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POWER9 44c 176t 2021

POWER9 testing with a PowerNV T2P9D01 REV 1.01 and ASPEED on Ubuntu 20.10 via the Phoronix Test Suite.

Automated Executive Summary

Run 1 had the most wins, coming in first place for 45% of the tests.

Based on the geometric mean of all complete results, the fastest (Run 2) was 5.342x the speed of the slowest (Run 4). Run 3 was 1x the speed of Run 2, Run 1 was 0.481x the speed of Run 3, Run 4 was 0.389x the speed of Run 1.

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

High Performance Conjugate Gradient at 1.281x
Zstd Compression (Compression Level: 3) at 1.158x
System GZIP Decompression at 1.132x
LAMMPS Molecular Dynamics Simulator (Model: 20k Atoms) at 1.1x
Redis (Test: SET) at 1.1x
GraphicsMagick (Operation: Noise-Gaussian) at 1.063x
System ZLIB Decompression at 1.06x
Stockfish (Total Time) at 1.058x
Mlpack Benchmark (Benchmark: scikit_qda) at 1.049x
x265 (Video Input: Bosphorus 1080p) at 1.047x.

Test Systems:

Run 1

Run 2

Run 3

Run 4

Processor: POWER9 @ 3.80GHz (44 Cores / 176 Threads), Motherboard: PowerNV T2P9D01 REV 1.01, Memory: 64GB, Disk: 500GB Samsung SSD 860, Graphics: ASPEED, Monitor: VE228, Network: 2 x Broadcom NetXtreme BCM5719 PCIe

OS: Ubuntu 20.10, Kernel: 5.9.10-050910-generic (ppc64le), Display Server: X Server, Compiler: GCC 10.2.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=powerpc64le-linux-gnu --disable-multilib --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-xyKMTo/gcc-10-10.2.0/debian/tmp-nvptx/usr --enable-plugin --enable-secureplt --enable-shared --enable-targets=powerpcle-linux --enable-threads=posix --host=powerpc64le-linux-gnu --program-prefix=powerpc64le-linux-gnu- --target=powerpc64le-linux-gnu --with-cpu=power8 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-long-double-128 --with-target-system-zlib=auto --without-cuda-driver -v
Processor Notes: SMT (threads per core): 4
Python Notes: Python 3.8.6
Security Notes: itlb_multihit: Not affected + l1tf: Mitigation of RFI Flush L1D private per thread + mds: Not affected + meltdown: Mitigation of RFI Flush L1D private per thread + spec_store_bypass: Mitigation of Kernel entry/exit barrier (eieio) + spectre_v1: Mitigation of __user pointer sanitization ori31 speculation barrier enabled + spectre_v2: Mitigation of Indirect branch cache disabled Software link stack flush + srbds: Not affected + tsx_async_abort: Not affected

	Run 1	Run 2	Run 3	Run 4
C-Blosc - blosclz (MB/s)	2983	**2969**	2980	**3014**
Normalized	98.97%	98.51%	98.9%	100%
Standard Deviation	0.2%			
High Performance Conjugate Gradient (GFLOP/s)	**15.0525**	**19.2851**	19.2758	19.2364
Normalized	78.05%	100%	99.95%	99.75%
Standard Deviation	2.9%			
LeelaChessZero - BLAS (Nodes/s)	946	**942**	**984**	
Normalized	96.14%	95.73%	100%	
Standard Deviation	3.8%			
CLOMP - Static OMP Speedup (Speedup)	**5.8**	**6**	**6**	
Normalized	96.67%	100%	100%	
Standard Deviation	1.7%			
Dolfyn - C.F.D (sec)	**38.066**	38.09	**38.149**	
Normalized	100%	99.94%	99.78%	
Standard Deviation	0.2%			
Algebraic Multi-Grid Benchmark (Figure Of Merit)	**3472681**	3486278	**3504642**	
Normalized	99.09%	99.48%	100%	
Standard Deviation	0.7%			

Timed MAFFT Alignment - M.S.A - LSU RNA (sec)	11.267	**11.363**	**11.212**
Normalized	99.51%	98.67%	100%
Standard Deviation	0.4%		
LAMMPS Molecular Dynamics Simulator - 20k Atoms (ns/day)	15.332	**14.441**	**15.892**
Normalized	96.48%	90.87%	100%
Standard Deviation	5.4%		
LAMMPS Molecular Dynamics Simulator - Rhodopsin Protein	**13.864**	14.852	**15.071**
Normalized	91.99%	98.55%	100%
Standard Deviation	10.7%		
WebP Image Encode - Default (Encode Time - sec)	7.868	**7.869**	**7.865**
Normalized	99.96%	99.95%	100%
Standard Deviation	0.1%		
WebP Image Encode - Quality 100 (Encode Time - sec)	**10.964**	**10.959**	10.961
Normalized	99.95%	100%	99.98%
Standard Deviation	0%		
WebP Image Encode - Q.1.L (Encode Time - sec)	29.966	**29.928**	**29.99**
Normalized	99.87%	100%	99.79%
Standard Deviation	0.1%		
WebP Image Encode - Q.1.H.C (Encode Time - sec)	**17.662**	**17.663**	**17.662**
Normalized	100%	99.99%	100%
Standard Deviation	0%		
WebP Image Encode - Q.1.L.H.C (Encode Time - sec)	**62.105**	62.095	**62.07**
Normalized	99.94%	99.96%	100%
Standard Deviation	0.1%		
libgav1 - Chimera 1080p (FPS)	27.70	**27.63**	**27.94**
Normalized	99.14%	98.89%	100%
Standard Deviation	1%		
libgav1 - Summer Nature 4K (FPS)	13.56	**13.42**	**13.72**
Normalized	98.83%	97.81%	100%
Standard Deviation	0.7%		
libgav1 - S.N.1 (FPS)	**42.27**	**42.66**	42.43
Normalized	99.09%	100%	99.46%
Standard Deviation	0.3%		
libgav1 - C.1.1.b (FPS)	13.76	**13.42**	**13.78**
Normalized	99.85%	97.39%	100%
Standard Deviation	0.3%		
simdjson - Kostya (GB/s)	1.06	1.06	1.06
Standard Deviation	0%		
simdjson - LargeRand (GB/s)	0.48	0.48	0.48
Standard Deviation	0%		
simdjson - PartialTweets (GB/s)	1.19	1.19	1.19
Standard Deviation	0.5%		
simdjson - DistinctUserID (GB/s)	**1.23**	**1.24**	**1.24**
Normalized	99.19%	100%	100%
Standard Deviation	0.5%		

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BYTE Unix Benchmark - Dhrystone 2 (LPS)	**27089795**	27261722	**27275695**
Normalized	99.32%	99.95%	100%
Standard Deviation	0.6%		
LZ4 Compression - 1 - Compression Speed (MB/s)	**9088**	**9062**	9062
Normalized	100%	99.72%	99.72%
Standard Deviation	0.7%		
LZ4 Compression - 1 - D.S (MB/s)	**10342**	10338	**10334**
Normalized	100%	99.96%	99.91%
Standard Deviation	0.8%		
LZ4 Compression - 3 - Compression Speed (MB/s)	**39.71**	**39.66**	**39.66**
Normalized	100%	99.87%	99.87%
Standard Deviation	0%		
LZ4 Compression - 3 - D.S (MB/s)	9241	**9300**	**9183**
Normalized	99.37%	100%	98.75%
Standard Deviation	0%		
LZ4 Compression - 9 - Compression Speed (MB/s)	**38.06**	38.05	**38.03**
Normalized	100%	99.97%	99.92%
Standard Deviation	0.1%		
LZ4 Compression - 9 - D.S (MB/s)	**9251**	9243	**9225**
Normalized	100%	99.91%	99.72%
Standard Deviation	0%		
Zstd Compression - 3 (MB/s)	**4023**	**4658**	4229
Normalized	86.36%	100%	90.79%
Standard Deviation	1.6%		
Zstd Compression - 19 (MB/s)	**77.6**	79.5	**79.6**
Normalized	97.49%	99.87%	100%
Standard Deviation	5.9%		
LibRaw - P.P.B (Mpix/sec)	18.82	**18.76**	**18.91**
Normalized	99.52%	99.21%	100%
Standard Deviation	0.4%		
GraphicsMagick - Swirl	1203	**1205**	**1201**
Normalized	99.83%	100%	99.67%
Standard Deviation	0.8%		
GraphicsMagick - Rotate	638	**640**	**633**
Normalized	99.69%	100%	98.91%
Standard Deviation	0.8%		
GraphicsMagick - Sharpen (Iterations/min)	**417**	**417**	**414**
Normalized	100%	100%	99.28%
Standard Deviation	0.2%		
GraphicsMagick - Enhanced (Iterations/min)	**534**	**534**	**535**
Normalized	99.81%	99.81%	100%
Standard Deviation	0.5%		
GraphicsMagick - Resizing (Iterations/min)	**1821**	**1818**	1820
Normalized	100%	99.84%	99.95%

GraphicsMagick - Noise-Gaussian (Iterations/min)	414	**421**	**396**
Normalized	98.34%	100%	94.06%
Standard Deviation	2.8%		
GraphicsMagick - HWB Color Space (Iterations/min)	**1423**	1479	**1489**
Normalized	95.57%	99.33%	100%
Standard Deviation	8.9%		
oneDNN - IP Shapes 1D - f32 - CPU (ms)	**29.7698**	**30.2592**	29.8171
Normalized	100%	98.38%	99.84%
Standard Deviation	0.9%		
oneDNN - IP Shapes 3D - f32 - CPU (ms)	13.5635	**13.4069**	**13.6765**
Normalized	98.85%	100%	98.03%
Standard Deviation	0.7%		
oneDNN - IP Shapes 1D - u8s8f32 - CPU (ms)	40.8276	**40.6528**	**41.0755**
Normalized	99.57%	100%	98.97%
Standard Deviation	0.2%		
oneDNN - IP Shapes 3D - u8s8f32 - CPU (ms)	33.1977	**33.4242**	**33.1091**
Normalized	99.73%	99.06%	100%
Standard Deviation	1.1%		
oneDNN - C.B.S.A - f32 - CPU (ms)	**25.6088**	**25.5176**	25.5774
Normalized	99.64%	100%	99.77%
Standard Deviation	0.7%		
oneDNN - D.B.s - f32 - CPU (ms)	103.621	**103.388**	**103.748**
Normalized	99.78%	100%	99.65%
Standard Deviation	0.5%		
oneDNN - D.B.s - f32 - CPU (ms)	10.3496	**10.3217**	**10.3883**
Normalized	99.73%	100%	99.36%
Standard Deviation	0.2%		
oneDNN - C.B.S.A - u8s8f32 - CPU	55.2950	**55.2362**	**55.7995**
Normalized	99.89%	100%	98.99%
Standard Deviation	0.1%		
oneDNN - D.B.s - u8s8f32 - CPU (ms)	42.8257	**42.8246**	**42.9411**
Normalized	100%	100%	99.73%
Standard Deviation	0.1%		
oneDNN - D.B.s - u8s8f32 - CPU (ms)	26.8026	**26.0454**	**26.8142**
Normalized	97.17%	100%	97.13%
Standard Deviation	0.7%		
oneDNN - R.N.N.T - f32 - CPU (ms)	13101	**13012**	**13147**
Normalized	99.32%	100%	98.97%
Standard Deviation	0.6%		
oneDNN - R.N.N.I - f32 - CPU (ms)	**7532**	7671	**7680**
Normalized	100%	98.19%	98.08%
Standard Deviation	0.3%		
oneDNN - R.N.N.T - u8s8f32 - CPU	13142	**13133**	**13255**
Normalized	99.93%	100%	99.08%
Standard Deviation	0.2%		
oneDNN - R.N.N.I - u8s8f32 - CPU (ms)	7569	**7677**	**7535**
Normalized	99.55%	98.15%	100%
Standard Deviation	1.3%		

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oneDNN - M.M.B.S.T - f32 - CPU (ms)	4.77018	**4.77039**	**4.76997**
Normalized	100%	99.99%	100%
Standard Deviation	0.1%		
oneDNN - R.N.N.T - bf16bf16bf16 - CPU (ms)	13161	**13188**	**13157**
Normalized	99.97%	99.76%	100%
Standard Deviation	0.3%		
oneDNN - R.N.N.I - bf16bf16bf16 - CPU (ms)	**7566**	7667	**7693**
Normalized	100%	98.69%	98.35%
Standard Deviation	0.7%		
oneDNN - M.M.B.S.T - u8s8f32 - CPU (ms)	**9.16733**	**9.07736**	9.16306
Normalized	99.02%	100%	99.06%
Standard Deviation	0.1%		
dav1d - Chimera 1080p (FPS)	173.02	**172.06**	**174.53**
Normalized	99.13%	98.58%	100%
Standard Deviation	0.5%		
dav1d - Summer Nature 4K (FPS)	**89.15**	89.47	**89.69**
Normalized	99.4%	99.75%	100%
Standard Deviation	0.3%		
dav1d - S.N.1 (FPS)	261.55	**262.22**	**253.46**
Normalized	99.74%	100%	96.66%
Standard Deviation	2.3%		
dav1d - C.1.1.b (FPS)	**109.32**	109.23	**108.70**
Normalized	100%	99.92%	99.43%
Standard Deviation	1.7%		
TTSIOD 3D Renderer - P.R.W.S.S.M (FPS)	**782.068**	**776.94**	777.726
Normalized	100%	99.34%	99.44%
Standard Deviation	0.3%		
AOM AV1 - Speed 0 Two-Pass (FPS)	0.02	0.02	0.02
Standard Deviation	0%		
AOM AV1 - Speed 4 Two-Pass (FPS)	0.17	0.17	0.17
Standard Deviation	0%		
AOM AV1 - Speed 6 Realtime (FPS)	2.32	**2.33**	**2.31**
Normalized	99.57%	100%	99.14%
Standard Deviation	0.2%		
AOM AV1 - Speed 6 Two-Pass (FPS)	0.25	0.25	0.25
Standard Deviation	0%		
AOM AV1 - Speed 8 Realtime (FPS)	5.10	5.1	5.1
Standard Deviation	0.1%		
Kvazaar - Bosphorus 4K - Slow (FPS)	1.89	1.89	1.89
Standard Deviation	0.3%		
Kvazaar - Bosphorus 4K - Medium	1.87	1.87	1.87
Standard Deviation	0.5%		
Kvazaar - Bosphorus 1080p - Slow (FPS)	**7.05**	**6.97**	7.04
Normalized	100%	98.87%	99.86%
Standard Deviation	0.8%		
Kvazaar - Bosphorus 1080p - Medium (FPS)	**7.07**	**7.03**	7.05
Normalized	100%	99.43%	99.72%
Standard Deviation	0.4%		

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Kvazaar - Bosphorus 4K - Very Fast (FPS)	**5.65**	**5.66**	**5.66**
Normalized	99.82%	100%	100%
Standard Deviation	0.4%		
Kvazaar - Bosphorus 4K - Ultra Fast (FPS)	**14.04**	**14.04**	**14**
Normalized	100%	100%	99.72%
Standard Deviation	0.1%		
Kvazaar - Bosphorus 1080p - Very Fast (FPS)	**18.41**	**18.27**	18.37
Normalized	100%	99.24%	99.78%
Standard Deviation	0.9%		
Kvazaar - Bosphorus 1080p - Ultra Fast (FPS)	**43.25**	**42.96**	43.18
Normalized	100%	99.33%	99.84%
Standard Deviation	0.2%		
rav1e - 1 (FPS)	0.084	0.084	0.084
Standard Deviation	0.7%		
rav1e - 5 (FPS)	0.179	0.179	0.179
Standard Deviation	0.3%		
rav1e - 6 (FPS)	**0.209**	**0.208**	**0.209**
Normalized	100%	99.52%	100%
Standard Deviation	0.3%		
rav1e - 10 (FPS)	**0.401**	**0.402**	**0.401**
Normalized	99.75%	100%	99.75%
Standard Deviation	0.2%		
VP9 libvpx Encoding - Speed 0 (FPS)	0.58	0.58	0.58
Standard Deviation	0%		
VP9 libvpx Encoding - Speed 5 (FPS)	**2.71**	**2.69**	**2.71**
Normalized	100%	99.26%	100%
Standard Deviation	0.7%		
x264 - H.2.V.E (FPS)	**53.85**	36.66	**35.53**
Normalized	100%	68.08%	65.98%
Standard Deviation	11.6%		
x265 - Bosphorus 4K (FPS)	**6.24**	**6.17**	6.23
Normalized	100%	98.88%	99.84%
Standard Deviation	0.6%		
x265 - Bosphorus 1080p (FPS)	**12.90**	12.7	**12.32**
Normalized	100%	98.45%	95.5%
Standard Deviation	1.7%		
7-Zip Compression - C.S.T (MIPS)	**168456**	**170626**	170105
Normalized	98.73%	100%	99.69%
Standard Deviation	3.2%		
Stockfish - Total Time (Nodes/s)	**31660332**	31552898	**29938062**
Normalized	100%	99.66%	94.56%
Standard Deviation	1.3%		
Timed Apache Compilation - Time To Compile (sec)	44.886	**44.719**	**44.965**
Normalized	99.63%	100%	99.45%
Standard Deviation	0.1%		
Timed FFmpeg Compilation - Time To Compile (sec)	55.539	**55.274**	**55.665**
Normalized	99.52%	100%	99.3%
Standard Deviation	0.5%		

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Timed GCC Compilation - Time To Compile (sec)	**1432**	**1435**	1434
Normalized	100%	99.82%	99.85%
Standard Deviation	0.2%		
Timed ImageMagick Compilation - Time To Compile (sec)	29.041	**28.953**	**29.104**
Normalized	99.7%	100%	99.48%
Standard Deviation	0.1%		
Timed Linux Kernel Compilation - Time To Compile (sec)	**67.857**	**69.432**	69.144
Normalized	100%	97.73%	98.14%
Standard Deviation	1.4%		
Timed LLVM Compilation - Time To Compile (sec)	**536.167**	**568.008**	562.208
Normalized	100%	94.39%	95.37%
Standard Deviation	12%		
Timed PHP Compilation - Time To Compile (sec)	**86.394**	**86.047**	86.347
Normalized	99.6%	100%	99.65%
Standard Deviation	0.3%		
Build2 - Time To Compile (sec)	**135.397**	135.598	**136.676**
Normalized	100%	99.85%	99.06%
Standard Deviation	0.4%		
C-Ray - Total Time - 4.1.R.P.P (sec)	**18.531**	18.64	**18.732**
Normalized	100%	99.42%	98.93%
Standard Deviation	0.2%		
Parallel BZIP2 Compression - 2.F.C (sec)	**2.078**	2.051	**2.026**
Normalized	97.5%	98.78%	100%
POV-Ray - Trace Time (sec)	25.970	**26.045**	**25.293**
Normalized	97.39%	97.11%	100%
Standard Deviation	0.5%		
Smallpt - G.I.R.1.S (sec)	**4.417**	4.421	**4.451**
Normalized	100%	99.91%	99.24%
Standard Deviation	2%		
Numpy Benchmark (Score)	**167.76**	**168.59**	168.52
Normalized	99.51%	100%	99.96%
Standard Deviation	0.3%		
AOBench - 2048 x 2048 - Total Time (sec)	**63.882**	62.834	**62.594**
Normalized	97.98%	99.62%	100%
Standard Deviation	2.4%		
Timed Eigen Compilation - Time To Compile (sec)	**129.903**	129.73	**129.664**
Normalized	99.82%	99.95%	100%
Standard Deviation	0.1%		
Gzip Compression - L.S.T.A.T.t.g (sec)	**49.929**	**50.469**	50.232
Normalized	100%	98.93%	99.4%
Standard Deviation	0.7%		
XZ Compression - C.u.1.0.3.s.i.i.C.L.9 (sec)	**27.963**	**25.042**	27.649
Normalized	89.55%	100%	90.57%
Standard Deviation	6.1%		

dcraw - R.T.P.I.C (sec)	**113.306**	113.308	**113.589**
Normalized	100%	100%	99.75%
Standard Deviation	0.1%		
Monkey Audio Encoding - WAV To APE (sec)	**21.670**	21.795	**21.83**
Normalized	100%	99.43%	99.27%
Standard Deviation	0.6%		
FLAC Audio Encoding - WAV To FLAC (sec)	**40.182**	**40.182**	**40.275**
Normalized	100%	100%	99.77%
Standard Deviation	0.1%		
LAME MP3 Encoding - WAV To MP3 (sec)	**14.397**	**14.403**	14.399
Normalized	100%	99.96%	99.99%
Standard Deviation	0%		
Opus Codec Encoding - WAV To Opus Encode (sec)	**43.180**	43.203	**43.207**
Normalized	100%	99.95%	99.94%
Standard Deviation	0.1%		
eSpeak-NG Speech Engine - T.T.S.S (sec)	**54.410**	**54.916**	54.791
Normalized	100%	99.08%	99.3%
Standard Deviation	0.8%		
RNNoise (sec)	**38.309**	38.109	**38.081**
Normalized	99.4%	99.93%	100%
Standard Deviation	0.5%		
System GZIP Decompression (sec)	**4.935**	5.58	**5.587**
Normalized	100%	88.44%	88.33%
Standard Deviation	3.8%		
System XZ Decompression (sec)	**5.555**	5.561	**5.563**
Normalized	100%	99.89%	99.86%
Standard Deviation	0.1%		
Tachyon - Total Time (sec)	**43.4265**	43.2359	**42.9742**
Normalized	98.96%	99.39%	100%
Standard Deviation	0.4%		
System ZLIB Decompression (ms)	**2724**	**2886**	2875
Normalized	100%	94.38%	94.75%
Standard Deviation	2.1%		
Node.js V8 Web Tooling Benchmark (runs/s)	**4.01**	4.05	**4.06**
Normalized	98.77%	99.75%	100%
Standard Deviation	1.1%		
Cryptsetup - PBKDF2-sha512 (Iterations/sec)	1091132	**1091130**	**1092266**
Normalized	99.9%	99.9%	100%
Standard Deviation	0.2%		
Cryptsetup - PBKDF2-whirlpool (Iterations/sec)	**343870**	**344020**	**344020**
Normalized	99.96%	100%	100%
Standard Deviation	0.1%		
Cryptsetup - A.X.2.E (MiB/s)	**2473**	2494	**2492**
Normalized	99.14%	100%	99.92%
Standard Deviation	1.5%		
Cryptsetup - A.X.2.D (MiB/s)	2496	2496	**2494**

Normalized	99.96%	99.95%	99.89%
Standard Deviation	0.1%		
Cryptsetup - S.X.2.E (MiB/s)	**62.2**	**62.7**	**62.7**
Normalized	99.2%	100%	100%
Standard Deviation	1.5%		
Cryptsetup - S.X.2.D (MiB/s)	75.1	75.1	75.1
Standard Deviation	0%		
Cryptsetup - T.X.2.E (MiB/s)	**132.6**	**133.9**	**133.8**
Normalized	99.03%	100%	99.93%
Standard Deviation	1.7%		
Cryptsetup - T.X.2.D (MiB/s)	**133**	**133**	**132.9**
Normalized	100%	100%	99.92%
Cryptsetup - A.X.5.E (MiB/s)	2098	**2100**	**2098**
Normalized	99.9%	100%	99.88%
Standard Deviation	0%		
Cryptsetup - A.X.5.D (MiB/s)	2100	2101	**2099**
Normalized	99.96%	99.98%	99.92%
Standard Deviation	0.1%		
Cryptsetup - S.X.5.E (MiB/s)	62.7		
Cryptsetup - T.X.5.E (MiB/s)	133.9		
Cryptsetup - T.X.5.D (MiB/s)	**132.7**	**132.9**	**132.9**
Normalized	99.85%	100%	100%
Standard Deviation	0.3%		
libjpeg-turbo tjbench (Megapixels/sec)	**101.751578**	**101.807647**	101.806761
Normalized	99.94%	100%	100%
Standard Deviation	0%		
Basis Universal - ETC1S (sec)	**78.746**	**79.289**	78.983
Normalized	100%	99.32%	99.7%
Standard Deviation	0.4%		
Basis Universal - UASTC Level 0 (sec)	**11.269**	11.259	**11.235**
Normalized	99.7%	99.79%	100%
Standard Deviation	0.1%		
Basis Universal - UASTC Level 2 (sec)	18.539	**18.438**	**18.542**
Normalized	99.46%	100%	99.44%
Standard Deviation	0.8%		
Basis Universal - UASTC Level 3 (sec)	**26.553**	**26.553**	**26.57**
Normalized	100%	100%	99.94%
Standard Deviation	0.6%		
Basis Universal - U.L.2.R.P.P (sec)	**1081**	1078	**1078**
Normalized	99.7%	99.96%	100%
Standard Deviation	0.3%		
SQLite Speedtest - Timed Time - Size 1,000 (sec)	**170.616**	170.851	**171.612**
Normalized	100%	99.86%	99.42%
Standard Deviation	0.2%		
GEGL - Crop (sec)	**15.928**	16.235	**16.25**
Normalized	100%	98.11%	98.02%
Standard Deviation	1.3%		
GEGL - Scale (sec)	**12.639**	12.542	**12.518**
Normalized	99.04%	99.81%	100%
Standard Deviation	0.1%		
GEGL - Cartoon (sec)	**205.815**	**208.285**	207.468
Normalized	100%	98.81%	99.2%
Standard Deviation	0.2%		

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GEGL - Reflect (sec)	**51.935**	52.04	**52.106**
Normalized	100%	99.8%	99.67%
Standard Deviation	0.1%		
GEGL - Antialias (sec)	**70.745**	**70.982**	70.839
Normalized	100%	99.67%	99.87%
Standard Deviation	0.1%		
GEGL - Tile Glass (sec)	**59.862**	59.867	**60.168**
Normalized	100%	99.99%	99.49%
Standard Deviation	0.1%		
GEGL - Wavelet Blur (sec)	**106.159**	106.635	**106.696**
Normalized	100%	99.55%	99.5%
Standard Deviation	0.3%		
GEGL - Color Enhance (sec)	**106.514**	**106.829**	106.807
Normalized	100%	99.71%	99.73%
Standard Deviation	0.1%		
GEGL - Rotate 90 Degrees (sec)	**77.412**	77.587	**77.826**
Normalized	100%	99.77%	99.47%
Standard Deviation	0.4%		
GIMP - resize (sec)	**20.621**	**22.238**	21.835
Normalized	100%	92.73%	94.44%
Standard Deviation	6.4%		
GIMP - rotate (sec)	**28.239**	28.265	**28.326**
Normalized	100%	99.91%	99.69%
Standard Deviation	0.2%		
GIMP - auto-levels (sec)	39.529	**39.381**	**40.538**
Normalized	99.63%	100%	97.15%
Standard Deviation	2.1%		
GIMP - unsharp-mask (sec)	**51.214**	**51.903**	51.229
Normalized	100%	98.67%	99.97%
Standard Deviation	2.5%		
G'MIC - 2.F.P.1.T (sec)	2960	**2943**	**2976**
Normalized	99.43%	100%	98.9%
Standard Deviation	0.1%		
G'MIC - P.I.O.A.3.V.1.T (sec)	45.118	**45.13**	**45.1**
Normalized	99.96%	99.93%	100%
Standard Deviation	0.1%		
G'MIC - 3.E.F.I.R.C.1.T (sec)	**86.904**	**87.389**	87.162
Normalized	100%	99.45%	99.7%
Standard Deviation	0.2%		
Hugin - P.P.A.S.T (sec)	**104.452**	107.327	**108.532**
Normalized	100%	97.32%	96.24%
Standard Deviation	2.7%		
OCRMyPDF - P.6.P.P.D (sec)	**37.704**	**38.985**	38.53
Normalized	100%	96.71%	97.86%
Standard Deviation	2.2%		
GNU Octave Benchmark (sec)	**8.337**	**8.496**	**8.496**
Normalized	100%	98.13%	98.13%
Standard Deviation	1.2%		
RawTherapee - T.B.T (sec)	83.596	**83.676**	**83.358**
Normalized	99.72%	99.62%	100%
Standard Deviation	0.2%		
librsvg - SVG Files To PNG (sec)	**32.529**	**31.951**	32.498
Normalized	98.22%	100%	98.32%
Standard Deviation	1.4%		
Redis - LPOP (Reqs/sec)	519607	**500314**	**521050**

Normalized	99.72%	96.02%	100%
Standard Deviation	1%		
Redis - SADD (Reqs/sec)	**682251**	689655	**693378**
Normalized	98.4%	99.46%	100%
Standard Deviation	3.8%		
Redis - LPUSH (Reqs/sec)	509296	**501002**	**510286**
Normalized	99.81%	98.18%	100%
Standard Deviation	1.4%		
Redis - GET (Reqs/sec)	800111	**811922**	**791994**
Normalized	98.55%	100%	97.55%
Standard Deviation	1%		
Redis - SET (Reqs/sec)	**584775**	562275	**531520**
Normalized	100%	96.15%	90.89%
Standard Deviation	1%		
Caffe - AlexNet - CPU - 100 (ms)	70400		
Standard Deviation	12.3%		
Caffe - AlexNet - CPU - 200 (ms)	125007		
Standard Deviation	12.2%		
Caffe - AlexNet - CPU - 1000 (ms)	654412		
Standard Deviation	7.4%		
Caffe - GoogleNet - CPU - 100 (ms)	186059		
Standard Deviation	12.6%		
Caffe - GoogleNet - CPU - 200 (ms)	364395		
Standard Deviation	10.9%		
Caffe - GoogleNet - CPU - 1000 (ms)	1968783		
Standard Deviation	6.4%		
Mobile Neural Network - SqueezeNetV1.0 (ms)	**91.849**	**93.448**	91.879
Normalized	100%	98.29%	99.97%
Standard Deviation	0.8%		
Mobile Neural Network - resnet-v2-50 (ms)	**654.280**	654.388	**663.972**
Normalized	100%	99.98%	98.54%
Standard Deviation	0.6%		
Mobile Neural Network - MobileNetV2_224 (ms)	56.505	**56.148**	**56.959**
Normalized	99.37%	100%	98.58%
Standard Deviation	0.3%		
Mobile Neural Network - mobilenet-v1-1.0 (ms)	**116.431**	**114.129**	116.29
Normalized	98.02%	100%	98.14%
Standard Deviation	1.9%		
Mobile Neural Network - inception-v3 (ms)	471.076	**470.655**	**474.535**
Normalized	99.91%	100%	99.18%
Standard Deviation	0.1%		
TNN - CPU - MobileNet v2 (ms)	**637.131**	637.092	**637.081**
Normalized	99.99%	100%	100%
Standard Deviation	0.1%		
TNN - CPU - SqueezeNet v1.1 (ms)	**611.706**	**612.031**	611.766
Normalized	100%	99.95%	99.99%
Standard Deviation	0%		
Blender - BMW27 - CPU-Only (sec)	123.91	**125.57**	**122.66**
Normalized	98.99%	97.68%	100%

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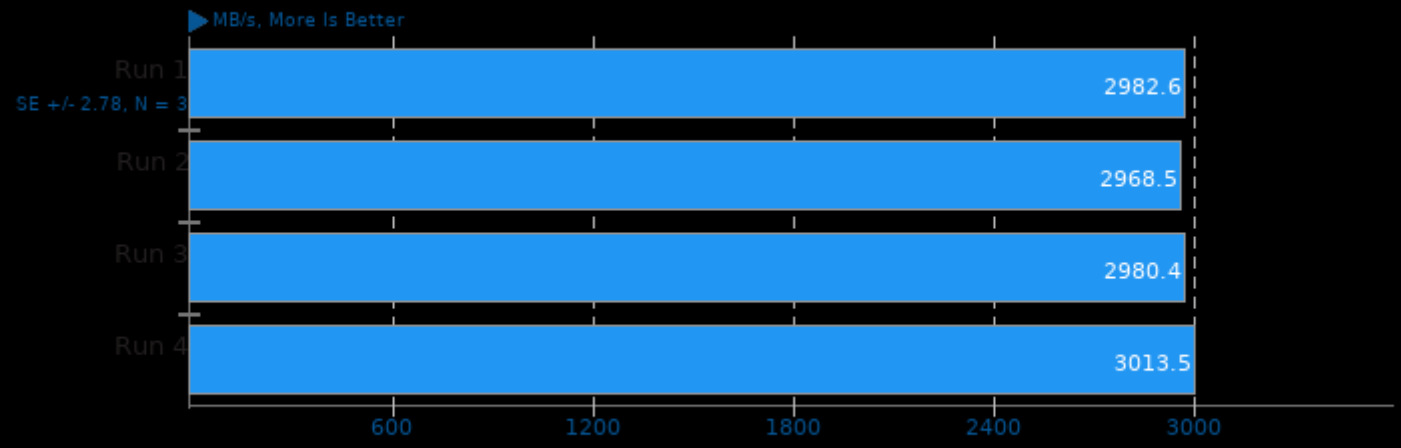
Standard Deviation	0.7%		
Blender - Classroom - CPU-Only (sec)	**264.29**	264.31	**264.49**
Normalized	100%	99.99%	99.92%
Standard Deviation	0.2%		
Blender - Fishy Cat - CPU-Only (sec)	**233.85**	229.33	**225.99**
Normalized	96.64%	98.54%	100%
Standard Deviation	0.9%		
Blender - Barbershop - CPU-Only	**424.42**	426.94	**427.26**
Normalized	100%	99.41%	99.34%
Standard Deviation	0.2%		
Blender - Pabellon Barcelona - CPU-Only (sec)	356.47	**358.1**	**356.07**
Normalized	99.89%	99.43%	100%
Standard Deviation	0.2%		
PyBench - T.F.A.T.T (Milliseconds)	3600	**3605**	**3597**
Normalized	99.92%	99.78%	100%
Standard Deviation	0%		
PyPerformance - go (Milliseconds)	**714**	**714**	**715**
Normalized	100%	100%	99.86%
Standard Deviation	0.2%		
PyPerformance - 2to3 (Milliseconds)	798	798	798
PyPerformance - chaos (Milliseconds)	314	314	314
PyPerformance - float (Milliseconds)	**384**	**384**	**383**
Normalized	99.74%	99.74%	100%
PyPerformance - nbody (Milliseconds)	**476**	**475**	**476**
Normalized	99.79%	100%	99.79%
Standard Deviation	0.1%		
PyPerformance - pathlib	**51.9**	**51.6**	51.8
Normalized	99.42%	100%	99.61%
Standard Deviation	0%		
PyPerformance - raytrace	**1.39**	**1.38**	**1.39**
Normalized	99.28%	100%	99.28%
Standard Deviation	0%		
PyPerformance - json_loads (Milliseconds)	**65.1**	**65.2**	**65.1**
Normalized	100%	99.85%	100%
Standard Deviation	0.2%		
PyPerformance - crypto_pyaes (Milliseconds)	327	**326**	**328**
Normalized	99.69%	100%	99.39%
PyPerformance - regex_compile (Milliseconds)	453	453	453
PyPerformance - python_startup (Milliseconds)	**14.5**	**14.9**	**14.5**
Normalized	100%	97.32%	100%
Standard Deviation	0.4%		
PyPerformance - django_template (Milliseconds)	150	150	150
PyPerformance - pickle_pure_python (Milliseconds)	**1.34**	**1.33**	**1.33**
Normalized	99.25%	100%	100%
Standard Deviation	0.4%		

Numenta Anomaly Benchmark - EXPoSE (sec)	**1410**	**1440**	1438
Normalized	100%	97.92%	98.07%
Standard Deviation	2.4%		
Numenta Anomaly Benchmark - Relative Entropy (sec)	**34.694**	34.54	**34.057**
Normalized	98.16%	98.6%	100%
Standard Deviation	0.9%		
Numenta Anomaly Benchmark - Windowed Gaussian (sec)	18.093	**18.173**	**17.895**
Normalized	98.91%	98.47%	100%
Standard Deviation	0.8%		
Numenta Anomaly Benchmark - Earthgecko Skyline (sec)	**228.372**	228.687	**231.401**
Normalized	100%	99.86%	98.69%
Standard Deviation	0.8%		
Numenta Anomaly Benchmark - B.C (sec)	70.328	**69.867**	**71.751**
Normalized	99.34%	100%	97.37%
Standard Deviation	2.7%		
WavPack Audio Encoding - WAV To WavPack (sec)	**128.759**	129.063	**129.185**
Normalized	100%	99.76%	99.67%
Standard Deviation	0.2%		
Git - T.T.C.C.G.C (sec)	**92.517**	**92.174**	92.249
Normalized	99.63%	100%	99.92%
Standard Deviation	0.4%		
Mlpack Benchmark - scikit_ica (sec)	**89.89**	89.38	**88.72**
Normalized	98.7%	99.26%	100%
Standard Deviation	0.1%		
Mlpack Benchmark - scikit_qda (sec)	45.63	**46.12**	**43.96**
Normalized	96.34%	95.32%	100%
Standard Deviation	2.9%		
Mlpack Benchmark - scikit_svm (sec)	**44.76**	44.72	**44.68**
Normalized	99.82%	99.91%	100%
Standard Deviation	0.1%		
Mlpack Benchmark - scikit_linearridgeregression (sec)	**3.75**	**3.85**	**3.75**
Normalized	100%	97.4%	100%
Standard Deviation	0.7%		
Scikit-Learn (sec)	**17.526**	**17.497**	17.498
Normalized	99.83%	100%	99.99%
Standard Deviation	0.1%		
Unpacking Firefox - firefox-84.0.source.tar.xz (sec)	**30.909**	**30.006**	30.821
Normalized	97.08%	100%	97.36%
Standard Deviation	2%		
Tesseract OCR - T.T.O.7.I (sec)	46.531	**46.641**	**46.325**
Normalized	99.56%	99.32%	100%
Standard Deviation	1.6%		
OpenCV - DNN - D.N.N (ms)	**25792**	25951	**26397**
Normalized	100%	99.39%	97.71%
Standard Deviation	4.4%		
Cryptsetup - PBKDF2-sha512 (MiB/s)		**1092266**	**1092266**

Normalized	99.9%	99.9%
Cryptsetup - PBKDF2-whirlpool	**344020**	**344020**
Normalized	100%	100%

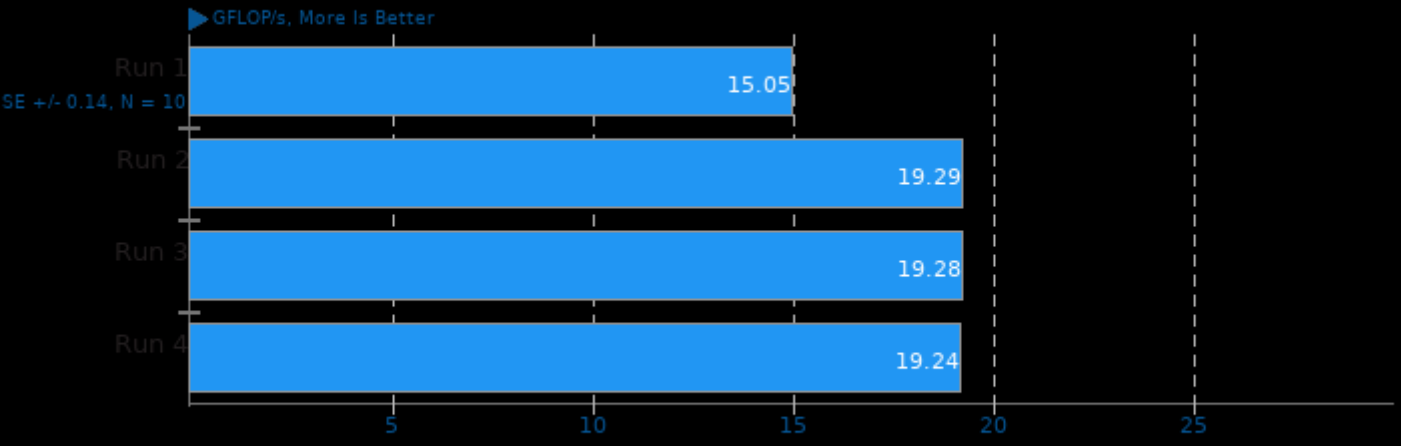
C-Blosc 2.0 Beta 5

Compressor: blosclz



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

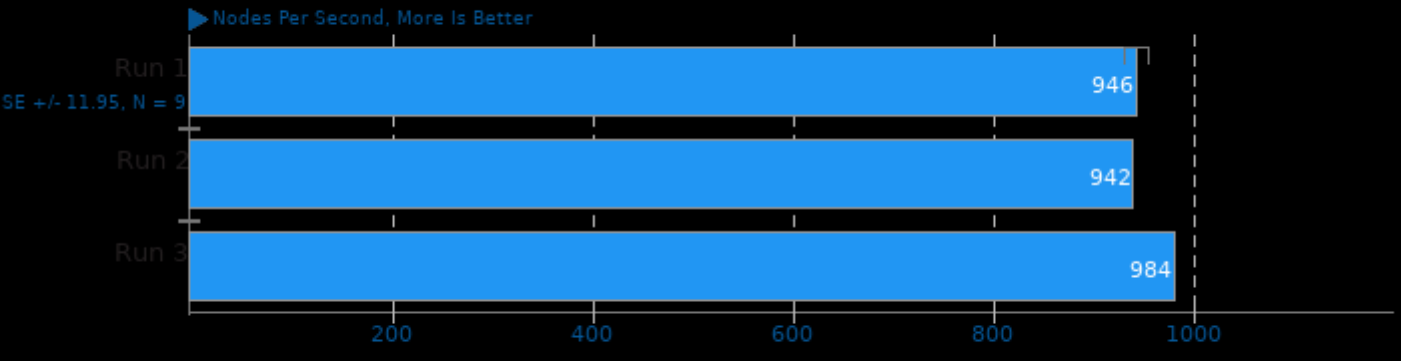
High Performance Conjugate Gradient 3.1



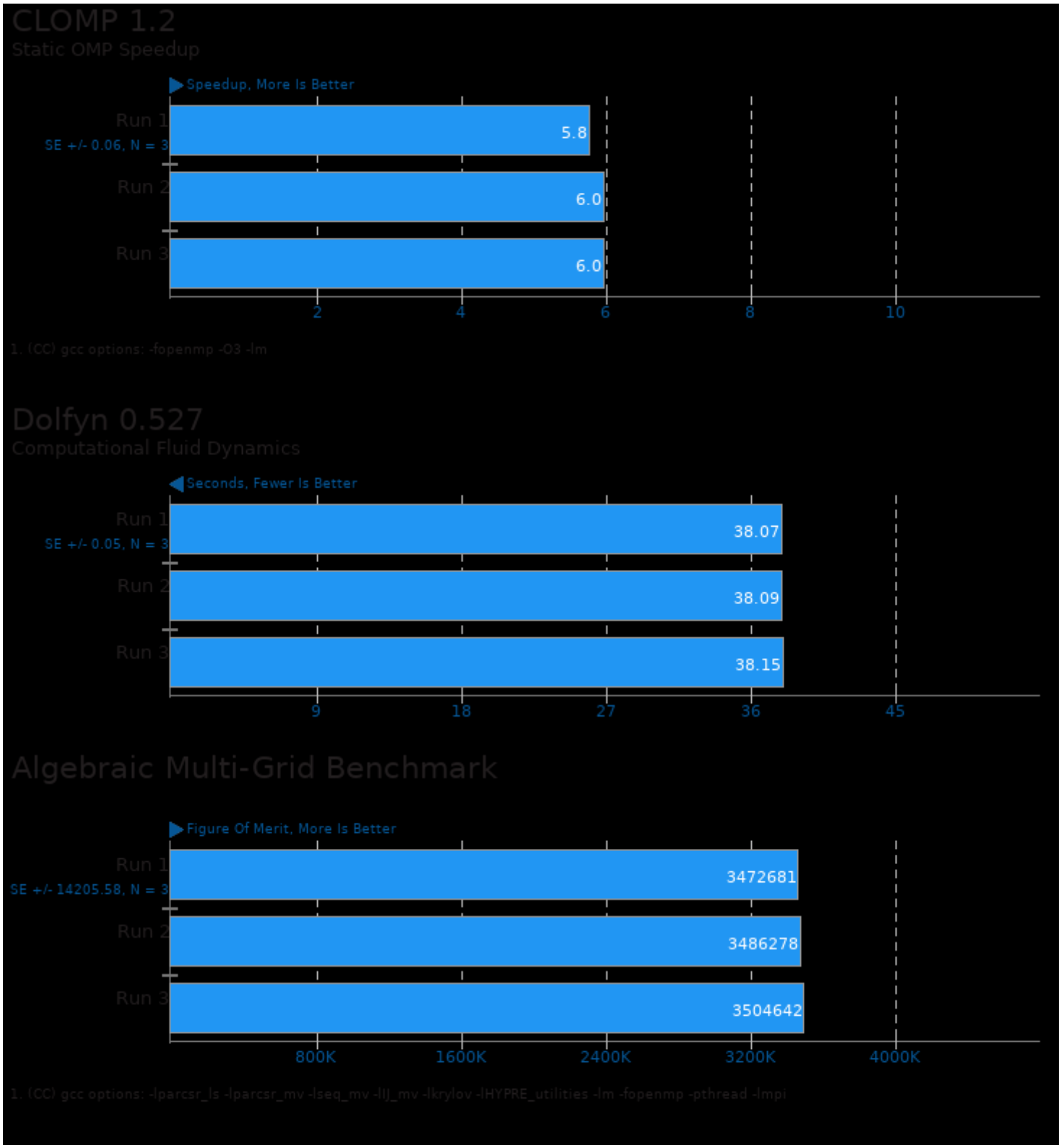
1. (CXX) g++ options: -O3 -ffast-math -ftree-vectorize -pthread -lmpi_cxx -lmpi

