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Intel Xeon Ice Lake-SP and Cascade Lake-SP vs. AMD EPYC Milan Preliminary Test

AMD EPYC 7763 | AMD EPYC 7543 | Intel Xeon Platinum 8368 | Intel Xeon Platinum 8260M on Ubuntu 20.10 via the Phoronix Test Suite.

Automated Executive Summary

2 x Intel Xeon Platinum 8368 had the most wins, coming in first place for 46% of the tests.

Based on the geometric mean of all complete results, the fastest (2 x Intel Xeon Platinum 8368) was 1.359x the speed of the slowest (2 x Intel Xeon Platinum 8260M). 2 x AMD EPYC 7763 was 0.813x the speed of 2 x Intel Xeon Platinum 8368, 2 x AMD EPYC 7543 was 0.996x the speed of 2 x AMD EPYC 7763, 2 x Intel Xeon Platinum 8260M was 0.908x the speed of 2 x AMD EPYC 7543.

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

LAMMPS Molecular Dynamics Simulator (Model: 20k Atoms) at 38.04x
oneDNN (Harness: Convolution Batch Shapes Auto - Data Type: f32 - Engine: CPU) at 7.388x
Sysbench (Test: CPU) at 6.325x
oneDNN (Harness: Deconvolution Batch shapes_1d - Data Type: u8s8f32 - Engine: CPU) at 4.943x
Pennant (Test: leblancbig) at 3.468x
Blender (Blend File: Classroom - Compute: CPU-Only) at 3.26x
oneDNN (Harness: Matrix Multiply Batch Shapes Transformer - Data Type: u8s8f32 - Engine: CPU) at 3.247x

Coremark (CoreMark Size 666 - Iterations Per Second) at 2.822x
Rodinia (Test: OpenMP LavaMD) at 2.803x
oneDNN (Harness: Recurrent Neural Network Training - Data Type: bf16bf16bf16 - Engine: CPU) at 2.795x.

Test Systems:

2 x AMD EPYC 7763

Processor: 2 x AMD EPYC 7763 64-Core @ 2.45GHz (128 Cores / 256 Threads), Motherboard: AMD DAYTONA_X (RYM1001D BIOS), Chipset: AMD Starship/Matisse, Memory: 1008GB, Disk: 3201GB HUSMR7632BDP3M1 + 256GB Micron_1100_MTFD, Graphics: ASPEED, Network: 2 x Mellanox MT27710

OS: Ubuntu 20.10, Kernel: 5.8.0-44-generic (x86_64), Compiler: GCC 10.2.0, File-System: xfs, Screen Resolution: 1024x768

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-gcn/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa001119
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

2 x AMD EPYC 7543

Processor: 2 x AMD EPYC 7543 32-Core @ 2.80GHz (64 Cores / 128 Threads), Motherboard: AMD DAYTONA_X (RYM1001D BIOS), Chipset: AMD Starship/Matisse, Memory: 504GB, Disk: 3201GB HUSMR7632BDP3M1 + 256GB Micron_1100_MTFD, Graphics: ASPEED, Network: 2 x Mellanox MT27710

OS: Ubuntu 20.10, Kernel: 5.8.0-44-generic (x86_64), Compiler: GCC 10.2.0, File-System: xfs, Screen Resolution: 1024x768

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-gcn/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Disk Notes: NONE / attr2,inode64,logbsize=32k,logbufs=8,noquota,relatime,rw / Block Size: 4096
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa001119
Java Notes: OpenJDK Runtime Environment (build 11.0.10+9-Ubuntu-0ubuntu1.20.10)
Python Notes: Python 2.7.18 + Python 3.8.6
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

2 x Intel Xeon Platinum 8368

Processor: 2 x Intel Xeon Platinum 8368 @ 3.40GHz (76 Cores / 152 Threads), Motherboard: Intel M50CYP2SB2U

(SE5C6200.86B.0022.D08.2103221623 BIOS), Chipset: Intel Device 0998, Memory: 1008GB, Disk: 400GB INTEL SSDPF21Q400GB + 15363GB INTEL SSDPE2NV153T8 + 240GB INTEL SSDSCKKB24, Graphics: ASPEED, Monitor: PHL 223V5, Network: 2 x Intel 10G X550T + 2 x Intel XXV710 for 25GbE SFP28

OS: Ubuntu 20.10, Kernel: 5.8.0-48-generic (x86_64), Compiler: GCC 10.2.0, File-System: xfs, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-gcn/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Disk Notes: NONE / attr2,inode64,logbsize=32k,logbufs=8,noquota,relatime,rw / Block Size: 4096
Processor Notes: Scaling Governor: intel_pstate performance - CPU Microcode: 0xd000270
Java Notes: OpenJDK Runtime Environment (build 11.0.10+9-Ubuntu-0ubuntu1.20.10)
Python Notes: Python 3.8.6
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 Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

2 x Intel Xeon Platinum 8260M

Processor: 2 x Intel Xeon Platinum 8260M @ 3.90GHz (48 Cores / 96 Threads), Motherboard: Intel S2600WFT (SE5C620.86B.02.01.0013.121520200651 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 756GB, Disk: 15363GB INTEL SSDPE2NV153T8 + 400GB INTEL SSDPF21Q400GB + 240GB INTEL SSDSCKJB24, Graphics: ASPEED, Monitor: PHL 223V5, Network: 2 x Intel X722 for 10GBASE-T + 2 x Intel XXV710 for 25GbE SFP28

OS: Ubuntu 20.10, Kernel: 5.8.0-48-generic (x86_64), Compiler: GCC 10.2.0, File-System: xfs, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-gcn/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Disk Notes: NONE / attr2,inode64,logbsize=32k,logbufs=8,noquota,relatime,rw / Block Size: 4096
Processor Notes: Scaling Governor: intel_pstate performance - CPU Microcode: 0x4003003
Java Notes: OpenJDK Runtime Environment (build 11.0.10+9-Ubuntu-0ubuntu1.20.10)
Python Notes: Python 3.8.6
Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Mitigation of TSX disabled

	2 x AMD EPYC 7763	2 x AMD EPYC 7543	2 x Intel Xeon Platinum 8368	2 x Intel Xeon Platinum 8260M
High Performance Conjugate Gradient (GFLOP/s)	28.0783	**32.7278**		**22.3148**
Normalized	85.79%	100%		68.18%
Standard Deviation	8.5%	0.8%		4%

NAS Parallel Benchmarks - EP.D (Mop/s)	**10363**	5866	9119	**4856**
Normalized	100%	56.6%	87.99%	46.86%
Standard Deviation	1.9%	2.9%	13.7%	2.1%
Rodinia - OpenMP LavaMD (sec)	**26.213**	37.575	38.708	**73.474**
Normalized	100%	69.76%	67.72%	35.68%
Standard Deviation	2.5%	2.4%	0.8%	0.6%
Rodinia - OpenMP HotSpot3D (sec)	97.471	**89.083**	102.906	**114.729**
Normalized	91.39%	100%	86.57%	77.65%
Standard Deviation	6.1%	5.6%	0.5%	1.4%
Rodinia - OpenMP Leukocyte (sec)	54.235	49.399	**45.537**	**69.554**
Normalized	83.96%	92.18%	100%	65.47%
Standard Deviation	2.4%	1.4%	6%	1.1%
Rodinia - OpenMP CFD Solver (sec)	6.224	**6.397**	**3.925**	6.346
Normalized	63.06%	61.36%	100%	61.85%
Standard Deviation	2%	13.4%	0.5%	0.7%
NAMD - ATPase Simulation - 327,506 Atoms (days/ns)	**0.22771**	0.34152	0.26675	**0.49704**
Normalized	100%	66.68%	85.36%	45.81%
Standard Deviation	1.5%	0.1%	0.5%	0.6%
Dolfyn - C.F.D (sec)	18.324	**17.148**	20.649	**21.607**
Normalized	93.58%	100%	83.05%	79.36%
Standard Deviation	0.1%	0%	0.1%	0.1%
Nebular Empirical Analysis Tool (sec)	30.563	28.237	**20.655**	**33.695**
Normalized	67.58%	73.15%	100%	61.3%
Standard Deviation	5.1%	2.2%	4.9%	3.1%
Pennant - leblancbig (Hydro Cycle Time - sec)	**16.95403**	12.68979	**4.888998**	11.66005
Normalized	28.84%	38.53%	100%	41.93%
Standard Deviation	0.9%	2.2%	2%	2.2%
Timed MAFFT Alignment - M.S.A - LSU RNA (sec)	10.426	9.311	**8.715**	**10.659**
Normalized	83.59%	93.6%	100%	81.76%
Standard Deviation	4.4%	1.9%	2.2%	3.3%
OpenFOAM - Motorbike 60M (sec)	**765.47**	377.23	**102.12**	204.76
Normalized	13.34%	27.07%	100%	49.87%
Standard Deviation	19.9%	1%	0.1%	0.3%
Quantum ESPRESSO - AUSURF112 (sec)	1089	**1025**	**1100**	
Normalized	94.04%	100%	93.15%	
Standard Deviation	0.6%	2%	5.6%	
LAMMPS Molecular Dynamics Simulator - 20k Atoms (ns/day)	**0.871**	3.549	**33.133**	20.892
Normalized	2.63%	10.71%	100%	63.05%
Standard Deviation	0.5%	0.2%	0.1%	0.2%
ACES DGEMM - S.F.P.R (GFLOP/s)	**37.604790**	18.311647	28.425921	**14.063351**
Normalized	100%	48.69%	75.59%	37.4%
Standard Deviation	2.3%	2.1%	0.2%	2.5%
Himeno Benchmark - P.P.S (MFLOPS)	3703	3709	**4129**	**3328**
Normalized	89.67%	89.84%	100%	80.59%
Standard Deviation	5.6%	1.8%	0%	0.1%
Numpy Benchmark (Score)	363.22	391.75	**396.14**	**355.52**
Normalized	91.69%	98.89%	100%	89.75%
Standard Deviation	0.7%	0.4%	0.2%	0.7%

Ngspice - C2670 (sec)	145.824	136.144	**128.633**	**158.370**
Normalized	88.21%	94.48%	100%	81.22%
Standard Deviation	0.9%	0.8%	0.6%	0.5%
Ngspice - C7552 (sec)	113.354	**103.659**	148.553	**152.358**
Normalized	91.45%	100%	69.78%	68.04%
Standard Deviation	1.1%	2.1%	0.1%	0.2%
Kripke (Throughput FoM)	119412673	132528867	**173672467**	**97292812**
Normalized	68.76%	76.31%	100%	56.02%
Standard Deviation	5.8%	1.1%	0.7%	6.3%
OSBench - Create Files (us/Event)	24.004262	**21.967675**	22.004364	**24.712765**
Normalized	91.52%	100%	99.83%	88.89%
Standard Deviation	1%	0.7%	0.7%	1.3%
OSBench - Create Threads (us/Event)	**28.843085**	23.477674	**16.019344**	16.891956
Normalized	55.54%	68.23%	100%	94.83%
Standard Deviation	2.4%	2.4%	0.6%	0.9%
OSBench - Launch Programs	**69.567045**	62.649250	**32.489300**	39.626758
Normalized	46.7%	51.86%	100%	81.99%
Standard Deviation	4.9%	1.9%	1.3%	0.5%
OSBench - Create Processes	**48.923492**	47.276338	**28.825601**	32.223860
Normalized	58.92%	60.97%	100%	89.45%
Standard Deviation	1.5%	3.9%	0.3%	1.5%
OSBench - Memory Allocations (Ns/Event)	77.320893	**68.823973**	69.346666	**104.860703**
Normalized	89.01%	100%	99.25%	65.63%
Standard Deviation	0.3%	0.5%	0.1%	1.7%
BYTE Unix Benchmark - Dhrystone 2 (LPS)	40277917	**43248926**	41456410	**38182436**
Normalized	93.13%	100%	95.86%	88.29%
Standard Deviation	1%	0.2%	0.1%	0.1%
CacheBench - Read (MB/s)	**2601**	2782	2877	**3712**
Normalized	70.07%	74.95%	77.51%	100%
Standard Deviation	0%	0%	0%	0%
CacheBench - Write (MB/s)	24981	26691	**23648**	**27566**
Normalized	90.62%	96.82%	85.79%	100%
Standard Deviation	0%	0%	0%	0%
CacheBench - R.M.W (MB/s)	49620	**53030**	37399	**19382**
Normalized	93.57%	100%	70.52%	36.55%
Standard Deviation	0%	0%	0%	0%
Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec)	**3733027**	2633539	2359710	**1322885**
Normalized	100%	70.55%	63.21%	35.44%
Standard Deviation	2.4%	0.2%	3.5%	2.3%
ctx_clock - C.S.T (Clocks)	147	140	**156**	**128**
Normalized	87.07%	91.43%	82.05%	100%
Sysbench - Memory (Events/sec)	7458386	**6007638**	**13427383**	12819941
Normalized	55.55%	44.74%	100%	95.48%
Standard Deviation	0.7%	0.7%	0.1%	1.8%
Sysbench - CPU (Events/sec)	**477380**	274610	217291	**75476**
Normalized	100%	57.52%	45.52%	15.81%
Standard Deviation	0.2%	0.8%	0%	0.3%
FinanceBench - Repo OpenMP (ms)	40846	**37281**	38934	**43008**
Normalized	91.27%	100%	95.75%	86.68%
Standard Deviation	1.5%	1.1%	0.1%	0.2%
FinanceBench - Bonds OpenMP (ms)	55531	**52390**	57178	**60569**
Normalized	94.34%	100%	91.63%	86.5%

Standard Deviation	0.5%	0.5%	0.1%	1.1%
MariaDB - 128 (Queries/sec)	384	378	202	182
Normalized	100%	98.44%	52.6%	47.4%
Standard Deviation	5.3%	0.2%	1.5%	0%
MariaDB - 256 (Queries/sec)	287	324	171	172
Normalized	88.58%	100%	52.78%	53.09%
Standard Deviation	2.5%	0.9%	0.4%	0.4%
MariaDB - 512 (Queries/sec)	314	325	173	173
Normalized	96.62%	100%	53.23%	53.23%
Standard Deviation	10%	0.4%	0.5%	0.1%
PostgreSQL pgbench - 100 - 250 - Read Only (TPS)	704577	716556	924156	525874
Normalized	76.24%	77.54%	100%	56.9%
Standard Deviation	9.7%	8%	6.4%	1.8%
PostgreSQL pgbench - 100 - 250 - Read Only - Average Latency (ms)	0.360	0.352	0.273	0.476
Normalized	75.83%	77.56%	100%	57.35%
Standard Deviation	10.5%	9.2%	6.5%	1.8%
PostgreSQL pgbench - 100 - 250 - Read Write (TPS)	51183	35338	37436	31338
Normalized	100%	69.04%	73.14%	61.23%
Standard Deviation	4.8%	2.2%	4.3%	3.5%
PostgreSQL pgbench - 100 - 250 - Read Write - Average Latency (ms)	4.918	7.094	6.708	8.002
Normalized	100%	69.33%	73.32%	61.46%
Standard Deviation	5.3%	2.2%	4.3%	3.5%
SQLite Speedtest - Timed Time - Size 1,000 (sec)	59.337	55.777	59.555	65.235
Normalized	94%	100%	93.66%	85.5%
Standard Deviation	0.4%	0.7%	1.2%	0.2%
Redis - LPOP (Reqs/sec)	2359254	2410419	2843902	2659032
Normalized	82.96%	84.76%	100%	93.5%
Standard Deviation	8.4%	2.4%	0.1%	0.9%
Redis - SADD (Reqs/sec)	2037944	1985172	2224301	2077706
Normalized	91.62%	89.25%	100%	93.41%
Standard Deviation	7.9%	0.9%	2%	2%
Redis - LPUSH (Reqs/sec)	1560259	1569646	1679884	1633413
Normalized	92.88%	93.44%	100%	97.23%
Standard Deviation	6.9%	1.4%	1.1%	0.3%
Redis - GET (Reqs/sec)	2319619	2382131	2712763	2483483
Normalized	85.51%	87.81%	100%	91.55%
Standard Deviation	4.4%	1.6%	0.2%	2.3%
Redis - SET (Reqs/sec)	1772195	1782419	1975204	1854411
Normalized	89.72%	90.24%	100%	93.88%
Standard Deviation	6.8%	1.6%	0.7%	2%
Apache Cassandra - Mixed 1:3 (Op/s)	15671	13407	29971	35945
Normalized	43.6%	37.3%	83.38%	100%
Standard Deviation	171.9%	148.4%	148.2%	86.2%
FLAC Audio Encoding - WAV To FLAC (sec)	8.874	8.565	9.999	10.032
Normalized	96.52%	100%	85.66%	85.38%
Standard Deviation	0.2%	0.6%	0.3%	0.9%

LAME MP3 Encoding - WAV To MP3 (sec)	8.089	**7.590**	9.087	**10.114**
Normalized	93.83%	100%	83.53%	75.04%
Standard Deviation	0.1%	0.3%	0.2%	0.1%
Zstd Compression - 8 - Compression Speed (MB/s)	2580	**3116**	1984	**1083**
Normalized	82.78%	100%	63.67%	34.75%
Standard Deviation	7.1%	5.5%	3.3%	1.4%
Zstd Compression - 8 - D.S (MB/s)	3433	**3650**	3013	**2457**
Normalized	94.06%	100%	82.56%	67.33%
Standard Deviation	2.7%	2.2%	0.6%	1.2%
John The Ripper - Blowfish (Real C/S)	**177138**	121560	120750	**65049**
Normalized	100%	68.62%	68.17%	36.72%
Standard Deviation	0.2%	0.4%	0.1%	0.3%
John The Ripper - MD5 (Real C/S)	**11282667**	6787000	10405667	**6128667**
Normalized	100%	60.15%	92.23%	54.32%
Standard Deviation	0.2%	0.7%	0.1%	0.3%
dav1d - Chimera 1080p (FPS)	**1438**	1179	1324	**899.38**
Normalized	100%	82.02%	92.1%	62.56%
Standard Deviation	4.9%	2.7%	0.2%	0.8%
dav1d - C.1.1.b (FPS)	**339.89**	275.05	261.53	**194.70**
Normalized	100%	80.92%	76.95%	57.28%
Standard Deviation	2.3%	0.8%	2.9%	0.2%
OSPray - M.R - SciVis (FPS)	66.67	**52.63**	**111.11**	55.56
Normalized	60%	47.37%	100%	50%
Standard Deviation	0%	0%	0%	0%
OSPray - M.R - Path Tracer (FPS)	**500**	**500**	**1000**	**500**
Normalized	50%	50%	100%	50%
Kvazaar - Bosphorus 1080p - Medium (FPS)	74.72	**82.65**	67.50	**43.09**
Normalized	90.41%	100%	81.67%	52.14%
Standard Deviation	0.1%	1.1%	0.9%	0.1%
SVT-VP9 - P.S.O - Bosphorus 1080p (FPS)	403.66	386.94	**479.67**	**306.77**
Normalized	84.15%	80.67%	100%	63.95%
Standard Deviation	9.5%	14.9%	9.7%	5.3%
x264 - H.2.V.E (FPS)	212.80	**230.85**	225.74	**147.33**
Normalized	92.18%	100%	97.79%	63.82%
Standard Deviation	4.2%	10%	14.9%	9.3%
x265 - Bosphorus 1080p (FPS)	69.73	70.40	**76.78**	**62.75**
Normalized	90.82%	91.69%	100%	81.73%
Standard Deviation	2.5%	4.1%	1%	0.4%
7-Zip Compression - C.S.T (MIPS)	**428677**	306883	329337	**182082**
Normalized	100%	71.59%	76.83%	42.48%
Standard Deviation	3.4%	2%	1.8%	1.6%
Timed GCC Compilation - Time To Compile (sec)	668.311	641.125	**606.060**	**722.148**
Normalized	90.69%	94.53%	100%	83.92%
Standard Deviation	0.3%	0.3%	0.1%	0.2%
Timed Linux Kernel Compilation - Time To Compile (sec)	**19.526**	24.134	22.460	**34.706**
Normalized	100%	80.91%	86.94%	56.26%
Standard Deviation	2.7%	3.2%	2.4%	2.2%

Timed LLVM Compilation - Time To Compile (sec)	**187.095**	190.060	192.378	**264.955**
Normalized	100%	98.44%	97.25%	70.61%
Standard Deviation	0.2%	1.1%	0.7%	2.3%
C-Ray - Total Time - 4.1.R.P.P (sec)	**6.095**	10.079	10.590	**20.458**
Normalized	100%	60.47%	57.55%	29.79%
Standard Deviation	1%	0.9%	0.2%	19.7%
POV-Ray - Trace Time (sec)	**7.691**	9.211	9.275	**18.215**
Normalized	100%	83.5%	82.92%	42.22%
Standard Deviation	2.2%	1.3%	1%	18%
Gzip Compression - L.S.T.A.T.t.g (sec)	41.393	**38.798**	40.871	**41.432**
Normalized	93.73%	100%	94.93%	93.64%
Standard Deviation	0.1%	0.2%	0.1%	0.9%
OpenSSL - R.4.b.P (Signs/sec)	**26545**	15764	18137	**10412**
Normalized	100%	59.39%	68.33%	39.22%
Standard Deviation	0.1%	0.1%	0.2%	0.2%
Cpuminer-Opt - Magi (kH/s)	**5185**	2331	3717	**1215**
Normalized	100%	44.97%	71.69%	23.44%
Standard Deviation	3.3%	7.4%	3.1%	10.3%
Cpuminer-Opt - x25x (kH/s)	**4207**	1805	2979	**1250**
Normalized	100%	42.91%	70.8%	29.7%
Standard Deviation	5.9%	8.9%	0.7%	4%
Cpuminer-Opt - Deepcoin (kH/s)	67078	41401	**74202**	**11953**
Normalized	90.4%	55.79%	100%	16.11%
Standard Deviation	33.6%	6%	7.3%	4.1%
Cpuminer-Opt - Ringcoin (kH/s)	**23200**	9712	11446	**3440**
Normalized	100%	41.86%	49.34%	14.83%
Standard Deviation	1.9%	6.2%	15.6%	14.8%
Cpuminer-Opt - Blake-2 S (kH/s)	1595925	**895838**	2541257	**2627117**
Normalized	60.75%	34.1%	96.73%	100%
Standard Deviation	83.6%	47.3%	32.9%	8.9%
Cpuminer-Opt - Garlicoin (kH/s)	17761	**8473**	**39848**	17521
Normalized	44.57%	21.26%	100%	43.97%
Standard Deviation	13.4%	2.1%	9.8%	5.6%
Cpuminer-Opt - Skeincoin (kH/s)	328605	**181871**	**680773**	550585
Normalized	48.27%	26.72%	100%	80.88%
Standard Deviation	79.5%	46.1%	16.1%	4.3%
Cpuminer-Opt - Myriad-Groestl (kH/s)	**103090**	91730	100119	**9296**
Normalized	100%	88.98%	97.12%	9.02%
Standard Deviation	68.1%	17.6%	42.3%	8.5%
Cpuminer-Opt - LBC, LBRY Credits (kH/s)	114072	**74295**	**410064**	315557
Normalized	27.82%	18.12%	100%	76.95%
Standard Deviation	75.2%	53.1%	15.8%	2.3%
Cpuminer-Opt - Q.S.2.P (kH/s)	**178498**		**820313**	664677
Normalized	21.76%		100%	81.03%
Standard Deviation	103.5%		5.7%	2.2%
Cpuminer-Opt - T.S.2.O (kH/s)	241722	**170887**	**1068182**	810153
Normalized	22.63%	16%	100%	75.84%
Standard Deviation	87.3%	55.2%	7.6%	15.9%
Blender - BMW27 - CPU-Only (sec)	**21.37**	29.30	28.38	**48.61**
Normalized	100%	72.94%	75.3%	43.96%
Standard Deviation	1.5%	0.9%	0.5%	0.2%
Blender - Classroom - CPU-Only (sec)	**42.14**	72.52	70.43	**137.39**
Normalized	100%	58.11%	59.83%	30.67%

Standard Deviation	0.1%	0.7%	0.2%	0.2%
GnuPG - 2.7.S.F.E (sec)	76.436	71.486	77.601	72.750
Normalized	93.52%	100%	92.12%	98.26%
Standard Deviation	1.2%	1.1%	0.8%	1.2%
Java SciMark - Composite (Mflops)	2587	2785	2113	2032
Normalized	92.89%	100%	75.86%	72.95%
Standard Deviation	0.8%	0.7%	0.4%	1.2%
Java SciMark - Monte Carlo (Mflops)	1377	1472	839.19	959.23
Normalized	93.55%	100%	57%	65.16%
Standard Deviation	0.4%	0.5%	0%	0%
Java SciMark - F.F.T (Mflops)	1952	2098	1536	1298
Normalized	93.07%	100%	73.21%	61.88%
Standard Deviation	0.7%	0.9%	0.7%	6.2%
Java SciMark - S.M.M (Mflops)	2281	2449	2143	1553
Normalized	93.14%	100%	87.48%	63.39%
Standard Deviation	0.6%	0.1%	0%	0%
Java SciMark - D.L.M.F (Mflops)	5715	6183	4576	4785
Normalized	92.42%	100%	74%	77.38%
Standard Deviation	1.7%	1.6%	0.7%	1.4%
Java SciMark - J.S.O.R (Mflops)	1612	1725	1472	1565
Normalized	93.44%	100%	85.34%	90.74%
Standard Deviation	0%	0.1%	0%	0%
Renaissance - Scala Dotty (ms)	1572	1498	1667	1883
Normalized	95.34%	100%	89.91%	79.56%
Standard Deviation	2.4%	2.4%	0.9%	2.4%
Renaissance - Rand Forest (ms)	1687	1616	1789	1993
Normalized	95.79%	100%	90.32%	81.08%
Standard Deviation	3%	4.5%	2.4%	2.4%
Renaissance - Apache Spark ALS	2072	1915	2172	2528
Normalized	92.4%	100%	88.16%	75.74%
Standard Deviation	5.4%	1.8%	1.2%	1.1%
Renaissance - Apache Spark Bayes (ms)	97.114	98.685	91.491	129.600
Normalized	94.21%	92.71%	100%	70.59%
Standard Deviation	25.9%	33.6%	24.4%	25.4%
Renaissance - Savina Reactors.IO	19448	15477	19939	25770
Normalized	79.58%	100%	77.62%	60.06%
Standard Deviation	11.5%	12.4%	13.2%	10.9%
Renaissance - A.S.P (ms)	4601	4082	3306	4357
Normalized	71.85%	80.98%	100%	75.88%
Standard Deviation	9.8%	8.5%	6.2%	4.5%
Renaissance - T.H.R (ms)	5558	3447	3158	3737
Normalized	56.82%	91.63%	100%	84.51%
Standard Deviation	4.4%	0.9%	1.4%	2%
Renaissance - I.M.D.S (ms)	6419	6234	4007	5877
Normalized	62.43%	64.27%	100%	68.18%
Standard Deviation	7.2%	7.1%	5.5%	4.1%
Renaissance - A.U.C.T (ms)	31103	26851	12307	17099
Normalized	39.57%	45.84%	100%	71.98%
Standard Deviation	3.1%	2.8%	4.2%	2.1%
Renaissance - G.A.U.J.F (ms)	1742	1619	1558	1905
Normalized	89.49%	96.27%	100%	81.82%
Standard Deviation	10.7%	14%	12.1%	6%
PostMark - D.T.P (TPS)	8524	8928	7896	6522
Normalized	95.47%	100%	88.44%	73.05%

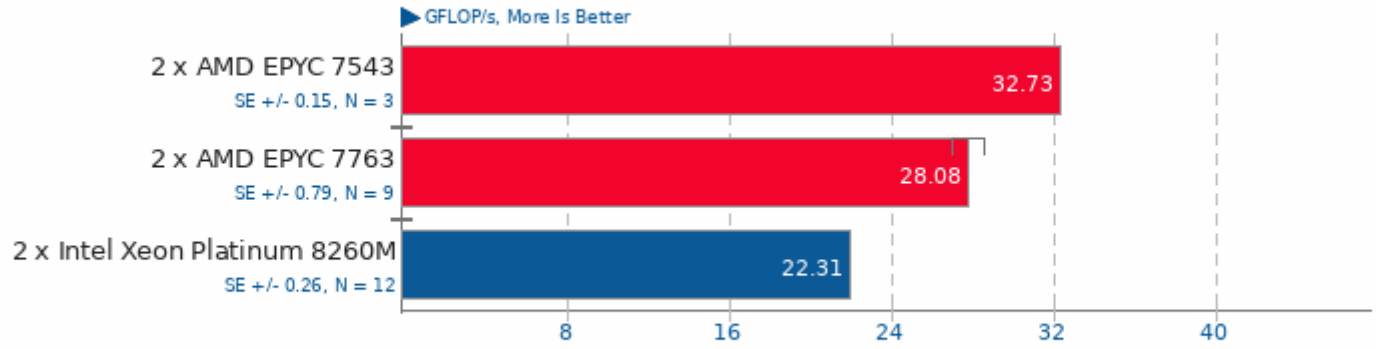
Standard Deviation	1.9%		1.8%	1.5%
Go Benchmarks - http (ns/op)	1756126	1037611	1037882	9028
Normalized	0.51%	0.87%	0.87%	100%
Standard Deviation	38.9%	0.3%	0.2%	1.4%
Go Benchmarks - json (ns/op)	1430231	1409180	1145003	1672463
Normalized	80.06%	81.25%	100%	68.46%
Standard Deviation	3.4%	2%	0.5%	0.3%
Go Benchmarks - build (ns/op)	22679779928	19867833291	22148540653	24143096918
Normalized	87.6%	100%	89.7%	82.29%
Standard Deviation	1%	1.6%	0.8%	1.3%
Go Benchmarks - garbage (ns/op)	847371	815016	551177	750575
Normalized	65.05%	67.63%	100%	73.43%
Standard Deviation	1.1%	0.7%	1.3%	0.7%
oneDNN - C.B.S.A - f32 - CPU (ms)	0.618082	0.746819	1.56305	4.56668
Normalized	100%	82.76%	39.54%	13.53%
Standard Deviation	0.3%	1.6%	0.2%	0.1%
oneDNN - D.B.s - f32 - CPU (ms)	2.53956	1.88246	1.08309	1.48023
Normalized	42.65%	57.54%	100%	73.17%
Standard Deviation	2.2%	2.1%	0.2%	1.2%
oneDNN - C.B.S.A - u8s8f32 - CPU	1.040769	1.015001	1.20263	4.33270
Normalized	97.52%	100%	84.4%	23.43%
Standard Deviation	11.3%	11%	0.7%	0.4%
oneDNN - D.B.s - u8s8f32 - CPU (ms)	1.65651	1.42739	0.335154	0.438041
Normalized	20.23%	23.48%	100%	76.51%
Standard Deviation	1.9%	2.4%	0.8%	0.4%
oneDNN - R.N.N.T - f32 - CPU (ms)	1850	1400	623.537	1140
Normalized	33.71%	44.54%	100%	54.69%
Standard Deviation	4.6%	4.8%	0.1%	9.9%
oneDNN - R.N.N.I - f32 - CPU (ms)	1718	1117	411.961	730.360
Normalized	23.99%	36.88%	100%	56.41%
Standard Deviation	6.4%	8.2%	1.2%	4.1%
oneDNN - R.N.N.T - u8s8f32 - CPU	1817	1413	623.629	1112
Normalized	34.32%	44.12%	100%	56.07%
Standard Deviation	7.1%	5.8%	0.7%	6.2%
oneDNN - R.N.N.I - u8s8f32 - CPU (ms)	1723	1115	409.647	731.058
Normalized	23.78%	36.73%	100%	56.03%
Standard Deviation	8.8%	5.8%	0.7%	4.6%
oneDNN - M.M.B.S.T - f32 - CPU (ms)	0.498212	0.435059	0.235915	0.398769
Normalized	47.35%	54.23%	100%	59.16%
Standard Deviation	1.3%	4.1%	1.8%	2.4%
oneDNN - R.N.N.T - bf16bf16bf16 - CPU (ms)	1757	1375	628.754	1078
Normalized	35.78%	45.74%	100%	58.34%
Standard Deviation	5%	1.6%	1.5%	0.3%
oneDNN - R.N.N.I - bf16bf16bf16 - CPU (ms)	1707	1234	411.918	719.112
Normalized	24.12%	33.38%	100%	57.28%
Standard Deviation	9.4%	0.8%	0.2%	2.1%
oneDNN - M.M.B.S.T - u8s8f32 - CPU (ms)	0.701525	0.689266	0.216025	0.324278
Normalized	30.79%	31.34%	100%	66.62%
Standard Deviation	1.3%	0.8%	1.9%	3.6%
TensorFlow Lite - SqueezeNet (us)	68821	52139	44779	81410
Normalized	65.07%	85.88%	100%	55%
Standard Deviation	1.4%	3.7%	0.4%	2.4%

TensorFlow Lite - Inception V4 (us)	659401	844623	**623887**	**1145795**
Normalized	94.61%	73.87%	100%	54.45%
Standard Deviation	5.2%	2.3%	0.2%	2.4%
TensorFlow Lite - NASNet Mobile (us)	166094	**193408**	**73292**	115676
Normalized	44.13%	37.9%	100%	63.36%
Standard Deviation	1.1%	11.4%	2.3%	1.2%
TensorFlow Lite - Mobilenet Float (us)	56184	32834	**31558**	**61270**
Normalized	56.17%	96.11%	100%	51.51%
Standard Deviation	1.1%	3.2%	1.8%	1.8%
TensorFlow Lite - Mobilenet Quant	56291	32765	**31903**	**63135**
Normalized	56.67%	97.37%	100%	50.53%
Standard Deviation	1.8%	2.2%	1.1%	0.6%
TensorFlow Lite - I.R.V (us)	695459	756430	**543326**	**1045843**
Normalized	78.12%	71.83%	100%	51.95%
Standard Deviation	2.5%	1.7%	0.7%	1.1%
TNN - CPU - MobileNet v2 (ms)	345.543	**288.849**	357.927	**362.408**
Normalized	83.59%	100%	80.7%	79.7%
Standard Deviation	0.4%	1.4%	0%	0.5%
TNN - CPU - SqueezeNet v1.1 (ms)	295.740	**276.862**	**366.176**	345.567
Normalized	93.62%	100%	75.61%	80.12%
Standard Deviation	0%	0.1%	0%	0%
PlaidML - No - Inference - VGG19 - CPU (FPS)	24.99	26.62	**32.63**	**21.15**
Normalized	76.59%	81.58%	100%	64.82%
Standard Deviation	2%	4.6%	3.5%	2.2%
PlaidML - No - Inference - ResNet 50 - CPU (FPS)	5.91	**7.80**	6.16	**3.91**
Normalized	75.77%	100%	78.97%	50.13%
Standard Deviation	0.8%	0.5%	1.3%	1.9%
ONNX Runtime - yolov4 - OpenMP CPU (Inferences/min)	**190**	249	**516**	311
Normalized	36.82%	48.26%	100%	60.27%
Standard Deviation	7.6%	5.1%	2.4%	2.2%
ONNX Runtime - fcn-resnet101-11 - OpenMP CPU (Inferences/min)	**72**	90	**196**	125
Normalized	36.73%	45.92%	100%	63.78%
Standard Deviation	7.7%	4.8%	1%	1.9%
ONNX Runtime - shufflenet-v2-10 - OpenMP CPU (Inferences/min)	**4621**	6198	**8613**	6977
Normalized	53.65%	71.96%	100%	81.01%
Standard Deviation	14.6%	8.7%	2.9%	2.5%
ONNX Runtime - super-resolution-10 - OpenMP CPU (Inferences/min)	**3580**	5352	**7222**	5701
Normalized	49.57%	74.11%	100%	78.94%
Standard Deviation	11.8%	8.7%	10.7%	5.5%
PyBench - T.F.A.T.T (Milliseconds)	972	**917**	984	**1135**
Normalized	94.34%	100%	93.19%	80.79%
Standard Deviation	0.5%	0.5%	0.2%	
PyPerformance - go (Milliseconds)	**256**	**238**	250	250
Normalized	92.97%	100%	95.2%	95.2%
Standard Deviation		0.2%		
PyPerformance - 2to3 (Milliseconds)	**321**	**301**	309	**321**
Normalized	93.77%	100%	97.41%	93.77%
Standard Deviation	0.2%			

Intel Xeon Ice Lake-SP and Cascade Lake-SP vs. AMD EPYC Milan Preliminary Test

PyPerformance - chaos (Milliseconds)	**111**	104	**102**	106
Normalized	91.89%	98.08%	100%	96.23%
Standard Deviation	1%	0.6%		
PyPerformance - float (Milliseconds)	**115**	**107**	112	114
Normalized	93.04%	100%	95.54%	93.86%
PyPerformance - nbody (Milliseconds)	119	111	**108**	**127**
Normalized	90.76%	97.3%	100%	85.04%
Standard Deviation		0.5%		
PyPerformance - pathlib	**18.1**	17.3	**16.4**	18.0
Normalized	90.61%	94.8%	100%	91.11%
Standard Deviation	0%	0%	0.4%	0.3%
PyPerformance - raytrace	**478**	**447**	472	474
Normalized	93.51%	100%	94.7%	94.3%
Standard Deviation	0.2%	0.2%	0.3%	
PyPerformance - json_loads (Milliseconds)	23.8	**22.3**	22.4	**26.7**
Normalized	93.7%	100%	99.55%	83.52%
Standard Deviation	0.2%	0.3%	0%	0.2%
PyPerformance - crypto_pyaes (Milliseconds)	106	**99.5**	103	**113**
Normalized	93.87%	100%	96.6%	88.05%
Standard Deviation		0.3%		
PyPerformance - regex_compile (Milliseconds)	**171**	**159**	165	167
Normalized	92.98%	100%	96.36%	95.21%
PyPerformance - python_startup (Milliseconds)	8.17	**7.68**	8.00	**8.32**
Normalized	94%	100%	96%	92.31%
Standard Deviation	0.3%	0.5%	0.1%	0.2%
PyPerformance - django_template (Milliseconds)	**49.2**	**45.2**	47.3	48.1
Normalized	91.87%	100%	95.56%	93.97%
Standard Deviation	0.1%	0.1%	0.2%	0.2%
PyPerformance - pickle_pure_python (Milliseconds)	**447**	**404**	428	435
Normalized	90.38%	100%	94.39%	92.87%
Standard Deviation	0.4%	0.4%		0.4%
NGINX Benchmark - S.W.P.S (Reqs/sec)	33827	**24918**	**48290**	43722
Normalized	70.05%	51.6%	100%	90.54%
Standard Deviation	2.5%	14.8%	11.3%	0.1%
Apache Benchmark - S.W.P.S (Reqs/sec)	**22343**	23701	**35223**	25464
Normalized	63.43%	67.29%	100%	72.29%
Standard Deviation	8.6%	1.3%	2.4%	0.7%
PHPBench - P.B.S (Score)	**592611**	639114	**721246**	655461
Normalized	82.16%	88.61%	100%	90.88%
Standard Deviation	0.9%	0.5%	0.6%	0.1%
WireGuard + Linux Networking Stack Stress Test (sec)	**457.877**	415.246	**246.323**	338.281
Normalized	53.8%	59.32%	100%	72.82%
Standard Deviation	1.7%	1.9%	2.2%	0.3%

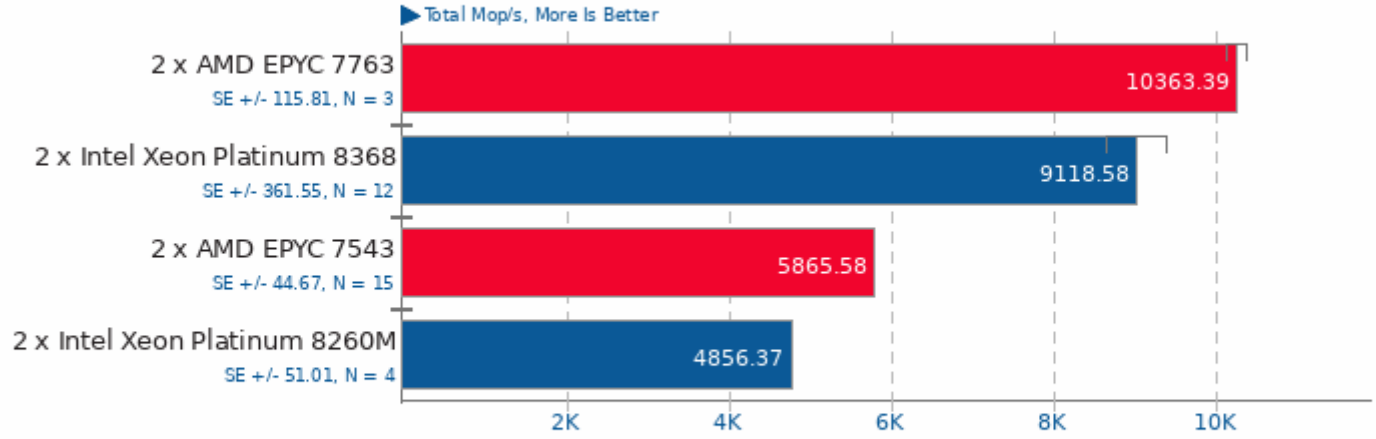
High Performance Conjugate Gradient 3.1



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

NAS Parallel Benchmarks 3.4

Test / Class: EP.D

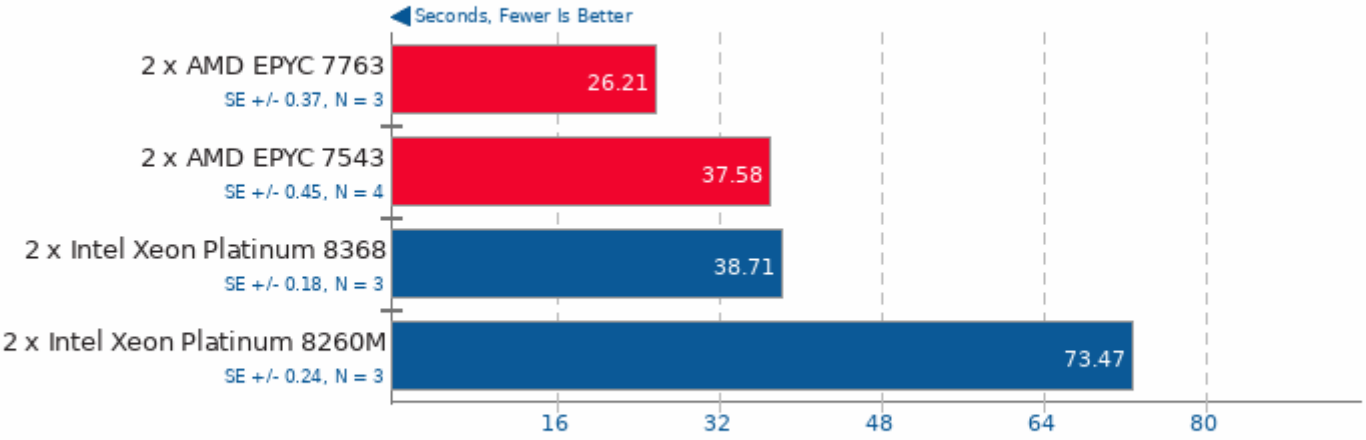


1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi -lopen-rte -lopen-pal -lhwloc -ldl -levent -levent_pthreads -lutil -lm -lrt -lz

