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AMD EPYC Rome

AMD EPYC 7F52 16-Core testing with a Supermicro H11DSi-NT v2.00 (2.1 BIOS) and llvmpipe on Ubuntu 21.10 via the Phoronix Test Suite.

Automated Executive Summary

A had the most wins, coming in first place for 32% of the tests.

Based on the geometric mean of all complete results, the fastest (A) was 1.003x the speed of the slowest (B). C was 0.998x the speed of A, D was 1x the speed of C, B was 0.999x the speed of D.

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

Redis (Test: LPOP) at 1.551x
Stress-NG (Test: Glibc C String Functions) at 1.305x
ONNX Runtime (Model: shufflenet-v2-10 - Device: OpenMP CPU) at 1.267x
NCNN (Target: CPU - Model: mnasnet) at 1.266x
NCNN (Target: CPU - Model: shufflenet-v2) at 1.219x
Mobile Neural Network (Model: MobileNetV2_224) at 1.186x
NCNN (Target: CPU - Model: mobilenet) at 1.186x
PostgreSQL pgbench (Scaling Factor: 1 - Clients: 500 - Mode: Read Write) at 1.181x
PostgreSQL pgbench (Scaling Factor: 1 - Clients: 500 - Mode: Read Write - Average Latency) at 1.181x

LuxCoreRender (Scene: Rainbow Colors and Prism - Acceleration: CPU) at 1.173x.

Test Systems:

A

B

C

D

Processor: AMD EPYC 7F52 16-Core @ 3.50GHz (16 Cores / 32 Threads), Motherboard: Supermicro H11DSi-NT v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 64GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe, Monitor: VE228, Network: 2 x Intel 10G X550T

OS: Ubuntu 21.10, Kernel: 5.13.0-19-generic (x86_64), Desktop: GNOME Shell 40.5, Display Server: X Server + Wayland, OpenGL: 4.5 Mesa 21.2.2 (LLVM 12.0.1 256 bits), Vulkan: 1.1.182, Compiler: GCC 11.2.0, 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-bootstrap --enable-cet --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-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-11-ZPT0kp/gcc-11-11.2.0/debian/tmp-gcn/usr --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-build-config=bootstrap-lto-lean --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 schedutil (Boost: Enabled) - CPU Microcode: 0x8301034
Java Notes: OpenJDK Runtime Environment (build 11.0.12+7-Ubuntu-0ubuntu3)
Python Notes: Python 3.9.7
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 IBRS_FW STIBP: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

	A	B	C	D
NWChem - C240 Buckyball (sec)	**6249**	6217	**6182**	6212
Normalized	98.94%	99.45%	100%	99.52%
BRL-CAD - V.P.M (VGR Performance Metric)	**243883**	**246890**	245406	
Normalized	98.78%	100%	99.4%	
ECP-CANDLE - P3B2 (sec)	**925.644**	925.987	**928.633**	926.744
Normalized	100%	99.96%	99.68%	99.88%
Timed GCC Compilation - Time To Compile (sec)	**834.032**	**831.694**	833.296	832.13
Normalized	99.72%	100%	99.81%	99.95%

OpenVKL - vklBenchmark ISPC (Items / Sec)	**52**	**52**	**51**	**52**
Normalized	100%	100%	98.08%	100%
OpenVKL - v.S (Items / Sec)	32	32	32	32
ECP-CANDLE - P3B1 (sec)	**654.725**	648.971	**643.356**	654.497
Normalized	98.26%	99.13%	100%	98.3%
Appleseed - Emily (sec)	**223.350141**	224.96032	225.169673	**226.453861**
Normalized	100%	99.28%	99.19%	98.63%
GNU GMP GMPbench - Total Time (GMPbench Score)	**5315**	5313	5313	**5313**
Normalized	100%	99.97%	99.97%	99.96%
LeelaChessZero - BLAS (Nodes/s)	1642	**1685**	**1479**	1622
Normalized	97.45%	100%	87.77%	96.26%
LeelaChessZero - Eigen (Nodes/s)	1519	**1633**	**1471**	1517
Normalized	93.02%	100%	90.08%	92.9%
Renaissance - A.U.C.T (ms)	19929	20122	**20215**	**19826**
Normalized	99.48%	98.53%	98.07%	100%
Quantum ESPRESSO - AUSURF112 (sec)	396.99	396.29	**395.13**	**397.14**
Normalized	99.53%	99.71%	100%	99.49%
Appleseed - Material Tester (sec)	**185.13305**	185.830833	185.471834	**185.880503**
Normalized	100%	99.62%	99.82%	99.6%
GNU Radio - Hilbert Transform (MiB/s)	**401.6**	**405.9**	402.1	402.6
Normalized	98.94%	100%	99.06%	99.19%
GNU Radio - F.D.F (MiB/s)	846.5	**761.9**	849.9	**864**
Normalized	97.97%	88.18%	98.37%	100%
GNU Radio - IIR Filter (MiB/s)	572.5	**566.5**	567.8	**578.6**
Normalized	98.95%	97.91%	98.13%	100%
GNU Radio - FIR Filter (MiB/s)	**653.2**	651.4	**646.1**	647.9
Normalized	100%	99.72%	98.91%	99.19%
GNU Radio - S.S.C (MiB/s)	**3391**	3337	3339	**3309**
Normalized	100%	98.4%	98.46%	97.57%
GNU Radio - F.B.t.B.F.F (MiB/s)	**450.8**	518.2	523.2	**523.5**
Normalized	86.11%	98.99%	99.94%	100%
JPEG XL libjxl - PNG - 8 (MP/s)	0.81	0.81	0.81	0.81
Blender - Barbershop - CPU-Only	341.81	342.26	**341.41**	**342.38**
Normalized	99.88%	99.75%	100%	99.72%
Timed LLVM Compilation - Unix Makefiles (sec)	**335.626**	335.751	339.467	**350.808**
Normalized	100%	99.96%	98.87%	95.67%
OpenFOAM - Motorbike 60M (sec)	264.66	264.52	**263.38**	**264.69**
Normalized	99.52%	99.57%	100%	99.51%
Timed LLVM Compilation - Ninja (sec)	299.277	**299.978**	299.705	**299.137**
Normalized	99.95%	99.72%	99.81%	100%
SecureMark - SecureMark-TLS	205382	**205334**	**207575**	206091
Normalized	98.94%	98.92%	100%	99.29%
Helsing - 14 digit (sec)	267.234	**266.576**	**267.956**	266.813
Normalized	99.75%	100%	99.48%	99.91%
Blender - Pabellon Barcelona - CPU-Only (sec)	259.17	**258.67**	**259.83**	258.96
Normalized	99.81%	100%	99.55%	99.89%
Numpy Benchmark (Score)	**351.67**	347.27	**338.88**	349.04

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Normalized	100%	98.75%	96.36%	99.25%
Appleseed - Disney Material (sec)	122.625317	124.392365	121.794447	126.276707
Normalized	99.32%	97.91%	100%	96.45%
LuaRadio - Complex Phase (MiB/s)	497.1	512.5	507.8	504.6
Normalized	97%	100%	99.08%	98.46%
LuaRadio - Hilbert Transform (MiB/s)	97.4	97.4	97.4	97.3
Normalized	100%	100%	100%	99.9%
LuaRadio - F.D.F (MiB/s)	377.1	372.3	369.5	375
Normalized	100%	98.73%	97.98%	99.44%
LuaRadio - F.B.t.B.F.F (MiB/s)	460.6	446.9	460.9	425.4
Normalized	99.93%	96.96%	100%	92.3%
Blender - Classroom - CPU-Only (sec)	232.6	233.58	235.6	231.1
Normalized	99.36%	98.94%	98.09%	100%
TNN - CPU - DenseNet (ms)	3157	3144	3152	3153
Normalized	99.58%	100%	99.76%	99.71%
AOM AV1 - Speed 4 Two-Pass - Bosphorus 4K (FPS)	3.75	3.79	3.8	3.78
Normalized	98.68%	99.74%	100%	99.47%
Renaissance - ALS Movie Lens (ms)	8165	8008	8326	8404
Normalized	98.07%	100%	96.18%	95.29%
OpenSSL - SHA256 (byte/s)	22548674150	21862246290	22192533750	22179182190
Normalized	100%	96.96%	98.42%	98.36%
Apache Cassandra - Reads (Op/s)	124837	141964	125421	131780
Normalized	87.94%	100%	88.35%	92.83%
Ngspice - C2670 (sec)	168.869	169.765	170.504	166.074
Normalized	98.34%	97.83%	97.4%	100%
asmFish - 1.H.M.2.D (Nodes/s)	46412228	44632377	46468751	45400632
Normalized	99.88%	96.05%	100%	97.7%
Renaissance - Savina Reactors.IO	10392	10786	10237	10325
Normalized	98.51%	94.91%	100%	99.15%
PostgreSQL pgbench - 100 - 500 - Read Write - Average Latency (ms)	15.52	15.487	15.421	15.491
Normalized	99.36%	99.57%	100%	99.55%
PostgreSQL pgbench - 100 - 500 - Read Write (TPS)	32217	32284	32423	32277
Normalized	99.36%	99.57%	100%	99.55%
PostgreSQL pgbench - 100 - 500 - Read Only - Average Latency (ms)	0.902	0.912	0.922	0.934
Normalized	100%	98.9%	97.83%	96.57%
PostgreSQL pgbench - 100 - 500 - Read Only (TPS)	554442	548201	542035	535062
Normalized	100%	98.87%	97.76%	96.5%
PostgreSQL pgbench - 100 - 1 - Read Only - Average Latency (ms)	0.038	0.038	0.038	0.038
PostgreSQL pgbench - 100 - 1 - Read Only (TPS)	26125	26056	26095	26003
Normalized	100%	99.74%	99.89%	99.53%
PostgreSQL pgbench - 100 - 250 - Read Write - Average Latency (ms)	6.559	6.605	6.579	6.592
Normalized	100%	99.3%	99.7%	99.5%

PostgreSQL pgbench - 100 - 250 - Read Write (TPS)	**38118**	**37852**	38001	37927
Normalized	100%	99.3%	99.69%	99.5%
PostgreSQL pgbench - 100 - 1 - Read Write - Average Latency (ms)	**0.287**	0.286	**0.284**	0.286
Normalized	98.95%	99.3%	100%	99.3%
PostgreSQL pgbench - 100 - 1 - Read Write (TPS)	**3480**	3499	**3521**	3493
Normalized	98.84%	99.38%	100%	99.2%
PostgreSQL pgbench - 100 - 250 - Read Only - Average Latency (ms)	**0.466**	0.464	0.464	**0.463**
Normalized	99.36%	99.78%	99.78%	100%
PostgreSQL pgbench - 100 - 250 - Read Only (TPS)	**536452**	538247	538933	**539686**
Normalized	99.4%	99.73%	99.86%	100%
PostgreSQL pgbench - 100 - 50 - Read Write - Average Latency (ms)	**1.114**	**1.114**	1.113	**1.108**
Normalized	99.46%	99.46%	99.55%	100%
PostgreSQL pgbench - 100 - 50 - Read Write (TPS)	44898	**44893**	44922	**45127**
Normalized	99.49%	99.48%	99.55%	100%
PostgreSQL pgbench - 100 - 100 - Read Write - Average Latency (ms)	**2.393**	2.401	**2.414**	2.394
Normalized	100%	99.67%	99.13%	99.96%
PostgreSQL pgbench - 100 - 100 - Read Write (TPS)	**41797**	41645	**41433**	41779
Normalized	100%	99.64%	99.13%	99.96%
PostgreSQL pgbench - 100 - 50 - Read Only - Average Latency (ms)	**0.103**	**0.102**	**0.102**	**0.102**
Normalized	99.03%	100%	100%	100%
PostgreSQL pgbench - 100 - 50 - Read Only (TPS)	**485159**	**489595**	488382	488259
Normalized	99.09%	100%	99.75%	99.73%
PostgreSQL pgbench - 100 - 100 - Read Only - Average Latency (ms)	**0.204**	**0.205**	**0.204**	**0.204**
Normalized	100%	99.51%	100%	100%
PostgreSQL pgbench - 100 - 100 - Read Only (TPS)	**490976**	**487642**	490149	489530
Normalized	100%	99.32%	99.83%	99.71%
OSPray - San Miguel - Path Tracer (FPS)	**1.88**	**1.88**	**1.88**	**1.87**
Normalized	100%	100%	100%	99.47%
JPEG XL libjxl - PNG - 7 (MP/s)	**7.86**	7.95	**7.97**	7.89
Normalized	98.62%	99.75%	100%	99%
Renaissance - A.S.P (ms)	4174	**3976**	4032	**4178**
Normalized	95.25%	100%	98.6%	95.16%
PostgreSQL pgbench - 1 - 500 - Read Write - Average Latency (ms)	**497.701**	565.773	**587.746**	563.748
Normalized	100%	87.97%	84.68%	88.28%

PostgreSQL pgbench - 1 - 500 - Read Write (TPS)	**1005**	884	**851**	887
Normalized	100%	87.96%	84.68%	88.26%
Ngspice - C7552 (sec)	126.181	**127.204**	127.089	**124.193**
Normalized	98.42%	97.63%	97.72%	100%
PostgreSQL pgbench - 1 - 250 - Read Write - Average Latency (ms)	**133.728**	**138.086**	135.085	135.506
Normalized	100%	96.84%	99%	98.69%
PostgreSQL pgbench - 1 - 250 - Read Write (TPS)	**1869**	**1810**	1851	1845
Normalized	100%	96.84%	99.04%	98.72%
PostgreSQL pgbench - 1 - 50 - Read Write - Average Latency (ms)	**10.734**	10.733	**10.711**	10.716
Normalized	99.79%	99.8%	100%	99.95%
PostgreSQL pgbench - 1 - 50 - Read Write (TPS)	**4658**	4659	**4668**	4666
Normalized	99.79%	99.81%	100%	99.96%
PostgreSQL pgbench - 1 - 500 - Read Only - Average Latency (ms)	0.872	0.874	**0.866**	**0.889**
Normalized	99.31%	99.08%	100%	97.41%
PostgreSQL pgbench - 1 - 500 - Read Only (TPS)	573673	572324	**577533**	**562348**
Normalized	99.33%	99.1%	100%	97.37%
PostgreSQL pgbench - 1 - 100 - Read Write - Average Latency (ms)	28.292	**28.738**	**28.259**	28.345
Normalized	99.88%	98.33%	100%	99.7%
PostgreSQL pgbench - 1 - 100 - Read Write (TPS)	3535	**3480**	**3539**	3528
Normalized	99.89%	98.33%	100%	99.69%
PostgreSQL pgbench - 1 - 250 - Read Only - Average Latency (ms)	0.431	**0.432**	**0.429**	0.431
Normalized	99.54%	99.31%	100%	99.54%
PostgreSQL pgbench - 1 - 250 - Read Only (TPS)	580488	**578469**	**582157**	580507
Normalized	99.71%	99.37%	100%	99.72%
PostgreSQL pgbench - 1 - 1 - Read Write - Average Latency (ms)	0.257	**0.258**	**0.254**	0.256
Normalized	98.83%	98.45%	100%	99.22%
PostgreSQL pgbench - 1 - 1 - Read Write (TPS)	3897	**3876**	**3929**	3900
Normalized	99.19%	98.65%	100%	99.26%
PostgreSQL pgbench - 1 - 1 - Read Only - Average Latency (ms)	**0.034**	**0.034**	**0.035**	**0.034**
Normalized	100%	100%	97.14%	100%
PostgreSQL pgbench - 1 - 1 - Read Only (TPS)	**29125**	29084	**28967**	29028
Normalized	100%	99.86%	99.46%	99.67%
PostgreSQL pgbench - 1 - 100 - Read Only - Average Latency (ms)	**0.192**	0.193	**0.192**	**0.194**
Normalized	100%	99.48%	100%	98.97%

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PostgreSQL pgbench - 1 - 100 - Read Only (TPS)	521657	519120	521028	516354
Normalized	100%	99.51%	99.88%	98.98%
PostgreSQL pgbench - 1 - 50 - Read Only - Average Latency (ms)	0.095	0.097	0.095	0.096
Normalized	100%	97.94%	100%	98.96%
PostgreSQL pgbench - 1 - 50 - Read Only (TPS)	525560	516049	528188	518400
Normalized	99.5%	97.7%	100%	98.15%
High Performance Conjugate Gradient (GFLOP/s)	16.68	16.8433	16.8117	17.0044
Normalized	98.09%	99.05%	98.87%	100%
Apache Cassandra - Writes (Op/s)	146054	149481	148165	148621
Normalized	97.71%	100%	99.12%	99.42%
ONNX Runtime - fcn-resnet101-11 - OpenMP CPU (Inferences/min)	152	149	150	150
Normalized	100%	98.03%	98.68%	98.68%
ONNX Runtime - bertsquad-10 - OpenMP CPU (Inferences/min)	625	616	722	650
Normalized	86.57%	85.32%	100%	90.03%
ONNX Runtime - yolov4 - OpenMP CPU (Inferences/min)	350	347	340	349
Normalized	100%	99.14%	97.14%	99.71%
Timed Erlang/OTP Compilation - Time To Compile (sec)	120.25	120.447	120.832	120.983
Normalized	100%	99.84%	99.52%	99.39%
ONNX Runtime - shufflenet-v2-10 - OpenMP CPU (Inferences/min)	13835	10986	13855	13919
Normalized	99.4%	78.93%	99.54%	100%
ONNX Runtime - super-resolution-10 - OpenMP CPU (Inferences/min)	4800	5499	4967	4718
Normalized	87.29%	100%	90.33%	85.8%
Renaissance - G.A.U.J.F (ms)	2325	2418	2328	2287
Normalized	98.37%	94.59%	98.23%	100%
OpenSCAD - Pistol (sec)	117.187	116.512	117.977	117.151
Normalized	99.42%	100%	98.76%	99.45%
AOM AV1 - Speed 0 Two-Pass - Bosphorus 4K (FPS)	0.18	0.18	0.17	0.18
Normalized	100%	100%	94.44%	100%
AOM AV1 - Speed 4 Two-Pass - Bosphorus 1080p (FPS)	5.85	5.87	5.85	5.77
Normalized	99.66%	100%	99.66%	98.3%
Mobile Neural Network - inception-v3 (ms)	29.955	29.295	30.045	29.241
Normalized	97.62%	99.82%	97.32%	100%
Mobile Neural Network - mobilenet-v1-1.0 (ms)	3.384	3.383	3.404	3.398
Normalized	99.97%	100%	99.38%	99.56%
Mobile Neural Network - MobileNetV2_224 (ms)	4.892	4.98	5.803	5.021
Normalized	100%	98.23%	84.3%	97.43%

Mobile Neural Network - SqueezeNetV1.0 (ms)	8.652	7.881	8.658	8.577
Normalized	91.09%	100%	91.03%	91.89%
Mobile Neural Network - resnet-v2-50 (ms)	24.445	24.387	24.686	24.48
Normalized	99.76%	100%	98.79%	99.62%
Mobile Neural Network - squeezenetv1.1 (ms)	6.6	6.653	6.636	6.545
Normalized	99.17%	98.38%	98.63%	100%
Mobile Neural Network - mobilenetV3 (ms)	3.799	3.831	3.871	3.817
Normalized	100%	99.16%	98.14%	99.53%
AOM AV1 - Speed 6 Two-Pass - Bosphorus 4K (FPS)	7.29	7.15	7.06	7.08
Normalized	100%	98.08%	96.84%	97.12%
Blender - Fishy Cat - CPU-Only (sec)	105.77	105.61	105.77	105.84
Normalized	99.85%	100%	99.85%	99.78%
VP9 libvpx Encoding - Speed 0 - Bosphorus 4K (FPS)	5.85	5.84	5.75	5.87
Normalized	99.66%	99.49%	97.96%	100%
Timed MrBayes Analysis - P.P.A (sec)	104.234	104.336	104.27	105.034
Normalized	100%	99.9%	99.97%	99.24%
SVT-AV1 - Preset 4 - Bosphorus 4K (FPS)	1.611	1.603	1.599	1.606
Normalized	100%	99.5%	99.26%	99.69%
Timed HMMer Search - P.D.S (sec)	100.066	100.272	99.996	100.217
Normalized	99.93%	99.72%	100%	99.78%
Apache HTTP Server - 1000	104416	104544	103843	104279
Normalized	99.88%	100%	99.33%	99.75%
Renaissance - I.M.D.S (ms)	5278	5249	5322	5263
Normalized	99.44%	100%	98.61%	99.73%
Apache HTTP Server - 500 (Reqs/sec)	103813	104247	104137	104744
Normalized	99.11%	99.53%	99.42%	100%
nginx - 1000 (Reqs/sec)	151655	151880	149229	149645
Normalized	99.85%	100%	98.25%	98.53%
nginx - 200 (Reqs/sec)	154272	152931	152122	151621
Normalized	100%	99.13%	98.61%	98.28%
nginx - 500 (Reqs/sec)	151387	152313	151991	152906
Normalized	99.01%	99.61%	99.4%	100%
nginx - 20 (Reqs/sec)	154119	154503	154065	154316
Normalized	99.75%	100%	99.72%	99.88%
nginx - 100 (Reqs/sec)	152400	153477	152392	152662
Normalized	99.3%	100%	99.29%	99.47%
nginx - 1 (Reqs/sec)	58574	58947	58558	58652
Normalized	99.37%	100%	99.34%	99.5%
Apache HTTP Server - 200 (Reqs/sec)	111393	111903	111050	111859
Normalized	99.54%	100%	99.24%	99.96%
Apache HTTP Server - 100 (Reqs/sec)	95744	95782	95516	96103
Normalized	99.63%	99.67%	99.39%	100%
Apache HTTP Server - 1 (Reqs/sec)	8316	7486	7692	7893
Normalized	100%	90.01%	92.49%	94.91%
Apache HTTP Server - 20 (Reqs/sec)	41568	43419	43492	42383

Normalized	95.58%	99.83%	100%	97.45%
Sysbench - CPU (Events/sec)	32725	32729	32726	32722
Normalized	99.99%	100%	99.99%	99.98%
OSPray - XFrog Forest - Path Tracer (FPS)	2.51	2.52	2.52	2.51
Normalized	99.6%	100%	100%	99.6%
Intel Open Image Denoise - RTLightmap.hdr.4096x4096 (Images / Sec)	0.34	0.34	0.34	0.34
Blender - BMW27 - CPU-Only (sec)	80.98	80.62	81.04	80.41
Normalized	99.3%	99.74%	99.22%	100%
NCNN - CPU - regnety_400m (ms)	20.34	20.51	19.96	20.27
Normalized	98.13%	97.32%	100%	98.47%
NCNN - CPU - squeezenet_ssd (ms)	21.28	21.11	20.87	19.14
Normalized	89.94%	90.67%	91.71%	100%
NCNN - CPU - yolov4-tiny (ms)	24.6	24.16	24.2	24.87
Normalized	98.21%	100%	99.83%	97.15%
NCNN - CPU - resnet50 (ms)	20.05	20.04	19.94	19.78
Normalized	98.65%	98.7%	99.2%	100%
NCNN - CPU - alexnet (ms)	6.66	6.62	6.62	7.21
Normalized	99.4%	100%	100%	91.82%
NCNN - CPU - resnet18 (ms)	10.46	10.48	10.62	10.66
Normalized	100%	99.81%	98.49%	98.12%
NCNN - CPU - vgg16 (ms)	28.43	28.58	28.6	28.79
Normalized	100%	99.48%	99.41%	98.75%
NCNN - CPU - googlenet (ms)	16.9	16.8	16.79	17.49
Normalized	99.35%	99.94%	100%	96%
NCNN - CPU - blazeface (ms)	3.4	3.37	3.33	3.41
Normalized	97.94%	98.81%	100%	97.65%
NCNN - CPU - efficientnet-b0 (ms)	10.97	10.93	11.03	11.6
Normalized	99.64%	100%	99.09%	94.22%
NCNN - CPU - mnasnet (ms)	7.15	7.58	7.31	9.05
Normalized	100%	94.33%	97.81%	79.01%
NCNN - CPU - shufflenet-v2 (ms)	9.26	9.15	8.83	10.76
Normalized	95.36%	96.5%	100%	82.06%
NCNN - CPU-v3-v3 - mobilenet-v3 (ms)	7.43	7.82	7.48	7.86
Normalized	100%	95.01%	99.33%	94.53%
NCNN - CPU-v2-v2 - mobilenet-v2 (ms)	8.16	8.31	7.96	8.36
Normalized	97.55%	95.79%	100%	95.22%
NCNN - CPU - mobilenet (ms)	19.64	19.96	19.68	16.83
Normalized	85.69%	84.32%	85.52%	100%
Xmrig - Monero - 1M (H/s)	13522	13573	13559	13619
Normalized	99.28%	99.66%	99.56%	100%
ASKAP - tConvolve MT - Degridding (Million Grid Points/sec)	5594	5508	5511	5493
Normalized	100%	98.45%	98.51%	98.19%
ASKAP - tConvolve MT - Gridding (Million Grid Points/sec)	3600	3544	3547	3535
Normalized	100%	98.46%	98.54%	98.22%
Chaos Group V-RAY - CPU (vsamples)	19484	19914	19768	
Normalized	97.84%	100%	99.27%	

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Timed Godot Game Engine Compilation - Time To Compile (sec)	73.111	72.531	72.889	72.782
Normalized	99.21%	100%	99.51%	99.66%
Xmrig - Wownero - 1M (H/s)	14146	14149	14164	14184
Normalized	99.73%	99.75%	99.86%	100%
Renaissance - Scala Dotty (ms)	884.6	884.9	1005	889.7
Normalized	100%	99.97%	88.04%	99.43%
NAMD - ATPase Simulation - 327,506 Atoms (days/ns)	1.13482	1.13454	1.13262	1.13357
Normalized	99.81%	99.83%	100%	99.92%
simdjson - PartialTweets (GB/s)	3.51	3.51	3.51	3.51
simdjson - DistinctUserID (GB/s)	3.95	3.95	3.96	3.95
Normalized	99.75%	99.75%	100%	99.75%
Renaissance - Apache Spark ALS	1660	1727	1662	1713
Normalized	100%	96.17%	99.89%	96.95%
LuxCoreRender - Orange Juice - CPU (M samples/sec)	5.14	4.98	5.01	5
Normalized	100%	96.89%	97.47%	97.28%
LuxCoreRender - Danish Mood - CPU (M samples/sec)	2.27	2.18	2.28	2.22
Normalized	99.56%	95.61%	100%	97.37%
LuxCoreRender - LuxCore Benchmark - CPU (M samples/sec)	2.55	2.58	2.52	2.5
Normalized	98.84%	100%	97.67%	96.9%
LuxCoreRender - DLSC - CPU (M samples/sec)	3.18	3.27	3.17	3.26
Normalized	97.25%	100%	96.94%	99.69%
Timed Wasmer Compilation - Time To Compile (sec)	59.821	59.382	61.419	60.426
Normalized	99.27%	100%	96.68%	98.27%
Facebook RocksDB - Rand Fill (Op/s)	636626	643776	631805	653731
Normalized	97.38%	98.48%	96.65%	100%
Facebook RocksDB - Read While Writing (Op/s)	2844661	3107833	2849465	2810480
Normalized	91.53%	100%	91.69%	90.43%
Facebook RocksDB - Rand Fill Sync (Op/s)	150877	150802	150417	149765
Normalized	100%	99.95%	99.7%	99.26%
Facebook RocksDB - R.R.W.R (Op/s)	1981347	1941074	1962192	1950083
Normalized	100%	97.97%	99.03%	98.42%
Facebook RocksDB - Update Rand (Op/s)	522631	524704	523413	525165
Normalized	99.52%	99.91%	99.67%	100%
Facebook RocksDB - Rand Read	97009030	95632732	96077569	94296782
Normalized	100%	98.58%	99.04%	97.2%
OpenSSL - RSA4096 (verify/s)	298680	298909	298994	298990
Normalized	99.89%	99.97%	100%	100%
OpenSSL - RSA4096 (sign/s)	4608	4610	4613	4613
Normalized	99.9%	99.94%	100%	100%
simdjson - Kostya (GB/s)	2.44	2.4	2.46	2.43
Normalized	99.19%	97.56%	100%	98.78%
JPEG XL Decoding libjxl - 1 (MP/s)	51.15	51.98	52.52	51.76

Normalized	97.39%	98.97%	100%	98.55%
libavif avifenc - 0 (sec)	54.876	54.155	53.83	55.272
Normalized	98.09%	99.4%	100%	97.39%
VP9 libvpx Encoding - Speed 5 - Bosphorus 4K (FPS)	10.92	11.4	11.27	11.57
Normalized	94.38%	98.53%	97.41%	100%
OpenSCAD - Mini-ITX Case (sec)	53.37	53.421	53.289	53.335
Normalized	99.85%	99.75%	100%	99.91%
simdjson - LargeRand (GB/s)	0.9	0.9	0.9	0.9
VP9 libvpx Encoding - Speed 0 - Bosphorus 1080p (FPS)	12.27	12.15	12.19	12.15
Normalized	100%	99.02%	99.35%	99.02%
Embree - Pathtracer ISPC - Asian Dragon Obj (FPS)	17.3294	17.2741	17.3047	17.309
Normalized	100%	99.68%	99.86%	99.88%
OSPray - XFrog Forest - SciVis (FPS)	4.72	4.72	4.72	4.72
AOM AV1 - Speed 6 Realtime - Bosphorus 4K (FPS)	12.83	12.82	12.89	12.89
Normalized	99.53%	99.46%	100%	100%
Timed Linux Kernel Compilation - Time To Compile (sec)	48.113	47.227	48.33	47.599
Normalized	98.16%	100%	97.72%	99.22%
Renaissance - Rand Forest (ms)	903.2	876.9	891.3	876.8
Normalized	97.08%	99.99%	98.37%	100%
ASTC Encoder - Exhaustive (sec)	42.1821	42.1897	42.1944	42.1761
Normalized	99.99%	99.97%	99.96%	100%
AOM AV1 - Speed 6 Two-Pass - Bosphorus 1080p (FPS)	17.74	17.23	17.27	17.15
Normalized	100%	97.13%	97.35%	96.67%
Embree - Pathtracer - Asian Dragon Obj (FPS)	20.3608	20.3787	20.3231	20.4835
Normalized	99.4%	99.49%	99.22%	100%
Facebook RocksDB - Seq Fill (Op/s)	720049	734629	723670	725238
Normalized	98.02%	100%	98.51%	98.72%
Intel Open Image Denoise - RT.hdr_alb_nrm.3840x2160 (Images / Sec)	0.69	0.69	0.69	0.69
Intel Open Image Denoise - RT.ldr_alb_nrm.3840x2160 (Images / Sec)	0.69	0.69	0.69	0.69
SVT-HEVC - 1 - Bosphorus 1080p	14.21	14.18	14.17	14.14
Normalized	100%	99.79%	99.72%	99.51%
AOM AV1 - Speed 0 Two-Pass - Bosphorus 1080p (FPS)	0.48	0.48	0.47	0.48
Normalized	100%	100%	97.92%	100%
Chia Blockchain VDF - S.A.O (IPS)	117200	121500	117100	119600
Normalized	96.46%	100%	96.38%	98.44%
OpenFOAM - Motorbike 30M (sec)	32.73	32.56	32.09	31.81
Normalized	97.19%	97.7%	99.13%	100%
Renaissance - F.H.R (ms)	2804	2873	2888	2831
Normalized	100%	97.59%	97.11%	99.04%

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ECP-CANDLE - P1B2 (sec)	**37.952**	37.629	**37.34**	37.412
Normalized	98.39%	99.23%	100%	99.81%
libavif avifenc - 6, Lossless (sec)	37.423	**38.027**	37.198	**37.052**
Normalized	99.01%	97.44%	99.61%	100%
SVT-AV1 - Preset 8 - Bosphorus 4K (FPS)	**16.662**	16.649	**16.553**	16.574
Normalized	100%	99.92%	99.35%	99.47%
Xcompact3d Incompact3d - i.i.1.C.P.D (sec)	36.0911446	**35.2049751**	**36.1263733**	35.2909126
Normalized	97.54%	100%	97.45%	99.76%
Embree - Pathtracer ISPC - Crown (FPS)	**17.8444**	**17.9471**	17.8879	17.8512
Normalized	99.43%	100%	99.67%	99.47%
Botan - AES-256 - Decrypt (MiB/s)	5192	**5185**	5190	**5195**
Normalized	99.95%	99.82%	99.91%	100%
Botan - AES-256 (MiB/s)	5211	**5183**	**5213**	5190
Normalized	99.97%	99.43%	100%	99.56%
OSPray - San Miguel - SciVis (FPS)	24.39	24.39	24.39	24.39
Sysbench - RAM / Memory (MiB/sec)	2965	2972	**2964**	**2973**
Normalized	99.71%	99.96%	99.69%	100%
C-Ray - Total Time - 4.1.R.P.P (sec)	**33.395**	33.405	**33.459**	33.407
Normalized	100%	99.97%	99.81%	99.96%
Chia Blockchain VDF - Square Plain C++ (IPS)	**150100**	**149700**	150000	**150100**
Normalized	100%	99.73%	99.93%	100%
Embree - Pathtracer ISPC - Asian Dragon (FPS)	19.2697	**19.3379**	19.0974	**19.0713**
Normalized	99.65%	100%	98.76%	98.62%
SVT-AV1 - Preset 4 - Bosphorus 1080p (FPS)	**4.982**	**5.026**	5.003	4.989
Normalized	99.12%	100%	99.54%	99.26%
QuantLib (MFLOPS)	**2626**	2615	**2589**	2604
Normalized	100%	99.58%	98.59%	99.14%
OSPray - NASA Streamlines - Path Tracer (FPS)	7.19	7.19	7.19	7.19
Embree - Pathtracer - Crown (FPS)	19.7658	19.8041	**19.717**	**19.9637**
Normalized	99.01%	99.2%	98.76%	100%
Timed FFmpeg Compilation - Time To Compile (sec)	**31.001**	30.858	30.961	**30.778**
Normalized	99.28%	99.74%	99.41%	100%
Cpuminer-Opt - Q.S.2.P (kH/s)	131500	**132410**	132130	**130090**
Normalized	99.31%	100%	99.79%	98.25%
Cpuminer-Opt - T.S.2.O (kH/s)	266640	**265370**	266840	**269680**
Normalized	98.87%	98.4%	98.95%	100%
Cpuminer-Opt - LBC, LBRY Credits (kH/s)	**40450**	40810	40800	**40820**
Normalized	99.09%	99.98%	99.95%	100%
Cpuminer-Opt - Deepcoin (kH/s)	**14960**	**15050**	14970	14990
Normalized	99.4%	100%	99.47%	99.6%
Cpuminer-Opt - Blake-2 S (kH/s)	**590120**	**580970**	586380	586560
Normalized	100%	98.45%	99.37%	99.4%
Cpuminer-Opt - Myriad-Groestl (kH/s)	7974	**7949**	7961	**7977**

	Normalized	99.97%	99.64%	99.8%	100%
Cpuminer-Opt - Skeincoin (kH/s)	136560	136480	136590	135430
	Normalized	99.98%	99.92%	100%	99.15%
Cpuminer-Opt - Ringcoin (kH/s)	1864	1819	2014	1812
	Normalized	92.52%	90.32%	100%	89.97%
Cpuminer-Opt - Garlicoin (kH/s)	1528	1586	1559	1710
	Normalized	89.37%	92.76%	91.2%	100%
Cpuminer-Opt - x25x (kH/s)	543.96	543.58	529.75	536.74
	Normalized	100%	99.93%	97.39%	98.67%
Botan - ChaCha20Poly1305 - Decrypt (MiB/s)	745.229	745.261	748.043	746.984
	Normalized	99.62%	99.63%	100%	99.86%
Botan - ChaCha20Poly1305 (MiB/s)	752.58	753.482	753.052	753.542
	Normalized	99.87%	99.99%	99.93%	100%
Cpuminer-Opt - Magi (kH/s)	872.74	865.65	863.62	864.06
	Normalized	100%	99.19%	98.96%	99.01%
Botan - Blowfish - Decrypt (MiB/s)	373.929	393.96	393.819	393.33
	Normalized	94.92%	100%	99.96%	99.84%
Botan - Blowfish (MiB/s)	374.672	394.704	394.833	394.492
	Normalized	94.89%	99.97%	100%	99.91%
Botan - Twofish - Decrypt (MiB/s)	332.674	332.781	332.835	332.94
	Normalized	99.92%	99.95%	99.97%	100%
Botan - Twofish (MiB/s)	328.028	328.129	327.992	327.858
	Normalized	99.97%	100%	99.96%	99.92%
Embree - Pathtracer - Asian Dragon (FPS)	20.9192	21.2924	20.8512	20.8215
	Normalized	98.25%	100%	97.93%	97.79%
Botan - CAST-256 - Decrypt (MiB/s)	136.993	136.963	136.85	137.025
	Normalized	99.98%	99.95%	99.87%	100%
Botan - CAST-256 (MiB/s)	136.899	136.883	136.733	136.912
	Normalized	99.99%	99.98%	99.87%	100%
Botan - KASUMI - Decrypt (MiB/s)	86.995	87.096	86.945	87.006
	Normalized	99.88%	100%	99.83%	99.9%
Botan - KASUMI (MiB/s)	89.862	89.806	89.821	89.842
	Normalized	100%	99.94%	99.95%	99.98%
Stress-NG - NUMA (Bogo Ops/s)	295.14	299.07	311.37	301.29
	Normalized	94.79%	96.05%	100%	96.76%
Stress-NG - IO_uring (Bogo Ops/s)	130359	129816	137570	131254
	Normalized	94.76%	94.36%	100%	95.41%
Stress-NG - MMAP (Bogo Ops/s)	256.62	256.55	256.45	255.29
	Normalized	100%	99.97%	99.93%	99.48%
Stress-NG - S.V.M.P (Bogo Ops/s)	3813479	3824110	3828562	3794218
	Normalized	99.61%	99.88%	100%	99.1%
Stress-NG - Memory Copying (Bogo Ops/s)	4389	4421	4414	4384
	Normalized	99.27%	100%	99.83%	99.15%
Stress-NG - Malloc (Bogo Ops/s)	338162843	338408972	337236125	339623981
	Normalized	99.57%	99.64%	99.3%	100%
Stress-NG - MEMFD (Bogo Ops/s)	706.5	706	706.22	706.3
	Normalized	100%	99.93%	99.96%	99.97%
Stress-NG - SENDFILE (Bogo Ops/s)	325878	326781	325627	326904
	Normalized	99.69%	99.96%	99.61%	100%
Stress-NG - CPU Cache (Bogo Ops/s)	144.39	142.79	154.72	156.73

Normalized	92.13%	91.11%	98.72%	100%
Stress-NG - G.Q.D.S (Bogo Ops/s)	281.2	276.8	277.5	280.83
Normalized	100%	98.44%	98.68%	99.87%
Stress-NG - G.C.S.F (Bogo Ops/s)	2698915	2067583	2695017	2643031
Normalized	100%	76.61%	99.86%	97.93%
Stress-NG - Context Switching (Bogo Ops/s)	7581039	7456534	7474093	7443653
Normalized	100%	98.36%	98.59%	98.19%
Stress-NG - Socket Activity (Bogo	10652	10718	10734	10746
Normalized	99.12%	99.74%	99.89%	100%
Stress-NG - Vector Math (Bogo Ops/s)	91516	91525	91528	91525
Normalized	99.99%	100%	100%	100%
Stress-NG - Matrix Math (Bogo Ops/s)	78189	77266	77864	78234
Normalized	99.94%	98.76%	99.53%	100%
Stress-NG - Semaphores (Bogo	2368813	2366432	2368622	2370631
Normalized	99.92%	99.82%	99.92%	100%
Stress-NG - CPU Stress (Bogo Ops/s)	46336	46471	46608	46564
Normalized	99.42%	99.7%	100%	99.9%
Stress-NG - Forking (Bogo Ops/s)	46396	45983	45813	46157
Normalized	100%	99.11%	98.75%	99.49%
Stress-NG - Crypto (Bogo Ops/s)	4593	4595	4595	4594
Normalized	99.96%	100%	100%	99.98%
Stress-NG - Atomic (Bogo Ops/s)	400787	400262	401960	400423
Normalized	99.71%	99.58%	100%	99.62%
Google SynthMark - VoiceMark_100 (Voices)	694.791	693.633	694.297	693.943
Normalized	100%	99.83%	99.93%	99.88%
PHPBench - P.B.S (Score)	671804	678069	670281	679880
Normalized	98.81%	99.73%	98.59%	100%
Renaissance - Apache Spark Bayes (ms)	690.4	772.6	719.7	779.9
Normalized	100%	89.36%	95.93%	88.52%
libavif avifenc - 2 (sec)	29.365	28.909	29.331	29.245
Normalized	98.45%	100%	98.56%	98.85%
Stockfish - Total Time (Nodes/s)	48524647	49976300	47479804	47751831
Normalized	97.1%	100%	95%	95.55%
AOM AV1 - Speed 6 Realtime - Bosphorus 1080p (FPS)	21.9	21.95	21.95	21.95
Normalized	99.77%	100%	100%	100%
Timed Mesa Compilation - Time To Compile (sec)	27.594	27.419	27.625	27.218
Normalized	98.64%	99.27%	98.53%	100%
Natron - Spaceship (FPS)	3.9	3.8	3.8	4.1
Normalized	95.12%	92.68%	92.68%	100%
JPEG XL libjxl - PNG - 5 (MP/s)	51.84	52.21	52.32	52.53
Normalized	98.69%	99.39%	99.6%	100%
Cython Benchmark - N-Queens (sec)	26.19	25.905	25.716	25.967
Normalized	98.19%	99.27%	100%	99.03%
JPEG XL Decoding libjxl - All (MP/s)	262.97	276.19	286.01	275.56
Normalized	91.94%	96.57%	100%	96.35%
dav1d - C.1.1.b (FPS)	444.53	446.95	446.07	445.75
Normalized	99.46%	100%	99.8%	99.73%

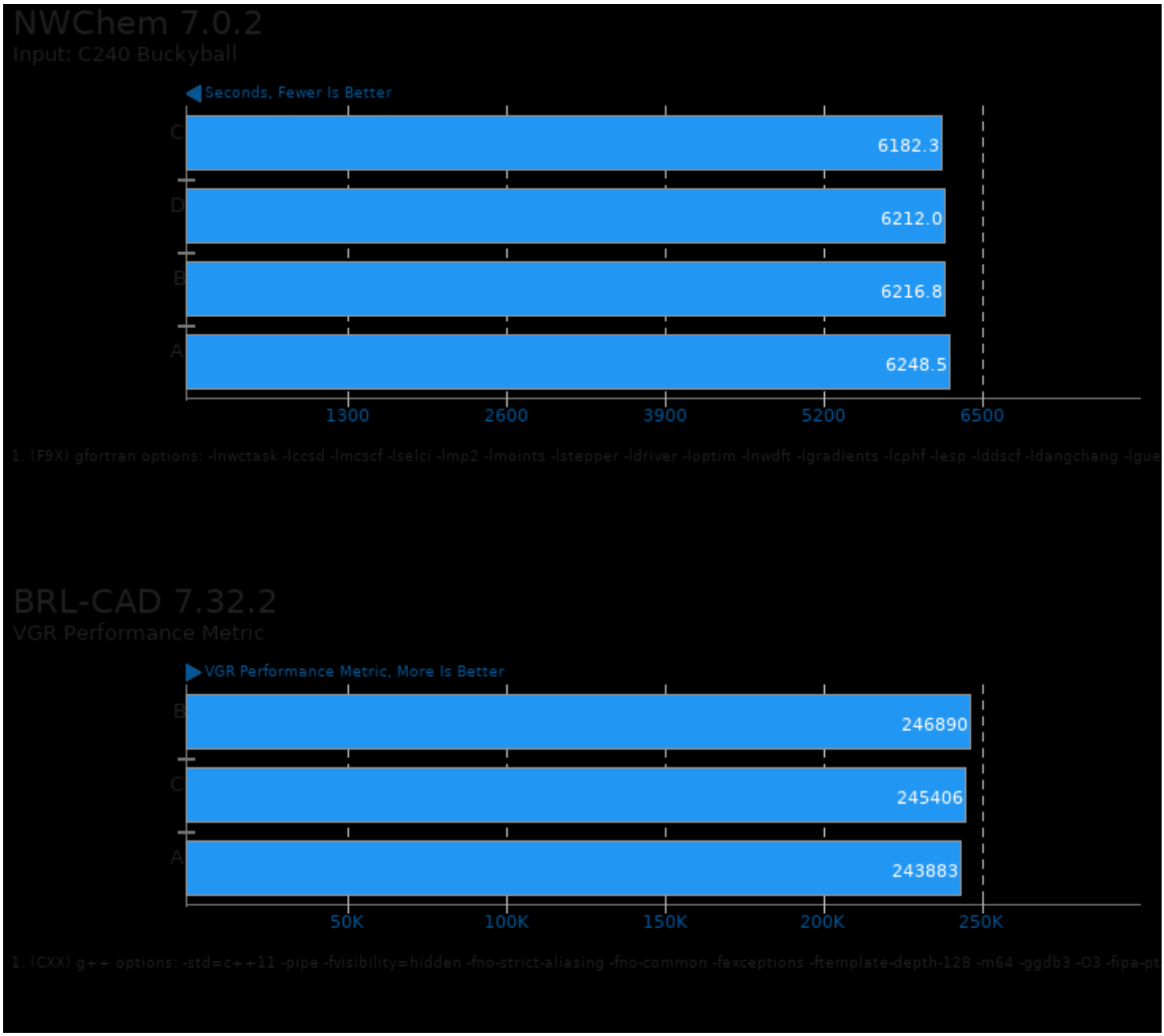
Pennant - sedovbig (Hydro Cycle Time - sec)	**24.91585**	24.78892	**24.69115**	24.74505
Normalized	99.1%	99.61%	100%	99.78%
libjpeg-turbo tjbench - D.T (Megapixels/sec)	200.781752	**200.393346**	200.715385	**200.87627**
Normalized	99.95%	99.76%	99.92%	100%
C-Blosc - blosclz (MB/s)	**22706**	23099	**23169**	22943
Normalized	98%	99.7%	100%	99.02%
VP9 libvpx Encoding - Speed 5 - Bosphorus 1080p (FPS)	**26.77**	**26.26**	26.6	26.41
Normalized	100%	98.09%	99.36%	98.66%
Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec)	**704458**	709849	**710085**	706363
Normalized	99.21%	99.97%	100%	99.48%
Kripke (Throughput FoM)	**154286200**	156477700	**168730500**	162211600
Normalized	91.44%	92.74%	100%	96.14%
OpenSCAD - L.P.C.S (sec)	**21.484**	21.272	21.364	**21.238**
Normalized	98.85%	99.84%	99.41%	100%
dav1d - Chimera 1080p (FPS)	**558.94**	561.7	**564.18**	561.87
Normalized	99.07%	99.56%	100%	99.59%
VOSK Speech Recognition Toolkit	**20.482**	20.449	20.396	**20.355**
Normalized	99.38%	99.54%	99.8%	100%
TNN - CPU - MobileNet v2 (ms)	**289.415**	288.876	**288.63**	289.096
Normalized	99.73%	99.91%	100%	99.84%
CloverLeaf - L.E.H (sec)	**19.36**	**19.23**	19.28	19.33
Normalized	99.33%	100%	99.74%	99.48%
JPEG XL libjxl - JPEG - 5 (MP/s)	**69.61**	70.81	**71.55**	70.85
Normalized	97.29%	98.97%	100%	99.02%
TNN - CPU - SqueezeNet v1.1 (ms)	266.958	**266.849**	266.854	**267.216**
Normalized	99.96%	100%	100%	99.86%
ASKAP - tConvolve MPI - Gridding (Mpix/sec)	16400	16400	16400	16400
ASKAP - tConvolve MPI - Degridding (Mpix/sec)	**13456**	**13456**	**13810**	**13456**
Normalized	97.44%	97.44%	100%	97.44%
AOM AV1 - Speed 8 Realtime - Bosphorus 4K (FPS)	35	**34.74**	35.16	**35.19**
Normalized	99.46%	98.72%	99.91%	100%
LuxCoreRender - R.C.a.P - CPU (M samples/sec)	8.99	**8.91**	9.47	**10.45**
Normalized	86.03%	85.26%	90.62%	100%
Redis - LPUSH (Reqs/sec)	**1329792**	1342642	1333524	**1373842**
Normalized	96.79%	97.73%	97.07%	100%
ASKAP - H.C.O (Iterations/sec)	**487.805**	**480.769**	483.092	**480.769**
Normalized	100%	98.56%	99.03%	98.56%
Redis - SET (Reqs/sec)	**1404530**	1471694	1513098	**1532836**
Normalized	91.63%	96.01%	98.71%	100%
Redis - LPOP (Reqs/sec)	**2140425**	1403554	**1380471**	1418239
Normalized	100%	65.57%	64.5%	66.26%
Redis - SADD (Reqs/sec)	1684952	**1763702**	**1638807**	1670865
Normalized	95.53%	100%	92.92%	94.74%
dav1d - Summer Nature 4K (FPS)	245.29	**248.77**	247.21	**244.28**

AMD EPYC Rome

Normalized	98.6%	100%	99.37%	98.2%
JPEG XL libjxl - JPEG - 7 (MP/s)	68.87	70.65	70.74	70.58
Normalized	97.36%	99.87%	100%	99.77%
Redis - GET (Reqs/sec)	1956953	1872665	1769912	1845036
Normalized	100%	95.69%	90.44%	94.28%
FLAC Audio Encoding - WAV To FLAC (sec)	15.213	15.215	15.231	15.212
Normalized	99.99%	99.98%	99.88%	100%
Pennant - leblancbig (Hydro Cycle Time - sec)	14.71975	14.58812	14.68187	14.54555
Normalized	98.82%	99.71%	99.07%	100%
OSPray - M.R - SciVis (FPS)	15.87	15.625	15.625	15.87
Normalized	100%	98.46%	98.46%	100%
AOM AV1 - Speed 9 Realtime - Bosphorus 4K (FPS)	48.73	48.16	48	46.38
Normalized	100%	98.83%	98.5%	95.18%
ASKAP - tConvolve OpenMP - Degridding (Million Grid Points/sec)	6339	6051	6339	6192
Normalized	100%	95.45%	100%	97.67%
ASKAP - tConvolve OpenMP - Gridding (Million Grid Points/sec)	6827	6656	6827	6827
Normalized	100%	97.5%	100%	100%
JPEG XL libjxl - JPEG - 8 (MP/s)	26.16	26.4	26.54	26.31
Normalized	98.57%	99.47%	100%	99.13%
SVT-AV1 - Preset 8 - Bosphorus 1080p (FPS)	56.35	56.757	56.205	56.962
Normalized	98.93%	99.64%	98.67%	100%
libavif avifenc - 6 (sec)	11.162	10.926	11.006	10.961
Normalized	97.89%	100%	99.27%	99.68%
OpenSCAD - P.M.S (sec)	10.598	10.582	10.484	10.474
Normalized	98.83%	98.98%	99.9%	100%
Xcompact3d Incompact3d - i.i.1.C.P.D (sec)	8.85260391	8.9701004	8.94024277	8.92117882
Normalized	100%	98.69%	99.02%	99.23%
ASTC Encoder - Thorough (sec)	9.327	9.3121	9.3619	9.3172
Normalized	99.84%	100%	99.47%	99.95%
OSPray - NASA Streamlines - SciVis (FPS)	33.33	33.33	33.33	33.33
AOM AV1 - Speed 8 Realtime - Bosphorus 1080p (FPS)	85.73	83.44	83.49	86.88
Normalized	98.68%	96.04%	96.1%	100%
dav1d - S.N.1 (FPS)	511.36	510.59	509.25	508.23
Normalized	100%	99.85%	99.59%	99.39%
LULESH (z/s)	8623	8573	8663	8682
Normalized	99.31%	98.74%	99.77%	100%
libavif avifenc - 10, Lossless (sec)	6.481	6.459	6.423	6.443
Normalized	99.11%	99.44%	100%	99.69%
AOM AV1 - Speed 9 Realtime - Bosphorus 1080p (FPS)	100.5	98.24	99.97	100.75
Normalized	99.75%	97.51%	99.23%	100%
Smallpt - G.I.R.1.S (sec)	5.661	5.62	5.63	5.617
Normalized	99.22%	99.95%	99.77%	100%

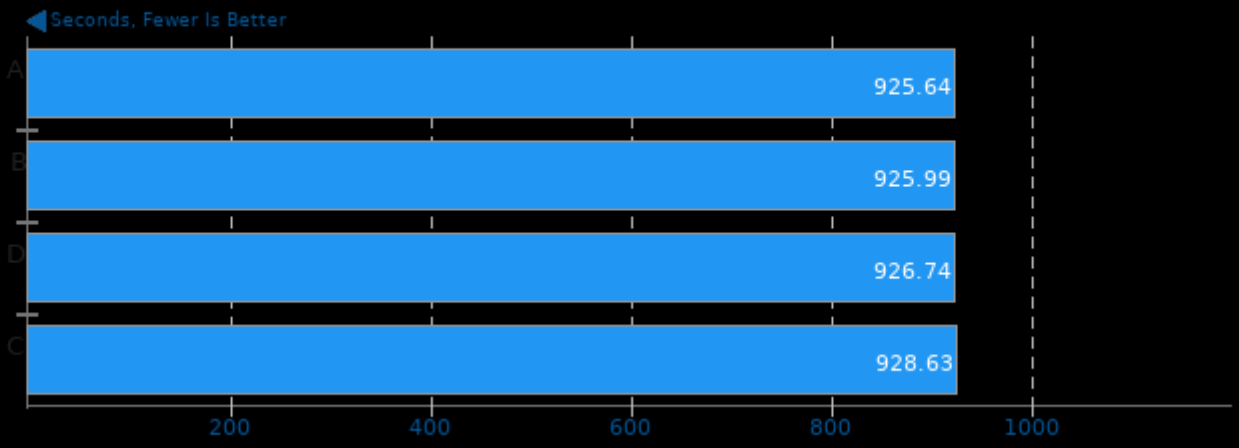
AMD EPYC Rome

TNN - CPU - SqueezeNet v2 (ms)	**76.418**	77.526	**78.241**	77.547
Normalized	100%	98.57%	97.67%	98.54%
OpenSCAD - Retro Car (sec)	**5.445**	5.45	5.452	**5.453**
Normalized	100%	99.91%	99.87%	99.85%
ASTC Encoder - Medium (sec)	4.5472	**4.534**	**4.5525**	4.5354
Normalized	99.71%	100%	99.59%	99.97%
SVT-HEVC - 7 - Bosphorus 1080p	174.52	176.42	**176.94**	**174.27**
Normalized	98.63%	99.71%	100%	98.49%
libavif avifenc - 10 (sec)	**3.725**	**3.657**	3.719	3.688
Normalized	98.17%	100%	98.33%	99.16%
SVT-VP9 - V.Q.O - Bosphorus 1080p (FPS)	**223.16**	**225.78**	224.39	225.52
Normalized	98.84%	100%	99.38%	99.88%
Helsing - 12 digit (sec)	**3.011**	3.001	**2.984**	3.002
Normalized	99.1%	99.43%	100%	99.4%
SVT-VP9 - VMAF Optimized - Bosphorus 1080p (FPS)	**265.49**	272.58	**275.08**	266.6
Normalized	96.51%	99.09%	100%	96.92%
SVT-VP9 - P.S.O - Bosphorus 1080p (FPS)	282.43	283.76	**280.67**	**286.32**
Normalized	98.64%	99.11%	98.03%	100%
SVT-HEVC - 10 - Bosphorus 1080p (FPS)	336.89	**342.08**	337.84	**336.13**
Normalized	98.48%	100%	98.76%	98.26%
OSPray - M.R - Path Tracer (FPS)	250	250	250	250


NWChem 7.0.2
Input: C240 Buckyball
Seconds, Fewer Is Better
C
6182.3
D
6212.0
B
6216.8
A
6248.5
1300
2600
3900
5200
6500
1. (F9X) gfortran options: -lnwctask -lccsd -lmcscf -lselci -lmp2 -lmoints -lstepper -ldriver -loptim -lnwdft -lgradients -lcphf -lesp -lddscf -ldangchang -lgue
BRL-CAD 7.32.2
VGR Performance Metric
VGR Performance Metric, More Is Better
B
246890
C
245406
A
243883
50K
100K
150K
200K
250K
1. (CXX) g++ options: -std=c++11 -pipe -fvisibility=hidden -fno-strict-aliasing -fno-common -fexceptions -ftemplate-depth-128 -m64 -ggdb3 -O3 -fipa-pt

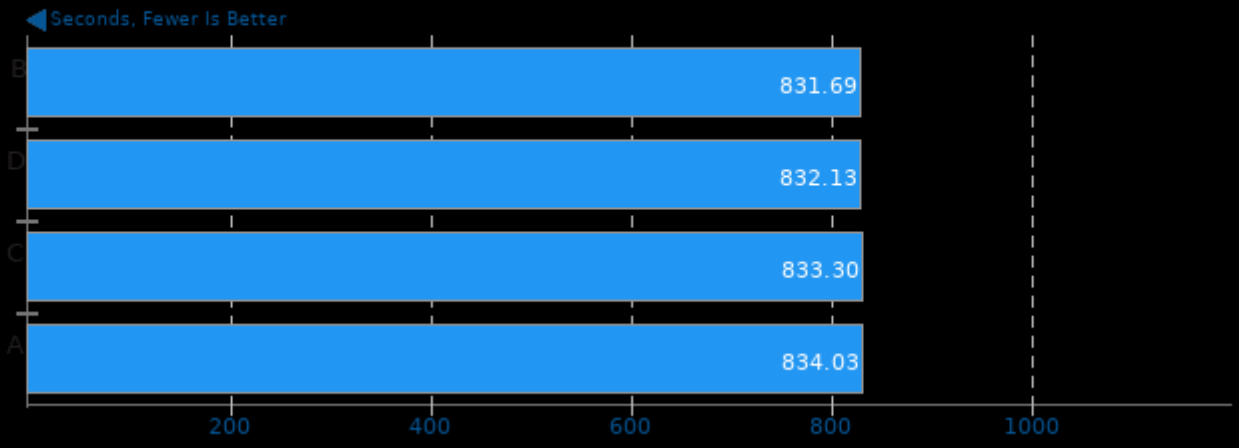
ECP-CANDLE 0.4

Benchmark: P3B2



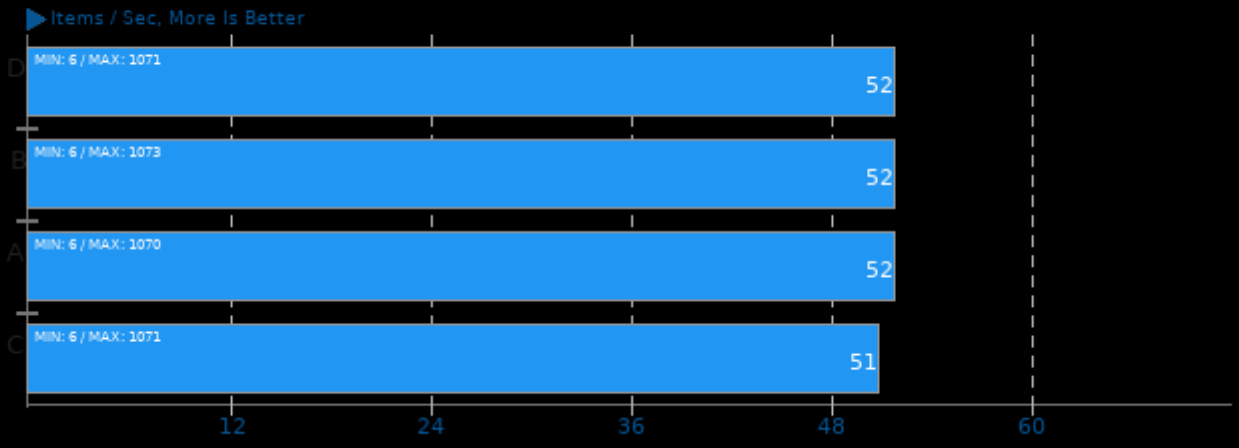
Timed GCC Compilation 11.2.0

Time To Compile



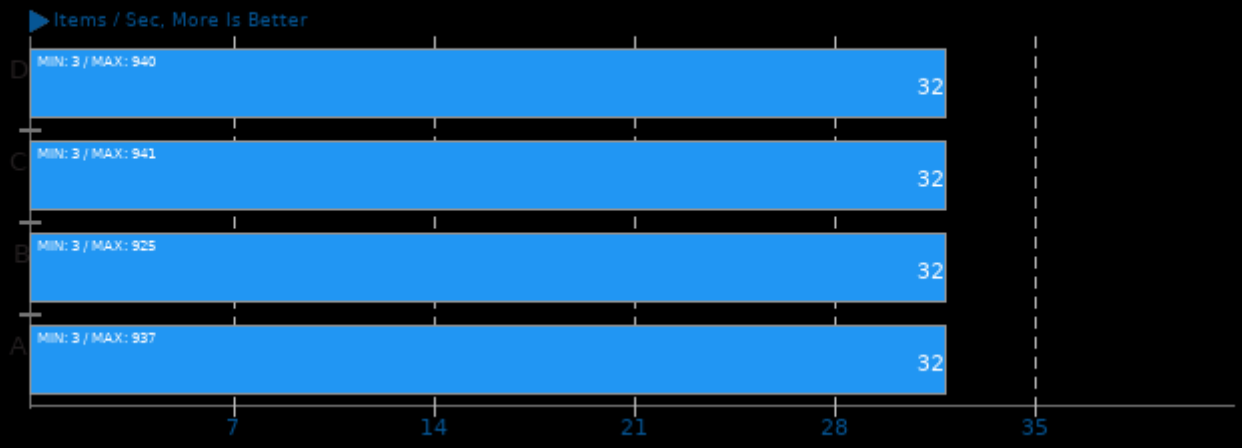
OpenVKL 1.0

Benchmark: vklBenchmark ISPC



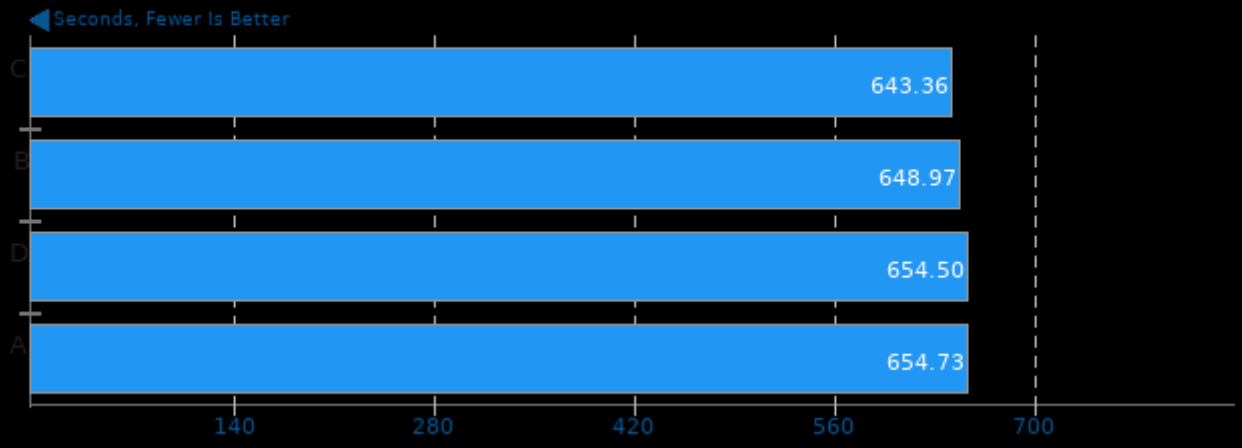
OpenVKL 1.0

Benchmark: vklBenchmark Scalar



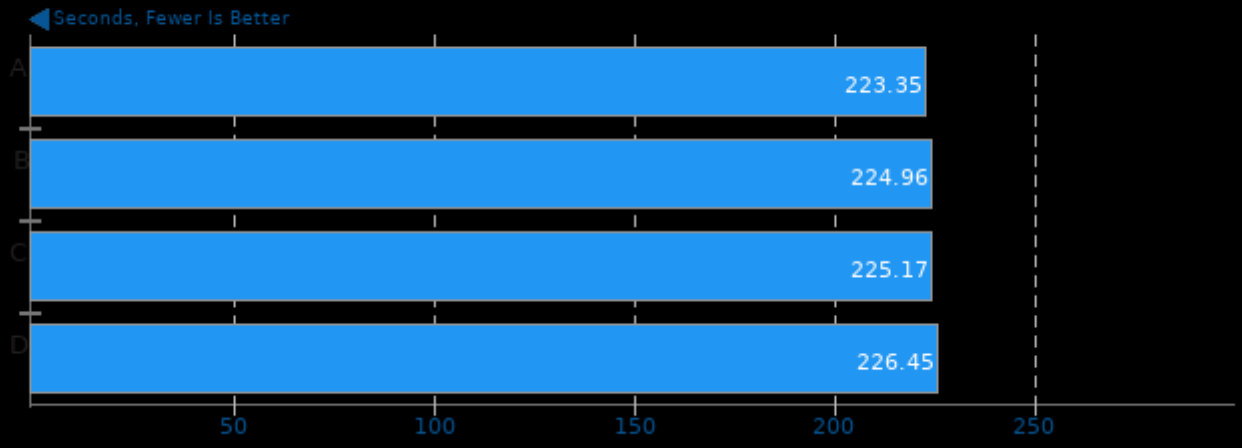
ECP-CANDLE 0.4

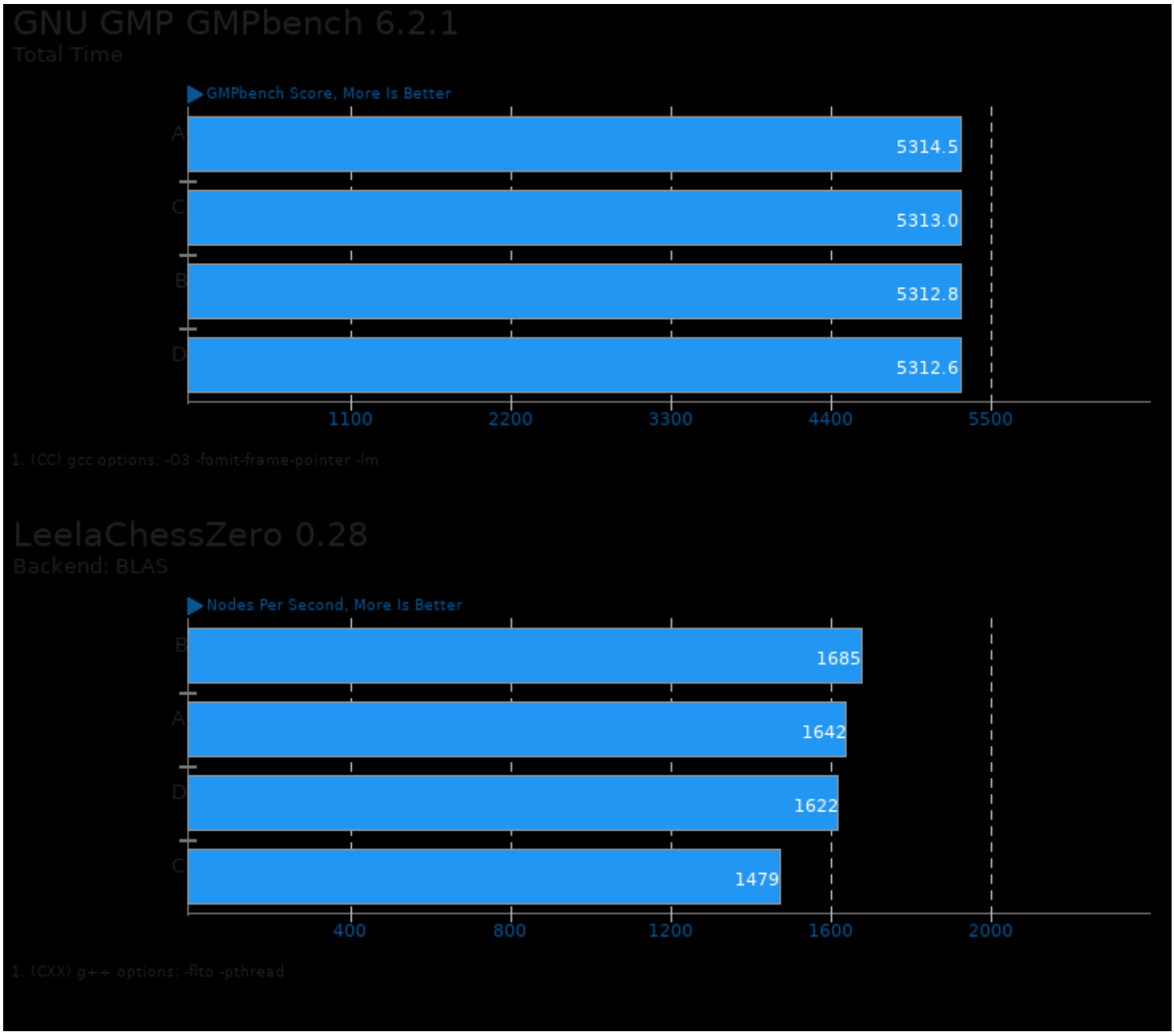
Benchmark: P3B1

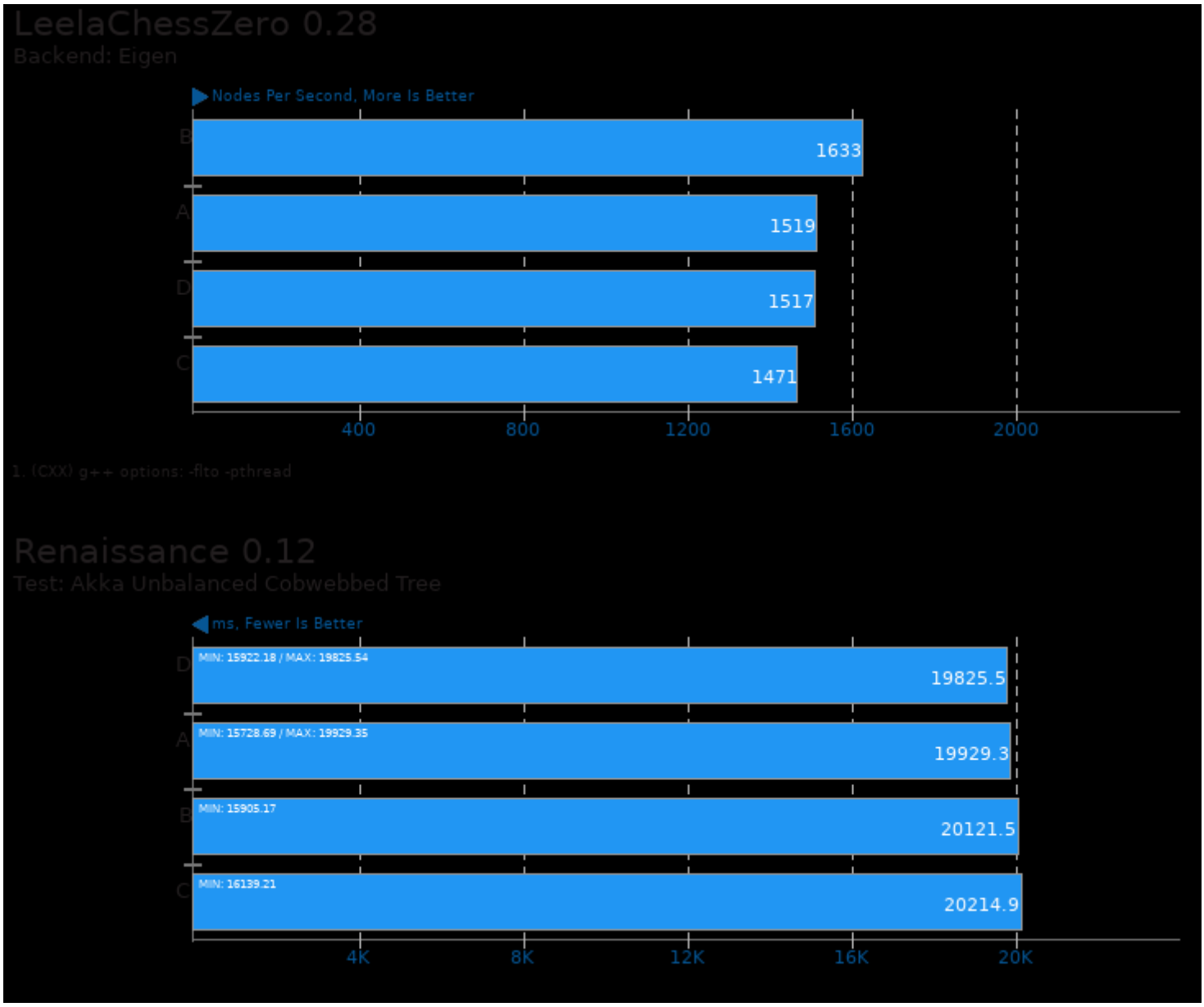


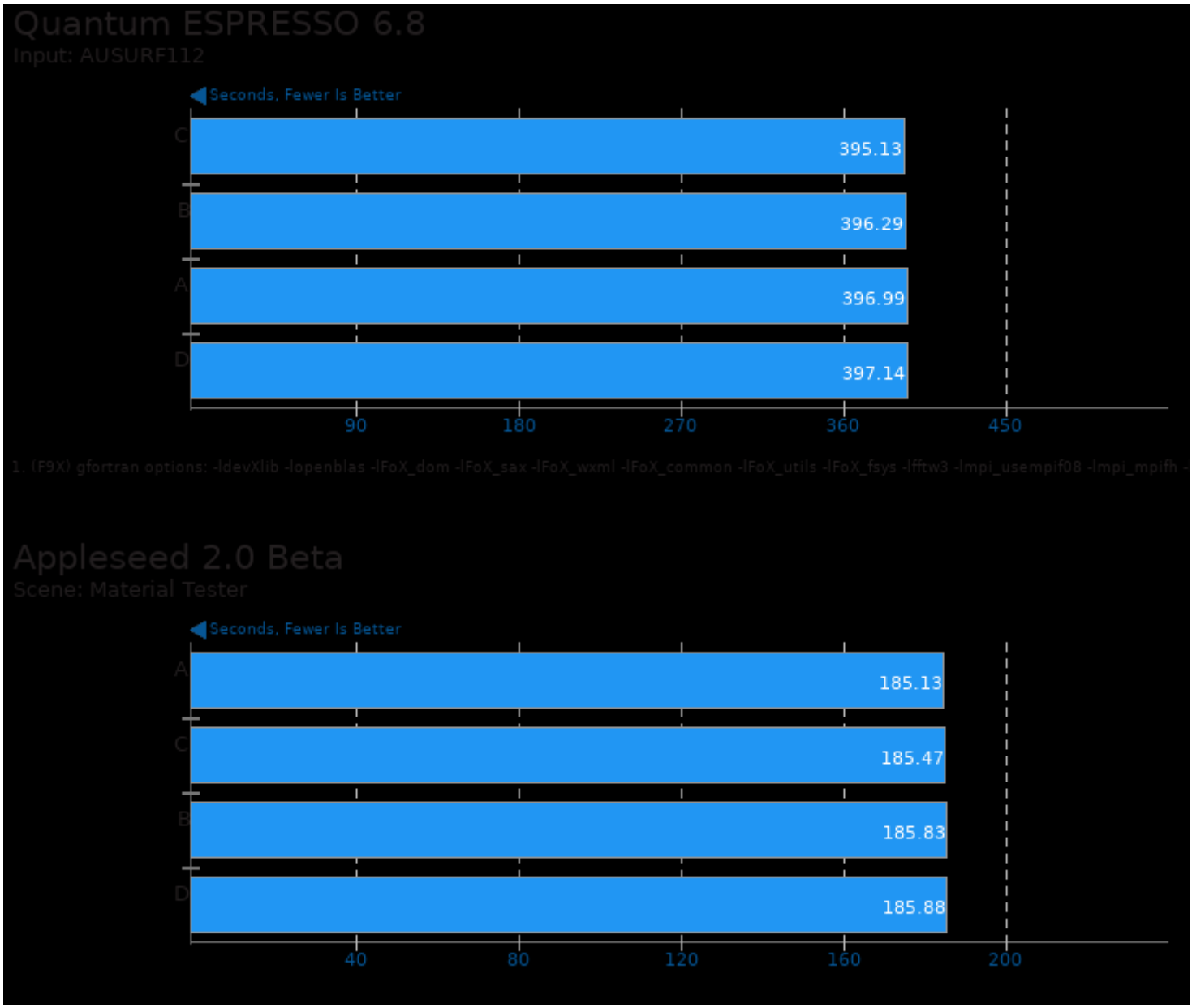
Appleseed 2.0 Beta

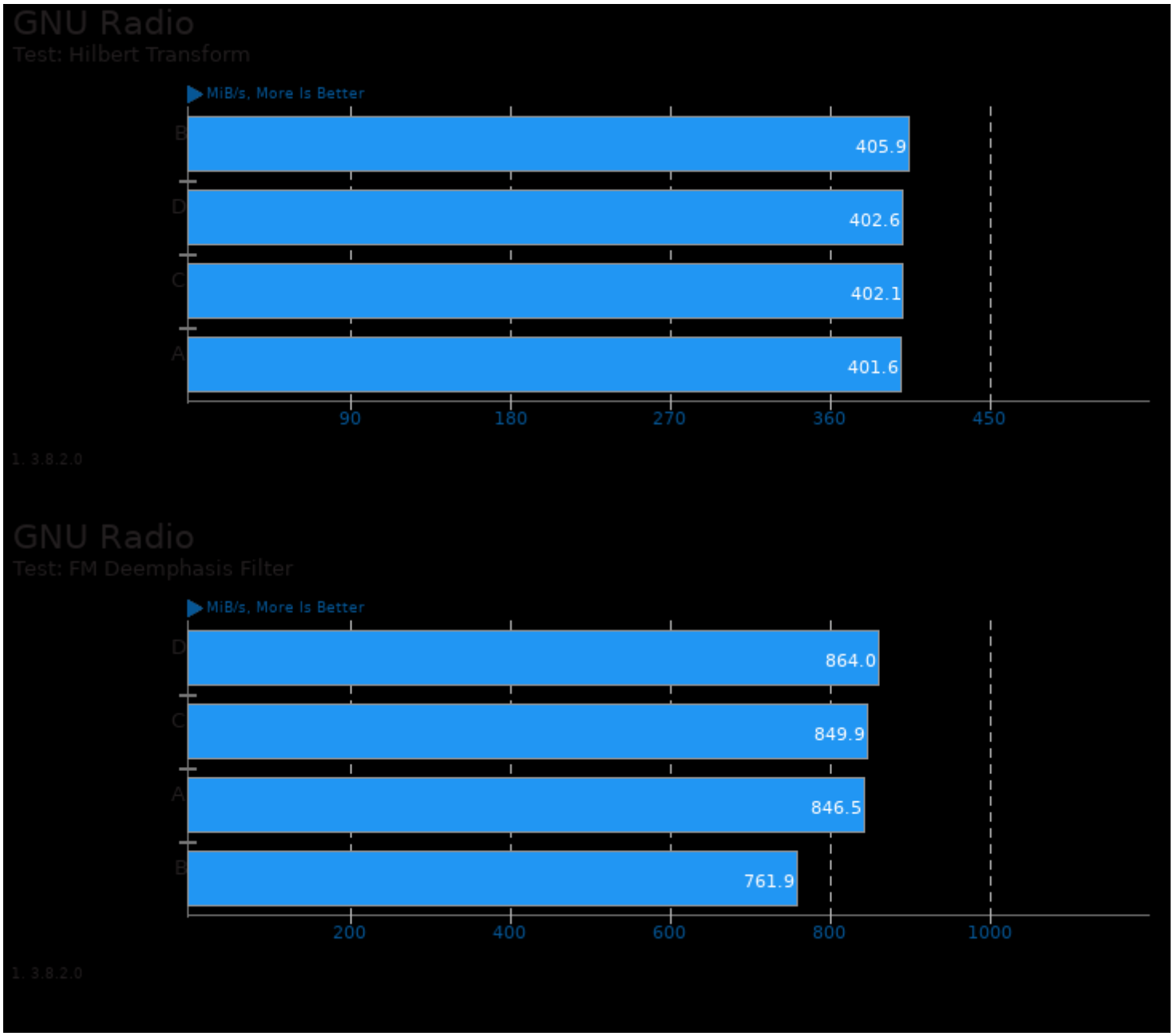
Scene: Emily

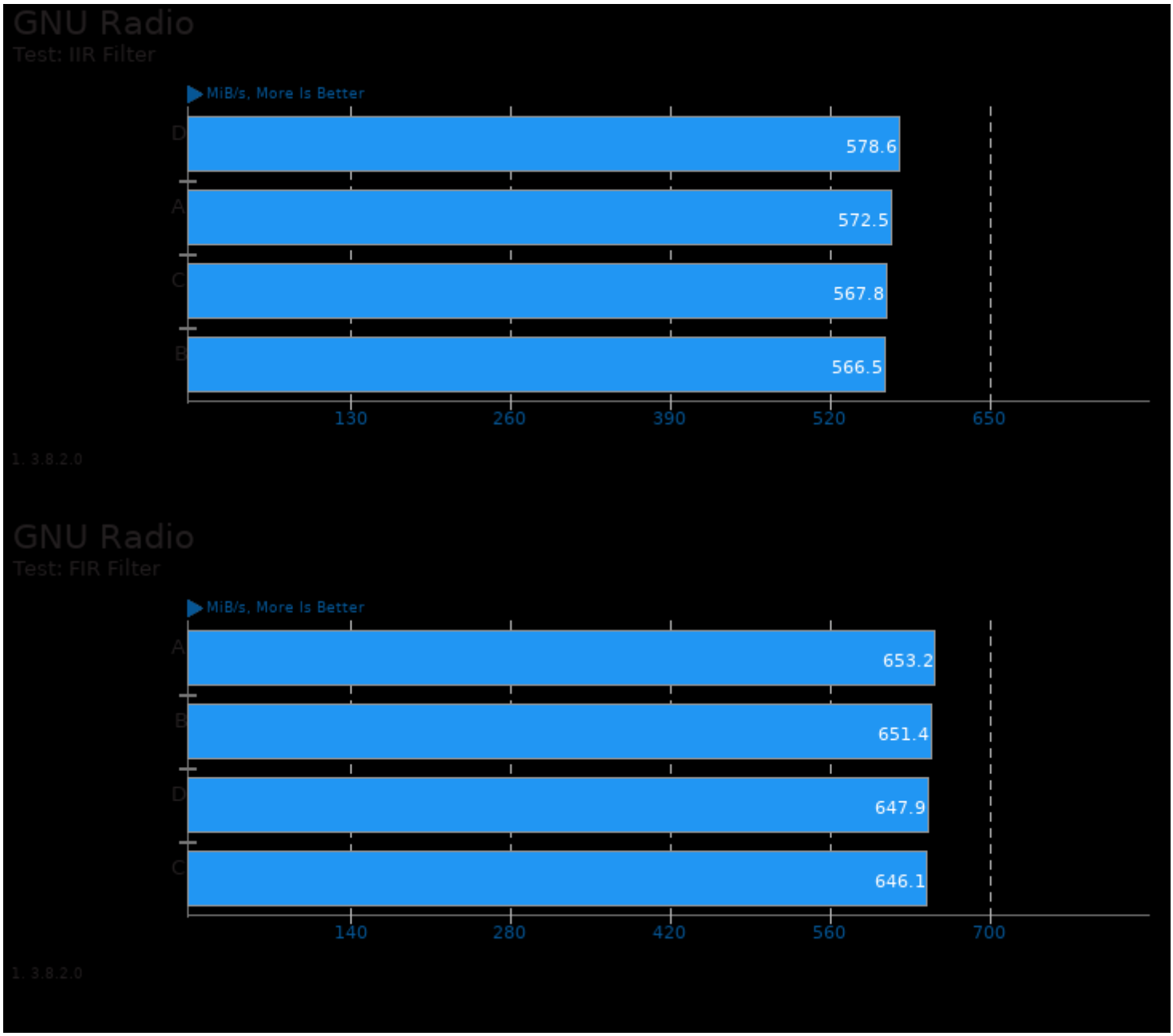


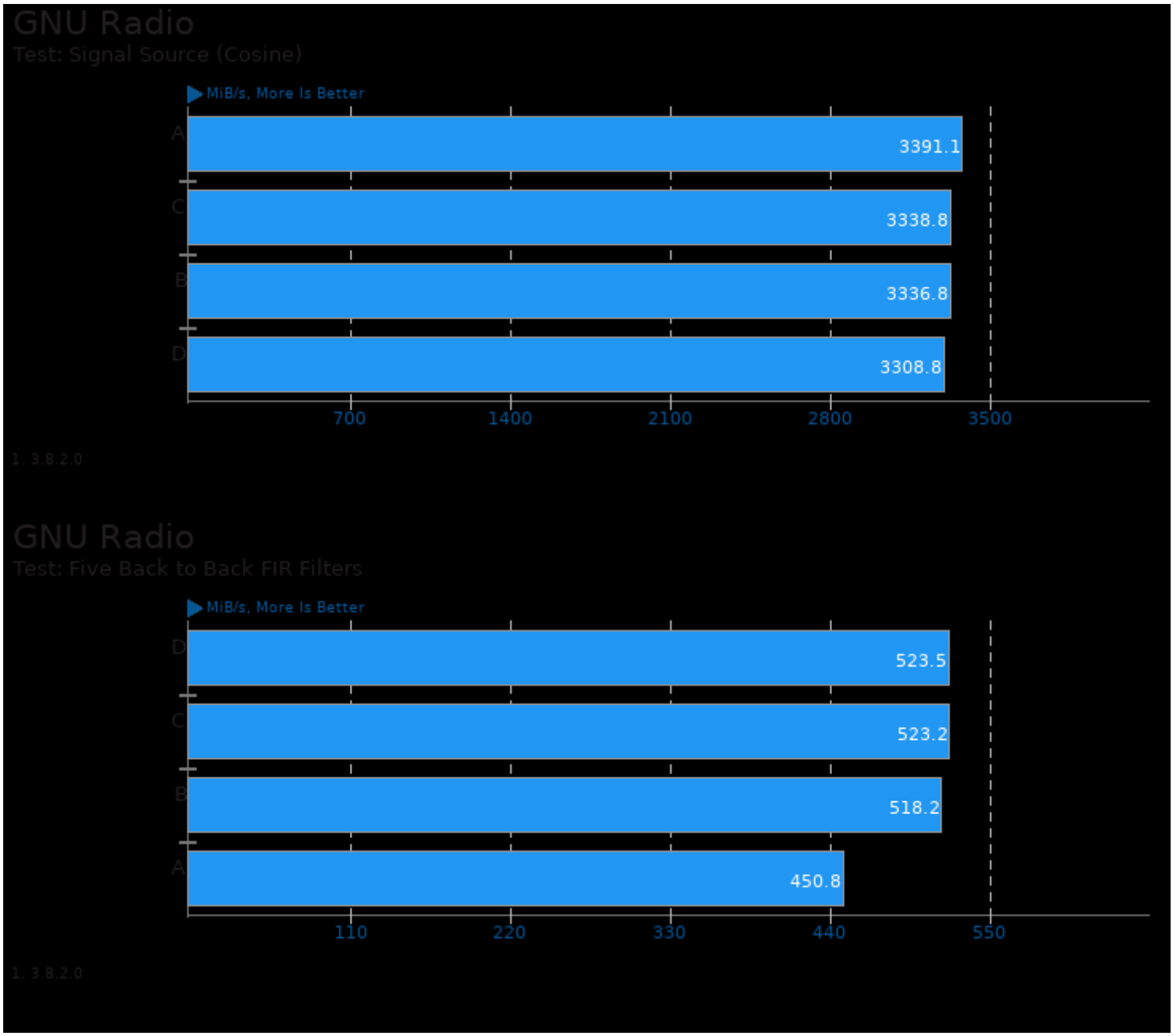

GNU GMP GMPbench 6.2.1
Total Time
GMPbench Score, More Is Better
A
C
B
D
5314.5
5313.0
5312.8
5312.6
1100
2200
3300
4400
5500
1. (CC) gcc options: -O3 -fomit-frame-pointer -lm
LeelaChessZero 0.28
Backend: BLAS
Nodes Per Second, More Is Better
B
A
D
C
1685
1642
1622
1479
400
800
1200
1600
2000
1. (CXX) g++ options: -flto -pthread


LeelaChessZero 0.28
Backend: Eigen
Nodes Per Second, More Is Better
B
1633
A
1519
D
1517
C
1471
400
800
1200
1600
2000
1. (CXX) g++ options: -flto -pthread
Renaissance 0.12
Test: Akka Unbalanced Cobwebbed Tree
ms, Fewer Is Better
D
MIN: 15922.18 / MAX: 19825.54
19825.5
A
MIN: 15728.69 / MAX: 19929.35
19929.3
B
MIN: 15905.17
20121.5
C
MIN: 16139.21
20214.9
4K
8K
12K
16K
20K


Quantum ESPRESSO 6.8
Input: AUSURF112
Seconds, Fewer Is Better
C
395.13
B
396.29
A
396.99
D
397.14
90
180
270
360
450
1. (F9X) gfortran options: -ldevXlib -lopenblas -lFoX_dom -lFoX_sax -lFoX_wxml -lFoX_common -lFoX_utils -lFoX_fsys -lfftw3 -lmpi_usempif08 -lmpi_mpifh
Appleseed 2.0 Beta
Scene: Material Tester
Seconds, Fewer Is Better
A
185.13
C
185.47
B
185.83
D
185.88
40
80
120
160
200

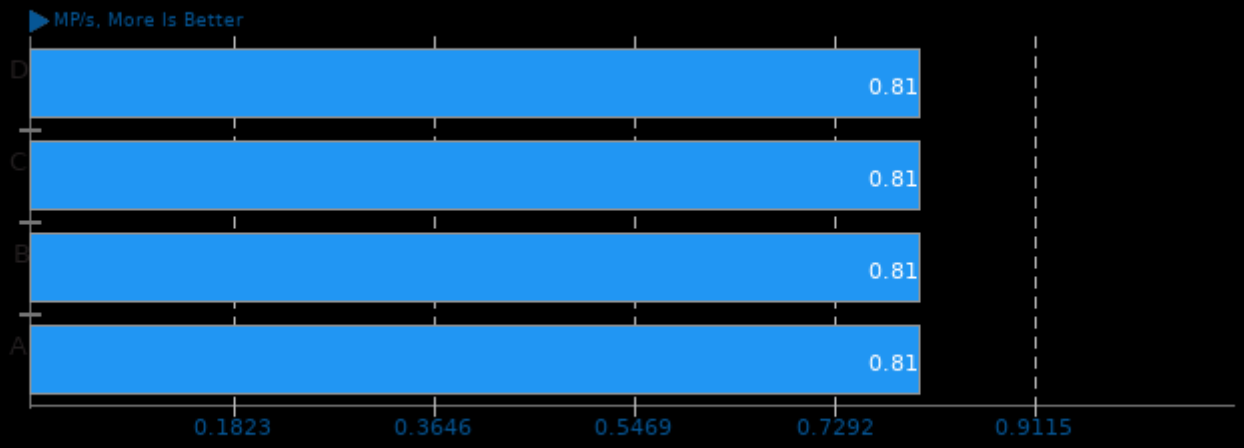

GNU Radio
Test: Hilbert Transform
MiB/s, More Is Better
B
D
C
A
405.9
402.6
402.1
401.6
90
180
270
360
450
1. 3.8.2.0
GNU Radio
Test: FM Deemphasis Filter
MiB/s, More Is Better
D
C
A
B
864.0
849.9
846.5
761.9
200
400
600
800
1000
1. 3.8.2.0


GNU Radio
Test: IIR Filter
MiB/s, More Is Better
D
578.6
A
572.5
C
567.8
B
566.5
130
260
390
520
650
1. 3.8.2.0
GNU Radio
Test: FIR Filter
MiB/s, More Is Better
A
653.2
B
651.4
D
647.9
C
646.1
140
280
420
560
700
1. 3.8.2.0


GNU Radio
Test: Signal Source (Cosine)
MiB/s, More Is Better
A
C
B
D
3391.1
3338.8
3336.8
3308.8
700
1400
2100
2800
3500
1. 3.8.2.0
GNU Radio
Test: Five Back to Back FIR Filters
MiB/s, More Is Better
D
C
B
A
523.5
523.2
518.2
450.8
110
220
330
440
550
1. 3.8.2.0

JPEG XL libjxl 0.5

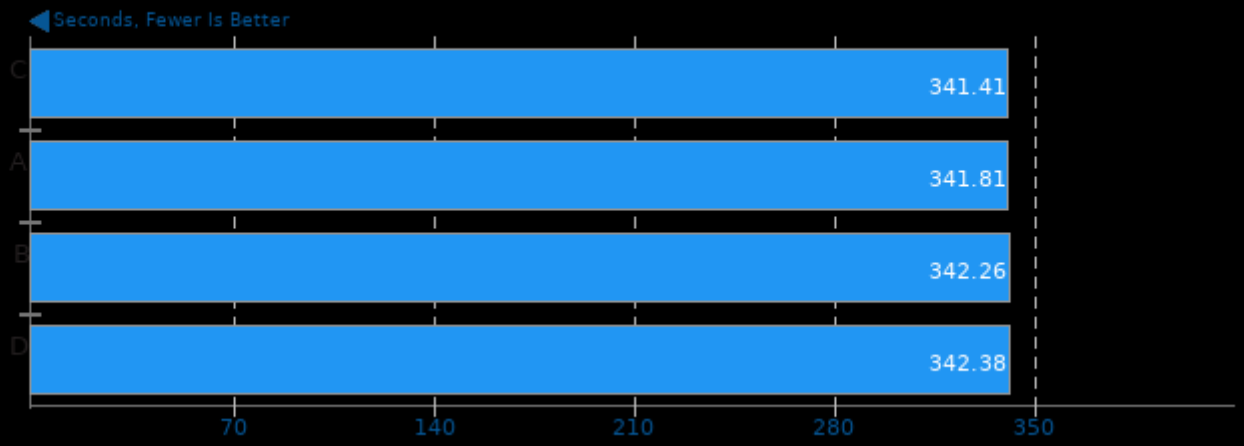
Input: PNG - Encode Speed: 8



1. (CXX) g++ options: -funwind-tables -O3 -O2 -pthread -fPIE -pie

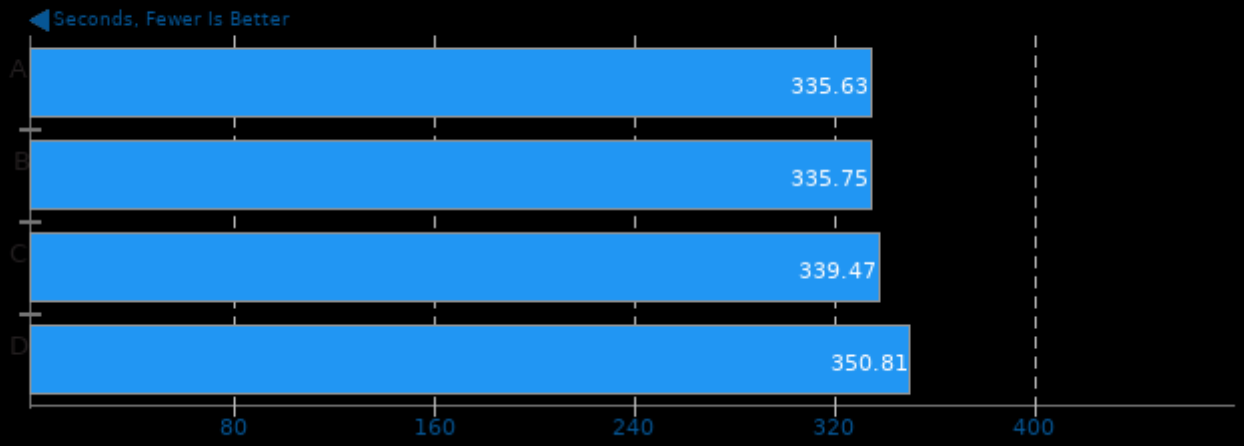
Blender 2.92

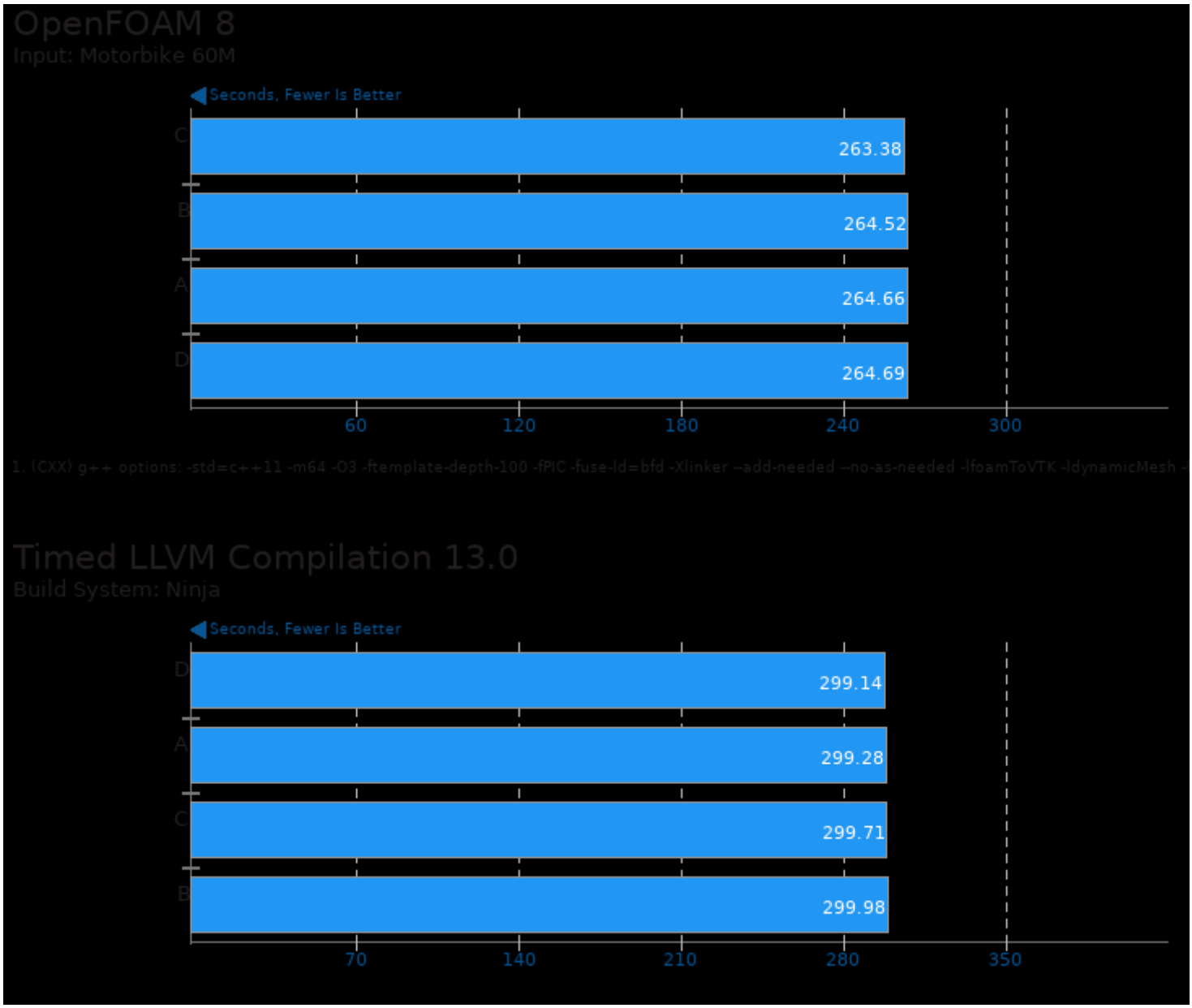
Blend File: Barbershop - Compute: CPU-Only

