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## EPYC Tyan Server

AMD EPYC 7543 32-Core testing with a TYAN S8036GM2NE-LE (V2.00.B21 BIOS) and ASPEED on Debian 11 via the Phoronix Test Suite.

### Automated Executive Summary

*Debian Bullseye had the most wins, coming in first place for 40% of the tests.*

*Based on the geometric mean of all complete results, the fastest (Debian 10.10) was 1.051x the speed of the slowest (Fedora Server 34). Ubuntu 20.04.2 LTS was 0.988x the speed of Debian 10.10, Debian Bullseye was 0.988x the speed of Ubuntu 20.04.2 LTS, Fedora Server 34 was 0.974x the speed of Debian Bullseye.*

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

*NAS Parallel Benchmarks (Test / Class: LU.C) at 4.926x*

*NAS Parallel Benchmarks (Test / Class: SP.C) at 3.365x*

*NAS Parallel Benchmarks (Test / Class: FT.C) at 2.727x*

*NAS Parallel Benchmarks (Test / Class: CG.C) at 2.234x*

*VP9 libvpx Encoding (Speed: Speed 5 - Input: Bosphorus 4K) at 1.743x*

*NAS Parallel Benchmarks (Test / Class: IS.D) at 1.636x*

*Timed Wasmer Compilation (Time To Compile) at 1.476x*

*SVT-AV1 (Encoder Mode: Preset 8 - Input: Bosphorus 4K) at 1.402x*

*libavif avifenc (Encoder Speed: 10) at 1.371x  
SVT-VP9 (Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p) at 1.364x.*

## Test Systems:

### Ubuntu 20.04.2 LTS

Processor: AMD EPYC 7543 32-Core @ 2.80GHz (32 Cores / 64 Threads), Motherboard: TYAN S8036GM2NE-LE (V2.00.B21 BIOS), Chipset: AMD Starship/Matisse, Memory: 64GB, Disk: 1000GB Western Digital WD\_BLACK SN850 1TB, Graphics: ASPEED, Monitor: VE228, Network: 2 x Broadcom NetXtreme BCM5720 2-port PCIe

OS: Ubuntu 20.04, Kernel: 5.8.0-55-generic (x86\_64), Desktop: GNOME Shell 3.36.4, Display Server: X Server 1.20.9, OpenGL: 4.5 Mesa 20.2.6 (LLVM 11.0.0 256 bits), 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=/build/gcc-9-HskZEA/gcc-9-9.3.0/debian/tmp-nvptx/usr.hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86\_64-linux-gnu --program-prefix=x86\_64-linux-gnu- --target=x86\_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v  
Processor Notes: Scaling Governor: acpi-cpufreq ondemand (Boost: Enabled) - CPU Microcode: 0xa001119  
Python Notes: Python 3.8.5  
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/swapgs barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS\_FW STIBP: always-on RSB filling + srbs: Not affected + tsx\_async\_abort: Not affected

### Fedora Server 34

Processor: AMD EPYC 7543 32-Core @ 2.80GHz (32 Cores / 64 Threads), Motherboard: TYAN S8036GM2NE-LE (V2.00.B21 BIOS), Chipset: AMD Starship/Matisse, Memory: 64GB, Disk: 1000GB Western Digital WD\_BLACK SN850 1TB, Graphics: ASPEED, Monitor: VE228, Network: 2 x Broadcom NetXtreme BCM5720 PCIe

OS: Fedora 34, Kernel: 5.12.11-300.fc34.x86\_64 (x86\_64), Compiler: GCC 11.1.1 20210531, File-System: xfs, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: madvise  
Compiler Notes: --build=x86\_64-redhat-linux --disable-libunwind-exceptions --enable-\_cxa\_atexit --enable-bootstrap --enable-cet --enable-checking=release --enable-gnu-indirect-function --enable-gnu-unique-object --enable-initfini-array --enable-languages=c,c++,fortran,objc,obj-c++,ada,go,d,lto --enable-multilib --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --mandir=/usr/share/man --with-arch\_32=i686 --with-gcc-major-version-only --with-linker-hash-style=gnu --with-tune=generic --without-cuda-driver  
Processor Notes: Scaling Governor: acpi-cpufreq schedutil (Boost: Enabled) - CPU Microcode: 0xa001119  
Python Notes: Python 3.9.5  
Security Notes: SELinux + itlb\_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of usercopy/swapgs barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS\_FW STIBP: always-on RSB filling + srbs: Not affected + tsx\_async\_abort: Not affected

### Debian 10.10

Processor: AMD EPYC 7543 32-Core @ 2.80GHz (32 Cores / 64 Threads), