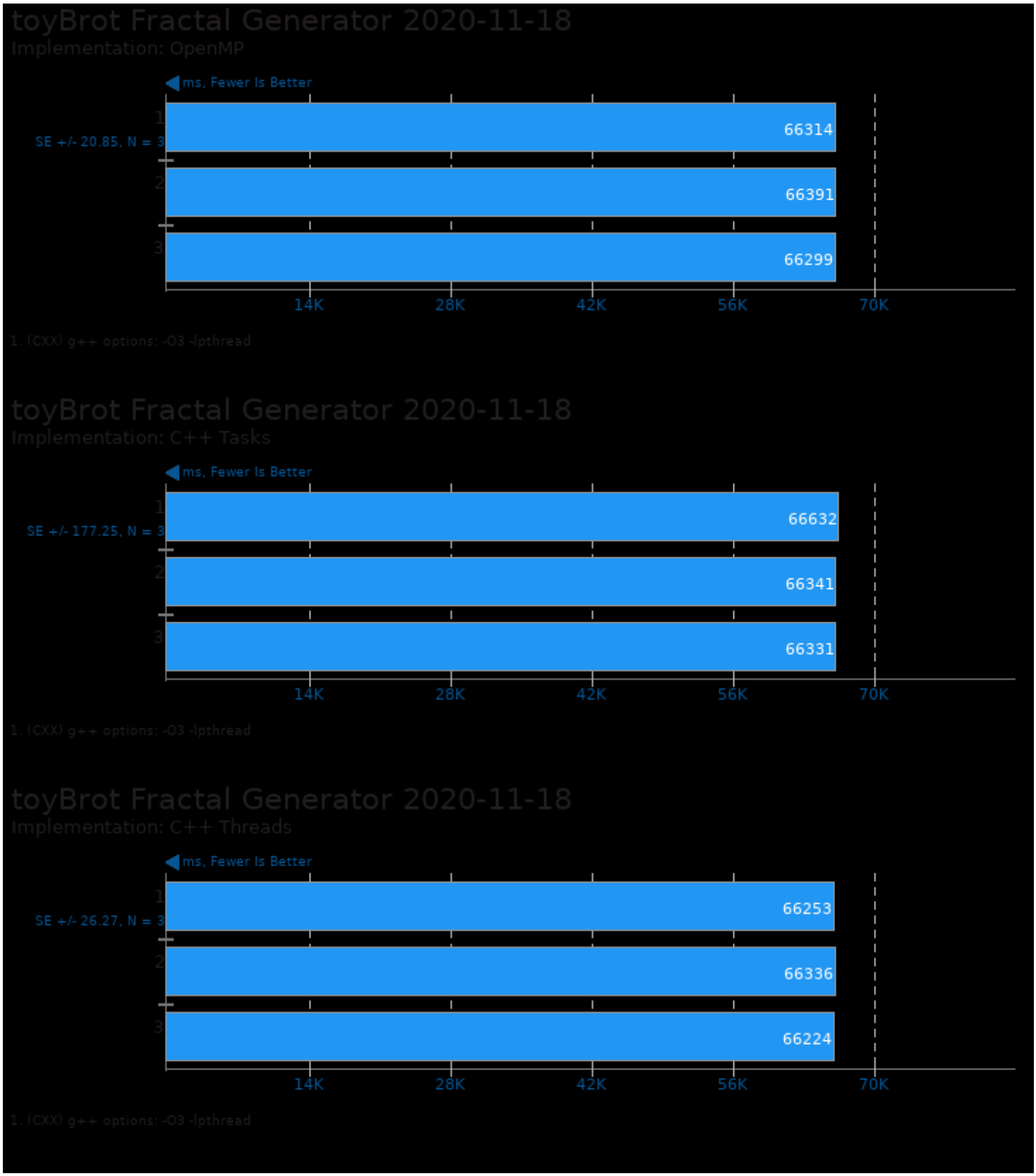
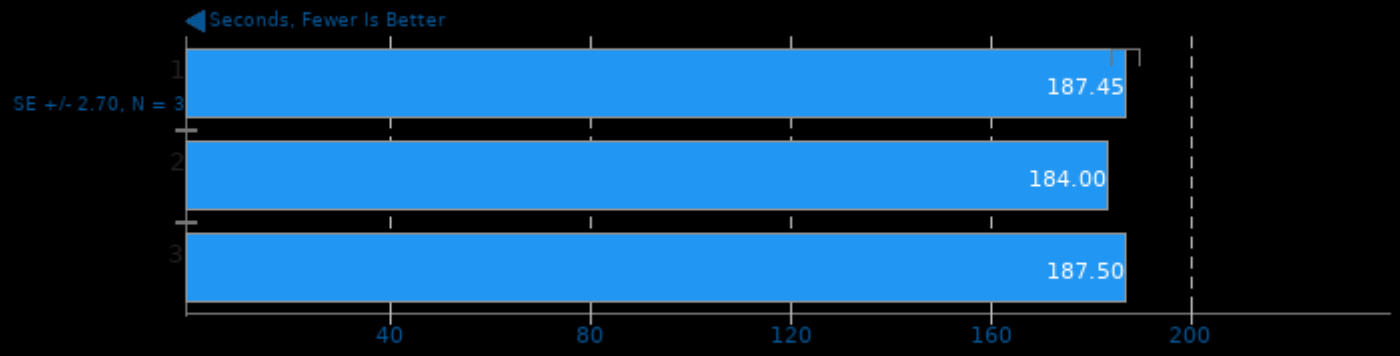
Normalized	99.71%	99.94%	100%
Standard Deviation	0.3%		
Blender - Classroom - CPU-Only (sec)	**589.06**	586.2	**585.15**
Normalized	99.34%	99.82%	100%
Standard Deviation	0.7%		
Blender - Fishy Cat - CPU-Only (sec)	**267.61**	268.21	**268.63**
Normalized	100%	99.78%	99.62%
Standard Deviation	0.1%		
Blender - Barbershop - CPU-Only (sec)	**775.57**	778.21	**779.06**
Normalized	100%	99.66%	99.55%
Standard Deviation	0.2%		
Blender - Pabellon Barcelona - CPU-Only	**652.69**	**659.72**	656.27
Normalized	100%	98.93%	99.45%
Standard Deviation	0.2%		
SVT-AV1 - Preset 4 - Bosphorus 4K (FPS)	**0.9**	**0.904**	0.902
Normalized	99.56%	100%	99.78%
SVT-AV1 - Preset 8 - Bosphorus 4K (FPS)	**9.987**	**9.943**	9.95
Normalized	100%	99.56%	99.63%
SVT-AV1 - Preset 4 - Bosphorus 1080p (FPS)	**3.065**	3.018	**2.968**
Normalized	100%	98.47%	96.84%
SVT-AV1 - Preset 8 - Bosphorus 1080p (FPS)	**37.198**	**36.775**	36.846
Normalized	100%	98.86%	99.05%
ViennaCL - CPU BLAS - dCOPY (GB/s)		27.5	27.5


toyBrot Fractal Generator 2020-11-18
Implementation: OpenMP
ms, Fewer Is Better
SE +/- 20.85, N = 3
66314
66391
66299
14K
28K
42K
56K
70K
1. (CXX) g++ options: -O3 -lpthread
toyBrot Fractal Generator 2020-11-18
Implementation: C++ Tasks
ms, Fewer Is Better
SE +/- 177.25, N = 3
66632
66341
66331
14K
28K
42K
56K
70K
1. (CXX) g++ options: -O3 -lpthread
toyBrot Fractal Generator 2020-11-18
Implementation: C++ Threads
ms, Fewer Is Better
SE +/- 26.27, N = 3
66253
66336
66224
14K
28K
42K
56K
70K
1. (CXX) g++ options: -O3 -lpthread

Timed MrBayes Analysis 3.2.7

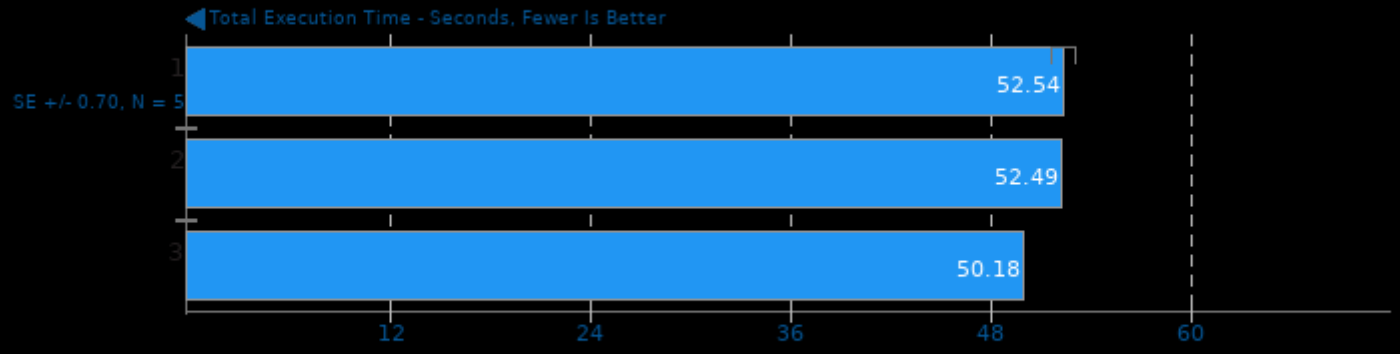
Primate Phylogeny Analysis



1. (CC) gcc options: -mmmx -msse -msse2 -msse3 -mssse3 -msse4.1 -msse4.2 -maes -mavx -mfma -mavx2 -mrdrnd -mbmi -mbmi2 -mabm -O3 -std=c99 -

QMCPACK 3.11

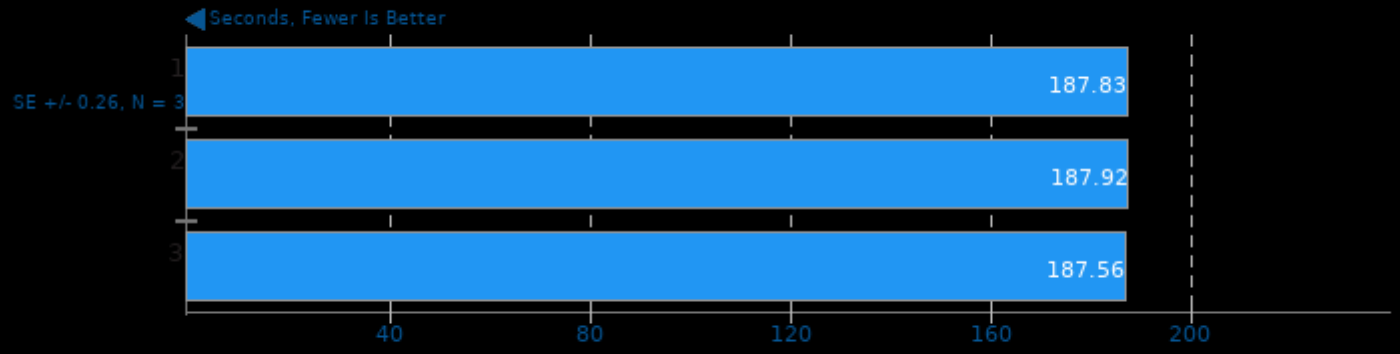
Input: simple-H2O



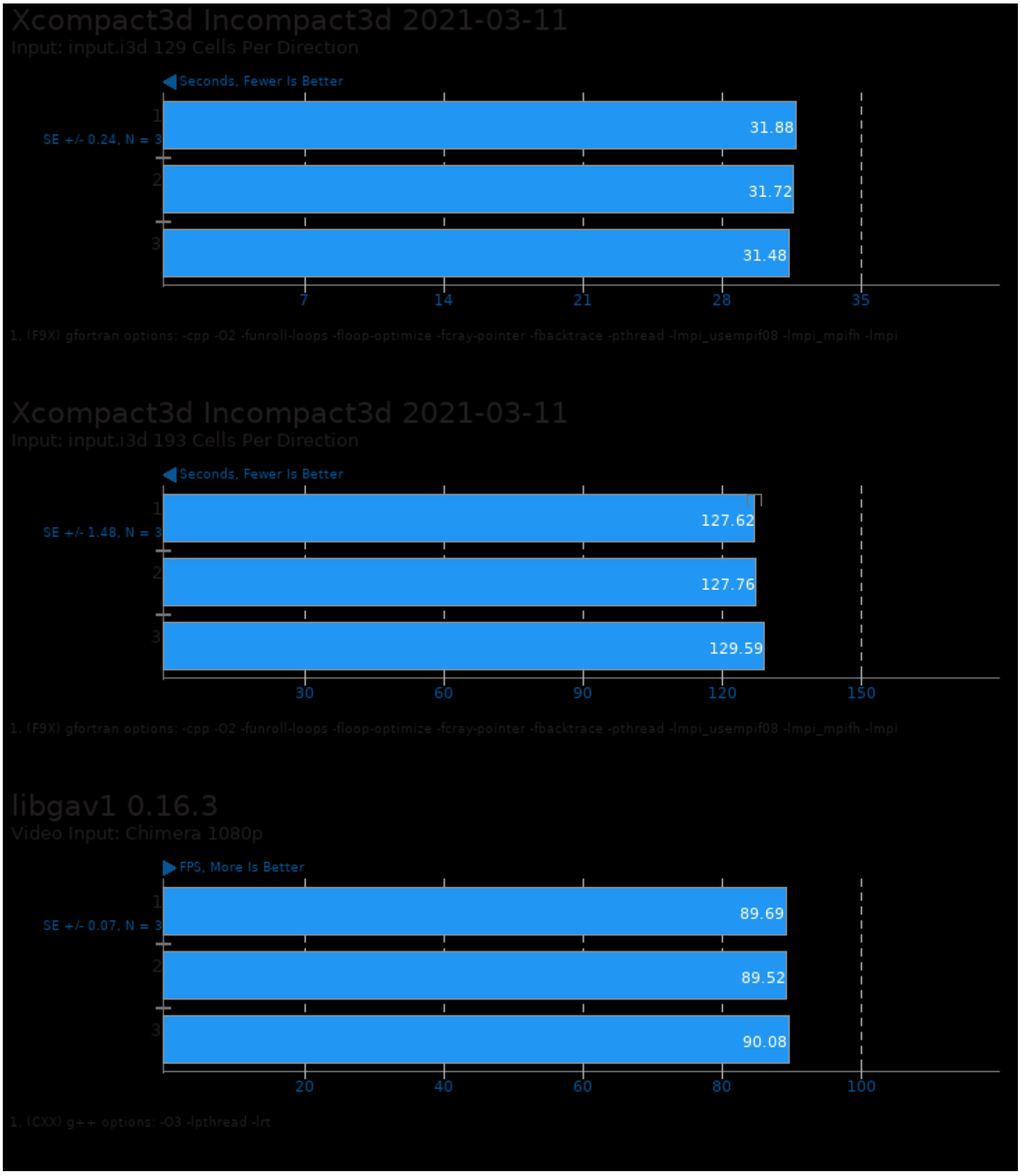
1. (CXX) g++ options: -fopenmp -finline-limit=1000 -fstrict-aliasing -funroll-all-loops -march=native -O3 -fomit-frame-pointer -ffast-math -pthread -lm

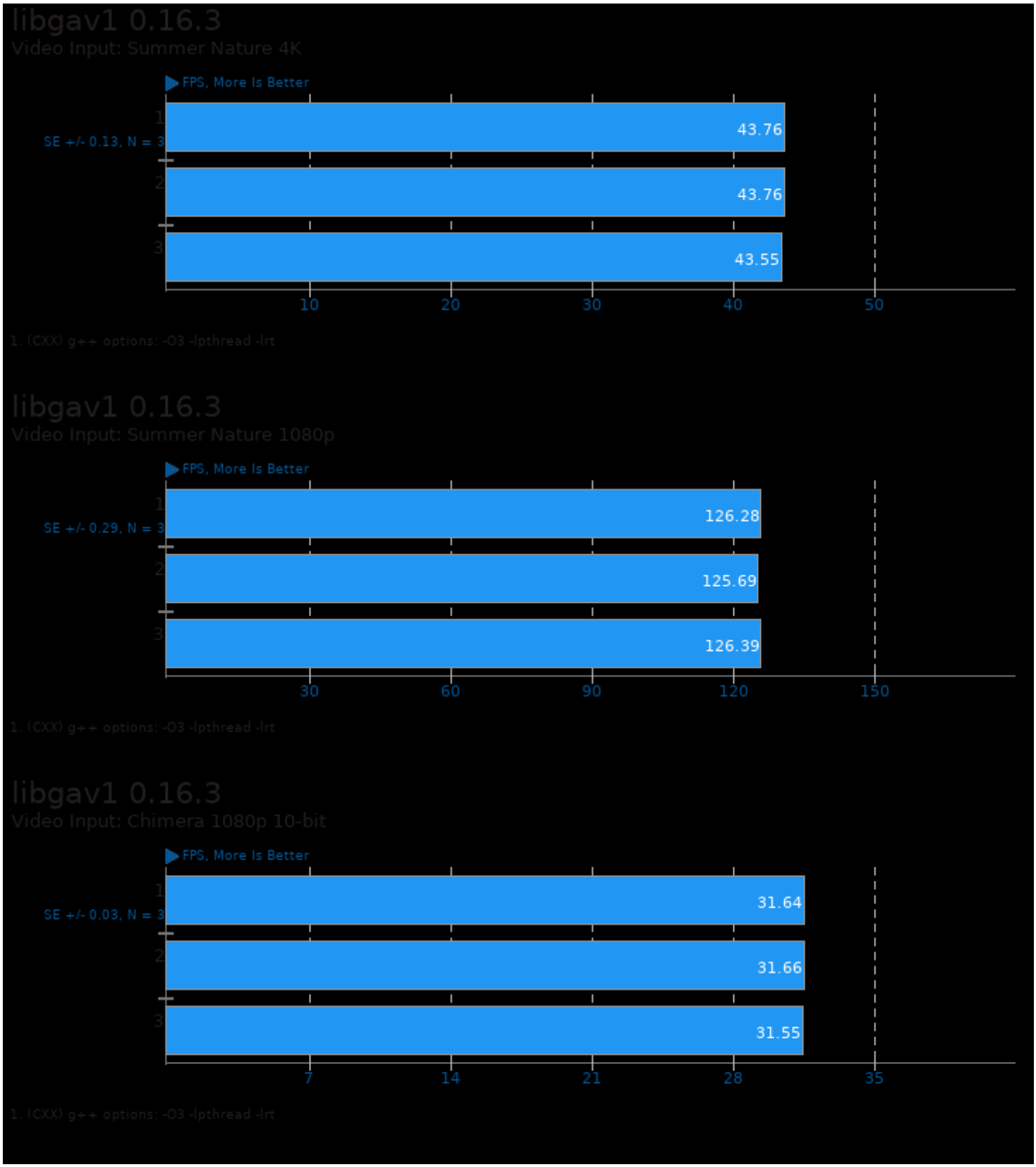
Timed HMMer Search 3.3.2

Pfam Database Search



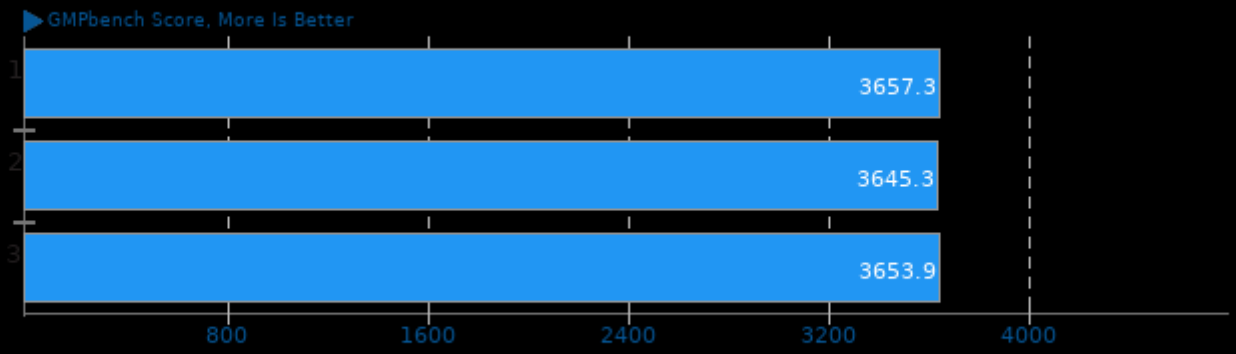
1. (CC) gcc options: -O3 -pthread -lhmmer -leasel -lm -lmpi


Xcompact3d Incompact3d 2021-03-11
Input: input.i3d 129 Cells Per Direction
Seconds, Fewer Is Better
SE +/- 0.24, N = 3
1
2
3
31.88
31.72
31.48
7
14
21
28
35
1. (F9X) gfortran options: -cpp -O2 -funroll-loops -floop-optimize -fcray-pointer -fbacktrace -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
Xcompact3d Incompact3d 2021-03-11
Input: input.i3d 193 Cells Per Direction
Seconds, Fewer Is Better
SE +/- 1.48, N = 3
1
2
3
127.62
127.76
129.59
30
60
90
120
150
1. (F9X) gfortran options: -cpp -O2 -funroll-loops -floop-optimize -fcray-pointer -fbacktrace -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
libgav1 0.16.3
Video Input: Chimera 1080p
FPS, More Is Better
SE +/- 0.07, N = 3
1
2
3
89.69
89.52
90.08
20
40
60
80
100
1. (CXX) g++ options: -O3 -lpthread -lrt


libgav1 0.16.3
Video Input: Summer Nature 4K
FPS, More Is Better
SE +/- 0.13, N = 3
1
2
3
43.76
43.76
43.55
10
20
30
40
50
1. (CXX) g++ options: -O3 -lpthread -lrt
libgav1 0.16.3
Video Input: Summer Nature 1080p
FPS, More Is Better
SE +/- 0.29, N = 3
1
2
3
126.28
125.69
126.39
30
60
90
120
150
1. (CXX) g++ options: -O3 -lpthread -lrt
libgav1 0.16.3
Video Input: Chimera 1080p 10-bit
FPS, More Is Better
SE +/- 0.03, N = 3
1
2
3
31.64
31.66
31.55
7
14
21
28
35
1. (CXX) g++ options: -O3 -lpthread -lrt

GNU GMP GMPbench 6.2.1

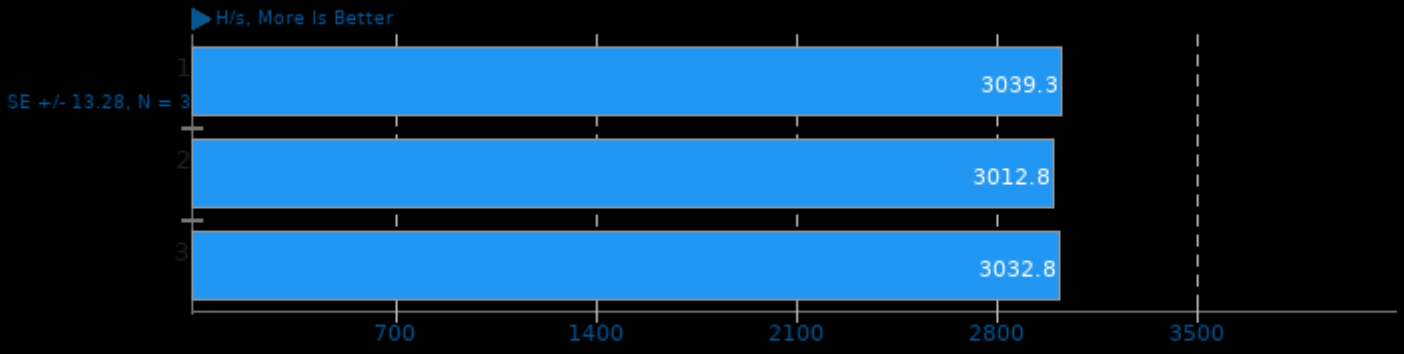
Total Time



1. (CC) gcc options: -O3 -fomit-frame-pointer -lm

Xmrig 6.12.1

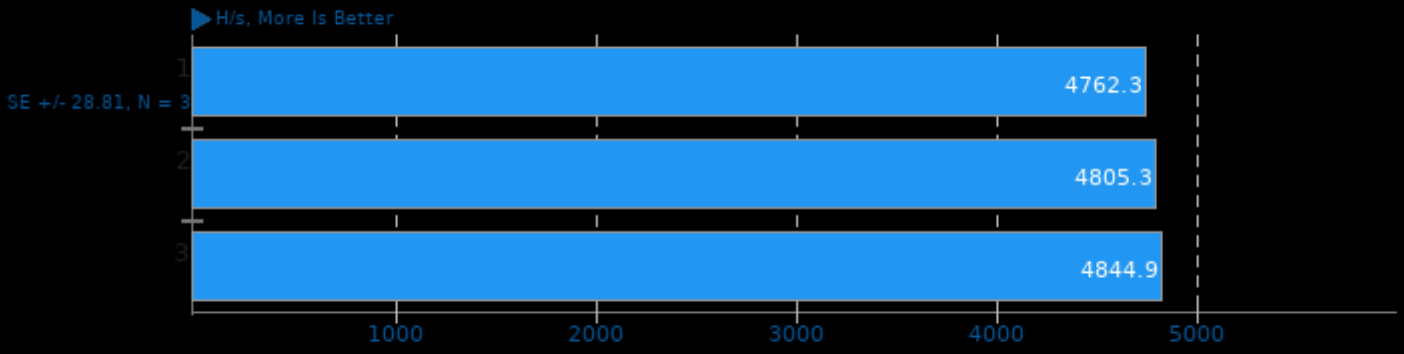
Variant: Monero - Hash Count: 1M



1. (CXX) g++ options: -fexceptions -fno-rtti -maes -O3 -Ofast -static-libgcc -static-libstdc++ -rdynamic -lssl -lcrypto -luv -lpthread -lrt -ldl -lhwloc

Xmrig 6.12.1

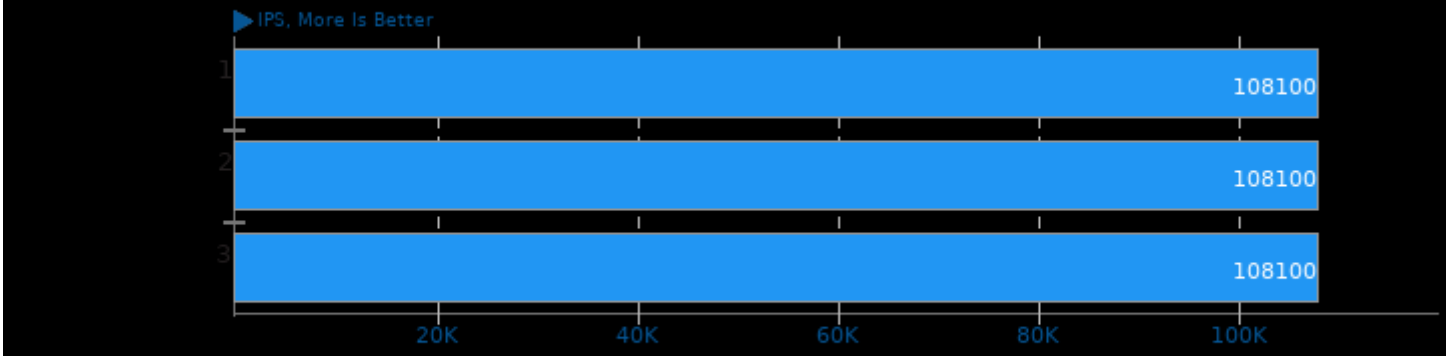
Variant: Wownero - Hash Count: 1M



1. (CXX) g++ options: -fexceptions -fno-rtti -maes -O3 -Ofast -static-libgcc -static-libstdc++ -rdynamic -lssl -lcrypto -luv -lpthread -lrt -ldl -lhwloc

Chia Blockchain VDF 1.0.1

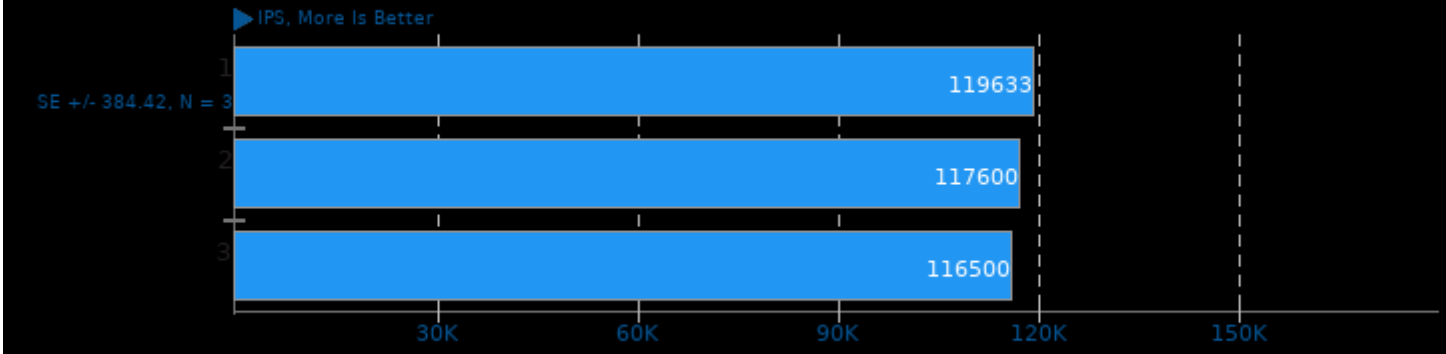
Test: Square Plain C++



1. (CXX) g++ options: -flto -no-pie -lgmpxx -lgmp -lboost_system -pthread

Chia Blockchain VDF 1.0.1

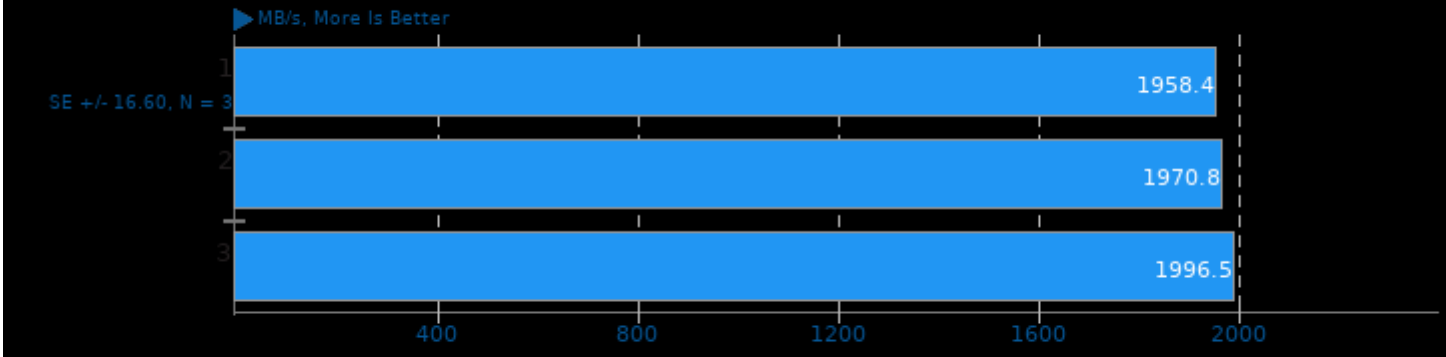
Test: Square Assembly Optimized



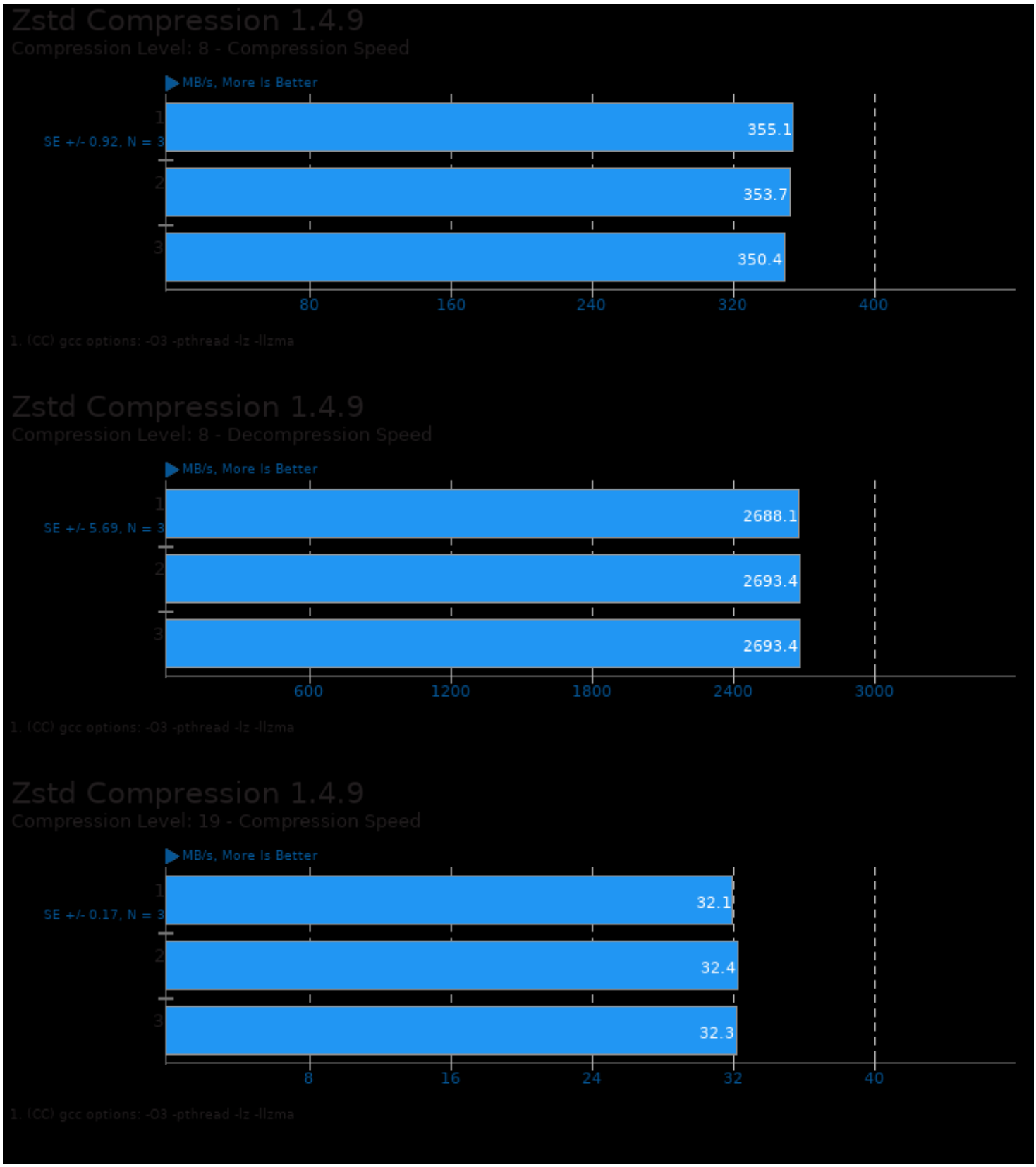
1. (CXX) g++ options: -flto -no-pie -lgmpxx -lgmp -lboost_system -pthread

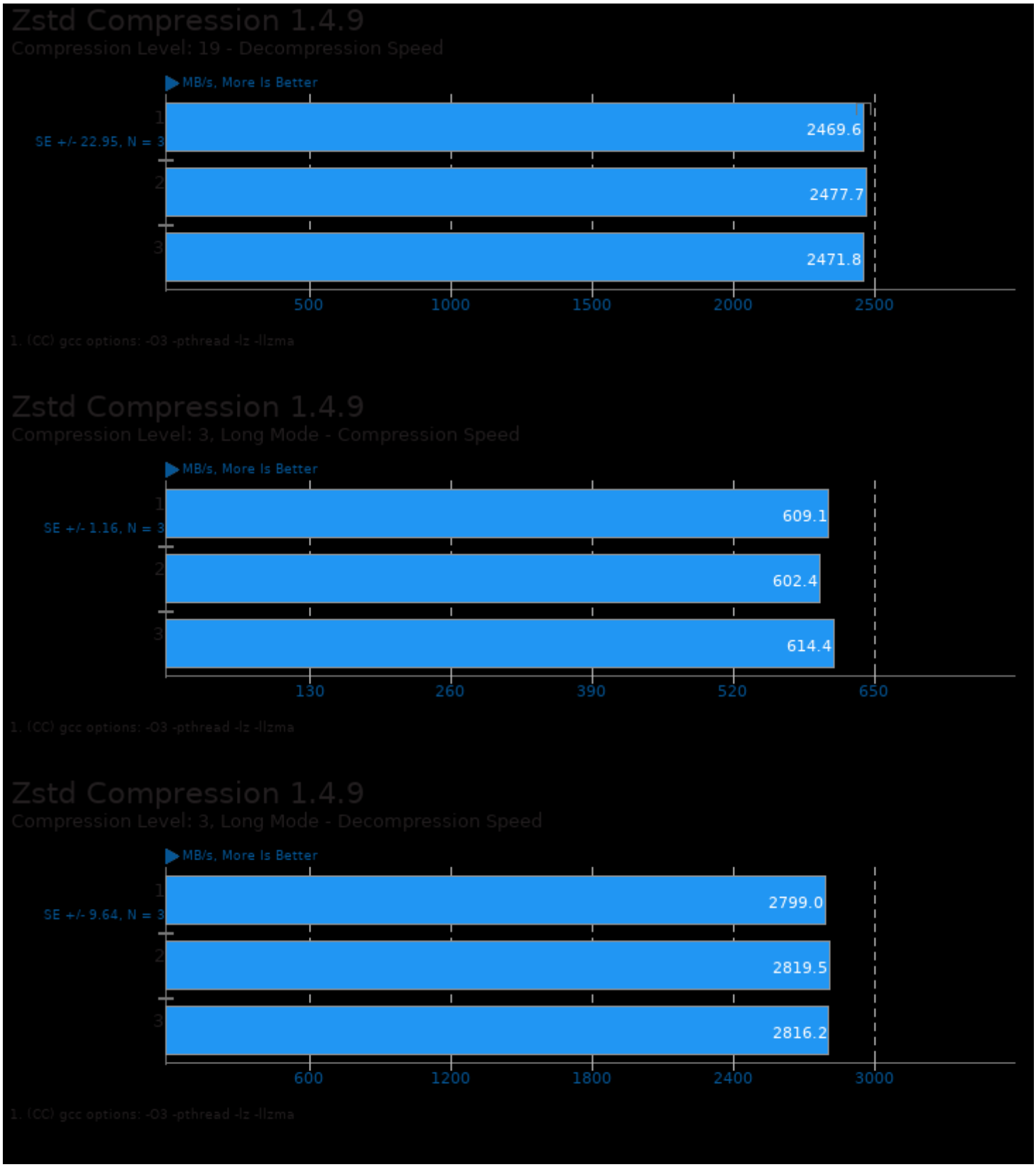
Zstd Compression 1.4.9

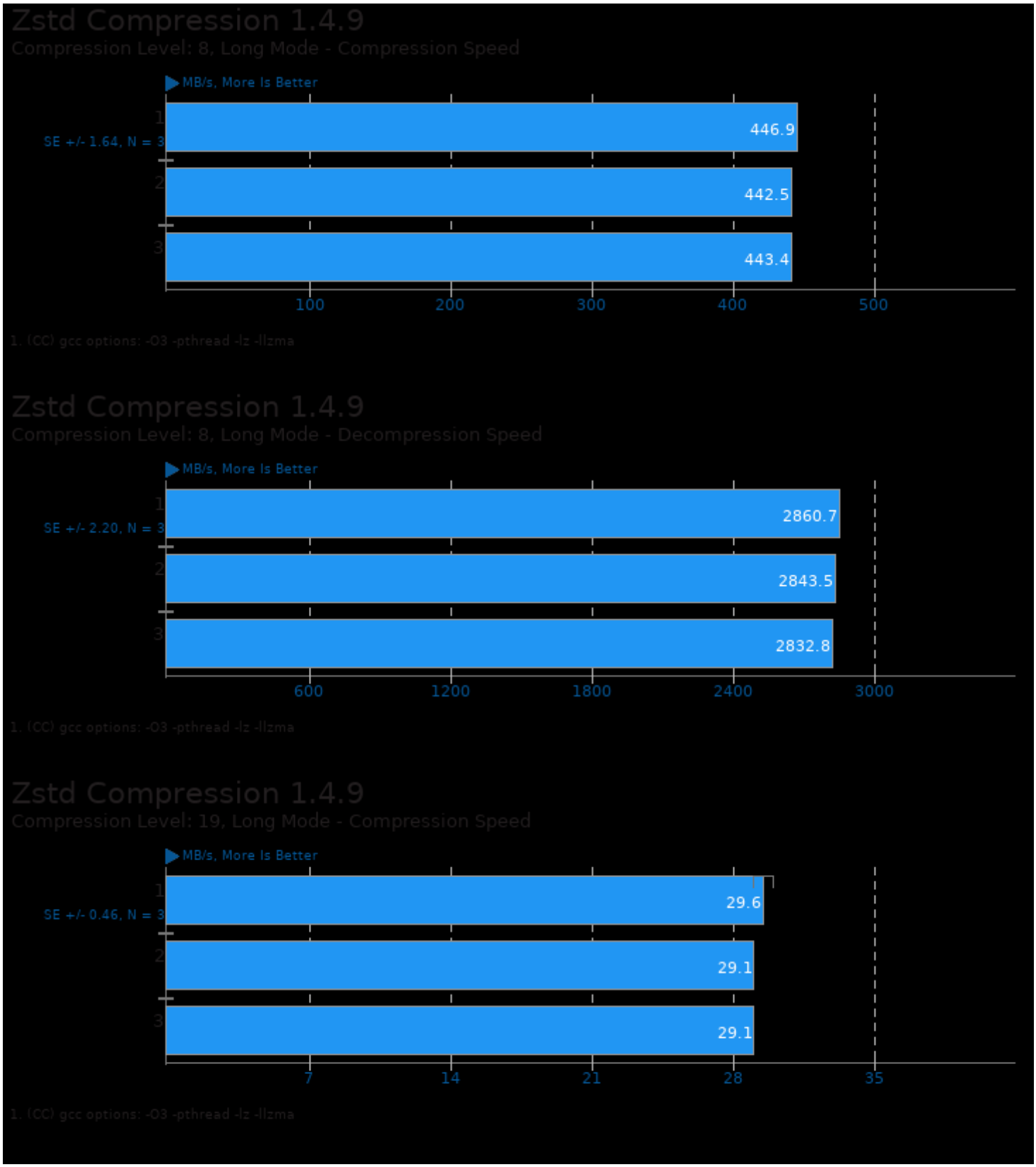
Compression Level: 3 - Compression Speed



