



## server-cpus-june-2021

Intel Xeon Platinum 8380 testing with a Intel M50CYP2SB2U (SE5C6200.86B.0022.D08.2103221623 BIOS) and ASPEED on Ubuntu 21.04 via the Phoronix Test Suite.

### Automated Executive Summary

*2 x Xeon Platinum 8380 had the most wins, coming in first place for 85% of the tests.*

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

*BRL-CAD (VGR Performance Metric) at 5.697x*

*Cpuminer-Opt (Algorithm: Magi) at 2.712x*

*Cpuminer-Opt (Algorithm: Garlicoin) at 2.642x*

*SVT-AV1 (Encoder Mode: Preset 8 - Input: Bosphorus 4K) at 2.634x*

*SVT-AV1 (Encoder Mode: Preset 4 - Input: Bosphorus 4K) at 2.547x*

*NAS Parallel Benchmarks (Test / Class: SP.B) at 2.464x*

*NAS Parallel Benchmarks (Test / Class: SP.C) at 2.457x*

*Pennant (Test: leblancbig) at 2.407x*

*Xcompact3d Incompact3d (Input: input.i3d 193 Cells Per Direction) at 2.174x*

*OpenFOAM (Input: Motorbike 60M) at 2.168x.*

## Test Systems:

### 2 x Xeon Platinum 8380

Processor: 2 x Intel Xeon Platinum 8380 @ 3.40GHz (80 Cores / 160 Threads), Motherboard: Intel M50CYP2SB2U (SE5C6200.86B.0022.D08.2103221623 BIOS), Chipset: Intel Device 0998, Memory: 504GB, Disk: 7682GB INTEL SSDPF2KX076TZ, Graphics: llvmpipe, Monitor: VE228, Network: 2 x Intel X710 for 10GBASE-T + 2 x Intel E810-C for QSFP

OS: Ubuntu 21.04, Kernel: 5.13.0-051300rc4-generic (x86\_64) 20210530, Desktop: GNOME Shell 3.38.4, Display Server: X Server, OpenGL: 4.5 Mesa 21.0.1 (LLVM 11.0.1 256 bits), Compiler: GCC 10.3.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: madvise

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-mutex --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-gDeRY6/gcc-10-10.3.0/debian/tmp-nvptx/usr,amdgcnc-ahsa=/build/gcc-10-gDeRY6/gcc-10-10.3.0/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-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: intel\_pstate performance - CPU Microcode: 0xd000270

Python Notes: Python 3.9.5

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/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx\_async\_abort: Not affected

### Xeon Platinum 8380

Processor: Intel Xeon Platinum 8380 @ 3.40GHz (40 Cores / 80 Threads), Motherboard: Intel M50CYP2SB2U (SE5C6200.86B.0022.D08.2103221623 BIOS), Chipset: Intel Device 0998, Memory: 252GB, Disk: 7682GB INTEL SSDPF2KX076TZ, Graphics: llvmpipe, Monitor: VE228, Network: 2 x Intel X710 for 10GBASE-T + 2 x Intel E810-C for QSFP

OS: Ubuntu 21.04, Kernel: 5.13.0-051300rc4-generic (x86\_64) 20210530, Desktop: GNOME Shell 3.38.4, Display Server: X Server, OpenGL: 4.5 Mesa 21.0.1 (LLVM 11.0.1 256 bits), Compiler: GCC 10.3.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: madvise

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-mutex --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-gDeRY6/gcc-10-10.3.0/debian/tmp-nvptx/usr,amdgcnc-ahsa=/build/gcc-10-gDeRY6/gcc-10-10.3.0/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-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: intel\_pstate performance - CPU Microcode: 0xd000270

Python Notes: Python 3.9.5

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/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx\_async\_abort: Not affected

### Xeon Platinum 8380 rest

Processor: Intel Xeon Platinum 8380 @ 3.40GHz (40 Cores / 80 Threads), Motherboard: Intel M50CYP2SB2U (SE5C6200.86B.0022.D08.2103221623 BIOS), Chipset: Intel Device 0998, Memory: 252GB, Disk: 7682GB INTEL SSDPF2KX076TZ, Graphics: ASPEED, Monitor: VE228, Network: 2 x Intel X710 for 10GBASE-T + 2 x Intel E810-C for QSFP

OS: Ubuntu 21.04, Kernel: 5.13.0-051300rc4-generic (x86\_64) 20210530, Desktop: GNOME Shell 3.38.4, Display

Server: X Server, Compiler: GCC 10.3.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: madvise

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-mutex --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-gDeRY6/gcc-10-10.3.0/debian/tmp-nvptx/usr,amdgcnc-ahsa=/build/gcc-10-gDeRY6/gcc-10-10.3.0/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-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: intel\_pstate performance - CPU Microcode: 0xd000270

Security Notes: itlb\_multihit: Not affected + 1tft: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of usercopy/swaps 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 Xeon Platinum 8380	Xeon Platinum 8380	Xeon Platinum 8380 rest
<b>NAS Parallel Benchmarks - BT.C (Mop/s)</b>	<b>198052</b>	<b>117333</b>	
Normalized	100%	59.24%	
Standard Deviation	0.2%	0.3%	
<b>NAS Parallel Benchmarks - CG.C (Mop/s)</b>	<b>40189</b>	<b>22890</b>	
Normalized	100%	56.96%	
Standard Deviation	0.6%	0.4%	
<b>NAS Parallel Benchmarks - EP.C (Mop/s)</b>	<b>7939</b>	<b>4334</b>	
Normalized	100%	54.6%	
Standard Deviation	3.4%	2.5%	
<b>NAS Parallel Benchmarks - EP.D (Mop/s)</b>	<b>8890</b>	<b>4594</b>	
Normalized	100%	51.67%	
Standard Deviation	2.4%	0.5%	
<b>NAS Parallel Benchmarks - FT.C (Mop/s)</b>	<b>100813</b>	<b>57275</b>	
Normalized	100%	56.81%	
Standard Deviation	0.3%	0.2%	
<b>NAS Parallel Benchmarks - IS.D (Mop/s)</b>	<b>3086</b>	<b>2334</b>	
Normalized	100%	75.61%	
Standard Deviation	1.4%	0.5%	
<b>NAS Parallel Benchmarks - LU.C (Mop/s)</b>	<b>188790</b>	<b>98454</b>	
Normalized	100%	52.15%	
Standard Deviation	0.1%	0.1%	
<b>NAS Parallel Benchmarks - MG.C (Mop/s)</b>	<b>118832</b>	<b>56288</b>	
Normalized	100%	47.37%	
Standard Deviation	0.7%	1%	
<b>NAS Parallel Benchmarks - SP.B (Mop/s)</b>	<b>123538</b>	<b>50134</b>	
Normalized	100%	40.58%	
Standard Deviation	0.7%	0.6%	
<b>NAS Parallel Benchmarks - SP.C (Mop/s)</b>	<b>92500</b>	<b>37645</b>	
Normalized	100%	40.7%	
Standard Deviation	0.2%	0.3%	
<b>miniFE - Small (CG Mflops)</b>	<b>28391</b>	<b>23125</b>	
Normalized	100%	81.45%	
Standard Deviation	0.6%	0.1%	
<b>CloverLeaf - L.E.H (sec)</b>	<b>10.08</b>	<b>15.92</b>	
Normalized	100%	63.32%	
Standard Deviation	0.9%	0.1%	
<b>Rodinia - OpenMP LavaMD (sec)</b>	<b>39.069</b>	<b>71.991</b>	

	Normalized	100%	54.27%
	Standard Deviation	1.1%	1.6%
<b>Rodinia - OpenMP Leukocyte (sec)</b>		<b>47.443</b>	<b>44.021</b>
	Normalized	92.79%	100%
	Standard Deviation	2.4%	7.2%
<b>Rodinia - OpenMP CFD Solver (sec)</b>		<b>4.709</b>	<b>6.211</b>
	Normalized	100%	75.82%
	Standard Deviation	1.4%	0.3%
<b>Rodinia - O.S (sec)</b>		<b>7.652</b>	<b>6.762</b>
	Normalized	88.37%	100%
	Standard Deviation	3.2%	3.6%
<b>NAMD - ATPase Simulation - 327,506 Atoms (days/ns)</b>		<b>0.27064</b>	<b>0.51889</b>
	Normalized	100%	52.16%
	Standard Deviation	0.2%	0.3%
<b>toyBrot Fractal Generator - TBB (ms)</b>		<b>6924</b>	<b>13486</b>
	Normalized	100%	51.34%
	Standard Deviation	2.4%	2.4%
<b>toyBrot Fractal Generator - OpenMP (ms)</b>		<b>7281</b>	<b>14057</b>
	Normalized	100%	51.8%
	Standard Deviation	0.3%	0.2%
<b>toyBrot Fractal Generator - C++ Tasks (ms)</b>		<b>7883</b>	<b>13726</b>
	Normalized	100%	57.43%
	Standard Deviation	0.9%	0.5%
<b>toyBrot Fractal Generator - C++ Threads</b>		<b>6992</b>	<b>13439</b>
	Normalized	100%	52.03%
	Standard Deviation	0.6%	0.4%
<b>Algebraic Multi-Grid Benchmark (Figure Of Merit)</b>		<b>2082103333</b>	<b>1084411667</b>
	Normalized	100%	52.08%
	Standard Deviation	0.1%	0.1%
<b>Pennant - sedovbig (Hydro Cycle Time - sec)</b>		<b>14.41379</b>	<b>23.84300</b>
	Normalized	100%	60.45%
	Standard Deviation	0.1%	0.1%
<b>Pennant - leblanbig (Hydro Cycle Time -</b>		<b>4.707610</b>	<b>11.32899</b>
	Normalized	100%	41.55%
	Standard Deviation	0.7%	0.3%
<b>NWChem - C240 Buckyball (sec)</b>		<b>1847</b>	<b>3085</b>
	Normalized	100%	59.86%
<b>Xcompact3d Incompact3d - X.b.i.i (sec)</b>		<b>291.416199</b>	<b>554.938761</b>
	Normalized	100%	52.51%
	Standard Deviation	1%	0.1%
<b>Xcompact3d Incompact3d - i.i.1.C.P.D (sec)</b>		<b>2.57966831</b>	<b>5.26849863</b>
	Normalized	100%	48.96%
	Standard Deviation	1%	0.5%
<b>Xcompact3d Incompact3d - i.i.1.C.P.D (sec)</b>		<b>11.0581346</b>	<b>24.0432320</b>
	Normalized	100%	45.99%
	Standard Deviation	0.3%	0.1%
<b>OpenFOAM - Motorbike 30M (sec)</b>		<b>14.30</b>	<b>23.49</b>
	Normalized	100%	60.88%
	Standard Deviation	0.4%	0.1%
<b>OpenFOAM - Motorbike 60M (sec)</b>		<b>103.61</b>	<b>224.58</b>
	Normalized	100%	46.14%
	Standard Deviation	0.1%	0.1%
<b>Quantum ESPRESSO - AUSURF112 (sec)</b>		<b>1169</b>	<b>1783</b>

	Normalized	100%	65.57%
	Standard Deviation	3.1%	4.9%
<b>RELION - Basic - CPU (sec)</b>		<b>350.743</b>	<b>686.961</b>
	Normalized	100%	51.06%
	Standard Deviation	0.8%	0.4%
<b>LAMMPS Molecular Dynamics Simulator - 20k Atoms (ns/day)</b>		<b>35.989</b>	<b>22.682</b>
	Normalized	100%	63.02%
	Standard Deviation	0.1%	0.7%
<b>LAMMPS Molecular Dynamics Simulator - Rhodopsin Protein (ns/day)</b>		<b>31.561</b>	<b>20.841</b>
	Normalized	100%	66.03%
	Standard Deviation	4%	4.2%
<b>LULESH (z/s)</b>		<b>35312</b>	<b>18780</b>
	Normalized	100%	53.18%
	Standard Deviation	0.4%	0.2%
<b>Xmrig - Monero - 1M (H/s)</b>		<b>26504</b>	<b>14658</b>
	Normalized	100%	55.31%
	Standard Deviation	0.4%	0.1%
<b>Xmrig - Wownero - 1M (H/s)</b>		<b>42771</b>	<b>23540</b>
	Normalized	100%	55.04%
	Standard Deviation	0.4%	0.5%
<b>John The Ripper - Blowfish (Real C/S)</b>		<b>118869</b>	<b>60553</b>
	Normalized	100%	50.94%
	Standard Deviation	0.2%	0.4%
<b>John The Ripper - MD5 (Real C/S)</b>		<b>10200000</b>	<b>5305667</b>
	Normalized	100%	52.02%
	Standard Deviation	0.2%	0.5%
<b>LuxCoreRender - DLSC - CPU (M)</b>		<b>9.41</b>	<b>5.50</b>
	Normalized	100%	58.45%
	Standard Deviation	1.5%	0.1%
<b>LuxCoreRender - Danish Mood - CPU (M samples/sec)</b>		<b>6.97</b>	<b>4.42</b>
	Normalized	100%	63.41%
	Standard Deviation	1.7%	0.6%
<b>LuxCoreRender - Orange Juice - CPU (M samples/sec)</b>		<b>14.33</b>	<b>8.95</b>
	Normalized	100%	62.46%
	Standard Deviation	1.6%	0.8%
<b>LuxCoreRender - LuxCore Benchmark - CPU (M samples/sec)</b>		<b>6.89</b>	<b>4.50</b>
	Normalized	100%	65.31%
	Standard Deviation	8.1%	5.6%
<b>LuxCoreRender - R.C.a.P - CPU (M samples/sec)</b>		<b>14.11</b>	<b>14.39</b>
	Normalized	98.05%	100%
	Standard Deviation	17.3%	7.2%
<b>GraphicsMagick - Swirl (Iterations/min)</b>		<b>2191</b>	<b>1452</b>
	Normalized	100%	66.27%
	Standard Deviation	0.3%	0.1%
<b>GraphicsMagick - Rotate (Iterations/min)</b>		<b>753</b>	<b>867</b>
	Normalized	86.85%	100%
	Standard Deviation	2.5%	2.3%
<b>GraphicsMagick - Sharpen (Iterations/min)</b>		<b>672</b>	<b>370</b>

	Normalized	100%	55.06%
	Standard Deviation	0.4%	
<b>GraphicsMagick - Enhanced (Iterations/min)</b>		<b>1125</b>	<b>641</b>
	Normalized	100%	56.98%
	Standard Deviation	0.1%	0.2%
<b>GraphicsMagick - Noise-Gaussian (Iterations/min)</b>		<b>732</b>	<b>586</b>
	Normalized	100%	80.05%
	Standard Deviation	0.5%	0.7%
<b>GraphicsMagick - HWB Color Space (Iterations/min)</b>		<b>1042</b>	<b>1159</b>
	Normalized	89.91%	100%
	Standard Deviation	0.4%	
<b>dav1d - Summer Nature 4K (FPS)</b>		<b>532.57</b>	<b>404.27</b>
	Normalized	100%	75.91%
	Standard Deviation	0.2%	0.3%
<b>dav1d - C.1.1.b (FPS)</b>		<b>861.39</b>	<b>775.38</b>
	Normalized	100%	90.01%
	Standard Deviation	0.4%	0.1%
<b>TTSIOD 3D Renderer - P.R.W.S.S.M (FPS)</b>		<b>1355</b>	<b>1356</b>
	Normalized	99.9%	100%
	Standard Deviation	1.7%	0.4%
<b>Embree - Pathtracer - Crown (FPS)</b>		<b>64.7709</b>	<b>36.0739</b>
	Normalized	100%	55.69%
	Standard Deviation	0.3%	0.3%
<b>Embree - Pathtracer ISPC - Crown (FPS)</b>		<b>75.4967</b>	<b>44.1689</b>
	Normalized	100%	58.5%
	Standard Deviation	0.8%	0.4%
<b>Embree - Pathtracer - Asian Dragon (FPS)</b>		<b>83.5723</b>	<b>42.6100</b>
	Normalized	100%	50.99%
	Standard Deviation	0.6%	2.3%
<b>Embree - Pathtracer - Asian Dragon Obj</b>		<b>72.4517</b>	<b>39.9934</b>
	Normalized	100%	55.2%
	Standard Deviation	0.6%	0.5%
<b>Embree - Pathtracer ISPC - Asian Dragon (FPS)</b>		<b>107.9025</b>	<b>58.2919</b>
	Normalized	100%	54.02%
	Standard Deviation	0.8%	0.4%
<b>Embree - Pathtracer ISPC - Asian Dragon Obj (FPS)</b>		<b>89.6186</b>	<b>50.0994</b>
	Normalized	100%	55.9%
	Standard Deviation	0.8%	0.2%
<b>Kvazaar - Bosphorus 4K - Very Fast (FPS)</b>		<b>38.71</b>	<b>27.57</b>
	Normalized	100%	71.22%
	Standard Deviation	1%	0.1%
<b>Kvazaar - Bosphorus 4K - Ultra Fast (FPS)</b>		<b>47.84</b>	<b>42.65</b>
	Normalized	100%	89.15%
	Standard Deviation	1.4%	0.4%
<b>SVT-AV1 - Preset 4 - Bosphorus 4K (FPS)</b>		<b>4.734</b>	<b>1.859</b>
	Normalized	100%	39.27%
	Standard Deviation	1.3%	0.7%
<b>SVT-AV1 - Preset 8 - Bosphorus 4K (FPS)</b>		<b>57.416</b>	<b>21.801</b>
	Normalized	100%	37.97%
	Standard Deviation	0.4%	0.4%

<b>SVT-HEVC - 1 - Bosphorus 1080p (FPS)</b>	<b>37.49</b>	<b>23.70</b>
Normalized	100%	63.22%
Standard Deviation	1.5%	0.4%
<b>SVT-HEVC - 7 - Bosphorus 1080p (FPS)</b>	<b>313.93</b>	<b>290.36</b>
Normalized	100%	92.49%
Standard Deviation	3.6%	0.6%
<b>SVT-HEVC - 10 - Bosphorus 1080p (FPS)</b>	<b>584.72</b>	<b>583.64</b>
Normalized	100%	99.82%
Standard Deviation	1.9%	0.8%
<b>SVT-VP9 - VMAF Optimized - Bosphorus 1080p (FPS)</b>	<b>475.45</b>	<b>485.12</b>
Normalized	98.01%	100%
Standard Deviation	4.3%	3.3%
<b>SVT-VP9 - P.S.O - Bosphorus 1080p (FPS)</b>	<b>469.70</b>	<b>485.54</b>
Normalized	96.74%	100%
Standard Deviation	1.2%	0.6%
<b>SVT-VP9 - V.Q.O - Bosphorus 1080p (FPS)</b>	<b>371.88</b>	<b>370.64</b>
Normalized	100%	99.67%
Standard Deviation	1.9%	1.8%
<b>x265 - Bosphorus 4K (FPS)</b>	<b>28.65</b>	<b>31.23</b>
Normalized	91.74%	100%
Standard Deviation	0.5%	0.3%
<b>ACES DGEMM - S.F.P.R (GFLOP/s)</b>	<b>28.146733</b>	<b>14.696138</b>
Normalized	100%	52.21%
Standard Deviation	0.7%	0.4%
<b>Intel Open Image Denoise - RT.hdr_alb_nrm.3840x2160 (Images / Sec)</b>	<b>2.98</b>	<b>1.78</b>
Normalized	100%	59.73%
Standard Deviation	0.1%	0.2%
<b>Intel Open Image Denoise - RT.Idr_alb_nrm.3840x2160 (Images / Sec)</b>	<b>2.99</b>	<b>1.79</b>
Normalized	100%	59.87%
Standard Deviation	0.3%	0%
<b>Intel Open Image Denoise - RTLighmap.hdr.4096x4096 (Images / Sec)</b>	<b>1.44</b>	<b>0.85</b>
Normalized	100%	59.03%
Standard Deviation	0.2%	0.1%
<b>OpenVKL - vkIBenchmark (Items / Sec)</b>	<b>820</b>	<b>641</b>
Normalized	100%	78.17%
Standard Deviation	0.7%	
<b>OpenVKL - vkIBenchmarkVdbVolume (Items / Sec)</b>	<b>29143044</b>	<b>29092155</b>
Normalized	100%	99.83%
Standard Deviation	0.5%	0.4%
<b>OpenVKL - vkIBenchmarkStructuredVolume (Items / Sec)</b>	<b>104922070</b>	<b>105023963</b>
Normalized	99.9%	100%
Standard Deviation	0.3%	0.1%
<b>Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec)</b>	<b>2365408</b>	<b>1206143</b>
Normalized	100%	50.99%
Standard Deviation	0.1%	0.3%
<b>7-Zip Compression - C.S.T (MIPS)</b>	<b>355140</b>	<b>201596</b>
Normalized	100%	56.77%

	Standard Deviation	1.7%	0.5%
<b>Stockfish - Total Time (Nodes/s)</b>		<b>180945380</b>	<b>94879448</b>
	Normalized	100%	52.44%
	Standard Deviation	1.5%	1%
<b>asmFish - 1.H.M.2.D (Nodes/s)</b>		<b>171121628</b>	<b>89220384</b>
	Normalized	100%	52.14%
	Standard Deviation	3.2%	1.5%
<b>ebizzy (Records/s)</b>		<b>2035986</b>	<b>1215587</b>
	Normalized	100%	59.71%
	Standard Deviation	3.7%	5.5%
<b>libavif avifenc - 6, Lossless (sec)</b>		<b>29.692</b>	<b>30.533</b>
	Normalized	100%	97.25%
	Standard Deviation	1.8%	1%
<b>Timed Apache Compilation - Time To Compile (sec)</b>		<b>19.790</b>	<b>19.788</b>
	Normalized	99.99%	100%
	Standard Deviation	0.1%	0%
<b>Timed FFmpeg Compilation - Time To Compile (sec)</b>		<b>16.426</b>	<b>22.316</b>
	Normalized	100%	73.61%
	Standard Deviation	1%	0.4%
<b>Timed GDB GNU Debugger Compilation - Time To Compile (sec)</b>		<b>39.835</b>	<b>42.710</b>
	Normalized	100%	93.27%
	Standard Deviation	0.2%	0.2%
<b>Timed Godot Game Engine Compilation - Time To Compile (sec)</b>		<b>48.068</b>	<b>56.580</b>
	Normalized	100%	84.96%
	Standard Deviation	0.3%	0.6%
<b>Timed ImageMagick Compilation - Time To Compile (sec)</b>		<b>11.962</b>	<b>14.369</b>
	Normalized	100%	83.25%
	Standard Deviation	2.4%	0.8%
<b>Timed Linux Kernel Compilation - Time To Compile (sec)</b>		<b>21.627</b>	<b>32.012</b>
	Normalized	100%	67.56%
	Standard Deviation	2.5%	2.2%
<b>Timed LLVM Compilation - Ninja (sec)</b>		<b>127.993</b>	<b>208.651</b>
	Normalized	100%	61.34%
	Standard Deviation	0.7%	0.8%
<b>Timed LLVM Compilation - Unix Makefiles</b>		<b>190.683</b>	<b>256.630</b>
	Normalized	100%	74.3%
	Standard Deviation	0.6%	0.5%
<b>Timed Mesa Compilation - Time To Compile (sec)</b>		<b>18.712</b>	<b>21.794</b>
	Normalized	100%	85.86%
	Standard Deviation	1.1%	0%
<b>Timed Node.js Compilation - Time To Compile (sec)</b>		<b>90.570</b>	<b>142.509</b>
	Normalized	100%	63.55%
	Standard Deviation	0.4%	0.3%

Timed PHP Compilation - Time To Compile (sec)	35.344	38.269
Normalized	100%	92.36%
Standard Deviation	0.3%	0.6%
Build2 - Time To Compile (sec)	57.639	67.161
Normalized	100%	85.82%
Standard Deviation	1%	0.6%
C-Ray - Total Time - 4.1.R.P.P (sec)	11.008	21.645
Normalized	100%	50.86%
Standard Deviation	0.2%	1.3%
POV-Ray - Trace Time (sec)	9.257	15.515
Normalized	100%	59.66%
Standard Deviation	1%	0.5%
Primesieve - 1.P.N.G (sec)	3.693	7.166
Normalized	100%	51.54%
Standard Deviation	0.8%	0.7%
Tungsten Renderer - Hair (sec)	5.73331	9.15446
Normalized	100%	62.63%
Standard Deviation	2.5%	1%
Tungsten Renderer - Water Caustic (sec)	20.3009	20.9080
Normalized	100%	97.1%
Standard Deviation	0.1%	0.2%
Tungsten Renderer - Non-Exponential (sec)	2.56596	2.81248
Normalized	100%	91.23%
Standard Deviation	1.5%	0.7%
YafaRay - T.T.F.S.S (sec)	81.513	74.903
Normalized	91.89%	100%
Standard Deviation	10.8%	2.4%
rays1bench - Large Scene (mrays/s)	346.31	184.56
Normalized	100%	53.29%
Standard Deviation	0.5%	0.2%
oneDNN - IP Shapes 1D - f32 - CPU (ms)	0.914865	1.21203
Normalized	100%	75.48%
Standard Deviation	0.8%	0.1%
oneDNN - IP Shapes 3D - f32 - CPU (ms)	1.36768	1.42703
Normalized	100%	95.84%
Standard Deviation	0.3%	0.2%
oneDNN - IP Shapes 1D - u8s8f32 - CPU (ms)	1.26700	0.872017
Normalized	68.83%	100%
Standard Deviation	2.4%	2.9%
oneDNN - IP Shapes 3D - u8s8f32 - CPU (ms)	0.438511	0.427987
Normalized	97.6%	100%
Standard Deviation	0.6%	0.3%
oneDNN - IP Shapes 1D - bf16bf16bf16 - CPU (ms)	2.99485	4.03139
Normalized	100%	74.29%
Standard Deviation	0.3%	1%
oneDNN - IP Shapes 3D - bf16bf16bf16 - CPU (ms)	1.81271	2.02106
Normalized	100%	89.69%
Standard Deviation	0.3%	0.2%
oneDNN - C.B.S.A - f32 - CPU (ms)	1.39717	1.45952
Normalized	100%	95.73%
Standard Deviation	0.6%	0.1%

oneDNN - D.B.s - f32 - CPU (ms)	<b>6.96910</b>	<b>4.51612</b>
Normalized	64.8%	100%
Standard Deviation	0.3%	16.2%
oneDNN - D.B.s - f32 - CPU (ms)	<b>0.839556</b>	<b>1.37155</b>
Normalized	100%	61.21%
Standard Deviation	0.2%	0.1%
oneDNN - C.B.S.A - u8s8f32 - CPU (ms)	<b>0.915086</b>	<b>1.48256</b>
Normalized	100%	61.72%
Standard Deviation	0.7%	0.2%
oneDNN - D.B.s - u8s8f32 - CPU (ms)	<b>0.363977</b>	<b>0.343258</b>
Normalized	94.31%	100%
Standard Deviation	0.6%	0.5%
oneDNN - D.B.s - u8s8f32 - CPU (ms)	<b>0.190628</b>	<b>0.310362</b>
Normalized	100%	61.42%
Standard Deviation	1%	2.8%
oneDNN - R.N.N.T - f32 - CPU (ms)	<b>675.163</b>	<b>812.260</b>
Normalized	100%	83.12%
Standard Deviation	0.6%	0.9%
oneDNN - R.N.N.I - f32 - CPU (ms)	<b>439.372</b>	<b>476.024</b>
Normalized	100%	92.3%
Standard Deviation	0.4%	0.5%
oneDNN - R.N.N.T - u8s8f32 - CPU (ms)	<b>675.115</b>	<b>810.358</b>
Normalized	100%	83.31%
Standard Deviation	0.2%	0.6%
oneDNN - C.B.S.A - bf16bf16bf16 - CPU (ms)	<b>2.08924</b>	<b>4.02680</b>
Normalized	100%	51.88%
Standard Deviation	0.2%	0.6%
oneDNN - D.B.s - bf16bf16bf16 - CPU (ms)	<b>3.25912</b>	<b>5.37652</b>
Normalized	100%	60.62%
Standard Deviation	0.1%	0.3%
oneDNN - D.B.s - bf16bf16bf16 - CPU (ms)	<b>3.56396</b>	<b>5.87433</b>
Normalized	100%	60.67%
Standard Deviation	0.3%	0.1%
oneDNN - R.N.N.I - u8s8f32 - CPU (ms)	<b>441.260</b>	<b>475.861</b>
Normalized	100%	92.73%
Standard Deviation	0.8%	0.6%
oneDNN - M.M.B.S.T - f32 - CPU (ms)	<b>0.249611</b>	<b>0.329636</b>
Normalized	100%	75.72%
Standard Deviation	0.5%	0.3%
oneDNN - R.N.N.T - bf16bf16bf16 - CPU (ms)	<b>757.062</b>	<b>813.025</b>
Normalized	100%	93.12%
Standard Deviation	35.3%	0.6%
oneDNN - R.N.N.I - bf16bf16bf16 - CPU (ms)	<b>439.640</b>	<b>476.214</b>
Normalized	100%	92.32%
Standard Deviation	0.8%	0.4%
oneDNN - M.M.B.S.T - u8s8f32 - CPU (ms)	<b>0.228632</b>	<b>0.234327</b>
Normalized	100%	97.57%
Standard Deviation	1.4%	0.3%
oneDNN - M.M.B.S.T - bf16bf16bf16 - CPU (ms)	<b>0.604378</b>	<b>0.960174</b>
(ms)		
Normalized	100%	62.94%
Standard Deviation	0.5%	0.3%

Timed Wasmer Compilation - Time To Compile (sec)	37.688	37.683
Normalized	99.99%	100%
Standard Deviation	0.6%	0.8%
Helsing - 14 digit (sec)	81.464	161.647
Normalized	100%	50.4%
Standard Deviation	1.9%	0.6%
m-queens - Time To Solve (sec)	11.301	22.128
Normalized	100%	51.07%
Standard Deviation	0.5%	0.3%
Tachyon - Total Time (sec)	13.6825	26.8736
Normalized	100%	50.91%
Standard Deviation	0.7%	0.5%
WebP2 Image Encode - Q.7.C.E.7 (sec)	117.573	120.690
Normalized	100%	97.42%
Standard Deviation	0.1%	0.1%
WebP2 Image Encode - Q.9.C.E.7 (sec)	218.163	223.969
Normalized	100%	97.41%
Standard Deviation	0.1%	0.1%
WebP2 Image Encode - Q.1.C.E.5 (sec)	6.251	6.303
Normalized	100%	99.17%
Standard Deviation	0.3%	0.1%
WebP2 Image Encode - Q.1.L.C (sec)	413.223	425.324
Normalized	100%	97.15%
Standard Deviation	0%	0%
OpenSSL - R.4.b.P (Signs/sec)	17836	8727
Normalized	100%	48.93%
Standard Deviation	0.7%	1.1%
Aircrack-ng (k/s)	211020	105477
Normalized	100%	49.98%
Standard Deviation	0.3%	0.2%
Cpuminer-Opt - Magi (kH/s)	3652	1347
Normalized	100%	36.88%
Standard Deviation	4.2%	3.5%
Cpuminer-Opt - x25x (kH/s)	2725	1022
Normalized	100%	37.52%
Standard Deviation	7.2%	2.4%
Cpuminer-Opt - Deepcoin (kH/s)	75061	33583
Normalized	100%	44.74%
Standard Deviation	11.3%	15%
Cpuminer-Opt - Blake-2 S (kH/s)	3662348	2476303
Normalized	100%	67.62%
Standard Deviation	5.5%	16.4%
Cpuminer-Opt - Garlicoin (kH/s)	41269	15618
Normalized	100%	37.84%
Standard Deviation	5.5%	2.3%
Cpuminer-Opt - Skeincoin (kH/s)	774163	407502
Normalized	100%	52.64%
Standard Deviation	8.7%	19.9%
Cpuminer-Opt - Myriad-Groestl (kH/s)	84872	75707
Normalized	100%	89.2%
Standard Deviation	6.9%	30.4%
Cpuminer-Opt - LBC, LBRY Credits (kH/s)	402726	273780
Normalized	100%	67.98%
Standard Deviation	26.3%	9.6%

Liquid-DSP - 64 - 256 - 57 (samples/s)	3047333333	1654066667
Normalized	100%	54.28%
Standard Deviation	0.2%	0.1%
Liquid-DSP - 128 - 256 - 57 (samples/s)	3279266667	1565266667
Normalized	100%	47.73%
Standard Deviation	0.2%	0.3%
Liquid-DSP - 160 - 256 - 57 (samples/s)	3086533333	1579300000
Normalized	100%	51.17%
Standard Deviation	0%	0.3%
ASKAP - tConvolve MT - Gridding (Million Grid Points/sec)	4997	5306
Normalized	94.18%	100%
Standard Deviation	1.6%	0.2%
ASKAP - tConvolve MT - Degriding (Million Grid Points/sec)	12929	7452
Normalized	100%	57.64%
Standard Deviation	5.4%	0.1%
ASKAP - tConvolve MPI - Degriding	18223	9240
Normalized	100%	50.7%
Standard Deviation	0.7%	0.7%
ASKAP - tConvolve MPI - Gridding	20662	10581
Normalized	100%	51.21%
Standard Deviation	0.8%	0.8%
ASKAP - tConvolve OpenMP - Gridding (Million Grid Points/sec)	18860	14169
Normalized	100%	75.13%
Standard Deviation	2.4%	2.5%
ASKAP - tConvolve OpenMP - Degriding (Million Grid Points/sec)	24810	16445
Normalized	100%	66.28%
Standard Deviation	4.5%	2.7%
ASKAP - H.C.O (Iterations/sec)	1239	1266
Normalized	97.82%	100%
Standard Deviation	1.9%	2.3%
KeyDB (Ops/sec)	541996	771533
Normalized	70.25%	100%
Standard Deviation	4.2%	2.4%
GROMACS - MPI CPU - water_GMX50_bare (Ns/Day)	9.063	5.017
Normalized	100%	55.36%
Standard Deviation	0.1%	0.3%
TensorFlow Lite - SqueezeNet (us)	47975	80456
Normalized	100%	59.63%
Standard Deviation	2.4%	0.1%
TensorFlow Lite - Inception V4 (us)	666967	1178463
Normalized	100%	56.6%
Standard Deviation	0.7%	0.2%
TensorFlow Lite - NASNet Mobile (us)	74702	81669
Normalized	100%	91.47%
Standard Deviation	1%	0.2%
TensorFlow Lite - Mobilenet Float (us)	32739	56410
Normalized	100%	58.04%
Standard Deviation	0.4%	0.4%
TensorFlow Lite - Mobilenet Quant (us)	34155	57591

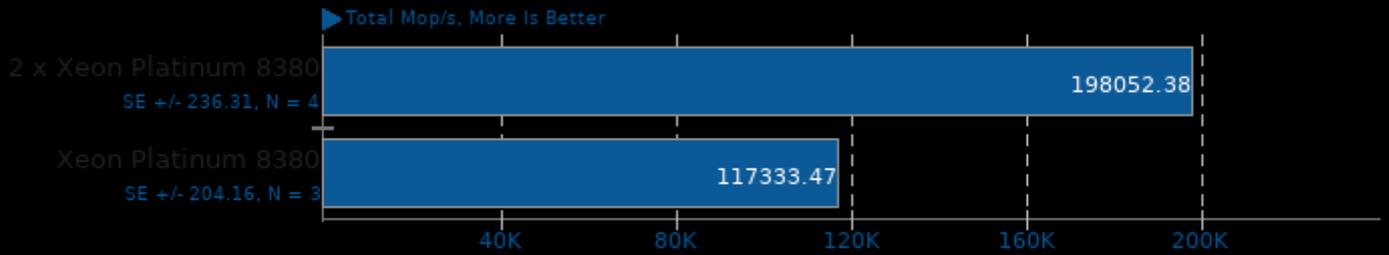
	Normalized	100%	59.31%
	Standard Deviation	2.6%	0.2%
<b>TensorFlow Lite - I.R.V (us)</b>		<b>572750</b>	<b>1026060</b>
	Normalized	100%	55.82%
	Standard Deviation	0.4%	0%
<b>MariaDB - 256 (Queries/sec)</b>		<b>697</b>	<b>918</b>
	Normalized	75.93%	100%
	Standard Deviation	0.5%	0.2%
<b>MariaDB - 512 (Queries/sec)</b>		<b>664</b>	<b>870</b>
	Normalized	76.32%	100%
	Standard Deviation	0.7%	0.2%
<b>ASTC Encoder - Exhaustive (sec)</b>		<b>16.6421</b>	<b>32.4903</b>
	Normalized	100%	51.22%
	Standard Deviation	0.1%	0.3%
<b>Basis Universal - UASTC Level 2 (sec)</b>		<b>11.415</b>	<b>14.930</b>
	Normalized	100%	76.46%
	Standard Deviation	0.3%	0.3%
<b>Basis Universal - UASTC Level 3 (sec)</b>		<b>15.513</b>	<b>22.870</b>
	Normalized	100%	67.83%
	Standard Deviation	0.5%	0.1%
<b>KTX-Software toktx - UASTC 3 (sec)</b>		<b>4.658</b>	<b>6.013</b>
	Normalized	100%	77.47%
	Standard Deviation	0.3%	0.3%
<b>KTX-Software toktx - U.3.Z.C.1 (sec)</b>		<b>9.111</b>	<b>10.387</b>
	Normalized	100%	87.72%
	Standard Deviation	0.6%	0.6%
<b>KTX-Software toktx - U.4.Z.C.1 (sec)</b>		<b>54.917</b>	<b>102.030</b>
	Normalized	100%	53.82%
	Standard Deviation	1%	0.5%
<b>WRF - conus 2.5km (sec)</b>		<b>9823</b>	<b>18356</b>
	Normalized	100%	53.51%
<b>PlaidML - No - Inference - VGG16 - CPU</b>		<b>38.51</b>	<b>36.97</b>
	Normalized	100%	96%
	Standard Deviation	1.4%	0.6%
<b>PlaidML - No - Inference - VGG19 - CPU</b>		<b>33.43</b>	<b>31.06</b>
	Normalized	100%	92.91%
	Standard Deviation	1.7%	1.2%
<b>PlaidML - No - Inference - ResNet 50 - CPU</b>		<b>6.21</b>	<b>7.30</b>
	(FPS)		
	Normalized	85.07%	100%
	Standard Deviation	0.9%	1.2%
<b>Facebook RocksDB - Rand Read (Op/s)</b>		<b>373831966</b>	<b>182180961</b>
	Normalized	100%	48.73%
	Standard Deviation	0.5%	1.3%
<b>Facebook RocksDB - Rand Fill Sync (Op/s)</b>		<b>482191</b>	<b>481504</b>
	Normalized	100%	99.86%
	Standard Deviation	0.2%	0.4%
<b>Facebook RocksDB - Read While Writing</b>		<b>9170260</b>	<b>6676556</b>
	Normalized	100%	72.81%
	Standard Deviation	4.4%	1.6%
<b>Blender - BMW27 - CPU-Only (sec)</b>		<b>28.24</b>	<b>51.05</b>
	Normalized	100%	55.32%
	Standard Deviation	1.4%	0.3%
<b>Blender - Classroom - CPU-Only (sec)</b>		<b>71.11</b>	<b>142.20</b>
	Normalized	100%	50.01%

