



## 990KS March

Intel Core i9-9900KS testing with a ASUS PRIME Z390-A (1502 BIOS) and ASUS Intel UHD 630 CFL GT2 3GB on Ubuntu 20.04 via the Phoronix Test Suite.

### Automated Executive Summary

*1 had the most wins, coming in first place for 49% of the tests.*

*Based on the geometric mean of all complete results, the fastest (1) was 1.001x the speed of the slowest (2). 3 was 0.999x the speed of 1 and 2 was 1x the speed of 3.*

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

*Zstd Compression (Compression Level: 8, Long Mode - Compression Speed) at 1.044x*

*AOM AV1 (Encoder Mode: Speed 8 Realtime - Input: Bosphorus 4K) at 1.042x*

*AOM AV1 (Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 1080p) at 1.03x*

*AOM AV1 (Encoder Mode: Speed 0 Two-Pass - Input: Bosphorus 1080p) at 1.027x*

*SHOC Scalable Heterogeneous Computing (Target: OpenCL - Benchmark: Triad) at 1.024x*

*OpenSCAD (Render: Projector Mount Swivel) at 1.022x*

*dav1d (Video Input: Chimera 1080p 10-bit) at 1.022x*

*AOM AV1 (Encoder Mode: Speed 9 Realtime - Input: Bosphorus 4K) at 1.021x*

*AOM AV1 (Encoder Mode: Speed 8 Realtime - Input: Bosphorus 1080p) at 1.02x*

Zstd Compression (Compression Level: 3, Long Mode - Compression Speed) at 1.017x.

## Test Systems:

1

2

3

Processor: Intel Core i9-9900KS @ 5.00GHz (8 Cores / 16 Threads), Motherboard: ASUS PRIME Z390-A (1502 BIOS), Chipset: Intel Cannon Lake PCH, Memory: 32GB, Disk: 240GB Corsair Force MP510, Graphics: ASUS Intel UHD 630 CFL GT2 3GB (1200MHz), Audio: Realtek ALC1220, Monitor: G237HL, Network: Intel I219-V

OS: Ubuntu 20.04, Kernel: 5.9.0-050900rc8daily20201005-generic (x86\_64) 20201004, Desktop: GNOME Shell 3.36.2, Display Server: X Server 1.20.8, OpenGL: 4.6 Mesa 20.2.6, OpenCL: OpenCL 2.1, Compiler: GCC 9.3.0, 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-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86\_64-linux-gnu --program-prefix=x86\_64-linux-gnu- --target=x86\_64-linux-gnu --with-abi=m64 --with-arch=32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: intel\_pstate powersave - CPU Microcode: 0xcc - Thermald 1.9.1

Python Notes: Python 2.7.18rc1 + Python 3.8.2

Security Notes: itlb\_multihit: KVM: Mitigation of VMX unsupported + 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: Mitigation of TSX disabled + tsx\_async\_abort: Mitigation of TSX disabled

	1	2	3
<b>AOM AV1 - Speed 0 Two-Pass - Bosphorus</b>	0.12	0.12	0.12
<b>4K (FPS)</b>			
Standard Deviation	0%	0%	0%
<b>AOM AV1 - Speed 4 Two-Pass - Bosphorus</b>	<b>3.42</b>	3.41	<b>3.39</b>
<b>4K (FPS)</b>			
Normalized	100%	99.71%	99.12%
Standard Deviation	0.9%	1.2%	0.5%
<b>AOM AV1 - Speed 6 Realtime - Bosphorus</b>	<b>13.16</b>	<b>13.12</b>	13.14
<b>4K (FPS)</b>			
Normalized	100%	99.7%	99.85%
Standard Deviation	0.3%	0.2%	0.1%
<b>AOM AV1 - Speed 6 Two-Pass - Bosphorus</b>	<b>6.34</b>	6.32	<b>6.30</b>
<b>4K (FPS)</b>			
Normalized	100%	99.68%	99.37%
Standard Deviation	0.2%	0.5%	0.4%

<b>AOM AV1 - Speed 8 Realtime - Bosphorus</b>	<b>38.68</b>	37.94	<b>37.12</b>
<b>4K (FPS)</b>			
Normalized	100%	98.09%	95.97%
Standard Deviation	0.2%	0.3%	2.8%
<b>AOM AV1 - Speed 9 Realtime - Bosphorus</b>	<b>47.78</b>	48.72	<b>48.78</b>
<b>4K (FPS)</b>			
Normalized	97.95%	99.88%	100%
Standard Deviation	4.3%	0.4%	0.2%
<b>AOM AV1 - Speed 0 Two-Pass - Bosphorus</b>	<b>0.38</b>	<b>0.37</b>	<b>0.38</b>
<b>1080p (FPS)</b>			
Normalized	100%	97.37%	100%
Standard Deviation	1.5%	1.5%	0%
<b>AOM AV1 - Speed 4 Two-Pass - Bosphorus</b>	<b>6.76</b>	<b>6.73</b>	6.75
<b>1080p (FPS)</b>			
Normalized	100%	99.56%	99.85%
Standard Deviation	0.2%	0.6%	0.4%
<b>AOM AV1 - Speed 6 Realtime - Bosphorus</b>	25.06	<b>24.95</b>	<b>25.07</b>
<b>1080p (FPS)</b>			
Normalized	99.96%	99.52%	100%
Standard Deviation	1.6%	2.6%	1.5%
<b>AOM AV1 - Speed 6 Two-Pass - Bosphorus</b>	<b>19.68</b>	<b>19.11</b>	19.21
<b>1080p (FPS)</b>			
Normalized	100%	97.1%	97.61%
Standard Deviation	1.5%	0.7%	0.1%
<b>AOM AV1 - Speed 8 Realtime - Bosphorus</b>	<b>124.39</b>	122.64	<b>121.96</b>
<b>1080p (FPS)</b>			
Normalized	100%	98.59%	98.05%
Standard Deviation	0.6%	2.7%	3.7%
<b>AOM AV1 - Speed 9 Realtime - Bosphorus</b>	<b>141.48</b>	140.39	<b>139.82</b>
<b>1080p (FPS)</b>			
Normalized	100%	99.23%	98.83%
Standard Deviation	2.8%	0.6%	2.9%
<b>ASTC Encoder - Medium (sec)</b>	<b>5.7949</b>	5.7757	<b>5.7737</b>
Normalized	99.63%	99.97%	100%
Standard Deviation	0.7%	0.2%	0.2%
<b>ASTC Encoder - Thorough (sec)</b>	<b>14.9207</b>	<b>14.9059</b>	14.9103
Normalized	99.9%	100%	99.97%
Standard Deviation	0.2%	0.3%	0.2%
<b>ASTC Encoder - Exhaustive (sec)</b>	113.8873	<b>113.7734</b>	<b>113.8933</b>
Normalized	99.9%	100%	99.89%
Standard Deviation	0.2%	0.2%	0.2%
<b>Basis Universal - ETC1S (sec)</b>	<b>23.455</b>	23.390	<b>23.367</b>
Normalized	99.62%	99.9%	100%
Standard Deviation	0.2%	0.6%	0.3%
<b>Basis Universal - UASTC Level 0 (sec)</b>	<b>7.172</b>	7.091	<b>7.089</b>
Normalized	98.84%	99.97%	100%
Standard Deviation	0%	0.1%	0.1%
<b>Basis Universal - UASTC Level 2 (sec)</b>	<b>33.461</b>	<b>33.374</b>	33.387
Normalized	99.74%	100%	99.96%
Standard Deviation	0.1%	0.5%	0.6%
<b>Basis Universal - UASTC Level 3 (sec)</b>	<b>63.543</b>	63.560	<b>63.593</b>
Normalized	100%	99.97%	99.92%
Standard Deviation	0.1%	0.1%	0.1%
<b>Botan - KASUMI (MiB/s)</b>	112.980	<b>112.943</b>	<b>112.985</b>

	Normalized	100%	99.96%	100%
	Standard Deviation	0.1%	0.1%	0.1%
Botan - KASUMI - Decrypt (MiB/s)		107.861	<b>107.764</b>	<b>107.878</b>
	Normalized	99.98%	99.89%	100%
	Standard Deviation	0.1%	0.1%	0.1%
Botan - AES-256 (MiB/s)		<b>4816</b>	<b>4815</b>	4816
	Normalized	100%	99.98%	99.99%
	Standard Deviation	0%	0%	0%
Botan - AES-256 - Decrypt (MiB/s)		<b>4806</b>	4811	<b>4812</b>
	Normalized	99.87%	99.97%	100%
	Standard Deviation	0.2%	0%	0%
Botan - Twofish (MiB/s)		436.078	<b>436.124</b>	<b>434.656</b>
	Normalized	99.99%	100%	99.66%
	Standard Deviation	0.1%	0%	0.7%
Botan - Twofish - Decrypt (MiB/s)		<b>437.297</b>	437.288	<b>436.744</b>
	Normalized	100%	100%	99.87%
	Standard Deviation	0.1%	0.1%	0.4%
Botan - Blowfish (MiB/s)		543.597	<b>543.385</b>	<b>543.951</b>
	Normalized	99.93%	99.9%	100%
	Standard Deviation	0%	0.1%	0%
Botan - Blowfish - Decrypt (MiB/s)		539.238	<b>539.017</b>	<b>539.337</b>
	Normalized	99.98%	99.94%	100%
	Standard Deviation	0%	0.1%	0%
Botan - CAST-256 (MiB/s)		171.954	<b>171.951</b>	<b>171.958</b>
	Normalized	100%	100%	100%
	Standard Deviation	0%	0%	0%
Botan - CAST-256 - Decrypt (MiB/s)		172.091	<b>172.076</b>	<b>172.150</b>
	Normalized	99.97%	99.96%	100%
	Standard Deviation	0%	0%	0%
Botan - ChaCha20Poly1305 (MiB/s)		<b>916.108</b>	<b>913.025</b>	914.454
	Normalized	100%	99.66%	99.82%
	Standard Deviation	0%	0.6%	0.3%
Botan - ChaCha20Poly1305 - Decrypt (MiB/s)		908.311	<b>907.952</b>	<b>908.474</b>
	Normalized	99.98%	99.94%	100%
	Standard Deviation	0.1%	0.2%	0.1%
dav1d - Chimera 1080p (FPS)		<b>733.64</b>	<b>731.76</b>	732.83
	Normalized	100%	99.74%	99.89%
	Standard Deviation	0.2%	0.5%	0.2%
dav1d - Summer Nature 4K (FPS)		<b>185.13</b>	184.25	<b>184.16</b>
	Normalized	100%	99.52%	99.48%
	Standard Deviation	0.1%	0.1%	0.2%
dav1d - S.N.1 (FPS)		648.26	<b>649.67</b>	<b>647.63</b>
	Normalized	99.78%	100%	99.69%
	Standard Deviation	0.4%	0.2%	0.1%
dav1d - C.1.1.b (FPS)		<b>160.91</b>	<b>164.40</b>	163.76
	Normalized	97.88%	100%	99.61%
	Standard Deviation	0.1%	1.8%	1.5%
GNU GMP GMPbench - Total Time (GMPbench Score)		<b>6250</b>	6222	<b>6218</b>
	Normalized	100%	99.54%	99.48%
GNU Radio - F.B.t.B.F.F (MiB/s)		1190	<b>1196</b>	<b>1189</b>
	Normalized	99.56%	100%	99.43%
	Standard Deviation	1.8%	1.4%	2.2%
GNU Radio - S.S.C (MiB/s)		<b>3003</b>	<b>3011</b>	3011
	Normalized	99.73%	100%	99.99%

	Standard Deviation	0.2%	0.1%	0.2%
<b>GNU Radio - FIR Filter (MiB/s)</b>		<b>822.3</b>	820.0	<b>818.3</b>
	Normalized	100%	99.72%	99.51%
	Standard Deviation	0.3%	0.8%	0.6%
<b>GNU Radio - IIR Filter (MiB/s)</b>		<b>666.1</b>	<b>664.9</b>	665.0
	Normalized	100%	99.82%	99.83%
	Standard Deviation	0.3%	0.3%	0.2%
<b>GNU Radio - F.D.F (MiB/s)</b>		<b>836.7</b>	<b>837.7</b>	837.3
	Normalized	99.88%	100%	99.95%
	Standard Deviation	0.5%	0.4%	0.3%
<b>GNU Radio - Hilbert Transform (MiB/s)</b>		<b>618.0</b>	618.3	<b>620.2</b>
	Normalized	99.65%	99.69%	100%
	Standard Deviation	0.3%	0.7%	0.3%
<b>libavif avifenc - 0 (sec)</b>		72.074	<b>72.258</b>	<b>71.799</b>
	Normalized	99.62%	99.36%	100%
	Standard Deviation	0.4%	0.6%	0.6%
<b>libavif avifenc - 2 (sec)</b>		<b>37.253</b>	37.304	<b>37.326</b>
	Normalized	100%	99.86%	99.8%
	Standard Deviation	0.3%	0.5%	0.4%
<b>libavif avifenc - 6 (sec)</b>		<b>12.952</b>	<b>13.005</b>	12.964
	Normalized	100%	99.59%	99.91%
	Standard Deviation	0.5%	0.6%	0.2%
<b>libavif avifenc - 10 (sec)</b>		<b>3.154</b>	3.160	<b>3.170</b>
	Normalized	100%	99.81%	99.5%
	Standard Deviation	0.2%	0.5%	0.6%
<b>libavif avifenc - 6, Lossless (sec)</b>		<b>62.674</b>	<b>62.389</b>	62.396
	Normalized	99.55%	100%	99.99%
	Standard Deviation	0.4%	0.3%	0.4%
<b>libavif avifenc - 10, Lossless (sec)</b>		5.778	<b>5.771</b>	<b>5.787</b>
	Normalized	99.88%	100%	99.72%
	Standard Deviation	0.4%	0.4%	0.4%
<b>Liquid-DSP - 1 - 256 - 57 (samples/s)</b>		67629667	<b>67632333</b>	<b>67599667</b>
	Normalized	100%	100%	99.95%
	Standard Deviation	0%	0%	0.1%
<b>Liquid-DSP - 2 - 256 - 57 (samples/s)</b>		130183333	<b>130046667</b>	<b>130663333</b>
	Normalized	99.63%	99.53%	100%
	Standard Deviation	0.1%	0.5%	0%
<b>Liquid-DSP - 4 - 256 - 57 (samples/s)</b>		<b>250856667</b>	<b>251576667</b>	251473333
	Normalized	99.71%	100%	99.96%
	Standard Deviation	0.2%	0.3%	0.2%
<b>Liquid-DSP - 8 - 256 - 57 (samples/s)</b>		452713333	<b>452073333</b>	<b>453086667</b>
	Normalized	99.92%	99.78%	100%
	Standard Deviation	0.6%	0.2%	0.8%
<b>Liquid-DSP - 16 - 256 - 57 (samples/s)</b>		<b>500333333</b>	500263333	<b>500016667</b>
	Normalized	100%	99.99%	99.94%
	Standard Deviation	0.1%	0.1%	0.1%
<b>LuaRadio - F.B.t.B.F.F (MiB/s)</b>		<b>1298</b>	1292	<b>1292</b>
	Normalized	100%	99.58%	99.53%
	Standard Deviation	0.4%	0.4%	0.7%
<b>LuaRadio - F.D.F (MiB/s)</b>		<b>486.8</b>	487.7	<b>489.5</b>
	Normalized	99.45%	99.63%	100%
	Standard Deviation	0.7%	0.7%	0.1%
<b>LuaRadio - Hilbert Transform (MiB/s)</b>		87.2	<b>87.1</b>	<b>87.5</b>
	Normalized	99.66%	99.54%	100%
	Standard Deviation	0.1%	0.1%	0.6%

LuaRadio - Complex Phase (MiB/s)	704.2	700.2	698.1
Normalized	100%	99.43%	99.13%
Standard Deviation	1.5%	1.7%	2.8%
Mobile Neural Network - SqueezeNetV1.0	4.899	4.882	4.943
Normalized	99.65%	100%	98.77%
Standard Deviation	1%	1.1%	1%
Mobile Neural Network - resnet-v2-50 (ms)	25.308	25.254	25.414
Normalized	99.79%	100%	99.37%
Standard Deviation	0.3%	0.2%	0.3%
Mobile Neural Network - MobileNetV2_224	2.672	2.655	2.683
Normalized	99.36%	100%	98.96%
Standard Deviation	4.1%	3.3%	4.1%
Mobile Neural Network - mobilenet-v1-1.0	2.329	2.333	2.346
Normalized	100%	99.83%	99.28%
Standard Deviation	0.5%	0.5%	0.7%
Mobile Neural Network - inception-v3 (ms)	29.447	29.670	29.795
Normalized	100%	99.25%	98.83%
Standard Deviation	0.4%	0.2%	1%
oneDNN - IP Shapes 1D - f32 - CPU (ms)	3.57740	3.57455	3.56577
Normalized	99.67%	99.75%	100%
Standard Deviation	0.6%	0.4%	0.1%
oneDNN - IP Shapes 3D - f32 - CPU (ms)	8.26103	8.14695	8.16788
Normalized	98.62%	100%	99.74%
Standard Deviation	0.1%	0.1%	0.3%
oneDNN - IP Shapes 1D - u8s8f32 - CPU (ms)	1.66747	1.66579	1.6655
Normalized	99.88%	99.98%	100%
Standard Deviation	0.2%	0.3%	0.1%
oneDNN - IP Shapes 3D - u8s8f32 - CPU (ms)	1.83215	1.82910	1.82340
Normalized	99.52%	99.69%	100%
Standard Deviation	0.3%	0.5%	0.2%
oneDNN - C.B.S.A - f32 - CPU (ms)	14.2830	14.3031	14.2936
Normalized	100%	99.86%	99.93%
Standard Deviation	0.2%	0.4%	0.2%
oneDNN - D.B.s - f32 - CPU (ms)	8.83898	8.86501	8.87618
Normalized	100%	99.71%	99.58%
Standard Deviation	0.1%	0.3%	0.1%
oneDNN - D.B.s - f32 - CPU (ms)	6.63993	6.64659	6.61557
Normalized	99.63%	99.53%	100%
Standard Deviation	0.3%	0.4%	0.1%
oneDNN - C.B.S.A - u8s8f32 - CPU (ms)	14.0335	13.9988	14.0106
Normalized	99.75%	100%	99.92%
Standard Deviation	0.3%	0.2%	0.3%
oneDNN - D.B.s - u8s8f32 - CPU (ms)	2.14490	2.14385	2.14452
Normalized	99.95%	100%	99.97%
Standard Deviation	0.3%	0.2%	0.1%
oneDNN - D.B.s - u8s8f32 - CPU (ms)	3.97706	3.93198	3.93216
Normalized	98.87%	100%	100%
Standard Deviation	0.9%	0.5%	0.8%
oneDNN - R.N.N.T - f32 - CPU (ms)	3408	3405	3406
Normalized	99.92%	100%	99.98%
Standard Deviation	0.3%	0.2%	0.2%
oneDNN - R.N.N.I - f32 - CPU (ms)	1852	1851	1852
Normalized	99.95%	100%	99.95%
Standard Deviation	0.1%	0.2%	0%
oneDNN - R.N.N.T - u8s8f32 - CPU (ms)	3415	3413	3414

	Normalized	99.96%	100%	99.97%
	Standard Deviation	0.2%	0%	0%
<b>oneDNN - R.N.N.I - u8s8f32 - CPU (ms)</b>		<b>1852</b>	<b>1851</b>	1851
	Normalized	99.92%	100%	99.97%
	Standard Deviation	0.1%	0%	0.1%
<b>oneDNN - M.M.B.S.T - f32 - CPU (ms)</b>		<b>3.15433</b>	3.15157	<b>3.14943</b>
	Normalized	99.84%	99.93%	100%
	Standard Deviation	0.4%	0.2%	0.5%
<b>oneDNN - R.N.N.T - bf16bf16bf16 - CPU (ms)</b>		<b>3414</b>	<b>3445</b>	3415
	Normalized	100%	99.09%	99.96%
	Standard Deviation	0.1%	1.3%	0%
<b>oneDNN - R.N.N.I - bf16bf16bf16 - CPU (ms)</b>		<b>1855</b>	<b>1851</b>	1854
	Normalized	99.8%	100%	99.83%
	Standard Deviation	0.3%	0.1%	0.1%
<b>oneDNN - M.M.B.S.T - u8s8f32 - CPU (ms)</b>		<b>3.44003</b>	<b>3.43359</b>	3.43914
	Normalized	99.81%	100%	99.84%
	Standard Deviation	0.2%	0.1%	0.1%
<b>OpenSCAD - Pistol (sec)</b>		<b>100.767</b>	<b>100.978</b>	100.813
	Normalized	100%	99.79%	99.95%
	Standard Deviation	0.1%	0.4%	0.1%
<b>OpenSCAD - Retro Car (sec)</b>		<b>17.259</b>	17.346	<b>17.367</b>
	Normalized	100%	99.5%	99.38%
	Standard Deviation	0.2%	1%	0.2%
<b>OpenSCAD - Mini-ITX Case (sec)</b>		<b>41.908</b>	42.053	<b>42.084</b>
	Normalized	100%	99.66%	99.58%
	Standard Deviation	0.3%	0.5%	0.1%
<b>OpenSCAD - P.M.S (sec)</b>		<b>92.931</b>	93.908	<b>94.966</b>
	Normalized	100%	98.96%	97.86%
	Standard Deviation	0.4%	0.8%	0.1%
<b>OpenSCAD - L.P.C.S (sec)</b>		16.975	<b>16.941</b>	<b>17.054</b>
	Normalized	99.8%	100%	99.34%
	Standard Deviation	0.1%	0.2%	0.1%
<b>SHOC Scalable HeterOgeneous Computing - OpenCL - S3D (GFLOPS)</b>		<b>20.9931</b>	20.8518	<b>20.8479</b>
	Normalized	100%	99.33%	99.31%
	Standard Deviation	0.3%	0.3%	0.2%
<b>SHOC Scalable HeterOgeneous Computing - OpenCL - Triad (GB/s)</b>		<b>15.6053</b>	<b>15.2336</b>	15.2518
	Normalized	100%	97.62%	97.73%
	Standard Deviation	0.3%	0.1%	0.4%
<b>SHOC Scalable HeterOgeneous Computing - OpenCL - FFT SP (GFLOPS)</b>		15.3682	<b>15.3757</b>	<b>15.3573</b>
	Normalized	99.95%	100%	99.88%
	Standard Deviation	0.1%	0.1%	0.2%
<b>SHOC Scalable HeterOgeneous Computing - OpenCL - MD5 Hash (GHash/s)</b>		<b>0.3861</b>	<b>0.3861</b>	<b>0.386</b>
	Normalized	100%	100%	99.97%
	Standard Deviation	0%	0%	0%
<b>SHOC Scalable HeterOgeneous Computing - OpenCL - Reduction (GB/s)</b>		<b>36.7934</b>	<b>36.7270</b>	36.7633
	Normalized	100%	99.82%	99.92%
	Standard Deviation	0.2%	0.3%	0.1%

SHOC Scalable HeterOgeneous Computing - OpenCL - GEMM SGEMM_N (GFLOPS)	245.920	245.885	245.783
Normalized	100%	99.99%	99.94%
Standard Deviation	0%	0%	0%
SHOC Scalable HeterOgeneous Computing - OpenCL - Max SP Flops (GFLOPS)	1761	1761	1761
Normalized	99.98%	100%	99.97%
Standard Deviation	0.1%	0.1%	0.1%
SHOC Scalable HeterOgeneous Computing - OpenCL - Bus Speed Download (GB/s)	29.2119	29.1641	29.1766
Normalized	100%	99.84%	99.88%
Standard Deviation	0.6%	0.3%	0.9%
SHOC Scalable HeterOgeneous Computing - OpenCL - Bus Speed Readback (GB/s)	29.0495	29.0520	29.1531
Normalized	99.64%	99.65%	100%
Standard Deviation	1.3%	0.6%	1.2%
SHOC Scalable HeterOgeneous Computing - OpenCL - T.R.B (GB/s)	56.9099	56.8932	56.9175
Normalized	99.99%	99.96%	100%
Standard Deviation	0%	0%	0%
simdjson - Kostya (GB/s)	3.1	3.10	3.09
Normalized	100%	100%	99.68%
Standard Deviation	0%	0.2%	0.6%
simdjson - LargeRand (GB/s)	1.07	1.07	1.07
Standard Deviation	0%	0%	0%
simdjson - PartialTweets (GB/s)	4.38	4.38	4.37
Normalized	100%	100%	99.77%
Standard Deviation	0.1%	0.1%	0.1%
simdjson - DistinctUserID (GB/s)	4.53	4.55	4.54
Normalized	99.56%	100%	99.78%
Standard Deviation	0.1%	0.3%	0.3%
srsLTE - OFDM_Test (Samples / Second)	126700000	128466667	128500000
Normalized	98.6%	99.97%	100%
Standard Deviation	0.6%	1.1%	0.9%
srsLTE - PHY_DL_Test (eNb Mb/s)	293.2	291.8	295.0
Normalized	99.39%	98.92%	100%
Standard Deviation	0.1%	0.4%	0.5%
srsLTE - PHY_DL_Test (UE Mb/s)	112.7	112.2	113.4
Normalized	99.38%	98.94%	100%
Standard Deviation	0.1%	0.2%	0.2%
Stockfish - Total Time (Nodes/s)	23777878	23501591	23832208
Normalized	99.77%	98.61%	100%
Standard Deviation	2.5%	2.2%	2.7%
SVT-HEVC - 1 - Bosphorus 1080p (FPS)	6.85	6.84	6.84
Normalized	100%	99.85%	99.85%
Standard Deviation	0.3%	0.1%	0.1%
SVT-HEVC - 7 - Bosphorus 1080p (FPS)	106.19	105.90	105.78
Normalized	100%	99.73%	99.61%
Standard Deviation	0.2%	0.1%	0.2%
SVT-HEVC - 10 - Bosphorus 1080p (FPS)	230.27	229.42	229.36
Normalized	100%	99.63%	99.6%
Standard Deviation	0.1%	0.1%	0.3%

SVT-VP9 - VMAF Optimized - Bosphorus 1080p (FPS)	173.31	172.24	172.10
Normalized	100%	99.38%	99.3%
Standard Deviation	0.2%	0.4%	0.3%
SVT-VP9 - P.S.O - Bosphorus 1080p (FPS)	176.29	175.27	175.06
Normalized	100%	99.42%	99.3%
Standard Deviation	0.3%	0.5%	0.1%
SVT-VP9 - V.Q.O - Bosphorus 1080p (FPS)	136.76	136.22	136.05
Normalized	100%	99.61%	99.48%
Standard Deviation	0.3%	0.2%	0.4%
Sysbench - RAM / Memory (MiB/sec)	28391	28492	28339
Normalized	99.65%	100%	99.46%
Standard Deviation	0.6%	0.8%	0.3%
Sysbench - CPU (Events/sec)	19380	19383	19367
Normalized	99.99%	100%	99.92%
Standard Deviation	0.1%	0.2%	0.1%
Systemd Total Boot Time - Total (ms)	24050	24050	24050
Systemd Total Boot Time - Kernel (ms)	1941	1941	1941
Systemd Total Boot Time - Loader (ms)	3555	3555	3555
Systemd Total Boot Time - Firmware (ms)	15679	15679	15679
Systemd Total Boot Time - Userspace (ms)	22109	22109	22109
Timed Erlang/OTP Compilation - Time To Compile (sec)	113.000	112.558	112.484
Normalized	99.54%	99.93%	100%
Standard Deviation	0.2%	0.6%	0.5%
Timed Linux Kernel Compilation - Time To Compile (sec)	94.714	94.569	94.768
Normalized	99.85%	100%	99.79%
Standard Deviation	1.4%	1.1%	0.9%
Timed Mesa Compilation - Time To Compile (sec)	56.415	56.468	56.475
Normalized	100%	99.91%	99.89%
Standard Deviation	0.1%	0.1%	0.1%
Timed Node.js Compilation - Time To Compile (sec)	477.097	476.801	477.284
Normalized	99.94%	100%	99.9%
Standard Deviation	0.1%	0.1%	0.1%
toyBrot Fractal Generator - TBB (ms)	44058	44135	44085
Normalized	100%	99.83%	99.94%
Standard Deviation	0.2%	0.3%	0.3%
toyBrot Fractal Generator - OpenMP (ms)	43866	43854	43838
Normalized	99.94%	99.96%	100%
Standard Deviation	0.1%	0.1%	0.1%
toyBrot Fractal Generator - C++ Tasks (ms)	44756	44842	44729
Normalized	99.94%	99.75%	100%
Standard Deviation	0.1%	0.5%	0.1%
toyBrot Fractal Generator - C++ Threads	44854	44774	44805
Normalized	99.82%	100%	99.93%
Standard Deviation	0.1%	0.1%	0.1%
ViennaCL - CPU BLAS - sCOPY (GB/s)	28.2	28.2	28.3
Normalized	99.65%	99.65%	100%
Standard Deviation	0.2%	0.2%	0.2%
ViennaCL - CPU BLAS - sAXPY (GB/s)	42.8	42.9	42.8
Normalized	99.77%	100%	99.77%

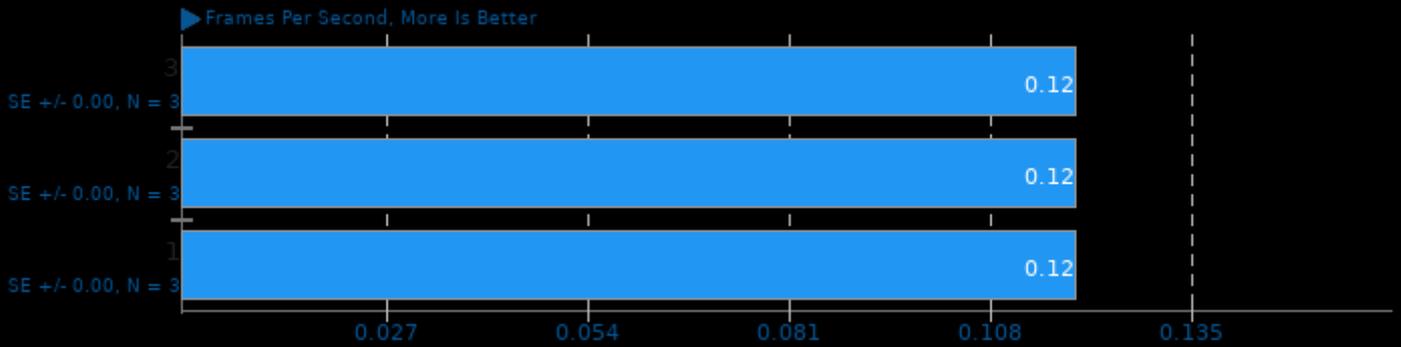
	Standard Deviation	0.1%	0.3%	0.4%
ViennaCL - CPU BLAS - sDOT (GB/s)		47.9	47.9	47.9
	Standard Deviation	0.2%	0.1%	0.1%
ViennaCL - CPU BLAS - dCOPY (GB/s)		26.2	26.2	26.2
	Standard Deviation	0.2%	0%	0%
ViennaCL - CPU BLAS - dAXPY (GB/s)		39.3	39.3	39.3
	Standard Deviation	0%	0%	0%
ViennaCL - CPU BLAS - dDOT (GB/s)		44.1	44.1	44.1
	Standard Deviation	0.1%	0%	0%
ViennaCL - CPU BLAS - dGEMV-N (GB/s)		<b>45.5</b>	<b>45.6</b>	<b>45.5</b>
	Normalized	99.78%	100%	99.78%
	Standard Deviation	0%	0.1%	0.1%
ViennaCL - CPU BLAS - dGEMV-T (GB/s)		46.5	46.5	46.5
	Standard Deviation	0.1%	0%	0%
ViennaCL - CPU BLAS - dGEMM-NN		34.8	34.8	34.8
	(GFLOPs/s)			
	Standard Deviation	0%	0%	0.2%
ViennaCL - CPU BLAS - dGEMM-NT		<b>34.1</b>	<b>34.2</b>	<b>34.1</b>
	(GFLOPs/s)			
	Normalized	99.71%	100%	99.71%
	Standard Deviation	0.2%	0.3%	0.2%
ViennaCL - CPU BLAS - dGEMM-TN		<b>36.5</b>	<b>36.4</b>	<b>36.5</b>
	(GFLOPs/s)			
	Normalized	100%	99.73%	100%
	Standard Deviation	0.2%	0.3%	0%
ViennaCL - CPU BLAS - dGEMM-TT		35.5	35.5	35.5
	(GFLOPs/s)			
	Standard Deviation	0.2%	0.2%	0.2%
ViennaCL - OpenCL BLAS - sCOPY (GB/s)		<b>32.9</b>	<b>33.3</b>	<b>33.3</b>
	Normalized	98.8%	100%	100%
	Standard Deviation	0.3%	0.5%	0.3%
ViennaCL - OpenCL BLAS - sAXPY (GB/s)		34.6	34.6	34.6
	Standard Deviation	0%	0%	0%
ViennaCL - OpenCL BLAS - sDOT (GB/s)		<b>37.7</b>	<b>37.6</b>	<b>37.6</b>
	Normalized	100%	99.73%	99.73%
	Standard Deviation	0%	0.2%	0.2%
ViennaCL - OpenCL BLAS - dCOPY (GB/s)		<b>34.0</b>	34.1	<b>34.2</b>
	Normalized	99.42%	99.71%	100%
	Standard Deviation	0.2%	0.2%	0.2%
ViennaCL - OpenCL BLAS - dAXPY (GB/s)		<b>35.3</b>	<b>35.3</b>	<b>35.4</b>
	Normalized	99.72%	99.72%	100%
	Standard Deviation	0.2%	0%	0.2%
ViennaCL - OpenCL BLAS - dDOT (GB/s)		38	38	38
	Standard Deviation	0%	0%	0%
ViennaCL - OpenCL BLAS - dGEMV-N (GB/s)		<b>37.9</b>	<b>38.1</b>	<b>37.9</b>
	Normalized	99.48%	100%	99.48%
	Standard Deviation	0%	0%	0%
ViennaCL - OpenCL BLAS - dGEMV-T (GB/s)		<b>34.8</b>	<b>34.7</b>	<b>34.8</b>
	Normalized	100%	99.71%	100%
	Standard Deviation	0%	0.2%	0.2%
ViennaCL - OpenCL BLAS - dGEMM-NN		18.9	18.9	18.9
	(GFLOPs/s)			
	Standard Deviation	0%	0%	0%

ViennaCL - OpenCL BLAS - dGEMM-NT (GFLOPs/s)	16.5	16.5	16.4
Normalized	100%	100%	99.39%
Standard Deviation	0%	0.4%	0.4%
ViennaCL - OpenCL BLAS - dGEMM-TN (GFLOPs/s)	15.8	15.8	15.8
Standard Deviation	0.4%	0.4%	0.4%
ViennaCL - OpenCL BLAS - dGEMM-TT (GFLOPs/s)	15.7	15.7	15.7
Standard Deviation	0%	0%	0%
Xcompact3d Incompact3d - i.i.1.C.P.D (sec)	34.3375969	34.4397227	34.3846003
Normalized	100%	99.7%	99.86%
Standard Deviation	1.8%	1.7%	1.6%
Xcompact3d Incompact3d - i.i.1.C.P.D (sec)	121.691170	121.826073	121.742472
Normalized	100%	99.89%	99.96%
Standard Deviation	0%	0%	0.1%
Zstd Compression - 3 - Compression Speed (MB/s)	2379	2375	2388
Normalized	99.62%	99.42%	100%
Standard Deviation	0.9%	1.2%	0.9%
Zstd Compression - 3 - D.S (MB/s)	4187	4165	4180
Normalized	100%	99.47%	99.85%
Standard Deviation	0.2%	0.8%	0.1%
Zstd Compression - 8 - Compression Speed (MB/s)	332.6	327.6	327.5
Normalized	100%	98.5%	98.47%
Standard Deviation	0.9%	1.2%	0.5%
Zstd Compression - 8 - D.S (MB/s)	4312	4309	4308
Normalized	100%	99.92%	99.89%
Standard Deviation	0.5%	0.2%	0.2%
Zstd Compression - 19 - Compression Speed (MB/s)	34.5	34.6	34.6
Normalized	99.71%	100%	100%
Standard Deviation	0.6%	0.3%	0.3%
Zstd Compression - 19 - D.S (MB/s)	3969	3983	3982
Normalized	99.65%	100%	99.97%
Standard Deviation	0.5%	0.1%	0.2%
Zstd Compression - 3, Long Mode - Compression Speed (MB/s)	1164	1157	1177
Normalized	98.89%	98.28%	100%
Standard Deviation	0.8%	1.6%	1%
Zstd Compression - 3, Long Mode - D.S	4433	4438	4443
Normalized	99.79%	99.89%	100%
Standard Deviation	0.3%	0.2%	0.1%
Zstd Compression - 8, Long Mode - Compression Speed (MB/s)	395.1	378.4	387.2
Normalized	100%	95.77%	98%
Standard Deviation	2.1%	0.9%	1.3%
Zstd Compression - 8, Long Mode - D.S	4610	4601	4575
Normalized	100%	99.82%	99.24%
Standard Deviation	0.1%	0.1%	0.8%

<b>Zstd Compression - 19, Long Mode - Compression Speed (MB/s)</b>	<b>31.9</b>	31.8	<b>31.5</b>
Normalized	100%	99.69%	98.75%
Standard Deviation	0.7%	0.3%	0.4%
<b>Zstd Compression - 19, Long Mode - D.S (MB/s)</b>	<b>3958</b>	<b>3964</b>	<b>3939</b>
Normalized	99.84%	100%	99.38%
Standard Deviation	0.4%	0%	0.3%

### AOM AV1 3.0

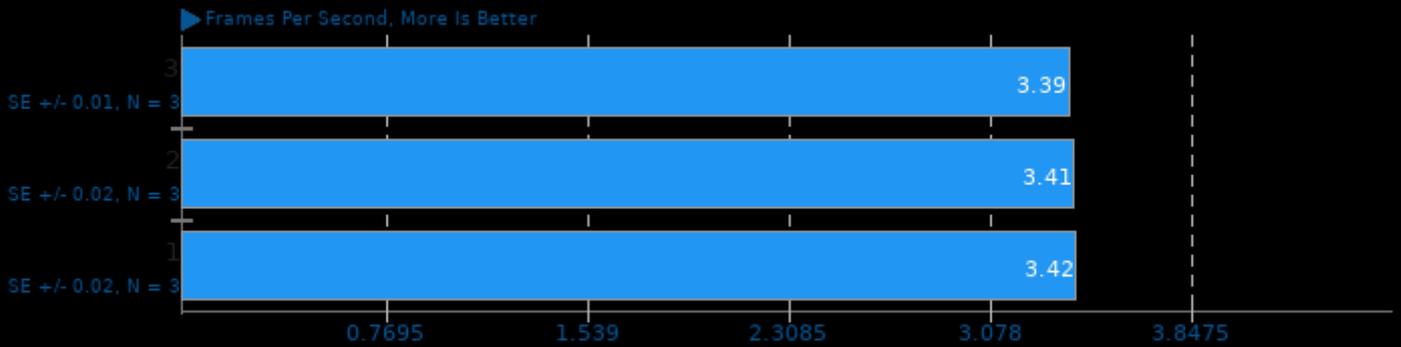
Encoder Mode: Speed 0 Two-Pass - Input: Bosphorus 4K



1. (CXX) g++ options: -O3 -std=c++11 -U\_FORTIFY\_SOURCE -lm -pthread

### AOM AV1 3.0

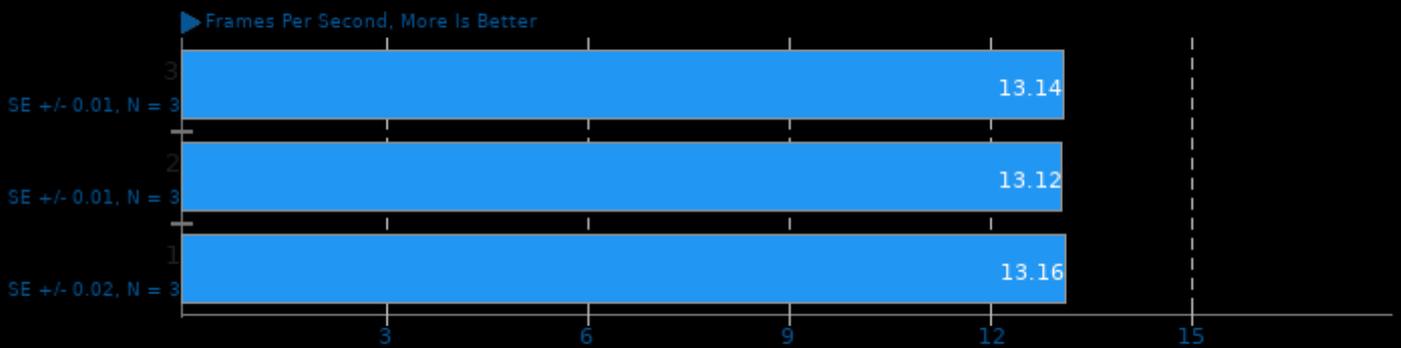
Encoder Mode: Speed 4 Two-Pass - Input: Bosphorus 4K



1. (CXX) g++ options: -O3 -std=c++11 -U\_FORTIFY\_SOURCE -lm -pthread

### AOM AV1 3.0

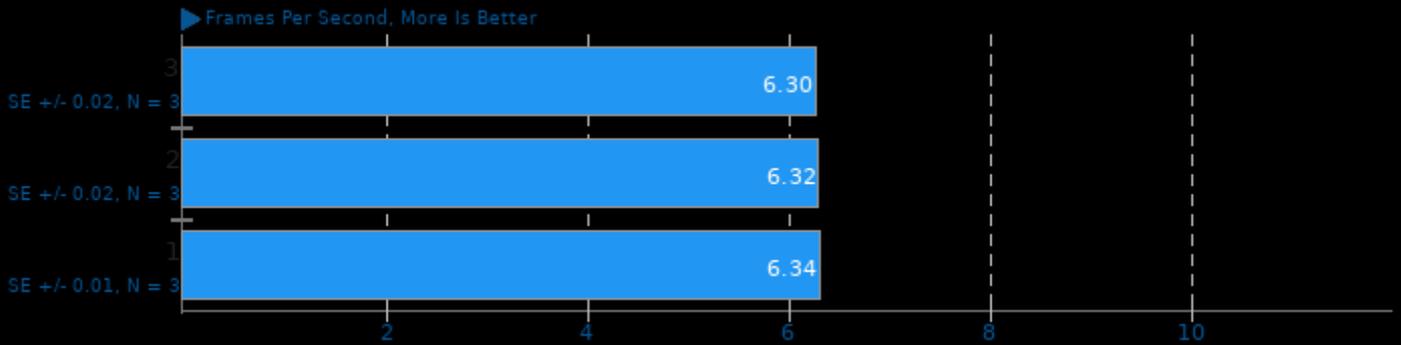
Encoder Mode: Speed 6 Realtime - Input: Bosphorus 4K



1. (CXX) g++ options: -O3 -std=c++11 -U\_FORTIFY\_SOURCE -lm -pthread

### AOM AV1 3.0

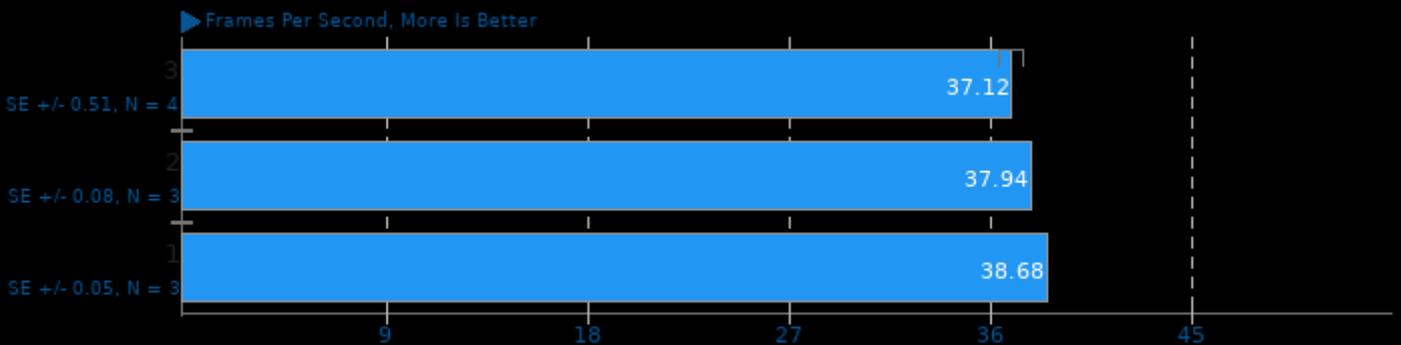
Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 4K



