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Big Comparison Core i9 10900K vs. Ryzen 9 3950X Linux Benchmarks

Tests fot a future article on Phoronix by Michael Larabel.

Automated Executive Summary

Core i9 10900K had the most wins, coming in first place for 55% of the tests.

Based on the geometric mean of all complete results, the fastest (Ryzen 9 3950X) was 1.014x the speed of the slowest (Core i9 10900K).

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

ebizzy at 2.769x
CP2K Molecular Dynamics (Fayalite-FIST Data) at 2.639x
ParaView (Test: Wavelet Volume - Resolution: 3840 x 2160) at 2.487x
ParaView (Test: Wavelet Volume - Resolution: 3840 x 2160) at 2.486x
Cpuminer-Opt (Algorithm: m7m) at 2.057x
Parboil (Test: OpenMP CUTCP) at 2.052x
Mlpack Benchmark (Benchmark: scikit_linearridgeregression) at 1.985x
GraphicsMagick (Operation: Swirl) at 1.904x
BLAKE2 at 1.896x
Facebook RocksDB (Test: Random Fill Sync) at 1.791x.

Test Systems:

Core i9 10900K

Processor: Intel Core i9-10900K @ 5.30GHz (10 Cores / 20 Threads), Motherboard: Gigabyte Z490 AORUS MASTER (F3 BIOS), Chipset: Intel Comet Lake PCH, Memory: 16GB, Disk: Samsung SSD 970 EVO 250GB, Graphics: AMD Radeon RX 5600 OEM/5600 XT / 5700/5700 8GB (2060/875MHz), Audio: Realtek ALC1220, Network: Intel Device 15f3 + Intel Wi-Fi 6 AX201

OS: Ubuntu 20.04, Kernel: 5.7.0-999-generic (x86_64) 20200519, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: amdgpu 19.1.0, OpenGL: 4.6 Mesa 20.0.4 (LLVM 9.0.1), Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Disk Notes: NONE / errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0xc8
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + Python 3.8.2
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + tsx_async_abort: Not affected

Ryzen 9 3950X

Processor: AMD Ryzen 9 3950X 16-Core @ 3.50GHz (16 Cores / 32 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (1201 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: Samsung SSD 970 EVO 250GB, Graphics: AMD Radeon RX 5600 OEM/5600 XT / 5700/5700 8GB (2060/875MHz), Audio: AMD Navi 10 HDMI Audio, Network: Realtek RTL8125 2.5GbE + Intel I211 + Intel Wi-Fi 6 AX200

OS: Ubuntu 20.04, Kernel: 5.7.0-999-generic (x86_64) 20200519, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: amdgpu 19.1.0, OpenGL: 4.6 Mesa 20.0.4 (LLVM 9.0.1), Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Disk Notes: NONE / errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0x8701013
Graphics Notes: GLAMOR
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + Python 3.8.2
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional STIBP: conditional RSB filling + tsx_async_abort: Not affected

	Core i9 10900K	Ryzen 9 3950X
Pennant - sedovbig (Hydro Cycle Time - sec)	**4228**	**4298**
Normalized	100%	98.38%
Standard Deviation	0.1%	0%

Pennant - leblancbig (Hydro Cycle Time - sec)	**3918**	**4113**
Normalized	100%	95.26%
Standard Deviation	0.3%	0%
NWChem - C240 Buckyball (sec)	**12612**	**9795**
Normalized	77.66%	100%
Selenium - Basemark - Google Chrome (Overall	**1075**	**1387**
Normalized	77.47%	100%
Standard Deviation	9.4%	7.8%
Selenium - Basemark - Firefox (Overall Score)	**759.91**	**757.95**
Normalized	100%	99.74%
Standard Deviation	7.3%	4.8%
Renaissance - A.U.C.T (ms)	**9185**	**11097**
Normalized	100%	82.77%
Standard Deviation	3.8%	1.8%
Selenium - MotionMark - Firefox (Score)	**231.54**	**161.79**
Normalized	100%	69.88%
Standard Deviation	28.2%	24.1%
Timed GCC Compilation - Time To Compile (sec)	**716.255**	**731.029**
Normalized	100%	97.98%
Standard Deviation	0.2%	0.3%
Crypto++ - All Algorithms (MiB/s)	**1962**	**1784**
Normalized	100%	90.95%
Standard Deviation	0%	0.1%
Numenta Anomaly Benchmark - EXPoSE (sec)	**624.538**	**644.836**
Normalized	100%	96.85%
Standard Deviation	0.4%	1%
PlaidML - No - Inference - DenseNet 201 - CPU (FPS)	**3.35**	**3.87**
Normalized	86.56%	100%
Standard Deviation	0.5%	1.1%
Renaissance - Savina Reactors.IO (ms)	**15777**	**10636**
Normalized	67.41%	100%
Standard Deviation	2%	6.1%
Basis Universal - U.L.2.R.P.P (sec)	**573.950**	**587.383**
Normalized	100%	97.71%
Standard Deviation	0.1%	0.2%
Renaissance - Apache Spark Bayes (ms)	**1704**	**2728**
Normalized	100%	62.47%
Standard Deviation	3%	19.6%
Selenium - WebXPRT - Firefox (Score)	**294**	**252**
Normalized	100%	85.71%
Standard Deviation		0.8%
Selenium - WebXPRT - Google Chrome (Score)	**264**	**258**
Normalized	100%	97.73%
Standard Deviation	0.8%	
LeelaChessZero - BLAS (Nodes/s)	**378**	**380**
Normalized	99.47%	100%
Standard Deviation	0.7%	2.9%
Java Gradle Build - Reactor (sec)	**188.102**	**251.425**
Normalized	100%	74.81%
Standard Deviation	2.8%	4%
Timed LLVM Compilation - Time To Compile (sec)	**505.431**	**365.636**
Normalized	72.34%	100%
Standard Deviation	1.1%	0.4%
Polyhedron Fortran Benchmarks - gas_dyn2 (sec)	**39.99**	**41.78**
Normalized	100%	95.72%

Blender - Barbershop - CPU-Only (sec)	**473.60**	**342.25**
Normalized	72.27%	100%
Standard Deviation	0.1%	0.1%
Renaissance - A.S.P (ms)	**2895**	**3302**
Normalized	100%	87.68%
Standard Deviation	2%	6.7%
Renaissance - Rand Forest (ms)	**1465**	**1816**
Normalized	100%	80.72%
Standard Deviation	1.8%	4.1%
Crypto++ - Keyed Algorithms (MiB/s)	**789.168824**	**697.187580**
Normalized	100%	88.34%
Standard Deviation	0%	0.3%
Core-Latency - A.L.B.C.C (ns)	**97.21**	**152.54**
Normalized	100%	63.73%
Selenium - CanvasMark - Firefox (Score)	**14181**	**13796**
Normalized	100%	97.29%
Standard Deviation	1.7%	4.2%
libgav1 - C.1.1.b (FPS)	**31.25**	**21.19**
Normalized	100%	67.81%
Standard Deviation	0.3%	0.3%
Blender - Pabellon Barcelona - CPU-Only (sec)	**426.20**	**285.86**
Normalized	67.07%	100%
Standard Deviation	0.2%	0.1%
LeelaChessZero - Eigen (Nodes/s)	**607**	**400**
Normalized	100%	65.9%
Standard Deviation	2.6%	1.8%
LeelaChessZero - Rand (Nodes/s)	**231501**	**185500**
Normalized	100%	80.13%
Standard Deviation	0.4%	0%
Renaissance - G.A.U.J.F (ms)	**1249**	**1725**
Normalized	100%	72.43%
Standard Deviation	4%	1.8%
FFTW - Float + SSE - 2D FFT Size 4096 (Mflops)	**27489**	**21239**
Normalized	100%	77.26%
Standard Deviation	1.6%	
libgav1 - Chimera 1080p (FPS)	**83.73**	**51.13**
Normalized	100%	61.07%
Standard Deviation	8.7%	0%
Facebook RocksDB - Rand Fill (Op/s)	**656303**	**680458**
Normalized	96.45%	100%
Standard Deviation	16.3%	15.2%
Crypto++ - I.E.C.P.K.A (MiB/s)	**6378**	**5494**
Normalized	100%	86.15%
Standard Deviation	0.1%	2.5%
Selenium - MotionMark - Google Chrome (Score)	1	1
PlaidML - No - Inference - ResNet 50 - CPU (FPS)	**7.38**	**7.34**
Normalized	100%	99.46%
Standard Deviation	0.6%	1.1%
Blender - Classroom - CPU-Only (sec)	**338.66**	**226.13**
Normalized	66.77%	100%
Standard Deviation	0.2%	0.1%
Renaissance - I.M.D.S (ms)	**2968**	**3622**
Normalized	100%	81.95%
Standard Deviation	12.2%	1.3%

Unigine Heaven - 1920 x 1080 - Windowed - OpenGL (FPS)	**160.184**	**158.578**
Normalized	100%	99%
Standard Deviation	0.1%	0.2%
Polyhedron Fortran Benchmarks - test_fpu2 (sec)	**28.67**	**26.44**
Normalized	92.22%	100%
High Performance Conjugate Gradient (GFLOP/s)	**4.36353**	**4.58602**
Normalized	95.15%	100%
Standard Deviation	0.3%	0%
BRL-CAD - V.P.M (VGR Performance Metric)	**192500**	**251130**
Normalized	76.65%	100%
PlaidML - No - Inference - Inception V3 - CPU (FPS)	**9.23**	**11.21**
Normalized	82.34%	100%
Standard Deviation	0.4%	0.4%
Selenium - Jetstream 2 - Firefox (Score)	**102.083**	**95.645**
Normalized	100%	93.69%
Standard Deviation	0.6%	0.8%
Algebraic Multi-Grid Benchmark (Figure Of Merit)	**23127**	**26110**
Normalized	88.57%	100%
Standard Deviation	1.4%	0%
CacheBench - Read (MB/s)	**4322**	**3052**
Normalized	100%	70.62%
Standard Deviation	0%	2.9%
Numpy Benchmark (Score)	**444.12**	**414.61**
Normalized	100%	93.36%
Standard Deviation	1.3%	1.4%
CP2K Molecular Dynamics - Fayalite-FIST Data (sec)	**855.403**	**324.193**
Normalized	37.9%	100%
Unigine Valley - 1920 x 1080 - Windowed - OpenGL (FPS)	**176.703**	**160.954**
Normalized	100%	91.09%
Standard Deviation	0.4%	0.3%
Hierarchical INTegration - FLOAT (QUIPs)	**510613895**	**380487205**
Normalized	100%	74.52%
Standard Deviation	0.3%	0.3%
FFTW - Stock - 2D FFT Size 4096 (Mflops)	**6969**	**6458**
Normalized	100%	92.66%
Standard Deviation	0.6%	0.5%
Unigine Superposition - 1920 x 1080 - Windowed - Ultra - OpenGL (FPS)	34.3	34.3
Standard Deviation	0.2%	0.2%
Unigine Superposition - 1920 x 1080 - Windowed - High - OpenGL (FPS)	**77.7**	**82.2**
Normalized	94.53%	100%
Standard Deviation	0.3%	0.1%
asmFish - 1.H.M.2.D (Nodes/s)	**39969419**	**51867171**
Normalized	77.06%	100%
Standard Deviation	3%	0.6%
Unigine Superposition - 1920 x 1080 - Windowed - Medium - OpenGL (FPS)	**113.6**	**118.2**
Normalized	96.11%	100%
Standard Deviation	0.8%	0%

Unigine Superposition - 1920 x 1080 - Windowed - Low - OpenGL (FPS)	**229.3**	**176.2**
Normalized	100%	76.84%
Standard Deviation	0.5%	0.1%
Facebook RocksDB - Rand Fill Sync (Op/s)	**2875**	**5148**
Normalized	55.85%	100%
Standard Deviation	1.5%	3.4%
Radiance Benchmark - Serial (sec)	**577.884**	**538.599**
Normalized	93.2%	100%
Selenium - Jetstream - Firefox (Score)	**237.52**	**218.55**
Normalized	100%	92.01%
Standard Deviation	0.3%	0.1%
Facebook RocksDB - Read While Writing (Op/s)	**2911882**	**3615702**
Normalized	80.53%	100%
Standard Deviation	3.1%	2.1%
Selenium - Jetstream - Google Chrome (Score)	**258.92**	**227.80**
Normalized	100%	87.98%
Standard Deviation	0.3%	0%
Appleseed - Emily (sec)	**299.753452**	**213.491346**
Normalized	71.22%	100%
Polyhedron Fortran Benchmarks - mp_prop_design	**49.13**	**53.27**
Normalized	100%	92.23%
GROMACS - Water Benchmark (Ns/Day)	**0.978**	**1.236**
Normalized	79.13%	100%
Standard Deviation	0.1%	0.2%
Parboil - OpenMP LBM (sec)	**165.151103**	**160.964244**
Normalized	97.46%	100%
Standard Deviation	0%	0.1%
Parboil - O.M.G (sec)	**54.937194**	**31.274319**
Normalized	56.93%	100%
Standard Deviation	6.5%	0.7%
Blender - Fishy Cat - CPU-Only (sec)	**179.55**	**123.52**
Normalized	68.79%	100%
Standard Deviation	0.2%	0.1%
Selenium - Jetstream 2 - Google Chrome (Score)	**149.132**	**138.227**
Normalized	100%	92.69%
Standard Deviation	2.1%	1.1%
Polyhedron Fortran Benchmarks - channel2 (sec)	**43.45**	**42.71**
Normalized	98.3%	100%
Polyhedron Fortran Benchmarks - fatigue2 (sec)	**36.69**	**46.89**
Normalized	100%	78.25%
libgav1 - Summer Nature 4K (FPS)	**34.85**	**24.18**
Normalized	100%	69.38%
Standard Deviation	1.3%	0.2%
PlaidML - No - Inference - VGG19 - CPU (FPS)	**16.09**	**19.19**
Normalized	83.85%	100%
Standard Deviation	0.7%	1%
Numenta Anomaly Benchmark - Earthgecko Skyline	**90.165**	**77.869**
Normalized	86.36%	100%
Standard Deviation	2.9%	0.4%
Renaissance - Scala Dotty (ms)	**1339**	**1368**
Normalized	100%	97.93%
Standard Deviation	2.3%	2.3%
PlaidML - No - Inference - Mobilenet - CPU (FPS)	**17.18**	**17.28**
Normalized	99.42%	100%

Standard Deviation	1.1%	1%
ACES DGEMM - S.F.P.R (GFLOP/s)	**5.351115**	**5.537606**
Normalized	96.63%	100%
Standard Deviation	1%	5.3%
CacheBench - R.M.W (MB/s)	**55906**	**61492**
Normalized	90.92%	100%
Standard Deviation	0%	0.6%
CacheBench - Write (MB/s)	**36212**	**31703**
Normalized	100%	87.55%
Standard Deviation	0%	0.3%
NAS Parallel Benchmarks - BT.C (Mop/s)	**26329**	**22727**
Normalized	100%	86.32%
Standard Deviation	0.1%	0.2%
NAS Parallel Benchmarks - EP.D (Mop/s)	**1792**	**1071**
Normalized	100%	59.75%
Standard Deviation	2.8%	0.2%
Mlpack Benchmark - scikit_qda (sec)	**62.50**	**68.93**
Normalized	100%	90.67%
Standard Deviation	0.4%	1.3%
Selenium - ARES-6 - Firefox (ms)	**36.73**	**42.85**
Normalized	100%	85.72%
Standard Deviation	0.9%	0.1%
PlaidML - No - Inference - VGG16 - CPU (FPS)	**19.28**	**23.31**
Normalized	82.71%	100%
Standard Deviation	0.9%	1.4%
dav1d - C.1.1.b (FPS)	**131.44**	**113.65**
Normalized	100%	86.47%
Standard Deviation	0.1%	0.4%
dav1d - C.1.1.b (FPS)	**132.44**	**114.24**
Normalized	100%	86.26%
Standard Deviation	0.1%	0.2%
Fhourstones - C.C.4.S (Kpos / sec)	**17312**	**14987**
Normalized	100%	86.57%
Standard Deviation	0.1%	0.2%
Selenium - StyleBench - Google Chrome (Runs /	**37.6**	**37.7**
Normalized	99.73%	100%
Standard Deviation	0.7%	0.7%
rav1e - 1 (FPS)	**0.205**	**0.193**
Normalized	100%	94.15%
Standard Deviation	0%	0.3%
Blender - BMW27 - CPU-Only (sec)	**114.39**	**84.77**
Normalized	74.11%	100%
Standard Deviation	0.3%	0.2%
Renaissance - Apache Spark ALS (ms)	**1654**	**1950**
Normalized	100%	84.84%
Standard Deviation	1.4%	0.8%
Appleseed - Disney Material (sec)	**174.867928**	**121.874074**
Normalized	69.69%	100%
Timed Linux Kernel Compilation - Time To Compile	**61.708**	**45.114**
Normalized	73.11%	100%
Standard Deviation	0.9%	2.9%
Gzip Compression - L.S.T.A.T.t.g (sec)	**28.833**	**33.392**
Normalized	100%	86.35%
Standard Deviation	2.7%	3.3%
Minion - Quasigroup (sec)	**93.440554**	**101.658951**

Normalized	100%	91.92%
Standard Deviation	0.2%	0.6%
Appleseed - Material Tester (sec)	**164.002915**	**128.457773**
Normalized	78.33%	100%
YafaRay - T.T.F.S.S (sec)	**108.878**	**81.477**
Normalized	74.83%	100%
Standard Deviation	0.1%	0.9%
Polyhedron Fortran Benchmarks - rnflow (sec)	**12.58**	**15**
Normalized	100%	83.87%
rav1e - 5 (FPS)	**0.670**	**0.626**
Normalized	100%	93.43%
Standard Deviation	0.1%	0.1%
PyPerformance - python_startup (Milliseconds)	**6.04**	**6.46**
Normalized	100%	93.5%
Standard Deviation	0.1%	2.4%
Stress-NG - CPU Cache (Bogo Ops/s)	**22.76**	**37.15**
Normalized	61.27%	100%
Standard Deviation	0.6%	4.7%
Stress-NG - Atomic (Bogo Ops/s)	**230445**	**747139**
Normalized	30.84%	100%
Standard Deviation	13.5%	0.3%
OpenVKL - vklBenchmark (Items / Sec)	**192.83**	**234.25**
Normalized	82.32%	100%
Standard Deviation	0.4%	0.2%
GEGL - Cartoon (sec)	**78.938**	**89.855**
Normalized	100%	87.85%
Standard Deviation	1.1%	1.1%
Timed GDB GNU Debugger Compilation - Time To Compile (sec)	**77.059**	**88.759**
Normalized	100%	86.82%
Standard Deviation	0.2%	0.1%
Selenium - Speedometer - Firefox (Runs/min)	**104**	**99.34**
Normalized	100%	95.52%
Standard Deviation	0.6%	0.4%
Build2 - Time To Compile (sec)	**84.939**	**70.665**
Normalized	83.19%	100%
Standard Deviation	1.6%	1.8%
Cpuminer-Opt - myr-gr (kH/s - Hash Speed)	**17627**	**9899**
Normalized	100%	56.16%
Standard Deviation	0.1%	10.6%
Zstd Compression - 19 (MB/s)	**30.3**	**39.6**
Normalized	76.52%	100%
Standard Deviation	0.3%	0.1%
VP9 libvpx Encoding - Speed 0 (FPS)	**8.20**	**7.79**
Normalized	100%	95%
Standard Deviation	0.6%	0.1%
Perl Benchmarks - Pod2html (sec)	**0.09327881**	**0.11237626**
Normalized	100%	83.01%
Standard Deviation	0.4%	0.9%
Hackbench - 32 - Process (sec)	**49.161**	**54.263**
Normalized	100%	90.6%
Standard Deviation	0.2%	2.7%
Crypto++ - Unkeyed Algorithms (MiB/s)	**407.907548**	**389.039005**
Normalized	100%	95.37%
Standard Deviation	0%	0.2%

Sockperf - Latency Under Load (usec)	**17.423**	**14.949**
Normalized	85.8%	100%
Standard Deviation	20.1%	27.8%
ASKAP - tConvolve MT - Degridding (Million Grid Points/sec)	**1946**	**1618**
Normalized	100%	83.12%
Standard Deviation	0.1%	0.2%
ASKAP - tConvolve MT - Gridding (Million Grid Points/sec)	**1142**	**874.050**
Normalized	100%	76.52%
Standard Deviation	0%	0.3%
Timed MrBayes Analysis - P.P.A (sec)	**63.719**	**70.989**
Normalized	100%	89.76%
Standard Deviation	0.1%	0.6%
PyPerformance - raytrace (Milliseconds)	**352**	**427**
Normalized	100%	82.44%
Standard Deviation	0.3%	
Stockfish - Total Time (Nodes/s)	**35260191**	**50373394**
Normalized	70%	100%
Standard Deviation	1.7%	0.5%
ET: Legacy - Renderer2 - 3840 x 2160 (FPS)	**288.5**	**255.8**
Normalized	100%	88.67%
Standard Deviation	6.5%	1.8%
Selenium - CanvasMark - Google Chrome (Score)	**5033**	**5050**
Normalized	99.66%	100%
Standard Deviation	0.5%	0.3%
oneDNN MKL-DNN - D.B.d - u8s8f32 (ms)	**121.267**	**69.5926**
Normalized	57.39%	100%
Standard Deviation	9.8%	0.1%
toyBrot Fractal Generator - OpenMP (ms)	**80088**	**47670**
Normalized	59.52%	100%
Standard Deviation	0%	0.7%
Himeno Benchmark - P.P.S (MFLOPS)	**4395**	**4966**
Normalized	88.49%	100%
Standard Deviation	0.1%	2.8%
NAMD - ATPase Simulation - 327,506 Atoms (days/ns)	**1.20434**	**1.11719**
Normalized	92.76%	100%
Standard Deviation	0.4%	0.3%
toyBrot Fractal Generator - TBB (ms)	**79924**	**46547**
Normalized	58.24%	100%
Standard Deviation	1.5%	1.1%
toyBrot Fractal Generator - C++ Threads (ms)	**79413**	**46331**
Normalized	58.34%	100%
Standard Deviation	0.1%	0.3%
toyBrot Fractal Generator - C++ Tasks (ms)	**79172**	**46370**
Normalized	58.57%	100%
Standard Deviation	0.1%	0.3%
LuxCoreRender - DLSC (M samples/sec)	**2.19**	**3.29**
Normalized	66.57%	100%
Standard Deviation	2%	1.3%
LuxCoreRender - R.C.a.P (M samples/sec)	**2.47**	**3.56**
Normalized	69.38%	100%
Standard Deviation	0.4%	0.1%
IndigoBench - Bedroom (M samples/s)	**1.894**	**2.669**
Normalized	70.96%	100%

Standard Deviation	0.2%	0.3%
IndigoBench - Supercar (M samples/s)	**4.435**	**5.660**
Normalized	78.36%	100%
Standard Deviation	0.1%	0.1%
Polyhedron Fortran Benchmarks - induct2 (sec)	**14.45**	**21.35**
Normalized	100%	67.68%
GraphicsMagick - Sharpen (Iterations/min)	**175**	**248**
Normalized	70.56%	100%
Standard Deviation		0.2%
John The Ripper - MD5 (Real C/S)	**1383667**	**1771667**
Normalized	78.1%	100%
Standard Deviation	0%	0.2%
GraphicsMagick - Enhanced (Iterations/min)	**269**	**400**
Normalized	67.25%	100%
GraphicsMagick - Noise-Gaussian (Iterations/min)	**317**	**455**
Normalized	69.67%	100%
Standard Deviation	0.2%	
Facebook RocksDB - Rand Read (Op/s)	**68514144**	**95962407**
Normalized	71.4%	100%
Standard Deviation	0.2%	1.1%
GraphicsMagick - Resizing (Iterations/min)	**1266**	**1774**
Normalized	71.36%	100%
Standard Deviation	0.2%	0.2%
GraphicsMagick - Swirl (Iterations/min)	**529**	**1007**
Normalized	52.53%	100%
Standard Deviation	0.2%	0.1%
GraphicsMagick - Rotate (Iterations/min)	**888**	**730**
Normalized	100%	82.21%
Standard Deviation		2.9%
GraphicsMagick - HWB Color Space (Iterations/min)	**1219**	**1507**
Normalized	80.89%	100%
Standard Deviation	0.2%	0.3%
Selenium - Speedometer - Google Chrome (Runs/min)	**130**	**133**
Normalized	97.74%	100%
Standard Deviation	0.4%	
oneDNN MKL-DNN - IP Batch All - f32 (ms)	**56.9110**	**50.1698**
Normalized	88.15%	100%
Standard Deviation	0.2%	0.3%
Radiance Benchmark - SMP Parallel (sec)	**182.363**	**170.288**
Normalized	93.38%	100%
oneDNN MKL-DNN - IP Batch All - u8s8f32 (ms)	**19.0225**	**19.8851**
Normalized	100%	95.66%
Standard Deviation	0.1%	0.2%
Selenium - StyleBench - Firefox (Runs / Minute)	**104**	**84.4**
Normalized	100%	81.15%
Standard Deviation		0.2%
ASKAP - tConvolve MPI - Degridding (Million Grid Points/sec)	**1953**	**1657**
Normalized	100%	84.84%
Standard Deviation	0.1%	0.1%
ASKAP - tConvolve MPI - Gridding (Million Grid Points/sec)	**1161**	**892.666**
Normalized	100%	76.88%
Standard Deviation	0.2%	0%

GEGL - Wavelet Blur (sec)	**52.123**	**61.585**
Normalized	100%	84.64%
Standard Deviation	0.3%	1.2%
Minion - Solitaire (sec)	**55.284448**	**57.688167**
Normalized	100%	95.83%
Standard Deviation	0.2%	0.1%
Tachyon - Total Time (sec)	**65.7816**	**46.0091**
Normalized	69.94%	100%
Standard Deviation	0.1%	0.3%
Mlpack Benchmark - scikit_ica (sec)	**53.21**	**53.76**
Normalized	100%	98.98%
Standard Deviation	1.7%	0.9%
NAS Parallel Benchmarks - SP.B (Mop/s)	**5284**	**8390**
Normalized	62.97%	100%
Standard Deviation	0.2%	0.1%
Perl Benchmarks - Interpreter (sec)	**0.00066725**	**0.00069115**
Normalized	100%	96.54%
Standard Deviation	1.4%	1.9%
Basemark GPU - Vulkan - 3840 x 2160 - High (FPS)	**81.93**	**80.95**
Normalized	100%	98.8%
Standard Deviation	0.2%	0.1%
RawTherapee - T.B.T (sec)	**53.309**	**52.809**
Normalized	99.06%	100%
Standard Deviation	0.2%	0.1%
GEGL - Color Enhance (sec)	**50.055**	**54.906**
Normalized	100%	91.16%
Standard Deviation	1.2%	0.4%
Polyhedron Fortran Benchmarks - protein (sec)	**11.62**	**12.37**
Normalized	100%	93.94%
Mlpack Benchmark - scikit_linearridgeregression	**4.05**	**2.04**
Normalized	50.37%	100%
Standard Deviation	0.7%	0.5%
SQLite Speedtest - Timed Time - Size 1,000 (sec)	**44.924**	**58.132**
Normalized	100%	77.28%
Standard Deviation	0.1%	1.1%
Cpuminer-Opt - skein (kH/s - Hash Speed)	**45343**	**54471**
Normalized	83.24%	100%
Standard Deviation	0.5%	2.9%
Git - T.T.C.C.G.C (sec)	**41.515**	**45.230**
Normalized	100%	91.79%
Standard Deviation	0.1%	2.8%
DeepSpeech - CPU (sec)	**78.36647**	**64.61712**
Normalized	82.46%	100%
Standard Deviation	1.9%	0.8%
Basemark GPU - OpenGL - 3840 x 2160 - High (FPS)	**59.64**	**73.68**
Normalized	80.94%	100%
Standard Deviation	0.9%	0.4%
PyPerformance - 2to3 (Milliseconds)	**241**	**283**
Normalized	100%	85.16%
Standard Deviation		0.2%
LibreOffice - 2.D.T.P (sec)	**6.403**	**6.605**
Normalized	100%	96.94%
Standard Deviation	2.7%	2.7%
Selenium - ARES-6 - Google Chrome (ms)	**17.47**	**20.20**
Normalized	100%	86.49%

Standard Deviation	0.5%	1.1%
m-queens - Time To Solve (sec)	**59.649**	**34.304**
Normalized	57.51%	100%
Standard Deviation	0%	0.1%
Renaissance - T.H.R (ms)	**2004**	**2094**
Normalized	100%	95.69%
Standard Deviation	1.3%	0.9%
Embree - Pathtracer - Asian Dragon Obj (FPS)	**16.1775**	**19.6503**
Normalized	82.33%	100%
Standard Deviation	0.2%	0.3%
Selenium - Octane - Firefox (Geometric Mean)	**38776**	**34528**
Normalized	100%	89.04%
Standard Deviation	1.1%	1.3%
Java SciMark - Composite (Mflops)	**3053**	**3116**
Normalized	97.98%	100%
Standard Deviation	0.5%	2%
G'MIC - P.I.O.A.3.V.1.T (sec)	**16.006**	**18.735**
Normalized	100%	85.43%
Standard Deviation	1.3%	3%
Timed PHP Compilation - Time To Compile (sec)	**47.704**	**42.697**
Normalized	89.5%	100%
Standard Deviation	0.8%	0.9%
Embree - Pathtracer ISPC - Asian Dragon Obj (FPS)	**18.2419**	**19.0858**
Normalized	95.58%	100%
Standard Deviation	0.2%	0.2%
ParaView - Many Spheres - 3840 x 2160 (MiPolys /	**6344**	**6547**
Normalized	96.91%	100%
Standard Deviation	4.6%	0.4%
ParaView - Many Spheres - 3840 x 2160 (Frames / Sec)	**63.28**	**65.30**
Normalized	96.91%	100%
Standard Deviation	4.6%	0.4%
Basis Universal - ETC1S (sec)	**42.177**	**42.788**
Normalized	100%	98.57%
Standard Deviation	0.5%	0.7%
C-Ray - Total Time - 4.1.R.P.P (sec)	**52.130**	**31.594**
Normalized	60.61%	100%
Standard Deviation	0%	0.1%
Selenium - Octane - Google Chrome (Geometric	**54153**	**49230**
Normalized	100%	90.91%
Standard Deviation	0.2%	0.7%
PyPerformance - go (Milliseconds)	**187**	**228**
Normalized	100%	82.02%
Sockperf - Throughput (Messages/sec)	**639629**	**590729**
Normalized	100%	92.35%
Standard Deviation	1.6%	3.5%
FLAC Audio Encoding - WAV To FLAC (sec)	**7.699**	**8.250**
Normalized	100%	93.32%
Standard Deviation	2.6%	3.4%
Minion - Graceful (sec)	**41.961286**	**39.558481**
Normalized	94.27%	100%
Standard Deviation	0.1%	0.5%
Timed FFmpeg Compilation - Time To Compile (sec)	**46.059**	**35.442**
Normalized	76.95%	100%
Standard Deviation	1.1%	1%
Basis Universal - UASTC Level 3 (sec)	**46.509**	**32.607**

Normalized	70.11%	100%
Standard Deviation	0%	0.3%
C-Blosc - blosclz (MB/s)	**10910**	**11288**
Normalized	96.65%	100%
Standard Deviation	0.3%	0.2%
Xonotic - 3840 x 2160 - Ultimate (FPS)	**318.7844013**	**308.6831229**
Normalized	100%	96.83%
Standard Deviation	0.5%	0.1%
rav1e - 6 (FPS)	**1.622**	**1.497**
Normalized	100%	92.29%
Standard Deviation	0.1%	0.1%
libgav1 - S.N.1 (FPS)	**135.37**	**78.41**
Normalized	100%	57.92%
Standard Deviation	0.6%	0.1%
NAS Parallel Benchmarks - FT.C (Mop/s)	**11106**	**11558**
Normalized	96.09%	100%
Standard Deviation	0.1%	0%
oneDNN MKL-DNN - R.N.N.T - f32 (ms)	**169.855**	**190.560**
Normalized	100%	89.13%
Standard Deviation	0.9%	0.3%
Cython benchmark (sec)	**35.064**	**38.658**
Normalized	100%	90.7%
Standard Deviation	0.6%	1.2%
oneDNN MKL-DNN - R.N.N.I - f32 (ms)	**28.0154**	**26.6223**
Normalized	95.03%	100%
Standard Deviation	0.1%	0.2%
Cpuminer-Opt - m7m (kH/s - Hash Speed)	**407.75**	**838.57**
Normalized	48.62%	100%
Standard Deviation	0.1%	0.3%
lzbench - XZ 0 - Decompression (MB/s)	**138**	**136**
Normalized	100%	98.55%
lzbench - XZ 0 - Compression (MB/s)	**51**	**43**
Normalized	100%	84.31%
Standard Deviation		2.7%
Stress-NG - Context Switching (Bogo Ops/s)	**5661608**	**7734524**
Normalized	73.2%	100%
Standard Deviation	0.8%	2.7%
GEGL - Rotate 90 Degrees (sec)	**32.369**	**37.640**
Normalized	100%	86%
Standard Deviation	1.2%	0.6%
LULESH (z/s)	**11.960647**	**9.8209433**
Normalized	100%	82.11%
Standard Deviation	1.6%	0.1%
GEGL - Antialias (sec)	**32.111**	**37.298**
Normalized	100%	86.09%
Standard Deviation	0.8%	0.6%
Embree - Pathtracer - Crown (FPS)	**15.4524**	**20.8580**
Normalized	74.08%	100%
Standard Deviation	0.2%	0.3%
Cpuminer-Opt - deep (kH/s - Hash Speed)	**12397**	**15150**
Normalized	81.83%	100%
Standard Deviation	0%	0.1%
7-Zip Compression - C.S.T (MIPS)	**65002**	**90026**
Normalized	72.2%	100%
Standard Deviation	0.6%	0.7%

PyPerformance - django_template (Milliseconds)	**38.3**	**45.5**
Normalized	100%	84.18%
Standard Deviation	0.5%	0.4%
Embree - Pathtracer ISPC - Crown (FPS)	**17.7342**	**20.0572**
Normalized	88.42%	100%
Standard Deviation	0.2%	0.8%
Xonotic - 3840 x 2160 - Ultra (FPS)	**398.0959725**	**393.3117643**
Normalized	100%	98.8%
Standard Deviation	0.5%	0.4%
Polyhedron Fortran Benchmarks - doduc (sec)	**6.13**	**6.56**
Normalized	100%	93.45%
PyPerformance - crypto_pyaes (Milliseconds)	**83.2**	**97.2**
Normalized	100%	85.6%
Standard Deviation	0%	0.3%
Tesseract - 3840 x 2160 (FPS)	**431.0337**	**364.8969**
Normalized	100%	84.66%
Standard Deviation	2.8%	1.1%
Redis - LPUSH (Reqs/sec)	**2289561**	**1666745**
Normalized	100%	72.8%
Standard Deviation	2.8%	4.5%
Embree - Pathtracer - Asian Dragon (FPS)	**17.5550**	**21.4302**
Normalized	81.92%	100%
Standard Deviation	0.7%	0.2%
Redis - SET (Reqs/sec)	**2770463**	**1992291**
Normalized	100%	71.91%
Standard Deviation	1.4%	5.4%
Numenta Anomaly Benchmark - B.C (sec)	**36.066**	**26.176**
Normalized	72.58%	100%
Standard Deviation	0.7%	2.9%
Cpuminer-Opt - sha256t (kH/s - Hash Speed)	**102523**	**119460**
Normalized	85.82%	100%
Standard Deviation	1.8%	2.6%
Cpuminer-Opt - lbry (kH/s - Hash Speed)	**38917**	**46910**
Normalized	82.96%	100%
Standard Deviation	0.1%	0.7%
Polyhedron Fortran Benchmarks - mdbx (sec)	**3.87**	**4.27**
Normalized	100%	90.63%
PyPerformance - chaos (Milliseconds)	**79.8**	**100**
Normalized	100%	79.8%
Standard Deviation	1.2%	
Stress-NG - CPU Stress (Bogo Ops/s)	**4731**	**6621**
Normalized	71.46%	100%
Standard Deviation	0.3%	0.2%
John The Ripper - Blowfish (Real C/S)	**23257**	**27740**
Normalized	83.84%	100%
Standard Deviation	0%	0.4%
Aircrack-ng (k/s)	**45912**	**58218**
Normalized	78.86%	100%
Standard Deviation	0%	0.1%
Stress-NG - Matrix Math (Bogo Ops/s)	**62671**	**77934**
Normalized	80.42%	100%
Standard Deviation	2.8%	0.8%
Stress-NG - Crypto (Bogo Ops/s)	**2678**	**4744**
Normalized	56.45%	100%
Standard Deviation	0.1%	0.3%

Stress-NG - Socket Activity (Bogo Ops/s)	**8782**	**11945**
Normalized	73.52%	100%
Standard Deviation	1.5%	0.8%
Stress-NG - Vector Math (Bogo Ops/s)	**94531**	**148737**
Normalized	63.56%	100%
Standard Deviation	0%	0.1%
AOM AV1 - Speed 0 Two-Pass (FPS)	**0.35**	**0.34**
Normalized	100%	97.14%
Standard Deviation	1.6%	0%
Xonotic - 3840 x 2160 - High (FPS)	**438.9449334**	**442.1980742**
Normalized	99.26%	100%
Standard Deviation	0.5%	0.5%
Embree - Pathtracer ISPC - Asian Dragon (FPS)	**20.5126**	**21.3600**
Normalized	96.03%	100%
Standard Deviation	0.7%	0.2%
AOBench - 2048 x 2048 - Total Time (sec)	**27.170**	**31.131**
Normalized	100%	87.28%
Standard Deviation	0.2%	0.6%
Polyhedron Fortran Benchmarks - air (sec)	**1.95**	**1.62**
Normalized	83.08%	100%
lzbench - Zstd 8 - Decompression (MB/s)	**1884**	**1714**
Normalized	100%	90.98%
Standard Deviation	0.2%	0.5%
lzbench - Zstd 8 - Compression (MB/s)	**104**	**111**
Normalized	93.69%	100%
Standard Deviation		0.9%
PyPerformance - regex_compile (Milliseconds)	**133**	**155**
Normalized	100%	85.81%
Standard Deviation	2.6%	
Polyhedron Fortran Benchmarks - aermod (sec)	**4.57**	**5.49**
Normalized	100%	83.24%
DaCapo Benchmark - Tradebeans (msec)	**2478**	**4064**
Normalized	100%	60.97%
Standard Deviation	3.4%	0.9%
PyPerformance - nbody (Milliseconds)	**89.9**	**101**
Normalized	100%	89.01%
Standard Deviation	0.2%	0.6%
Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec)	**517909**	**711755**
Normalized	72.77%	100%
Standard Deviation	0.4%	0.2%
AOM AV1 - Speed 6 Realtime (FPS)	**25.31**	**19.22**
Normalized	100%	75.94%
Standard Deviation	0.8%	0.7%
Zstd Compression - 3 (MB/s)	**2867**	**4014**
Normalized	71.42%	100%
Standard Deviation	0.5%	1.6%
lzbench - Crush 0 - Decompression (MB/s)	**612**	**529**
Normalized	100%	86.44%
Standard Deviation	0.2%	0.3%
lzbench - Crush 0 - Compression (MB/s)	**131**	**114**
Normalized	100%	87.02%
Standard Deviation		1%
GEGL - Reflect (sec)	**25.416**	**29.718**
Normalized	100%	85.52%
Standard Deviation	0.2%	1.8%

Selenium - Kraken - Firefox (ms)	**715.7**	**725.2**
Normalized	100%	98.69%
Standard Deviation	2.3%	0.4%
Selenium - Kraken - Google Chrome (ms)	**779.3**	**743.1**
Normalized	95.35%	100%
Standard Deviation	2.7%	1%
PyPerformance - float (Milliseconds)	**82.5**	**102**
Normalized	100%	80.88%
Standard Deviation	0.2%	
PyPerformance - json_loads (Milliseconds)	**18.3**	**22.0**
Normalized	100%	83.18%
Standard Deviation	0%	0.3%
rav1e - 10 (FPS)	**3.460**	**3.241**
Normalized	100%	93.67%
Standard Deviation	0.2%	0.2%
GEGL - Tile Glass (sec)	**24.658**	**29.061**
Normalized	100%	84.85%
Standard Deviation	0.1%	0.5%
Redis - SADD (Reqs/sec)	**3071108**	**2357410**
Normalized	100%	76.76%
Standard Deviation	6.3%	2.2%
SMHasher - t1ha0_aes_avx2 (cycles/hash)	32.315	
Standard Deviation	0.1%	
SMHasher - t1ha0_aes_avx2 (MiB/sec)	46159	
Standard Deviation	2.9%	
Xonotic - 3840 x 2160 - Low (FPS)	**532.2734013**	**544.3905119**
Normalized	97.77%	100%
Standard Deviation	0.7%	0.5%
Timed MPlayer Compilation - Time To Compile (sec)	**29.273**	**20.967**
Normalized	71.63%	100%
Standard Deviation	0.2%	0.3%
PyPerformance - pathlib (Milliseconds)	**14.4**	**15.5**
Normalized	100%	92.9%
Standard Deviation	0.4%	0.4%
AOM AV1 - Speed 6 Two-Pass (FPS)	**4.66**	**4.16**
Normalized	100%	89.27%
Standard Deviation	0.3%	0.8%
lzbench - Brotli 2 - Decompression (MB/s)	**908**	**780**
Normalized	100%	85.9%
Standard Deviation	0.1%	0.5%
lzbench - Brotli 2 - Compression (MB/s)	**233**	**222**
Normalized	100%	95.28%
TTSIOD 3D Renderer - P.R.W.S.S.M (FPS)	**706.616**	**834.379**
Normalized	84.69%	100%
Standard Deviation	0.2%	0.2%
DaCapo Benchmark - H2 (msec)	**2615**	**3293**
Normalized	100%	79.41%
Standard Deviation	8.2%	1.7%
Xsbench (Lookups/s)	**2639580**	**2653413**
Normalized	99.48%	100%
Standard Deviation	0%	0.1%
ebizzy (Records/s)	**495906**	**1373026**
Normalized	36.12%	100%
Standard Deviation	2.9%	0.8%
Tungsten Renderer - Water Caustic (sec)	**23.6946**	**21.3900**

Normalized	90.27%	100%
Standard Deviation	0.6%	0.5%
Mlpack Benchmark - scikit_svm (sec)	**20.91**	**19.21**
Normalized	91.87%	100%
Standard Deviation	0.1%	0.6%
XZ Compression - C.u.1.0.3.s.i.i.C.L.9 (sec)	**22.326**	**24.112**
Normalized	100%	92.59%
Standard Deviation	0.5%	0.3%
lzbench - Libdeflate 1 - Decompression (MB/s)	**1482**	**1298**
Normalized	100%	87.58%
lzbench - Libdeflate 1 - Compression (MB/s)	**290**	**271**
Normalized	100%	93.45%
Standard Deviation	0.4%	
Timed ImageMagick Compilation - Time To Compile	**25.033**	**20.860**
Normalized	83.33%	100%
Standard Deviation	0.8%	0.1%
Botan - AES-256 (MiB/s)	**4925**	**5865**
Normalized	83.98%	100%
Standard Deviation	0%	0.1%
PyPerformance - pickle_pure_python (Milliseconds)	**331**	**424**
Normalized	100%	78.07%
Standard Deviation	0.3%	
Basis Universal - UASTC Level 2 (sec)	**25.170**	**19.048**
Normalized	75.68%	100%
Standard Deviation	0.4%	0.4%
lzbench - Brotli 0 - Decompression (MB/s)	**783**	**661**
Normalized	100%	84.42%
Standard Deviation	0.1%	
lzbench - Brotli 0 - Compression (MB/s)	**543**	**555**
Normalized	97.84%	100%
Standard Deviation	0.2%	0.4%
VP9 libvpx Encoding - Speed 5 (FPS)	**30.43**	**25.53**
Normalized	100%	83.9%
Standard Deviation	0.3%	0.4%
lzbench - Zstd 1 - Decompression (MB/s)	**1776**	**1563**
Normalized	100%	88.01%
Standard Deviation	0.3%	1%
lzbench - Zstd 1 - Compression (MB/s)	**615**	**568**
Normalized	100%	92.36%
Standard Deviation		1.3%
Rodinia - O.S (sec)	**17.306**	**25.517**
Normalized	100%	67.82%
Standard Deviation	0.1%	0.3%
oneDNN MKL-DNN - D.B.d - f32 (ms)	**3.03768**	**2.55517**
Normalized	84.12%	100%
Standard Deviation	0.2%	0.4%
Botan - Blowfish (MiB/s)	**556.522**	**479.252**
Normalized	100%	86.12%
Standard Deviation	0.1%	0.1%
Botan - Twofish (MiB/s)	**446.240**	**393.003**
Normalized	100%	88.07%
Standard Deviation	0.3%	0.1%
Botan - CAST-256 (MiB/s)	**175.908**	**156.180**
Normalized	100%	88.79%
Standard Deviation	0.1%	0.2%

Botan - KASUMI (MiB/s)	**115.381**	**101.025**
Normalized	100%	87.56%
Standard Deviation	0.3%	0.3%
OpenSSL - R.4.b.P (Signs/sec)	**3756**	**4707**
Normalized	79.79%	100%
Standard Deviation	0.1%	0.1%
dav1d - Summer Nature 4K (FPS)	**177.43**	**187.35**
Normalized	94.71%	100%
Standard Deviation	0.1%	0.5%
Facebook RocksDB - Seq Fill (Op/s)	**1431900**	**1292441**
Normalized	100%	90.26%
Standard Deviation	0.4%	0.5%
Polyhedron Fortran Benchmarks - ac (sec)	**4.34**	**5.89**
Normalized	100%	73.68%
PyBench - T.F.A.T.T (Milliseconds)	**760**	**894**
Normalized	100%	85.01%
Standard Deviation	0.5%	2.1%
Timed Apache Compilation - Time To Compile (sec)	**17.907**	**20.240**
Normalized	100%	88.47%
Standard Deviation	0.2%	0.4%
Selenium - PSPDFKit WASM - Firefox (Score)	**1148**	**1304**
Normalized	100%	88.04%
Standard Deviation	0.6%	0.1%
Zstd Compression - C.u.1.0.3.s.i.i.C.L.1 (sec)	**21.925**	**15.514**
Normalized	70.76%	100%
Standard Deviation	0.2%	0.7%
dav1d - Summer Nature 4K (FPS)	**185.20**	**204.01**
Normalized	90.78%	100%
Standard Deviation	0.1%	0.1%
dav1d - Chimera 1080p (FPS)	**700.92**	**519.76**
Normalized	100%	74.15%
Standard Deviation	0.1%	0.5%
Selenium - Maze Solver - Firefox (sec)	**5.4**	**4.5**
Normalized	83.33%	100%
Standard Deviation	1.1%	1.3%
Rodinia - OpenMP LavaMD (sec)	**21.053**	**14.967**
Normalized	71.09%	100%
Standard Deviation	0.8%	0.2%
Selenium - W.c - Firefox (ms)	**414.4**	**351.9**
Normalized	84.92%	100%
Standard Deviation	0.3%	0.7%
AOM AV1 - Speed 4 Two-Pass (FPS)	**2.93**	**2.71**
Normalized	100%	92.49%
Standard Deviation	0.4%	0.2%
Selenium - PSPDFKit WASM - Google Chrome (Score)	**1387**	**1509**
Normalized	100%	91.92%
Standard Deviation	0.7%	1.1%
Parboil - OpenMP Stencil (sec)	**16.403124**	**15.106023**
Normalized	92.09%	100%
Standard Deviation	1.1%	0.8%
Tungsten Renderer - Hair (sec)	**20.2258**	**13.6067**
Normalized	67.27%	100%
Standard Deviation	0.4%	0.2%
Intel Open Image Denoise - Memorial (Images / Sec)	**11.12**	**12.73**
Normalized	87.35%	100%

Standard Deviation	0%	0.3%
dav1d - Chimera 1080p (FPS)	**782.60**	**626.95**
Normalized	100%	80.11%
Standard Deviation	0.3%	0.3%
NAS Parallel Benchmarks - MG.C (Mop/s)	**11256**	**10836**
Normalized	100%	96.27%
Standard Deviation	0.4%	0.1%
Polyhedron Fortran Benchmarks - linpk (sec)	**2.31**	**3.05**
Normalized	100%	75.74%
Numenta Anomaly Benchmark - Relative Entropy	**16.561**	**14.391**
Normalized	86.9%	100%
Standard Deviation	1.5%	1%
oneDNN MKL-DNN - IP Batch 1D - f32 (ms)	**3.30905**	**4.58909**
Normalized	100%	72.11%
Standard Deviation	0.6%	0.1%
oneDNN MKL-DNN - IP Batch 1D - u8s8f32 (ms)	**1.17466**	**1.34228**
Normalized	100%	87.51%
Standard Deviation	0%	0.2%
OSBench - Create Threads (us/Event)	**8.883476**	**12.243907**
Normalized	100%	72.55%
Standard Deviation	0.6%	11.5%
Swet - Average (Operations/sec)	**972233554**	**816912713**
Normalized	100%	84.02%
Standard Deviation	0.3%	1.9%
Basemark GPU - OpenGL - 3840 x 2160 - Medium	**304.94**	**187.04**
Normalized	100%	61.34%
Standard Deviation	1.4%	2.6%
Go Benchmarks - json (ns/op)	**3100011**	**2321631**
Normalized	74.89%	100%
Standard Deviation	0.6%	0.1%
Rodinia - OpenMP CFD Solver (sec)	**18.283**	**10.914**
Normalized	59.69%	100%
Standard Deviation	0.2%	0.3%
Selenium - Maze Solver - Google Chrome (sec)	**5.4**	**4.1**
Normalized	75.93%	100%
Standard Deviation	0%	1.4%
Primesieve - 1.P.N.G (sec)	**17.181**	**11.821**
Normalized	68.8%	100%
Standard Deviation	0.6%	0.6%
AOM AV1 - Speed 8 Realtime (FPS)	**49.01**	**38.24**
Normalized	100%	78.02%
Standard Deviation	0.5%	1.6%
Sockperf - Latency Ping Pong (usec)	**3.222**	**3.835**
Normalized	100%	84.02%
Standard Deviation	1.3%	2.4%
Selenium - W.c - Google Chrome (ms)	**343.4547**	**278.3210**
Normalized	81.04%	100%
Standard Deviation	1.7%	1.8%
Nebular Empirical Analysis Tool (sec)	**13.970**	**12.957**
Normalized	92.75%	100%
Standard Deviation	0.1%	0.9%
GIMP - unsharp-mask (sec)	**11.946**	**14.776**
Normalized	100%	80.85%
Standard Deviation	0.1%	0.5%

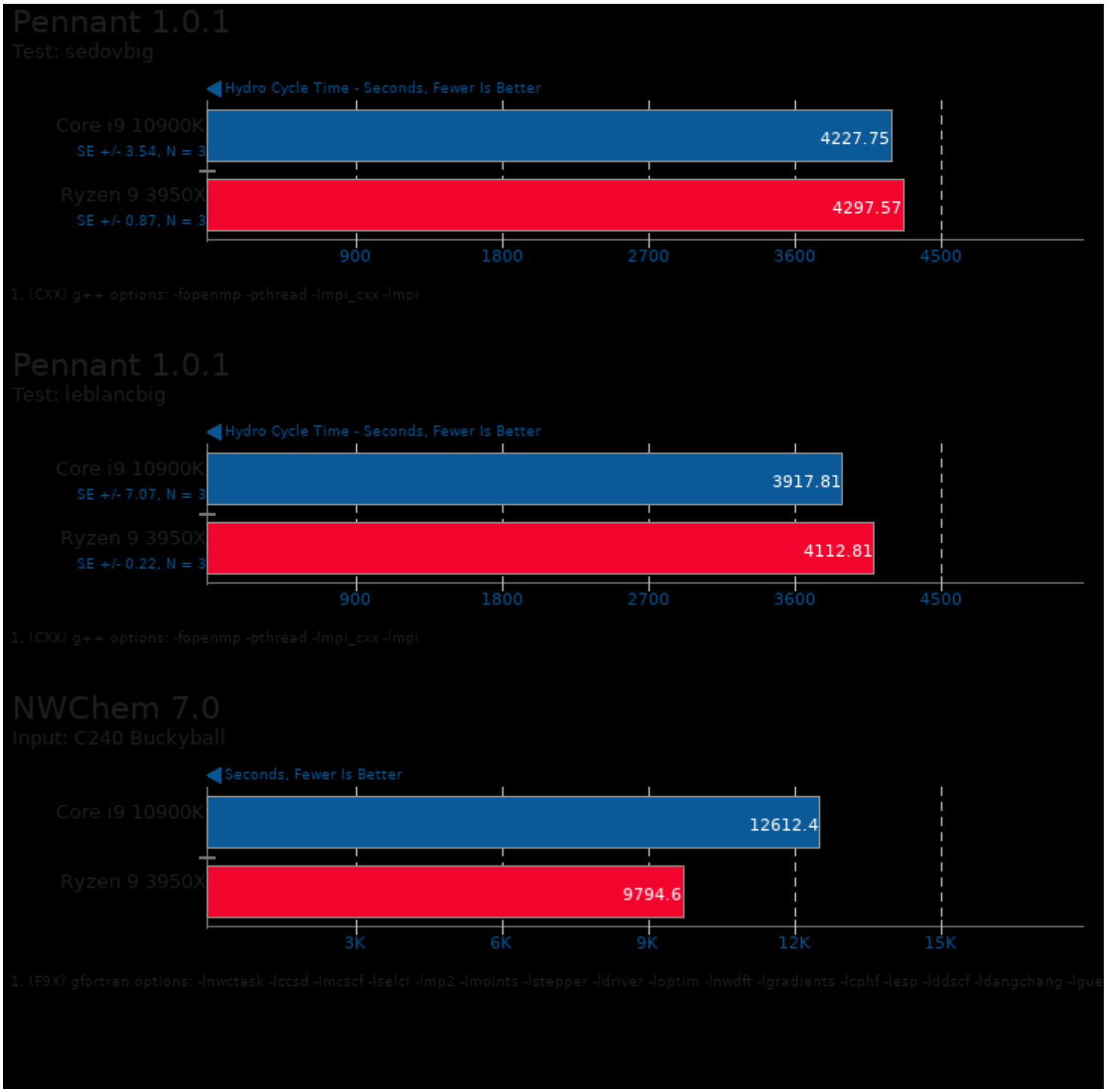
ASKAP - tConvolve OpenMP - Degridding (Million Grid Points/sec)	**2165**	**1925**
Normalized	100%	88.91%
Standard Deviation	0.8%	0.4%
ASKAP - tConvolve OpenMP - Gridding (Million Grid Points/sec)	**1307**	**1165**
Normalized	100%	89.09%
Standard Deviation	0.8%	2%
SMHasher - MeowHash (cycles/hash)	51.813	
Standard Deviation	0.2%	
SMHasher - MeowHash (MiB/sec)	40765	
Standard Deviation	0.3%	
Basemark GPU - Vulkan - 3840 x 2160 - Medium (FPS)	**404.07**	**415.32**
Normalized	97.29%	100%
Standard Deviation	0.1%	0.3%
Redis - GET (Reqs/sec)	**3788205**	**2609128**
Normalized	100%	68.88%
Standard Deviation	1.1%	2.8%
SMHasher - Spooky32 (cycles/hash)	41.073	
Standard Deviation	0%	
SMHasher - Spooky32 (MiB/sec)	15361	
Standard Deviation	1.8%	
Bork File Encrypter - F.E.T (sec)	**5.124**	**8.578**
Normalized	100%	59.73%
Standard Deviation	1.5%	2.9%
GIMP - auto-levels (sec)	**9.693**	**11.692**
Normalized	100%	82.9%
Standard Deviation	0.3%	0.4%
rays1bench - Large Scene (mrays/s)	**81.82**	**108.20**
Normalized	75.62%	100%
Standard Deviation	0%	0.1%
Redis - LPOP (Reqs/sec)	**3942561**	**2716045**
Normalized	100%	68.89%
Standard Deviation	1.2%	2.5%
DaCapo Benchmark - Tradesoap (msec)	**2889**	**3442**
Normalized	100%	83.93%
Standard Deviation	1.4%	1.5%
GIMP - rotate (sec)	**9.573**	**10.542**
Normalized	100%	90.81%
Standard Deviation	0.5%	0.7%
Sysbench - CPU (Events/sec)	**27066**	**34951**
Normalized	77.44%	100%
Standard Deviation	0%	0.1%
SMHasher - fasthash32 (cycles/hash)	31.994	
Standard Deviation	0%	
SMHasher - fasthash32 (MiB/sec)	7843	
Standard Deviation	0.1%	
Selenium - W.i - Firefox (ms)	**27.1**	**26.2**
Normalized	96.68%	100%
Standard Deviation	0.7%	2.3%
SMHasher - t1ha2_atonce (cycles/hash)	32.065	
Standard Deviation	0%	
SMHasher - t1ha2_atonce (MiB/sec)	17288	
Standard Deviation	0.8%	

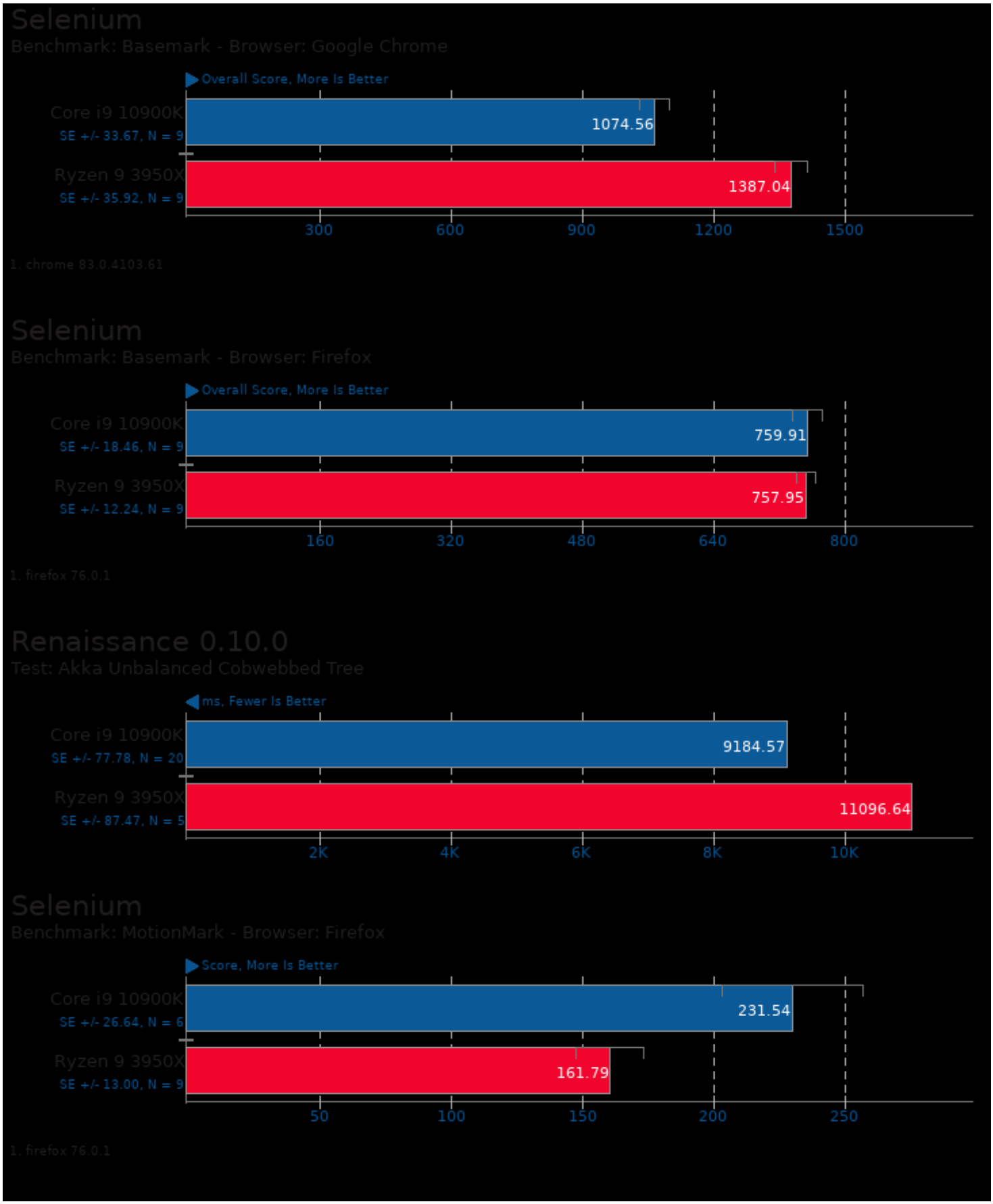
GnuPG - 2.F.E (sec)	**7.949**	**11.194**
Normalized	100%	71.01%
Standard Deviation	0.4%	1.9%
Go Benchmarks - garbage (ns/op)	**788879**	**750702**
Normalized	95.16%	100%
Standard Deviation	0.4%	0.7%
x265 - H.2.1.V.E (FPS)	**72.38**	**62.85**
Normalized	100%	86.83%
Standard Deviation	1%	0.8%
N-Queens - Elapsed Time (sec)	**10.350**	**6.760**
Normalized	65.31%	100%
Standard Deviation	0%	0.2%
Scikit-Learn (sec)	**8.782**	**8.273**
Normalized	94.2%	100%
Standard Deviation	2.5%	2.4%
NeatBench - CPU (FPS)	**18.3**	**26.2**
Normalized	69.85%	100%
Standard Deviation	0.3%	2.4%
SMHasher - wyhash (cycles/hash)	24.548	
Standard Deviation	0%	
SMHasher - wyhash (MiB/sec)	18893	
Standard Deviation	1.7%	
IPC_benchmark - U.U.D.S - 4096 (Messages/sec)	**1260891**	**1088654**
Normalized	100%	86.34%
Standard Deviation	0.6%	1.1%
Numenta Anomaly Benchmark - Windowed Gaussian (sec)	**7.665**	**6.695**
Normalized	87.35%	100%
Standard Deviation	0.7%	0.5%
GEGL - Crop (sec)	**6.764**	**7.538**
Normalized	100%	89.73%
Standard Deviation	1.4%	1.7%
Selenium - W.i - Google Chrome (ms)	**35.7272**	**35.8952**
Normalized	100%	99.53%
Standard Deviation	0.5%	0.9%
IPC_benchmark - TCP Socket - 4096 (Messages/sec)	**1575932**	**1445302**
Normalized	100%	91.71%
Standard Deviation	0.5%	0.8%
LAME MP3 Encoding - WAV To MP3 (sec)	**6.974**	**6.954**
Normalized	99.71%	100%
Standard Deviation	0.2%	2.3%
Basis Universal - UASTC Level 0 (sec)	**6.514**	**7.197**
Normalized	100%	90.51%
Standard Deviation	1.1%	1%
NAS Parallel Benchmarks - EP.C (Mop/s)	**1829**	**1077**
Normalized	100%	58.91%
Standard Deviation	0.4%	0.1%
Smallpt - G.I.R.1.S (sec)	**7.852**	**5.237**
Normalized	66.7%	100%
Standard Deviation	0.1%	0.1%
DaCapo Benchmark - Jython (msec)	**3319**	**4010**
Normalized	100%	82.77%
Standard Deviation	0.8%	
GIMP - resize (sec)	**6.135**	**6.689**
Normalized	100%	91.72%

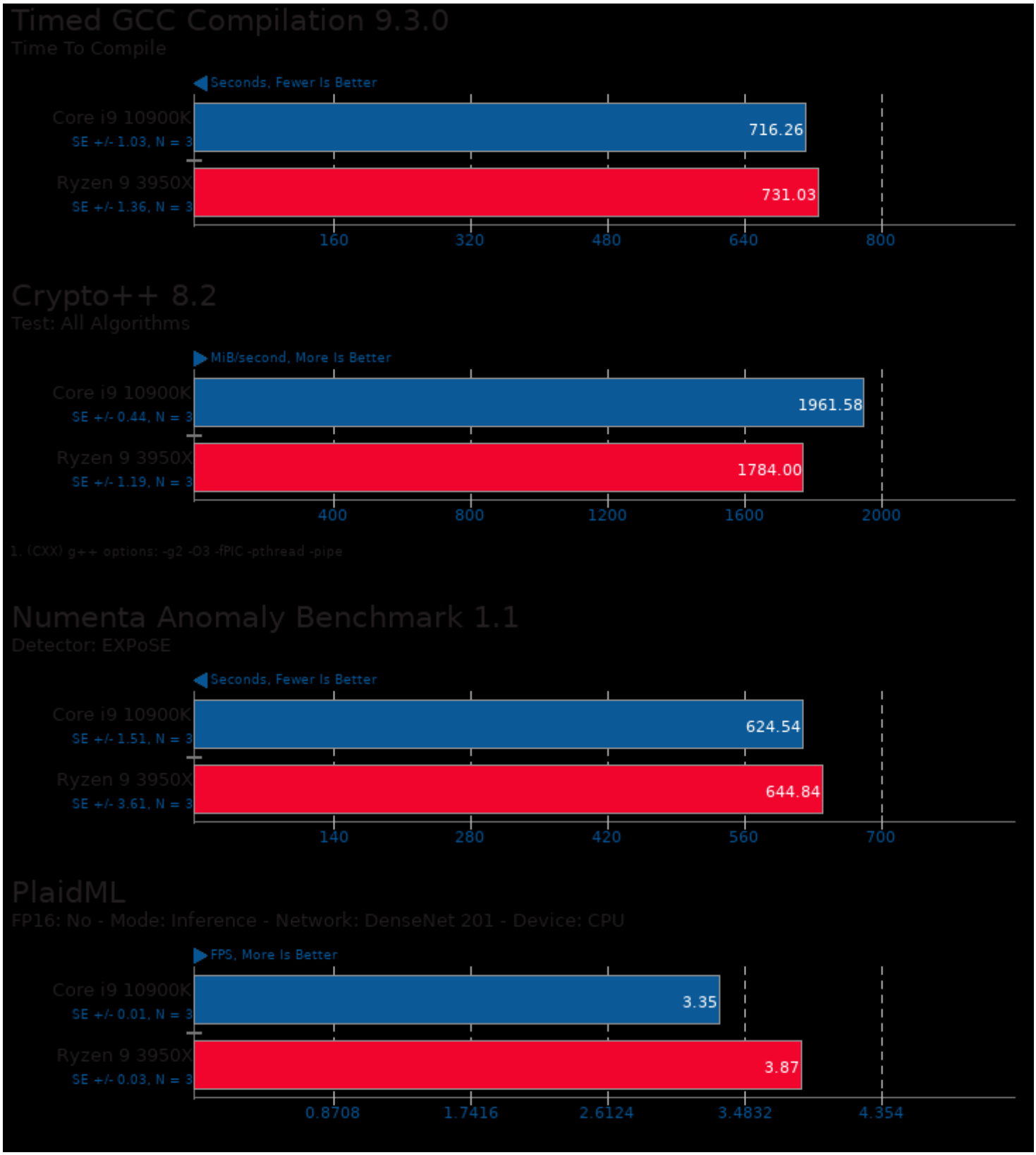
Standard Deviation	1%	1.7%
Tungsten Renderer - Volumetric Caustic (sec)	**6.98866**	**5.53479**
Normalized	79.2%	100%
Standard Deviation	0.3%	1.6%
libjpeg-turbo tjbench - D.T (Megapixels/sec)	**237.108141**	**221.087385**
Normalized	100%	93.24%
Standard Deviation	0.2%	0.2%
dav1d - S.N.1 (FPS)	**671.39**	**547.69**
Normalized	100%	81.58%
Standard Deviation	0.2%	0.3%
FFmpeg - H.2.H.T.N.D (sec)	**4.562**	**7.197**
Normalized	100%	63.39%
Standard Deviation	2.1%	1.5%
ParaView - Wavelet Volume - 3840 x 2160 (MiVoxels / Sec)	**1306**	**3246**
Normalized	40.22%	100%
Standard Deviation	2.2%	4.1%
ParaView - Wavelet Volume - 3840 x 2160 (Frames /	**81.60**	**202.90**
Normalized	40.22%	100%
Standard Deviation	2.2%	4.1%
dav1d - S.N.1 (FPS)	**735.61**	**587.62**
Normalized	100%	79.88%
Standard Deviation	0.2%	0.3%
OSBench - Create Files (us/Event)	**10.474451**	**11.633563**
Normalized	100%	90.04%
Standard Deviation	0.8%	0.4%
IPC_benchmark - FIFO Named Pipe - 4096 (Messages/sec)	**1462821**	**2260588**
Normalized	64.71%	100%
Standard Deviation	0.4%	1.3%
IPC_benchmark - Unnamed Pipe - 4096	**1460097**	**2268105**
Normalized	64.38%	100%
Standard Deviation	0.8%	0.6%
OSBench - Memory Allocations (Ns/Event)	**56.163311**	**69.227616**
Normalized	100%	81.13%
Standard Deviation	0.2%	0.3%
OSBench - Create Processes (us/Event)	**16.390483**	**27.797222**
Normalized	100%	58.96%
Standard Deviation	1.7%	2.4%
OSBench - Launch Programs (us/Event)	**26.023388**	**35.923322**
Normalized	100%	72.44%
Standard Deviation	0.3%	1.2%
GEGL - Scale (sec)	**4.822**	**5.042**
Normalized	100%	95.64%
Standard Deviation	2%	0.5%
ParaView - Wavelet Contour - 3840 x 2160 (MiPolys / Sec)	**1962**	**1977**
Normalized	99.24%	100%
Standard Deviation	1.9%	1.3%
ParaView - Wavelet Contour - 3840 x 2160 (Frames / Sec)	**188.23**	**189.67**
Normalized	99.24%	100%
Standard Deviation	1.9%	1.3%
Tungsten Renderer - Non-Exponential (sec)	**5.14902**	**4.40751**
Normalized	85.6%	100%

Standard Deviation	0.2%	0.4%
Timed HMMer Search - P.D.S (sec)	**4.281**	**5.086**
Normalized	100%	84.17%
Standard Deviation	0.4%	1.6%
Nettle - aes256 (Mbyte/s)	**8094**	**6114**
Normalized	100%	75.54%
Standard Deviation	0%	0.1%
x264 - H.2.V.E (FPS)	**126.49**	**159.92**
Normalized	79.1%	100%
Standard Deviation	2.9%	2.9%
Bullet Physics Engine - Raytests (sec)	**2.043963**	**2.084161**
Normalized	100%	98.07%
Standard Deviation	0.4%	0.4%
Multichase Pointer Chaser - 1.A.2.B.S.4.T (ns)	**50.128**	**70.200**
Normalized	100%	71.41%
Standard Deviation	0%	0.1%
Multichase Pointer Chaser - 1.A.2.B.S.2.T (ns)	**46.168**	**67.811**
Normalized	100%	68.08%
Standard Deviation	0.2%	0%
Multichase Pointer Chaser - 1.A.2.B.S (ns)	**44.604**	**67.366**
Normalized	100%	66.21%
Standard Deviation	0.2%	0.1%
Parallel BZIP2 Compression - 2.F.C (sec)	3.118	
Standard Deviation	2.5%	
oneDNN MKL-DNN - D.B.d - u8s8f32 (ms)	**2.23525**	**2.63474**
Normalized	100%	84.84%
Standard Deviation	0.4%	0.2%
Multichase Pointer Chaser - 2.A.2.B.S (ns)	**41.813**	**67.194**
Normalized	100%	62.23%
Standard Deviation	0.1%	0.3%
oneDNN MKL-DNN - D.B.d - f32 (ms)	**4.76923**	**4.37431**
Normalized	91.72%	100%
Standard Deviation	0.3%	0.3%
Nettle - sha512 (Mbyte/s)	**639.74**	**640.16**
Normalized	99.93%	100%
Standard Deviation	0.4%	2.9%
Multichase Pointer Chaser - 4.A.6.B.S (ns)	**5.206**	**4.720**
Normalized	90.66%	100%
Standard Deviation	0.1%	0.3%
Hackbench - 1 - Thread (sec)	**2.245**	**3.016**
Normalized	100%	74.44%
Standard Deviation	0.5%	1.1%
Hackbench - 1 - Process (sec)	**2.029**	**2.711**
Normalized	100%	74.84%
Standard Deviation	0.2%	1.8%
Optcarrot - O.B (FPS)	**180.40**	**141.62**
Normalized	100%	78.5%
Standard Deviation	0.3%	1.3%
Parboil - OpenMP CUTCP (sec)	**2.718560**	**1.324664**
Normalized	48.73%	100%
Standard Deviation	0.1%	0.5%
TSCP - A.C.P (Nodes/s)	**1623785**	**1320223**
Normalized	100%	81.31%
Standard Deviation	0.5%	0.7%
Nettle - chacha (Mbyte/s)	**1360**	**992.023**

Normalized	100%	72.96%
Standard Deviation	0%	0.1%
IOR - Read Test (MB/s)	**867.37**	**1083**
Normalized	80.06%	100%
Standard Deviation	4.7%	0.1%
IOR - Write Test (MB/s)	**249.66**	**279.04**
Normalized	89.47%	100%
Standard Deviation	0.2%	1%
ctx_clock - C.S.T (Clocks)	**144**	**140**
Normalized	97.22%	100%
Nettle - poly1305-aes (Mbyte/s)	**3726**	**2711**
Normalized	100%	72.77%
Standard Deviation	0.3%	0.2%
BLAKE2 (Cycles/Byte)	**4.03**	**7.64**
Normalized	100%	52.75%
Standard Deviation	0%	0.6%
Bullet Physics Engine - Convex Trimesh (sec)	**0.937118**	**0.943135**
Normalized	100%	99.36%
Standard Deviation	0.8%	0.5%
Bullet Physics Engine - Prim Trimesh (sec)	**0.782503**	**0.788758**
Normalized	100%	99.21%
Standard Deviation	0.9%	0.4%
Bullet Physics Engine - 136 Ragdolls (sec)	**2.233182**	**2.150808**
Normalized	96.31%	100%
Standard Deviation	0.8%	0.4%
Bullet Physics Engine - 1000 Convex (sec)	**3.584657**	**3.745295**
Normalized	100%	95.71%
Standard Deviation	0.1%	0.4%
Bullet Physics Engine - 1000 Stack (sec)	**3.810223**	**4.047731**
Normalized	100%	94.13%
Standard Deviation	0.4%	0.5%
Bullet Physics Engine - 3000 Fall (sec)	**3.359547**	**3.367286**
Normalized	100%	99.77%
Standard Deviation	1.1%	0.4%
Java SciMark - J.S.O.R (Mflops)	**1994**	**2074**
Normalized	96.15%	100%
Standard Deviation	0.1%	1.4%
Java SciMark - D.L.M.F (Mflops)	**7302**	**6835**
Normalized	100%	93.6%
Standard Deviation	1%	2.9%
Java SciMark - S.M.M (Mflops)	**2780**	**2784**
Normalized	99.85%	100%
Standard Deviation	0.3%	1.8%
Java SciMark - F.F.T (Mflops)	**1930**	**2134**
Normalized	90.45%	100%
Standard Deviation	0.9%	2.1%
Java SciMark - Monte Carlo (Mflops)	**1259**	**1753**
Normalized	71.8%	100%
Standard Deviation	0%	1.7%


Pennant 1.0.1
Test: sedovbig
Hydro Cycle Time - Seconds, Fewer Is Better
Core i9 10900K
SE +/- 3.54, N = 3
4227.75
Ryzen 9 3950X
SE +/- 0.87, N = 3
4297.57
900
1800
2700
3600
4500
1. (CXX) g++ options: -fopenmp -pthread -lmpi_cxx -lmpi
Pennant 1.0.1
Test: leblancbig
Hydro Cycle Time - Seconds, Fewer Is Better
Core i9 10900K
SE +/- 7.07, N = 3
3917.81
Ryzen 9 3950X
SE +/- 0.22, N = 3
4112.81
900
1800
2700
3600
4500
1. (CXX) g++ options: -fopenmp -pthread -lmpi_cxx -lmpi
NWChem 7.0
Input: C240 Buckyball
Seconds, Fewer Is Better
Core i9 10900K
12612.4
Ryzen 9 3950X
9794.6
3K
6K
9K
12K
15K
1. (F9X) gfortran options: -lnwctask -lccsd -lmcscf -lselci -lmp2 -lmoints -lstepper -ldriver -loptim -lnwdft -lgradients -lcphf -lesp -lddscf -ldangchang -lgue

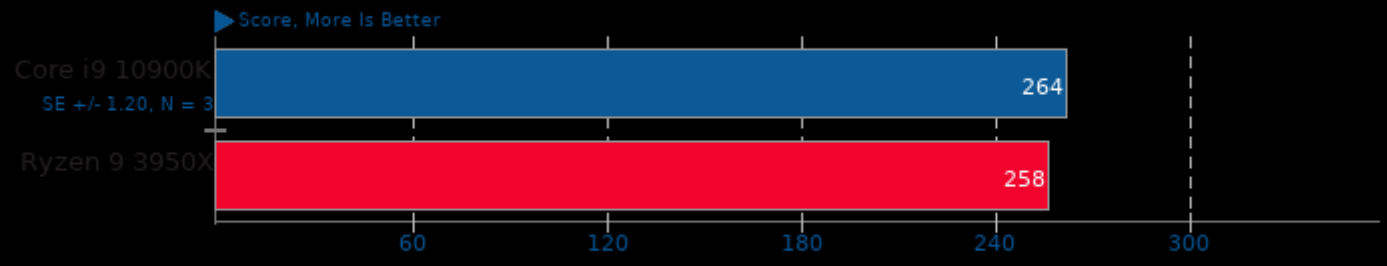

Selenium
Benchmark: Basemark - Browser: Google Chrome
Overall Score, More Is Better
Core i9 10900K
SE +/- 33.67, N = 9
1074.56
Ryzen 9 3950X
SE +/- 35.92, N = 9
1387.04
300
600
900
1200
1500
1: chrome 83.0.4103.61
Selenium
Benchmark: Basemark - Browser: Firefox
Overall Score, More Is Better
Core i9 10900K
SE +/- 18.46, N = 9
759.91
Ryzen 9 3950X
SE +/- 12.24, N = 9
757.95
160
320
480
640
800
1: firefox 76.0.1
Renaissance 0.10.0
Test: Akka Unbalanced Cobwebbed Tree
ms, Fewer Is Better
Core i9 10900K
SE +/- 77.78, N = 20
9184.57
Ryzen 9 3950X
SE +/- 87.47, N = 5
11096.64
2K
4K
6K
8K
10K
Selenium
Benchmark: MotionMark - Browser: Firefox
Score, More Is Better
Core i9 10900K
SE +/- 26.64, N = 6
231.54
Ryzen 9 3950X
SE +/- 13.00, N = 9
161.79
50
100
150
200
250
1: firefox 76.0.1


Timed GCC Compilation 9.3.0
Time To Compile
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 1.03, N = 3
716.26
Ryzen 9 3950X
SE +/- 1.36, N = 3
731.03
160
320
480
640
800
Crypto++ 8.2
Test: All Algorithms
MiB/second, More Is Better
Core i9 10900K
SE +/- 0.44, N = 3
1961.58
Ryzen 9 3950X
SE +/- 1.19, N = 3
1784.00
400
800
1200
1600
2000
1. (CXX) g++ options: -g2 -O3 -fPIC -pthread -pipe
Numenta Anomaly Benchmark 1.1
Detector: EXPoSE
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 1.51, N = 3
624.54
Ryzen 9 3950X
SE +/- 3.61, N = 3
644.84
140
280
420
560
700
PlaidML
FP16: No - Mode: Inference - Network: DenseNet 201 - Device: CPU
FPS, More Is Better
Core i9 10900K
SE +/- 0.01, N = 3
3.35
Ryzen 9 3950X
SE +/- 0.03, N = 3
3.87
0.8708
1.7416
2.6124
3.4832
4.354


Renaissance 0.10.0
Test: Savina Reactors.IO
ms, Fewer Is Better
Core i9 10900K
SE +/- 140.82, N = 5
15777.24
Ryzen 9 3950X
SE +/- 130.33, N = 25
10635.88
3K
6K
9K
12K
15K
Basis Universal 1.12
Settings: UASTC Level 2 + RDO Post-Processing
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.41, N = 3
573.95
Ryzen 9 3950X
SE +/- 0.82, N = 3
587.38
130
260
390
520
650
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread
Renaissance 0.10.0
Test: Apache Spark Bayes
ms, Fewer Is Better
Core i9 10900K
SE +/- 12.37, N = 17
1704.12
Ryzen 9 3950X
SE +/- 107.08, N = 25
2727.91
600
1200
1800
2400
3000
Selenium
Benchmark: WebXPRT - Browser: Firefox
Score, More Is Better
Core i9 10900K
294
Ryzen 9 3950X
SE +/- 1.20, N = 3
252
60
120
180
240
300
1. firefox 76.0.1

Selenium

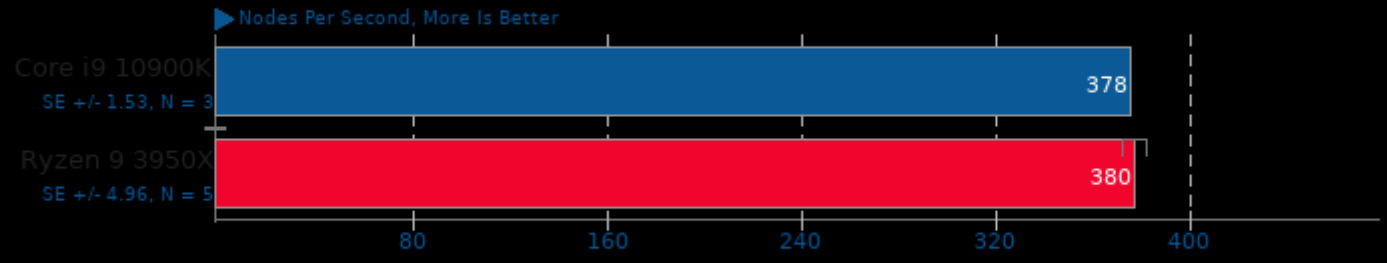
Benchmark: WebXPRT - Browser: Google Chrome



1. chrome 83.0.4103.61

LeelaChessZero 0.25

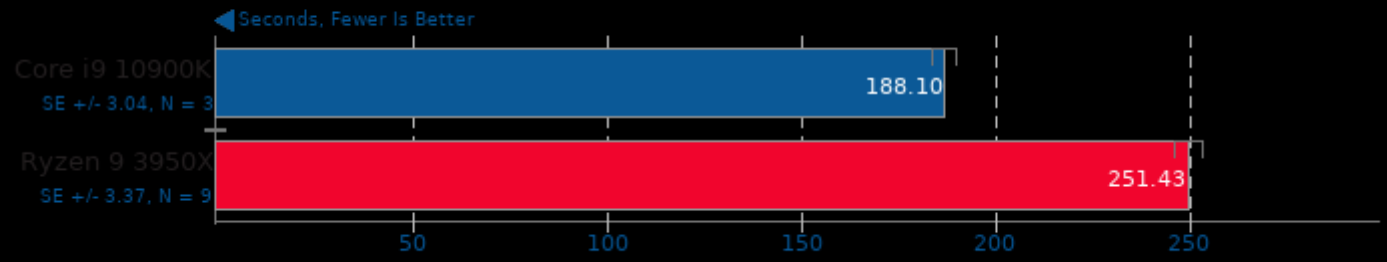
Backend: BLAS



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

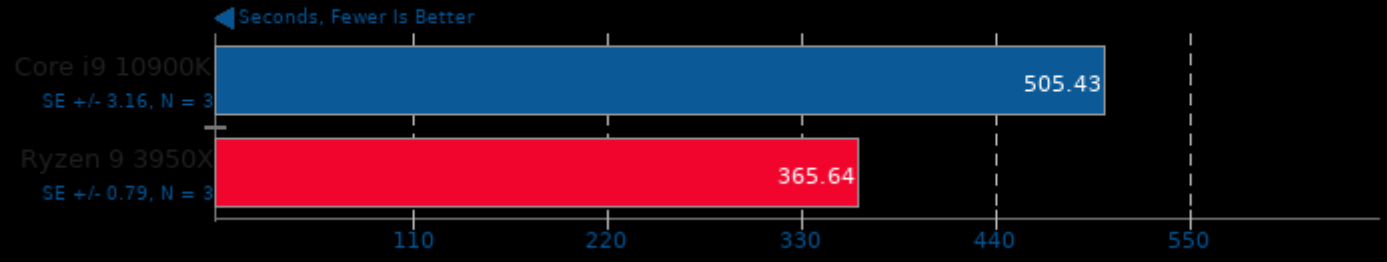
Java Gradle Build

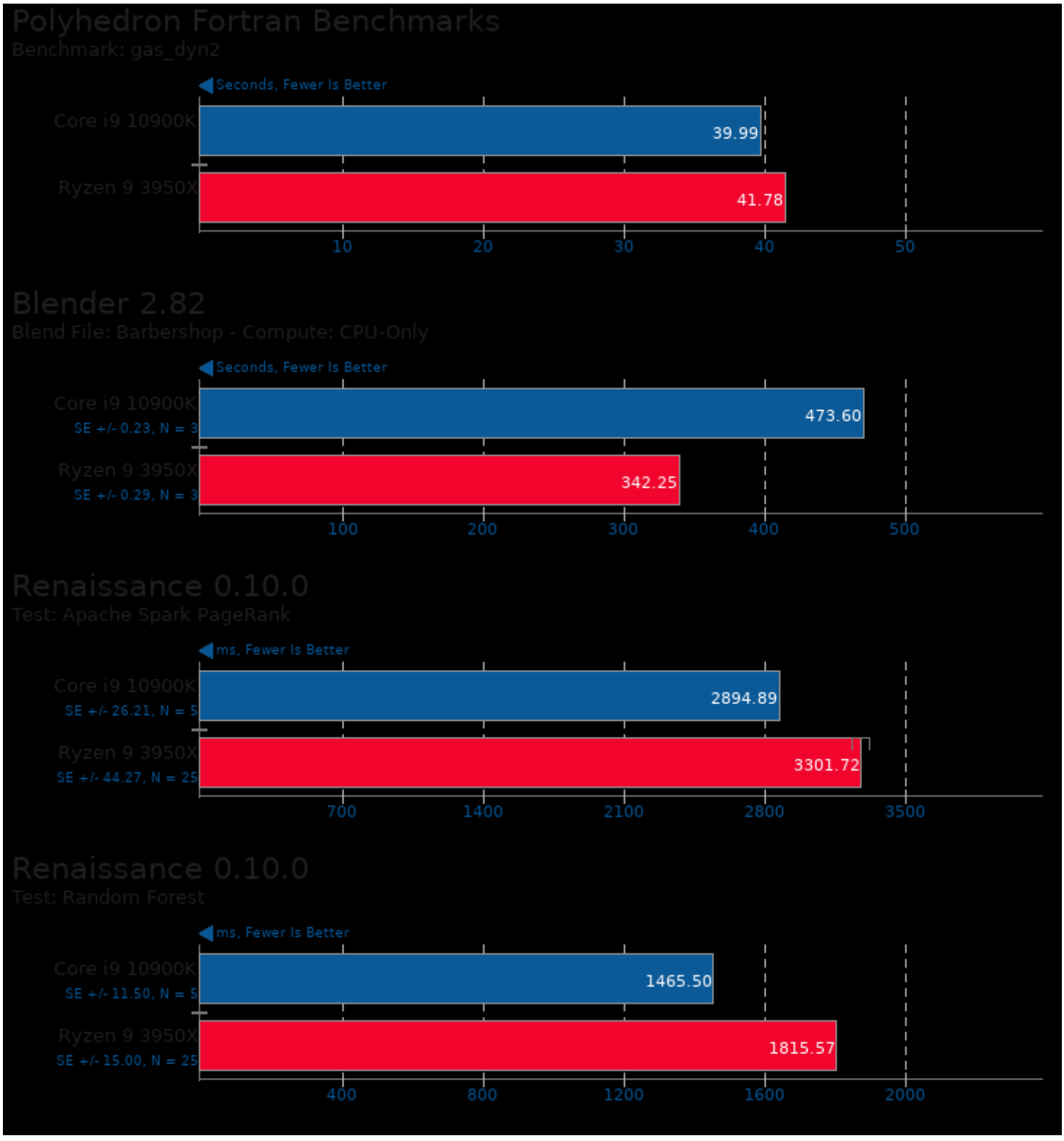
Gradle Build: Reactor



Timed LLVM Compilation 10.0

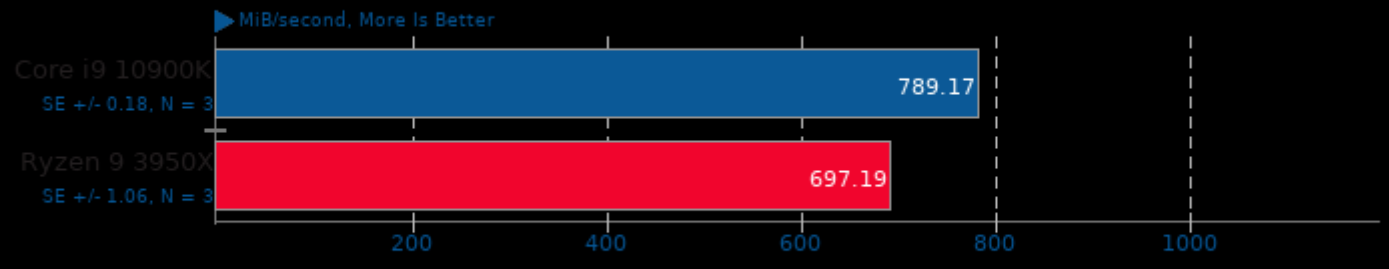
Time To Compile




Polyhedron Fortran Benchmarks
Benchmark: gas_dyn2
Seconds, Fewer Is Better
Core i9 10900K
39.99
Ryzen 9 3950X
41.78
10
20
30
40
50
Blender 2.82
Blend File: Barbershop - Compute: CPU-Only
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.23, N = 3
473.60
Ryzen 9 3950X
SE +/- 0.29, N = 3
342.25
100
200
300
400
500
Renaissance 0.10.0
Test: Apache Spark PageRank
ms, Fewer Is Better
Core i9 10900K
SE +/- 26.21, N = 5
2894.89
Ryzen 9 3950X
SE +/- 44.27, N = 25
3301.72
700
1400
2100
2800
3500
Renaissance 0.10.0
Test: Random Forest
ms, Fewer Is Better
Core i9 10900K
SE +/- 11.50, N = 5
1465.50
Ryzen 9 3950X
SE +/- 15.00, N = 25
1815.57
400
800
1200
1600
2000

Crypto++ 8.2

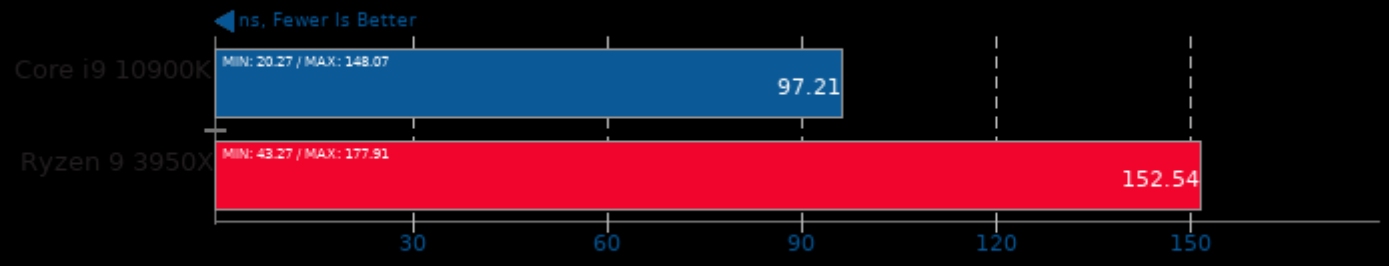
Test: Keyed Algorithms



1. (CXX) g++ options: -g2 -O3 -fPIC -pthread -pipe

Core-Latency

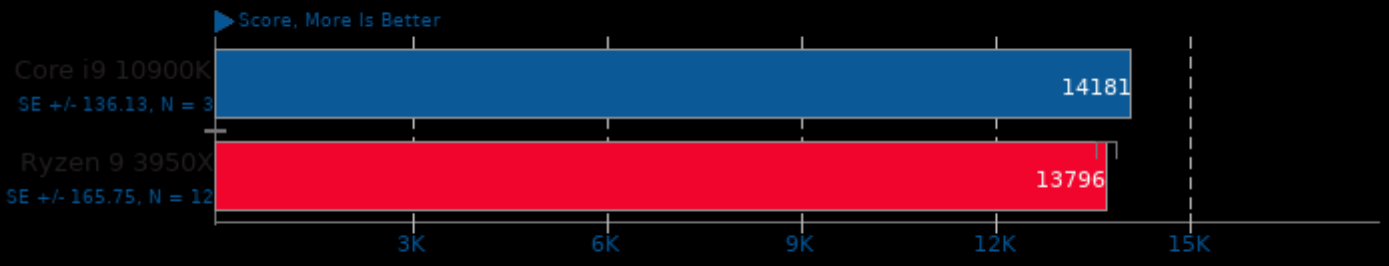
Average Latency Between CPU Cores



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

Selenium

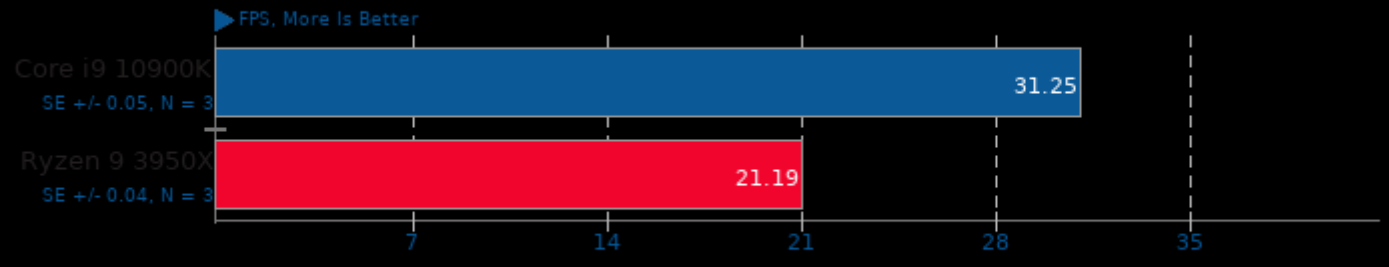
Benchmark: CanvasMark - Browser: Firefox



1. firefox 76.0.1

libgav1 2019-10-05

Video Input: Chimera 1080p 10-bit

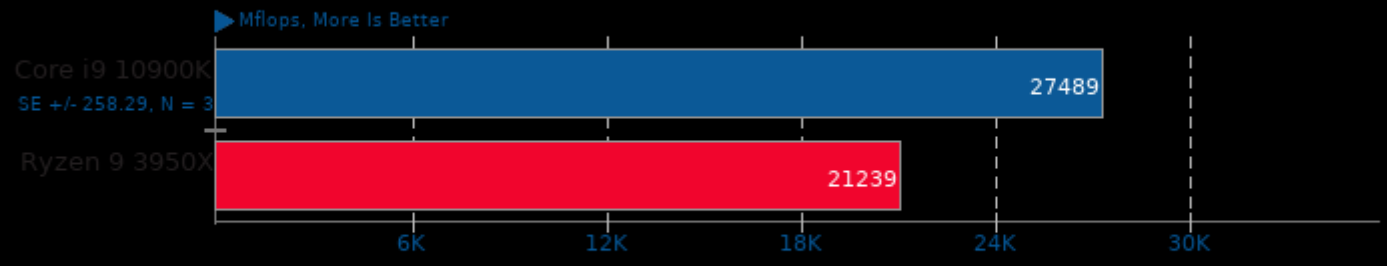


1. (CXX) g++ options: -O3 -lpthread


Blender 2.82
Blend File: Pabellon Barcelona - Compute: CPU-Only
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.52, N = 3
426.20
Ryzen 9 3950X
SE +/- 0.15, N = 3
285.86
90
180
270
360
450
LeelaChessZero 0.25
Backend: Eigen
Nodes Per Second, More Is Better
Core i9 10900K
SE +/- 9.02, N = 3
607
Ryzen 9 3950X
SE +/- 4.04, N = 3
400
130
260
390
520
650
1. (CXX) g++ options: -pthread
LeelaChessZero 0.25
Backend: Random
Nodes Per Second, More Is Better
Core i9 10900K
SE +/- 473.05, N = 3
231501
Ryzen 9 3950X
SE +/- 51.41, N = 3
185500
50K
100K
150K
200K
250K
1. (CXX) g++ options: -pthread
Renaissance 0.10.0
Test: Genetic Algorithm Using Jenetics + Futures
ms, Fewer Is Better
Core i9 10900K
SE +/- 9.89, N = 25
1249.40
Ryzen 9 3950X
SE +/- 13.66, N = 5
1725.09
400
800
1200
1600
2000

FFTW 3.3.6

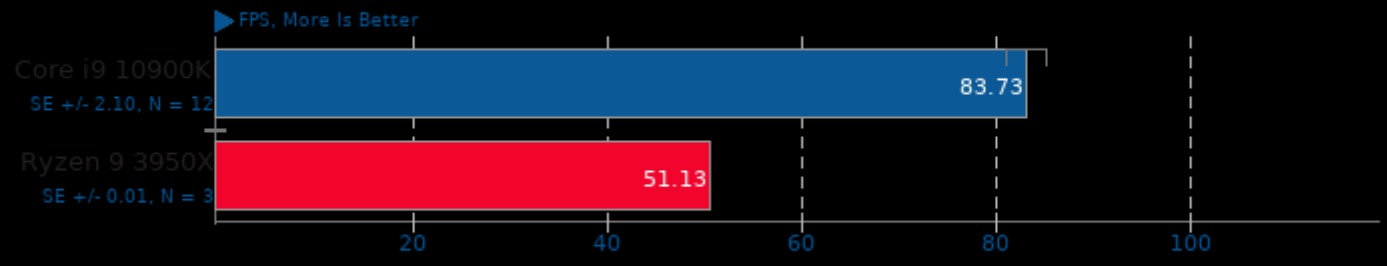
Build: Float + SSE - Size: 2D FFT Size 4096



1. (CC) gcc options: -pthread -O3 -fomit-frame-pointer -mtune=native -malign-double -fstrict-aliasing -fno-schedule-insns -ffast-math -lm

libgav1 2019-10-05

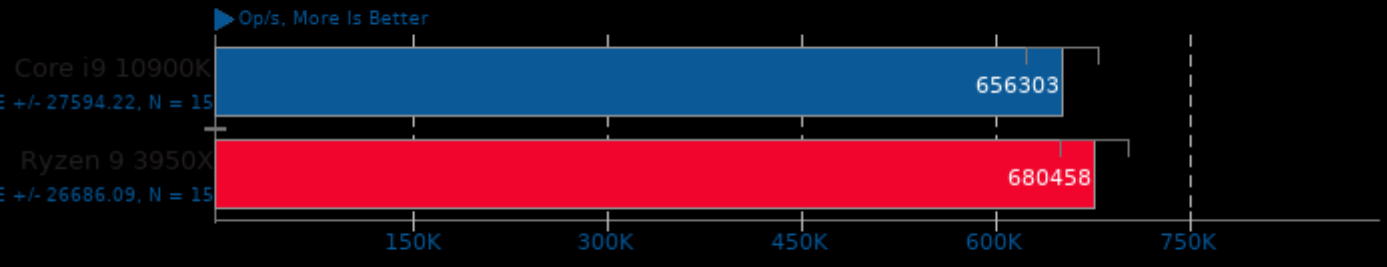
Video Input: Chimera 1080p



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

Facebook RocksDB 6.3.6

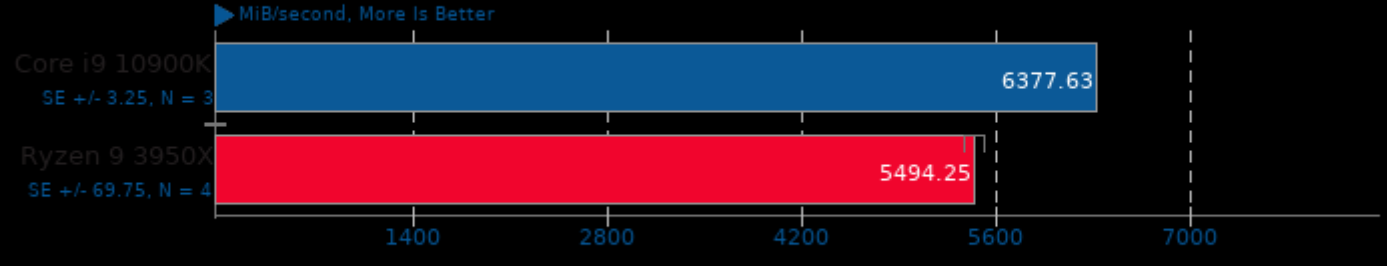
Test: Random Fill



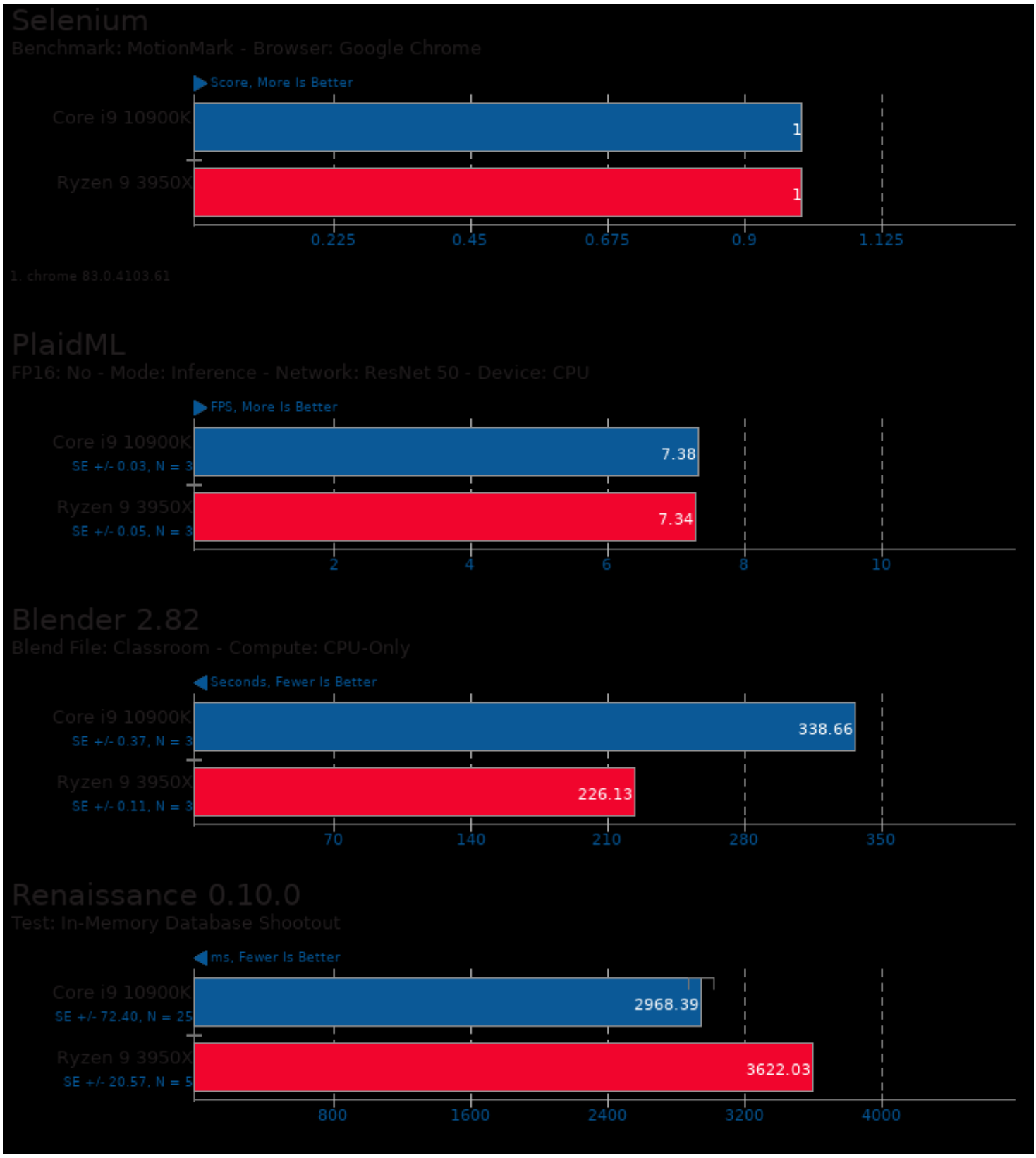
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fno-builtin-memcmp -fno-rtti -rdynamic -lpthread

Crypto++ 8.2

Test: Integer + Elliptic Curve Public Key Algorithms

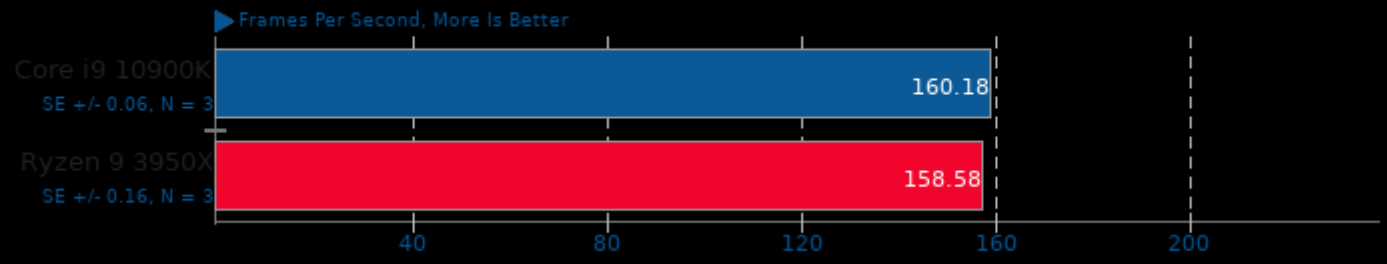


1. (CXX) g++ options: -g2 -O3 -fPIC -pthread -pipe


Selenium
Benchmark: MotionMark - Browser: Google Chrome
Score, More Is Better
Core i9 10900K
Ryzen 9 3950X
1
1
0.225
0.45
0.675
0.9
1.125
1: chrome 83.0.4103.61
PlaidML
FP16: No - Mode: Inference - Network: ResNet 50 - Device: CPU
FPS, More Is Better
Core i9 10900K
SE +/- 0.03, N = 3
Ryzen 9 3950X
SE +/- 0.05, N = 3
7.38
7.34
2
4
6
8
10
Blender 2.82
Blend File: Classroom - Compute: CPU-Only
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.37, N = 3
Ryzen 9 3950X
SE +/- 0.11, N = 3
338.66
226.13
70
140
210
280
350
Renaissance 0.10.0
Test: In-Memory Database Shootout
ms, Fewer Is Better
Core i9 10900K
SE +/- 72.40, N = 25
Ryzen 9 3950X
SE +/- 20.57, N = 5
2968.39
3622.03
800
1600
2400
3200
4000

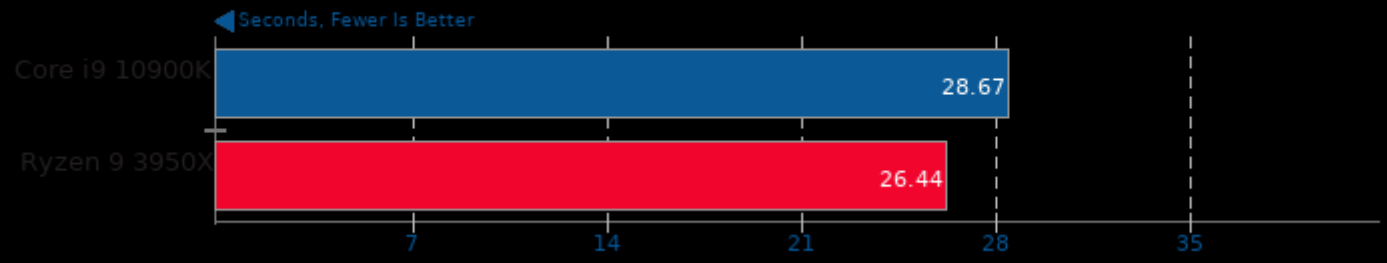
Unigine Heaven 4.0

Resolution: 1920 x 1080 - Mode: Windowed - Renderer: OpenGL

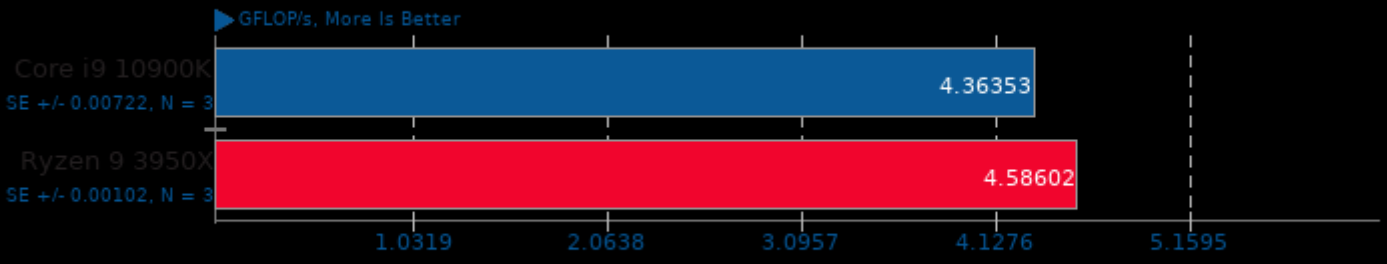


Polyhedron Fortran Benchmarks

Benchmark: test_fpu2



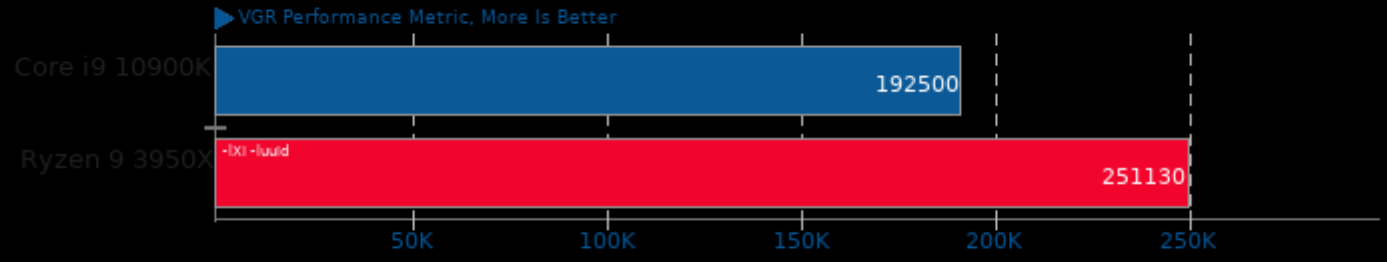
High Performance Conjugate Gradient 3.1



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

BRL-CAD 7.30.8

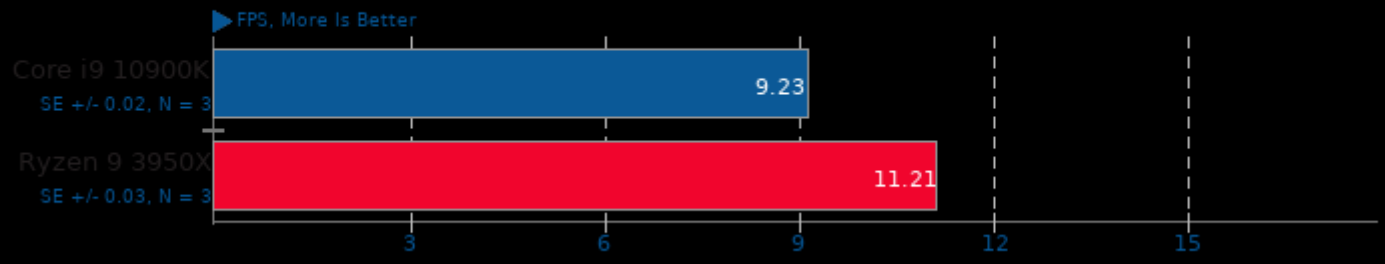
VGR Performance Metric



1. (CXX) g++ options: -std=c++11 -pipe -fno-strict-aliasing -fno-common -fexceptions -ftemplate-depth-128 -m64 -ggdb3 -O3 -fipa-pta -fstrength-reduce

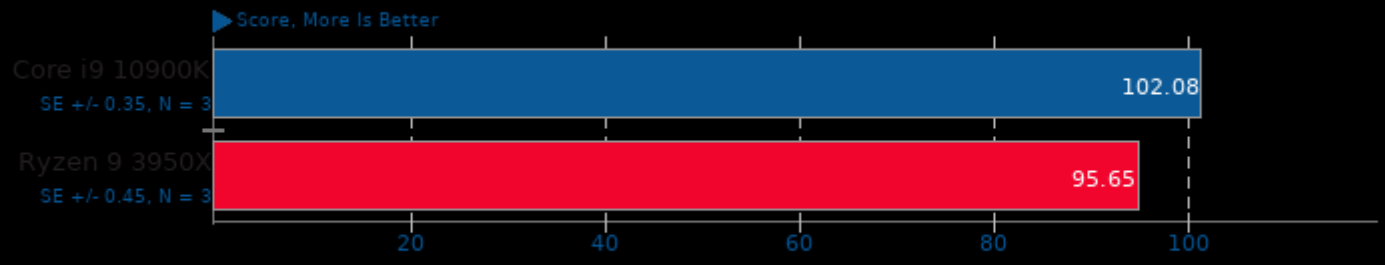
PlaidML

FP16: No - Mode: Inference - Network: Inception V3 - Device: CPU



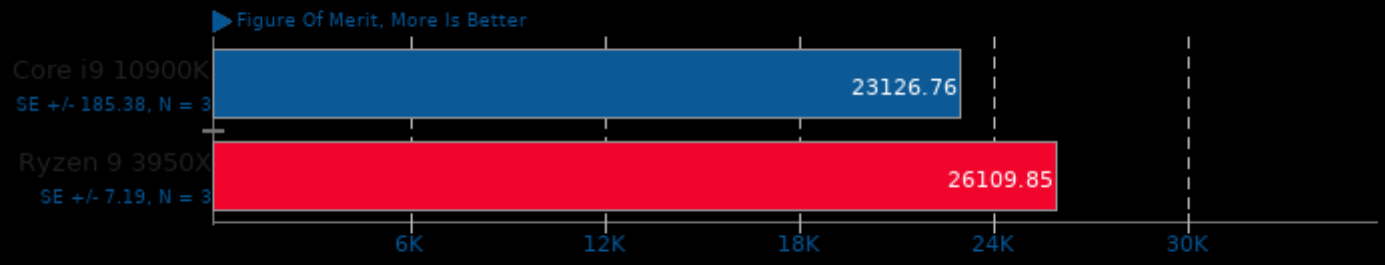
Selenium

Benchmark: Jetstream 2 - Browser: Firefox



1. firefox 76.0.1

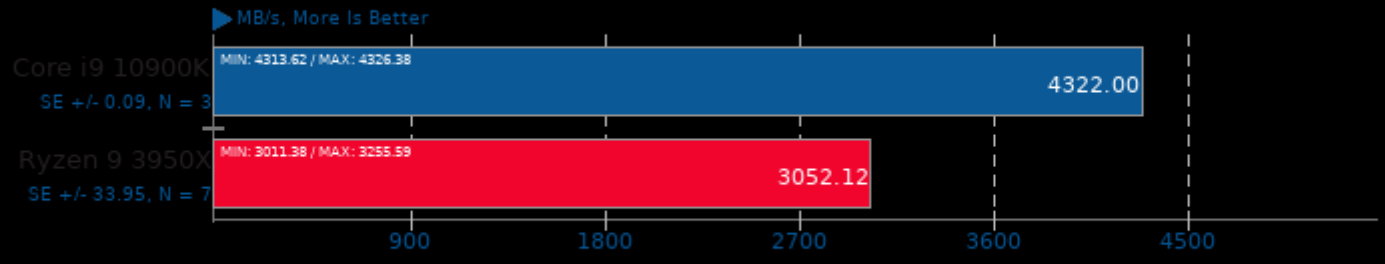
Algebraic Multi-Grid Benchmark



1. (CC) gcc options: -lparcsr_ls -lparcsr_mv -lseq_mv -lIJ_mv -lkrylov -lHYPRE_utilities -lm -fopenmp -pthread -lmpi

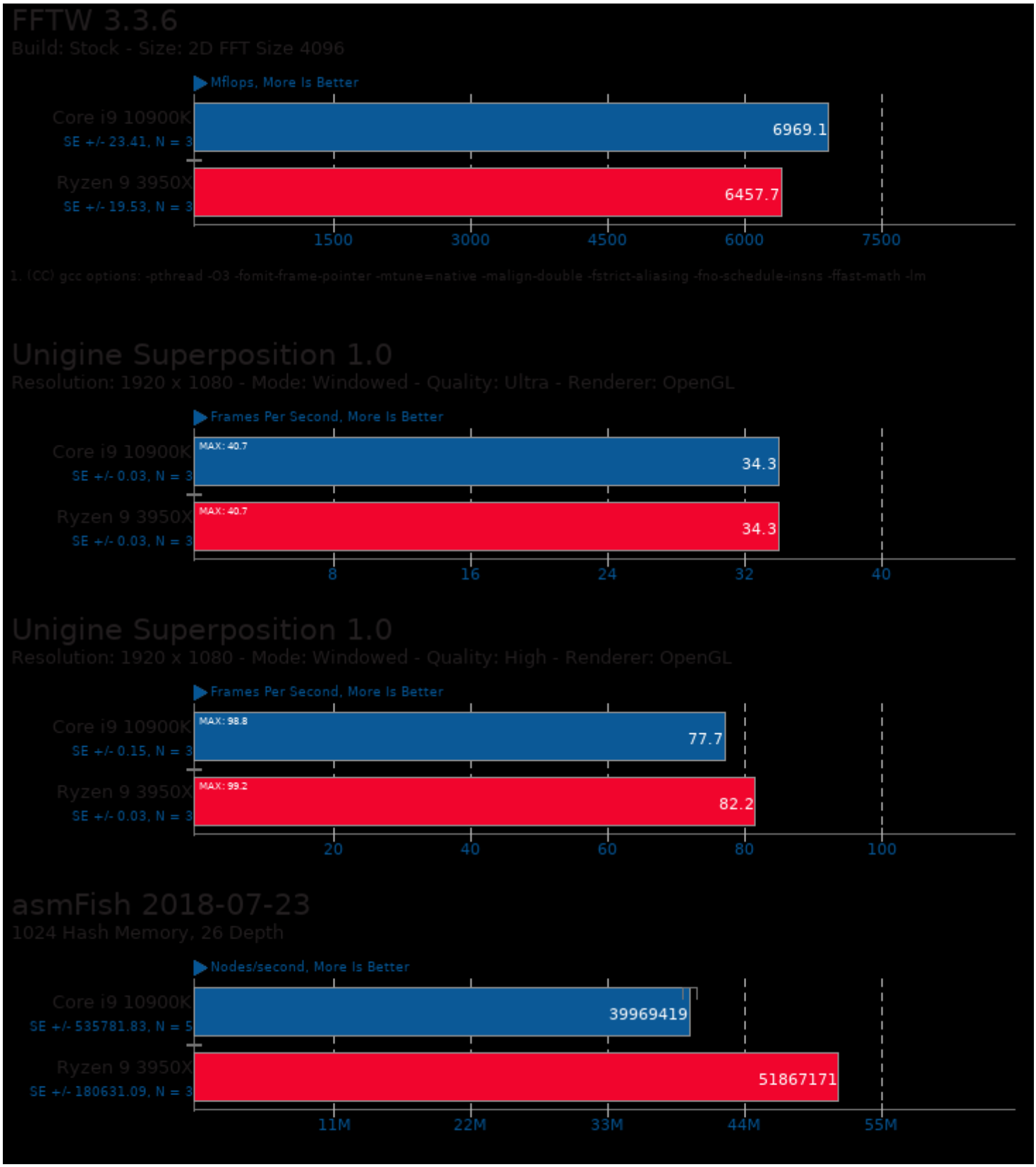
CacheBench

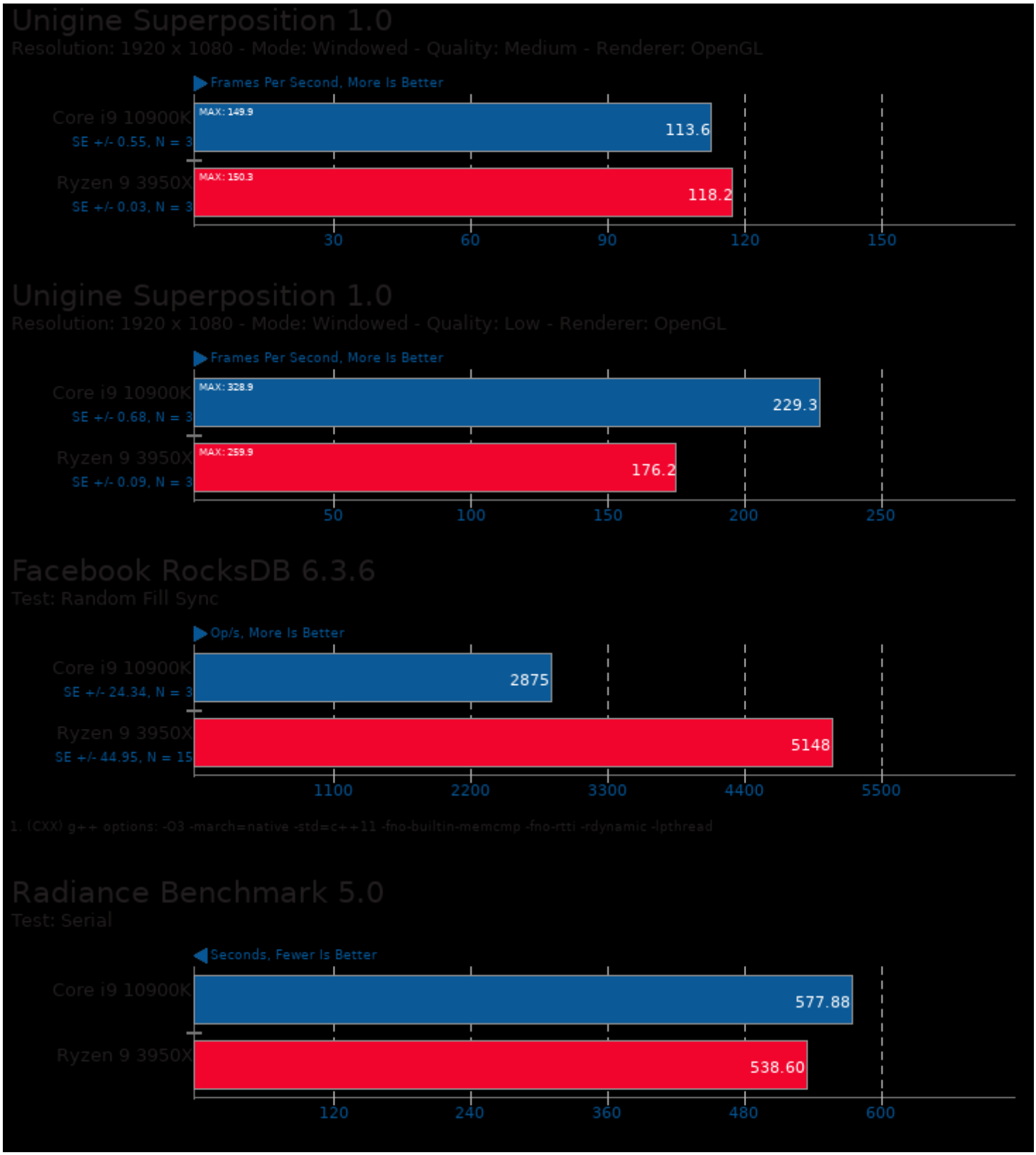
Test: Read



1. (CC) gcc options: -lrt

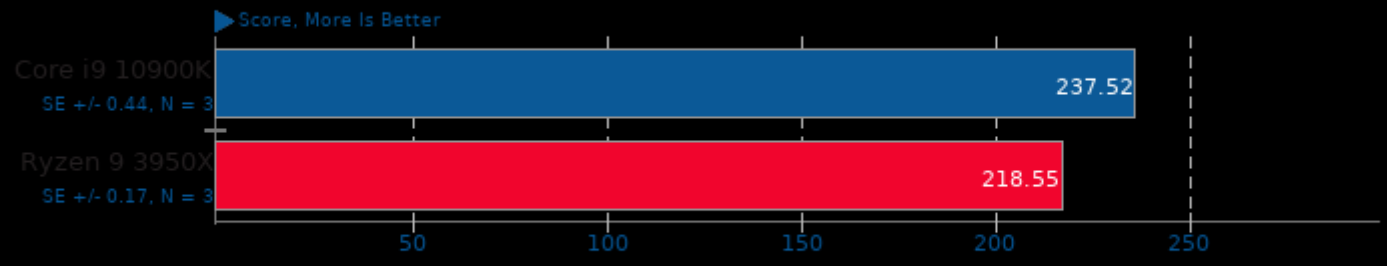

Numpy Benchmark
Score, More Is Better
Core i9 10900K
SE +/- 3.41, N = 3
444.12
Ryzen 9 3950X
SE +/- 3.33, N = 3
414.61
100
200
300
400
500
CP2K Molecular Dynamics 6.1
Fayalite-FIST Data
Seconds, Fewer Is Better
Core i9 10900K
855.40
Ryzen 9 3950X
324.19
200
400
600
800
1000
Unigine Valley 1.0
Resolution: 1920 x 1080 - Mode: Windowed - Renderer: OpenGL
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.42, N = 3
176.70
Ryzen 9 3950X
SE +/- 0.23, N = 3
160.95
40
80
120
160
200
Hierarchical INTegration 1.0
Test: FLOAT
QUIPs, More Is Better
Core i9 10900K
SE +/- 782794.53, N = 3
510613895.04
Ryzen 9 3950X
SE +/- 556299.47, N = 3
380487205.37
110M
220M
330M
440M
550M
1. (CC) gcc options: -O3 -march=native -lm


FFTW 3.3.6
Build: Stock - Size: 2D FFT Size 4096
Mflops, More Is Better
Core i9 10900K
SE +/- 23.41, N = 3
6969.1
Ryzen 9 3950X
SE +/- 19.53, N = 3
6457.7
1500
3000
4500
6000
7500
1. (CC) gcc options: -pthread -O3 -fomit-frame-pointer -mtune=native -malign-double -fstrict-aliasing -fno-schedule-insns -ffast-math -lm
Unigine Superposition 1.0
Resolution: 1920 x 1080 - Mode: Windowed - Quality: Ultra - Renderer: OpenGL
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.03, N = 3
MAX: 40.7
34.3
Ryzen 9 3950X
SE +/- 0.03, N = 3
MAX: 40.7
34.3
8
16
24
32
40
Unigine Superposition 1.0
Resolution: 1920 x 1080 - Mode: Windowed - Quality: High - Renderer: OpenGL
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.15, N = 3
MAX: 98.8
77.7
Ryzen 9 3950X
SE +/- 0.03, N = 3
MAX: 99.2
82.2
20
40
60
80
100
asmFish 2018-07-23
1024 Hash Memory, 26 Depth
Nodes/second, More Is Better
Core i9 10900K
SE +/- 535781.83, N = 5
39969419
Ryzen 9 3950X
SE +/- 180631.09, N = 3
51867171
11M
22M
33M
44M
55M


Unigine Superposition 1.0
Resolution: 1920 x 1080 - Mode: Windowed - Quality: Medium - Renderer: OpenGL
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.55, N = 3
MAX: 149.9
113.6
Ryzen 9 3950X
SE +/- 0.03, N = 3
MAX: 150.3
118.2
30
60
90
120
150
Unigine Superposition 1.0
Resolution: 1920 x 1080 - Mode: Windowed - Quality: Low - Renderer: OpenGL
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.68, N = 3
MAX: 328.9
229.3
Ryzen 9 3950X
SE +/- 0.09, N = 3
MAX: 259.9
176.2
50
100
150
200
250
Facebook RocksDB 6.3.6
Test: Random Fill Sync
Op/s, More Is Better
Core i9 10900K
SE +/- 24.34, N = 3
2875
Ryzen 9 3950X
SE +/- 44.95, N = 15
5148
1100
2200
3300
4400
5500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fno-builtin-memcmp -fno-rtti -rdynamic -lpthread
Radiance Benchmark 5.0
Test: Serial
Seconds, Fewer Is Better
Core i9 10900K
577.88
Ryzen 9 3950X
538.60
120
240
360
480
600

Selenium

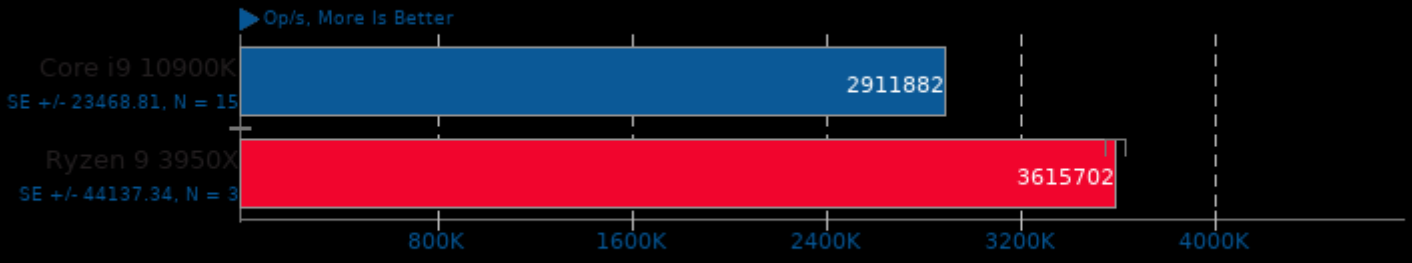
Benchmark: Jetstream - Browser: Firefox



1. firefox 76.0.1

Facebook RocksDB 6.3.6

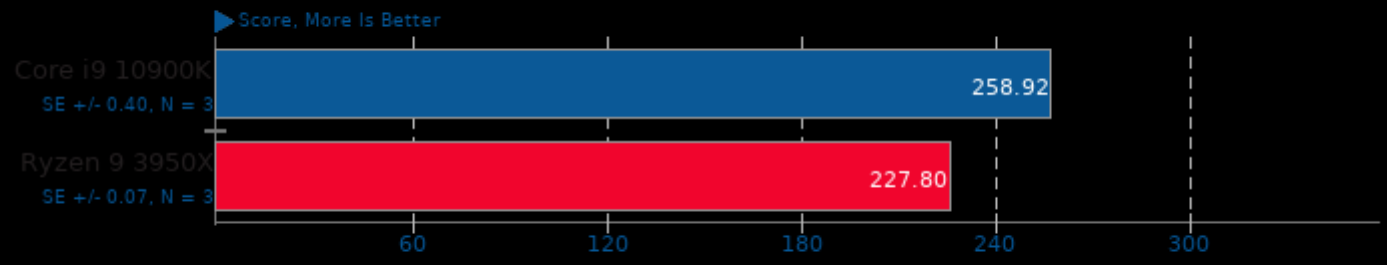
Test: Read While Writing



1. (CXX) g++ options: -O3 -march=native -std=c++11 -fno-builtin-memcmp -fno-rtti -rdynamic -lpthread

Selenium

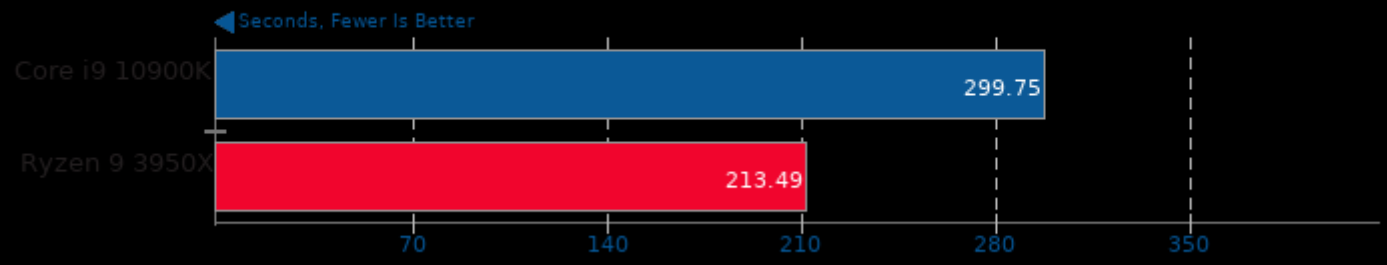
Benchmark: Jetstream - Browser: Google Chrome



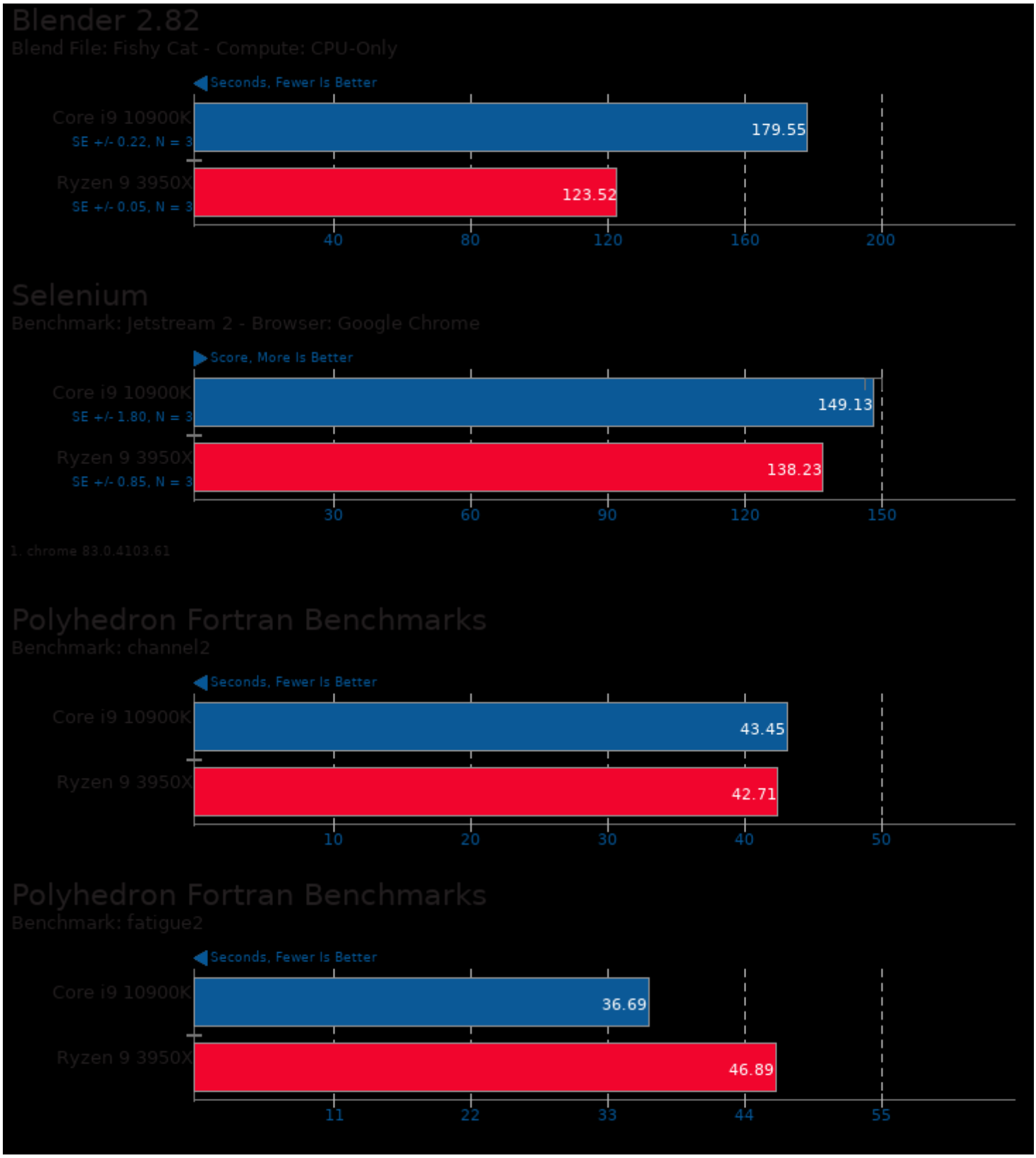
1. chrome 83.0.4103.61

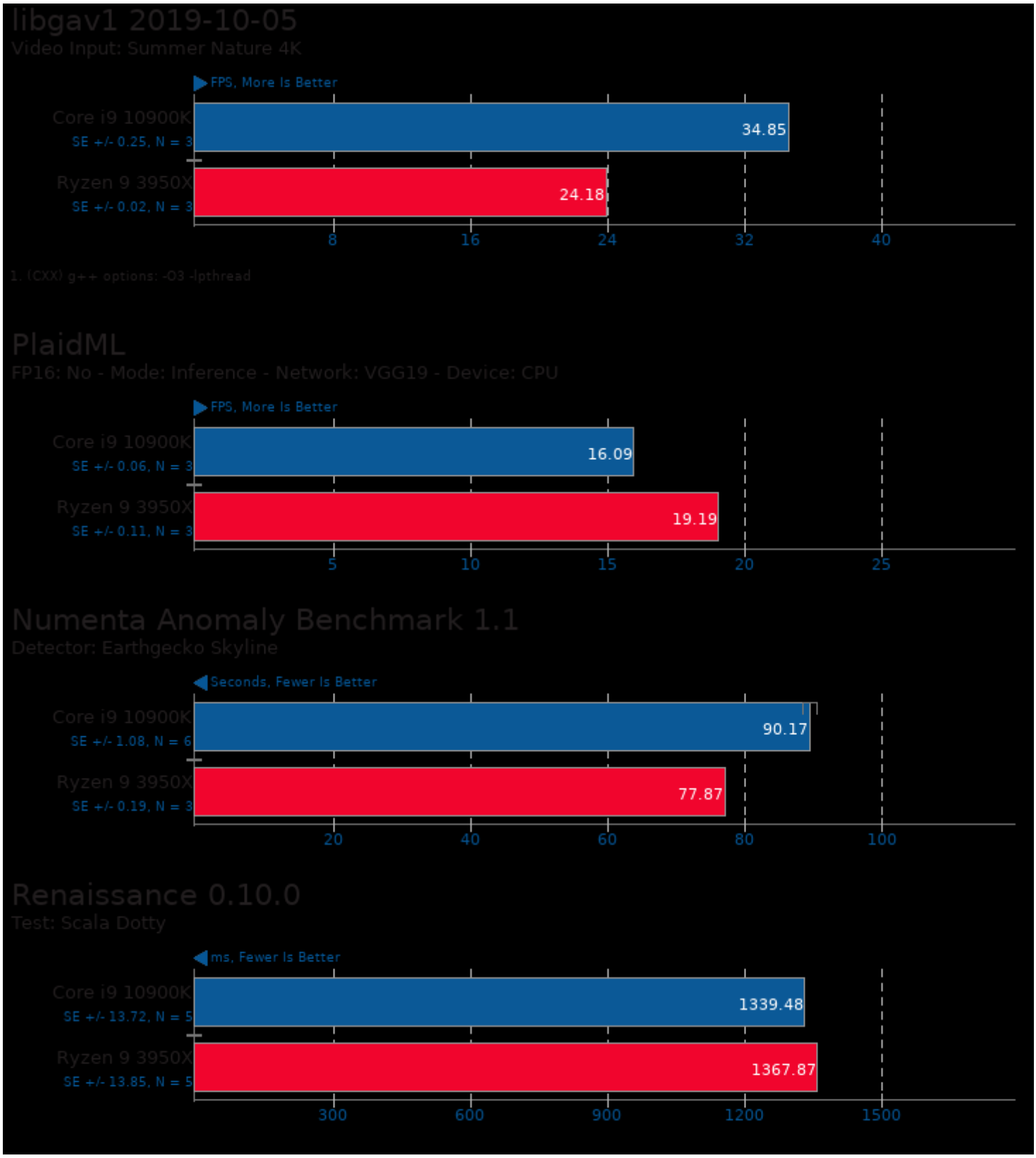
Appleseed 2.0 Beta

Scene: Emily




Polyhedron Fortran Benchmarks
Benchmark: mp_prop_design
Seconds, Fewer Is Better
Core i9 10900K
49.13
Ryzen 9 3950X
53.27
12
24
36
48
60
GROMACS 2020.1
Water Benchmark
Ns Per Day, More Is Better
Core i9 10900K
SE +/- 0.001, N = 3
0.978
Ryzen 9 3950X
SE +/- 0.002, N = 3
1.236
0.2781
0.5562
0.8343
1.1124
1.3905
1. (CXX) g++ options: -O3 -pthread -lrt -lpthread -lm
Parboil 2.5
Test: OpenMP LBM
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.03, N = 3
165.15
Ryzen 9 3950X
SE +/- 0.05, N = 3
160.96
40
80
120
160
200
1. (CXX) g++ options: -lm -lpthread -lgomp -O3 -ffast-math -fopenmp
Parboil 2.5
Test: OpenMP MRI Gridding
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.92, N = 15
54.94
Ryzen 9 3950X
SE +/- 0.12, N = 3
31.27
12
24
36
48
60
1. (CXX) g++ options: -lm -lpthread -lgomp -O3 -ffast-math -fopenmp

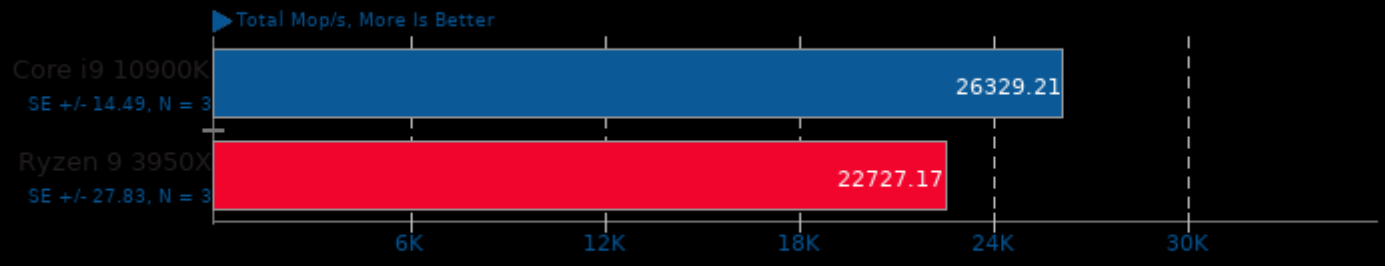

Blender 2.82
Blend File: Fishy Cat - Compute: CPU-Only
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.22, N = 3
179.55
Ryzen 9 3950X
SE +/- 0.05, N = 3
123.52
40
80
120
160
200
Selenium
Benchmark: Jetstream 2 - Browser: Google Chrome
Score, More Is Better
Core i9 10900K
SE +/- 1.80, N = 3
149.13
Ryzen 9 3950X
SE +/- 0.85, N = 3
138.23
30
60
90
120
150
1. chrome 83.0.4103.61
Polyhedron Fortran Benchmarks
Benchmark: channel2
Seconds, Fewer Is Better
Core i9 10900K
43.45
Ryzen 9 3950X
42.71
10
20
30
40
50
Polyhedron Fortran Benchmarks
Benchmark: fatigue2
Seconds, Fewer Is Better
Core i9 10900K
36.69
Ryzen 9 3950X
46.89
11
22
33
44
55


libgav1 2019-10-05
Video Input: Summer Nature 4K
FPS, More Is Better
Core i9 10900K
SE +/- 0.25, N = 3
34.85
Ryzen 9 3950X
SE +/- 0.02, N = 3
24.18
8
16
24
32
40
1. (CXX) g++ options: -O3 -lpthread
PlaidML
FP16: No - Mode: Inference - Network: VGG19 - Device: CPU
FPS, More Is Better
Core i9 10900K
SE +/- 0.06, N = 3
16.09
Ryzen 9 3950X
SE +/- 0.11, N = 3
19.19
5
10
15
20
25
Numenta Anomaly Benchmark 1.1
Detector: Earthgecko Skyline
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 1.08, N = 6
90.17
Ryzen 9 3950X
SE +/- 0.19, N = 3
77.87
20
40
60
80
100
Renaissance 0.10.0
Test: Scala Dotty
ms, Fewer Is Better
Core i9 10900K
SE +/- 13.72, N = 5
1339.48
Ryzen 9 3950X
SE +/- 13.85, N = 5
1367.87
300
600
900
1200
1500


PlaidML
FP16: No - Mode: Inference - Network: Mobilenet - Device: CPU
FPS, More Is Better
Core i9 10900K
SE +/- 0.11, N = 3
17.18
Ryzen 9 3950X
SE +/- 0.10, N = 3
17.28
4
8
12
16
20
ACES DGEMM 1.0
Sustained Floating-Point Rate
GFLOP/s, More Is Better
Core i9 10900K
SE +/- 0.032335, N = 3
5.351115
Ryzen 9 3950X
SE +/- 0.075216, N = 15
5.537606
1.246
2.492
3.738
4.984
6.23
1. (CC) gcc options: -O3 -march=native -fopenmp
CacheBench
Test: Read / Modify / Write
MB/s, More Is Better
Core i9 10900K
SE +/- 0.46, N = 3
MIN: 50582.09 / MAX: 58158.99
55905.54
Ryzen 9 3950X
SE +/- 213.83, N = 3
MIN: 55601.77 / MAX: 66238.13
61491.83
13K
26K
39K
52K
65K
1. (CC) gcc options: -lrt
CacheBench
Test: Write
MB/s, More Is Better
Core i9 10900K
SE +/- 0.94, N = 3
MIN: 32247.07 / MAX: 38681.89
36212.48
Ryzen 9 3950X
SE +/- 62.60, N = 3
MIN: 27072.24 / MAX: 33156.15
31703.46
8K
16K
24K
32K
40K
1. (CC) gcc options: -lrt