	Standard Deviation	0.3%	0.3%
<b>Blender - Fishy Cat - CPU-Only (sec)</b>		<b>44.45</b>	<b>74.51</b>
	Normalized	100%	59.66%
	Standard Deviation	0.4%	0.4%
<b>Blender - Barbershop - CPU-Only (sec)</b>		<b>103.87</b>	<b>195.16</b>
	Normalized	100%	53.22%
	Standard Deviation	0.1%	0.1%
<b>Blender - Pabellon Barcelona - CPU-Only</b>		<b>87.63</b>	<b>164.01</b>
	Normalized	100%	53.43%
	Standard Deviation	0%	0.1%
<b>ONNX Runtime - yolov4 - OpenMP CPU</b>		<b>482</b>	<b>659</b>
	(Inferences/min)		
	Normalized	73.14%	100%
	Standard Deviation	2%	0.6%
<b>ONNX Runtime - bert squad-10 - OpenMP</b>		<b>516</b>	<b>586</b>
	CPU (Inferences/min)		
	Normalized	88.05%	100%
	Standard Deviation	5.5%	2.4%
<b>ONNX Runtime - fcn-resnet101-11 - OpenMP</b>		<b>197</b>	<b>204</b>
	CPU (Inferences/min)		
	Normalized	96.57%	100%
	Standard Deviation	1.5%	1.3%
<b>ONNX Runtime - shufflenet-v2-10 - OpenMP</b>		<b>8402</b>	<b>9056</b>
	CPU (Inferences/min)		
	Normalized	92.78%	100%
	Standard Deviation	0.1%	0.3%
<b>ONNX Runtime - super-resolution-10 -</b>		<b>7609</b>	<b>6381</b>
	OpenMP CPU (Inferences/min)		
	Normalized	100%	83.86%
	Standard Deviation	0.4%	10%
<b>Appleseed - Emily (sec)</b>		<b>123.700529</b>	<b>140.509089</b>
	Normalized	100%	88.04%
<b>Appleseed - Disney Material (sec)</b>		<b>57.396983</b>	<b>77.521925</b>
	Normalized	100%	74.04%
<b>Appleseed - Material Tester (sec)</b>		<b>177.779916</b>	<b>106.17271</b>
	Normalized	59.72%	100%
<b>Kripke (Throughput FoM)</b>		<b>178965233</b>	<b>175890300</b>
	Normalized	100%	98.28%
	Standard Deviation	2.9%	0.9%
<b>BRL-CAD - V.P.M (VGR Performance Metric)</b>		<b>2411587</b>	<b>423324</b>
	Normalized	100%	17.55%
<b>Chaos Group V-RAY - CPU (vsamples)</b>		<b>66328</b>	<b>35347</b>
	Normalized	100%	53.29%
	Standard Deviation	0.8%	0.6%
<b>srsRAN - OFDM_Test (Samples / Second)</b>			120400000
	Standard Deviation		0.4%
<b>srsRAN - 4.P.1.P.M.6.Q (eNb Mb/s)</b>			279.9
	Standard Deviation		0.2%
<b>srsRAN - 4.P.1.P.M.6.Q (UE Mb/s)</b>			110.1
	Standard Deviation		4.2%
<b>srsRAN - 4.P.1.P.S.6.Q (eNb Mb/s)</b>			273.2
	Standard Deviation		0.3%
<b>srsRAN - 4.P.1.P.S.6.Q (UE Mb/s)</b>			174.3
	Standard Deviation		0%

<b>srsRAN - 4.P.1.P.M.2.Q (eNb Mb/s)</b>	305.6
Standard Deviation	0.1%
<b>srsRAN - 4.P.1.P.M.2.Q (UE Mb/s)</b>	129.6
Standard Deviation	0.8%
<b>srsRAN - 4.P.1.P.S.2.Q (eNb Mb/s)</b>	306.8
Standard Deviation	0.7%
<b>srsRAN - 4.P.1.P.S.2.Q (UE Mb/s)</b>	207.5
Standard Deviation	0.4%
<b>srsRAN - 5.P.T.5.P.S.6.Q (eNb Mb/s)</b>	98.3
Standard Deviation	0.9%
<b>srsRAN - 5.P.T.5.P.S.6.Q (UE Mb/s)</b>	71.4
Standard Deviation	0.5%
<b>srsRAN - 5.P.T.2.P.S.2.Q (eNb Mb/s)</b>	132.2
Standard Deviation	0.2%
<b>srsRAN - 5.P.T.2.P.S.2.Q (UE Mb/s)</b>	95.9
Standard Deviation	0.1%
<b>VP9 libvpx Encoding - Speed 0 - Bosphorus</b>	5.67
<b>4K (FPS)</b>	
Standard Deviation	0.1%
<b>VP9 libvpx Encoding - Speed 5 - Bosphorus</b>	13.97
<b>4K (FPS)</b>	
Standard Deviation	0.8%
<b>VP9 libvpx Encoding - Speed 0 - Bosphorus</b>	11.80
<b>1080p (FPS)</b>	
Standard Deviation	0.1%
<b>VP9 libvpx Encoding - Speed 5 - Bosphorus</b>	25.46
<b>1080p (FPS)</b>	
Standard Deviation	0.1%
<b>ASTC Encoder - Medium (sec)</b>	4.8512
Standard Deviation	0.7%
<b>ASTC Encoder - Thorough (sec)</b>	7.4107
Standard Deviation	0.6%
<b>ASTC Encoder - Exhaustive (sec)</b>	19.5959
Standard Deviation	0.2%

### NAS Parallel Benchmarks 3.4

Test / Class: BT.C



- 1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi -lopen-rte -lopen-pal -lhwcloc -ldl -levent\_core -levent\_pthread
- 2. Open MPI 4.1.0

### NAS Parallel Benchmarks 3.4

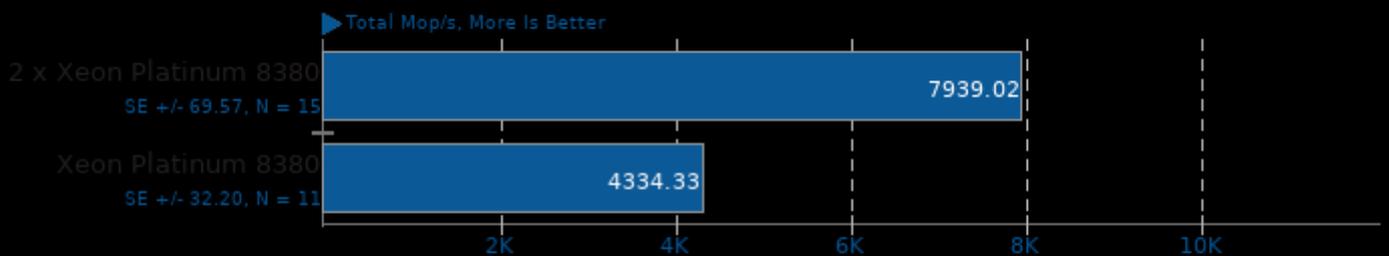
Test / Class: CG.C



- 1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi -lopen-rte -lopen-pal -lhwcloc -ldl -levent\_core -levent\_pthread
- 2. Open MPI 4.1.0

### NAS Parallel Benchmarks 3.4

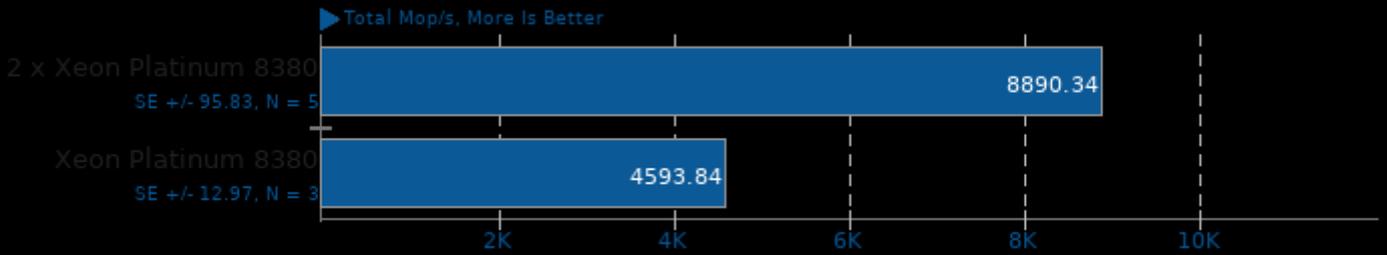
Test / Class: EP.C



- 1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi -lopen-rte -lopen-pal -lhwcloc -ldl -levent\_core -levent\_pthread
- 2. Open MPI 4.1.0

### NAS Parallel Benchmarks 3.4

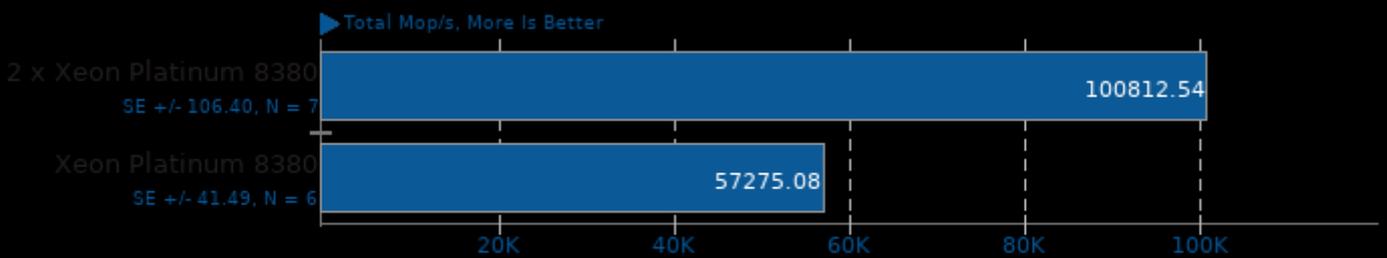
Test / Class: EP.D



- 1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi -lopen-rte -lopen-pal -lhwcloc -ldl -levent\_core -levent\_pthread
- 2. Open MPI 4.1.0

### NAS Parallel Benchmarks 3.4

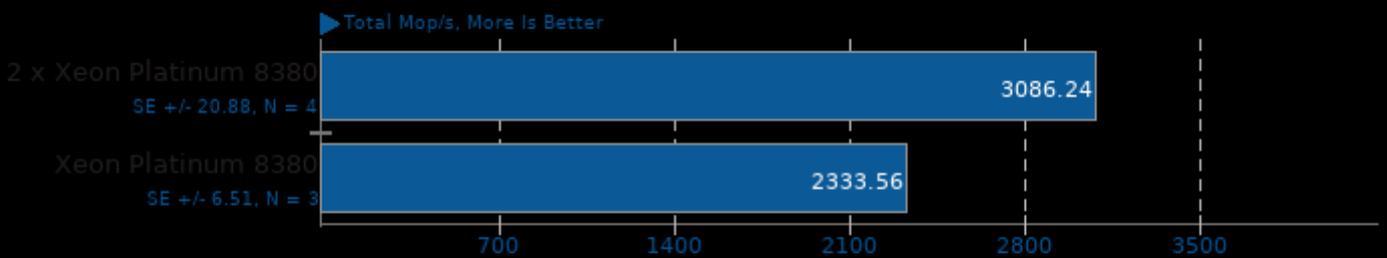
Test / Class: FT.C



- 1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi -lopen-rte -lopen-pal -lhwcloc -ldl -levent\_core -levent\_pthread
- 2. Open MPI 4.1.0

### NAS Parallel Benchmarks 3.4

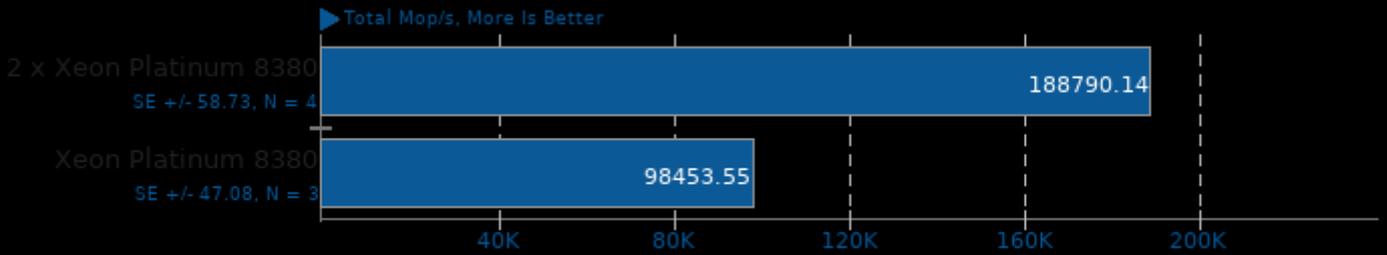
Test / Class: IS.D



- 1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi -lopen-rte -lopen-pal -lhwcloc -ldl -levent\_core -levent\_pthread
- 2. Open MPI 4.1.0

### NAS Parallel Benchmarks 3.4

Test / Class: LU.C

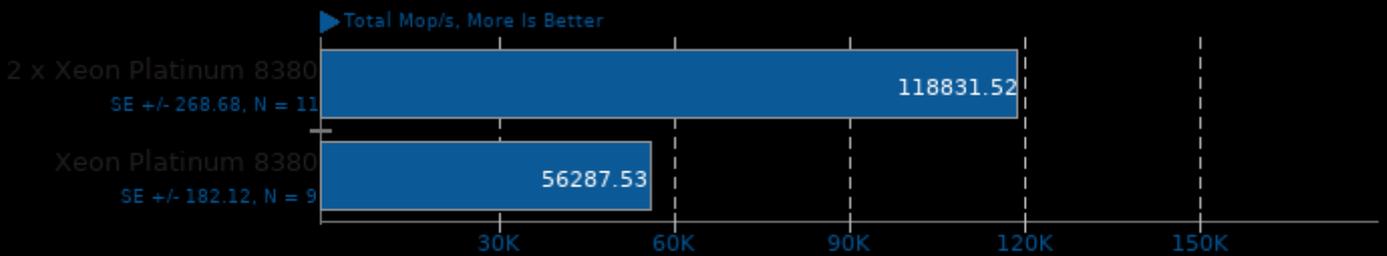


1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi -lopen-rte -lopen-pal -lhwcloc -ldl -levent\_core -levent\_pthread

2. Open MPI 4.1.0

### NAS Parallel Benchmarks 3.4

Test / Class: MG.C

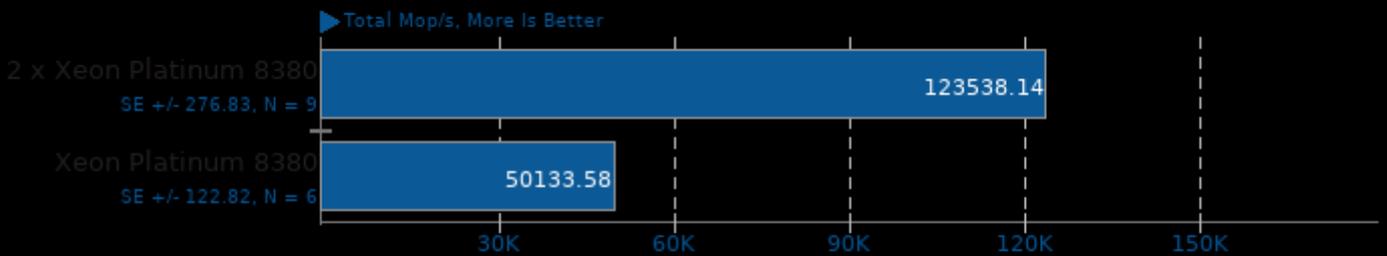


1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi -lopen-rte -lopen-pal -lhwcloc -ldl -levent\_core -levent\_pthread

2. Open MPI 4.1.0

### NAS Parallel Benchmarks 3.4

Test / Class: SP.B

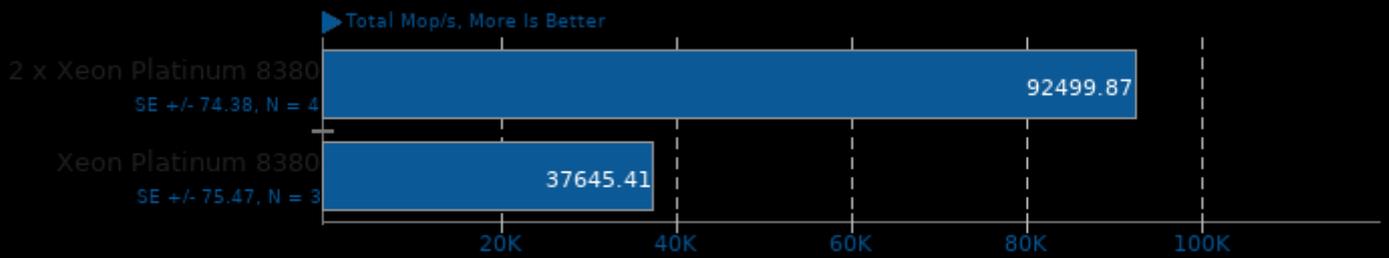


1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi -lopen-rte -lopen-pal -lhwcloc -ldl -levent\_core -levent\_pthread

2. Open MPI 4.1.0

## NAS Parallel Benchmarks 3.4

Test / Class: SP.C

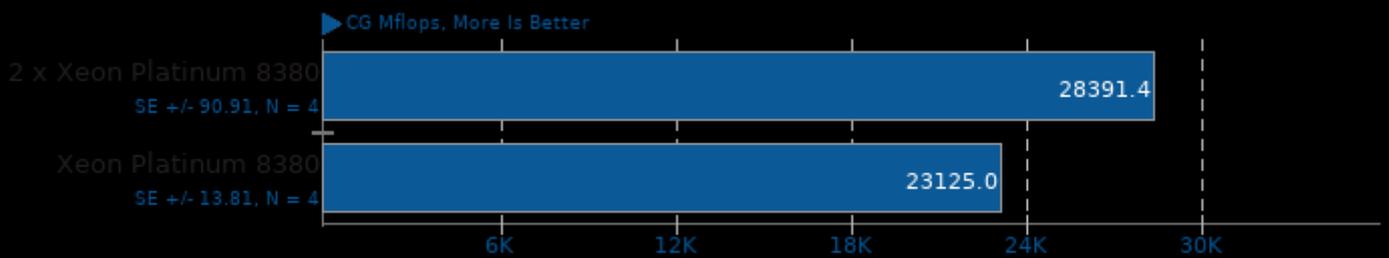


1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi -lopen-rte -lopen-pal -lhwloc -ldl -levent\_core -levent\_pthread

2. Open MPI 4.1.0

## miniFE 2.2

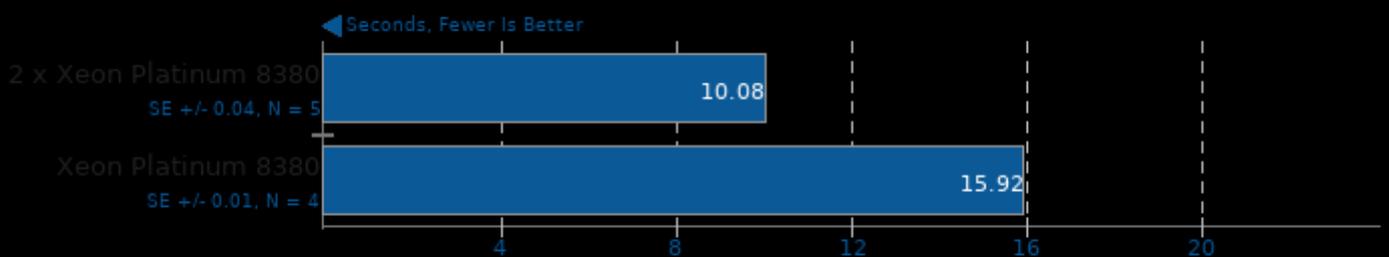
Problem Size: Small



1. (CXX) g++ options: -O3 -fopenmp -pthread -lmpi\_cxx -lmpi

## CloverLeaf

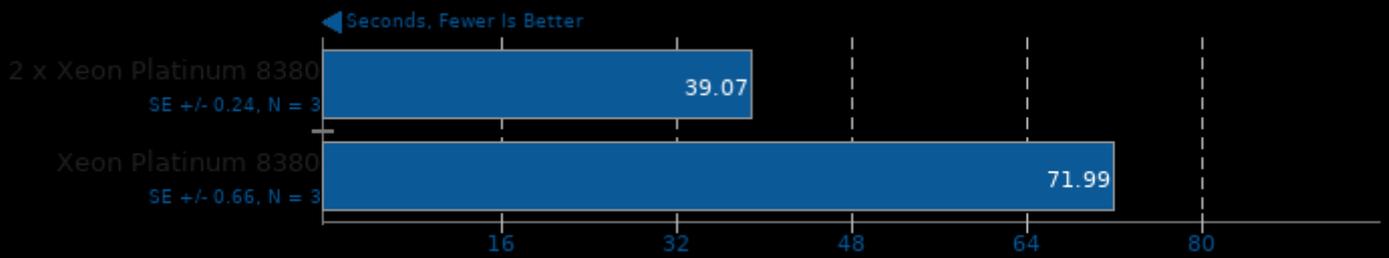
Lagrangian-Eulerian Hydrodynamics



1. (F9X) gfortran options: -O3 -march=native -funroll-loops -fopenmp

### Rodinia 3.1

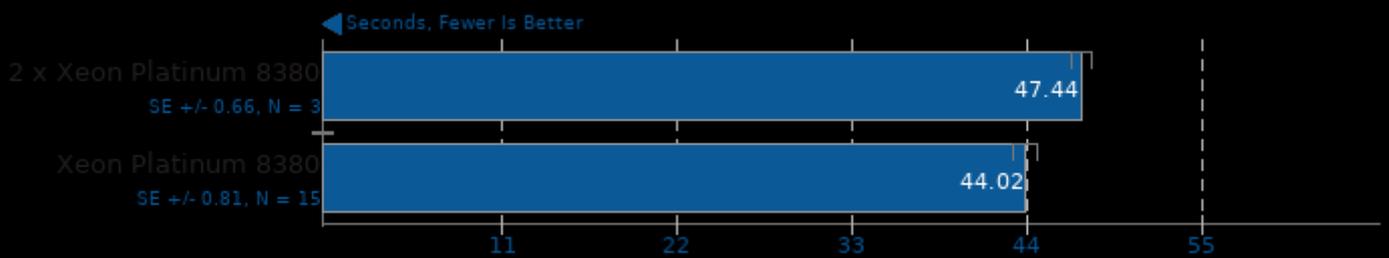
Test: OpenMP LavaMD



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

### Rodinia 3.1

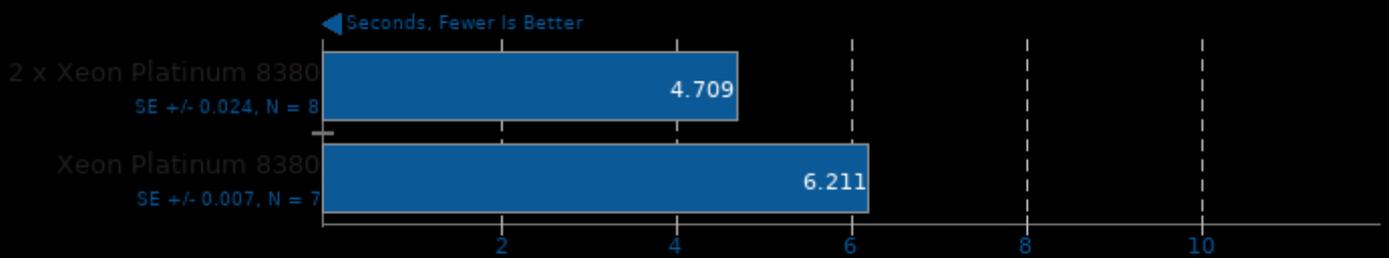
Test: OpenMP Leukocyte



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

### Rodinia 3.1

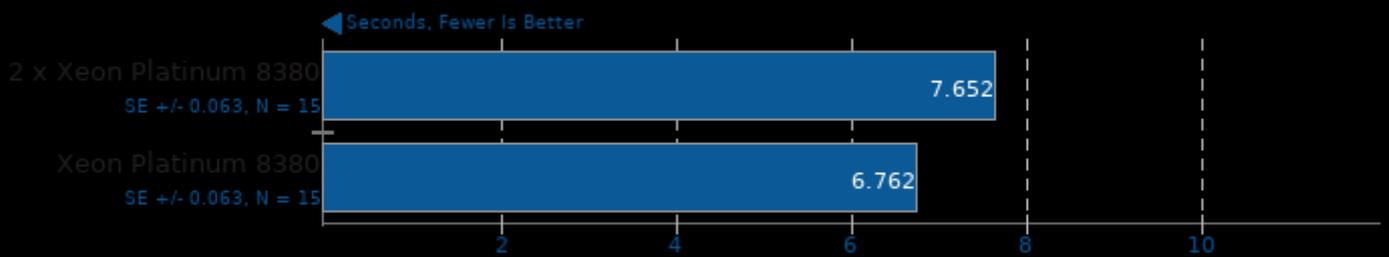
Test: OpenMP CFD Solver



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

### Rodinia 3.1

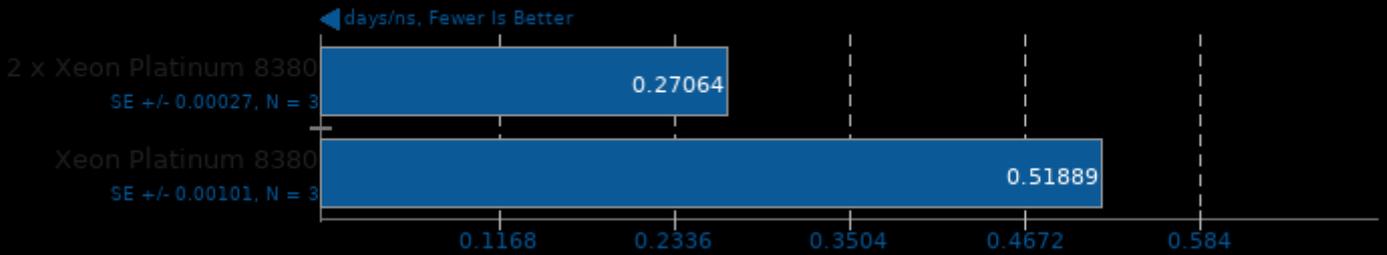
Test: OpenMP Streamcluster



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

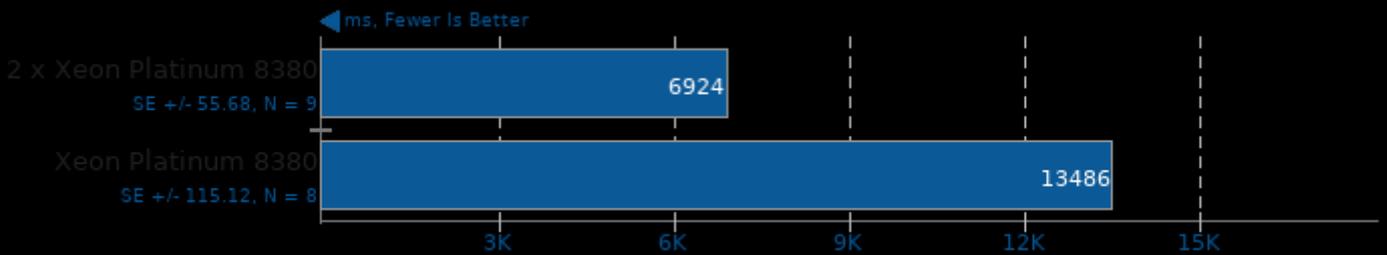
### NAMD 2.14

ATPase Simulation - 327,506 Atoms



### toyBrot Fractal Generator 2020-11-18

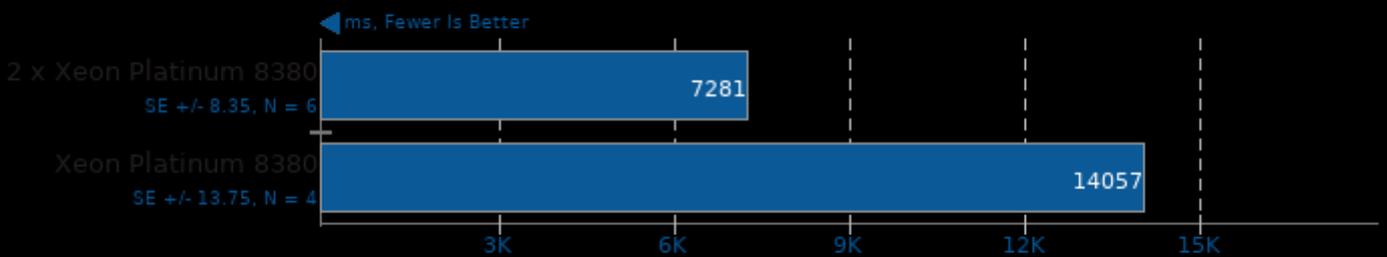
Implementation: TBB



1. (CXX) g++ options: -O3 -lthread -lm -lgcc -lgcc\_s -lc

### toyBrot Fractal Generator 2020-11-18

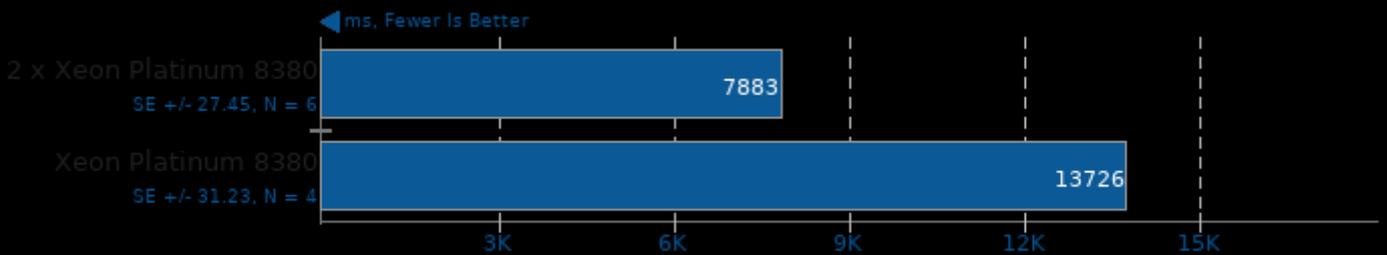
Implementation: OpenMP



1. (CXX) g++ options: -O3 -lthread -lm -lgcc -lgcc\_s -lc

### toyBrot Fractal Generator 2020-11-18

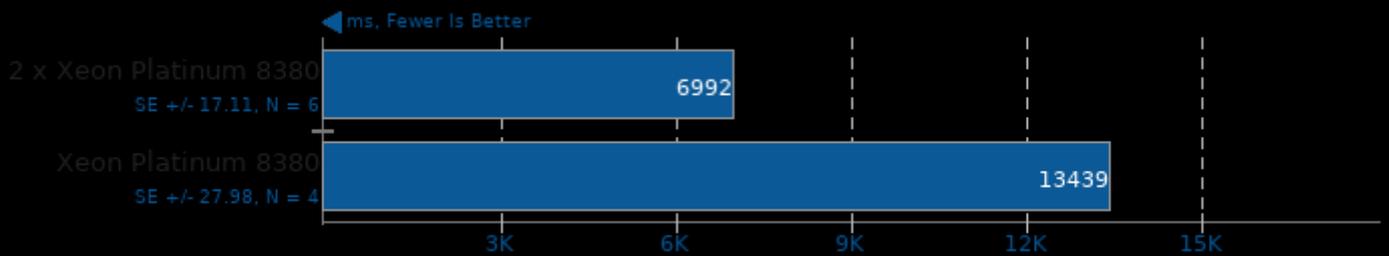
Implementation: C++ Tasks



1. (CXX) g++ options: -O3 -lthread -lm -lgcc -lgcc\_s -lc

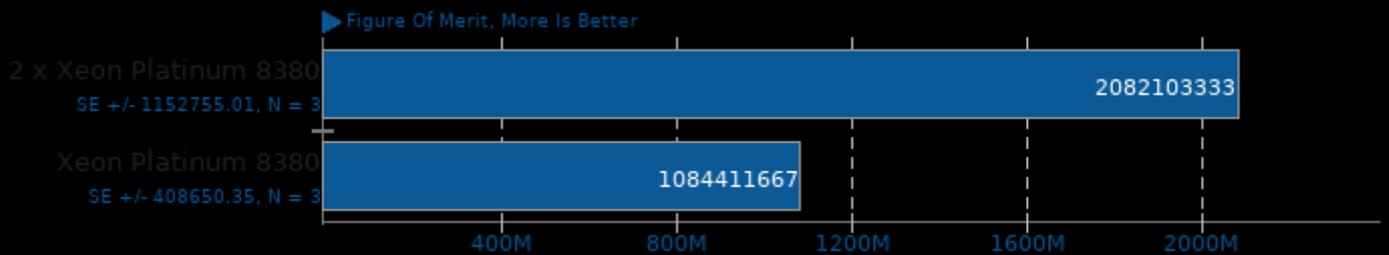
## toyBrot Fractal Generator 2020-11-18

Implementation: C++ Threads



1. (CXX) g++ options: -O3 -lpthread -lm -lgcc -lgcc\_s -lc

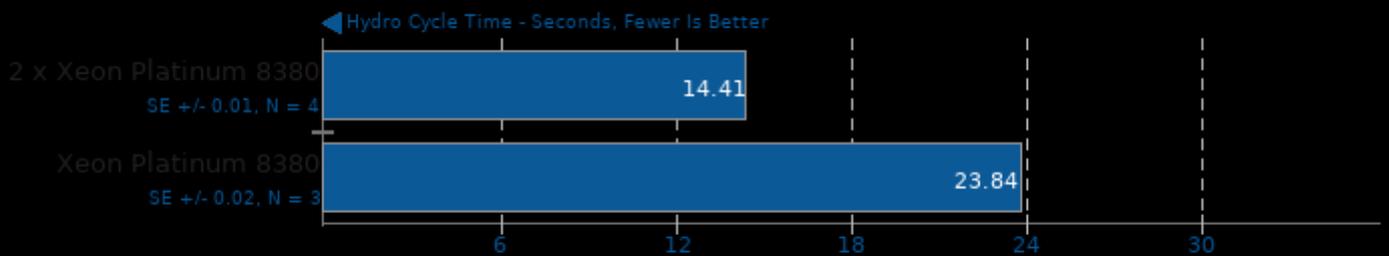
## Algebraic Multi-Grid Benchmark 1.2



1. (CO) gcc options: -lparcsr\_ls -lparcsr\_mv -lseq\_mv -llj\_mv -lkrylov -lHYPRE\_utilities -lm -fopenmp -pthread -lmpi

## Pennant 1.0.1

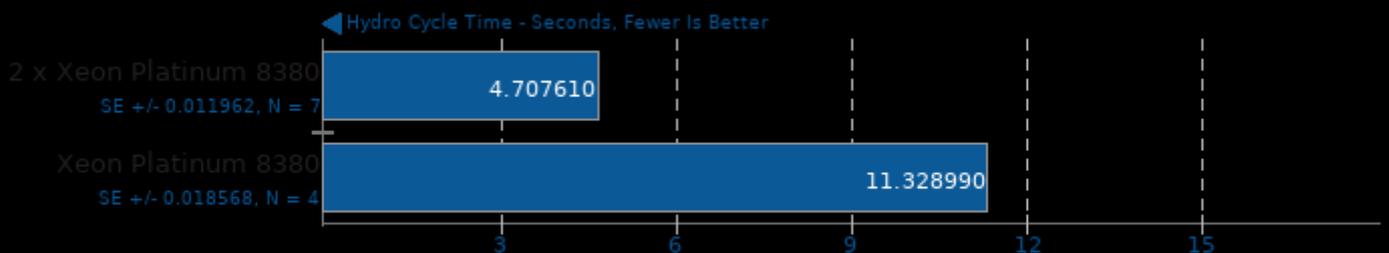
Test: sedovbig



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

## Pennant 1.0.1

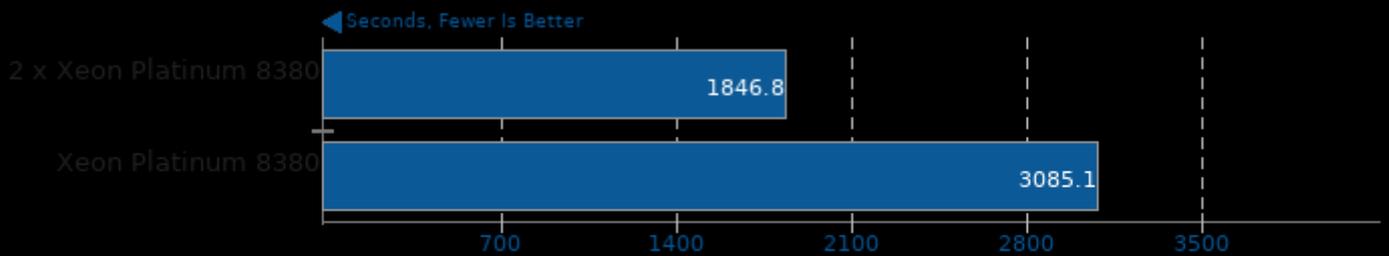
Test: leblancbig



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

### NWChem 7.0.2

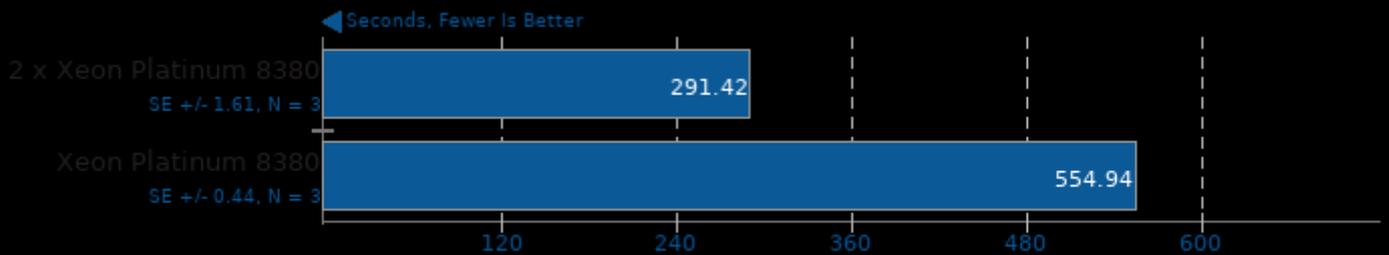
Input: C240 Buckyball



1. (F9X) gfortran options: -lnwctask -lccsd -lmcsf -lscf -lmp2 -lmoints -lstepper -ldriver -loptim -lnwdf -lgradients -lcpfh -lesp -laddscf -ldangchang -lgue

