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Intel Atom C3950 Tyan S3227 Linux

Intel Atom C3950 Linux benchmarks with Tyan motherboard. Tests by Michael Larabel for a future article.

Automated Executive Summary

Ryzen 1700 had the most wins, coming in first place for 71% of the tests.

Based on the geometric mean of all complete results, the fastest (Ryzen 1700) was 2.205x the speed of the slowest (Xeon E3-1235L v5). Xeon Silver 4108 was 0.808x the speed of Ryzen 1700, Xeon E3-1280 v5 was 0.896x the speed of Xeon Silver 4108, Xeon E3-1245 v5 was 0.995x the speed of Xeon E3-1280 v5, Atom C3950 was 0.934x the speed of Xeon E3-1245 v5, Xeon E3-1235L v5 was 0.674x the speed of Atom C3950.

Test Systems:

Atom C3950

Processor: Intel Atom C3950 @ 1.70GHz (16 Cores), Motherboard: American Megatrends V1.00, Chipset: Intel Device 1980, Memory: 2 x 4096 MB DDR4-2400MT/s 9ASF51272AZ-2G3B1, Disk: 240GB OCZ ARC100, Network: Realtek

RTL8111/8168/8411

OS: Ubuntu 17.10, Kernel: 4.15.0-999-generic (x86_64) 20180128, Compiler: GCC 7.2.0, File-System: ext4

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++ --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: acpi-cpufreq ondemand
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: KPTI + Minimal generic ASM retpoline Protection

Xeon E3-1235L v5

Processor: Intel Xeon E3-1235L v5 @ 3.00GHz (4 Cores), Motherboard: ASRockRack C236M WS (P2.60 BIOS), Chipset: Intel Skylake, Memory: 8192MB, Disk: 120GB OCZ TRION150 + 525GB SABRENT, Graphics: Intel HD 530 3072MB (1000MHz), Audio: Realtek ALC1150, Monitor: DELL S2409W, Network: Intel Connection

OS: Ubuntu 17.10, Kernel: 4.15.0-999-generic (x86_64) 20180128, Desktop: GNOME Shell 3.26.2, Display Server: Wayland, OpenGL: 4.5 Mesa 17.2.4, Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1920x1080

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++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: KPTI + Minimal generic ASM retpoline Protection

Xeon E3-1245 v5

Processor: Intel Xeon E3-1245 v5 @ 3.90GHz (4 Cores / 8 Threads), Motherboard: MSI C236A WORKSTATION (MS-7998) v1.0 (2.90 BIOS), Chipset: Intel Skylake, Memory: 31744MB, Disk: 120GB Samsung SSD 850 + 525GB SABRENT, Graphics: Intel HD P530 3072MB (1150MHz), Audio: Realtek ALC1150, Monitor: Acer B286HK, Network: Intel Connection

OS: Ubuntu 17.10, Kernel: 4.15.0-999-generic (x86_64) 20180128, Desktop: GNOME Shell 3.26.2, Display Server: Wayland, OpenGL: 4.5 Mesa 17.2.4, Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1920x1080

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++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: KPTI + Minimal generic ASM retpoline Protection

Xeon E3-1280 v5

Processor: Intel Xeon E3-1280 v5 @ 4.00GHz (4 Cores / 8 Threads), Motherboard: MSI C236A WORKSTATION (MS-7998) v1.0 (2.50 BIOS), Chipset: Intel Skylake, Memory: 16384MB, Disk: 525GB SABRENT + 256GB TOSHIBA-RD400, Graphics: Sapphire AMD Radeon 4096MB, Audio: Realtek ALC1150, Monitor: ASUS PB278, Network: Intel Connection

OS: Ubuntu 17.10, Kernel: 4.15.0-999-generic (x86_64) 20180128, Desktop: GNOME Shell 3.26.2, Display Server: Wayland, OpenGL: 4.5 Mesa 17.2.4 (LLVM 5.0.0), Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution:

2560x1440

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++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: KPTI + Minimal generic ASM retpoline Protection

Xeon Silver 4108

Processor: Intel Xeon Silver 4108 @ 3.00GHz (8 Cores / 16 Threads), Motherboard: TYAN S7100AG2NR (V3.00 BIOS), Chipset: Intel Device 2020, Memory: 23552MB, Disk: 525GB SABRENT + 240GB Force MP500, Graphics: ASPEED ASPEED Family, Audio: Realtek ALC892, Monitor: VE228, Network: Intel I350 Gigabit Connection

OS: Ubuntu 17.10, Kernel: 4.15.0-999-generic (x86_64) 20180128, Desktop: GNOME Shell 3.26.2, Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1920x1080

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++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: KPTI + Minimal generic ASM retpoline Protection

Ryzen 1700

Processor: AMD Ryzen 7 1700 Eight-Core @ 3.00GHz (16 Cores), Motherboard: ASUS PRIME X370-PRO, Chipset: AMD Device 1450, Memory: 32768MB, Disk: 500GB Samsung SSD 850 + 4 x 500GB Seagate ST500LM021-1KJ15 + Samsung SSD 960 EVO 500GB, Graphics: AMD VEGA10 8192MB, Audio: AMD Device aaf8, Monitor: PHL BDM3270, Network: Intel I211 Gigabit Connection

OS: neon 16.04, Kernel: 4.15.0-041500-generic (x86_64), Desktop: KDE Frameworks 5, Display Server: X Server 1.18.4, Display Driver: modesetting 1.18.4, OpenGL: 4.5 Mesa 17.3.2- padoka PPA (LLVM 5.0.1), OpenCL: OpenCL 1.1 Mesa 17.3.2- padoka PPA, Compiler: GCC 5.4.0 20160609 + Clang 3.8.0-2ubuntu4, File-System: ext4, Screen Resolution: 2560x1440

Compiler Notes: --build=x86_64-linux-gnu --disable-browser-plugin --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-arch-directory=amd64 --with-default-libstdcxx-abi=new --with-multilib-list=m32,m64,mx32 --with-tune=generic -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand

	Atom C3950	Xeon E3-1235L v5	Xeon E3-1245 v5	Xeon E3-1280 v5	Xeon Silver 4108	Ryzen 1700
TTSIOD 3D Renderer - P.R.W.S.S.M (FPS)	186.03	**130.83**	226.16	232.23	209.89	**271.90**
Normalized	68.42%	48.12%	83.18%	85.41%	77.19%	100%
Standard Deviation	1.2%	0.2%	0.6%	0.4%	0.6%	0.1%