NAS Parallel Benchmarks 3.4

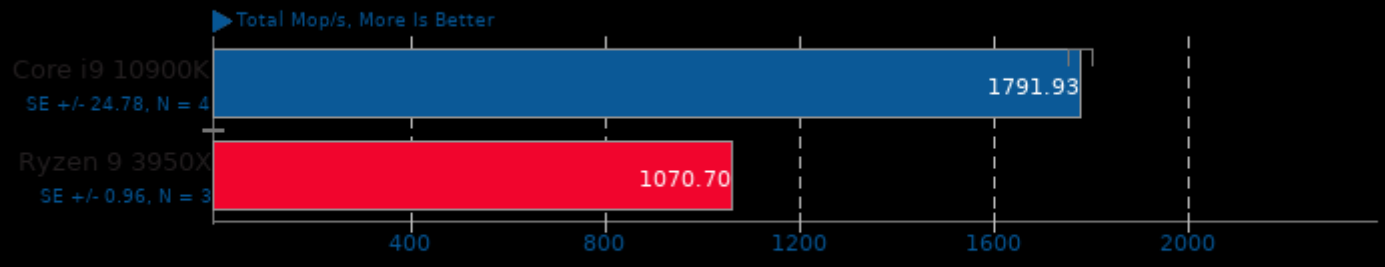
Test / Class: BT.C



1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.3

NAS Parallel Benchmarks 3.4

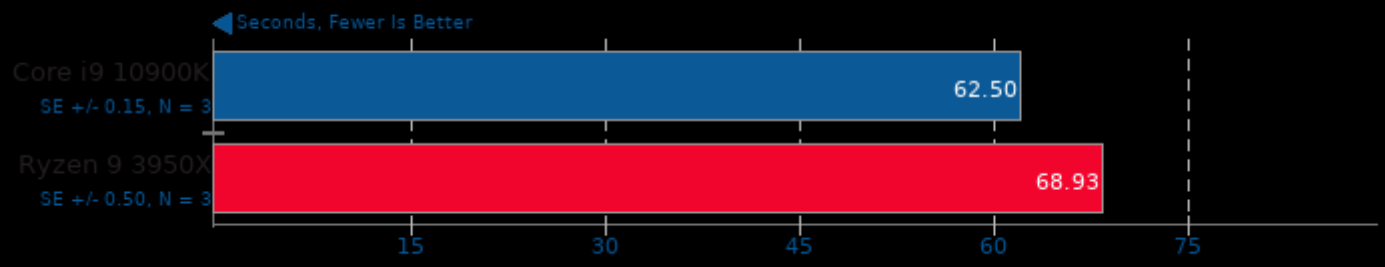
Test / Class: EP.D



1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.3

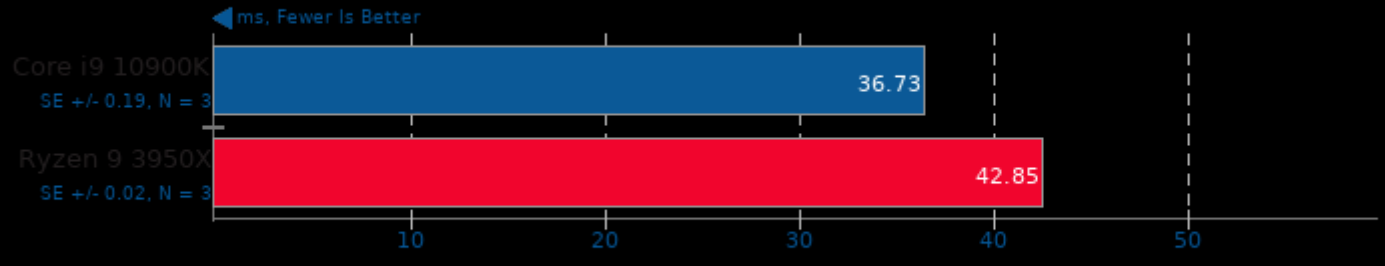
Mlpack Benchmark

Benchmark: scikit_qda



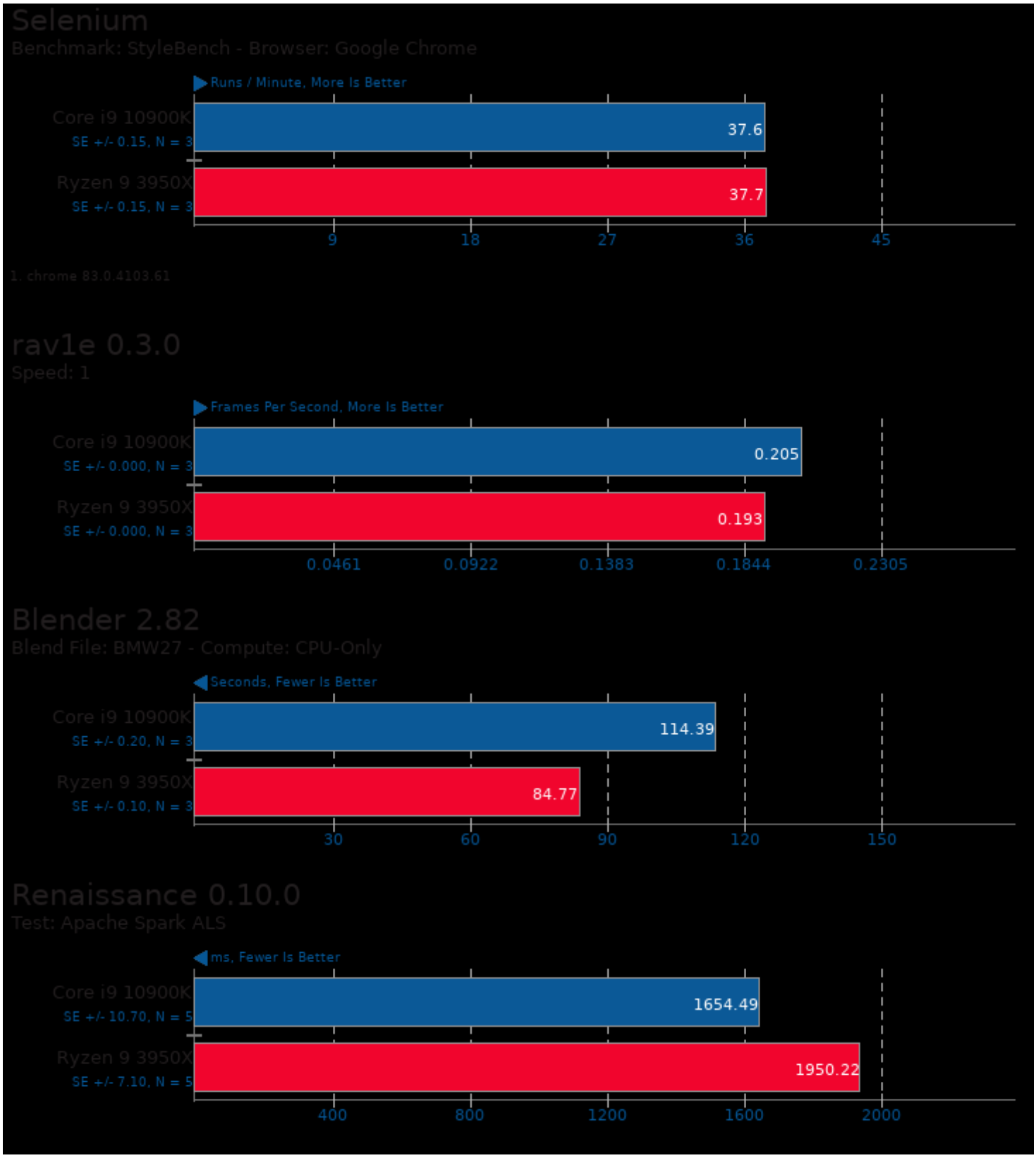
Selenium

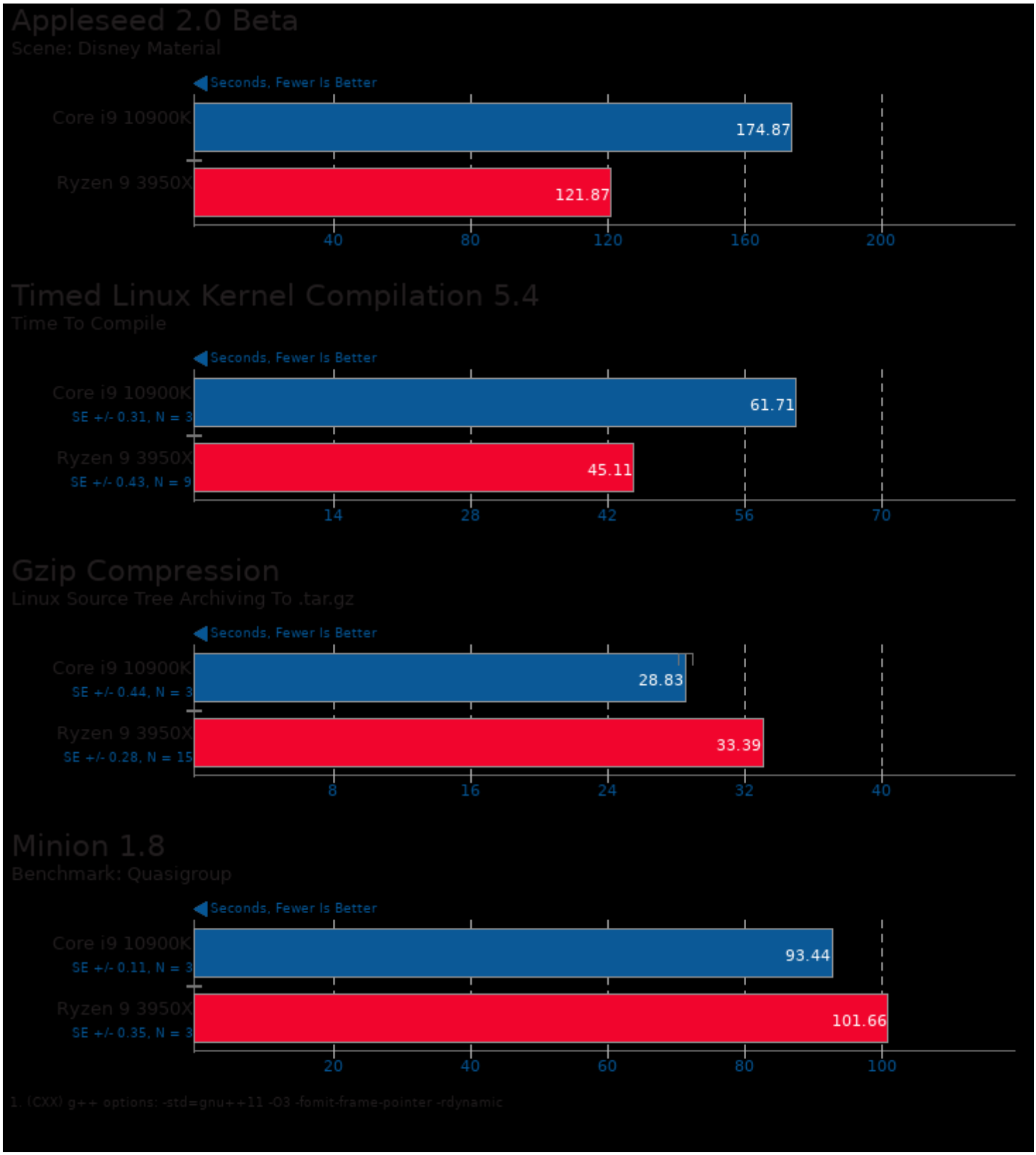
Benchmark: ARES-6 - Browser: Firefox

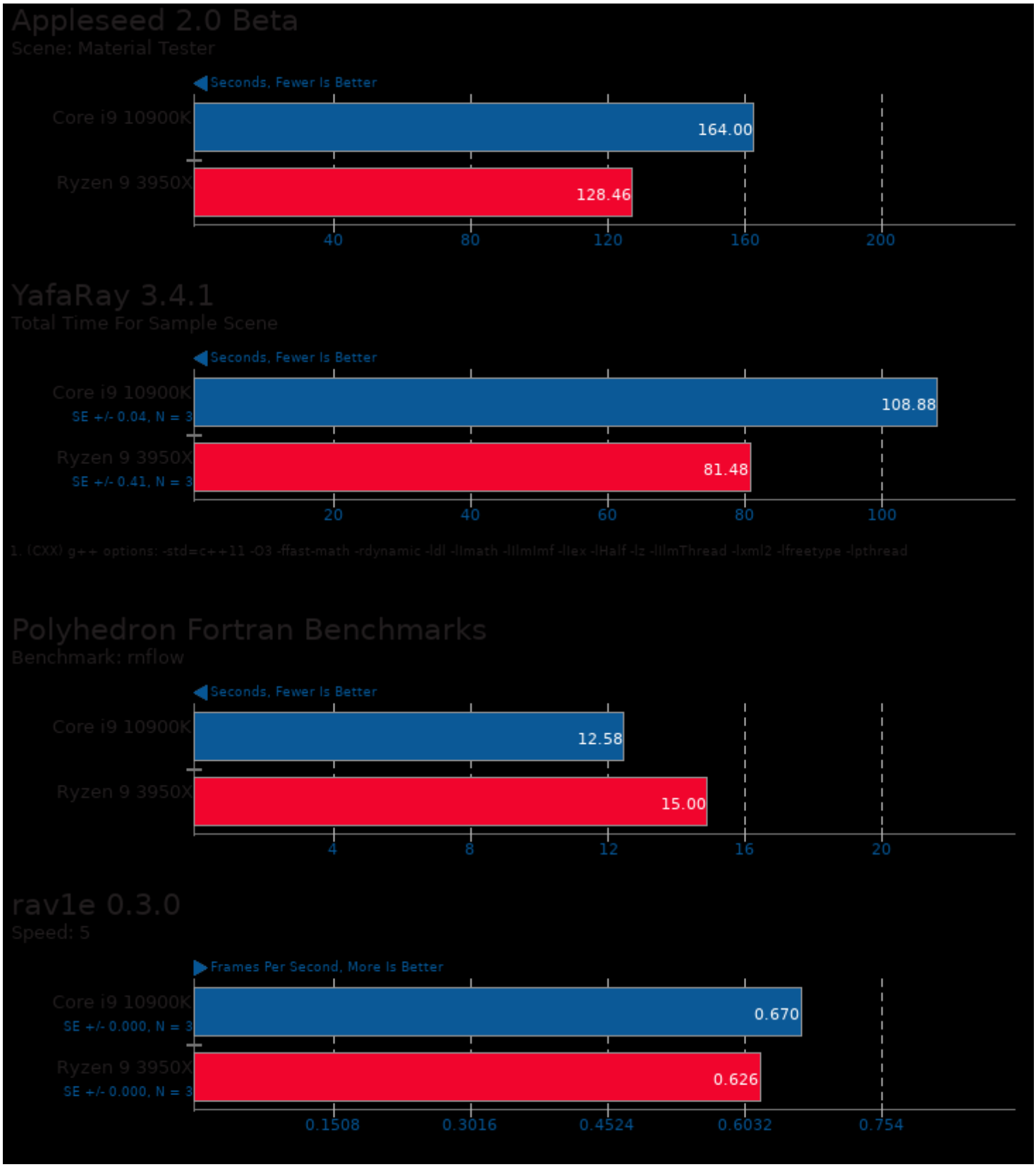


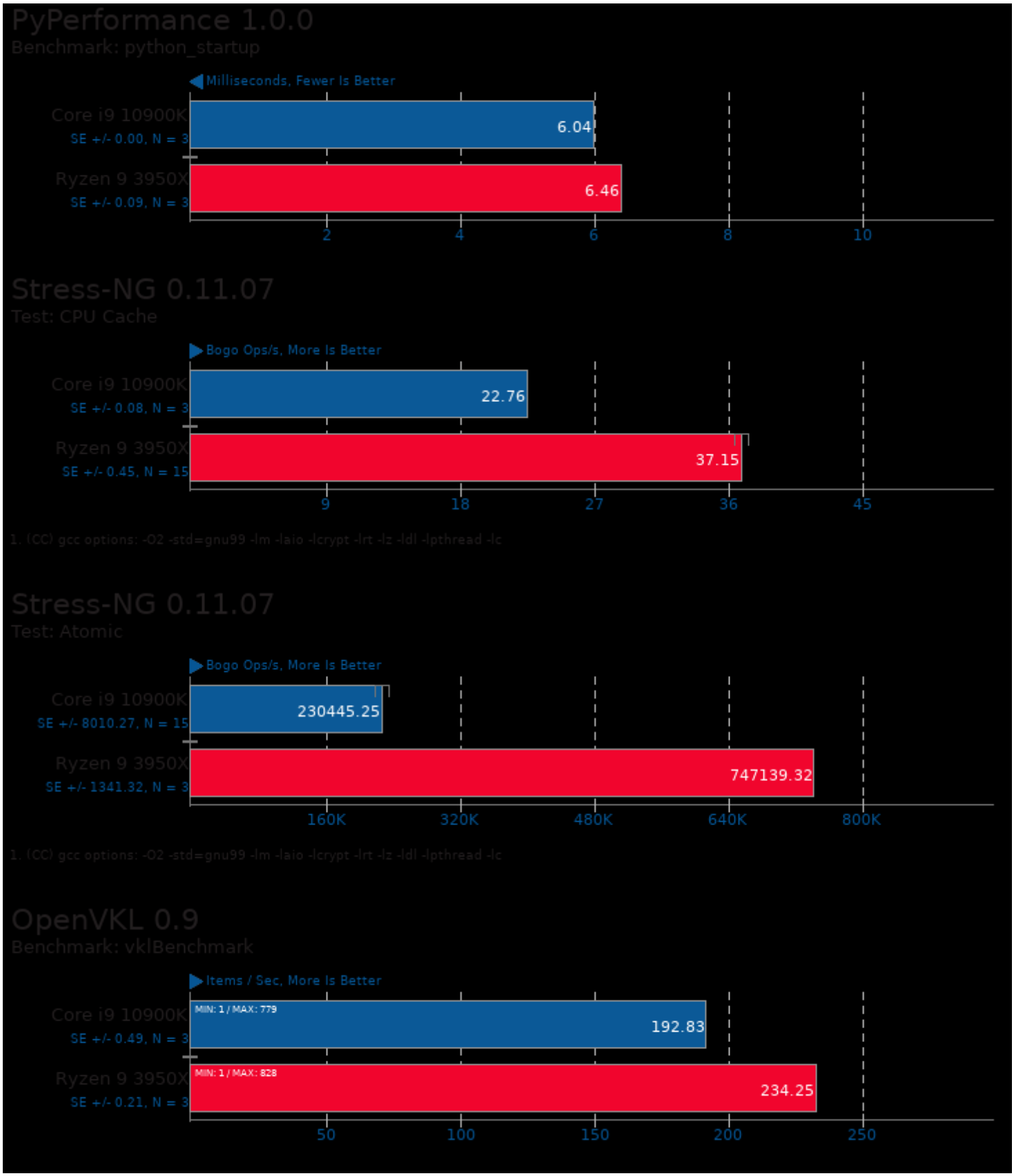
1. firefox 76.0.1

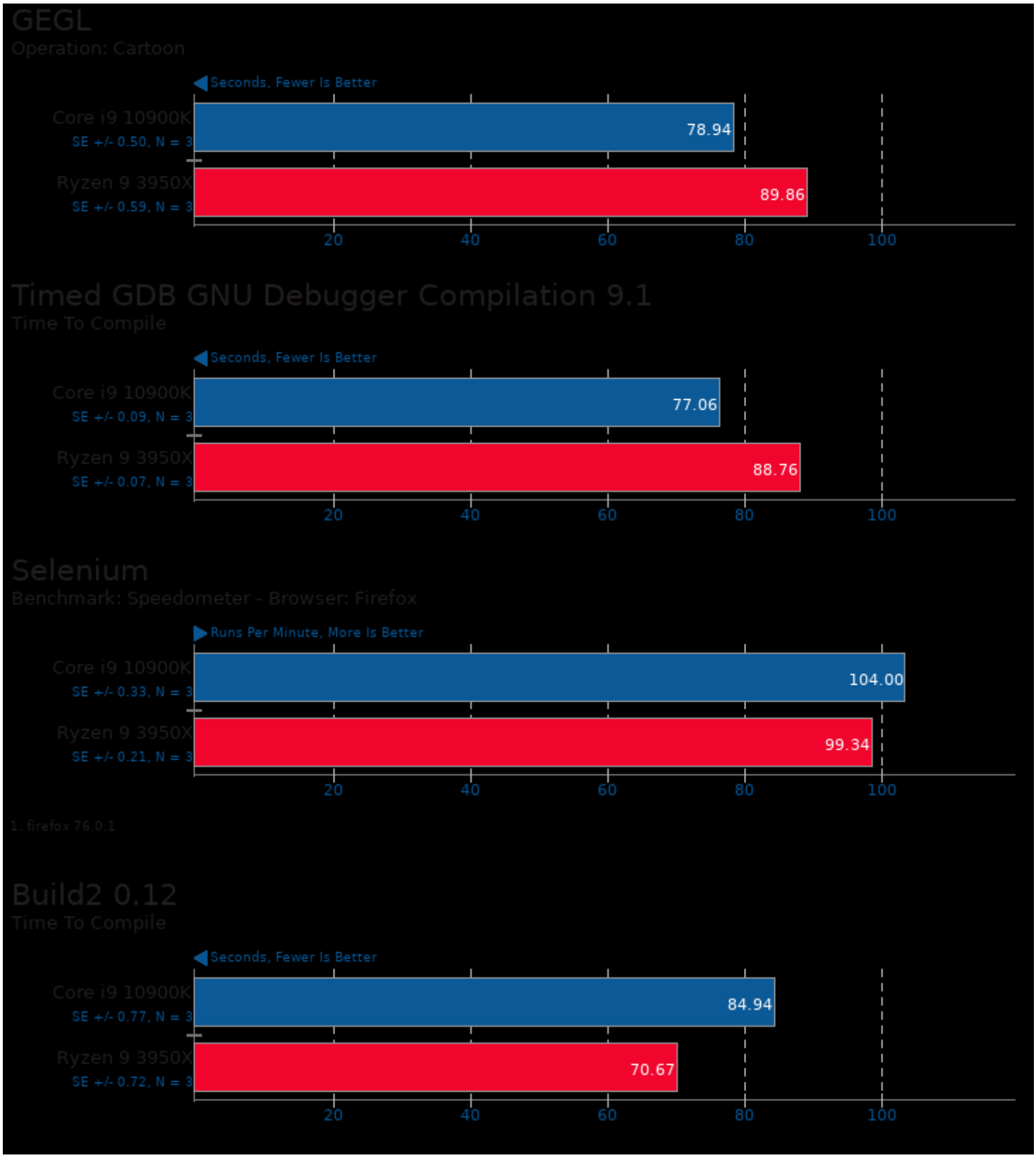

PlaidML
FP16: No - Mode: Inference - Network: VGG16 - Device: CPU
FPS, More Is Better
Core i9 10900K
SE +/- 0.10, N = 3
19.28
Ryzen 9 3950X
SE +/- 0.18, N = 3
23.31
6
12
18
24
30
dav1d 0.6.0
Video Input: Chimera 1080p 10-bit
FPS, More Is Better
Core i9 10900K
SE +/- 0.10, N = 3
MIN: 84.61 / MAX: 295.01
131.44
Ryzen 9 3950X
SE +/- 0.26, N = 3
MIN: 77.55 / MAX: 224.73
113.65
30
60
90
120
150
1. (CC) gcc options: -pthread
dav1d 0.7.0
Video Input: Chimera 1080p 10-bit
FPS, More Is Better
Core i9 10900K
SE +/- 0.06, N = 3
MIN: 84.86 / MAX: 306.23
132.44
Ryzen 9 3950X
SE +/- 0.11, N = 3
MIN: 77.82 / MAX: 226.83
114.24
30
60
90
120
150
1. (CC) gcc options: -pthread
Fhourstones 3.1
Complex Connect-4 Solving
Kpos / sec, More Is Better
Core i9 10900K
SE +/- 8.93, N = 3
17312.0
Ryzen 9 3950X
SE +/- 14.40, N = 3
14986.6
4K
8K
12K
16K
20K
1. (CC) gcc options: -O3


Selenium
Benchmark: StyleBench - Browser: Google Chrome
Runs / Minute, More Is Better
Core i9 10900K
SE +/- 0.15, N = 3
37.6
Ryzen 9 3950X
SE +/- 0.15, N = 3
37.7
9
18
27
36
45
1: chrome 83.0.4103.61
rav1e 0.3.0
Speed: 1
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.000, N = 3
0.205
Ryzen 9 3950X
SE +/- 0.000, N = 3
0.193
0.0461
0.0922
0.1383
0.1844
0.2305
Blender 2.82
Blend File: BMW27 - Compute: CPU-Only
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.20, N = 3
114.39
Ryzen 9 3950X
SE +/- 0.10, N = 3
84.77
30
60
90
120
150
Renaissance 0.10.0
Test: Apache Spark ALS
ms, Fewer Is Better
Core i9 10900K
SE +/- 10.70, N = 5
1654.49
Ryzen 9 3950X
SE +/- 7.10, N = 5
1950.22
400
800
1200
1600
2000


Appleseed 2.0 Beta
Scene: Disney Material
Seconds, Fewer Is Better
Core i9 10900K
174.87
Ryzen 9 3950X
121.87
40
80
120
160
200
Timed Linux Kernel Compilation 5.4
Time To Compile
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.31, N = 3
61.71
Ryzen 9 3950X
SE +/- 0.43, N = 9
45.11
14
28
42
56
70
Gzip Compression
Linux Source Tree Archiving To .tar.gz
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.44, N = 3
28.83
Ryzen 9 3950X
SE +/- 0.28, N = 15
33.39
8
16
24
32
40
Minion 1.8
Benchmark: Quasigroup
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.11, N = 3
93.44
Ryzen 9 3950X
SE +/- 0.35, N = 3
101.66
20
40
60
80
100
1. (CXX) g++ options: -std=gnu++11 -O3 -fomit-frame-pointer -rdynamic


Appleseed 2.0 Beta
Scene: Material Tester
Seconds, Fewer Is Better
Core i9 10900K
164.00
Ryzen 9 3950X
128.46
40
80
120
160
200
YafaRay 3.4.1
Total Time For Sample Scene
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.04, N = 3
108.88
Ryzen 9 3950X
SE +/- 0.41, N = 3
81.48
20
40
60
80
100
1. (CXX) g++ options: -std=c++11 -O3 -ffast-math -rdynamic -ldl -lImath -lIlmImf -lIex -lHalf -lz -lIlmThread -lxml2 -lfreetype -lpthread
Polyhedron Fortran Benchmarks
Benchmark: rnflow
Seconds, Fewer Is Better
Core i9 10900K
12.58
Ryzen 9 3950X
15.00
4
8
12
16
20
rav1e 0.3.0
Speed: 5
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.000, N = 3
0.670
Ryzen 9 3950X
SE +/- 0.000, N = 3
0.626
0.1508
0.3016
0.4524
0.6032
0.754

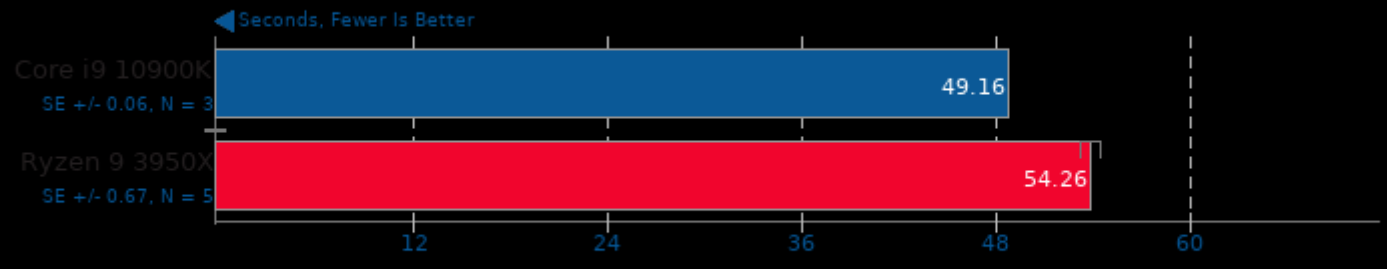

PyPerformance 1.0.0
Benchmark: python_startup
Milliseconds, Fewer Is Better
Core i9 10900K
SE +/- 0.00, N = 3
6.04
Ryzen 9 3950X
SE +/- 0.09, N = 3
6.46
2
4
6
8
10
Stress-NG 0.11.07
Test: CPU Cache
Bogo Ops/s, More Is Better
Core i9 10900K
SE +/- 0.08, N = 3
22.76
Ryzen 9 3950X
SE +/- 0.45, N = 15
37.15
9
18
27
36
45
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lz -ldl -lpthread -lc
Stress-NG 0.11.07
Test: Atomic
Bogo Ops/s, More Is Better
Core i9 10900K
SE +/- 8010.27, N = 15
230445.25
Ryzen 9 3950X
SE +/- 1341.32, N = 3
747139.32
160K
320K
480K
640K
800K
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lz -ldl -lpthread -lc
OpenVKL 0.9
Benchmark: vklBenchmark
Items / Sec, More Is Better
Core i9 10900K
SE +/- 0.49, N = 3
MIN: 1 / MAX: 779
192.83
Ryzen 9 3950X
SE +/- 0.21, N = 3
MIN: 1 / MAX: 828
234.25
50
100
150
200
250


GEGL
Operation: Cartoon
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.50, N = 3
78.94
Ryzen 9 3950X
SE +/- 0.59, N = 3
89.86
20
40
60
80
100
Timed GDB GNU Debugger Compilation 9.1
Time To Compile
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.09, N = 3
77.06
Ryzen 9 3950X
SE +/- 0.07, N = 3
88.76
20
40
60
80
100
Selenium
Benchmark: Speedometer - Browser: Firefox
Runs Per Minute, More Is Better
Core i9 10900K
SE +/- 0.33, N = 3
104.00
Ryzen 9 3950X
SE +/- 0.21, N = 3
99.34
20
40
60
80
100
1. firefox 76.0.1
Build2 0.12
Time To Compile
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.77, N = 3
84.94
Ryzen 9 3950X
SE +/- 0.72, N = 3
70.67
20
40
60
80
100


Cpuminer-Opt 3.8.8.1
Algorithm: myr-gr
kH/s - Hash Speed, More Is Better
Core i9 10900K
SE +/- 13.33, N = 3
17627.00
Ryzen 9 3950X
SE +/- 271.95, N = 15
9898.85
4K
8K
12K
16K
20K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp
Zstd Compression 1.4.5
Compression Level: 19
MB/s, More Is Better
Core i9 10900K
SE +/- 0.06, N = 3
30.3
Ryzen 9 3950X
SE +/- 0.03, N = 3
39.6
9
18
27
36
45
1. (CC) gcc options: -O3 -pthread -lz -llzma
VP9 libvpx Encoding 1.8.2
Speed: Speed 0
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.03, N = 3
8.20
Ryzen 9 3950X
SE +/- 0.01, N = 3
7.79
2
4
6
8
10
1. (CXX) g++ options: -m64 -lm -lpthread -O3 -fPIC -U_FORTIFY_SOURCE -std=c++11
Perl Benchmarks
Test: Pod2html
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.00021129, N = 3
0.09327881
Ryzen 9 3950X
SE +/- 0.00058377, N = 3
0.11237626
0.0253
0.0506
0.0759
0.1012
0.1265

Hackbench

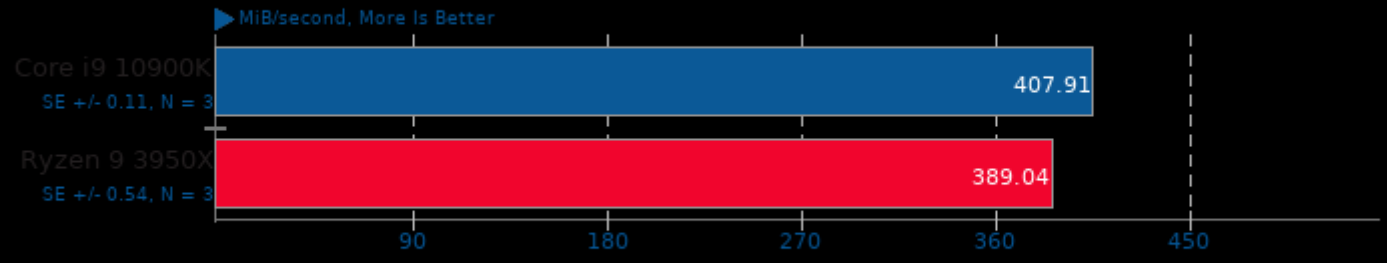
Count: 32 - Type: Process



1. (CC) gcc options: -lpthread

Crypto++ 8.2

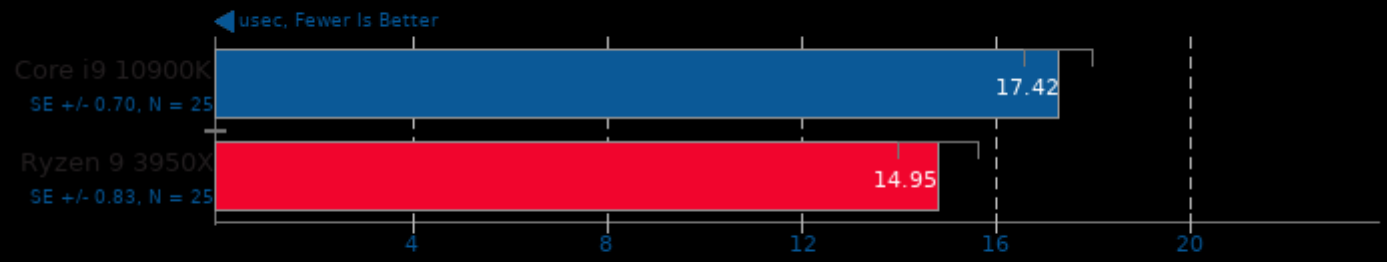
Test: Unkeyed Algorithms



1. (CXX) g++ options: -g2 -O3 -fPIC -pthread -pipe

Sockperf 3.4

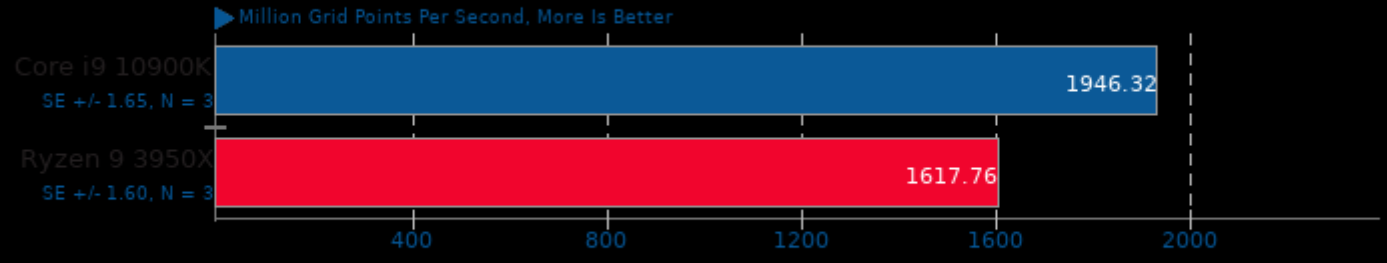
Test: Latency Under Load



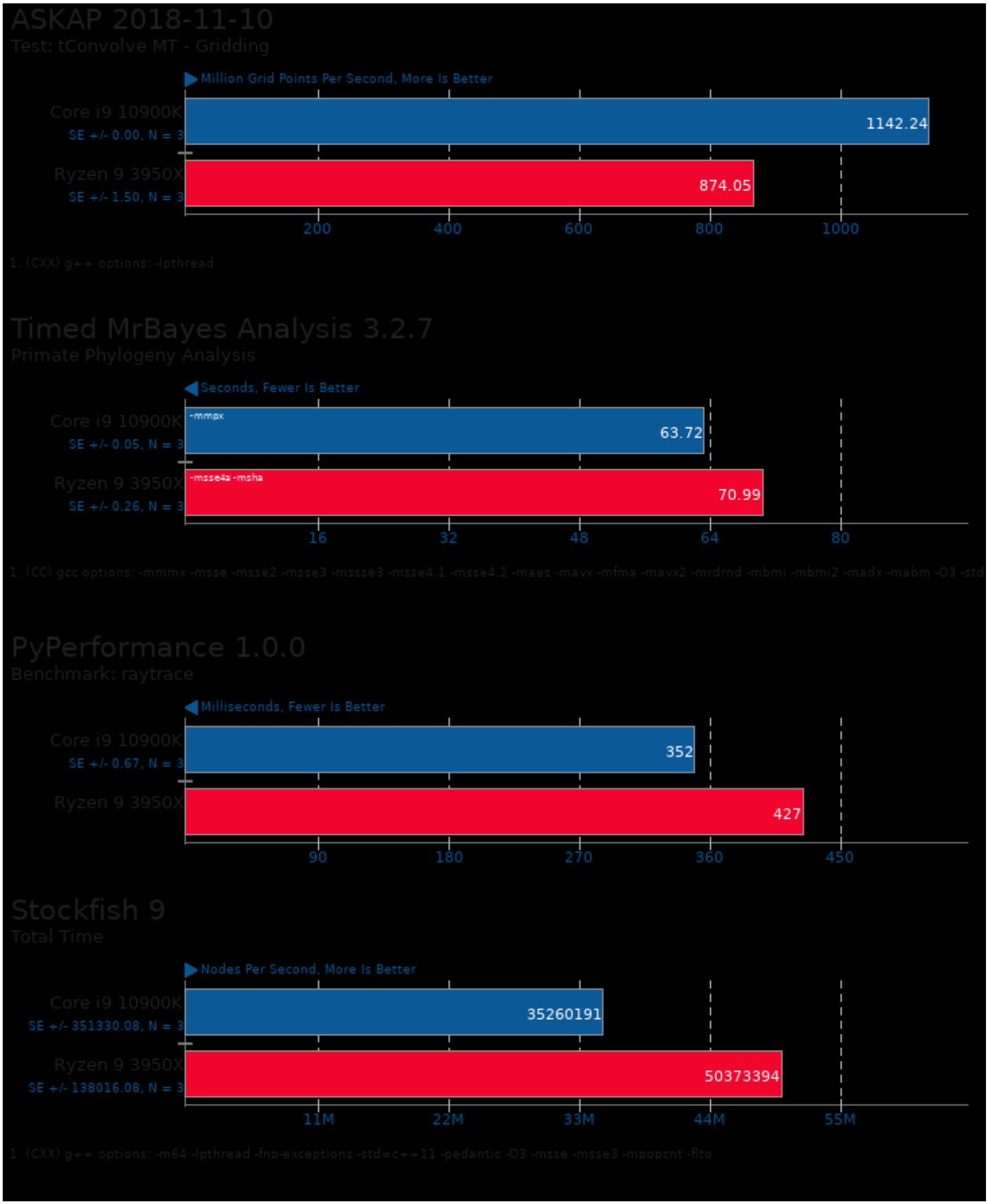
1. (CXX) g++ options: --param -O3 -rdynamic -ldl -lpthread

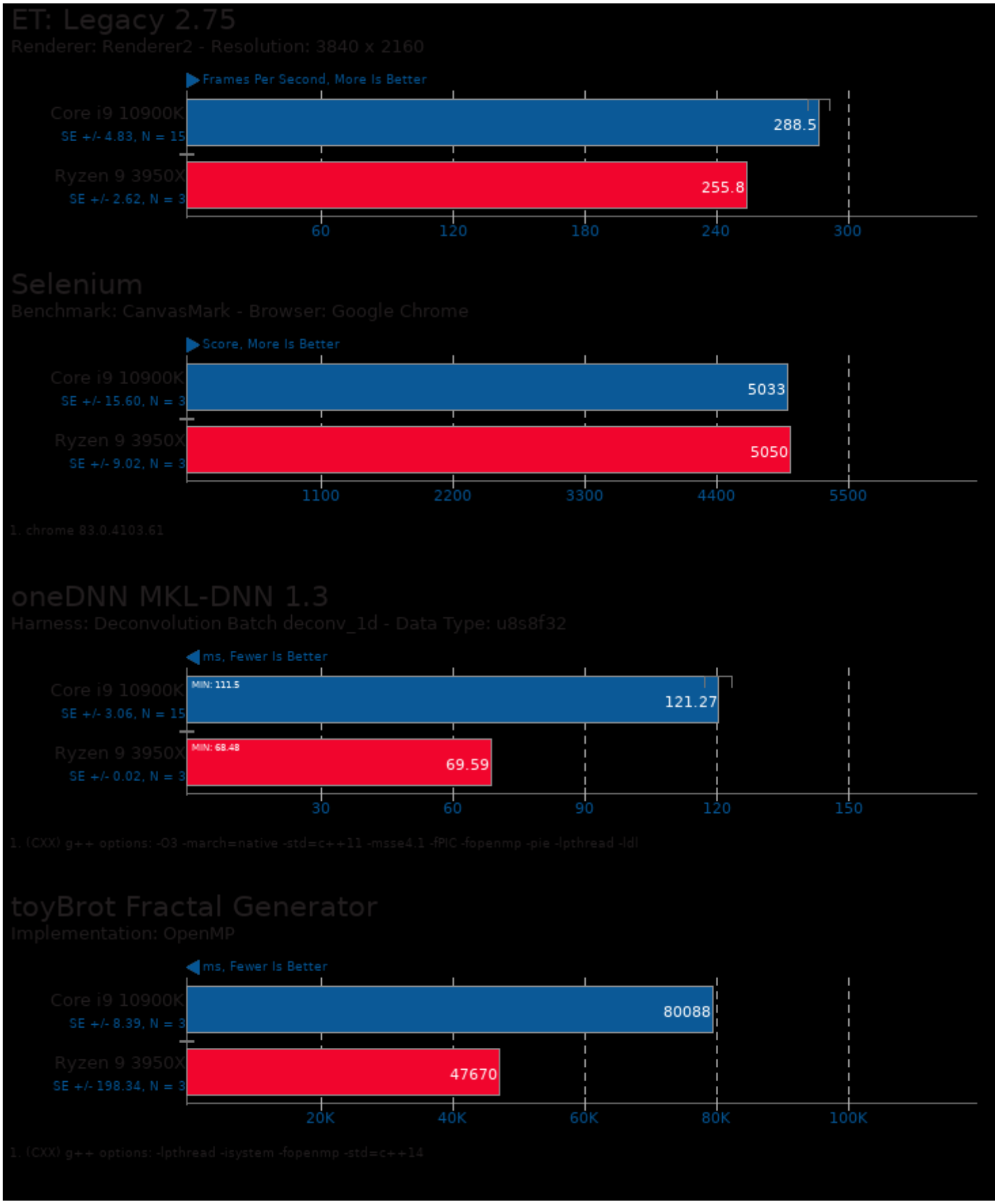
ASKAP 2018-11-10

Test: tConvolve MT - Degridding



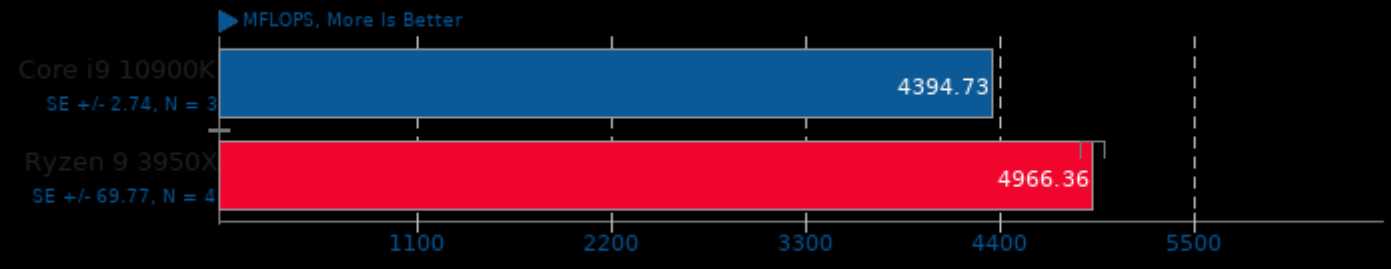
1. (CXX) g++ options: -lpthread


ASKAP 2018-11-10
Test: tConvolve MT - Gridding
Million Grid Points Per Second, More Is Better
Core i9 10900K
SE +/- 0.00, N = 3
1142.24
Ryzen 9 3950X
SE +/- 1.50, N = 3
874.05
200
400
600
800
1000
1. (CXX) g++ options: -lpthread
Timed MrBayes Analysis 3.2.7
Primate Phylogeny Analysis
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.05, N = 3
-mmpx
63.72
Ryzen 9 3950X
SE +/- 0.26, N = 3
-msse4a -msha
70.99
16
32
48
64
80
1. (CC) gcc options: -mmmx -msse -msse2 -msse3 -mssse3 -msse4.1 -msse4.2 -maes -mavx -mfma -mavx2 -mrdrnd -mbmi -mbmi2 -madx -mabm -O3 -std
PyPerformance 1.0.0
Benchmark: raytrace
Milliseconds, Fewer Is Better
Core i9 10900K
SE +/- 0.67, N = 3
352
Ryzen 9 3950X
427
90
180
270
360
450
Stockfish 9
Total Time
Nodes Per Second, More Is Better
Core i9 10900K
SE +/- 351330.08, N = 3
35260191
Ryzen 9 3950X
SE +/- 138016.08, N = 3
50373394
11M
22M
33M
44M
55M
1. (CXX) g++ options: -m64 -lpthread -fno-exceptions -std=c++11 -pedantic -O3 -msse -msse3 -mpopcnt -flto


ET: Legacy 2.75
Renderer: Renderer2 - Resolution: 3840 x 2160
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 4.83, N = 15
288.5
Ryzen 9 3950X
SE +/- 2.62, N = 3
255.8
60
120
180
240
300
Selenium
Benchmark: CanvasMark - Browser: Google Chrome
Score, More Is Better
Core i9 10900K
SE +/- 15.60, N = 3
5033
Ryzen 9 3950X
SE +/- 9.02, N = 3
5050
1100
2200
3300
4400
5500
1. chrome 83.0.4103.61
oneDNN MKL-DNN 1.3
Harness: Deconvolution Batch deconv_1d - Data Type: u8s8f32
ms, Fewer Is Better
Core i9 10900K
SE +/- 3.06, N = 15
MIN: 111.5
121.27
Ryzen 9 3950X
SE +/- 0.02, N = 3
MIN: 68.48
69.59
30
60
90
120
150
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl
toyBrot Fractal Generator
Implementation: OpenMP
ms, Fewer Is Better
Core i9 10900K
SE +/- 8.39, N = 3
80088
Ryzen 9 3950X
SE +/- 198.34, N = 3
47670
20K
40K
60K
80K
100K
1. (CXX) g++ options: -lpthread -isystem -fopenmp -std=c++14

Himeno Benchmark 3.0

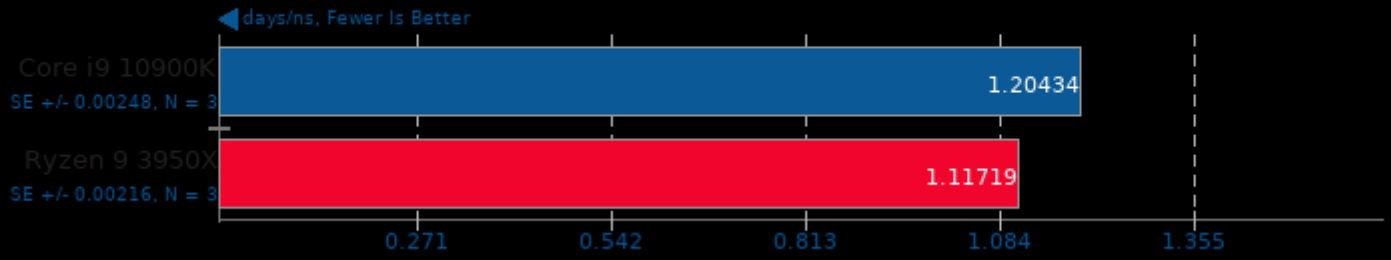
Poisson Pressure Solver



1. (CC) gcc options: -O3 -mavx2

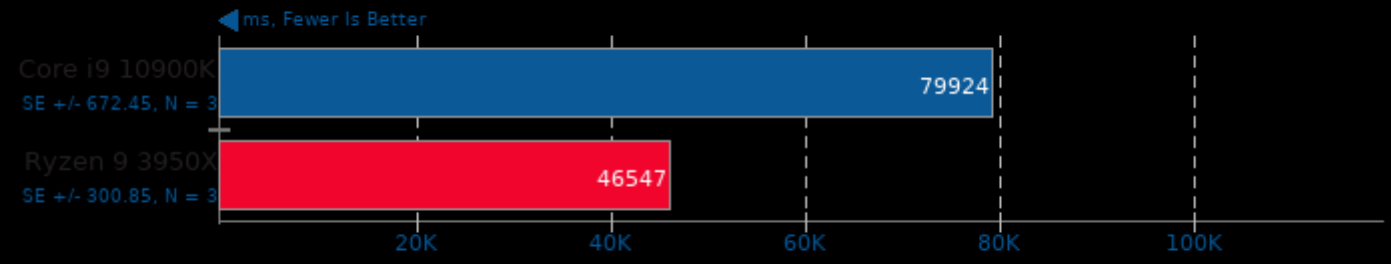
NAMD 2.13

ATPase Simulation - 327,506 Atoms



toyBrot Fractal Generator

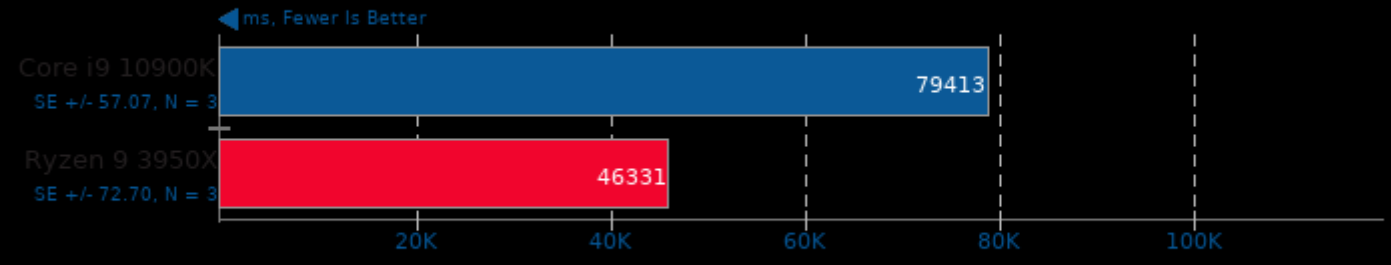
Implementation: TBB



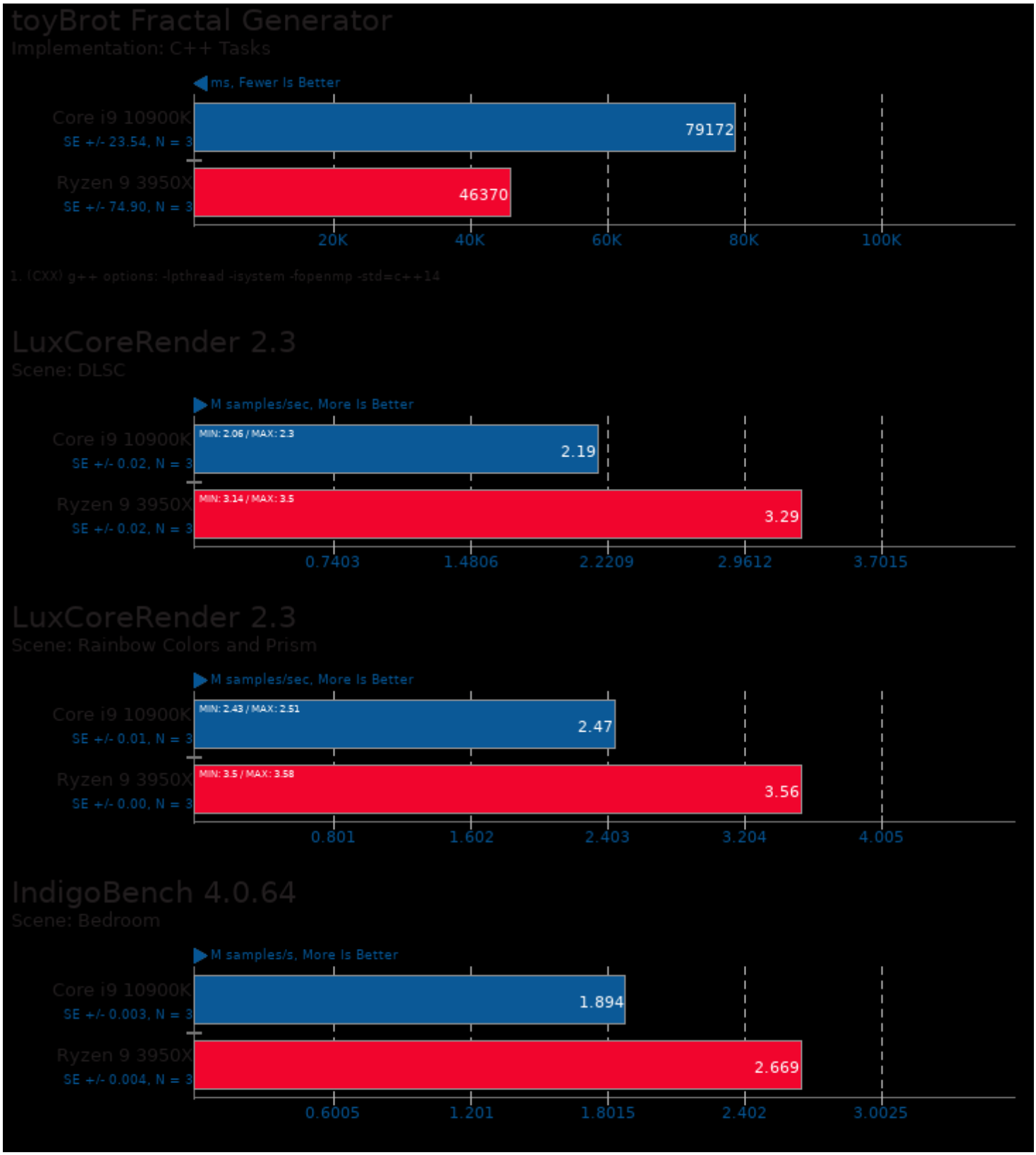
1. (CXX) g++ options: -lpthread -isystem -fopenmp -std=c++14

toyBrot Fractal Generator

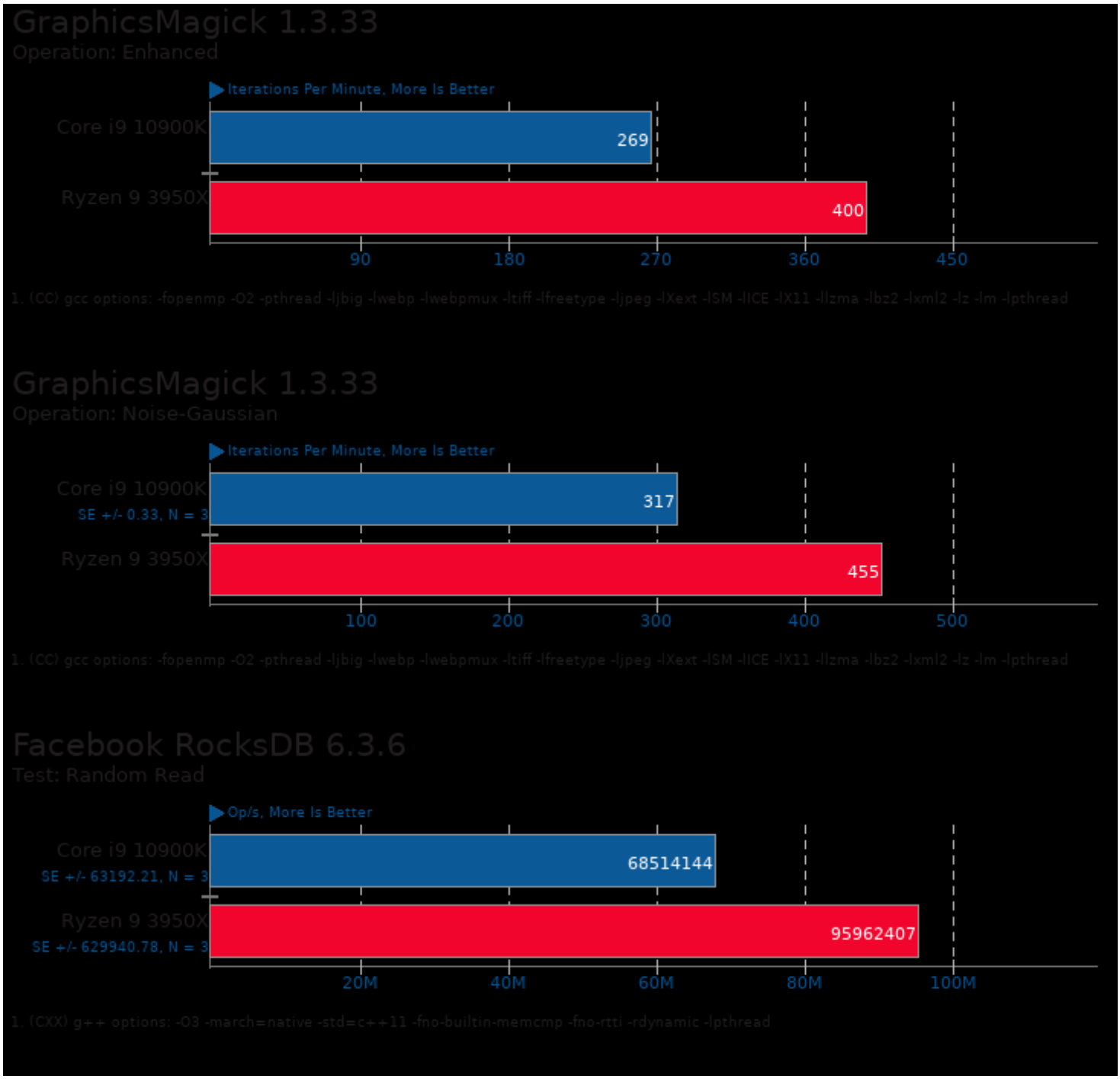
Implementation: C++ Threads

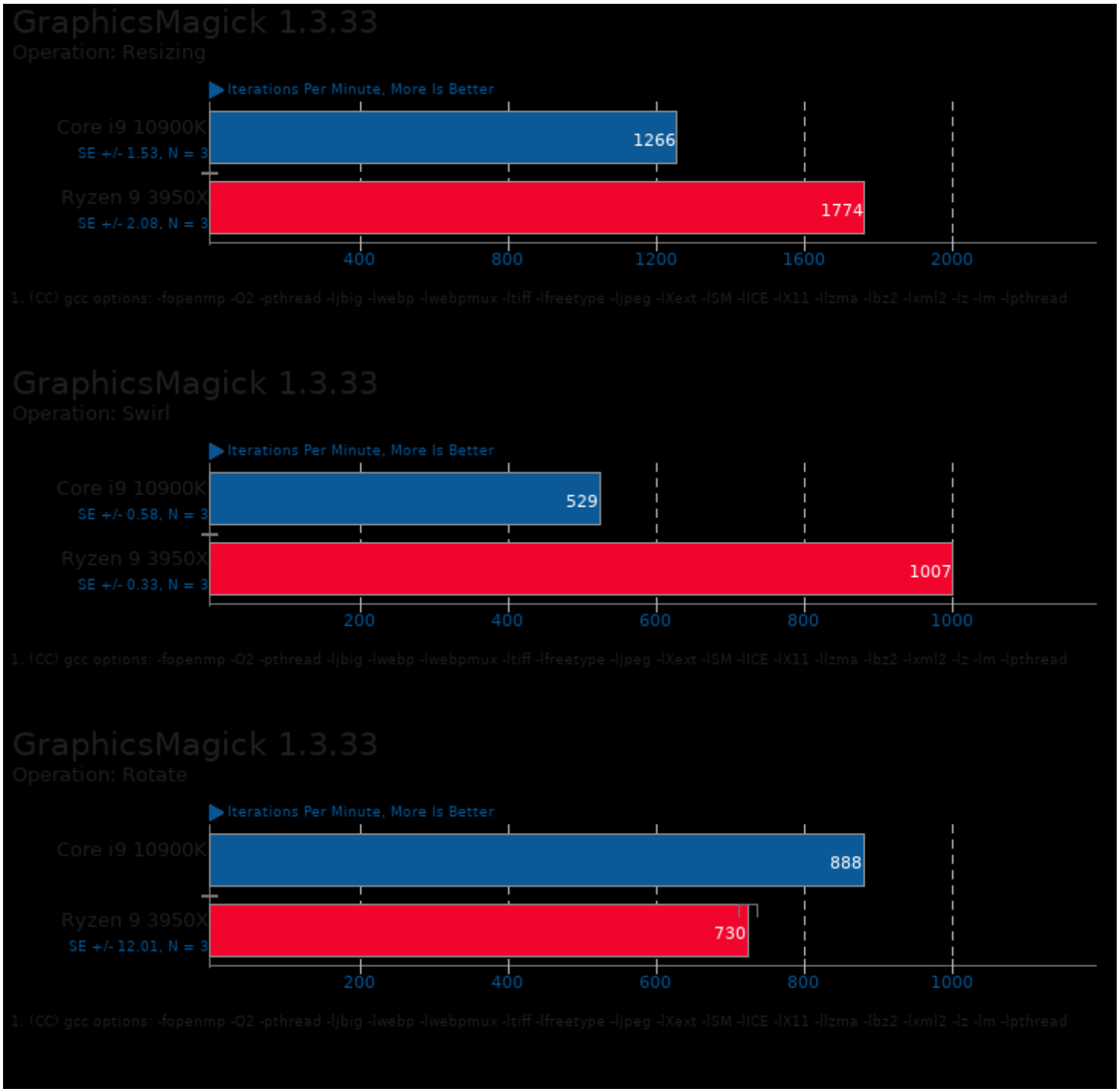


1. (CXX) g++ options: -lpthread -isystem -fopenmp -std=c++14


toyBrot Fractal Generator
Implementation: C++ Tasks
ms, Fewer Is Better
Core i9 10900K
SE +/- 23.54, N = 3
79172
Ryzen 9 3950X
SE +/- 74.90, N = 3
46370
20K
40K
60K
80K
100K
1. (CXX) g++ options: -lpthread -isystem -fopenmp -std=c++14
LuxCoreRender 2.3
Scene: DLSC
M samples/sec, More Is Better
Core i9 10900K
SE +/- 0.02, N = 3
MIN: 2.06 / MAX: 2.3
2.19
Ryzen 9 3950X
SE +/- 0.02, N = 3
MIN: 3.14 / MAX: 3.5
3.29
0.7403
1.4806
2.2209
2.9612
3.7015
LuxCoreRender 2.3
Scene: Rainbow Colors and Prism
M samples/sec, More Is Better
Core i9 10900K
SE +/- 0.01, N = 3
MIN: 2.43 / MAX: 2.51
2.47
Ryzen 9 3950X
SE +/- 0.00, N = 3
MIN: 3.5 / MAX: 3.58
3.56
0.801
1.602
2.403
3.204
4.005
IndigoBench 4.0.64
Scene: Bedroom
M samples/s, More Is Better
Core i9 10900K
SE +/- 0.003, N = 3
1.894
Ryzen 9 3950X
SE +/- 0.004, N = 3
2.669
0.6005
1.201
1.8015
2.402
3.0025

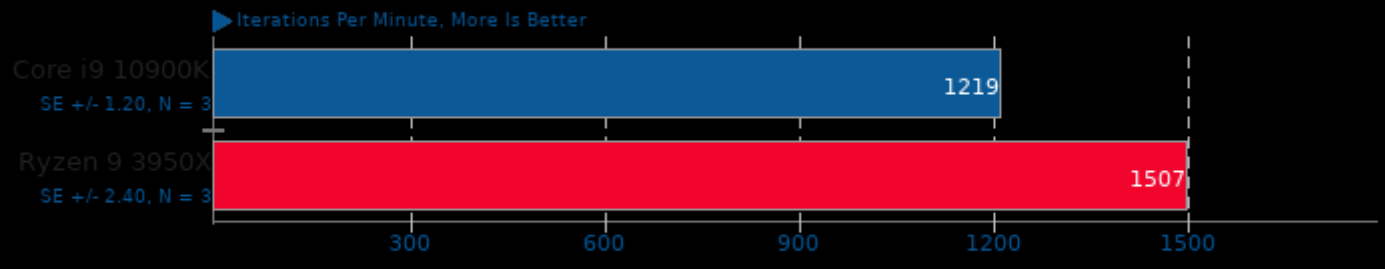

IndigoBench 4.0.64
Scene: Supercar
M samples/s, More Is Better
Core i9 10900K
SE +/- 0.003, N = 3
4.435
Ryzen 9 3950X
SE +/- 0.003, N = 3
5.660
1.2735
2.547
3.8205
5.094
6.3675
Polyhedron Fortran Benchmarks
Benchmark: induct2
Seconds, Fewer Is Better
Core i9 10900K
14.45
Ryzen 9 3950X
21.35
5
10
15
20
25
GraphicsMagick 1.3.33
Operation: Sharpen
Iterations Per Minute, More Is Better
Core i9 10900K
175
Ryzen 9 3950X
SE +/- 0.33, N = 3
248
50
100
150
200
250
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -lfreetype -ljpeg -lXext -lSM -lICE -lX11 -llzma -lbz2 -lxml2 -lz -lm -lpthread
John The Ripper 1.9.0-jumbo-1
Test: MD5
Real C/S, More Is Better
Core i9 10900K
SE +/- 333.33, N = 3
1383667
Ryzen 9 3950X
SE +/- 1666.67, N = 3
1771667
400K
800K
1200K
1600K
2000K
1. (CC) gcc options: -m64 -lssl -lcrypto -fopenmp -lgmp -pthread -lm -lz -ldl -lcrypt -lbz2


GraphicsMagick 1.3.33
Operation: Enhanced
Iterations Per Minute, More Is Better
Core i9 10900K
269
Ryzen 9 3950X
400
90
180
270
360
450
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -lfreetype -ljpeg -lXext -lSM -lICE -lX11 -llzma -lbz2 -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: Noise-Gaussian
Iterations Per Minute, More Is Better
Core i9 10900K
SE +/- 0.33, N = 3
317
Ryzen 9 3950X
455
100
200
300
400
500
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -lfreetype -ljpeg -lXext -lSM -lICE -lX11 -llzma -lbz2 -lxml2 -lz -lm -lpthread
Facebook RocksDB 6.3.6
Test: Random Read
Op/s, More Is Better
Core i9 10900K
SE +/- 63192.21, N = 3
68514144
Ryzen 9 3950X
SE +/- 629940.78, N = 3
95962407
20M
40M
60M
80M
100M
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fno-builtin-memcmp -fno-rtti -rdynamic -lpthread


GraphicsMagick 1.3.33
Operation: Resizing
Iterations Per Minute, More Is Better
Core i9 10900K
SE +/- 1.53, N = 3
1266
Ryzen 9 3950X
SE +/- 2.08, N = 3
1774
400
800
1200
1600
2000
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -lfreetype -ljpeg -lXext -lSM -lICE -lX11 -llzma -lbz2 -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: Swirl
Iterations Per Minute, More Is Better
Core i9 10900K
SE +/- 0.58, N = 3
529
Ryzen 9 3950X
SE +/- 0.33, N = 3
1007
200
400
600
800
1000
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -lfreetype -ljpeg -lXext -lSM -lICE -lX11 -llzma -lbz2 -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: Rotate
Iterations Per Minute, More Is Better
Core i9 10900K
888
Ryzen 9 3950X
SE +/- 12.01, N = 3
730
200
400
600
800
1000
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -lfreetype -ljpeg -lXext -lSM -lICE -lX11 -llzma -lbz2 -lxml2 -lz -lm -lpthread

GraphicsMagick 1.3.33

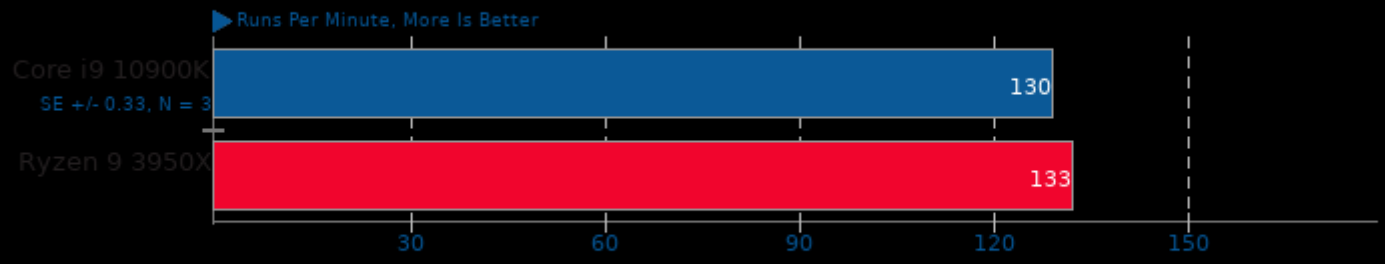
Operation: HWB Color Space



1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -lfreetype -ljpeg -lXext -lSM -lICE -lX11 -llzma -lbz2 -lxml2 -lz -lm -lpthread

Selenium

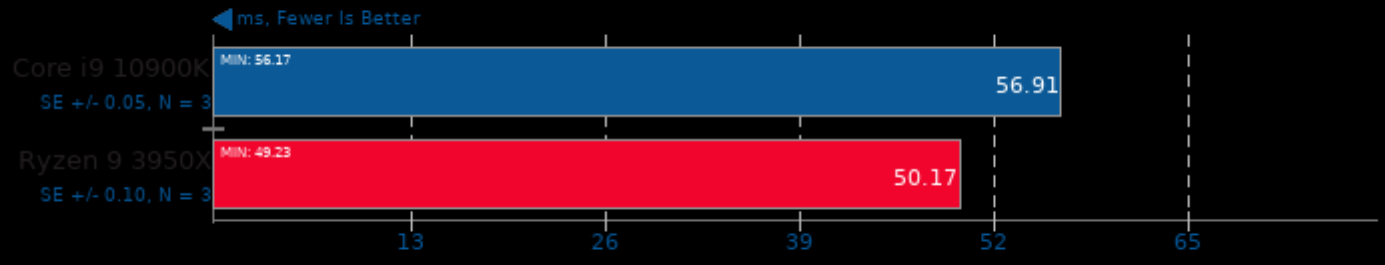
Benchmark: Speedometer - Browser: Google Chrome



1. chrome 83.0.4103.61

oneDNN MKL-DNN 1.3

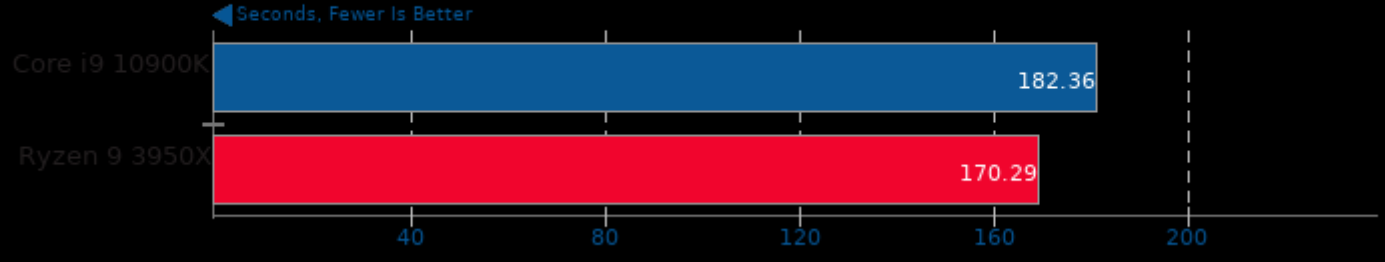
Harness: IP Batch All - Data Type: f32



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

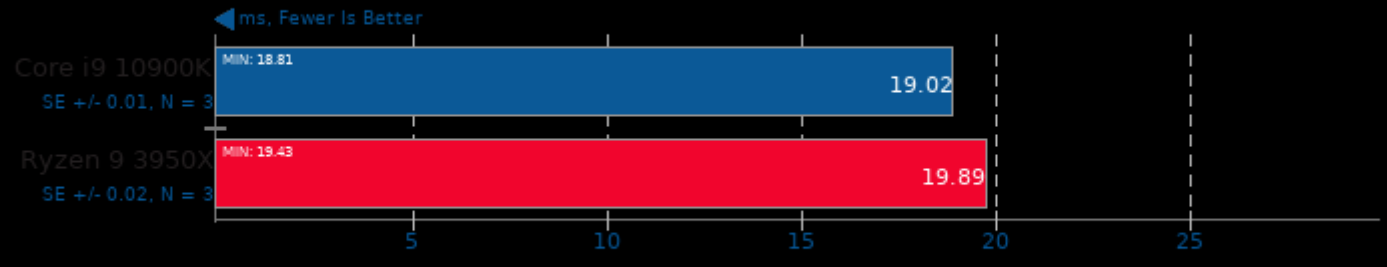
Radiance Benchmark 5.0

Test: SMP Parallel



oneDNN MKL-DNN 1.3

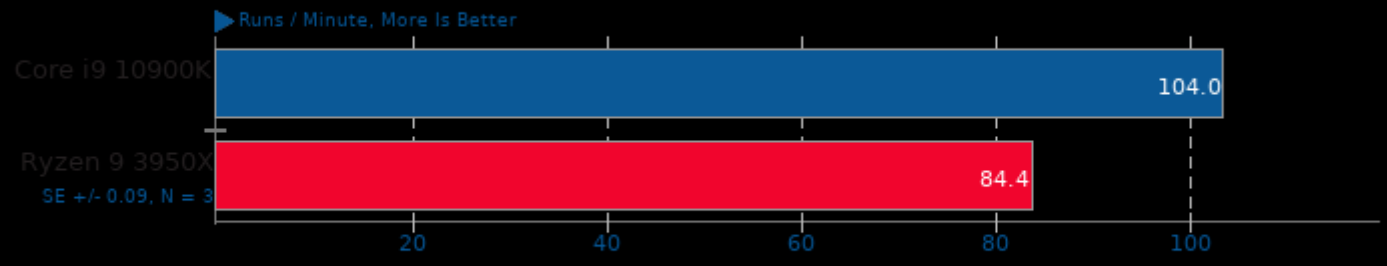
Harness: IP Batch All - Data Type: u8s8f32