### Xcompact3d Incompact3d 2021-03-11

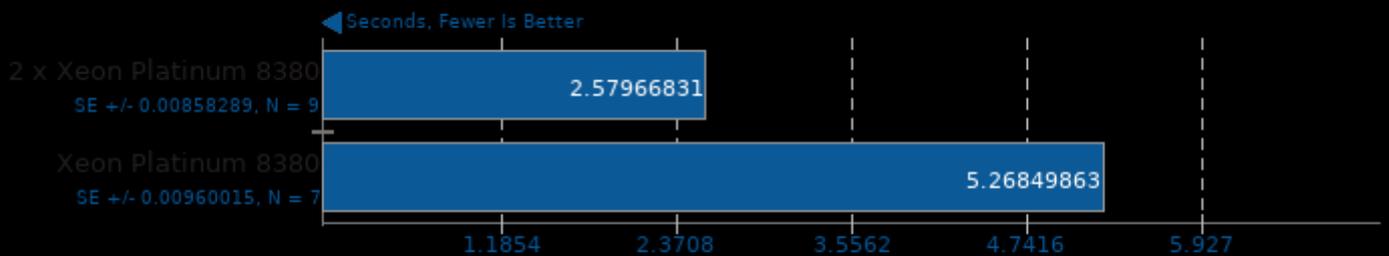
Input: X3D-benchmarking input.i3d



1. (F9X) gfortran options: -cpp -O2 -funroll-loops -floop-optimize -fcray-pointer -fbacktrace -pthread -lmpi\_usempif08 -lmpi\_mpihf -lmpi -lopen-rte -lopen

### Xcompact3d Incompact3d 2021-03-11

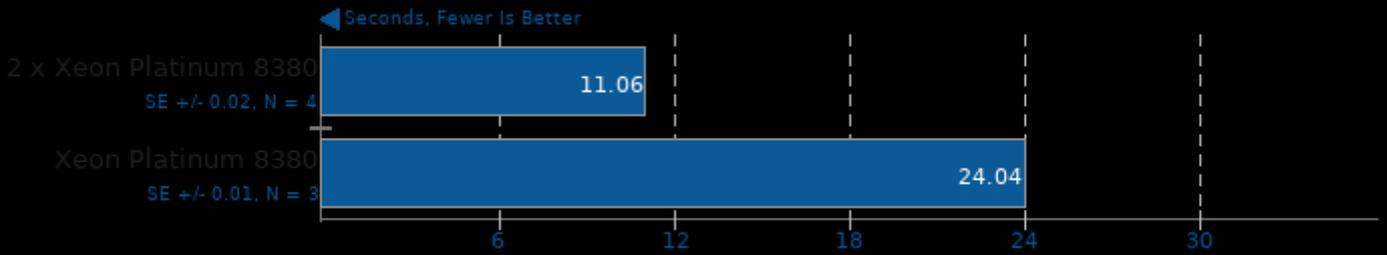
Input: input.i3d 129 Cells Per Direction



1. (F9X) gfortran options: -cpp -O2 -funroll-loops -floop-optimize -fcray-pointer -fbacktrace -pthread -lmpi\_usempif08 -lmpi\_mpihf -lmpi -lopen-rte -lopen

### Xcompact3d Incompact3d 2021-03-11

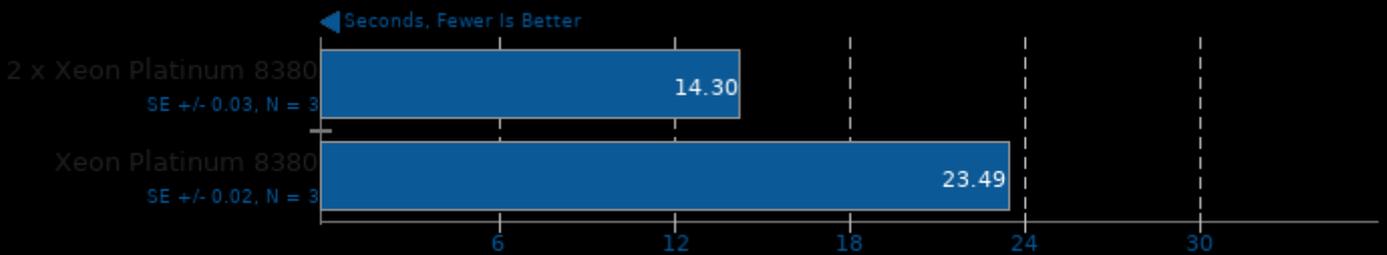
Input: input.i3d 193 Cells Per Direction



1. (F9X) gfortran options: -cpp -O2 -funroll-loops -floop-optimize -fcray-pointer -fbacktrace -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi -lopen-rte -lopen

### OpenFOAM 8

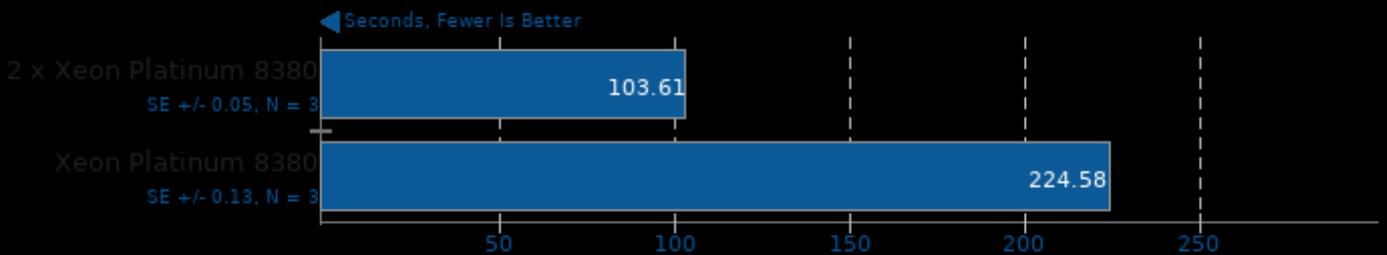
Input: Motorbike 30M



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

### OpenFOAM 8

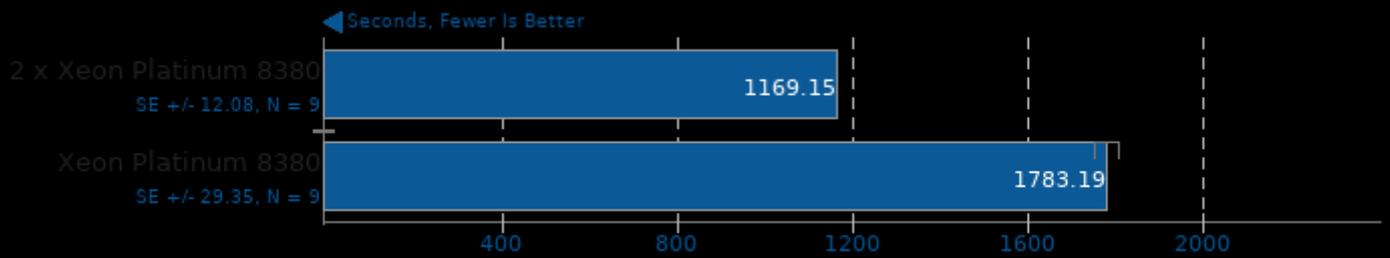
Input: Motorbike 60M



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

### Quantum ESPRESSO 6.7

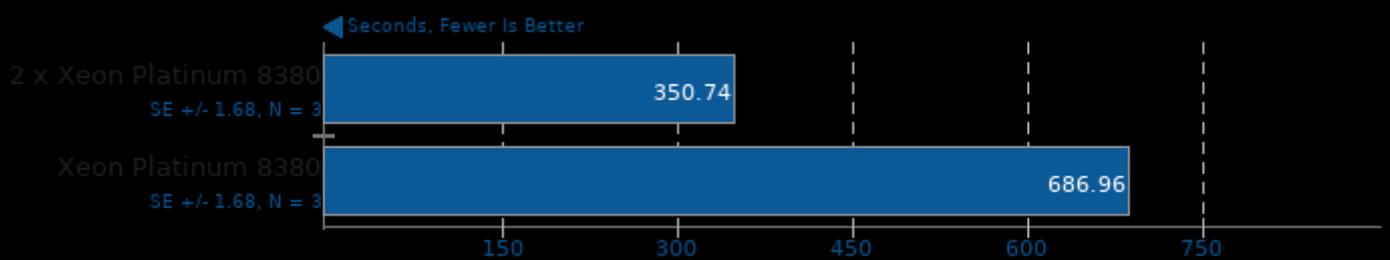
Input: AUSURF112



1. (F9X) gfortran options: -fopenblas -fFoX\_dom -fFoX\_sax -fFoX\_wxml -fFoX\_common -fFoX\_utils -fFoX\_fsys -lfftw3 -pthread -lmpi\_usempif08 -lmpi\_mpifh

### RELION 3.1.1

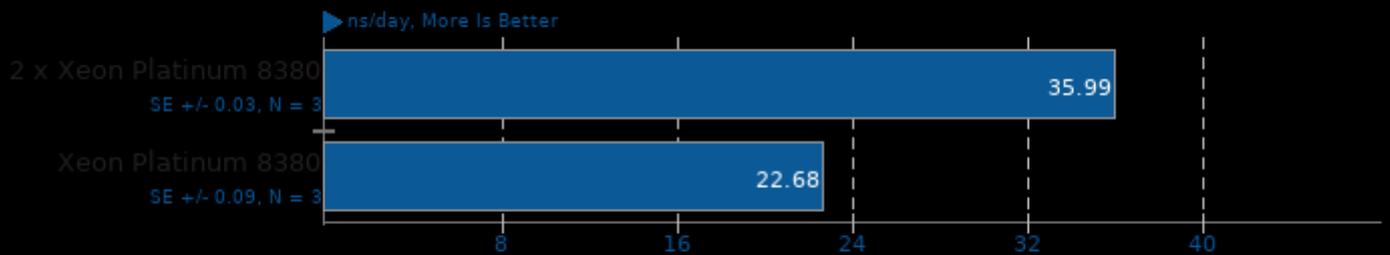
Test: Basic - Device: CPU



1. (CXX) g++ options: -fopenmp -std=c++0x -O3 -rdynamic -ldl -ltiff -lfftw3f -lfftw3 -lpng -pthread -lmpi\_cxx -lmpi

### LAMMPS Molecular Dynamics Simulator 29Oct2020

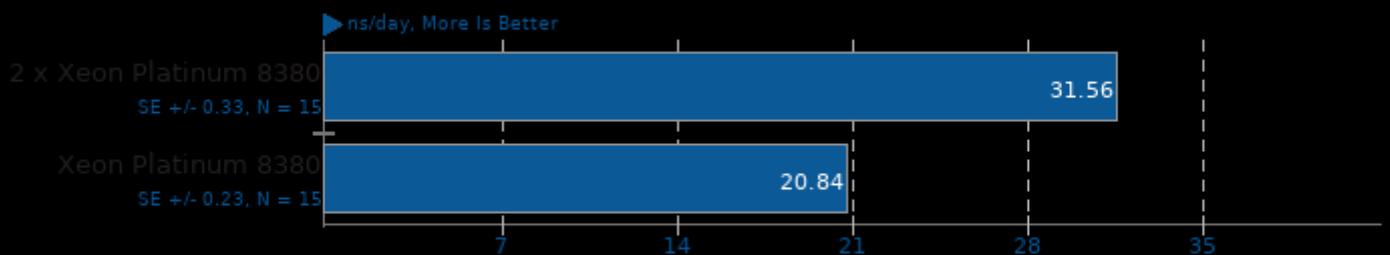
Model: 20k Atoms



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

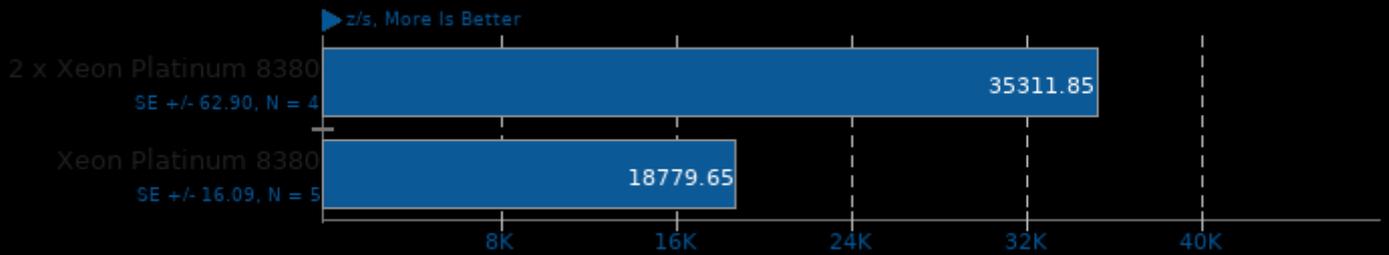
### LAMMPS Molecular Dynamics Simulator 29Oct2020

Model: Rhodopsin Protein



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

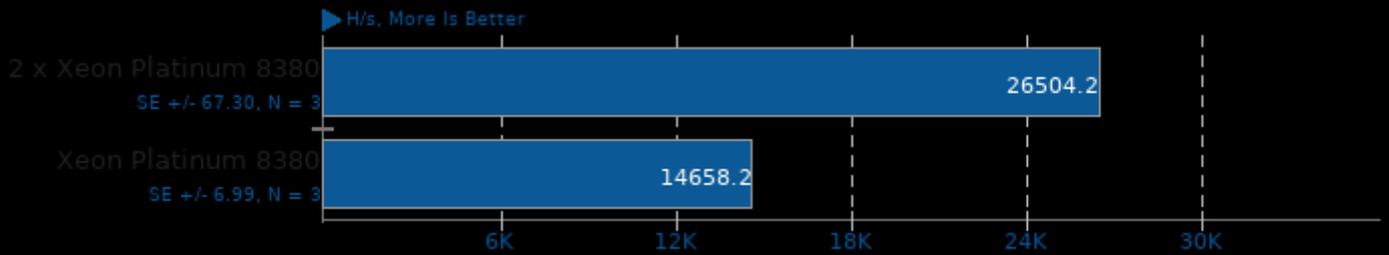
### LULESH 2.0.3



1. (CXX) g++ options: -O3 -fopenmp -lm -pthread -lmpi\_cxx -lmpi

### Xmrig 6.12.1

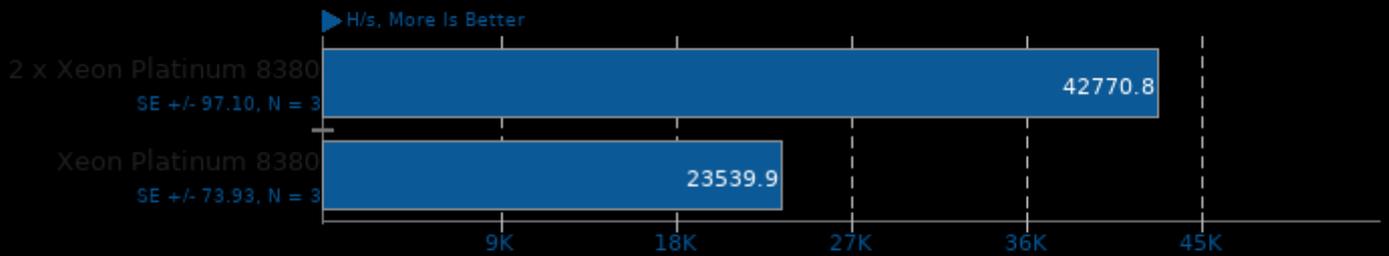
Variant: Monero - Hash Count: 1M



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

### Xmrig 6.12.1

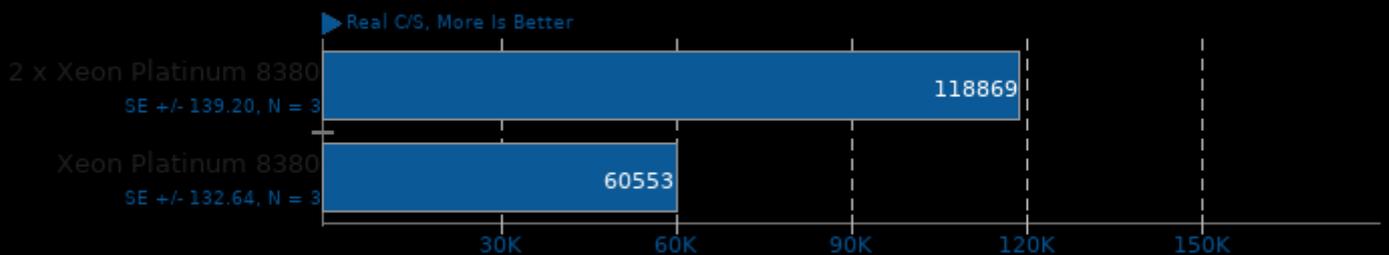
Variant: Wownero - Hash Count: 1M



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

### John The Ripper 1.9.0-jumbo-1

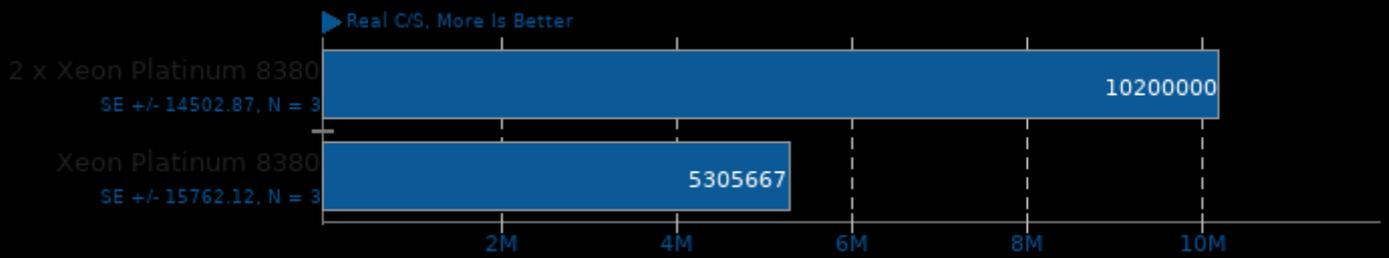
Test: Blowfish



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

### John The Ripper 1.9.0-jumbo-1

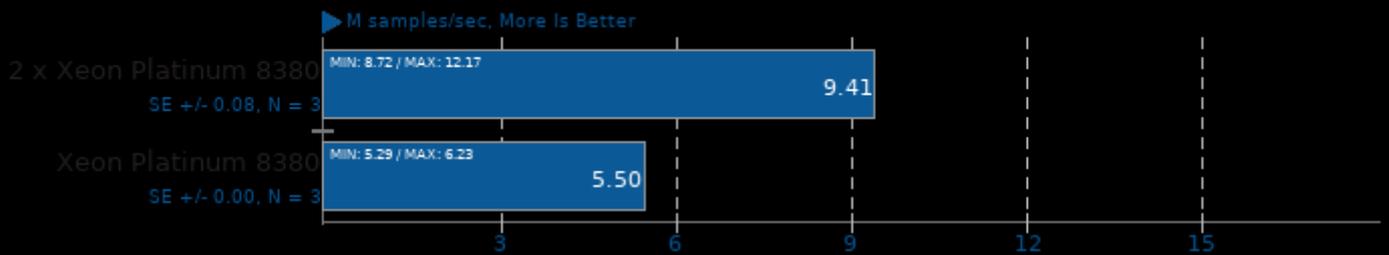
Test: MD5



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

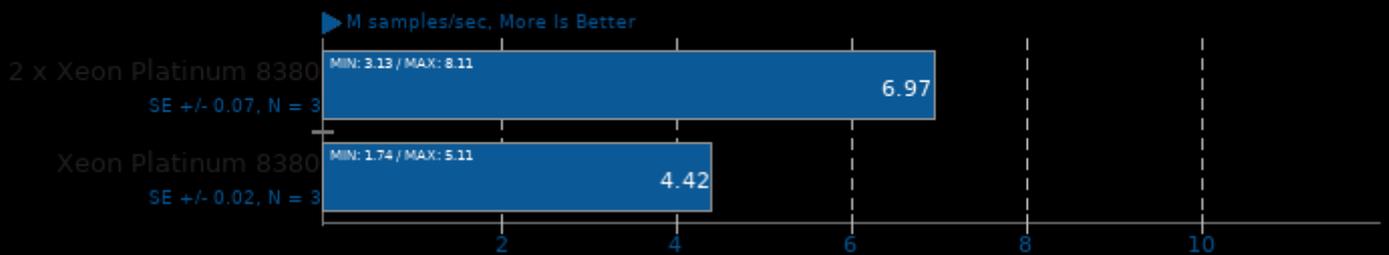
### LuxCoreRender 2.5

Scene: DLSC - Acceleration: CPU



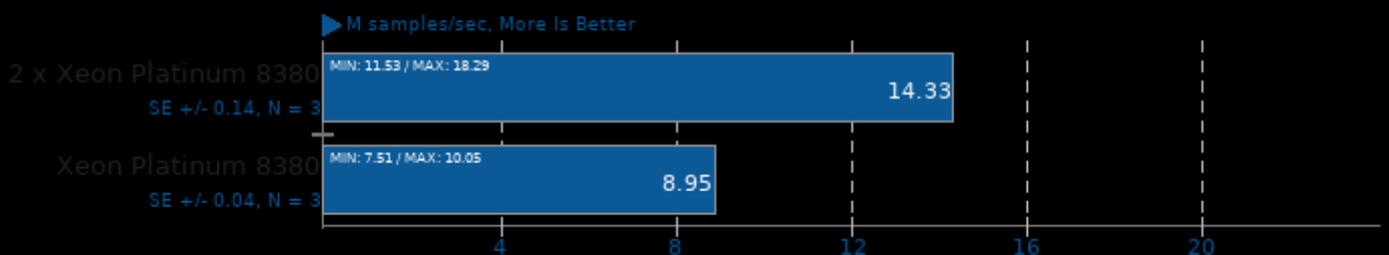
### LuxCoreRender 2.5

Scene: Danish Mood - Acceleration: CPU



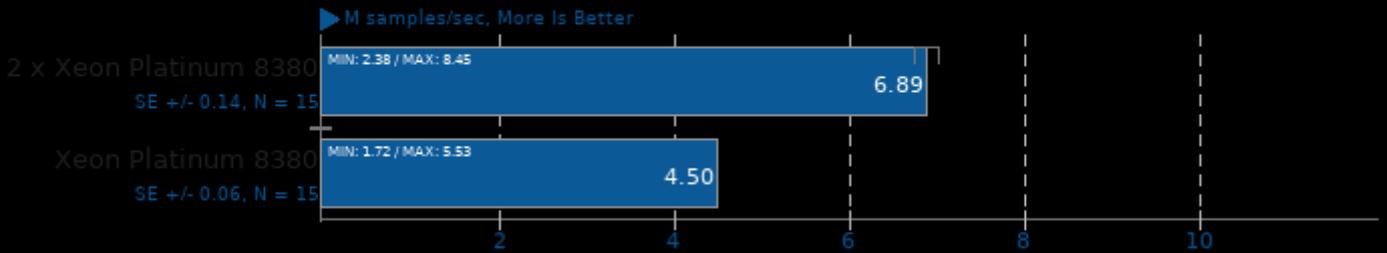
### LuxCoreRender 2.5

Scene: Orange Juice - Acceleration: CPU



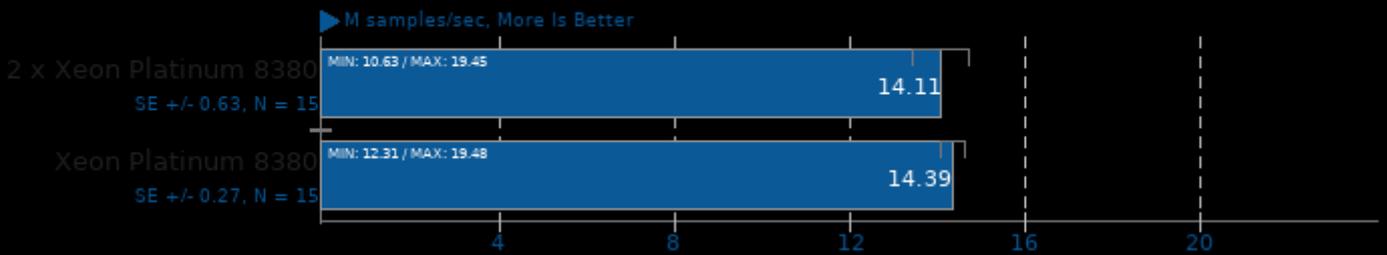
### LuxCoreRender 2.5

Scene: LuxCore Benchmark - Acceleration: CPU



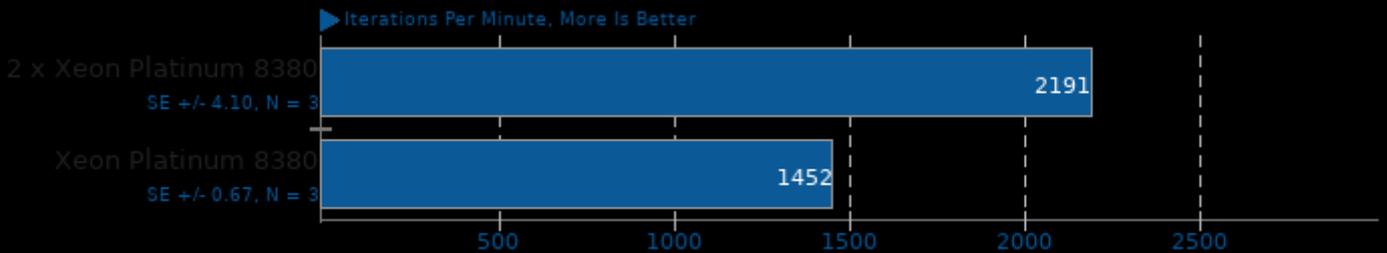
### LuxCoreRender 2.5

Scene: Rainbow Colors and Prism - Acceleration: CPU



### GraphicsMagick 1.3.33

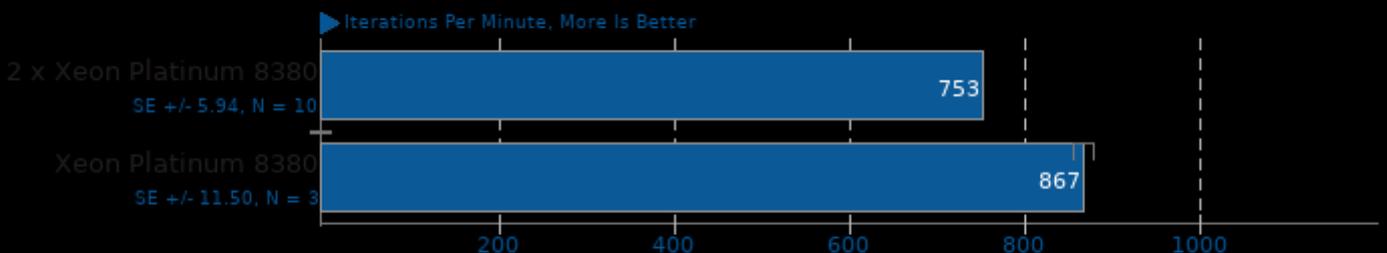
Operation: Swirl



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

### GraphicsMagick 1.3.33

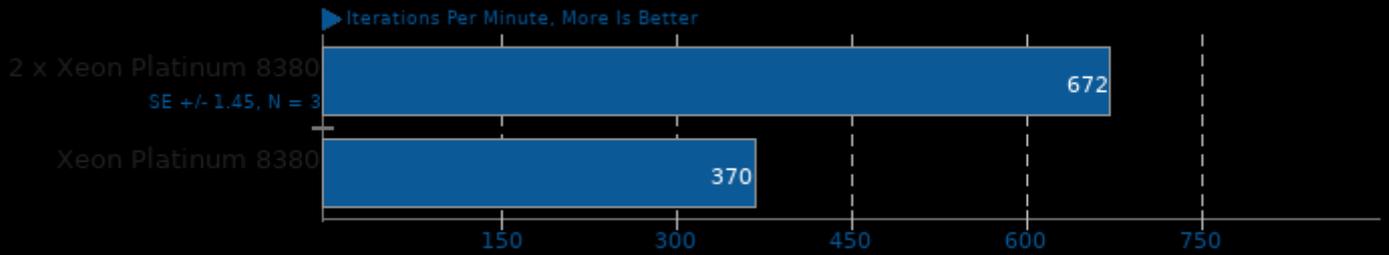
Operation: Rotate



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

### GraphicsMagick 1.3.33

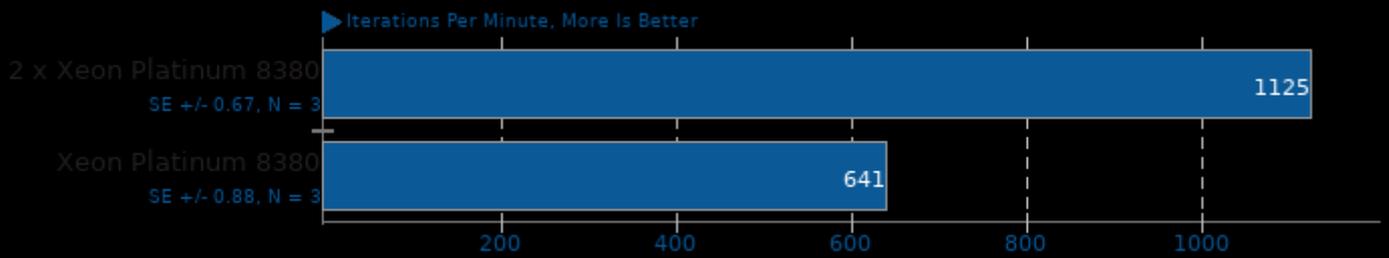
Operation: Sharpen



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

### GraphicsMagick 1.3.33

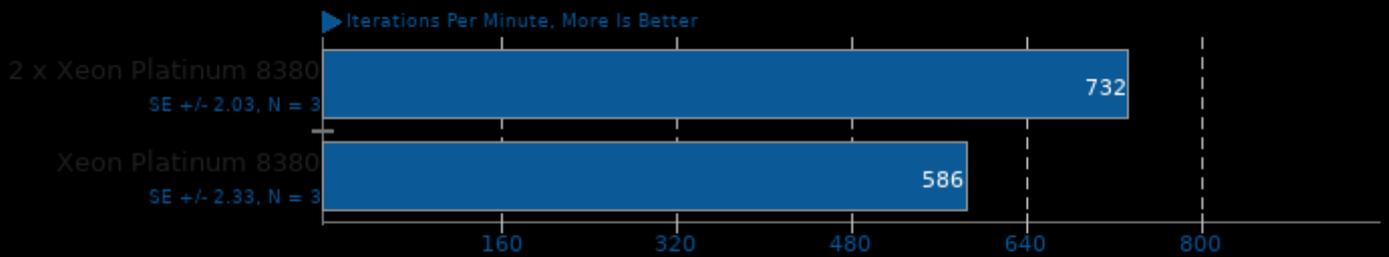
Operation: Enhanced



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

### GraphicsMagick 1.3.33

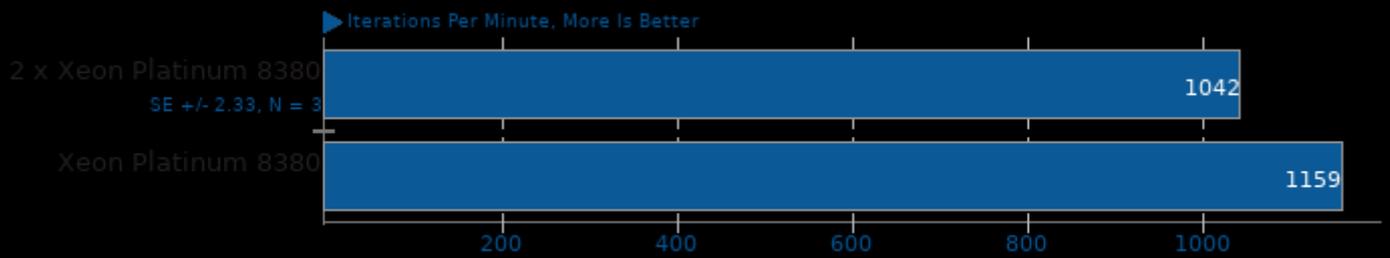
Operation: Noise-Gaussian



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

### GraphicsMagick 1.3.33

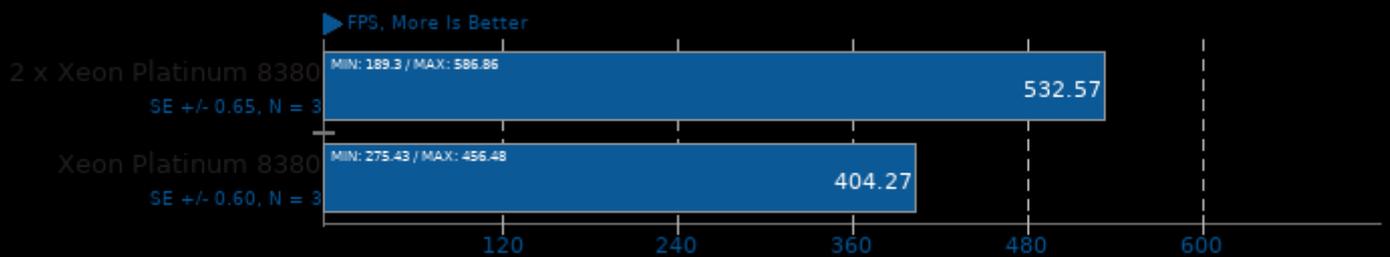
Operation: HWB Color Space



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

### dav1d 0.9.0

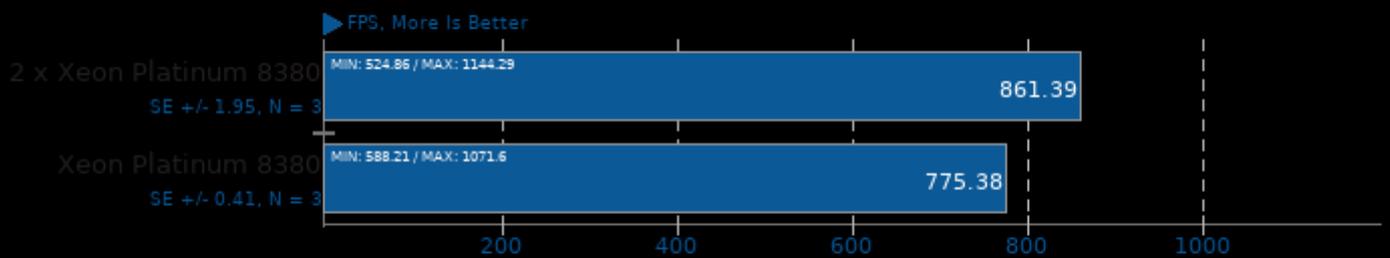
Video Input: Summer Nature 4K



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

### dav1d 0.9.0

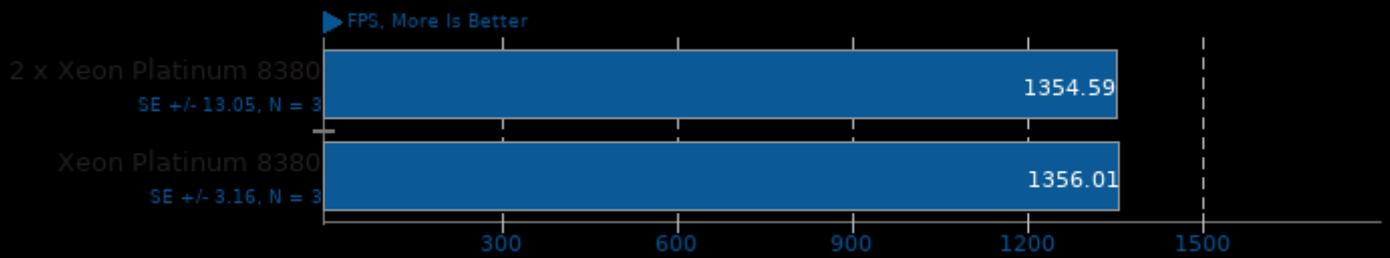
Video Input: Chimera 1080p 10-bit



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

### TTSIOD 3D Renderer 2.3b

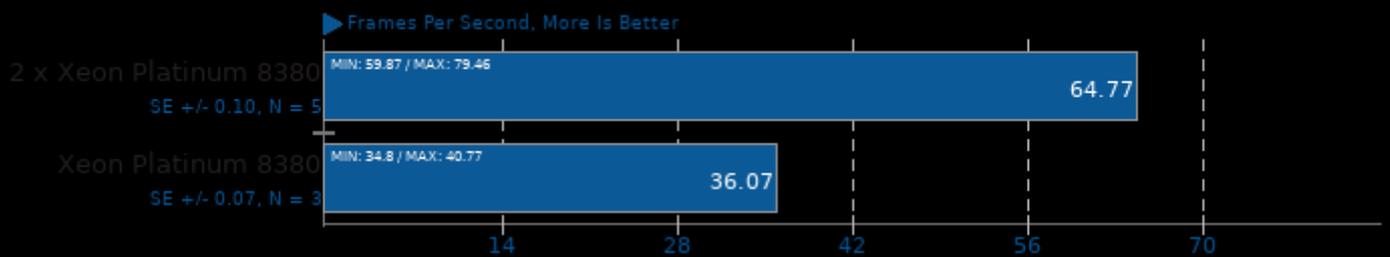
Phong Rendering With Soft-Shadow Mapping