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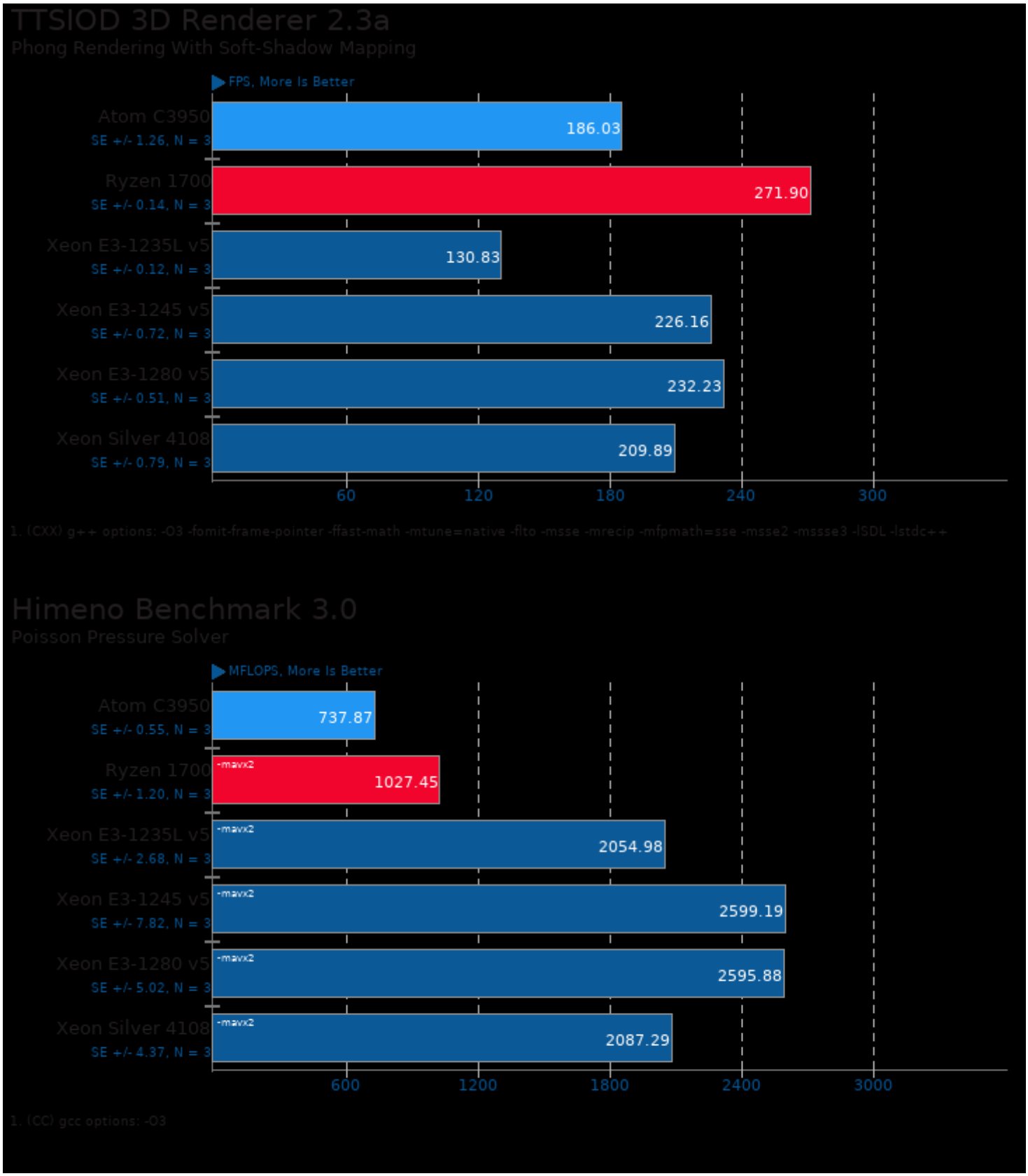
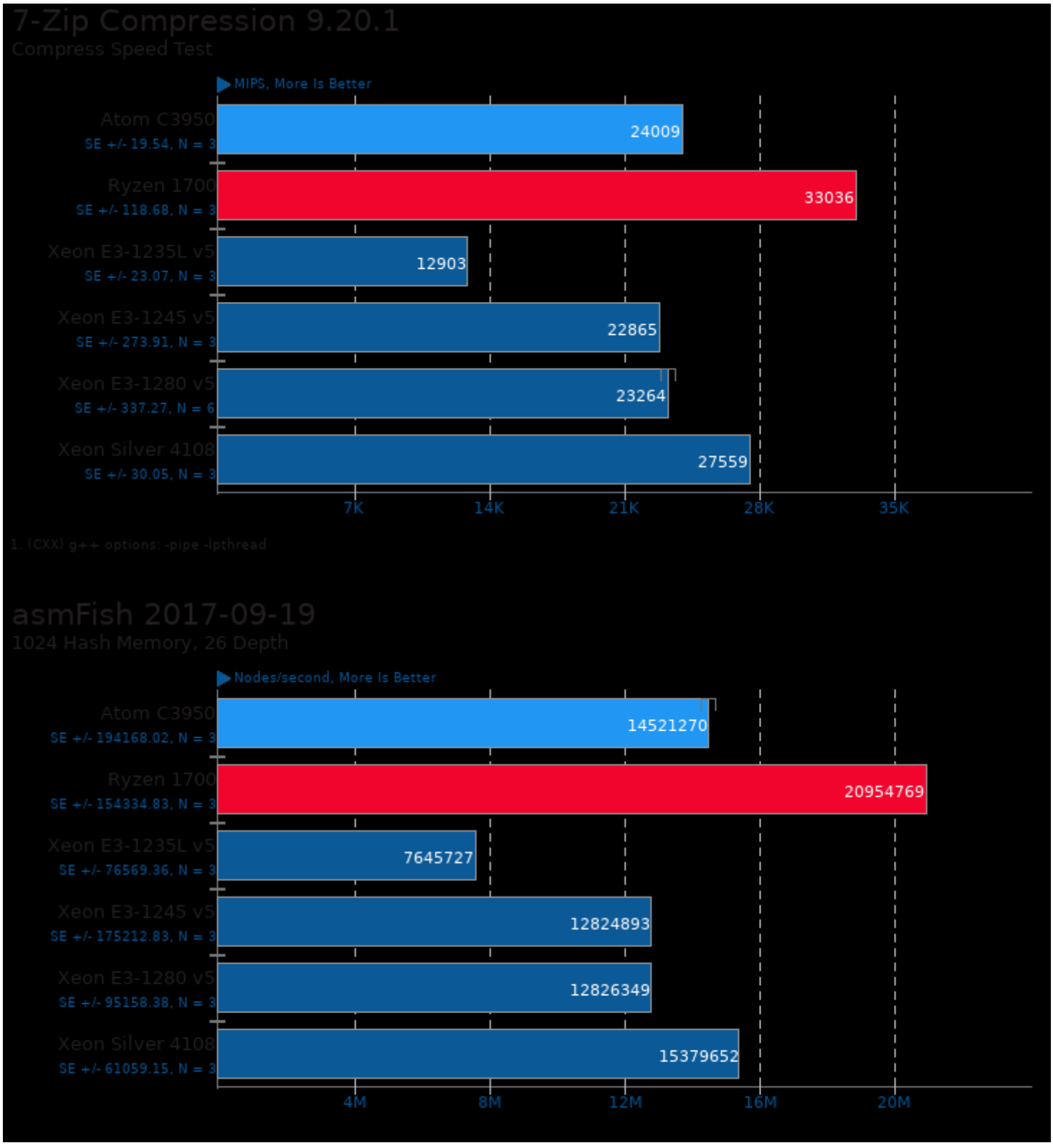
Himeno Benchmark - P.P.S (MFLOPS)	737.87	2055	2599	2596	2087	1027
Normalized	28.39%	79.06%	100%	99.87%	80.31%	39.53%
Standard Deviation	0.1%	0.2%	0.5%	0.3%	0.4%	0.2%
7-Zip Compression - C.S.T (MIPS)	24009	12903	22865	23264	27559	33036
Normalized	72.68%	39.06%	69.21%	70.42%	83.42%	100%
Standard Deviation	0.1%	0.3%	2.1%	3.6%	0.2%	0.6%
asmFish - 1.H.M.2.D	14521270	7645727	12824893	12826349	15379652	20954769
Normalized	69.3%	36.49%	61.2%	61.21%	73.39%	100%
Standard Deviation	2.3%	1.7%	2.4%	1.3%	0.7%	1.3%
Java JMH - Throughput (Ops/s)	14917840611	10788094451	14346905740	14743069181	16740943508	
Normalized	89.11%	64.44%	85.7%	88.07%	100%	
John The Ripper - Blowfish (Real C/S)	9196	3313	7099	7300	8276	10194
Normalized	90.21%	32.5%	69.64%	71.61%	81.19%	100%
Standard Deviation		0.1%	0.1%	0.1%	0%	1.3%
OpenSSL - R.4.b.P	803.30	458.40	677.50	697.00	790.20	986.80
Normalized	81.4%	46.45%	68.66%	70.63%	80.08%	100%
Standard Deviation	1.1%	0.7%	0%	0%	0%	0%
Parboil - OpenMP LBM (sec)	167.04	222.21	153.82	169.95	127.15	118.55
Normalized	70.97%	53.35%	77.07%	69.76%	93.24%	100%
Standard Deviation	0.3%	0%	0.2%	0%	0.6%	0.1%
Parboil - OpenMP CUTCP (sec)	12.67	19.68	12.41	12.08	10.96	6.57
Normalized	51.85%	33.38%	52.94%	54.39%	59.95%	100%
Standard Deviation	0.2%	0.1%	0.4%	0.1%	0.1%	0.2%
Rodinia - OpenMP LavaMD (sec)	169.88	300.86	191.35	186.77	170.02	93.11
Normalized	54.81%	30.95%	48.66%	49.85%	54.76%	100%
Standard Deviation	0.3%	0.1%	0.3%	0.2%	0.6%	0.4%
Rodinia - OpenMP CFD Solver (sec)	54.67	68.47	48.07	48.65	37.23	40.29
Normalized	68.1%	54.37%	77.45%	76.53%	100%	92.41%
Standard Deviation	0.7%	0%	0.2%	0.1%	0.2%	0.1%
Rodinia - O.S (sec)	26.56	49.68	29.71	30.10	23.55	25.73
Normalized	88.67%	47.4%	79.27%	78.24%	100%	91.53%
Standard Deviation	0.7%	0%	0.1%	0.1%	0.1%	0.3%
Timed Linux Kernel Compilation - Time To Compile (sec)	155.30	215.10	133.31	131.32	127.50	75.67
Normalized	48.73%	35.18%	56.76%	57.62%	59.35%	100%
Standard Deviation	2.6%	1%	1.4%	1.6%	2.3%	2.1%
C-Ray - Total Time (sec)	20.26	32.84	22.89	22.21	19.69	9.21
Normalized	45.46%	28.05%	40.24%	41.47%	46.78%	100%
Standard Deviation	1.6%	0.1%	0%	0.1%	0.1%	0.1%


TTSIOD 3D Renderer 2.3a
Phong Rendering With Soft-Shadow Mapping
FPS, More Is Better
Atom C3950
SE +/- 1.26, N = 3
186.03
Ryzen 1700
SE +/- 0.14, N = 3
271.90
Xeon E3-1235L v5
SE +/- 0.12, N = 3
130.83
Xeon E3-1245 v5
SE +/- 0.72, N = 3
226.16
Xeon E3-1280 v5
SE +/- 0.51, N = 3
232.23
Xeon Silver 4108
SE +/- 0.79, N = 3
209.89
60
120
180
240
300
1. (CXX) g++ options: -O3 -fomit-frame-pointer -ffast-math -mtune=native -flto -msse -mrecip -mfpmath=sse -msse2 -mssse3 -lSDL -lstdc++
Himeno Benchmark 3.0
Poisson Pressure Solver
MFLOPS, More Is Better
Atom C3950
SE +/- 0.55, N = 3
737.87
Ryzen 1700
SE +/- 1.20, N = 3
-mavx2
1027.45
Xeon E3-1235L v5
SE +/- 2.68, N = 3
-mavx2
2054.98
Xeon E3-1245 v5
SE +/- 7.82, N = 3
-mavx2
2599.19
Xeon E3-1280 v5
SE +/- 5.02, N = 3
-mavx2
2595.88
Xeon Silver 4108
SE +/- 4.37, N = 3
-mavx2
2087.29
600
1200
1800
2400
3000
1. (CC) gcc options: -O3


7-Zip Compression 9.20.1
Compress Speed Test
MIPS, More Is Better
Atom C3950
SE +/- 19.54, N = 3
24009
Ryzen 1700
SE +/- 118.68, N = 3
33036
Xeon E3-1235L v5
SE +/- 23.07, N = 3
12903
Xeon E3-1245 v5
SE +/- 273.91, N = 3
22865
Xeon E3-1280 v5
SE +/- 337.27, N = 6
23264
Xeon Silver 4108
SE +/- 30.05, N = 3
27559
7K
14K
21K
28K
35K
1. (CXX) g++ options: -pipe -lpthread
asmFish 2017-09-19
1024 Hash Memory, 26 Depth
Nodes/second, More Is Better
Atom C3950
SE +/- 194168.02, N = 3
14521270
Ryzen 1700
SE +/- 154334.83, N = 3
20954769
Xeon E3-1235L v5
SE +/- 76569.36, N = 3
7645727
Xeon E3-1245 v5
SE +/- 175212.83, N = 3
12824893
Xeon E3-1280 v5
SE +/- 95158.38, N = 3
12826349
Xeon Silver 4108
SE +/- 61059.15, N = 3
15379652
4M
8M
12M
16M
20M