2. Open MPI 4.0.3

Rodinia 3.1

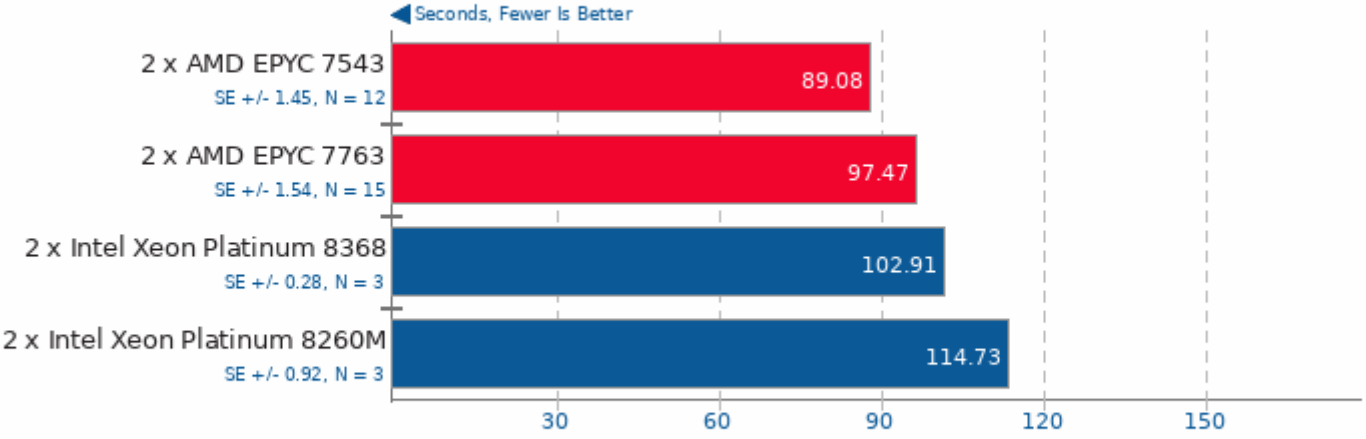
Test: OpenMP LavaMD



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

Rodinia 3.1

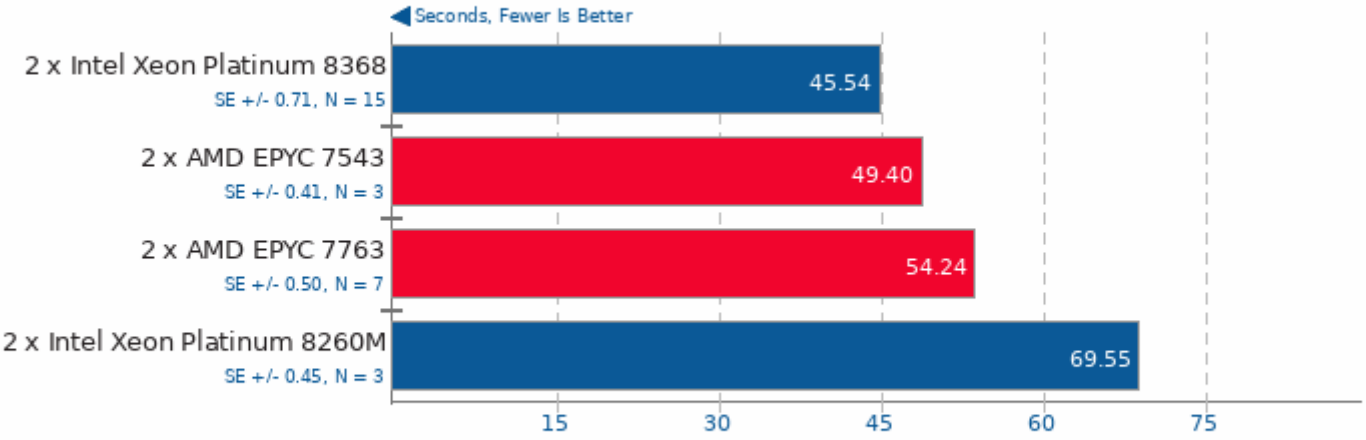
Test: OpenMP HotSpot3D



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

Rodinia 3.1

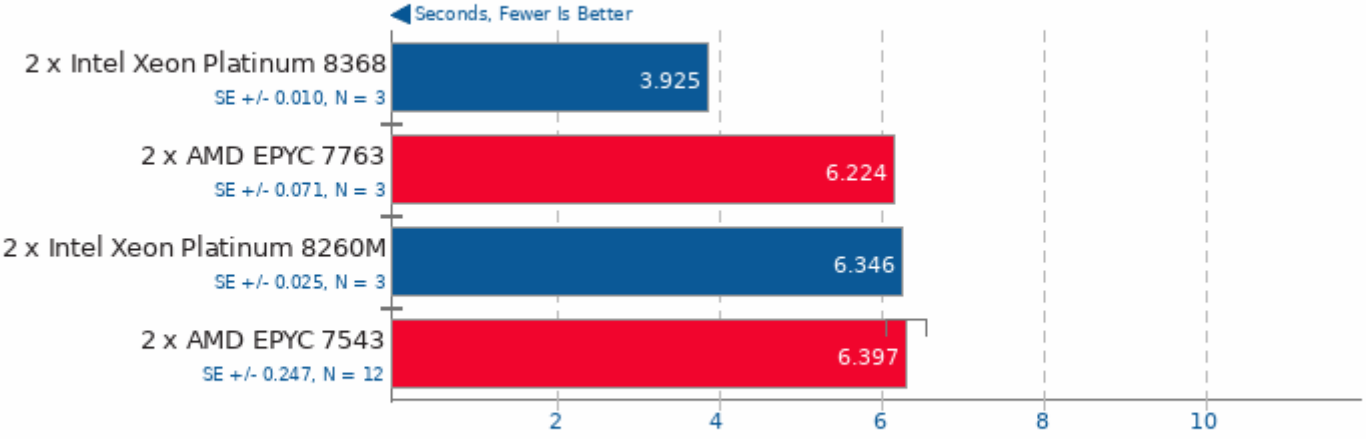
Test: OpenMP Leukocyte



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

Rodinia 3.1

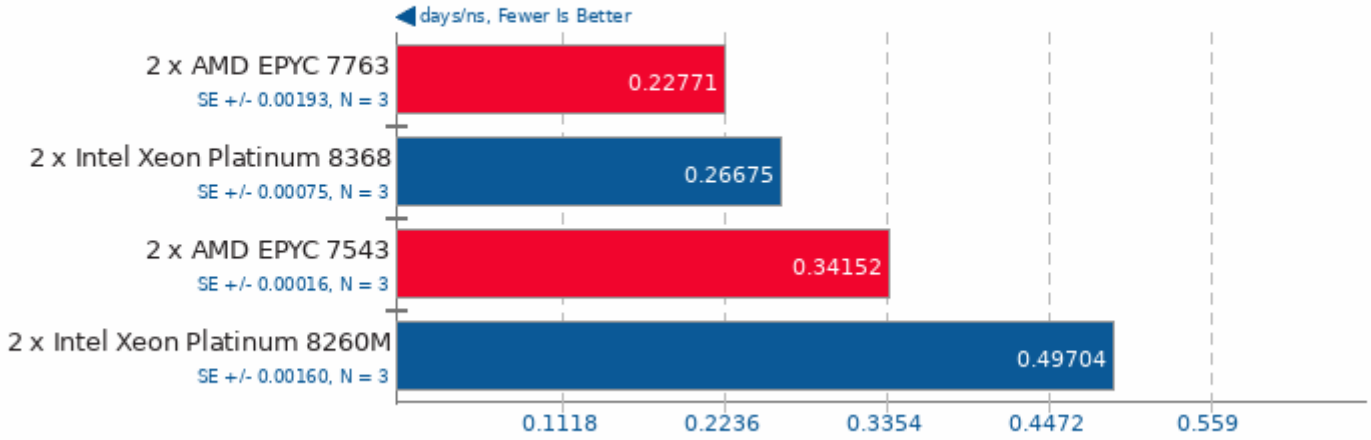
Test: OpenMP CFD Solver



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

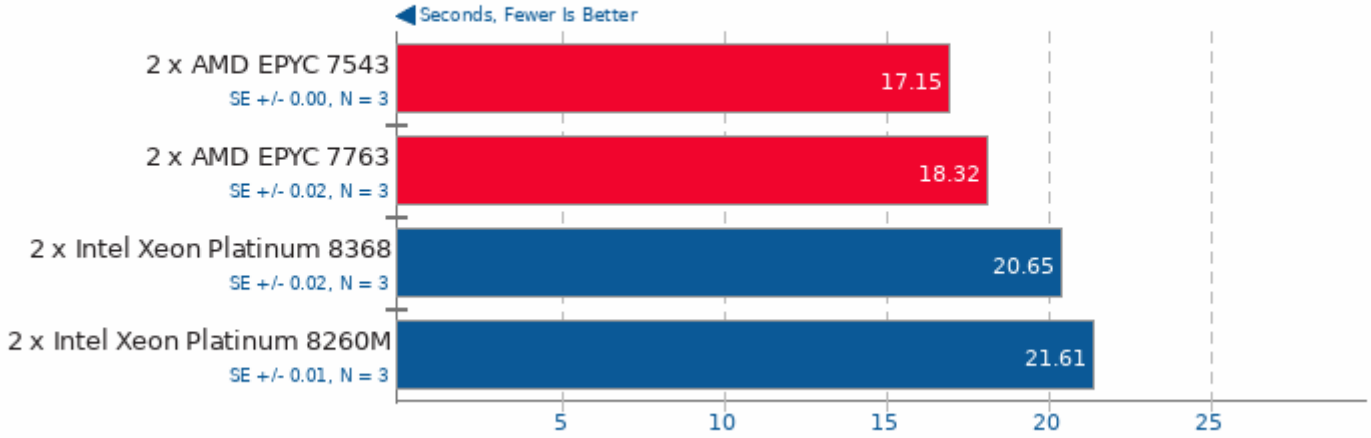
NAMD 2.14

ATPase Simulation - 327,506 Atoms

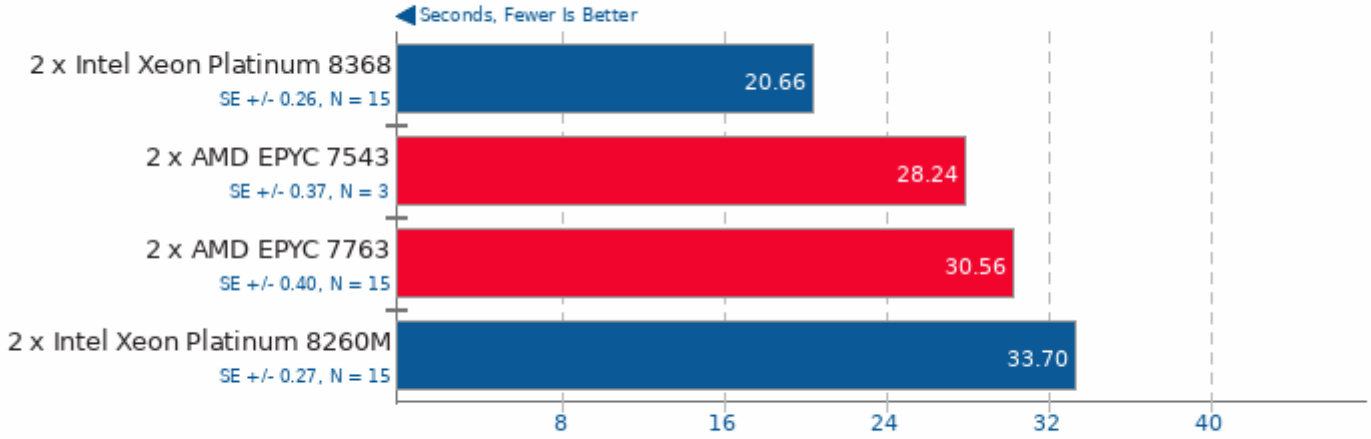


Dolfyn 0.527

Computational Fluid Dynamics



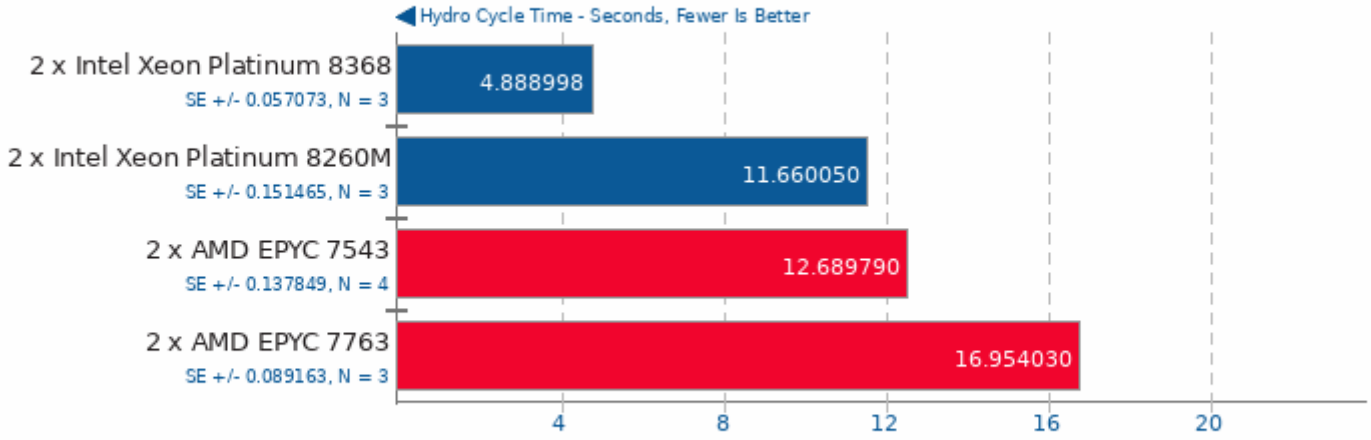
Nebular Empirical Analysis Tool 2020-02-29



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

Pennant 1.0.1

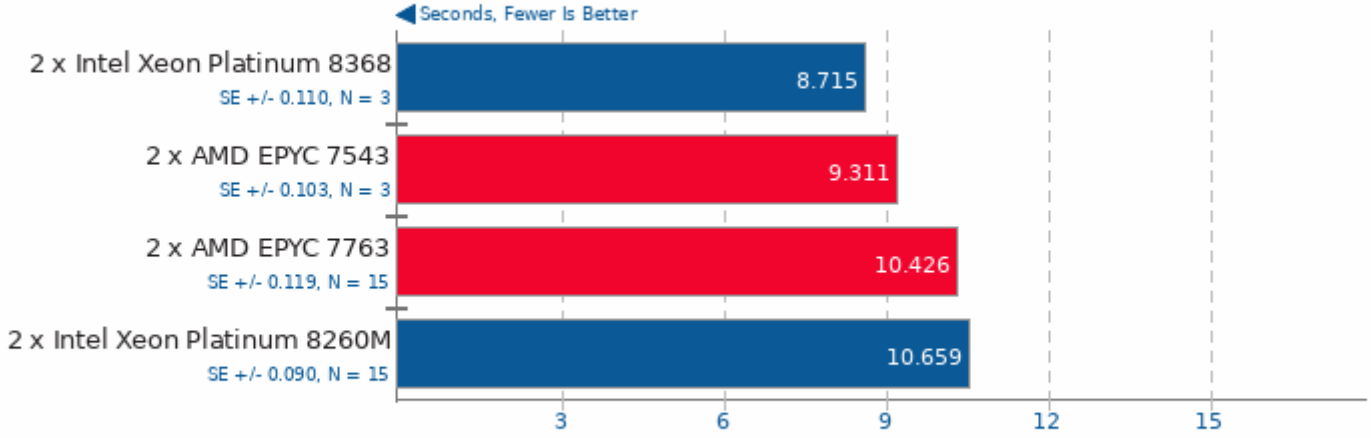
Test: leblancbig



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

Timed MAFFT Alignment 7.471

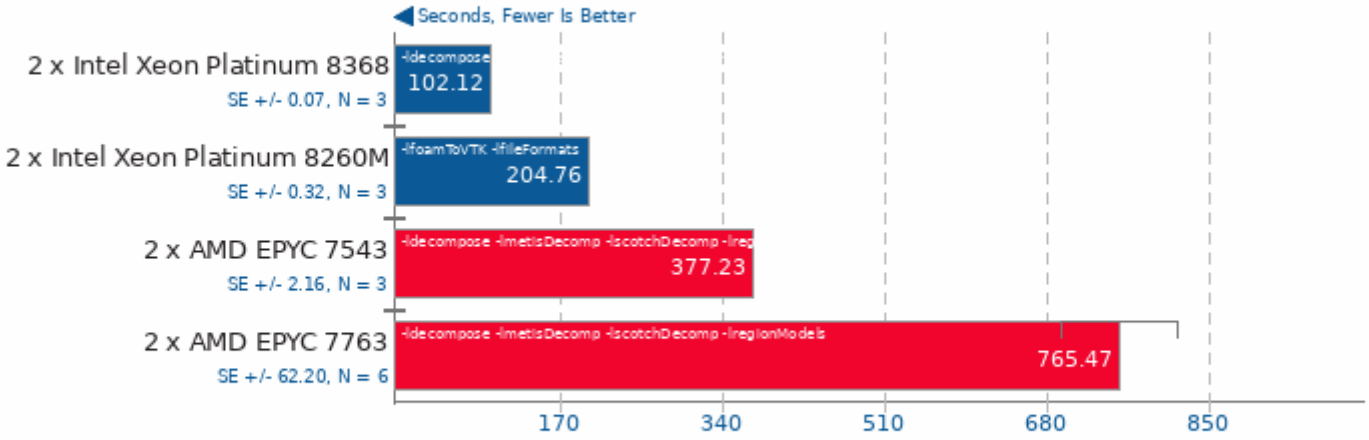
Multiple Sequence Alignment - LSU RNA



1. (CC) gcc options: -std=c99 -O3 -lm -lpthread

OpenFOAM 8

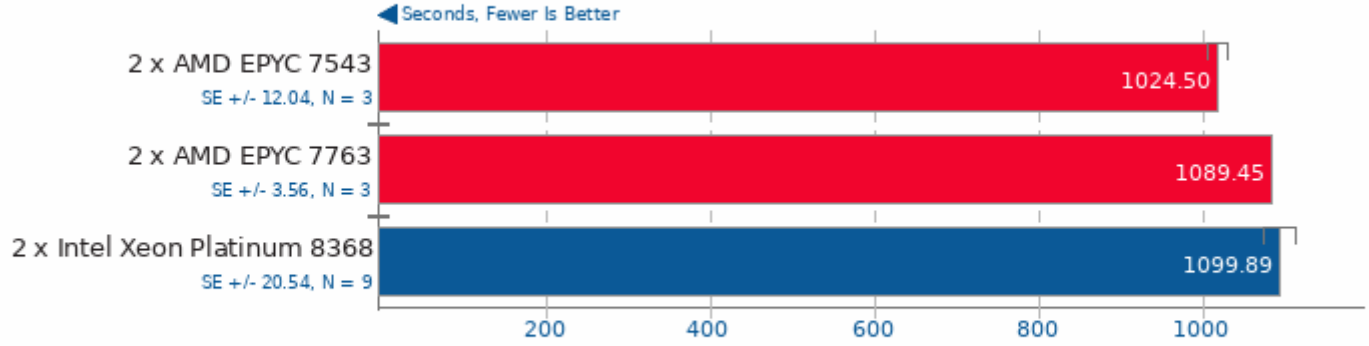
Input: Motorbike 60M



1. (CXX) g++ options: -std=c++11 -m64 -O3 -ftemplate-depth-100 -fPIC -fuse-ld=bfd -Xlinker --add-needed --no-as-needed -ldynamicMesh -lgenericPatchFields -llag

Quantum ESPRESSO 6.7

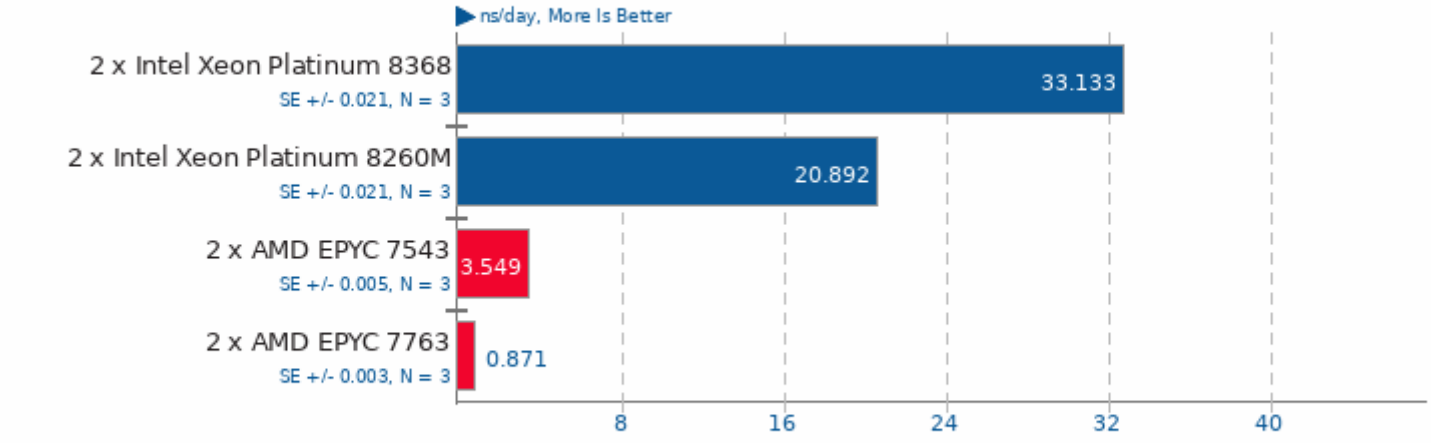
Input: AUSURF112



1. (F9X) gfortran options: -lopenblas -lFoX_dom -lFoX_sax -lFoX_wxml -lFoX_common -lFoX_utils -lFoX_fsys -lfftw3 -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi -lopen-

LAMMPS Molecular Dynamics Simulator 29Oct2020

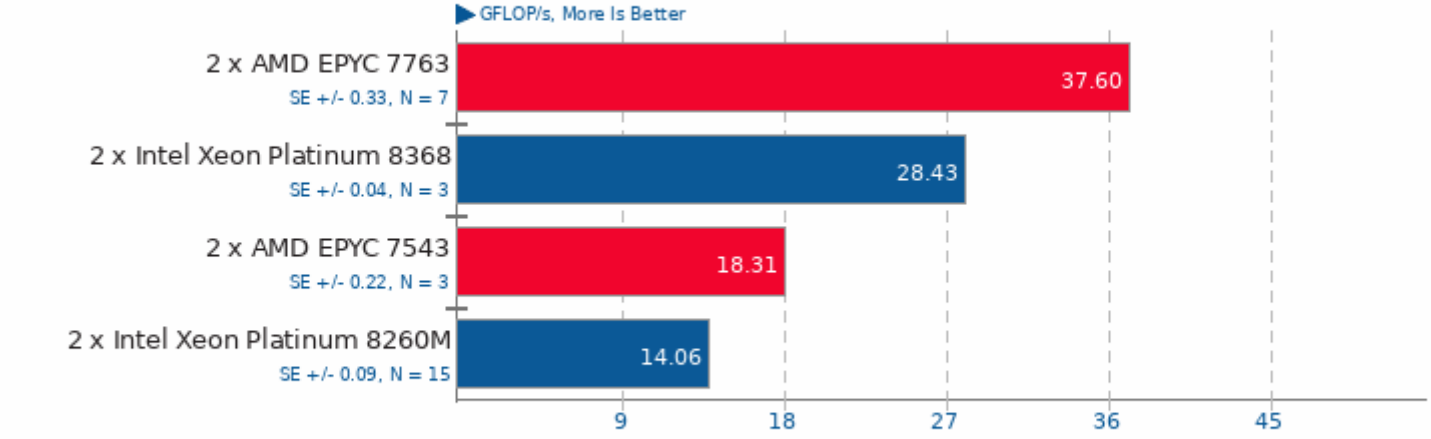
Model: 20k Atoms



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

ACES DGEMM 1.0

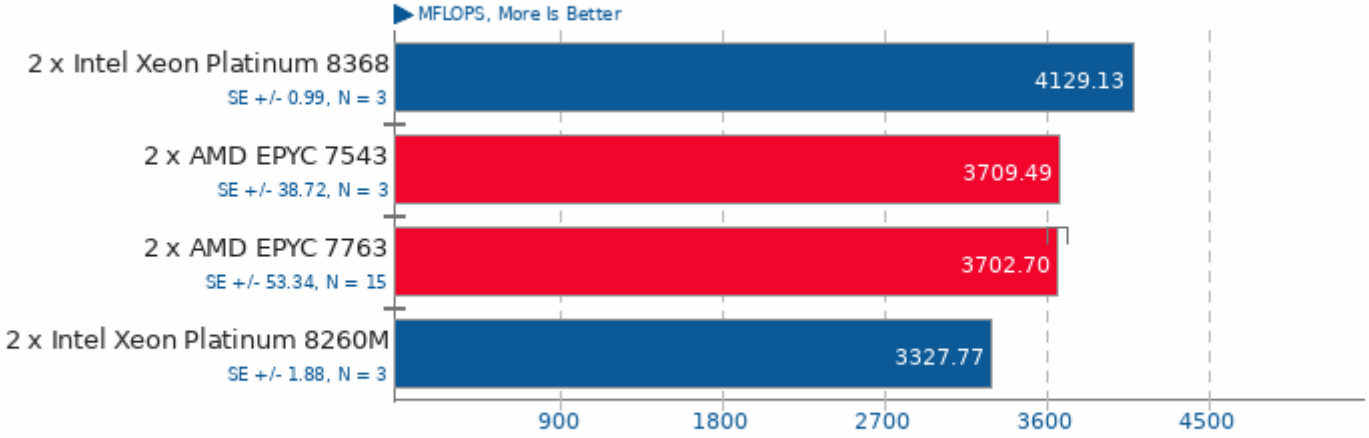
Sustained Floating-Point Rate



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

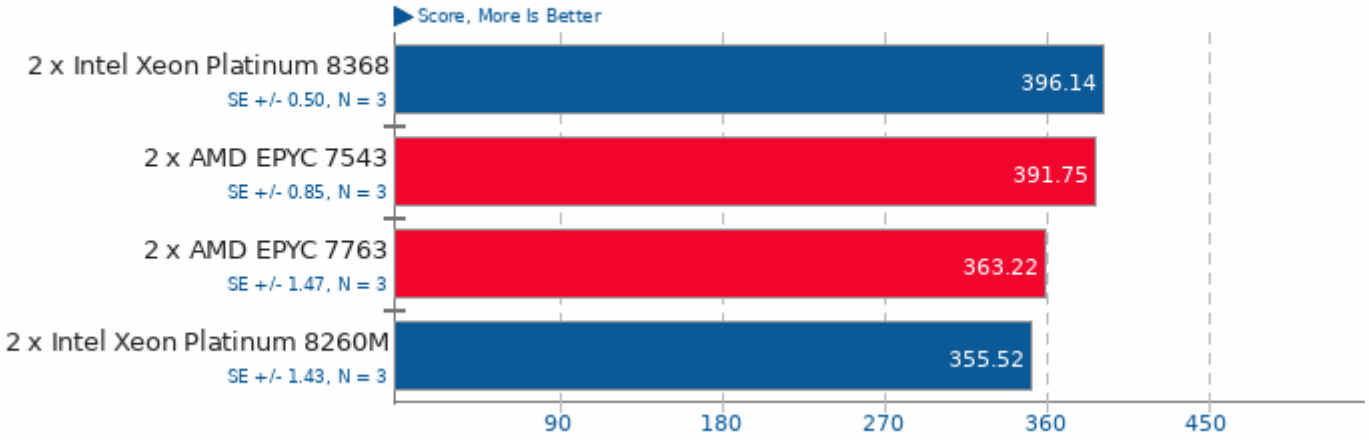
Himeno Benchmark 3.0

Poisson Pressure Solver



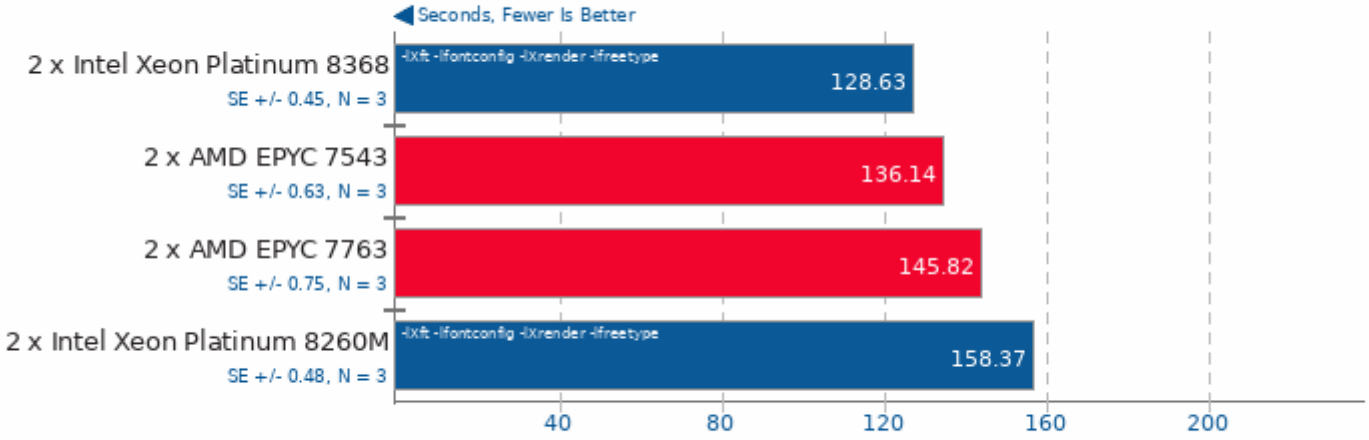
1. (CC) gcc options: -O3 -mavx2

Numpy Benchmark



Ngspice 34

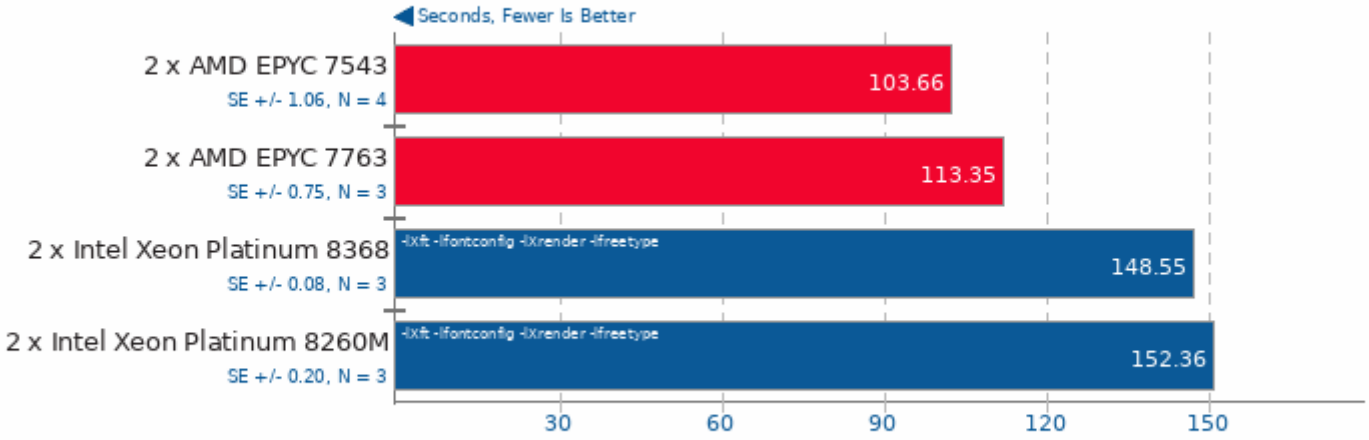
Circuit: C2670



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

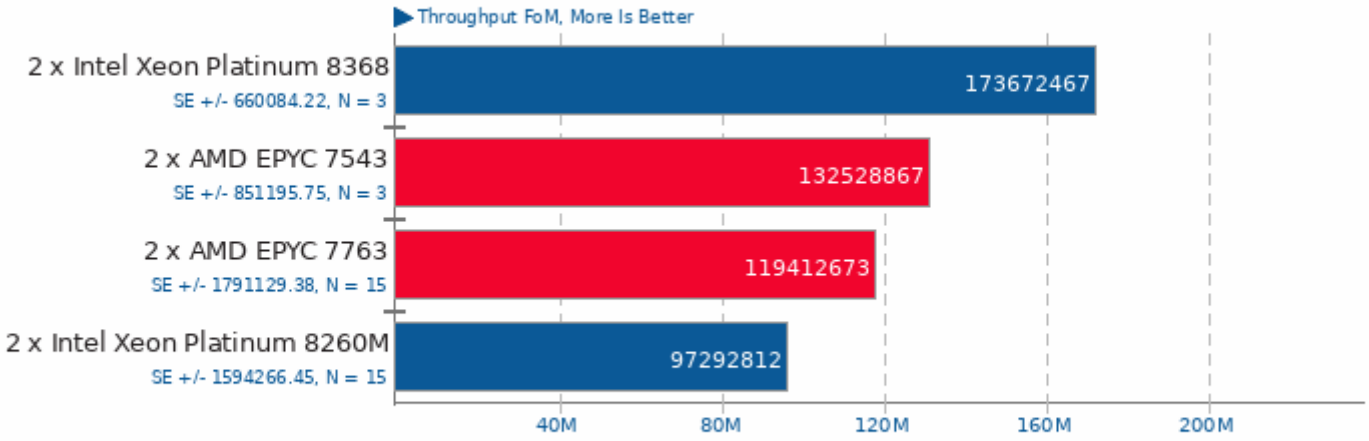
Ngspice 34

Circuit: C7552



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

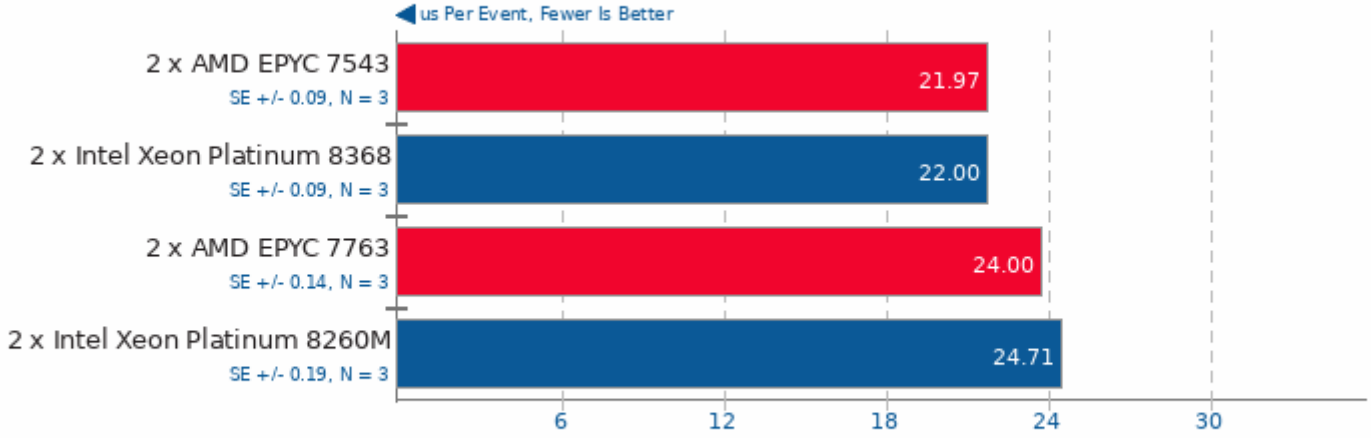
Kripke 1.2.4



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

OSBench

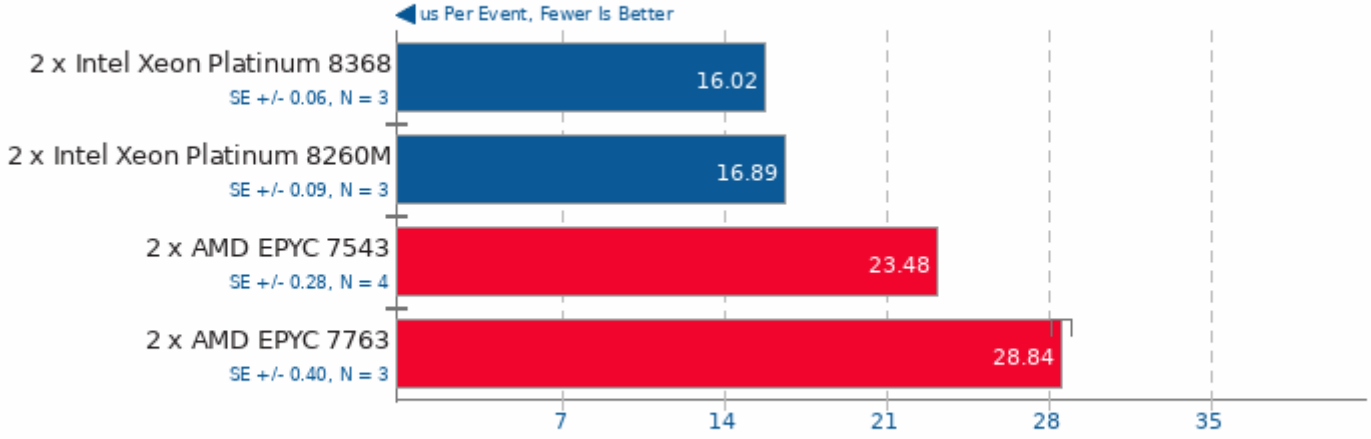
Test: Create Files



1. (CC) gcc options: -lm

OSBench

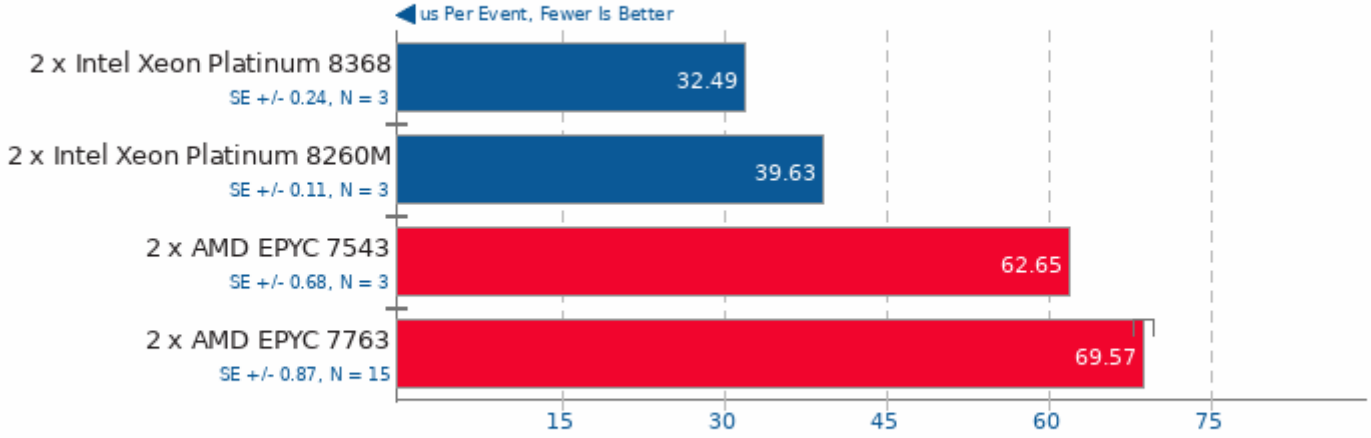
Test: Create Threads



1. (CC) gcc options: -lm

OSBench

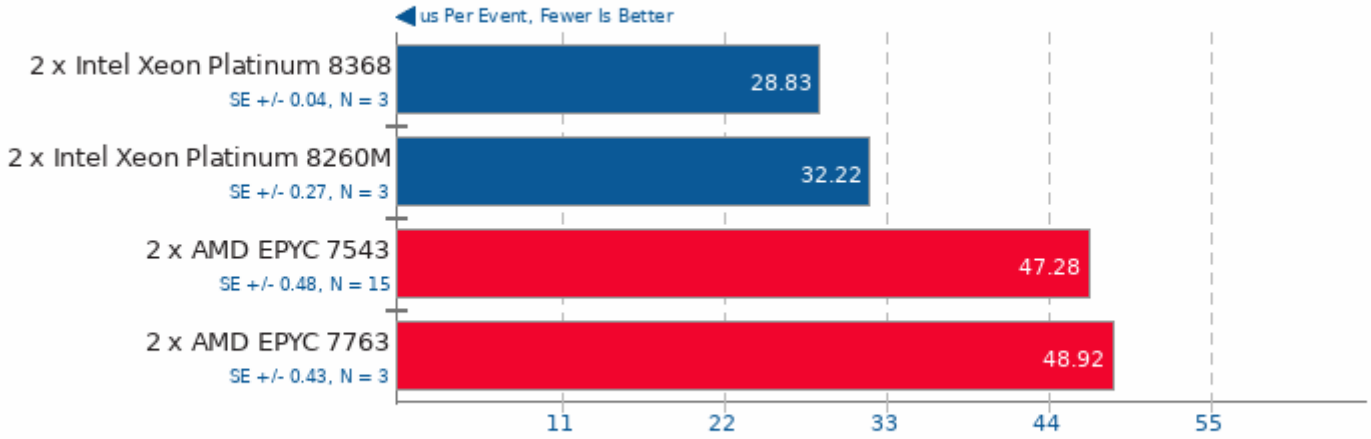
Test: Launch Programs



1. (CC) gcc options: -lm

OSBench

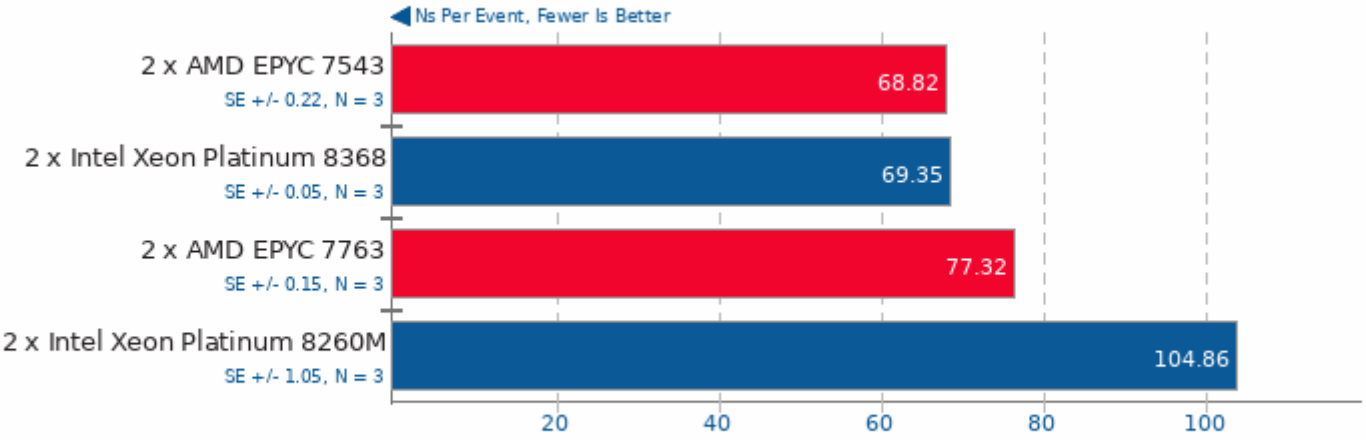
Test: Create Processes



1. (CC) gcc options: -lm

OSBench

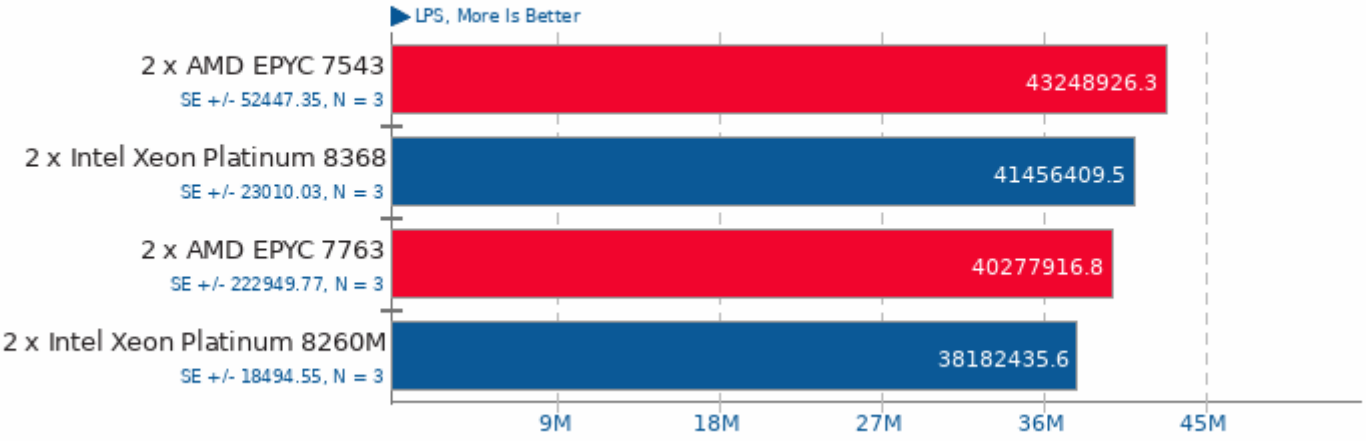
Test: Memory Allocations



1. (CC) gcc options: -lm

BYTE Unix Benchmark 3.6

Computational Test: Dhrystone 2



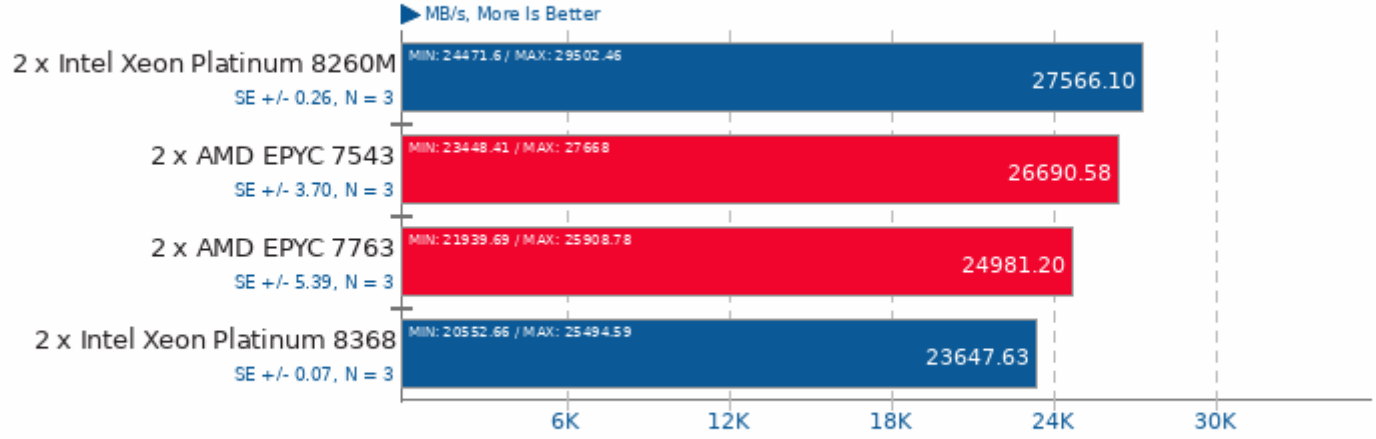
CacheBench

Test: Read

1. (CC) gcc options: -lrt

CacheBench

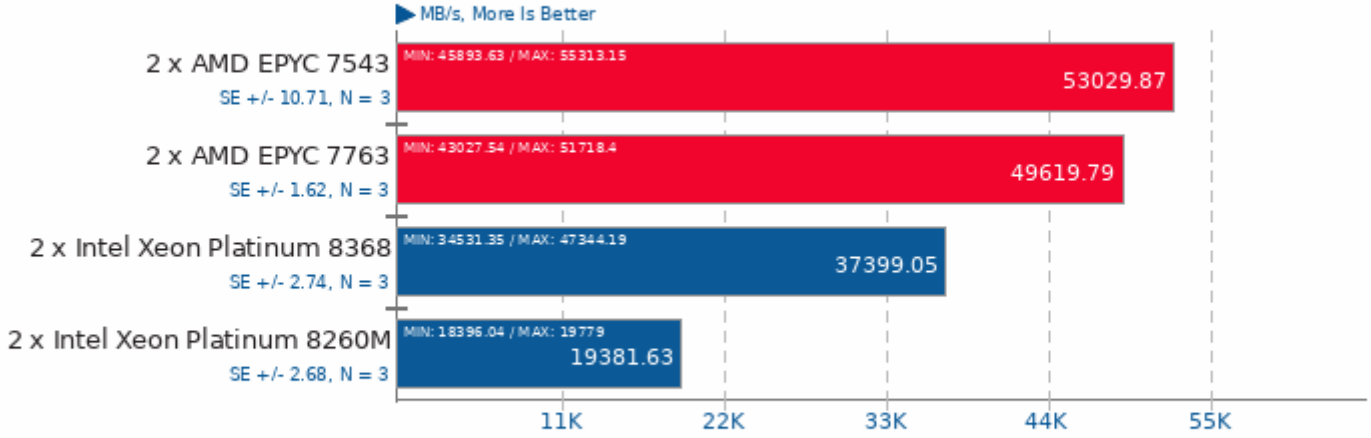
Test: Write



1. (CC) gcc options: -lrt

CacheBench

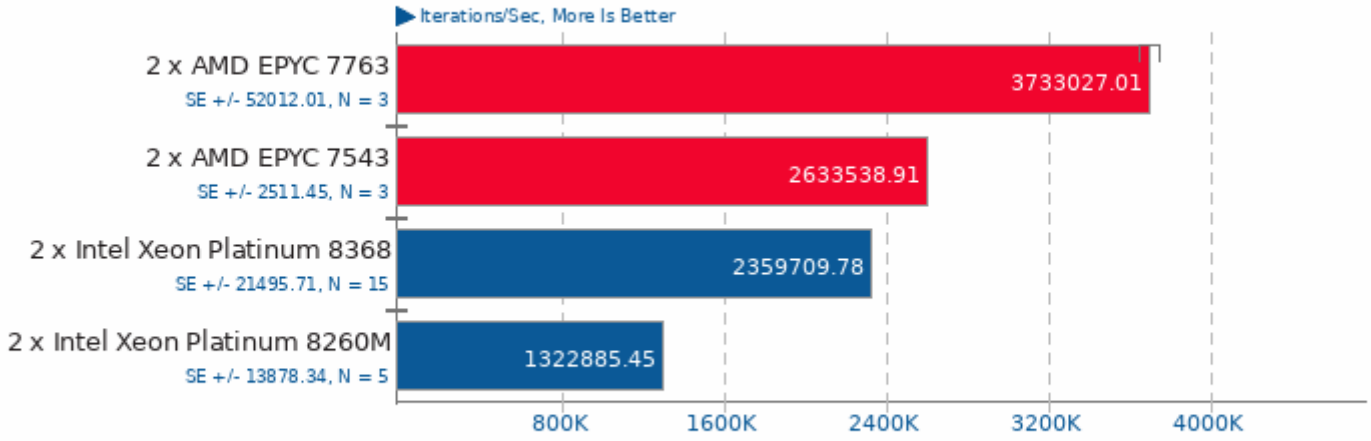
Test: Read / Modify / Write



1. (CC) gcc options: -lrt

Coremark 1.0

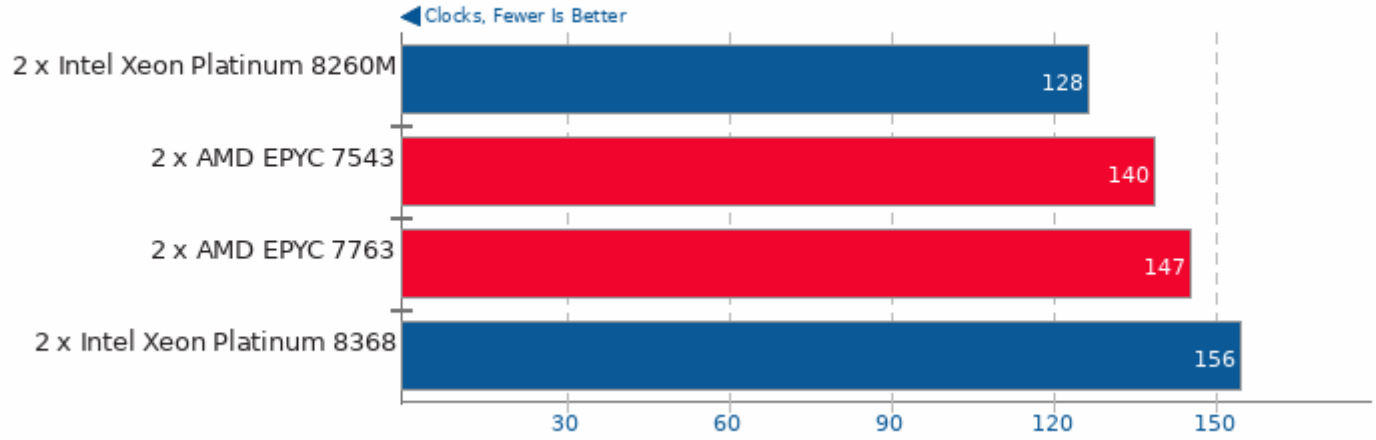
CoreMark Size 666 - Iterations Per Second



