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xeon silver april

Intel Xeon Silver 4216 testing with a TYAN S7100AG2NR (V4.02 BIOS) and ASPEED on Debian 10 via the Phoronix Test Suite.

Automated Executive Summary

1 had the most wins, coming in first place for 48% of the tests.

Based on the geometric mean of all complete results, the fastest (3) was 1.003x the speed of the slowest (2). 1 was 0.998x the speed of 3 and 2 was 0.999x the speed of 1.

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

LuxCoreRender (Scene: Rainbow Colors and Prism - Acceleration: CPU) at 1.035x
ViennaCL (Test: CPU BLAS - sAXPY) at 1.028x
ViennaCL (Test: CPU BLAS - dGEMM-TT) at 1.028x
LuxCoreRender (Scene: Danish Mood - Acceleration: CPU) at 1.024x
ViennaCL (Test: CPU BLAS - dGEMV-N) at 1.022x
Timed LLVM Compilation (Build System: Unix Makefiles) at 1.021x
ViennaCL (Test: CPU BLAS - sCOPY) at 1.017x
LuxCoreRender (Scene: LuxCore Benchmark - Acceleration: CPU) at 1.015x
ViennaCL (Test: CPU BLAS - dCOPY) at 1.013x

ViennaCL (Test: CPU BLAS - dGEMM-TN) at 1.012x.

Test Systems:

1

2

3

Processor: Intel Xeon Silver 4216 @ 3.20GHz (16 Cores / 32 Threads), Motherboard: TYAN S7100AG2NR (V4.02 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 24GB, Disk: 240GB Corsair Force MP500, Graphics: ASPEED, Audio: Realtek ALC892, Network: 2 x Intel I350

OS: Debian 10, Kernel: 4.19.0-9-amd64 (x86_64), Desktop: GNOME Shell 3.30.2, Display Server: X Server, Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1024x768

Kernel Notes: Transparent Huge Pages: always
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --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 --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0x500002c
Python Notes: Python 2.7.16 + Python 3.7.3
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Mitigation of TSX disabled

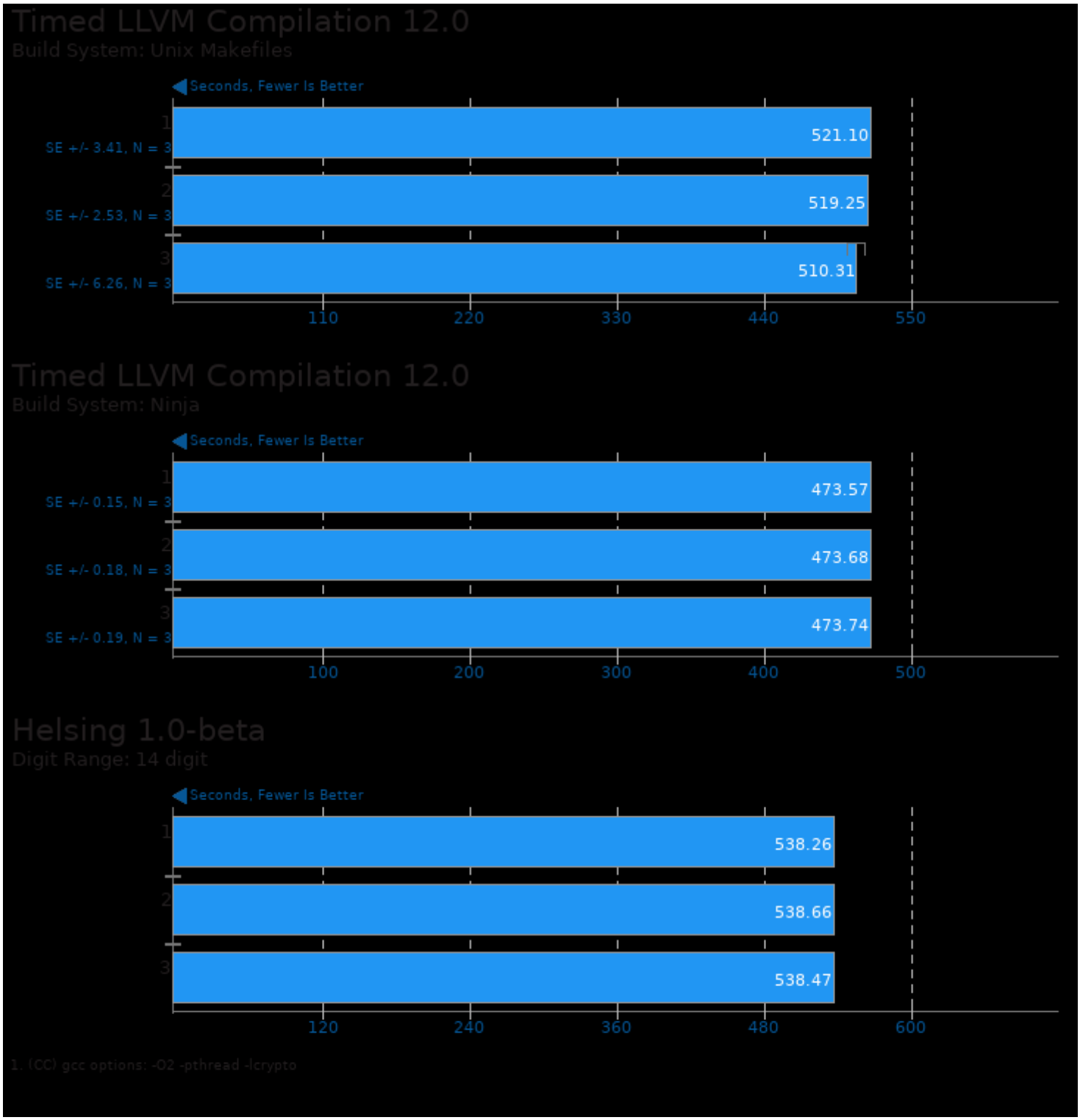
	1	2	3
Timed LLVM Compilation - Unix Makefiles	**521.103**	519.249	**510.308**
Normalized	97.93%	98.28%	100%
Standard Deviation	1.1%	0.8%	2.1%
Timed LLVM Compilation - Ninja (sec)	**473.567**	473.684	**473.736**
Normalized	100%	99.98%	99.96%
Standard Deviation	0.1%	0.1%	0.1%
Helsing - 14 digit (sec)	**538.255**	**538.663**	538.471
Normalized	100%	99.92%	99.96%
Xmrig - Monero - 1M (H/s)	**6079**	6026	**6023**
Normalized	100%	99.12%	99.07%
Standard Deviation	0.3%	0.4%	0.3%
GNU GMP GMPbench - Total Time (GMPbench Score)	**3998**	**3993**	3998
Normalized	100%	99.87%	99.99%
Xmrig - Wownero - 1M (H/s)	**9452**	9407	**9365**
Normalized	100%	99.52%	99.07%
Standard Deviation	0.2%	0.1%	0.3%

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LuxCoreRender - Orange Juice - CPU (M samples/sec)	**2.95**	**2.94**	**2.94**
Normalized	100%	99.66%	99.66%
Standard Deviation	0.2%	0.5%	0.4%
LuxCoreRender - Danish Mood - CPU (M samples/sec)	**1.26**	**1.23**	**1.26**
Normalized	100%	97.62%	100%
Standard Deviation	2.4%	0.5%	2.1%
LuxCoreRender - LuxCore Benchmark - CPU (M samples/sec)	**1.34**	1.35	**1.36**
Normalized	98.53%	99.26%	100%
Standard Deviation	0.9%	0.9%	0.4%
LuxCoreRender - DLSC - CPU (M	**1.83**	**1.85**	**1.83**
Normalized	98.92%	100%	98.92%
Standard Deviation	1.4%	1.7%	1.4%
LuxCoreRender - R.C.a.P - CPU (M samples/sec)	7.39	**7.38**	**7.64**
Normalized	96.73%	96.6%	100%
Standard Deviation	3.8%	2.3%	0.8%
Botan - AES-256 - Decrypt (MiB/s)	**3066**	3064	**3064**
Normalized	100%	99.95%	99.95%
Standard Deviation	0.1%	0.1%	0.1%
Botan - AES-256 (MiB/s)	3057	**3056**	**3057**
Normalized	99.98%	99.97%	100%
Standard Deviation	0.1%	0.1%	0.1%
Botan - Blowfish - Decrypt (MiB/s)	**345.576**	345.860	**346.048**
Normalized	99.86%	99.95%	100%
Standard Deviation	0.1%	0.1%	0%
Botan - Blowfish (MiB/s)	346.475	**346.695**	**346.400**
Normalized	99.94%	100%	99.91%
Standard Deviation	0.1%	0.1%	0.1%
Botan - ChaCha20Poly1305 - Decrypt (MiB/s)	**500.926**	**500.997**	500.963
Normalized	99.99%	100%	99.99%
Standard Deviation	0%	0.1%	0.1%
Botan - ChaCha20Poly1305 (MiB/s)	506.443	**506.580**	**505.493**
Normalized	99.97%	100%	99.79%
Standard Deviation	0.1%	0.1%	0.4%
Botan - Twofish - Decrypt (MiB/s)	**278.218**	**276.648**	278.078
Normalized	100%	99.44%	99.95%
Standard Deviation	0.1%	0.9%	0.1%
Botan - Twofish (MiB/s)	**277.071**	**275.626**	276.632
Normalized	100%	99.48%	99.84%
Standard Deviation	0.1%	0.8%	0%
Botan - CAST-256 - Decrypt (MiB/s)	**109.656**	**109.551**	109.605
Normalized	100%	99.9%	99.95%
Standard Deviation	0%	0.2%	0.1%
Botan - CAST-256 (MiB/s)	**109.457**	**109.543**	109.499
Normalized	99.92%	100%	99.96%
Standard Deviation	0.1%	0%	0.1%
Botan - KASUMI - Decrypt (MiB/s)	**69.639**	**69.594**	69.606
Normalized	100%	99.94%	99.95%
Standard Deviation	0%	0%	0%
Botan - KASUMI (MiB/s)	**71.768**	**71.75**	71.764
Normalized	100%	99.97%	99.99%
Standard Deviation	0.1%	0.1%	0.1%