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

Selenium

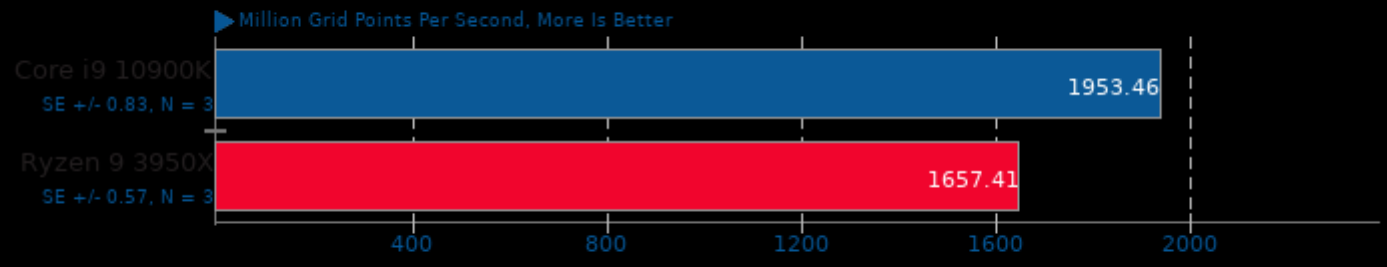
Benchmark: StyleBench - Browser: Firefox



1. firefox 76.0.1

ASKAP 2018-11-10

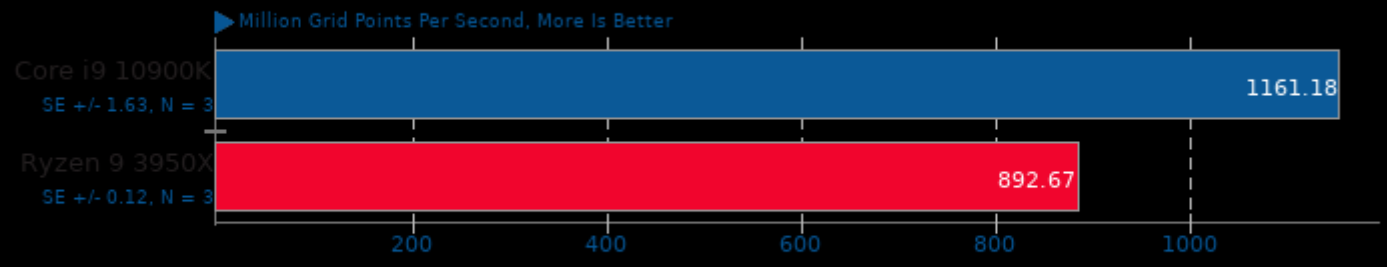
Test: tConvolve MPI - Degridding



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

ASKAP 2018-11-10

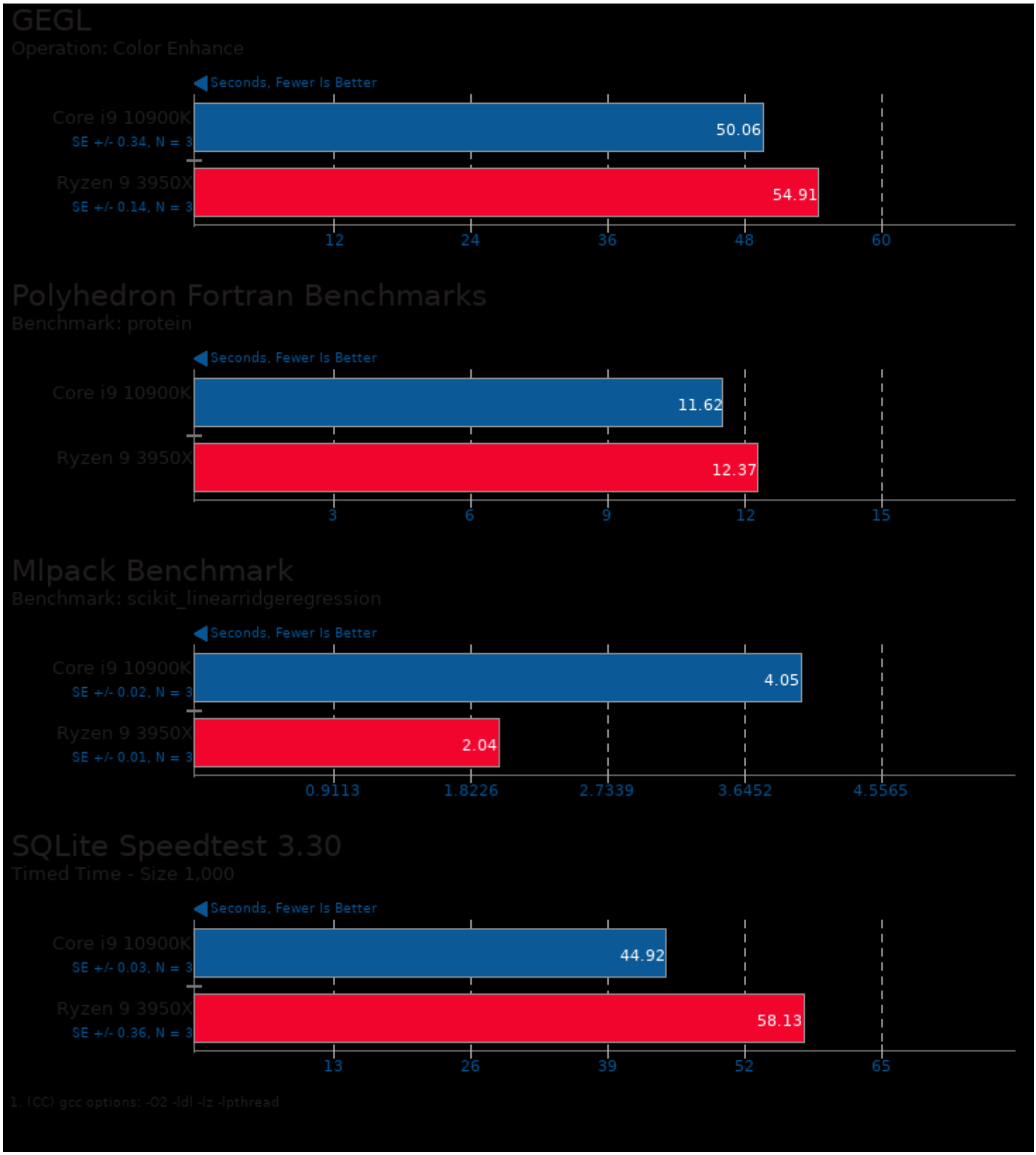
Test: tConvolve MPI - Gridding

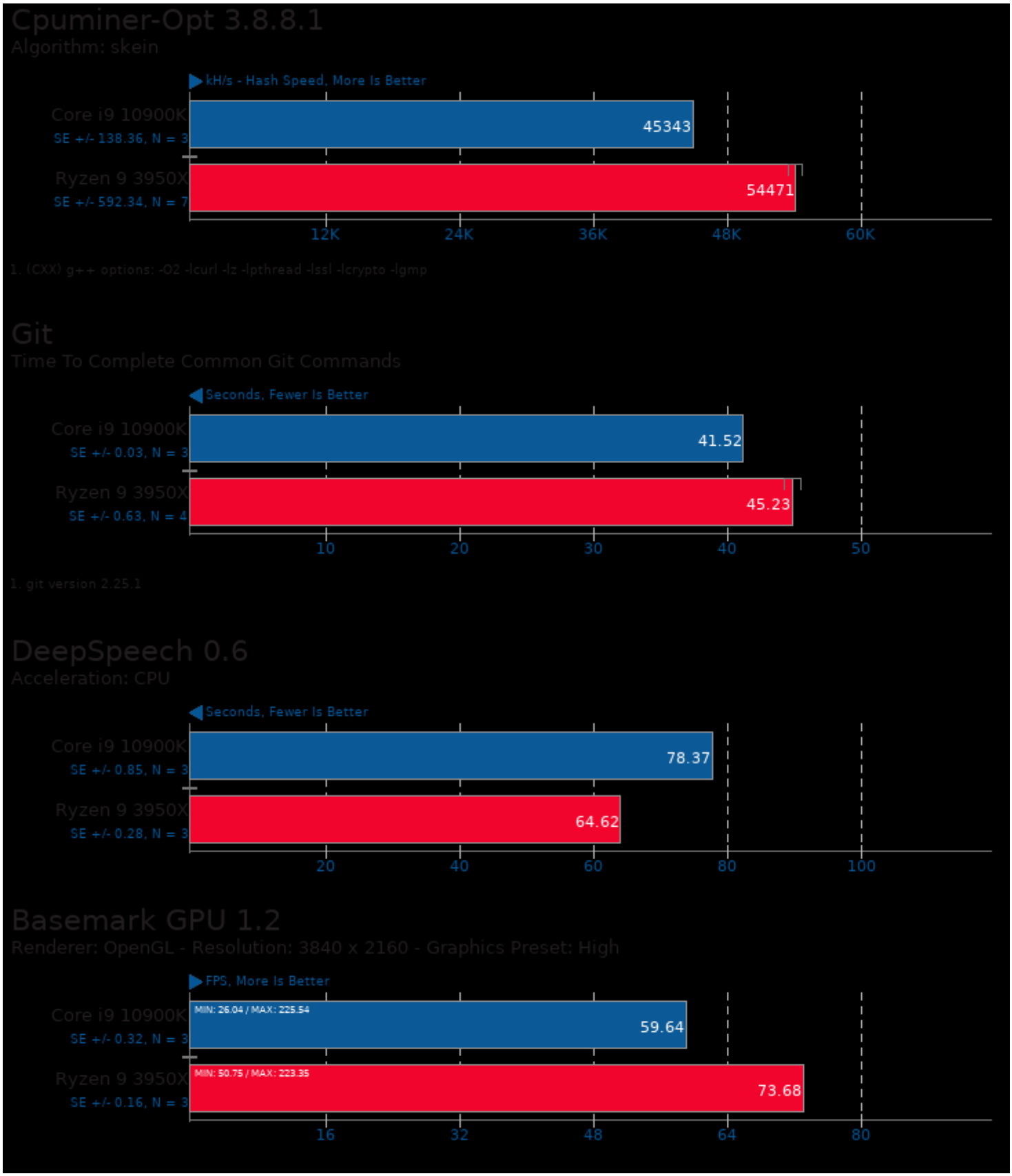


1. (CXX) g++ options: -lpthread


GEGL
Operation: Wavelet Blur
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.10, N = 3
52.12
Ryzen 9 3950X
SE +/- 0.42, N = 3
61.59
14
28
42
56
70
Minion 1.8
Benchmark: Solitaire
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.08, N = 3
55.28
Ryzen 9 3950X
SE +/- 0.05, N = 3
57.69
13
26
39
52
65
1. (CXX) g++ options: -std=gnu++11 -O3 -fomit-frame-pointer -rdynamic
Tachyon 0.99b6
Total Time
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.04, N = 3
65.78
Ryzen 9 3950X
SE +/- 0.09, N = 3
46.01
15
30
45
60
75
1. (CC) gcc options: -m64 -O3 -fomit-frame-pointer -ffast-math -ltachyon -lm -lpthread
Mlpack Benchmark
Benchmark: scikit_ica
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.53, N = 3
53.21
Ryzen 9 3950X
SE +/- 0.29, N = 3
53.76
12
24
36
48
60

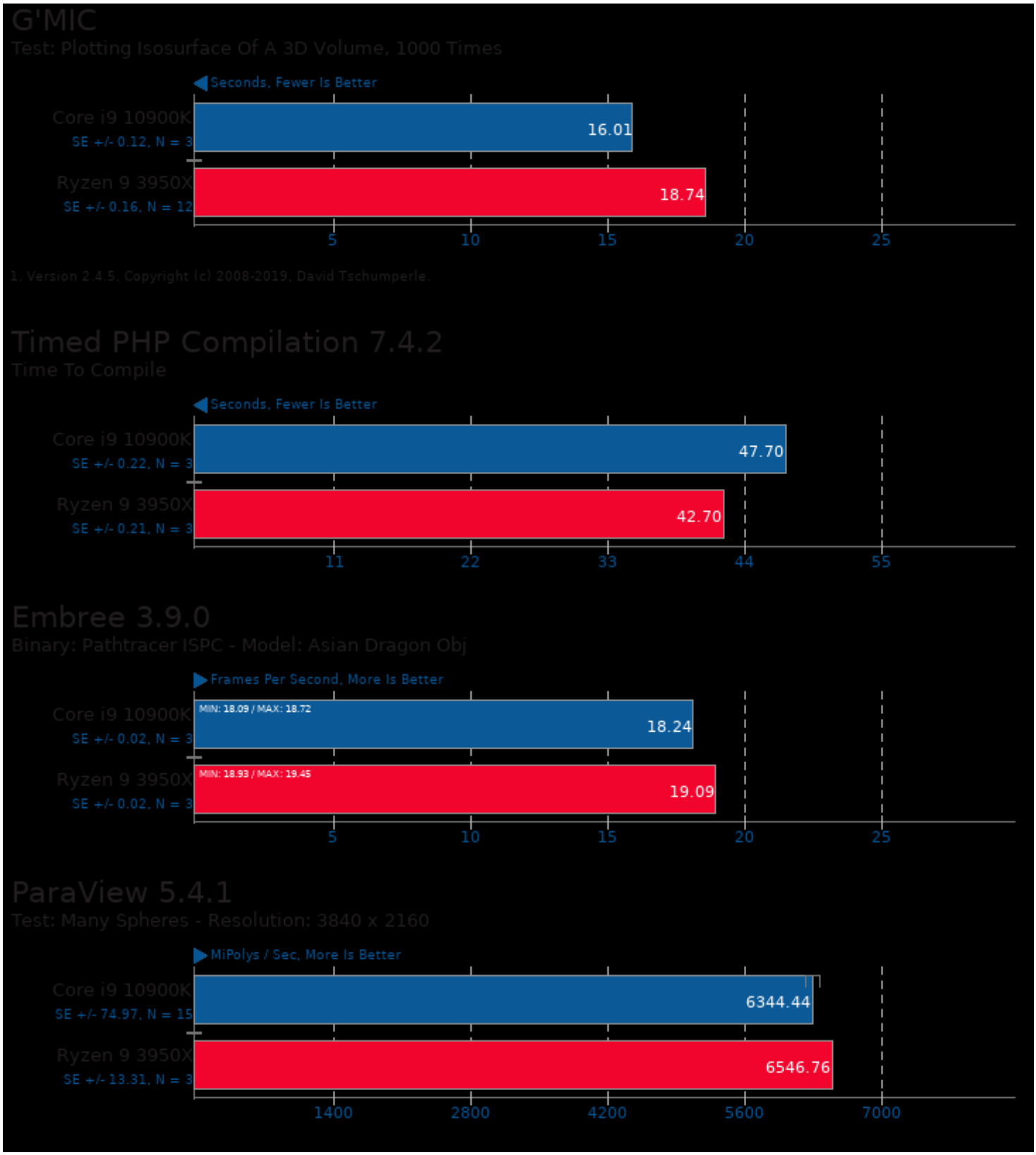

NAS Parallel Benchmarks 3.4
Test / Class: SP.B
Total Mop/s, More Is Better
Core i9 10900K
SE +/- 6.05, N = 3
5283.52
Ryzen 9 3950X
SE +/- 3.52, N = 3
8390.19
2K
4K
6K
8K
10K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.3
Perl Benchmarks
Test: Interpreter
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.00000533, N = 3
0.00066725
Ryzen 9 3950X
SE +/- 0.00000755, N = 3
0.00069115
0.0002
0.0004
0.0006
0.0008
0.001
Basemark GPU 1.2
Renderer: Vulkan - Resolution: 3840 x 2160 - Graphics Preset: High
FPS, More Is Better
Core i9 10900K
SE +/- 0.08, N = 3
MIN: 64.4 / MAX: 112.07
81.93
Ryzen 9 3950X
SE +/- 0.06, N = 3
MIN: 66.95 / MAX: 108.2
80.95
20
40
60
80
100
RawTherapee
Total Benchmark Time
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.06, N = 3
53.31
Ryzen 9 3950X
SE +/- 0.03, N = 3
52.81
12
24
36
48
60
1. RawTherapee, version 5.8, command line.


GEGL
Operation: Color Enhance
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.34, N = 3
50.06
Ryzen 9 3950X
SE +/- 0.14, N = 3
54.91
12
24
36
48
60
Polyhedron Fortran Benchmarks
Benchmark: protein
Seconds, Fewer Is Better
Core i9 10900K
11.62
Ryzen 9 3950X
12.37
3
6
9
12
15
Mlpack Benchmark
Benchmark: scikit_linearridgeregression
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.02, N = 3
4.05
Ryzen 9 3950X
SE +/- 0.01, N = 3
2.04
0.9113
1.8226
2.7339
3.6452
4.5565
SQLite Speedtest 3.30
Timed Time - Size 1,000
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.03, N = 3
44.92
Ryzen 9 3950X
SE +/- 0.36, N = 3
58.13
13
26
39
52
65
1. (CC) gcc options: -O2 -ldl -lz -lpthread


Cpuminer-Opt 3.8.8.1
Algorithm: skein
kH/s - Hash Speed, More Is Better
Core i9 10900K
SE +/- 138.36, N = 3
45343
Ryzen 9 3950X
SE +/- 592.34, N = 7
54471
12K
24K
36K
48K
60K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp
Git
Time To Complete Common Git Commands
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.03, N = 3
41.52
Ryzen 9 3950X
SE +/- 0.63, N = 4
45.23
10
20
30
40
50
1. git version 2.25.1
DeepSpeech 0.6
Acceleration: CPU
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.85, N = 3
78.37
Ryzen 9 3950X
SE +/- 0.28, N = 3
64.62
20
40
60
80
100
Basemark GPU 1.2
Renderer: OpenGL - Resolution: 3840 x 2160 - Graphics Preset: High
FPS, More Is Better
Core i9 10900K
SE +/- 0.32, N = 3
MIN: 26.04 / MAX: 225.54
59.64
Ryzen 9 3950X
SE +/- 0.16, N = 3
MIN: 50.75 / MAX: 223.35
73.68
16
32
48
64
80


PyPerformance 1.0.0
Benchmark: 2to3
Milliseconds, Fewer Is Better
Core i9 10900K
241
Ryzen 9 3950X
SE +/- 0.33, N = 3
283
60
120
180
240
300
LibreOffice
Test: 20 Documents To PDF
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.039, N = 20
6.403
Ryzen 9 3950X
SE +/- 0.036, N = 24
6.605
2
4
6
8
10
1. LibreOffice 6.4.3.2 40(Build:2)
Selenium
Benchmark: ARES-6 - Browser: Google Chrome
ms, Fewer Is Better
Core i9 10900K
SE +/- 0.05, N = 3
17.47
Ryzen 9 3950X
SE +/- 0.13, N = 3
20.20
5
10
15
20
25
1. chrome 83.0.4103.61
m-queens 1.2
Time To Solve
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.01, N = 3
59.65
Ryzen 9 3950X
SE +/- 0.01, N = 3
34.30
13
26
39
52
65
1. (CXX) g++ options: -fopenmp -O2 -march=native

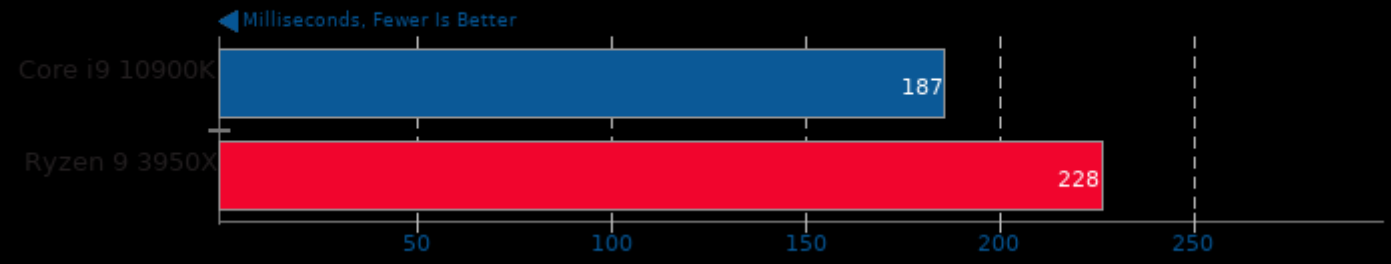

Renaissance 0.10.0
Test: Twitter HTTP Requests
ms, Fewer Is Better
Core i9 10900K
SE +/- 11.83, N = 5
2003.91
Ryzen 9 3950X
SE +/- 8.13, N = 5
2094.16
400
800
1200
1600
2000
Embree 3.9.0
Binary: Pathtracer - Model: Asian Dragon Obj
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.01, N = 3
MIN: 16.08 / MAX: 16.46
16.18
Ryzen 9 3950X
SE +/- 0.03, N = 3
MIN: 19.45 / MAX: 20.1
19.65
5
10
15
20
25
Selenium
Benchmark: Octane - Browser: Firefox
Geometric Mean, More Is Better
Core i9 10900K
SE +/- 241.35, N = 3
38776
Ryzen 9 3950X
SE +/- 264.89, N = 3
34528
8K
16K
24K
32K
40K
1. firefox 76.0.1
Java SciMark 2.0
Computational Test: Composite
Mflops, More Is Better
Core i9 10900K
SE +/- 7.45, N = 4
3053.01
Ryzen 9 3950X
SE +/- 31.68, N = 4
3115.94
700
1400
2100
2800
3500


G'MIC
Test: Plotting Isosurface Of A 3D Volume, 1000 Times
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.12, N = 3
16.01
Ryzen 9 3950X
SE +/- 0.16, N = 12
18.74
5
10
15
20
25
1, Version 2.4.5, Copyright (c) 2008-2019, David Tschumperle.
Timed PHP Compilation 7.4.2
Time To Compile
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.22, N = 3
47.70
Ryzen 9 3950X
SE +/- 0.21, N = 3
42.70
11
22
33
44
55
Embree 3.9.0
Binary: Pathtracer ISPC - Model: Asian Dragon Obj
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.02, N = 3
MIN: 18.09 / MAX: 18.72
18.24
Ryzen 9 3950X
SE +/- 0.02, N = 3
MIN: 18.93 / MAX: 19.45
19.09
5
10
15
20
25
ParaView 5.4.1
Test: Many Spheres - Resolution: 3840 x 2160
MiPolys / Sec, More Is Better
Core i9 10900K
SE +/- 74.97, N = 15
6344.44
Ryzen 9 3950X
SE +/- 13.31, N = 3
6546.76
1400
2800
4200
5600
7000


ParaView 5.4.1
Test: Many Spheres - Resolution: 3840 x 2160
Frames / Sec, More Is Better
Core i9 10900K
SE +/- 0.75, N = 15
63.28
Ryzen 9 3950X
SE +/- 0.13, N = 3
65.30
15
30
45
60
75
Basis Universal 1.12
Settings: ETC1S
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.13, N = 3
42.18
Ryzen 9 3950X
SE +/- 0.17, N = 3
42.79
10
20
30
40
50
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread
C-Ray 1.1
Total Time - 4K, 16 Rays Per Pixel
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.01, N = 3
52.13
Ryzen 9 3950X
SE +/- 0.02, N = 3
31.59
12
24
36
48
60
1. (CC) gcc options: -lm -lpthread -O3
Selenium
Benchmark: Octane - Browser: Google Chrome
Geometric Mean, More Is Better
Core i9 10900K
SE +/- 76.22, N = 3
54153
Ryzen 9 3950X
SE +/- 186.91, N = 3
49230
12K
24K
36K
48K
60K
1. chrome 83.0.4103.61

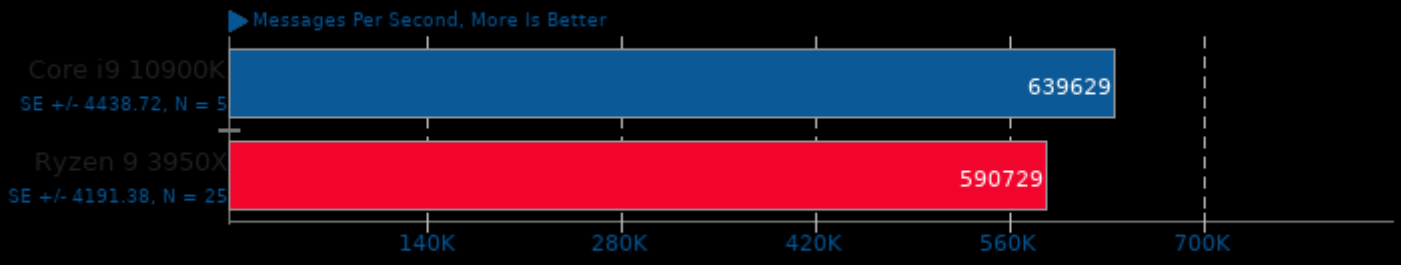
PyPerformance 1.0.0

Benchmark: go



Sockperf 3.4

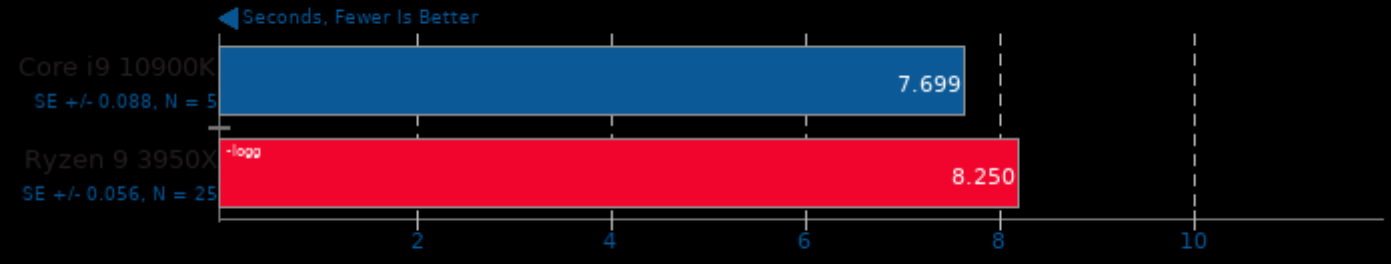
Test: Throughput



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

FLAC Audio Encoding 1.3.2

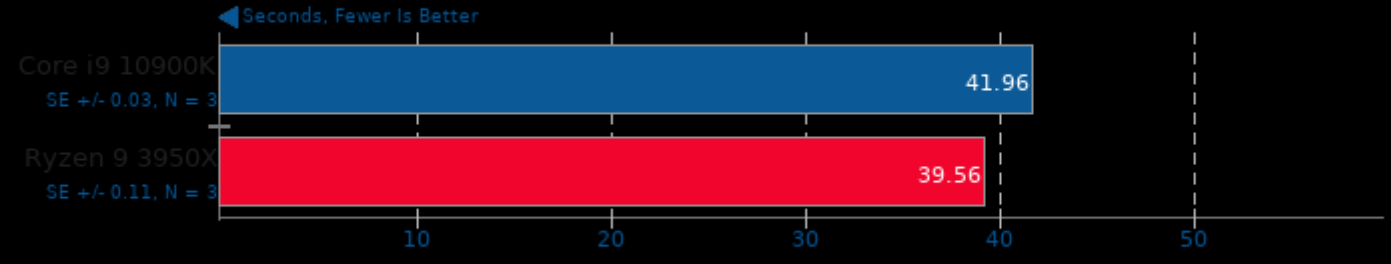
WAV To FLAC



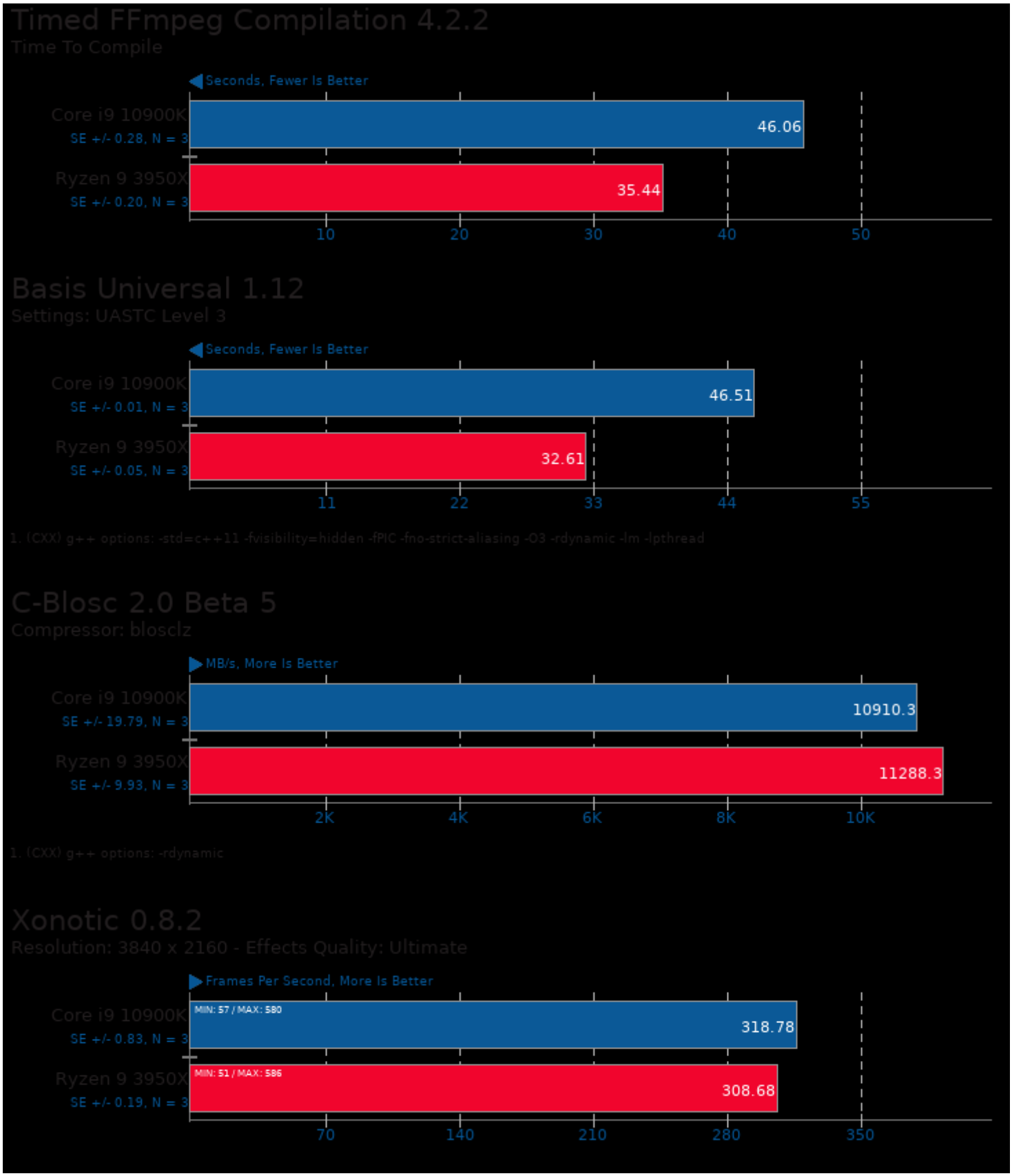
1. (CXX) g++ options: -O2 -fvisibility=hidden -lm

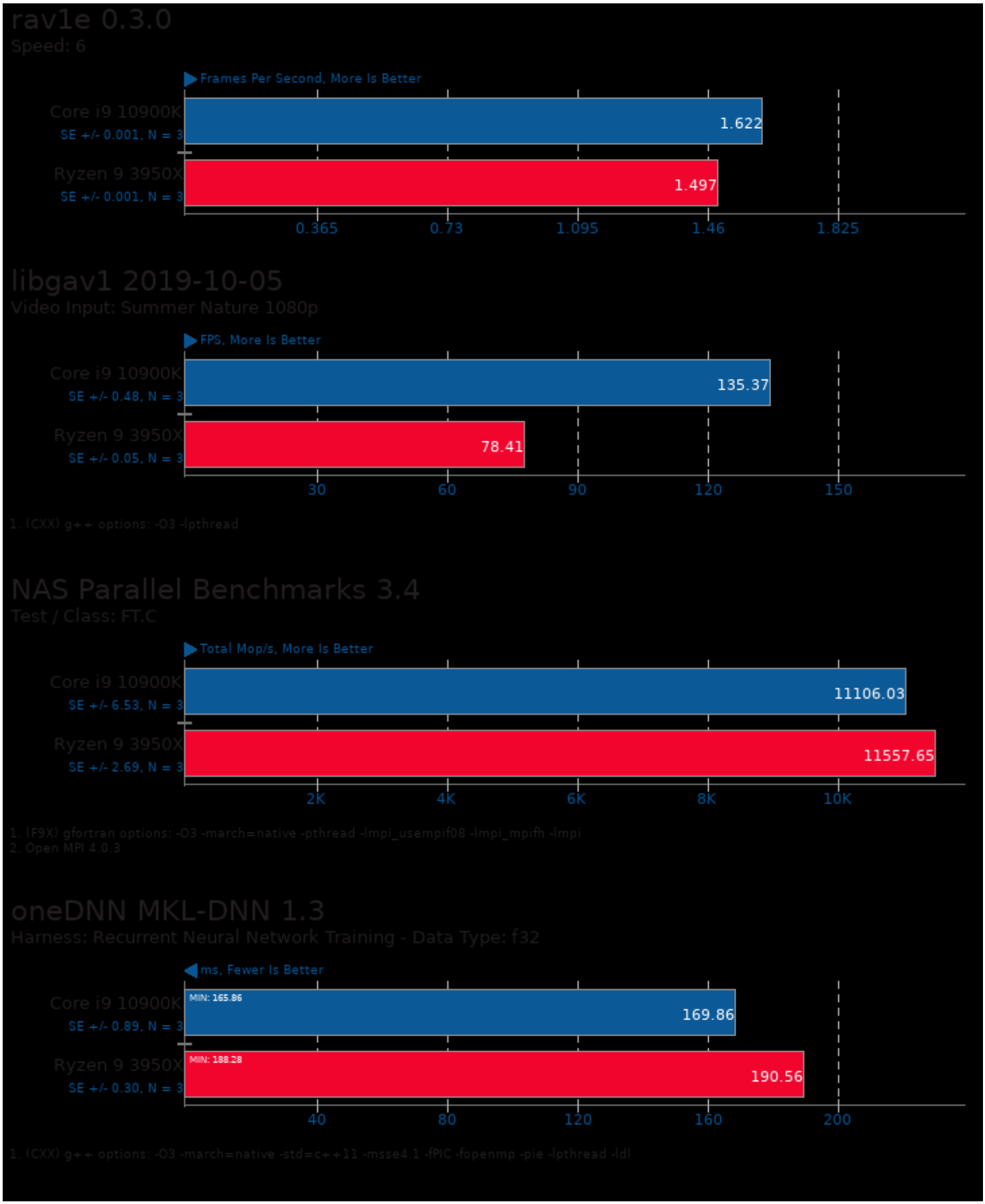
Minion 1.8

Benchmark: Graceful

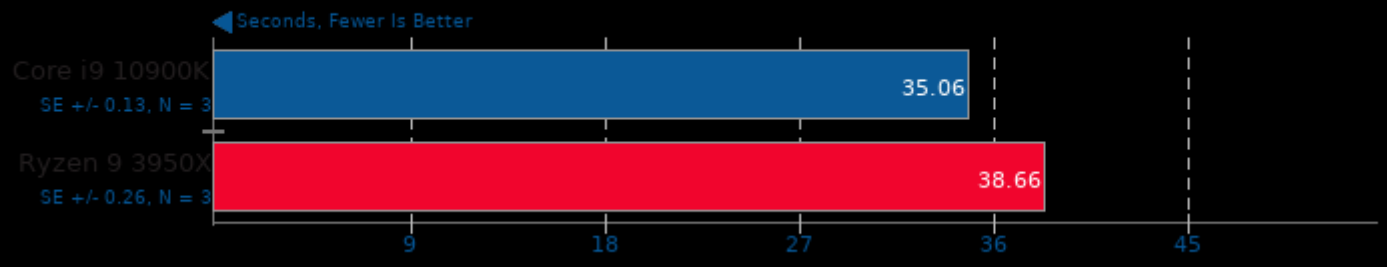


1. (CXX) g++ options: -std=gnu++11 -O3 -fomit-frame-pointer -rdynamic


Timed FFmpeg Compilation 4.2.2
Time To Compile
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.28, N = 3
46.06
Ryzen 9 3950X
SE +/- 0.20, N = 3
35.44
10
20
30
40
50
Basis Universal 1.12
Settings: UASTC Level 3
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.01, N = 3
46.51
Ryzen 9 3950X
SE +/- 0.05, N = 3
32.61
11
22
33
44
55
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread
C-Blosc 2.0 Beta 5
Compressor: blosclz
MB/s, More Is Better
Core i9 10900K
SE +/- 19.79, N = 3
10910.3
Ryzen 9 3950X
SE +/- 9.93, N = 3
11288.3
2K
4K
6K
8K
10K
1. (CXX) g++ options: -rdynamic
Xonotic 0.8.2
Resolution: 3840 x 2160 - Effects Quality: Ultimate
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.83, N = 3
MIN: 57 / MAX: 580
318.78
Ryzen 9 3950X
SE +/- 0.19, N = 3
MIN: 51 / MAX: 586
308.68
70
140
210
280
350

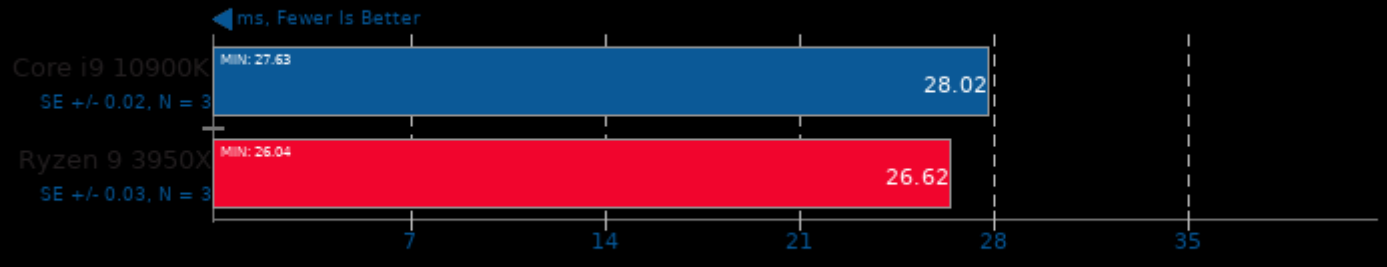

rav1e 0.3.0
Speed: 6
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.001, N = 3
1.622
Ryzen 9 3950X
SE +/- 0.001, N = 3
1.497
0.365
0.73
1.095
1.46
1.825
libgav1 2019-10-05
Video Input: Summer Nature 1080p
FPS, More Is Better
Core i9 10900K
SE +/- 0.48, N = 3
135.37
Ryzen 9 3950X
SE +/- 0.05, N = 3
78.41
30
60
90
120
150
1. (CXX) g++ options: -O3 -lpthread
NAS Parallel Benchmarks 3.4
Test / Class: FT.C
Total Mop/s, More Is Better
Core i9 10900K
SE +/- 6.53, N = 3
11106.03
Ryzen 9 3950X
SE +/- 2.69, N = 3
11557.65
2K
4K
6K
8K
10K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.3
oneDNN MKL-DNN 1.3
Harness: Recurrent Neural Network Training - Data Type: f32
ms, Fewer Is Better
Core i9 10900K
SE +/- 0.89, N = 3
MIN: 165.86
169.86
Ryzen 9 3950X
SE +/- 0.30, N = 3
MIN: 188.28
190.56
40
80
120
160
200
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

Cython benchmark 0.27



oneDNN MKL-DNN 1.3

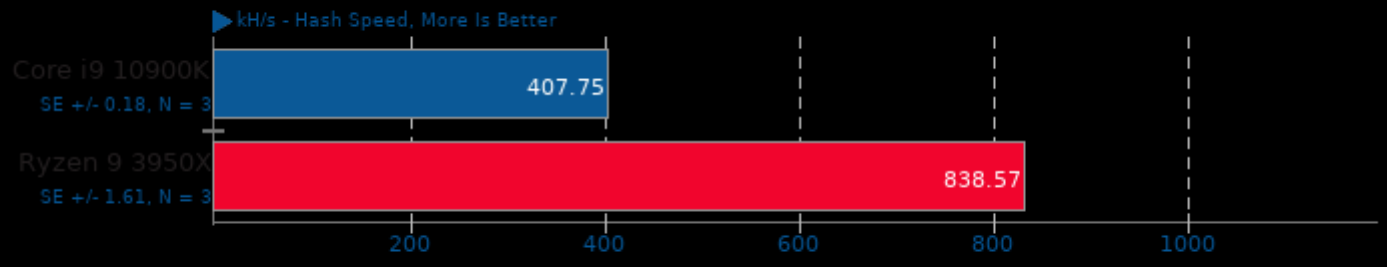
Harness: Recurrent Neural Network Inference - Data Type: f32



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

Cpuminer-Opt 3.8.8.1

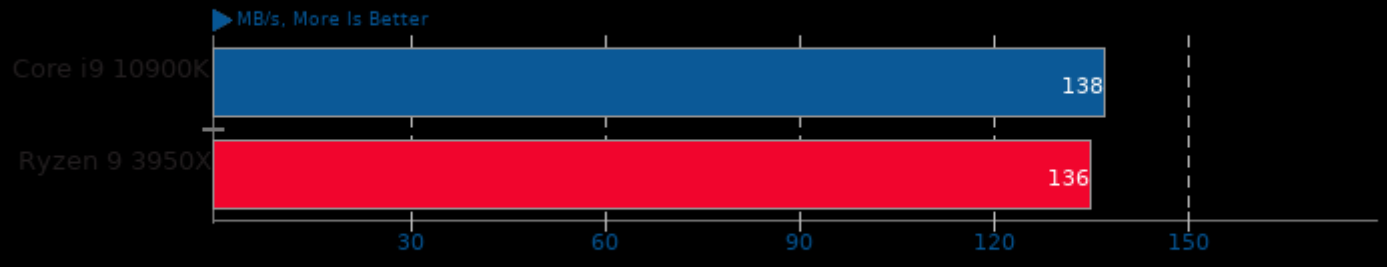
Algorithm: m7m



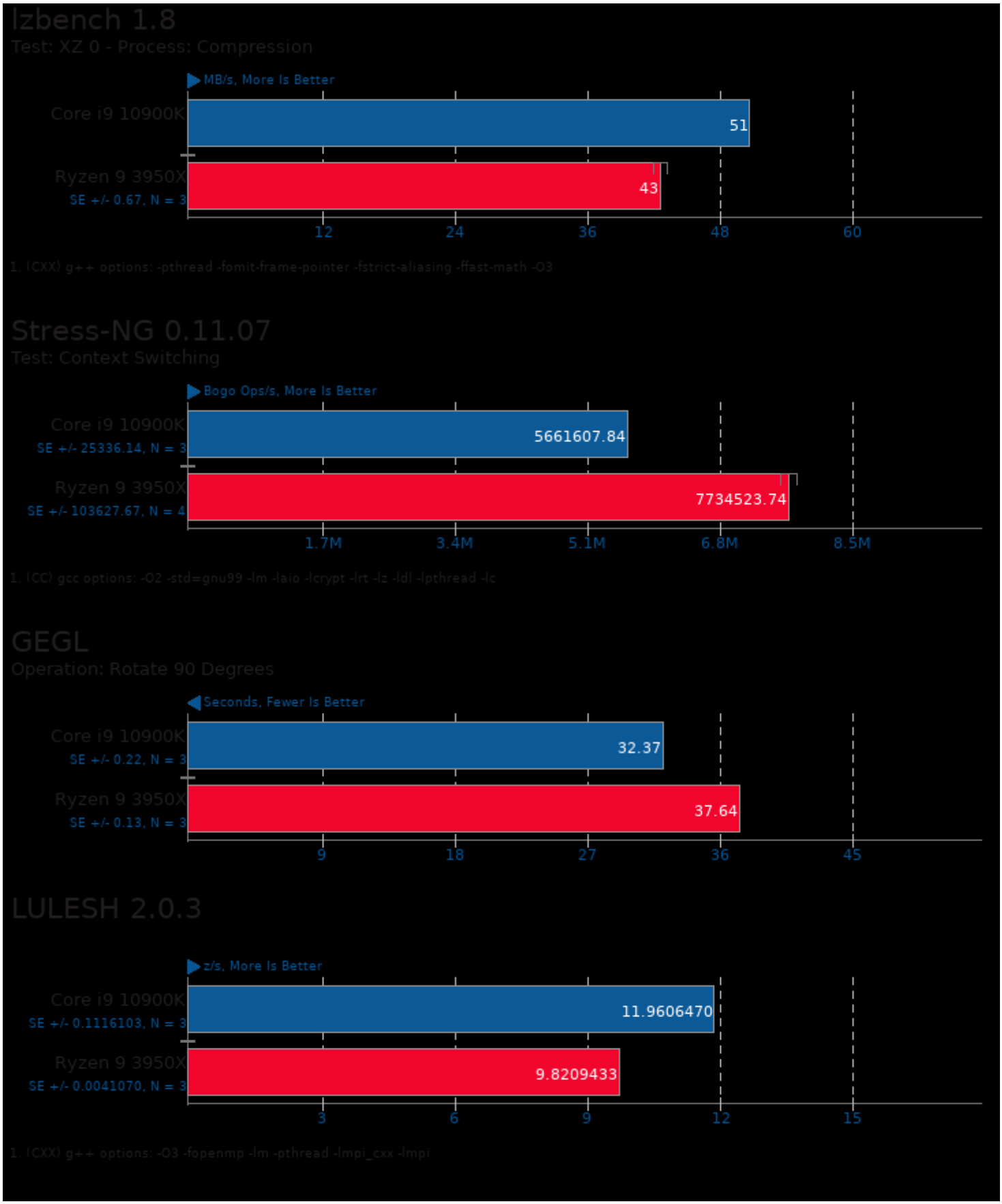
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp

lzbench 1.8

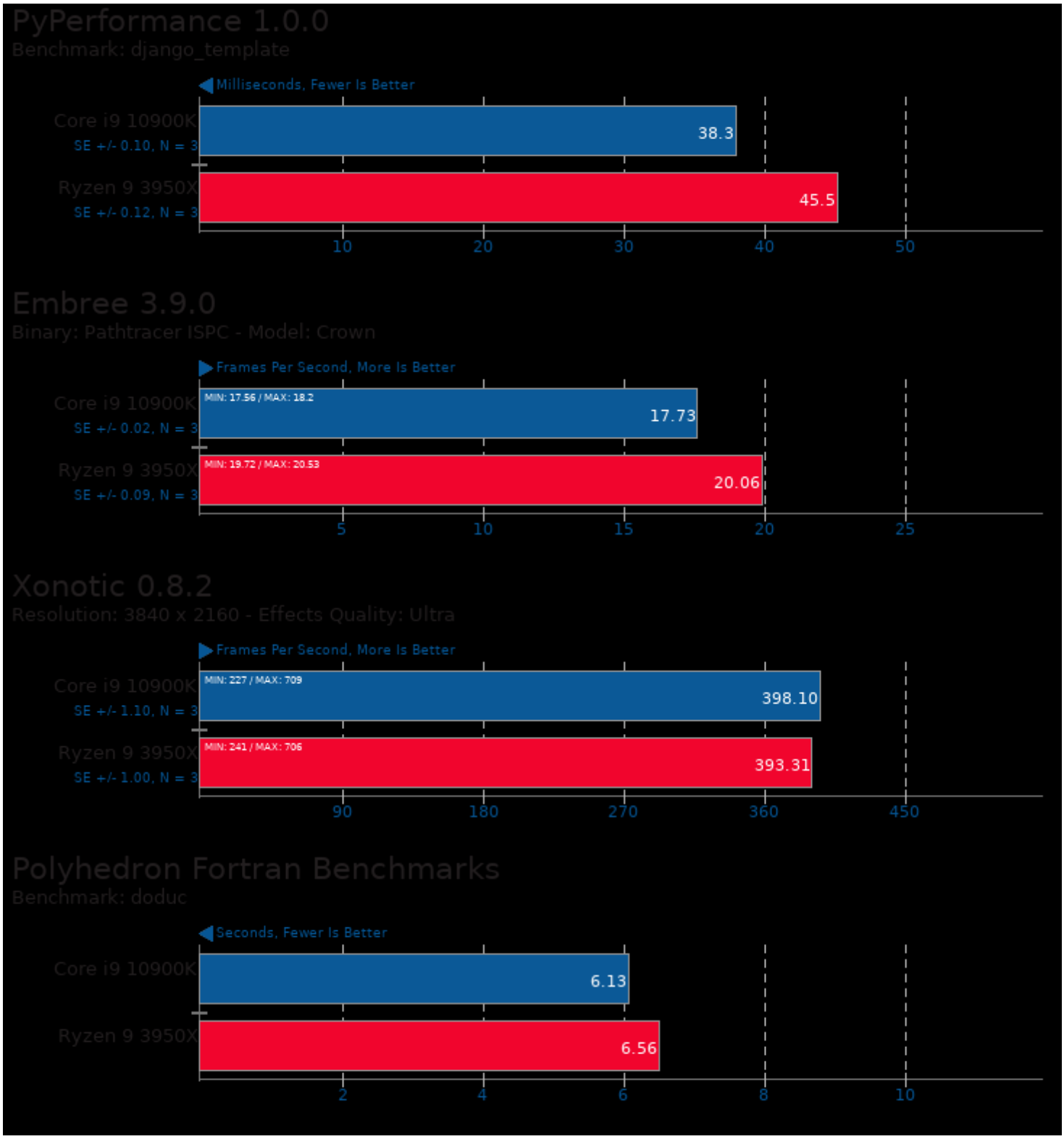
Test: XZ 0 - Process: Decompression

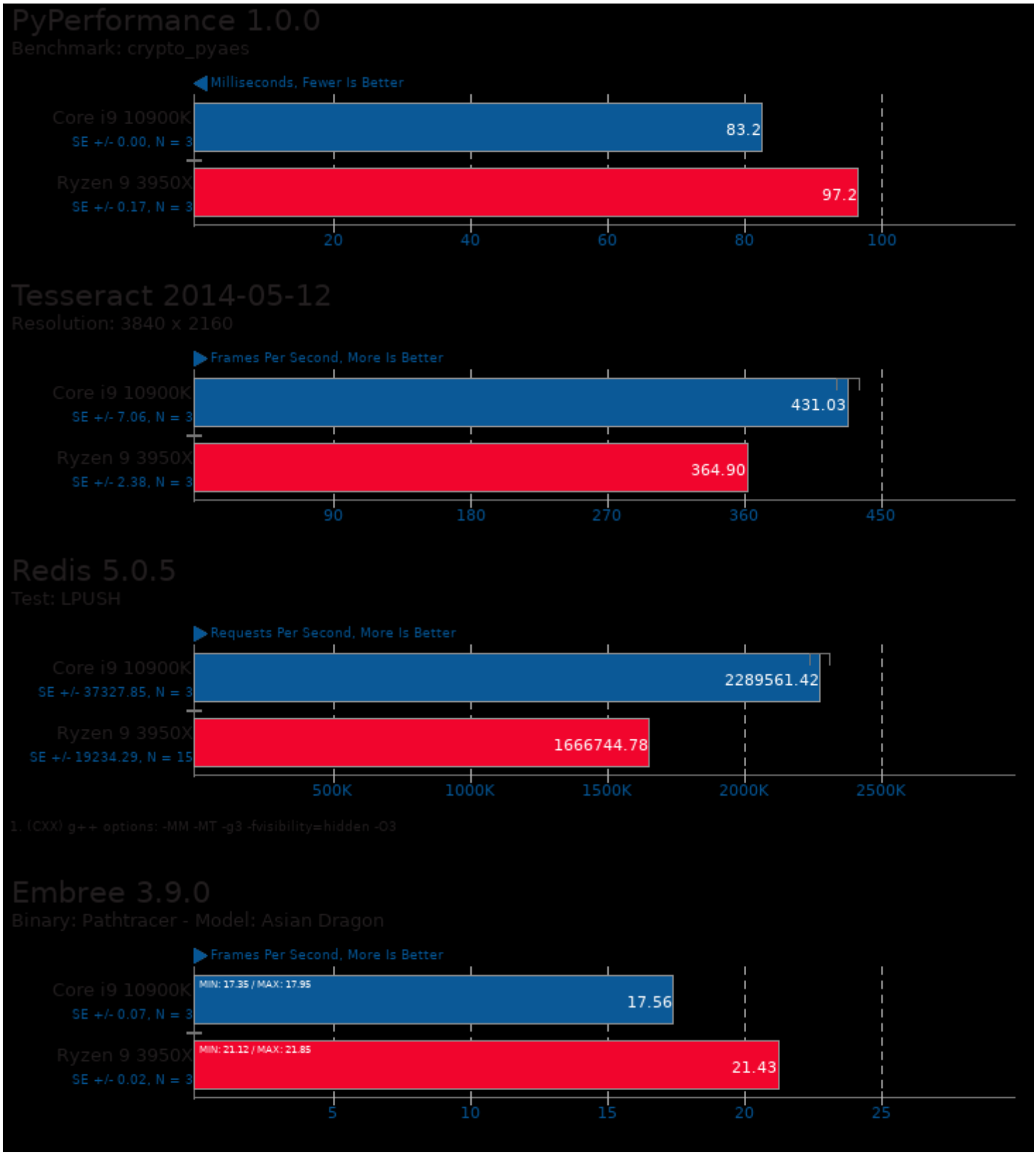


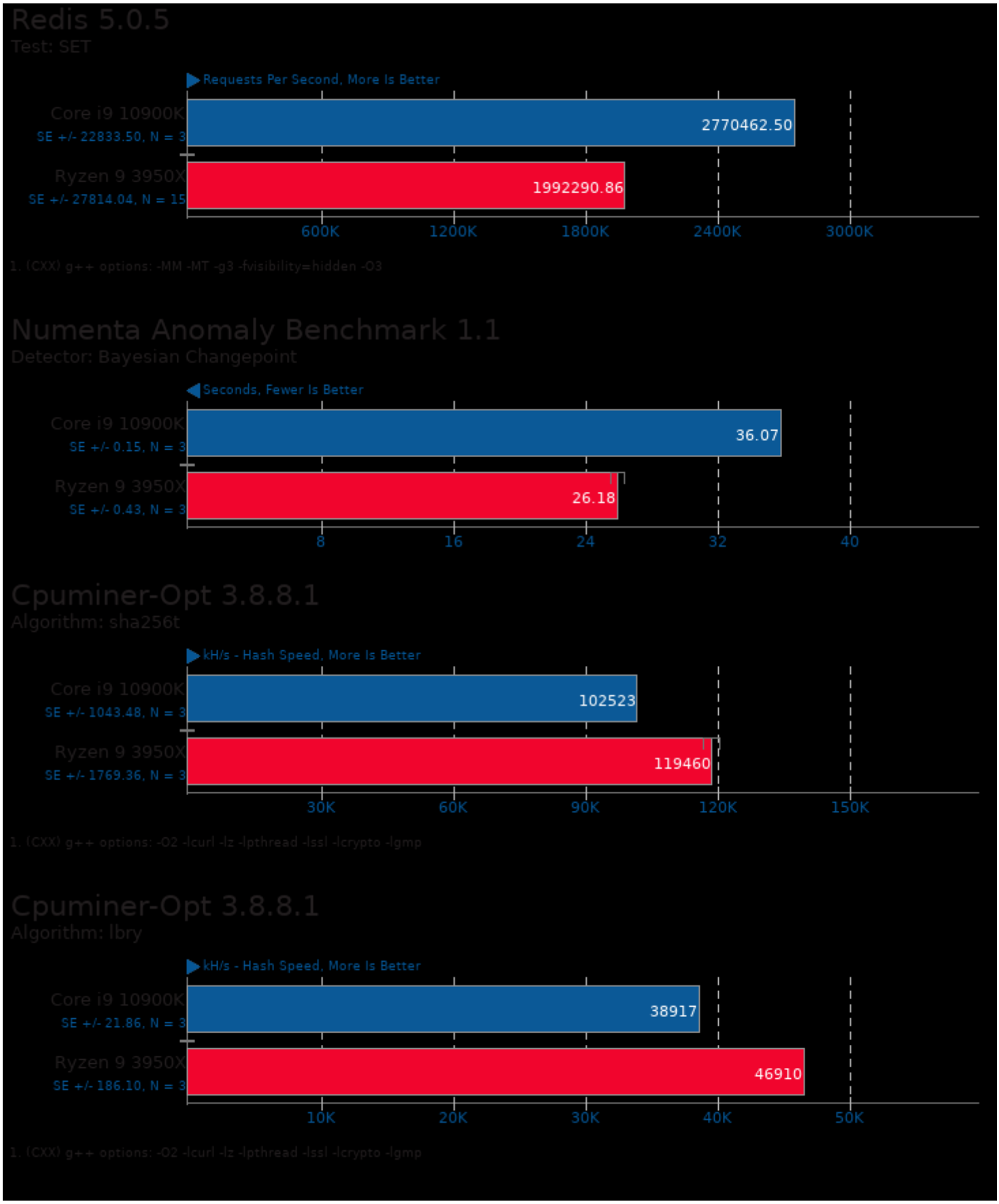
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3


lzbench 1.8
Test: XZ 0 - Process: Compression
MB/s, More Is Better
Core i9 10900K
51
Ryzen 9 3950X
SE +/- 0.67, N = 3
43
12
24
36
48
60
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3
Stress-NG 0.11.07
Test: Context Switching
Bogo Ops/s, More Is Better
Core i9 10900K
SE +/- 25336.14, N = 3
5661607.84
Ryzen 9 3950X
SE +/- 103627.67, N = 4
7734523.74
1.7M
3.4M
5.1M
6.8M
8.5M
1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lz -ldl -lpthread -lc
GEGL
Operation: Rotate 90 Degrees
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.22, N = 3
32.37
Ryzen 9 3950X
SE +/- 0.13, N = 3
37.64
9
18
27
36
45
LULESH 2.0.3
z/s, More Is Better
Core i9 10900K
SE +/- 0.1116103, N = 3
11.9606470
Ryzen 9 3950X
SE +/- 0.0041070, N = 3
9.8209433
3
6
9
12
15
1. (CXX) g++ options: -O3 -fopenmp -lm -pthread -lmpi_cxx -lmpi


GEGL
Operation: Antialias
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.15, N = 3
32.11
Ryzen 9 3950X
SE +/- 0.14, N = 3
37.30
9
18
27
36
45
Embree 3.9.0
Binary: Pathtracer - Model: Crown
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.02, N = 3
MIN: 15.31 / MAX: 15.79
15.45
Ryzen 9 3950X
SE +/- 0.03, N = 3
MIN: 20.65 / MAX: 21.39
20.86
5
10
15
20
25
Cpuminer-Opt 3.8.8.1
Algorithm: deep
kH/s - Hash Speed, More Is Better
Core i9 10900K
SE +/- 3.33, N = 3
12397
Ryzen 9 3950X
SE +/- 5.77, N = 3
15150
3K
6K
9K
12K
15K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp
7-Zip Compression 16.02
Compress Speed Test
MIPS, More Is Better
Core i9 10900K
SE +/- 226.30, N = 3
65002
Ryzen 9 3950X
SE +/- 347.43, N = 3
90026
20K
40K
60K
80K
100K
1. (CXX) g++ options: -pipe -lpthread

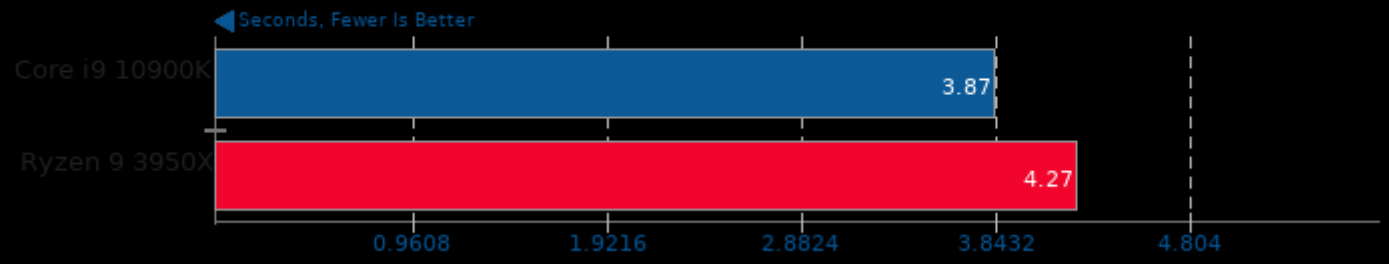

PyPerformance 1.0.0
Benchmark: django_template
Milliseconds, Fewer Is Better
Core i9 10900K
SE +/- 0.10, N = 3
38.3
Ryzen 9 3950X
SE +/- 0.12, N = 3
45.5
10
20
30
40
50
Embree 3.9.0
Binary: Pathtracer ISPC - Model: Crown
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.02, N = 3
MIN: 17.56 / MAX: 18.2
17.73
Ryzen 9 3950X
SE +/- 0.09, N = 3
MIN: 19.72 / MAX: 20.53
20.06
5
10
15
20
25
Xonotic 0.8.2
Resolution: 3840 x 2160 - Effects Quality: Ultra
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 1.10, N = 3
MIN: 227 / MAX: 709
398.10
Ryzen 9 3950X
SE +/- 1.00, N = 3
MIN: 241 / MAX: 706
393.31
90
180
270
360
450
Polyhedron Fortran Benchmarks
Benchmark: doduc
Seconds, Fewer Is Better
Core i9 10900K
6.13
Ryzen 9 3950X
6.56
2
4
6
8
10


PyPerformance 1.0.0
Benchmark: crypto_pyaes
Milliseconds, Fewer Is Better
Core i9 10900K
SE +/- 0.00, N = 3
83.2
Ryzen 9 3950X
SE +/- 0.17, N = 3
97.2
20
40
60
80
100
Tesseract 2014-05-12
Resolution: 3840 x 2160
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 7.06, N = 3
431.03
Ryzen 9 3950X
SE +/- 2.38, N = 3
364.90
90
180
270
360
450
Redis 5.0.5
Test: LPUSH
Requests Per Second, More Is Better
Core i9 10900K
SE +/- 37327.85, N = 3
2289561.42
Ryzen 9 3950X
SE +/- 19234.29, N = 15
1666744.78
500K
1000K
1500K
2000K
2500K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3
Embree 3.9.0
Binary: Pathtracer - Model: Asian Dragon
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.07, N = 3
MIN: 17.35 / MAX: 17.95
17.56
Ryzen 9 3950X
SE +/- 0.02, N = 3
MIN: 21.12 / MAX: 21.85
21.43
5
10
15
20
25


Redis 5.0.5
Test: SET
Requests Per Second, More Is Better
Core i9 10900K
SE +/- 22833.50, N = 3
2770462.50
Ryzen 9 3950X
SE +/- 27814.04, N = 15
1992290.86
600K
1200K
1800K
2400K
3000K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3
Numenta Anomaly Benchmark 1.1
Detector: Bayesian Changepoint
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.15, N = 3
36.07
Ryzen 9 3950X
SE +/- 0.43, N = 3
26.18
8
16
24
32
40
Cpuminer-Opt 3.8.8.1
Algorithm: sha256t
kH/s - Hash Speed, More Is Better
Core i9 10900K
SE +/- 1043.48, N = 3
102523
Ryzen 9 3950X
SE +/- 1769.36, N = 3
119460
30K
60K
90K
120K
150K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp
Cpuminer-Opt 3.8.8.1
Algorithm: lbry
kH/s - Hash Speed, More Is Better
Core i9 10900K
SE +/- 21.86, N = 3
38917
Ryzen 9 3950X
SE +/- 186.10, N = 3
46910
10K
20K
30K
40K
50K
1. (CXX) g++ options: -O2 -lcurl -lz -lpthread -lssl -lcrypto -lgmp

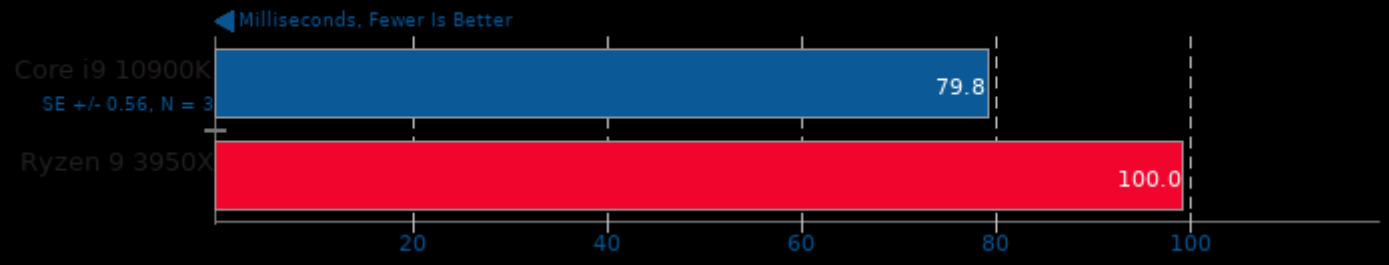
Polyhedron Fortran Benchmarks

Benchmark: mdbx



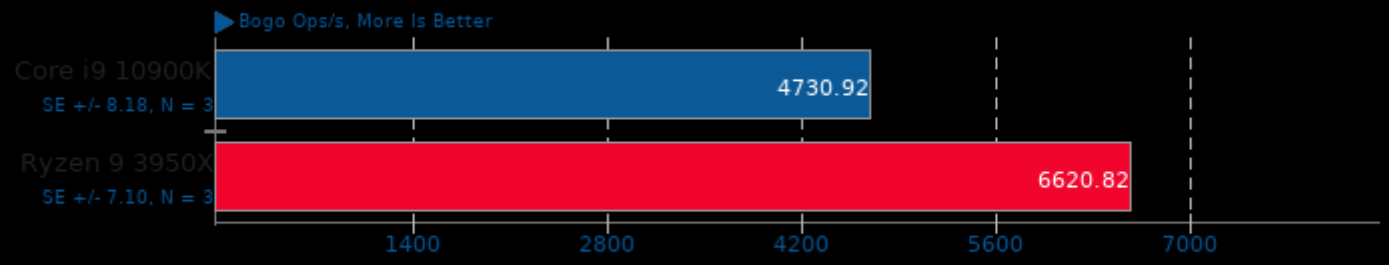
PyPerformance 1.0.0

Benchmark: chaos



Stress-NG 0.11.07

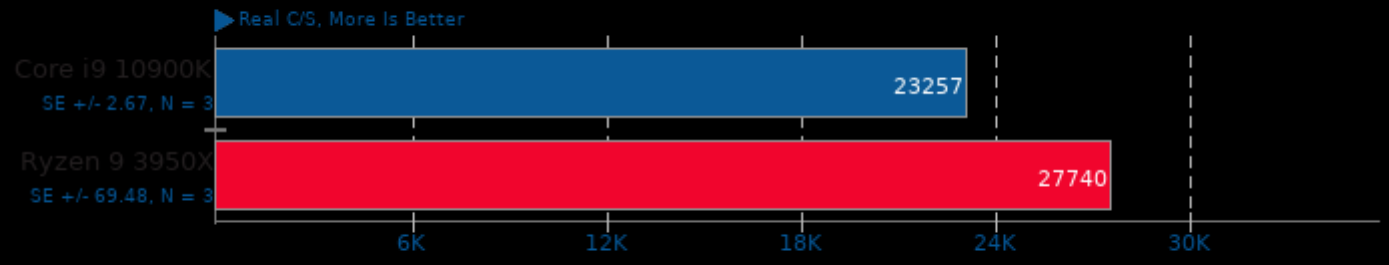
Test: CPU Stress



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

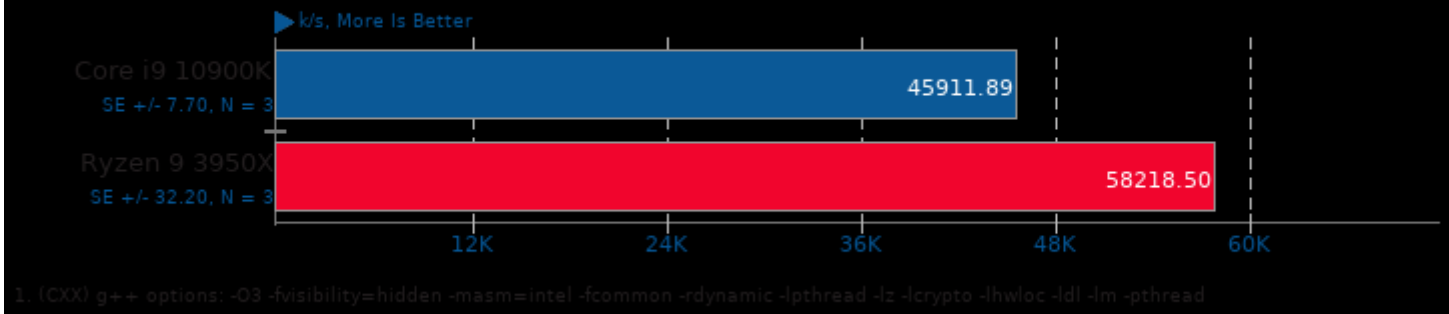
John The Ripper 1.9.0-jumbo-1

Test: Blowfish



1. (CC) gcc options: -m64 -lssl -lcrypto -fopenmp -lgmp -pthread -lm -lz -ldl -lcrypt -lbz2

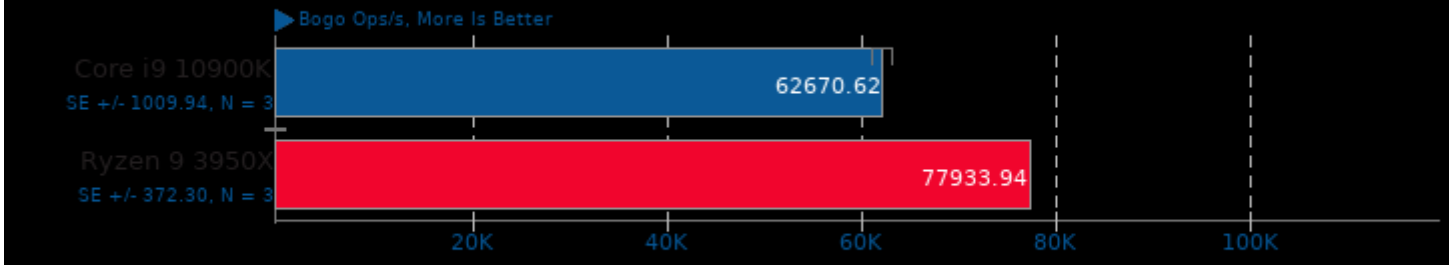
Aircrack-ng 1.5.2



1. (CXX) g++ options: -O3 -fvisibility=hidden -masm=intel -fcommon -rdynamic -lpthread -lz -lcrypto -lhwloc -ldl -lm -pthread