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

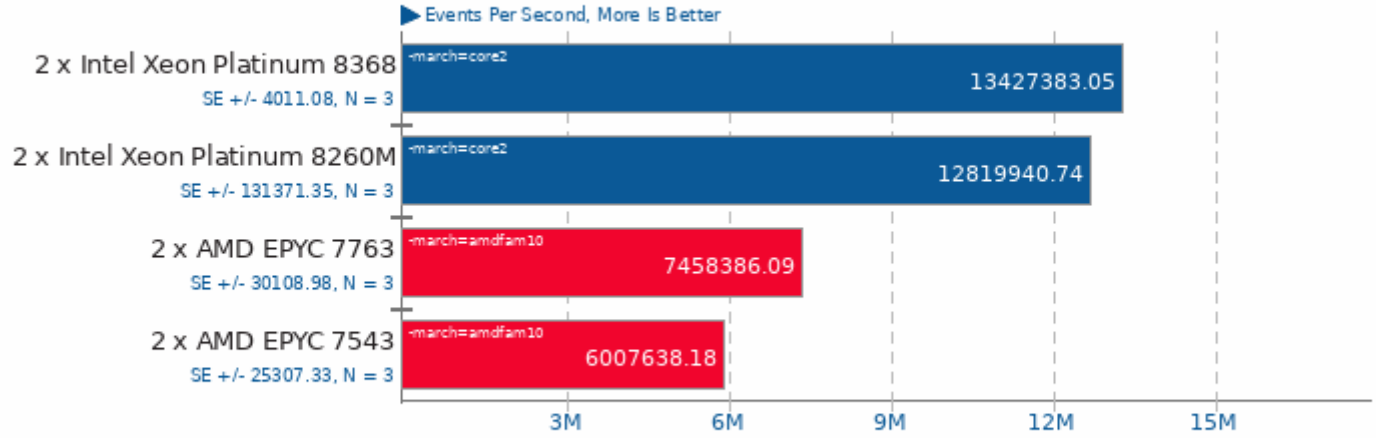
ctx_clock

Context Switch Time



Sysbench 2018-07-28

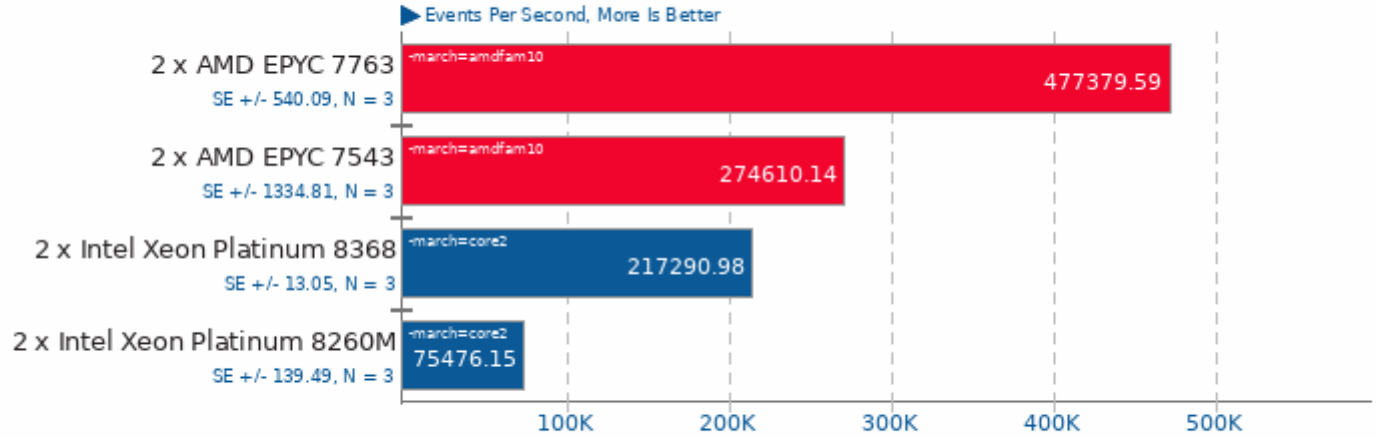
Test: Memory



1. (CC) gcc options: -pthread -O3 -funroll-loops -ggdb3 -rdynamic -ldl -laio -lm

Sysbench 2018-07-28

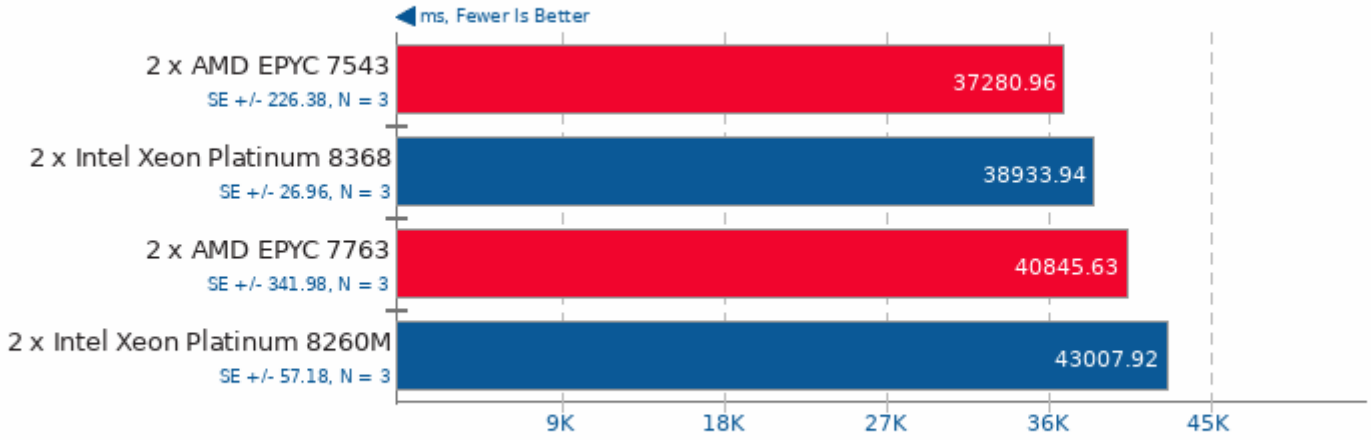
Test: CPU



1. (CC) gcc options: -pthread -O3 -funroll-loops -ggdb3 -rdynamic -ldl -laio -lm

FinanceBench 2016-07-25

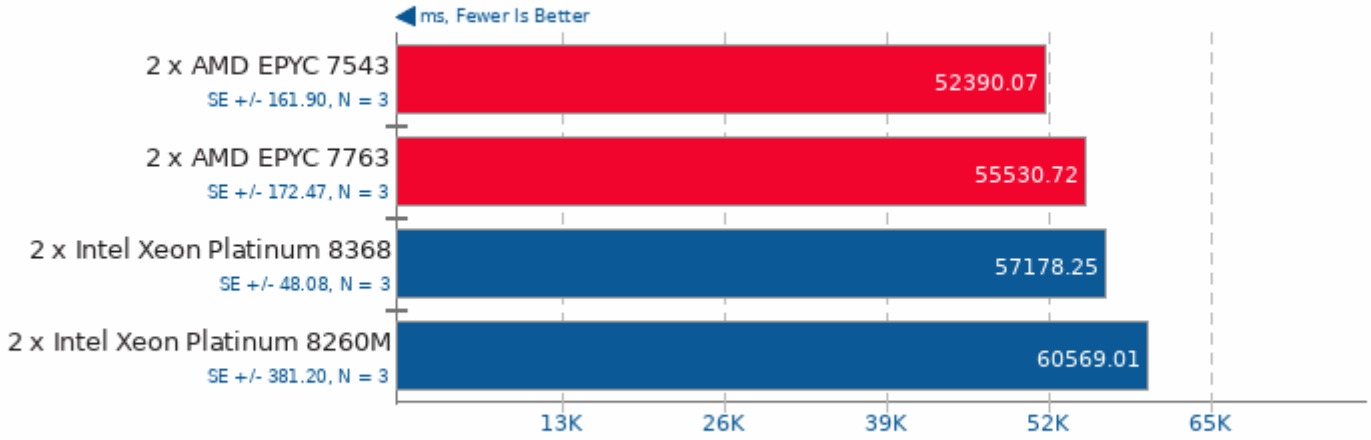
Benchmark: Repo OpenMP



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

FinanceBench 2016-07-25

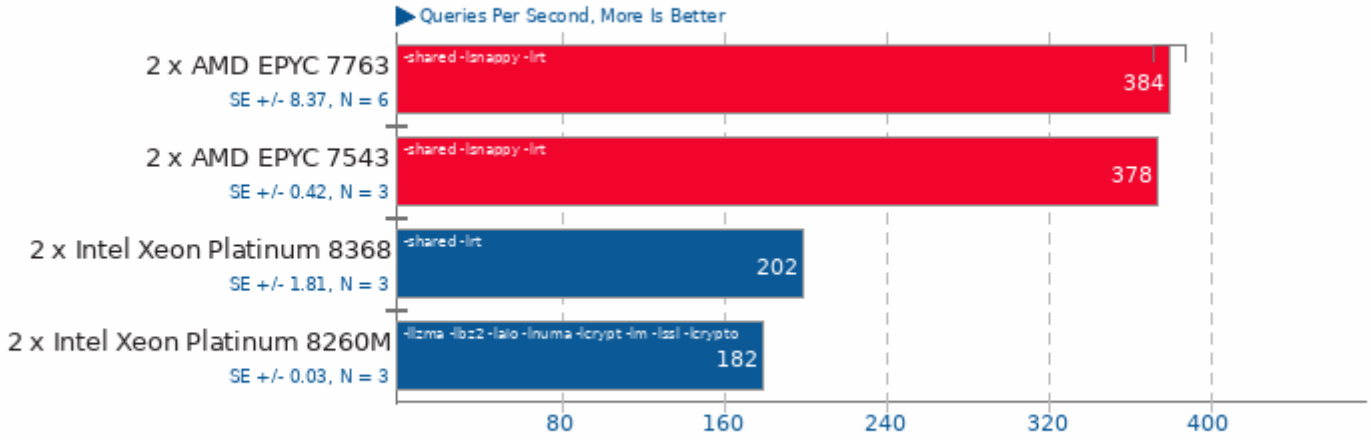
Benchmark: Bonds OpenMP



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

MariaDB 10.5.2

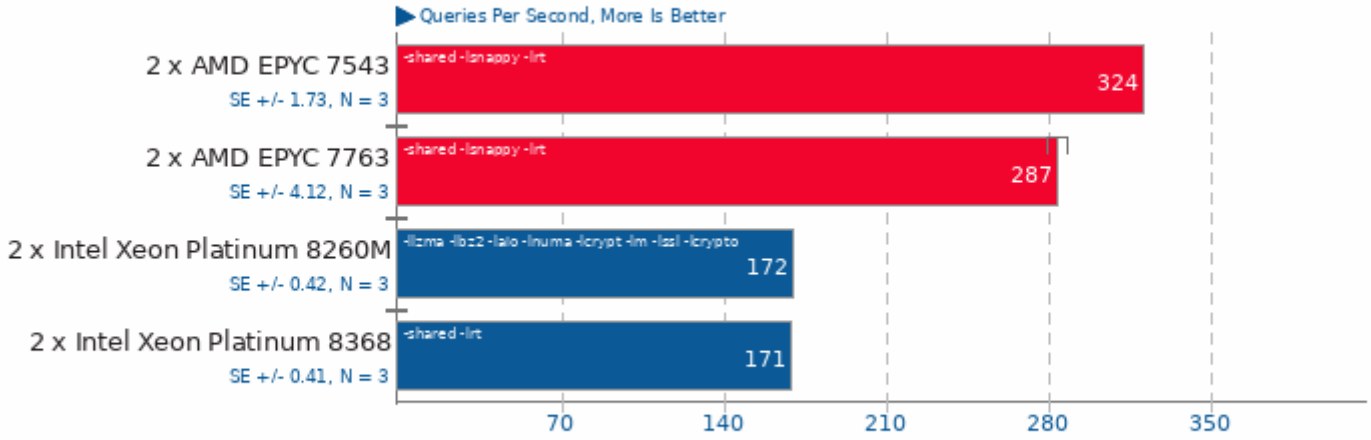
Clients: 128



1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -lpthread -ldl -lz

MariaDB 10.5.2

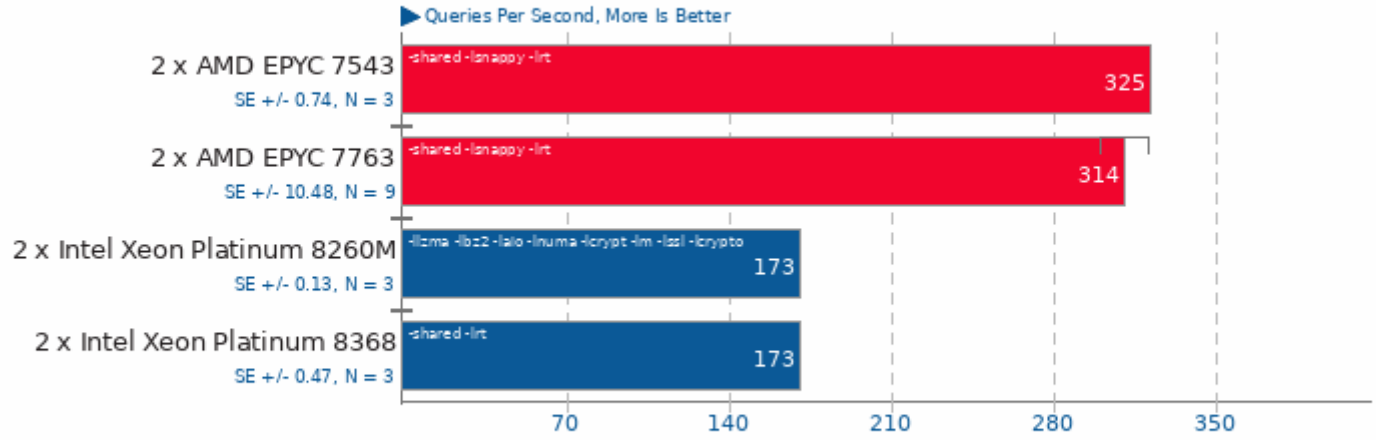
Clients: 256



1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -lpthread -ldl -lz

MariaDB 10.5.2

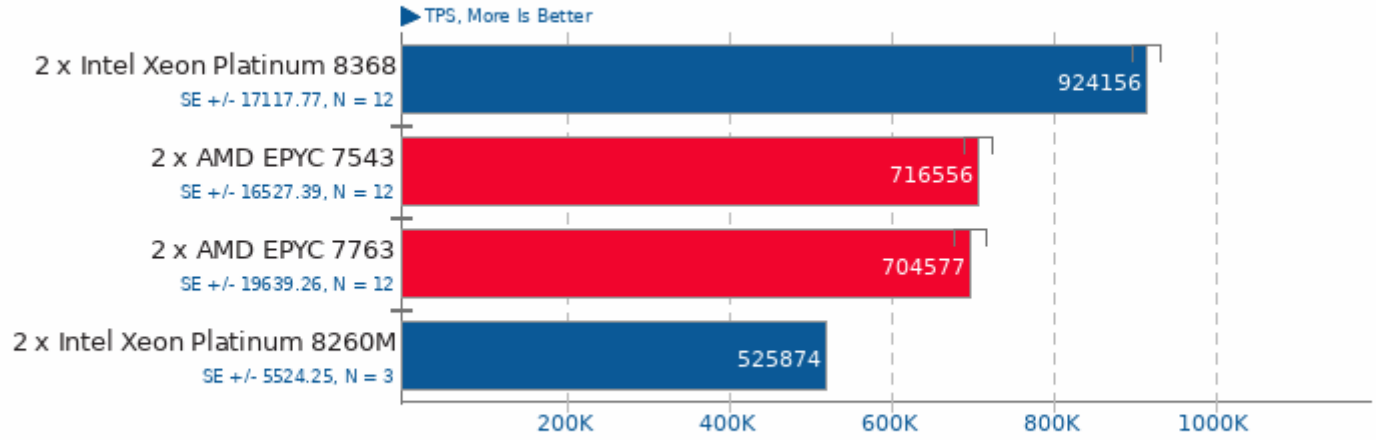
Clients: 512



1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -lpthread -ldl -lz

PostgreSQL pgbench 13.0

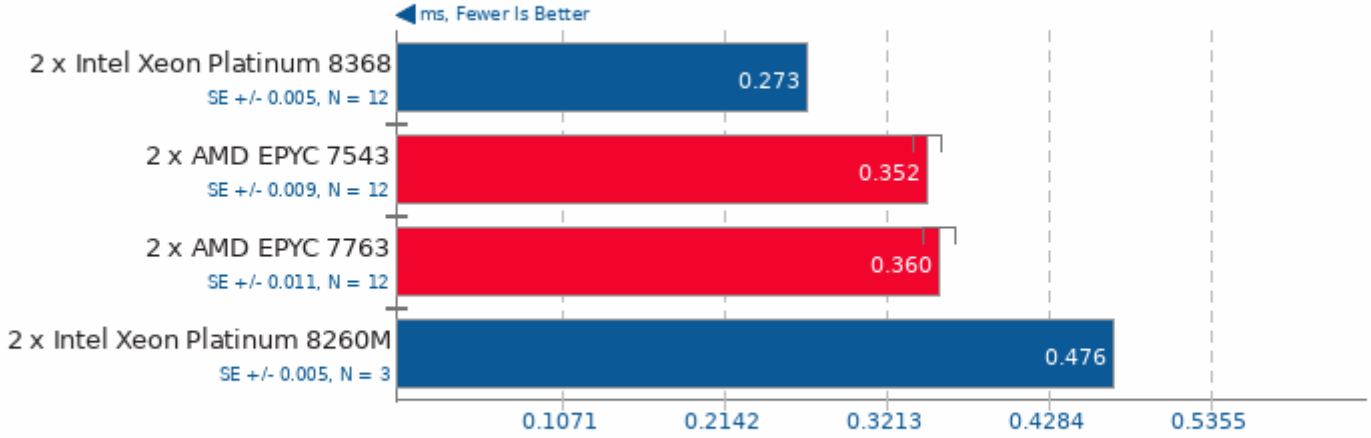
Scaling Factor: 100 - Clients: 250 - Mode: Read Only



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

PostgreSQL pgbench 13.0

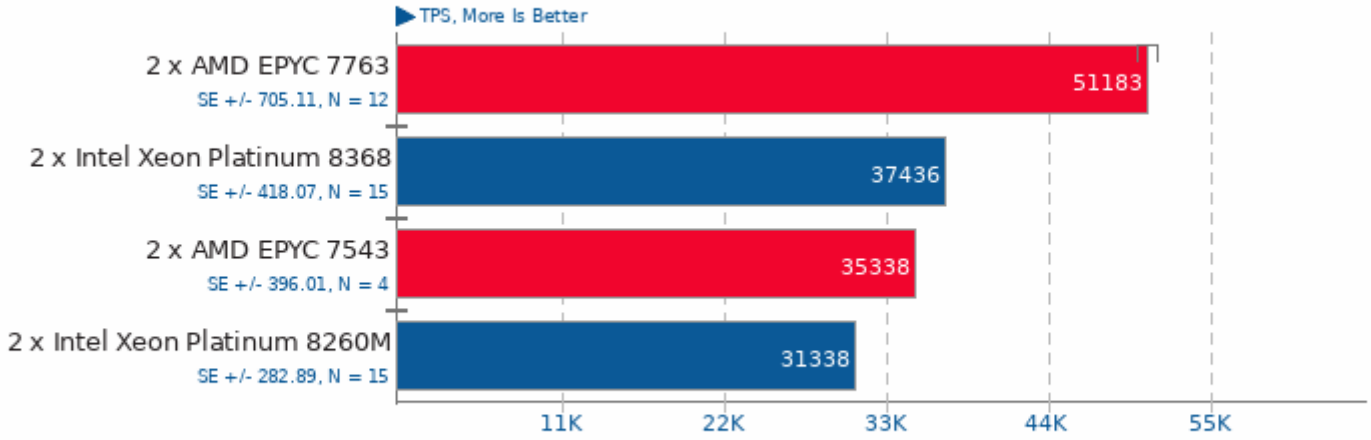
Scaling Factor: 100 - Clients: 250 - Mode: Read Only - Average Latency



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

PostgreSQL pgbench 13.0

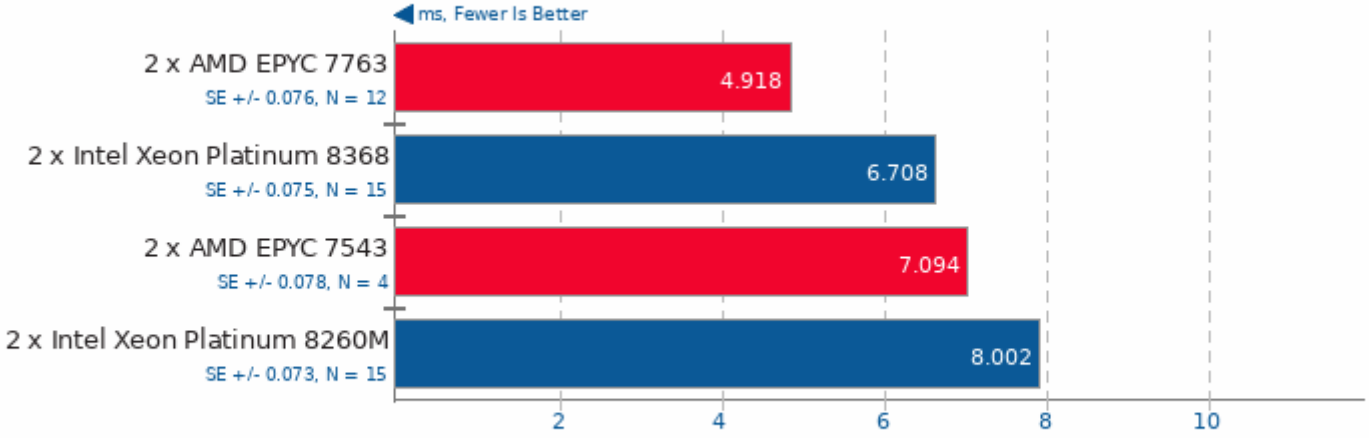
Scaling Factor: 100 - Clients: 250 - Mode: Read Write



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

PostgreSQL pgbench 13.0

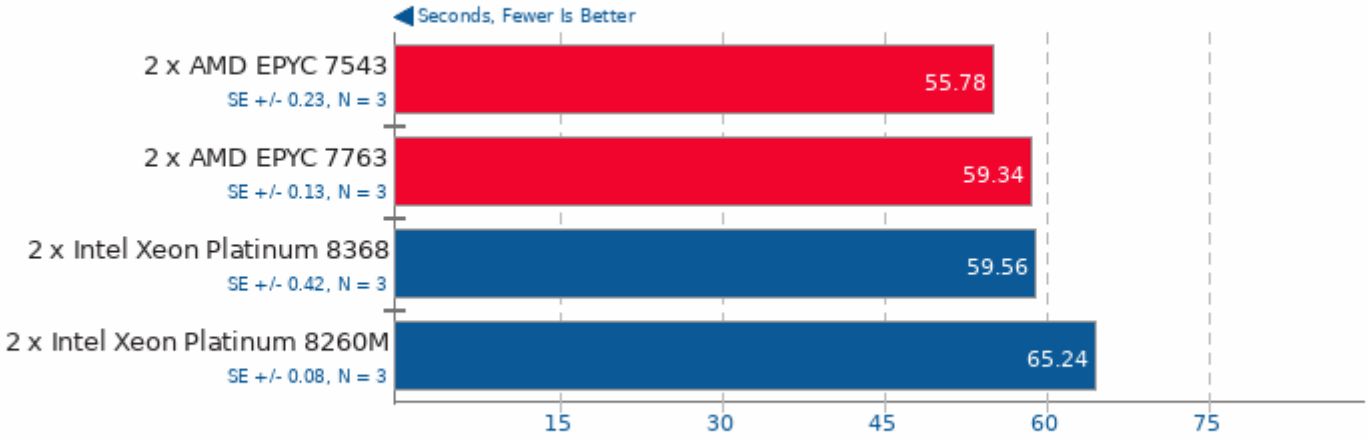
Scaling Factor: 100 - Clients: 250 - Mode: Read Write - Average Latency



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

SQLite Speedtest 3.30

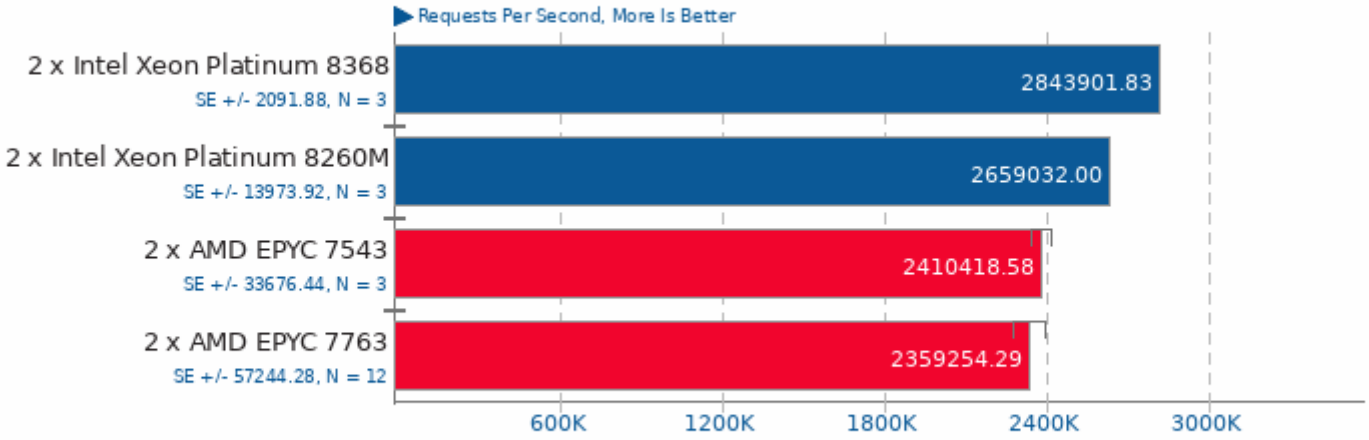
Timed Time - Size 1,000



1. (CC) gcc options: -O2 -ldl -lz -lpthread

Redis 6.0.9

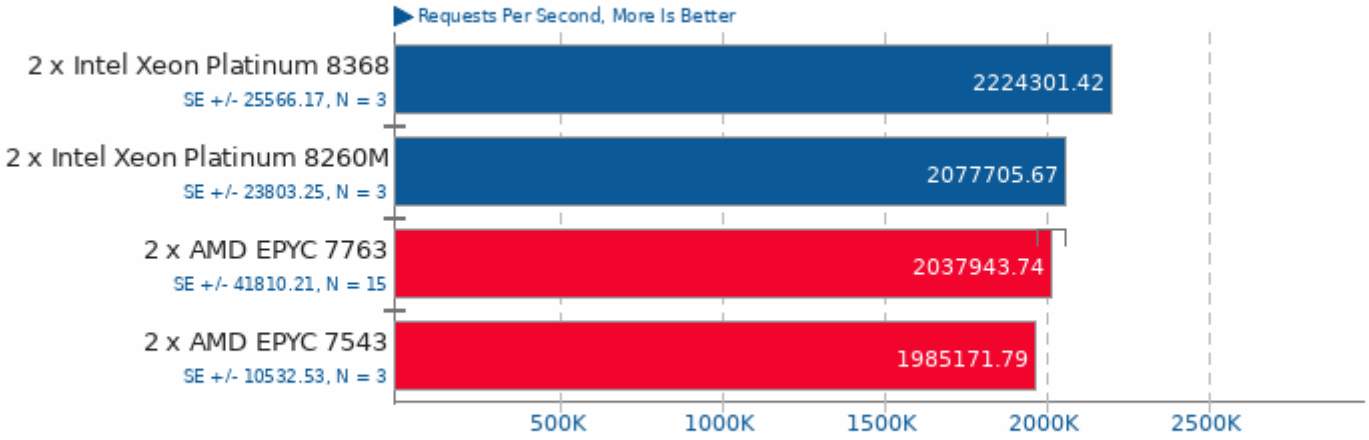
Test: LPOP



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

Redis 6.0.9

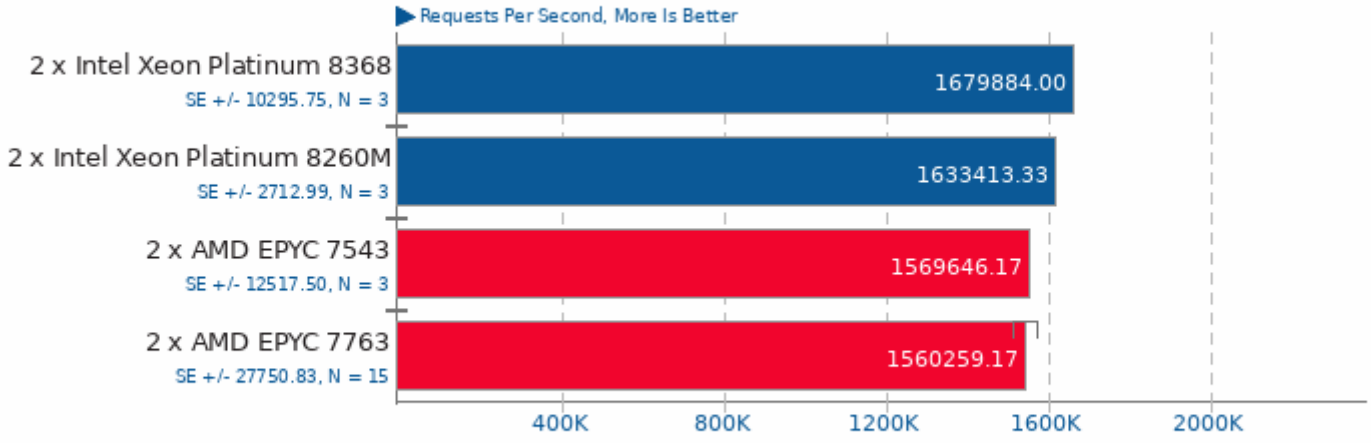
Test: SADD



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

Redis 6.0.9

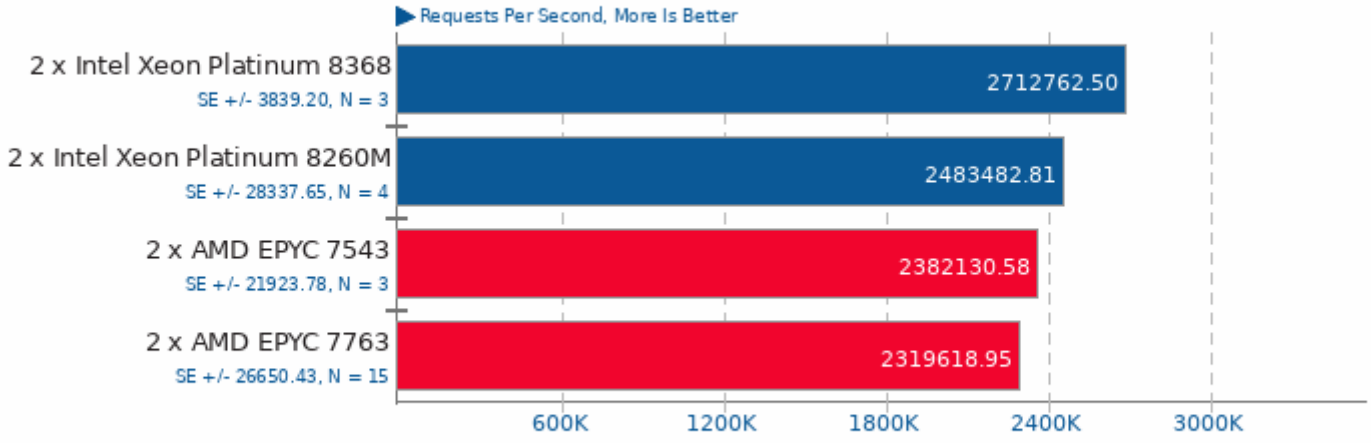
Test: LPUSH



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

Redis 6.0.9

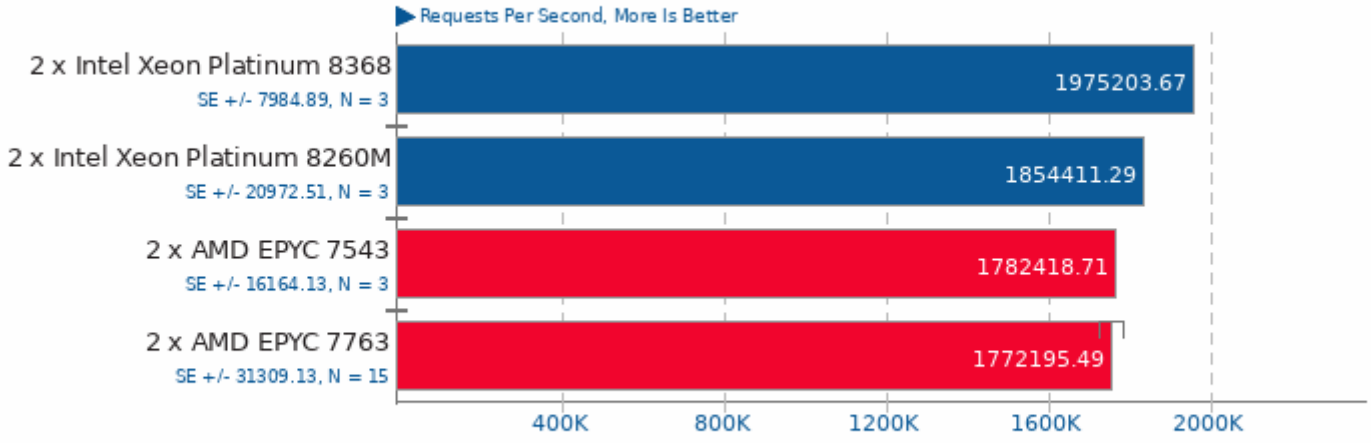
Test: GET



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

Redis 6.0.9

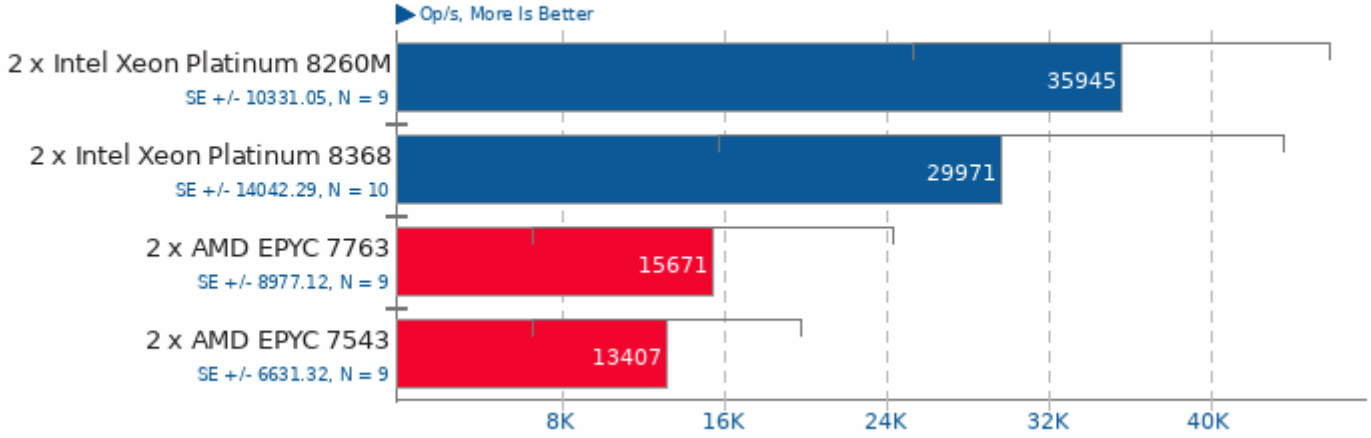
Test: SET



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

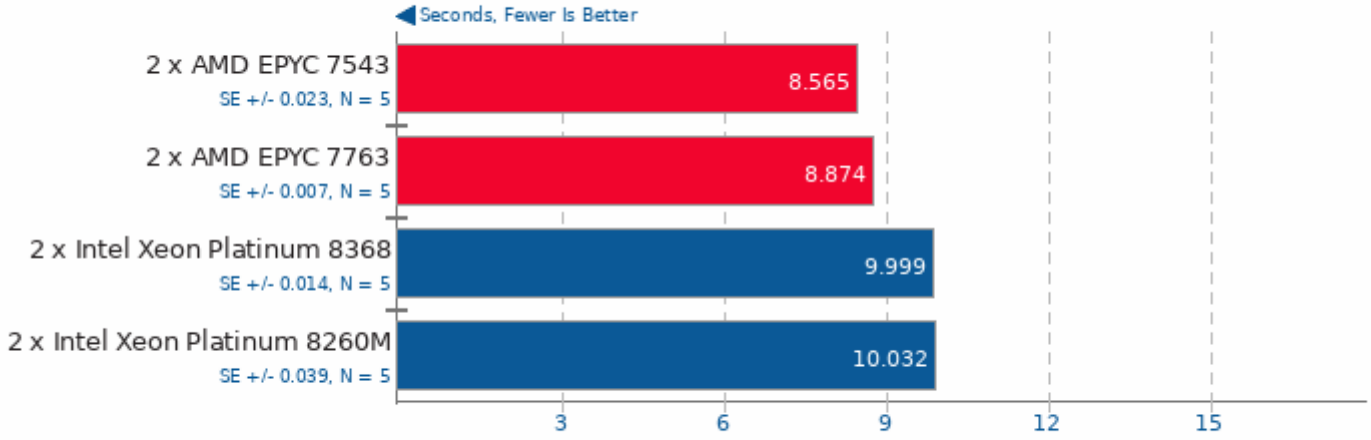
Apache Cassandra 3.11.4

Test: Mixed 1:3



FLAC Audio Encoding 1.3.2

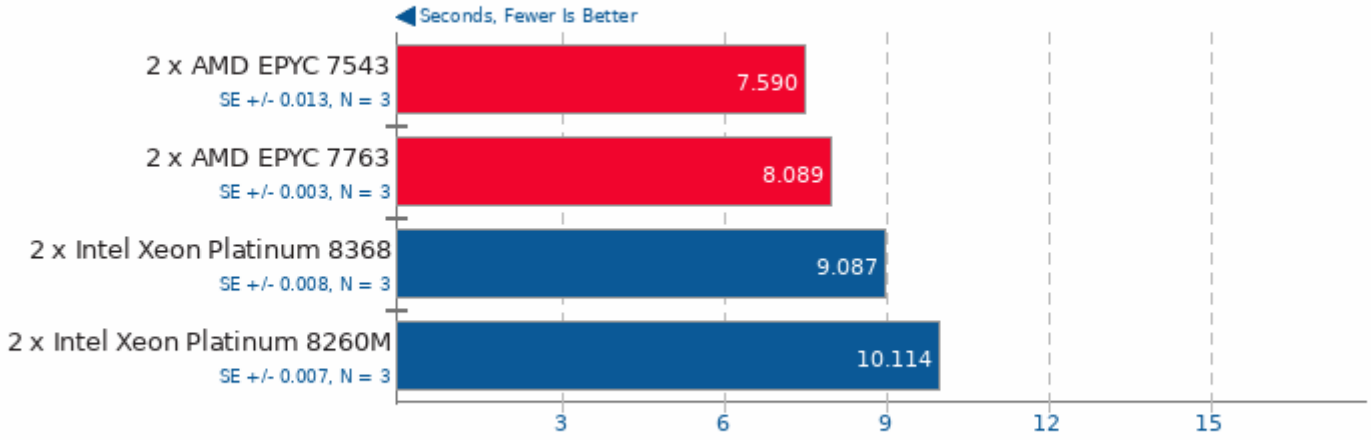
WAV To FLAC



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

LAME MP3 Encoding 3.100

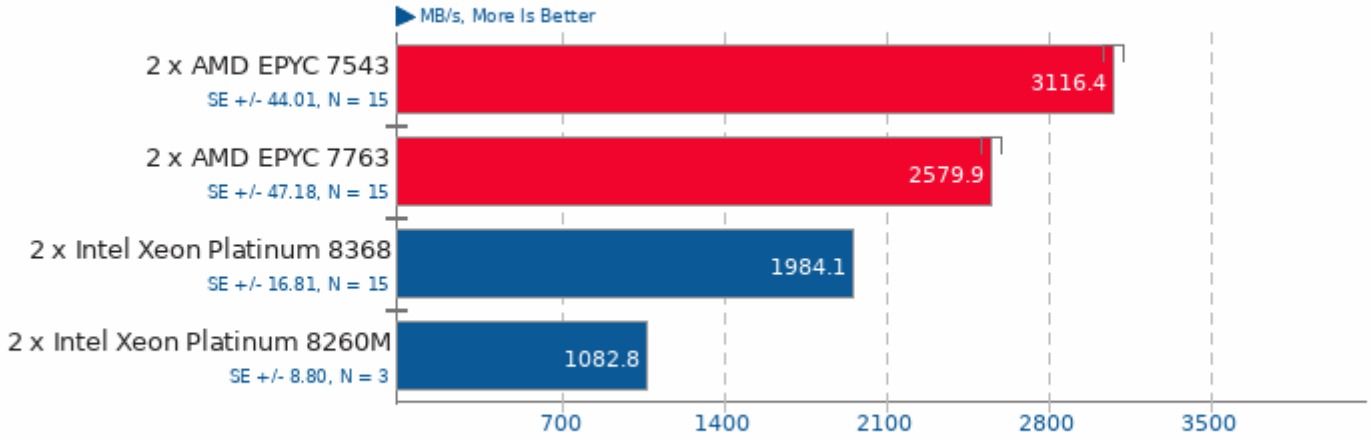
WAV To MP3



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

Zstd Compression 1.4.9

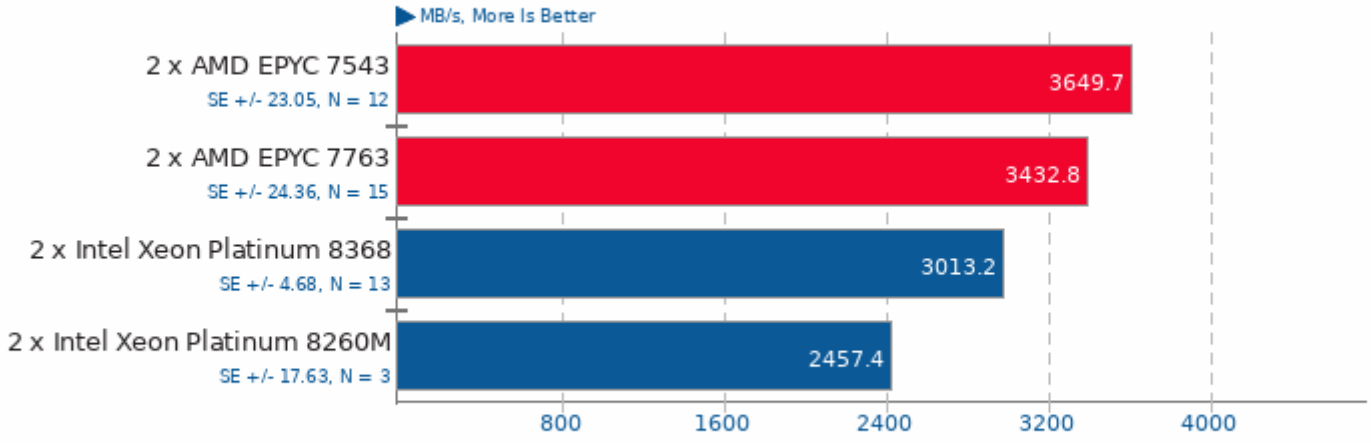
Compression Level: 8 - Compression Speed



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

Zstd Compression 1.4.9

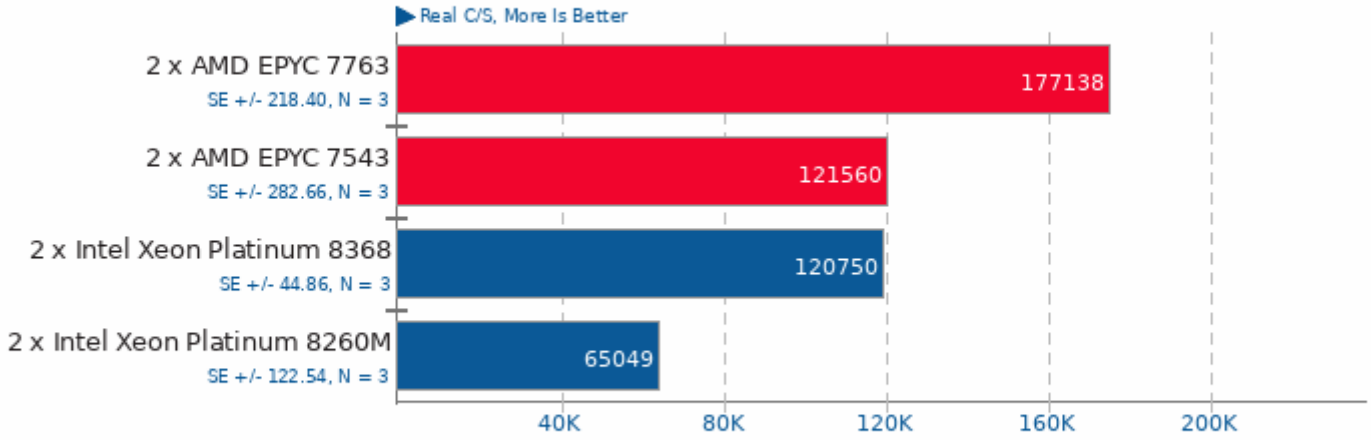
Compression Level: 8 - Decompression Speed