1. (CXX) g++ options: -O3 -fomit-frame-pointer -ffast-math -mtune=native -fno-math-errno -msse -mrecip -mfpmath=sse -msse2 -msse3 -fopenmp -fwhole-program

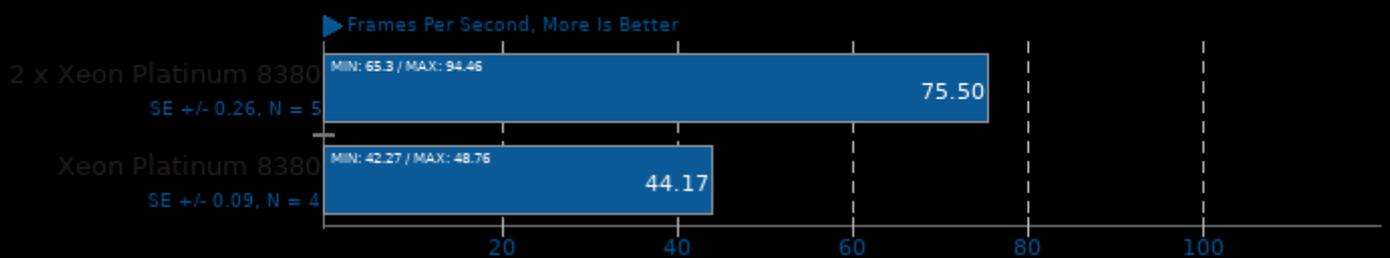
### Embree 3.13

Binary: Pathtracer - Model: Crown



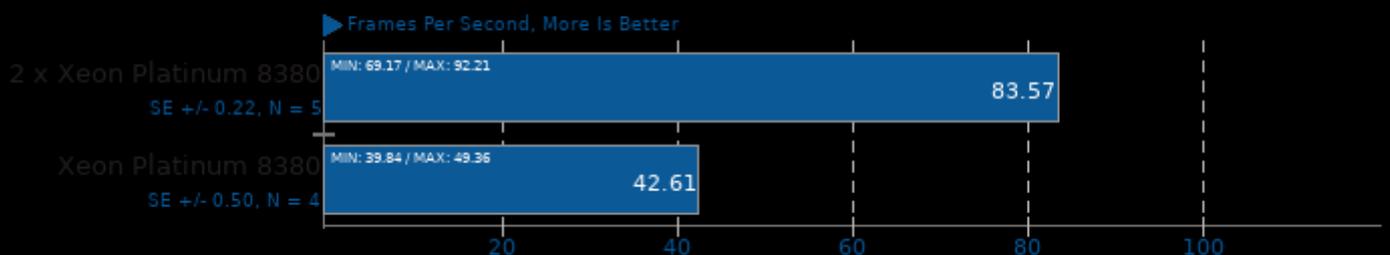
### Embree 3.13

Binary: Pathtracer ISPC - Model: Crown



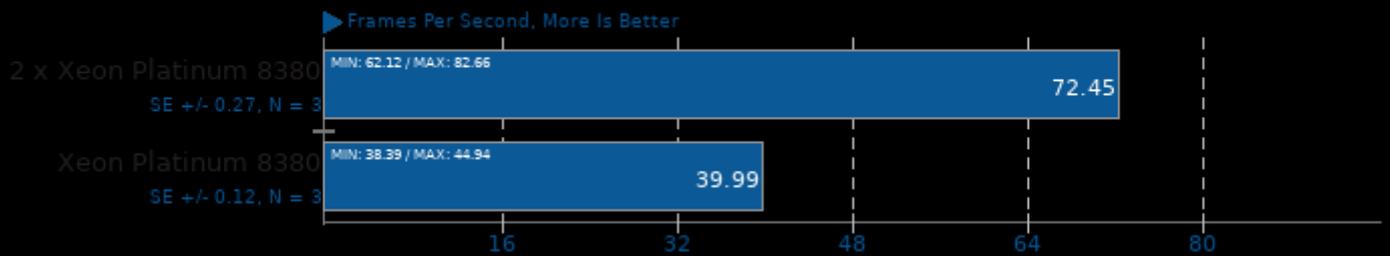
### Embree 3.13

Binary: Pathtracer - Model: Asian Dragon



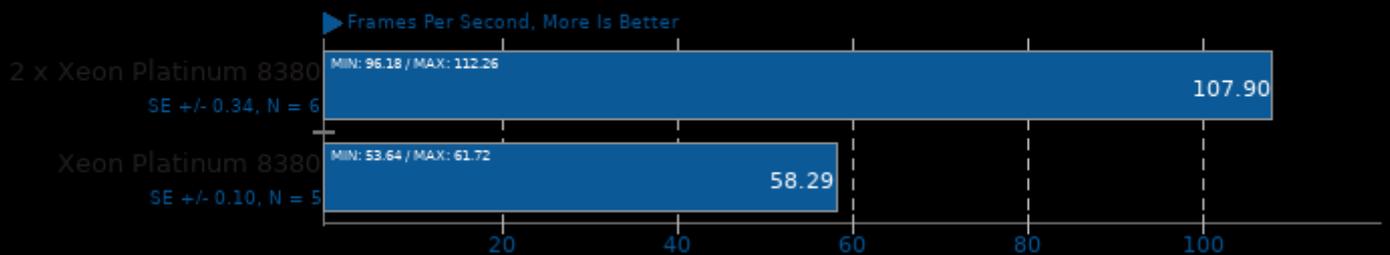
## Embree 3.13

Binary: Pathtracer - Model: Asian Dragon Obj



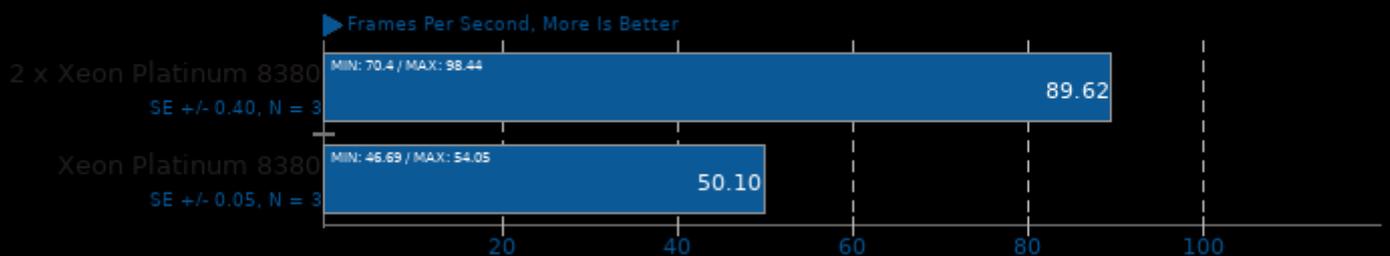
## Embree 3.13

Binary: Pathtracer ISPC - Model: Asian Dragon



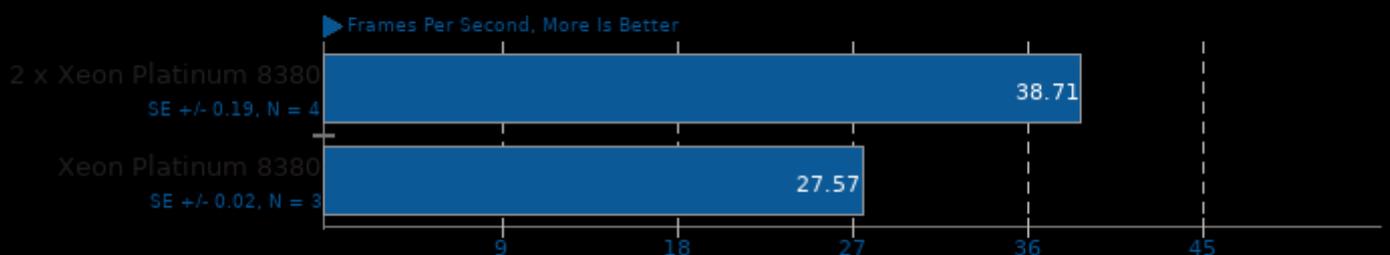
## Embree 3.13

Binary: Pathtracer ISPC - Model: Asian Dragon Obj



## Kvazaar 2.0

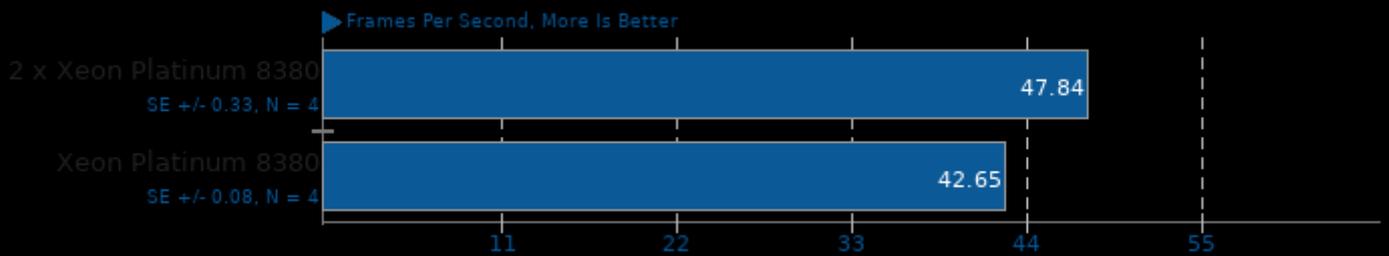
Video Input: Bosphorus 4K - Video Preset: Very Fast



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

## Kvazaar 2.0

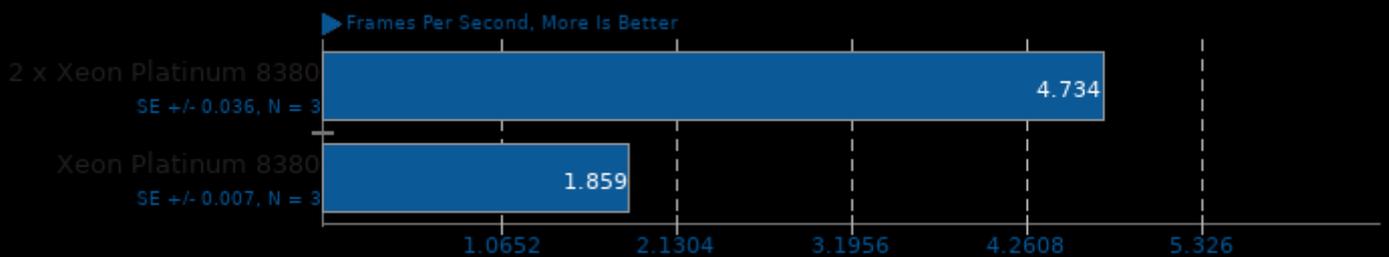
Video Input: Bosphorus 4K - Video Preset: Ultra Fast



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

## SVT-AV1 0.8.7

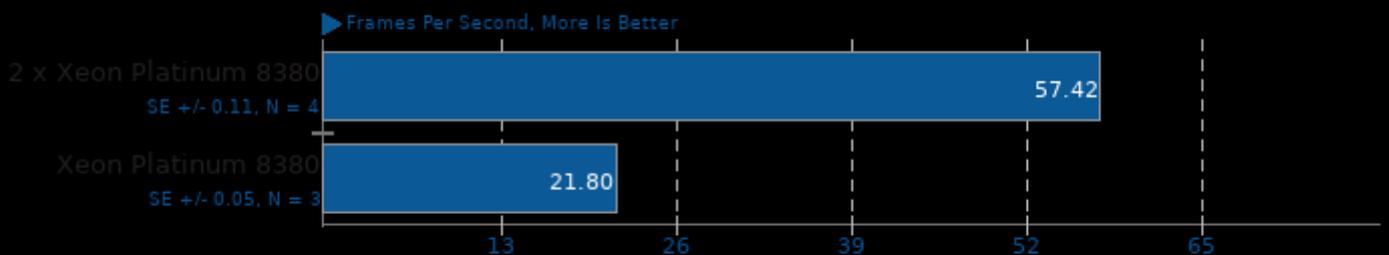
Encoder Mode: Preset 4 - Input: Bosphorus 4K



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

## SVT-AV1 0.8.7

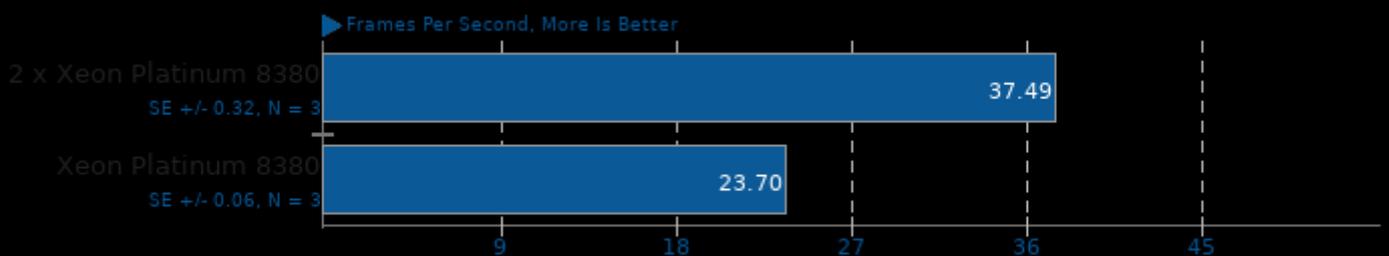
Encoder Mode: Preset 8 - Input: Bosphorus 4K



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

## SVT-HEVC 1.5.0

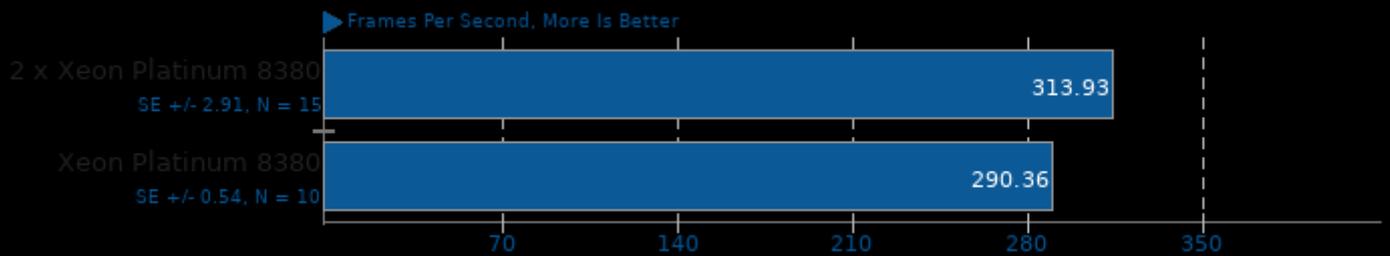
Tuning: 1 - Input: Bosphorus 1080p



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

### SVT-HEVC 1.5.0

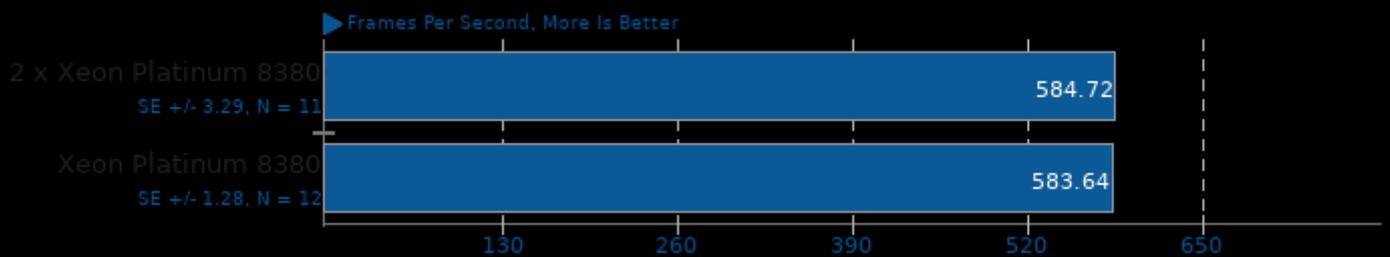
Tuning: 7 - Input: Bosphorus 1080p



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

### SVT-HEVC 1.5.0

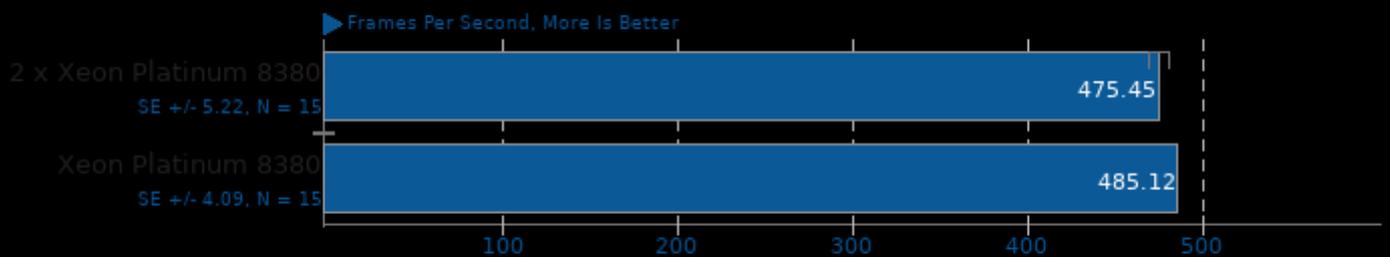
Tuning: 10 - Input: Bosphorus 1080p



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

### SVT-VP9 0.3

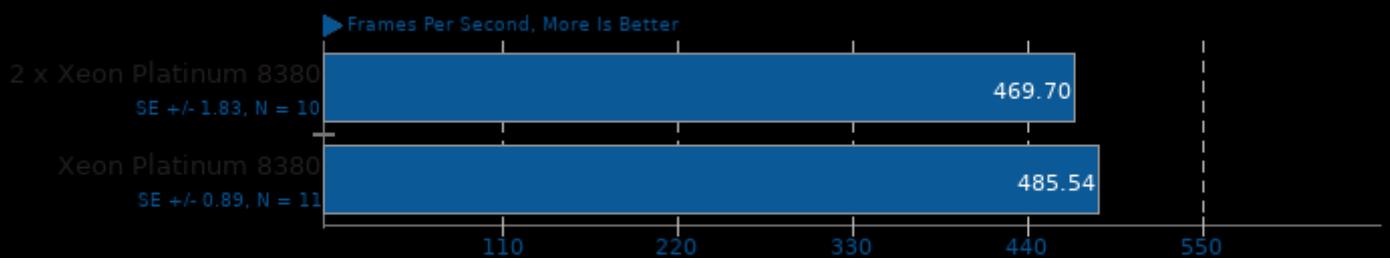
Tuning: VMAF Optimized - Input: Bosphorus 1080p



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

### SVT-VP9 0.3

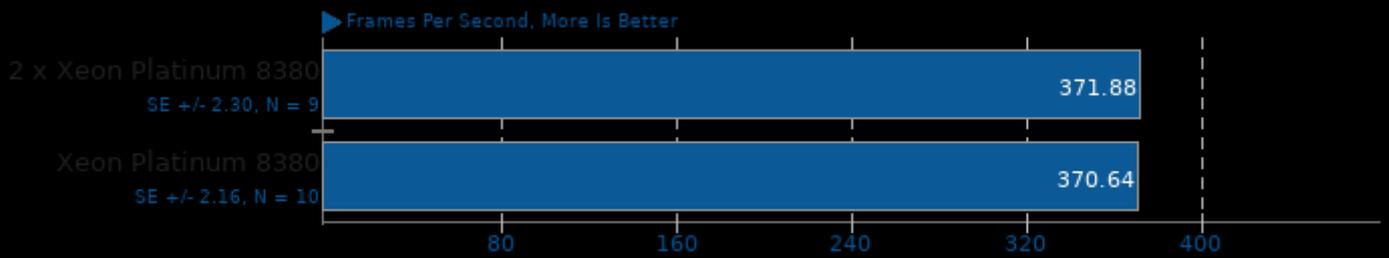
Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p



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

### SVT-VP9 0.3

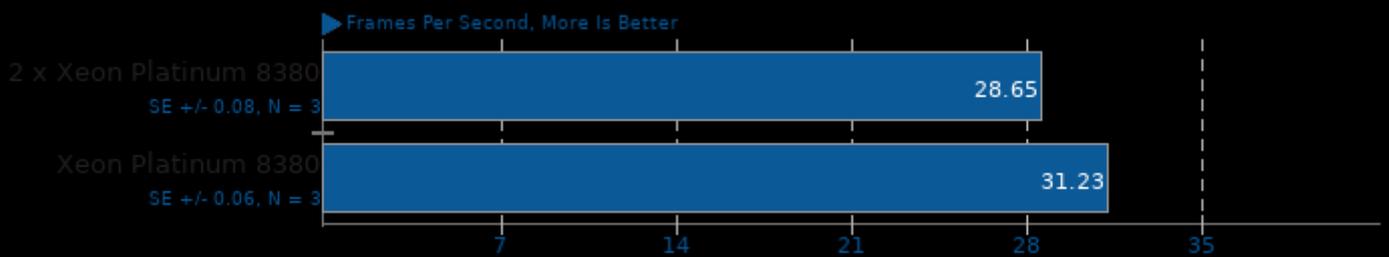
Tuning: Visual Quality Optimized - Input: Bosphorus 1080p



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

### x265 3.4

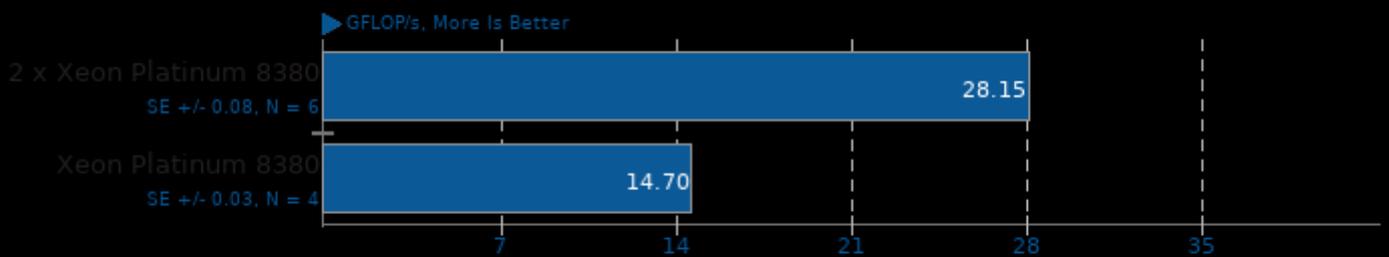
Video Input: Bosphorus 4K



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

### ACES DGEMM 1.0

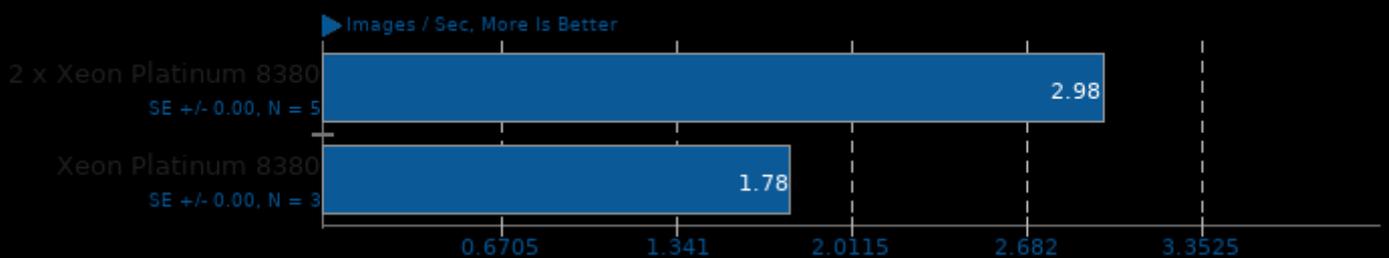
Sustained Floating-Point Rate



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

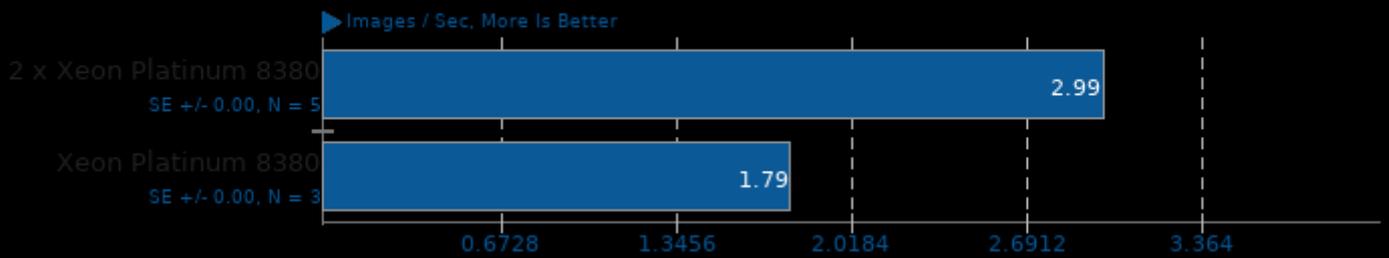
### Intel Open Image Denoise 1.4.0

Run: RT.hdr\_alb\_nrm.3840x2160



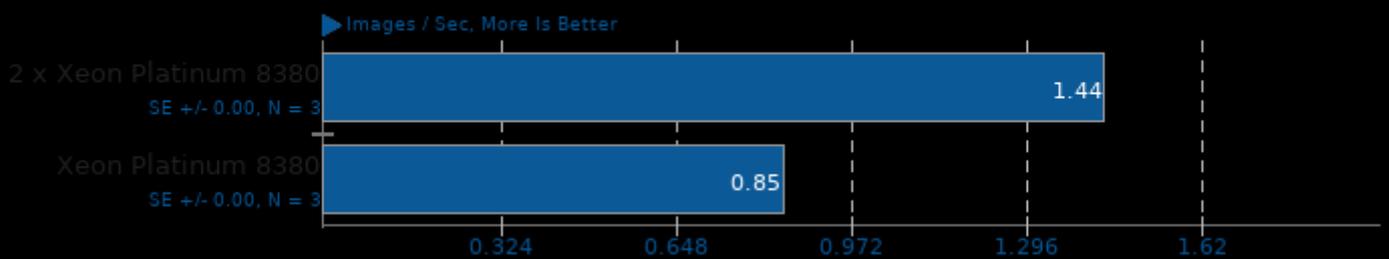
### Intel Open Image Denoise 1.4.0

Run: RT.ldr\_alb\_nrm.3840x2160



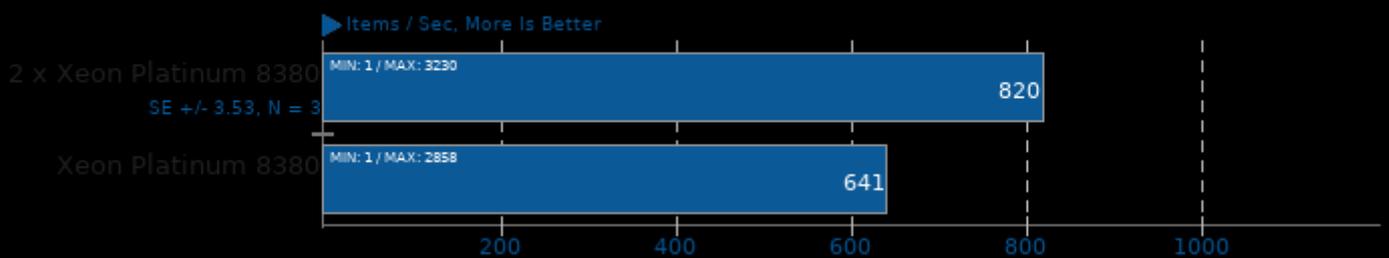
### Intel Open Image Denoise 1.4.0

Run: RTLightmap.hdr.4096x4096



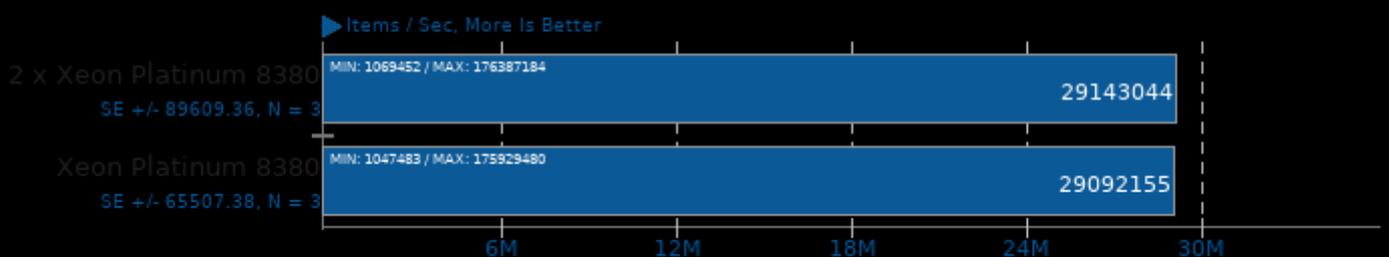
### OpenVKL 0.9

Benchmark: vklBenchmark



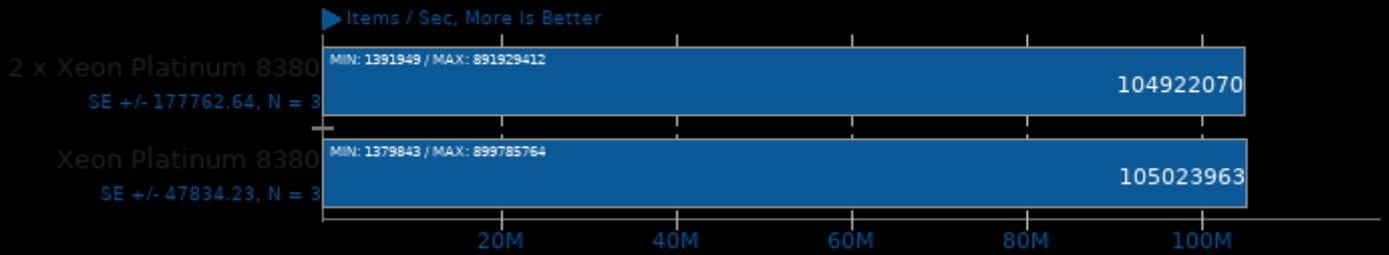
### OpenVKL 0.9

Benchmark: vklBenchmarkVdbVolume



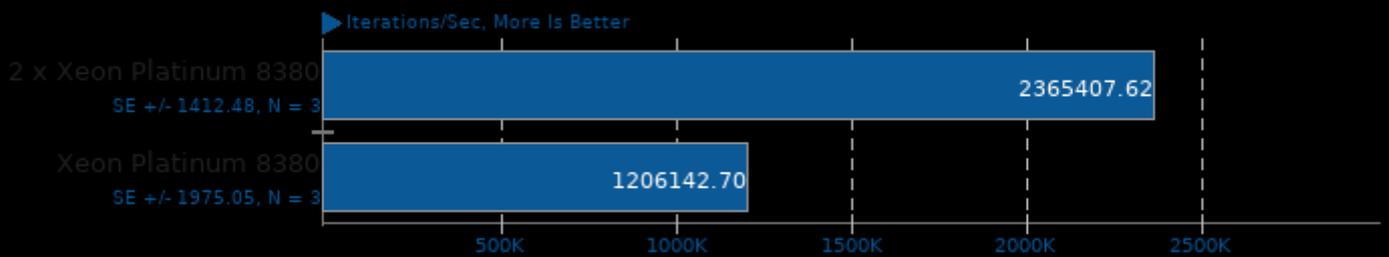
## OpenVKL 0.9

Benchmark: vklBenchmarkStructuredVolume



## Coremark 1.0

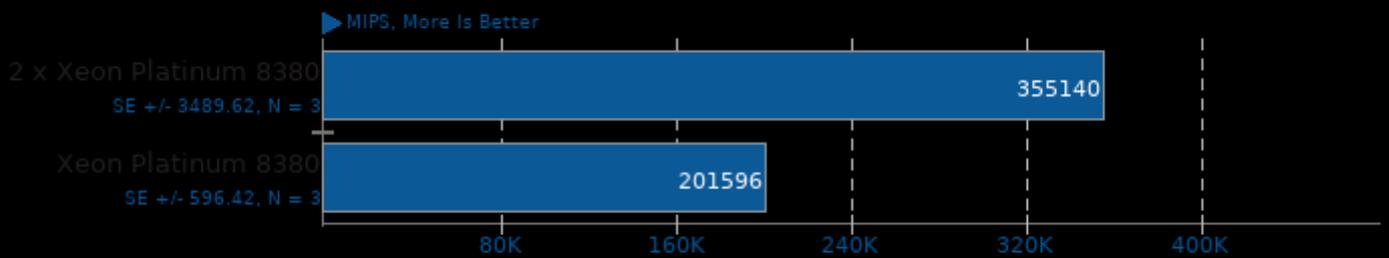
CoreMark Size 666 - Iterations Per Second



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

## 7-Zip Compression 16.02

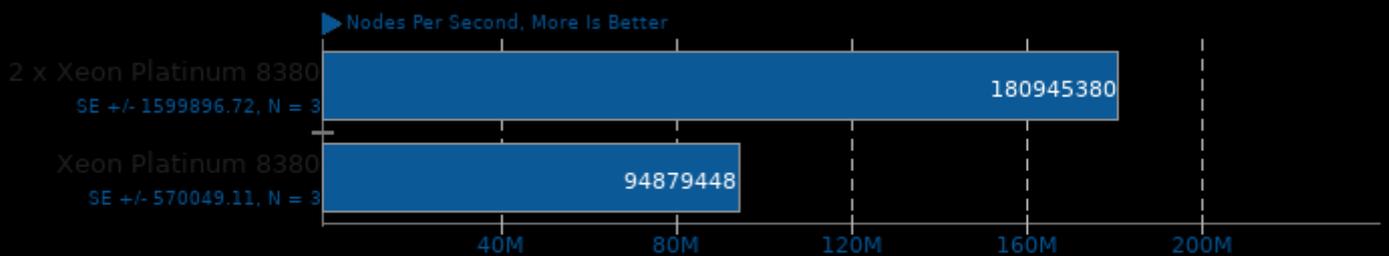
Compress Speed Test



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

## Stockfish 13

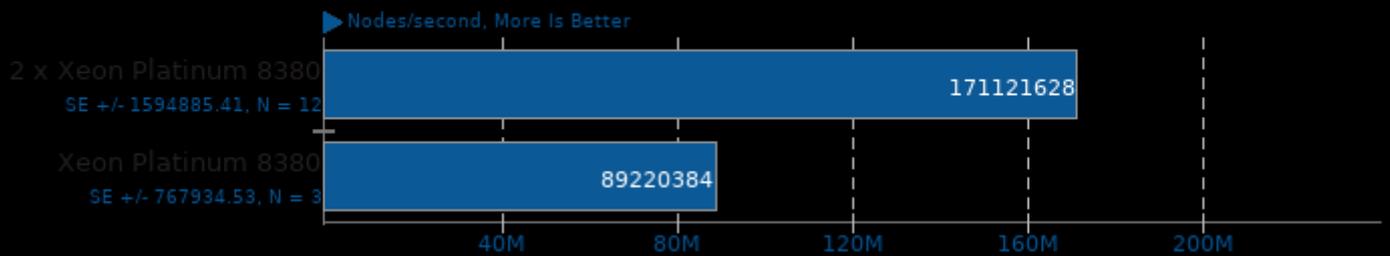
Total Time



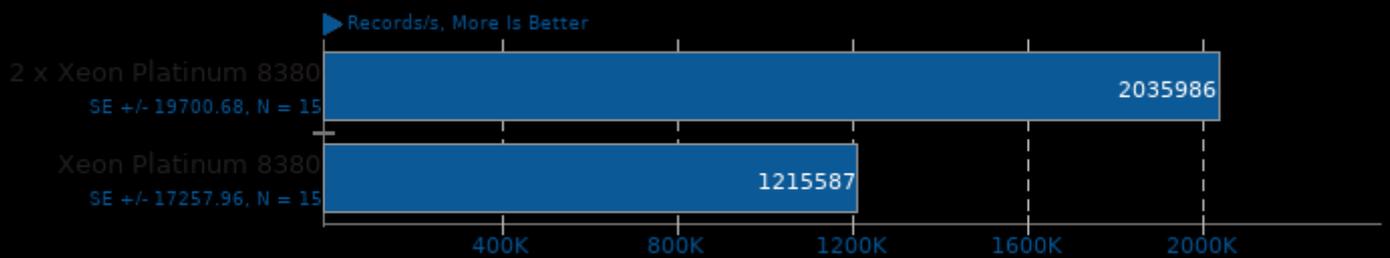
1. (CXX) g++ options: -lgcov -m64 -pthread -fno-exceptions -std=c++17 -fprofile-use -fno-peel-loops -fno-tracer -pedantic -O3 -msse -msse3 -mpopcnt