Stress-NG 0.11.07

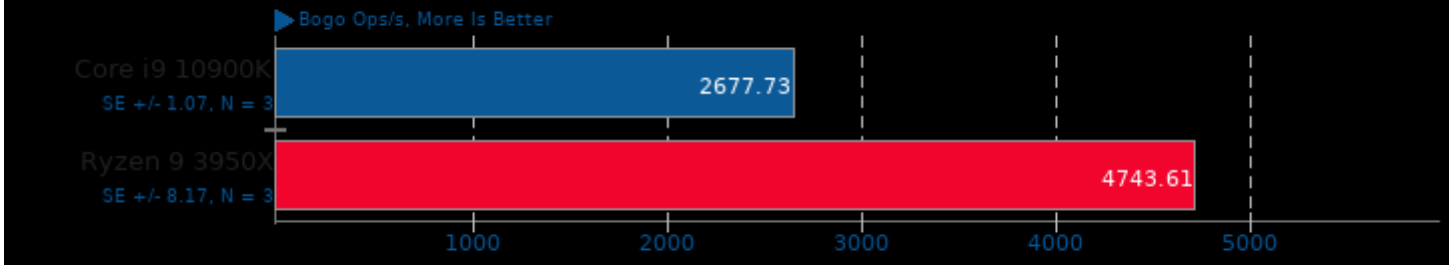
Test: Matrix Math



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

Stress-NG 0.11.07

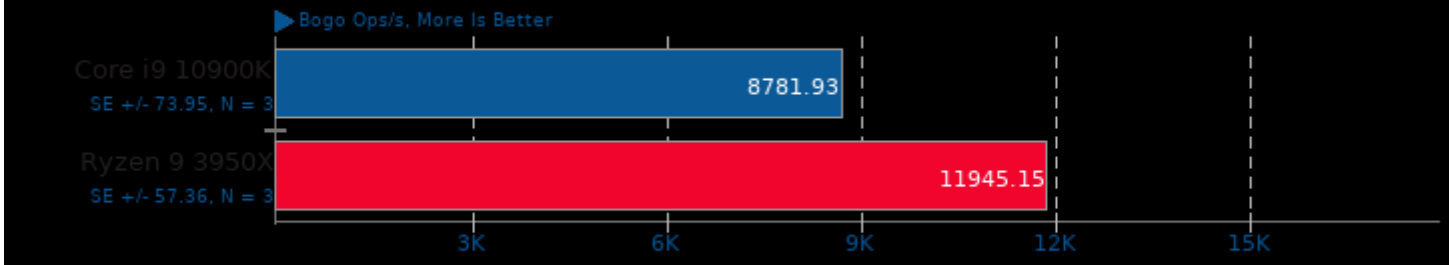
Test: Crypto



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

Stress-NG 0.11.07

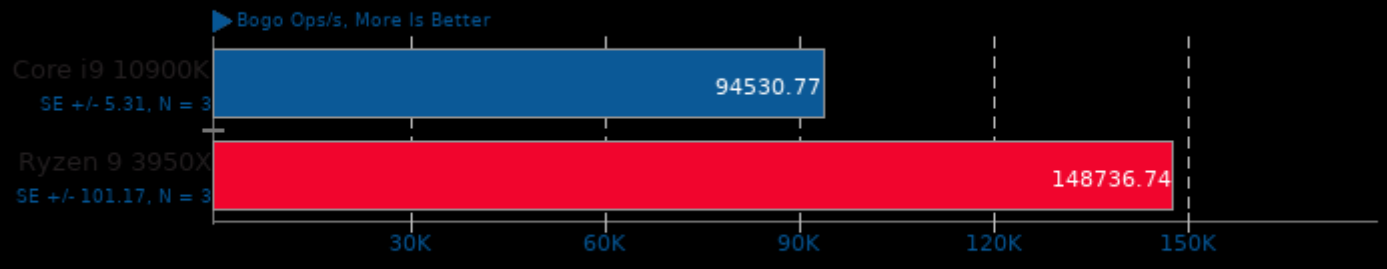
Test: Socket Activity



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

Stress-NG 0.11.07

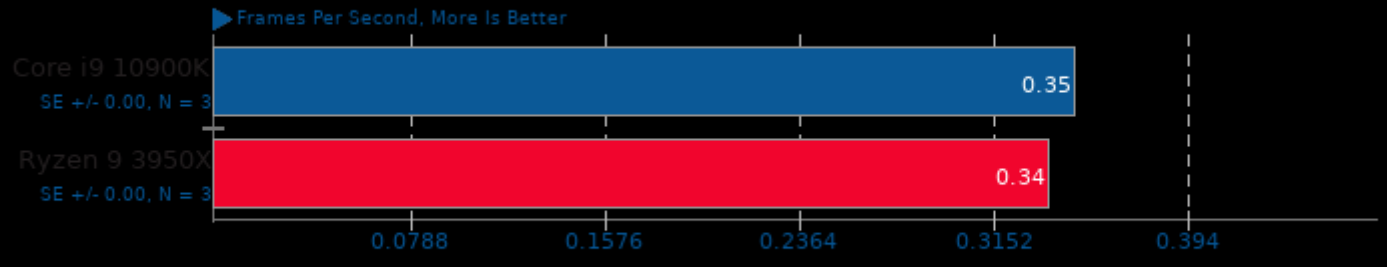
Test: Vector Math



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

AOM AV1 2.0

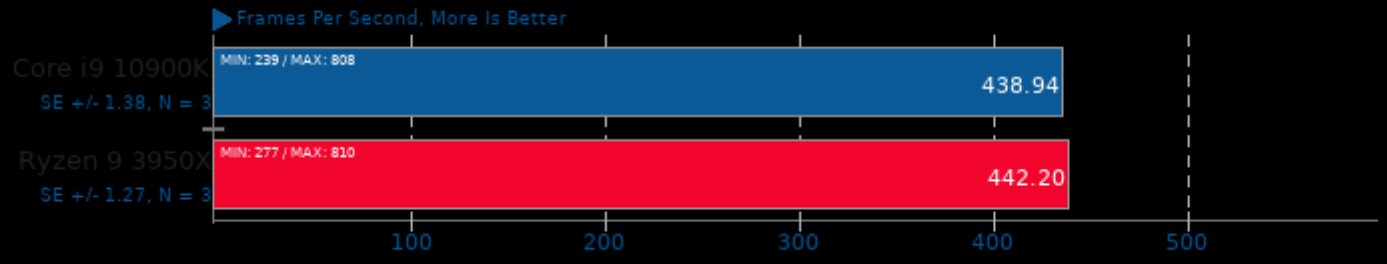
Encoder Mode: Speed 0 Two-Pass



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

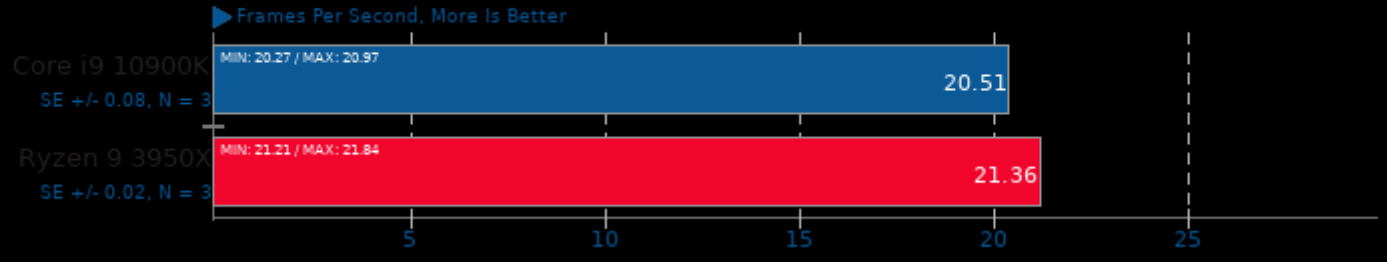
Xonotic 0.8.2

Resolution: 3840 x 2160 - Effects Quality: High



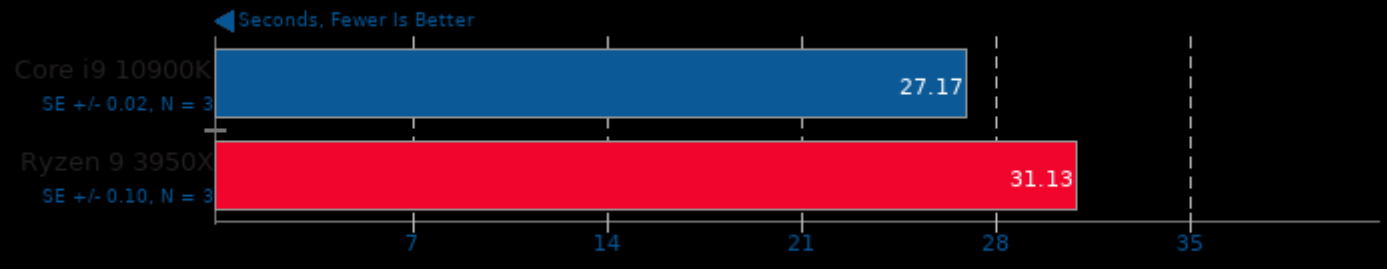
Embree 3.9.0

Binary: Pathtracer ISPC - Model: Asian Dragon



AOBench

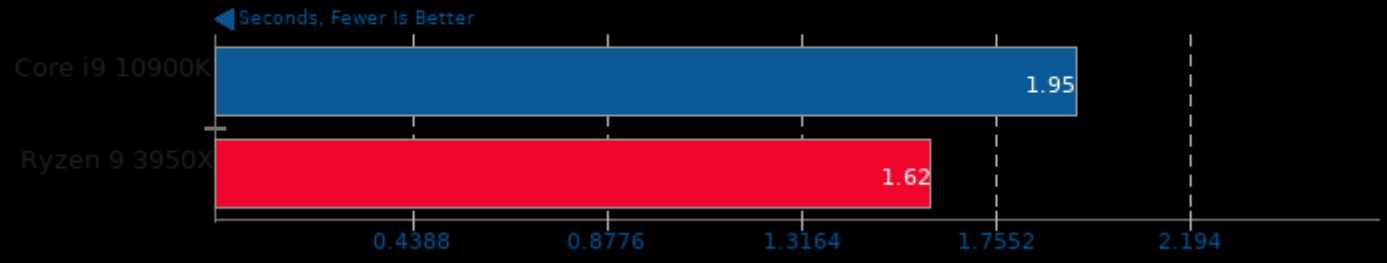
Size: 2048 x 2048 - Total Time



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

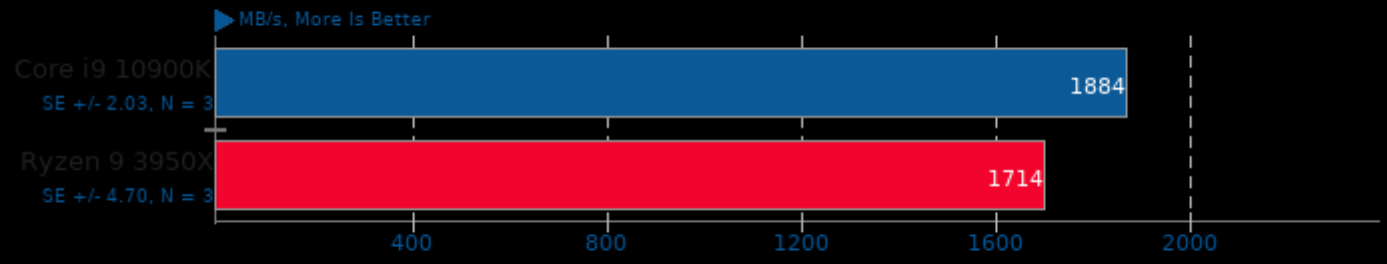
Polyhedron Fortran Benchmarks

Benchmark: air



lzbench 1.8

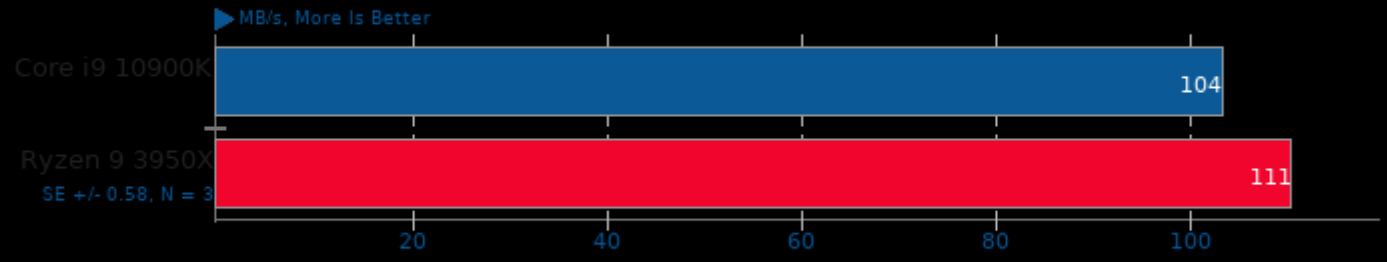
Test: Zstd 8 - Process: Decompression



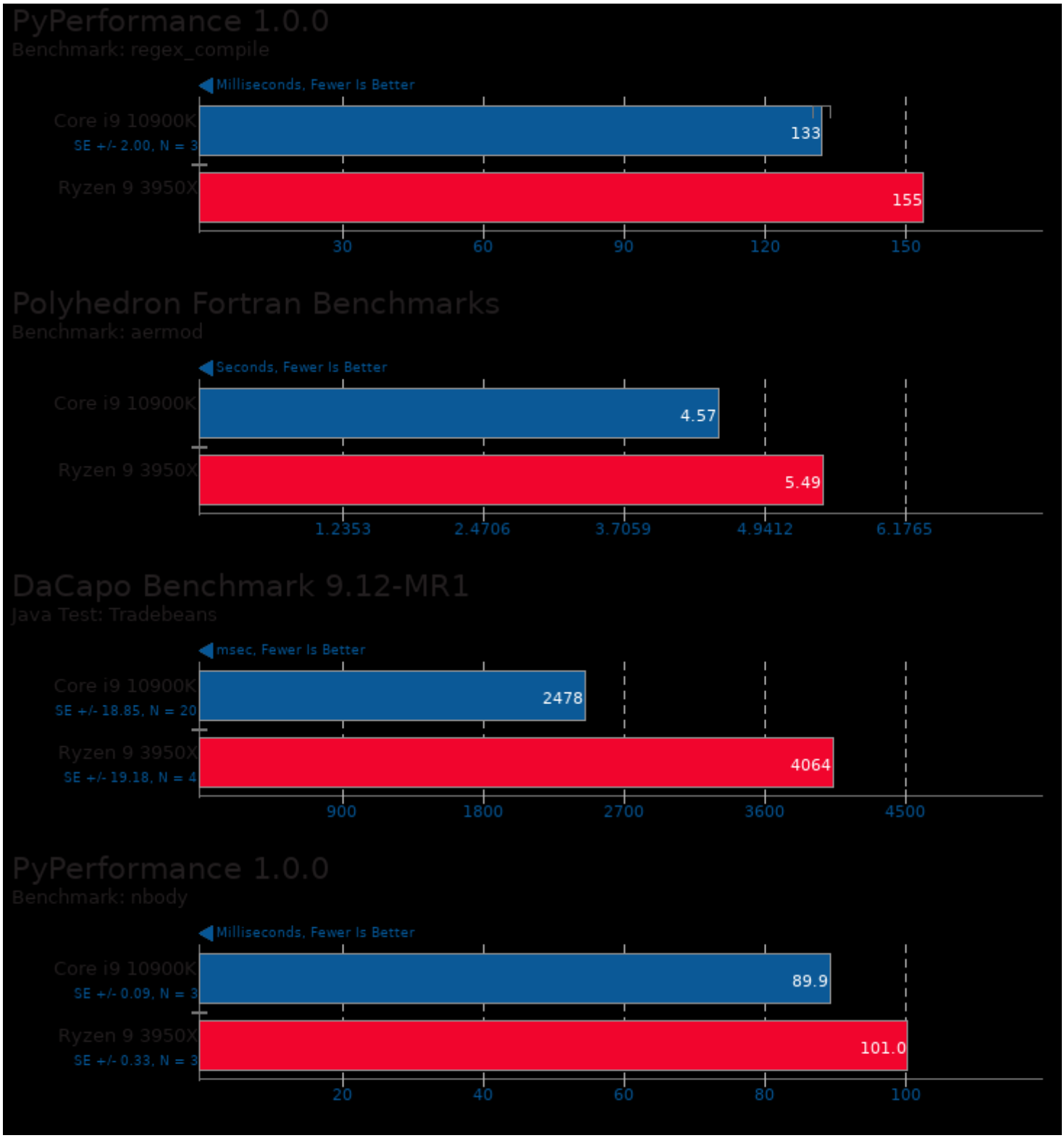
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3

lzbench 1.8

Test: Zstd 8 - Process: Compression

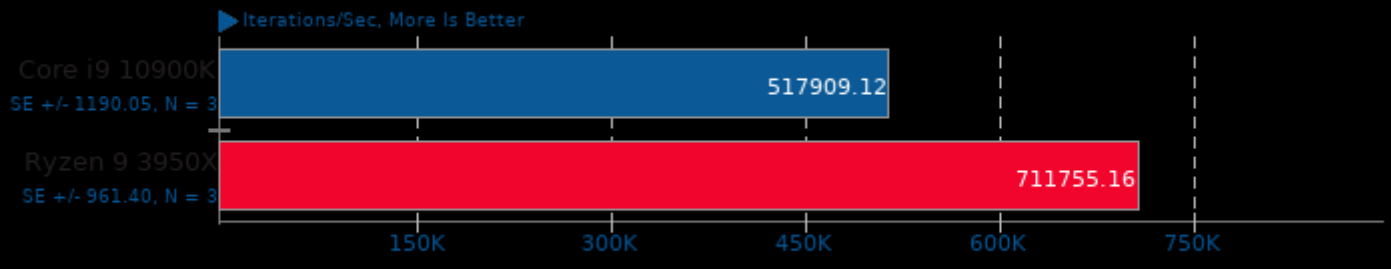


1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3


PyPerformance 1.0.0
Benchmark: regex_compile
Milliseconds, Fewer Is Better
Core i9 10900K
SE +/- 2.00, N = 3
133
Ryzen 9 3950X
155
30
60
90
120
150
Polyhedron Fortran Benchmarks
Benchmark: aermod
Seconds, Fewer Is Better
Core i9 10900K
4.57
Ryzen 9 3950X
5.49
1.2353
2.4706
3.7059
4.9412
6.1765
DaCapo Benchmark 9.12-MR1
Java Test: Tradebeans
msec, Fewer Is Better
Core i9 10900K
SE +/- 18.85, N = 20
2478
Ryzen 9 3950X
SE +/- 19.18, N = 4
4064
900
1800
2700
3600
4500
PyPerformance 1.0.0
Benchmark: nbody
Milliseconds, Fewer Is Better
Core i9 10900K
SE +/- 0.09, N = 3
89.9
Ryzen 9 3950X
SE +/- 0.33, N = 3
101.0
20
40
60
80
100

Coremark 1.0

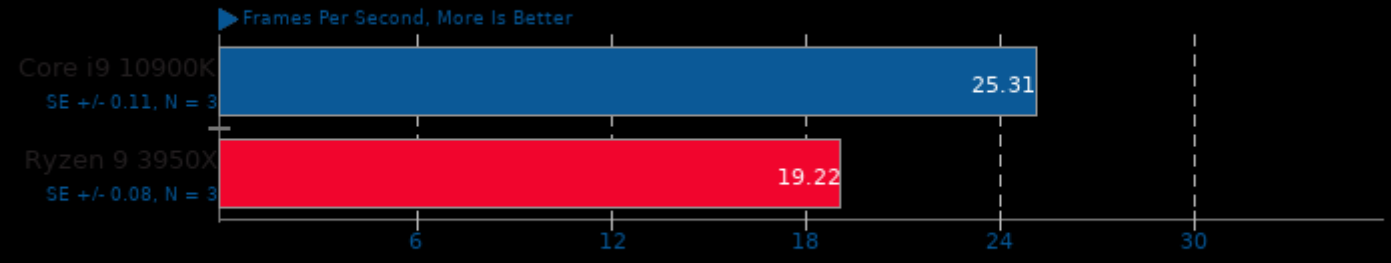
CoreMark Size 666 - Iterations Per Second



1. (CC) gcc options: -O2 -lrt" -lrt

AOM AV1 2.0

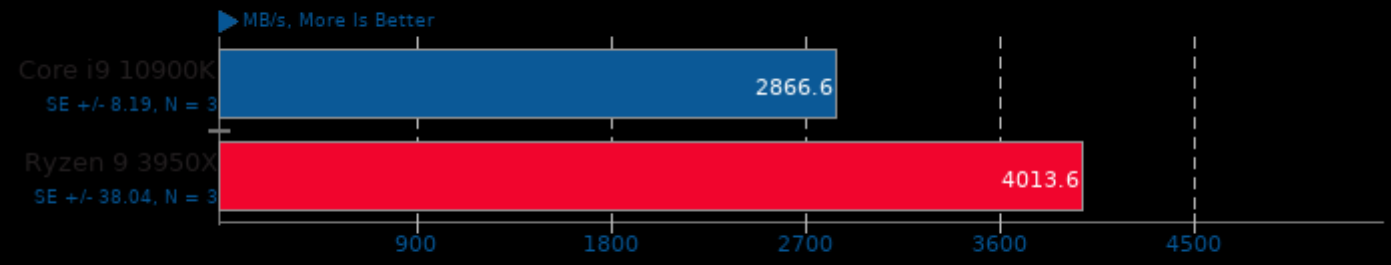
Encoder Mode: Speed 6 Realtime



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

Zstd Compression 1.4.5

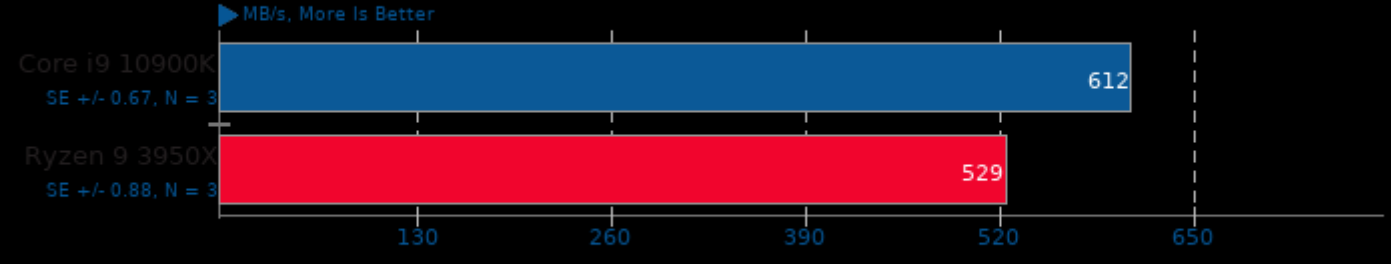
Compression Level: 3



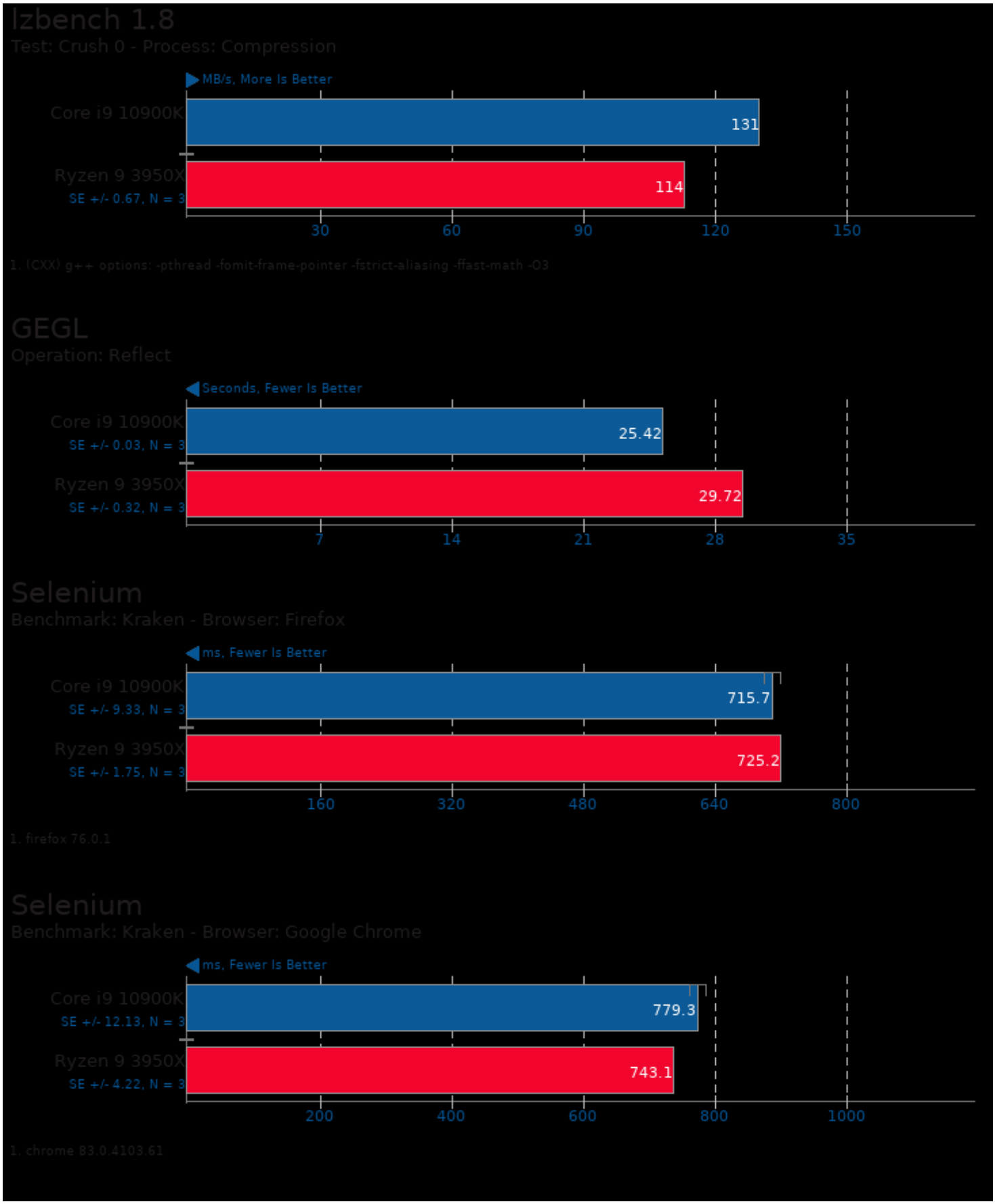
1. (CC) gcc options: -O3 -pthread -lz -llzma

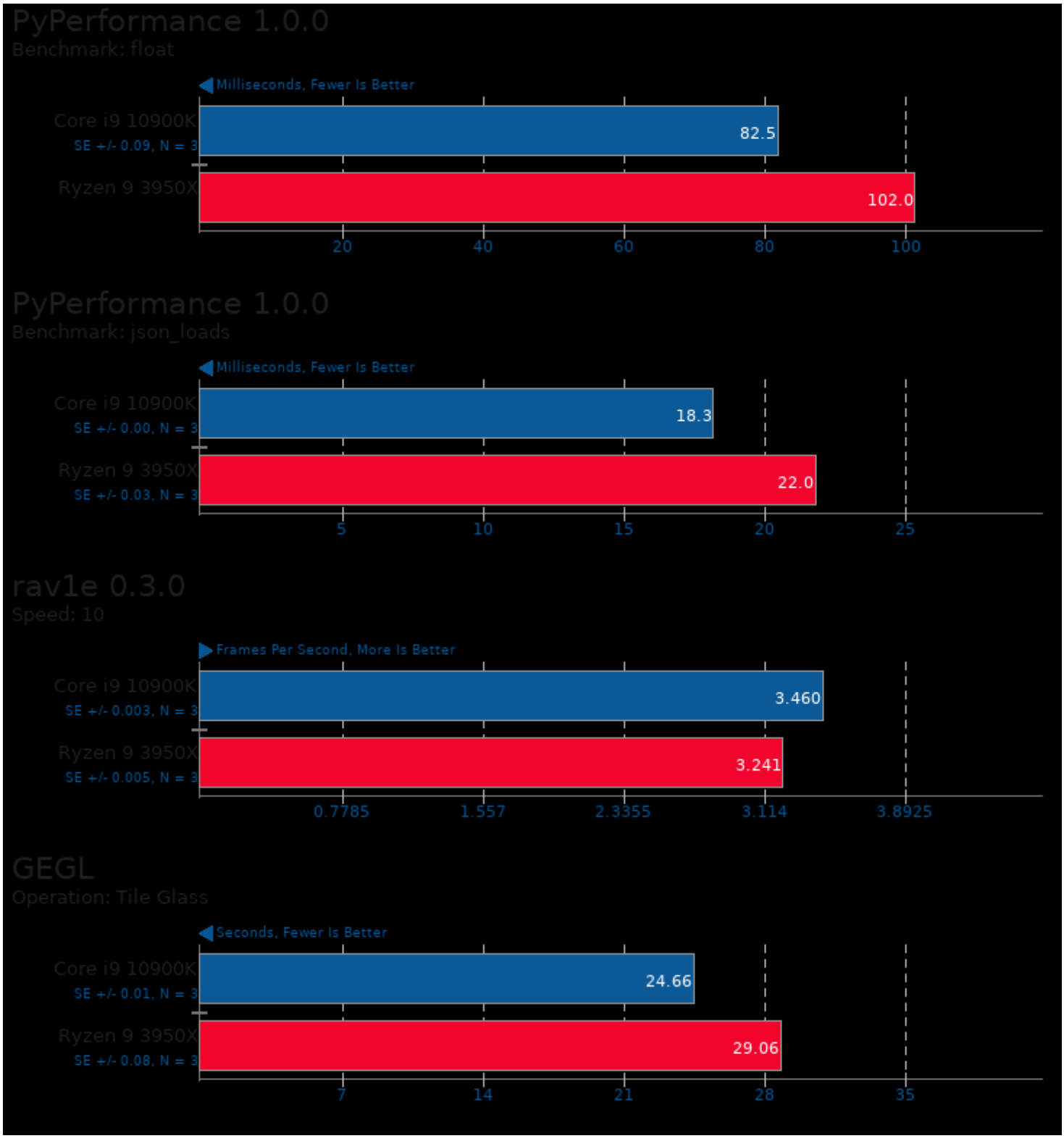
lzbench 1.8

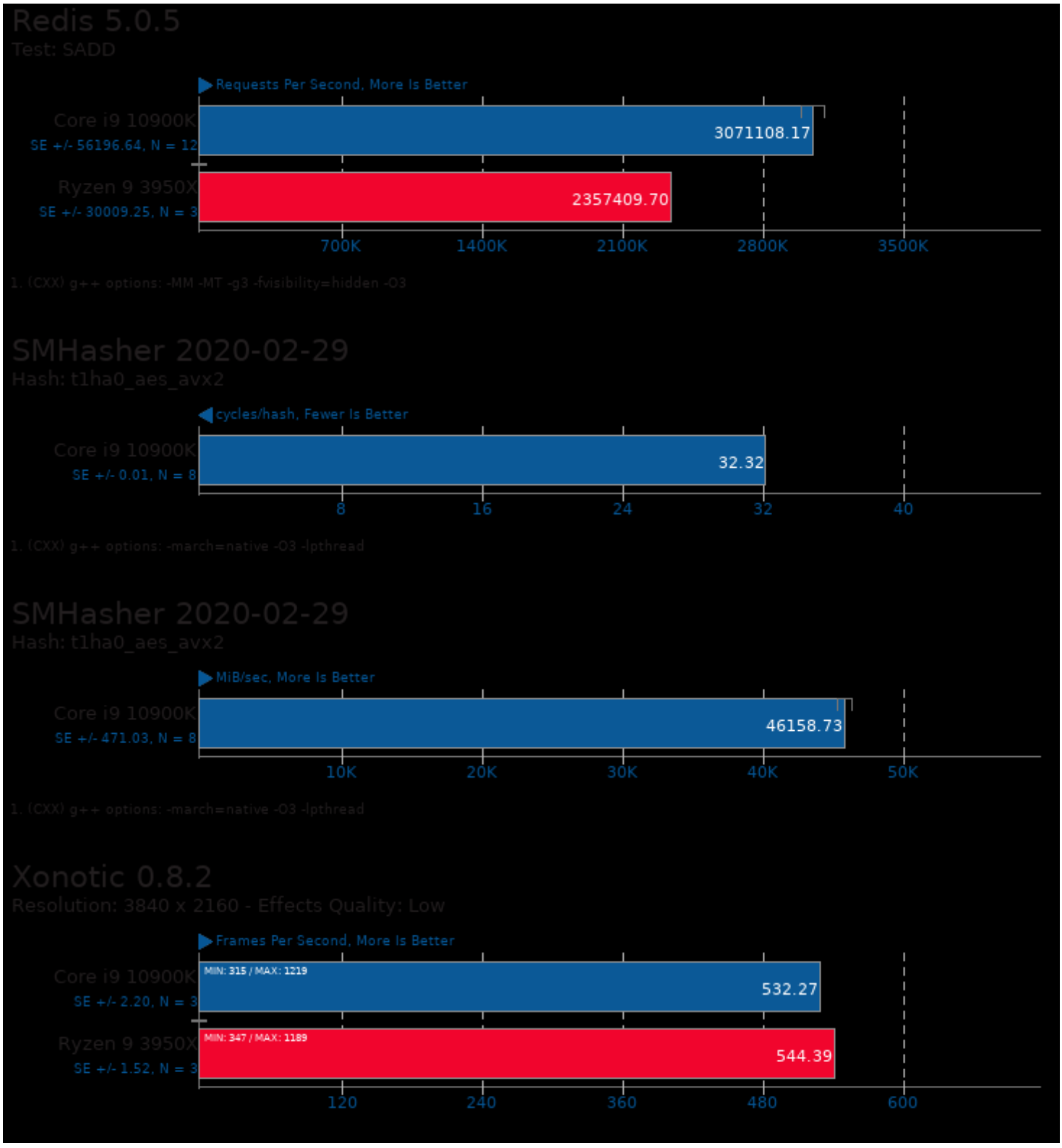
Test: Crush 0 - Process: Decompression



1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3


lzbench 1.8
Test: Crush 0 - Process: Compression
MB/s, More Is Better
Core i9 10900K
131
Ryzen 9 3950X
SE +/- 0.67, N = 3
114
30
60
90
120
150
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3
GEGL
Operation: Reflect
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.03, N = 3
25.42
Ryzen 9 3950X
SE +/- 0.32, N = 3
29.72
7
14
21
28
35
Selenium
Benchmark: Kraken - Browser: Firefox
ms, Fewer Is Better
Core i9 10900K
SE +/- 9.33, N = 3
715.7
Ryzen 9 3950X
SE +/- 1.75, N = 3
725.2
160
320
480
640
800
1. firefox 76.0.1
Selenium
Benchmark: Kraken - Browser: Google Chrome
ms, Fewer Is Better
Core i9 10900K
SE +/- 12.13, N = 3
779.3
Ryzen 9 3950X
SE +/- 4.22, N = 3
743.1
200
400
600
800
1000
1. chrome 83.0.4103.61

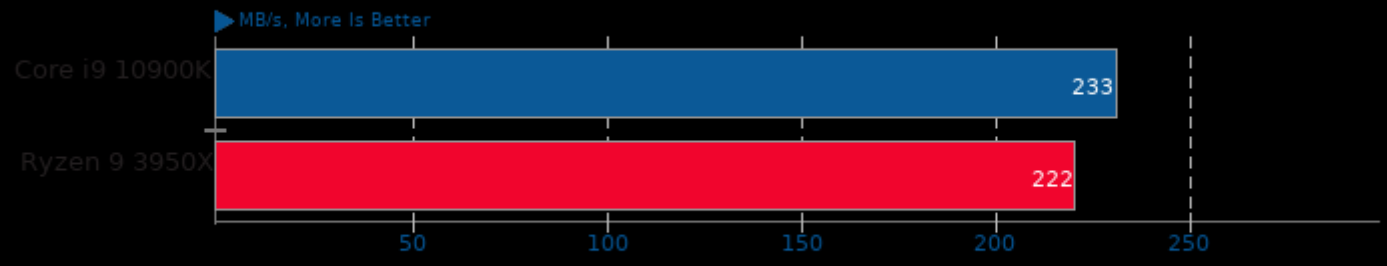

PyPerformance 1.0.0
Benchmark: float
Milliseconds, Fewer Is Better
Core i9 10900K
SE +/- 0.09, N = 3
82.5
Ryzen 9 3950X
102.0
20
40
60
80
100
PyPerformance 1.0.0
Benchmark: json_loads
Milliseconds, Fewer Is Better
Core i9 10900K
SE +/- 0.00, N = 3
18.3
Ryzen 9 3950X
SE +/- 0.03, N = 3
22.0
5
10
15
20
25
rav1e 0.3.0
Speed: 10
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.003, N = 3
3.460
Ryzen 9 3950X
SE +/- 0.005, N = 3
3.241
0.7785
1.557
2.3355
3.114
3.8925
GEGL
Operation: Tile Glass
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.01, N = 3
24.66
Ryzen 9 3950X
SE +/- 0.08, N = 3
29.06
7
14
21
28
35


Redis 5.0.5
Test: SADD
Requests Per Second, More Is Better
Core i9 10900K
SE +/- 56196.64, N = 12
3071108.17
Ryzen 9 3950X
SE +/- 30009.25, N = 3
2357409.70
700K
1400K
2100K
2800K
3500K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3
SMHasher 2020-02-29
Hash: t1ha0_aes_avx2
cycles/hash, Fewer Is Better
Core i9 10900K
SE +/- 0.01, N = 8
32.32
8
16
24
32
40
1. (CXX) g++ options: -march=native -O3 -lpthread
SMHasher 2020-02-29
Hash: t1ha0_aes_avx2
MiB/sec, More Is Better
Core i9 10900K
SE +/- 471.03, N = 8
46158.73
10K
20K
30K
40K
50K
1. (CXX) g++ options: -march=native -O3 -lpthread
Xonotic 0.8.2
Resolution: 3840 x 2160 - Effects Quality: Low
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 2.20, N = 3
MIN: 315 / MAX: 1219
532.27
Ryzen 9 3950X
SE +/- 1.52, N = 3
MIN: 347 / MAX: 1189
544.39
120
240
360
480
600


Timed MPlayer Compilation 1.4
Time To Compile
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.03, N = 3
29.27
Ryzen 9 3950X
SE +/- 0.03, N = 3
20.97
7
14
21
28
35
PyPerformance 1.0.0
Benchmark: pathlib
Milliseconds, Fewer Is Better
Core i9 10900K
SE +/- 0.03, N = 3
14.4
Ryzen 9 3950X
SE +/- 0.03, N = 3
15.5
4
8
12
16
20
AOM AV1 2.0
Encoder Mode: Speed 6 Two-Pass
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.01, N = 3
4.66
Ryzen 9 3950X
SE +/- 0.02, N = 3
4.16
1.0485
2.097
3.1455
4.194
5.2425
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
lzbench 1.8
Test: Brotli 2 - Process: Decompression
MB/s, More Is Better
Core i9 10900K
SE +/- 0.58, N = 3
908
Ryzen 9 3950X
SE +/- 2.03, N = 3
780
200
400
600
800
1000
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3

lzbench 1.8

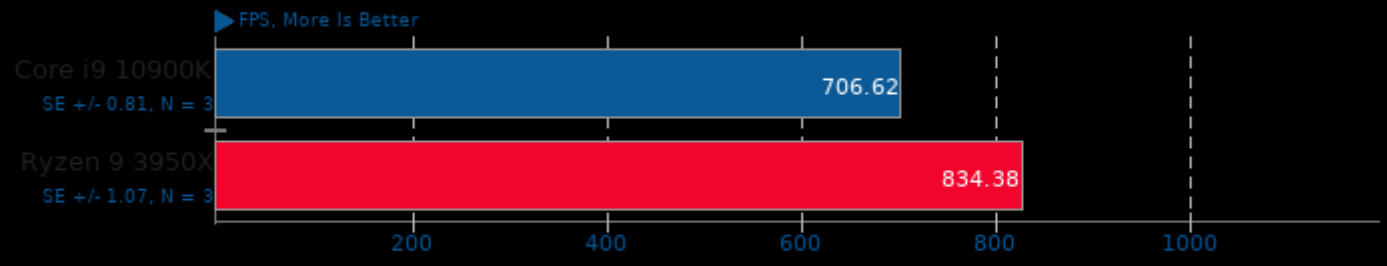
Test: Brotli 2 - Process: Compression



1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3

TTSIOD 3D Renderer 2.3b

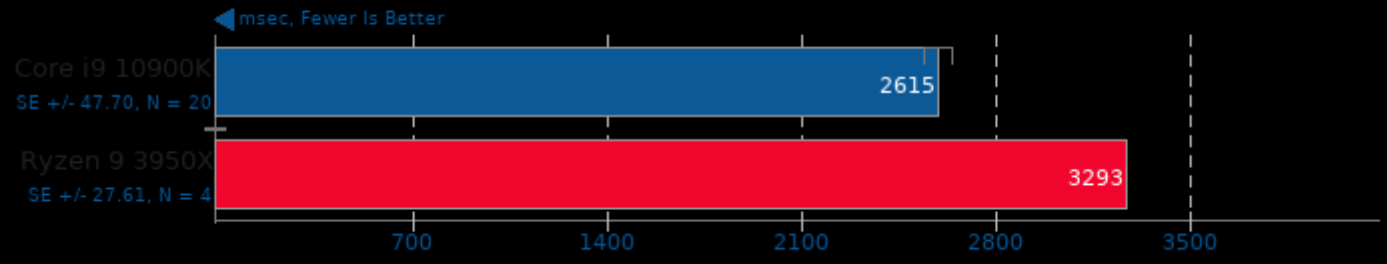
Phong Rendering With Soft-Shadow Mapping



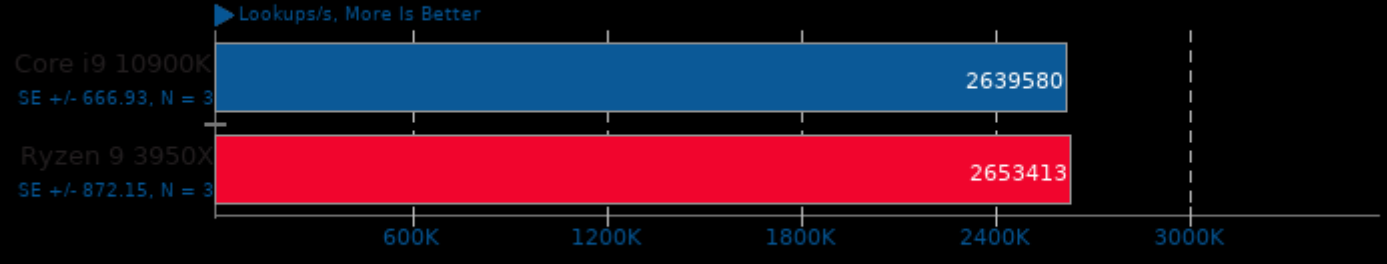
1. (CXX) g++ options: -O3 -fomit-frame-pointer -ffast-math -mtune=native -flto -msse -mrecip -mfpmath=sse -msse2 -mssse3 -lSDL -fopenmp -fwhole-pr

DaCapo Benchmark 9.12-MR1

Java Test: H2

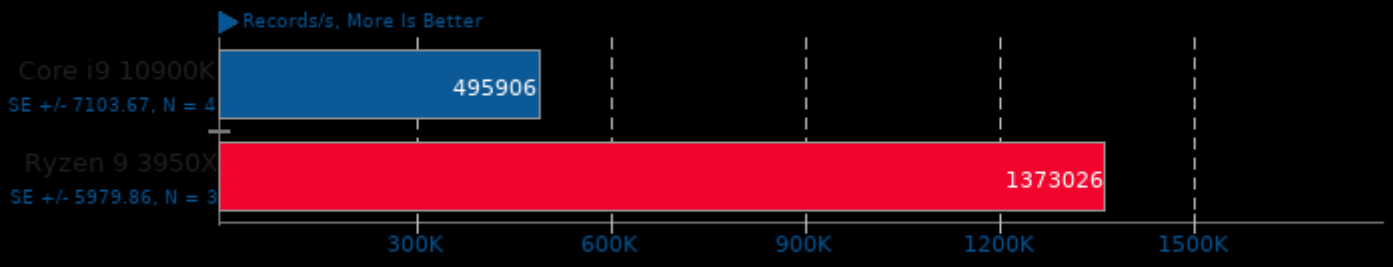


Xsbench 2017-07-06



1. (CC) gcc options: -std=gnu99 -fopenmp -O3 -lm

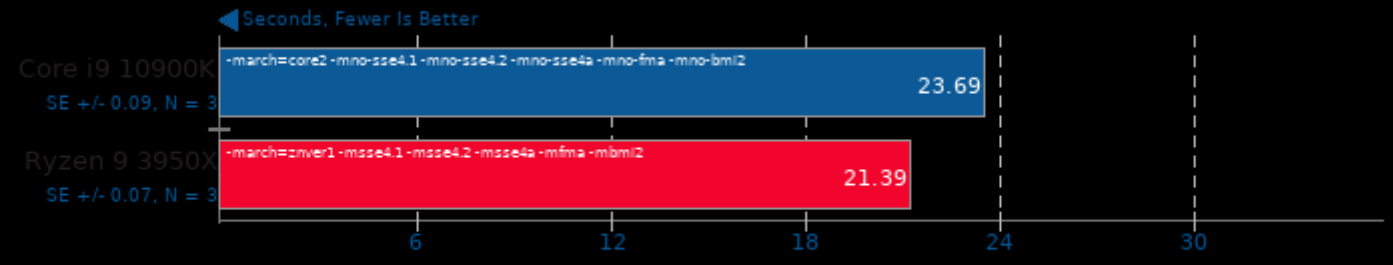
ebizzy 0.3



1. (CC) gcc options: -pthread -lpthread -O3 -march=native

Tungsten Renderer 0.2.2

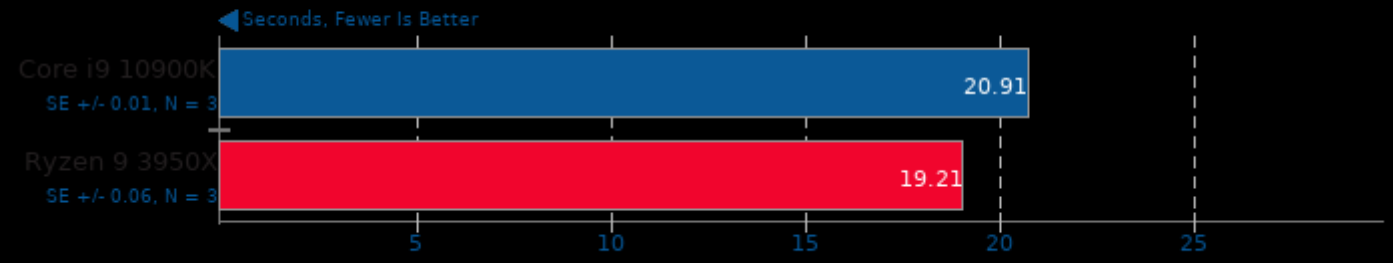
Scene: Water Caustic



1. (CXX) g++ options: -std=c++0x -msse2 -msse3 -mssse3 -mno-avx -mno-avx2 -mno-xop -mno-fma4 -mno-avx512f -mno-avx512vl -mno-avx512pf -mno-

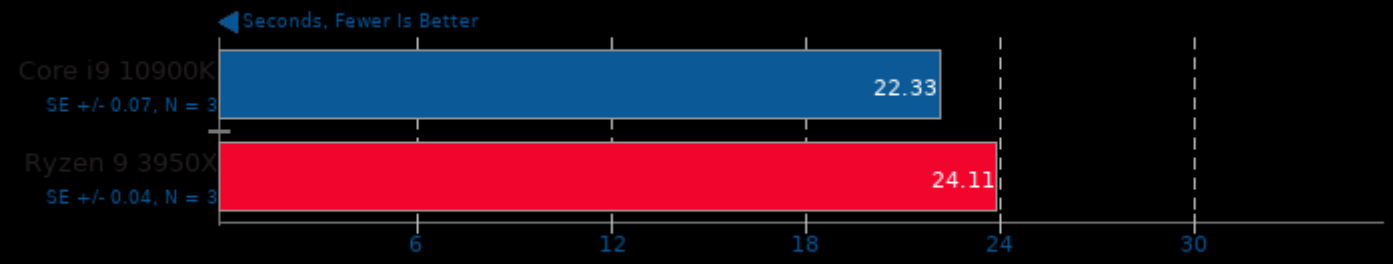
Mlpack Benchmark

Benchmark: scikit_svm

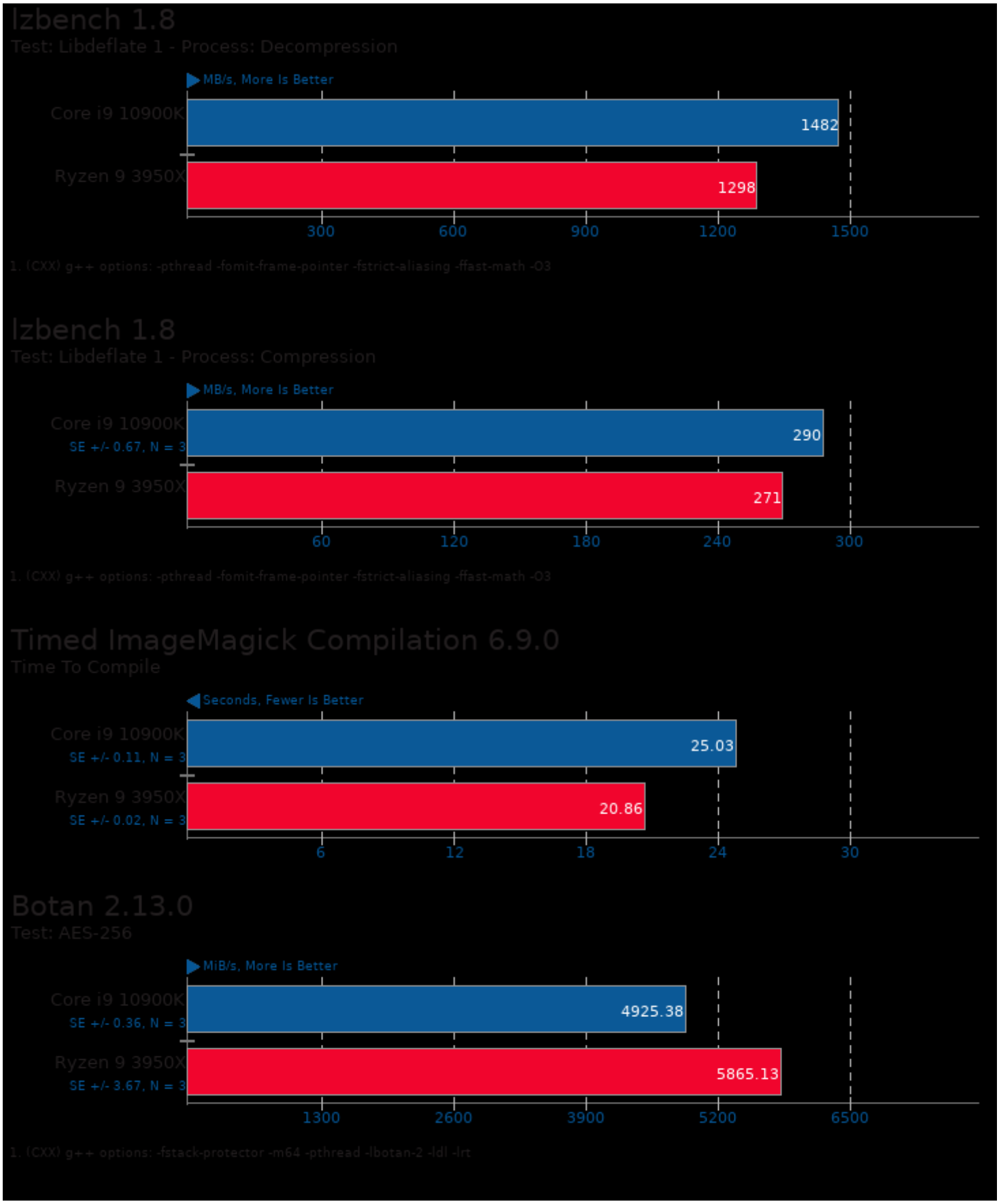


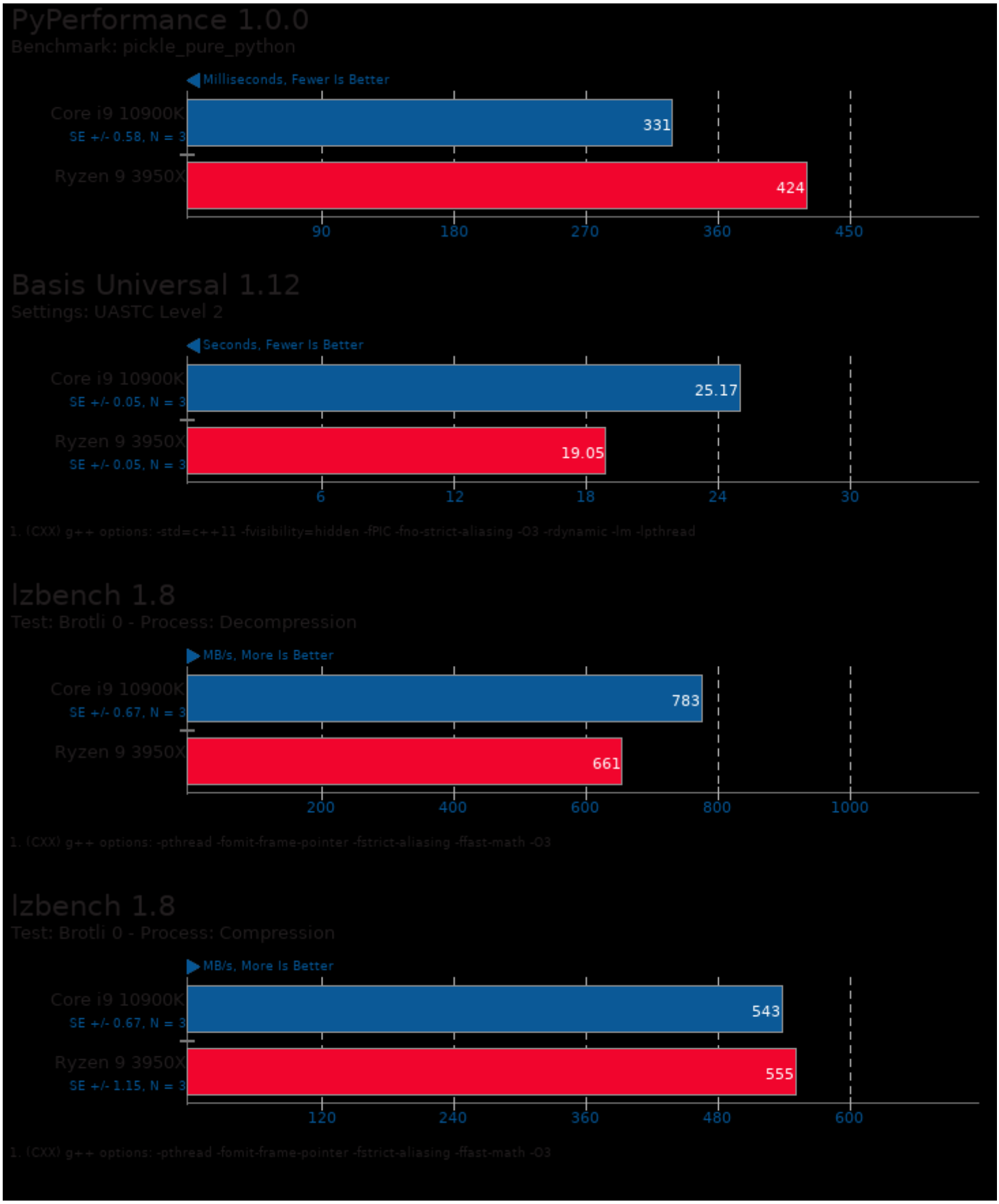
XZ Compression 5.2.4

Compressing ubuntu-16.04.3-server-i386.img, Compression Level 9



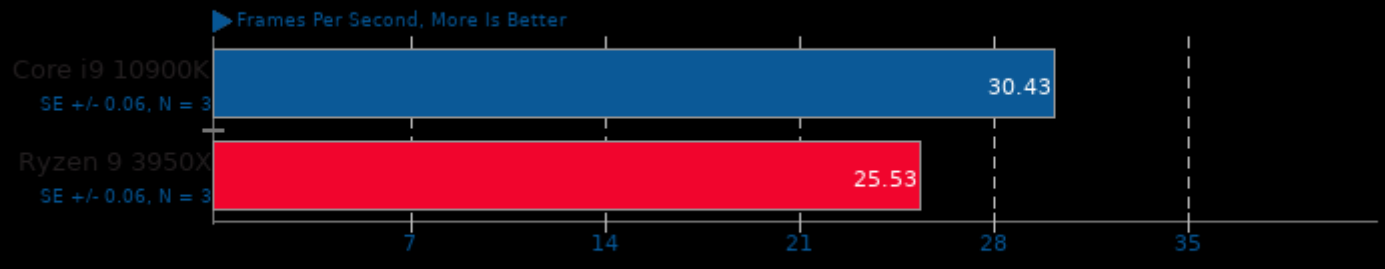
1. (CC) gcc options: -pthread -fvisibility=hidden -O2


lzbench 1.8
Test: Libdeflate 1 - Process: Decompression
MB/s, More Is Better
Core i9 10900K
1482
Ryzen 9 3950X
1298
300
600
900
1200
1500
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3
lzbench 1.8
Test: Libdeflate 1 - Process: Compression
MB/s, More Is Better
Core i9 10900K
SE +/- 0.67, N = 3
290
Ryzen 9 3950X
271
60
120
180
240
300
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3
Timed ImageMagick Compilation 6.9.0
Time To Compile
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.11, N = 3
25.03
Ryzen 9 3950X
SE +/- 0.02, N = 3
20.86
6
12
18
24
30
Botan 2.13.0
Test: AES-256
MiB/s, More Is Better
Core i9 10900K
SE +/- 0.36, N = 3
4925.38
Ryzen 9 3950X
SE +/- 3.67, N = 3
5865.13
1300
2600
3900
5200
6500
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt


PyPerformance 1.0.0
Benchmark: pickle_pure_python
Milliseconds, Fewer Is Better
Core i9 10900K
SE +/- 0.58, N = 3
331
Ryzen 9 3950X
424
90
180
270
360
450
Basis Universal 1.12
Settings: UASTC Level 2
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.05, N = 3
25.17
Ryzen 9 3950X
SE +/- 0.05, N = 3
19.05
6
12
18
24
30
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread
lzbench 1.8
Test: Brotli 0 - Process: Decompression
MB/s, More Is Better
Core i9 10900K
SE +/- 0.67, N = 3
783
Ryzen 9 3950X
661
200
400
600
800
1000
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3
lzbench 1.8
Test: Brotli 0 - Process: Compression
MB/s, More Is Better
Core i9 10900K
SE +/- 0.67, N = 3
543
Ryzen 9 3950X
SE +/- 1.15, N = 3
555
120
240
360
480
600
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3

VP9 libvpx Encoding 1.8.2

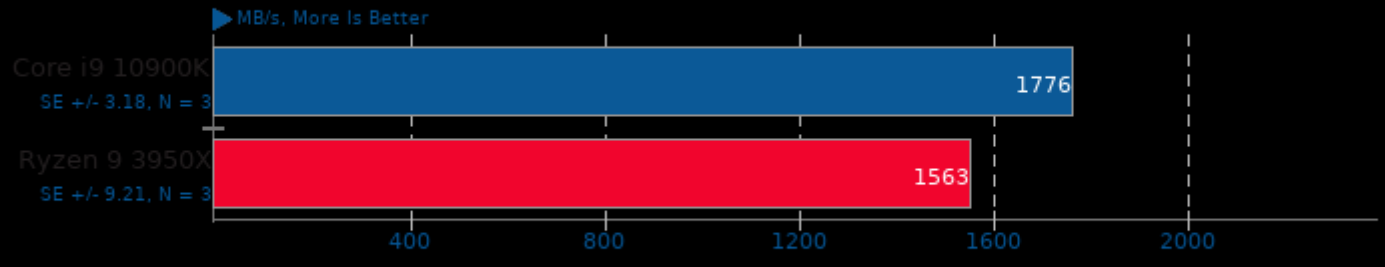
Speed: Speed 5



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

lzbench 1.8

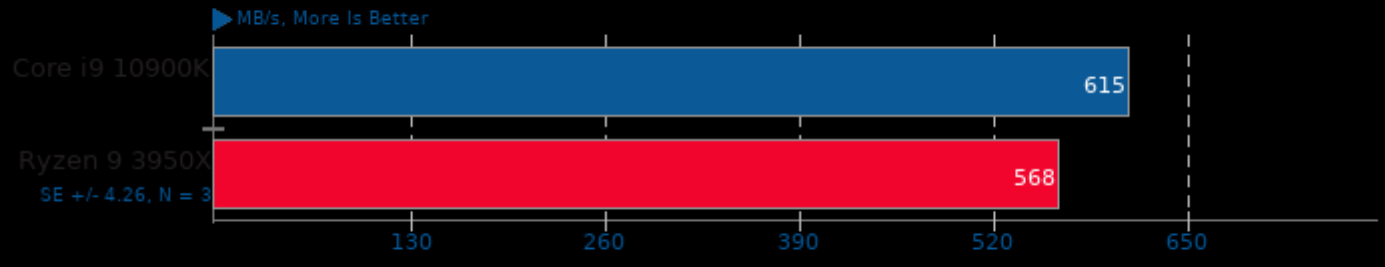
Test: Zstd 1 - Process: Decompression



1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3

lzbench 1.8

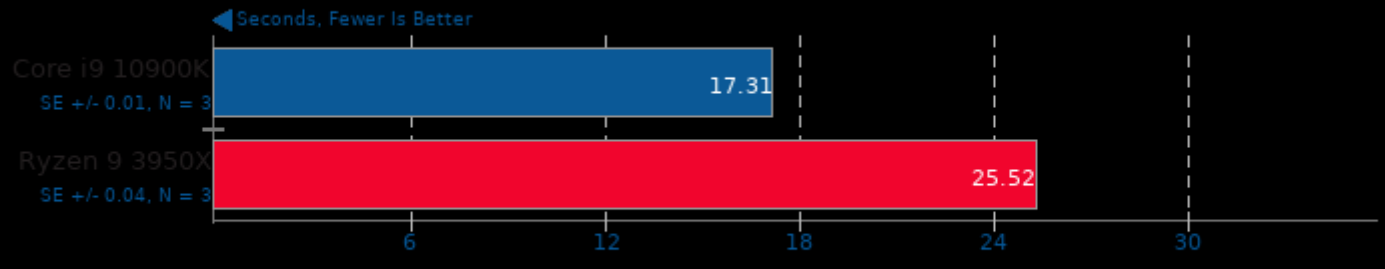
Test: Zstd 1 - Process: Compression



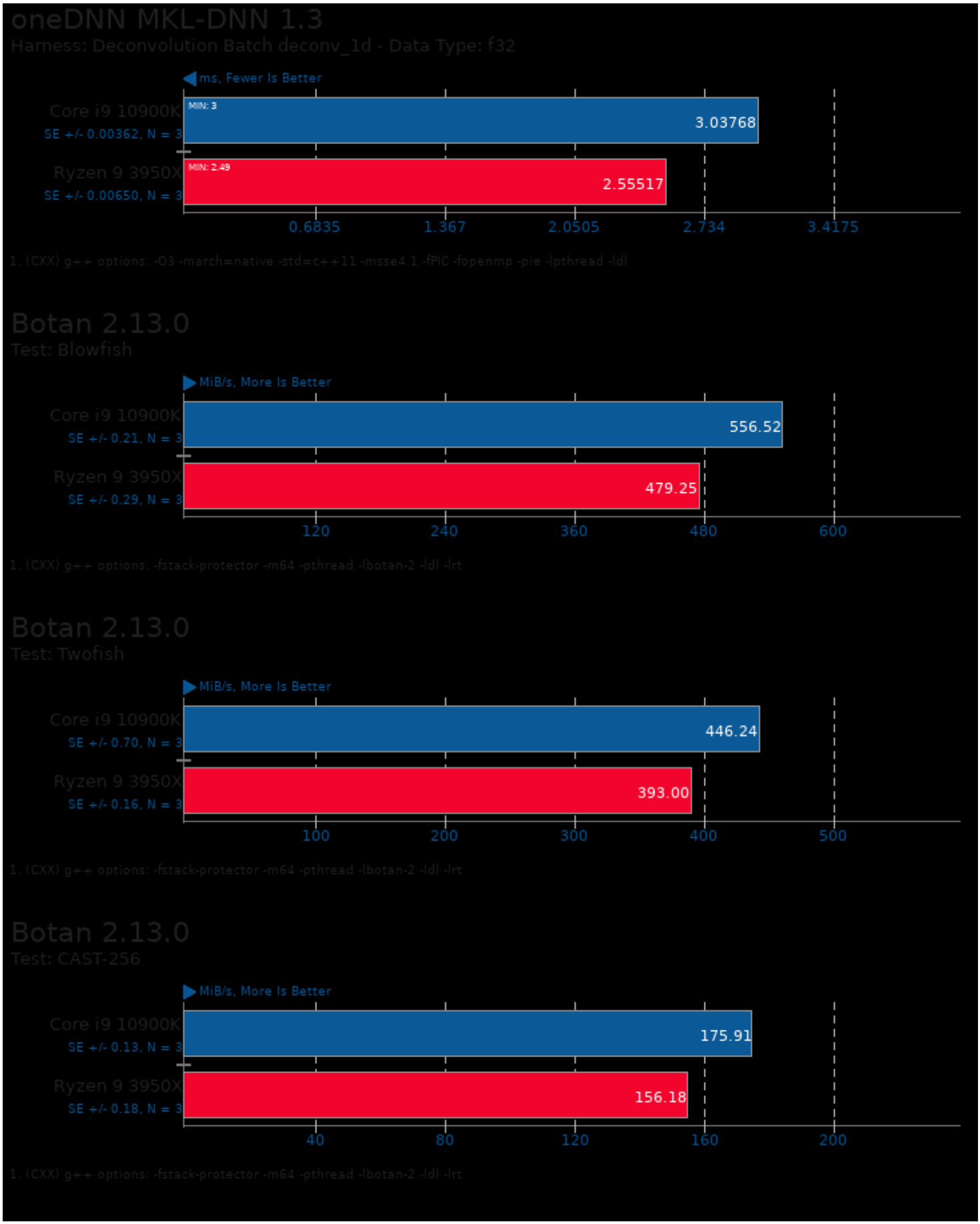
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3

Rodinia 2.4

Test: OpenMP Streamcluster

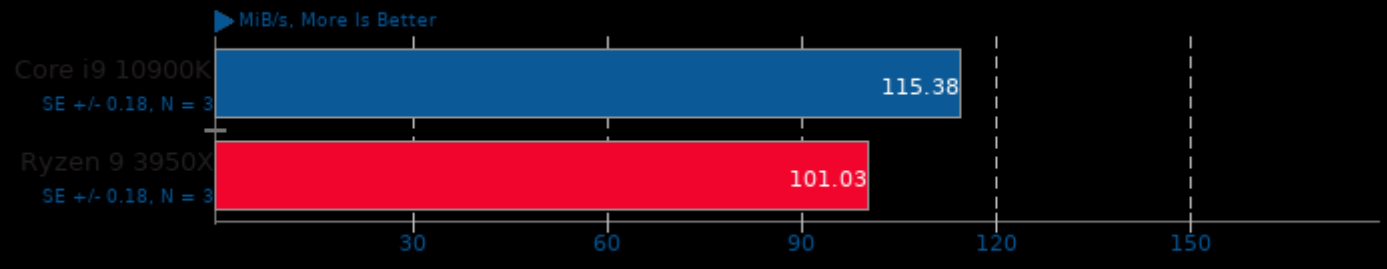


1. (CXX) g++ options: -O2 -lOpenCL


oneDNN MKL-DNN 1.3
Harness: Deconvolution Batch deconv_1d - Data Type: f32
ms, Fewer Is Better
Core i9 10900K
SE +/- 0.00362, N = 3
MIN: 3
3.03768
Ryzen 9 3950X
SE +/- 0.00650, N = 3
MIN: 2.49
2.55517
0.6835
1.367
2.0505
2.734
3.4175
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl
Botan 2.13.0
Test: Blowfish
MiB/s, More Is Better
Core i9 10900K
SE +/- 0.21, N = 3
556.52
Ryzen 9 3950X
SE +/- 0.29, N = 3
479.25
120
240
360
480
600
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.13.0
Test: Twofish
MiB/s, More Is Better
Core i9 10900K
SE +/- 0.70, N = 3
446.24
Ryzen 9 3950X
SE +/- 0.16, N = 3
393.00
100
200
300
400
500
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.13.0
Test: CAST-256
MiB/s, More Is Better
Core i9 10900K
SE +/- 0.13, N = 3
175.91
Ryzen 9 3950X
SE +/- 0.18, N = 3
156.18
40
80
120
160
200
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

Botan 2.13.0

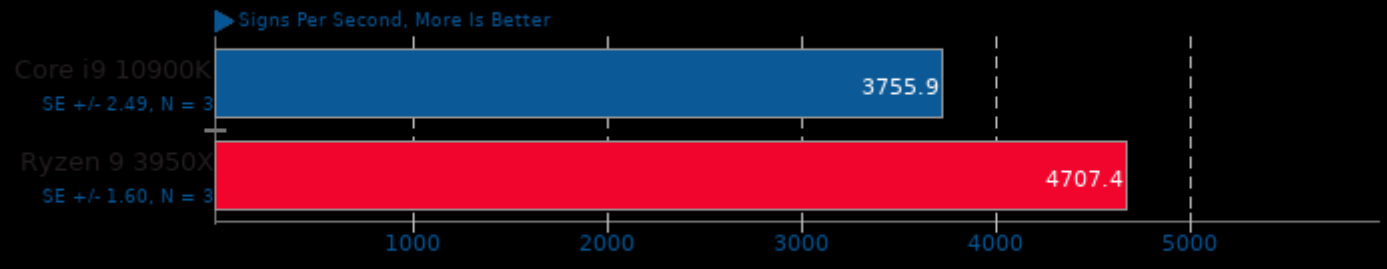
Test: KASUMI



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

OpenSSL 1.1.1

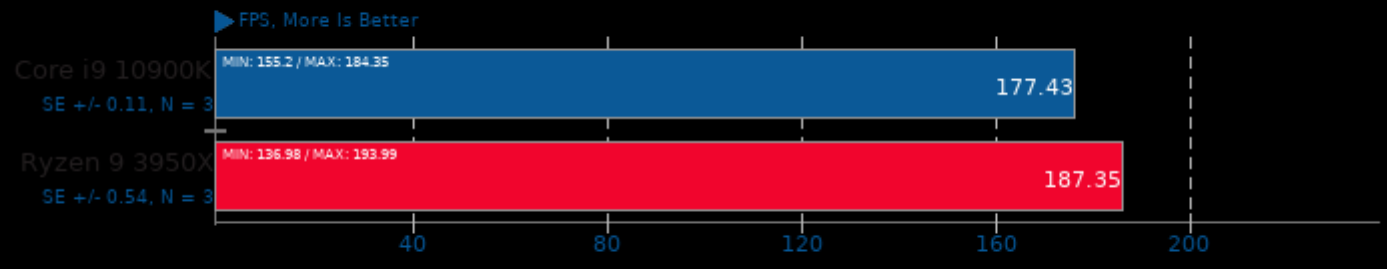
RSA 4096-bit Performance



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

dav1d 0.6.0

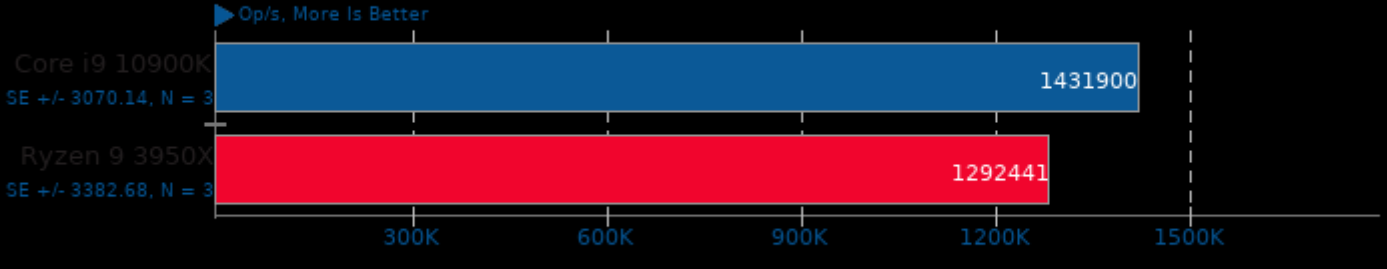
Video Input: Summer Nature 4K



1. (CC) gcc options: -pthread

Facebook RocksDB 6.3.6

Test: Sequential Fill



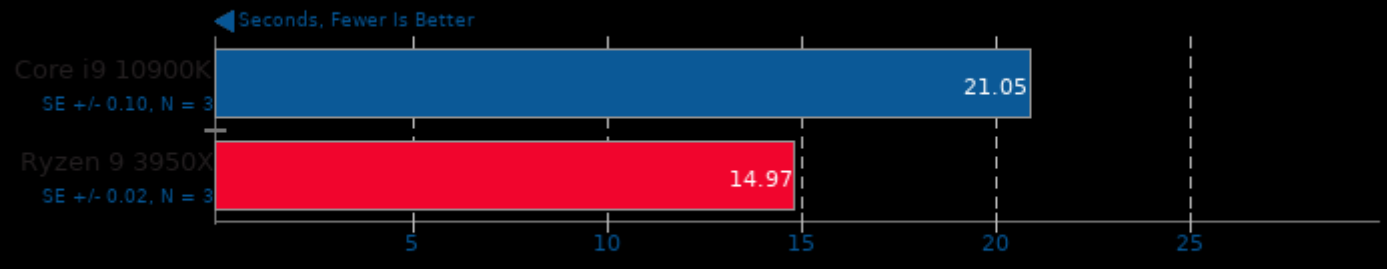
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fno-builtin-memcmp -fno-rtti -rdynamic -lpthread


Polyhedron Fortran Benchmarks
Benchmark: ac
Seconds, Fewer Is Better
Core i9 10900K
4.34
Ryzen 9 3950X
5.89
1.3253
2.6506
3.9759
5.3012
6.6265
PyBench 2018-02-16
Total For Average Test Times
Milliseconds, Fewer Is Better
Core i9 10900K
SE +/- 2.40, N = 3
760
Ryzen 9 3950X
SE +/- 10.84, N = 3
894
200
400
600
800
1000
Timed Apache Compilation 2.4.41
Time To Compile
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.02, N = 3
17.91
Ryzen 9 3950X
SE +/- 0.05, N = 3
20.24
5
10
15
20
25
Selenium
Benchmark: PSPDFKit WASM - Browser: Firefox
Score, Fewer Is Better
Core i9 10900K
SE +/- 4.26, N = 3
1148
Ryzen 9 3950X
SE +/- 0.88, N = 3
1304
300
600
900
1200
1500
1. firefox 76.0.1


Zstd Compression 1.3.4
Compressing ubuntu-16.04.3-server-i386.img, Compression Level 19
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.03, N = 3
21.93
Ryzen 9 3950X
SE +/- 0.06, N = 3
15.51
5
10
15
20
25
1. (CC) gcc options: -O3 -pthread -lz -llzma
dav1d 0.7.0
Video Input: Summer Nature 4K
FPS, More Is Better
Core i9 10900K
SE +/- 0.14, N = 3
MIN: 160 / MAX: 192.81
185.20
Ryzen 9 3950X
SE +/- 0.14, N = 3
MIN: 149.38 / MAX: 211.16
204.01
40
80
120
160
200
1. (CC) gcc options: -pthread
dav1d 0.6.0
Video Input: Chimera 1080p
FPS, More Is Better
Core i9 10900K
SE +/- 0.37, N = 3
MIN: 565.29 / MAX: 877.74
700.92
Ryzen 9 3950X
SE +/- 1.48, N = 3
MIN: 416.32 / MAX: 626.07
519.76
150
300
450
600
750
1. (CC) gcc options: -pthread
Selenium
Benchmark: Maze Solver - Browser: Firefox
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.03, N = 3
5.4
Ryzen 9 3950X
SE +/- 0.03, N = 3
4.5
1.215
2.43
3.645
4.86
6.075
1. firefox 76.0.1