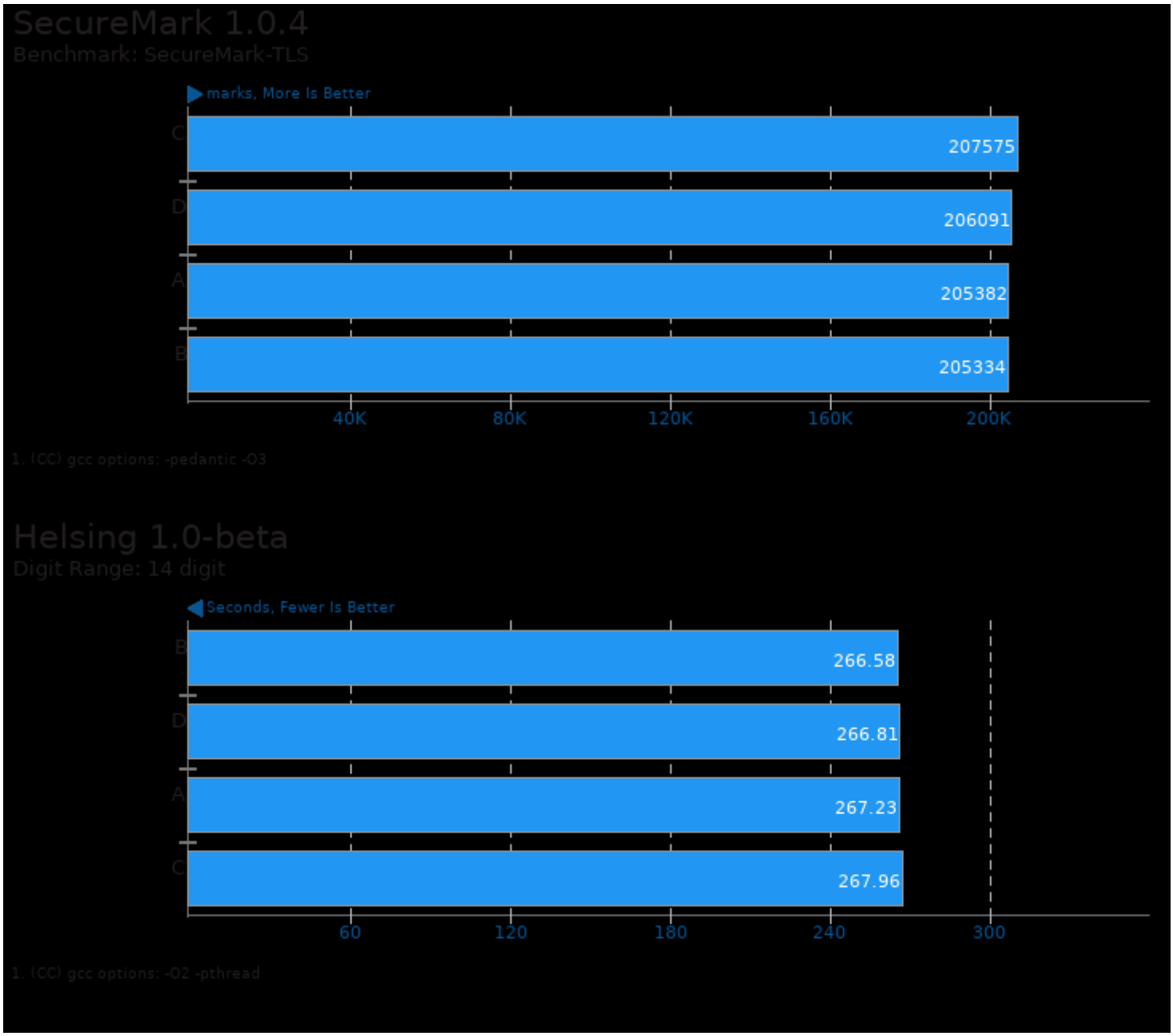


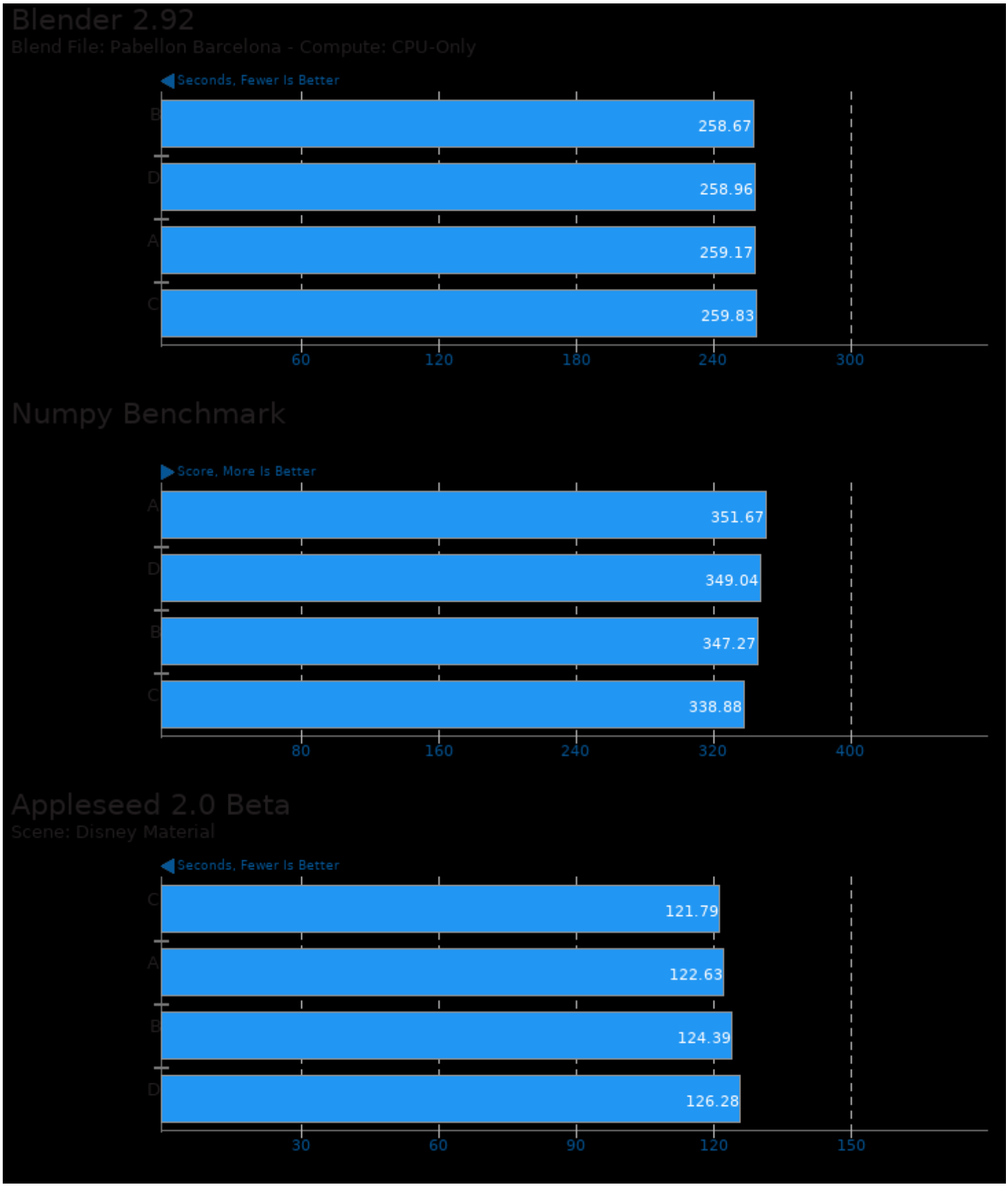
Timed LLVM Compilation 13.0

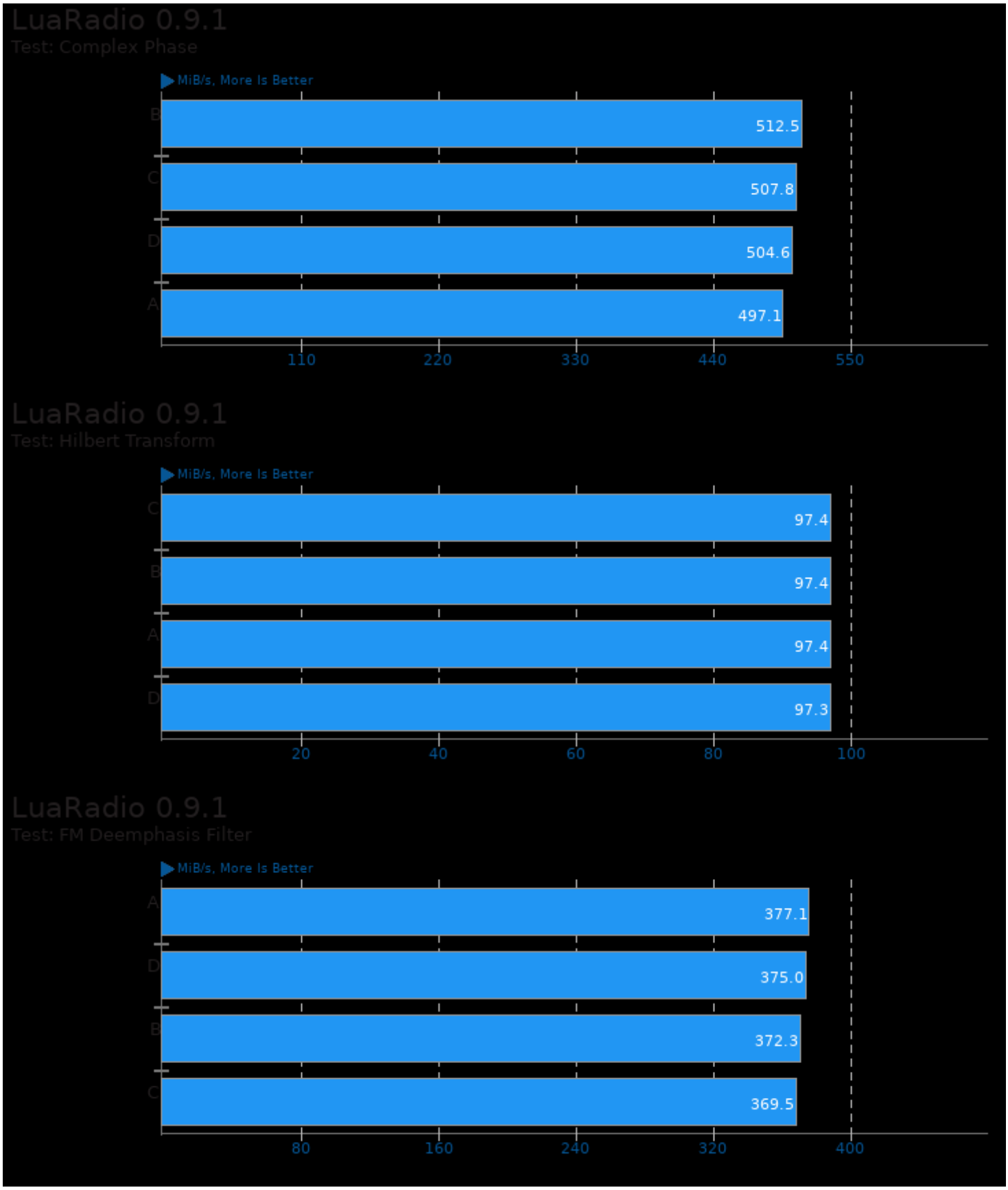
Build System: Unix Makefiles




OpenFOAM 8
Input: Motorbike 60M
Seconds, Fewer Is Better
C
B
A
D
263.38
264.52
264.66
264.69
60
120
180
240
300
1. (CXX) g++ options: -std=c++11 -m64 -O3 -ftemplate-depth-100 -fPIC -fuse-ld=bfd -Xlinker --add-needed --no-as-needed -lfoamToVTK -ldynamicMesh
Timed LLVM Compilation 13.0
Build System: Ninja
Seconds, Fewer Is Better
D
A
C
B
299.14
299.28
299.71
299.98
70
140
210
280
350

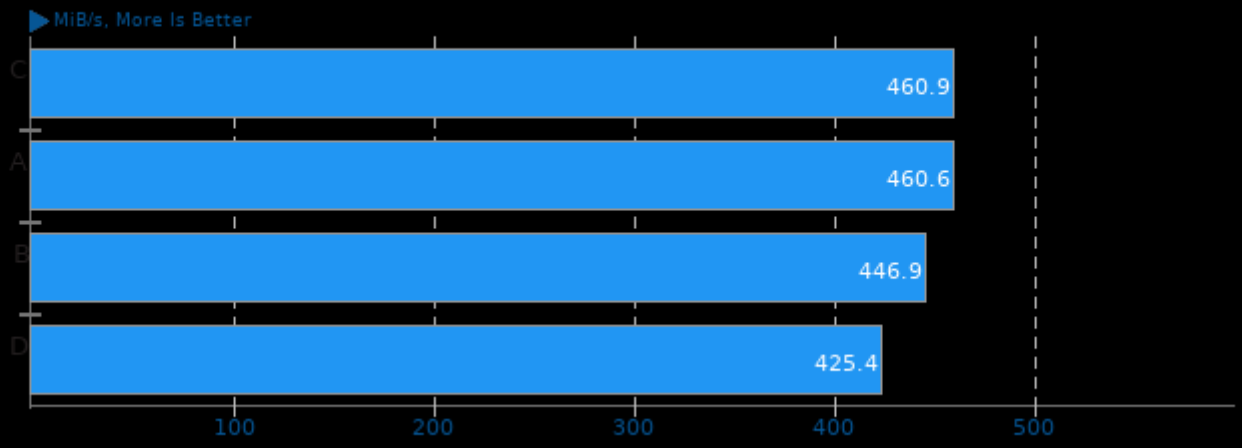

SecureMark 1.0.4
Benchmark: SecureMark-TLS
marks, More Is Better
C
207575
D
206091
A
205382
B
205334
40K
80K
120K
160K
200K
1. (CC) gcc options: -pedantic -O3
Helsing 1.0-beta
Digit Range: 14 digit
Seconds, Fewer Is Better
B
266.58
D
266.81
A
267.23
C
267.96
60
120
180
240
300
1. (CC) gcc options: -O2 -pthread


Blender 2.92
Blend File: Pabellon Barcelona - Compute: CPU-Only
Seconds, Fewer Is Better
B
258.67
D
258.96
A
259.17
C
259.83
60
120
180
240
300
Numpy Benchmark
Score, More Is Better
A
351.67
D
349.04
B
347.27
C
338.88
80
160
240
320
400
Appleseed 2.0 Beta
Scene: Disney Material
Seconds, Fewer Is Better
C
121.79
A
122.63
B
124.39
D
126.28
30
60
90
120
150


LuaRadio 0.9.1
Test: Complex Phase
MiB/s, More Is Better
B
512.5
C
507.8
D
504.6
A
497.1
110
220
330
440
550
LuaRadio 0.9.1
Test: Hilbert Transform
MiB/s, More Is Better
C
97.4
B
97.4
A
97.4
D
97.3
20
40
60
80
100
LuaRadio 0.9.1
Test: FM Deemphasis Filter
MiB/s, More Is Better
A
377.1
D
375.0
B
372.3
C
369.5
80
160
240
320
400

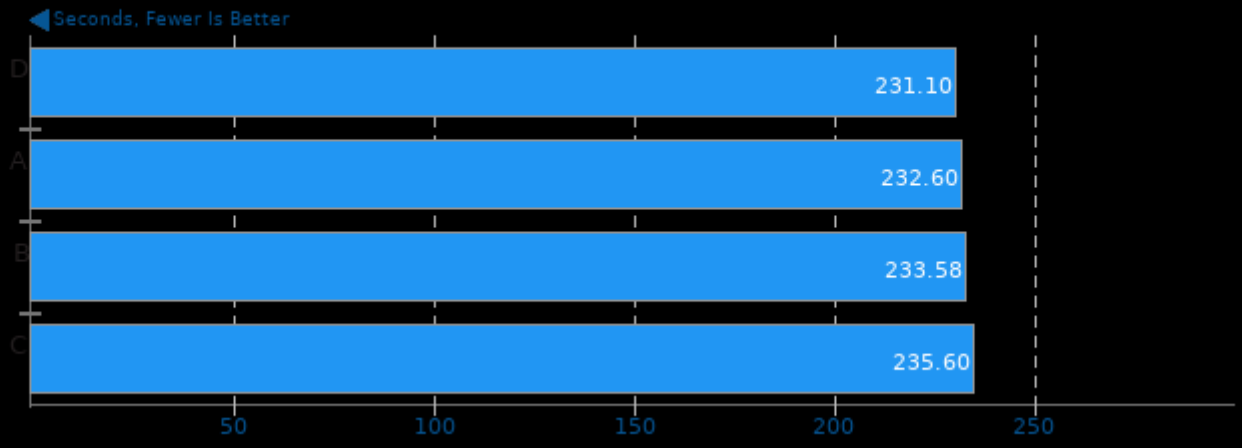
LuaRadio 0.9.1

Test: Five Back to Back FIR Filters



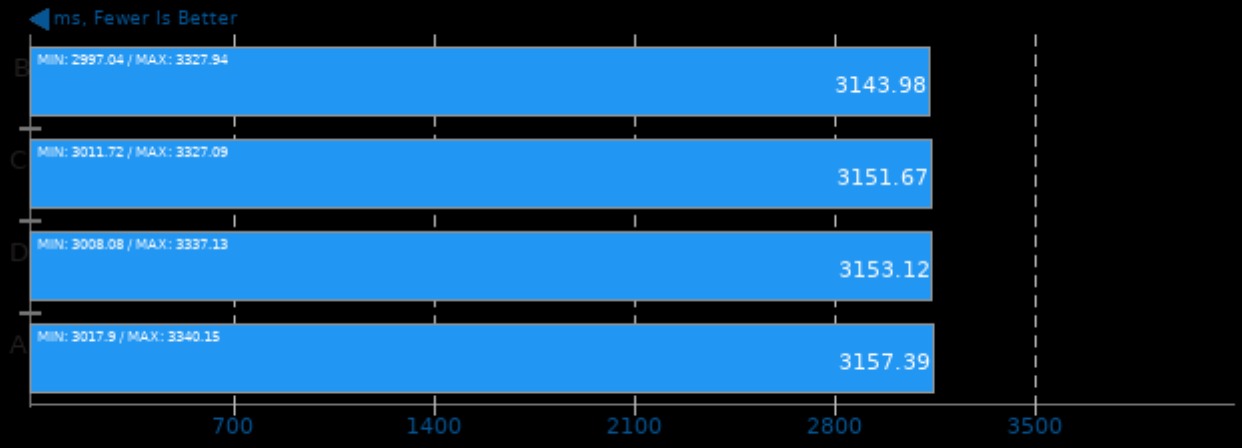
Blender 2.92

Blend File: Classroom - Compute: CPU-Only



TNN 0.3

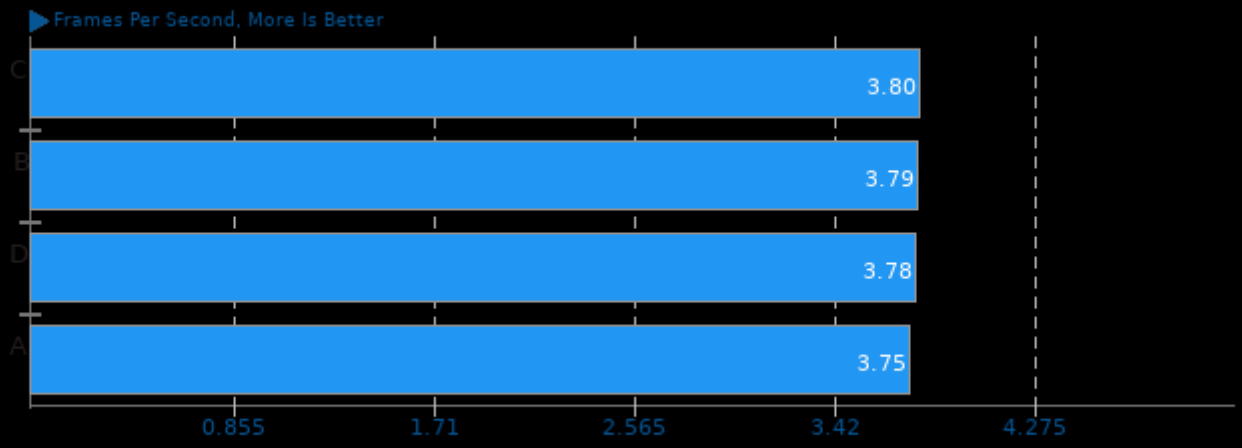
Target: CPU - Model: DenseNet



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

AOM AV1 3.1

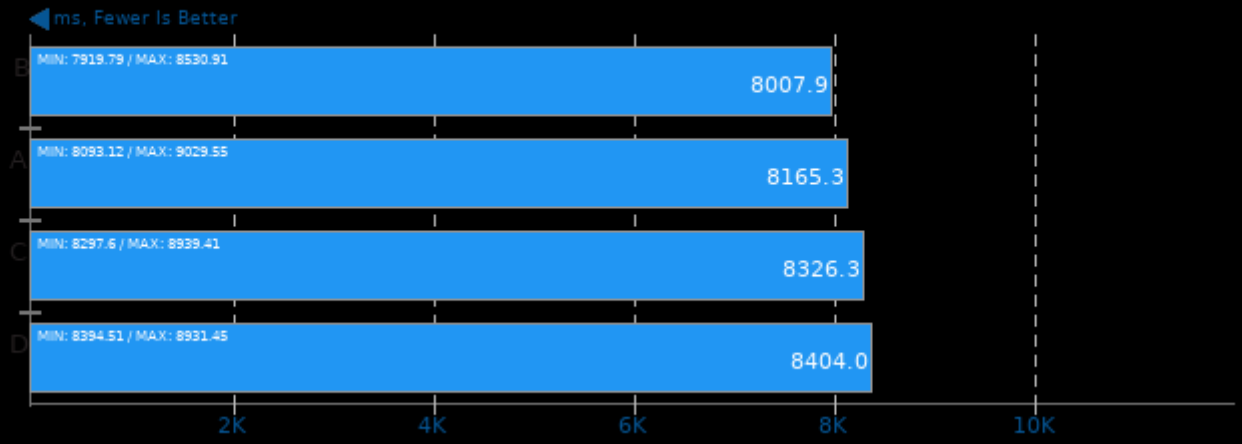
Encoder Mode: Speed 4 Two-Pass - Input: Bosphorus 4K



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

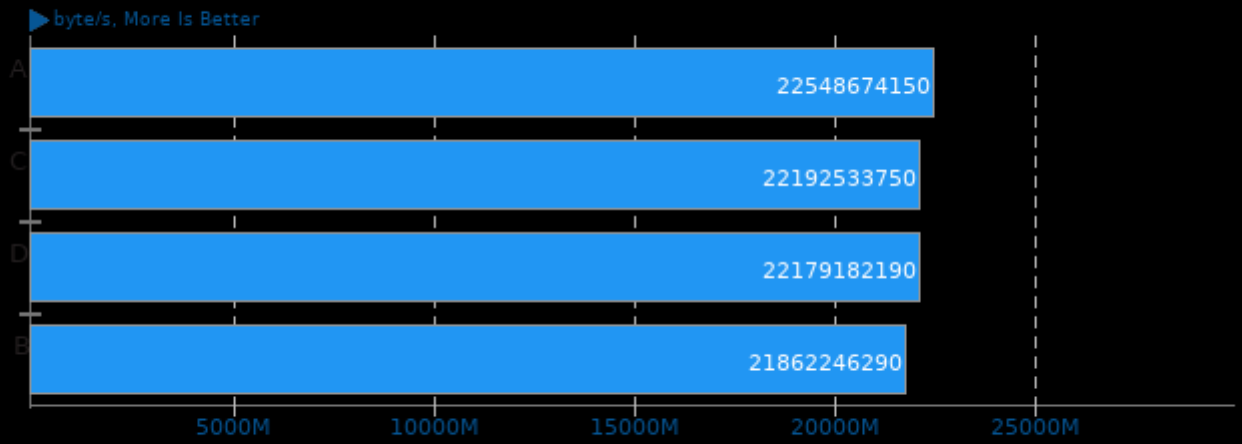
Renaissance 0.12

Test: ALS Movie Lens



OpenSSL 3.0

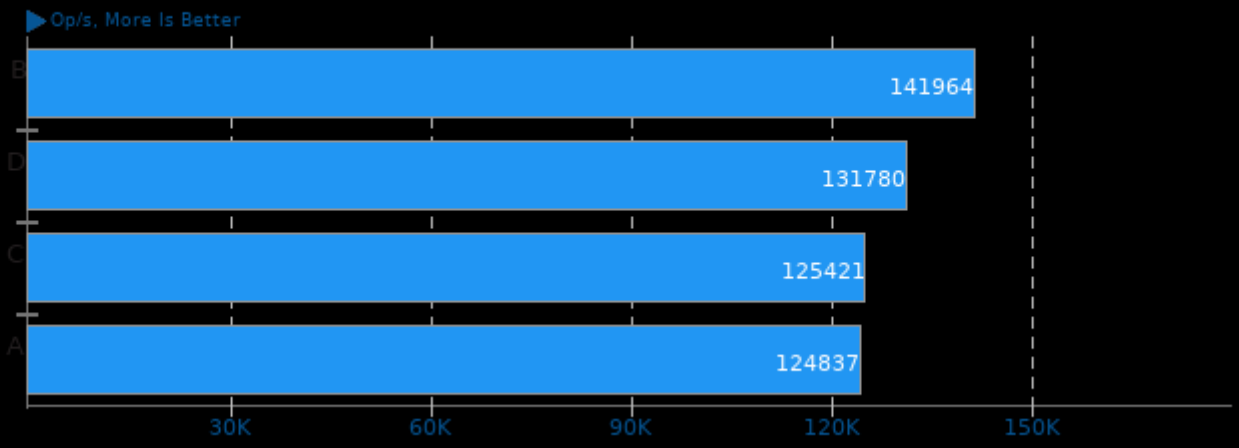
Algorithm: SHA256



1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl

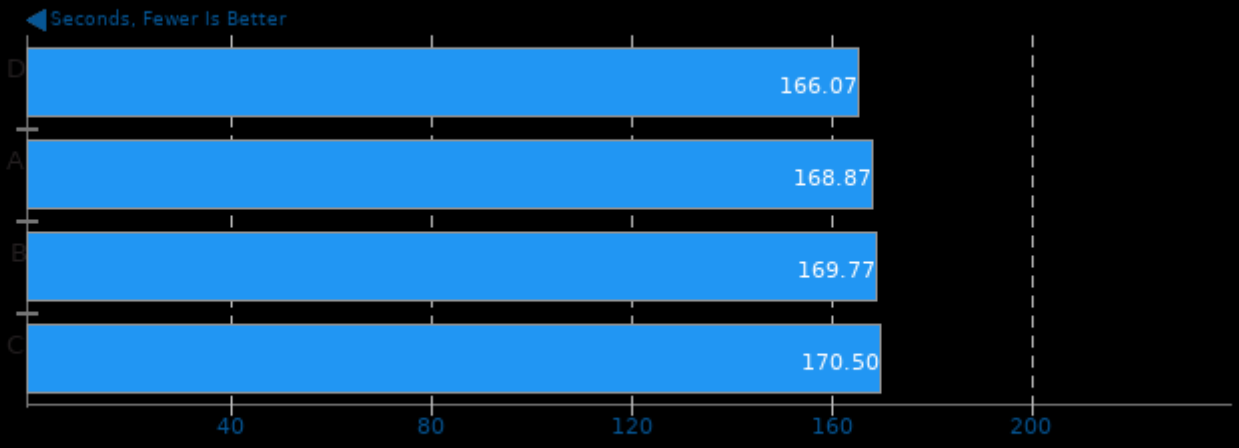
Apache Cassandra 4.0

Test: Reads



Ngspice 34

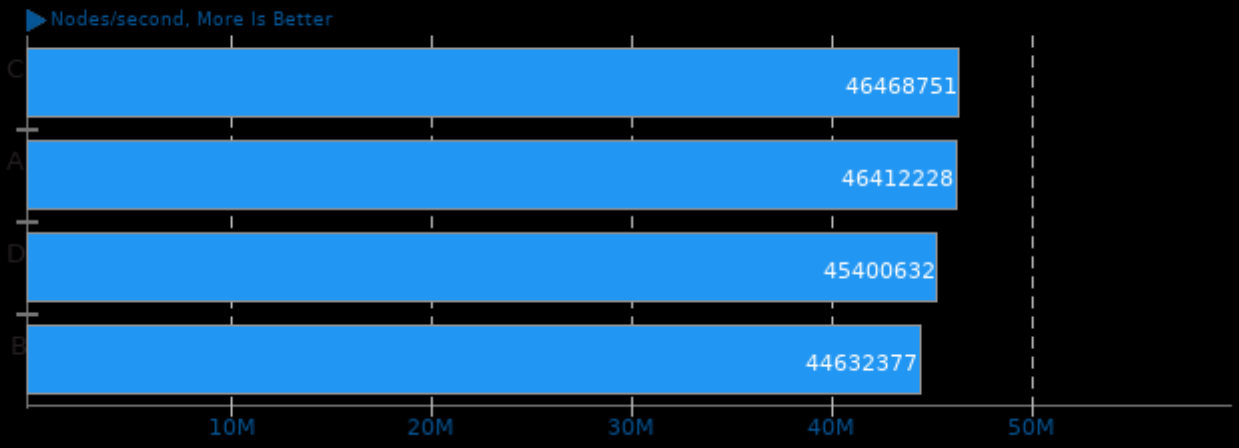
Circuit: C2670



1. (CC) gcc options: -O0 -fopenmp -lm -lstdc++ -lfftw3 -lXaw -lXmu -lXt -lXext -lX11 -lXft -lfontconfig -lXrender -lfreetype -lSM -lICE

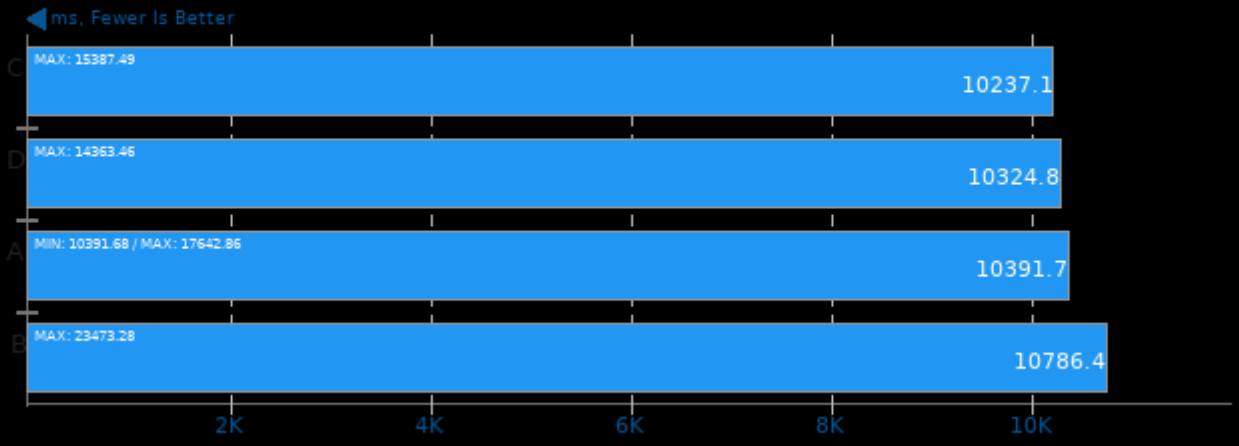
asmFish 2018-07-23

1024 Hash Memory, 26 Depth



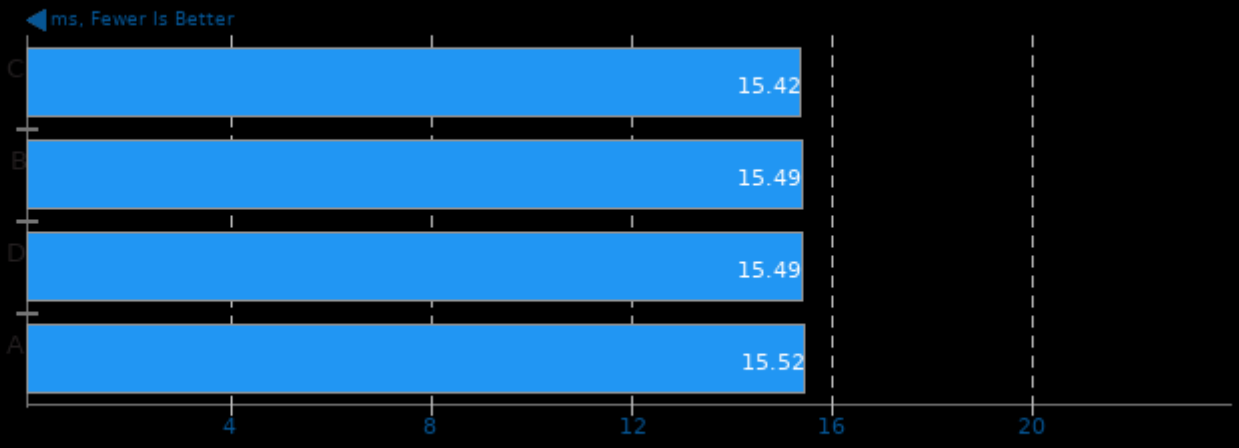
Renaissance 0.12

Test: Savina Reactors.IO



PostgreSQL pgbench 14.0

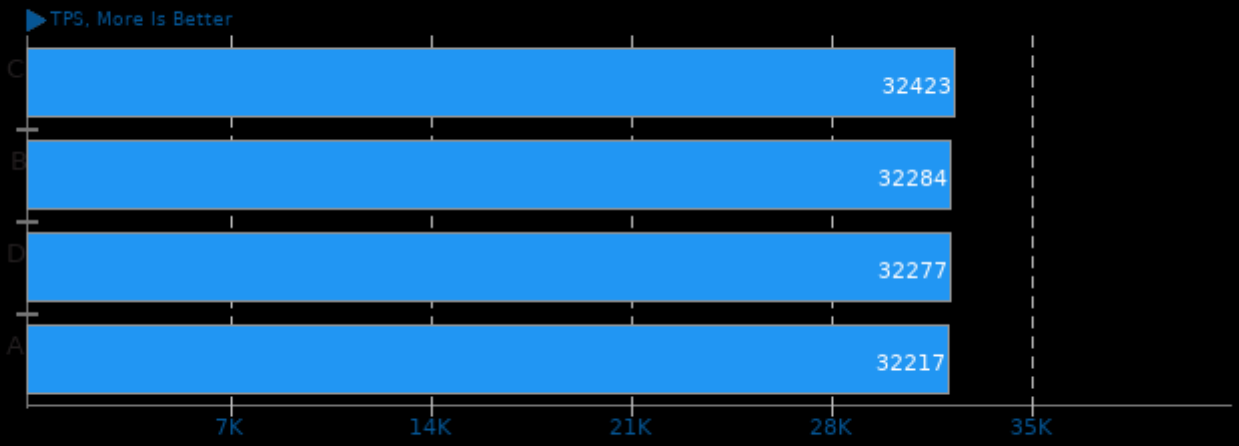
Scaling Factor: 100 - Clients: 500 - Mode: Read Write - Average Latency



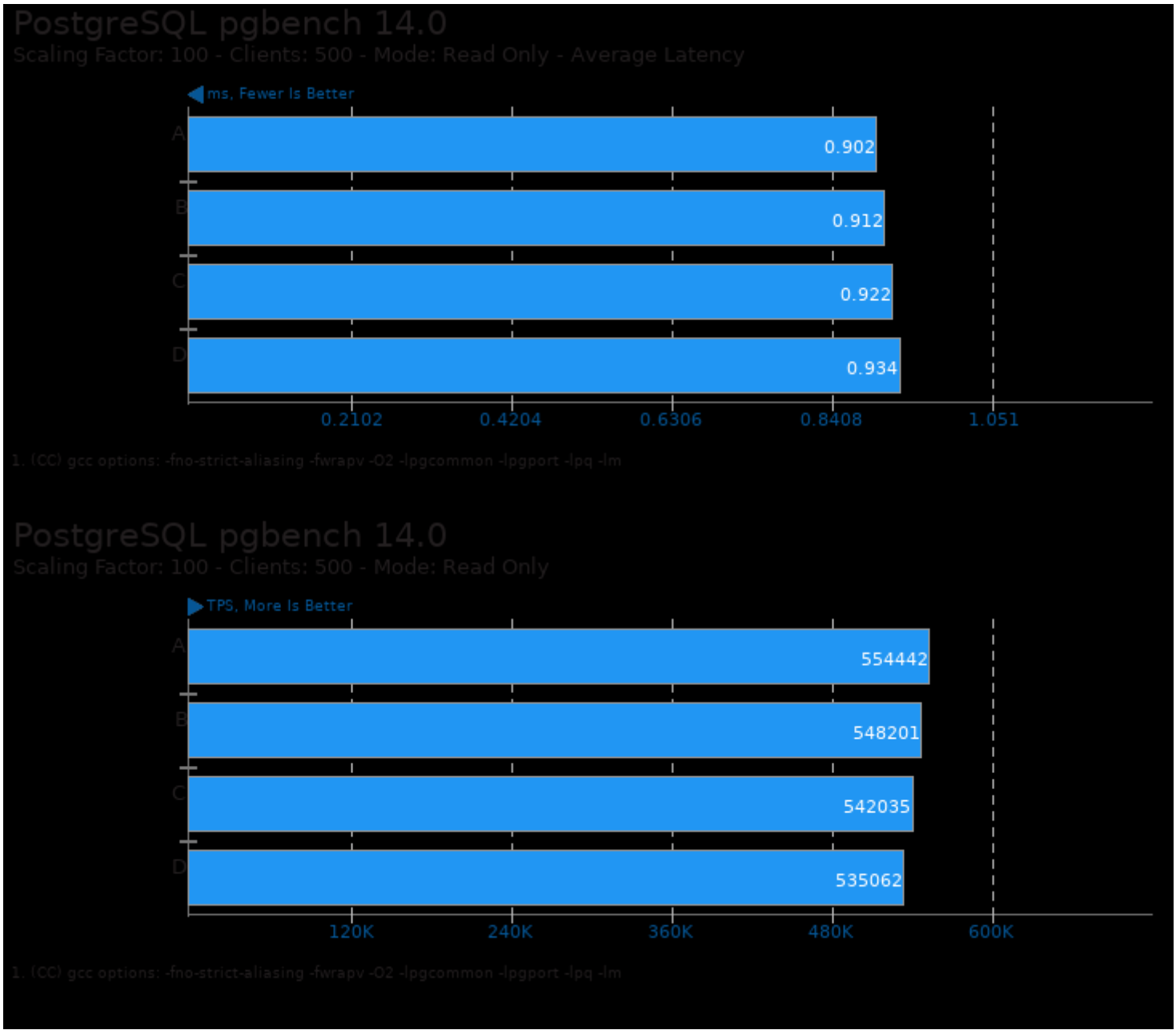
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm

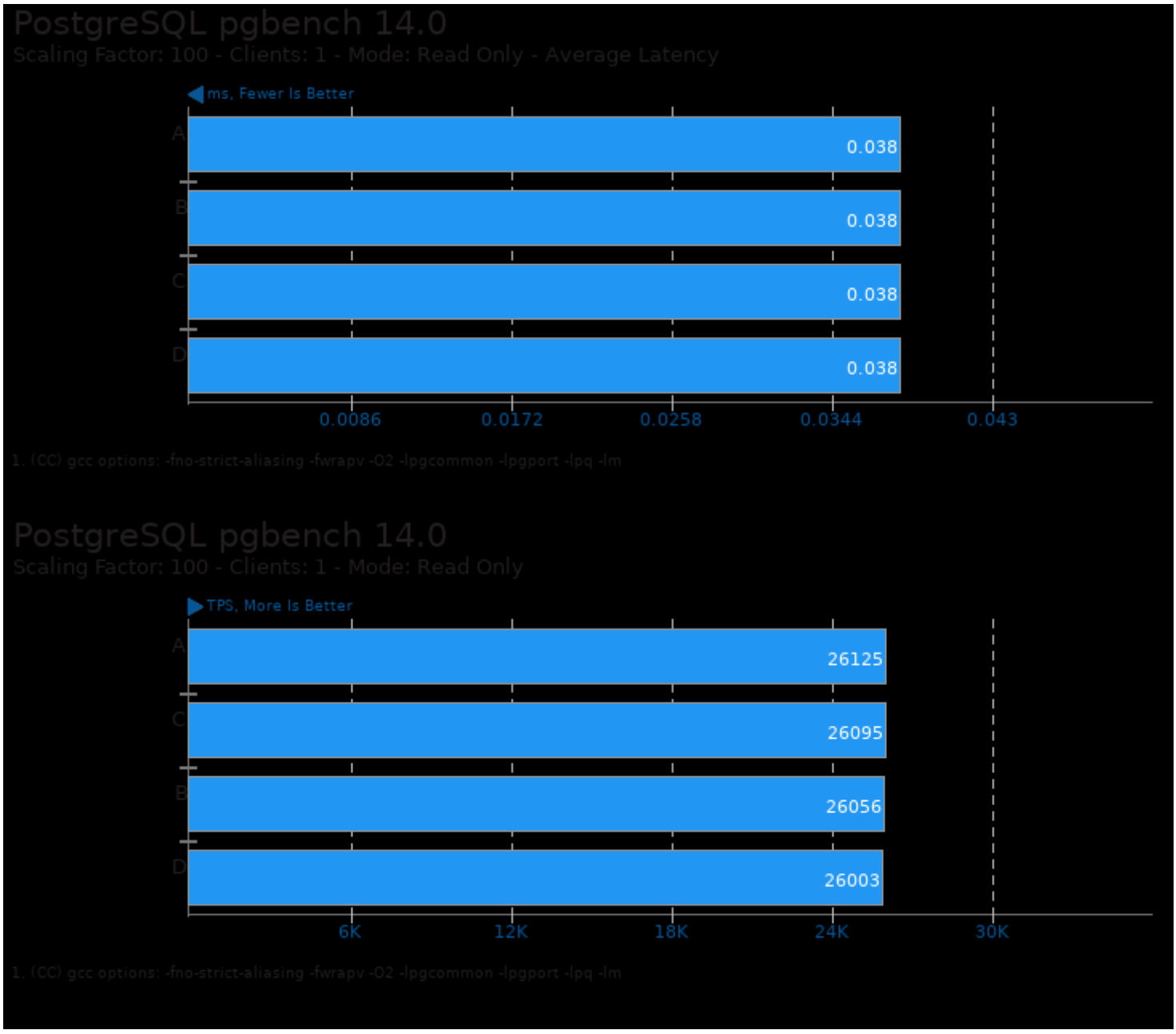
PostgreSQL pgbench 14.0

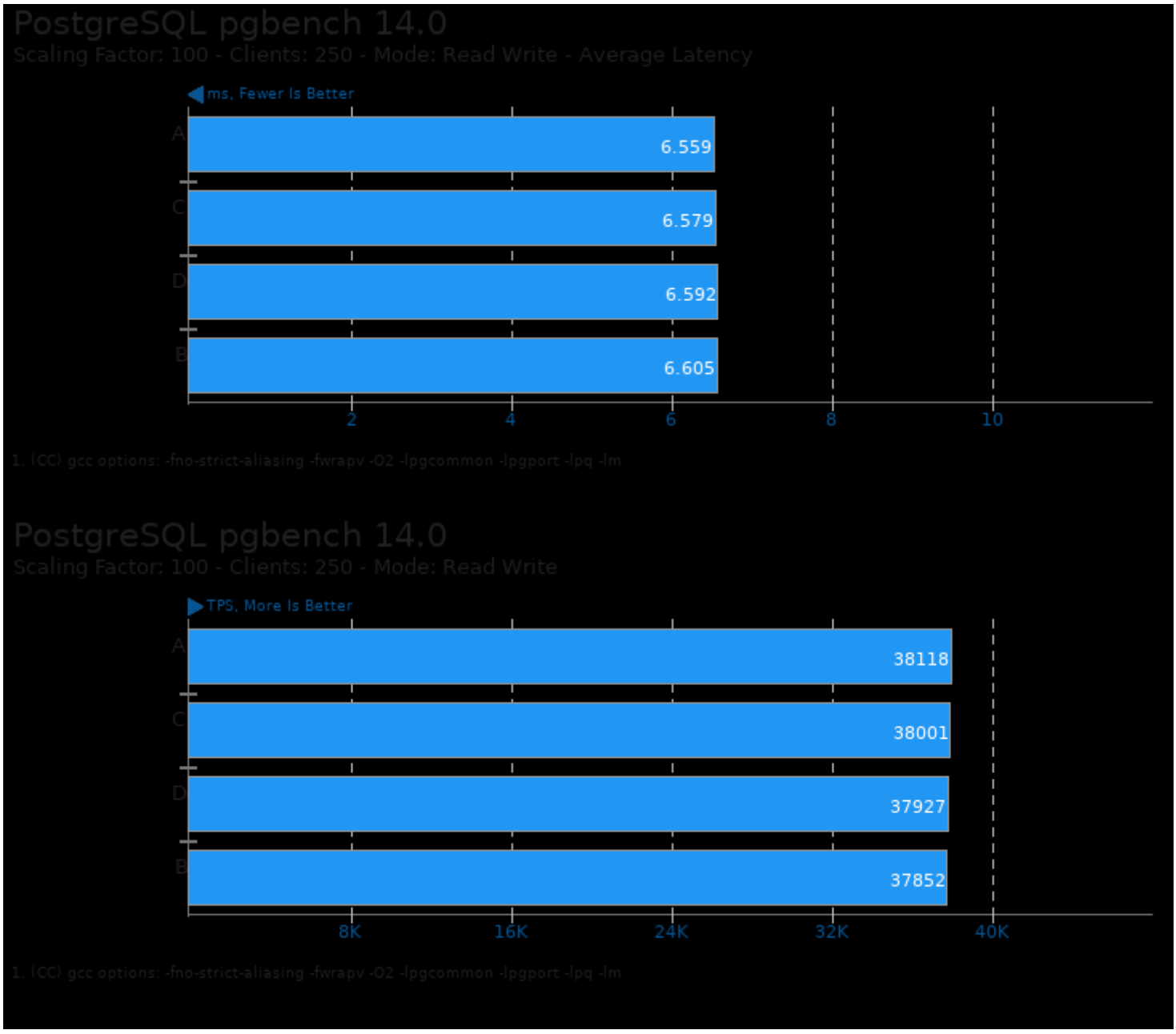
Scaling Factor: 100 - Clients: 500 - Mode: Read Write

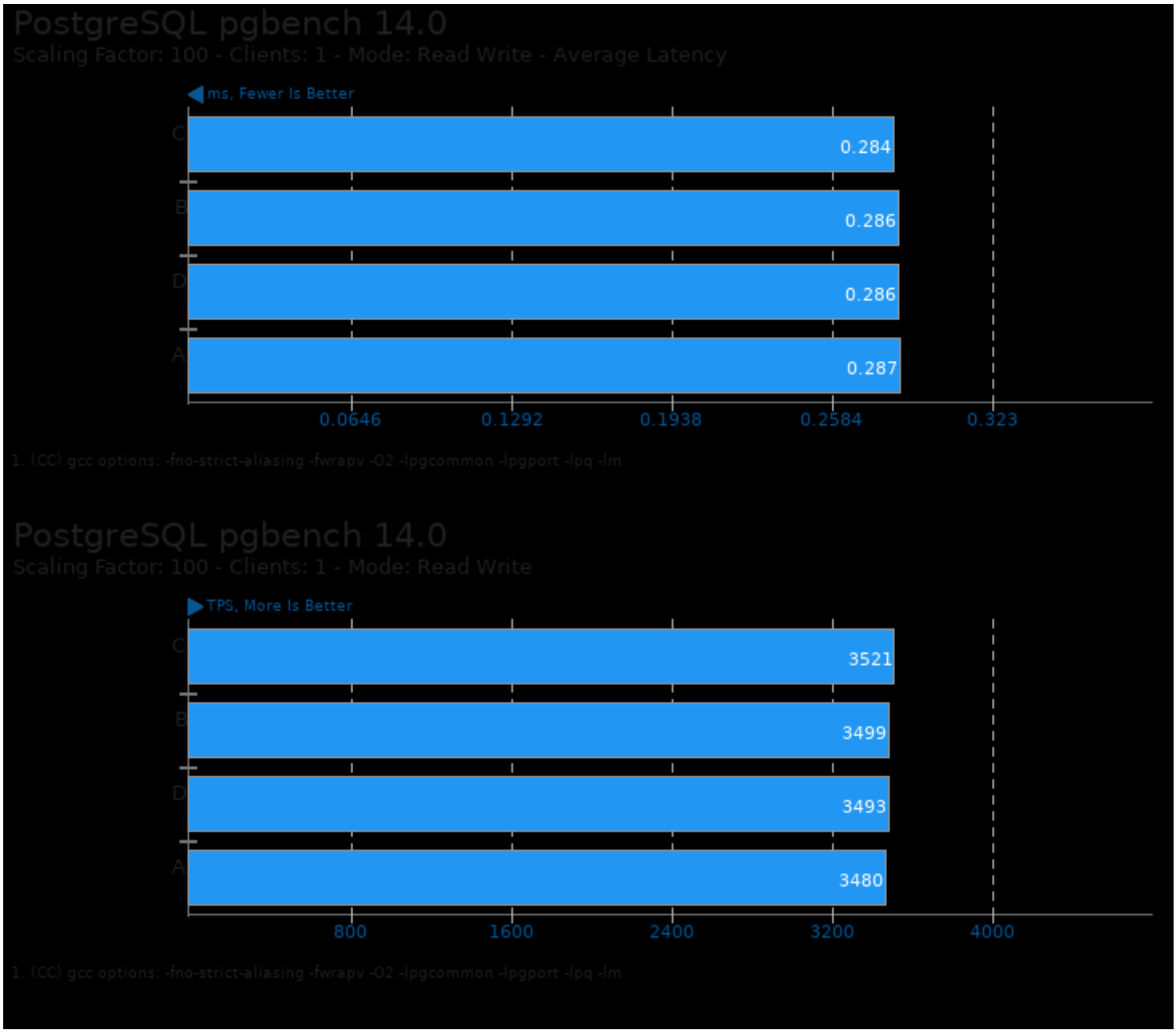


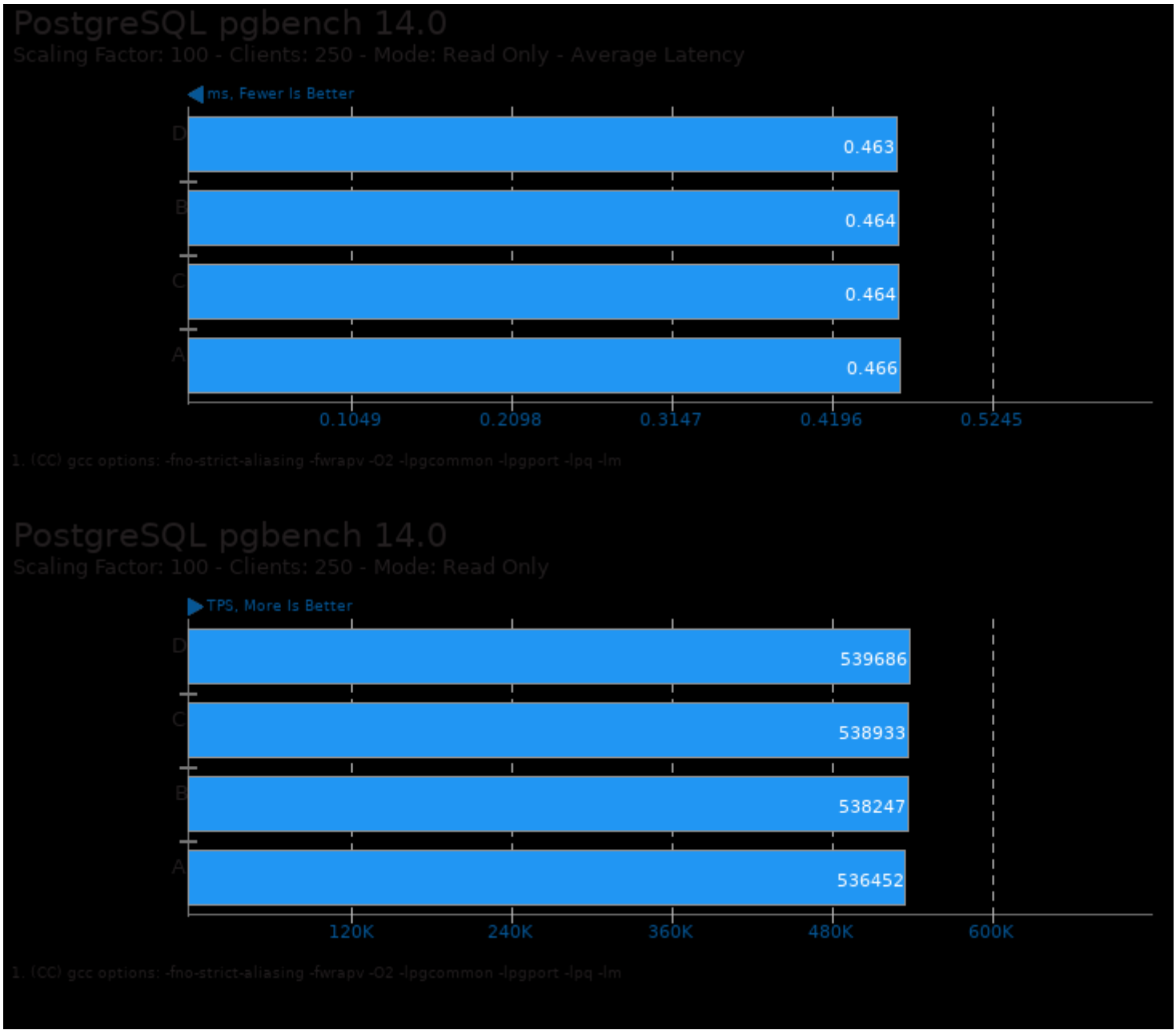
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm

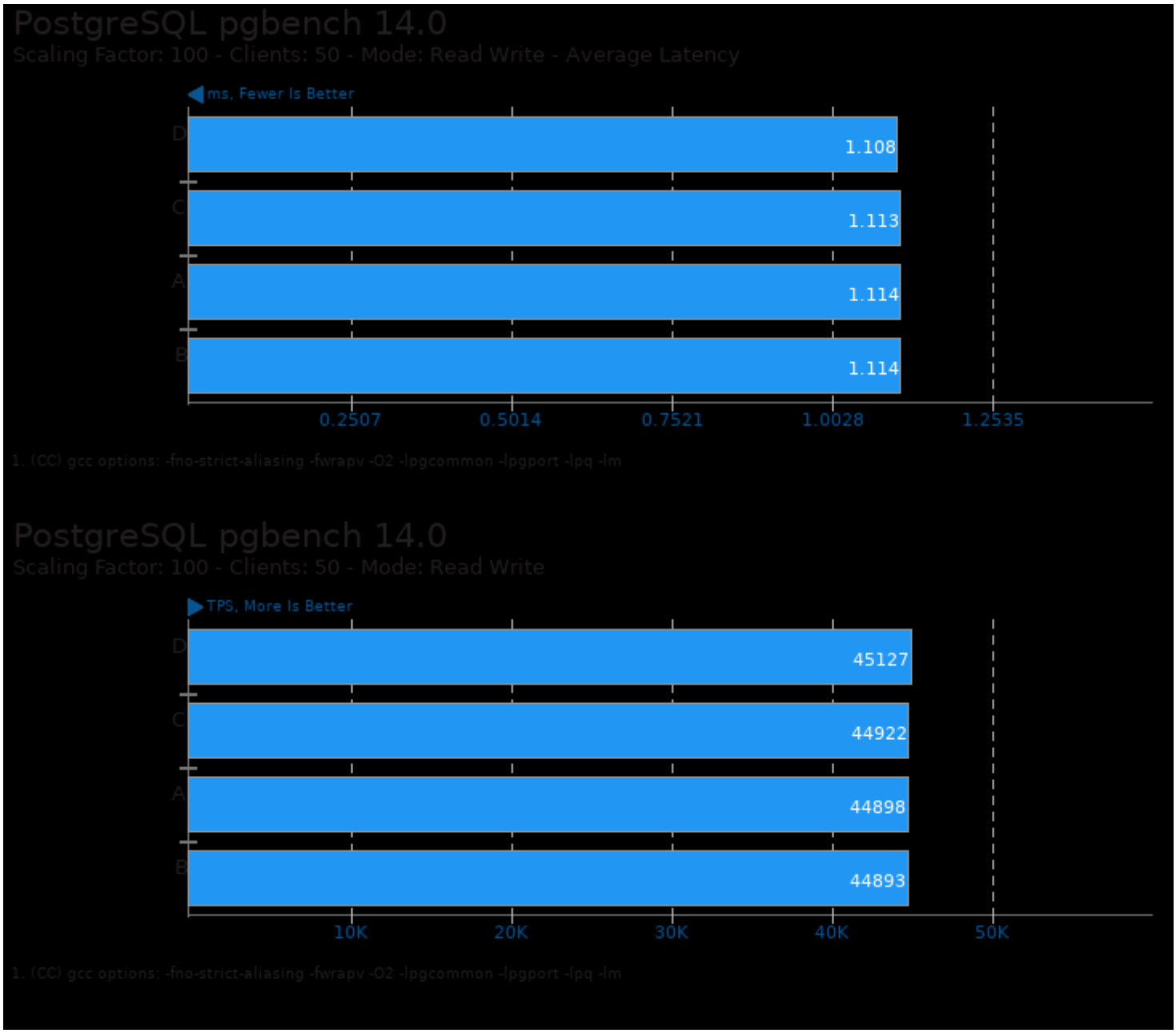

PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 500 - Mode: Read Only - Average Latency
ms, Fewer Is Better
A
B
C
D
0.902
0.912
0.922
0.934
0.2102
0.4204
0.6306
0.8408
1.051
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 500 - Mode: Read Only
TPS, More Is Better
A
B
C
D
554442
548201
542035
535062
120K
240K
360K
480K
600K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm

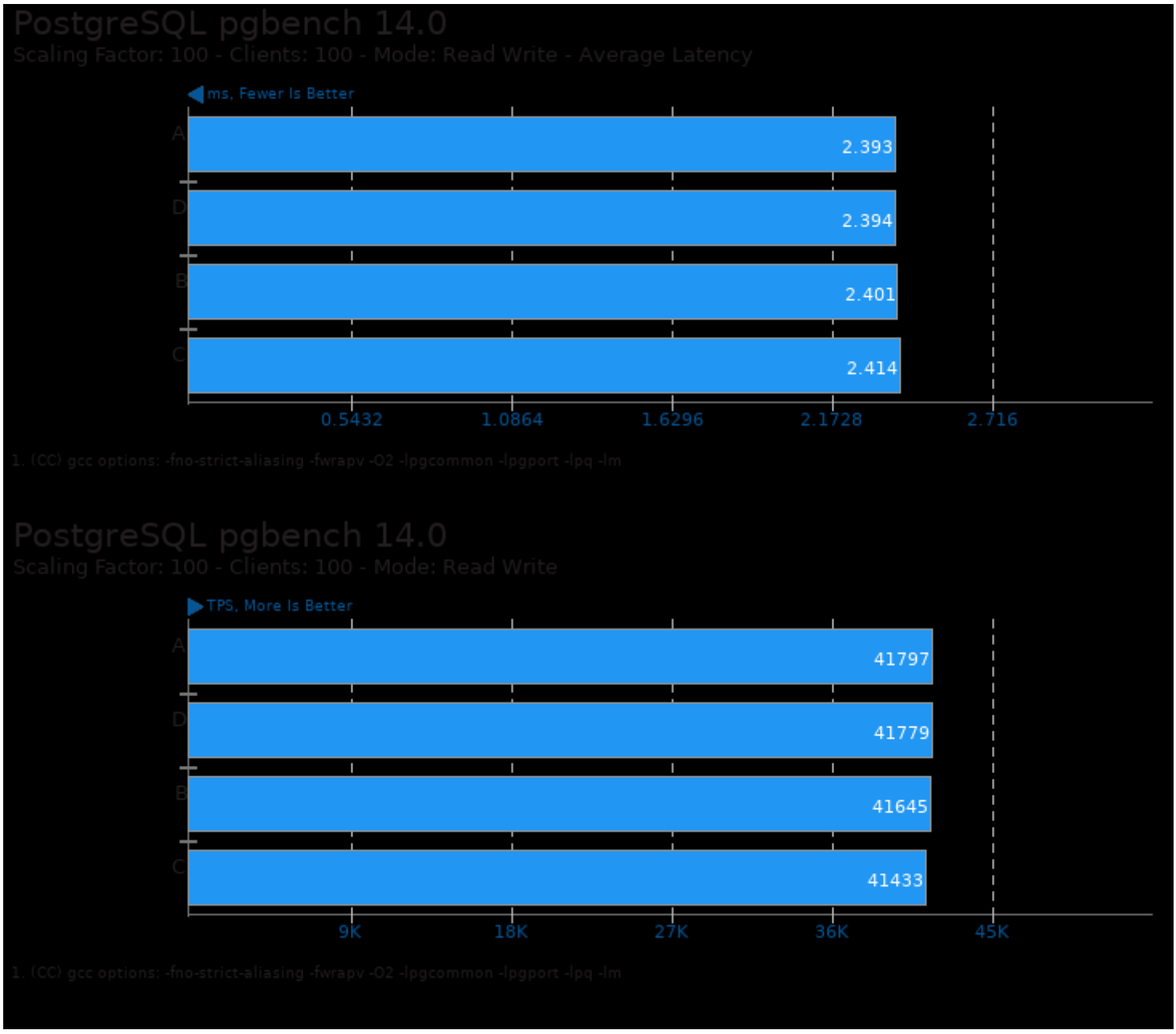

PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 1 - Mode: Read Only - Average Latency
ms, Fewer Is Better
A
B
C
D
0.038
0.038
0.038
0.038
0.0086
0.0172
0.0258
0.0344
0.043
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 1 - Mode: Read Only
TPS, More Is Better
A
C
B
D
26125
26095
26056
26003
6K
12K
18K
24K
30K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm

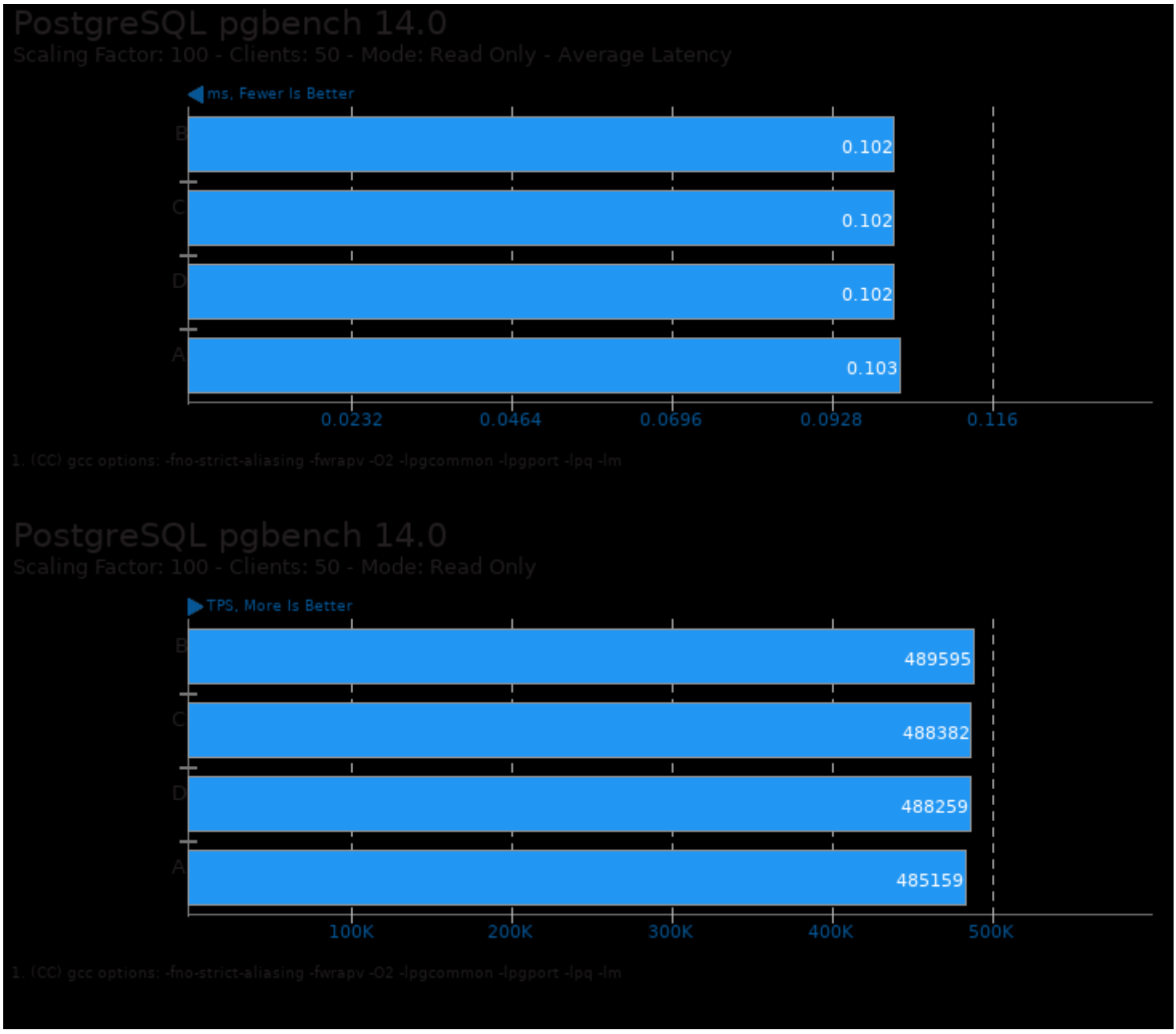

PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Write - Average Latency
ms, Fewer Is Better
A
C
D
B
6.559
6.579
6.592
6.605
2
4
6
8
10
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Write
TPS, More Is Better
A
C
D
B
38118
38001
37927
37852
8K
16K
24K
32K
40K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm


PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 1 - Mode: Read Write - Average Latency
ms, Fewer Is Better
C
B
D
A
0.284
0.286
0.286
0.287
0.0646
0.1292
0.1938
0.2584
0.323
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 1 - Mode: Read Write
TPS, More Is Better
C
B
D
A
3521
3499
3493
3480
800
1600
2400
3200
4000
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm


PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Only - Average Latency
ms, Fewer Is Better
D
B
C
A
0.463
0.464
0.464
0.466
0.1049
0.2098
0.3147
0.4196
0.5245
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Only
TPS, More Is Better
D
C
B
A
539686
538933
538247
536452
120K
240K
360K
480K
600K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm

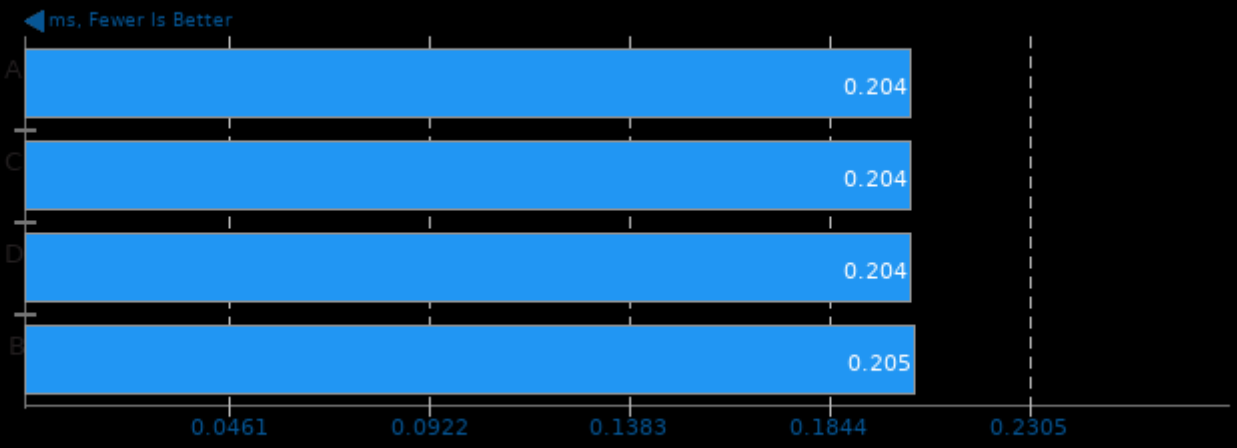

PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 50 - Mode: Read Write - Average Latency
ms, Fewer Is Better
D
C
A
B
1.108
1.113
1.114
1.114
0.2507
0.5014
0.7521
1.0028
1.2535
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 50 - Mode: Read Write
TPS, More Is Better
D
C
A
B
45127
44922
44898
44893
10K
20K
30K
40K
50K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm


PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 100 - Mode: Read Write - Average Latency
ms, Fewer Is Better
A
D
B
C
2.393
2.394
2.401
2.414
0.5432
1.0864
1.6296
2.1728
2.716
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 100 - Mode: Read Write
TPS, More Is Better
A
D
B
C
41797
41779
41645
41433
9K
18K
27K
36K
45K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm


PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 50 - Mode: Read Only - Average Latency
ms, Fewer Is Better
B
C
D
A
0.102
0.102
0.102
0.103
0.0232
0.0464
0.0696
0.0928
0.116
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 100 - Clients: 50 - Mode: Read Only
TPS, More Is Better
B
C
D
A
489595
488382
488259
485159
100K
200K
300K
400K
500K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm

PostgreSQL pgbench 14.0

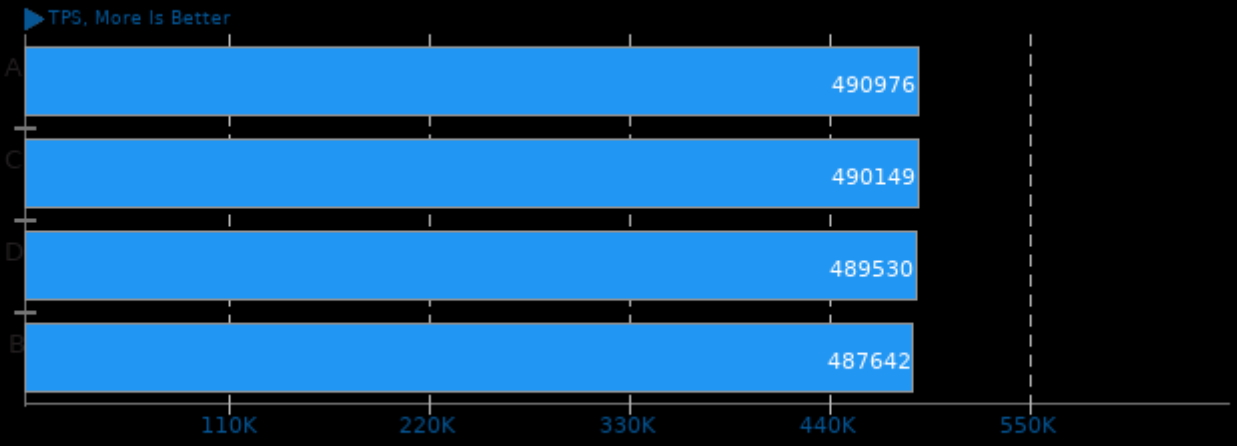
Scaling Factor: 100 - Clients: 100 - Mode: Read Only - Average Latency



1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm

PostgreSQL pgbench 14.0

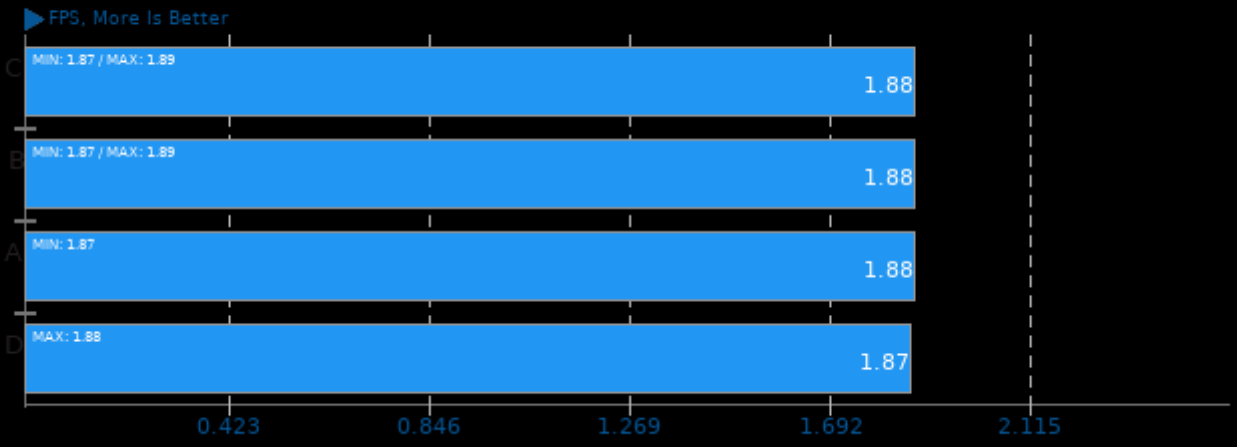
Scaling Factor: 100 - Clients: 100 - Mode: Read Only



1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm

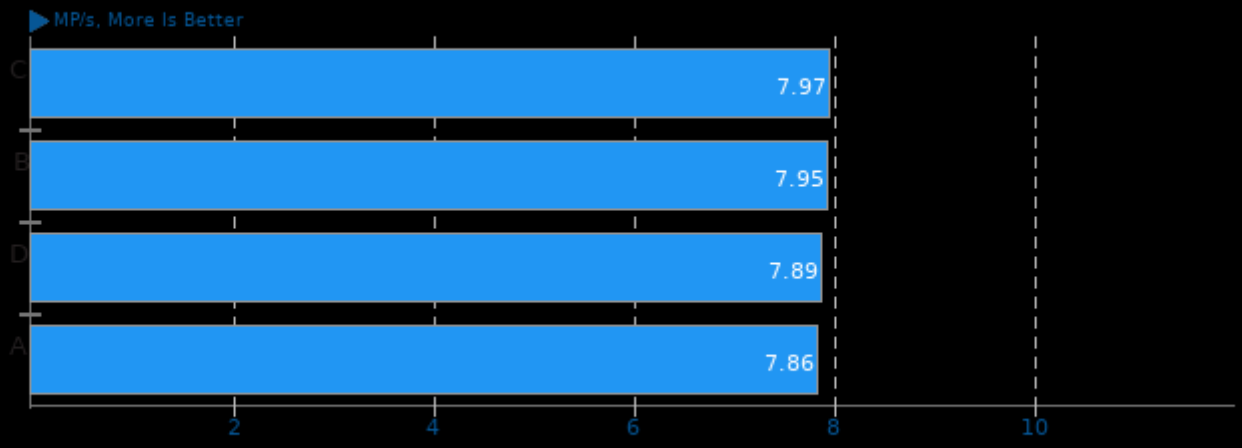
OSPray 1.8.5

Demo: San Miguel - Renderer: Path Tracer



JPEG XL libjxl 0.5

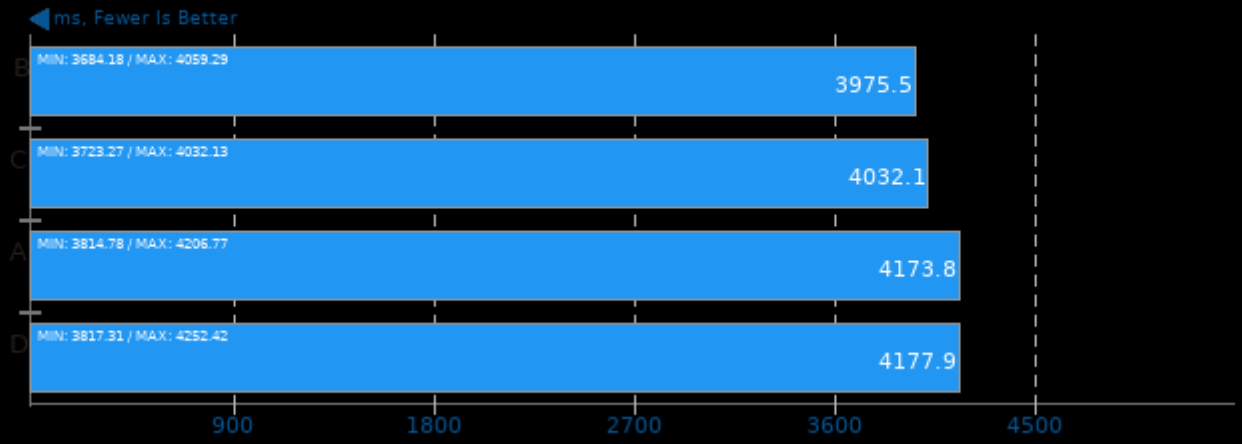
Input: PNG - Encode Speed: 7



1. (CXX) g++ options: -funwind-tables -O3 -O2 -pthread -fPIE -pie

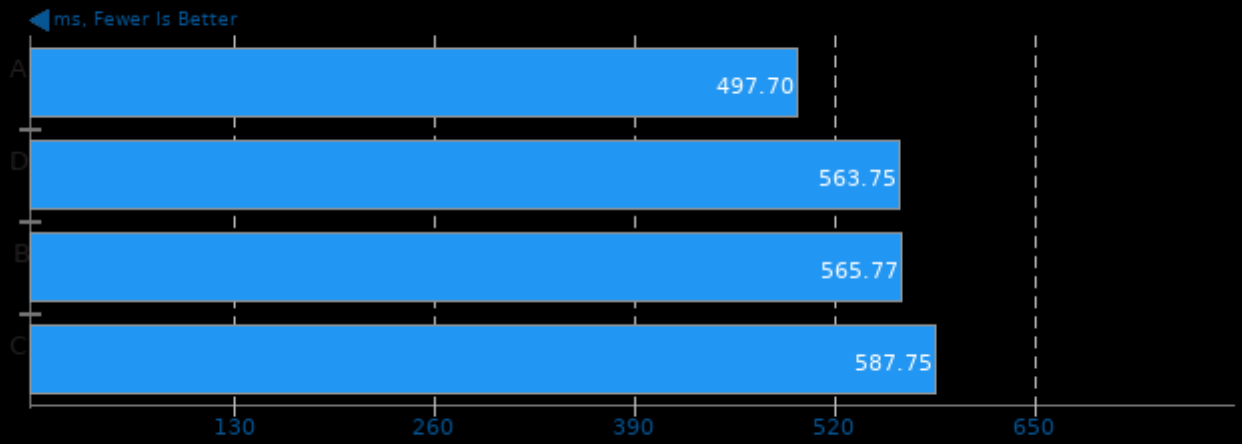
Renaissance 0.12

Test: Apache Spark PageRank

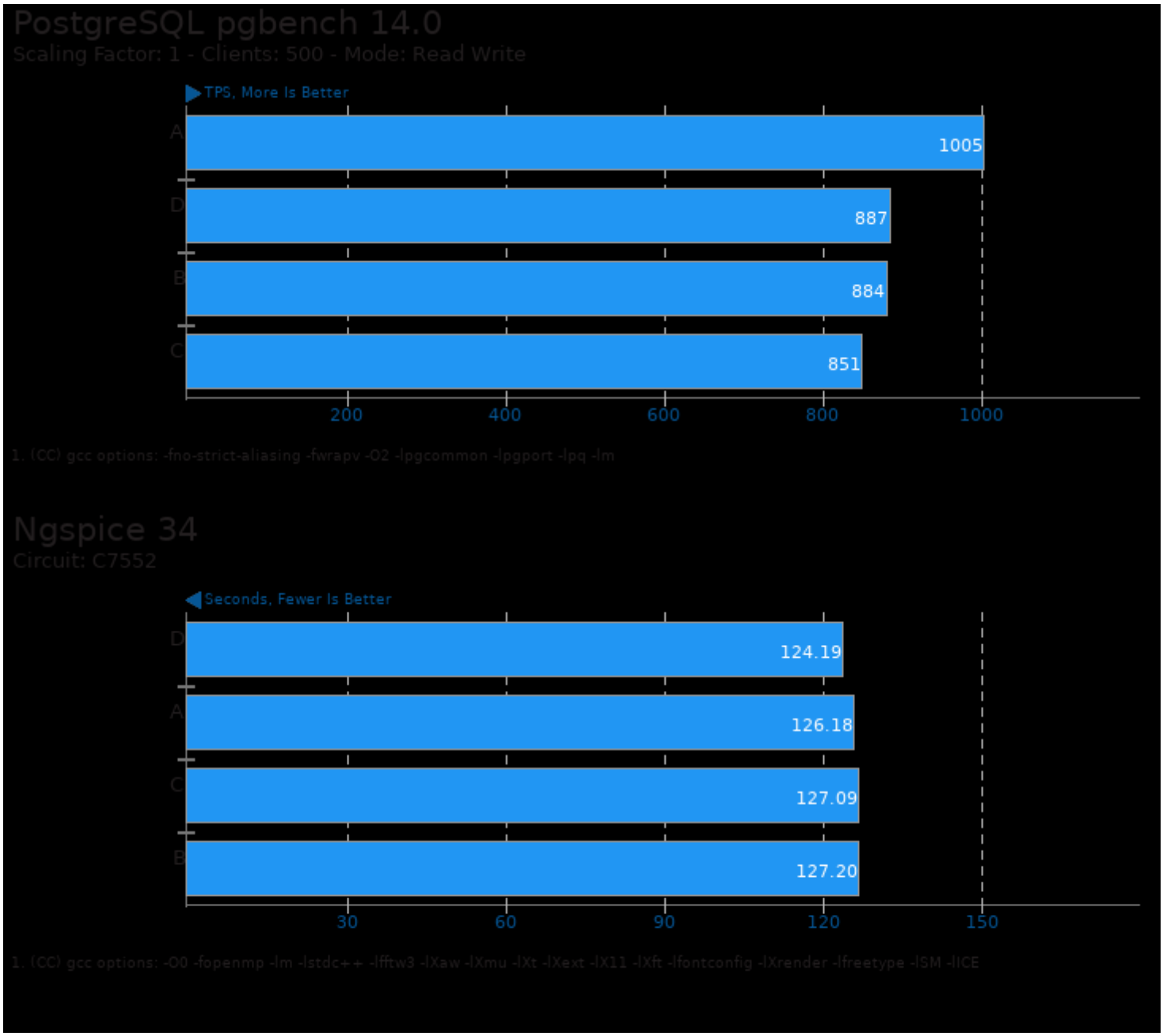


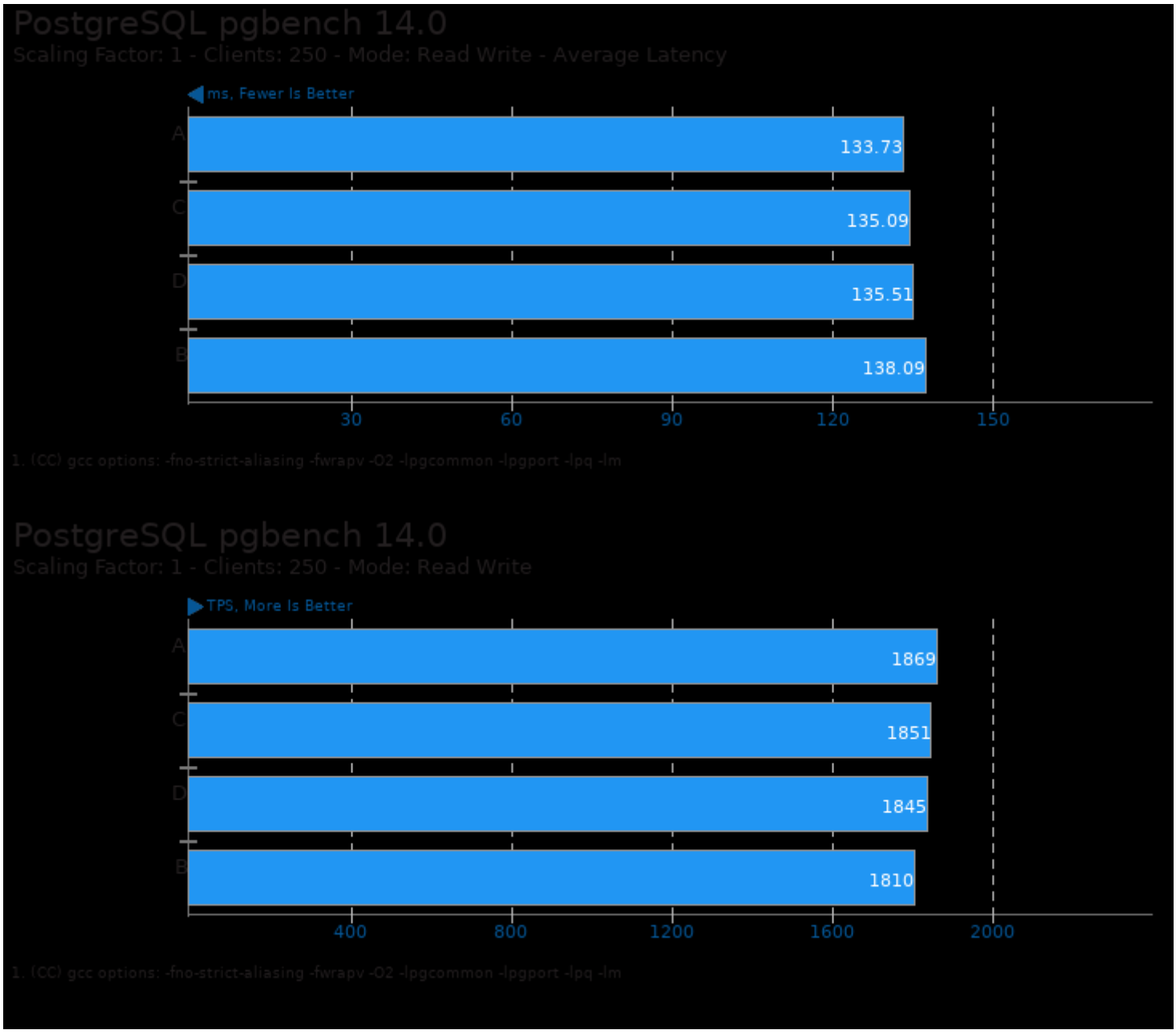
PostgreSQL pgbench 14.0

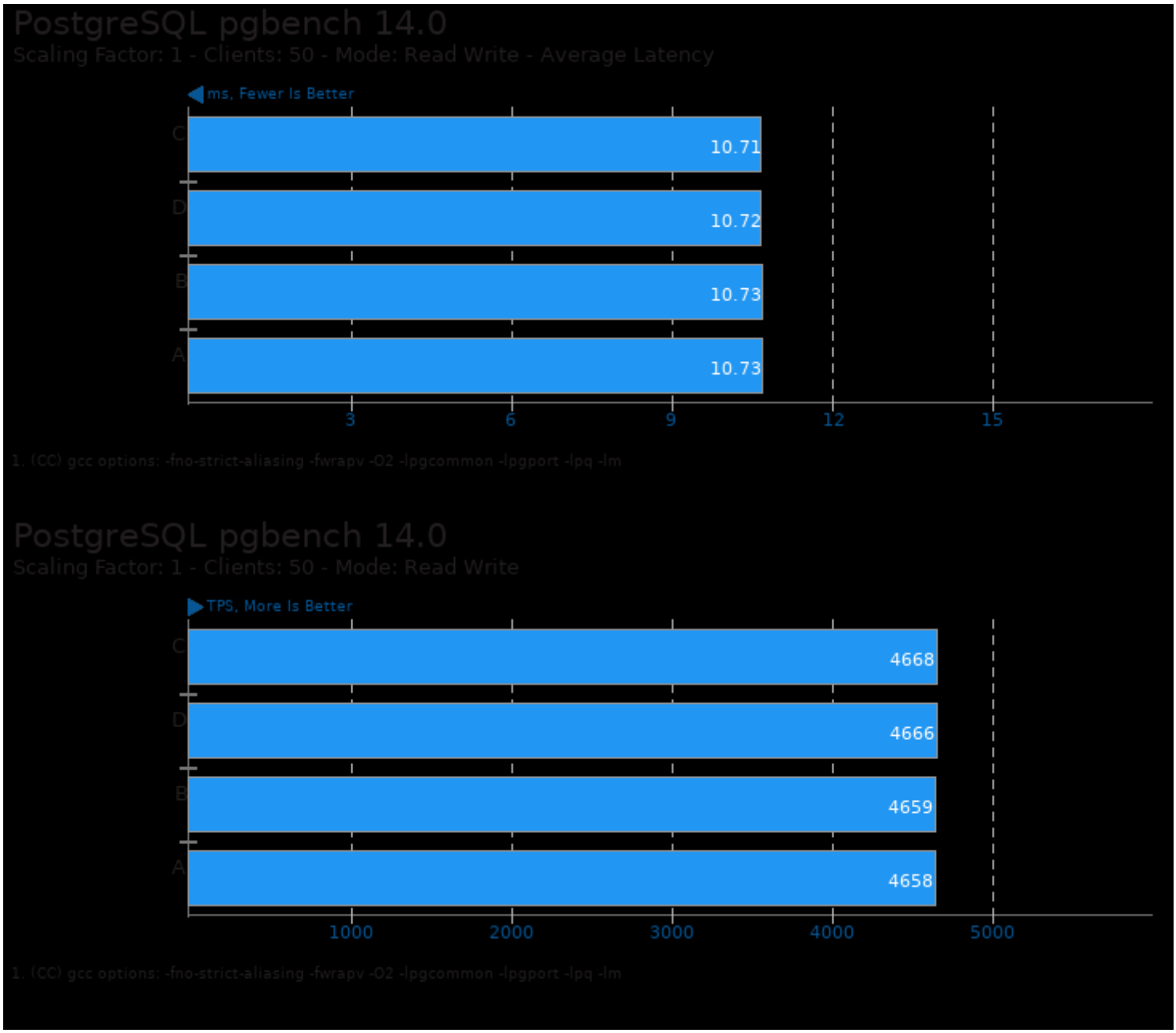
Scaling Factor: 1 - Clients: 500 - Mode: Read Write - Average Latency

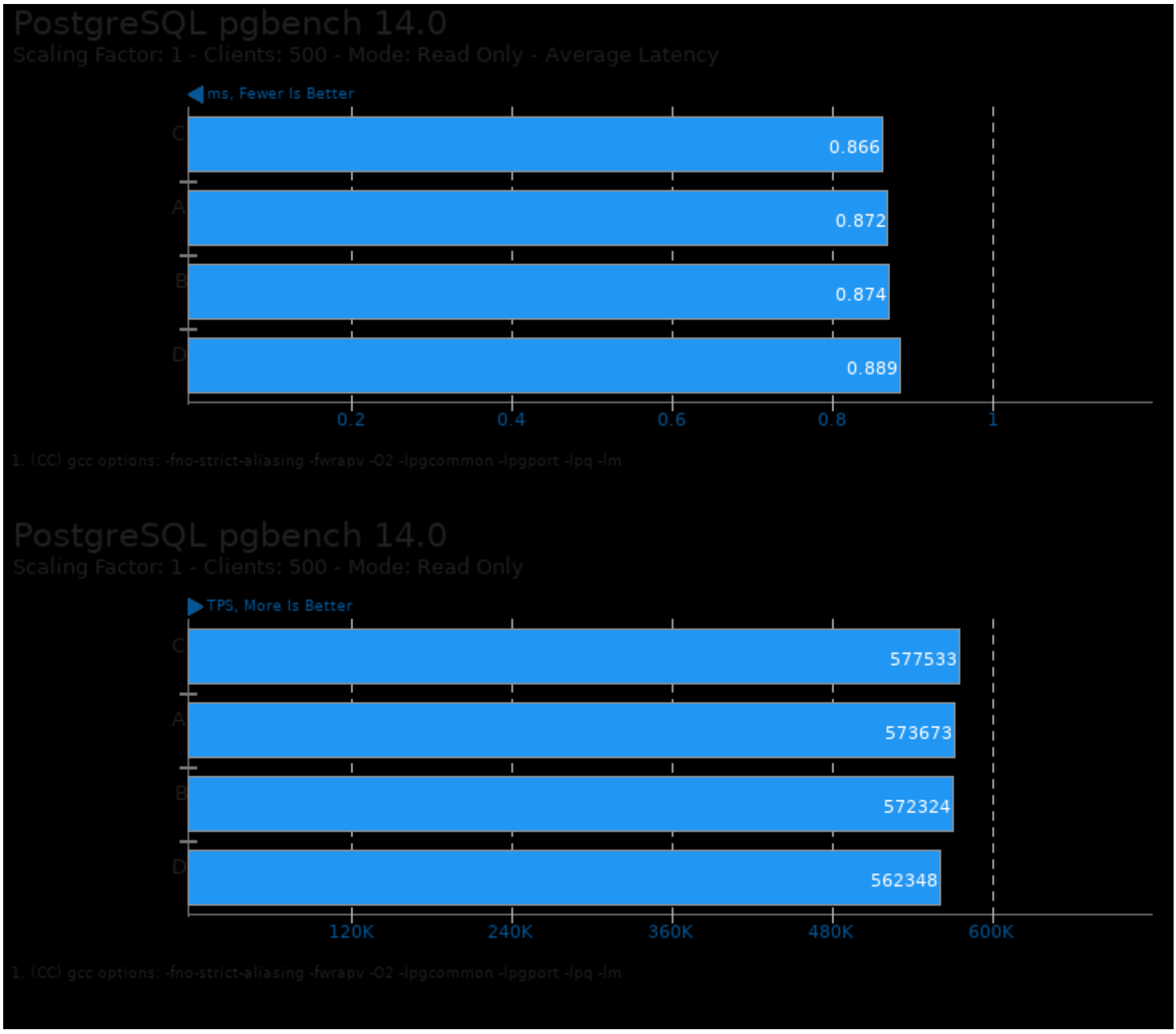


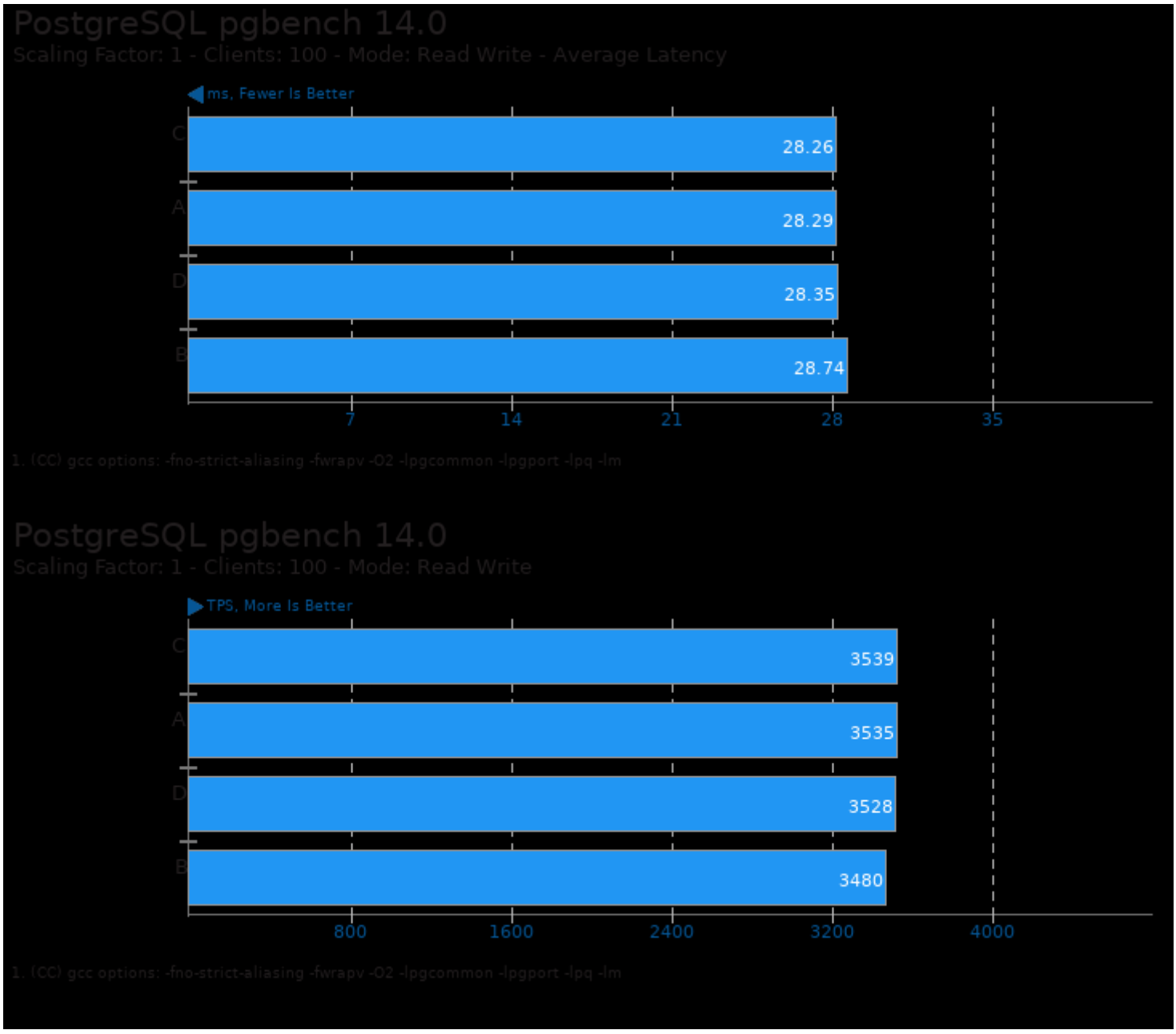
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm

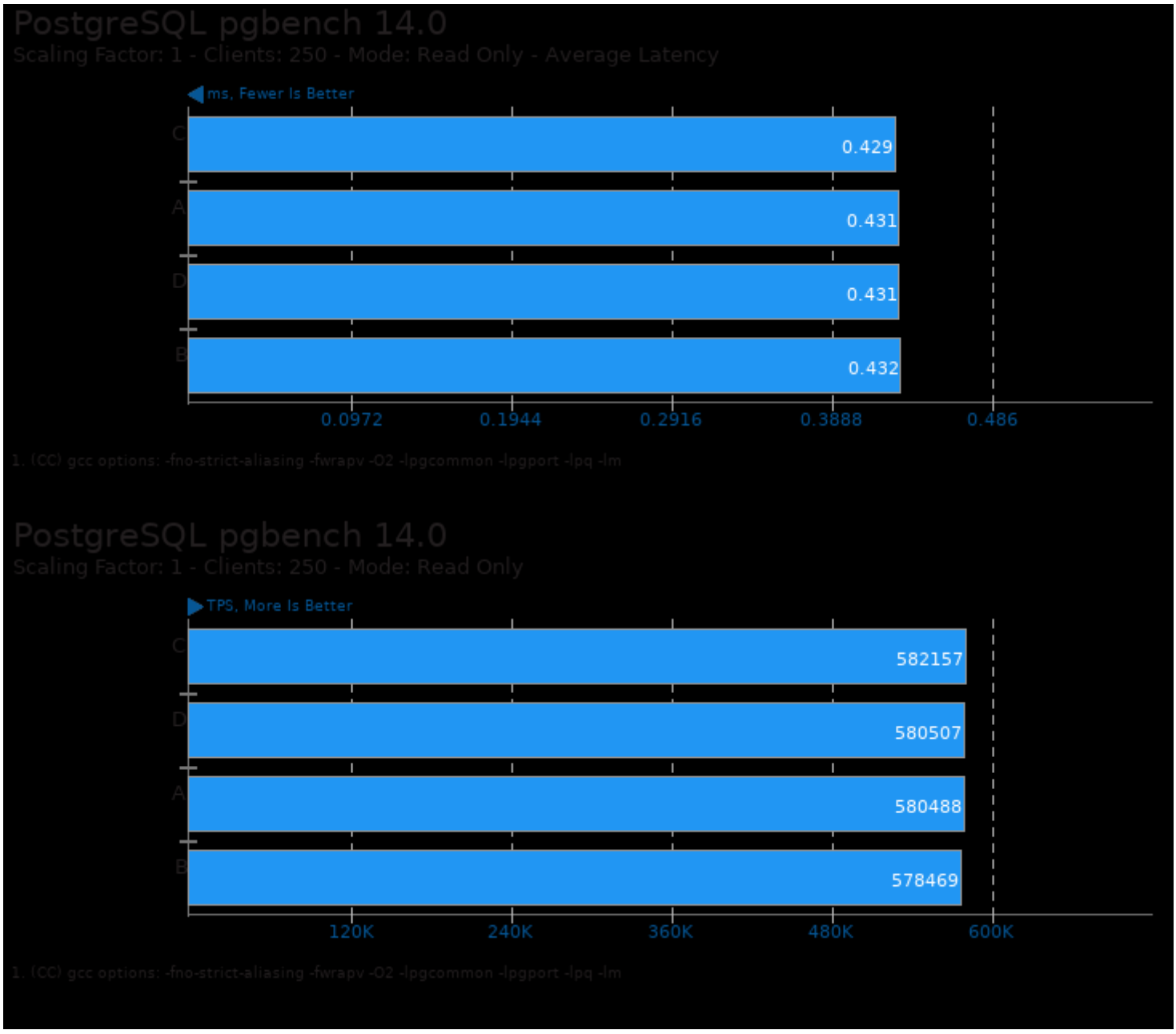

PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 500 - Mode: Read Write
TPS, More Is Better
A
1005
D
887
B
884
C
851
200
400
600
800
1000
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
Ngspice 34
Circuit: C7552
Seconds, Fewer Is Better
D
124.19
A
126.18
C
127.09
B
127.20
30
60
90
120
150
1. (CC) gcc options: -O0 -fopenmp -lm -lstdc++ -lfftw3 -lXaw -lXmu -lXt -lXext -lX11 -lXft -lfontconfig -lXrender -lfreetype -lSM -lICE

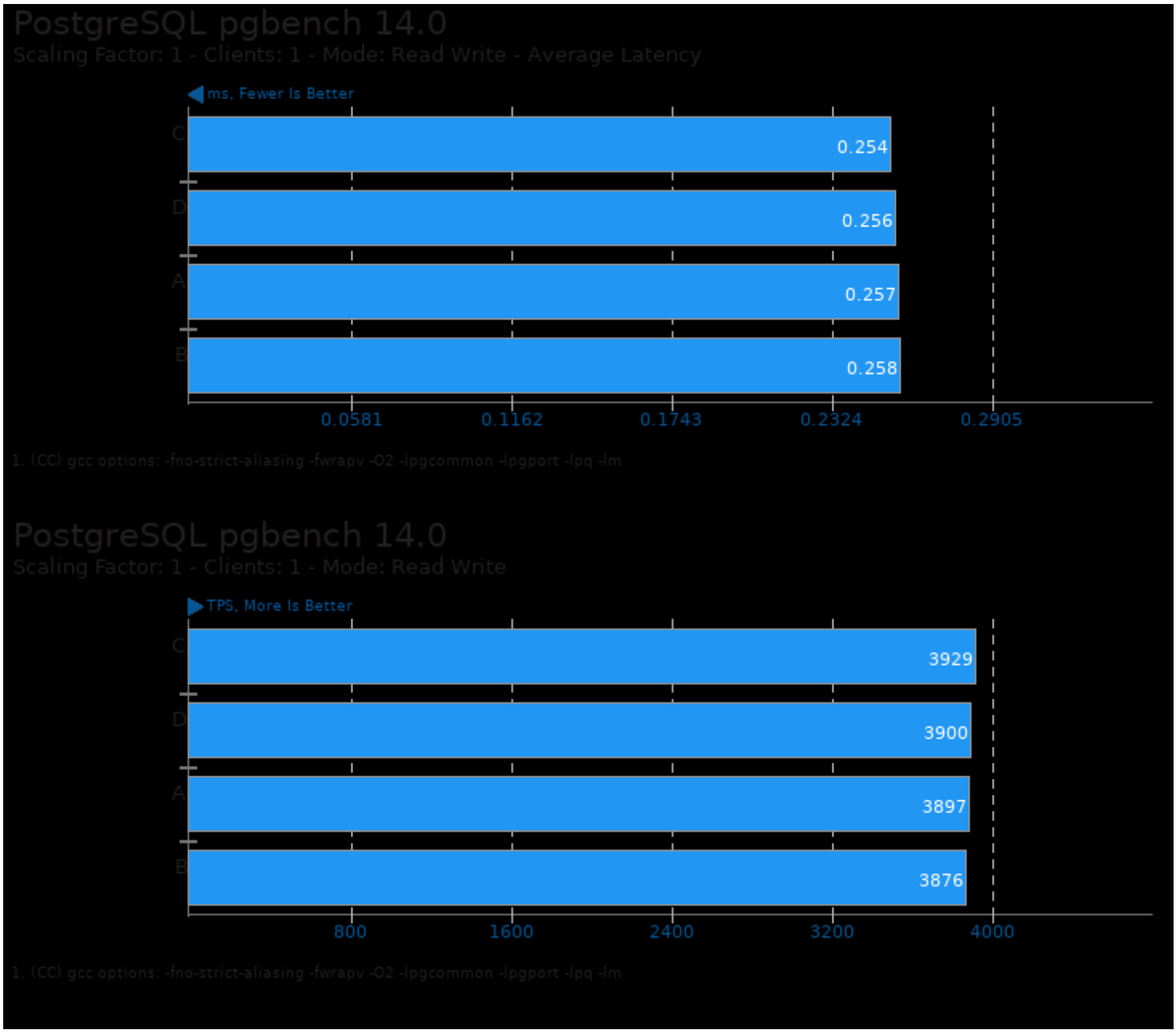

PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 250 - Mode: Read Write - Average Latency
ms, Fewer Is Better
A
C
D
B
133.73
135.09
135.51
138.09
30
60
90
120
150
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 250 - Mode: Read Write
TPS, More Is Better
A
C
D
B
1869
1851
1845
1810
400
800
1200
1600
2000
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm

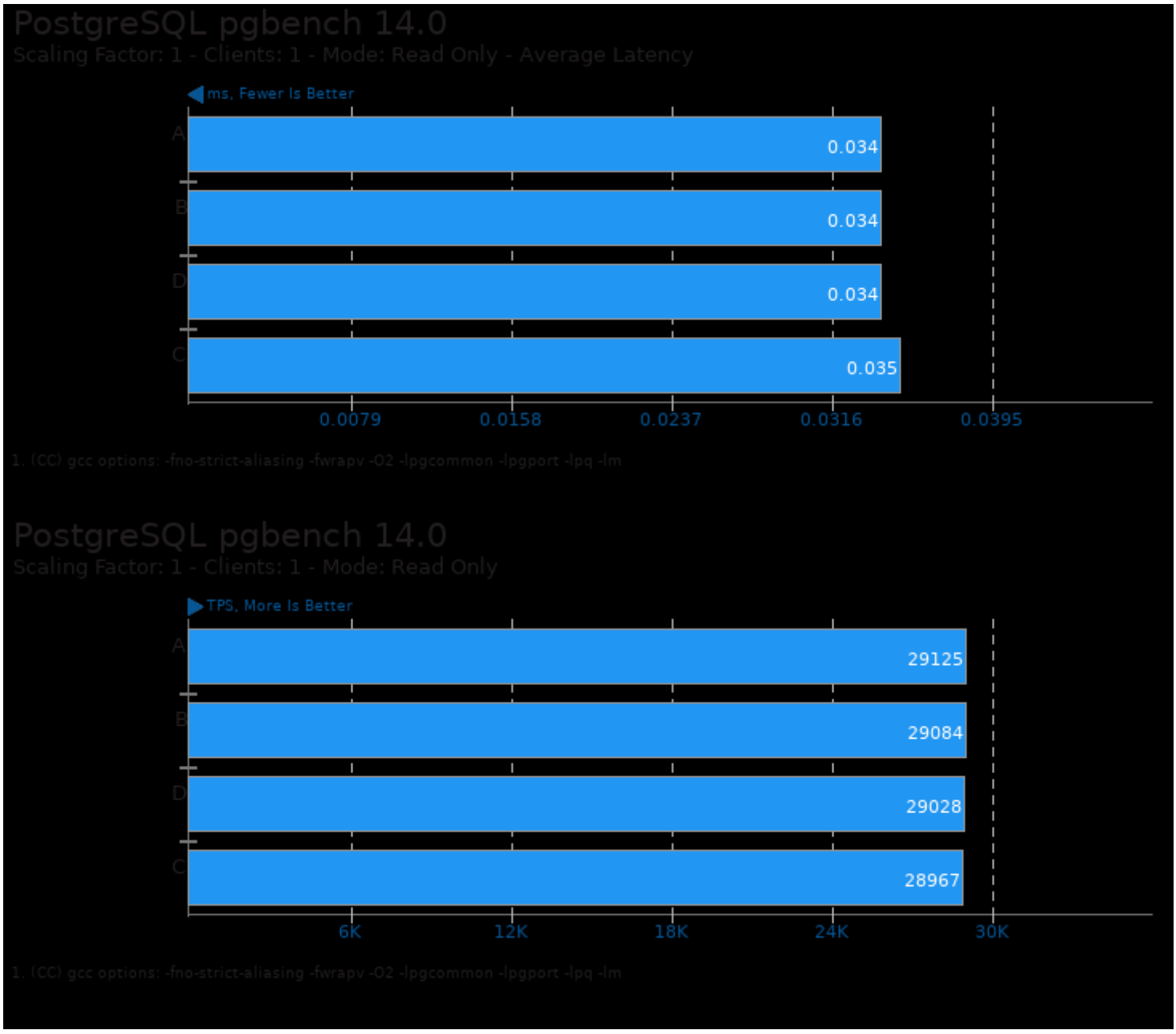

PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 50 - Mode: Read Write - Average Latency
ms, Fewer Is Better
C
D
B
A
10.71
10.72
10.73
10.73
3
6
9
12
15
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 50 - Mode: Read Write
TPS, More Is Better
C
D
B
A
4668
4666
4659
4658
1000
2000
3000
4000
5000
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm

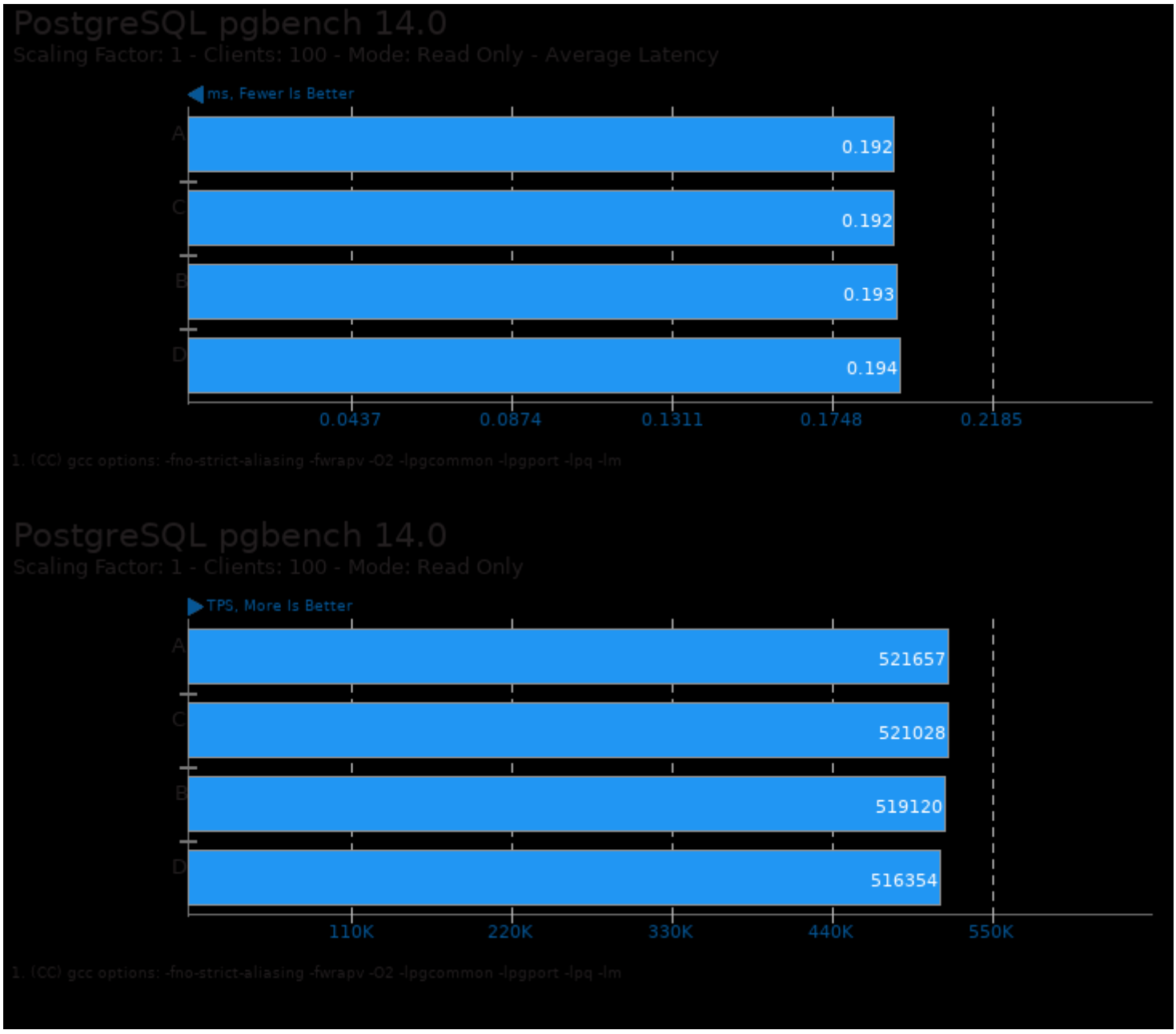

PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 500 - Mode: Read Only - Average Latency
ms, Fewer Is Better
C
A
B
D
0.866
0.872
0.874
0.889
0.2
0.4
0.6
0.8
1
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 500 - Mode: Read Only
TPS, More Is Better
C
A
B
D
577533
573673
572324
562348
120K
240K
360K
480K
600K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm

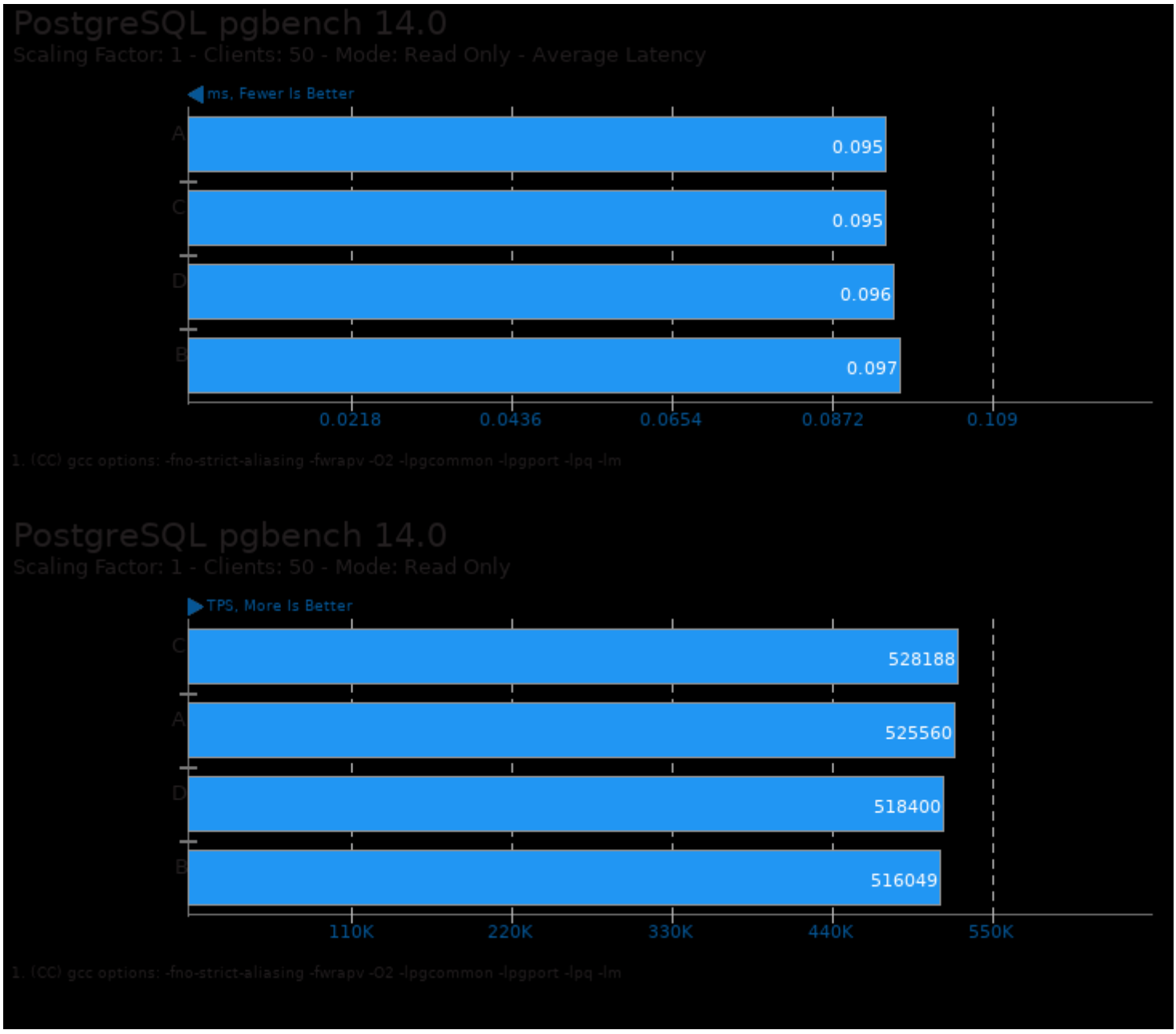

PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 100 - Mode: Read Write - Average Latency
ms, Fewer Is Better
C
28.26
A
28.29
D
28.35
B
28.74
7
14
21
28
35
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 100 - Mode: Read Write
TPS, More Is Better
C
3539
A
3535
D
3528
B
3480
800
1600
2400
3200
4000
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm


PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 250 - Mode: Read Only - Average Latency
ms, Fewer Is Better
C
A
D
B
0.429
0.431
0.431
0.432
0.0972
0.1944
0.2916
0.3888
0.486
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 250 - Mode: Read Only
TPS, More Is Better
C
D
A
B
582157
580507
580488
578469
120K
240K
360K
480K
600K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm

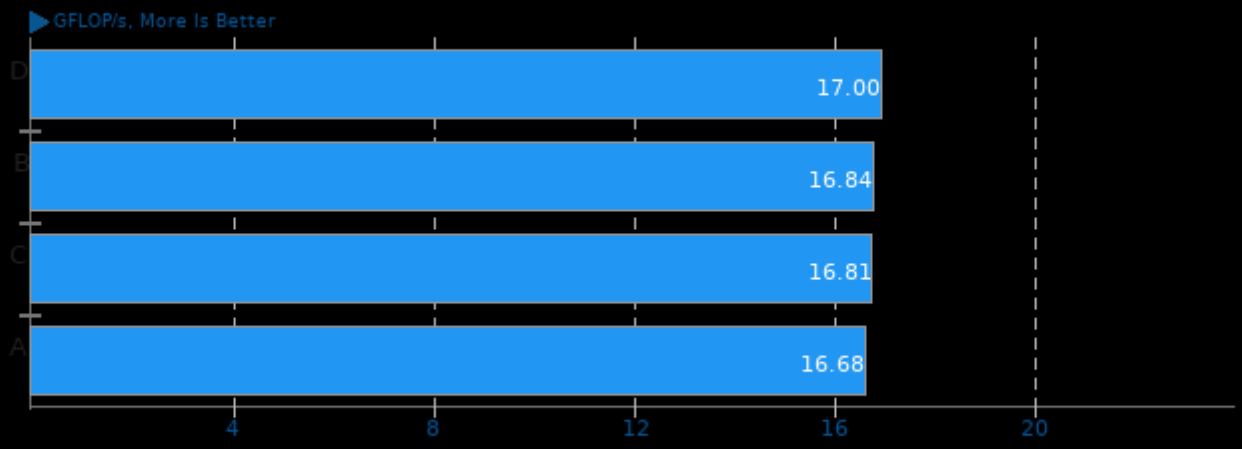

PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 1 - Mode: Read Write - Average Latency
ms, Fewer Is Better
C
D
A
B
0.254
0.256
0.257
0.258
0.0581
0.1162
0.1743
0.2324
0.2905
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 1 - Mode: Read Write
TPS, More Is Better
C
D
A
B
3929
3900
3897
3876
800
1600
2400
3200
4000
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm


PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 1 - Mode: Read Only - Average Latency
ms, Fewer Is Better
A
B
D
C
0.034
0.034
0.034
0.035
0.0079
0.0158
0.0237
0.0316
0.0395
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 1 - Mode: Read Only
TPS, More Is Better
A
B
D
C
29125
29084
29028
28967
6K
12K
18K
24K
30K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm


PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 100 - Mode: Read Only - Average Latency
ms, Fewer Is Better
A
C
B
D
0.192
0.192
0.193
0.194
0.0437
0.0874
0.1311
0.1748
0.2185
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 100 - Mode: Read Only
TPS, More Is Better
A
C
B
D
521657
521028
519120
516354
110K
220K
330K
440K
550K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm


PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 50 - Mode: Read Only - Average Latency
ms, Fewer Is Better
A
C
D
B
0.095
0.095
0.096
0.097
0.0218
0.0436
0.0654
0.0872
0.109
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm
PostgreSQL pgbench 14.0
Scaling Factor: 1 - Clients: 50 - Mode: Read Only
TPS, More Is Better
C
A
D
B
528188
525560
518400
516049
110K
220K
330K
440K
550K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lm

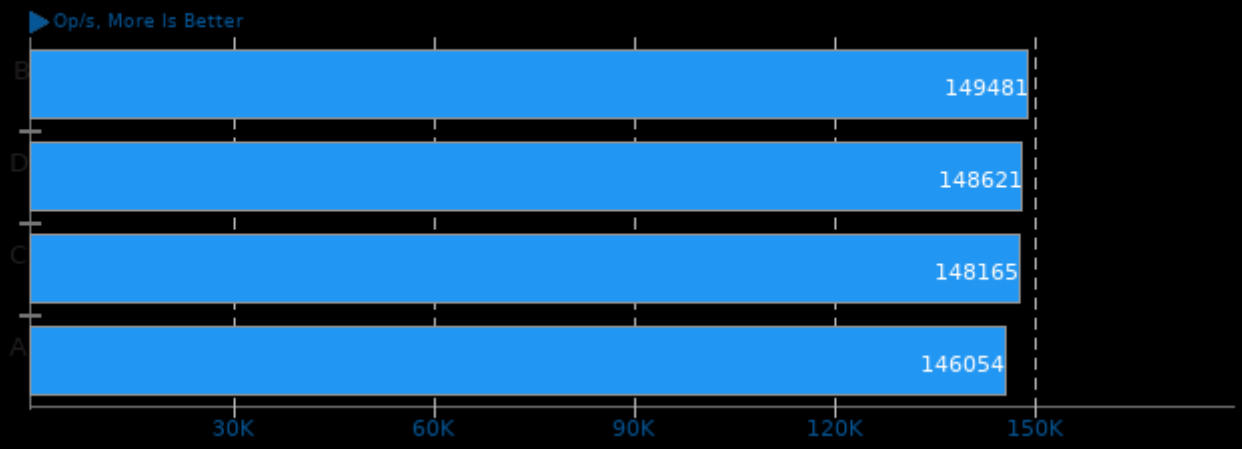
High Performance Conjugate Gradient 3.1



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

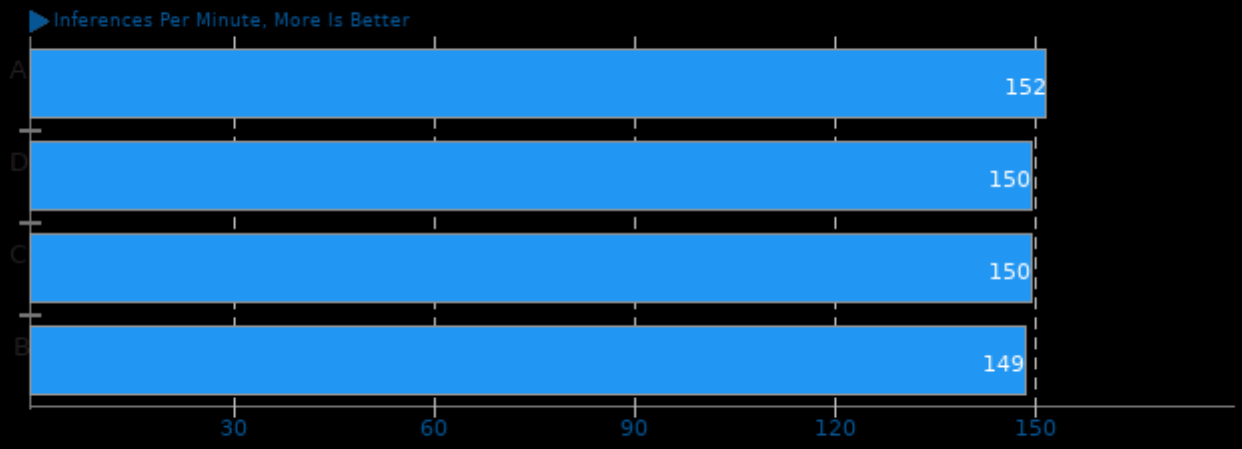
Apache Cassandra 4.0

Test: Writes



ONNX Runtime 1.8.2

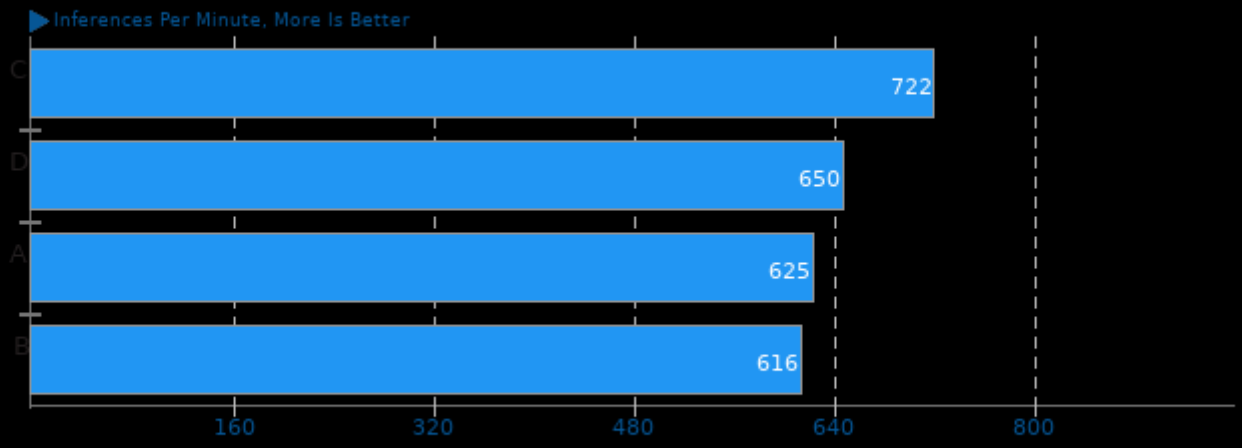
Model: fcn-resnet101-11 - Device: OpenMP CPU



1. (CXX) g++ options: -fopenmp -ffunction-sections -fdata-sections -O3 -ldl -lrt

ONNX Runtime 1.8.2

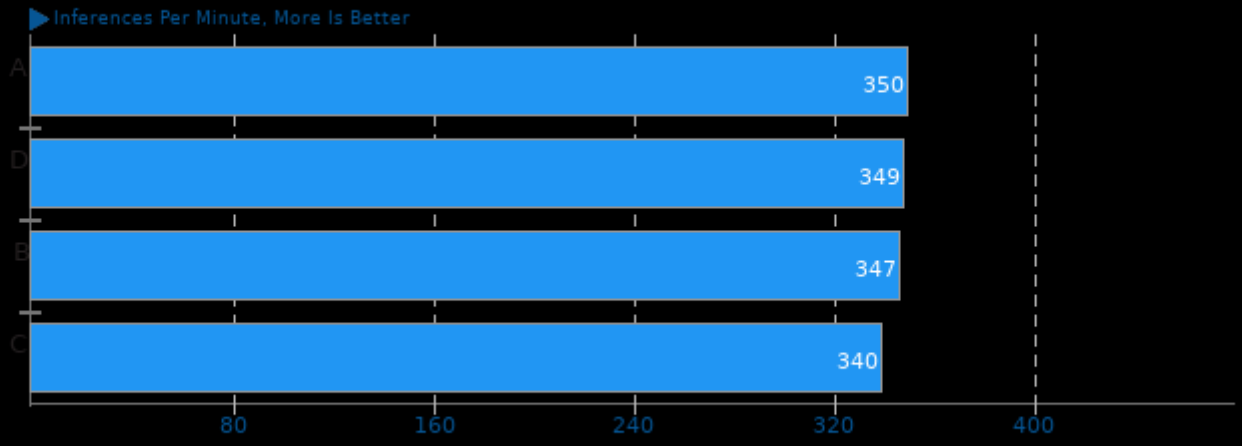
Model: bertsquad-10 - Device: OpenMP CPU



1. (CXX) g++ options: -fopenmp -ffunction-sections -fdata-sections -O3 -ldl -lrt

ONNX Runtime 1.8.2

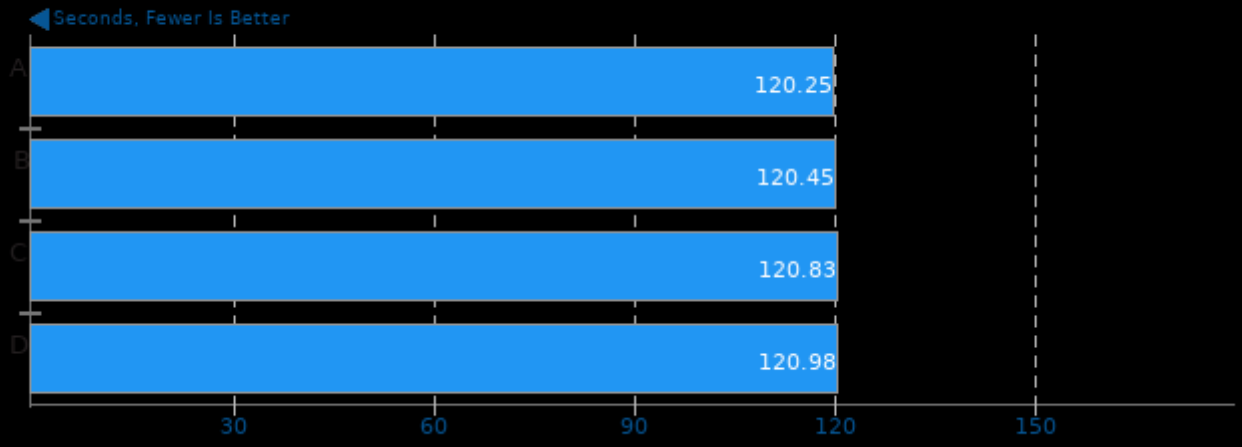
Model: yolov4 - Device: OpenMP CPU



1. (CXX) g++ options: -fopenmp -ffunction-sections -fdata-sections -O3 -ldl -lrt

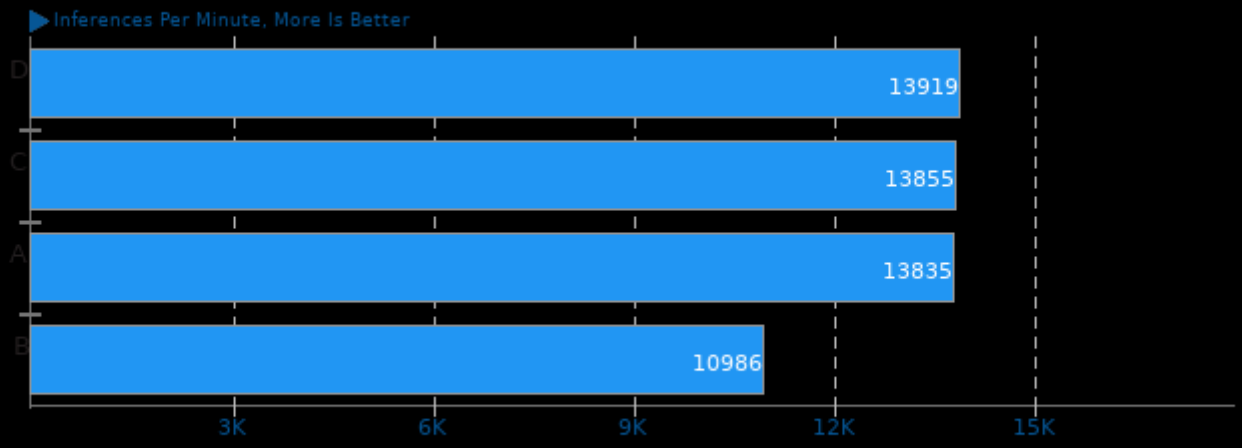
Timed Erlang/OTP Compilation 23.2

Time To Compile



ONNX Runtime 1.8.2

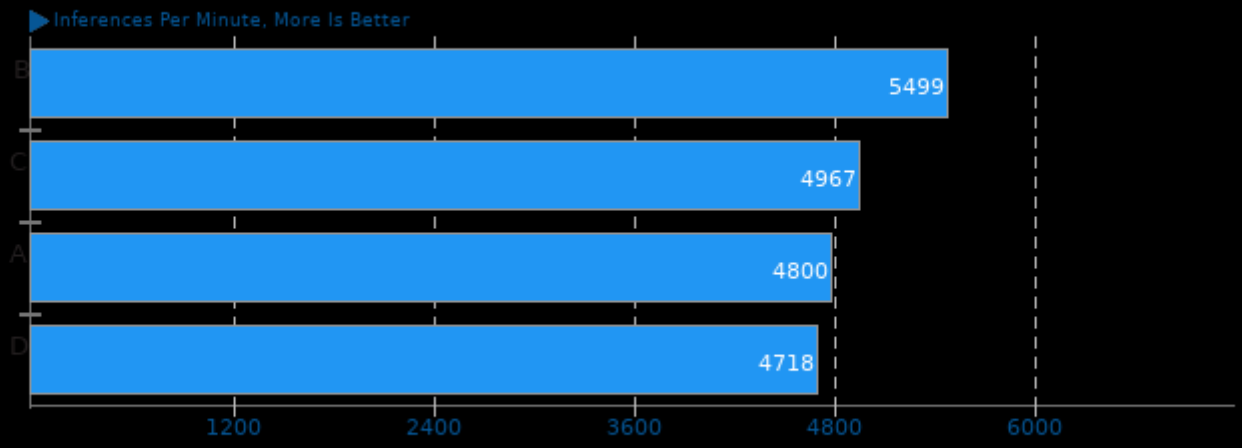
Model: shufflenet-v2-10 - Device: OpenMP CPU



1. (CXX) g++ options: -fopenmp -ffunction-sections -fdata-sections -O3 -ldl -lrt

ONNX Runtime 1.8.2

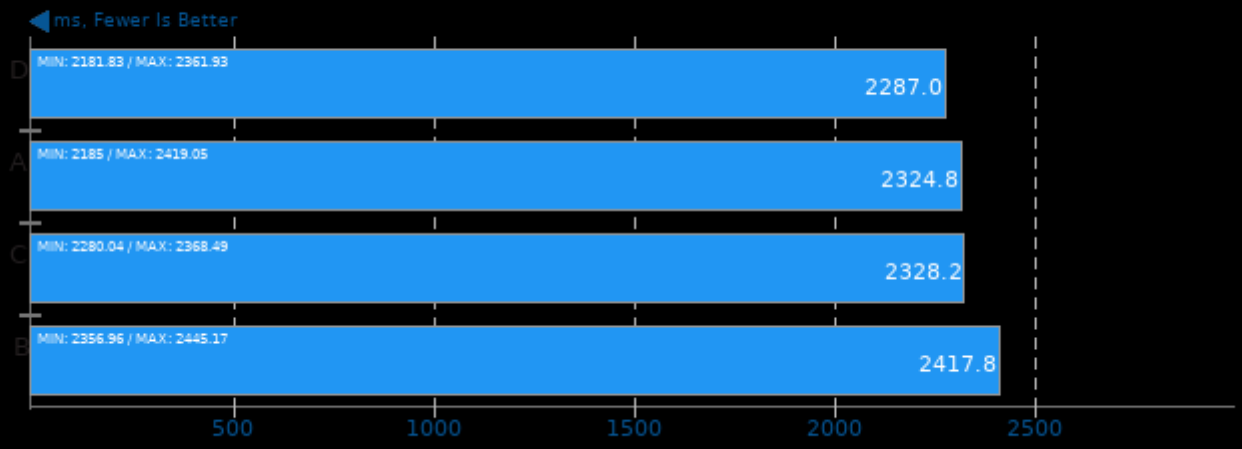
Model: super-resolution-10 - Device: OpenMP CPU

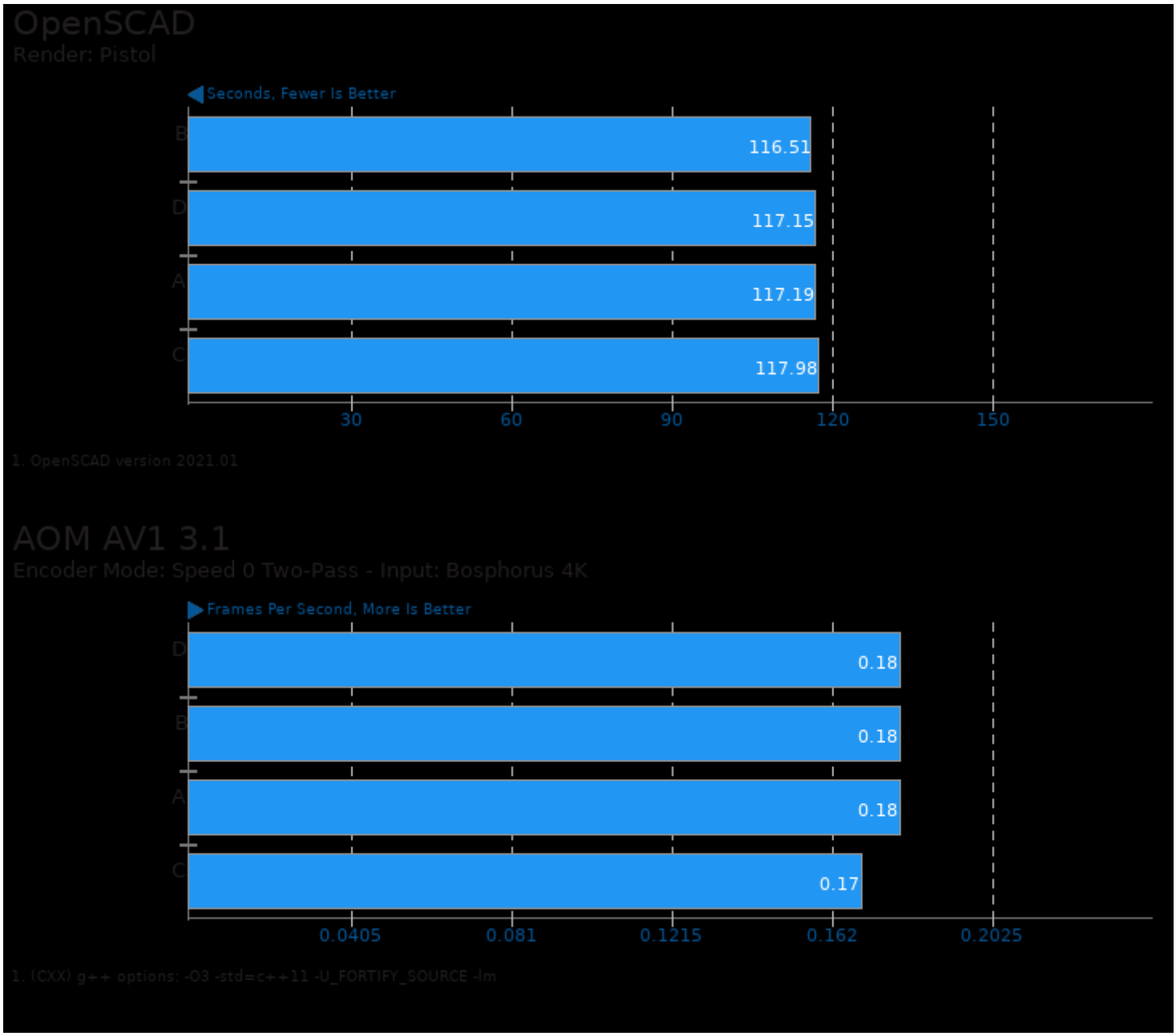


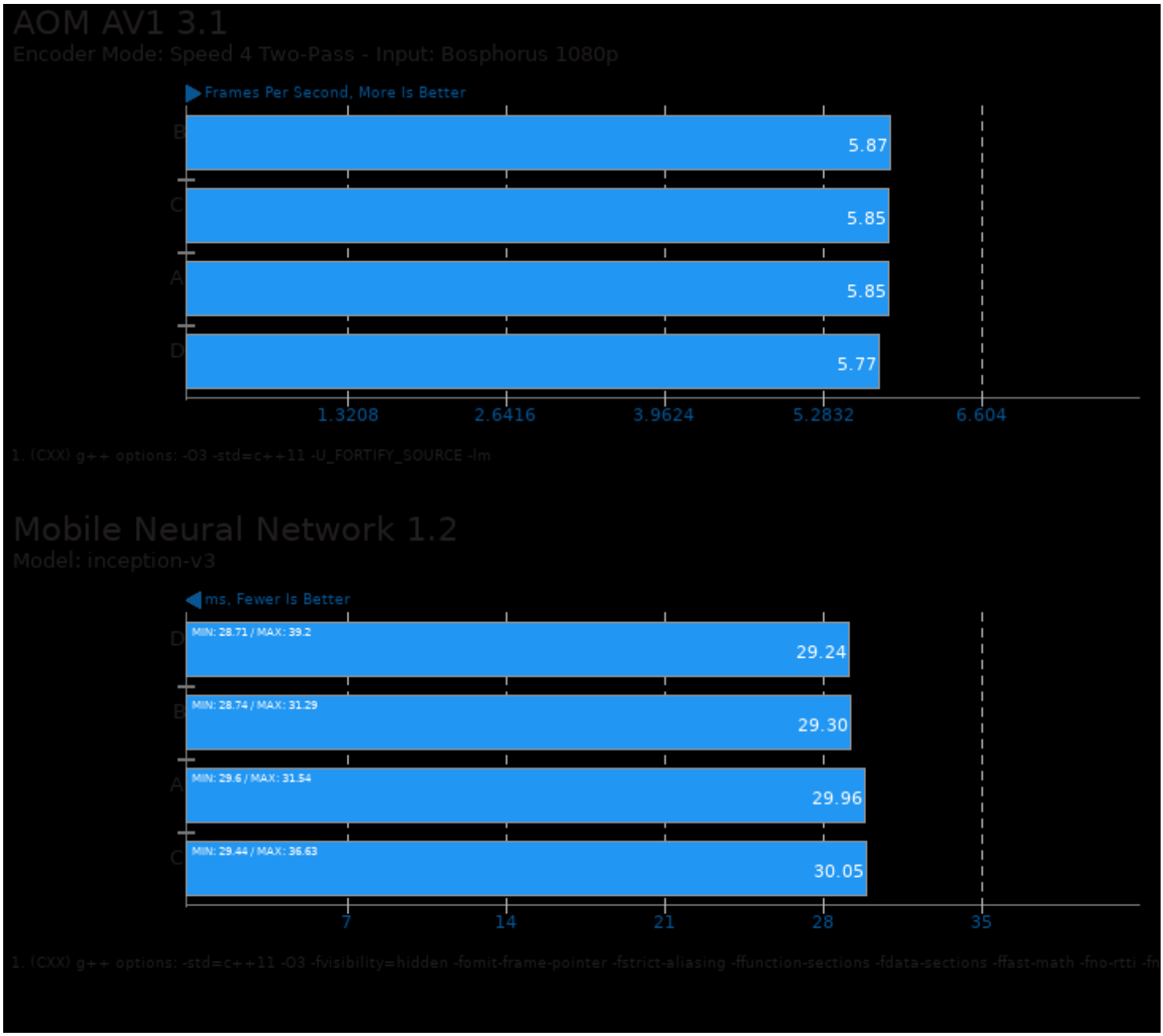
1. (CXX) g++ options: -fopenmp -ffunction-sections -fdata-sections -O3 -ldl -lrt

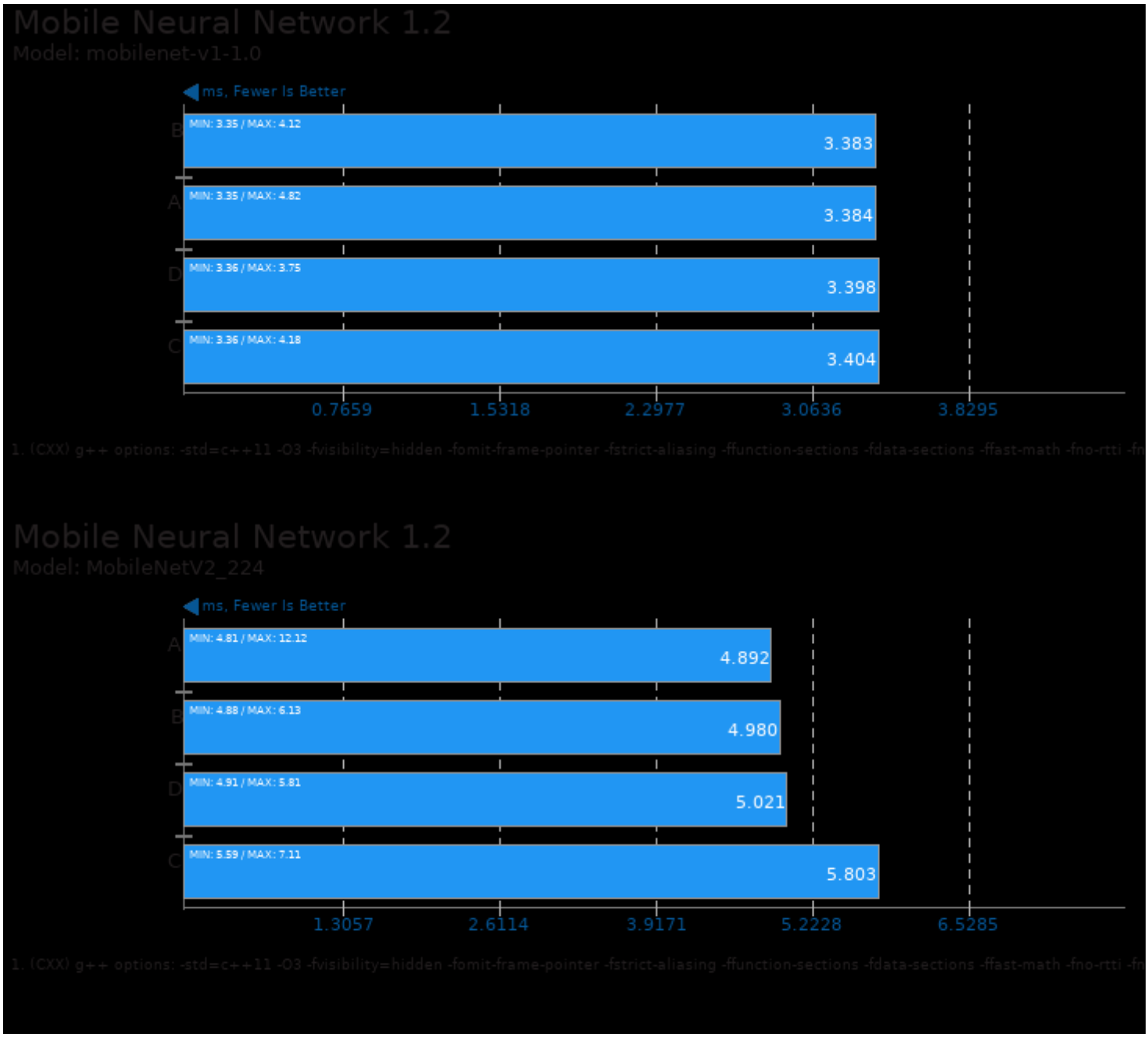
Renaissance 0.12

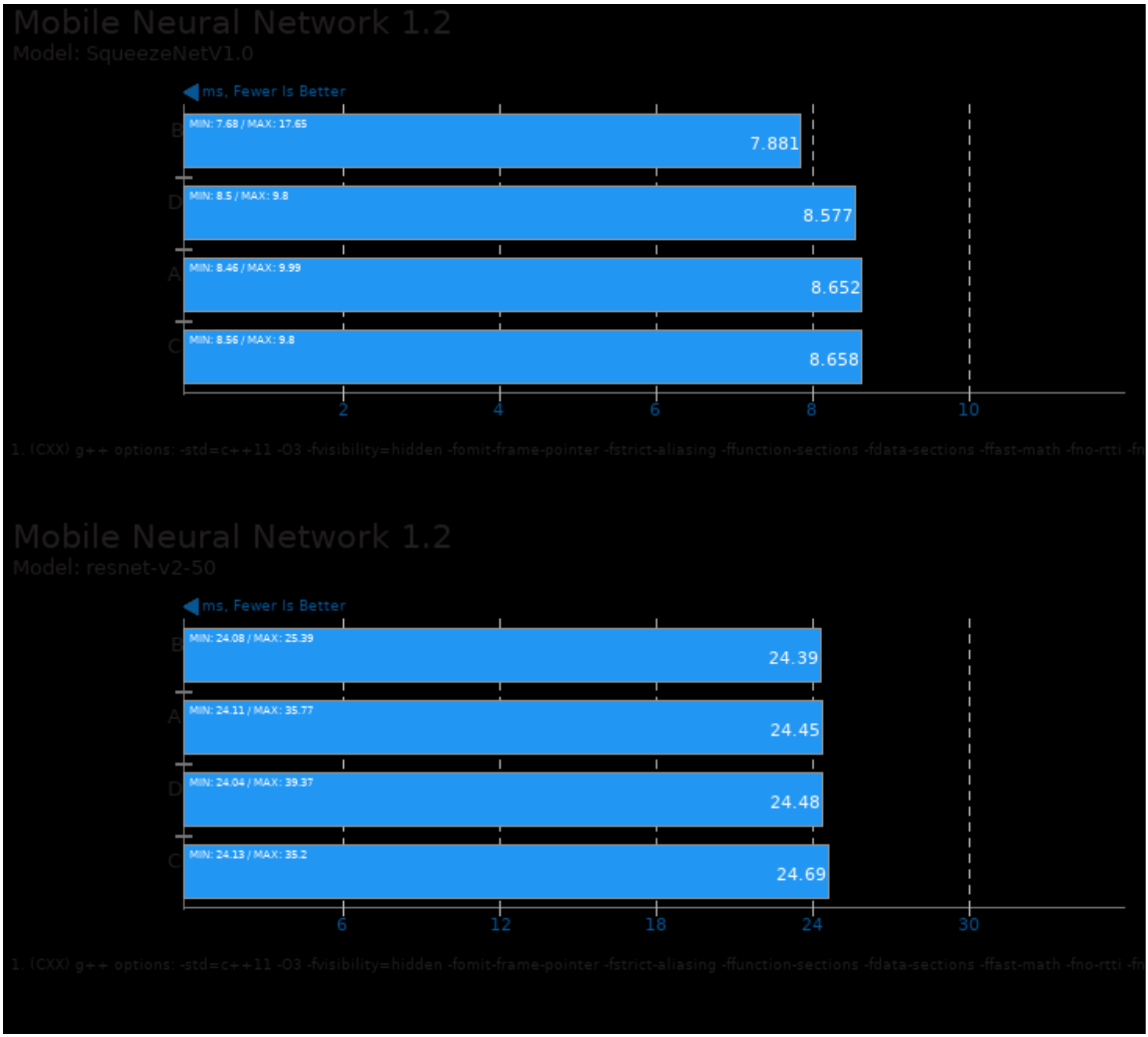
Test: Genetic Algorithm Using Jenetics + Futures

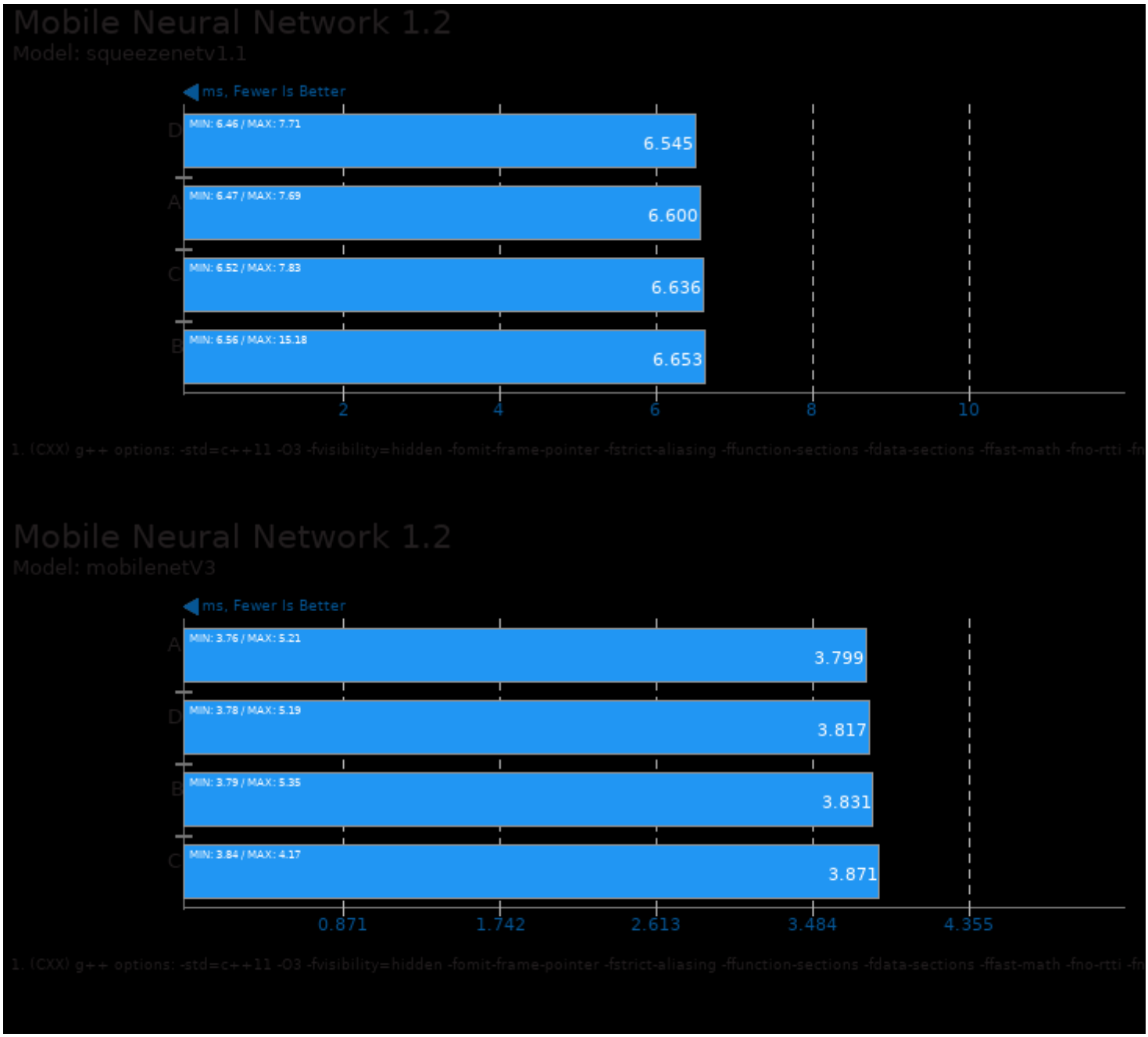



OpenSCAD
Render: Pistol
Seconds, Fewer Is Better
B
D
A
C
116.51
117.15
117.19
117.98
30
60
90
120
150
1. OpenSCAD version 2021.01
AOM AV1 3.1
Encoder Mode: Speed 0 Two-Pass - Input: Bosphorus 4K
Frames Per Second, More Is Better
D
B
A
C
0.18
0.18
0.18
0.17
0.0405
0.081
0.1215
0.162
0.2025
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm


AOM AV1 3.1
Encoder Mode: Speed 4 Two-Pass - Input: Bosphorus 1080p
Frames Per Second, More Is Better
B
C
A
D
5.87
5.85
5.85
5.77
1.3208
2.6416
3.9624
5.2832
6.604
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm
Mobile Neural Network 1.2
Model: inception-v3
ms, Fewer Is Better
D
B
A
C
MIN: 28.71 / MAX: 39.2
29.24
MIN: 28.74 / MAX: 31.29
29.30
MIN: 29.6 / MAX: 31.54
29.96
MIN: 29.44 / MAX: 36.63
30.05
7
14
21
28
35
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fv

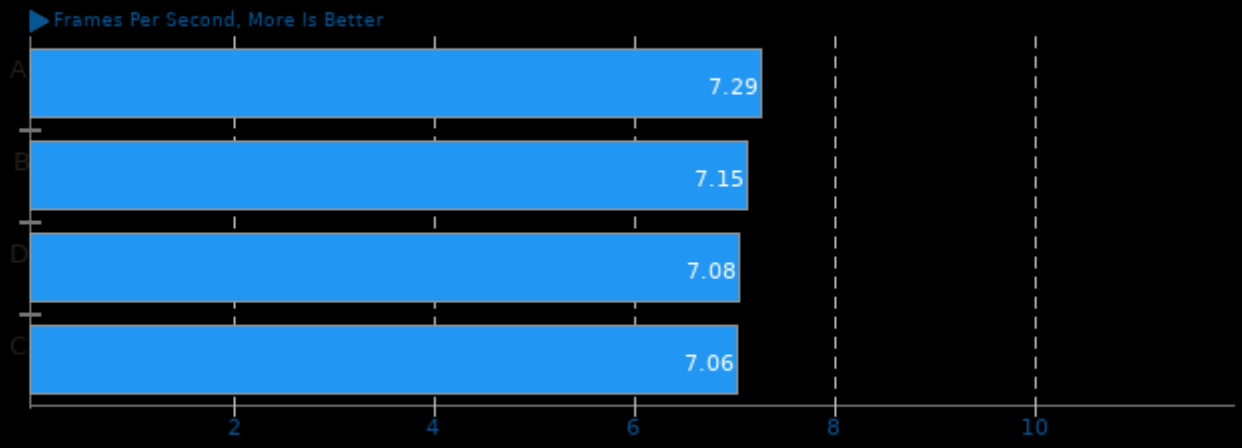

Mobile Neural Network 1.2
Model: mobilenet-v1-1.0
ms, Fewer Is Better
B
MIN: 3.35 / MAX: 4.12
3.383
A
MIN: 3.35 / MAX: 4.82
3.384
D
MIN: 3.36 / MAX: 3.75
3.398
C
MIN: 3.36 / MAX: 4.18
3.404
0.7659
1.5318
2.2977
3.0636
3.8295
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fr
Mobile Neural Network 1.2
Model: MobileNetV2_224
ms, Fewer Is Better
A
MIN: 4.81 / MAX: 12.12
4.892
B
MIN: 4.88 / MAX: 6.13
4.980
D
MIN: 4.91 / MAX: 5.81
5.021
C
MIN: 5.59 / MAX: 7.11
5.803
1.3057
2.6114
3.9171
5.2228
6.5285
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fr


Mobile Neural Network 1.2
Model: SqueezeNetV1.0
ms, Fewer Is Better
B
MIN: 7.68 / MAX: 17.65
7.881
D
MIN: 8.5 / MAX: 9.8
8.577
A
MIN: 8.46 / MAX: 9.99
8.652
C
MIN: 8.56 / MAX: 9.8
8.658
2
4
6
8
10
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fr
Mobile Neural Network 1.2
Model: resnet-v2-50
ms, Fewer Is Better
B
MIN: 24.08 / MAX: 25.39
24.39
A
MIN: 24.11 / MAX: 35.77
24.45
D
MIN: 24.04 / MAX: 39.37
24.48
C
MIN: 24.13 / MAX: 35.2
24.69
6
12
18
24
30
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fr


Mobile Neural Network 1.2
Model: squeezenetv1.1
ms, Fewer Is Better
D
MIN: 6.46 / MAX: 7.71
6.545
A
MIN: 6.47 / MAX: 7.69
6.600
C
MIN: 6.52 / MAX: 7.83
6.636
B
MIN: 6.56 / MAX: 15.18
6.653
2
4
6
8
10
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fr
Mobile Neural Network 1.2
Model: mobilenetV3
ms, Fewer Is Better
A
MIN: 3.76 / MAX: 5.21
3.799
D
MIN: 3.78 / MAX: 5.19
3.817
B
MIN: 3.79 / MAX: 5.35
3.831
C
MIN: 3.84 / MAX: 4.17
3.871
0.871
1.742
2.613
3.484
4.355
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fr

AOM AV1 3.1

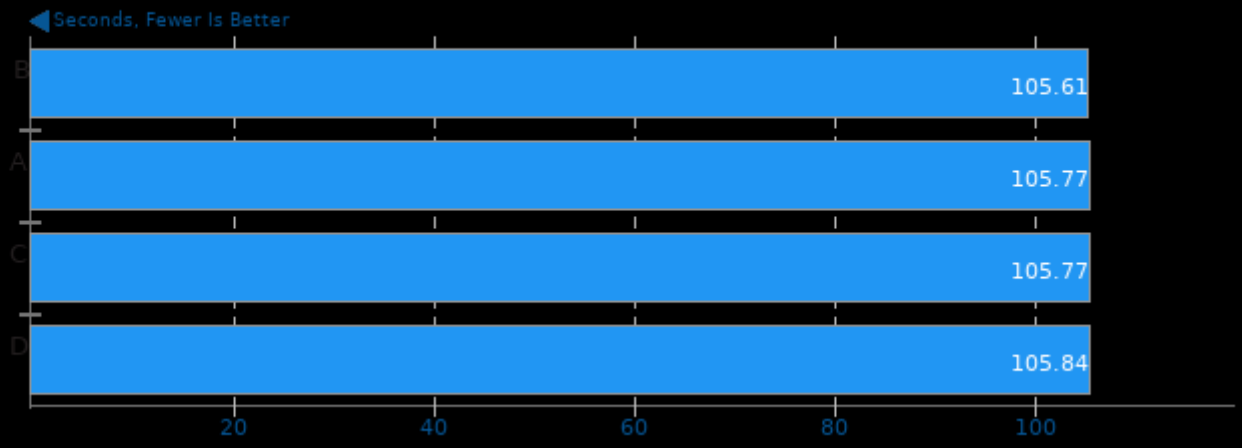
Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 4K



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

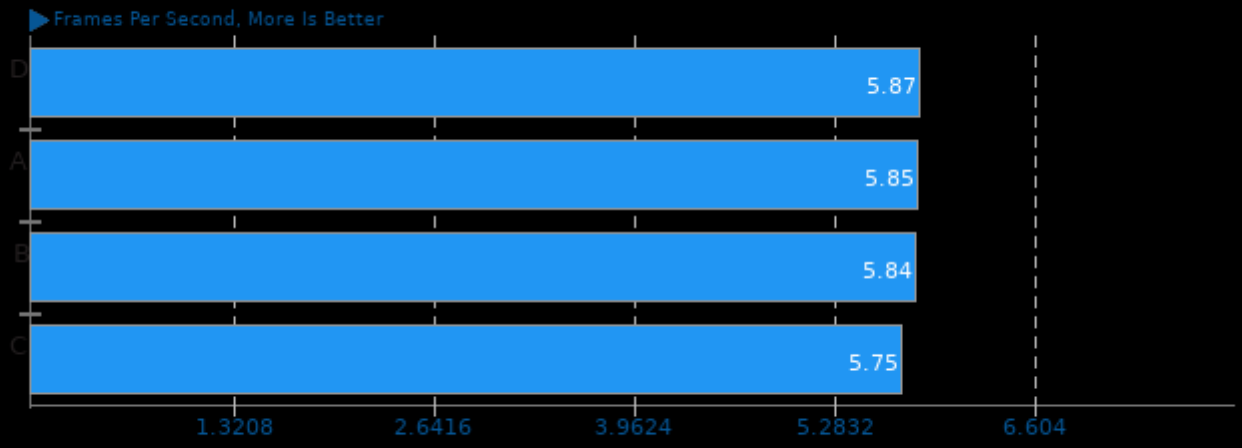
Blender 2.92

Blend File: Fishy Cat - Compute: CPU-Only

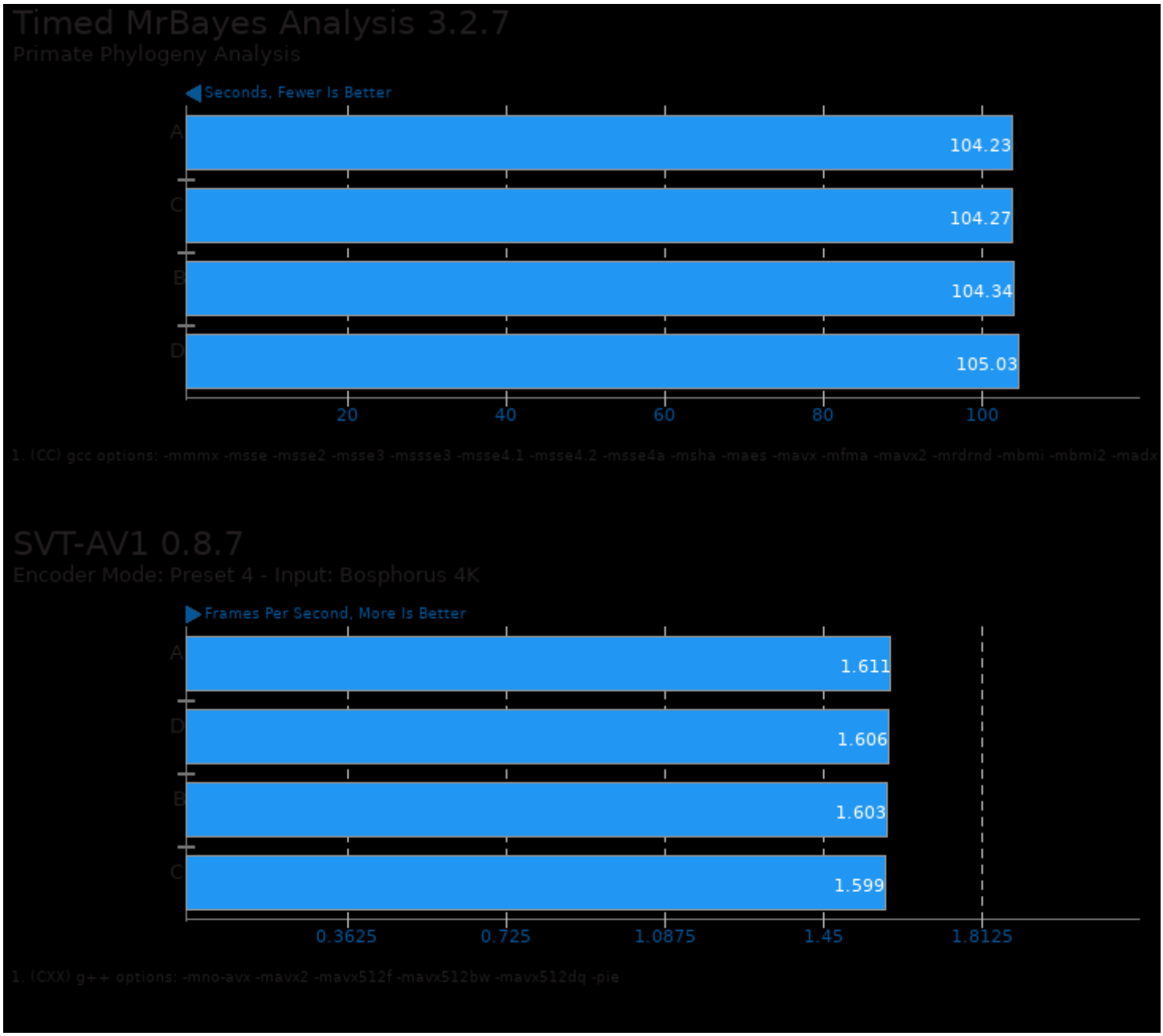


VP9 libvpx Encoding 1.10.0

Speed: Speed 0 - Input: Bosphorus 4K

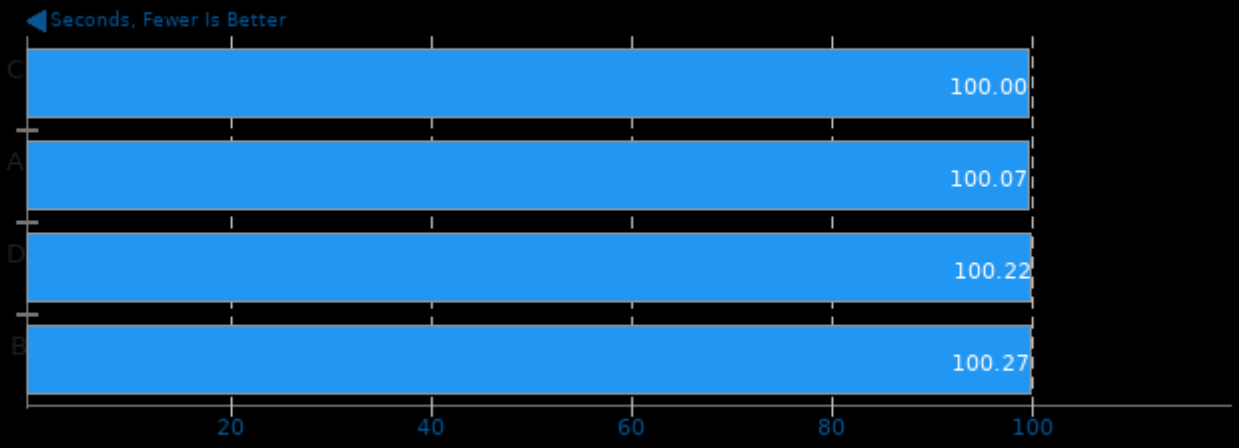


1. (CXX) g++ options: -m64 -lm -lpthread -O3 -fPIC -U_FORTIFY_SOURCE -std=gnu++11


Timed MrBayes Analysis 3.2.7
Primate Phylogeny Analysis
Seconds, Fewer Is Better
A
C
B
D
104.23
104.27
104.34
105.03
20
40
60
80
100
1. (CC) gcc options: -mmmx -msse -msse2 -msse3 -mssse3 -msse4.1 -msse4.2 -msse4a -msha -maes -mavx -mfma -mavx2 -mrdrnd -mbmi -mbmi2 -madx
SVT-AV1 0.8.7
Encoder Mode: Preset 4 - Input: Bosphorus 4K
Frames Per Second, More Is Better
A
D
B
C
1.611
1.606
1.603
1.599
0.3625
0.725
1.0875
1.45
1.8125
1. (CXX) g++ options: -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq -pie

Timed HMMer Search 3.3.2

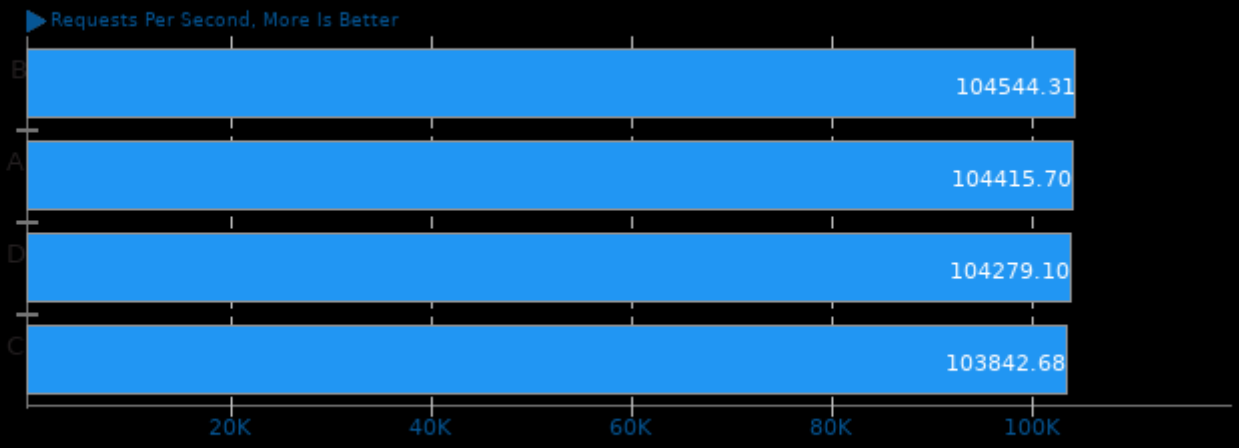
Pfam Database Search



1. (CC) gcc options: -O3 -pthread -lhmmer -leasel -lm -lmpi

Apache HTTP Server 2.4.48

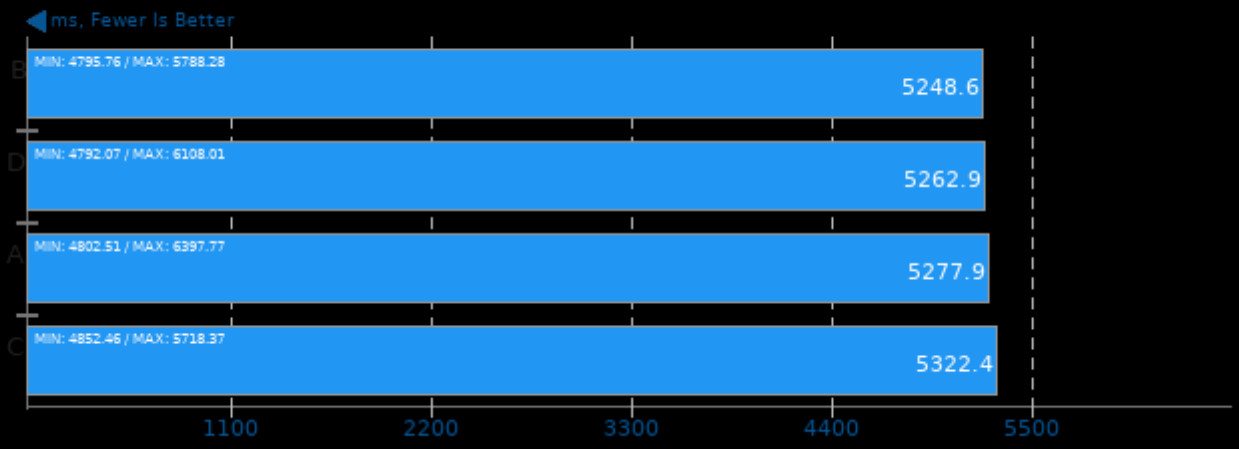
Concurrent Requests: 1000

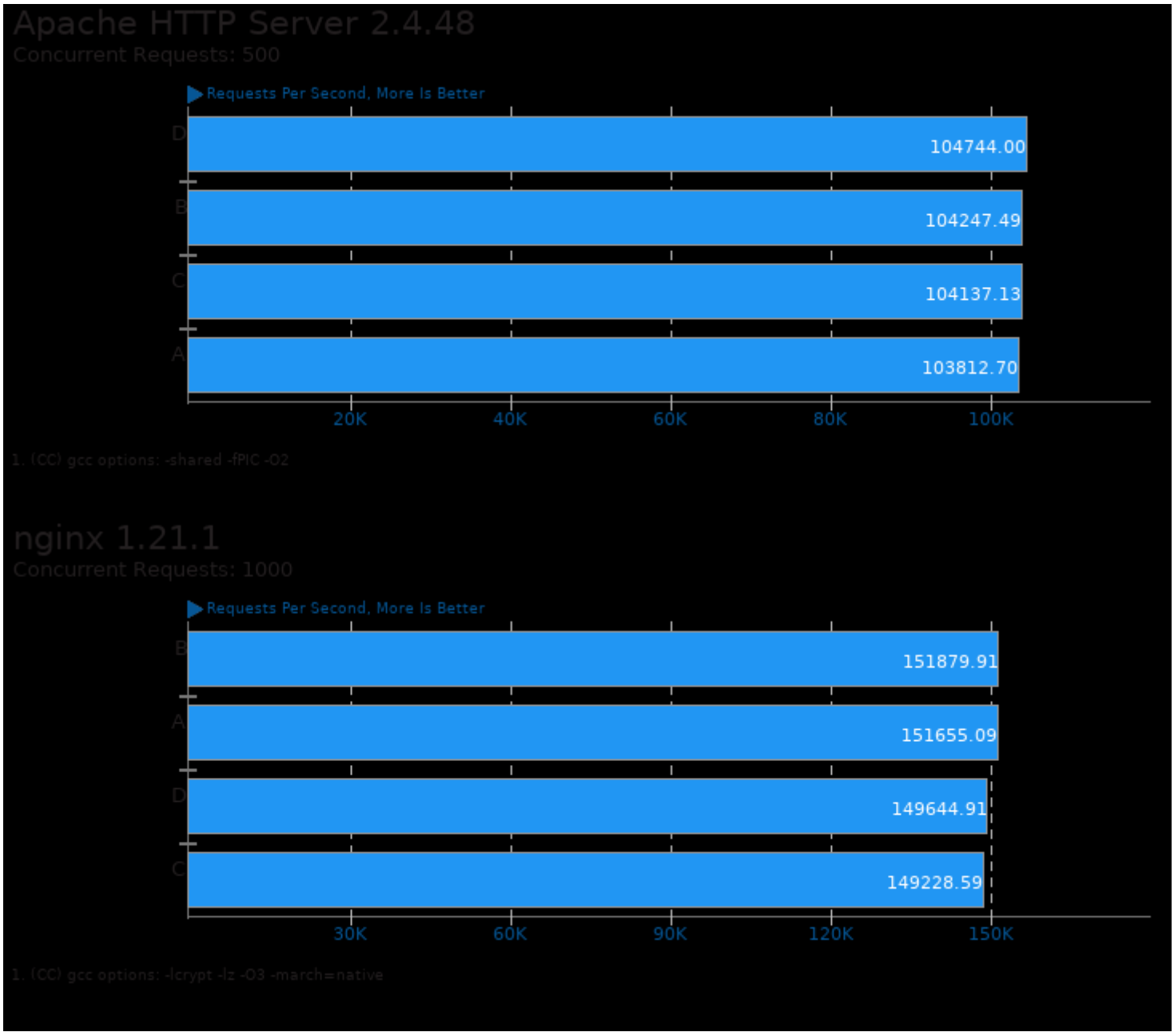


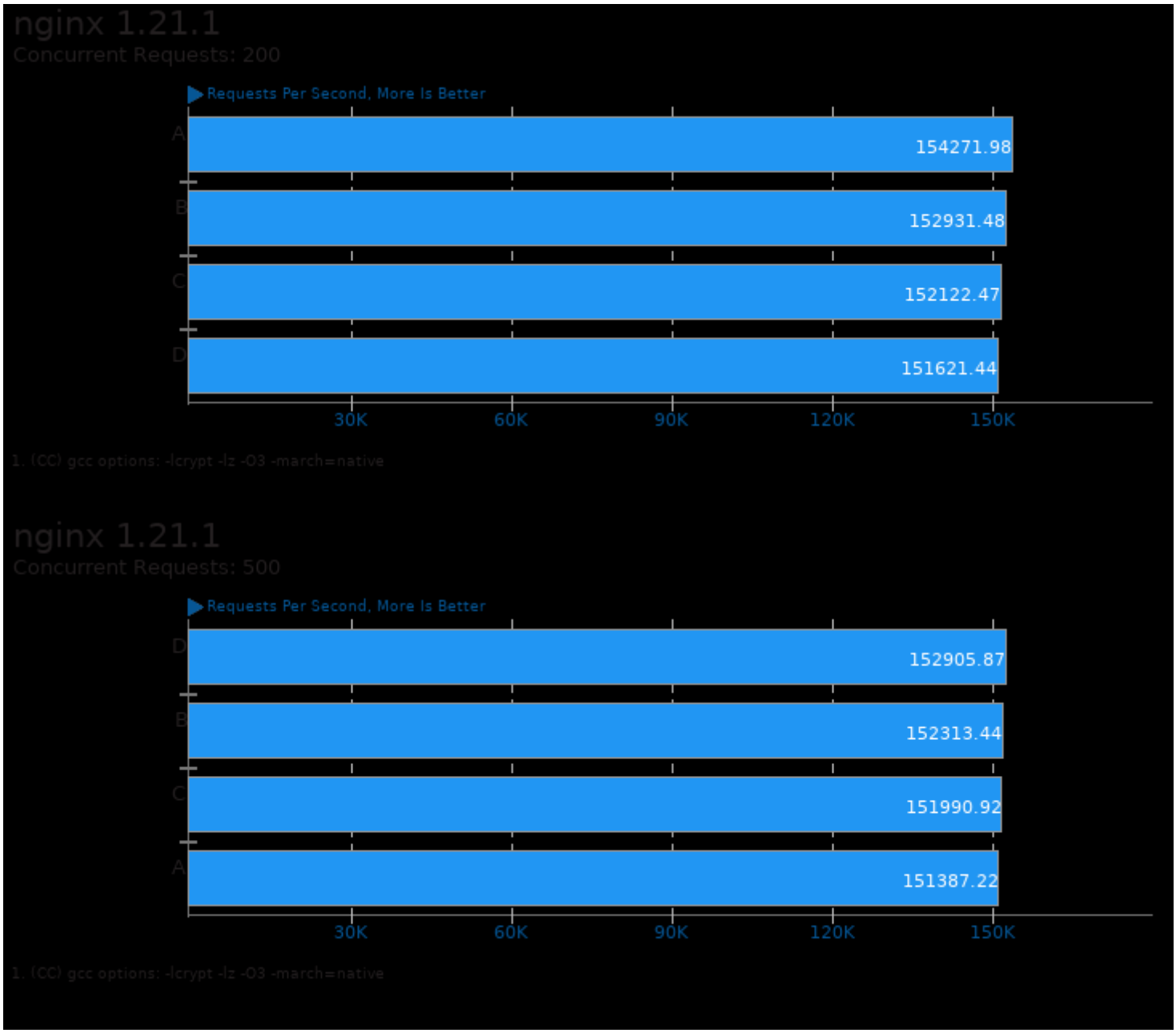
1. (CC) gcc options: -shared -fPIC -O2

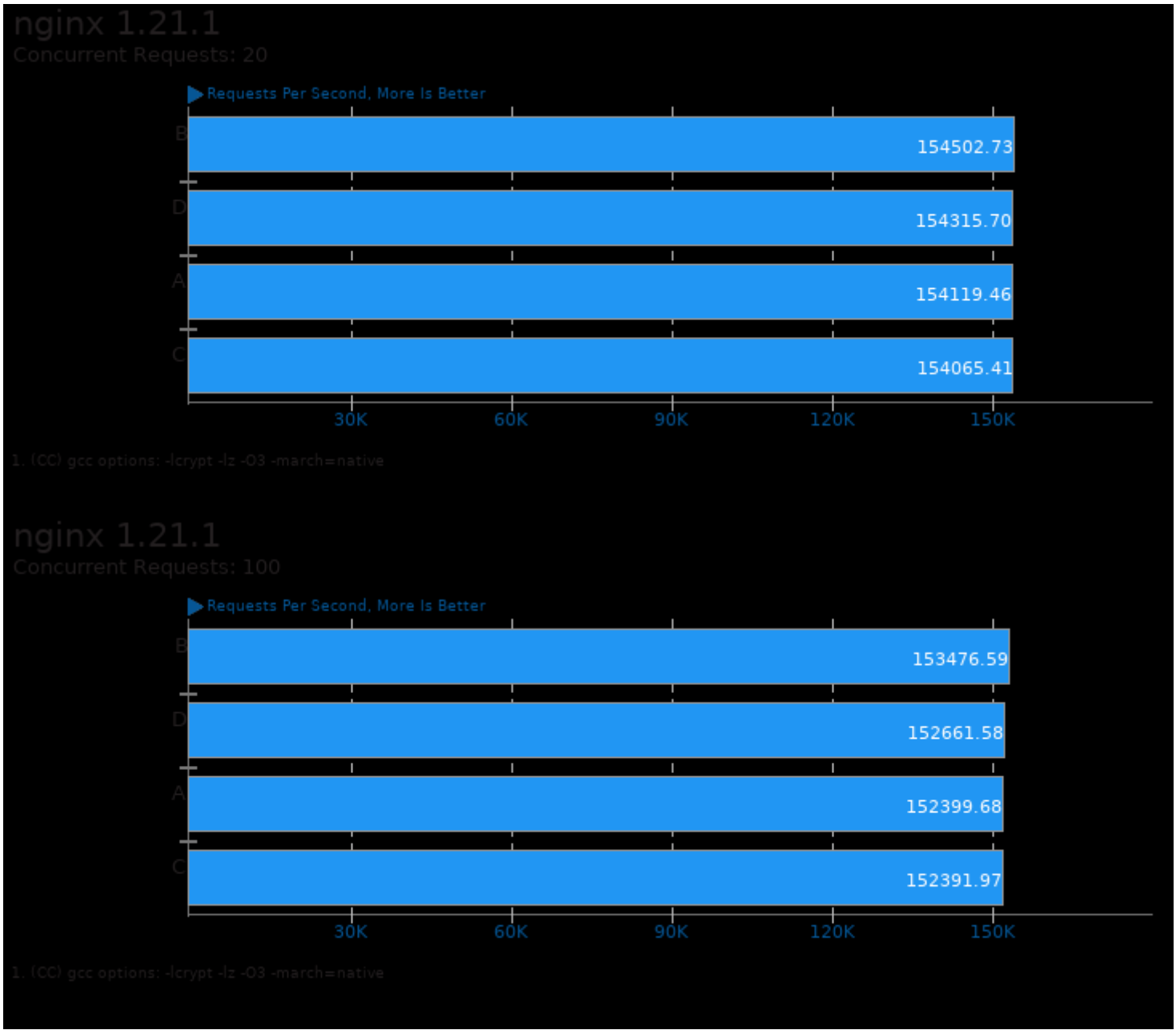
Renaissance 0.12

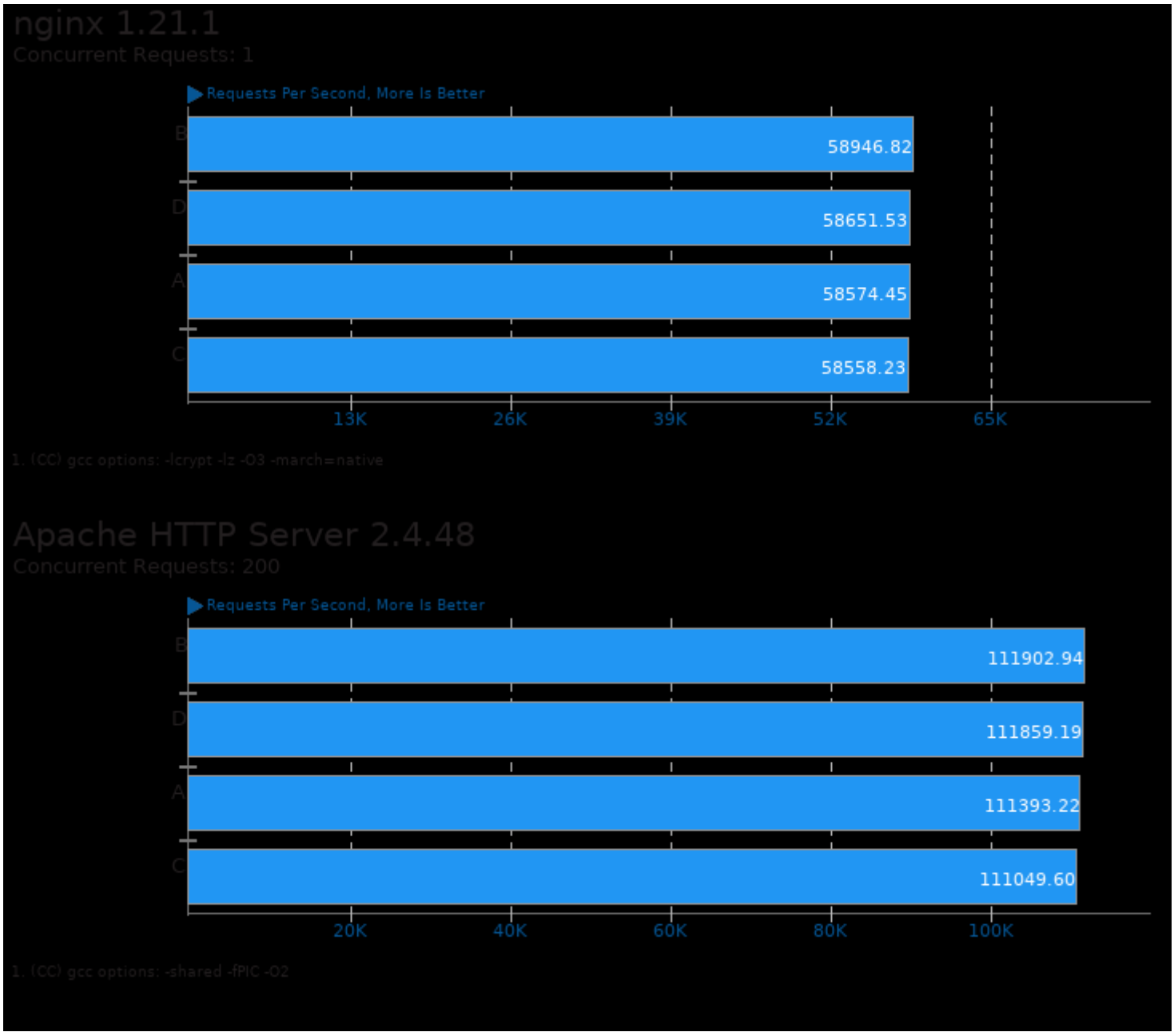
Test: In-Memory Database Shootout



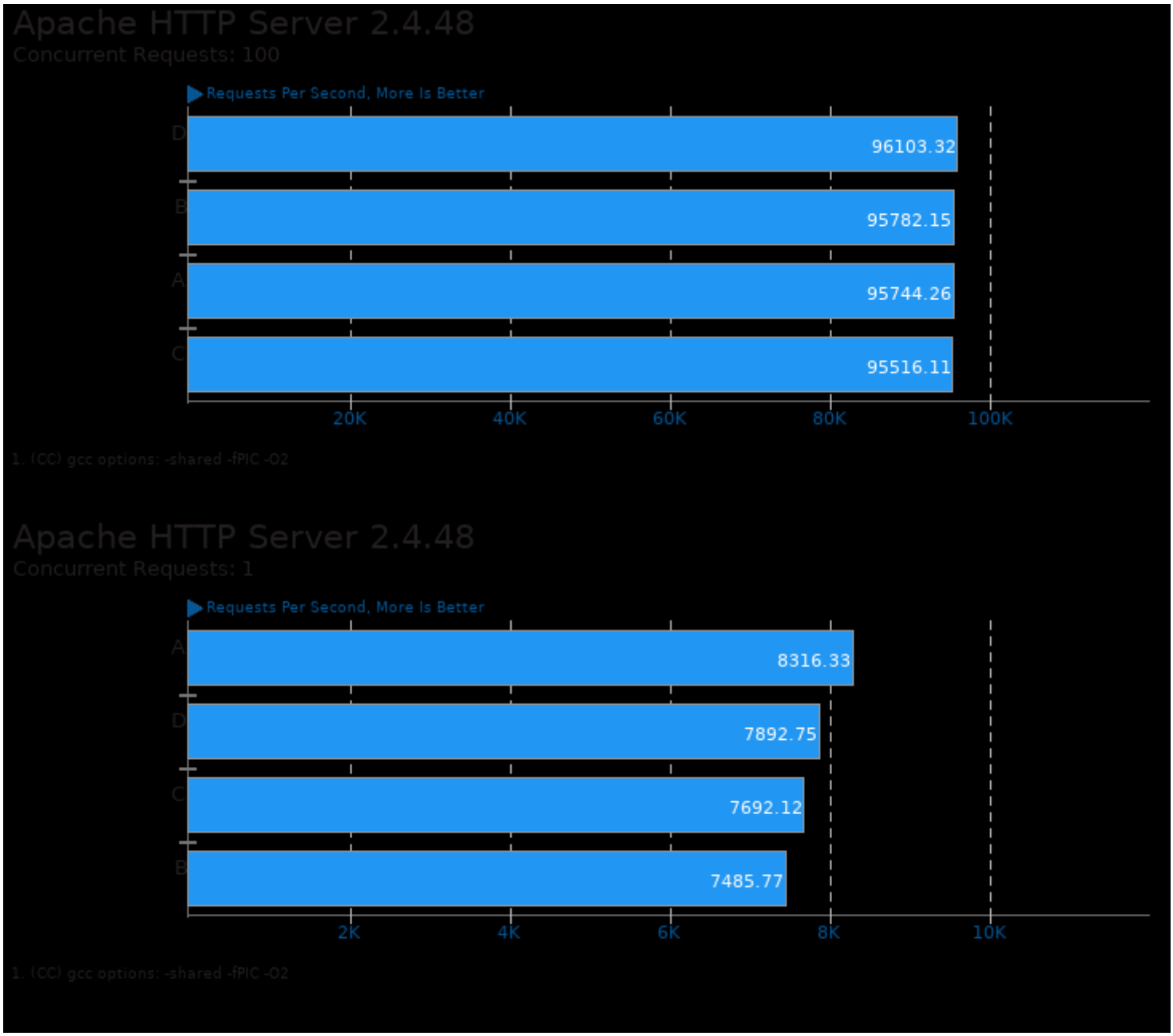

Apache HTTP Server 2.4.48
Concurrent Requests: 500
Requests Per Second, More Is Better
D
104744.00
B
104247.49
C
104137.13
A
103812.70
20K
40K
60K
80K
100K
1. (CC) gcc options: -shared -fPIC -O2
nginx 1.21.1
Concurrent Requests: 1000
Requests Per Second, More Is Better
B
151879.91
A
151655.09
D
149644.91
C
149228.59
30K
60K
90K
120K
150K
1. (CC) gcc options: -lcrypt -lz -O3 -march=native


nginx 1.21.1
Concurrent Requests: 200
Requests Per Second, More Is Better
A
B
C
D
154271.98
152931.48
152122.47
151621.44
30K
60K
90K
120K
150K
1. (CC) gcc options: -lcrypt -lz -O3 -march=native
nginx 1.21.1
Concurrent Requests: 500
Requests Per Second, More Is Better
D
B
C
A
152905.87
152313.44
151990.92
151387.22
30K
60K
90K
120K
150K
1. (CC) gcc options: -lcrypt -lz -O3 -march=native


nginx 1.21.1
Concurrent Requests: 20
Requests Per Second, More Is Better
B
D
A
C
154502.73
154315.70
154119.46
154065.41
30K
60K
90K
120K
150K
1. (CC) gcc options: -lcrypt -lz -O3 -march=native
nginx 1.21.1
Concurrent Requests: 100
Requests Per Second, More Is Better
B
D
A
C
153476.59
152661.58
152399.68
152391.97
30K
60K
90K
120K
150K
1. (CC) gcc options: -lcrypt -lz -O3 -march=native