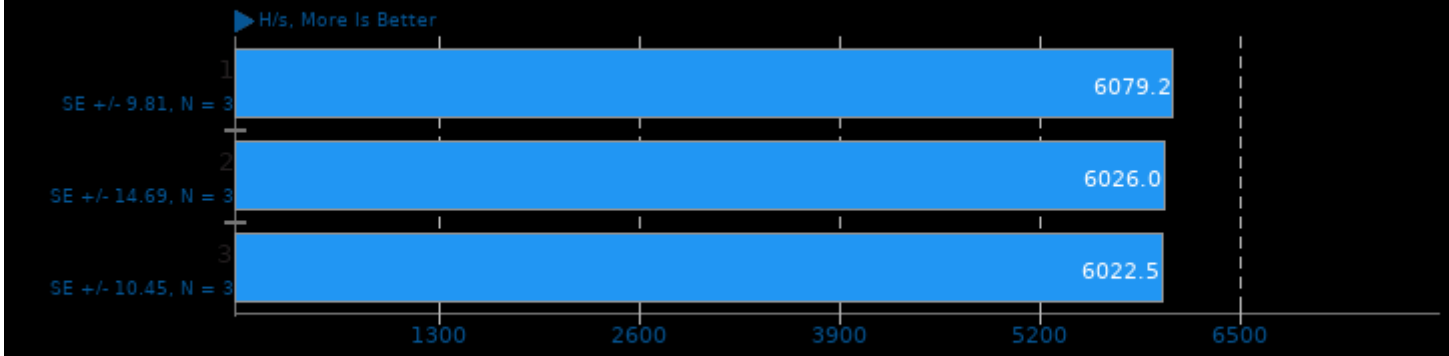
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libjpeg-turbo tjbench - D.T (Megapixels/sec)	146.215852	**145.425097**	**146.709279**
Normalized	99.66%	99.12%	100%
Standard Deviation	1.2%	1.1%	0.6%
ViennaCL - CPU BLAS - dGEMM-TT (GFLOPs/s)	**39.6**	**40.7**	40.3
Normalized	97.3%	100%	99.02%
Standard Deviation		0%	1.4%
ViennaCL - CPU BLAS - dGEMM-TN (GFLOPs/s)	**40.9**	**41.4**	41.3
Normalized	98.79%	100%	99.76%
Standard Deviation	1.9%	0.6%	1%
ViennaCL - CPU BLAS - dGEMM-NT (GFLOPs/s)	**39.6**	**40.0**	39.9
Normalized	99%	100%	99.75%
Standard Deviation	1.4%	0.3%	0.4%
ViennaCL - CPU BLAS - dGEMM-NN (GFLOPs/s)	40.7	**40.8**	**40.6**
Normalized	99.75%	100%	99.51%
Standard Deviation	0.1%	0.1%	0.8%
ViennaCL - CPU BLAS - dGEMV-T (GB/s)	**107**	**108**	**108**
Normalized	99.07%	100%	100%
Standard Deviation		2%	
ViennaCL - CPU BLAS - dGEMV-N (GB/s)	**92.9**	94.1	**94.9**
Normalized	97.89%	99.16%	100%
Standard Deviation	3.4%	1.1%	0.6%
ViennaCL - CPU BLAS - dDOT (GB/s)	104	104	104
Standard Deviation	1.5%	1.5%	0.6%
ViennaCL - CPU BLAS - dAXPY (GB/s)	92.4	**91.7**	**92.6**
Normalized	99.78%	99.03%	100%
Standard Deviation	2%	2.6%	0.2%
ViennaCL - CPU BLAS - dCOPY (GB/s)	**61.6**	**60.8**	61.5
Normalized	100%	98.7%	99.84%
Standard Deviation	1.7%	2.6%	0.5%
ViennaCL - CPU BLAS - sDOT (GB/s)	**117**	**117**	**116**
Normalized	100%	100%	99.15%
Standard Deviation	1.3%	1.8%	
ViennaCL - CPU BLAS - sAXPY (GB/s)	**110**	**107**	108
Normalized	100%	97.27%	98.18%
Standard Deviation	1.1%	1.1%	1.9%
ViennaCL - CPU BLAS - sCOPY (GB/s)	**71.9**	**70.7**	**70.7**
Normalized	100%	98.33%	98.33%
Standard Deviation	0.6%	0.7%	2.1%
Google Draco - Church Facade (ms)	**9212**	9192	**9131**
Normalized	99.12%	99.34%	100%
Standard Deviation	0.3%	0.2%	0.2%
Google Draco - Lion (ms)	**7438**	7413	**7382**
Normalized	99.25%	99.58%	100%
Standard Deviation	0.3%		0.2%
Helsing - 12 digit (sec)	**5.127**	5.13	**5.153**
Normalized	100%	99.94%	99.5%


Timed LLVM Compilation 12.0
Build System: Unix Makefiles
Seconds, Fewer Is Better
1
SE +/- 3.41, N = 3
521.10
2
SE +/- 2.53, N = 3
519.25
3
SE +/- 6.26, N = 3
510.31
110
220
330
440
550
Timed LLVM Compilation 12.0
Build System: Ninja
Seconds, Fewer Is Better
1
SE +/- 0.15, N = 3
473.57
2
SE +/- 0.18, N = 3
473.68
3
SE +/- 0.19, N = 3
473.74
100
200
300
400
500
Helsing 1.0-beta
Digit Range: 14 digit
Seconds, Fewer Is Better
1
538.26
2
538.66
3
538.47
120
240
360
480
600
1. (CC) gcc options: -O2 -pthread -lcrypto