1. (CXX) g++ options: -O3 -std=c++11 -U\_FORTIFY\_SOURCE -lm -pthread

### AOM AV1 3.0

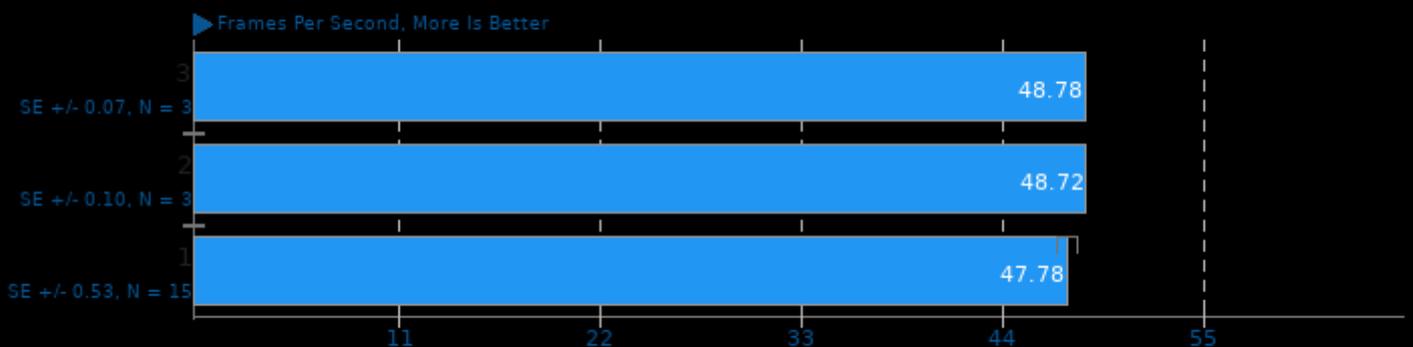
Encoder Mode: Speed 8 Realtime - Input: Bosphorus 4K



1. (CXX) g++ options: -O3 -std=c++11 -U\_FORTIFY\_SOURCE -lm -pthread

### AOM AV1 3.0

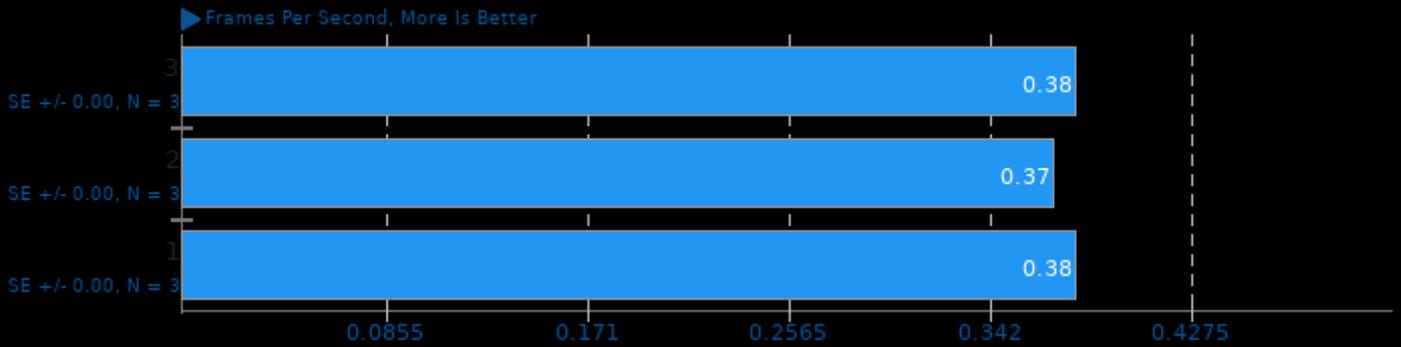
Encoder Mode: Speed 9 Realtime - Input: Bosphorus 4K



1. (CXX) g++ options: -O3 -std=c++11 -U\_FORTIFY\_SOURCE -lm -pthread

### AOM AV1 3.0

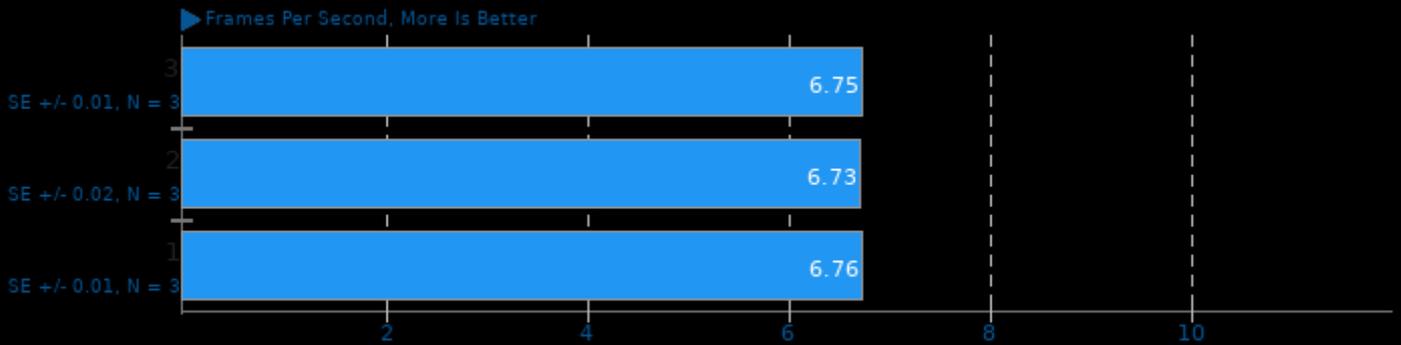
Encoder Mode: Speed 0 Two-Pass - Input: Bosphorus 1080p



1. (CXX) g++ options: -O3 -std=c++11 -U\_FORTIFY\_SOURCE -lm -pthread

### AOM AV1 3.0

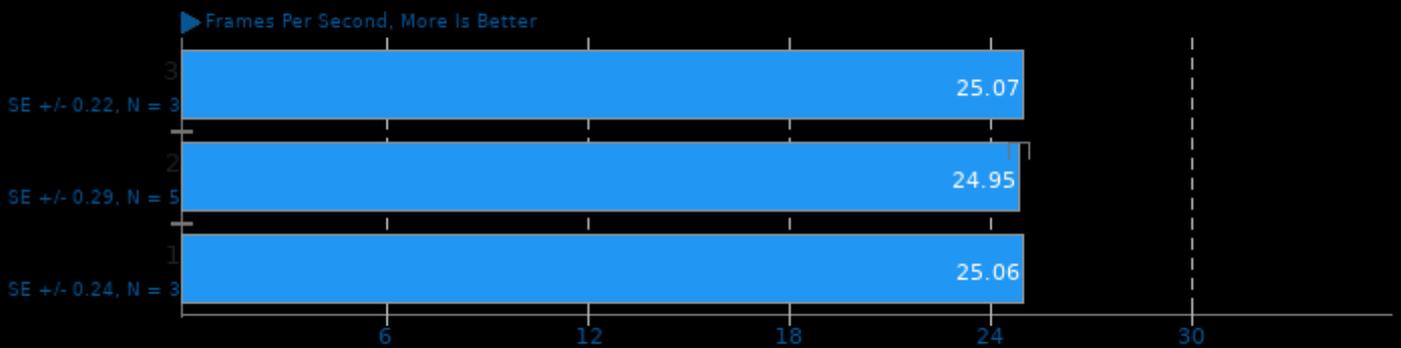
Encoder Mode: Speed 4 Two-Pass - Input: Bosphorus 1080p



1. (CXX) g++ options: -O3 -std=c++11 -U\_FORTIFY\_SOURCE -lm -pthread

### AOM AV1 3.0

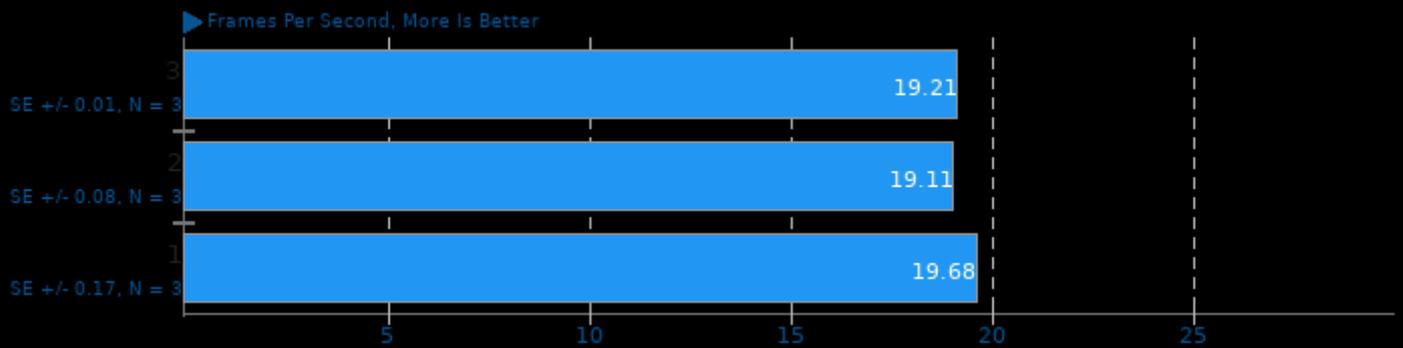
Encoder Mode: Speed 6 Realtime - Input: Bosphorus 1080p



1. (CXX) g++ options: -O3 -std=c++11 -U\_FORTIFY\_SOURCE -lm -pthread

### AOM AV1 3.0

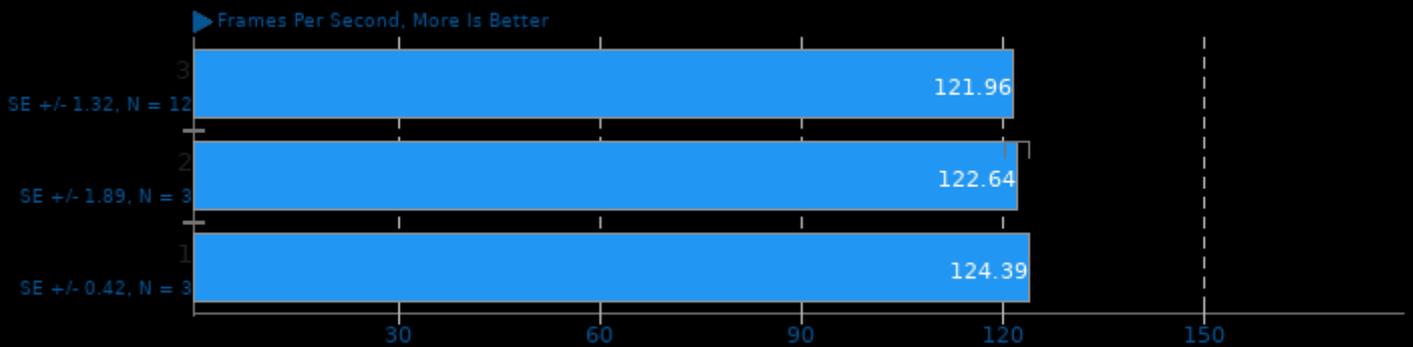
Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 1080p



1. (CXX) g++ options: -O3 -std=c++11 -U\_FORTIFY\_SOURCE -lm -pthread

### AOM AV1 3.0

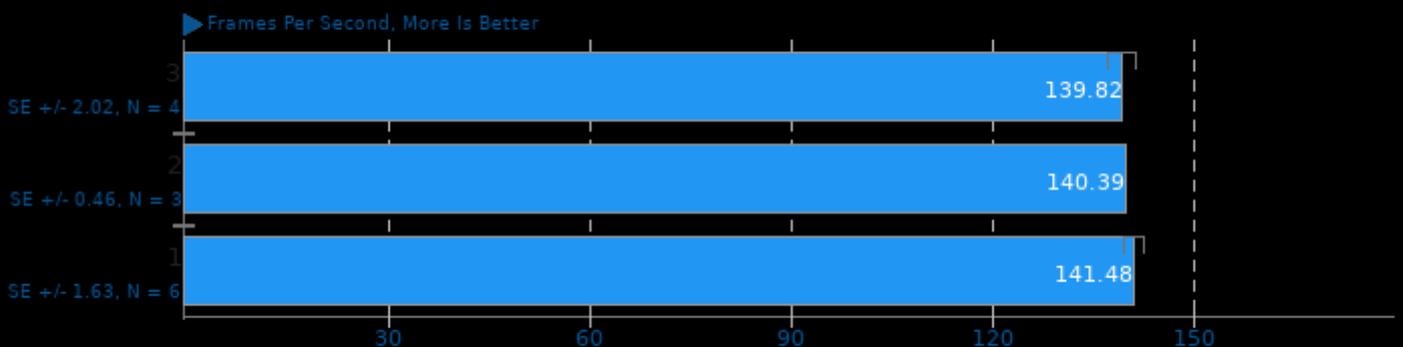
Encoder Mode: Speed 8 Realtime - Input: Bosphorus 1080p



1. (CXX) g++ options: -O3 -std=c++11 -U\_FORTIFY\_SOURCE -lm -pthread

### AOM AV1 3.0

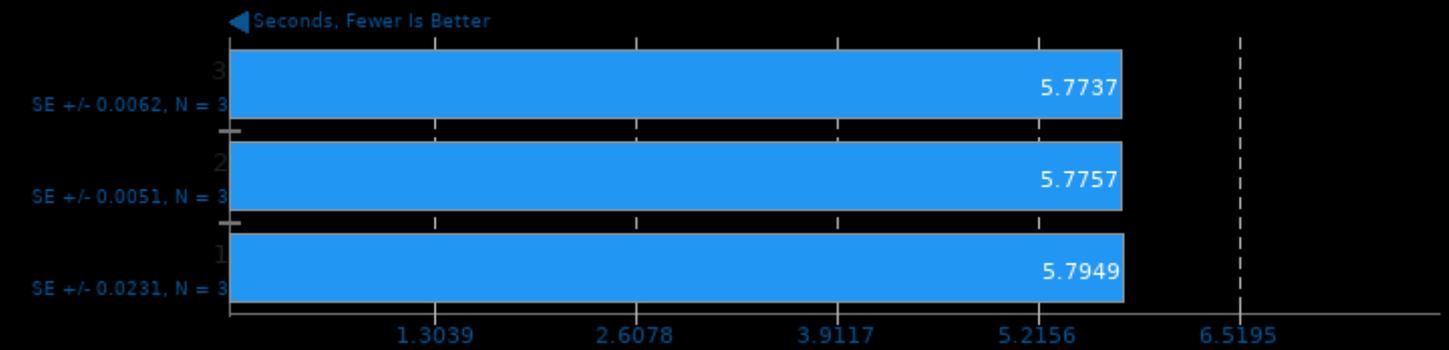
Encoder Mode: Speed 9 Realtime - Input: Bosphorus 1080p