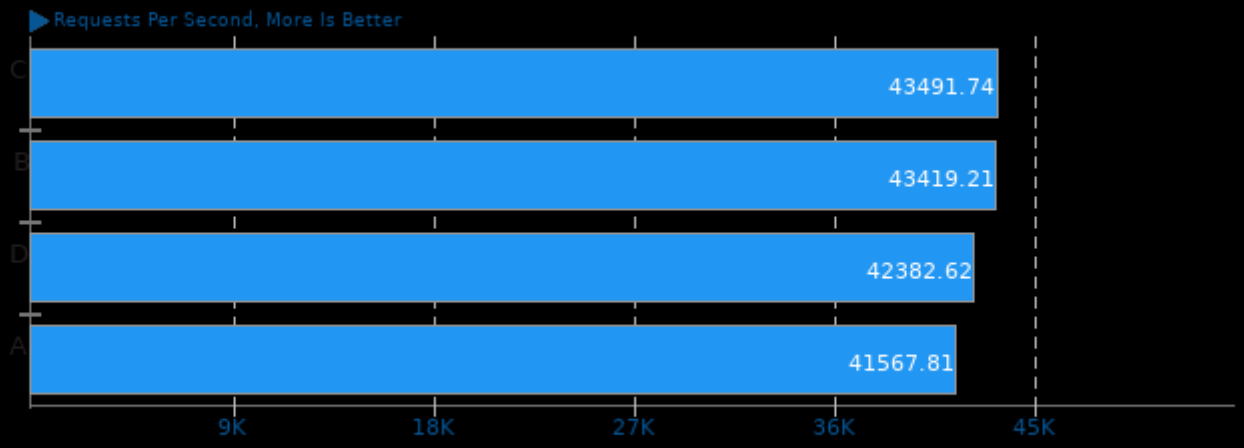

nginx 1.21.1
Concurrent Requests: 1
Requests Per Second, More Is Better
B
D
A
C
58946.82
58651.53
58574.45
58558.23
13K
26K
39K
52K
65K
1. (CC) gcc options: -lcrypt -lz -O3 -march=native

Apache HTTP Server 2.4.48
Concurrent Requests: 200
Requests Per Second, More Is Better
B
D
A
C
111902.94
111859.19
111393.22
111049.60
20K
40K
60K
80K
100K
1. (CC) gcc options: -shared -fPIC -O2


Apache HTTP Server 2.4.48
Concurrent Requests: 100
Requests Per Second, More Is Better
D
B
A
C
96103.32
95782.15
95744.26
95516.11
20K
40K
60K
80K
100K
1. (CC) gcc options: -shared -fPIC -O2
Apache HTTP Server 2.4.48
Concurrent Requests: 1
Requests Per Second, More Is Better
A
D
C
B
8316.33
7892.75
7692.12
7485.77
2K
4K
6K
8K
10K
1. (CC) gcc options: -shared -fPIC -O2

Apache HTTP Server 2.4.48

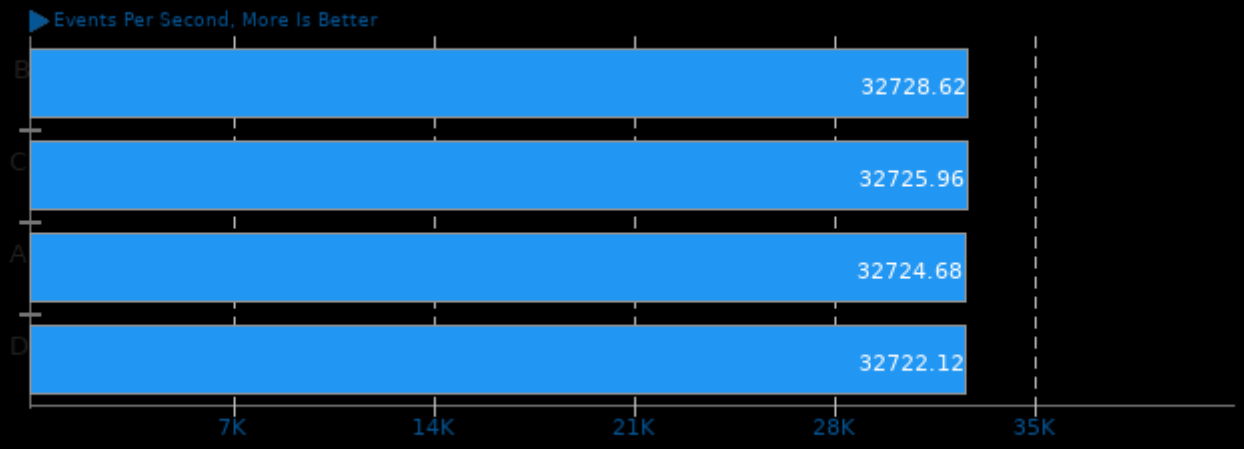
Concurrent Requests: 20



1. (CC) gcc options: -shared -fPIC -O2

Sysbench 1.0.20

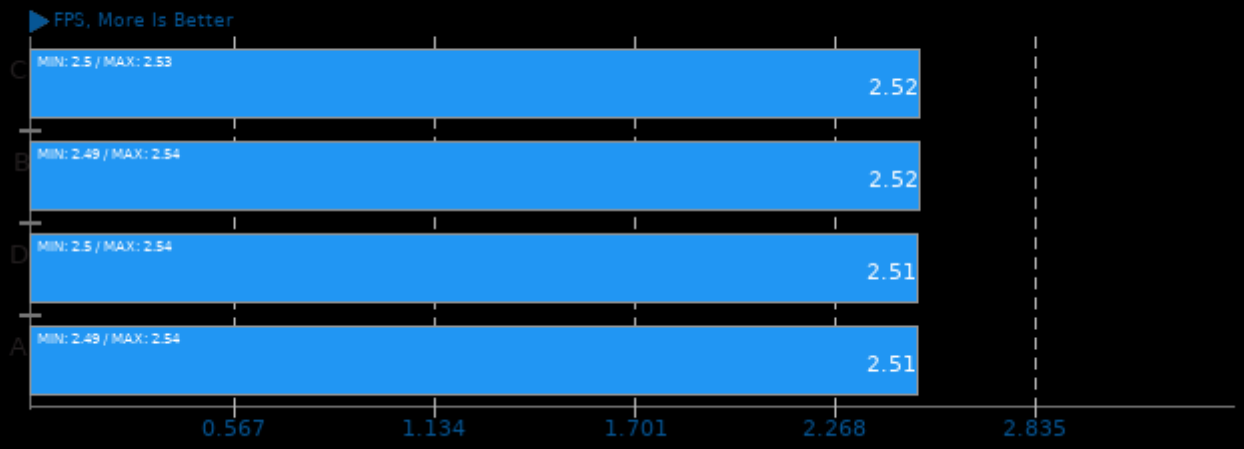
Test: CPU



1. (CC) gcc options: -O2 -funroll-loops -rdynamic -ldl -laio -lm

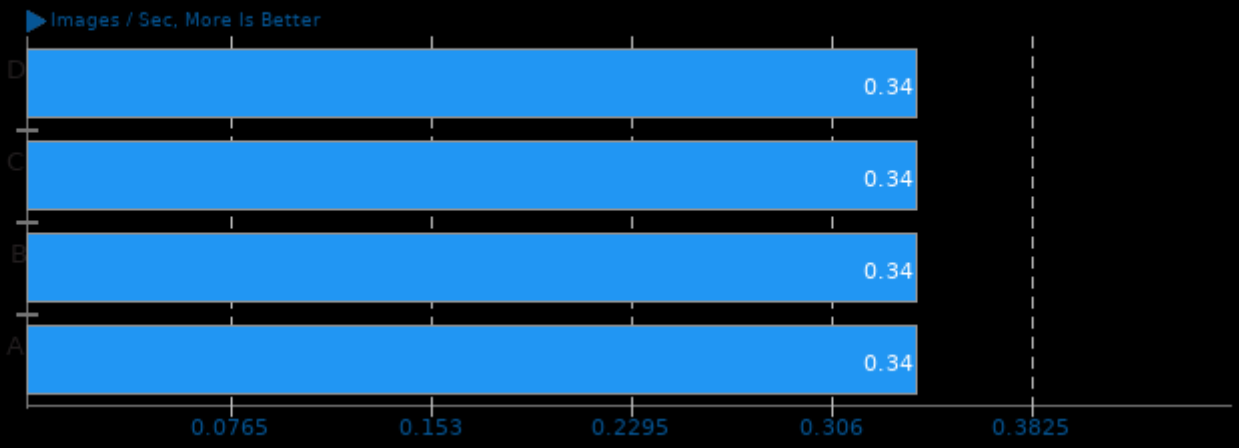
OSPray 1.8.5

Demo: XFrog Forest - Renderer: Path Tracer



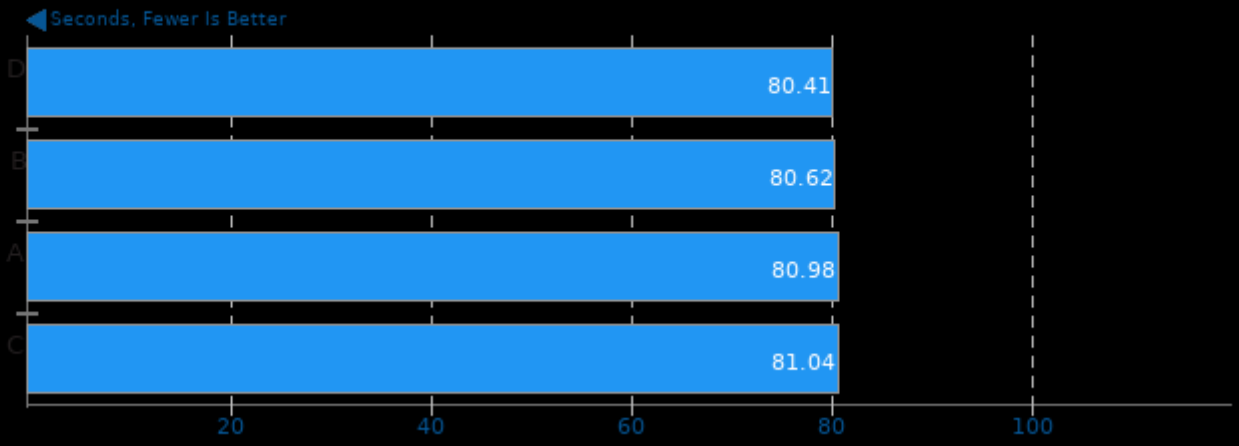
Intel Open Image Denoise 1.4.0

Run: RTLightmap.hdr.4096x4096



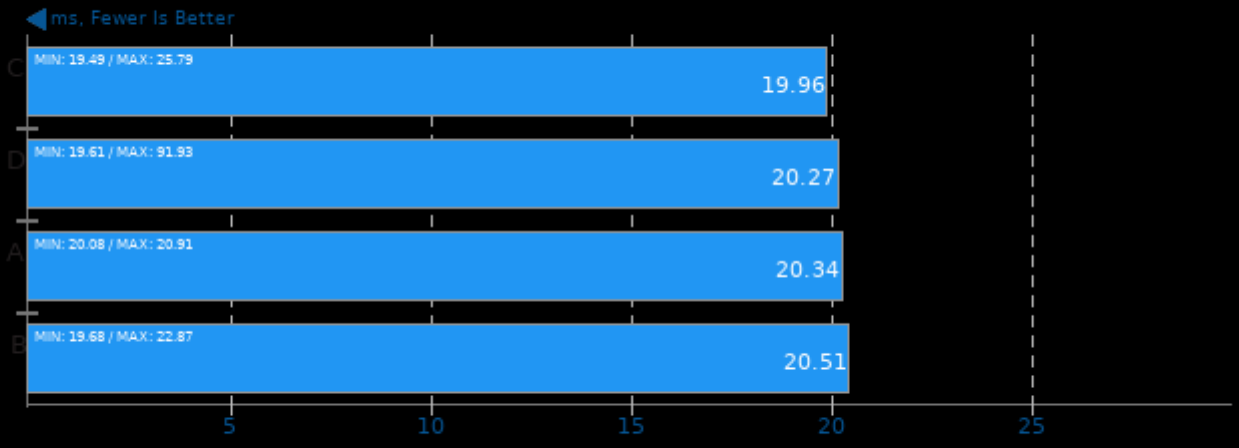
Blender 2.92

Blend File: BMW27 - Compute: CPU-Only

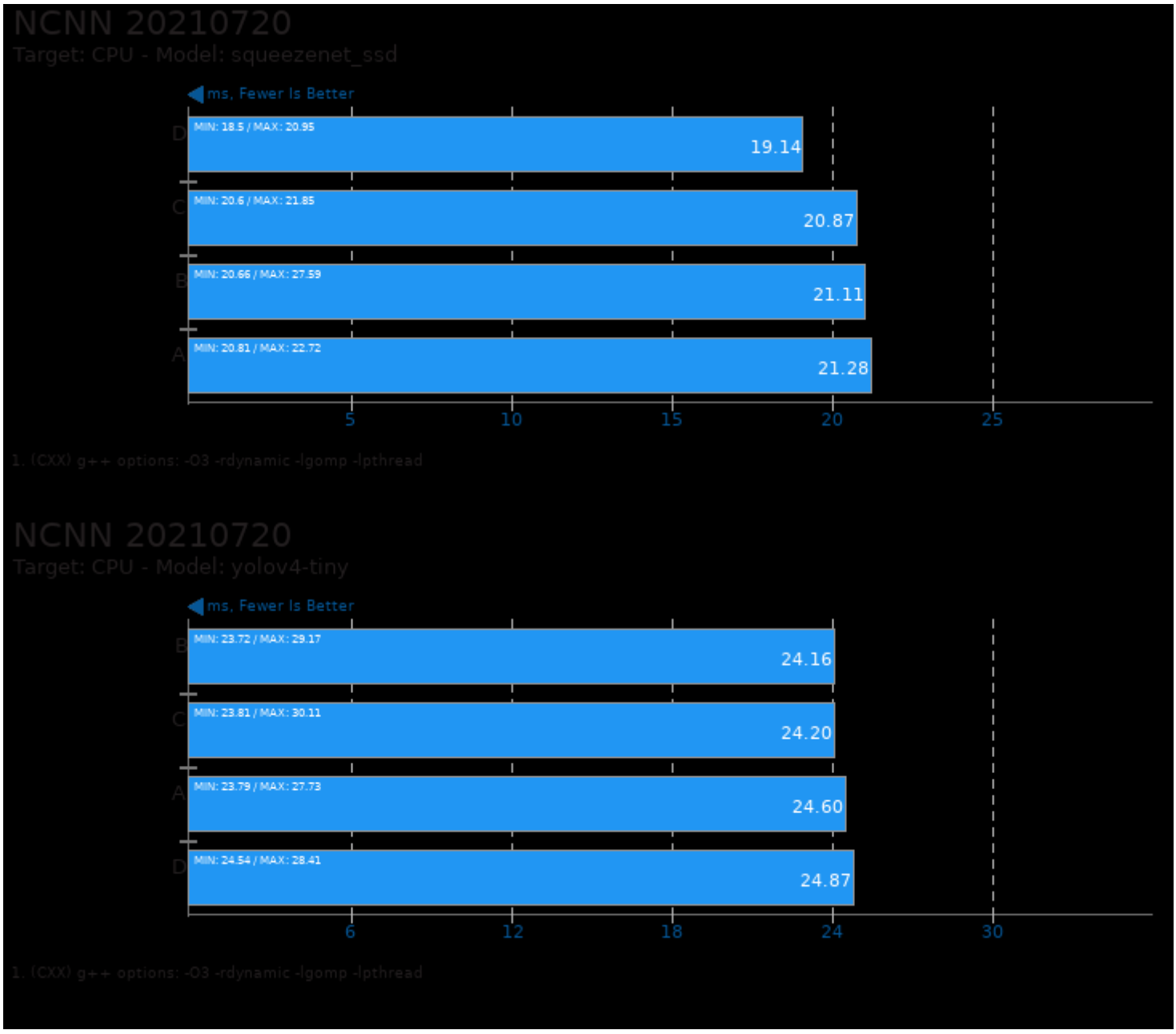


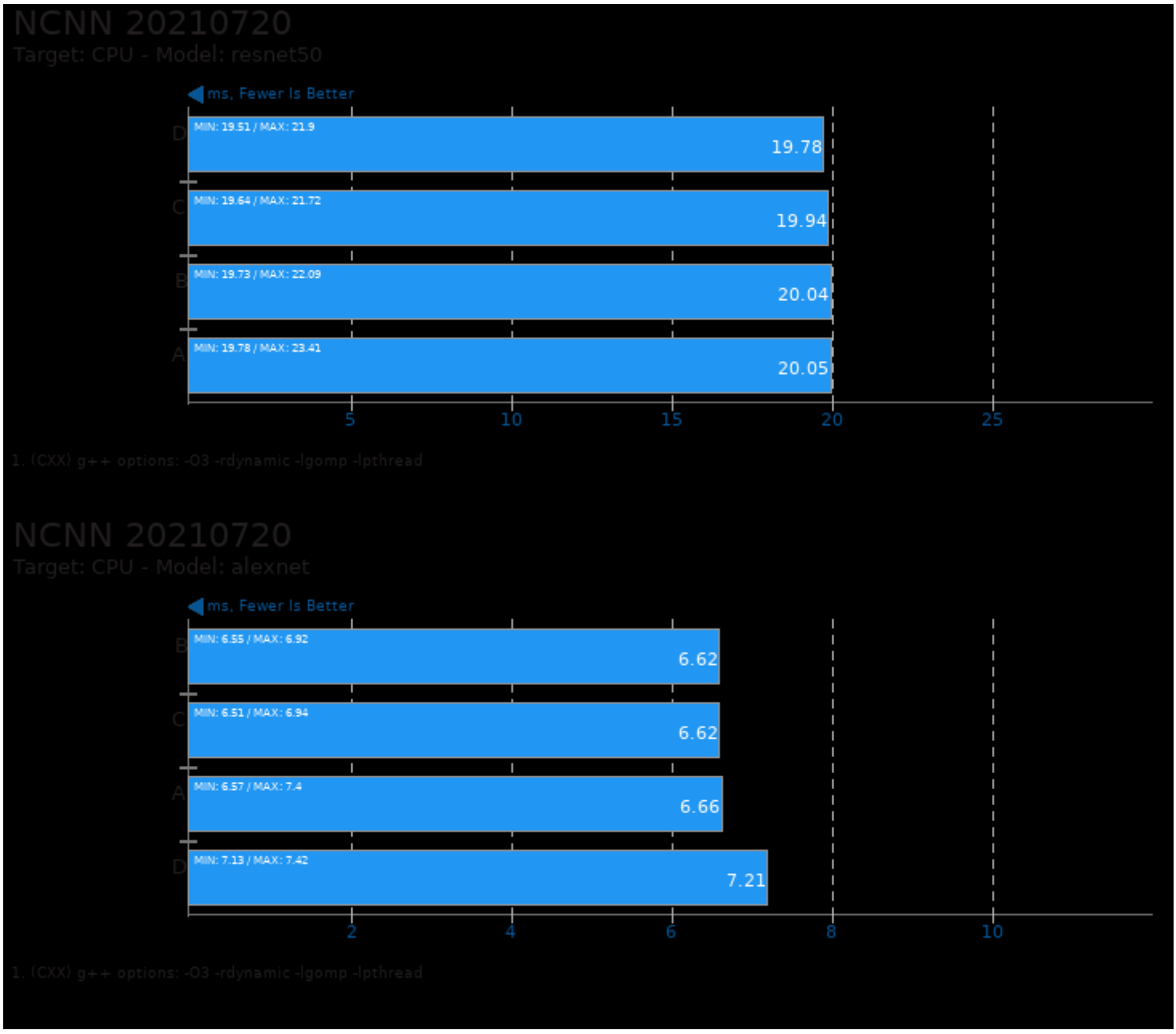
NCNN 20210720

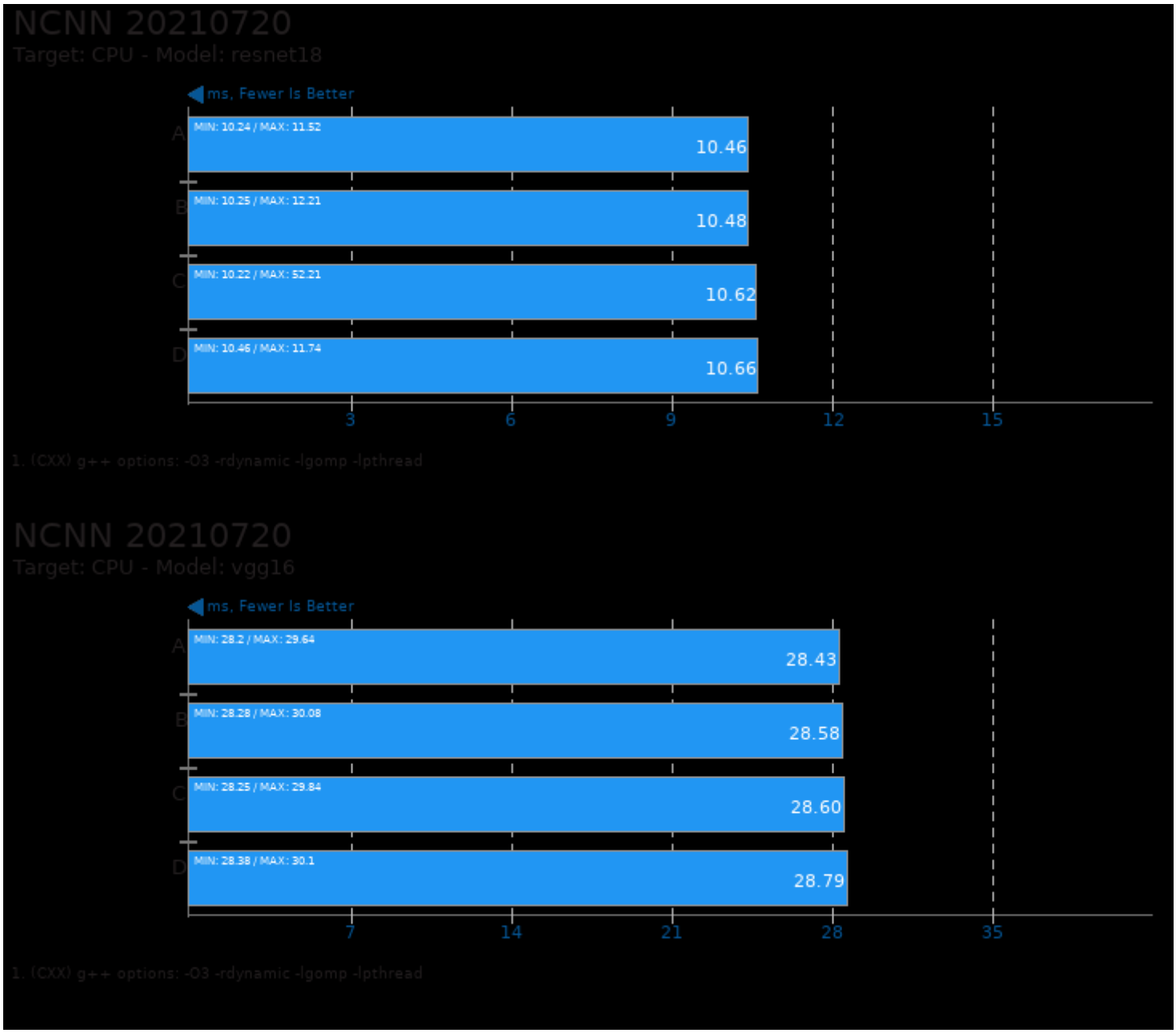
Target: CPU - Model: regnety_400m

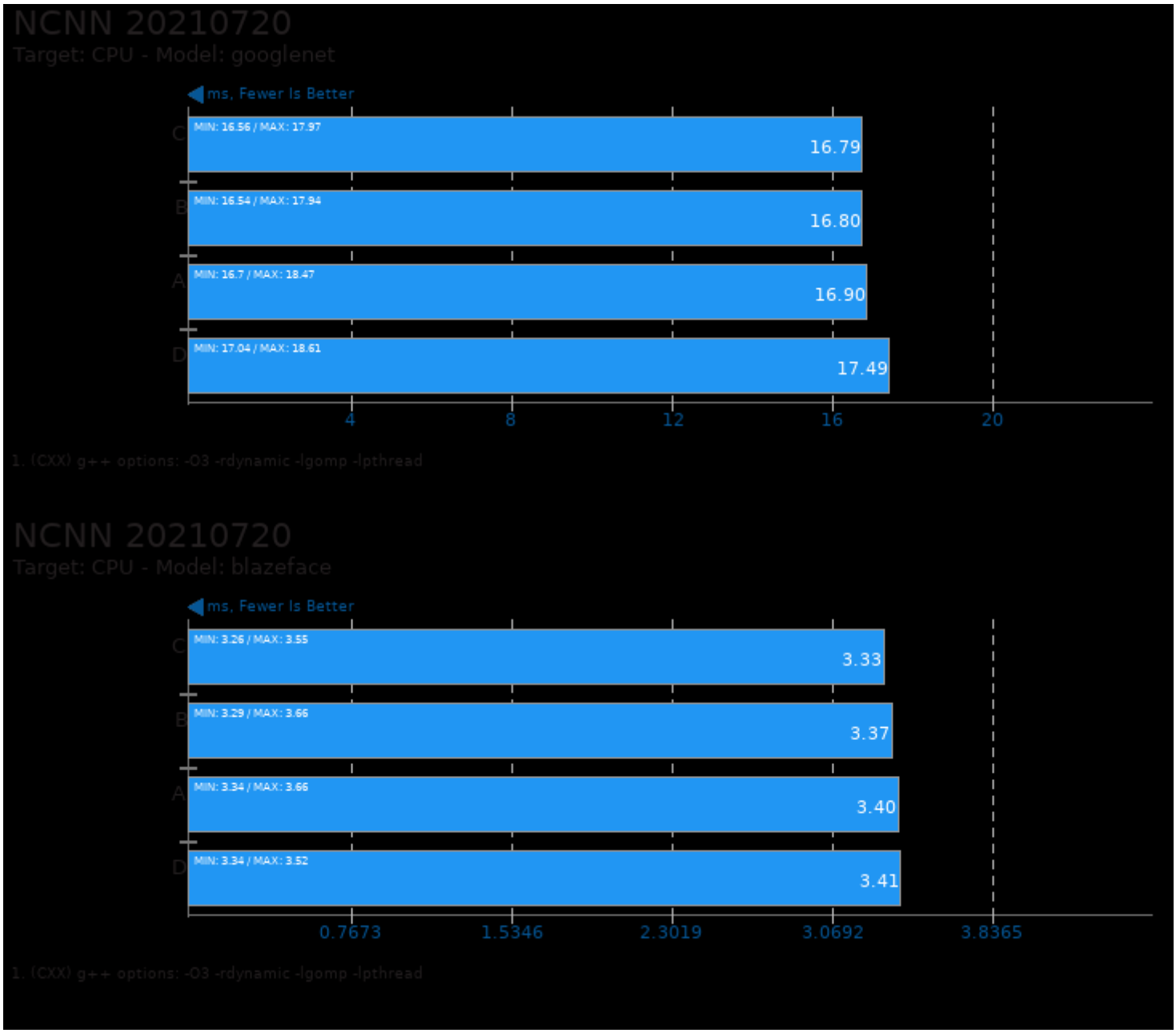


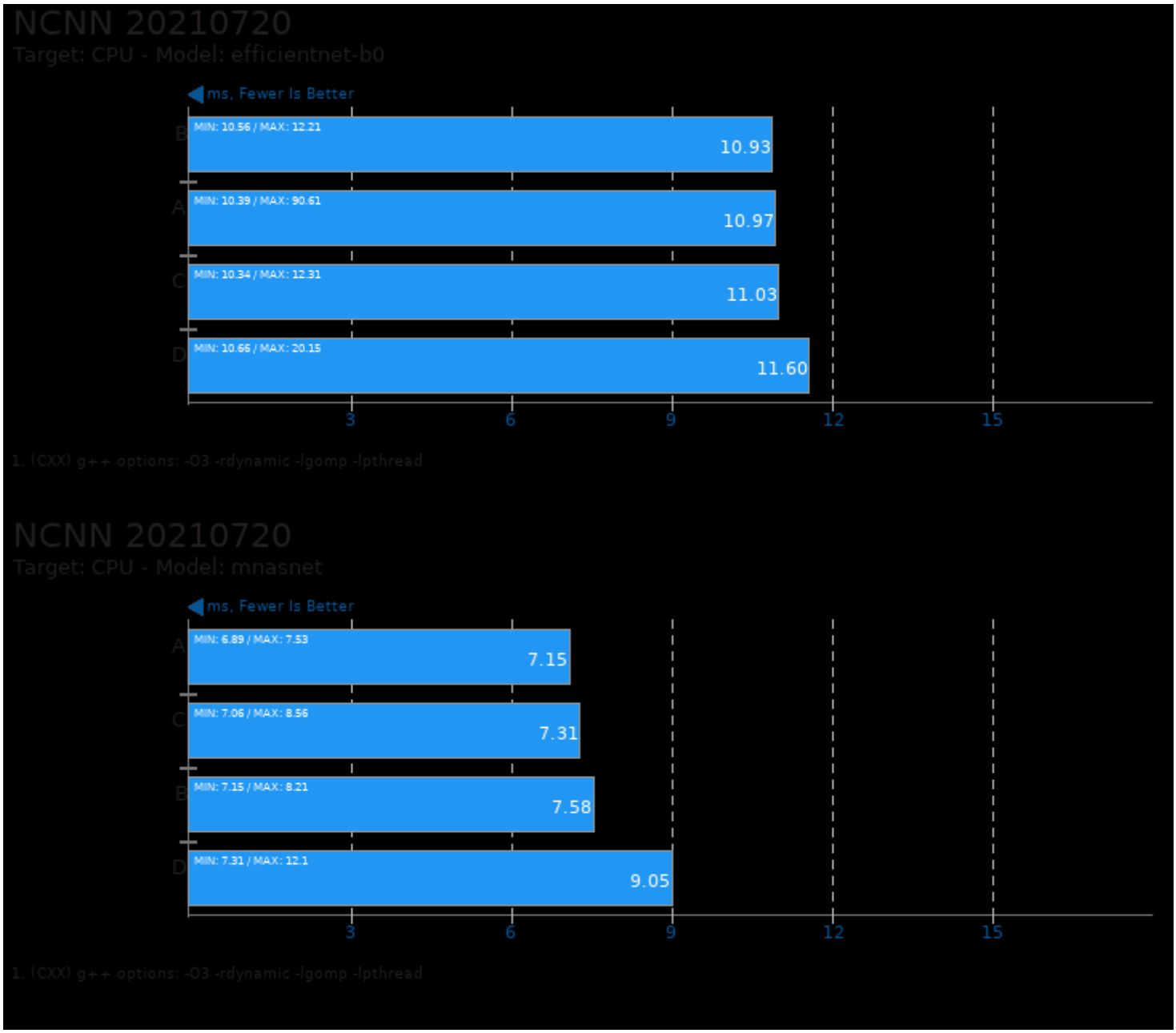
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread

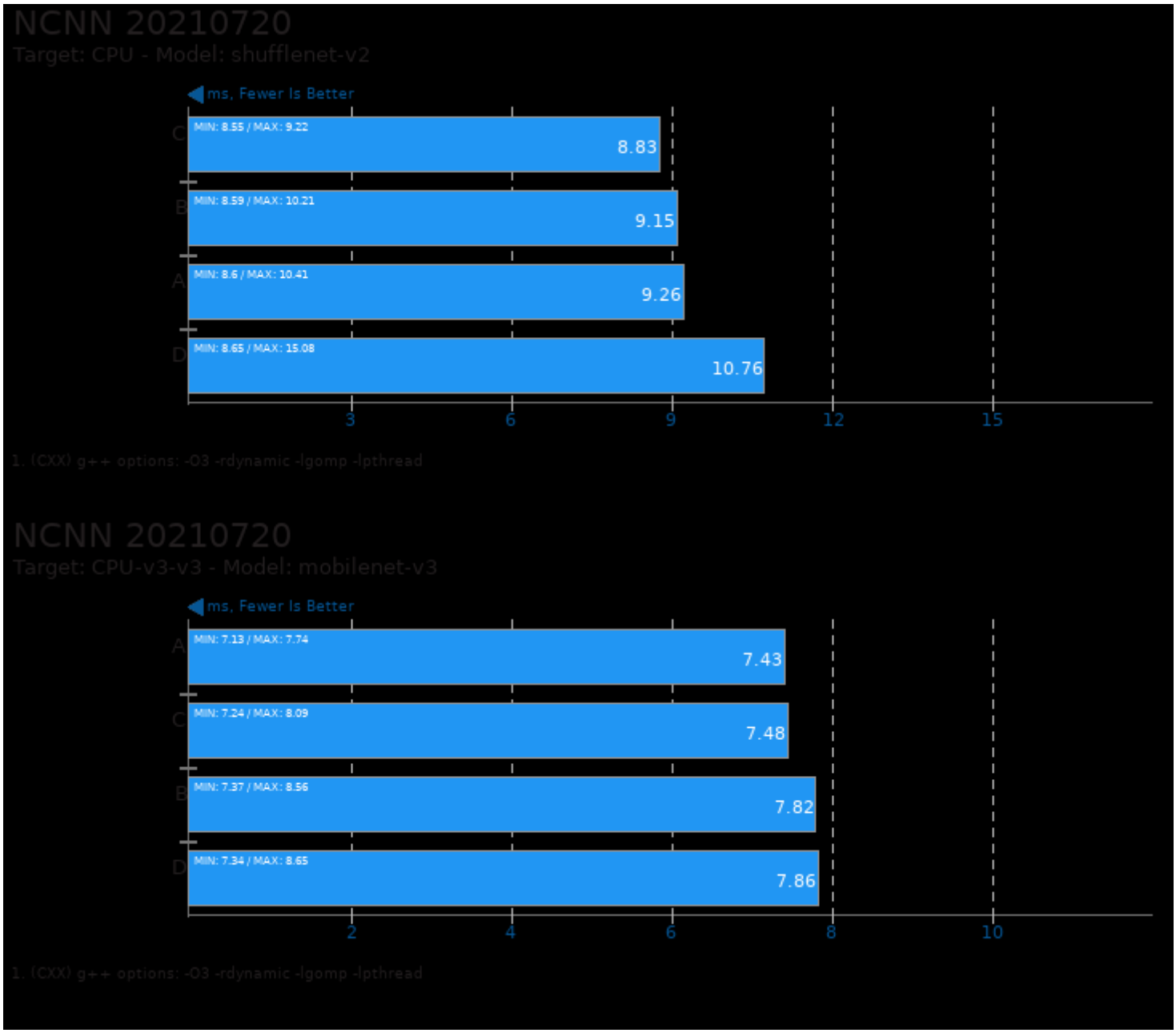

NCNN 20210720
Target: CPU - Model: squeezenet_ssd
ms, Fewer Is Better
D
MIN: 18.5 / MAX: 20.95
19.14
C
MIN: 20.6 / MAX: 21.85
20.87
B
MIN: 20.66 / MAX: 27.59
21.11
A
MIN: 20.81 / MAX: 22.72
21.28
5
10
15
20
25
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: yolov4-tiny
ms, Fewer Is Better
B
MIN: 23.72 / MAX: 29.17
24.16
C
MIN: 23.81 / MAX: 30.11
24.20
A
MIN: 23.79 / MAX: 27.73
24.60
D
MIN: 24.54 / MAX: 28.41
24.87
6
12
18
24
30
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread

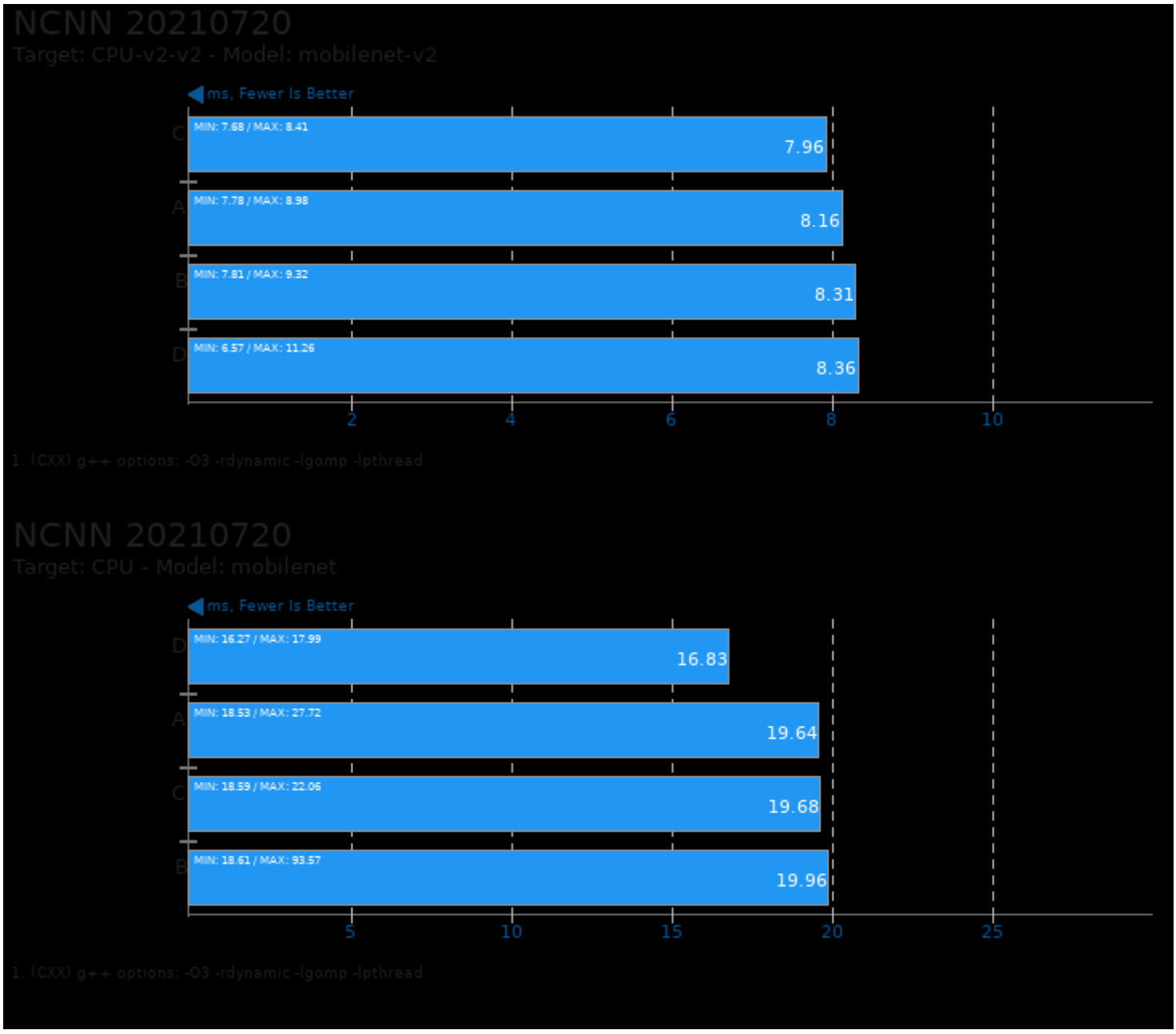

NCNN 20210720
Target: CPU - Model: resnet50
ms, Fewer Is Better
D
MIN: 19.51 / MAX: 21.9
19.78
C
MIN: 19.64 / MAX: 21.72
19.94
B
MIN: 19.73 / MAX: 22.09
20.04
A
MIN: 19.78 / MAX: 23.41
20.05
5
10
15
20
25
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: alexnet
ms, Fewer Is Better
B
MIN: 6.55 / MAX: 6.92
6.62
C
MIN: 6.51 / MAX: 6.94
6.62
A
MIN: 6.57 / MAX: 7.4
6.66
D
MIN: 7.13 / MAX: 7.42
7.21
2
4
6
8
10
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread

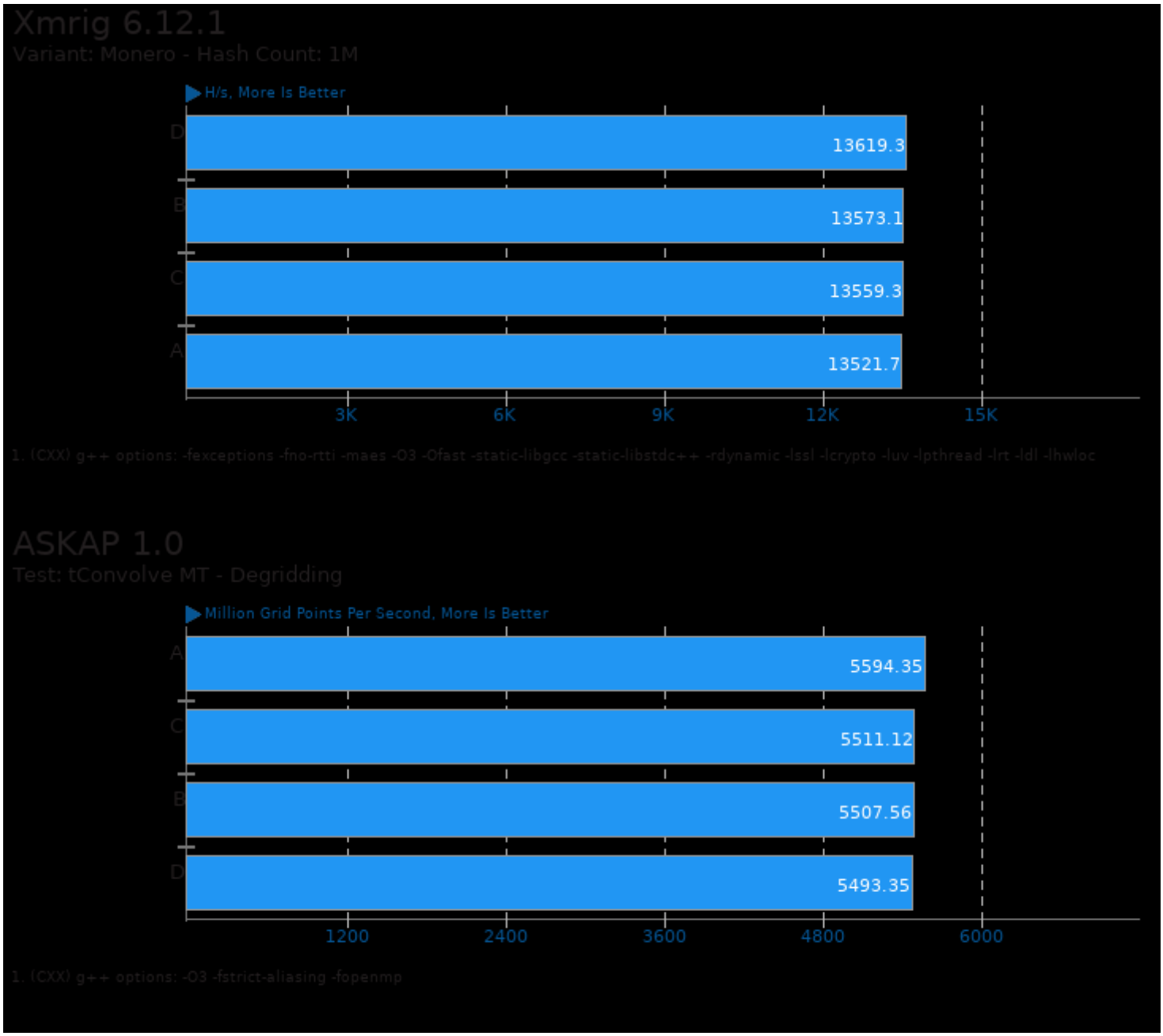

NCNN 20210720
Target: CPU - Model: resnet18
ms, Fewer Is Better
A
MIN: 10.24 / MAX: 11.52
10.46
B
MIN: 10.25 / MAX: 12.21
10.48
C
MIN: 10.22 / MAX: 52.21
10.62
D
MIN: 10.46 / MAX: 11.74
10.66
3
6
9
12
15
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: vgg16
ms, Fewer Is Better
A
MIN: 28.2 / MAX: 29.64
28.43
B
MIN: 28.28 / MAX: 30.08
28.58
C
MIN: 28.25 / MAX: 29.84
28.60
D
MIN: 28.38 / MAX: 30.1
28.79
7
14
21
28
35
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread


NCNN 20210720
Target: CPU - Model: googlenet
ms, Fewer Is Better
C
MIN: 16.56 / MAX: 17.97
16.79
B
MIN: 16.54 / MAX: 17.94
16.80
A
MIN: 16.7 / MAX: 18.47
16.90
D
MIN: 17.04 / MAX: 18.61
17.49
4
8
12
16
20
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: blazeface
ms, Fewer Is Better
C
MIN: 3.26 / MAX: 3.55
3.33
B
MIN: 3.29 / MAX: 3.66
3.37
A
MIN: 3.34 / MAX: 3.66
3.40
D
MIN: 3.34 / MAX: 3.52
3.41
0.7673
1.5346
2.3019
3.0692
3.8365
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread


NCNN 20210720
Target: CPU - Model: efficientnet-b0
ms, Fewer Is Better
B
MIN: 10.56 / MAX: 12.21
10.93
A
MIN: 10.39 / MAX: 90.61
10.97
C
MIN: 10.34 / MAX: 12.31
11.03
D
MIN: 10.66 / MAX: 20.15
11.60
3
6
9
12
15
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: mnasnet
ms, Fewer Is Better
A
MIN: 6.89 / MAX: 7.53
7.15
C
MIN: 7.06 / MAX: 8.56
7.31
B
MIN: 7.15 / MAX: 8.21
7.58
D
MIN: 7.31 / MAX: 12.1
9.05
3
6
9
12
15
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread

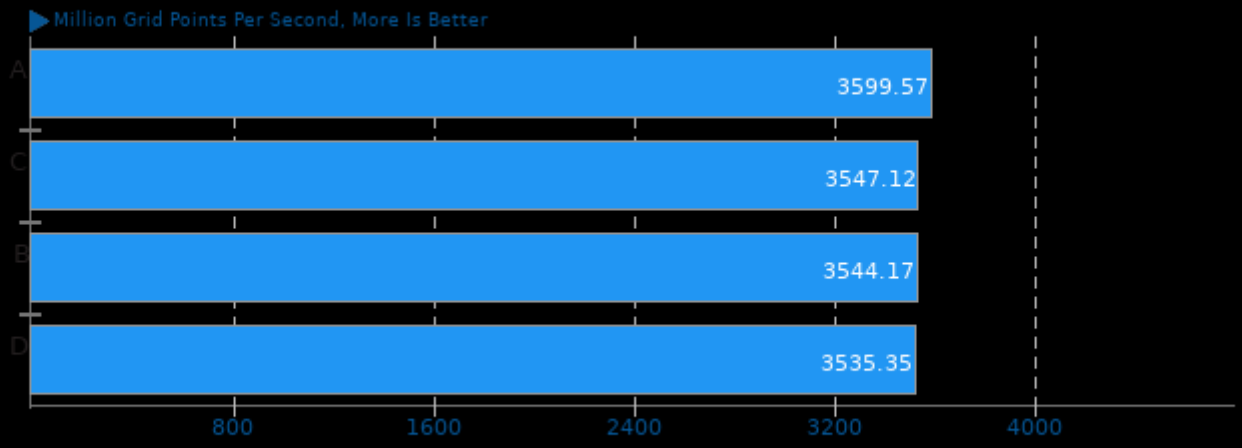

NCNN 20210720
Target: CPU - Model: shufflenet-v2
ms, Fewer Is Better
C
MIN: 8.55 / MAX: 9.22
8.83
B
MIN: 8.59 / MAX: 10.21
9.15
A
MIN: 8.6 / MAX: 10.41
9.26
D
MIN: 8.65 / MAX: 15.08
10.76
3
6
9
12
15
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU-v3-v3 - Model: mobilenet-v3
ms, Fewer Is Better
A
MIN: 7.13 / MAX: 7.74
7.43
C
MIN: 7.24 / MAX: 8.09
7.48
B
MIN: 7.37 / MAX: 8.56
7.82
D
MIN: 7.34 / MAX: 8.65
7.86
2
4
6
8
10
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread


NCNN 20210720
Target: CPU-v2-v2 - Model: mobilenet-v2
ms, Fewer Is Better
C
MIN: 7.68 / MAX: 8.41
7.96
A
MIN: 7.78 / MAX: 8.98
8.16
B
MIN: 7.81 / MAX: 9.32
8.31
D
MIN: 6.57 / MAX: 11.26
8.36
2
4
6
8
10
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20210720
Target: CPU - Model: mobilenet
ms, Fewer Is Better
D
MIN: 16.27 / MAX: 17.99
16.83
A
MIN: 18.53 / MAX: 27.72
19.64
C
MIN: 18.59 / MAX: 22.06
19.68
B
MIN: 18.61 / MAX: 93.57
19.96
5
10
15
20
25
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread


Xmrig 6.12.1
Variant: Monero - Hash Count: 1M
H/s, More Is Better
D
13619.3
B
13573.1
C
13559.3
A
13521.7
3K
6K
9K
12K
15K
1. (CXX) g++ options: -fexceptions -fno-rtti -maes -O3 -Ofast -static-libgcc -static-libstdc++ -rdynamic -lssl -lcrypto -luv -lpthread -lrt -ldl -lhwloc
ASKAP 1.0
Test: tConvolve MT - Degridding
Million Grid Points Per Second, More Is Better
A
5594.35
C
5511.12
B
5507.56
D
5493.35
1200
2400
3600
4800
6000
1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp

ASKAP 1.0

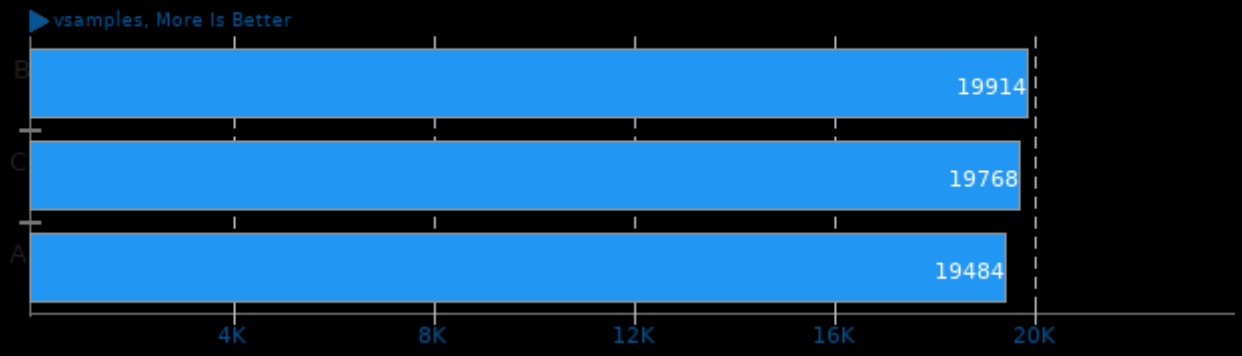
Test: tConvolve MT - Gridding



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

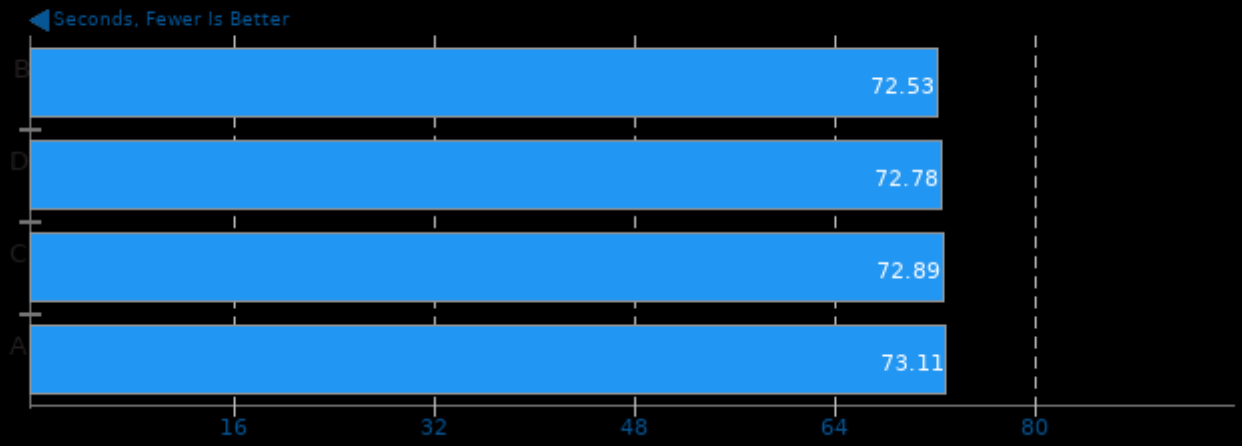
Chaos Group V-RAY 5

Mode: CPU



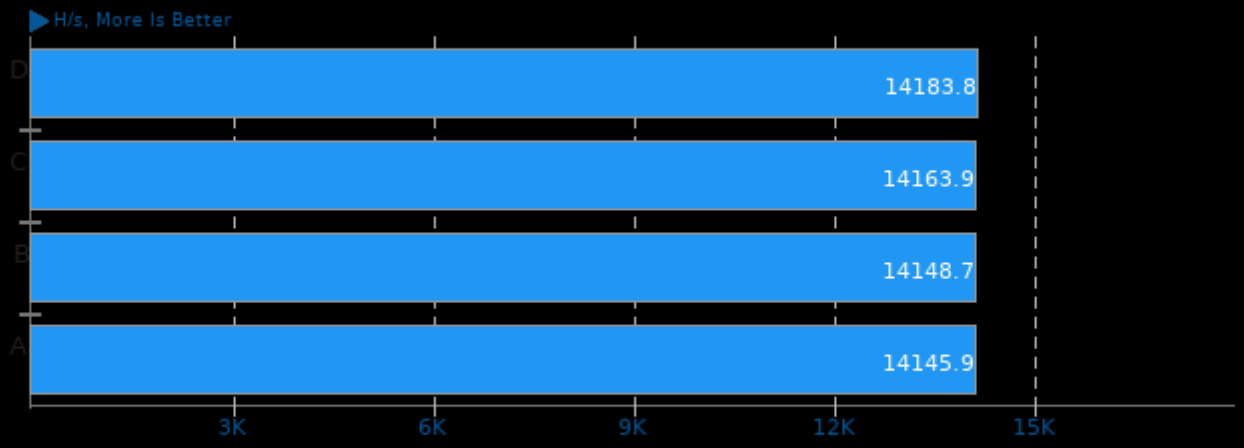
Timed Godot Game Engine Compilation 3.2.3

Time To Compile



Xmrig 6.12.1

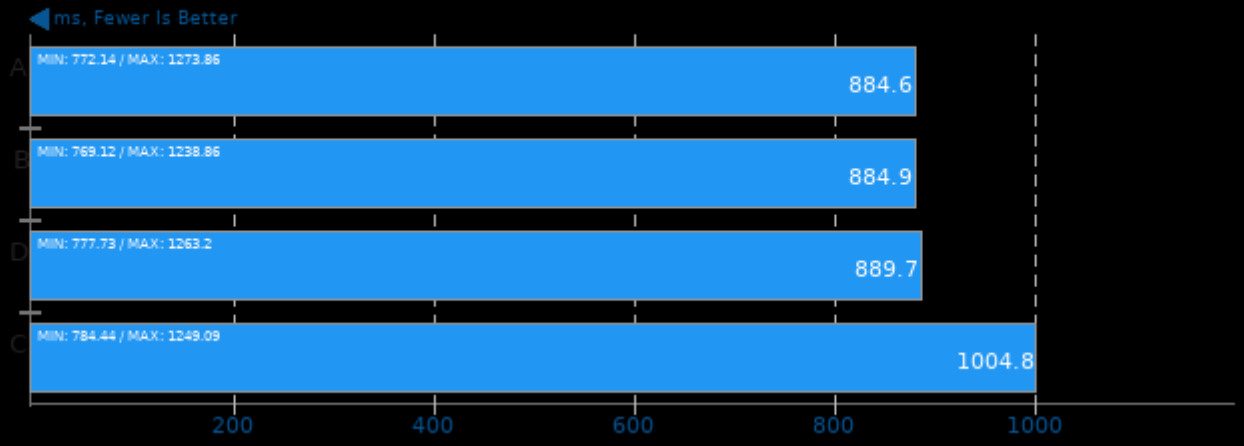
Variant: Wownero - Hash Count: 1M



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

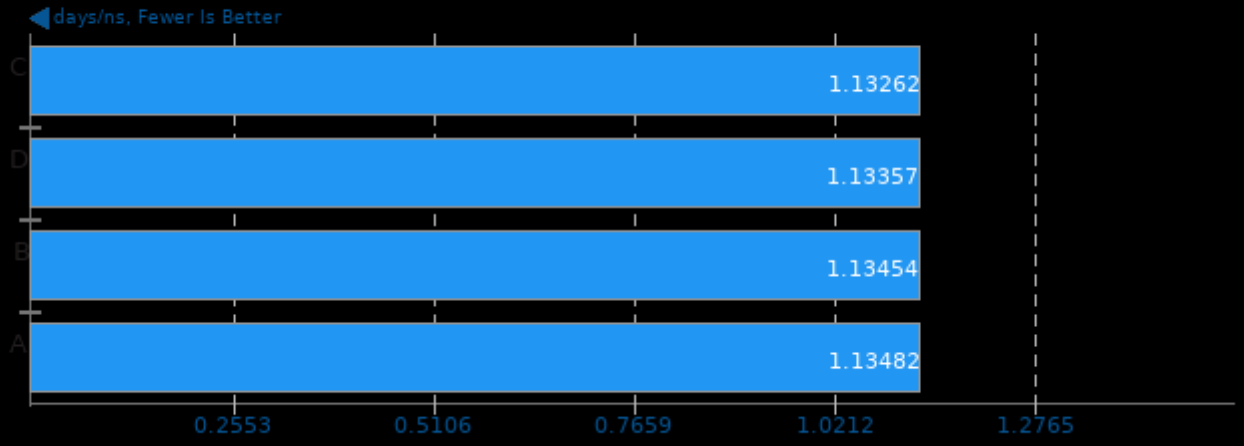
Renaissance 0.12

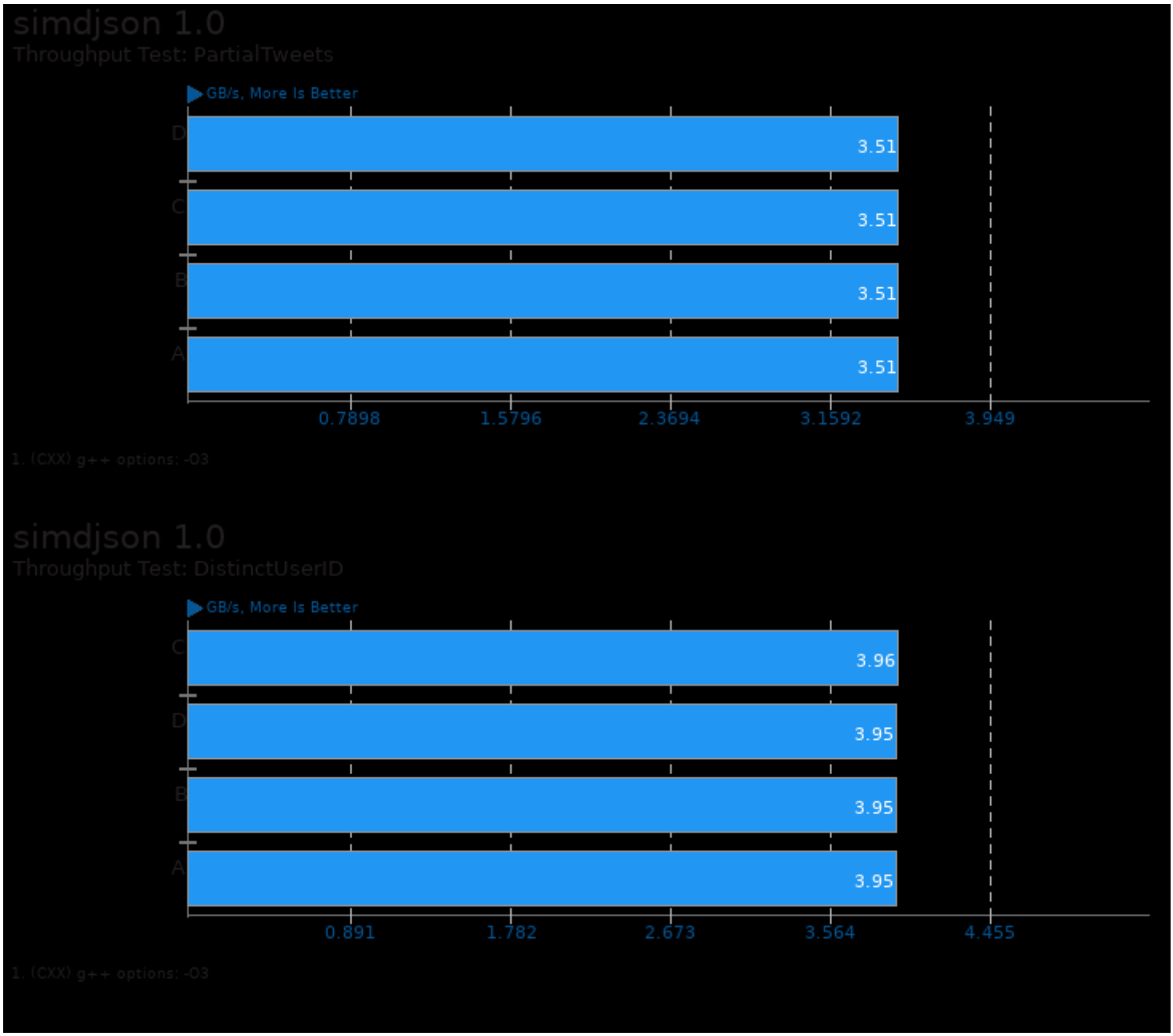
Test: Scala Dotty



NAMD 2.14

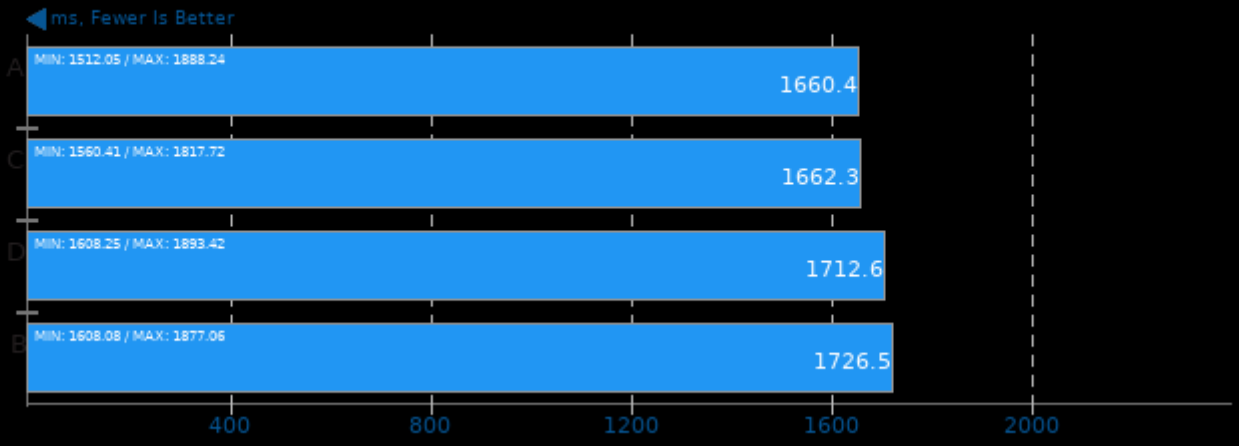
ATPase Simulation - 327,506 Atoms




simdjson 1.0
Throughput Test: PartialTweets
GB/s, More Is Better
D
C
B
A
3.51
3.51
3.51
3.51
0.7898
1.5796
2.3694
3.1592
3.949
1. (CXX) g++ options: -O3
simdjson 1.0
Throughput Test: DistinctUserID
GB/s, More Is Better
C
D
B
A
3.96
3.95
3.95
3.95
0.891
1.782
2.673
3.564
4.455
1. (CXX) g++ options: -O3

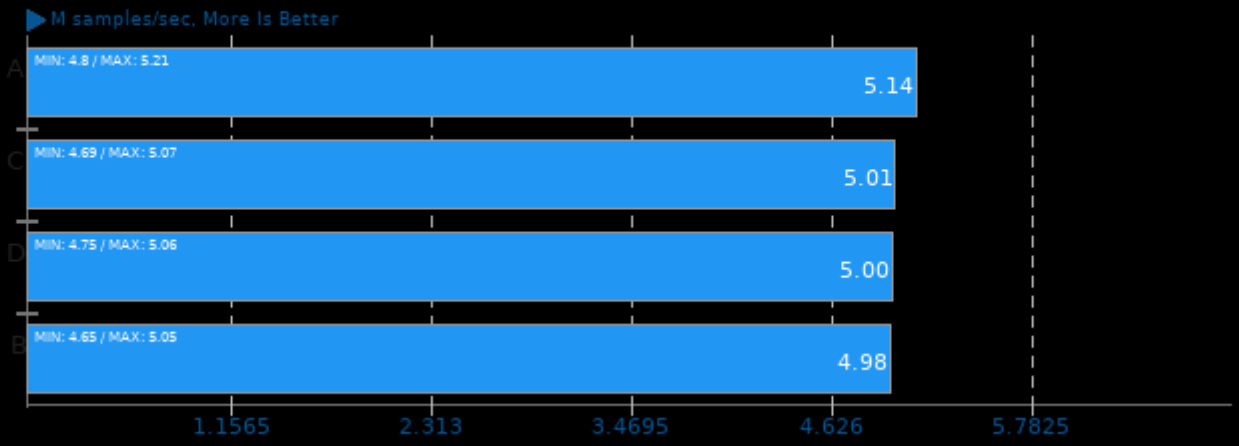
Renaissance 0.12

Test: Apache Spark ALS



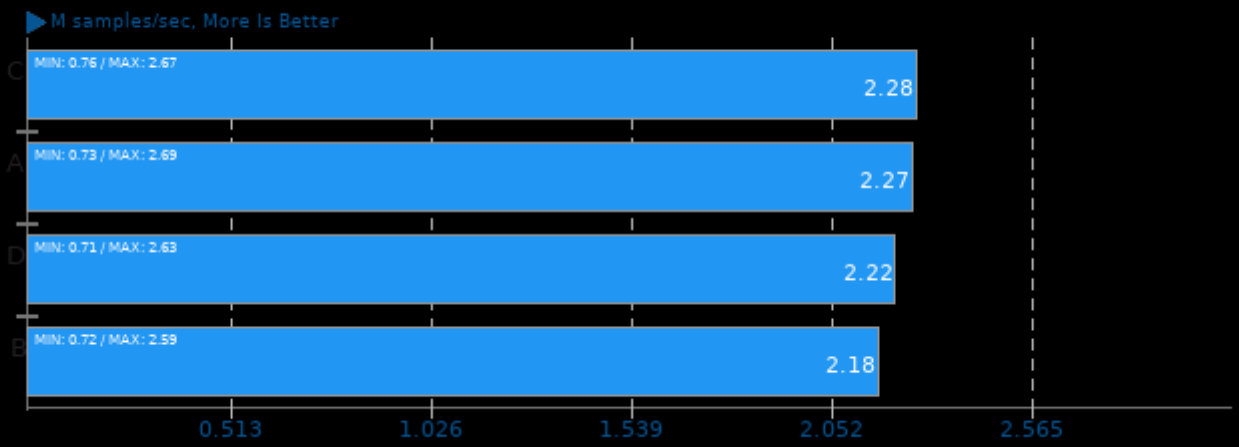
LuxCoreRender 2.5

Scene: Orange Juice - Acceleration: CPU



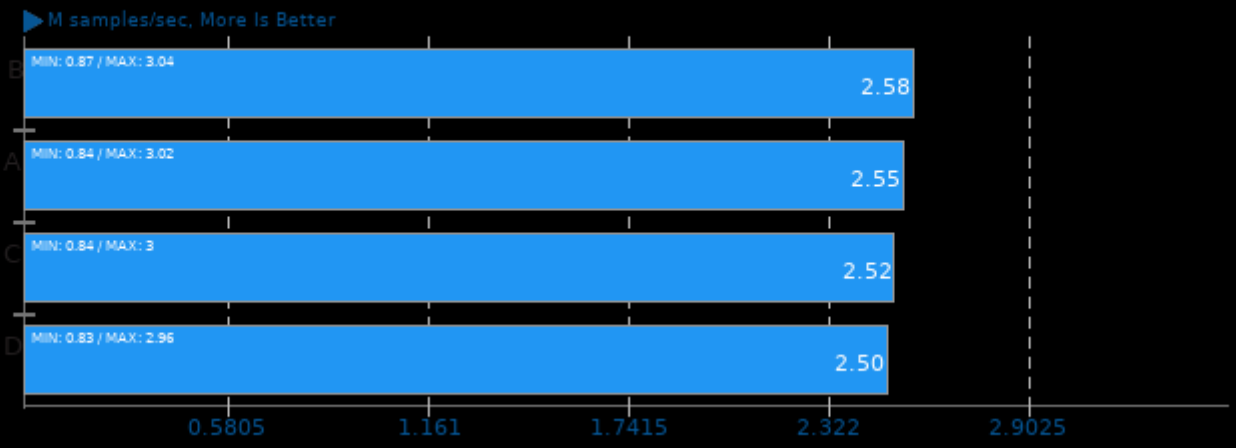
LuxCoreRender 2.5

Scene: Danish Mood - Acceleration: CPU



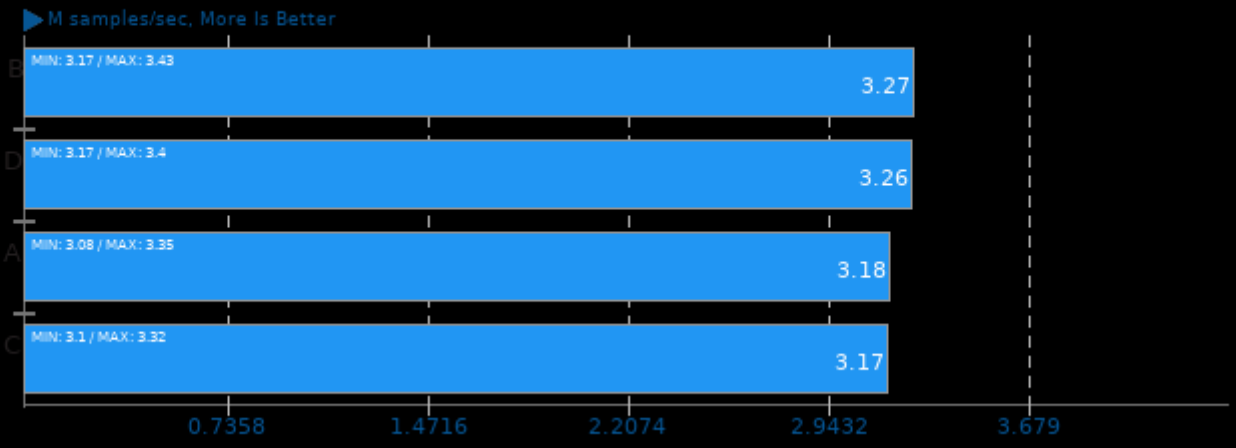
LuxCoreRender 2.5

Scene: LuxCore Benchmark - Acceleration: CPU



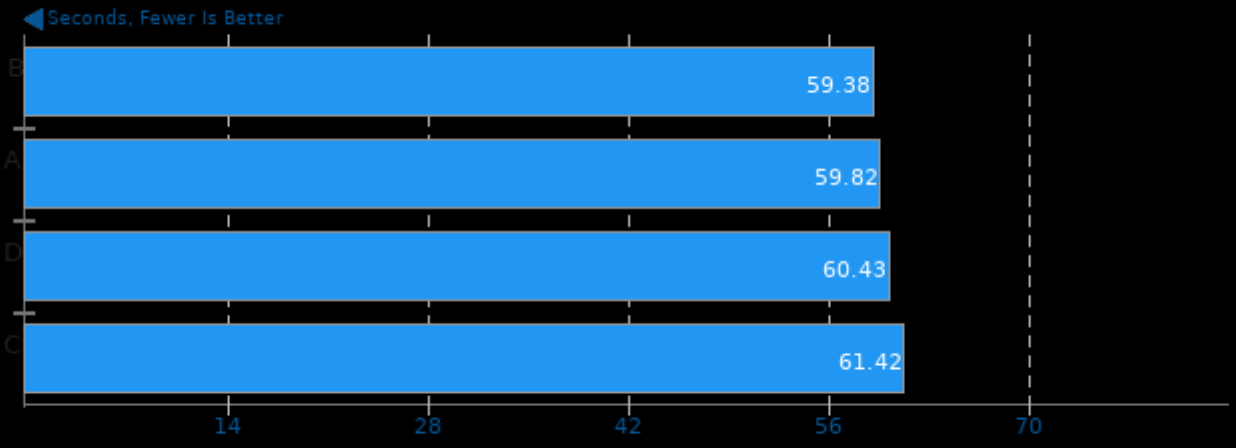
LuxCoreRender 2.5

Scene: DLSC - Acceleration: CPU

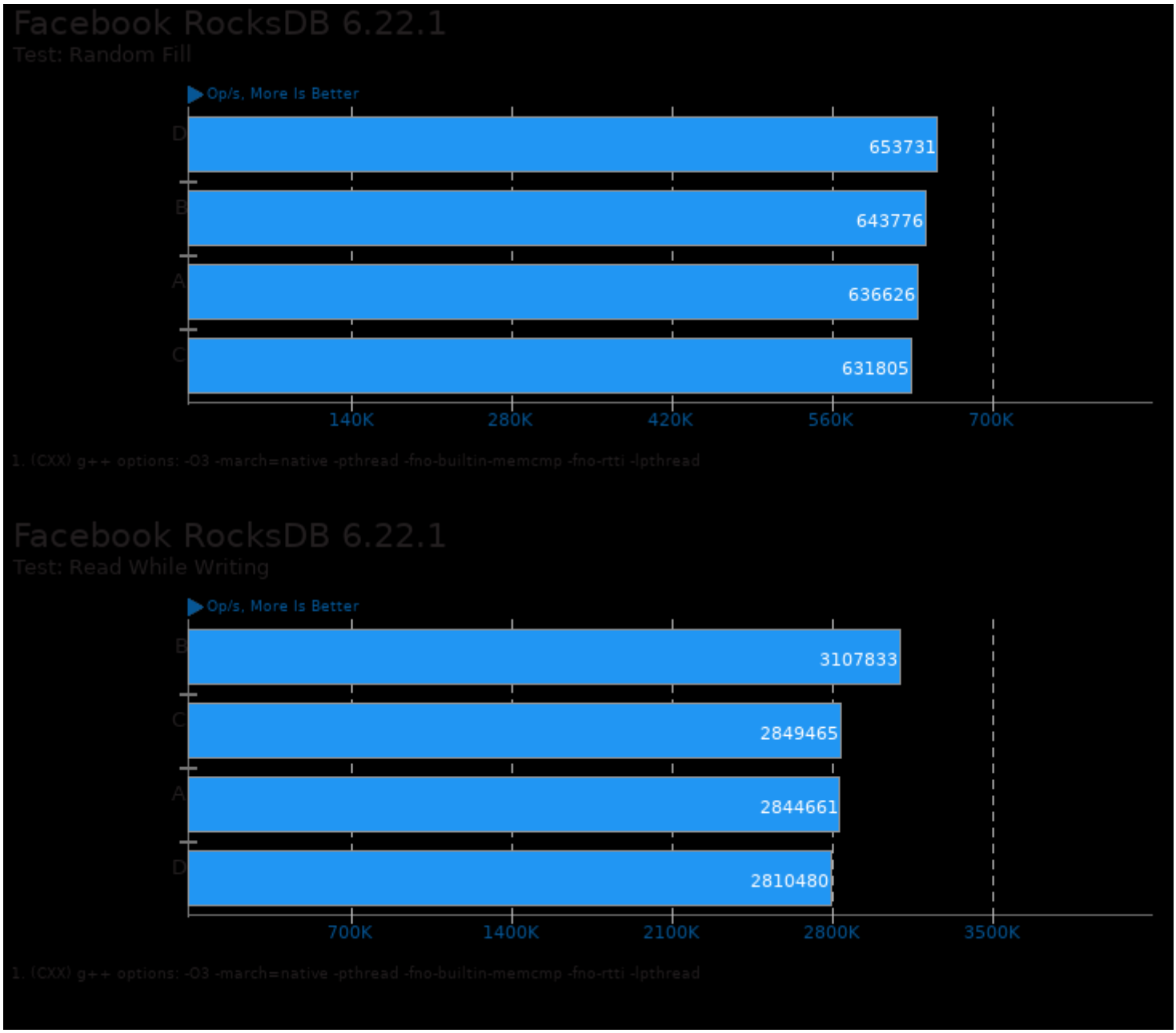


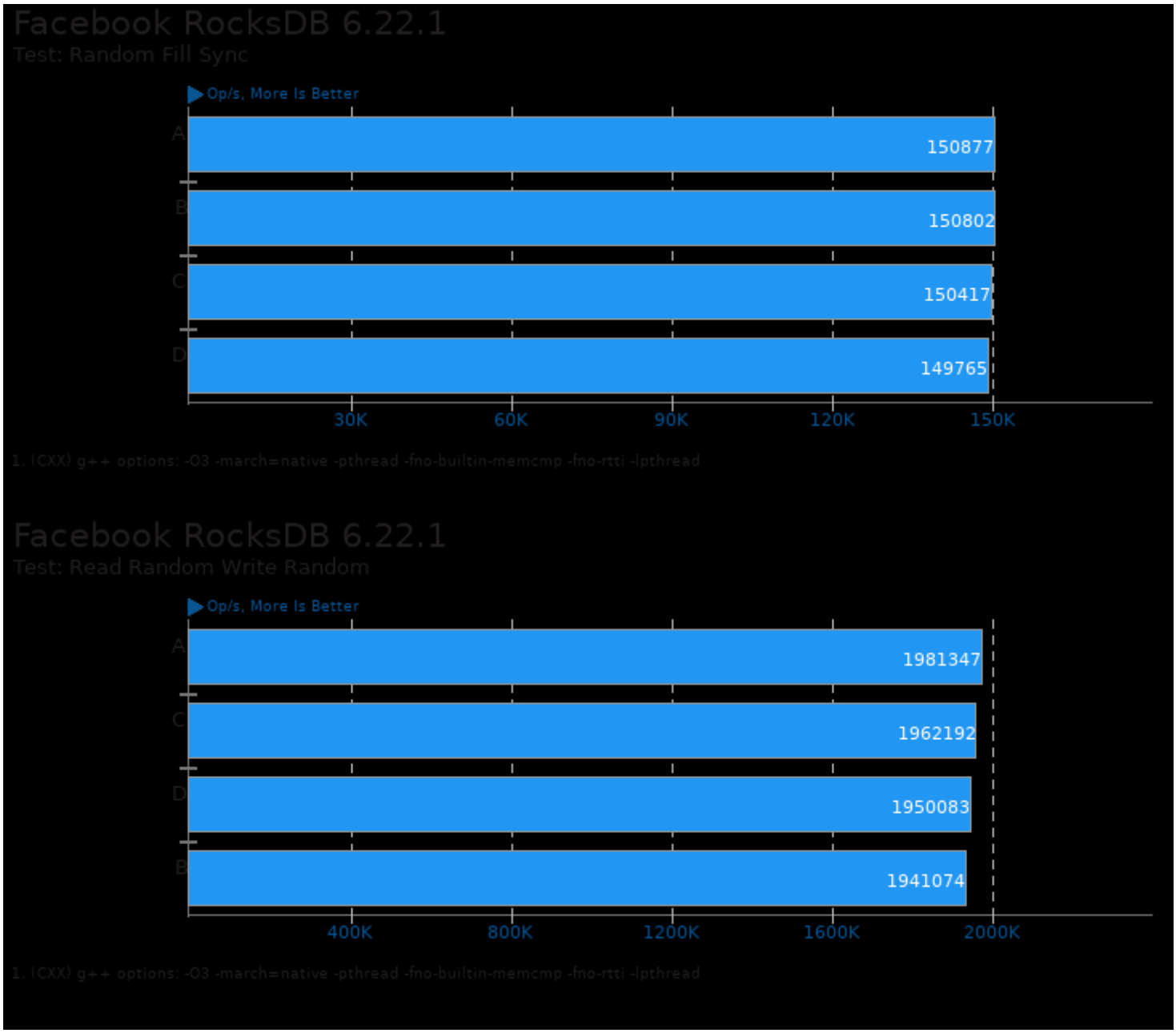
Timed Wasmer Compilation 1.0.2

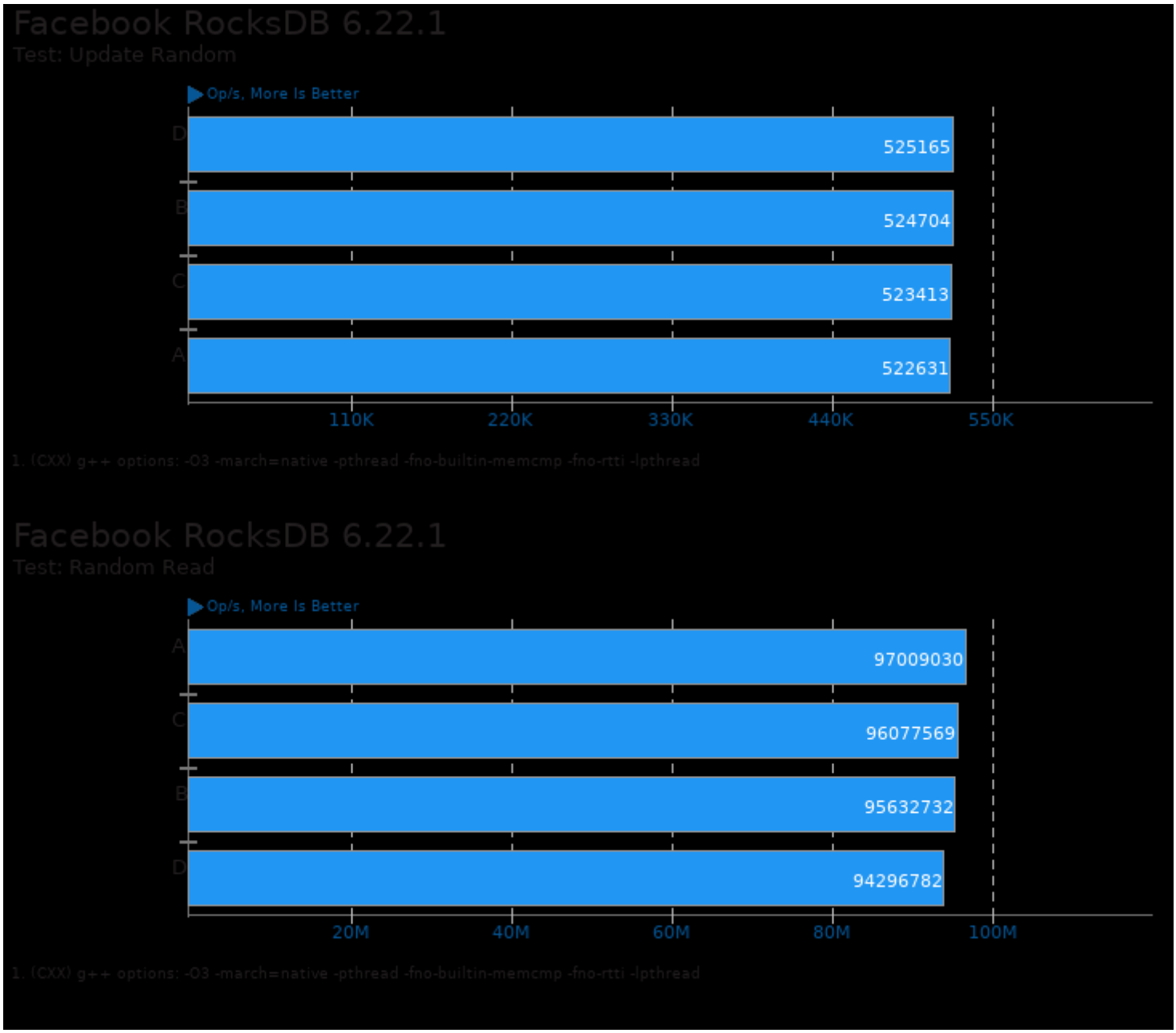
Time To Compile

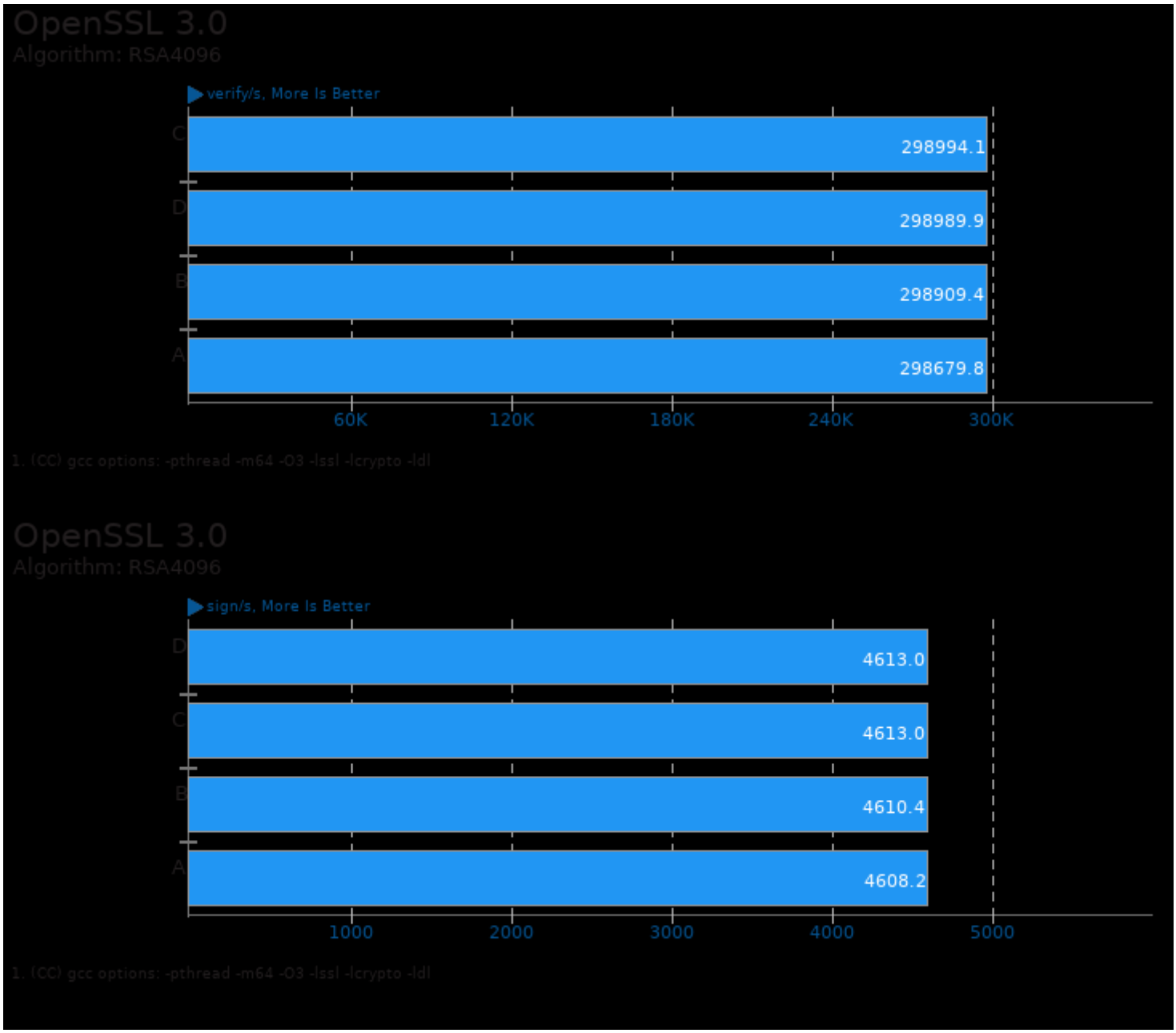


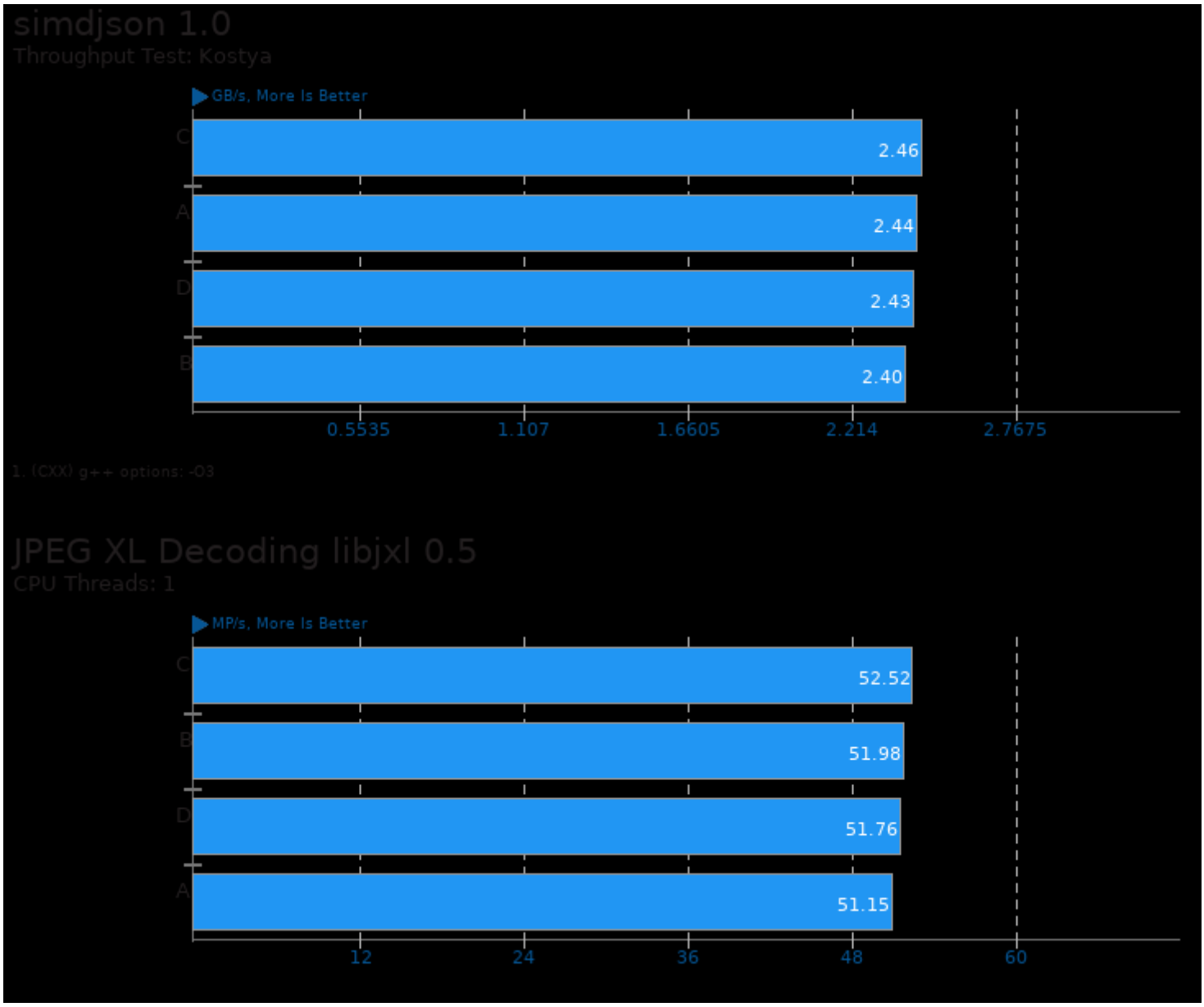
1. (CC) gcc options: -m64 -pie -nodefaultlibs -ldl -lgcc_s -lutil -lrt -lpthread -lm -lc

