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2990WX Feb 2021

AMD Ryzen Threadripper 2990WX 32-Core testing with a ASUS ROG ZENITH EXTREME (1701 BIOS) and llvmpipe on Ubuntu 20.10 via the Phoronix Test Suite.

Automated Executive Summary

1 had the most wins, coming in first place for 50% of the tests.

Based on the geometric mean of all complete results, the fastest (1) was 1.008x the speed of the slowest (3). 2 was 0.996x the speed of 1, 4 was 0.999x the speed of 2, 3 was 0.998x the speed of 4.

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

JPEG XL Decoding (CPU Threads: All) at 1.045x
toyBrot Fractal Generator (Implementation: TBB) at 1.034x
JPEG XL (Input: JPEG - Encode Speed: 7) at 1.033x
JPEG XL (Input: PNG - Encode Speed: 5) at 1.033x
JPEG XL (Input: PNG - Encode Speed: 8) at 1.029x
libavif avifenc (Encoder Speed: 10) at 1.029x
JPEG XL (Input: JPEG - Encode Speed: 5) at 1.026x
libavif avifenc (Encoder Speed: 6, Lossless) at 1.018x
JPEG XL (Input: JPEG - Encode Speed: 8) at 1.015x

libavif avifenc (Encoder Speed: 2) at 1.013x.

Test Systems:

1

2

3

4

Processor: AMD Ryzen Threadripper 2990WX 32-Core @ 3.00GHz (32 Cores / 64 Threads), Motherboard: ASUS ROG ZENITH EXTREME (1701 BIOS), Chipset: AMD 17h, Memory: 32GB, Disk: Samsung SSD 970 EVO 500GB + 250GB Western Digital WDS250G2X0C-00L350, Graphics: llvmpipe, Audio: Realtek ALC1220, Network: Intel I211 + Qualcomm Atheros QCA6174 802.11ac + Wilocity Wil6200 802.11ad

OS: Ubuntu 20.10, Kernel: 5.8.0-41-generic (x86_64), Desktop: GNOME Shell 3.38.1, Display Server: X Server 1.20.9, OpenGL: 4.5 Mesa 20.2.1 (LLVM 11.0.0 256 bits), Compiler: GCC 10.2.0, 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++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-gcn/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand (Boost: Enabled) - CPU Microcode: 0x800820d
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional STIBP: disabled RSB filling + srbds: Not affected + tsx_async_abort: Not affected

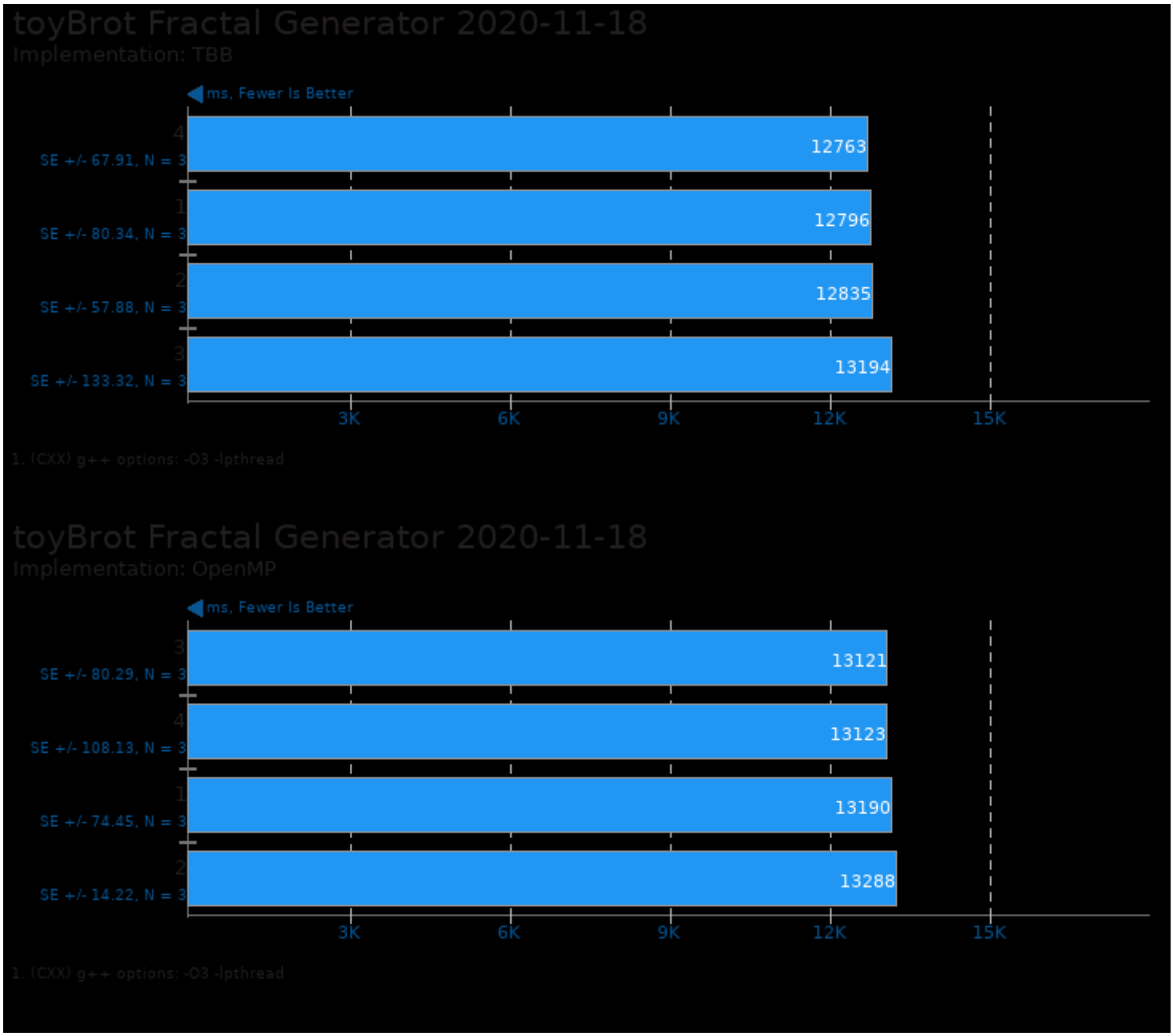
	1	2	3	4
toyBrot Fractal Generator - TBB (ms)	12796	12835	**13194**	**12763**
Normalized	99.74%	99.44%	96.73%	100%
Standard Deviation	1.1%	0.8%	1.8%	0.9%
toyBrot Fractal Generator - OpenMP (ms)	13190	**13288**	**13121**	13123
Normalized	99.48%	98.74%	100%	99.98%
Standard Deviation	1%	0.2%	1.1%	1.4%
toyBrot Fractal Generator - C++ Tasks (ms)	13364	13342	**13318**	**13373**
Normalized	99.66%	99.82%	100%	99.59%
Standard Deviation	0.4%	1%	0.8%	1.4%

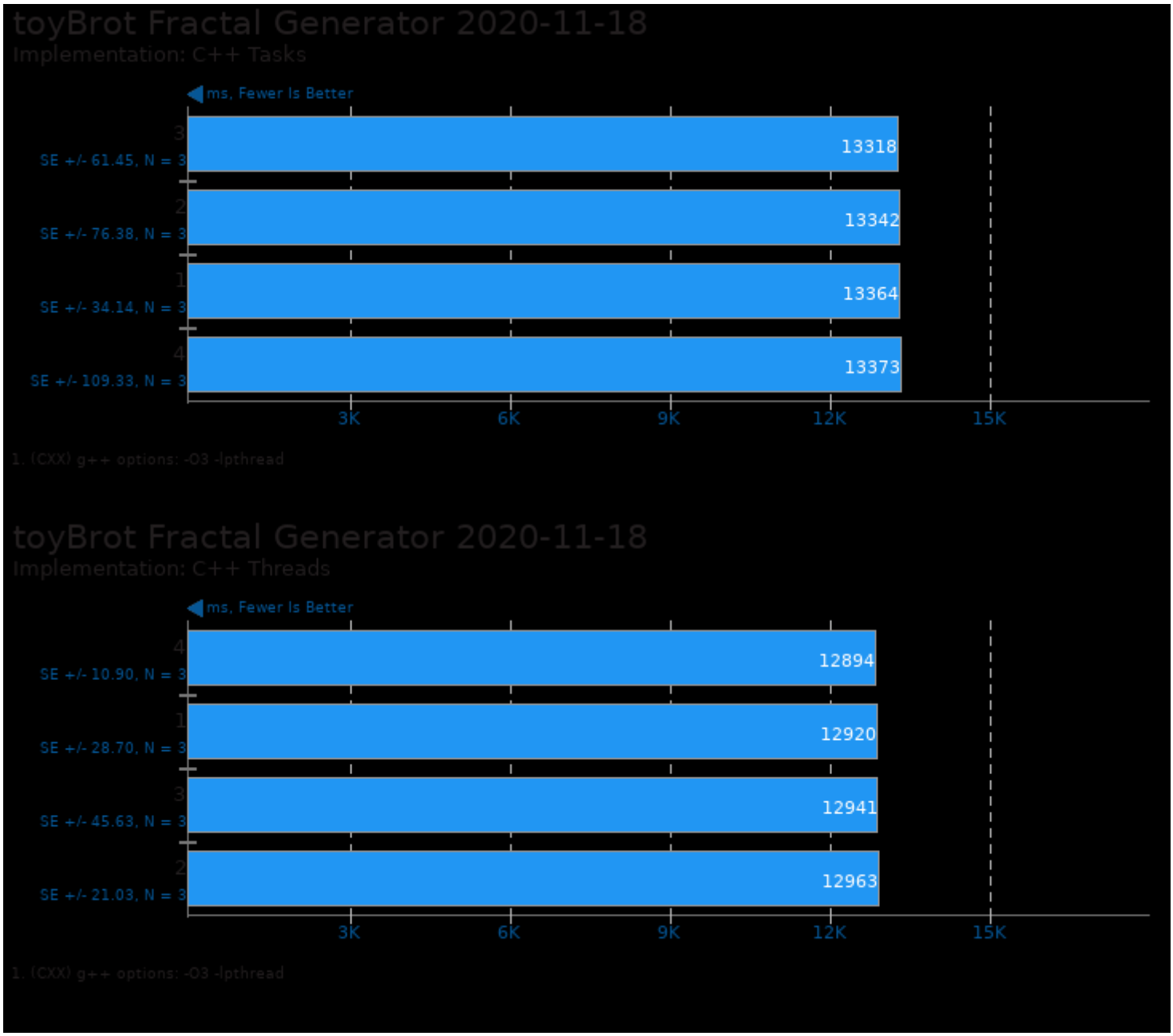
2990WX Feb 2021

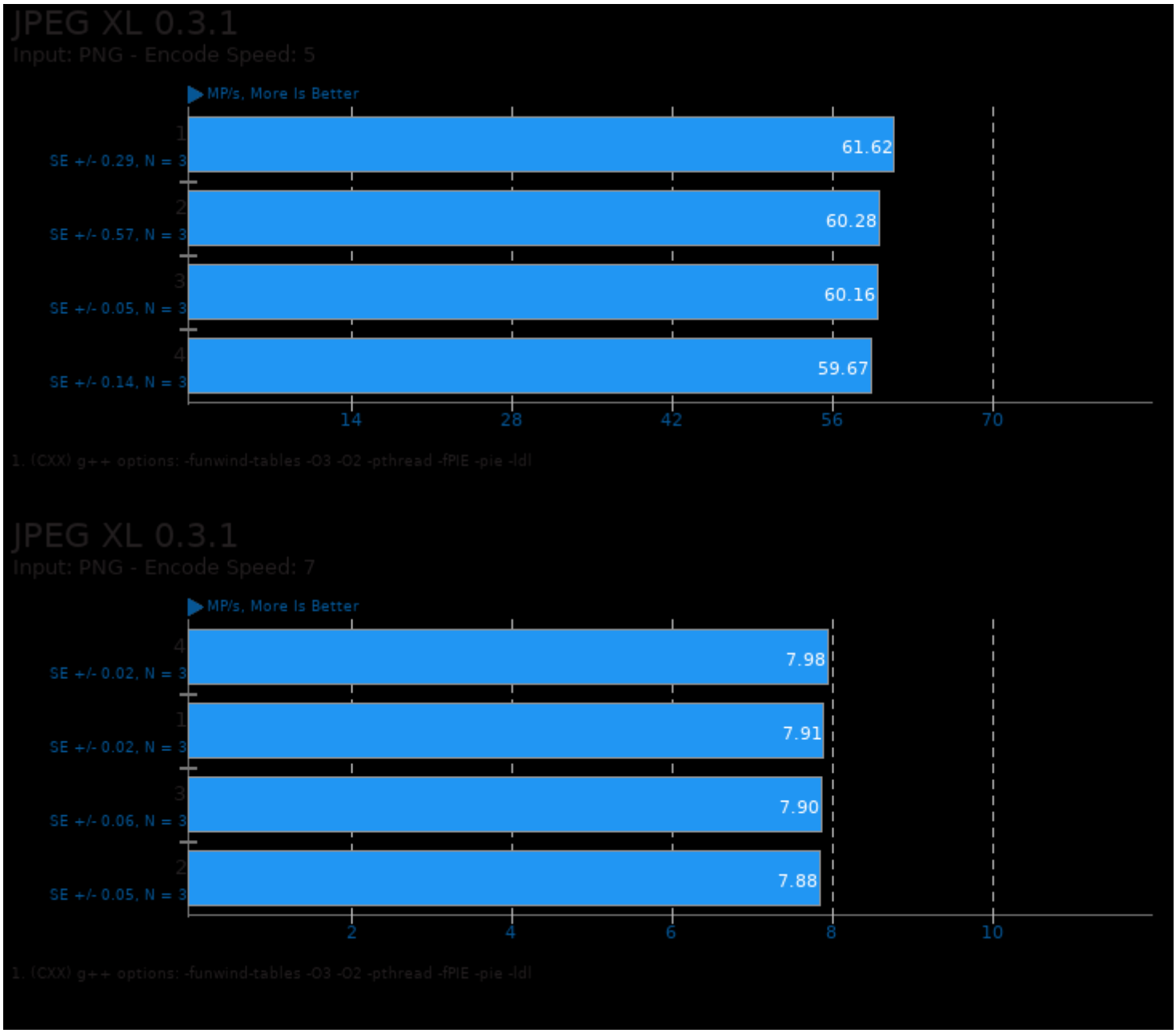
toyBrot Fractal Generator - C++ Threads (ms)	12920	**12963**	12941	**12894**
Normalized	99.8%	99.47%	99.64%	100%
Standard Deviation	0.4%	0.3%	0.6%	0.1%
JPEG XL - PNG - 5 (MP/s)	**61.62**	60.28	60.16	**59.67**
Normalized	100%	97.83%	97.63%	96.84%
Standard Deviation	0.8%	1.6%	0.2%	0.4%
JPEG XL - PNG - 7 (MP/s)	7.91	**7.88**	7.90	**7.98**
Normalized	99.12%	98.75%	99%	100%
Standard Deviation	0.4%	1.1%	1.2%	0.5%
JPEG XL - PNG - 8 (MP/s)	**0.68**	**0.70**	**0.70**	**0.70**
Normalized	97.14%	100%	100%	100%
Standard Deviation	0.9%	0.8%	0.8%	0.8%
JPEG XL - JPEG - 5 (MP/s)	**54.56**	53.92	**53.20**	53.28
Normalized	100%	98.83%	97.51%	97.65%
Standard Deviation	1%	0.4%	1.1%	0.4%
JPEG XL - JPEG - 7 (MP/s)	**54.17**	53.34	**52.43**	53.08
Normalized	100%	98.47%	96.79%	97.99%
Standard Deviation	0.5%	0.9%	1.2%	0.7%
JPEG XL - JPEG - 8 (MP/s)	23.27	**23.33**	**22.99**	23.12
Normalized	99.74%	100%	98.54%	99.1%
Standard Deviation	0.2%	1.1%	1.7%	1.6%
JPEG XL Decoding - 1 (MP/s)	**30.19**	30.02	**29.80**	29.97
Normalized	100%	99.44%	98.71%	99.27%
Standard Deviation	0.3%	0.3%	0.7%	0.9%
JPEG XL Decoding - All (MP/s)	**151.72**	148.25	147.37	**145.16**
Normalized	100%	97.71%	97.13%	95.68%
Standard Deviation	0.3%	1.2%	1.6%	0.6%
dav1d - Chimera 1080p (FPS)	**552.58**	551.42	**547.63**	549.06
Normalized	100%	99.79%	99.1%	99.36%
Standard Deviation	0.1%	0.2%	0.6%	0.5%
dav1d - Summer Nature 4K (FPS)	**209.55**	208.93	**207.63**	208.40
Normalized	100%	99.7%	99.08%	99.45%
Standard Deviation	0.7%	1.4%	2.1%	0.5%
dav1d - S.N.1 (FPS)	**564.42**	565.80	**568.04**	566.83
Normalized	99.36%	99.61%	100%	99.79%
Standard Deviation	0.4%	0.9%	1%	0.6%
dav1d - C.1.1.b (FPS)	142.43	**142.58**	**142.58**	**141.04**
Normalized	99.89%	100%	100%	98.92%
Standard Deviation	0.5%	0.3%	0.4%	1.4%
libavif avifenc - 0 (sec)	69.182	**69.098**	**69.919**	69.332
Normalized	99.88%	100%	98.83%	99.66%
Standard Deviation	0.5%	0.4%	0.9%	1.1%
libavif avifenc - 2 (sec)	**37.774**	38.140	38.243	**38.275**
Normalized	100%	99.04%	98.77%	98.69%
Standard Deviation	1.3%	1.7%	1.6%	2.9%
libavif avifenc - 6 (sec)	13.948	13.915	**14.072**	**13.888**
Normalized	99.57%	99.81%	98.69%	100%
Standard Deviation	2%	2.8%	2%	2.5%
libavif avifenc - 10 (sec)	**4.128**	**4.246**	4.139	4.189
Normalized	100%	97.22%	99.73%	98.54%
Standard Deviation	2.7%	0.4%	2.8%	1.7%
libavif avifenc - 6, Lossless (sec)	**35.637**	**36.289**	36.265	36.058
Normalized	100%	98.2%	98.27%	98.83%
Standard Deviation	0.7%	1.7%	1.2%	2.2%

