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Gold stuff

2 x Intel Xeon Gold 5220R testing with a TYAN S7106 (V2.01.B40 BIOS) and llvmpipe on Ubuntu 20.04 via the Phoronix Test Suite.

Automated Executive Summary

1 had the most wins, coming in first place for 27% of the tests.

Based on the geometric mean of all complete results, the fastest (1) was 1.016x the speed of the slowest (2). 3 was 0.991x the speed of 1, 4 was 0.997x the speed of 3, 2 was 0.996x the speed of 4.

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

Redis (Test: LPOP) at 1.558x
ASKAP (Test: tConvolve MT - Gridding) at 1.096x
Redis (Test: GET) at 1.086x
ASKAP (Test: Hogbom Clean OpenMP) at 1.04x
Redis (Test: LPUSH) at 1.038x
Redis (Test: SET) at 1.034x
Cpuminer-Opt (Algorithm: Skeincoin) at 1.033x
Cpuminer-Opt (Algorithm: Triple SHA-256, Onecoin) at 1.03x
NAS Parallel Benchmarks (Test / Class: EP.C) at 1.028x

Cpuminer-Opt (Algorithm: LBC, LBRY Credits) at 1.027x.

Test Systems:

1

2

3

4

Processor: 2 x Intel Xeon Gold 5220R @ 3.90GHz (36 Cores / 72 Threads), Motherboard: TYAN S7106 (V2.01.B40 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 94GB, Disk: 500GB Samsung SSD 860, Graphics: llvmpipe, Monitor: VE228, Network: 2 x Intel I210 + 2 x QLogic cLOM8214 1/10GbE

OS: Ubuntu 20.04, Kernel: 5.9.0-050900rc6-generic (x86_64) 20200920, Desktop: GNOME Shell 3.36.4, Display Server: X Server 1.20.9, Display Driver: modesetting 1.20.9, OpenGL: 3.3 Mesa 20.0.4 (LLVM 9.0.1 256 bits), Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-9-HskZEa/gcc-9-9.3.0/debian/tmp-nvptx/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0x5003003
Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + 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	4
Redis - LPOP (Reqs/sec)	**2492023**	**1599615**	1613933	1609762
Normalized	100%	64.19%	64.76%	64.6%
Standard Deviation	4.6%	1.3%	0.6%	1.1%
ASKAP - tConvolve MT - Gridding (Million Grid Points/sec)	3272	**2988**	**3274**	3176
Normalized	99.96%	91.28%	100%	97.02%
Standard Deviation	2.9%	0.9%	1.9%	4.3%
Redis - GET (Reqs/sec)	**2385412**	2243570	2208014	**2197470**
Normalized	100%	94.05%	92.56%	92.12%
Standard Deviation	1.2%	2.2%	1.8%	1.3%
ASKAP - H.C.O (Iterations/sec)	**585.078**	596.426	**608.524**	596.426
Normalized	96.15%	98.01%	100%	98.01%
Standard Deviation	2.7%	0.3%	0.4%	0.3%
Redis - LPUSH (Reqs/sec)	1509546	**1542798**	1521175	**1486022**

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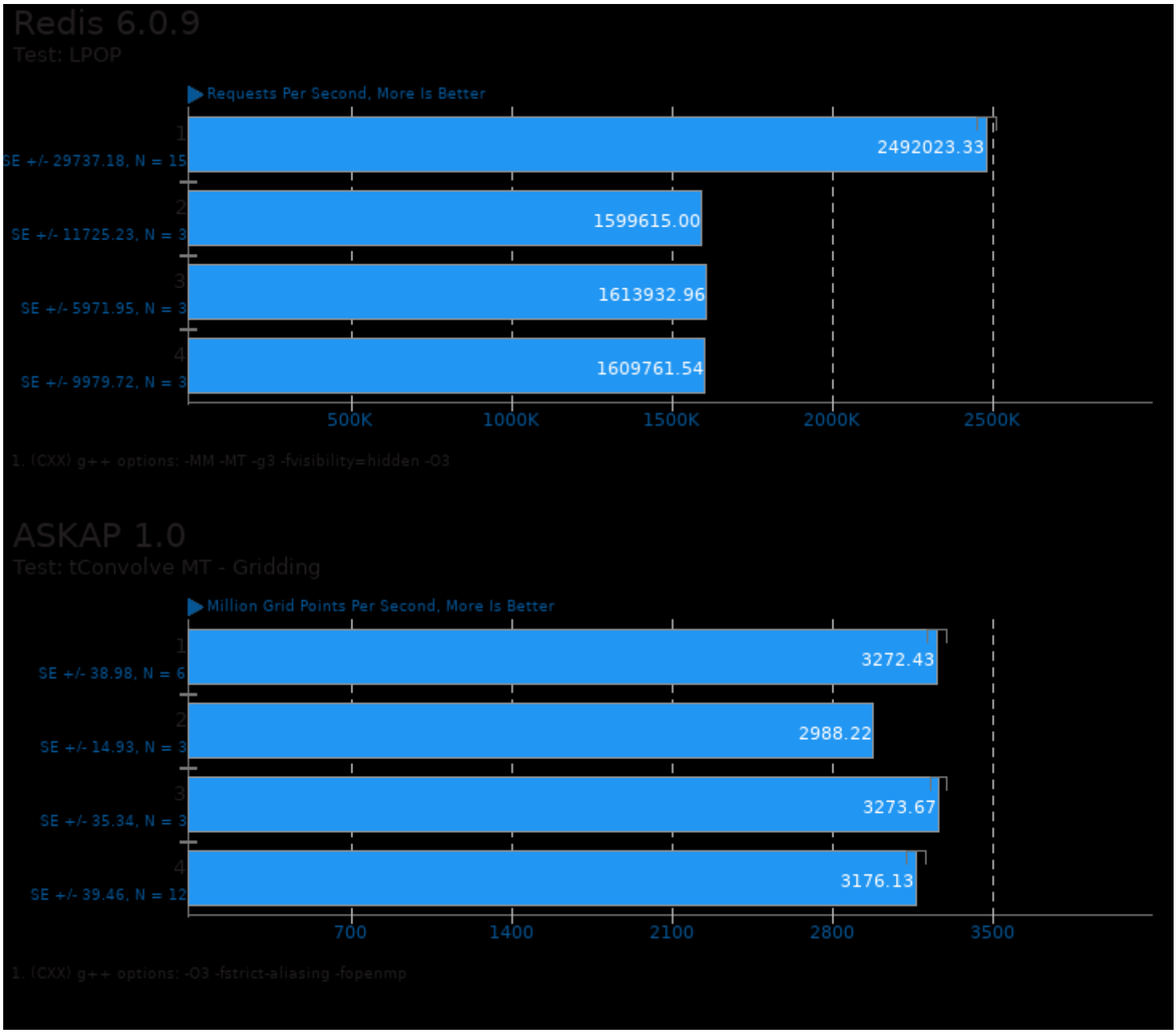
Normalized	97.84%	100%	98.6%	96.32%
Standard Deviation	2.7%	0.6%	1.3%	5.7%
Redis - SET (Reqs/sec)	1766435	1774663	**1766252**	**1826016**
Normalized	96.74%	97.19%	96.73%	100%
Standard Deviation	1.7%	3%	1.5%	0.7%
Cpuminer-Opt - Skeincoin (kH/s)	175430	**176407**	**170700**	176393
Normalized	99.45%	100%	96.76%	99.99%
Standard Deviation	2.7%	2.3%	2.1%	1.2%
Cpuminer-Opt - T.S.2.O (kH/s)	**281323**	279337	280933	**273127**
Normalized	100%	99.29%	99.86%	97.09%
Standard Deviation	0.8%	2%	1.1%	1.5%
NAS Parallel Benchmarks - EP.C (Mop/s)	3641	3595	**3672**	**3573**
Normalized	99.17%	97.9%	100%	97.3%
Standard Deviation	0.7%	1.2%	1.6%	0.9%
Cpuminer-Opt - LBC, LBRY Credits (kH/s)	**98743**	**96117**	97760	96923
Normalized	100%	97.34%	99%	98.16%
Standard Deviation	1.3%	2.2%	1.9%	2.9%
ASKAP - tConvolve OpenMP - Gridding (Million Grid Points/sec)	**5521**	5509	**5399**	5437
Normalized	100%	99.79%	97.79%	98.48%
Standard Deviation	2.6%	1.2%	2.4%	2.9%
Cpuminer-Opt - Myriad-Groestl (kH/s)	**11155**	11266	11303	**11388**
Normalized	97.95%	98.93%	99.25%	100%
Standard Deviation	3.5%	2.7%	2.5%	5%
Cpuminer-Opt - Q.S.2.P (kH/s)	**208293**	**212607**	210365	212040
Normalized	97.97%	100%	98.95%	99.73%
Standard Deviation	2.8%	0.5%	2.8%	3%
Cpuminer-Opt - Ringcoin (kH/s)	3348	**3374**	3343	**3310**
Normalized	99.23%	100%	99.07%	98.11%
Standard Deviation	1.3%	0.8%	2.1%	3%
Cpuminer-Opt - Blake-2 S (kH/s)	1115825	**1097290**	1113763	**1115883**
Normalized	99.99%	98.33%	99.81%	100%
Standard Deviation	2.9%	0.8%	1%	4.3%
lzbench - Zstd 8 - Compression (MB/s)	**76**	**76**	**77**	**77**
Normalized	98.7%	98.7%	100%	100%
Gcrypt Library (sec)	230.955	**230.332**	231.281	**233.229**
Normalized	99.73%	100%	99.59%	98.76%
Standard Deviation	0.1%	0.3%	0.5%	1.3%
lzbench - Brotli 2 - Compression	**169**	**171**	**171**	**171**
Normalized	98.83%	100%	100%	100%
Standard Deviation	0.9%			
FinanceBench - Repo OpenMP (ms)	**53411**	53330	**52787**	53237
Normalized	98.83%	98.98%	100%	99.16%
Standard Deviation	2.7%	1.4%	0.5%	0.4%
FinanceBench - Bonds OpenMP (ms)	93584	**92690**	**93647**	93313
Normalized	99.04%	100%	98.98%	99.33%
Standard Deviation	1.9%	0.6%	1.6%	1.2%
lzbench - Crush 0 - Compression	**97**	**97**	**98**	**98**
Normalized	98.98%	98.98%	100%	100%
Cpuminer-Opt - Garlicoin (kH/s)	12453	**12467**	**12350**	12380
Normalized	99.89%	100%	99.06%	99.3%
Standard Deviation	2.9%	1.3%	1.1%	1.1%

Gold stuff

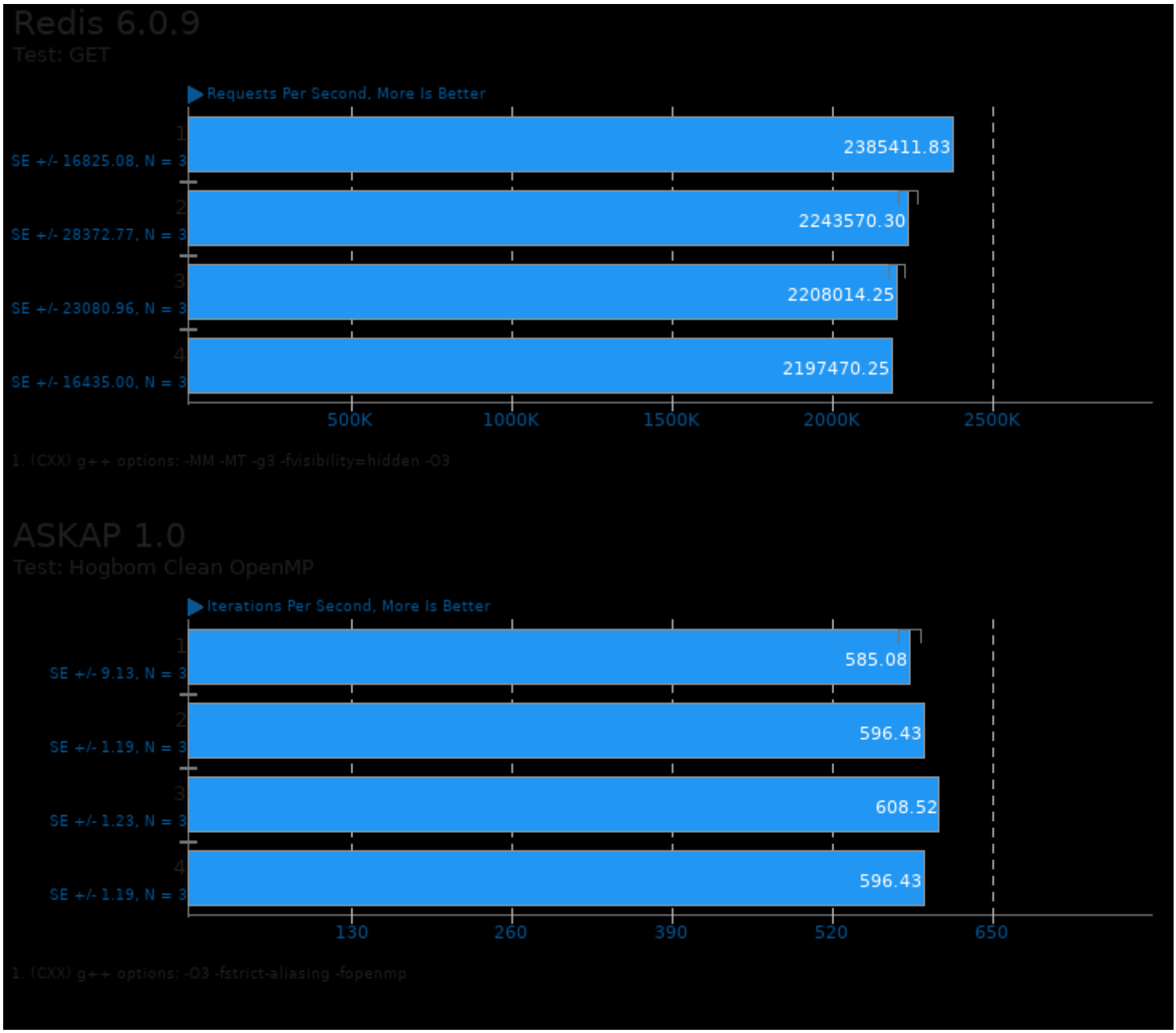
ASKAP - tConvolve MPI - Degridding (Mpix/sec)	6584	**6609**	**6548**	**6609**
Normalized	99.63%	100%	99.08%	100%
Standard Deviation	0.6%	0.3%	0.3%	0.3%
lzbench - Zstd 8 - Decompression	**1439**	1446	1448	**1452**
Normalized	99.1%	99.59%	99.72%	100%
Standard Deviation	0.2%	0.2%	0.1%	0.1%
ASKAP - tConvolve OpenMP - Degridding (Million Grid Points/sec)	**4734**	4727	4727	**4692**
Normalized	100%	99.85%	99.85%	99.12%
Standard Deviation	0.9%	1%	1%	0.9%
ASKAP - tConvolve MPI - Gridding (Mpix/sec)	**7718**	7718	7668	**7667**
Normalized	100%	100%	99.35%	99.35%
Standard Deviation	0.7%	0%	0.6%	0%
lzbench - Zstd 1 - Decompression	**1520**	1521	1522	**1529**
Normalized	99.41%	99.48%	99.54%	100%
Standard Deviation	0.1%	0%	0.1%	0.1%
NAS Parallel Benchmarks - BT.C (Mop/s)	**93370**	**92832**	92967	92865
Normalized	100%	99.42%	99.57%	99.46%
Standard Deviation	0.6%	0%	0.1%	0.2%
lzbench - Libdeflate 1 - Decompression (MB/s)	**977**	978	**982**	979
Normalized	99.49%	99.59%	100%	99.69%
Standard Deviation	0.2%		0.2%	
lzbench - Libdeflate 1 - Compression (MB/s)	**206**	**207**	**207**	**207**
Normalized	99.52%	100%	100%	100%
Standard Deviation	0.8%			
NAS Parallel Benchmarks - LU.C (Mop/s)	99459	**99344**	99686	**99810**
Normalized	99.65%	99.53%	99.88%	100%
Standard Deviation	0.2%	0.2%	0.3%	0.1%
lzbench - Zstd 1 - Compression (MB/s)	**447**	**447**	**447**	**449**
Normalized	99.55%	99.55%	99.55%	100%
Standard Deviation	0.2%	0.1%		
Redis - SADD (Reqs/sec)	**2003478**	2006307	**2011425**	2007727
Normalized	99.6%	99.75%	100%	99.82%
Standard Deviation	1%	1%	3%	1.3%
lzbench - Brotli 0 - Decompression (MB/s)	**526**	527	**528**	**528**
Normalized	99.62%	99.81%	100%	100%
Standard Deviation			0.2%	
NAS Parallel Benchmarks - SP.B (Mop/s)	41289	**41166**	41307	**41315**
Normalized	99.94%	99.64%	99.98%	100%
Standard Deviation	0.8%	0.2%	0.4%	0.3%
lzbench - Brotli 2 - Decompression (MB/s)	**603**	604	**605**	**605**
Normalized	99.67%	99.83%	100%	100%
Standard Deviation	1%	0.1%		
GnuPG - 2.7.S.F.E (sec)	**77.872**	**77.617**	77.683	77.674
Normalized	99.67%	100%	99.92%	99.93%