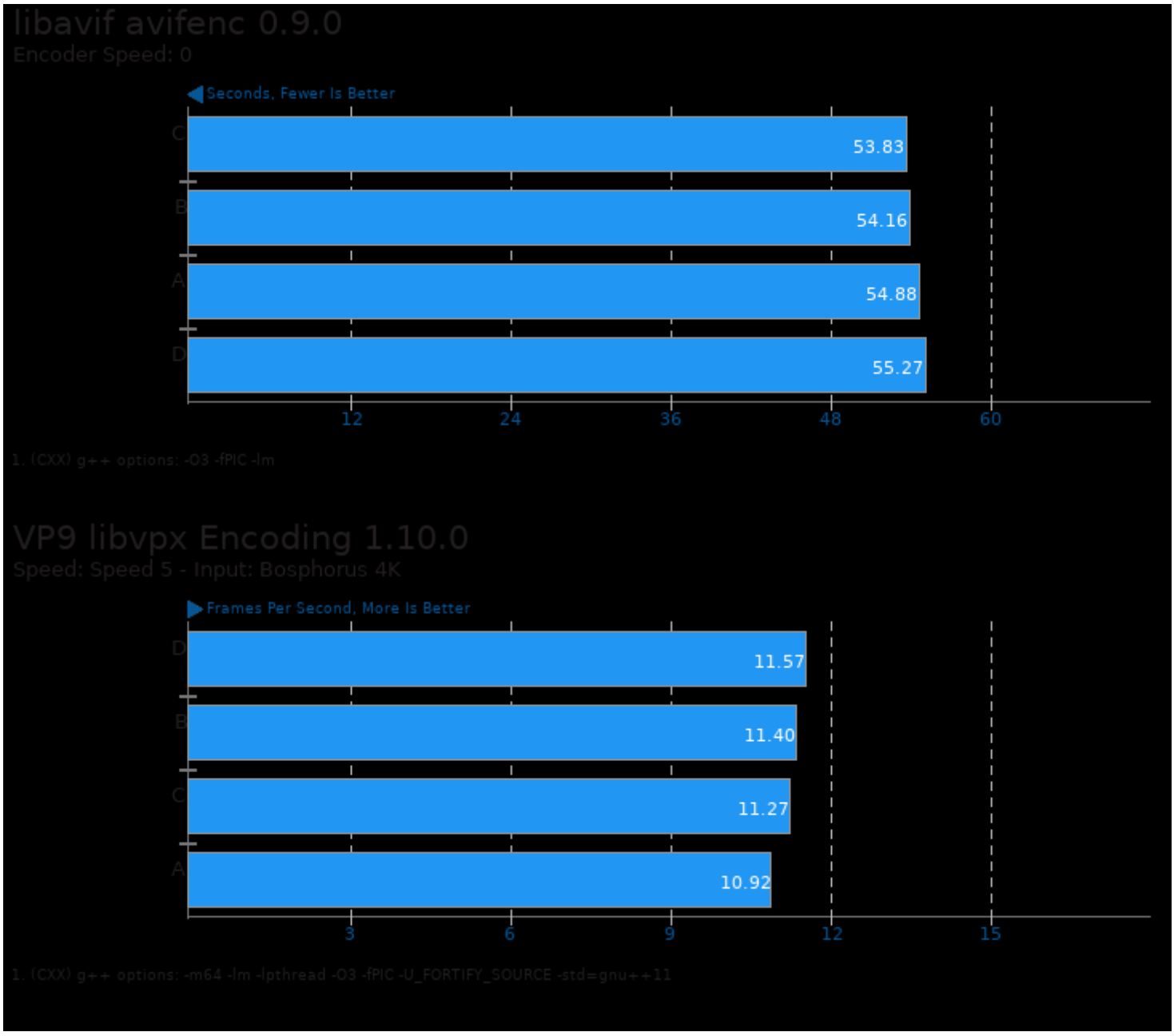

Facebook RocksDB 6.22.1
Test: Random Fill
Op/s, More Is Better
D
653731
B
643776
A
636626
C
631805
140K
280K
420K
560K
700K
1. (CXX) g++ options: -O3 -march=native -pthread -fno-builtin-memcmp -fno-rtti -lpthread
Facebook RocksDB 6.22.1
Test: Read While Writing
Op/s, More Is Better
B
3107833
C
2849465
A
2844661
D
2810480
700K
1400K
2100K
2800K
3500K
1. (CXX) g++ options: -O3 -march=native -pthread -fno-builtin-memcmp -fno-rtti -lpthread

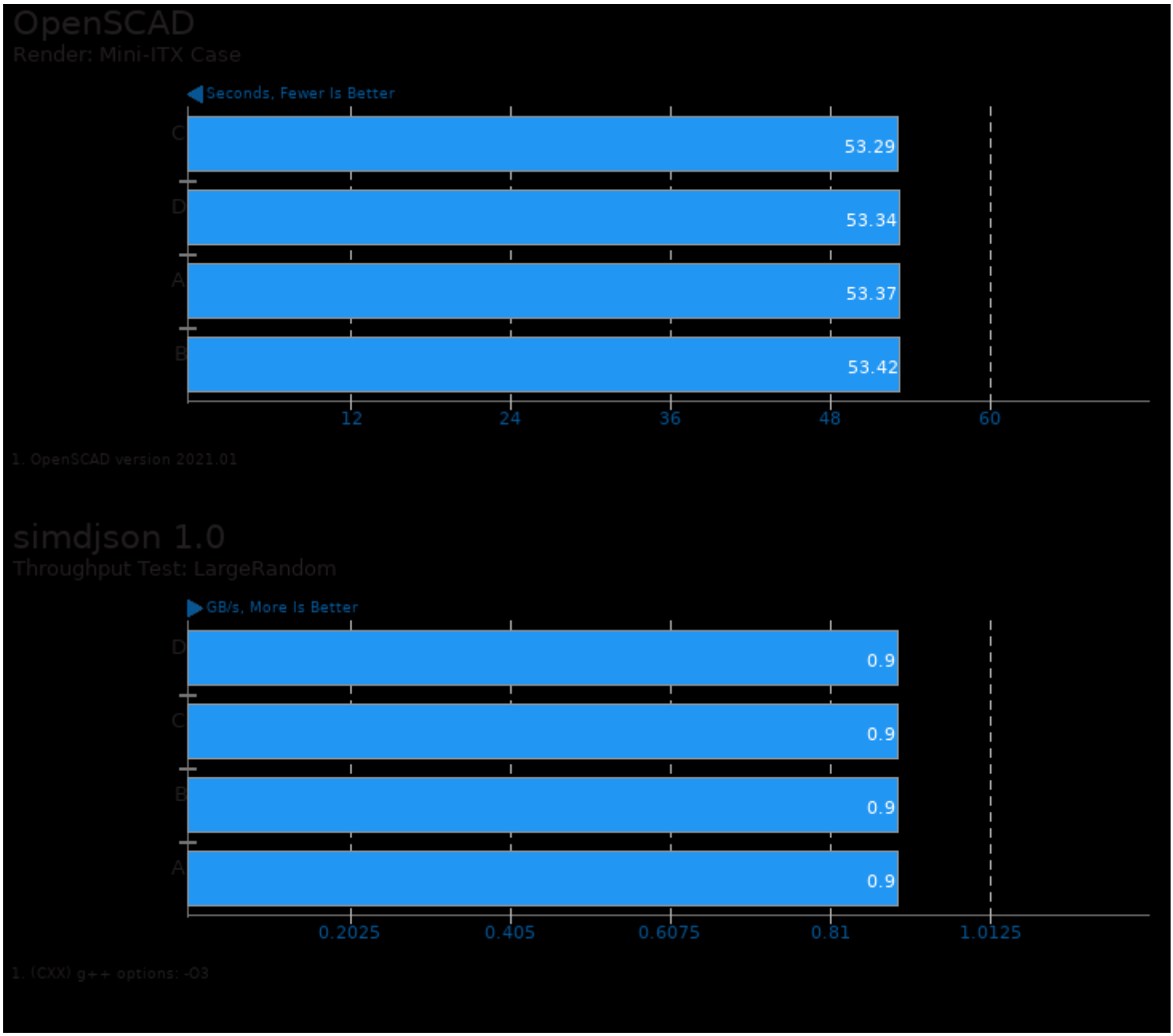

Facebook RocksDB 6.22.1
Test: Random Fill Sync
Op/s, More Is Better
A
B
C
D
150877
150802
150417
149765
30K
60K
90K
120K
150K
1. (CXX) g++ options: -O3 -march=native -pthread -fno-builtin-memcmp -fno-rtti -lpthread
Facebook RocksDB 6.22.1
Test: Read Random Write Random
Op/s, More Is Better
A
C
D
B
1981347
1962192
1950083
1941074
400K
800K
1200K
1600K
2000K
1. (CXX) g++ options: -O3 -march=native -pthread -fno-builtin-memcmp -fno-rtti -lpthread


Facebook RocksDB 6.22.1
Test: Update Random
Op/s, More Is Better
D
525165
B
524704
C
523413
A
522631
110K
220K
330K
440K
550K
1. (CXX) g++ options: -O3 -march=native -pthread -fno-builtin-memcmp -fno-rtti -lpthread
Facebook RocksDB 6.22.1
Test: Random Read
Op/s, More Is Better
A
97009030
C
96077569
B
95632732
D
94296782
20M
40M
60M
80M
100M
1. (CXX) g++ options: -O3 -march=native -pthread -fno-builtin-memcmp -fno-rtti -lpthread


OpenSSL 3.0
Algorithm: RSA4096
verify/s, More Is Better
C
298994.1
D
298989.9
B
298909.4
A
298679.8
60K
120K
180K
240K
300K
1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl
OpenSSL 3.0
Algorithm: RSA4096
sign/s, More Is Better
D
4613.0
C
4613.0
B
4610.4
A
4608.2
1000
2000
3000
4000
5000
1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl

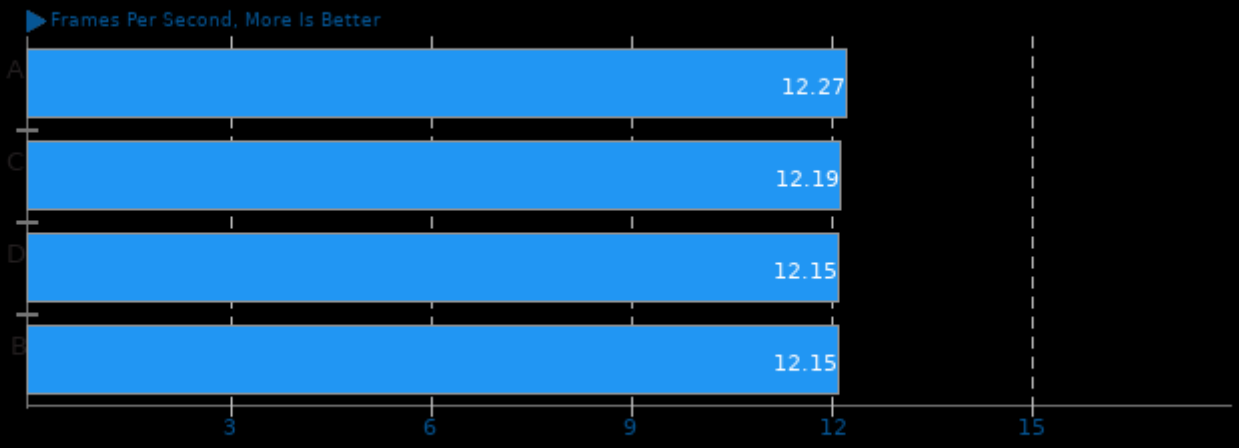

simdjson 1.0
Throughput Test: Kostya
GB/s, More Is Better
C
A
D
B
2.46
2.44
2.43
2.40
0.5535
1.107
1.6605
2.214
2.7675
1. (CXX) g++ options: -O3
JPEG XL Decoding libjxl 0.5
CPU Threads: 1
MP/s, More Is Better
C
B
D
A
52.52
51.98
51.76
51.15
12
24
36
48
60


libavif avifenc 0.9.0
Encoder Speed: 0
Seconds, Fewer Is Better
C
B
A
D
53.83
54.16
54.88
55.27
12
24
36
48
60
1. (CXX) g++ options: -O3 -fPIC -lm
VP9 libvpx Encoding 1.10.0
Speed: Speed 5 - Input: Bosphorus 4K
Frames Per Second, More Is Better
D
B
C
A
11.57
11.40
11.27
10.92
3
6
9
12
15
1. (CXX) g++ options: -m64 -lm -lpthread -O3 -fPIC -U_FORTIFY_SOURCE -std=gnu++11


OpenSCAD
Render: Mini-ITX Case
Seconds, Fewer Is Better
C
D
A
B
53.29
53.34
53.37
53.42
12
24
36
48
60
1. OpenSCAD version 2021.01
simdjson 1.0
Throughput Test: LargeRandom
GB/s, More Is Better
D
C
B
A
0.9
0.9
0.9
0.9
0.2025
0.405
0.6075
0.81
1.0125
1. (CXX) g++ options: -O3

VP9 libvpx Encoding 1.10.0

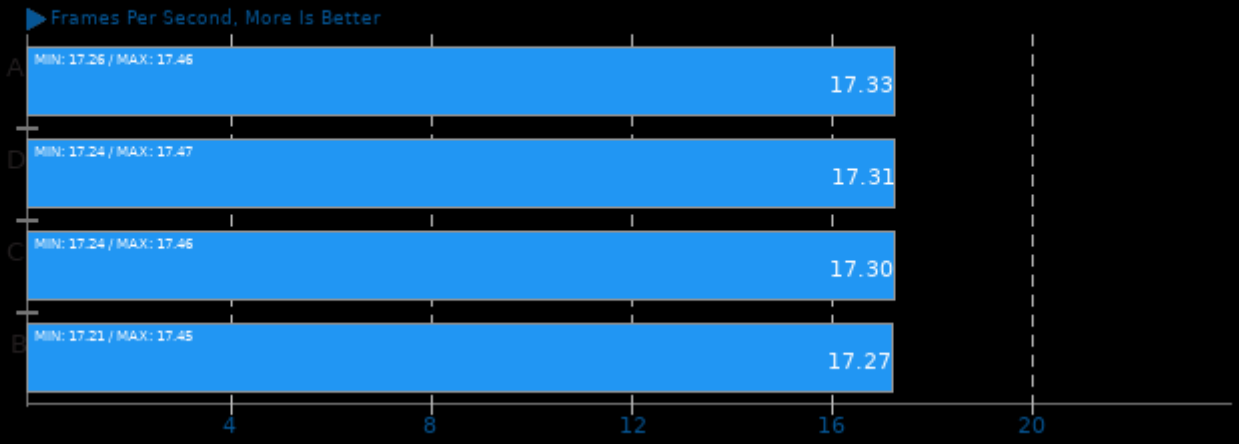
Speed: Speed 0 - Input: Bosphorus 1080p



1. (CXX) g++ options: -m64 -lm -lpthread -O3 -fPIC -U_FORTIFY_SOURCE -std=gnu++11

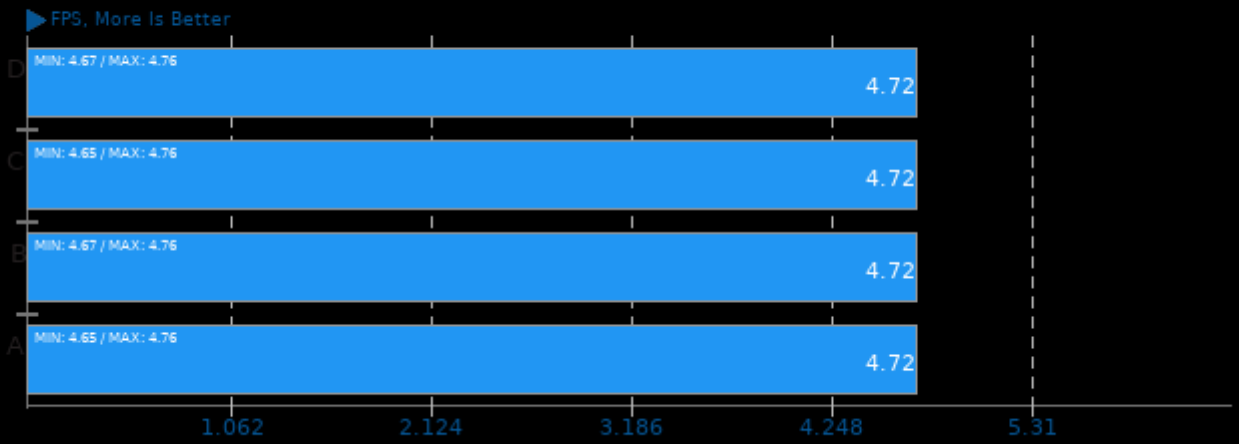
Embree 3.13

Binary: Pathtracer ISPC - Model: Asian Dragon Obj



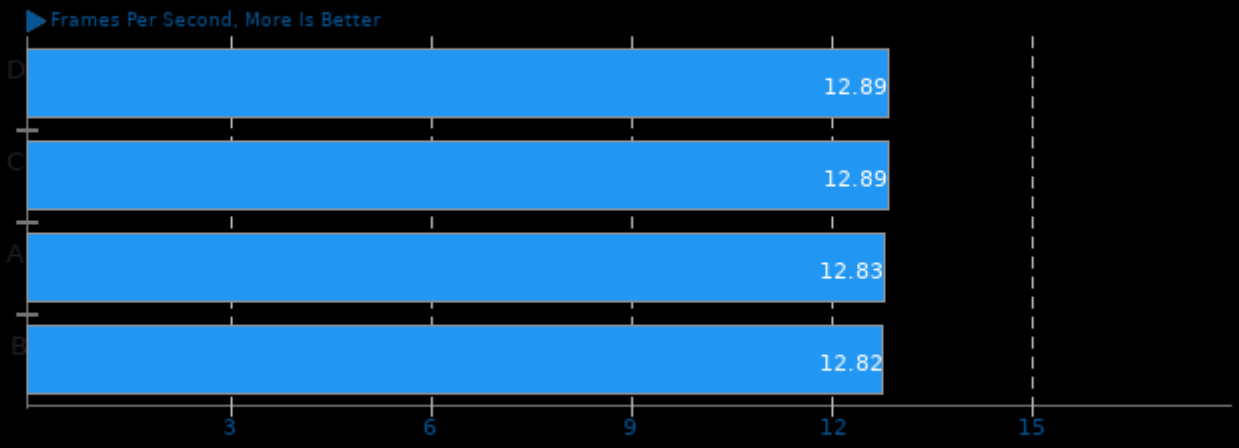
OSPray 1.8.5

Demo: XFrog Forest - Renderer: SciVis



AOM AV1 3.1

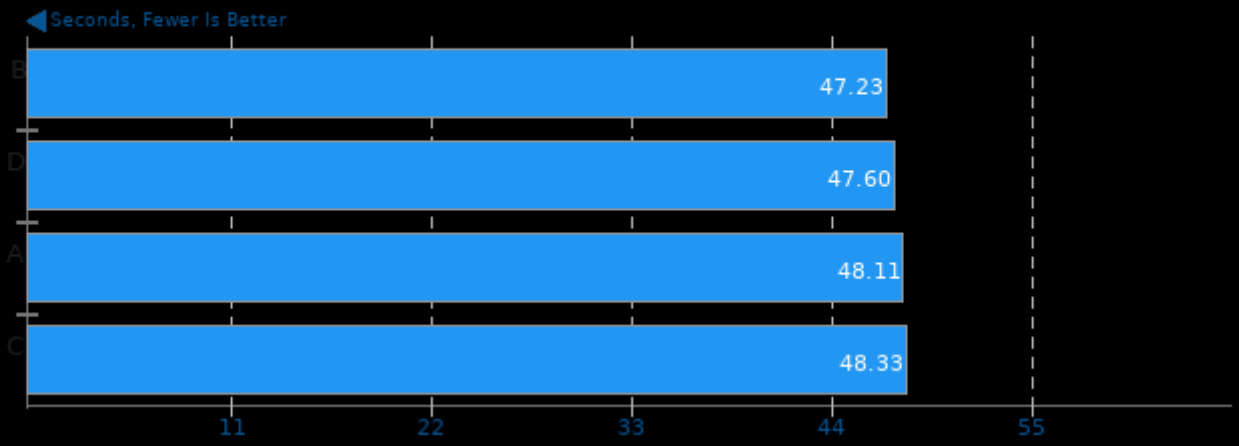
Encoder Mode: Speed 6 Realtime - Input: Bosphorus 4K



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

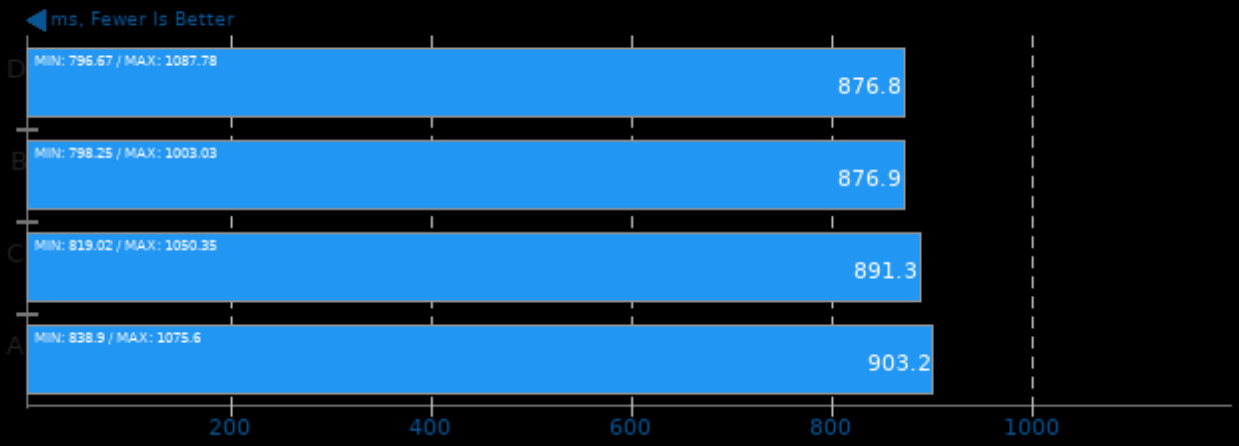
Timed Linux Kernel Compilation 5.14

Time To Compile



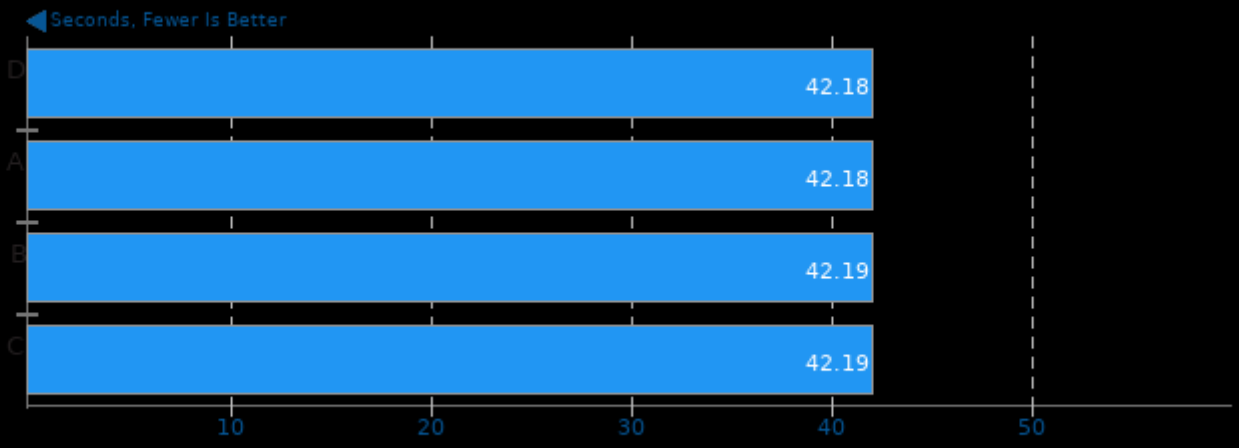
Renaissance 0.12

Test: Random Forest



ASTC Encoder 3.2

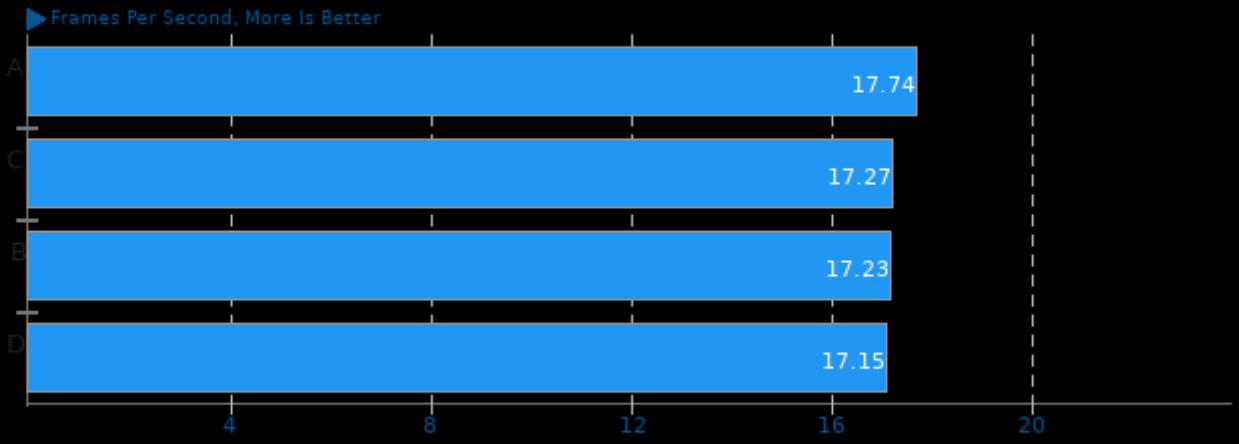
Preset: Exhaustive



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

AOM AV1 3.1

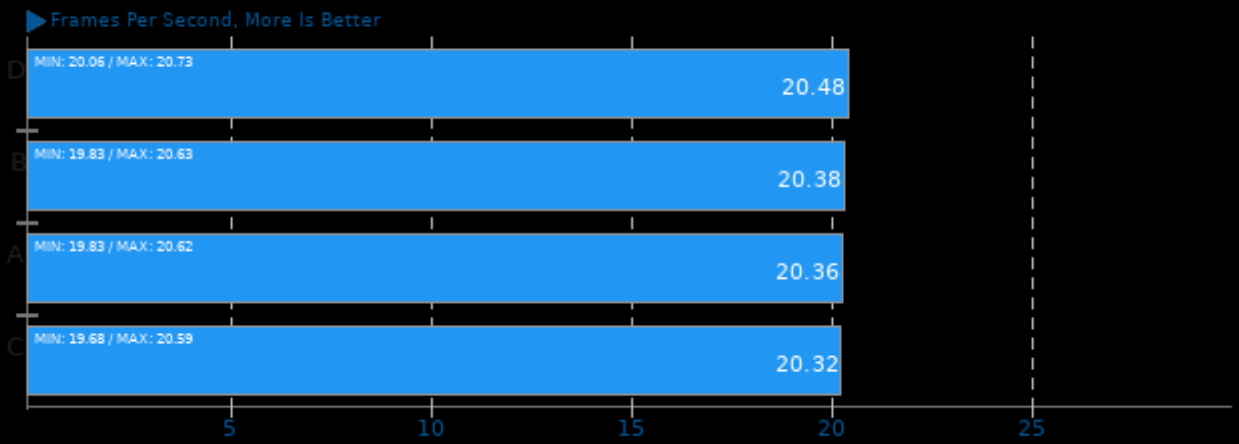
Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 1080p



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

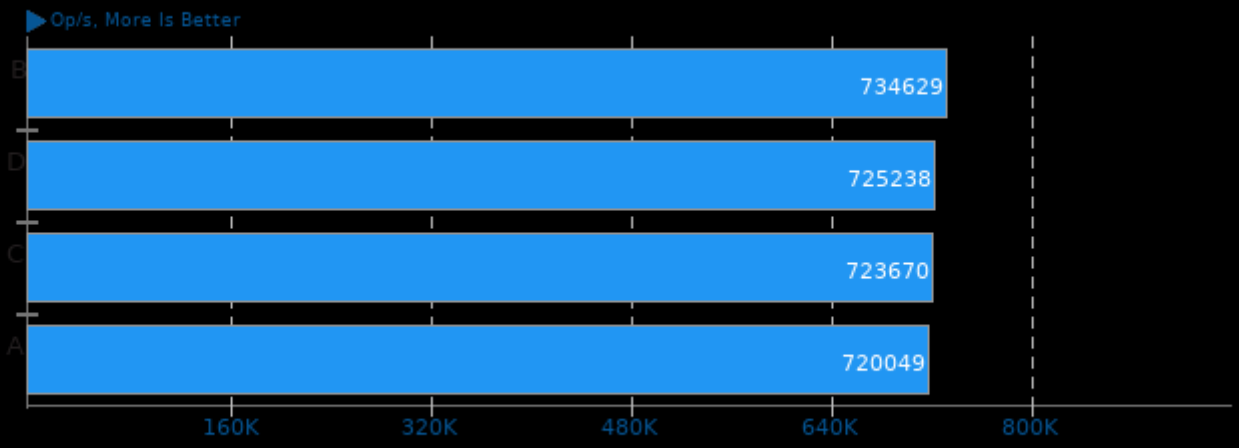
Embree 3.13

Binary: Pathtracer - Model: Asian Dragon Obj



Facebook RocksDB 6.22.1

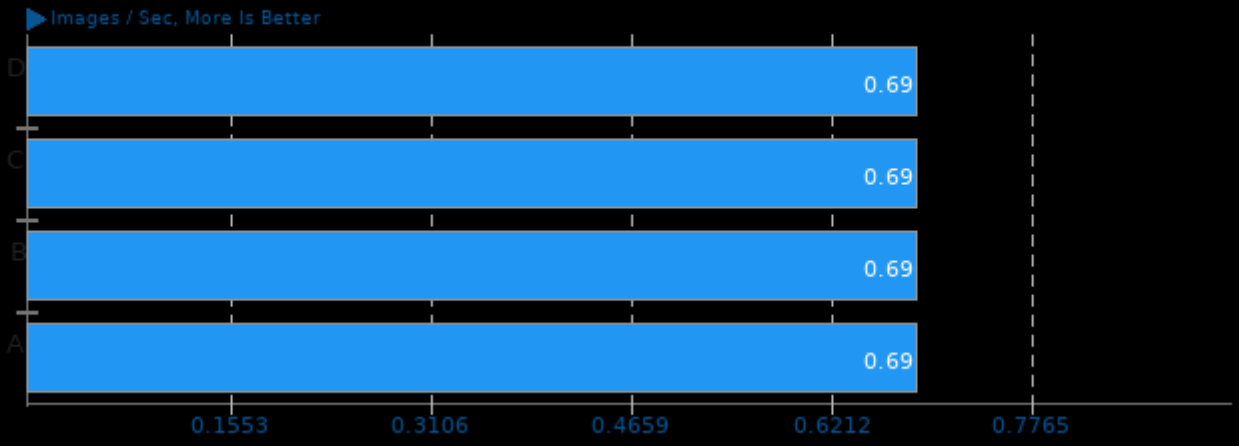
Test: Sequential Fill



1. (CXX) g++ options: -O3 -march=native -pthread -fno-builtin-memcmp -fno-rtti -lpthread

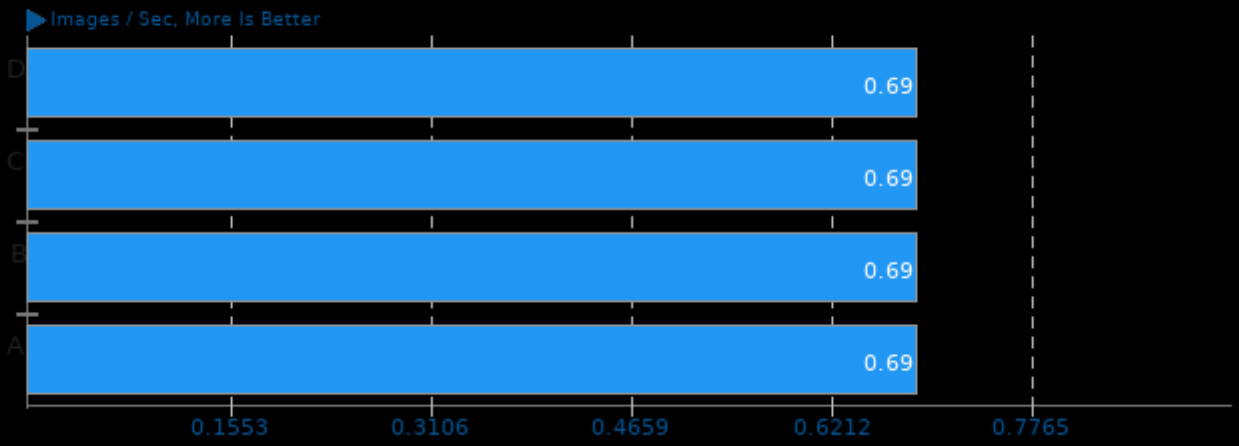
Intel Open Image Denoise 1.4.0

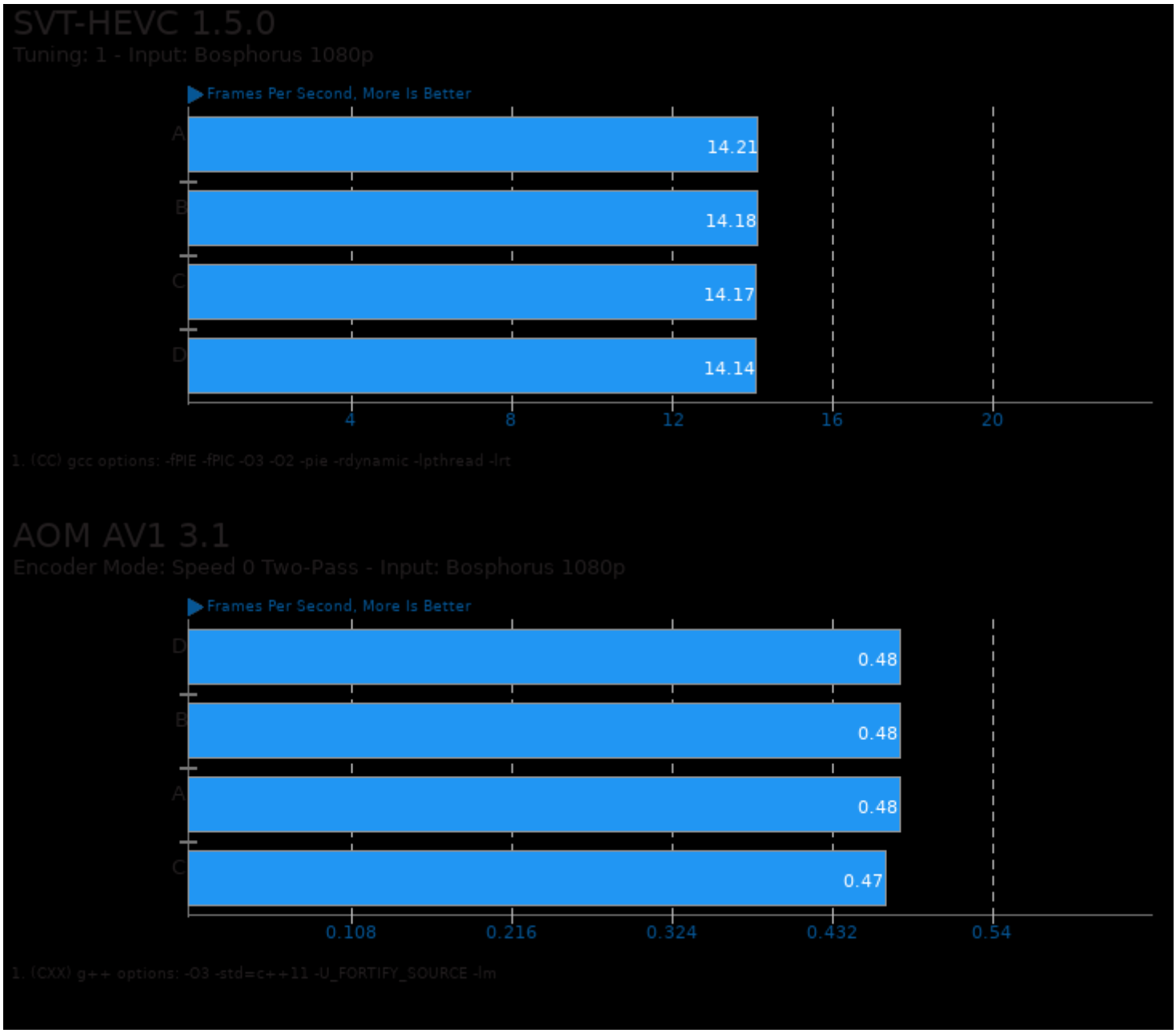
Run: RT.hdr_alb_nrm.3840x2160

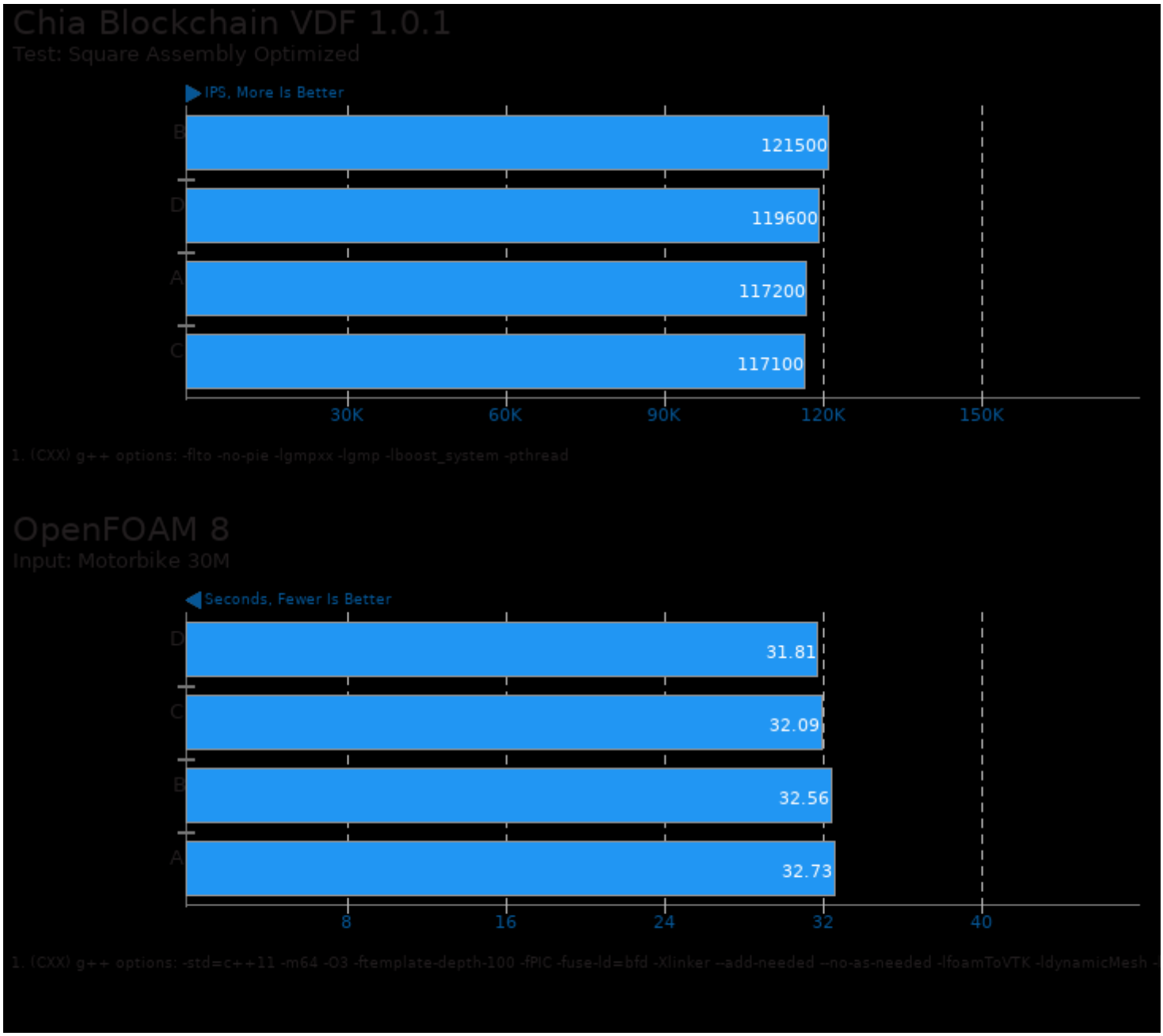


Intel Open Image Denoise 1.4.0

Run: RT.ldr_alb_nrm.3840x2160

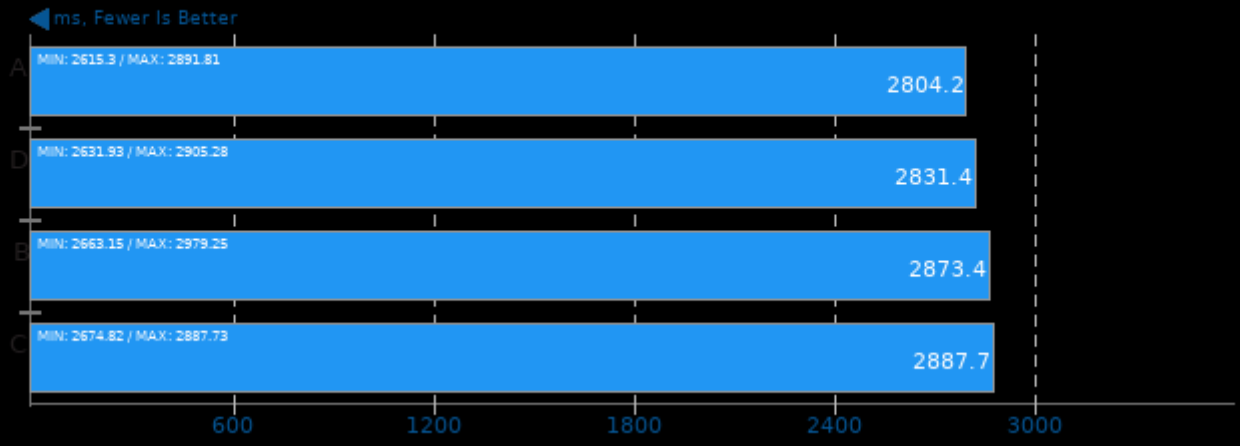



SVT-HEVC 1.5.0
Tuning: 1 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
A
B
C
D
14.21
14.18
14.17
14.14
4
8
12
16
20
1. (CC) gcc options: -fPIE -fPIC -O3 -O2 -pie -rdynamic -lpthread -lrt
AOM AV1 3.1
Encoder Mode: Speed 0 Two-Pass - Input: Bosphorus 1080p
Frames Per Second, More Is Better
D
B
A
C
0.48
0.48
0.48
0.47
0.108
0.216
0.324
0.432
0.54
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm


Chia Blockchain VDF 1.0.1
Test: Square Assembly Optimized
IPS, More Is Better
B
121500
D
119600
A
117200
C
117100
30K
60K
90K
120K
150K
1. (CXX) g++ options: -flto -no-pie -lgmpxx -lgmp -lboost_system -pthread
OpenFOAM 8
Input: Motorbike 30M
Seconds, Fewer Is Better
D
31.81
C
32.09
B
32.56
A
32.73
8
16
24
32
40
1. (CXX) g++ options: -std=c++11 -m64 -O3 -ftemplate-depth-100 -fPIC -fuse-ld=bfd -Xlinker --add-needed --no-as-needed -lfoamToVTK -ldynamicMesh

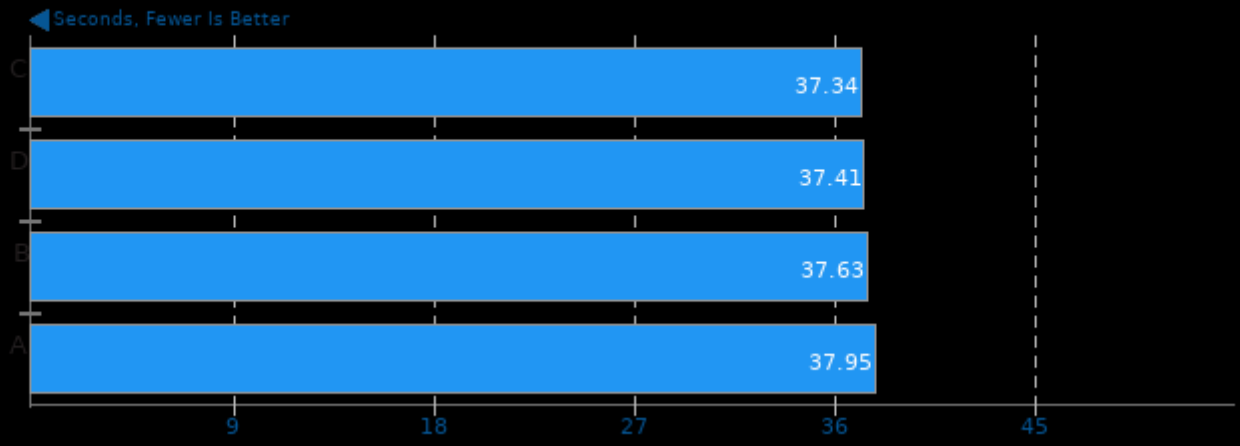
Renaissance 0.12

Test: Finagle HTTP Requests



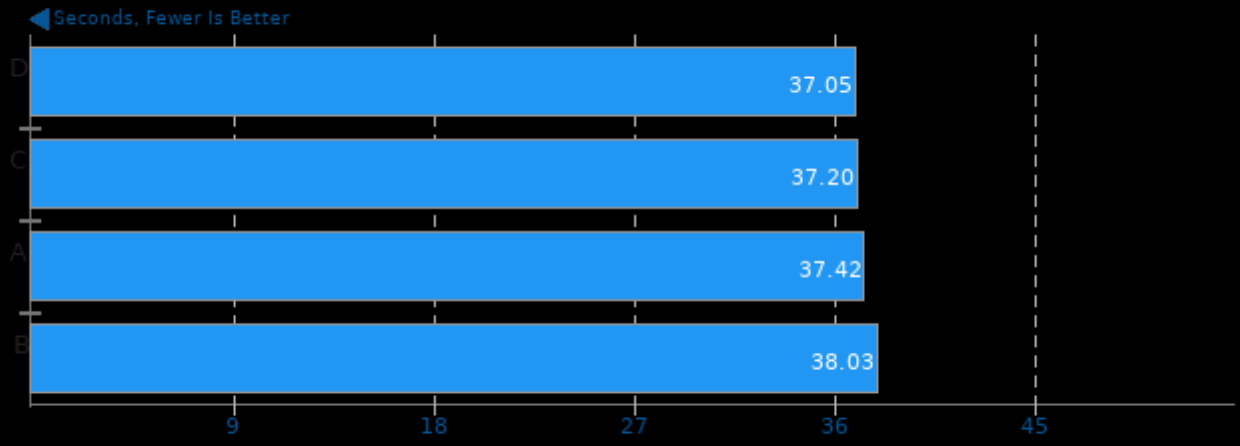
ECP-CANDLE 0.4

Benchmark: P1B2

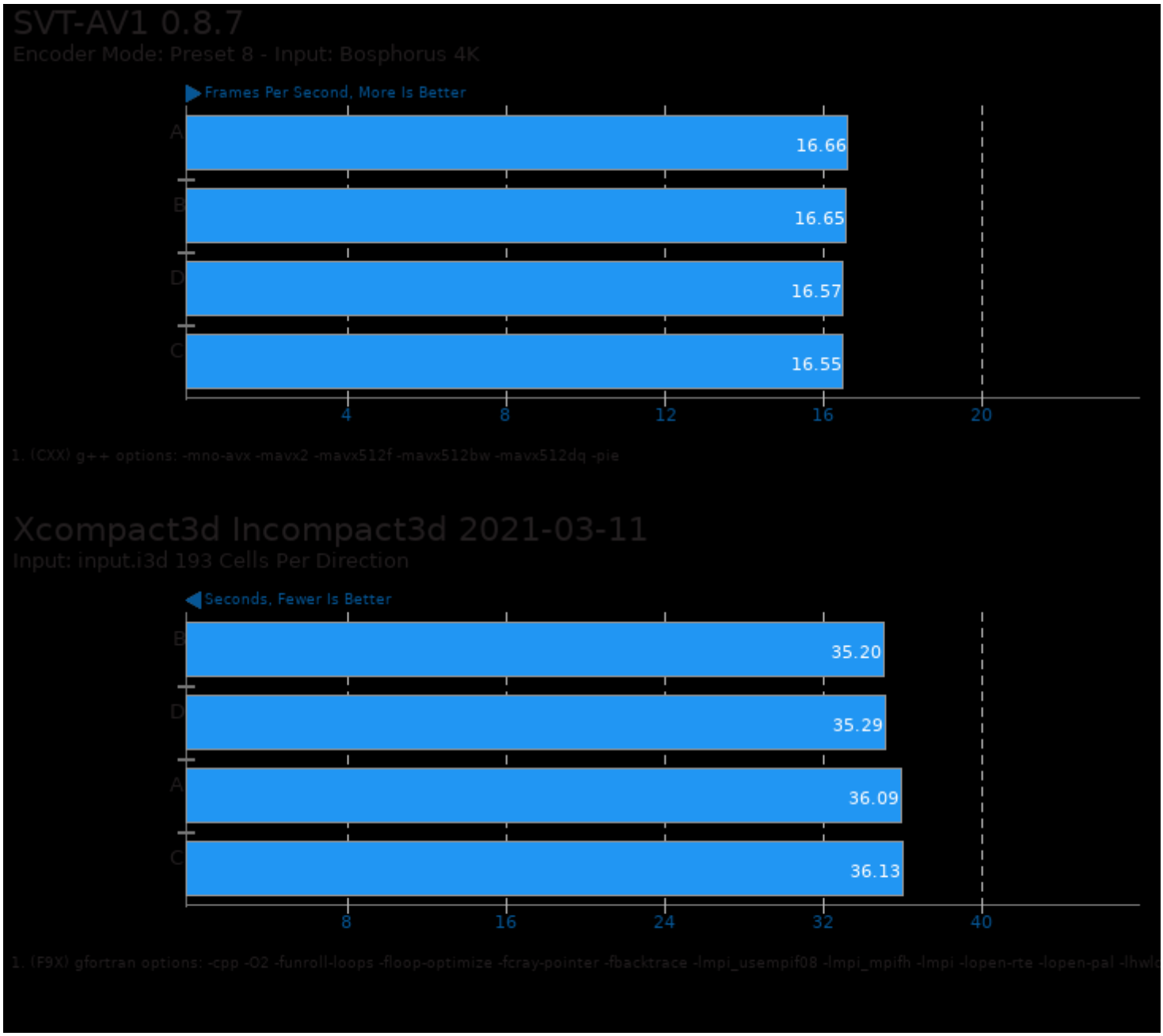


libavif avifenc 0.9.0

Encoder Speed: 6, Lossless

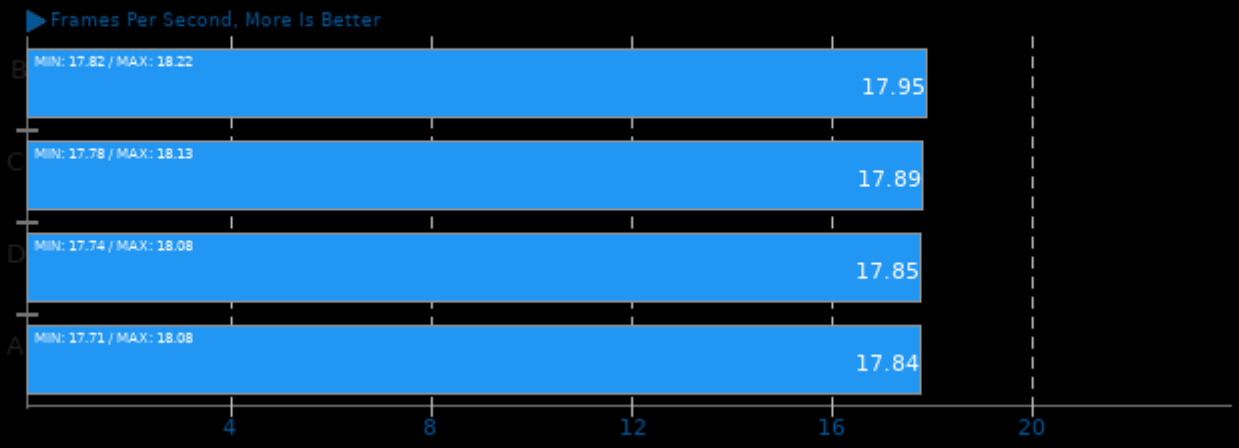


1. (CXX) g++ options: -O3 -fPIC -lm


SVT-AV1 0.8.7
Encoder Mode: Preset 8 - Input: Bosphorus 4K
Frames Per Second, More Is Better
A
16.66
B
16.65
D
16.57
C
16.55
4
8
12
16
20
1. (CXX) g++ options: -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq -pie
Xcompact3d Incompact3d 2021-03-11
Input: input.i3d 193 Cells Per Direction
Seconds, Fewer Is Better
B
35.20
D
35.29
A
36.09
C
36.13
8
16
24
32
40
1. (F9X) gfortran options: -cpp -O2 -funroll-loops -floop-optimize -fcray-pointer -fbacktrace -lmpi_usempif08 -lmpi_mpifh -lmpi -lopen-rte -lopen-pal -lhwl

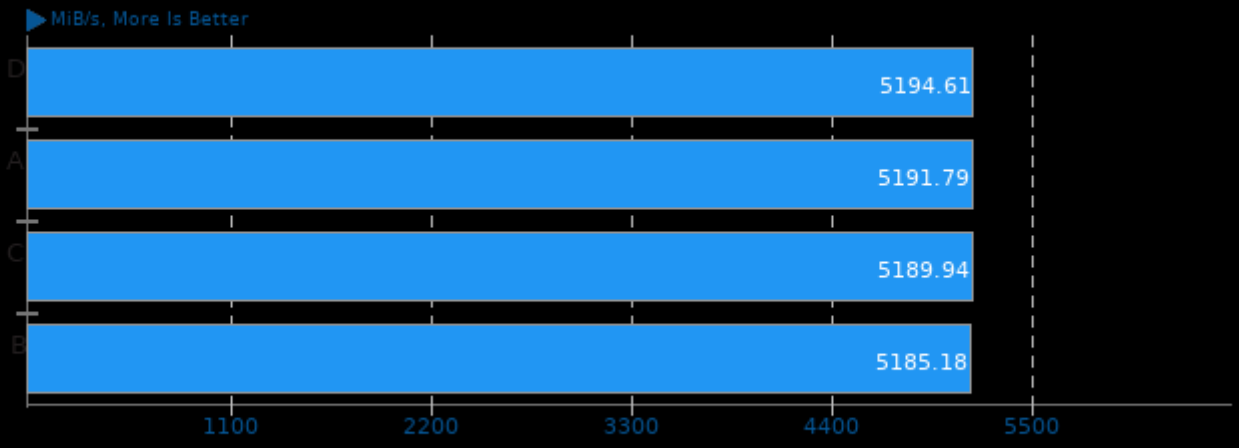
Embree 3.13

Binary: Pathtracer ISPC - Model: Crown



Botan 2.17.3

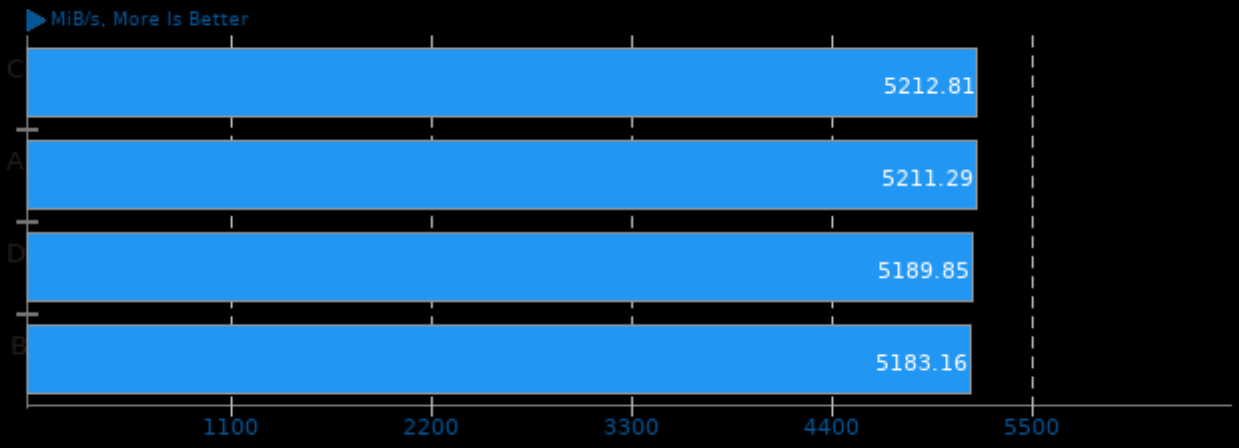
Test: AES-256 - Decrypt



1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

Botan 2.17.3

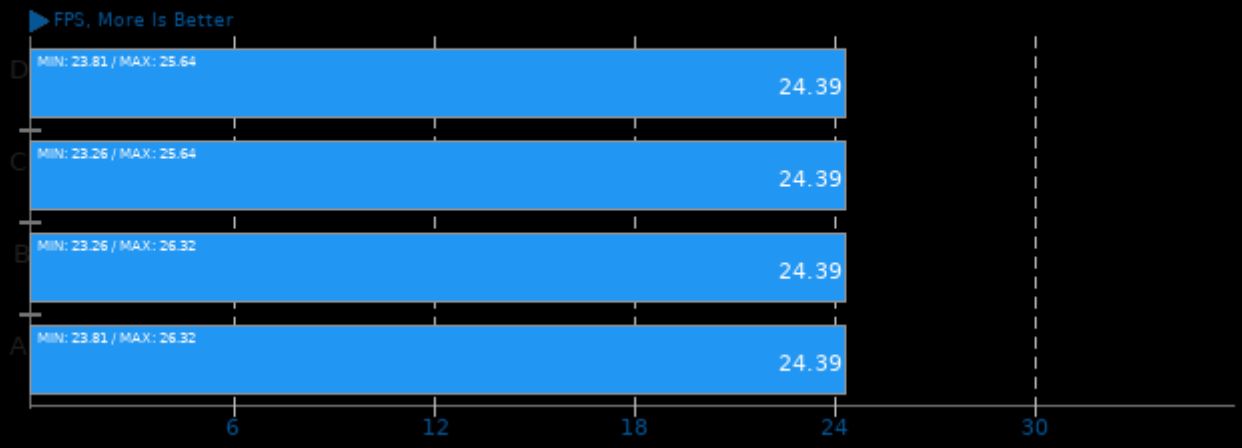
Test: AES-256



1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

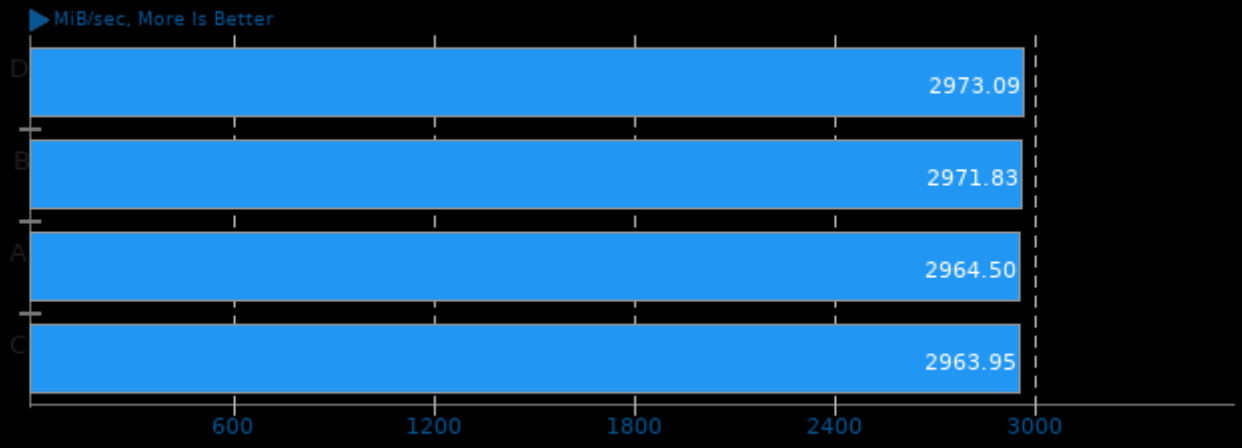
OSPray 1.8.5

Demo: San Miguel - Renderer: SciVis



Sysbench 1.0.20

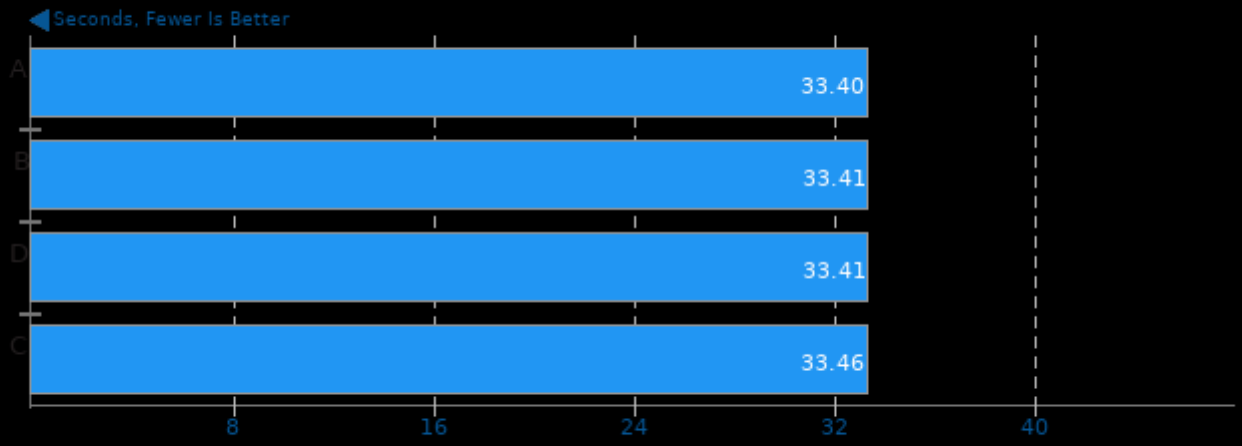
Test: RAM / Memory



1. (CC) gcc options: -O2 -funroll-loops -rdynamic -ldl -laio -lm

C-Ray 1.1

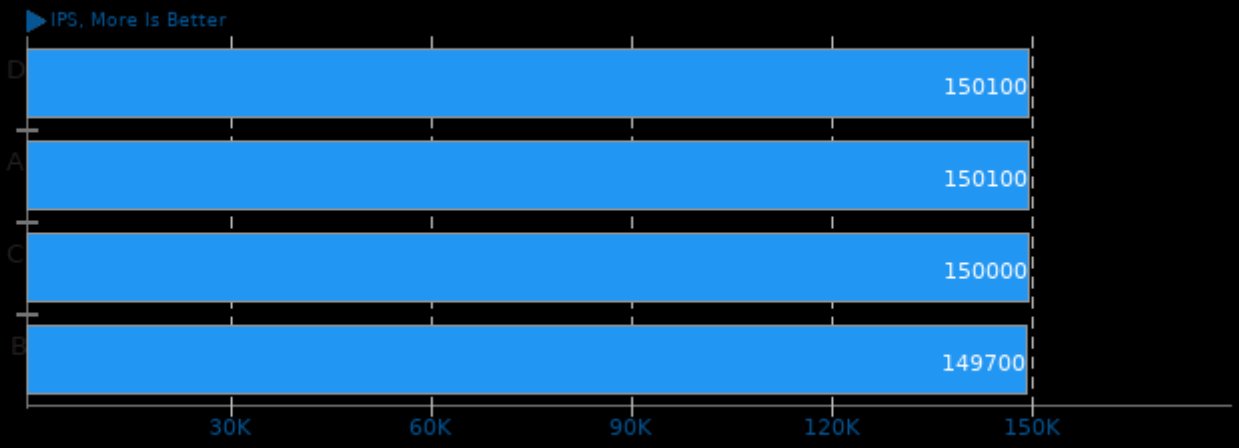
Total Time - 4K, 16 Rays Per Pixel



1. (CC) gcc options: -lm -lpthread -O3

Chia Blockchain VDF 1.0.1

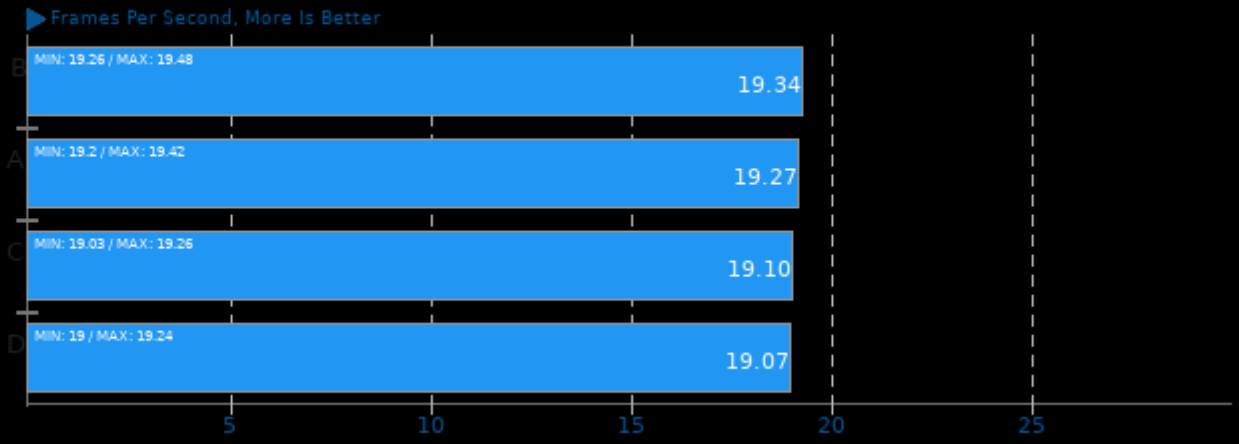
Test: Square Plain C++



1. (CXX) g++ options: -flto -no-pie -lgmpxx -lgmp -lboost_system -pthread

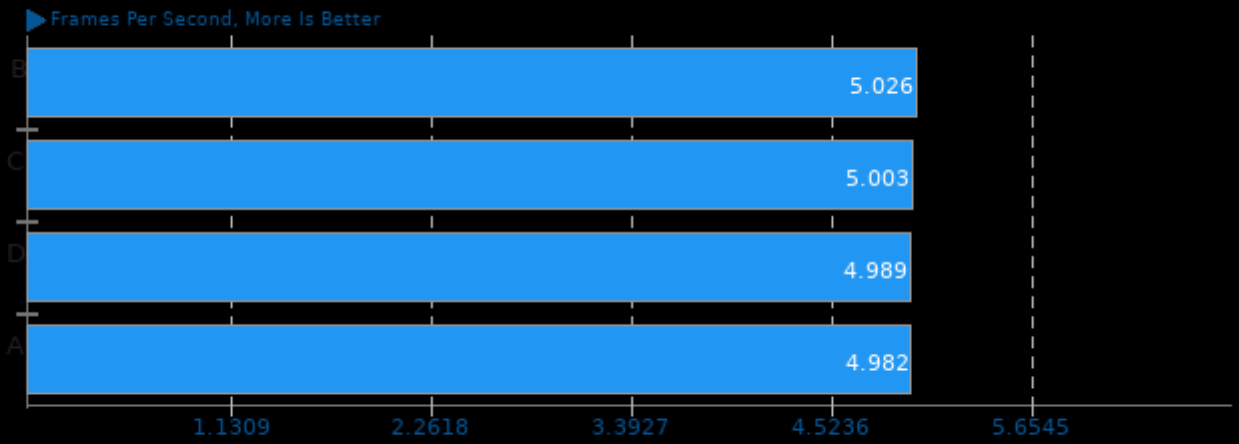
Embree 3.13

Binary: Pathtracer ISPC - Model: Asian Dragon



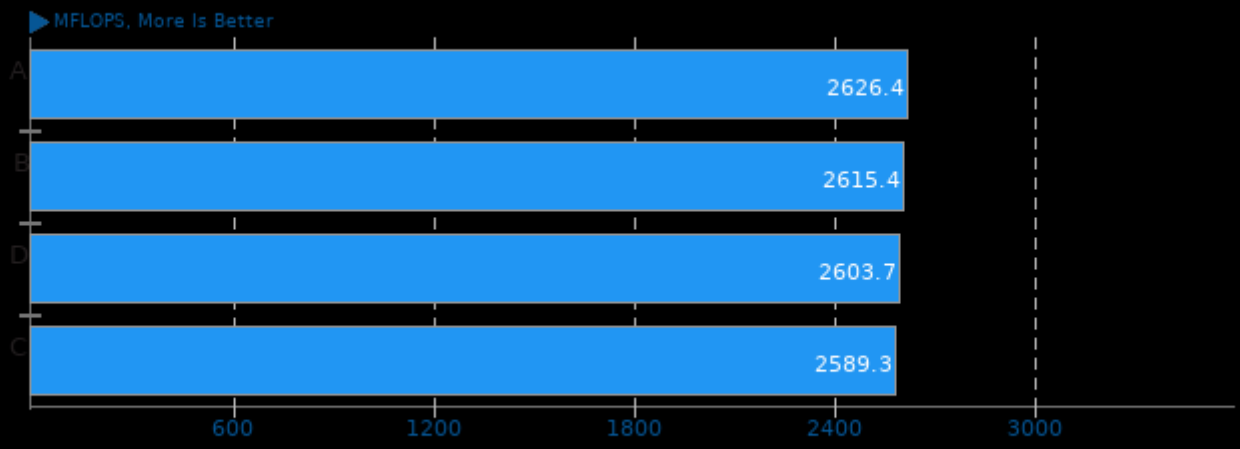
SVT-AV1 0.8.7

Encoder Mode: Preset 4 - Input: Bosphorus 1080p



1. (CXX) g++ options: -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq -pie

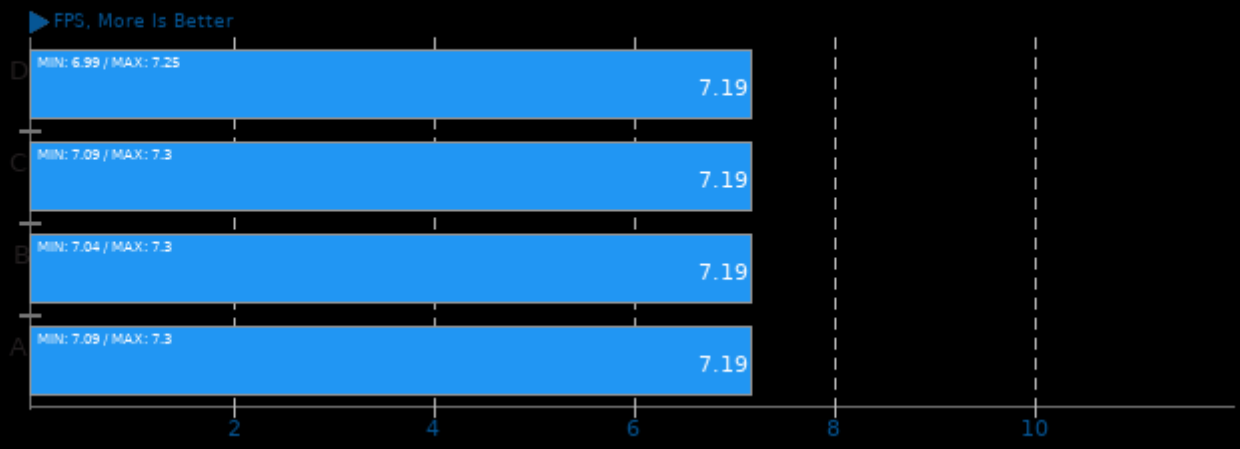
QuantLib 1.21



1. (CXX) g++ options: -O3 -march=native -rdynamic

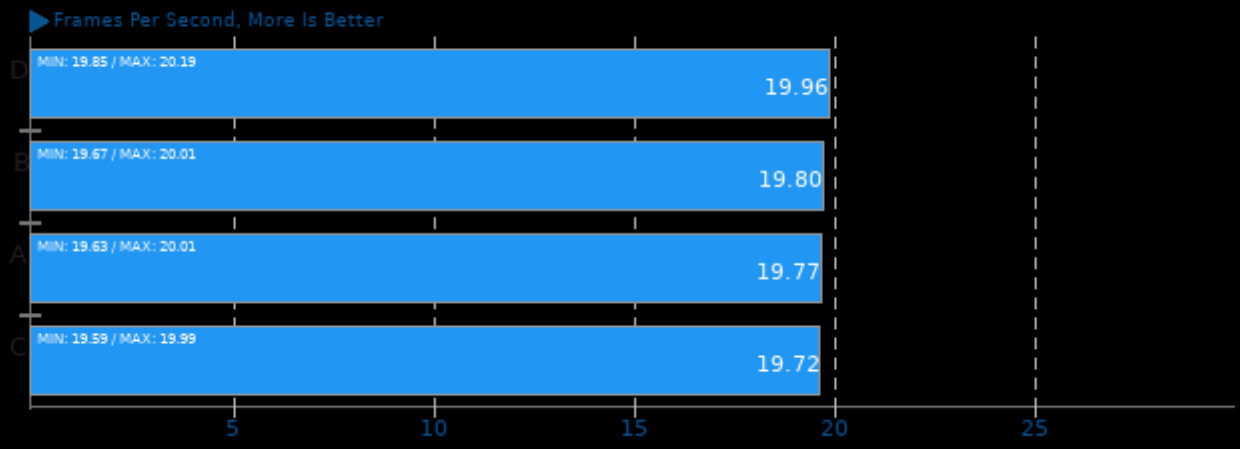
OSPray 1.8.5

Demo: NASA Streamlines - Renderer: Path Tracer



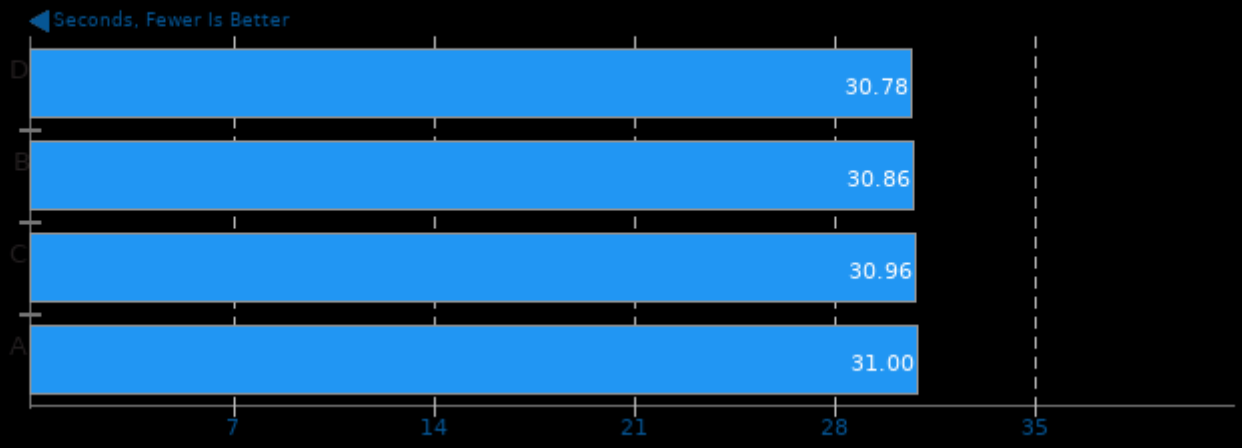
Embree 3.13

Binary: Pathtracer - Model: Crown



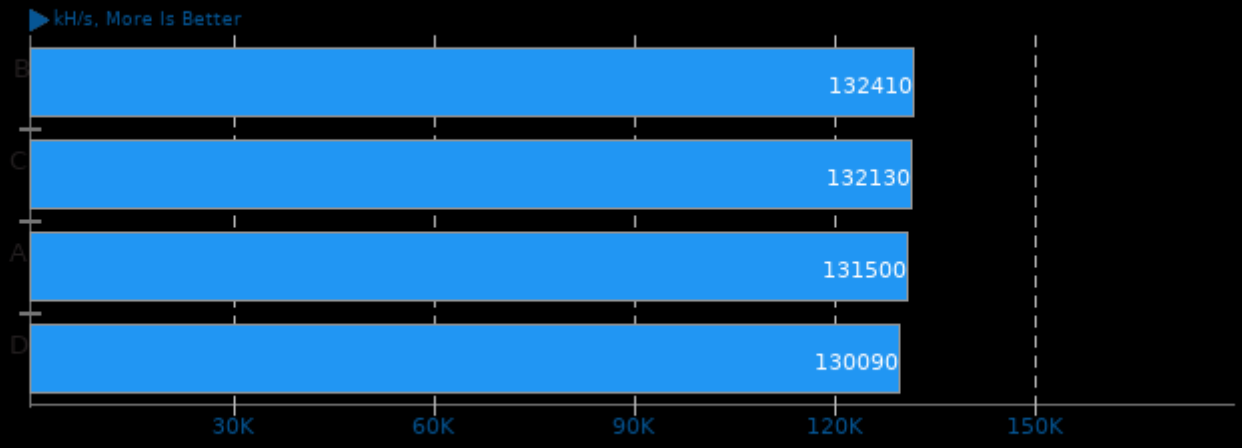
Timed FFmpeg Compilation 4.4

Time To Compile



Cpuminer-Opt 3.18

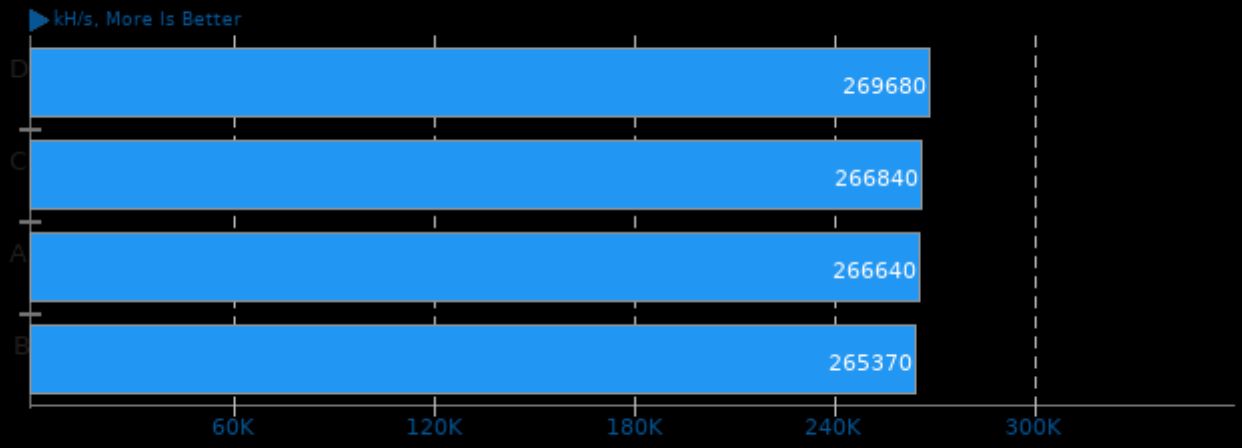
Algorithm: Quad SHA-256, Pyrite



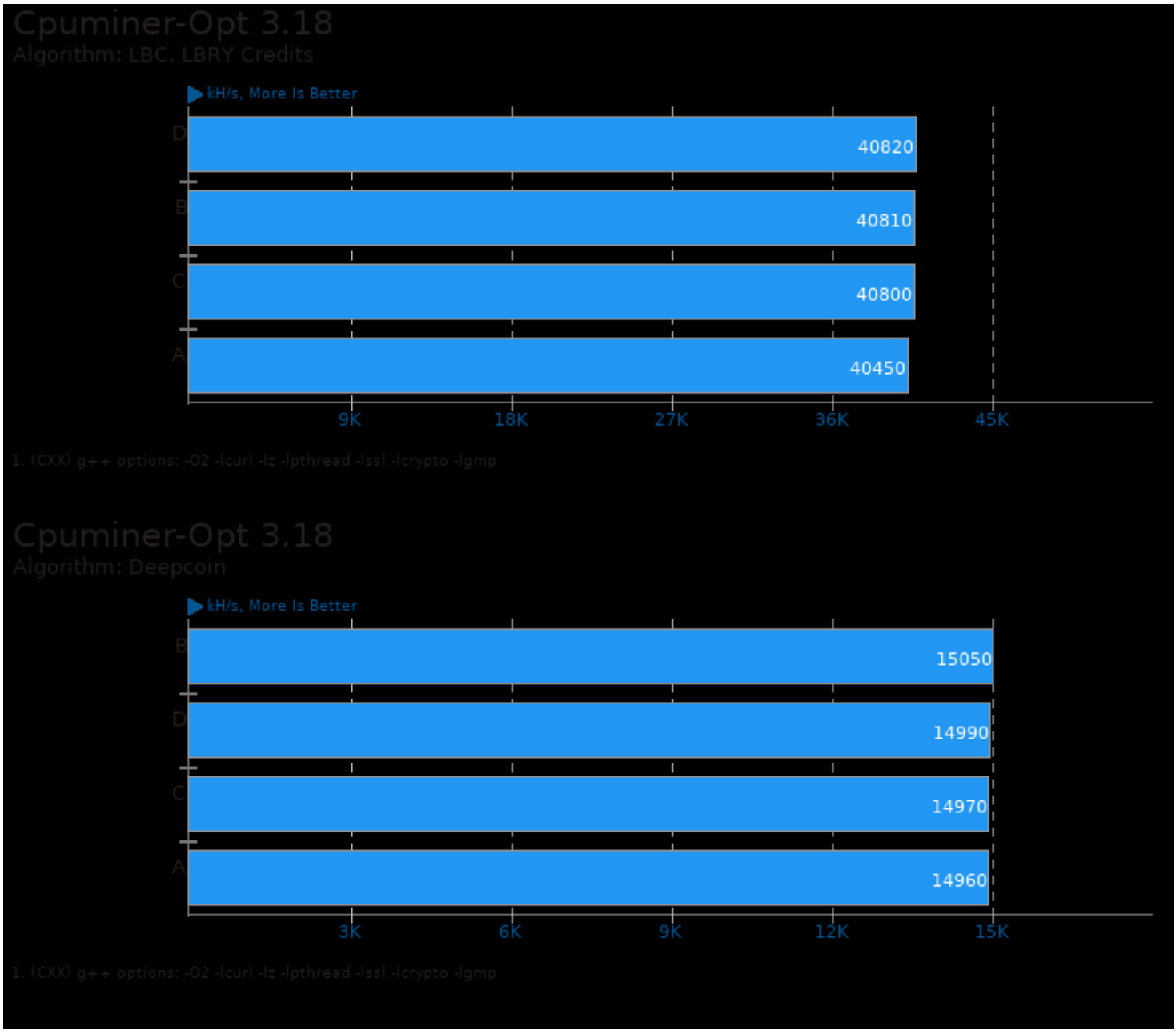
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp

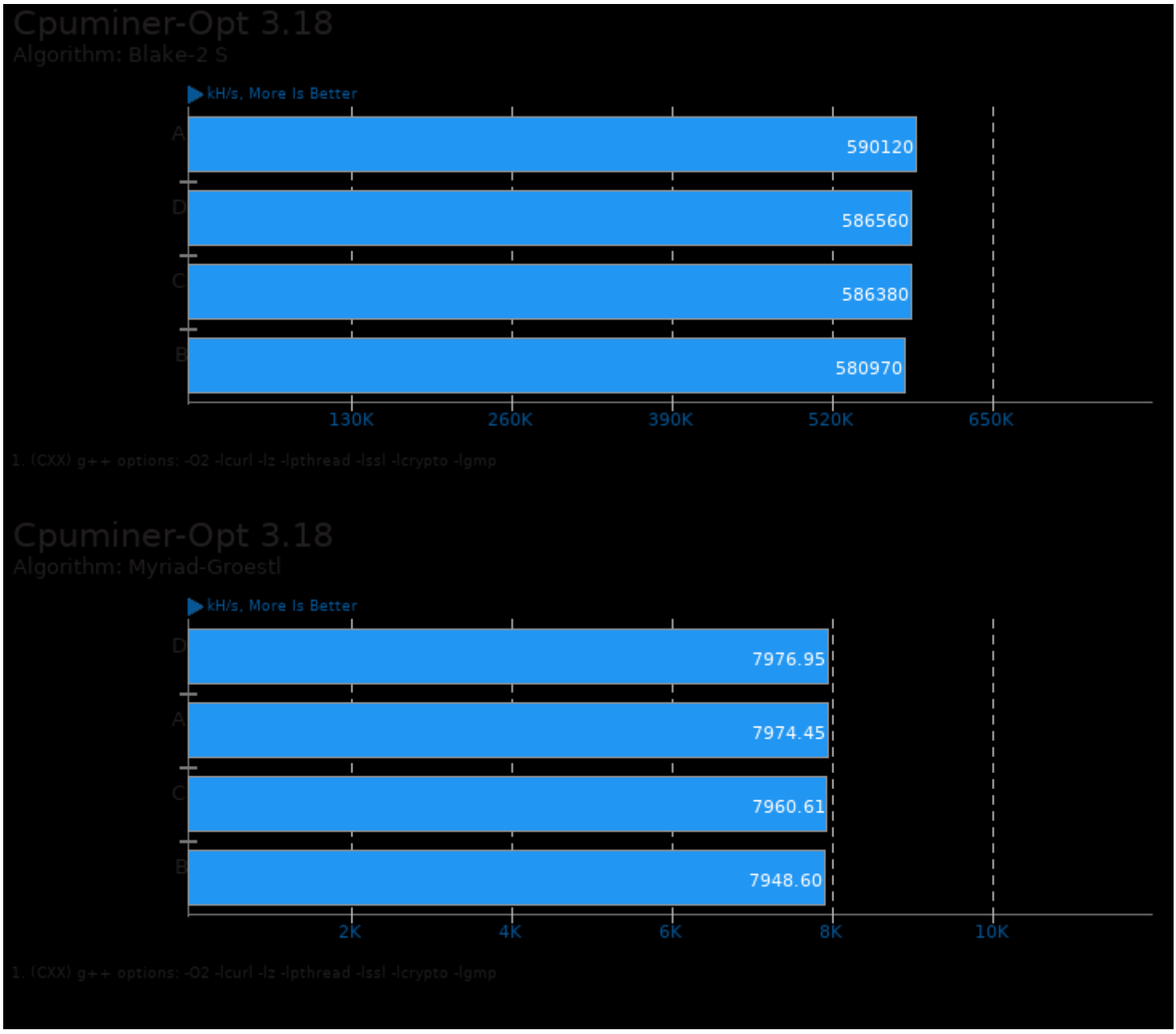
Cpuminer-Opt 3.18

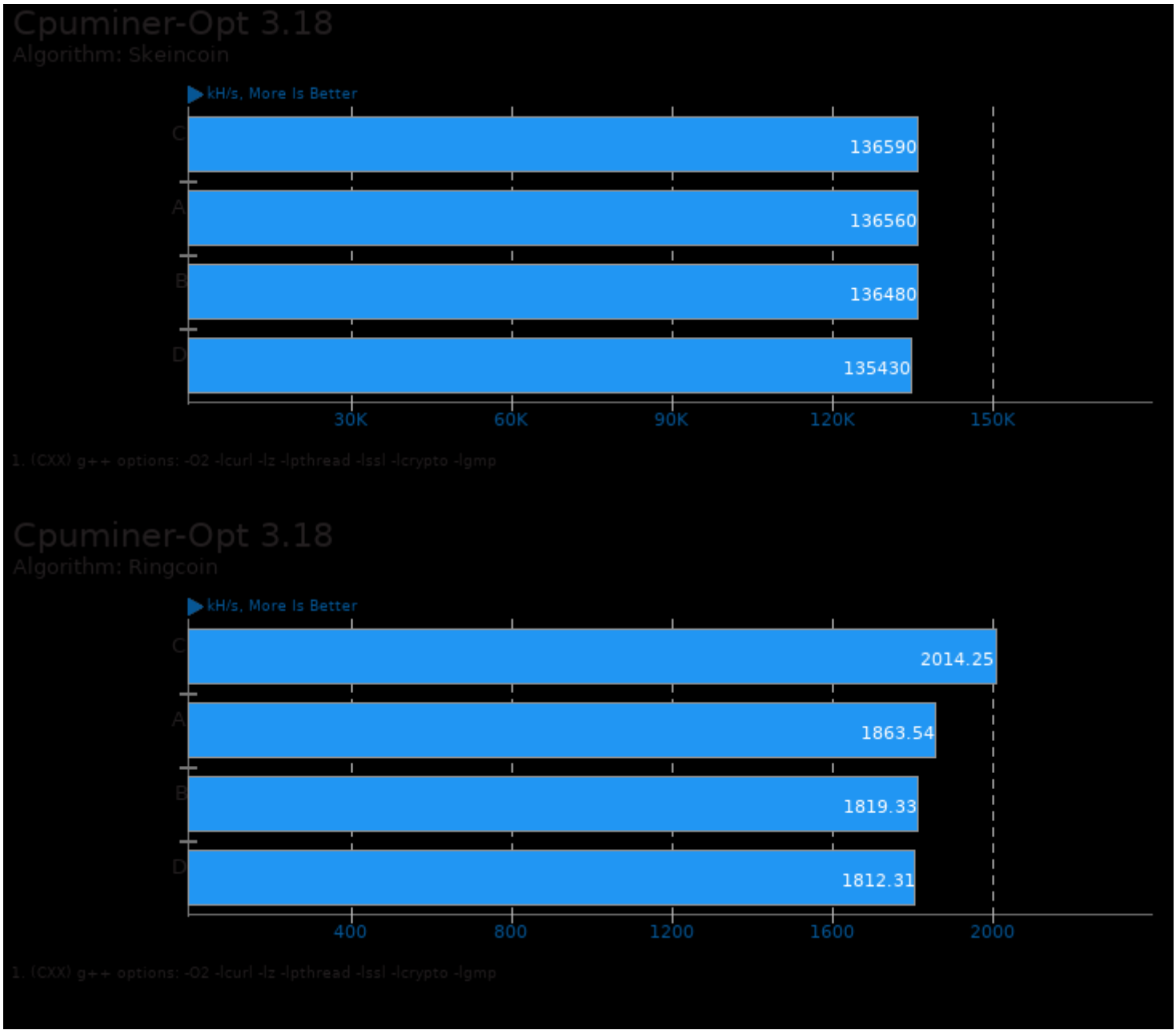
Algorithm: Triple SHA-256, Onecoin

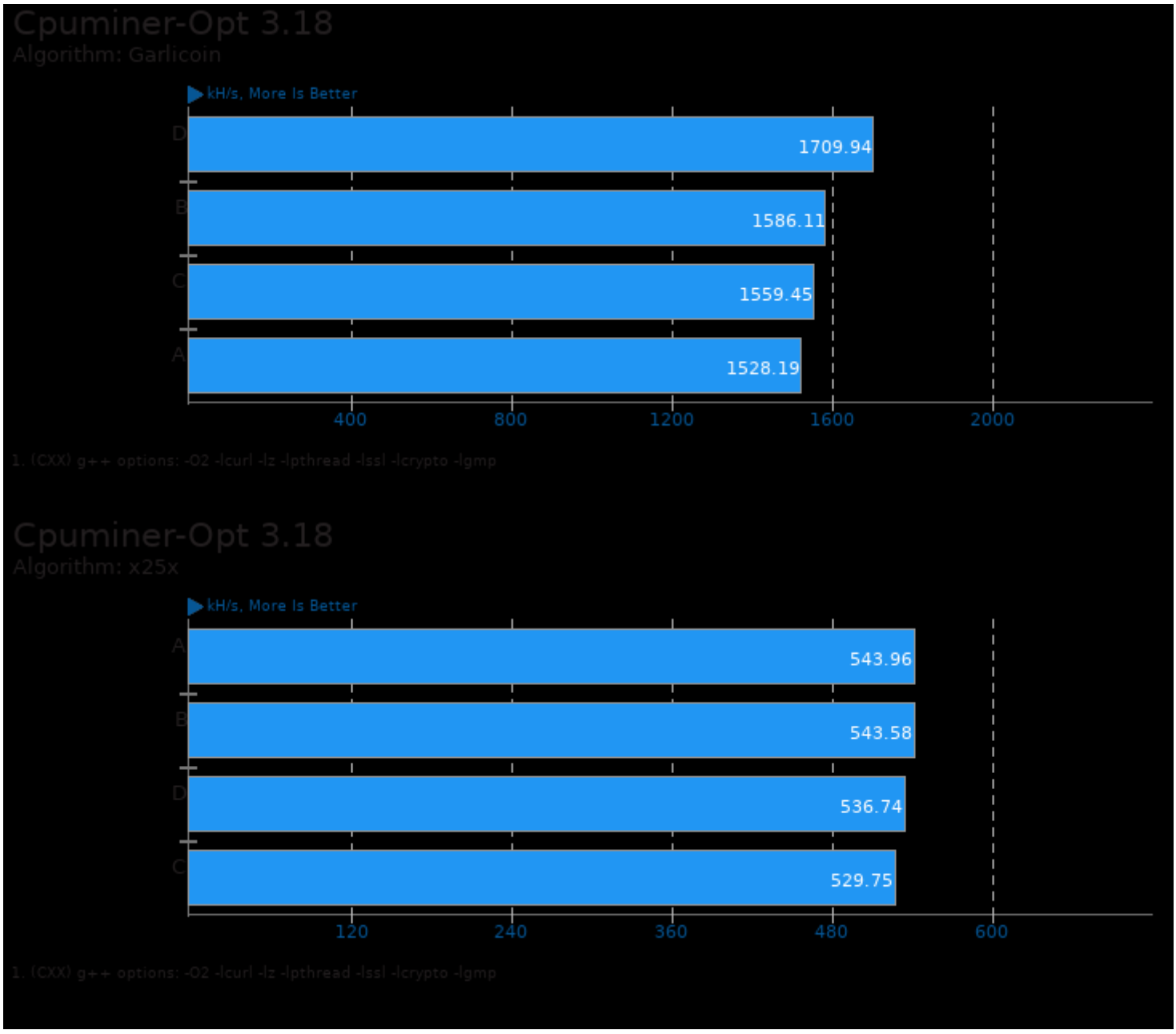


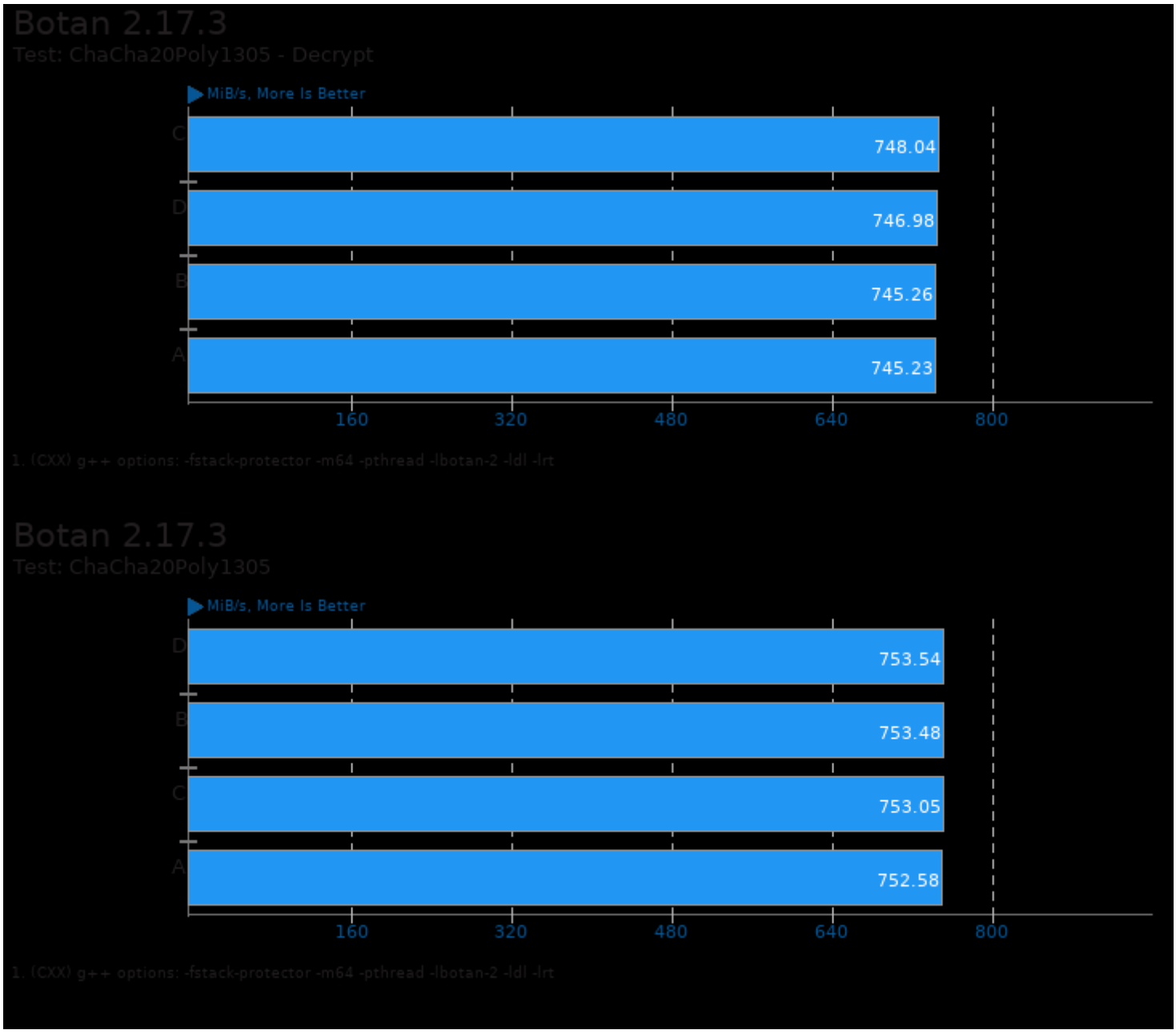
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp