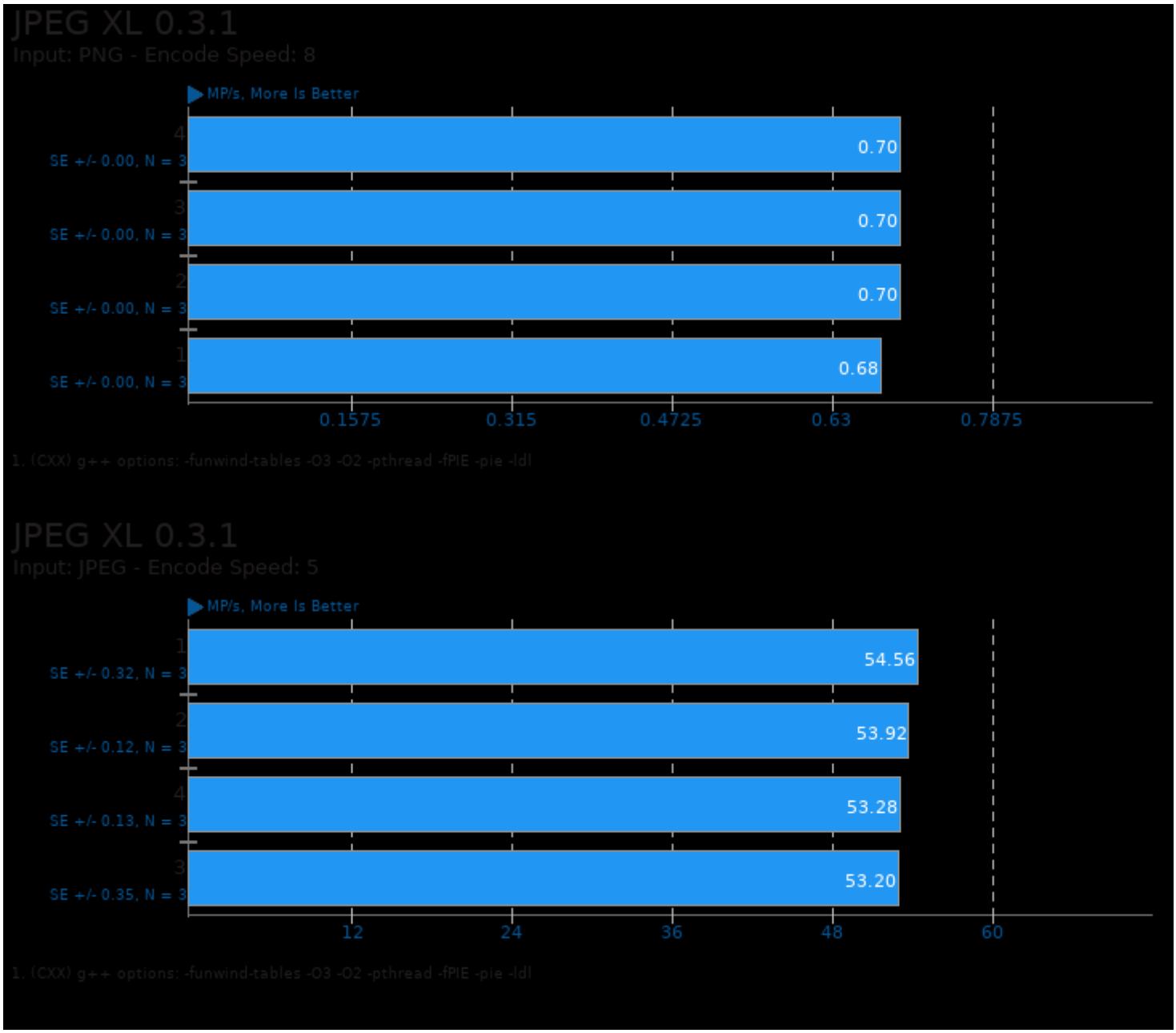
2990WX Feb 2021

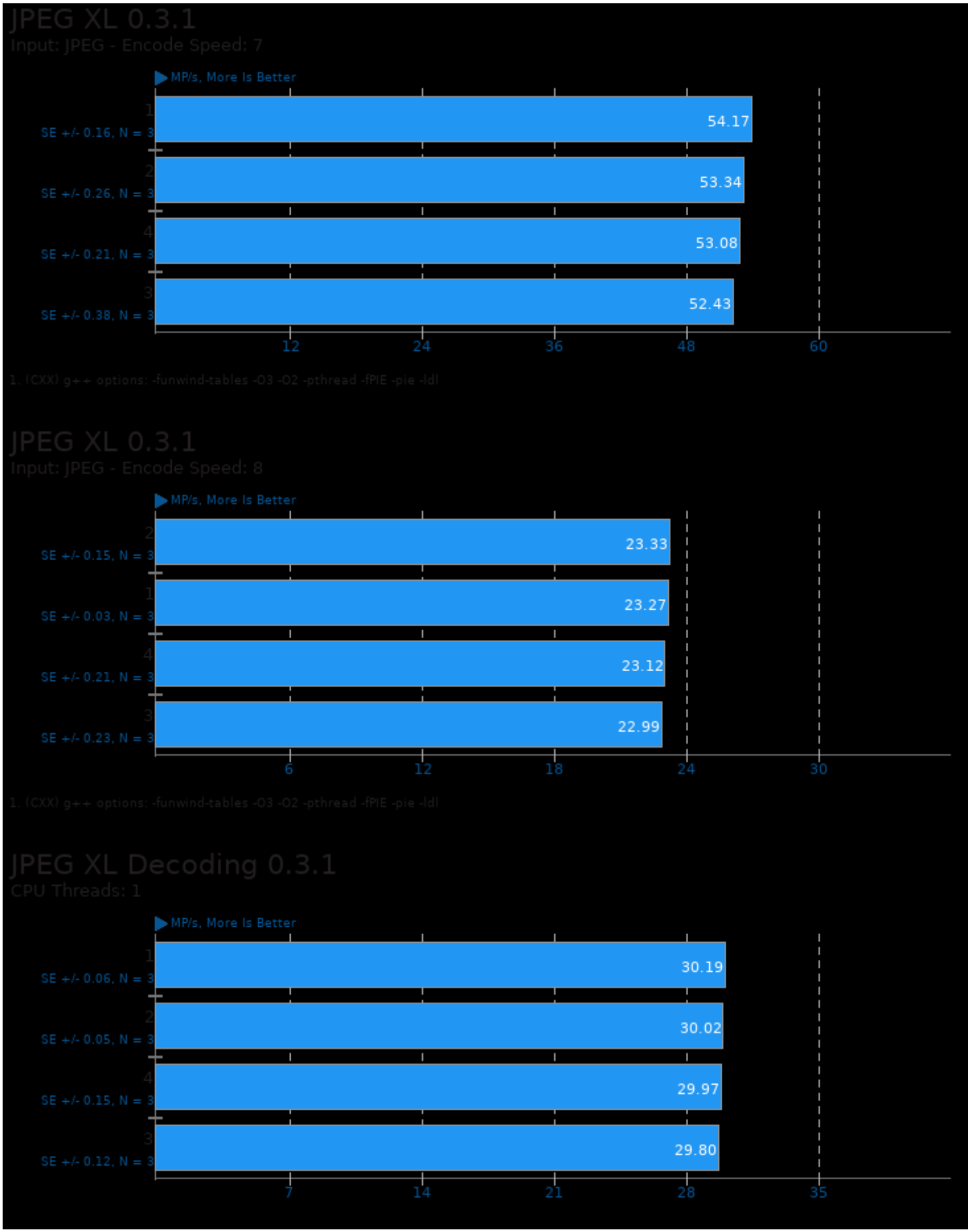
libavif avifenc - 10, Lossless (sec)	7.109	**7.068**	**7.140**	7.101
Normalized	99.42%	100%	98.99%	99.54%
Standard Deviation	2.8%	2.9%	2.9%	2.8%
GROMACS - water_GMX50_bare (Ns/Day)	**1.785**	**1.769**	1.783	1.782
Normalized	100%	99.1%	99.89%	99.83%
Standard Deviation	1%	0.5%	0.5%	0.7%
Blender - BMW27 - CPU-Only (sec)	60.54	60.46	**60.41**	**60.66**
Normalized	99.79%	99.92%	100%	99.59%
Standard Deviation	0.5%	0.5%	0.6%	0.3%
Blender - Classroom - CPU-Only (sec)	**170.85**	**171.58**	171.41	171.48
Normalized	100%	99.57%	99.67%	99.63%
Standard Deviation	0.2%	0.2%	0.1%	0.2%
Blender - Fishy Cat - CPU-Only (sec)	**89.93**	89.95	89.96	**90.08**
Normalized	100%	99.98%	99.97%	99.83%
Standard Deviation	0.4%	0.3%	0.1%	0.3%
Blender - Barbershop - CPU-Only	262.31	**262.34**	262.18	**261.51**
Normalized	99.7%	99.68%	99.74%	100%
Standard Deviation	0.2%	0.2%	0.2%	0.2%
Blender - Pabellon Barcelona - CPU-Only (sec)	**202.79**	203.20	**203.67**	202.98
Normalized	100%	99.8%	99.57%	99.91%
Standard Deviation	0.2%	0.5%	0.1%	0.2%

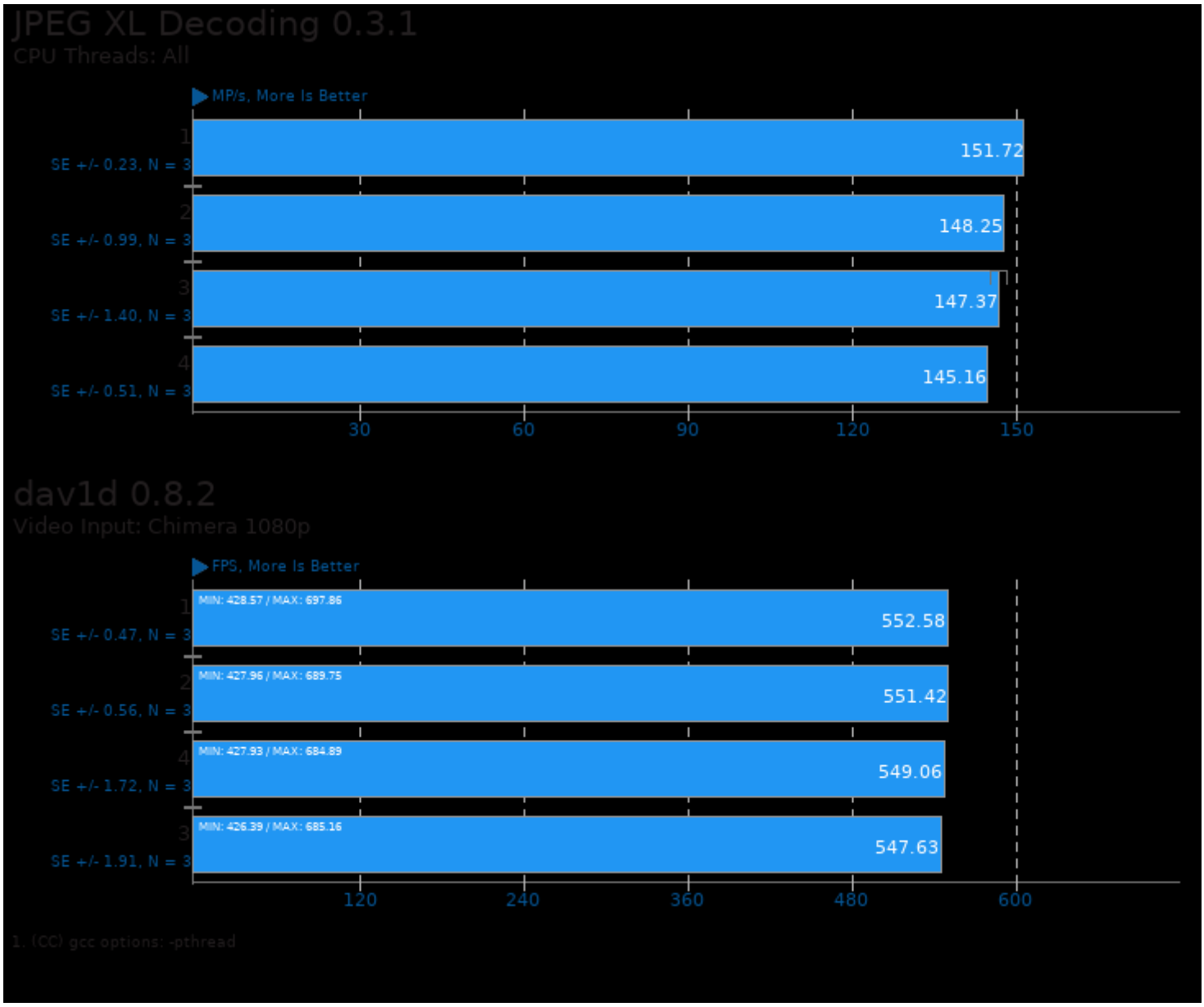

toyBrot Fractal Generator 2020-11-18
Implementation: TBB
ms, Fewer Is Better
4
SE +/- 67.91, N = 3
12763
1
SE +/- 80.34, N = 3
12796
2
SE +/- 57.88, N = 3
12835
3
SE +/- 133.32, N = 3
13194
3K
6K
9K
12K
15K
1. (CXX) g++ options: -O3 -lpthread
toyBrot Fractal Generator 2020-11-18
Implementation: OpenMP
ms, Fewer Is Better
3
SE +/- 80.29, N = 3
13121
4
SE +/- 108.13, N = 3
13123
1
SE +/- 74.45, N = 3
13190
2
SE +/- 14.22, N = 3
13288
3K
6K
9K
12K
15K
1. (CXX) g++ options: -O3 -lpthread

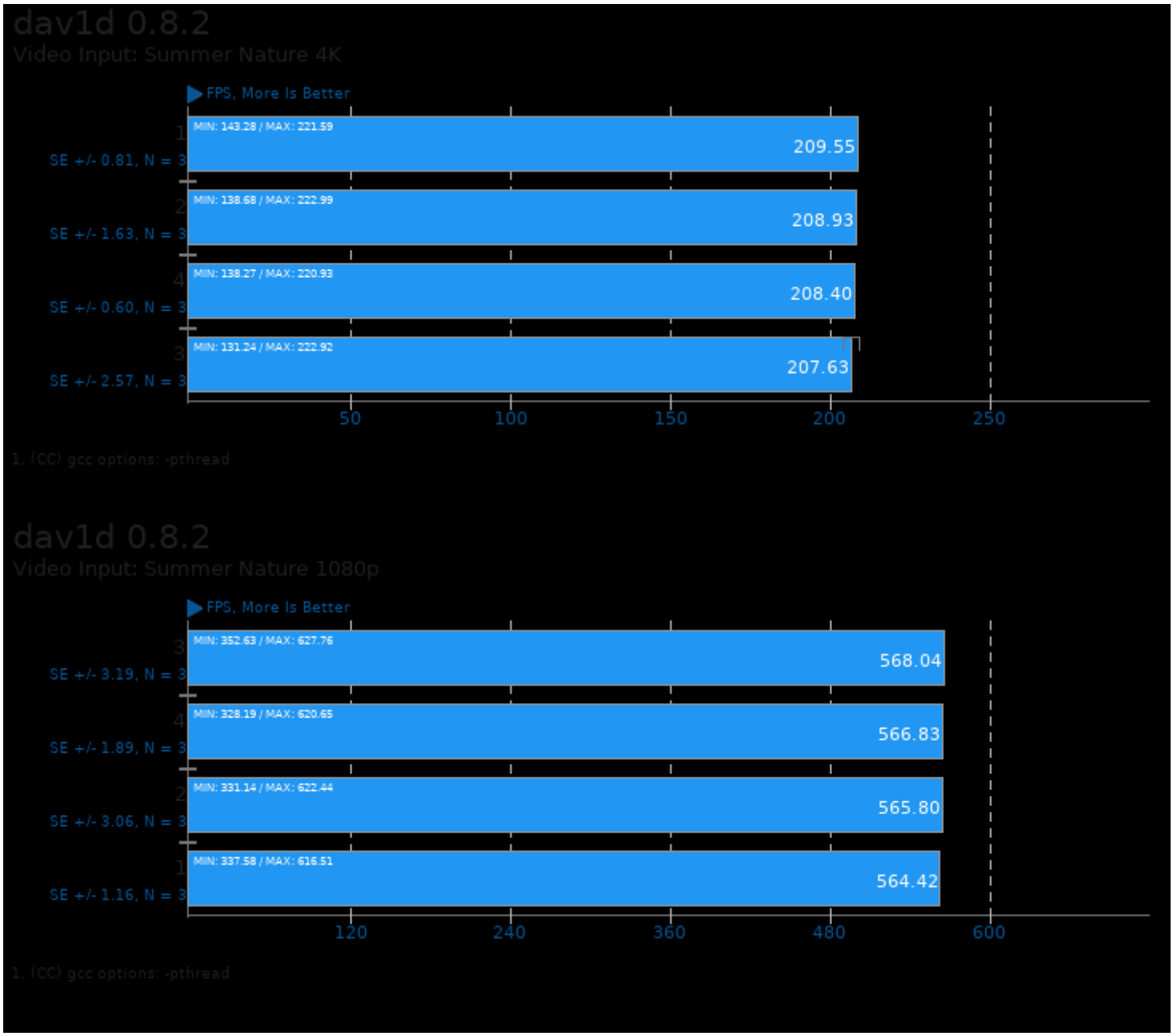

toyBrot Fractal Generator 2020-11-18
Implementation: C++ Tasks
ms, Fewer Is Better
3
SE +/- 61.45, N = 3
13318
2
SE +/- 76.38, N = 3
13342
1
SE +/- 34.14, N = 3
13364
4
SE +/- 109.33, N = 3
13373
3K
6K
9K
12K
15K
1. (CXX) g++ options: -O3 -lpthread
toyBrot Fractal Generator 2020-11-18
Implementation: C++ Threads
ms, Fewer Is Better
4
SE +/- 10.90, N = 3
12894
1
SE +/- 28.70, N = 3
12920
3
SE +/- 45.63, N = 3
12941
2
SE +/- 21.03, N = 3
12963
3K
6K
9K
12K
15K
1. (CXX) g++ options: -O3 -lpthread