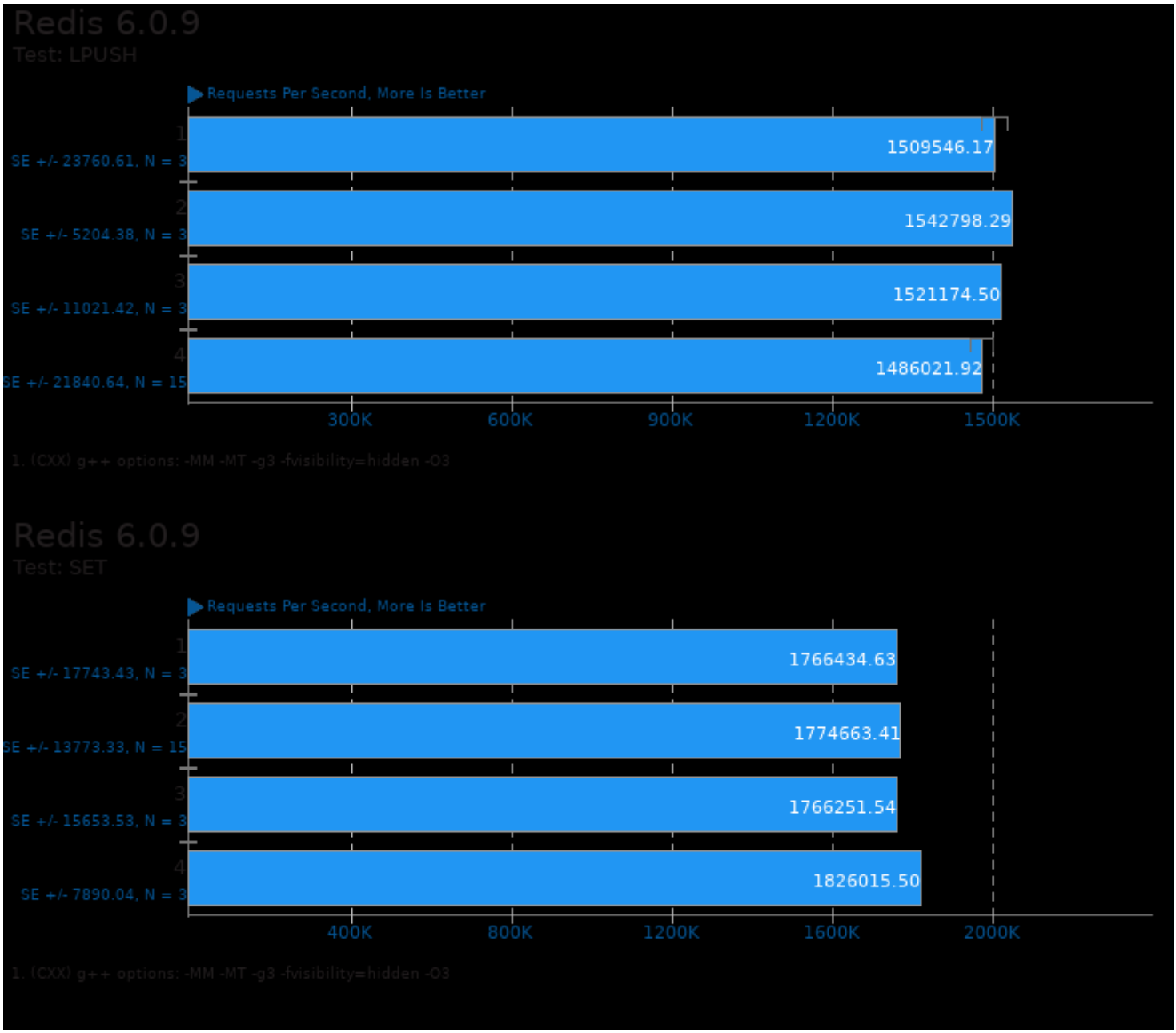
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Standard Deviation	0.7%	0.1%	0.2%	0.2%
QuantLib (MFLOPS)	2231	2233	**2236**	**2230**
Normalized	99.76%	99.86%	100%	99.75%
Standard Deviation	0.5%	0.2%	0.1%	0.2%
lzbench - Crush 0 - Decompression (MB/s)	**434**	**435**	**435**	**435**
Normalized	99.77%	100%	100%	100%
Standard Deviation	0.2%			
lzbench - Brotli 0 - Compression	402	402	402	402
Standard Deviation	0.1%			
lzbench - XZ 0 - Decompression	100	100	100	100
lzbench - XZ 0 - Compression (MB/s)	38	38	38	38
Standard Deviation	1.5%			1.5%
ASKAP - tConvolve MT - Degridding (Million Grid Points/sec)	6098	**5496**	6123	**6134**
Normalized	99.41%	89.6%	99.82%	100%
Standard Deviation	1.9%	1.7%	6.8%	20%
Cpuminer-Opt - Deepcoin (kH/s)	**10063**	**9831**	10046	9972
Normalized	100%	97.69%	99.84%	99.1%
Standard Deviation	8.1%	6.1%	5.7%	6.3%
Cpuminer-Opt - x25x (kH/s)	**945.86**	912.94	941.00	**908.63**
Normalized	100%	96.52%	99.49%	96.06%
Standard Deviation	2.8%	10.6%	3.5%	10.6%
Cpuminer-Opt - Magi (kH/s)	**702.26**	711.53	705.45	**720.27**
Normalized	97.5%	98.79%	97.94%	100%
Standard Deviation	0.1%	6.4%	0.8%	7%
NAS Parallel Benchmarks - EP.D (Mop/s)	3775	**3522**	**3848**	3693
Normalized	98.12%	91.53%	100%	95.99%
Standard Deviation	3.5%	17.7%	2.9%	13.4%

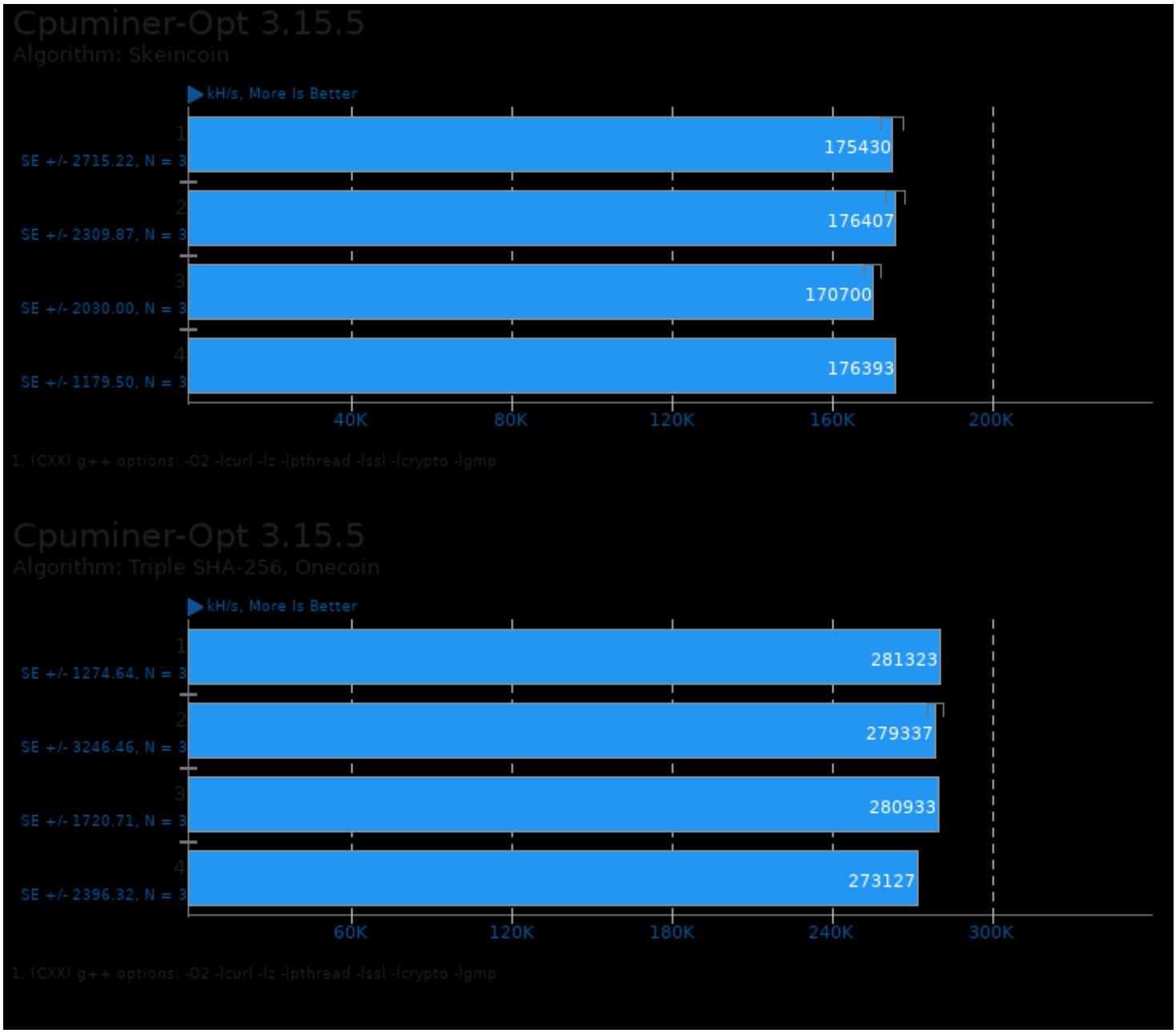

Redis 6.0.9
Test: LPOP
Requests Per Second, More Is Better
1
SE +/- 29737.18, N = 15
2492023.33
2
SE +/- 11725.23, N = 3
1599615.00
3
SE +/- 5971.95, N = 3
1613932.96
4
SE +/- 9979.72, N = 3
1609761.54
500K
1000K
1500K
2000K
2500K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3
ASKAP 1.0
Test: tConvolve MT - Gridding
Million Grid Points Per Second, More Is Better
1
SE +/- 38.98, N = 6
3272.43
2
SE +/- 14.93, N = 3
2988.22
3
SE +/- 35.34, N = 3
3273.67
4
SE +/- 39.46, N = 12
3176.13
700
1400
2100
2800
3500
1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp

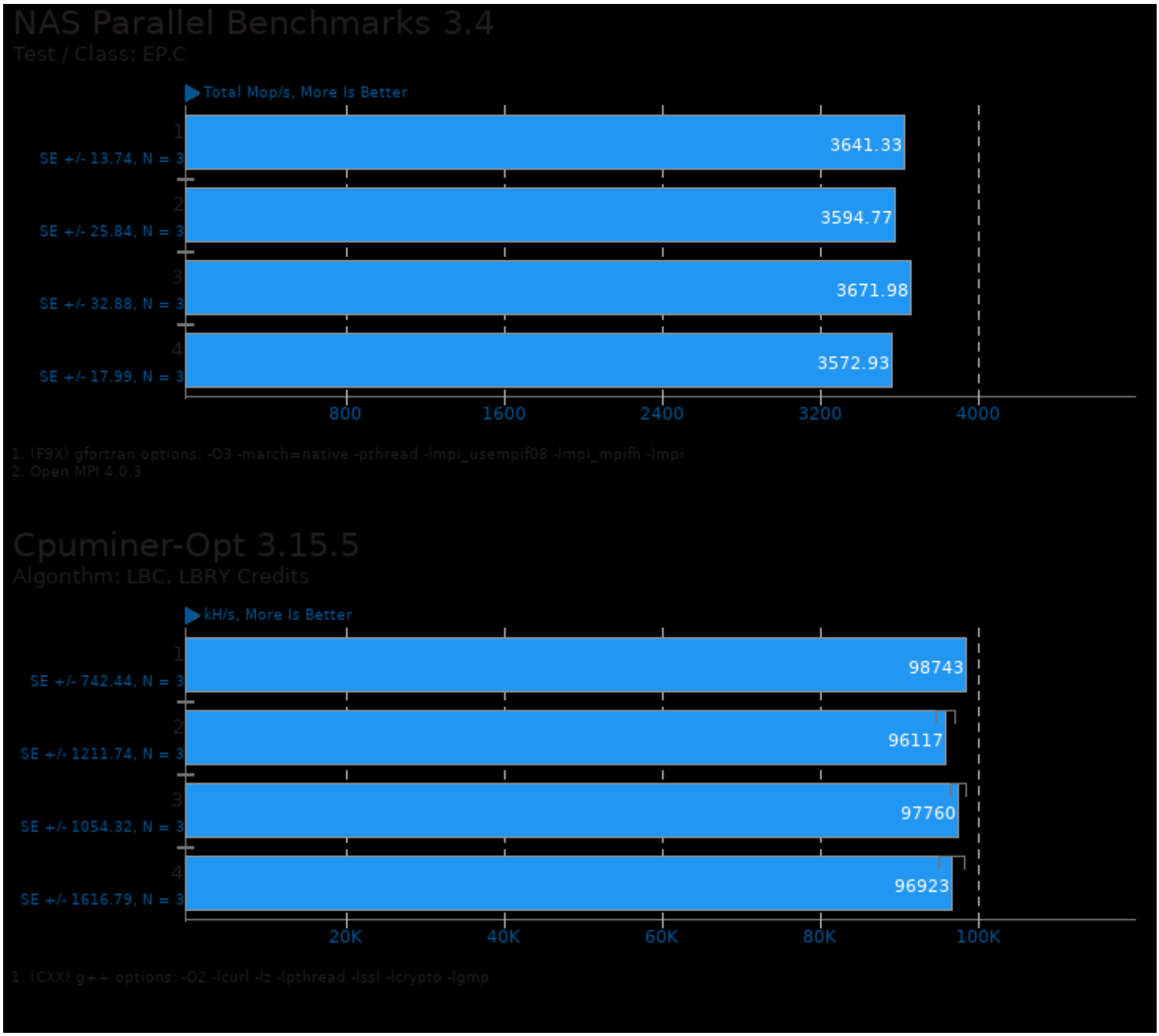
Gold stuff


Redis 6.0.9
Test: GET
Requests Per Second, More Is Better
1
SE +/- 16825.08, N = 3
2385411.83
2
SE +/- 28372.77, N = 3
2243570.30
3
SE +/- 23080.96, N = 3
2208014.25
4
SE +/- 16435.00, N = 3
2197470.25
500K
1000K
1500K
2000K
2500K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3
ASKAP 1.0
Test: Hogbom Clean OpenMP
Iterations Per Second, More Is Better
1
SE +/- 9.13, N = 3
585.08
2
SE +/- 1.19, N = 3
596.43
3
SE +/- 1.23, N = 3
608.52
4
SE +/- 1.19, N = 3
596.43
130
260
390
520
650
1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp

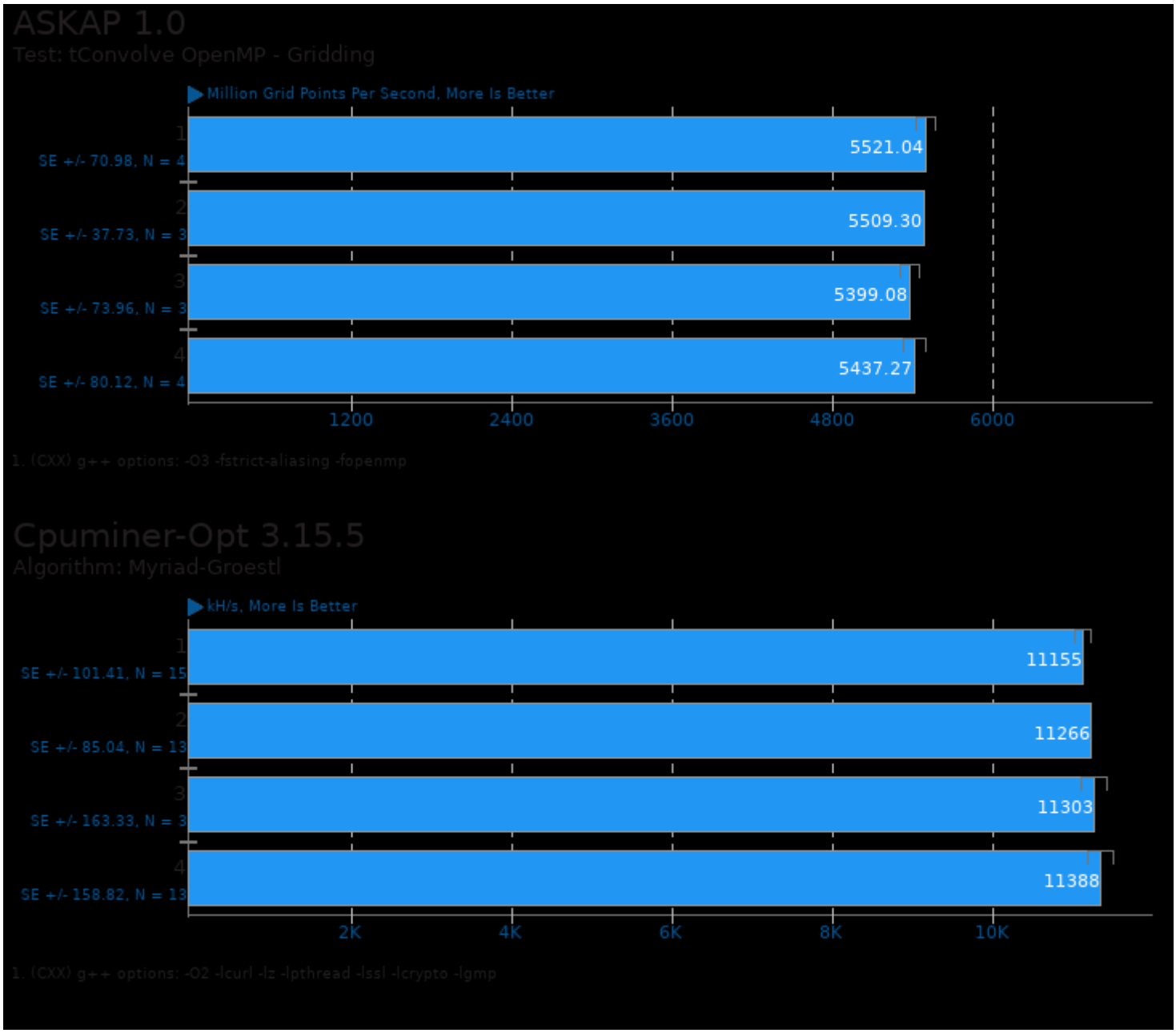

Redis 6.0.9
Test: LPUSH
Requests Per Second, More Is Better
1
SE +/- 23760.61, N = 3
1509546.17
2
SE +/- 5204.38, N = 3
1542798.29
3
SE +/- 11021.42, N = 3
1521174.50
4
SE +/- 21840.64, N = 15
1486021.92
300K
600K
900K
1200K
1500K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3
Redis 6.0.9
Test: SET
Requests Per Second, More Is Better
1
SE +/- 17743.43, N = 3
1766434.63
2
SE +/- 13773.33, N = 15
1774663.41
3
SE +/- 15653.53, N = 3
1766251.54
4
SE +/- 7890.04, N = 3
1826015.50
400K
800K
1200K
1600K
2000K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3