Xmrig 6.12.1

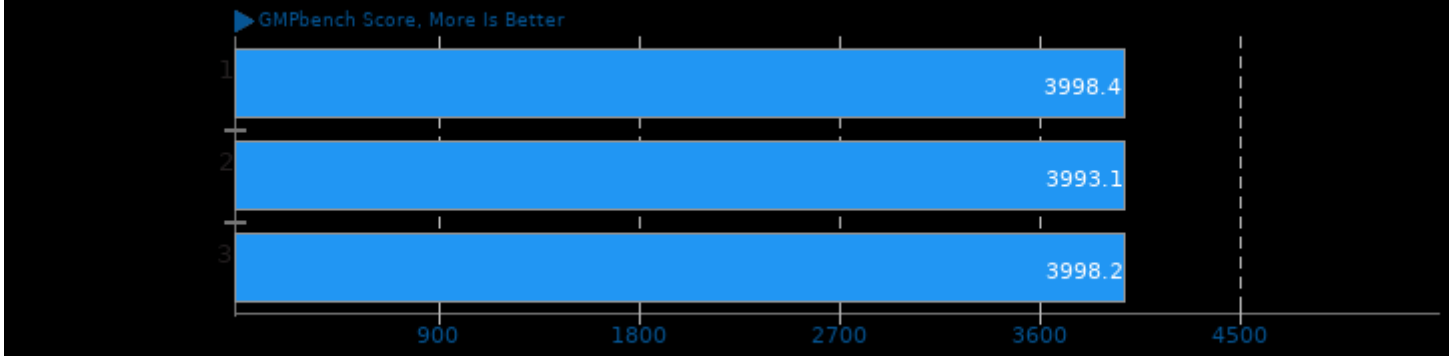
Variant: Monero - Hash Count: 1M



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

GNU GMP GMPbench 6.2.1

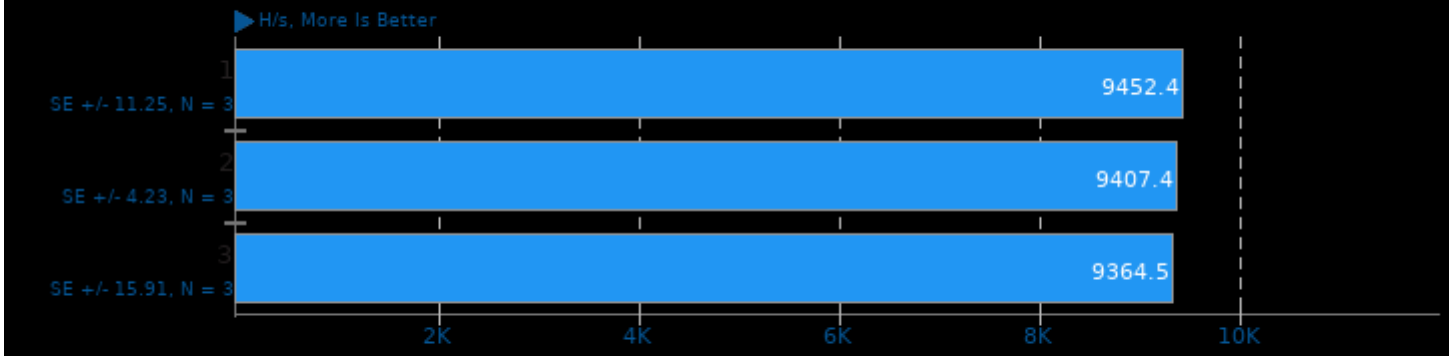
Total Time



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

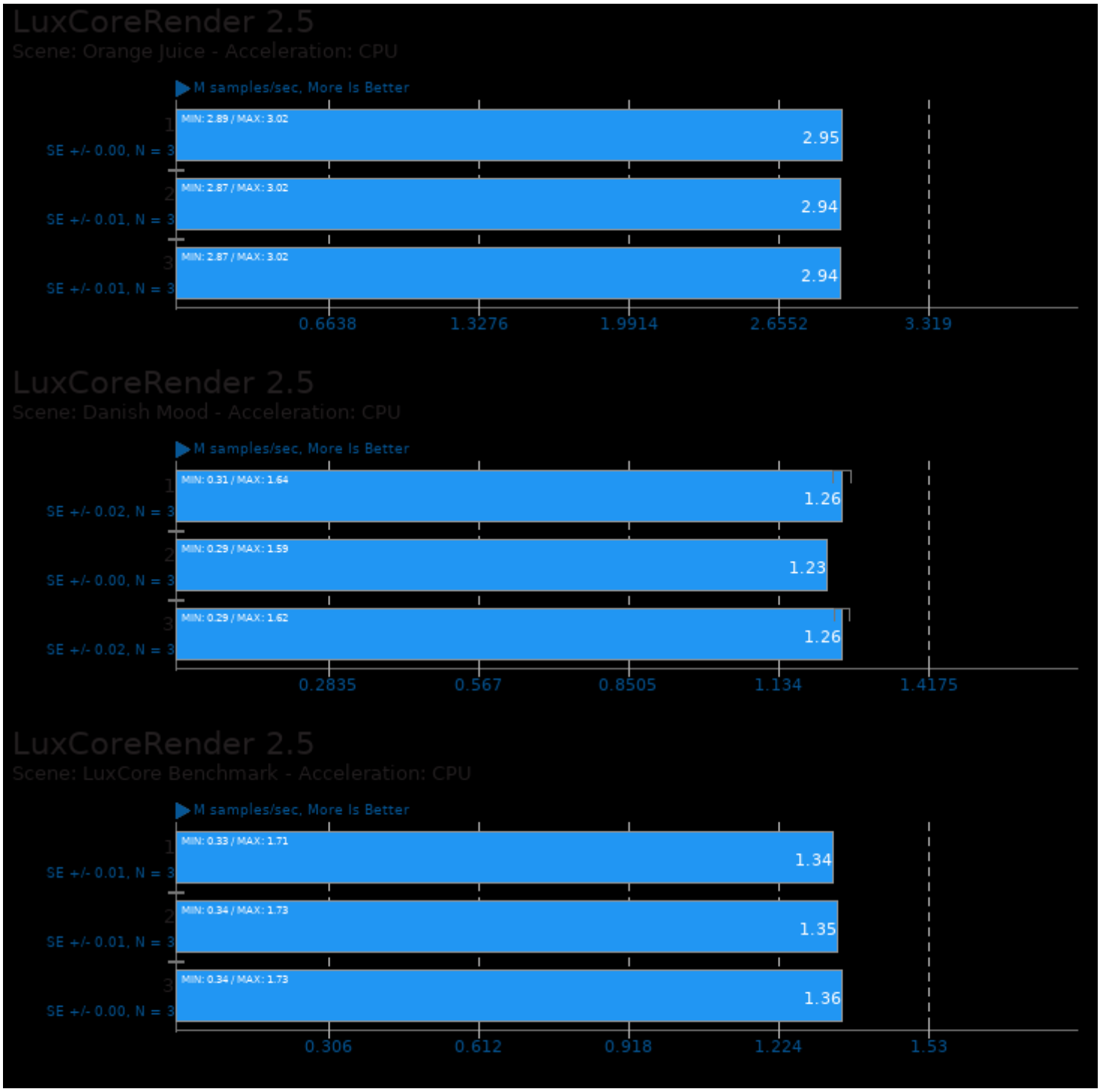
Xmrig 6.12.1

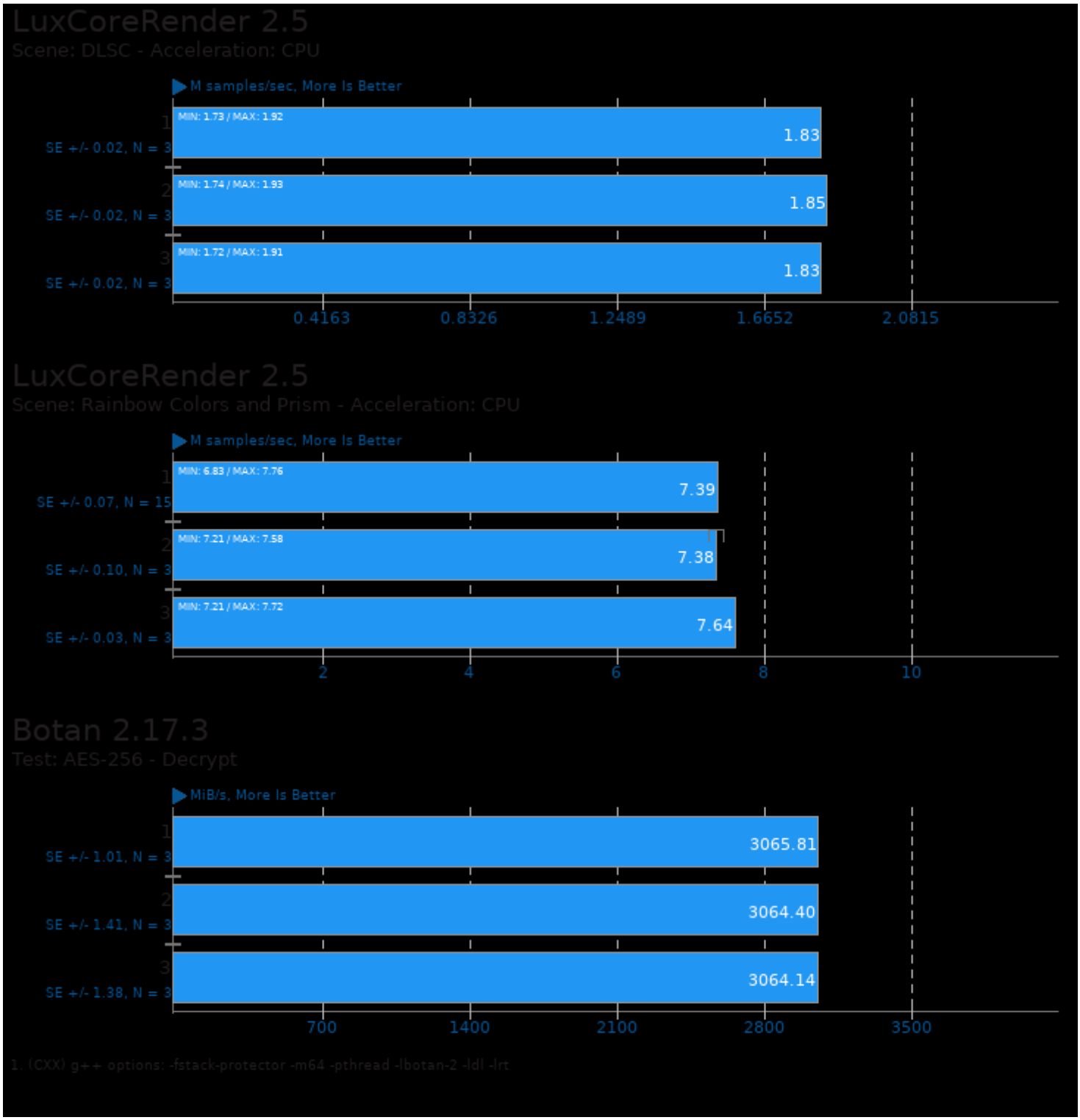