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

John The Ripper 1.9.0-jumbo-1

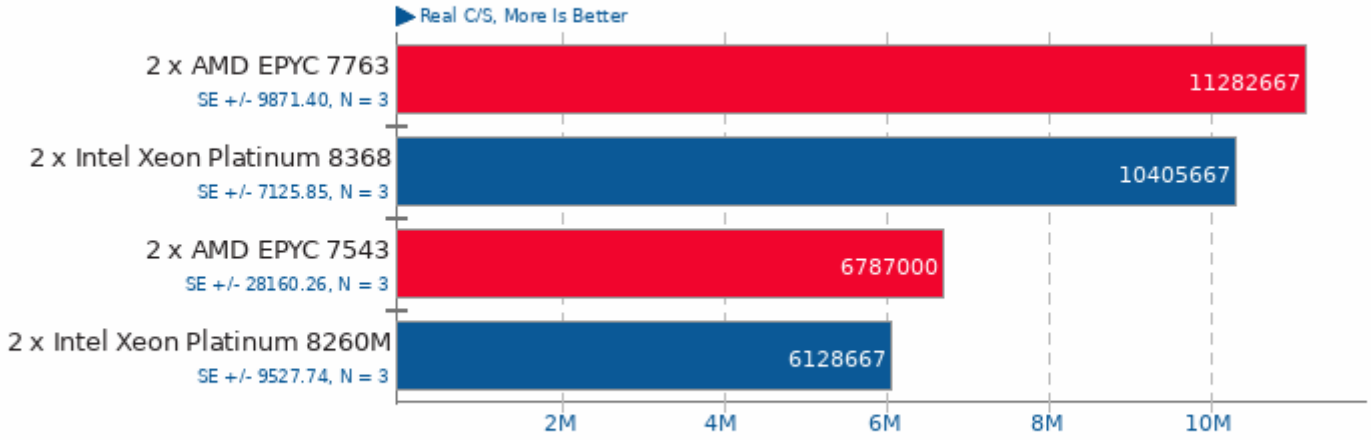
Test: Blowfish



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

John The Ripper 1.9.0-jumbo-1

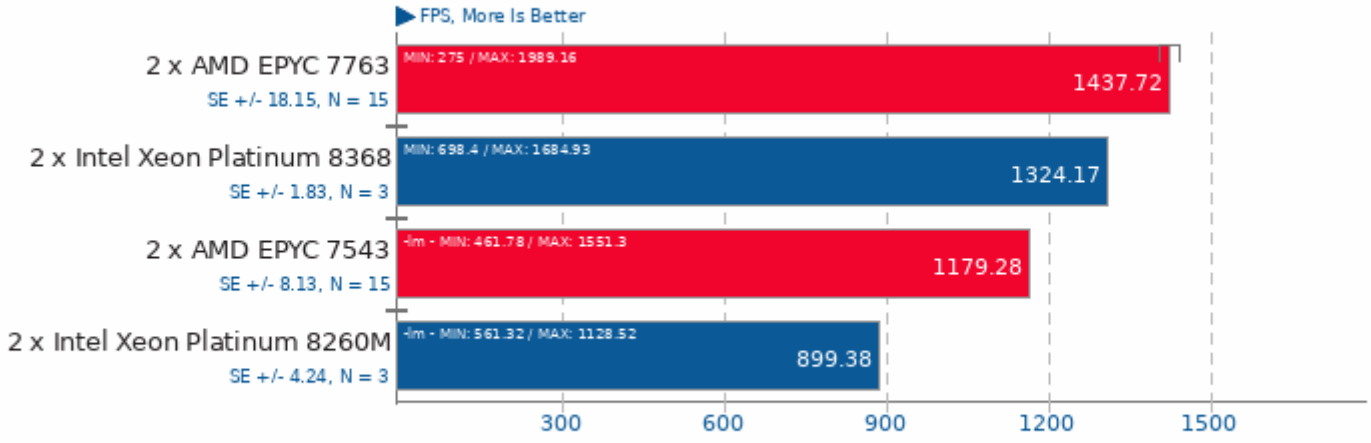
Test: MD5



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

dav1d 0.8.2

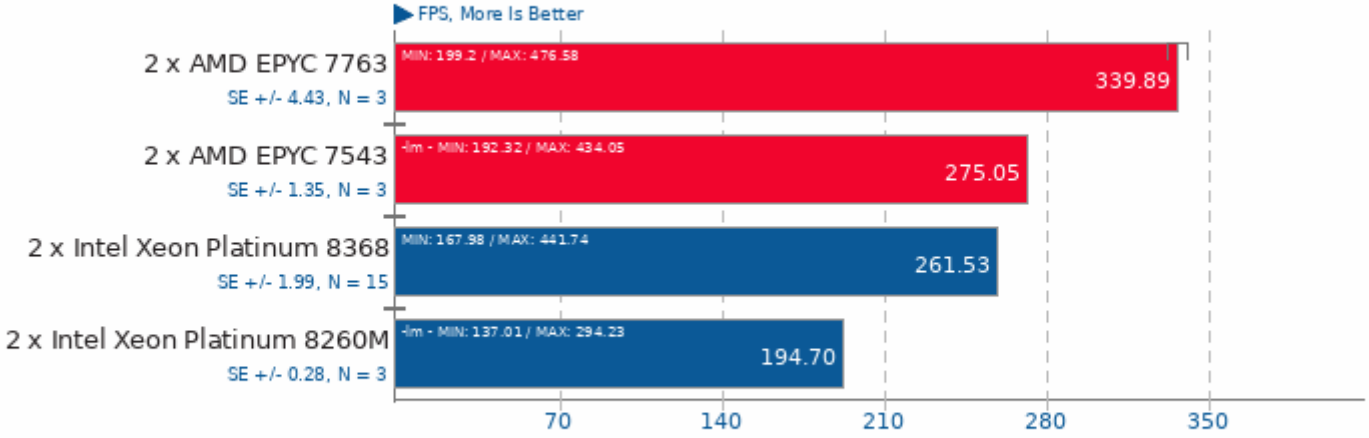
Video Input: Chimera 1080p



1. (CC) gcc options: -pthread

dav1d 0.8.2

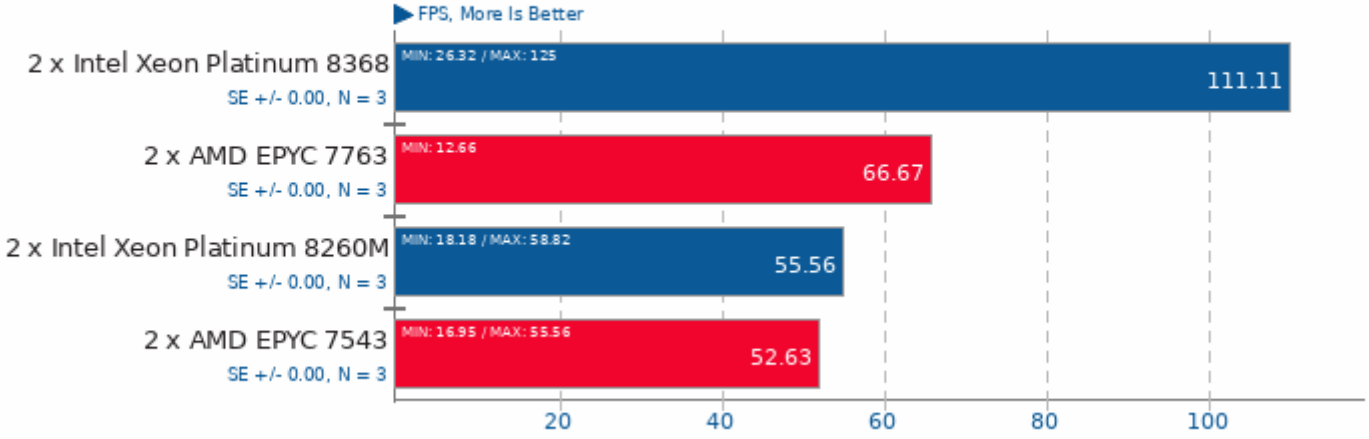
Video Input: Chimera 1080p 10-bit



1. (CC) gcc options: -pthread

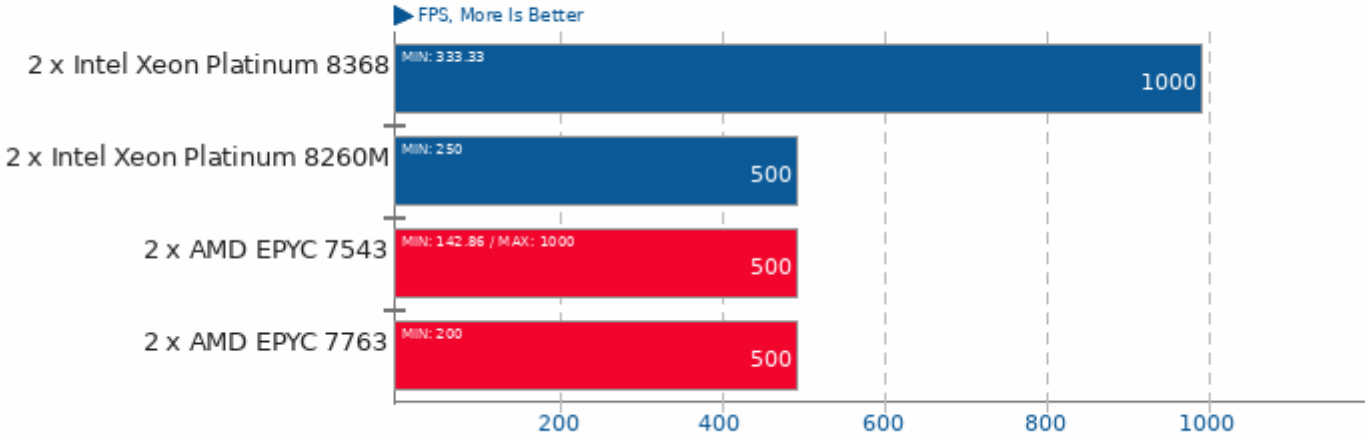
OSPray 1.8.5

Demo: Magnetic Reconnection - Renderer: SciVis



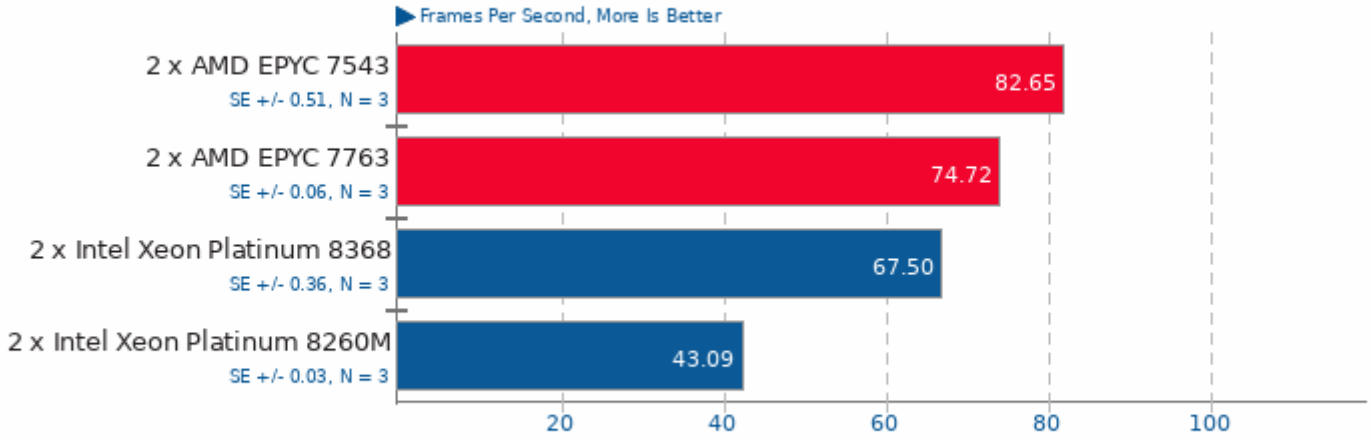
OSPray 1.8.5

Demo: Magnetic Reconnection - Renderer: Path Tracer



Kvazaar 2.0

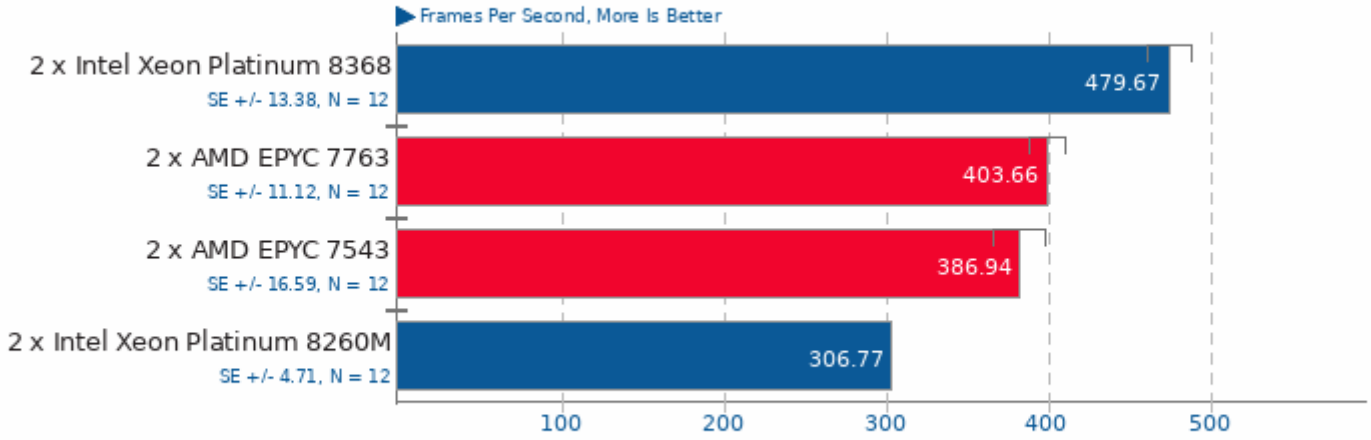
Video Input: Bosphorus 1080p - Video Preset: Medium



1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -O2 -lpthread -lm -lrt

SVT-VP9 0.1

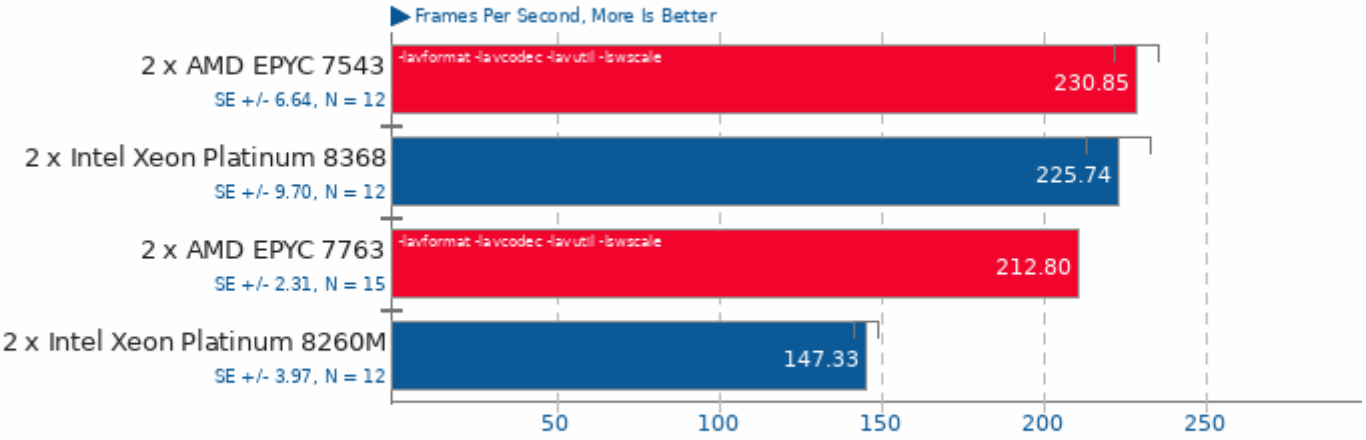
Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p



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

x264 2019-12-17

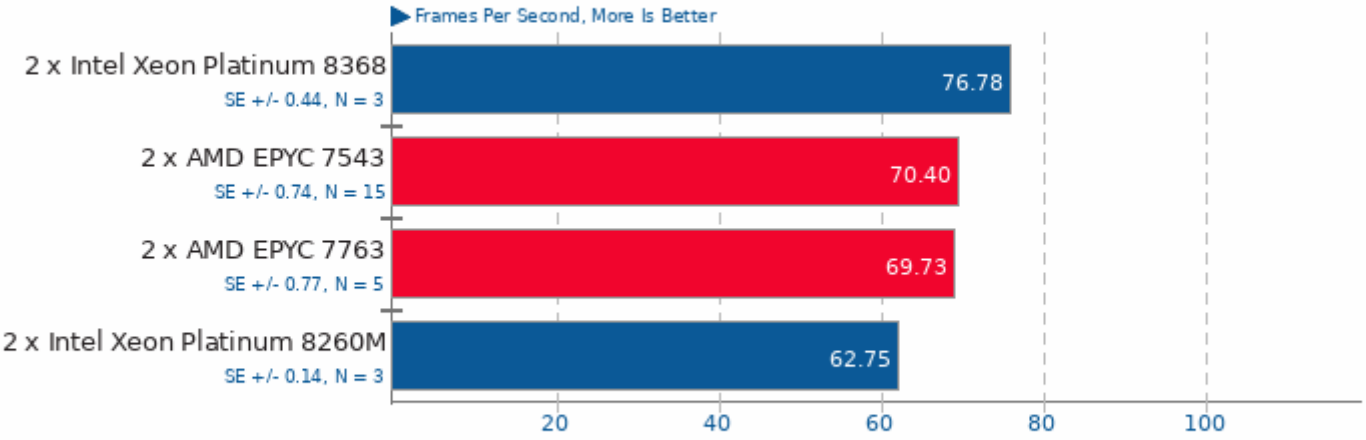
H.264 Video Encoding



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

x265 3.4

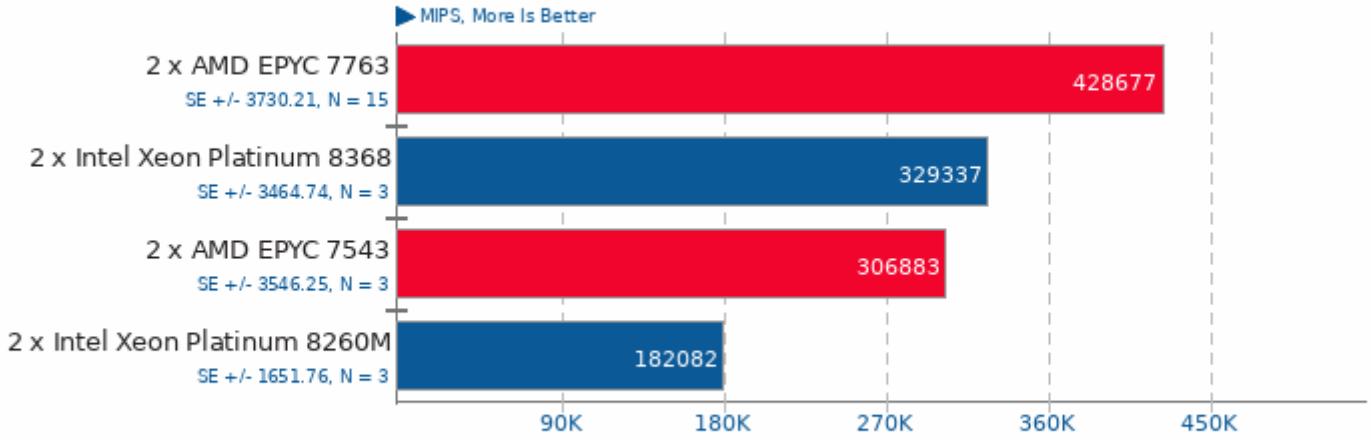
Video Input: Bosphorus 1080p



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

7-Zip Compression 16.02

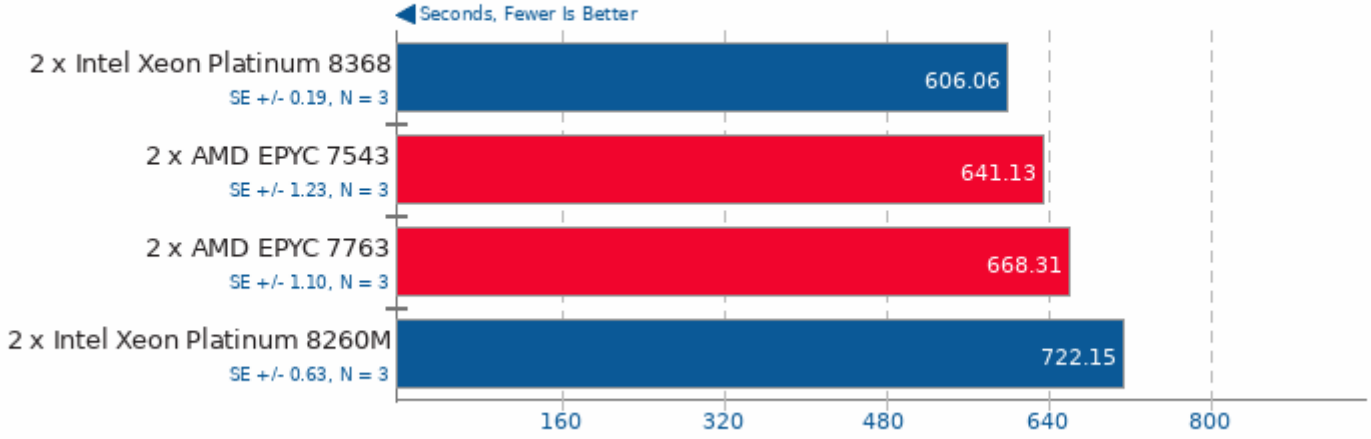
Compress Speed Test



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

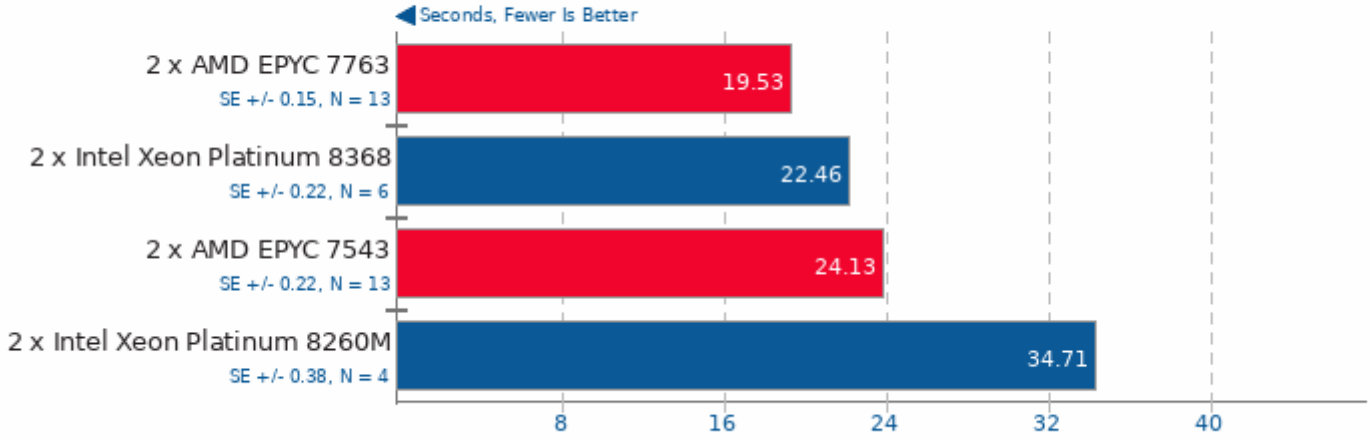
Timed GCC Compilation 9.3.0

Time To Compile



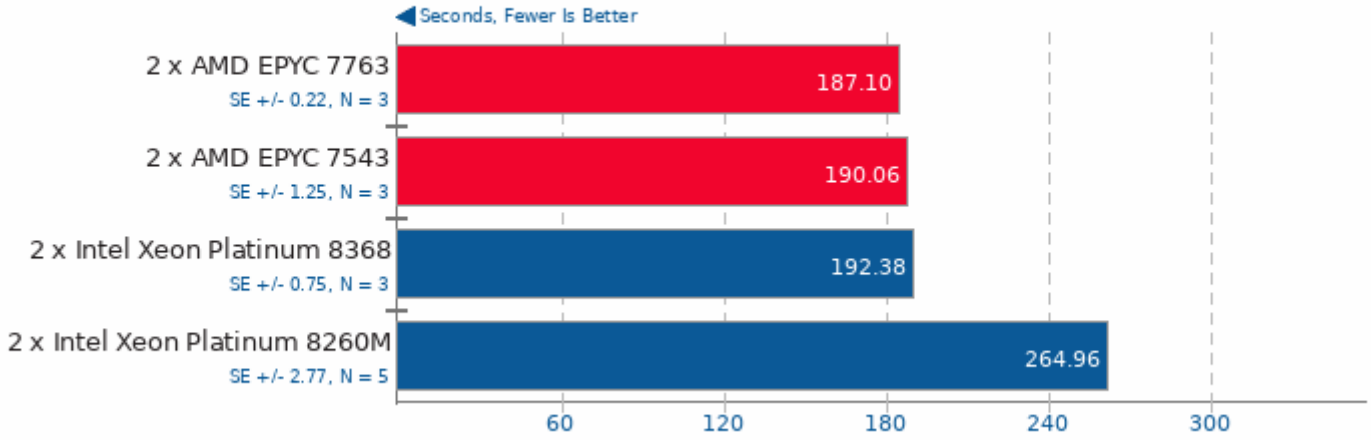
Timed Linux Kernel Compilation 5.10.20

Time To Compile



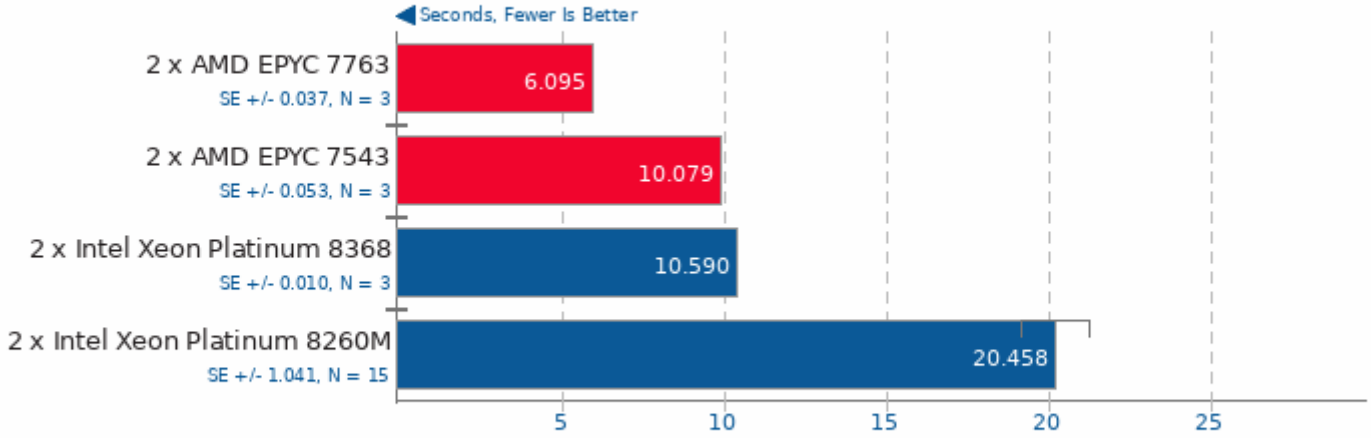
Timed LLVM Compilation 10.0

Time To Compile



C-Ray 1.1

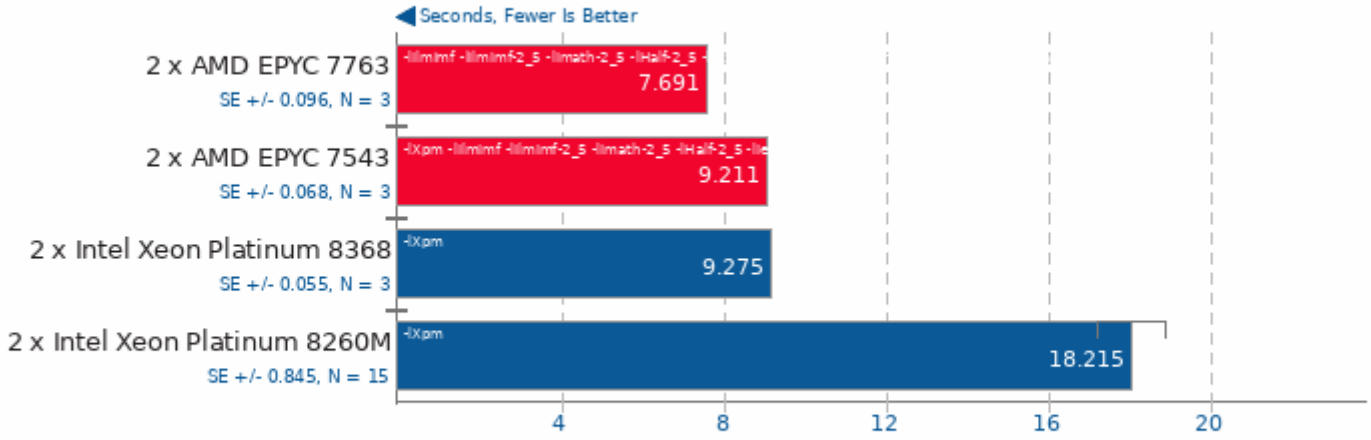
Total Time - 4K, 16 Rays Per Pixel



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

POV-Ray 3.7.0.7

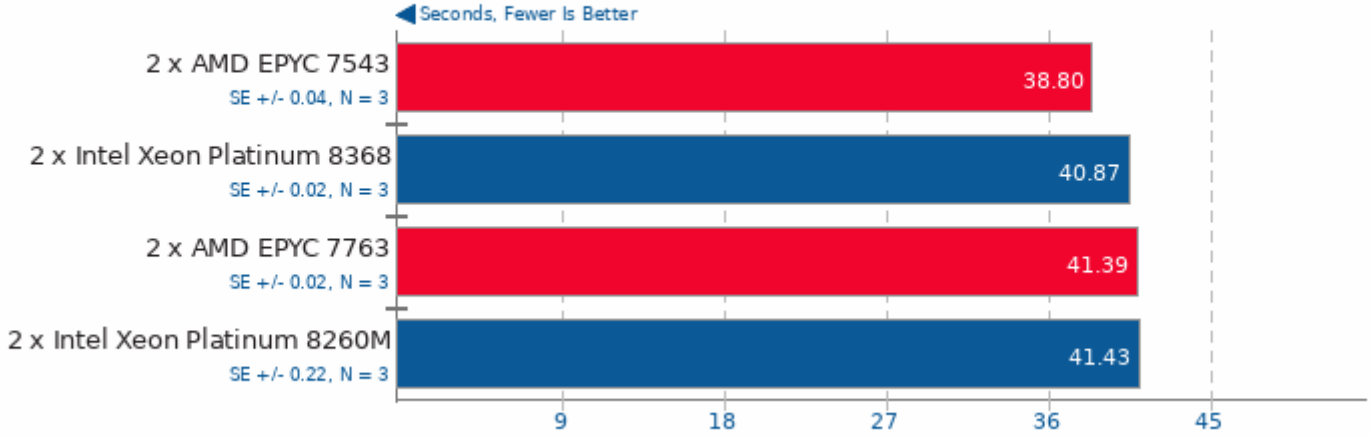
Trace Time



1. (CXX) g++ options: -pipe -O3 -ffast-math -march=native -pthread -lSM -lICE -lX11 -ltiff -ljpeg -lpng -lz -lrt -lm -lboost_thread -lboost_system