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

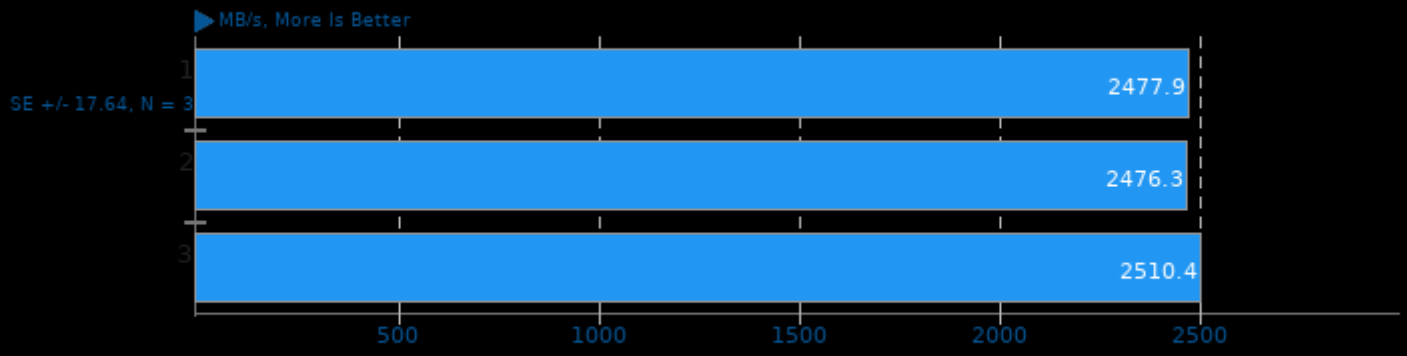

Zstd Compression 1.4.9
Compression Level: 8 - Compression Speed
MB/s, More Is Better
SE +/- 0.92, N = 3
1
2
3
355.1
353.7
350.4
80
160
240
320
400
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.4.9
Compression Level: 8 - Decompression Speed
MB/s, More Is Better
SE +/- 5.69, N = 3
1
2
3
2688.1
2693.4
2693.4
600
1200
1800
2400
3000
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.4.9
Compression Level: 19 - Compression Speed
MB/s, More Is Better
SE +/- 0.17, N = 3
1
2
3
32.1
32.4
32.3
8
16
24
32
40
1. (CC) gcc options: -O3 -pthread -lz -llzma


Zstd Compression 1.4.9
Compression Level: 19 - Decompression Speed
MB/s, More Is Better
SE +/- 22.95, N = 3
1
2
3
2469.6
2477.7
2471.8
500
1000
1500
2000
2500
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.4.9
Compression Level: 3, Long Mode - Compression Speed
MB/s, More Is Better
SE +/- 1.16, N = 3
1
2
3
609.1
602.4
614.4
130
260
390
520
650
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.4.9
Compression Level: 3, Long Mode - Decompression Speed
MB/s, More Is Better
SE +/- 9.64, N = 3
1
2
3
2799.0
2819.5
2816.2
600
1200
1800
2400
3000
1. (CC) gcc options: -O3 -pthread -lz -llzma


Zstd Compression 1.4.9
Compression Level: 8, Long Mode - Compression Speed
MB/s, More Is Better
SE +/- 1.64, N = 3
1
2
3
446.9
442.5
443.4
100
200
300
400
500
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.4.9
Compression Level: 8, Long Mode - Decompression Speed
MB/s, More Is Better
SE +/- 2.20, N = 3
1
2
3
2860.7
2843.5
2832.8
600
1200
1800
2400
3000
1. (CC) gcc options: -O3 -pthread -lz -llzma
Zstd Compression 1.4.9
Compression Level: 19, Long Mode - Compression Speed
MB/s, More Is Better
SE +/- 0.46, N = 3
1
2
3
29.6
29.1
29.1
7
14
21
28
35
1. (CC) gcc options: -O3 -pthread -lz -llzma

Zstd Compression 1.4.9

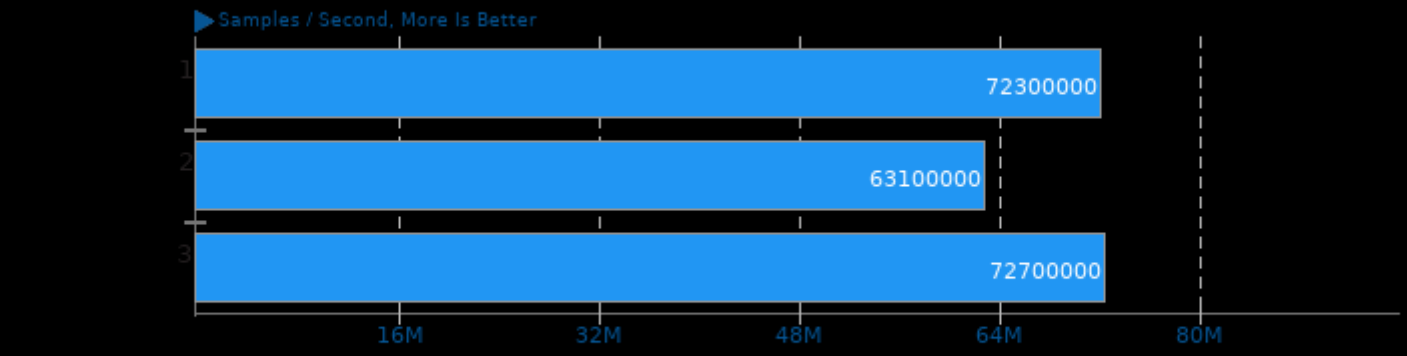
Compression Level: 19, Long Mode - Decompression Speed



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

srsLTE 20.10.1

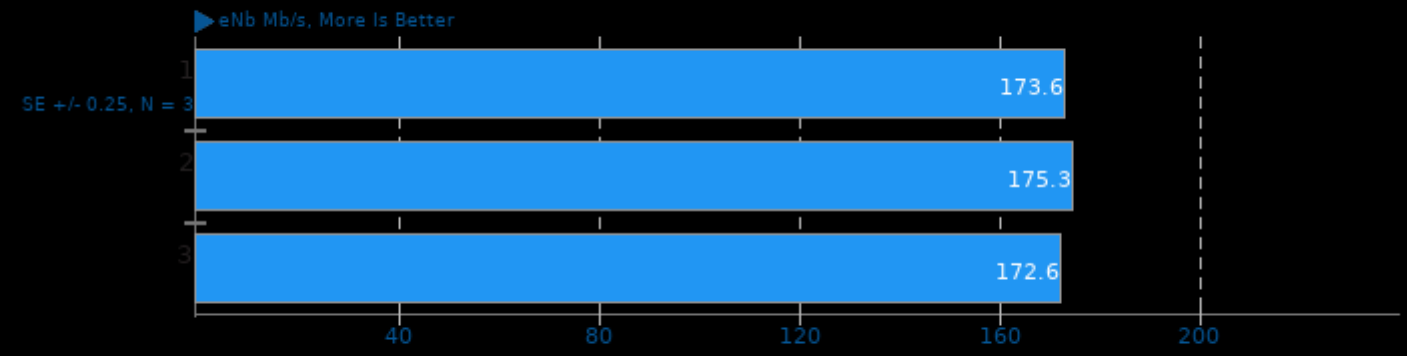
Test: OFDM_Test



1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

srsLTE 20.10.1

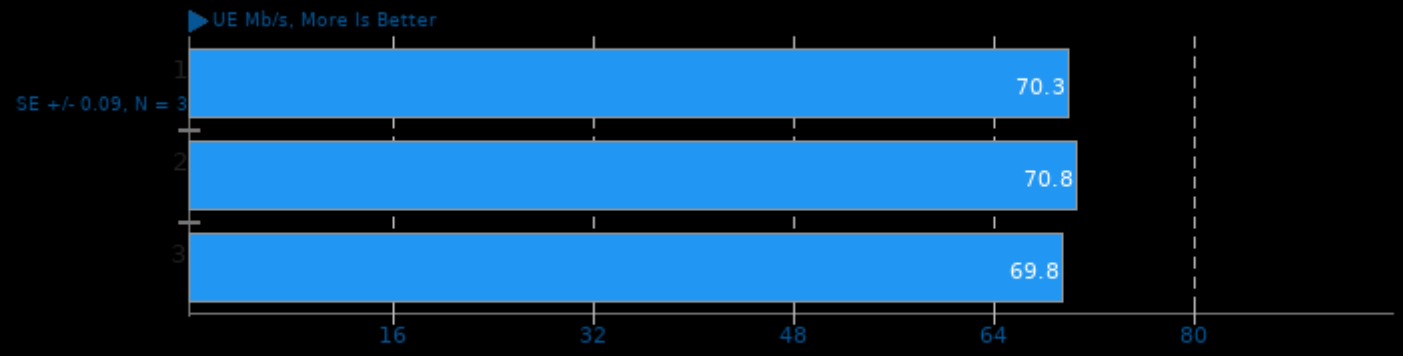
Test: PHY_DL_Test



1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

srsLTE 20.10.1

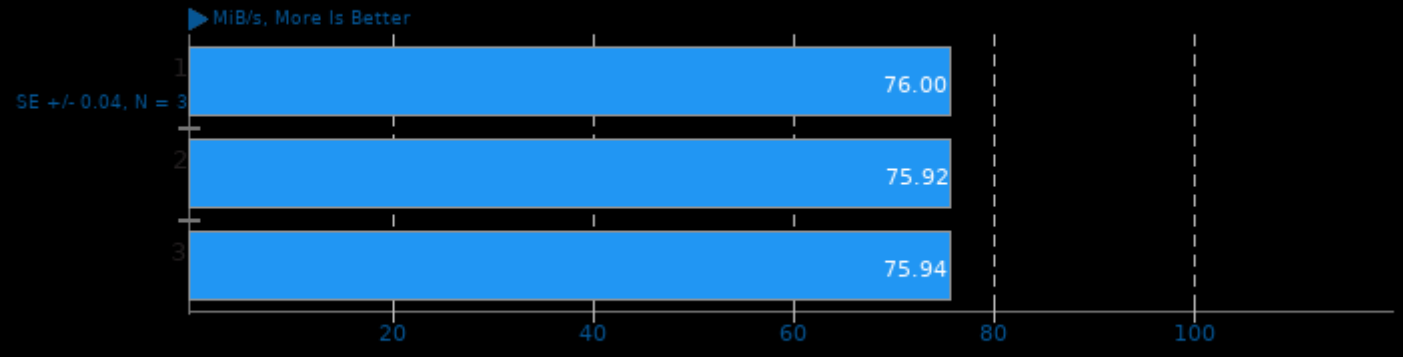
Test: PHY_DL_Test



1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

Botan 2.17.3

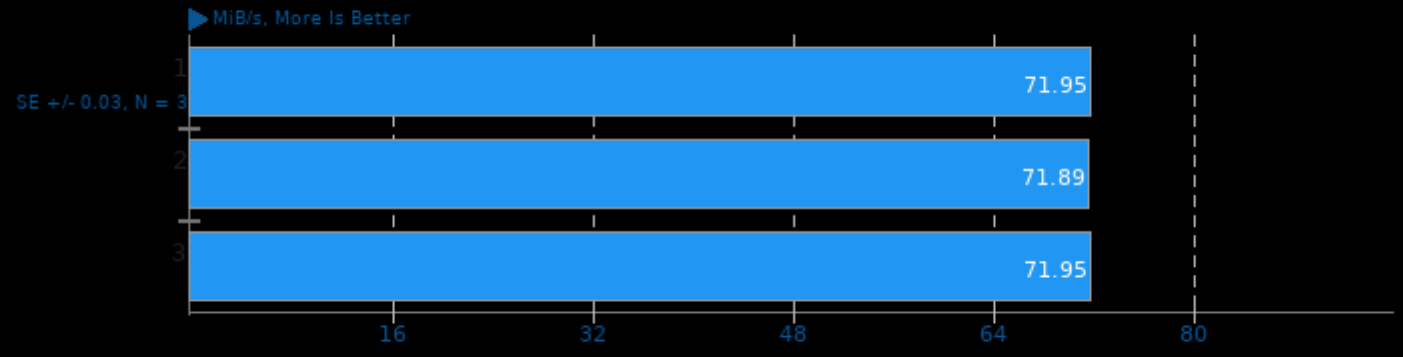
Test: KASUMI



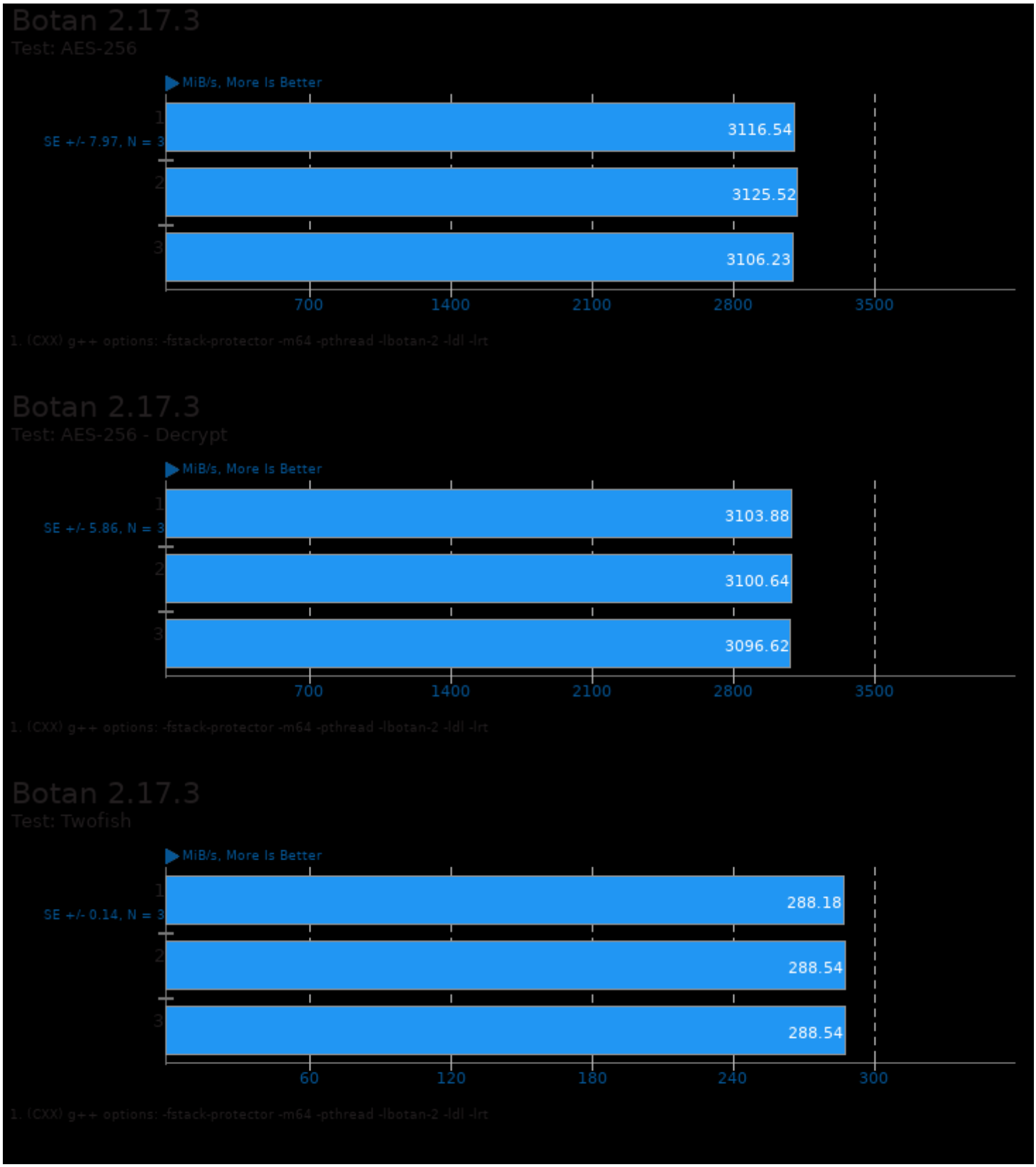
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

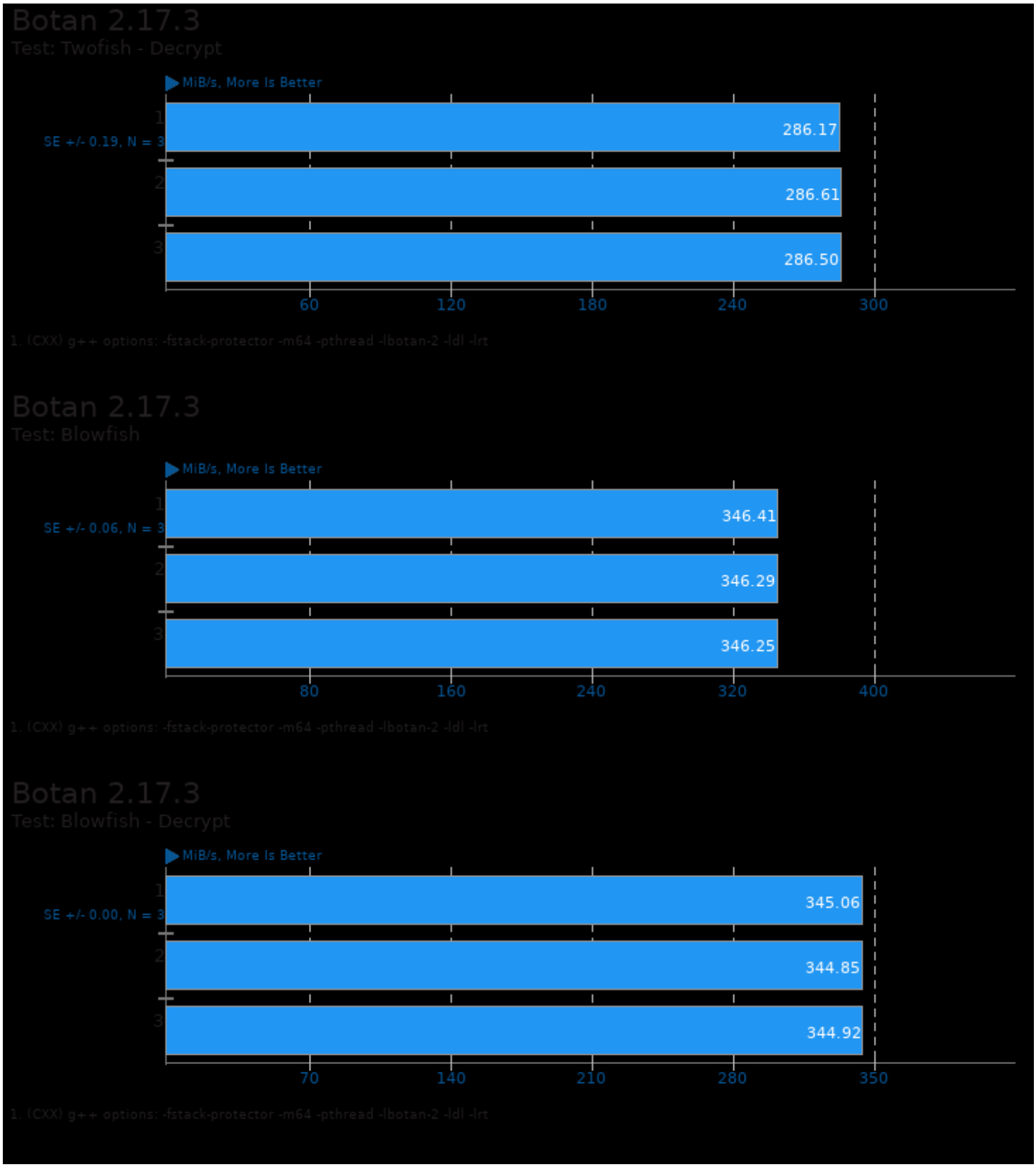
Botan 2.17.3

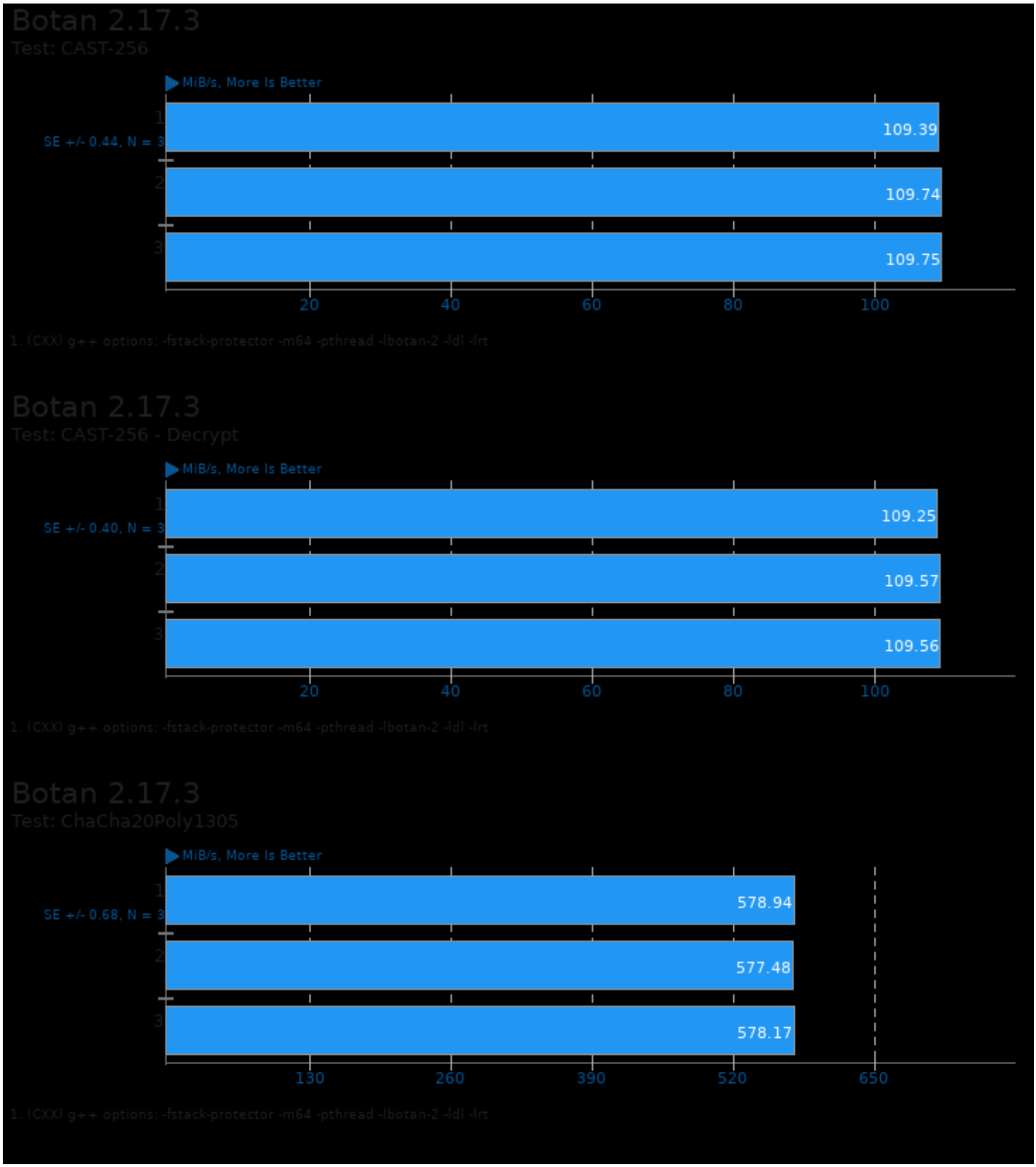
Test: KASUMI - Decrypt

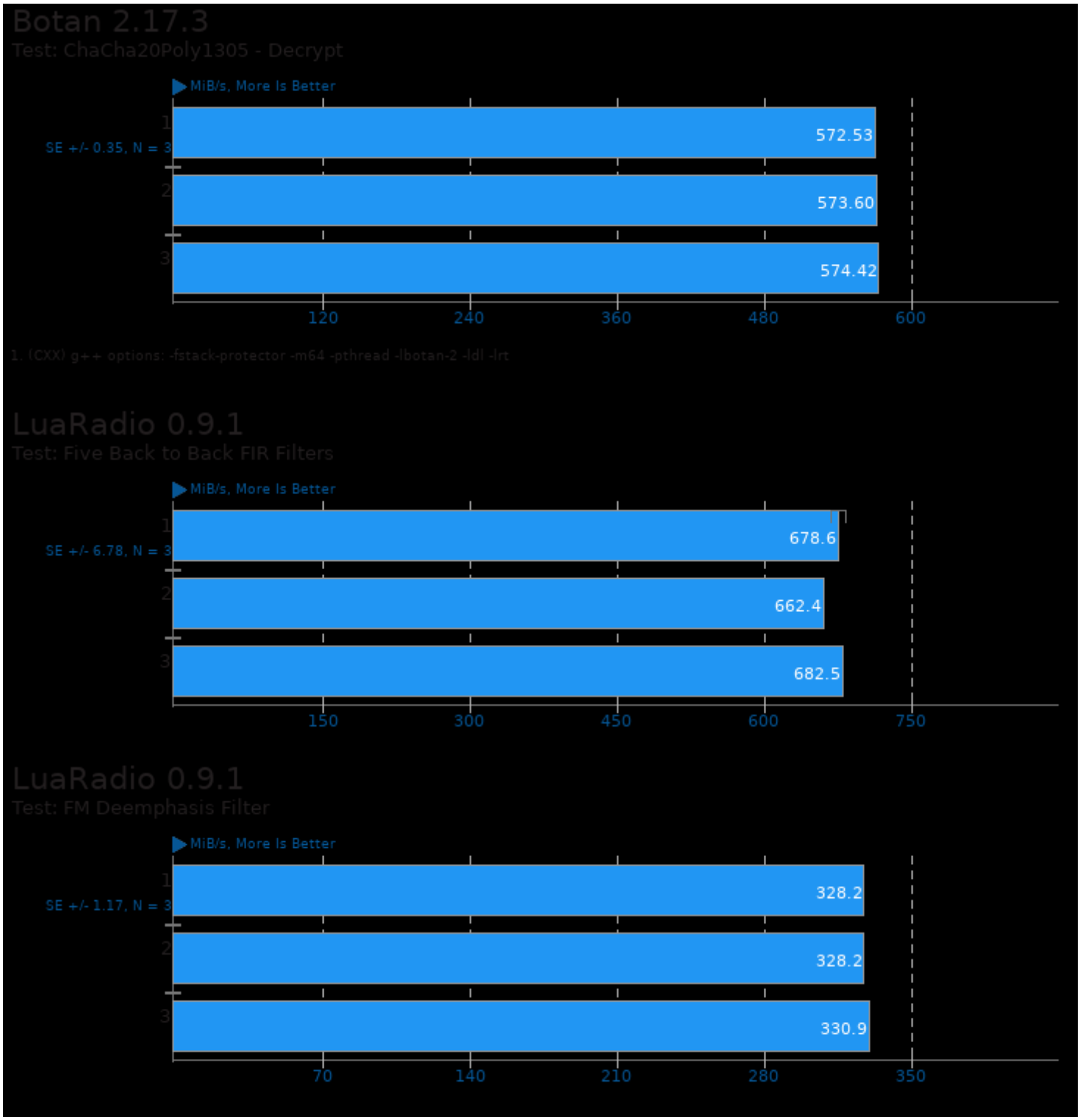


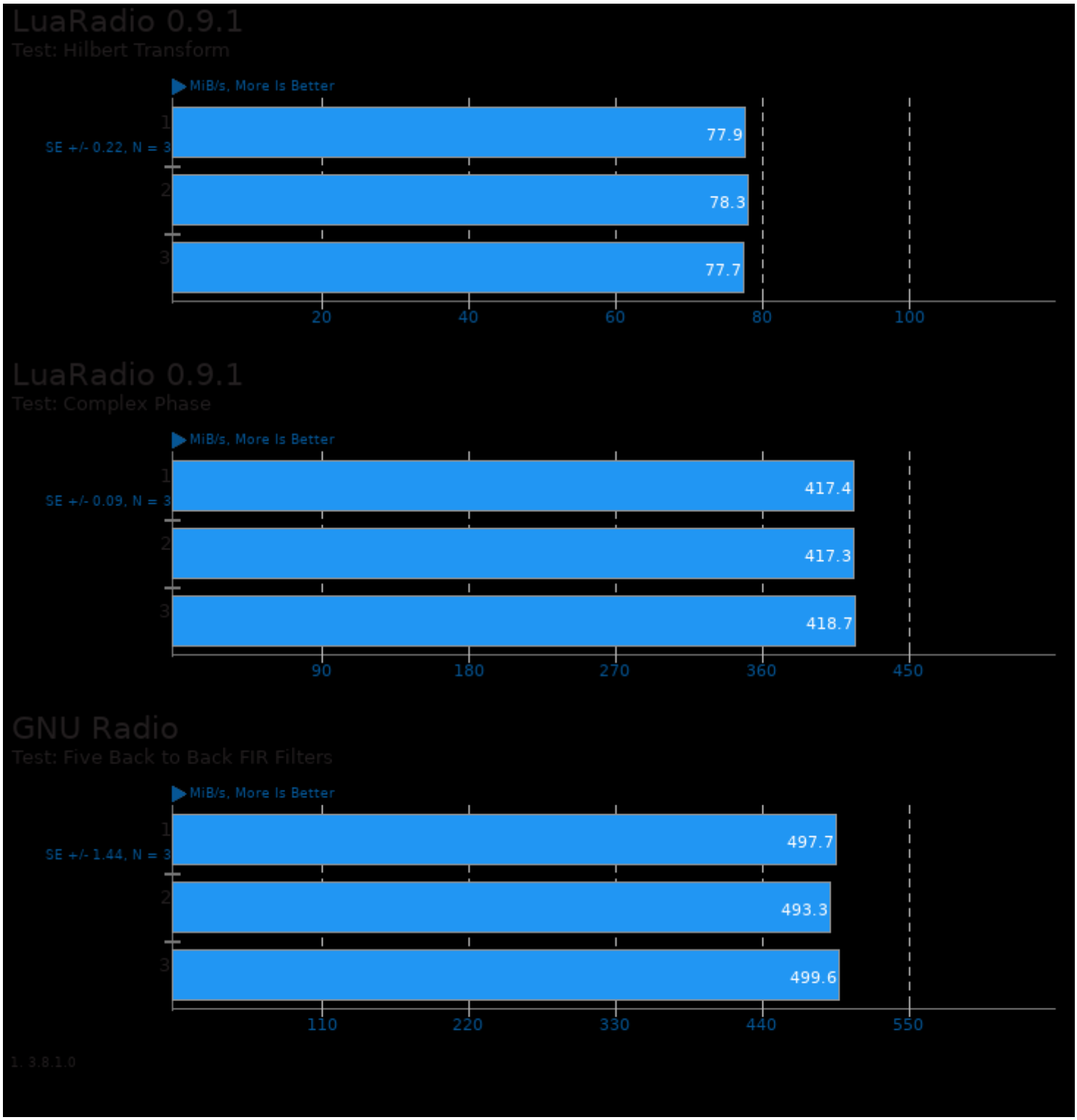
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt


Botan 2.17.3
Test: AES-256
MiB/s, More Is Better
SE +/- 7.97, N = 3
1
2
3
3116.54
3125.52
3106.23
700
1400
2100
2800
3500
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: AES-256 - Decrypt
MiB/s, More Is Better
SE +/- 5.86, N = 3
1
2
3
3103.88
3100.64
3096.62
700
1400
2100
2800
3500
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: Twofish
MiB/s, More Is Better
SE +/- 0.14, N = 3
1
2
3
288.18
288.54
288.54
60
120
180
240
300
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

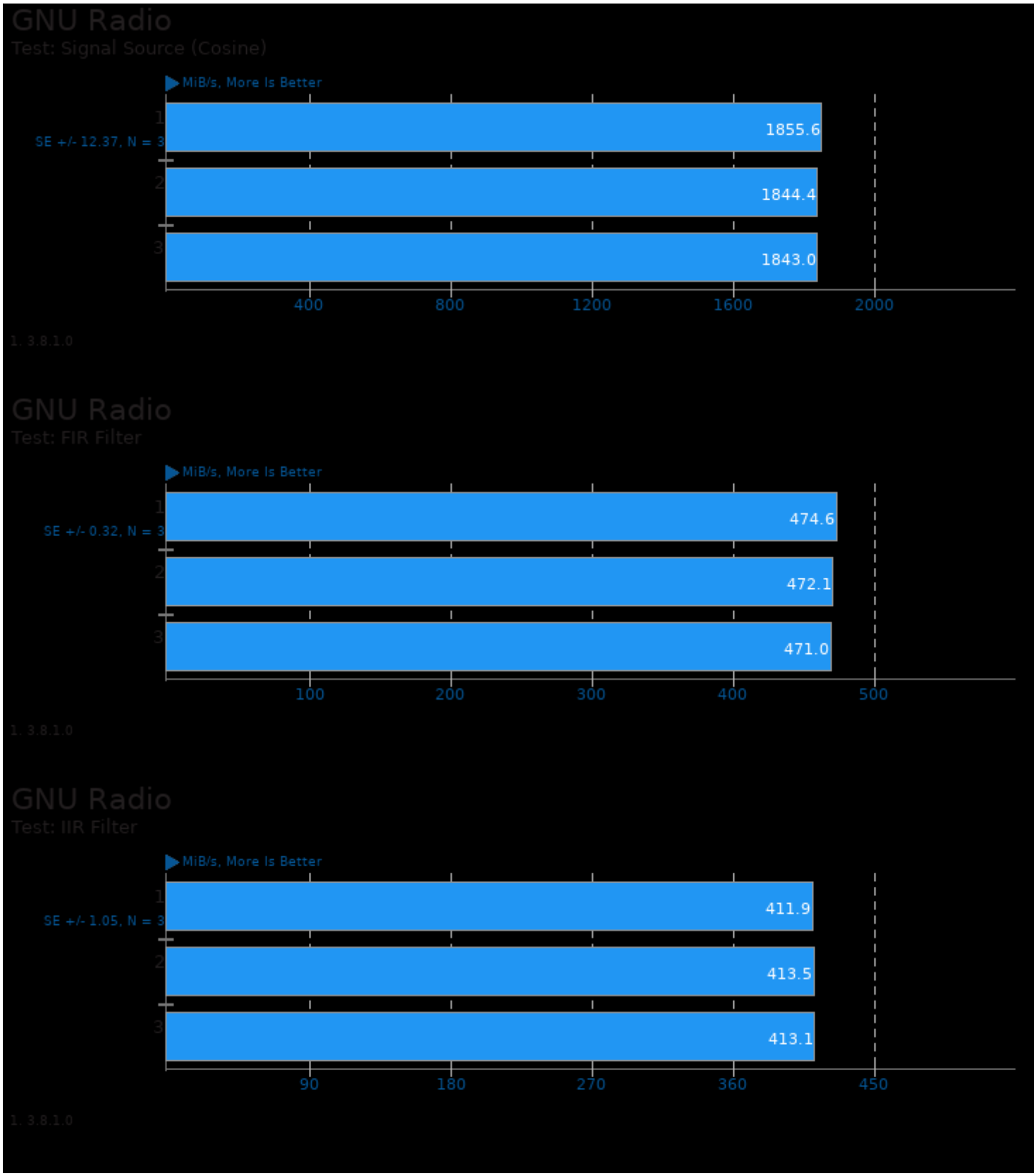

Botan 2.17.3
Test: Twofish - Decrypt
MiB/s, More Is Better
SE +/- 0.19, N = 3
1
286.17
2
286.61
3
286.50
60
120
180
240
300
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: Blowfish
MiB/s, More Is Better
SE +/- 0.06, N = 3
1
346.41
2
346.29
3
346.25
80
160
240
320
400
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: Blowfish - Decrypt
MiB/s, More Is Better
SE +/- 0.00, N = 3
1
345.06
2
344.85
3
344.92
70
140
210
280
350
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt


Botan 2.17.3
Test: CAST-256
MiB/s, More Is Better
SE +/- 0.44, N = 3
1
109.39
2
109.74
3
109.75
20
40
60
80
100
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: CAST-256 - Decrypt
MiB/s, More Is Better
SE +/- 0.40, N = 3
1
109.25
2
109.57
3
109.56
20
40
60
80
100
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: ChaCha20Poly1305
MiB/s, More Is Better
SE +/- 0.68, N = 3
1
578.94
2
577.48
3
578.17
130
260
390
520
650
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