Variant: Wownero - Hash Count: 1M

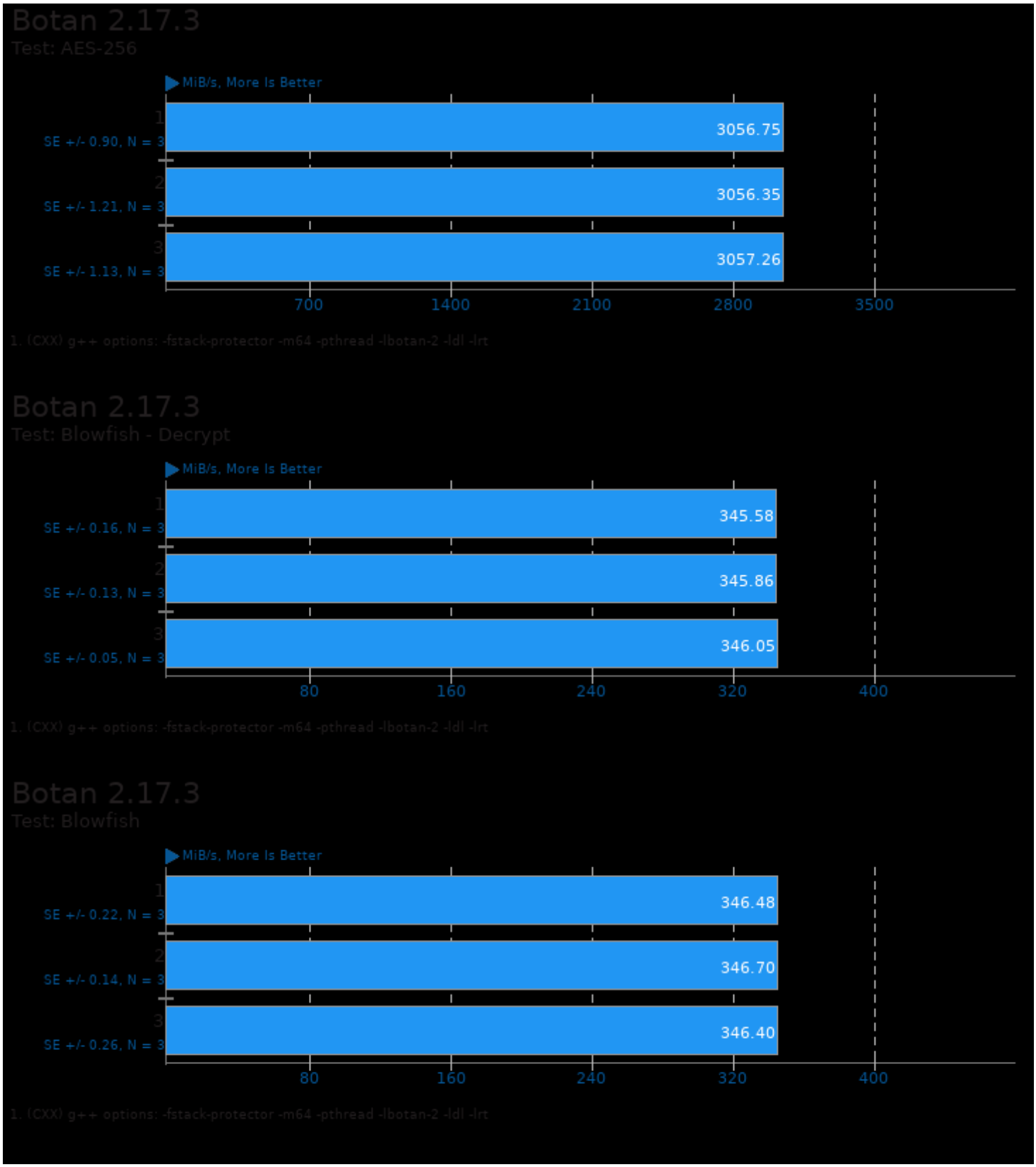


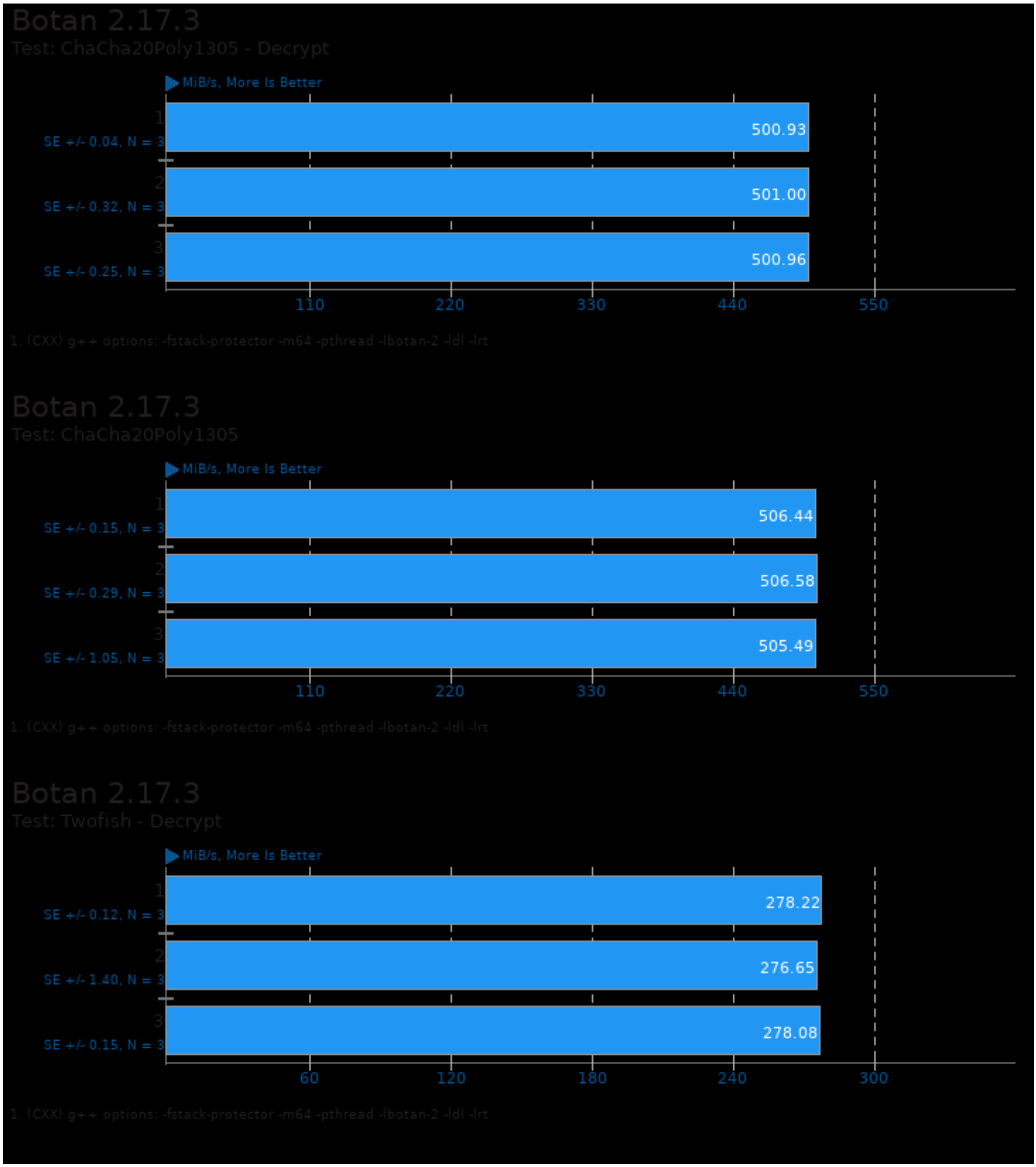
1. (CXX) g++ options: -fexceptions -fno-rtti -maes -O3 -Ofast -static-libgcc -static-libstdc++ -rdynamic -lssl -lcrypto -luv -lpthread -lrt -ldl -lhwloc

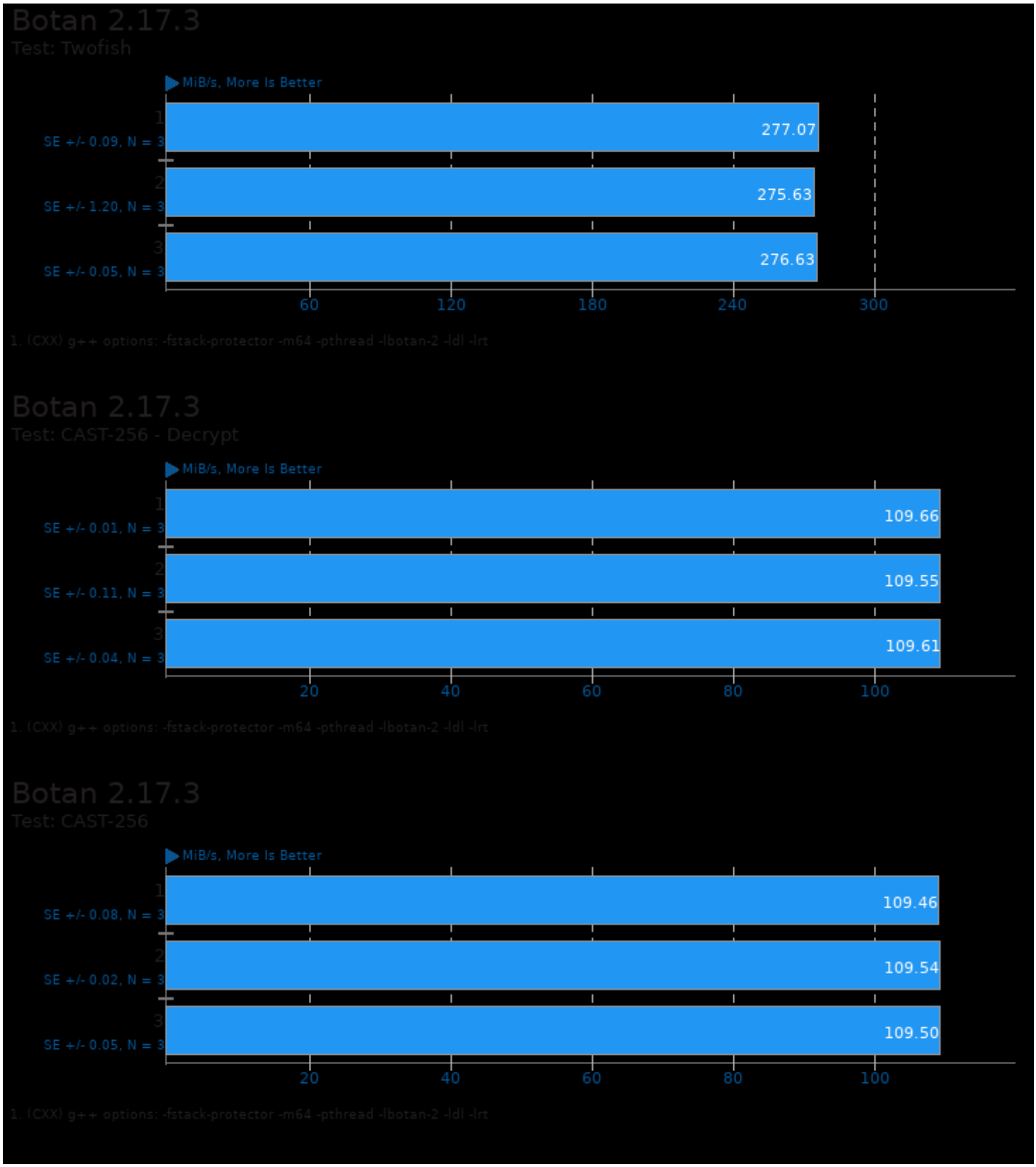
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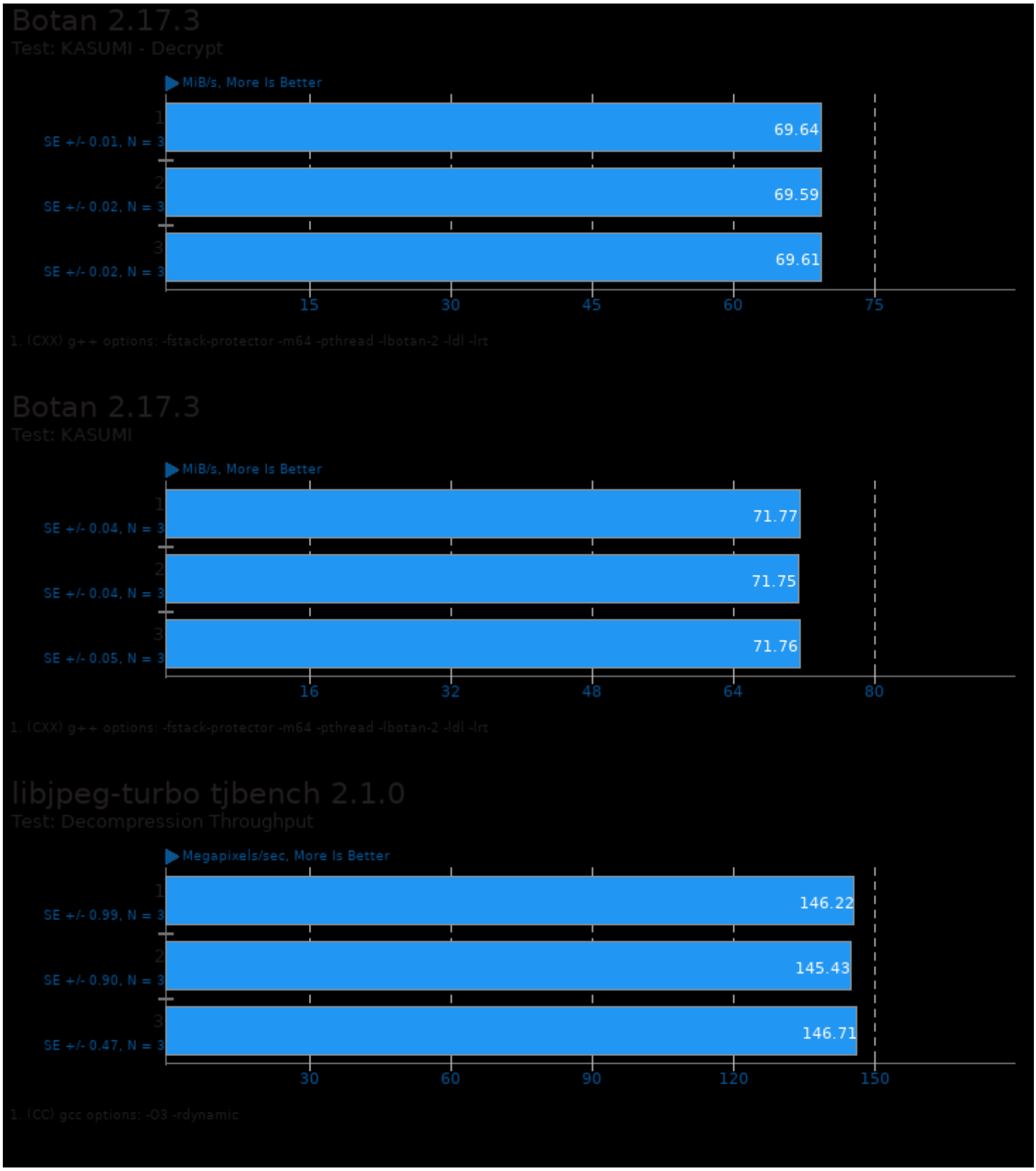