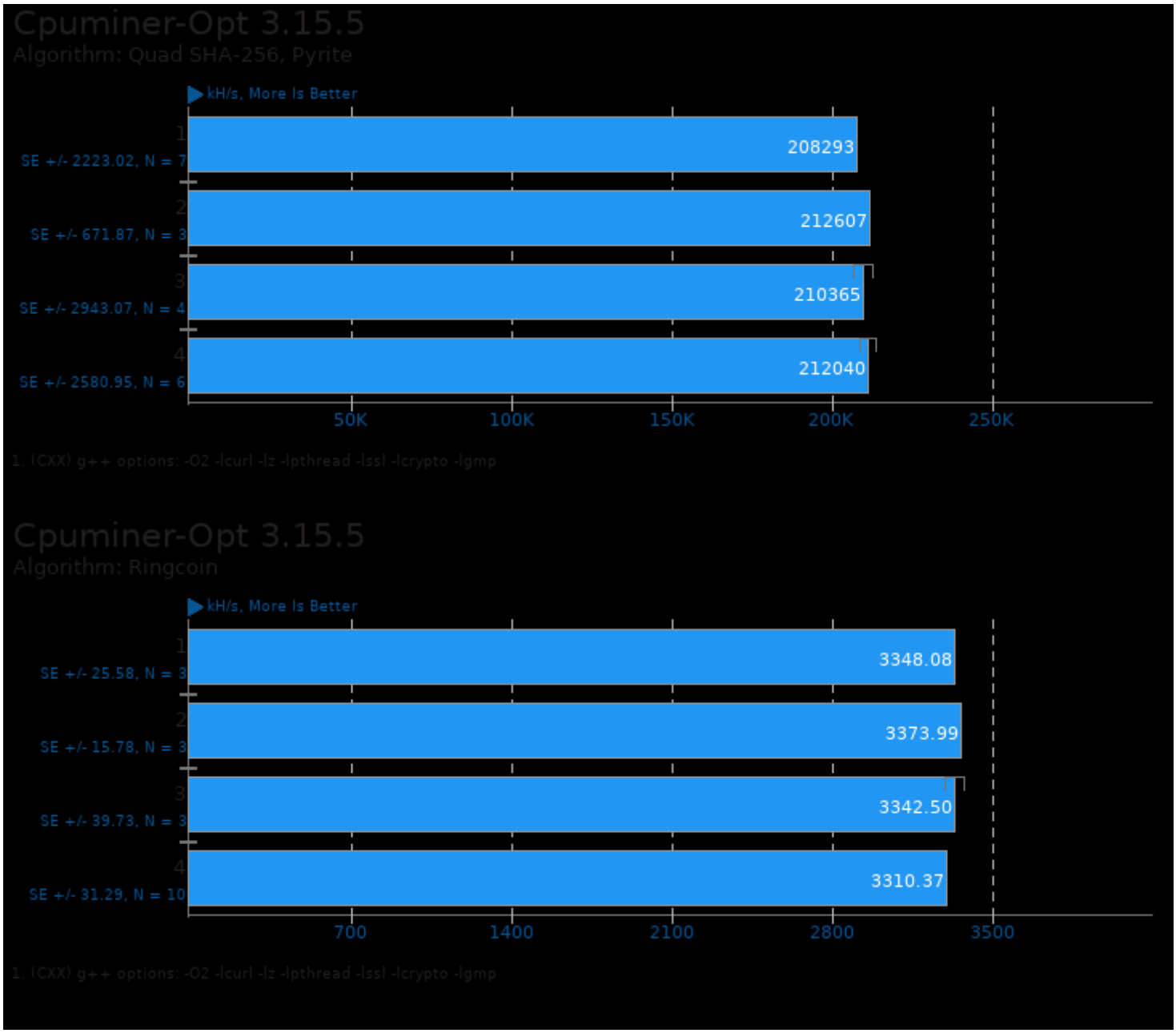
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Cpuminer-Opt 3.15.5
Algorithm: Skeincoin
kH/s, More Is Better
1
SE +/- 2715.22, N = 3
175430
2
SE +/- 2309.87, N = 3
176407
3
SE +/- 2030.00, N = 3
170700
4
SE +/- 1179.50, N = 3
176393
40K
80K
120K
160K
200K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp
Cpuminer-Opt 3.15.5
Algorithm: Triple SHA-256, Onecoin
kH/s, More Is Better
1
SE +/- 1274.64, N = 3
281323
2
SE +/- 3246.46, N = 3
279337
3
SE +/- 1720.71, N = 3
280933
4
SE +/- 2396.32, N = 3
273127
60K
120K
180K
240K
300K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp

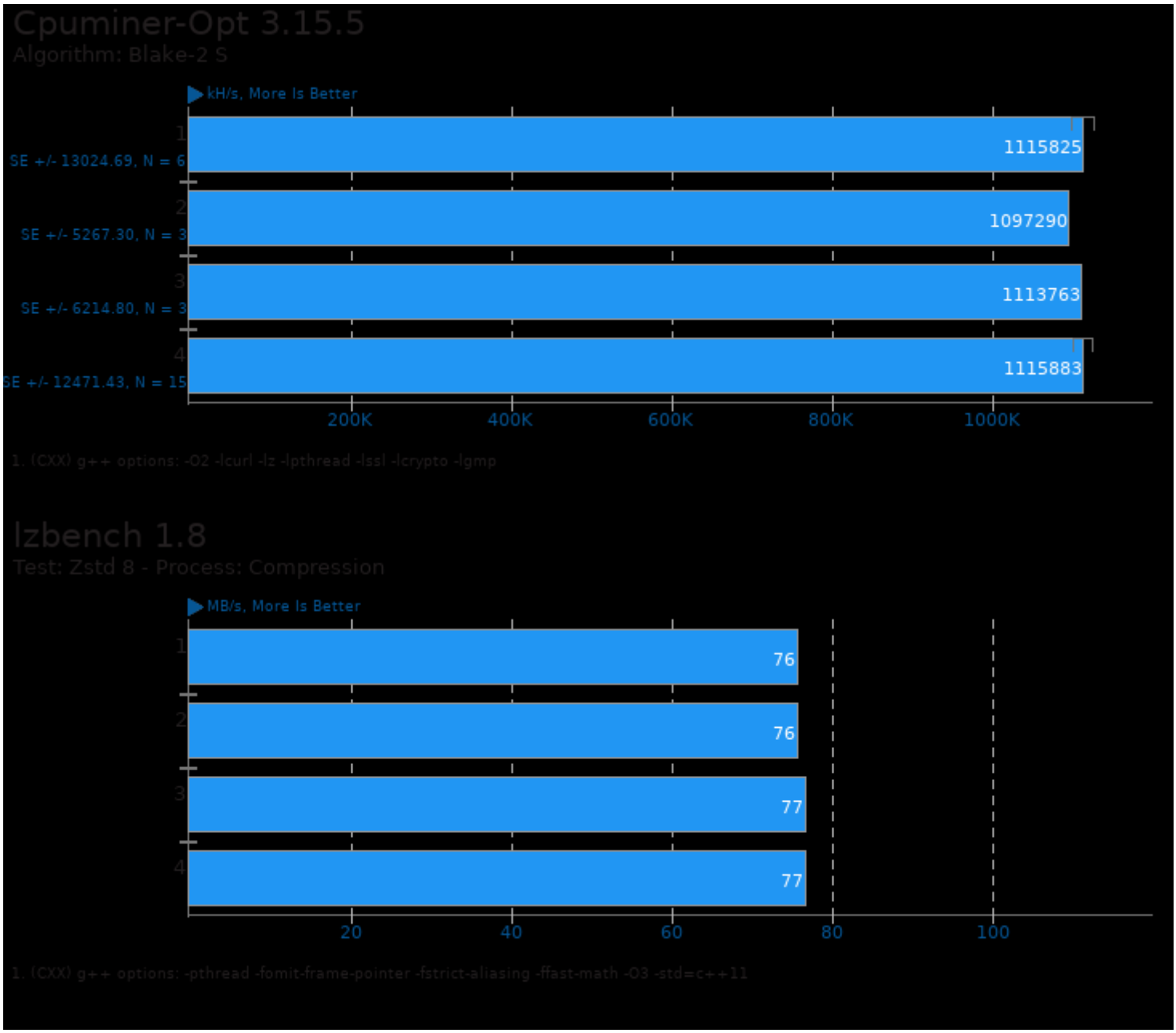

NAS Parallel Benchmarks 3.4
Test / Class: EP.C
Total Mop/s, More Is Better
1
SE +/- 13.74, N = 3
3641.33
2
SE +/- 25.84, N = 3
3594.77
3
SE +/- 32.88, N = 3
3671.98
4
SE +/- 17.99, N = 3
3572.93
800
1600
2400
3200
4000
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.3
Cpuminer-Opt 3.15.5
Algorithm: LBC, LBRY Credits
kH/s, More Is Better
1
SE +/- 742.44, N = 3
98743
2
SE +/- 1211.74, N = 3
96117
3
SE +/- 1054.32, N = 3
97760
4
SE +/- 1616.79, N = 3
96923
20K
40K
60K
80K
100K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp

Gold stuff

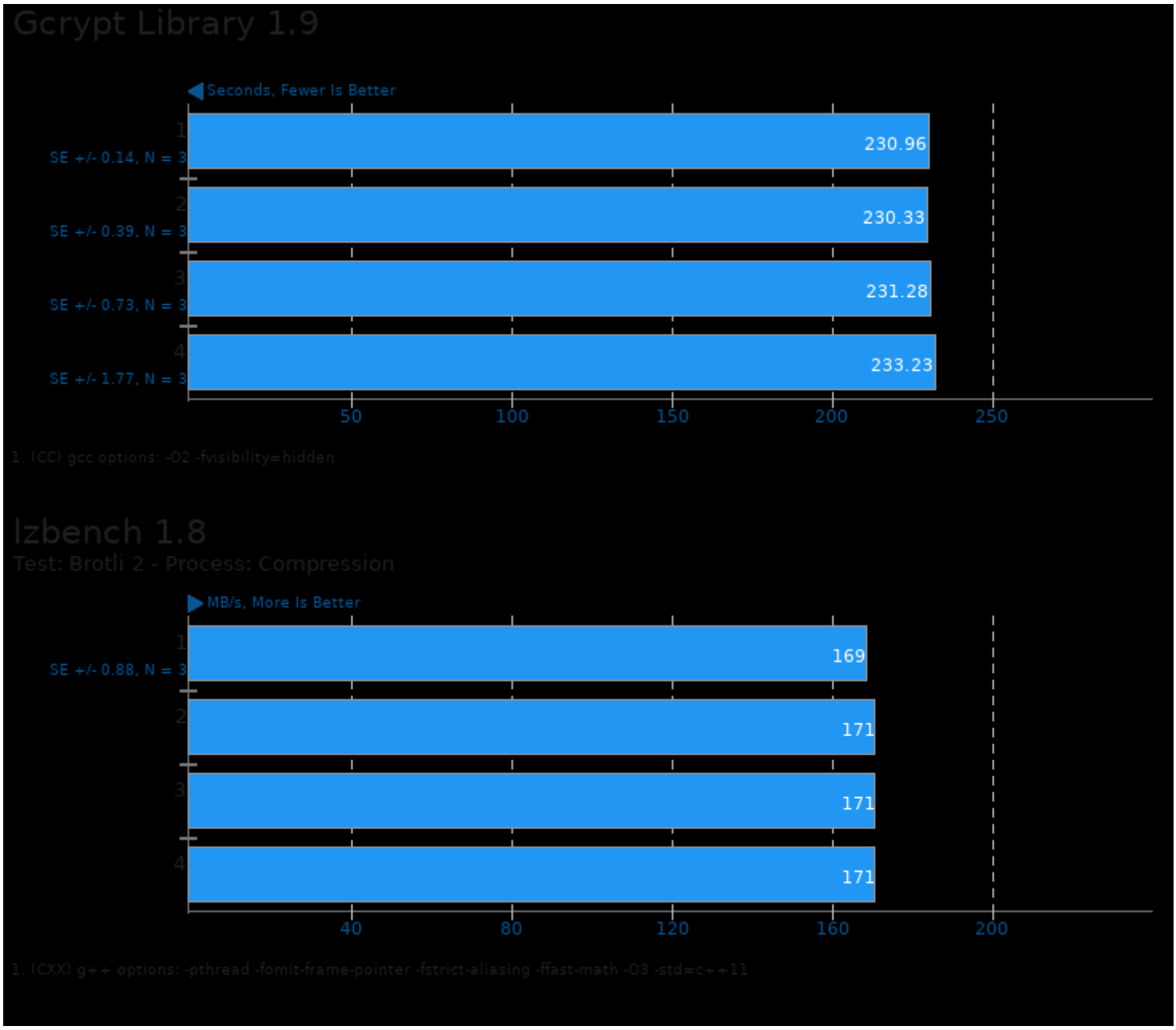

ASKAP 1.0
Test: tConvolve OpenMP - Gridding
Million Grid Points Per Second, More Is Better
1
SE +/- 70.98, N = 4
5521.04
2
SE +/- 37.73, N = 3
5509.30
3
SE +/- 73.96, N = 3
5399.08
4
SE +/- 80.12, N = 4
5437.27
1200
2400
3600
4800
6000
1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp
Cpuminer-Opt 3.15.5
Algorithm: Myriad-Groestl
kH/s, More Is Better
1
SE +/- 101.41, N = 15
11155
2
SE +/- 85.04, N = 13
11266
3
SE +/- 163.33, N = 3
11303
4
SE +/- 158.82, N = 13
11388
2K
4K
6K
8K
10K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp


Cpuminer-Opt 3.15.5
Algorithm: Quad SHA-256, Pyrite
kH/s, More Is Better
1
SE +/- 2223.02, N = 7
208293
2
SE +/- 671.87, N = 3
212607
3
SE +/- 2943.07, N = 4
210365
4
SE +/- 2580.95, N = 6
212040
50K
100K
150K
200K
250K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp
Cpuminer-Opt 3.15.5
Algorithm: Ringcoin
kH/s, More Is Better
1
SE +/- 25.58, N = 3
3348.08
2
SE +/- 15.78, N = 3
3373.99
3
SE +/- 39.73, N = 3
3342.50
4
SE +/- 31.29, N = 10
3310.37
700
1400
2100
2800
3500
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp

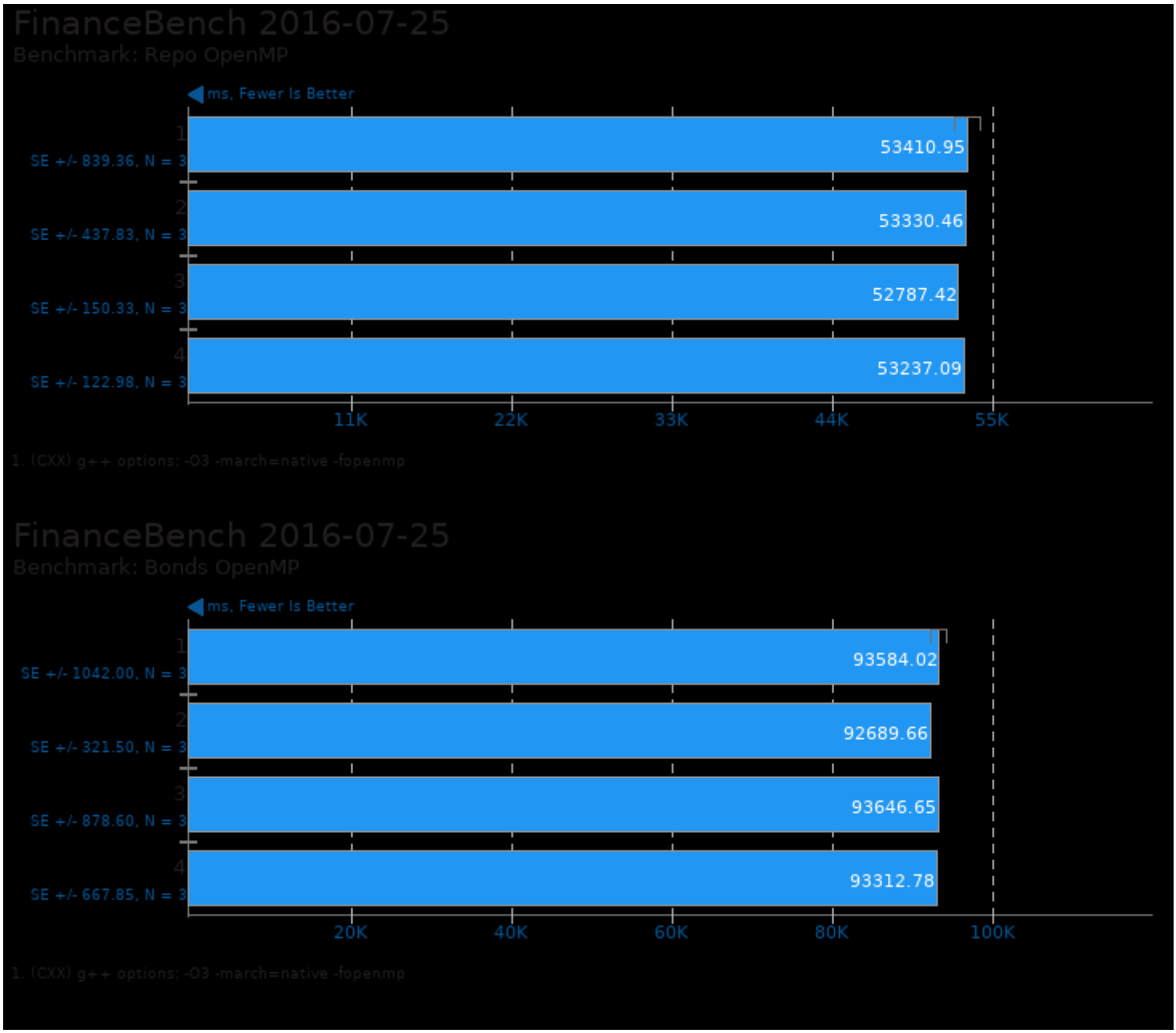
Gold stuff

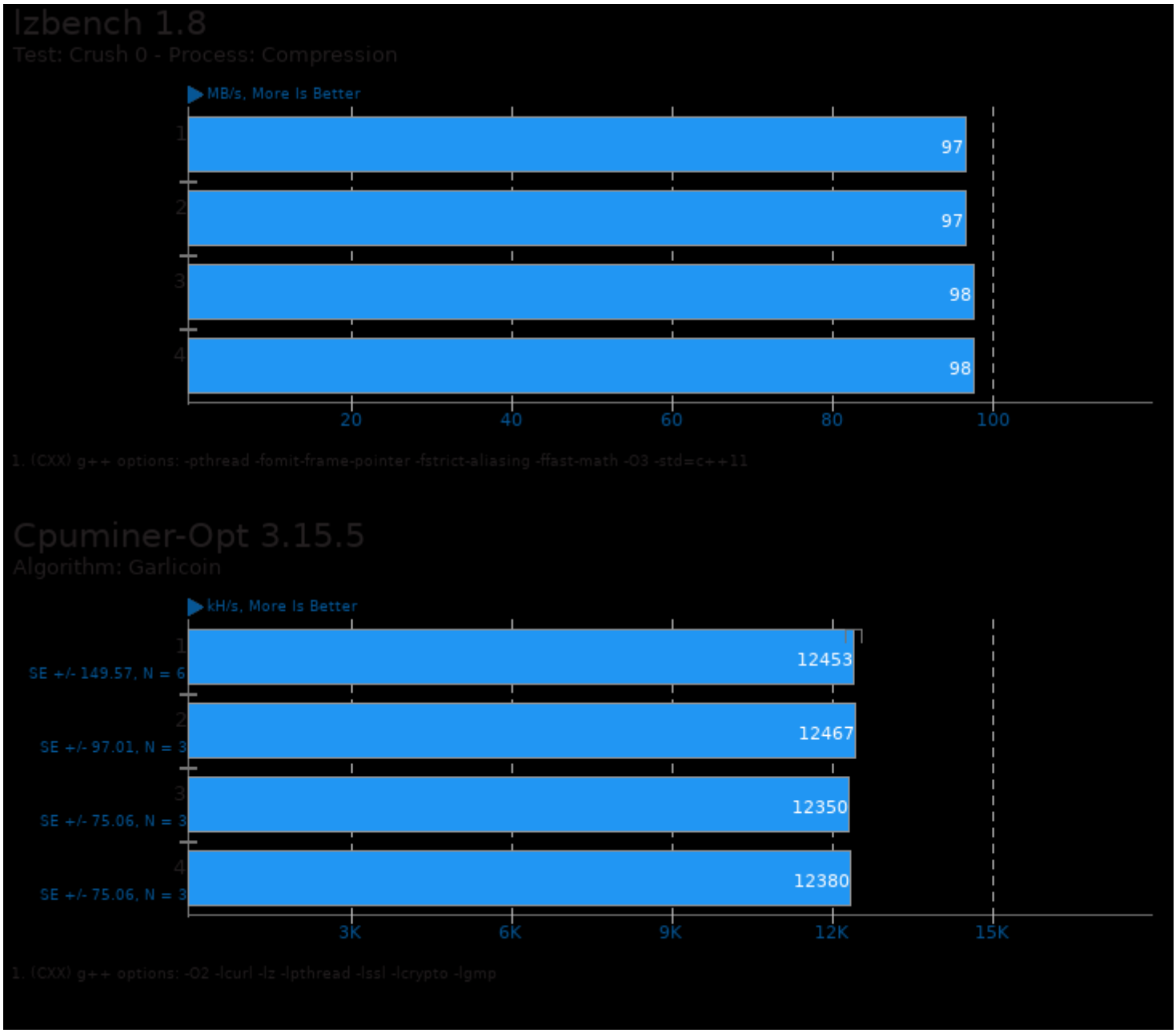

Cpuminer-Opt 3.15.5
Algorithm: Blake-2 S
kH/s, More Is Better
1
SE +/- 13024.69, N = 6
1115825
2
SE +/- 5267.30, N = 3
1097290
3
SE +/- 6214.80, N = 3
1113763
4
SE +/- 12471.43, N = 15
1115883
200K
400K
600K
800K
1000K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp
lzbench 1.8
Test: Zstd 8 - Process: Compression
MB/s, More Is Better
1
76
2
76
3
77
4
77
20
40
60
80
100
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3 -std=c++11

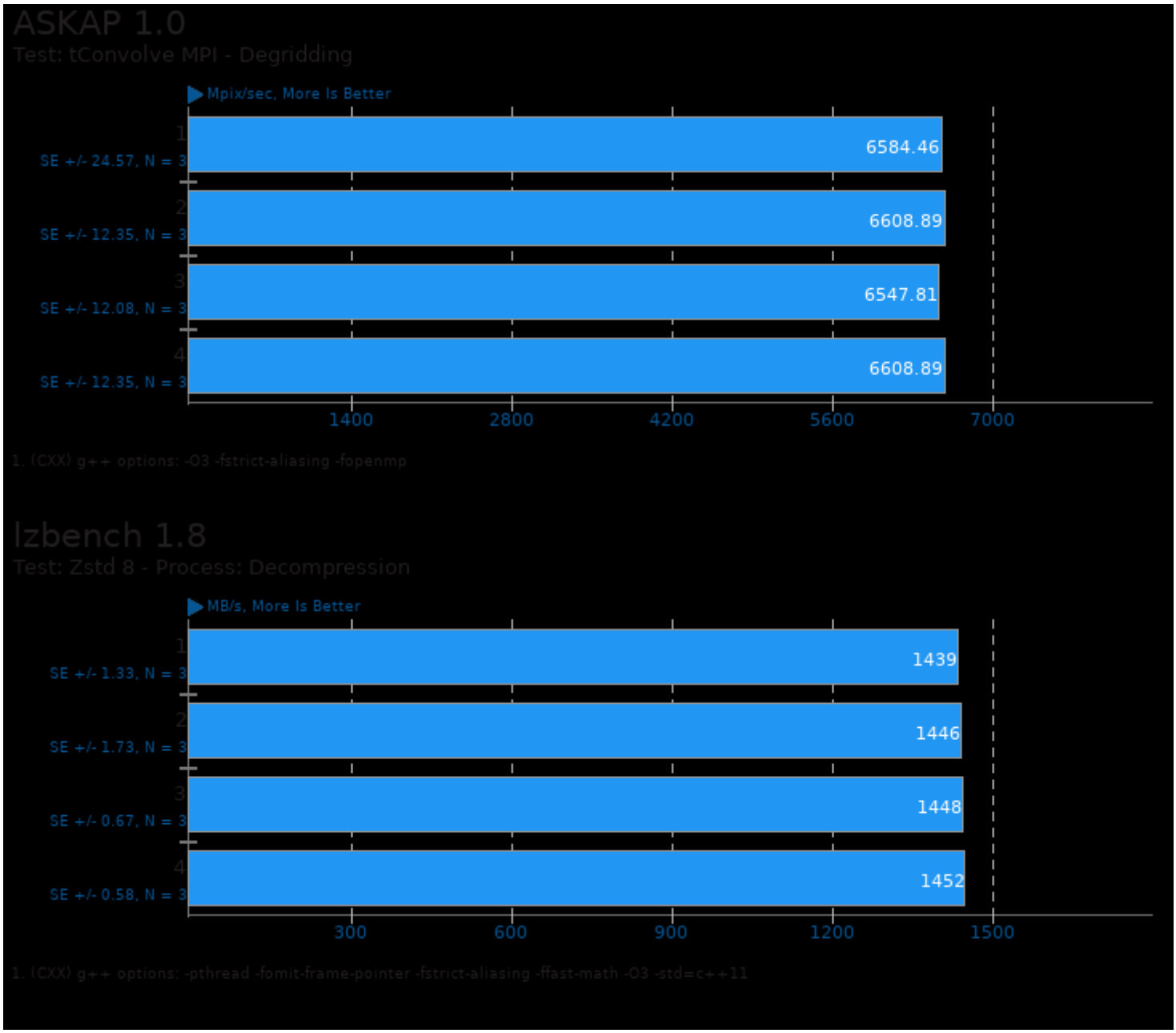
Gold stuff

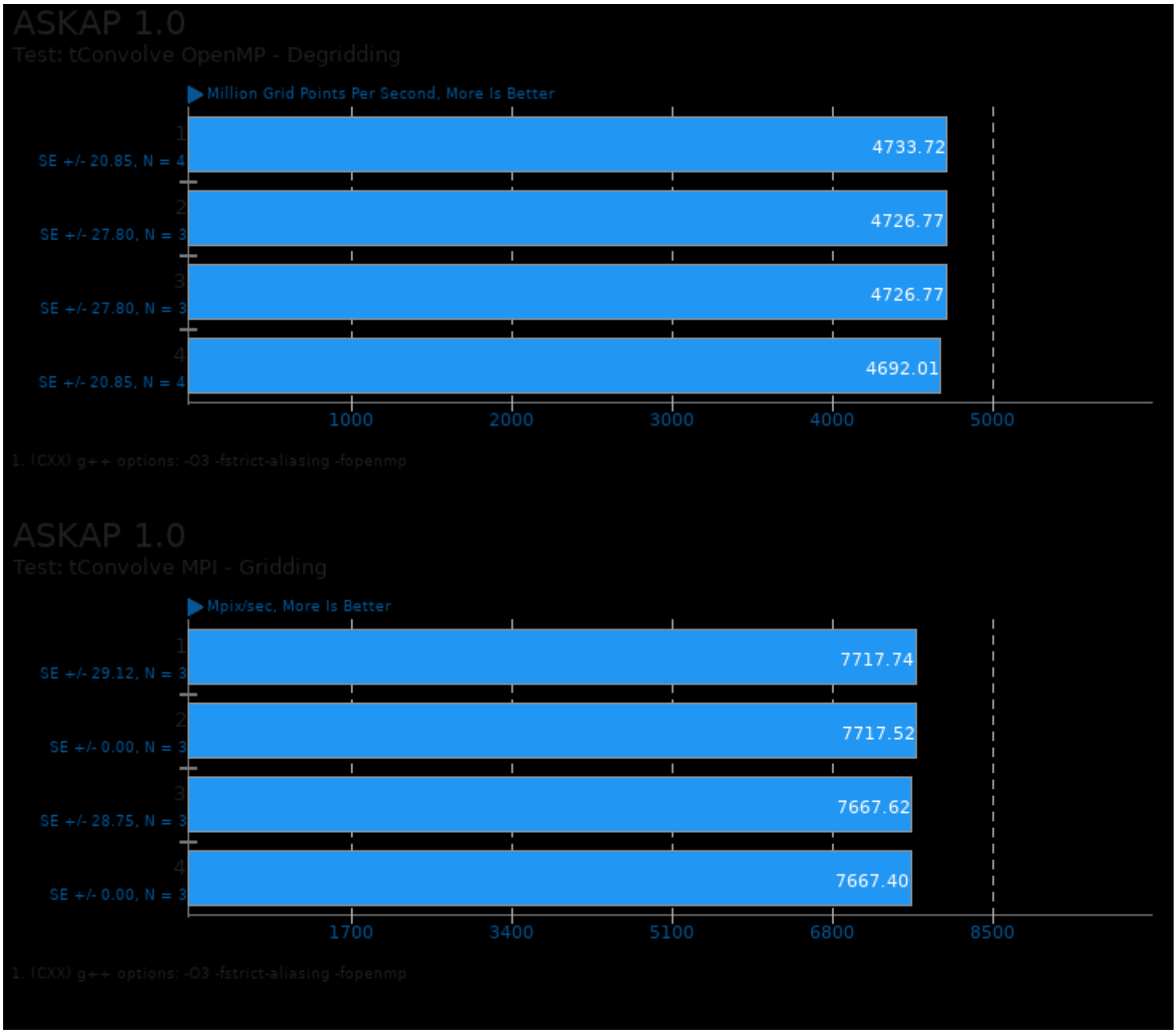

Gcrypt Library 1.9
Seconds, Fewer Is Better
1
SE +/- 0.14, N = 3
230.96
2
SE +/- 0.39, N = 3
230.33
3
SE +/- 0.73, N = 3
231.28
4
SE +/- 1.77, N = 3
233.23
50
100
150
200
250
1. (CC) gcc options: -O2 -fvisibility=hidden
lzbench 1.8
Test: Brotli 2 - Process: Compression
MB/s, More Is Better
1
SE +/- 0.88, N = 3
169
2
171
3
171
4
171
40
80
120
160
200
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3 -std=c++11

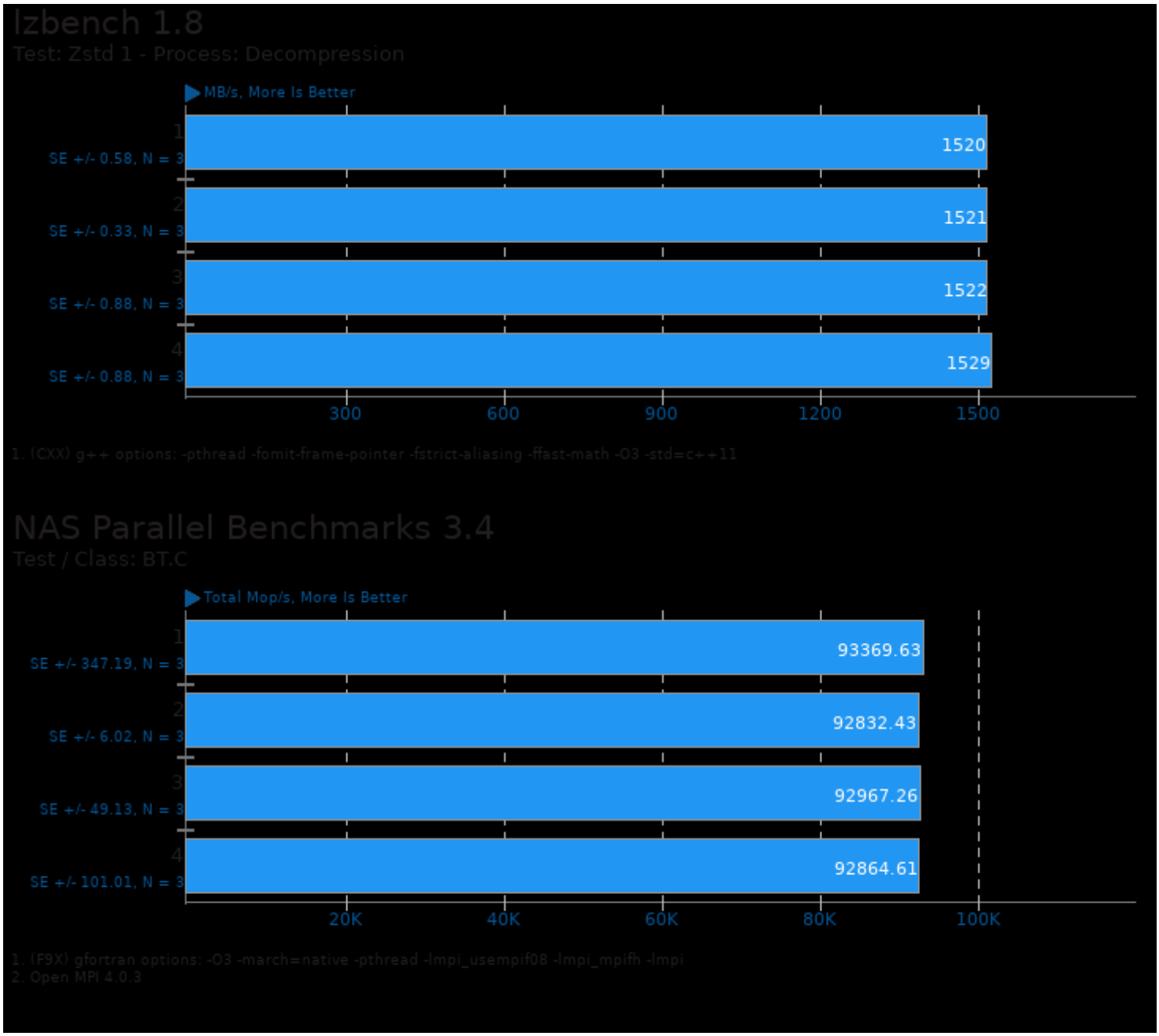
Gold stuff


FinanceBench 2016-07-25
Benchmark: Repo OpenMP
ms, Fewer Is Better
1
SE +/- 839.36, N = 3
53410.95
2
SE +/- 437.83, N = 3
53330.46
3
SE +/- 150.33, N = 3
52787.42
4
SE +/- 122.98, N = 3
53237.09
11K
22K
33K
44K
55K
1. (CXX) g++ options: -O3 -march=native -fopenmp
FinanceBench 2016-07-25
Benchmark: Bonds OpenMP
ms, Fewer Is Better
1
SE +/- 1042.00, N = 3
93584.02
2
SE +/- 321.50, N = 3
92689.66
3
SE +/- 878.60, N = 3
93646.65
4
SE +/- 667.85, N = 3
93312.78
20K
40K
60K
80K
100K
1. (CXX) g++ options: -O3 -march=native -fopenmp