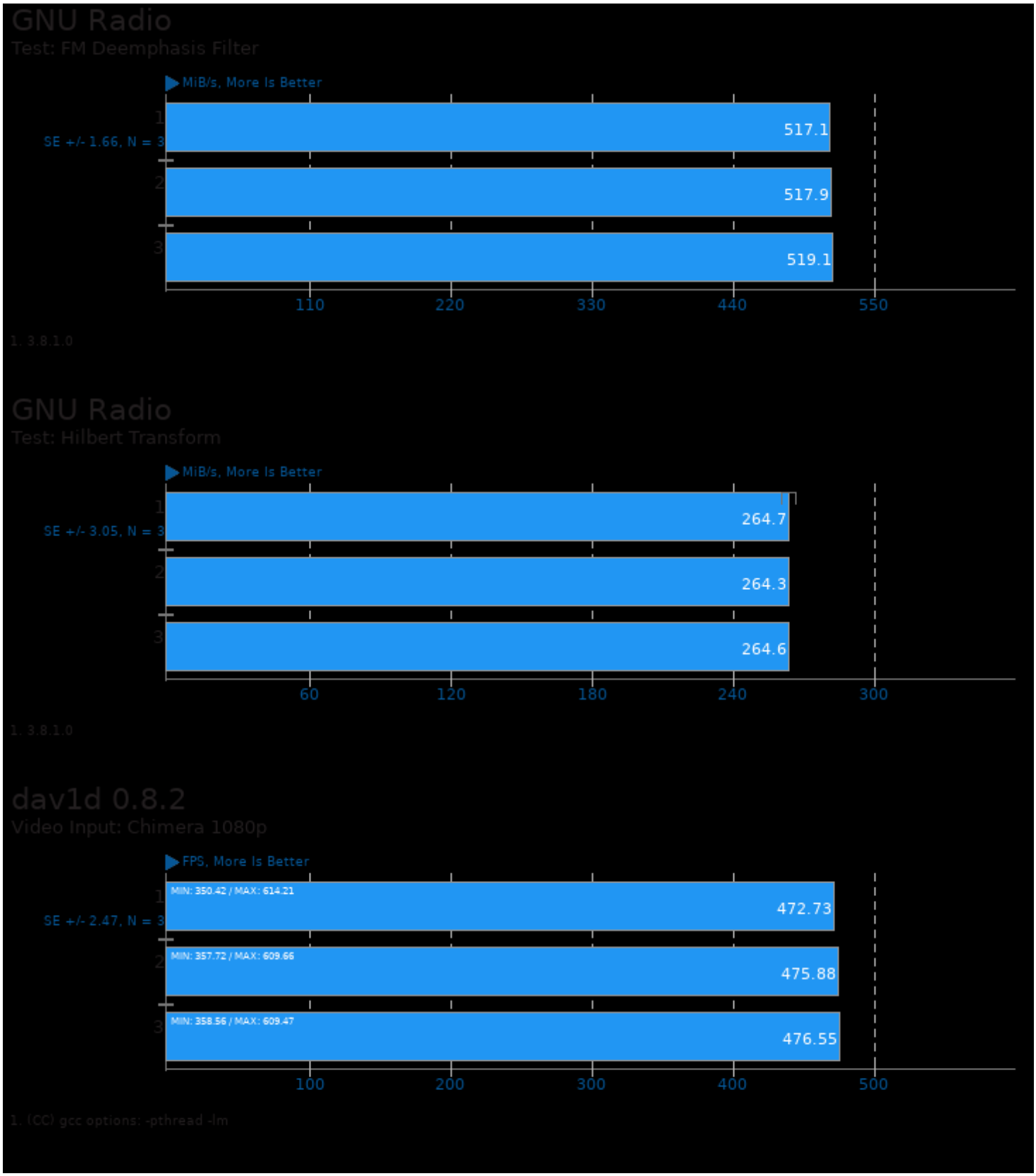

Botan 2.17.3
Test: ChaCha20Poly1305 - Decrypt
MiB/s, More Is Better
SE +/- 0.35, N = 3
572.53
573.60
574.42
120
240
360
480
600
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
LuaRadio 0.9.1
Test: Five Back to Back FIR Filters
MiB/s, More Is Better
SE +/- 6.78, N = 3
678.6
662.4
682.5
150
300
450
600
750
LuaRadio 0.9.1
Test: FM Deemphasis Filter
MiB/s, More Is Better
SE +/- 1.17, N = 3
328.2
328.2
330.9
70
140
210
280
350

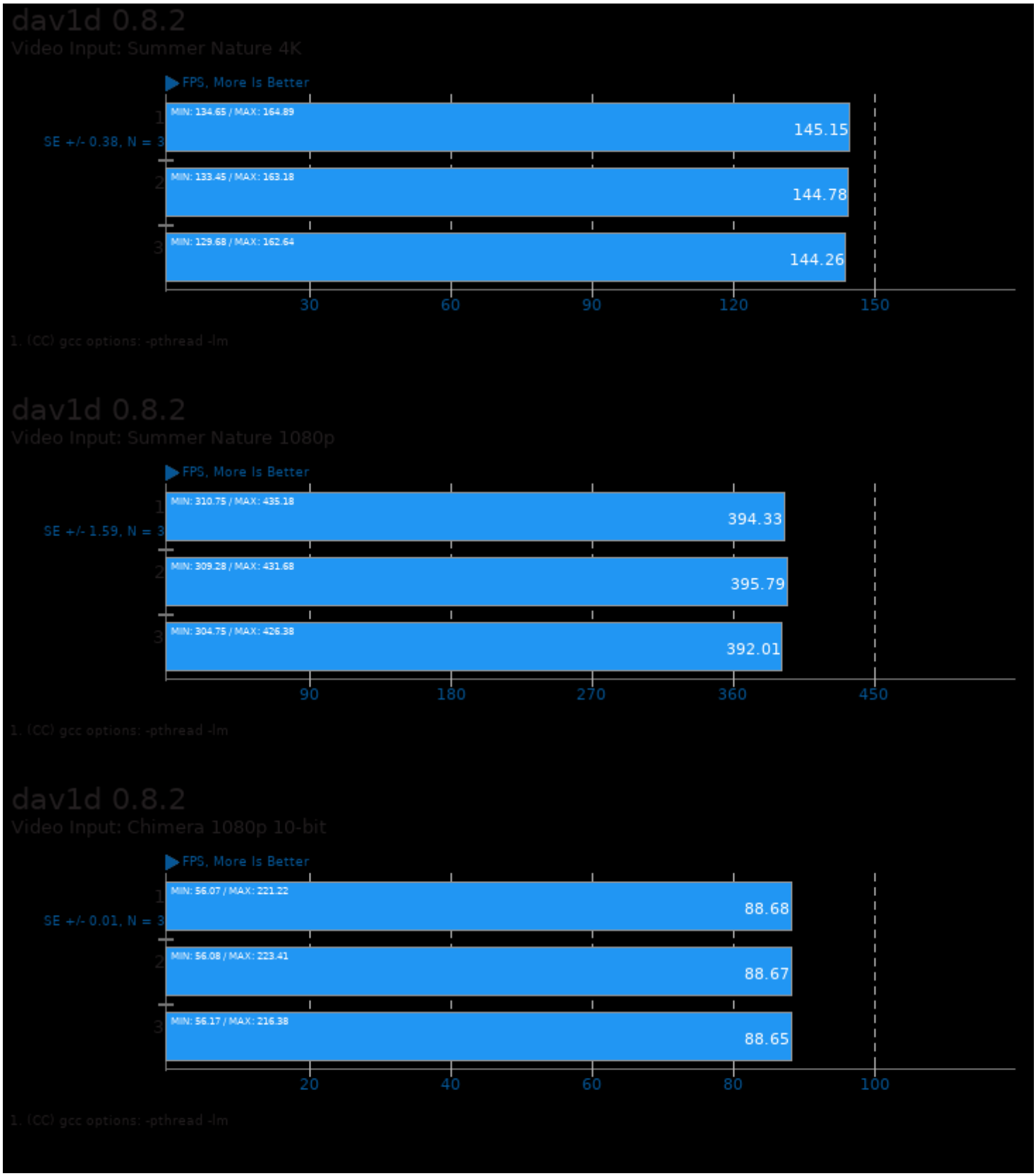

LuaRadio 0.9.1
Test: Hilbert Transform
MiB/s, More Is Better
SE +/- 0.22, N = 3
1
2
3
77.9
78.3
77.7
20
40
60
80
100
LuaRadio 0.9.1
Test: Complex Phase
MiB/s, More Is Better
SE +/- 0.09, N = 3
1
2
3
417.4
417.3
418.7
90
180
270
360
450
GNU Radio
Test: Five Back to Back FIR Filters
MiB/s, More Is Better
SE +/- 1.44, N = 3
1
2
3
497.7
493.3
499.6
110
220
330
440
550
1. 3.8.1.0

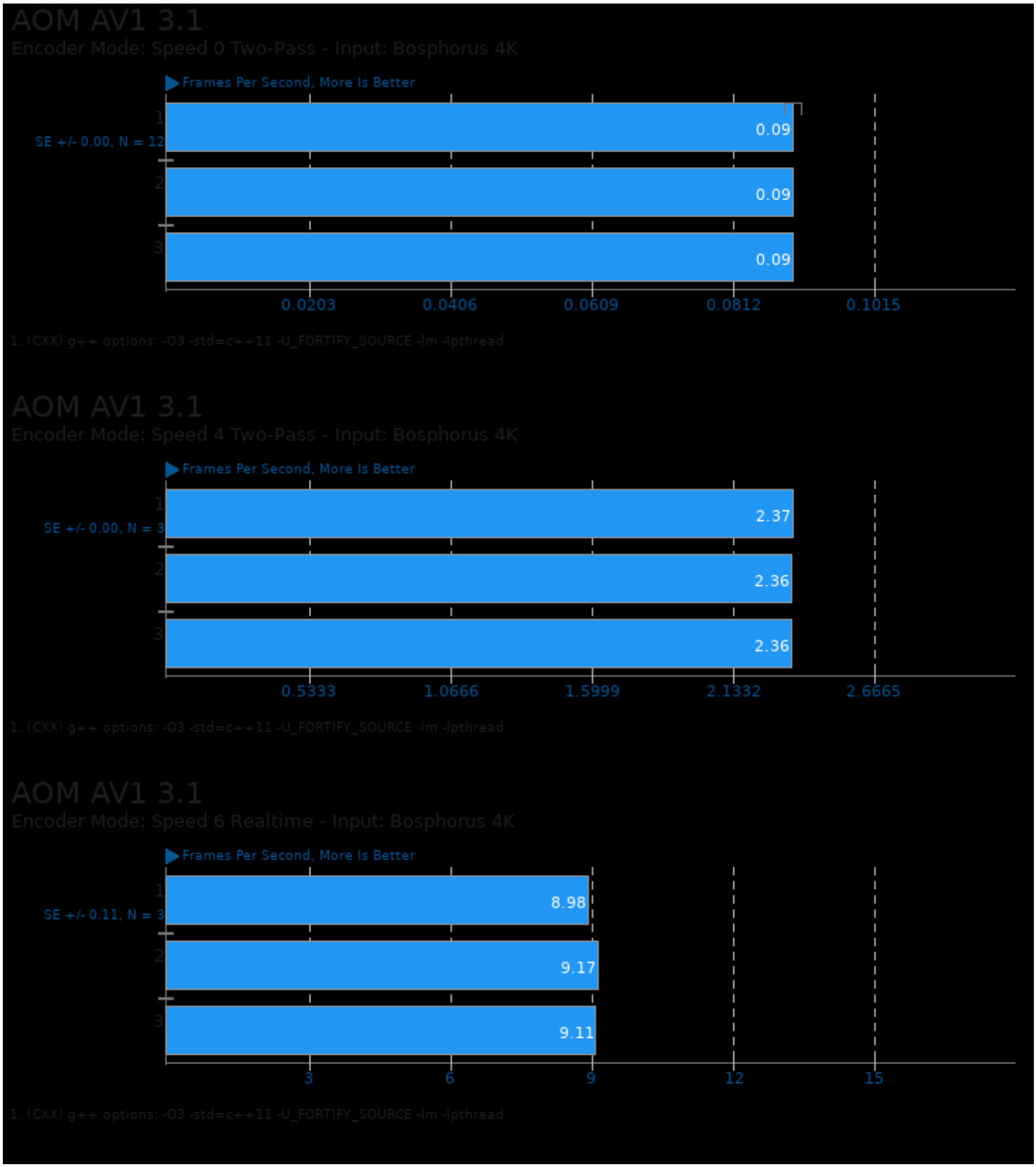
haswell may

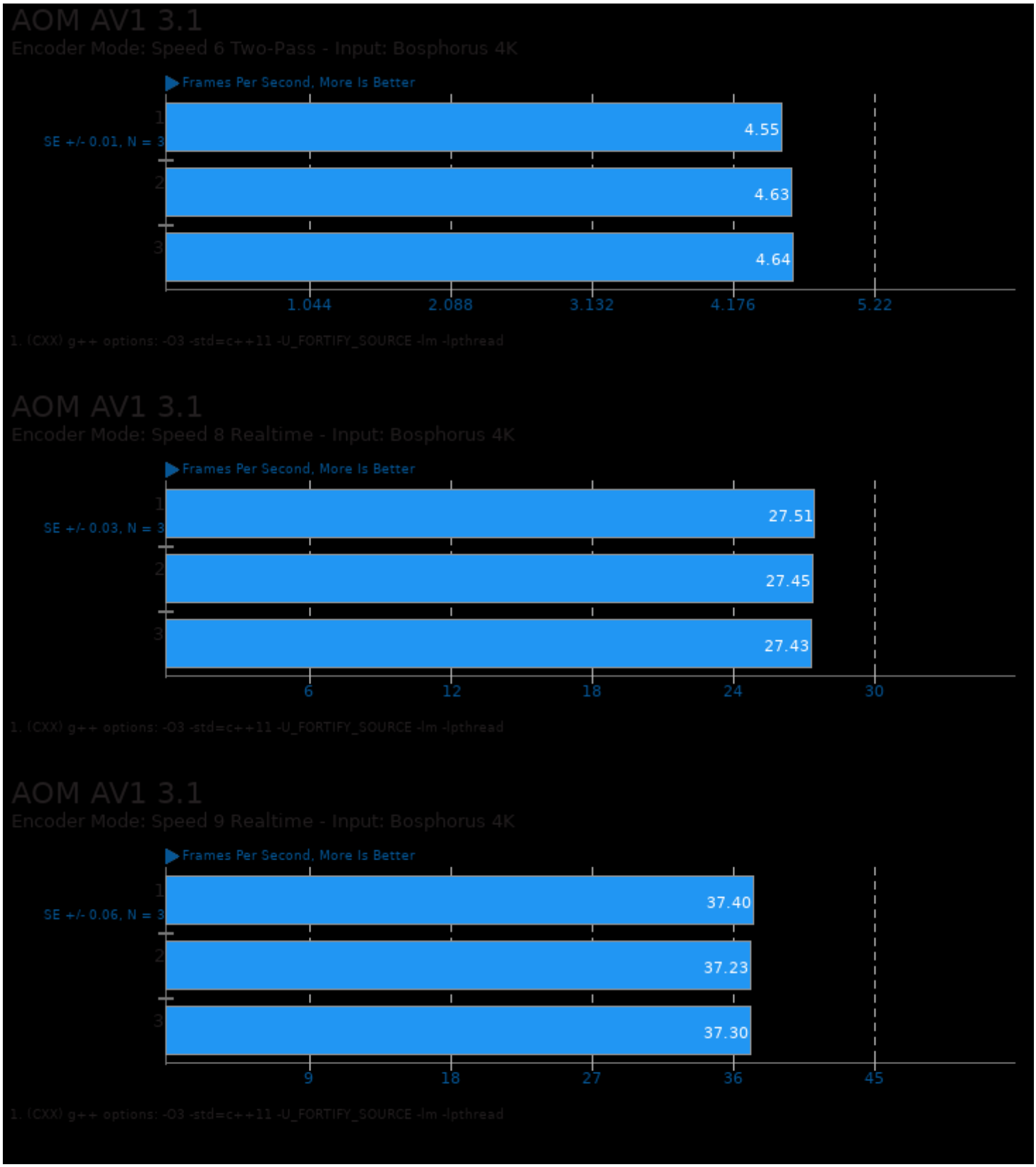

GNU Radio
Test: Signal Source (Cosine)
MiB/s, More Is Better
SE +/- 12.37, N = 3
1855.6
1844.4
1843.0
400
800
1200
1600
2000
1. 3.8.1.0
GNU Radio
Test: FIR Filter
MiB/s, More Is Better
SE +/- 0.32, N = 3
474.6
472.1
471.0
100
200
300
400
500
1. 3.8.1.0
GNU Radio
Test: IIR Filter
MiB/s, More Is Better
SE +/- 1.05, N = 3
411.9
413.5
413.1
90
180
270
360
450
1. 3.8.1.0

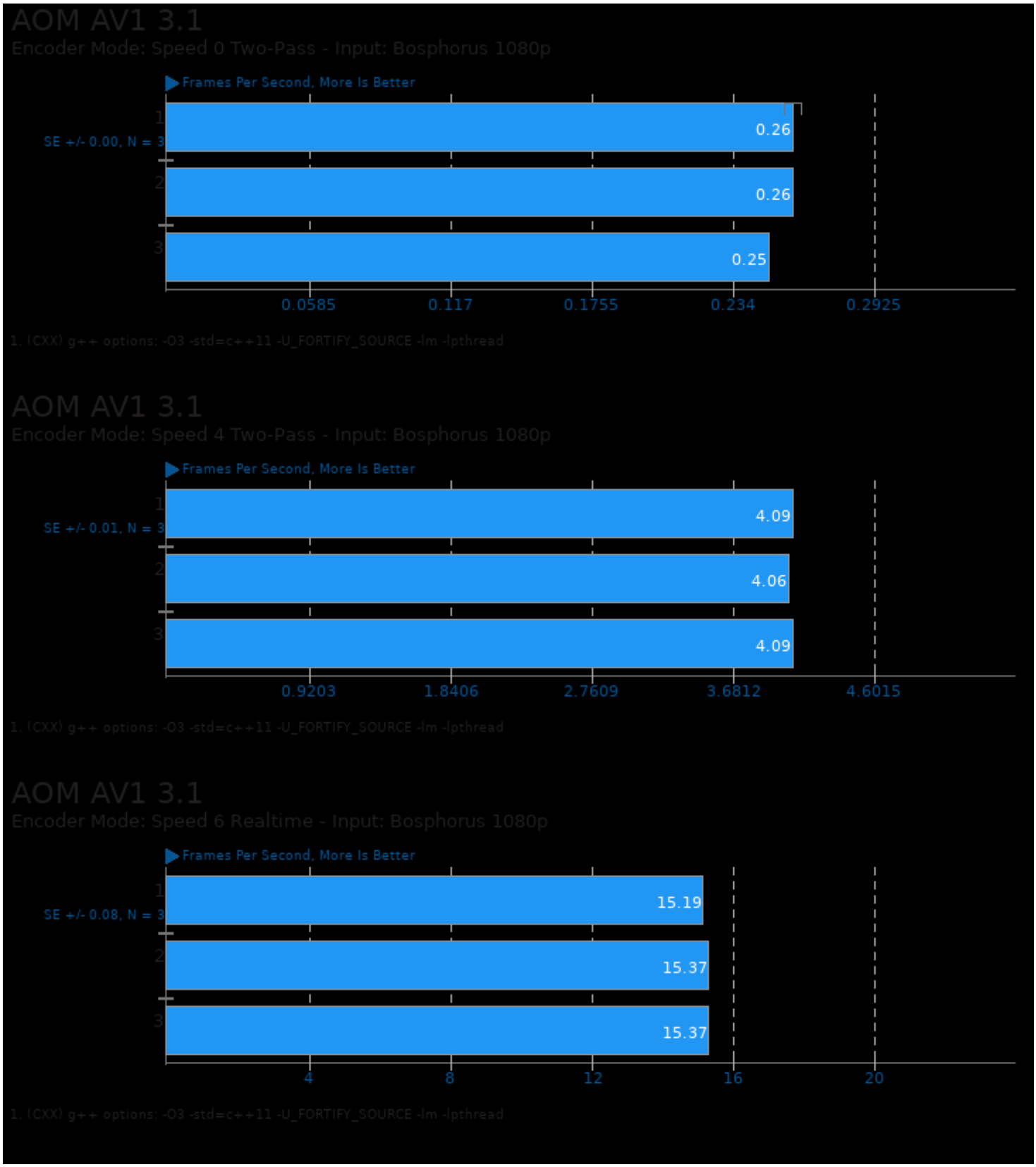
haswell may

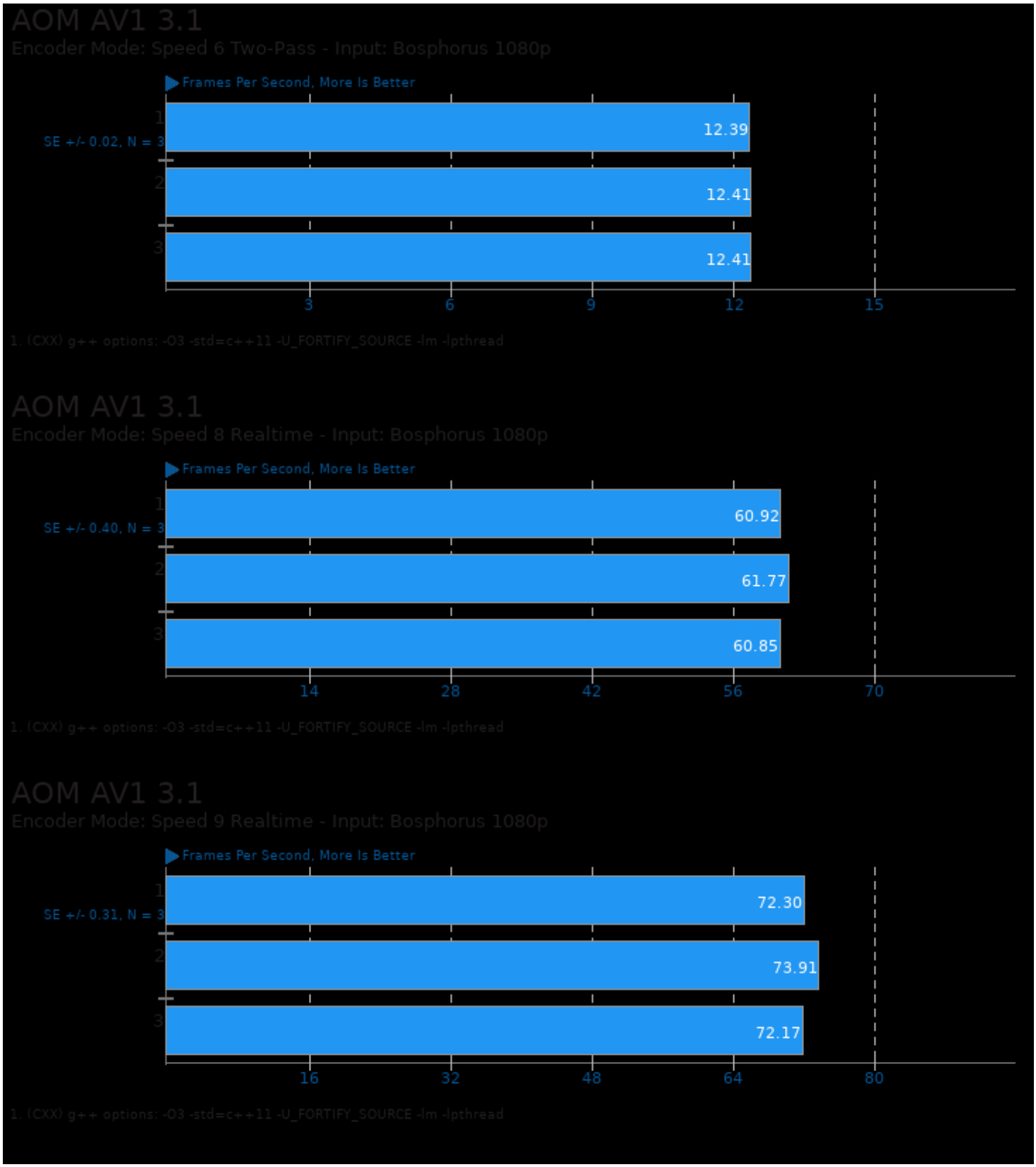

GNU Radio
Test: FM Deemphasis Filter
MiB/s, More Is Better
SE +/- 1.66, N = 3
517.1
517.9
519.1
110
220
330
440
550
1. 3.8.1.0
GNU Radio
Test: Hilbert Transform
MiB/s, More Is Better
SE +/- 3.05, N = 3
264.7
264.3
264.6
60
120
180
240
300
1. 3.8.1.0
dav1d 0.8.2
Video Input: Chimera 1080p
FPS, More Is Better
SE +/- 2.47, N = 3
MIN: 350.42 / MAX: 614.21
472.73
MIN: 357.72 / MAX: 609.66
475.88
MIN: 358.56 / MAX: 609.47
476.55
100
200
300
400
500
1. (CC) gcc options: -pthread -lm


dav1d 0.8.2
Video Input: Summer Nature 4K
FPS, More Is Better
SE +/- 0.38, N = 3
1
MIN: 134.65 / MAX: 164.89
145.15
2
MIN: 133.45 / MAX: 163.18
144.78
3
MIN: 129.68 / MAX: 162.64
144.26
30
60
90
120
150
1. (CC) gcc options: -pthread -lm
dav1d 0.8.2
Video Input: Summer Nature 1080p
FPS, More Is Better
SE +/- 1.59, N = 3
1
MIN: 310.75 / MAX: 435.18
394.33
2
MIN: 309.28 / MAX: 431.68
395.79
3
MIN: 304.75 / MAX: 426.38
392.01
90
180
270
360
450
1. (CC) gcc options: -pthread -lm
dav1d 0.8.2
Video Input: Chimera 1080p 10-bit
FPS, More Is Better
SE +/- 0.01, N = 3
1
MIN: 56.07 / MAX: 221.22
88.68
2
MIN: 56.08 / MAX: 223.41
88.67
3
MIN: 56.17 / MAX: 216.38
88.65
20
40
60
80
100
1. (CC) gcc options: -pthread -lm

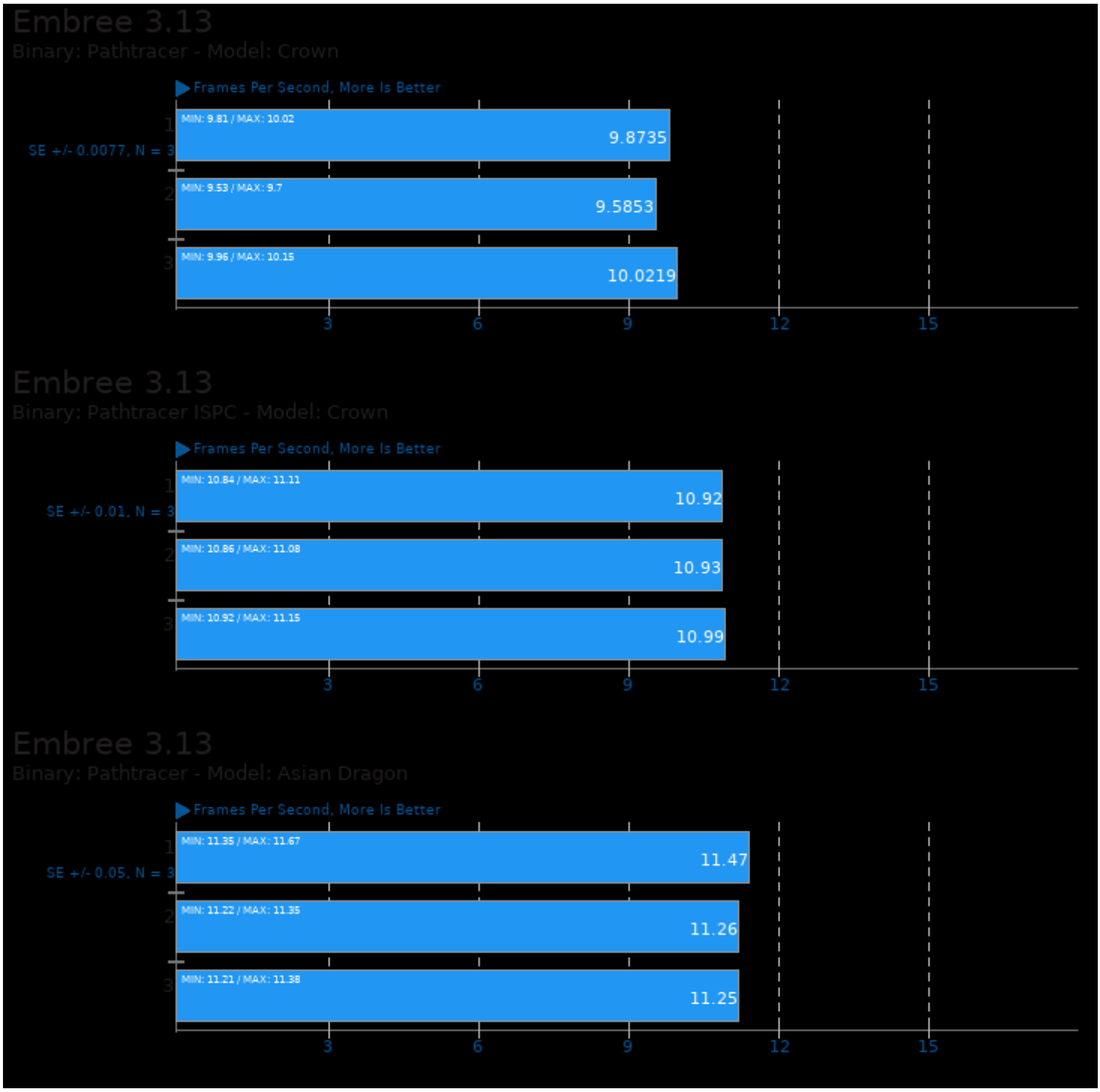

AOM AV1 3.1
Encoder Mode: Speed 0 Two-Pass - Input: Bosphorus 4K
Frames Per Second, More Is Better
SE +/- 0.00, N = 12
1
2
3
0.09
0.09
0.09
0.0203
0.0406
0.0609
0.0812
0.1015
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.1
Encoder Mode: Speed 4 Two-Pass - Input: Bosphorus 4K
Frames Per Second, More Is Better
SE +/- 0.00, N = 3
1
2
3
2.37
2.36
2.36
0.5333
1.0666
1.5999
2.1332
2.6665
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.1
Encoder Mode: Speed 6 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
SE +/- 0.11, N = 3
1
2
3
8.98
9.17
9.11
3
6
9
12
15
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread


AOM AV1 3.1
Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 4K
Frames Per Second, More Is Better
SE +/- 0.01, N = 3
1
2
3
4.55
4.63
4.64
1.044
2.088
3.132
4.176
5.22
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.1
Encoder Mode: Speed 8 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
SE +/- 0.03, N = 3
1
2
3
27.51
27.45
27.43
6
12
18
24
30
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.1
Encoder Mode: Speed 9 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
SE +/- 0.06, N = 3
1
2
3
37.40
37.23
37.30
9
18
27
36
45
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

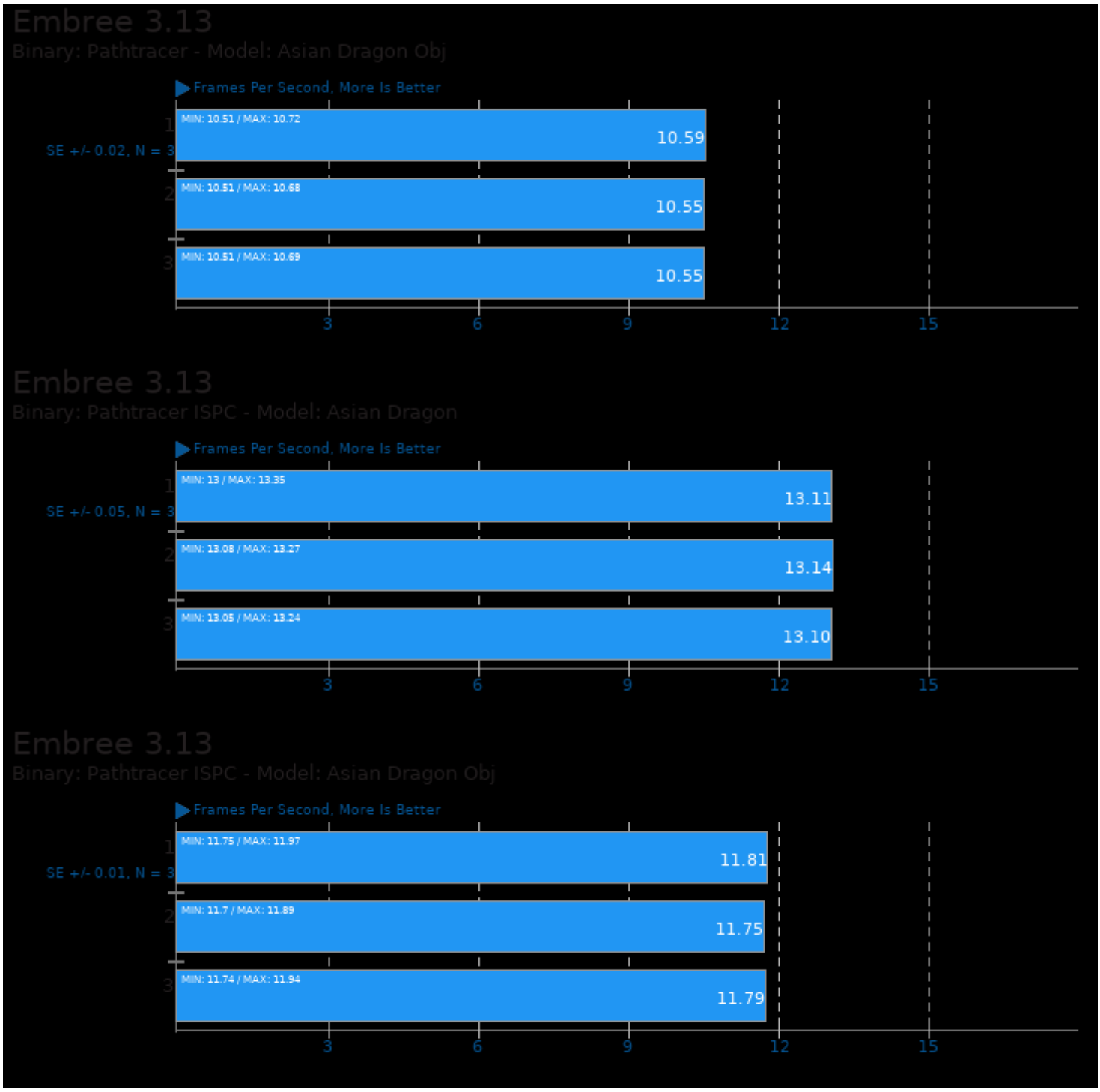

AOM AV1 3.1
Encoder Mode: Speed 0 Two-Pass - Input: Bosphorus 1080p
Frames Per Second, More Is Better
SE +/- 0.00, N = 3
1
2
3
0.26
0.26
0.25
0.0585
0.117
0.1755
0.234
0.2925
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.1
Encoder Mode: Speed 4 Two-Pass - Input: Bosphorus 1080p
Frames Per Second, More Is Better
SE +/- 0.01, N = 3
1
2
3
4.09
4.06
4.09
0.9203
1.8406
2.7609
3.6812
4.6015
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.1
Encoder Mode: Speed 6 Realtime - Input: Bosphorus 1080p
Frames Per Second, More Is Better
SE +/- 0.08, N = 3
1
2
3
15.19
15.37
15.37
4
8
12
16
20
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

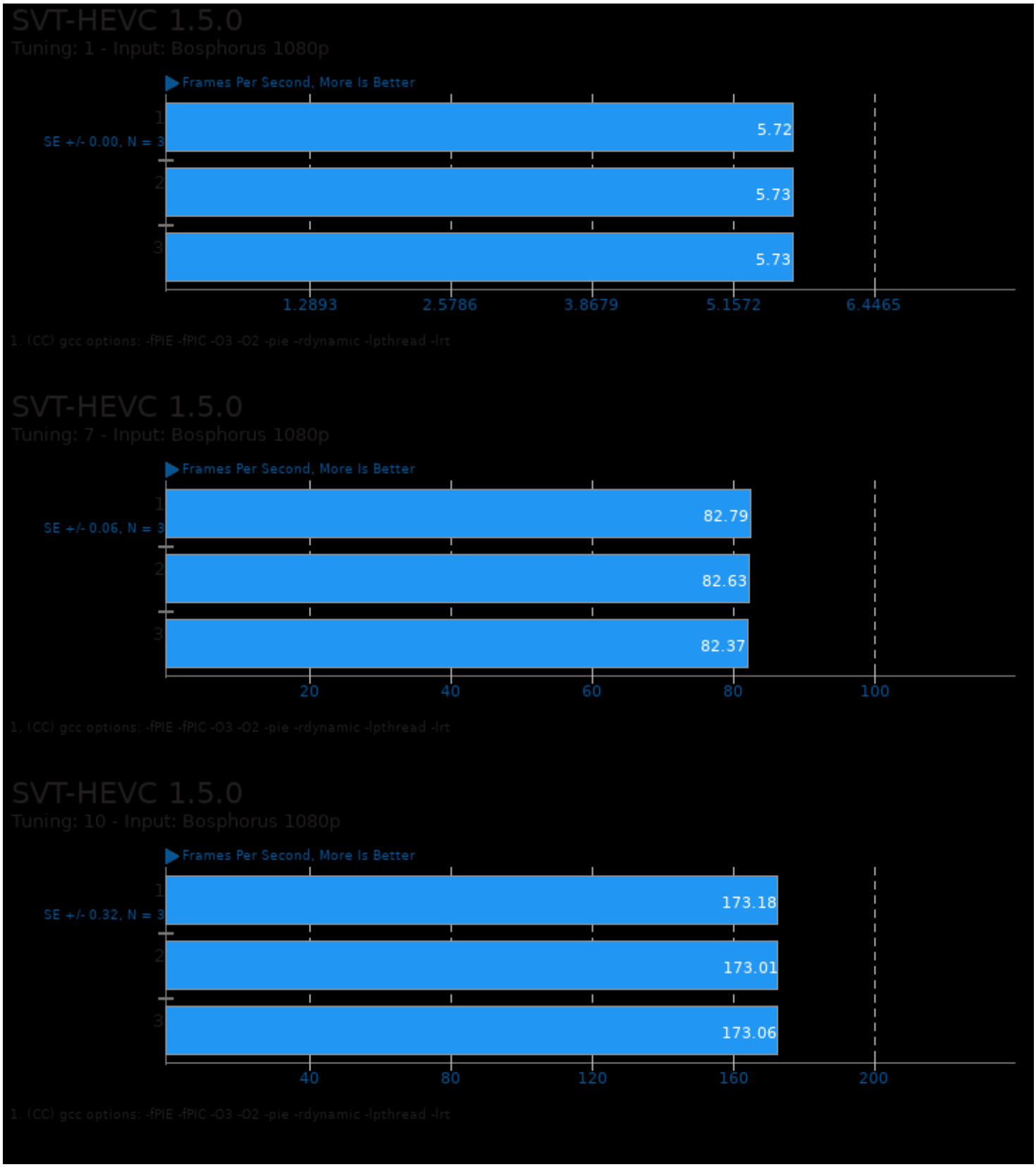

AOM AV1 3.1
Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 1080p
Frames Per Second, More Is Better
SE +/- 0.02, N = 3
1
12.39
2
12.41
3
12.41
3
6
9
12
15
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.1
Encoder Mode: Speed 8 Realtime - Input: Bosphorus 1080p
Frames Per Second, More Is Better
SE +/- 0.40, N = 3
1
60.92
2
61.77
3
60.85
14
28
42
56
70
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.1
Encoder Mode: Speed 9 Realtime - Input: Bosphorus 1080p
Frames Per Second, More Is Better
SE +/- 0.31, N = 3
1
72.30
2
73.91
3
72.17
16
32
48
64
80
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