1. (CXX) g++ options: -O3 -std=c++11 -U\_FORTIFY\_SOURCE -lm -pthread

### ASTC Encoder 2.4

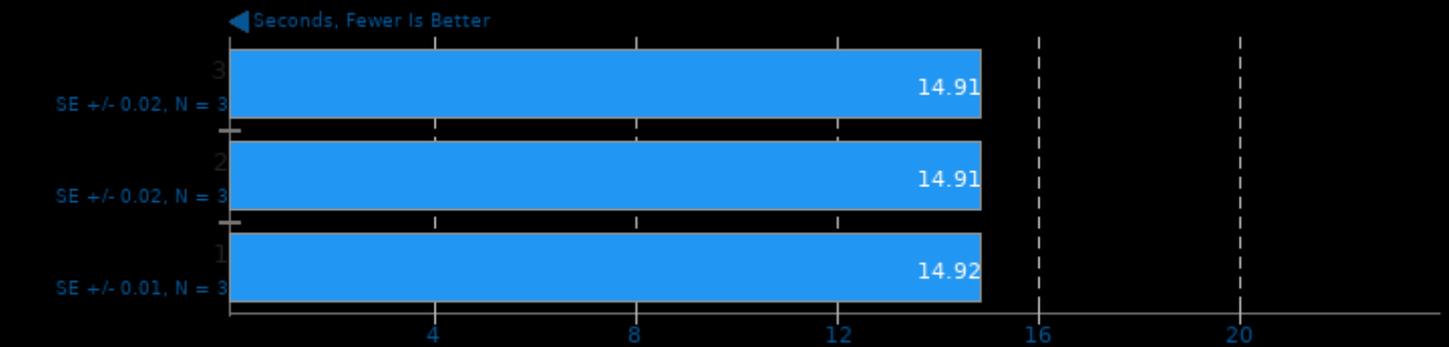
Preset: Medium



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

### ASTC Encoder 2.4

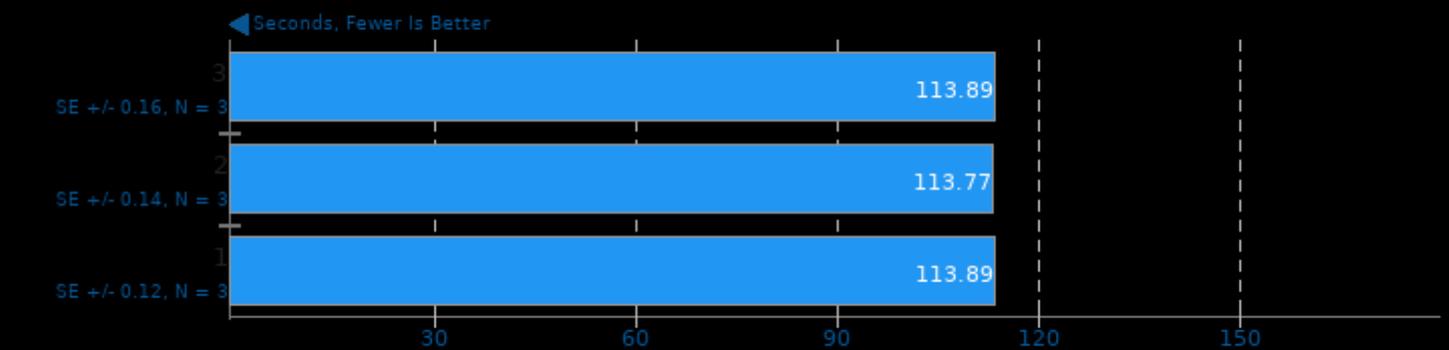
Preset: Thorough



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

### ASTC Encoder 2.4

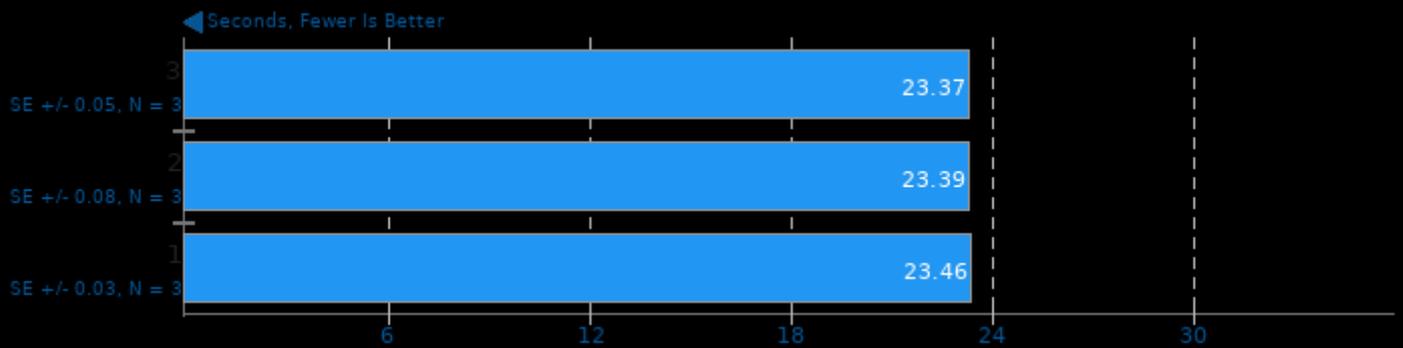
Preset: Exhaustive



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

### Basis Universal 1.13

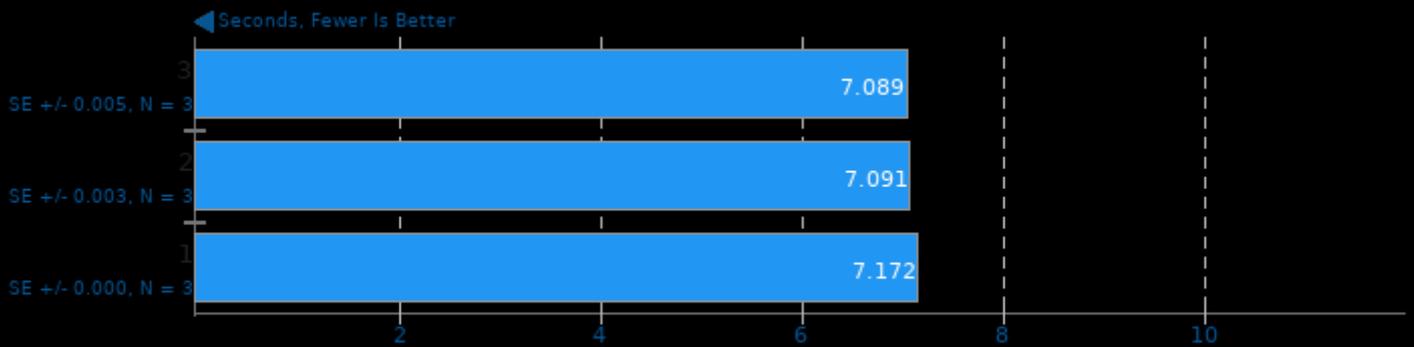
Settings: ETC1S



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

### Basis Universal 1.13

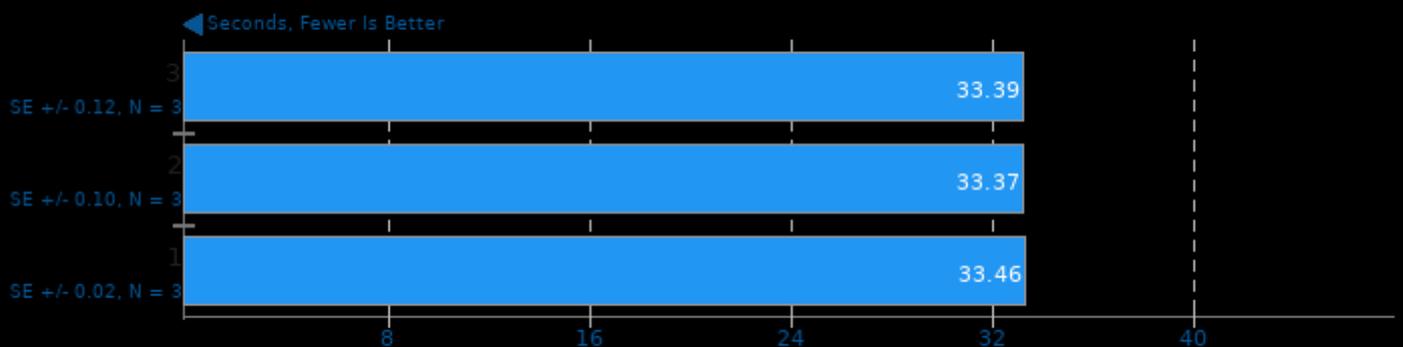
Settings: UASTC Level 0



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

### Basis Universal 1.13

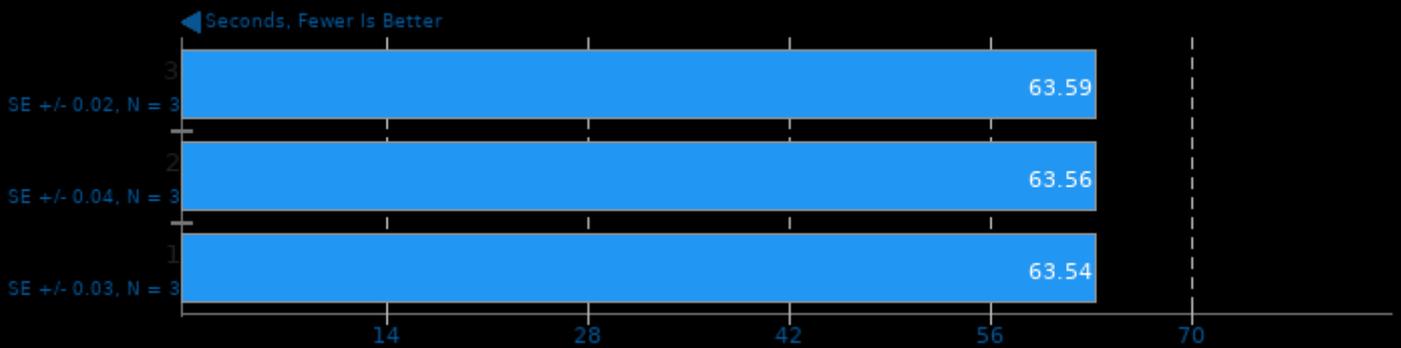
Settings: UASTC Level 2



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

### Basis Universal 1.13

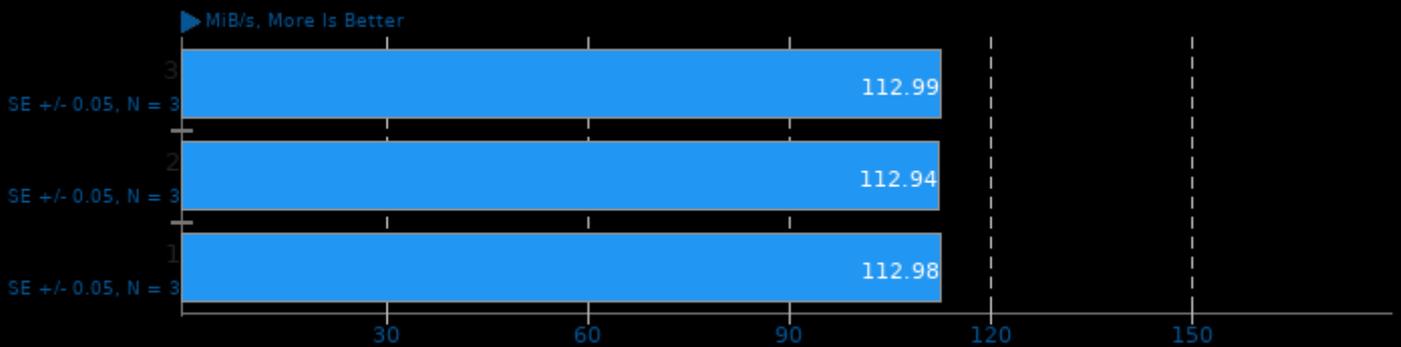
Settings: UASTC Level 3



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

### Botan 2.17.3

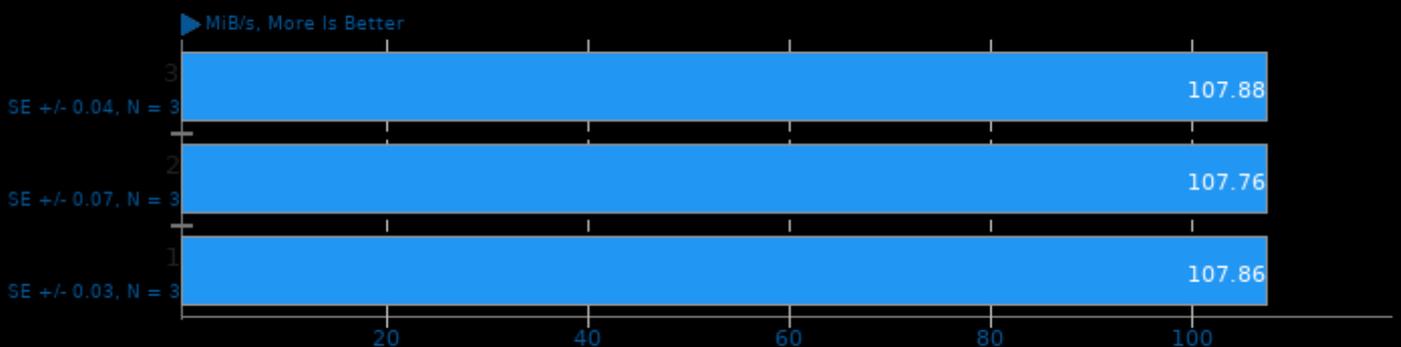
Test: KASUMI



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

### Botan 2.17.3

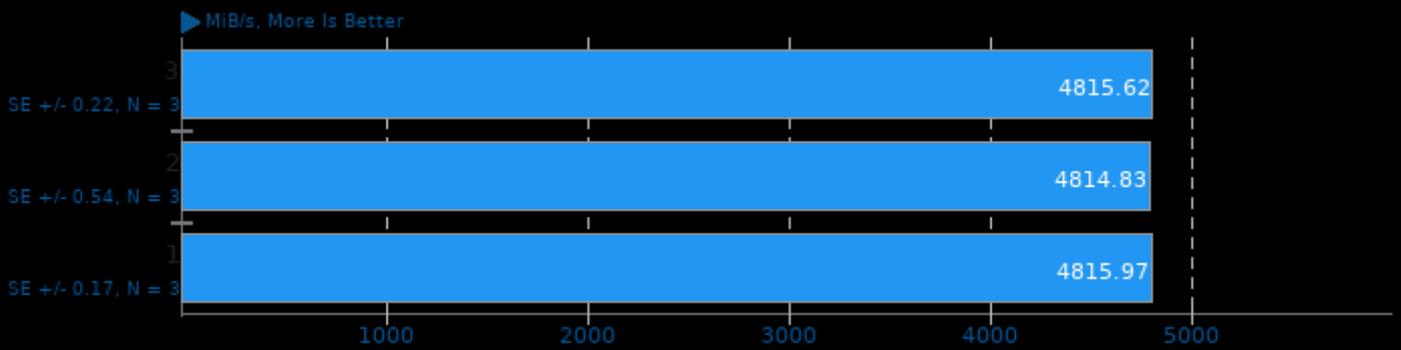
Test: KASUMI - Decrypt



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

### Botan 2.17.3

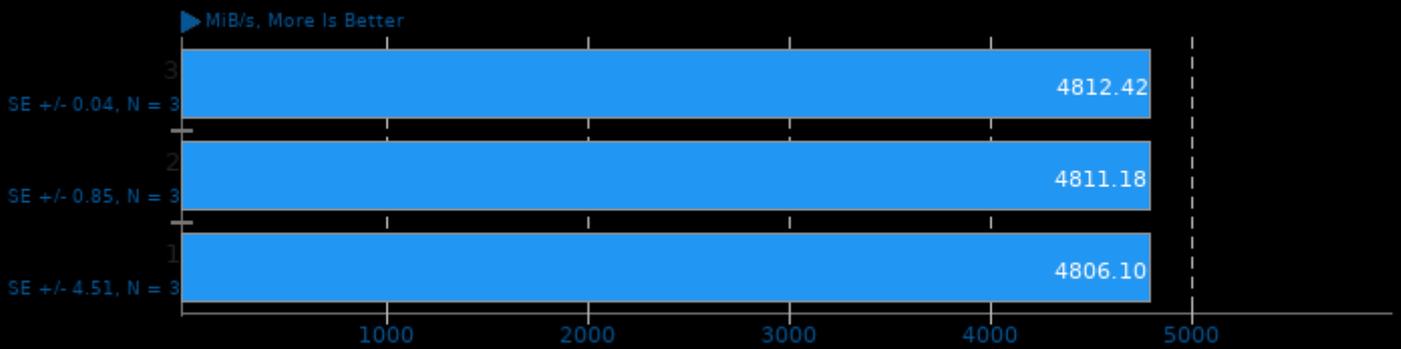
Test: AES-256



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

### Botan 2.17.3

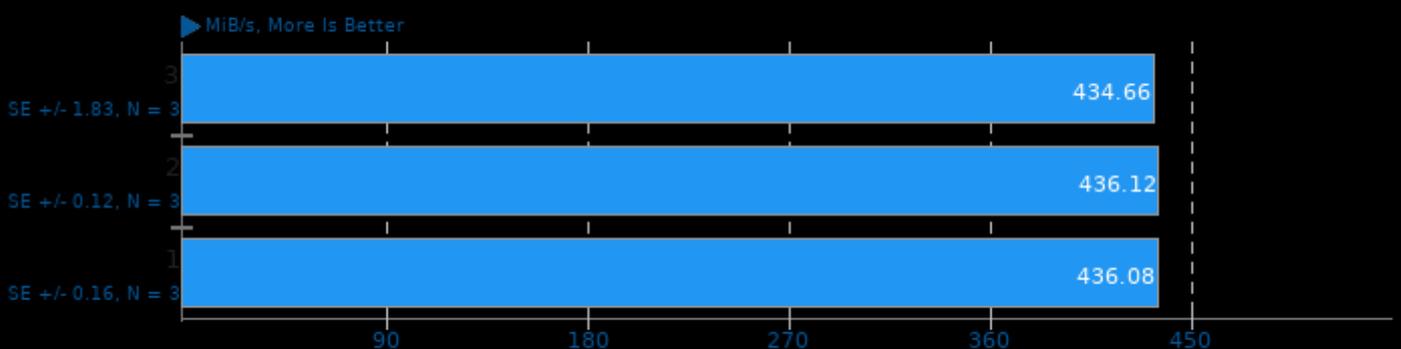
Test: AES-256 - Decrypt



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

### Botan 2.17.3

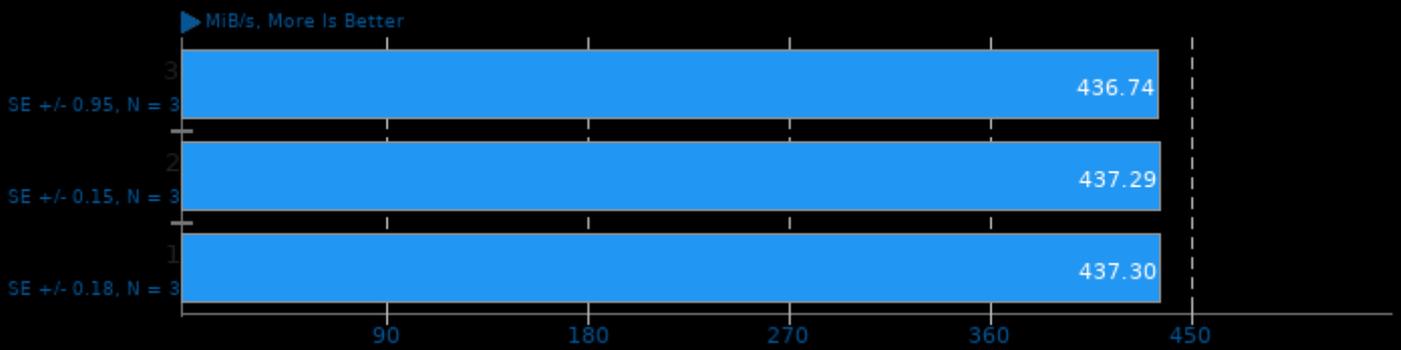
Test: Twofish



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

### Botan 2.17.3

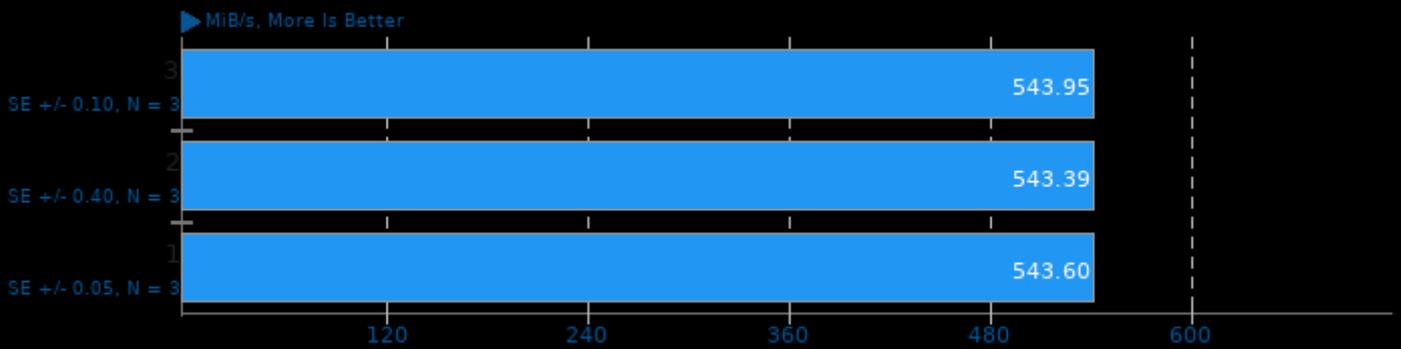
Test: Twofish - Decrypt



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

### Botan 2.17.3

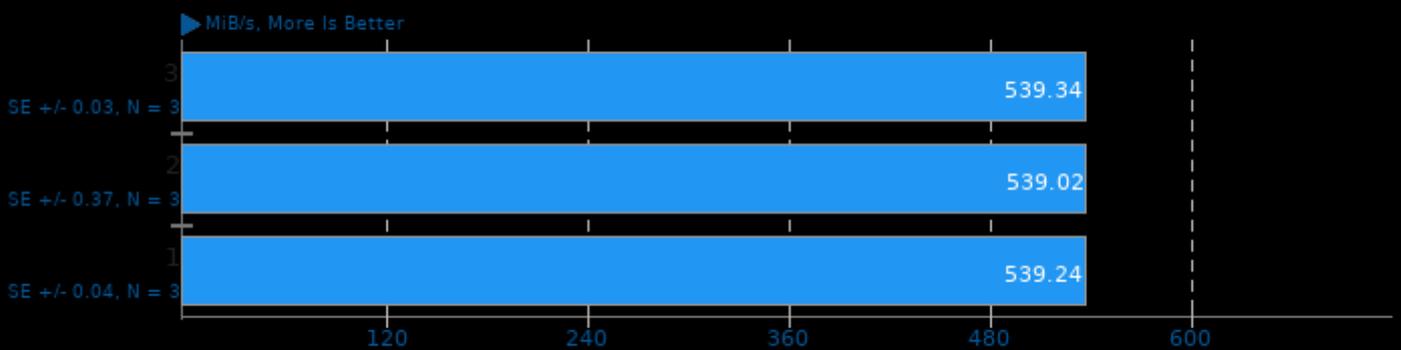
Test: Blowfish



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

### Botan 2.17.3

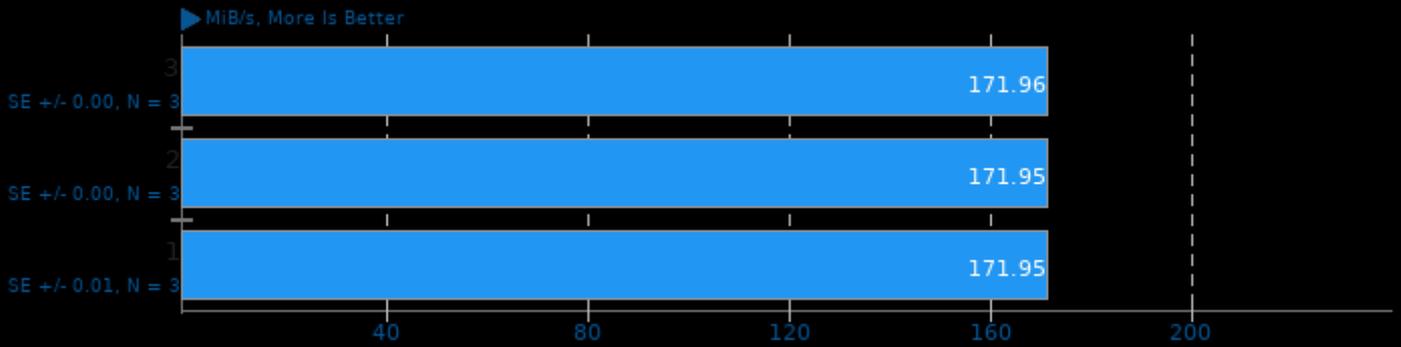
Test: Blowfish - Decrypt



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

### Botan 2.17.3

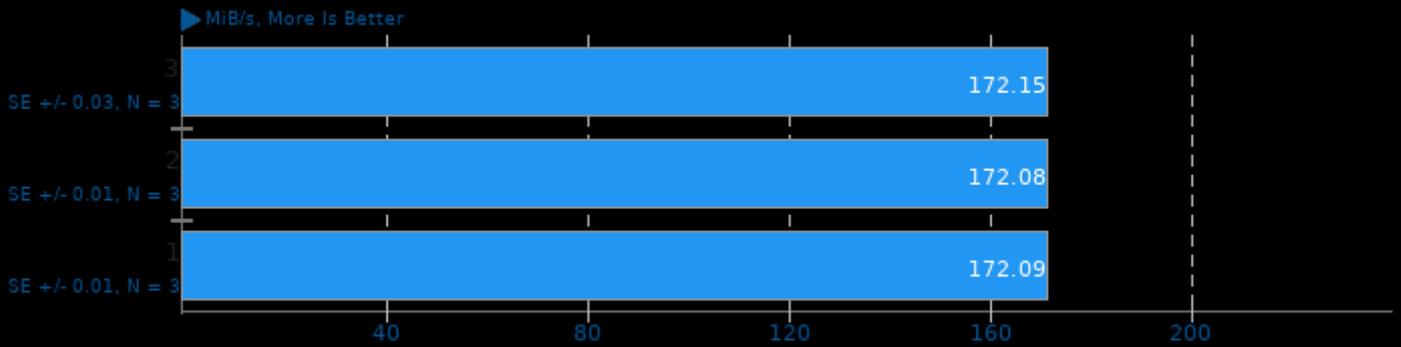
Test: CAST-256



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

### Botan 2.17.3

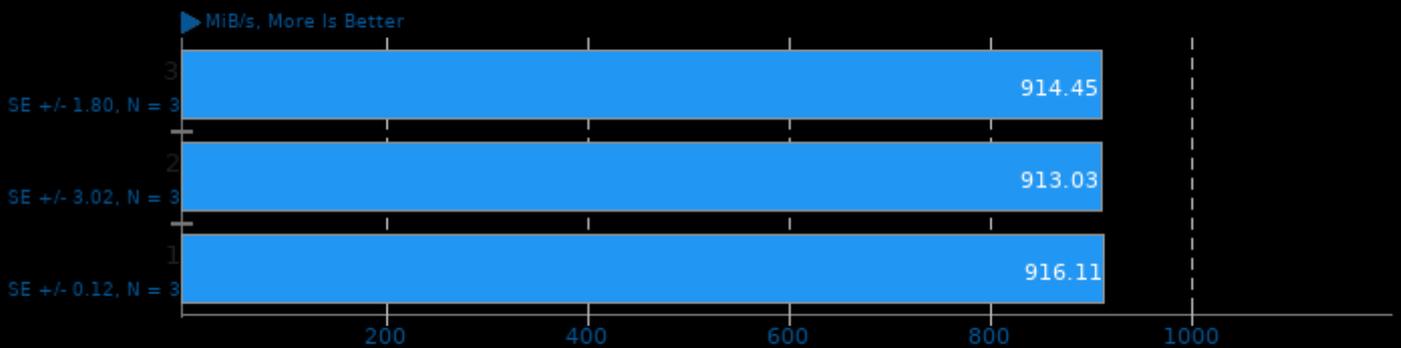
Test: CAST-256 - Decrypt



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

### Botan 2.17.3

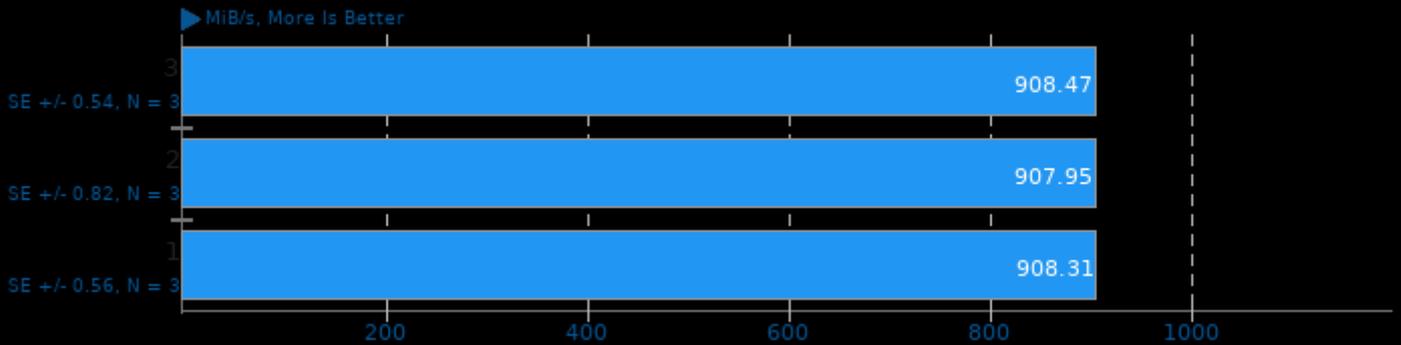
Test: ChaCha20Poly1305



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

### Botan 2.17.3

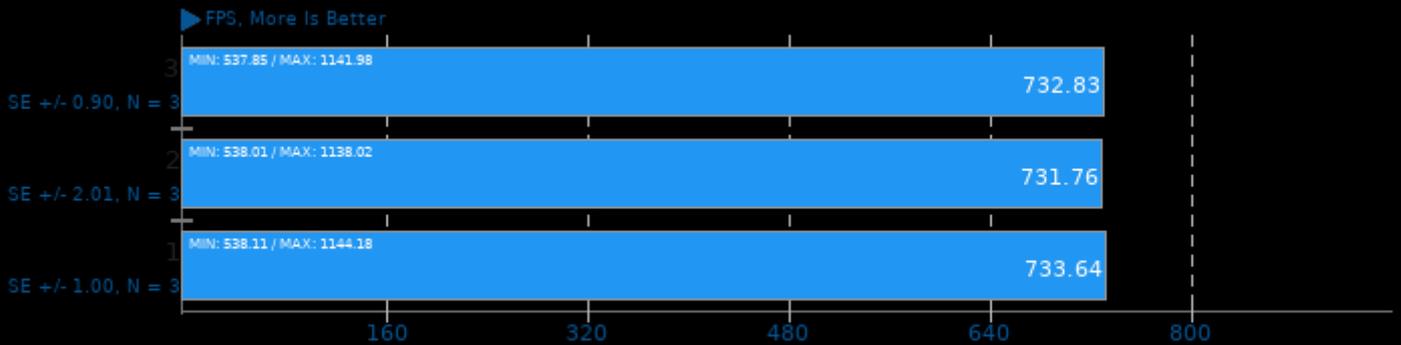
Test: ChaCha20Poly1305 - Decrypt



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

### dav1d 0.8.2

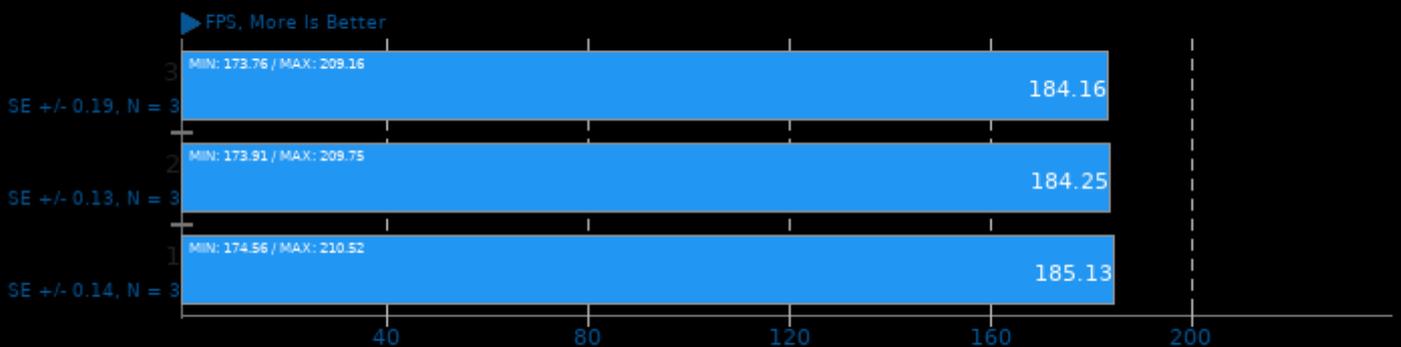
Video Input: Chimera 1080p



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

### dav1d 0.8.2

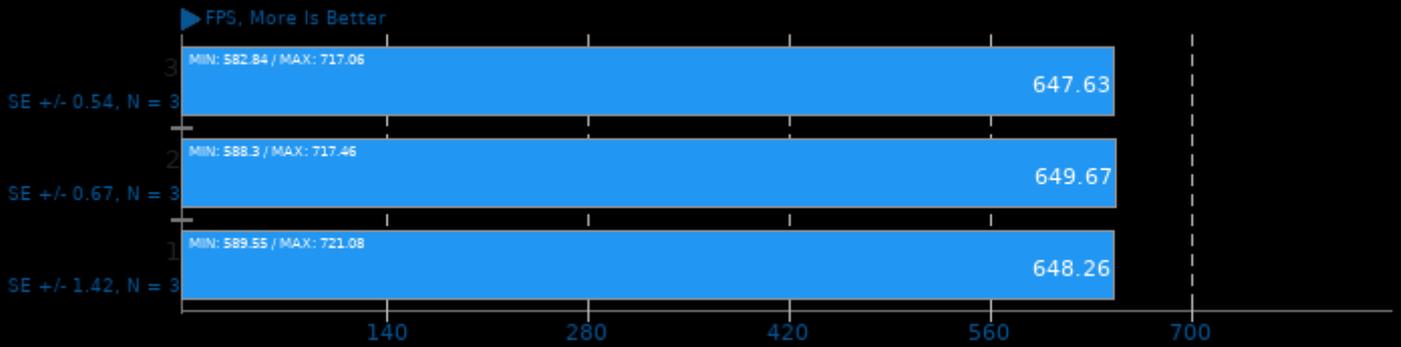
Video Input: Summer Nature 4K



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

### dav1d 0.8.2

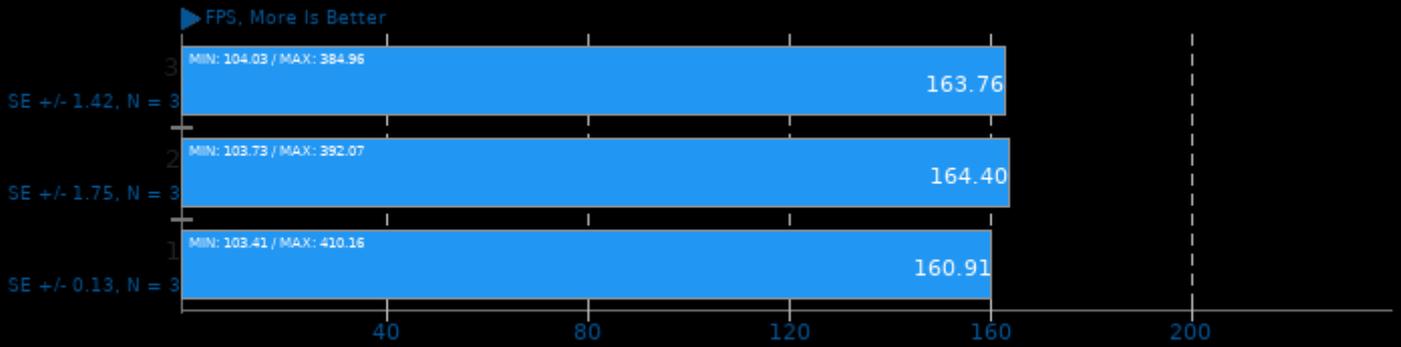
Video Input: Summer Nature 1080p



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

### dav1d 0.8.2

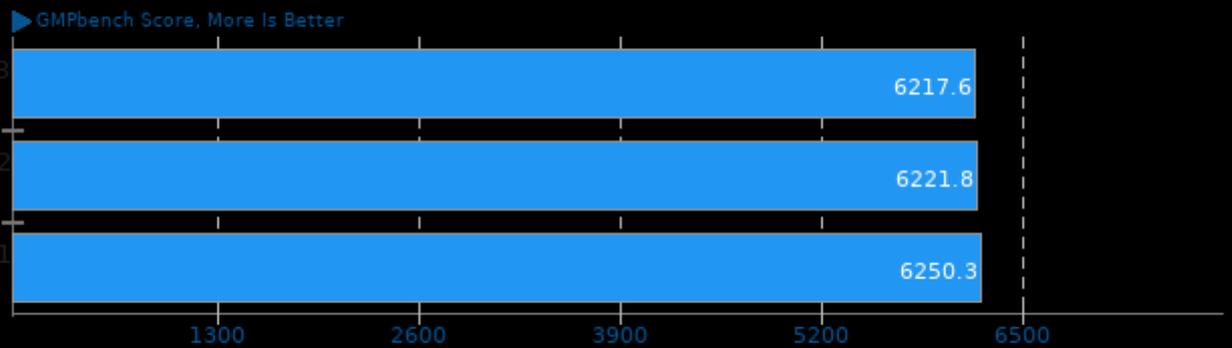
Video Input: Chimera 1080p 10-bit



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

### GNU GMP GMPbench 6.2.1

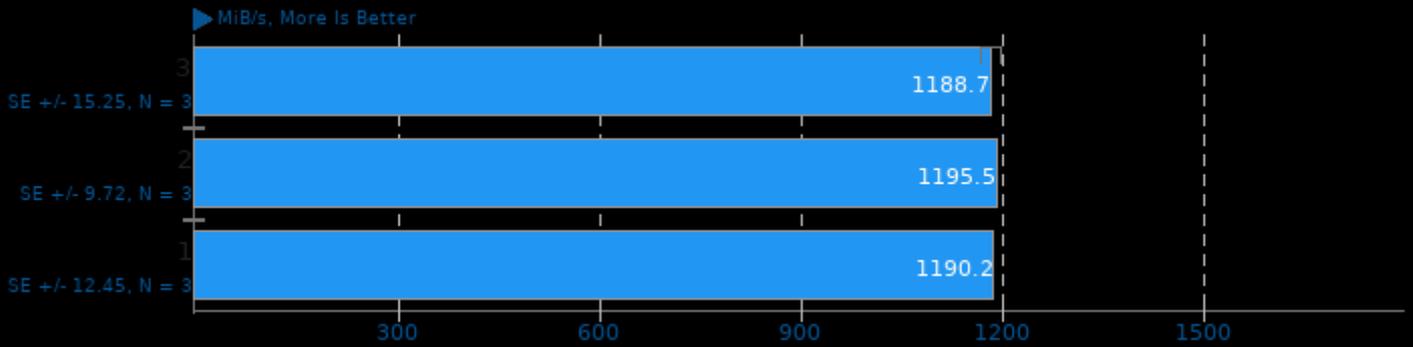
Total Time



1. (CC) gcc options: -O3 -fomit-frame-pointer -lm

### GNU Radio

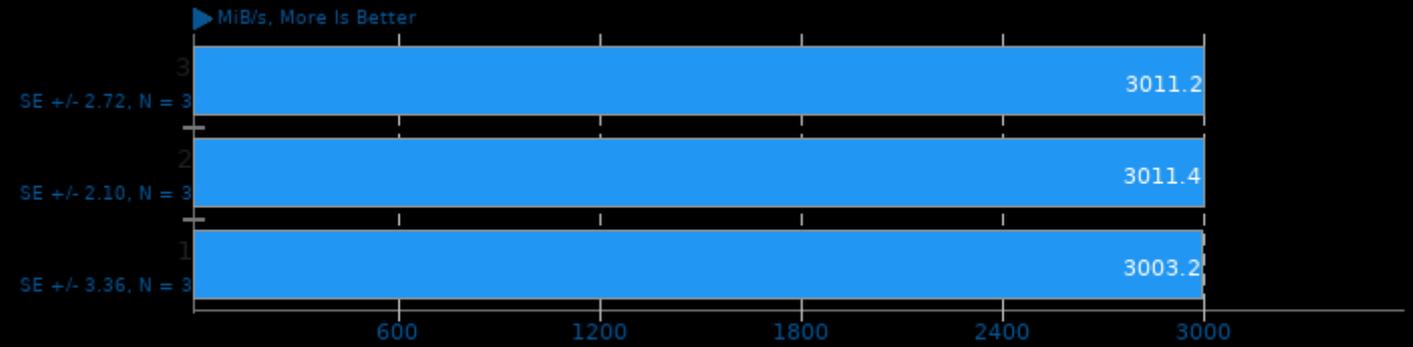
Test: Five Back to Back FIR Filters



1.3.8.1.0

### GNU Radio

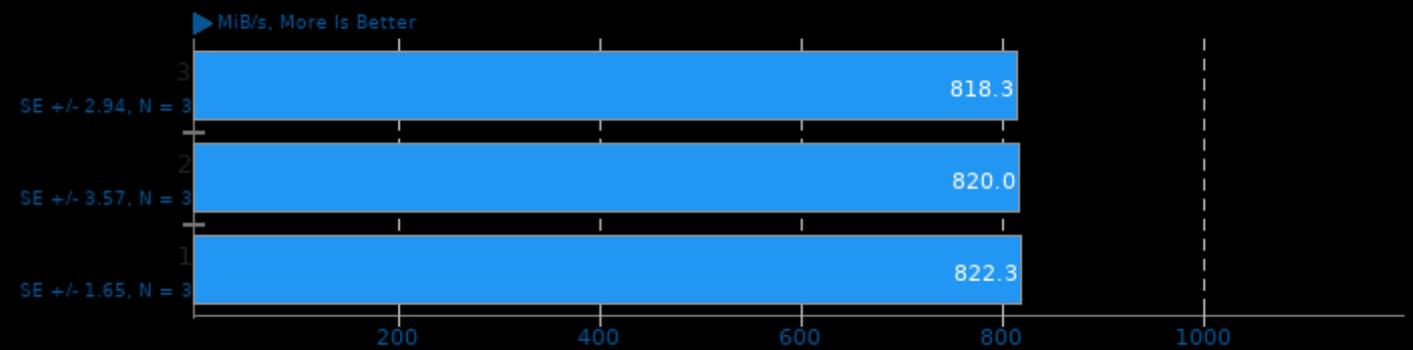
Test: Signal Source (Cosine)



1.3.8.1.0

### GNU Radio

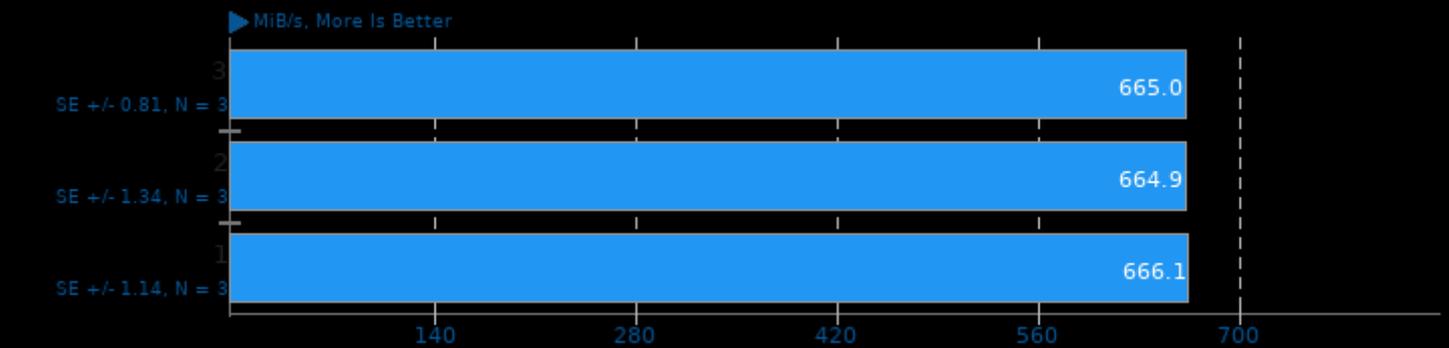
Test: FIR Filter



1.3.8.1.0

### GNU Radio

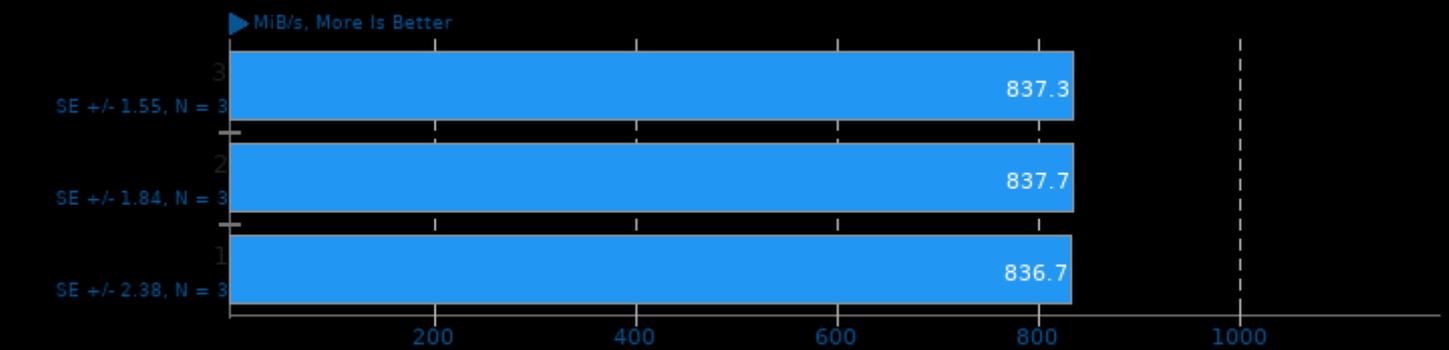
Test: IIR Filter



1.3.8.1.0

### GNU Radio

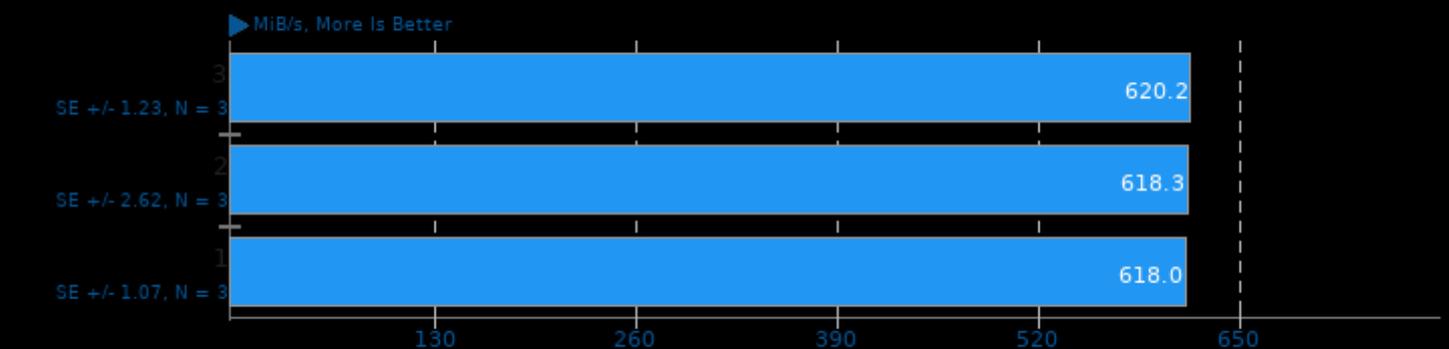
Test: FM Deemphasis Filter



1.3.8.1.0

### GNU Radio

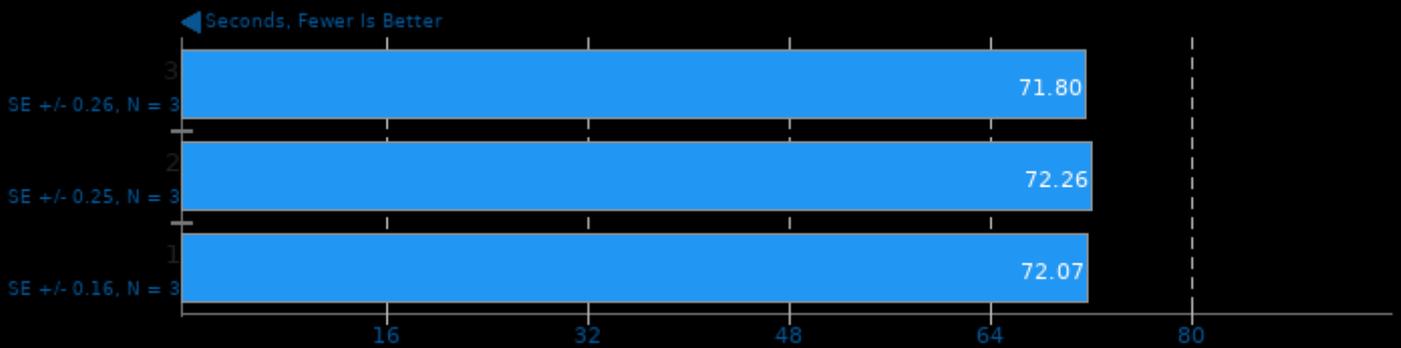
Test: Hilbert Transform



1.3.8.1.0

### libavif avifenc 0.9.0

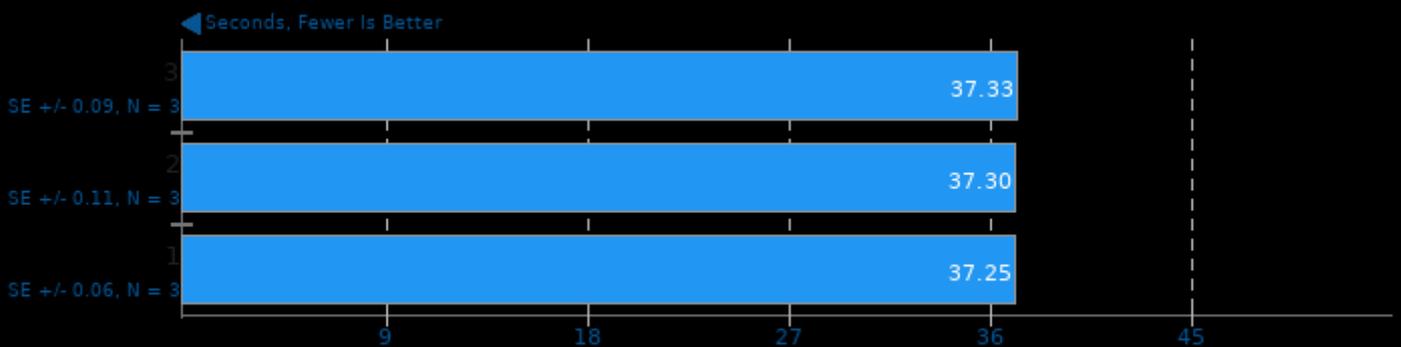
Encoder Speed: 0



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

### libavif avifenc 0.9.0

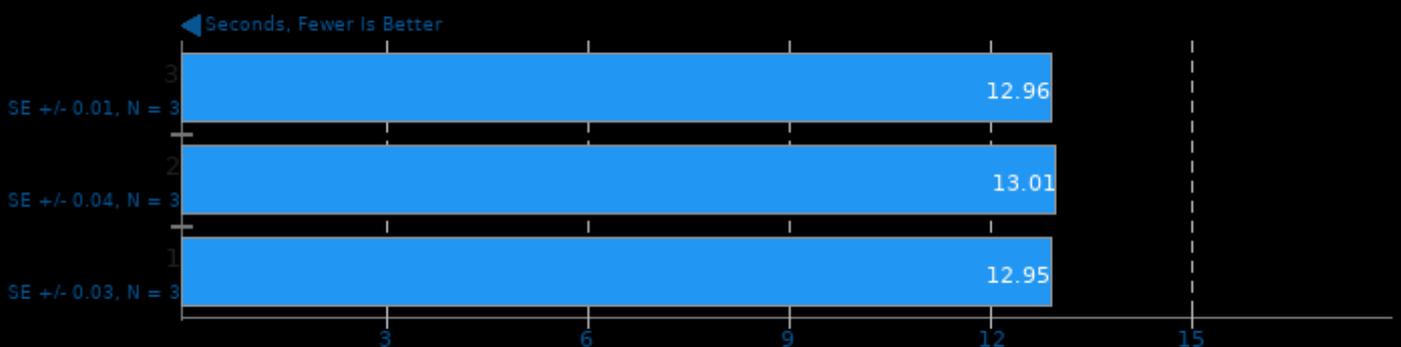
Encoder Speed: 2



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

### libavif avifenc 0.9.0

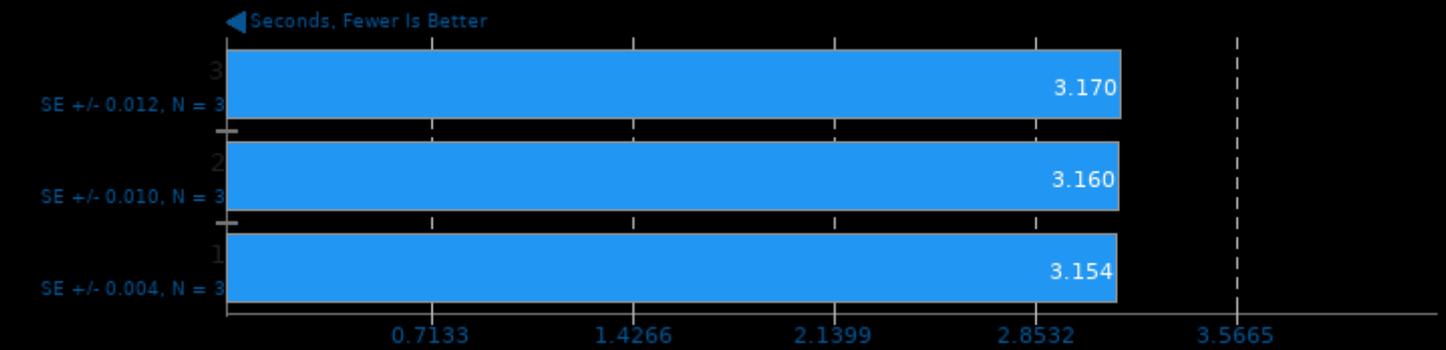
Encoder Speed: 6



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

### libavif avifenc 0.9.0

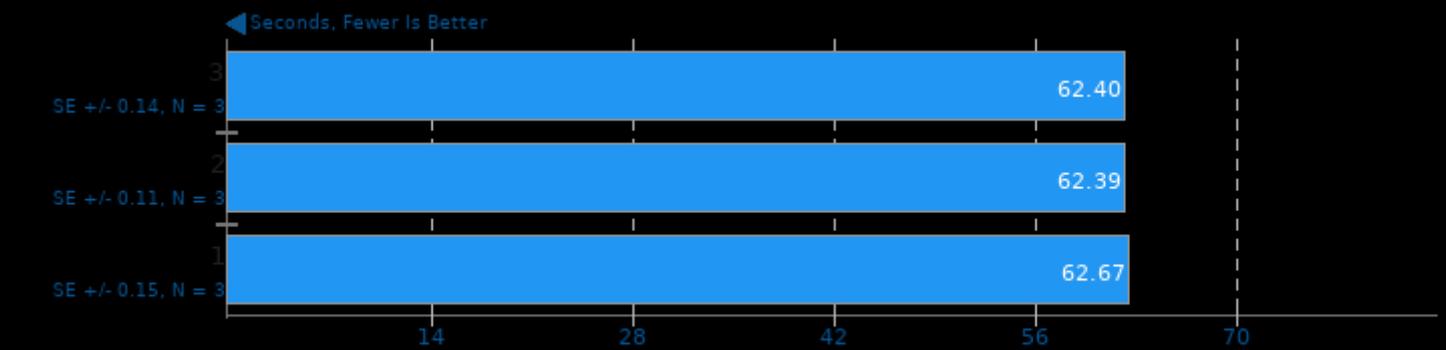
Encoder Speed: 10



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

### libavif avifenc 0.9.0

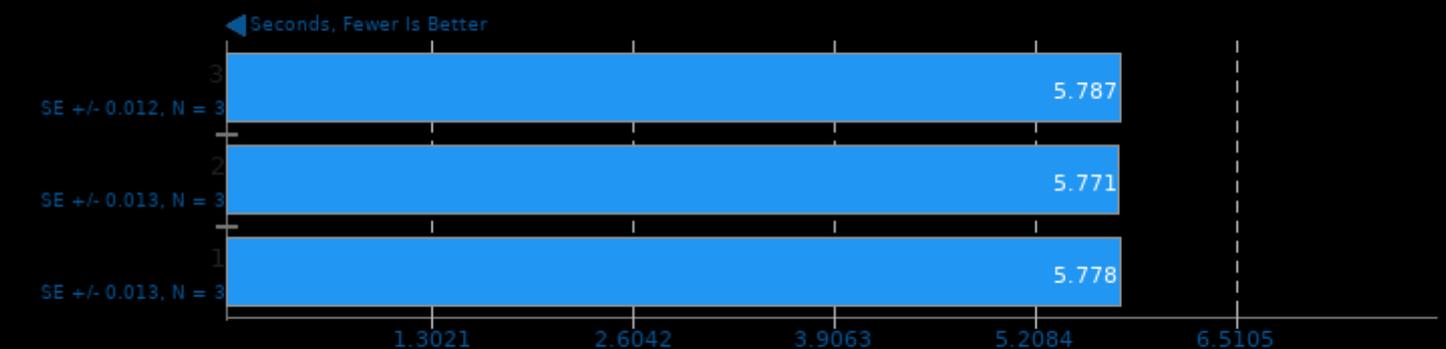
Encoder Speed: 6, Lossless



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

### libavif avifenc 0.9.0

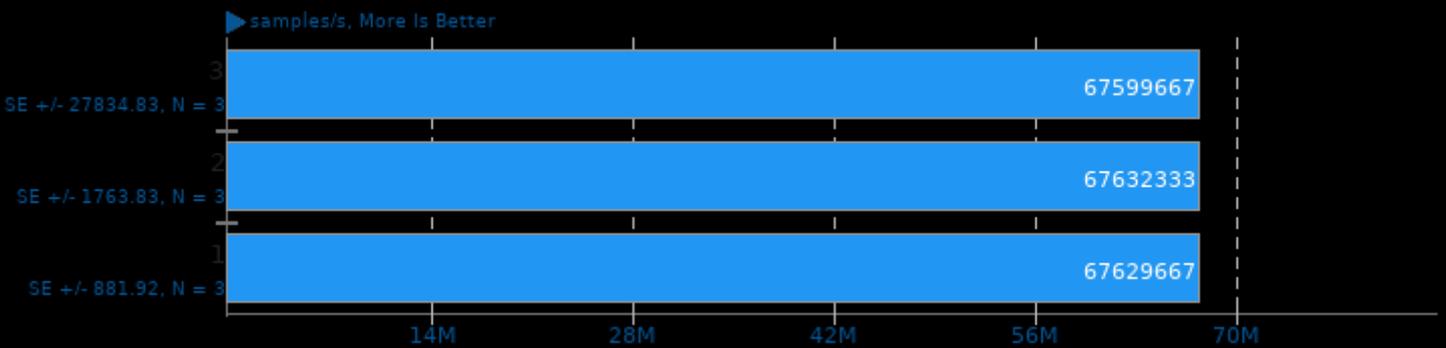
Encoder Speed: 10, Lossless



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

### Liquid-DSP 2021.01.31

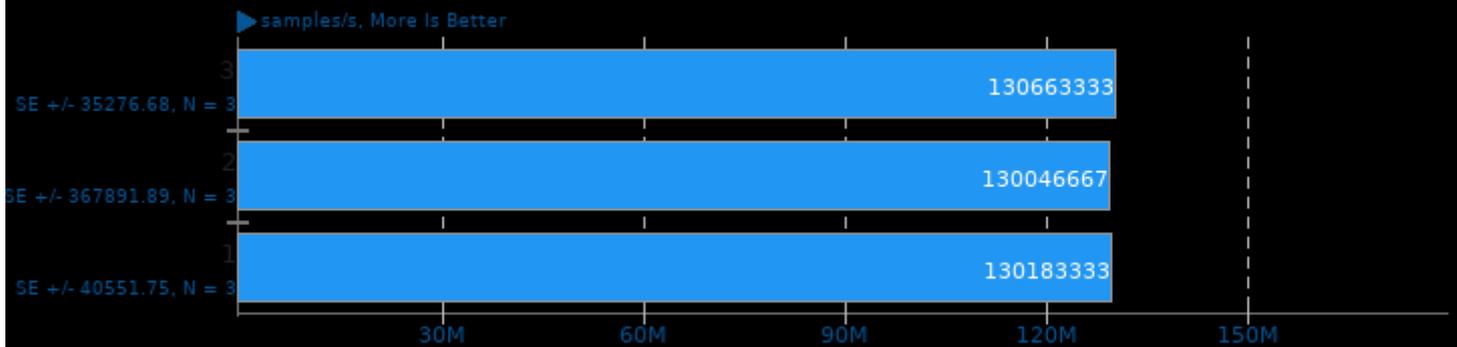
Threads: 1 - Buffer Length: 256 - Filter Length: 57



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

### Liquid-DSP 2021.01.31

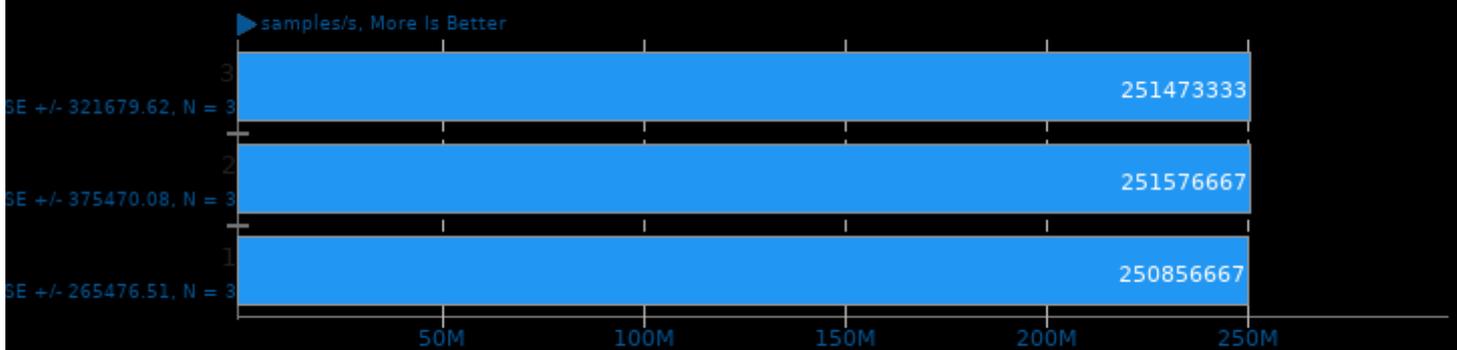
Threads: 2 - Buffer Length: 256 - Filter Length: 57



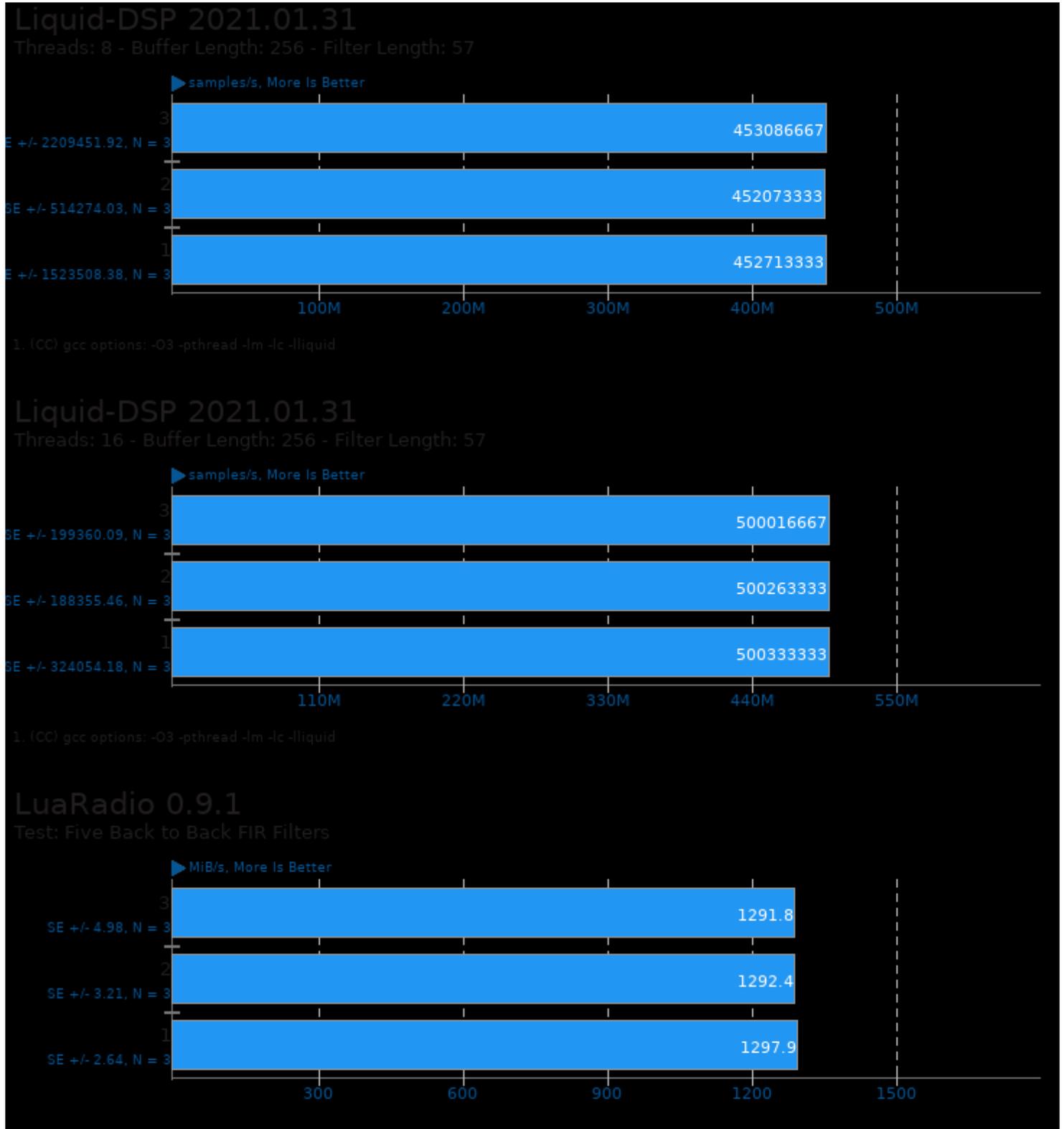
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid

### Liquid-DSP 2021.01.31

Threads: 4 - Buffer Length: 256 - Filter Length: 57

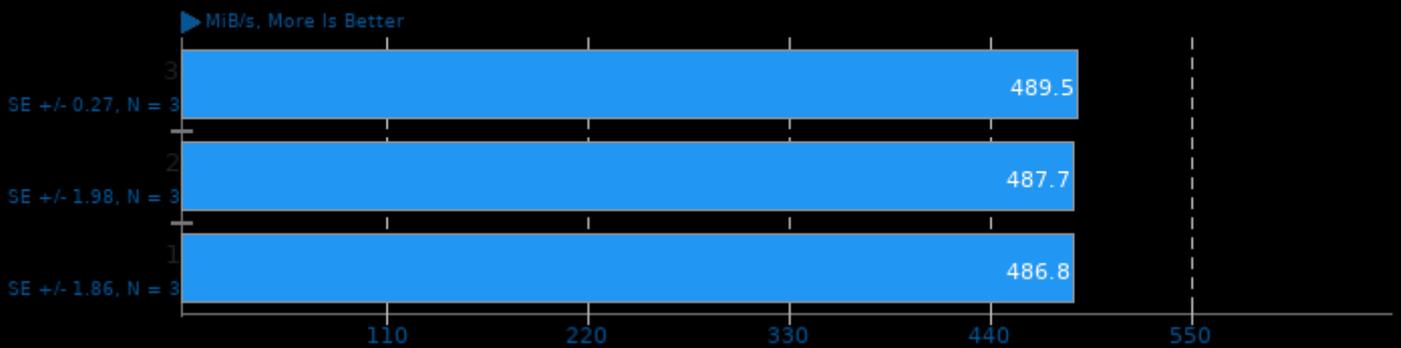


1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid



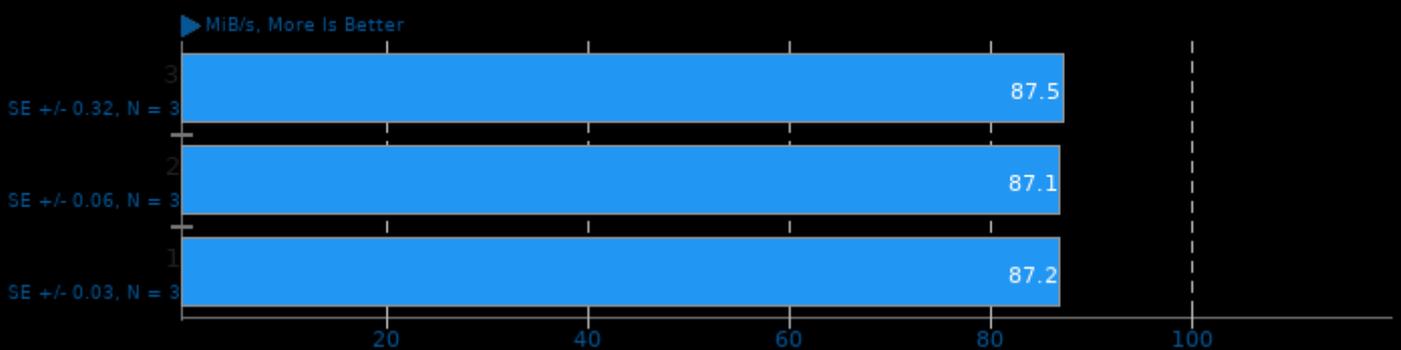
### LuaRadio 0.9.1

Test: FM Deemphasis Filter



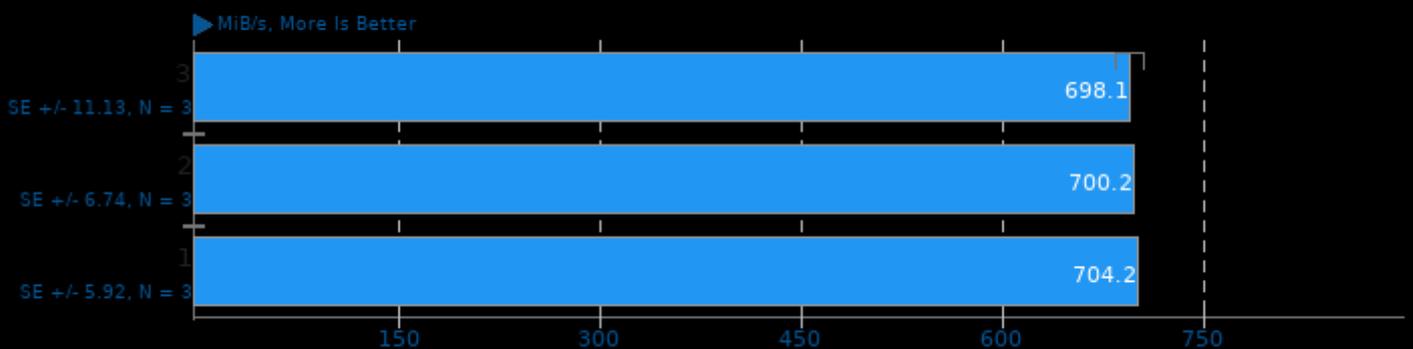
### LuaRadio 0.9.1

Test: Hilbert Transform



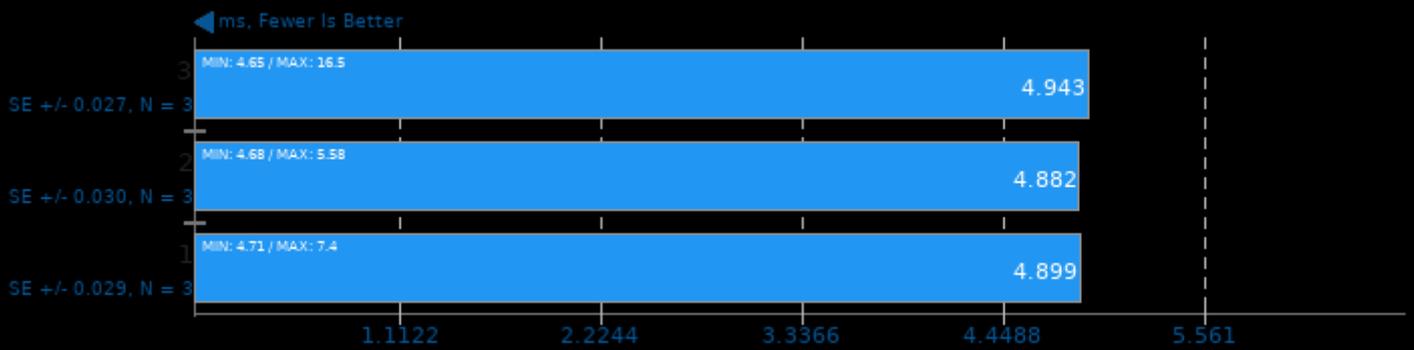
### LuaRadio 0.9.1

Test: Complex Phase



### Mobile Neural Network 1.1.3

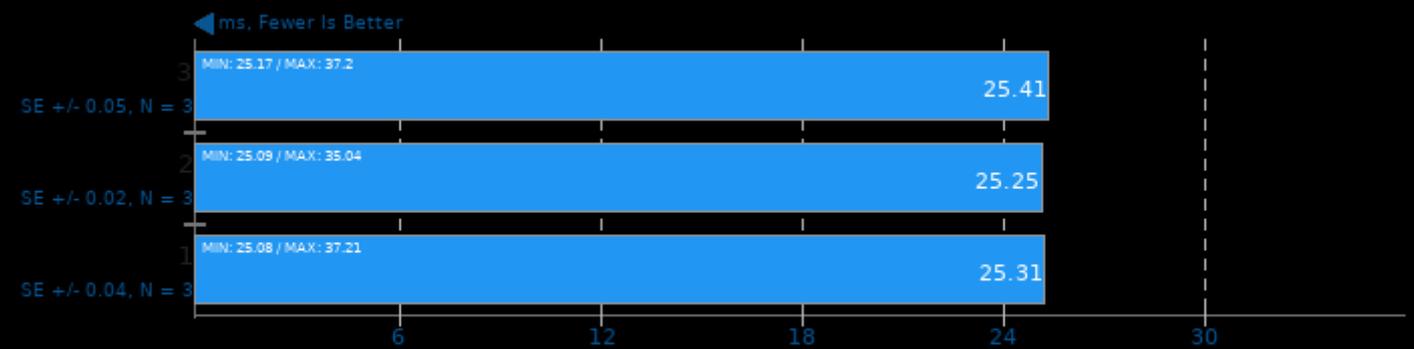
Model: SqueezeNetV1.0



1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fno-

### Mobile Neural Network 1.1.3

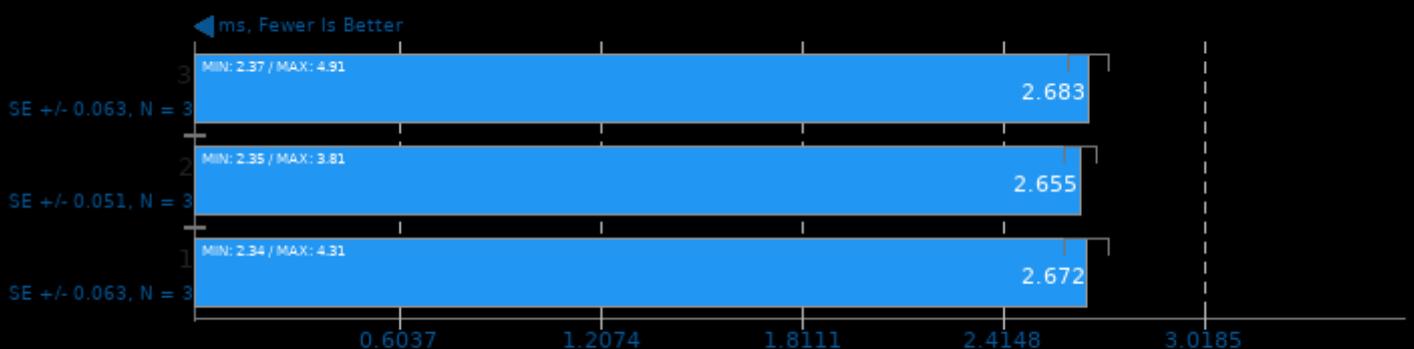
Model: resnet-v2-50



1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fno-

### Mobile Neural Network 1.1.3

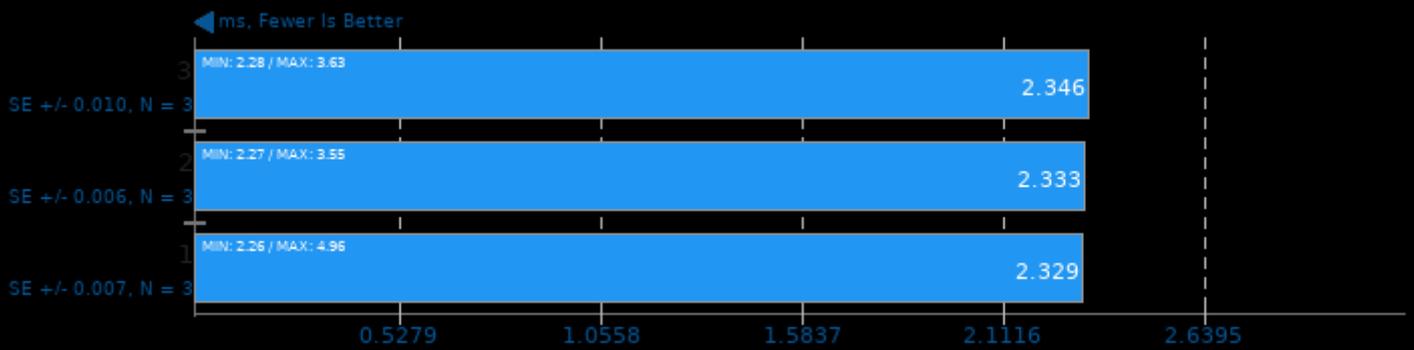
Model: MobileNetV2\_224



1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fno-

## Mobile Neural Network 1.1.3

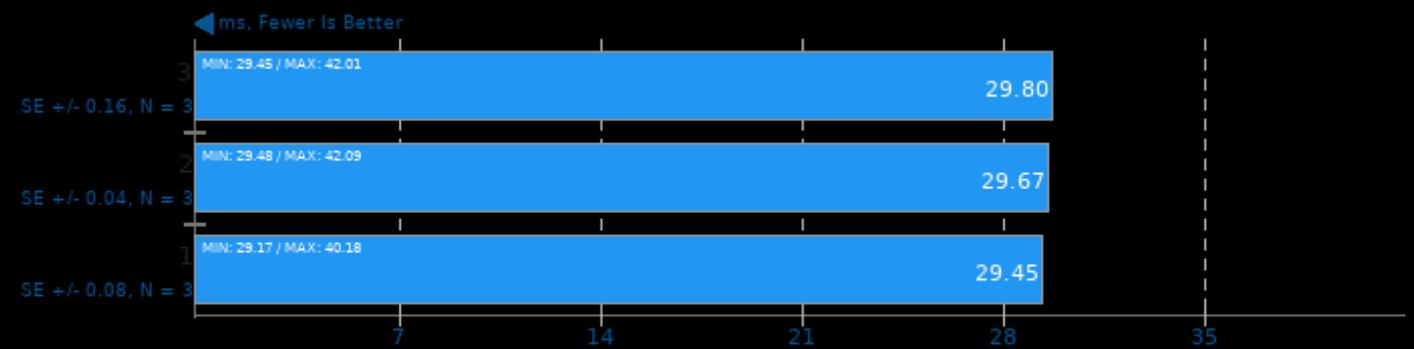
Model: mobilenet-v1-1.0



1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fno-

## Mobile Neural Network 1.1.3

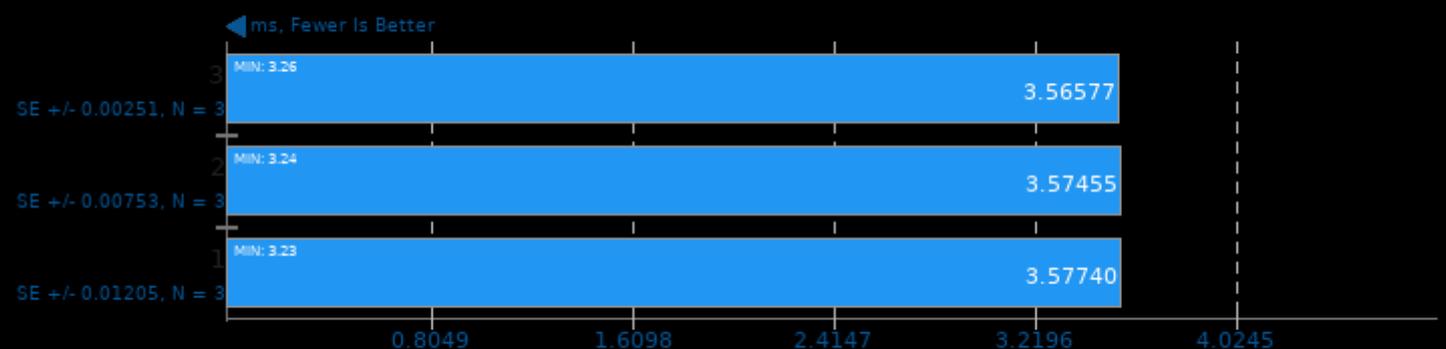
Model: inception-v3



1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fno-

## oneDNN 2.1.2

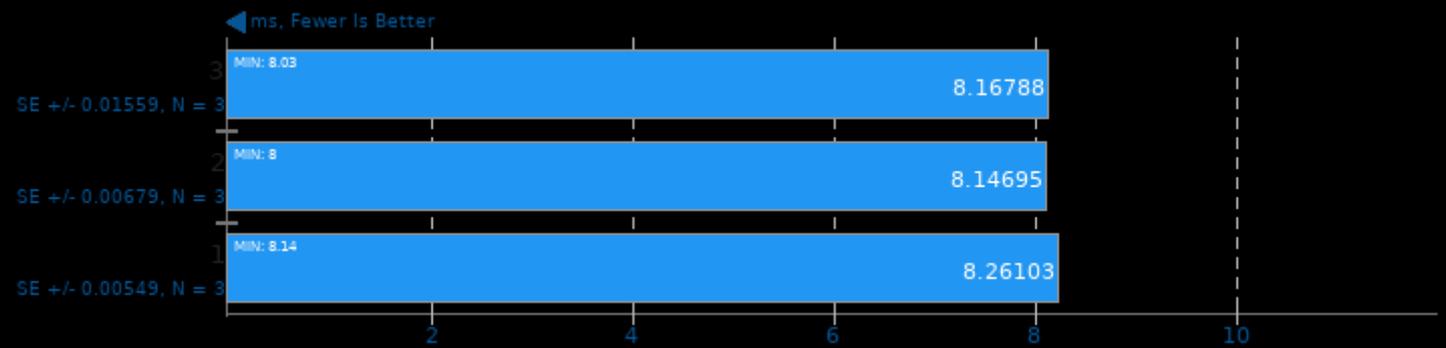
Harness: IP Shapes 1D - Data Type: f32 - Engine: CPU



1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -mssse4.1 -fPIC -pie -pthread -ldl

### oneDNN 2.1.2

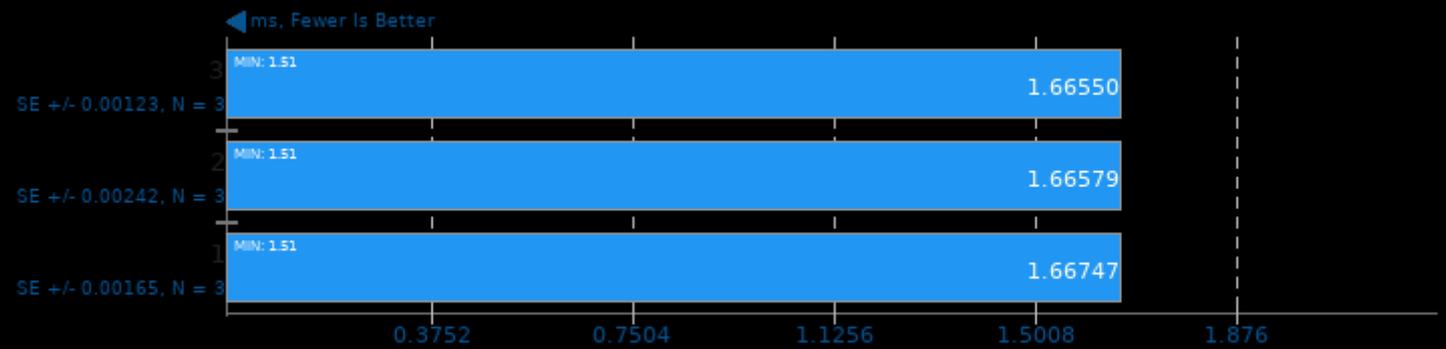
Harness: IP Shapes 3D - Data Type: f32 - Engine: CPU



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

### oneDNN 2.1.2

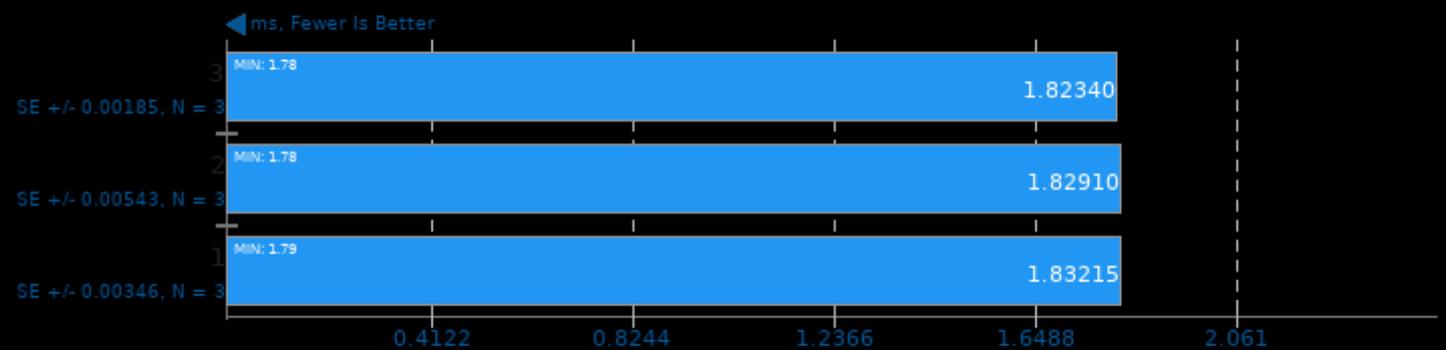
Harness: IP Shapes 1D - Data Type: u8s8f32 - Engine: CPU



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

### oneDNN 2.1.2

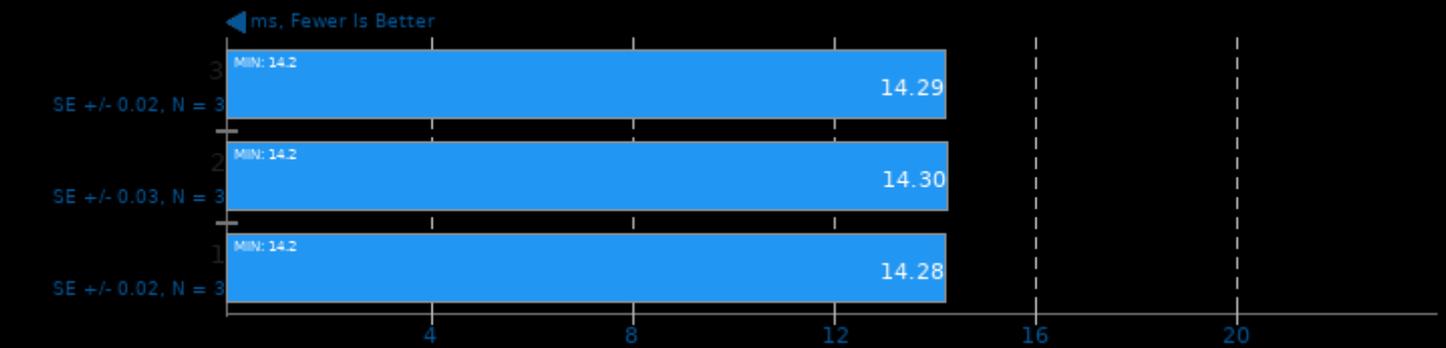
Harness: IP Shapes 3D - Data Type: u8s8f32 - Engine: CPU



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

### oneDNN 2.1.2

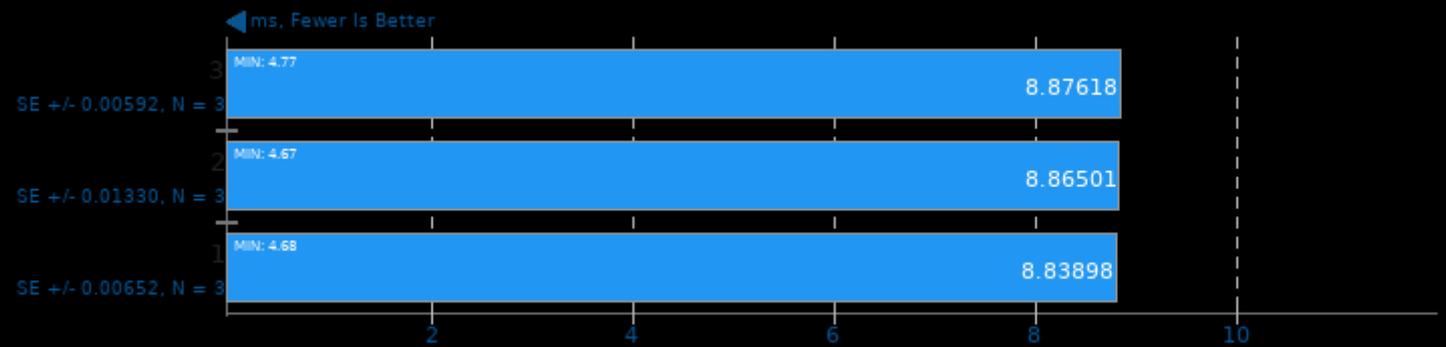
Harness: Convolution Batch Shapes Auto - Data Type: f32 - Engine: CPU



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

### oneDNN 2.1.2

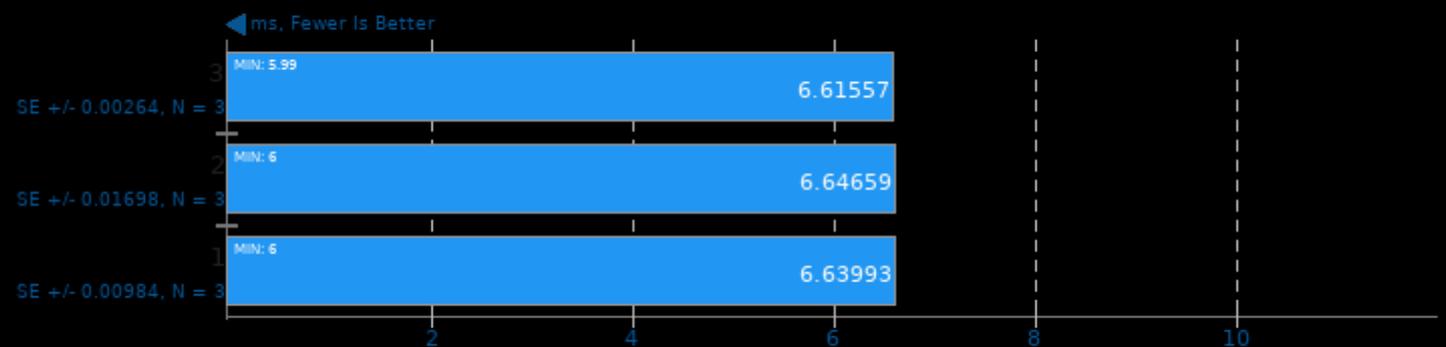
Harness: Deconvolution Batch shapes\_1d - Data Type: f32 - Engine: CPU



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

### oneDNN 2.1.2

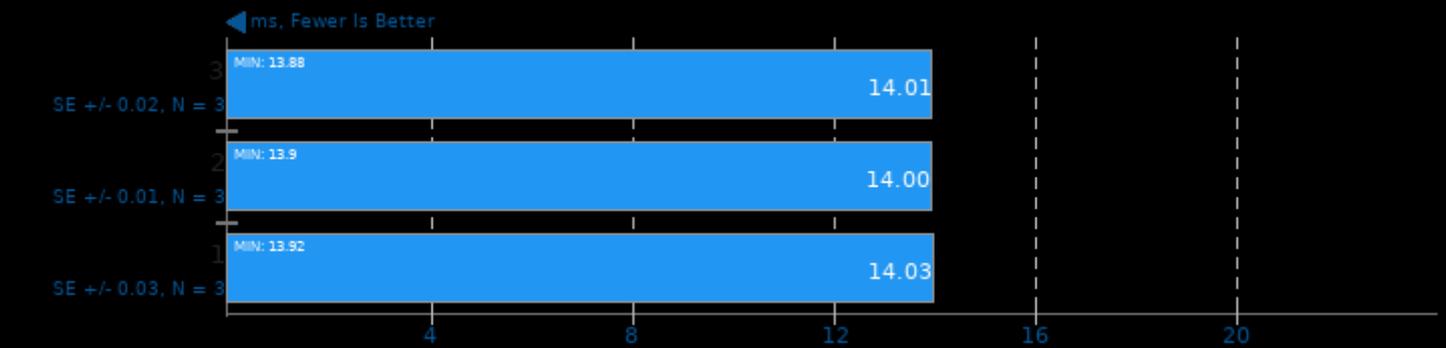
Harness: Deconvolution Batch shapes\_3d - Data Type: f32 - Engine: CPU



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

### oneDNN 2.1.2

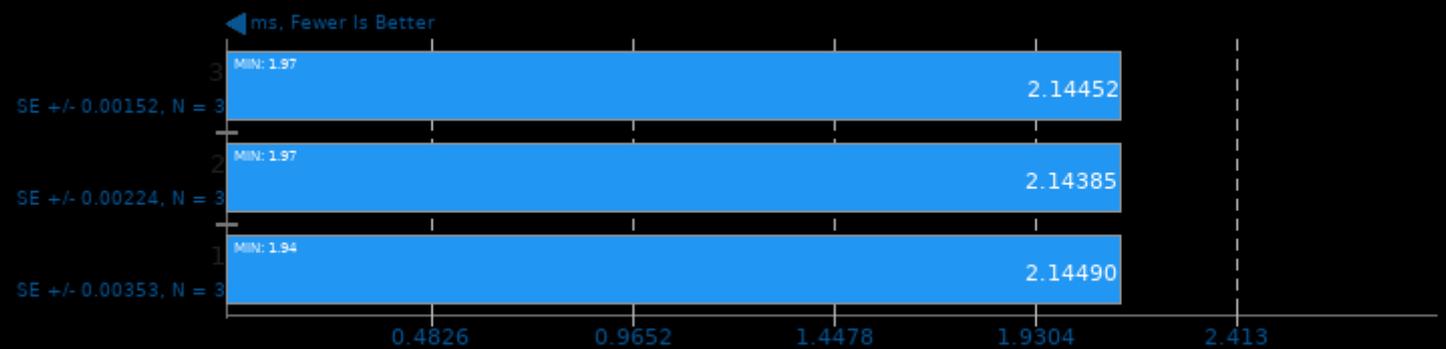
Harness: Convolution Batch Shapes Auto - Data Type: u8s8f32 - Engine: CPU



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

### oneDNN 2.1.2

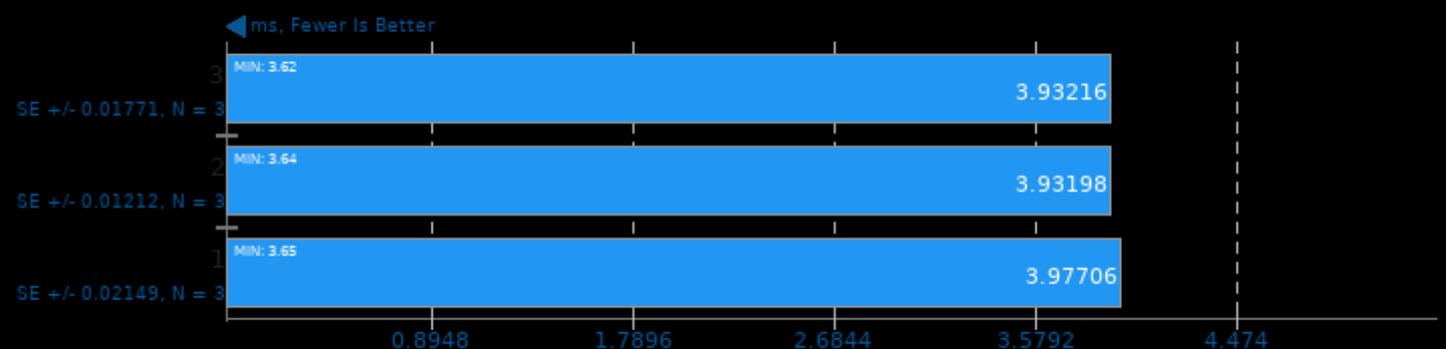
Harness: Deconvolution Batch shapes\_1d - Data Type: u8s8f32 - Engine: CPU



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

### oneDNN 2.1.2

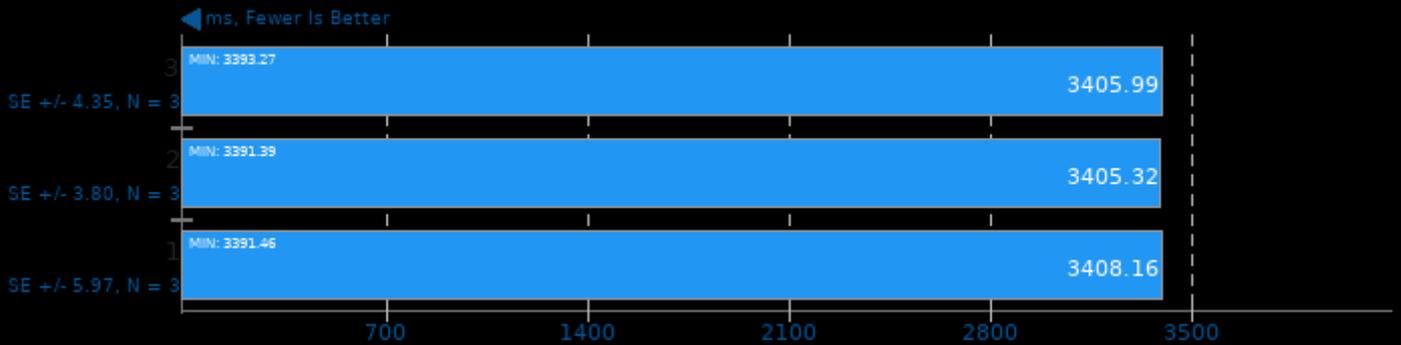
Harness: Deconvolution Batch shapes\_3d - Data Type: u8s8f32 - Engine: CPU



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

### oneDNN 2.1.2

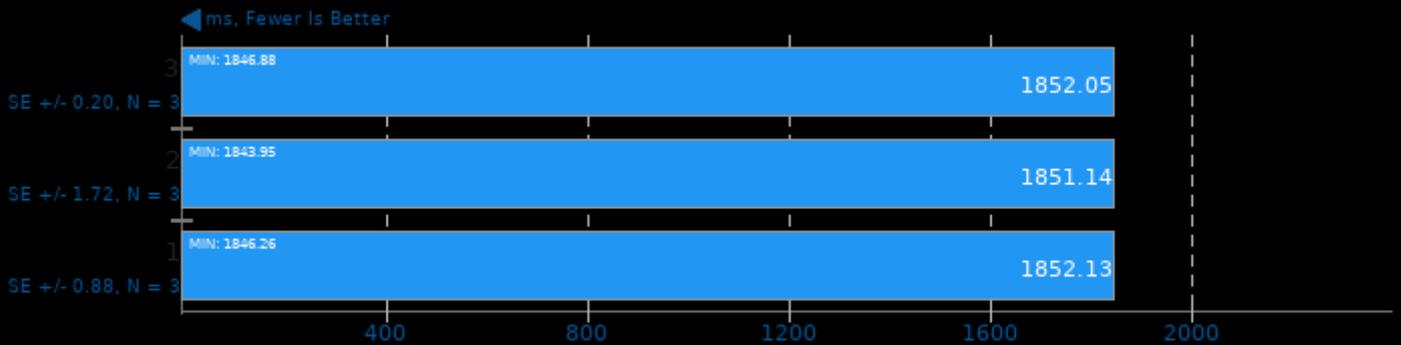
Harness: Recurrent Neural Network Training - Data Type: f32 - Engine: CPU



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

### oneDNN 2.1.2

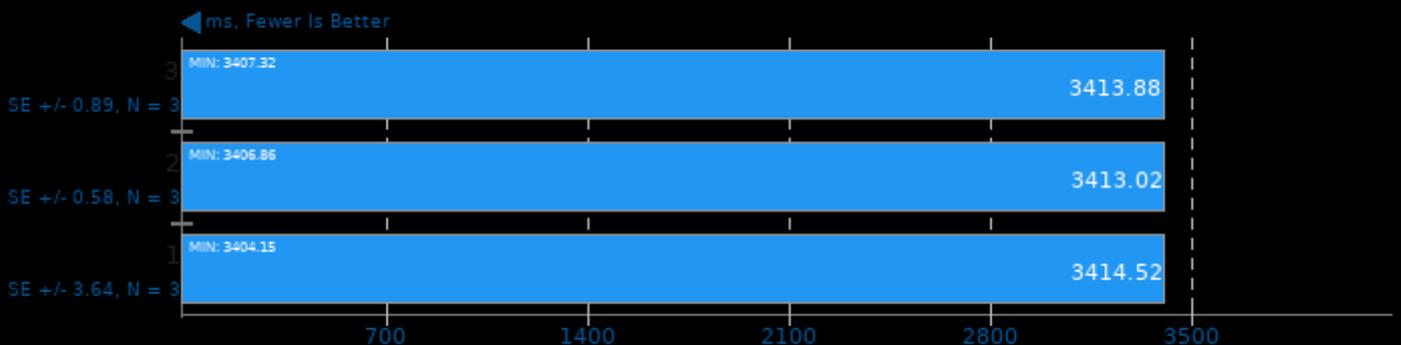
Harness: Recurrent Neural Network Inference - Data Type: f32 - Engine: CPU



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

### oneDNN 2.1.2

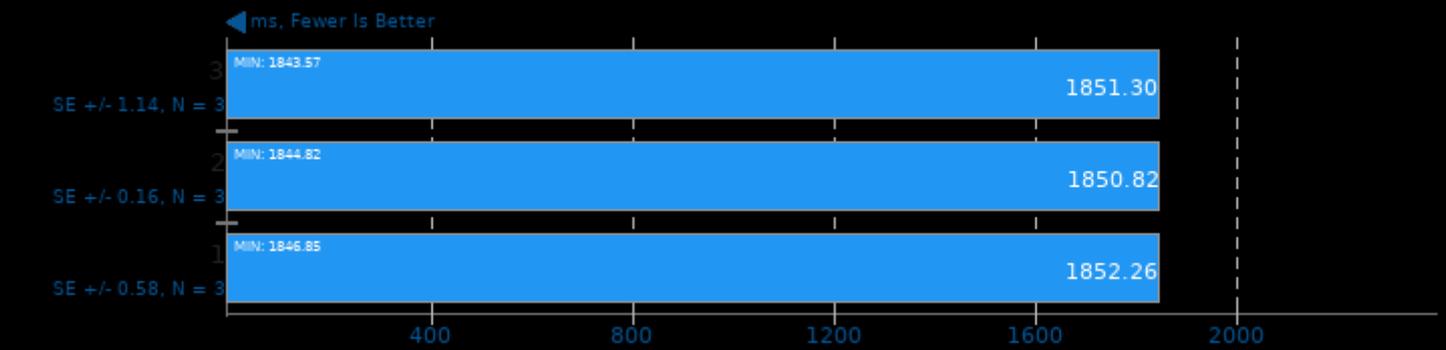
Harness: Recurrent Neural Network Training - Data Type: u8s8f32 - Engine: CPU



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

### oneDNN 2.1.2

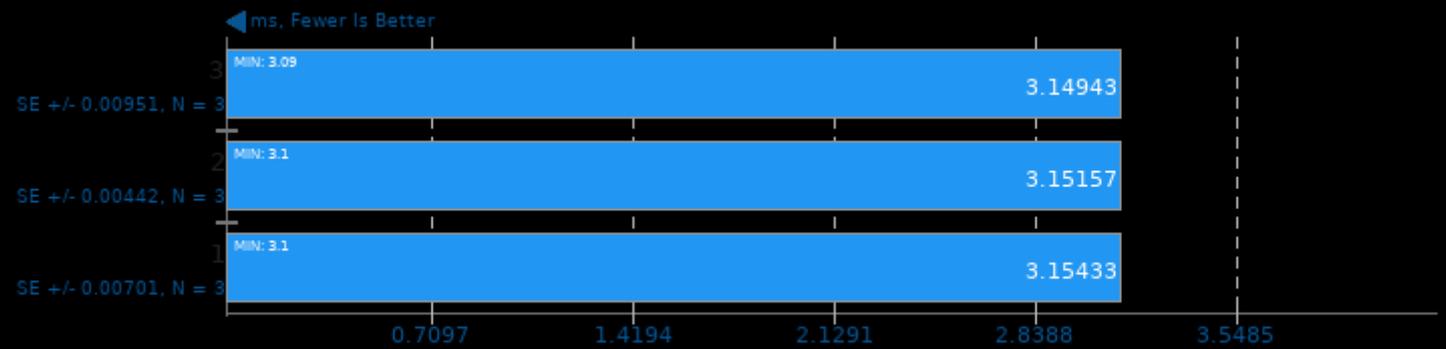
Harness: Recurrent Neural Network Inference - Data Type: u8s8f32 - Engine: CPU



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

### oneDNN 2.1.2

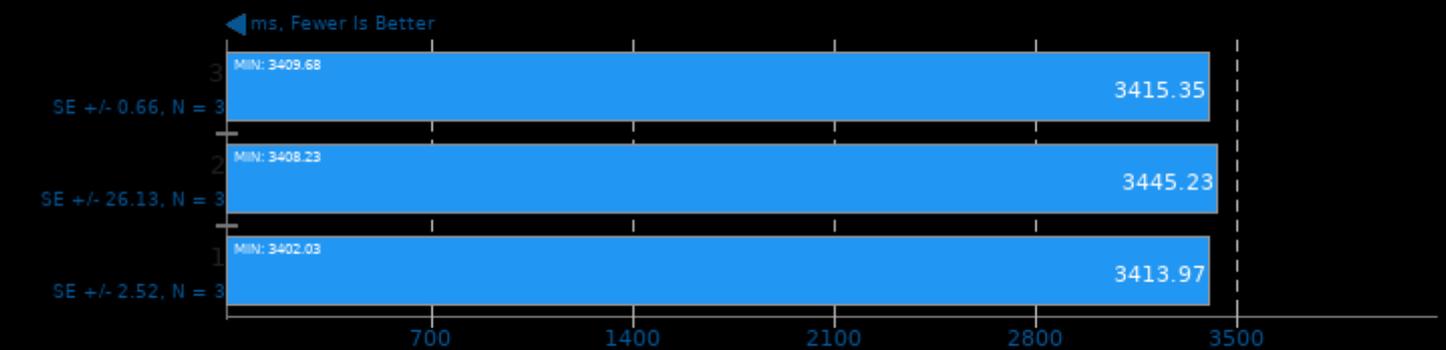
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: f32 - Engine: CPU



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

### oneDNN 2.1.2

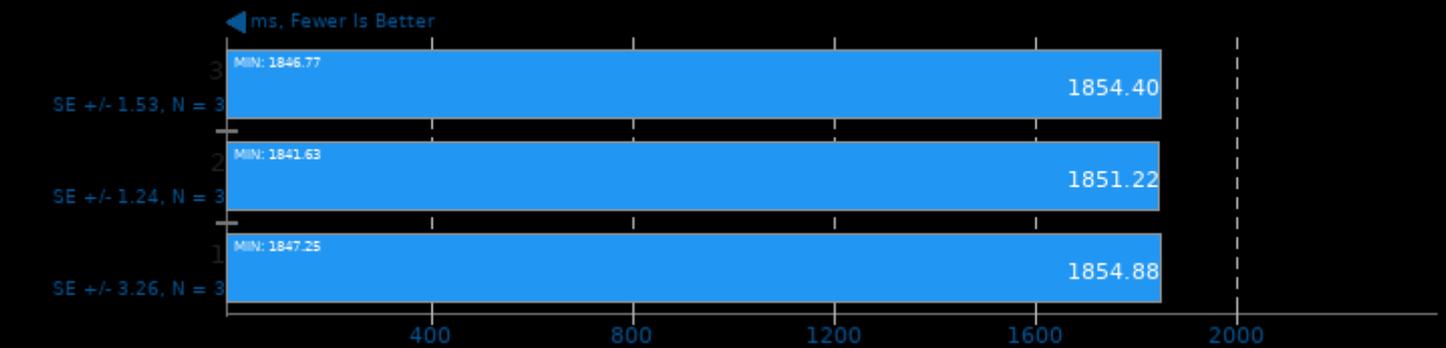
Harness: Recurrent Neural Network Training - Data Type: bf16bf16bf16 - Engine: CPU