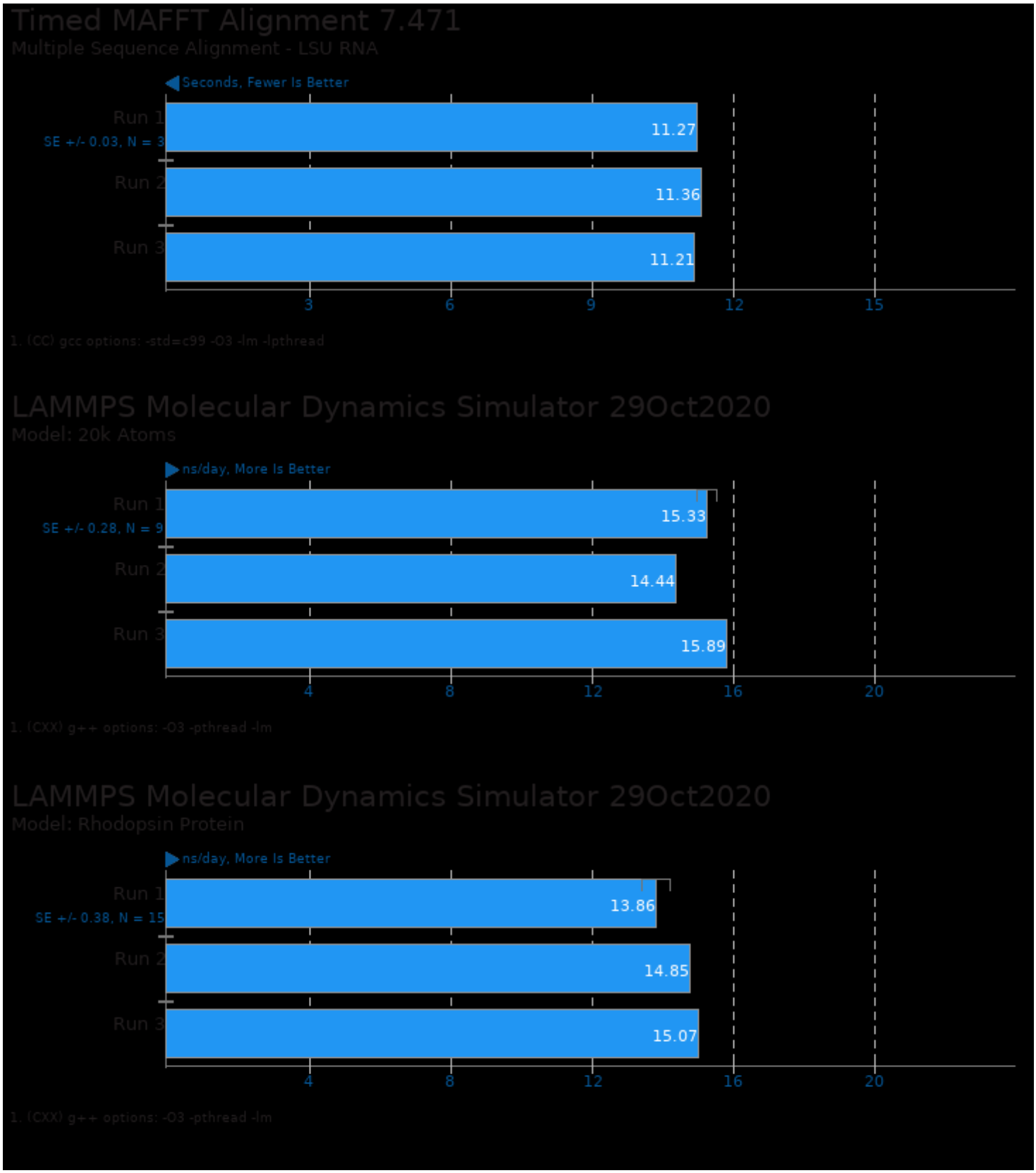
LeelaChessZero 0.26

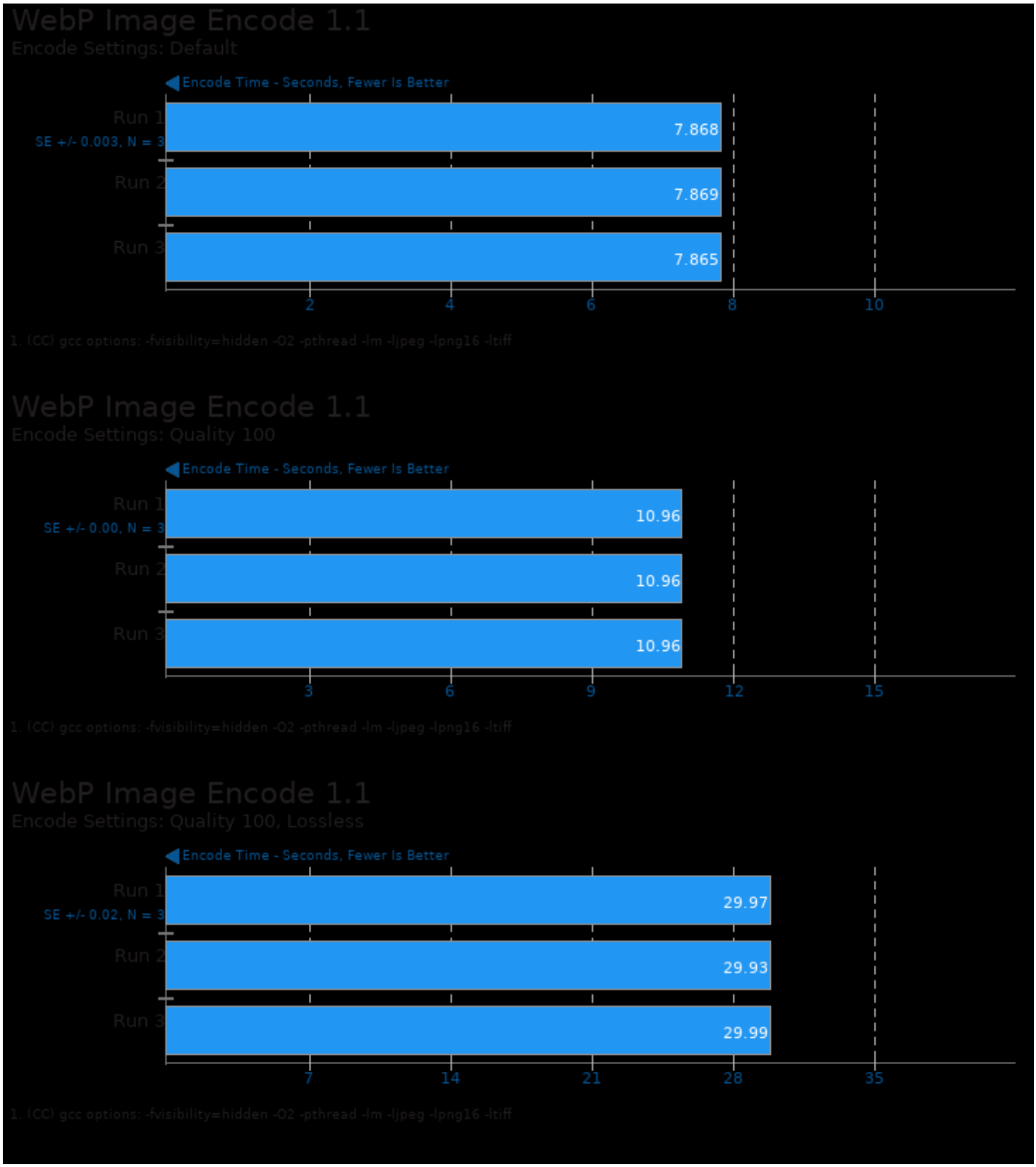
Backend: BLAS

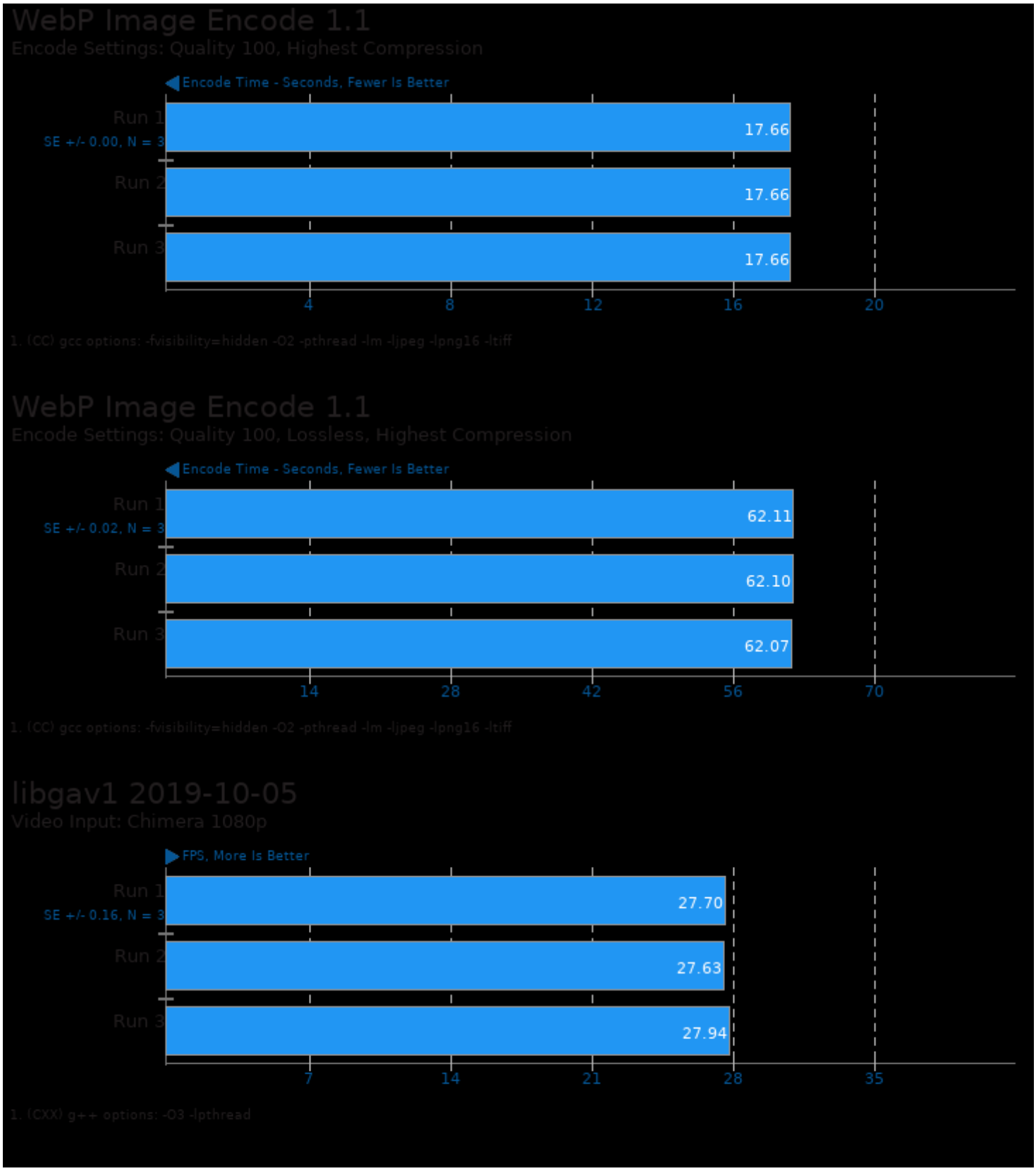


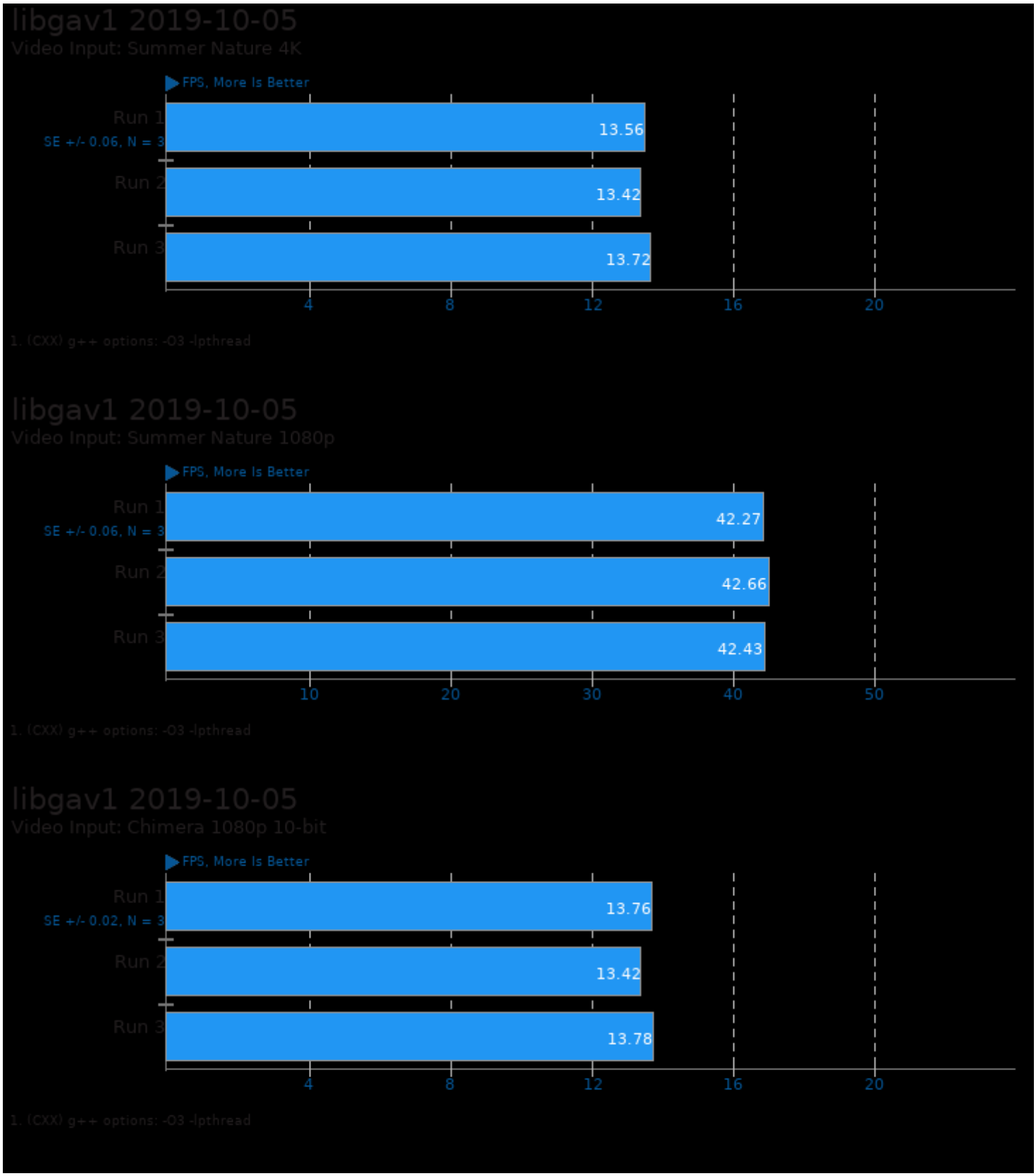
1. (CXX) g++ options: -flto -pthread

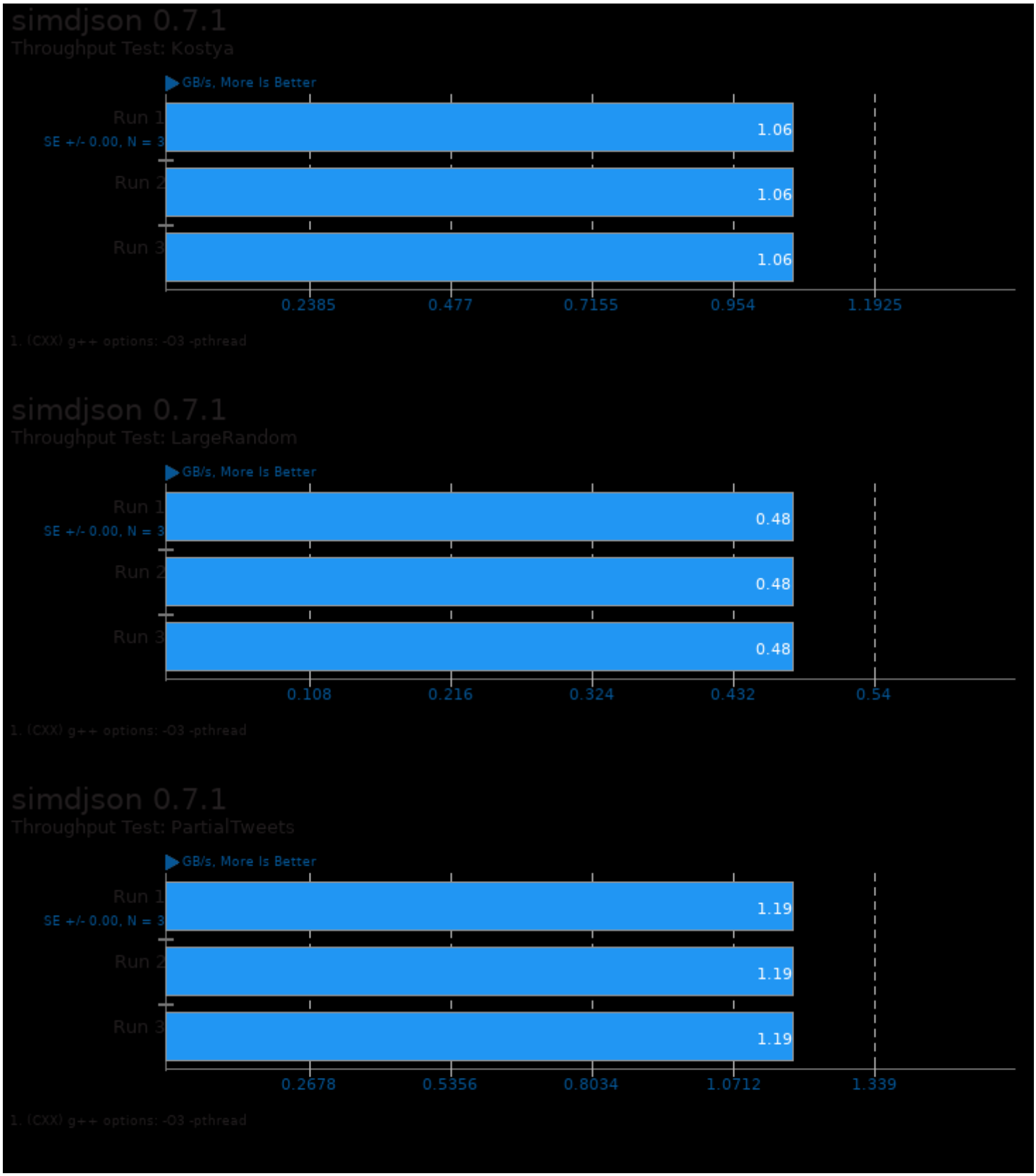

CLOMP 1.2
Static OMP Speedup
Speedup, More Is Better
Run 1
SE +/- 0.06, N = 3
5.8
Run 2
6.0
Run 3
6.0
2
4
6
8
10
1. (CC) gcc options: -fopenmp -O3 -lm
Dolfyn 0.527
Computational Fluid Dynamics
Seconds, Fewer Is Better
Run 1
SE +/- 0.05, N = 3
38.07
Run 2
38.09
Run 3
38.15
9
18
27
36
45
Algebraic Multi-Grid Benchmark
Figure Of Merit, More Is Better
Run 1
SE +/- 14205.58, N = 3
3472681
Run 2
3486278
Run 3
3504642
800K
1600K
2400K
3200K
4000K
1. (CC) gcc options: -lparcsr_ls -lparcsr_mv -lseq_mv -lIJ_mv -lkrylov -lHYPRE_utilities -lm -fopenmp -pthread -lmpi

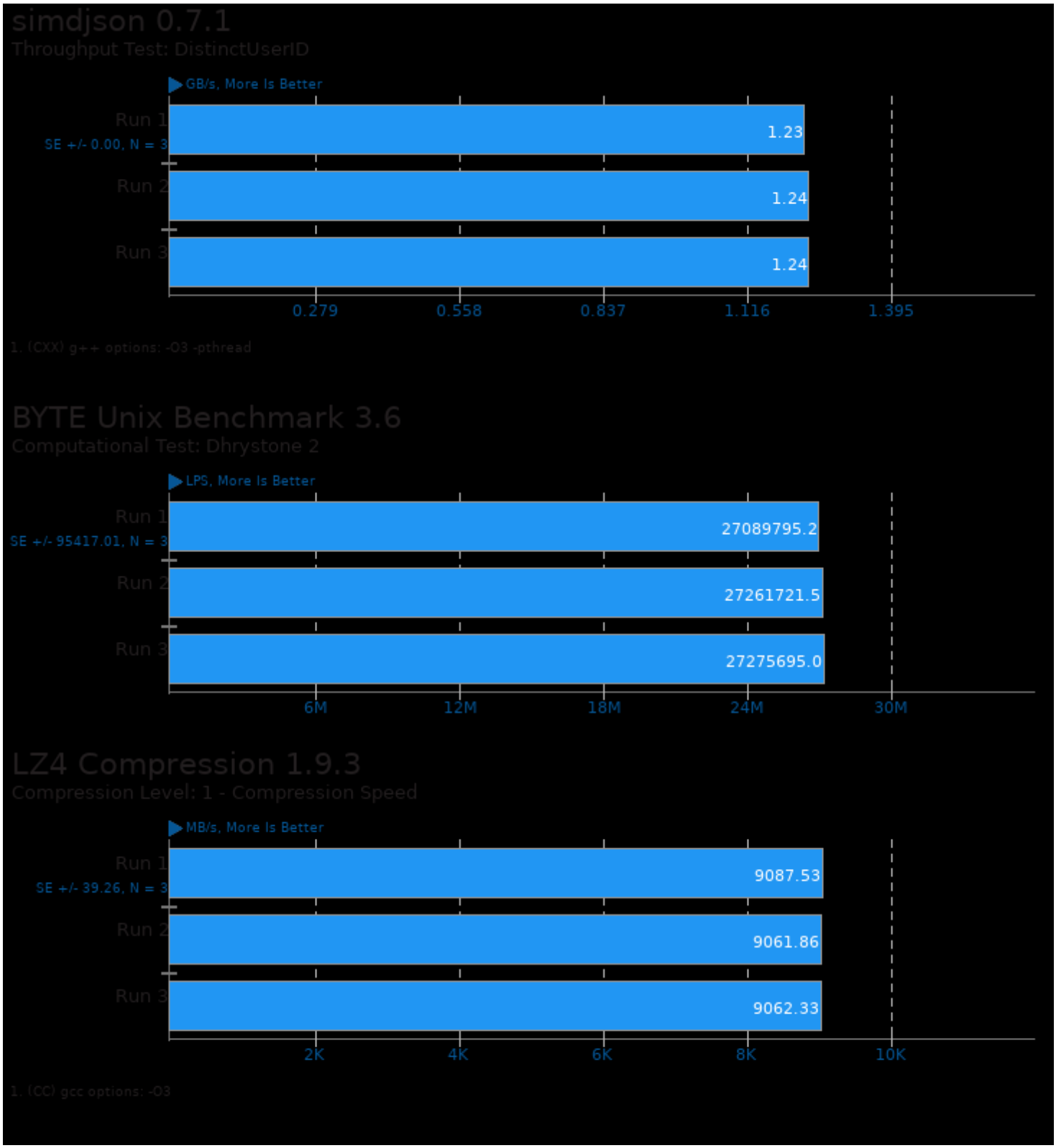

Timed MAFFT Alignment 7.471
Multiple Sequence Alignment - LSU RNA
Seconds, Fewer Is Better
Run 1
SE +/- 0.03, N = 3
11.27
Run 2
11.36
Run 3
11.21
3
6
9
12
15
1. (CC) gcc options: -std=c99 -O3 -lm -lpthread
LAMMPS Molecular Dynamics Simulator 29Oct2020
Model: 20k Atoms
ns/day, More Is Better
Run 1
SE +/- 0.28, N = 9
15.33
Run 2
14.44
Run 3
15.89
4
8
12
16
20
1. (CXX) g++ options: -O3 -pthread -lm
LAMMPS Molecular Dynamics Simulator 29Oct2020
Model: Rhodopsin Protein
ns/day, More Is Better
Run 1
SE +/- 0.38, N = 15
13.86
Run 2
14.85
Run 3
15.07
4
8
12
16
20
1. (CXX) g++ options: -O3 -pthread -lm

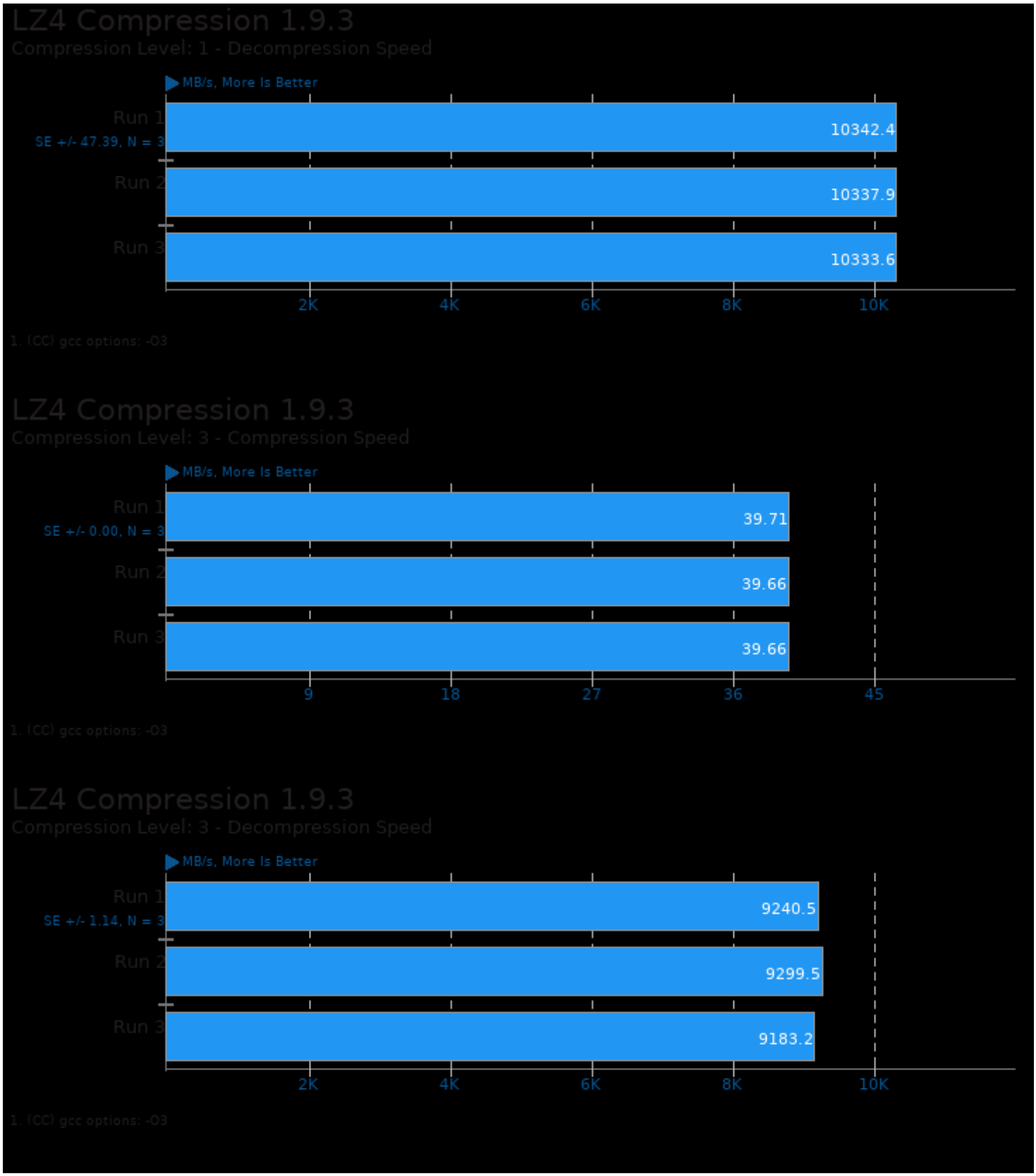

WebP Image Encode 1.1
Encode Settings: Default
Encode Time - Seconds, Fewer Is Better
Run 1
SE +/- 0.003, N = 3
Run 2
Run 3
7.868
7.869
7.865
2
4
6
8
10
1. (CC) gcc options: -fvisibility=hidden -O2 -pthread -lm -ljpeg -lpng16 -ltiff
WebP Image Encode 1.1
Encode Settings: Quality 100
Encode Time - Seconds, Fewer Is Better
Run 1
SE +/- 0.00, N = 3
Run 2
Run 3
10.96
10.96
10.96
3
6
9
12
15
1. (CC) gcc options: -fvisibility=hidden -O2 -pthread -lm -ljpeg -lpng16 -ltiff
WebP Image Encode 1.1
Encode Settings: Quality 100, Lossless
Encode Time - Seconds, Fewer Is Better
Run 1
SE +/- 0.02, N = 3
Run 2
Run 3
29.97
29.93
29.99
7
14
21
28
35
1. (CC) gcc options: -fvisibility=hidden -O2 -pthread -lm -ljpeg -lpng16 -ltiff

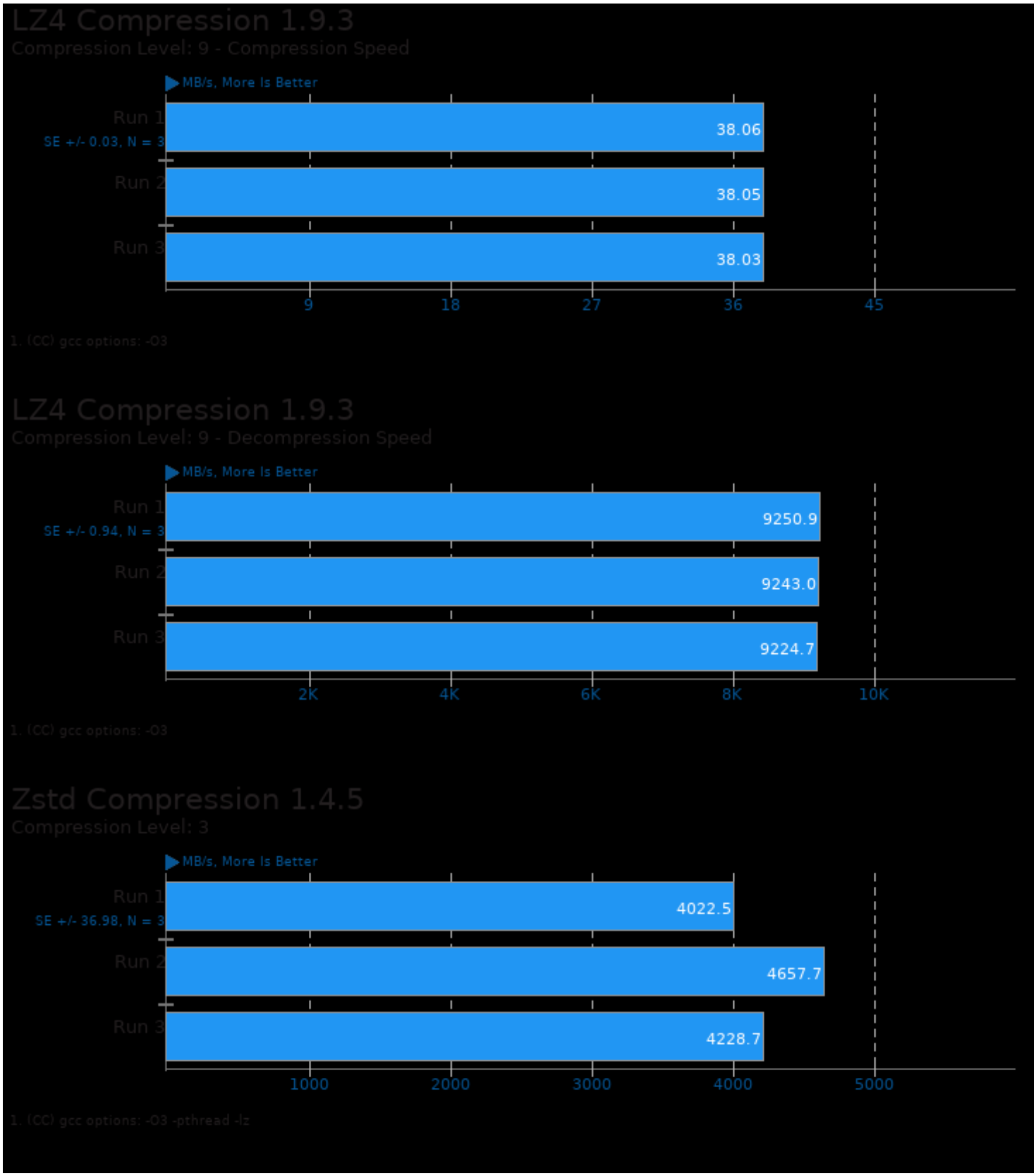

WebP Image Encode 1.1
Encode Settings: Quality 100, Highest Compression
Encode Time - Seconds, Fewer Is Better
Run 1
SE +/- 0.00, N = 3
Run 2
Run 3
17.66
17.66
17.66
4
8
12
16
20
1. (CC) gcc options: -fvisibility=hidden -O2 -pthread -lm -ljpeg -lpng16 -ltiff
WebP Image Encode 1.1
Encode Settings: Quality 100, Lossless, Highest Compression
Encode Time - Seconds, Fewer Is Better
Run 1
SE +/- 0.02, N = 3
Run 2
Run 3
62.11
62.10
62.07
14
28
42
56
70
1. (CC) gcc options: -fvisibility=hidden -O2 -pthread -lm -ljpeg -lpng16 -ltiff
libgav1 2019-10-05
Video Input: Chimera 1080p
FPS, More Is Better
Run 1
SE +/- 0.16, N = 3
Run 2
Run 3
27.70
27.63
27.94
7
14
21
28
35
1. (CXX) g++ options: -O3 -lpthread

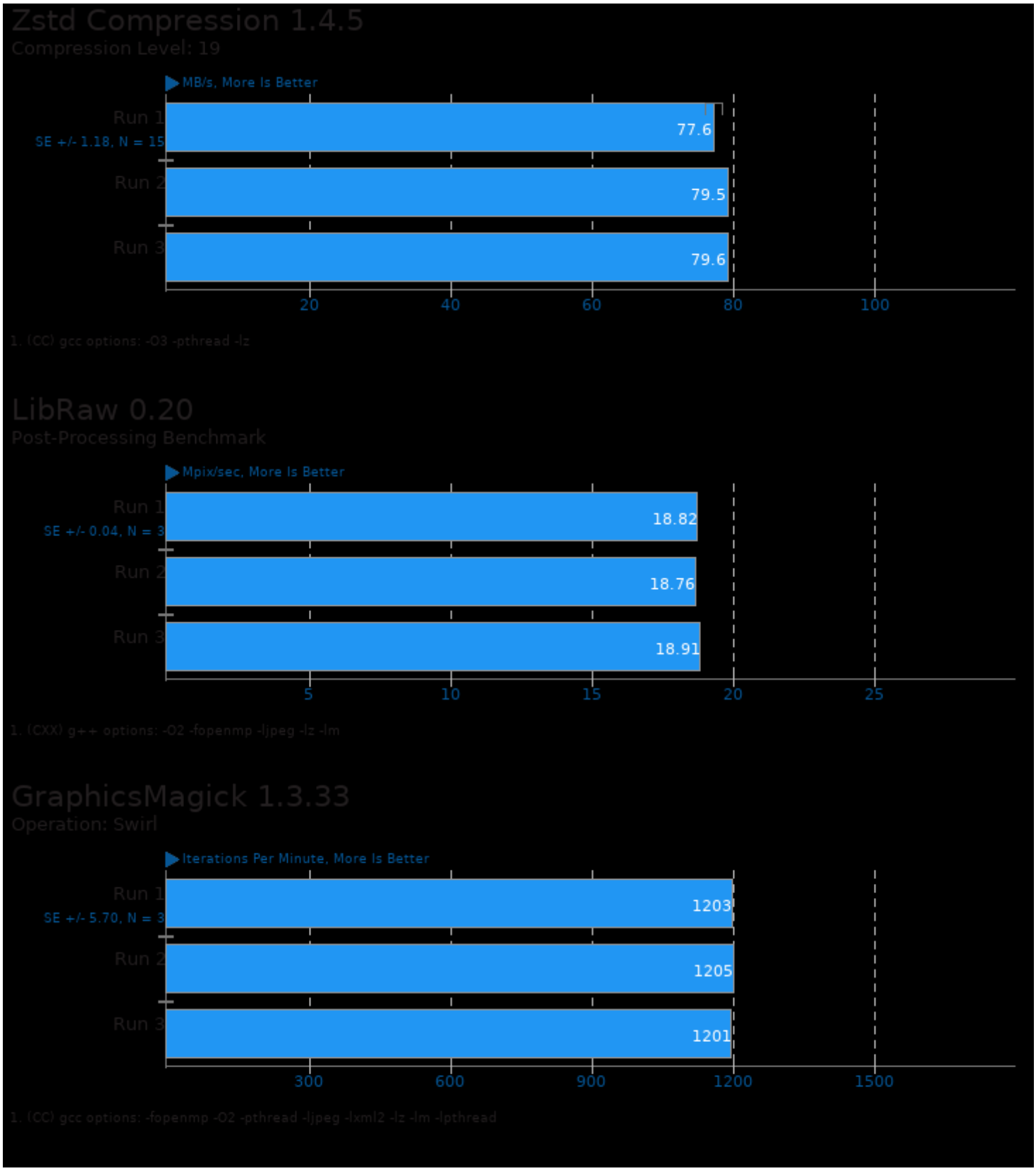

libgav1 2019-10-05
Video Input: Summer Nature 4K
FPS, More Is Better
Run 1
Run 2
Run 3
SE +/- 0.06, N = 3
13.56
13.42
13.72
4
8
12
16
20
1. (CXX) g++ options: -O3 -lpthread
libgav1 2019-10-05
Video Input: Summer Nature 1080p
FPS, More Is Better
Run 1
Run 2
Run 3
SE +/- 0.06, N = 3
42.27
42.66
42.43
10
20
30
40
50
1. (CXX) g++ options: -O3 -lpthread
libgav1 2019-10-05
Video Input: Chimera 1080p 10-bit
FPS, More Is Better
Run 1
Run 2
Run 3
SE +/- 0.02, N = 3
13.76
13.42
13.78
4
8
12
16
20
1. (CXX) g++ options: -O3 -lpthread

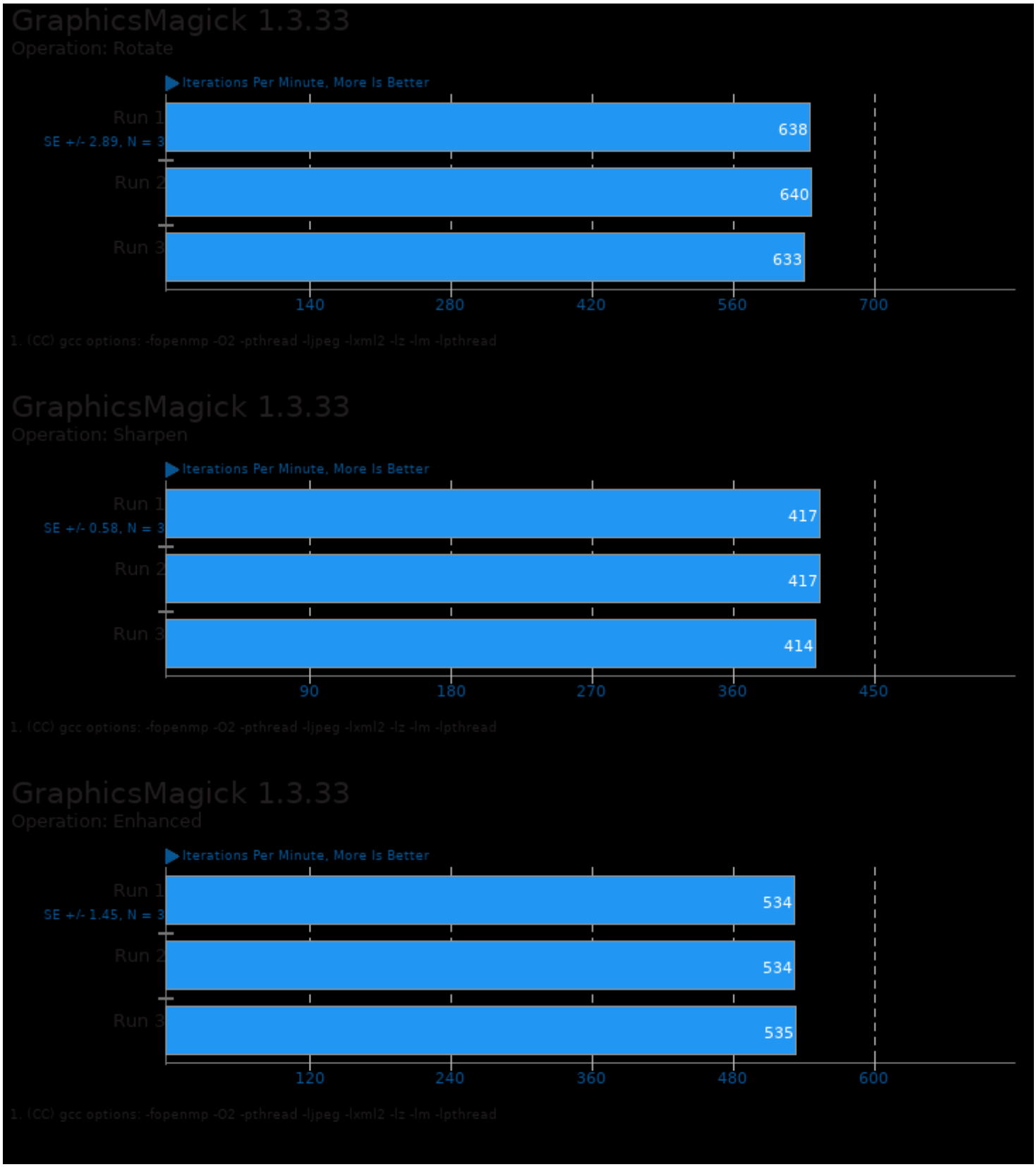

simdjson 0.7.1
Throughput Test: Kostya
GB/s, More Is Better
Run 1
SE +/- 0.00, N = 3
Run 2
Run 3
1.06
1.06
1.06
0.2385
0.477
0.7155
0.954
1.1925
1. (CXX) g++ options: -O3 -pthread
simdjson 0.7.1
Throughput Test: LargeRandom
GB/s, More Is Better
Run 1
SE +/- 0.00, N = 3
Run 2
Run 3
0.48
0.48
0.48
0.108
0.216
0.324
0.432
0.54
1. (CXX) g++ options: -O3 -pthread
simdjson 0.7.1
Throughput Test: PartialTweets
GB/s, More Is Better
Run 1
SE +/- 0.00, N = 3
Run 2
Run 3
1.19
1.19
1.19
0.2678
0.5356
0.8034
1.0712
1.339
1. (CXX) g++ options: -O3 -pthread