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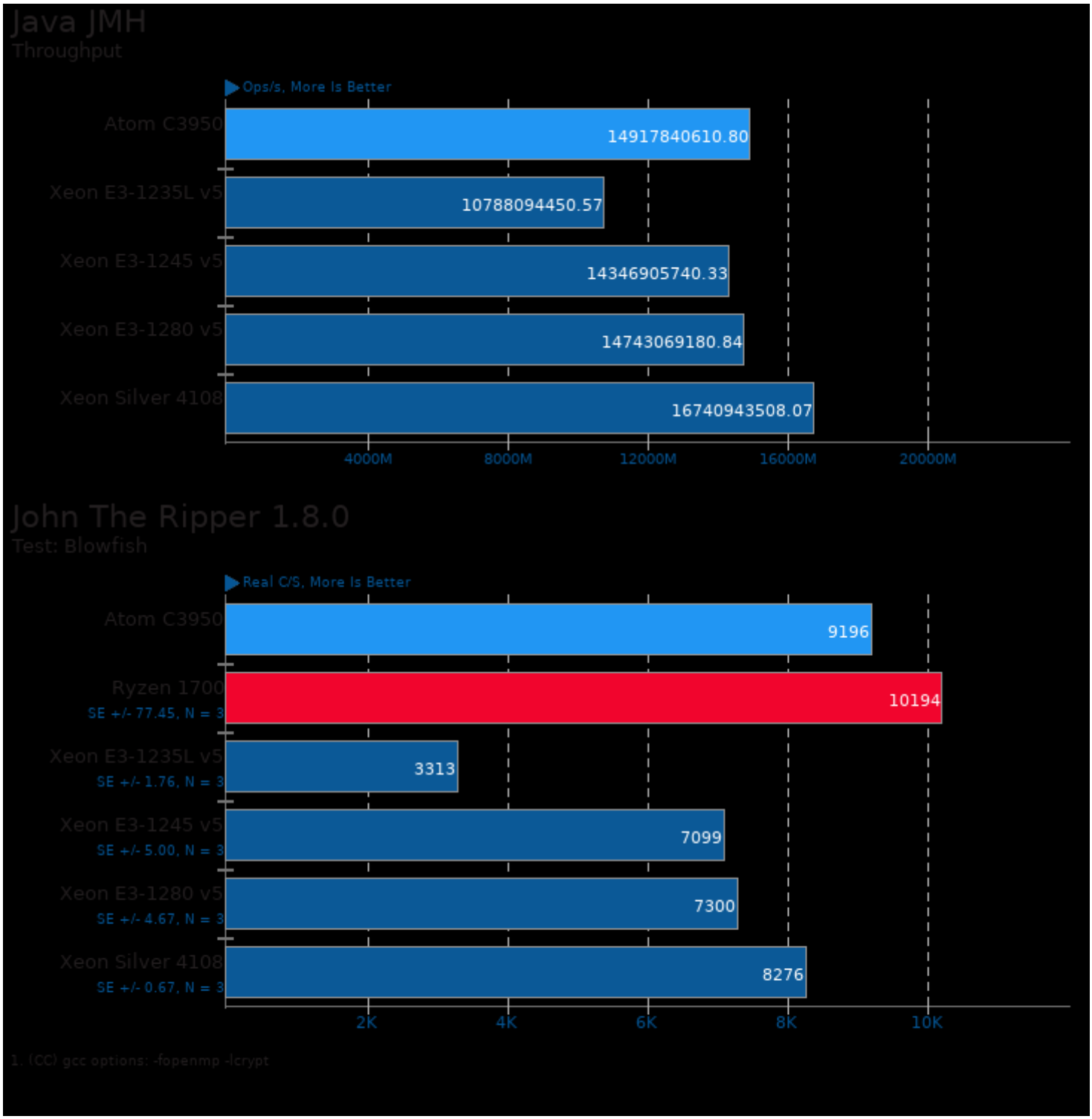
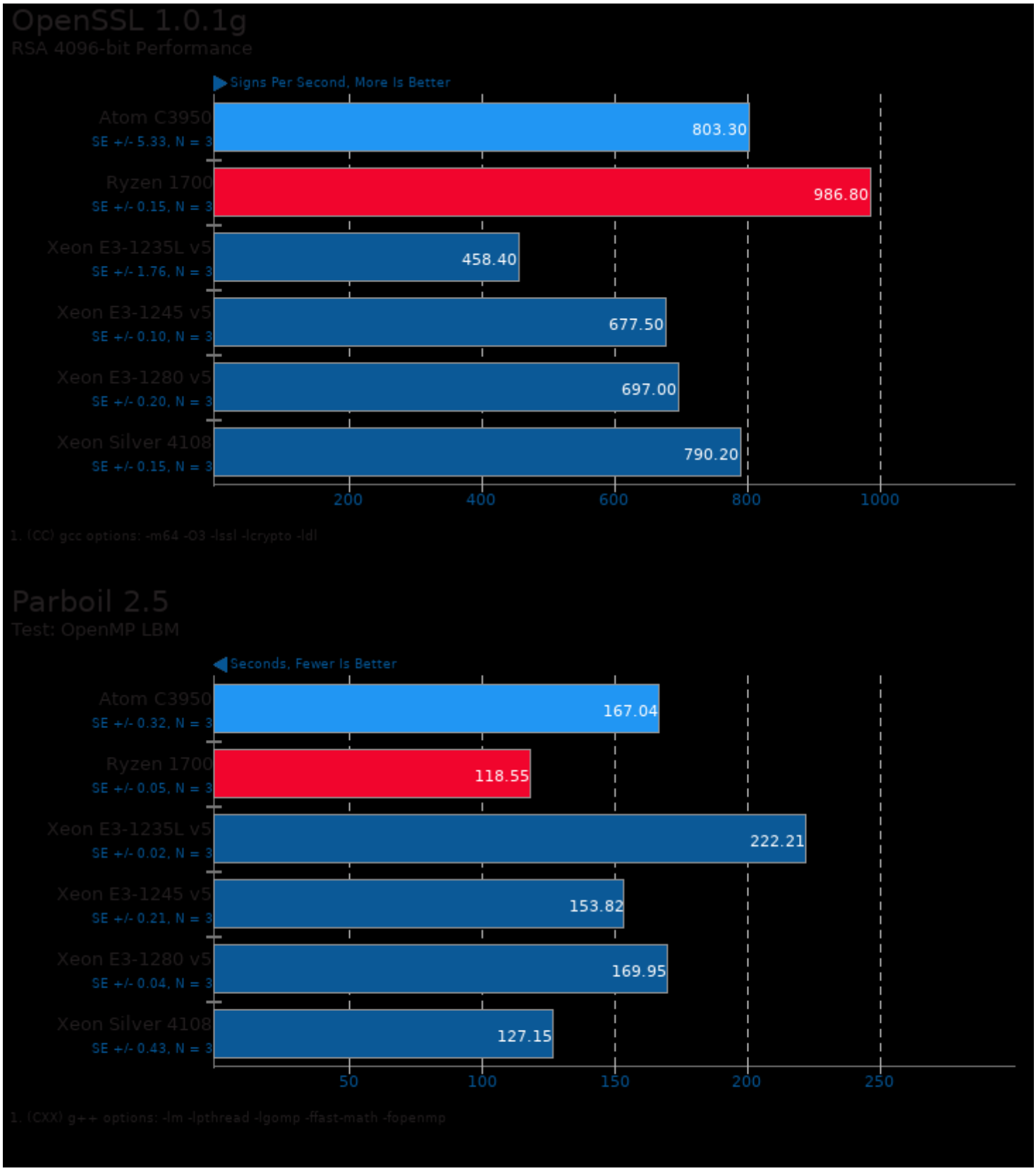
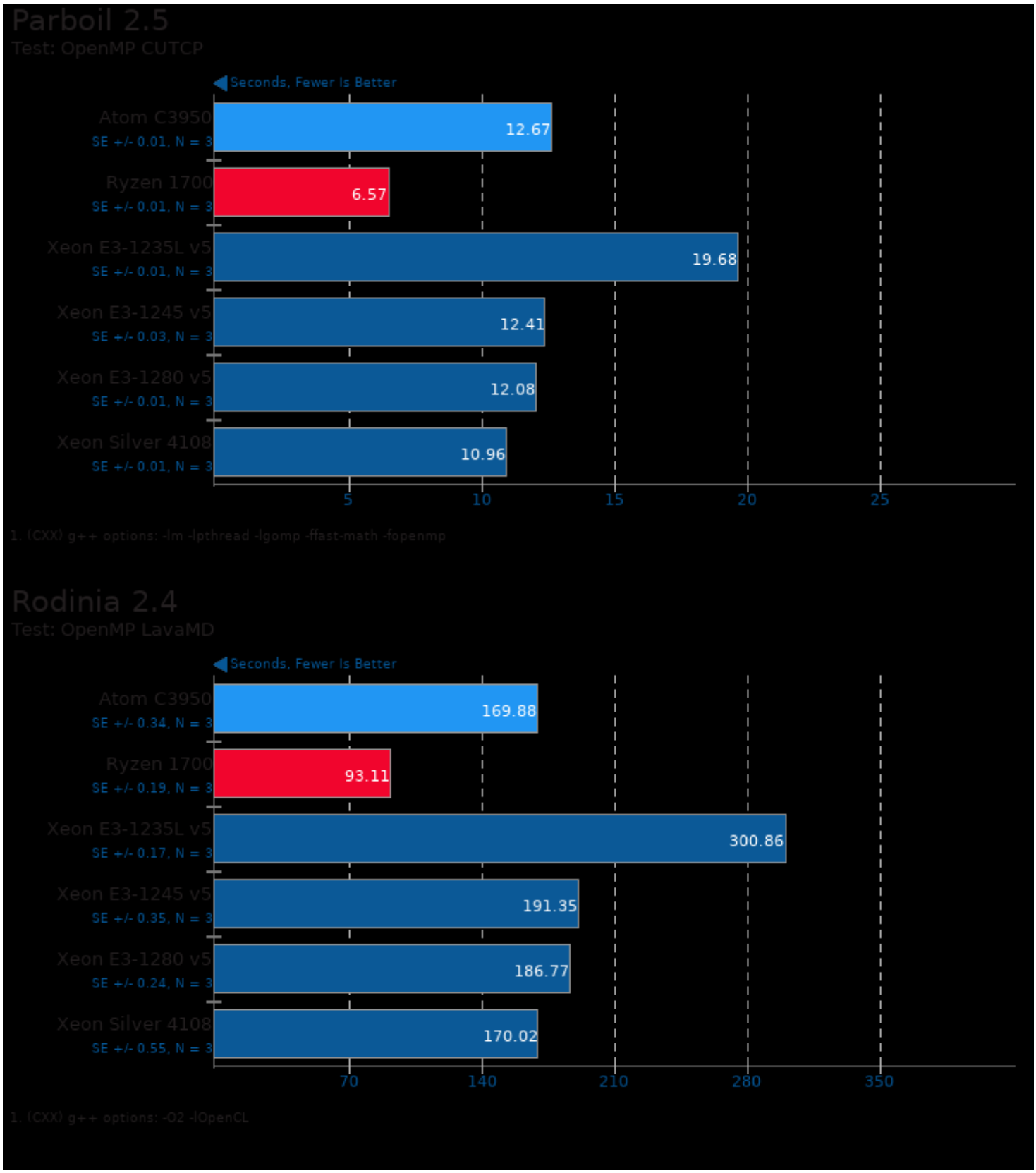
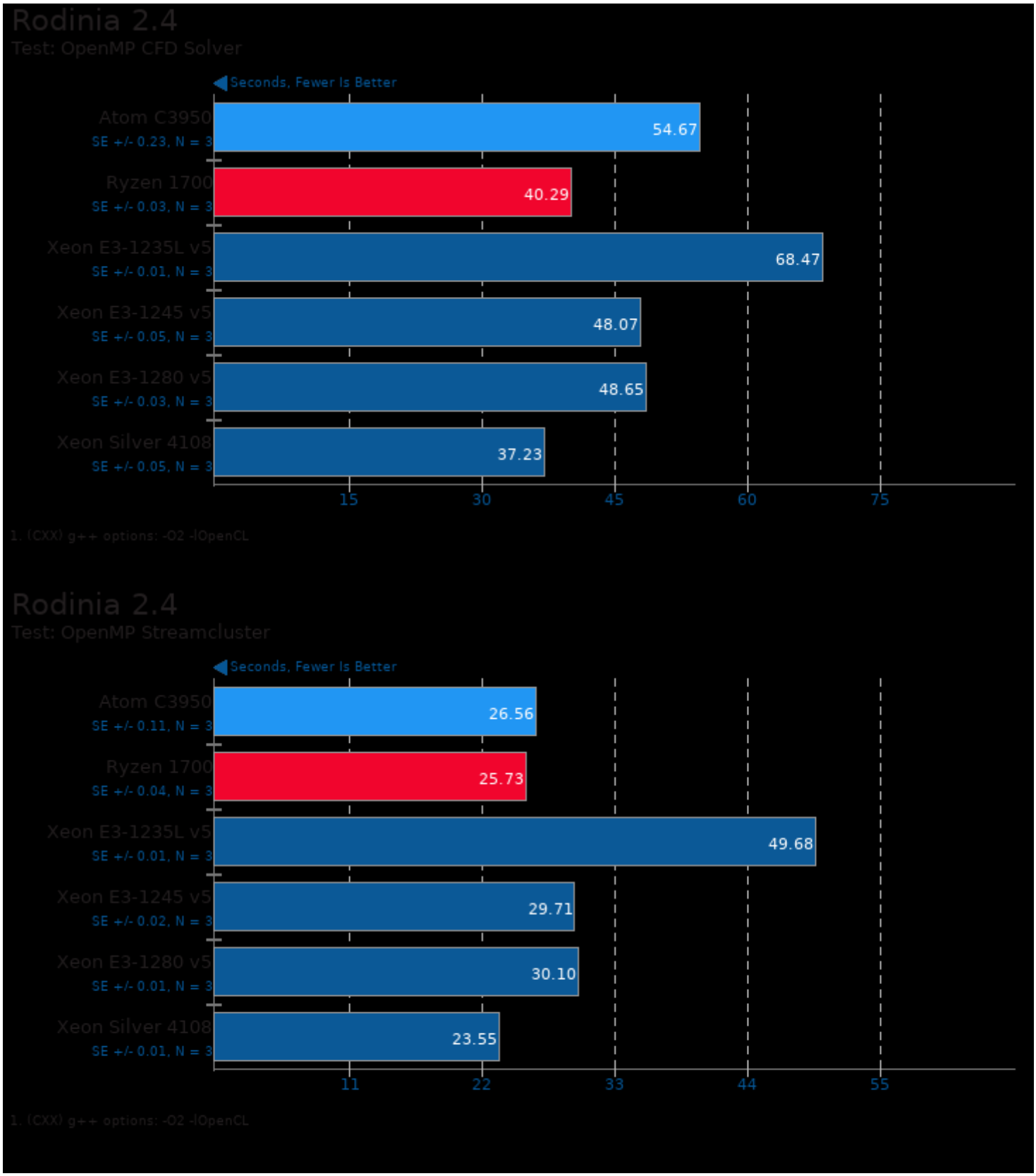
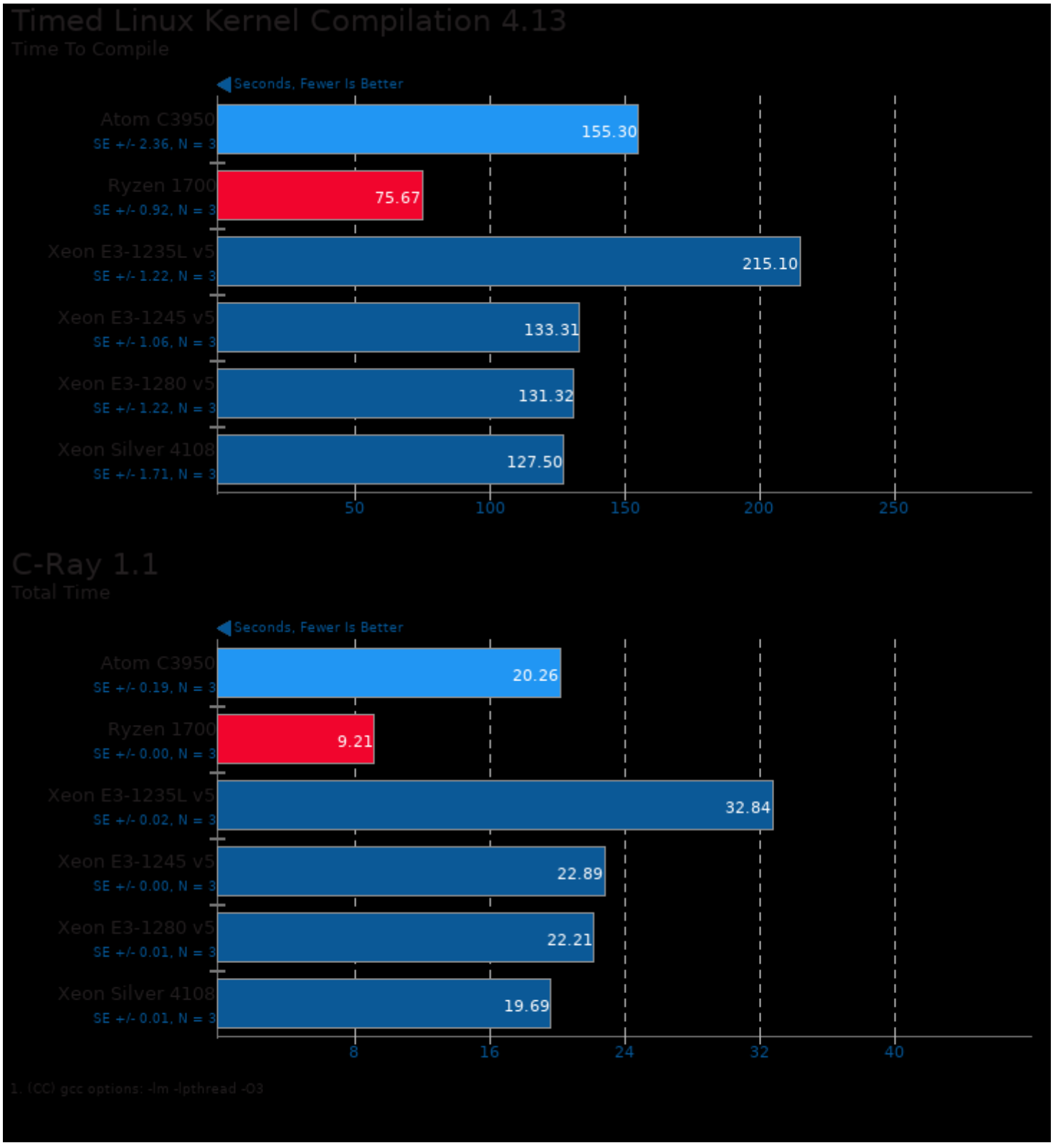