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

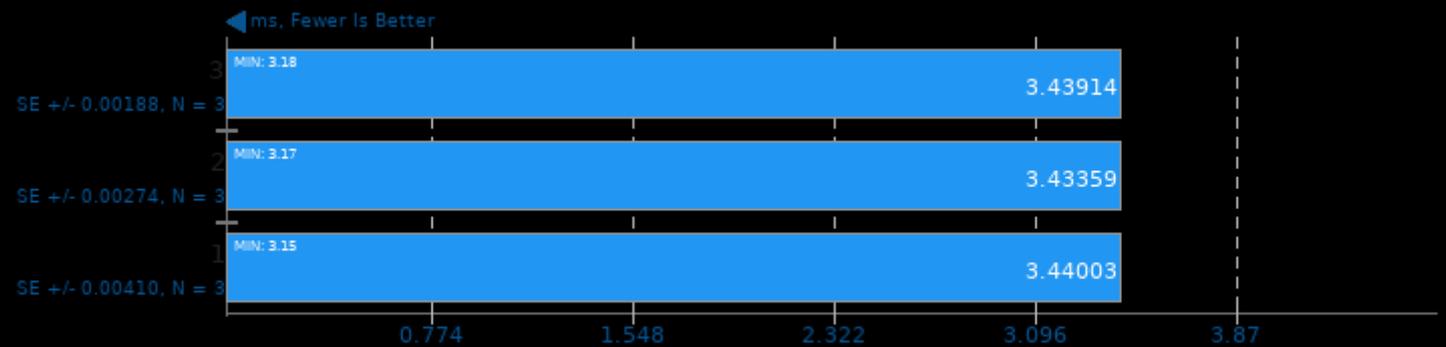
### oneDNN 2.1.2

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



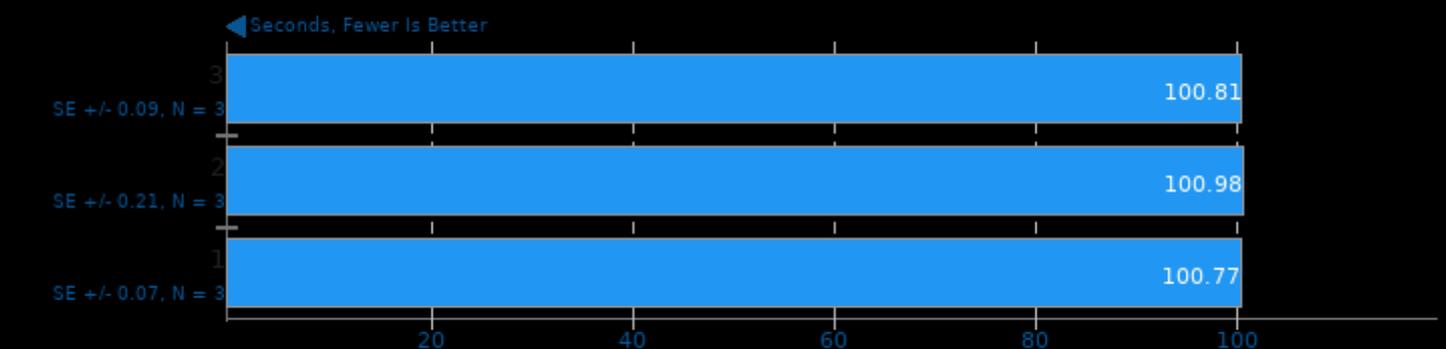
### oneDNN 2.1.2

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



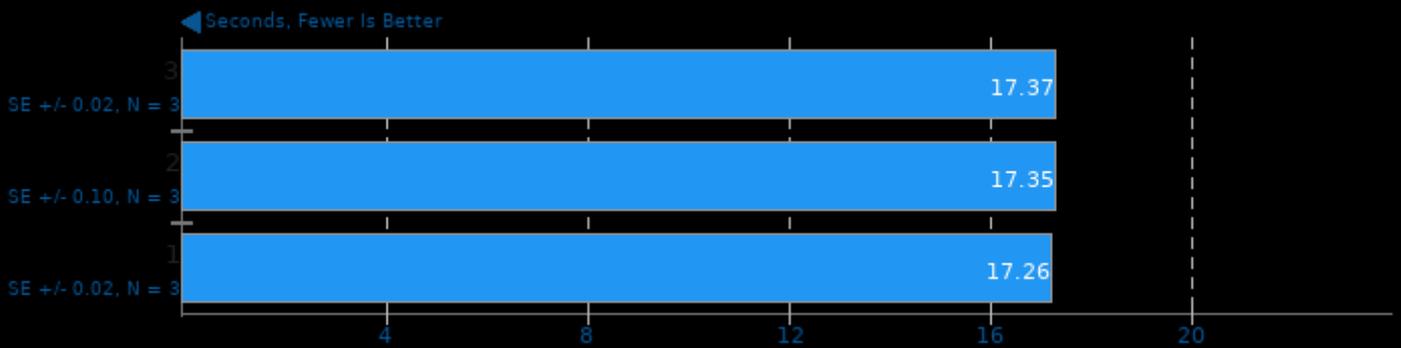
### OpenSCAD

Render: Pistol



### OpenSCAD

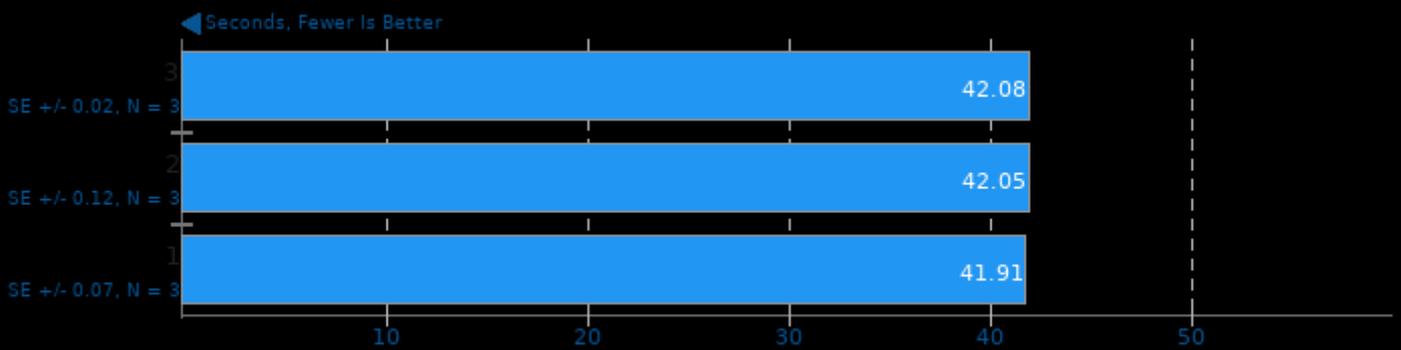
Render: Retro Car



1. OpenSCAD version 2019.05

### OpenSCAD

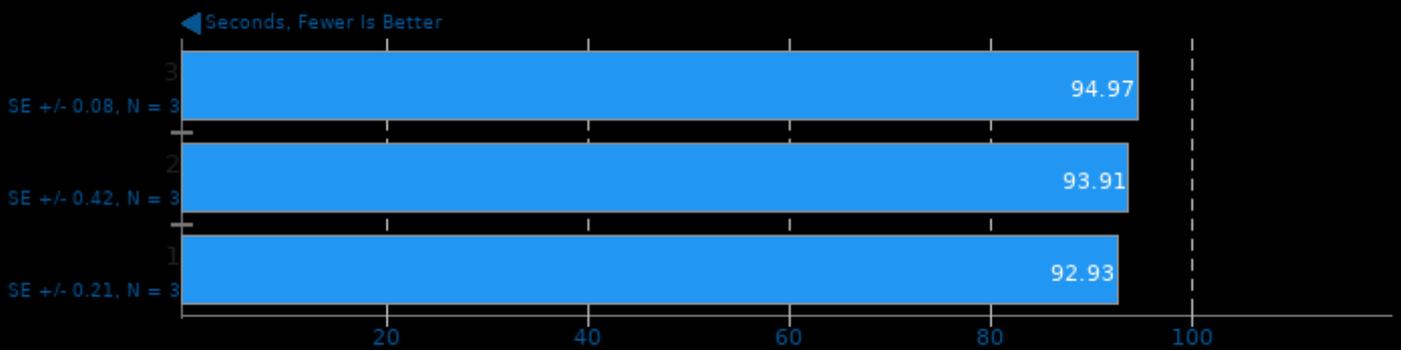
Render: Mini-ITX Case



1. OpenSCAD version 2019.05

### OpenSCAD

Render: Projector Mount Swivel

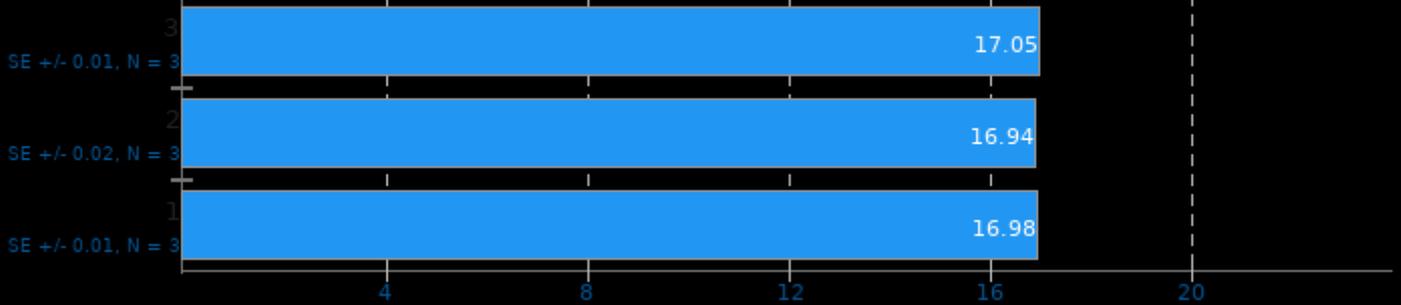


1. OpenSCAD version 2019.05

### OpenSCAD

Render: Leonardo Phone Case Slim

◀ Seconds, Fewer Is Better

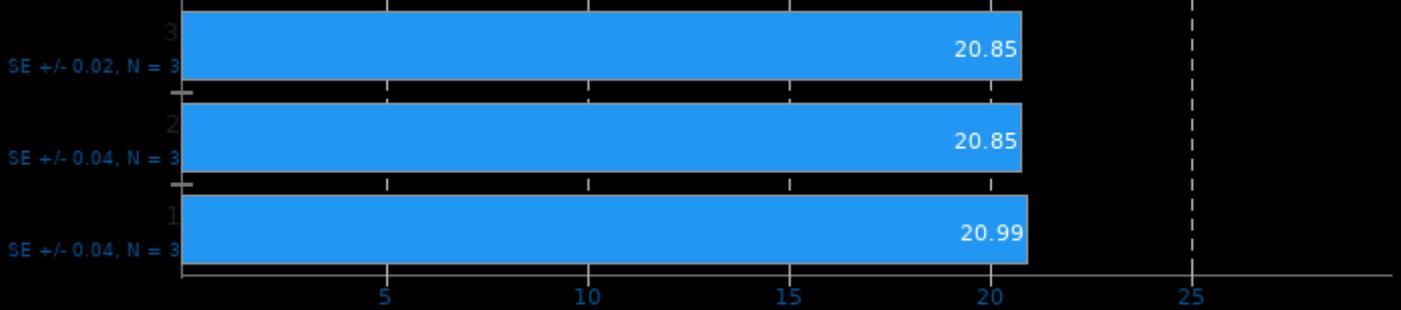


1. OpenSCAD version 2019.05

### SHOC Scalable Heterogeneous Computing 2020-04-17

Target: OpenCL - Benchmark: S3D

▶ GFLOPS, More Is Better

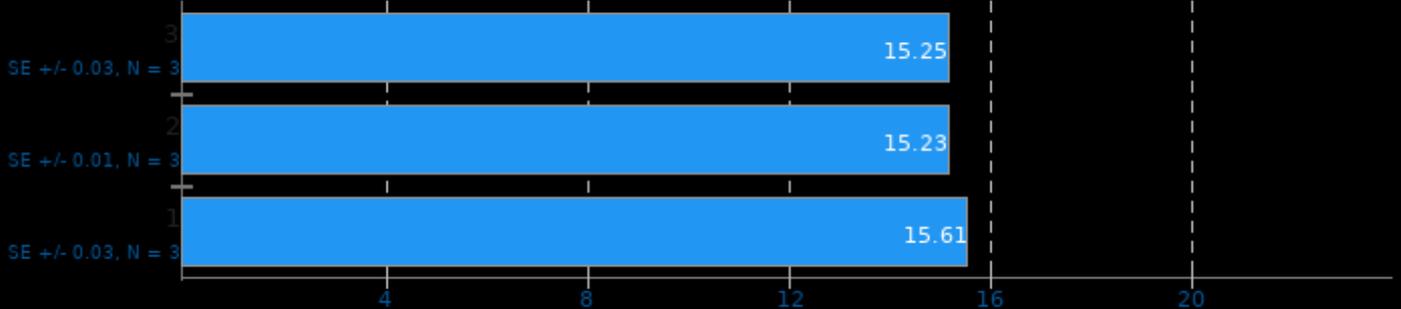


1. (CXX) g++ options: -O2 -ISHOCCommonMPI -ISHOCCommonOpenCL -ISHOCCommon -lOpenCL -lrt -pthread -lmpi\_cxx -lmpi

### SHOC Scalable Heterogeneous Computing 2020-04-17

Target: OpenCL - Benchmark: Triad

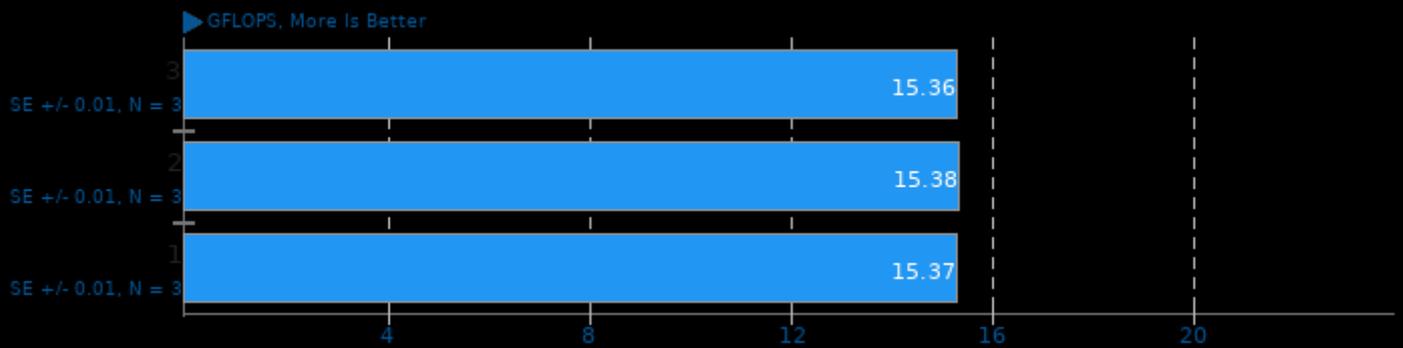
▶ GB/s, More Is Better



1. (CXX) g++ options: -O2 -ISHOCCommonMPI -ISHOCCommonOpenCL -ISHOCCommon -lOpenCL -lrt -pthread -lmpi\_cxx -lmpi

### SHOC Scalable Heterogeneous Computing 2020-04-17

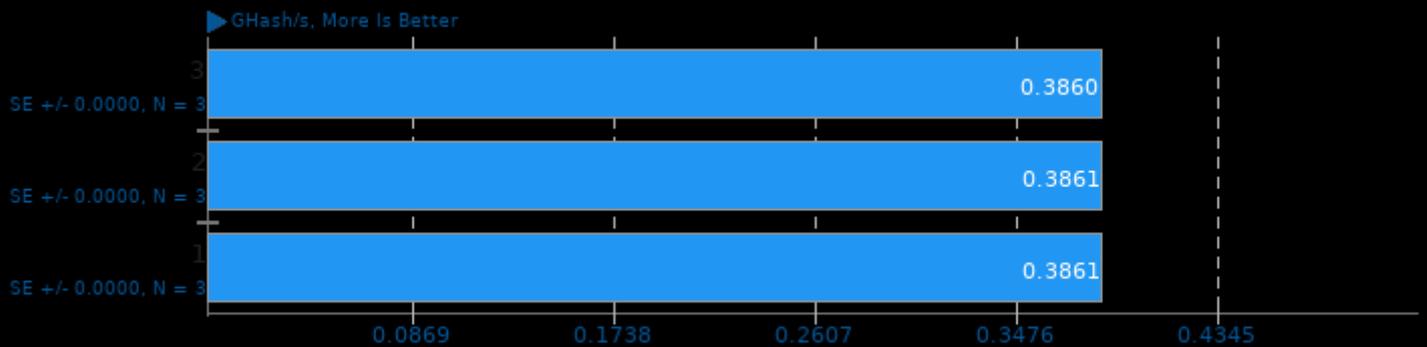
Target: OpenCL - Benchmark: FFT SP



1. (CXX) g++ options: -O2 -ISHOCCommonMPI -ISHOCCommonOpenCL -ISHOCCommon -lOpenCL -lrt -pthread -lmpi\_cxx -lmpi

### SHOC Scalable Heterogeneous Computing 2020-04-17

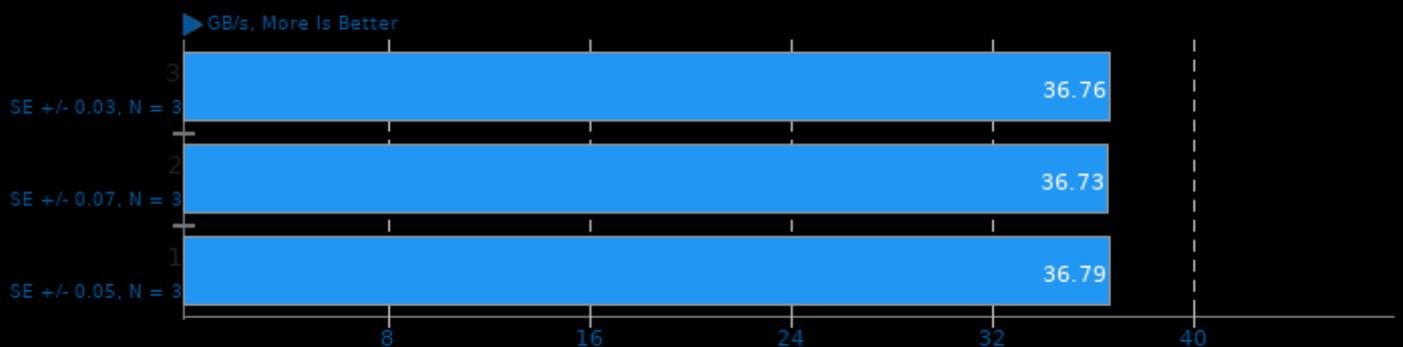
Target: OpenCL - Benchmark: MD5 Hash



1. (CXX) g++ options: -O2 -ISHOCCommonMPI -ISHOCCommonOpenCL -ISHOCCommon -lOpenCL -lrt -pthread -lmpi\_cxx -lmpi

### SHOC Scalable Heterogeneous Computing 2020-04-17

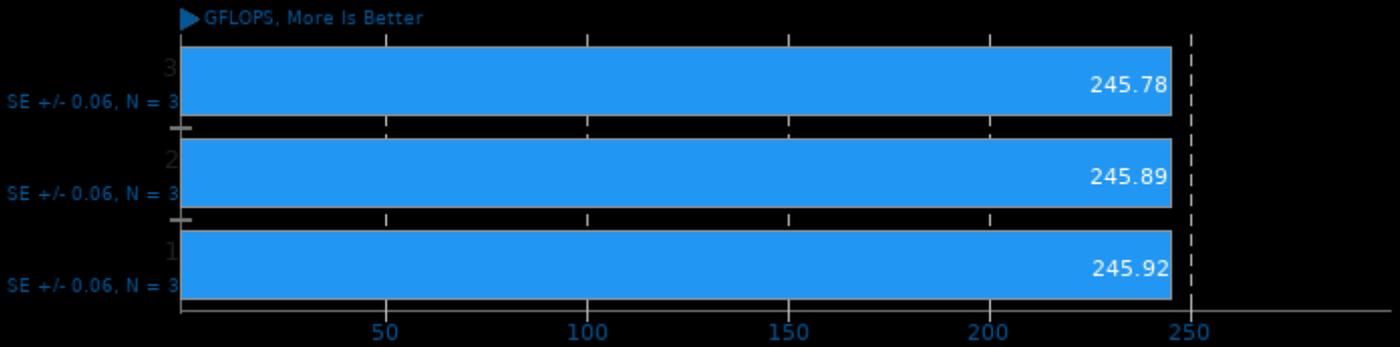
Target: OpenCL - Benchmark: Reduction



1. (CXX) g++ options: -O2 -ISHOCCommonMPI -ISHOCCommonOpenCL -ISHOCCommon -lOpenCL -lrt -pthread -lmpi\_cxx -lmpi

### SHOC Scalable Heterogeneous Computing 2020-04-17

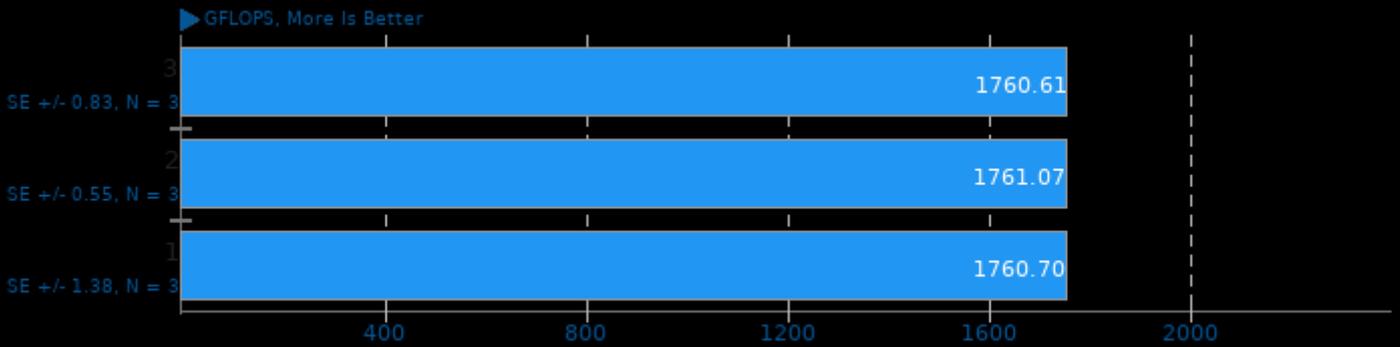
Target: OpenCL - Benchmark: GEMM SGEMM\_N



1. (CXX) g++ options: -O2 -ISHOCCommonMPI -ISHOCCommonOpenCL -ISHOCCommon -lOpenCL -lrt -pthread -lmpi\_cxx -lmpi

### SHOC Scalable Heterogeneous Computing 2020-04-17

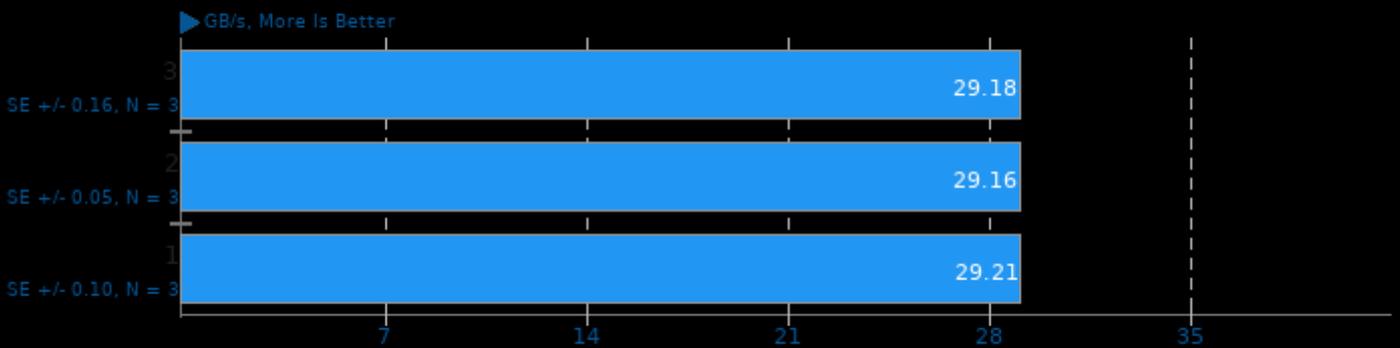
Target: OpenCL - Benchmark: Max SP Flops



1. (CXX) g++ options: -O2 -ISHOCCommonMPI -ISHOCCommonOpenCL -ISHOCCommon -lOpenCL -lrt -pthread -lmpi\_cxx -lmpi

### SHOC Scalable Heterogeneous Computing 2020-04-17

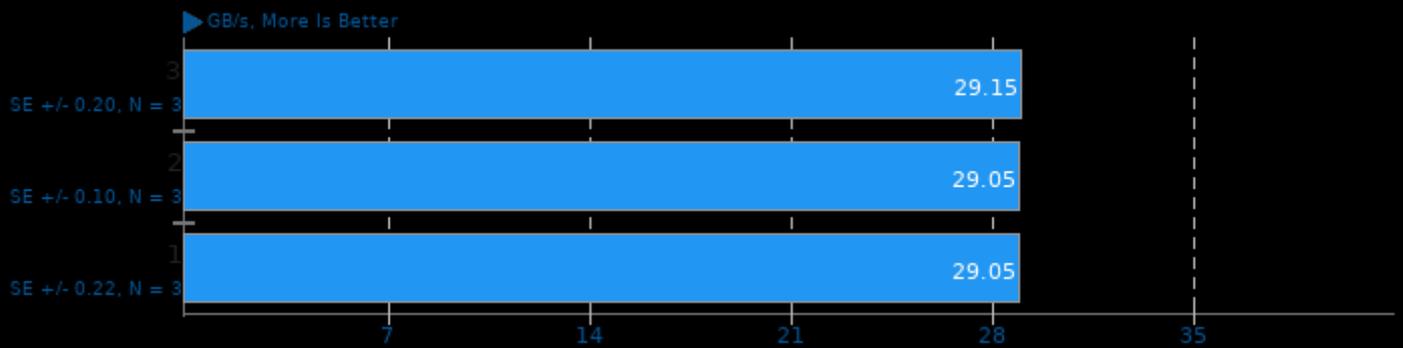
Target: OpenCL - Benchmark: Bus Speed Download



1. (CXX) g++ options: -O2 -ISHOCCommonMPI -ISHOCCommonOpenCL -ISHOCCommon -lOpenCL -lrt -pthread -lmpi\_cxx -lmpi

## SHOC Scalable Heterogeneous Computing 2020-04-17

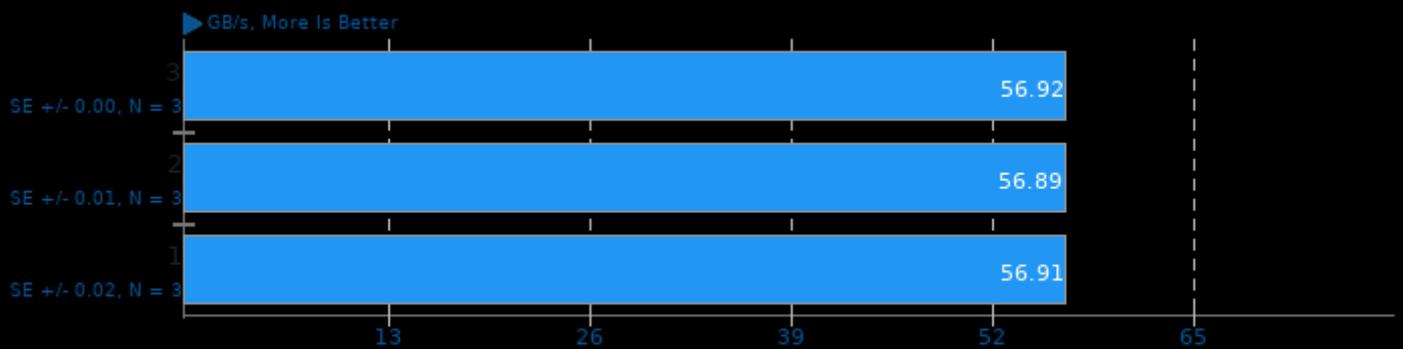
Target: OpenCL - Benchmark: Bus Speed Readback



1. (CXX) g++ options: -O2 -ISHOCCommonMPI -ISHOCCommonOpenCL -ISHOCCommon -lOpenCL -lrt -pthread -lmpi\_cxx -lmpi

## SHOC Scalable Heterogeneous Computing 2020-04-17

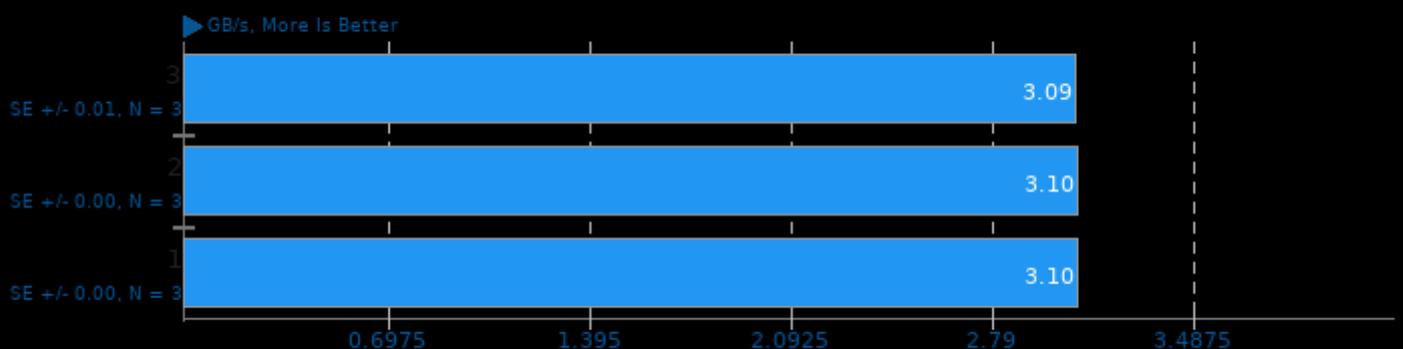
Target: OpenCL - Benchmark: Texture Read Bandwidth



1. (CXX) g++ options: -O2 -ISHOCCommonMPI -ISHOCCommonOpenCL -ISHOCCommon -lOpenCL -lrt -pthread -lmpi\_cxx -lmpi

## simdjson 0.8.2

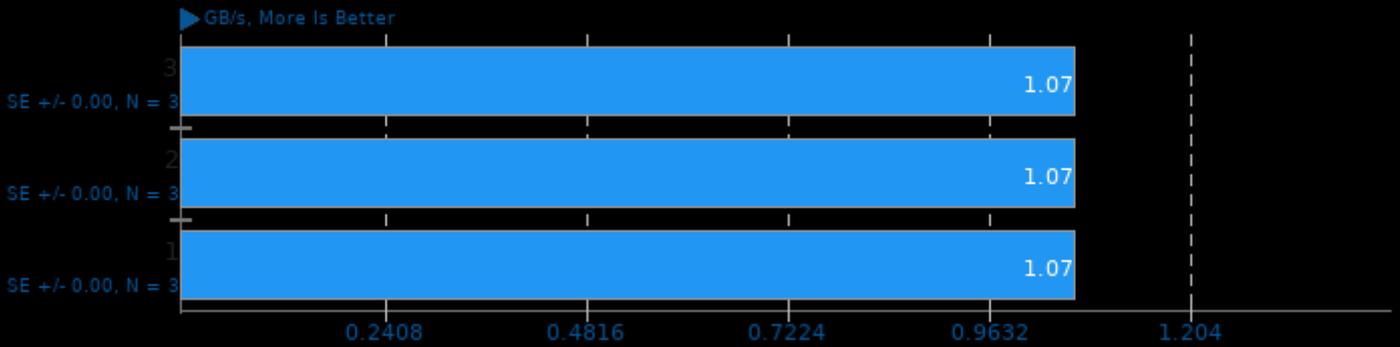
Throughput Test: Kostya



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

### simdjson 0.8.2

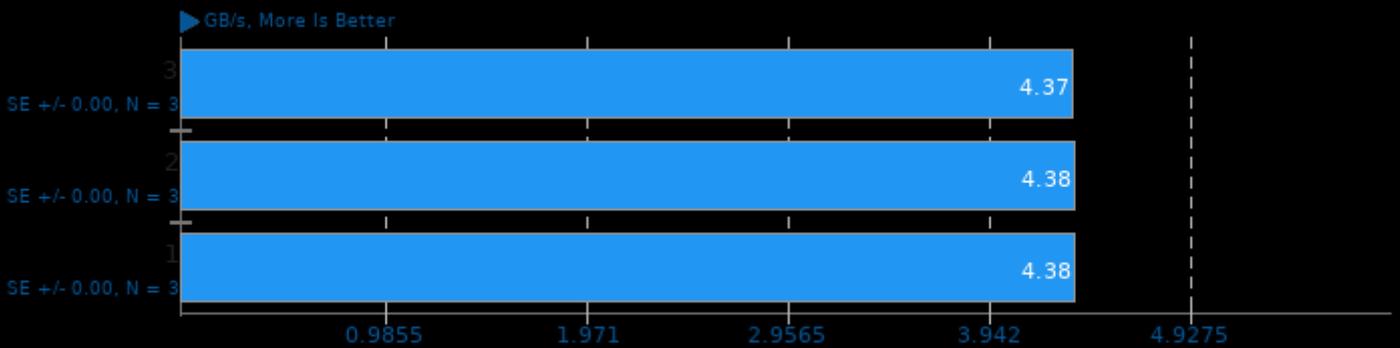
Throughput Test: LargeRandom



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

### simdjson 0.8.2

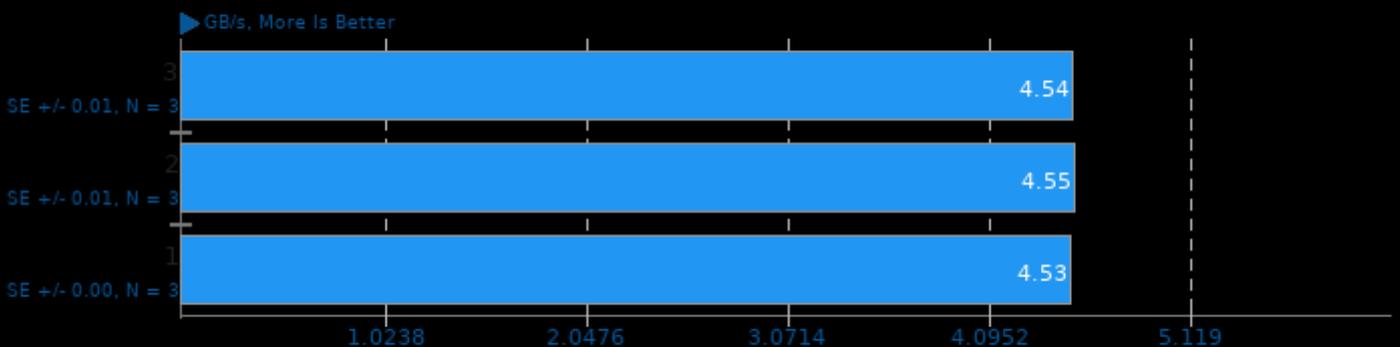
Throughput Test: PartialTweets



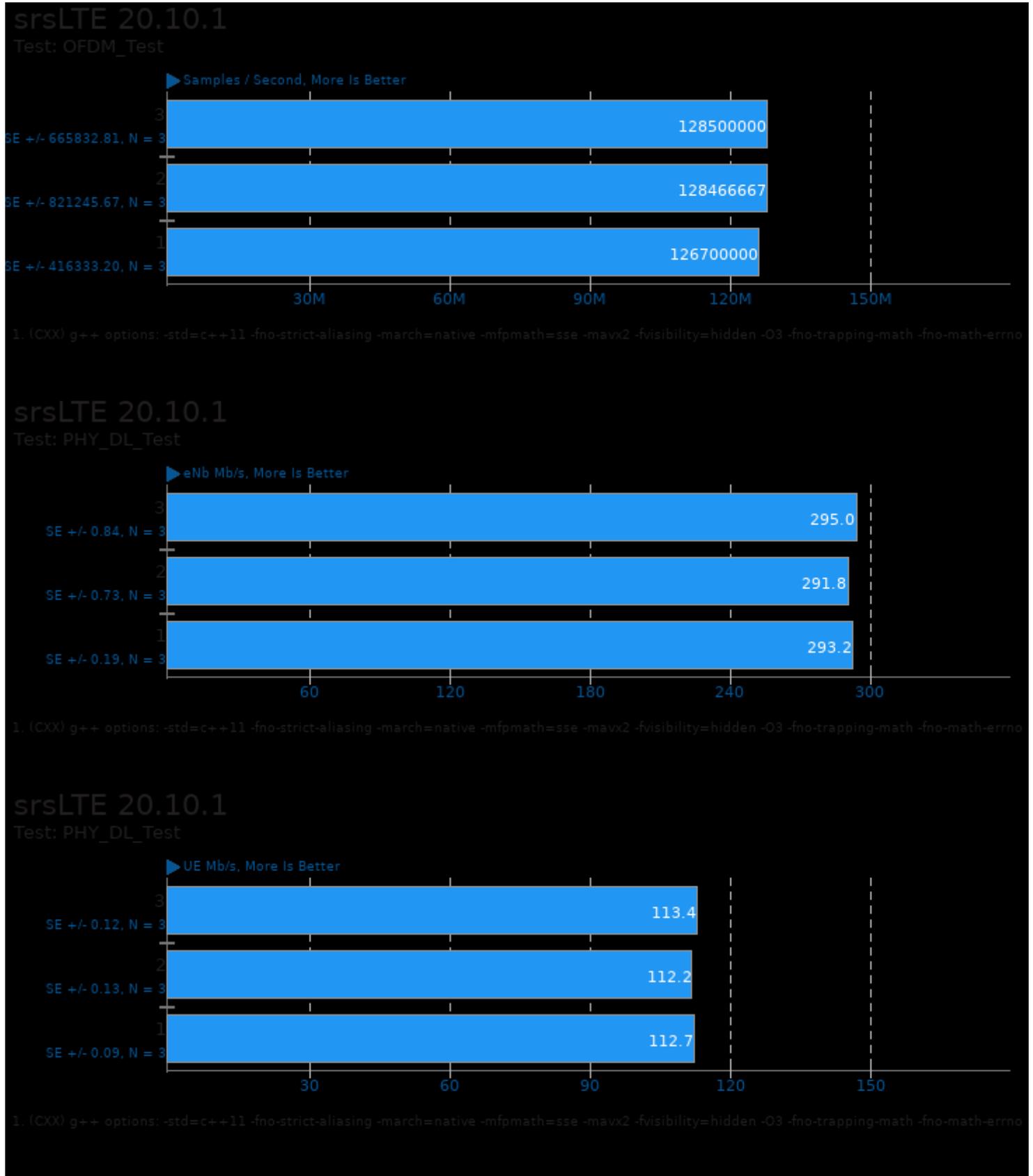
1. (CXX) g++ options: -O3 -pthread

### simdjson 0.8.2

Throughput Test: DistinctUserID

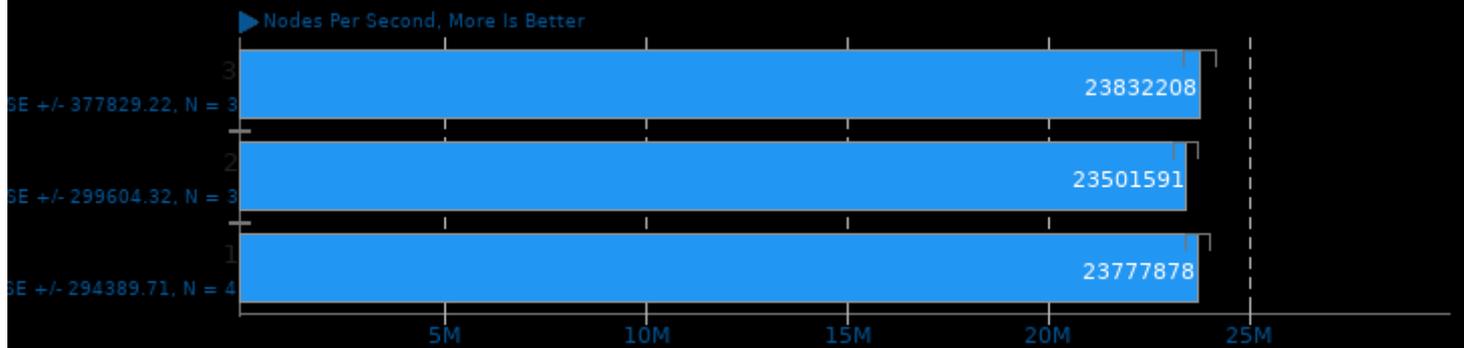


1. (CXX) g++ options: -O3 -pthread



### Stockfish 13

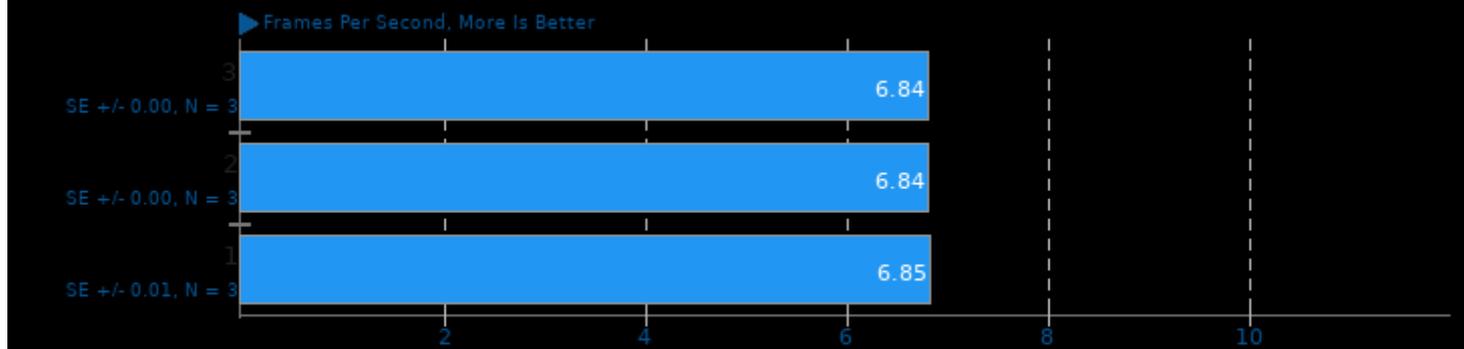
Total Time



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

### SVT-HEVC 1.5.0

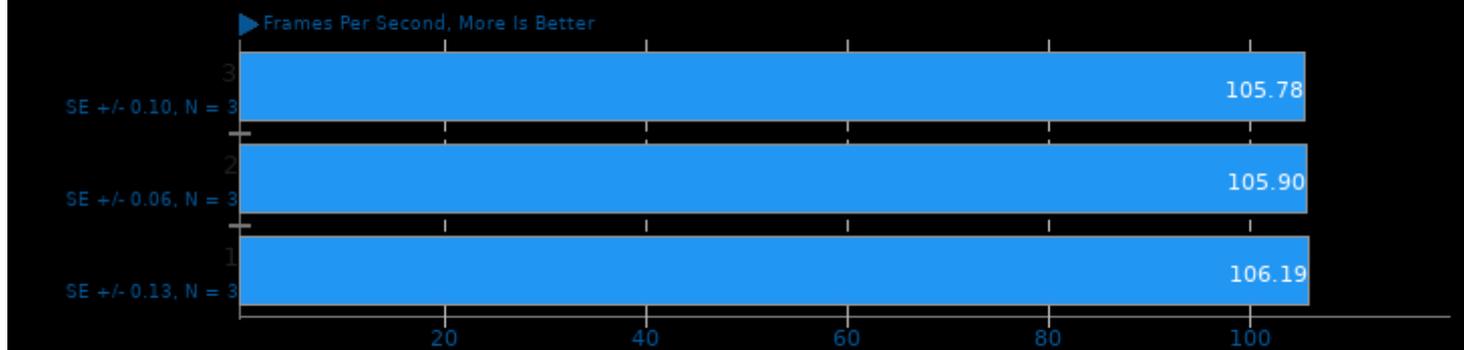
Tuning: 1 - Input: Bosphorus 1080p



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

### SVT-HEVC 1.5.0

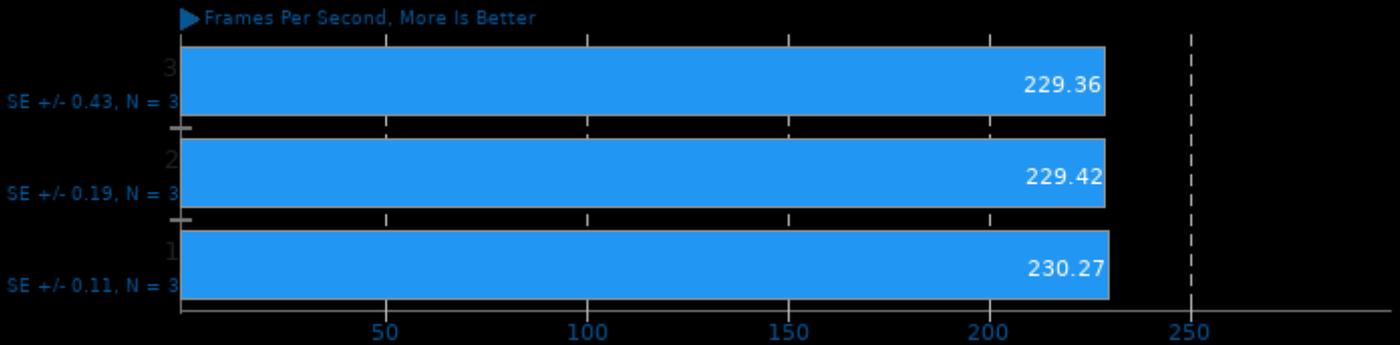
Tuning: 7 - Input: Bosphorus 1080p



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

### SVT-HEVC 1.5.0

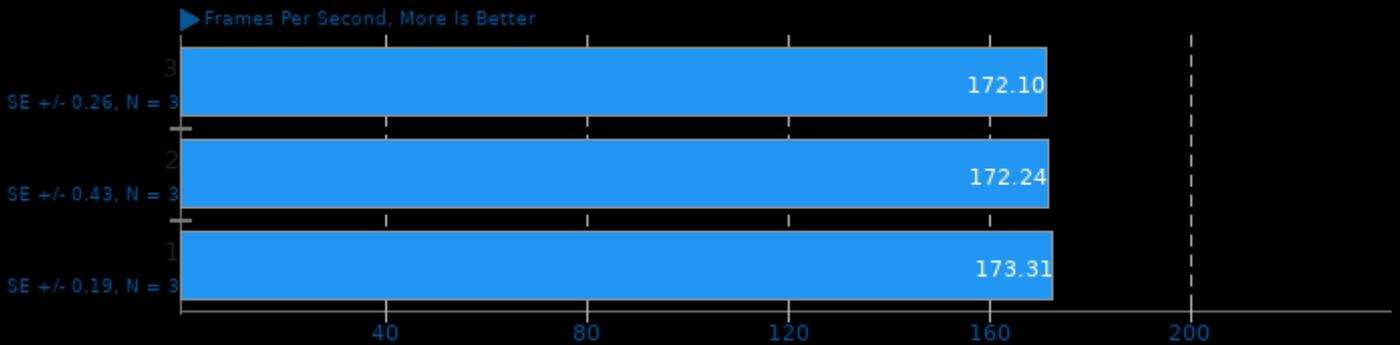
Tuning: 10 - Input: Bosphorus 1080p



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

### SVT-VP9 0.3

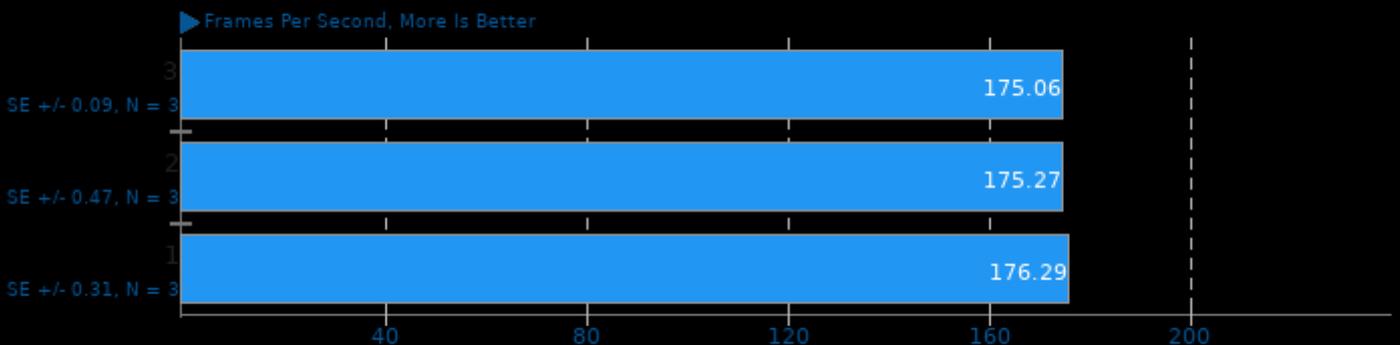
Tuning: VMAF Optimized - Input: Bosphorus 1080p



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

### SVT-VP9 0.3

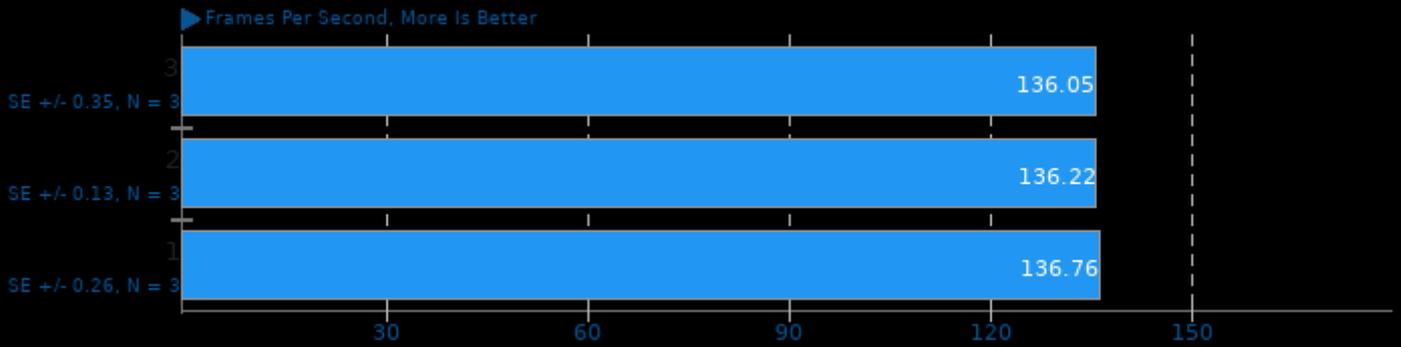
Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p