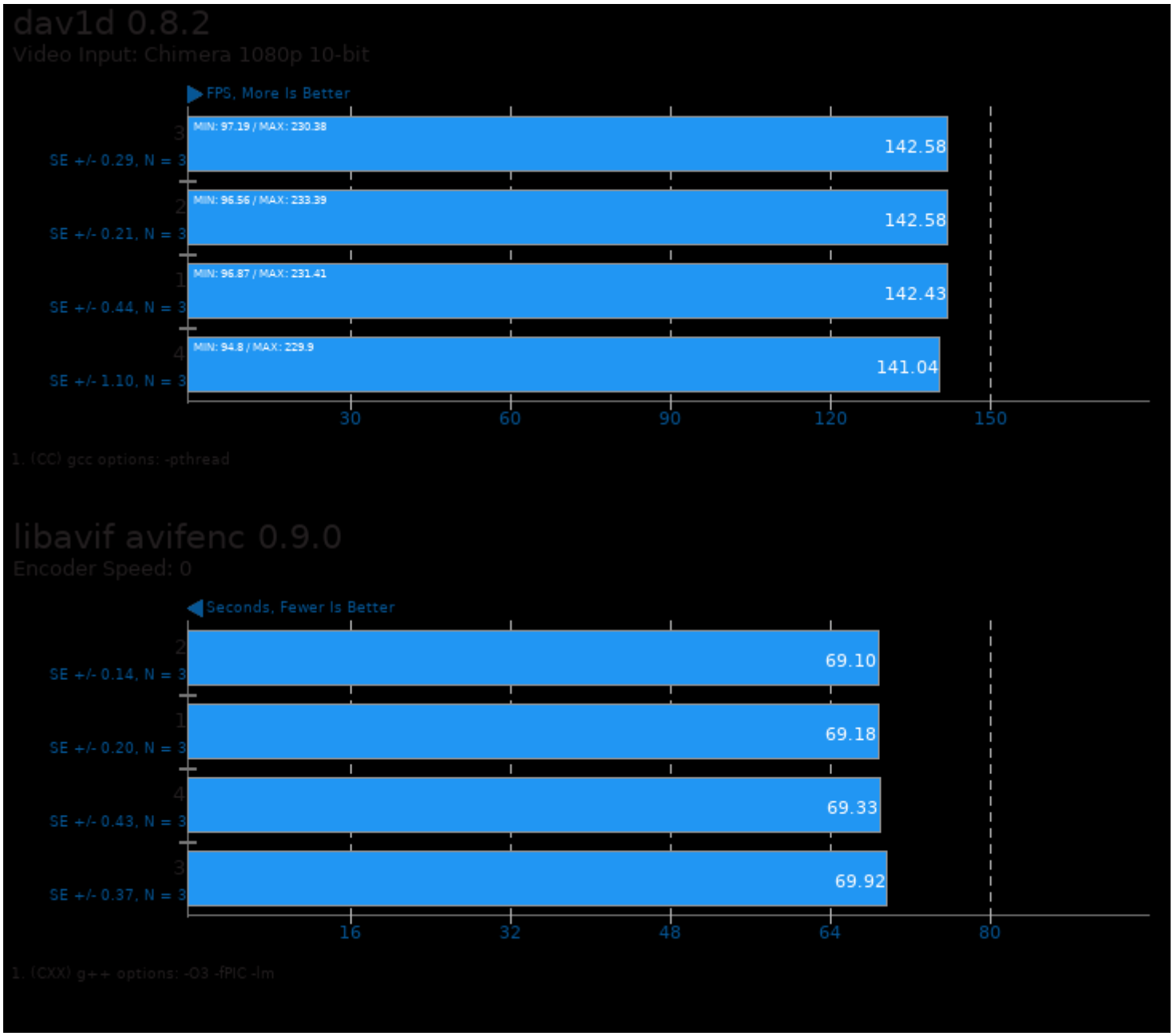

JPEG XL 0.3.1
Input: PNG - Encode Speed: 5
MP/s, More Is Better
1
SE +/- 0.29, N = 3
61.62
2
SE +/- 0.57, N = 3
60.28
3
SE +/- 0.05, N = 3
60.16
4
SE +/- 0.14, N = 3
59.67
14
28
42
56
70
1. (CXX) g++ options: -funwind-tables -O3 -O2 -pthread -fPIE -pie -ldl
JPEG XL 0.3.1
Input: PNG - Encode Speed: 7
MP/s, More Is Better
4
SE +/- 0.02, N = 3
7.98
1
SE +/- 0.02, N = 3
7.91
3
SE +/- 0.06, N = 3
7.90
2
SE +/- 0.05, N = 3
7.88
2
4
6
8
10
1. (CXX) g++ options: -funwind-tables -O3 -O2 -pthread -fPIE -pie -ldl

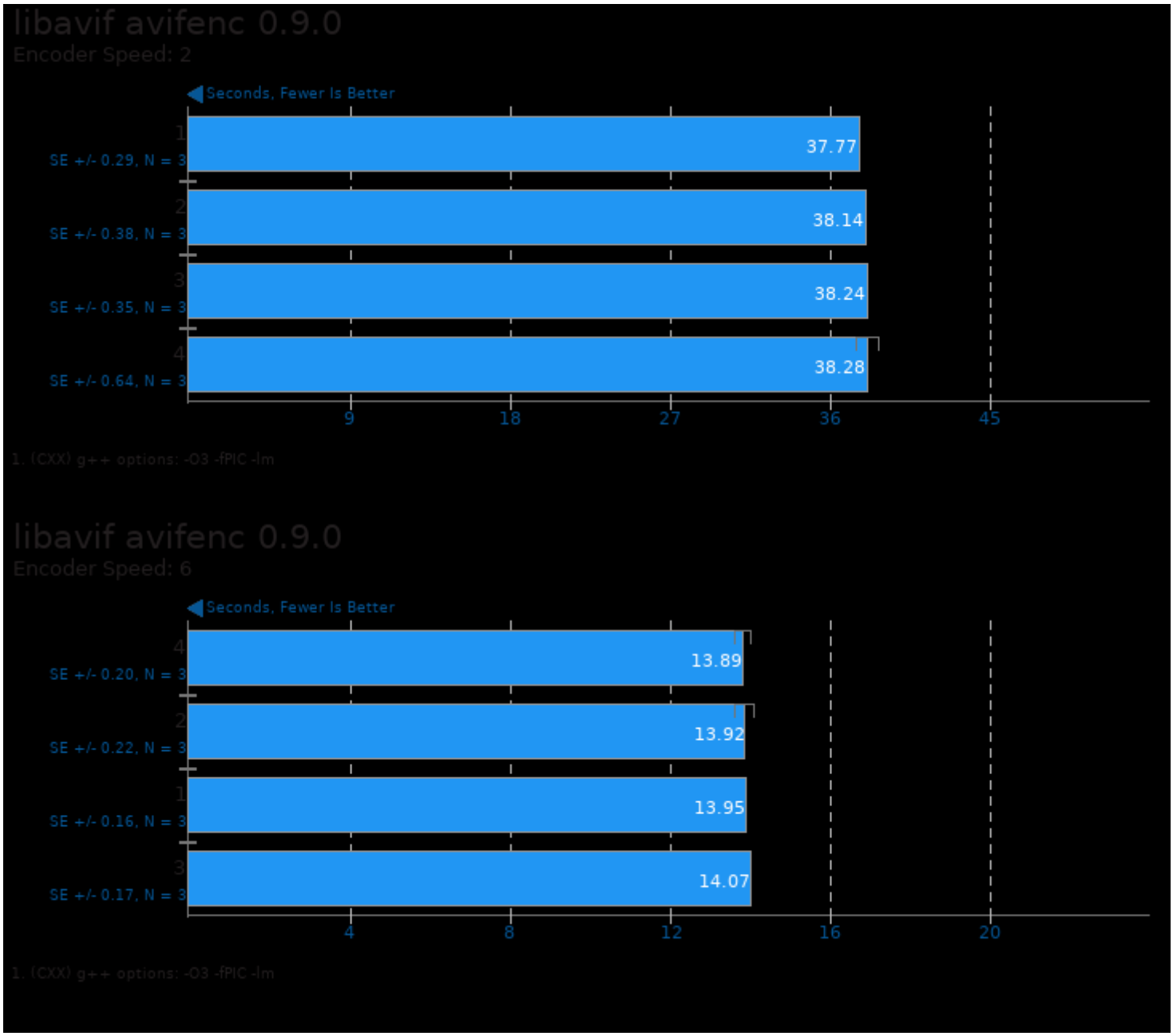

JPEG XL 0.3.1
Input: PNG - Encode Speed: 8
MP/s, More Is Better
4
SE +/- 0.00, N = 3
0.70
3
SE +/- 0.00, N = 3
0.70
2
SE +/- 0.00, N = 3
0.70
1
SE +/- 0.00, N = 3
0.68
0.1575
0.315
0.4725
0.63
0.7875
1. (CXX) g++ options: -funwind-tables -O3 -O2 -pthread -fPIE -pie -ldl
JPEG XL 0.3.1
Input: JPEG - Encode Speed: 5
MP/s, More Is Better
1
SE +/- 0.32, N = 3
54.56
2
SE +/- 0.12, N = 3
53.92
4
SE +/- 0.13, N = 3
53.28
3
SE +/- 0.35, N = 3
53.20
12
24
36
48
60
1. (CXX) g++ options: -funwind-tables -O3 -O2 -pthread -fPIE -pie -ldl