### asmFish 2018-07-23

1024 Hash Memory, 26 Depth



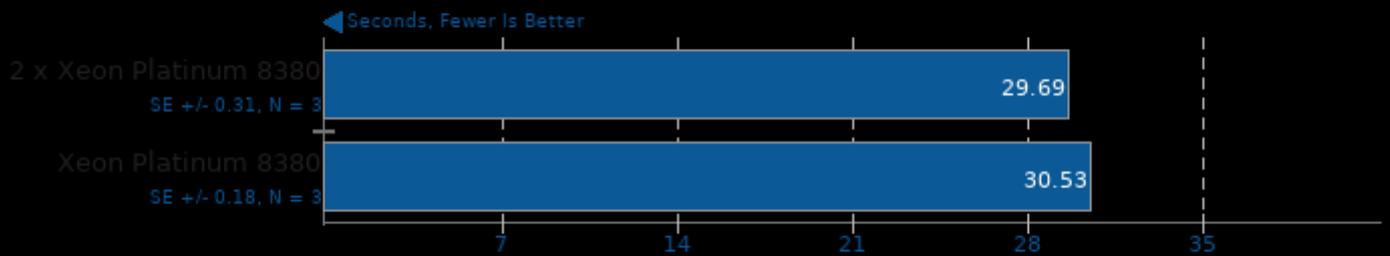
### ebizzy 0.3



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

### libavif avifenc 0.9.0

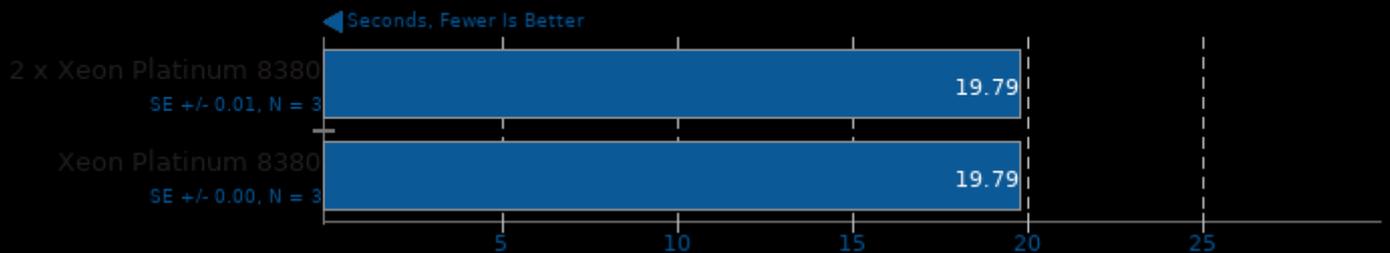
Encoder Speed: 6, Lossless



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

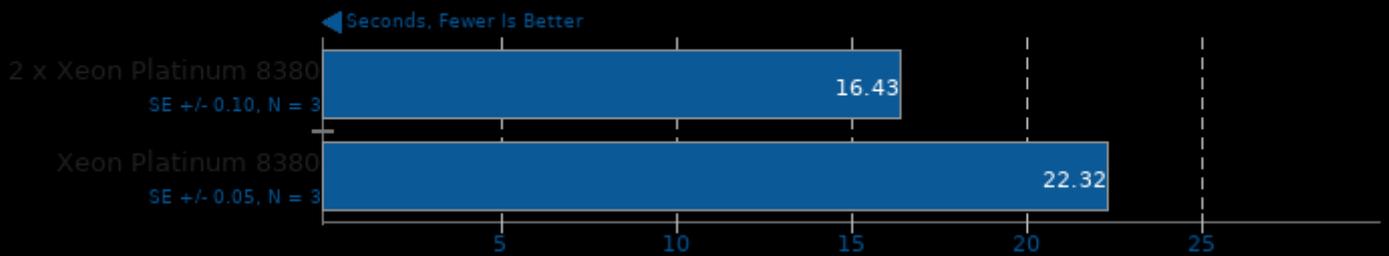
### Timed Apache Compilation 2.4.41

Time To Compile



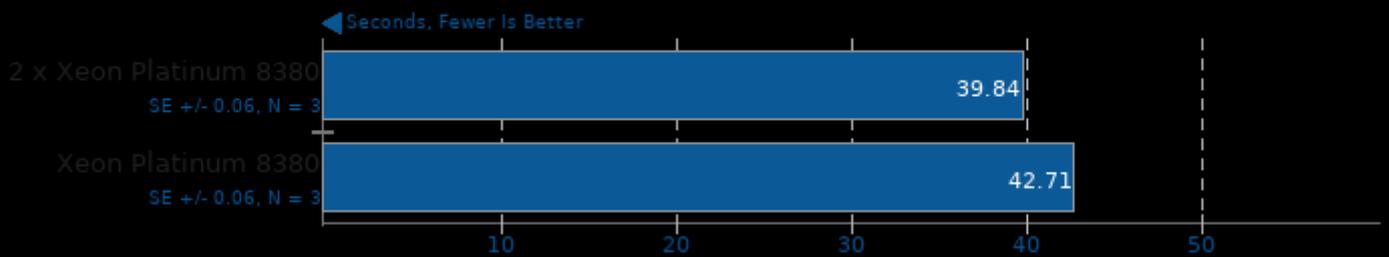
### Timed FFmpeg Compilation 4.4

Time To Compile



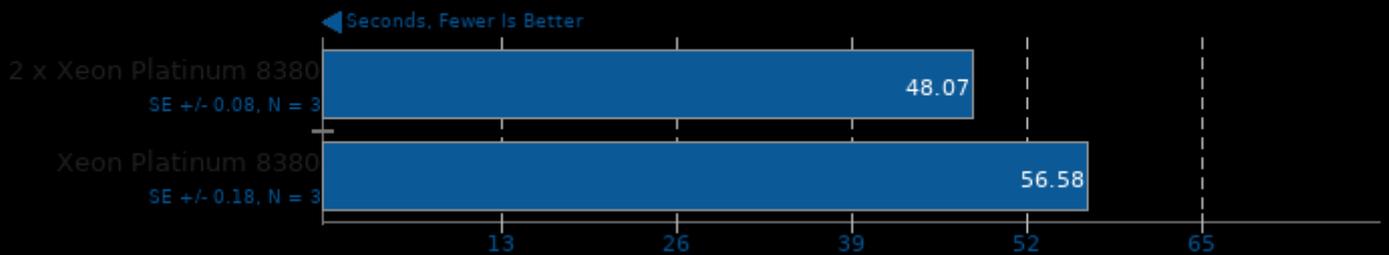
### Timed GDB GNU Debugger Compilation 10.2

Time To Compile



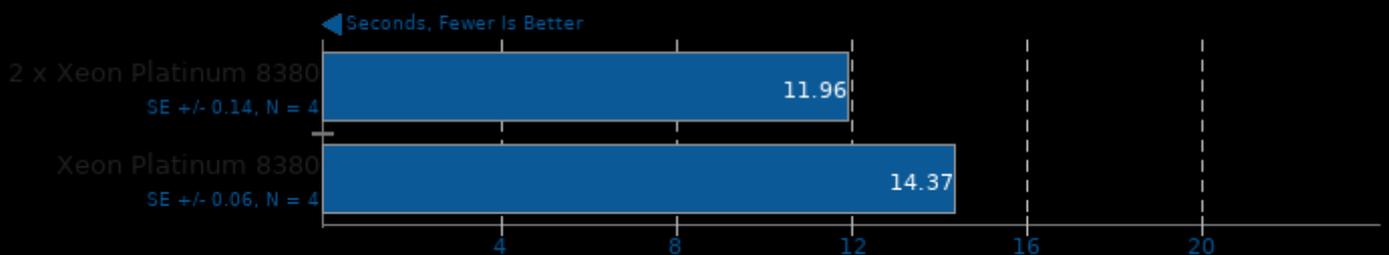
### Timed Godot Game Engine Compilation 3.2.3

Time To Compile



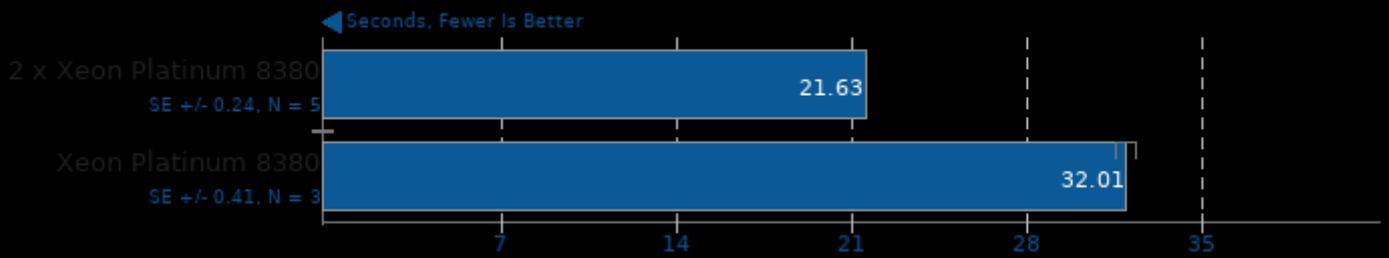
### Timed ImageMagick Compilation 6.9.0

Time To Compile



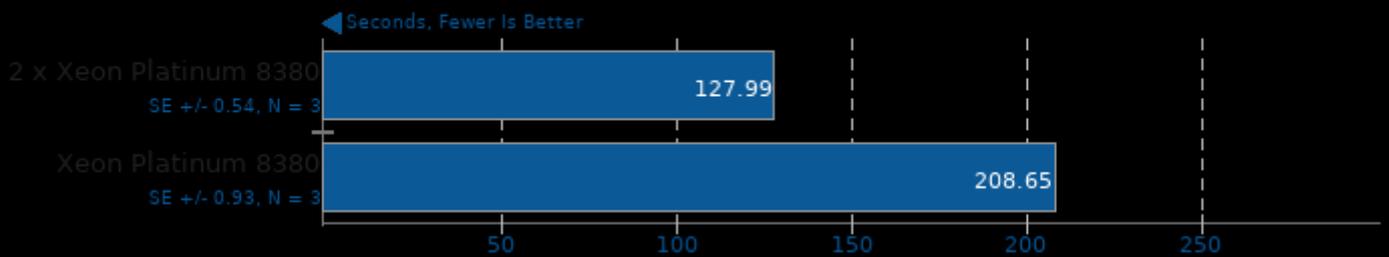
### Timed Linux Kernel Compilation 5.10.20

Time To Compile



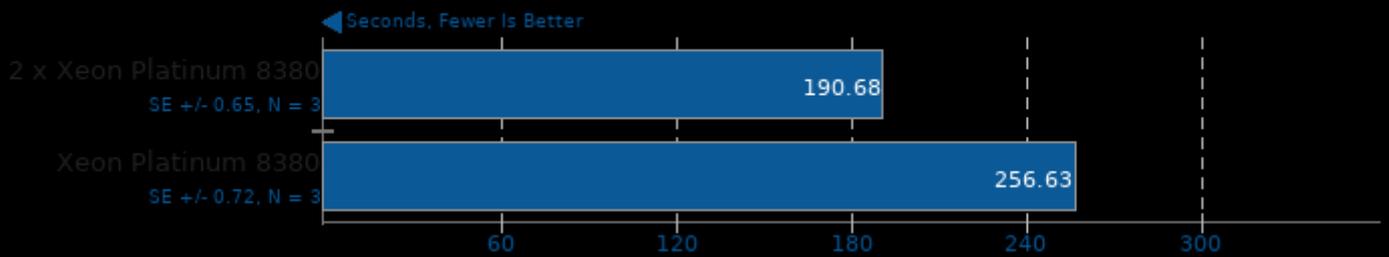
### Timed LLVM Compilation 12.0

Build System: Ninja



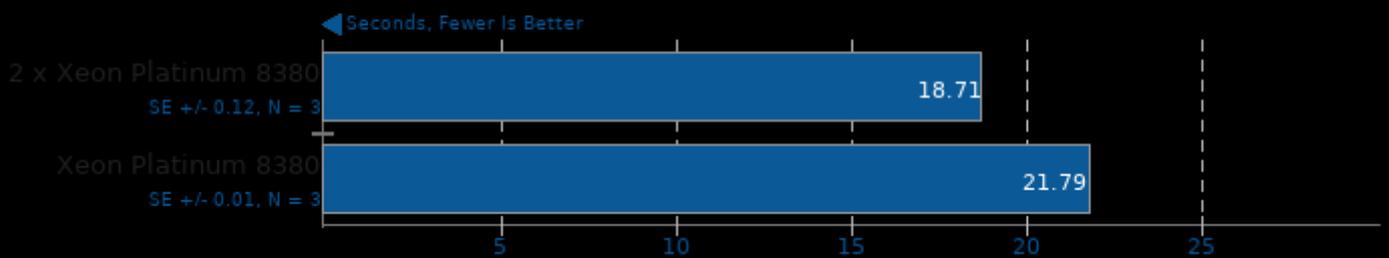
### Timed LLVM Compilation 12.0

Build System: Unix Makefiles



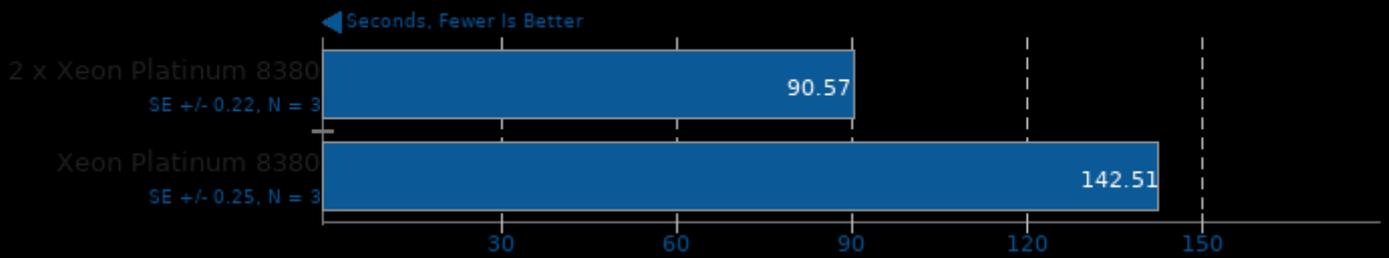
### Timed Mesa Compilation 21.0

Time To Compile



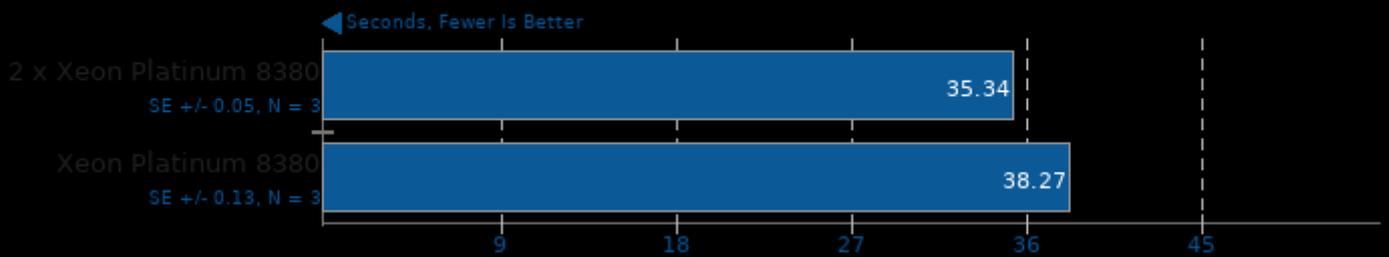
### Timed Node.js Compilation 15.11

Time To Compile



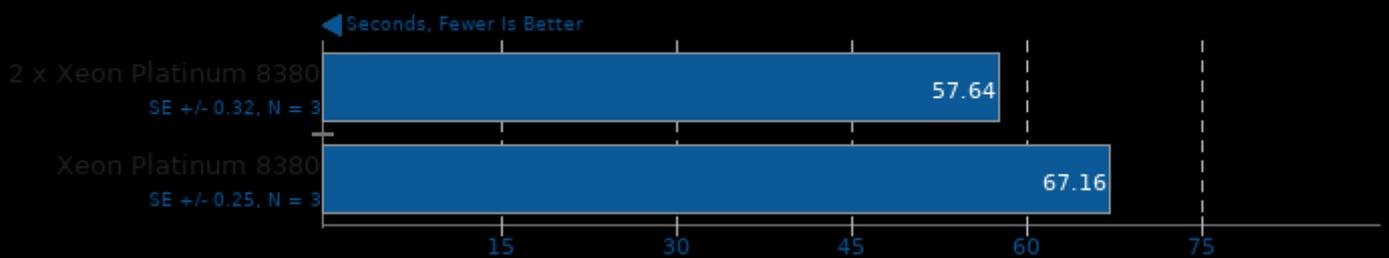
### Timed PHP Compilation 7.4.2

Time To Compile



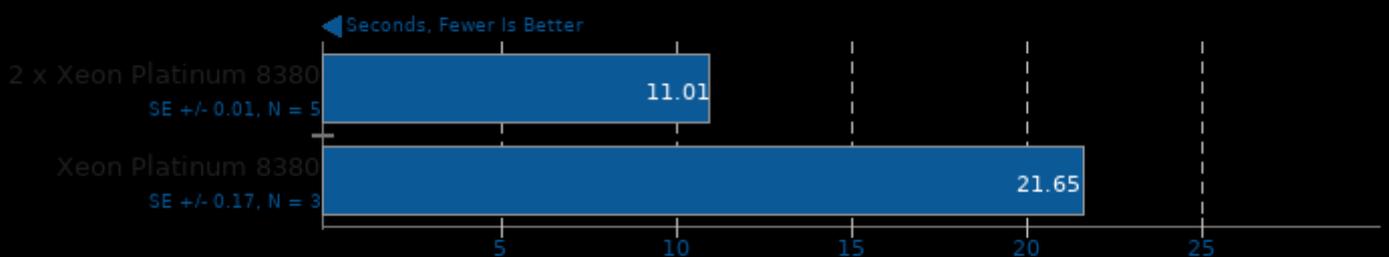
### Build2 0.13

Time To Compile



### C-Ray 1.1

Total Time - 4K, 16 Rays Per Pixel



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



### Tungsten Renderer 0.2.2

Scene: Water Caustic

Seconds, Fewer Is Better

2 x Xeon Platinum 8380

SE +/- 0.02, N = 3

20.30

Xeon Platinum 8380

SE +/- 0.03, N = 3

20.91

1. (CXX) g++ options: -std=c++0x -march=core2 -msse2 -msse3 -mssse3 -mno-sse4.1 -mno-sse4.2 -mno-sse4a -mno-avx -mno-fma -mno-bmi2 -mno-avx512

### Tungsten Renderer 0.2.2

Scene: Non-Exponential

Seconds, Fewer Is Better

2 x Xeon Platinum 8380

SE +/- 0.01197, N = 10

2.56596

Xeon Platinum 8380

SE +/- 0.00595, N = 10

2.81248

1. (CXX) g++ options: -std=c++0x -march=core2 -msse2 -msse3 -mssse3 -mno-sse4.1 -mno-sse4.2 -mno-sse4a -mno-avx -mno-fma -mno-bmi2 -mno-avx512

### YafaRay 3.4.1

Total Time For Sample Scene

Seconds, Fewer Is Better

2 x Xeon Platinum 8380

SE +/- 2.28, N = 15

81.51

Xeon Platinum 8380

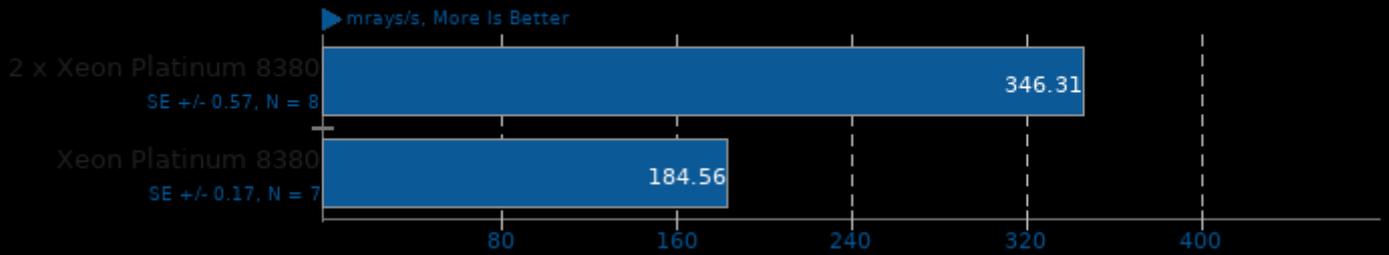
SE +/- 1.05, N = 3

74.90

1. (CXX) g++ options: -std=c++11 -O3 -ffast-math -rdynamic -ldl -lmath -llmImf -llex -lHalf -lz -llmThread -lxm2 -lfreetype -lpthread

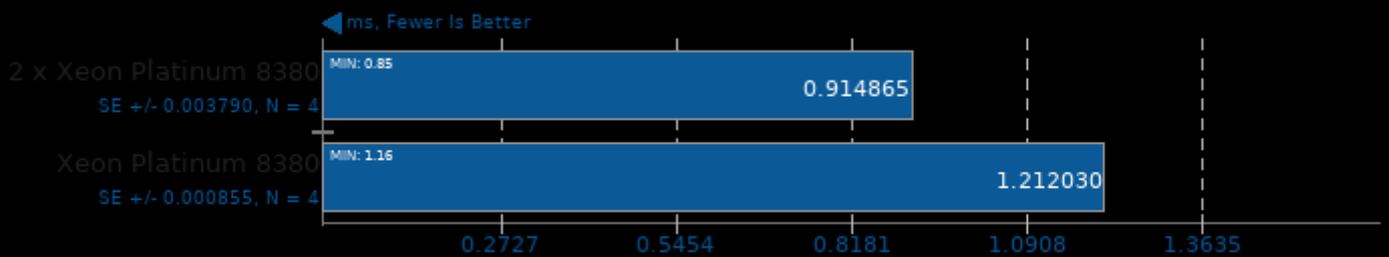
## rays1bench 2020-01-09

Large Scene



## oneDNN 2.1.2

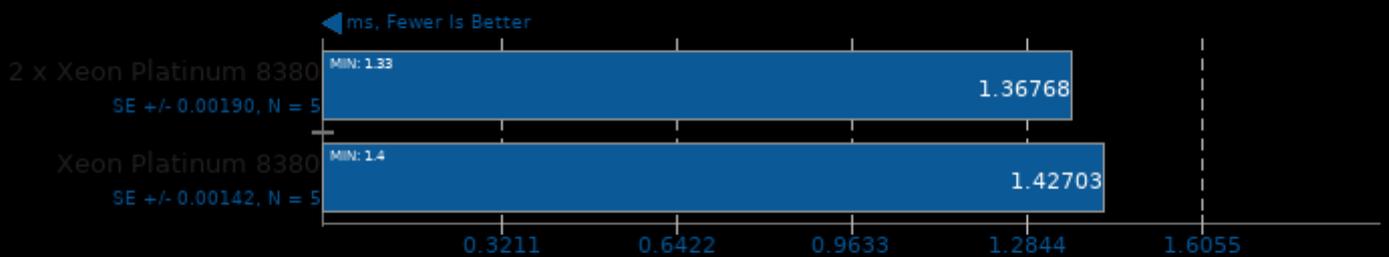
Harness: IP Shapes 1D - Data Type: f32 - Engine: CPU



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

## oneDNN 2.1.2

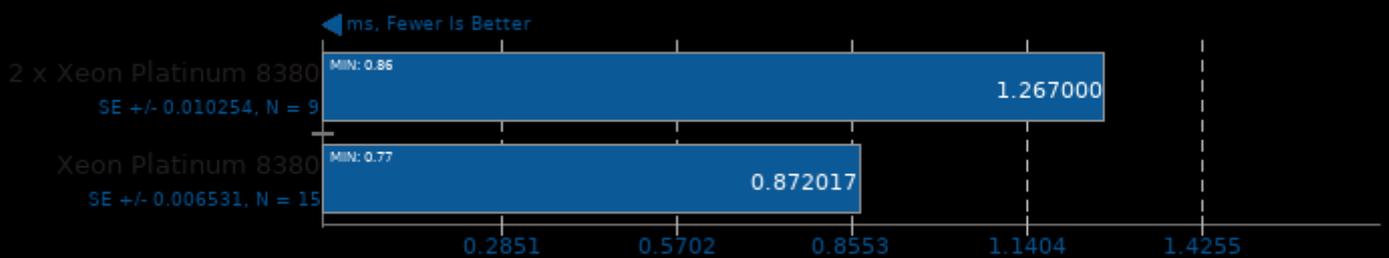
Harness: IP Shapes 3D - Data Type: f32 - Engine: CPU



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

## oneDNN 2.1.2

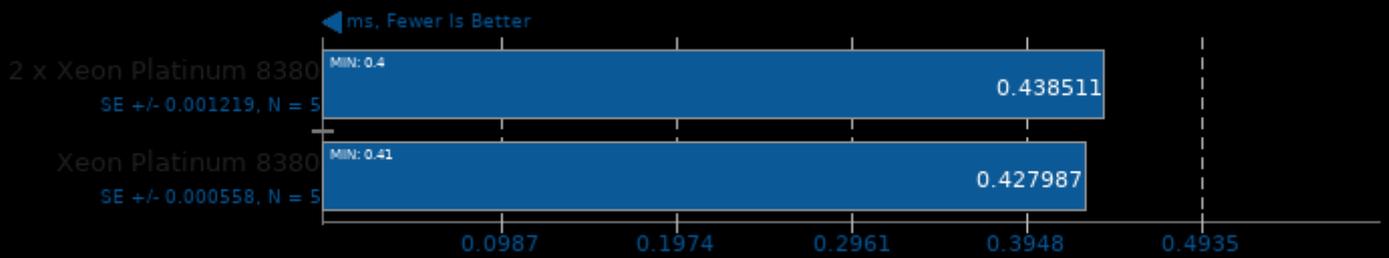
Harness: IP Shapes 1D - Data Type: u8s8f32 - Engine: CPU



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

### oneDNN 2.1.2

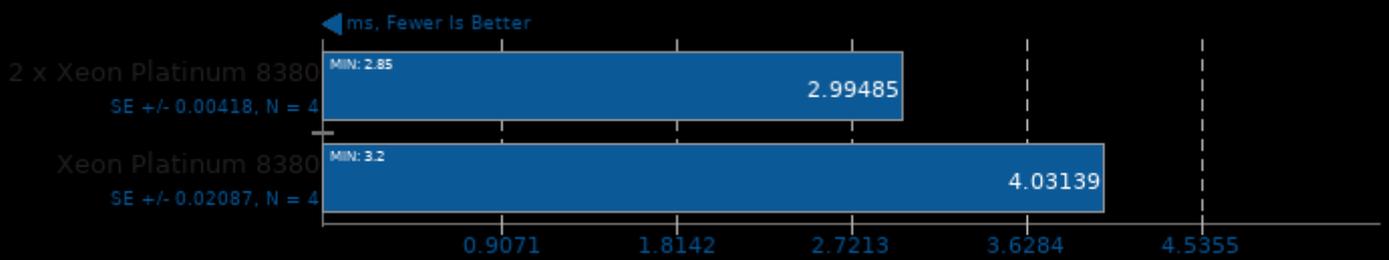
Harness: IP Shapes 3D - Data Type: u8s8f32 - Engine: CPU



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

### oneDNN 2.1.2

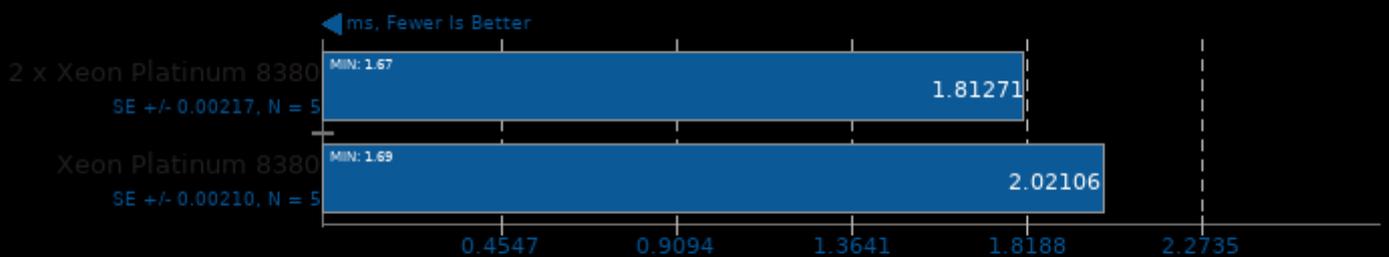
Harness: IP Shapes 1D - Data Type: bf16bf16bf16 - Engine: CPU



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

### oneDNN 2.1.2

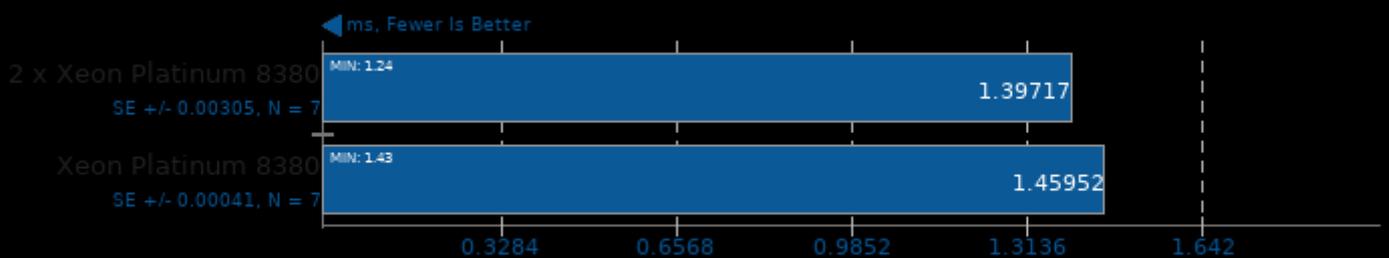
Harness: IP Shapes 3D - Data Type: bf16bf16bf16 - Engine: CPU



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

### oneDNN 2.1.2

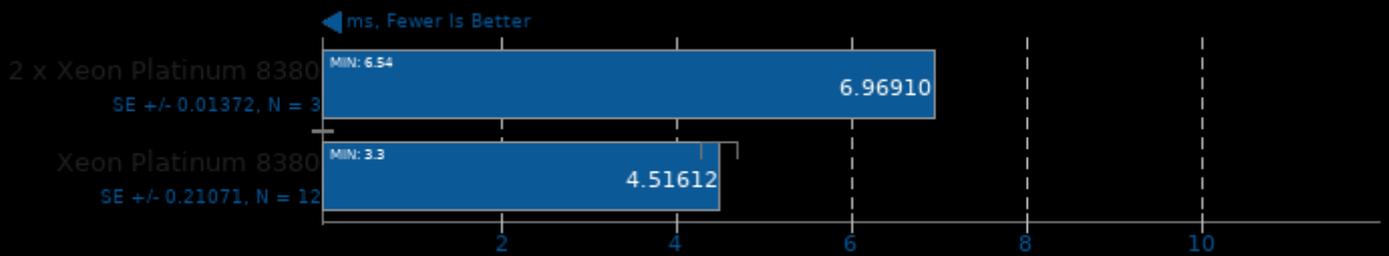
Harness: Convolution Batch Shapes Auto - Data Type: f32 - Engine: CPU



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

### oneDNN 2.1.2

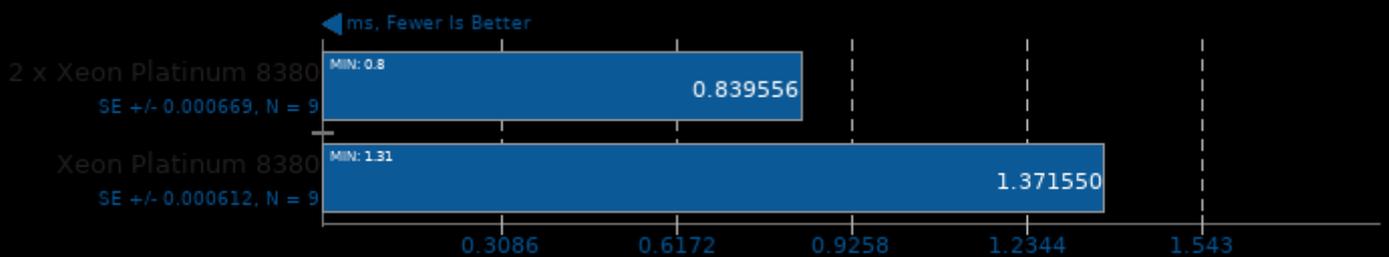
Harness: Deconvolution Batch shapes\_1d - Data Type: f32 - Engine: CPU



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

### oneDNN 2.1.2

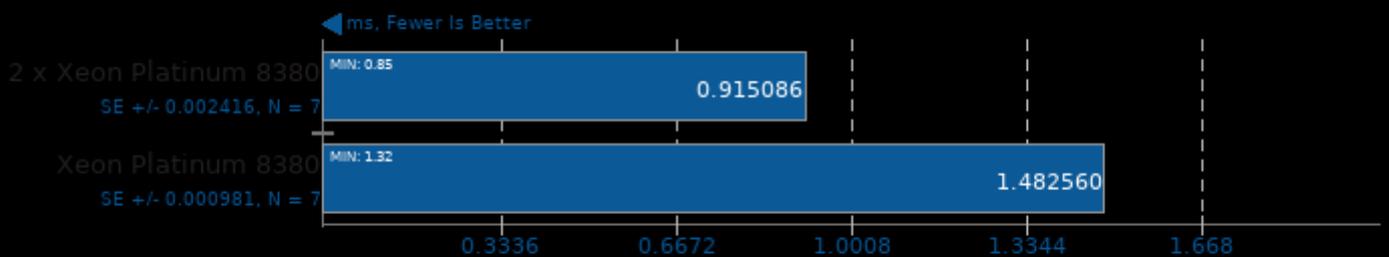
Harness: Deconvolution Batch shapes\_3d - Data Type: f32 - Engine: CPU



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

### oneDNN 2.1.2

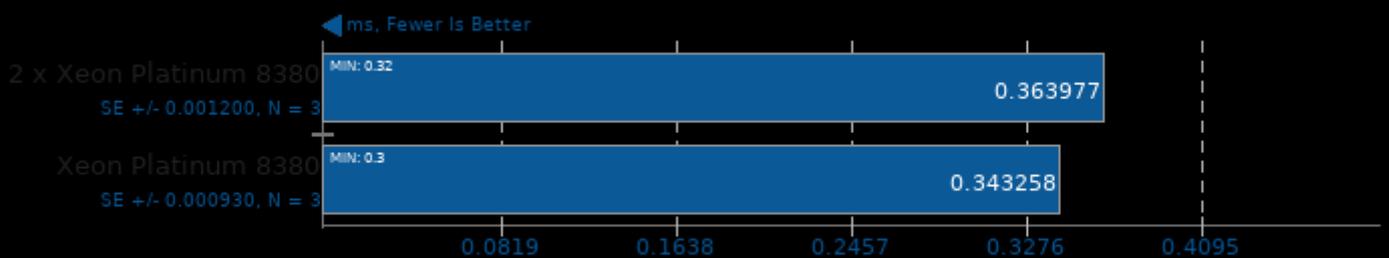
Harness: Convolution Batch Shapes Auto - Data Type: u8s8f32 - Engine: CPU



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

### oneDNN 2.1.2

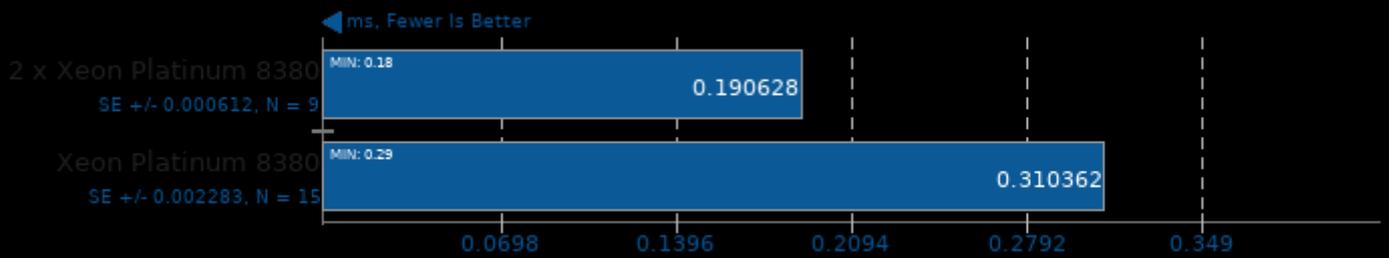
Harness: Deconvolution Batch shapes\_1d - Data Type: u8s8f32 - Engine: CPU



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

### oneDNN 2.1.2

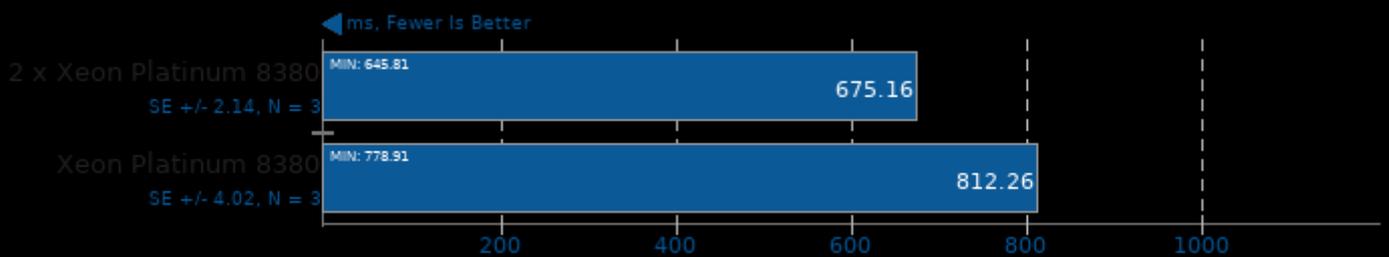
Harness: Deconvolution Batch shapes\_3d - Data Type: u8s8f32 - Engine: CPU