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

### SVT-VP9 0.3

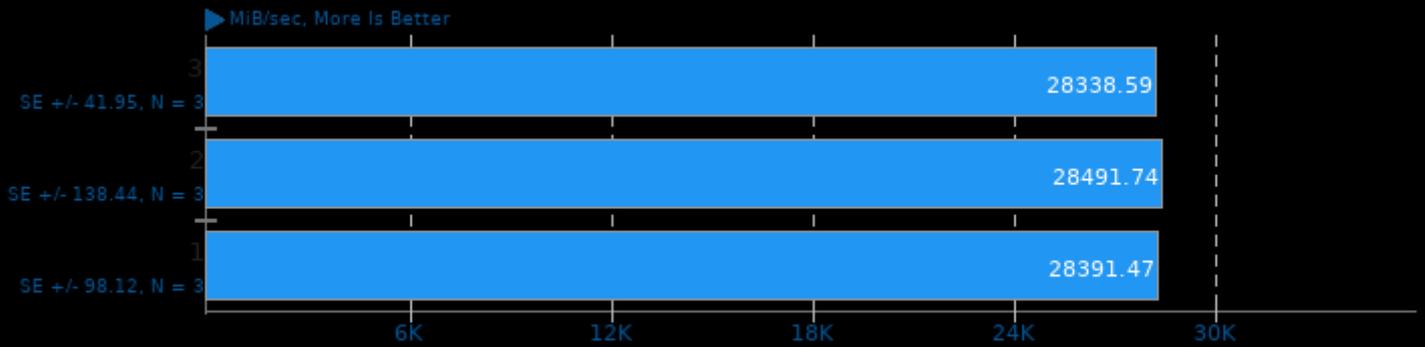
Tuning: Visual Quality Optimized - Input: Bosphorus 1080p



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

### Sysbench 1.0.20

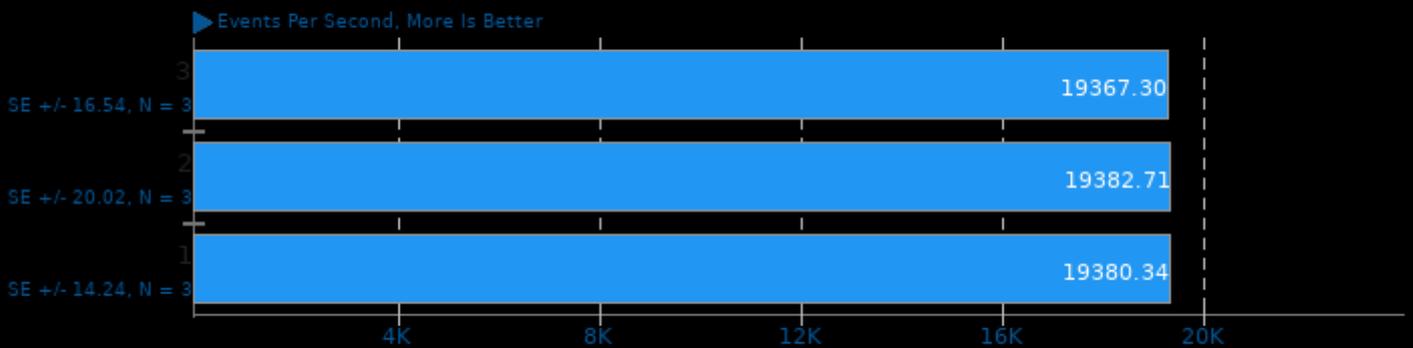
Test: RAM / Memory



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

### Sysbench 1.0.20

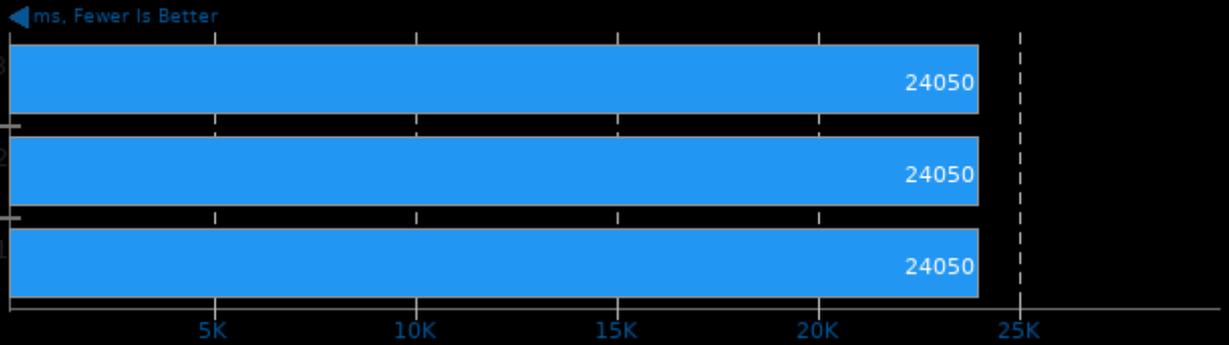
Test: CPU



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

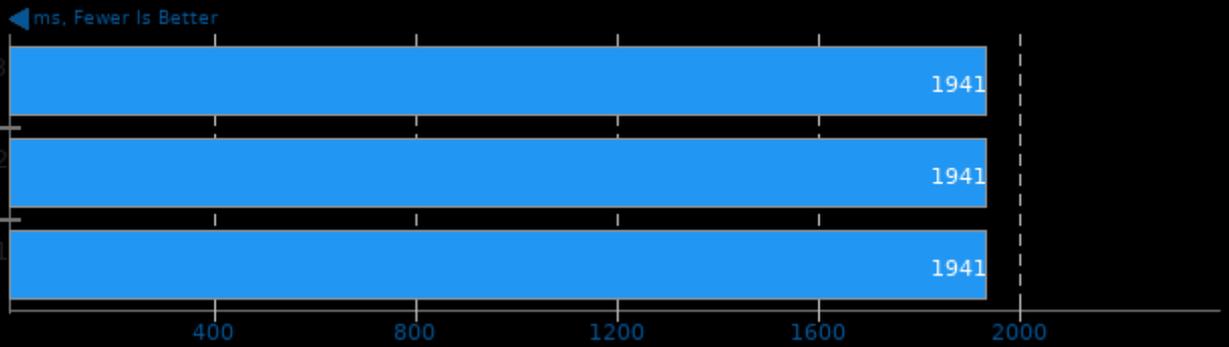
### Systemd Total Boot Time

Test: Total



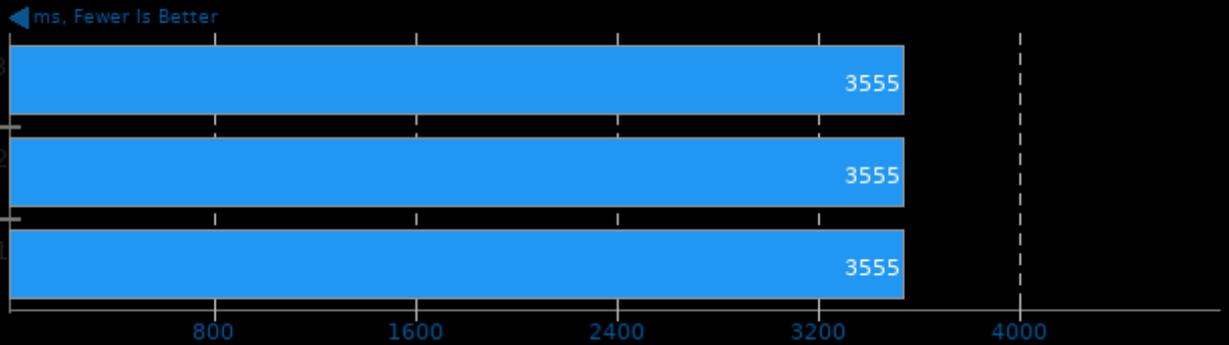
### Systemd Total Boot Time

Test: Kernel



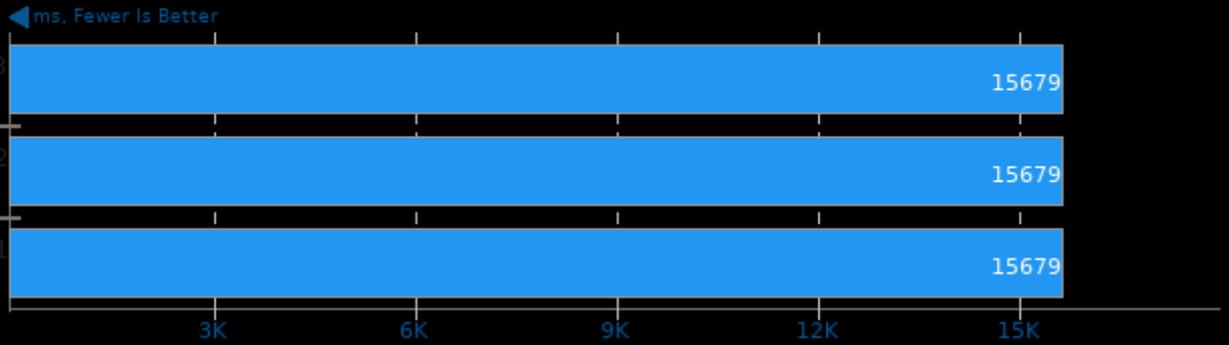
### Systemd Total Boot Time

Test: Loader



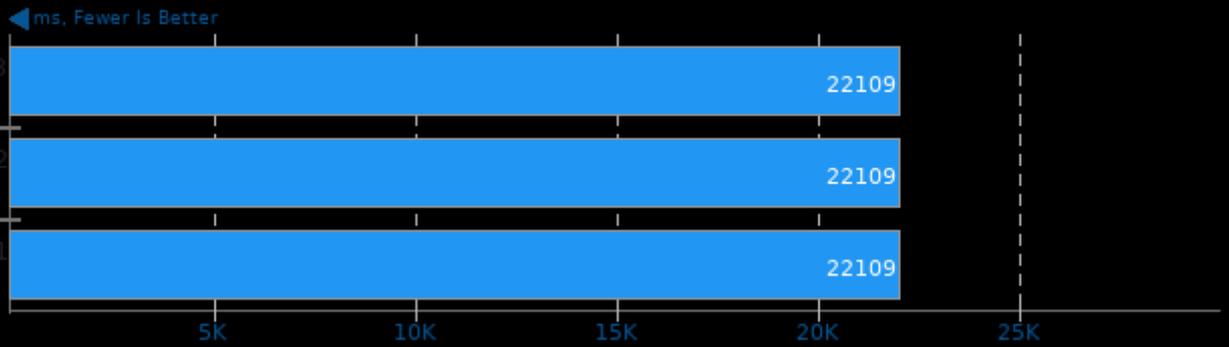
### Systemd Total Boot Time

Test: Firmware



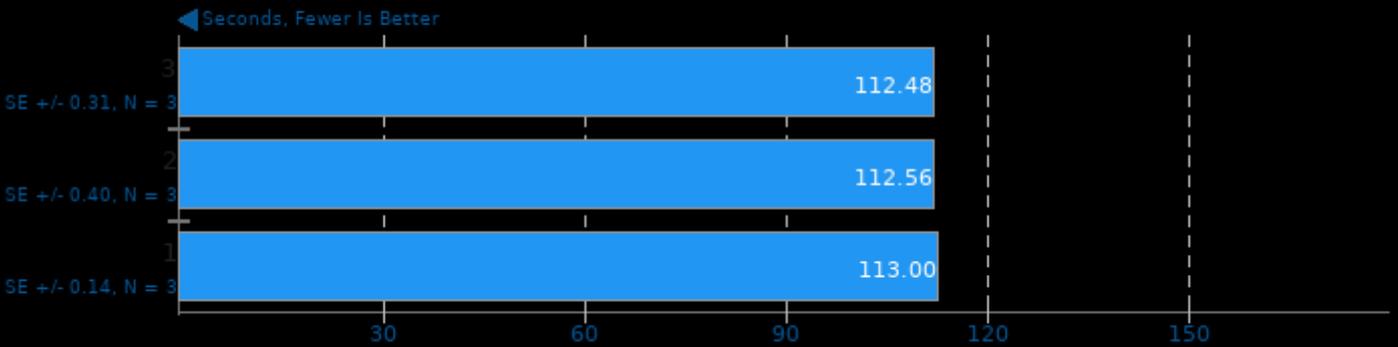
### Systemd Total Boot Time

Test: Userspace



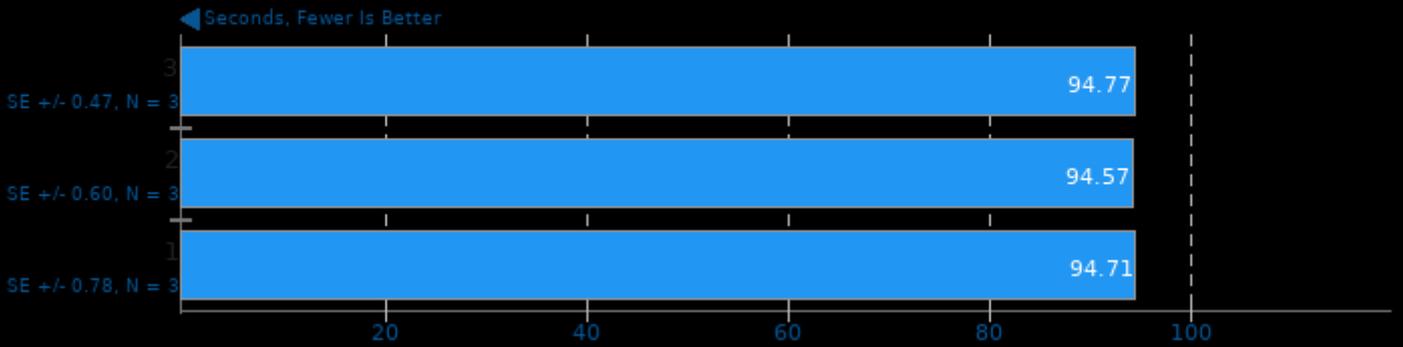
### Timed Erlang/OTP Compilation 23.2

Time To Compile



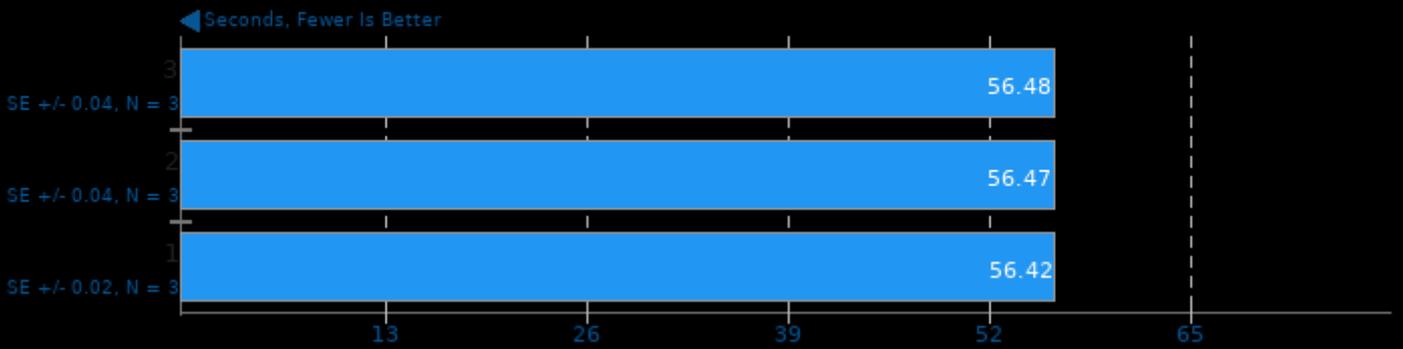
### Timed Linux Kernel Compilation 5.10.20