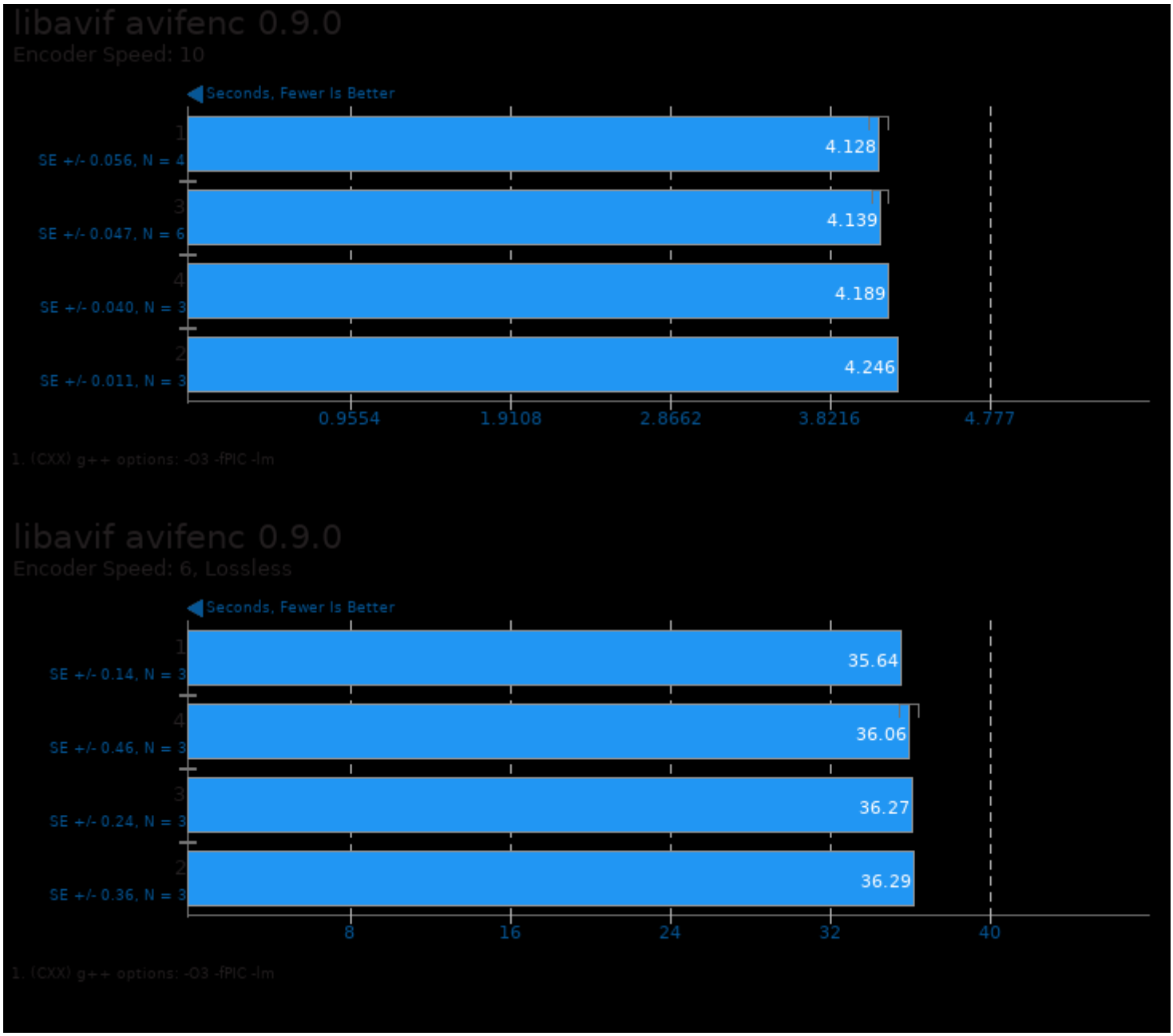

JPEG XL 0.3.1
Input: JPEG - Encode Speed: 7
MP/s, More Is Better
1
SE +/- 0.16, N = 3
54.17
2
SE +/- 0.26, N = 3
53.34
4
SE +/- 0.21, N = 3
53.08
3
SE +/- 0.38, N = 3
52.43
12
24
36
48
60
1. (CXX) g++ options: -funwind-tables -O3 -O2 -pthread -fPIE -pie -ldl
JPEG XL 0.3.1
Input: JPEG - Encode Speed: 8
MP/s, More Is Better
2
SE +/- 0.15, N = 3
23.33
1
SE +/- 0.03, N = 3
23.27
4
SE +/- 0.21, N = 3
23.12
3
SE +/- 0.23, N = 3
22.99
6
12
18
24
30
1. (CXX) g++ options: -funwind-tables -O3 -O2 -pthread -fPIE -pie -ldl
JPEG XL Decoding 0.3.1
CPU Threads: 1
MP/s, More Is Better
1
SE +/- 0.06, N = 3
30.19
2
SE +/- 0.05, N = 3
30.02
4
SE +/- 0.15, N = 3
29.97
3
SE +/- 0.12, N = 3
29.80
7
14
21
28
35

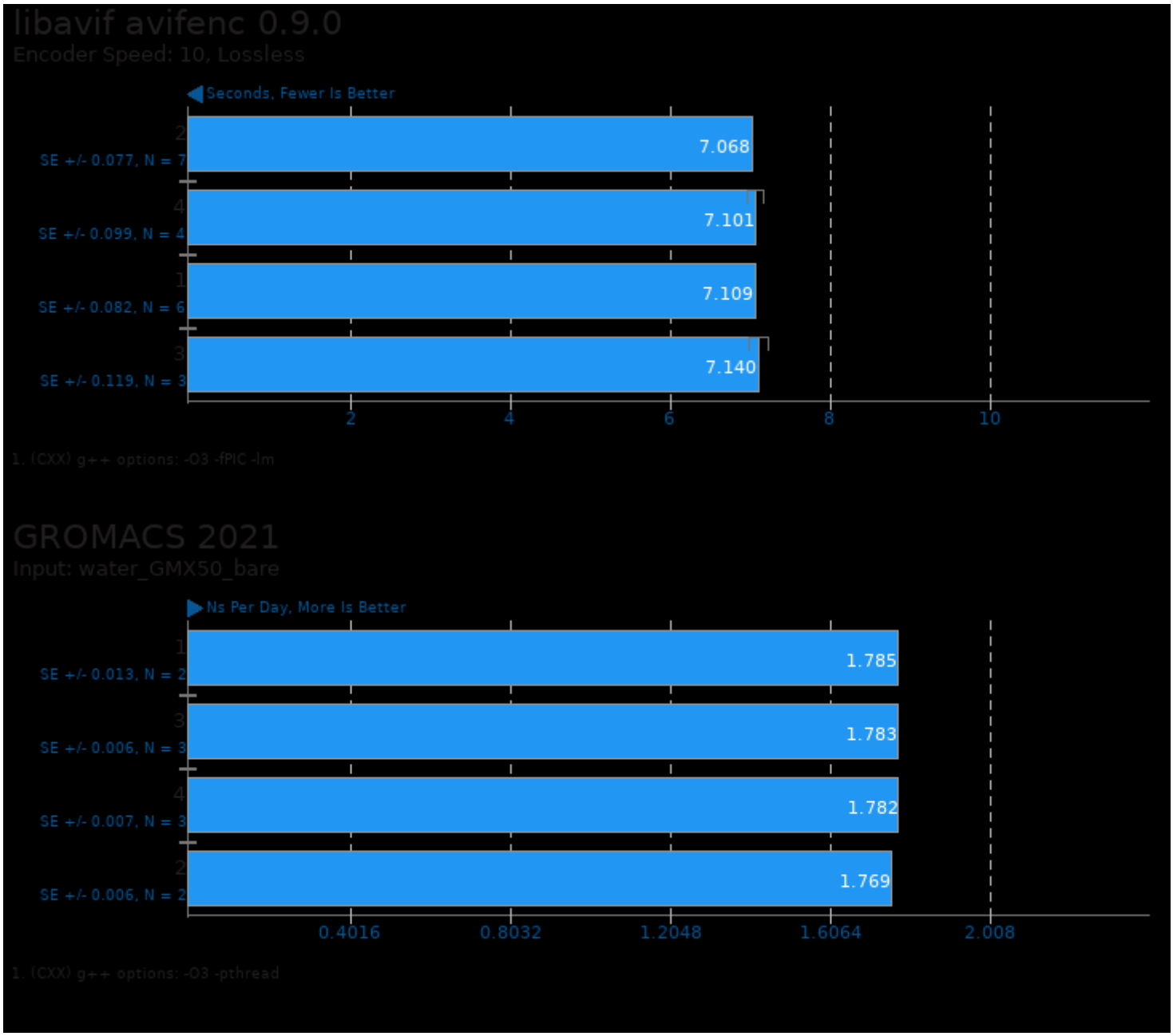

JPEG XL Decoding 0.3.1
CPU Threads: All
MP/s, More Is Better
1
SE +/- 0.23, N = 3
151.72
2
SE +/- 0.99, N = 3
148.25
3
SE +/- 1.40, N = 3
147.37
4
SE +/- 0.51, N = 3
145.16
30
60
90
120
150
dav1d 0.8.2
Video Input: Chimera 1080p
FPS, More Is Better
1
SE +/- 0.47, N = 3
MIN: 428.57 / MAX: 697.86
552.58
2
SE +/- 0.56, N = 3
MIN: 427.96 / MAX: 689.75
551.42
4
SE +/- 1.72, N = 3
MIN: 427.93 / MAX: 684.89
549.06
3
SE +/- 1.91, N = 3
MIN: 426.39 / MAX: 685.16
547.63
120
240
360
480
600
1. (CC) gcc options: -pthread

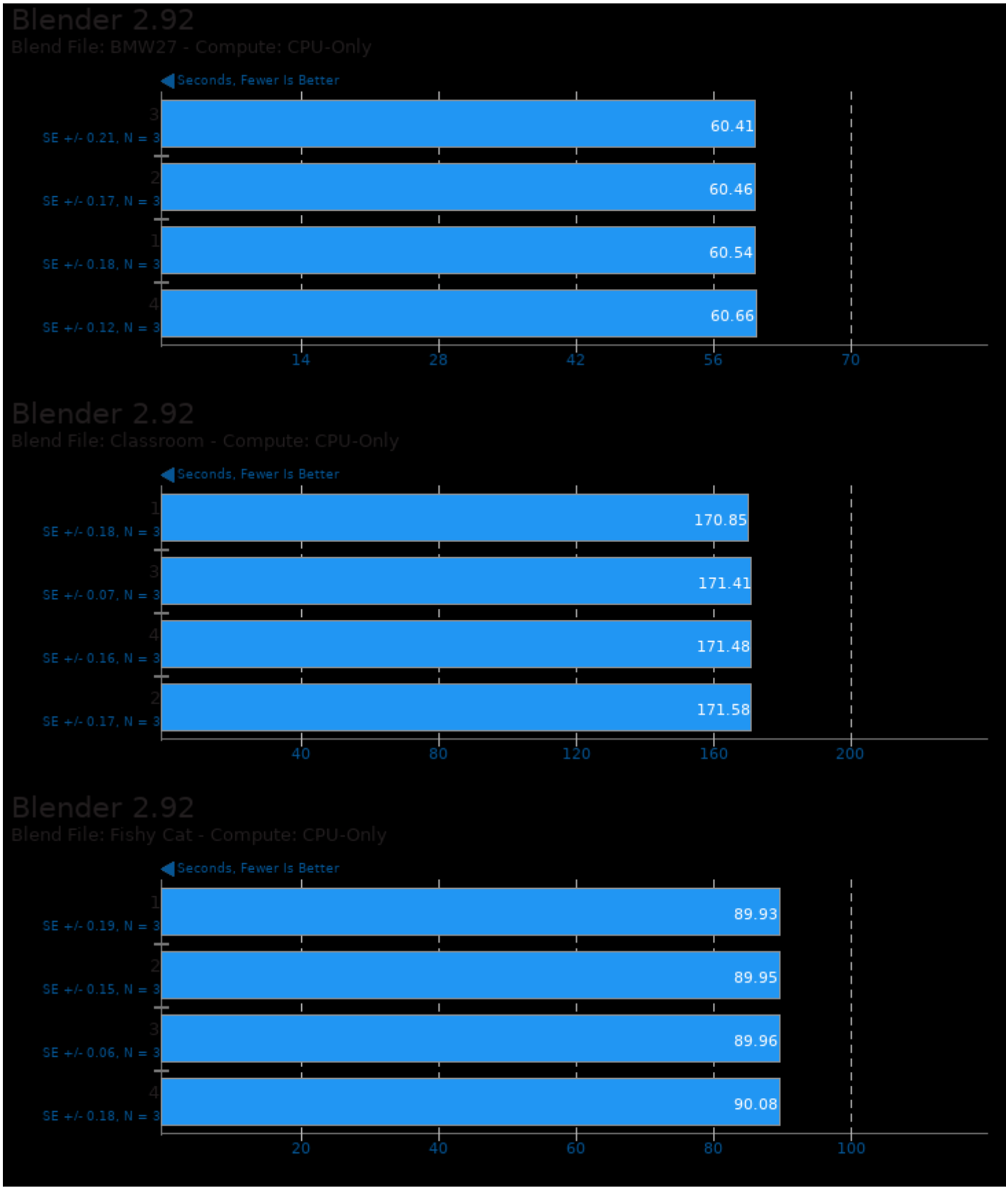

dav1d 0.8.2
Video Input: Summer Nature 4K
FPS, More Is Better
1
MIN: 143.28 / MAX: 221.59
209.55
SE +/- 0.81, N = 3
2
MIN: 138.68 / MAX: 222.99
208.93
SE +/- 1.63, N = 3
4
MIN: 138.27 / MAX: 220.93
208.40
SE +/- 0.60, N = 3
3
MIN: 131.24 / MAX: 222.92
207.63
SE +/- 2.57, N = 3
50
100
150
200
250
1. (CC) gcc options: -pthread
dav1d 0.8.2
Video Input: Summer Nature 1080p
FPS, More Is Better
3
MIN: 352.63 / MAX: 627.76
568.04
SE +/- 3.19, N = 3
4
MIN: 328.19 / MAX: 620.65
566.83
SE +/- 1.89, N = 3
2
MIN: 331.14 / MAX: 622.44
565.80
SE +/- 3.06, N = 3
1
MIN: 337.58 / MAX: 616.51
564.42
SE +/- 1.16, N = 3
120
240
360
480
600
1. (CC) gcc options: -pthread