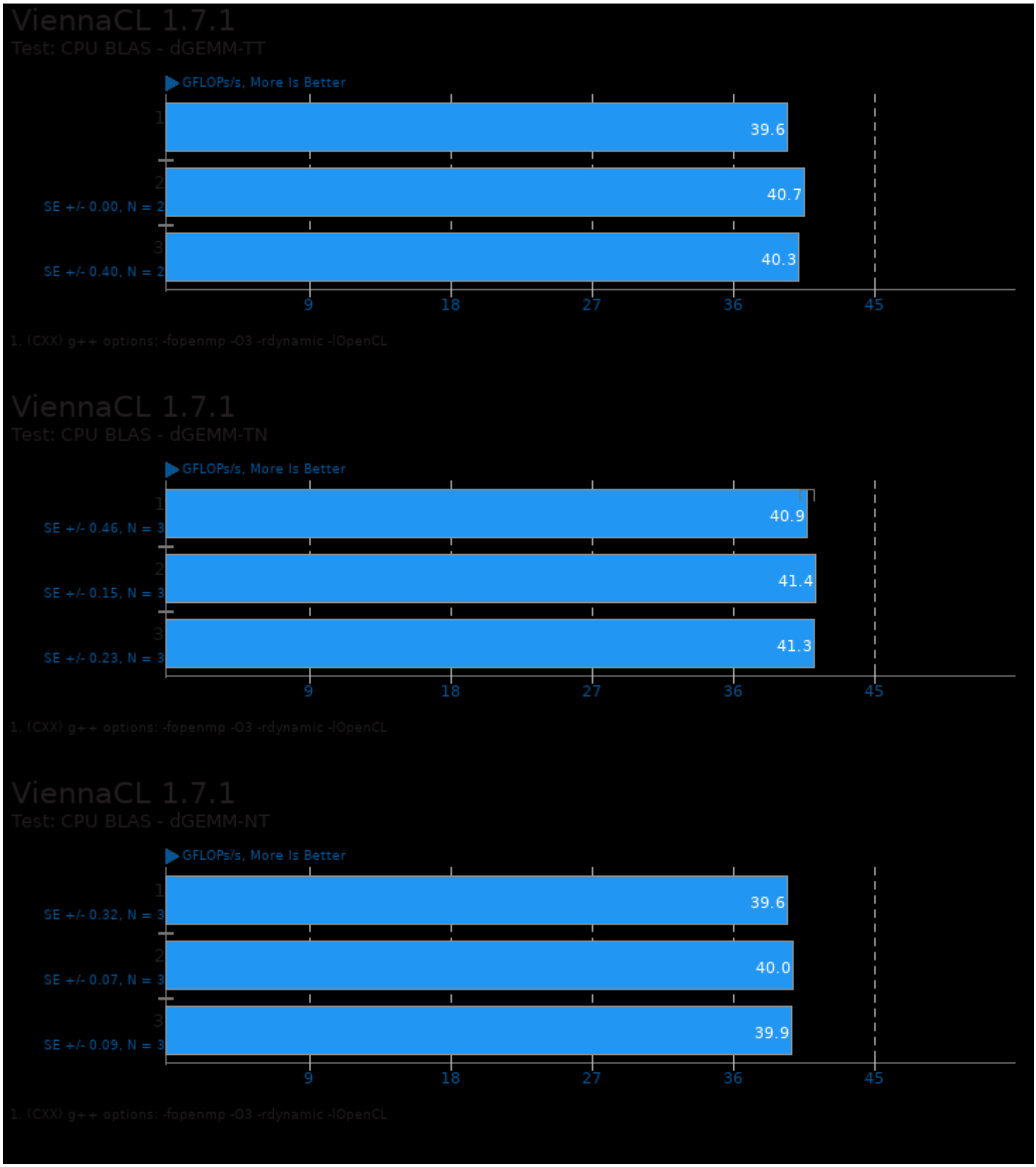

LuxCoreRender 2.5
Scene: DLSC - Acceleration: CPU
M samples/sec, More Is Better
1
MIN: 1.73 / MAX: 1.92
1.83
SE +/- 0.02, N = 3
2
MIN: 1.74 / MAX: 1.93
1.85
SE +/- 0.02, N = 3
3
MIN: 1.72 / MAX: 1.91
1.83
SE +/- 0.02, N = 3
0.4163
0.8326
1.2489
1.6652
2.0815
LuxCoreRender 2.5
Scene: Rainbow Colors and Prism - Acceleration: CPU
M samples/sec, More Is Better
1
MIN: 6.83 / MAX: 7.76
7.39
SE +/- 0.07, N = 15
2
MIN: 7.21 / MAX: 7.58
7.38
SE +/- 0.10, N = 3
3
MIN: 7.21 / MAX: 7.72
7.64
SE +/- 0.03, N = 3
2
4
6
8
10
Botan 2.17.3
Test: AES-256 - Decrypt
MiB/s, More Is Better
1
3065.81
SE +/- 1.01, N = 3
2
3064.40
SE +/- 1.41, N = 3
3
3064.14
SE +/- 1.38, N = 3
700
1400
2100
2800
3500
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