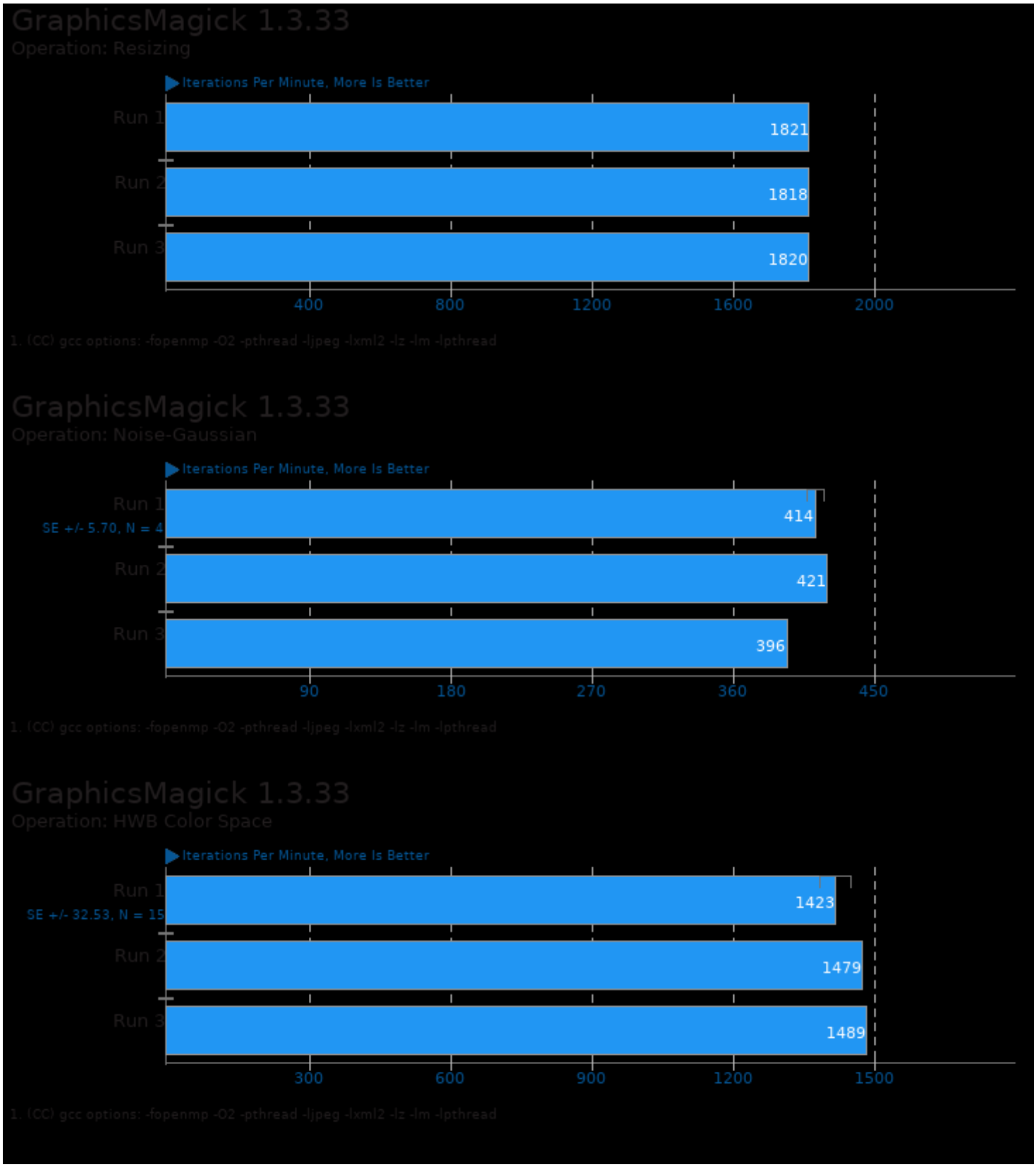

simdjson 0.7.1
Throughput Test: DistinctUserID
GB/s, More Is Better
Run 1
SE +/- 0.00, N = 3
1.23
Run 2
1.24
Run 3
1.24
0.279
0.558
0.837
1.116
1.395
1. (CXX) g++ options: -O3 -pthread
BYTE Unix Benchmark 3.6
Computational Test: Dhrystone 2
LPS, More Is Better
Run 1
SE +/- 95417.01, N = 3
27089795.2
Run 2
27261721.5
Run 3
27275695.0
6M
12M
18M
24M
30M
LZ4 Compression 1.9.3
Compression Level: 1 - Compression Speed
MB/s, More Is Better
Run 1
SE +/- 39.26, N = 3
9087.53
Run 2
9061.86
Run 3
9062.33
2K
4K
6K
8K
10K
1. (CC) gcc options: -O3

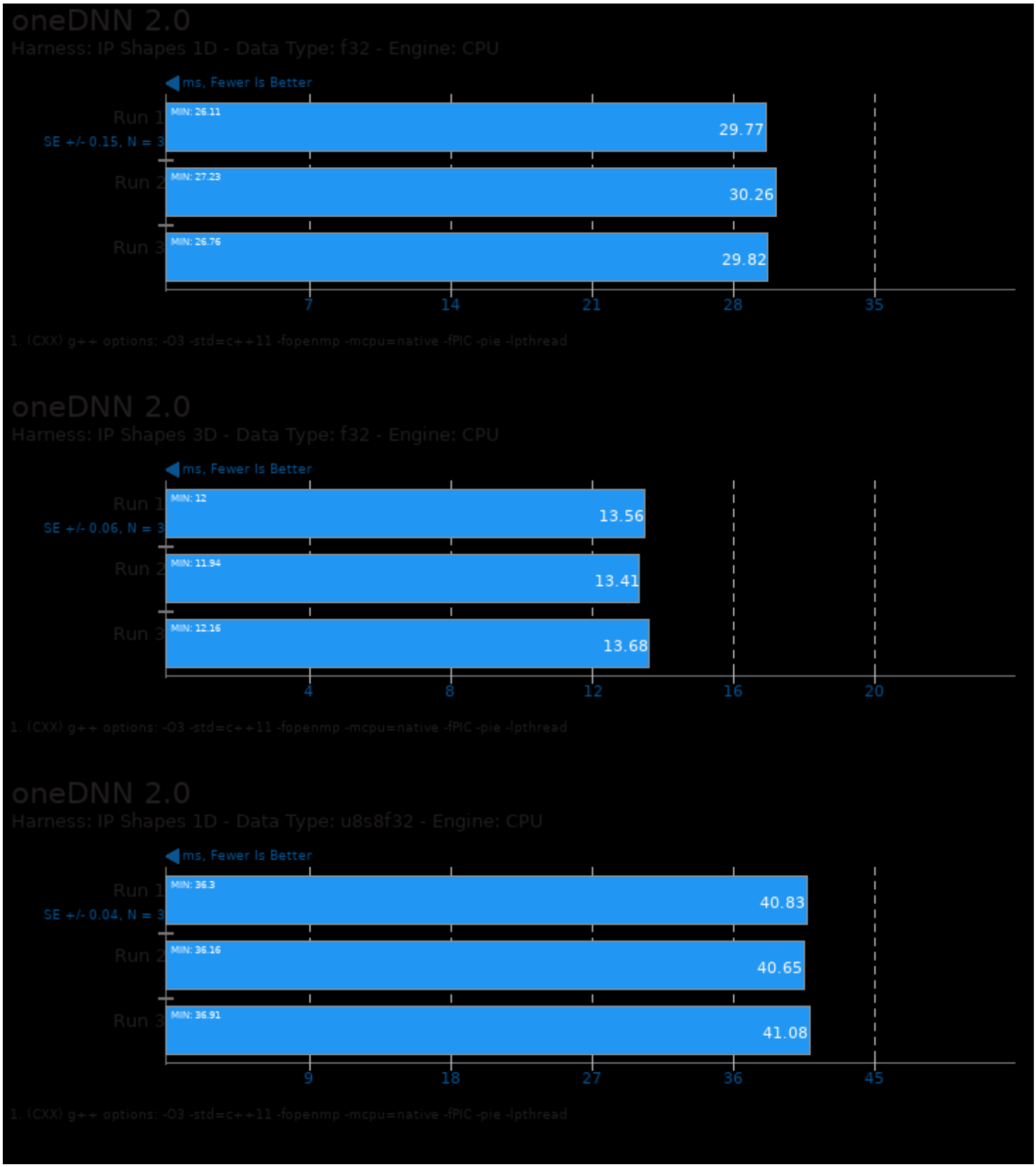

LZ4 Compression 1.9.3
Compression Level: 1 - Decompression Speed
MB/s, More Is Better
Run 1
SE +/- 47.39, N = 3
10342.4
Run 2
10337.9
Run 3
10333.6
2K
4K
6K
8K
10K
1. (CC) gcc options: -O3
LZ4 Compression 1.9.3
Compression Level: 3 - Compression Speed
MB/s, More Is Better
Run 1
SE +/- 0.00, N = 3
39.71
Run 2
39.66
Run 3
39.66
9
18
27
36
45
1. (CC) gcc options: -O3
LZ4 Compression 1.9.3
Compression Level: 3 - Decompression Speed
MB/s, More Is Better
Run 1
SE +/- 1.14, N = 3
9240.5
Run 2
9299.5
Run 3
9183.2
2K
4K
6K
8K
10K
1. (CC) gcc options: -O3

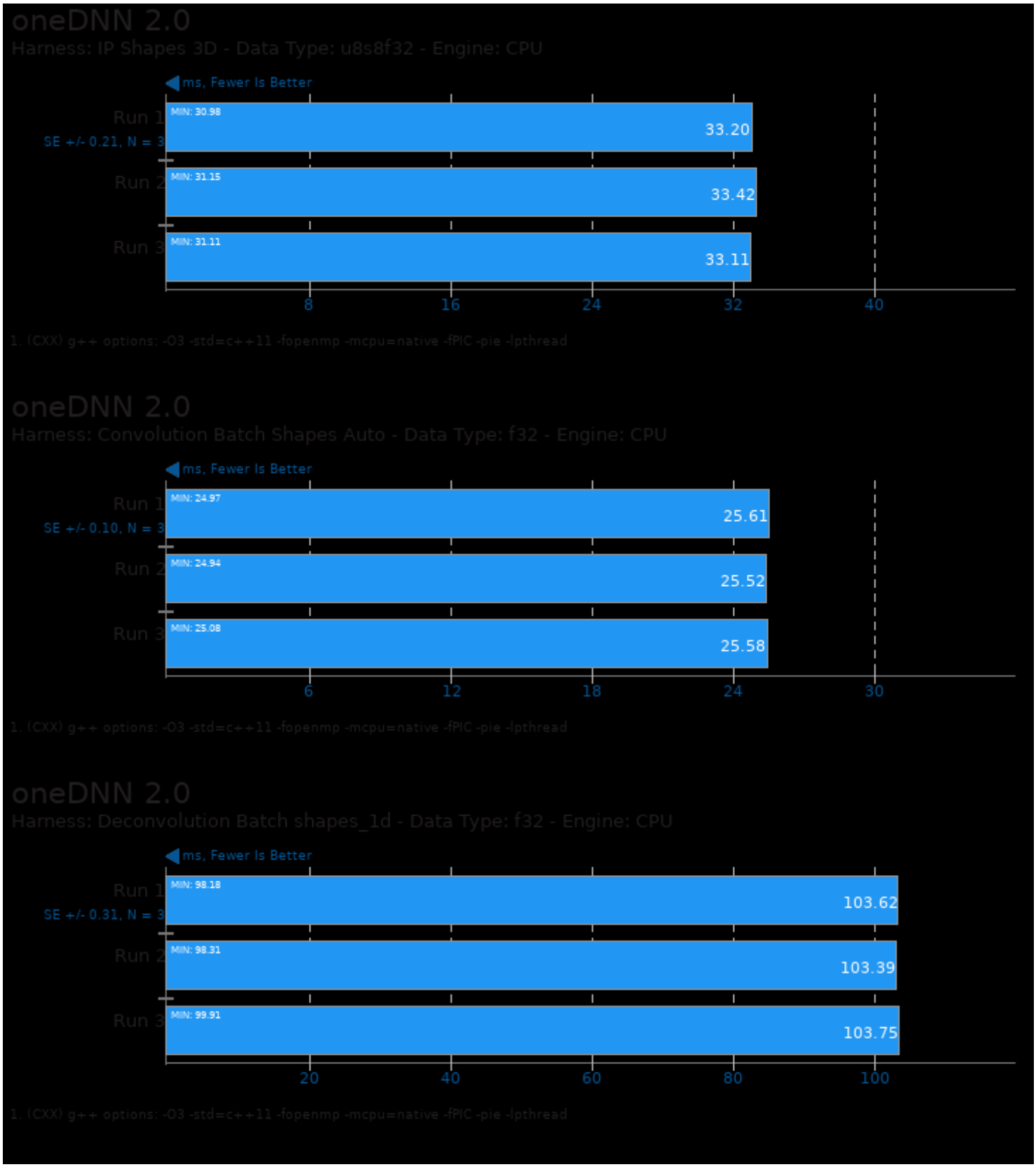

LZ4 Compression 1.9.3
Compression Level: 9 - Compression Speed
MB/s, More Is Better
Run 1
SE +/- 0.03, N = 3
38.06
Run 2
38.05
Run 3
38.03
9
18
27
36
45
1. (CC) gcc options: -O3
LZ4 Compression 1.9.3
Compression Level: 9 - Decompression Speed
MB/s, More Is Better
Run 1
SE +/- 0.94, N = 3
9250.9
Run 2
9243.0
Run 3
9224.7
2K
4K
6K
8K
10K
1. (CC) gcc options: -O3
Zstd Compression 1.4.5
Compression Level: 3
MB/s, More Is Better
Run 1
SE +/- 36.98, N = 3
4022.5
Run 2
4657.7
Run 3
4228.7
1000
2000
3000
4000
5000
1. (CC) gcc options: -O3 -pthread -lz

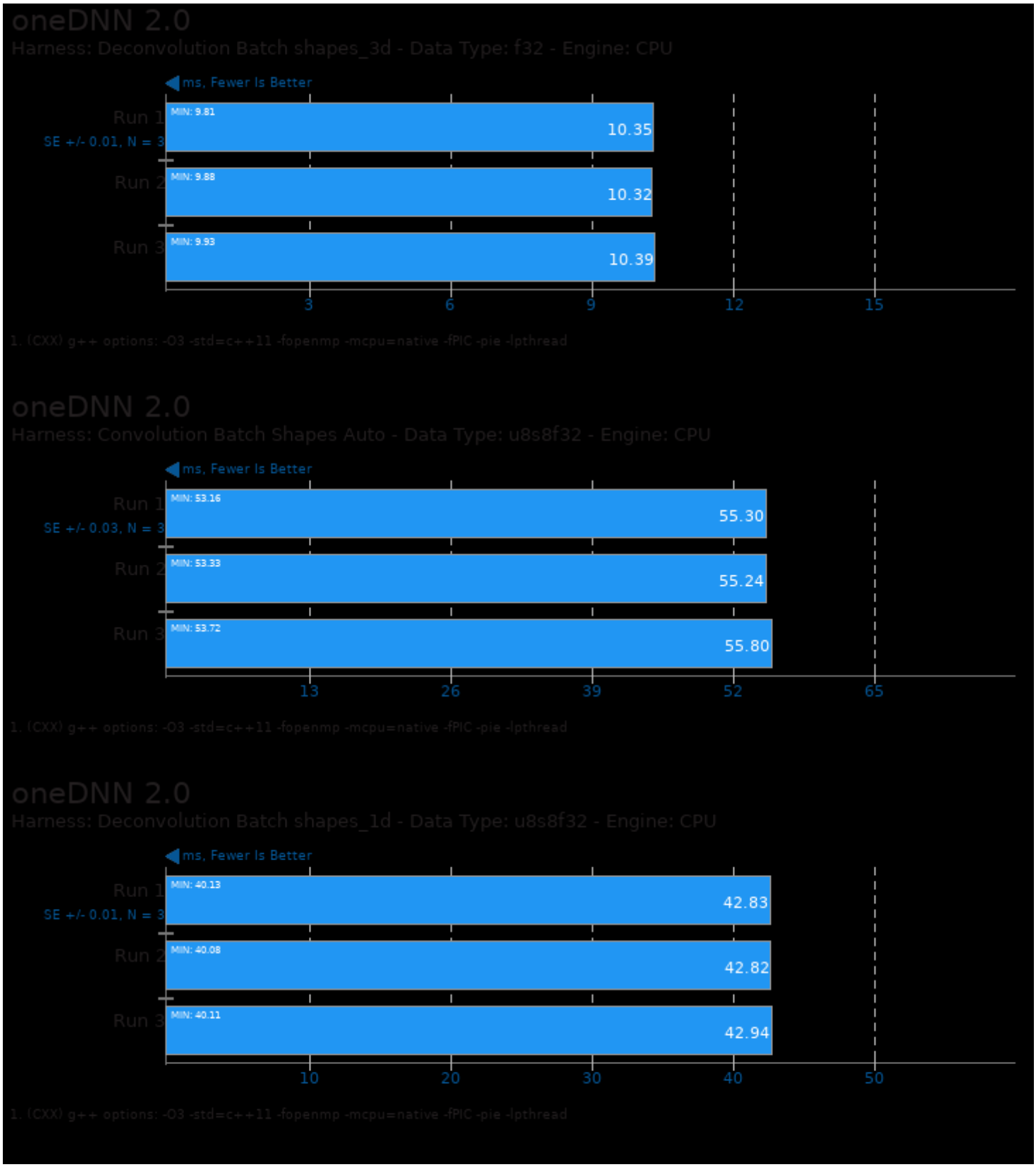

Zstd Compression 1.4.5
Compression Level: 19
MB/s, More Is Better
Run 1
SE +/- 1.18, N = 15
77.6
Run 2
79.5
Run 3
79.6
20
40
60
80
100
1. (CC) gcc options: -O3 -pthread -lz
LibRaw 0.20
Post-Processing Benchmark
Mpix/sec, More Is Better
Run 1
SE +/- 0.04, N = 3
18.82
Run 2
18.76
Run 3
18.91
5
10
15
20
25
1. (CXX) g++ options: -O2 -fopenmp -ljpeg -lz -lm
GraphicsMagick 1.3.33
Operation: Swirl
Iterations Per Minute, More Is Better
Run 1
SE +/- 5.70, N = 3
1203
Run 2
1205
Run 3
1201
300
600
900
1200
1500
1. (CC) gcc options: -fopenmp -O2 -pthread -ljpeg -lxml2 -lz -lm -lpthread

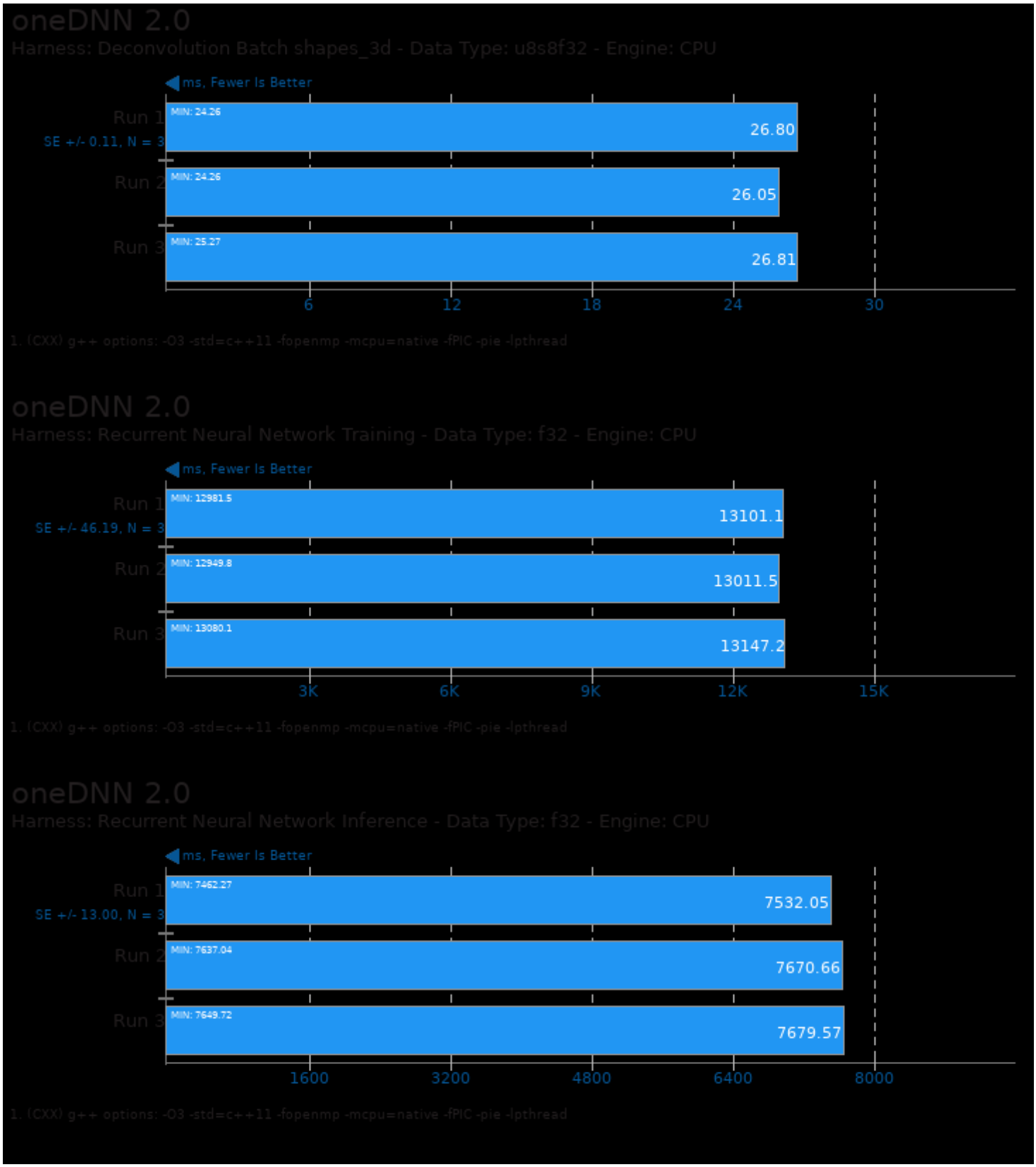

GraphicsMagick 1.3.33
Operation: Rotate
Iterations Per Minute, More Is Better
Run 1
SE +/- 2.89, N = 3
638
Run 2
640
Run 3
633
140
280
420
560
700
1. (CC) gcc options: -fopenmp -O2 -pthread -ljpeg -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: Sharpen
Iterations Per Minute, More Is Better
Run 1
SE +/- 0.58, N = 3
417
Run 2
417
Run 3
414
90
180
270
360
450
1. (CC) gcc options: -fopenmp -O2 -pthread -ljpeg -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: Enhanced
Iterations Per Minute, More Is Better
Run 1
SE +/- 1.45, N = 3
534
Run 2
534
Run 3
535
120
240
360
480
600
1. (CC) gcc options: -fopenmp -O2 -pthread -ljpeg -lxml2 -lz -lm -lpthread

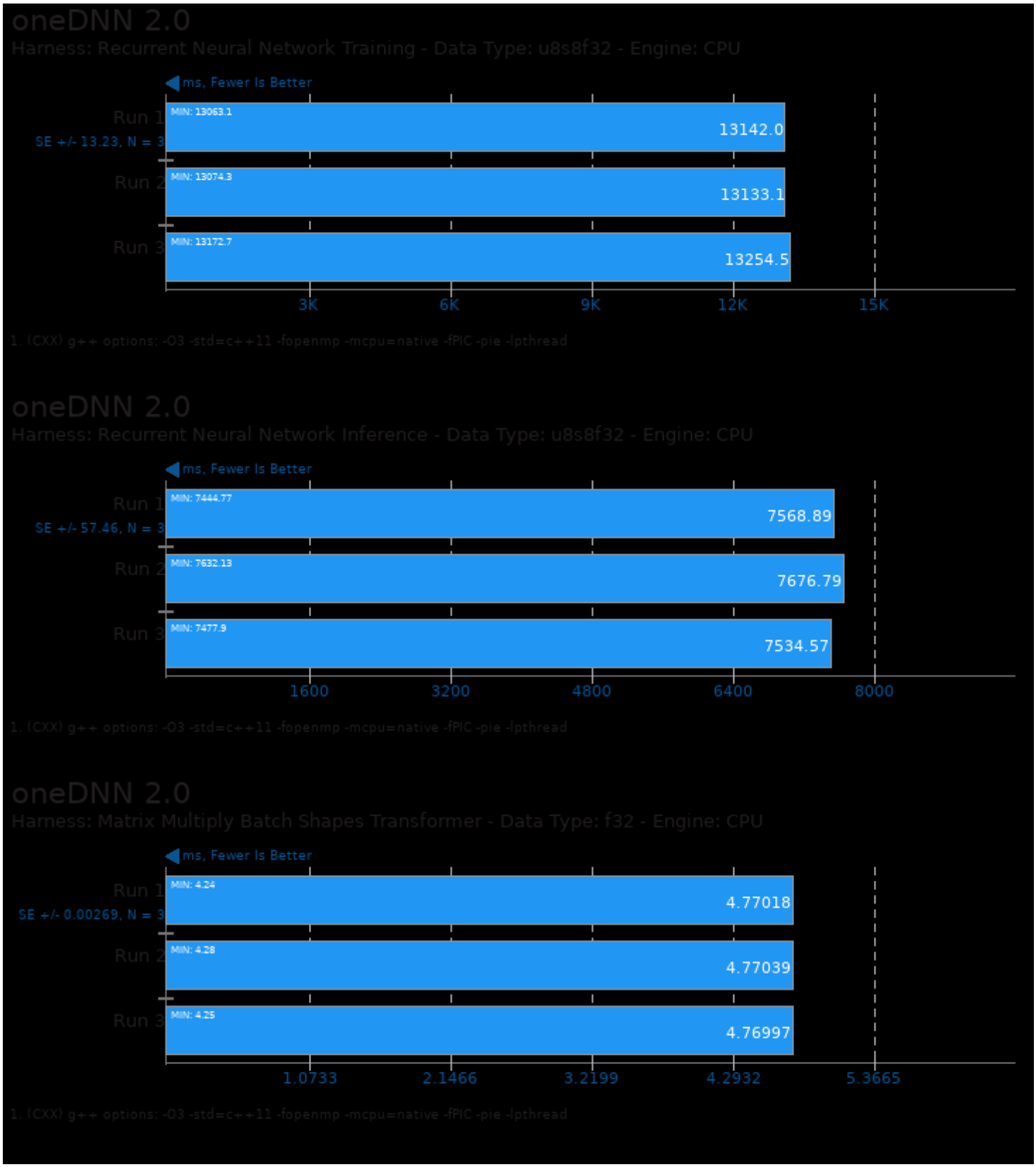

GraphicsMagick 1.3.33
Operation: Resizing
Iterations Per Minute, More Is Better
Run 1
Run 2
Run 3
1821
1818
1820
400
800
1200
1600
2000
1. (CC) gcc options: -fopenmp -O2 -pthread -ljpeg -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: Noise-Gaussian
Iterations Per Minute, More Is Better
Run 1
SE +/- 5.70, N = 4
Run 2
Run 3
414
421
396
90
180
270
360
450
1. (CC) gcc options: -fopenmp -O2 -pthread -ljpeg -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: HWB Color Space
Iterations Per Minute, More Is Better
Run 1
SE +/- 32.53, N = 15
Run 2
Run 3
1423
1479
1489
300
600
900
1200
1500
1. (CC) gcc options: -fopenmp -O2 -pthread -ljpeg -lxml2 -lz -lm -lpthread

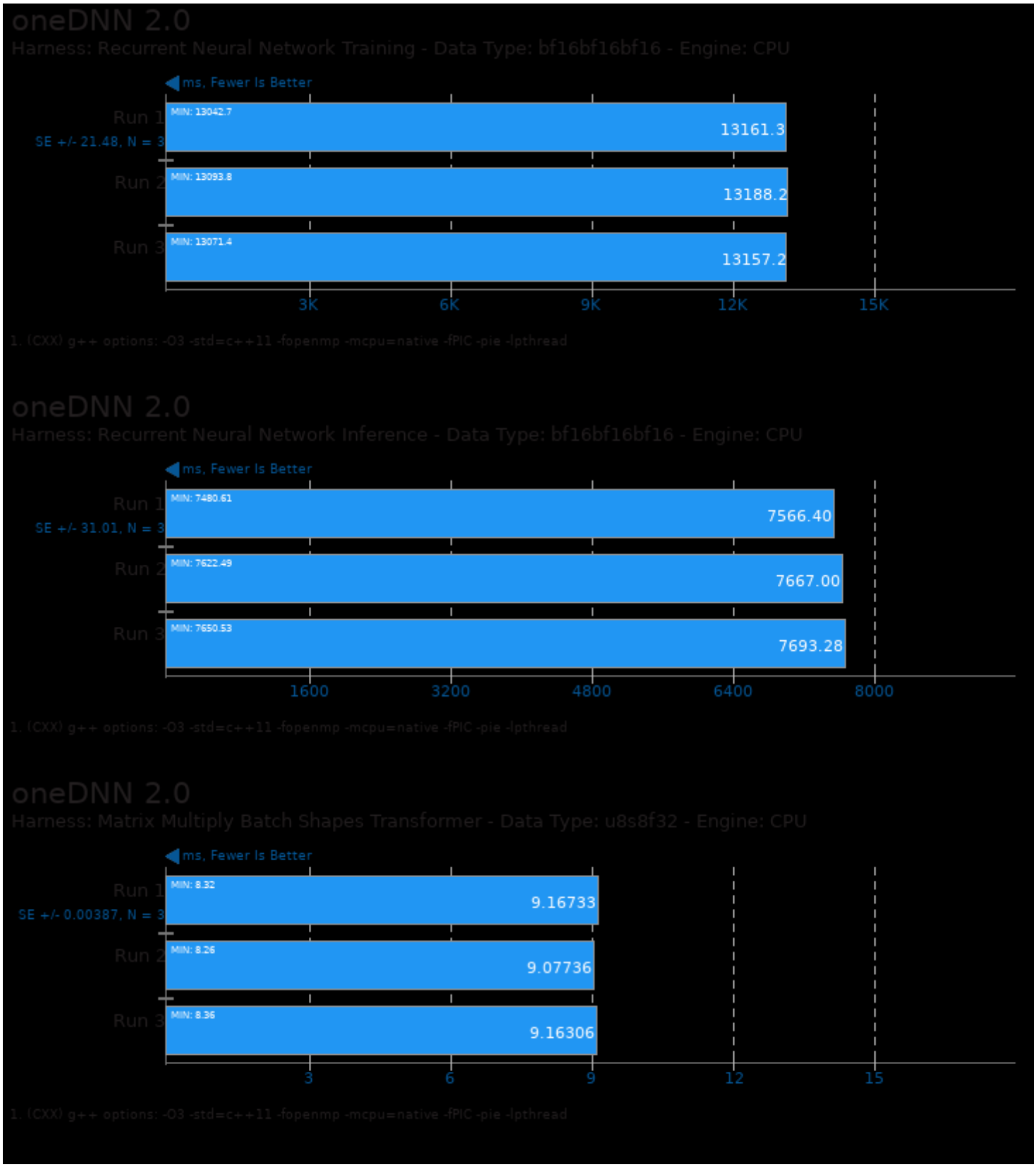

oneDNN 2.0
Harness: IP Shapes 1D - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
Run 1
Run 2
Run 3
SE +/- 0.15, N = 3
MIN: 26.11
29.77
MIN: 27.23
30.26
MIN: 26.76
29.82
7
14
21
28
35
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread
oneDNN 2.0
Harness: IP Shapes 3D - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
Run 1
Run 2
Run 3
SE +/- 0.06, N = 3
MIN: 12
13.56
MIN: 11.94
13.41
MIN: 12.16
13.68
4
8
12
16
20
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread
oneDNN 2.0
Harness: IP Shapes 1D - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
Run 1
Run 2
Run 3
SE +/- 0.04, N = 3
MIN: 36.3
40.83
MIN: 36.16
40.65
MIN: 36.91
41.08
9
18
27
36
45
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread

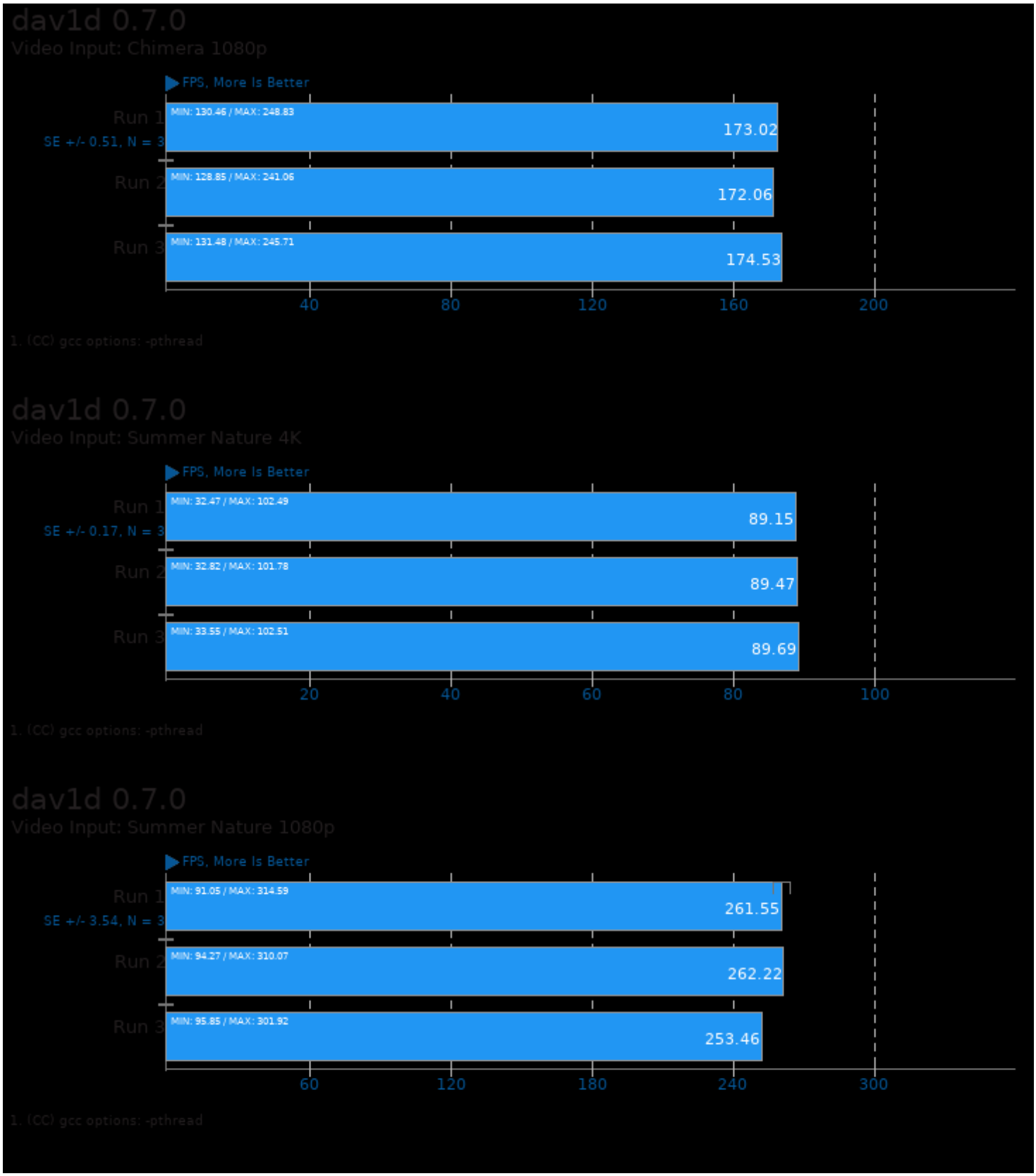

oneDNN 2.0
Harness: IP Shapes 3D - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
Run 1
SE +/- 0.21, N = 3
MIN: 30.98
33.20
Run 2
MIN: 31.15
33.42
Run 3
MIN: 31.11
33.11
8
16
24
32
40
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread
oneDNN 2.0
Harness: Convolution Batch Shapes Auto - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
Run 1
SE +/- 0.10, N = 3
MIN: 24.97
25.61
Run 2
MIN: 24.94
25.52
Run 3
MIN: 25.08
25.58
6
12
18
24
30
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread
oneDNN 2.0
Harness: Deconvolution Batch shapes_1d - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
Run 1
SE +/- 0.31, N = 3
MIN: 98.18
103.62
Run 2
MIN: 98.31
103.39
Run 3
MIN: 99.91
103.75
20
40
60
80
100
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread

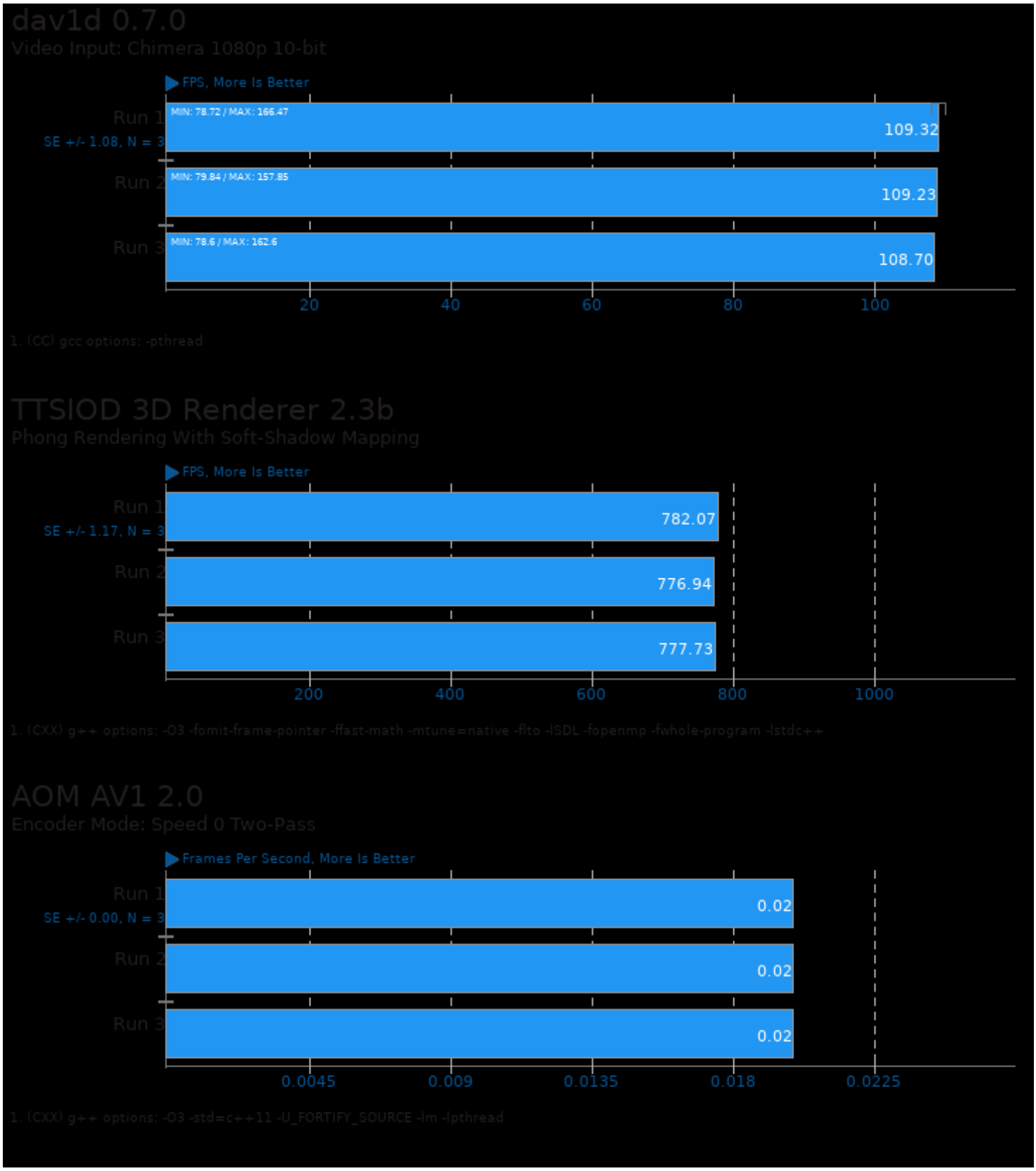

oneDNN 2.0
Harness: Deconvolution Batch shapes_3d - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
Run 1
MIN: 9.81
10.35
SE +/- 0.01, N = 3
Run 2
MIN: 9.88
10.32
Run 3
MIN: 9.93
10.39
3
6
9
12
15
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread
oneDNN 2.0
Harness: Convolution Batch Shapes Auto - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
Run 1
MIN: 53.16
55.30
SE +/- 0.03, N = 3
Run 2
MIN: 53.33
55.24
Run 3
MIN: 53.72
55.80
13
26
39
52
65
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread
oneDNN 2.0
Harness: Deconvolution Batch shapes_1d - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
Run 1
MIN: 40.13
42.83
SE +/- 0.01, N = 3
Run 2
MIN: 40.08
42.82
Run 3
MIN: 40.11
42.94
10
20
30
40
50
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread

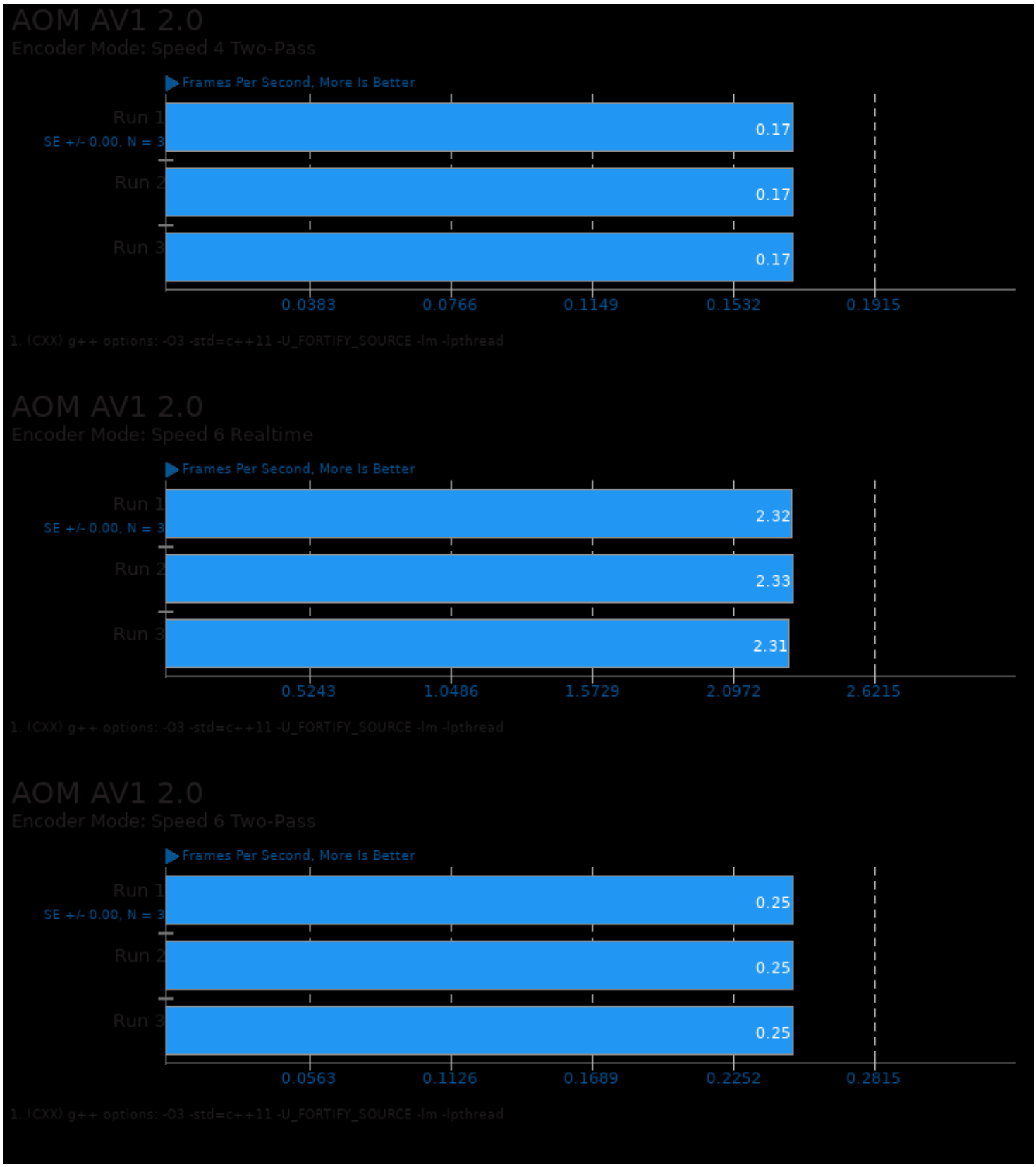

oneDNN 2.0
Harness: Deconvolution Batch shapes_3d - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
Run 1
SE +/- 0.11, N = 3
MIN: 24.26
26.80
Run 2
MIN: 24.26
26.05
Run 3
MIN: 25.27
26.81
6
12
18
24
30
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread
oneDNN 2.0
Harness: Recurrent Neural Network Training - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
Run 1
SE +/- 46.19, N = 3
MIN: 12981.5
13101.1
Run 2
MIN: 12949.8
13011.5
Run 3
MIN: 13080.1
13147.2
3K
6K
9K
12K
15K
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread
oneDNN 2.0
Harness: Recurrent Neural Network Inference - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
Run 1
SE +/- 13.00, N = 3
MIN: 7462.27
7532.05
Run 2
MIN: 7637.04
7670.66
Run 3
MIN: 7649.72
7679.57
1600
3200
4800
6400
8000
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread


oneDNN 2.0
Harness: Recurrent Neural Network Training - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
Run 1
SE +/- 13.23, N = 3
MIN: 13063.1
13142.0
Run 2
MIN: 13074.3
13133.1
Run 3
MIN: 13172.7
13254.5
3K
6K
9K
12K
15K
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread
oneDNN 2.0
Harness: Recurrent Neural Network Inference - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
Run 1
SE +/- 57.46, N = 3
MIN: 7444.77
7568.89
Run 2
MIN: 7632.13
7676.79
Run 3
MIN: 7477.9
7534.57
1600
3200
4800
6400
8000
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread
oneDNN 2.0
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
Run 1
SE +/- 0.00269, N = 3
MIN: 4.24
4.77018
Run 2
MIN: 4.28
4.77039
Run 3
MIN: 4.25
4.76997
1.0733
2.1466
3.2199
4.2932
5.3665
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread


oneDNN 2.0
Harness: Recurrent Neural Network Training - Data Type: bf16bf16bf16 - Engine: CPU
ms, Fewer Is Better
Run 1
SE +/- 21.48, N = 3
MIN: 13042.7
13161.3
Run 2
MIN: 13093.8
13188.2
Run 3
MIN: 13071.4
13157.2
3K
6K
9K
12K
15K
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread
oneDNN 2.0
Harness: Recurrent Neural Network Inference - Data Type: bf16bf16bf16 - Engine: CPU
ms, Fewer Is Better
Run 1
SE +/- 31.01, N = 3
MIN: 7480.61
7566.40
Run 2
MIN: 7622.49
7667.00
Run 3
MIN: 7650.53
7693.28
1600
3200
4800
6400
8000
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread
oneDNN 2.0
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
Run 1
SE +/- 0.00387, N = 3
MIN: 8.32
9.16733
Run 2
MIN: 8.26
9.07736
Run 3
MIN: 8.36
9.16306
3
6
9
12
15
1. (CXX) g++ options: -O3 -std=c++11 -fopenmp -mcpu=native -fPIC -pie -lpthread