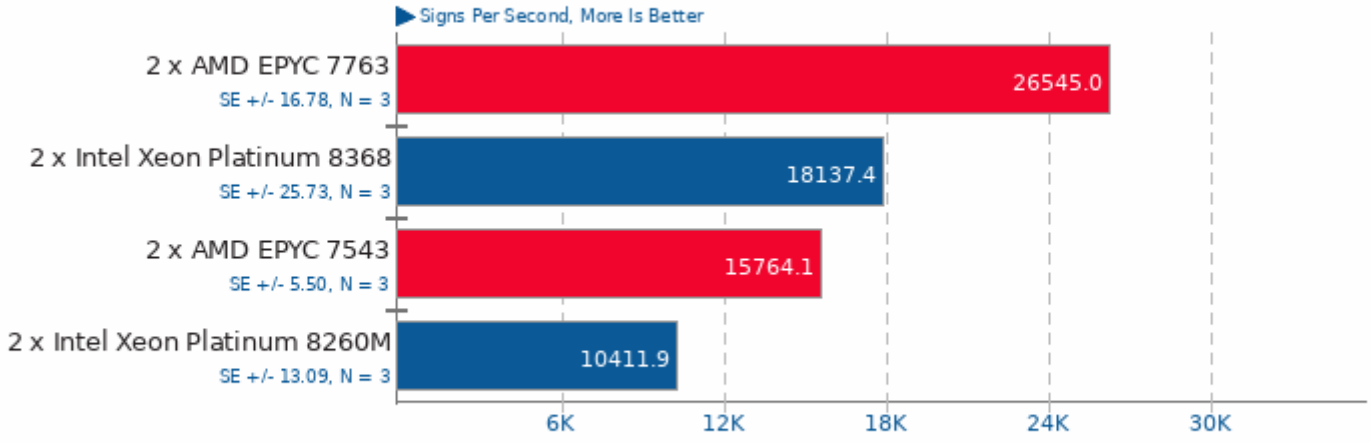
Gzip Compression

Linux Source Tree Archiving To .tar.gz



OpenSSL 1.1.1

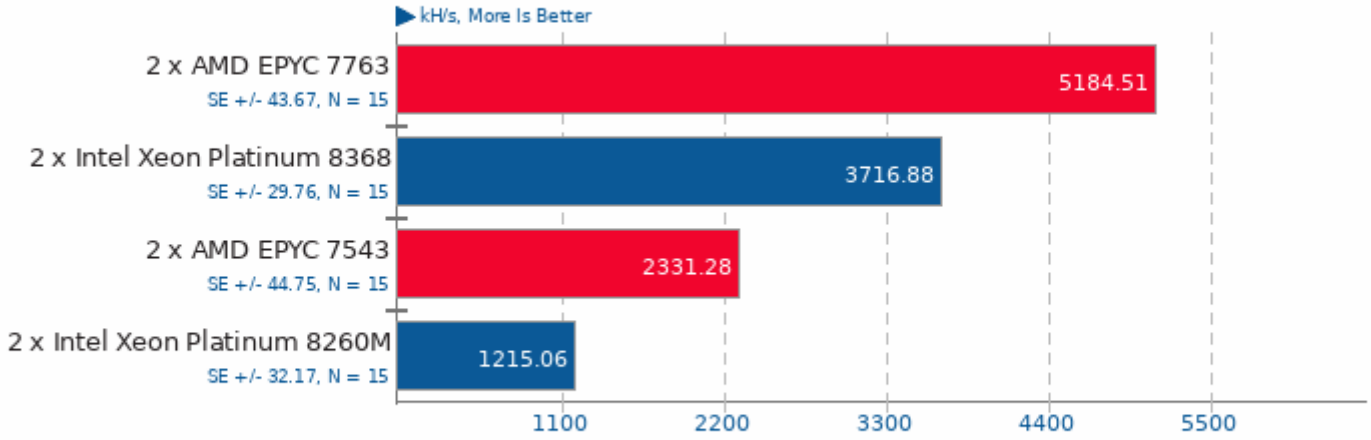
RSA 4096-bit Performance



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

Cpuminer-Opt 3.15.5

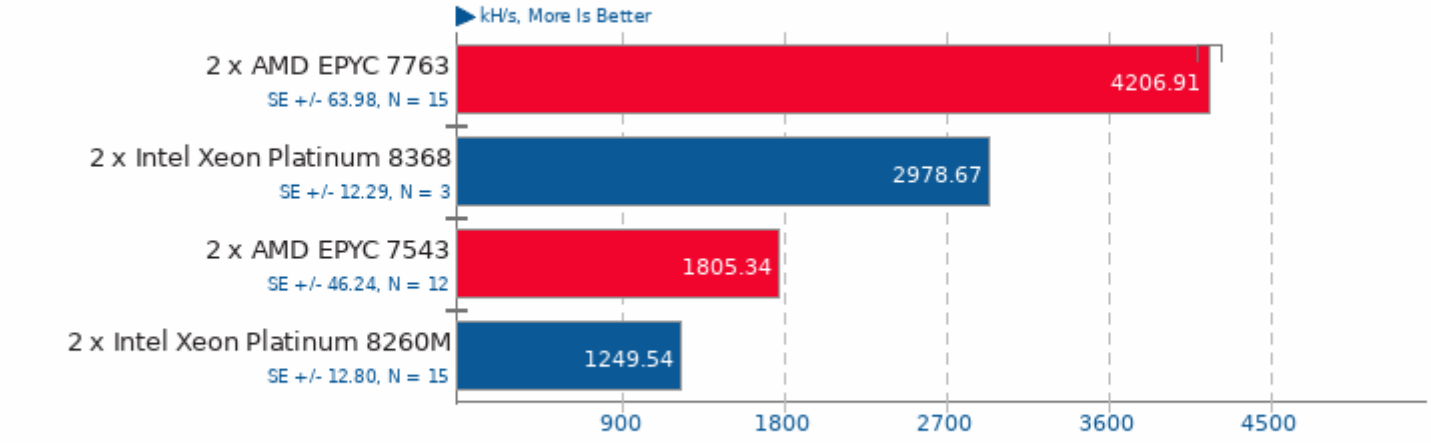
Algorithm: Magi



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

Cpuminer-Opt 3.15.5

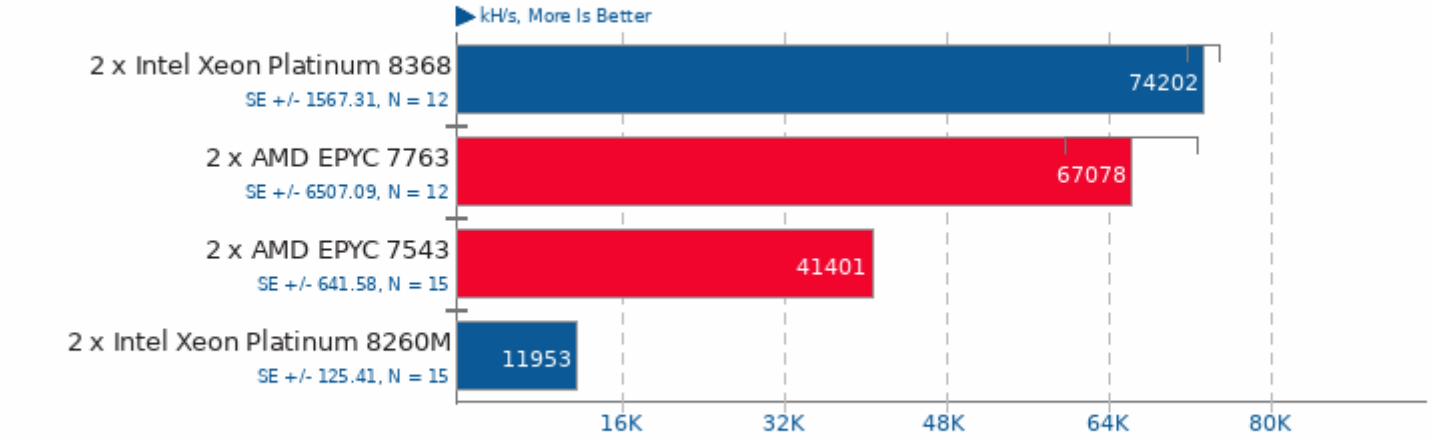
Algorithm: x25x



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

Cpuminer-Opt 3.15.5

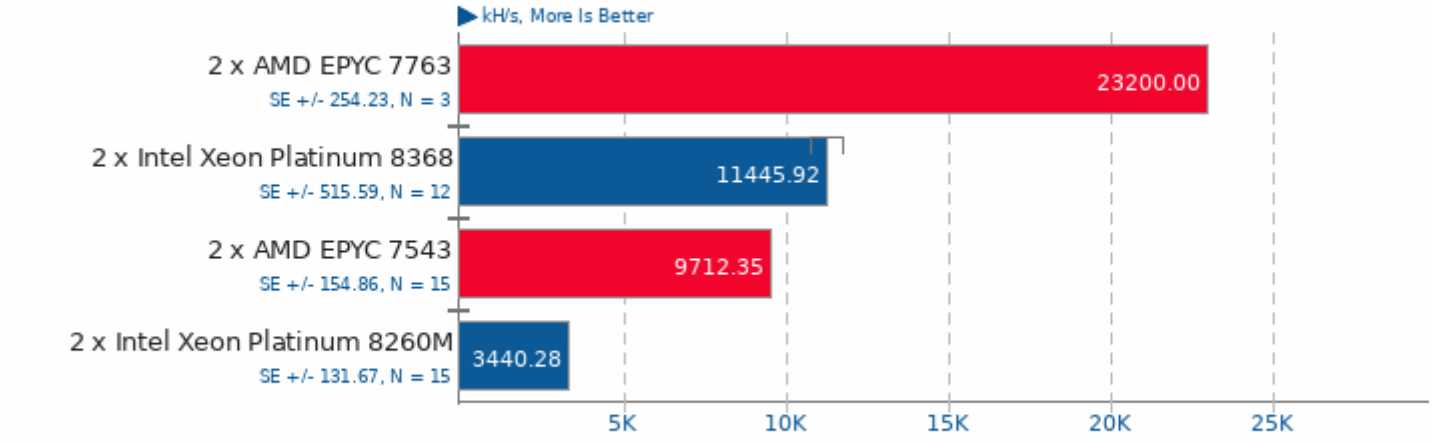
Algorithm: Deepcoin



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

Cpuminer-Opt 3.15.5

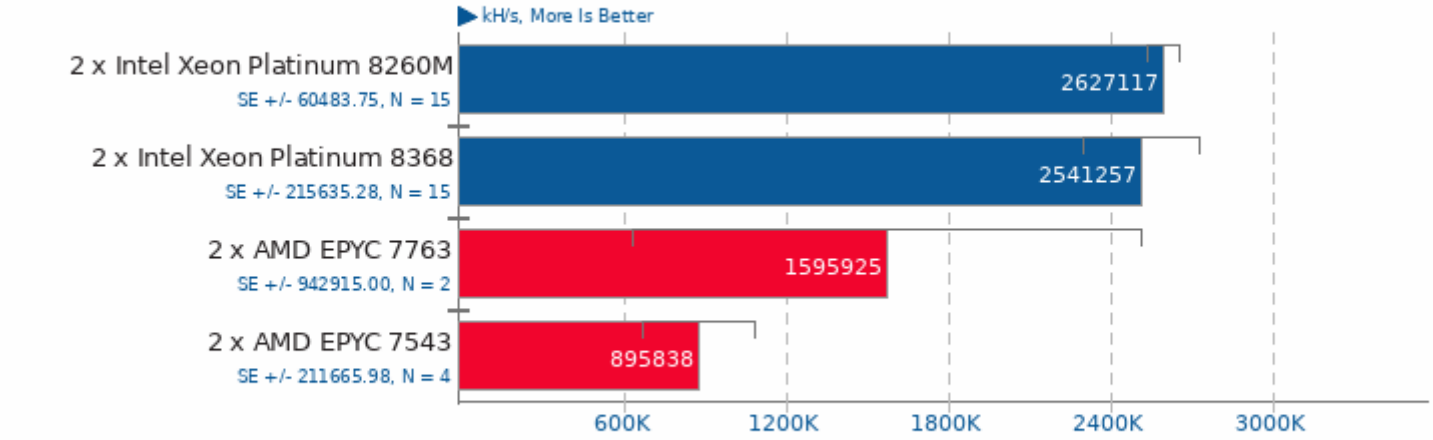
Algorithm: Ringcoin



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

Cpuminer-Opt 3.15.5

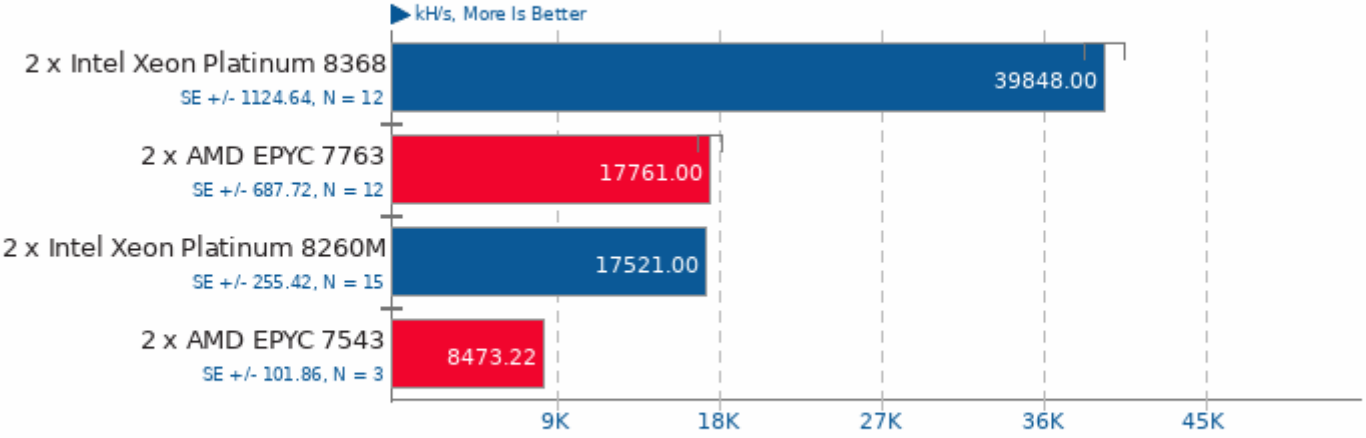
Algorithm: Blake-2 S



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

Cpuminer-Opt 3.15.5

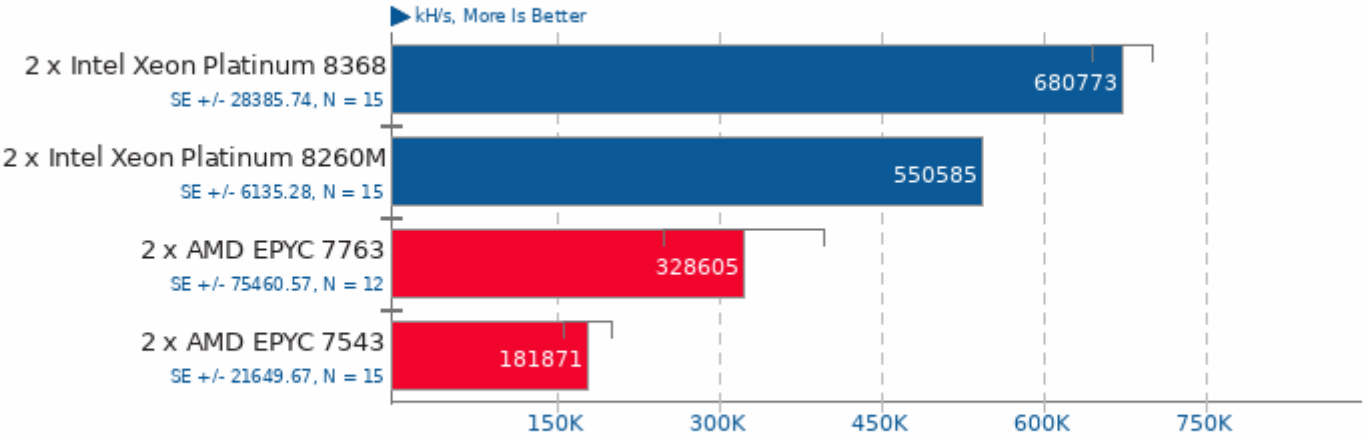
Algorithm: Garlicoin



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

Cpuminer-Opt 3.15.5

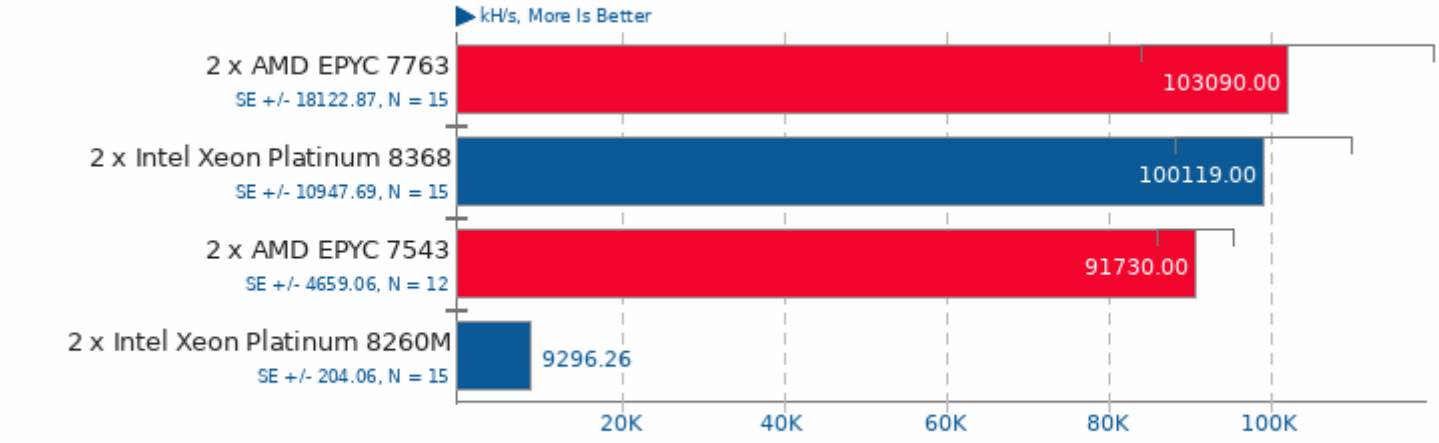
Algorithm: Skeincoin



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

Cpuminer-Opt 3.15.5

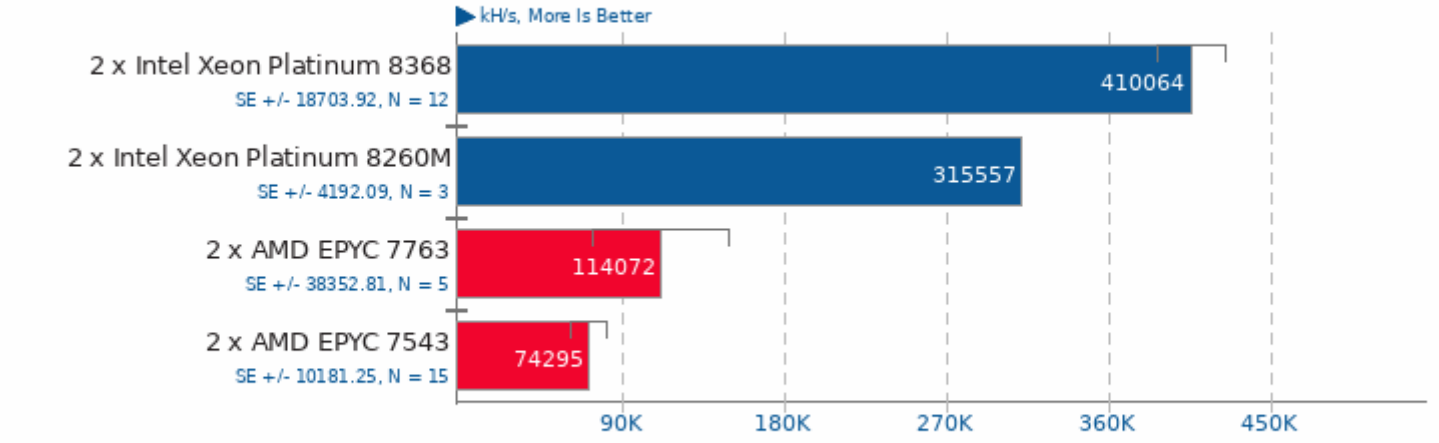
Algorithm: Myriad-Groestl



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

Cpuminer-Opt 3.15.5

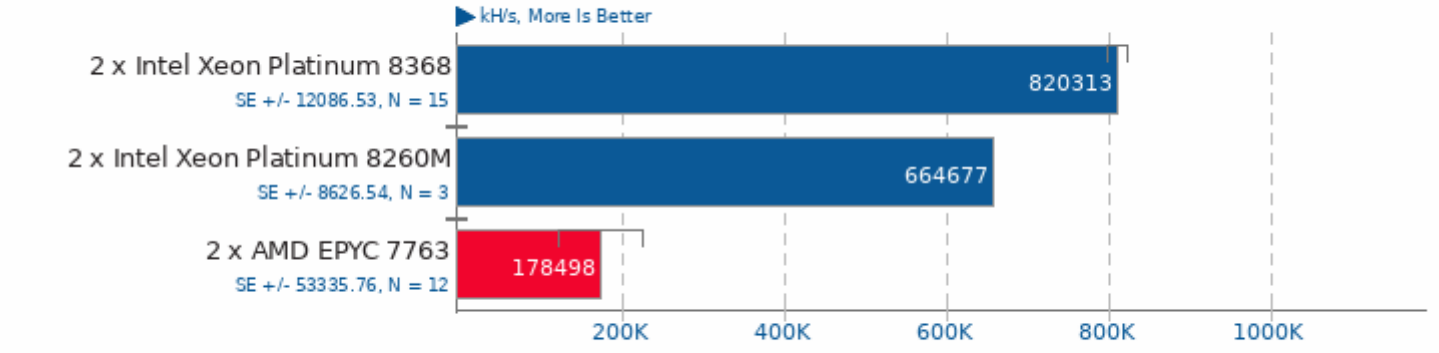
Algorithm: LBC, LBRY Credits



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

Cpuminer-Opt 3.15.5

Algorithm: Quad SHA-256, Pyrite



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

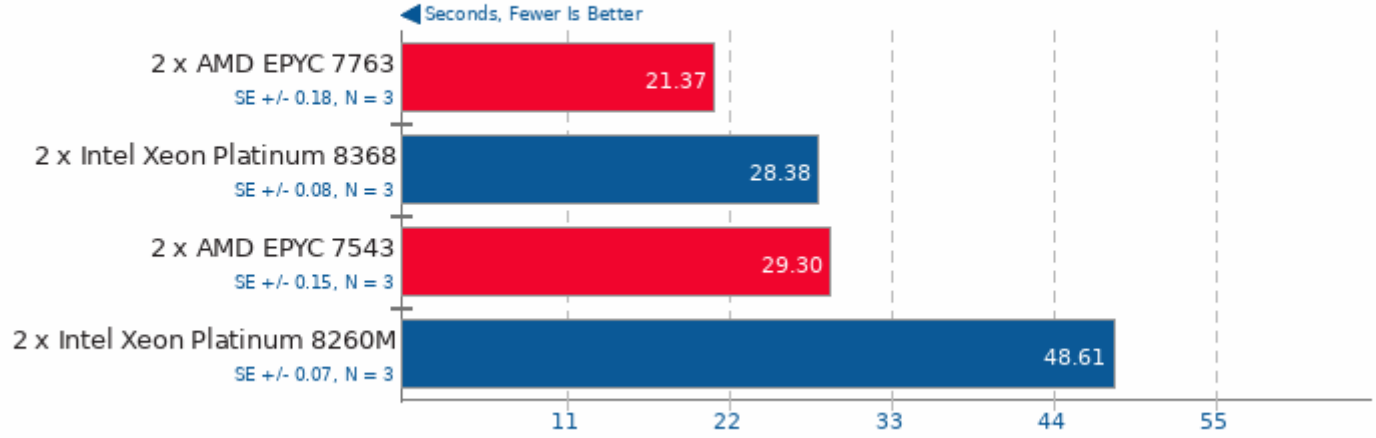
Cpuminer-Opt 3.15.5

Algorithm: Triple SHA-256, Onecoin

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

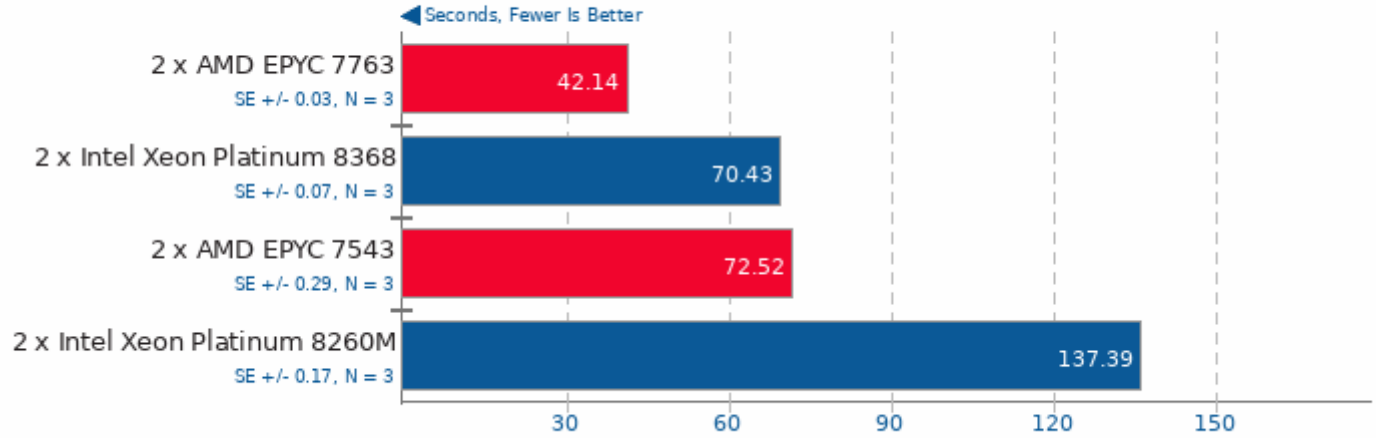
Blender 2.92

Blend File: BMW27 - Compute: CPU-Only



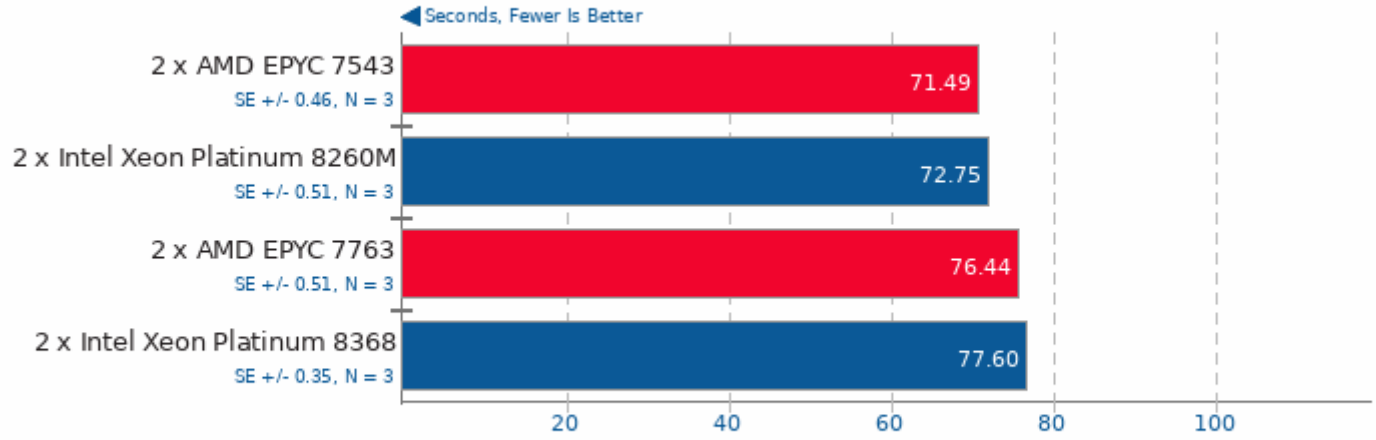
Blender 2.92

Blend File: Classroom - Compute: CPU-Only



GnuPG 2.2.27

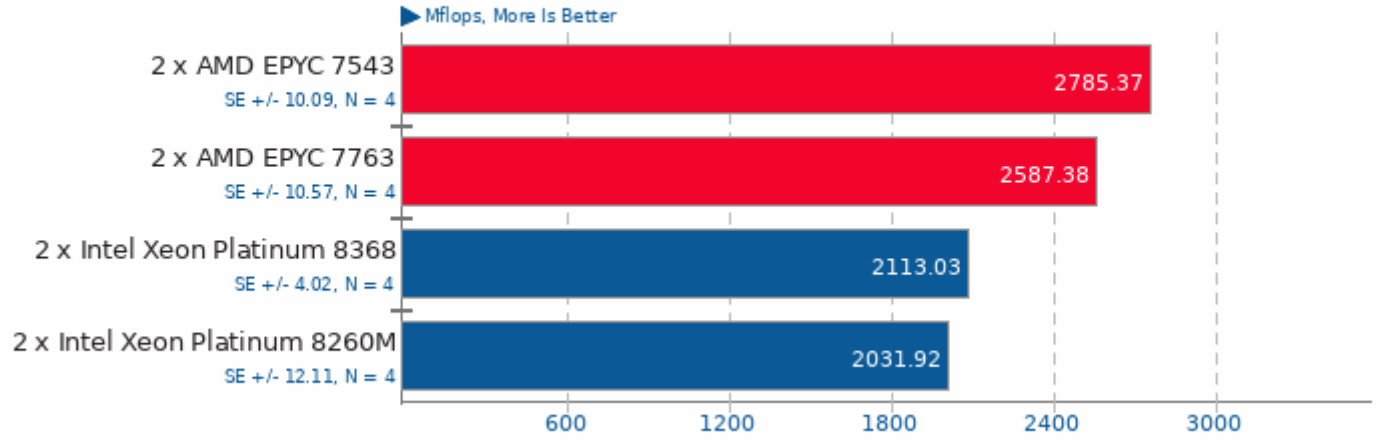
2.7GB Sample File Encryption



1. (CC) gcc options: -O2

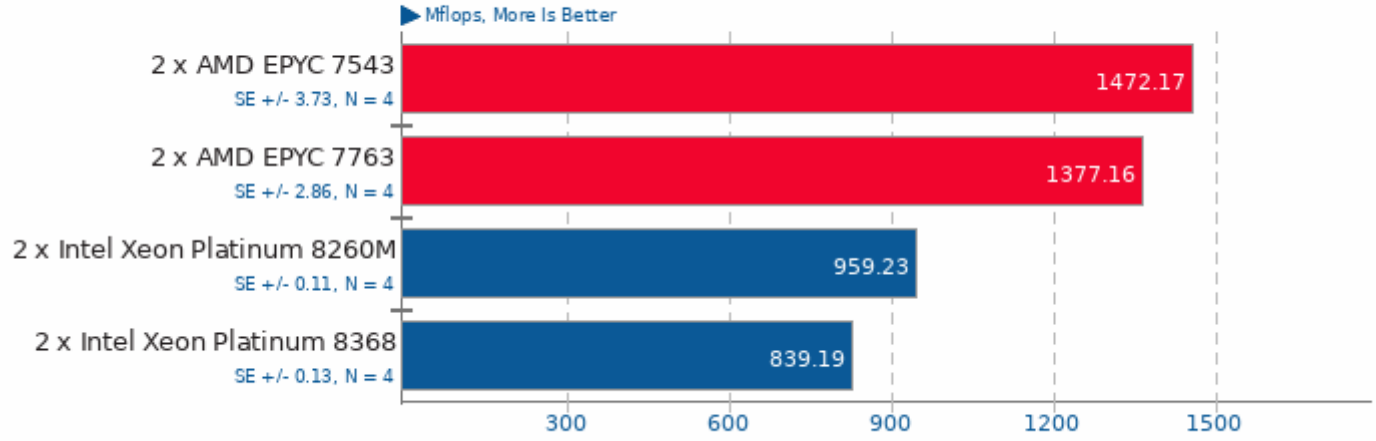
Java SciMark 2.0

Computational Test: Composite



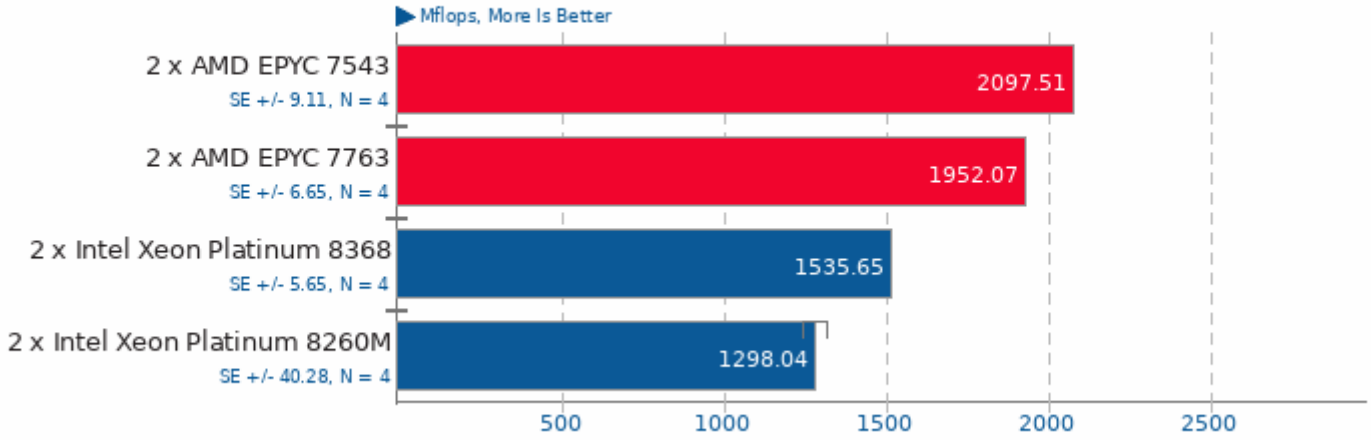
Java SciMark 2.0

Computational Test: Monte Carlo



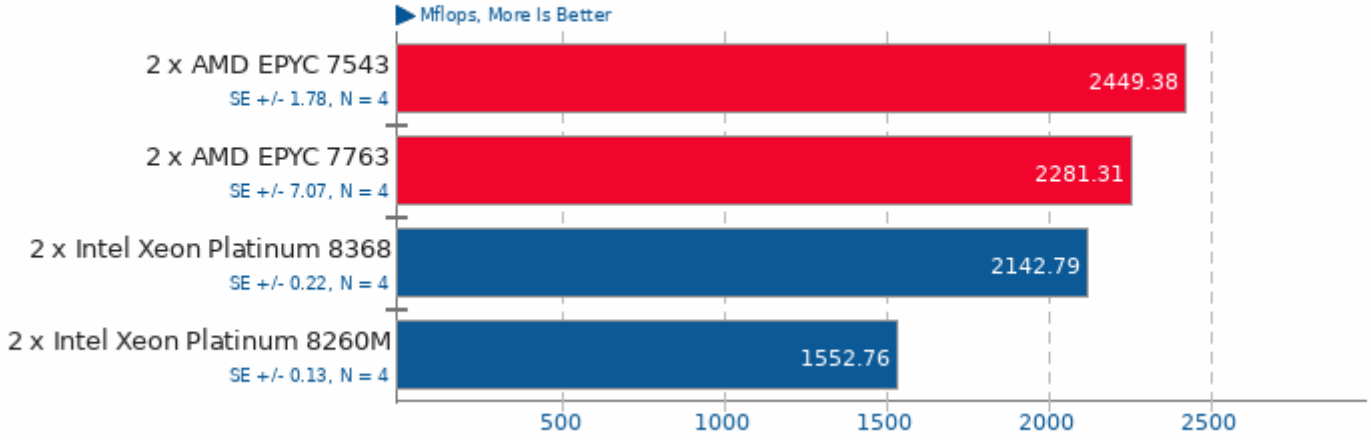
Java SciMark 2.0

Computational Test: Fast Fourier Transform



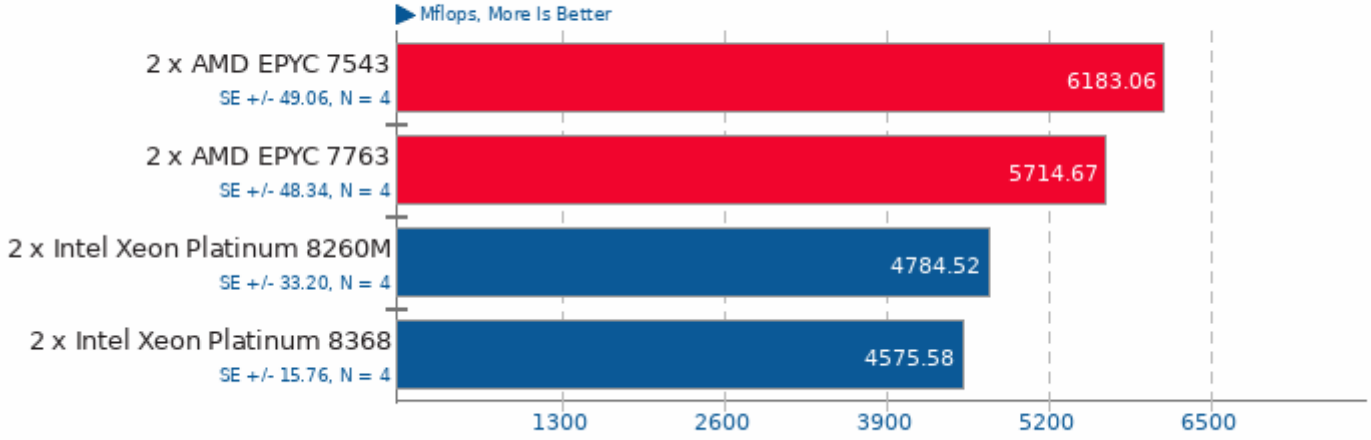
Java SciMark 2.0

Computational Test: Sparse Matrix Multiply



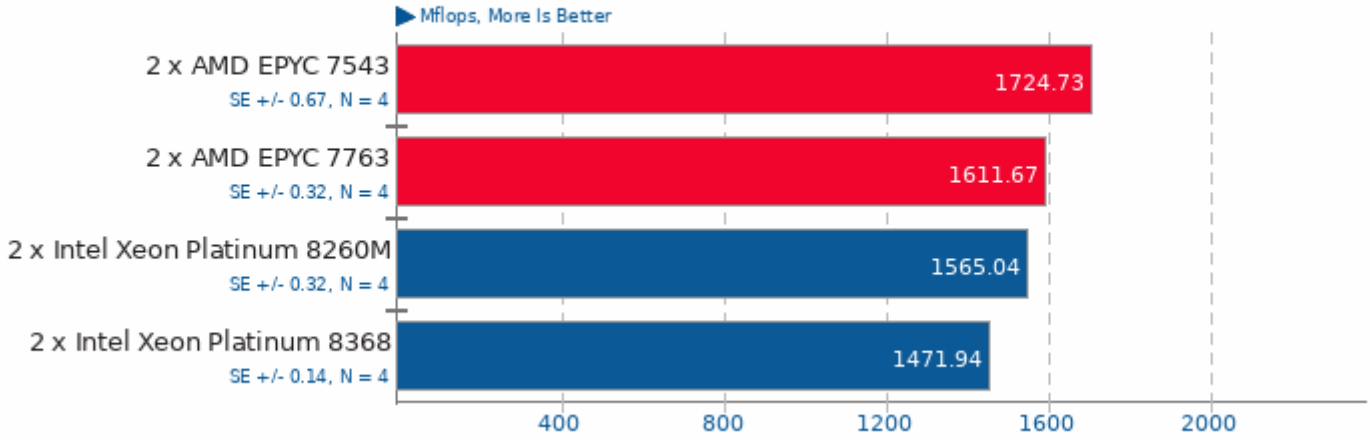
Java SciMark 2.0

Computational Test: Dense LU Matrix Factorization



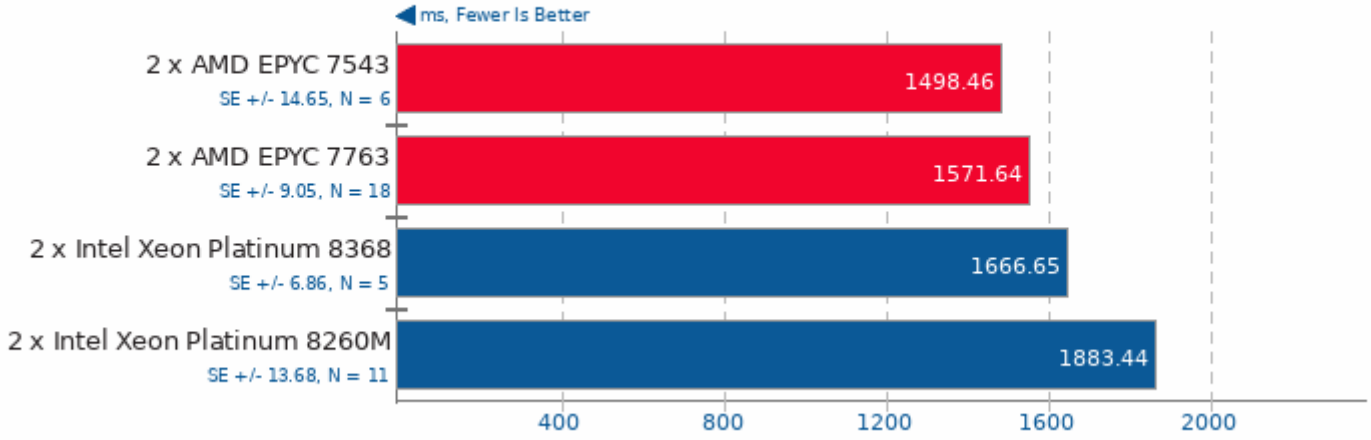
Java SciMark 2.0

Computational Test: Jacobi Successive Over-Relaxation



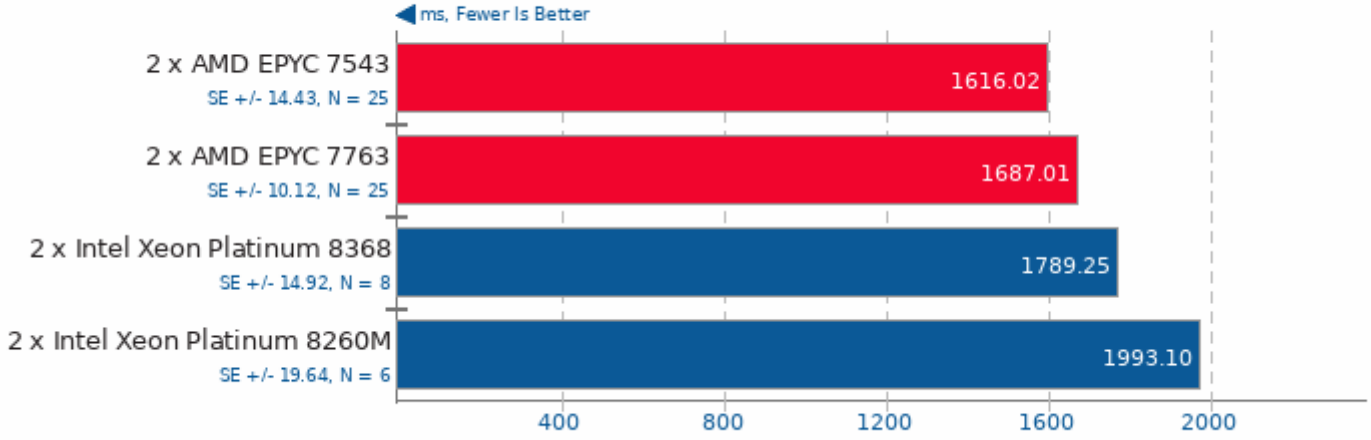
Renaissance 0.10.0

Test: Scala Dotty



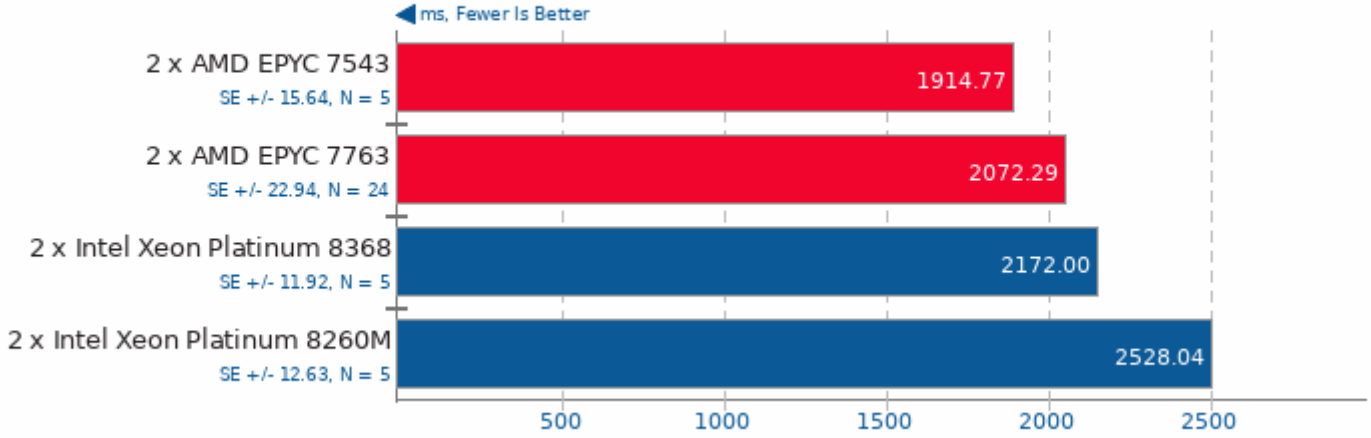
Renaissance 0.10.0

Test: Random Forest



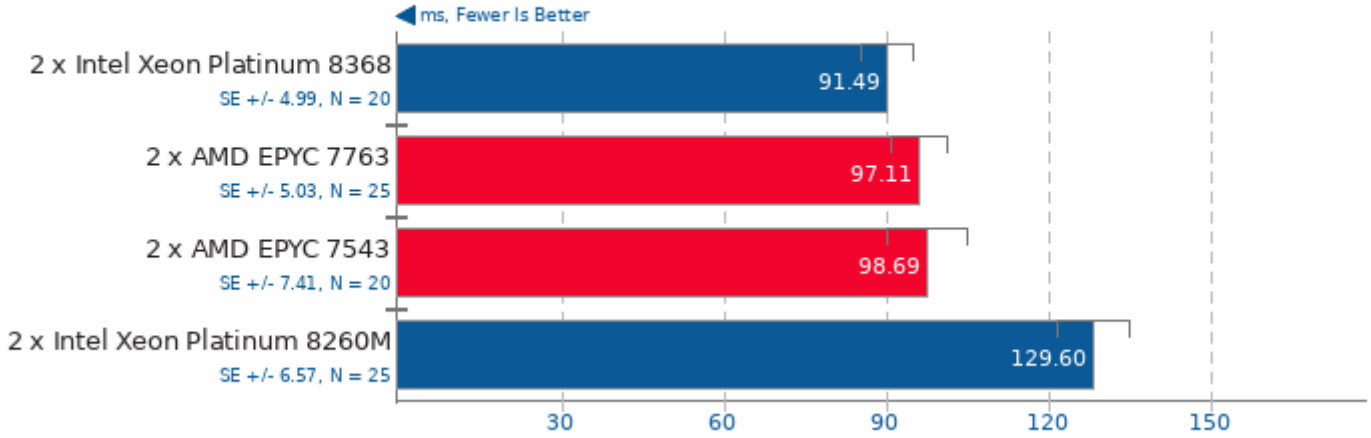
Renaissance 0.10.0

Test: Apache Spark ALS



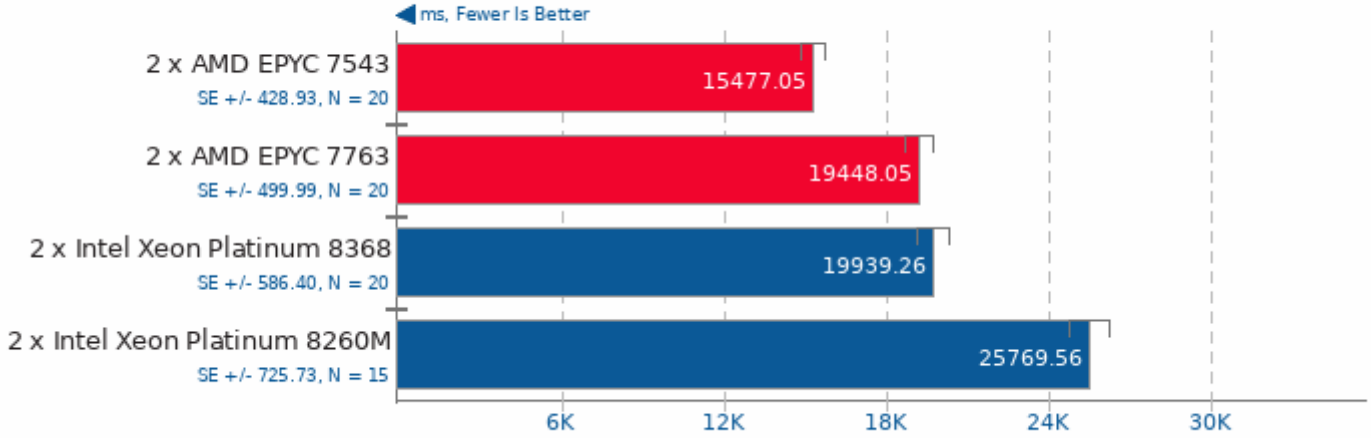
Renaissance 0.10.0

Test: Apache Spark Bayes



Renaissance 0.10.0

Test: Savina Reactors.IO

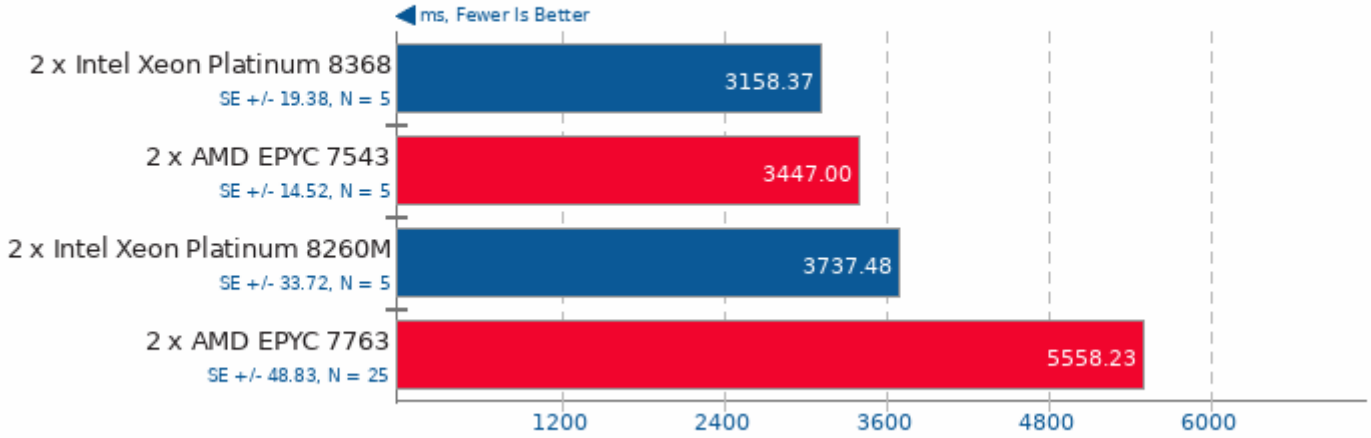


Renaissance 0.10.0

Test: Apache Spark PageRank

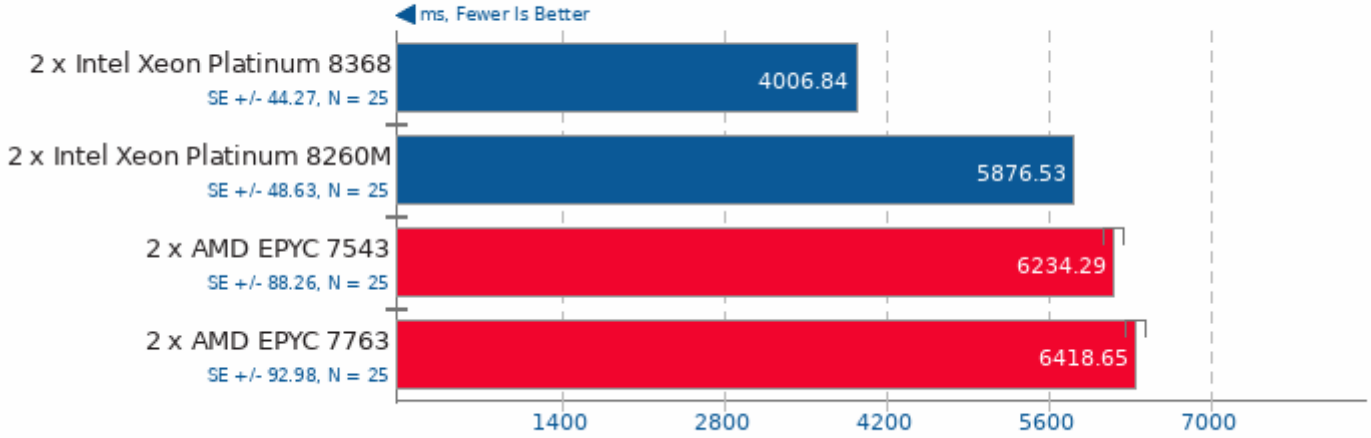
Renaissance 0.10.0

Test: Twitter HTTP Requests



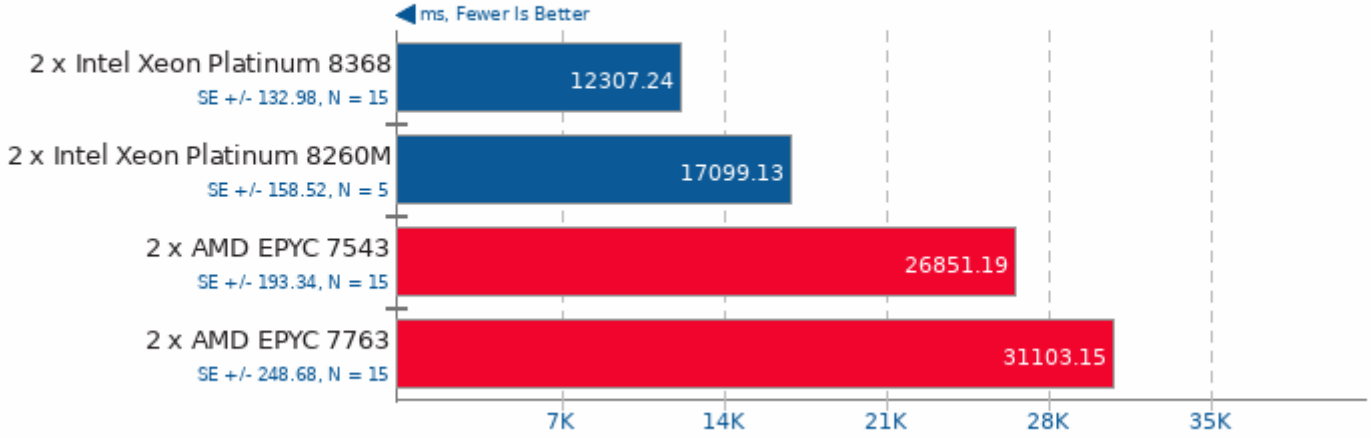
Renaissance 0.10.0

Test: In-Memory Database Shootout



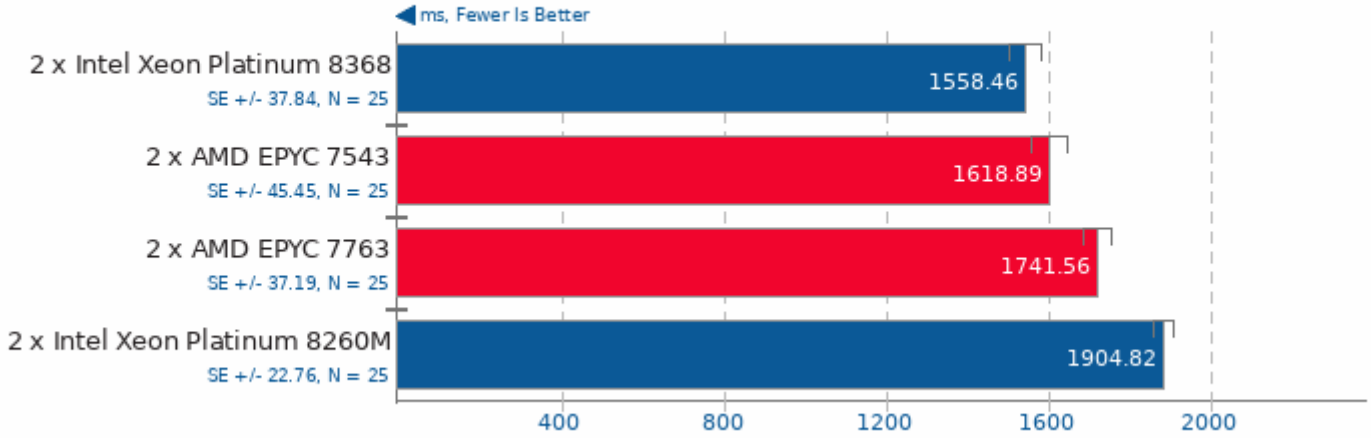
Renaissance 0.10.0

Test: Akka Unbalanced Cobwebbed Tree



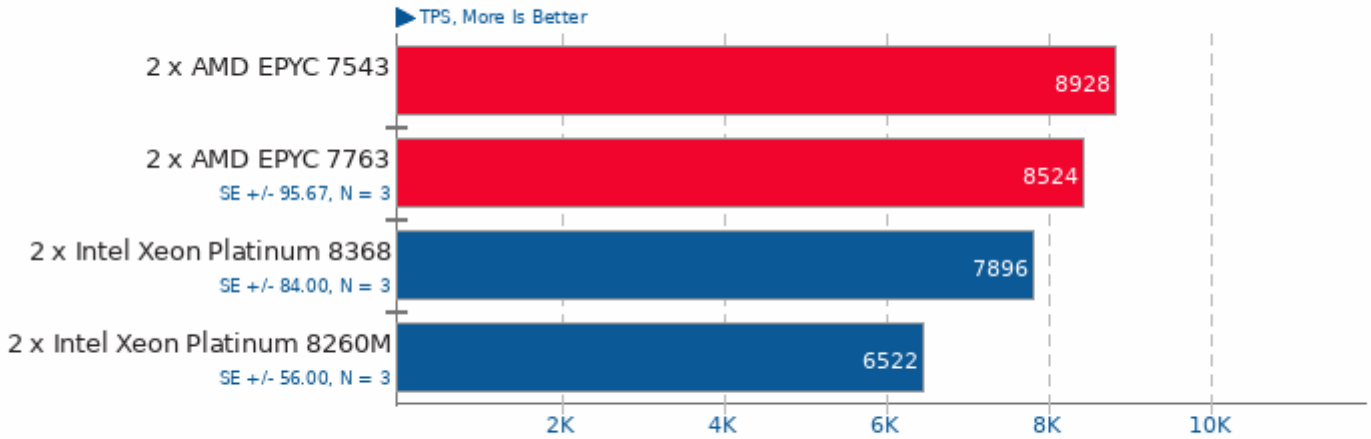
Renaissance 0.10.0

Test: Genetic Algorithm Using Jenetics + Futures



PostMark 1.51

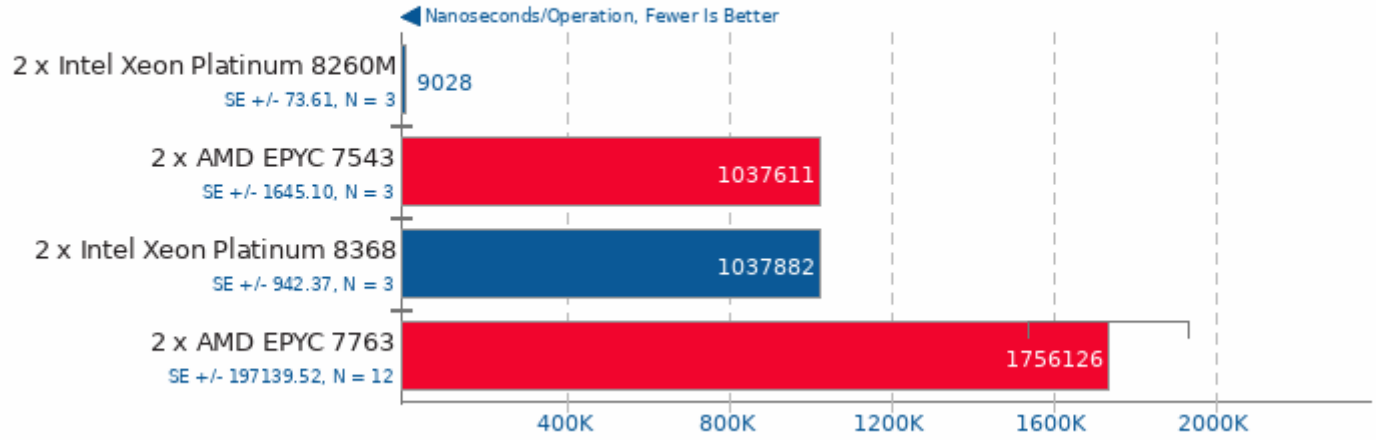
Disk Transaction Performance



1. (CC) gcc options: -O3

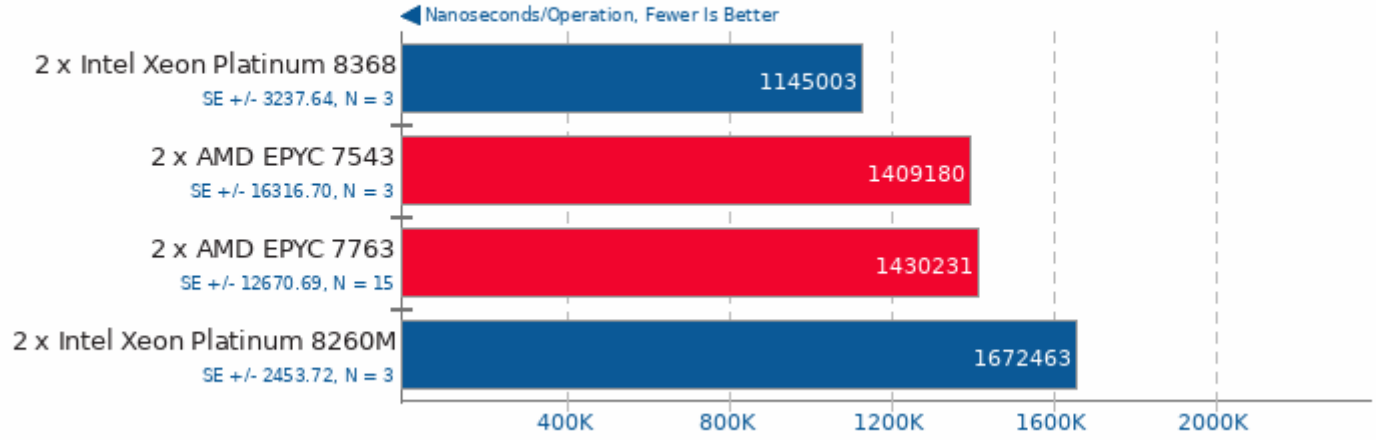
Go Benchmarks

Test: http



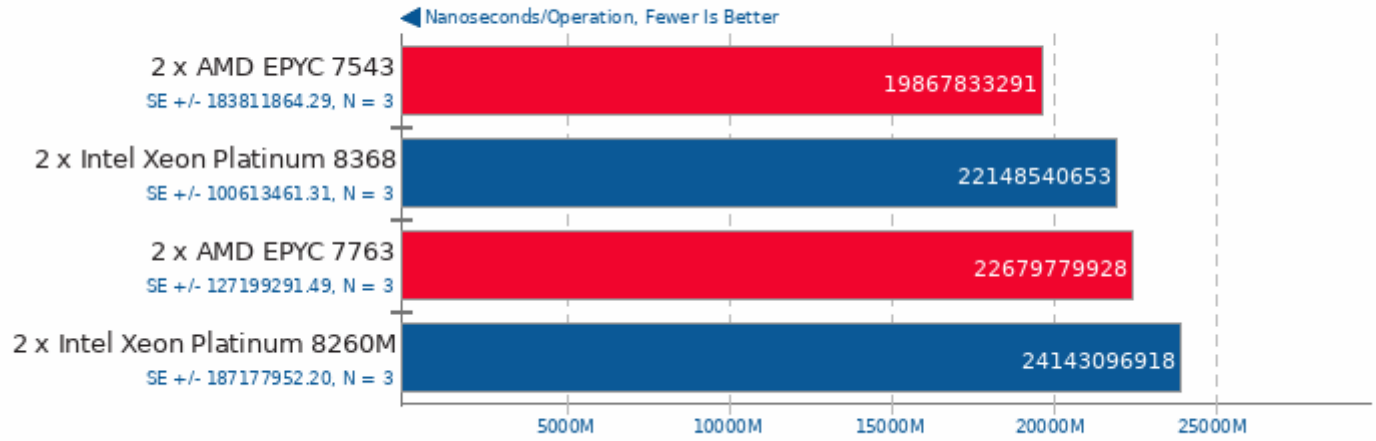
Go Benchmarks

Test: json



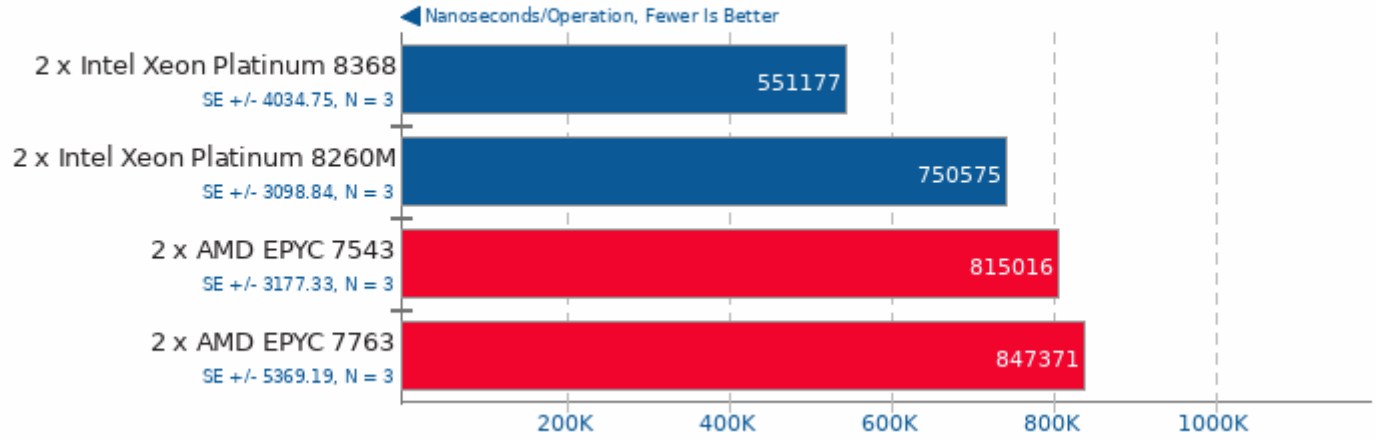
Go Benchmarks

Test: build



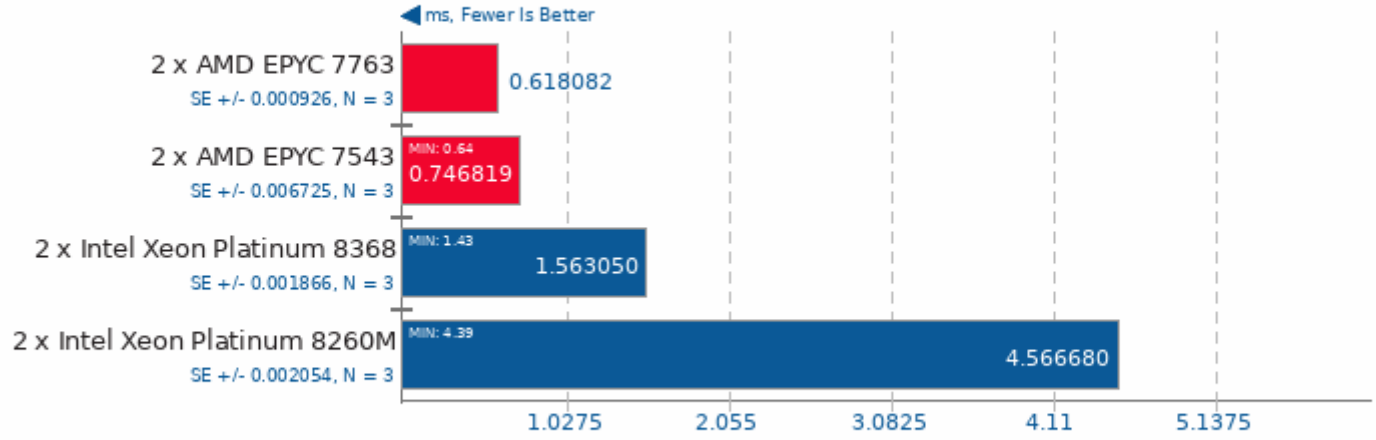
Go Benchmarks

Test: garbage



oneDNN 2.0

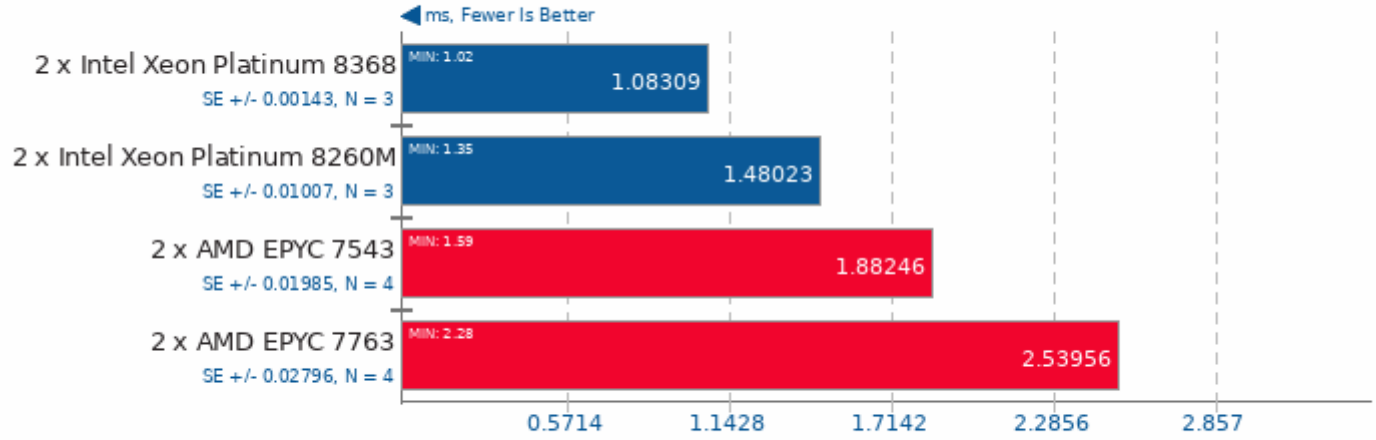
Harness: Convolution Batch Shapes Auto - Data Type: f32 - Engine: CPU



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

oneDNN 2.0

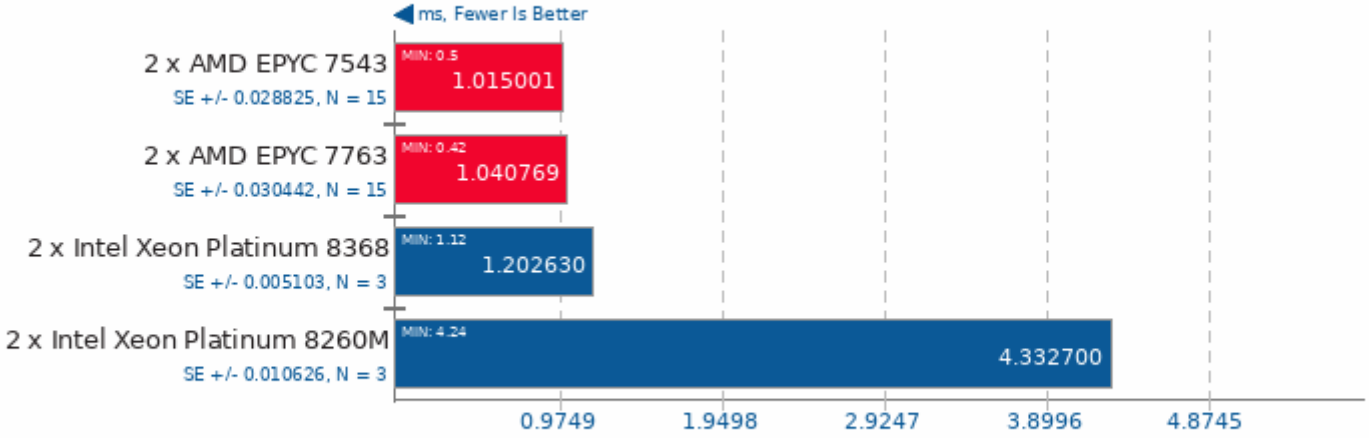
Harness: Deconvolution Batch shapes_1d - Data Type: f32 - Engine: CPU