Rodinia 2.4

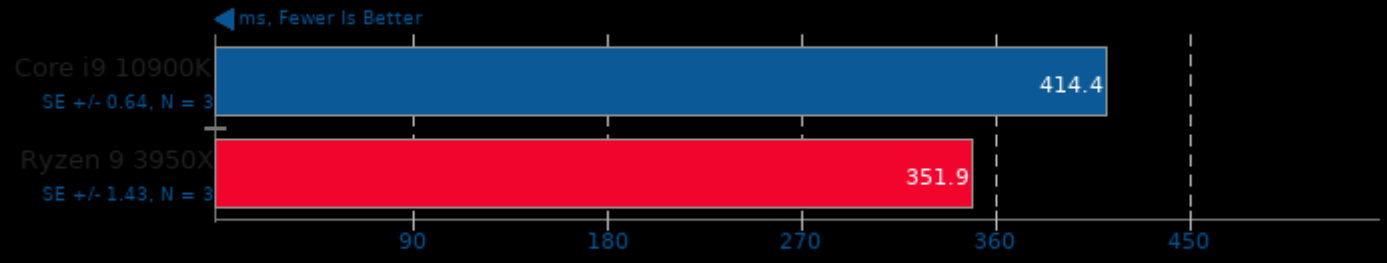
Test: OpenMP LavaMD



1. (CXX) g++ options: -O2 -lOpenCL

Selenium

Benchmark: WASM collisionDetection - Browser: Firefox



1. firefox 76.0.1

AOM AV1 2.0

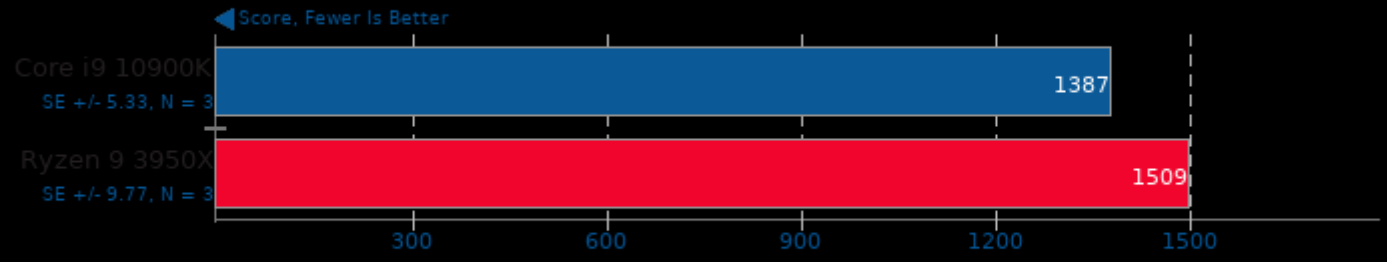
Encoder Mode: Speed 4 Two-Pass



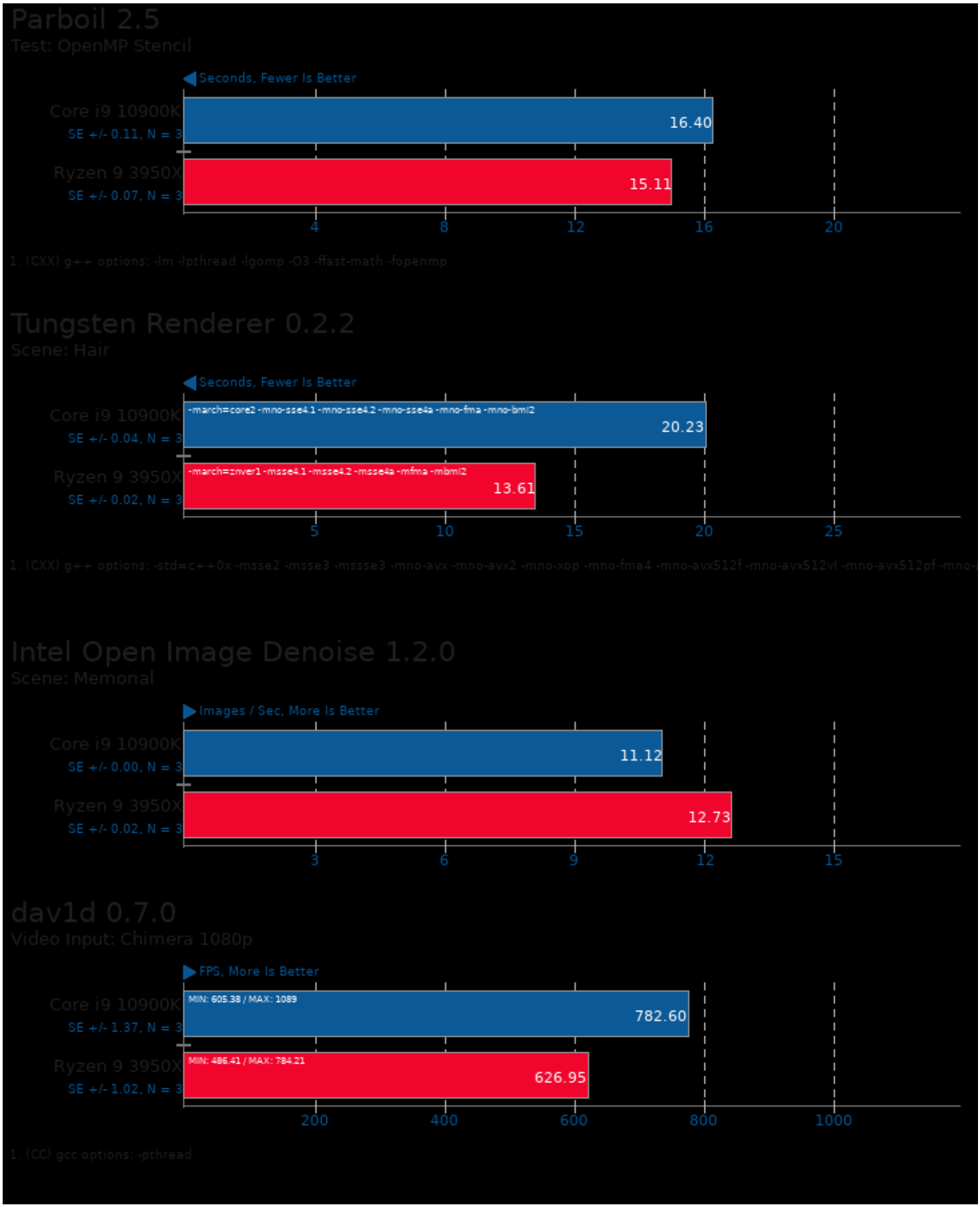
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

Selenium

Benchmark: PSPDFKit WASM - Browser: Google Chrome

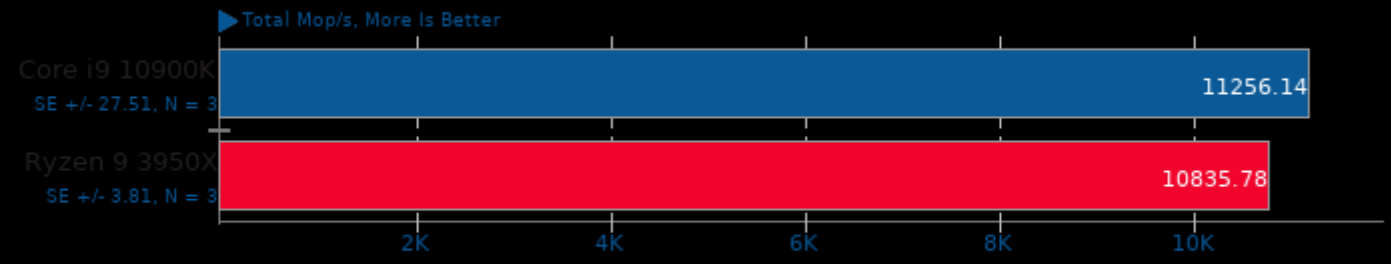


1. chrome 83.0.4103.61


Parboil 2.5
Test: OpenMP Stencil
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.11, N = 3
16.40
Ryzen 9 3950X
SE +/- 0.07, N = 3
15.11
4
8
12
16
20
1. (CXX) g++ options: -lm -lpthread -lgomp -O3 -ffast-math -fopenmp
Tungsten Renderer 0.2.2
Scene: Hair
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.04, N = 3
-march=core2 -mno-sse4.1 -mno-sse4.2 -mno-sse4a -mno-fma -mno-bmi2
20.23
Ryzen 9 3950X
SE +/- 0.02, N = 3
-march=znver1 -msse4.1 -msse4.2 -msse4a -mfma -mbmi2
13.61
5
10
15
20
25
1. (CXX) g++ options: -std=c++0x -msse2 -msse3 -mssse3 -mno-avx -mno-avx2 -mno-xop -mno-fma4 -mno-avx512f -mno-avx512vl -mno-avx512pf -mno-
Intel Open Image Denoise 1.2.0
Scene: Memorial
Images / Sec, More Is Better
Core i9 10900K
SE +/- 0.00, N = 3
11.12
Ryzen 9 3950X
SE +/- 0.02, N = 3
12.73
3
6
9
12
15
dav1d 0.7.0
Video Input: Chimera 1080p
FPS, More Is Better
Core i9 10900K
SE +/- 1.37, N = 3
MIN: 605.38 / MAX: 1089
782.60
Ryzen 9 3950X
SE +/- 1.02, N = 3
MIN: 486.41 / MAX: 784.21
626.95
200
400
600
800
1000
1. (CC) gcc options: -pthread

NAS Parallel Benchmarks 3.4

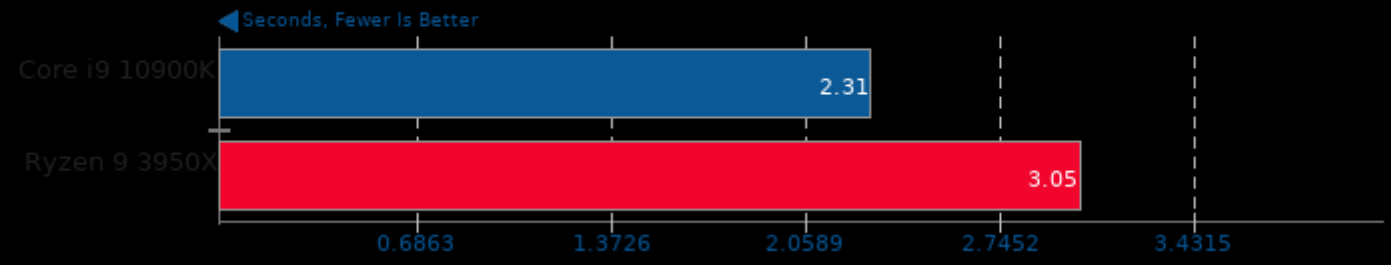
Test / Class: MG.C



1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.3

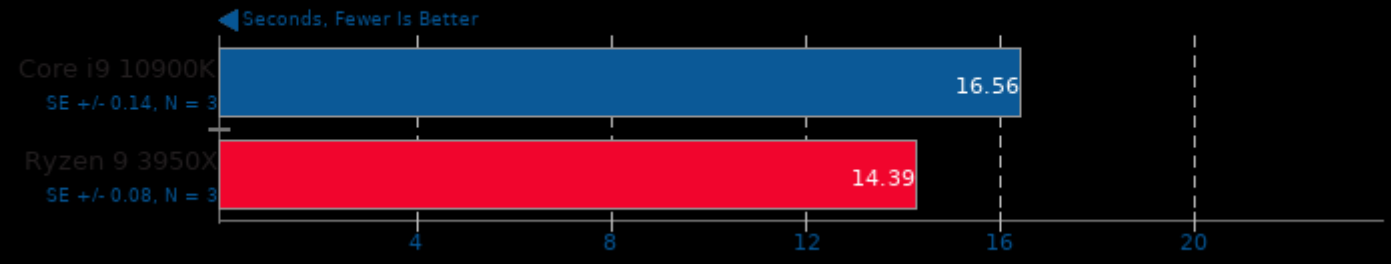
Polyhedron Fortran Benchmarks

Benchmark: linpk



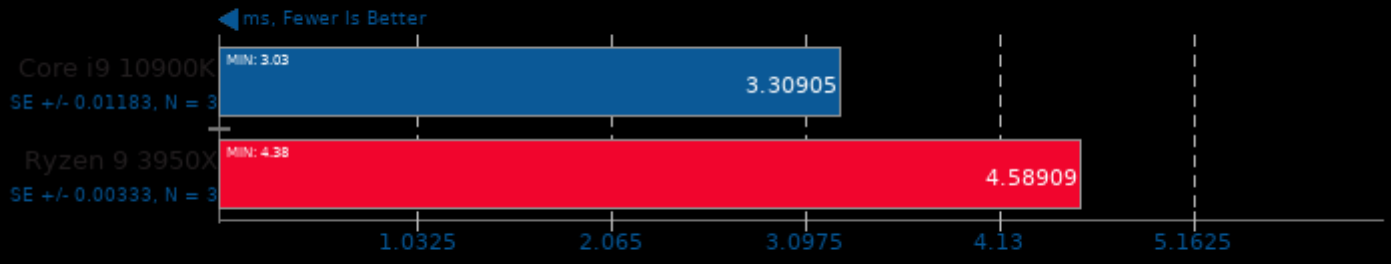
Numenta Anomaly Benchmark 1.1

Detector: Relative Entropy

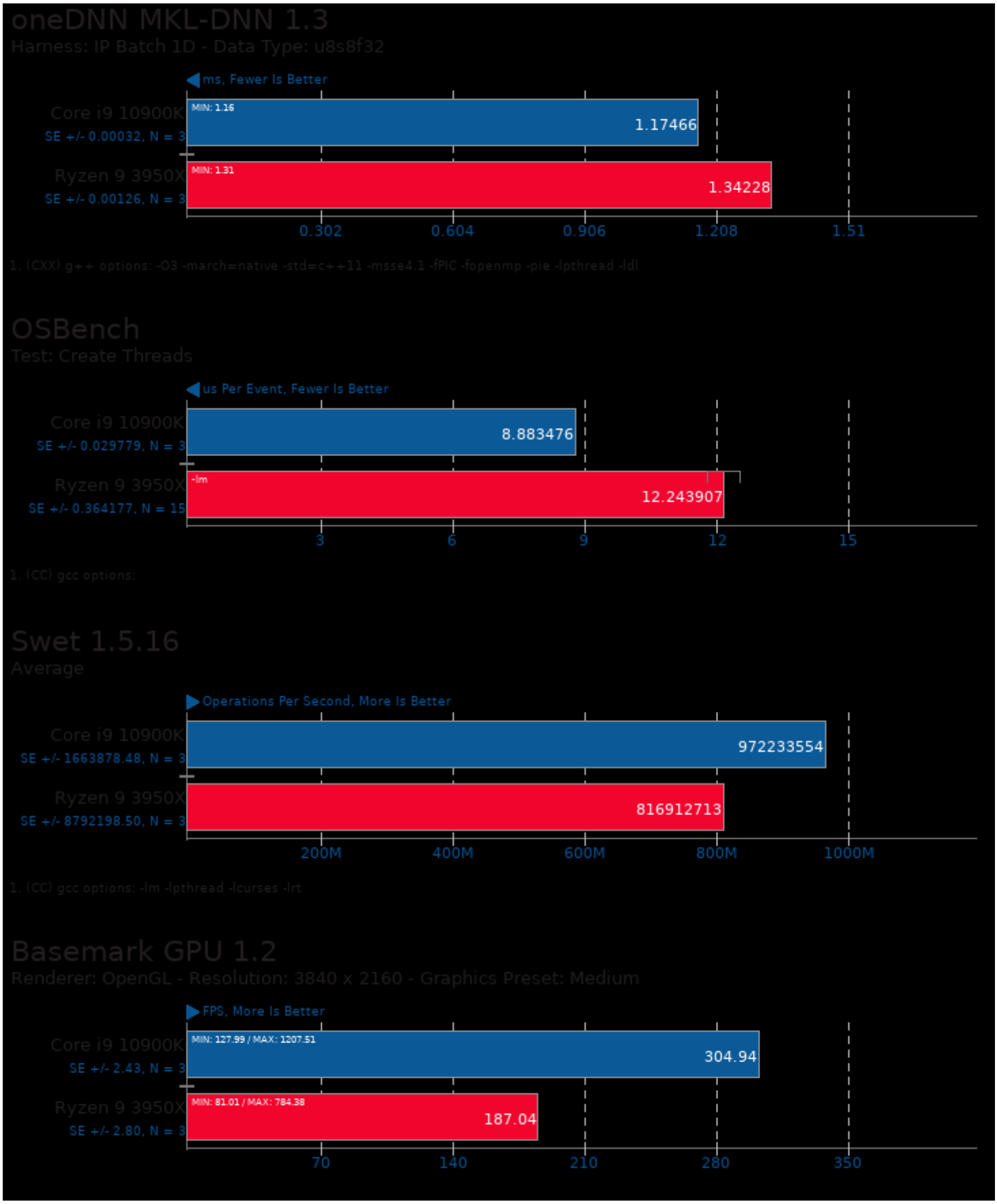


oneDNN MKL-DNN 1.3

Harness: IP Batch 1D - Data Type: f32

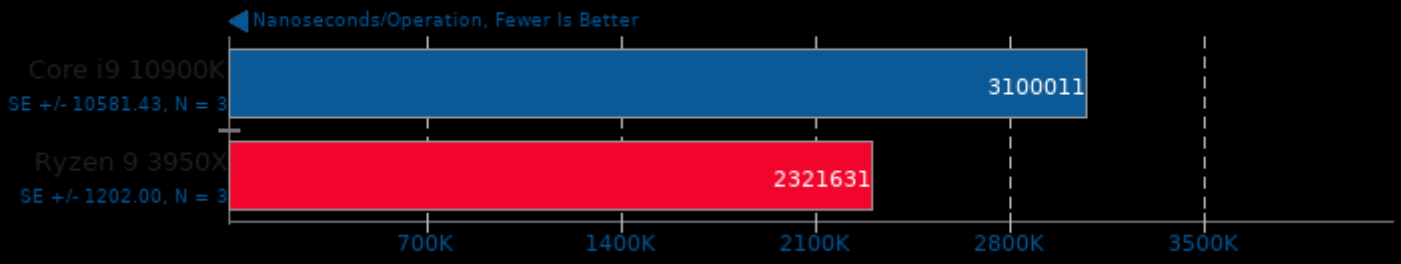


1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl


oneDNN MKL-DNN 1.3
Harness: IP Batch 1D - Data Type: u8s8f32
ms, Fewer Is Better
Core i9 10900K
SE +/- 0.00032, N = 3
MIN: 1.16
1.17466
Ryzen 9 3950X
SE +/- 0.00126, N = 3
MIN: 1.31
1.34228
0.302
0.604
0.906
1.208
1.51
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl
OSBench
Test: Create Threads
us Per Event, Fewer Is Better
Core i9 10900K
SE +/- 0.029779, N = 3
8.883476
Ryzen 9 3950X
SE +/- 0.364177, N = 15
-lm
12.243907
3
6
9
12
15
1. (CC) gcc options:
Swet 1.5.16
Average
Operations Per Second, More Is Better
Core i9 10900K
SE +/- 1663878.48, N = 3
972233554
Ryzen 9 3950X
SE +/- 8792198.50, N = 3
816912713
200M
400M
600M
800M
1000M
1. (CC) gcc options: -lm -lpthread -lcurses -lrt
Basemark GPU 1.2
Renderer: OpenGL - Resolution: 3840 x 2160 - Graphics Preset: Medium
FPS, More Is Better
Core i9 10900K
SE +/- 2.43, N = 3
MIN: 127.99 / MAX: 1207.51
304.94
Ryzen 9 3950X
SE +/- 2.80, N = 3
MIN: 81.01 / MAX: 784.38
187.04
70
140
210
280
350

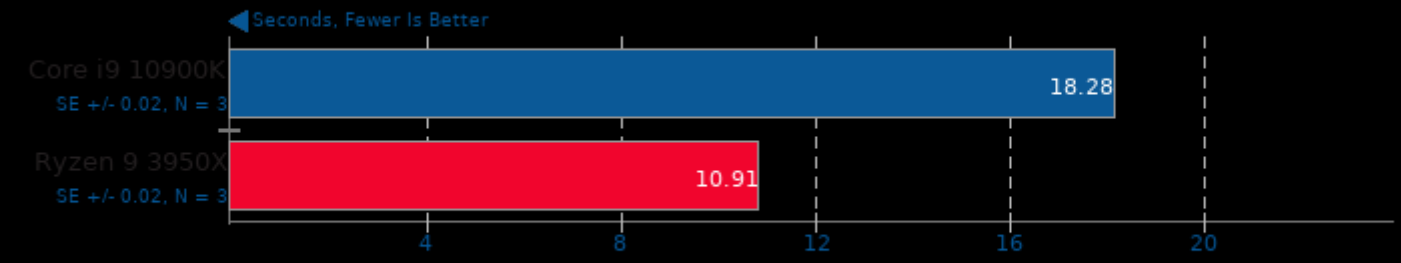
Go Benchmarks

Test: json



Rodinia 2.4

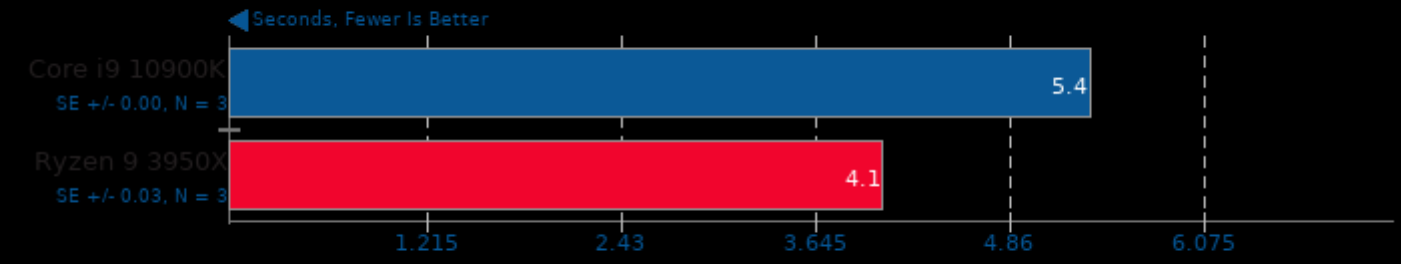
Test: OpenMP CFD Solver



1. (CXX) g++ options: -O2 -lOpenCL

Selenium

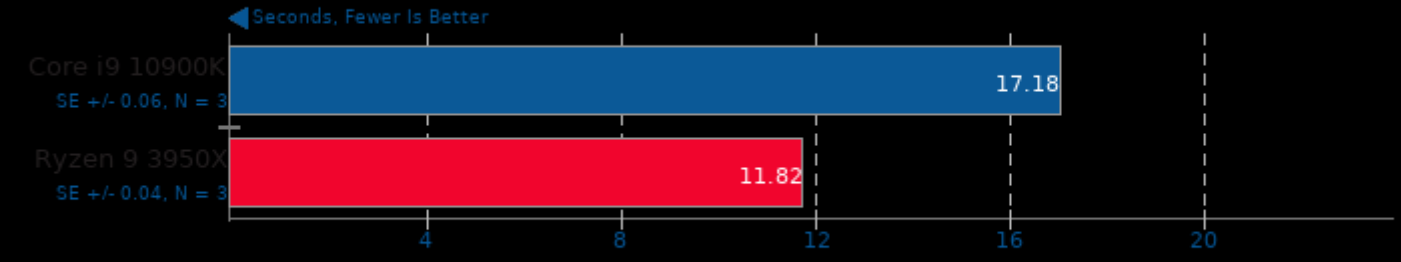
Benchmark: Maze Solver - Browser: Google Chrome



1. chrome 83.0.4103.61

Primesieve 7.4

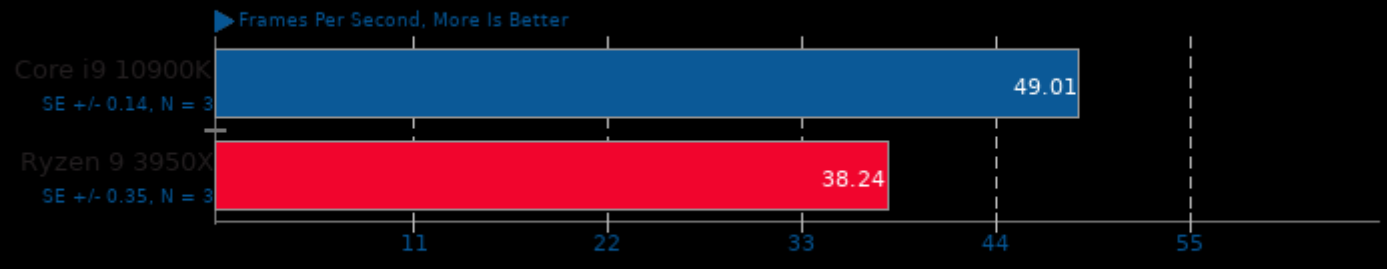
1e12 Prime Number Generation



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

AOM AV1 2.0

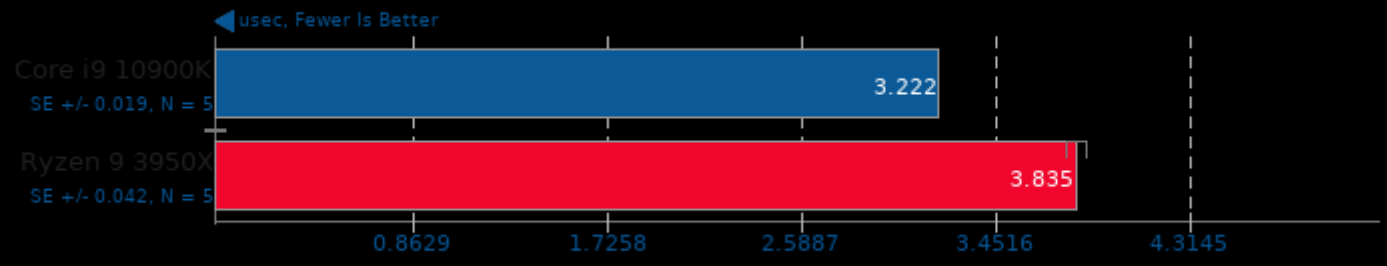
Encoder Mode: Speed 8 Realtime



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

Sockperf 3.4

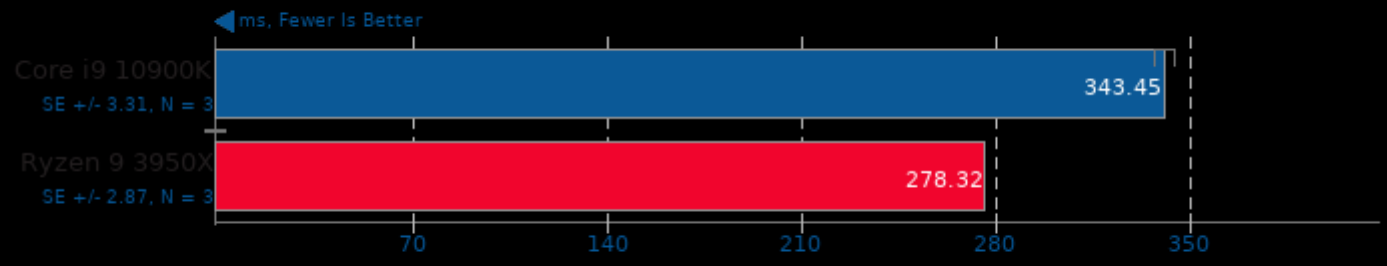
Test: Latency Ping Pong



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

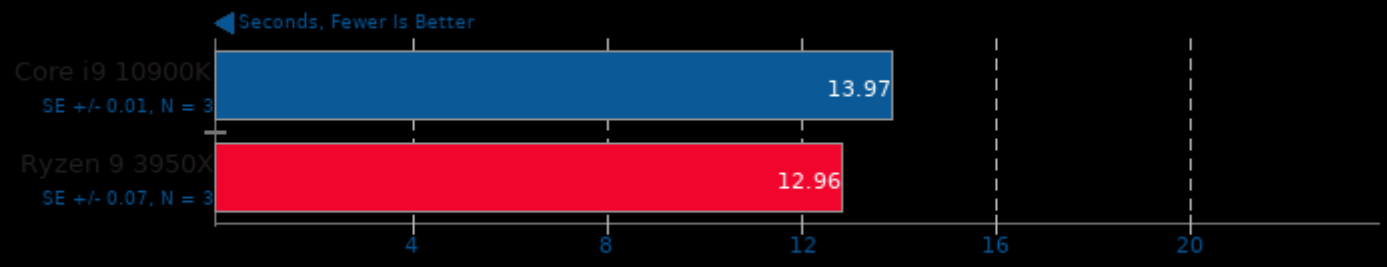
Selenium

Benchmark: WASM collisionDetection - Browser: Google Chrome

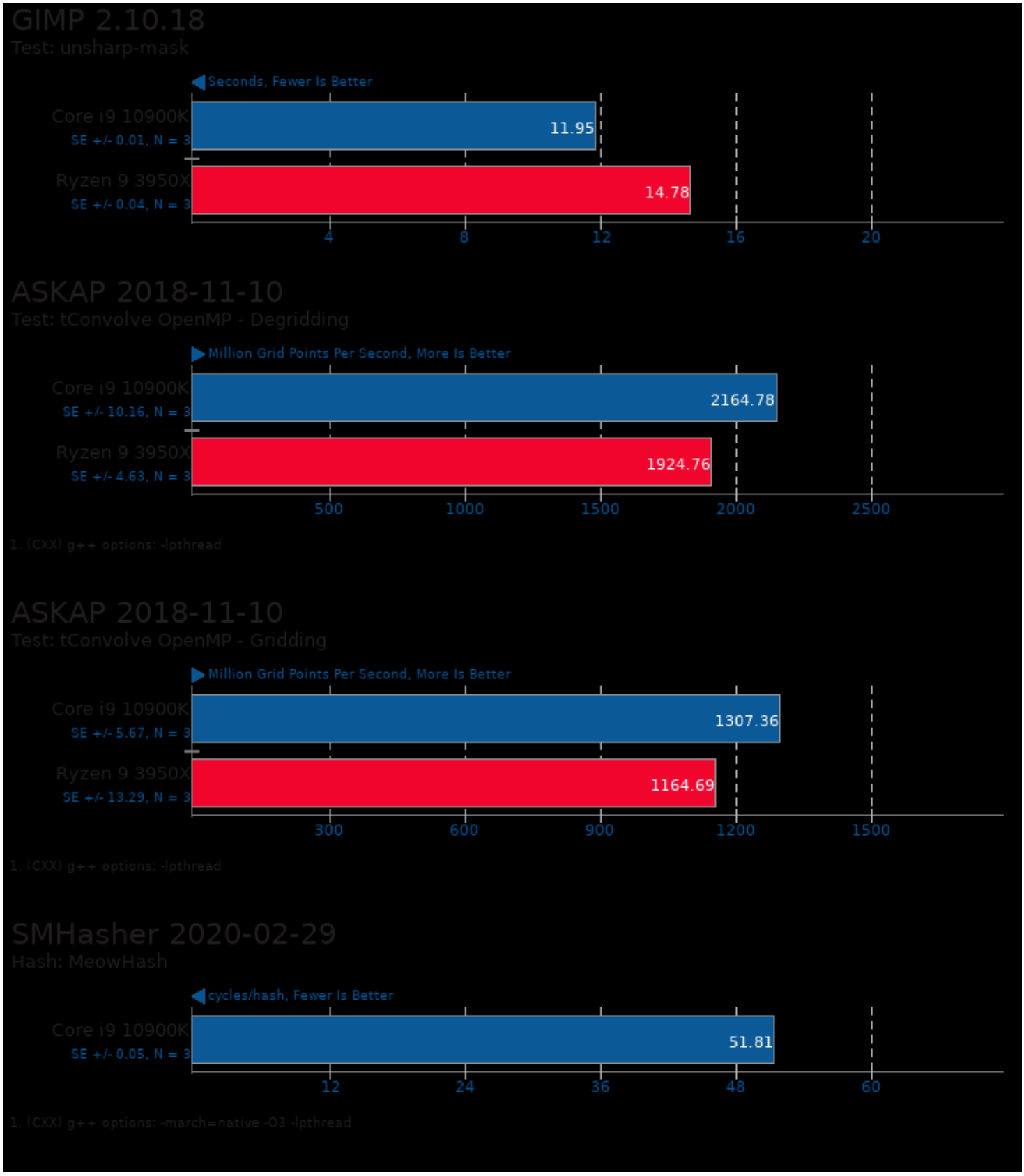


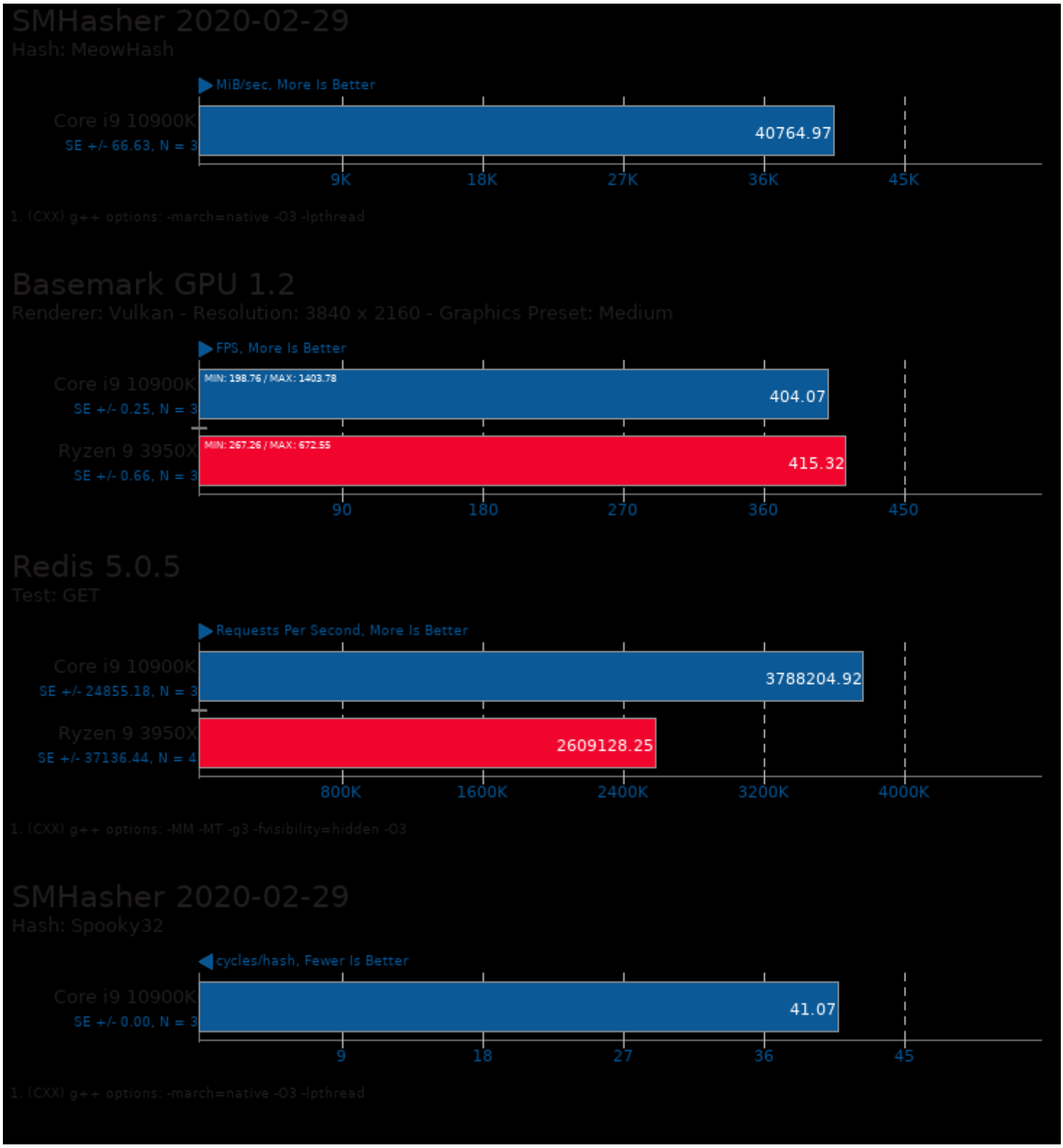
1. chrome 83.0.4103.61

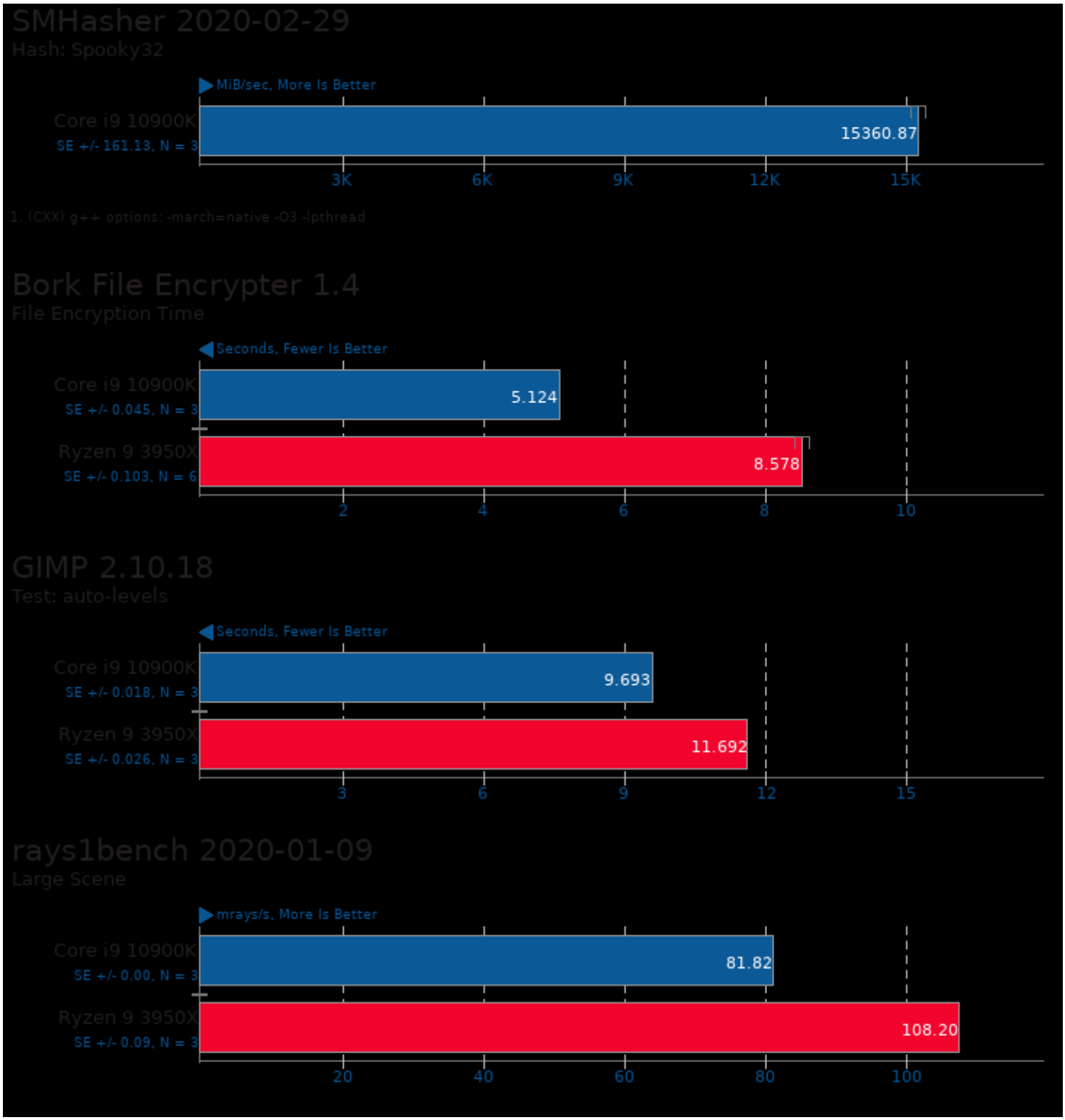
Nebular Empirical Analysis Tool 2020-02-29

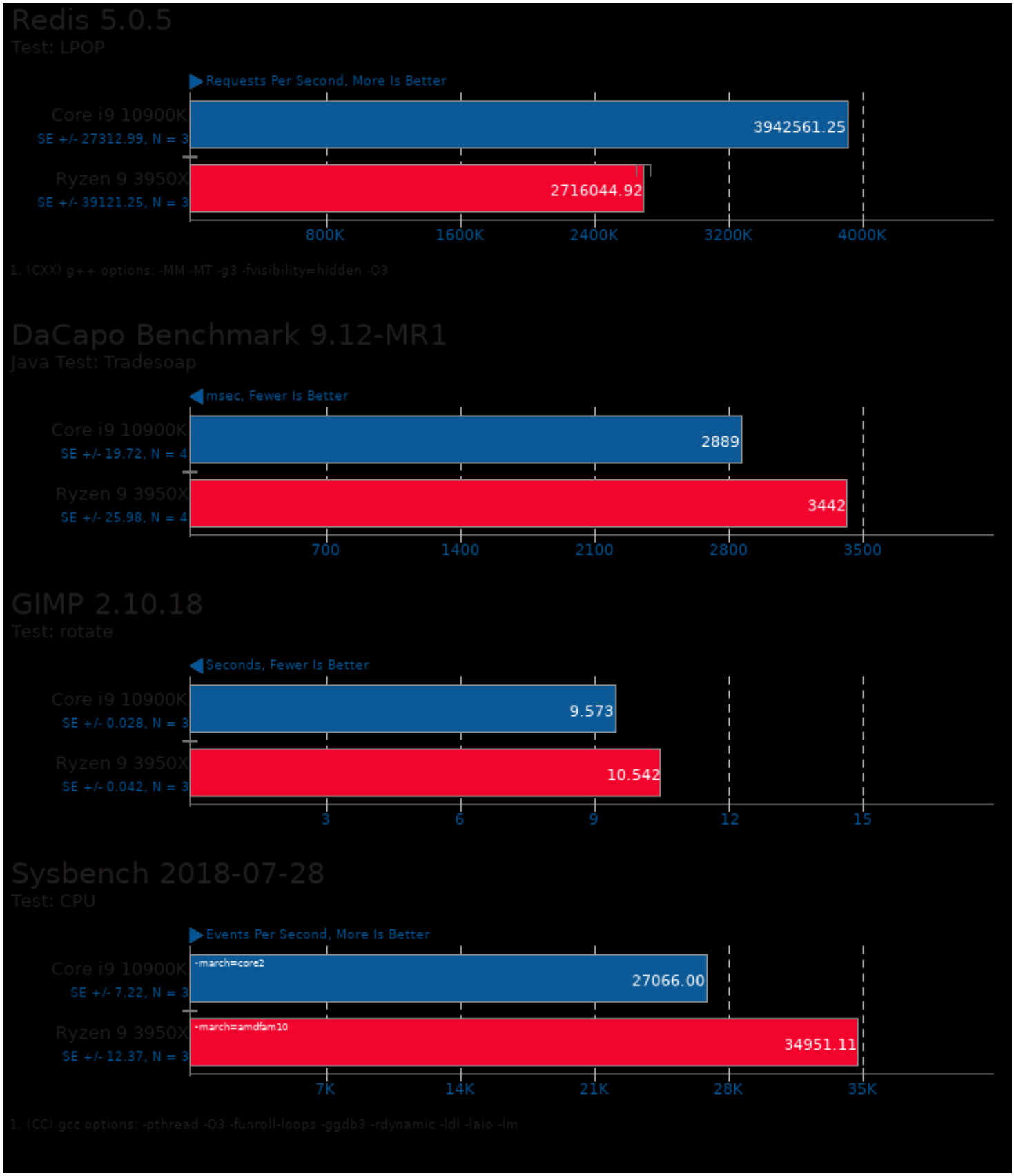


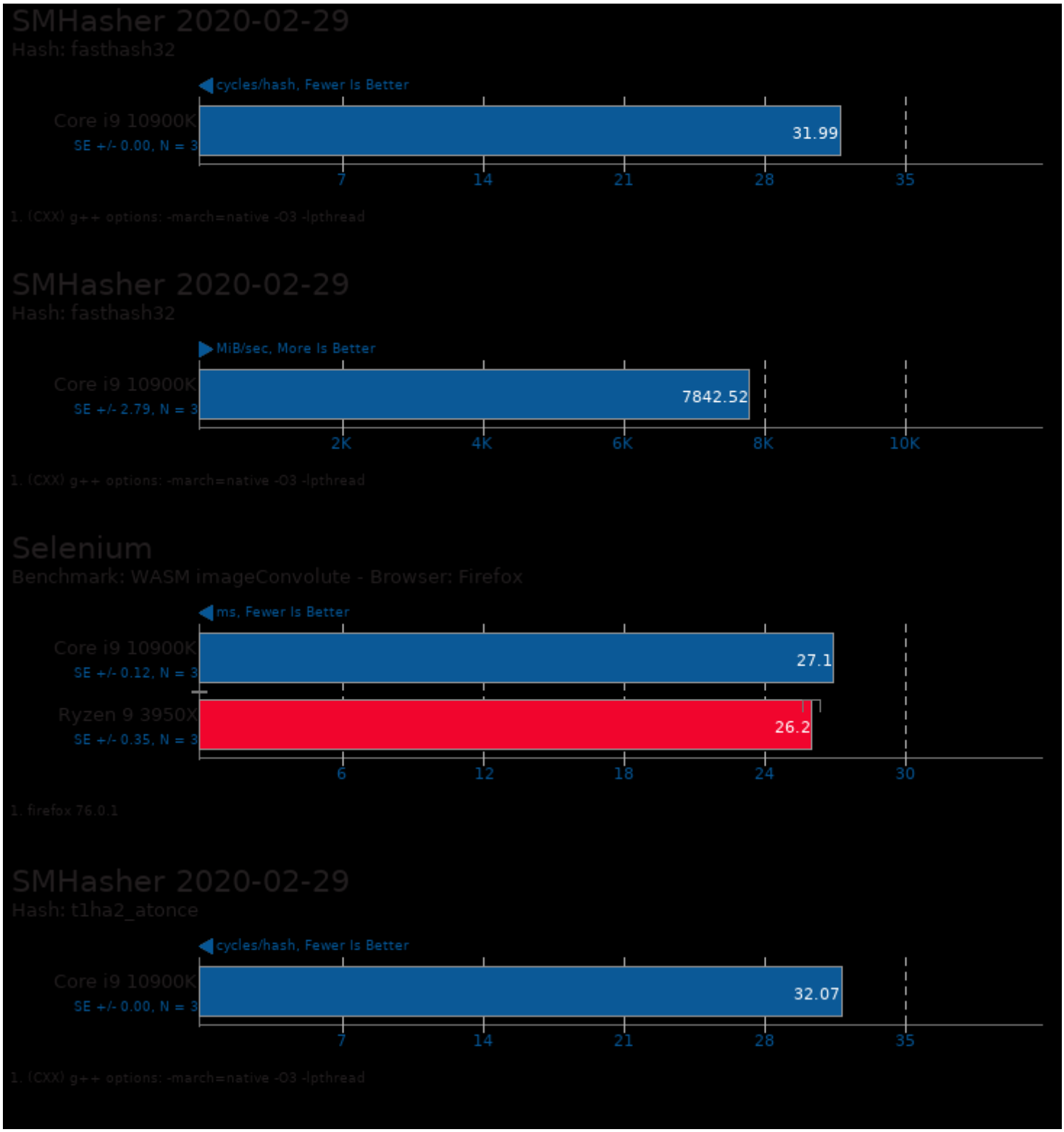
1. (F9X) gfortran options: -cpp -ffree-line-length-0 -Jsource/ -fopenmp -O3 -fno-backtrace

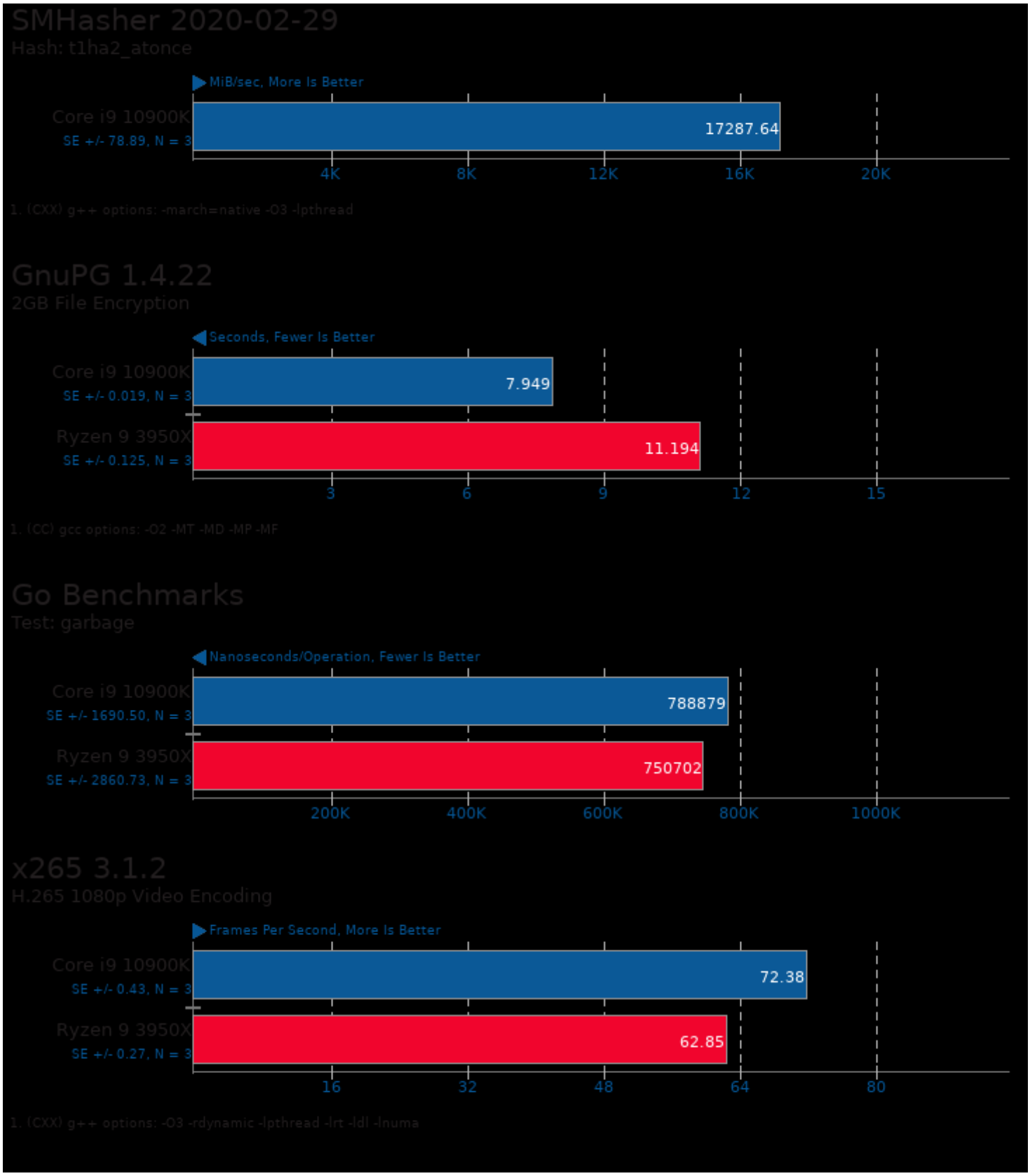

GIMP 2.10.18
Test: unsharp-mask
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.01, N = 3
11.95
Ryzen 9 3950X
SE +/- 0.04, N = 3
14.78
4
8
12
16
20
ASKAP 2018-11-10
Test: tConvolve OpenMP - Degridding
Million Grid Points Per Second, More Is Better
Core i9 10900K
SE +/- 10.16, N = 3
2164.78
Ryzen 9 3950X
SE +/- 4.63, N = 3
1924.76
500
1000
1500
2000
2500
1. (CXX) g++ options: -lpthread
ASKAP 2018-11-10
Test: tConvolve OpenMP - Gridding
Million Grid Points Per Second, More Is Better
Core i9 10900K
SE +/- 5.67, N = 3
1307.36
Ryzen 9 3950X
SE +/- 13.29, N = 3
1164.69
300
600
900
1200
1500
1. (CXX) g++ options: -lpthread
SMHasher 2020-02-29
Hash: MeowHash
cycles/hash, Fewer Is Better
Core i9 10900K
SE +/- 0.05, N = 3
51.81
12
24
36
48
60
1. (CXX) g++ options: -march=native -O3 -lpthread

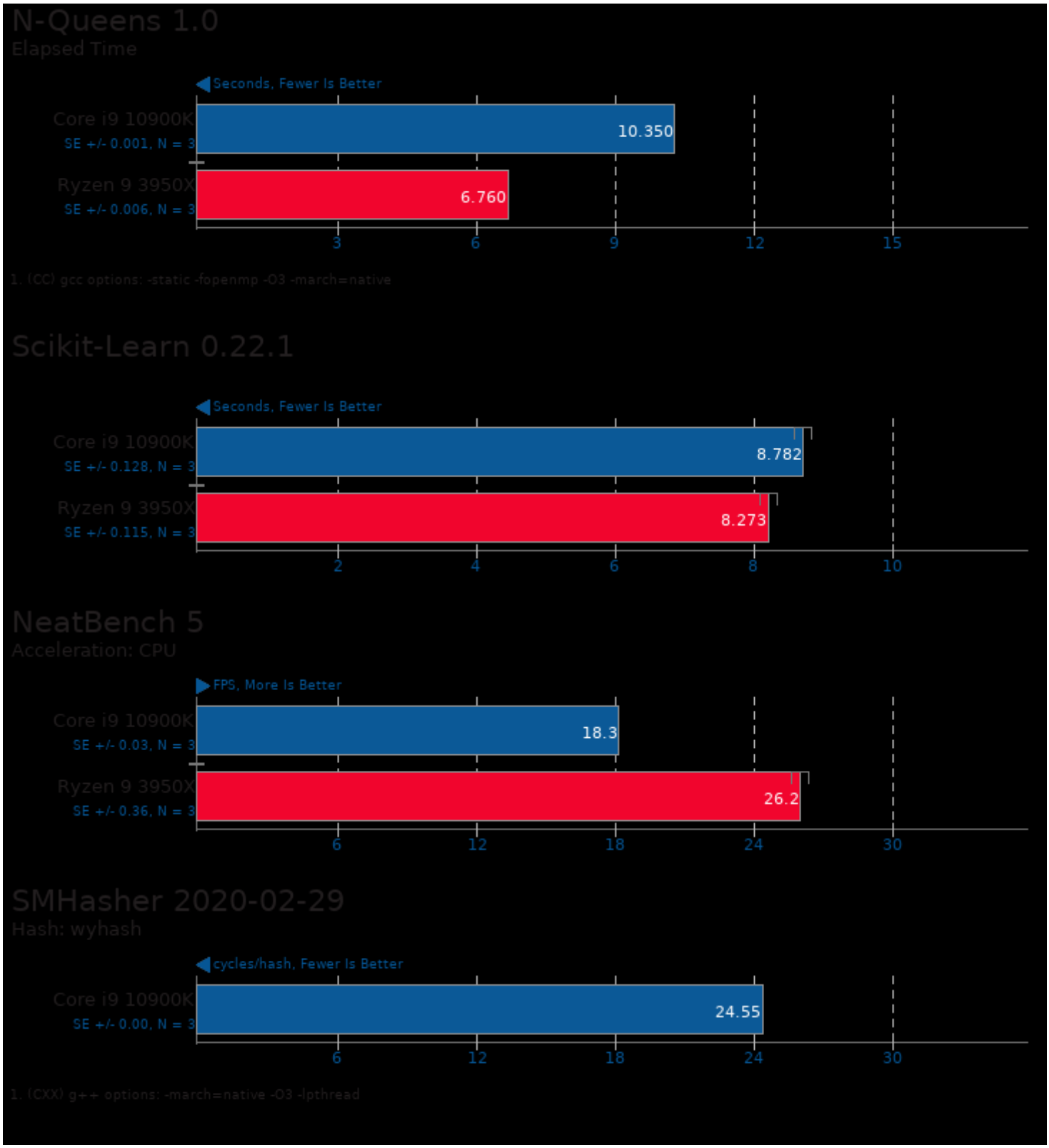

SMHasher 2020-02-29
Hash: MeowHash
MiB/sec, More Is Better
Core i9 10900K
SE +/- 66.63, N = 3
40764.97
9K
18K
27K
36K
45K
1. (CXX) g++ options: -march=native -O3 -lpthread
Basemark GPU 1.2
Renderer: Vulkan - Resolution: 3840 x 2160 - Graphics Preset: Medium
FPS, More Is Better
Core i9 10900K
SE +/- 0.25, N = 3
MIN: 198.76 / MAX: 1403.78
404.07
Ryzen 9 3950X
SE +/- 0.66, N = 3
MIN: 267.26 / MAX: 672.55
415.32
90
180
270
360
450
Redis 5.0.5
Test: GET
Requests Per Second, More Is Better
Core i9 10900K
SE +/- 24855.18, N = 3
3788204.92
Ryzen 9 3950X
SE +/- 37136.44, N = 4
2609128.25
800K
1600K
2400K
3200K
4000K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3
SMHasher 2020-02-29
Hash: Spooky32
cycles/hash, Fewer Is Better
Core i9 10900K
SE +/- 0.00, N = 3
41.07
9
18
27
36
45
1. (CXX) g++ options: -march=native -O3 -lpthread

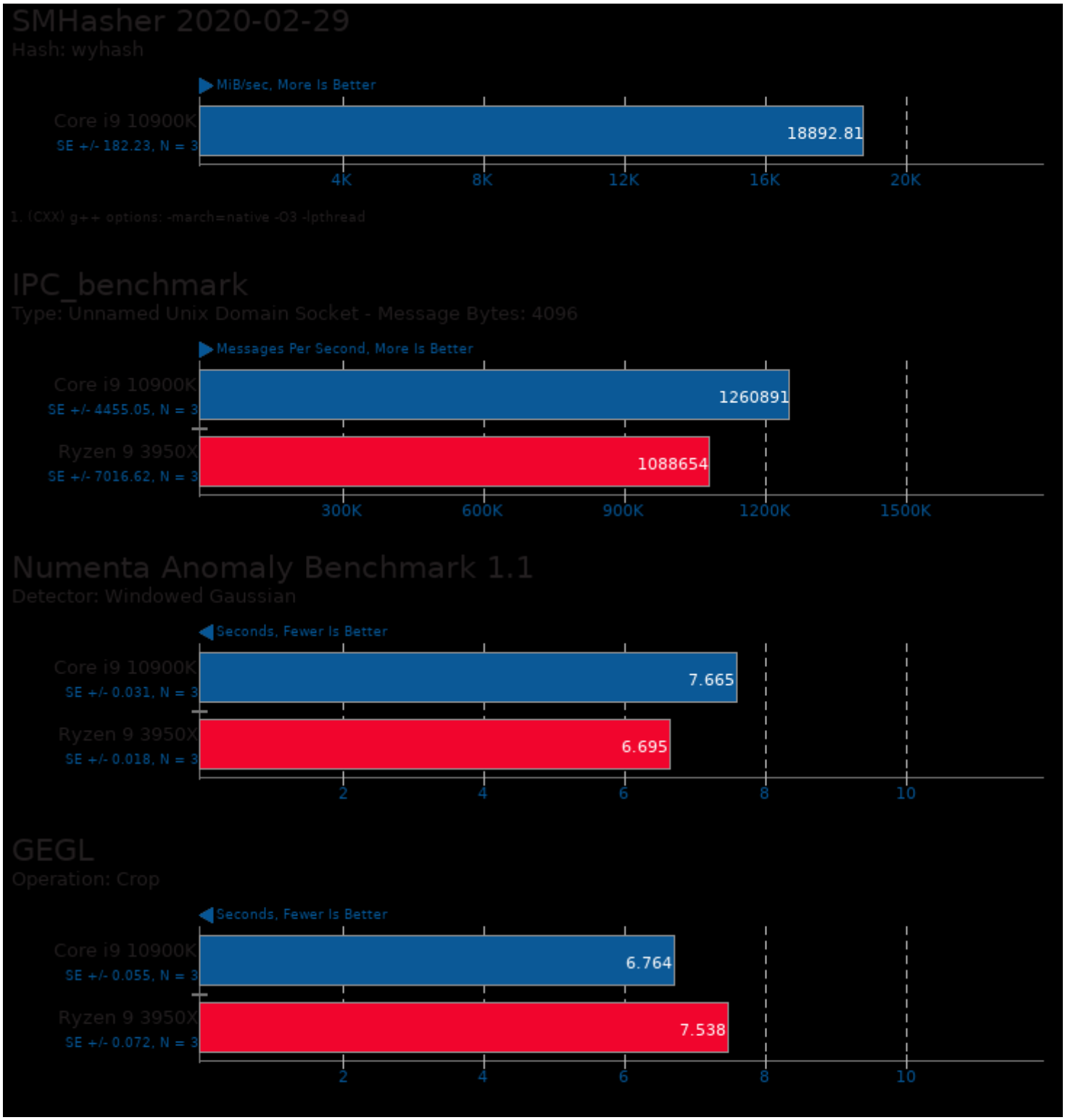

SMHasher 2020-02-29
Hash: Spooky32
MiB/sec, More Is Better
Core i9 10900K
SE +/- 161.13, N = 3
15360.87
3K
6K
9K
12K
15K
1. (CXX) g++ options: -march=native -O3 -lpthread
Bork File Encrypter 1.4
File Encryption Time
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.045, N = 3
5.124
Ryzen 9 3950X
SE +/- 0.103, N = 6
8.578
2
4
6
8
10
GIMP 2.10.18
Test: auto-levels
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.018, N = 3
9.693
Ryzen 9 3950X
SE +/- 0.026, N = 3
11.692
3
6
9
12
15
rays1bench 2020-01-09
Large Scene
mrays/s, More Is Better
Core i9 10900K
SE +/- 0.00, N = 3
81.82
Ryzen 9 3950X
SE +/- 0.09, N = 3
108.20
20
40
60
80
100


Redis 5.0.5
Test: LPOP
Requests Per Second, More Is Better
Core i9 10900K
SE +/- 27312.99, N = 3
3942561.25
Ryzen 9 3950X
SE +/- 39121.25, N = 3
2716044.92
800K
1600K
2400K
3200K
4000K
1. (CXX) g++ options: -MM -MT -g3 -fvisibility=hidden -O3
DaCapo Benchmark 9.12-MR1
Java Test: Tradesoap
msec, Fewer Is Better
Core i9 10900K
SE +/- 19.72, N = 4
2889
Ryzen 9 3950X
SE +/- 25.98, N = 4
3442
700
1400
2100
2800
3500
GIMP 2.10.18
Test: rotate
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.028, N = 3
9.573
Ryzen 9 3950X
SE +/- 0.042, N = 3
10.542
3
6
9
12
15
Sysbench 2018-07-28
Test: CPU
Events Per Second, More Is Better
Core i9 10900K
SE +/- 7.22, N = 3
-march=core2
27066.00
Ryzen 9 3950X
SE +/- 12.37, N = 3
-march=amdfam10
34951.11
7K
14K
21K
28K
35K
1. (CC) gcc options: -pthread -O3 -funroll-loops -ggdb3 -rdynamic -ldl -laio -lm


SMHasher 2020-02-29
Hash: fasthash32
cycles/hash, Fewer Is Better
Core i9 10900K
SE +/- 0.00, N = 3
31.99
7
14
21
28
35
1. (CXX) g++ options: -march=native -O3 -lpthread
SMHasher 2020-02-29
Hash: fasthash32
MiB/sec, More Is Better
Core i9 10900K
SE +/- 2.79, N = 3
7842.52
2K
4K
6K
8K
10K
1. (CXX) g++ options: -march=native -O3 -lpthread
Selenium
Benchmark: WASM imageConvolute - Browser: Firefox
ms, Fewer Is Better
Core i9 10900K
SE +/- 0.12, N = 3
27.1
Ryzen 9 3950X
SE +/- 0.35, N = 3
26.2
6
12
18
24
30
1. firefox 76.0.1
SMHasher 2020-02-29
Hash: t1ha2_atonce
cycles/hash, Fewer Is Better
Core i9 10900K
SE +/- 0.00, N = 3
32.07
7
14
21
28
35
1. (CXX) g++ options: -march=native -O3 -lpthread

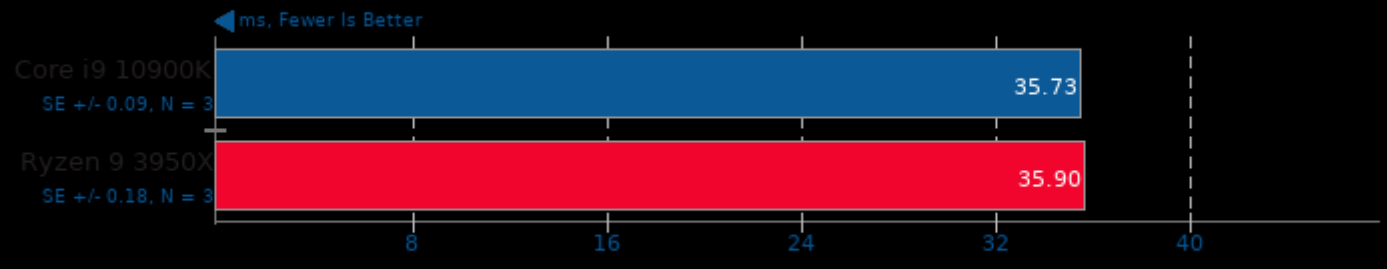

SMHasher 2020-02-29
Hash: t1ha2_atonce
MiB/sec, More Is Better
Core i9 10900K
SE +/- 78.89, N = 3
17287.64
4K
8K
12K
16K
20K
1. (CXX) g++ options: -march=native -O3 -lpthread
GnuPG 1.4.22
2GB File Encryption
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.019, N = 3
7.949
Ryzen 9 3950X
SE +/- 0.125, N = 3
11.194
3
6
9
12
15
1. (CC) gcc options: -O2 -MT -MD -MP -MF
Go Benchmarks
Test: garbage
Nanoseconds/Operation, Fewer Is Better
Core i9 10900K
SE +/- 1690.50, N = 3
788879
Ryzen 9 3950X
SE +/- 2860.73, N = 3
750702
200K
400K
600K
800K
1000K
x265 3.1.2
H.265 1080p Video Encoding
Frames Per Second, More Is Better
Core i9 10900K
SE +/- 0.43, N = 3
72.38
Ryzen 9 3950X
SE +/- 0.27, N = 3
62.85
16
32
48
64
80
1. (CXX) g++ options: -O3 -rdynamic -lpthread -lrt -ldl -lnuma


N-Queens 1.0
Elapsed Time
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.001, N = 3
10.350
Ryzen 9 3950X
SE +/- 0.006, N = 3
6.760
3
6
9
12
15
1. (CC) gcc options: -static -fopenmp -O3 -march=native
Scikit-Learn 0.22.1
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.128, N = 3
8.782
Ryzen 9 3950X
SE +/- 0.115, N = 3
8.273
2
4
6
8
10
NeatBench 5
Acceleration: CPU
FPS, More Is Better
Core i9 10900K
SE +/- 0.03, N = 3
18.3
Ryzen 9 3950X
SE +/- 0.36, N = 3
26.2
6
12
18
24
30
SMHasher 2020-02-29
Hash: wyhash
cycles/hash, Fewer Is Better
Core i9 10900K
SE +/- 0.00, N = 3
24.55
6
12
18
24
30
1. (CXX) g++ options: -march=native -O3 -lpthread


SMHasher 2020-02-29
Hash: wyhash
MiB/sec, More Is Better
Core i9 10900K
SE +/- 182.23, N = 3
18892.81
4K
8K
12K
16K
20K
1. (CXX) g++ options: -march=native -O3 -lpthread
IPC_benchmark
Type: Unnamed Unix Domain Socket - Message Bytes: 4096
Messages Per Second, More Is Better
Core i9 10900K
SE +/- 4455.05, N = 3
1260891
Ryzen 9 3950X
SE +/- 7016.62, N = 3
1088654
300K
600K
900K
1200K
1500K
Numenta Anomaly Benchmark 1.1
Detector: Windowed Gaussian
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.031, N = 3
7.665
Ryzen 9 3950X
SE +/- 0.018, N = 3
6.695
2
4
6
8
10
GEGL
Operation: Crop
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.055, N = 3
6.764
Ryzen 9 3950X
SE +/- 0.072, N = 3
7.538
2
4
6
8
10

Selenium

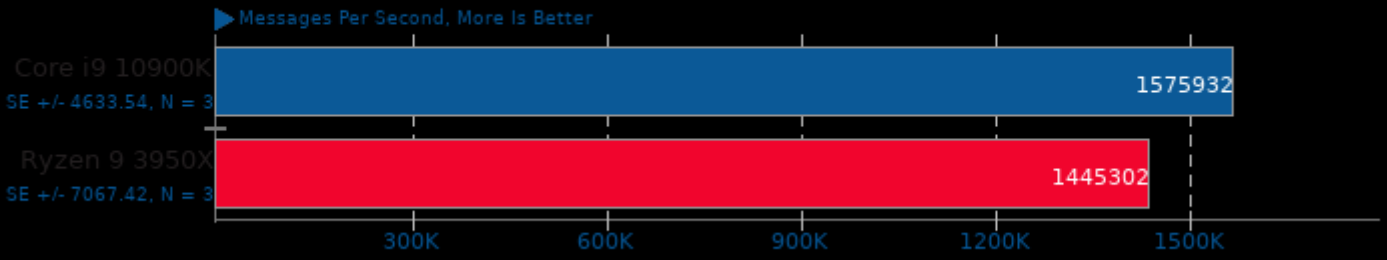
Benchmark: WASM imageConvolute - Browser: Google Chrome



1. chrome 83.0.4103.61

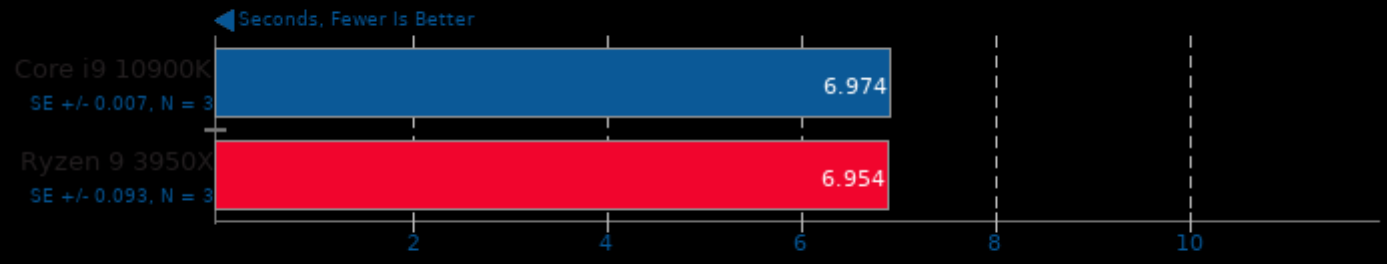
IPC_benchmark

Type: TCP Socket - Message Bytes: 4096



LAME MP3 Encoding 3.100

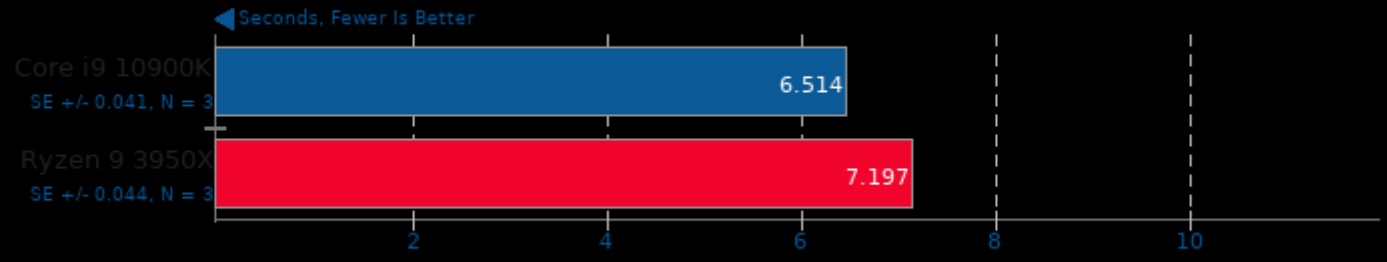
WAV To MP3



1. (CC) gcc options: -O3 -ffast-math -funroll-loops -fschedule-insns2 -fbranch-count-reg -fforce-addr -pipe -lncurses -lm