OpenSSL 1.0.1g
RSA 4096-bit Performance
Signs Per Second, More Is Better
Atom C3950
SE +/- 5.33, N = 3
803.30
Ryzen 1700
SE +/- 0.15, N = 3
986.80
Xeon E3-1235L v5
SE +/- 1.76, N = 3
458.40
Xeon E3-1245 v5
SE +/- 0.10, N = 3
677.50
Xeon E3-1280 v5
SE +/- 0.20, N = 3
697.00
Xeon Silver 4108
SE +/- 0.15, N = 3
790.20
200
400
600
800
1000
1. (CC) gcc options: -m64 -O3 -lssl -lcrypto -ldl
Parboil 2.5
Test: OpenMP LBM
Seconds, Fewer Is Better
Atom C3950
SE +/- 0.32, N = 3
167.04
Ryzen 1700
SE +/- 0.05, N = 3
118.55
Xeon E3-1235L v5
SE +/- 0.02, N = 3
222.21
Xeon E3-1245 v5
SE +/- 0.21, N = 3
153.82
Xeon E3-1280 v5
SE +/- 0.04, N = 3
169.95
Xeon Silver 4108
SE +/- 0.43, N = 3
127.15
50
100
150
200
250
1. (CXX) g++ options: -lm -lpthread -lgomp -ffast-math -fopenmp