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

### oneDNN 2.1.2

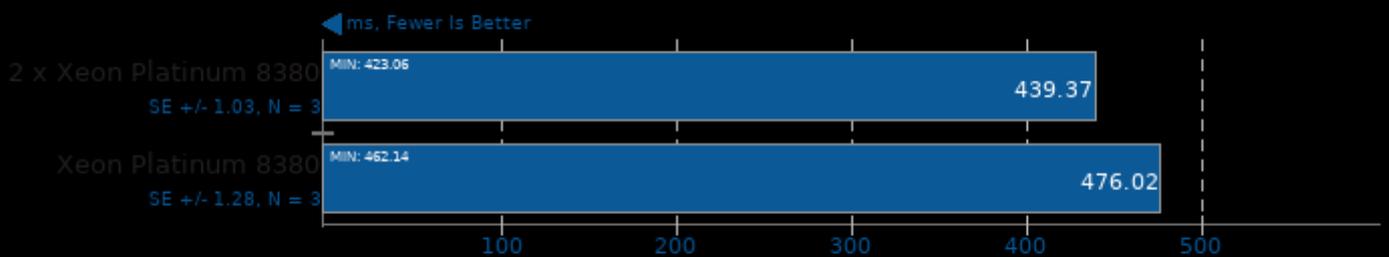
Harness: Recurrent Neural Network Training - Data Type: f32 - Engine: CPU



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

### oneDNN 2.1.2

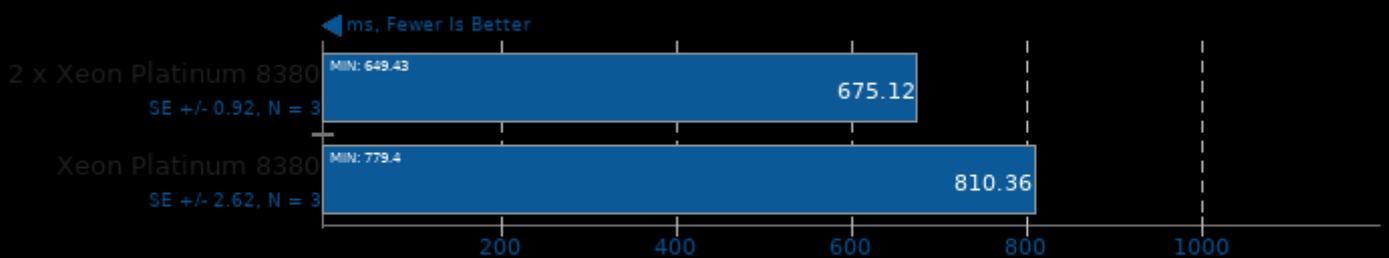
Harness: Recurrent Neural Network Inference - Data Type: f32 - Engine: CPU



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

### oneDNN 2.1.2

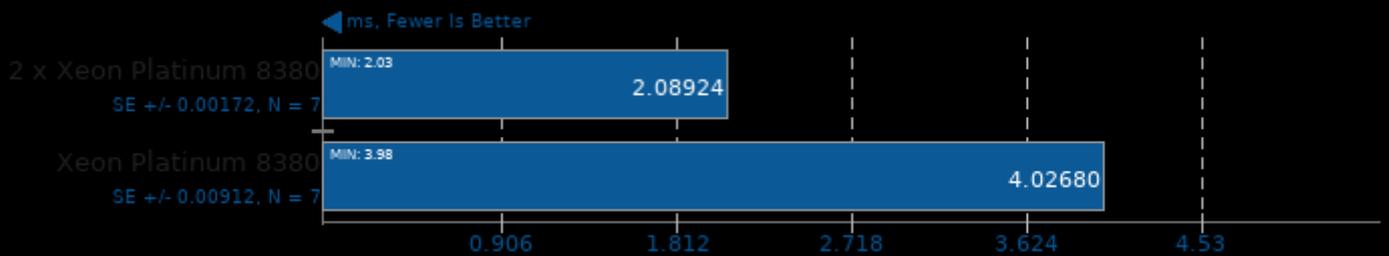
Harness: Recurrent Neural Network Training - Data Type: u8s8f32 - Engine: CPU



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

### oneDNN 2.1.2

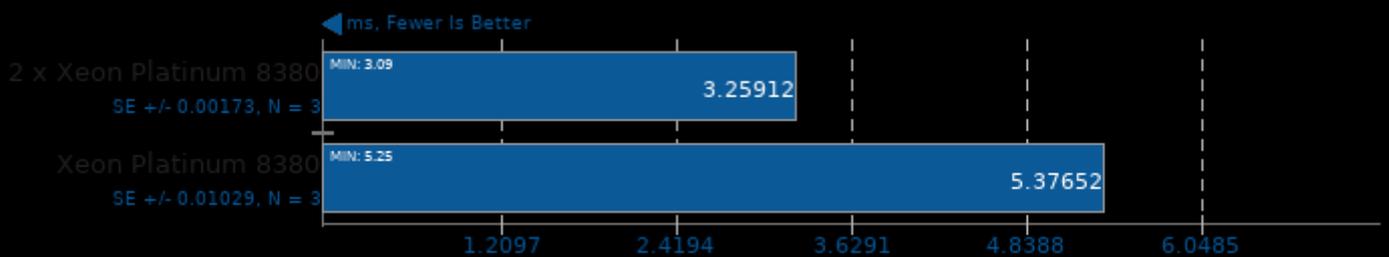
Harness: Convolution Batch Shapes Auto - Data Type: bf16bf16bf16 - Engine: CPU



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

### oneDNN 2.1.2

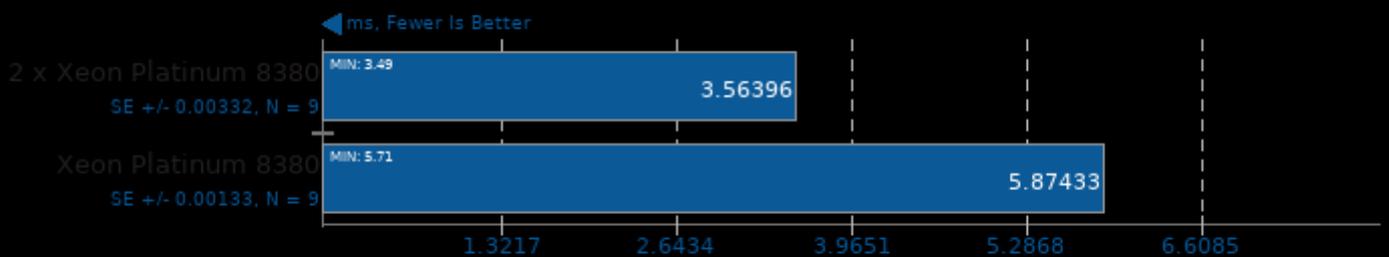
Harness: Deconvolution Batch shapes\_1d - Data Type: bf16bf16bf16 - Engine: CPU



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

### oneDNN 2.1.2

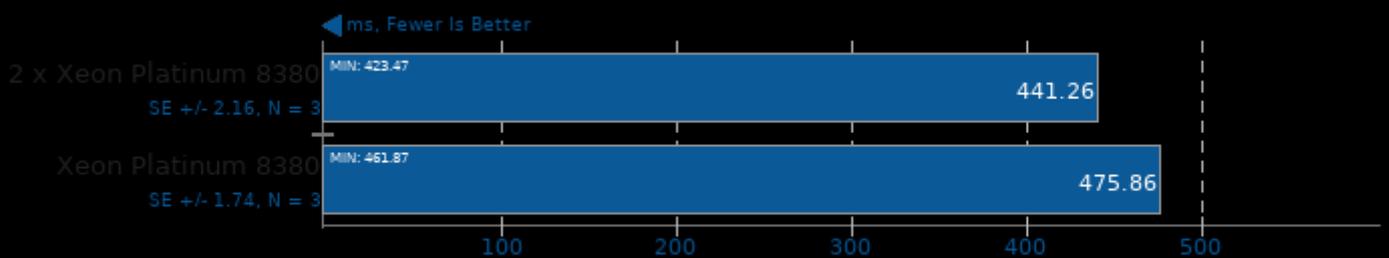
Harness: Deconvolution Batch shapes\_3d - Data Type: bf16bf16bf16 - Engine: CPU



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

### oneDNN 2.1.2

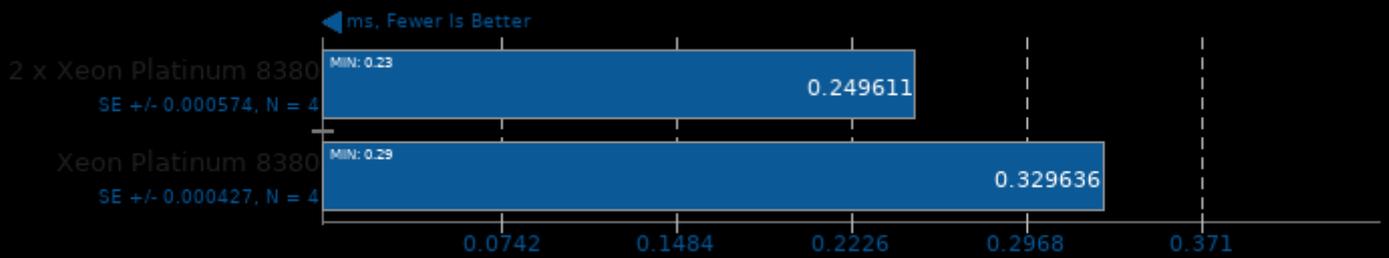
Harness: Recurrent Neural Network Inference - Data Type: u8s8f32 - Engine: CPU



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

### oneDNN 2.1.2

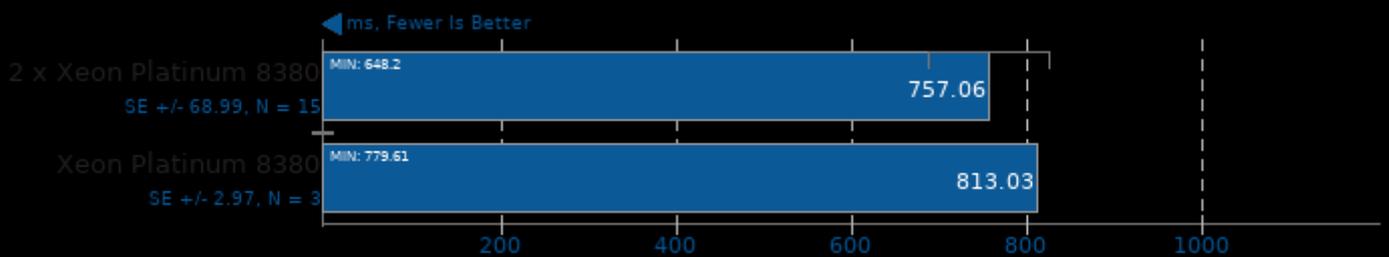
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: f32 - Engine: CPU



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

### oneDNN 2.1.2

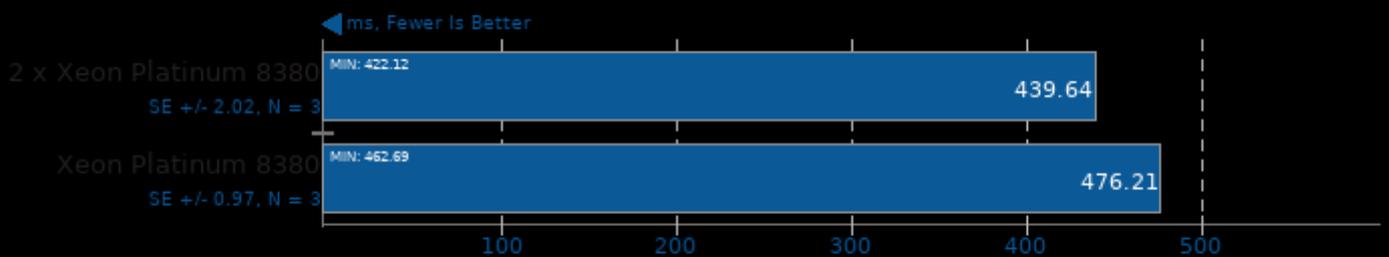
Harness: Recurrent Neural Network Training - Data Type: bf16bf16bf16 - Engine: CPU



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

### oneDNN 2.1.2

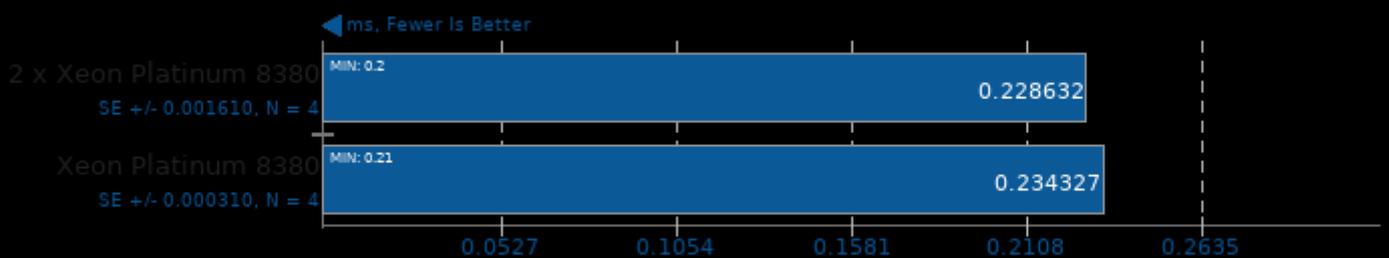
Harness: Recurrent Neural Network Inference - Data Type: bf16bf16bf16 - Engine: CPU



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

### oneDNN 2.1.2

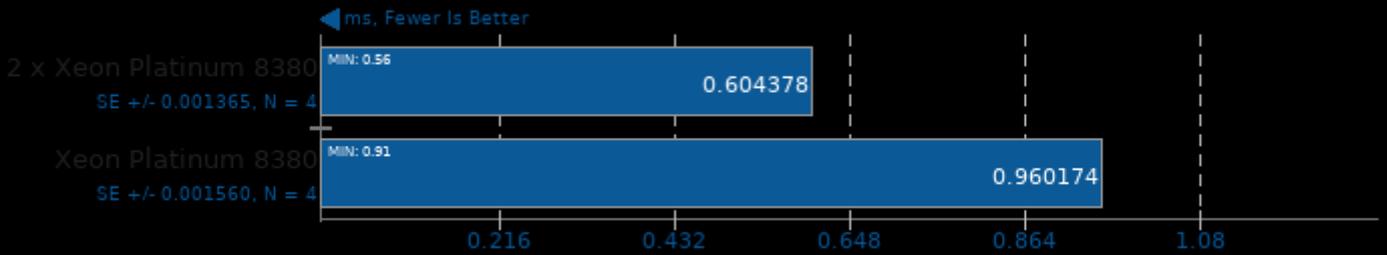
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: u8s8f32 - Engine: CPU



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

### oneDNN 2.1.2

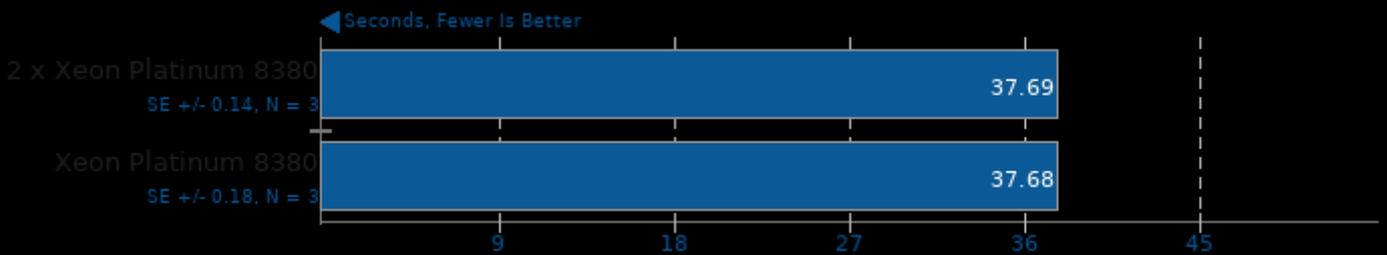
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: bf16bf16bf16 - Engine: CPU



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

### Timed Wasmer Compilation 1.0.2

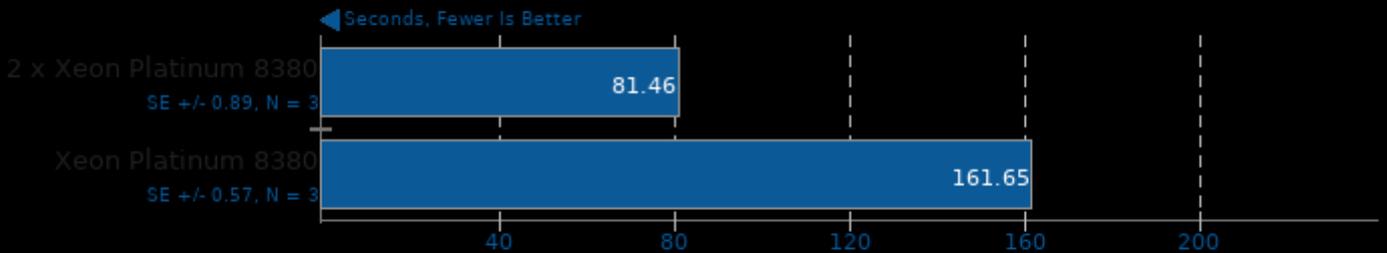
Time To Compile



1. (CC) gcc options: -m64 -pie -nodefaultlibs -ldl -lgcc\_s -lutil -lrt -pthread -lm -lc

### Helsing 1.0-beta

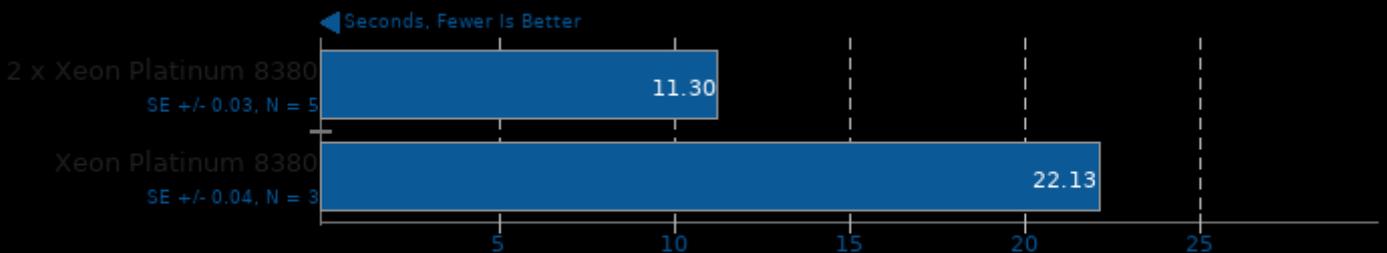
Digit Range: 14 digit



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

### m-queens 1.2

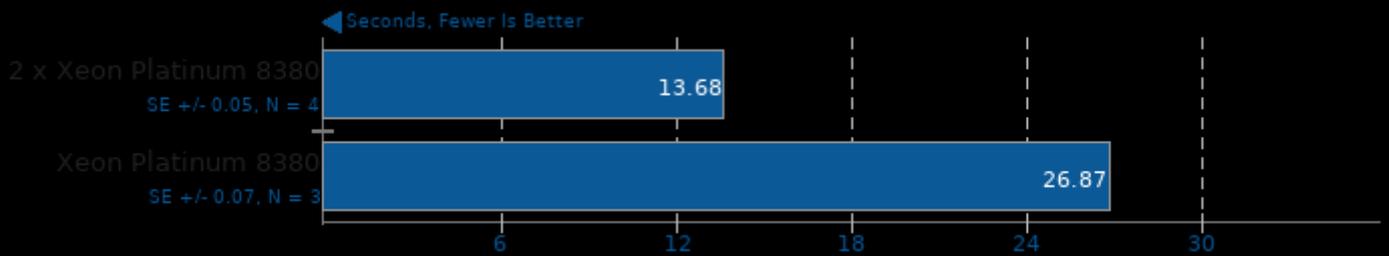
Time To Solve



1. (CXX) g++ options: -fopenmp -O2 -march=native

## Tachyon 0.99b6

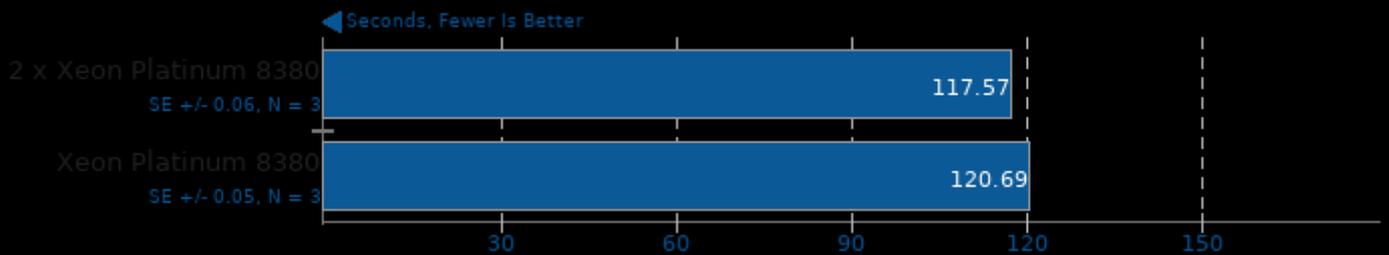
Total Time



1. (ICC) gcc options: -m64 -O3 -fomit-frame-pointer -ffast-math -ltachyon -lm -lpthread

## WebP2 Image Encode 20210126

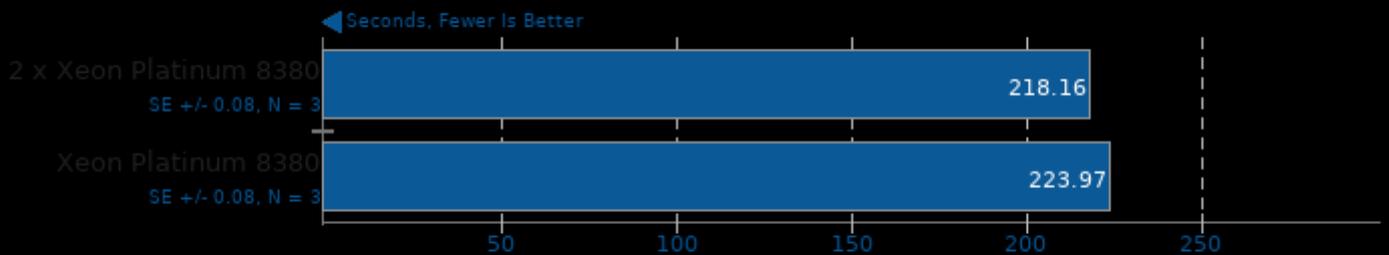
Encode Settings: Quality 75, Compression Effort 7



1. (CXX) g++ options: -msse4.2 -fno-rtti -O3 -rdynamic -lpthread -ljpeg -lwebp -lwebpdemux

## WebP2 Image Encode 20210126

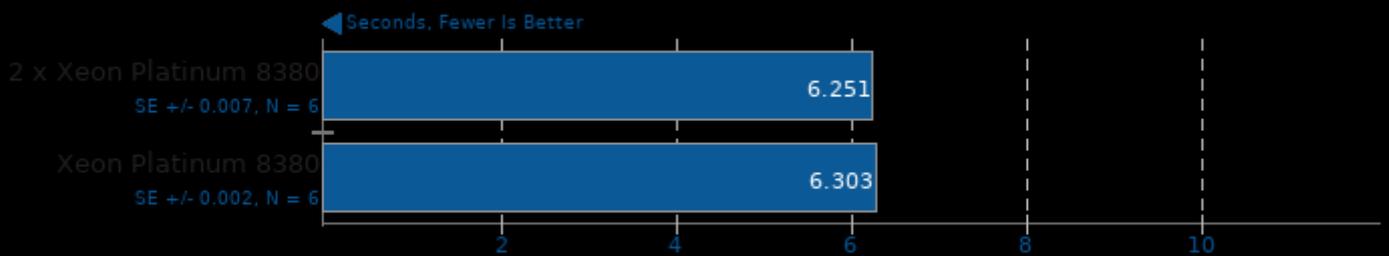
Encode Settings: Quality 95, Compression Effort 7



1. (CXX) g++ options: -msse4.2 -fno-rtti -O3 -rdynamic -lpthread -ljpeg -lwebp -lwebpdemux

## WebP2 Image Encode 20210126

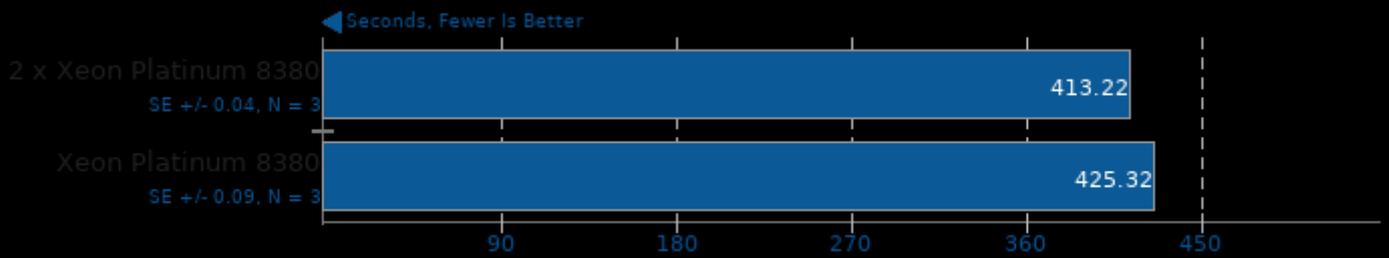
Encode Settings: Quality 100, Compression Effort 5



1. (CXX) g++ options: -msse4.2 -fno-rtti -O3 -rdynamic -lpthread -ljpeg -lwebp -lwebpdemux

## WebP2 Image Encode 20210126

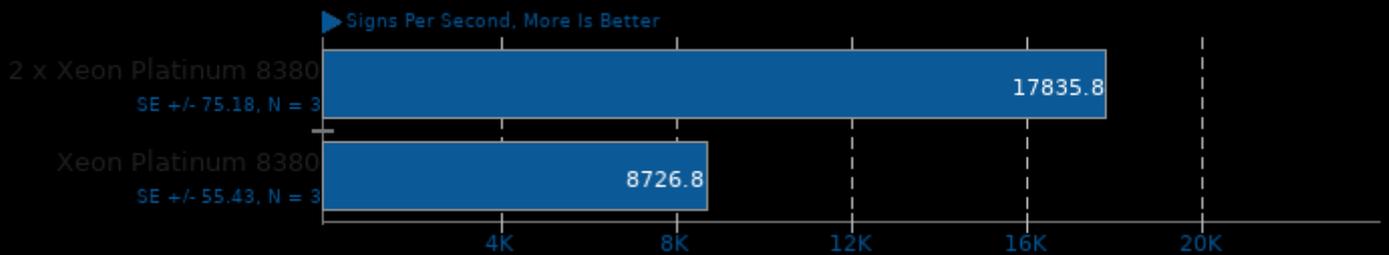
Encode Settings: Quality 100, Lossless Compression



1. (CXX) g++ options: -mssse4.2 -fno-rtti -O3 -rdynamic -lpthread -ljpeg -lwebp -lwebpdemux

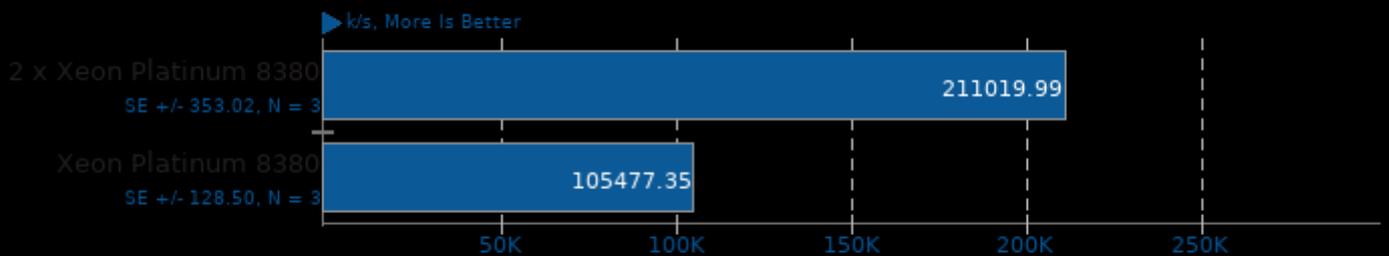
## OpenSSL 1.1.1

RSA 4096-bit Performance



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

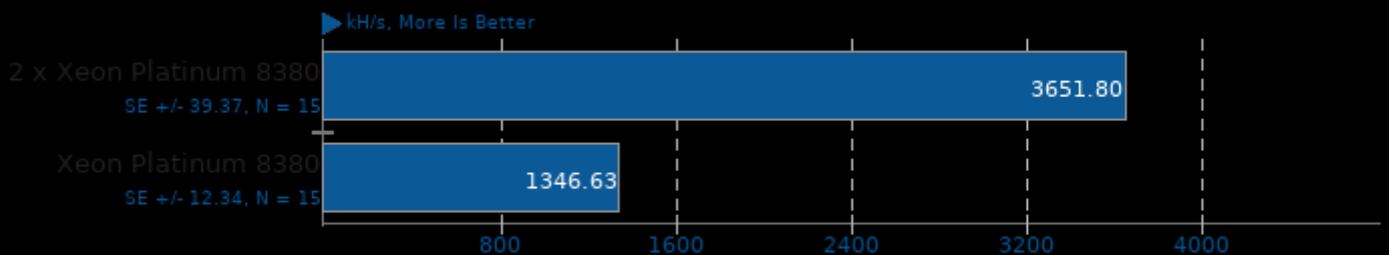
## Aircrack-ng 1.5.2



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

## Cpuminer-Opt 3.15.5

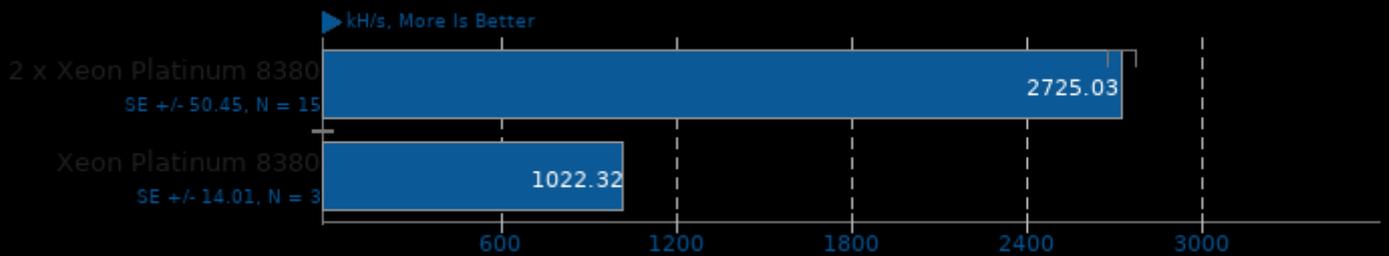
Algorithm: Magi



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

### Cpuminer-Opt 3.15.5

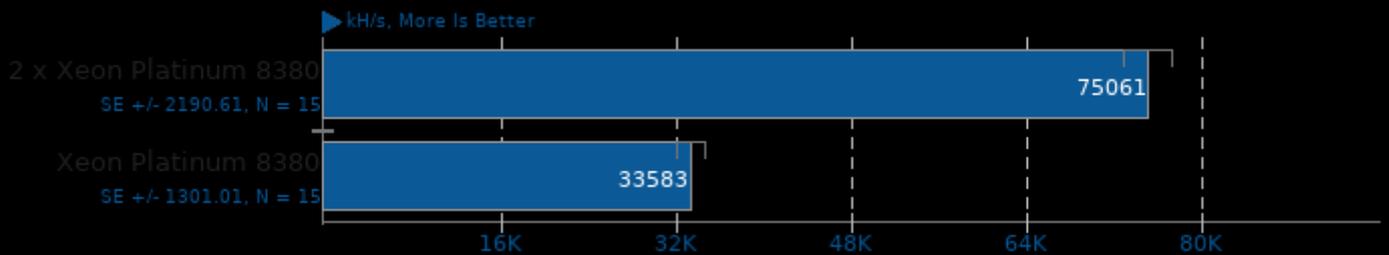
Algorithm: x25x



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

### Cpuminer-Opt 3.15.5

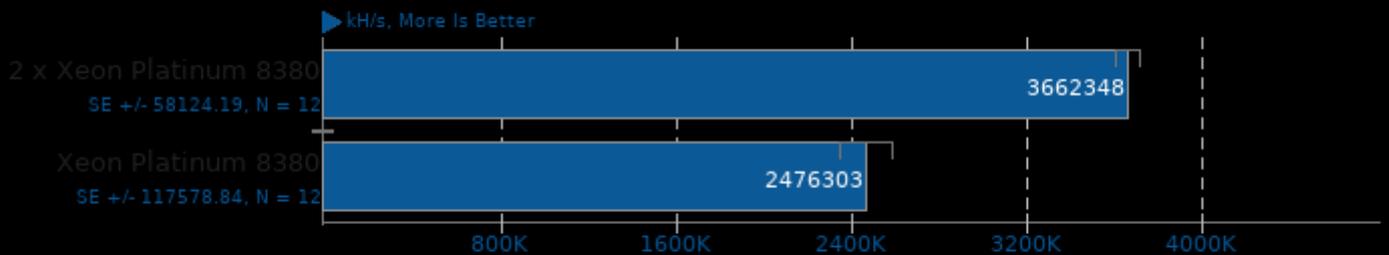
Algorithm: Deepcoin



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

### Cpuminer-Opt 3.15.5

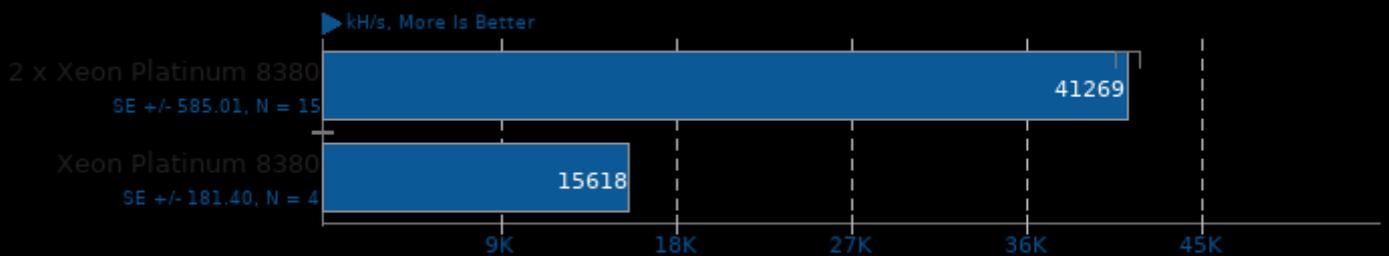
Algorithm: Blake-2 S



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

### Cpuminer-Opt 3.15.5

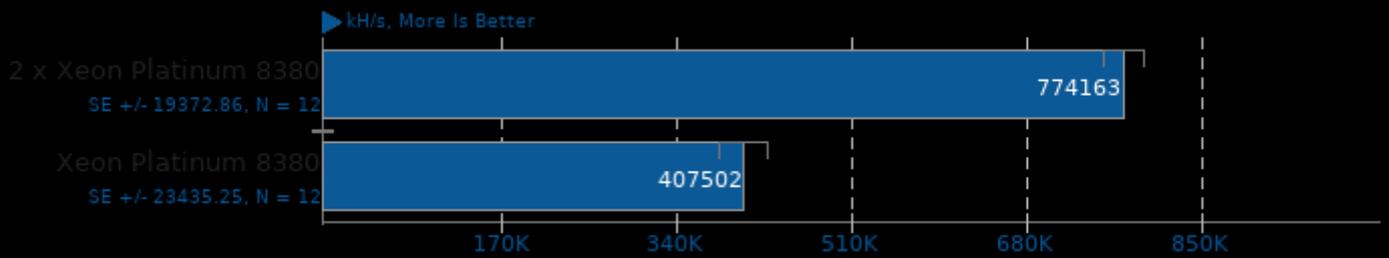
Algorithm: Garlicoin



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

### Cpuminer-Opt 3.15.5

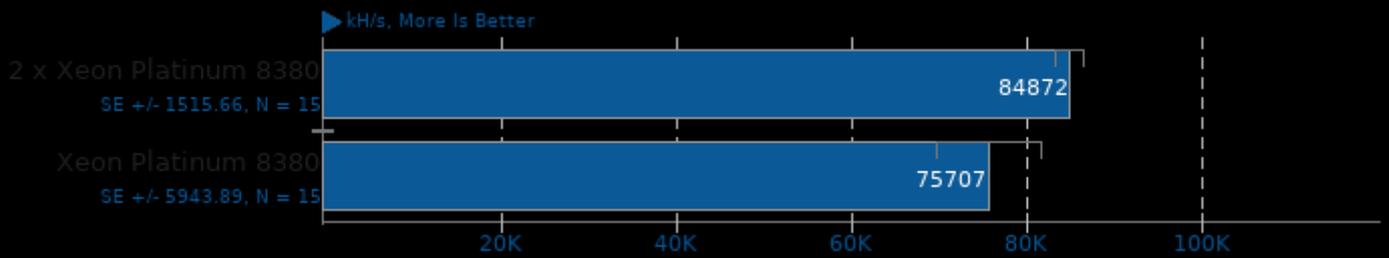
Algorithm: Skeincoin



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

### Cpuminer-Opt 3.15.5

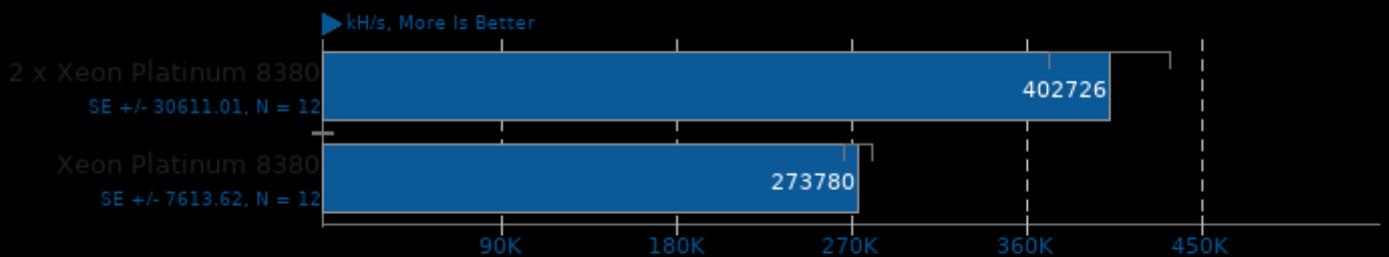
Algorithm: Myriad-Groestl



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

### Cpuminer-Opt 3.15.5

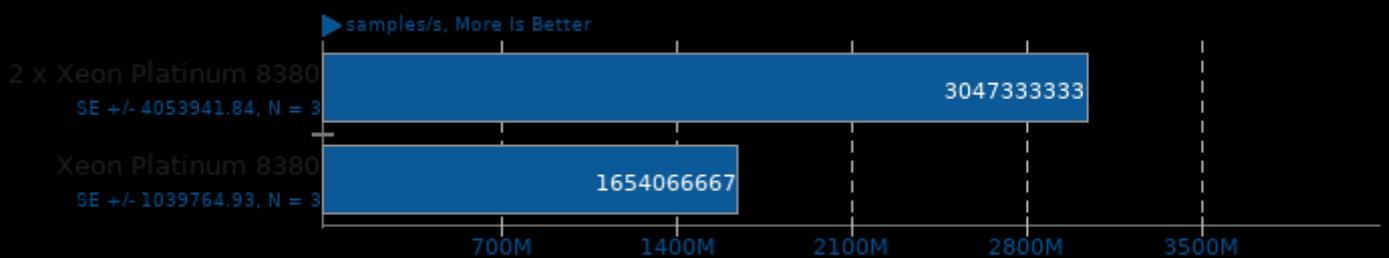
Algorithm: LBC, LBRY Credits



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

### Liquid-DSP 2021.01.31

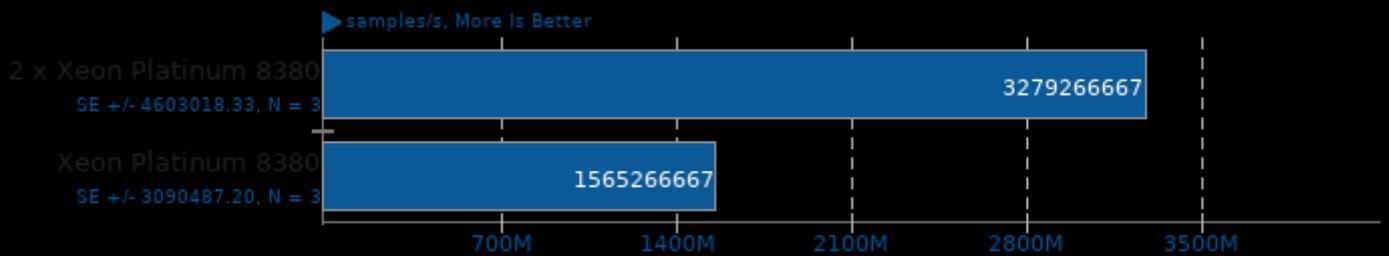
Threads: 64 - Buffer Length: 256 - Filter Length: 57