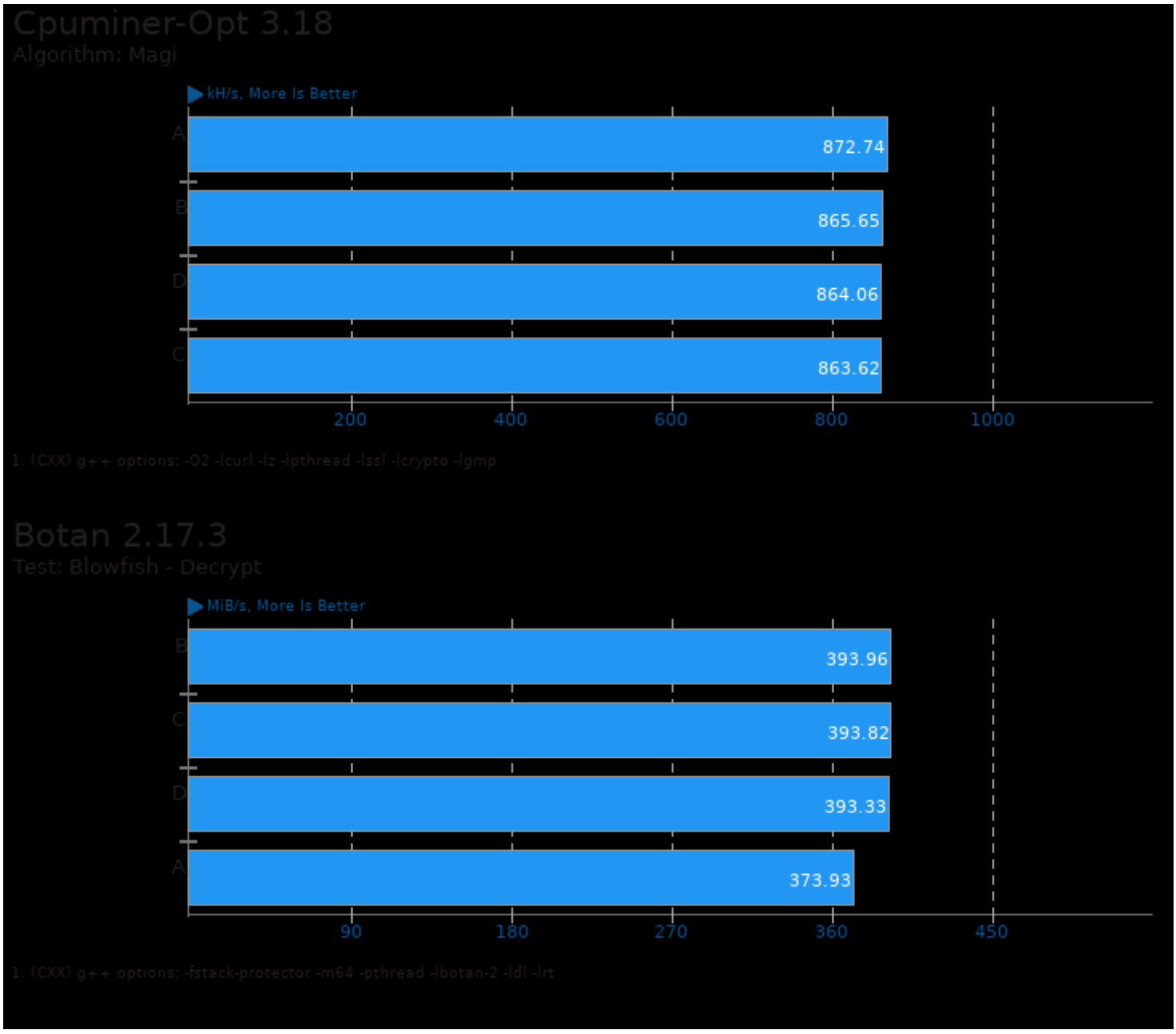

Cpuminer-Opt 3.18
Algorithm: LBC, LBRY Credits
kH/s, More Is Better
D
B
C
A
40820
40810
40800
40450
9K
18K
27K
36K
45K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp
Cpuminer-Opt 3.18
Algorithm: Deepcoin
kH/s, More Is Better
B
D
C
A
15050
14990
14970
14960
3K
6K
9K
12K
15K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp

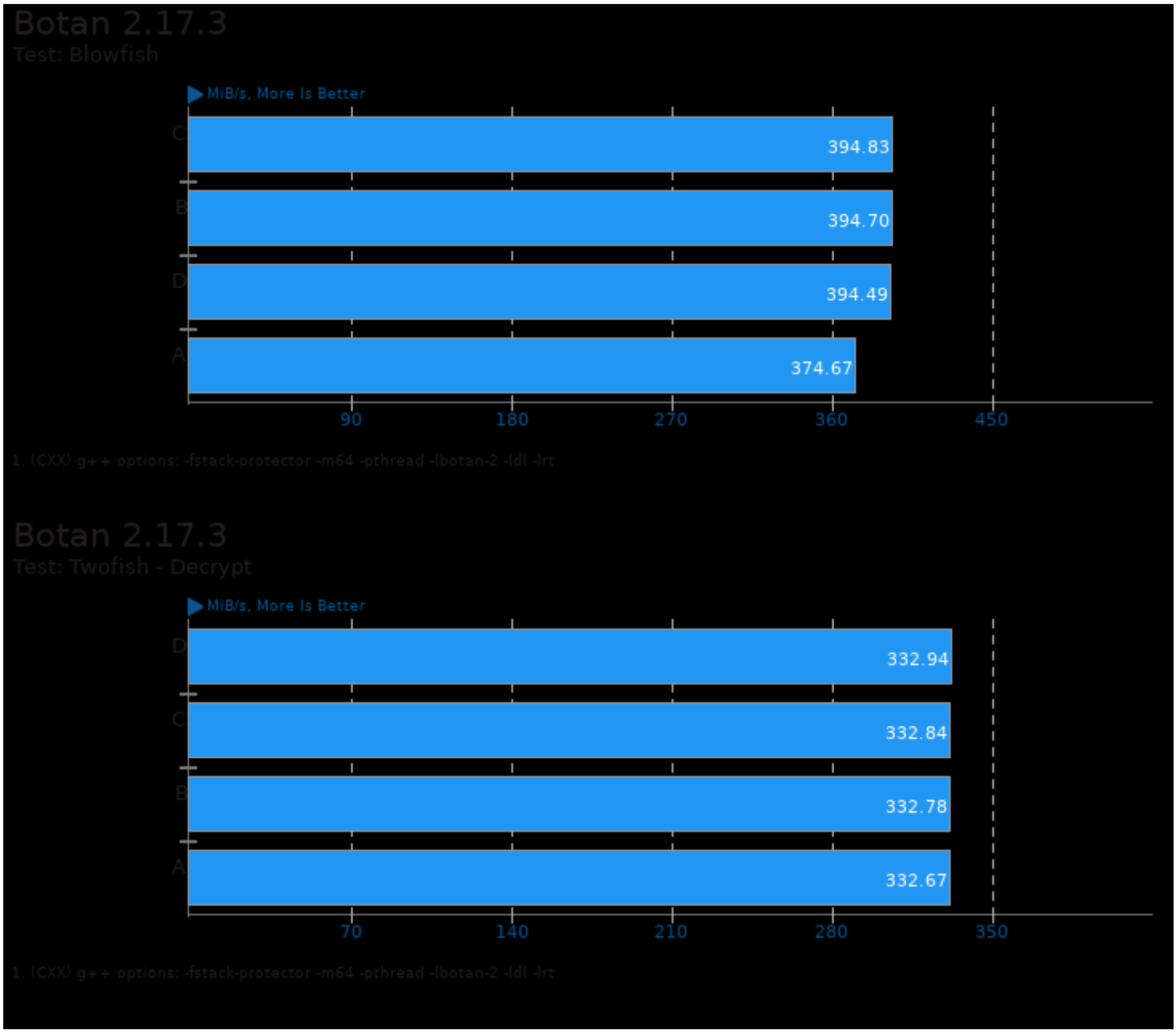

Cpuminer-Opt 3.18
Algorithm: Blake-2 S
kH/s, More Is Better
A
D
C
B
590120
586560
586380
580970
130K
260K
390K
520K
650K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp
Cpuminer-Opt 3.18
Algorithm: Myriad-Groestl
kH/s, More Is Better
D
A
C
B
7976.95
7974.45
7960.61
7948.60
2K
4K
6K
8K
10K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp


Cpuminer-Opt 3.18
Algorithm: Skeincoin
kH/s, More Is Better
C
A
B
D
136590
136560
136480
135430
30K
60K
90K
120K
150K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp
Cpuminer-Opt 3.18
Algorithm: Ringcoin
kH/s, More Is Better
C
A
B
D
2014.25
1863.54
1819.33
1812.31
400
800
1200
1600
2000
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp


Cpuminer-Opt 3.18
Algorithm: Garlicoin
kH/s, More Is Better
D
1709.94
B
1586.11
C
1559.45
A
1528.19
400
800
1200
1600
2000
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp
Cpuminer-Opt 3.18
Algorithm: x25x
kH/s, More Is Better
A
543.96
B
543.58
D
536.74
C
529.75
120
240
360
480
600
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp

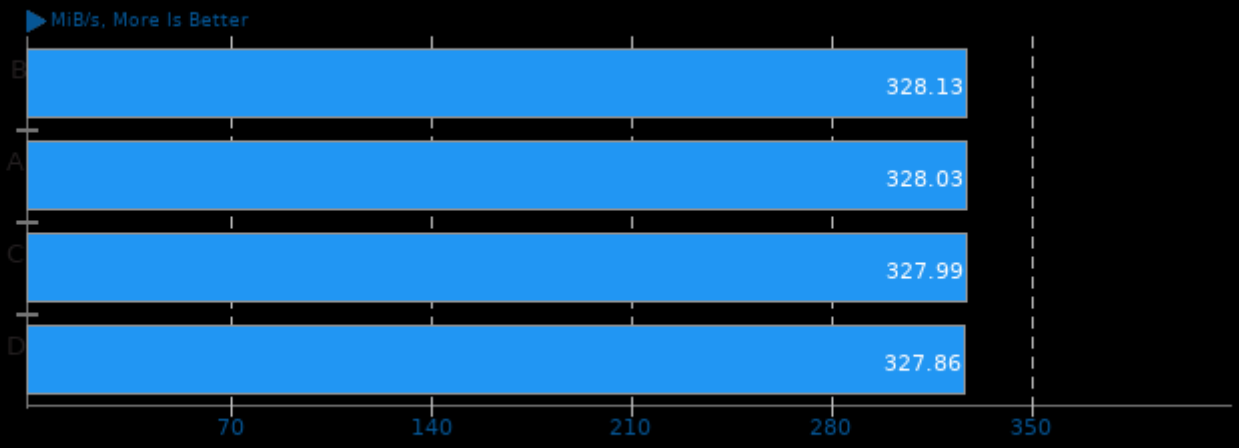

Botan 2.17.3
Test: ChaCha20Poly1305 - Decrypt
MiB/s, More Is Better
C
D
B
A
748.04
746.98
745.26
745.23
160
320
480
640
800
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: ChaCha20Poly1305
MiB/s, More Is Better
D
B
C
A
753.54
753.48
753.05
752.58
160
320
480
640
800
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt


Cpuminer-Opt 3.18
Algorithm: Magi
kH/s, More Is Better
A
872.74
B
865.65
D
864.06
C
863.62
200
400
600
800
1000
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp
Botan 2.17.3
Test: Blowfish - Decrypt
MiB/s, More Is Better
B
393.96
C
393.82
D
393.33
A
373.93
90
180
270
360
450
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt


Botan 2.17.3
Test: Blowfish
MiB/s, More Is Better
C
394.83
B
394.70
D
394.49
A
374.67
90
180
270
360
450
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: Twofish - Decrypt
MiB/s, More Is Better
D
332.94
C
332.84
B
332.78
A
332.67
70
140
210
280
350
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

Botan 2.17.3

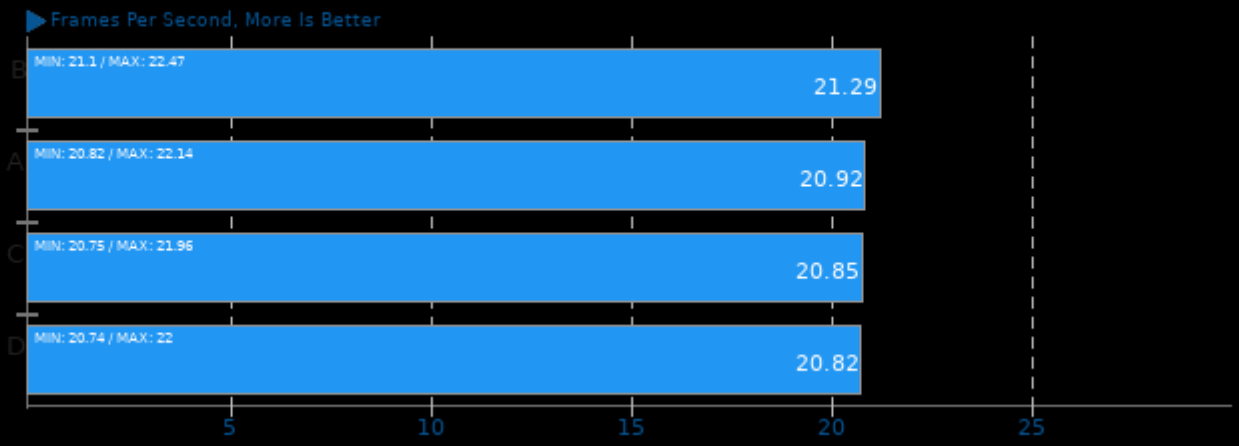
Test: Twofish



1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

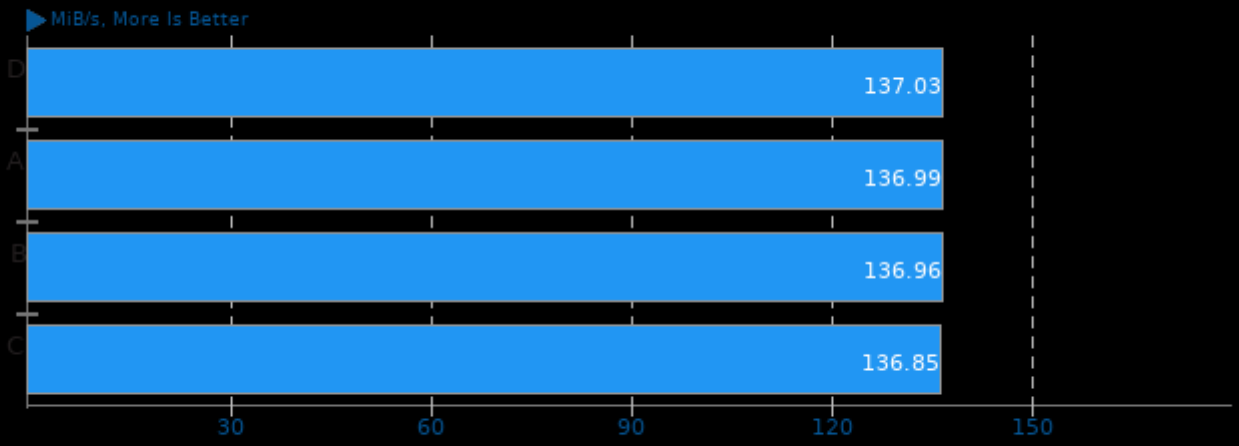
Embree 3.13

Binary: Pathtracer - Model: Asian Dragon

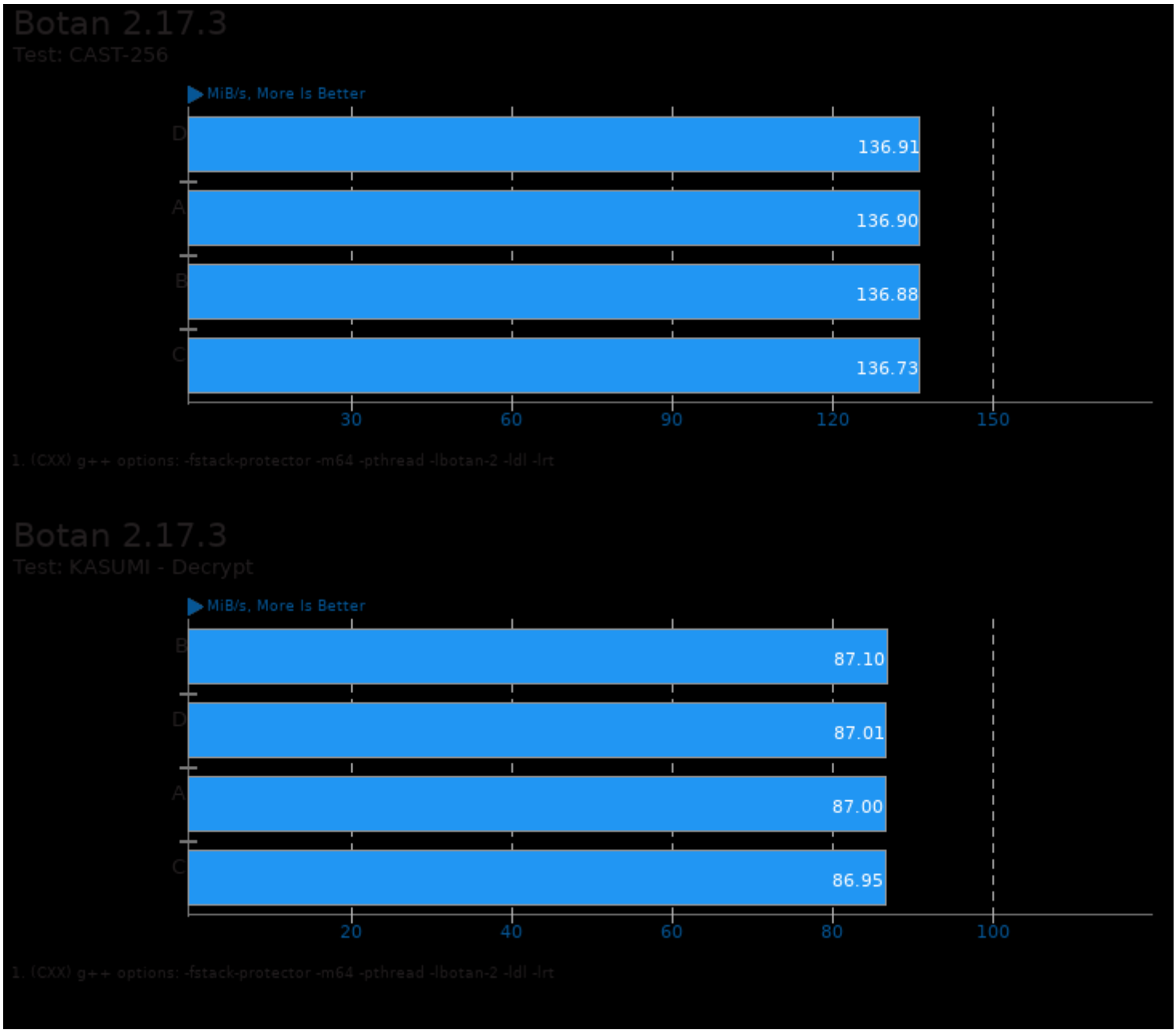


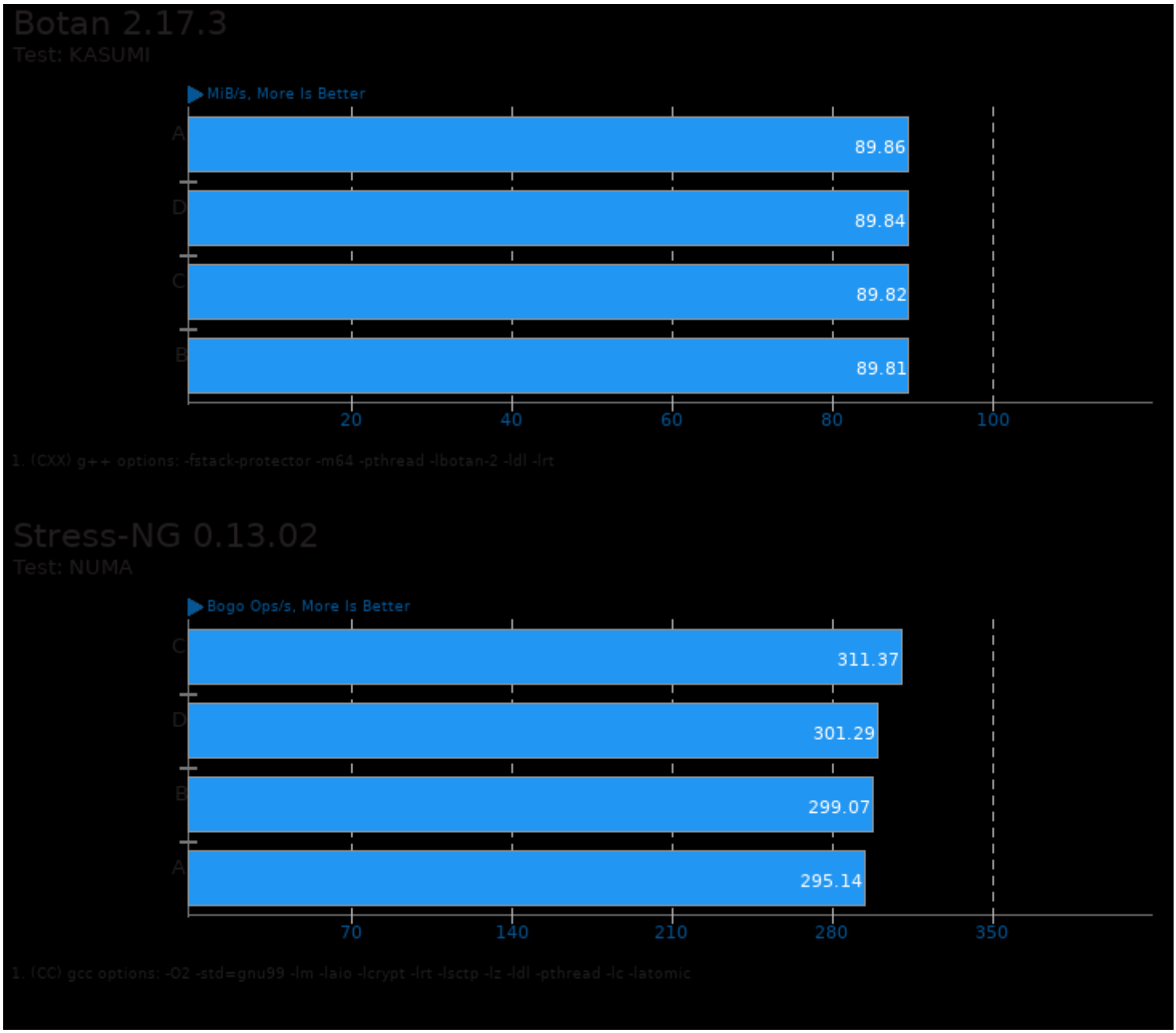
Botan 2.17.3

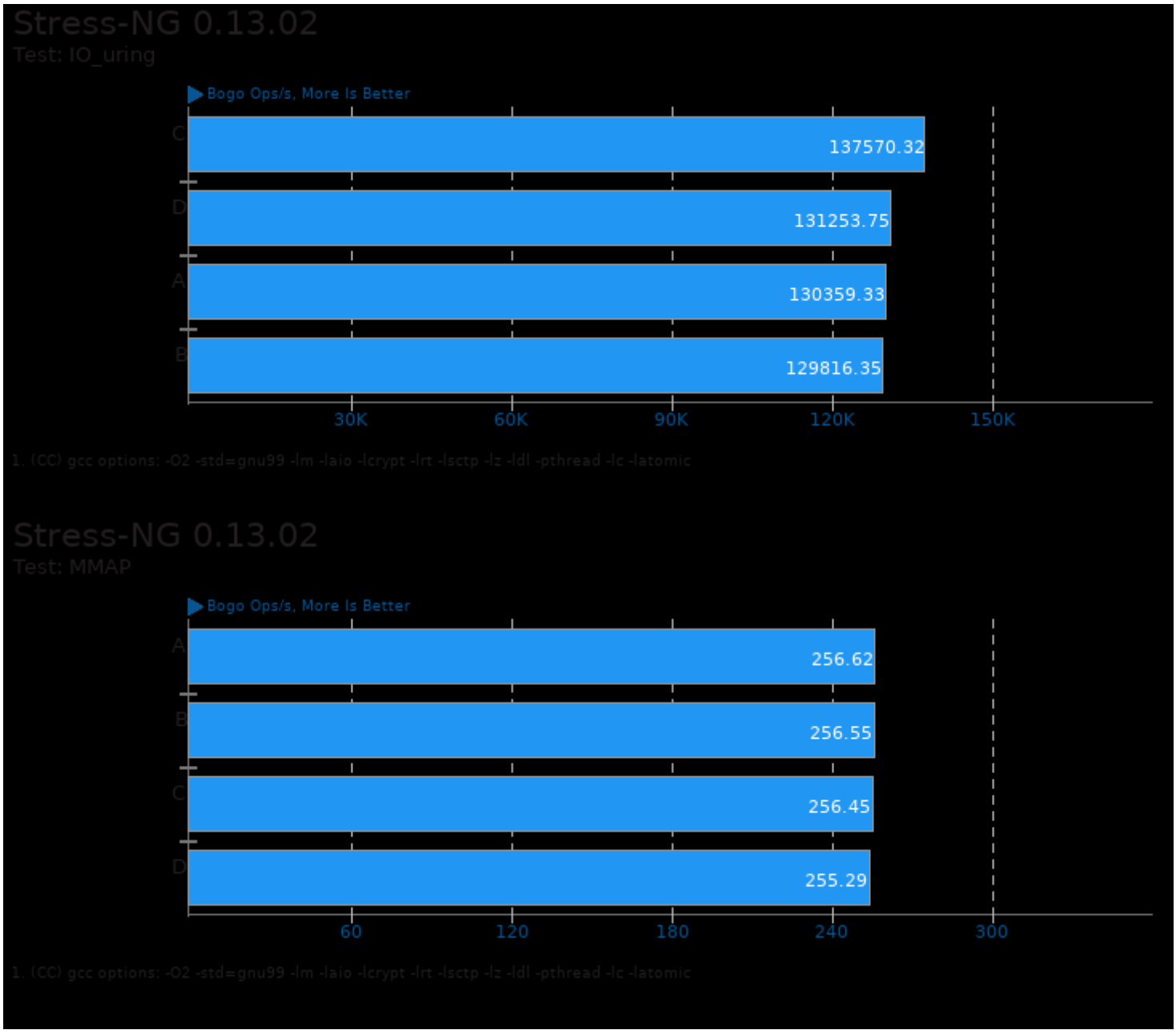
Test: CAST-256 - Decrypt

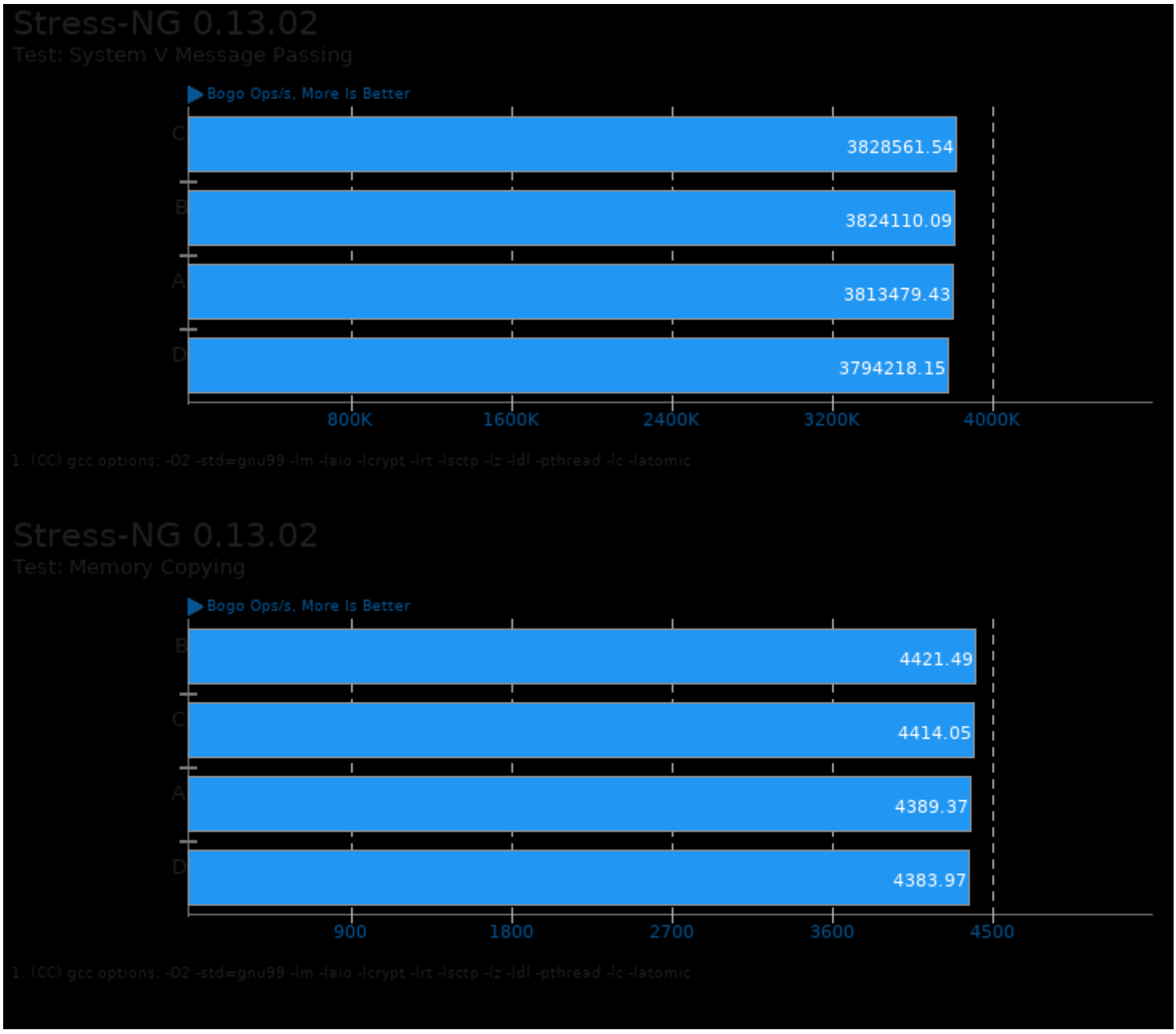


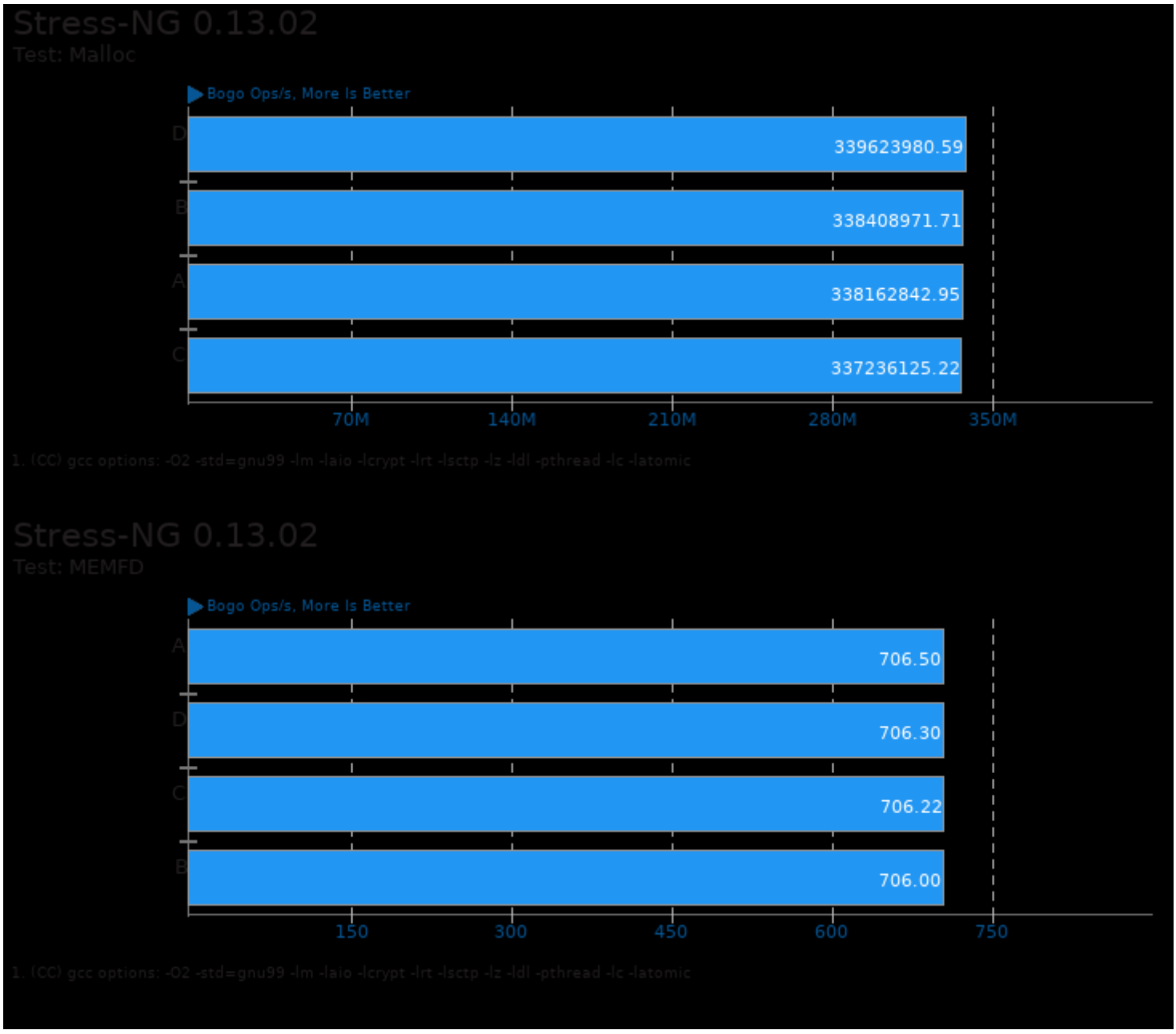
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

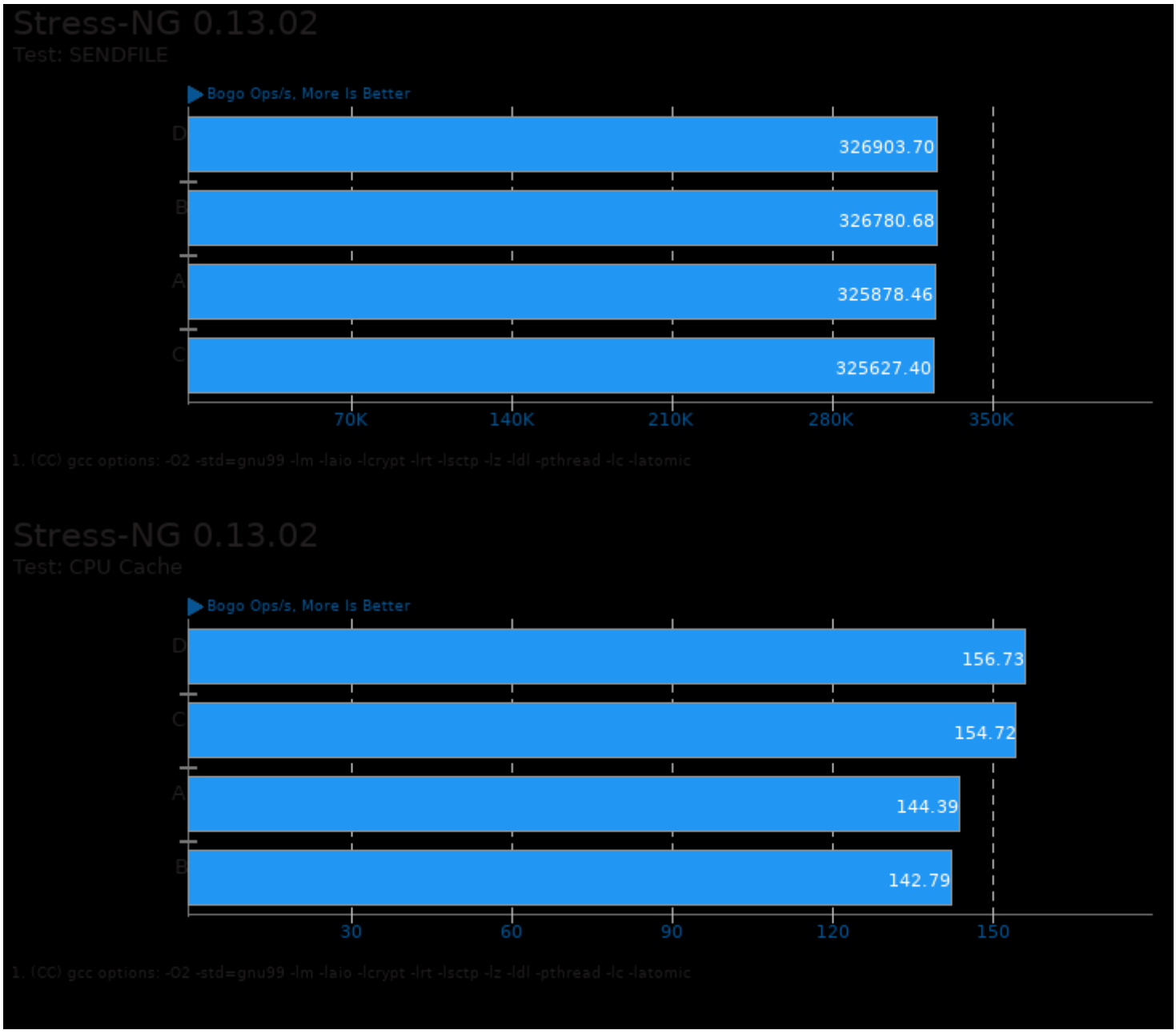

Botan 2.17.3
Test: CAST-256
MiB/s, More Is Better
D
A
B
C
136.91
136.90
136.88
136.73
30
60
90
120
150
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: KASUMI - Decrypt
MiB/s, More Is Better
B
D
A
C
87.10
87.01
87.00
86.95
20
40
60
80
100
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

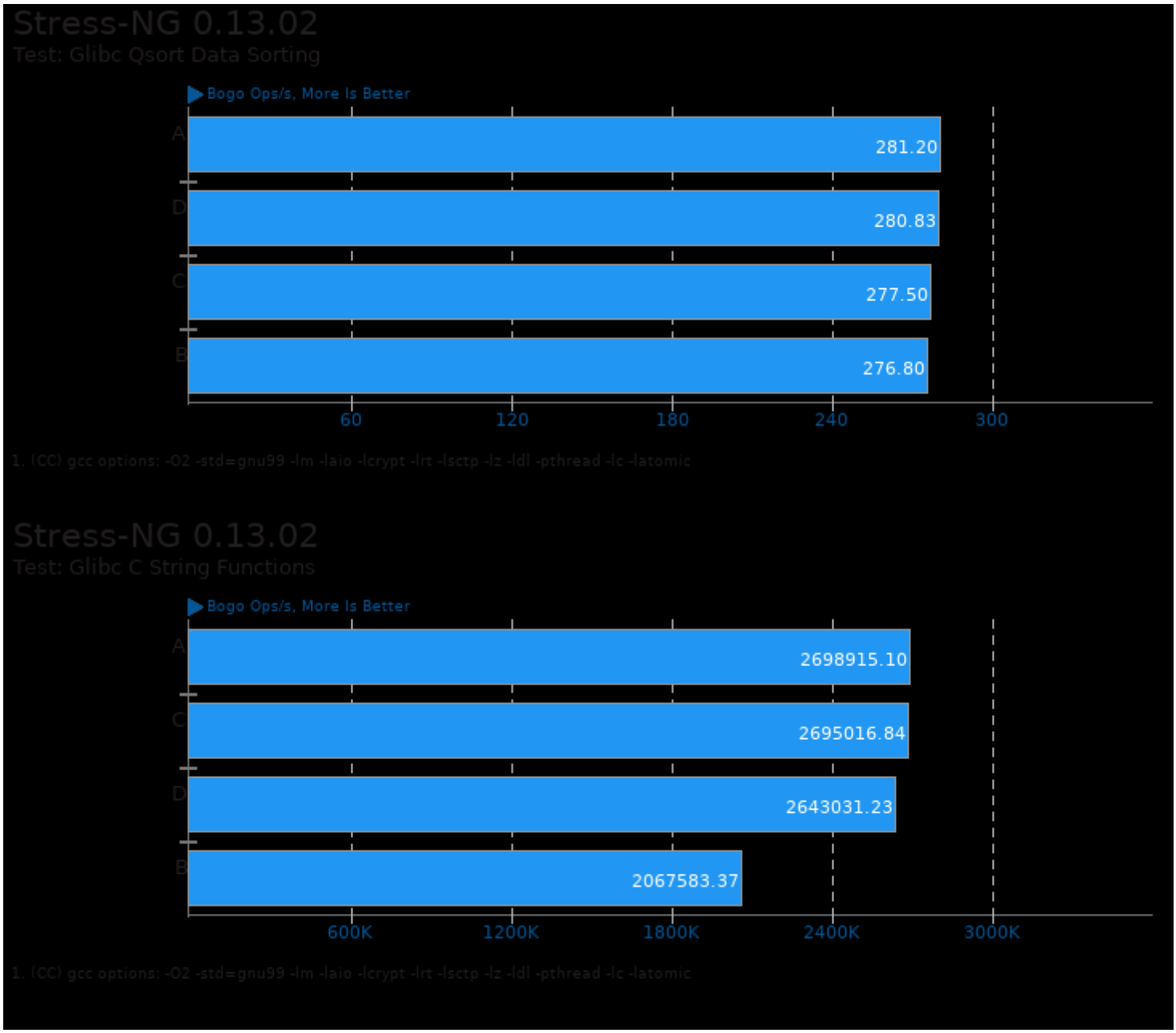

Botan 2.17.3
Test: KASUMI
MiB/s, More Is Better
A
D
C
B
89.86
89.84
89.82
89.81
20
40
60
80
100
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Stress-NG 0.13.02
Test: NUMA
Bogo Ops/s, More Is Better
C
D
B
A
311.37
301.29
299.07
295.14
70
140
210
280
350
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic

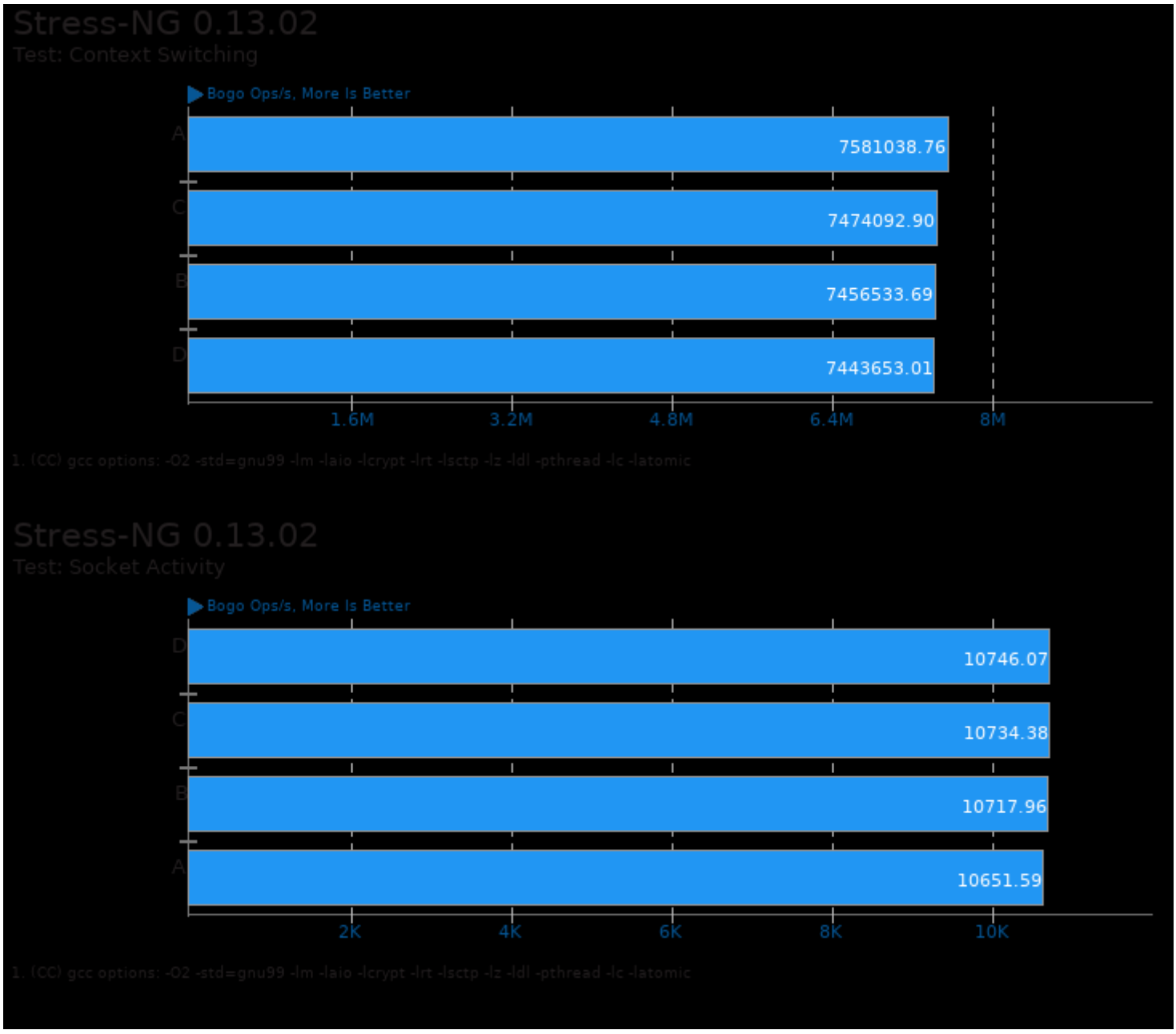

Stress-NG 0.13.02
Test: IO_uring
Bogo Ops/s, More Is Better
C
137570.32
D
131253.75
A
130359.33
B
129816.35
30K
60K
90K
120K
150K
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: MMAP
Bogo Ops/s, More Is Better
A
256.62
B
256.55
C
256.45
D
255.29
60
120
180
240
300
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic

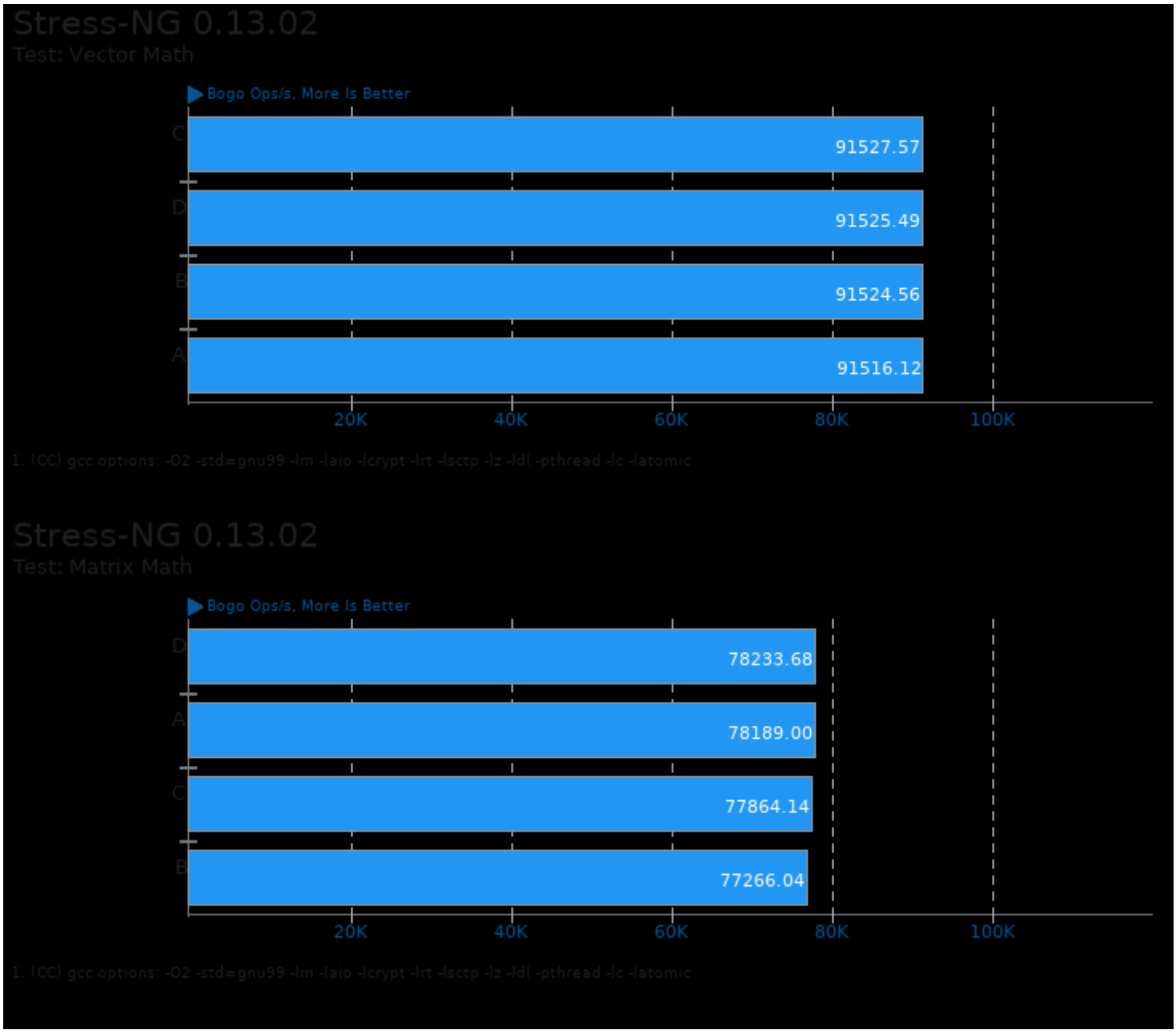

Stress-NG 0.13.02
Test: System V Message Passing
Bogo Ops/s, More Is Better
C
B
A
D
3828561.54
3824110.09
3813479.43
3794218.15
800K
1600K
2400K
3200K
4000K
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Memory Copying
Bogo Ops/s, More Is Better
B
C
A
D
4421.49
4414.05
4389.37
4383.97
900
1800
2700
3600
4500
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic

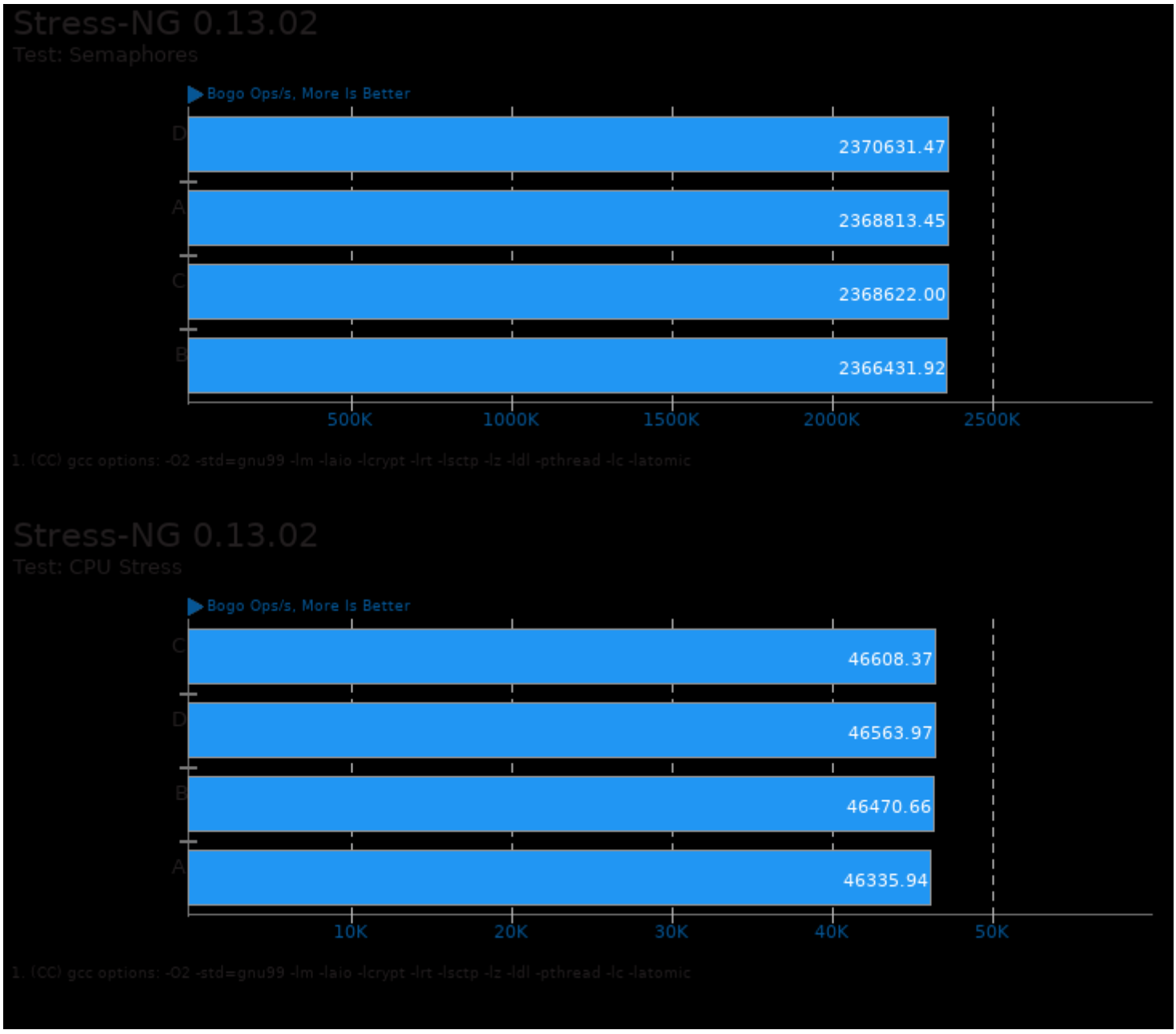

Stress-NG 0.13.02
Test: Malloc
Bogo Ops/s, More Is Better
D
B
A
C
339623980.59
338408971.71
338162842.95
337236125.22
70M
140M
210M
280M
350M
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: MEMFD
Bogo Ops/s, More Is Better
A
D
C
B
706.50
706.30
706.22
706.00
150
300
450
600
750
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic

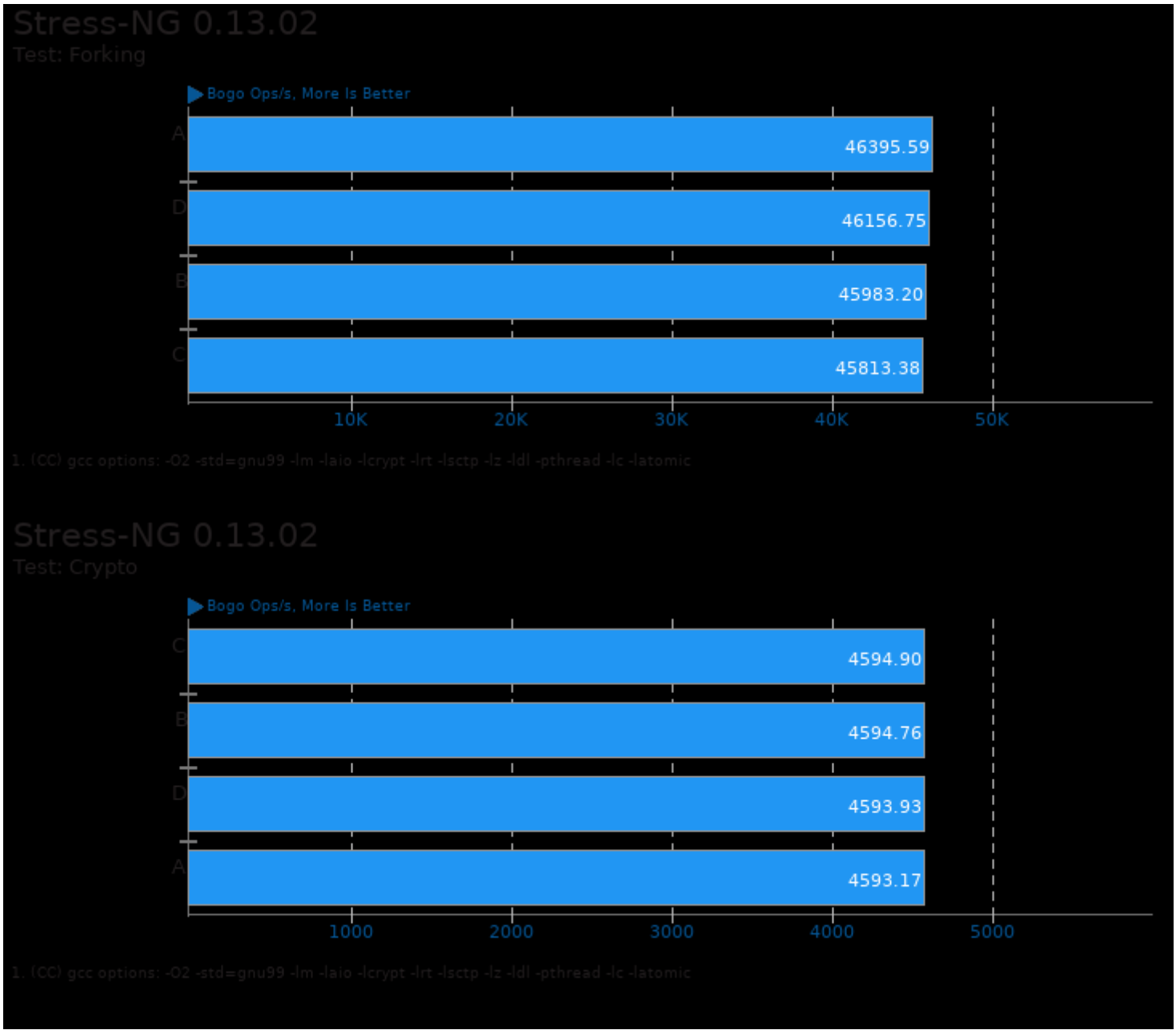

Stress-NG 0.13.02
Test: SENDFILE
Bogo Ops/s, More Is Better
D
B
A
C
326903.70
326780.68
325878.46
325627.40
70K
140K
210K
280K
350K
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: CPU Cache
Bogo Ops/s, More Is Better
D
C
A
B
156.73
154.72
144.39
142.79
30
60
90
120
150
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic


Stress-NG 0.13.02
Test: Glibc Qsort Data Sorting
Bogo Ops/s, More Is Better
A
D
C
B
281.20
280.83
277.50
276.80
60
120
180
240
300
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Glibc C String Functions
Bogo Ops/s, More Is Better
A
C
D
B
2698915.10
2695016.84
2643031.23
2067583.37
600K
1200K
1800K
2400K
3000K
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic


Stress-NG 0.13.02
Test: Context Switching
Bogo Ops/s, More Is Better
A
C
B
D
7581038.76
7474092.90
7456533.69
7443653.01
1.6M
3.2M
4.8M
6.4M
8M
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Socket Activity
Bogo Ops/s, More Is Better
D
C
B
A
10746.07
10734.38
10717.96
10651.59
2K
4K
6K
8K
10K
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic

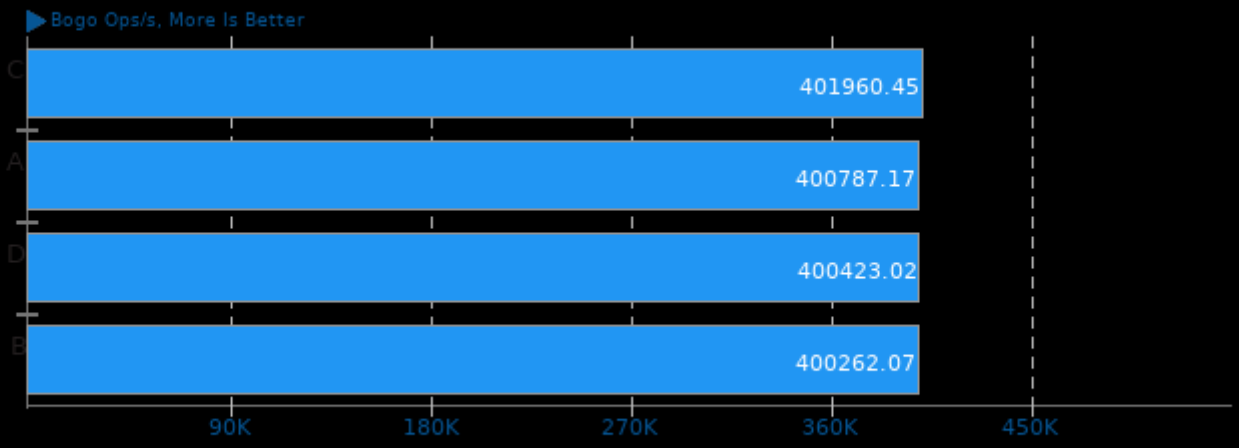

Stress-NG 0.13.02
Test: Vector Math
Bogo Ops/s, More Is Better
C
D
B
A
91527.57
91525.49
91524.56
91516.12
20K
40K
60K
80K
100K
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Matrix Math
Bogo Ops/s, More Is Better
D
A
C
B
78233.68
78189.00
77864.14
77266.04
20K
40K
60K
80K
100K
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic


Stress-NG 0.13.02
Test: Semaphores
Bogo Ops/s, More Is Better
D
A
C
B
2370631.47
2368813.45
2368622.00
2366431.92
500K
1000K
1500K
2000K
2500K
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: CPU Stress
Bogo Ops/s, More Is Better
C
D
B
A
46608.37
46563.97
46470.66
46335.94
10K
20K
30K
40K
50K
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic


Stress-NG 0.13.02
Test: Forking
Bogo Ops/s, More Is Better
A
D
B
C
46395.59
46156.75
45983.20
45813.38
10K
20K
30K
40K
50K
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Crypto
Bogo Ops/s, More Is Better
C
B
D
A
4594.90
4594.76
4593.93
4593.17
1000
2000
3000
4000
5000
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic

Stress-NG 0.13.02

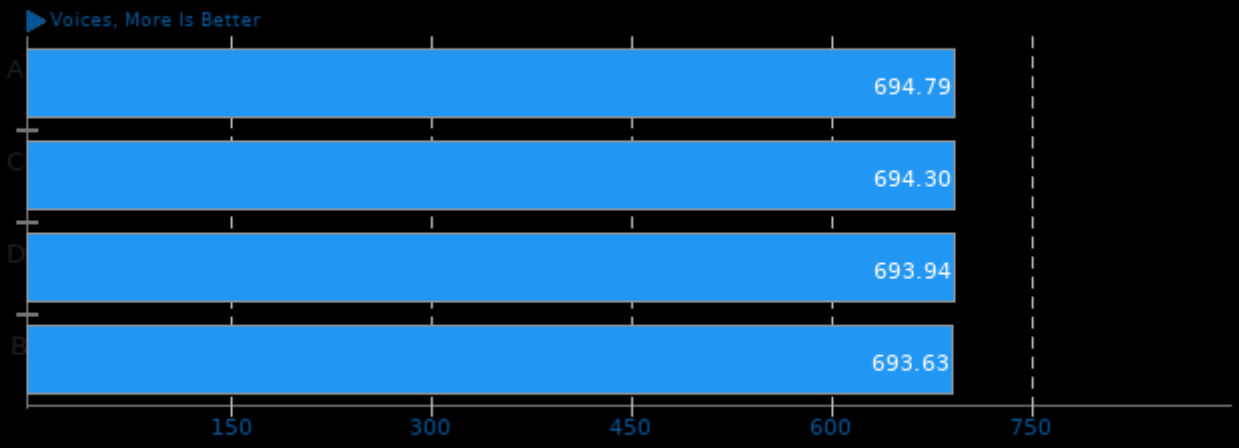
Test: Atomic



1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lsctp -lz -ldl -pthread -lc -latomic

Google SynthMark 20201109

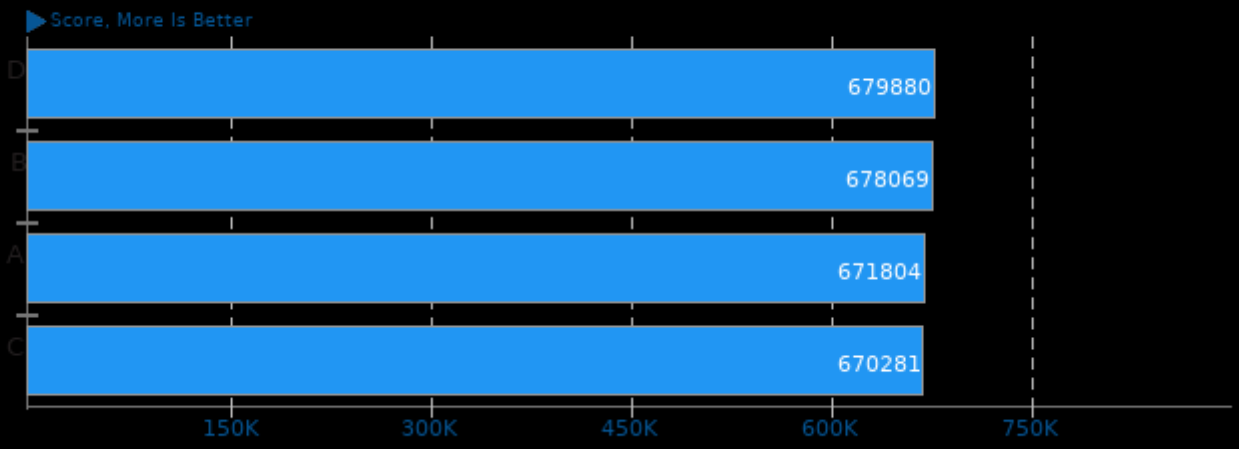
Test: VoiceMark_100

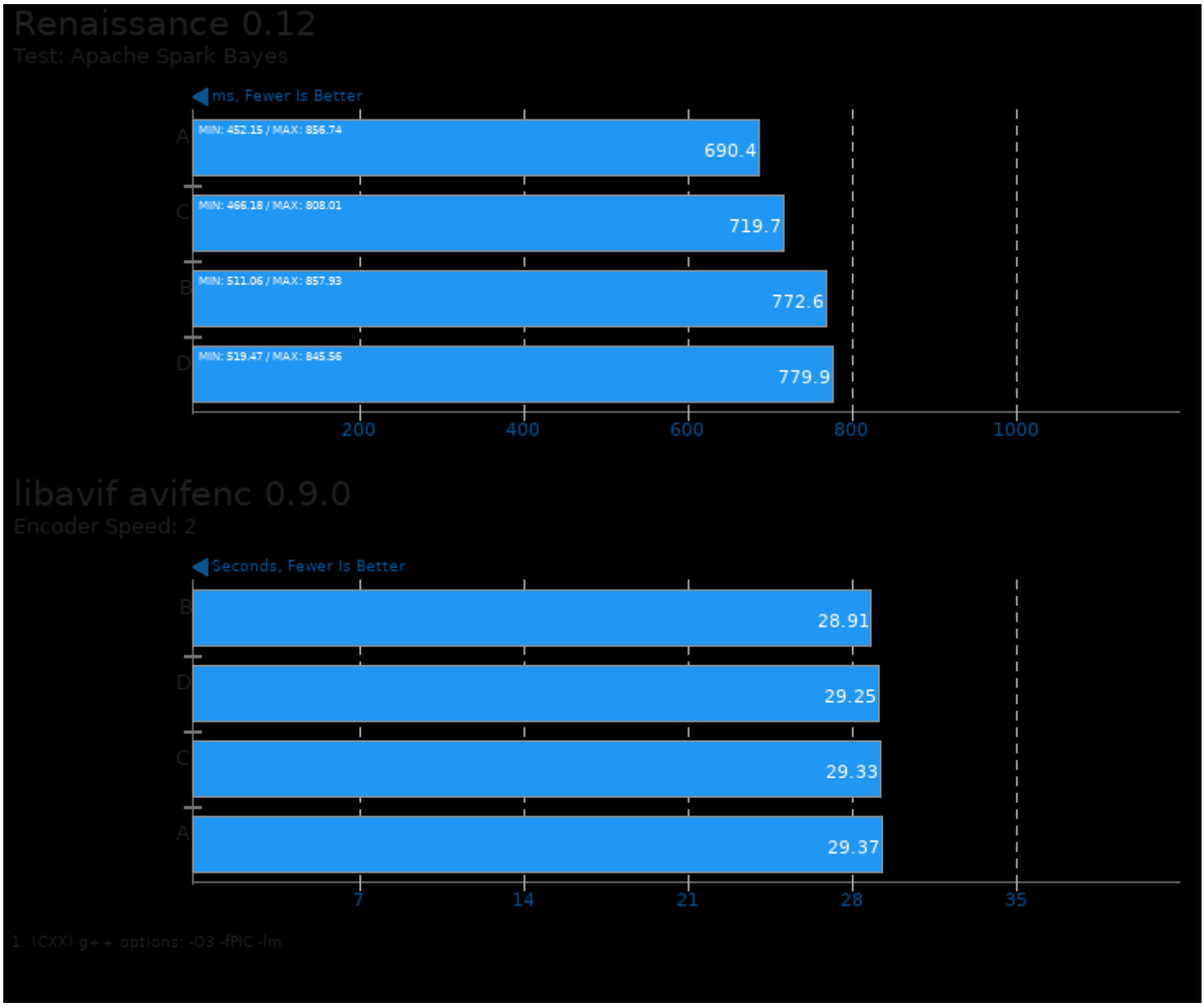


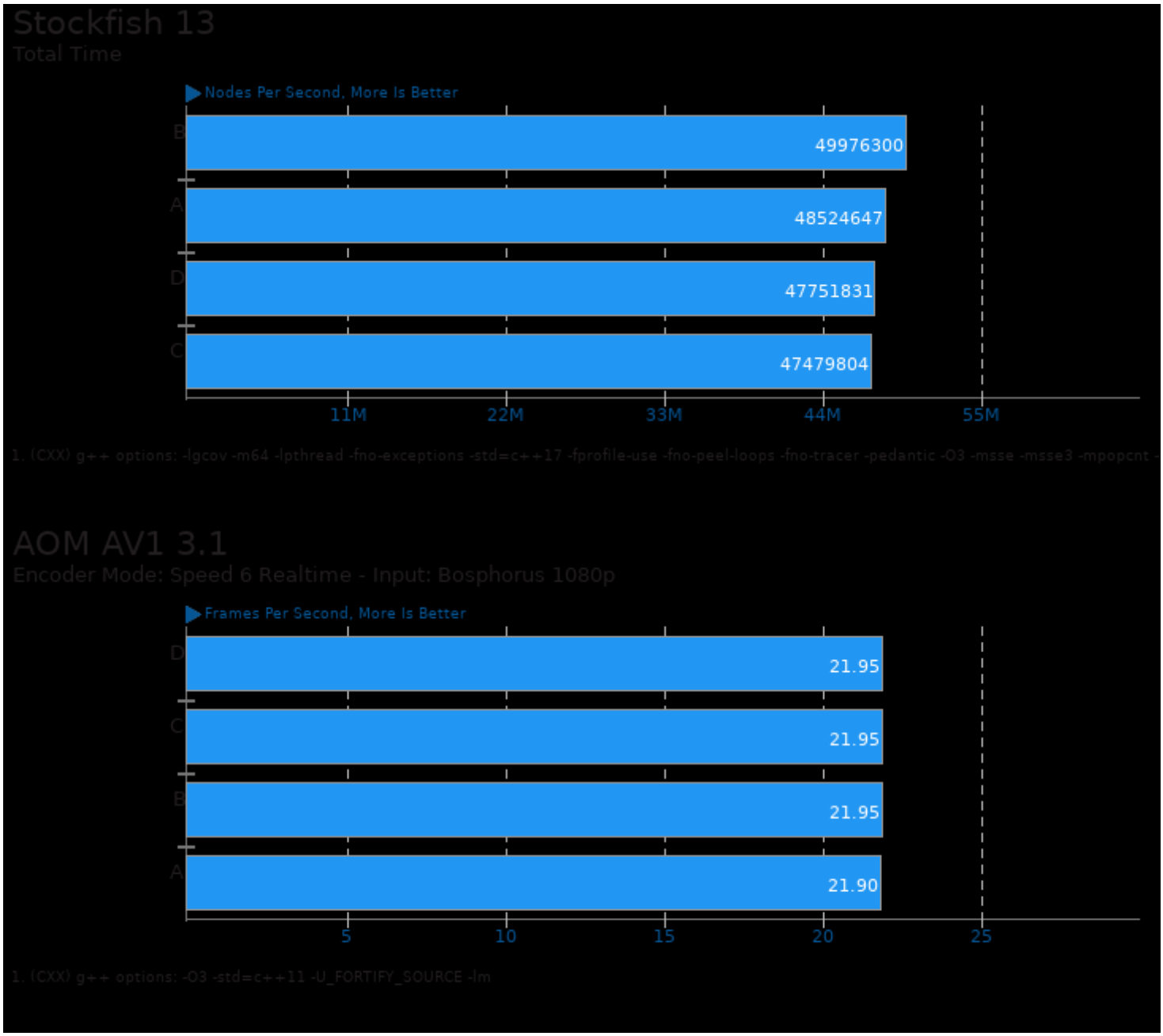
1. (CXX) g++ options: -lm -lpthread -std=c++11 -Ofast

PHPBench 0.8.1

PHP Benchmark Suite

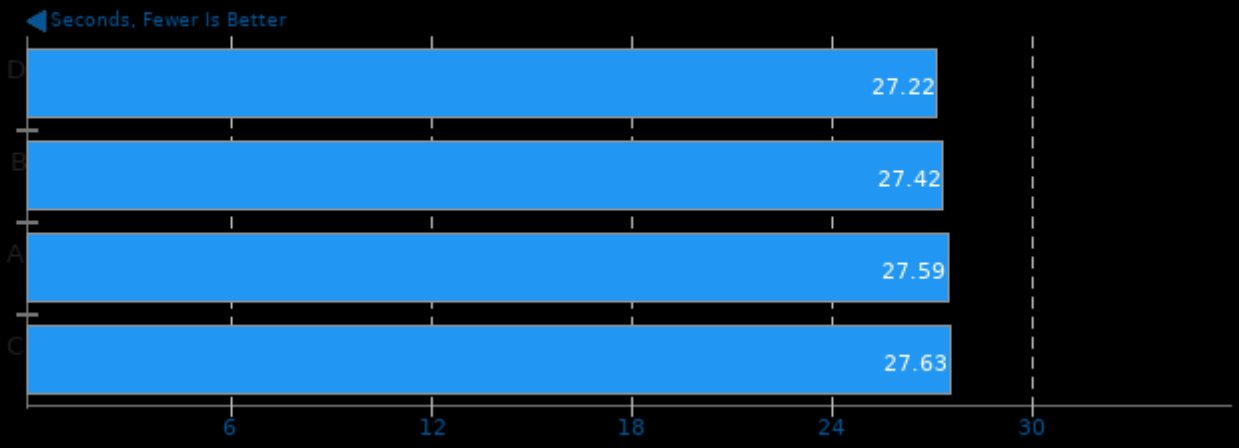



Renaissance 0.12
Test: Apache Spark Bayes
ms, Fewer Is Better
A
MIN: 452.15 / MAX: 856.74
690.4
C
MIN: 466.18 / MAX: 808.01
719.7
B
MIN: 511.06 / MAX: 857.93
772.6
D
MIN: 519.47 / MAX: 845.56
779.9
200
400
600
800
1000
libavif avifenc 0.9.0
Encoder Speed: 2
Seconds, Fewer Is Better
B
28.91
D
29.25
C
29.33
A
29.37
7
14
21
28
35
1. (CXX) g++ options: -O3 -fPIC -lm


Stockfish 13
Total Time
Nodes Per Second, More Is Better
B
49976300
A
48524647
D
47751831
C
47479804
11M
22M
33M
44M
55M
1. (CXX) g++ options: -lgcov -m64 -lpthread -fno-exceptions -std=c++17 -fprofile-use -fno-peel-loops -fno-tracer -pedantic -O3 -msse -msse3 -mpopcnt
AOM AV1 3.1
Encoder Mode: Speed 6 Realtime - Input: Bosphorus 1080p
Frames Per Second, More Is Better
D
21.95
C
21.95
B
21.95
A
21.90
5
10
15
20
25
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm

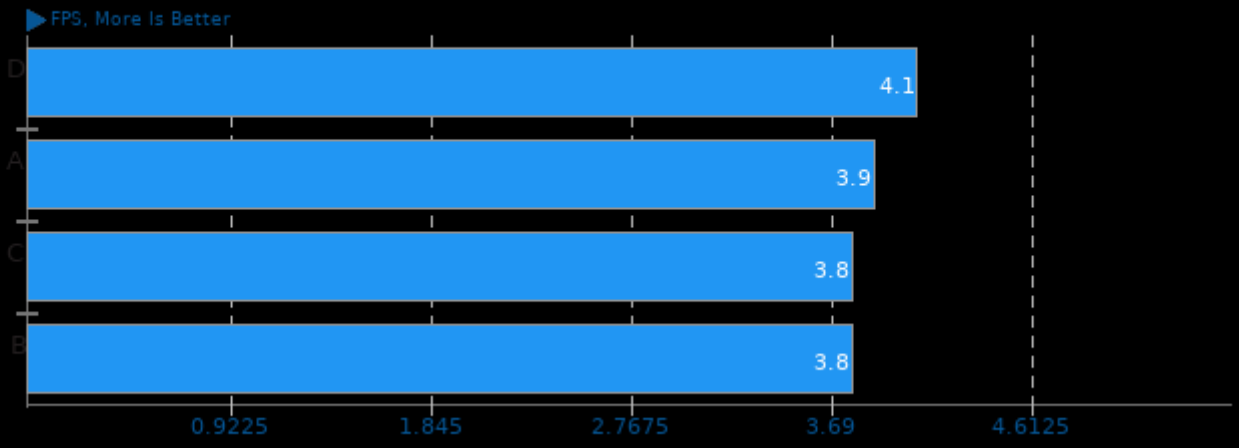
Timed Mesa Compilation 21.0

Time To Compile



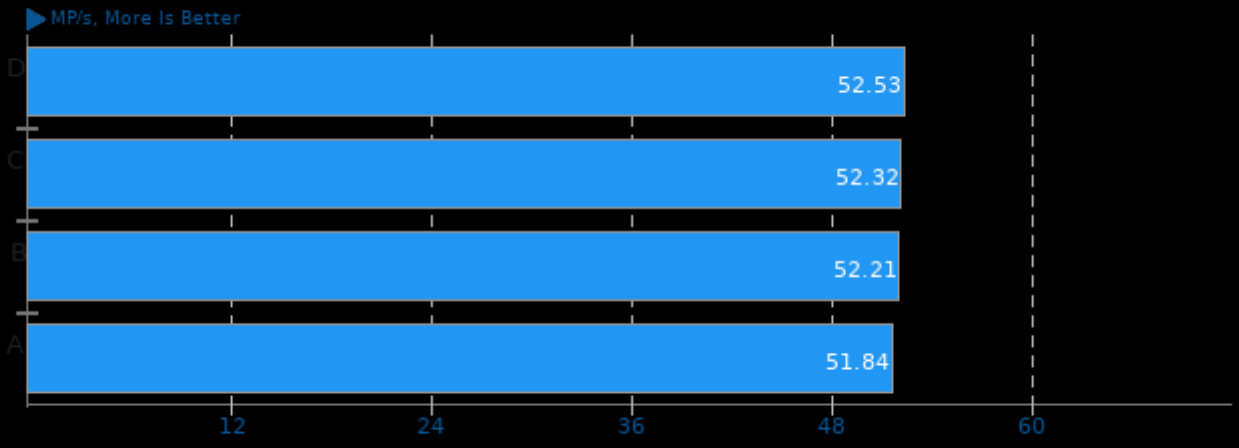
Natron 2.4

Input: Spaceship



JPEG XL libjxl 0.5

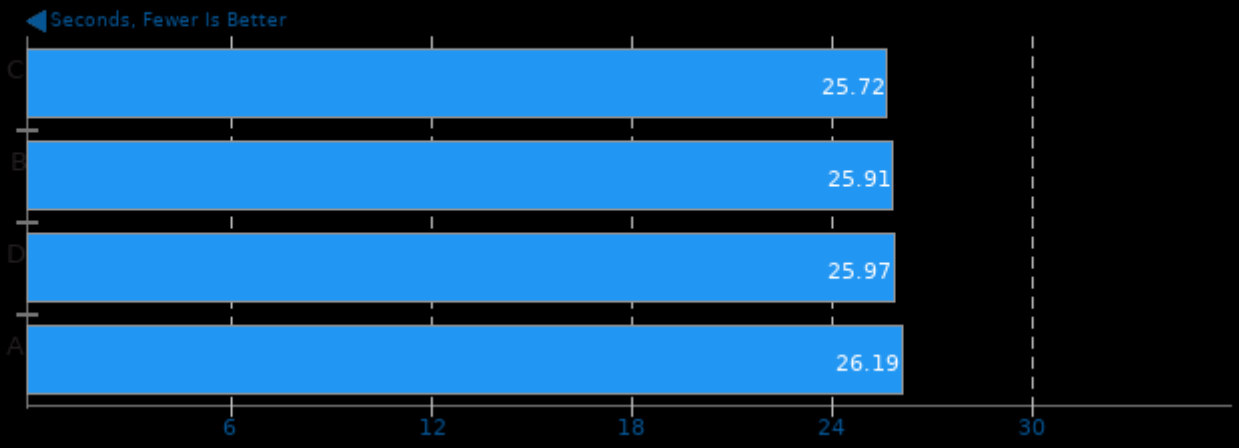
Input: PNG - Encode Speed: 5



1. (CXX) g++ options: -funwind-tables -O3 -O2 -pthread -fPIE -pie

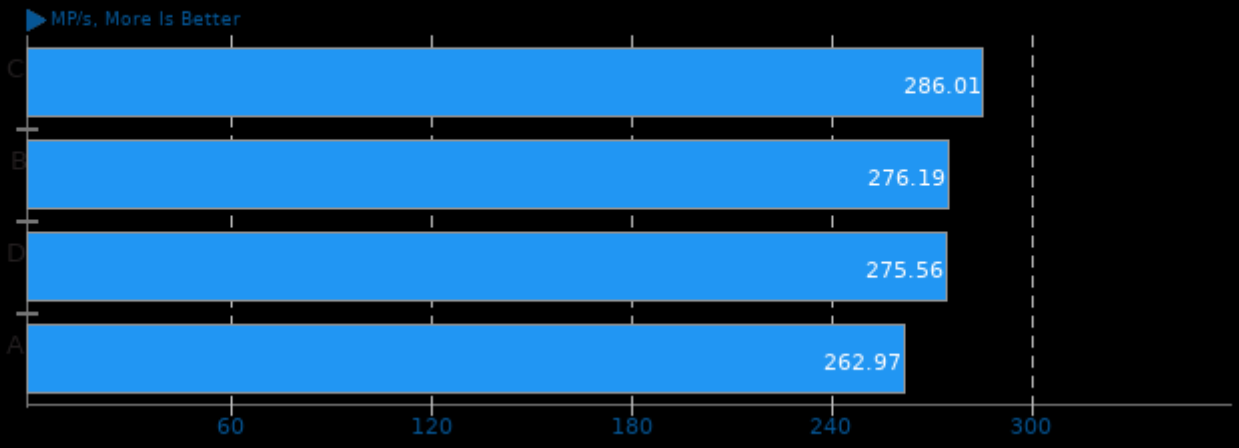
Cython Benchmark 0.29.21

Test: N-Queens



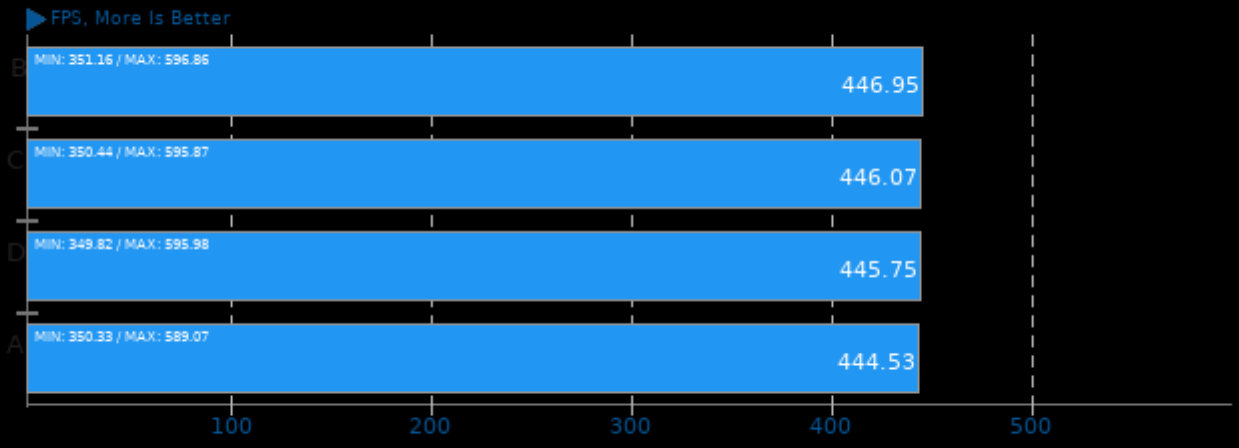
JPEG XL Decoding libjxl 0.5

CPU Threads: All

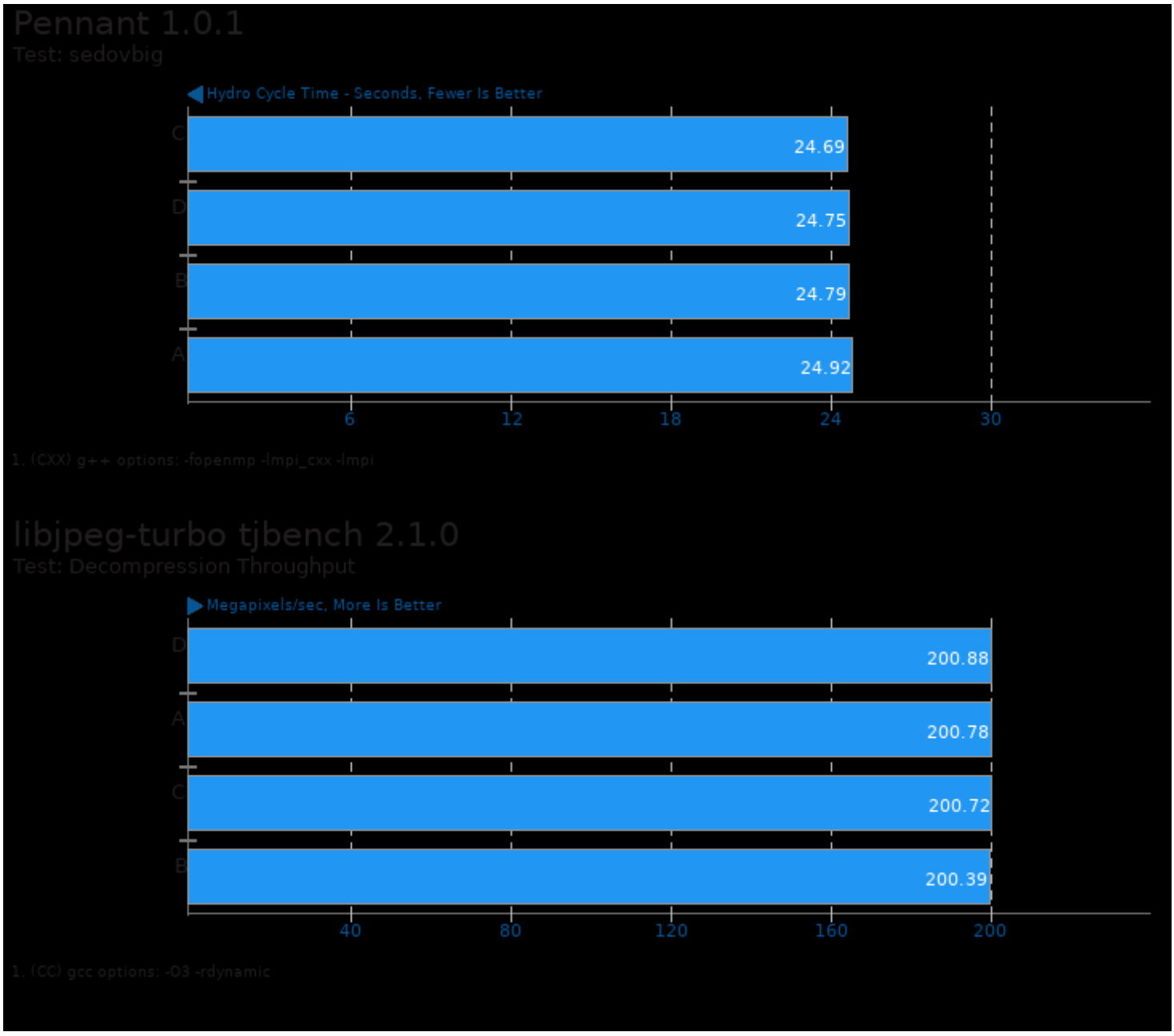


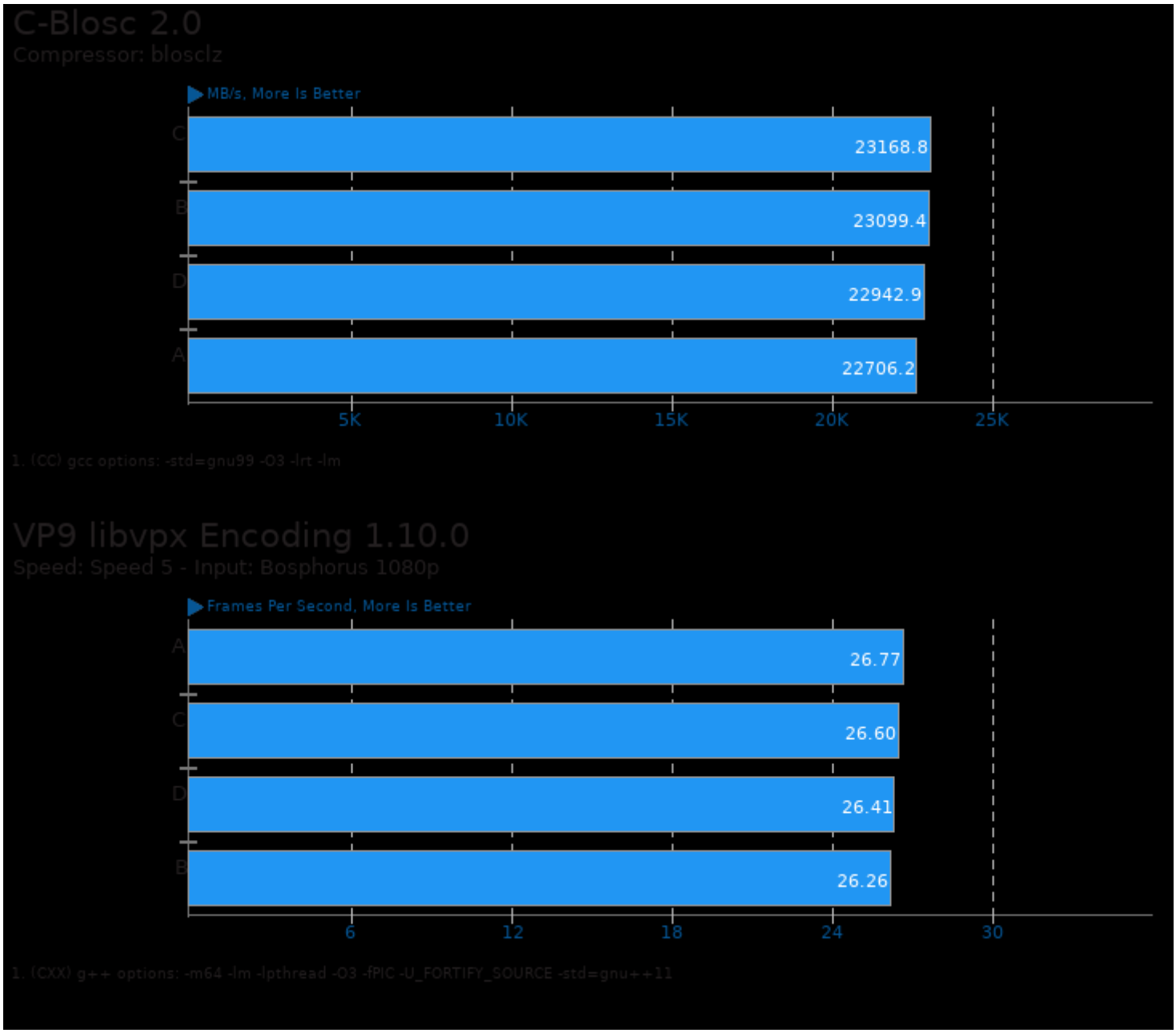
dav1d 0.9.2

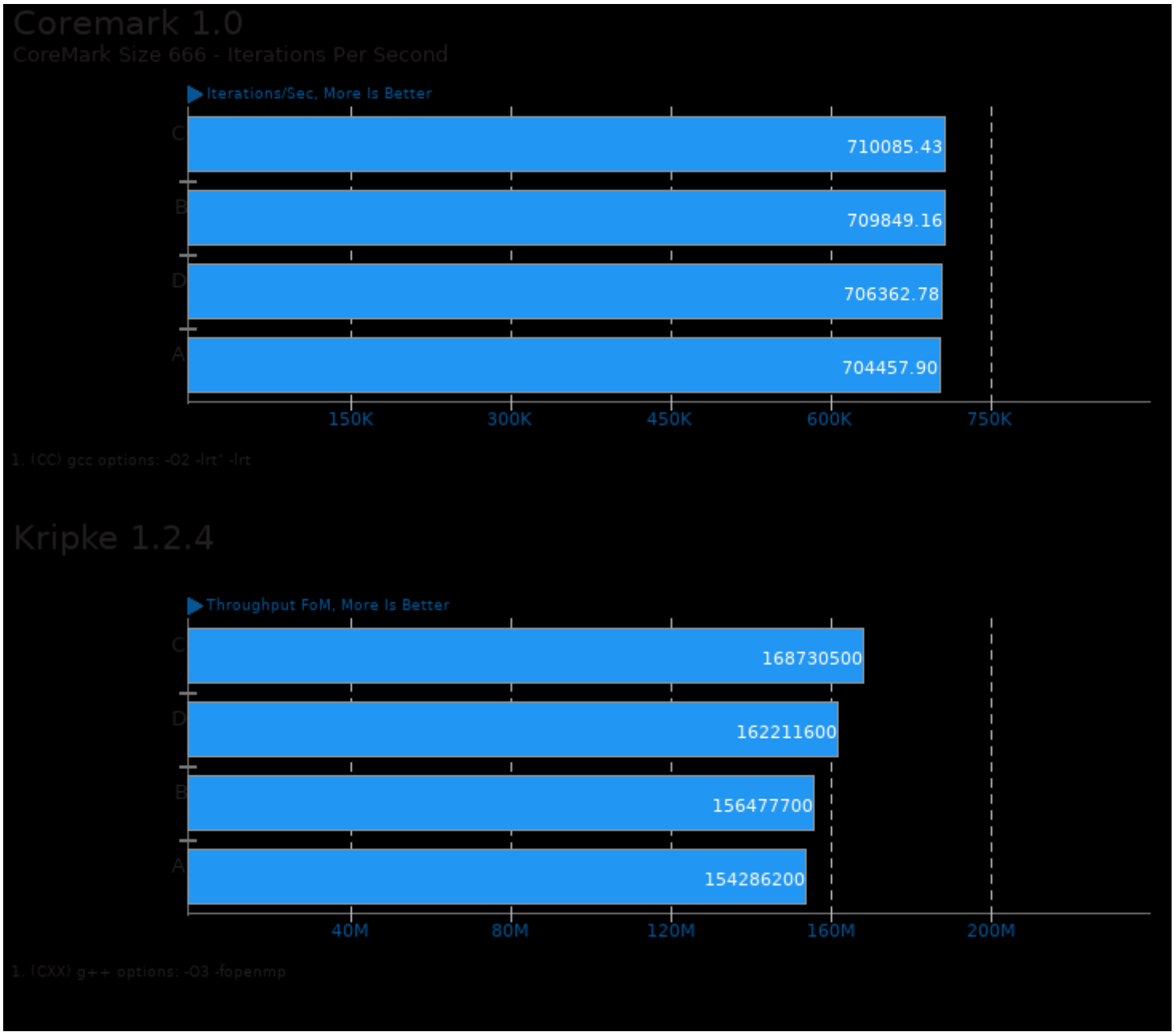
Video Input: Chimera 1080p 10-bit



1. (CC) gcc options: -pthread -lm

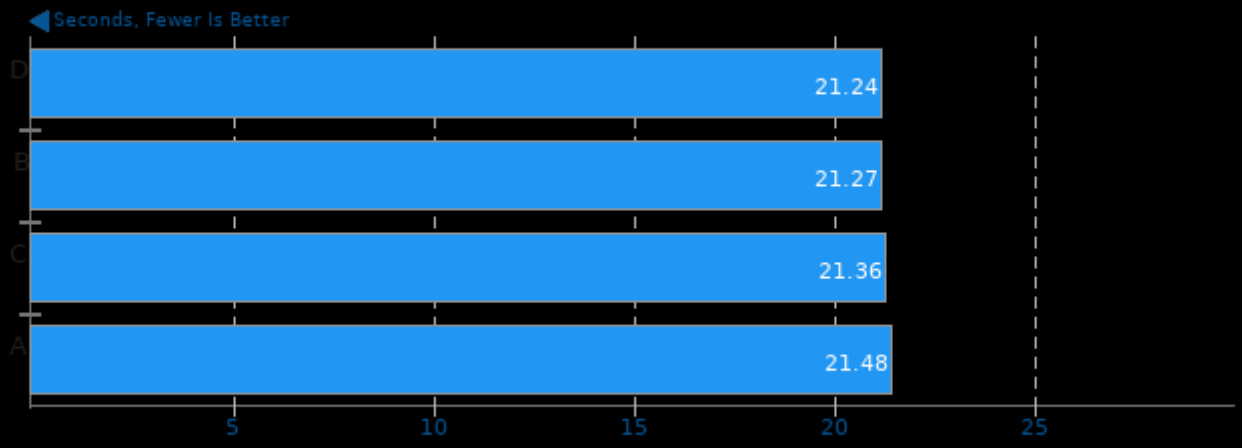

Pennant 1.0.1
Test: sedovbig
Hydro Cycle Time - Seconds, Fewer Is Better
C
D
B
A
24.69
24.75
24.79
24.92
6
12
18
24
30
1. (CXX) g++ options: -fopenmp -lmpi_cxx -lmpi
libjpeg-turbo tjbench 2.1.0
Test: Decompression Throughput
Megapixels/sec, More Is Better
D
A
C
B
200.88
200.78
200.72
200.39
40
80
120
160
200
1. (CC) gcc options: -O3 -rdynamic