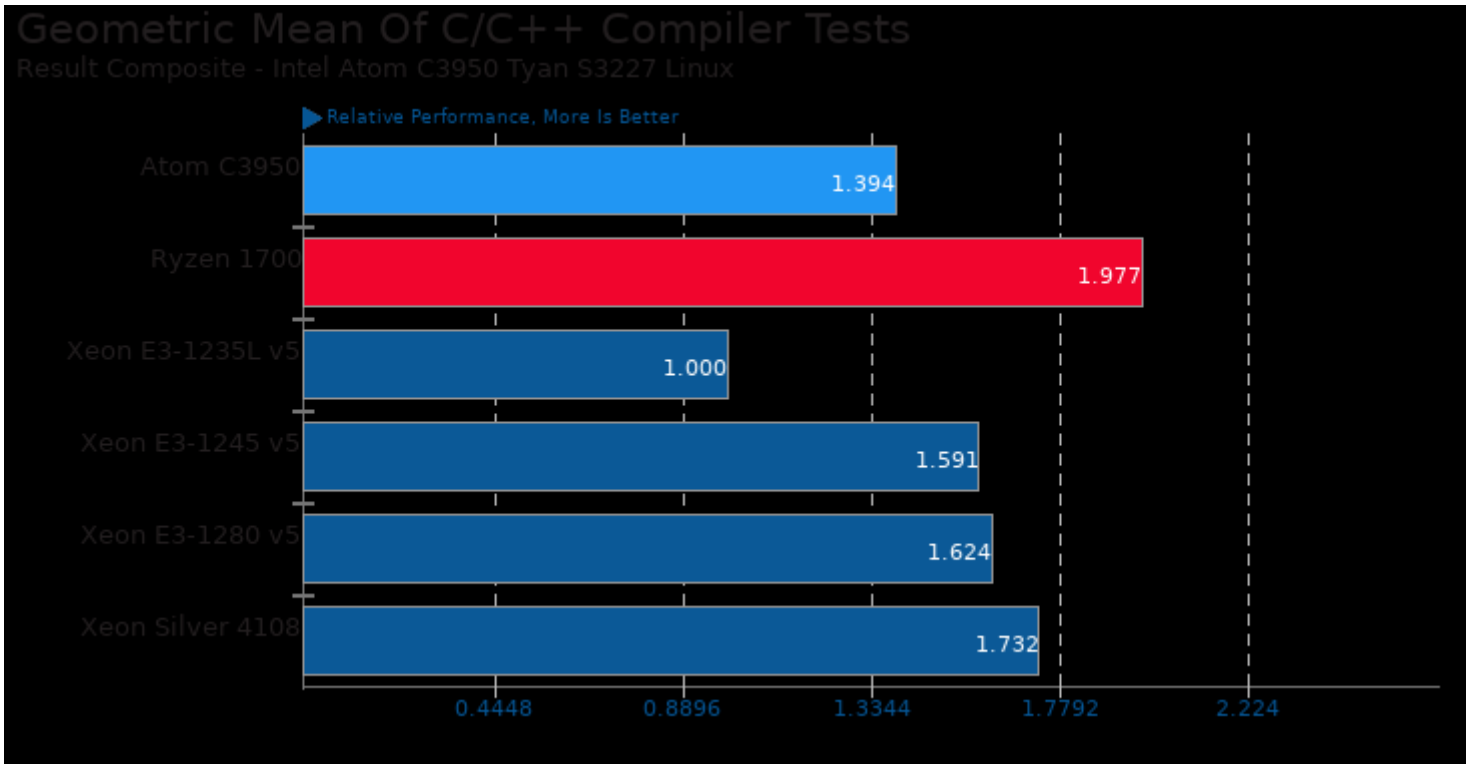

Parboil 2.5
Test: OpenMP CUTCP
Seconds, Fewer Is Better
Atom C3950
SE +/- 0.01, N = 3
12.67
Ryzen 1700
SE +/- 0.01, N = 3
6.57
Xeon E3-1235L v5
SE +/- 0.01, N = 3
19.68
Xeon E3-1245 v5
SE +/- 0.03, N = 3
12.41
Xeon E3-1280 v5
SE +/- 0.01, N = 3
12.08
Xeon Silver 4108
SE +/- 0.01, N = 3
10.96
5
10
15
20
25
1. (CXX) g++ options: -lm -lpthread -lgomp -ffast-math -fopenmp
Rodinia 2.4
Test: OpenMP LavaMD
Seconds, Fewer Is Better
Atom C3950
SE +/- 0.34, N = 3
169.88
Ryzen 1700
SE +/- 0.19, N = 3
93.11
Xeon E3-1235L v5
SE +/- 0.17, N = 3
300.86
Xeon E3-1245 v5
SE +/- 0.35, N = 3
191.35
Xeon E3-1280 v5
SE +/- 0.24, N = 3
186.77
Xeon Silver 4108
SE +/- 0.55, N = 3
170.02
70
140
210
280
350
1. (CXX) g++ options: -O2 -lOpenCL


Rodinia 2.4
Test: OpenMP CFD Solver
Seconds, Fewer Is Better
Atom C3950
SE +/- 0.23, N = 3
54.67
Ryzen 1700
SE +/- 0.03, N = 3
40.29
Xeon E3-1235L v5
SE +/- 0.01, N = 3
68.47
Xeon E3-1245 v5
SE +/- 0.05, N = 3
48.07
Xeon E3-1280 v5
SE +/- 0.03, N = 3
48.65
Xeon Silver 4108
SE +/- 0.05, N = 3
37.23
15
30
45
60
75
1. (CXX) g++ options: -O2 -lOpenCL
Rodinia 2.4
Test: OpenMP Streamcluster
Seconds, Fewer Is Better
Atom C3950
SE +/- 0.11, N = 3
26.56
Ryzen 1700
SE +/- 0.04, N = 3
25.73
Xeon E3-1235L v5
SE +/- 0.01, N = 3
49.68
Xeon E3-1245 v5
SE +/- 0.02, N = 3
29.71
Xeon E3-1280 v5
SE +/- 0.01, N = 3
30.10
Xeon Silver 4108
SE +/- 0.01, N = 3
23.55
11
22
33
44
55
1. (CXX) g++ options: -O2 -lOpenCL