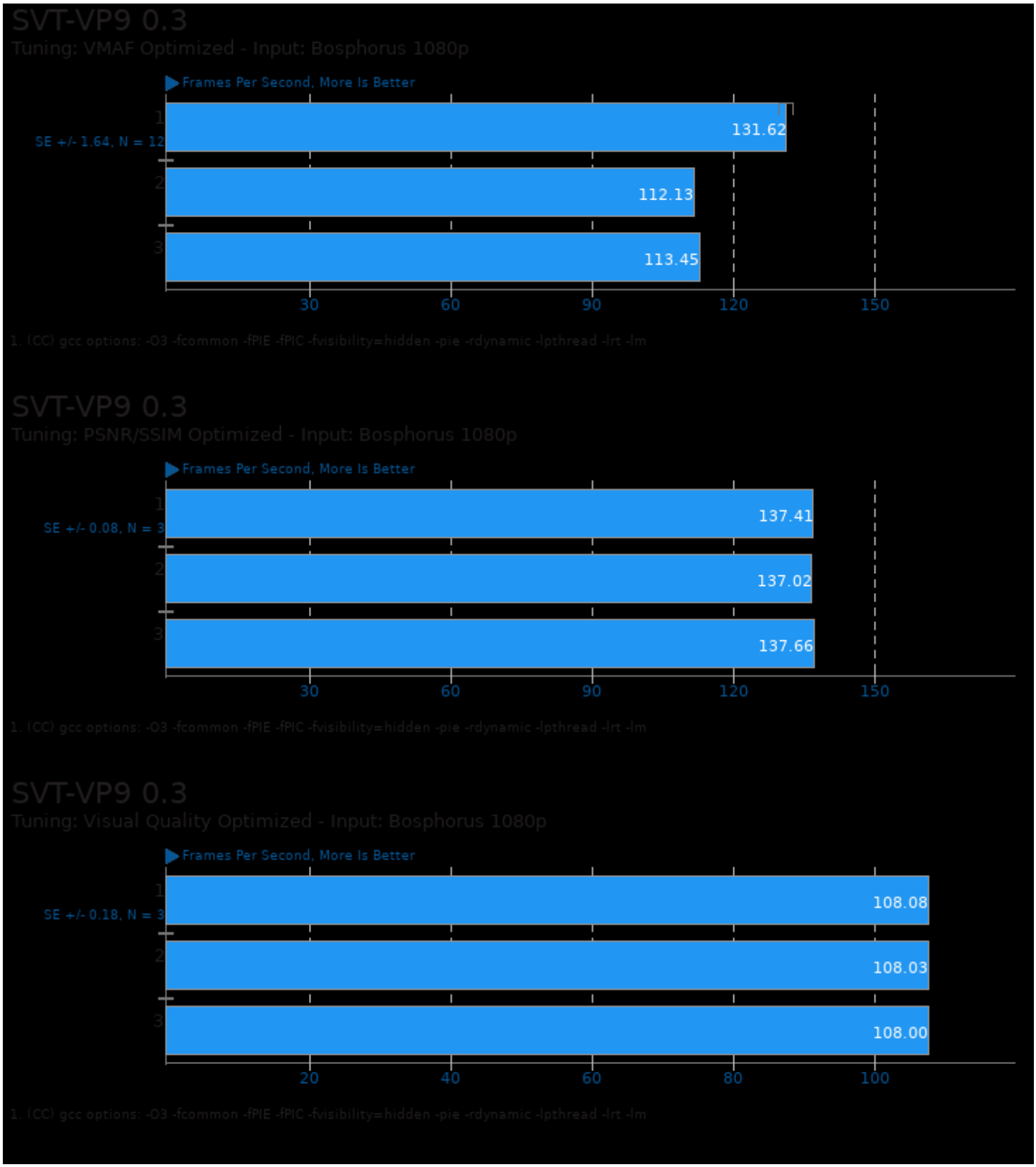
haswell may


Embree 3.13
Binary: Pathtracer - Model: Crown
Frames Per Second, More Is Better
SE +/- 0.0077, N = 3
MIN: 9.81 / MAX: 10.02
9.8735
MIN: 9.53 / MAX: 9.7
9.5853
MIN: 9.96 / MAX: 10.15
10.0219
3
6
9
12
15
Embree 3.13
Binary: Pathtracer ISPC - Model: Crown
Frames Per Second, More Is Better
SE +/- 0.01, N = 3
MIN: 10.84 / MAX: 11.11
10.92
MIN: 10.86 / MAX: 11.08
10.93
MIN: 10.92 / MAX: 11.15
10.99
3
6
9
12
15
Embree 3.13
Binary: Pathtracer - Model: Asian Dragon
Frames Per Second, More Is Better
SE +/- 0.05, N = 3
MIN: 11.35 / MAX: 11.67
11.47
MIN: 11.22 / MAX: 11.35
11.26
MIN: 11.21 / MAX: 11.38
11.25
3
6
9
12
15

haswell may

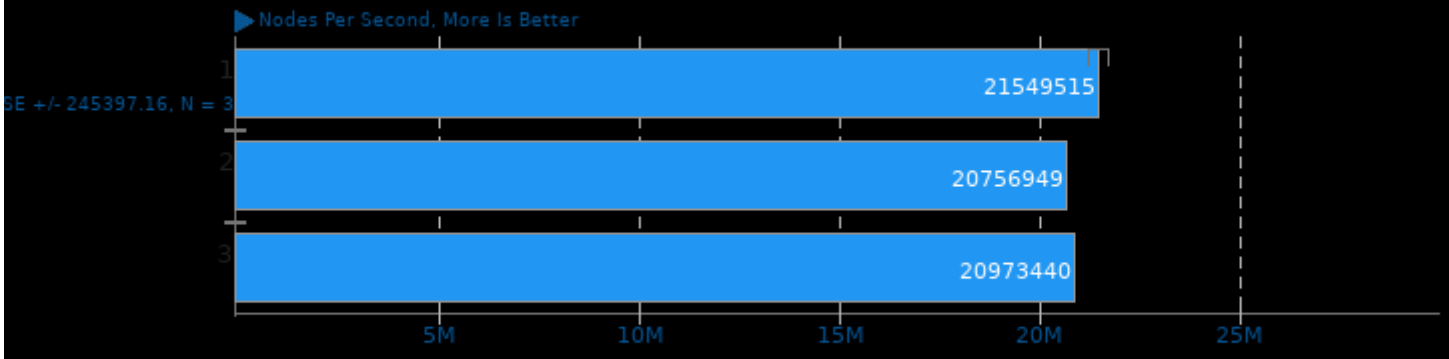

Embree 3.13
Binary: Pathtracer - Model: Asian Dragon Obj
Frames Per Second, More Is Better
SE +/- 0.02, N = 3
1
MIN: 10.51 / MAX: 10.72
10.59
2
MIN: 10.51 / MAX: 10.68
10.55
3
MIN: 10.51 / MAX: 10.69
10.55
3
6
9
12
15
Embree 3.13
Binary: Pathtracer ISPC - Model: Asian Dragon
Frames Per Second, More Is Better
SE +/- 0.05, N = 3
1
MIN: 13 / MAX: 13.35
13.11
2
MIN: 13.08 / MAX: 13.27
13.14
3
MIN: 13.05 / MAX: 13.24
13.10
3
6
9
12
15
Embree 3.13
Binary: Pathtracer ISPC - Model: Asian Dragon Obj
Frames Per Second, More Is Better
SE +/- 0.01, N = 3
1
MIN: 11.75 / MAX: 11.97
11.81
2
MIN: 11.7 / MAX: 11.89
11.75
3
MIN: 11.74 / MAX: 11.94
11.79
3
6
9
12
15


SVT-HEVC 1.5.0
Tuning: 1 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
SE +/- 0.00, N = 3
1
2
3
5.72
5.73
5.73
1.2893
2.5786
3.8679
5.1572
6.4465
1. (CC) gcc options: -fPIE -fPIC -O3 -O2 -pie -rdynamic -lpthread -lrt
SVT-HEVC 1.5.0
Tuning: 7 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
SE +/- 0.06, N = 3
1
2
3
82.79
82.63
82.37
20
40
60
80
100
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
SE +/- 0.32, N = 3
1
2
3
173.18
173.01
173.06
40
80
120
160
200
1. (CC) gcc options: -fPIE -fPIC -O3 -O2 -pie -rdynamic -lpthread -lrt


SVT-VP9 0.3
Tuning: VMAF Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
SE +/- 1.64, N = 12
1
131.62
2
112.13
3
113.45
30
60
90
120
150
1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm
SVT-VP9 0.3
Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
SE +/- 0.08, N = 3
1
137.41
2
137.02
3
137.66
30
60
90
120
150
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
SE +/- 0.18, N = 3
1
108.08
2
108.03
3
108.00
20
40
60
80
100
1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm

Stockfish 13

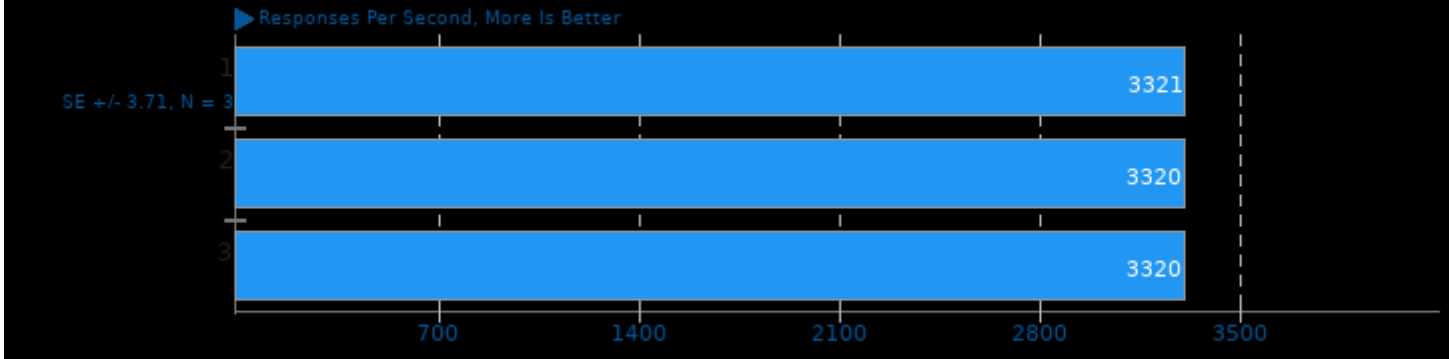
Total Time



1. (CXX) g++ options: -lgcov -m64 -lpthread -fno-exceptions -std=c++17 -fprofile-use -fno-peel-loops -fno-tracer -pedantic -O3 -msse -msse3 -mpopcnt -

PJSIP 2.11

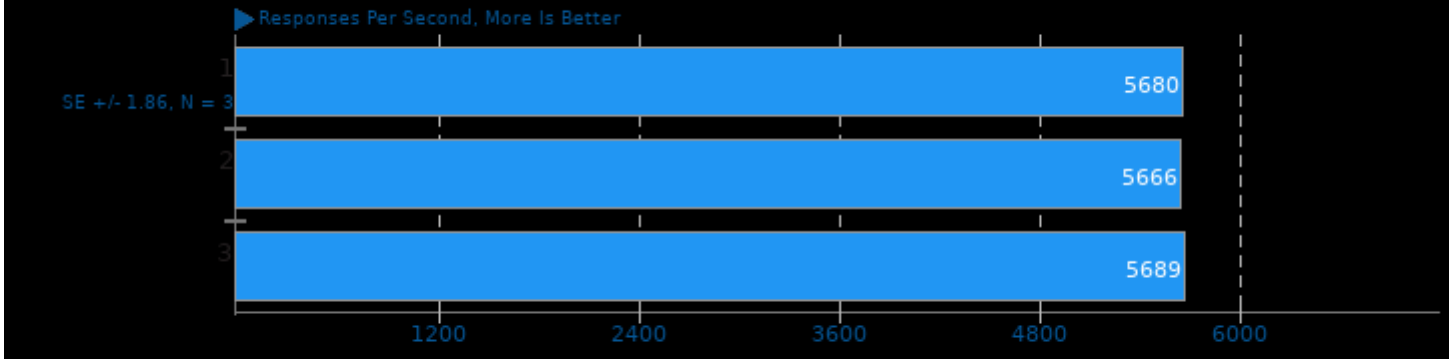
Method: INVITE



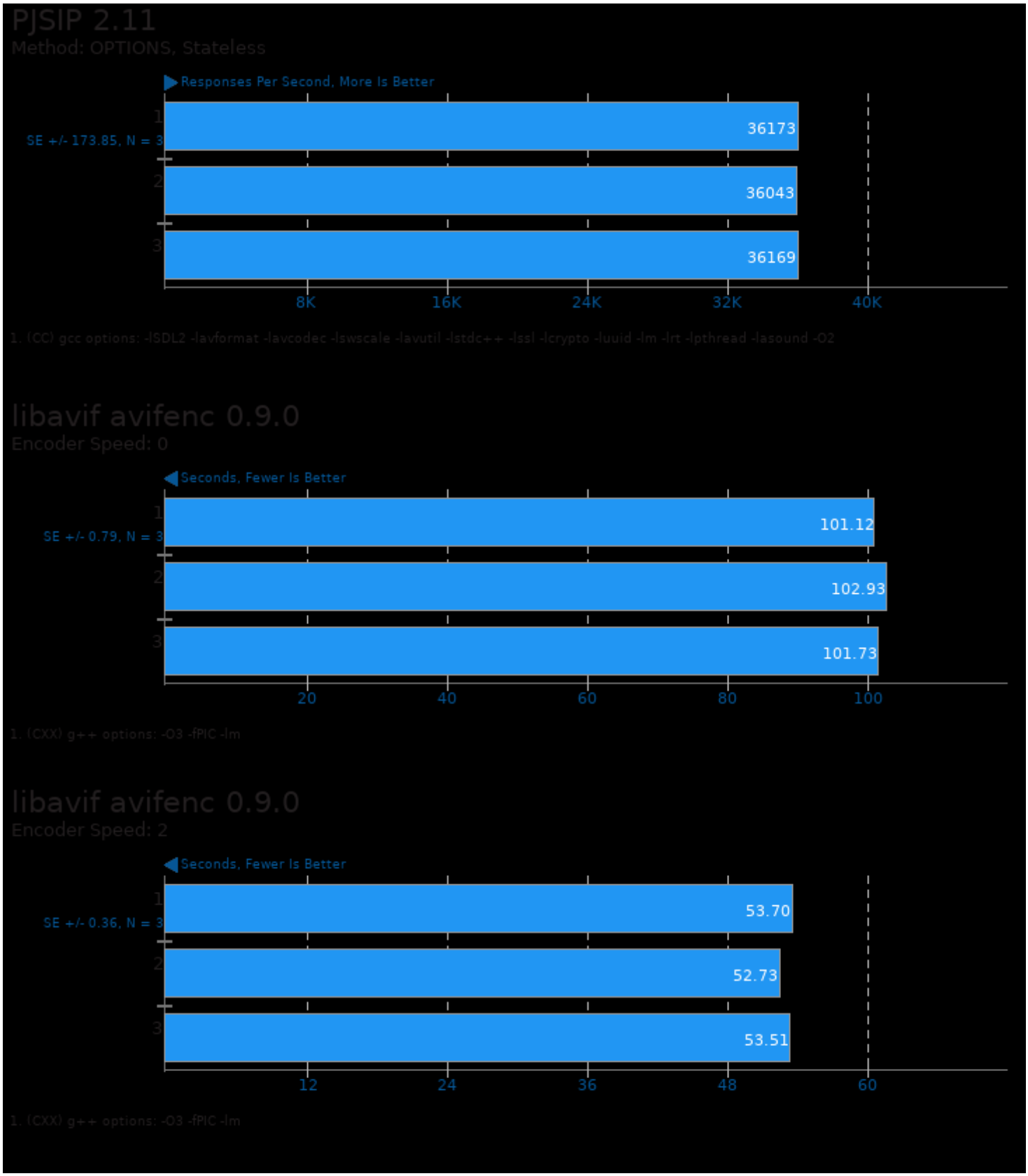
1. (CC) gcc options: -lSDL2 -lavformat -lavcodec -lswscale -lavutil -lstdc++ -lssl -lcrypto -luuid -lm -lrt -lpthread -lasound -O2

PJSIP 2.11

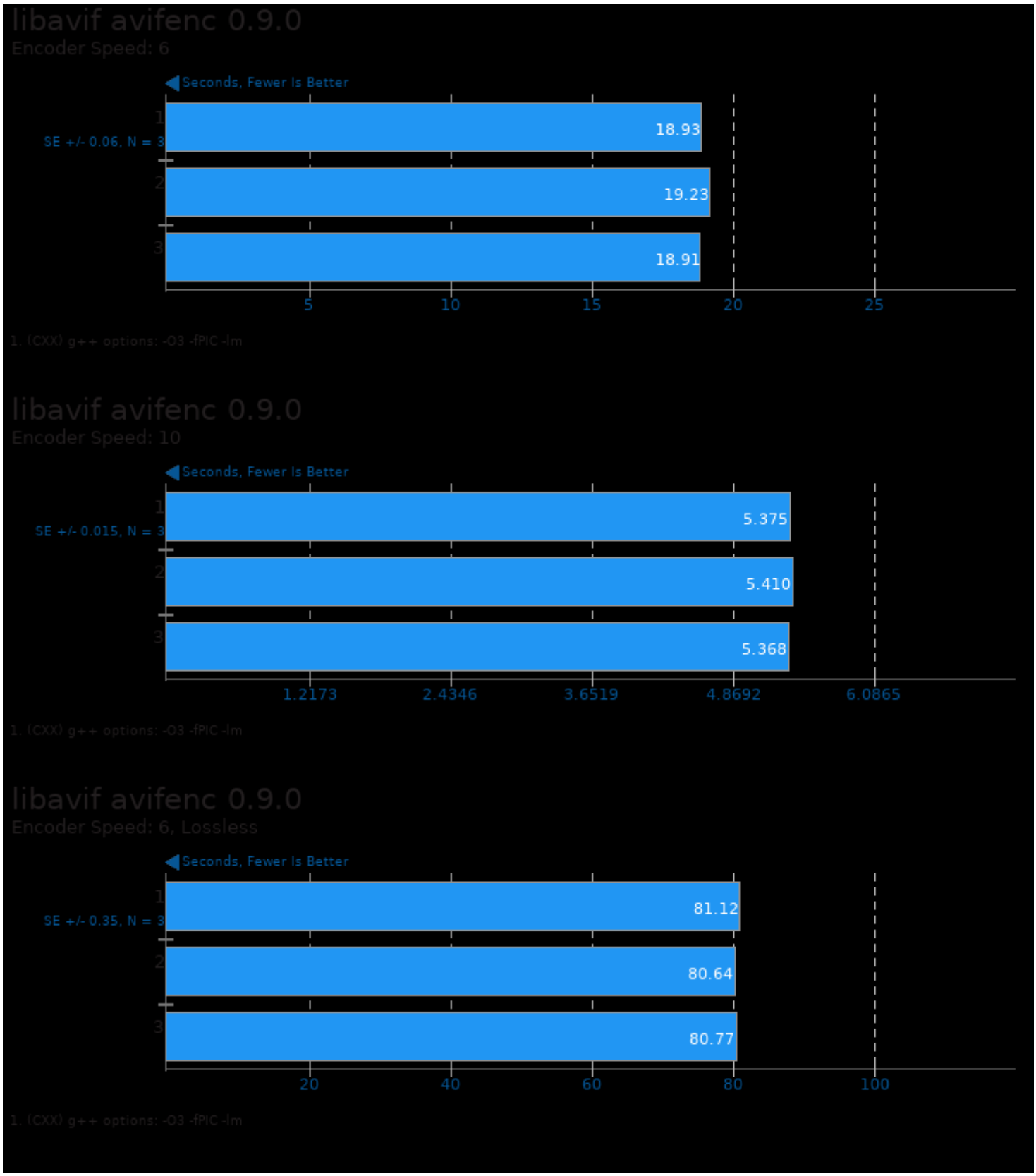
Method: OPTIONS, Stateful

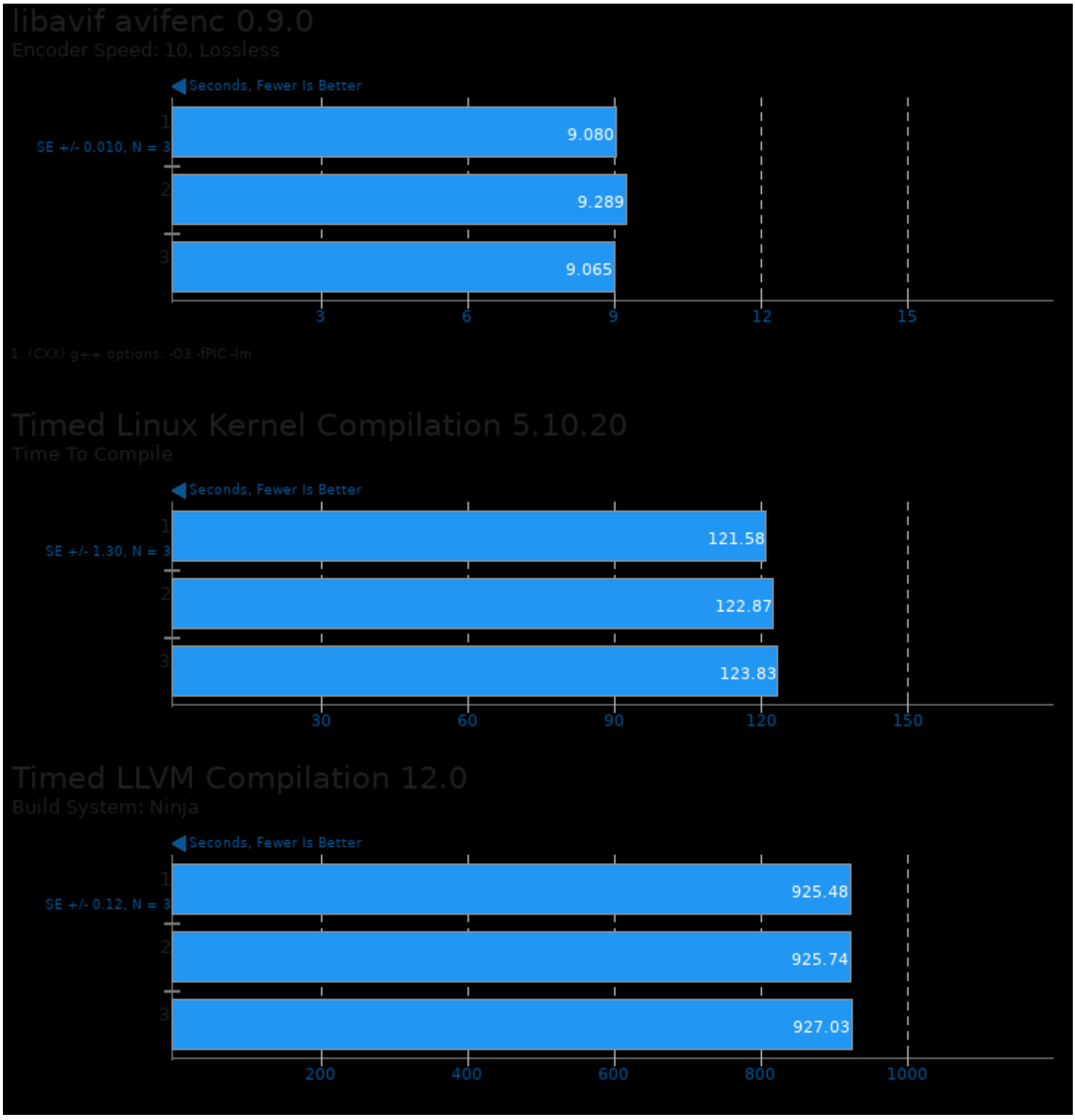


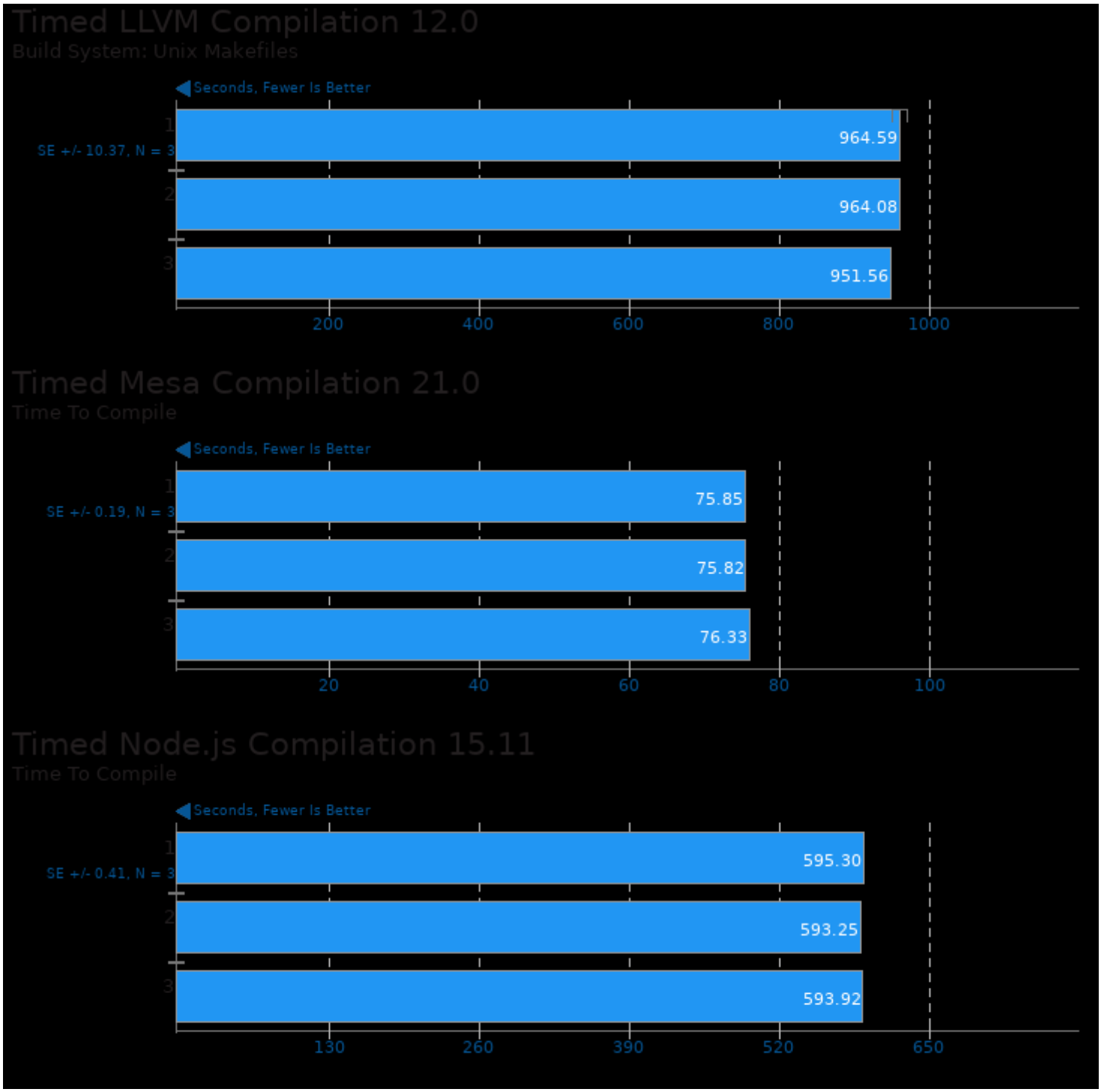
1. (CC) gcc options: -lSDL2 -lavformat -lavcodec -lswscale -lavutil -lstdc++ -lssl -lcrypto -luuid -lm -lrt -lpthread -lasound -O2

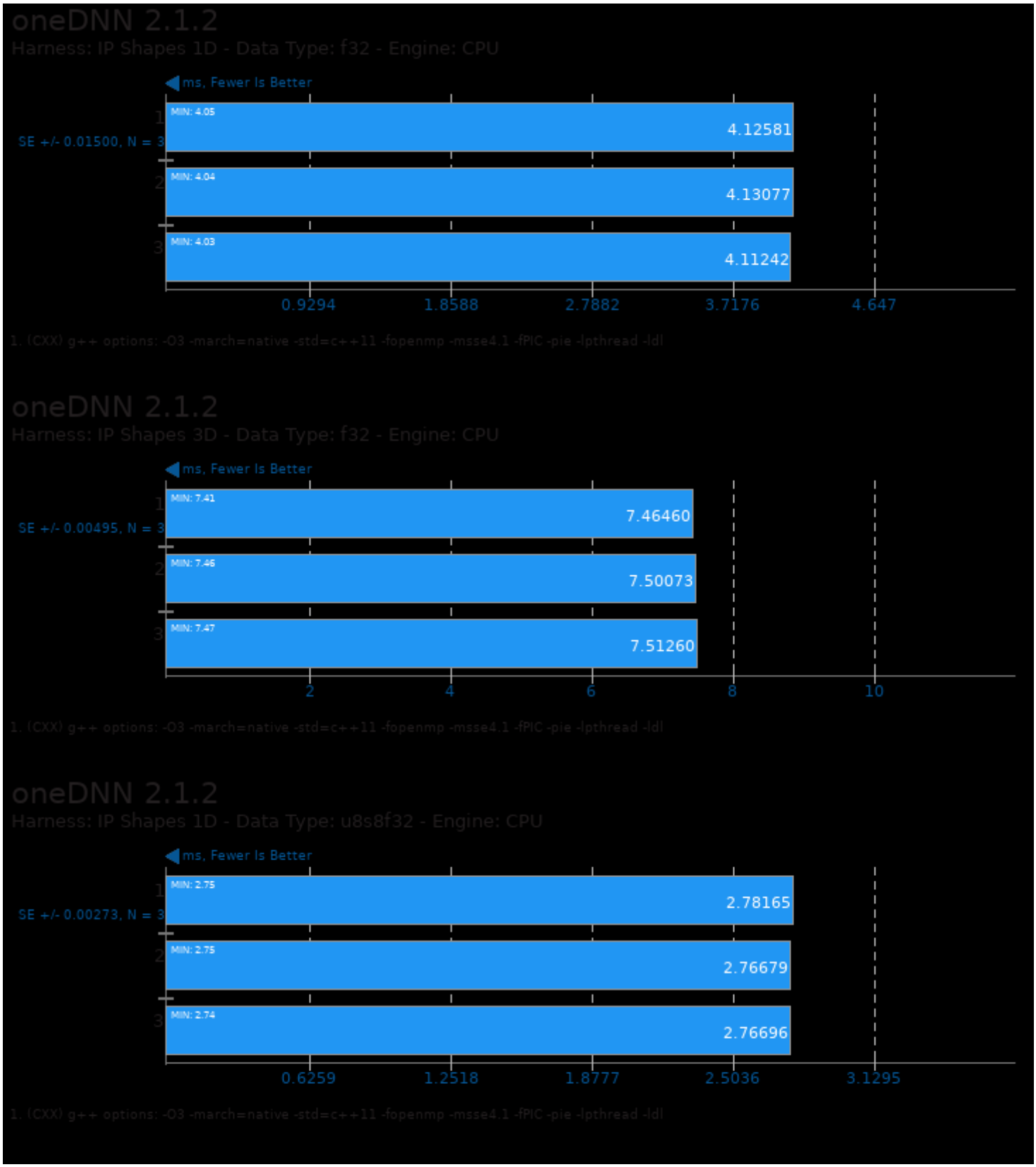

PJSIP 2.11
Method: OPTIONS, Stateless
Responses Per Second, More Is Better
SE +/- 173.85, N = 3
1
2
3
36173
36043
36169
8K
16K
24K
32K
40K
1. (CC) gcc options: -lSDL2 -lavformat -lavcodec -lswscale -lavutil -lstdc++ -lssl -lcrypto -luuid -lm -lrt -lpthread -lasound -O2
libavif avifenc 0.9.0
Encoder Speed: 0
Seconds, Fewer Is Better
SE +/- 0.79, N = 3
1
2
3
101.12
102.93
101.73
20
40
60
80
100
1. (CXX) g++ options: -O3 -fPIC -lm
libavif avifenc 0.9.0
Encoder Speed: 2
Seconds, Fewer Is Better
SE +/- 0.36, N = 3
1
2
3
53.70
52.73
53.51
12
24
36
48
60
1. (CXX) g++ options: -O3 -fPIC -lm

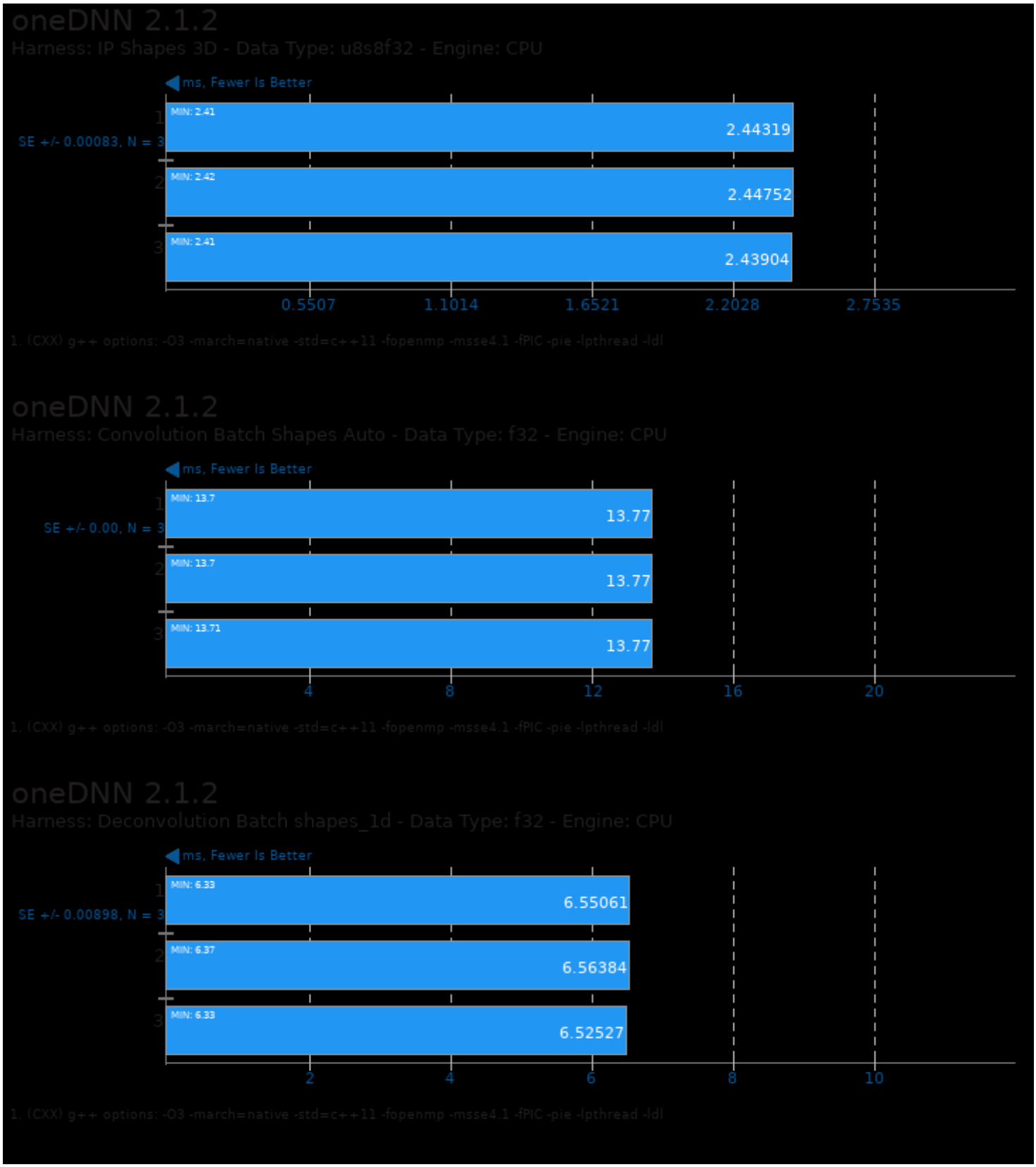
haswell may

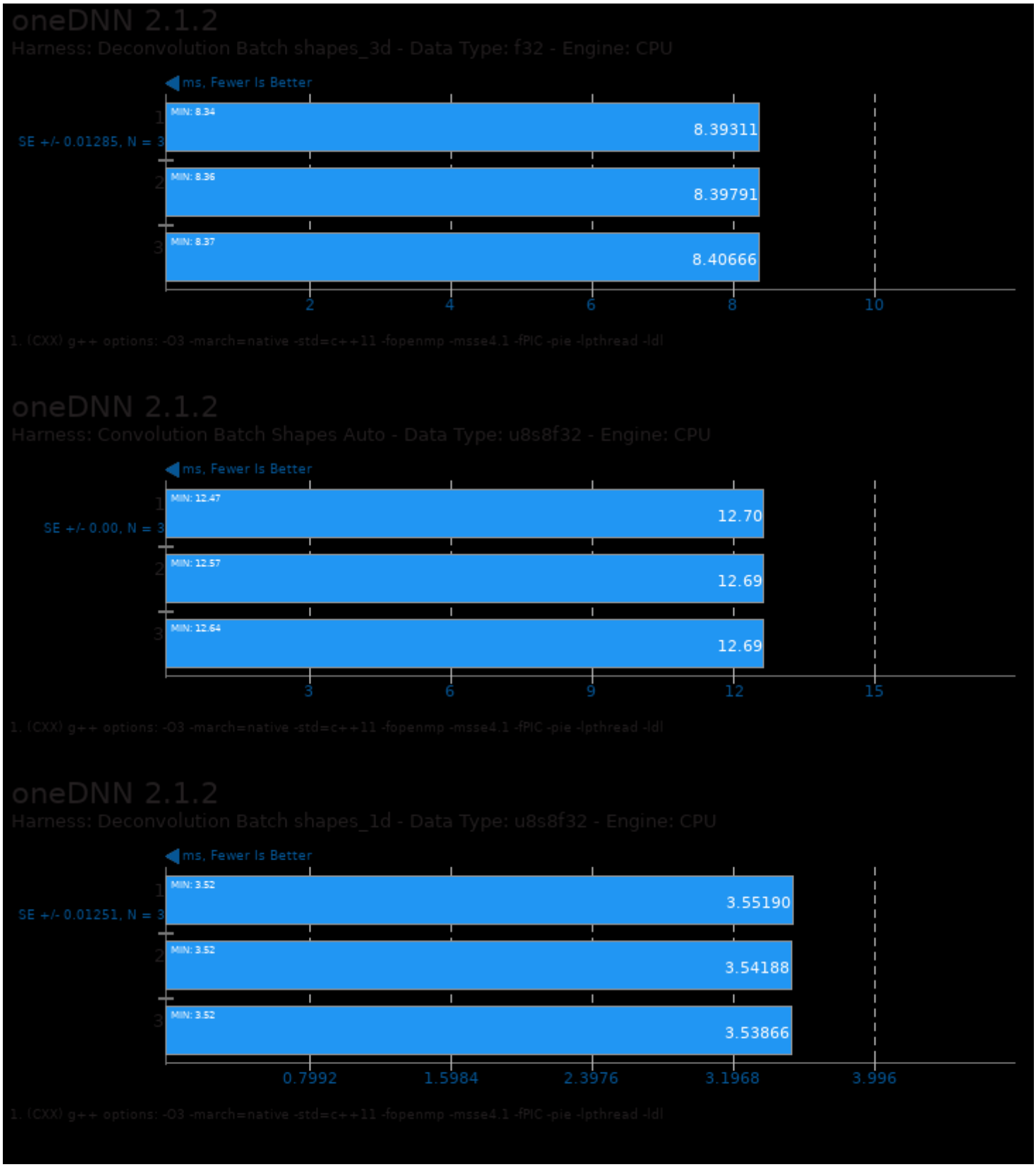

libavif avifenc 0.9.0
Encoder Speed: 6
Seconds, Fewer Is Better
SE +/- 0.06, N = 3
1
2
3
18.93
19.23
18.91
5
10
15
20
25
1. (CXX) g++ options: -O3 -fPIC -lm
libavif avifenc 0.9.0
Encoder Speed: 10
Seconds, Fewer Is Better
SE +/- 0.015, N = 3
1
2
3
5.375
5.410
5.368
1.2173
2.4346
3.6519
4.8692
6.0865
1. (CXX) g++ options: -O3 -fPIC -lm
libavif avifenc 0.9.0
Encoder Speed: 6, Lossless
Seconds, Fewer Is Better
SE +/- 0.35, N = 3
1
2
3
81.12
80.64
80.77
20
40
60
80
100
1. (CXX) g++ options: -O3 -fPIC -lm