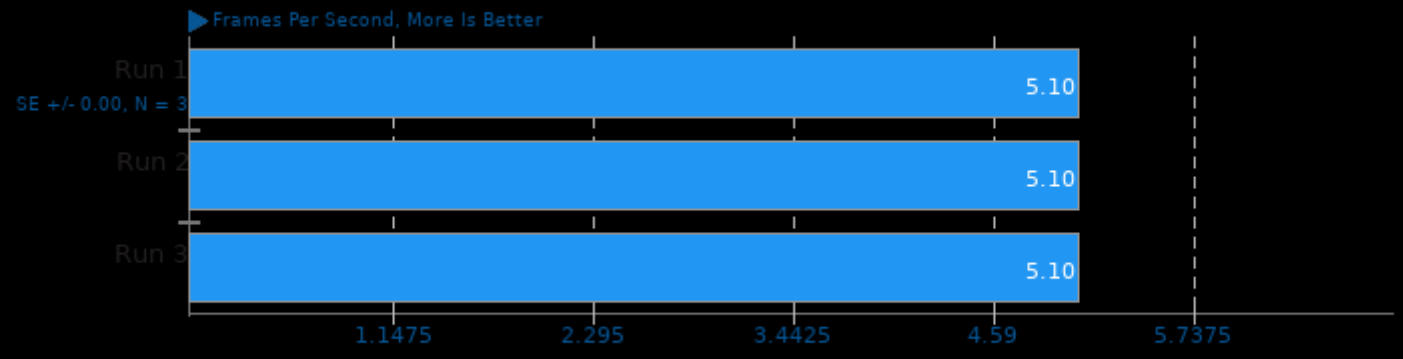

dav1d 0.7.0
Video Input: Chimera 1080p
FPS, More Is Better
Run 1
MIN: 130.46 / MAX: 248.83
173.02
SE +/- 0.51, N = 3
Run 2
MIN: 128.85 / MAX: 241.06
172.06
Run 3
MIN: 131.48 / MAX: 245.71
174.53
40
80
120
160
200
1. (CC) gcc options: -pthread
dav1d 0.7.0
Video Input: Summer Nature 4K
FPS, More Is Better
Run 1
MIN: 32.47 / MAX: 102.49
89.15
SE +/- 0.17, N = 3
Run 2
MIN: 32.82 / MAX: 101.78
89.47
Run 3
MIN: 33.55 / MAX: 102.51
89.69
20
40
60
80
100
1. (CC) gcc options: -pthread
dav1d 0.7.0
Video Input: Summer Nature 1080p
FPS, More Is Better
Run 1
MIN: 91.05 / MAX: 314.59
261.55
SE +/- 3.54, N = 3
Run 2
MIN: 94.27 / MAX: 310.07
262.22
Run 3
MIN: 95.85 / MAX: 301.92
253.46
60
120
180
240
300
1. (CC) gcc options: -pthread


dav1d 0.7.0
Video Input: Chimera 1080p 10-bit
FPS, More Is Better
Run 1
MIN: 78.72 / MAX: 166.47
109.32
SE +/- 1.08, N = 3
Run 2
MIN: 79.84 / MAX: 157.85
109.23
Run 3
MIN: 78.6 / MAX: 162.6
108.70
20
40
60
80
100
1. (CC) gcc options: -pthread
TTSIOD 3D Renderer 2.3b
Phong Rendering With Soft-Shadow Mapping
FPS, More Is Better
Run 1
782.07
SE +/- 1.17, N = 3
Run 2
776.94
Run 3
777.73
200
400
600
800
1000
1. (CXX) g++ options: -O3 -fomit-frame-pointer -ffast-math -mtune=native -flto -lSDL -fopenmp -fwhole-program -lstdc++
AOM AV1 2.0
Encoder Mode: Speed 0 Two-Pass
Frames Per Second, More Is Better
Run 1
0.02
SE +/- 0.00, N = 3
Run 2
0.02
Run 3
0.02
0.0045
0.009
0.0135
0.018
0.0225
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread


AOM AV1 2.0
Encoder Mode: Speed 4 Two-Pass
Frames Per Second, More Is Better
Run 1
Run 2
Run 3
SE +/- 0.00, N = 3
0.17
0.17
0.17
0.0383
0.0766
0.1149
0.1532
0.1915
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 2.0
Encoder Mode: Speed 6 Realtime
Frames Per Second, More Is Better
Run 1
Run 2
Run 3
SE +/- 0.00, N = 3
2.32
2.33
2.31
0.5243
1.0486
1.5729
2.0972
2.6215
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 2.0
Encoder Mode: Speed 6 Two-Pass
Frames Per Second, More Is Better
Run 1
Run 2
Run 3
SE +/- 0.00, N = 3
0.25
0.25
0.25
0.0563
0.1126
0.1689
0.2252
0.2815
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

AOM AV1 2.0

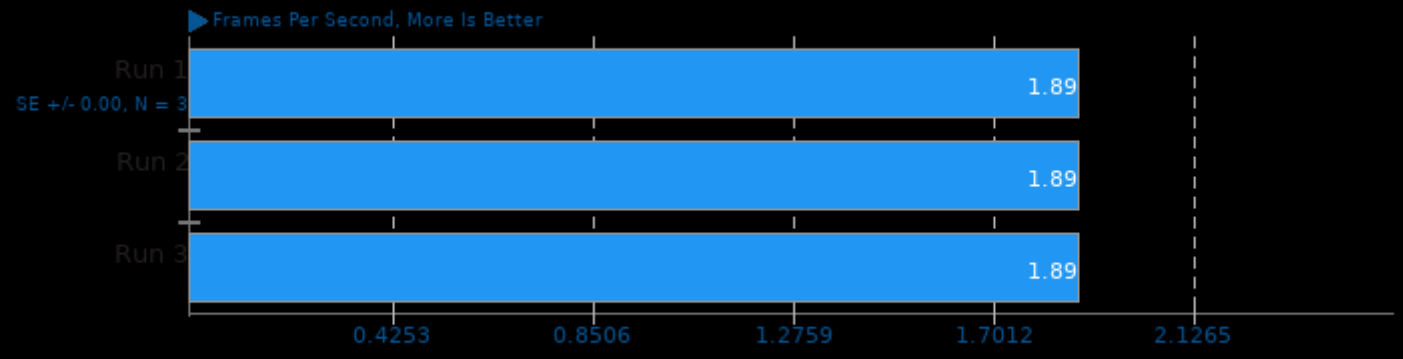
Encoder Mode: Speed 8 Realtime



1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

Kvazaar 2.0

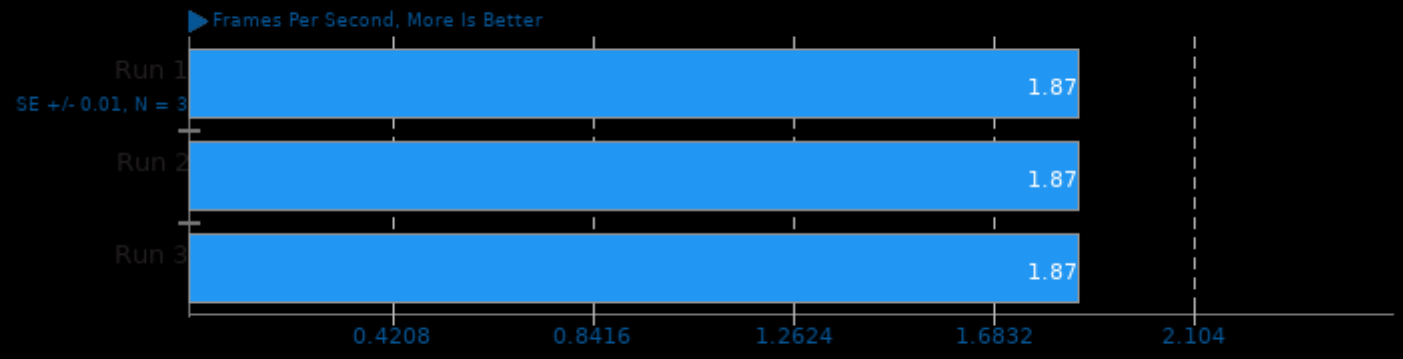
Video Input: Bosphorus 4K - Video Preset: Slow



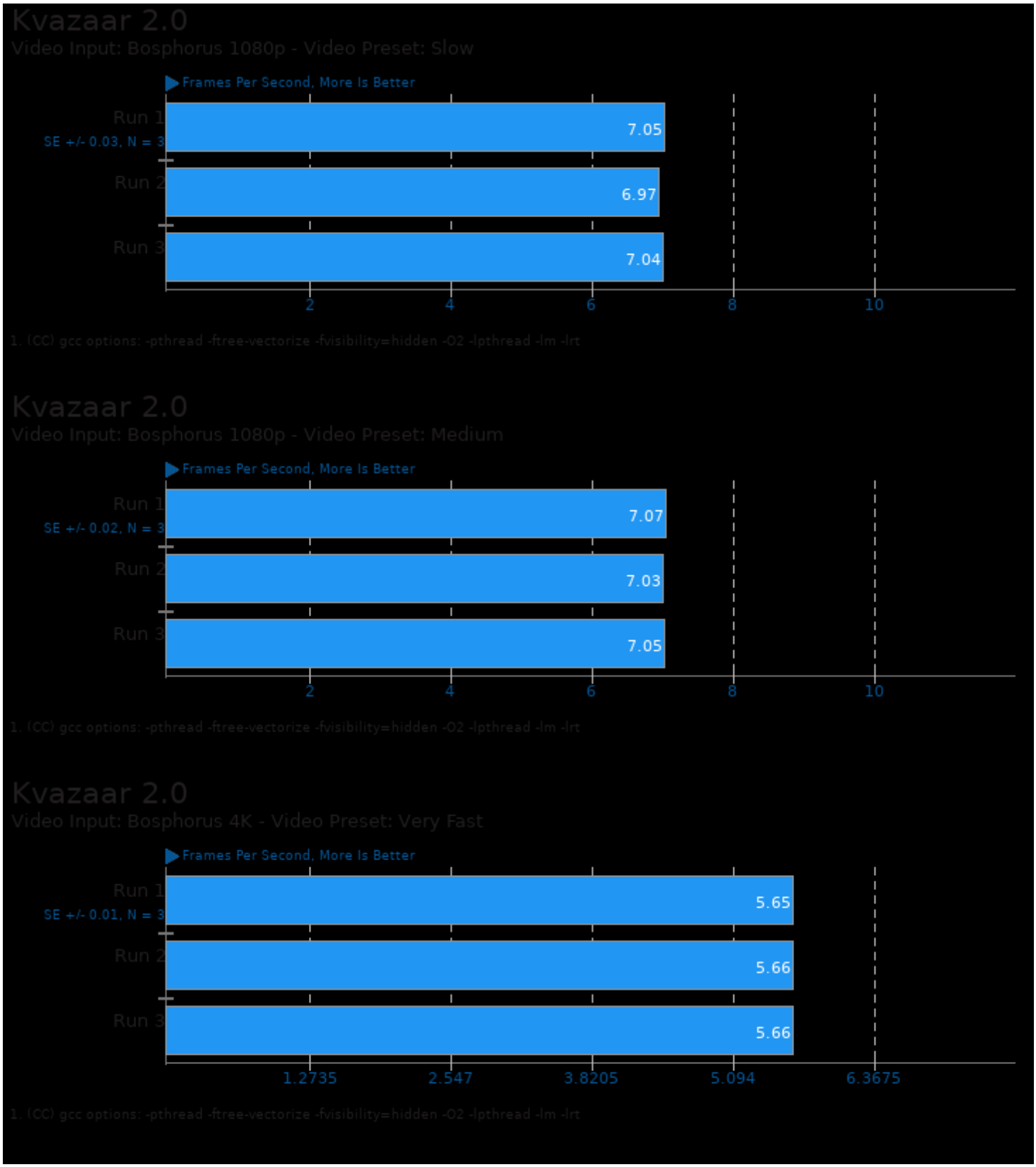
1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -O2 -lpthread -lm -lrt

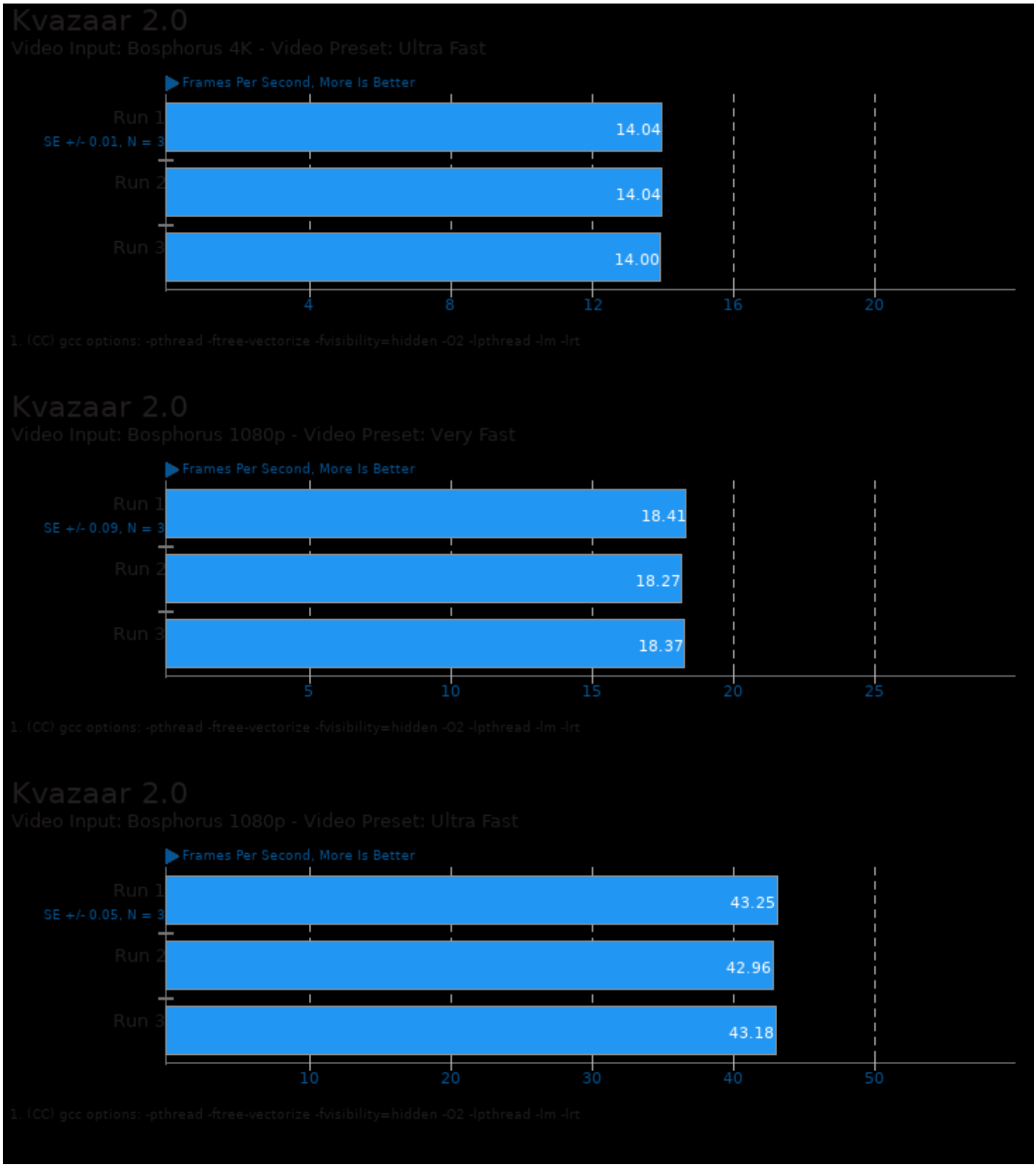
Kvazaar 2.0

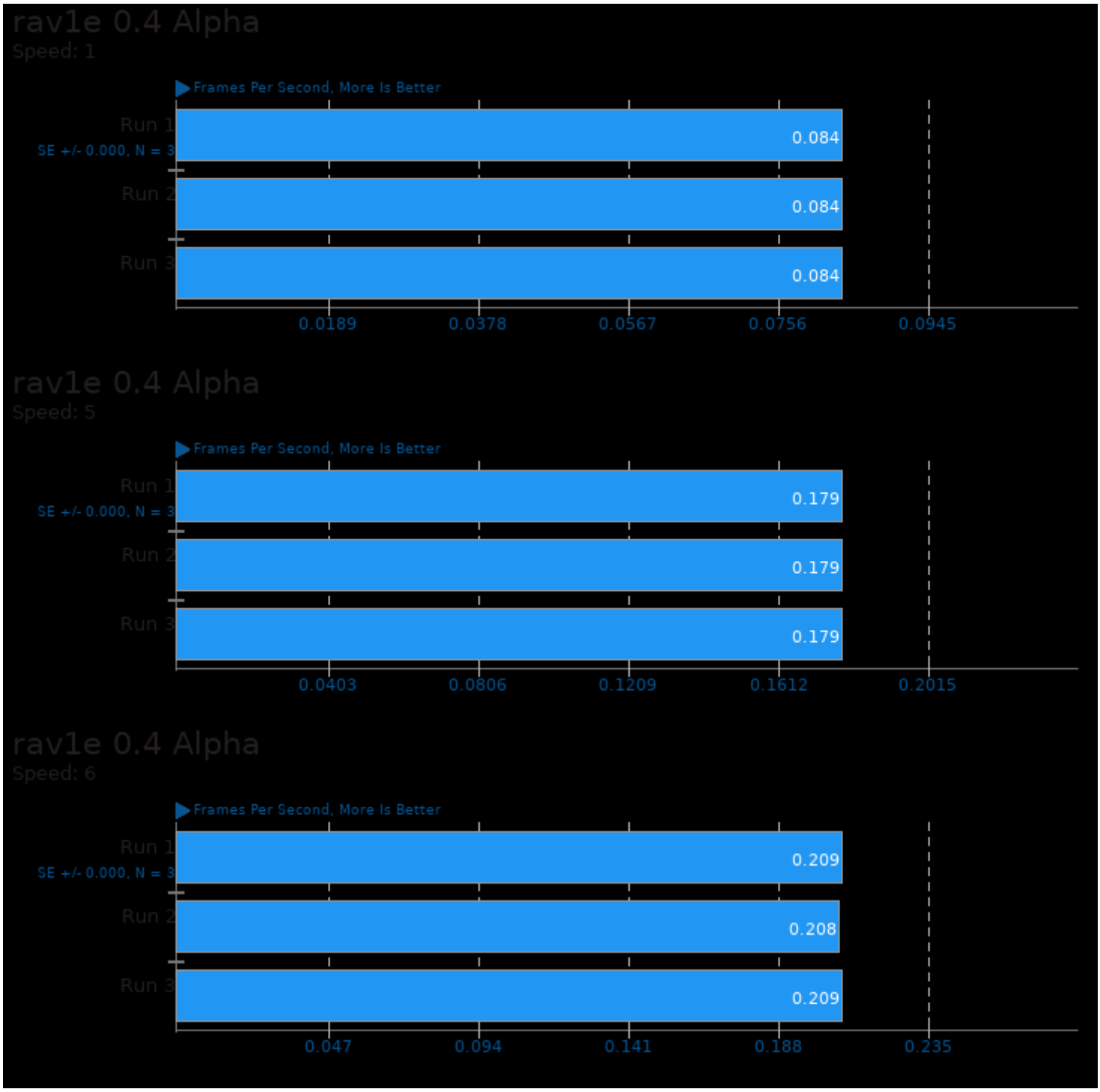
Video Input: Bosphorus 4K - Video Preset: Medium

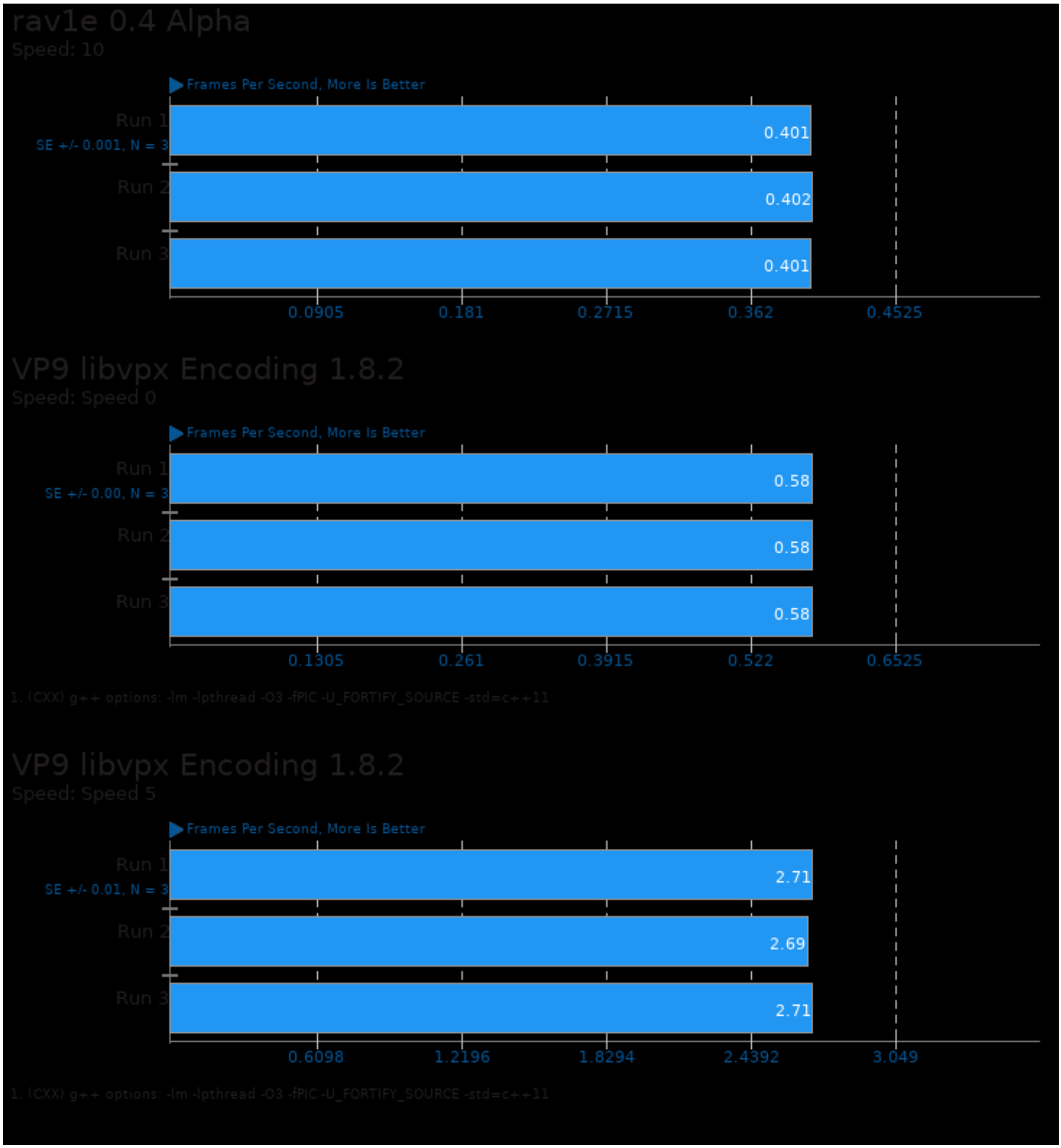


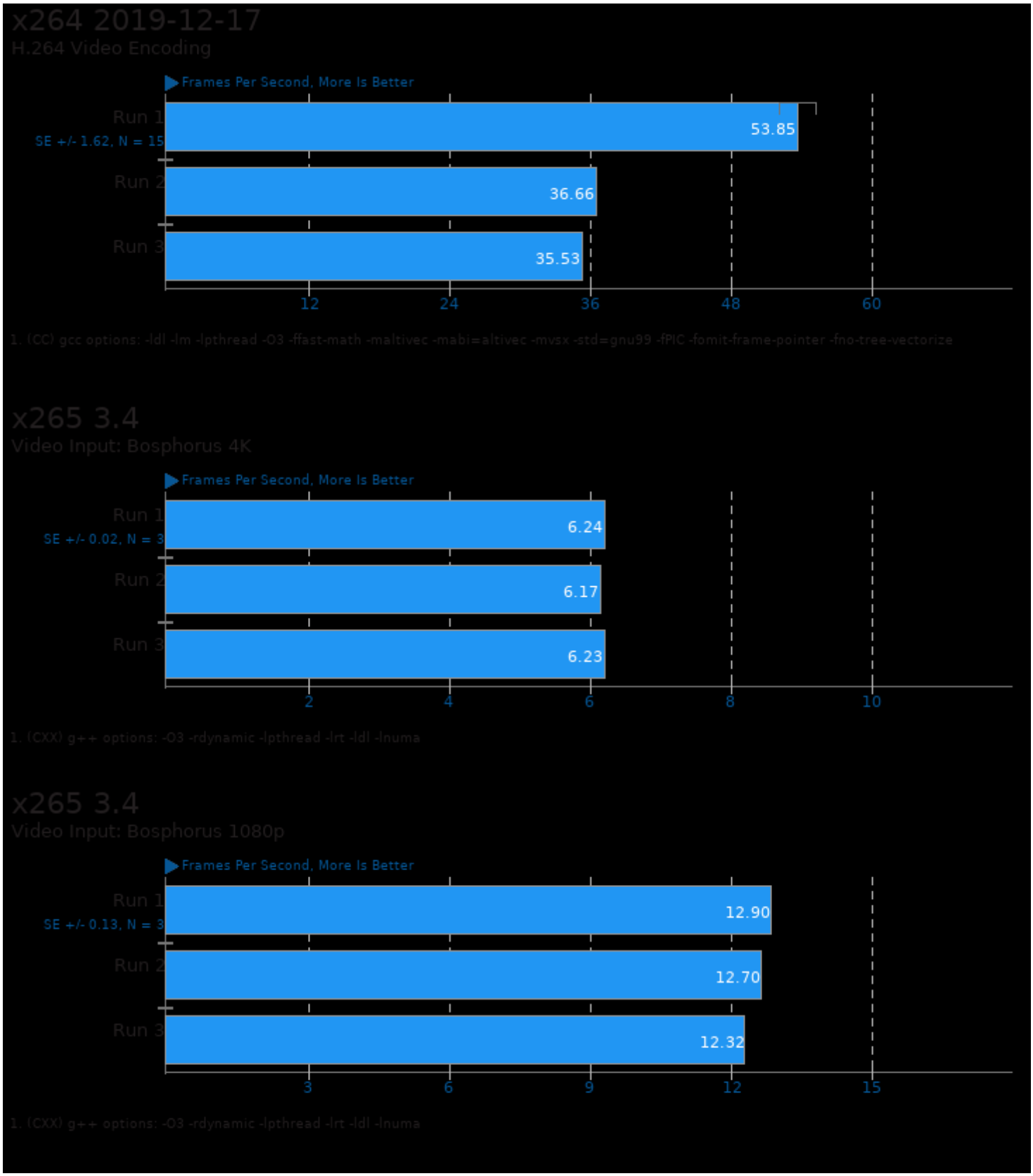
1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -O2 -lpthread -lm -lrt

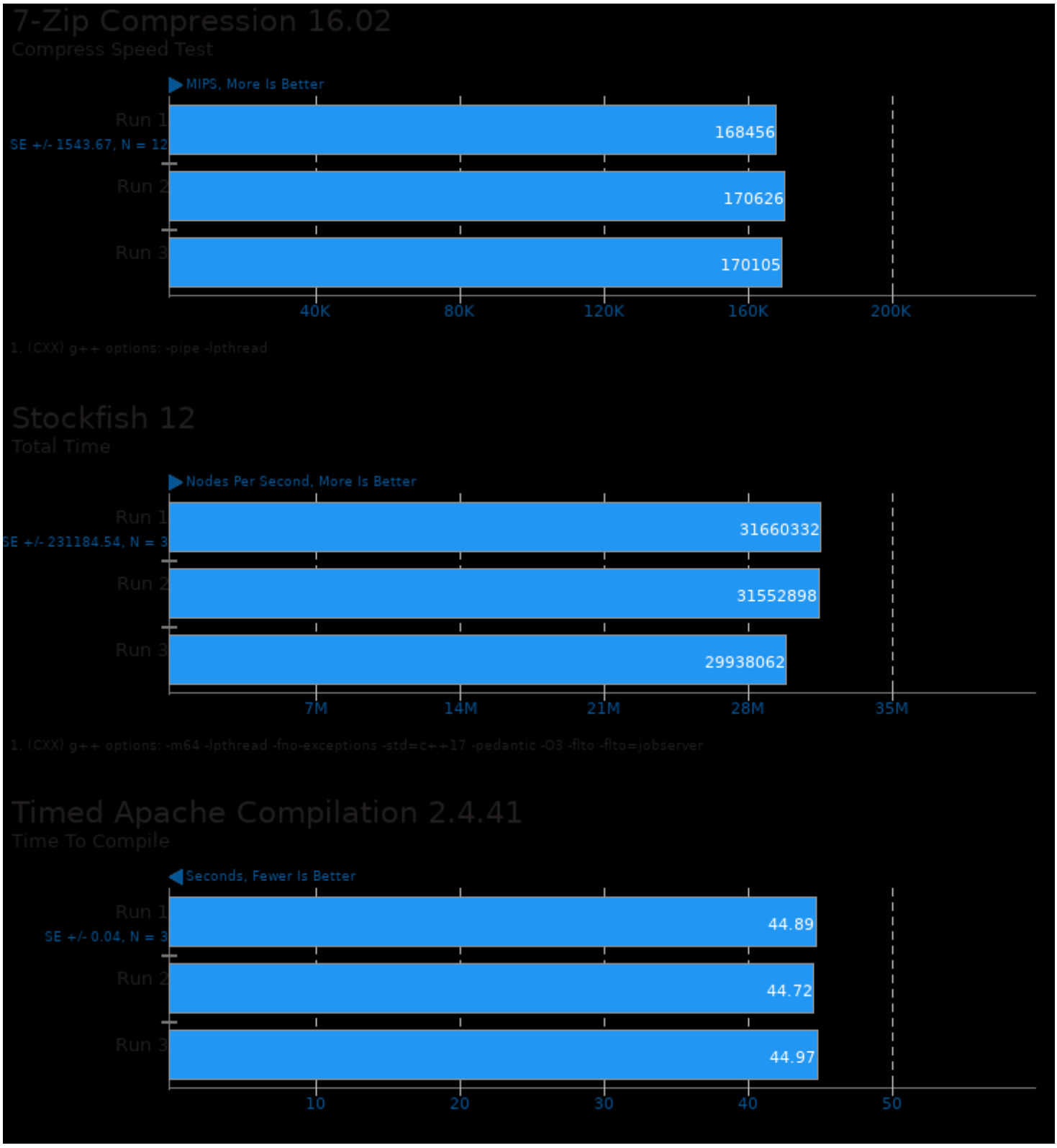

Kvazaar 2.0
Video Input: Bosphorus 1080p - Video Preset: Slow
Frames Per Second, More Is Better
Run 1
SE +/- 0.03, N = 3
7.05
Run 2
6.97
Run 3
7.04
2
4
6
8
10
1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -O2 -lpthread -lm -lrt
Kvazaar 2.0
Video Input: Bosphorus 1080p - Video Preset: Medium
Frames Per Second, More Is Better
Run 1
SE +/- 0.02, N = 3
7.07
Run 2
7.03
Run 3
7.05
2
4
6
8
10
1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -O2 -lpthread -lm -lrt
Kvazaar 2.0
Video Input: Bosphorus 4K - Video Preset: Very Fast
Frames Per Second, More Is Better
Run 1
SE +/- 0.01, N = 3
5.65
Run 2
5.66
Run 3
5.66
1.2735
2.547
3.8205
5.094
6.3675
1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -O2 -lpthread -lm -lrt

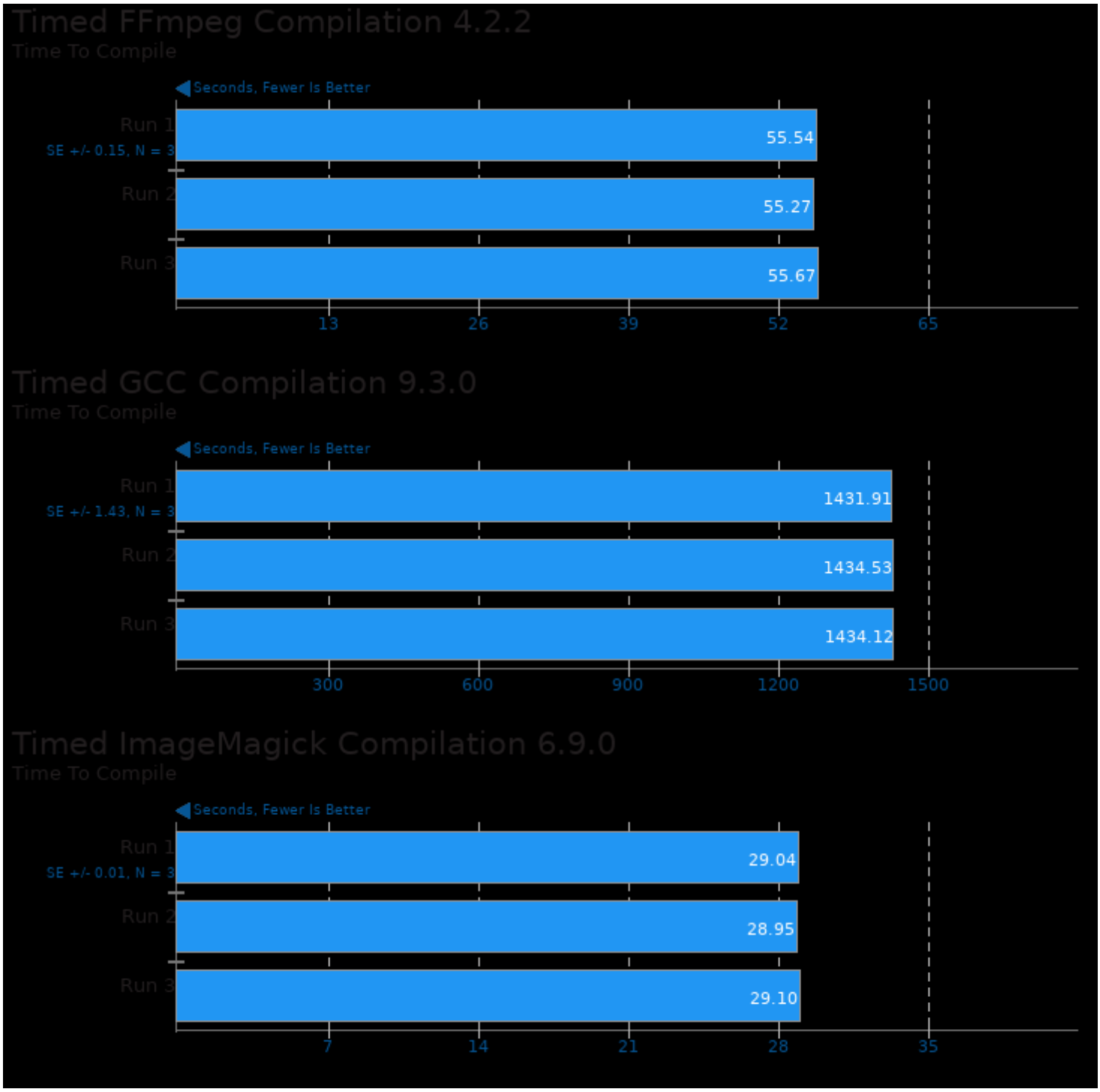

Kvazaar 2.0
Video Input: Bosphorus 4K - Video Preset: Ultra Fast
Frames Per Second, More Is Better
Run 1
SE +/- 0.01, N = 3
14.04
Run 2
14.04
Run 3
14.00
4
8
12
16
20
1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -O2 -lpthread -lm -lrt
Kvazaar 2.0
Video Input: Bosphorus 1080p - Video Preset: Very Fast
Frames Per Second, More Is Better
Run 1
SE +/- 0.09, N = 3
18.41
Run 2
18.27
Run 3
18.37
5
10
15
20
25
1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -O2 -lpthread -lm -lrt
Kvazaar 2.0
Video Input: Bosphorus 1080p - Video Preset: Ultra Fast
Frames Per Second, More Is Better
Run 1
SE +/- 0.05, N = 3
43.25
Run 2
42.96
Run 3
43.18
10
20
30
40
50
1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -O2 -lpthread -lm -lrt

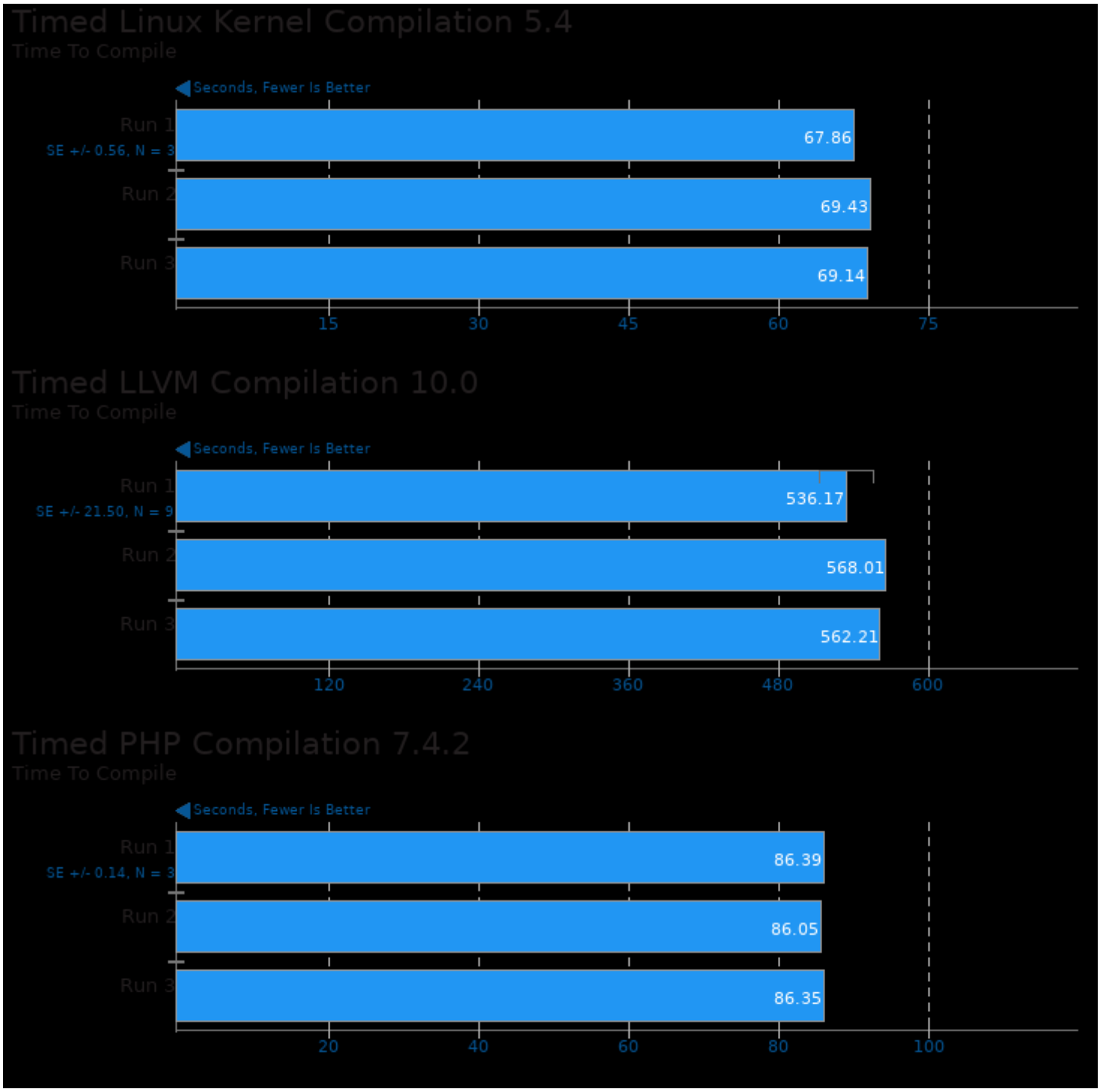

rav1e 0.4 Alpha
Speed: 1
Frames Per Second, More Is Better
Run 1
SE +/- 0.000, N = 3
Run 2
Run 3
0.084
0.084
0.084
0.0189
0.0378
0.0567
0.0756
0.0945
rav1e 0.4 Alpha
Speed: 5
Frames Per Second, More Is Better
Run 1
SE +/- 0.000, N = 3
Run 2
Run 3
0.179
0.179
0.179
0.0403
0.0806
0.1209
0.1612
0.2015
rav1e 0.4 Alpha
Speed: 6
Frames Per Second, More Is Better
Run 1
SE +/- 0.000, N = 3
Run 2
Run 3
0.209
0.208
0.209
0.047
0.094
0.141
0.188
0.235