C-Blosc 2.0
Compressor: blosclz
MB/s, More Is Better
C
23168.8
B
23099.4
D
22942.9
A
22706.2
5K
10K
15K
20K
25K
1. (CC) gcc options: -std=gnu99 -O3 -lrt -lm
VP9 libvpx Encoding 1.10.0
Speed: Speed 5 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
A
26.77
C
26.60
D
26.41
B
26.26
6
12
18
24
30
1. (CXX) g++ options: -m64 -lm -lpthread -O3 -fPIC -U_FORTIFY_SOURCE -std=gnu++11


Coremark 1.0
CoreMark Size 666 - Iterations Per Second
Iterations/Sec, More Is Better
C
B
D
A
710085.43
709849.16
706362.78
704457.90
150K
300K
450K
600K
750K
1. (CC) gcc options: -O2 -lrt" -lrt
Kripke 1.2.4
Throughput FoM, More Is Better
C
D
B
A
168730500
162211600
156477700
154286200
40M
80M
120M
160M
200M
1. (CXX) g++ options: -O3 -fopenmp

OpenSCAD

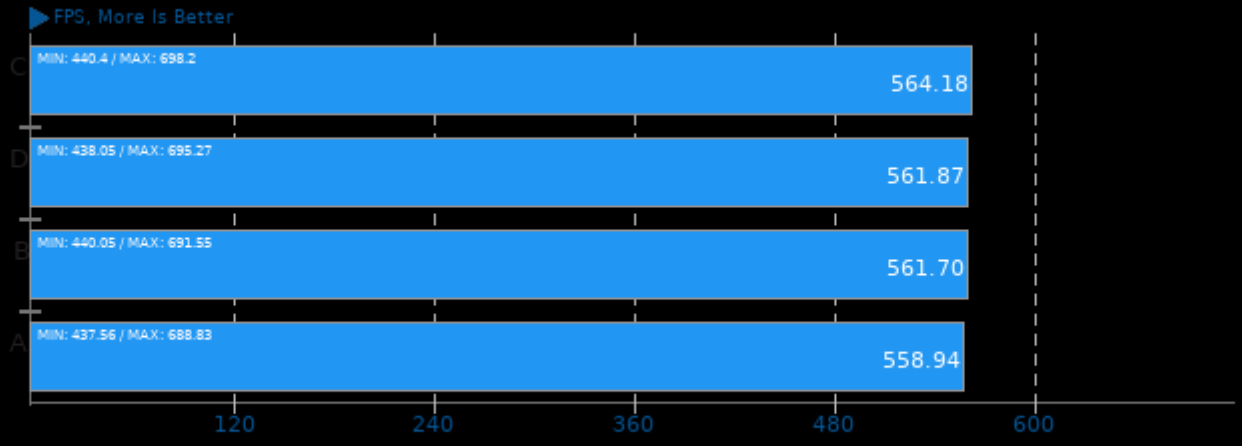
Render: Leonardo Phone Case Slim



1. OpenSCAD version 2021.01

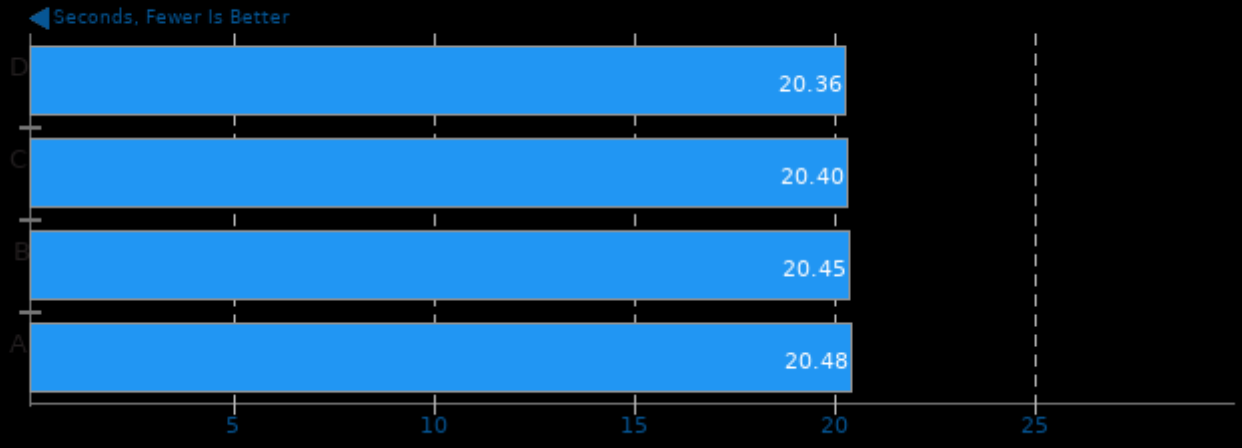
dav1d 0.9.2

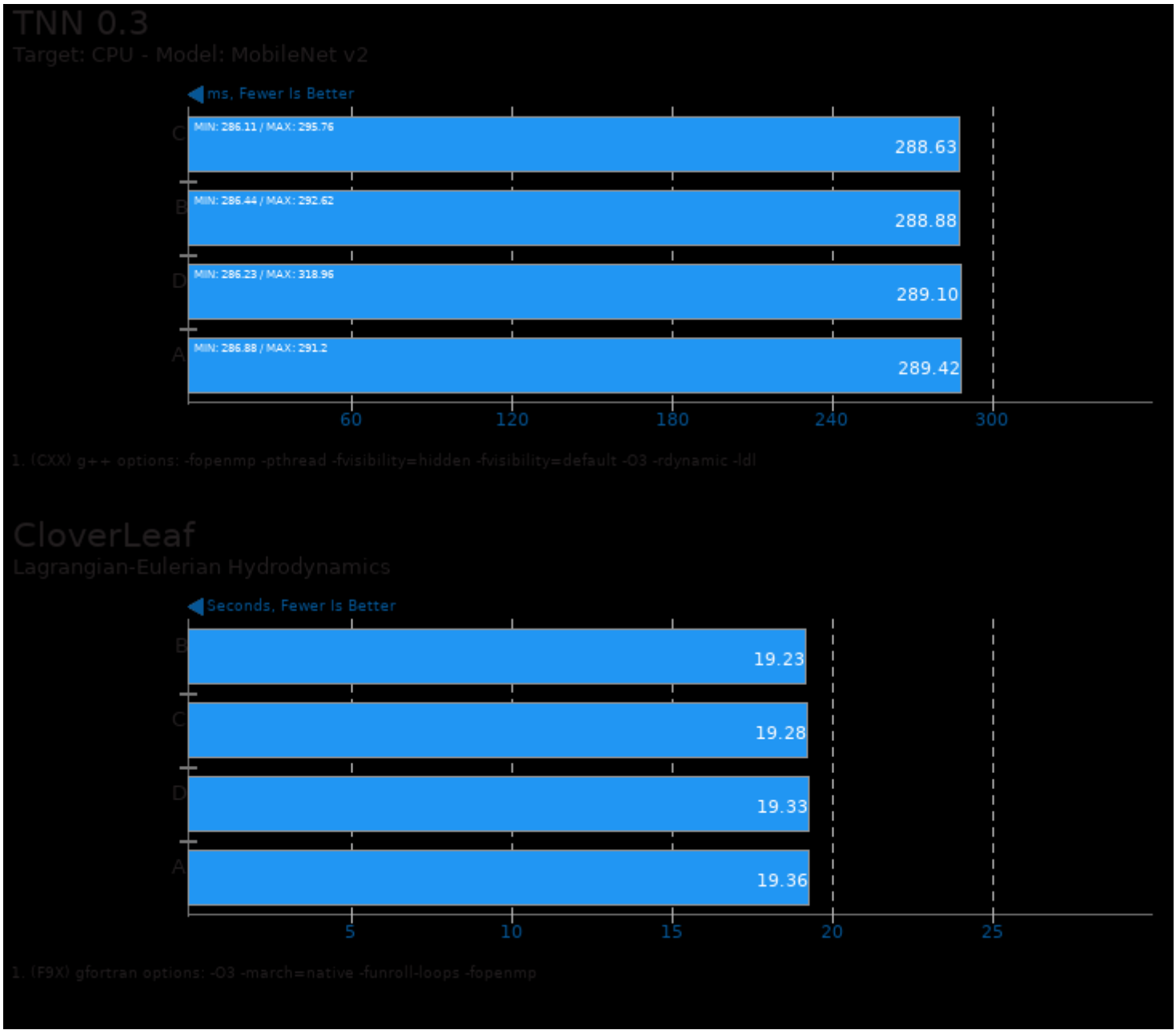
Video Input: Chimera 1080p

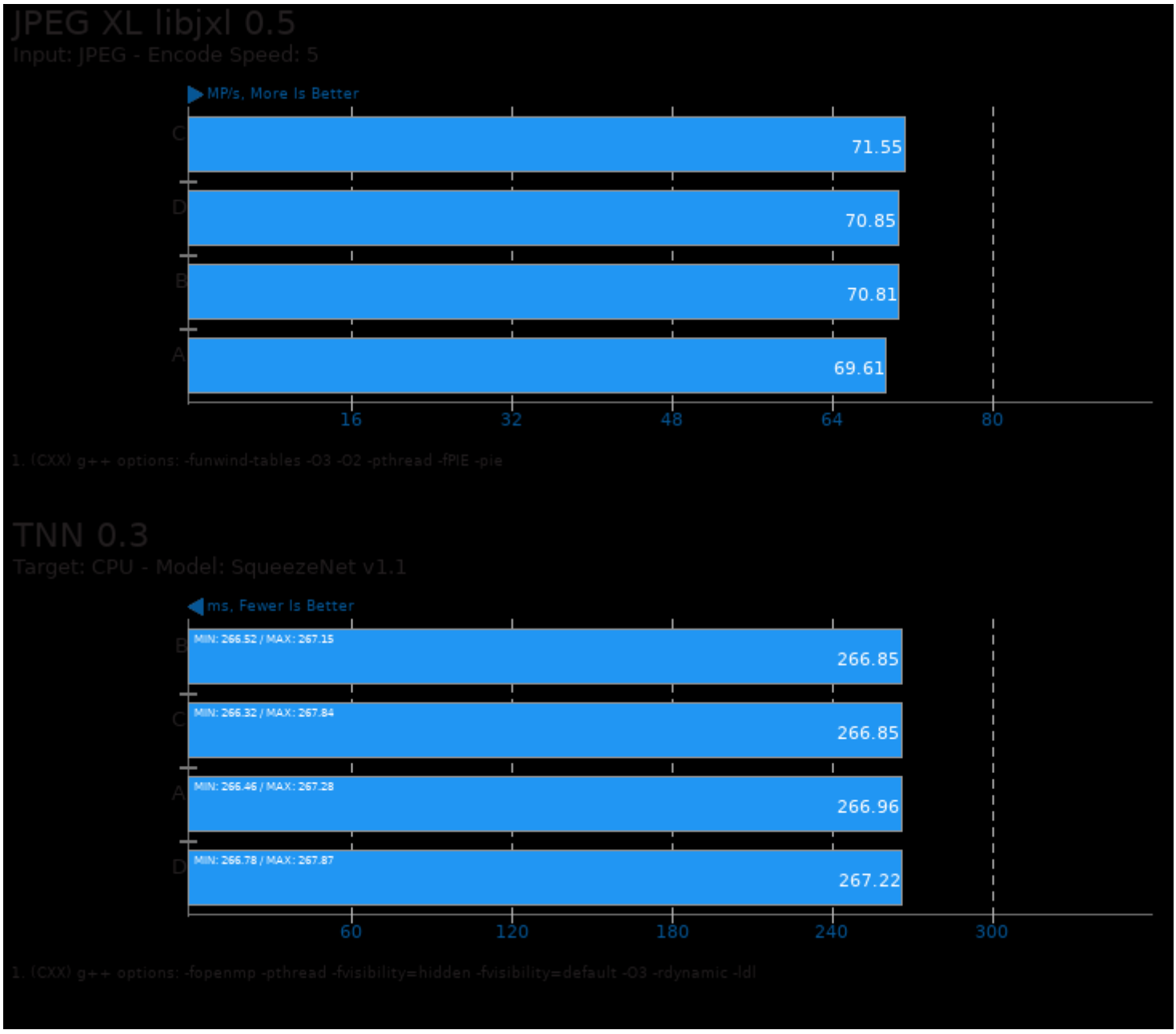


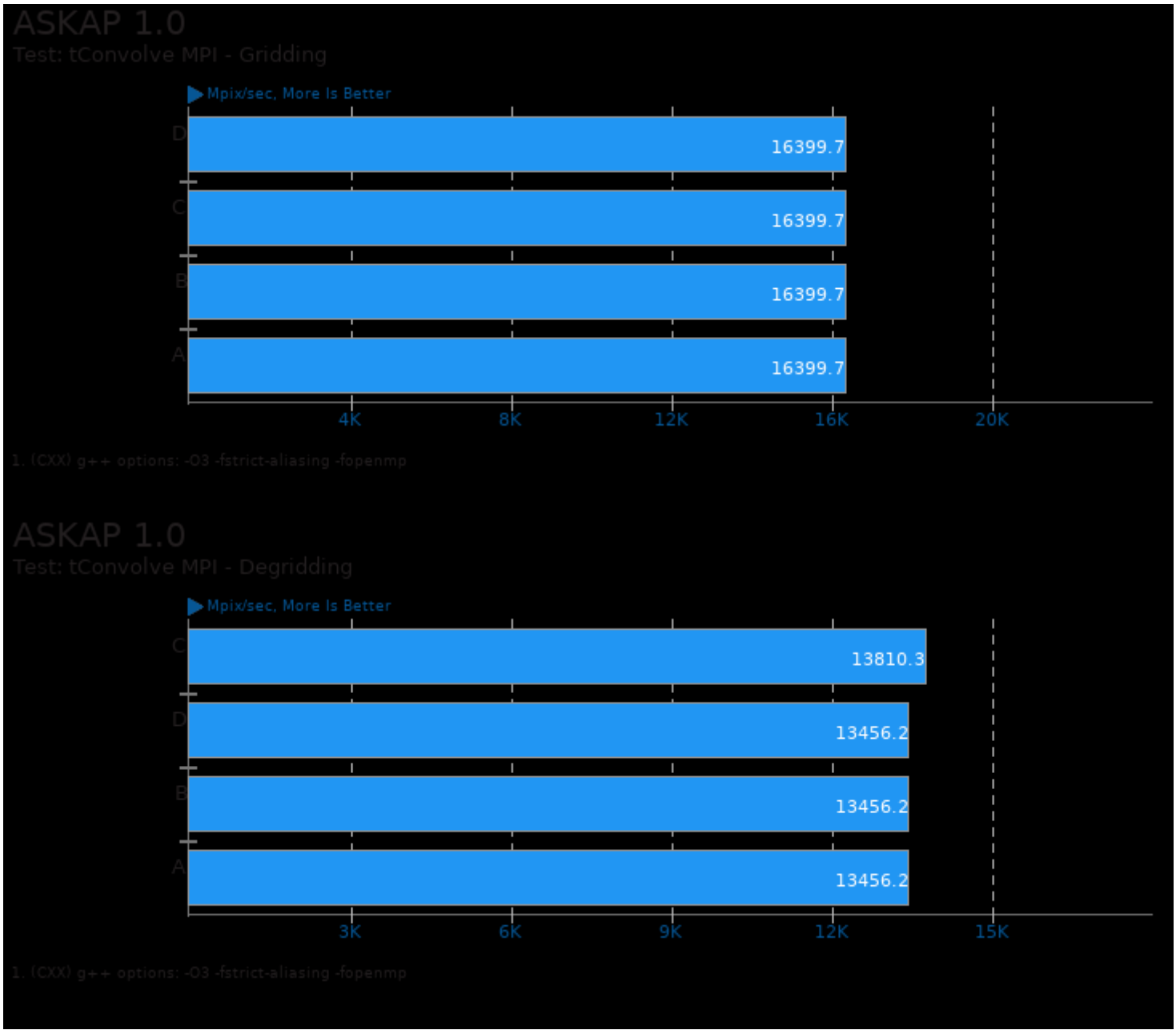
1. (CC) gcc options: -pthread -lm

VOSK Speech Recognition Toolkit 0.3.21



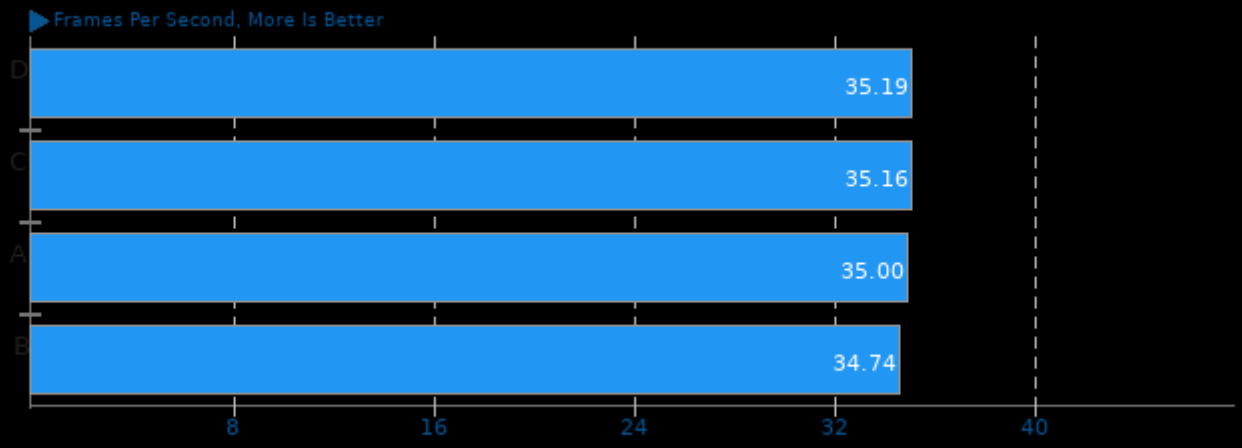

TNN 0.3
Target: CPU - Model: MobileNet v2
ms, Fewer Is Better
C
MIN: 286.11 / MAX: 295.76
288.63
B
MIN: 286.44 / MAX: 292.62
288.88
D
MIN: 286.23 / MAX: 318.96
289.10
A
MIN: 286.88 / MAX: 291.2
289.42
60
120
180
240
300
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -fvisibility=default -O3 -rdynamic -ldl
CloverLeaf
Lagrangian-Eulerian Hydrodynamics
Seconds, Fewer Is Better
B
19.23
C
19.28
D
19.33
A
19.36
5
10
15
20
25
1. (F9X) gfortran options: -O3 -march=native -funroll-loops -fopenmp


JPEG XL libjxl 0.5
Input: JPEG - Encode Speed: 5
MP/s, More Is Better
C
71.55
D
70.85
B
70.81
A
69.61
16
32
48
64
80
1. (CXX) g++ options: -funwind-tables -O3 -O2 -pthread -fPIE -pie
TNN 0.3
Target: CPU - Model: SqueezeNet v1.1
ms, Fewer Is Better
B
MIN: 266.52 / MAX: 267.15
266.85
C
MIN: 266.32 / MAX: 267.84
266.85
A
MIN: 266.46 / MAX: 267.28
266.96
D
MIN: 266.78 / MAX: 267.87
267.22
60
120
180
240
300
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -fvisibility=default -O3 -rdynamic -ldl


ASKAP 1.0
Test: tConvolve MPI - Gridding
Mpix/sec, More Is Better
D
C
B
A
16399.7
16399.7
16399.7
16399.7
4K
8K
12K
16K
20K
1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp
ASKAP 1.0
Test: tConvolve MPI - Degridding
Mpix/sec, More Is Better
C
D
B
A
13810.3
13456.2
13456.2
13456.2
3K
6K
9K
12K
15K
1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp

AOM AV1 3.1

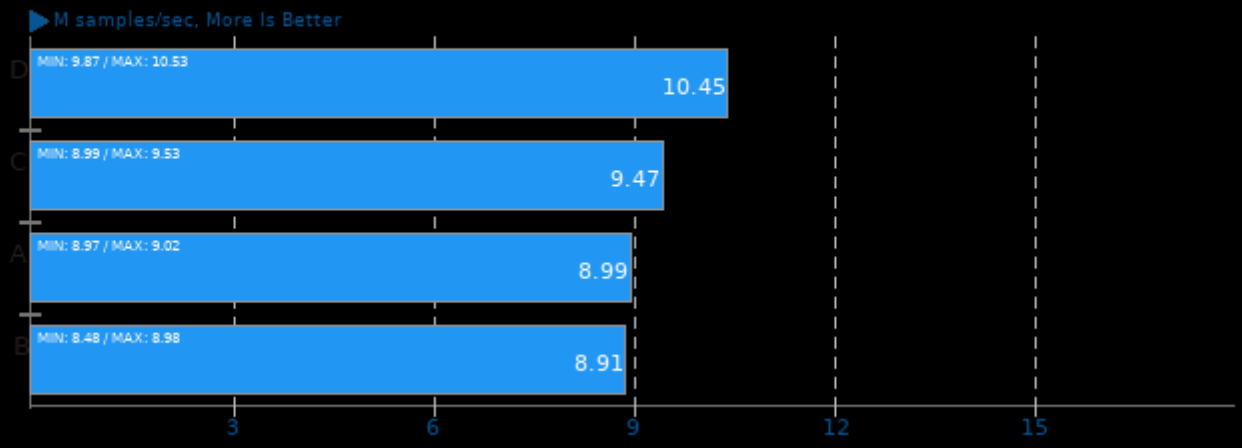
Encoder Mode: Speed 8 Realtime - Input: Bosphorus 4K



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

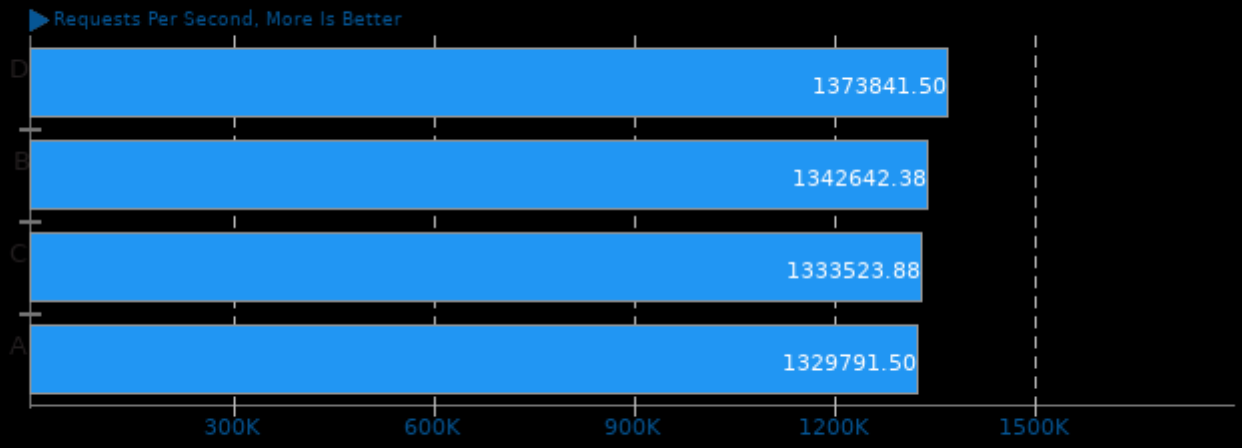
LuxCoreRender 2.5

Scene: Rainbow Colors and Prism - Acceleration: CPU

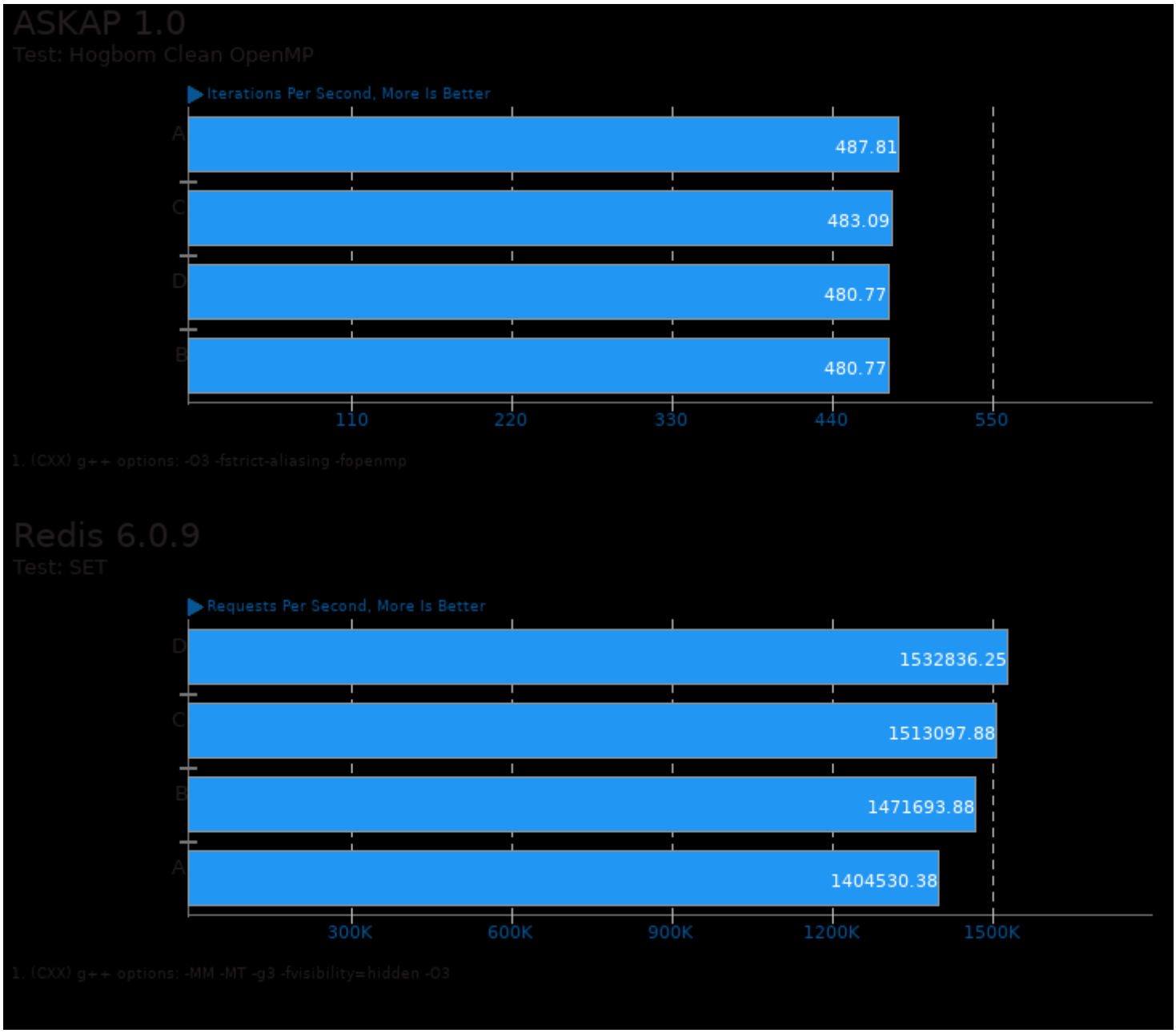


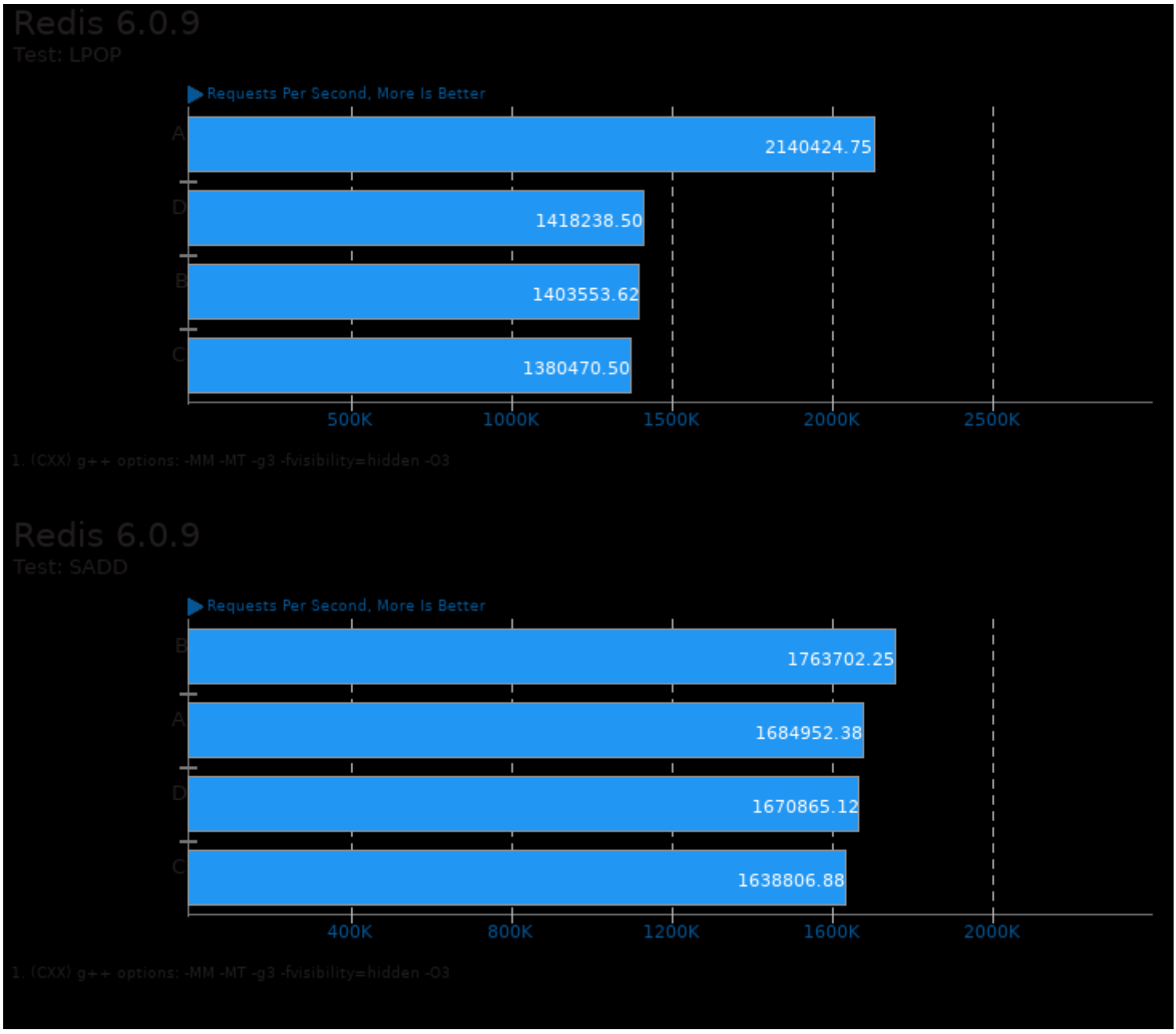
Redis 6.0.9

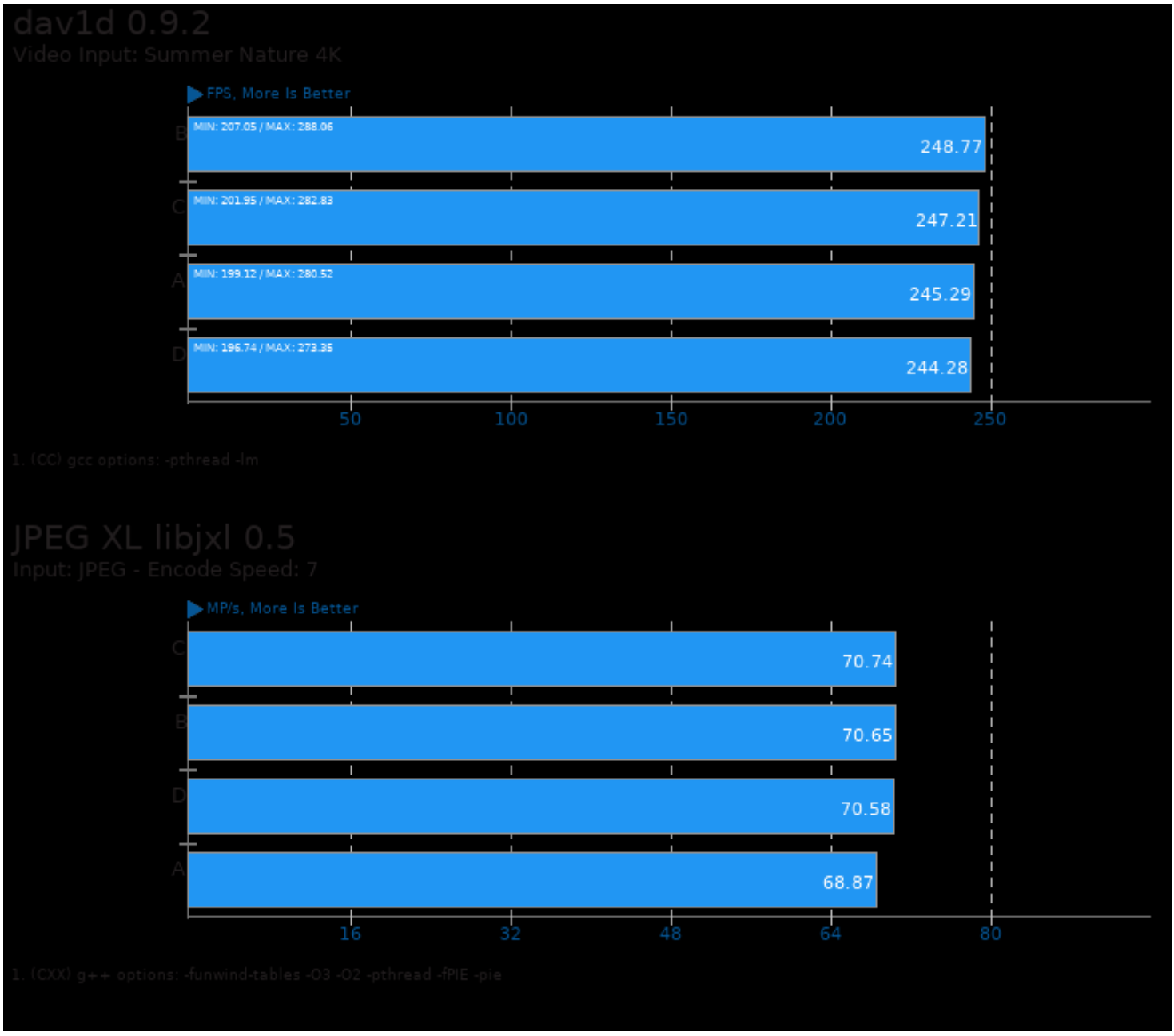
Test: LPUSH

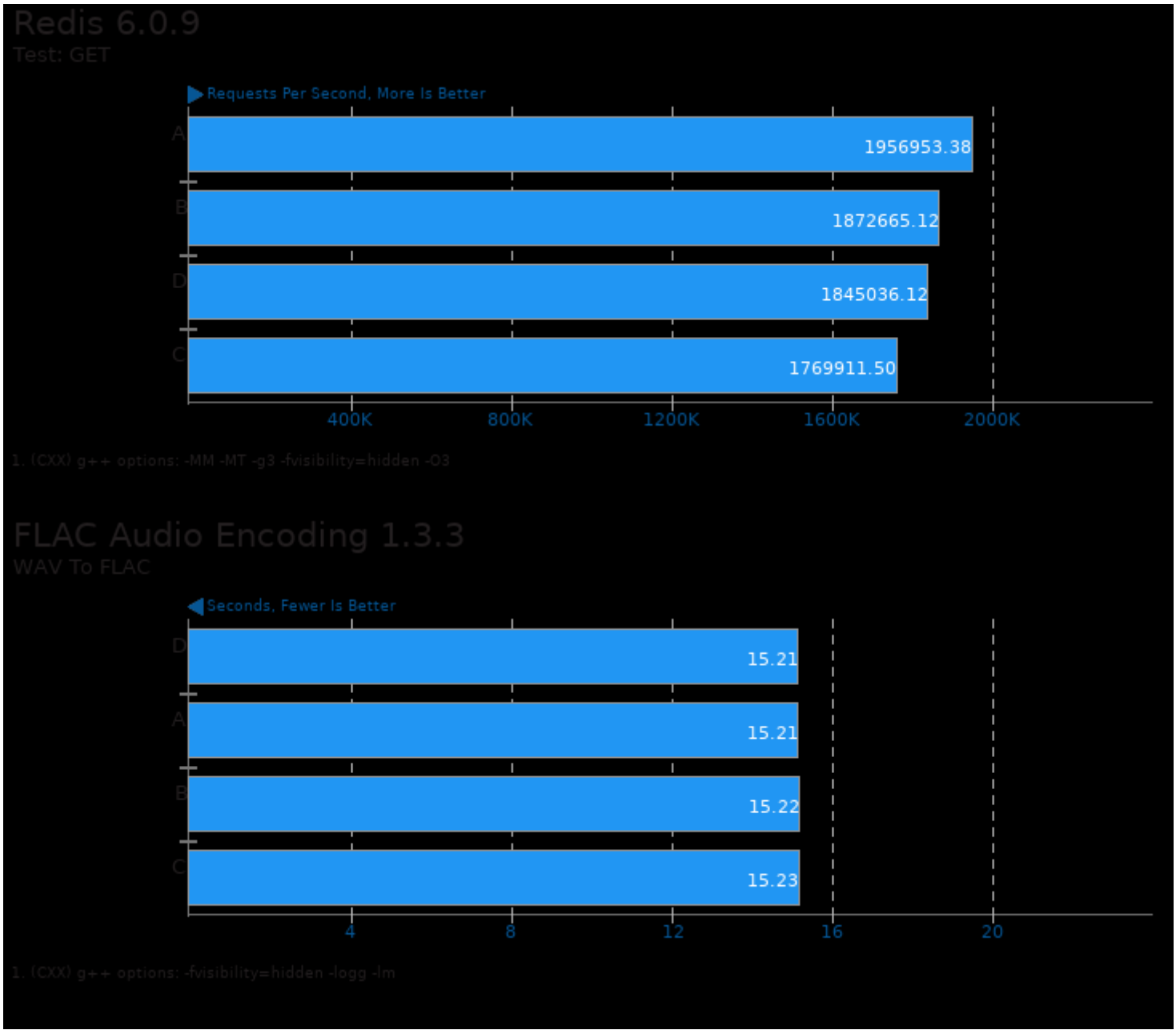


1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3


ASKAP 1.0
Test: Hogbom Clean OpenMP
Iterations Per Second, More Is Better
A
C
D
B
487.81
483.09
480.77
480.77
110
220
330
440
550
1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp
Redis 6.0.9
Test: SET
Requests Per Second, More Is Better
D
C
B
A
1532836.25
1513097.88
1471693.88
1404530.38
300K
600K
900K
1200K
1500K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3

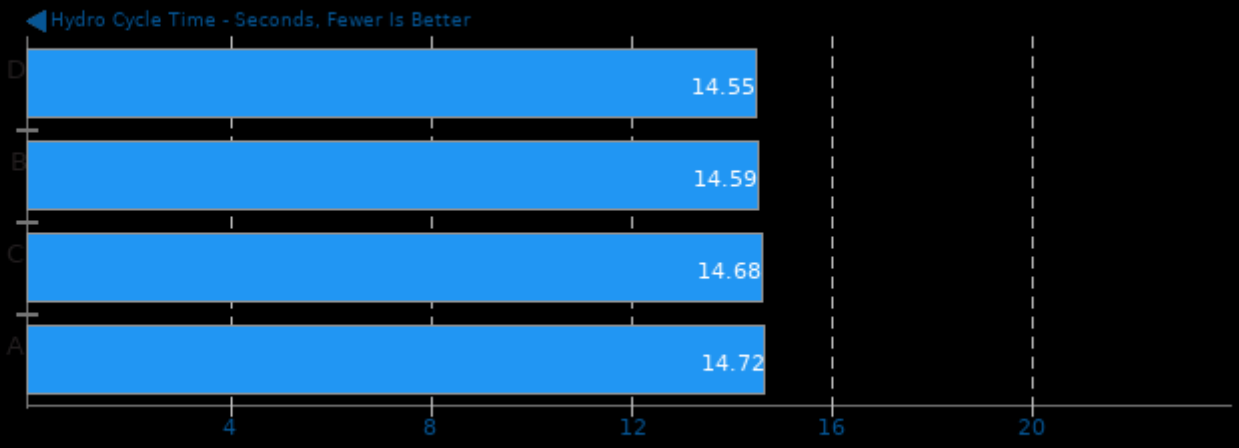

Redis 6.0.9
Test: LPOP
Requests Per Second, More Is Better
A
D
B
C
2140424.75
1418238.50
1403553.62
1380470.50
500K
1000K
1500K
2000K
2500K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3
Redis 6.0.9
Test: SADD
Requests Per Second, More Is Better
B
A
D
C
1763702.25
1684952.38
1670865.12
1638806.88
400K
800K
1200K
1600K
2000K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3


dav1d 0.9.2
Video Input: Summer Nature 4K
FPS, More Is Better
B
MIN: 207.05 / MAX: 288.06
248.77
C
MIN: 201.95 / MAX: 282.83
247.21
A
MIN: 199.12 / MAX: 280.52
245.29
D
MIN: 196.74 / MAX: 273.35
244.28
50
100
150
200
250
1. (CC) gcc options: -pthread -lm
JPEG XL libjxl 0.5
Input: JPEG - Encode Speed: 7
MP/s, More Is Better
C
70.74
B
70.65
D
70.58
A
68.87
16
32
48
64
80
1. (CXX) g++ options: -funwind-tables -O3 -O2 -pthread -fPIE -pie


Redis 6.0.9
Test: GET
Requests Per Second, More Is Better
A
B
D
C
1956953.38
1872665.12
1845036.12
1769911.50
400K
800K
1200K
1600K
2000K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3
FLAC Audio Encoding 1.3.3
WAV To FLAC
Seconds, Fewer Is Better
D
A
B
C
15.21
15.21
15.22
15.23
4
8
12
16
20
1. (CXX) g++ options: -fvisibility=hidden -logg -lm

Pennant 1.0.1

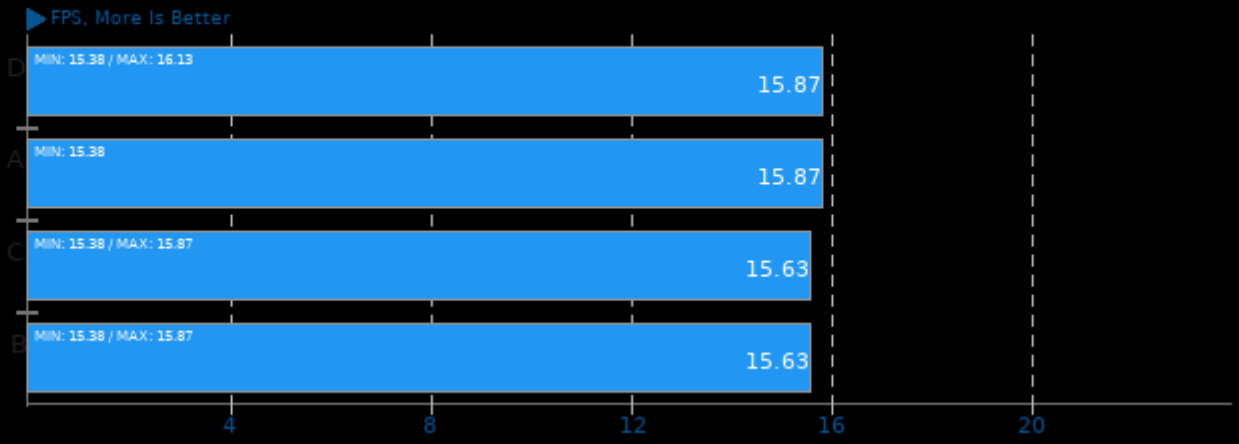
Test: leblancbig



1. (CXX) g++ options: -fopenmp -lmpi_cxx -lmpi

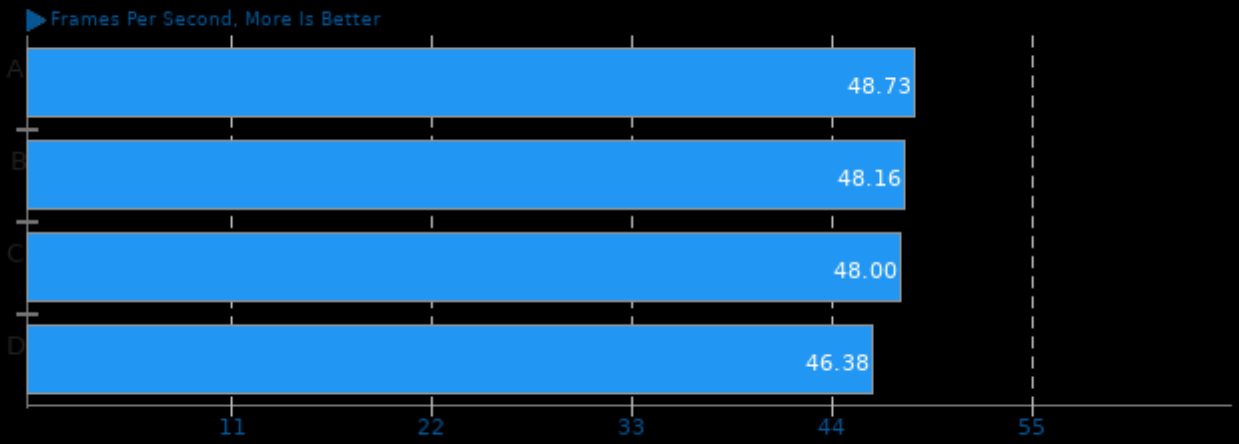
OSPray 1.8.5

Demo: Magnetic Reconnection - Renderer: SciVis

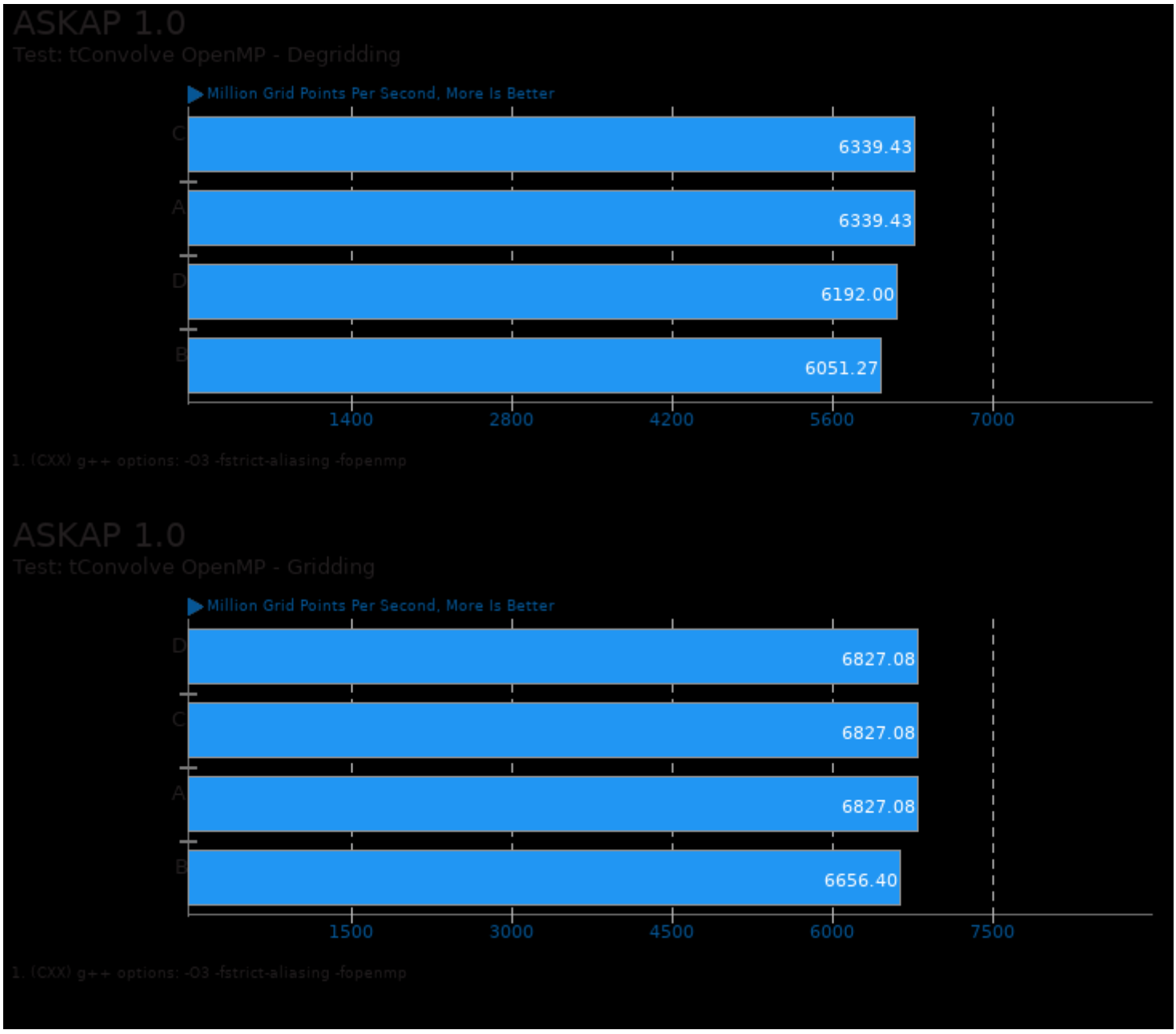


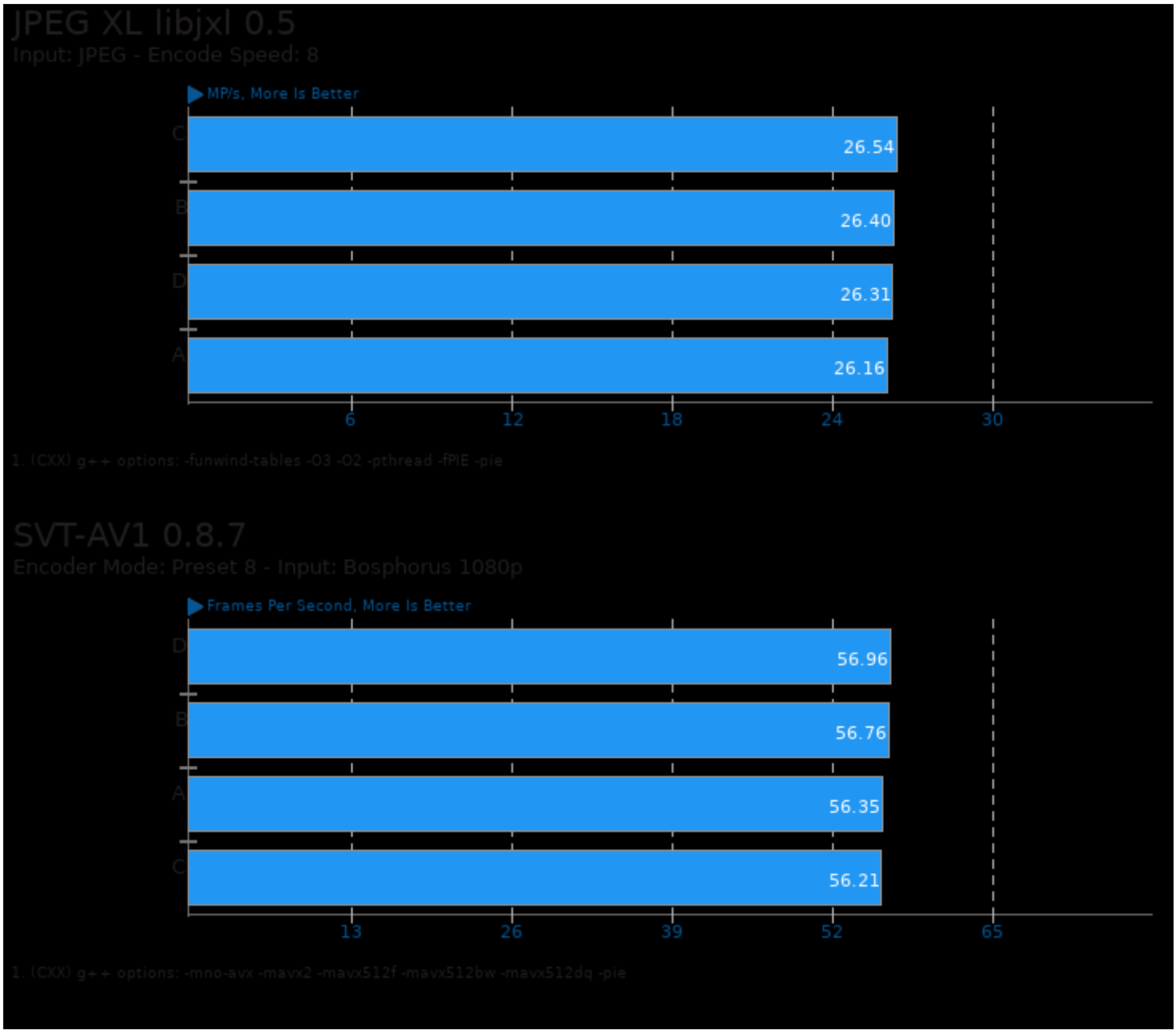
AOM AV1 3.1

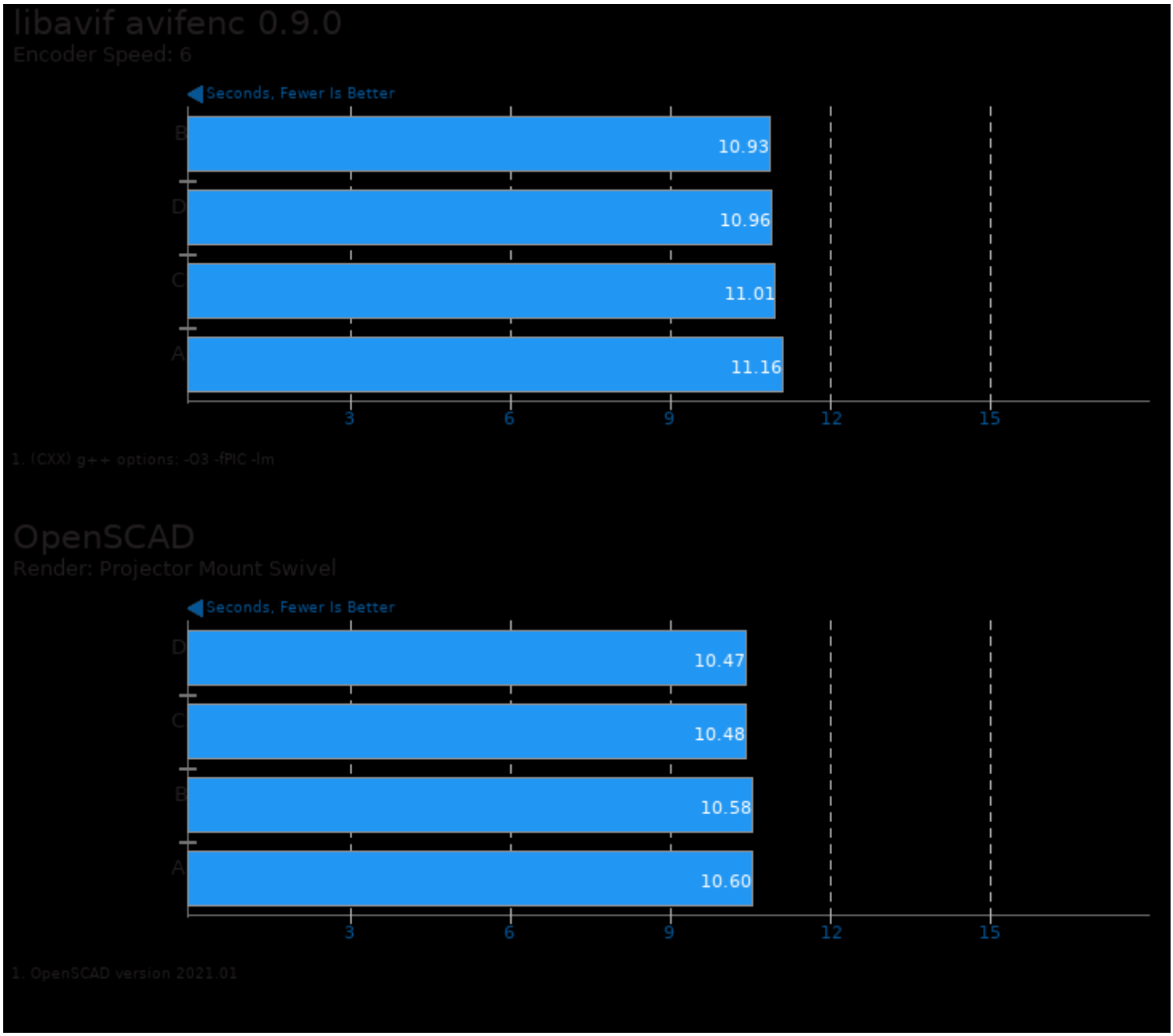
Encoder Mode: Speed 9 Realtime - Input: Bosphorus 4K



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

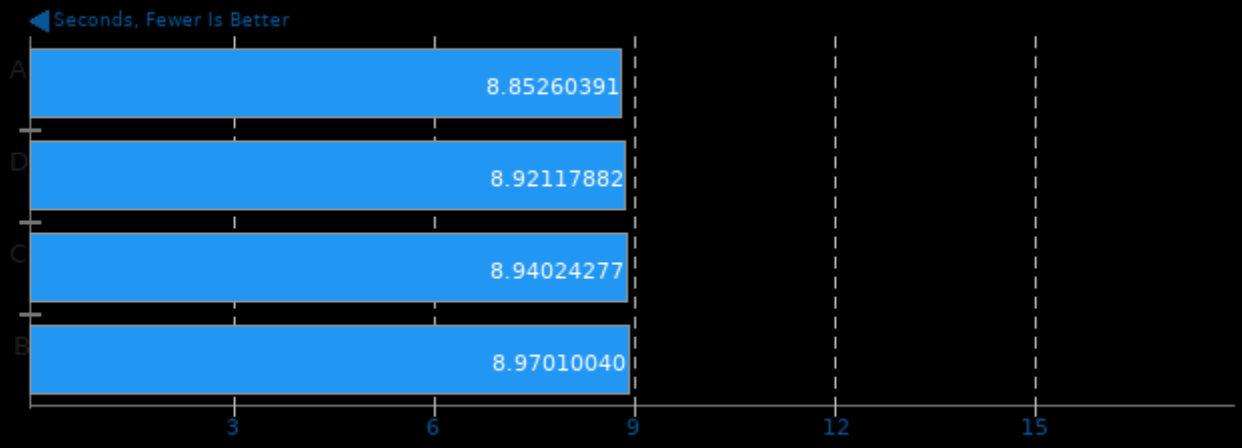

ASKAP 1.0
Test: tConvolve OpenMP - Degridding
Million Grid Points Per Second, More Is Better
C
6339.43
A
6339.43
D
6192.00
B
6051.27
1400
2800
4200
5600
7000
1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp
ASKAP 1.0
Test: tConvolve OpenMP - Gridding
Million Grid Points Per Second, More Is Better
D
6827.08
C
6827.08
A
6827.08
B
6656.40
1500
3000
4500
6000
7500
1. (CXX) g++ options: -O3 -fstrict-aliasing -fopenmp


JPEG XL libjxl 0.5
Input: JPEG - Encode Speed: 8
MP/s, More Is Better
C
B
D
A
26.54
26.40
26.31
26.16
6
12
18
24
30
1. (CXX) g++ options: -funwind-tables -O3 -O2 -pthread -fPIE -pie
SVT-AV1 0.8.7
Encoder Mode: Preset 8 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
D
B
A
C
56.96
56.76
56.35
56.21
13
26
39
52
65
1. (CXX) g++ options: -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq -pie


libavif avifenc 0.9.0
Encoder Speed: 6
Seconds, Fewer Is Better
B
D
C
A
10.93
10.96
11.01
11.16
3
6
9
12
15
1. (CXX) g++ options: -O3 -fPIC -lm
OpenSCAD
Render: Projector Mount Swivel
Seconds, Fewer Is Better
D
C
B
A
10.47
10.48
10.58
10.60
3
6
9
12
15
1. OpenSCAD version 2021.01

Xcompact3d Incompact3d 2021-03-11

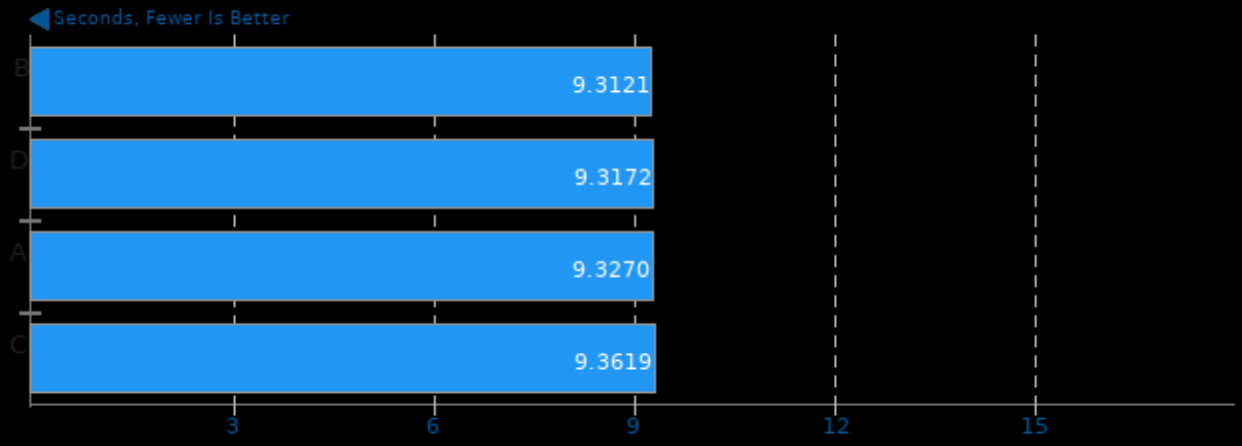
Input: input.i3d 129 Cells Per Direction



1. (F9X) gfortran options: -cpp -O2 -funroll-loops -floop-optimize -fcray-pointer -fbacktrace -lmpi_usempif08 -lmpi_mpifh -lmpi -lopen-rte -lopen-pal -lhwl

ASTC Encoder 3.2

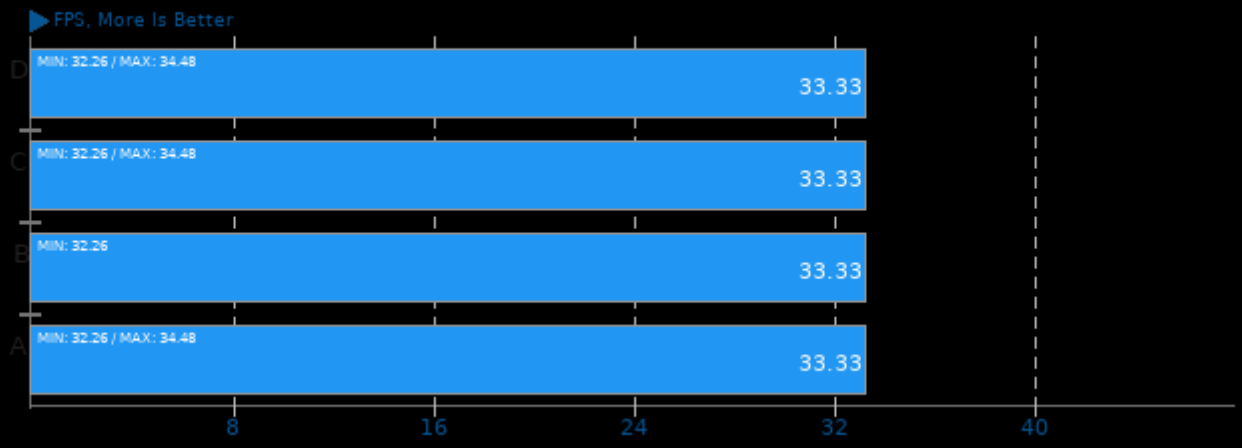
Preset: Thorough



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

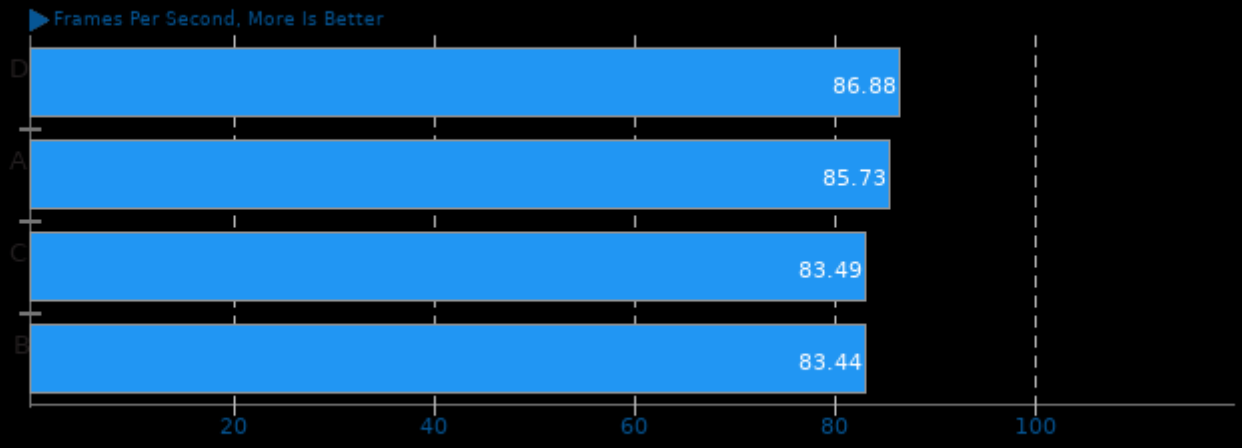
OSPray 1.8.5

Demo: NASA Streamlines - Renderer: SciVis



AOM AV1 3.1

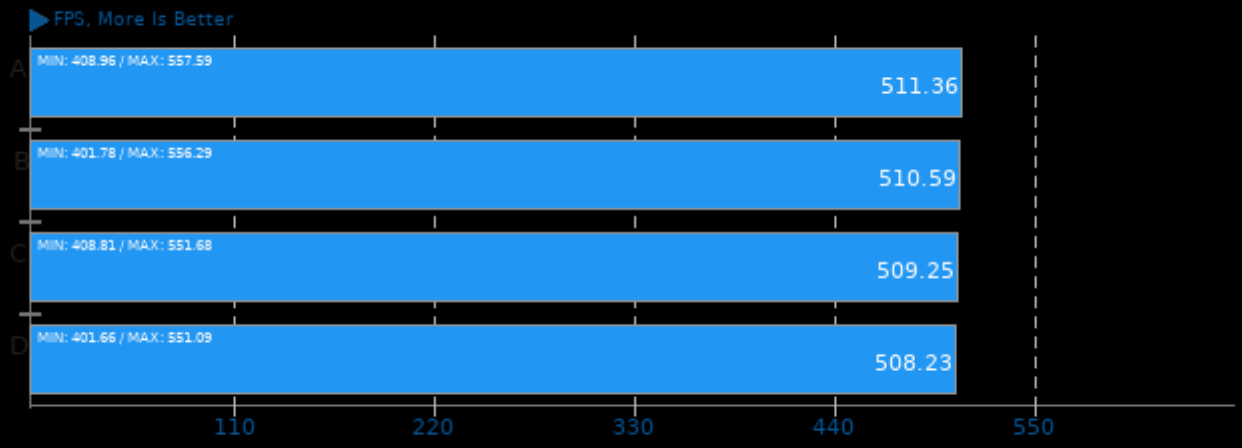
Encoder Mode: Speed 8 Realtime - Input: Bosphorus 1080p



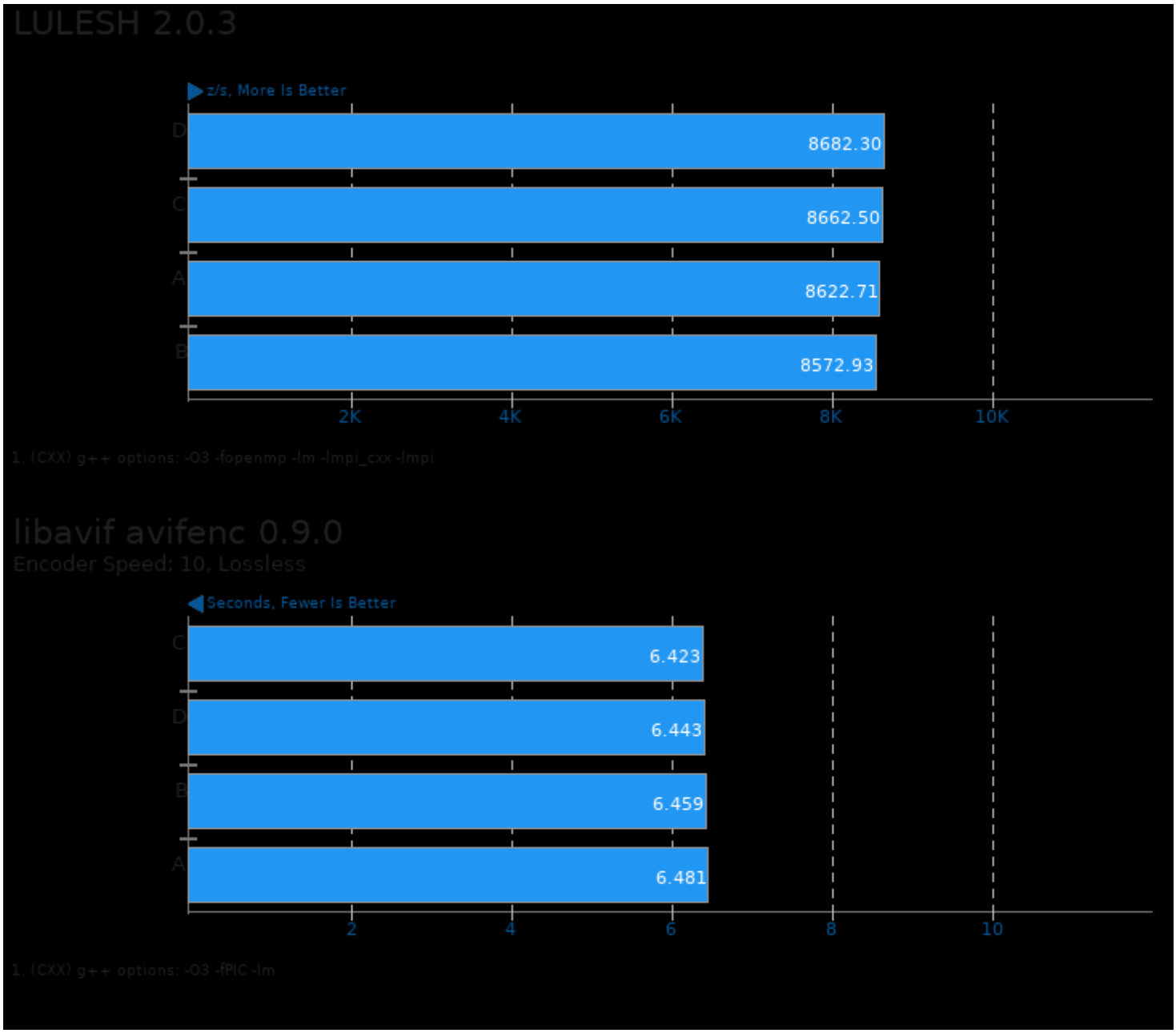
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm

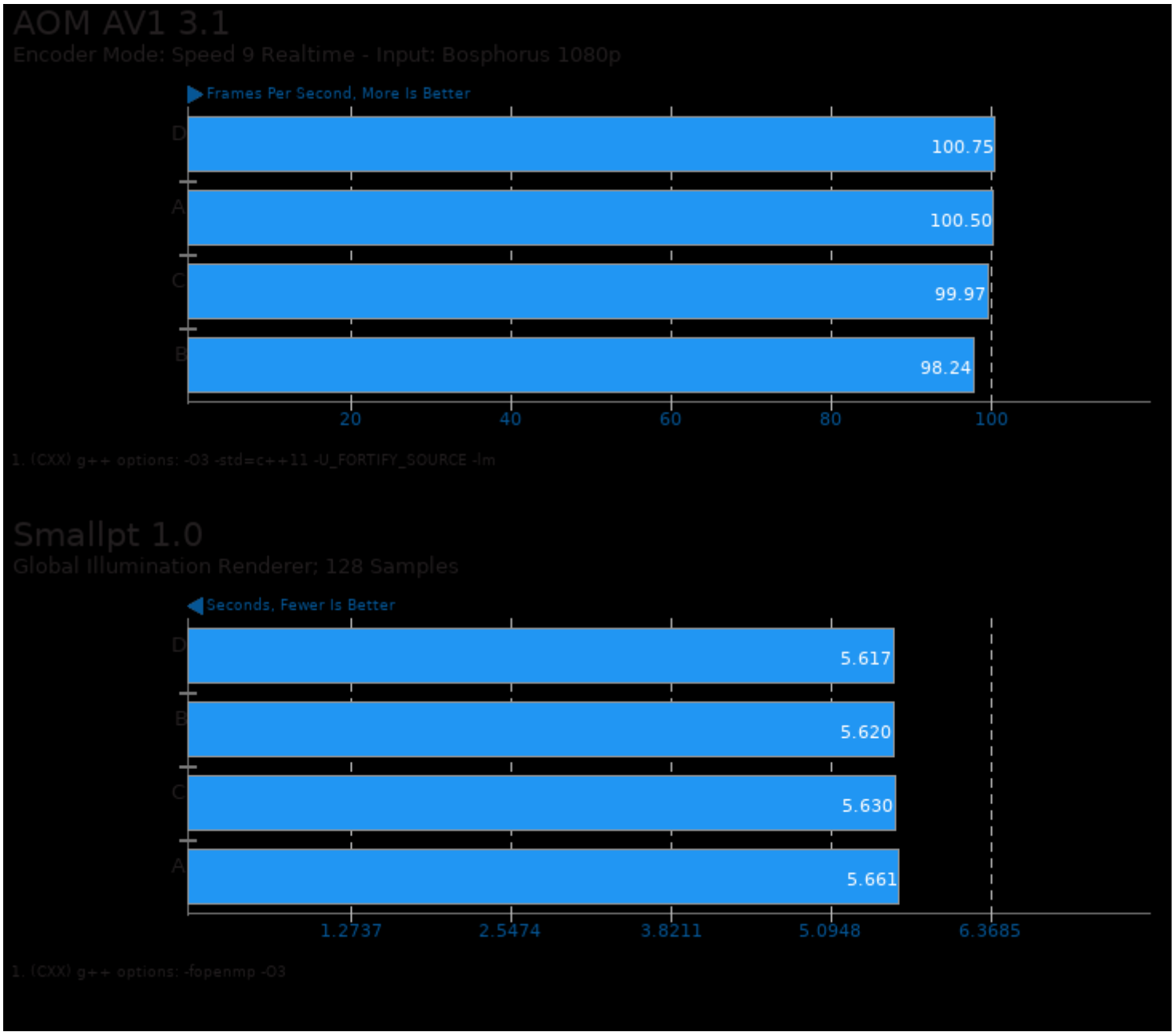
dav1d 0.9.2

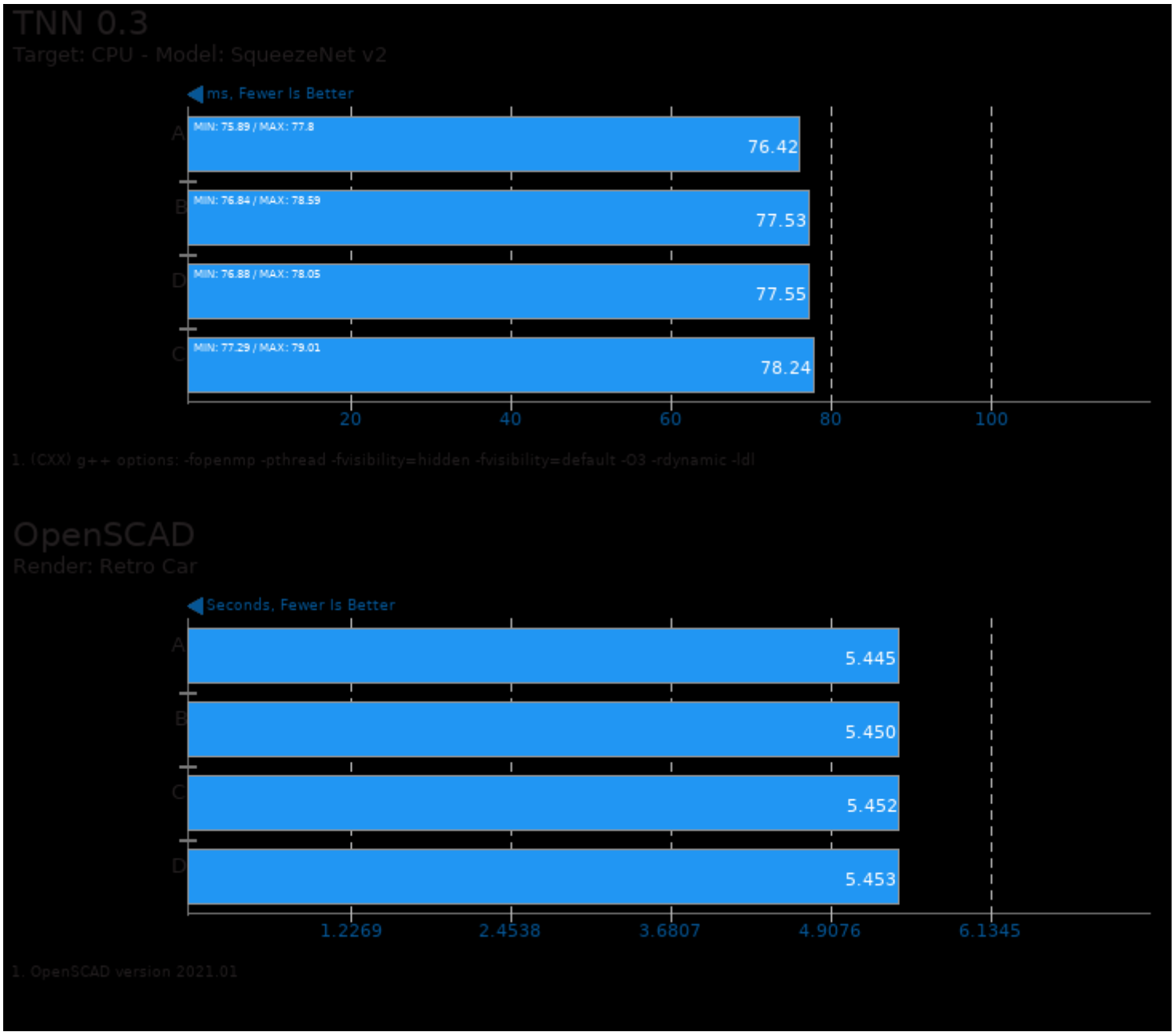
Video Input: Summer Nature 1080p

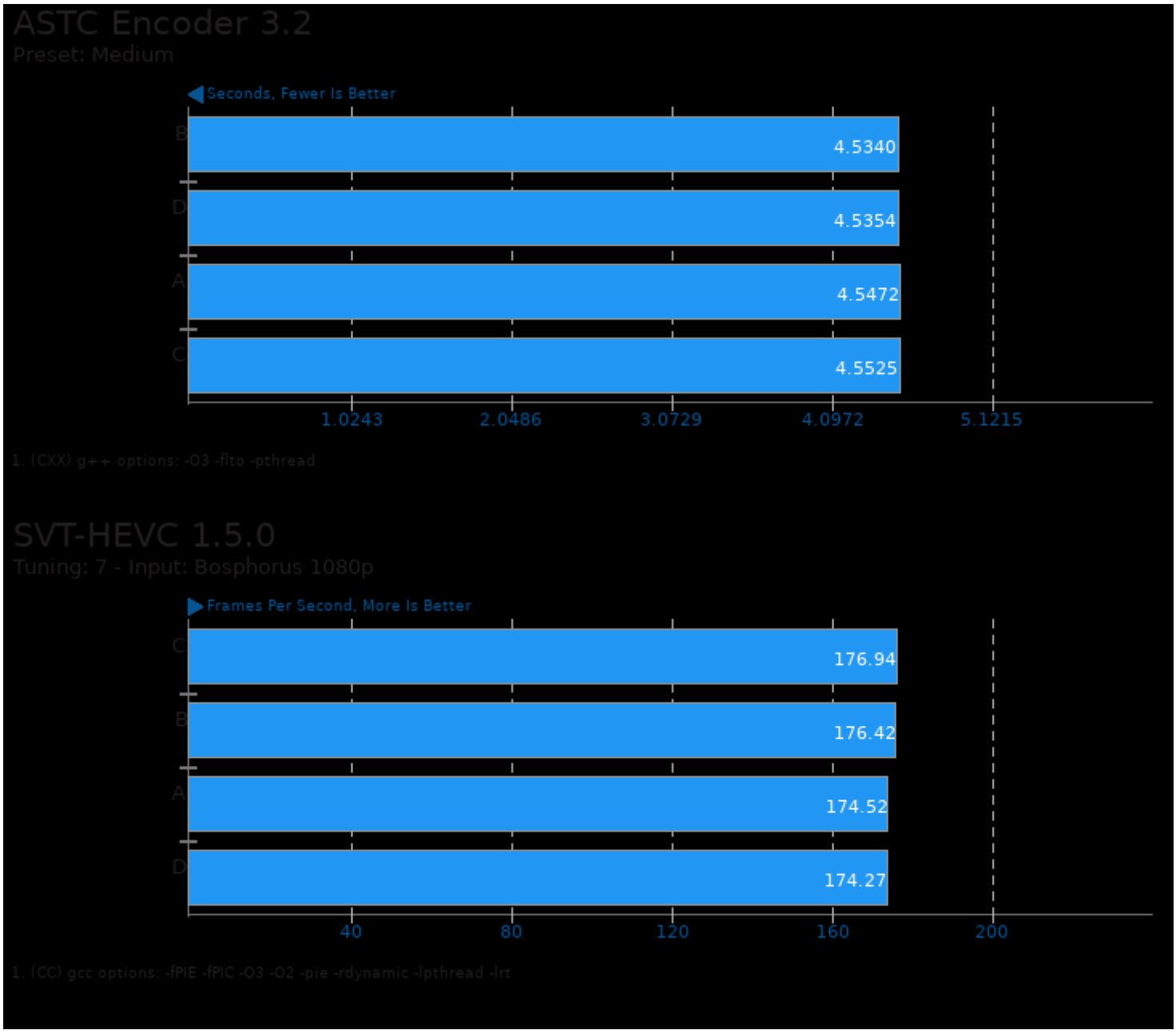


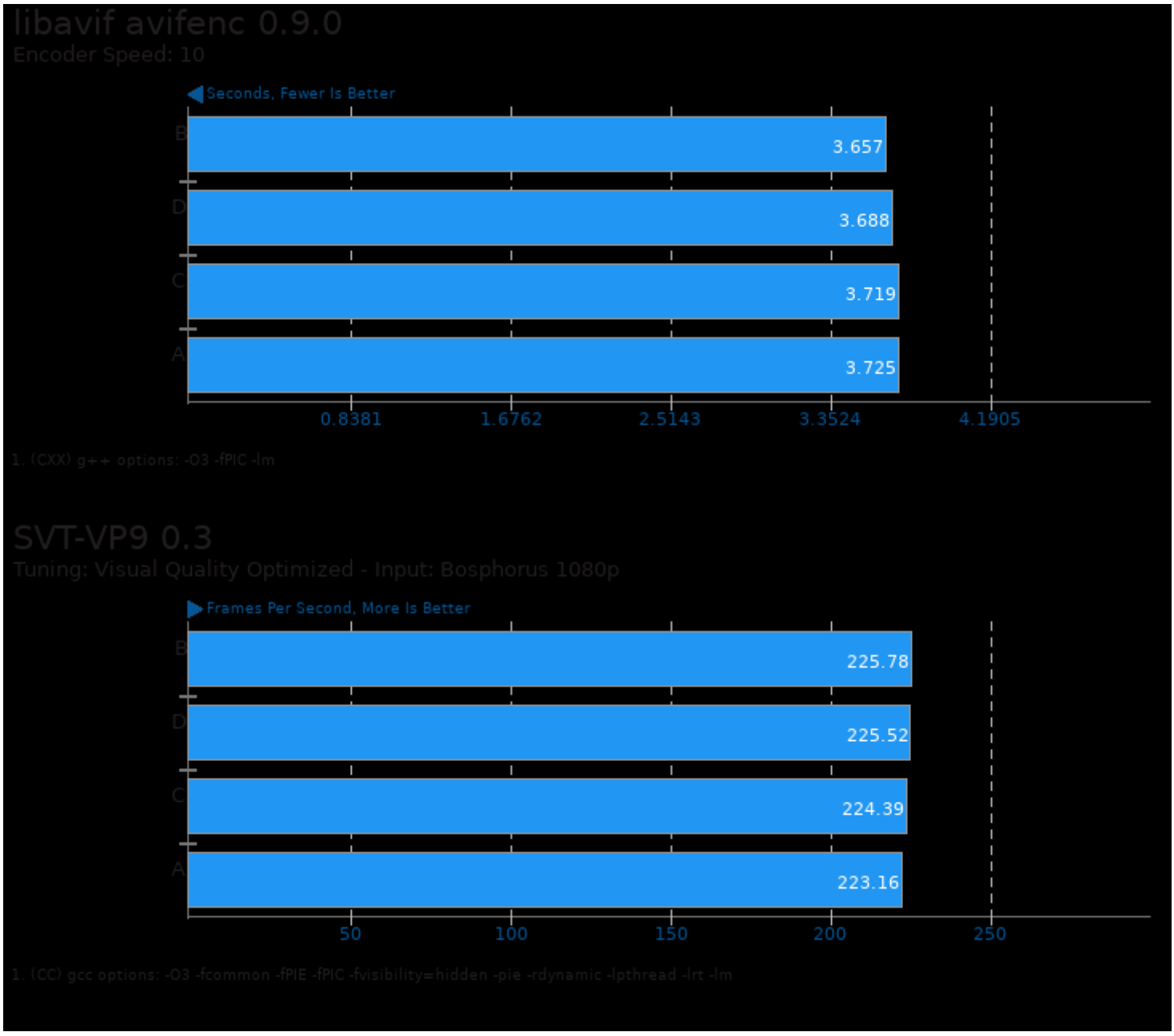
1. (CC) gcc options: -pthread -lm

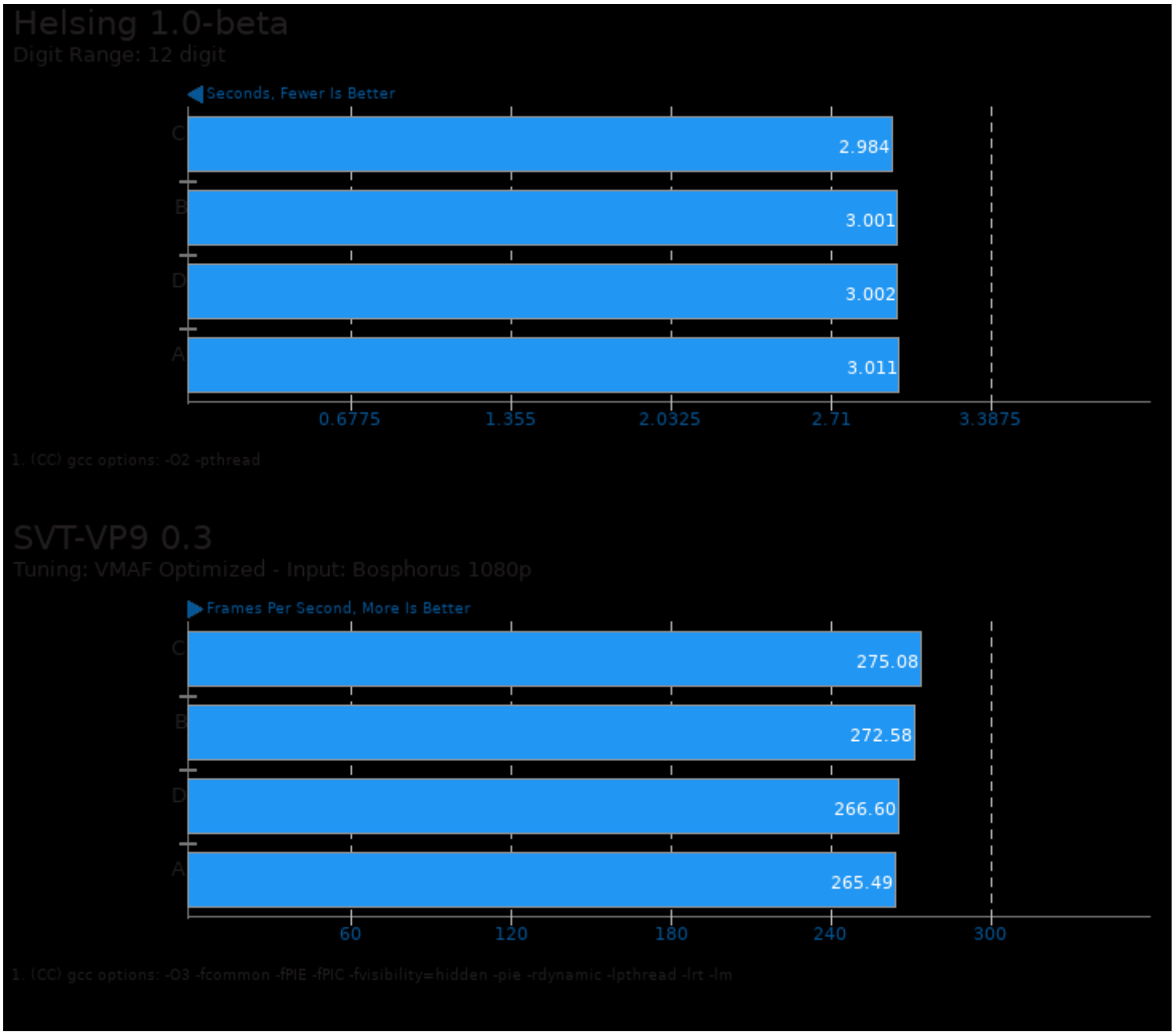

LULESH 2.0.3
z/s, More Is Better
D
C
A
B
8682.30
8662.50
8622.71
8572.93
2K
4K
6K
8K
10K
1. (CXX) g++ options: -O3 -fopenmp -lm -lmpi_cxx -lmpi
libavif avifenc 0.9.0
Encoder Speed: 10, Lossless
Seconds, Fewer Is Better
C
D
B
A
6.423
6.443
6.459
6.481
2
4
6
8
10
1. (CXX) g++ options: -O3 -fPIC -lm


AOM AV1 3.1
Encoder Mode: Speed 9 Realtime - Input: Bosphorus 1080p
Frames Per Second, More Is Better
D
A
C
B
100.75
100.50
99.97
98.24
20
40
60
80
100
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm
Smallpt 1.0
Global Illumination Renderer; 128 Samples
Seconds, Fewer Is Better
D
B
C
A
5.617
5.620
5.630
5.661
1.2737
2.5474
3.8211
5.0948
6.3685
1. (CXX) g++ options: -fopenmp -O3


TNN 0.3
Target: CPU - Model: SqueezeNet v2
ms, Fewer Is Better
A
MIN: 75.89 / MAX: 77.8
76.42
B
MIN: 76.84 / MAX: 78.59
77.53
D
MIN: 76.88 / MAX: 78.05
77.55
C
MIN: 77.29 / MAX: 79.01
78.24
20
40
60
80
100
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -fvisibility=default -O3 -rdynamic -ldl
OpenSCAD
Render: Retro Car
Seconds, Fewer Is Better
A
5.445
B
5.450
C
5.452
D
5.453
1.2269
2.4538
3.6807
4.9076
6.1345
1. OpenSCAD version 2021.01

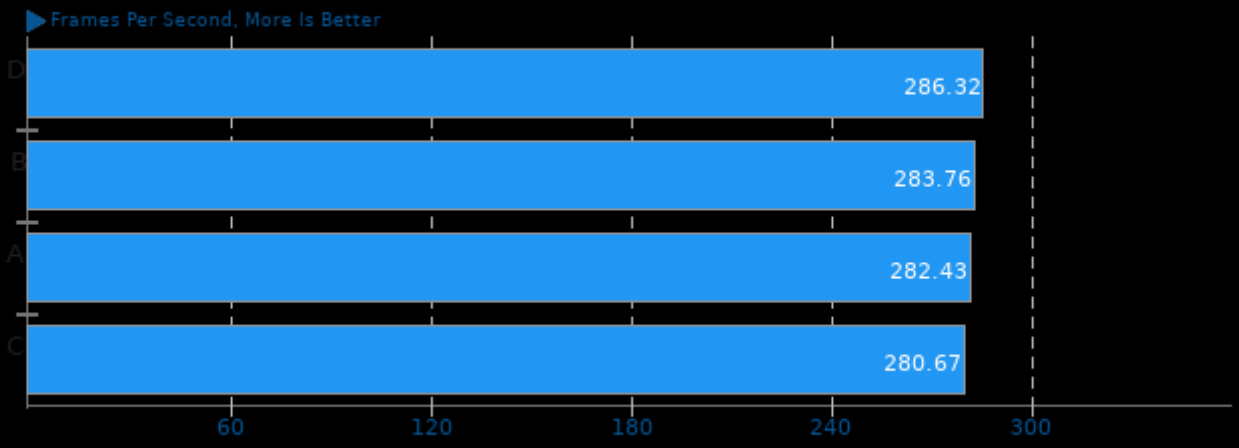

ASTC Encoder 3.2
Preset: Medium
Seconds, Fewer Is Better
B
D
A
C
4.5340
4.5354
4.5472
4.5525
1.0243
2.0486
3.0729
4.0972
5.1215
1. (CXX) g++ options: -O3 -flto -pthread
SVT-HEVC 1.5.0
Tuning: 7 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
C
B
A
D
176.94
176.42
174.52
174.27
40
80
120
160
200
1. (CC) gcc options: -fPIE -fPIC -O3 -O2 -pie -rdynamic -lpthread -lrt


libavif avifenc 0.9.0
Encoder Speed: 10
Seconds, Fewer Is Better
B
D
C
A
3.657
3.688
3.719
3.725
0.8381
1.6762
2.5143
3.3524
4.1905
1. (CXX) g++ options: -O3 -fPIC -lm
SVT-VP9 0.3
Tuning: Visual Quality Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
B
D
C
A
225.78
225.52
224.39
223.16
50
100
150
200
250
1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm


Helsing 1.0-beta
Digit Range: 12 digit
Seconds, Fewer Is Better
C
2.984
B
3.001
D
3.002
A
3.011
0.6775
1.355
2.0325
2.71
3.3875
1. (CC) gcc options: -O2 -pthread
SVT-VP9 0.3
Tuning: VMAF Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
C
275.08
B
272.58
D
266.60
A
265.49
60
120
180
240
300
1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm

SVT-VP9 0.3

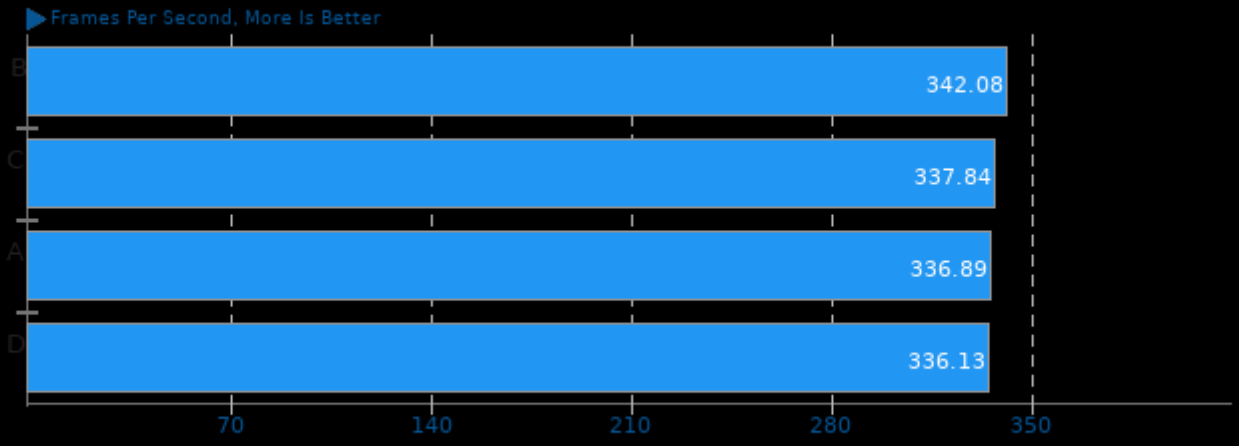
Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p



1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm

SVT-HEVC 1.5.0

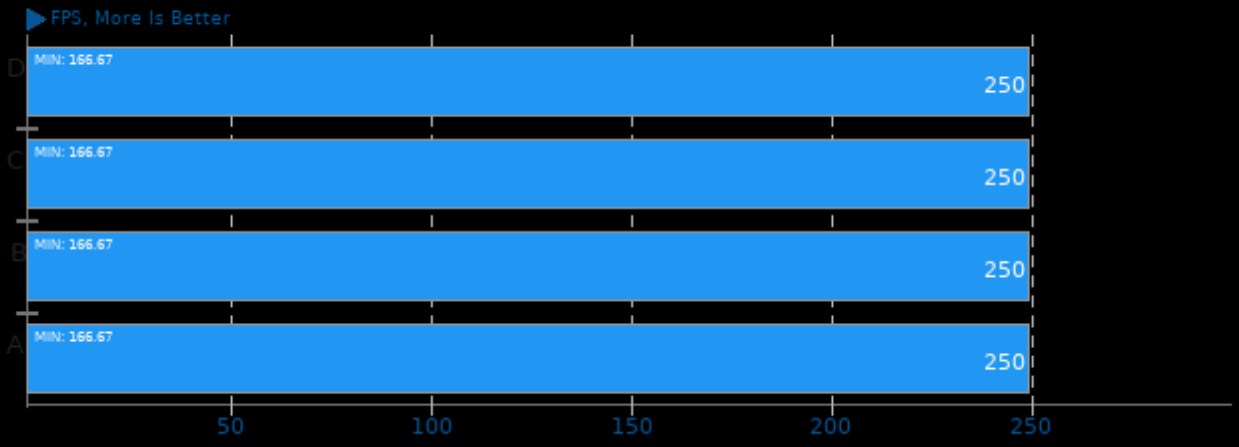
Tuning: 10 - Input: Bosphorus 1080p



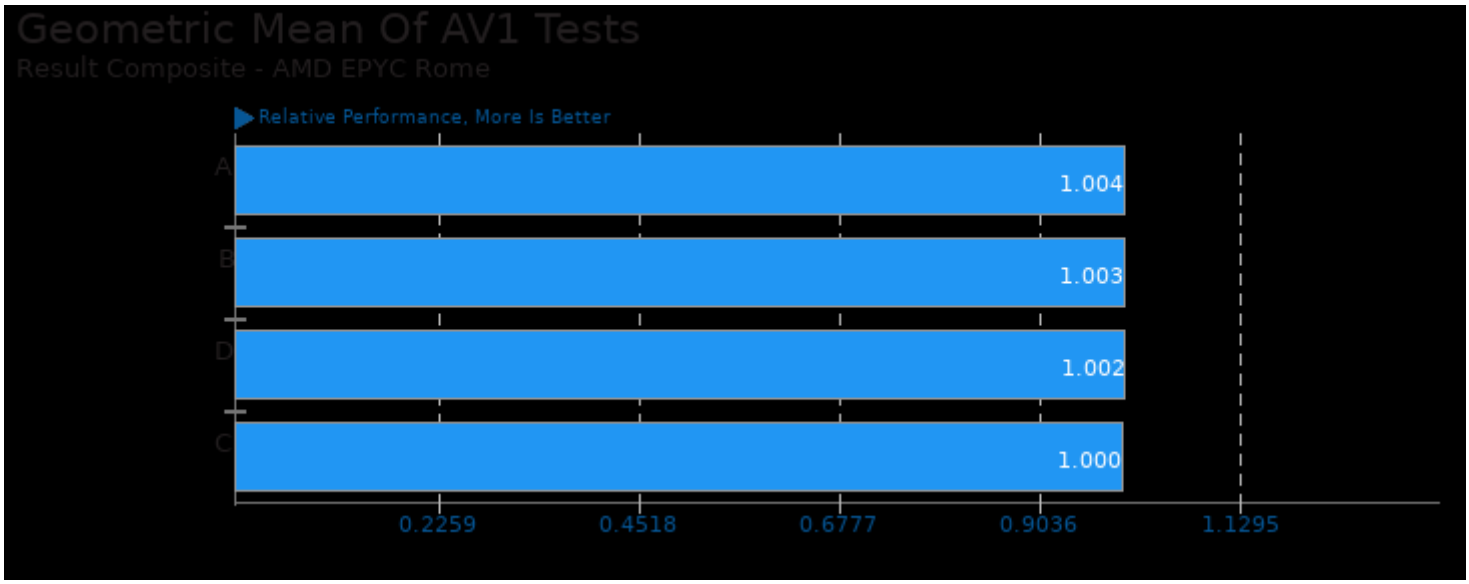
1. (CC) gcc options: -fPIE -fPIC -O3 -O2 -pie -rdynamic -lpthread -lrt

OSPray 1.8.5

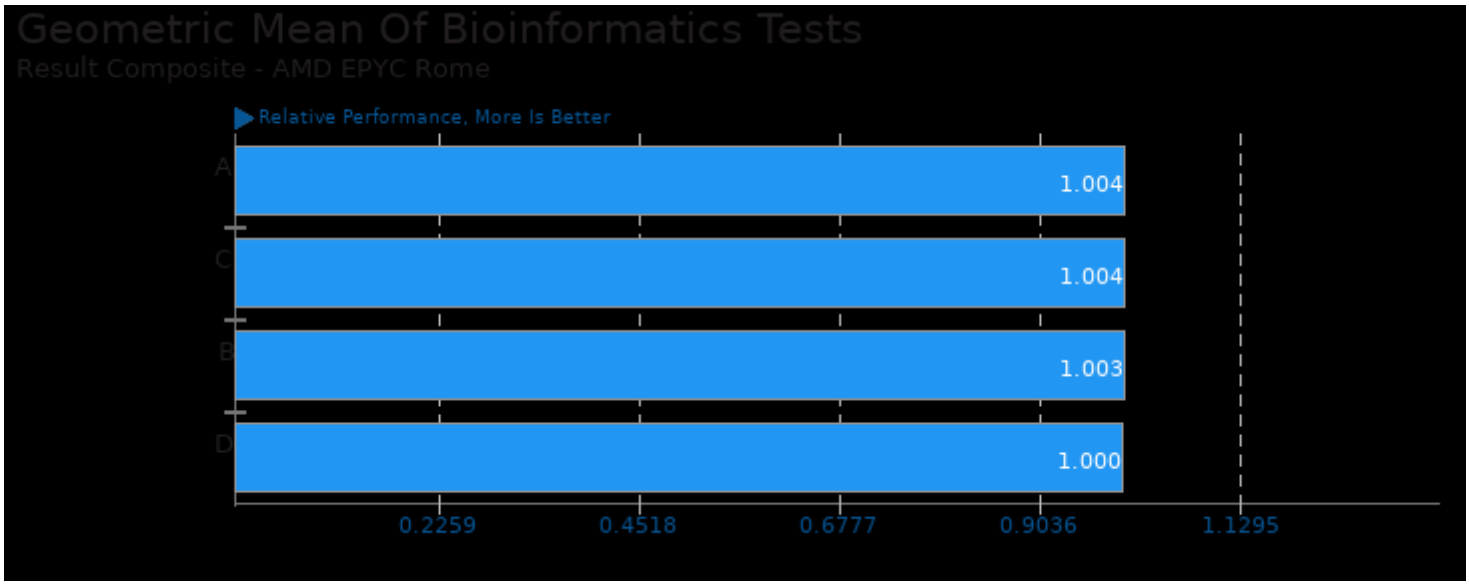
Demo: Magnetic Reconnection - Renderer: Path Tracer



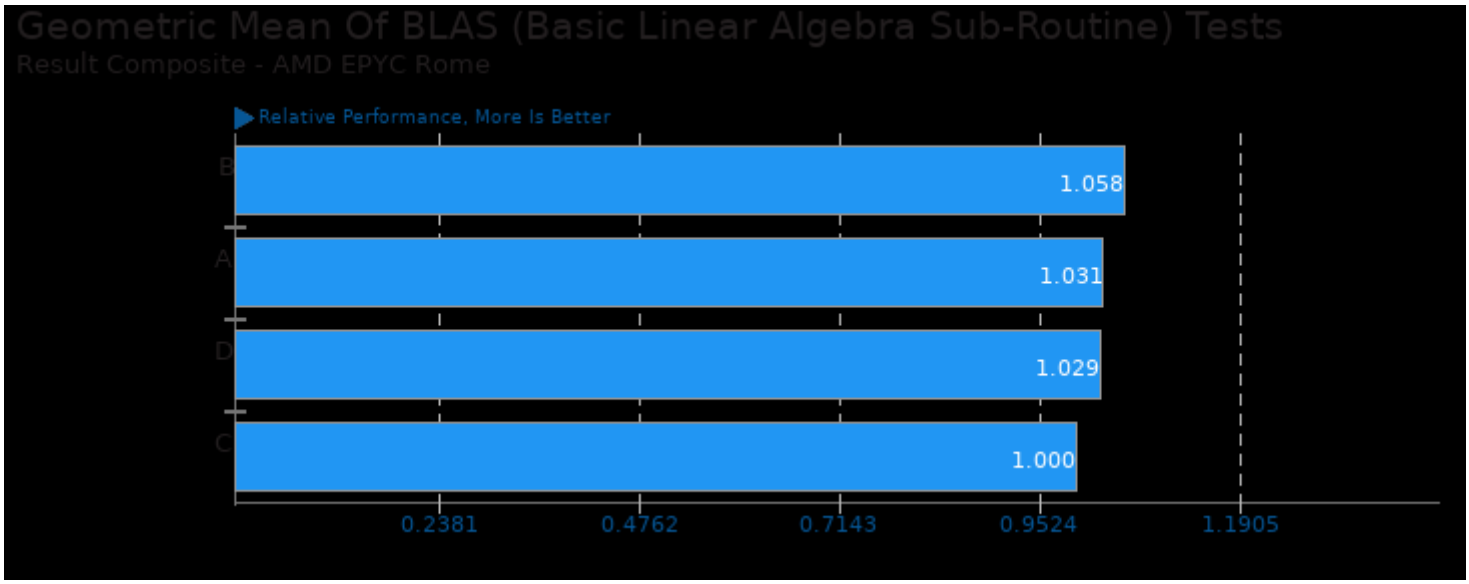
These geometric means are based upon test groupings / test suites for this result file.