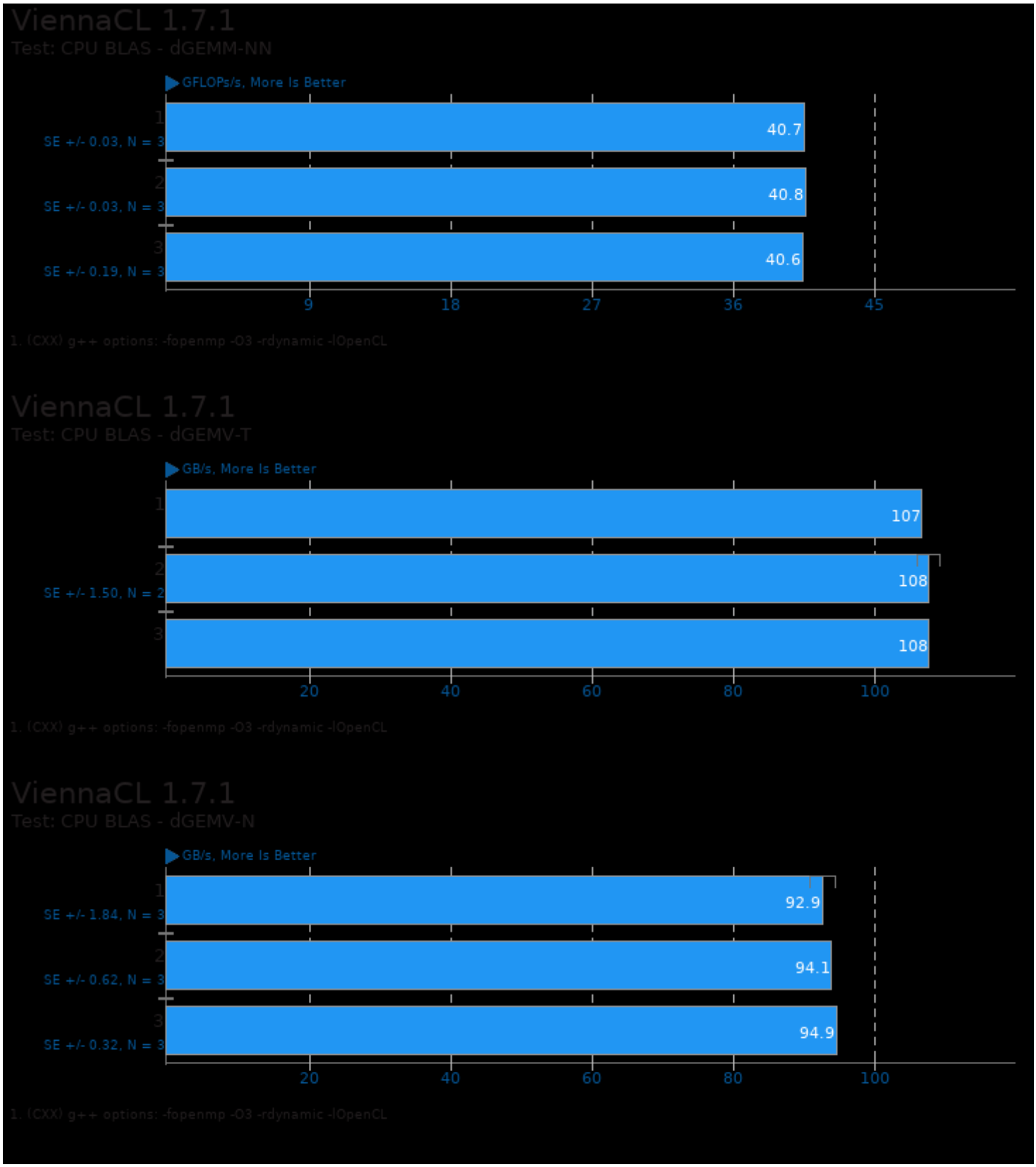

Botan 2.17.3
Test: AES-256
MiB/s, More Is Better
1
SE +/- 0.90, N = 3
3056.75
2
SE +/- 1.21, N = 3
3056.35
3
SE +/- 1.13, N = 3
3057.26
700
1400
2100
2800
3500
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: Blowfish - Decrypt
MiB/s, More Is Better
1
SE +/- 0.16, N = 3
345.58
2
SE +/- 0.13, N = 3
345.86
3
SE +/- 0.05, N = 3
346.05
80
160
240
320
400
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: Blowfish
MiB/s, More Is Better
1
SE +/- 0.22, N = 3
346.48
2
SE +/- 0.14, N = 3
346.70
3
SE +/- 0.26, N = 3
346.40
80
160
240
320
400
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

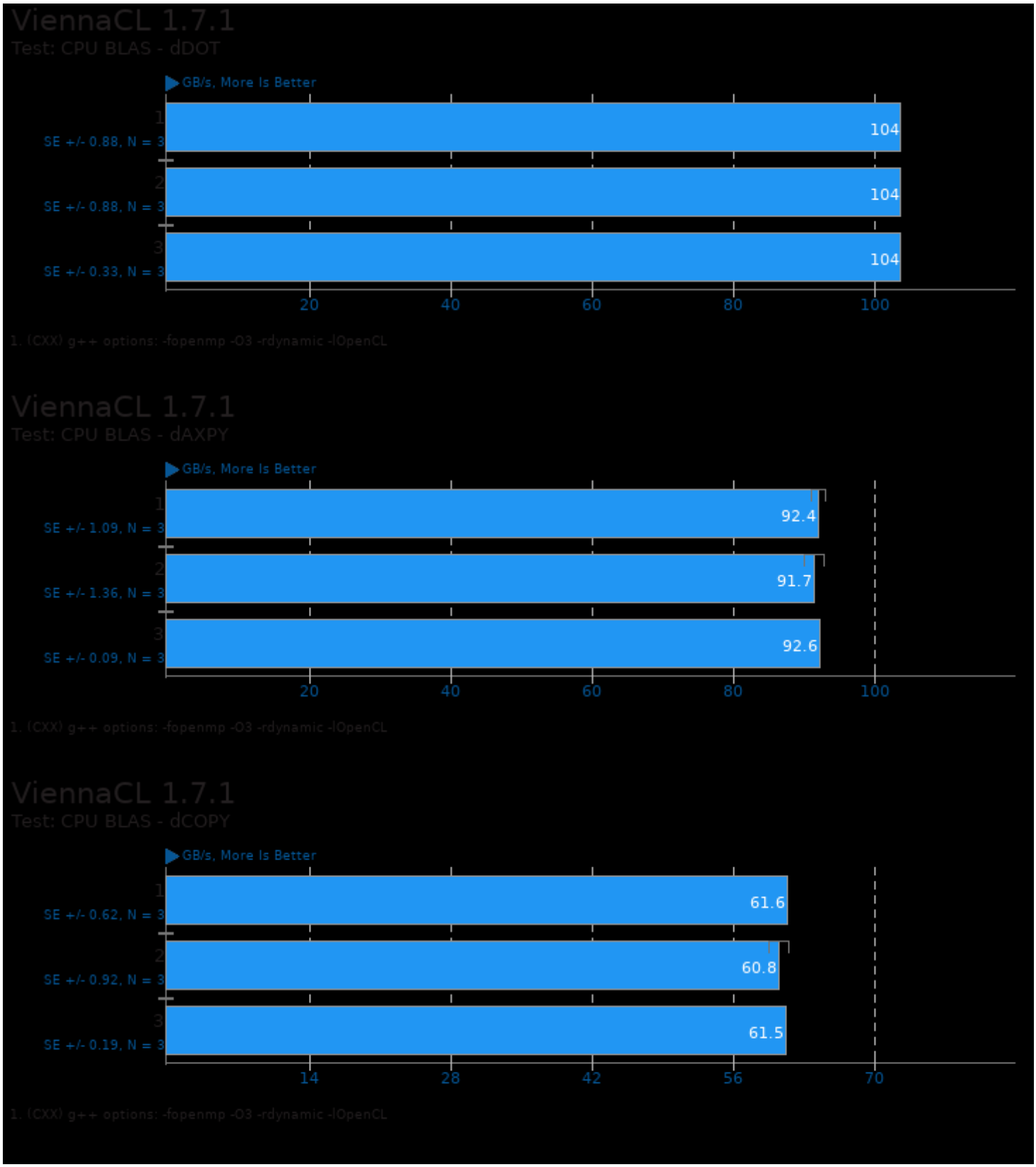

Botan 2.17.3
Test: ChaCha20Poly1305 - Decrypt
MiB/s, More Is Better
1
SE +/- 0.04, N = 3
500.93
2
SE +/- 0.32, N = 3
501.00
3
SE +/- 0.25, N = 3
500.96
110
220
330
440
550
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: ChaCha20Poly1305
MiB/s, More Is Better
1
SE +/- 0.15, N = 3
506.44
2
SE +/- 0.29, N = 3
506.58
3
SE +/- 1.05, N = 3
505.49
110
220
330
440
550
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: Twofish - Decrypt
MiB/s, More Is Better
1
SE +/- 0.12, N = 3
278.22
2
SE +/- 1.40, N = 3
276.65
3
SE +/- 0.15, N = 3
278.08
60
120
180
240
300
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

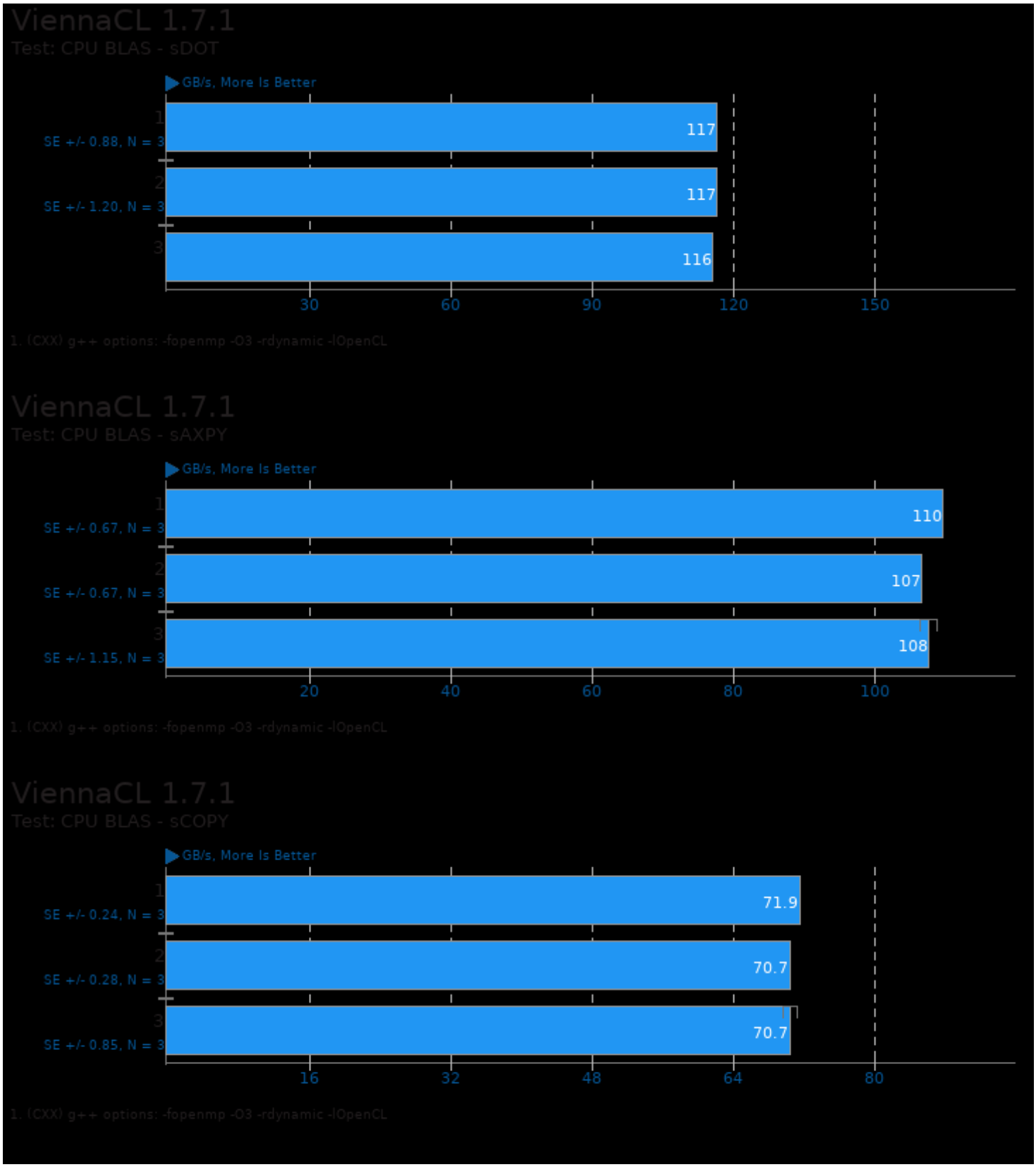

Botan 2.17.3
Test: Twofish
MiB/s, More Is Better
1
SE +/- 0.09, N = 3
277.07
2
SE +/- 1.20, N = 3
275.63
3
SE +/- 0.05, N = 3
276.63
60
120
180
240
300
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: CAST-256 - Decrypt
MiB/s, More Is Better
1
SE +/- 0.01, N = 3
109.66
2
SE +/- 0.11, N = 3
109.55
3
SE +/- 0.04, N = 3
109.61
20
40
60
80
100
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: CAST-256
MiB/s, More Is Better
1
SE +/- 0.08, N = 3
109.46
2
SE +/- 0.02, N = 3
109.54
3
SE +/- 0.05, N = 3
109.50
20
40
60
80
100
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt


Botan 2.17.3
Test: KASUMI - Decrypt
MiB/s, More Is Better
1
SE +/- 0.01, N = 3
69.64
2
SE +/- 0.02, N = 3
69.59
3
SE +/- 0.02, N = 3
69.61
15
30
45
60
75
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: KASUMI
MiB/s, More Is Better
1
SE +/- 0.04, N = 3
71.77
2
SE +/- 0.04, N = 3
71.75
3
SE +/- 0.05, N = 3
71.76
16
32
48
64
80
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
libjpeg-turbo tjbench 2.1.0
Test: Decompression Throughput
Megapixels/sec, More Is Better
1
SE +/- 0.99, N = 3
146.22
2
SE +/- 0.90, N = 3
145.43
3
SE +/- 0.47, N = 3
146.71
30
60
90
120
150
1. (CC) gcc options: -O3 -rdynamic


ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-TT
GFLOPs/s, More Is Better
1
39.6
2
40.7
SE +/- 0.00, N = 2
3
40.3
SE +/- 0.40, N = 2
9
18
27
36
45
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-TN
GFLOPs/s, More Is Better
1
40.9
SE +/- 0.46, N = 3
2
41.4
SE +/- 0.15, N = 3
3
41.3
SE +/- 0.23, N = 3
9
18
27
36
45
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-NT
GFLOPs/s, More Is Better
1
39.6
SE +/- 0.32, N = 3
2
40.0
SE +/- 0.07, N = 3
3
39.9
SE +/- 0.09, N = 3
9
18
27
36
45
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

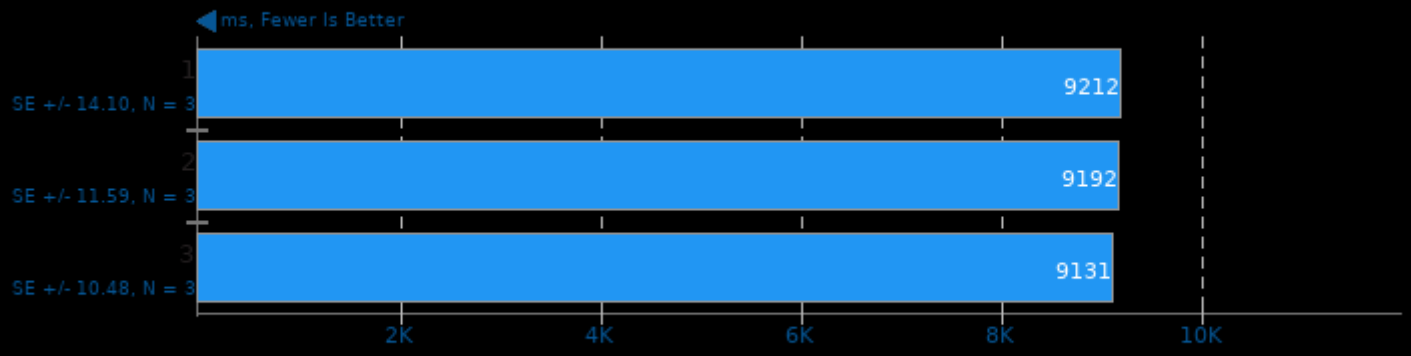

ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-NN
GFLOPs/s, More Is Better
1
SE +/- 0.03, N = 3
40.7
2
SE +/- 0.03, N = 3
40.8
3
SE +/- 0.19, N = 3
40.6
9
18
27
36
45
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dGEMV-T
GB/s, More Is Better
1
107
2
SE +/- 1.50, N = 2
108
3
108
20
40
60
80
100
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dGEMV-N
GB/s, More Is Better
1
SE +/- 1.84, N = 3
92.9
2
SE +/- 0.62, N = 3
94.1
3
SE +/- 0.32, N = 3
94.9
20
40
60
80
100
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL


ViennaCL 1.7.1
Test: CPU BLAS - dDOT
GB/s, More Is Better
1
SE +/- 0.88, N = 3
104
2
SE +/- 0.88, N = 3
104
3
SE +/- 0.33, N = 3
104
20
40
60
80
100
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dAXPY
GB/s, More Is Better
1
SE +/- 1.09, N = 3
92.4
2
SE +/- 1.36, N = 3
91.7
3
SE +/- 0.09, N = 3
92.6
20
40
60
80
100
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dCOPY
GB/s, More Is Better
1
SE +/- 0.62, N = 3
61.6
2
SE +/- 0.92, N = 3
60.8
3
SE +/- 0.19, N = 3
61.5
14
28
42
56
70
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL


ViennaCL 1.7.1
Test: CPU BLAS - sDOT
GB/s, More Is Better
1
SE +/- 0.88, N = 3
117
2
SE +/- 1.20, N = 3
117
3
116
30
60
90
120
150
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - sAXPY
GB/s, More Is Better
1
SE +/- 0.67, N = 3
110
2
SE +/- 0.67, N = 3
107
3
SE +/- 1.15, N = 3
108
20
40
60
80
100
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - sCOPY
GB/s, More Is Better
1
SE +/- 0.24, N = 3
71.9
2
SE +/- 0.28, N = 3
70.7
3
SE +/- 0.85, N = 3
70.7
16
32
48
64
80
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