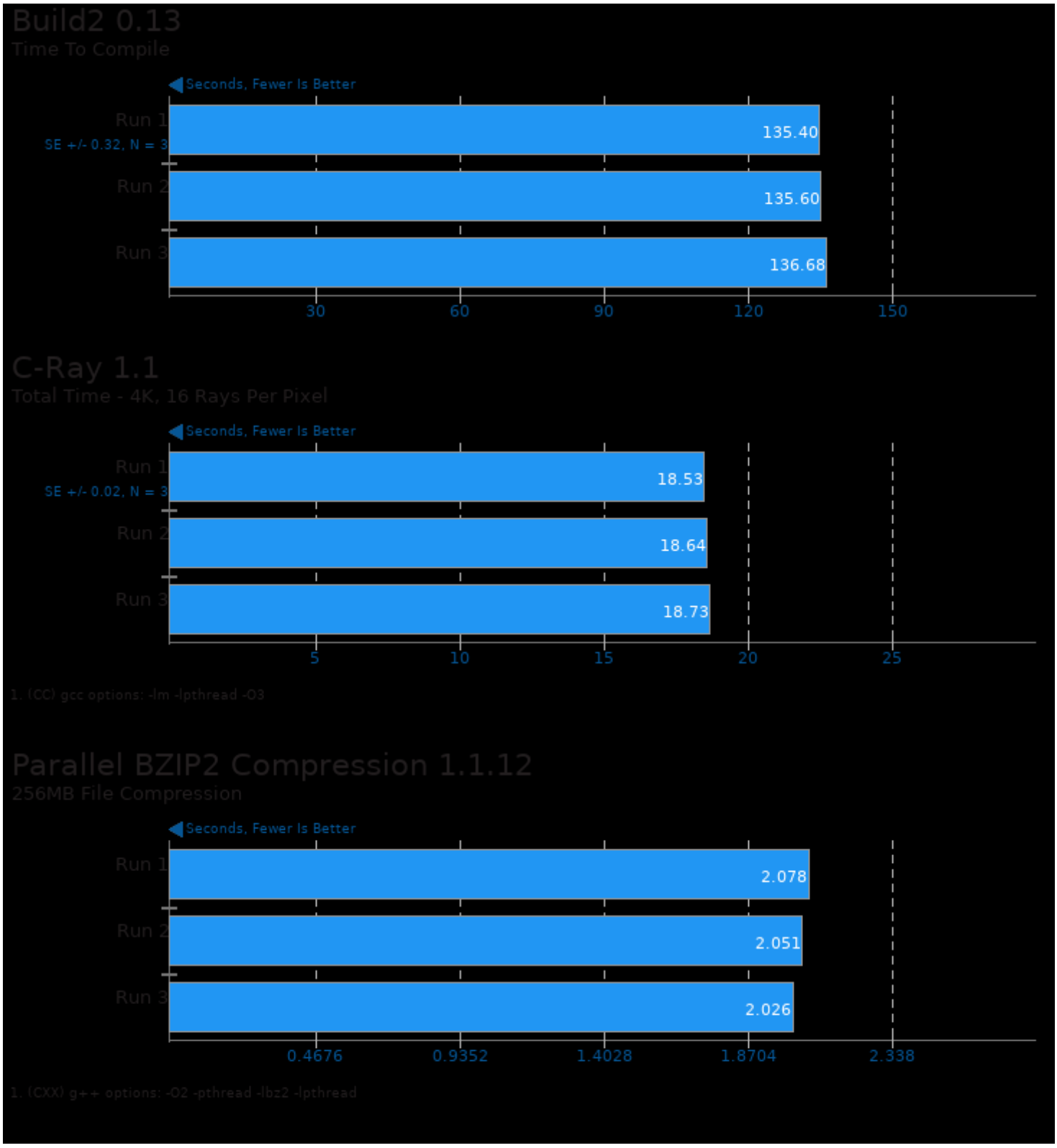

rav1e 0.4 Alpha
Speed: 10
Frames Per Second, More Is Better
Run 1
SE +/- 0.001, N = 3
0.401
Run 2
0.402
Run 3
0.401
0.0905
0.181
0.2715
0.362
0.4525
VP9 libvpx Encoding 1.8.2
Speed: Speed 0
Frames Per Second, More Is Better
Run 1
SE +/- 0.00, N = 3
0.58
Run 2
0.58
Run 3
0.58
0.1305
0.261
0.3915
0.522
0.6525
1. (CXX) g++ options: -lm -lpthread -O3 -fPIC -U_FORTIFY_SOURCE -std=c++11
VP9 libvpx Encoding 1.8.2
Speed: Speed 5
Frames Per Second, More Is Better
Run 1
SE +/- 0.01, N = 3
2.71
Run 2
2.69
Run 3
2.71
0.6098
1.2196
1.8294
2.4392
3.049
1. (CXX) g++ options: -lm -lpthread -O3 -fPIC -U_FORTIFY_SOURCE -std=c++11


x264 2019-12-17
H.264 Video Encoding
Frames Per Second, More Is Better
Run 1
SE +/- 1.62, N = 15
53.85
Run 2
36.66
Run 3
35.53
12
24
36
48
60
1. (CC) gcc options: -ldl -lm -lpthread -O3 -ffast-math -maltivec -mabi=altivec -mvsx -std=gnu99 -fPIC -fomit-frame-pointer -fno-tree-vectorize
x265 3.4
Video Input: Bosphorus 4K
Frames Per Second, More Is Better
Run 1
SE +/- 0.02, N = 3
6.24
Run 2
6.17
Run 3
6.23
2
4
6
8
10
1. (CXX) g++ options: -O3 -rdynamic -lpthread -lrt -ldl -lnuma
x265 3.4
Video Input: Bosphorus 1080p
Frames Per Second, More Is Better
Run 1
SE +/- 0.13, N = 3
12.90
Run 2
12.70
Run 3
12.32
3
6
9
12
15
1. (CXX) g++ options: -O3 -rdynamic -lpthread -lrt -ldl -lnuma


7-Zip Compression 16.02
Compress Speed Test
MIPS, More Is Better
Run 1
SE +/- 1543.67, N = 12
168456
Run 2
170626
Run 3
170105
40K
80K
120K
160K
200K
1. (CXX) g++ options: -pipe -lpthread
Stockfish 12
Total Time
Nodes Per Second, More Is Better
Run 1
SE +/- 231184.54, N = 3
31660332
Run 2
31552898
Run 3
29938062
7M
14M
21M
28M
35M
1. (CXX) g++ options: -m64 -lpthread -fno-exceptions -std=c++17 -pedantic -O3 -flto -flto=jobserver
Timed Apache Compilation 2.4.41
Time To Compile
Seconds, Fewer Is Better
Run 1
SE +/- 0.04, N = 3
44.89
Run 2
44.72
Run 3
44.97
10
20
30
40
50

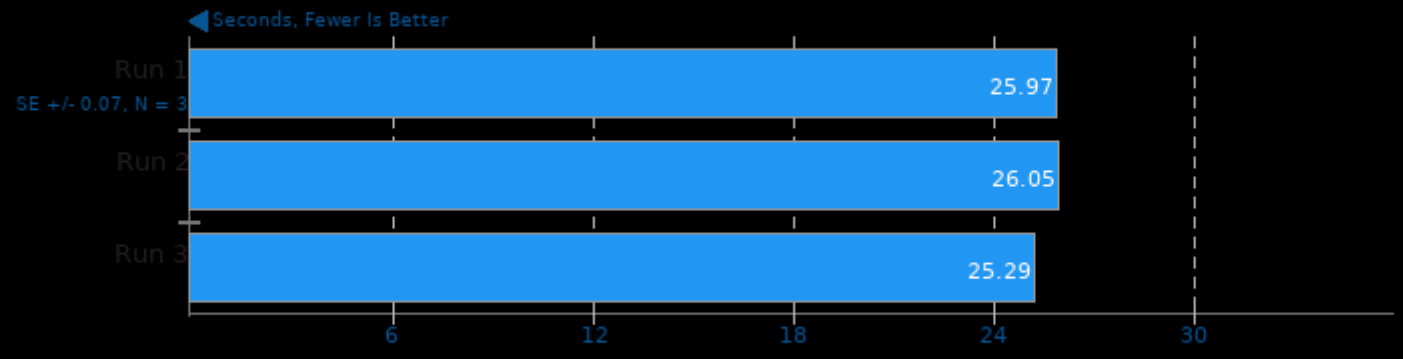

Timed FFmpeg Compilation 4.2.2
Time To Compile
Seconds, Fewer Is Better
Run 1
SE +/- 0.15, N = 3
55.54
Run 2
55.27
Run 3
55.67
13
26
39
52
65
Timed GCC Compilation 9.3.0
Time To Compile
Seconds, Fewer Is Better
Run 1
SE +/- 1.43, N = 3
1431.91
Run 2
1434.53
Run 3
1434.12
300
600
900
1200
1500
Timed ImageMagick Compilation 6.9.0
Time To Compile
Seconds, Fewer Is Better
Run 1
SE +/- 0.01, N = 3
29.04
Run 2
28.95
Run 3
29.10
7
14
21
28
35


Timed Linux Kernel Compilation 5.4
Time To Compile
Seconds, Fewer Is Better
Run 1
SE +/- 0.56, N = 3
67.86
Run 2
69.43
Run 3
69.14
15
30
45
60
75
Timed LLVM Compilation 10.0
Time To Compile
Seconds, Fewer Is Better
Run 1
SE +/- 21.50, N = 9
536.17
Run 2
568.01
Run 3
562.21
120
240
360
480
600
Timed PHP Compilation 7.4.2
Time To Compile
Seconds, Fewer Is Better
Run 1
SE +/- 0.14, N = 3
86.39
Run 2
86.05
Run 3
86.35
20
40
60
80
100


Build2 0.13
Time To Compile
Seconds, Fewer Is Better
Run 1
SE +/- 0.32, N = 3
135.40
Run 2
135.60
Run 3
136.68
30
60
90
120
150
C-Ray 1.1
Total Time - 4K, 16 Rays Per Pixel
Seconds, Fewer Is Better
Run 1
SE +/- 0.02, N = 3
18.53
Run 2
18.64
Run 3
18.73
5
10
15
20
25
1. (CC) gcc options: -lm -lpthread -O3
Parallel BZIP2 Compression 1.1.12
256MB File Compression
Seconds, Fewer Is Better
Run 1
2.078
Run 2
2.051
Run 3
2.026
0.4676
0.9352
1.4028
1.8704
2.338
1. (CXX) g++ options: -O2 -pthread -lbz2 -lpthread

POV-Ray 3.7.0.7

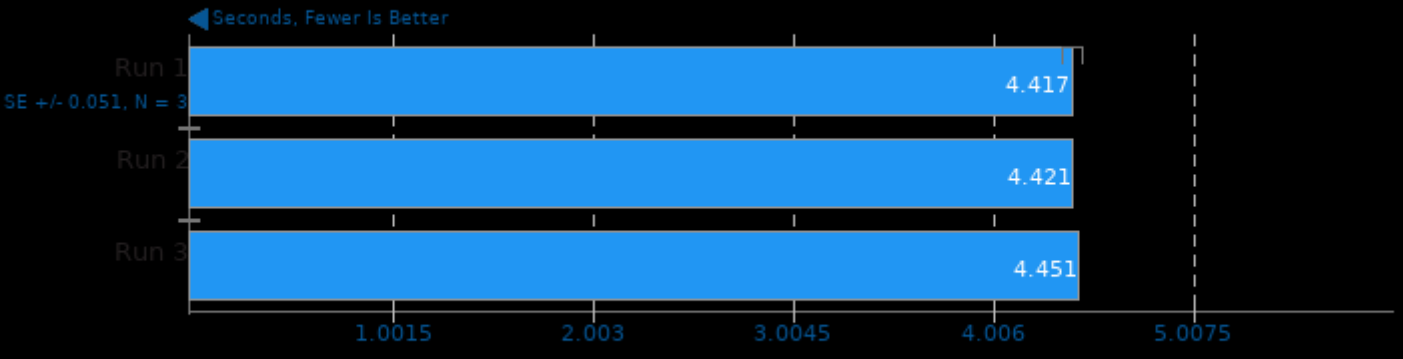
Trace Time



1. (CXX) g++ options: -pipe -O3 -ffast-math -pthread -R/usr/lib -lSDL -lX11 -lIlmImf -lIlmImf-2_5 -lImath-2_5 -lHalf-2_5 -lIex-2_5 -lIexMath-2_5 -lIlmThread-

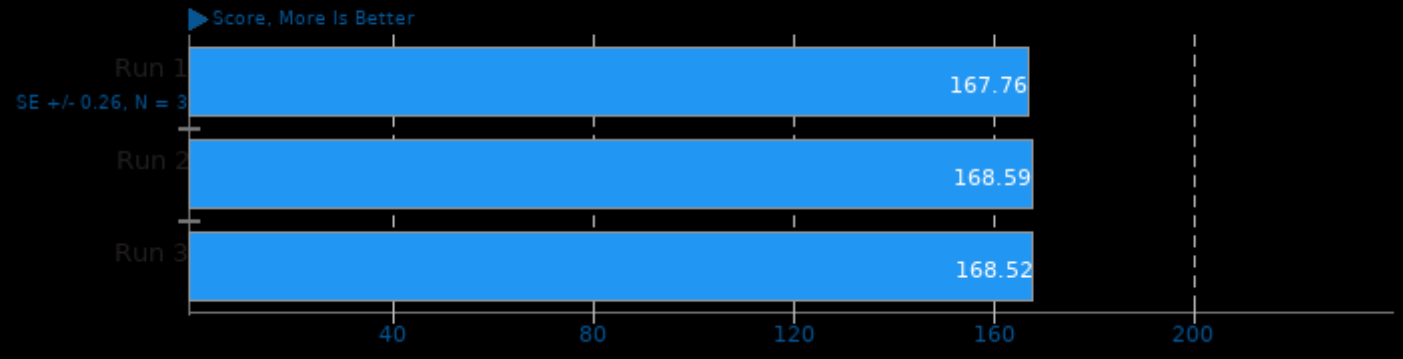
Smallpt 1.0

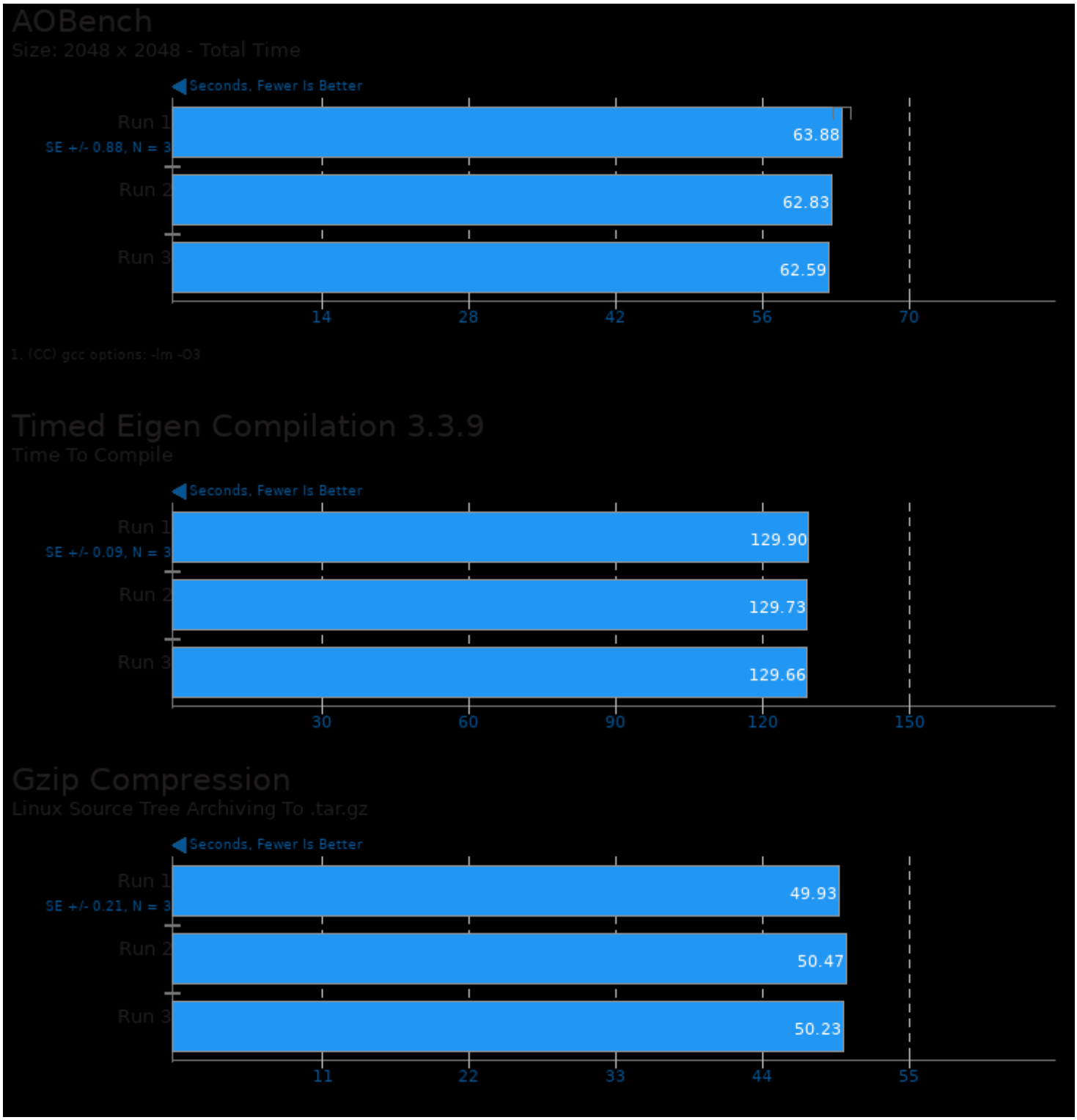
Global Illumination Renderer; 128 Samples



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

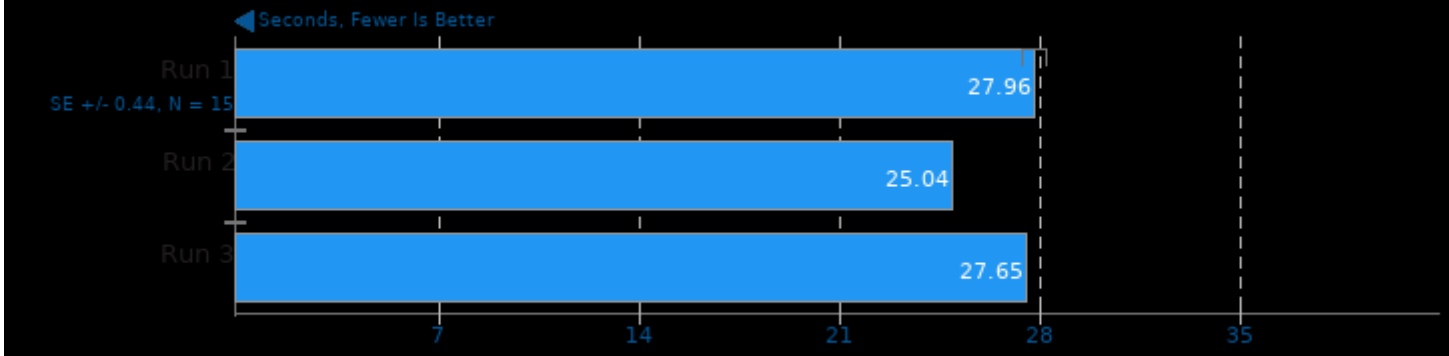
Numpy Benchmark




AOBench
Size: 2048 x 2048 - Total Time
Seconds, Fewer Is Better
Run 1
SE +/- 0.88, N = 3
63.88
Run 2
62.83
Run 3
62.59
14
28
42
56
70
1. (CC) gcc options: -lm -O3
Timed Eigen Compilation 3.3.9
Time To Compile
Seconds, Fewer Is Better
Run 1
SE +/- 0.09, N = 3
129.90
Run 2
129.73
Run 3
129.66
30
60
90
120
150
Gzip Compression
Linux Source Tree Archiving To .tar.gz
Seconds, Fewer Is Better
Run 1
SE +/- 0.21, N = 3
49.93
Run 2
50.47
Run 3
50.23
11
22
33
44
55

XZ Compression 5.2.4

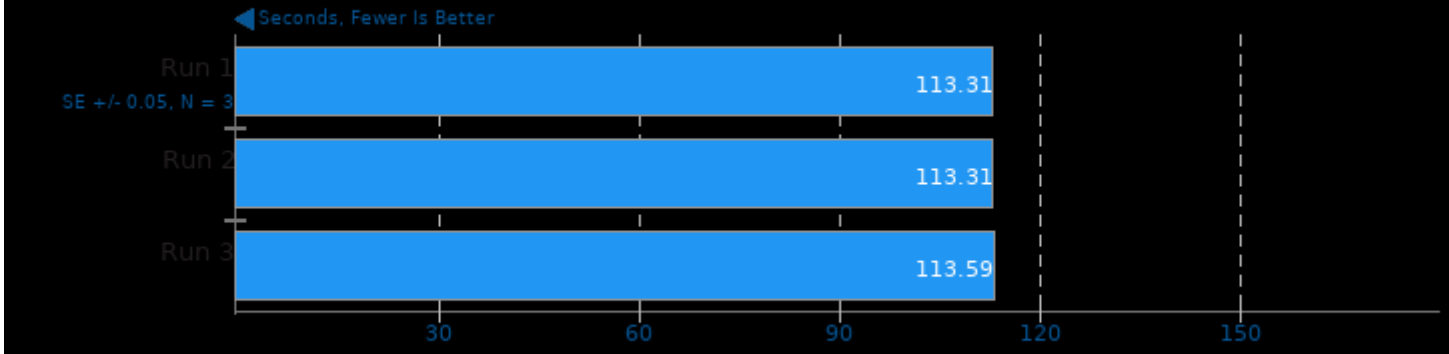
Compressing ubuntu-16.04.3-server-i386.img, Compression Level 9



1. (CC) gcc options: -pthread -fvisibility=hidden -O2

dcraw

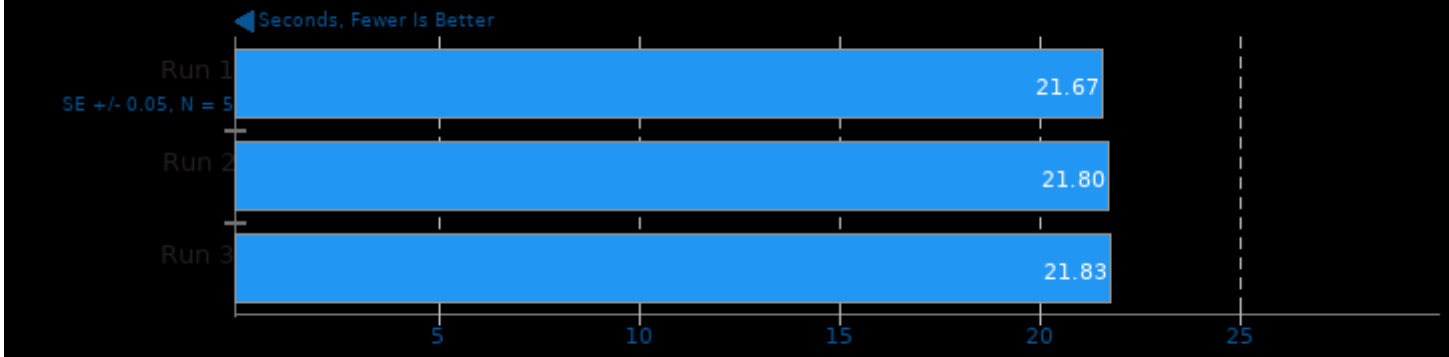
RAW To PPM Image Conversion



1. (CC) gcc options: -lm

Monkey Audio Encoding 3.99.6

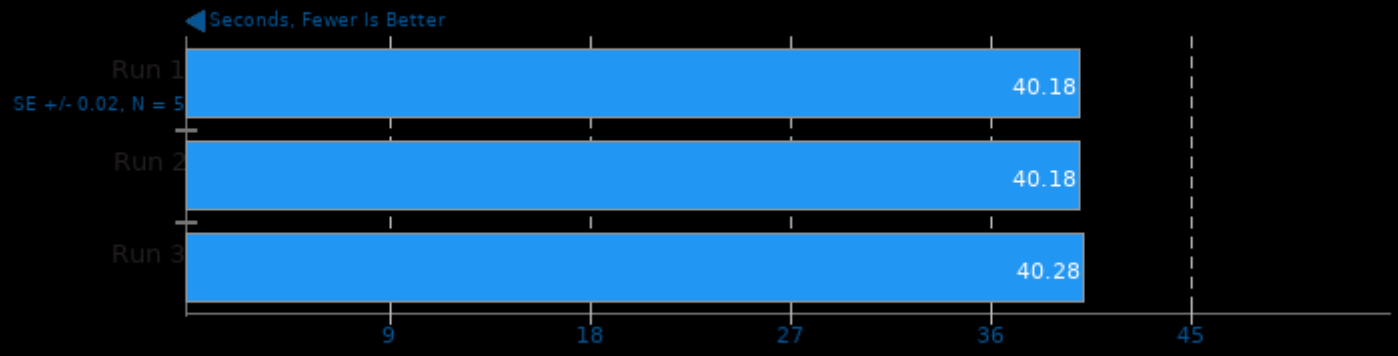
WAV To APE



1. (CXX) g++ options: -O3 -pedantic -rdynamic -lrt

FLAC Audio Encoding 1.3.2

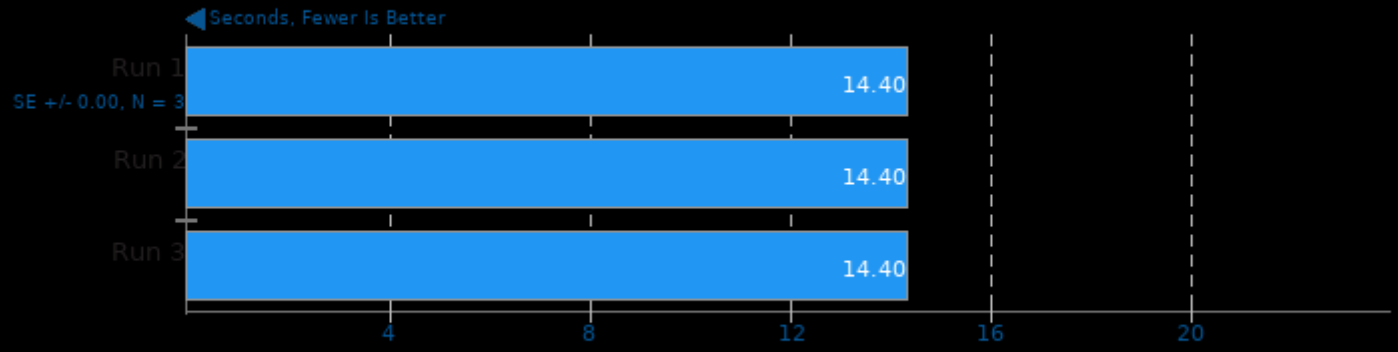
WAV To FLAC



1. (CXX) g++ options: -O2 -fvisibility=hidden -lm

LAME MP3 Encoding 3.100

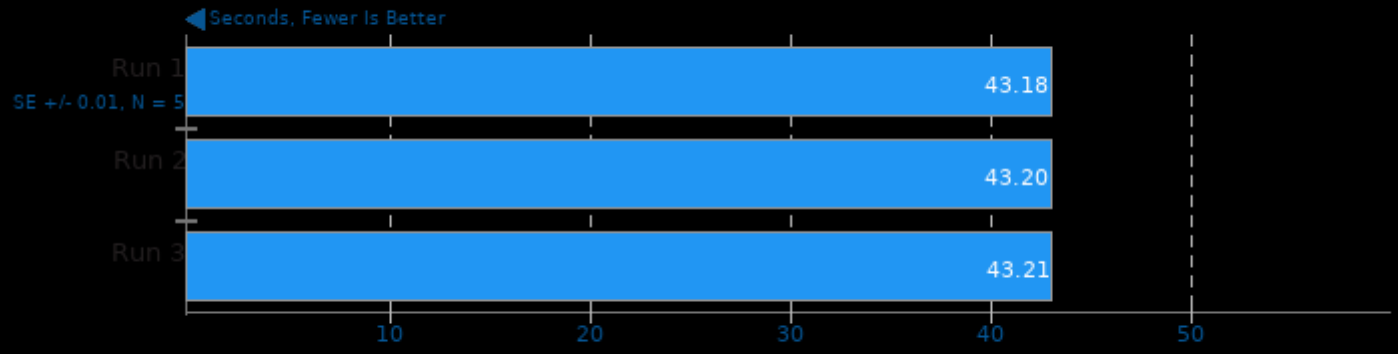
WAV To MP3



1. (CC) gcc options: -O3 -ffast-math -funroll-loops -fschedule-insns2 -fbranch-count-reg -fforce-addr -pipe -lncurses -lm

Opus Codec Encoding 1.3.1

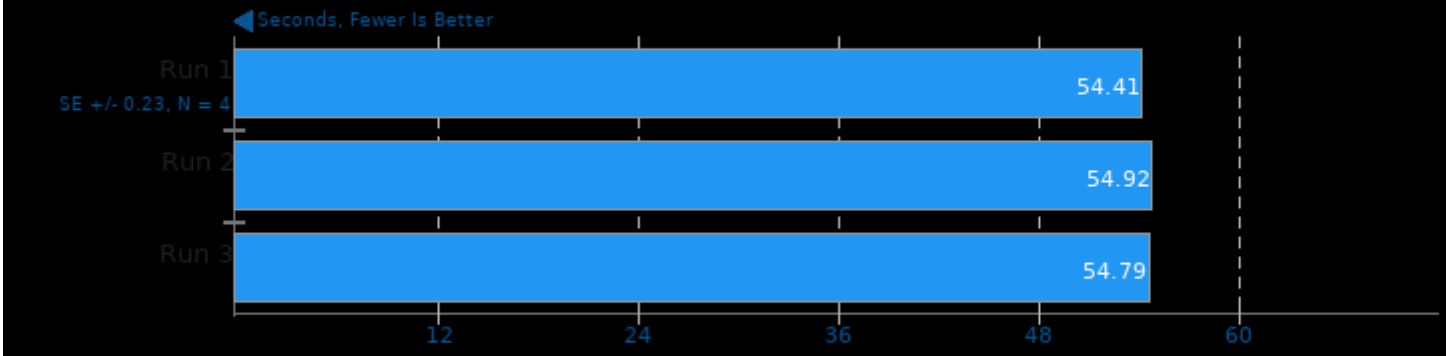
WAV To Opus Encode



1. (CXX) g++ options: -fvisibility=hidden -logg -lm

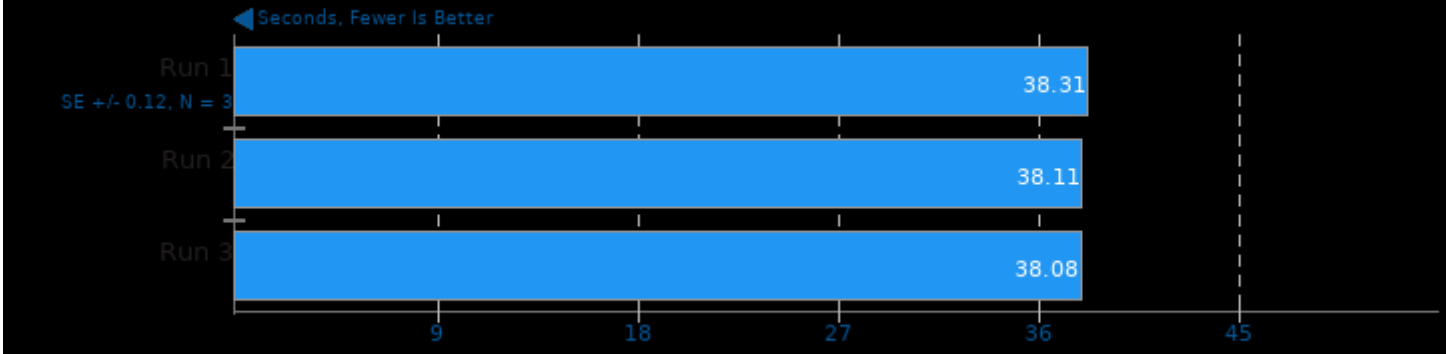
eSpeak-NG Speech Engine 20200907

Text-To-Speech Synthesis



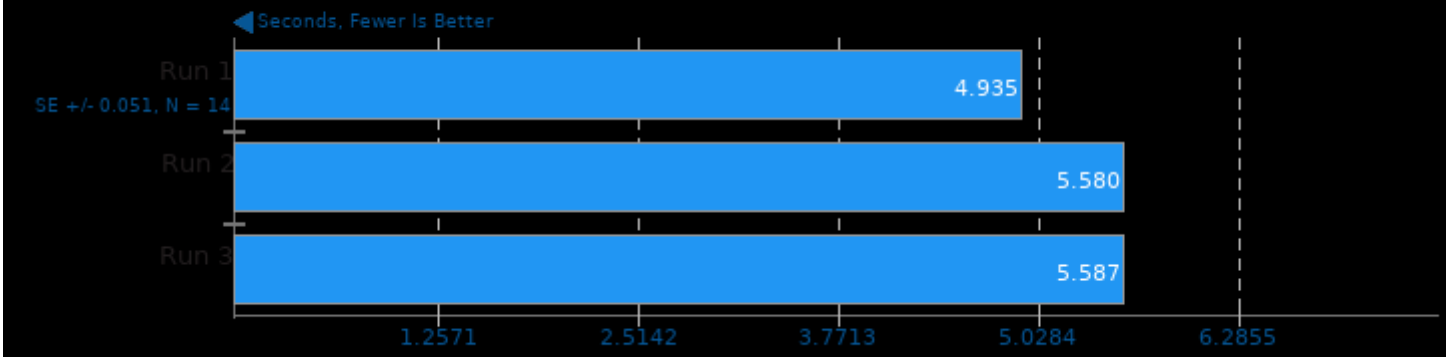
1. (CC) gcc options: -O2 -std=c99

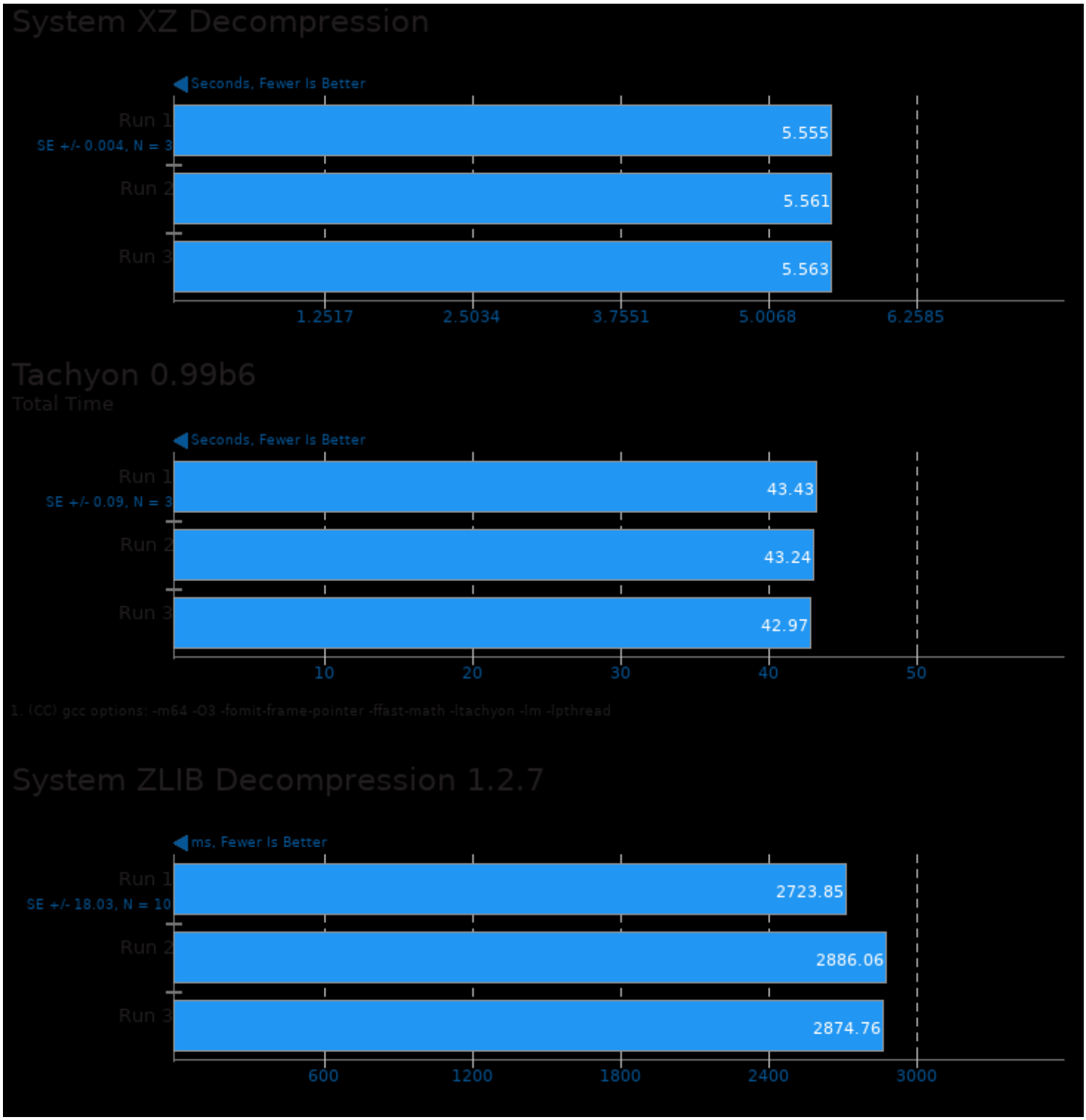
RNNoise 2020-06-28

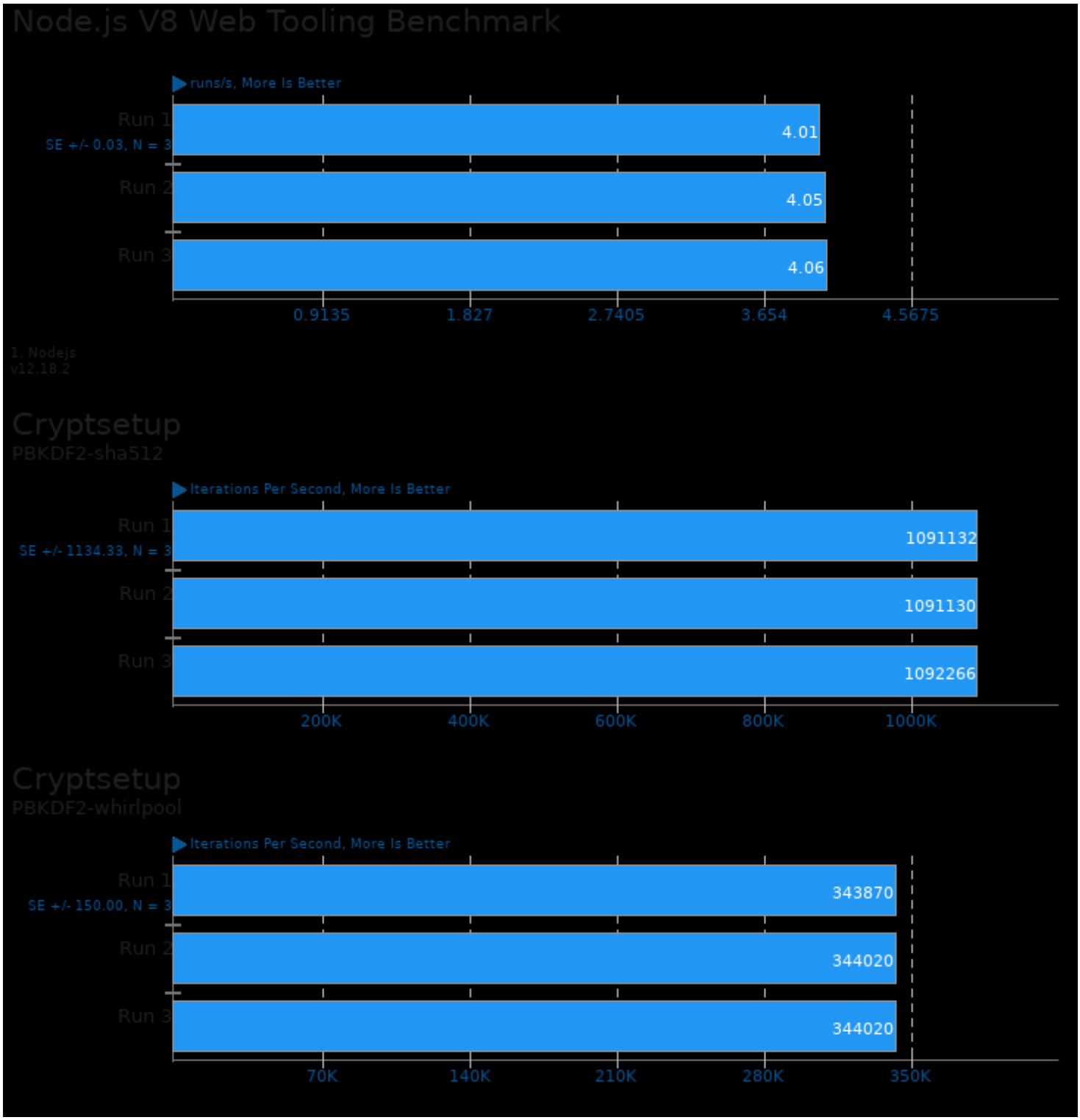


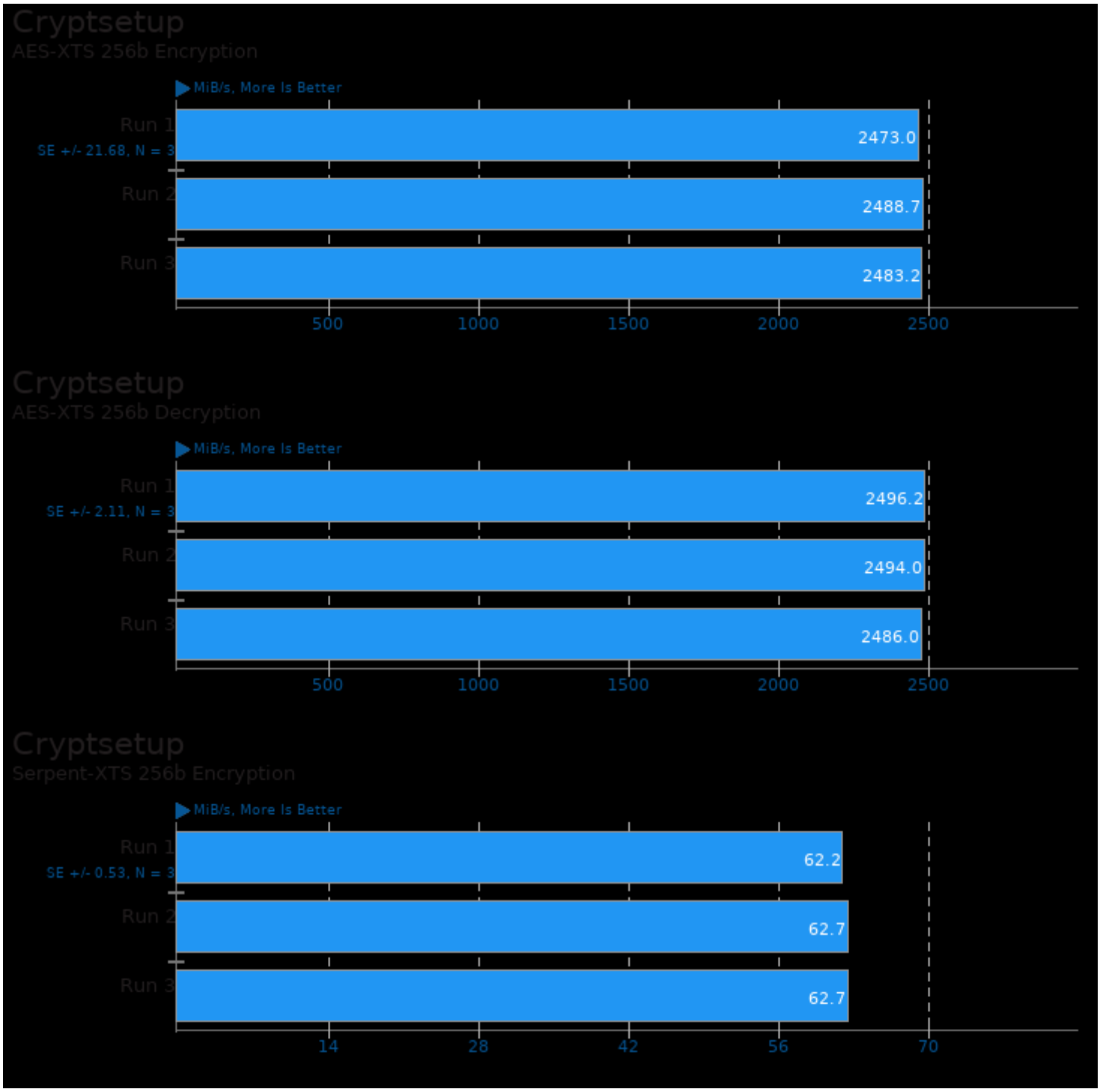
1. (CC) gcc options: -O2 -pedantic -fvisibility=hidden