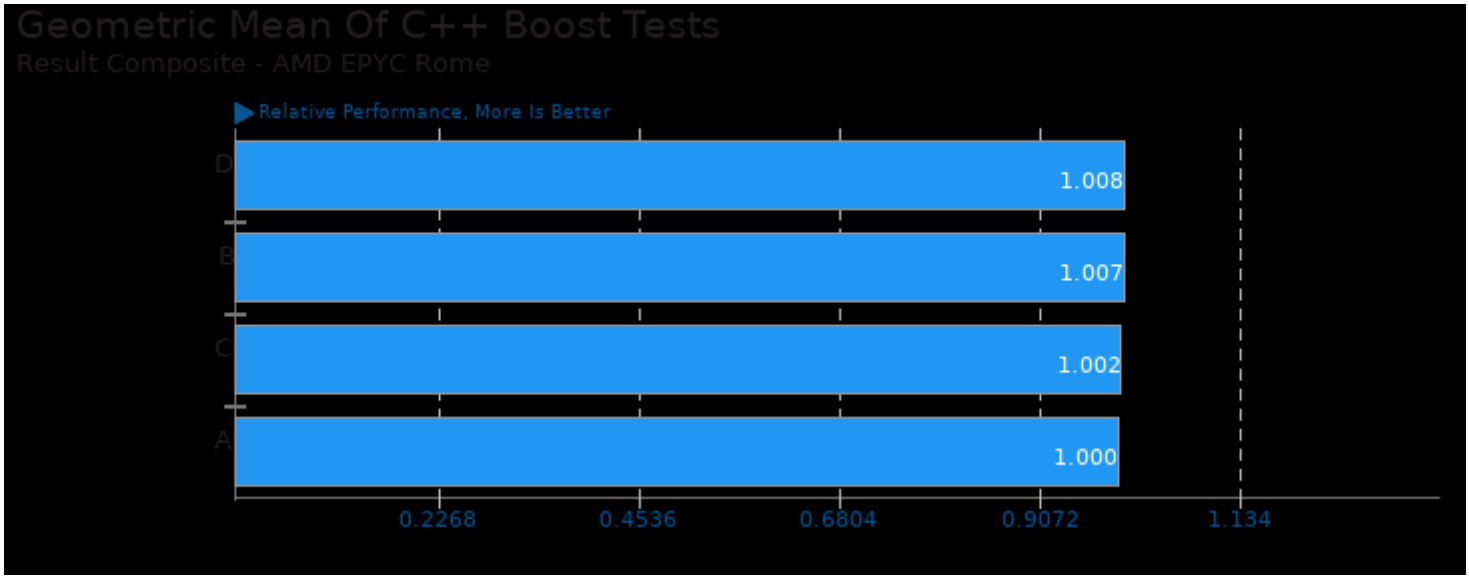
Geometric mean based upon tests: pts/dav1d, pts/aom-av1, pts/svt-av1 and pts/avifenc



Geometric mean based upon tests: pts/mrbayes and pts/hmmer



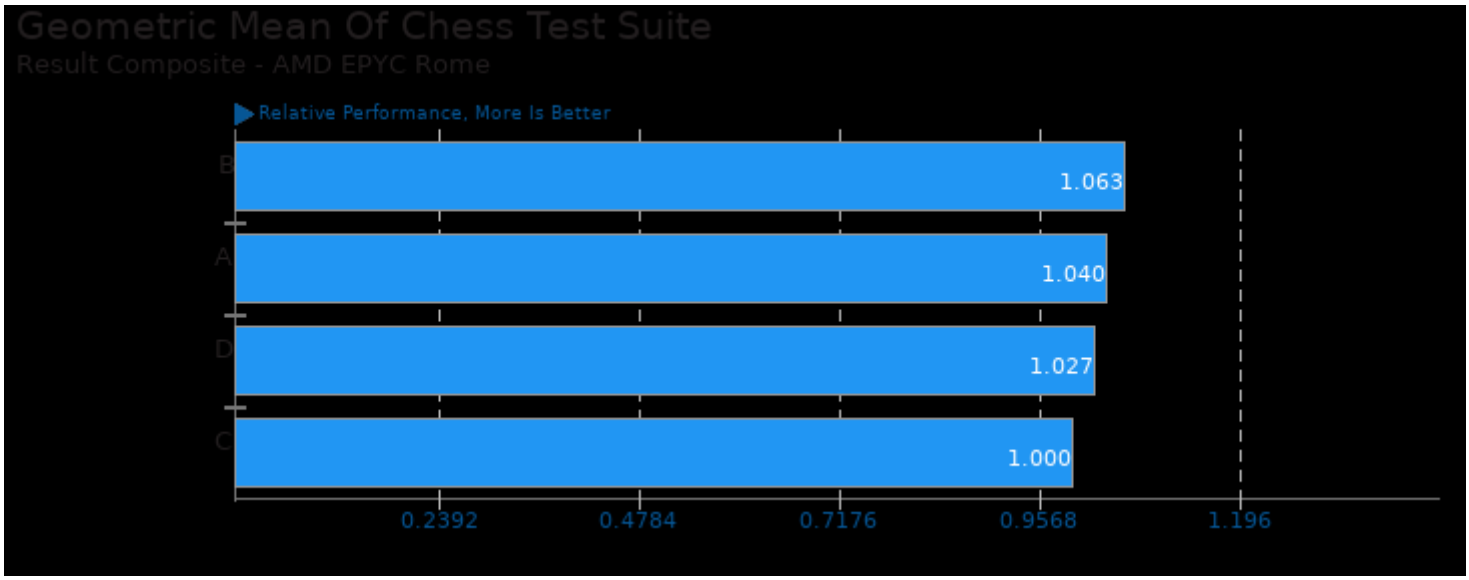
Geometric mean based upon tests: pts/nwchem, pts/lczero and pts/qe



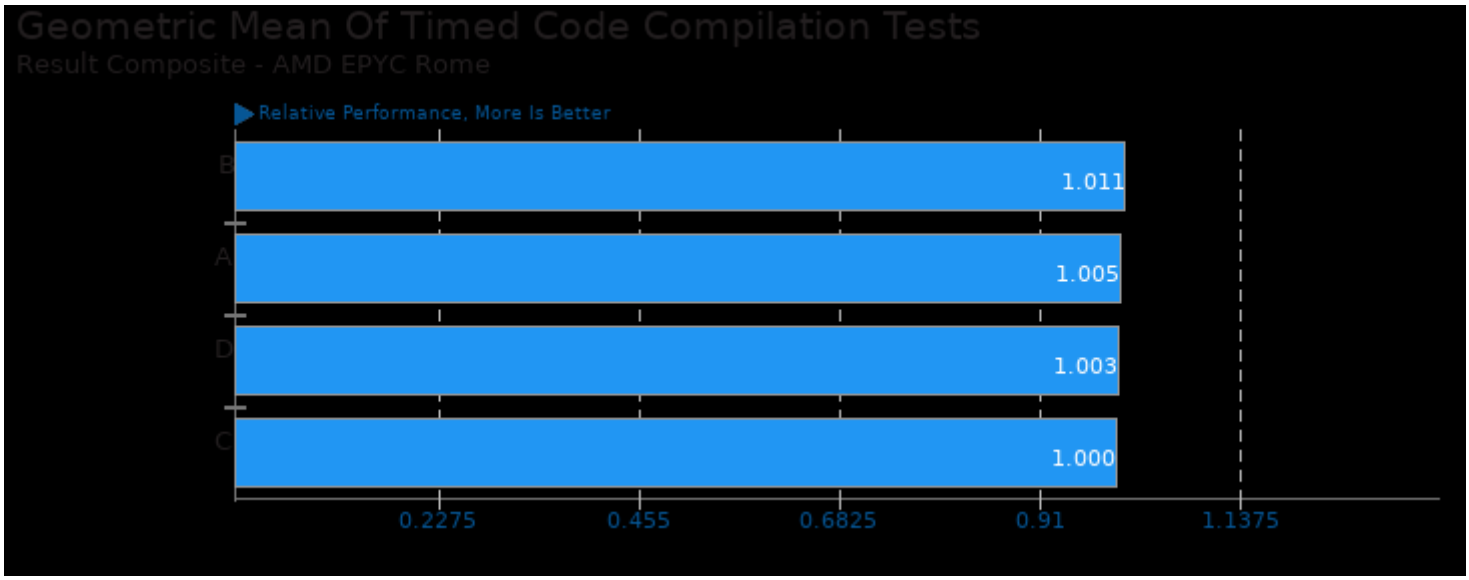
Geometric mean based upon tests: pts/openfoam, pts/chia-vdf and pts/quantlib



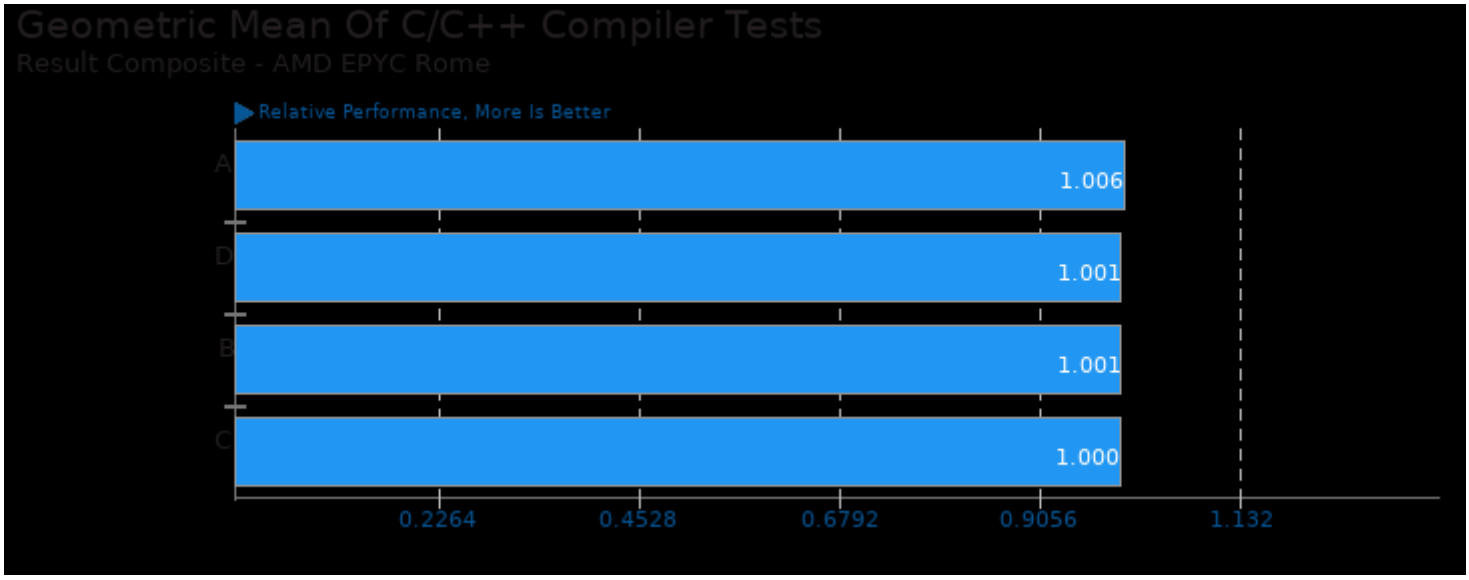
Geometric mean based upon tests: system/openscad and pts/brl-cad



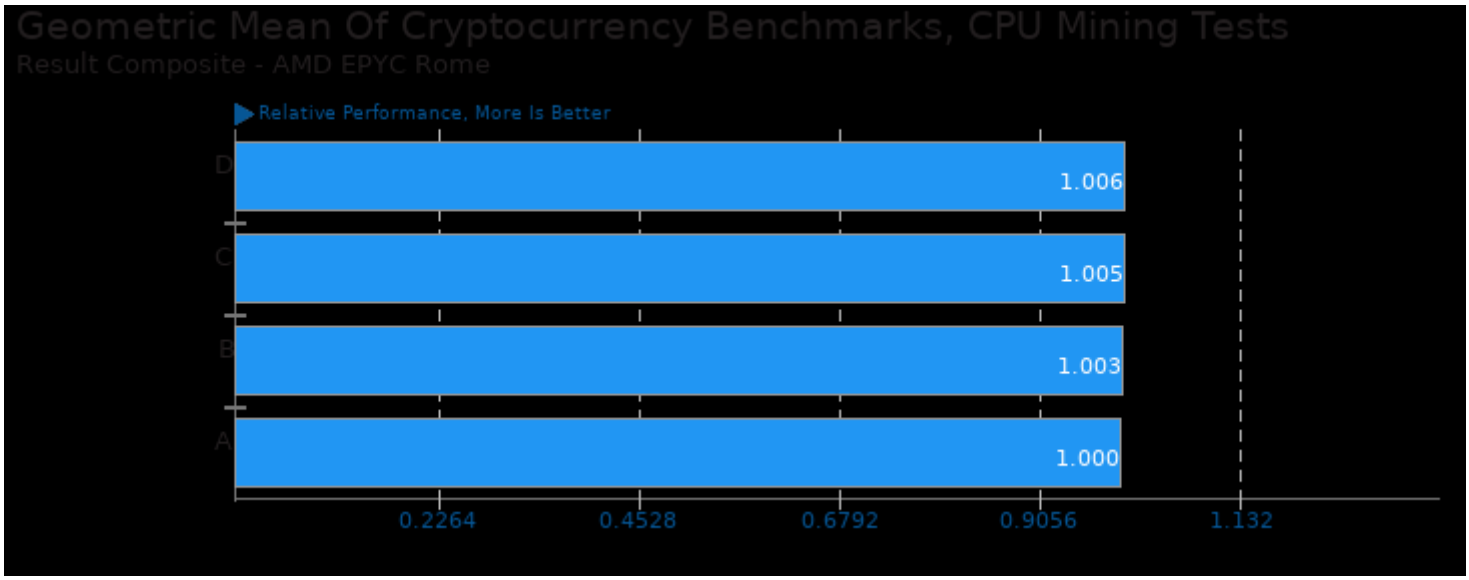
Geometric mean based upon tests: pts/lczero, pts/stockfish and pts/asmfish



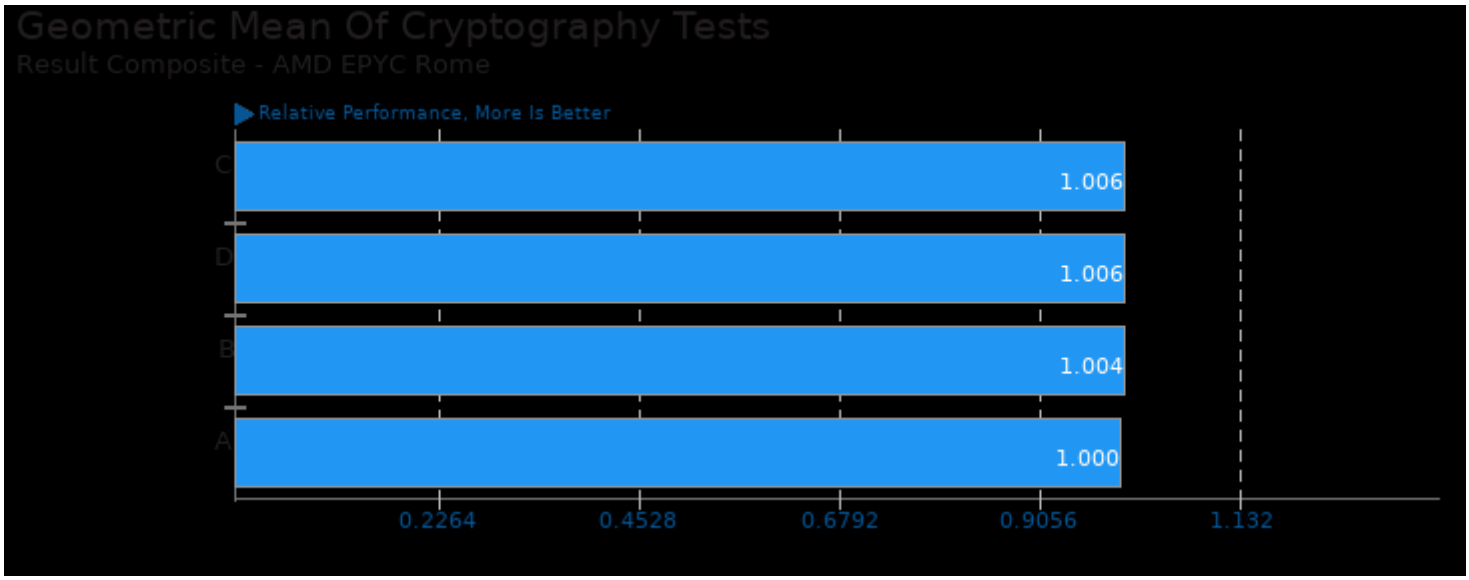
Geometric mean based upon tests: pts/build-linux-kernel, pts/build-gcc, pts/build-llvm, pts/build-ffmpeg, pts/build-godot, pts/build-erlang, pts/build-wasmer and pts/build-mesa



Geometric mean based upon tests: pts/vpxenc, pts/stockfish, pts/hmmer, pts/build-llvm, pts/c-ray, pts/encode-flac, pts/pgbench, pts/apache, pts/mrbayes, pts/dav1d, pts/openssl, pts/nginx, pts/aom-av1, pts/svt-av1, pts/svt-vp9 and pts/build-ffmpeg



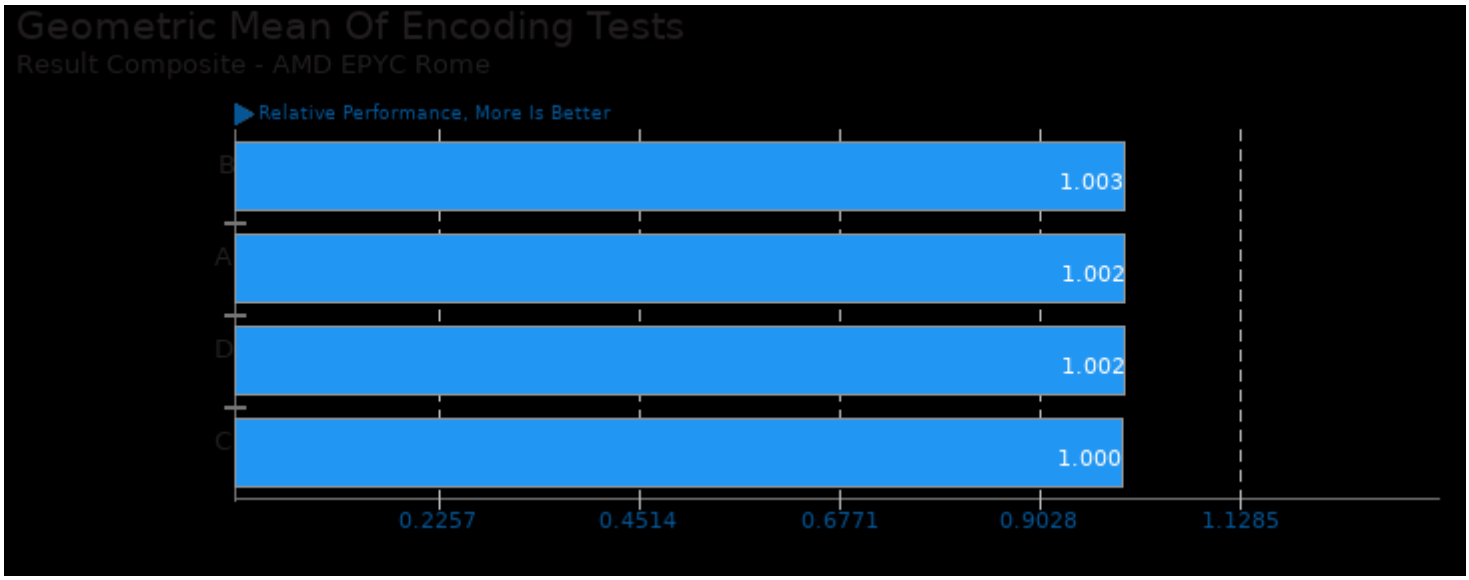
Geometric mean based upon tests: pts/cpuminer-opt, pts/xmrig and pts/chia-vdf



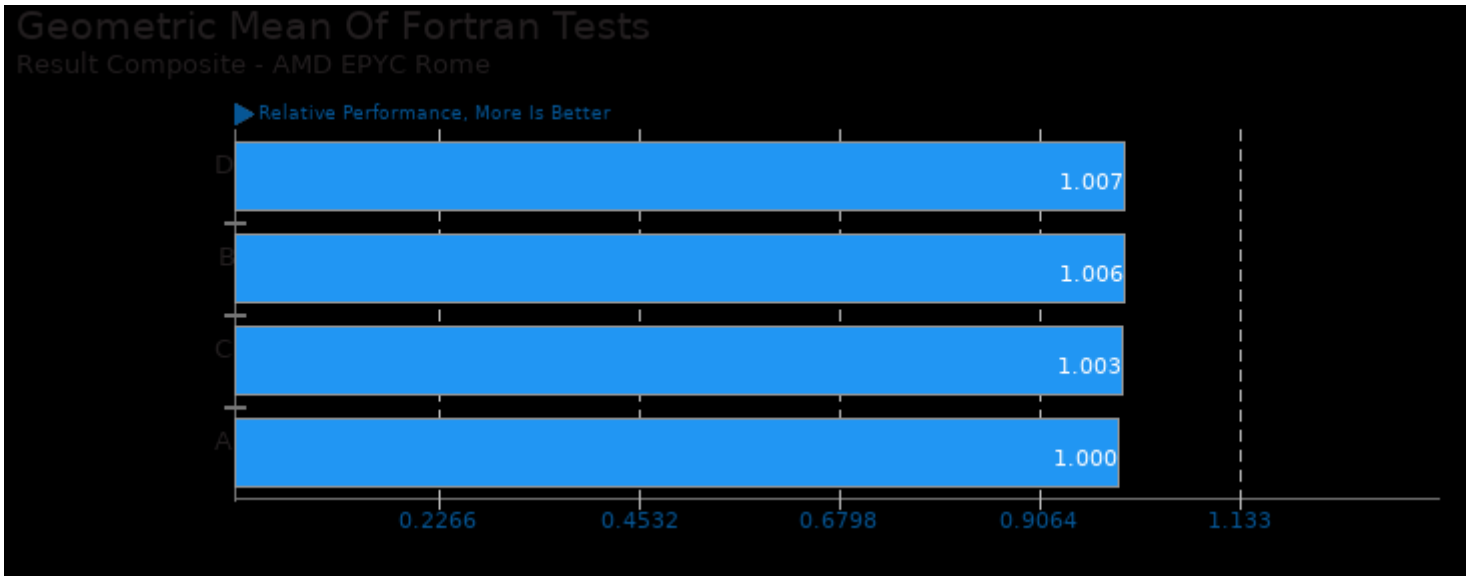
Geometric mean based upon tests: pts/openssl, pts/botan, pts/securemark, pts/cpuminer-opt, pts/xmrig and pts/chia-vdf



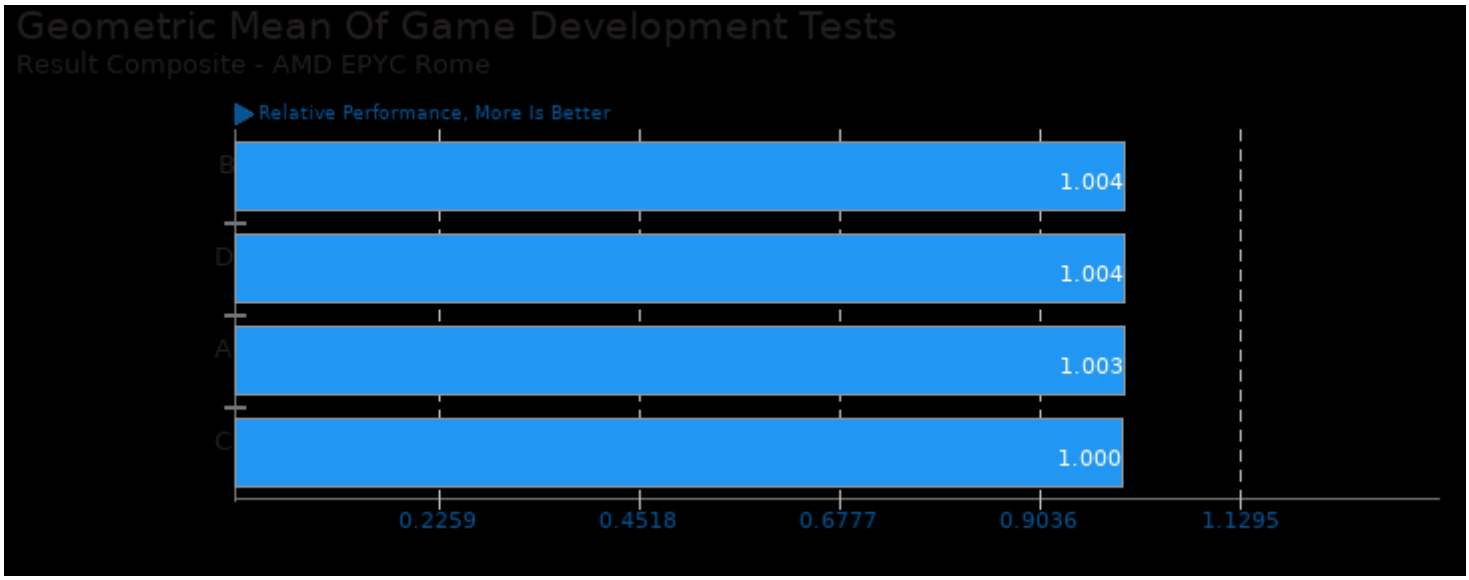
Geometric mean based upon tests: pts/redis, pts/rocksdb, pts/cassandra and pts/pgbench



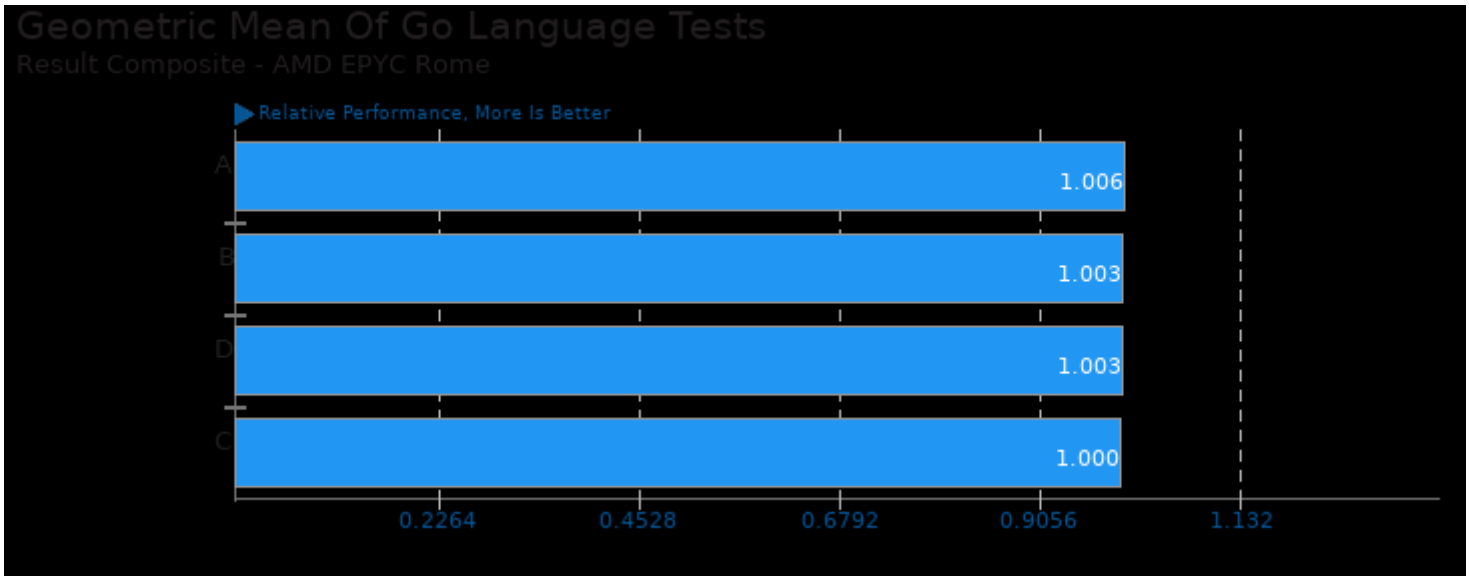
Geometric mean based upon tests: pts/encode-flac, pts/svt-vp9, pts/svt-hevc, pts/vpxenc, pts/dav1d, pts/aom-av1, pts/svt-av1 and pts/avifenc



Geometric mean based upon tests: pts/nwchem, pts/qe, pts/hpcg, pts/incompact3d and pts/cloverleaf



Geometric mean based upon tests: pts/astcenc, pts/build-godot, pts/blender, pts/oidn and pts/openvkl



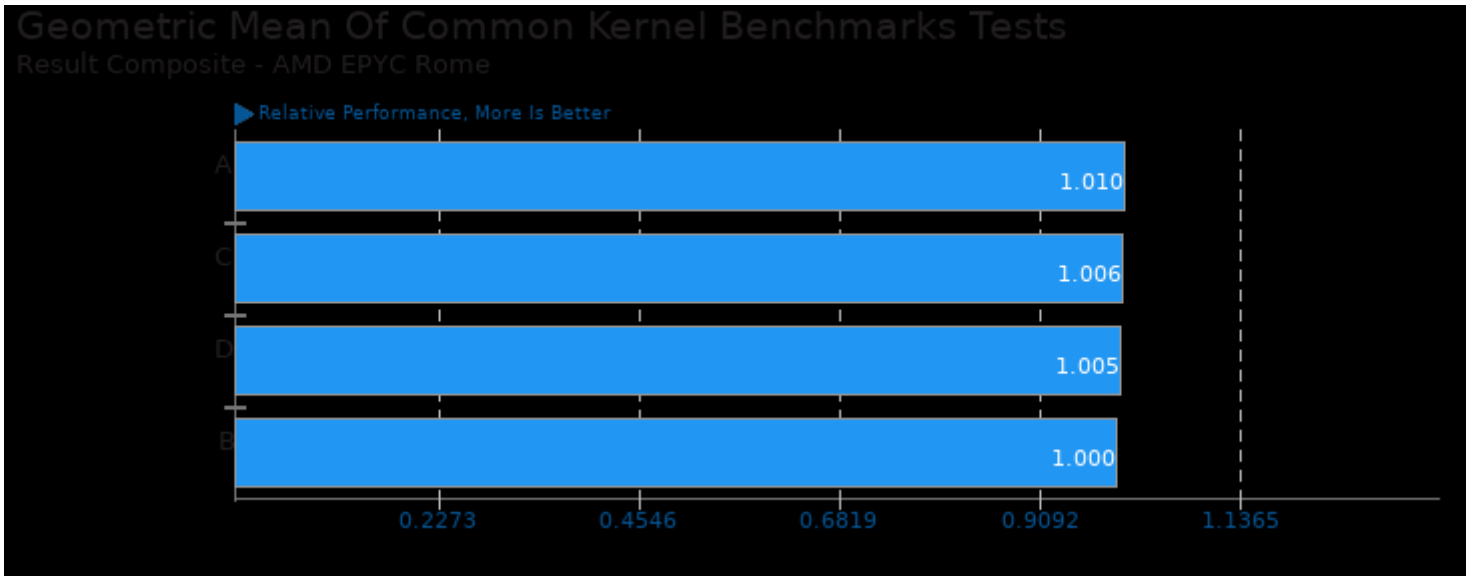
Geometric mean based upon tests: pts/apache and pts/nginx



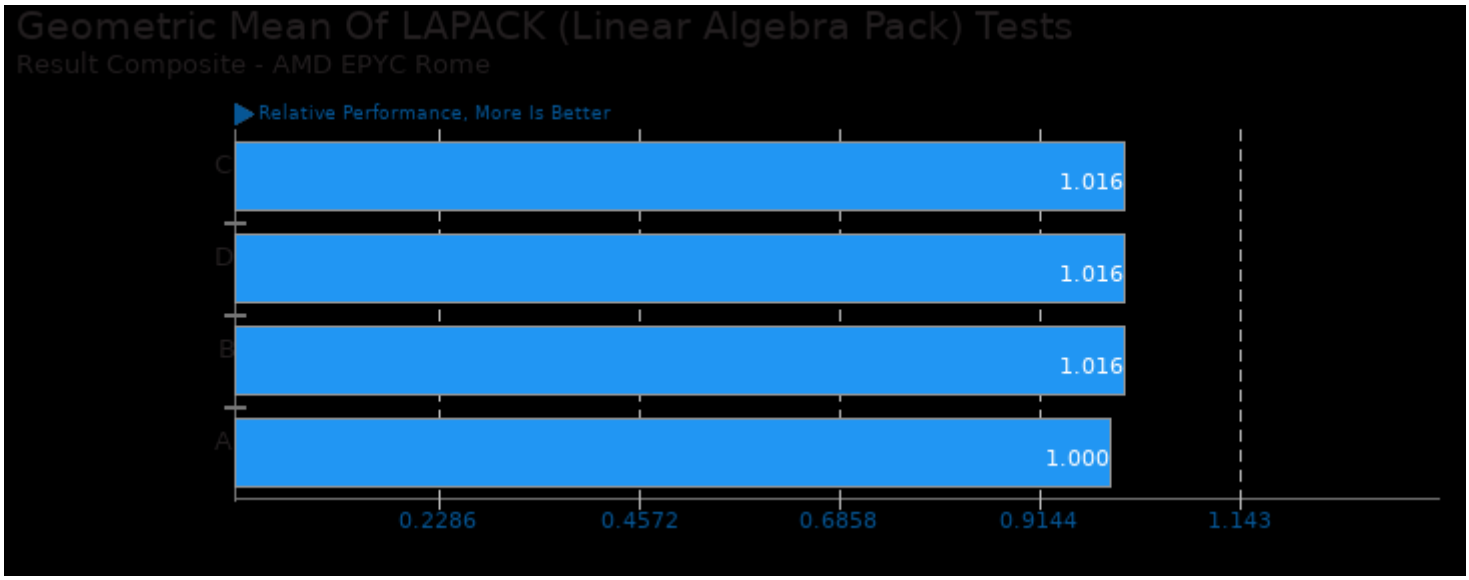
Geometric mean based upon tests: pts/jpegxl, pts/jpegxl-decode, pts/tjbench and pts/avifenc



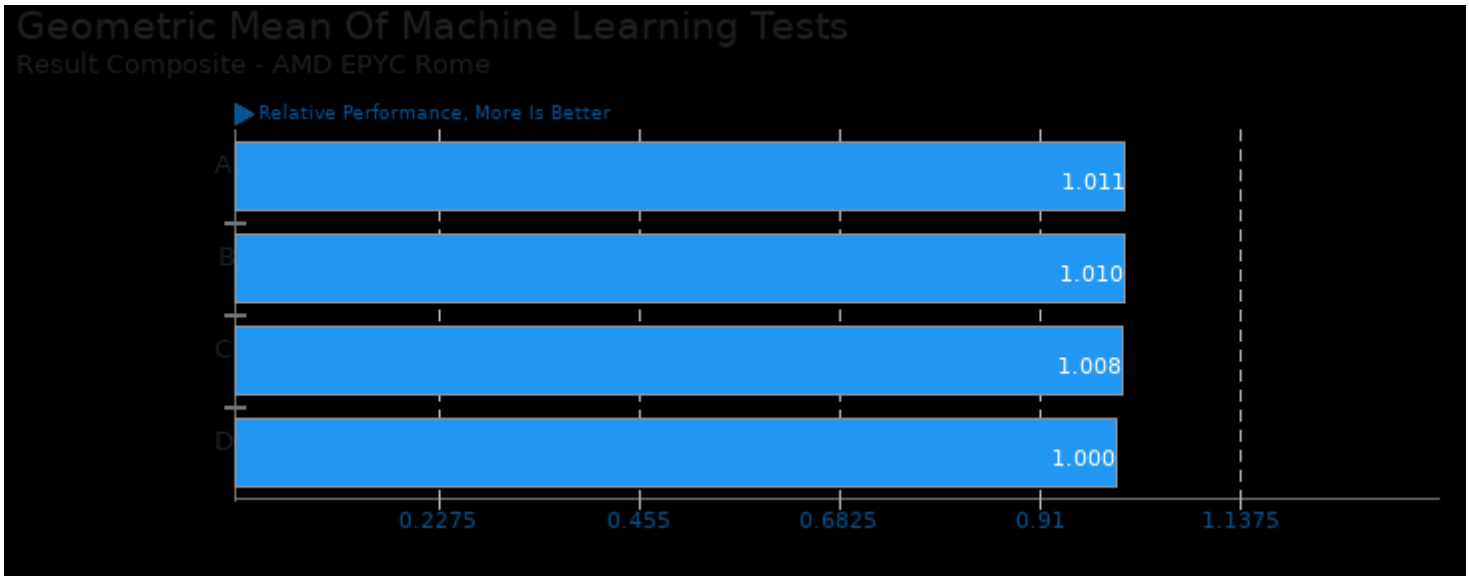
Geometric mean based upon tests: pts/renaissance and pts/cassandra



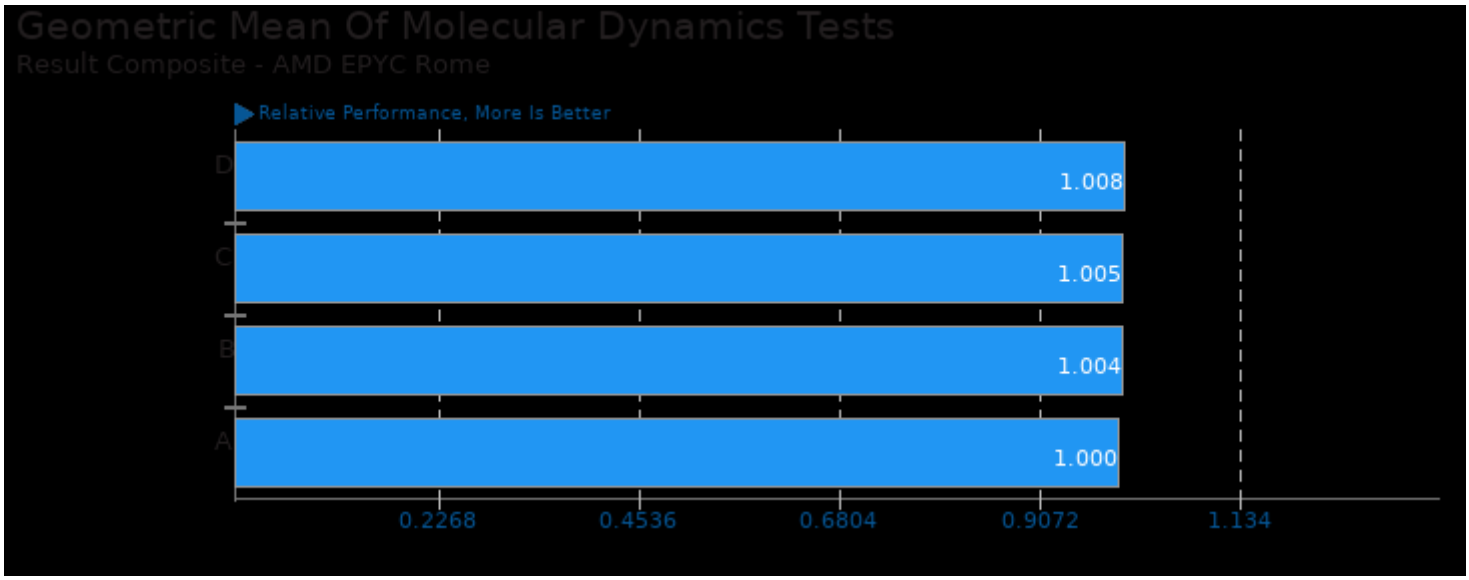
Geometric mean based upon tests: pts/apache, pts/pgbench, pts/openssl, pts/stress-ng and pts/rocksdb



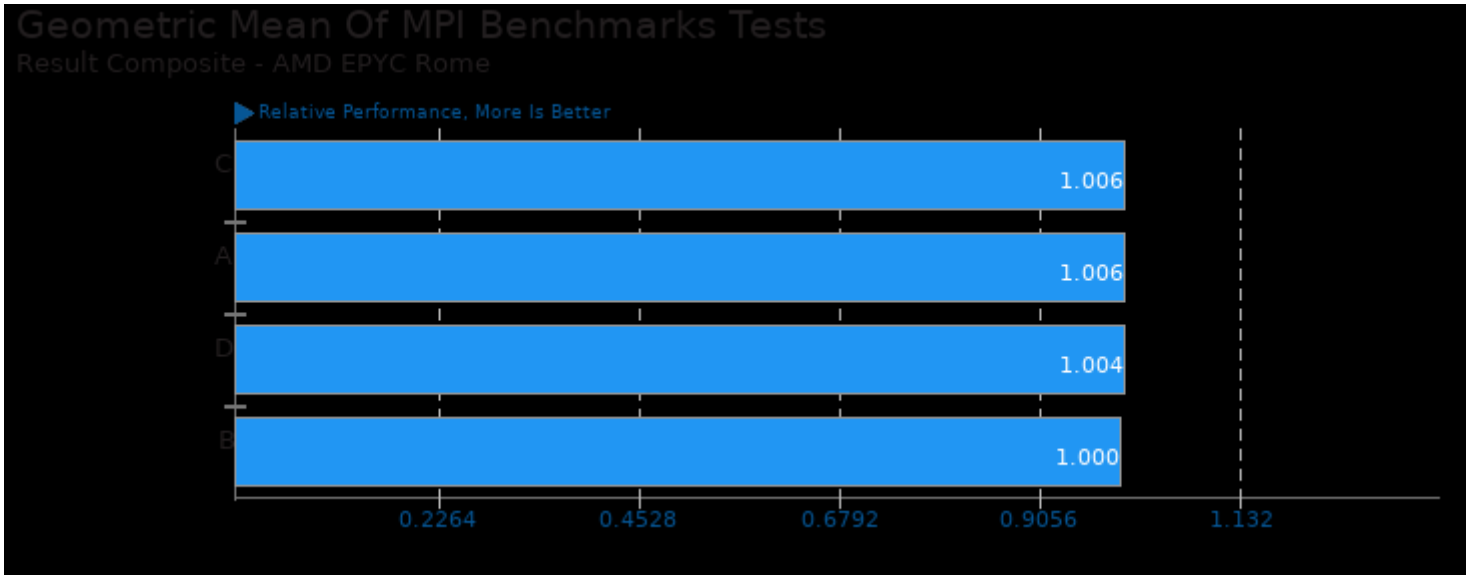
Geometric mean based upon tests: pts/nwchem and pts/qe



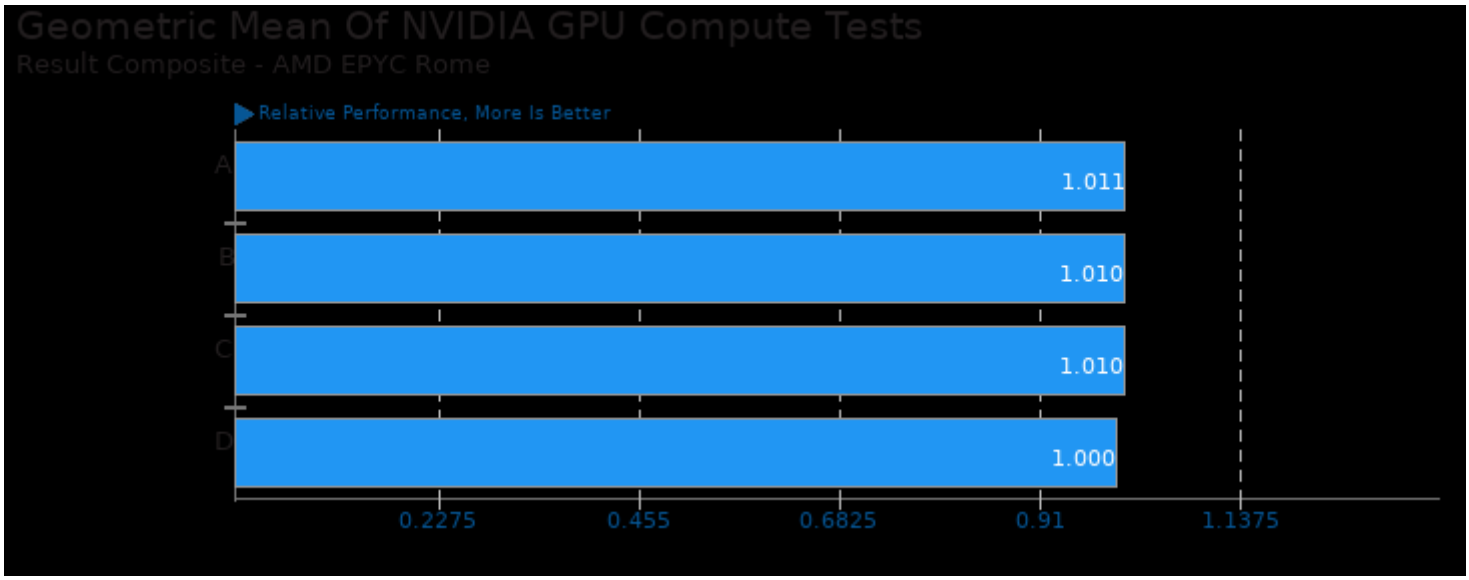
Geometric mean based upon tests: pts/mnn, pts/ncnn, pts/tnn, pts/numpy, pts/ecp-candle, pts/onnx and pts/lczero



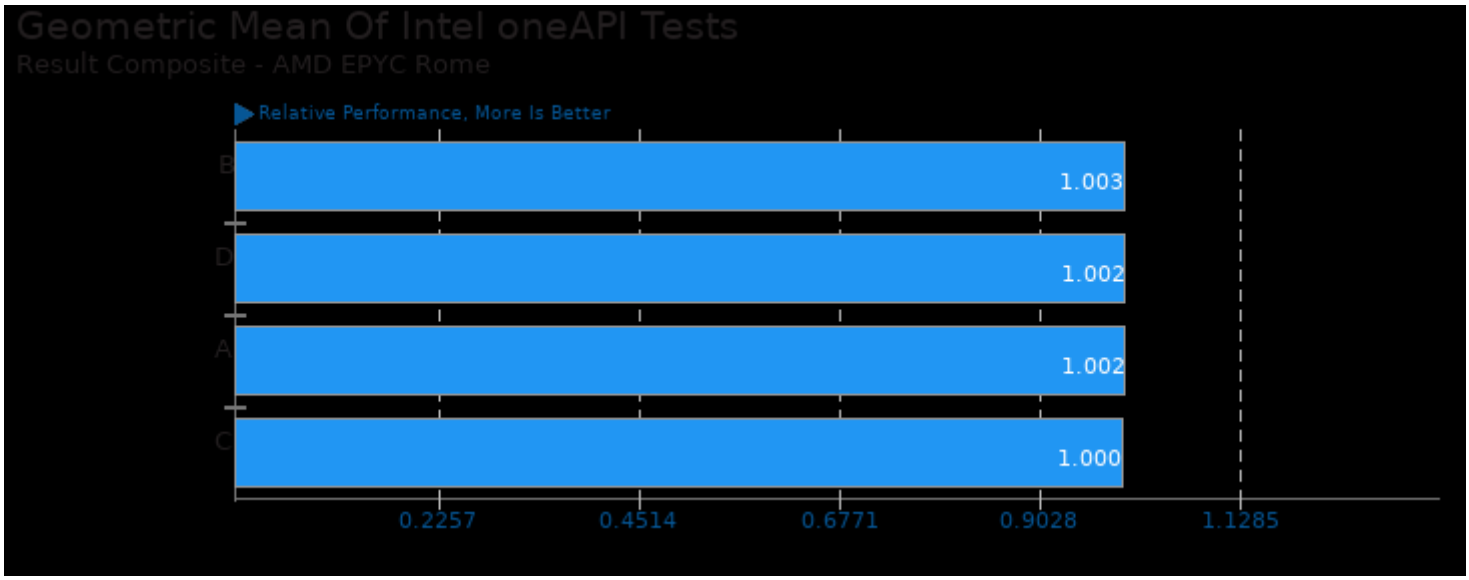
Geometric mean based upon tests: pts/namd, pts/nwchem, pts/cloverleaf, pts/lulesh, pts/pennant, pts/incompact3d and pts/openfoam



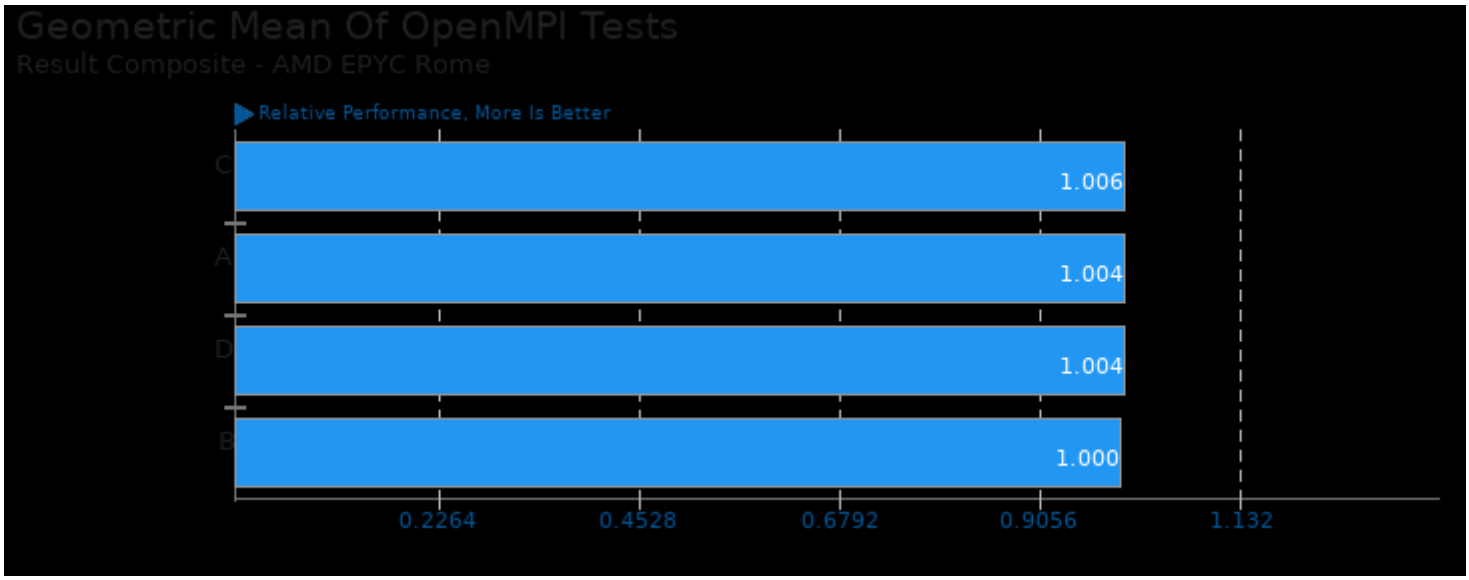
Geometric mean based upon tests: pts/askap, pts/incompact3d, pts/pennant, pts/hpcg and pts/mrbayes



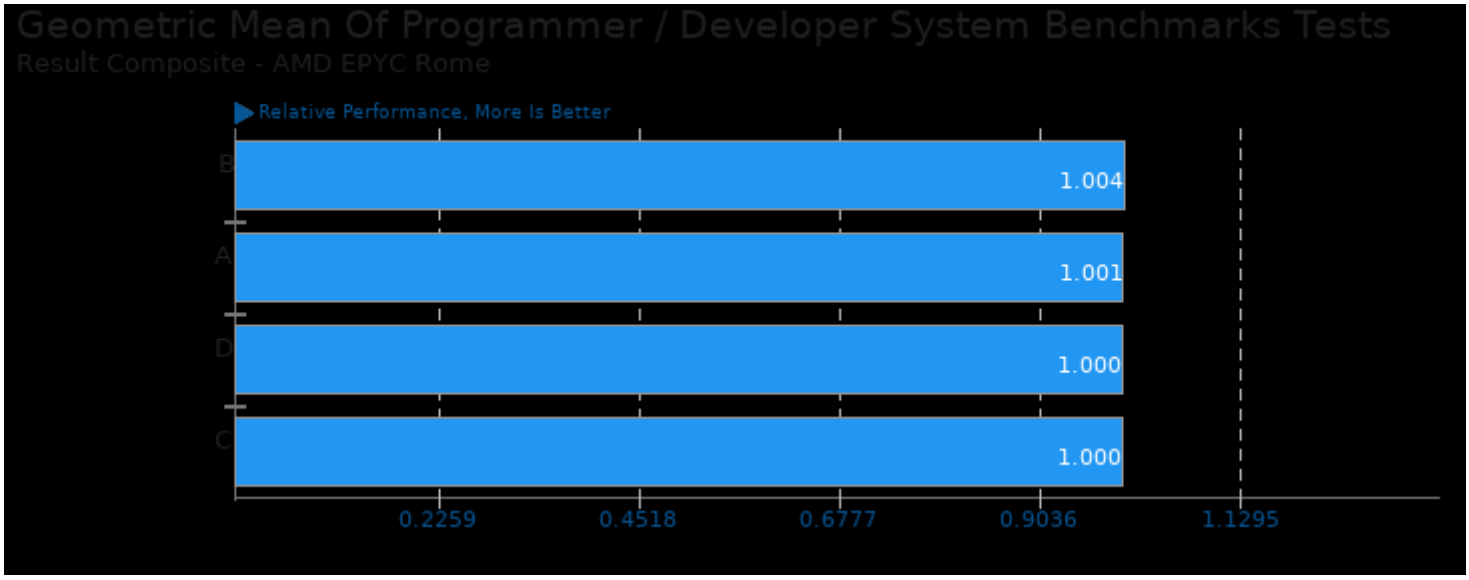
Geometric mean based upon tests: pts/luxcorerender, pts/lczero, pts/v-ray, pts/blender and pts/ncnn



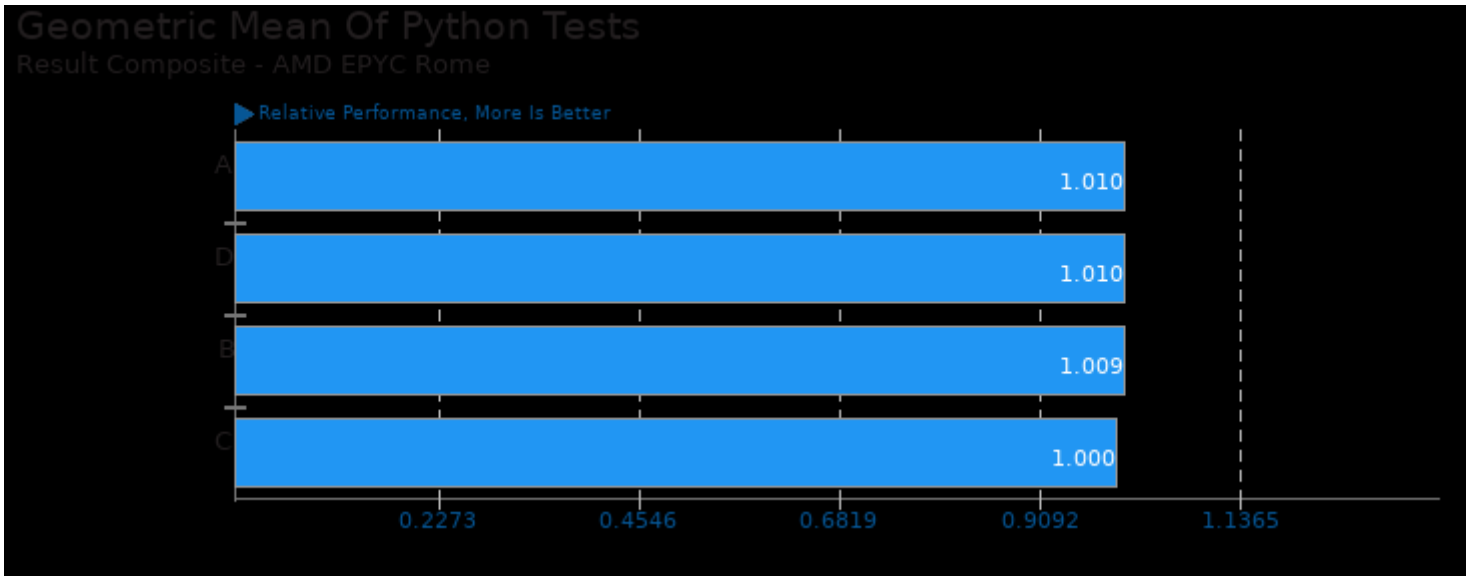
Geometric mean based upon tests: pts/embree, pts/oidn, pts/ospray and pts/openvkl



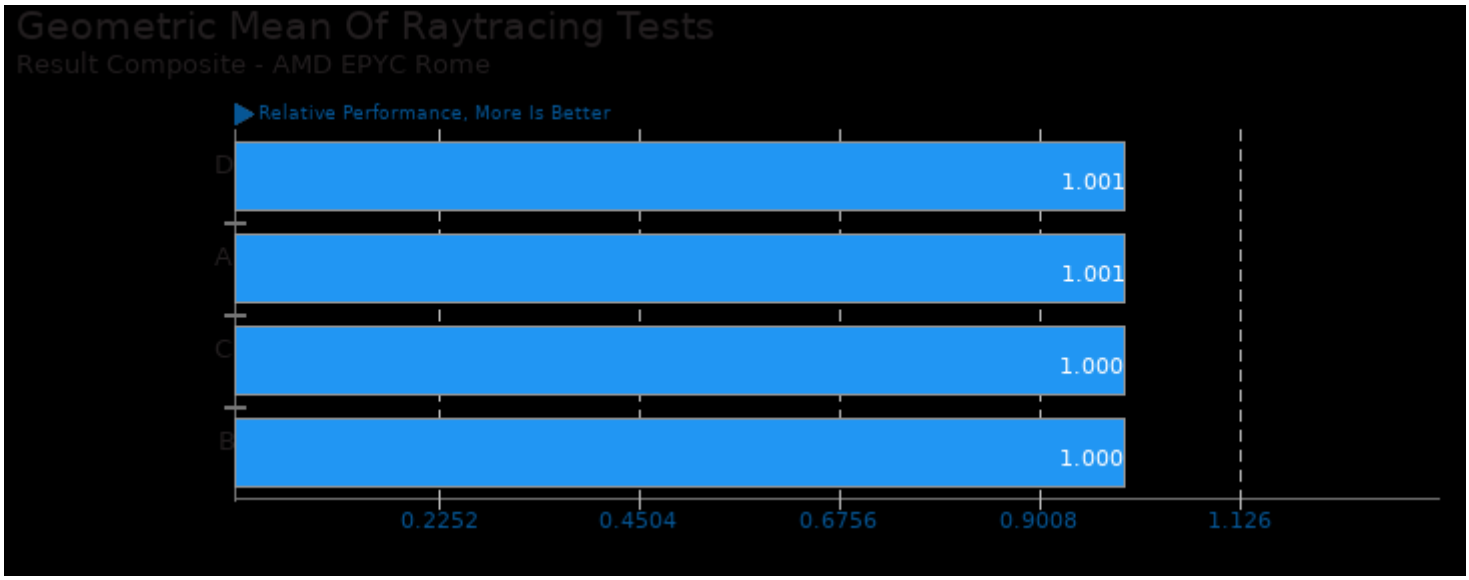
Geometric mean based upon tests: pts/nwchem, pts/qe, pts/openfoam, pts/hpcg, pts/mrbayes, pts/hmmer, pts/askap, pts/incompact3d, pts/pennant, pts/cloverleaf and pts/lulesh



Geometric mean based upon tests: pts/simdjson, pts/blosc, pts/build-linux-kernel, pts/build-gcc, pts/build-llvm, pts/build-ffmpeg, pts/build-godot, pts/build-erlang, pts/build-wasmer and pts/build-mesa



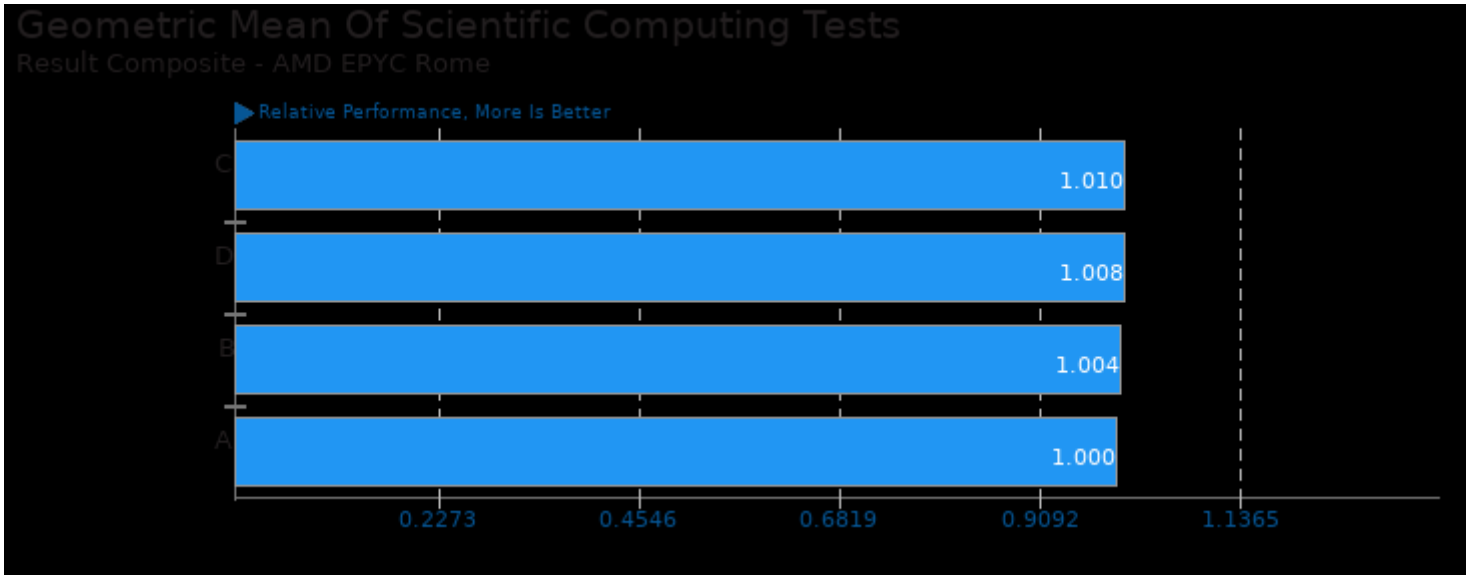
Geometric mean based upon tests: pts/cython-bench and pts/numpy



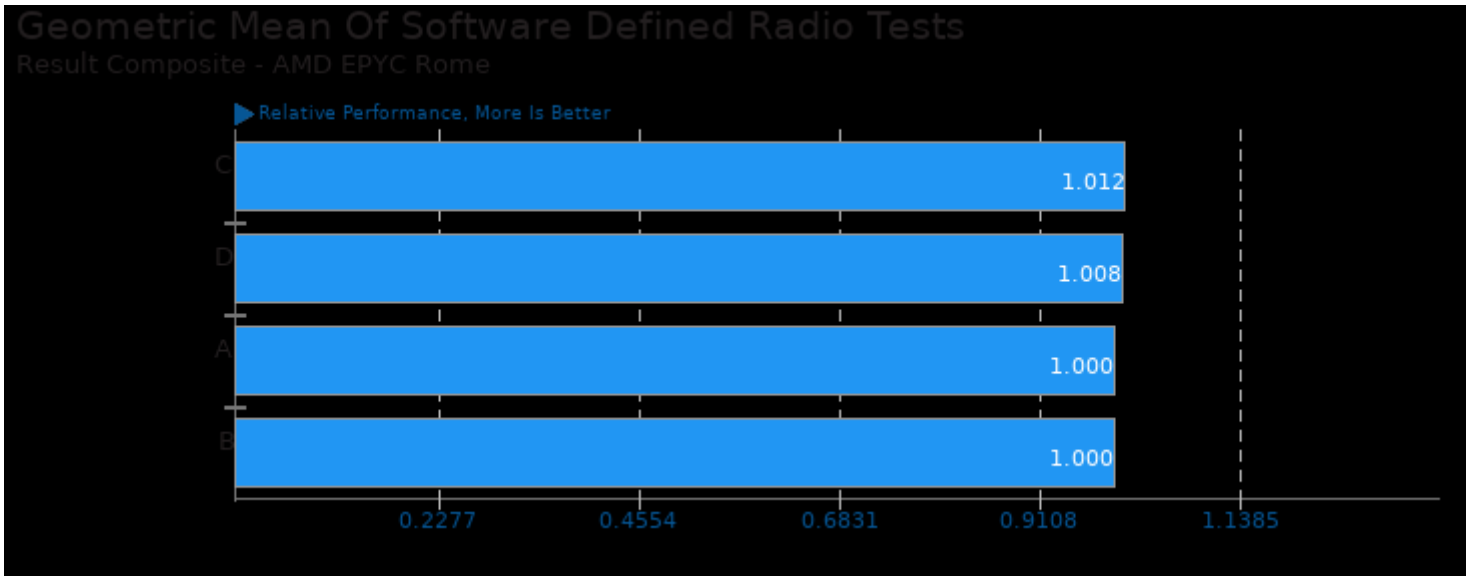
Geometric mean based upon tests: pts/ospray and pts/c-ray



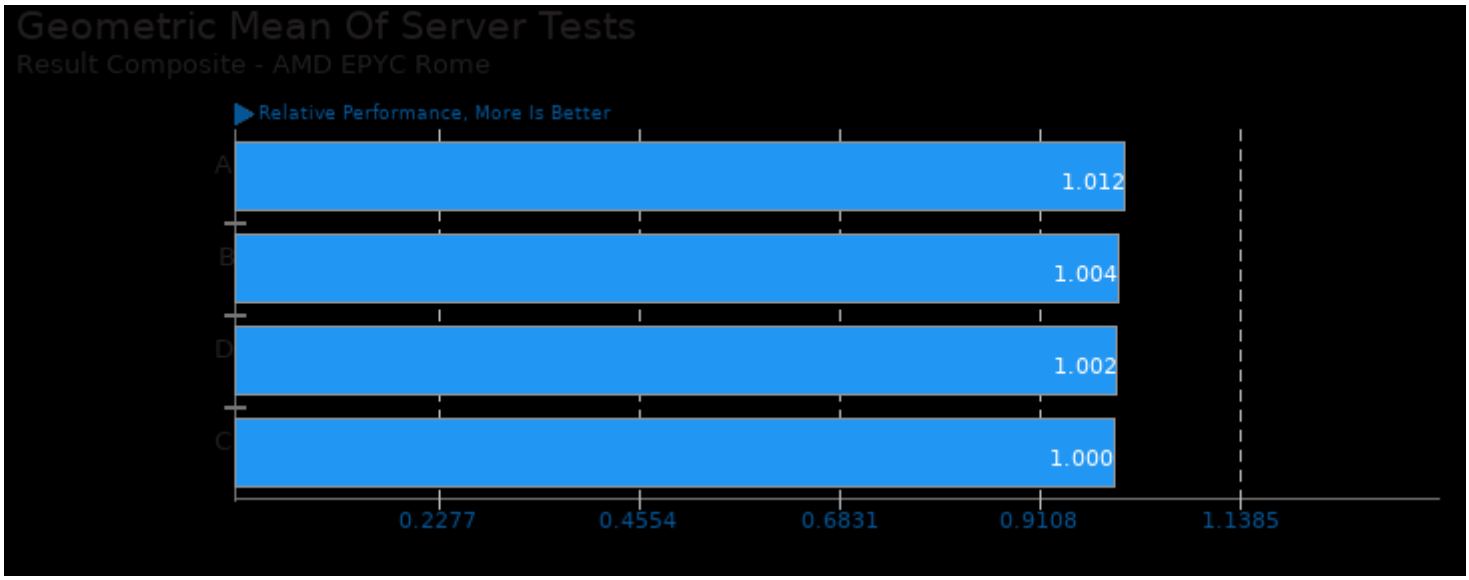
Geometric mean based upon tests: pts/ospray, pts/c-ray, pts/blender, pts/appleseed, pts/luxcorerender, pts/smallpt, pts/v-ray and pts/natron



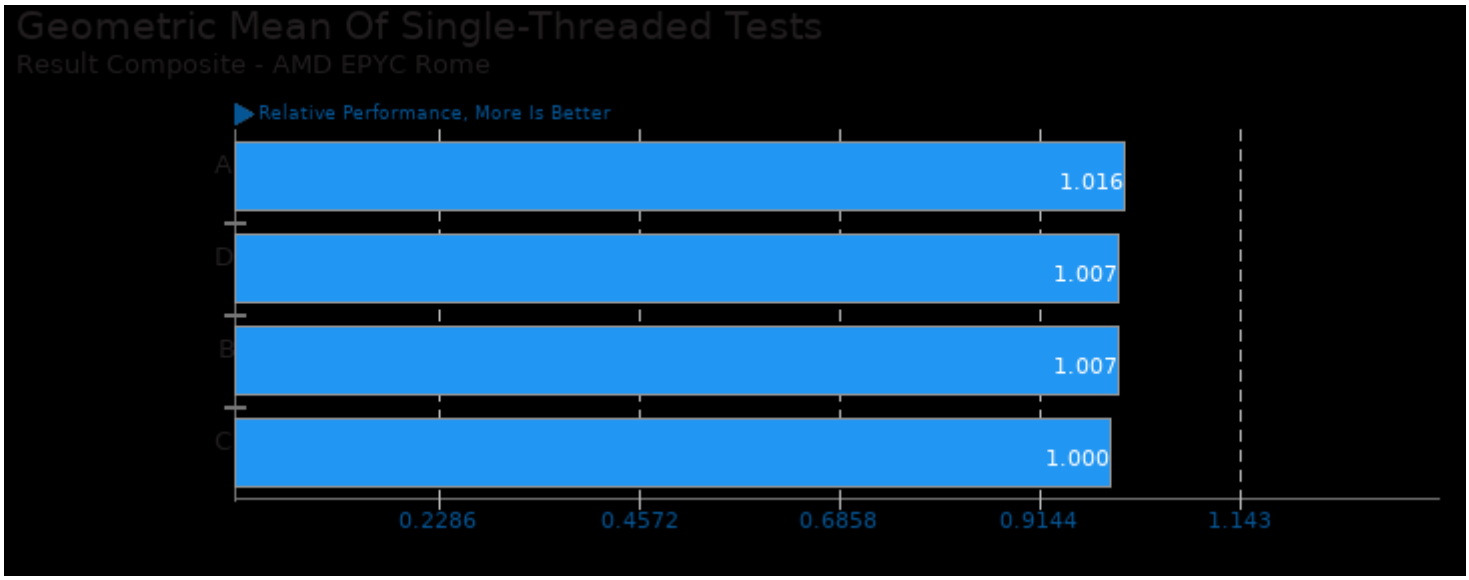
Geometric mean based upon tests: pts/namd, pts/nwchem, pts/cloverleaf, pts/lulesh, pts/pennant, pts/incompact3d, pts/openfoam, pts/mrbayes, pts/hmmer, pts/qe and pts/kripke



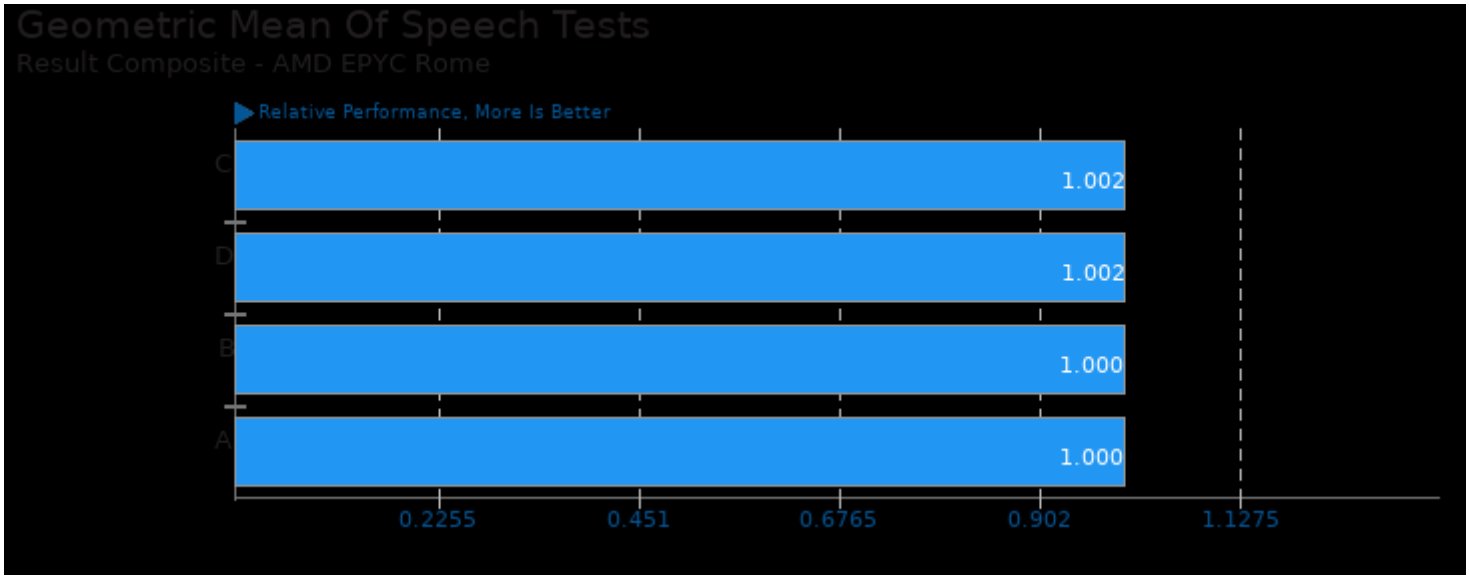
Geometric mean based upon tests: pts/luaradio and system/gnuradio



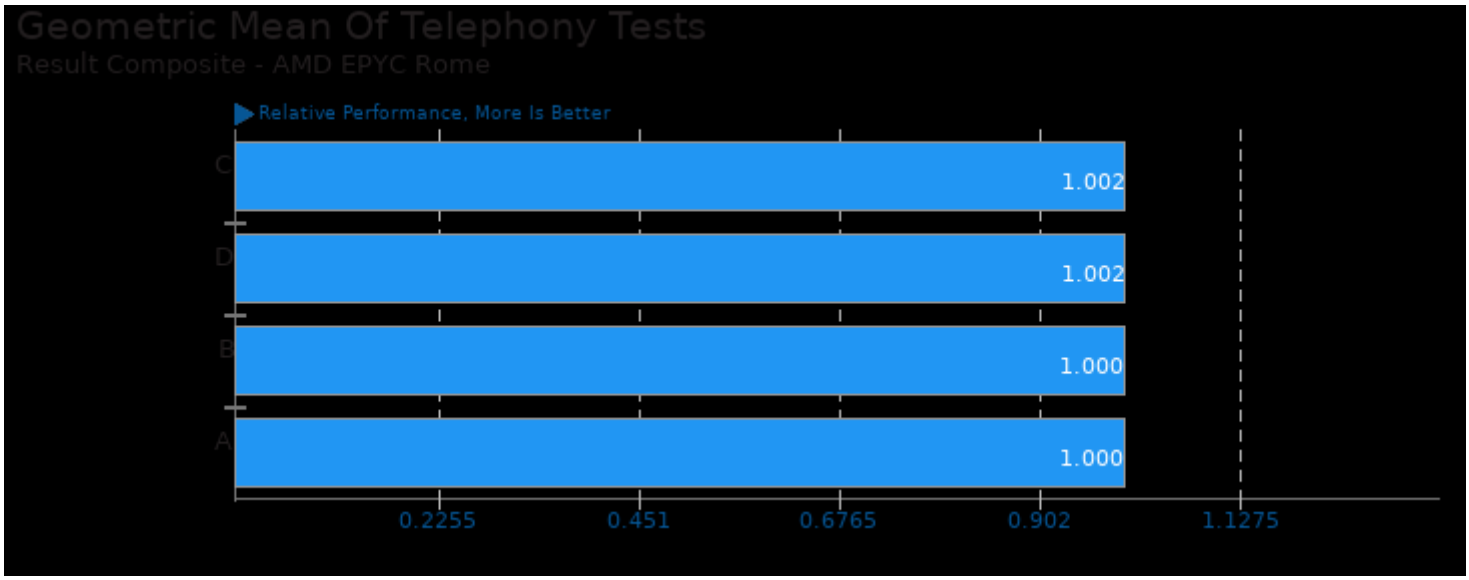
Geometric mean based upon tests: pts/apache, pts/nginx, pts/pgbench, pts/redis, pts/cassandra, pts/rocksdb, pts/phpbench, pts/openssl and pts/simdjson



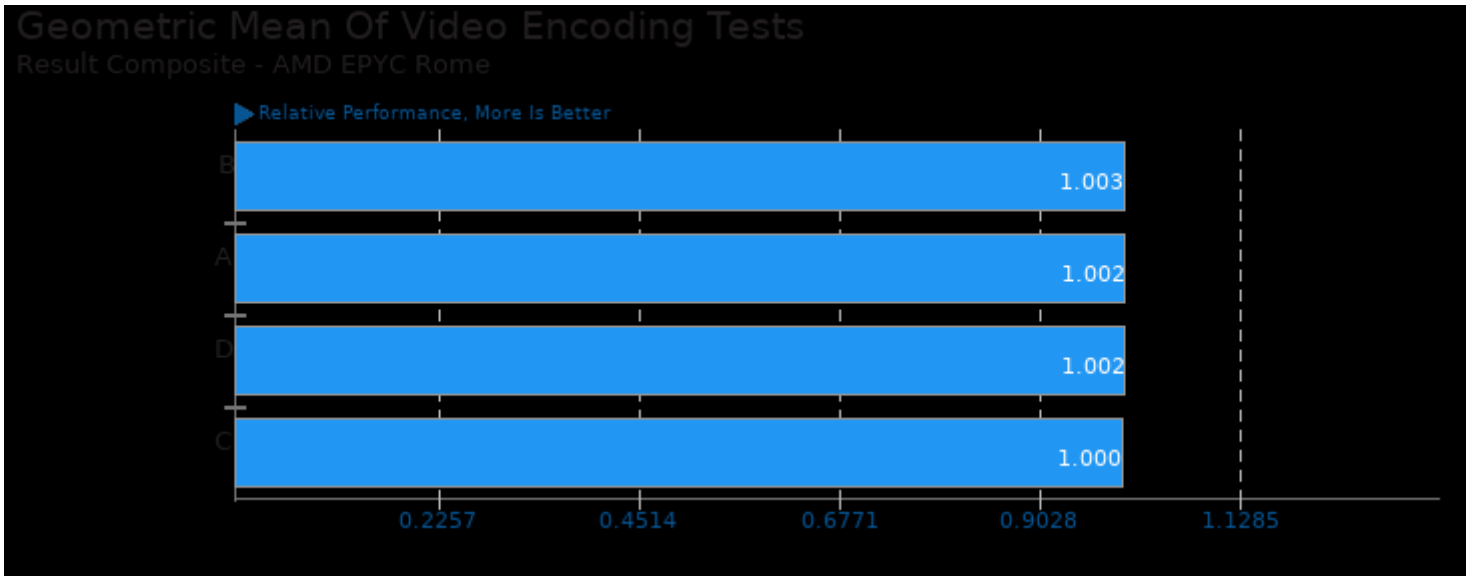
Geometric mean based upon tests: pts/gmpbench, pts/botan, pts/numpy, pts/encode-flac, pts/tjbench, pts/redis, pts/phpbench and pts/nginx



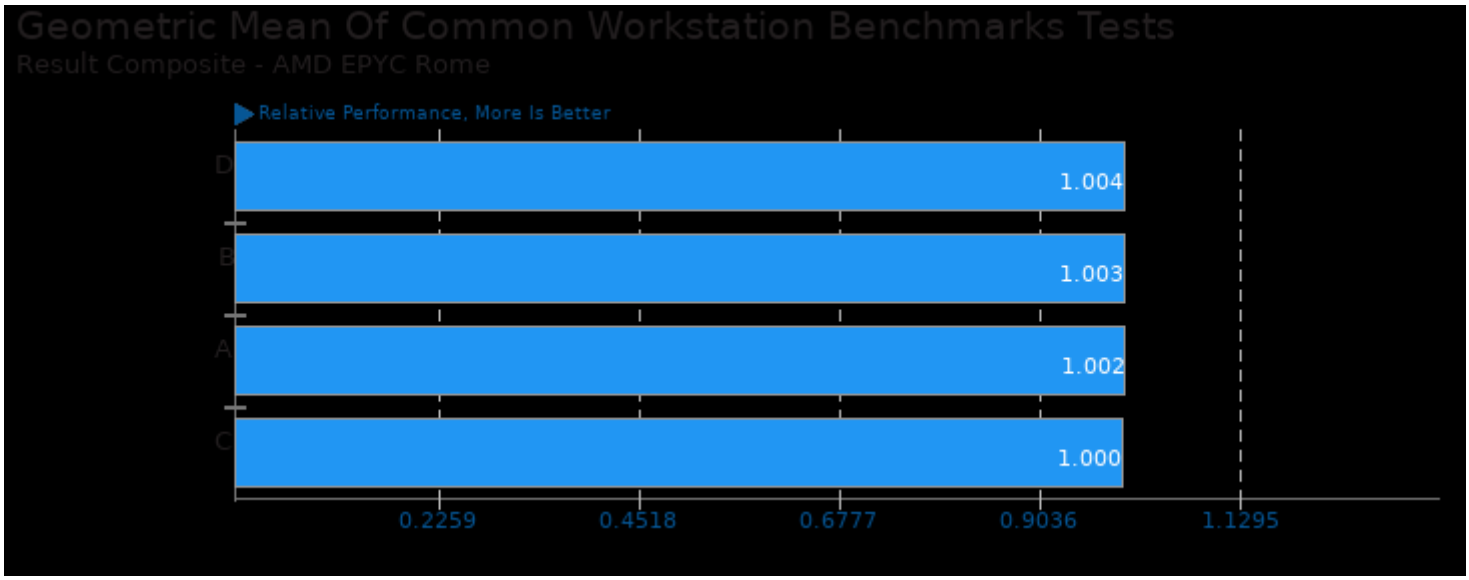
Geometric mean based upon tests: pts/vosk and pts/synthmark



Geometric mean based upon tests: pts/vosk and pts/synthmark



Geometric mean based upon tests: pts/svt-vp9, pts/svt-hevc, pts/vpxenc, pts/dav1d, pts/aom-av1, pts/svt-av1 and pts/avifenc



Geometric mean based upon tests: pts/blender, pts/brl-cad and pts/sysbench

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