Time To Compile



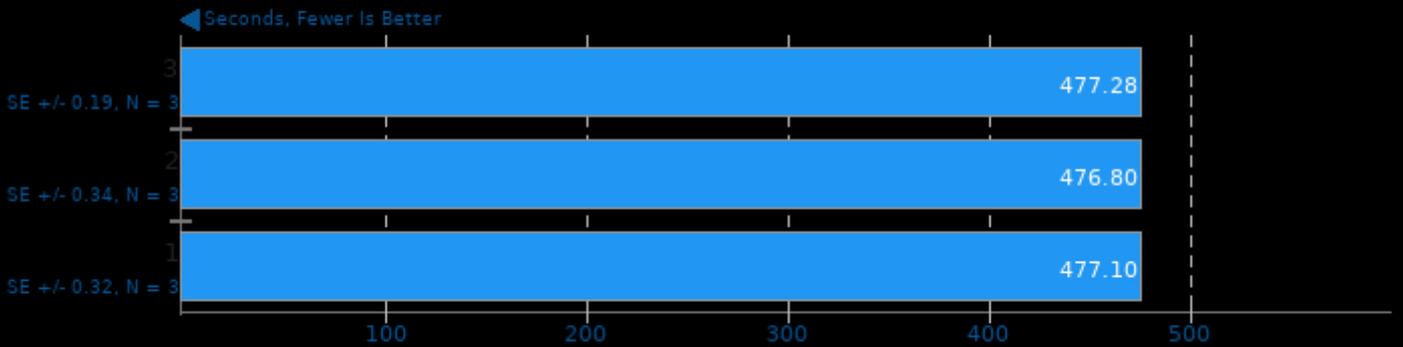
### Timed Mesa Compilation 21.0

Time To Compile



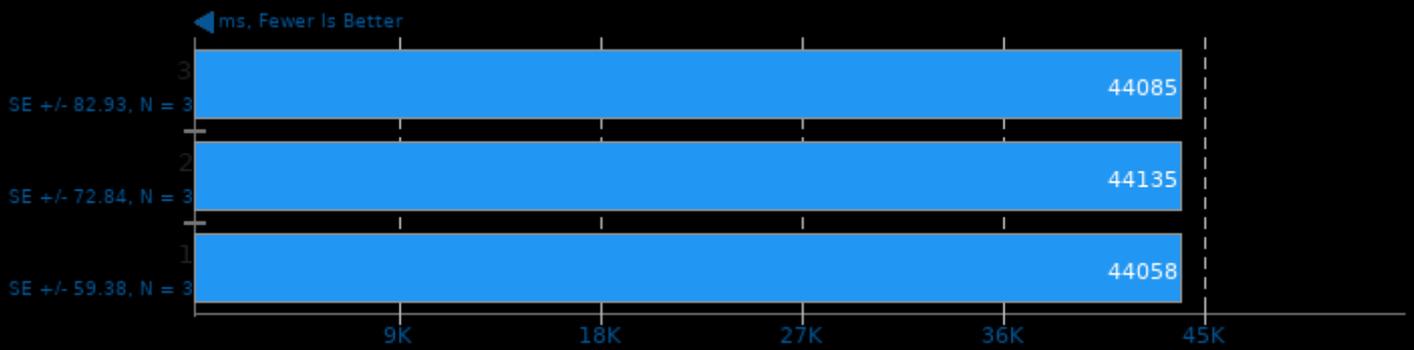
### Timed Node.js Compilation 15.11

Time To Compile



### toyBrot Fractal Generator 2020-11-18

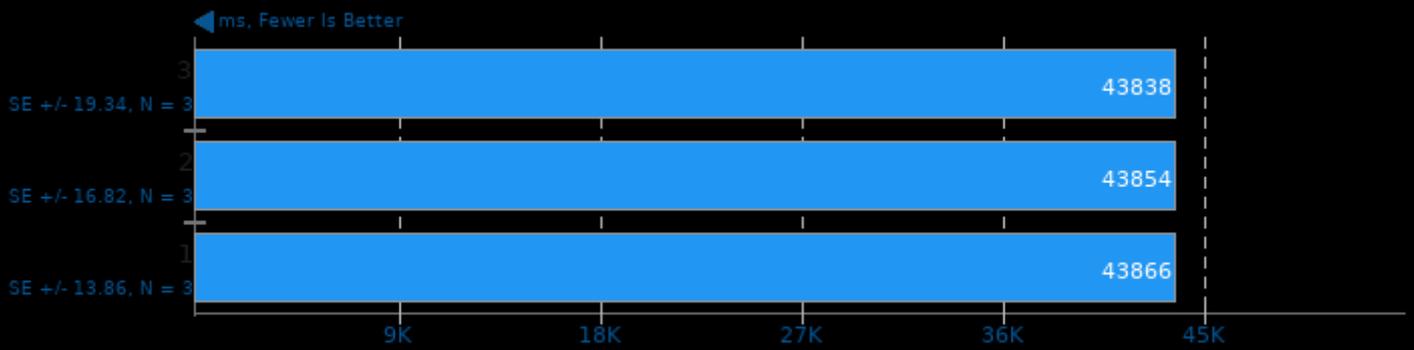
Implementation: TBB



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

### toyBrot Fractal Generator 2020-11-18

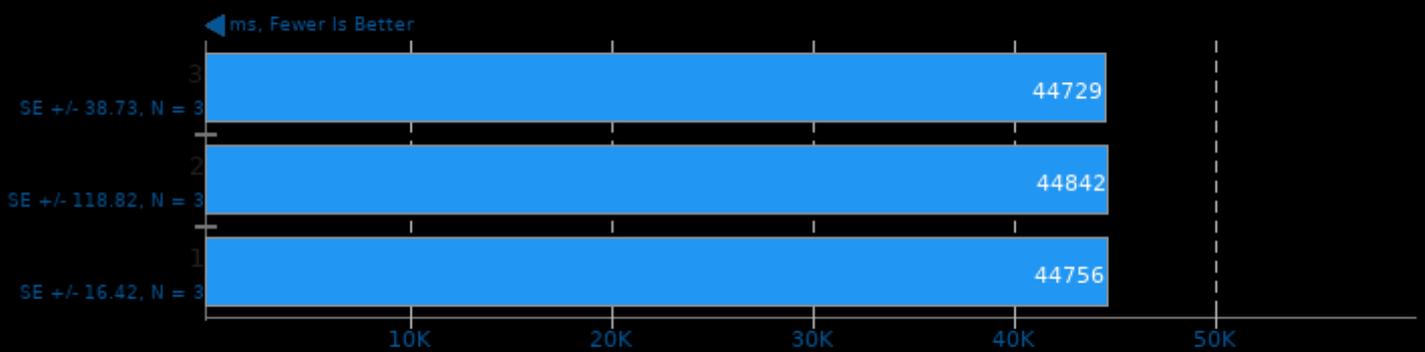
Implementation: OpenMP



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

### toyBrot Fractal Generator 2020-11-18

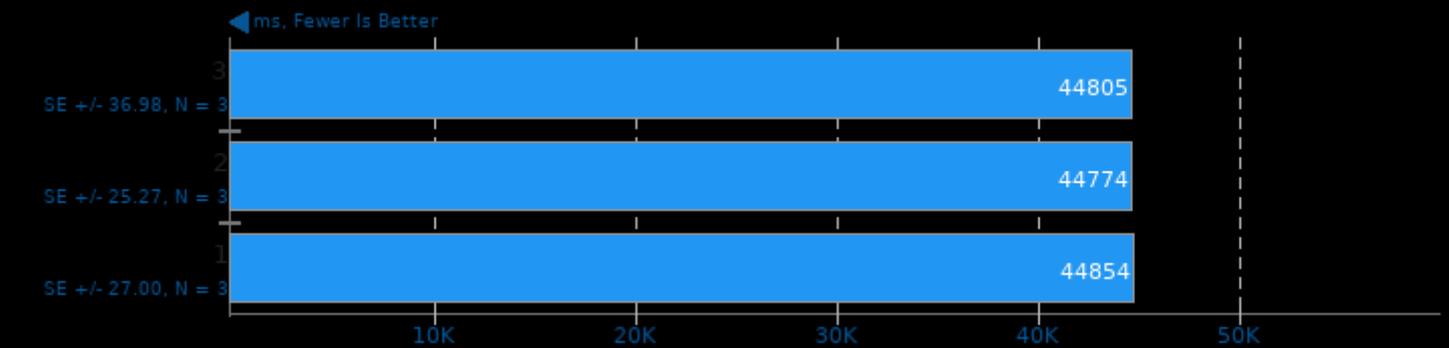
Implementation: C++ Tasks



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

### toyBrot Fractal Generator 2020-11-18

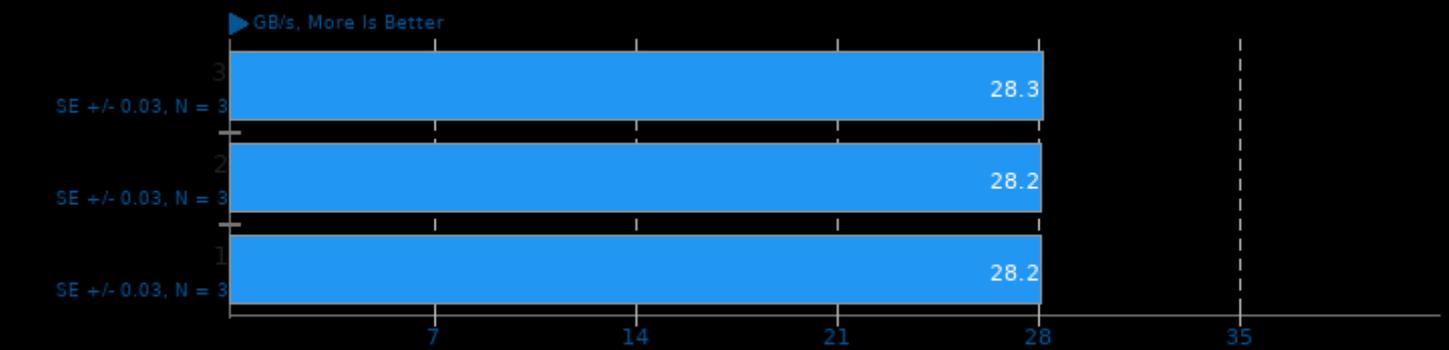
Implementation: C++ Threads



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

### ViennaCL 1.7.1

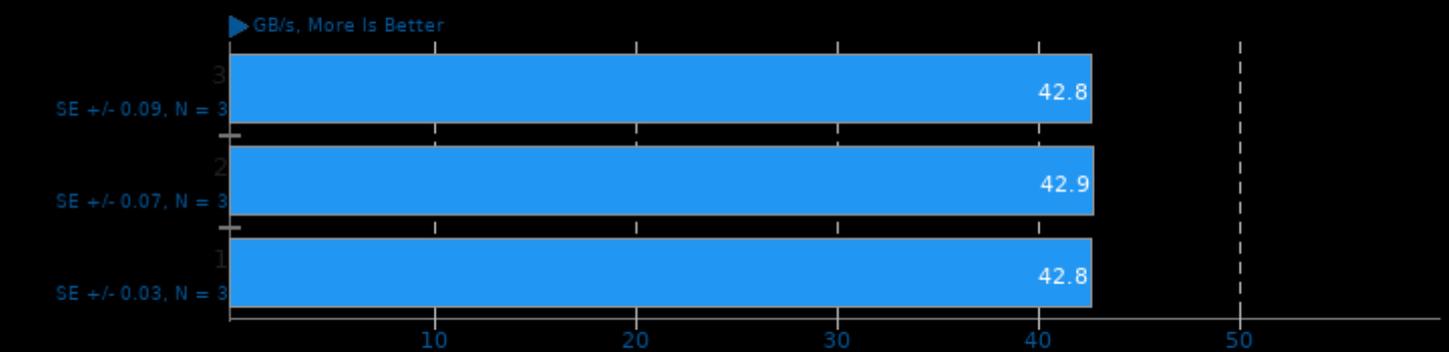
Test: CPU BLAS - sCOPY



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

### ViennaCL 1.7.1

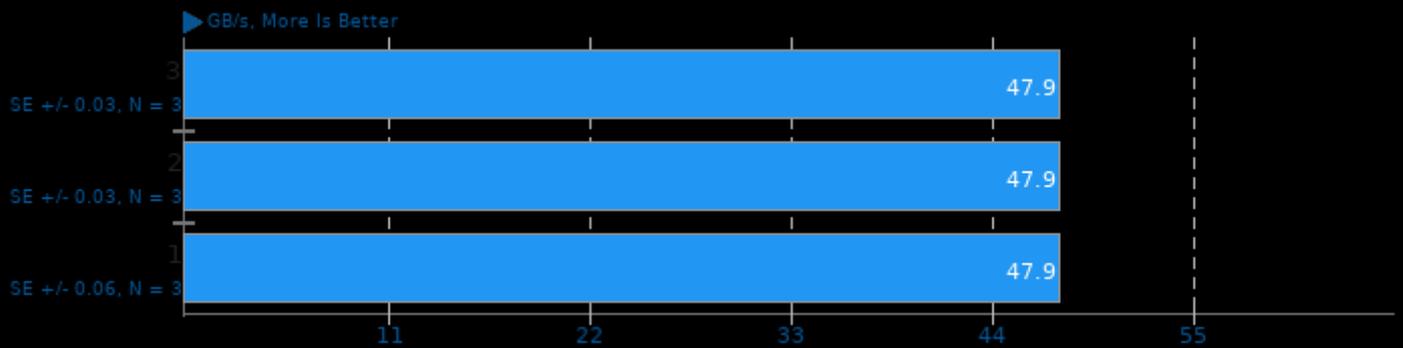
Test: CPU BLAS - sAXPY



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

### ViennaCL 1.7.1

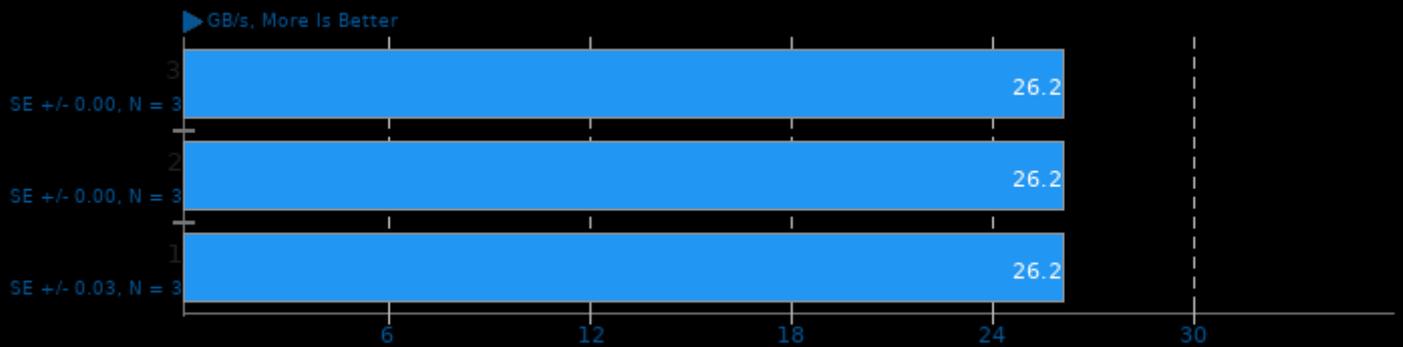
Test: CPU BLAS - sDOT



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

### ViennaCL 1.7.1

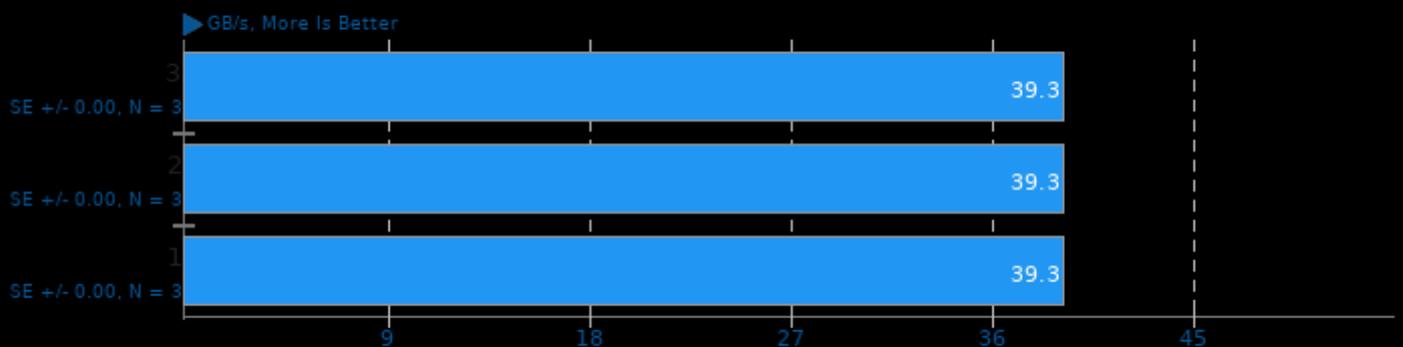
Test: CPU BLAS - dCOPY



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

### ViennaCL 1.7.1

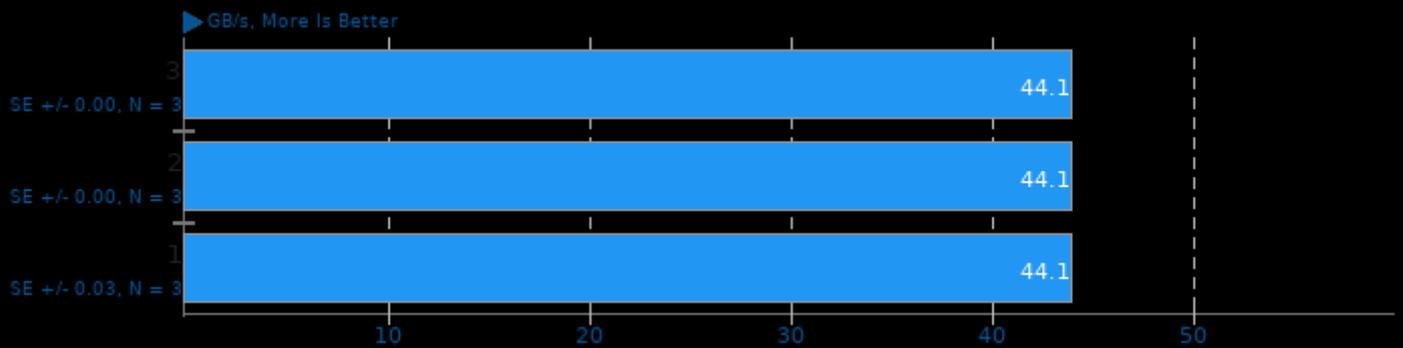
Test: CPU BLAS - dAXPY



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

### ViennaCL 1.7.1

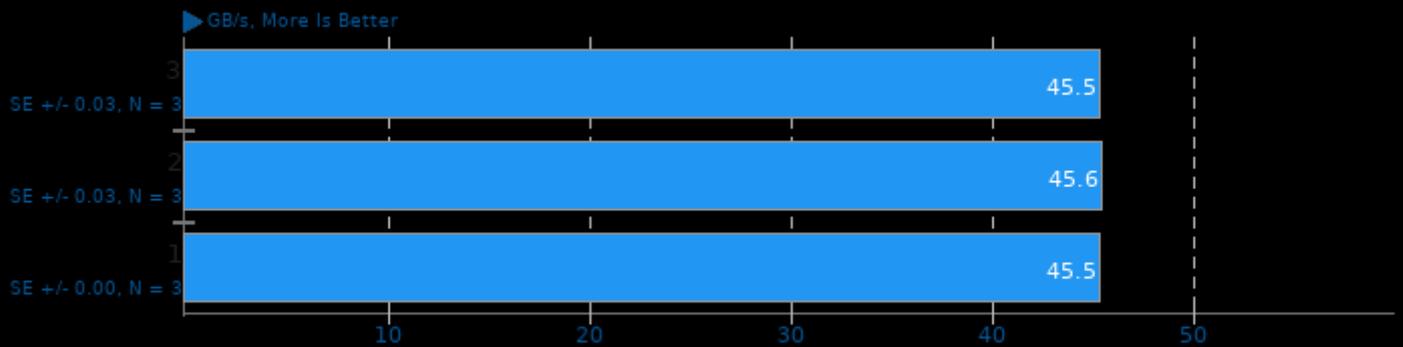
Test: CPU BLAS - dDOT



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

### ViennaCL 1.7.1

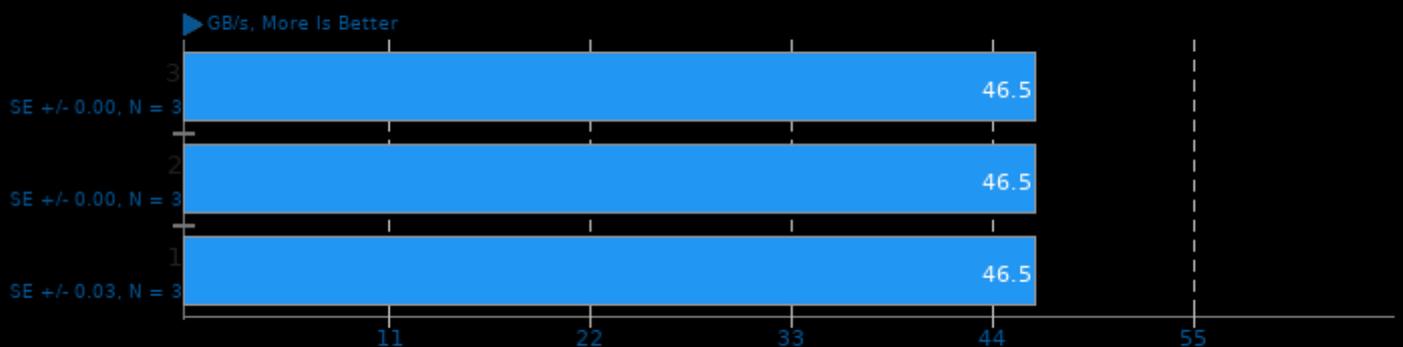
Test: CPU BLAS - dGEMV-N



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

### ViennaCL 1.7.1

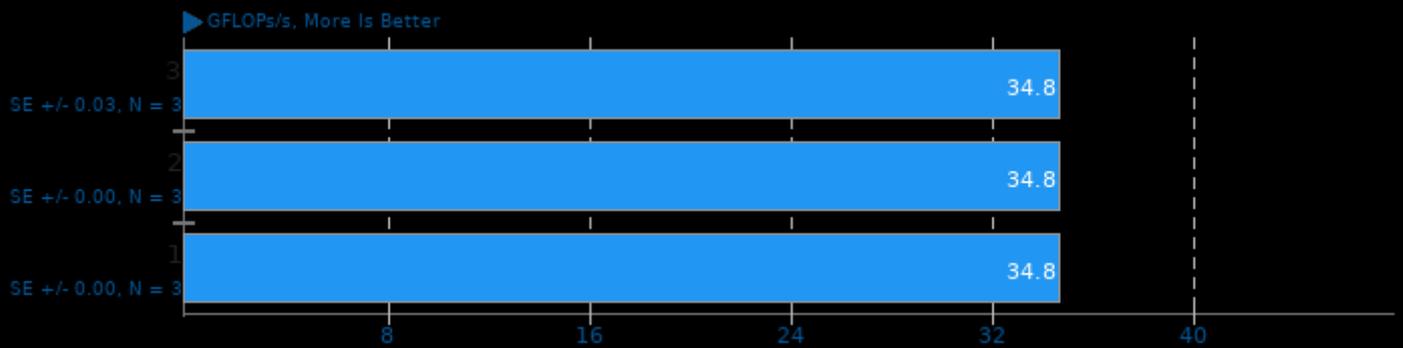
Test: CPU BLAS - dGEMV-T



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

### ViennaCL 1.7.1

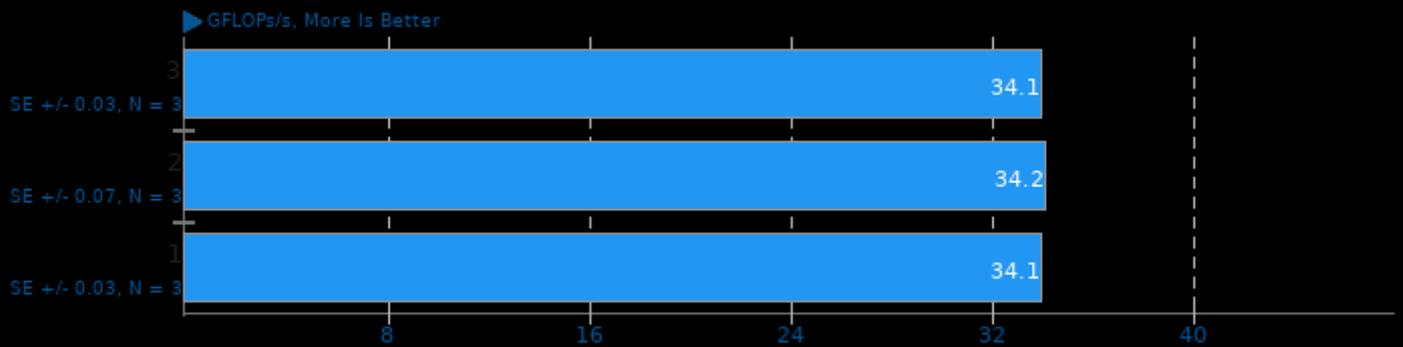
Test: CPU BLAS - dGEMM-NN



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

### ViennaCL 1.7.1

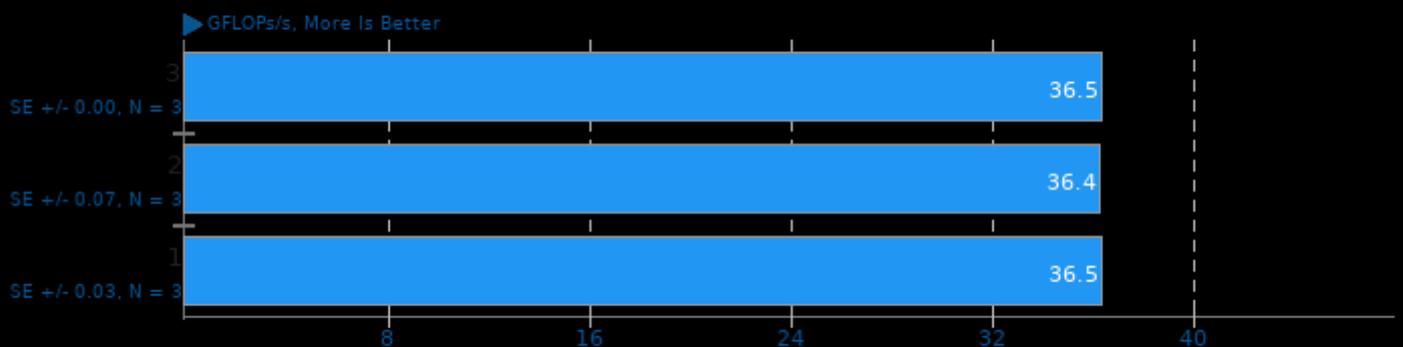
Test: CPU BLAS - dGEMM-NT



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

### ViennaCL 1.7.1

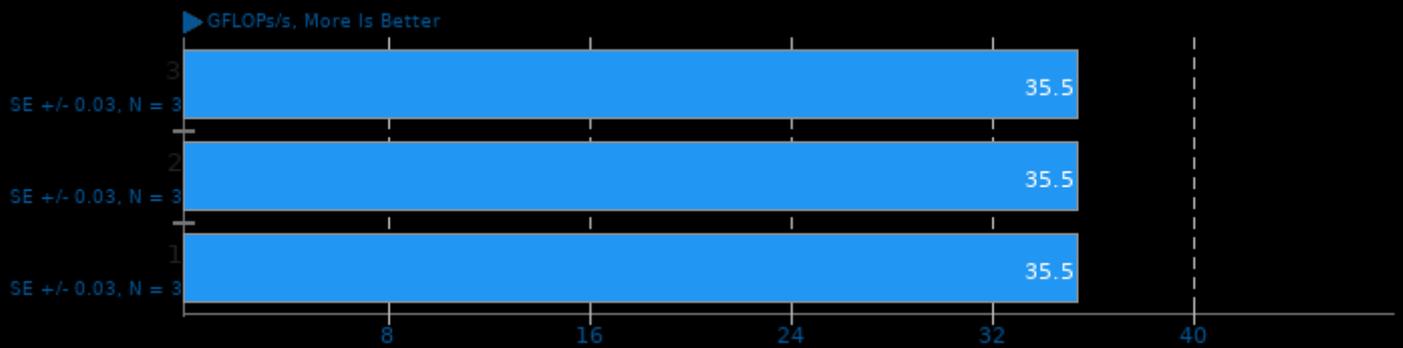
Test: CPU BLAS - dGEMM-TN



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

### ViennaCL 1.7.1

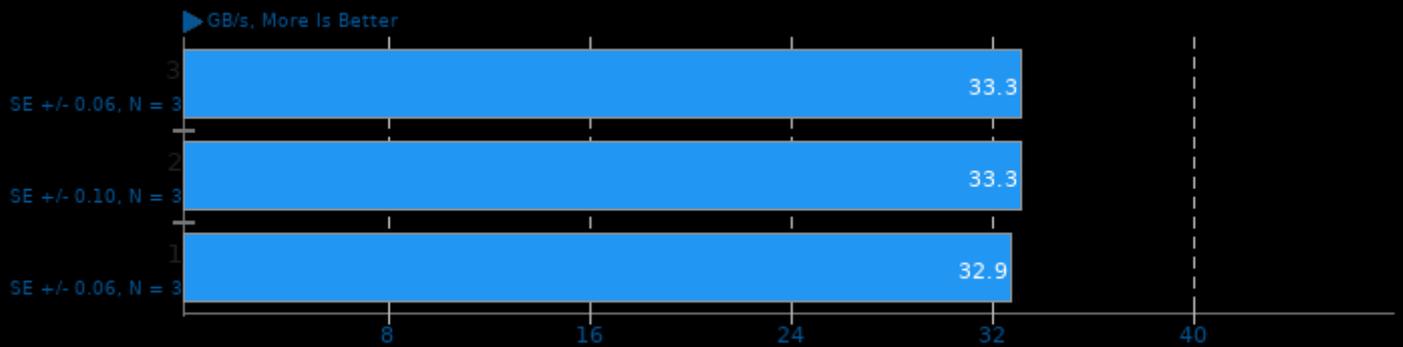
Test: CPU BLAS - dGEMM-TT



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

### ViennaCL 1.7.1

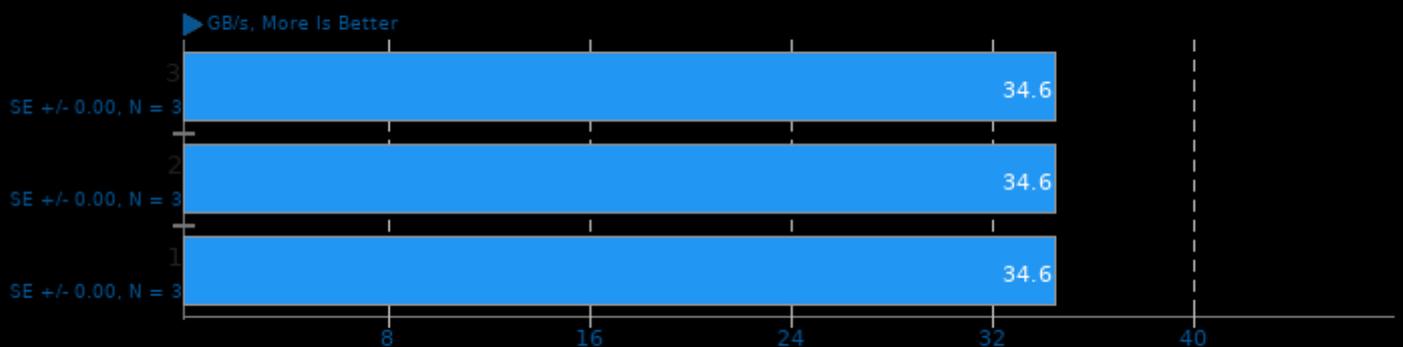
Test: OpenCL BLAS - sCOPY



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

### ViennaCL 1.7.1

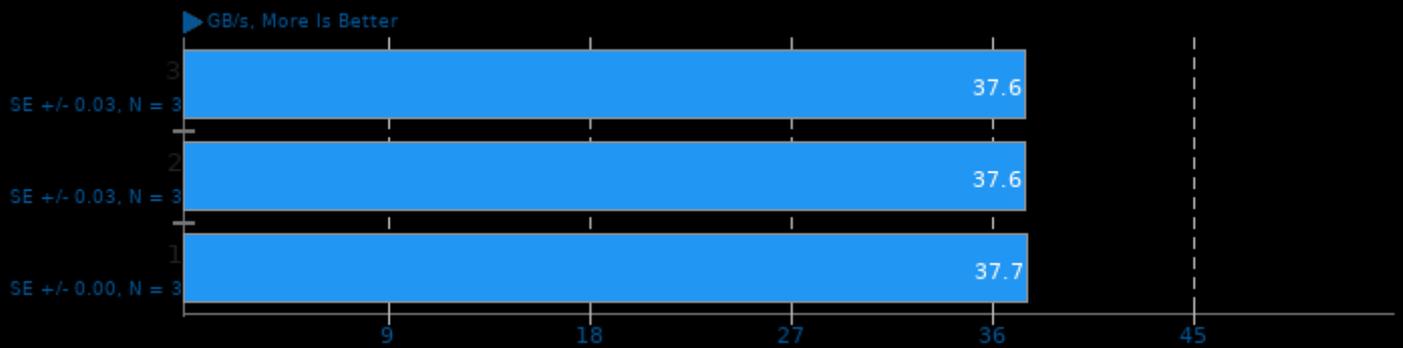
Test: OpenCL BLAS - sAXPY



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

### ViennaCL 1.7.1

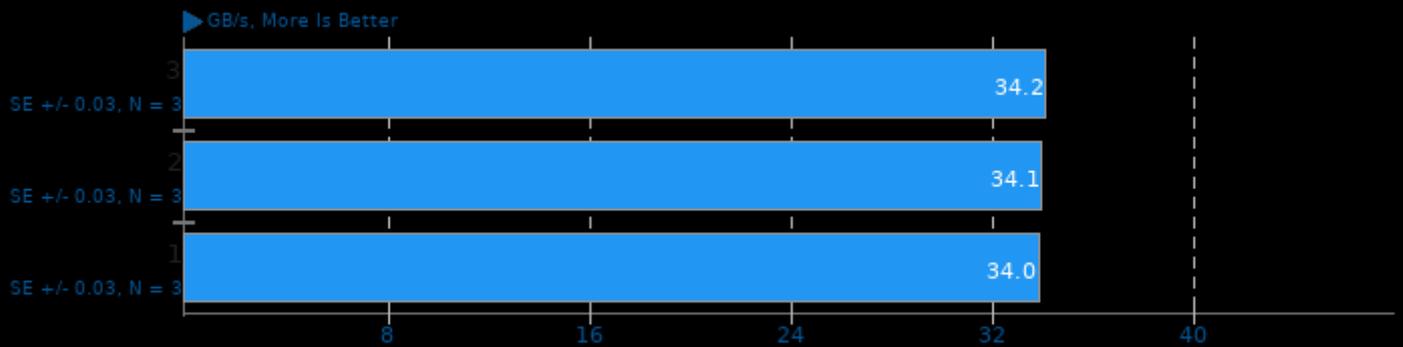
Test: OpenCL BLAS - sDOT



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

### ViennaCL 1.7.1

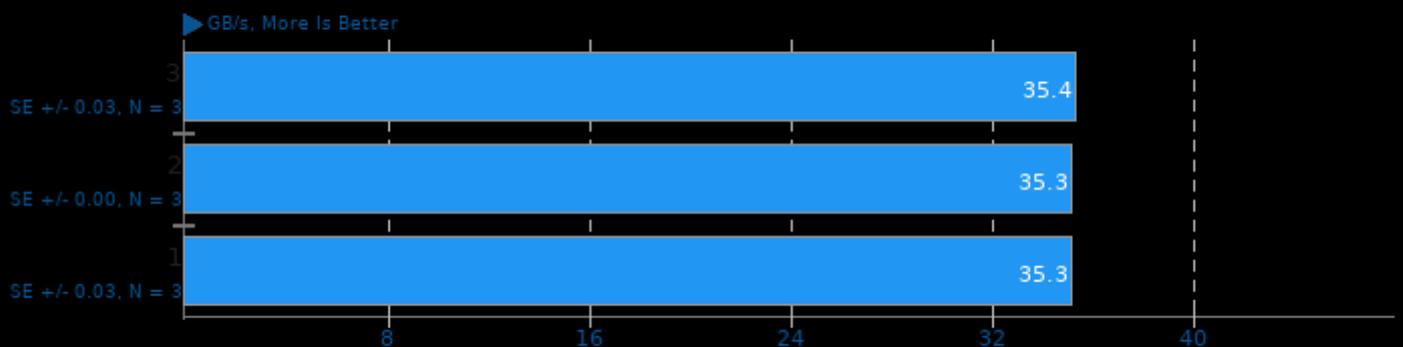
Test: OpenCL BLAS - dCOPY



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

### ViennaCL 1.7.1

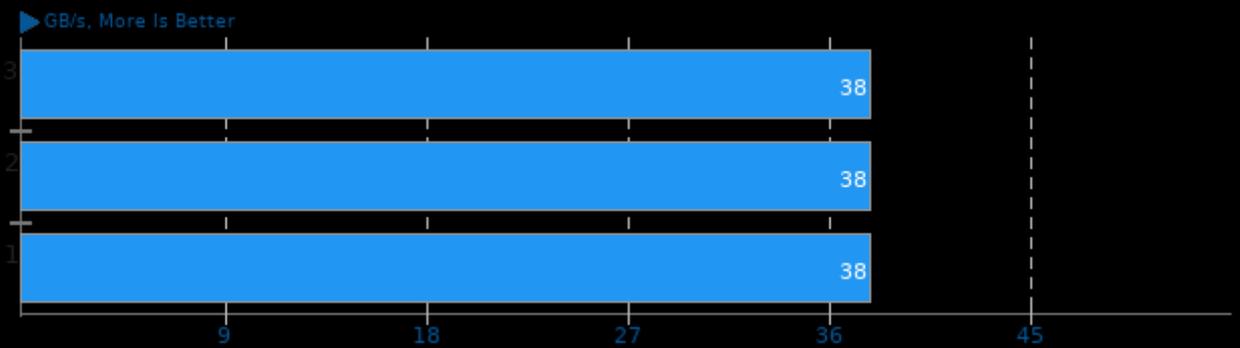
Test: OpenCL BLAS - dAXPY



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

### ViennaCL 1.7.1

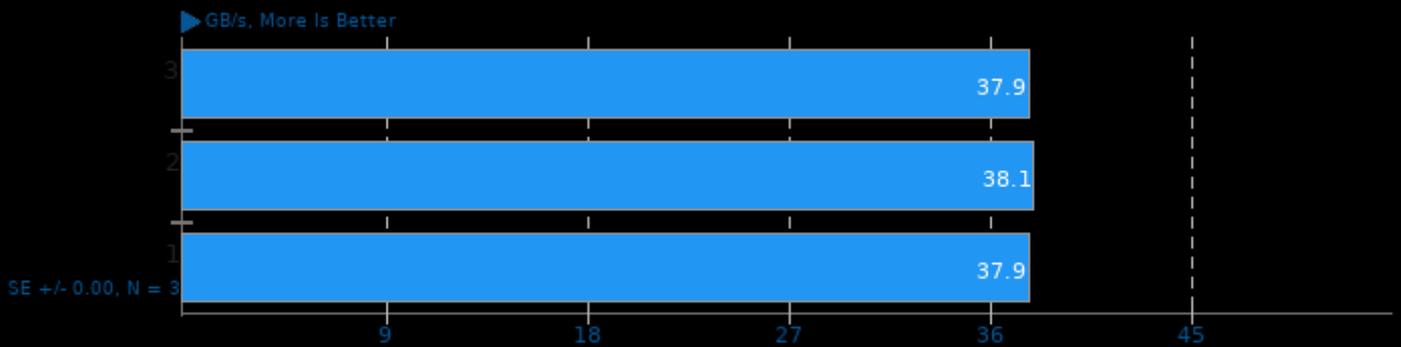
Test: OpenCL BLAS - dDOT



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

### ViennaCL 1.7.1

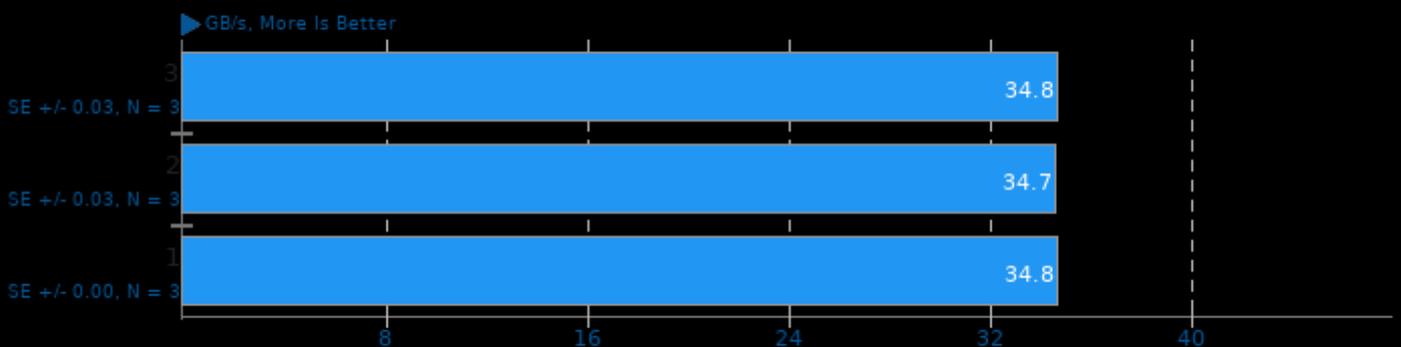
Test: OpenCL BLAS - dGEMV-N



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

### ViennaCL 1.7.1

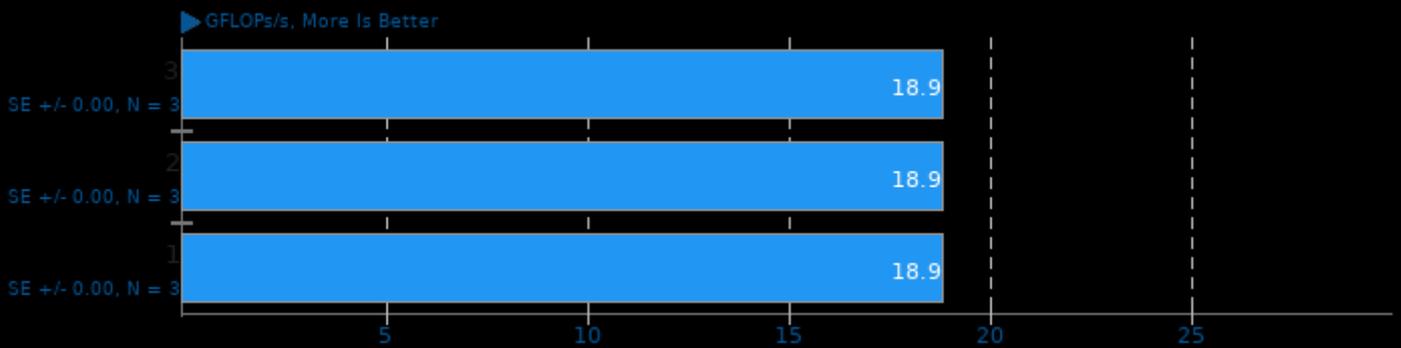
Test: OpenCL BLAS - dGEMV-T



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

### ViennaCL 1.7.1

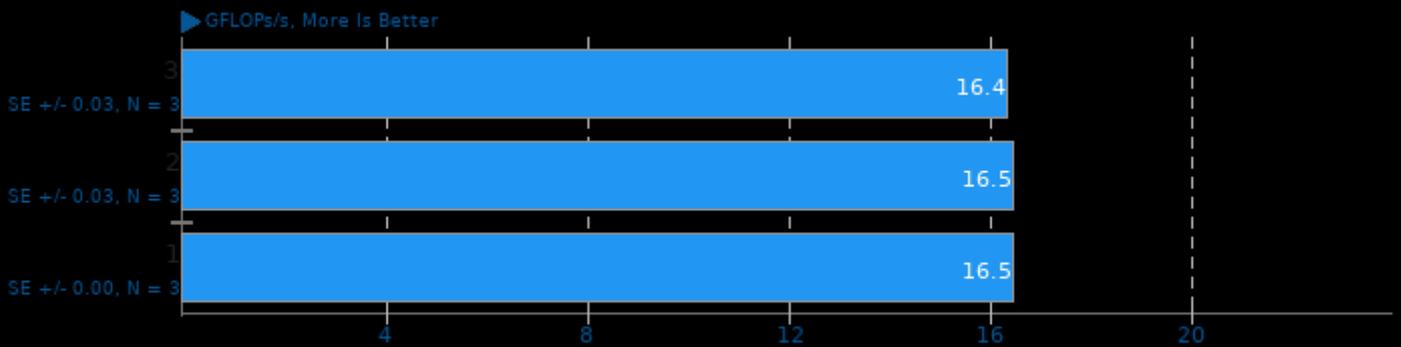
Test: OpenCL BLAS - dGEMM-NN



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

### ViennaCL 1.7.1

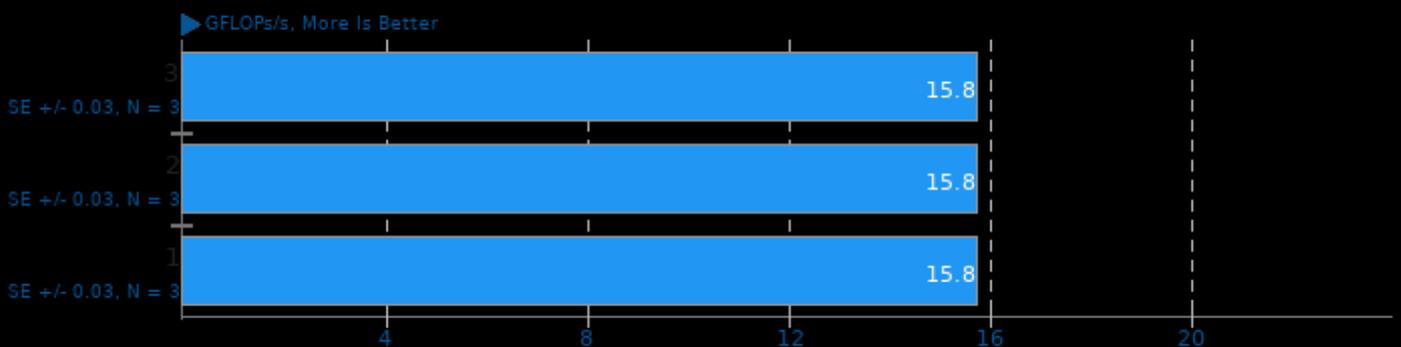
Test: OpenCL BLAS - dGEMM-NT



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

### ViennaCL 1.7.1

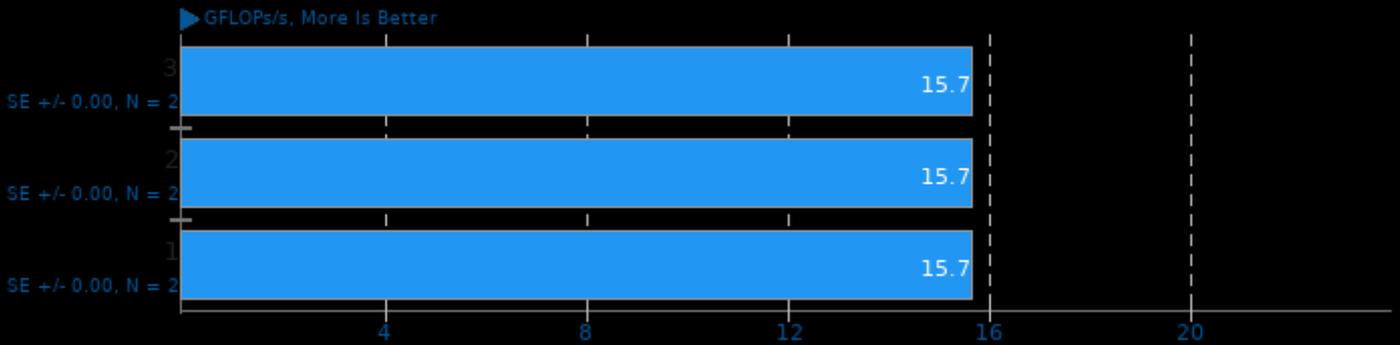
Test: OpenCL BLAS - dGEMM-TN



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

### ViennaCL 1.7.1

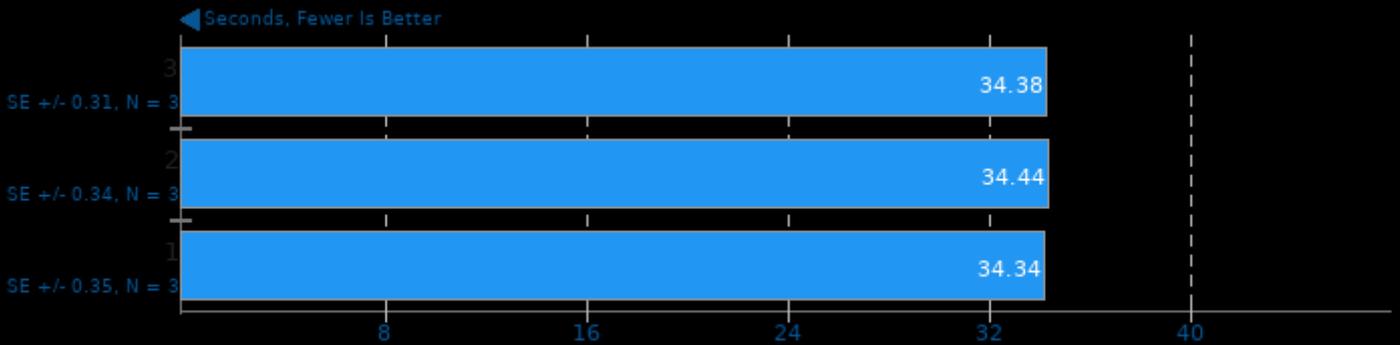
Test: OpenCL BLAS - dGEMM-TT



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

### Xcompact3d Incompact3d 2021-03-11

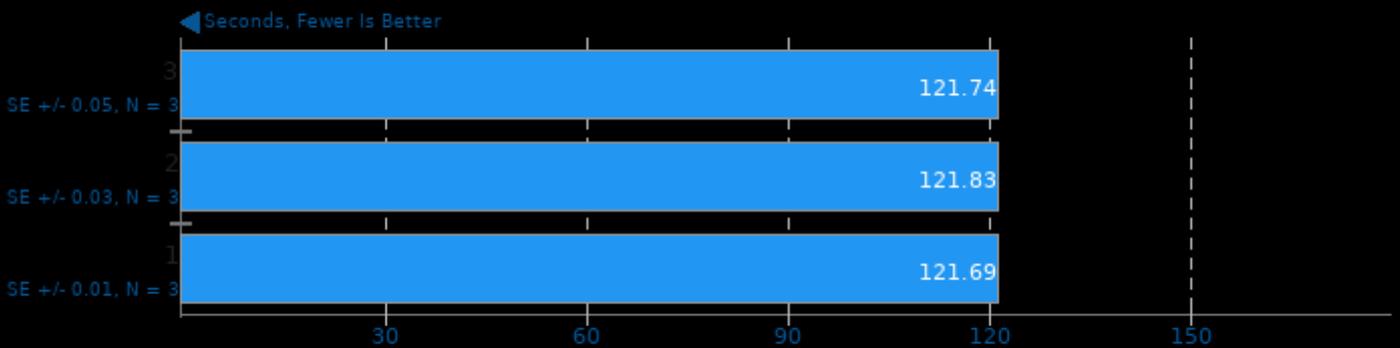
Input: input.i3d 129 Cells Per Direction



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

### Xcompact3d Incompact3d 2021-03-11

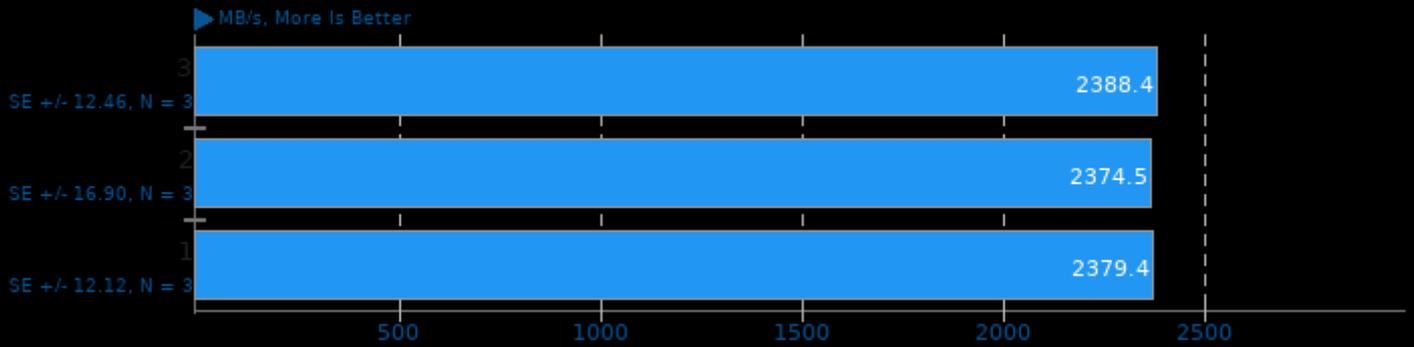
Input: input.i3d 193 Cells Per Direction



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

### Zstd Compression 1.4.9

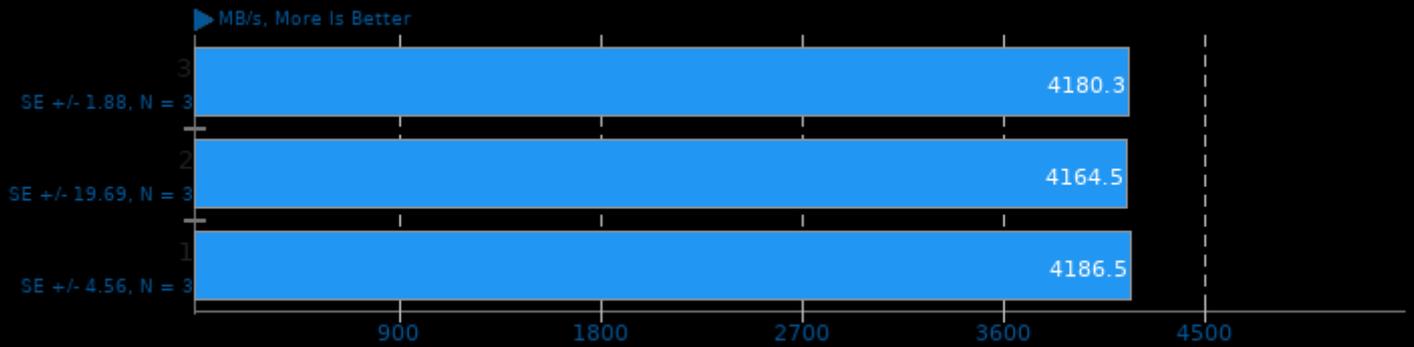
Compression Level: 3 - Compression Speed



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

### Zstd Compression 1.4.9

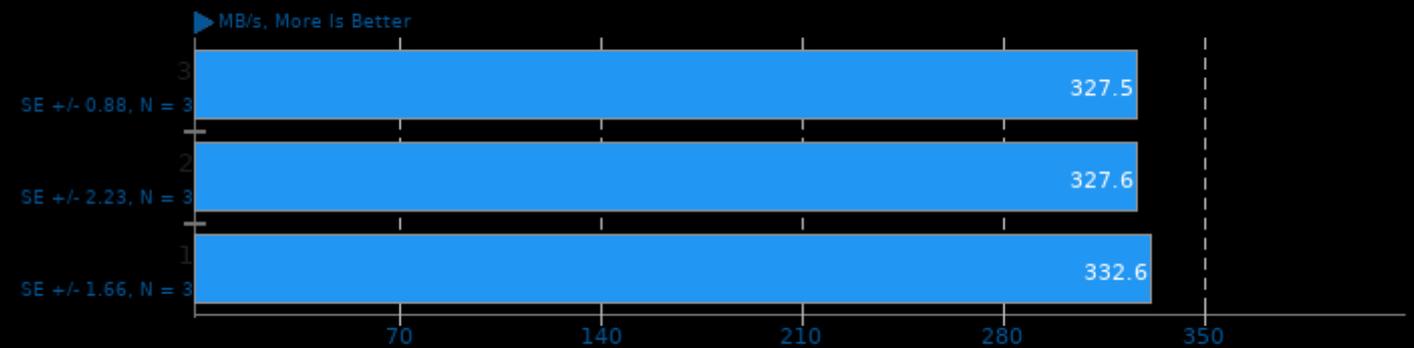
Compression Level: 3 - Decompression Speed



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

### Zstd Compression 1.4.9

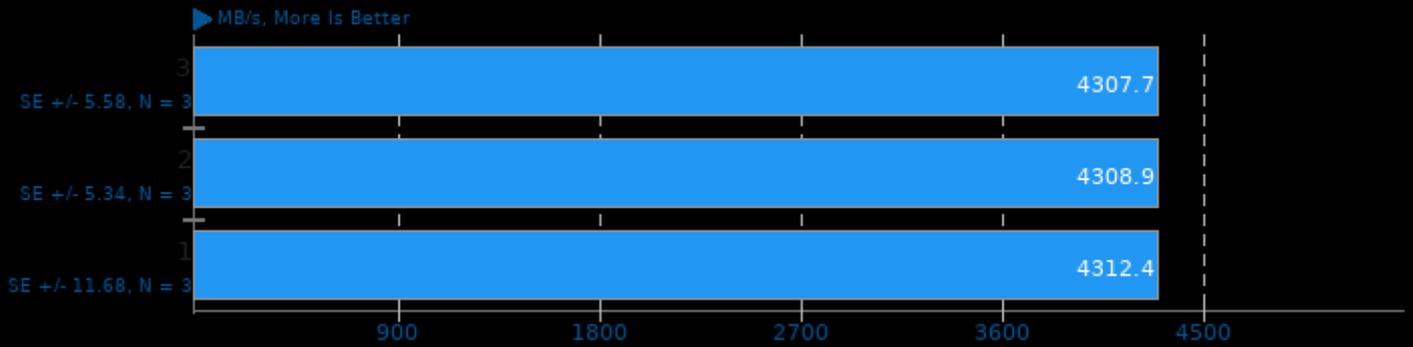
Compression Level: 8 - Compression Speed



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

### Zstd Compression 1.4.9

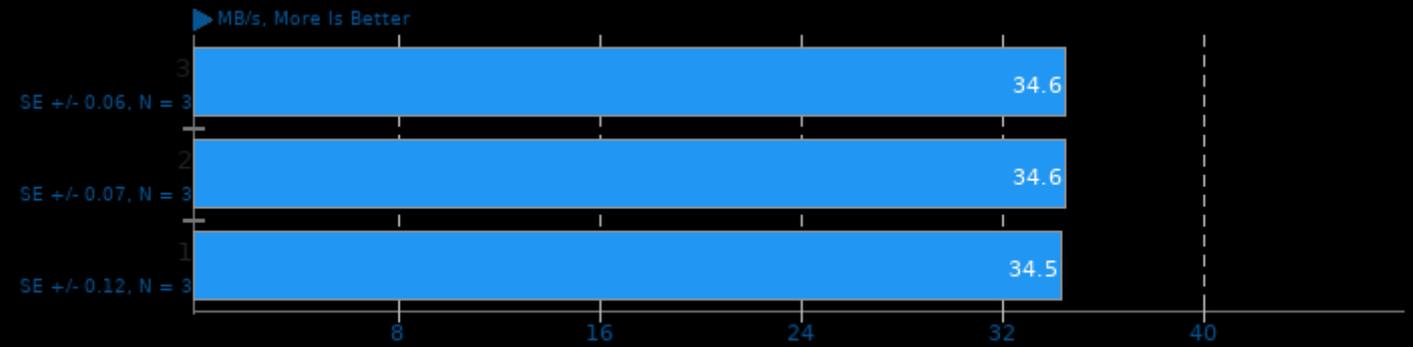
Compression Level: 8 - Decompression Speed



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

### Zstd Compression 1.4.9

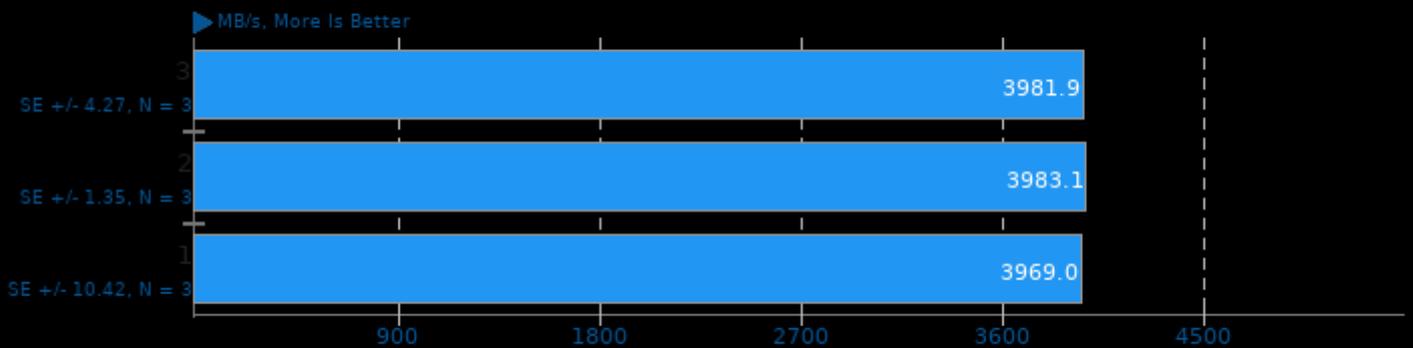
Compression Level: 19 - Compression Speed



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

### Zstd Compression 1.4.9

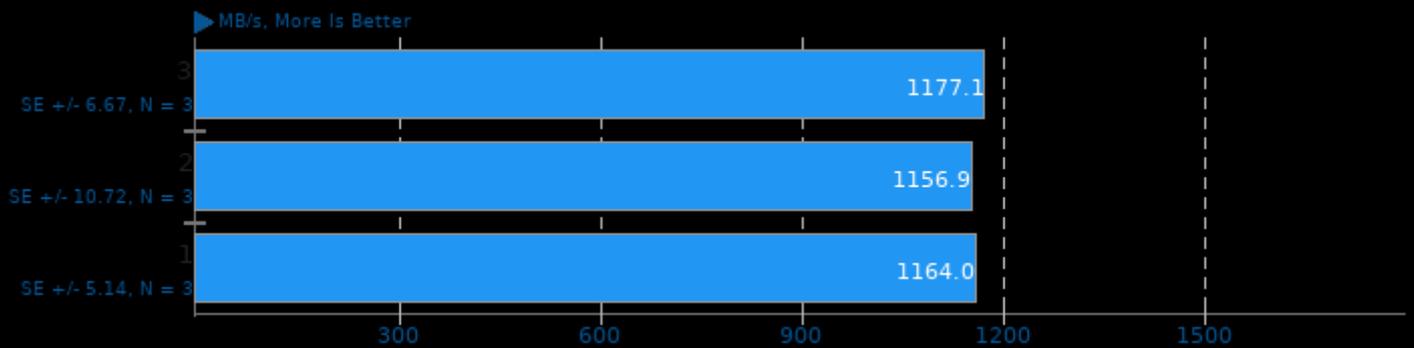
Compression Level: 19 - Decompression Speed



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

### Zstd Compression 1.4.9

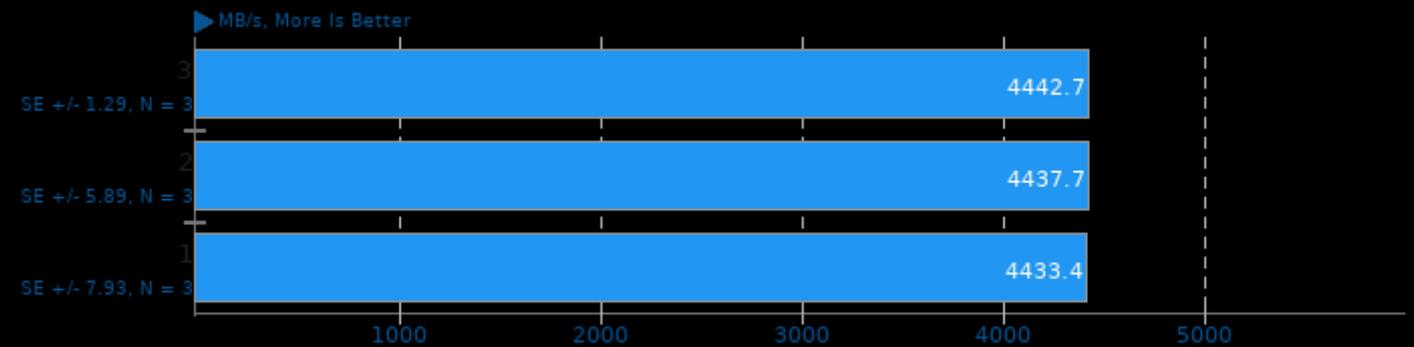
Compression Level: 3, Long Mode - Compression Speed



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

### Zstd Compression 1.4.9

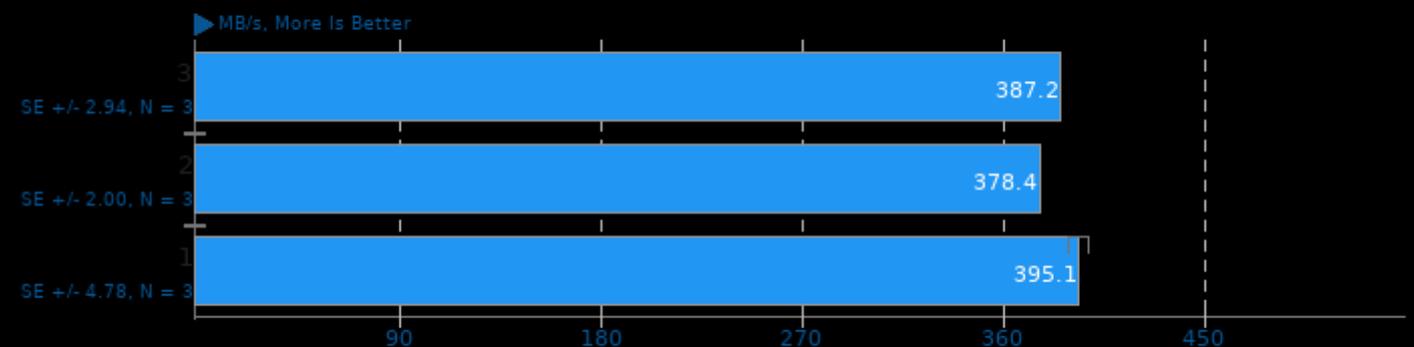
Compression Level: 3, Long Mode - Decompression Speed



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

### Zstd Compression 1.4.9

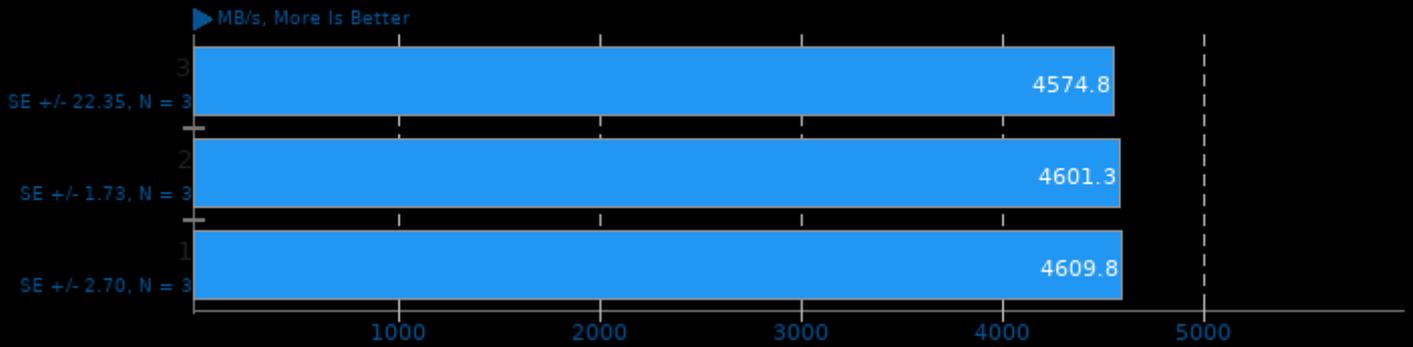
Compression Level: 8, Long Mode - Compression Speed



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

### Zstd Compression 1.4.9

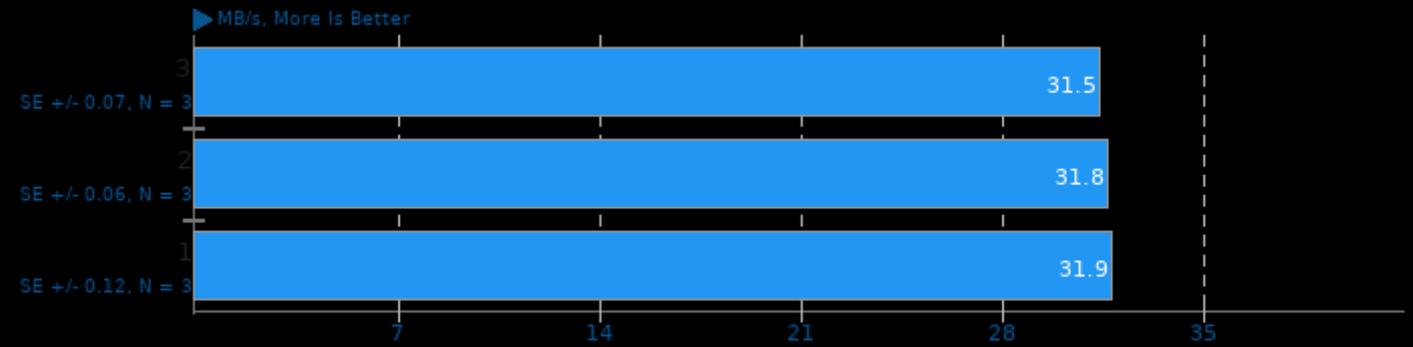
Compression Level: 8, Long Mode - Decompression Speed



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

### Zstd Compression 1.4.9

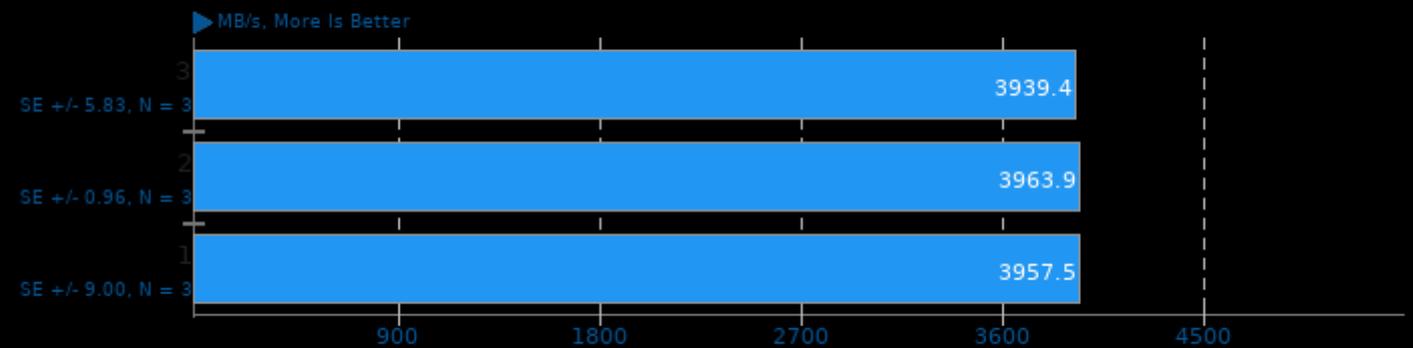
Compression Level: 19, Long Mode - Compression Speed