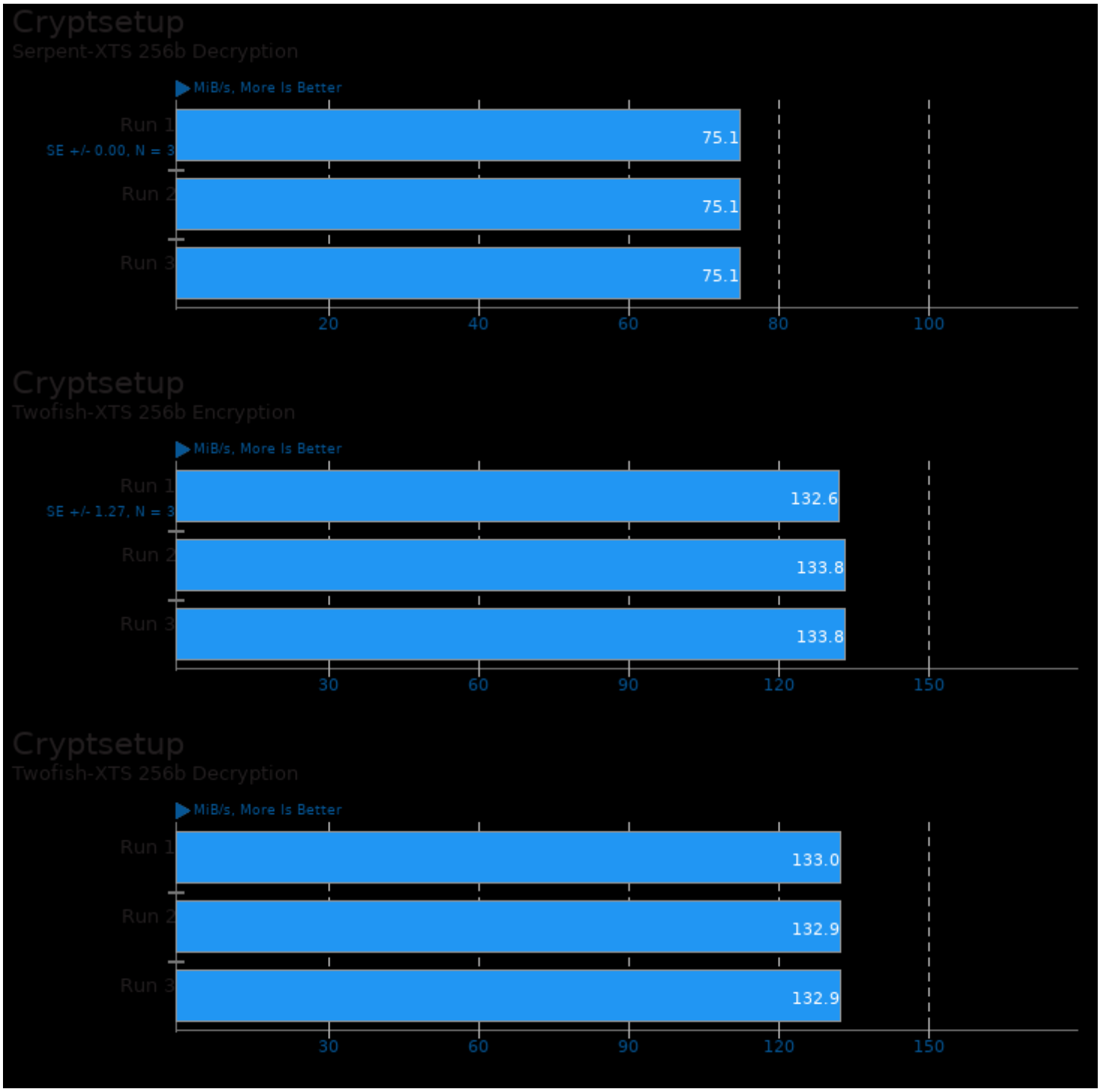
System GZIP Decompression

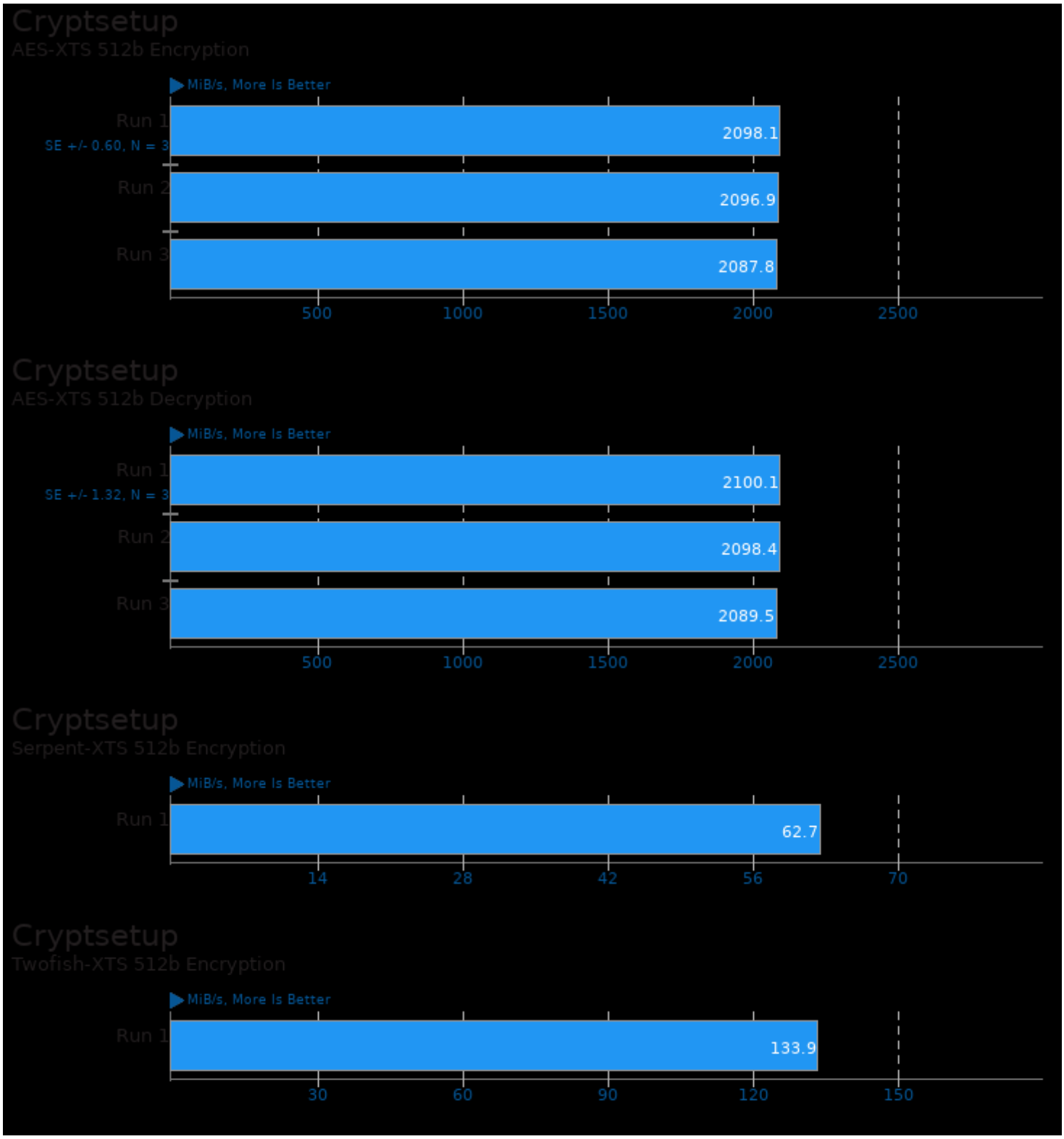


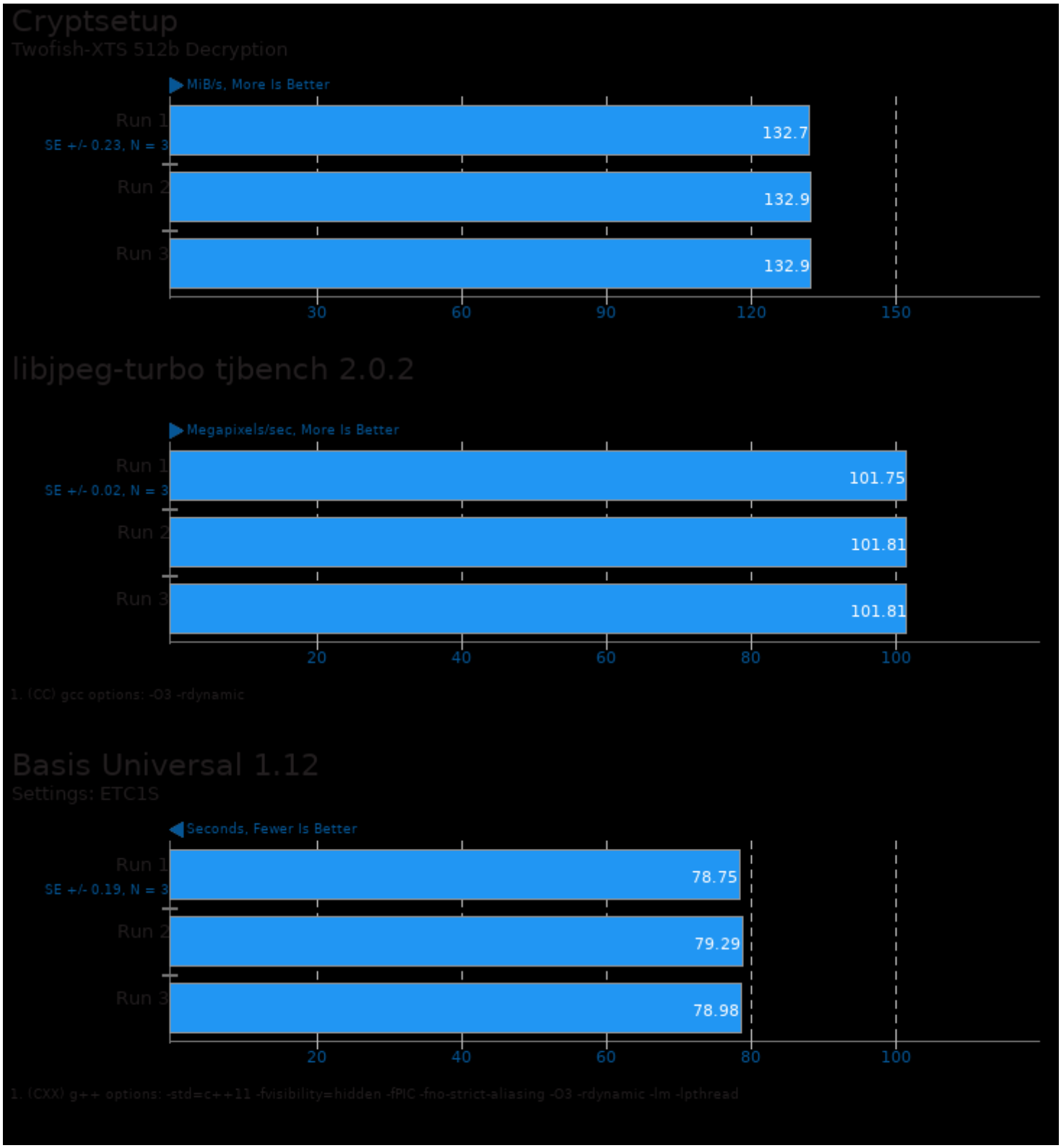

System XZ Decompression
Seconds, Fewer Is Better
Run 1
SE +/- 0.004, N = 3
5.555
Run 2
5.561
Run 3
5.563
1.2517
2.5034
3.7551
5.0068
6.2585
Tachyon 0.99b6
Total Time
Seconds, Fewer Is Better
Run 1
SE +/- 0.09, N = 3
43.43
Run 2
43.24
Run 3
42.97
10
20
30
40
50
1. (CC) gcc options: -m64 -O3 -fomit-frame-pointer -ffast-math -ltachyon -lm -lpthread
System ZLIB Decompression 1.2.7
ms, Fewer Is Better
Run 1
SE +/- 18.03, N = 10
2723.85
Run 2
2886.06
Run 3
2874.76
600
1200
1800
2400
3000

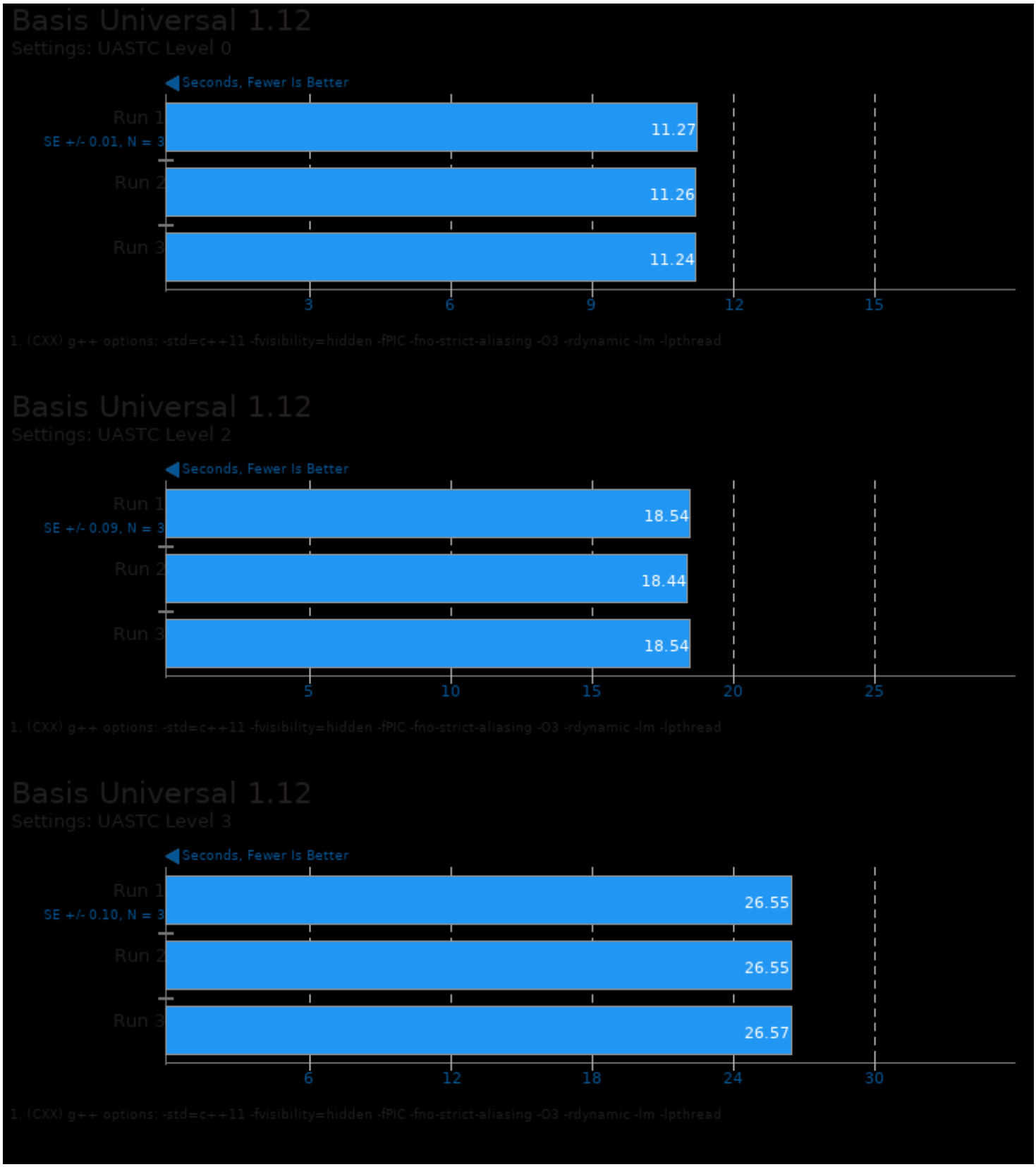

Node.js V8 Web Tooling Benchmark
runs/s, More Is Better
Run 1
SE +/- 0.03, N = 3
4.01
Run 2
4.05
Run 3
4.06
0.9135
1.827
2.7405
3.654
4.5675
1. Nodejs v12.18.2
Cryptsetup
PBKDF2-sha512
Iterations Per Second, More Is Better
Run 1
SE +/- 1134.33, N = 3
1091132
Run 2
1091130
Run 3
1092266
200K
400K
600K
800K
1000K
Cryptsetup
PBKDF2-whirlpool
Iterations Per Second, More Is Better
Run 1
SE +/- 150.00, N = 3
343870
Run 2
344020
Run 3
344020
70K
140K
210K
280K
350K


Cryptsetup
AES-XTS 256b Encryption
MiB/s, More Is Better
Run 1
SE +/- 21.68, N = 3
Run 2
Run 3
2473.0
2488.7
2483.2
500
1000
1500
2000
2500
Cryptsetup
AES-XTS 256b Decryption
MiB/s, More Is Better
Run 1
SE +/- 2.11, N = 3
Run 2
Run 3
2496.2
2494.0
2486.0
500
1000
1500
2000
2500
Cryptsetup
Serpent-XTS 256b Encryption
MiB/s, More Is Better
Run 1
SE +/- 0.53, N = 3
Run 2
Run 3
62.2
62.7
62.7
14
28
42
56
70


Cryptsetup
Serpent-XTS 256b Decryption
MiB/s, More Is Better
Run 1
SE +/- 0.00, N = 3
Run 2
Run 3
75.1
75.1
75.1
20
40
60
80
100
Cryptsetup
Twofish-XTS 256b Encryption
MiB/s, More Is Better
Run 1
SE +/- 1.27, N = 3
Run 2
Run 3
132.6
133.8
133.8
30
60
90
120
150
Cryptsetup
Twofish-XTS 256b Decryption
MiB/s, More Is Better
Run 1
Run 2
Run 3
133.0
132.9
132.9
30
60
90
120
150

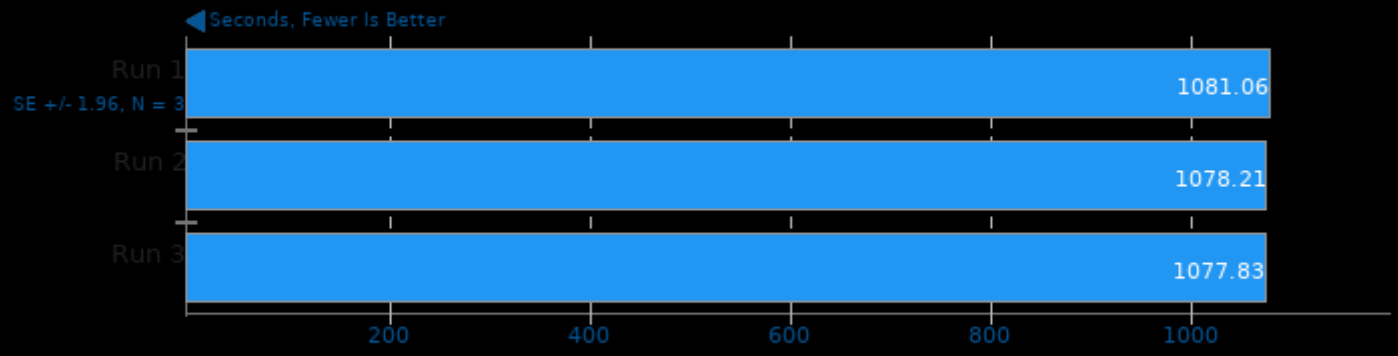

Cryptsetup
AES-XTS 512b Encryption
MiB/s, More Is Better
Run 1
SE +/- 0.60, N = 3
2098.1
Run 2
2096.9
Run 3
2087.8
500
1000
1500
2000
2500
Cryptsetup
AES-XTS 512b Decryption
MiB/s, More Is Better
Run 1
SE +/- 1.32, N = 3
2100.1
Run 2
2098.4
Run 3
2089.5
500
1000
1500
2000
2500
Cryptsetup
Serpent-XTS 512b Encryption
MiB/s, More Is Better
Run 1
62.7
14
28
42
56
70
Cryptsetup
Twofish-XTS 512b Encryption
MiB/s, More Is Better
Run 1
133.9
30
60
90
120
150


Cryptsetup
Twofish-XTS 512b Decryption
MiB/s, More Is Better
Run 1
SE +/- 0.23, N = 3
132.7
Run 2
132.9
Run 3
132.9
30
60
90
120
150
libjpeg-turbo tjbench 2.0.2
Megapixels/sec, More Is Better
Run 1
SE +/- 0.02, N = 3
101.75
Run 2
101.81
Run 3
101.81
20
40
60
80
100
1. (CC) gcc options: -O3 -rdynamic
Basis Universal 1.12
Settings: ETC1S
Seconds, Fewer Is Better
Run 1
SE +/- 0.19, N = 3
78.75
Run 2
79.29
Run 3
78.98
20
40
60
80
100
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread


Basis Universal 1.12
Settings: UASTC Level 0
Seconds, Fewer Is Better
Run 1
Run 2
Run 3
SE +/- 0.01, N = 3
11.27
11.26
11.24
3
6
9
12
15
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread
Basis Universal 1.12
Settings: UASTC Level 2
Seconds, Fewer Is Better
Run 1
Run 2
Run 3
SE +/- 0.09, N = 3
18.54
18.44
18.54
5
10
15
20
25
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread
Basis Universal 1.12
Settings: UASTC Level 3
Seconds, Fewer Is Better
Run 1
Run 2
Run 3
SE +/- 0.10, N = 3
26.55
26.55
26.57
6
12
18
24
30
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

Basis Universal 1.12

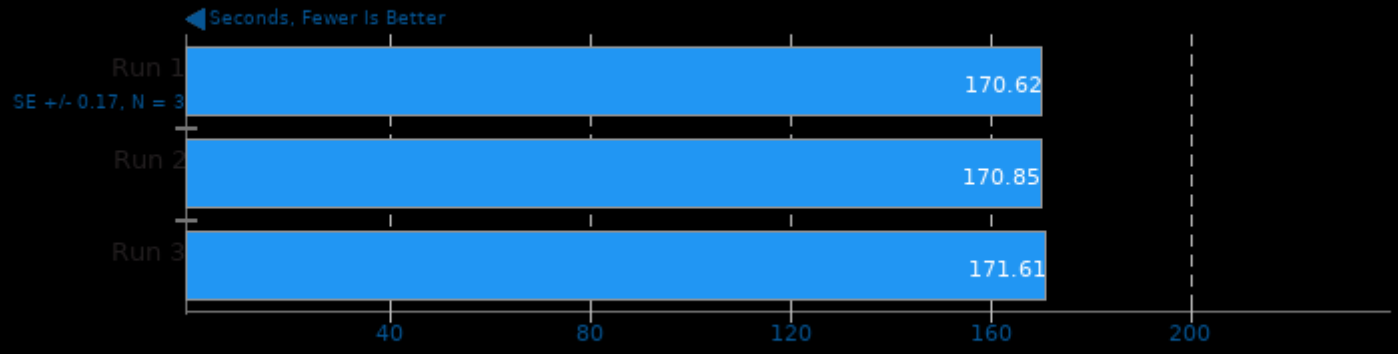
Settings: UASTC Level 2 + RDO Post-Processing



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

SQLite Speedtest 3.30

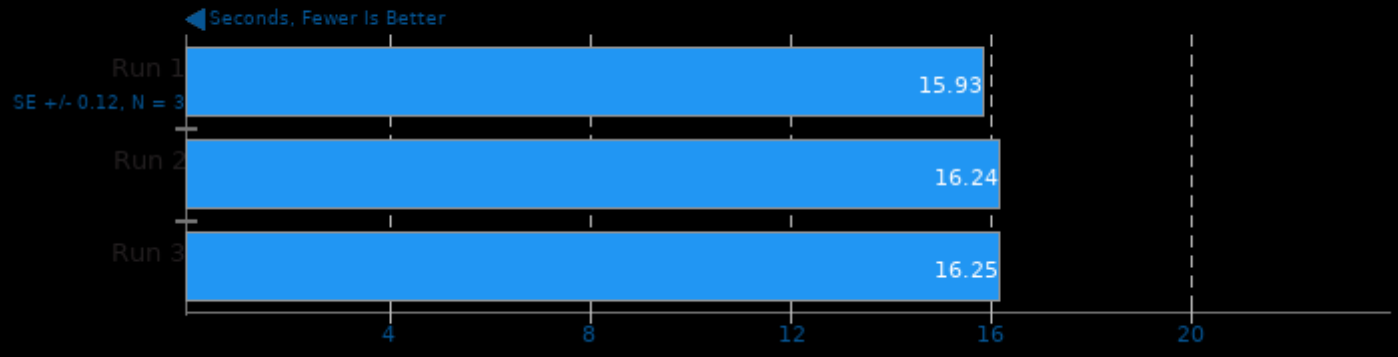
Timed Time - Size 1,000

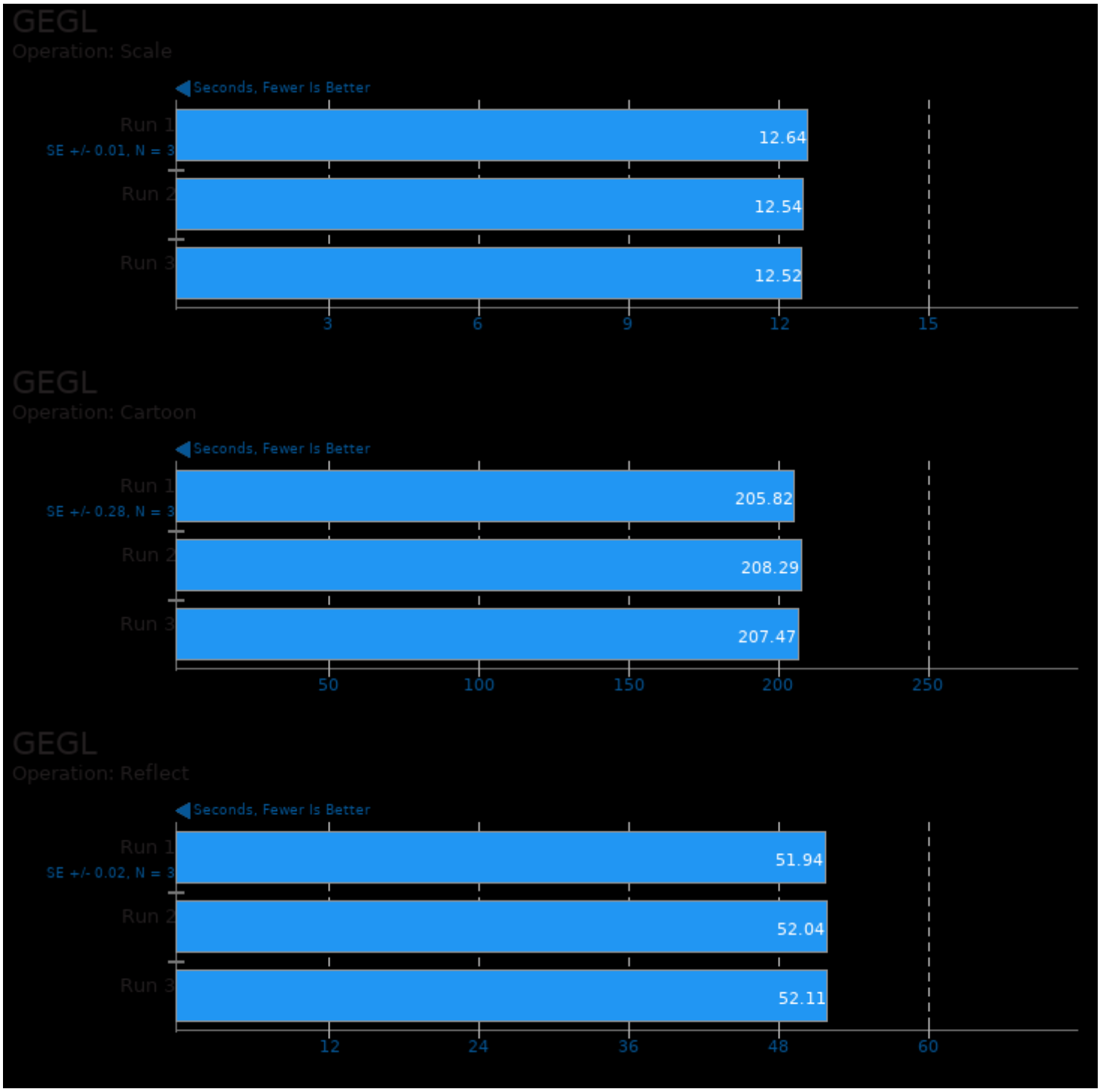


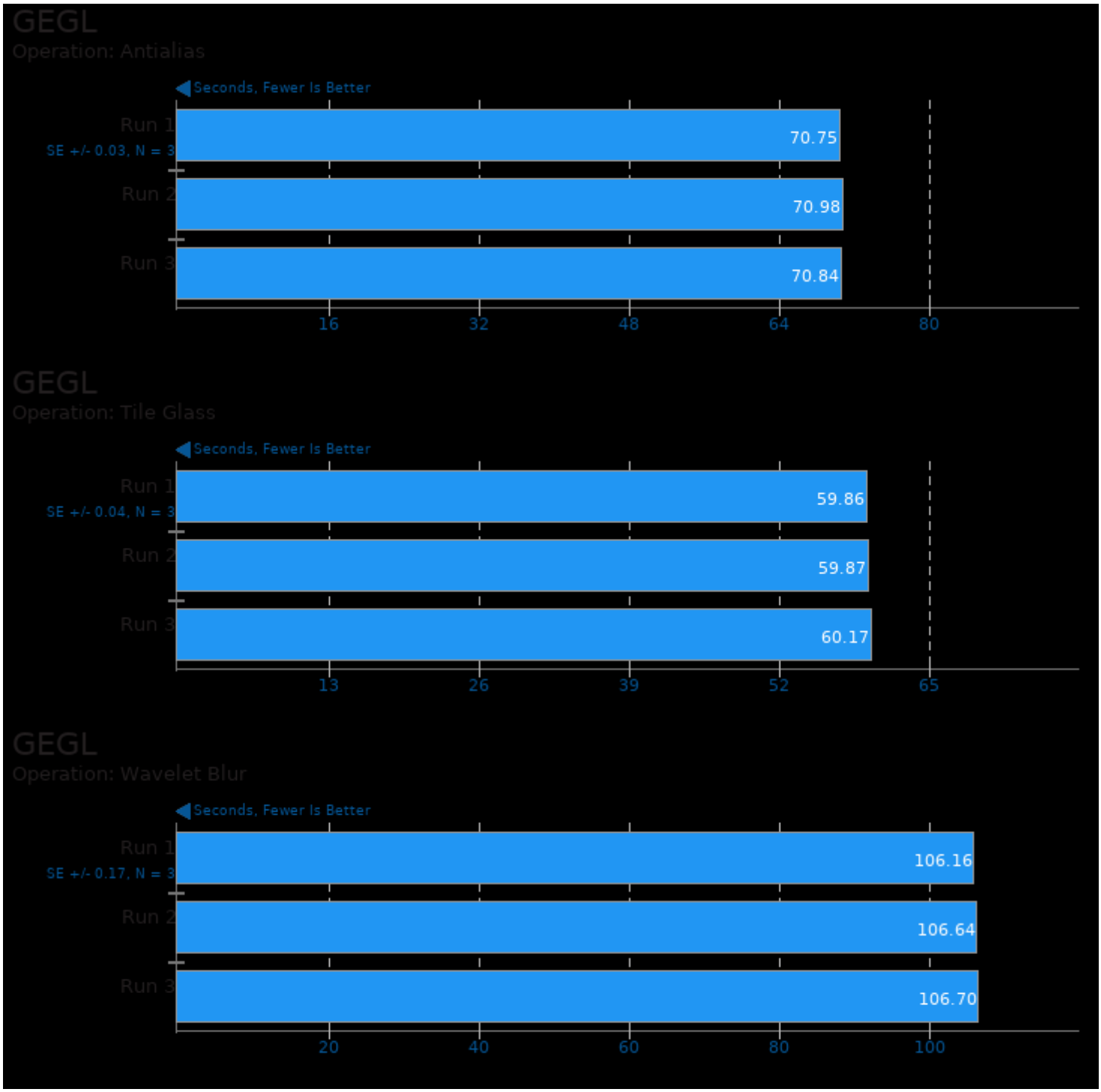
1. (CC) gcc options: -O2 -ldl -lz -lpthread

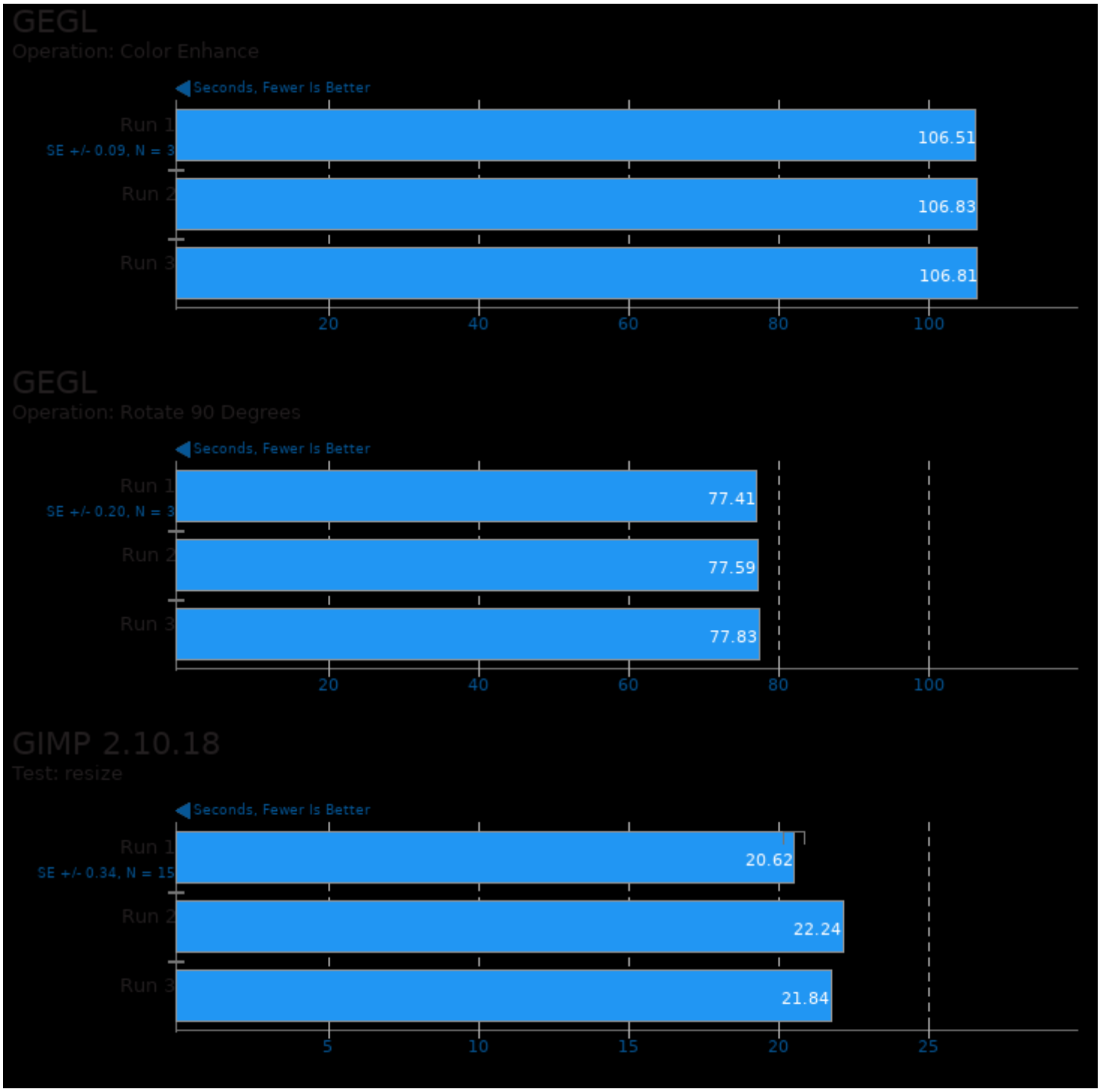
GEGL

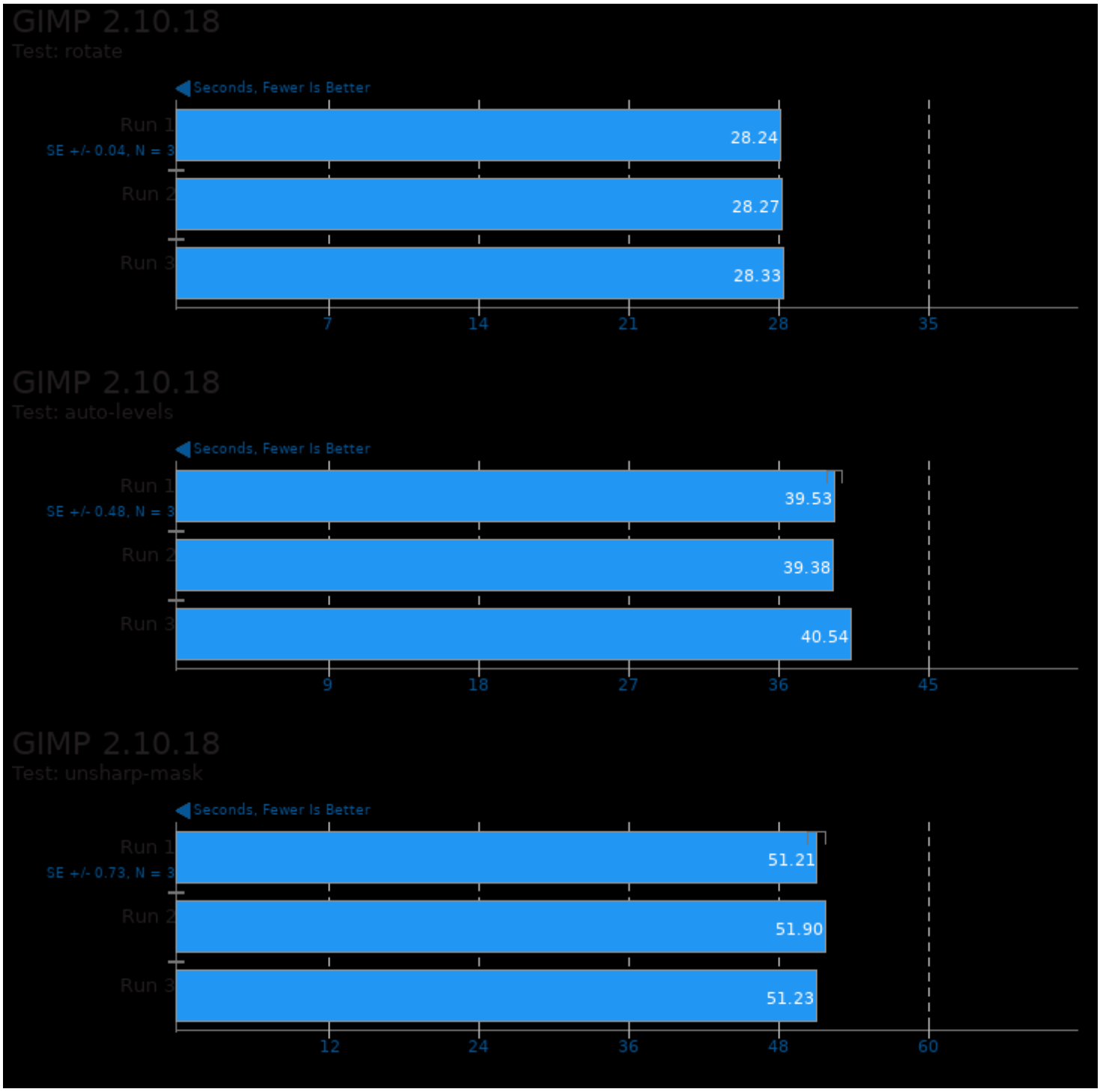
Operation: Crop

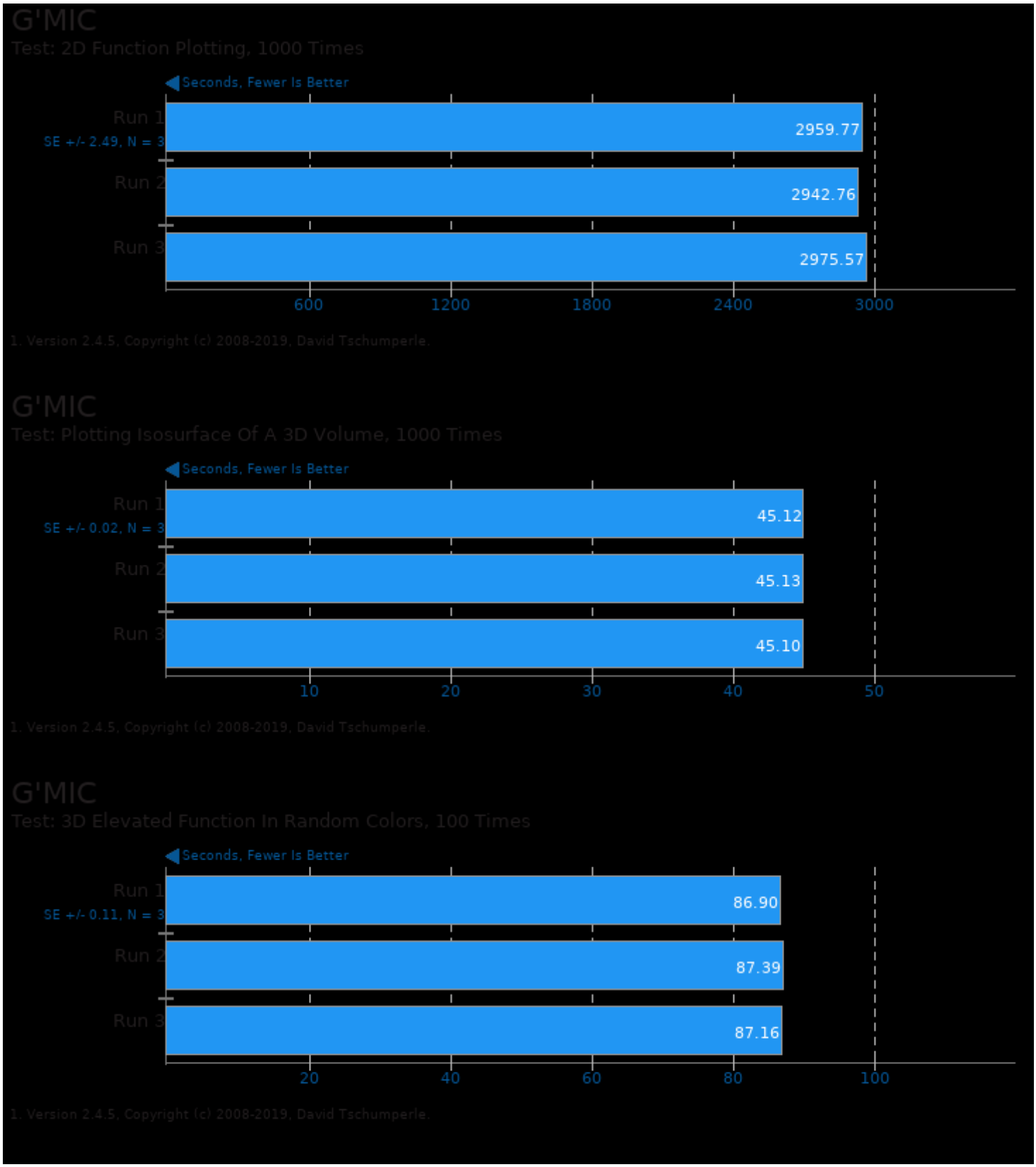


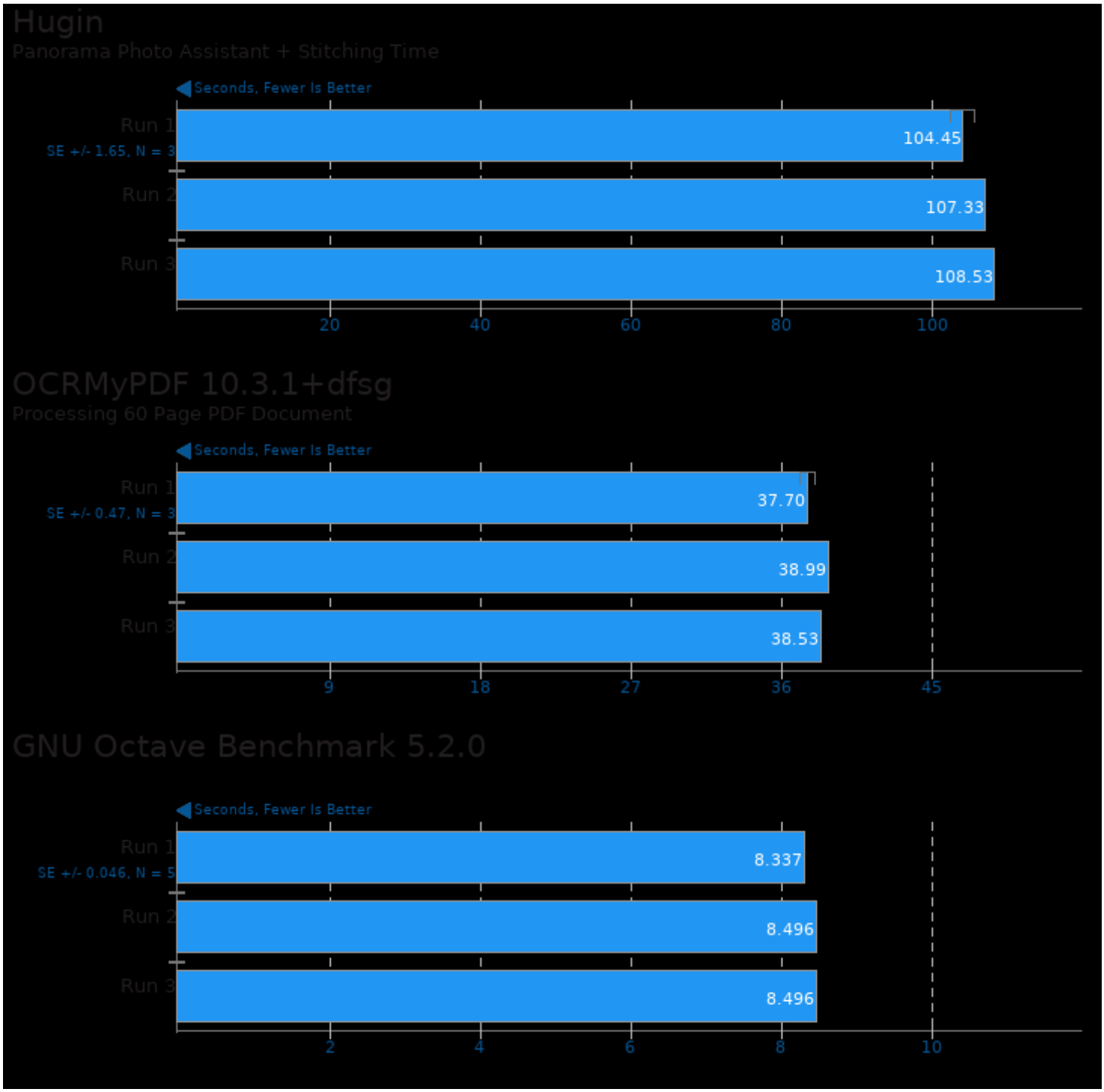

GEGL
Operation: Scale
Seconds, Fewer Is Better
Run 1
SE +/- 0.01, N = 3
12.64
Run 2
12.54
Run 3
12.52
3
6
9
12
15
GEGL
Operation: Cartoon
Seconds, Fewer Is Better
Run 1
SE +/- 0.28, N = 3
205.82
Run 2
208.29
Run 3
207.47
50
100
150
200
250
GEGL
Operation: Reflect
Seconds, Fewer Is Better
Run 1
SE +/- 0.02, N = 3
51.94
Run 2
52.04
Run 3
52.11
12
24
36
48
60