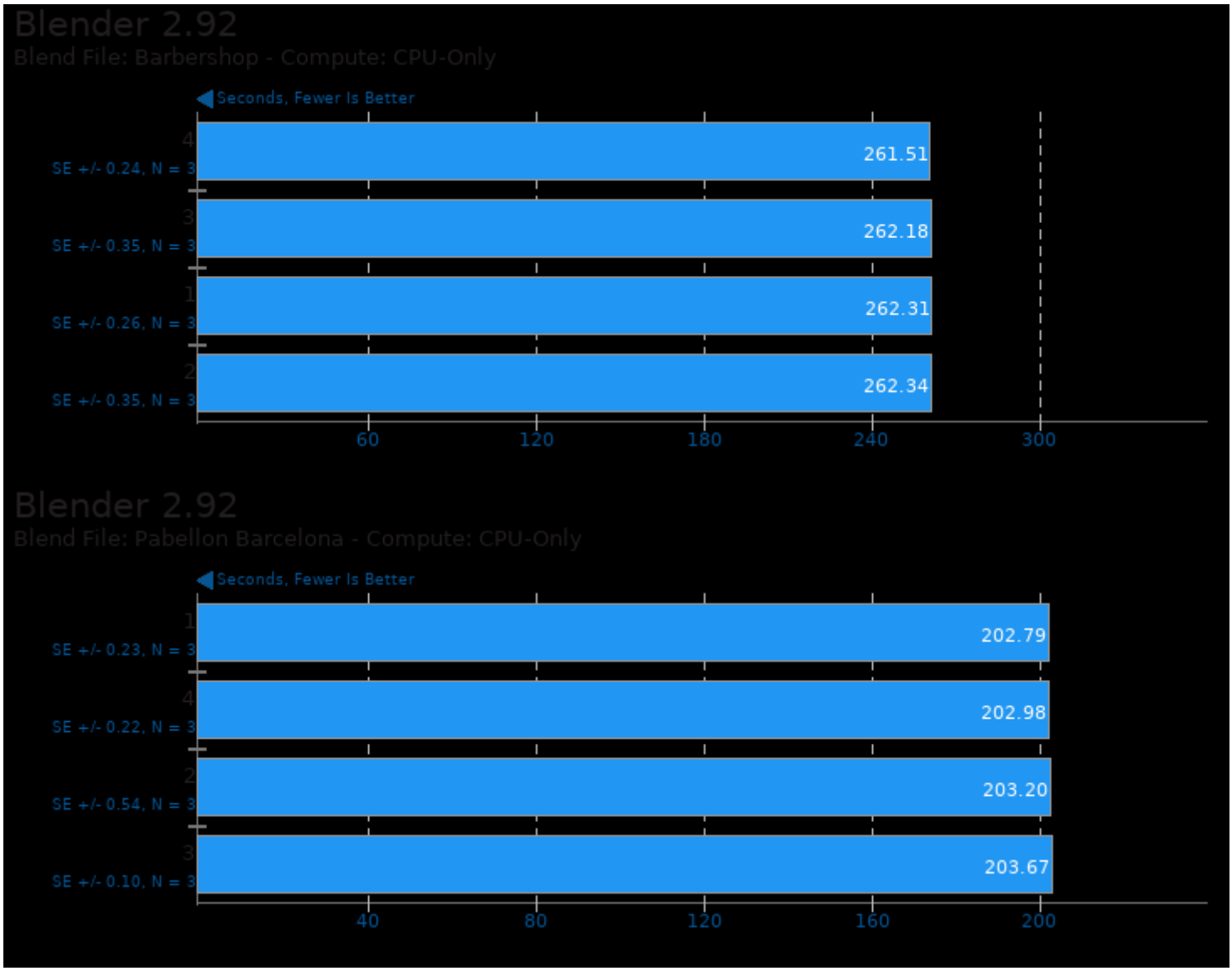

dav1d 0.8.2
Video Input: Chimera 1080p 10-bit
FPS, More Is Better
3
MIN: 97.19 / MAX: 230.38
142.58
SE +/- 0.29, N = 3
2
MIN: 96.56 / MAX: 233.39
142.58
SE +/- 0.21, N = 3
1
MIN: 96.87 / MAX: 231.41
142.43
SE +/- 0.44, N = 3
4
MIN: 94.8 / MAX: 229.9
141.04
SE +/- 1.10, N = 3
30
60
90
120
150
1. (CC) gcc options: -pthread
libavif avifenc 0.9.0
Encoder Speed: 0
Seconds, Fewer Is Better
2
69.10
SE +/- 0.14, N = 3
1
69.18
SE +/- 0.20, N = 3
4
69.33
SE +/- 0.43, N = 3
3
69.92
SE +/- 0.37, N = 3
16
32
48
64
80
1. (CXX) g++ options: -O3 -fPIC -lm


libavif avifenc 0.9.0
Encoder Speed: 2
Seconds, Fewer Is Better
1
SE +/- 0.29, N = 3
37.77
2
SE +/- 0.38, N = 3
38.14
3
SE +/- 0.35, N = 3
38.24
4
SE +/- 0.64, N = 3
38.28
9
18
27
36
45
1. (CXX) g++ options: -O3 -fPIC -lm
libavif avifenc 0.9.0
Encoder Speed: 6
Seconds, Fewer Is Better
4
SE +/- 0.20, N = 3
13.89
2
SE +/- 0.22, N = 3
13.92
1
SE +/- 0.16, N = 3
13.95
3
SE +/- 0.17, N = 3
14.07
4
8
12
16
20
1. (CXX) g++ options: -O3 -fPIC -lm

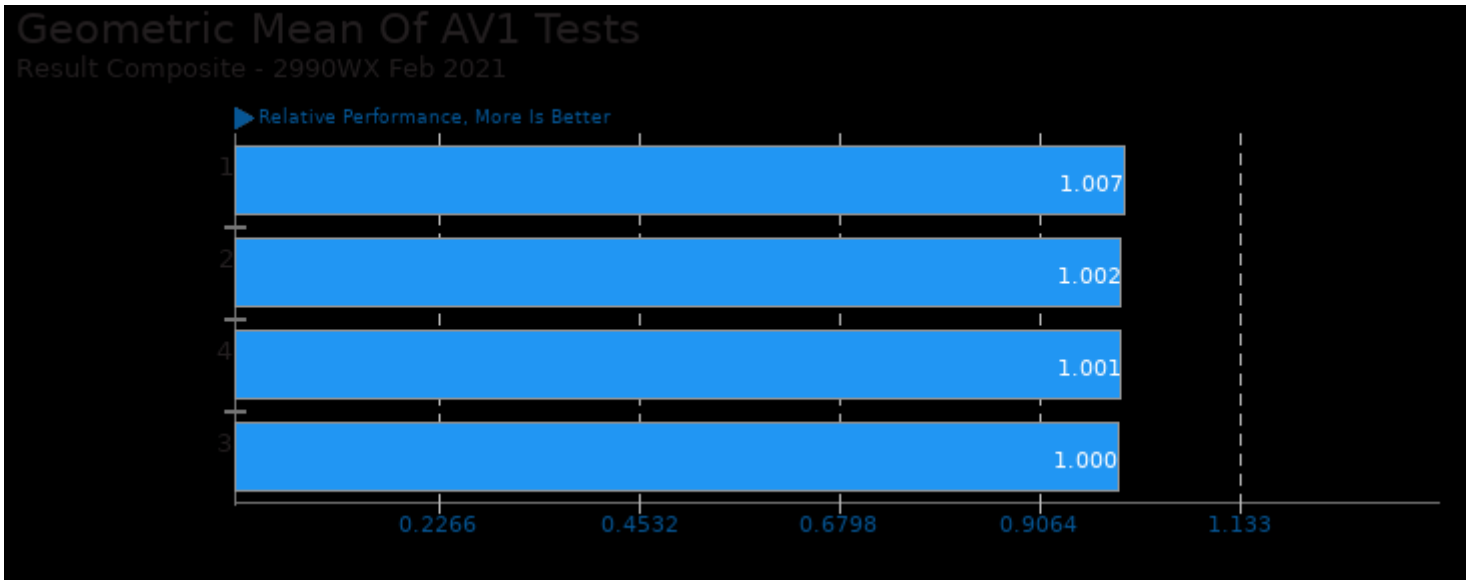

libavif avifenc 0.9.0
Encoder Speed: 10
Seconds, Fewer Is Better
1
SE +/- 0.056, N = 4
4.128
3
SE +/- 0.047, N = 6
4.139
4
SE +/- 0.040, N = 3
4.189
2
SE +/- 0.011, N = 3
4.246
0.9554
1.9108
2.8662
3.8216
4.777
1. (CXX) g++ options: -O3 -fPIC -lm
libavif avifenc 0.9.0
Encoder Speed: 6, Lossless
Seconds, Fewer Is Better
1
SE +/- 0.14, N = 3
35.64
4
SE +/- 0.46, N = 3
36.06
3
SE +/- 0.24, N = 3
36.27
2
SE +/- 0.36, N = 3
36.29
8
16
24
32
40
1. (CXX) g++ options: -O3 -fPIC -lm


libavif avifenc 0.9.0
Encoder Speed: 10, Lossless
Seconds, Fewer Is Better
2
SE +/- 0.077, N = 7
7.068
4
SE +/- 0.099, N = 4
7.101
1
SE +/- 0.082, N = 6
7.109
3
SE +/- 0.119, N = 3
7.140
2
4
6
8
10
1. (CXX) g++ options: -O3 -fPIC -lm
GROMACS 2021
Input: water_GMX50_bare
Ns Per Day, More Is Better
1
SE +/- 0.013, N = 2
1.785
3
SE +/- 0.006, N = 3
1.783
4
SE +/- 0.007, N = 3
1.782
2
SE +/- 0.006, N = 2
1.769
0.4016
0.8032
1.2048
1.6064
2.008
1. (CXX) g++ options: -O3 -pthread

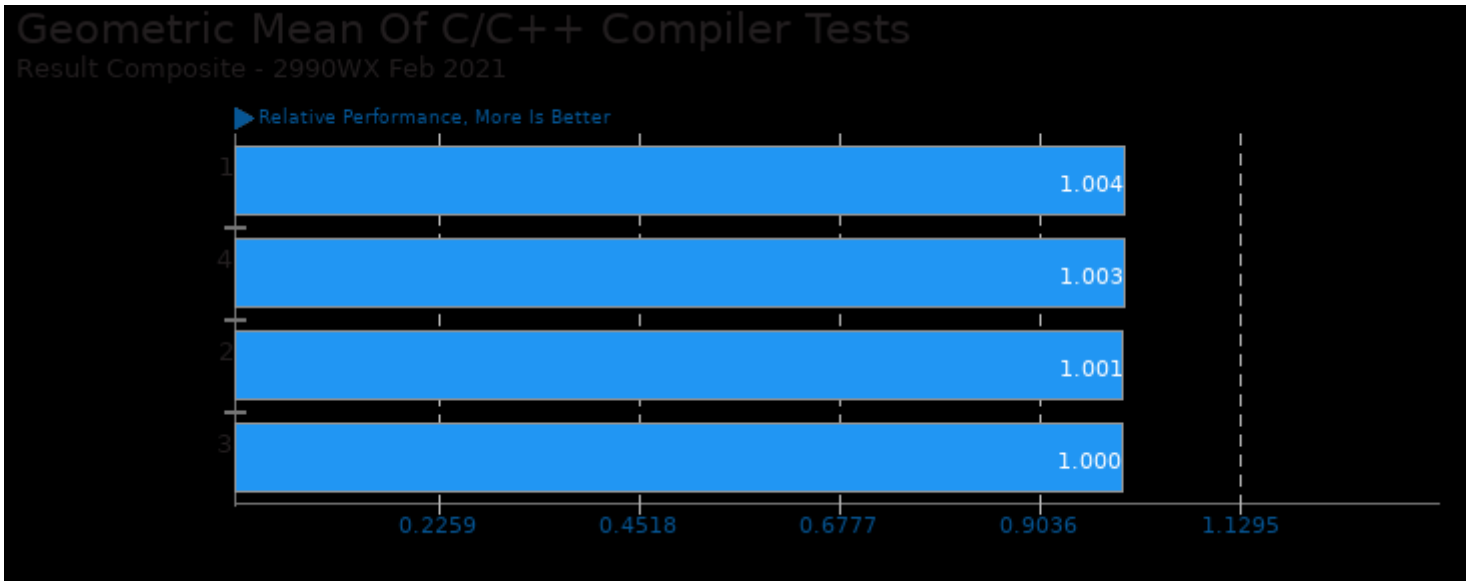

Blender 2.92
Blend File: BMW27 - Compute: CPU-Only
Seconds, Fewer Is Better
3
SE +/- 0.21, N = 3
60.41
2
SE +/- 0.17, N = 3
60.46
1
SE +/- 0.18, N = 3
60.54
4
SE +/- 0.12, N = 3
60.66
14
28
42
56
70
Blender 2.92
Blend File: Classroom - Compute: CPU-Only
Seconds, Fewer Is Better
1
SE +/- 0.18, N = 3
170.85
3
SE +/- 0.07, N = 3
171.41
4
SE +/- 0.16, N = 3
171.48
2
SE +/- 0.17, N = 3
171.58
40
80
120
160
200
Blender 2.92
Blend File: Fishy Cat - Compute: CPU-Only
Seconds, Fewer Is Better
1
SE +/- 0.19, N = 3
89.93
2
SE +/- 0.15, N = 3
89.95
3
SE +/- 0.06, N = 3
89.96
4
SE +/- 0.18, N = 3
90.08
20
40
60
80
100