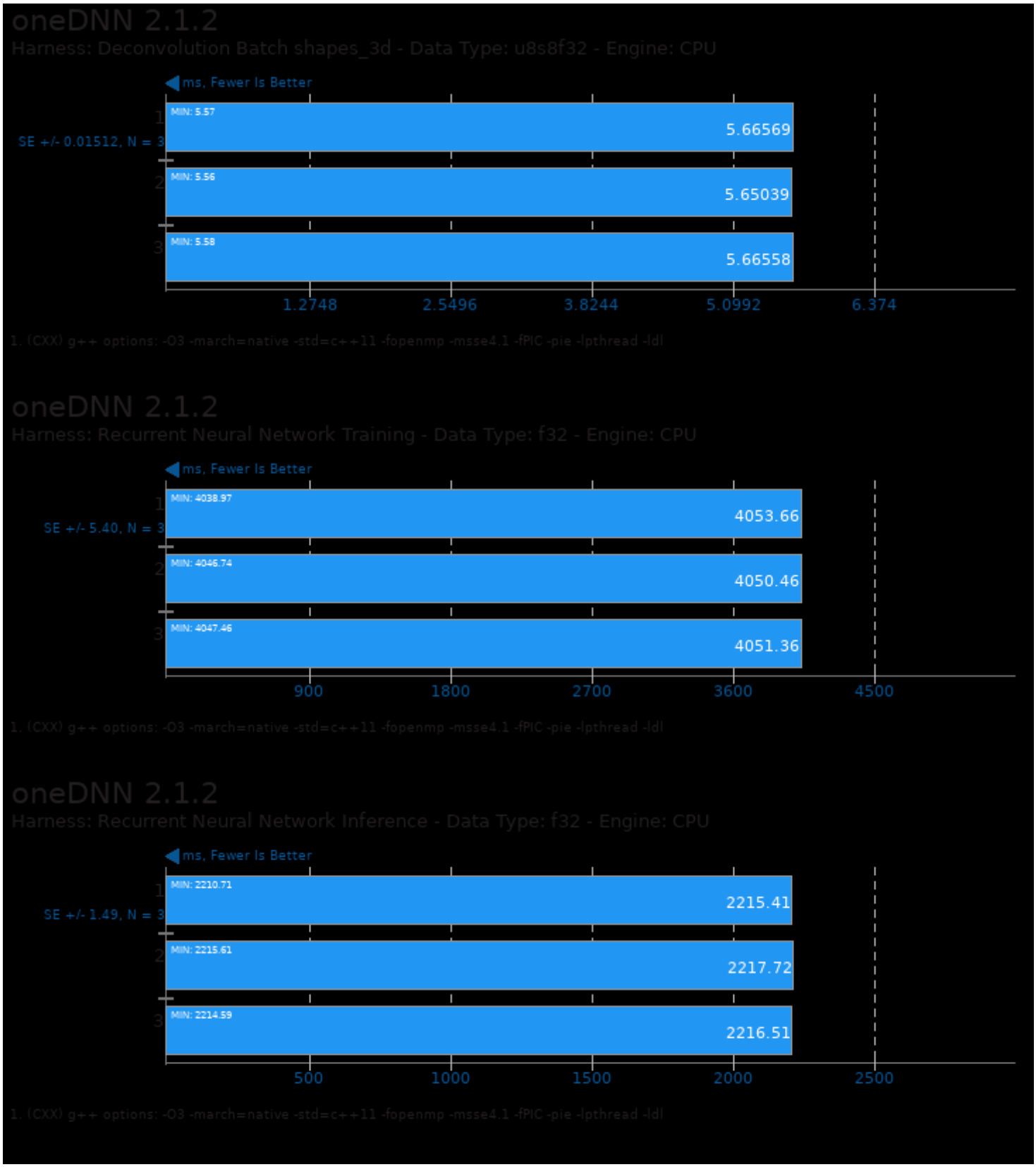

libavif avifenc 0.9.0
Encoder Speed: 10, Lossless
Seconds, Fewer Is Better
SE +/- 0.010, N = 3
1
9.080
2
9.289
3
9.065
3
6
9
12
15
1. (CXX) g++ options: -O3 -fPIC -lm
Timed Linux Kernel Compilation 5.10.20
Time To Compile
Seconds, Fewer Is Better
SE +/- 1.30, N = 3
1
121.58
2
122.87
3
123.83
30
60
90
120
150
Timed LLVM Compilation 12.0
Build System: Ninja
Seconds, Fewer Is Better
SE +/- 0.12, N = 3
1
925.48
2
925.74
3
927.03
200
400
600
800
1000

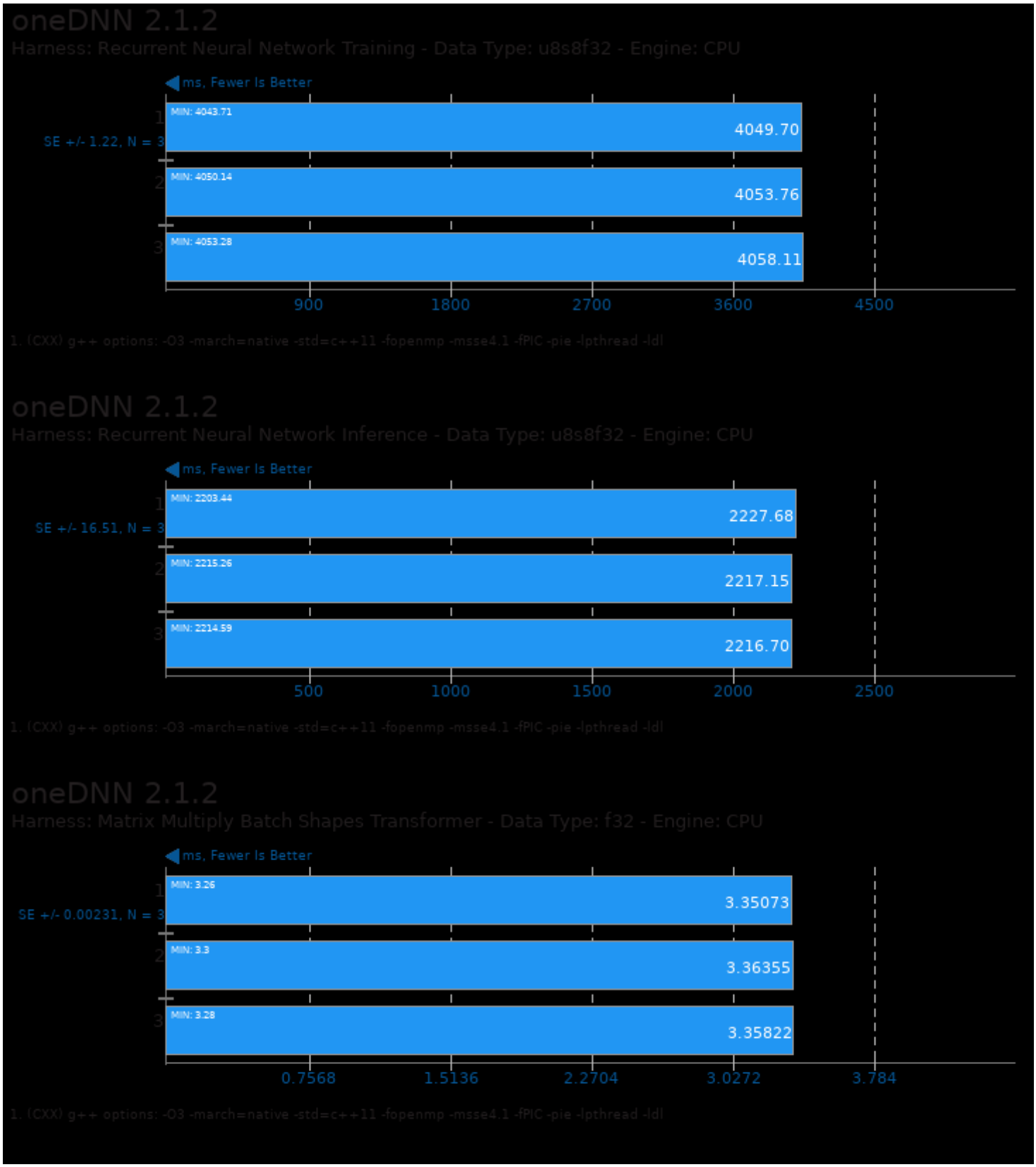

Timed LLVM Compilation 12.0
Build System: Unix Makefiles
Seconds, Fewer Is Better
SE +/- 10.37, N = 3
964.59
964.08
951.56
200
400
600
800
1000
Timed Mesa Compilation 21.0
Time To Compile
Seconds, Fewer Is Better
SE +/- 0.19, N = 3
75.85
75.82
76.33
20
40
60
80
100
Timed Node.js Compilation 15.11
Time To Compile
Seconds, Fewer Is Better
SE +/- 0.41, N = 3
595.30
593.25
593.92
130
260
390
520
650

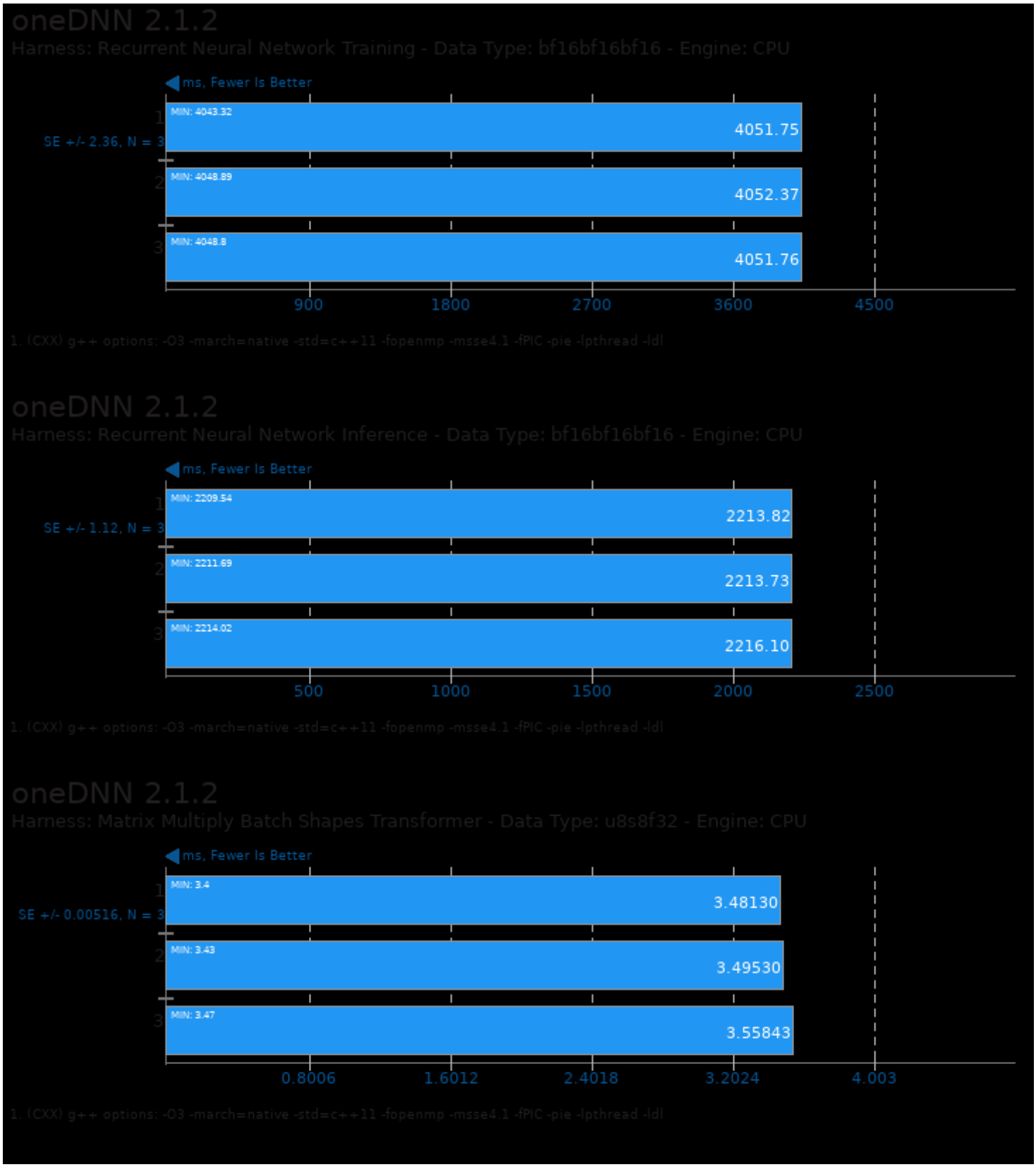

oneDNN 2.1.2
Harness: IP Shapes 1D - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 0.01500, N = 3
MIN: 4.05
4.12581
MIN: 4.04
4.13077
MIN: 4.03
4.11242
0.9294
1.8588
2.7882
3.7176
4.647
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: IP Shapes 3D - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 0.00495, N = 3
MIN: 7.41
7.46460
MIN: 7.46
7.50073
MIN: 7.47
7.51260
2
4
6
8
10
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: IP Shapes 1D - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 0.00273, N = 3
MIN: 2.75
2.78165
MIN: 2.75
2.76679
MIN: 2.74
2.76696
0.6259
1.2518
1.8777
2.5036
3.1295
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

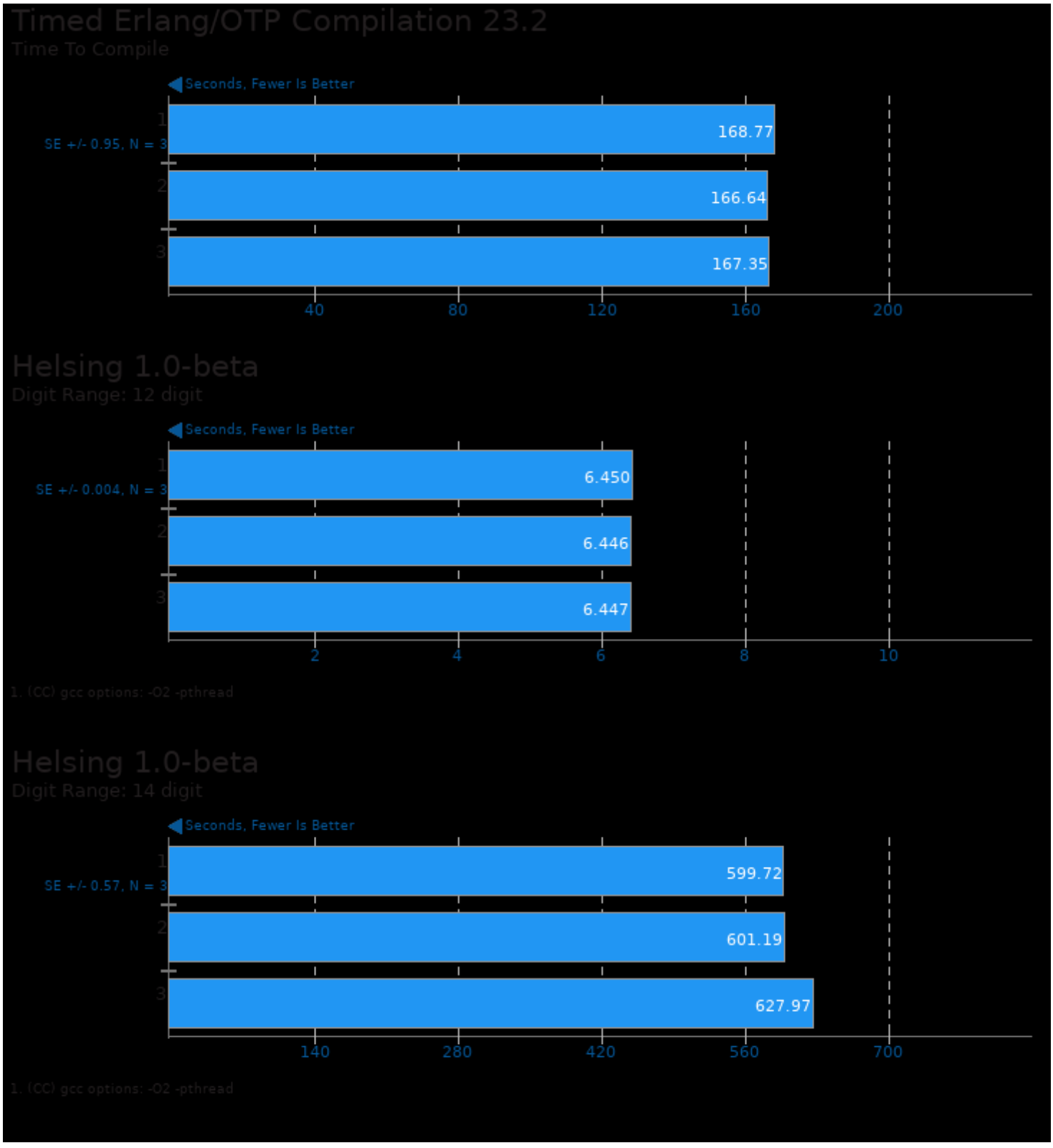

oneDNN 2.1.2
Harness: IP Shapes 3D - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 0.00083, N = 3
1
MIN: 2.41
2.44319
2
MIN: 2.42
2.44752
3
MIN: 2.41
2.43904
0.5507
1.1014
1.6521
2.2028
2.7535
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Convolution Batch Shapes Auto - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 0.00, N = 3
1
MIN: 13.7
13.77
2
MIN: 13.7
13.77
3
MIN: 13.71
13.77
4
8
12
16
20
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Deconvolution Batch shapes_1d - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 0.00898, N = 3
1
MIN: 6.33
6.55061
2
MIN: 6.37
6.56384
3
MIN: 6.33
6.52527
2
4
6
8
10
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl


oneDNN 2.1.2
Harness: Deconvolution Batch shapes_3d - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 0.01285, N = 3
MIN: 8.34
8.39311
MIN: 8.36
8.39791
MIN: 8.37
8.40666
2
4
6
8
10
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Convolution Batch Shapes Auto - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 0.00, N = 3
MIN: 12.47
12.70
MIN: 12.57
12.69
MIN: 12.64
12.69
3
6
9
12
15
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Deconvolution Batch shapes_1d - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 0.01251, N = 3
MIN: 3.52
3.55190
MIN: 3.52
3.54188
MIN: 3.52
3.53866
0.7992
1.5984
2.3976
3.1968
3.996
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

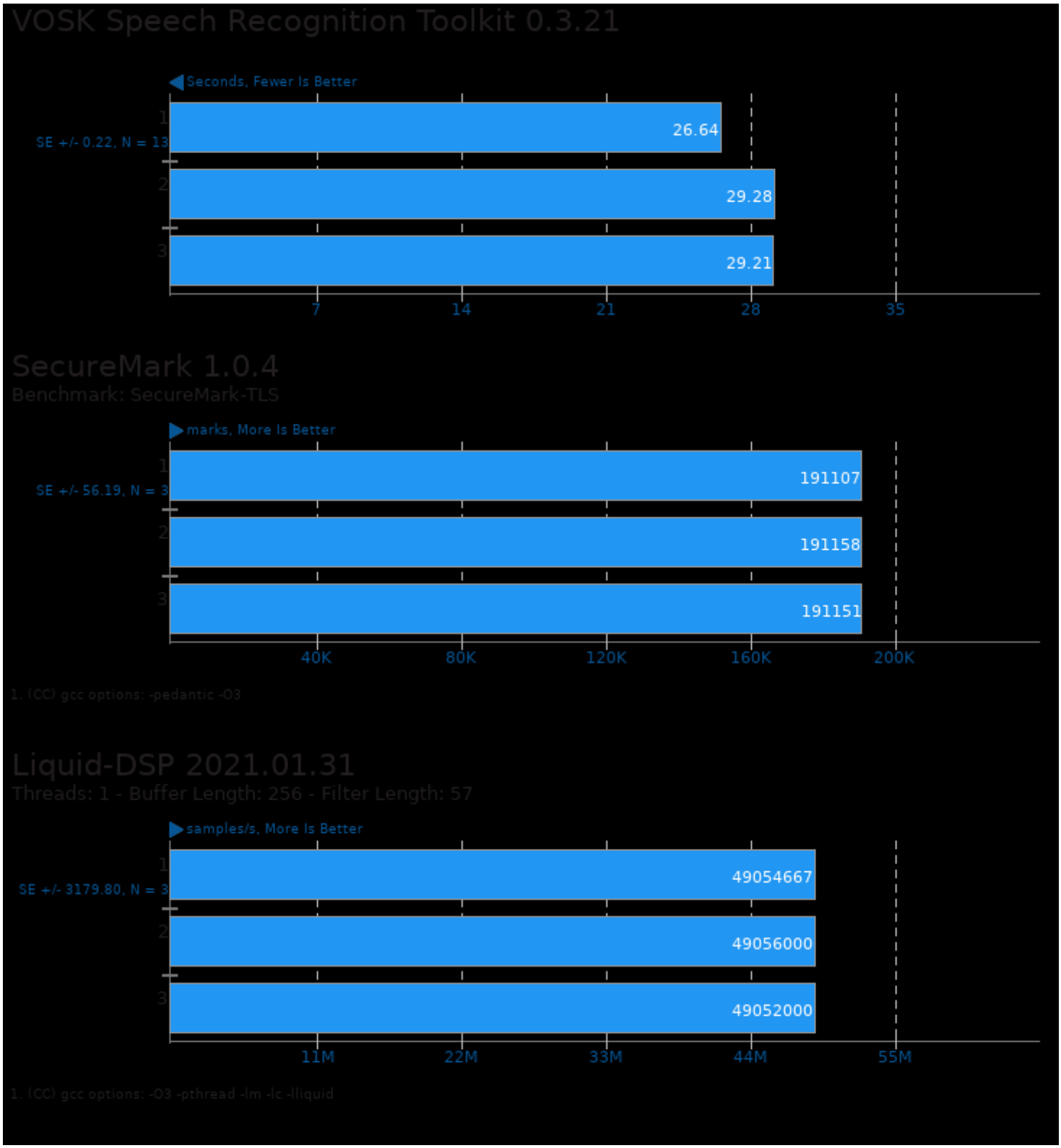

oneDNN 2.1.2
Harness: Deconvolution Batch shapes_3d - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 0.01512, N = 3
1
MIN: 5.57
5.66569
2
MIN: 5.56
5.65039
3
MIN: 5.58
5.66558
1.2748
2.5496
3.8244
5.0992
6.374
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Recurrent Neural Network Training - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 5.40, N = 3
1
MIN: 4038.97
4053.66
2
MIN: 4046.74
4050.46
3
MIN: 4047.46
4051.36
900
1800
2700
3600
4500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Recurrent Neural Network Inference - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 1.49, N = 3
1
MIN: 2210.71
2215.41
2
MIN: 2215.61
2217.72
3
MIN: 2214.59
2216.51
500
1000
1500
2000
2500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

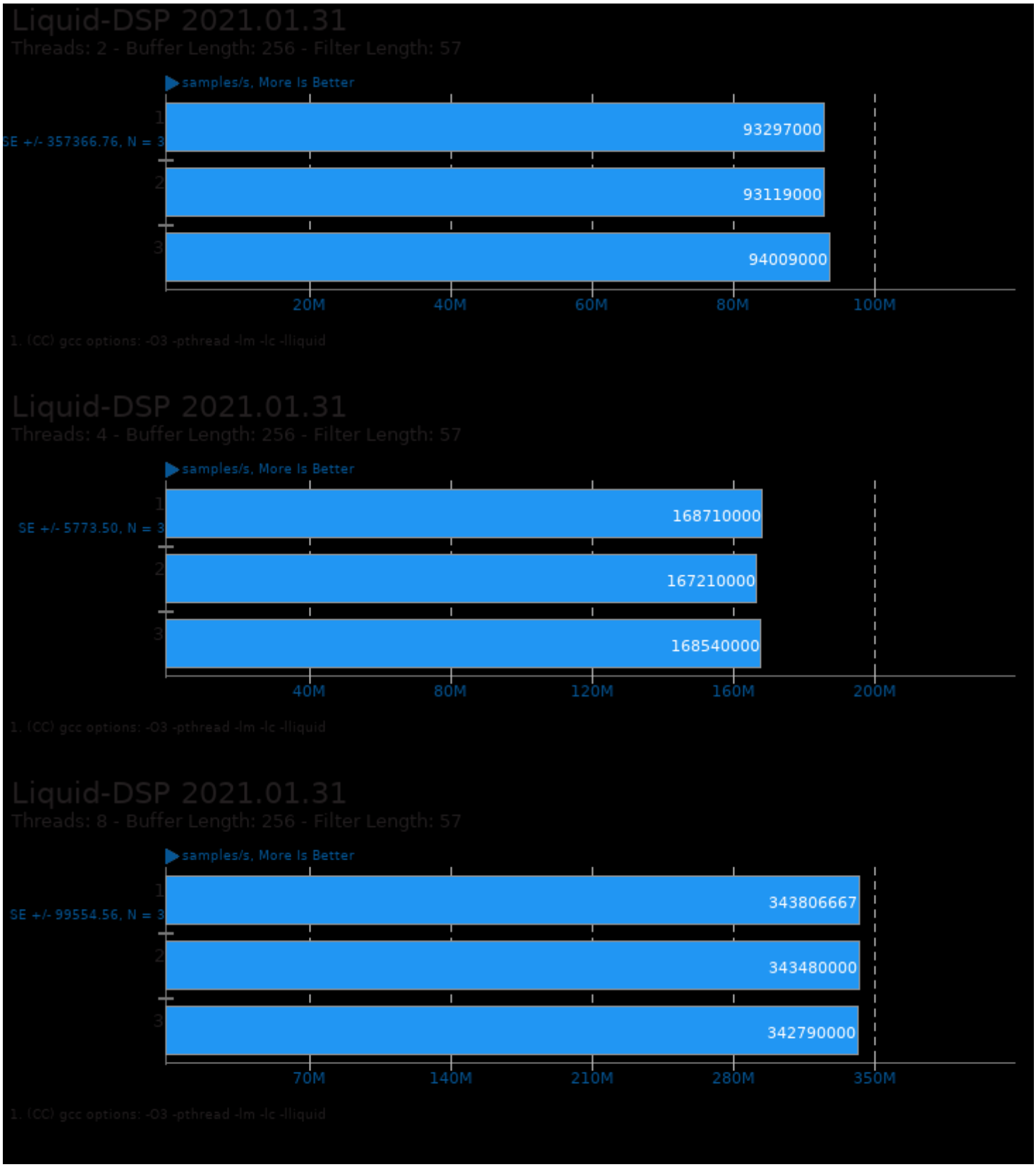

oneDNN 2.1.2
Harness: Recurrent Neural Network Training - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 1.22, N = 3
MIN: 4043.71
4049.70
MIN: 4050.14
4053.76
MIN: 4053.28
4058.11
900
1800
2700
3600
4500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Recurrent Neural Network Inference - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 16.51, N = 3
MIN: 2203.44
2227.68
MIN: 2215.26
2217.15
MIN: 2214.59
2216.70
500
1000
1500
2000
2500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 0.00231, N = 3
MIN: 3.26
3.35073
MIN: 3.3
3.36355
MIN: 3.28
3.35822
0.7568
1.5136
2.2704
3.0272
3.784
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

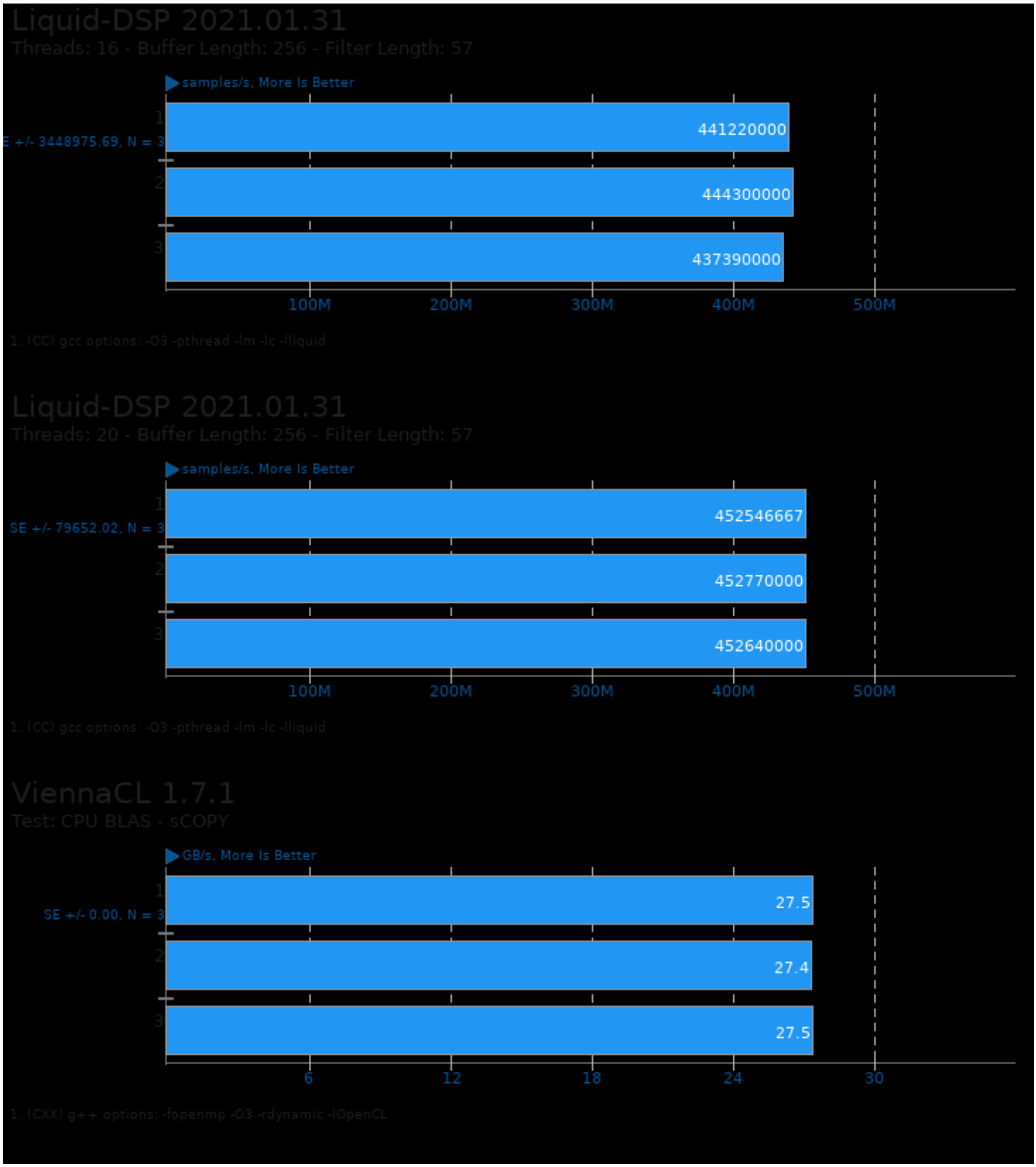

oneDNN 2.1.2
Harness: Recurrent Neural Network Training - Data Type: bf16bf16bf16 - Engine: CPU
ms, Fewer Is Better
SE +/- 2.36, N = 3
1
MIN: 4043.32
4051.75
2
MIN: 4048.89
4052.37
3
MIN: 4048.8
4051.76
900
1800
2700
3600
4500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Recurrent Neural Network Inference - Data Type: bf16bf16bf16 - Engine: CPU
ms, Fewer Is Better
SE +/- 1.12, N = 3
1
MIN: 2209.54
2213.82
2
MIN: 2211.69
2213.73
3
MIN: 2214.02
2216.10
500
1000
1500
2000
2500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
SE +/- 0.00516, N = 3
1
MIN: 3.4
3.48130
2
MIN: 3.43
3.49530
3
MIN: 3.47
3.55843
0.8006
1.6012
2.4018
3.2024
4.003
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

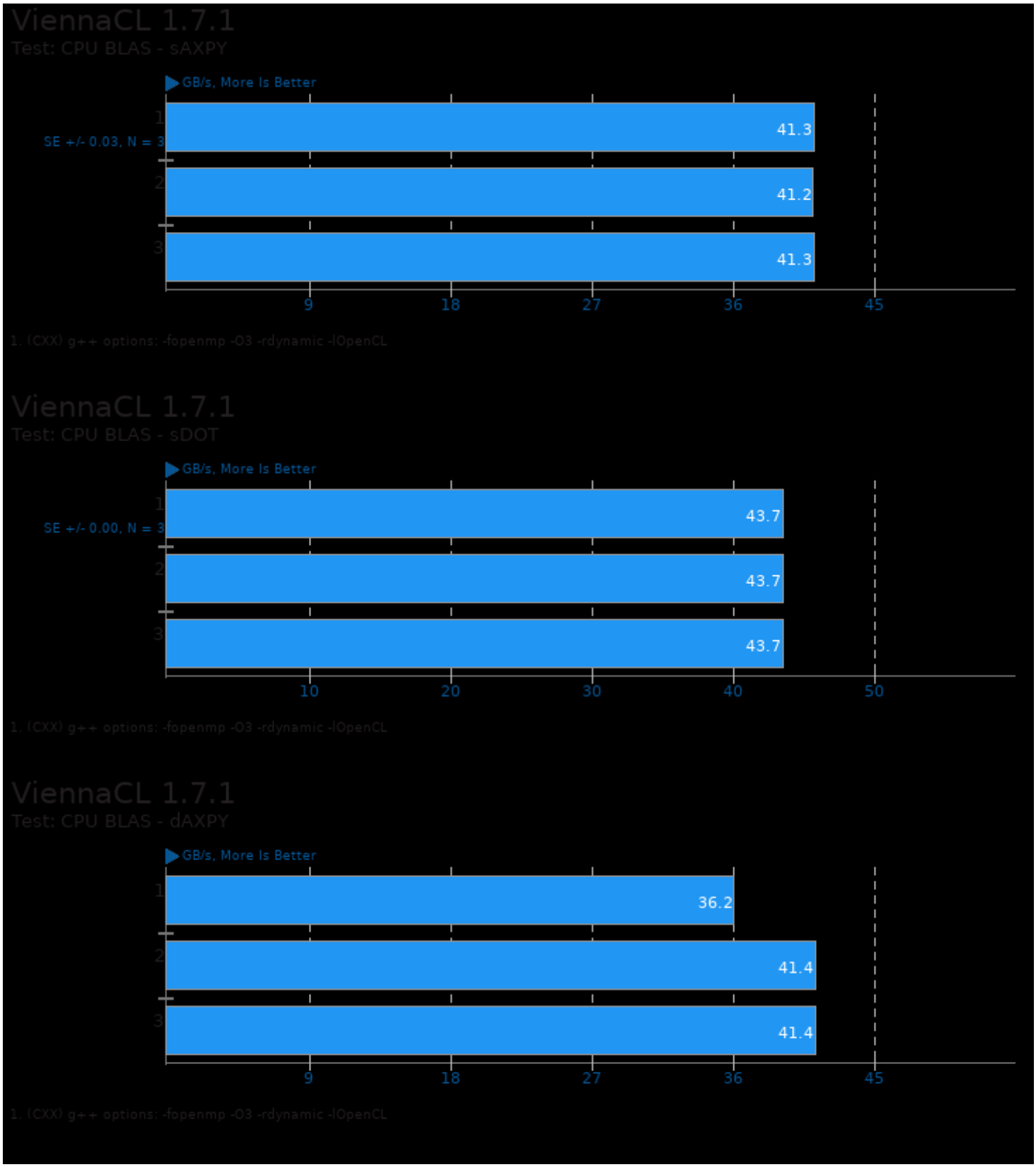

Timed Erlang/OTP Compilation 23.2
Time To Compile
Seconds, Fewer Is Better
SE +/- 0.95, N = 3
1
2
3
168.77
166.64
167.35
40
80
120
160
200
Helsing 1.0-beta
Digit Range: 12 digit
Seconds, Fewer Is Better
SE +/- 0.004, N = 3
1
2
3
6.450
6.446
6.447
2
4
6
8
10
1. (CC) gcc options: -O2 -pthread
Helsing 1.0-beta
Digit Range: 14 digit
Seconds, Fewer Is Better
SE +/- 0.57, N = 3
1
2
3
599.72
601.19
627.97
140
280
420
560
700
1. (CC) gcc options: -O2 -pthread

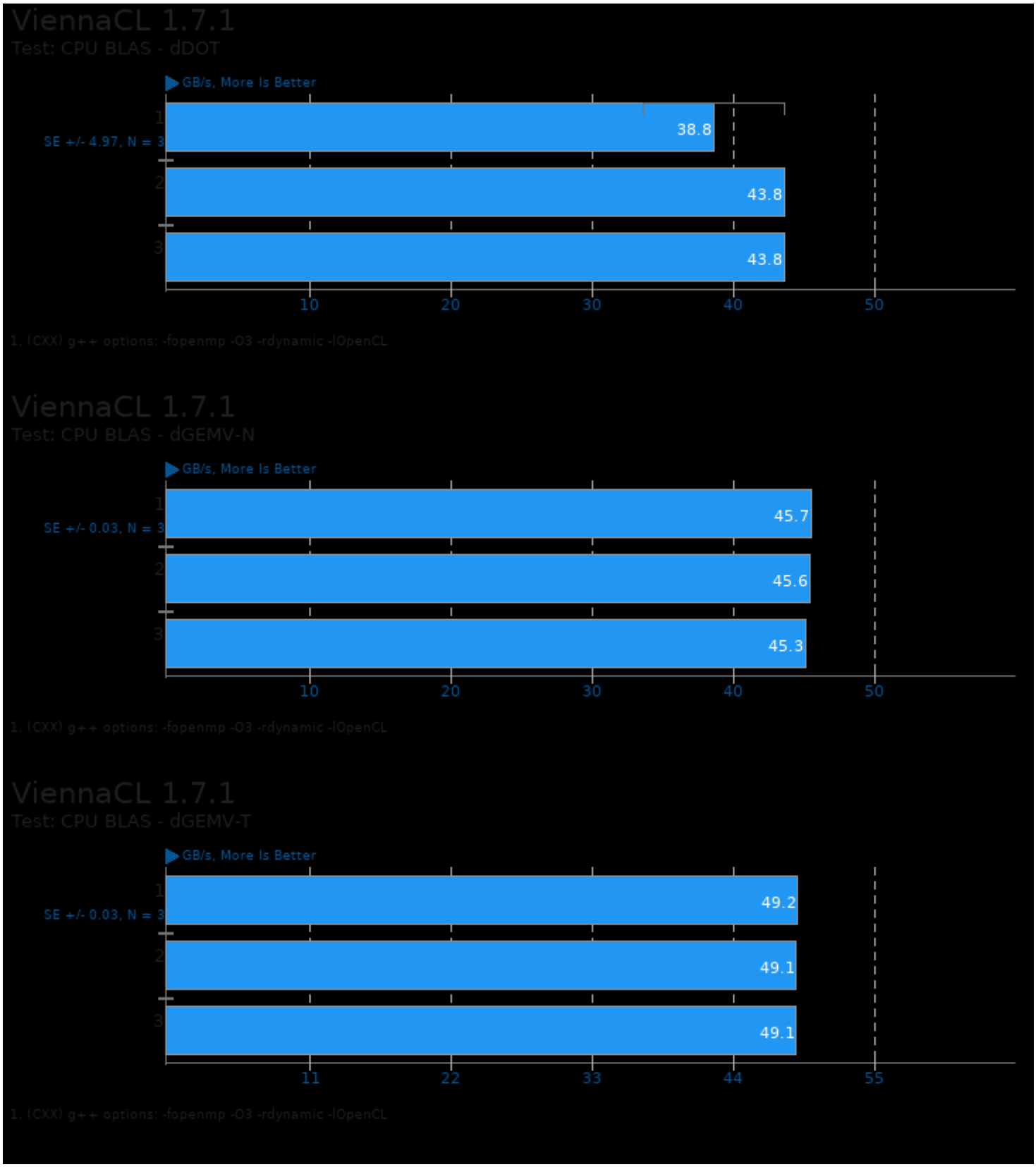
haswell may

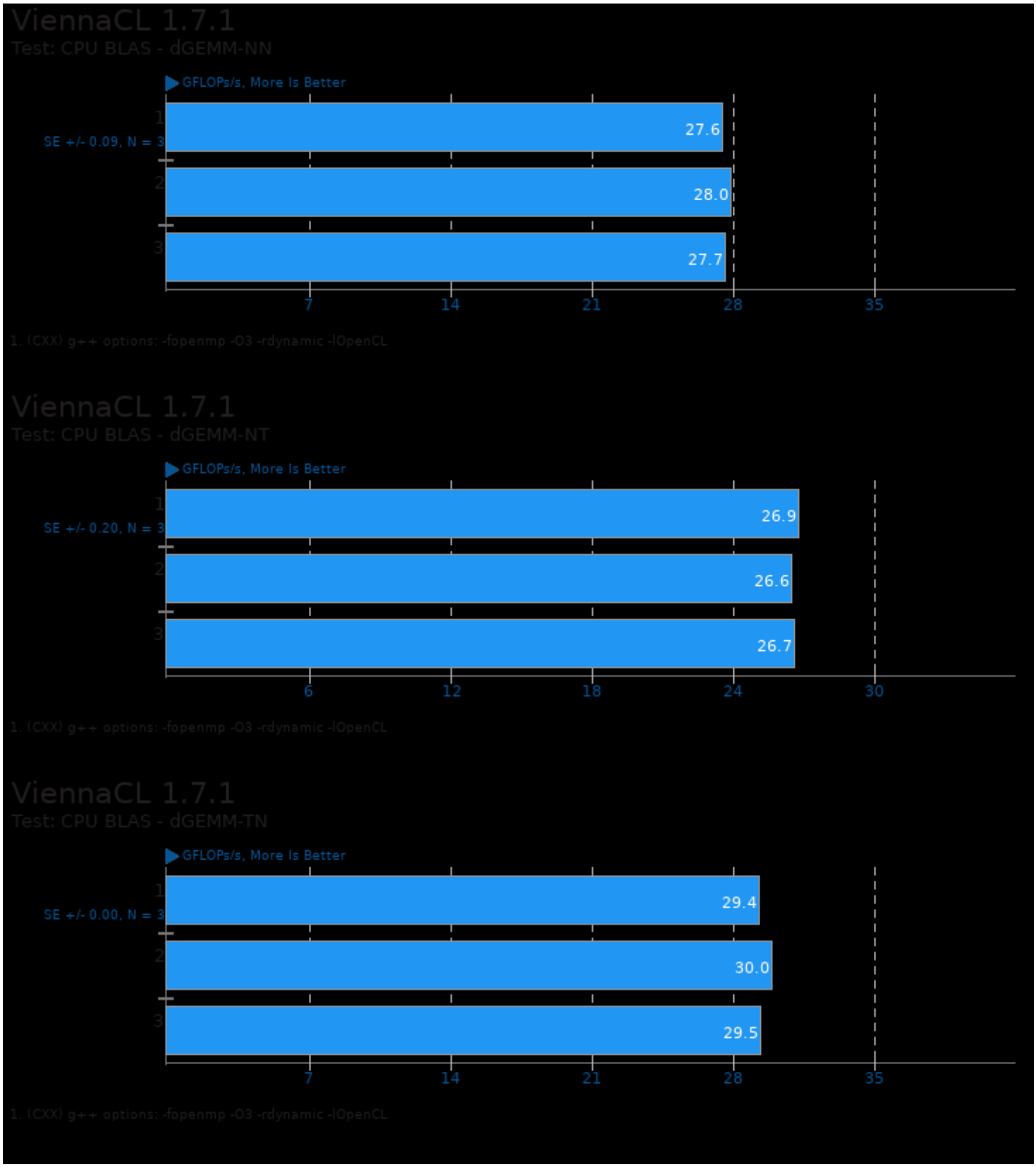

VOSK Speech Recognition Toolkit 0.3.21
Seconds, Fewer Is Better
SE +/- 0.22, N = 13
1
26.64
2
29.28
3
29.21
7
14
21
28
35
SecureMark 1.0.4
Benchmark: SecureMark-TLS
marks, More Is Better
SE +/- 56.19, N = 3
1
191107
2
191158
3
191151
40K
80K
120K
160K
200K
1. (CC) gcc options: -pedantic -O3
Liquid-DSP 2021.01.31
Threads: 1 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
SE +/- 3179.80, N = 3
1
49054667
2
49056000
3
49052000
11M
22M
33M
44M
55M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid

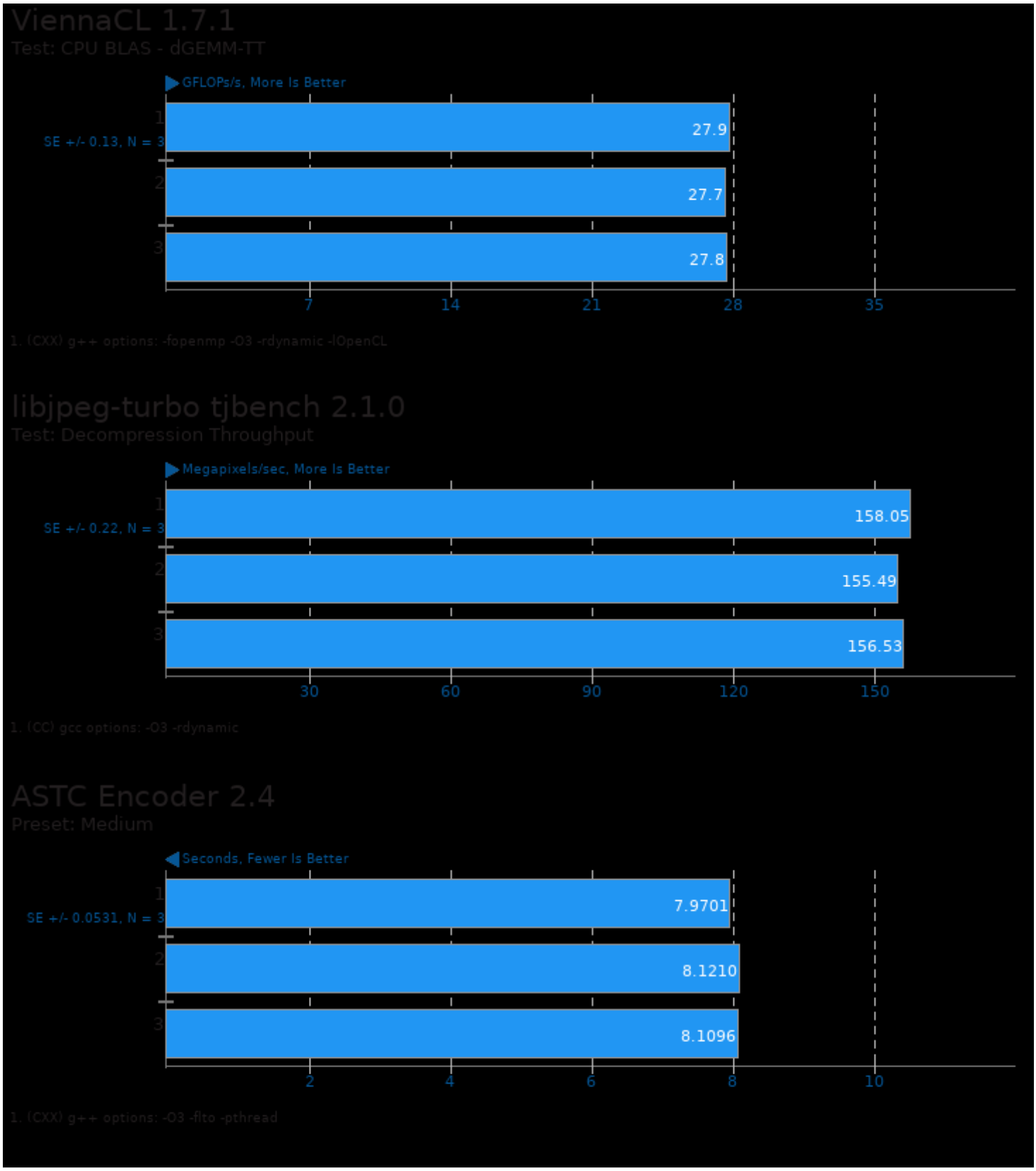

Liquid-DSP 2021.01.31
Threads: 2 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
SE +/- 357366.76, N = 3
1
2
3
93297000
93119000
94009000
20M
40M
60M
80M
100M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid
Liquid-DSP 2021.01.31
Threads: 4 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
SE +/- 5773.50, N = 3
1
2
3
168710000
167210000
168540000
40M
80M
120M
160M
200M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid
Liquid-DSP 2021.01.31
Threads: 8 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
SE +/- 99554.56, N = 3
1
2
3
343806667
343480000
342790000
70M
140M
210M
280M
350M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid


Liquid-DSP 2021.01.31
Threads: 16 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
E +/- 3448975.69, N = 3
1
441220000
2
444300000
3
437390000
100M
200M
300M
400M
500M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid
Liquid-DSP 2021.01.31
Threads: 20 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
SE +/- 79652.02, N = 3
1
452546667
2
452770000
3
452640000
100M
200M
300M
400M
500M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid
ViennaCL 1.7.1
Test: CPU BLAS - sCOPY
GB/s, More Is Better
SE +/- 0.00, N = 3
1
27.5
2
27.4
3
27.5
6
12
18
24
30
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL


ViennaCL 1.7.1
Test: CPU BLAS - sAXPY
GB/s, More Is Better
SE +/- 0.03, N = 3
1
2
3
41.3
41.2
41.3
9
18
27
36
45
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - sDOT
GB/s, More Is Better
SE +/- 0.00, N = 3
1
2
3
43.7
43.7
43.7
10
20
30
40
50
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dAXPY
GB/s, More Is Better
1
2
3
36.2
41.4
41.4
9
18
27
36
45
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

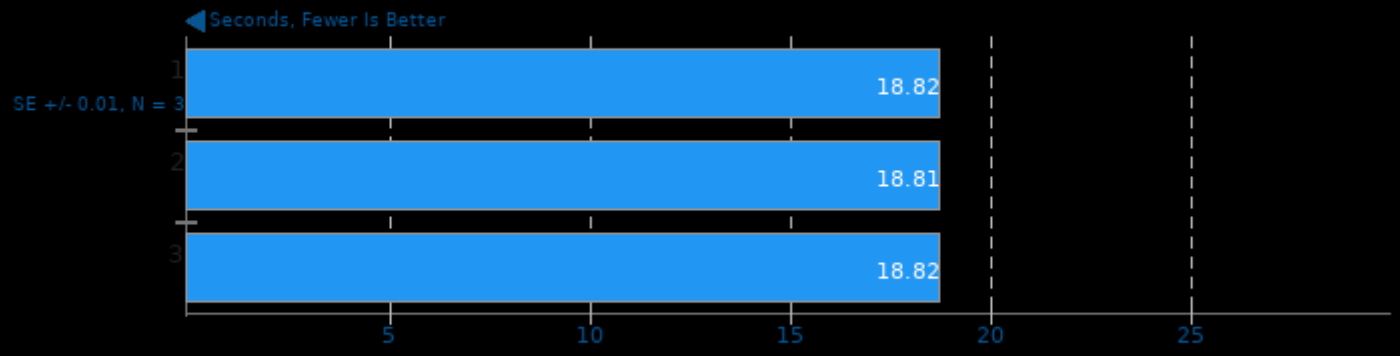

ViennaCL 1.7.1
Test: CPU BLAS - dDOT
GB/s, More Is Better
SE +/- 4.97, N = 3
1
38.8
2
43.8
3
43.8
10
20
30
40
50
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dGEMV-N
GB/s, More Is Better
SE +/- 0.03, N = 3
1
45.7
2
45.6
3
45.3
10
20
30
40
50
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dGEMV-T
GB/s, More Is Better
SE +/- 0.03, N = 3
1
49.2
2
49.1
3
49.1
11
22
33
44
55
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL


ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-NN
GFLOPs/s, More Is Better
SE +/- 0.09, N = 3
1
27.6
2
28.0
3
27.7
7
14
21
28
35
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-NT
GFLOPs/s, More Is Better
SE +/- 0.20, N = 3
1
26.9
2
26.6
3
26.7
6
12
18
24
30
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-TN
GFLOPs/s, More Is Better
SE +/- 0.00, N = 3
1
29.4
2
30.0
3
29.5
7
14
21
28
35
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL


ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-TT
GFLOPs/s, More Is Better
SE +/- 0.13, N = 3
1
27.9
2
27.7
3
27.8
7
14
21
28
35
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
libjpeg-turbo tjbench 2.1.0
Test: Decompression Throughput
Megapixels/sec, More Is Better
SE +/- 0.22, N = 3
1
158.05
2
155.49
3
156.53
30
60
90
120
150
1. (CC) gcc options: -O3 -rdynamic
ASTC Encoder 2.4
Preset: Medium
Seconds, Fewer Is Better
SE +/- 0.0531, N = 3
1
7.9701
2
8.1210
3
8.1096
2
4
6
8
10
1. (CXX) g++ options: -O3 -flto -pthread

ASTC Encoder 2.4

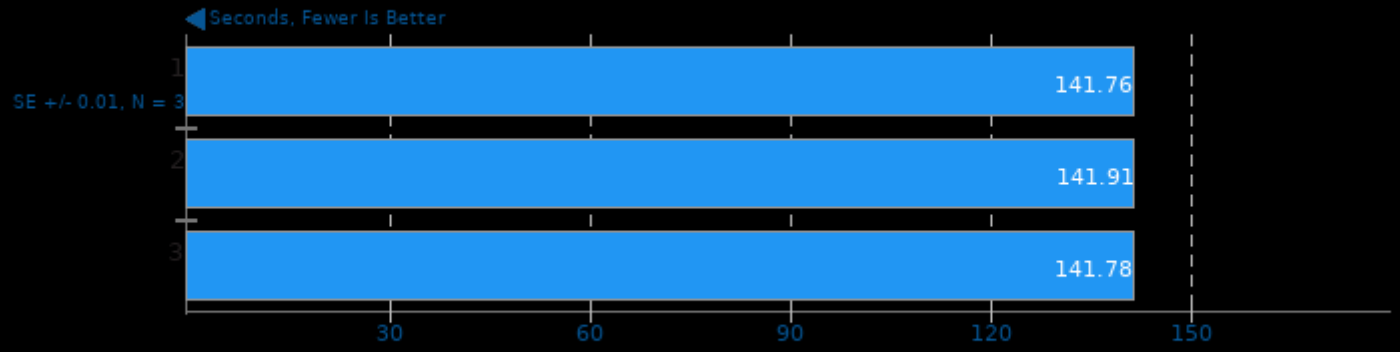
Preset: Thorough



1. (CXX) g++ options: -O3 -flto -pthread

ASTC Encoder 2.4

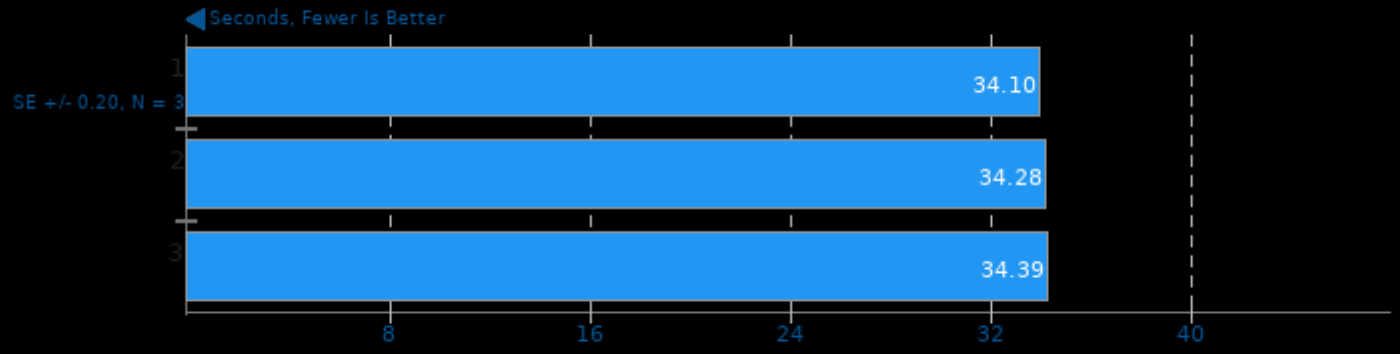
Preset: Exhaustive



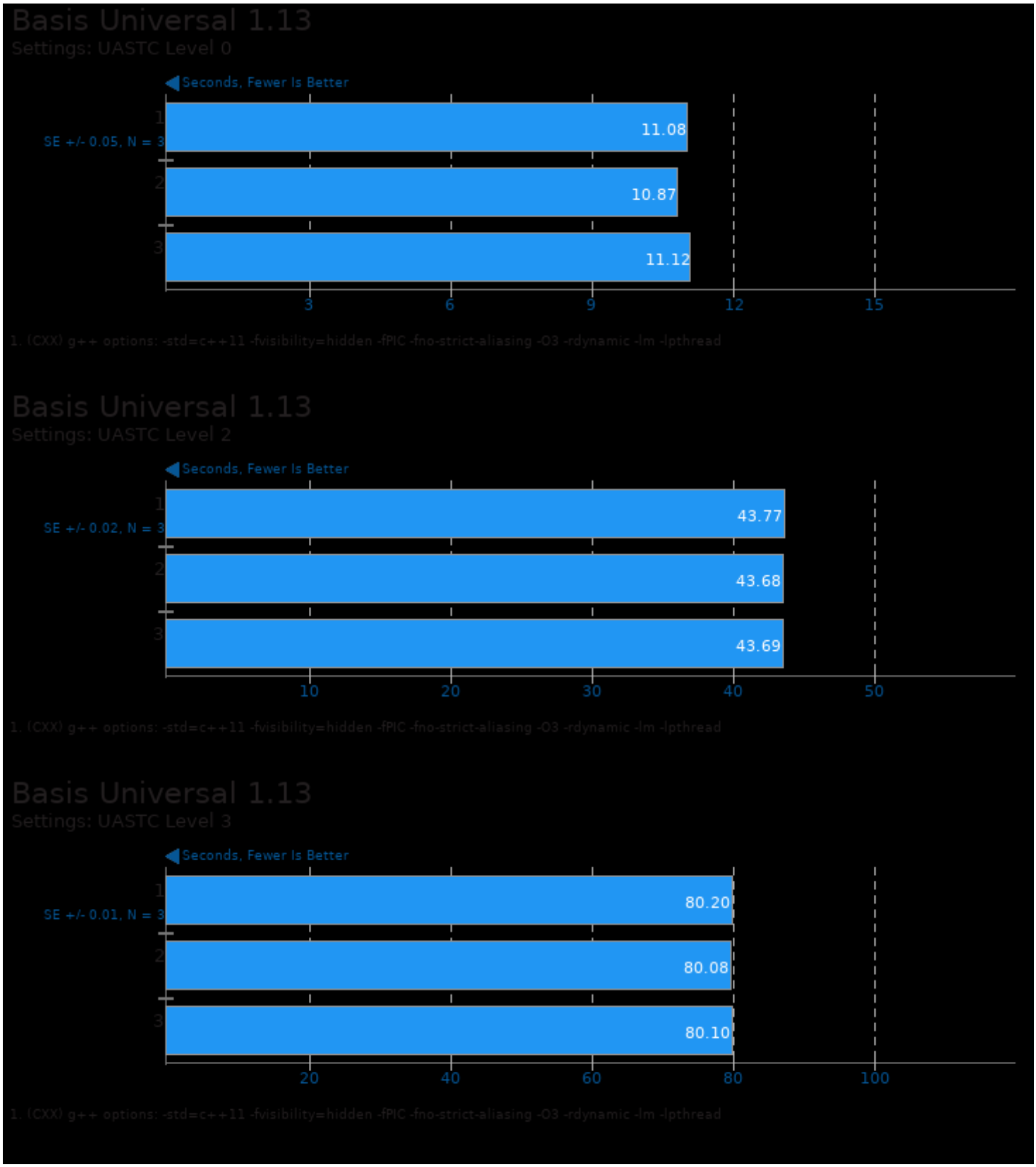
1. (CXX) g++ options: -O3 -flto -pthread

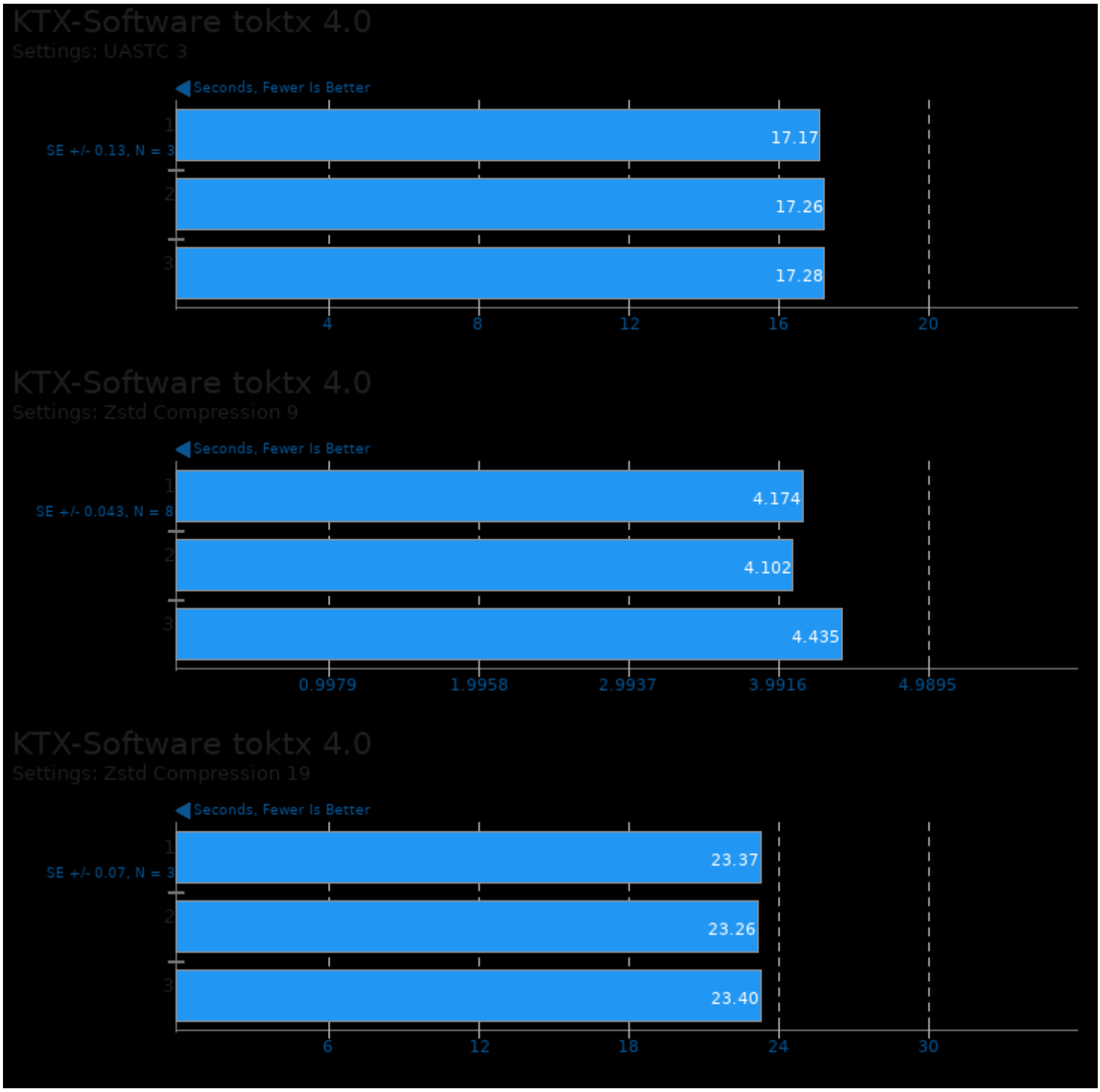
Basis Universal 1.13

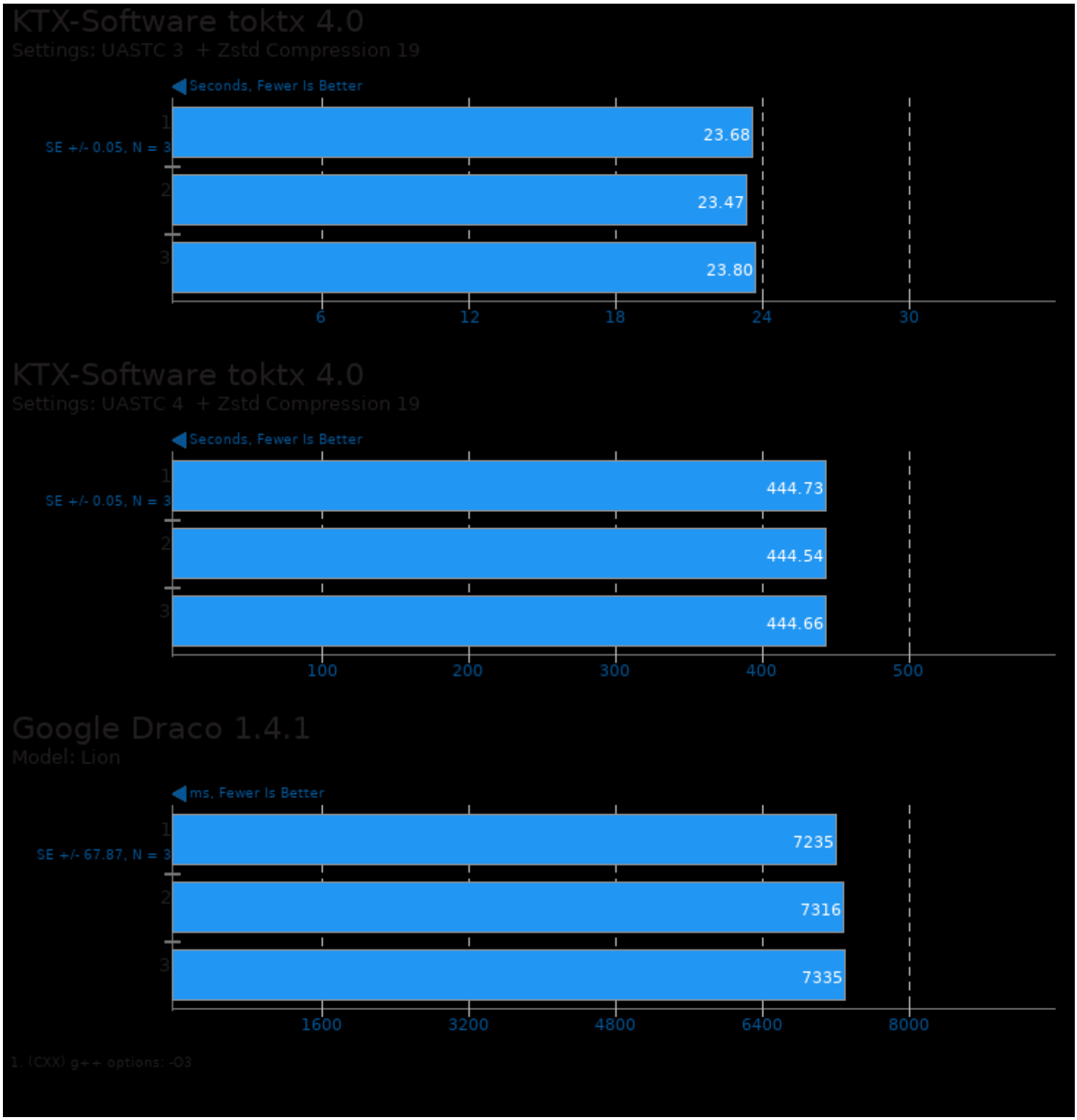
Settings: ETC1S



1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

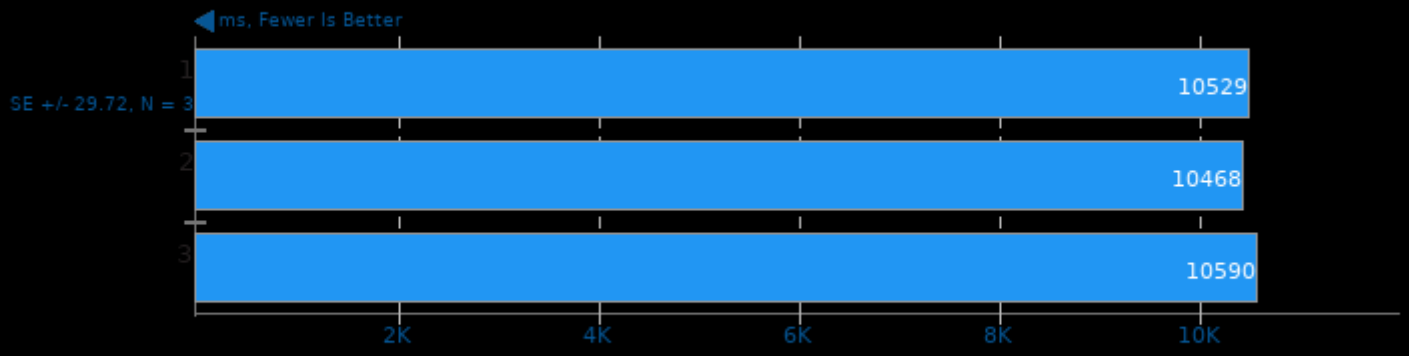

Basis Universal 1.13
Settings: UASTC Level 0
Seconds, Fewer Is Better
SE +/- 0.05, N = 3
1
11.08
2
10.87
3
11.12
3
6
9
12
15
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread
Basis Universal 1.13
Settings: UASTC Level 2
Seconds, Fewer Is Better
SE +/- 0.02, N = 3
1
43.77
2
43.68
3
43.69
10
20
30
40
50
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread
Basis Universal 1.13
Settings: UASTC Level 3
Seconds, Fewer Is Better
SE +/- 0.01, N = 3
1
80.20
2
80.08
3
80.10
20
40
60
80
100
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread


KTX-Software toktx 4.0
Settings: UASTC 3
Seconds, Fewer Is Better
SE +/- 0.13, N = 3
1
2
3
17.17
17.26
17.28
4
8
12
16
20
KTX-Software toktx 4.0
Settings: Zstd Compression 9
Seconds, Fewer Is Better
SE +/- 0.043, N = 8
1
2
3
4.174
4.102
4.435
0.9979
1.9958
2.9937
3.9916
4.9895
KTX-Software toktx 4.0
Settings: Zstd Compression 19
Seconds, Fewer Is Better
SE +/- 0.07, N = 3
1
2
3
23.37
23.26
23.40
6
12
18
24
30


KTX-Software toktx 4.0
Settings: UASTC 3 + Zstd Compression 19
Seconds, Fewer Is Better
SE +/- 0.05, N = 3
1
23.68
2
23.47
3
23.80
6
12
18
24
30
KTX-Software toktx 4.0
Settings: UASTC 4 + Zstd Compression 19
Seconds, Fewer Is Better
SE +/- 0.05, N = 3
1
444.73
2
444.54
3
444.66
100
200
300
400
500
Google Draco 1.4.1
Model: Lion
ms, Fewer Is Better
SE +/- 67.87, N = 3
1
7235
2
7316
3
7335
1600
3200
4800
6400
8000
1. (CXX) g++ options: -O3

Google Draco 1.4.1

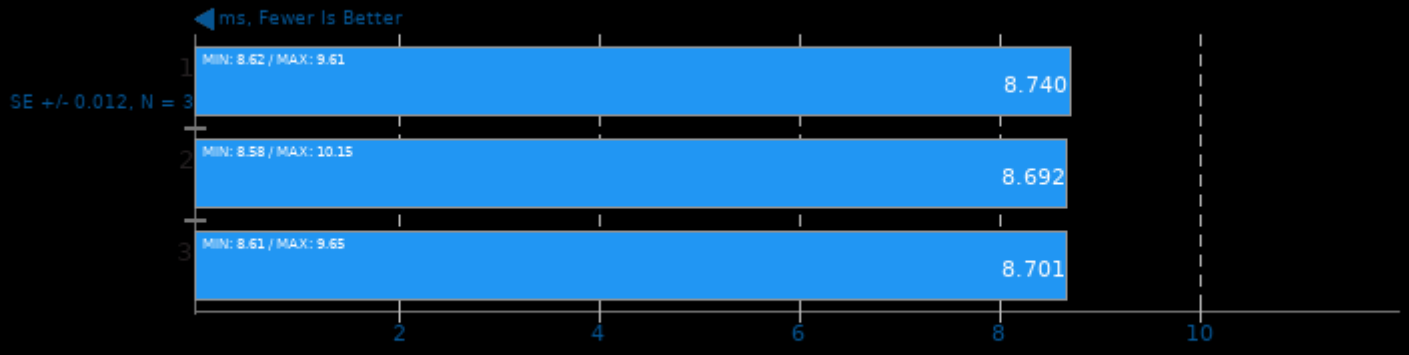
Model: Church Facade



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

Mobile Neural Network 1.1.3

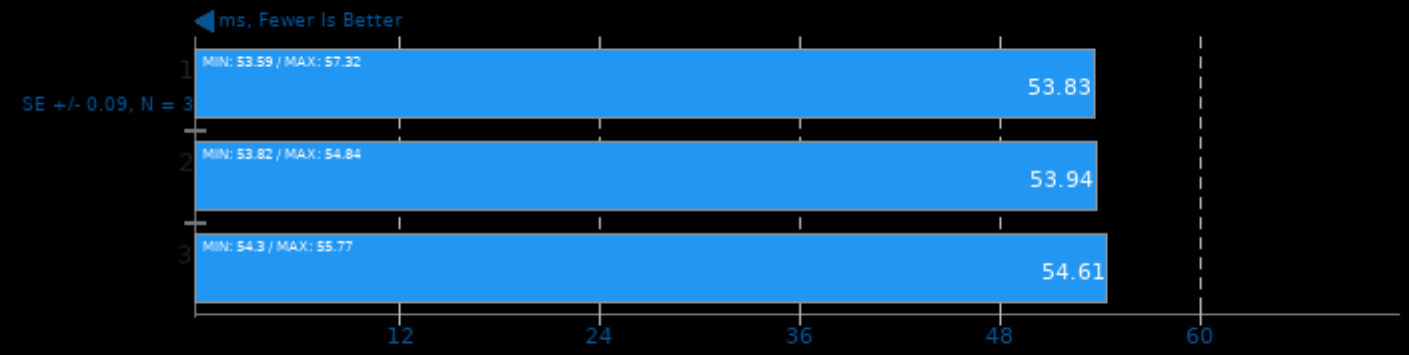
Model: SqueezeNetV1.0



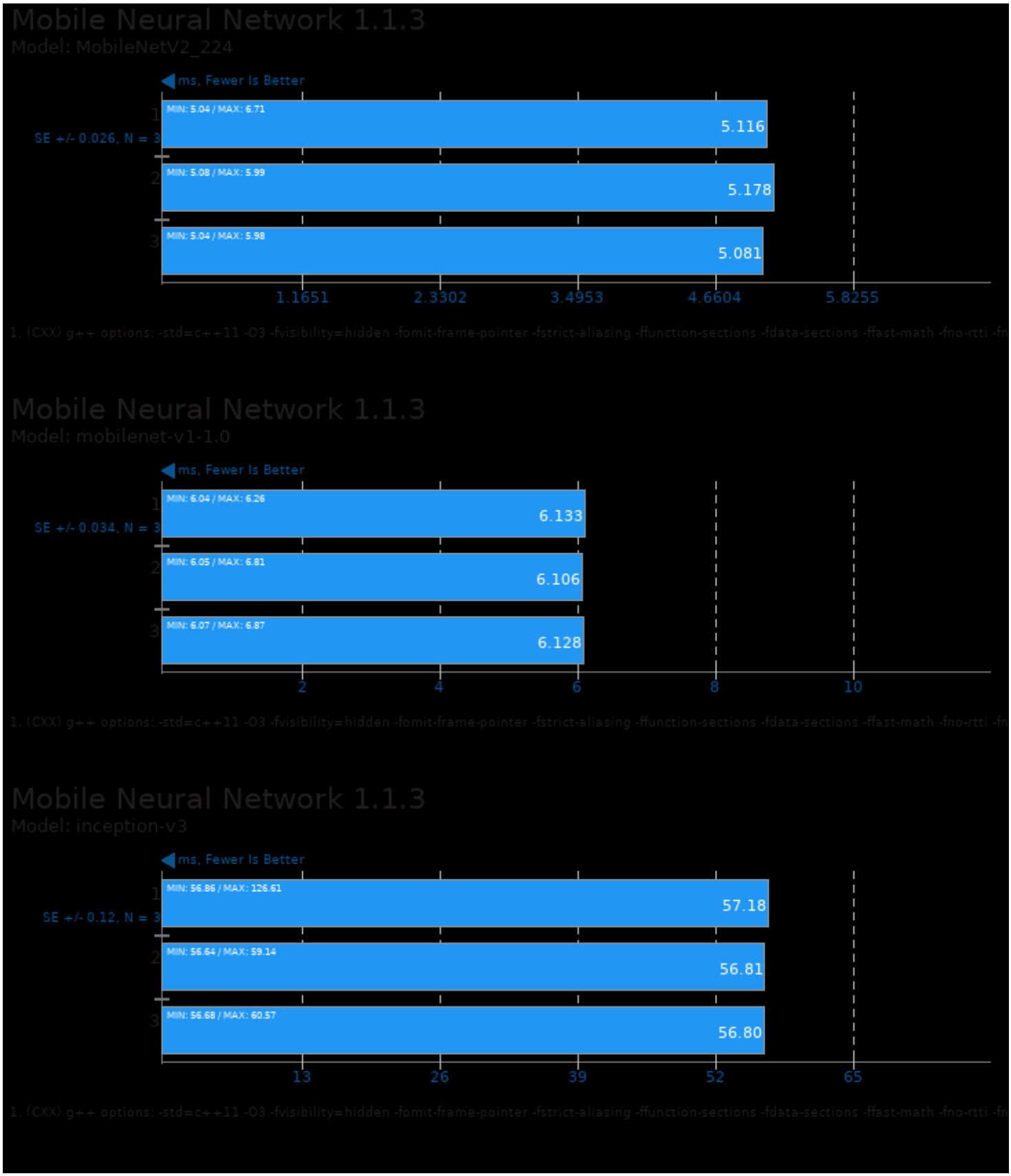
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv