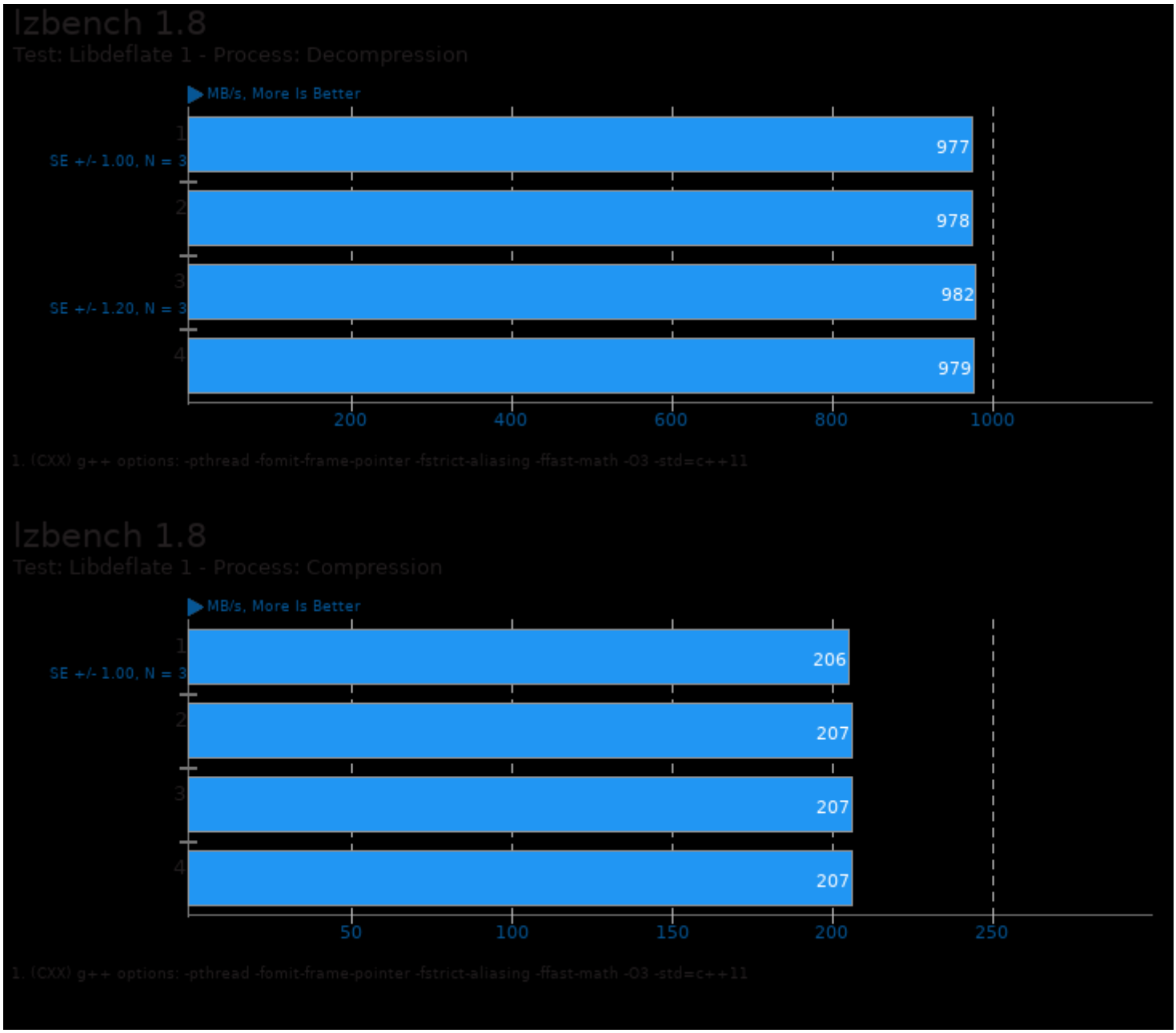

lzbench 1.8
Test: Crush 0 - Process: Compression
MB/s, More Is Better
1
2
3
4
97
97
98
98
20
40
60
80
100
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3 -std=c++11
Cpuminer-Opt 3.15.5
Algorithm: Garlicoin
kH/s, More Is Better
1
2
3
4
SE +/- 149.57, N = 6
SE +/- 97.01, N = 3
SE +/- 75.06, N = 3
SE +/- 75.06, N = 3
12453
12467
12350
12380
3K
6K
9K
12K
15K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp


ASKAP 1.0
Test: tConvolve MPI - Degridding
Mpix/sec, More Is Better
1
SE +/- 24.57, N = 3
6584.46
2
SE +/- 12.35, N = 3
6608.89
3
SE +/- 12.08, N = 3
6547.81
4
SE +/- 12.35, N = 3
6608.89
1400
2800
4200
5600
7000
1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp
lzbench 1.8
Test: Zstd 8 - Process: Decompression
MB/s, More Is Better
1
SE +/- 1.33, N = 3
1439
2
SE +/- 1.73, N = 3
1446
3
SE +/- 0.67, N = 3
1448
4
SE +/- 0.58, N = 3
1452
300
600
900
1200
1500
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3 -std=c++11

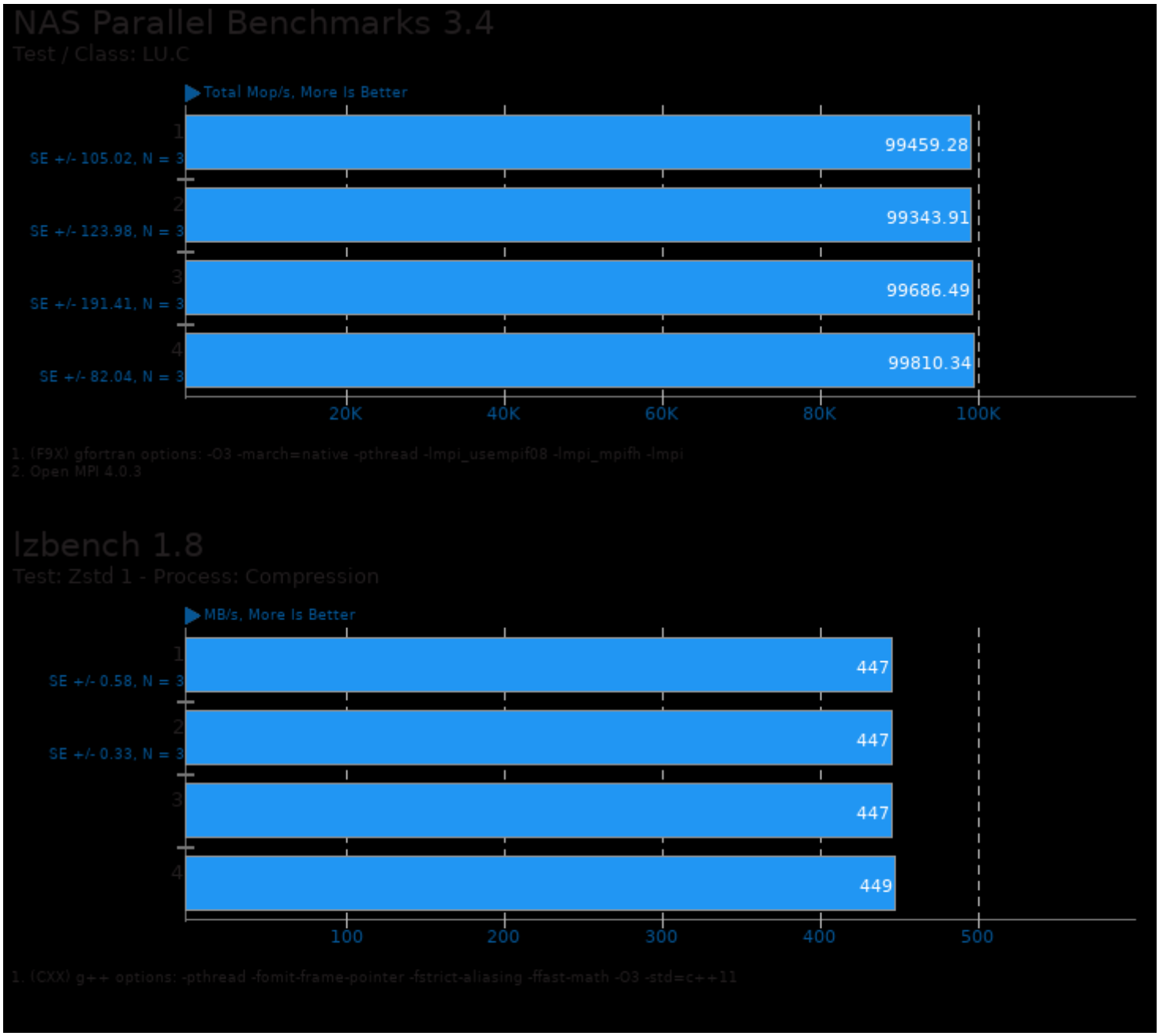

ASKAP 1.0
Test: tConvolve OpenMP - Degridding
Million Grid Points Per Second, More Is Better
1
SE +/- 20.85, N = 4
4733.72
2
SE +/- 27.80, N = 3
4726.77
3
SE +/- 27.80, N = 3
4726.77
4
SE +/- 20.85, N = 4
4692.01
1000
2000
3000
4000
5000
1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp
ASKAP 1.0
Test: tConvolve MPI - Gridding
Mpix/sec, More Is Better
1
SE +/- 29.12, N = 3
7717.74
2
SE +/- 0.00, N = 3
7717.52
3
SE +/- 28.75, N = 3
7667.62
4
SE +/- 0.00, N = 3
7667.40
1700
3400
5100
6800
8500
1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp


lzbench 1.8
Test: Zstd 1 - Process: Decompression
MB/s, More Is Better
1
SE +/- 0.58, N = 3
1520
2
SE +/- 0.33, N = 3
1521
3
SE +/- 0.88, N = 3
1522
4
SE +/- 0.88, N = 3
1529
300
600
900
1200
1500
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3 -std=c++11
NAS Parallel Benchmarks 3.4
Test / Class: BT.C
Total Mop/s, More Is Better
1
SE +/- 347.19, N = 3
93369.63
2
SE +/- 6.02, N = 3
92832.43
3
SE +/- 49.13, N = 3
92967.26
4
SE +/- 101.01, N = 3
92864.61
20K
40K
60K
80K
100K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.3

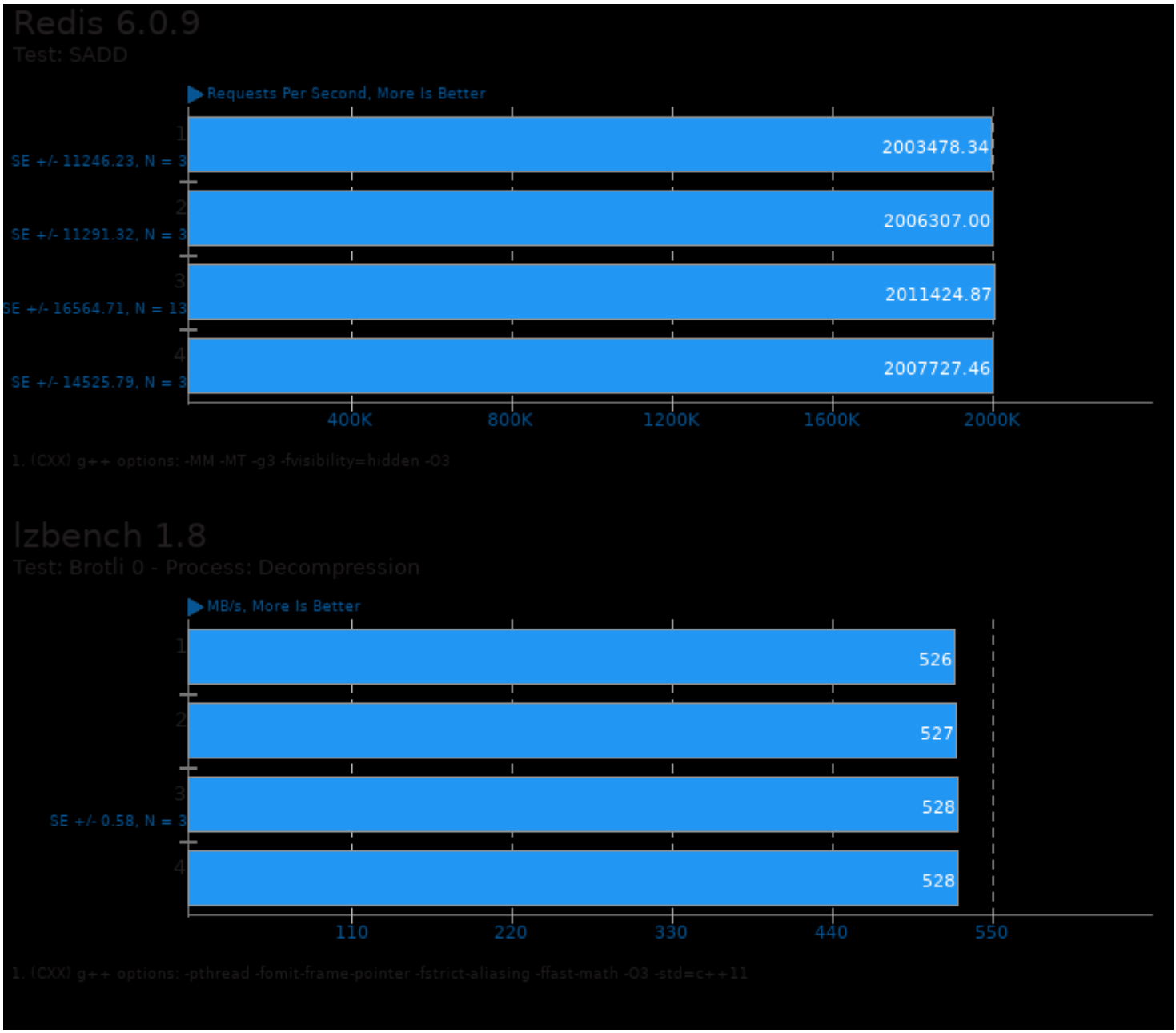
Gold stuff


lzbench 1.8
Test: Libdeflate 1 - Process: Decompression
MB/s, More Is Better
SE +/- 1.00, N = 3
SE +/- 1.20, N = 3
977
978
982
979
200
400
600
800
1000
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3 -std=c++11
lzbench 1.8
Test: Libdeflate 1 - Process: Compression
MB/s, More Is Better
SE +/- 1.00, N = 3
206
207
207
207
50
100
150
200
250
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3 -std=c++11

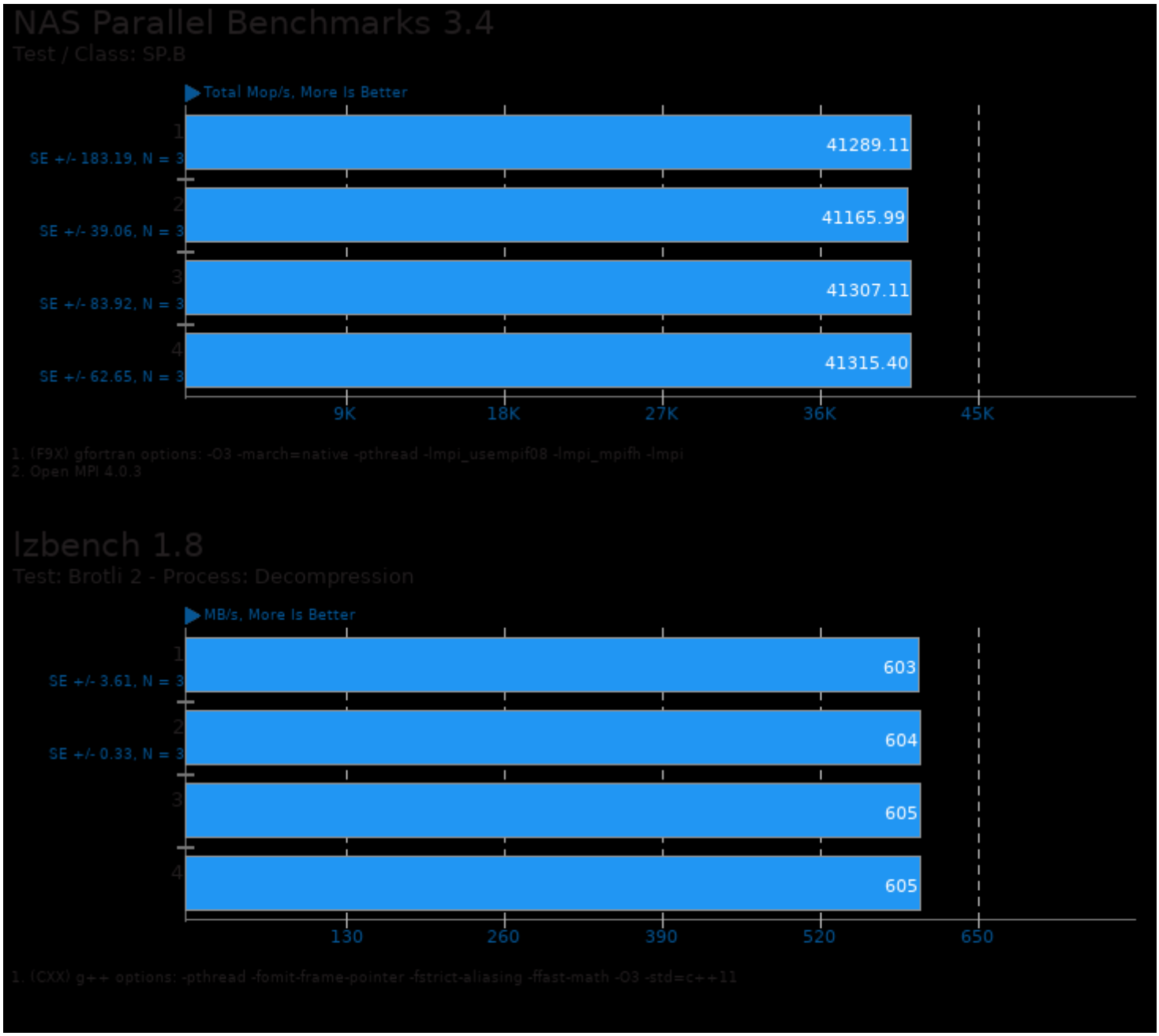
Gold stuff


NAS Parallel Benchmarks 3.4
Test / Class: LU.C
Total Mop/s, More Is Better
1
SE +/- 105.02, N = 3
99459.28
2
SE +/- 123.98, N = 3
99343.91
3
SE +/- 191.41, N = 3
99686.49
4
SE +/- 82.04, N = 3
99810.34
20K
40K
60K
80K
100K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.3
lzbench 1.8
Test: Zstd 1 - Process: Compression
MB/s, More Is Better
1
SE +/- 0.58, N = 3
447
2
SE +/- 0.33, N = 3
447
3
447
4
449
100
200
300
400
500
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3 -std=c++11