Blender 2.92
Blend File: Barbershop - Compute: CPU-Only
Seconds, Fewer Is Better
4
SE +/- 0.24, N = 3
261.51
3
SE +/- 0.35, N = 3
262.18
1
SE +/- 0.26, N = 3
262.31
2
SE +/- 0.35, N = 3
262.34
60
120
180
240
300
Blender 2.92
Blend File: Pabellon Barcelona - Compute: CPU-Only
Seconds, Fewer Is Better
1
SE +/- 0.23, N = 3
202.79
4
SE +/- 0.22, N = 3
202.98
2
SE +/- 0.54, N = 3
203.20
3
SE +/- 0.10, N = 3
203.67
40
80
120
160
200

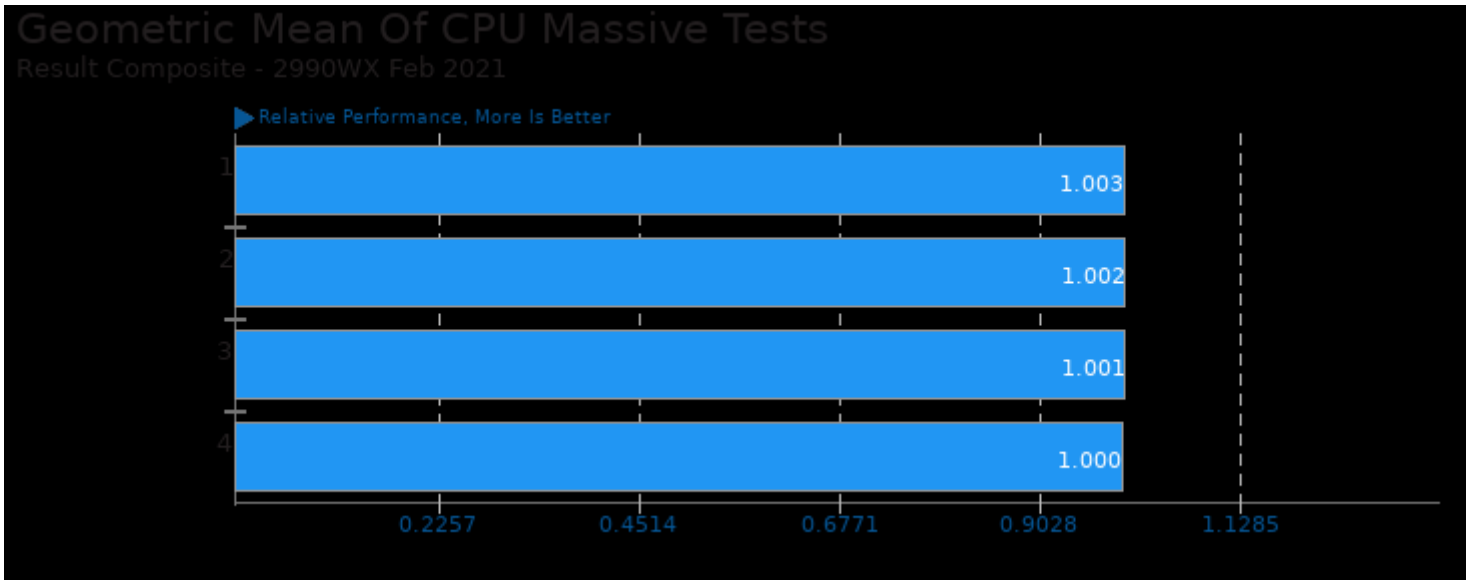
These geometric means are based upon test groupings / test suites for this result file.



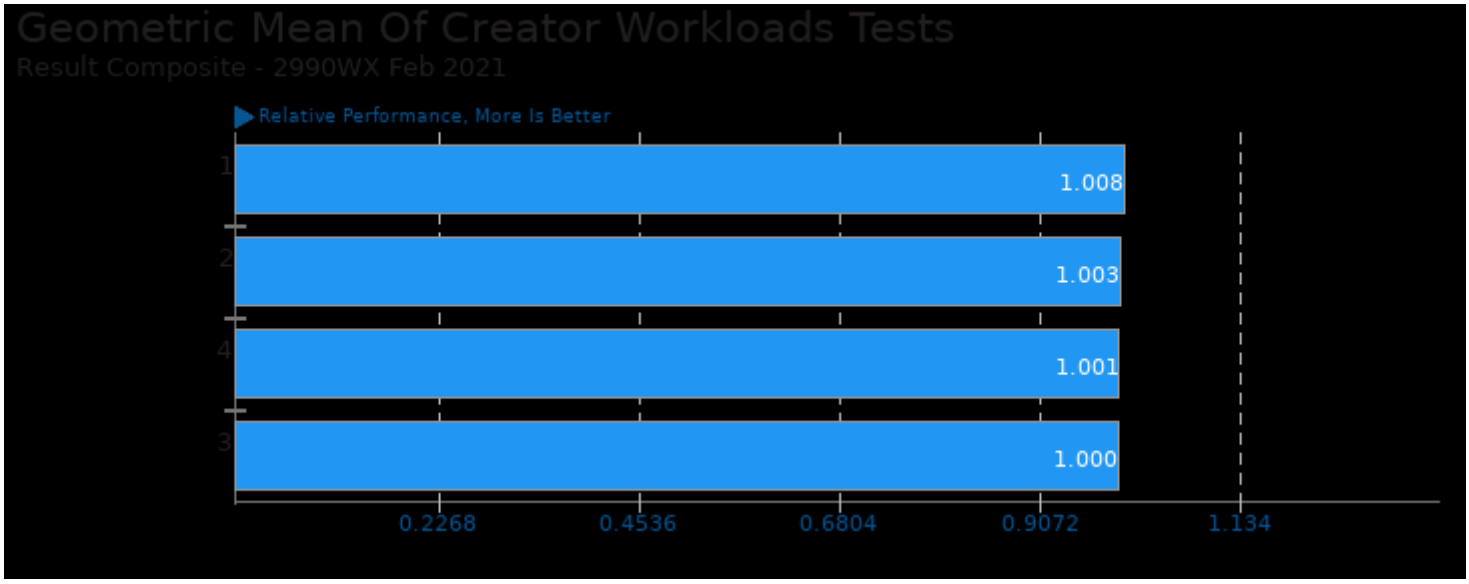
Geometric mean based upon tests: pts/dav1d and pts/avifenc



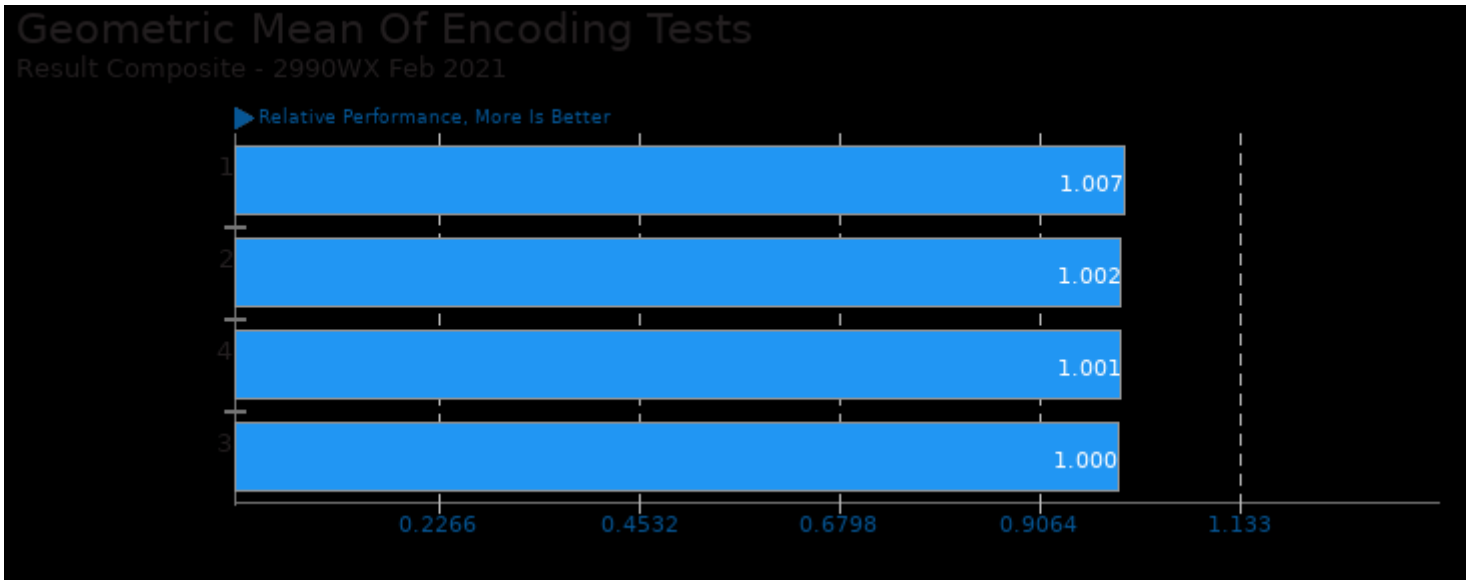
Geometric mean based upon tests: pts/dav1d, pts/gromacs and pts/toybrot



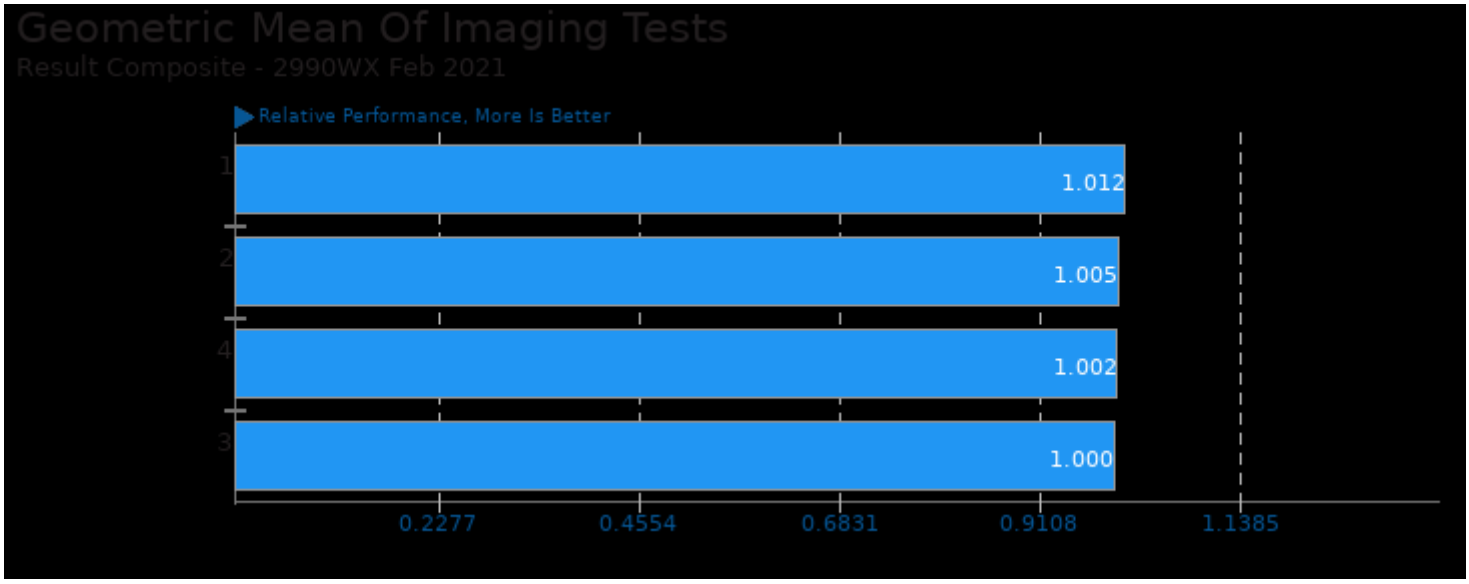
Geometric mean based upon tests: pts/dav1d and pts/blender