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

oneDNN 2.0

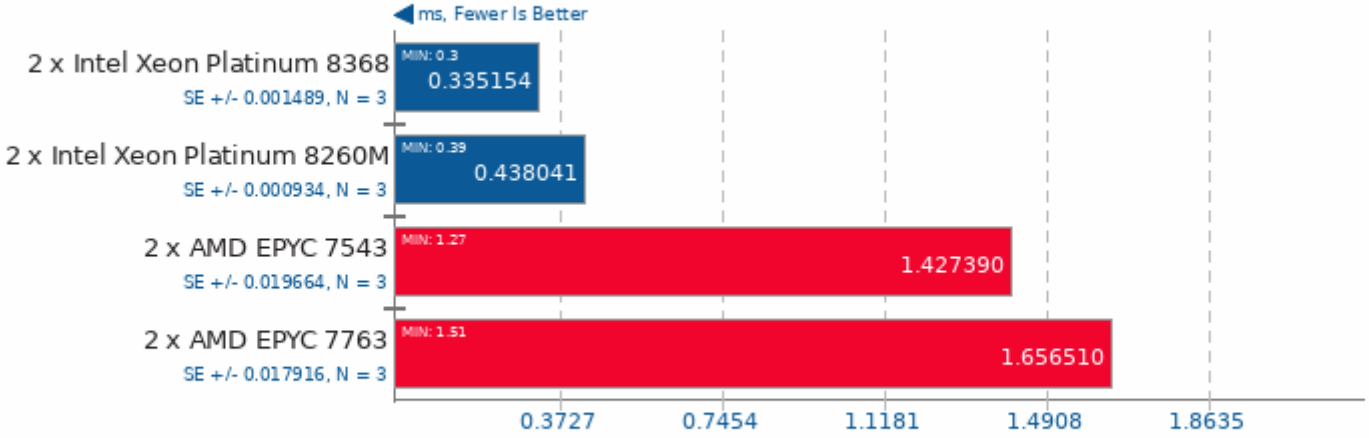
Harness: Convolution Batch Shapes Auto - Data Type: u8s8f32 - Engine: CPU



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

oneDNN 2.0

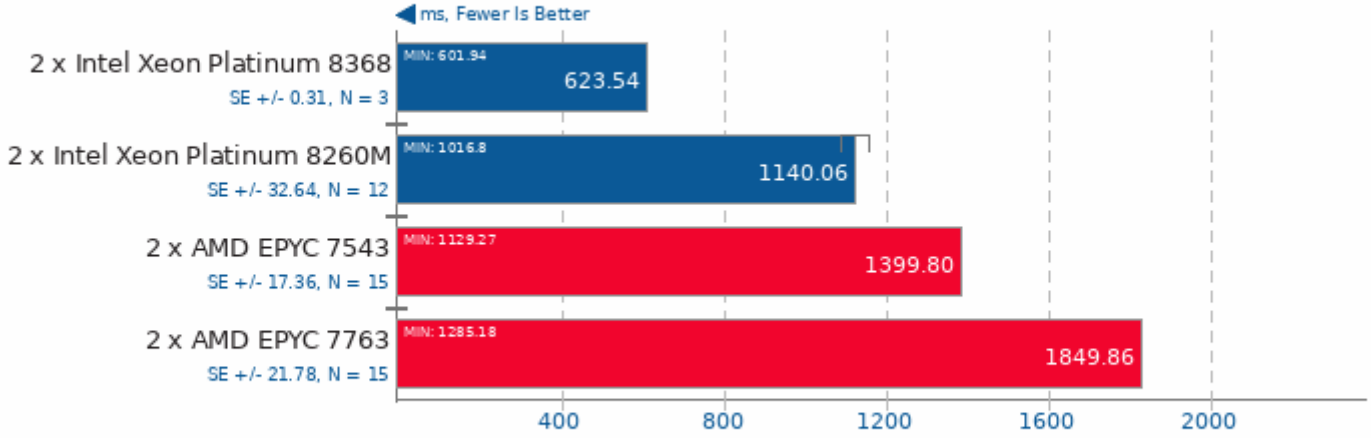
Harness: Deconvolution Batch shapes_1d - Data Type: u8s8f32 - Engine: CPU



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

oneDNN 2.0

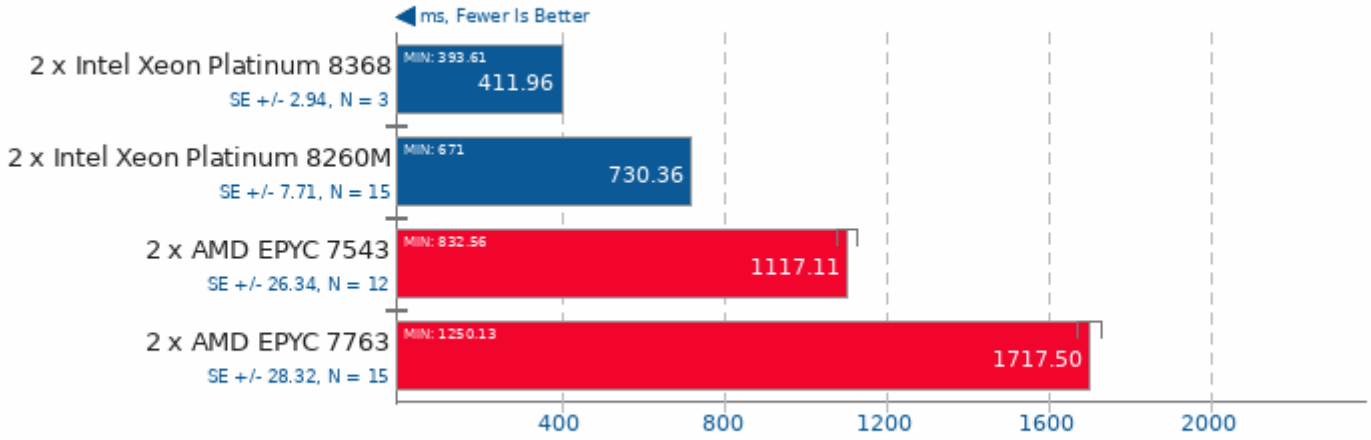
Harness: Recurrent Neural Network Training - Data Type: f32 - Engine: CPU



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

oneDNN 2.0

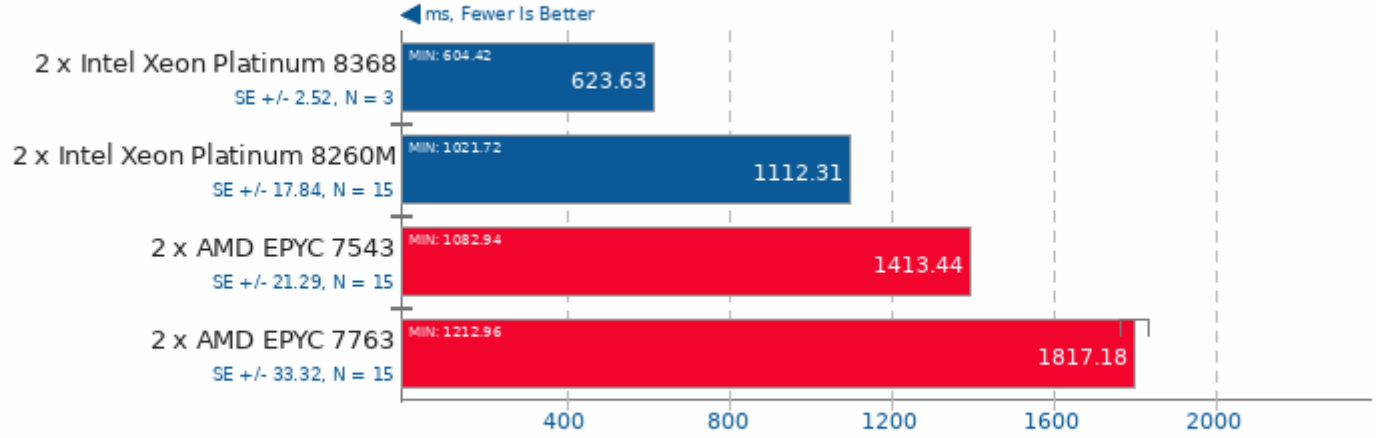
Harness: Recurrent Neural Network Inference - Data Type: f32 - Engine: CPU



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

oneDNN 2.0

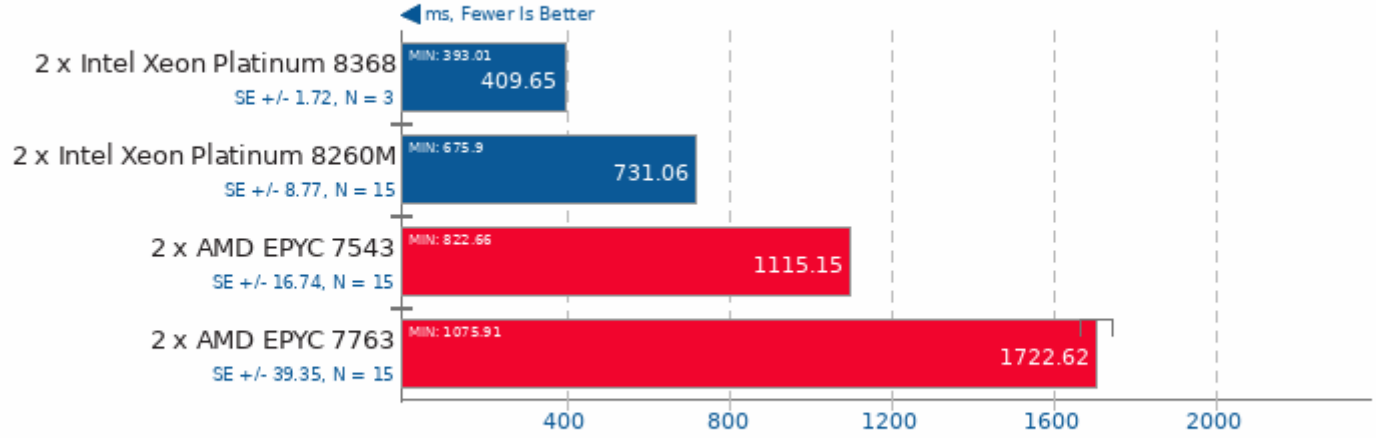
Harness: Recurrent Neural Network Training - Data Type: u8s8f32 - Engine: CPU



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

oneDNN 2.0

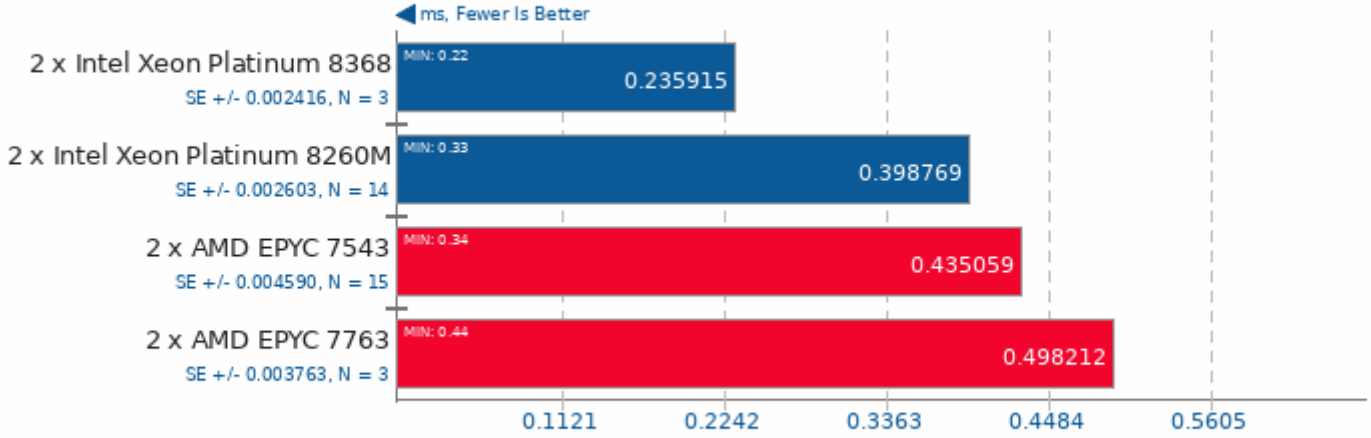
Harness: Recurrent Neural Network Inference - Data Type: u8s8f32 - Engine: CPU



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

oneDNN 2.0

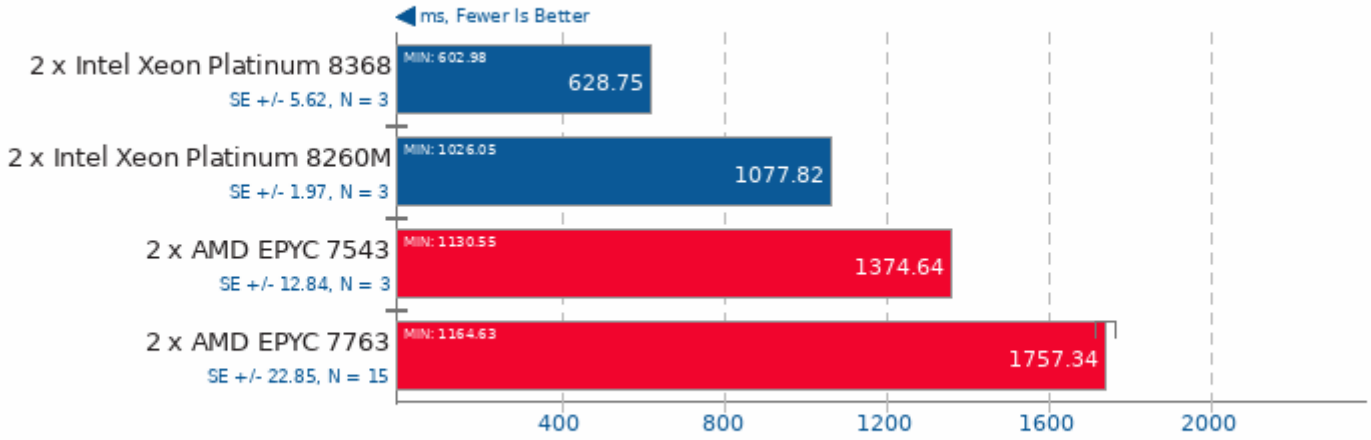
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: f32 - Engine: CPU



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

oneDNN 2.0

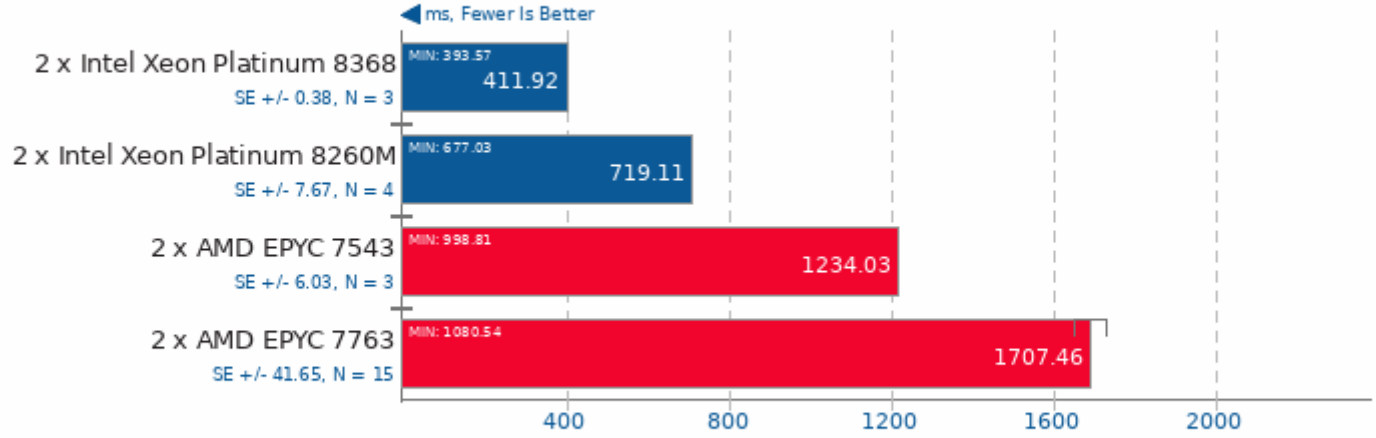
Harness: Recurrent Neural Network Training - Data Type: bf16bf16bf16 - Engine: CPU



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

oneDNN 2.0

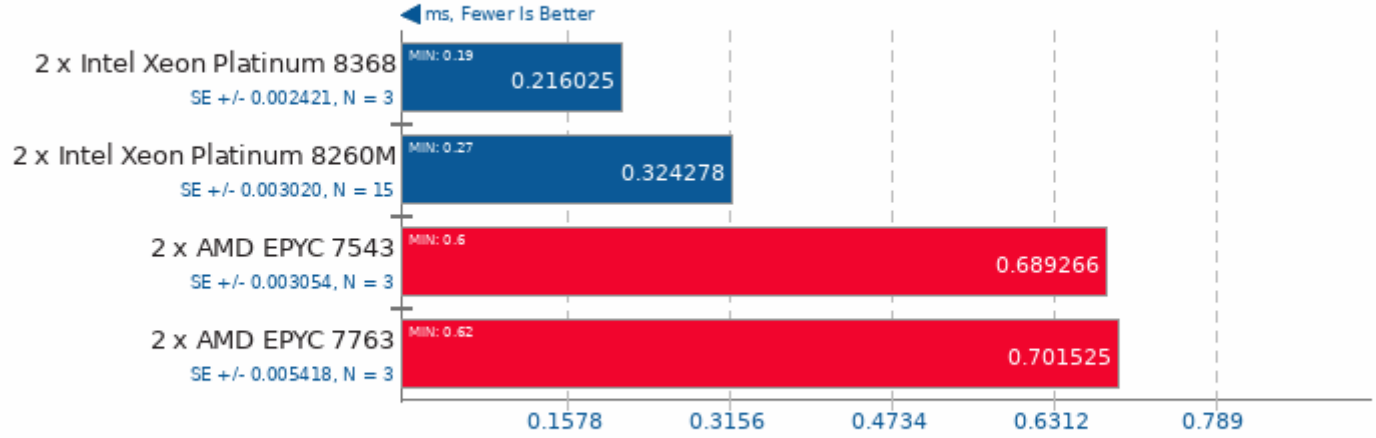
Harness: Recurrent Neural Network Inference - Data Type: bf16bf16bf16 - Engine: CPU



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

oneDNN 2.0

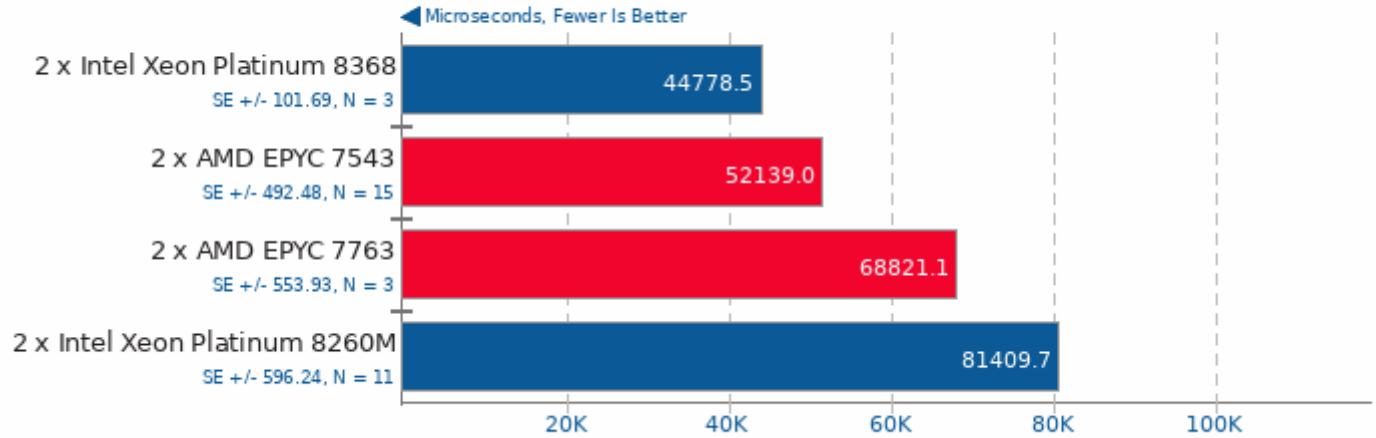
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: u8s8f32 - Engine: CPU



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

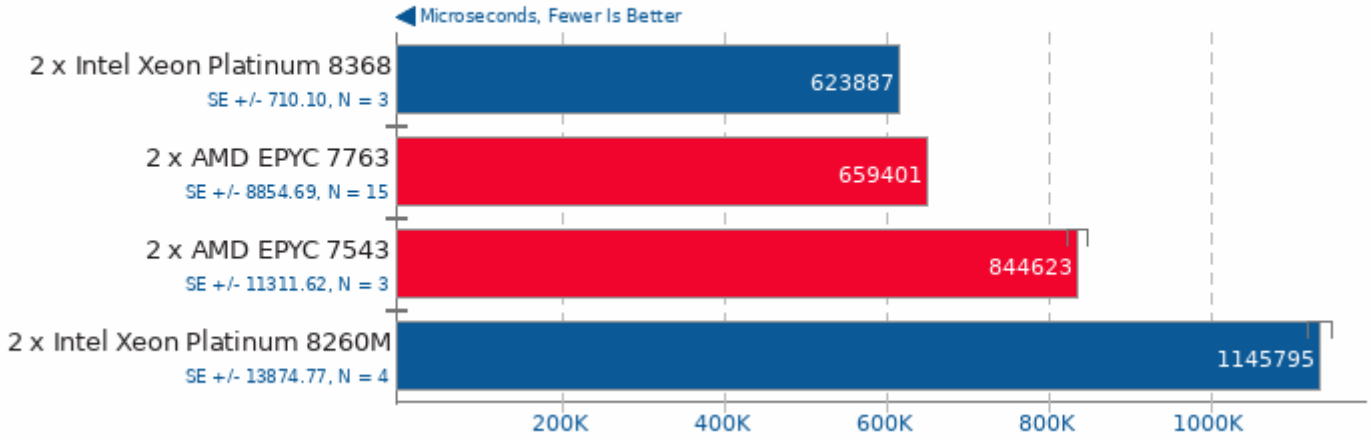
TensorFlow Lite 2020-08-23

Model: SqueezeNet



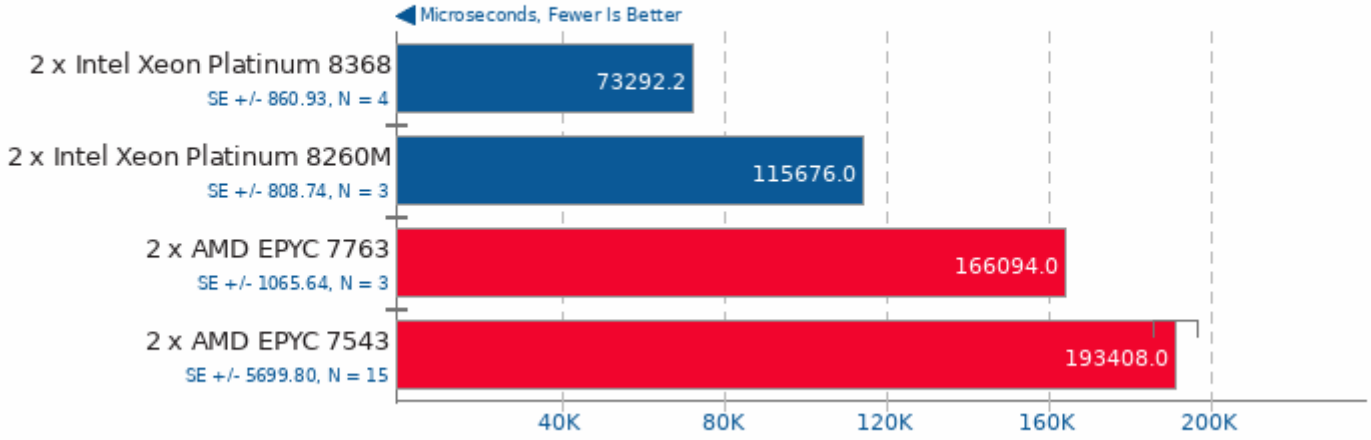
TensorFlow Lite 2020-08-23

Model: Inception V4



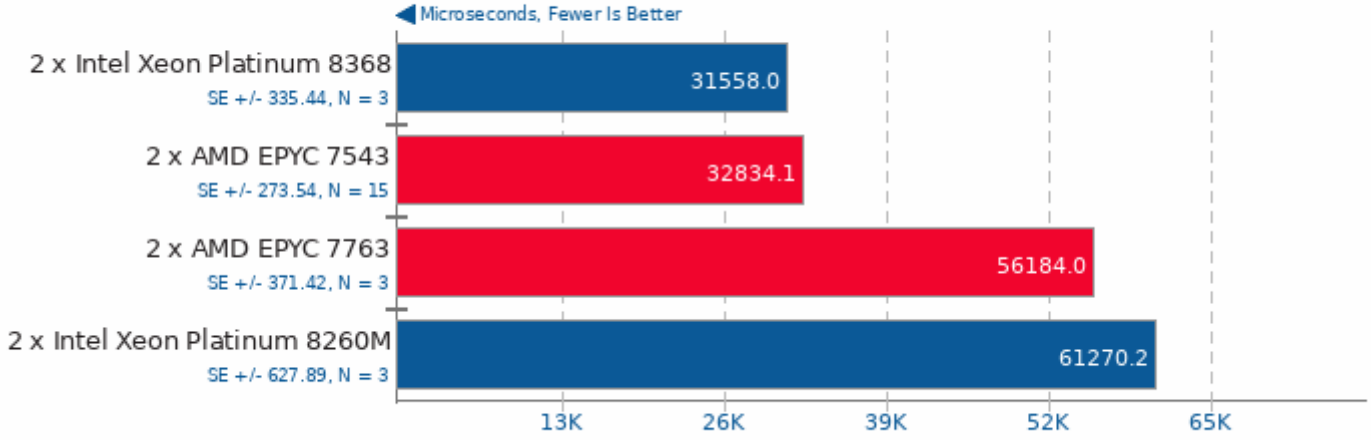
TensorFlow Lite 2020-08-23

Model: NASNet Mobile



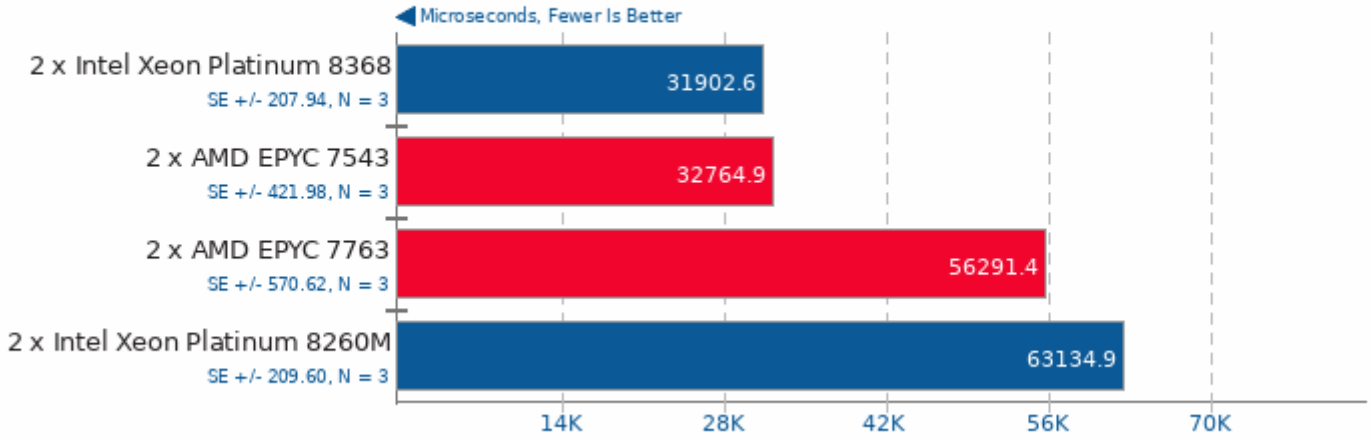
TensorFlow Lite 2020-08-23

Model: Mobilenet Float



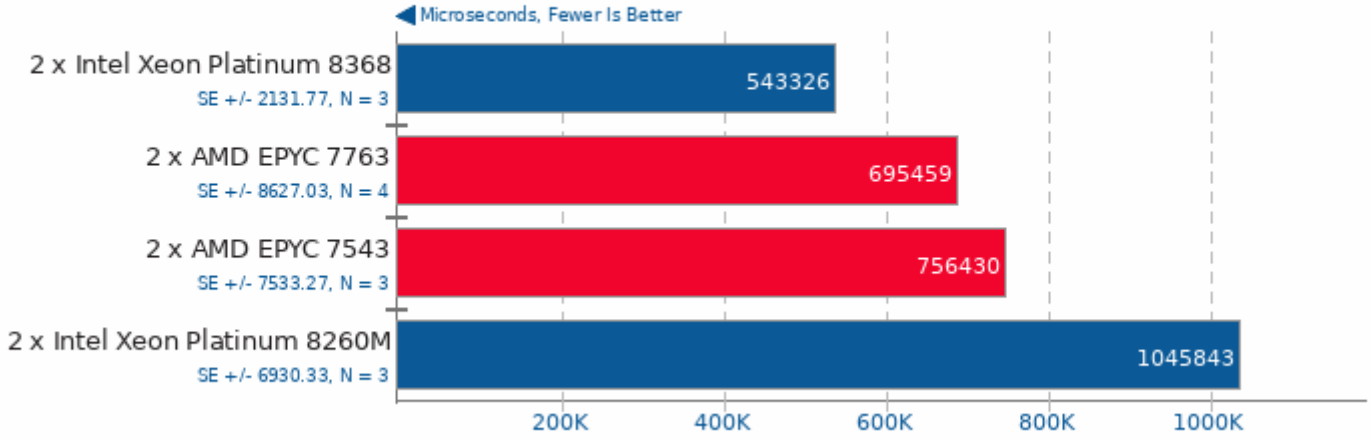
TensorFlow Lite 2020-08-23

Model: Mobilenet Quant



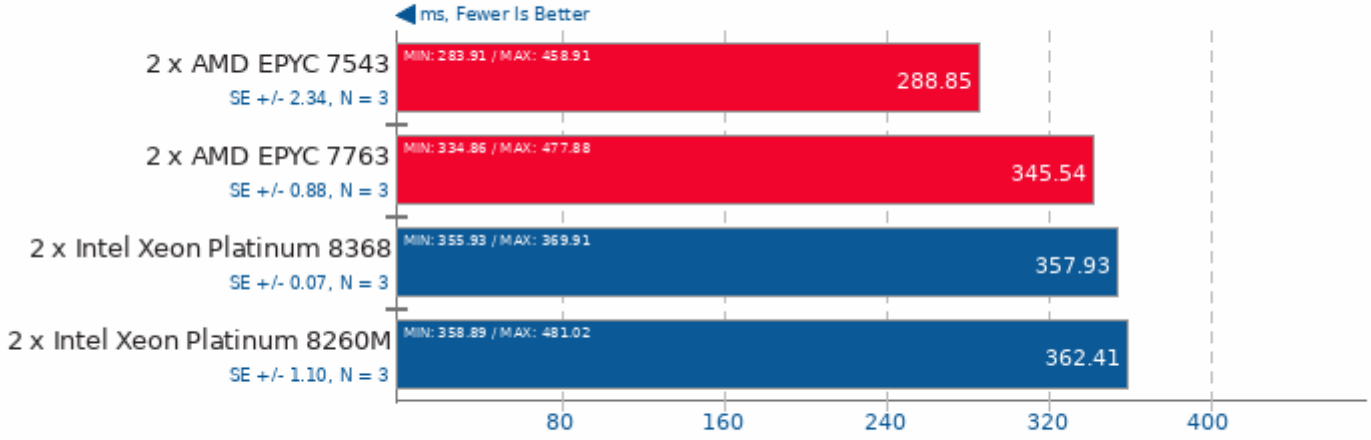
TensorFlow Lite 2020-08-23

Model: Inception ResNet V2



TNN 0.2.3

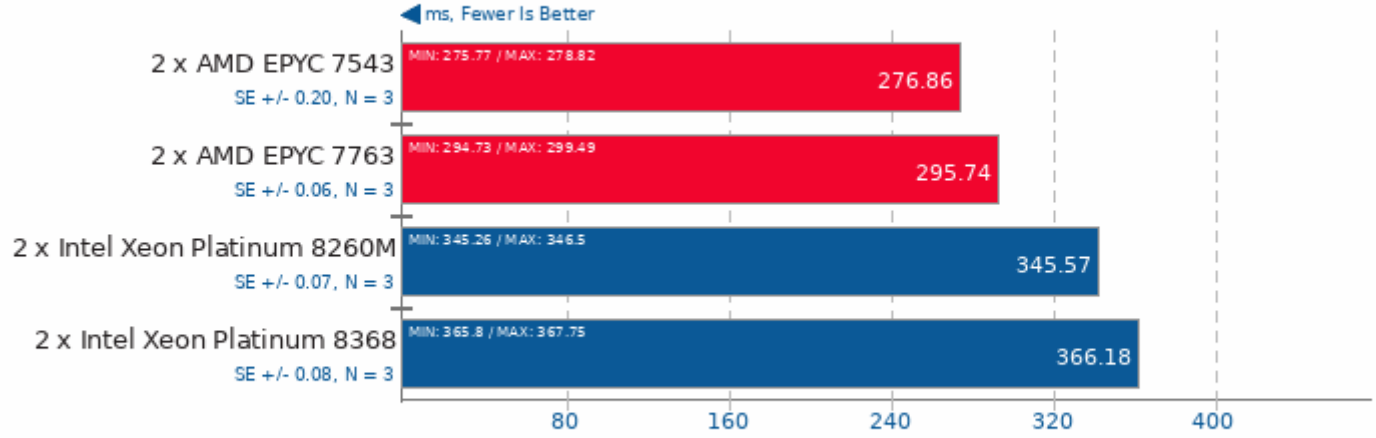
Target: CPU - Model: MobileNet v2



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

TNN 0.2.3

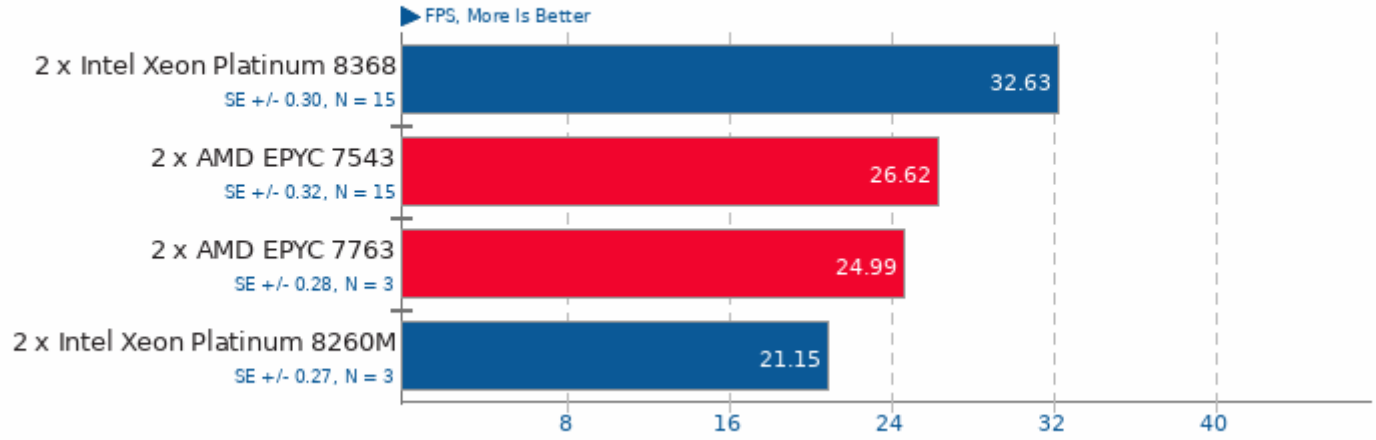
Target: CPU - Model: SqueezeNet v1.1



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

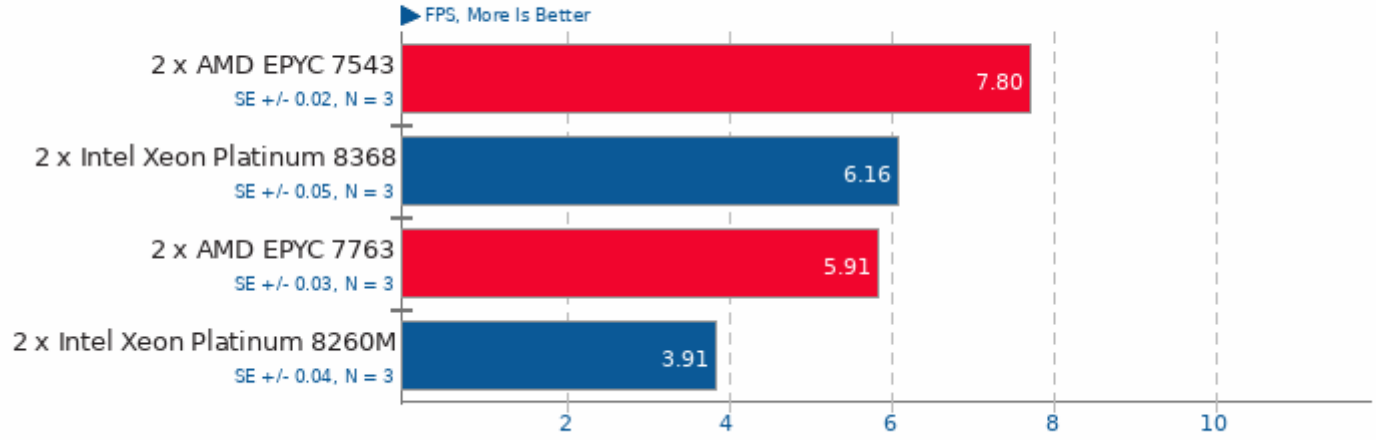
PlaidML

FP16: No - Mode: Inference - Network: VGG19 - Device: CPU



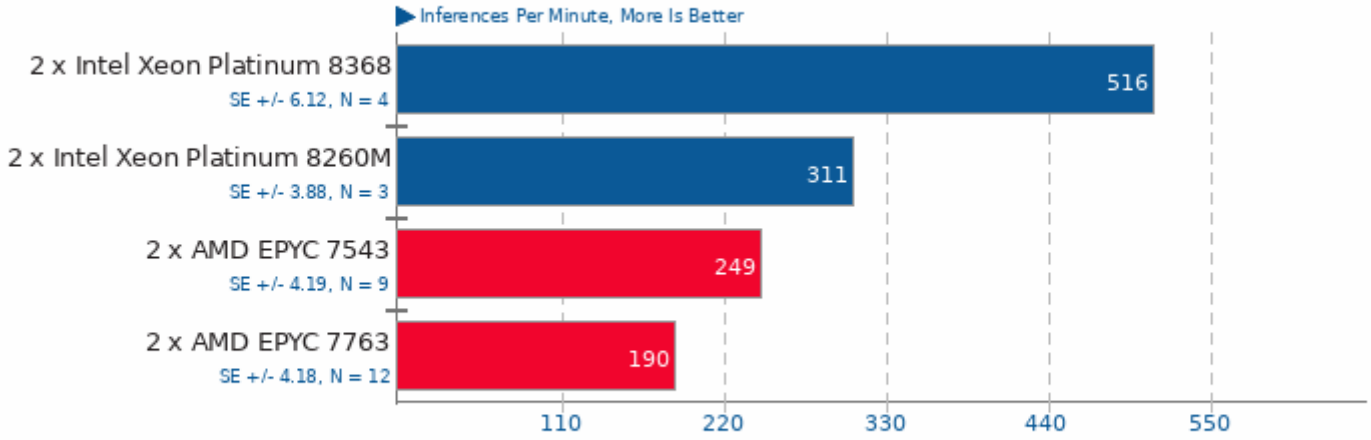
PlaidML

FP16: No - Mode: Inference - Network: ResNet 50 - Device: CPU



ONNX Runtime 1.6

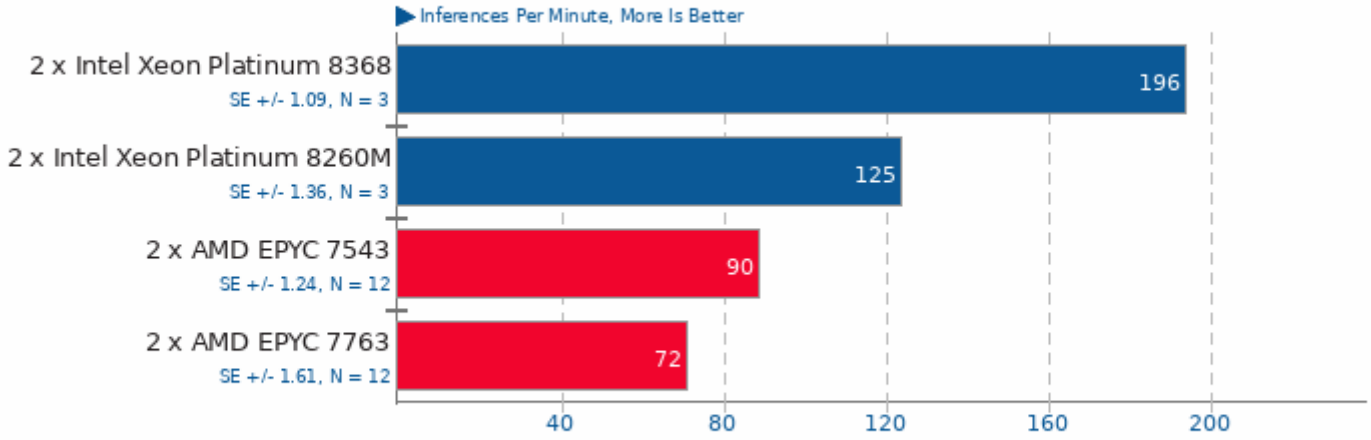
Model: yolov4 - Device: OpenMP CPU



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

ONNX Runtime 1.6

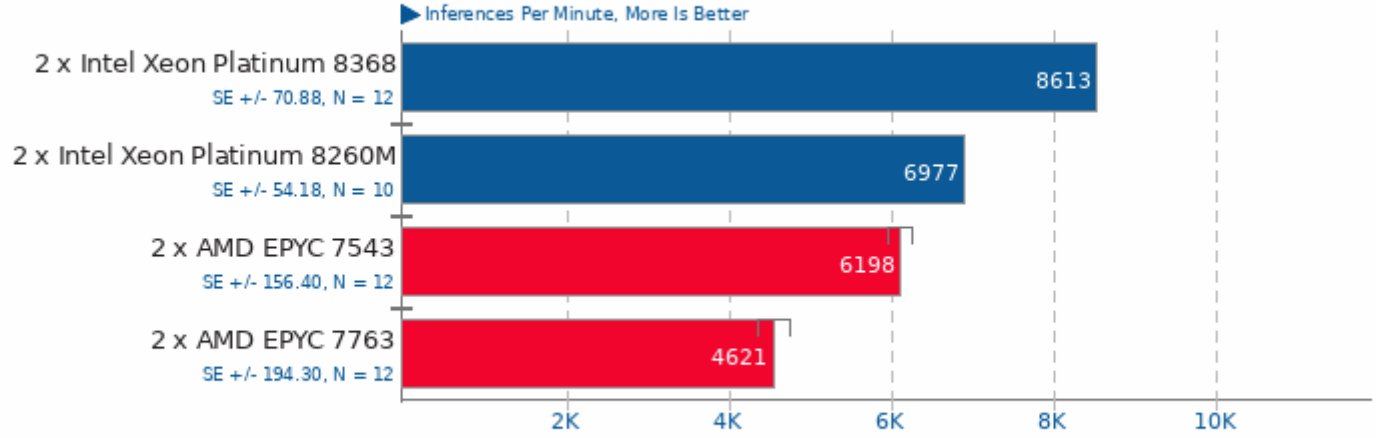
Model: fcn-resnet101-11 - Device: OpenMP CPU



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

ONNX Runtime 1.6

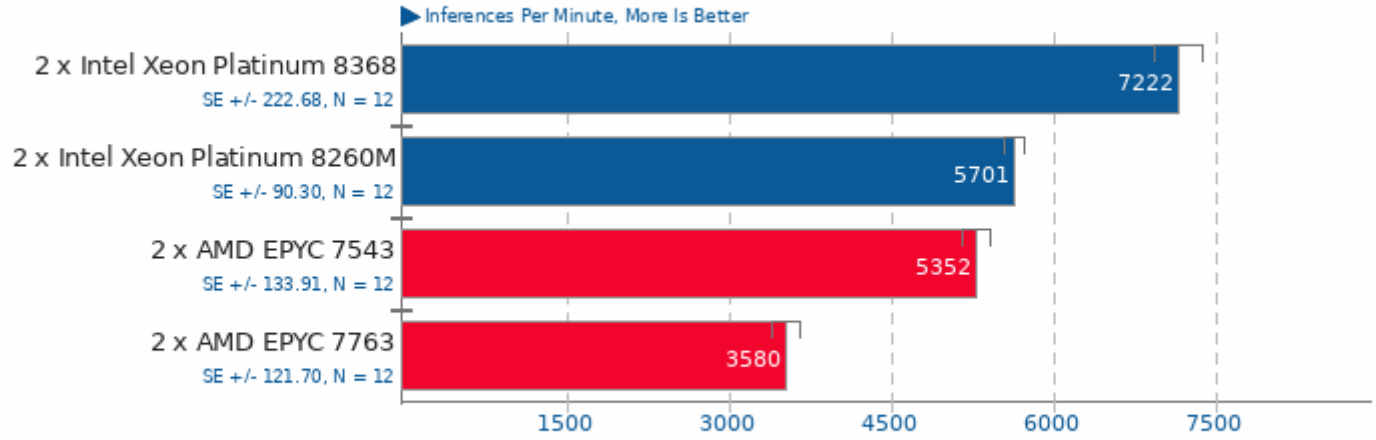
Model: shufflenet-v2-10 - Device: OpenMP CPU



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

ONNX Runtime 1.6

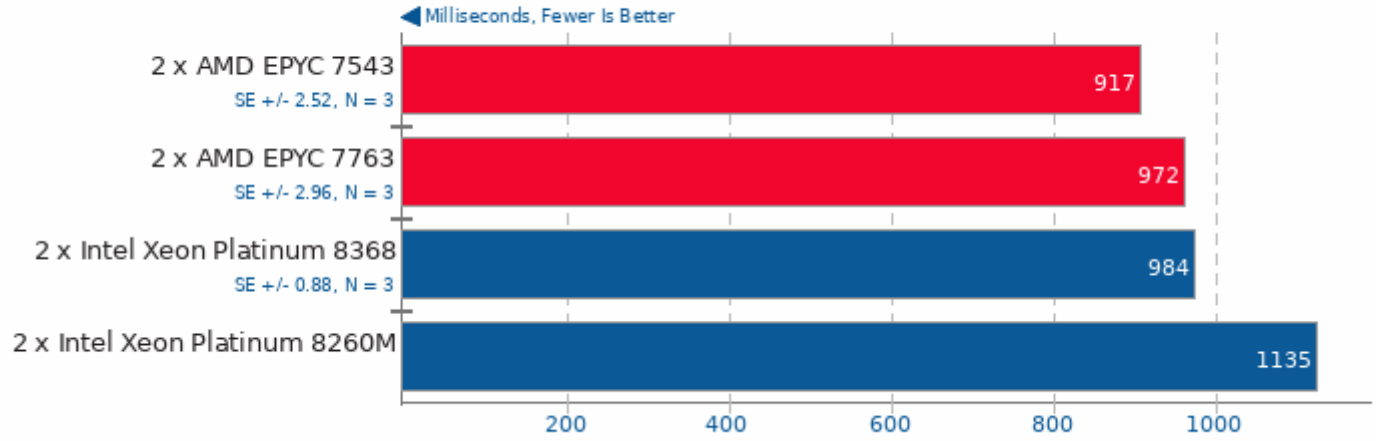
Model: super-resolution-10 - Device: OpenMP CPU



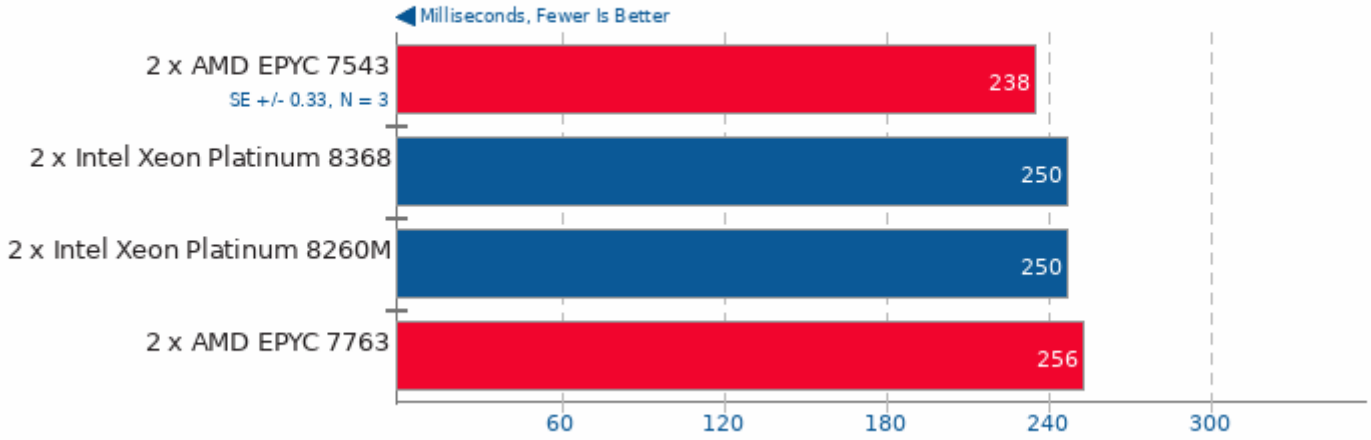
1. (CXX) g++ options: -fopenmp -ffunction-sections -fdata-sections -O3 -ldl -lrt