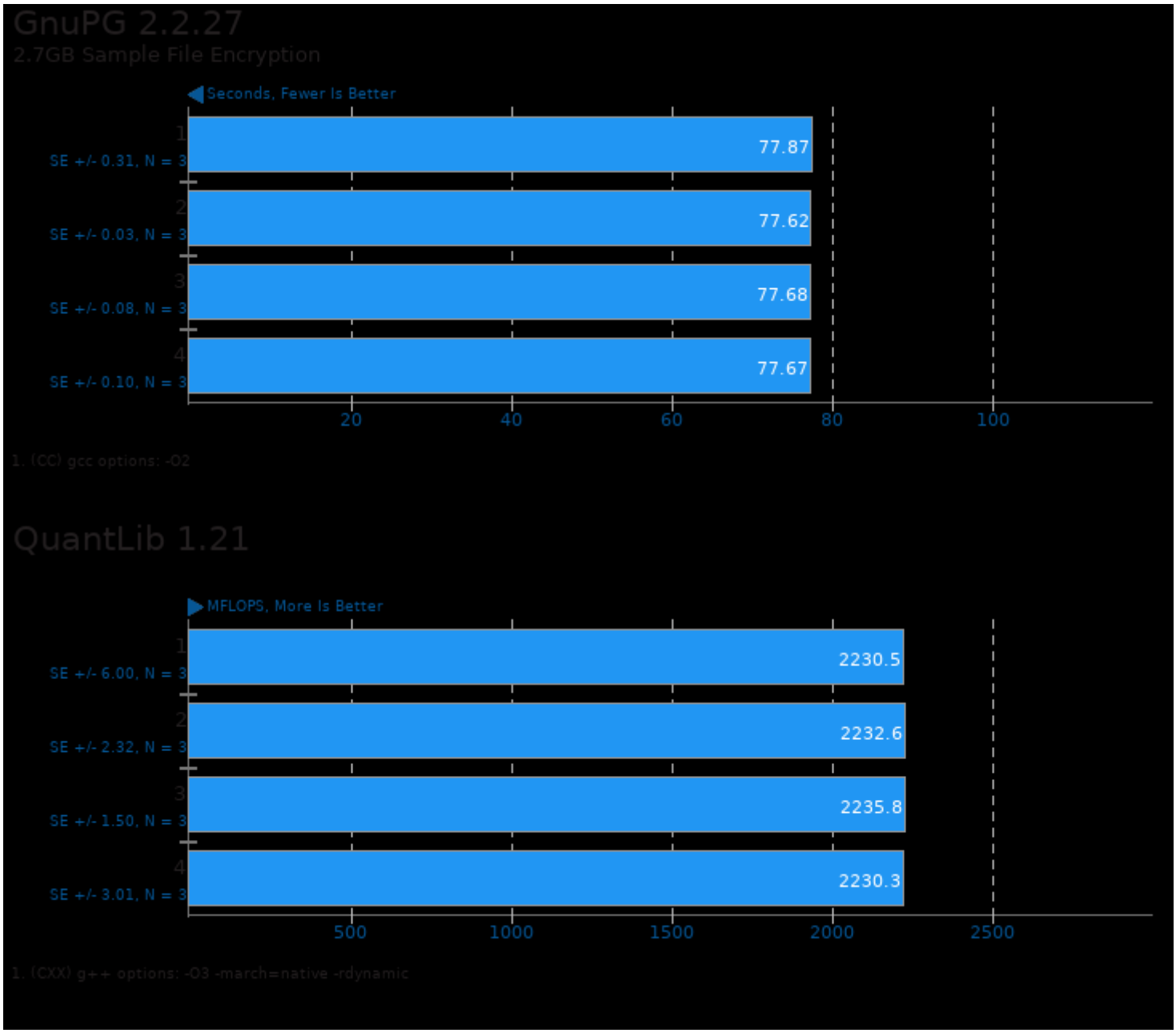
Gold stuff

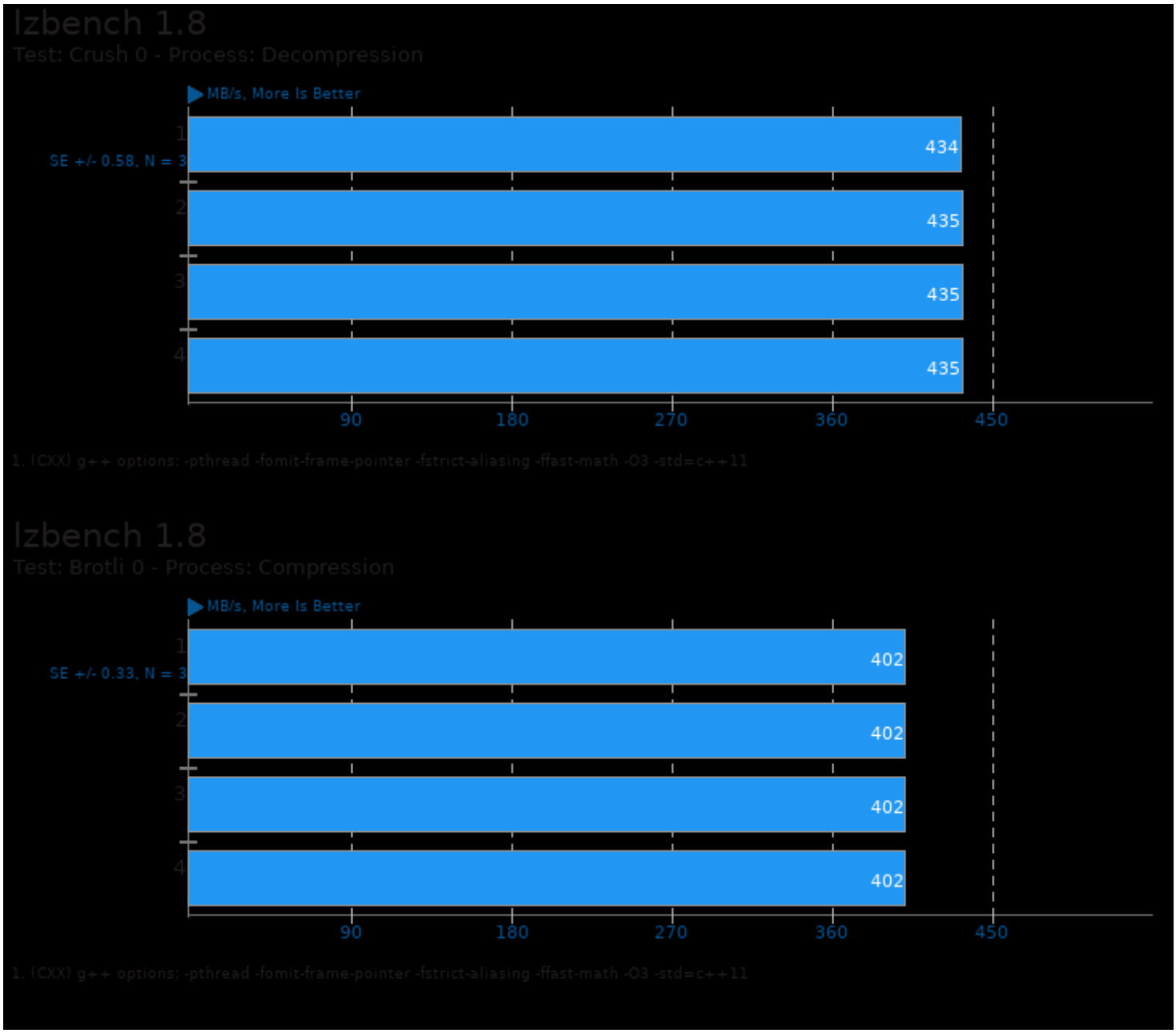

Redis 6.0.9
Test: SADD
Requests Per Second, More Is Better
1
SE +/- 11246.23, N = 3
2003478.34
2
SE +/- 11291.32, N = 3
2006307.00
3
SE +/- 16564.71, N = 13
2011424.87
4
SE +/- 14525.79, N = 3
2007727.46
400K
800K
1200K
1600K
2000K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3
lzbench 1.8
Test: Brotli 0 - Process: Decompression
MB/s, More Is Better
1
526
2
527
3
SE +/- 0.58, N = 3
528
4
528
110
220
330
440
550
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3 -std=c++11

Gold stuff

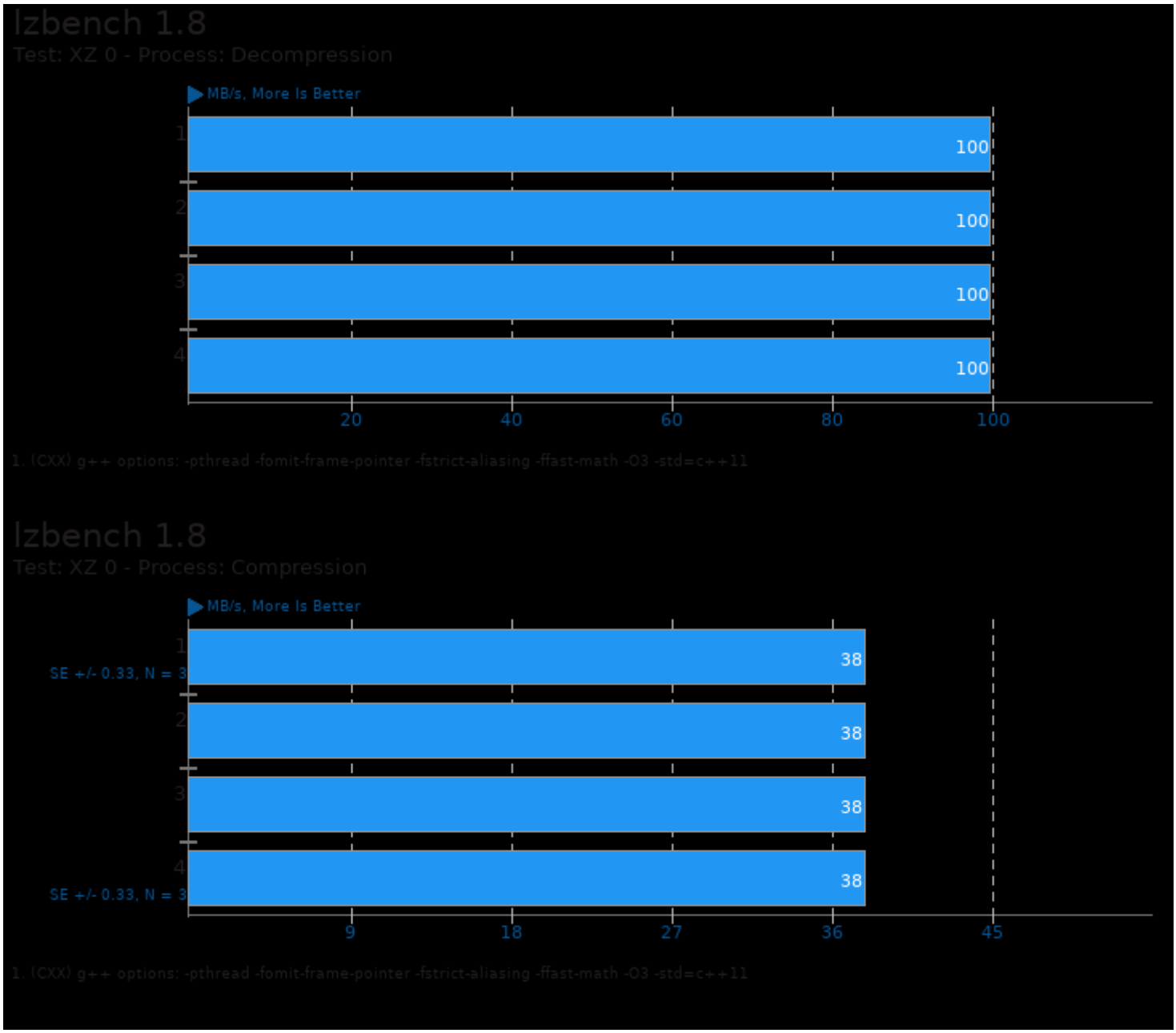

NAS Parallel Benchmarks 3.4
Test / Class: SP.B
Total Mop/s, More Is Better
1
SE +/- 183.19, N = 3
41289.11
2
SE +/- 39.06, N = 3
41165.99
3
SE +/- 83.92, N = 3
41307.11
4
SE +/- 62.65, N = 3
41315.40
9K
18K
27K
36K
45K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.3
lzbench 1.8
Test: Brotli 2 - Process: Decompression
MB/s, More Is Better
1
SE +/- 3.61, N = 3
603
2
SE +/- 0.33, N = 3
604
3
605
4
605
130
260
390
520
650
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3 -std=c++11

Gold stuff

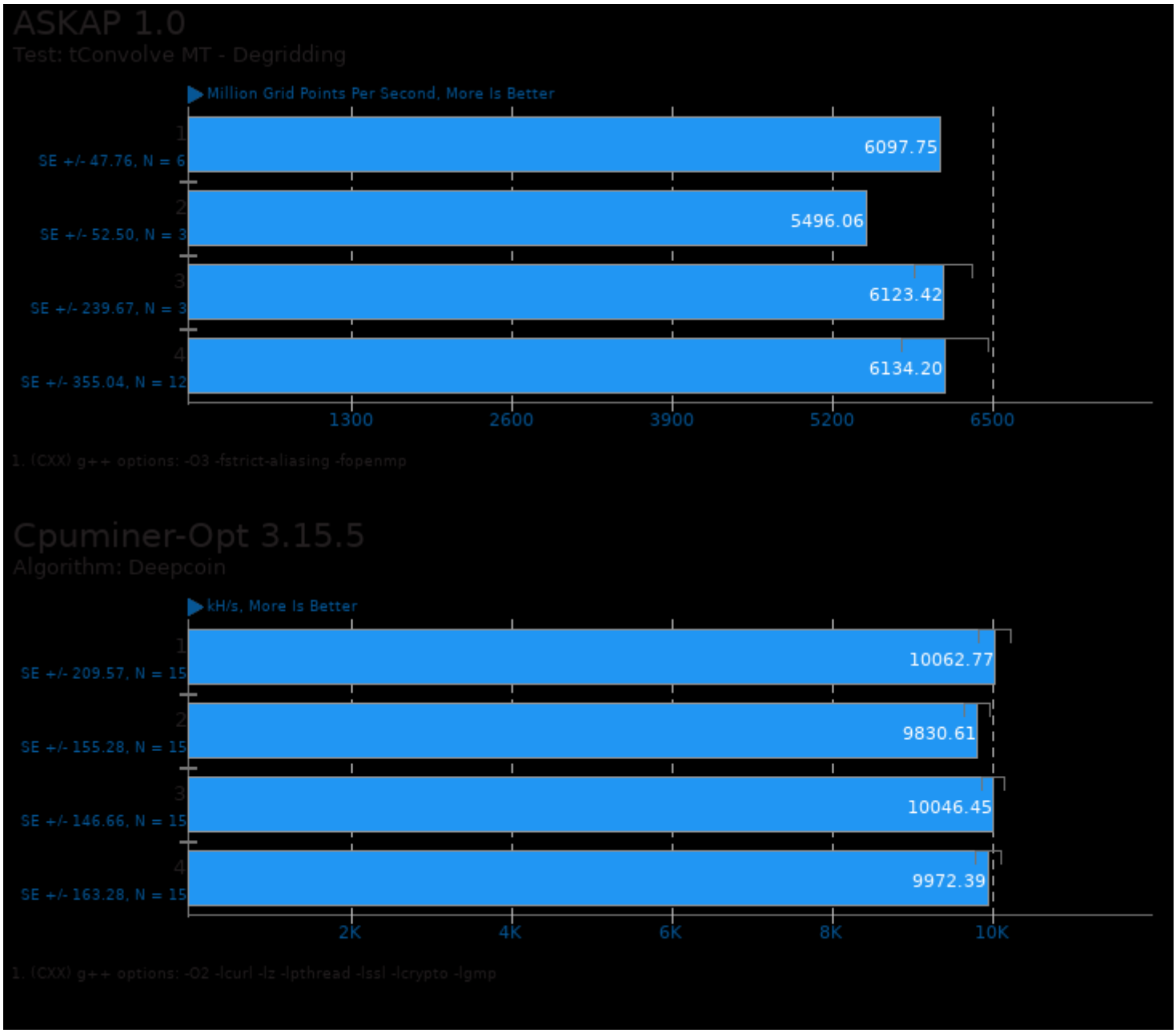

GnuPG 2.2.27
2.7GB Sample File Encryption
Seconds, Fewer Is Better
1
SE +/- 0.31, N = 3
77.87
2
SE +/- 0.03, N = 3
77.62
3
SE +/- 0.08, N = 3
77.68
4
SE +/- 0.10, N = 3
77.67
20
40
60
80
100
1. (CC) gcc options: -O2
QuantLib 1.21
MFLOPS, More Is Better
1
SE +/- 6.00, N = 3
2230.5
2
SE +/- 2.32, N = 3
2232.6
3
SE +/- 1.50, N = 3
2235.8
4
SE +/- 3.01, N = 3
2230.3
500
1000
1500
2000
2500
1. (CXX) g++ options: -O3 -march=native -rdynamic