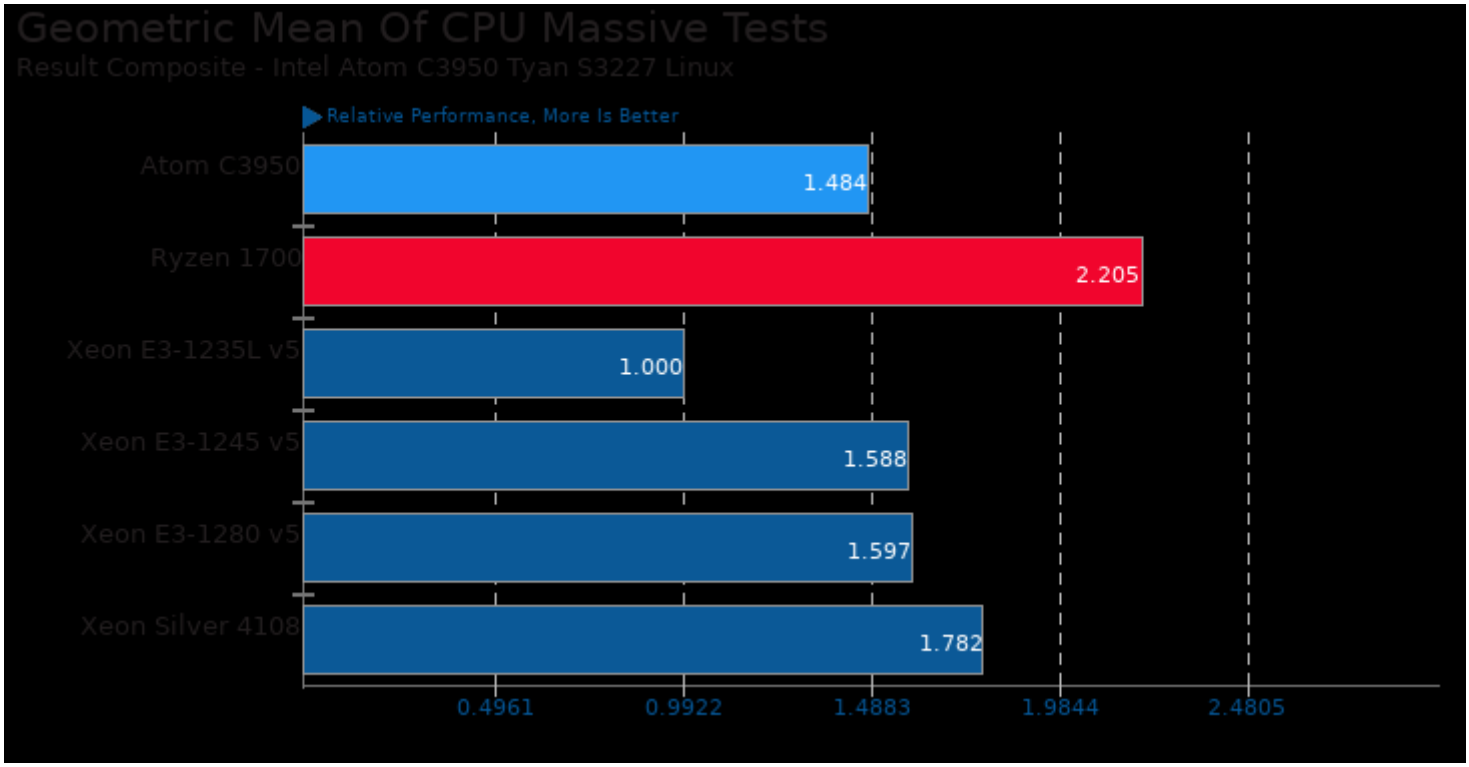

Timed Linux Kernel Compilation 4.13
Time To Compile
Seconds, Fewer Is Better
Atom C3950
SE +/- 2.36, N = 3
155.30
Ryzen 1700
SE +/- 0.92, N = 3
75.67
Xeon E3-1235L v5
SE +/- 1.22, N = 3
215.10
Xeon E3-1245 v5
SE +/- 1.06, N = 3
133.31
Xeon E3-1280 v5
SE +/- 1.22, N = 3
131.32
Xeon Silver 4108
SE +/- 1.71, N = 3
127.50
50
100
150
200
250
C-Ray 1.1
Total Time
Seconds, Fewer Is Better
Atom C3950
SE +/- 0.19, N = 3
20.26
Ryzen 1700
SE +/- 0.00, N = 3
9.21
Xeon E3-1235L v5
SE +/- 0.02, N = 3
32.84
Xeon E3-1245 v5
SE +/- 0.00, N = 3
22.89
Xeon E3-1280 v5
SE +/- 0.01, N = 3
22.21
Xeon Silver 4108
SE +/- 0.01, N = 3
19.69
8
16
24
32
40
1. (CC) gcc options: -lm -lpthread -O3

Intel Atom C3950 Tyan S3227 Linux

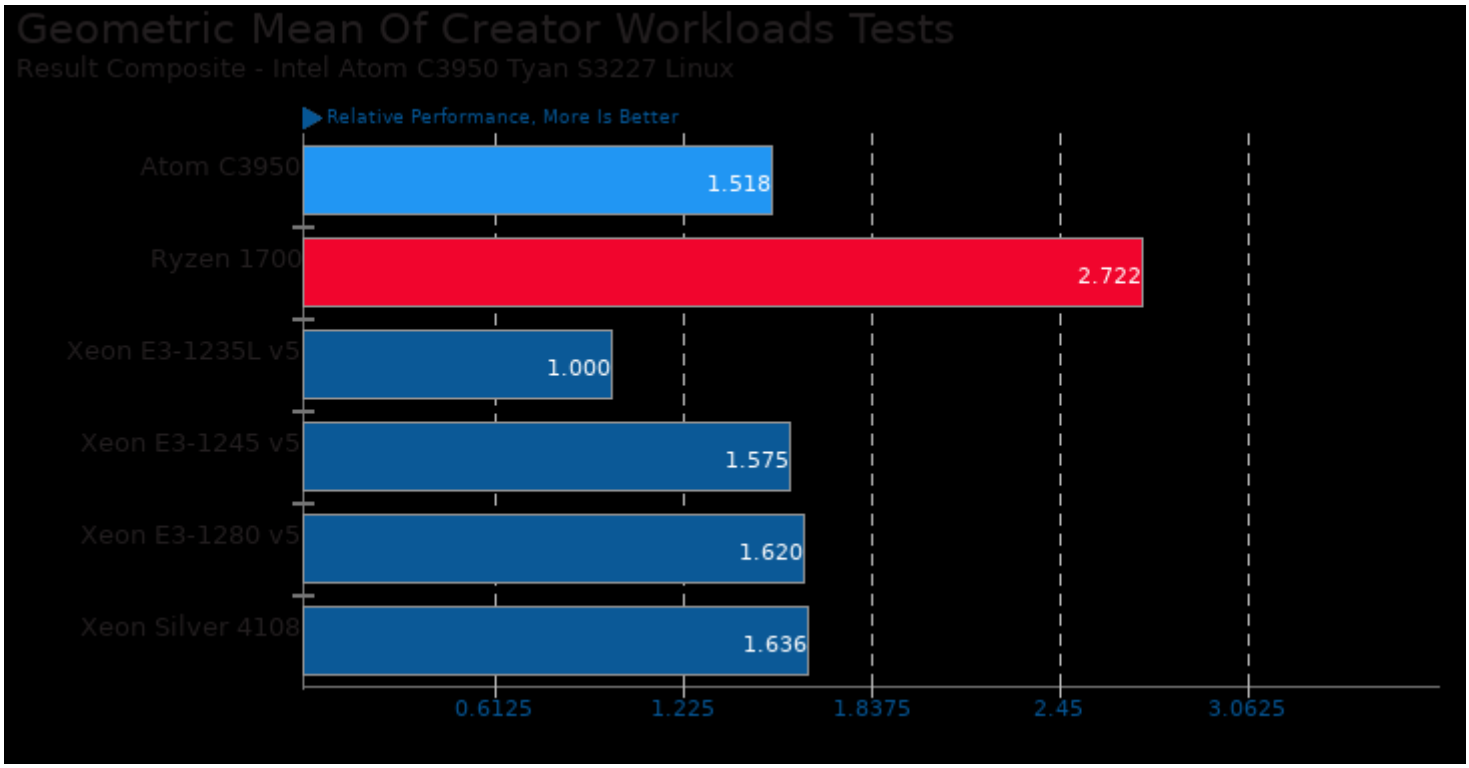
These geometric means are based upon test groupings / test suites for this result file.



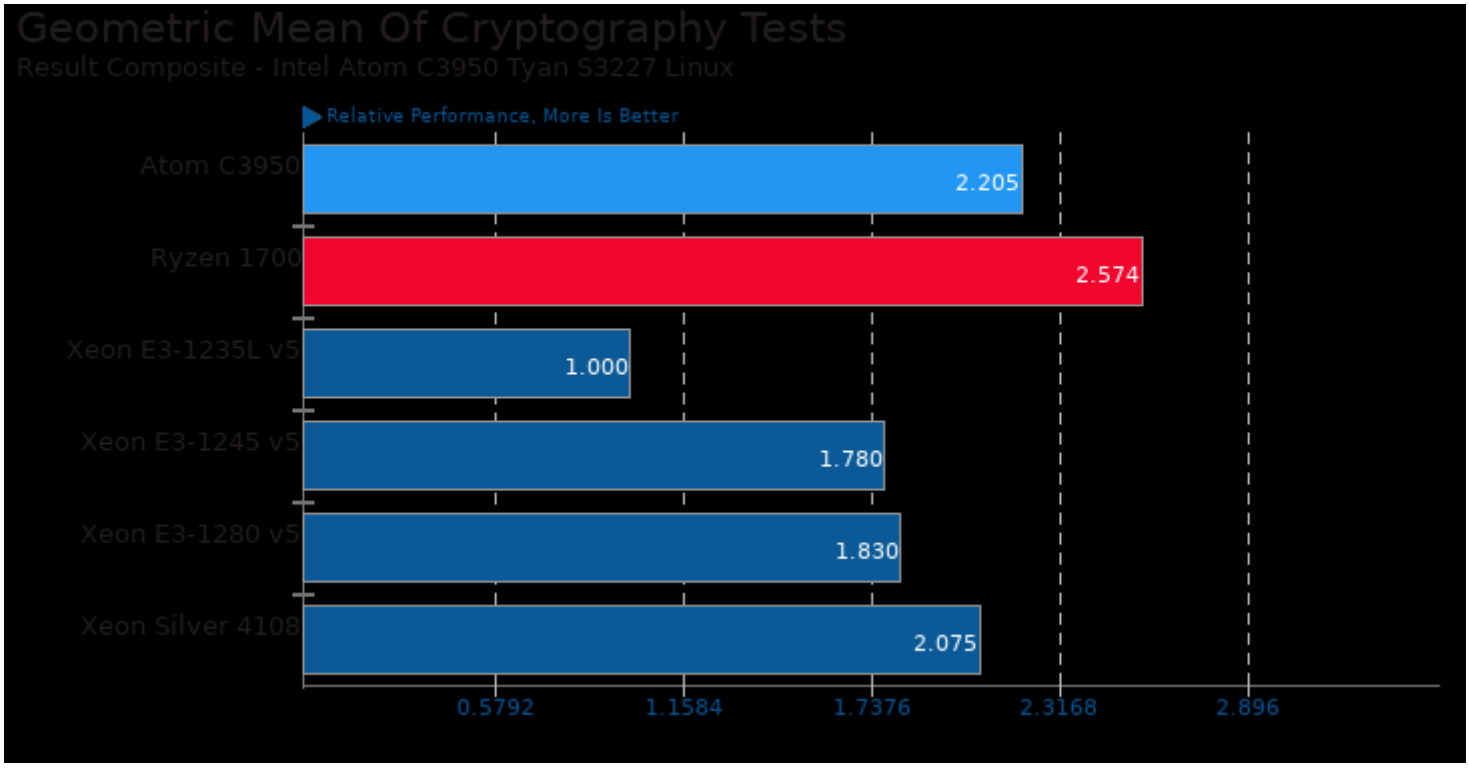
Geometric mean based upon tests: pts/himeno, pts/c-ray, pts/compress-7zip, pts/john-the-ripper and pts/openssl