Google Draco 1.4.1

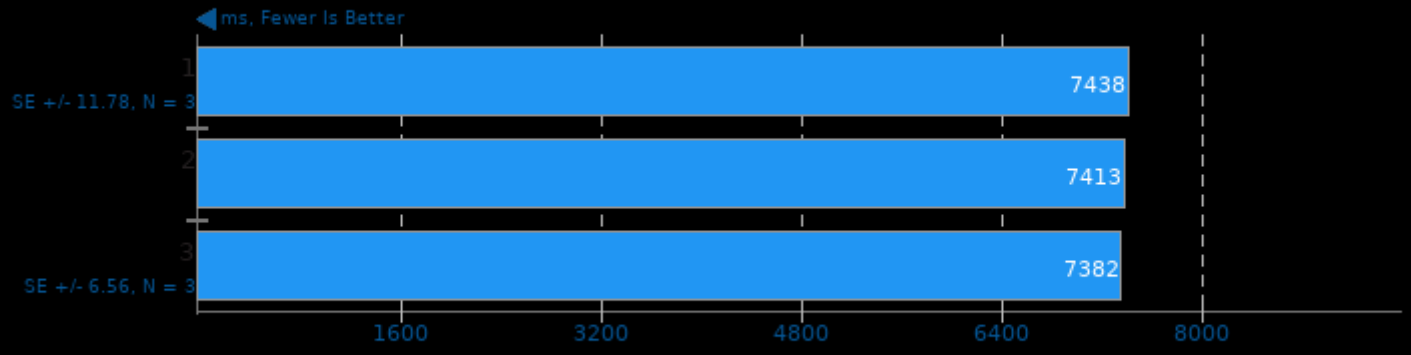
Model: Church Facade



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

Google Draco 1.4.1

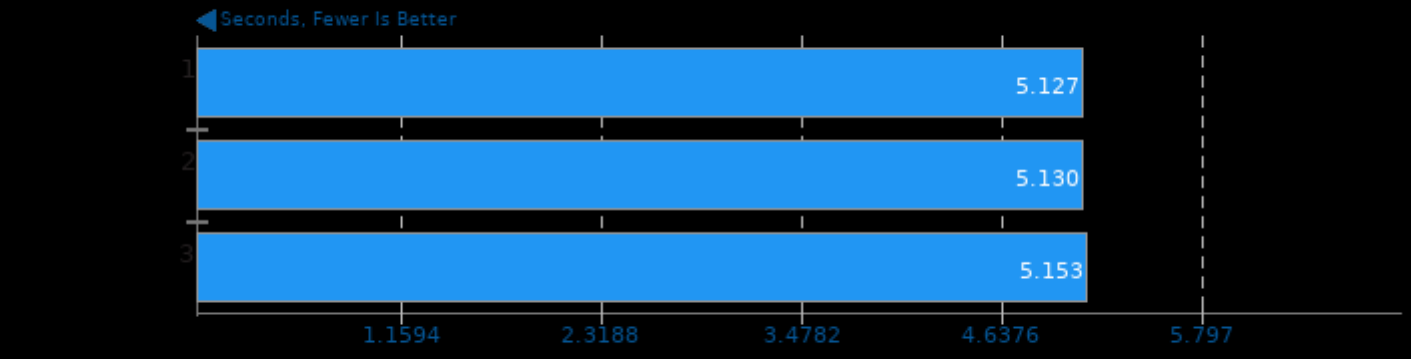
Model: Lion



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

Helsing 1.0-beta

Digit Range: 12 digit



1. (CC) gcc options: -O2 -pthread -lcrypto

xeon silver april

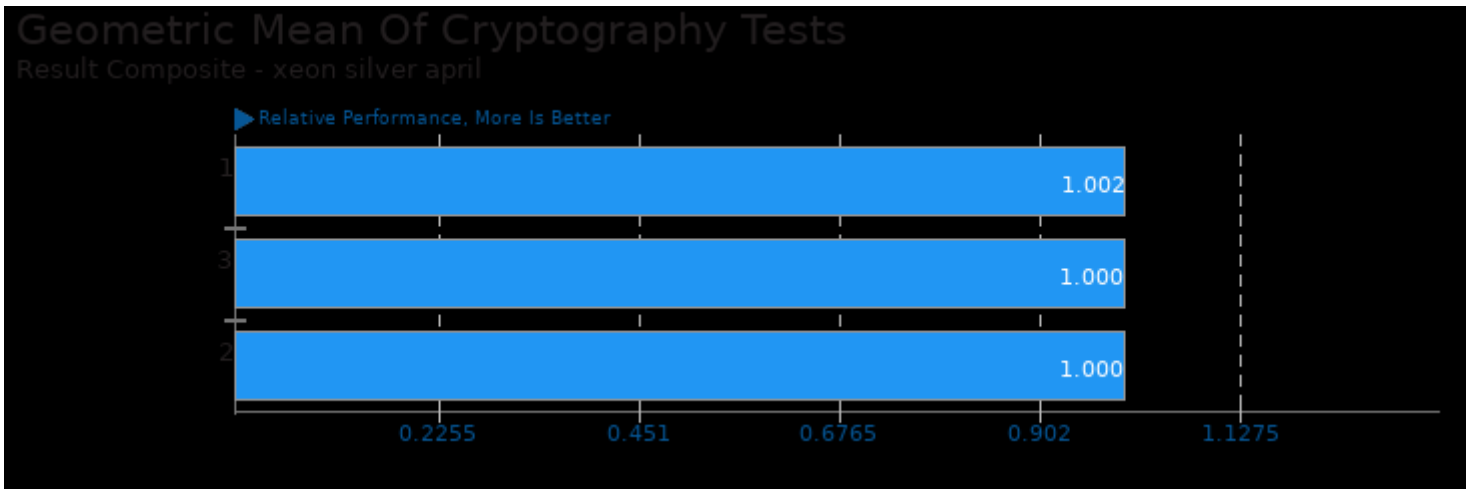
These geometric means are based upon test groupings / test suites for this result file.



Geometric mean based upon tests: pts/build-llvm, pts/botan and pts/tjbench



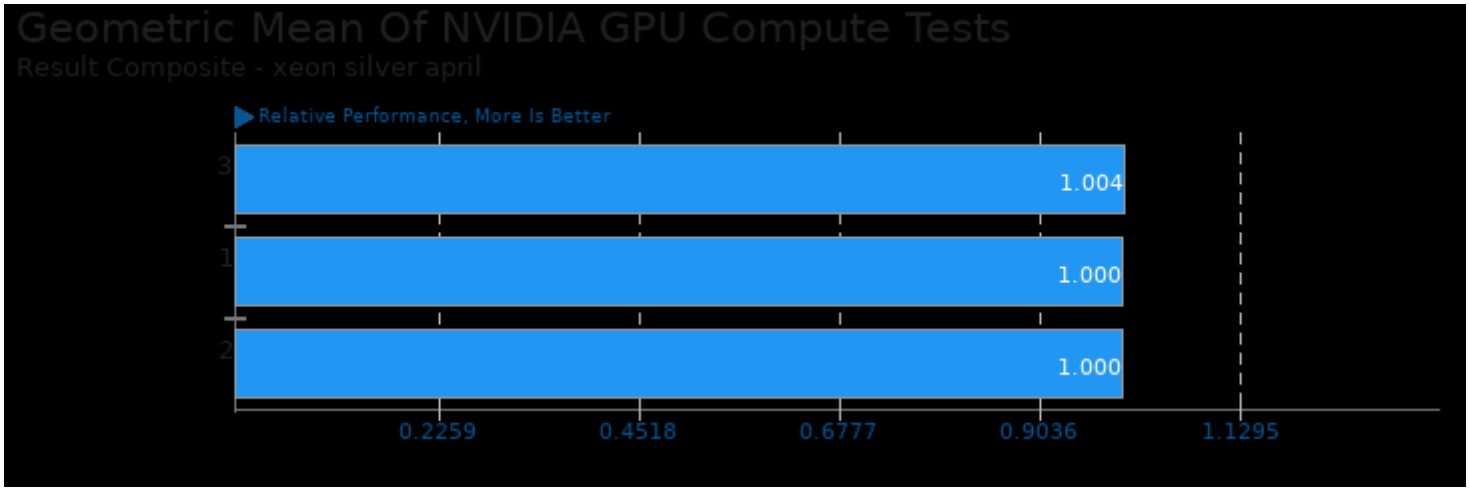
Geometric mean based upon tests: pts/luxcorerender, pts/tjbench and pts/draco



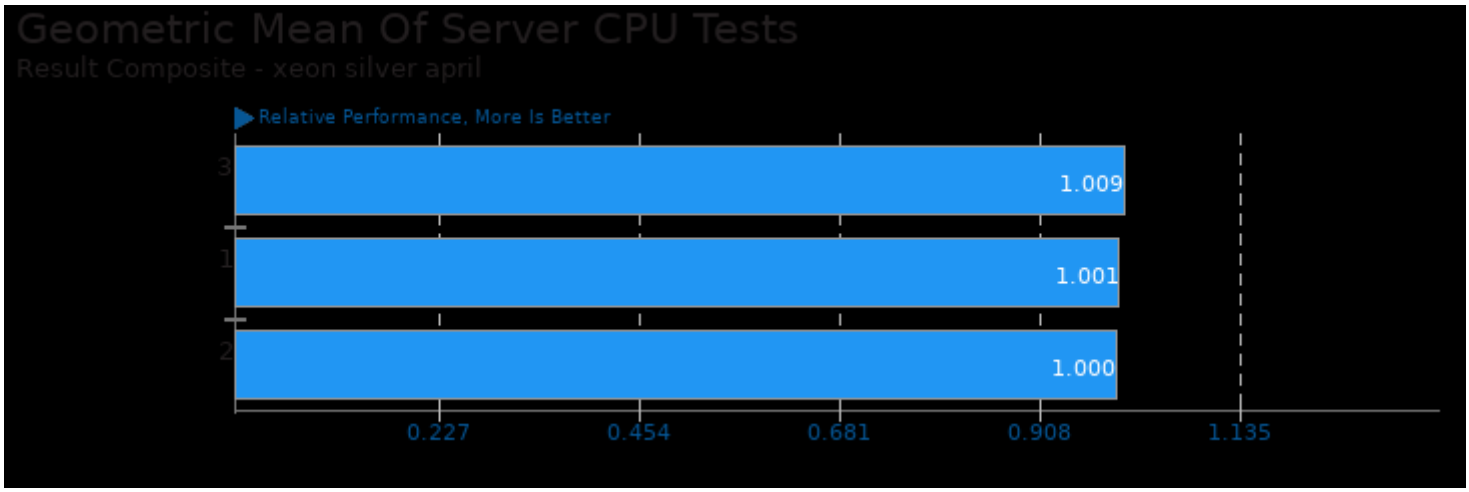
Geometric mean based upon tests: pts/botan and pts/xmrig



Geometric mean based upon tests: pts/build-llvm and pts/luxcorerender

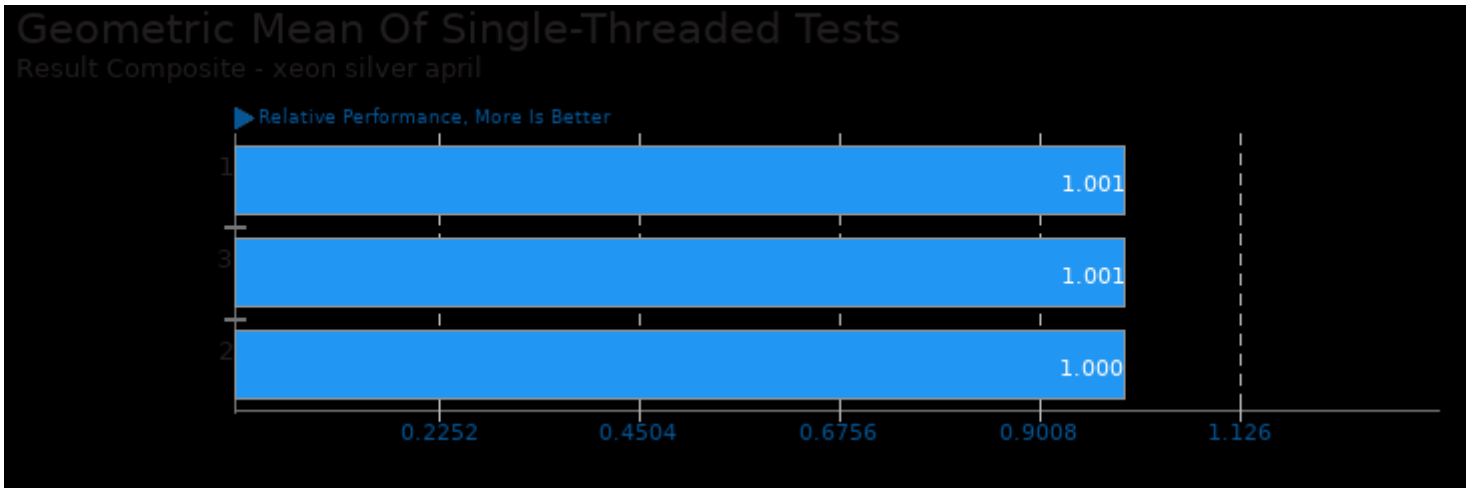


Geometric mean based upon tests: pts/luxcorerender and pts/viennacl



Geometric mean based upon tests: pts/build-llvm and pts/tjbench

xeon silver april



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

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 15:41.