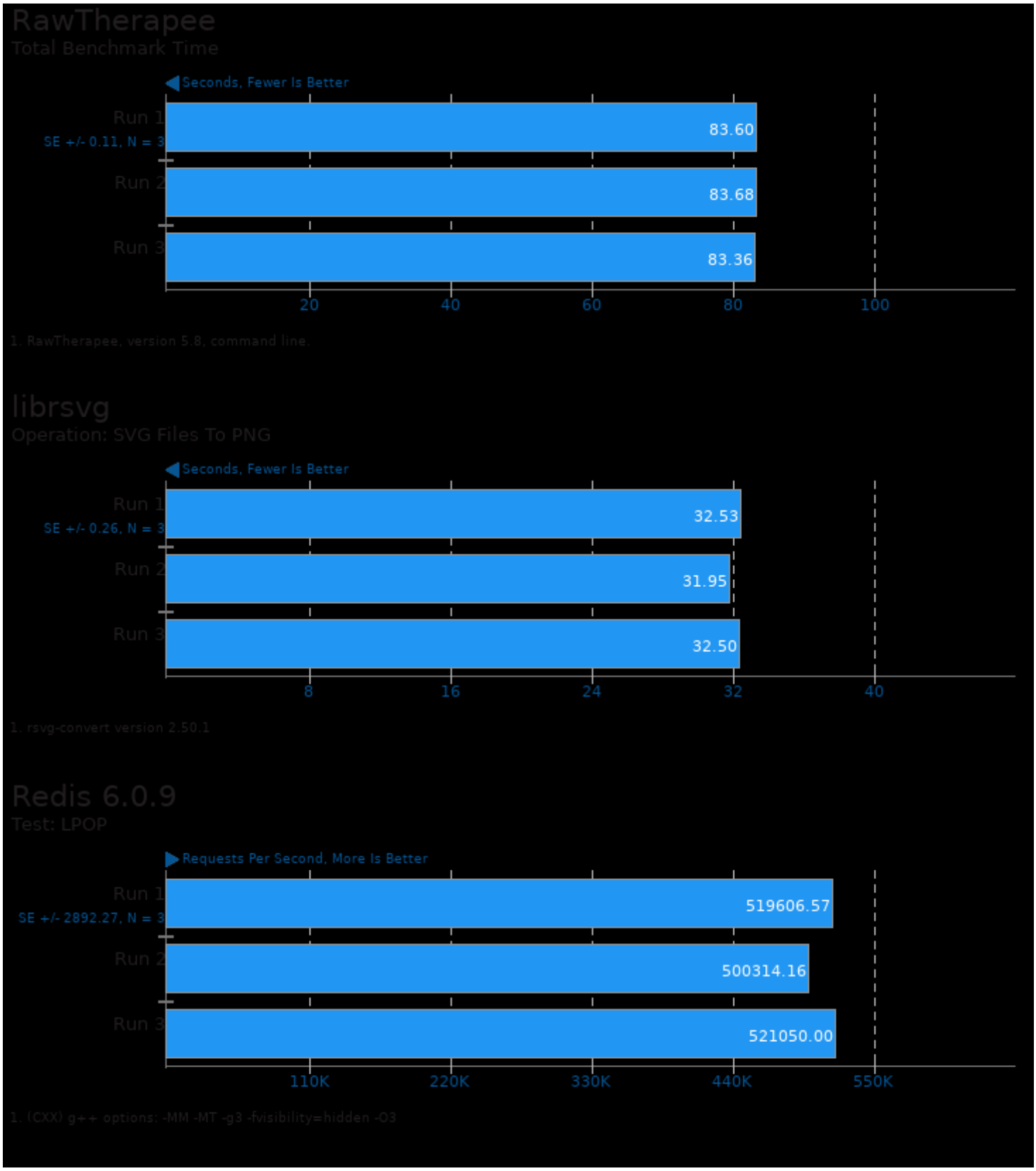

GEGL
Operation: Antialias
Seconds, Fewer Is Better
Run 1
SE +/- 0.03, N = 3
70.75
Run 2
70.98
Run 3
70.84
16
32
48
64
80
GEGL
Operation: Tile Glass
Seconds, Fewer Is Better
Run 1
SE +/- 0.04, N = 3
59.86
Run 2
59.87
Run 3
60.17
13
26
39
52
65
GEGL
Operation: Wavelet Blur
Seconds, Fewer Is Better
Run 1
SE +/- 0.17, N = 3
106.16
Run 2
106.64
Run 3
106.70
20
40
60
80
100

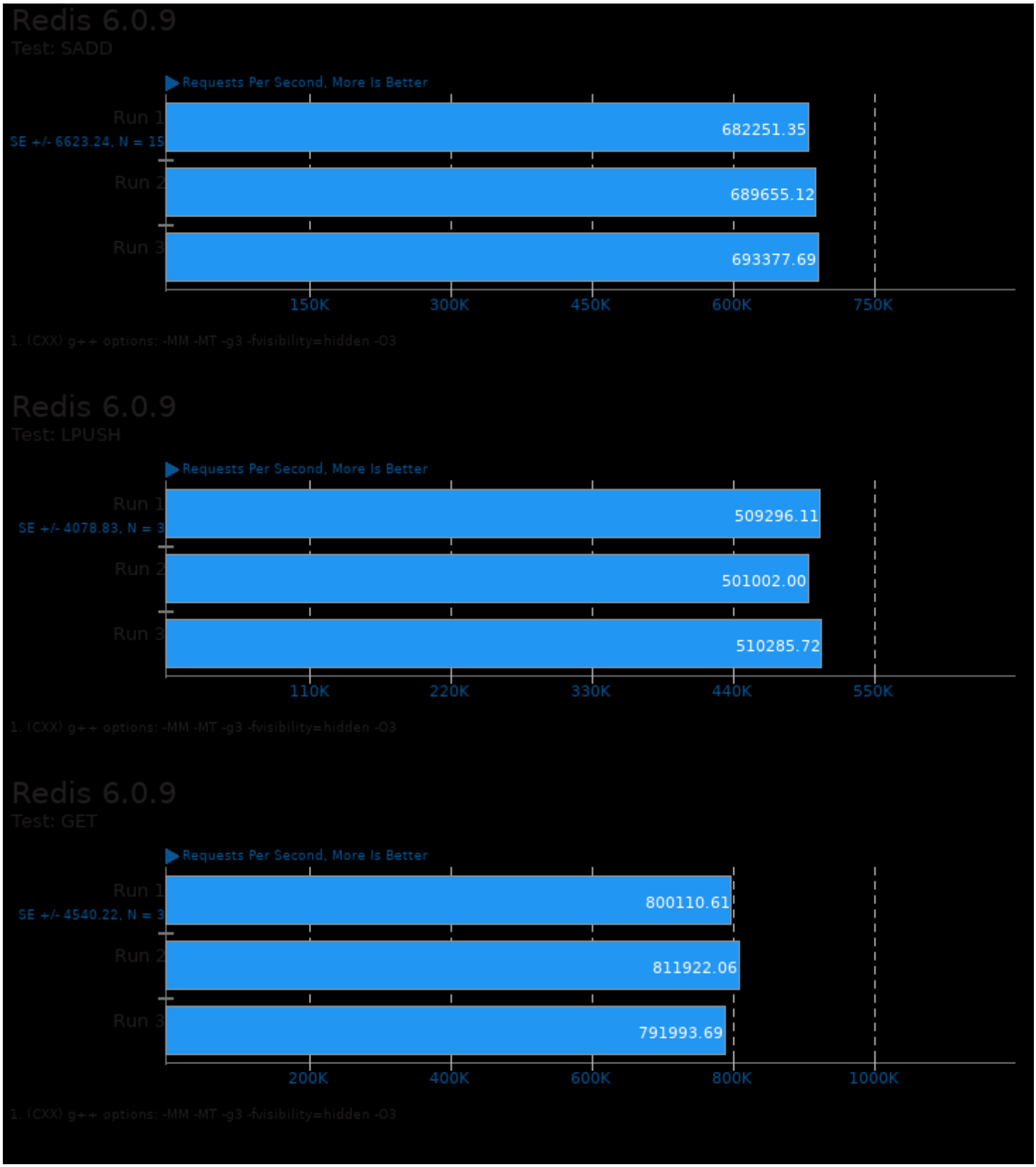

GEGL
Operation: Color Enhance
Seconds, Fewer Is Better
Run 1
SE +/- 0.09, N = 3
106.51
Run 2
106.83
Run 3
106.81
20
40
60
80
100
GEGL
Operation: Rotate 90 Degrees
Seconds, Fewer Is Better
Run 1
SE +/- 0.20, N = 3
77.41
Run 2
77.59
Run 3
77.83
20
40
60
80
100
GIMP 2.10.18
Test: resize
Seconds, Fewer Is Better
Run 1
SE +/- 0.34, N = 15
20.62
Run 2
22.24
Run 3
21.84
5
10
15
20
25

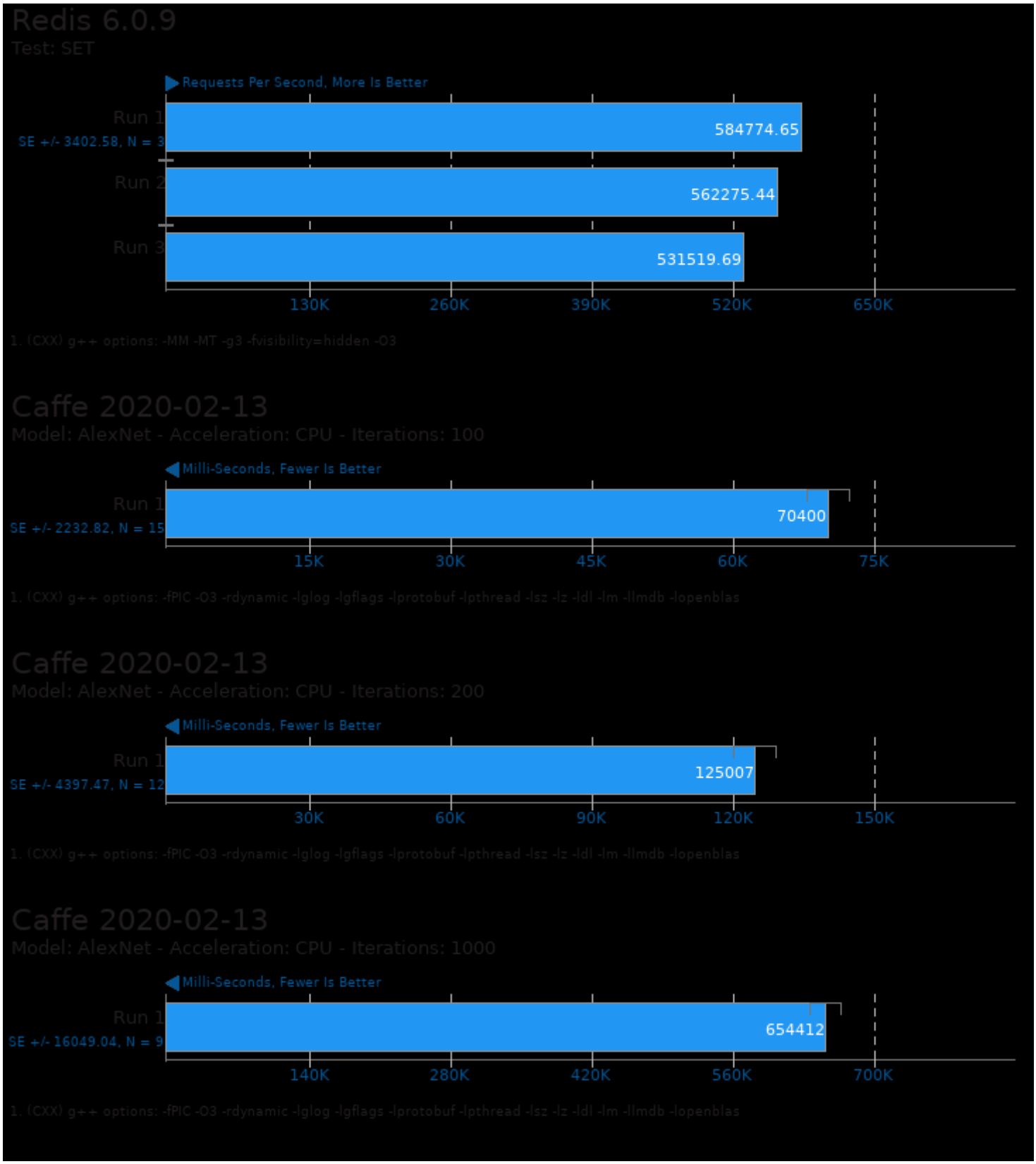

GIMP 2.10.18
Test: rotate
Seconds, Fewer Is Better
Run 1
SE +/- 0.04, N = 3
28.24
Run 2
28.27
Run 3
28.33
7
14
21
28
35
GIMP 2.10.18
Test: auto-levels
Seconds, Fewer Is Better
Run 1
SE +/- 0.48, N = 3
39.53
Run 2
39.38
Run 3
40.54
9
18
27
36
45
GIMP 2.10.18
Test: unsharp-mask
Seconds, Fewer Is Better
Run 1
SE +/- 0.73, N = 3
51.21
Run 2
51.90
Run 3
51.23
12
24
36
48
60


G'MIC
Test: 2D Function Plotting, 1000 Times
Seconds, Fewer Is Better
Run 1
SE +/- 2.49, N = 3
2959.77
Run 2
2942.76
Run 3
2975.57
600
1200
1800
2400
3000
1. Version 2.4.5, Copyright (c) 2008-2019, David Tschumperle.
G'MIC
Test: Plotting Isosurface Of A 3D Volume, 1000 Times
Seconds, Fewer Is Better
Run 1
SE +/- 0.02, N = 3
45.12
Run 2
45.13
Run 3
45.10
10
20
30
40
50
1. Version 2.4.5, Copyright (c) 2008-2019, David Tschumperle.
G'MIC
Test: 3D Elevated Function In Random Colors, 100 Times
Seconds, Fewer Is Better
Run 1
SE +/- 0.11, N = 3
86.90
Run 2
87.39
Run 3
87.16
20
40
60
80
100
1. Version 2.4.5, Copyright (c) 2008-2019, David Tschumperle.


Hugin
Panorama Photo Assistant + Stitching Time
Seconds, Fewer Is Better
Run 1
SE +/- 1.65, N = 3
104.45
Run 2
107.33
Run 3
108.53
20
40
60
80
100
OCRMyPDF 10.3.1+dfsg
Processing 60 Page PDF Document
Seconds, Fewer Is Better
Run 1
SE +/- 0.47, N = 3
37.70
Run 2
38.99
Run 3
38.53
9
18
27
36
45
GNU Octave Benchmark 5.2.0
Seconds, Fewer Is Better
Run 1
SE +/- 0.046, N = 5
8.337
Run 2
8.496
Run 3
8.496
2
4
6
8
10

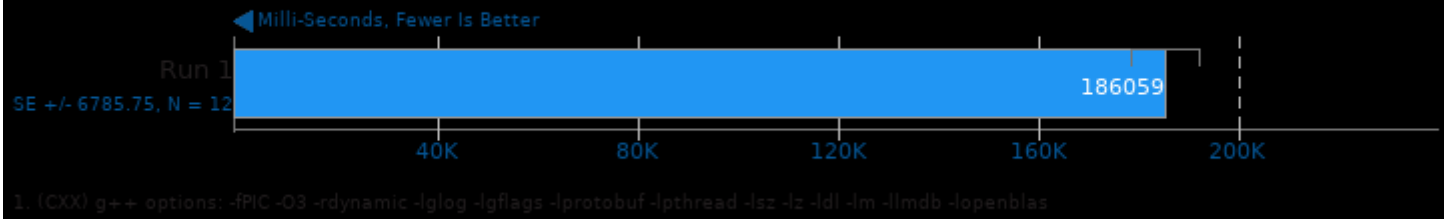

RawTherapee
Total Benchmark Time
Seconds, Fewer Is Better
Run 1
SE +/- 0.11, N = 3
83.60
Run 2
83.68
Run 3
83.36
20
40
60
80
100
1. RawTherapee, version 5.8, command line.
librsvg
Operation: SVG Files To PNG
Seconds, Fewer Is Better
Run 1
SE +/- 0.26, N = 3
32.53
Run 2
31.95
Run 3
32.50
8
16
24
32
40
1. rsvg-convert version 2.50.1
Redis 6.0.9
Test: LPOP
Requests Per Second, More Is Better
Run 1
SE +/- 2892.27, N = 3
519606.57
Run 2
500314.16
Run 3
521050.00
110K
220K
330K
440K
550K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3


Redis 6.0.9
Test: SADD
Requests Per Second, More Is Better
Run 1
Run 2
Run 3
SE +/- 6623.24, N = 15
682251.35
689655.12
693377.69
150K
300K
450K
600K
750K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3
Redis 6.0.9
Test: LPUSH
Requests Per Second, More Is Better
Run 1
Run 2
Run 3
SE +/- 4078.83, N = 3
509296.11
501002.00
510285.72
110K
220K
330K
440K
550K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3
Redis 6.0.9
Test: GET
Requests Per Second, More Is Better
Run 1
Run 2
Run 3
SE +/- 4540.22, N = 3
800110.61
811922.06
791993.69
200K
400K
600K
800K
1000K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3


Redis 6.0.9
Test: SET
Requests Per Second, More Is Better
Run 1
SE +/- 3402.58, N = 3
584774.65
Run 2
562275.44
Run 3
531519.69
130K
260K
390K
520K
650K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3
Caffe 2020-02-13
Model: AlexNet - Acceleration: CPU - Iterations: 100
Milli-Seconds, Fewer Is Better
Run 1
SE +/- 2232.82, N = 15
70400
15K
30K
45K
60K
75K
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas
Caffe 2020-02-13
Model: AlexNet - Acceleration: CPU - Iterations: 200
Milli-Seconds, Fewer Is Better
Run 1
SE +/- 4397.47, N = 12
125007
30K
60K
90K
120K
150K
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas
Caffe 2020-02-13
Model: AlexNet - Acceleration: CPU - Iterations: 1000
Milli-Seconds, Fewer Is Better
Run 1
SE +/- 16049.04, N = 9
654412
140K
280K
420K
560K
700K
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas

Caffe 2020-02-13

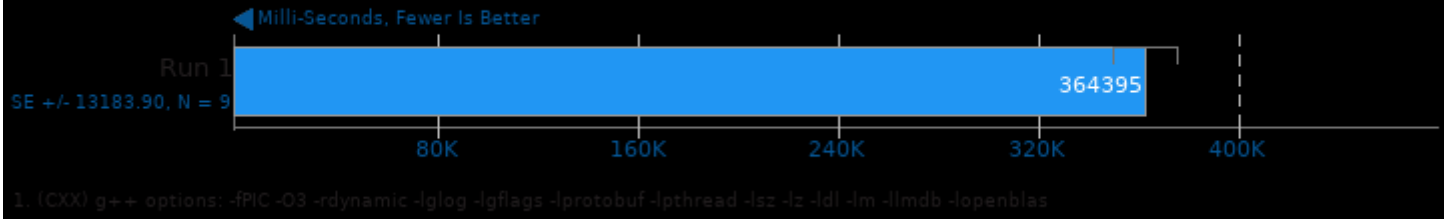
Model: GoogleNet - Acceleration: CPU - Iterations: 100



1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas

Caffe 2020-02-13

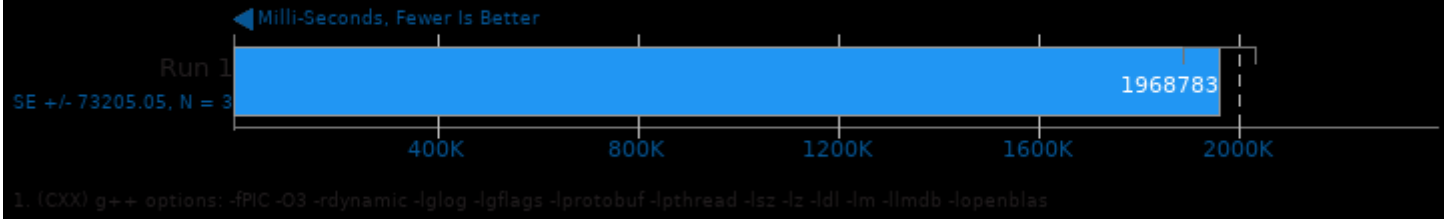
Model: GoogleNet - Acceleration: CPU - Iterations: 200



1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas

Caffe 2020-02-13

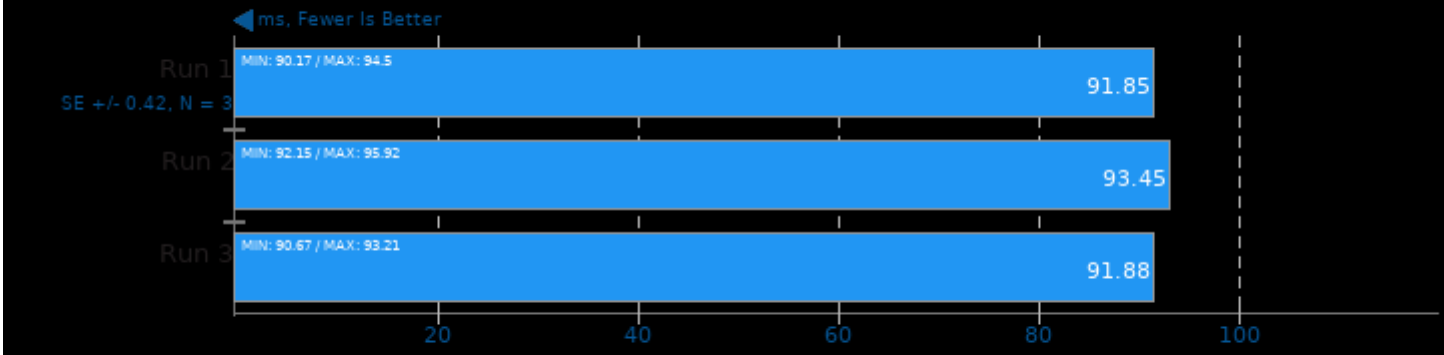
Model: GoogleNet - Acceleration: CPU - Iterations: 1000



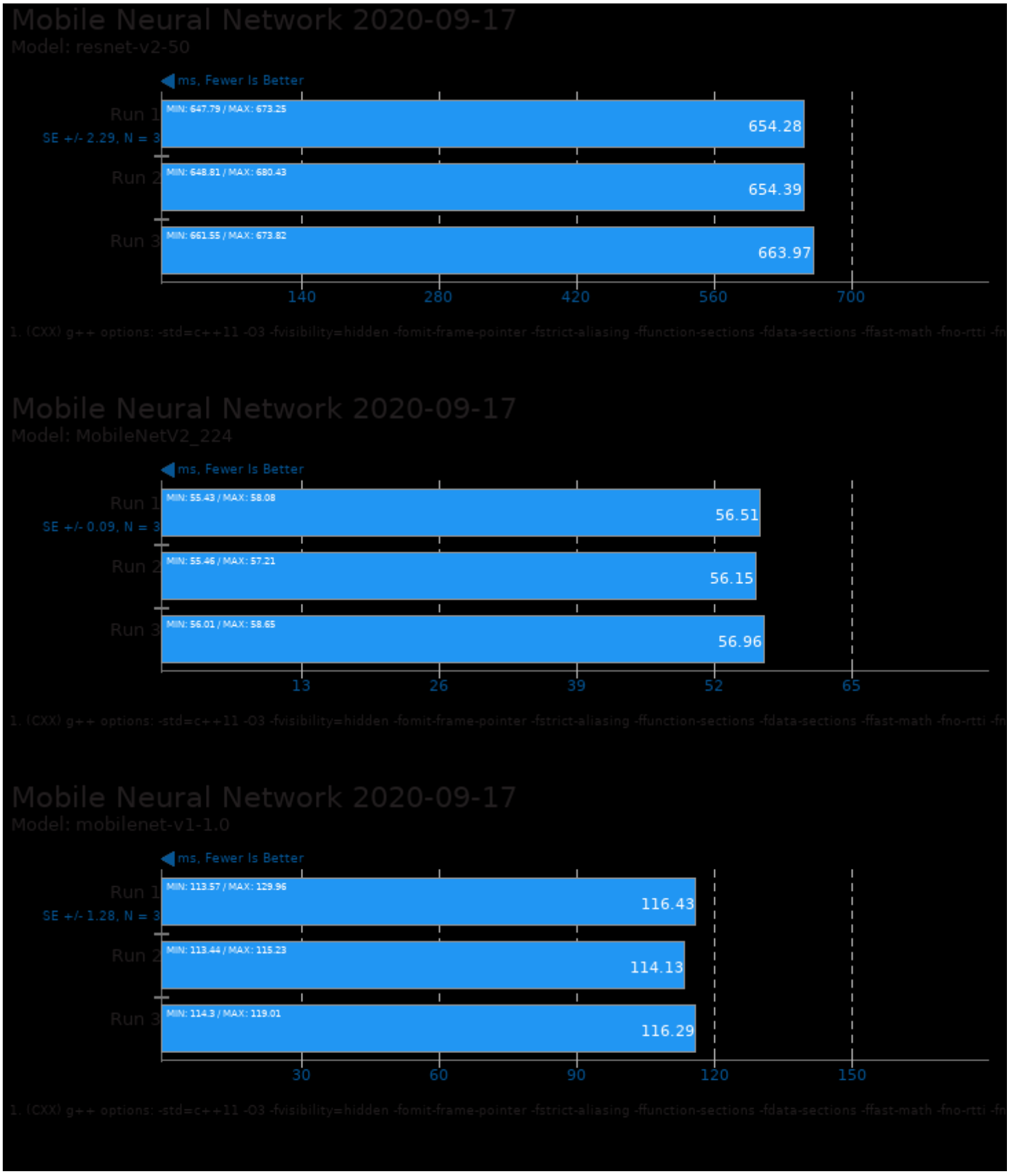
1. (CXX) g++ options: -fPIC -O3 -rdynamic -lglog -lgflags -lprotobuf -lpthread -lsz -lz -ldl -lm -llmdb -lopenblas

Mobile Neural Network 2020-09-17

Model: SqueezeNetV1.0

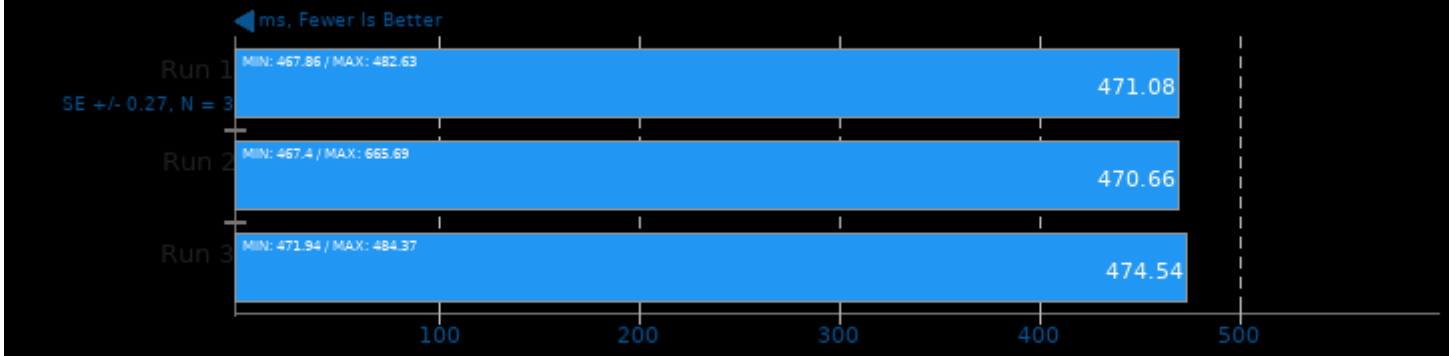


1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fn


Mobile Neural Network 2020-09-17
Model: resnet-v2-50
ms, Fewer Is Better
Run 1
MIN: 647.79 / MAX: 673.25
654.28
SE +/- 2.29, N = 3
Run 2
MIN: 648.81 / MAX: 680.43
654.39
Run 3
MIN: 661.55 / MAX: 673.82
663.97
140
280
420
560
700
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 2020-09-17
Model: MobileNetV2_224
ms, Fewer Is Better
Run 1
MIN: 55.43 / MAX: 58.08
56.51
SE +/- 0.09, N = 3
Run 2
MIN: 55.46 / MAX: 57.21
56.15
Run 3
MIN: 56.01 / MAX: 58.65
56.96
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
Mobile Neural Network 2020-09-17
Model: mobilenet-v1-1.0
ms, Fewer Is Better
Run 1
MIN: 113.57 / MAX: 129.96
116.43
SE +/- 1.28, N = 3
Run 2
MIN: 113.44 / MAX: 115.23
114.13
Run 3
MIN: 114.3 / MAX: 119.01
116.29
30
60
90
120
150
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 2020-09-17

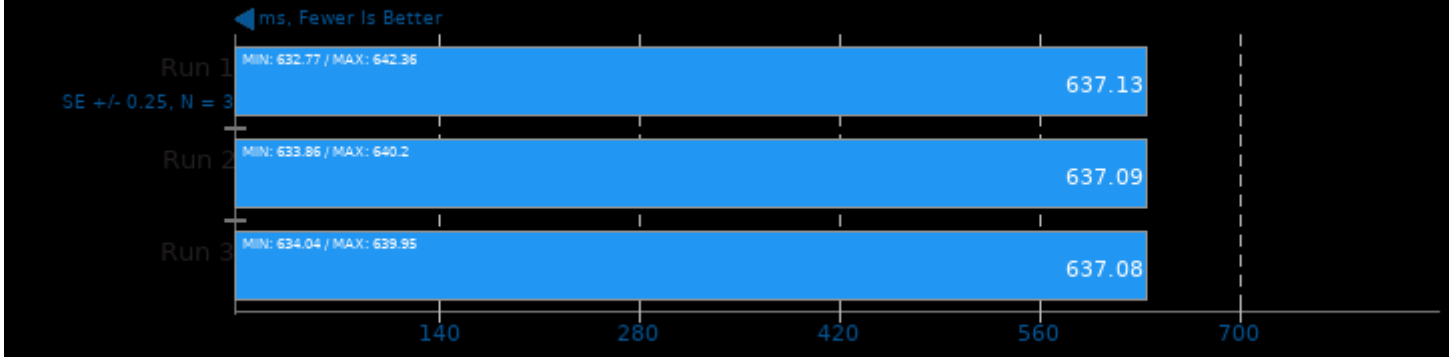
Model: inception-v3



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

TNN 0.2.3

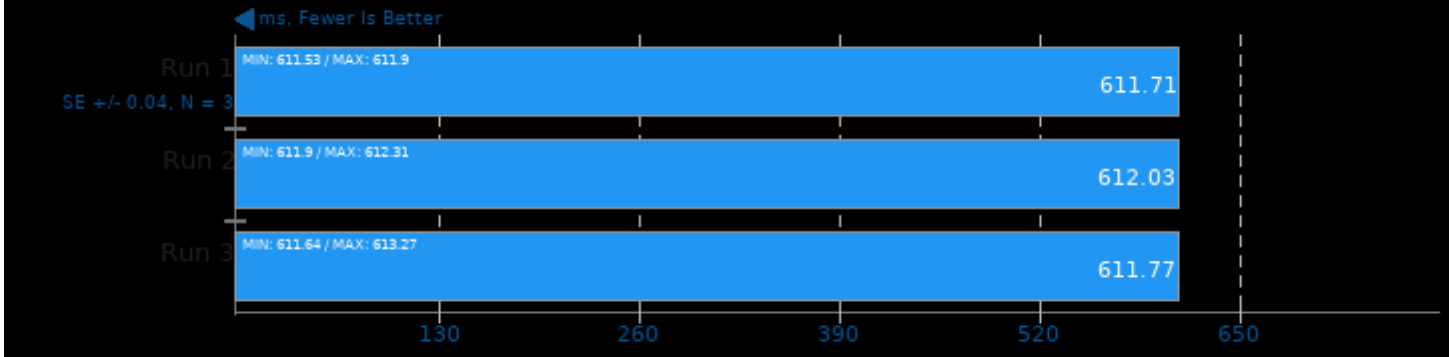
Target: CPU - Model: MobileNet v2



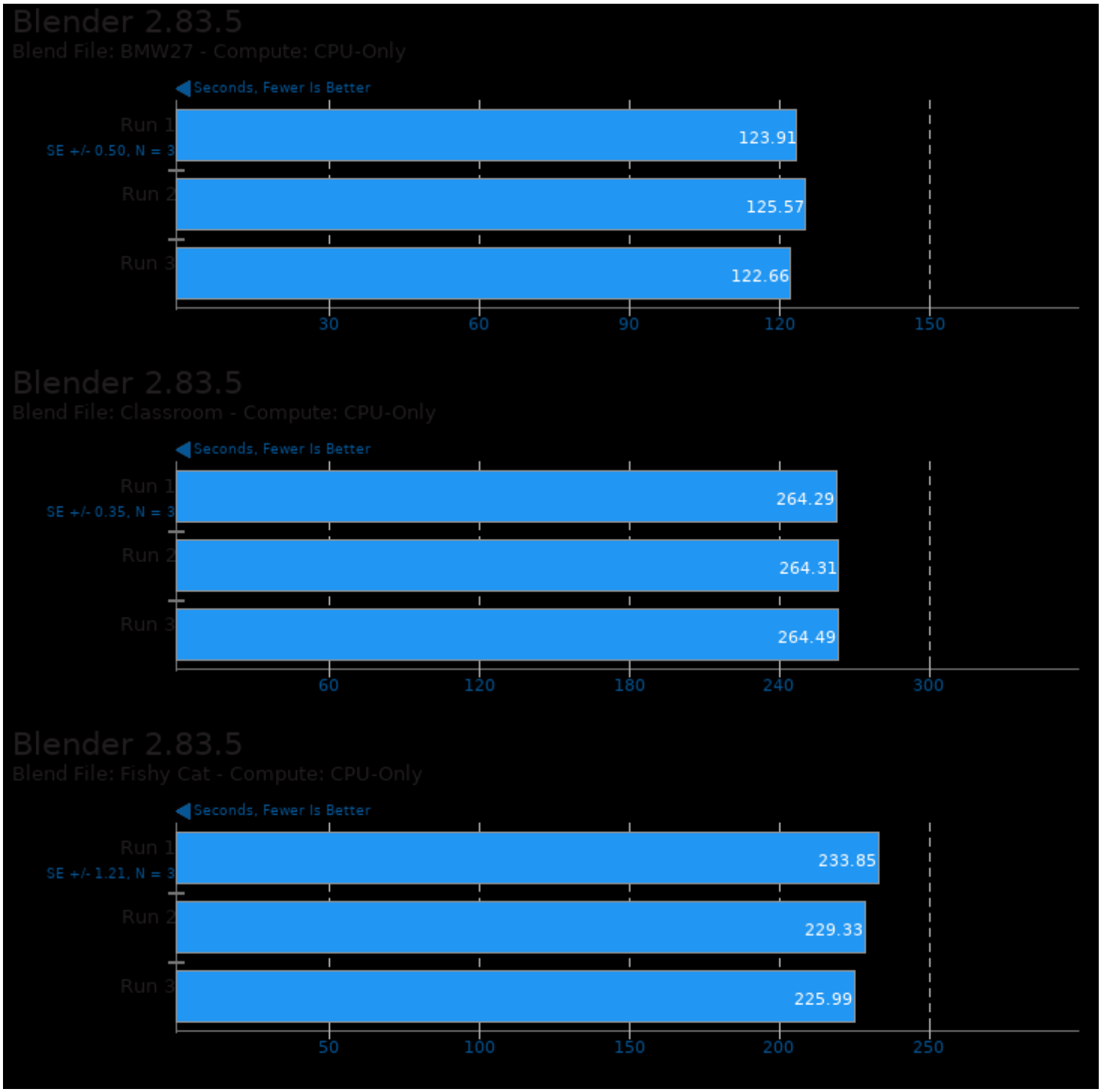
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -O3 -rdynamic -ldl