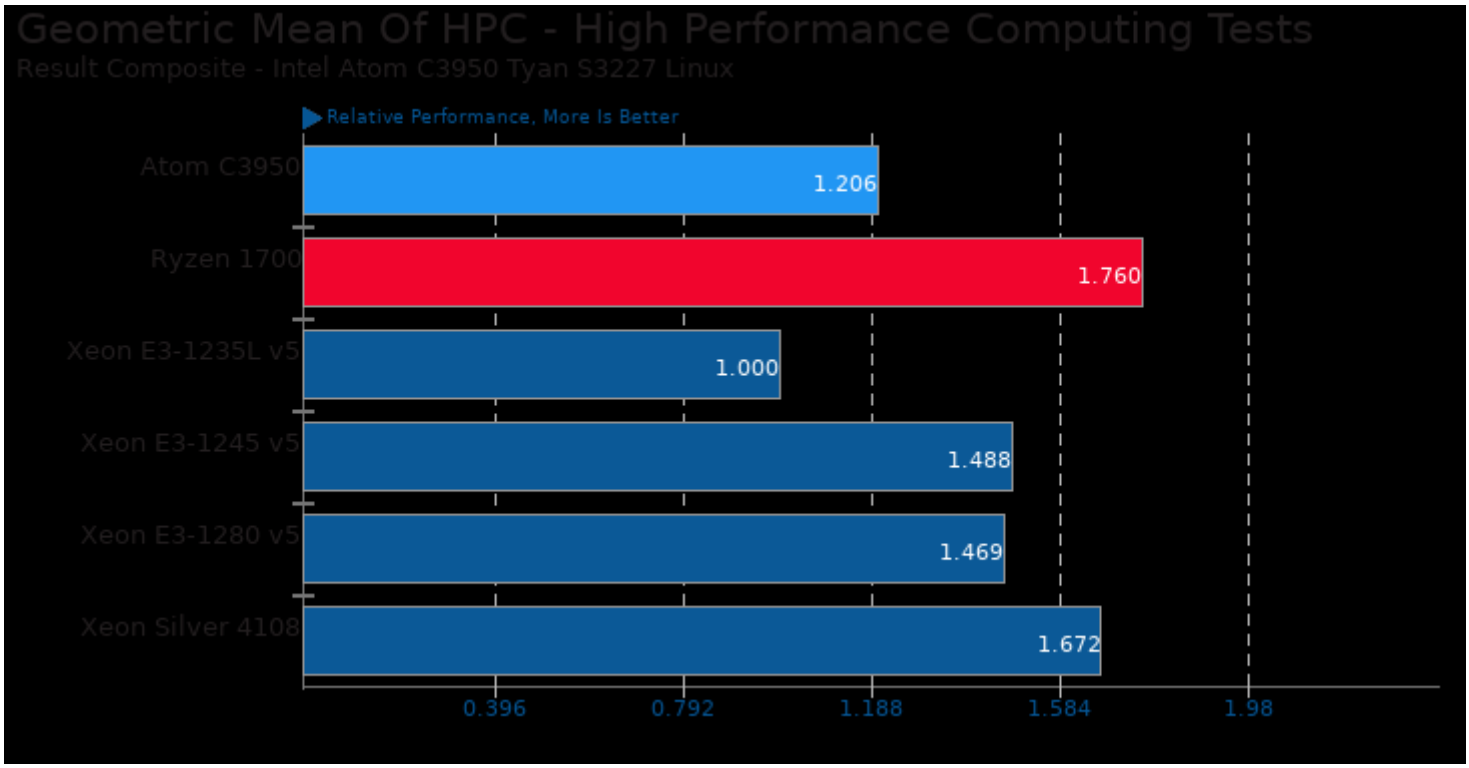
Geometric mean based upon tests: pts/asmfish, pts/build-linux-kernel, pts/c-ray, pts/compress-7zip, pts/himeno, pts/john-the-ripper, pts/openssl, pts/parboil, pts/rodinia and pts/ttsiod-renderer



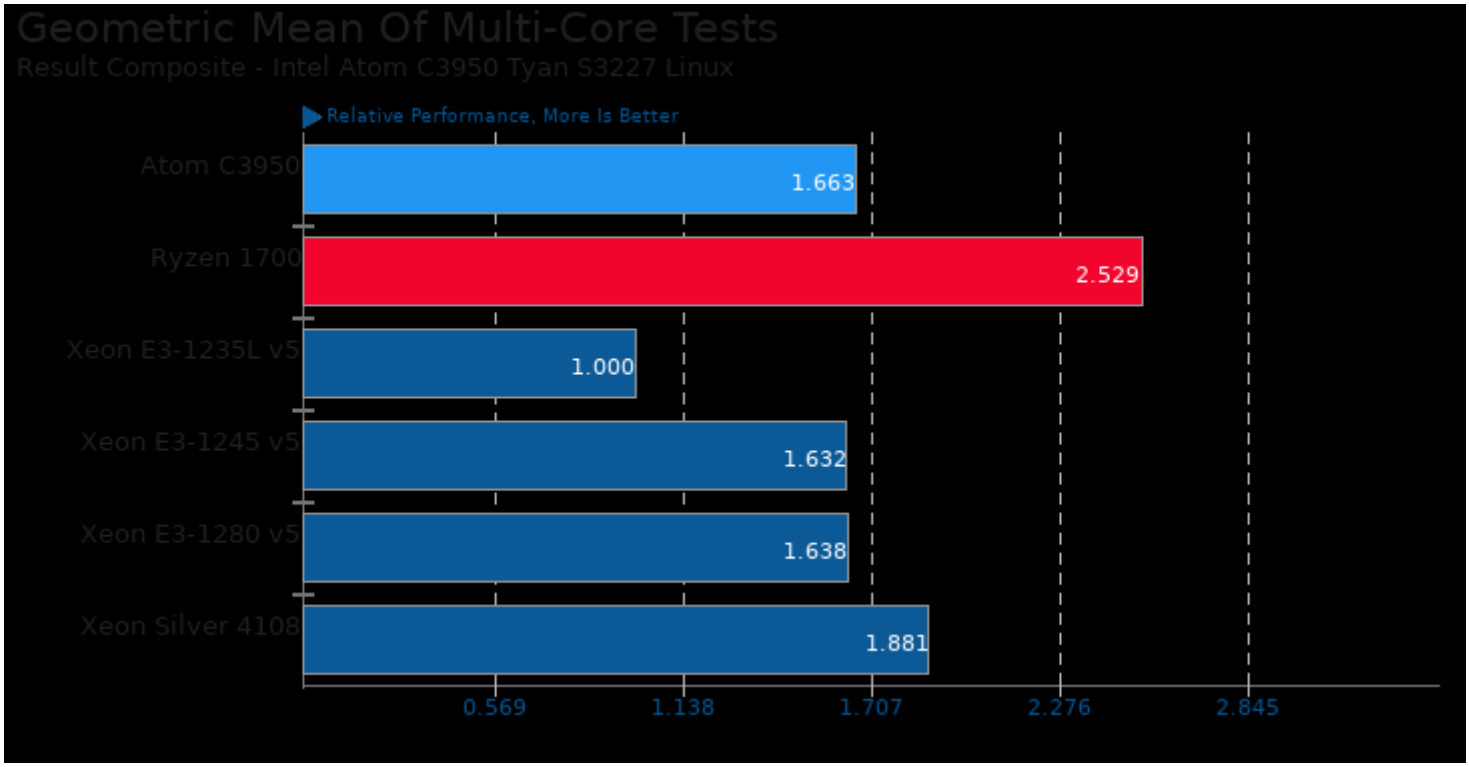
Geometric mean based upon tests: pts/c-ray and pts/ttsiod-renderer



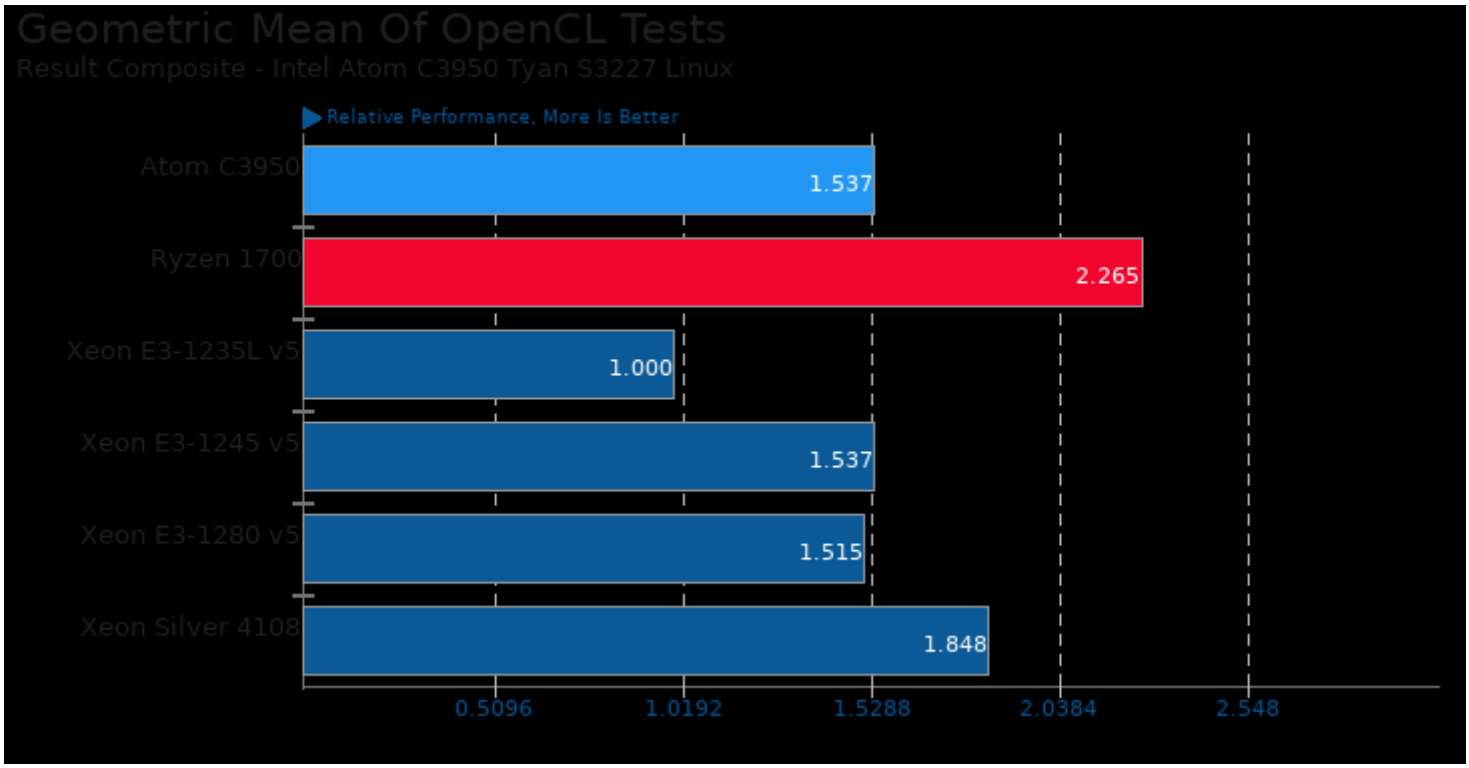
Geometric mean based upon tests: pts/openssl and pts/john-the-ripper