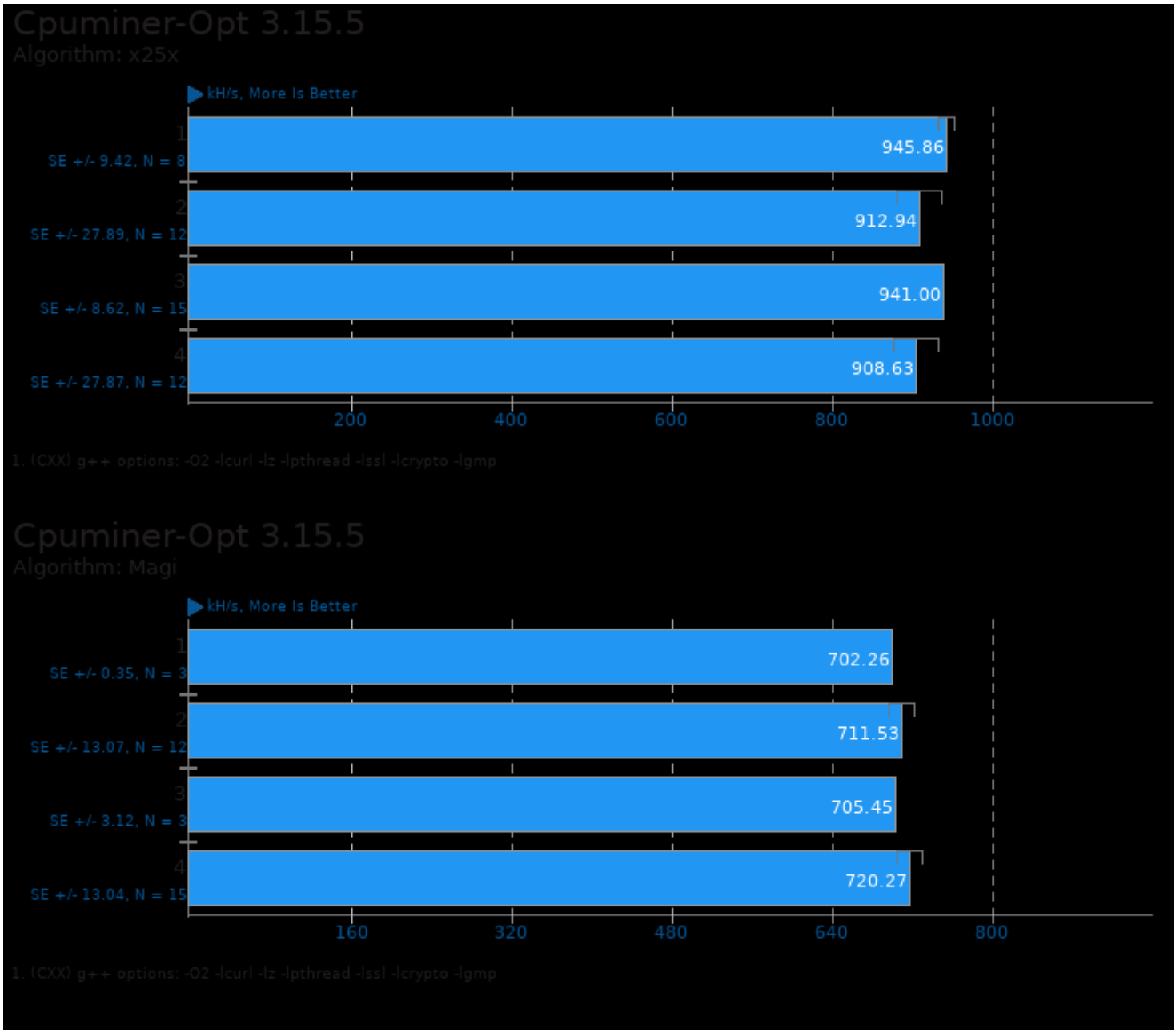

lzbench 1.8
Test: Crush 0 - Process: Decompression
MB/s, More Is Better
SE +/- 0.58, N = 3
1
2
3
4
434
435
435
435
90
180
270
360
450
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3 -std=c++11
lzbench 1.8
Test: Brotli 0 - Process: Compression
MB/s, More Is Better
SE +/- 0.33, N = 3
1
2
3
4
402
402
402
402
90
180
270
360
450
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3 -std=c++11

Gold stuff

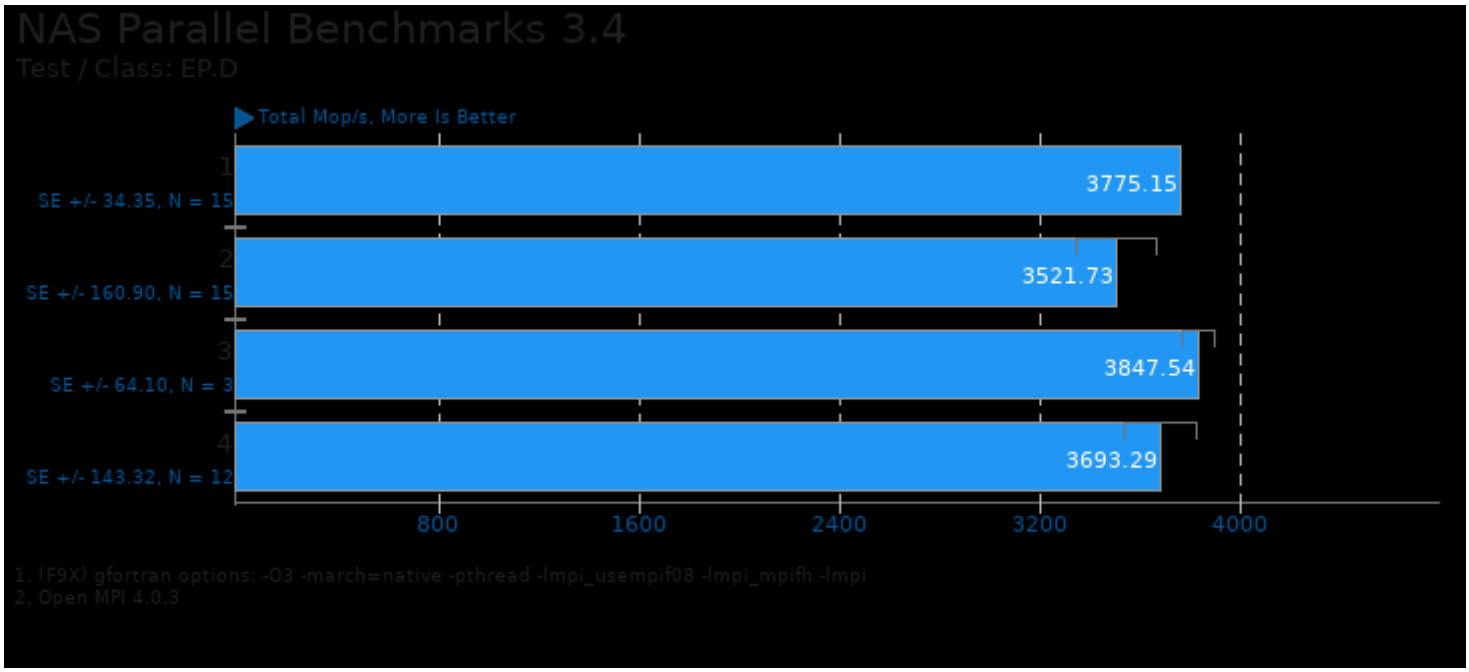

lzbench 1.8
Test: XZ 0 - Process: Decompression
MB/s, More Is Better
1
2
3
4
100
100
100
100
20
40
60
80
100
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3 -std=c++11
lzbench 1.8
Test: XZ 0 - Process: Compression
MB/s, More Is Better
SE +/- 0.33, N = 3
SE +/- 0.33, N = 3
38
38
38
38
9
18
27
36
45
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3 -std=c++11

Gold stuff


ASKAP 1.0
Test: tConvolve MT - Degridding
Million Grid Points Per Second, More Is Better
1
SE +/- 47.76, N = 6
6097.75
2
SE +/- 52.50, N = 3
5496.06
3
SE +/- 239.67, N = 3
6123.42
4
SE +/- 355.04, N = 12
6134.20
1300
2600
3900
5200
6500
1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp
Cpuminer-Opt 3.15.5
Algorithm: Deepcoin
kH/s, More Is Better
1
SE +/- 209.57, N = 15
10062.77
2
SE +/- 155.28, N = 15
9830.61
3
SE +/- 146.66, N = 15
10046.45
4
SE +/- 163.28, N = 15
9972.39
2K
4K
6K
8K
10K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp

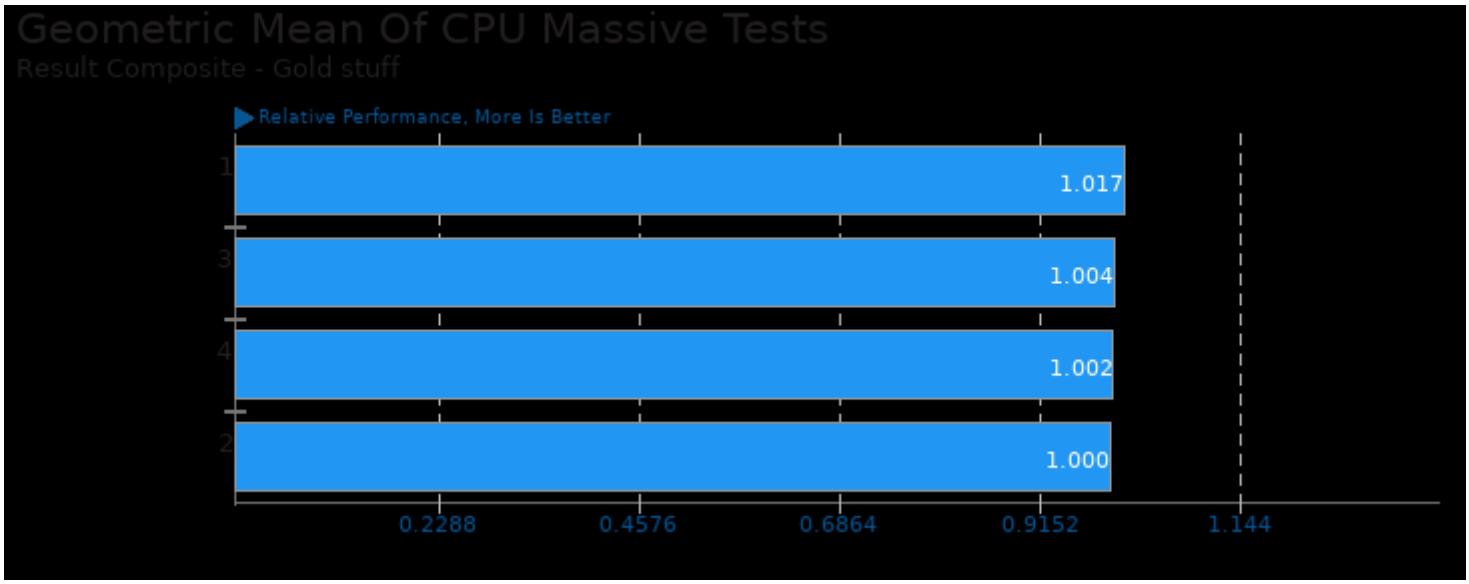

Cpuminer-Opt 3.15.5
Algorithm: x25x
kH/s, More Is Better
1
SE +/- 9.42, N = 8
945.86
2
SE +/- 27.89, N = 12
912.94
3
SE +/- 8.62, N = 15
941.00
4
SE +/- 27.87, N = 12
908.63
200
400
600
800
1000
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp
Cpuminer-Opt 3.15.5
Algorithm: Magi
kH/s, More Is Better
1
SE +/- 0.35, N = 3
702.26
2
SE +/- 13.07, N = 12
711.53
3
SE +/- 3.12, N = 3
705.45
4
SE +/- 13.04, N = 15
720.27
160
320
480
640
800
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp

Gold stuff

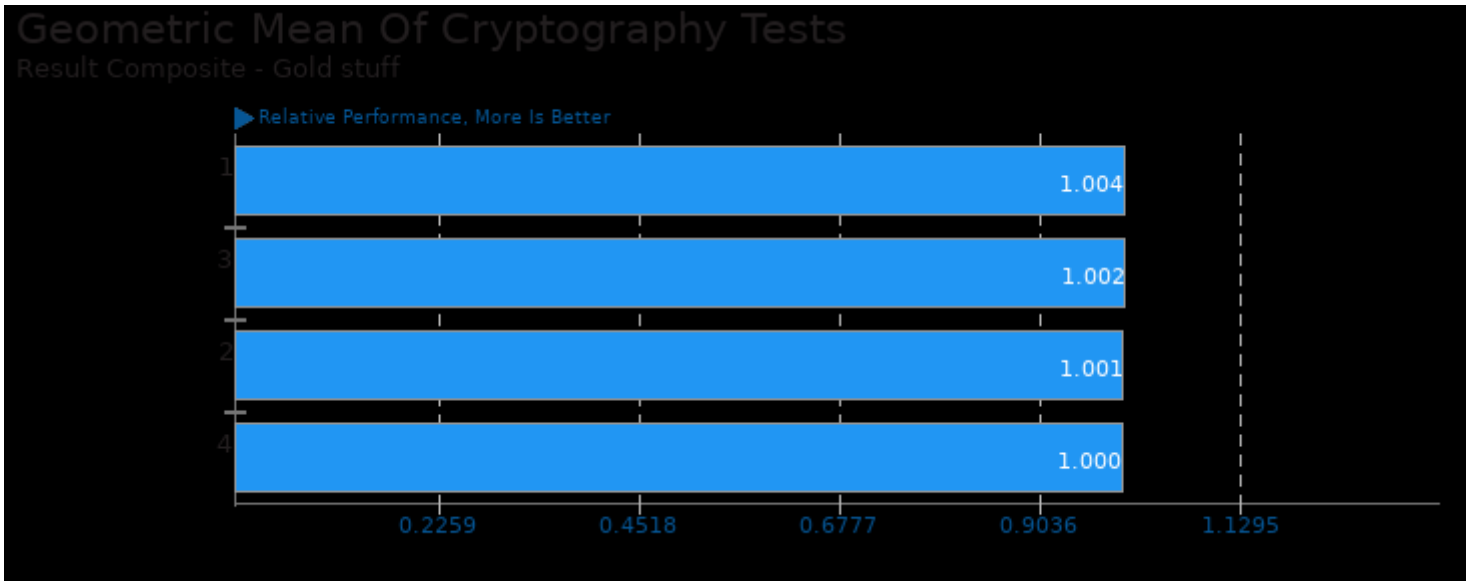

NAS Parallel Benchmarks 3.4
Test / Class: EP.D
Total Mop/s, More Is Better
1
SE +/- 34.35, N = 15
3775.15
2
SE +/- 160.90, N = 15
3521.73
3
SE +/- 64.10, N = 3
3847.54
4
SE +/- 143.32, N = 12
3693.29
800
1600
2400
3200
4000
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.3

Gold stuff

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

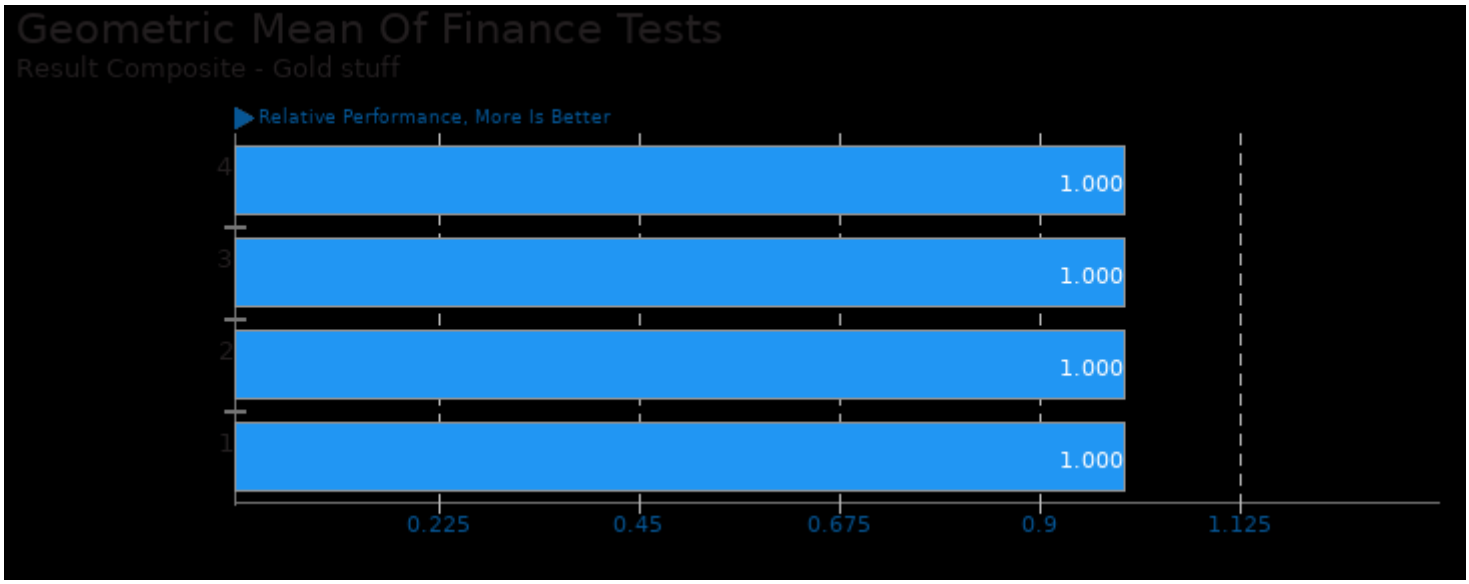


Geometric mean based upon tests: pts/lzbench, pts/npb, pts/redis and pts/cpuminer-opt