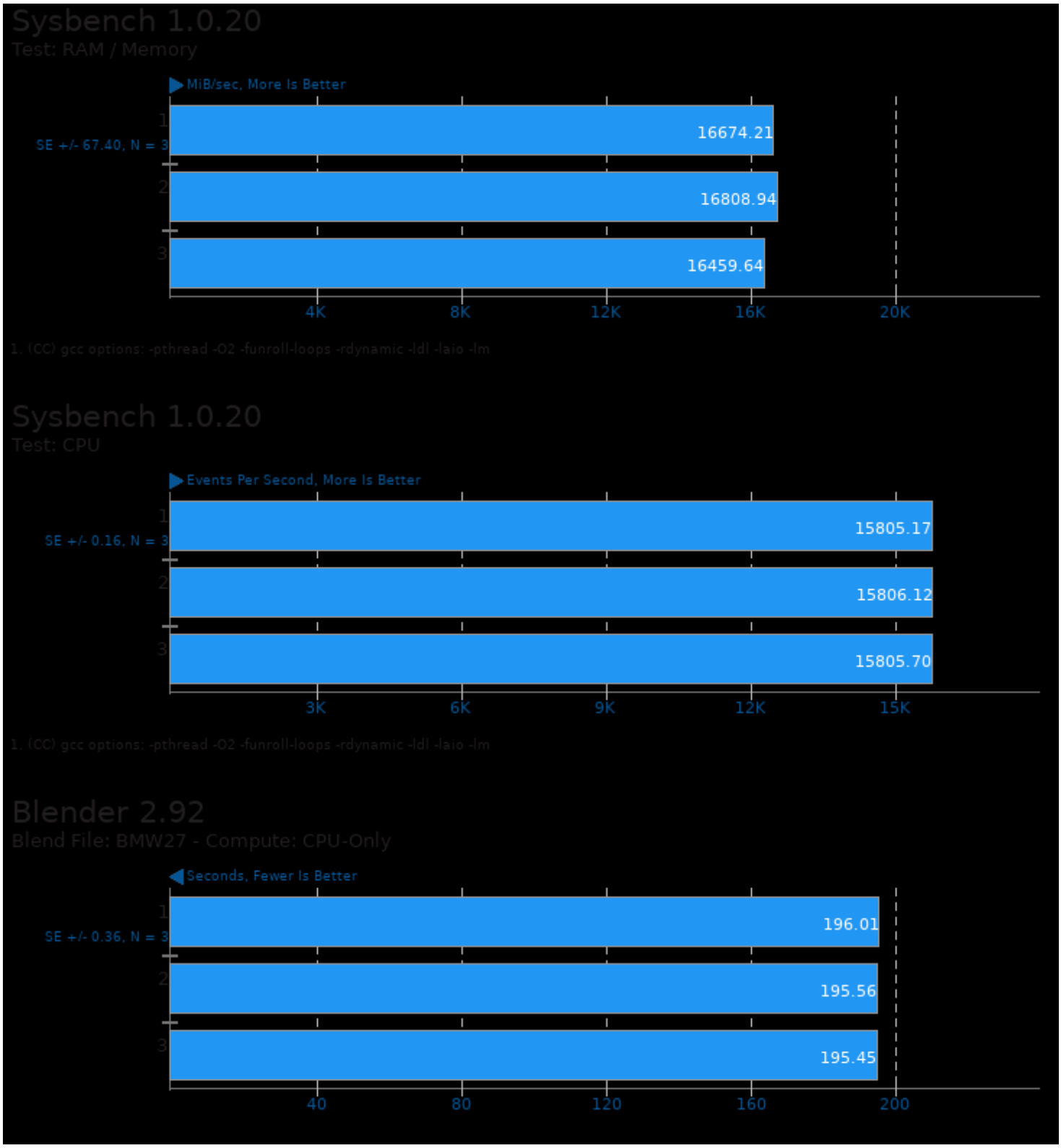
Mobile Neural Network 1.1.3

Model: resnet-v2-50

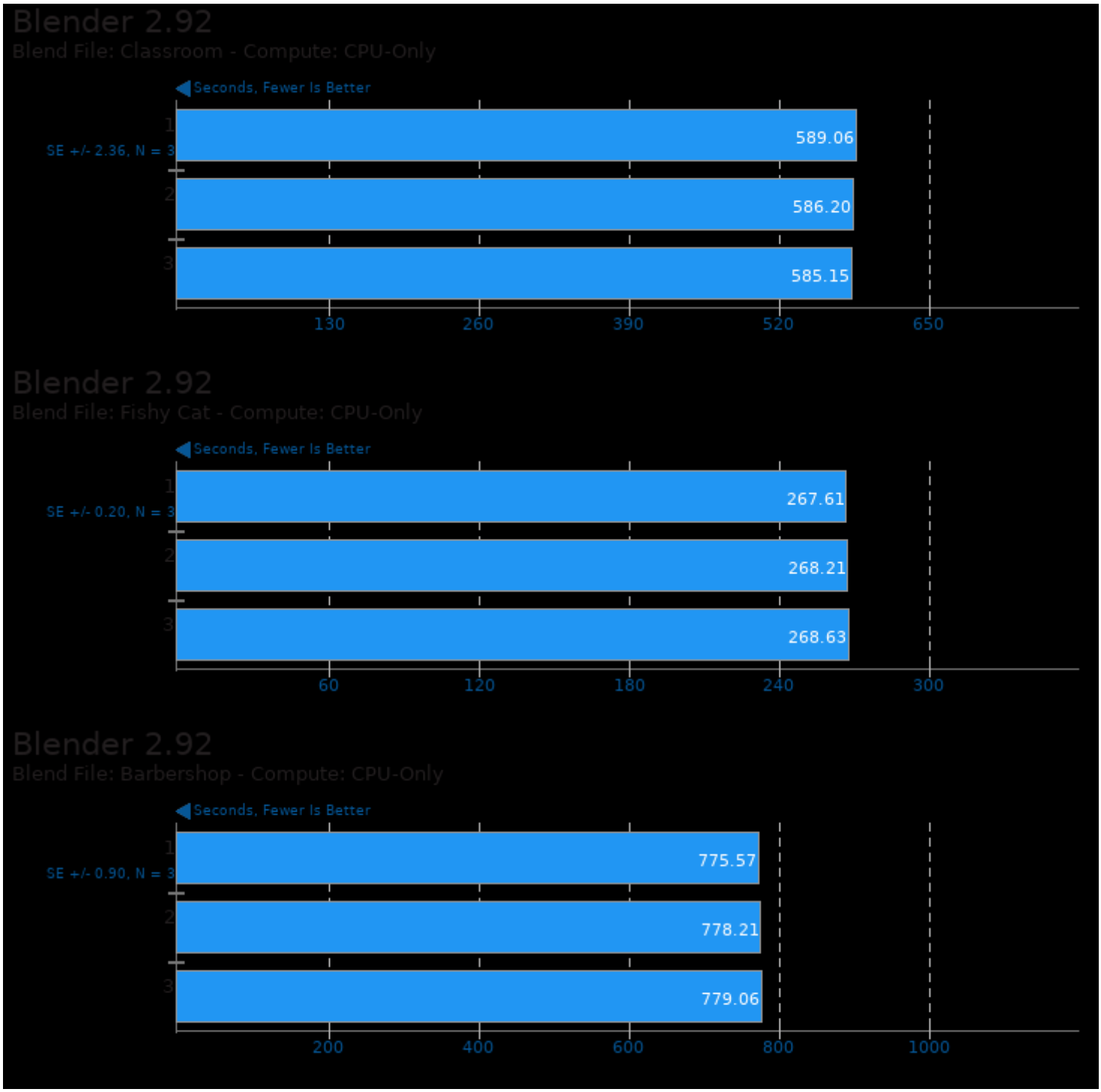


1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv


Mobile Neural Network 1.1.3
Model: MobileNetV2_224
ms, Fewer Is Better
SE +/- 0.026, N = 3
MIN: 5.04 / MAX: 6.71
5.116
MIN: 5.08 / MAX: 5.99
5.178
MIN: 5.04 / MAX: 5.98
5.081
1.1651
2.3302
3.4953
4.6604
5.8255
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv
Mobile Neural Network 1.1.3
Model: mobilenet-v1-1.0
ms, Fewer Is Better
SE +/- 0.034, N = 3
MIN: 6.04 / MAX: 6.26
6.133
MIN: 6.05 / MAX: 6.81
6.106
MIN: 6.07 / MAX: 6.87
6.128
2
4
6
8
10
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv
Mobile Neural Network 1.1.3
Model: inception-v3
ms, Fewer Is Better
SE +/- 0.12, N = 3
MIN: 56.86 / MAX: 126.61
57.18
MIN: 56.64 / MAX: 59.14
56.81
MIN: 56.68 / MAX: 60.57
56.80
13
26
39
52
65
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv

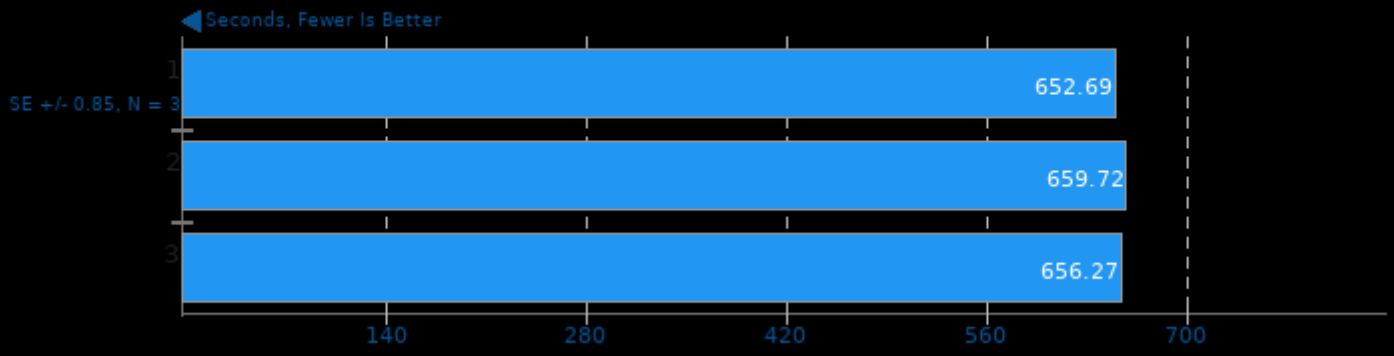

Sysbench 1.0.20
Test: RAM / Memory
MiB/sec, More Is Better
SE +/- 67.40, N = 3
1
16674.21
2
16808.94
3
16459.64
4K
8K
12K
16K
20K
1. (CC) gcc options: -pthread -O2 -funroll-loops -rdynamic -ldl -laio -lm
Sysbench 1.0.20
Test: CPU
Events Per Second, More Is Better
SE +/- 0.16, N = 3
1
15805.17
2
15806.12
3
15805.70
3K
6K
9K
12K
15K
1. (CC) gcc options: -pthread -O2 -funroll-loops -rdynamic -ldl -laio -lm
Blender 2.92
Blend File: BMW27 - Compute: CPU-Only
Seconds, Fewer Is Better
SE +/- 0.36, N = 3
1
196.01
2
195.56
3
195.45
40
80
120
160
200

haswell may


Blender 2.92
Blend File: Classroom - Compute: CPU-Only
Seconds, Fewer Is Better
SE +/- 2.36, N = 3
1
2
3
589.06
586.20
585.15
130
260
390
520
650
Blender 2.92
Blend File: Fishy Cat - Compute: CPU-Only
Seconds, Fewer Is Better
SE +/- 0.20, N = 3
1
2
3
267.61
268.21
268.63
60
120
180
240
300
Blender 2.92
Blend File: Barbershop - Compute: CPU-Only
Seconds, Fewer Is Better
SE +/- 0.90, N = 3
1
2
3
775.57
778.21
779.06
200
400
600
800
1000

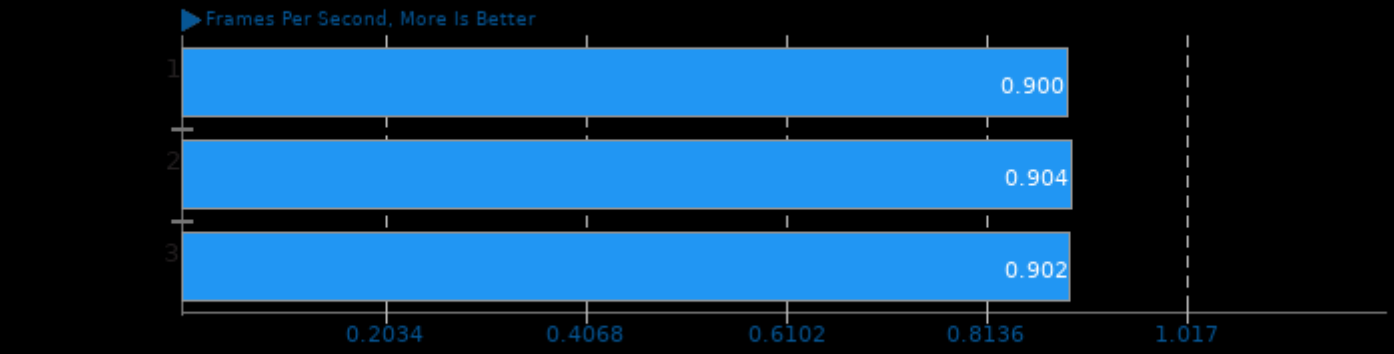
Blender 2.92

Blend File: Pabellon Barcelona - Compute: CPU-Only



SVT-AV1 0.8.7

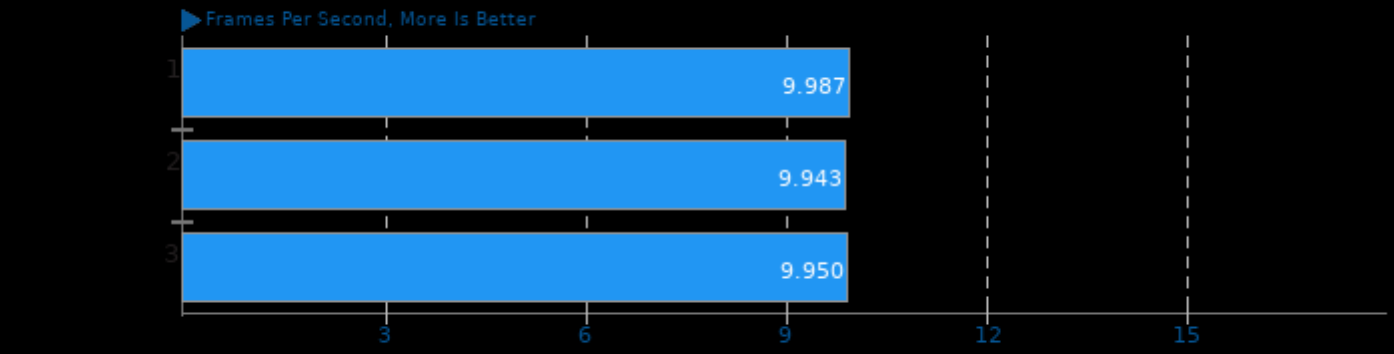
Encoder Mode: Preset 4 - Input: Bosphorus 4K



1. (CXX) g++ options: -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq -pie

SVT-AV1 0.8.7

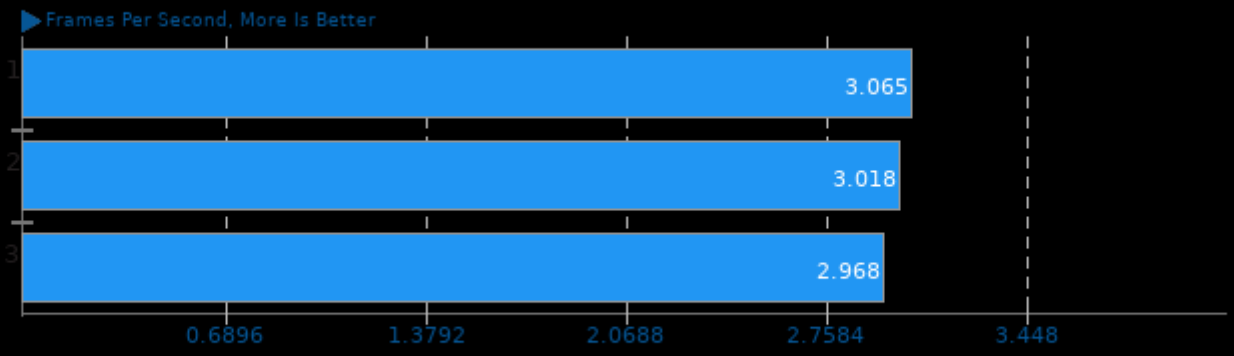
Encoder Mode: Preset 8 - Input: Bosphorus 4K



1. (CXX) g++ options: -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq -pie

SVT-AV1 0.8.7

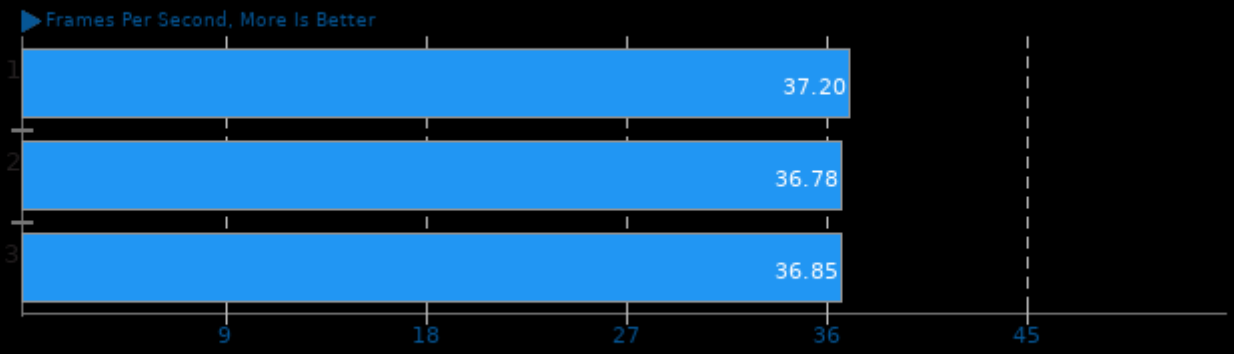
Encoder Mode: Preset 4 - Input: Bosphorus 1080p



1. (CXX) g++ options: -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq -pie

SVT-AV1 0.8.7

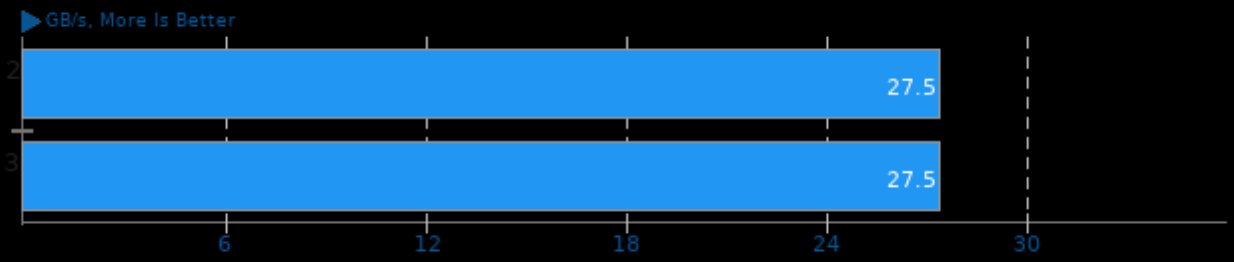
Encoder Mode: Preset 8 - Input: Bosphorus 1080p



1. (CXX) g++ options: -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq -pie

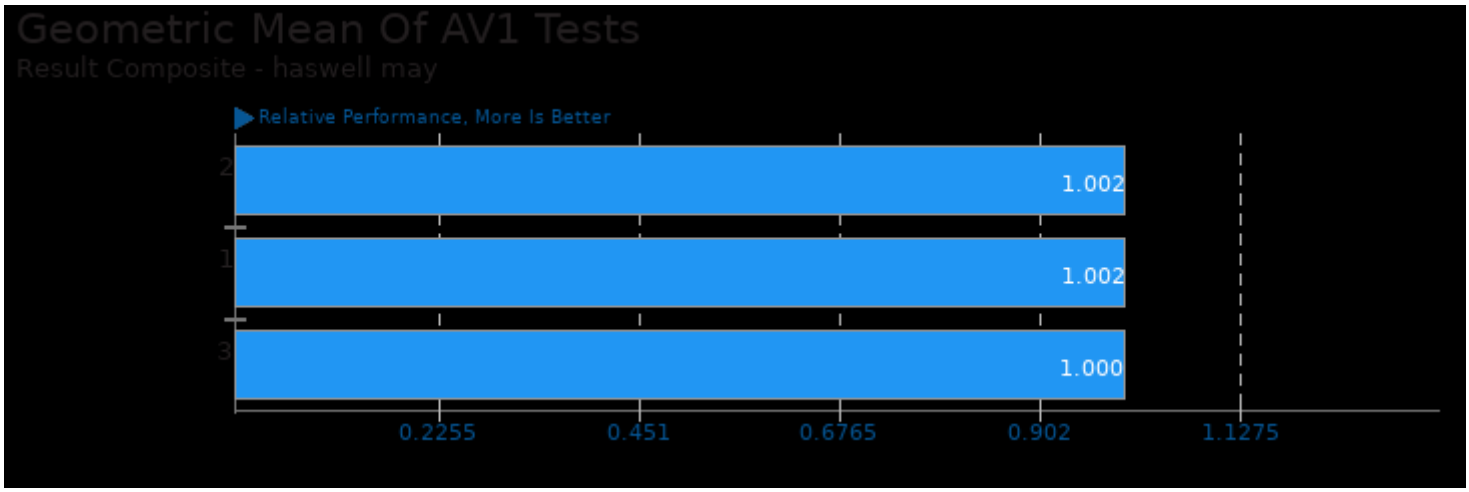
ViennaCL 1.7.1

Test: CPU BLAS - dCOPY



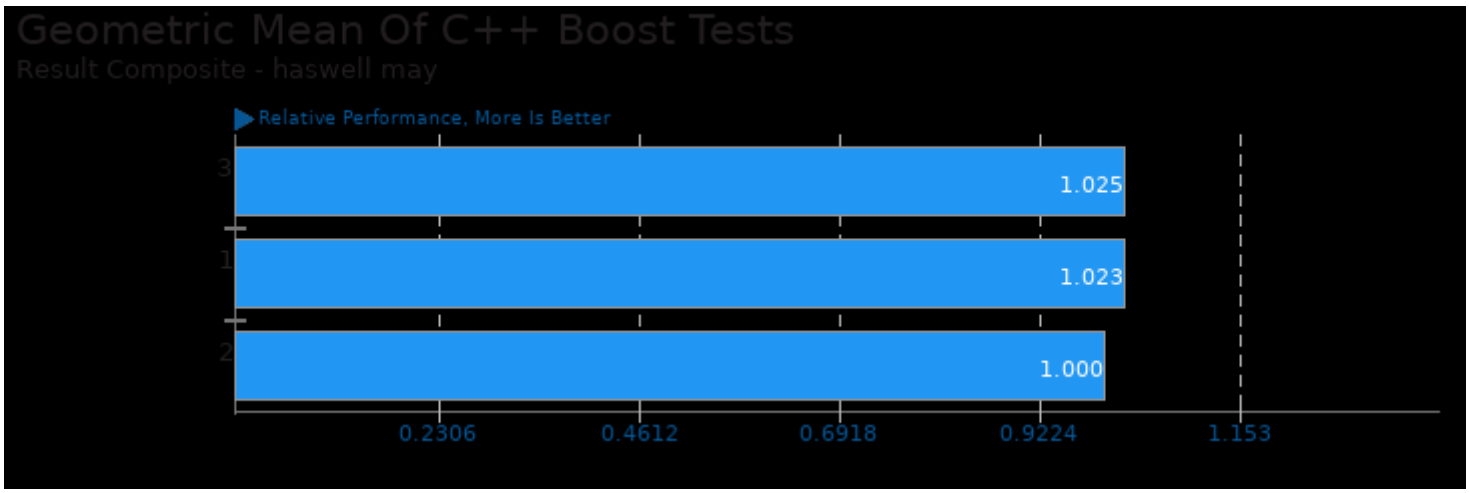
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

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

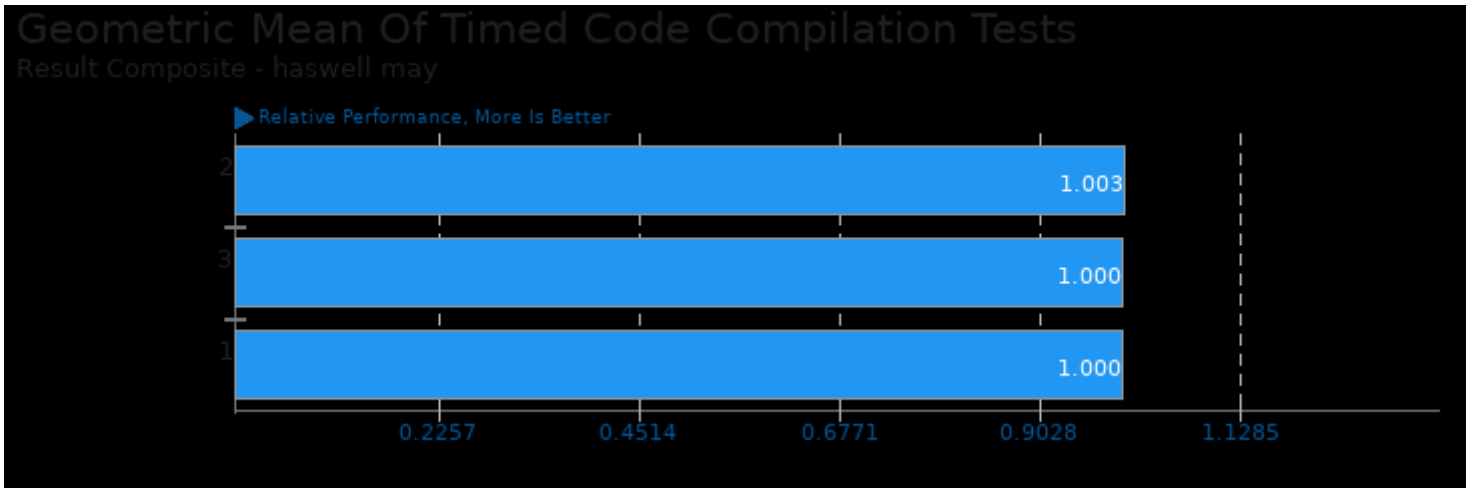


Geometric mean based upon tests: pts/dav1d, pts/aom-av1, pts/svt-av1, pts/libgav1 and pts/avifenc

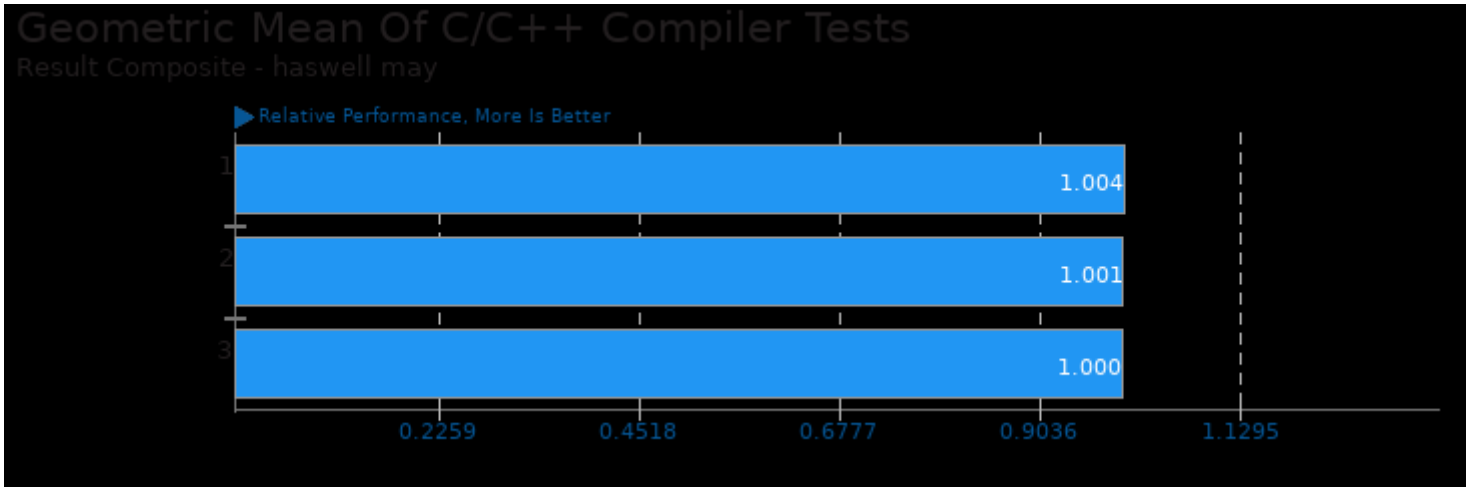
Geometric mean based upon tests: pts/mrbayes, pts/hmmer and pts/qmcpack



Geometric mean based upon tests: pts/qmcpack, pts/chia-vdf and pts/srslte



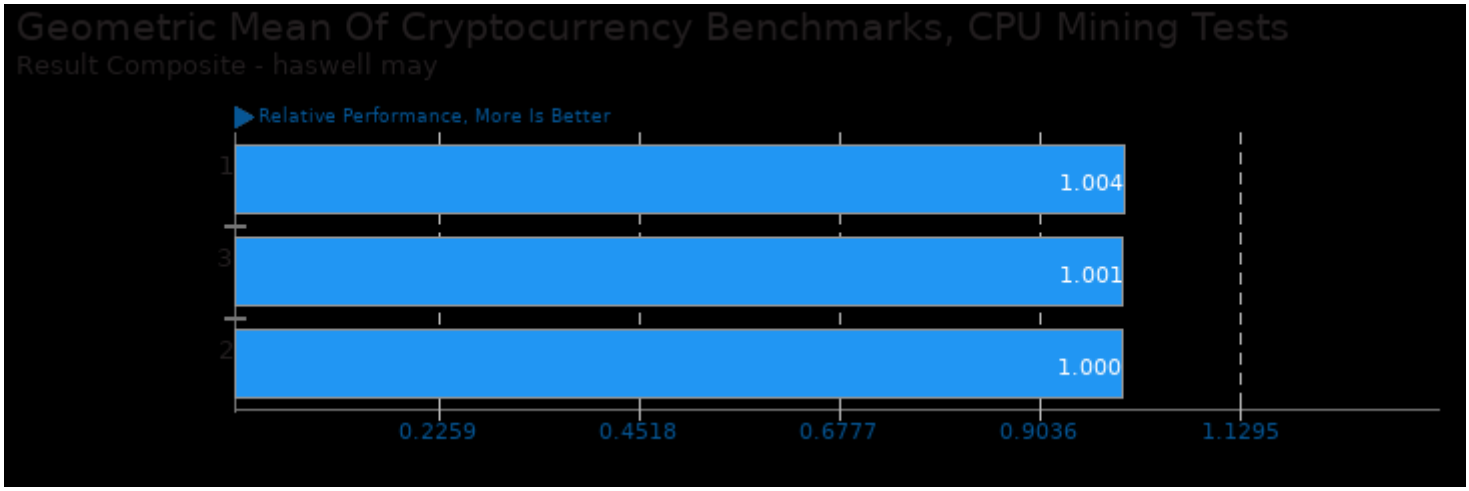
Geometric mean based upon tests: pts/build-linux-kernel, pts/build-llvm, pts/build-erlang, pts/build-nodejs and pts/build-mesa



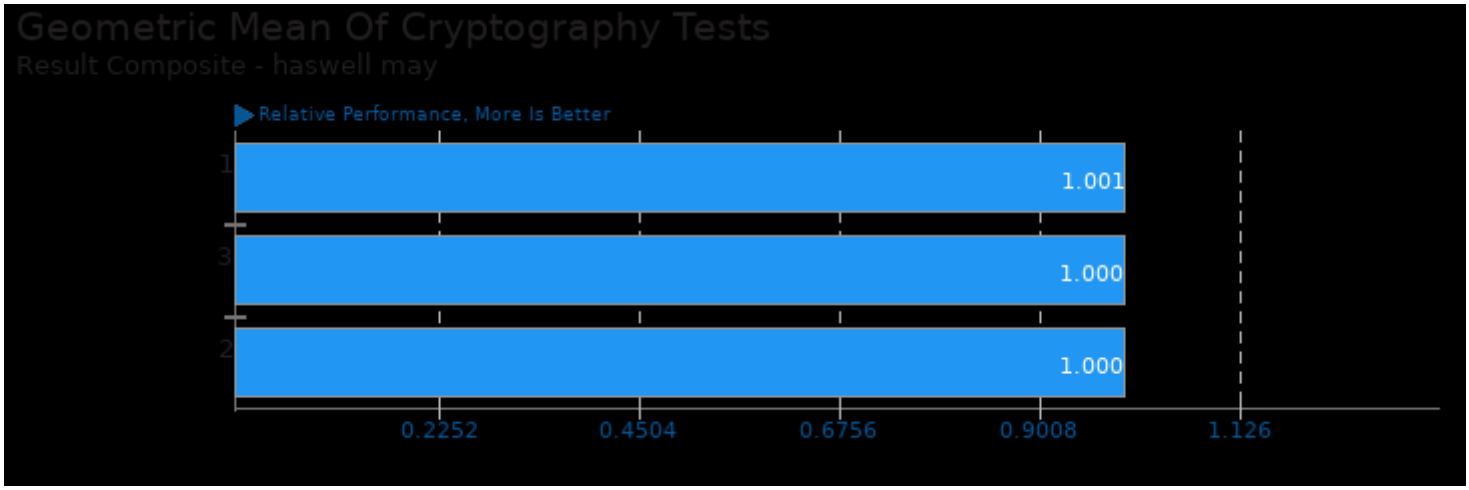
Geometric mean based upon tests: pts/stockfish, pts/hmmer, pts/build-llvm, pts/mrbayes, pts/libgav1, pts/dav1d, pts/compress-zstd, pts/aom-av1, pts/svt-av1, pts/svt-vp9, pts/toybrot and pts/basis

Geometric mean based upon tests: pts/build-llvm, pts/build-linux-kernel, pts/compress-zstd, pts/dav1d, pts/svt-av1, pts/svt-hevc, pts/svt-vp9, pts/hmmer, pts/onednn, pts/mrbayes, pts/stockfish, pts/sysbench, pts/blender, pts/botan and pts/tjbench

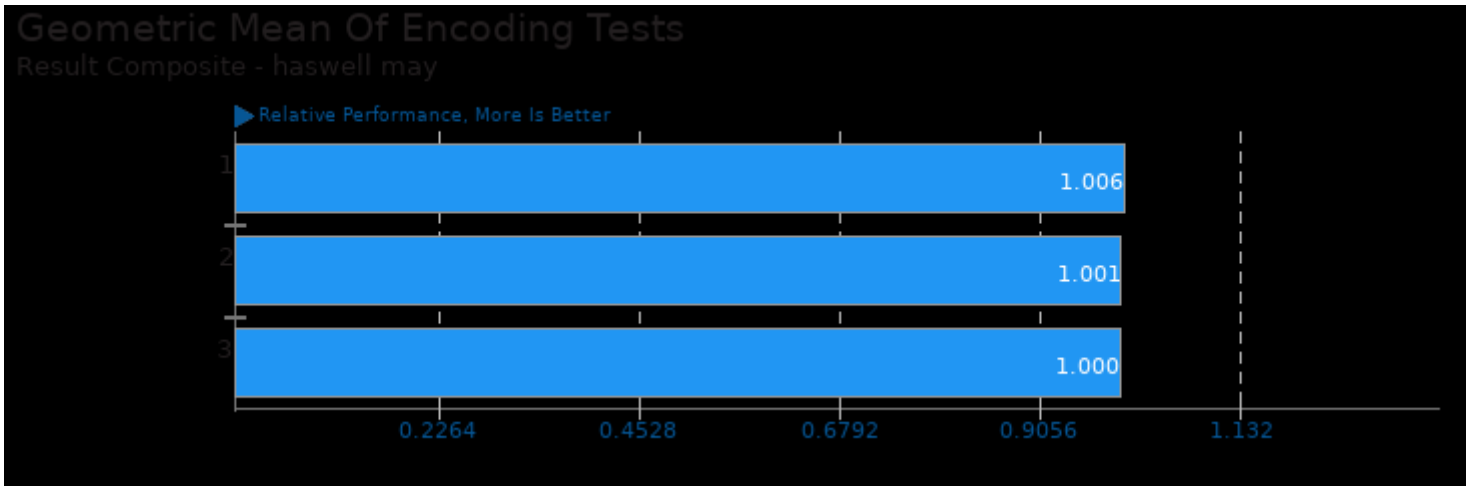
Geometric mean based upon tests: pts/blender, pts/svt-vp9, pts/svt-hevc, pts/dav1d, pts/aom-av1, pts/svt-av1, pts/libgav1, pts/avifenc, pts/tjbench, pts/embree, pts/onednn, pts/basis, pts/astcenc, pts/toktx, pts/draco and pts/vosk



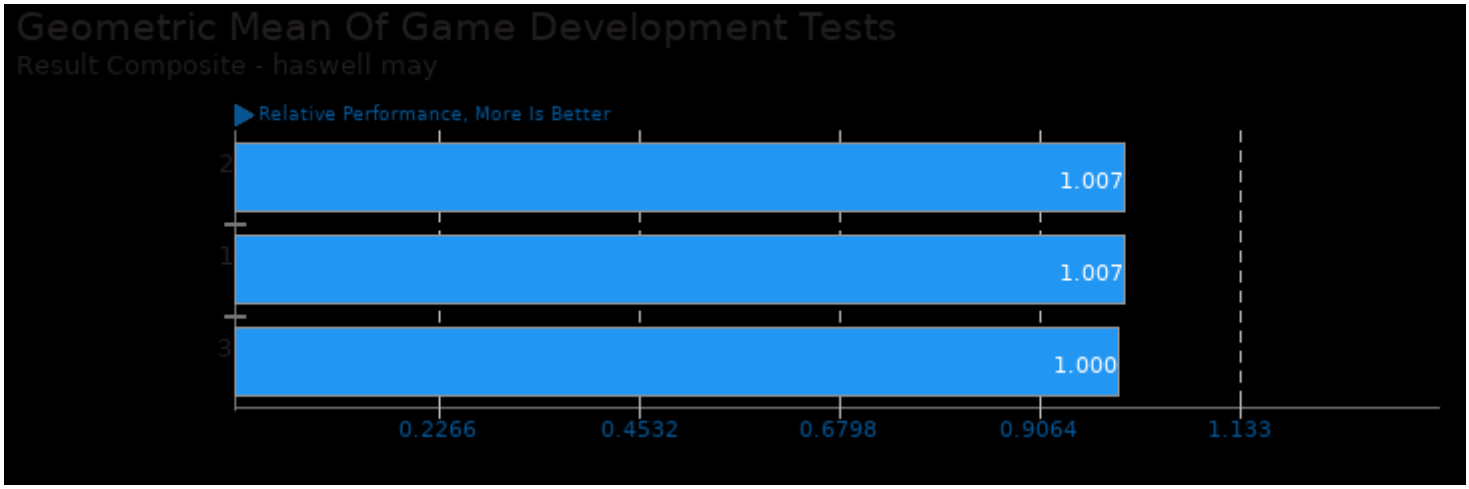
Geometric mean based upon tests: pts/xmrig and pts/chia-vdf



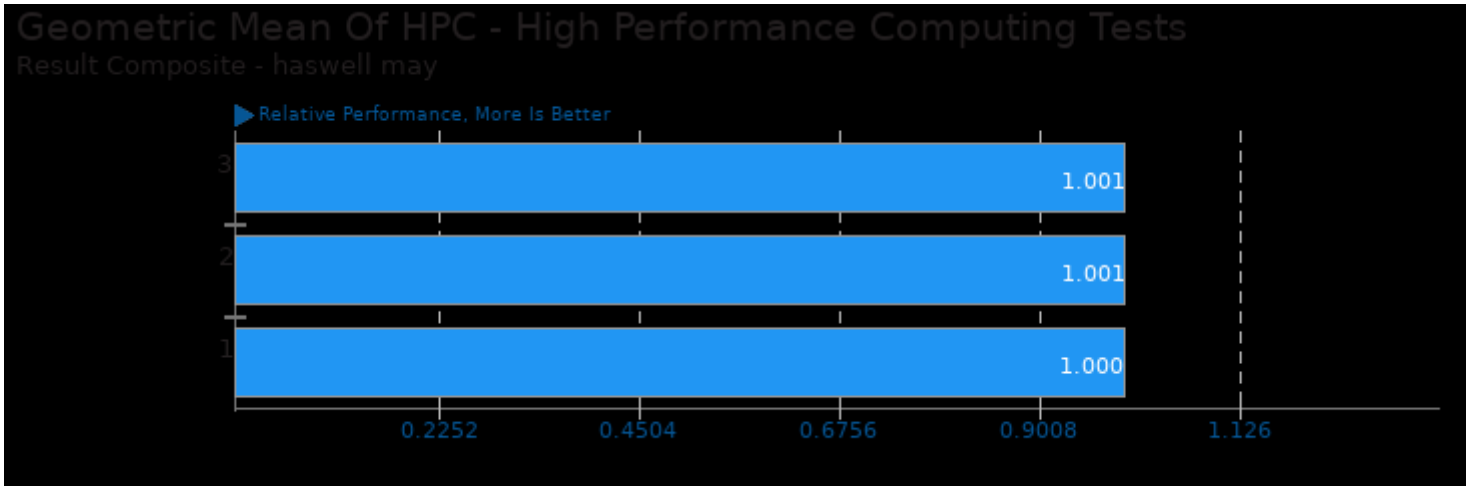
Geometric mean based upon tests: pts/botan, pts/securemark, pts/xmrig and pts/chia-vdf



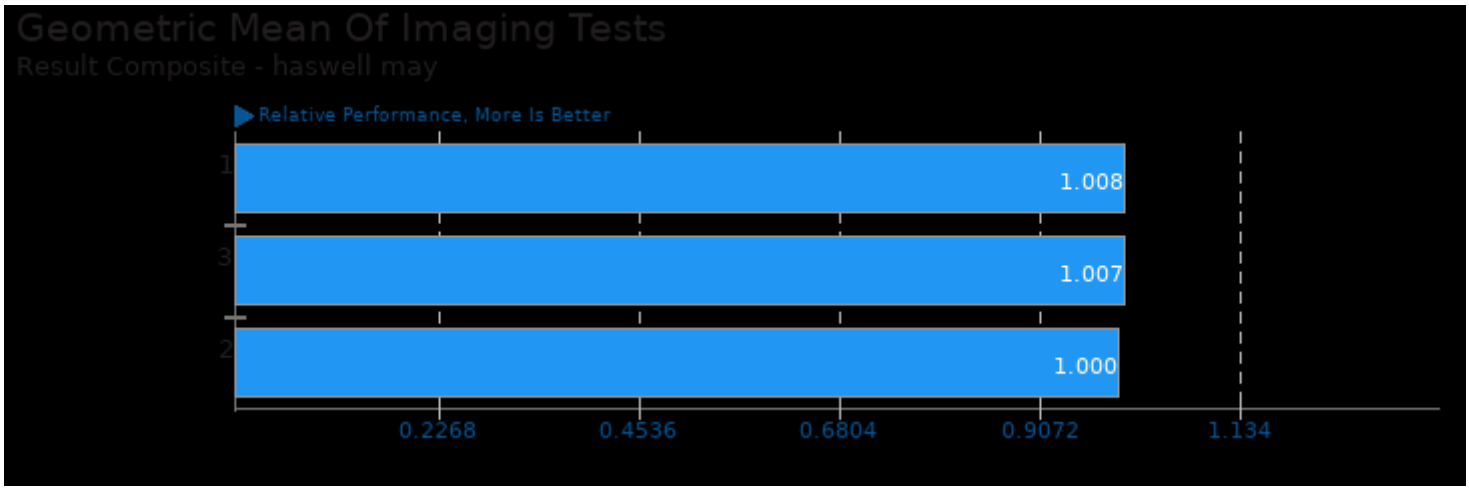
Geometric mean based upon tests: pts/svt-vp9, pts/svt-hevc, pts/dav1d, pts/aom-av1, pts/svt-av1, pts/libgav1 and pts/avifenc