Geometric mean based upon tests: pts/blender, pts/dav1d, pts/avifenc, pts/jpegxl and pts/jpegxl-decode

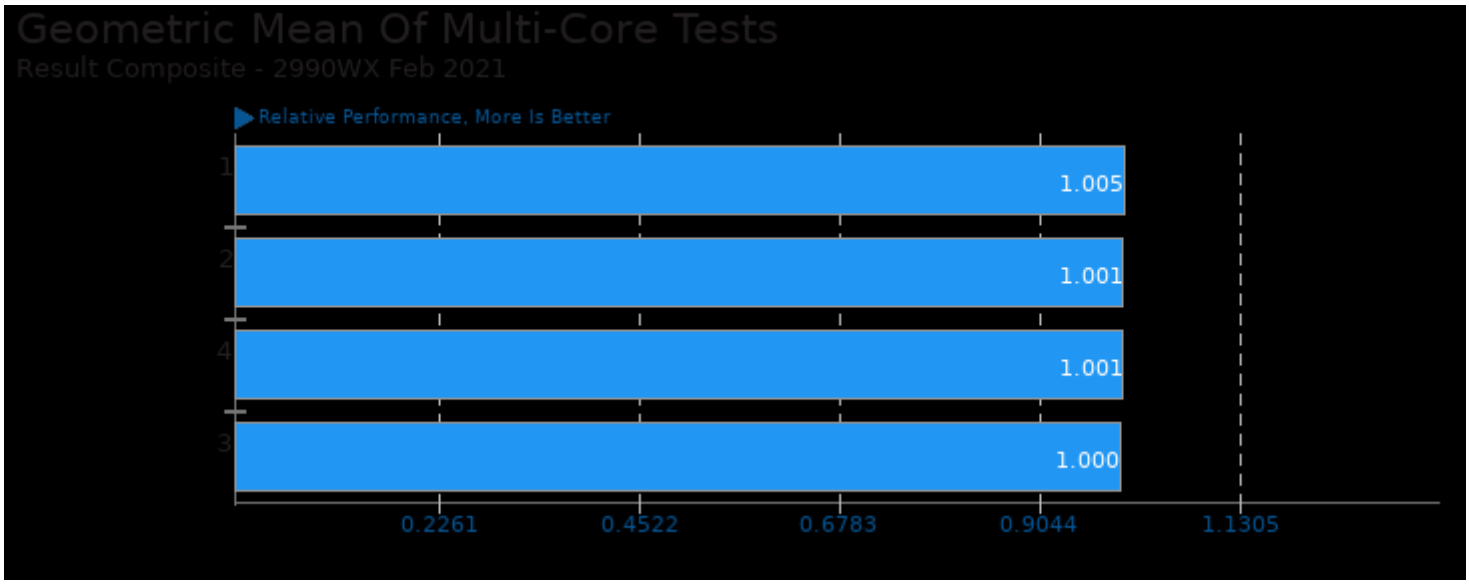


Geometric mean based upon tests: pts/dav1d and pts/avifenc

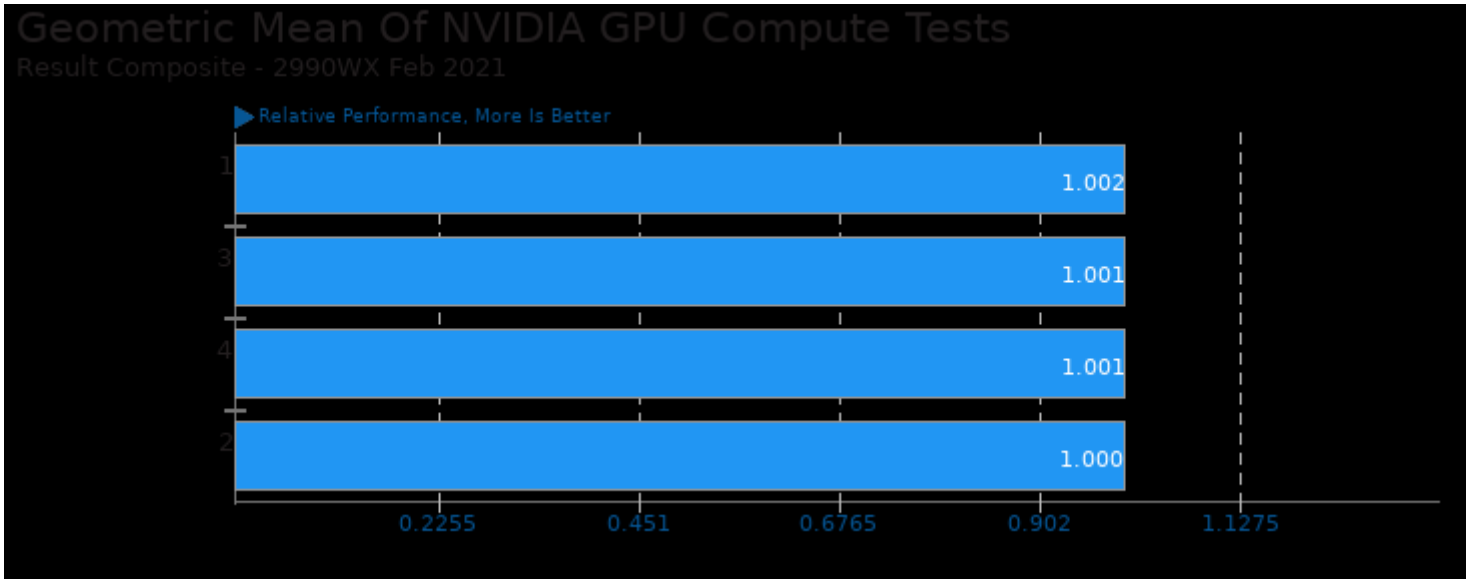


Geometric mean based upon tests: pts/jpegxl, pts/jpegxl-decode and pts/avifenc

2990WX Feb 2021

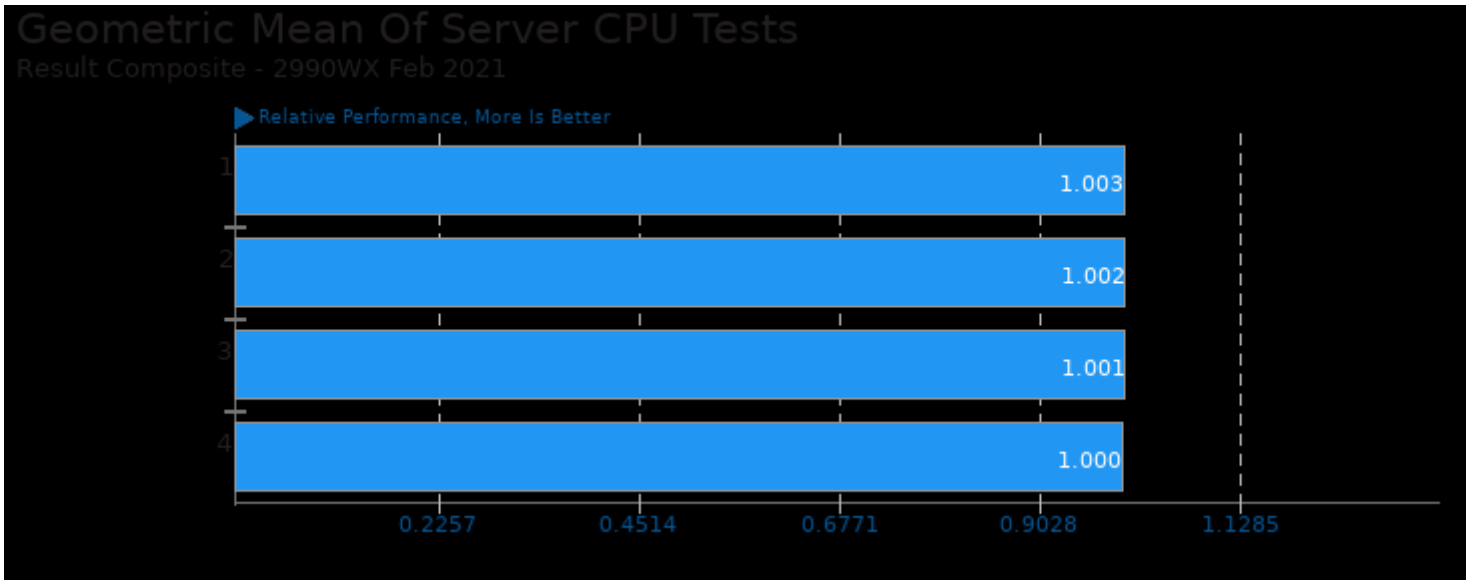


Geometric mean based upon tests: pts/blender, pts/dav1d, pts/avifenc and pts/gromacs

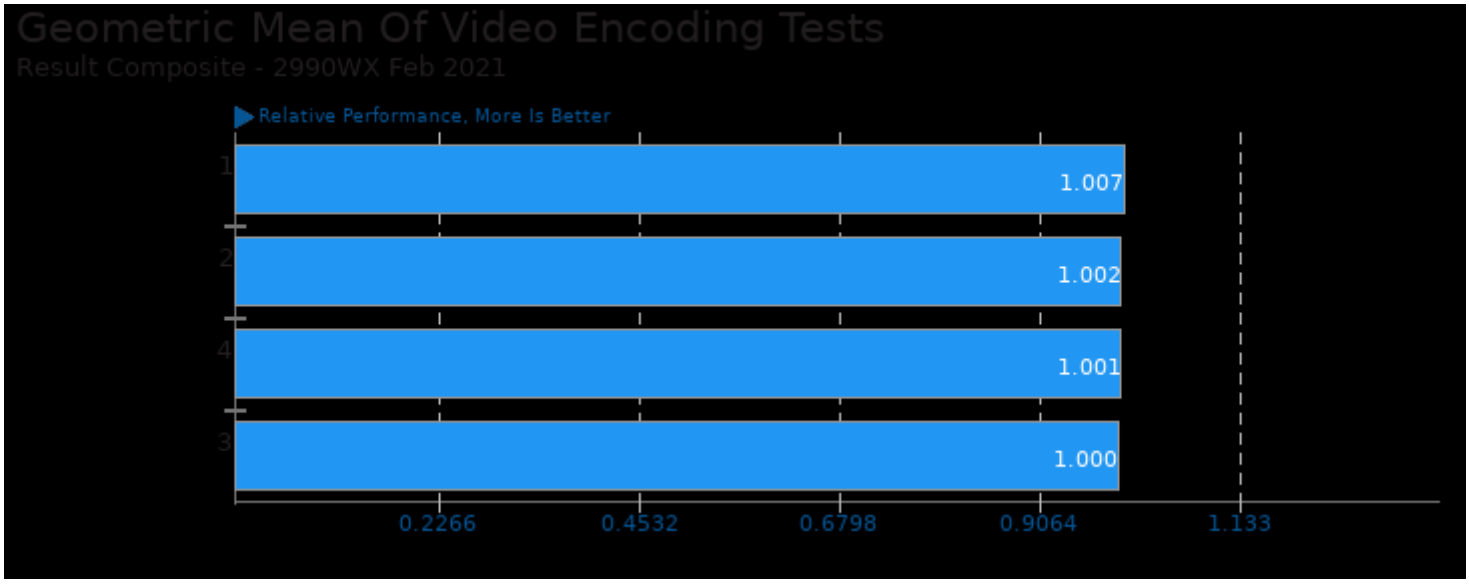


Geometric mean based upon tests: pts/gromacs and pts/blender

2990WX Feb 2021



Geometric mean based upon tests: pts/dav1d and pts/blender



Geometric mean based upon tests: pts/dav1d and pts/avifenc

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 19:02.