Basis Universal 1.12

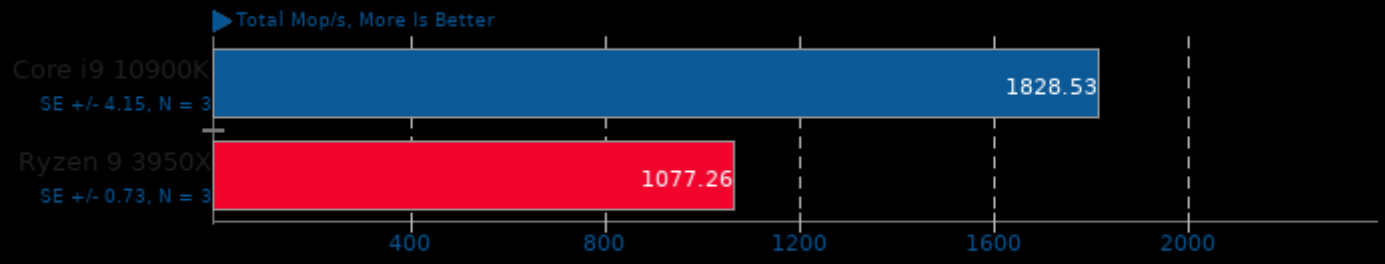
Settings: UASTC Level 0



1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

NAS Parallel Benchmarks 3.4

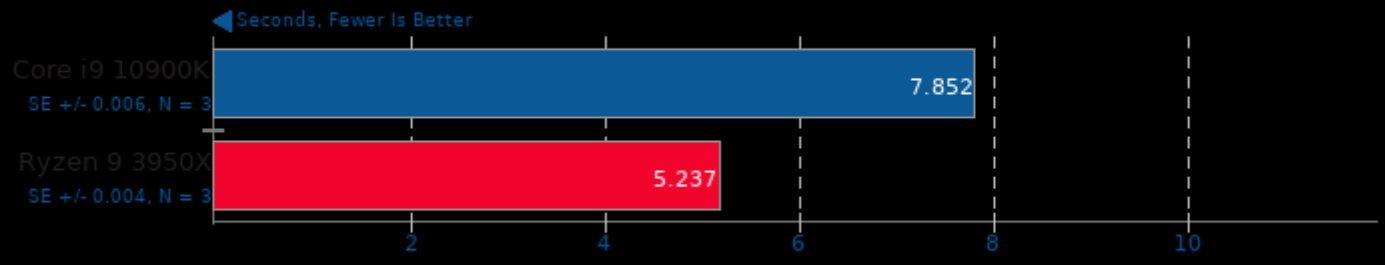
Test / Class: EP.C



1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Open MPI 4.0.3

Smallpt 1.0

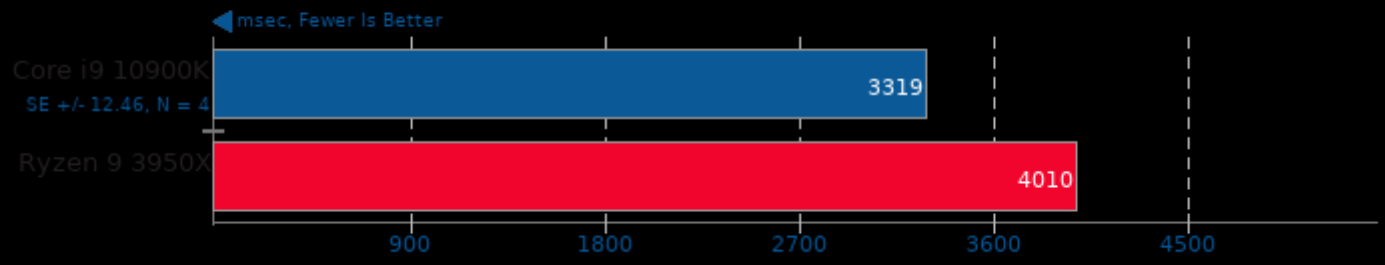
Global Illumination Renderer; 128 Samples



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

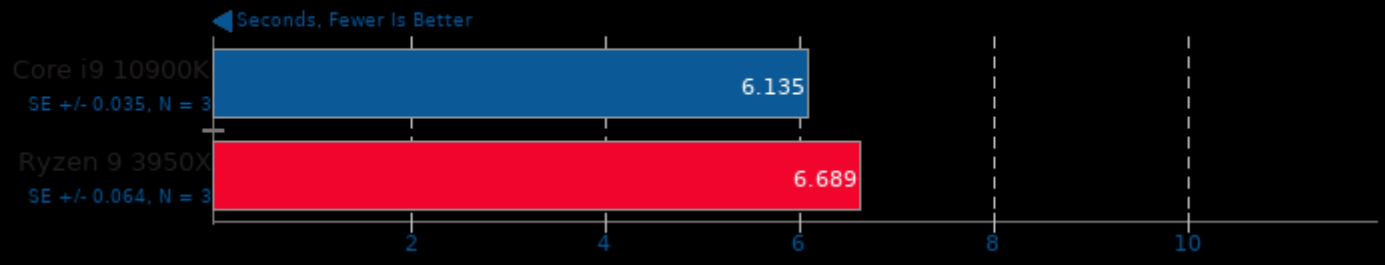
DaCapo Benchmark 9.12-MR1

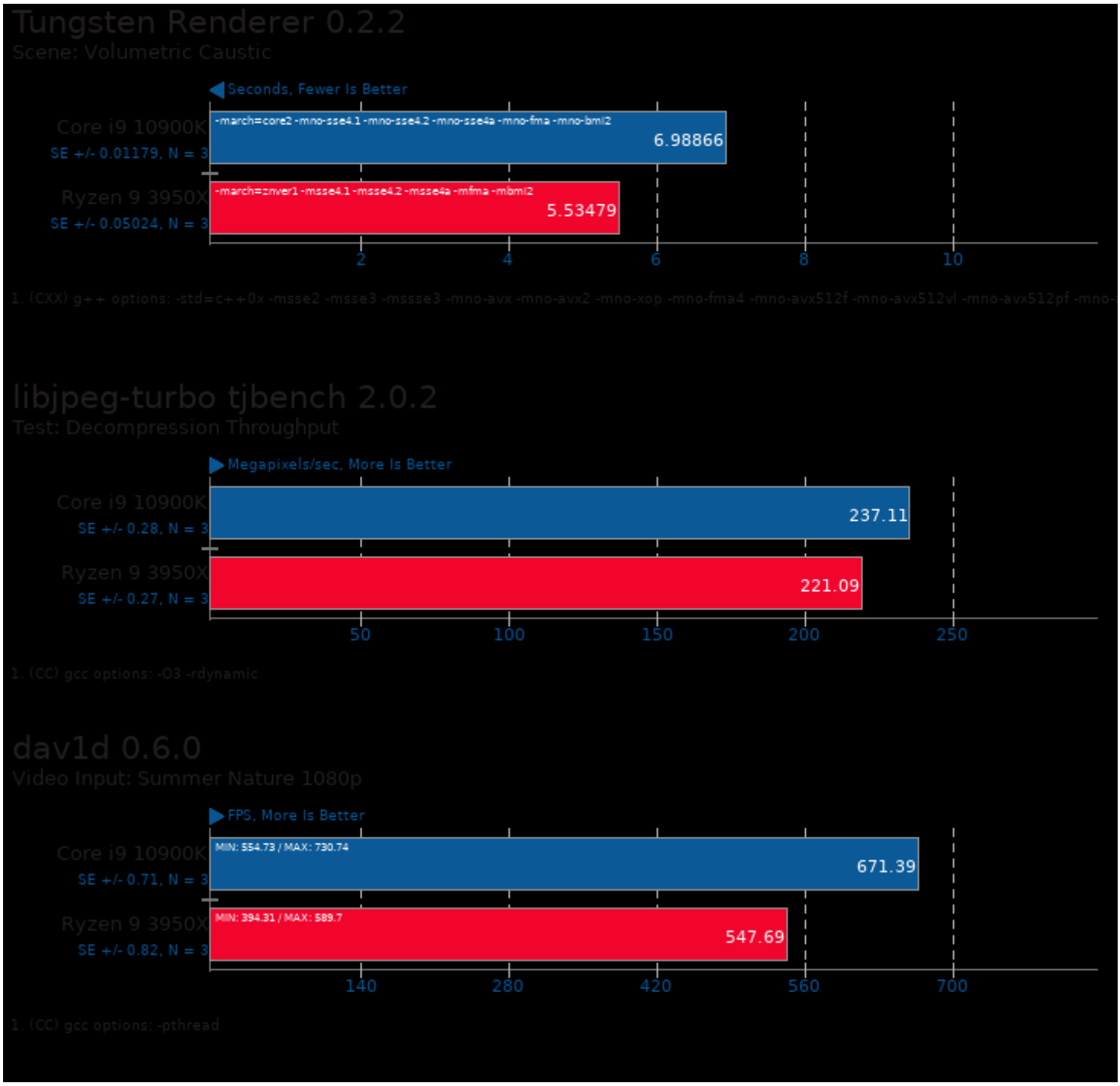
Java Test: Jython

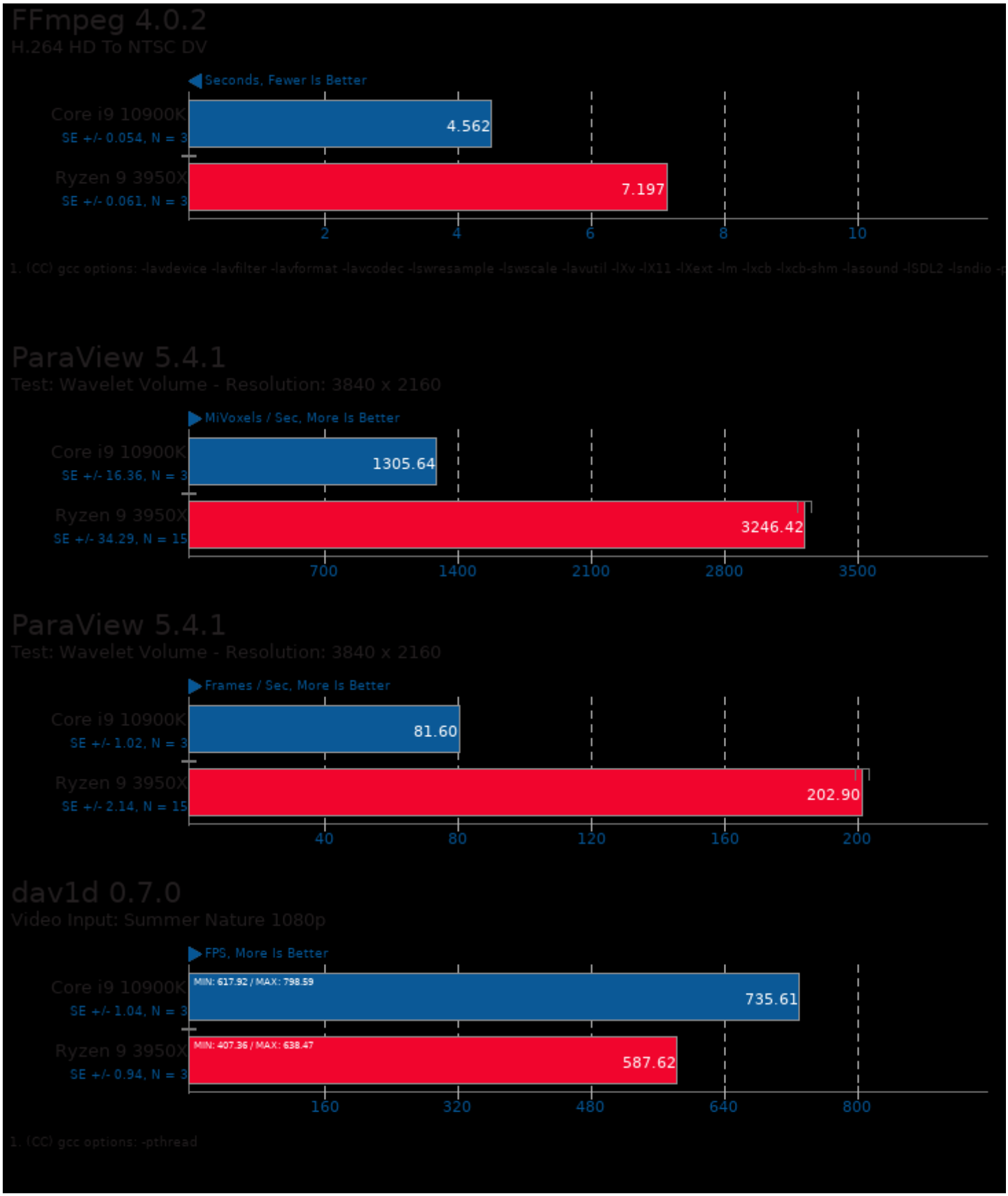


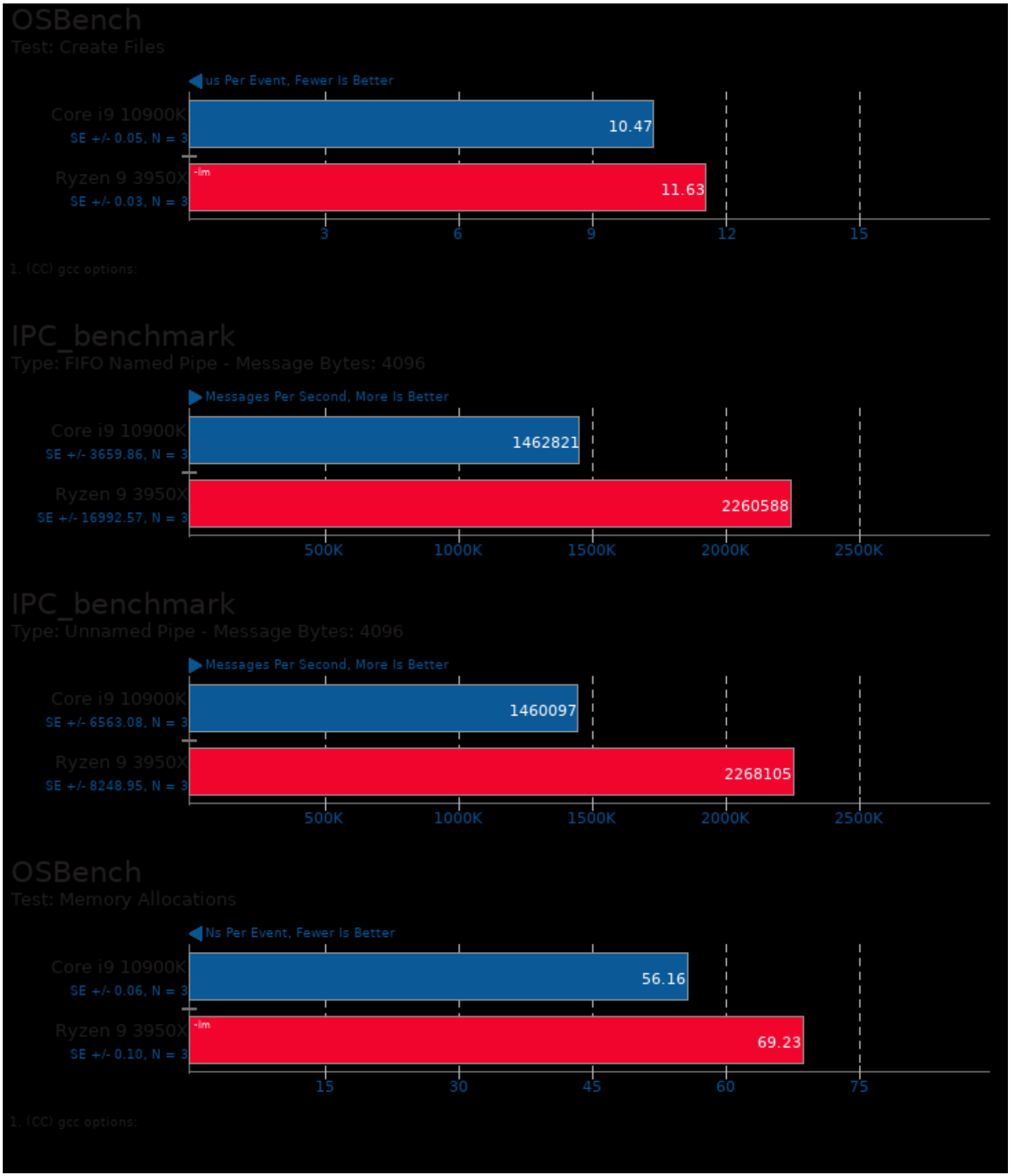
GIMP 2.10.18

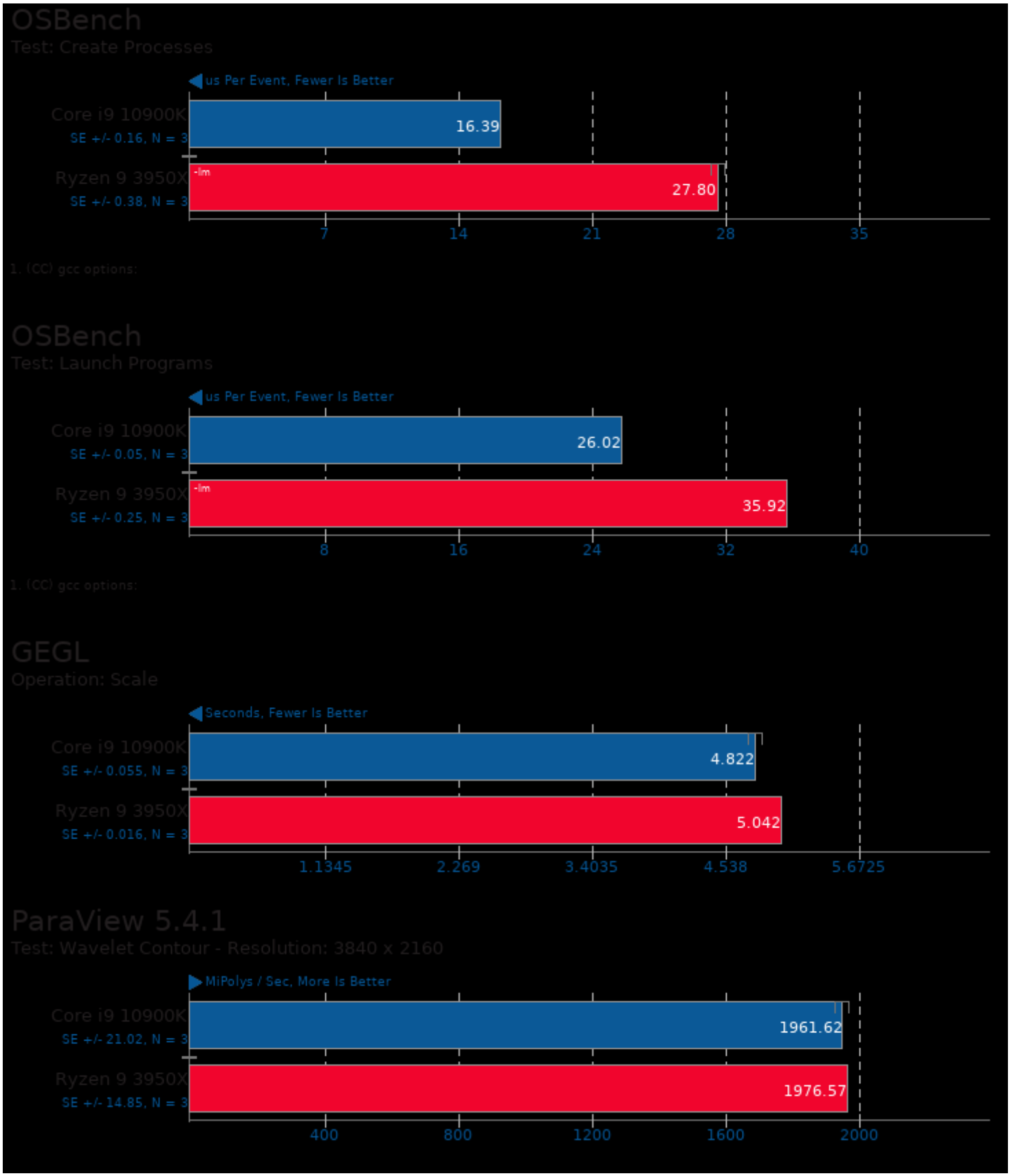
Test: resize

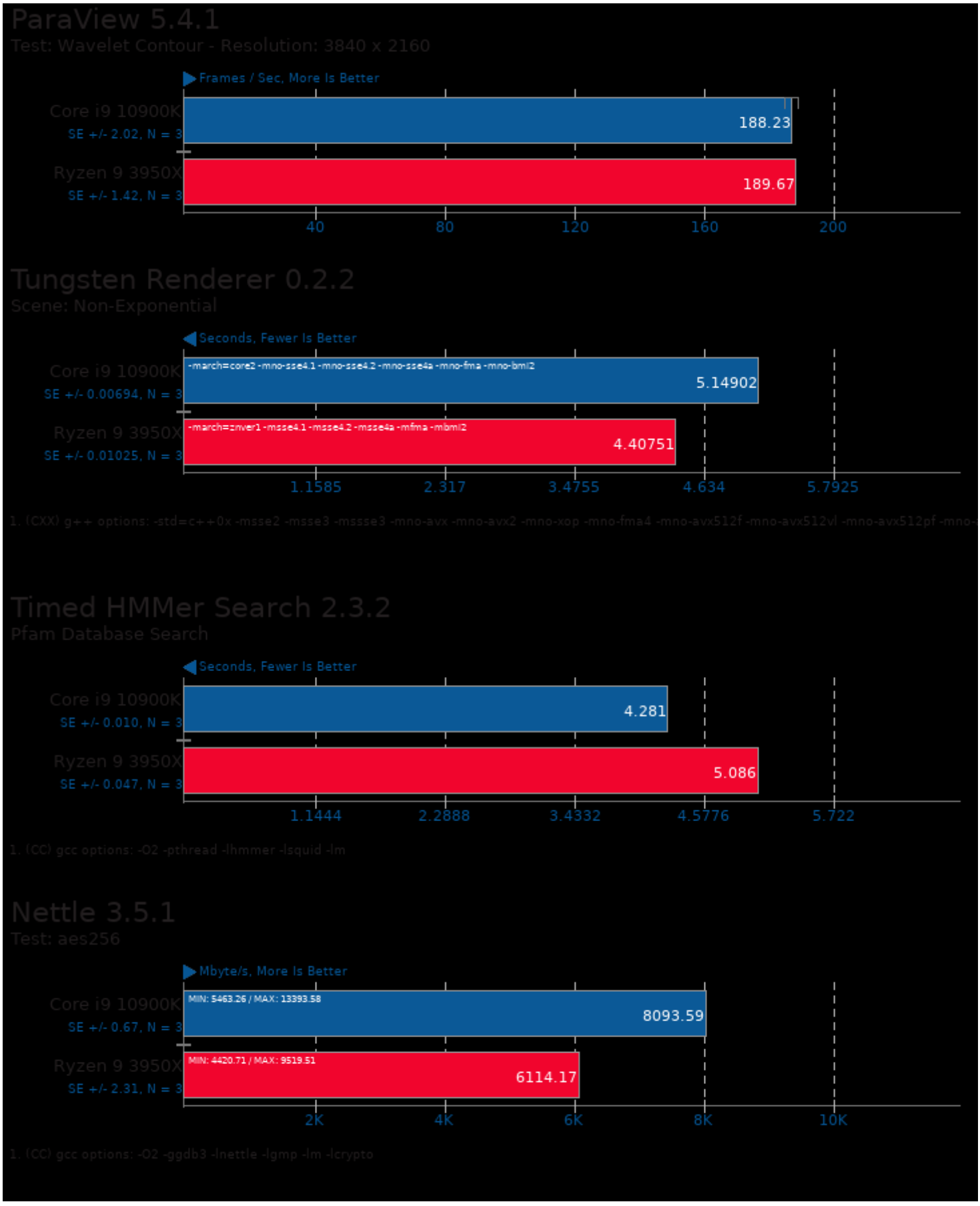



Tungsten Renderer 0.2.2
Scene: Volumetric Caustic
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.01179, N = 3
-march=core2 -mno-sse4.1 -mno-sse4.2 -mno-sse4a -mno-fma -mno-bmi2
6.98866
Ryzen 9 3950X
SE +/- 0.05024, N = 3
-march=znver1 -msse4.1 -msse4.2 -msse4a -mfma -mbmi2
5.53479
2
4
6
8
10
1. (CXX) g++ options: -std=c++0x -msse2 -msse3 -mssse3 -mno-avx -mno-avx2 -mno-xop -mno-fma4 -mno-avx512f -mno-avx512vl -mno-avx512pf -mno-
libjpeg-turbo tjbench 2.0.2
Test: Decompression Throughput
Megapixels/sec, More Is Better
Core i9 10900K
SE +/- 0.28, N = 3
237.11
Ryzen 9 3950X
SE +/- 0.27, N = 3
221.09
50
100
150
200
250
1. (CC) gcc options: -O3 -rdynamic
dav1d 0.6.0
Video Input: Summer Nature 1080p
FPS, More Is Better
Core i9 10900K
SE +/- 0.71, N = 3
MIN: 554.73 / MAX: 730.74
671.39
Ryzen 9 3950X
SE +/- 0.82, N = 3
MIN: 394.31 / MAX: 589.7
547.69
140
280
420
560
700
1. (CC) gcc options: -pthread


FFmpeg 4.0.2
H.264 HD To NTSC DV
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.054, N = 3
4.562
Ryzen 9 3950X
SE +/- 0.061, N = 3
7.197
2
4
6
8
10
1. (CC) gcc options: -lavdevice -lavfilter -lavformat -lavcodec -lswresample -lswscale -lavutil -lXv -lX11 -lXext -lm -lxcb -lxcb-shm -lasound -lSDL2 -lsndio
ParaView 5.4.1
Test: Wavelet Volume - Resolution: 3840 x 2160
MiVoxels / Sec, More Is Better
Core i9 10900K
SE +/- 16.36, N = 3
1305.64
Ryzen 9 3950X
SE +/- 34.29, N = 15
3246.42
700
1400
2100
2800
3500
ParaView 5.4.1
Test: Wavelet Volume - Resolution: 3840 x 2160
Frames / Sec, More Is Better
Core i9 10900K
SE +/- 1.02, N = 3
81.60
Ryzen 9 3950X
SE +/- 2.14, N = 15
202.90
40
80
120
160
200
dav1d 0.7.0
Video Input: Summer Nature 1080p
FPS, More Is Better
Core i9 10900K
SE +/- 1.04, N = 3
MIN: 617.92 / MAX: 798.59
735.61
Ryzen 9 3950X
SE +/- 0.94, N = 3
MIN: 407.36 / MAX: 638.47
587.62
160
320
480
640
800
1. (CC) gcc options: -pthread

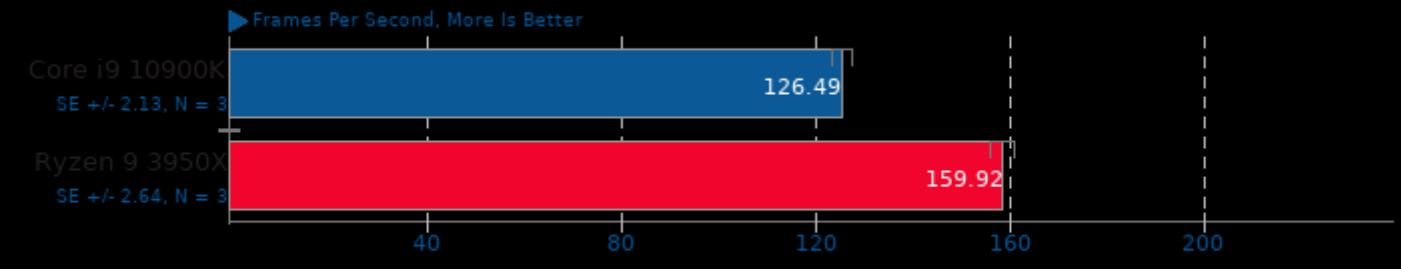

OSBench
Test: Create Files
us Per Event, Fewer Is Better
Core i9 10900K
SE +/- 0.05, N = 3
10.47
Ryzen 9 3950X
-lm
SE +/- 0.03, N = 3
11.63
3
6
9
12
15
1. (CC) gcc options:
IPC_benchmark
Type: FIFO Named Pipe - Message Bytes: 4096
Messages Per Second, More Is Better
Core i9 10900K
SE +/- 3659.86, N = 3
1462821
Ryzen 9 3950X
SE +/- 16992.57, N = 3
2260588
500K
1000K
1500K
2000K
2500K
IPC_benchmark
Type: Unnamed Pipe - Message Bytes: 4096
Messages Per Second, More Is Better
Core i9 10900K
SE +/- 6563.08, N = 3
1460097
Ryzen 9 3950X
SE +/- 8248.95, N = 3
2268105
500K
1000K
1500K
2000K
2500K
OSBench
Test: Memory Allocations
Ns Per Event, Fewer Is Better
Core i9 10900K
SE +/- 0.06, N = 3
56.16
Ryzen 9 3950X
-lm
SE +/- 0.10, N = 3
69.23
15
30
45
60
75
1. (CC) gcc options:


OSBench
Test: Create Processes
us Per Event, Fewer Is Better
Core i9 10900K
SE +/- 0.16, N = 3
16.39
Ryzen 9 3950X
SE +/- 0.38, N = 3
-lm
27.80
7
14
21
28
35
1. (CC) gcc options:
OSBench
Test: Launch Programs
us Per Event, Fewer Is Better
Core i9 10900K
SE +/- 0.05, N = 3
26.02
Ryzen 9 3950X
SE +/- 0.25, N = 3
-lm
35.92
8
16
24
32
40
1. (CC) gcc options:
GEGL
Operation: Scale
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.055, N = 3
4.822
Ryzen 9 3950X
SE +/- 0.016, N = 3
5.042
1.1345
2.269
3.4035
4.538
5.6725
ParaView 5.4.1
Test: Wavelet Contour - Resolution: 3840 x 2160
MiPolys / Sec, More Is Better
Core i9 10900K
SE +/- 21.02, N = 3
1961.62
Ryzen 9 3950X
SE +/- 14.85, N = 3
1976.57
400
800
1200
1600
2000


ParaView 5.4.1
Test: Wavelet Contour - Resolution: 3840 x 2160
Frames / Sec, More Is Better
Core i9 10900K
SE +/- 2.02, N = 3
188.23
Ryzen 9 3950X
SE +/- 1.42, N = 3
189.67
40
80
120
160
200
Tungsten Renderer 0.2.2
Scene: Non-Exponential
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.00694, N = 3
-march=core2 -mno-sse4.1 -mno-sse4.2 -mno-sse4a -mno-fma -mno-bmi2
5.14902
Ryzen 9 3950X
SE +/- 0.01025, N = 3
-march=znver1 -msse4.1 -msse4.2 -msse4a -mfma -mbmi2
4.40751
1.1585
2.317
3.4755
4.634
5.7925
1. (CXX) g++ options: -std=c++0x -msse2 -msse3 -mssse3 -mno-avx -mno-avx2 -mno-xop -mno-fma4 -mno-avx512f -mno-avx512vl -mno-avx512pf -mno-
Timed HMMer Search 2.3.2
Pfam Database Search
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.010, N = 3
4.281
Ryzen 9 3950X
SE +/- 0.047, N = 3
5.086
1.1444
2.2888
3.4332
4.5776
5.722
1. (CC) gcc options: -O2 -pthread -lhmmer -lsquid -lm
Nettle 3.5.1
Test: aes256
Mbyte/s, More Is Better
Core i9 10900K
SE +/- 0.67, N = 3
MIN: 5463.26 / MAX: 13393.58
8093.59
Ryzen 9 3950X
SE +/- 2.31, N = 3
MIN: 4420.71 / MAX: 9519.51
6114.17
2K
4K
6K
8K
10K
1. (CC) gcc options: -O2 -ggdb3 -lnettle -lgmp -lm -lcrypto

x264 2019-12-17

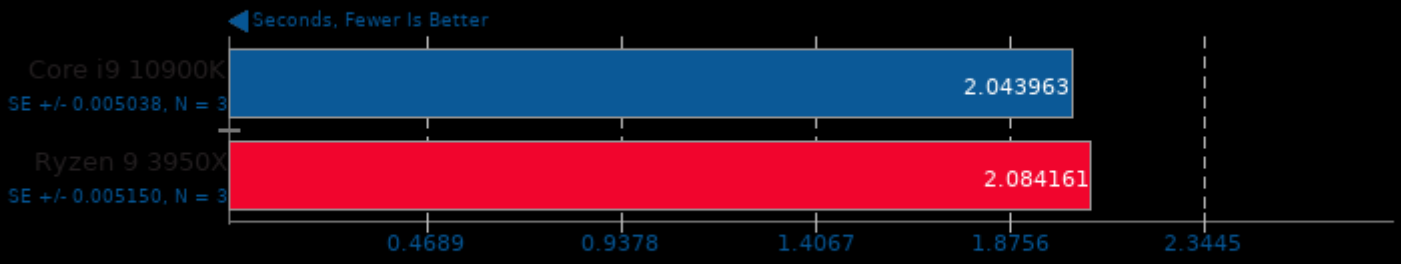
H.264 Video Encoding



1. (CC) gcc options: -ldl -lavformat -lavcodec -lavutil -lswscale -m64 -lm -lpthread -O3 -ffast-math -std=gnu99 -fPIC -fomit-frame-pointer -fno-tree-vectori

Bullet Physics Engine 2.81

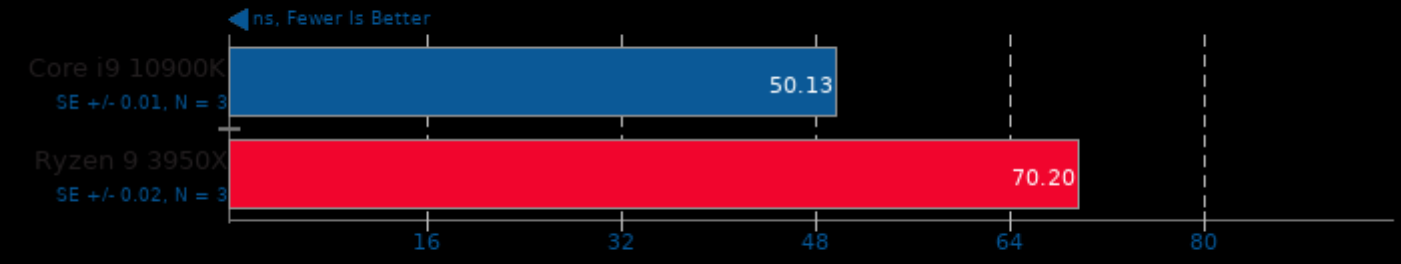
Test: Raytests



1. (CXX) g++ options: -O3 -rdynamic -lglut -lGL -lGLU

Multichase Pointer Chaser

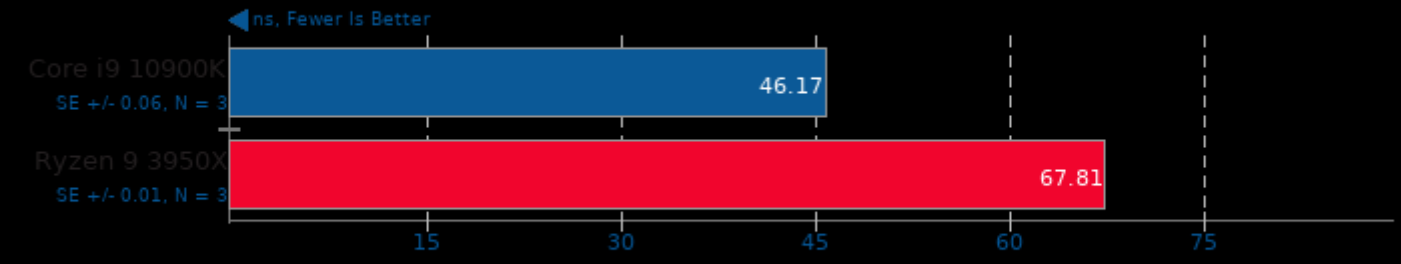
Test: 1GB Array, 256 Byte Stride, 4 Threads



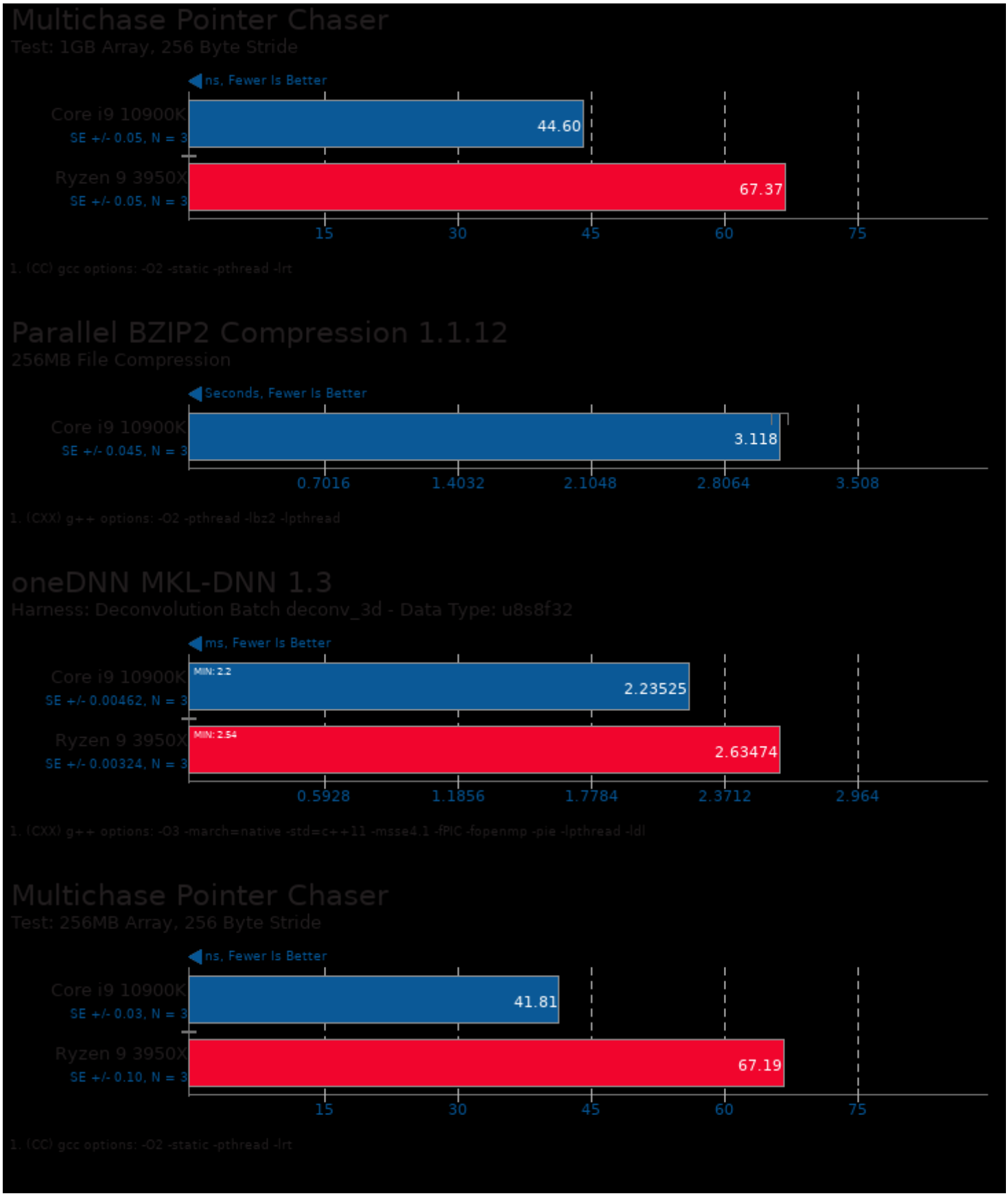
1. (CC) gcc options: -O2 -static -pthread -lrt

Multichase Pointer Chaser

Test: 1GB Array, 256 Byte Stride, 2 Threads

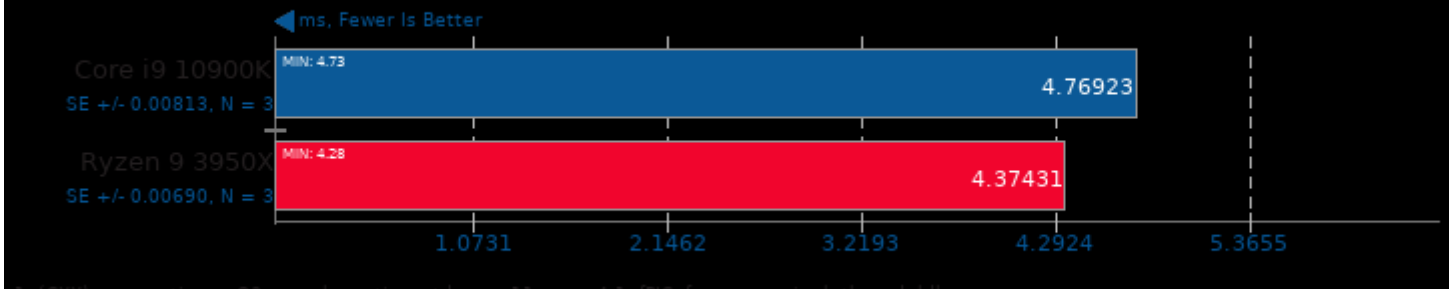


1. (CC) gcc options: -O2 -static -pthread -lrt


Multichase Pointer Chaser
Test: 1GB Array, 256 Byte Stride
ns, Fewer Is Better
Core i9 10900K
SE +/- 0.05, N = 3
44.60
Ryzen 9 3950X
SE +/- 0.05, N = 3
67.37
15
30
45
60
75
1. (CC) gcc options: -O2 -static -pthread -lrt
Parallel BZIP2 Compression 1.1.12
256MB File Compression
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.045, N = 3
3.118
0.7016
1.4032
2.1048
2.8064
3.508
1. (CXX) g++ options: -O2 -pthread -lbz2 -lpthread
oneDNN MKL-DNN 1.3
Harness: Deconvolution Batch deconv_3d - Data Type: u8s8f32
ms, Fewer Is Better
Core i9 10900K
SE +/- 0.00462, N = 3
MIN: 2.2
2.23525
Ryzen 9 3950X
SE +/- 0.00324, N = 3
MIN: 2.54
2.63474
0.5928
1.1856
1.7784
2.3712
2.964
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl
Multichase Pointer Chaser
Test: 256MB Array, 256 Byte Stride
ns, Fewer Is Better
Core i9 10900K
SE +/- 0.03, N = 3
41.81
Ryzen 9 3950X
SE +/- 0.10, N = 3
67.19
15
30
45
60
75
1. (CC) gcc options: -O2 -static -pthread -lrt

oneDNN MKL-DNN 1.3

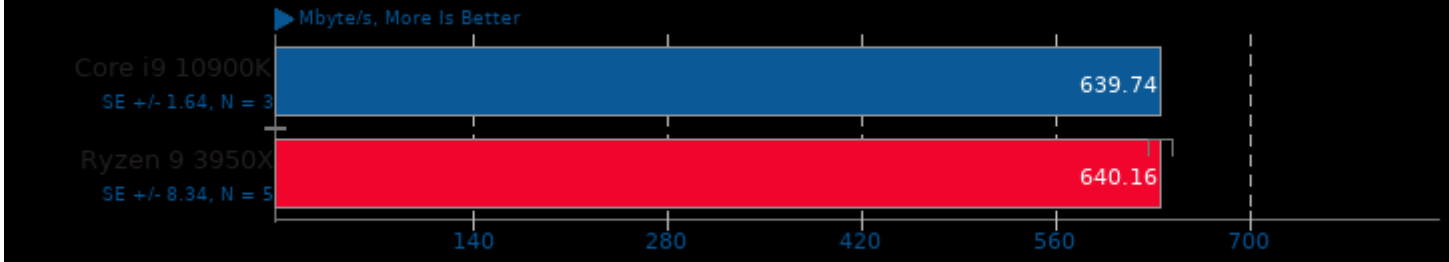
Harness: Deconvolution Batch deconv_3d - Data Type: f32



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

Nettle 3.5.1

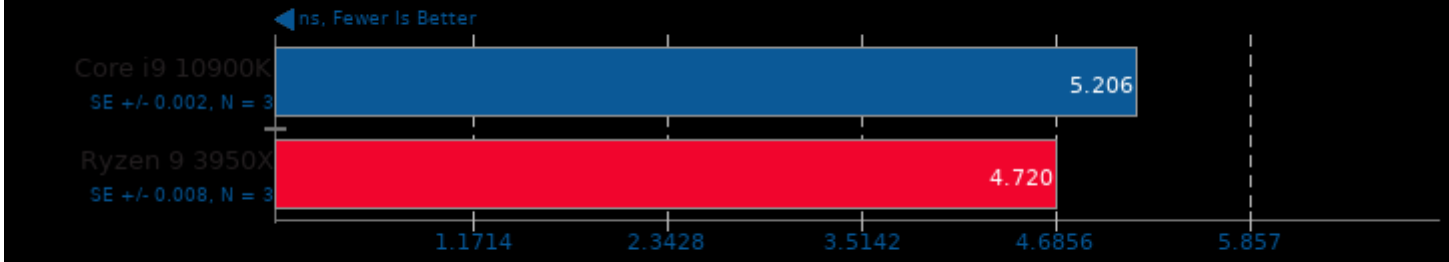
Test: sha512



1. (CC) gcc options: -O2 -ggdb3 -lnettle -lgmp -lm -lcrypto

Multichase Pointer Chaser

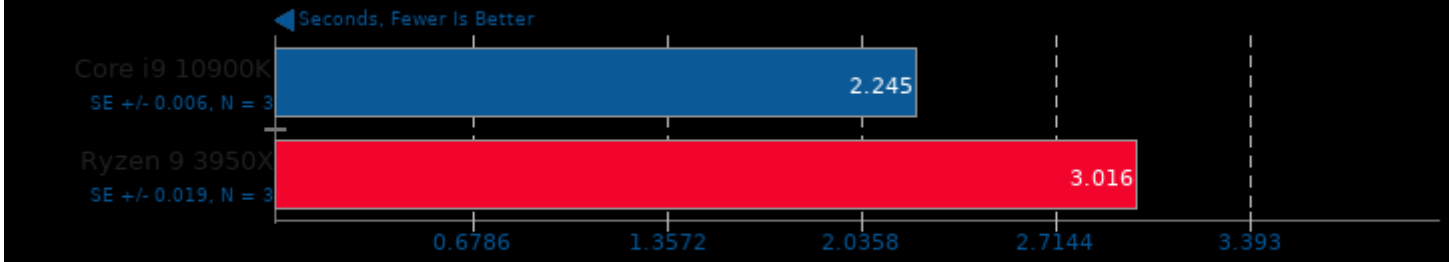
Test: 4MB Array, 64 Byte Stride



1. (CC) gcc options: -O2 -static -pthread -lrt

Hackbench

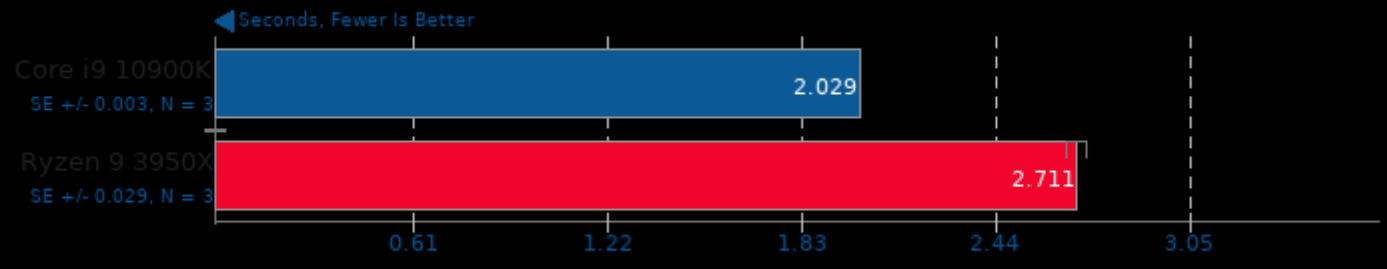
Count: 1 - Type: Thread



1. (CC) gcc options: -lpthread

Hackbench

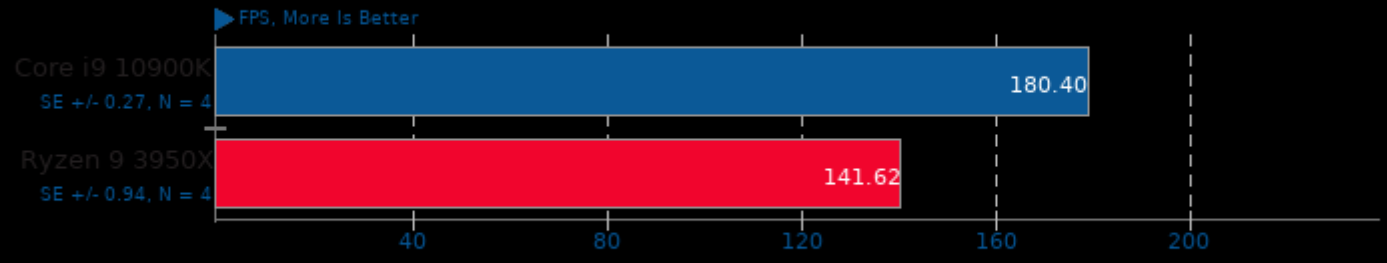
Count: 1 - Type: Process



1. (CC) gcc options: -lpthread

Optcarrot

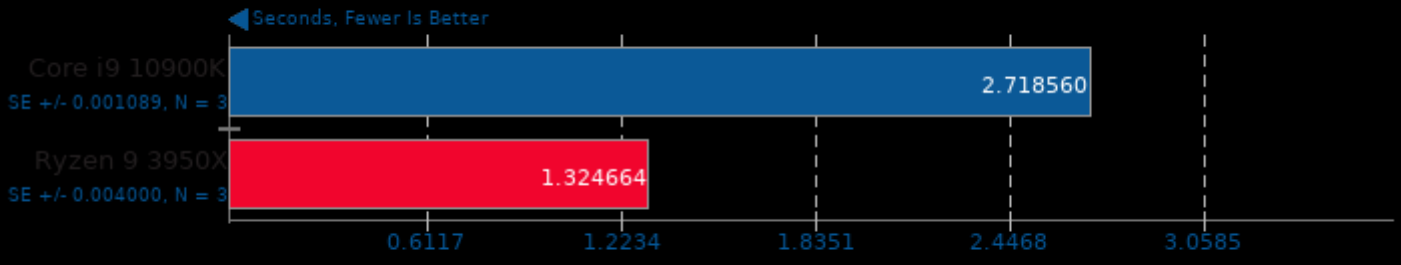
Optimized Benchmark



1. ruby 2.7.0p0 (2019-12-25 revision 647ee6f091) [x86_64-linux-gnu]

Parboil 2.5

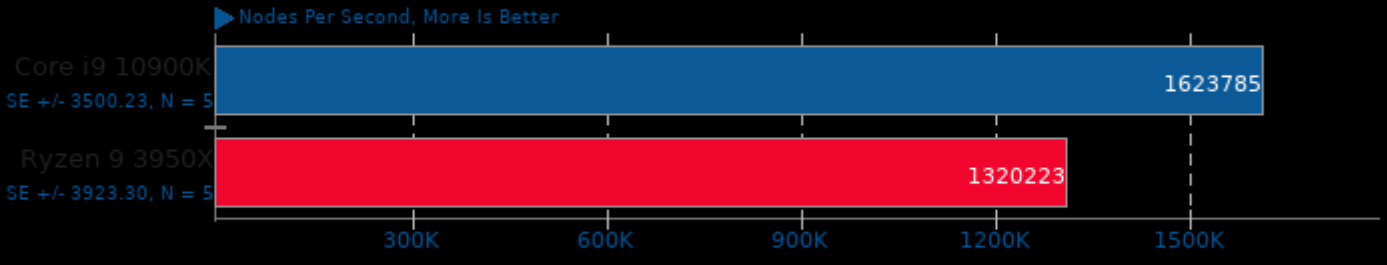
Test: OpenMP CUTCP



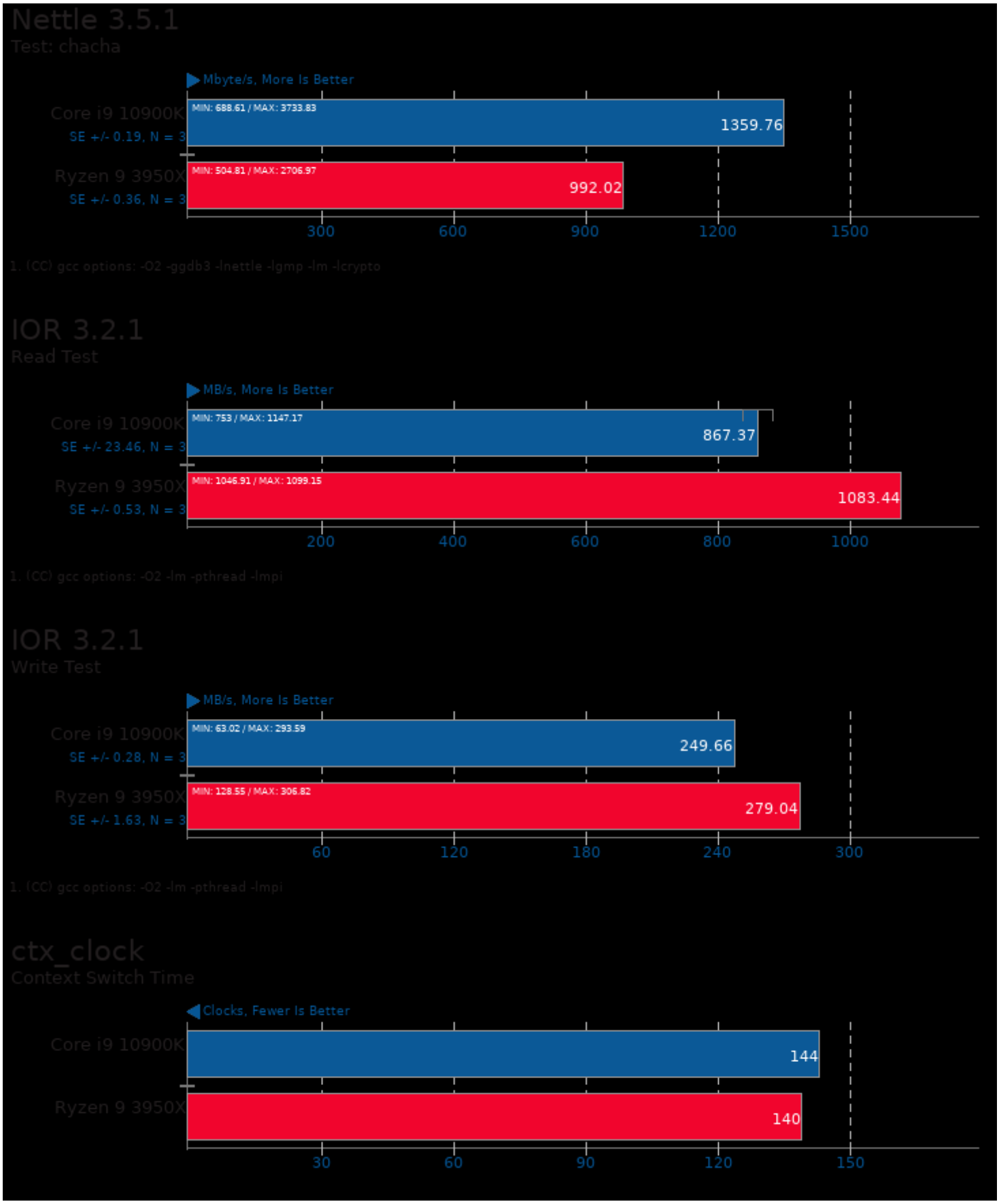
1. (CXX) g++ options: -lm -lpthread -lgomp -O3 -ffast-math -fopenmp

TSCP 1.81

AI Chess Performance

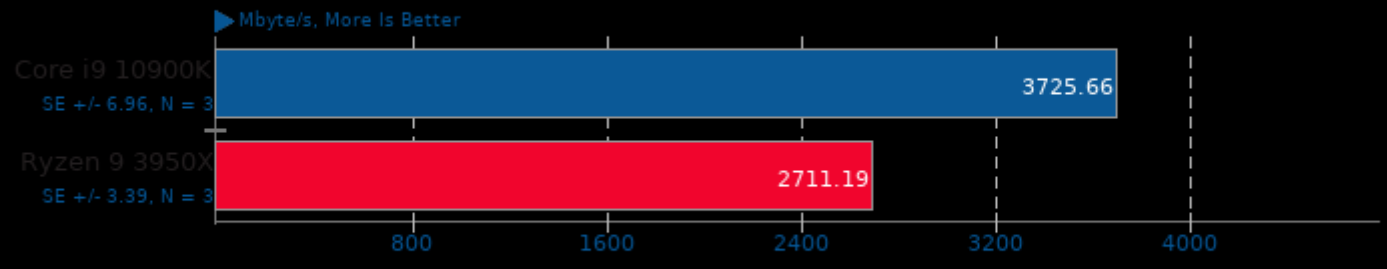


1. (CC) gcc options: -O3 -march=native


Nettle 3.5.1
Test: chacha
Mbyte/s, More Is Better
Core i9 10900K
SE +/- 0.19, N = 3
MIN: 688.61 / MAX: 3733.83
1359.76
Ryzen 9 3950X
SE +/- 0.36, N = 3
MIN: 504.81 / MAX: 2706.97
992.02
300
600
900
1200
1500
1. (CC) gcc options: -O2 -ggdb3 -lnettle -lgmp -lm -lcrypto
IOR 3.2.1
Read Test
MB/s, More Is Better
Core i9 10900K
SE +/- 23.46, N = 3
MIN: 753 / MAX: 1147.17
867.37
Ryzen 9 3950X
SE +/- 0.53, N = 3
MIN: 1046.91 / MAX: 1099.15
1083.44
200
400
600
800
1000
1. (CC) gcc options: -O2 -lm -pthread -lmpi
IOR 3.2.1
Write Test
MB/s, More Is Better
Core i9 10900K
SE +/- 0.28, N = 3
MIN: 63.02 / MAX: 293.59
249.66
Ryzen 9 3950X
SE +/- 1.63, N = 3
MIN: 128.55 / MAX: 306.82
279.04
60
120
180
240
300
1. (CC) gcc options: -O2 -lm -pthread -lmpi
ctx_clock
Context Switch Time
Clocks, Fewer Is Better
Core i9 10900K
144
Ryzen 9 3950X
140
30
60
90
120
150

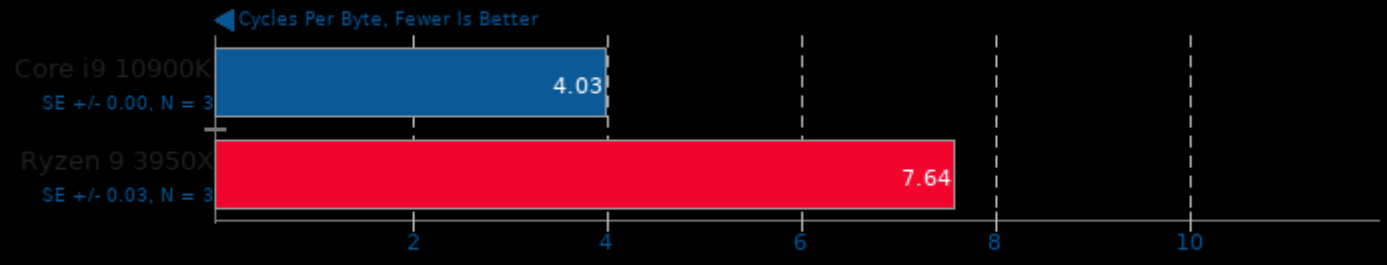
Nettle 3.5.1

Test: poly1305-aes



1. (CC) gcc options: -O2 -ggdb3 -lnettle -lgmp -lm -lcrypto

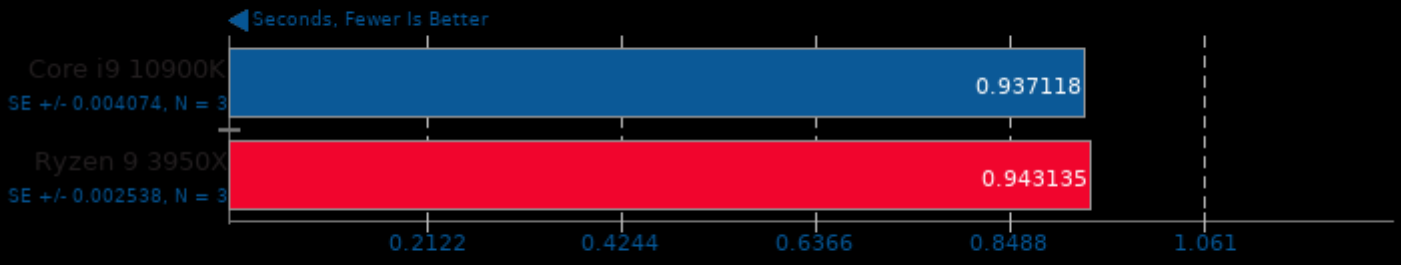
BLAKE2 20170307



1. (CC) gcc options: -O3 -march=native -lcrypto -lz

Bullet Physics Engine 2.81

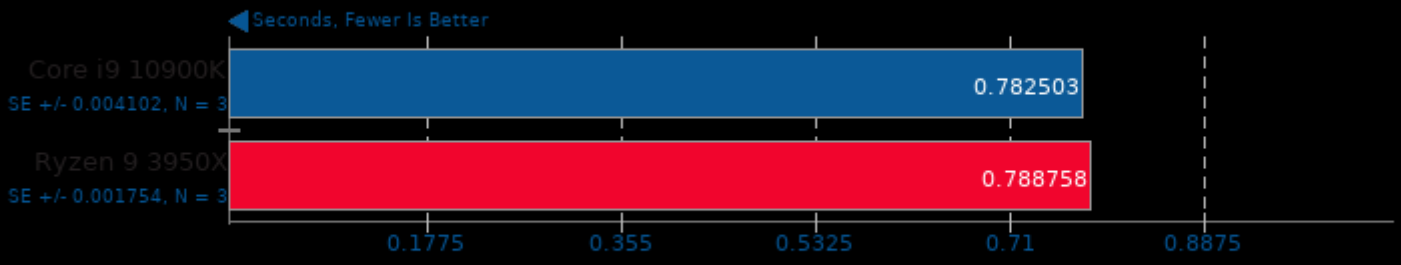
Test: Convex Trimesh



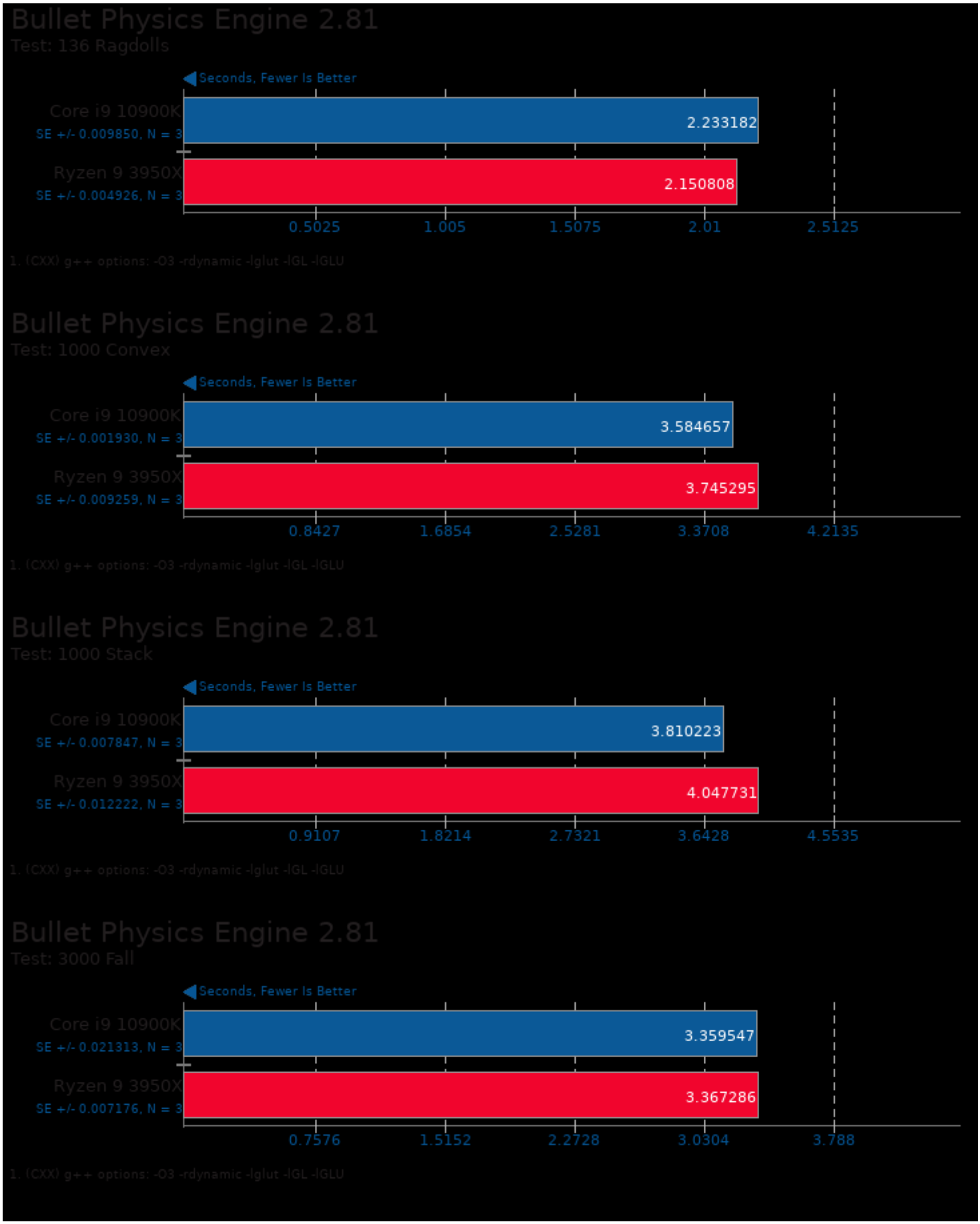
1. (CXX) g++ options: -O3 -rdynamic -lglut -lGL -lGLU

Bullet Physics Engine 2.81

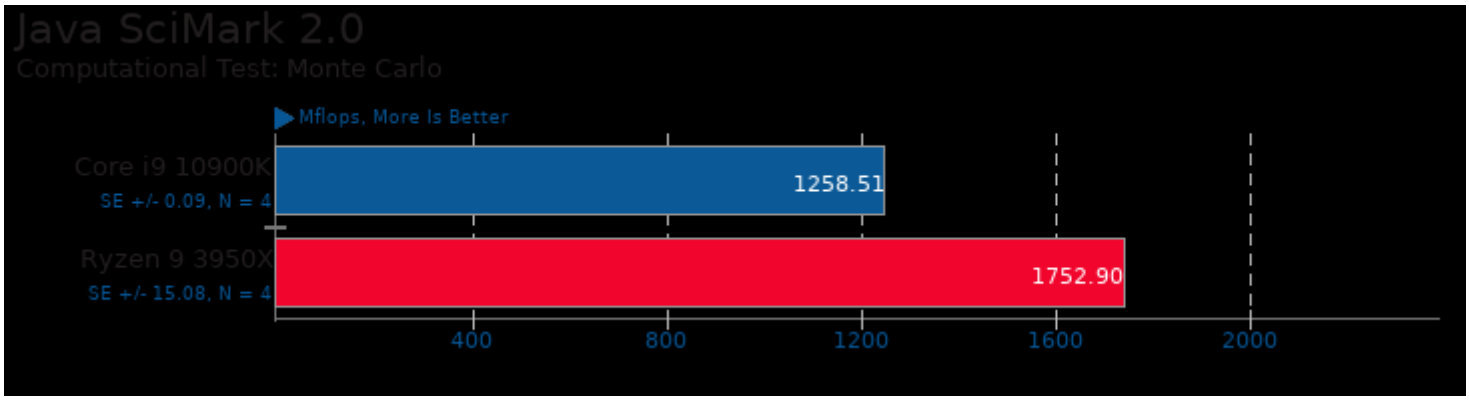
Test: Prim Trimesh



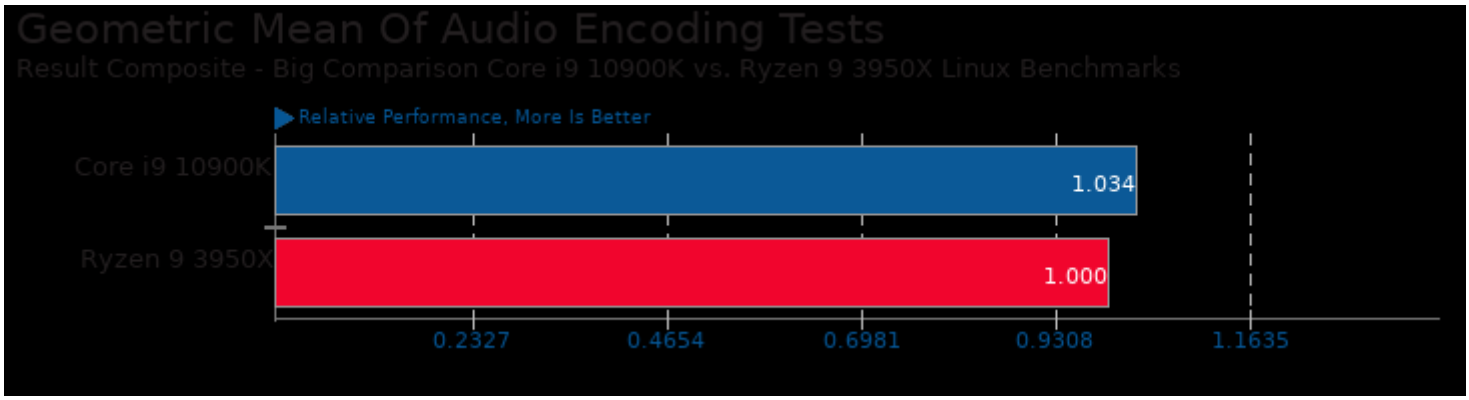
1. (CXX) g++ options: -O3 -rdynamic -lglut -lGL -lGLU


Bullet Physics Engine 2.81
Test: 136 Ragdolls
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.009850, N = 3
2.233182
Ryzen 9 3950X
SE +/- 0.004926, N = 3
2.150808
0.5025
1.005
1.5075
2.01
2.5125
1. (CXX) g++ options: -O3 -rdynamic -lglut -lGL -lGLU
Bullet Physics Engine 2.81
Test: 1000 Convex
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.001930, N = 3
3.584657
Ryzen 9 3950X
SE +/- 0.009259, N = 3
3.745295
0.8427
1.6854
2.5281
3.3708
4.2135
1. (CXX) g++ options: -O3 -rdynamic -lglut -lGL -lGLU
Bullet Physics Engine 2.81
Test: 1000 Stack
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.007847, N = 3
3.810223
Ryzen 9 3950X
SE +/- 0.012222, N = 3
4.047731
0.9107
1.8214
2.7321
3.6428
4.5535
1. (CXX) g++ options: -O3 -rdynamic -lglut -lGL -lGLU
Bullet Physics Engine 2.81
Test: 3000 Fall
Seconds, Fewer Is Better
Core i9 10900K
SE +/- 0.021313, N = 3
3.359547
Ryzen 9 3950X
SE +/- 0.007176, N = 3
3.367286
0.7576
1.5152
2.2728
3.0304
3.788
1. (CXX) g++ options: -O3 -rdynamic -lglut -lGL -lGLU

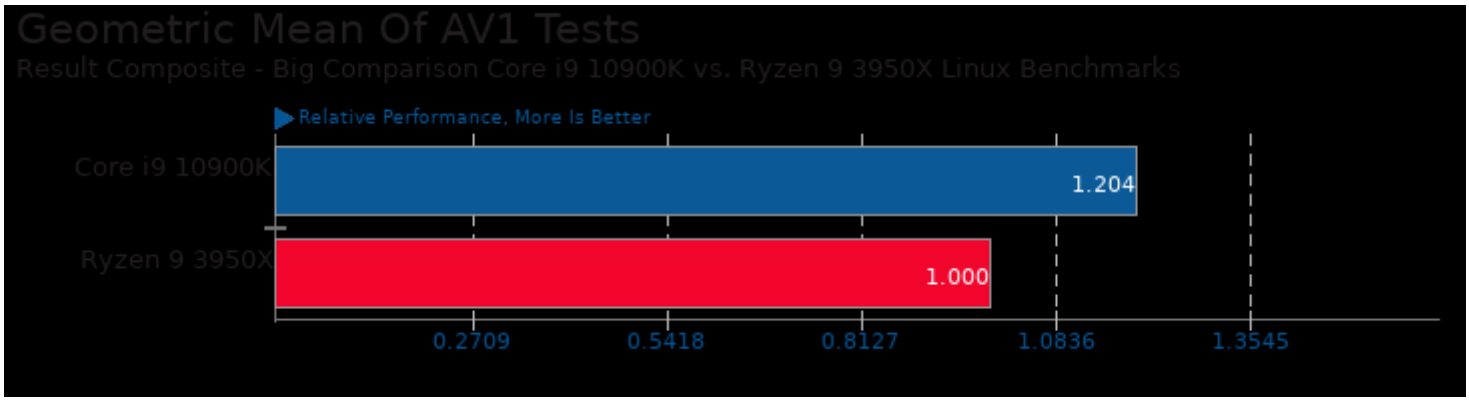

Java SciMark 2.0
Computational Test: Jacobi Successive Over-Relaxation
Mflops, More Is Better
Core i9 10900K
SE +/- 0.65, N = 4
1993.88
Ryzen 9 3950X
SE +/- 14.29, N = 4
2073.68
400
800
1200
1600
2000
Java SciMark 2.0
Computational Test: Dense LU Matrix Factorization
Mflops, More Is Better
Core i9 10900K
SE +/- 35.73, N = 4
7302.38
Ryzen 9 3950X
SE +/- 100.10, N = 4
6834.75
1600
3200
4800
6400
8000
Java SciMark 2.0
Computational Test: Sparse Matrix Multiply
Mflops, More Is Better
Core i9 10900K
SE +/- 3.66, N = 4
2779.91
Ryzen 9 3950X
SE +/- 24.78, N = 4
2784.06
600
1200
1800
2400
3000
Java SciMark 2.0
Computational Test: Fast Fourier Transform
Mflops, More Is Better
Core i9 10900K
SE +/- 8.64, N = 4
1930.39
Ryzen 9 3950X
SE +/- 22.10, N = 4
2134.31
500
1000
1500
2000
2500


Java SciMark 2.0
Computational Test: Monte Carlo
Mflops, More Is Better
Core i9 10900K
SE +/- 0.09, N = 4
1258.51
Ryzen 9 3950X
SE +/- 15.08, N = 4
1752.90
400
800
1200
1600
2000

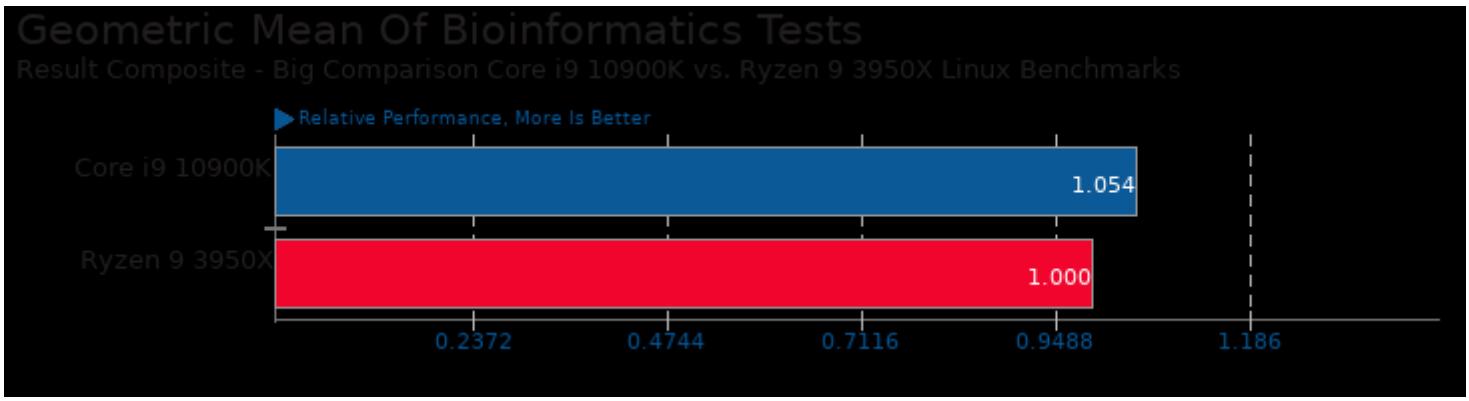
These geometric means are based upon test groupings / test suites for this result file.