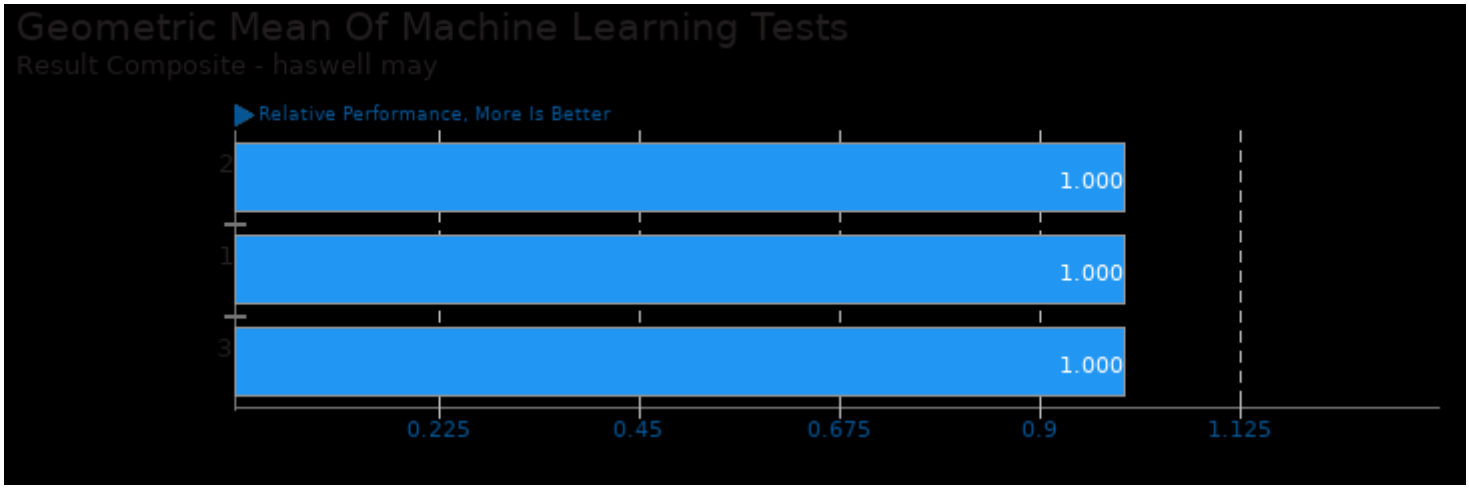
Geometric mean based upon tests: pts/basis, pts/astcenc, pts/toktx, pts/draco and pts/blender



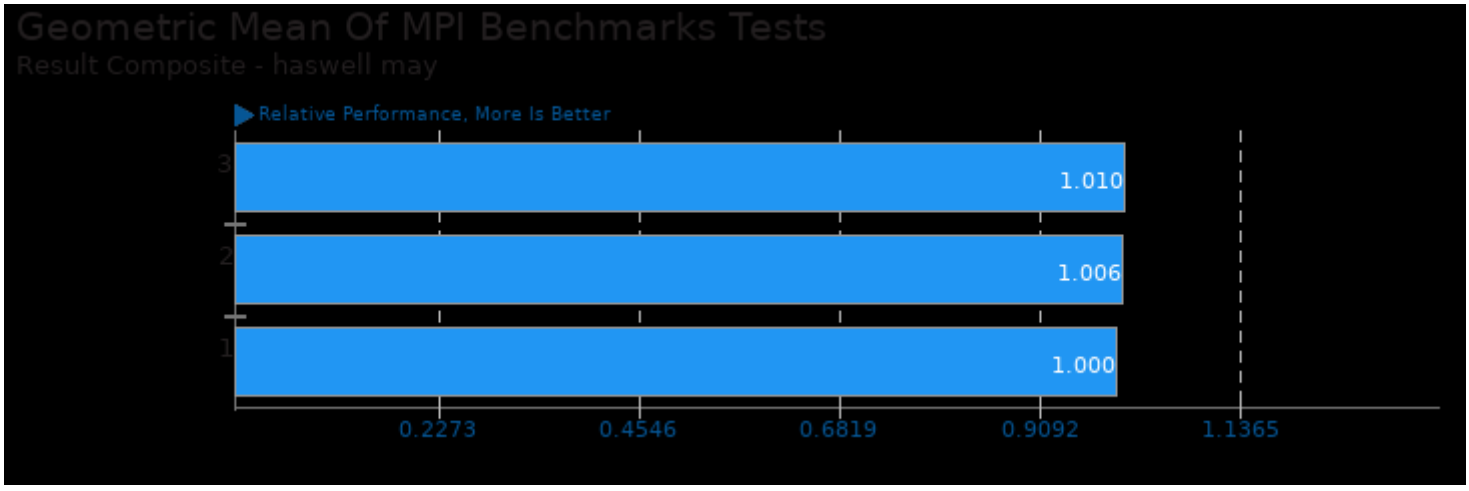
Geometric mean based upon tests: pts/incompact3d, pts/mrbayes, pts/hmmer, pts/qmcpack, pts/mnn and pts/onednn



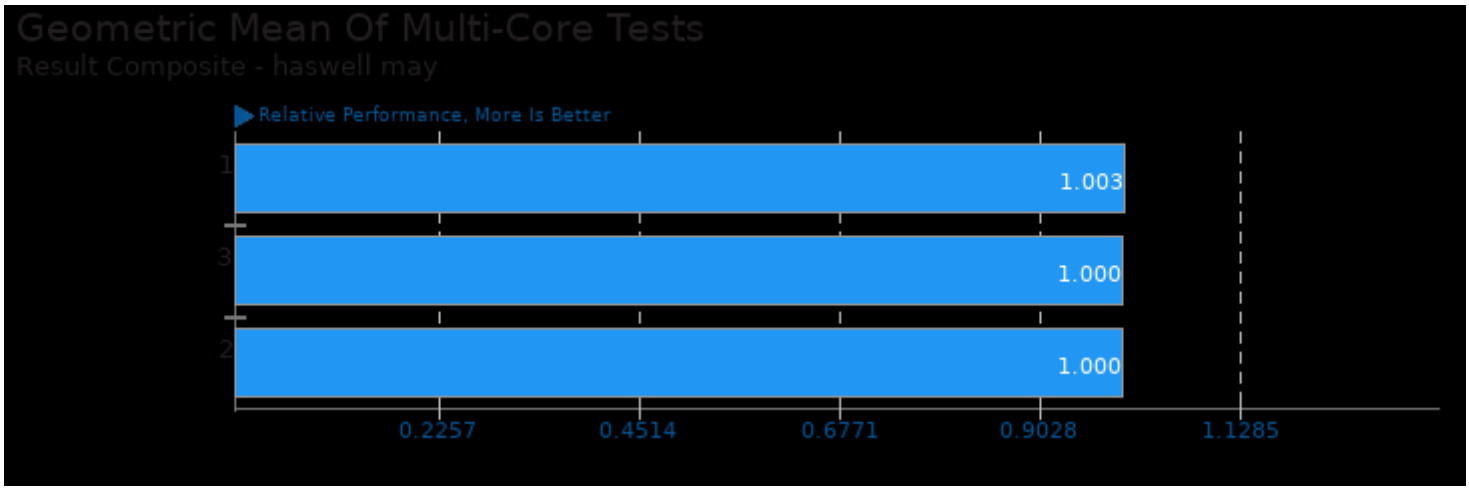
Geometric mean based upon tests: pts/tjbench and pts/avifenc



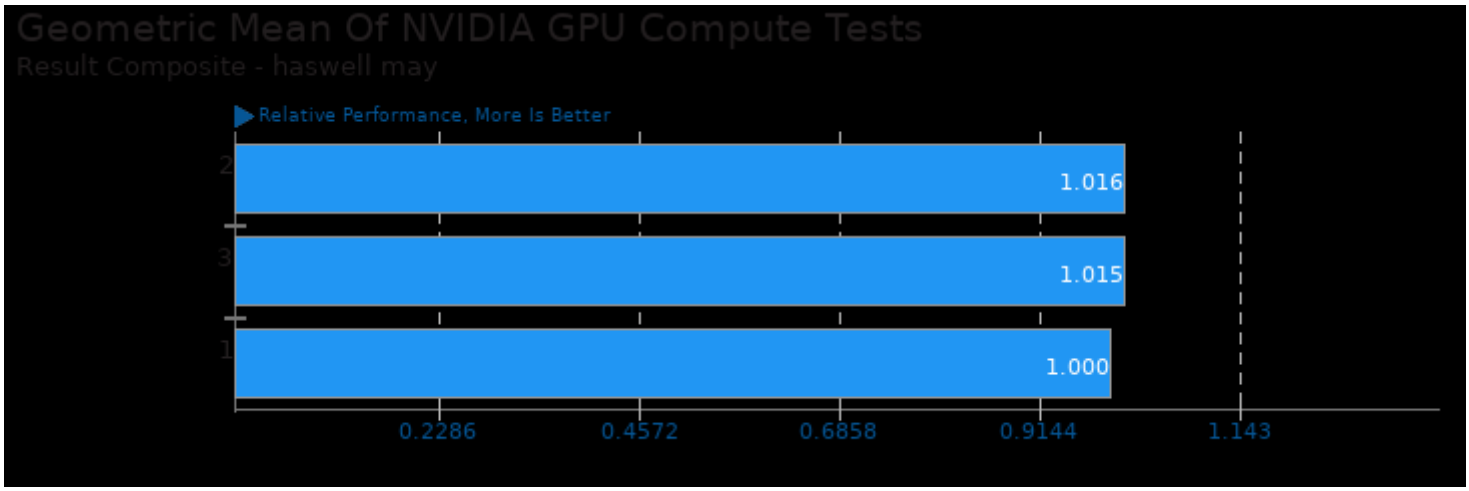
Geometric mean based upon tests: pts/mnn and pts/onednn



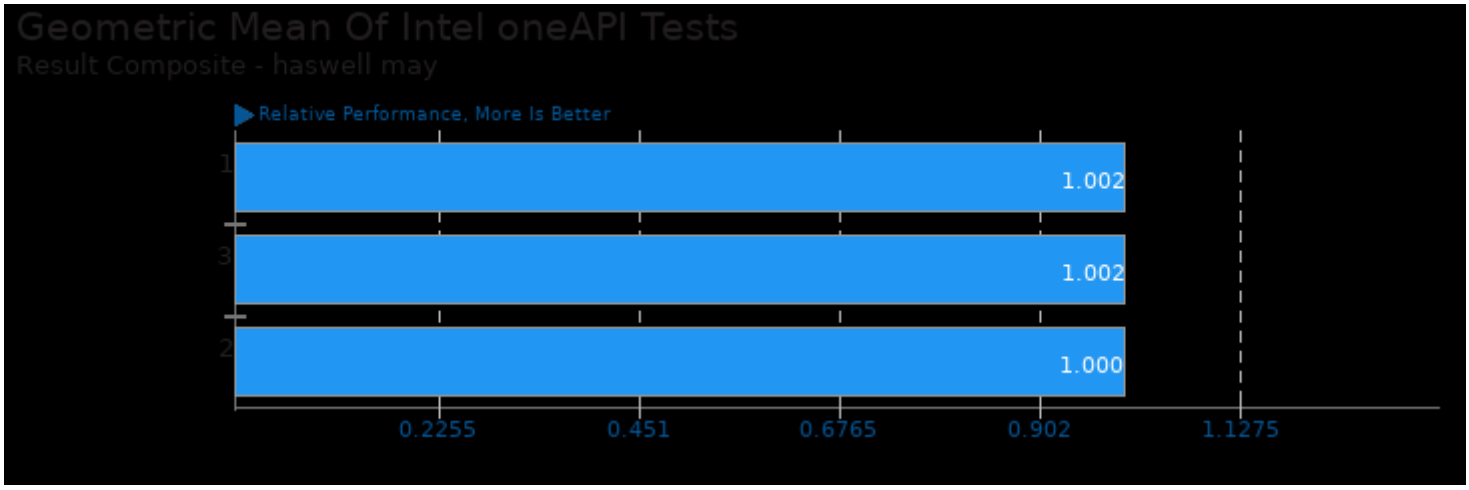
Geometric mean based upon tests: pts/incompact3d, pts/qmcpack and pts/mrbayes



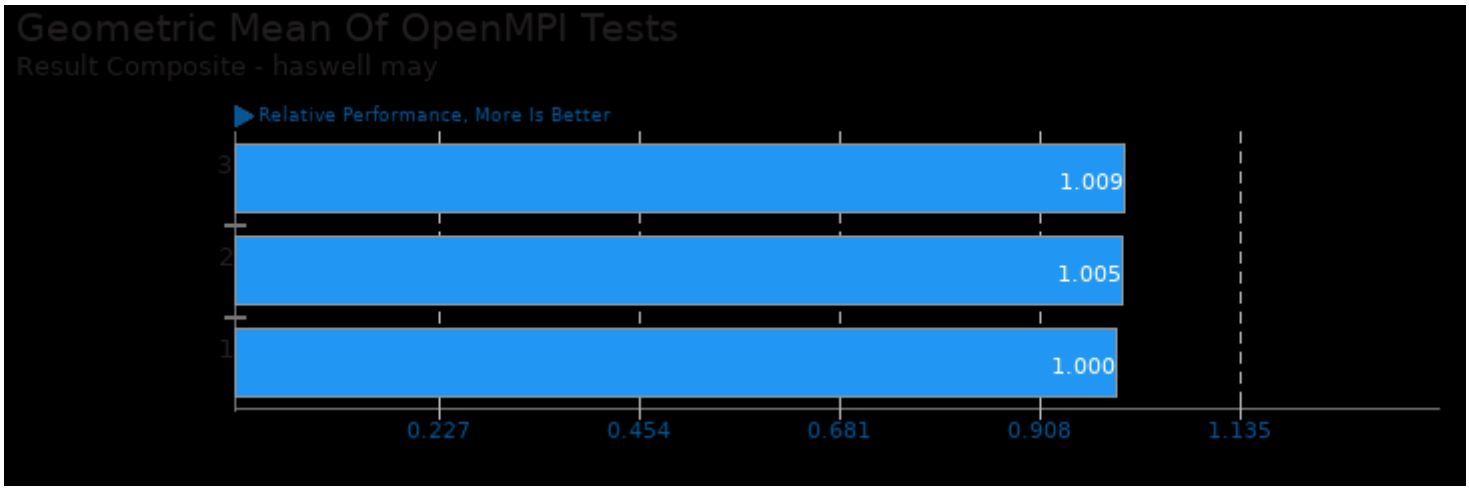
Geometric mean based upon tests: pts/blender, pts/sysbench, pts/stockfish, pts/svt-vp9, pts/svt-hevc, pts/dav1d, pts/aom-av1, pts/svt-av1, pts/libgav1, pts/avifenc, pts/onednn, pts/compress-zstd, pts/build-linux-kernel, pts/build-llvm, pts/build-erlang, pts/build-nodejs, pts/build-mesa and pts/embree



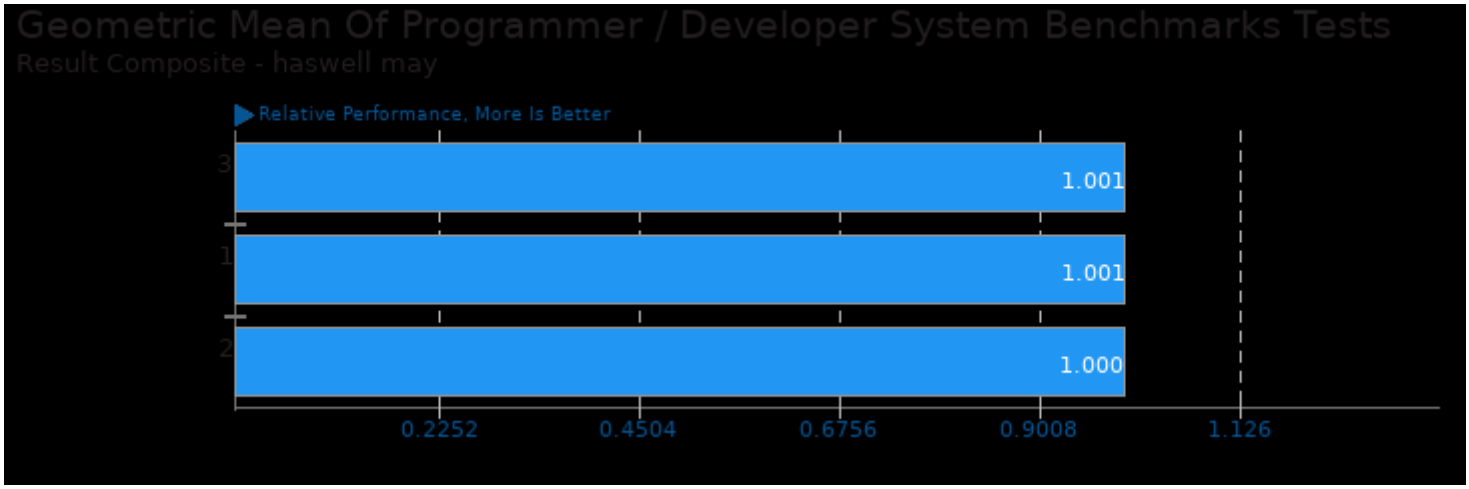
Geometric mean based upon tests: pts/viennacl and pts/blender



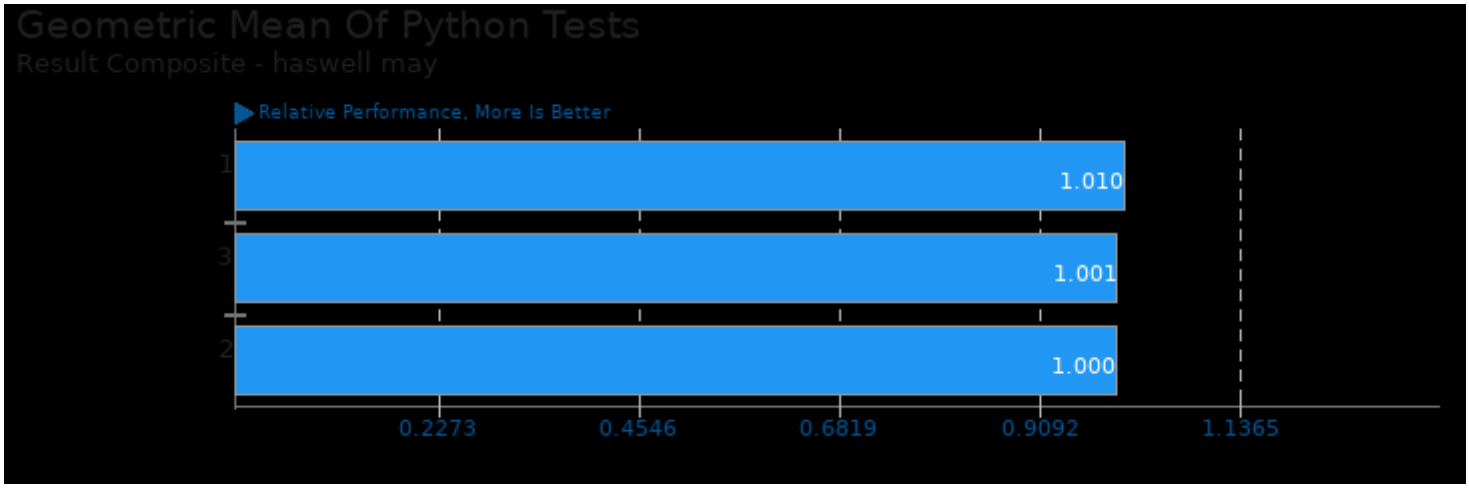
Geometric mean based upon tests: pts/embree and pts/onednn



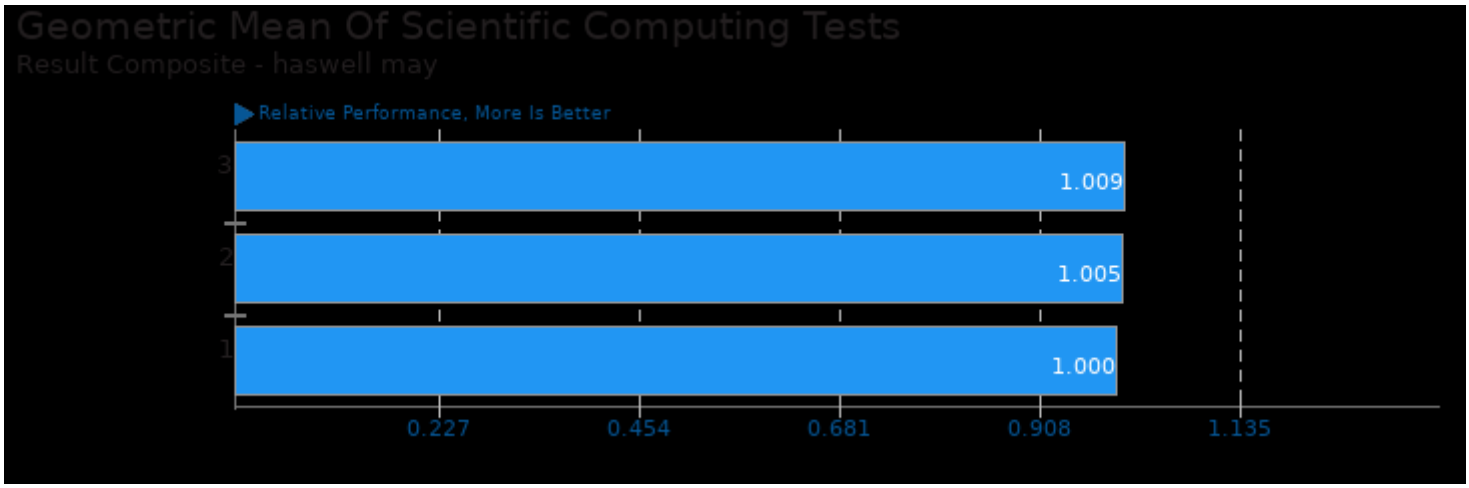
Geometric mean based upon tests: pts/mrbayes, pts/qmcpack, pts/hmmer and pts/incompact3d



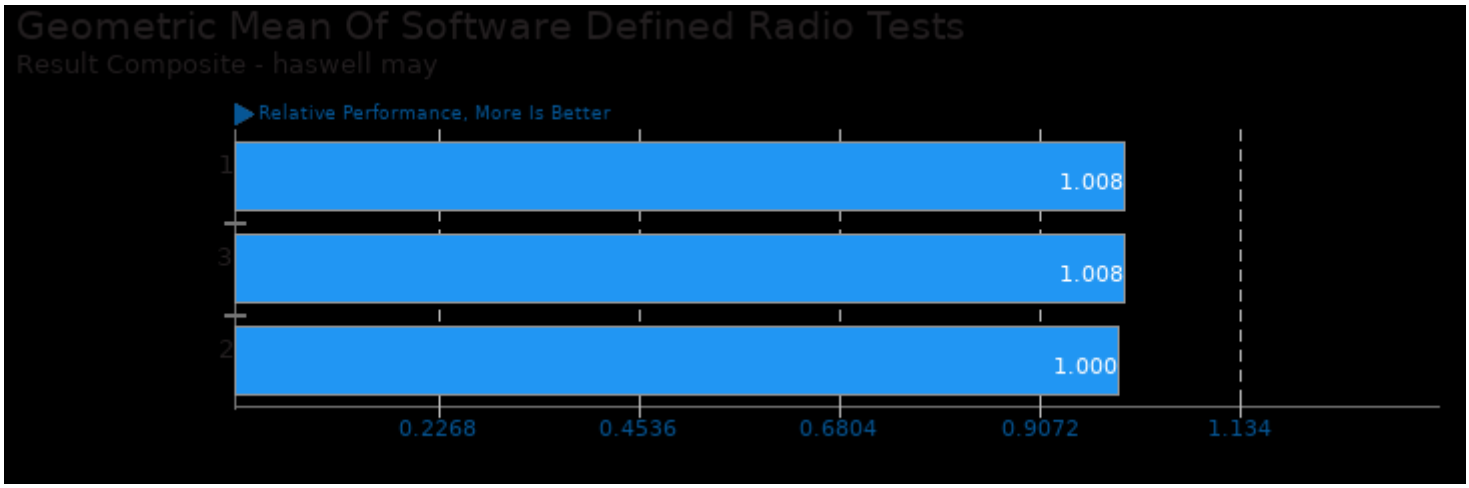
Geometric mean based upon tests: pts/compress-zstd, pts/build-linux-kernel, pts/build-llvm, pts/build-erlang, pts/build-nodejs and pts/build-mesa



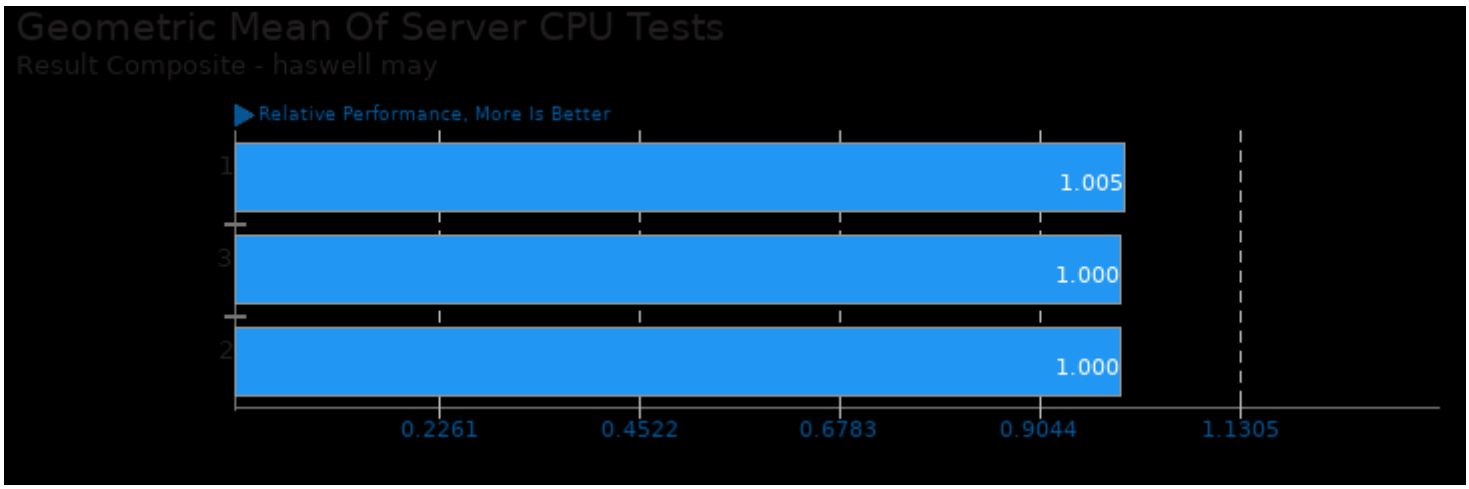
Geometric mean based upon tests: pts/chia-vdf, system/gnuradio, pts/build-llvm, pts/build-mesa, pts/build-nodejs and pts/vosk



Geometric mean based upon tests: pts/incompact3d, pts/mrbayes, pts/hmmer and pts/qmcpack



Geometric mean based upon tests: pts/liquid-dsp, pts/srslte, pts/luaradio and system/gnuradio



Geometric mean based upon tests: pts/onednn, pts/svt-av1, pts/svt-hevc, pts/svt-vp9, pts/dav1d, pts/stockfish, pts/build-linux-kernel, pts/build-llvm, pts/compress-zstd, pts/tjbench, pts/sysbench and pts/blender

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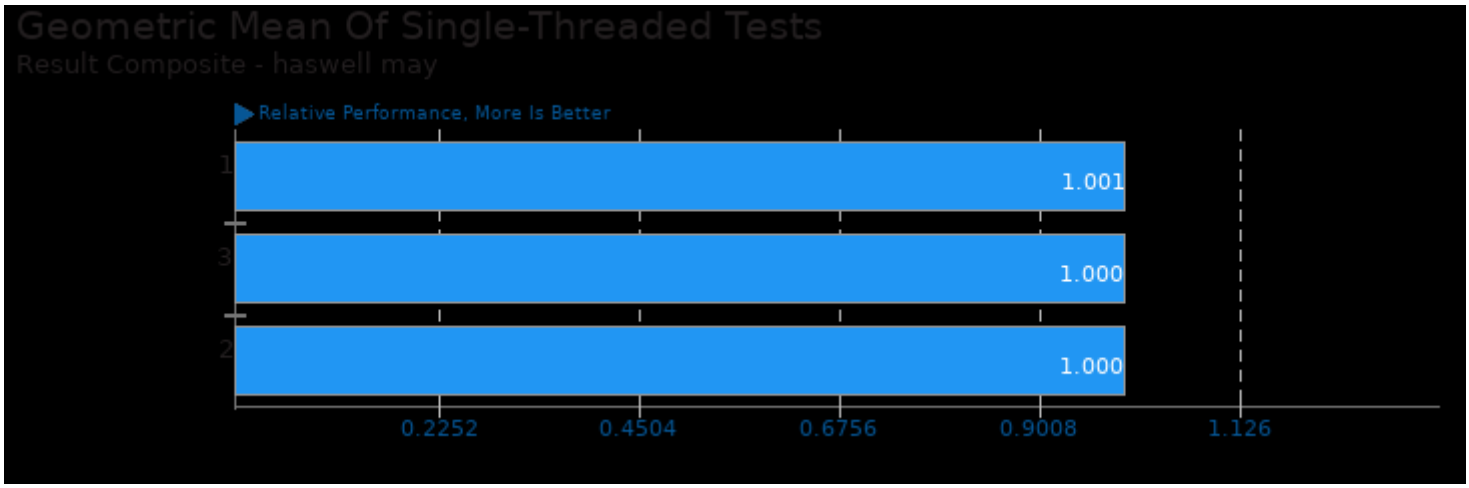
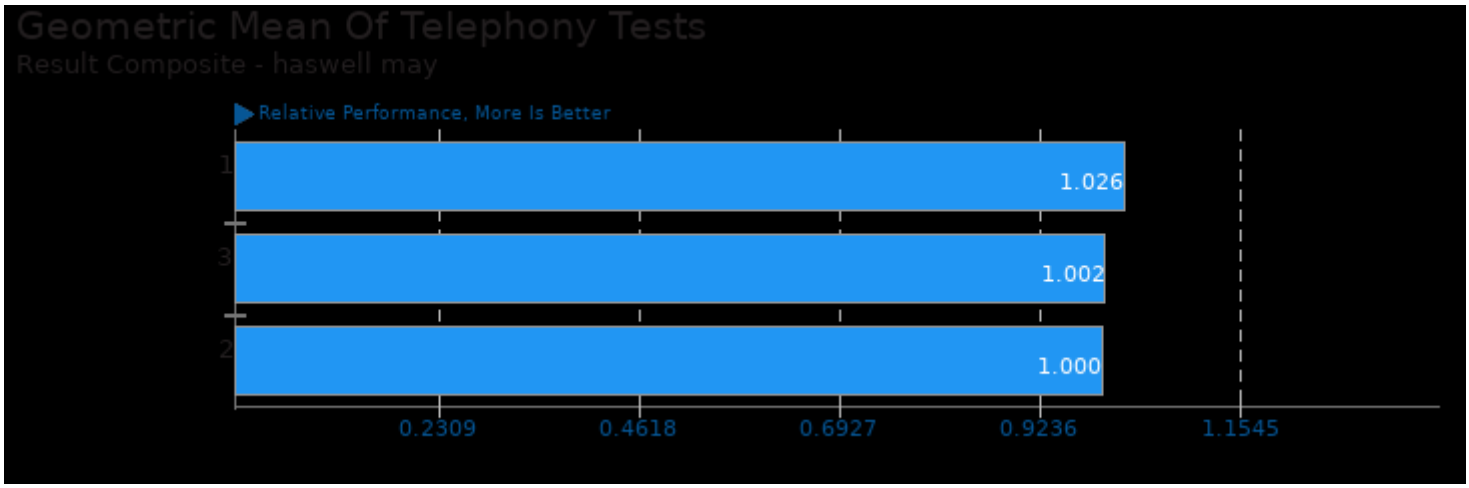
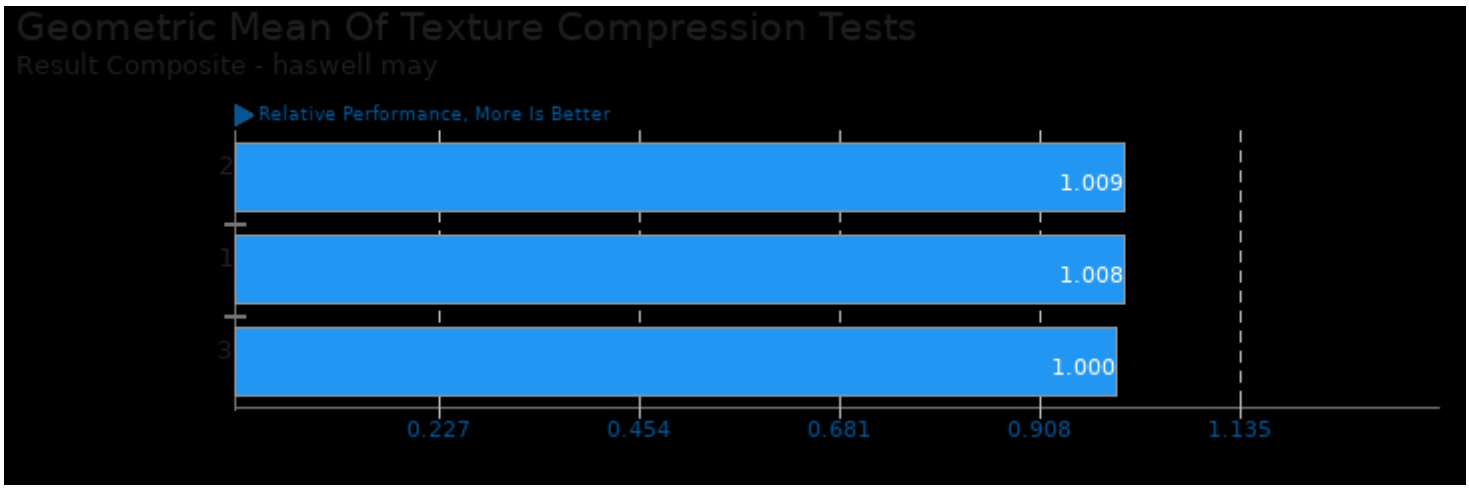


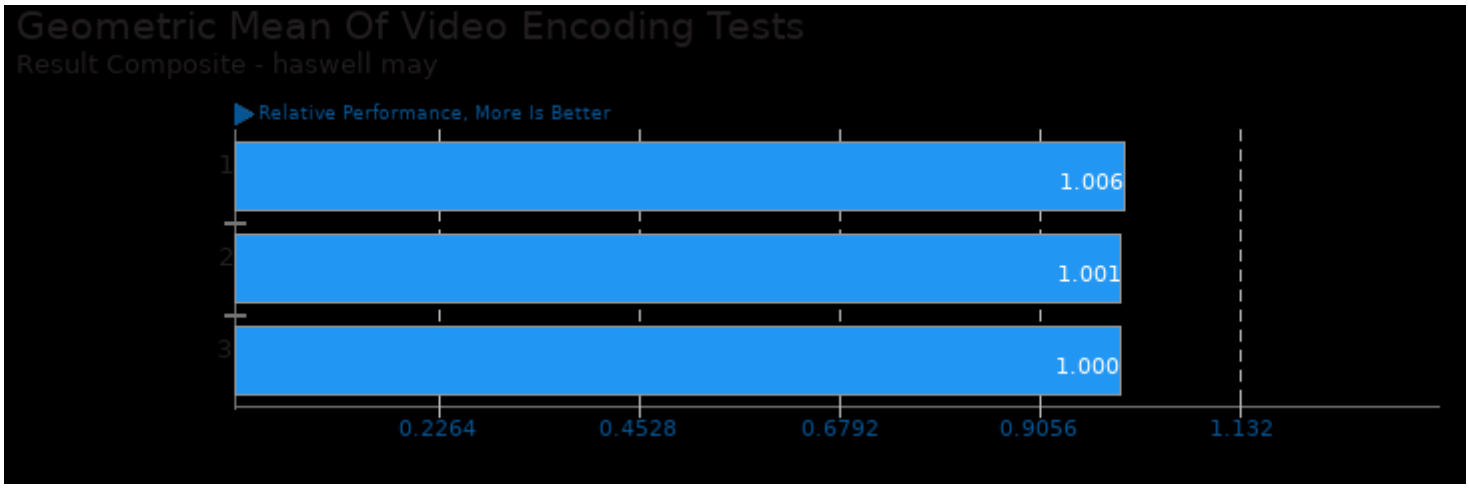
Geometric mean based upon tests: pts/gmpbench, pts/botan and pts/tjbench



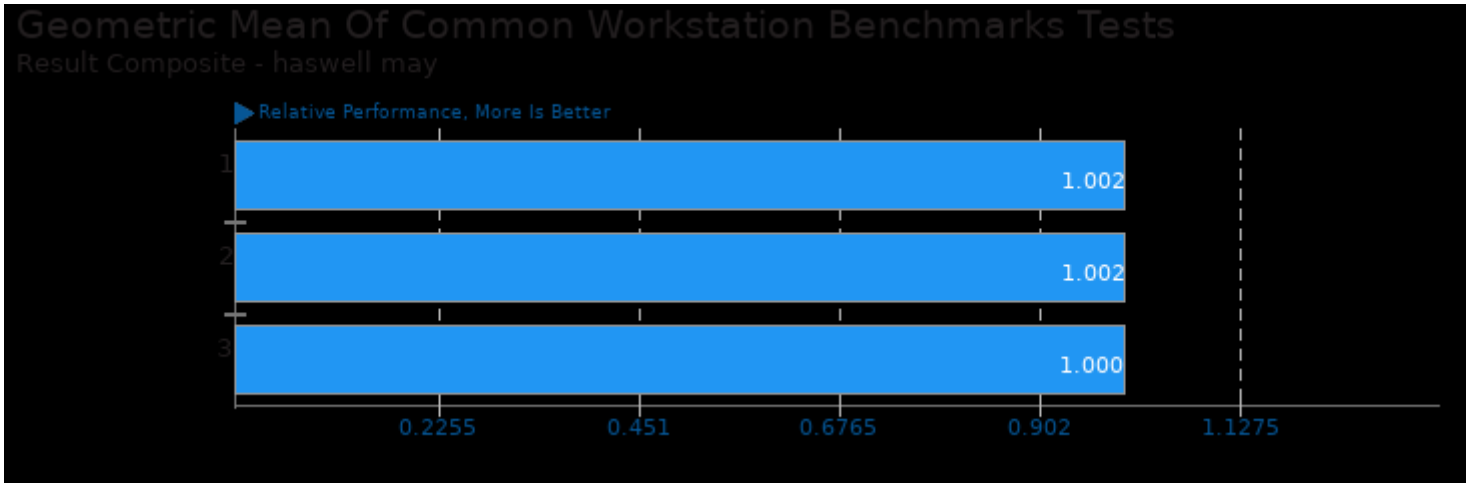
Geometric mean based upon tests: pts/pjsip and pts/vosk



Geometric mean based upon tests: pts/basis, pts/astcenc, pts/toktx and pts/draco



Geometric mean based upon tests: pts/svt-vp9, pts/svt-hevc, pts/dav1d, pts/aom-av1, pts/svt-av1, pts/libgav1 and pts/avifenc



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

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