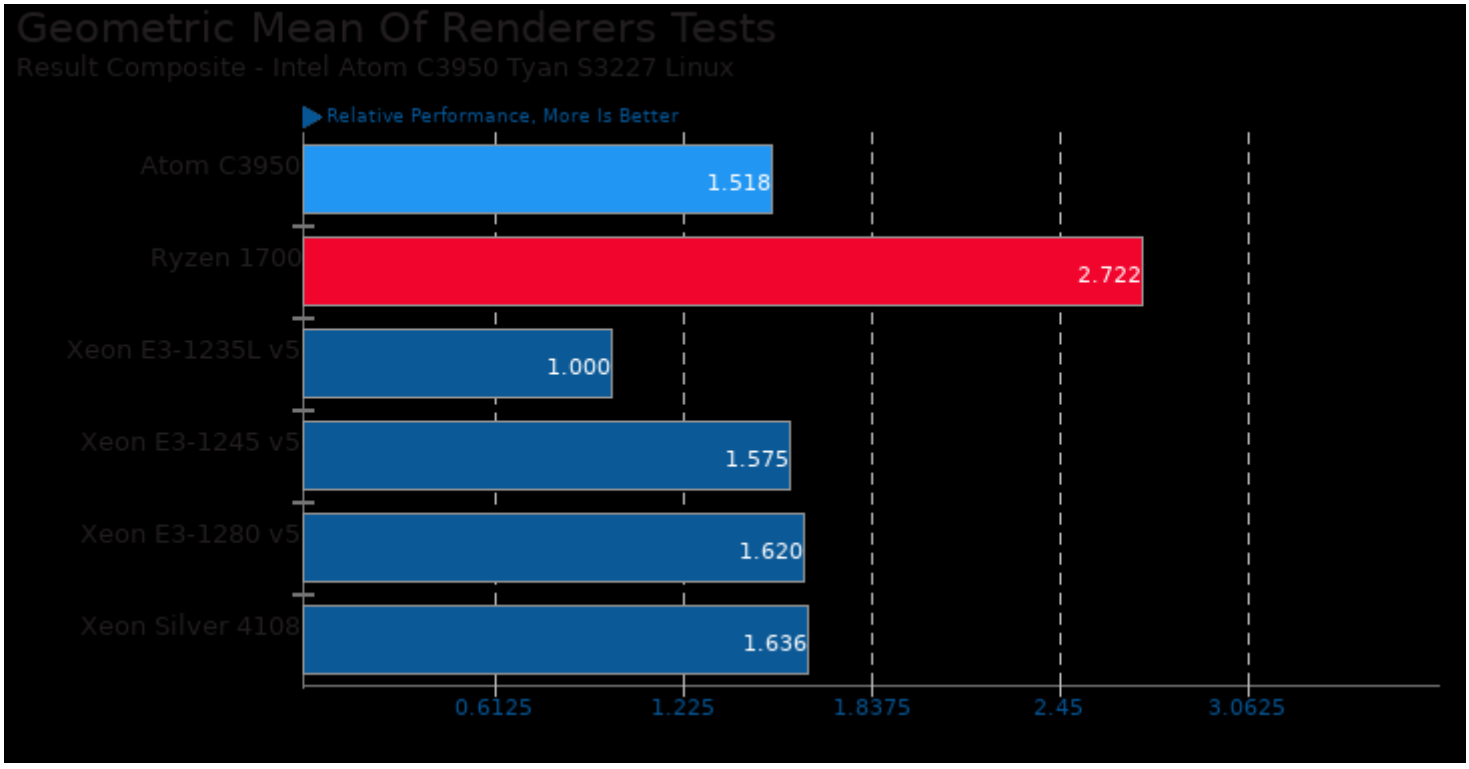
Geometric mean based upon tests: pts/rodinia, pts/parboil and pts/himeno



Geometric mean based upon tests: pts/c-ray, pts/rodinia, pts/parboil, pts/john-the-ripper, pts/asmfish, pts/compress-7zip, pts/build-linux-kernel and pts/ttsiod-renderer

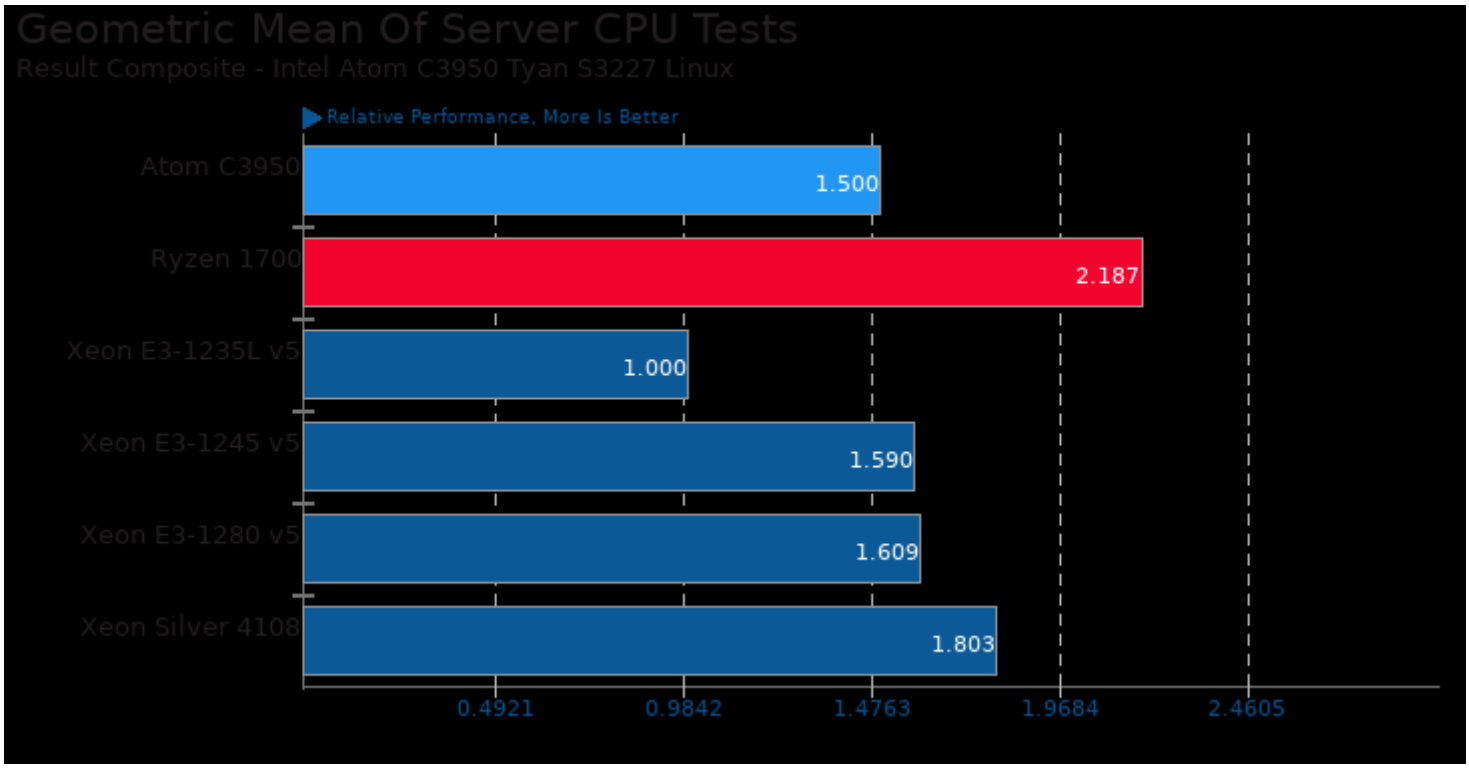


Geometric mean based upon tests: pts/rodinia and pts/parboil



Geometric mean based upon tests: pts/c-ray and pts/ttsiod-renderer

Intel Atom C3950 Tyan S3227 Linux



Geometric mean based upon tests: pts/rodinia, pts/john-the-ripper, pts/himeno, pts/compress-7zip, pts/asmfish, pts/build-linux-kernel, pts/c-ray and pts/openssl

Geometric mean based upon tests: pts/rodinia, pts/parboil and pts/himeno

This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 29 March 2024 11:08.