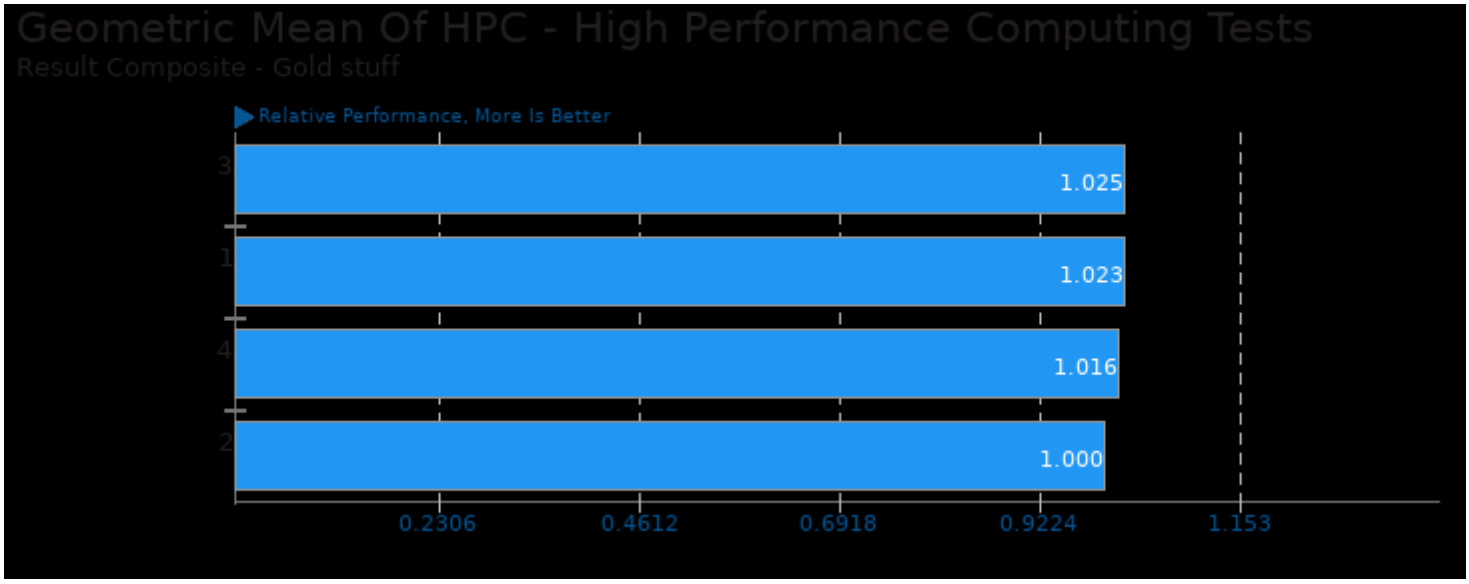


Geometric mean based upon tests: pts/gnupg, pts/gcrypt and pts/cpuminer-opt

Gold stuff

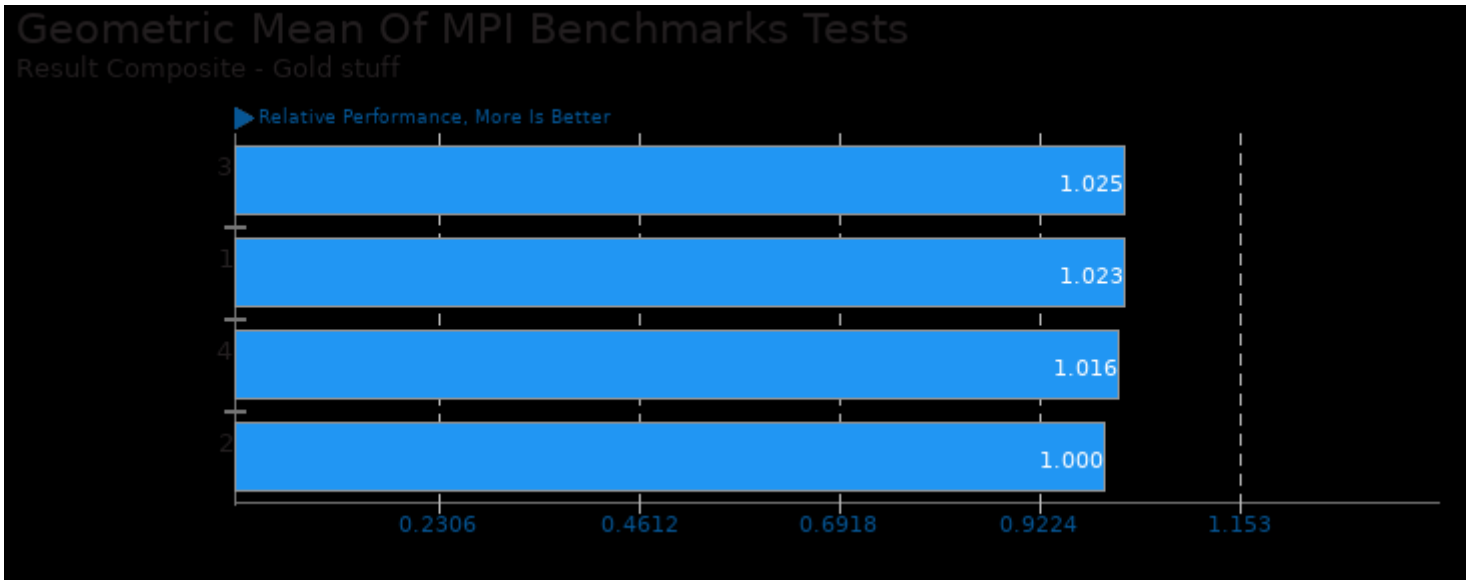


Geometric mean based upon tests: pts/financebench and pts/quantlib

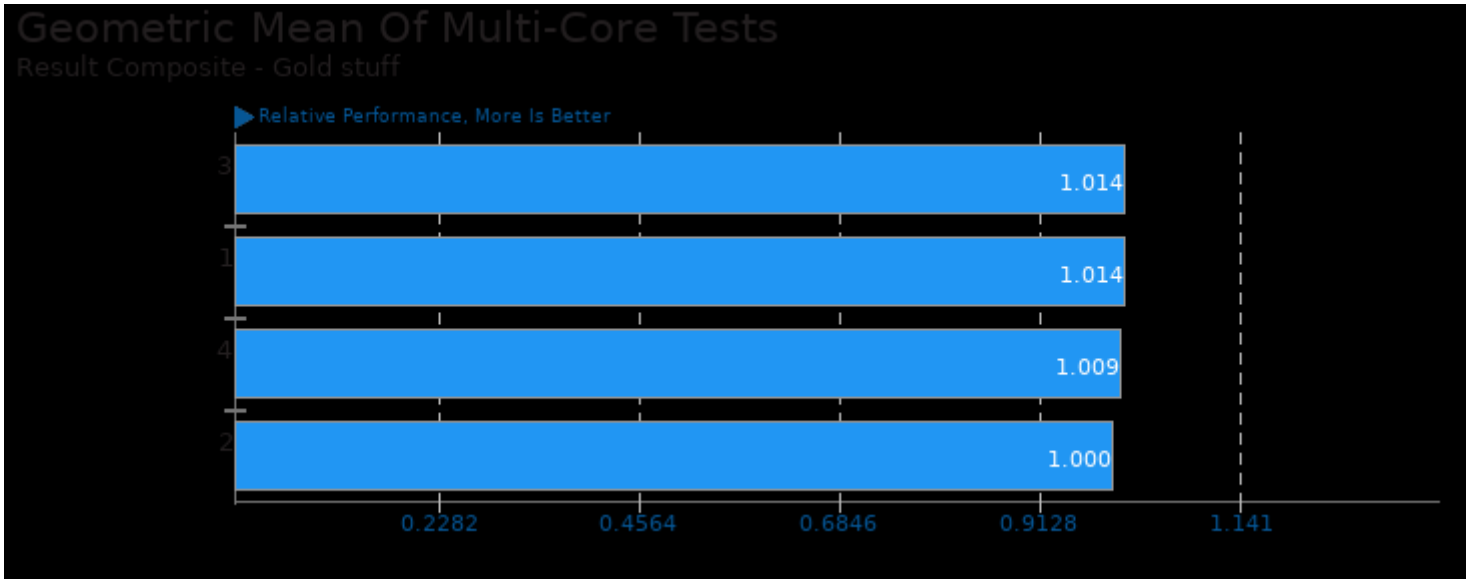


Geometric mean based upon tests: pts/npb and pts/askap

Gold stuff

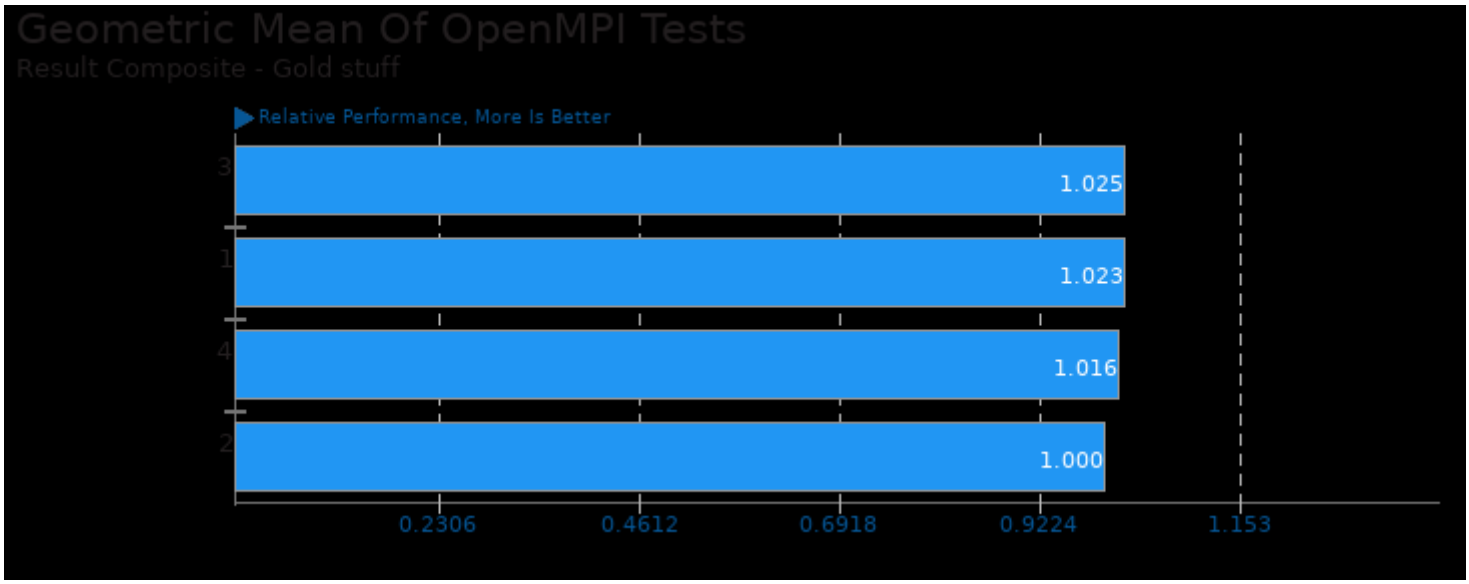


Geometric mean based upon tests: pts/askap and pts/npb

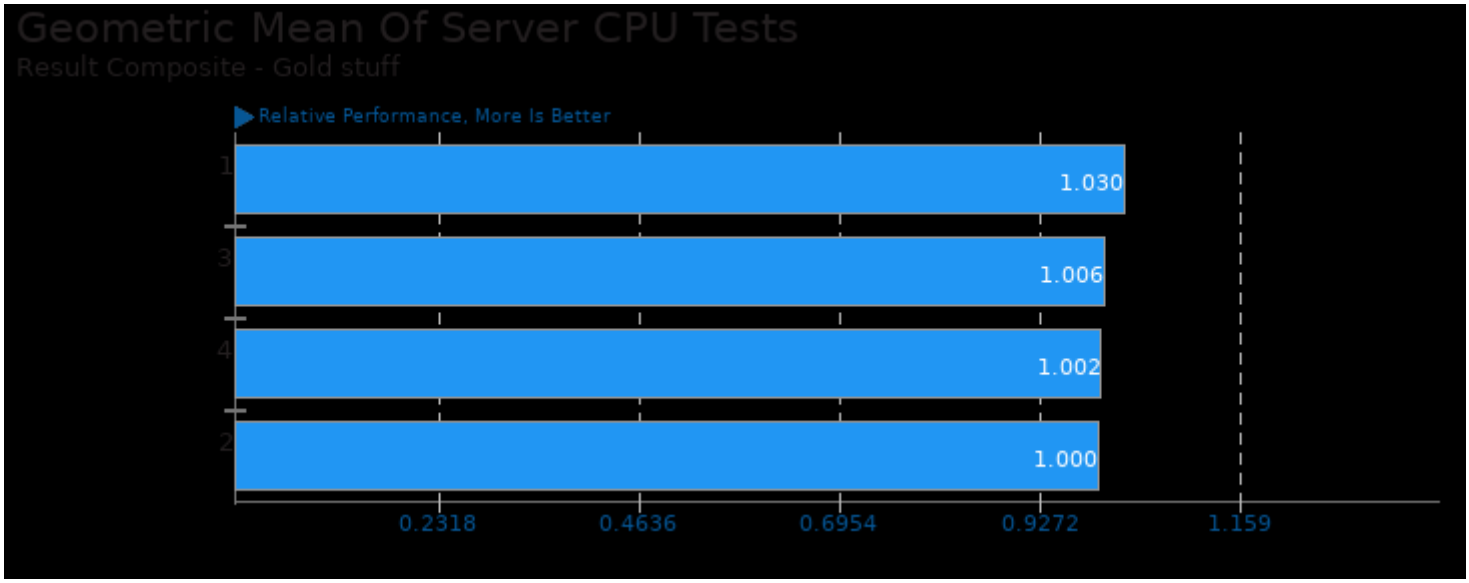


Geometric mean based upon tests: pts/cpuminer-opt, pts/askap and pts/npb

Gold stuff

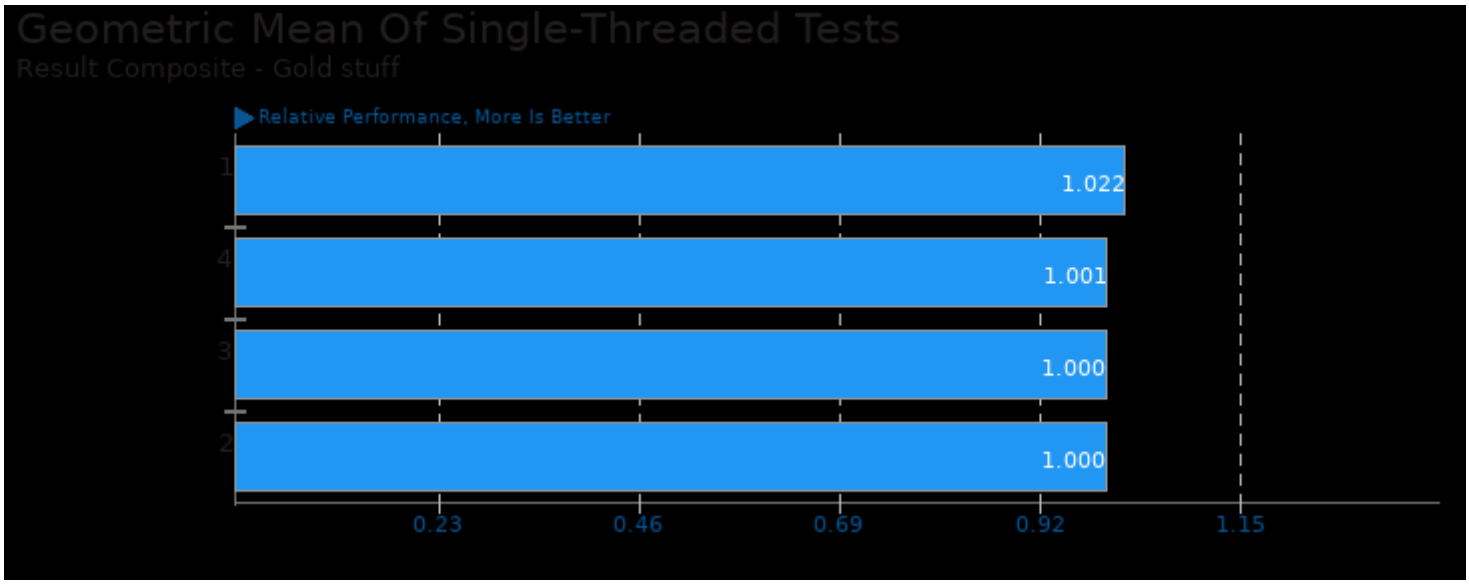


Geometric mean based upon tests: pts/askap and pts/npb



Geometric mean based upon tests: pts/npb, pts/redis and pts/cpuminer-opt

Gold stuff



Geometric mean based upon tests: pts/lzbench, pts/gnupg and pts/redis

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