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

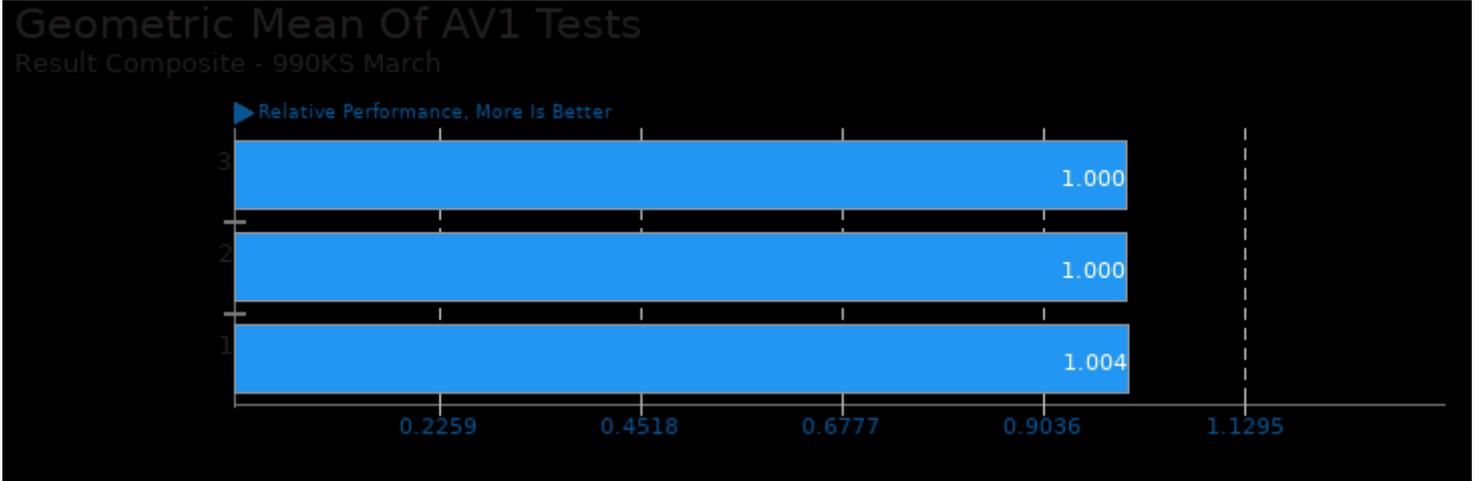
### Zstd Compression 1.4.9

Compression Level: 19, Long Mode - Decompression Speed

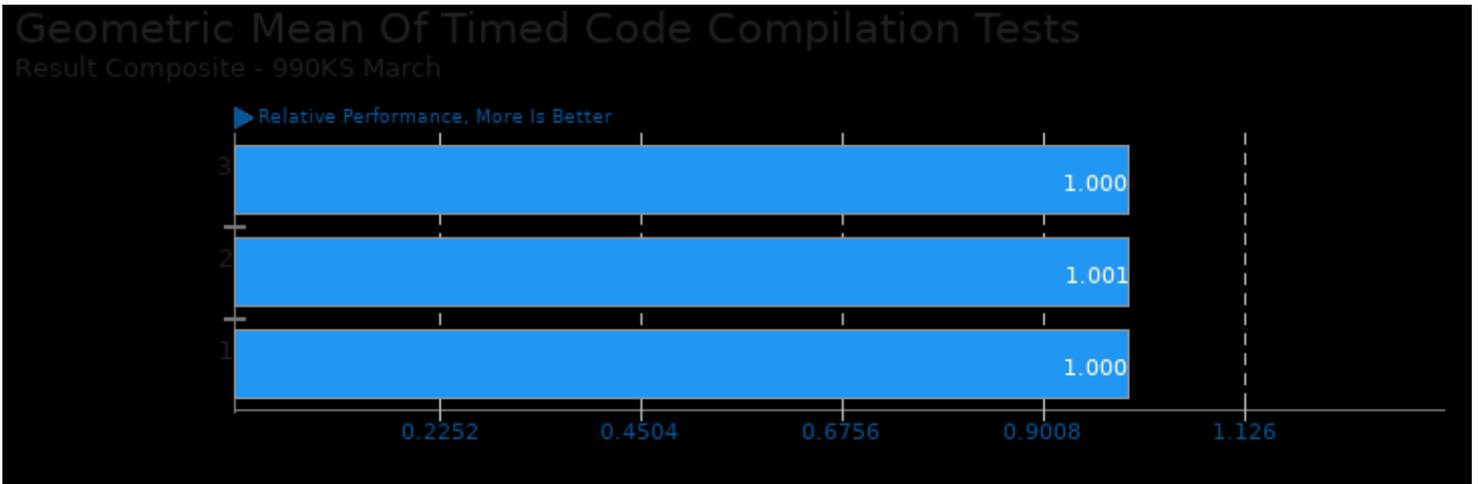


1. (CC) gcc options: -O3 -pthread -lz -lzma

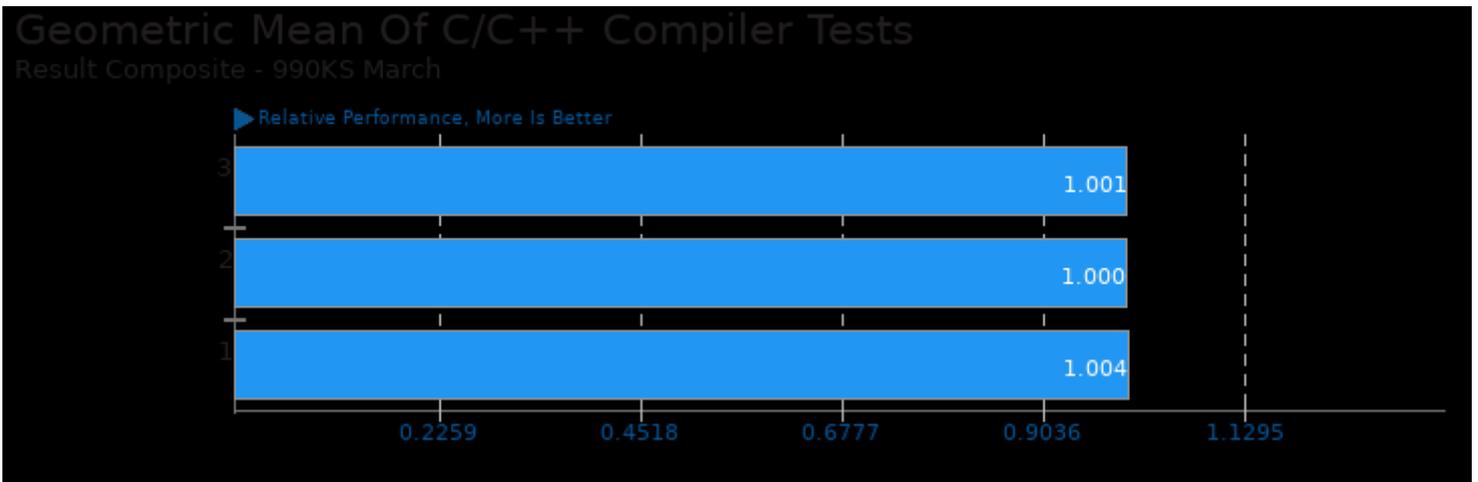
These geometric means are based upon test groupings / test suites for this result file.



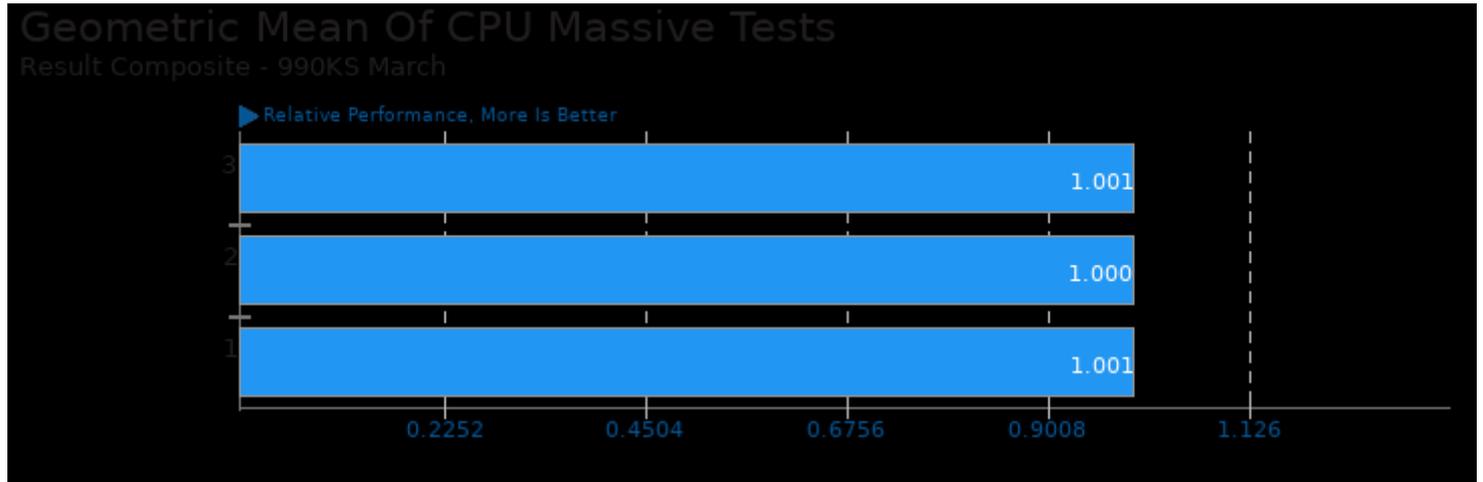
Geometric mean based upon tests: pts/dav1d, pts/aom-av1 and pts/avifenc



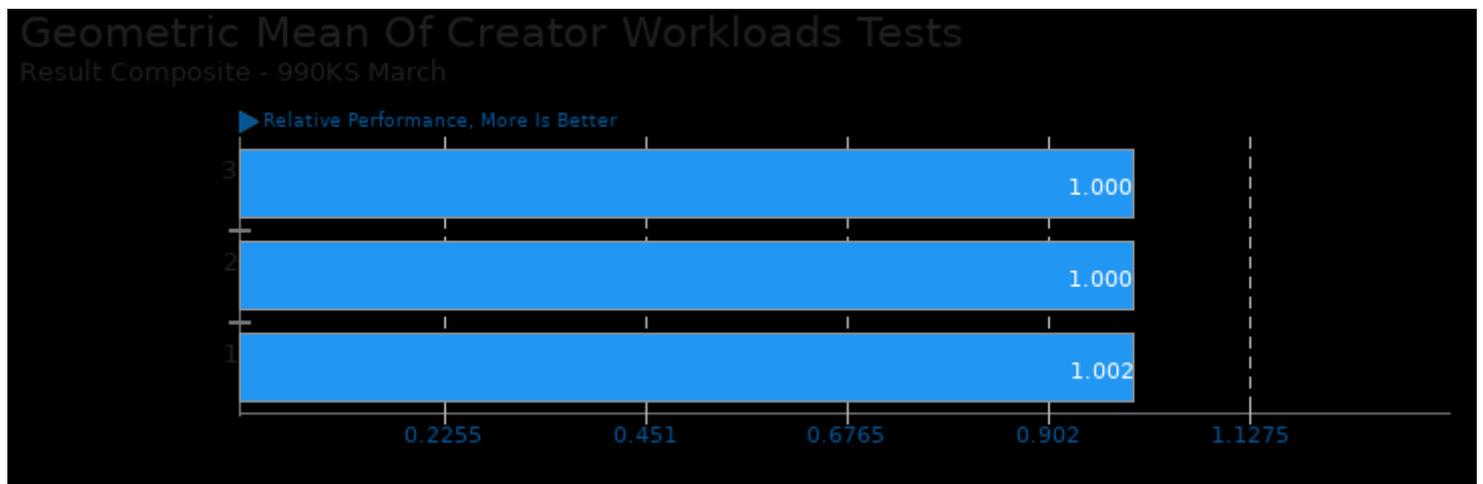
Geometric mean based upon tests: pts/build-linux-kernel, pts/build-erlang, pts/build-nodejs and pts/build-mesa



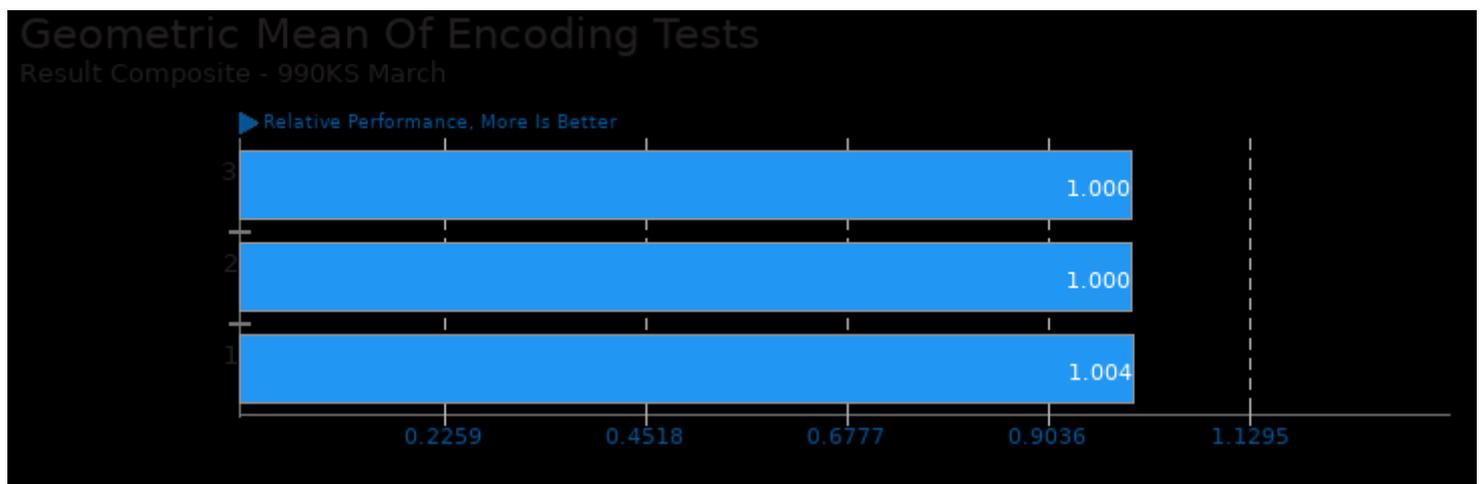
Geometric mean based upon tests: pts/stockfish, pts/dav1d, pts/compress-zstd, pts/aom-av1, pts/svt-vp9, pts/toybot and pts/basis



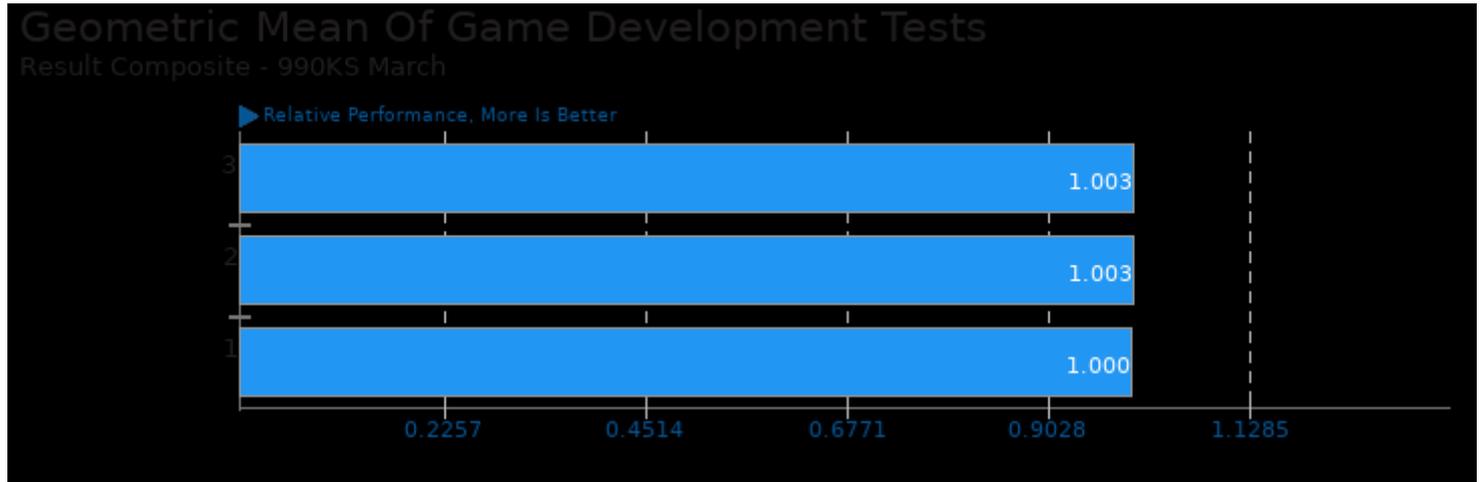
Geometric mean based upon tests: pts/build-linux-kernel, pts/compress-zstd, pts/dav1d, pts/svt-hevc, pts/svt-vp9, pts/onednn, pts/stockfish, pts/sysbench and pts/botan



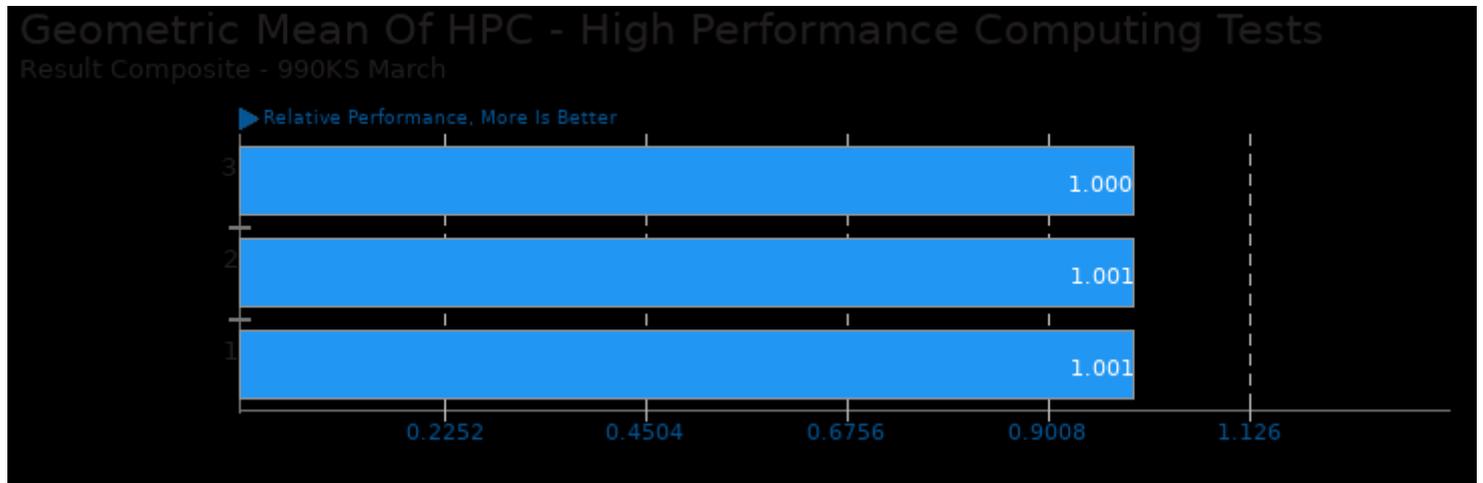
Geometric mean based upon tests: pts/svt-vp9, pts/svt-hevc, pts/dav1d, pts/aom-av1, pts/avifenc, pts/onednn, pts/basis, pts/astcenc and system/openscad



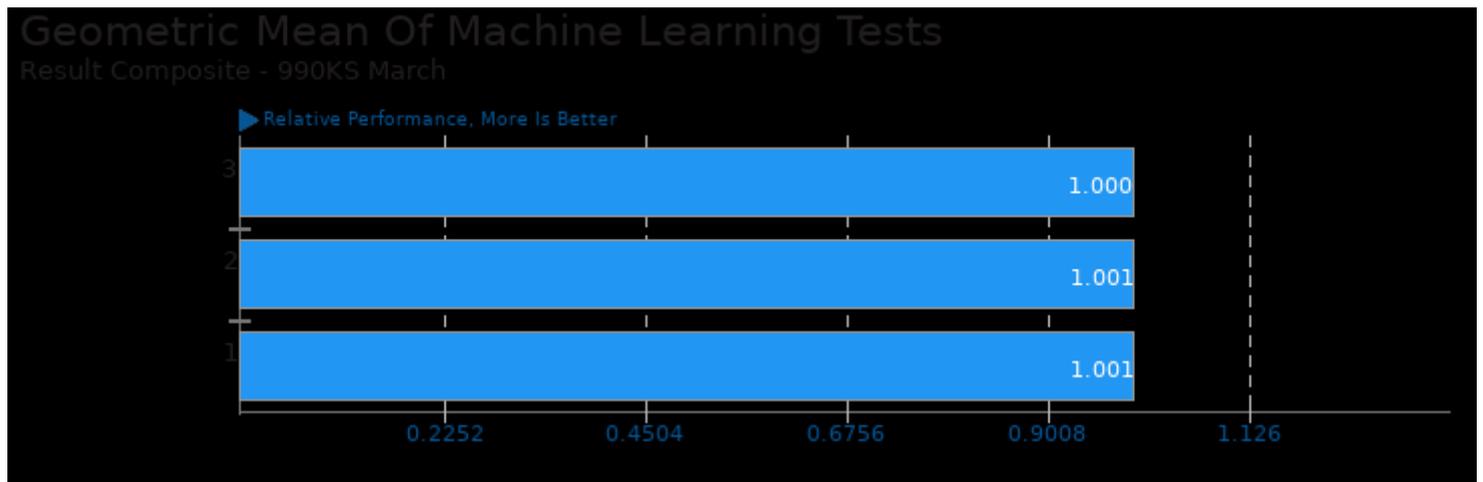
Geometric mean based upon tests: pts/svt-vp9, pts/svt-hevc, pts/dav1d, pts/aom-av1 and pts/avifenc



Geometric mean based upon tests: pts/basis and pts/ascenc



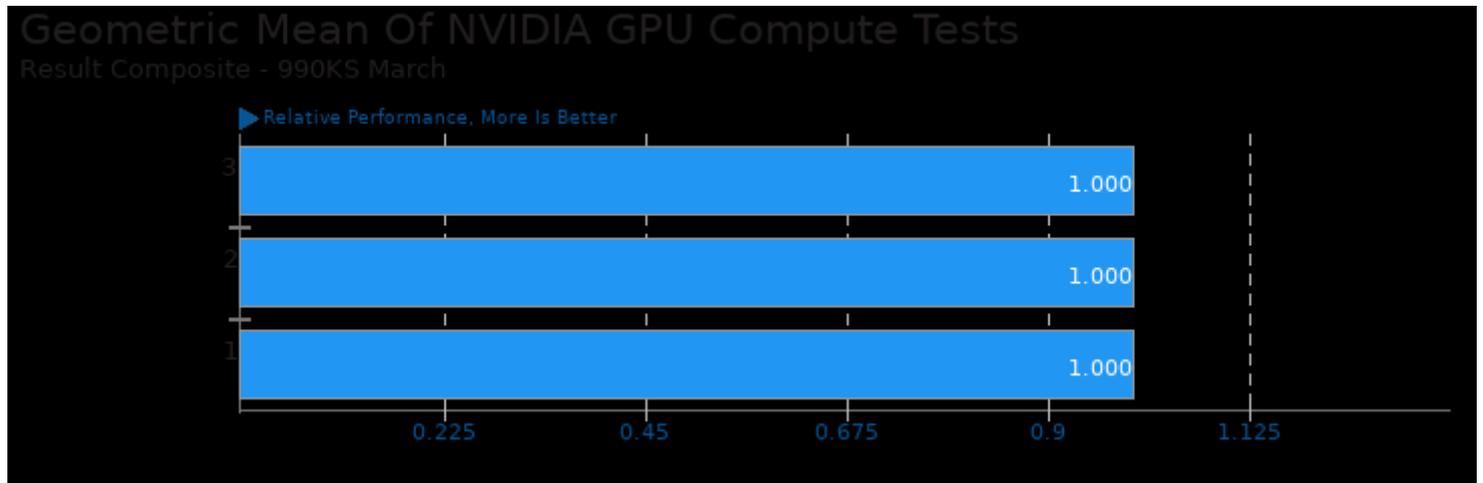
Geometric mean based upon tests: pts/incompact3d, pts/mnn, pts/shoc and pts/onednn



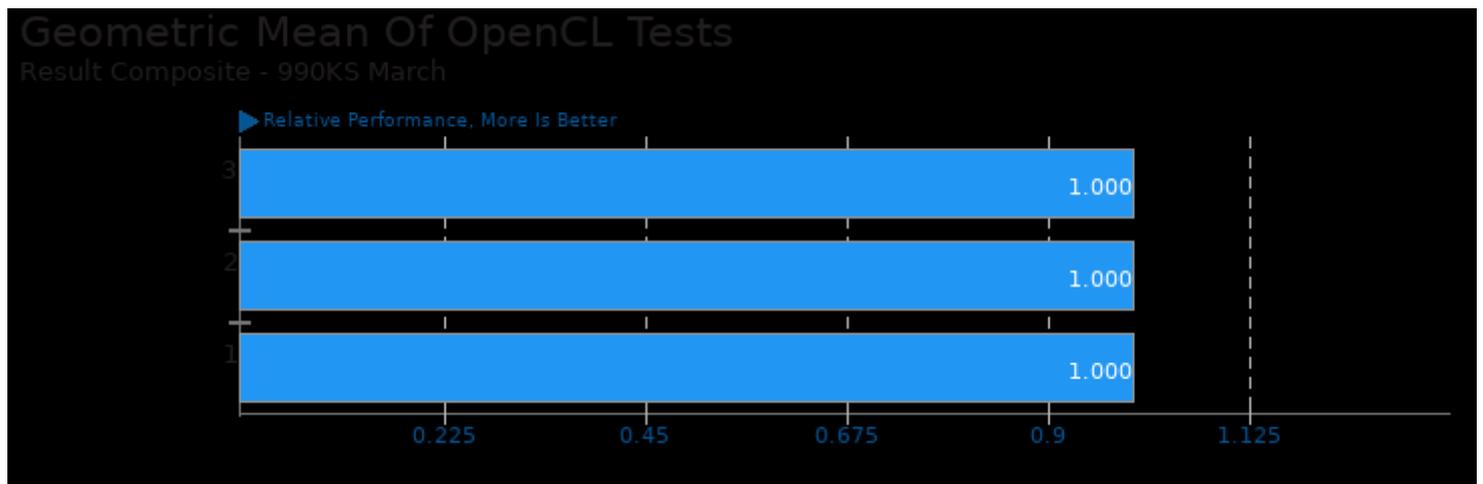
Geometric mean based upon tests: pts/mnn, pts/shoc and pts/onednn



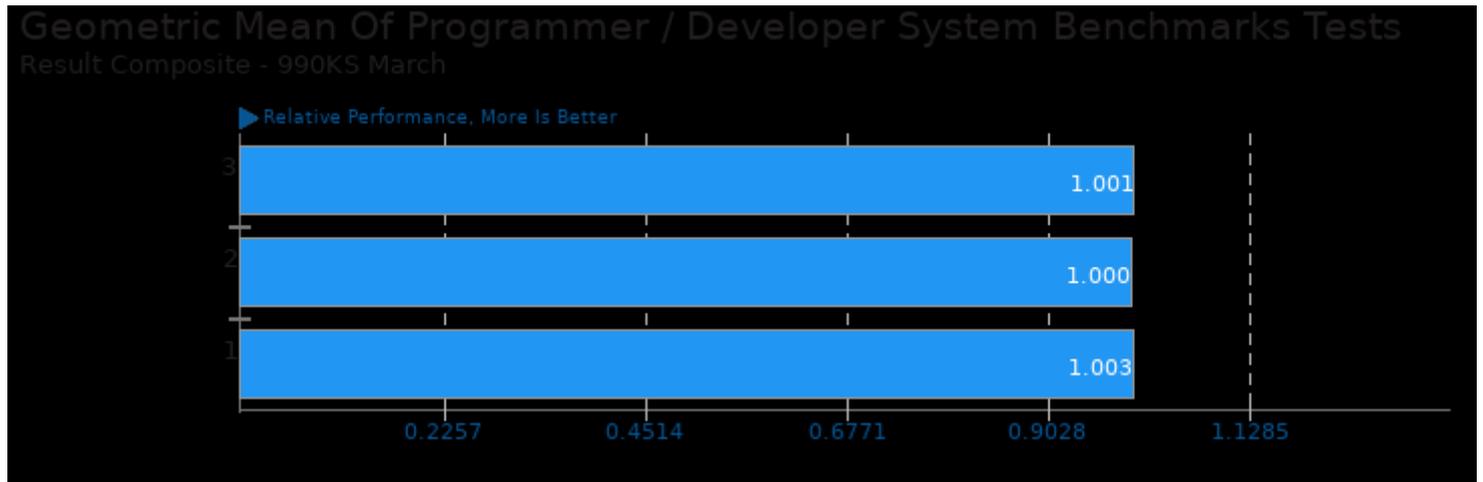
Geometric mean based upon tests: pts/sysbench, pts/stockfish, pts/svt-vp9, pts/svt-hevc, pts/dav1d, pts/aom-av1, pts/avifenc, pts/onednn, pts/compress-zstd, pts/build-linux-kernel, pts/build-erlang, pts/build-nodejs and pts/build-mesa



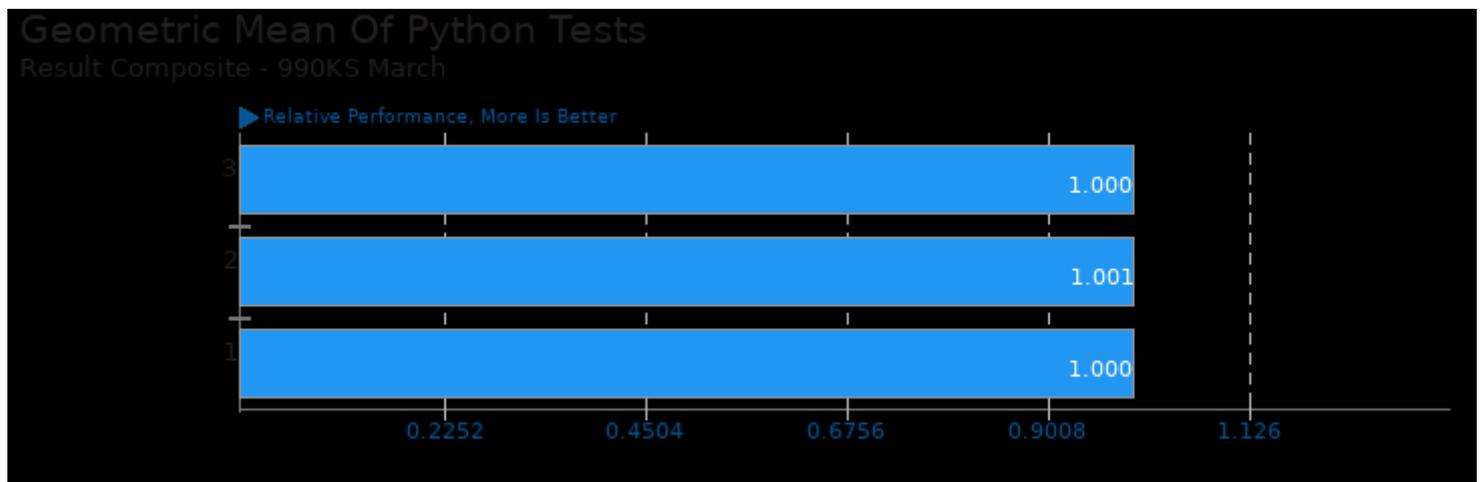
Geometric mean based upon tests: pts/viennacl and pts/shoc



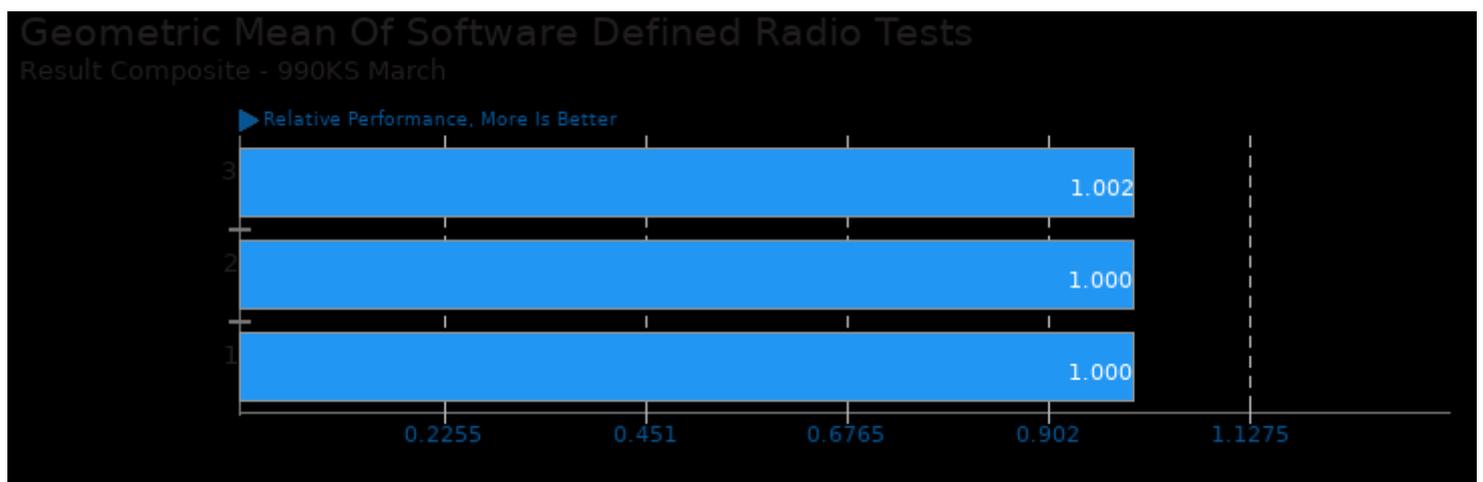
Geometric mean based upon tests: pts/shoc and pts/viennacl



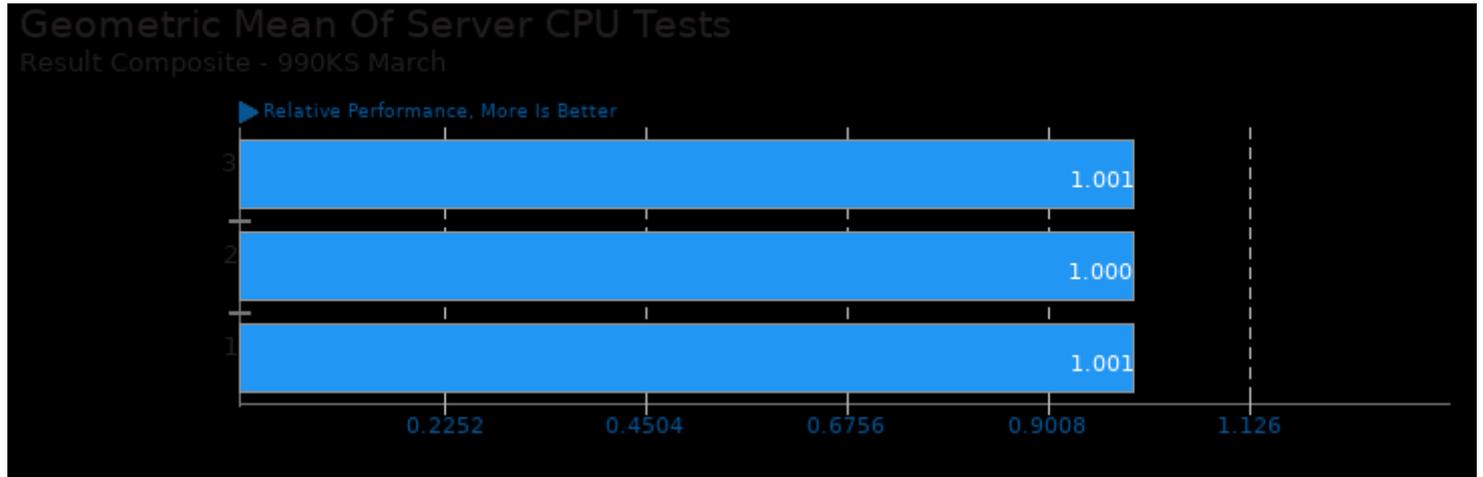
Geometric mean based upon tests: pts/simdjson, pts/compress-zstd, pts/build-linux-kernel, pts/build-erlang, pts/build-nodejs and pts/build-mesa



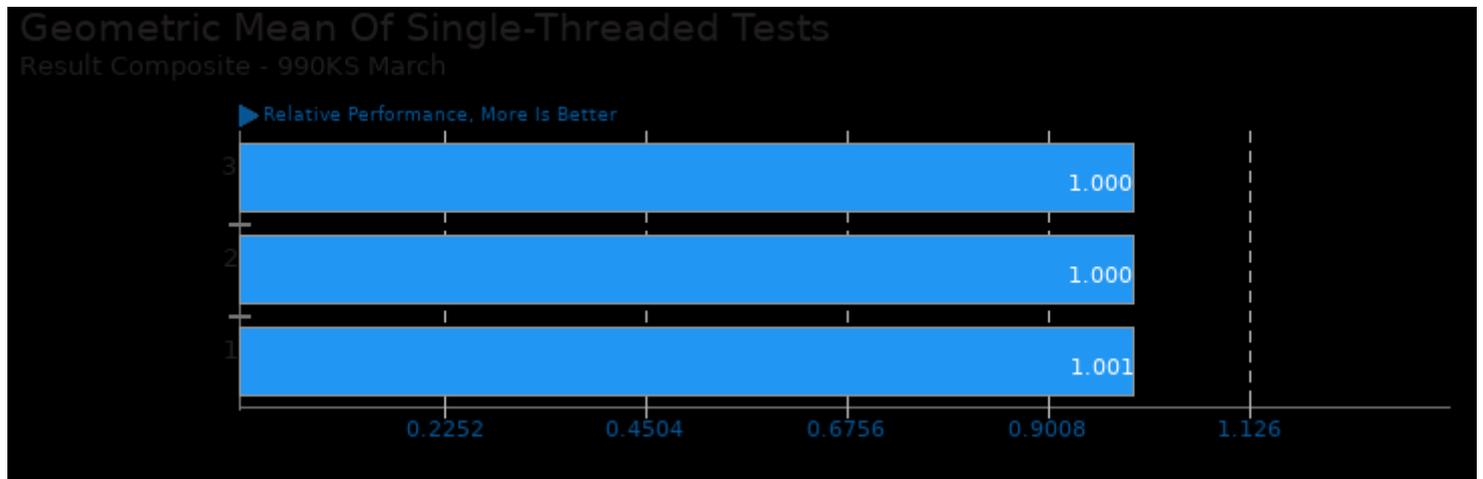
Geometric mean based upon tests: system/gnuradio, pts/systemd-boot-total, pts/build-mesa and pts/build-nodejs



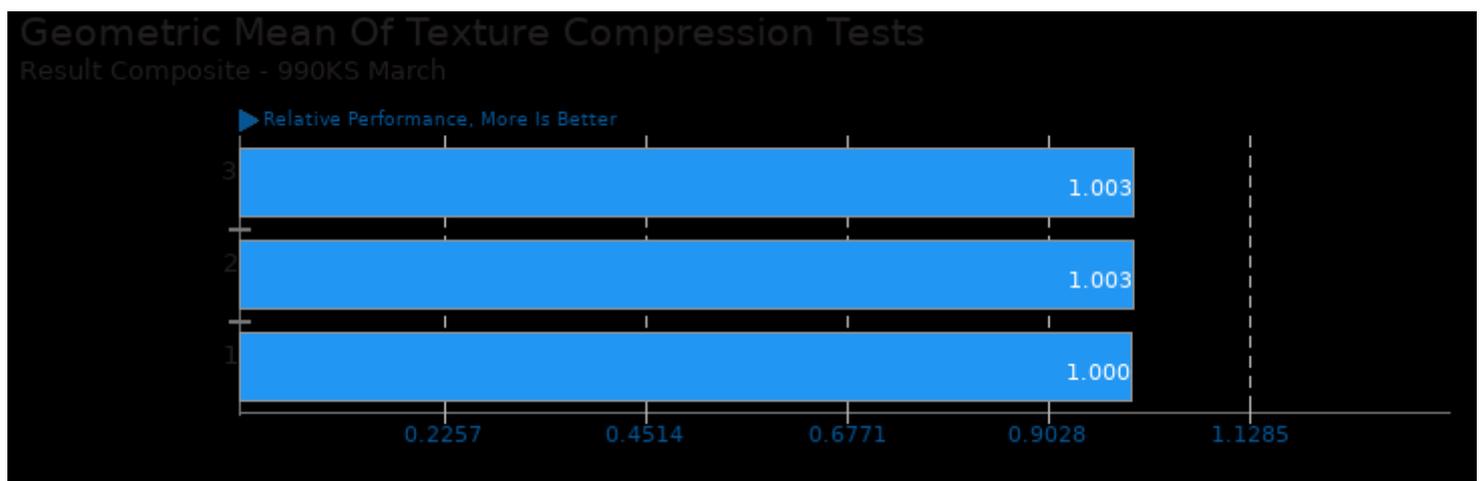
Geometric mean based upon tests: pts/liquid-dsp, pts/srslte, pts/luaradio and system/gnuradio



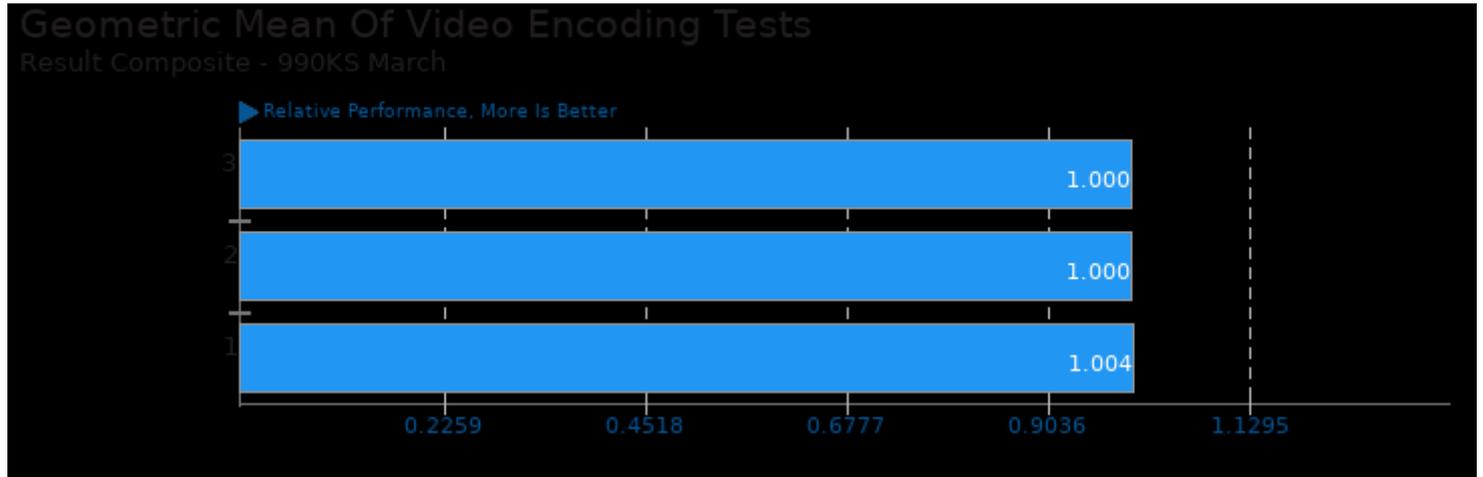
Geometric mean based upon tests: pts/onednn, pts/svt-hevc, pts/svt-vp9, pts/dav1d, pts/stockfish, pts/build-linux-kernel, pts/compress-zstd and pts/sysbench



Geometric mean based upon tests: pts/gmpbench and pts/botan



Geometric mean based upon tests: pts/basis and pts/ascenc



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

*This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 29 March 2024 11:34.*