1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid

### Liquid-DSP 2021.01.31

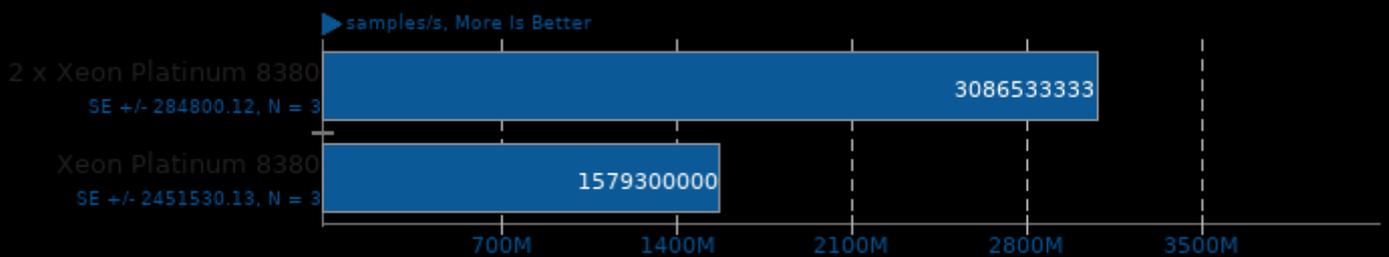
Threads: 128 - Buffer Length: 256 - Filter Length: 57



1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid

### Liquid-DSP 2021.01.31

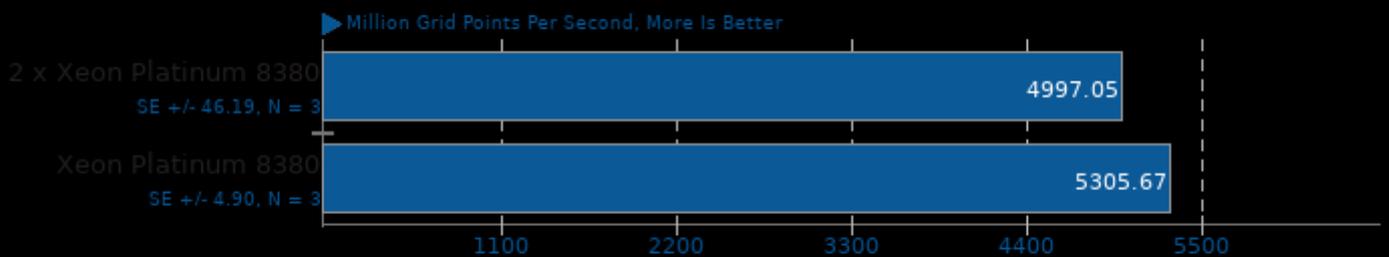
Threads: 160 - Buffer Length: 256 - Filter Length: 57



1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid

### ASKAP 1.0

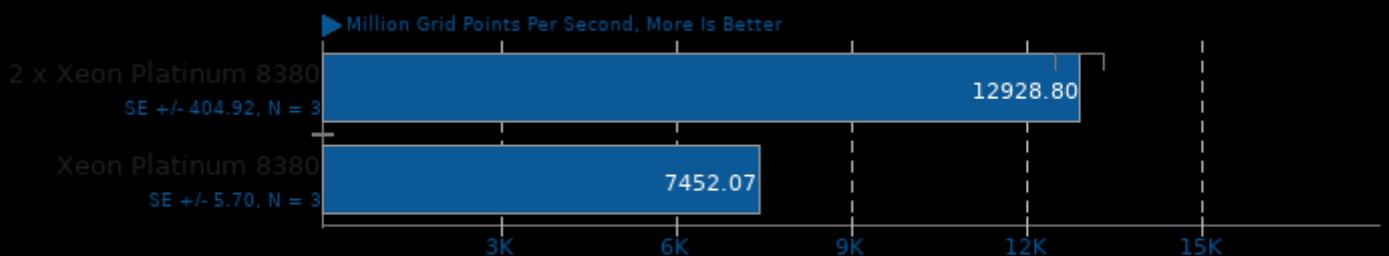
Test: tConvolve MT - Gridding



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

### ASKAP 1.0

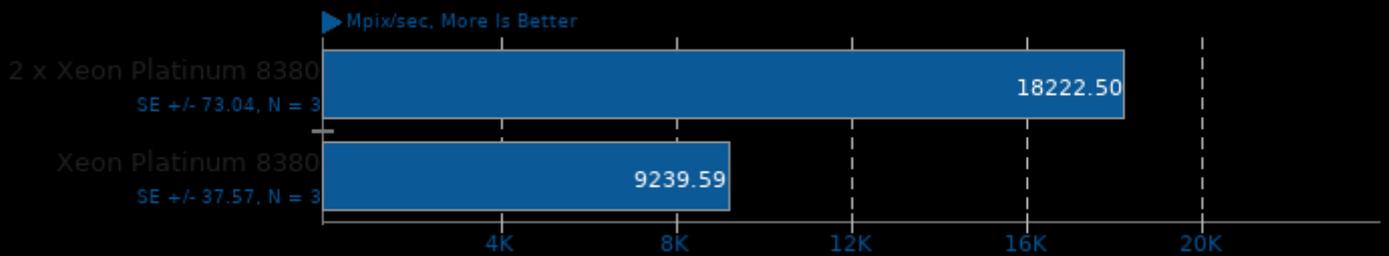
Test: tConvolve MT - Degriding



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

### ASKAP 1.0

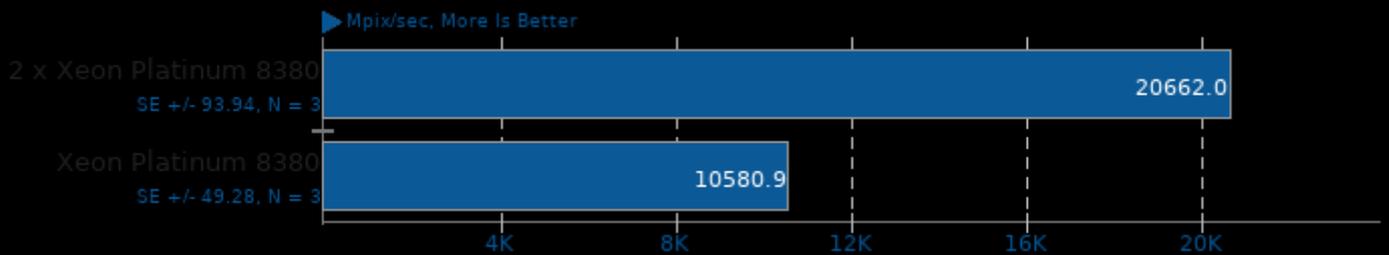
Test: tConvolve MPI - Degriding



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

### ASKAP 1.0

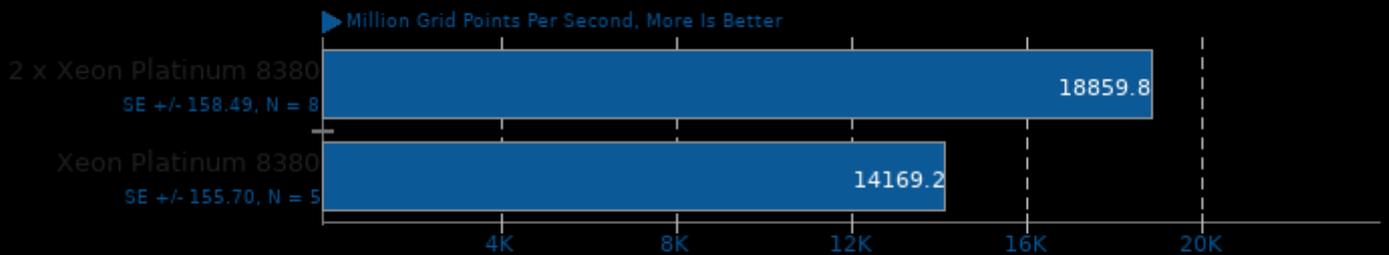
Test: tConvolve MPI - Gridding



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

### ASKAP 1.0

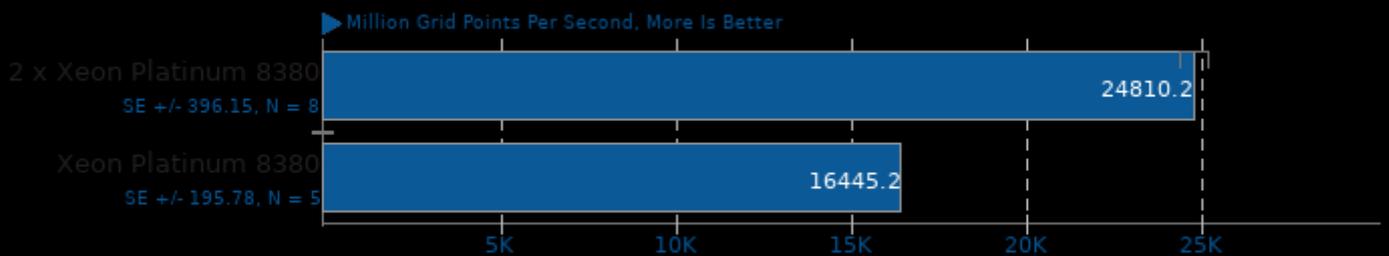
Test: tConvolve OpenMP - Gridding



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

### ASKAP 1.0

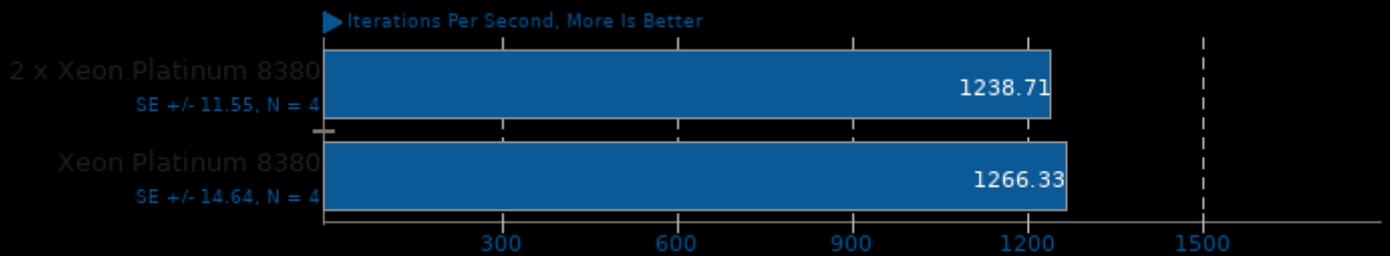
Test: tConvolve OpenMP - Degriding



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

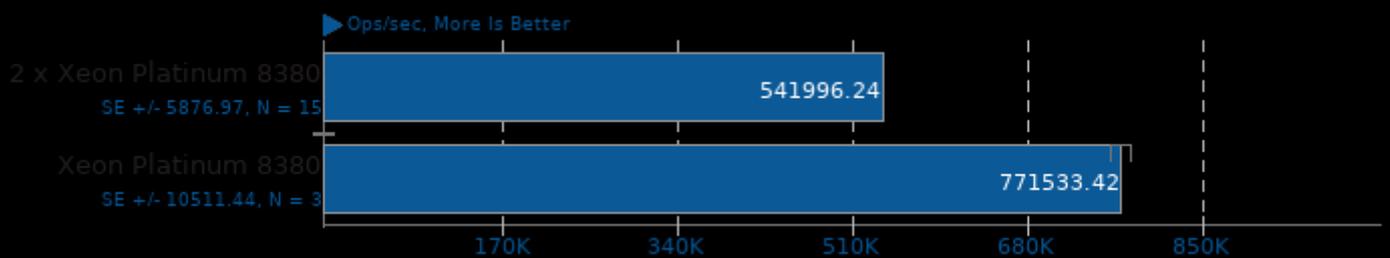
## ASKAP 1.0

Test: Hogbom Clean OpenMP



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

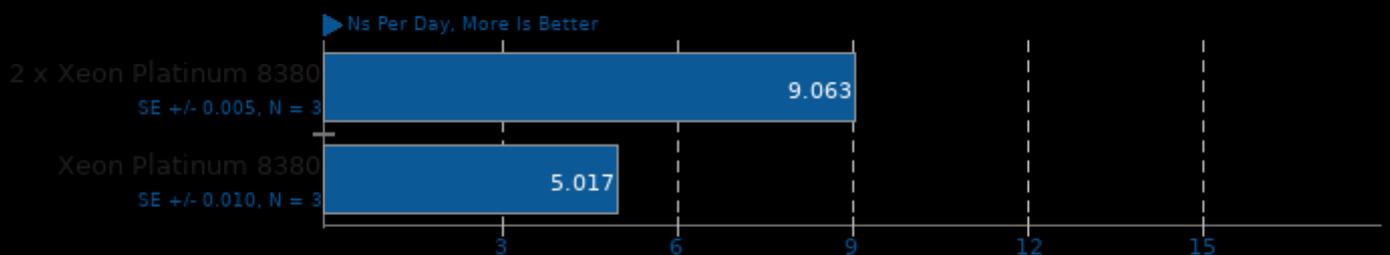
## KeyDB 6.0.16



1. (CXX) g++ options: -O2 -levent\_openssl -levent -lcrypto -lssl -lpthread -lz -lpre

## GROMACS 2021.2

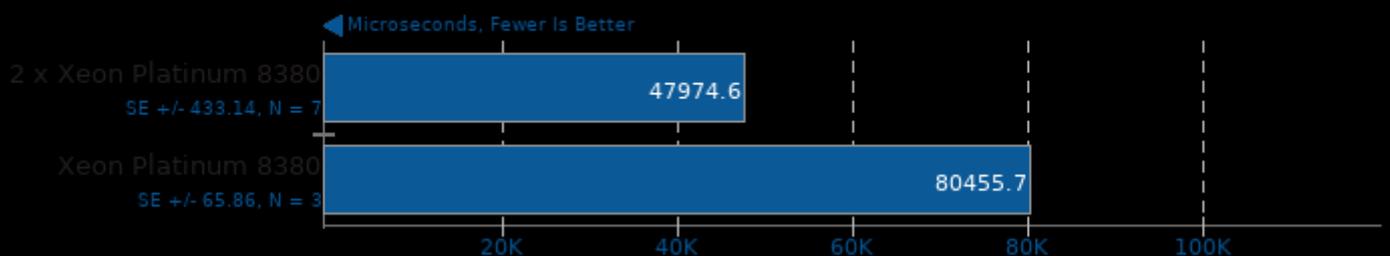
Implementation: MPI CPU - Input: water\_GMX50\_bare