PyBench 2018-02-16

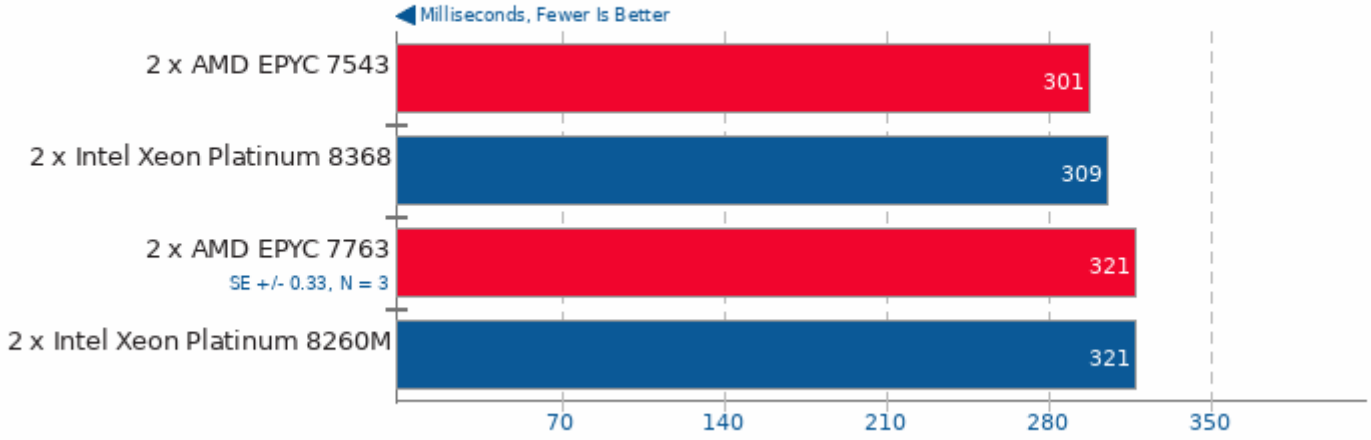
Total For Average Test Times



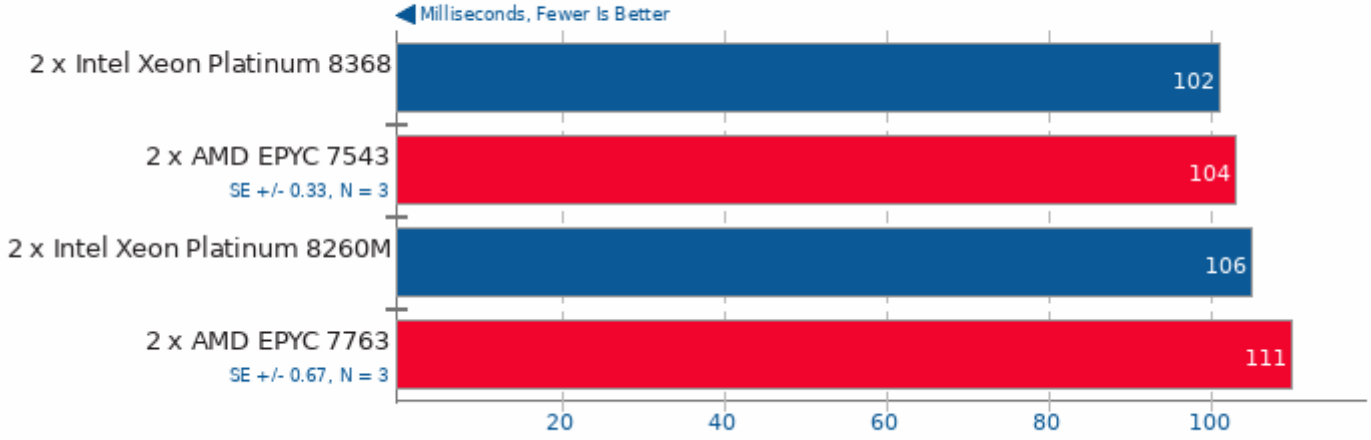
PyPerformance 1.0.0
Benchmark: go



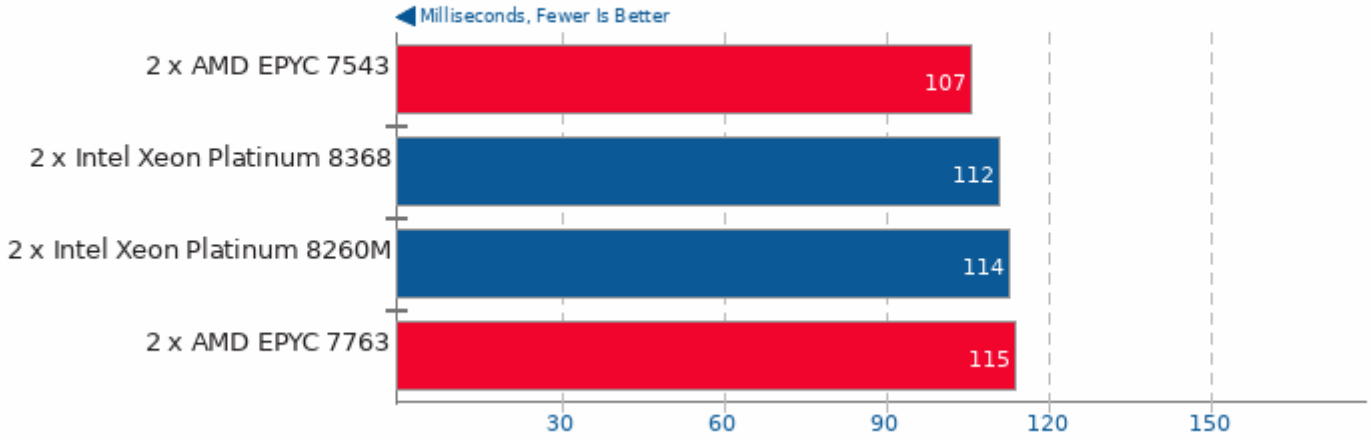
PyPerformance 1.0.0
Benchmark: 2to3



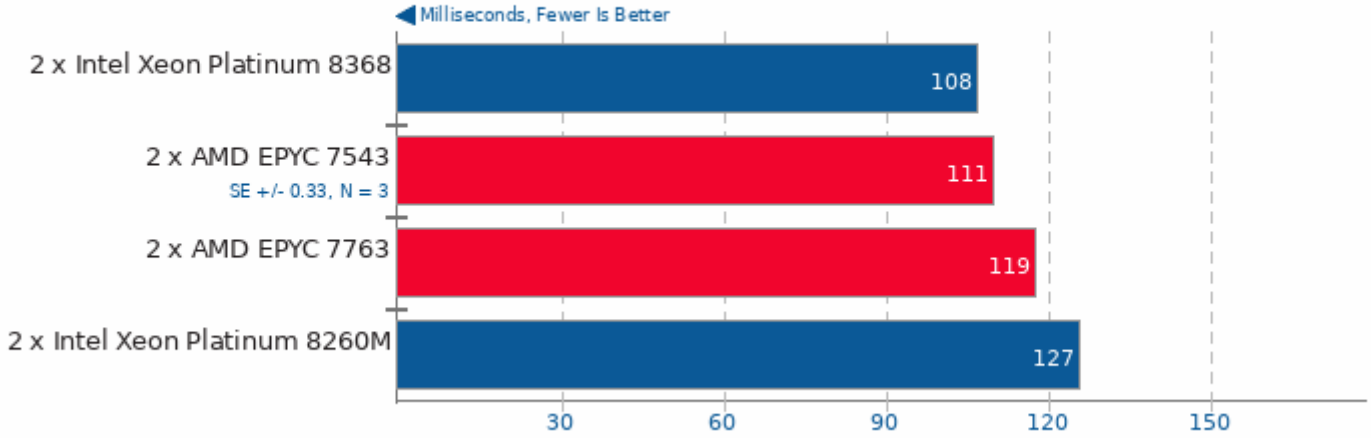
PyPerformance 1.0.0
Benchmark: chaos



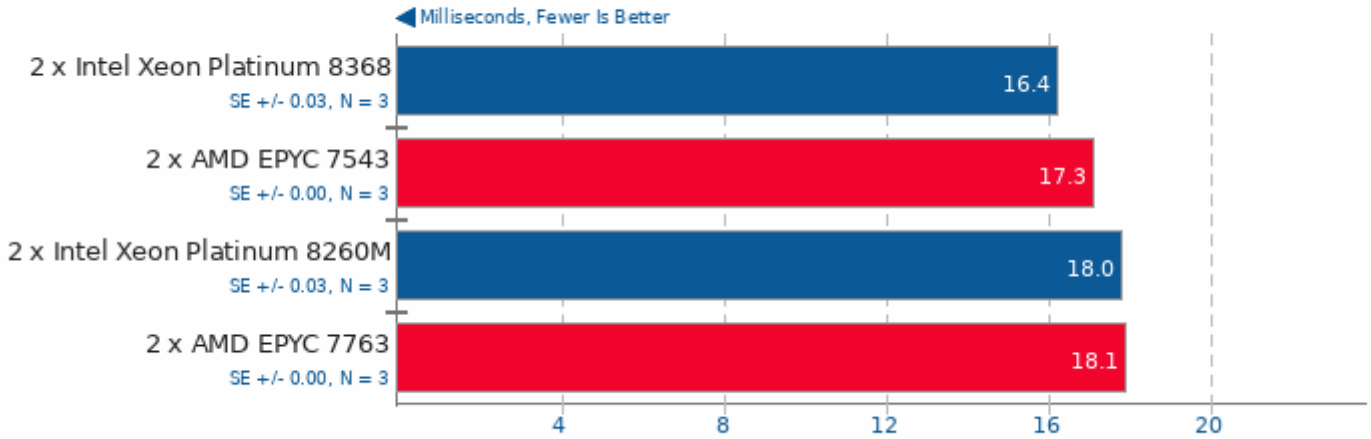
PyPerformance 1.0.0
Benchmark: float



PyPerformance 1.0.0
Benchmark: nbody

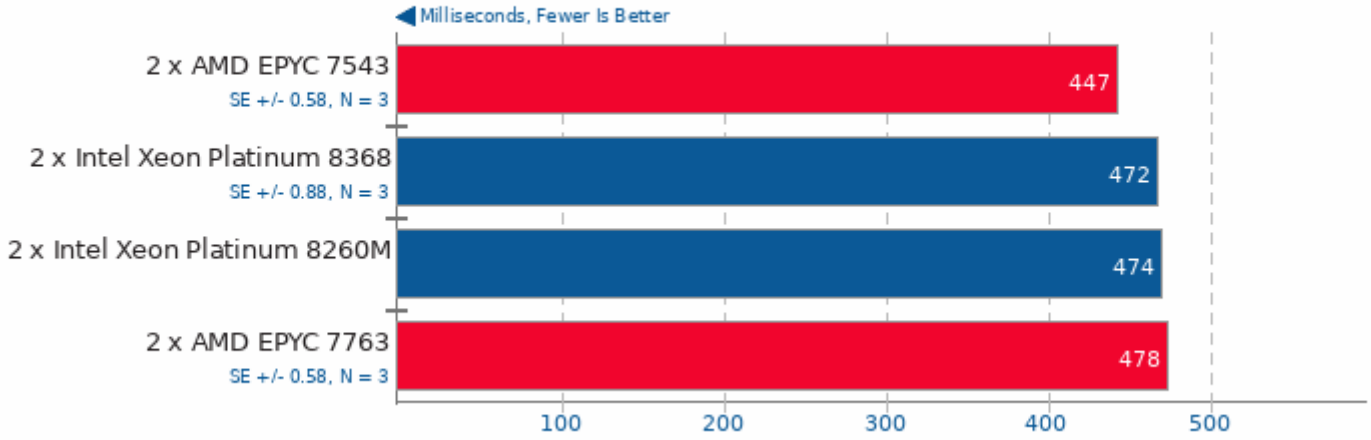


PyPerformance 1.0.0
Benchmark: pathlib



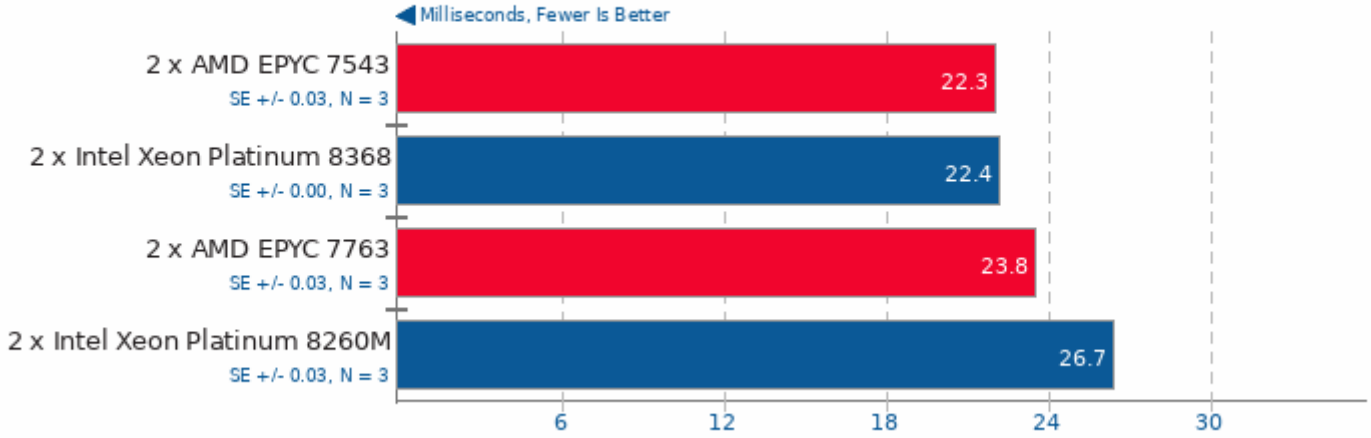
PyPerformance 1.0.0

Benchmark: raytrace



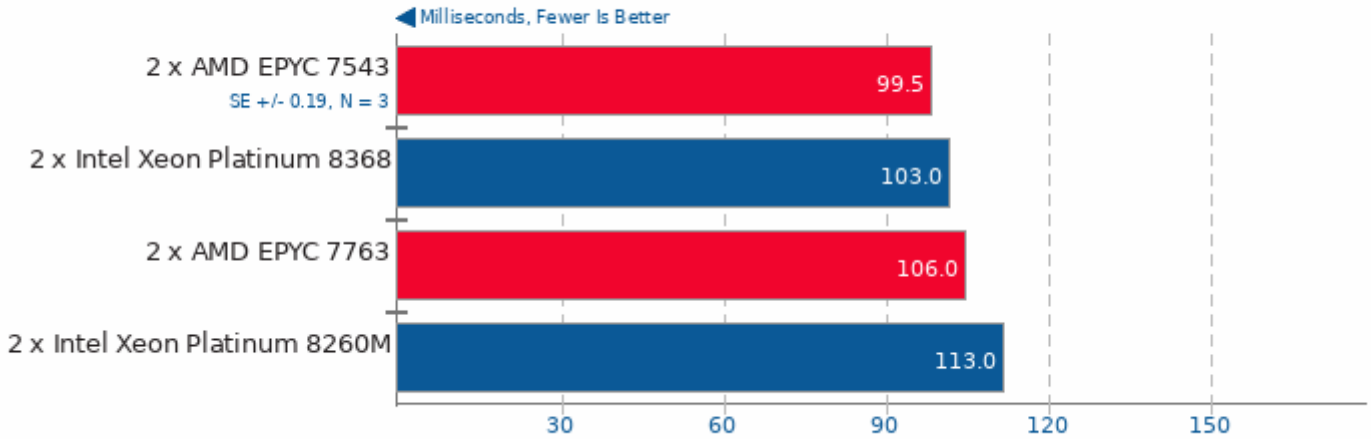
PyPerformance 1.0.0

Benchmark: json_loads

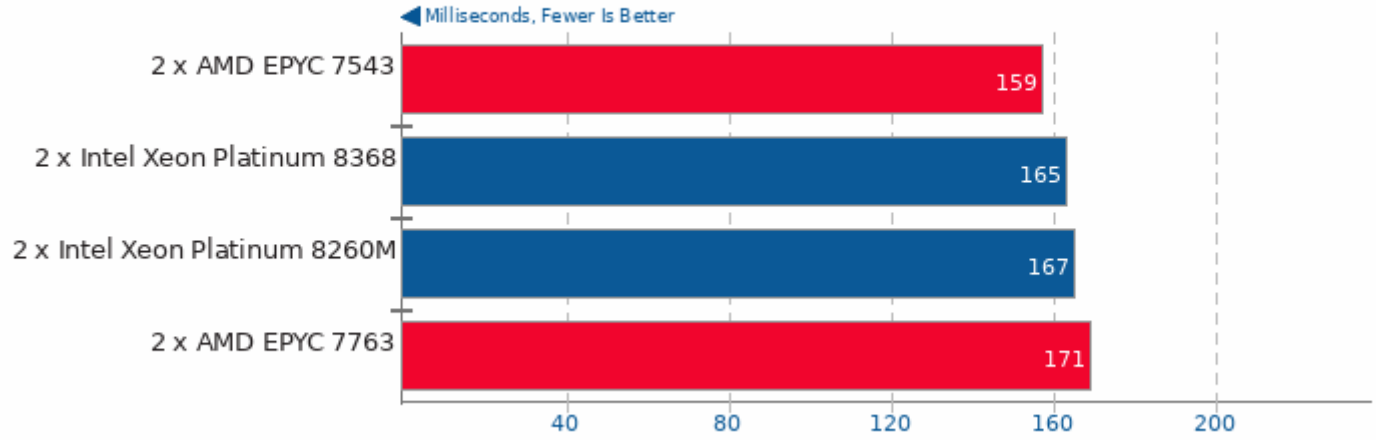


PyPerformance 1.0.0

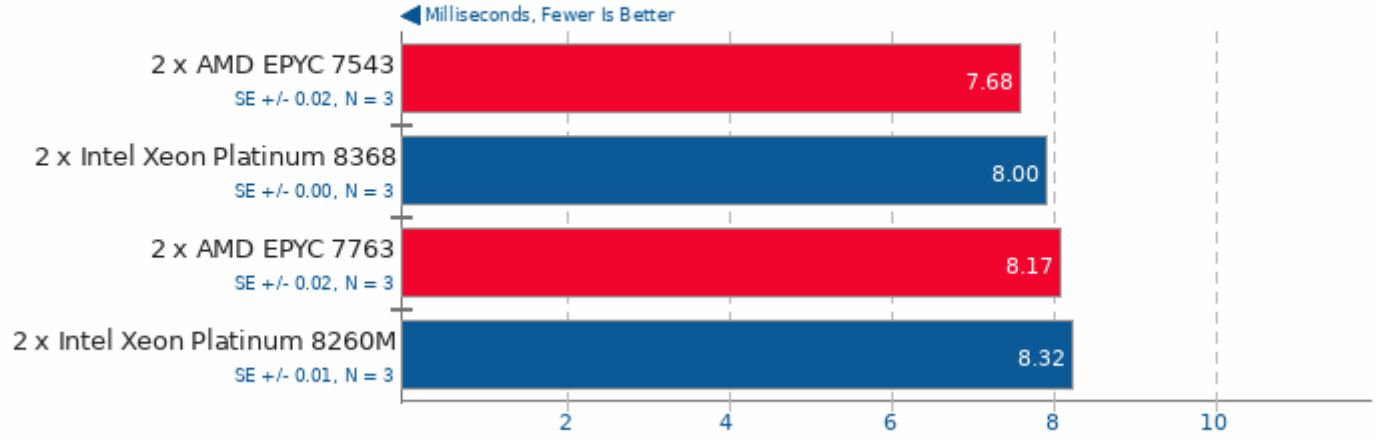
Benchmark: crypto_pyaes



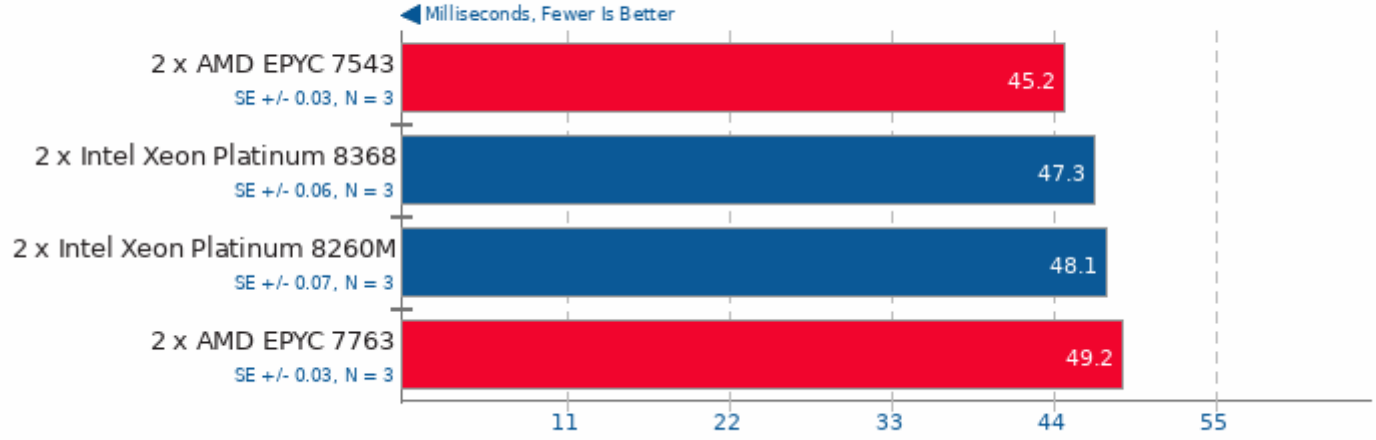
PyPerformance 1.0.0
Benchmark: regex_compile



PyPerformance 1.0.0
Benchmark: python_startup

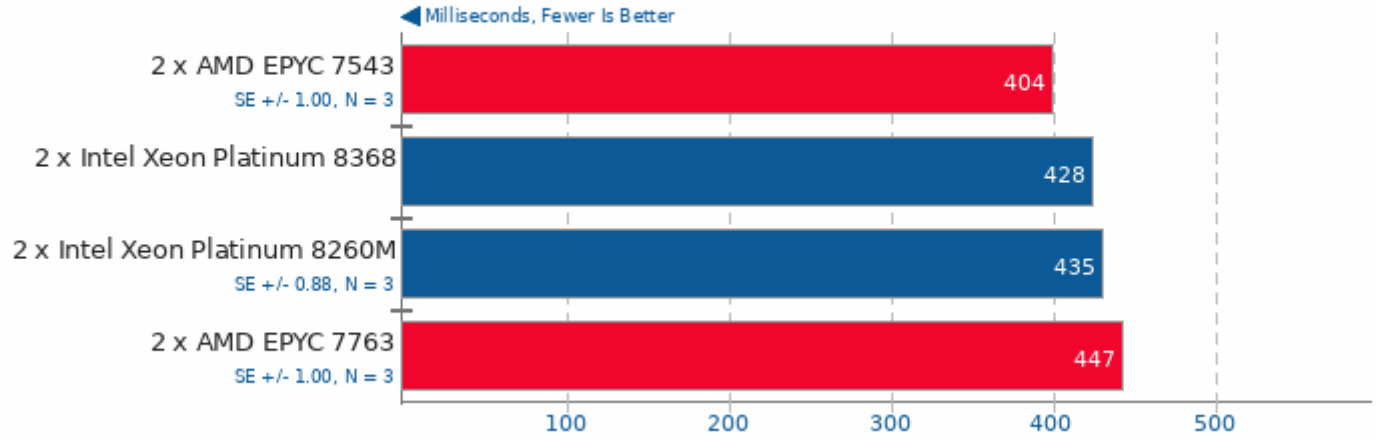


PyPerformance 1.0.0
Benchmark: django_template



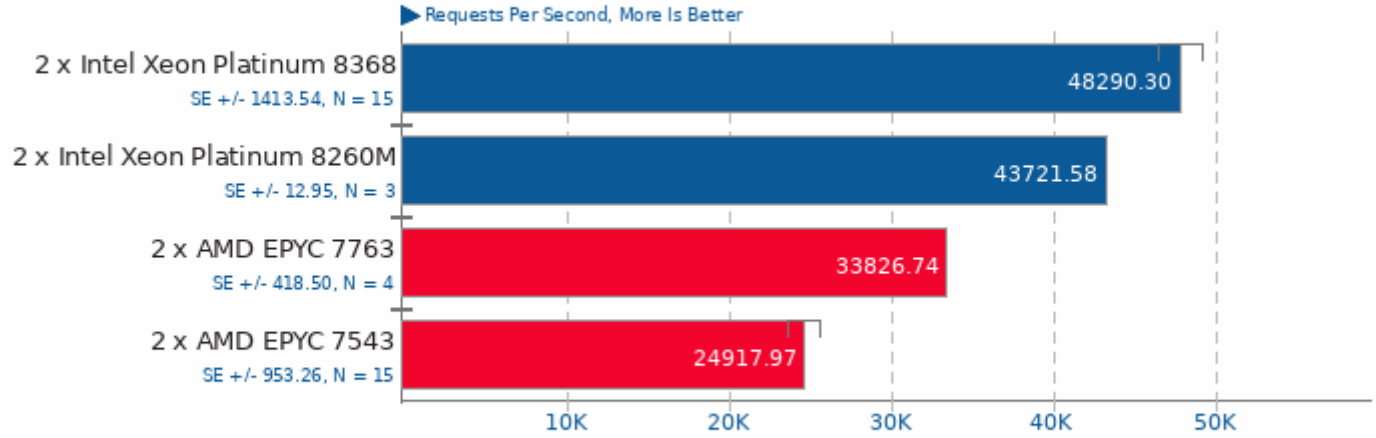
PyPerformance 1.0.0

Benchmark: pickle_pure_python



NGINX Benchmark 1.9.9

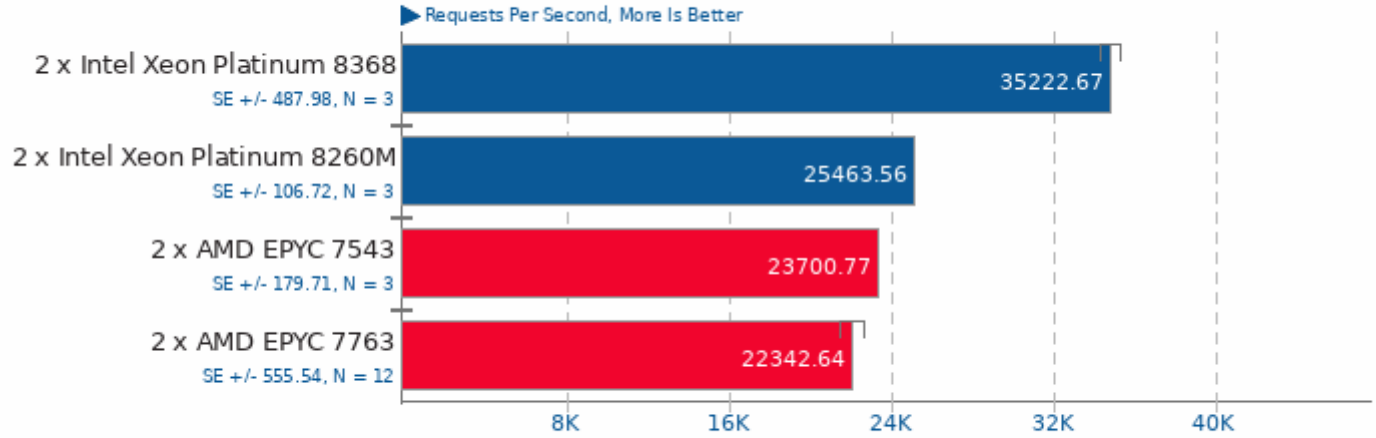
Static Web Page Serving



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

Apache Benchmark 2.4.29

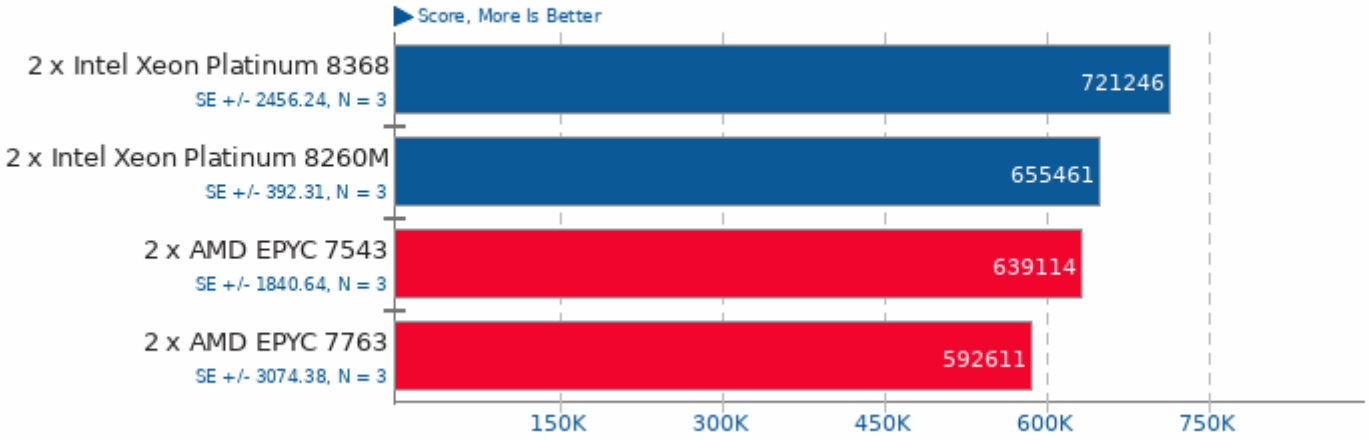
Static Web Page Serving



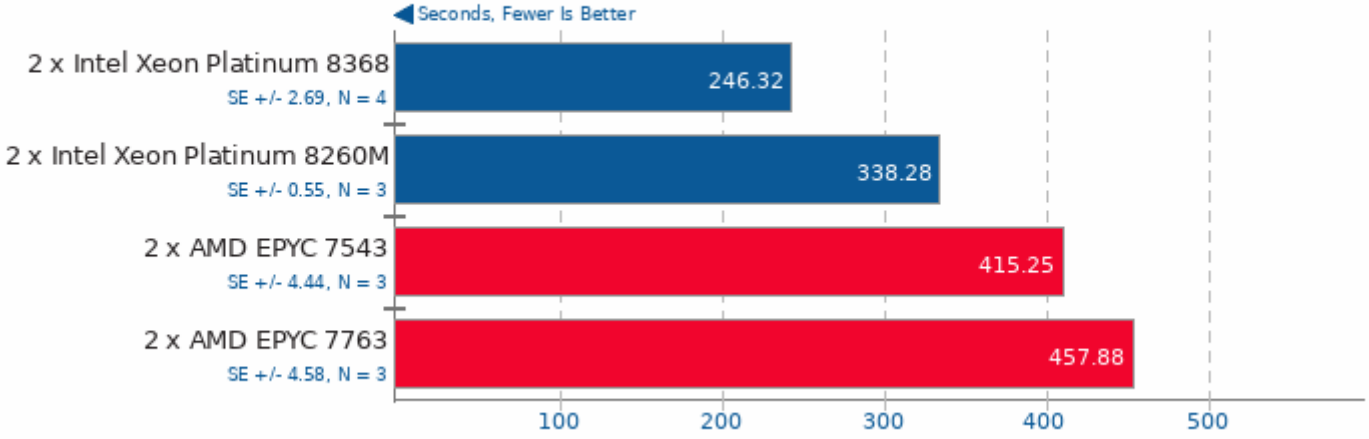
1. (CC) gcc options: -shared -fPIC -O2 -pthread

PHPBench 0.8.1

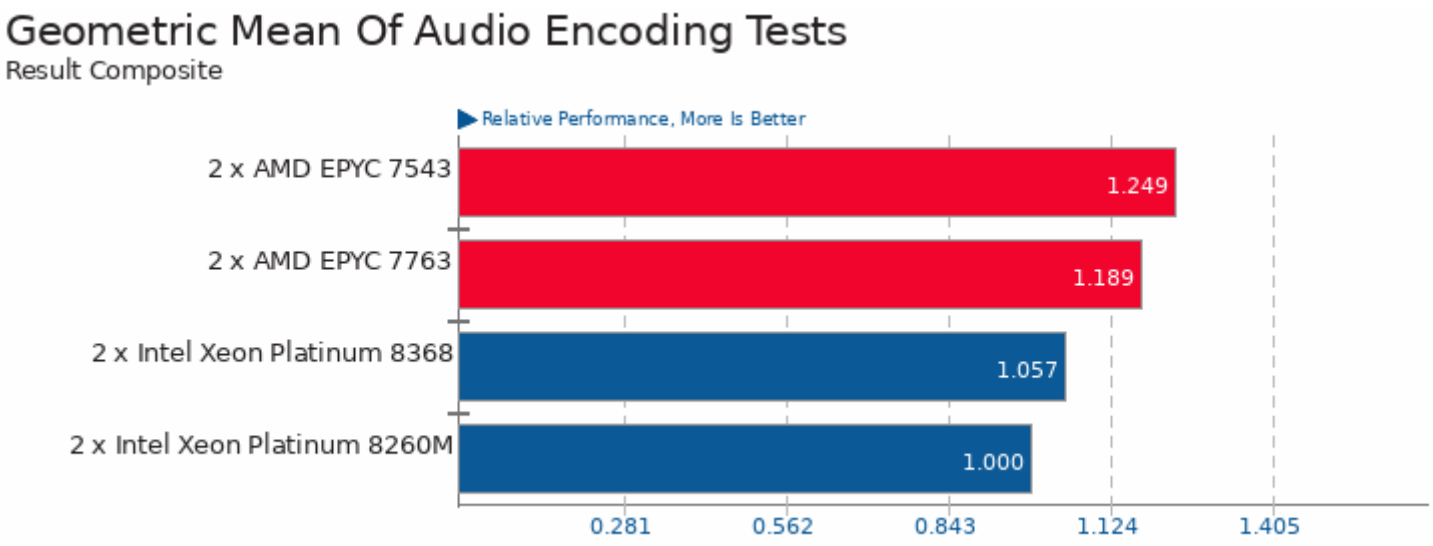
PHP Benchmark Suite



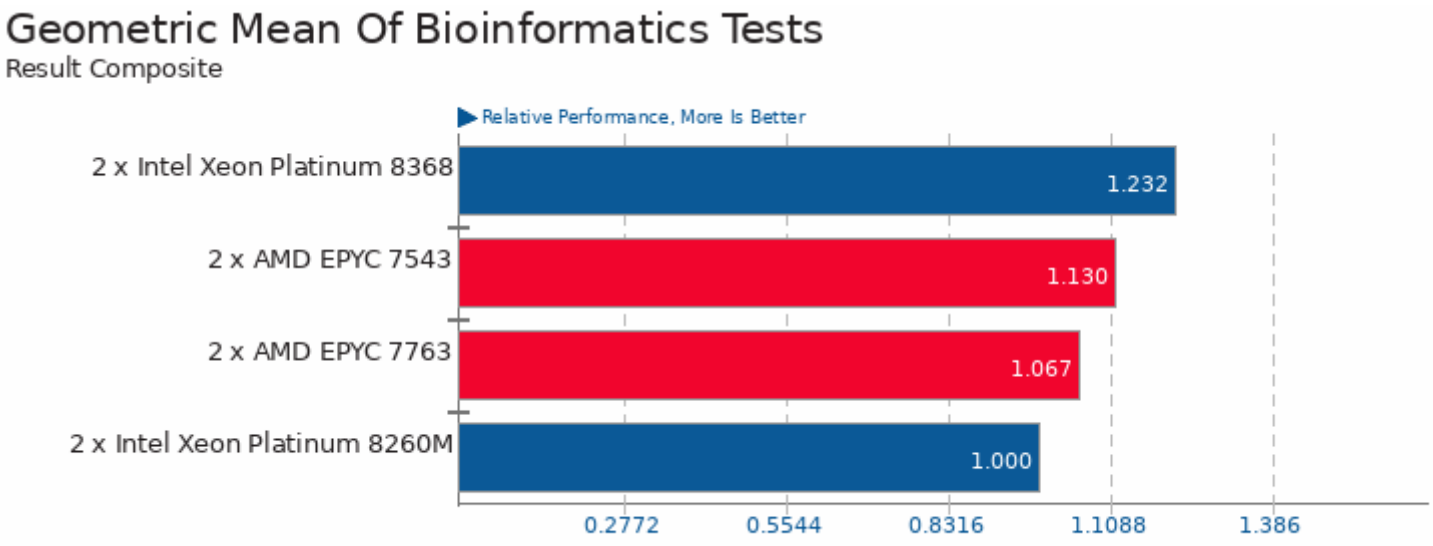
WireGuard + Linux Networking Stack Test



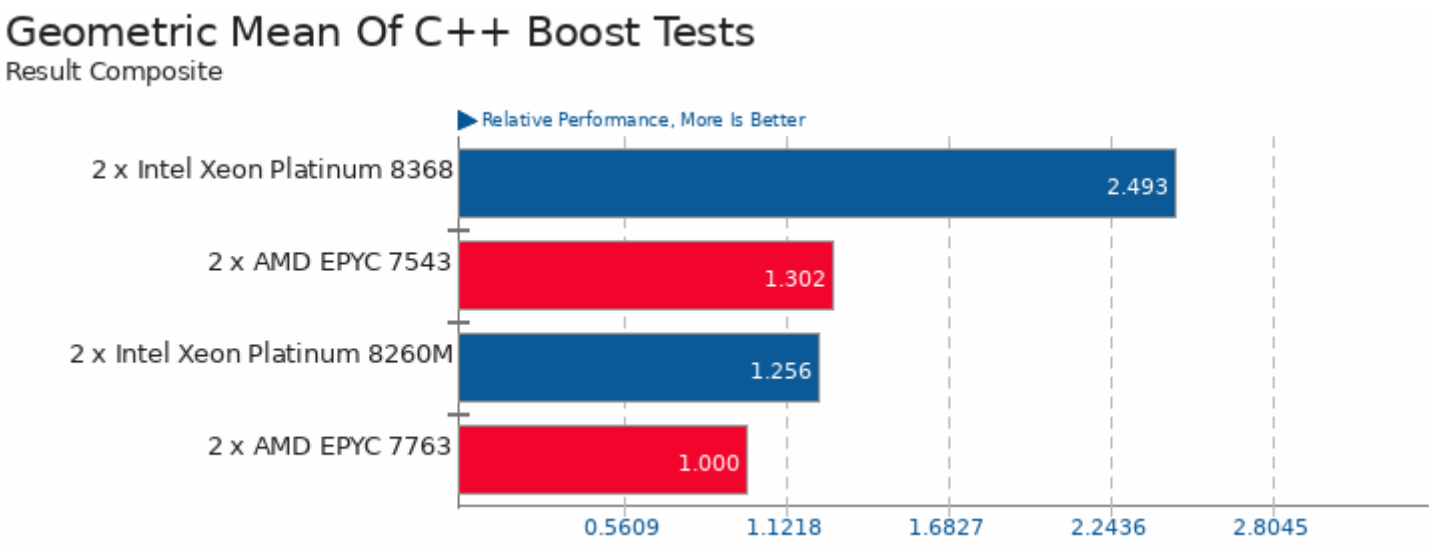
These geometric means are based upon test groupings / test suites for this result file.



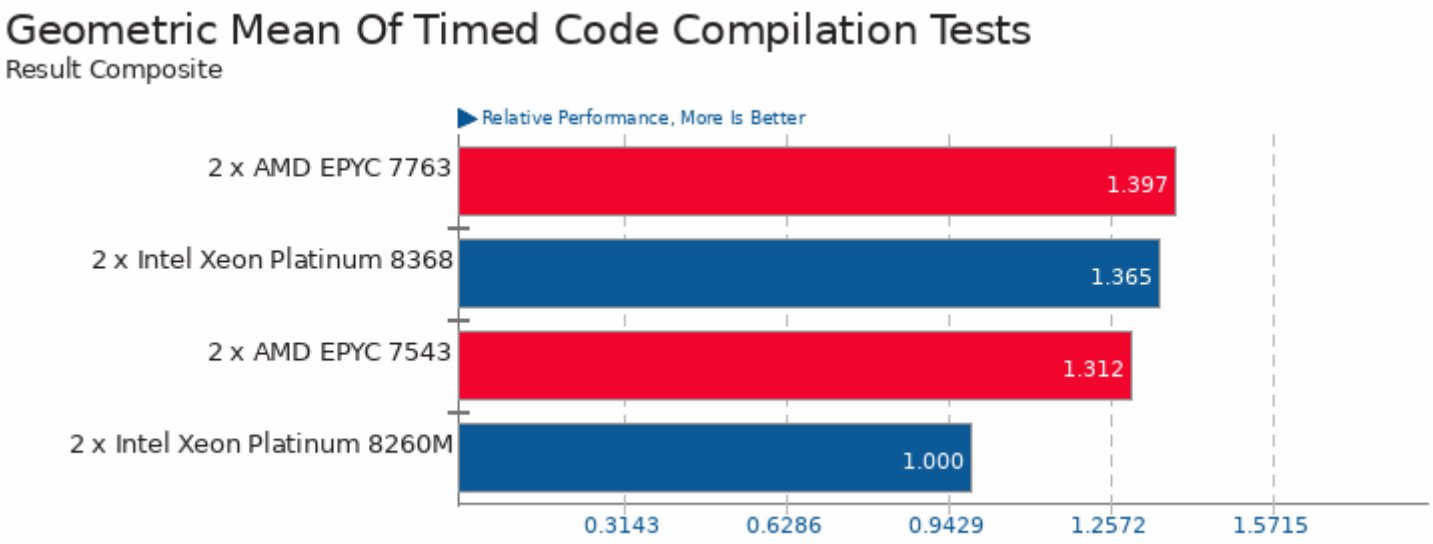
Geometric mean based upon tests: pts/encode-mp3 and pts/encode-flac



Geometric mean based upon tests: pts/himeno and pts/mafft



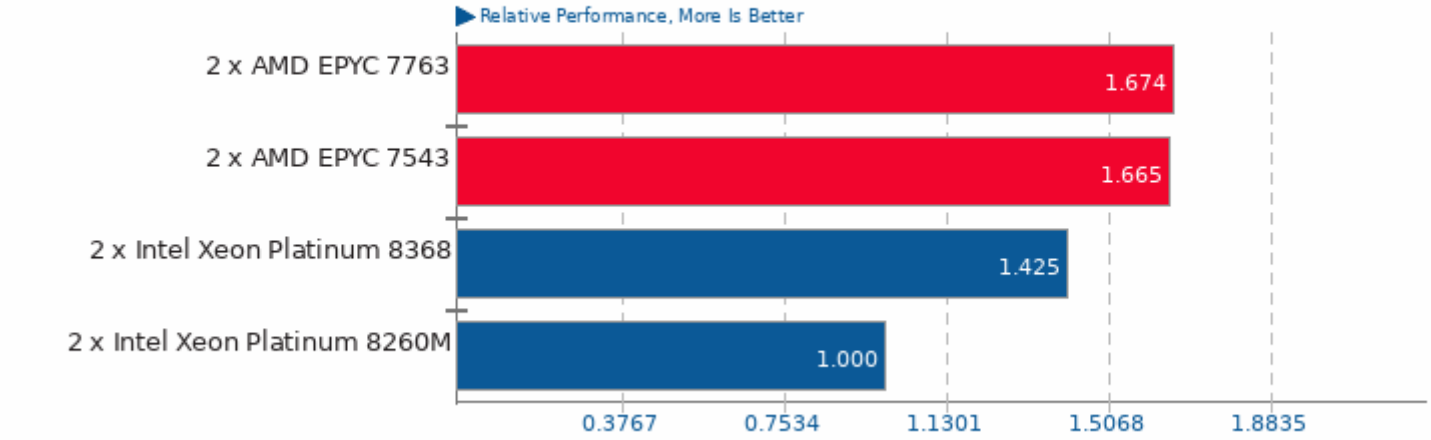
Geometric mean based upon tests: pts/openfoam and pts/povray



Geometric mean based upon tests: pts/build-linux-kernel, pts/build-gcc and pts/build-llvm

Geometric Mean Of Compression Tests

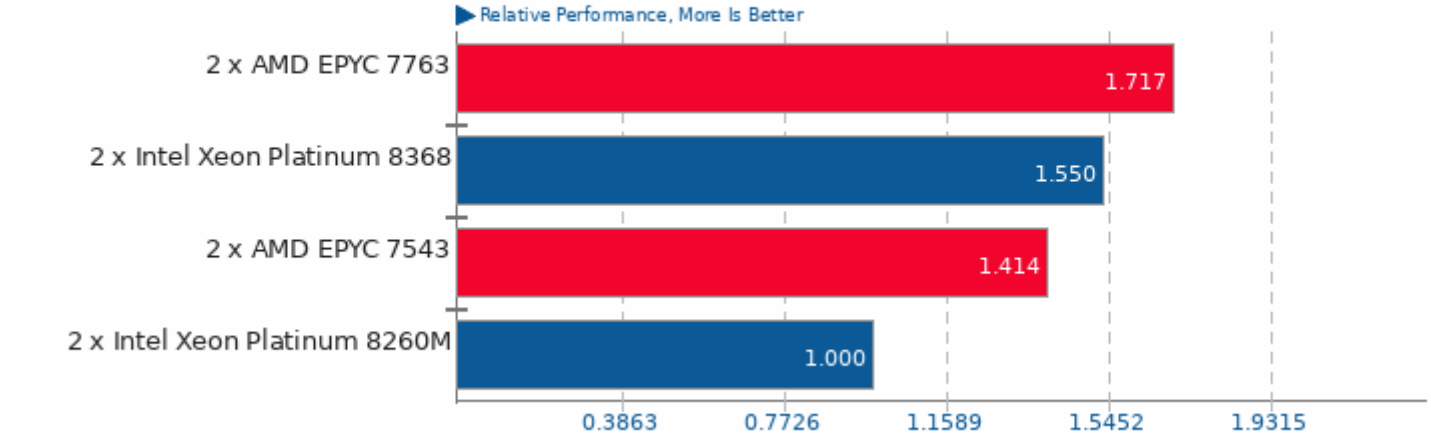
Result Composite



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

Geometric Mean Of CPU / Processor Suite Tests

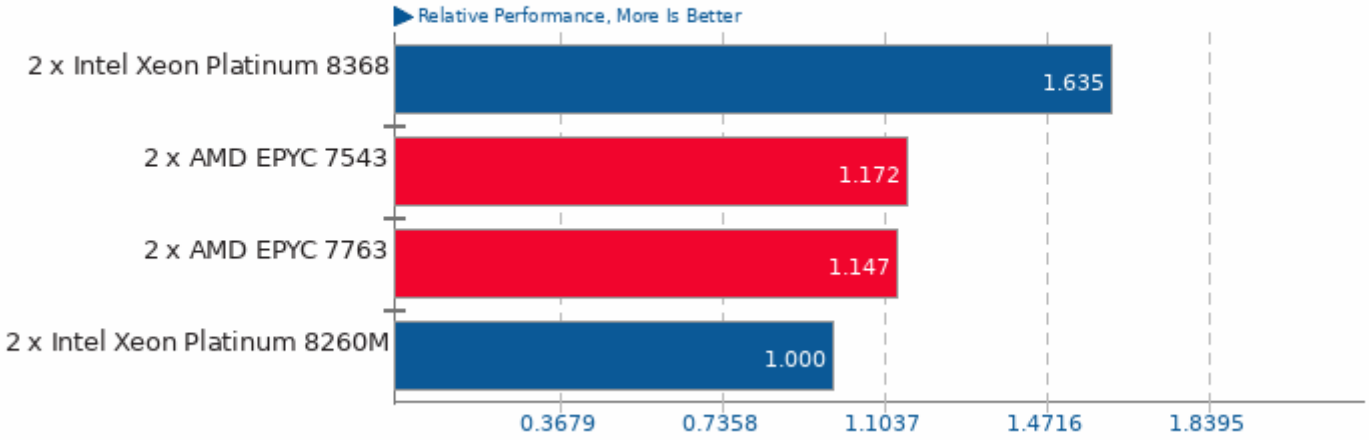
Result Composite



Geometric mean based upon tests: pts/rodinia, pts/namd, pts/x264, pts/x265, pts/compress-7zip, pts/blender, pts/build-linux-kernel, pts/build-gcc, pts/openssl, pts/ctx-clock, pts/sysbench and pts/povray