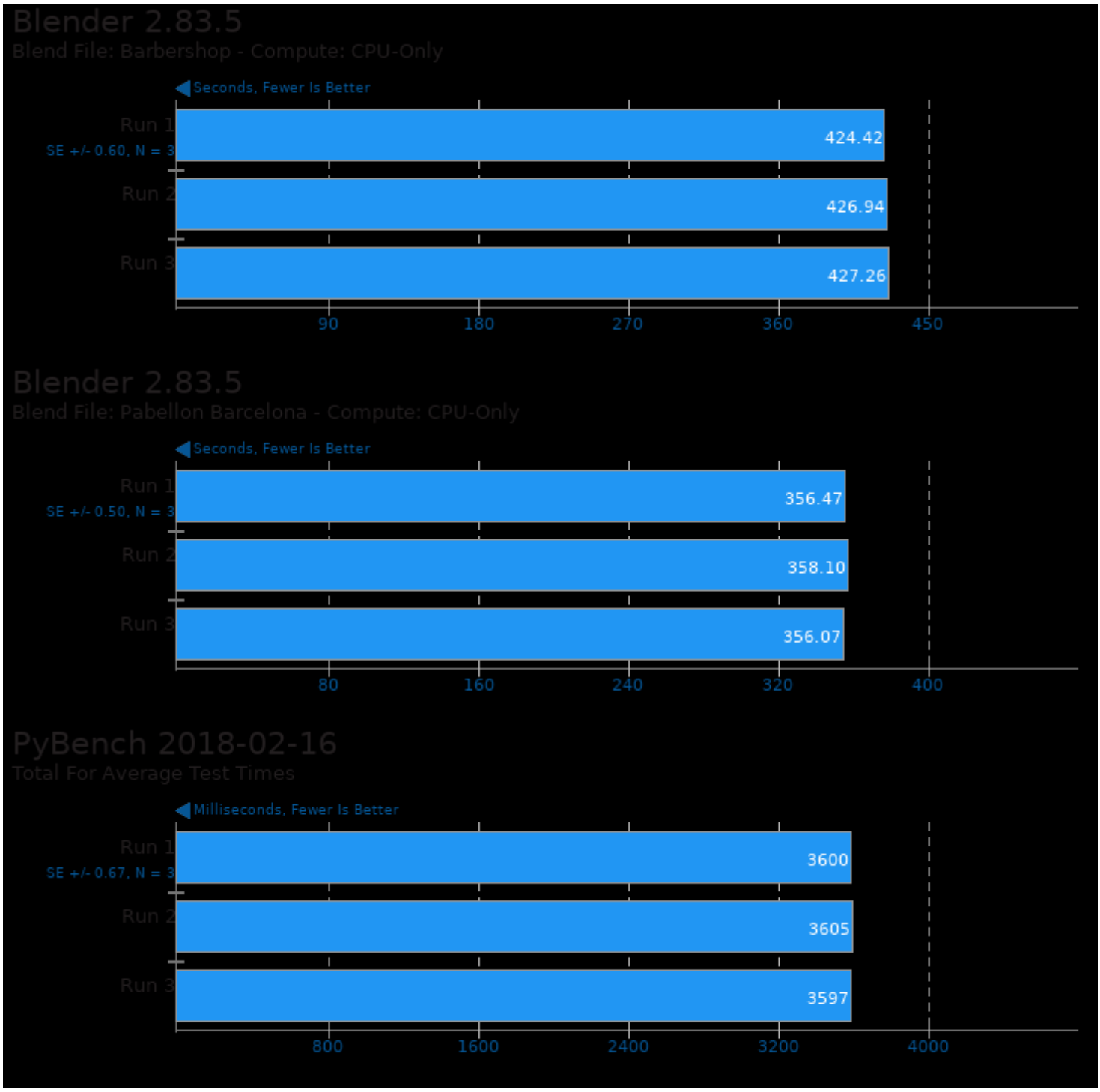
TNN 0.2.3

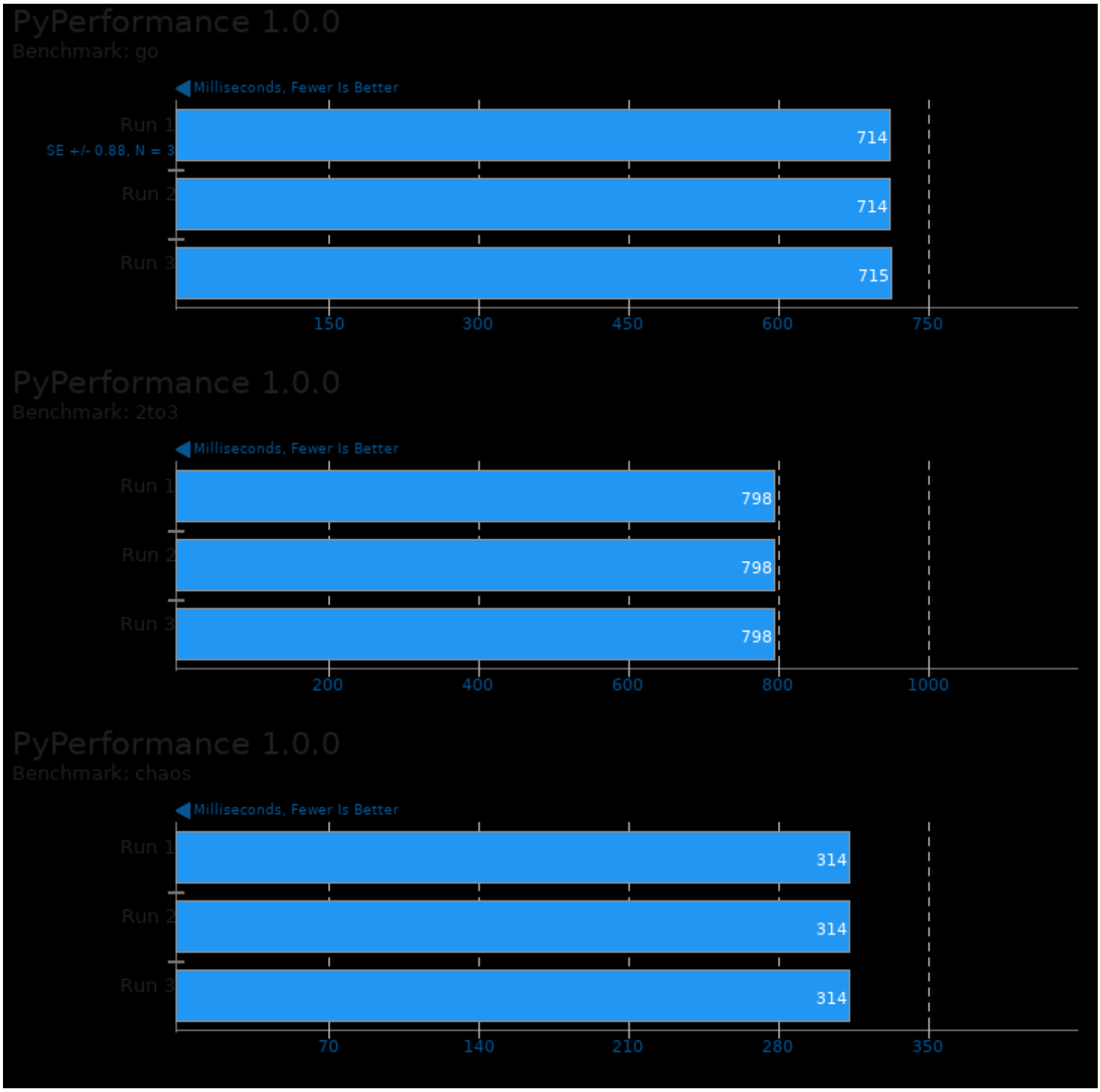
Target: CPU - Model: SqueezeNet v1.1

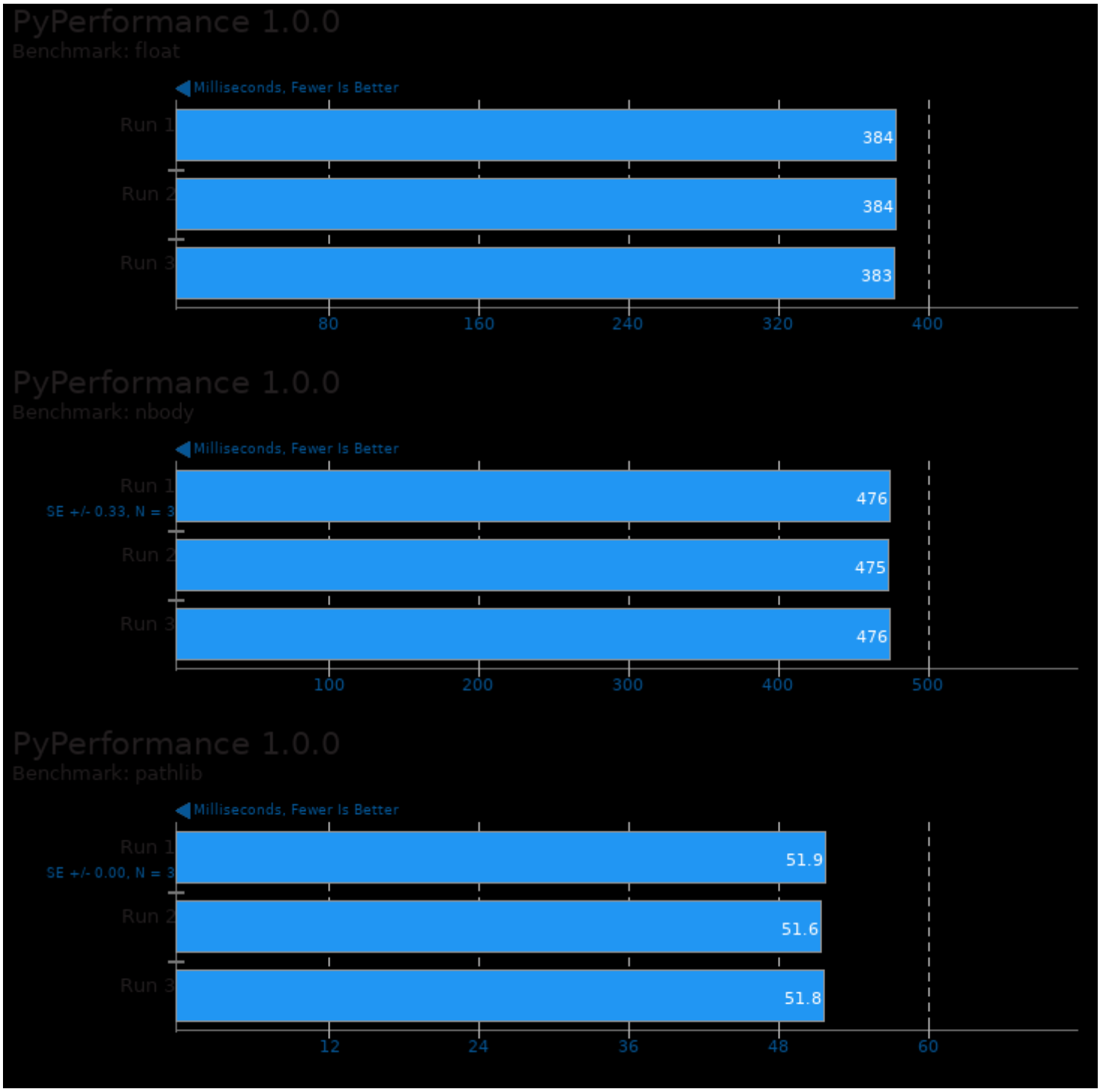


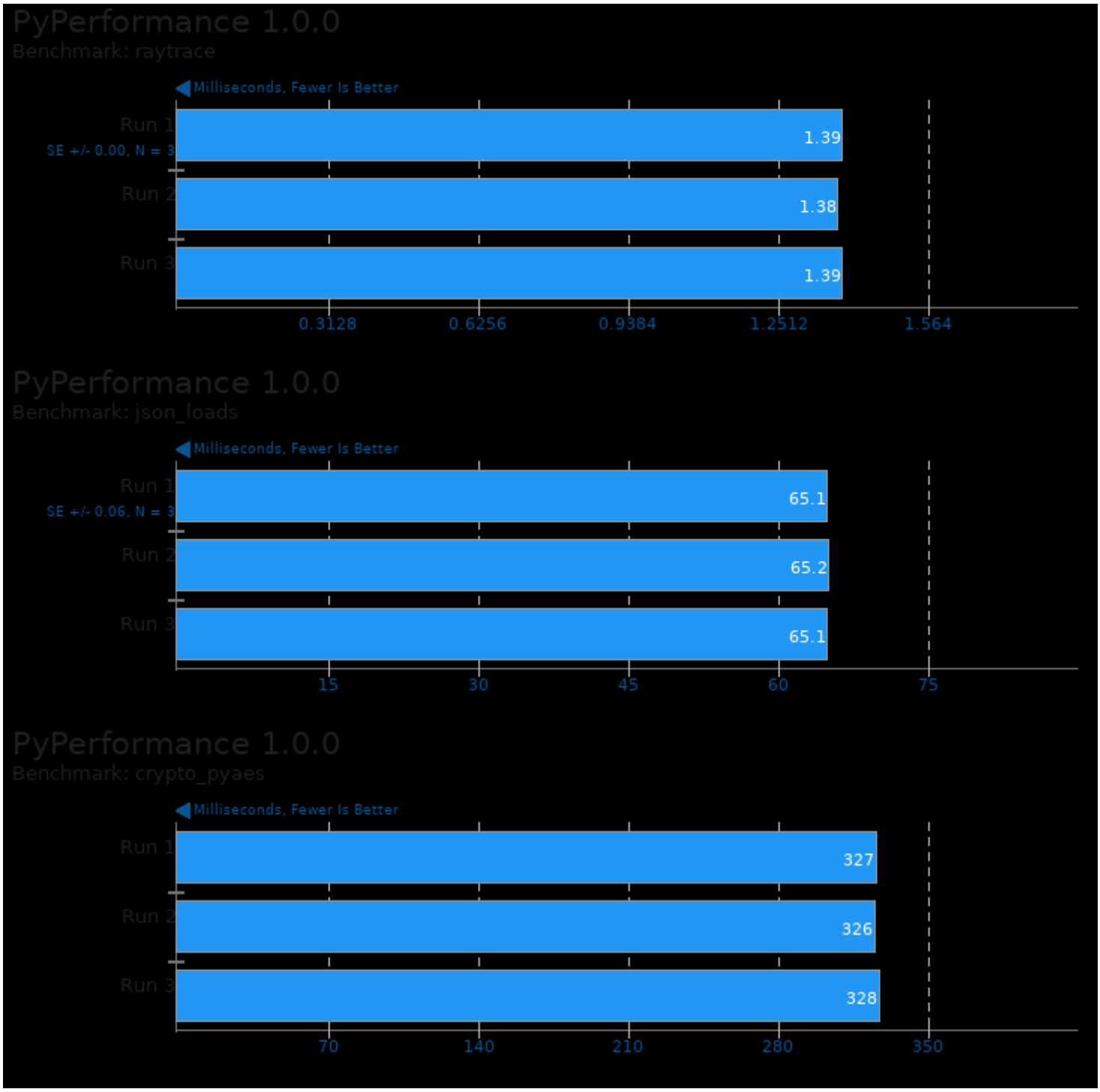
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -O3 -rdynamic -ldl

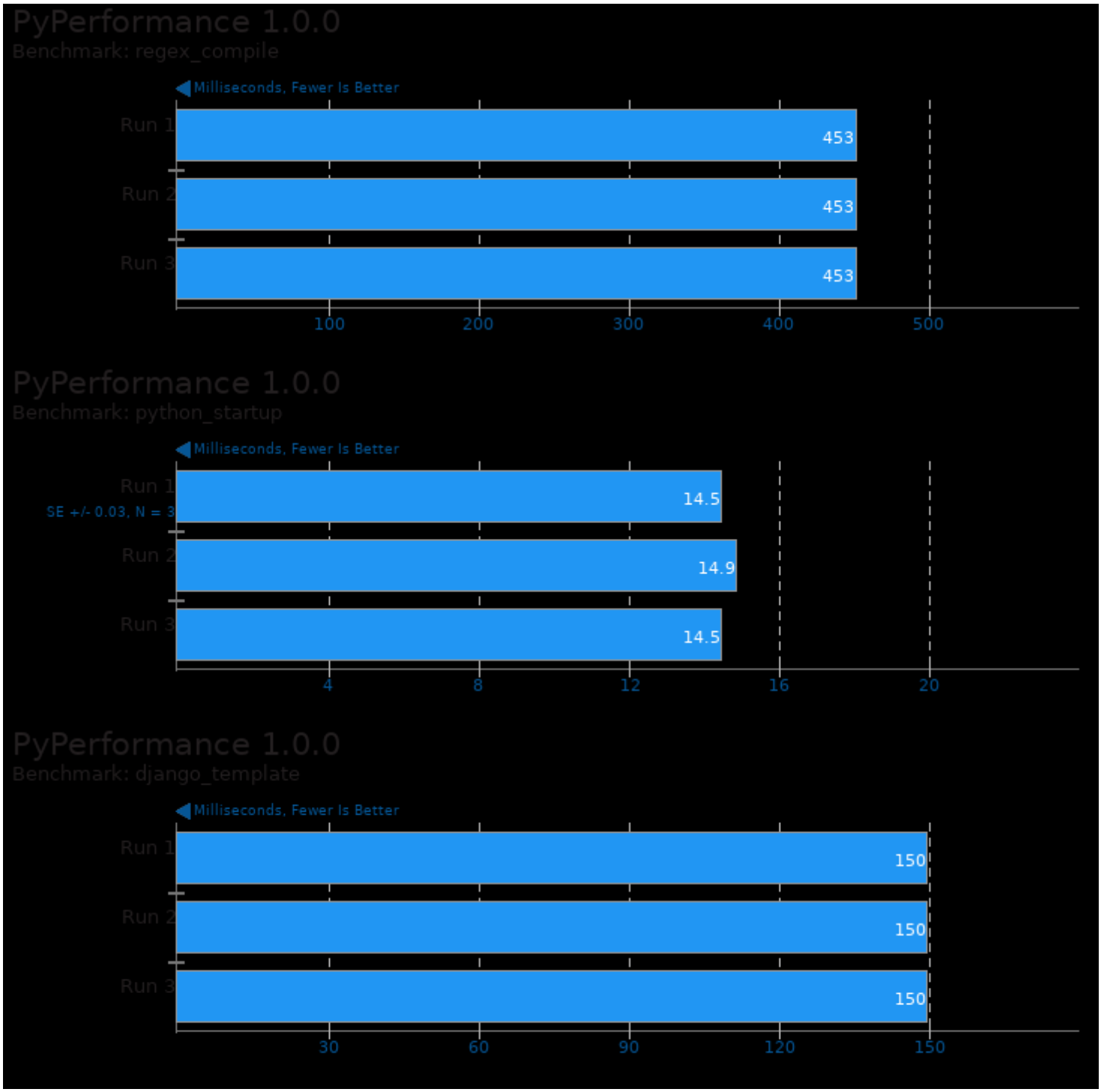

Blender 2.83.5
Blend File: BMW27 - Compute: CPU-Only
Seconds, Fewer Is Better
Run 1
SE +/- 0.50, N = 3
123.91
Run 2
125.57
Run 3
122.66
30
60
90
120
150
Blender 2.83.5
Blend File: Classroom - Compute: CPU-Only
Seconds, Fewer Is Better
Run 1
SE +/- 0.35, N = 3
264.29
Run 2
264.31
Run 3
264.49
60
120
180
240
300
Blender 2.83.5
Blend File: Fishy Cat - Compute: CPU-Only
Seconds, Fewer Is Better
Run 1
SE +/- 1.21, N = 3
233.85
Run 2
229.33
Run 3
225.99
50
100
150
200
250

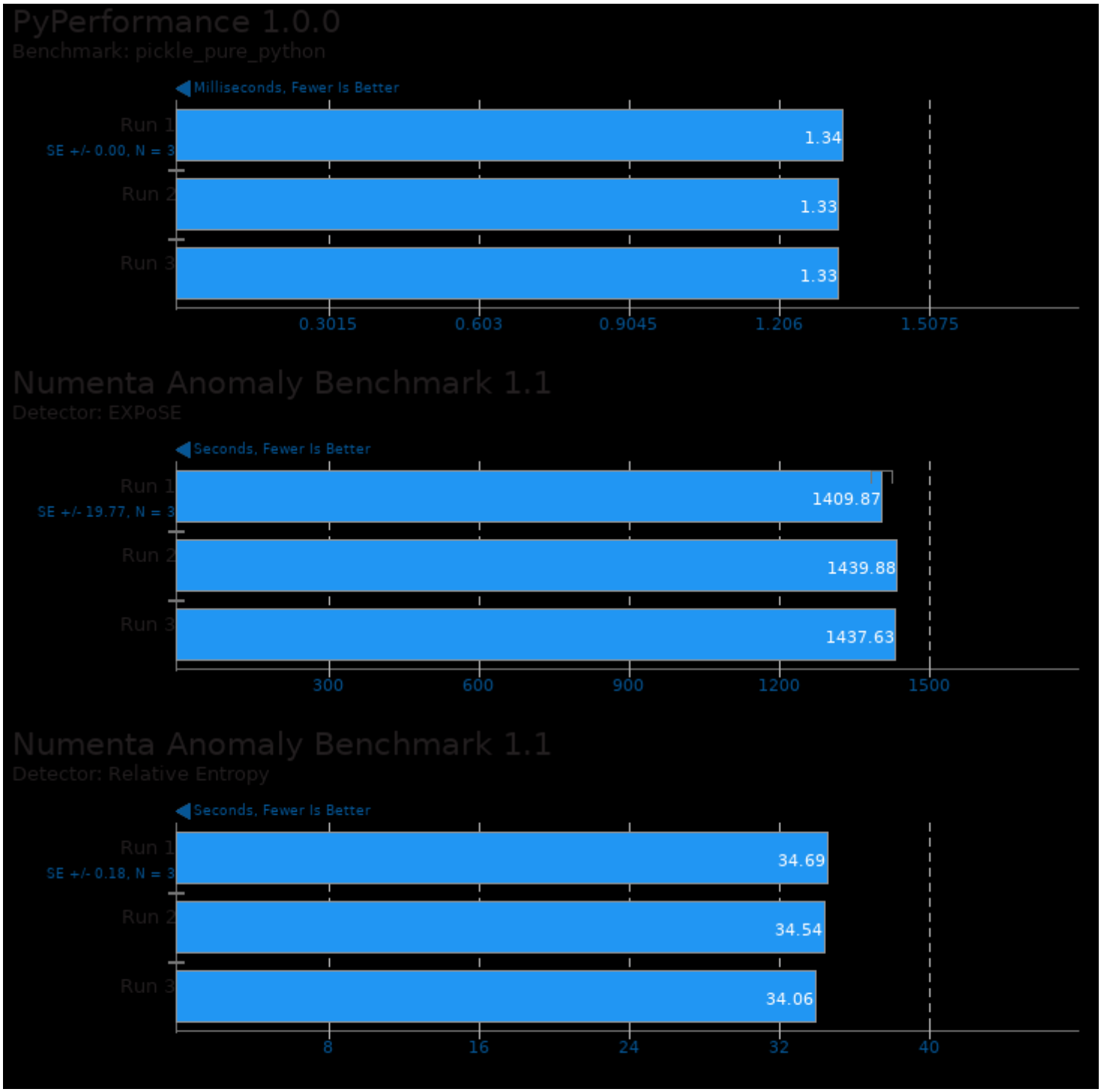

Blender 2.83.5
Blend File: Barbershop - Compute: CPU-Only
Seconds, Fewer Is Better
Run 1
SE +/- 0.60, N = 3
424.42
Run 2
426.94
Run 3
427.26
90
180
270
360
450
Blender 2.83.5
Blend File: Pabellon Barcelona - Compute: CPU-Only
Seconds, Fewer Is Better
Run 1
SE +/- 0.50, N = 3
356.47
Run 2
358.10
Run 3
356.07
80
160
240
320
400
PyBench 2018-02-16
Total For Average Test Times
Milliseconds, Fewer Is Better
Run 1
SE +/- 0.67, N = 3
3600
Run 2
3605
Run 3
3597
800
1600
2400
3200
4000

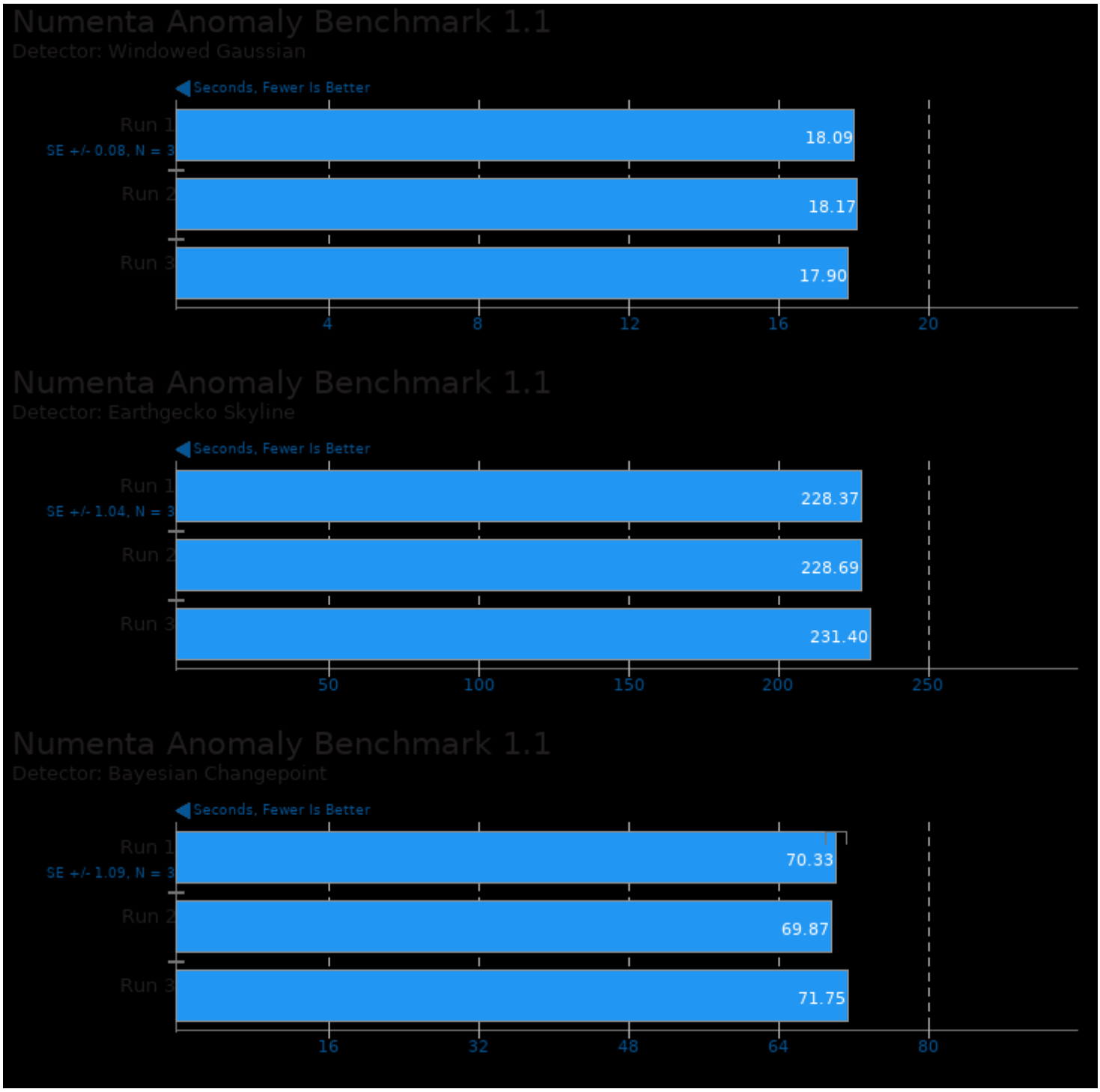

PyPerformance 1.0.0
Benchmark: go
Milliseconds, Fewer Is Better
Run 1
SE +/- 0.88, N = 3
Run 2
Run 3
714
714
715
150
300
450
600
750
PyPerformance 1.0.0
Benchmark: 2to3
Milliseconds, Fewer Is Better
Run 1
Run 2
Run 3
798
798
798
200
400
600
800
1000
PyPerformance 1.0.0
Benchmark: chaos
Milliseconds, Fewer Is Better
Run 1
Run 2
Run 3
314
314
314
70
140
210
280
350


PyPerformance 1.0.0
Benchmark: float
Milliseconds, Fewer Is Better
Run 1
384
Run 2
384
Run 3
383
80
160
240
320
400
PyPerformance 1.0.0
Benchmark: nbody
Milliseconds, Fewer Is Better
Run 1
SE +/- 0.33, N = 3
476
Run 2
475
Run 3
476
100
200
300
400
500
PyPerformance 1.0.0
Benchmark: pathlib
Milliseconds, Fewer Is Better
Run 1
SE +/- 0.00, N = 3
51.9
Run 2
51.6
Run 3
51.8
12
24
36
48
60


PyPerformance 1.0.0
Benchmark: raytrace
Milliseconds, Fewer Is Better
Run 1
SE +/- 0.00, N = 3
Run 2
Run 3
1.39
1.38
1.39
0.3128
0.6256
0.9384
1.2512
1.564
PyPerformance 1.0.0
Benchmark: json_loads
Milliseconds, Fewer Is Better
Run 1
SE +/- 0.06, N = 3
Run 2
Run 3
65.1
65.2
65.1
15
30
45
60
75
PyPerformance 1.0.0
Benchmark: crypto_pyaes
Milliseconds, Fewer Is Better
Run 1
Run 2
Run 3
327
326
328
70
140
210
280
350

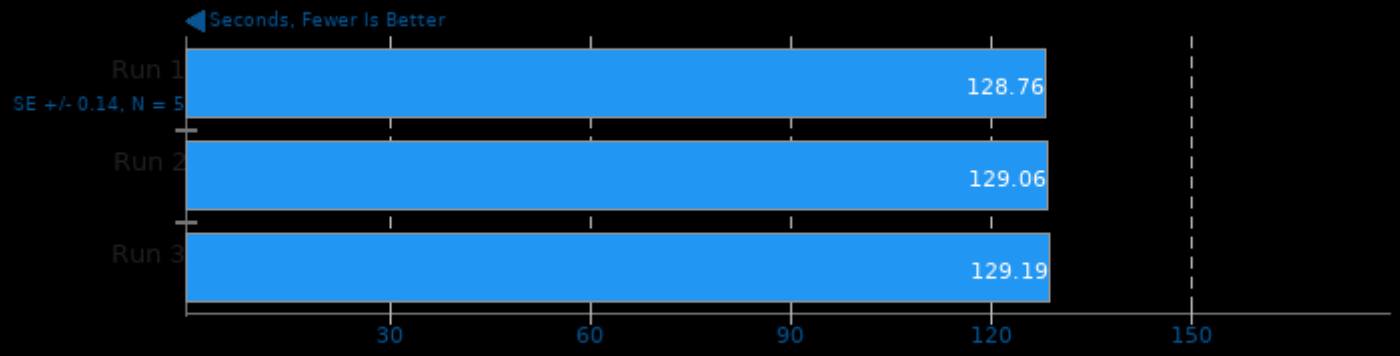

PyPerformance 1.0.0
Benchmark: regex_compile
Milliseconds, Fewer Is Better
Run 1
Run 2
Run 3
453
453
453
100
200
300
400
500
PyPerformance 1.0.0
Benchmark: python_startup
Milliseconds, Fewer Is Better
SE +/- 0.03, N = 3
Run 1
Run 2
Run 3
14.5
14.9
14.5
4
8
12
16
20
PyPerformance 1.0.0
Benchmark: django_template
Milliseconds, Fewer Is Better
Run 1
Run 2
Run 3
150
150
150
30
60
90
120
150


PyPerformance 1.0.0
Benchmark: pickle_pure_python
Milliseconds, Fewer Is Better
Run 1
SE +/- 0.00, N = 3
1.34
Run 2
1.33
Run 3
1.33
0.3015
0.603
0.9045
1.206
1.5075
Numenta Anomaly Benchmark 1.1
Detector: EXPoSE
Seconds, Fewer Is Better
Run 1
SE +/- 19.77, N = 3
1409.87
Run 2
1439.88
Run 3
1437.63
300
600
900
1200
1500
Numenta Anomaly Benchmark 1.1
Detector: Relative Entropy
Seconds, Fewer Is Better
Run 1
SE +/- 0.18, N = 3
34.69
Run 2
34.54
Run 3
34.06
8
16
24
32
40


Numenta Anomaly Benchmark 1.1
Detector: Windowed Gaussian
Seconds, Fewer Is Better
Run 1
SE +/- 0.08, N = 3
18.09
Run 2
18.17
Run 3
17.90
4
8
12
16
20
Numenta Anomaly Benchmark 1.1
Detector: Earthgecko Skyline
Seconds, Fewer Is Better
Run 1
SE +/- 1.04, N = 3
228.37
Run 2
228.69
Run 3
231.40
50
100
150
200
250
Numenta Anomaly Benchmark 1.1
Detector: Bayesian Changepoint
Seconds, Fewer Is Better
Run 1
SE +/- 1.09, N = 3
70.33
Run 2
69.87
Run 3
71.75
16
32
48
64
80

WavPack Audio Encoding 5.3

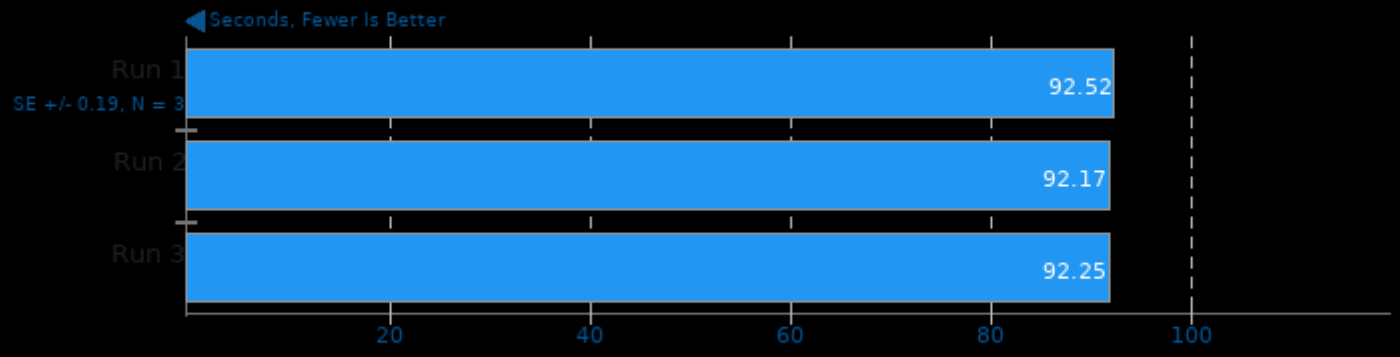
WAV To WavPack



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

Git

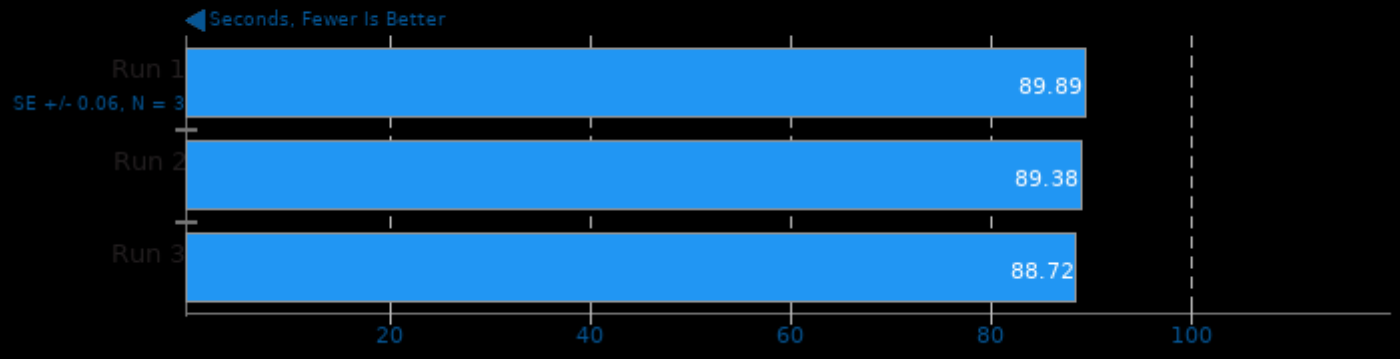
Time To Complete Common Git Commands

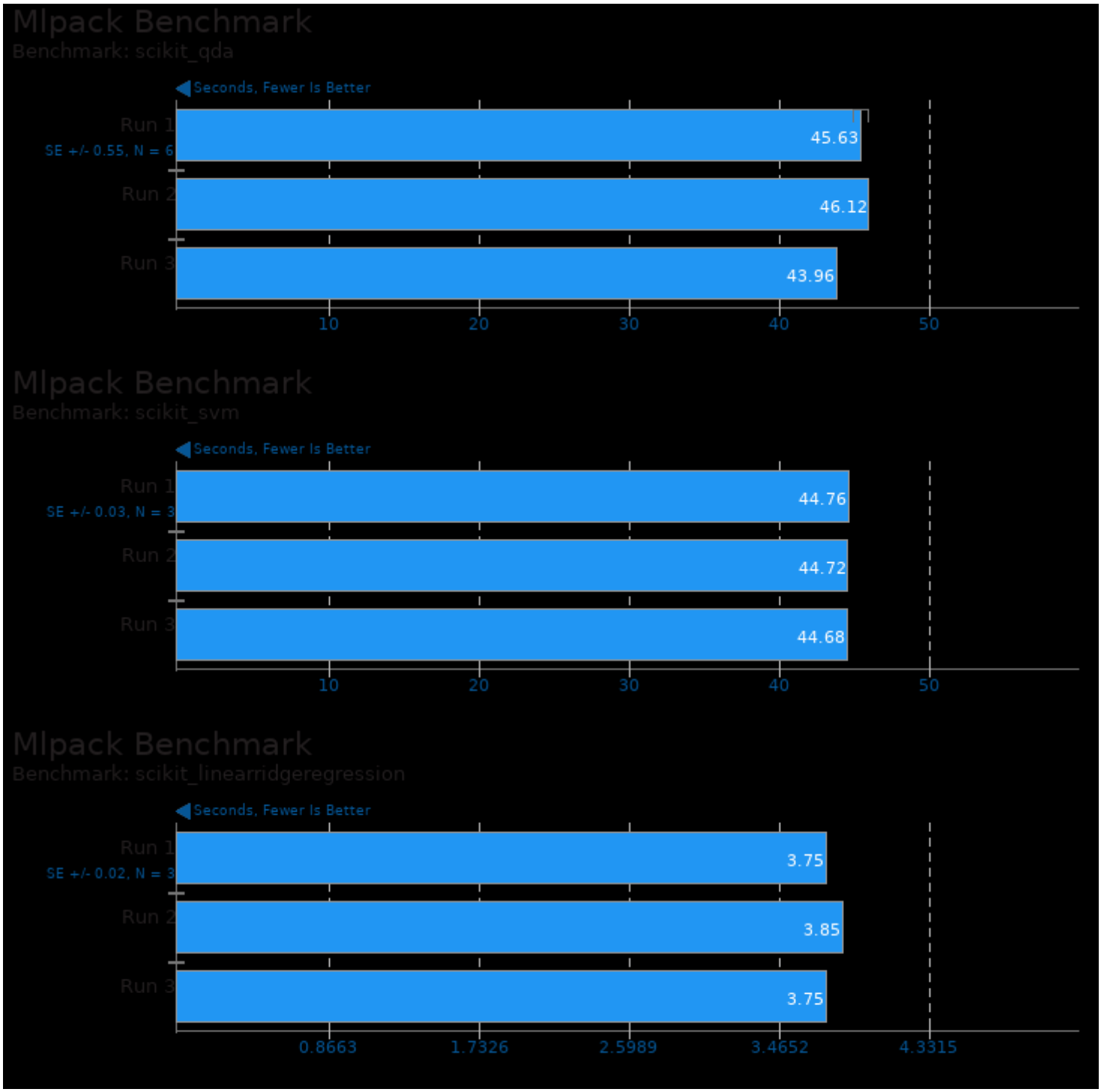


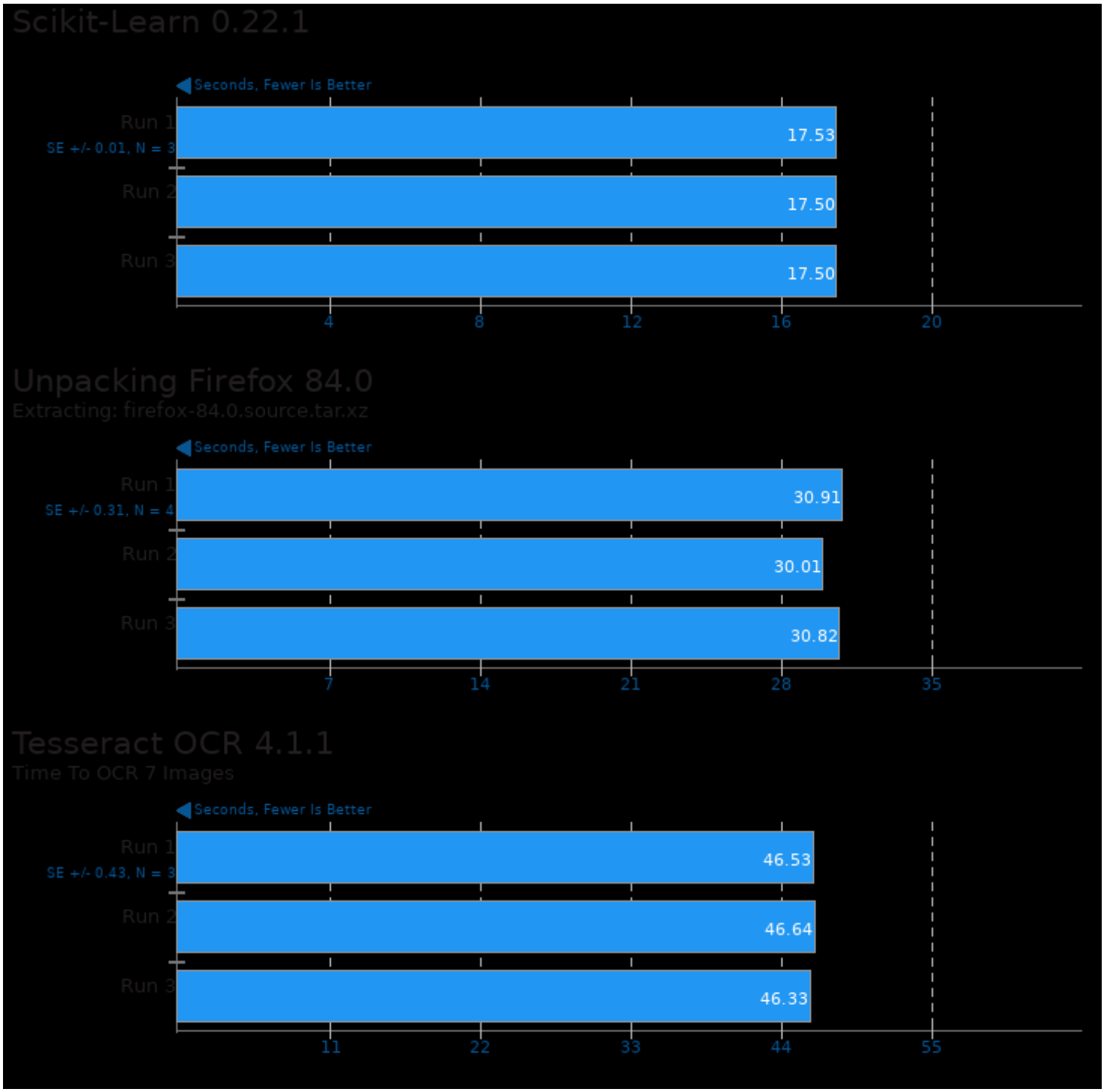
1. git version 2.27.0

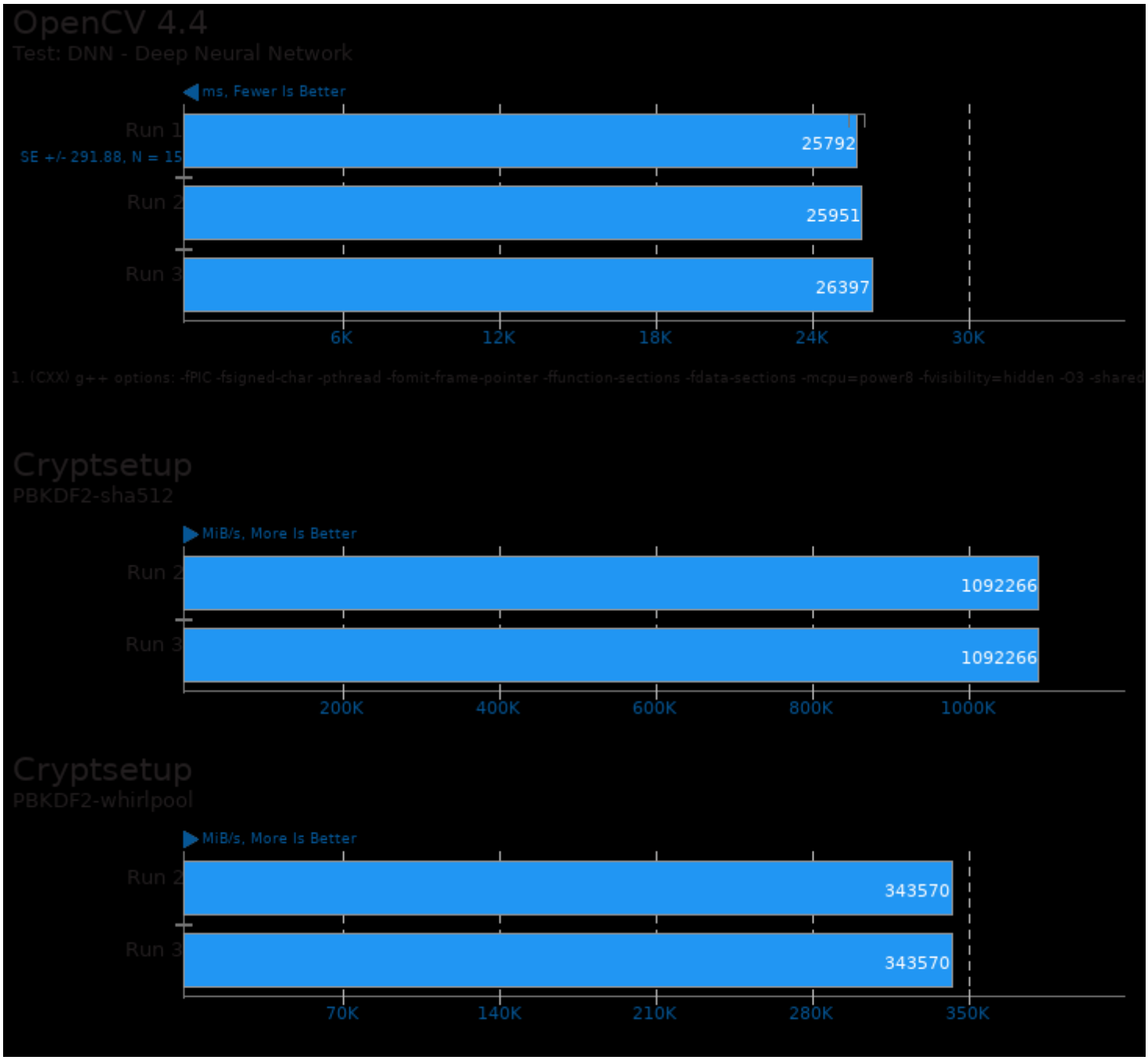
Mlpack Benchmark

Benchmark: scikit_ica




Mlpack Benchmark
Benchmark: scikit_qda
Seconds, Fewer Is Better
Run 1
SE +/- 0.55, N = 6
45.63
Run 2
46.12
Run 3
43.96
10
20
30
40
50
Mlpack Benchmark
Benchmark: scikit_svm
Seconds, Fewer Is Better
Run 1
SE +/- 0.03, N = 3
44.76
Run 2
44.72
Run 3
44.68
10
20
30
40
50
Mlpack Benchmark
Benchmark: scikit_linearridgeregression
Seconds, Fewer Is Better
Run 1
SE +/- 0.02, N = 3
3.75
Run 2
3.85
Run 3
3.75
0.8663
1.7326
2.5989
3.4652
4.3315


Scikit-Learn 0.22.1
Seconds, Fewer Is Better
Run 1
SE +/- 0.01, N = 3
17.53
Run 2
17.50
Run 3
17.50
4
8
12
16
20
Unpacking Firefox 84.0
Extracting: firefox-84.0.source.tar.xz
Seconds, Fewer Is Better
Run 1
SE +/- 0.31, N = 4
30.91
Run 2
30.01
Run 3
30.82
7
14
21
28
35
Tesseract OCR 4.1.1
Time To OCR 7 Images
Seconds, Fewer Is Better
Run 1
SE +/- 0.43, N = 3
46.53
Run 2
46.64
Run 3
46.33
11
22
33
44
55



This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 29 March 2024 09:05.