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

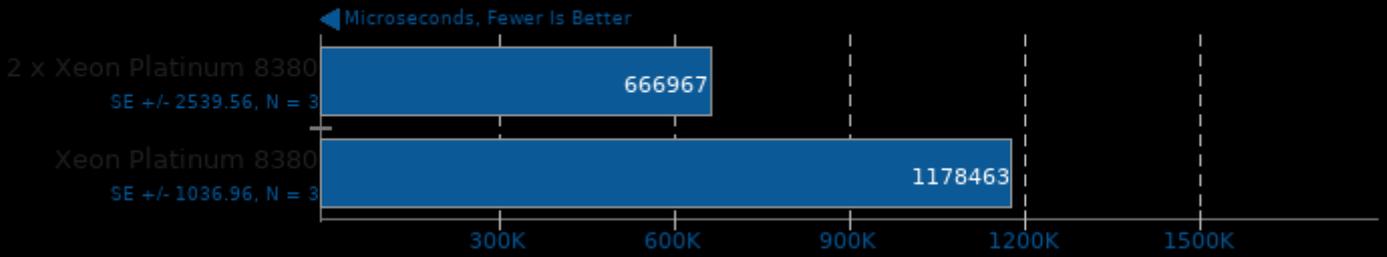
## TensorFlow Lite 2020-08-23

Model: SqueezeNet



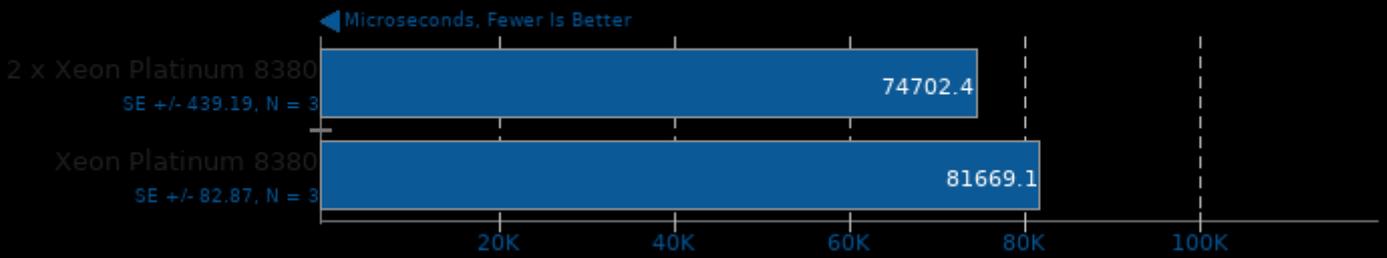
### TensorFlow Lite 2020-08-23

Model: Inception V4



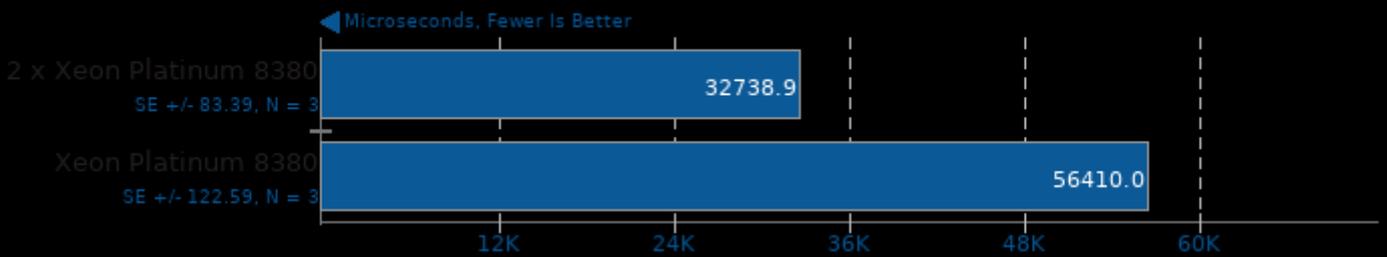
### TensorFlow Lite 2020-08-23

Model: NASNet Mobile



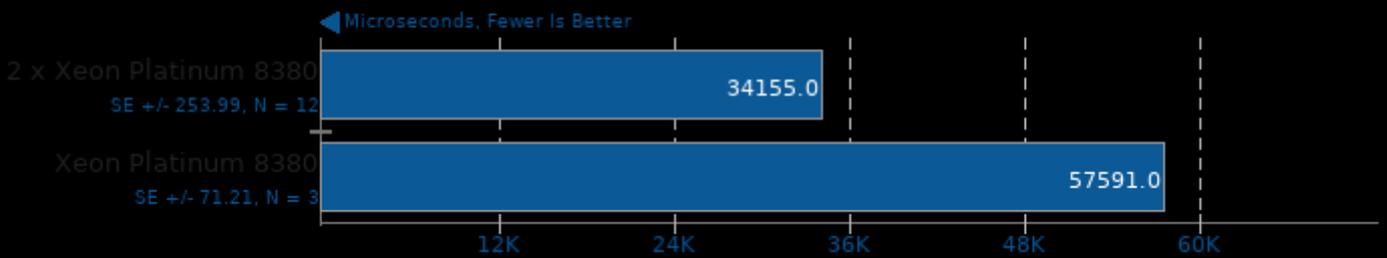
### TensorFlow Lite 2020-08-23

Model: Mobilenet Float



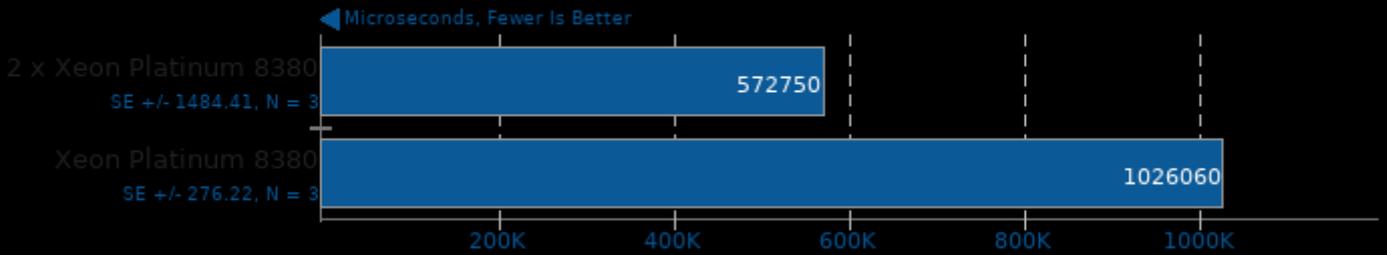
### TensorFlow Lite 2020-08-23

Model: Mobilenet Quant



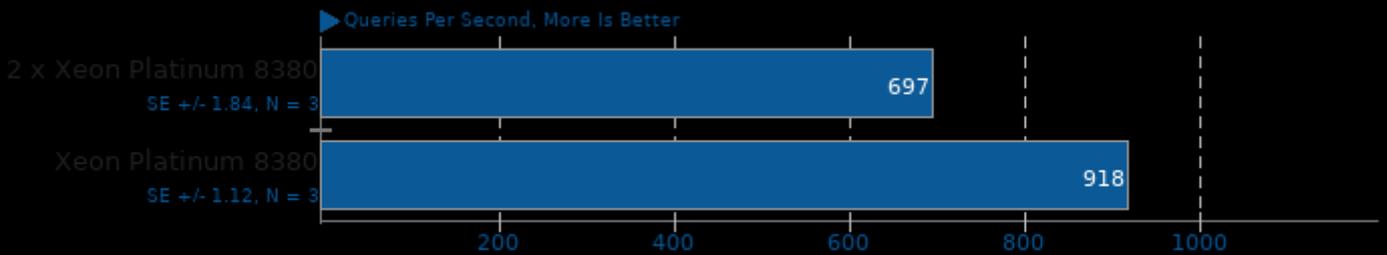
### TensorFlow Lite 2020-08-23

Model: Inception ResNet V2



### MariaDB 10.5.2

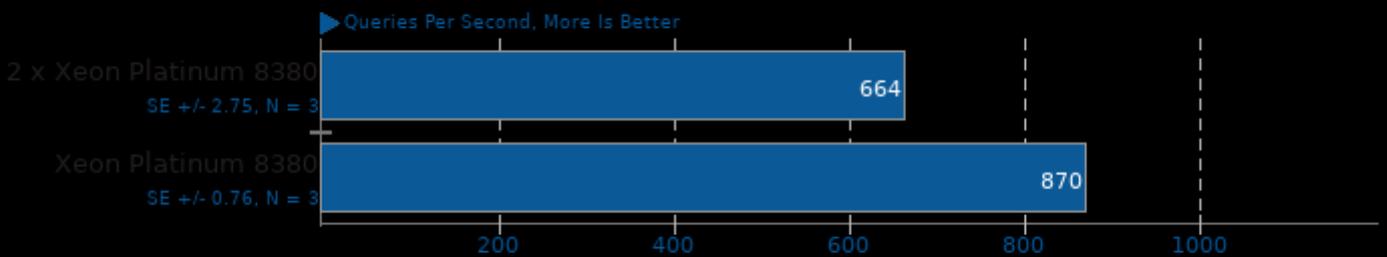
Clients: 256



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

### MariaDB 10.5.2

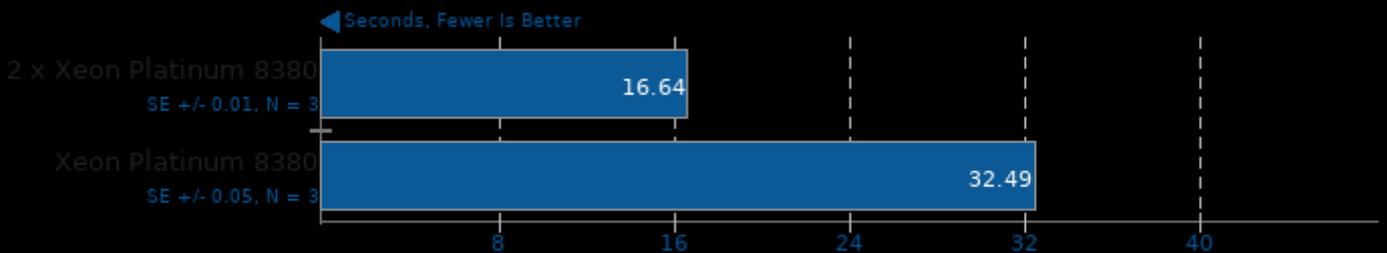
Clients: 512



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

### ASTC Encoder 2.4

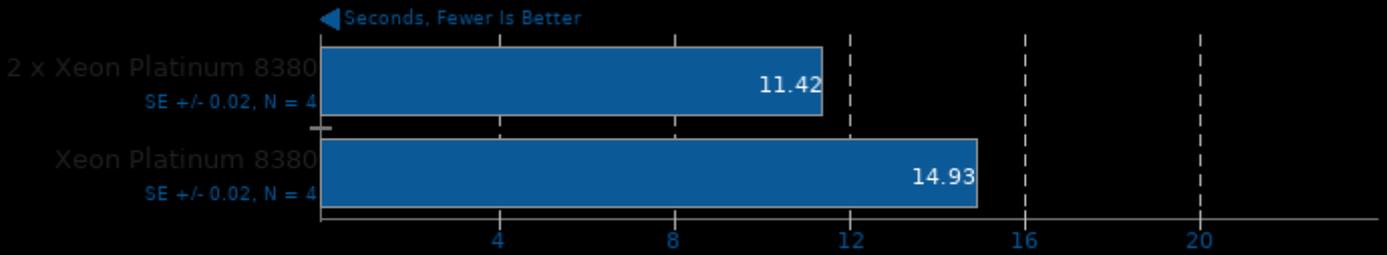
Preset: Exhaustive



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

### Basis Universal 1.13

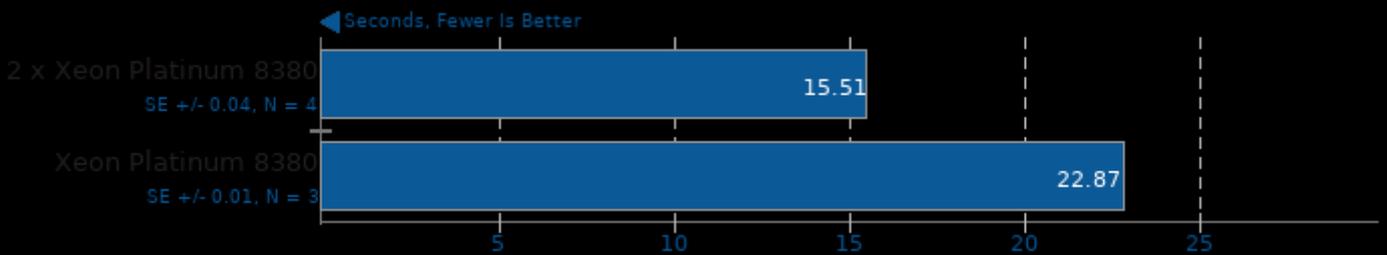
Settings: UASTC Level 2



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

### Basis Universal 1.13

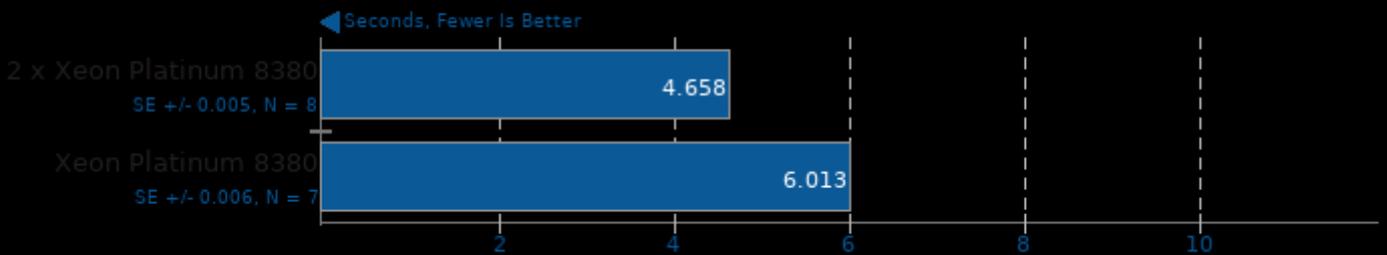
Settings: UASTC Level 3



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

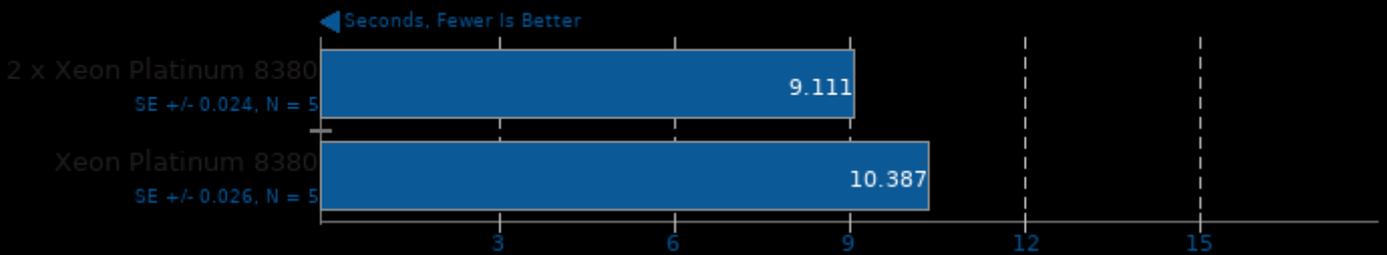
### KTX-Software toktx 4.0

Settings: UASTC 3



### KTX-Software toktx 4.0

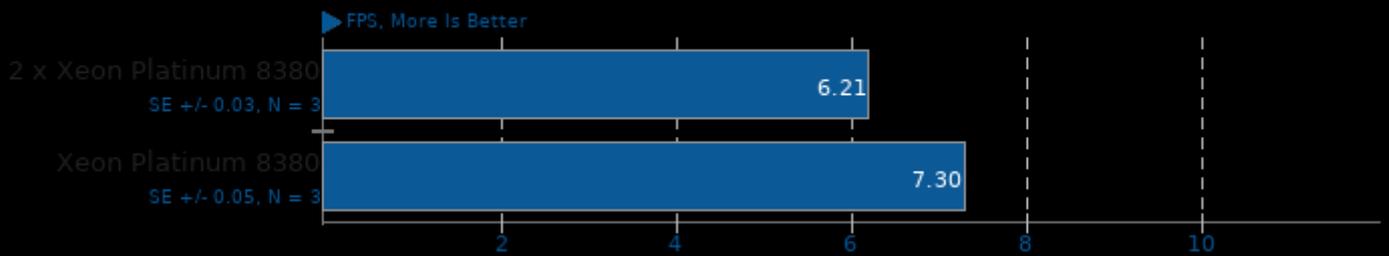
Settings: UASTC 3 + Zstd Compression 19





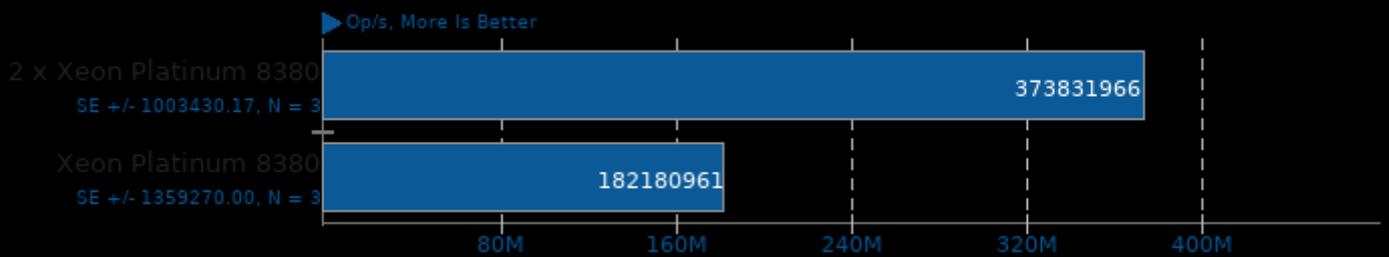
### PlaidML

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



### Facebook RocksDB 6.3.6

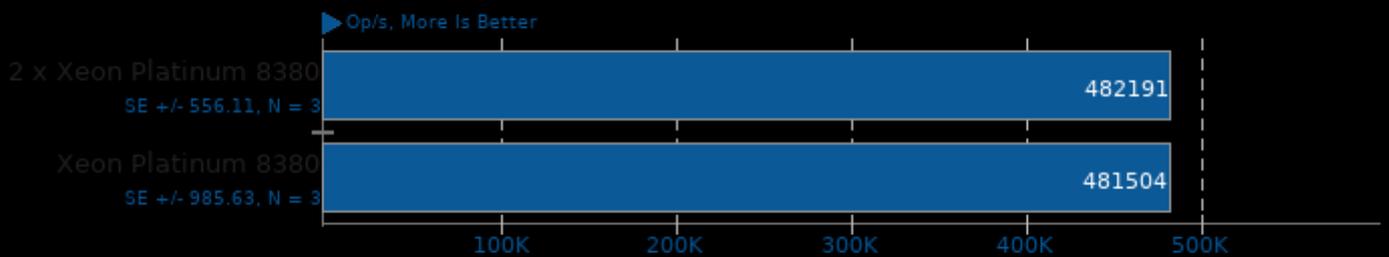
Test: Random Read



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

### Facebook RocksDB 6.3.6

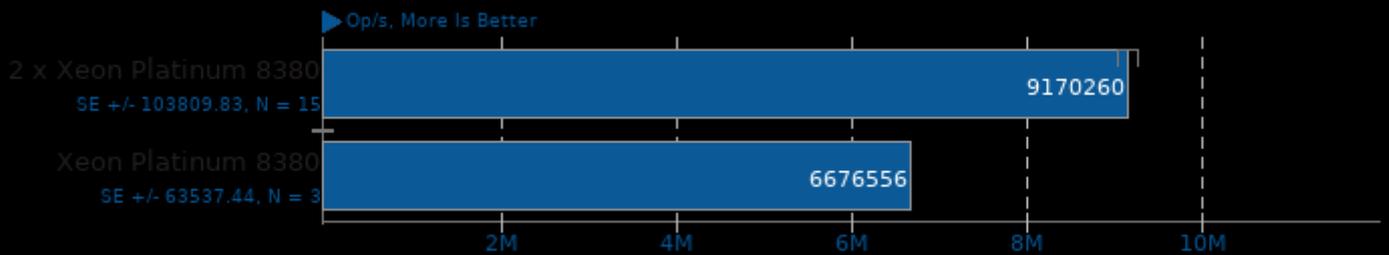
Test: Random Fill Sync



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

### Facebook RocksDB 6.3.6

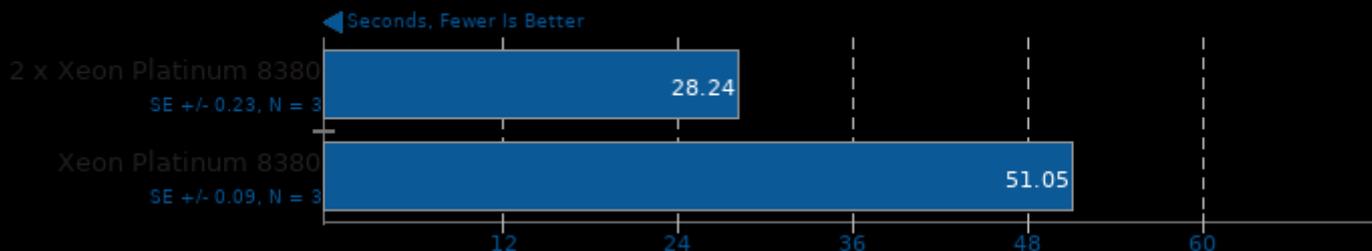
Test: Read While Writing



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

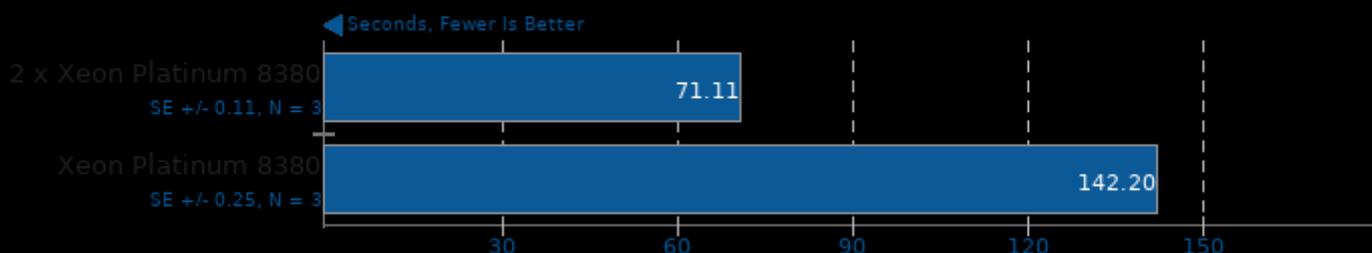
### Blender 2.92

Blend File: BMW27 - Compute: CPU-Only



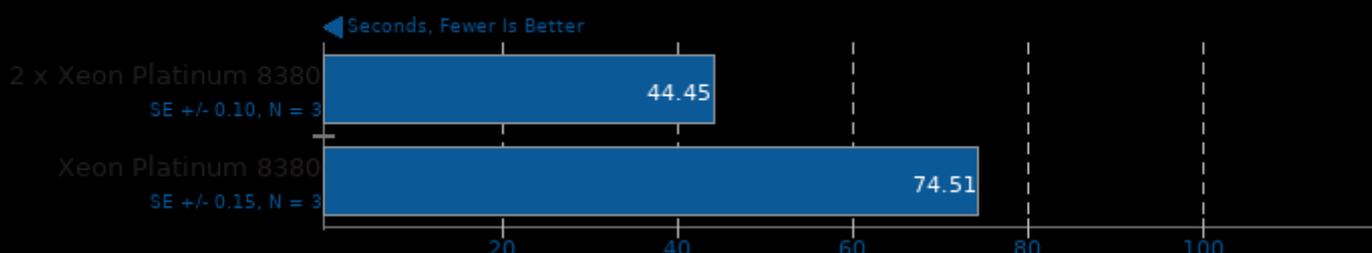
### Blender 2.92

Blend File: Classroom - Compute: CPU-Only



### Blender 2.92

Blend File: Fishy Cat - Compute: CPU-Only



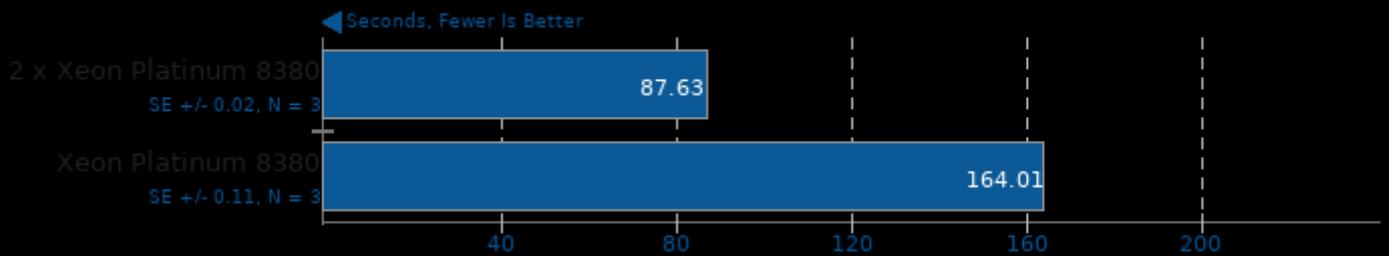
### Blender 2.92

Blend File: Barbershop - Compute: CPU-Only



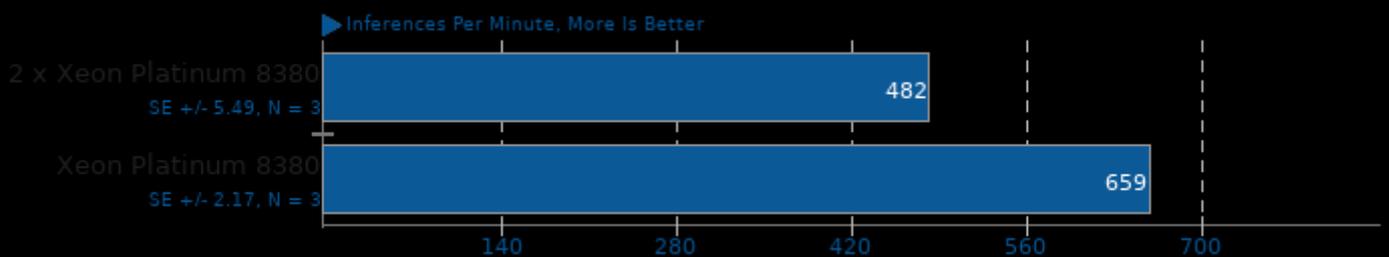
## Blender 2.92

Blend File: Pabellon Barcelona - Compute: CPU-Only



## ONNX Runtime 1.6

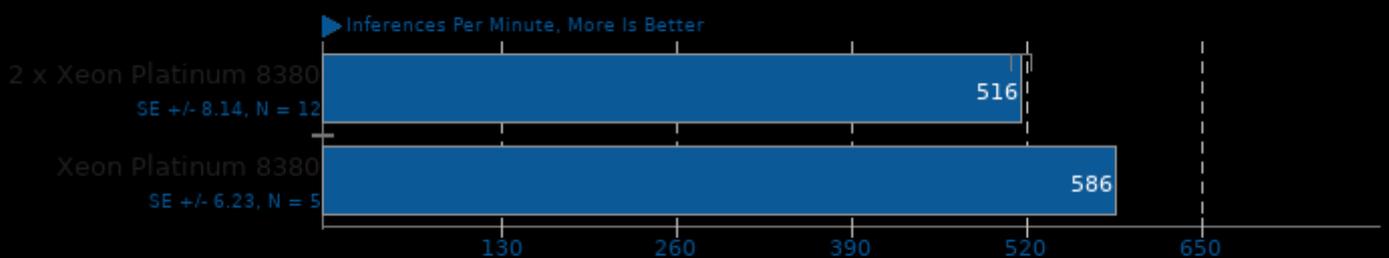
Model: yolov4 - Device: OpenMP CPU



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

## ONNX Runtime 1.6

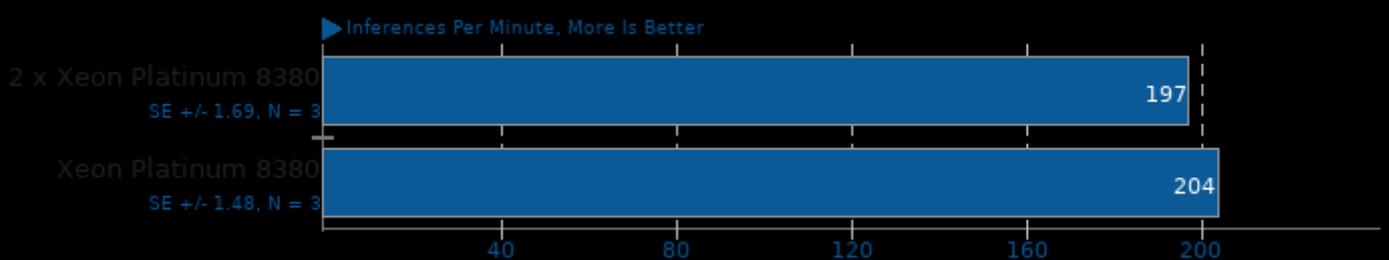
Model: bertsquad-10 - Device: OpenMP CPU



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

## ONNX Runtime 1.6

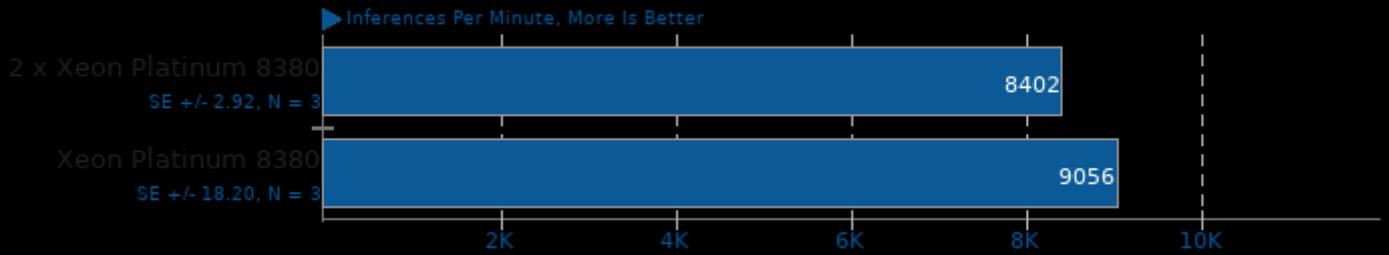
Model: fc-resnet101-11 - Device: OpenMP CPU



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

### ONNX Runtime 1.6

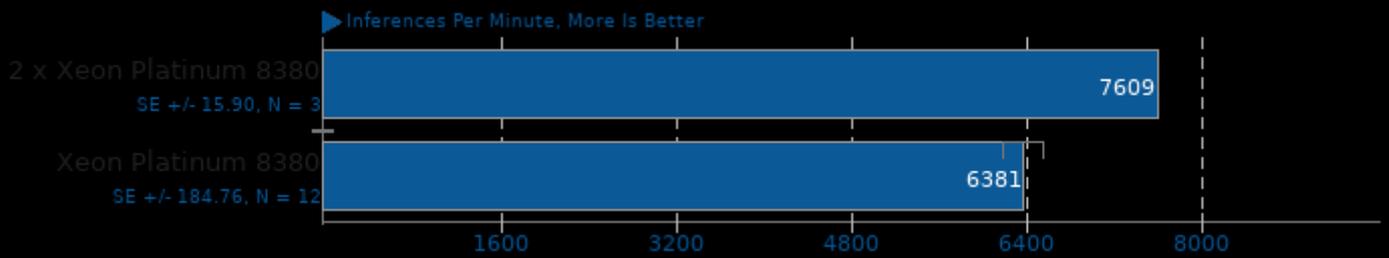
Model: shufflenet-v2-10 - Device: OpenMP CPU



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

### ONNX Runtime 1.6

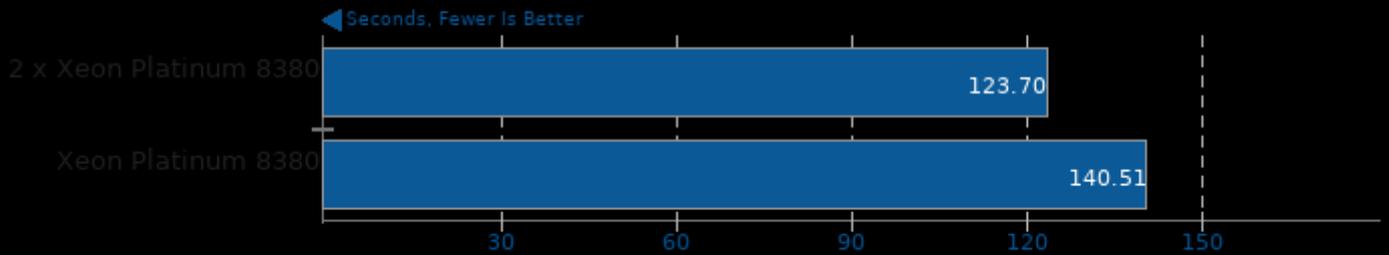
Model: super-resolution-10 - Device: OpenMP CPU



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

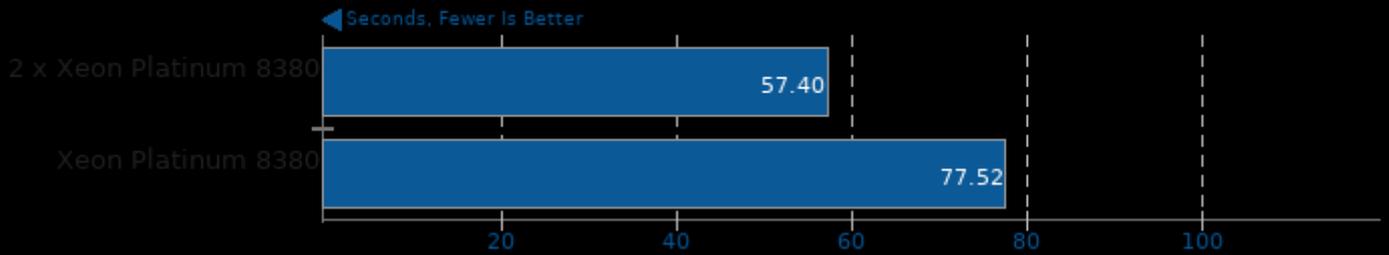
### Appleseed 2.0 Beta

Scene: Emily



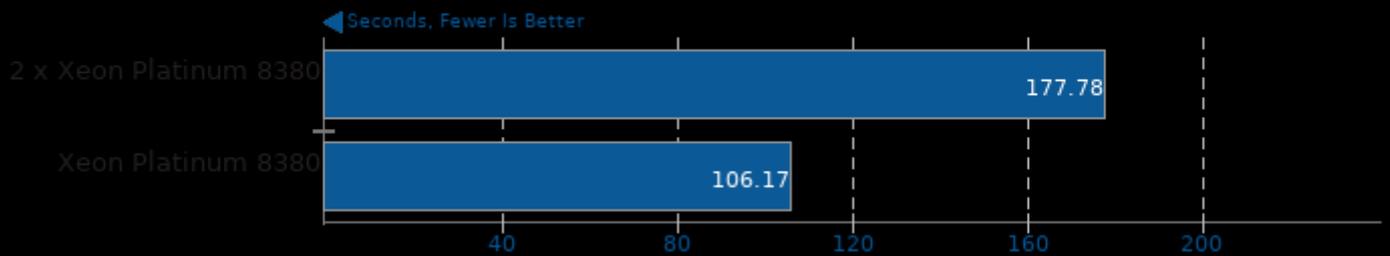
### Appleseed 2.0 Beta

Scene: Disney Material

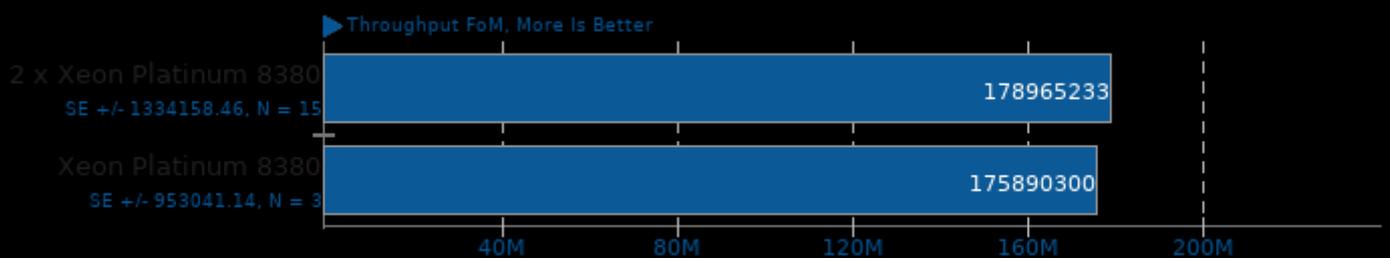


### Appleseed 2.0 Beta

Scene: Material Tester



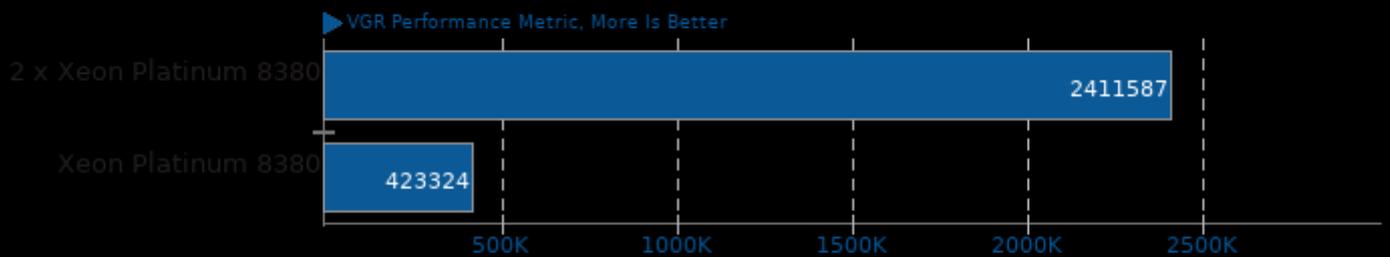
### Kripke 1.2.4



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

### BRL-CAD 7.32.2

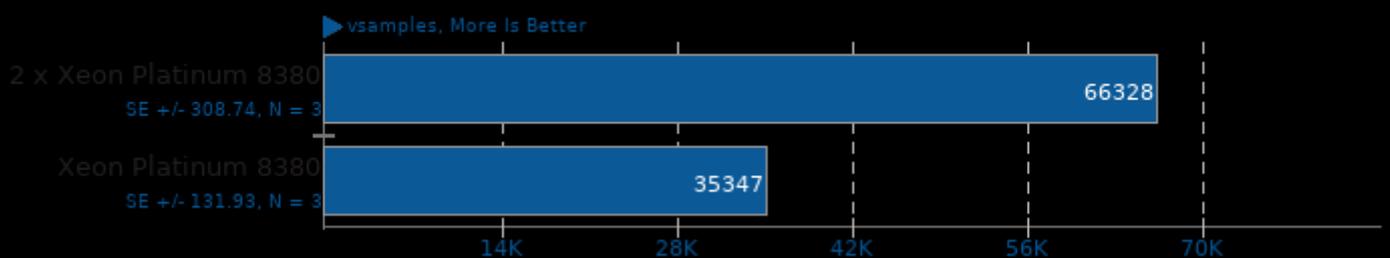
VGR Performance Metric



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

### Chaos Group V-RAY 5

Mode: CPU



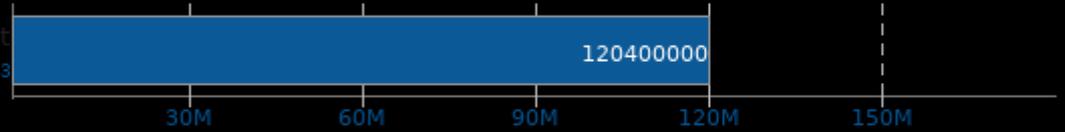
### srsRAN 21.04

Test: OFDM\_Test

► Samples / Second, More Is Better

Xeon Platinum 8380 rest

SE +/- 305505.05, N = 3



1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

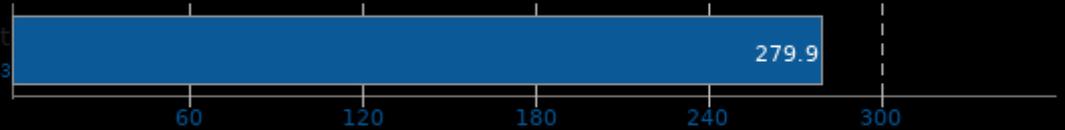
### srsRAN 21.04

Test: 4G PHY\_DL\_Test 100 PRB MIMO 64-QAM

► eNb Mb/s, More Is Better

Xeon Platinum 8380 rest

SE +/- 0.25, N = 3



1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

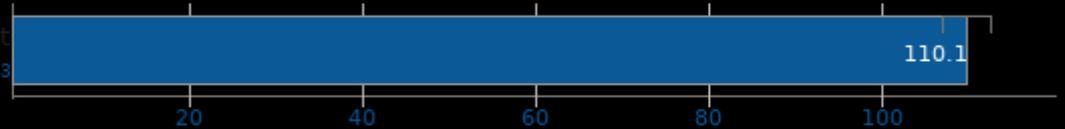
### srsRAN 21.04

Test: 4G PHY\_DL\_Test 100 PRB MIMO 64-QAM

► UE Mb/s, More Is Better

Xeon Platinum 8380 rest

SE +/- 2.67, N = 3



1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

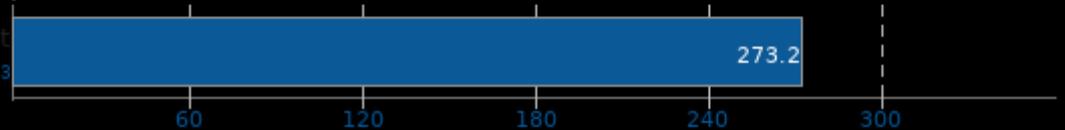
### srsRAN 21.04

Test: 4G PHY\_DL\_Test 100 PRB SISO 64-QAM

► eNb Mb/s, More Is Better

Xeon Platinum 8380 rest

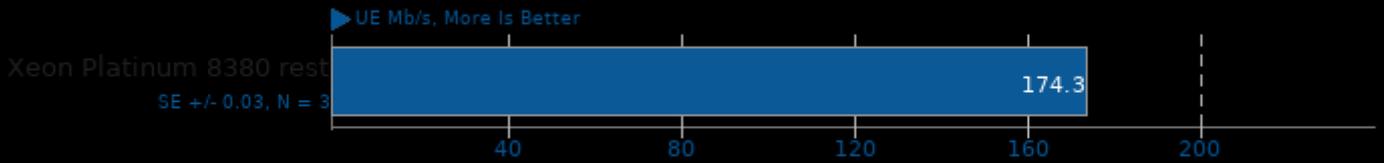
SE +/- 0.45, N = 3



1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

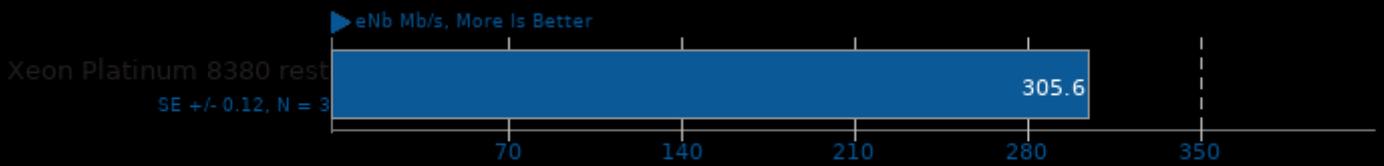
### srsRAN 21.04

Test: 4G PHY\_DL\_Test 100 PRB SISO 64-QAM



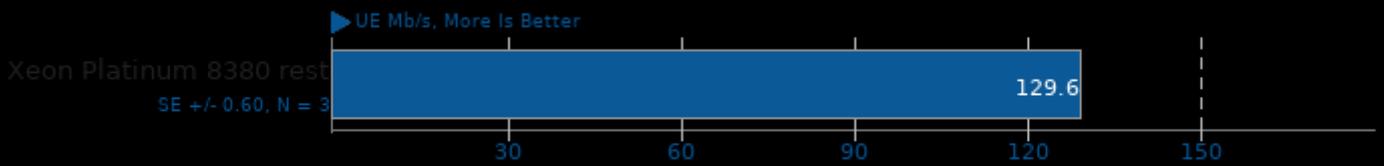
### srsRAN 21.04

Test: 4G PHY\_DL\_Test 100 PRB MIMO 256-QAM



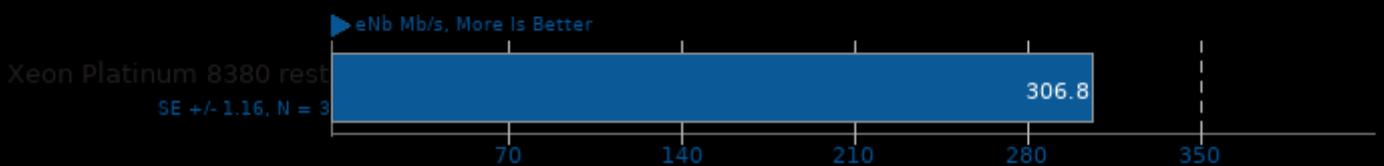
### srsRAN 21.04

Test: 4G PHY\_DL\_Test 100 PRB MIMO 256-QAM



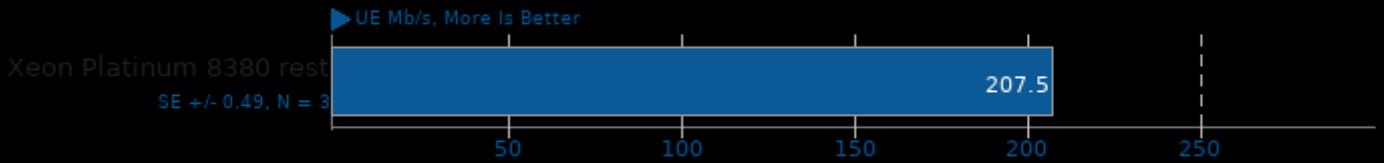
### srsRAN 21.04

Test: 4G PHY\_DL\_Test 100 PRB SISO 256-QAM



### srsRAN 21.04

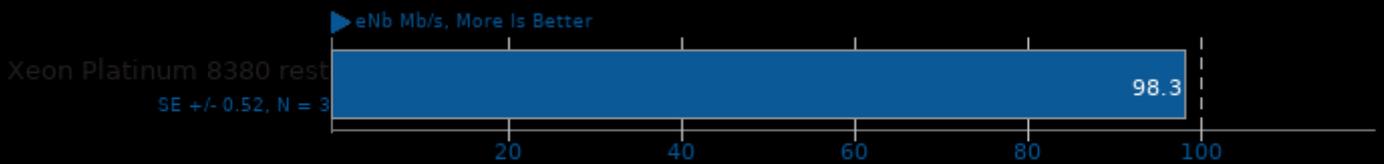
Test: 4G PHY\_DL\_Test 100 PRB SISO 256-QAM



1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

### srsRAN 21.04

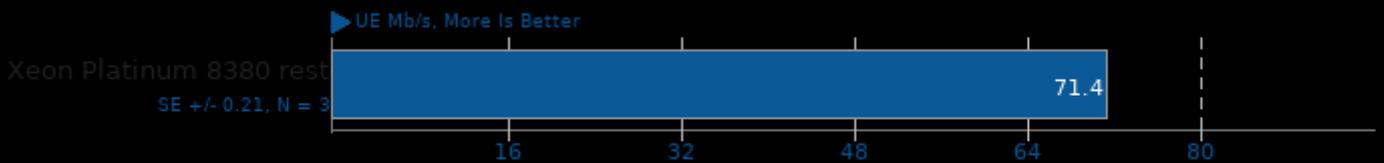
Test: 5G PHY\_DL\_NR Test 52 PRB SISO 64-QAM



1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

### srsRAN 21.04

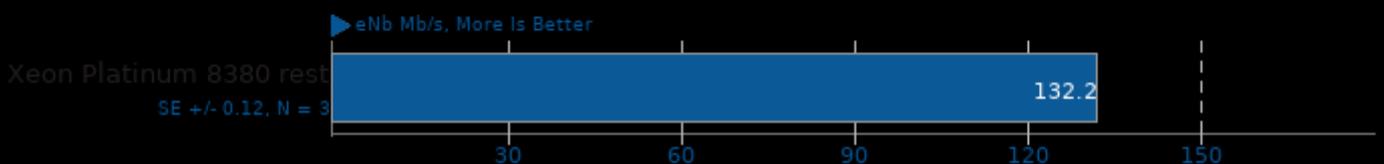
Test: 5G PHY\_DL\_NR Test 52 PRB SISO 64-QAM



1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

### srsRAN 21.04

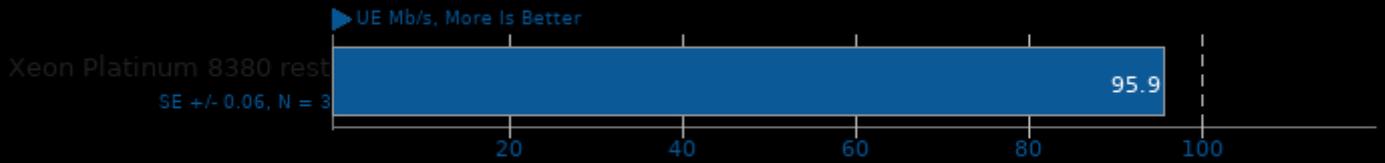
Test: 5G PHY\_DL\_NR Test 270 PRB SISO 256-QAM



1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

### srsRAN 21.04

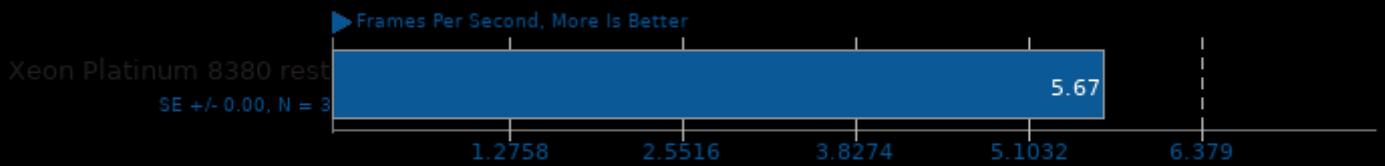
Test: 5G PHY\_DL\_NR Test 270 PRB SISO 256-QAM



1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno

### VP9 libvpx Encoding 1.10.0

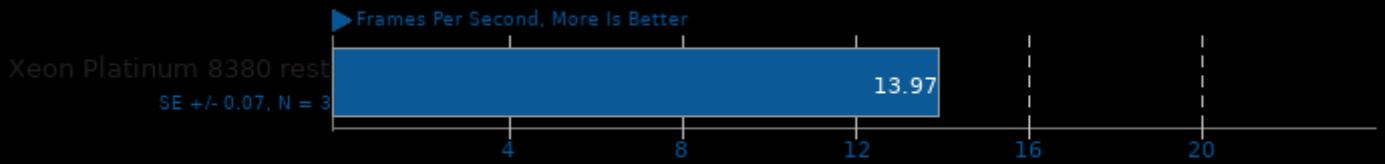
Speed: Speed 0 - Input: Bosphorus 4K



1. (CXX) g++ options: -m64 -lm -lpthread -O3 -fPIC -U\_FORTIFY\_SOURCE -std=gnu++11

### VP9 libvpx Encoding 1.10.0

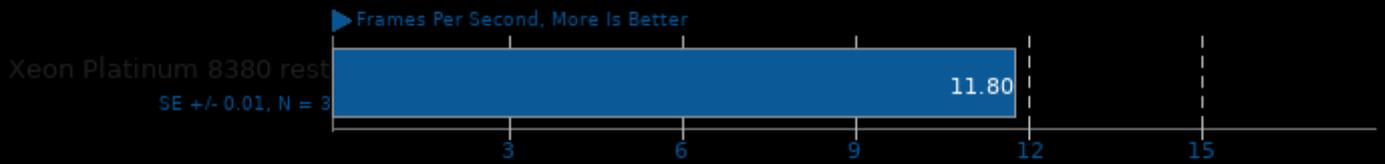
Speed: Speed 5 - Input: Bosphorus 4K



1. (CXX) g++ options: -m64 -lm -lpthread -O3 -fPIC -U\_FORTIFY\_SOURCE -std=gnu++11

### VP9 libvpx Encoding 1.10.0

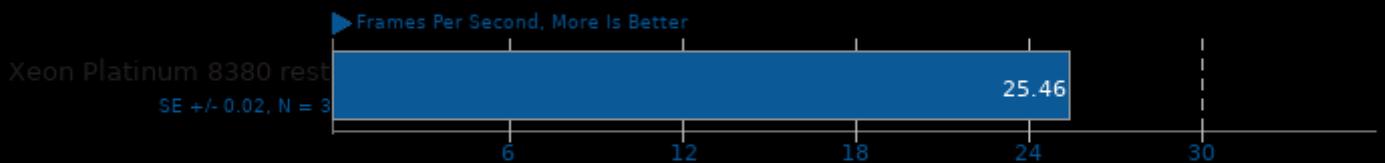
Speed: Speed 0 - Input: Bosphorus 1080p



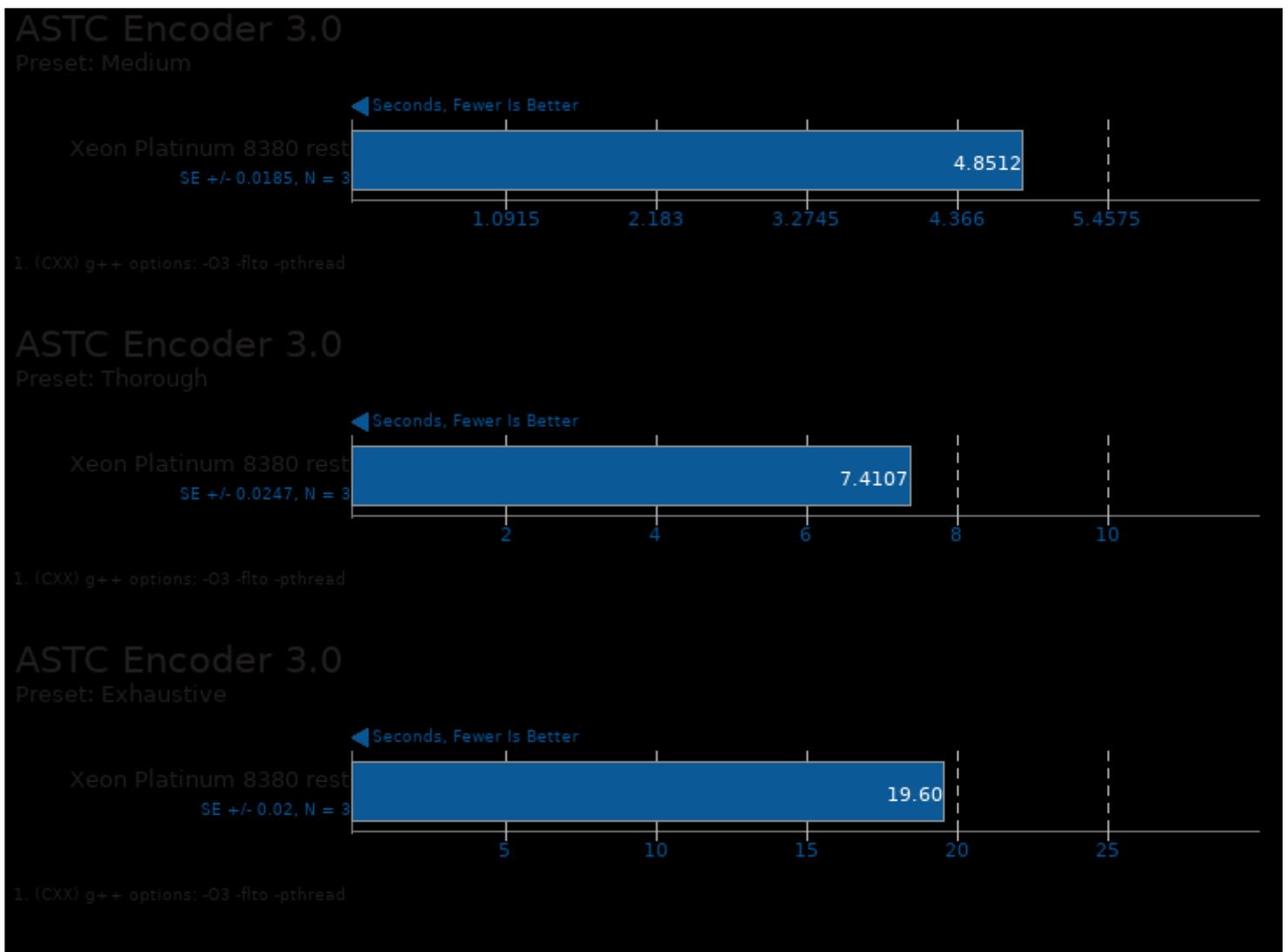
1. (CXX) g++ options: -m64 -lm -lpthread -O3 -fPIC -U\_FORTIFY\_SOURCE -std=gnu++11

### VP9 libvpx Encoding 1.10.0

Speed: Speed 5 - Input: Bosphorus 1080p



1. (CXX) g++ options: -m64 -lm -lpthread -O3 -fPIC -U\_FORTIFY\_SOURCE -std=gnu++11



This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 19:11.