Geometric Mean Of Creator Workloads Tests

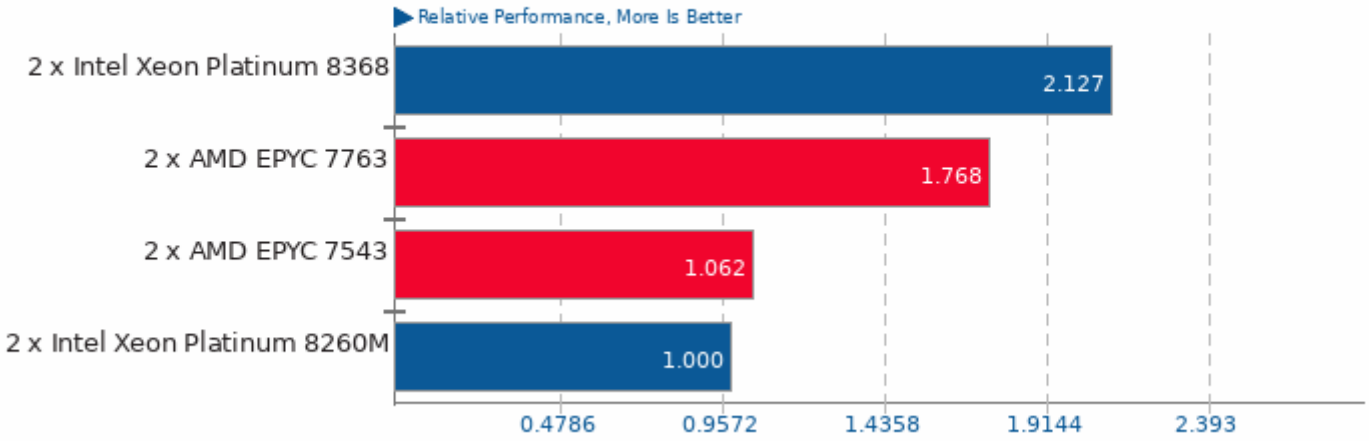
Result Composite



Geometric mean based upon tests: pts/ospray, pts/c-ray, pts/povray, pts/blender, pts/svt-vp9, pts/x264, pts/x265, pts/kvazaar, pts/dav1d, pts/encode-mp3, pts/encode-flac, pts/onednn and pts/ngspice

Geometric Mean Of Cryptography Tests

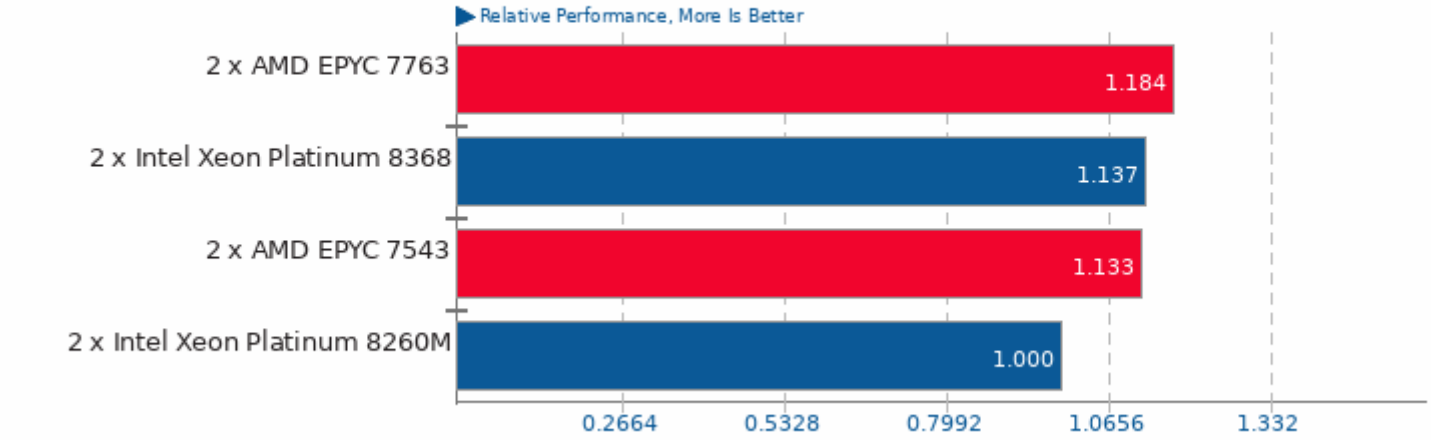
Result Composite



Geometric mean based upon tests: pts/gnupg, pts/openssl, pts/john-the-ripper and pts/cpuminer-opt

Geometric Mean Of Database Test Suite

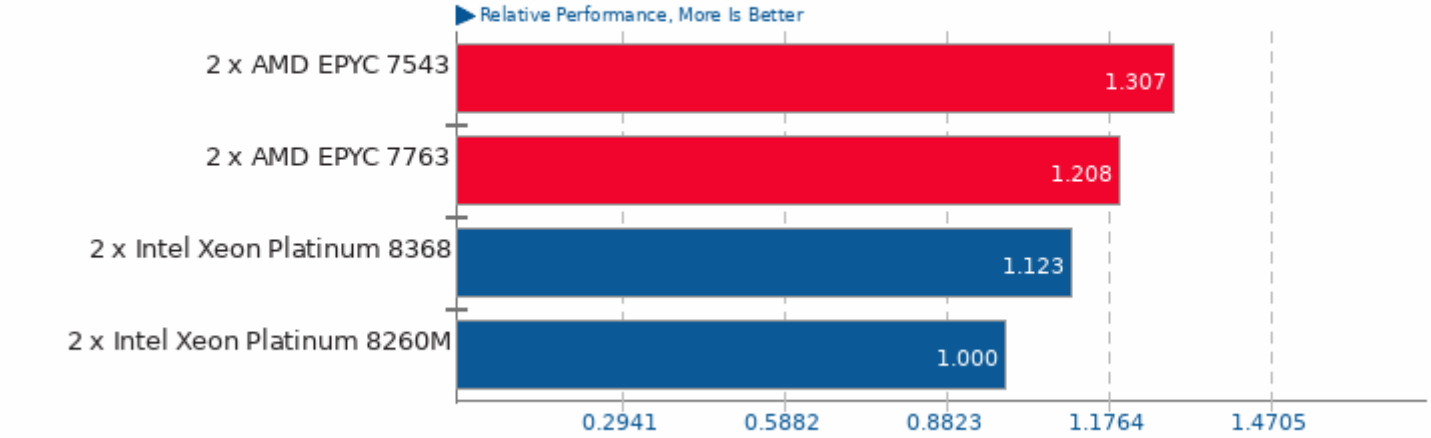
Result Composite



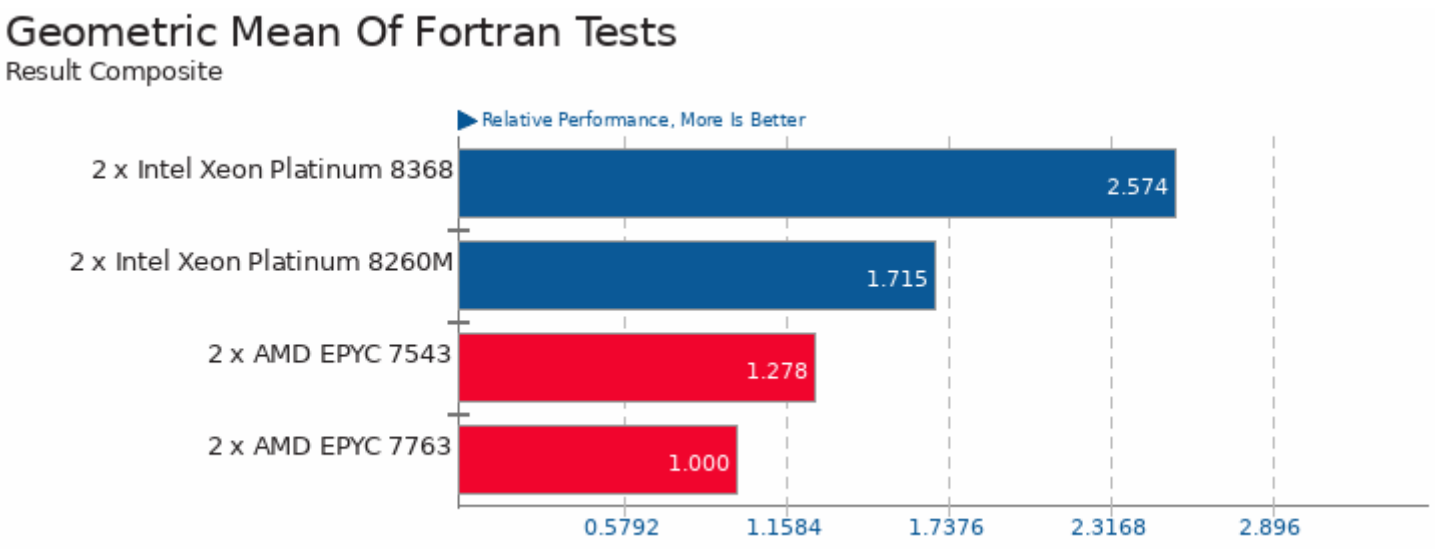
Geometric mean based upon tests: pts/sqlite-speedtest, pts/redis, pts/cassandra, pts/pgbench and pts/mysqlslap

Geometric Mean Of Electronic Design Tests

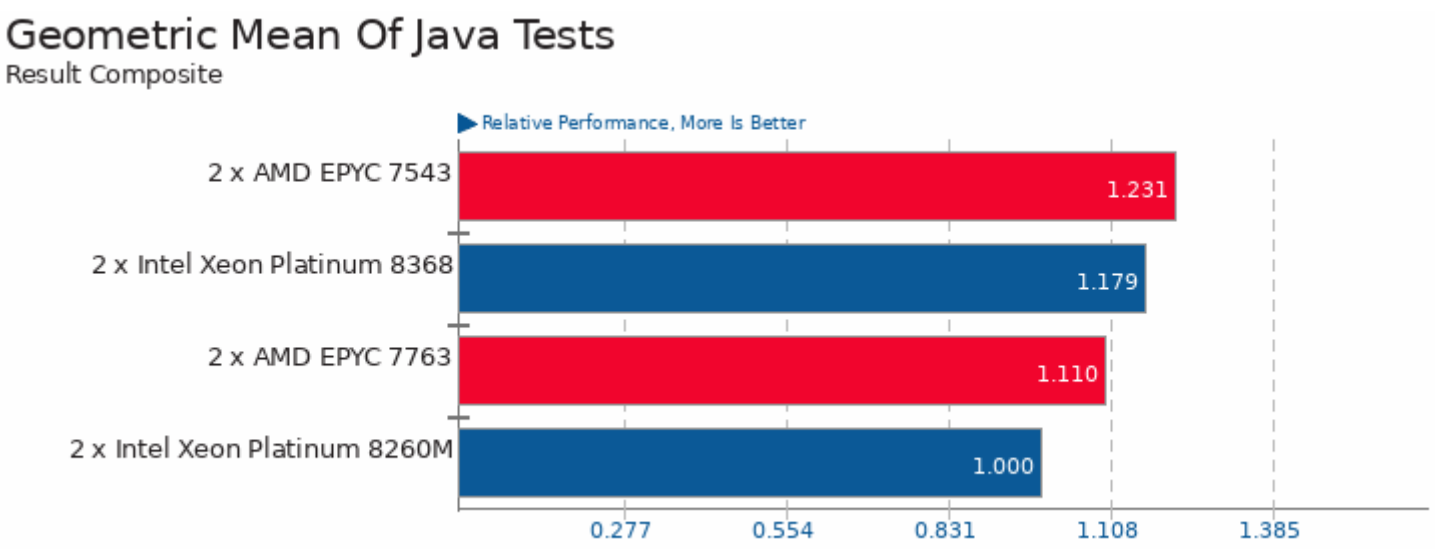
Result Composite



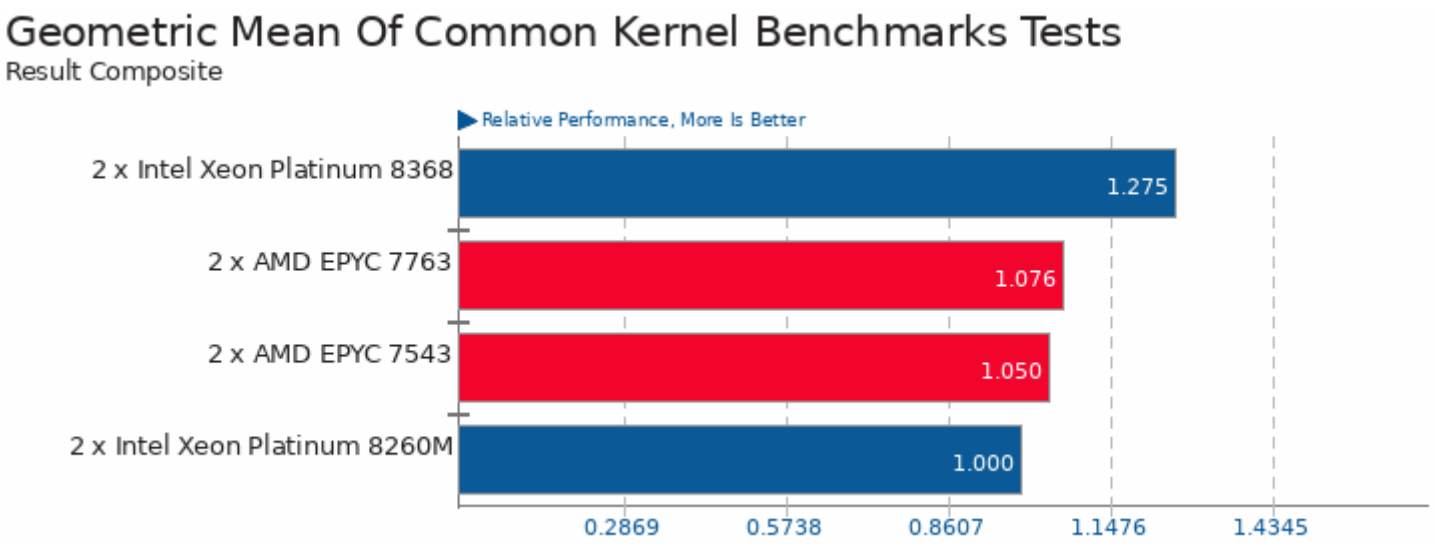
Geometric mean based upon tests: pts/ngspice



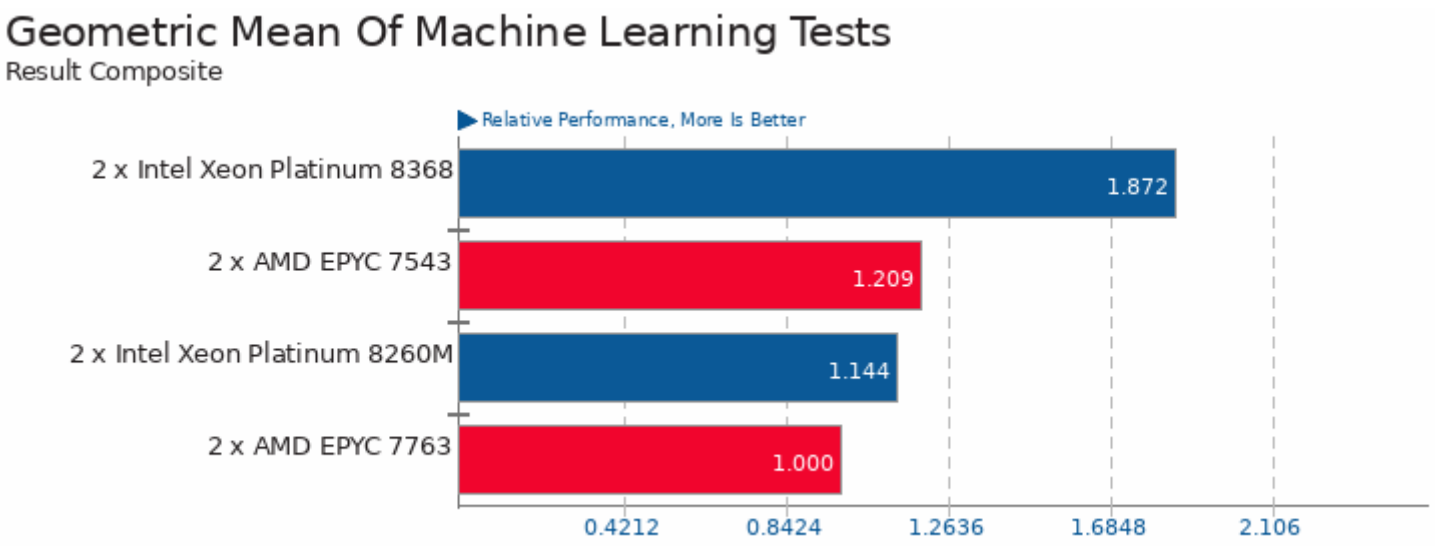
Geometric mean based upon tests: pts/hpcg, pts/npb, pts/dolfyn, pts/neat, pts/qe and pts/lammps



Geometric mean based upon tests: pts/java-scimark2 and pts/renaissance



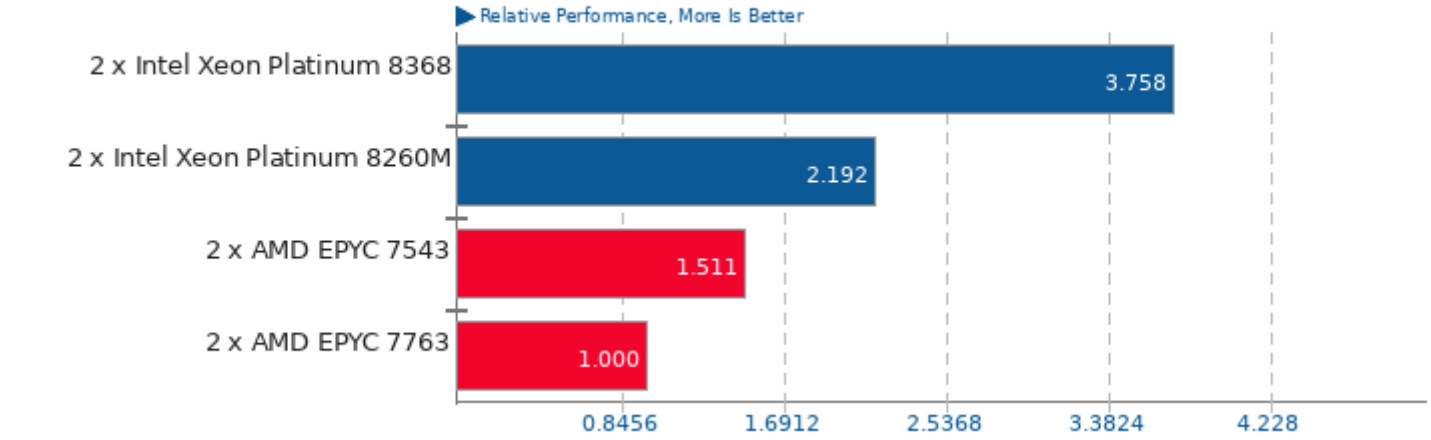
Geometric mean based upon tests: pts/apache, system/wireguard, pts/postmark, pts/sqlite-speedtest, pts/pgbench, pts/openssl, pts/ctx-clock and pts/osbench



Geometric mean based upon tests: pts/tnn, pts/numpy, pts/tensorflow-lite, pts/onednn, pts/onnx and pts/plaidml

Geometric Mean Of Molecular Dynamics Tests

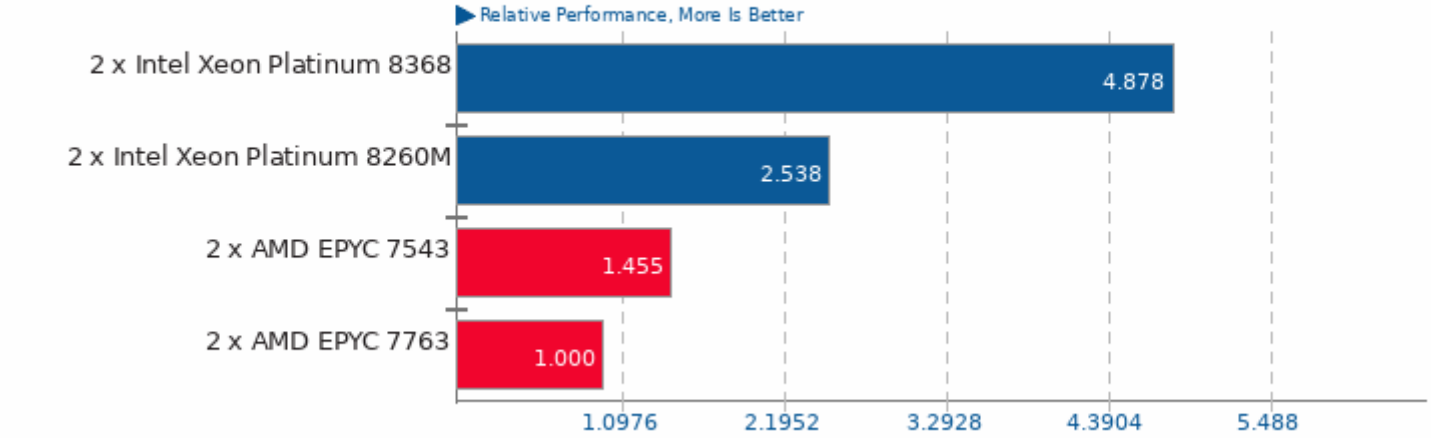
Result Composite



Geometric mean based upon tests: pts/namd, pts/dolfyn, pts/lammps, pts/pennant and pts/openfoam

Geometric Mean Of MPI Benchmarks Tests

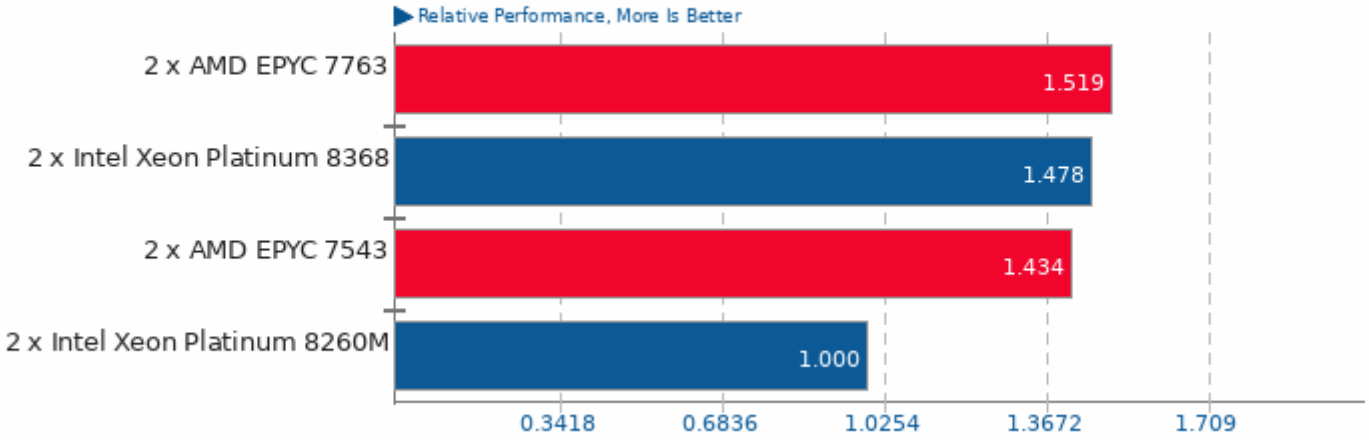
Result Composite



Geometric mean based upon tests: pts/lammps, pts/pennant, pts/hpcg and pts/npb

Geometric Mean Of NVIDIA GPU Compute Tests

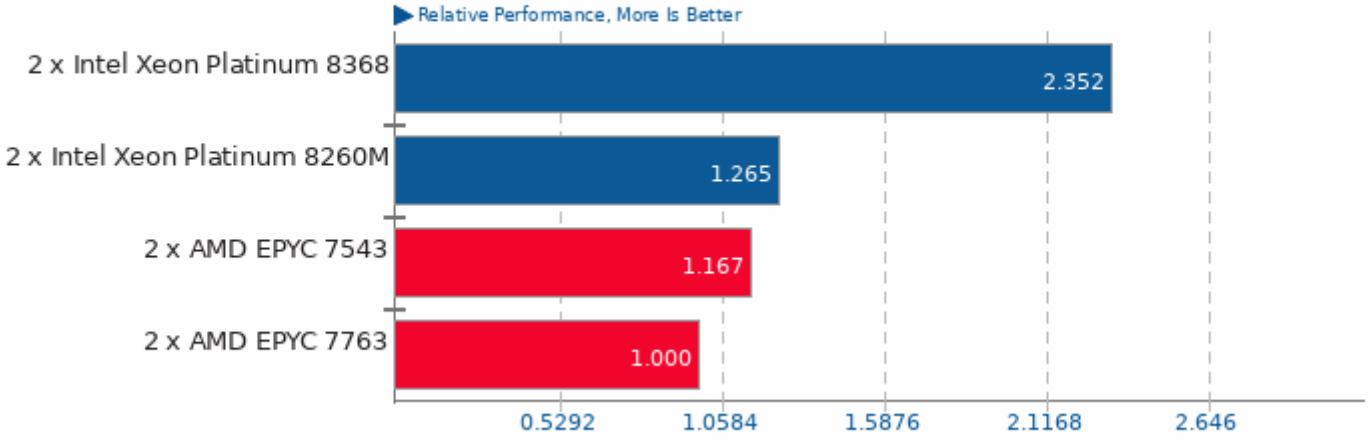
Result Composite



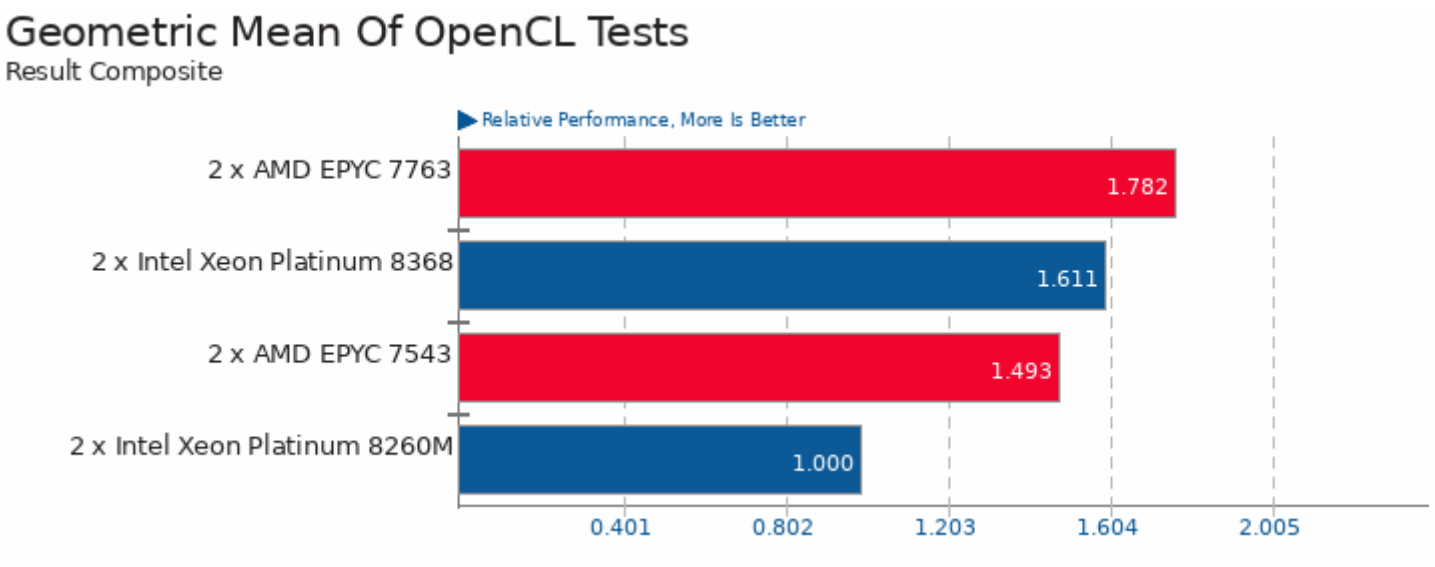
Geometric mean based upon tests: pts/rodinia, pts/financebench, pts/plaidml and pts/blender

Geometric Mean Of Intel oneAPI Tests

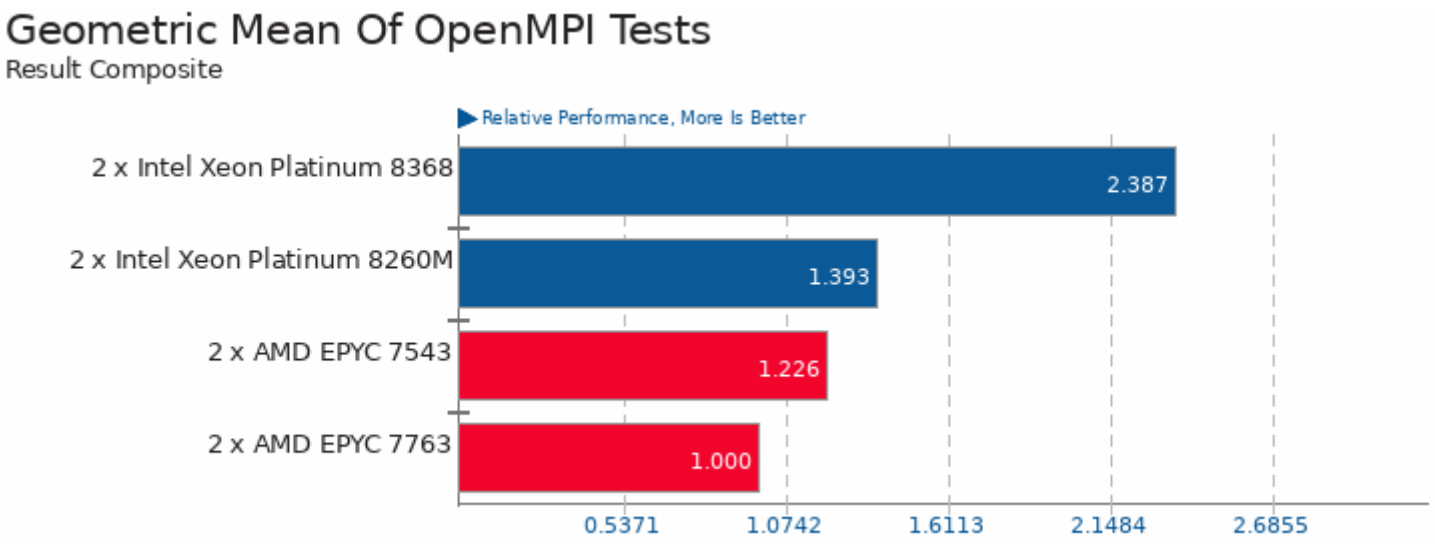
Result Composite



Geometric mean based upon tests: pts/onednn and pts/ospray



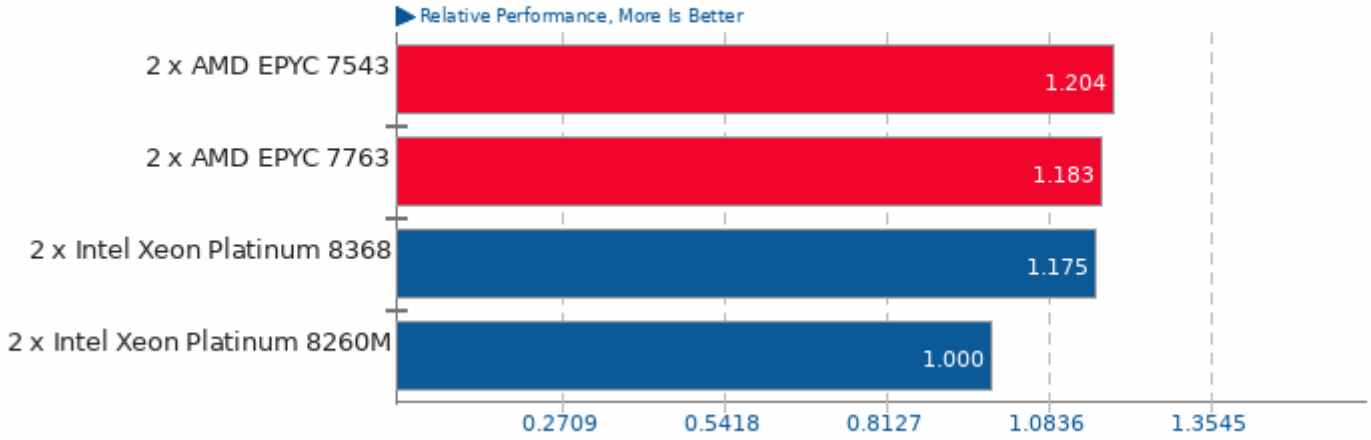
Geometric mean based upon tests: pts/rodinia and pts/blender



Geometric mean based upon tests: pts/hpcg, pts/npb, pts/rodinia, pts/pennant, pts/openfoam, pts/qe and pts/lammps

Geometric Mean Of Programmer / Developer System Benchmarks Tests

Result Composite

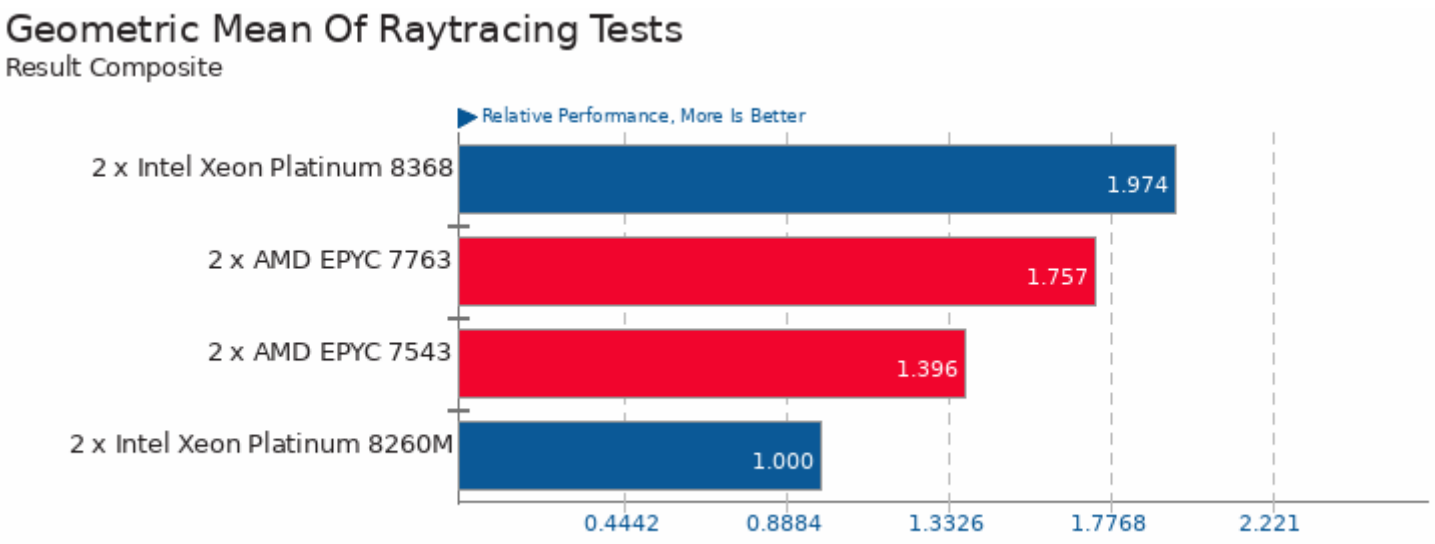


Geometric mean based upon tests: pts/sqlite-speedtest, pts/compress-zstd, pts/pyperformance, pts/pybench, pts/build-linux-kernel, pts/build-gcc, pts/build-llvm and pts/mt-dgemm

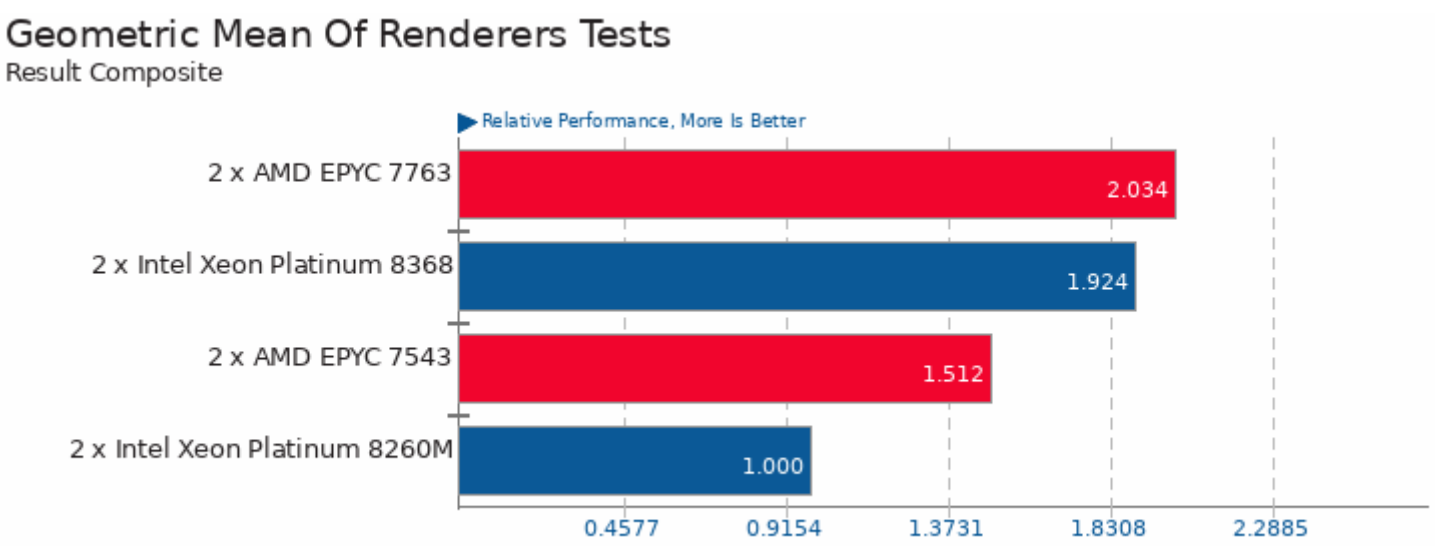
Geometric Mean Of Python Tests

Result Composite

Geometric mean based upon tests: pts/pybench, pts/numpy and pts/pyperformance



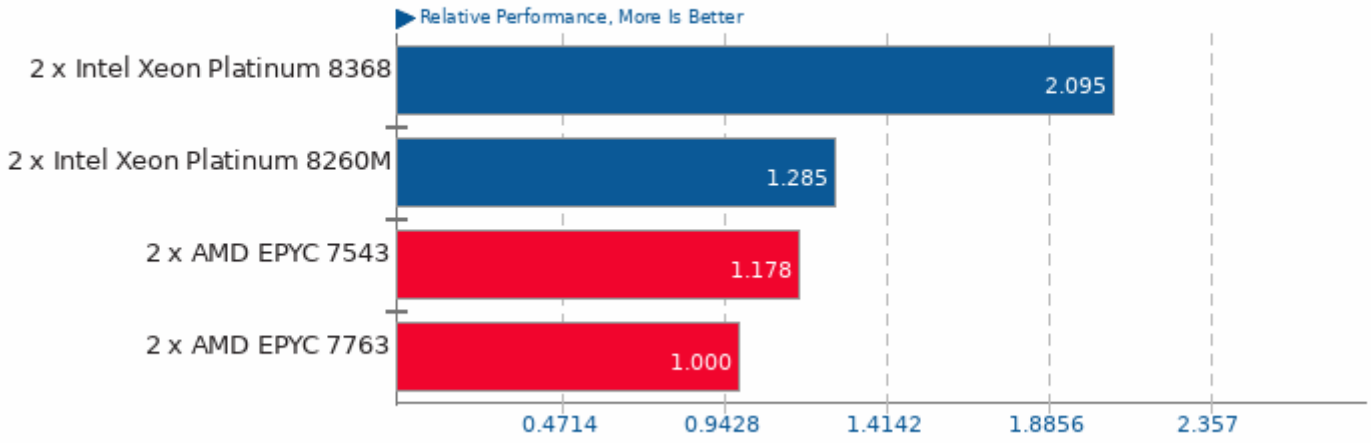
Geometric mean based upon tests: pts/ospray, pts/c-ray and pts/povray



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

Geometric Mean Of Scientific Computing Tests

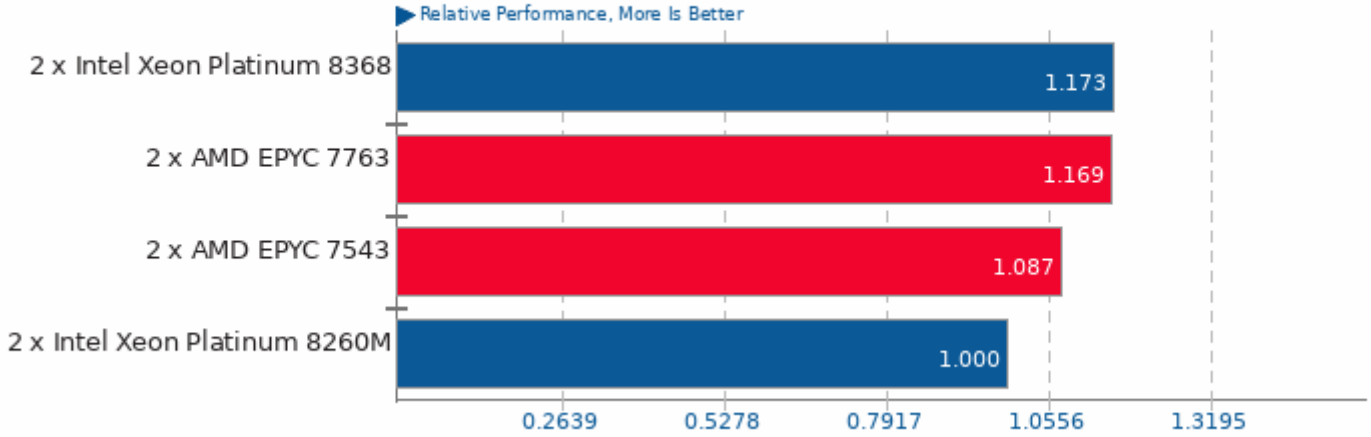
Result Composite



Geometric mean based upon tests: pts/neat, pts/mt-dgemm, pts/namd, pts/dolfyn, pts/lammps, pts/pennant, pts/openfoam, pts/himeno, pts/mafft, pts/qe and pts/kripke

Geometric Mean Of Server Tests

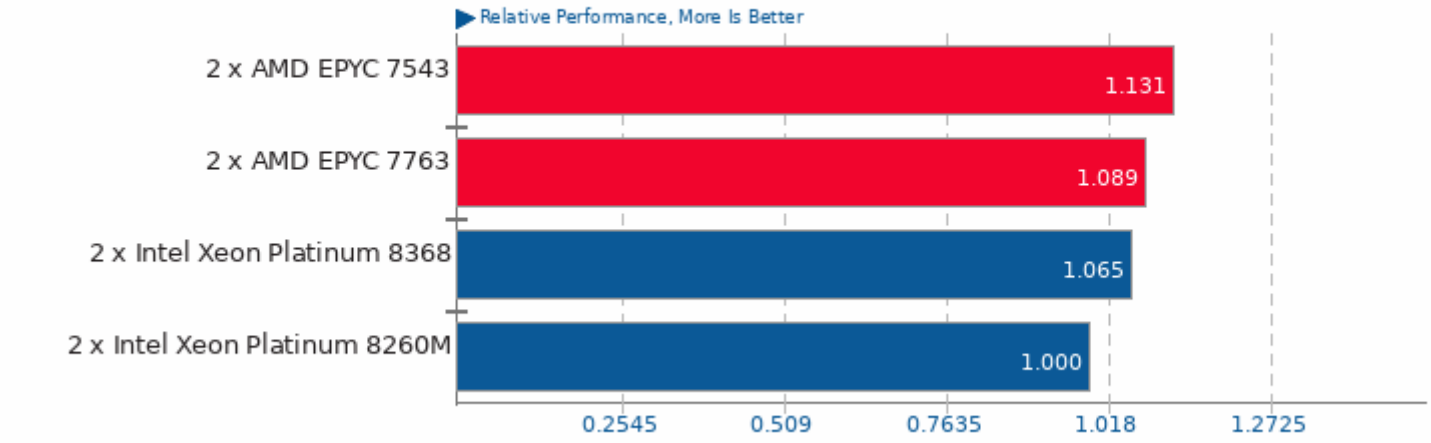
Result Composite



Geometric mean based upon tests: pts/apache, pts/nginx, pts/mysqlslap, pts/pgbench, pts/redis, pts/cassandra, pts/phpbench, pts/openssl and pts/sqlite-speedtest

Geometric Mean Of Single-Threaded Tests

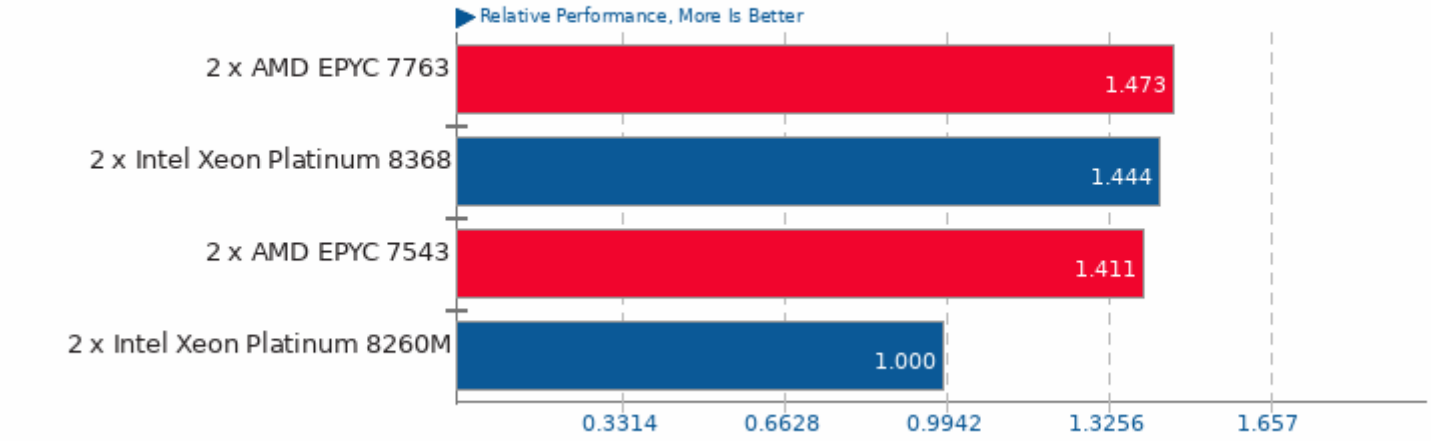
Result Composite



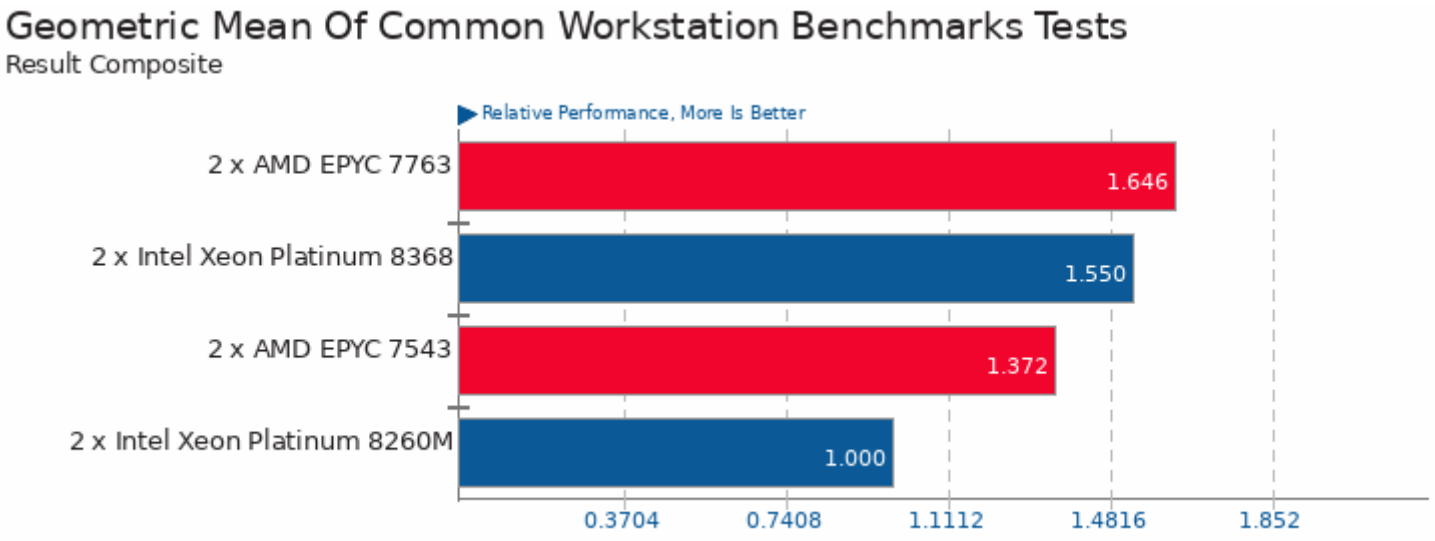
Geometric mean based upon tests: pts/java-scimark2, pts/byte, pts/cachebench, pts/numpy, pts/compress-gzip, pts/encode-flac, pts/encode-mp3, pts/gnupg, pts/redis, pts/pybench, pts/phpbench and pts/nginx

Geometric Mean Of Video Encoding Tests

Result Composite



Geometric mean based upon tests: pts/svt-vp9, pts/x264, pts/x265, pts/kvazaar and pts/dav1d



Geometric mean based upon tests: pts/blender, pts/rodinia, pts/himeno, pts/x265 and pts/sysbench

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