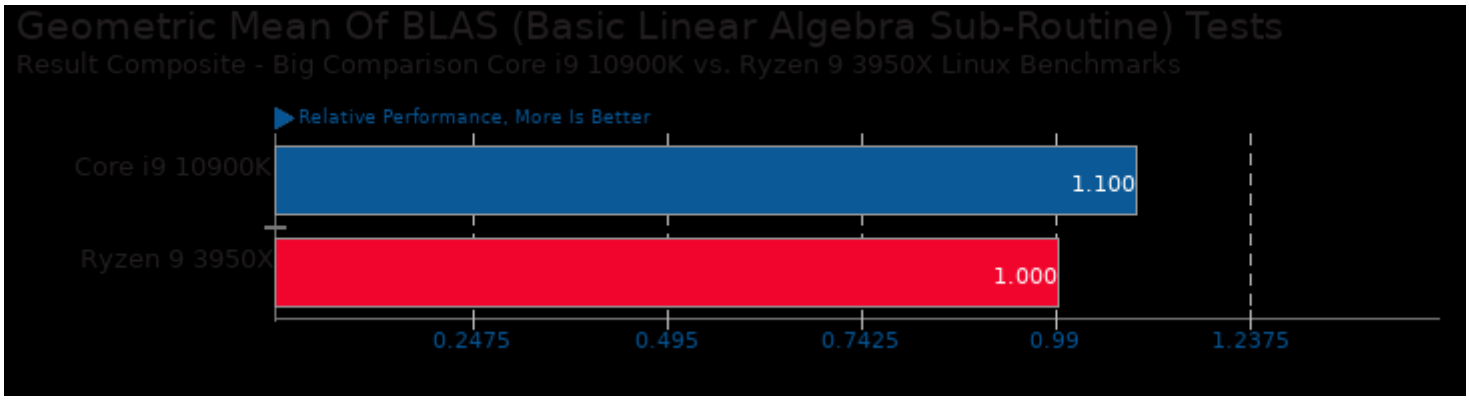
Geometric mean based upon tests: pts/encode-mp3 and pts/encode-flac



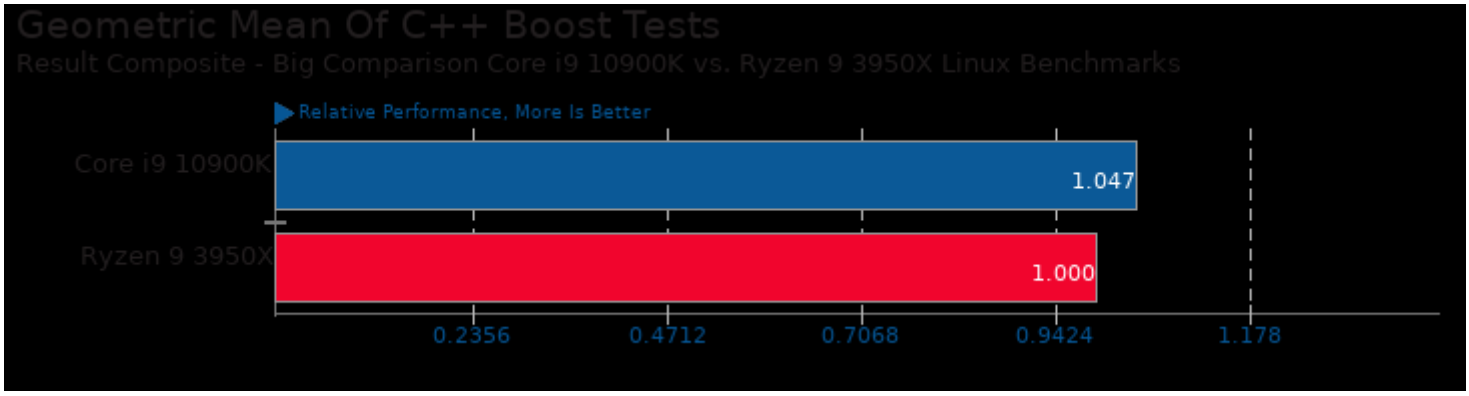
Geometric mean based upon tests: pts/dav1d, pts/aom-av1, pts/libgav1 and pts/rav1e



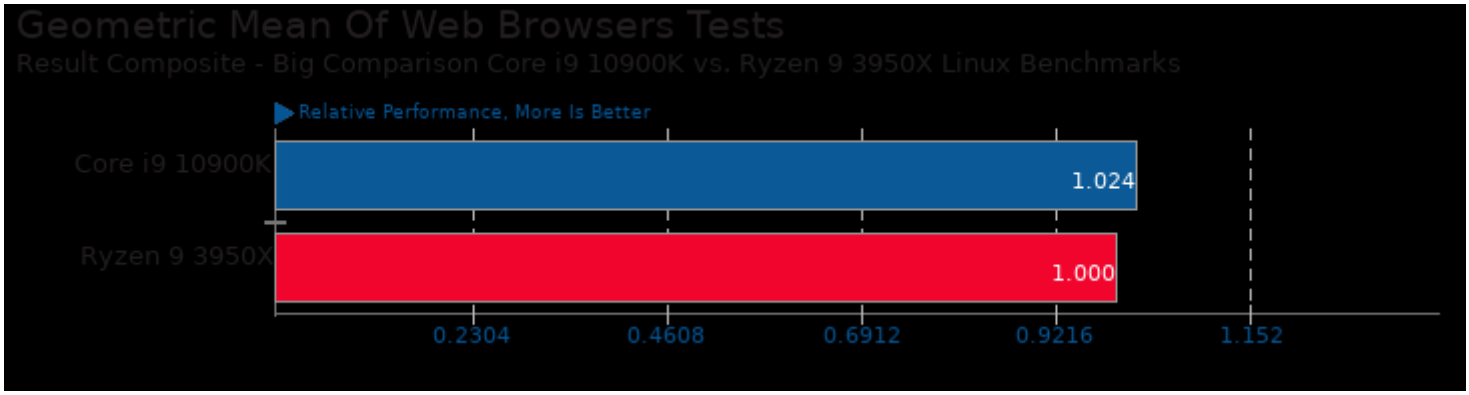
Geometric mean based upon tests: pts/himeno, pts/mrbayes and pts/hmmer



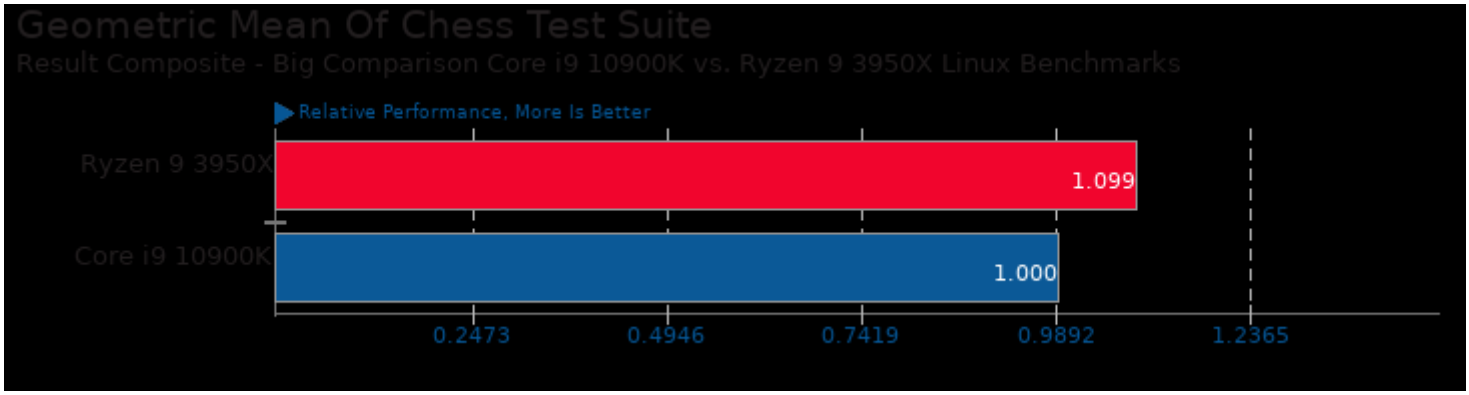
Geometric mean based upon tests: pts/nwchem and pts/lczero



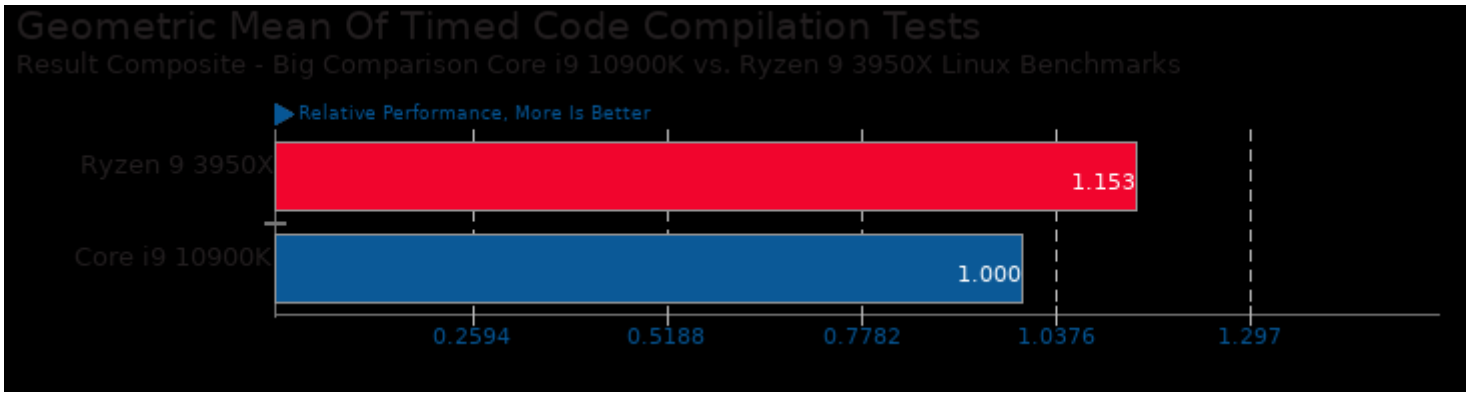
Geometric mean based upon tests: pts/core-latency, pts/minion and pts/yafaray



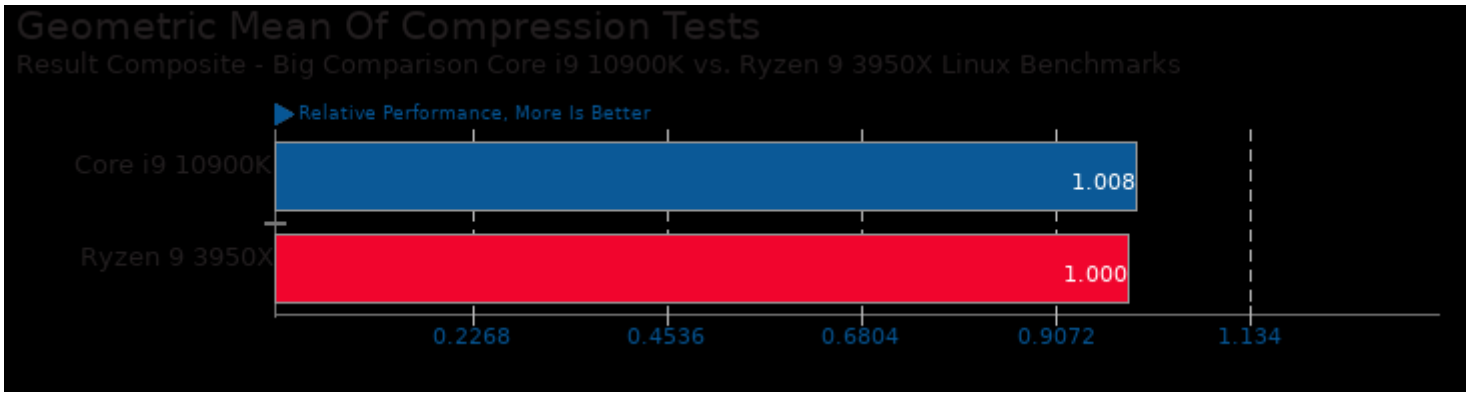
Geometric mean based upon tests: system/selenium



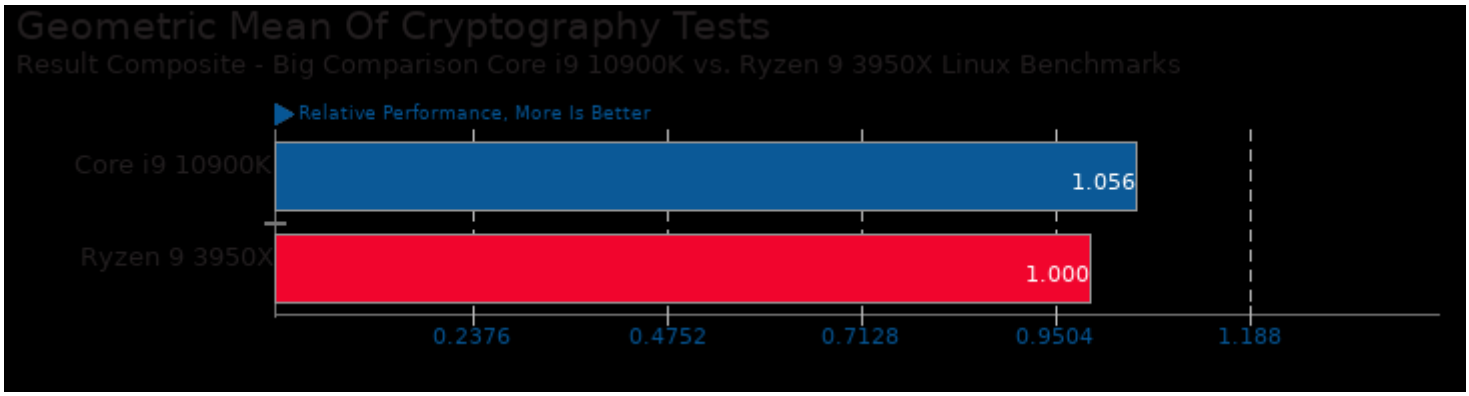
Geometric mean based upon tests: pts/tscp, pts/lczero, pts/stockfish, pts/asmfish, pts/n-queens and pts/m-queens



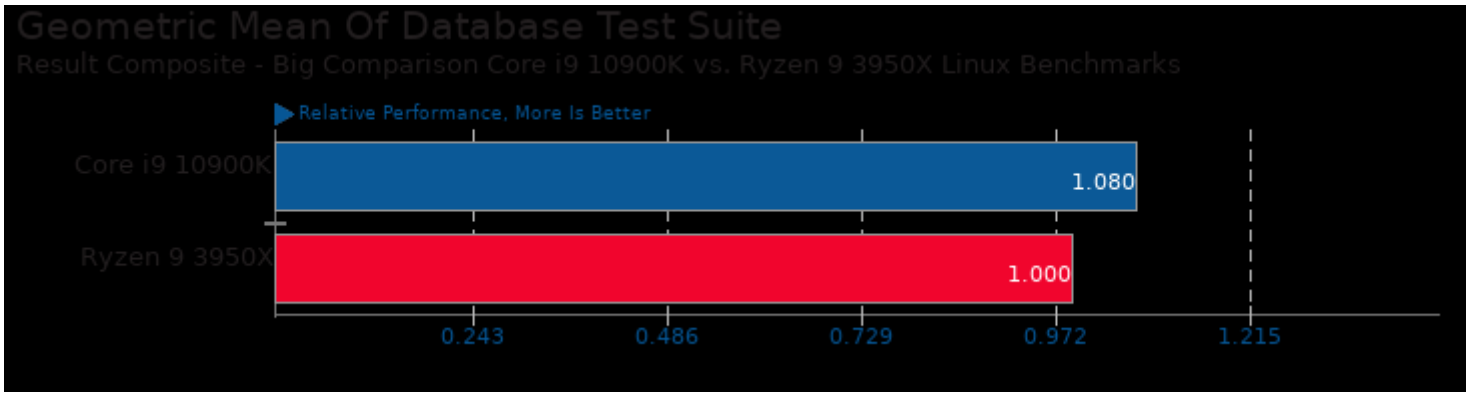
Geometric mean based upon tests: pts/build-apache, pts/build-php, pts/build-linux-kernel, pts/build-imagemagick, pts/build-gcc, pts/build-gdb, pts/build-llvm, pts/build-ffmpeg, pts/build-mplayer and pts/build2



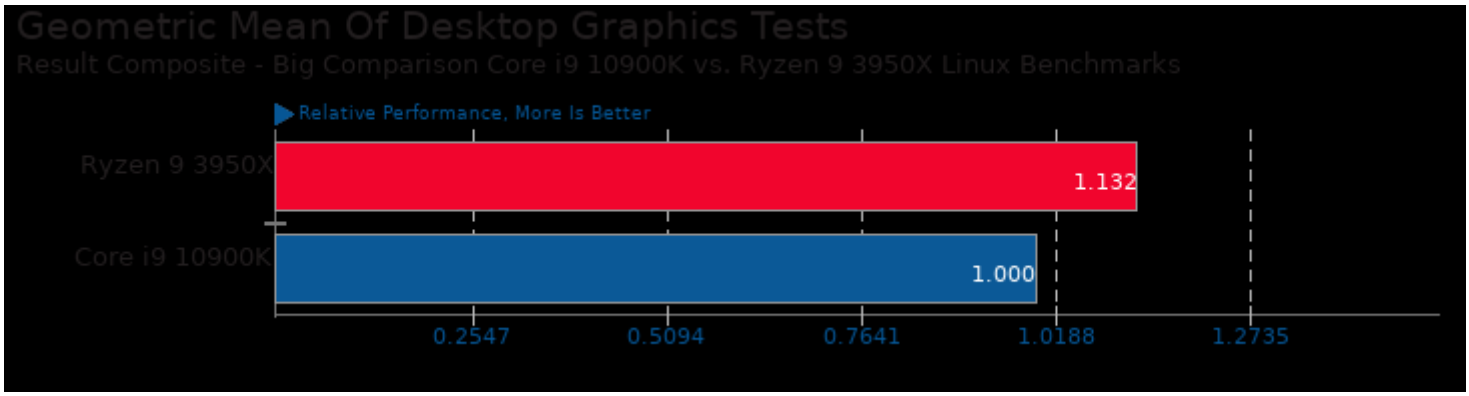
Geometric mean based upon tests: pts/compress-7zip, pts/compress-gzip, pts/compress-pbzip2, pts/compress-zstd, pts/compress-xz, pts/lzbench and pts/blosc



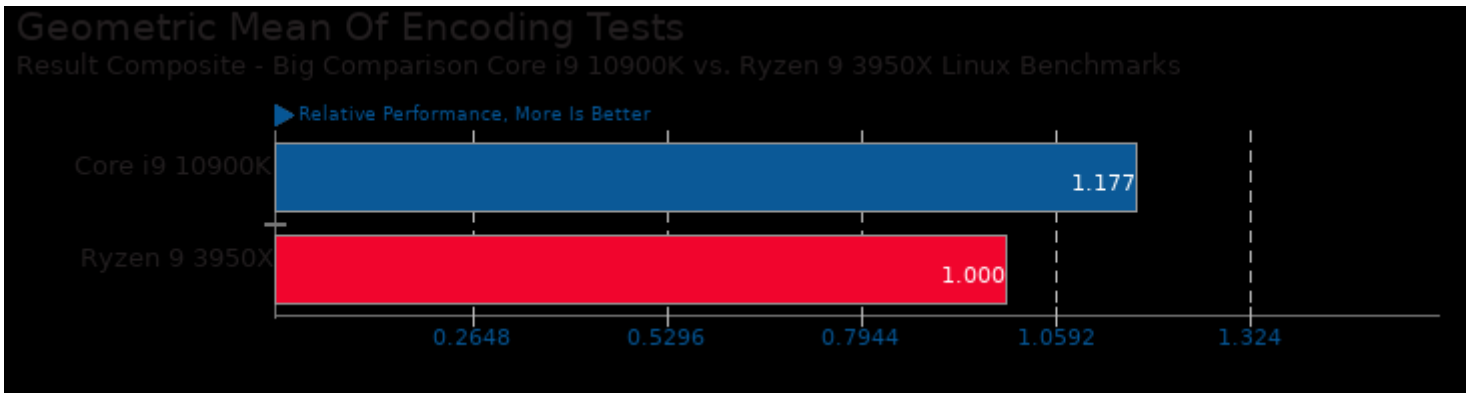
Geometric mean based upon tests: pts/gnupg, pts/openssl, pts/blake2, pts/john-the-ripper, pts/smhasher, pts/botan, pts/cryptopp, pts/bork, pts/nettle, pts/aircrack-ng and pts/cpuminer-opt



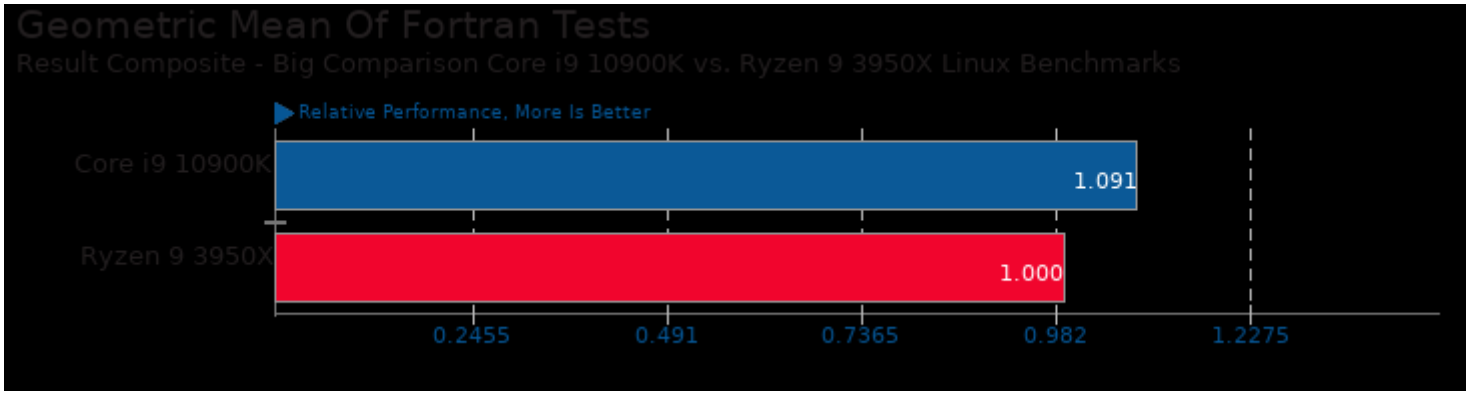
Geometric mean based upon tests: pts/sqlite-speedtest, pts/redis and pts/rocksdb



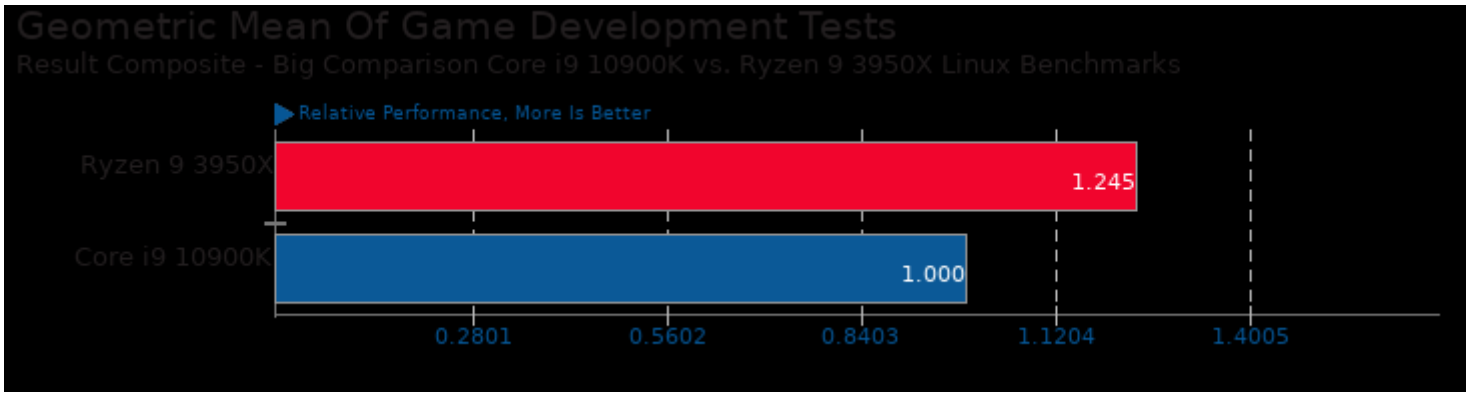
Geometric mean based upon tests: pts/xonotic, pts/tesseract, pts/paraview, pts/unigine-valley and pts/unigine-heaven



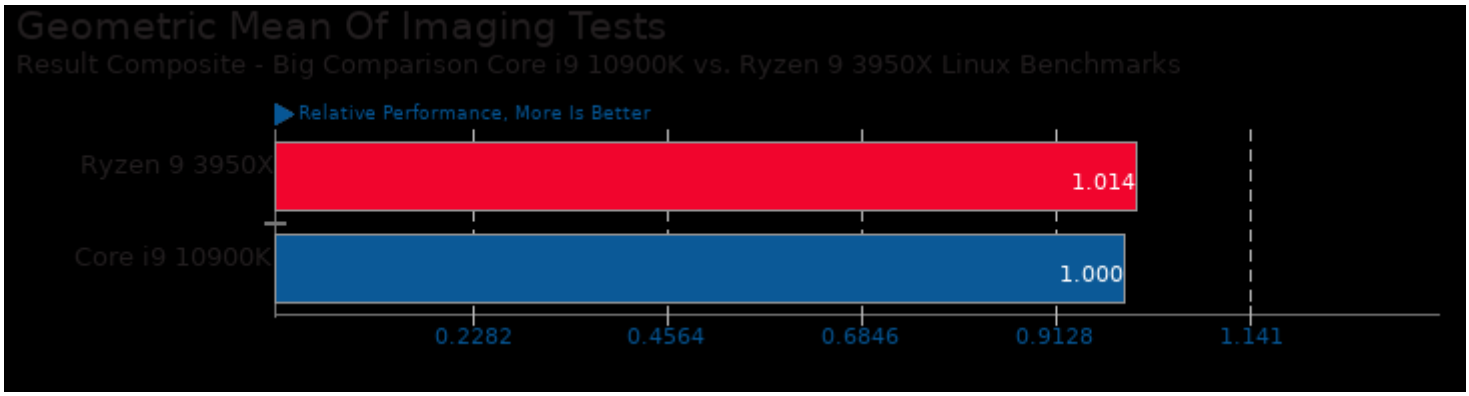
Geometric mean based upon tests: pts/encode-mp3, pts/encode-flac, pts/x264, pts/x265, pts/ffmpeg, pts/vpxenc, pts/dav1d, pts/aom-av1, pts/libgav1 and pts/rav1e



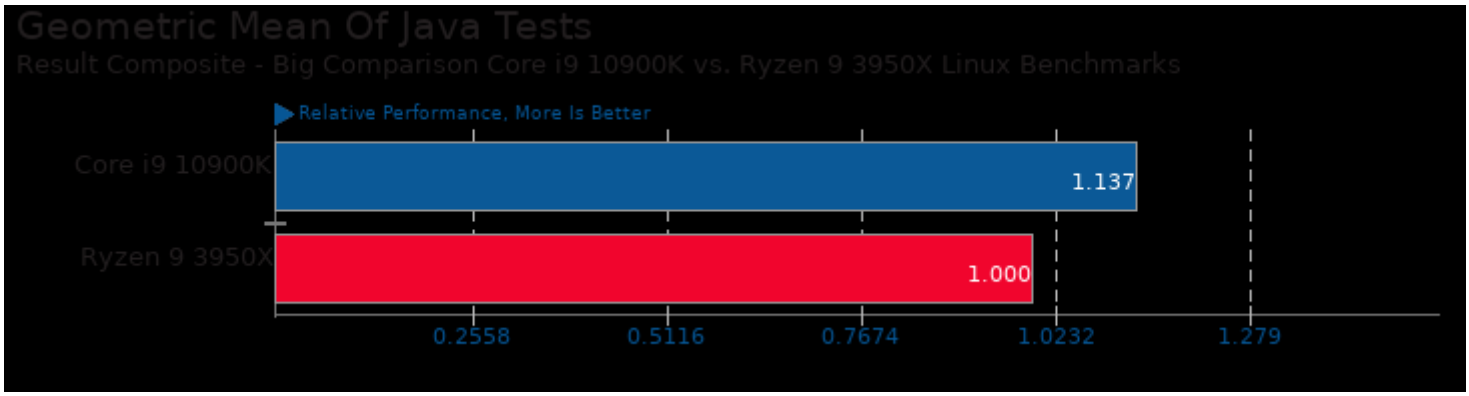
Geometric mean based upon tests: pts/nwchem, pts/polyhedron, pts/hpcg, pts/npb and pts/neat



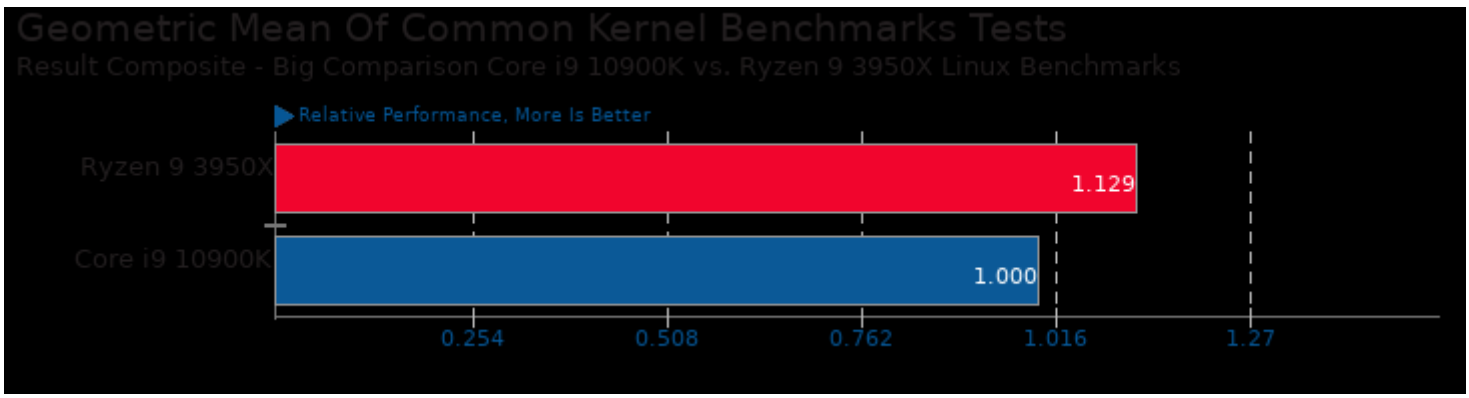
Geometric mean based upon tests: pts/basis, pts/blender, pts/oidn and pts/openvkl



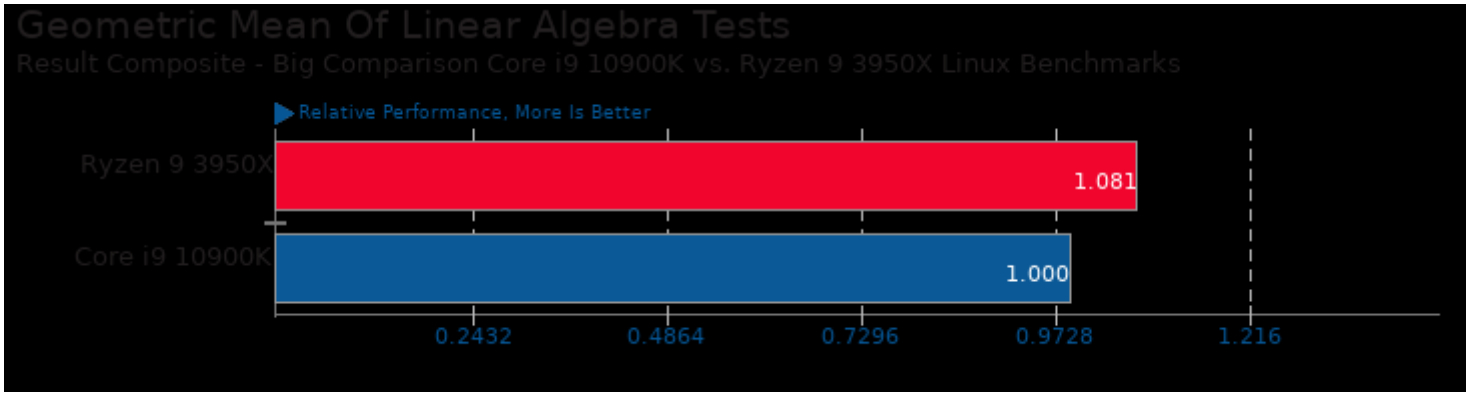
Geometric mean based upon tests: pts/graphics-magick, system/rawtherapee, pts/tjbench, system/gimp and system/gegl



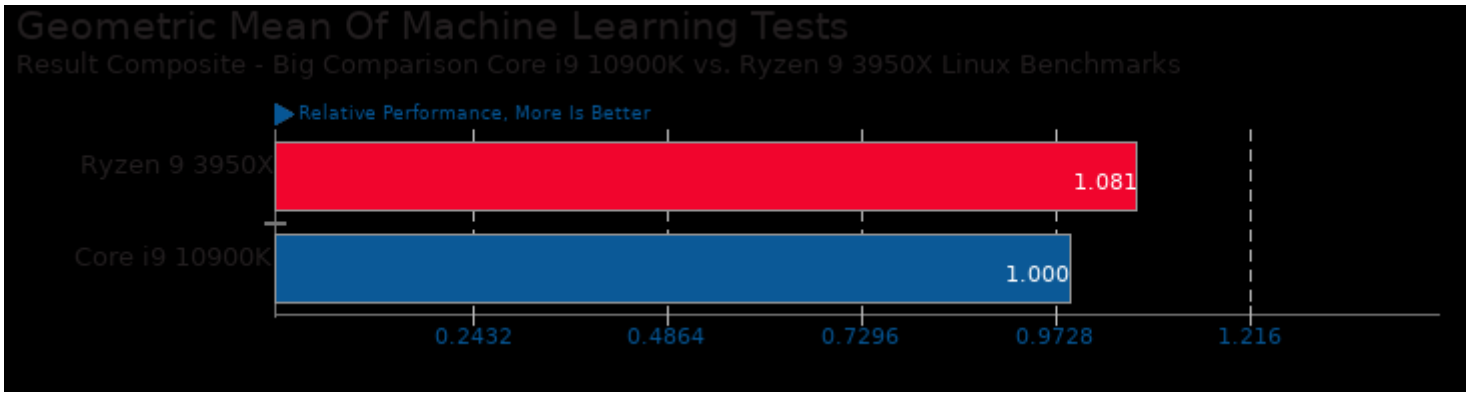
Geometric mean based upon tests: pts/bork, pts/java-scimark2, pts/dacapobench, pts/java-gradle-perf and pts/renaissance



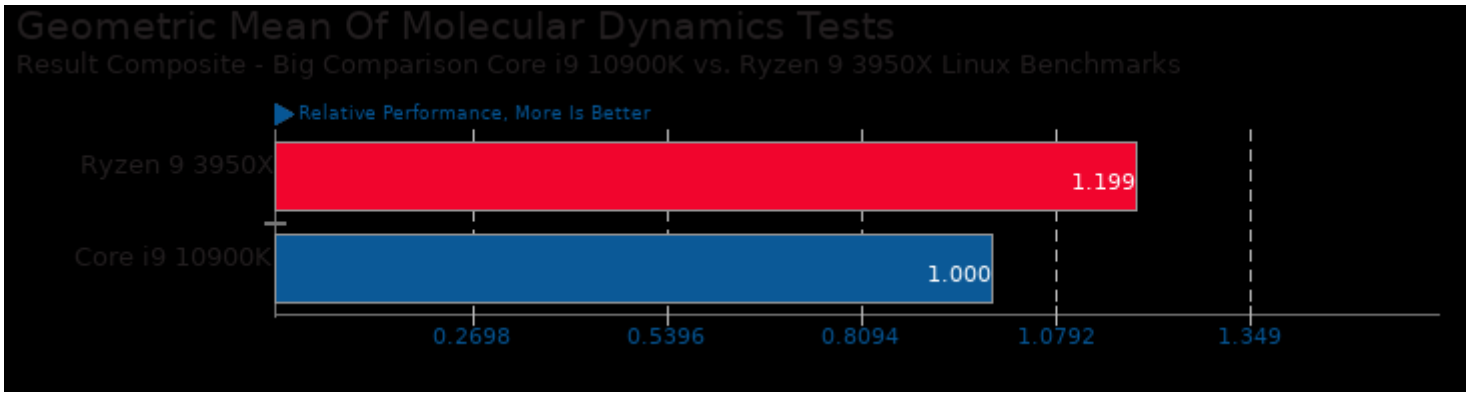
Geometric mean based upon tests: pts/sqlite-speedtest, pts/openssl, pts/ctx-clock, pts/hackbench, pts/ipc-benchmark, pts/stress-ng, pts/osbench and pts/rocksdb



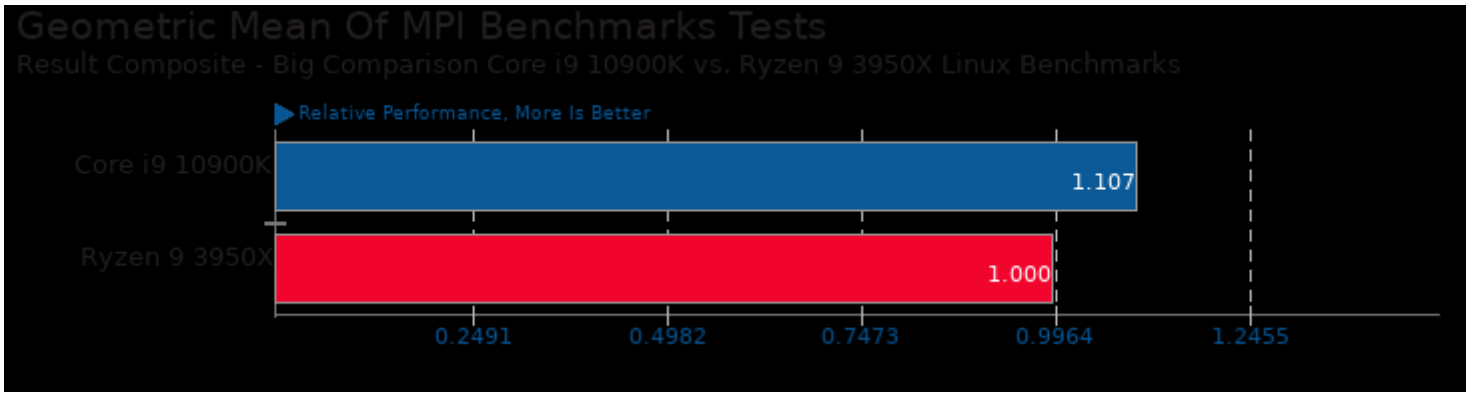
Geometric mean based upon tests: pts/mt-dgemm and pts/amg



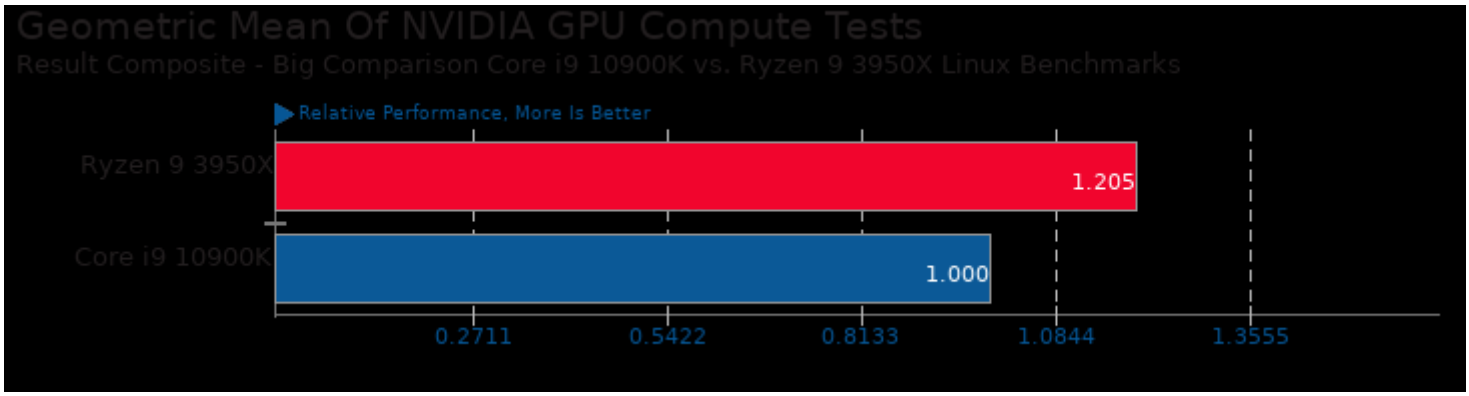
Geometric mean based upon tests: pts/numpy, pts/deepspeech, pts/scikit-learn, pts/mlpack, pts/numenta-nab, pts/plaidml and pts/lczero



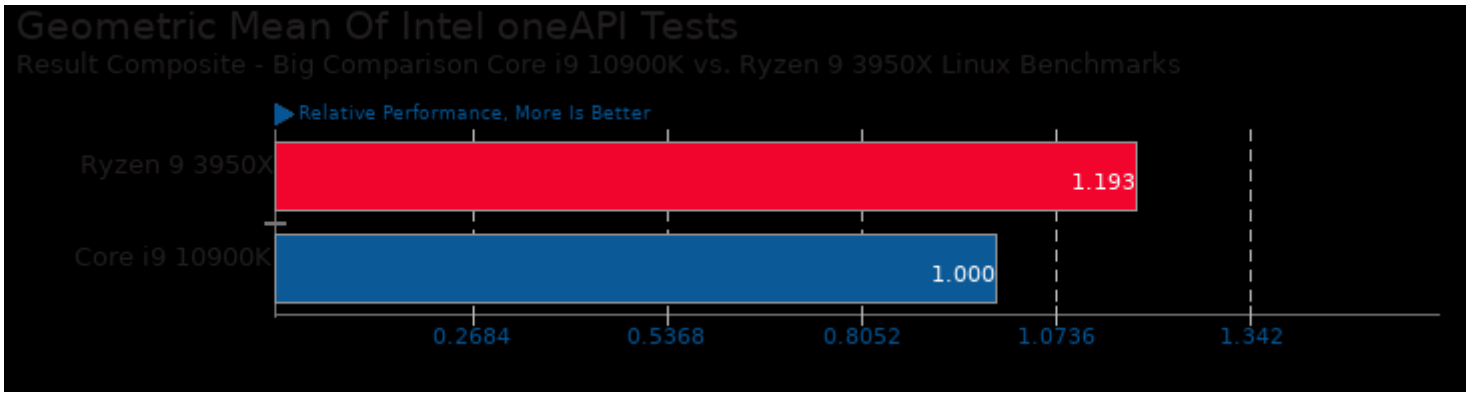
Geometric mean based upon tests: pts/namd, pts/gromacs, pts/cp2k, pts/nwchem, pts/lulesh and pts/pennant



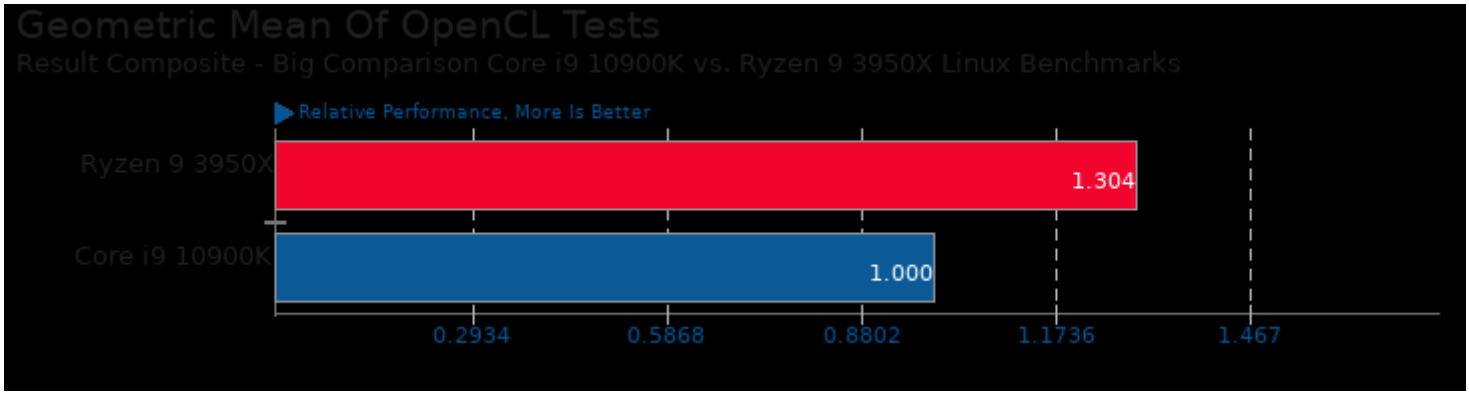
Geometric mean based upon tests: pts/askap, pts/gromacs, pts/pennant, pts/hpcg, pts/mrbayes and pts/npb



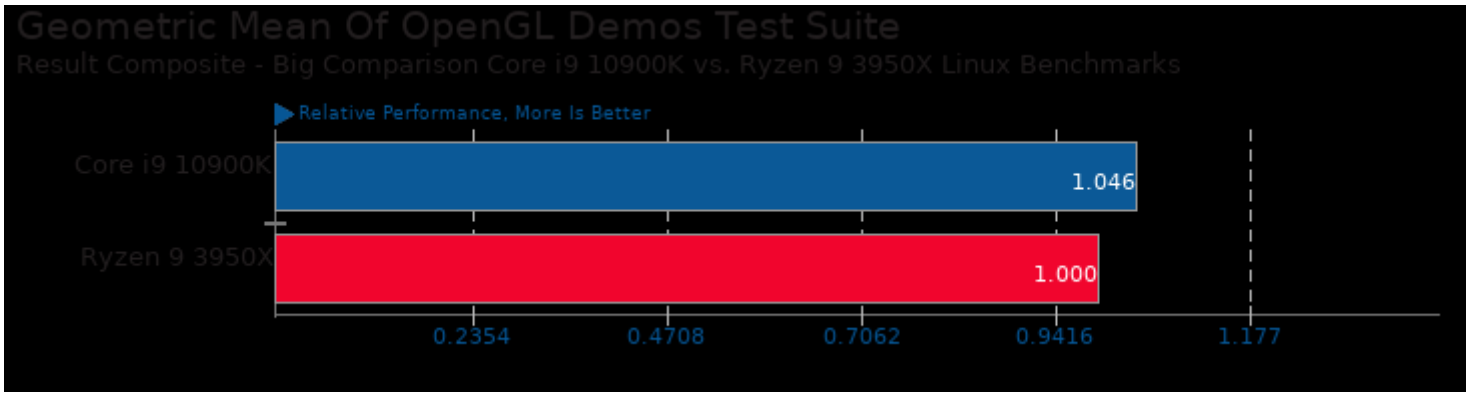
Geometric mean based upon tests: pts/gromacs, pts/luxcorerender, pts/rodinia, pts/neatbench, pts/plaidml, pts/lczero, pts/indigobench and pts/blender



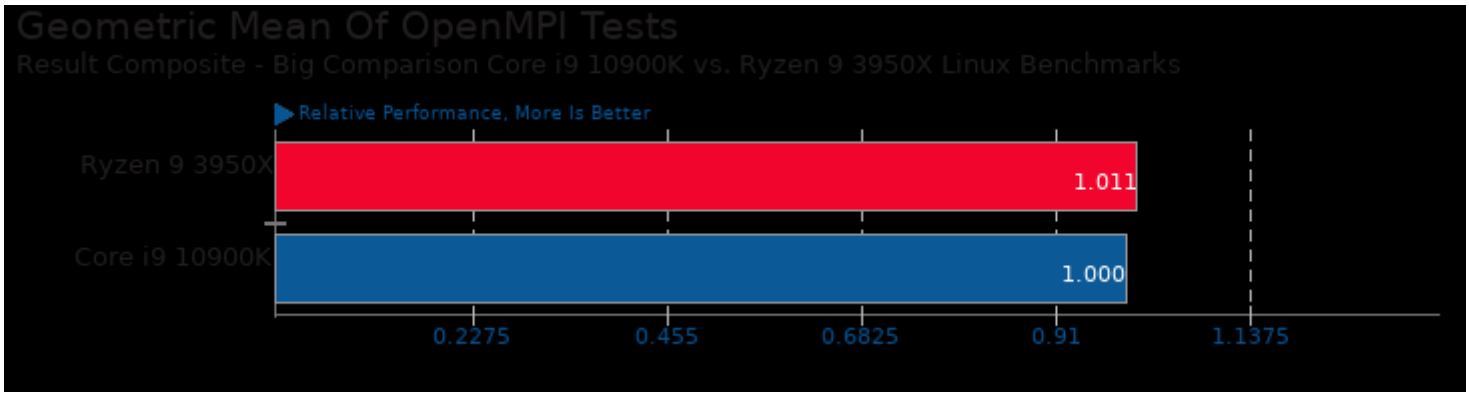
Geometric mean based upon tests: pts/embree, pts/oidn, pts/tungsten and pts/openvkl



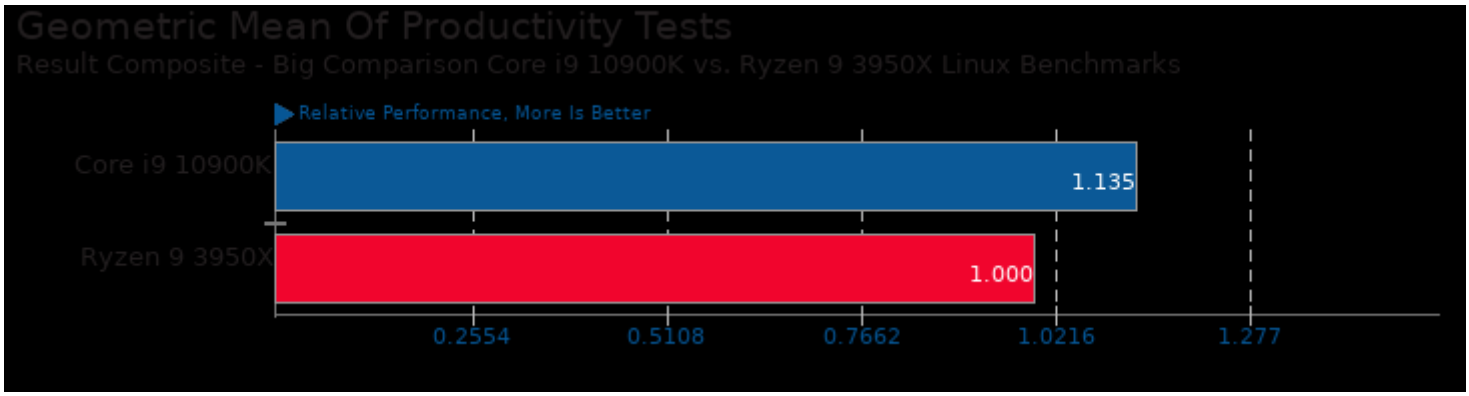
Geometric mean based upon tests: pts/rodinia and pts/parboil



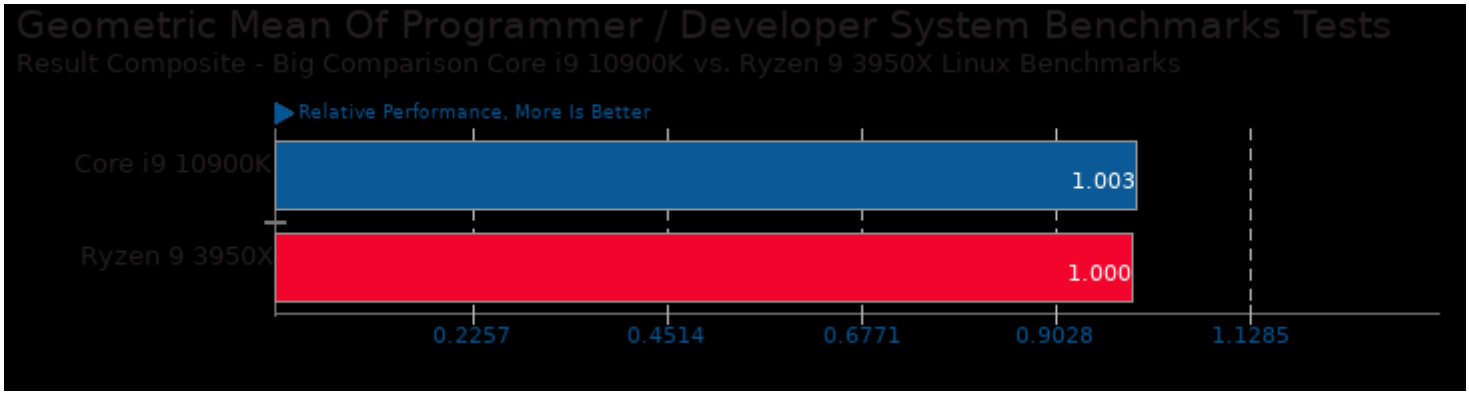
Geometric mean based upon tests: pts/unigine-valley, pts/unigine-heaven and pts/unigine-super



Geometric mean based upon tests: pts/pennant, pts/nwchem, pts/hpcg, pts/amg, pts/gromacs, pts/parboil, pts/npb, pts/askap, pts/mrbayes, pts/lulesh and pts/rodinia

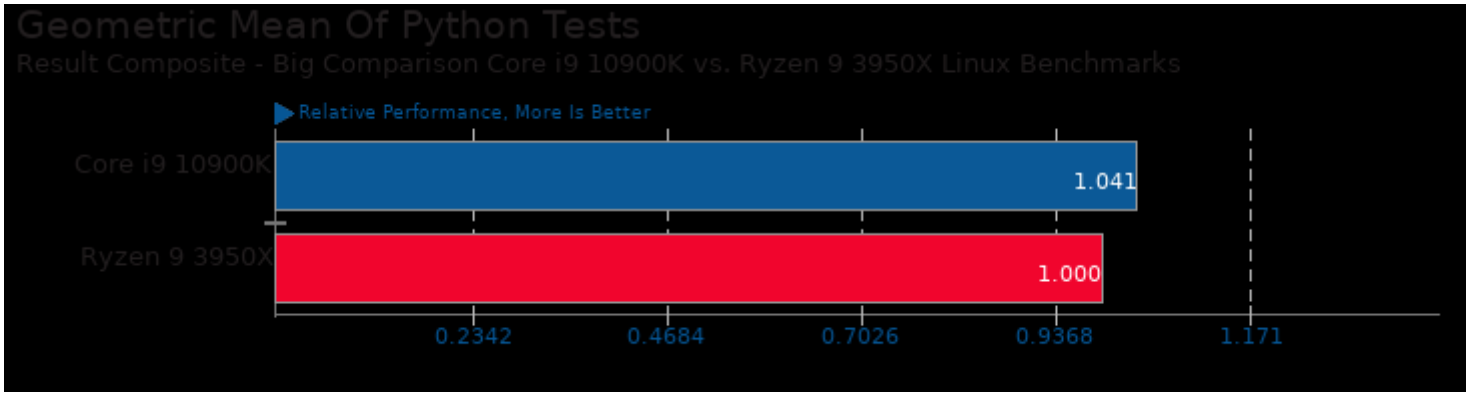


Geometric mean based upon tests: system/libreoffice, system/gimp and system/gegl

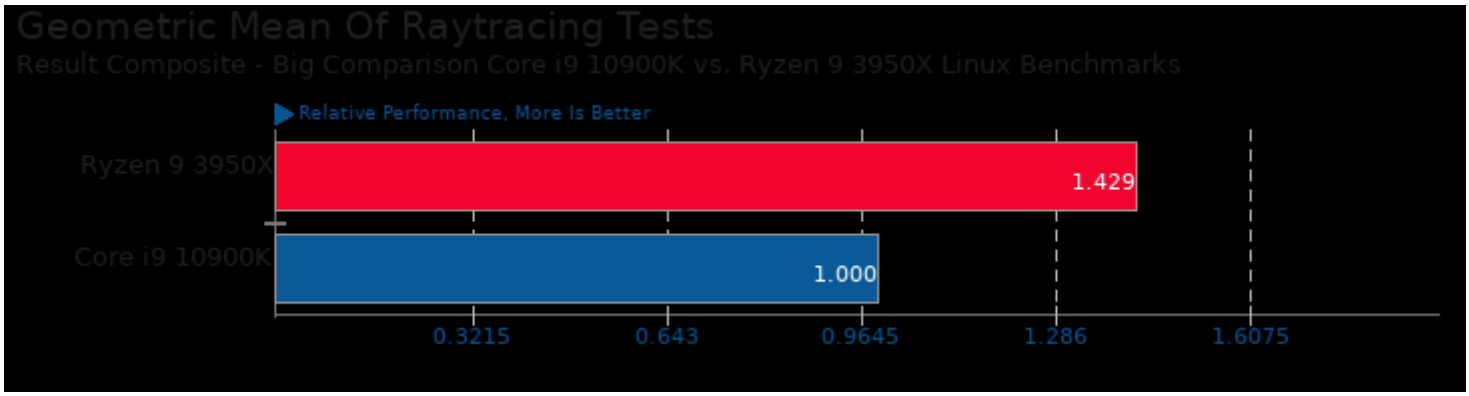


Geometric mean based upon tests: pts/sqlite-speedtest, pts/git, pts/blosc, pts/compress-zstd, pts/pyperformance,

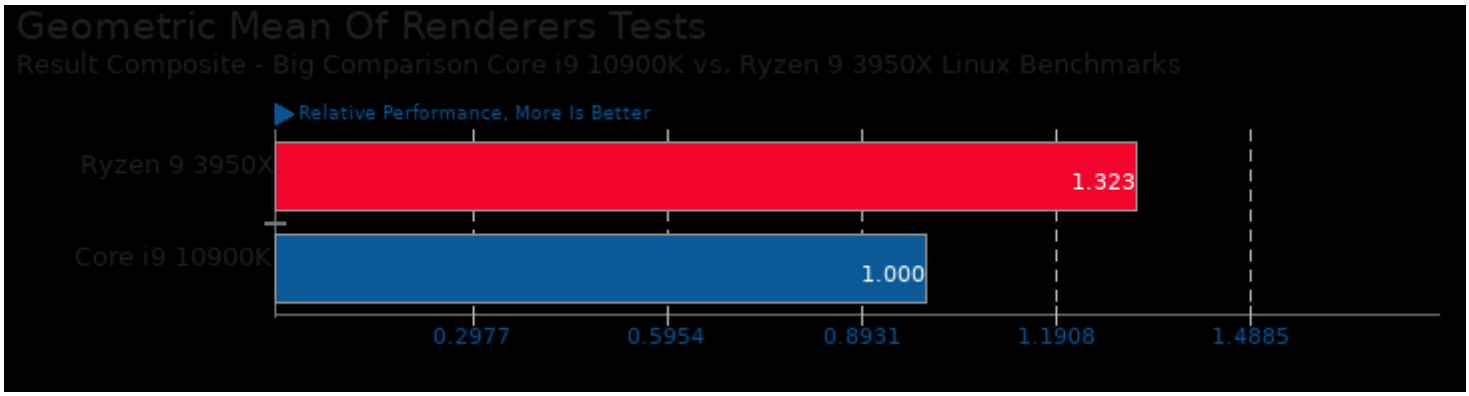
pts/pybench, pts/build-apache, pts/build-php, pts/build-linux-kernel, pts/build-imagemagick, pts/build-gcc, pts/build-gdb, pts/build-llvm, pts/build-ffmpeg, pts/build-mplayer, pts/build2, pts/mt-dgemm and pts/amg



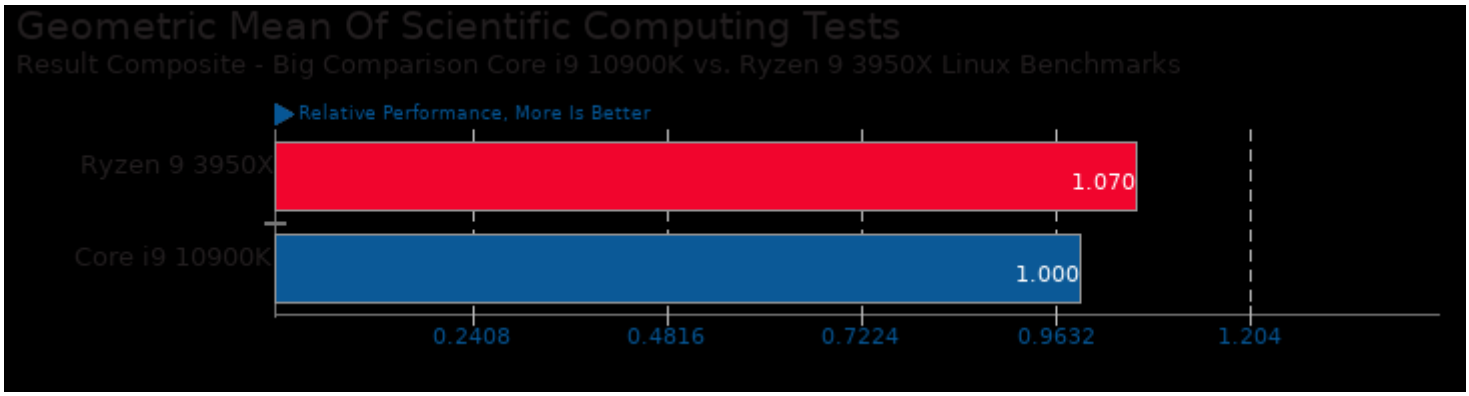
Geometric mean based upon tests: pts/pybench, pts/numenta-nab, pts/cython-bench, pts/numpy, pts/mlpack, pts/scikit-learn and pts/pyperformance



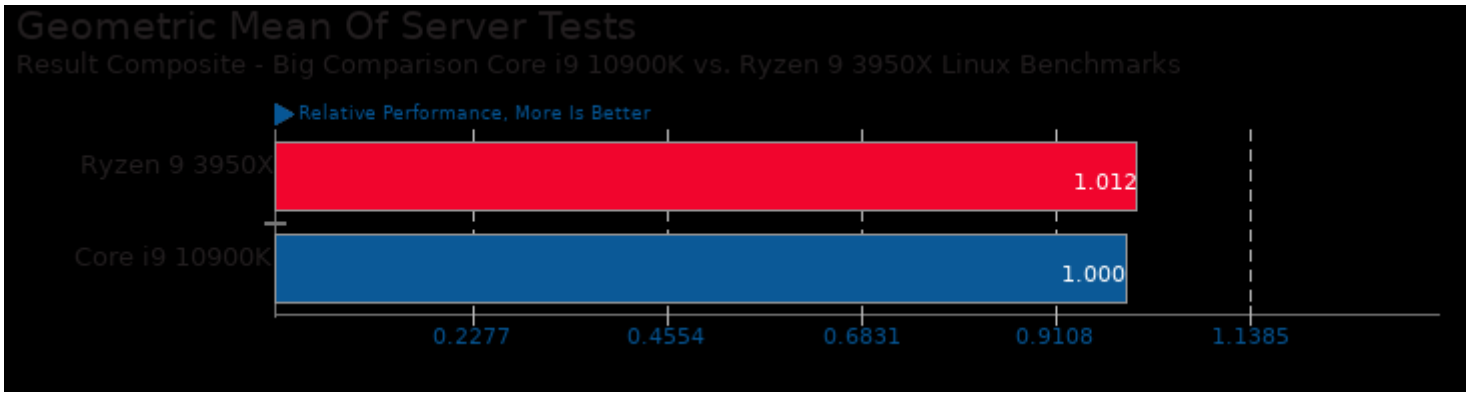
Geometric mean based upon tests: pts/c-ray, pts/tachyon, pts/rays1bench and pts/yafaray



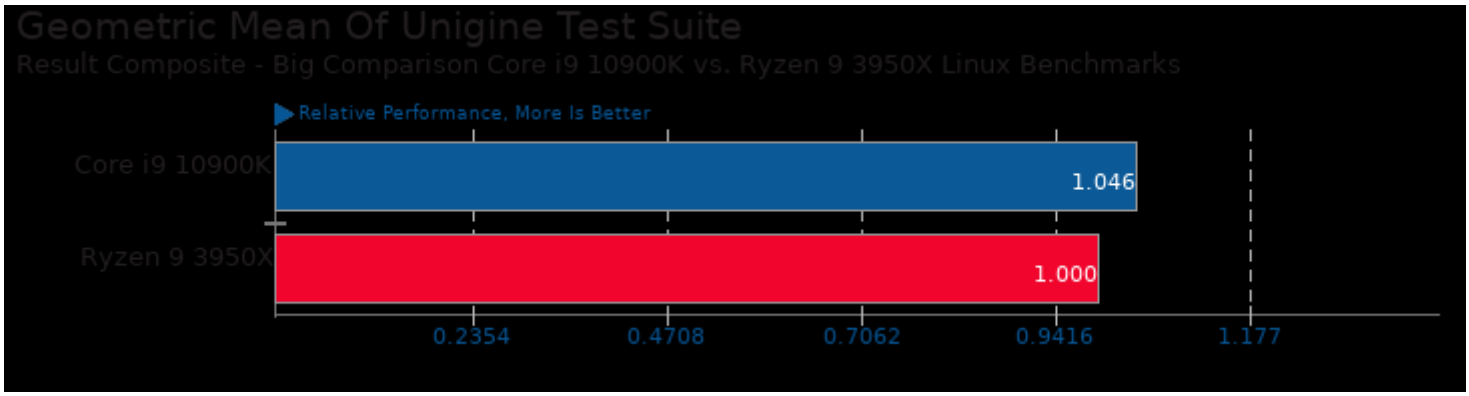
Geometric mean based upon tests: pts/c-ray, pts/tachyon, pts/rays1bench, pts/yafaray, pts/blender, pts/tungsten, pts/appleseed, pts/radiance, pts/aobench, pts/luxcorerender, pts/smallpt, pts/ttsiod-renderer and pts/indigobench



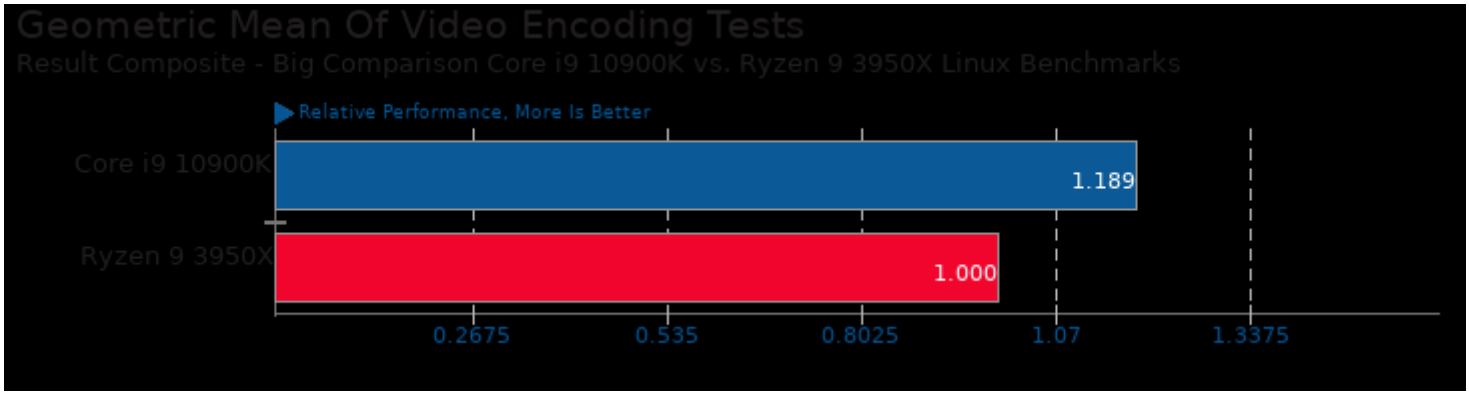
Geometric mean based upon tests: pts/fftw, pts/neat, pts/mt-dgemm, pts/amg, pts/namd, pts/gromacs, pts/cp2k, pts/nwchem, pts/lulesh, pts/pennant, pts/himeno, pts/mrbayes and pts/hmmer



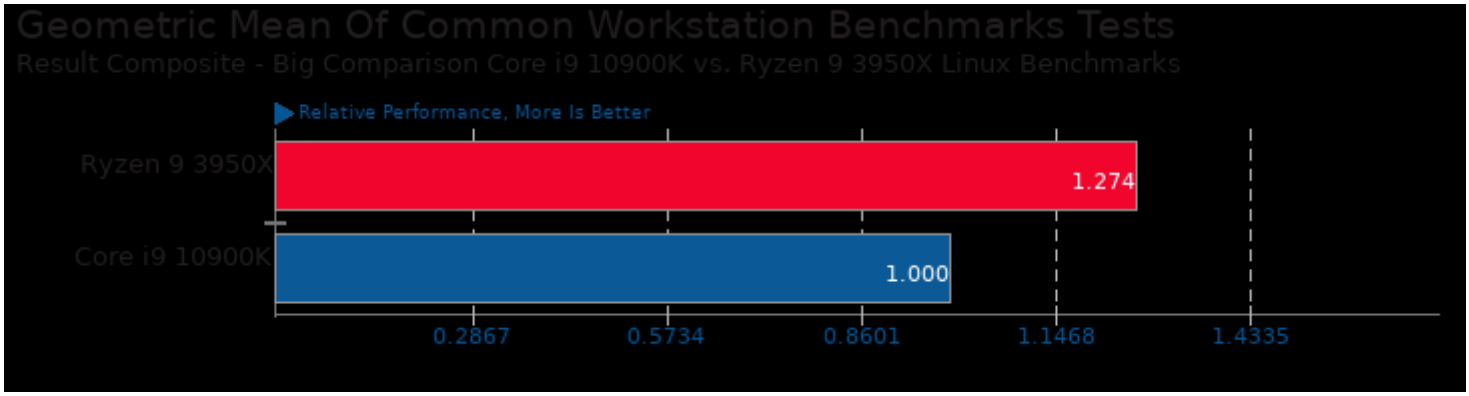
Geometric mean based upon tests: pts/ebizzy, pts/redis, pts/rocksdb, pts/openssl, pts/perl-benchmark and pts/sqlite-speedtest



Geometric mean based upon tests: pts/unigine-valley, pts/unigine-heaven and pts/unigine-super



Geometric mean based upon tests: pts/x264, pts/x265, pts/ffmpeg, pts/vpxenc, pts/dav1d, pts/aom-av1, pts/libgav1 and pts/rav1e



Geometric mean based upon tests: pts/blender, pts/rodinia, pts/parboil, pts/himeno, pts/brl-cad, pts/x265, pts/paraview, pts/swet, pts/sysbench and pts/git

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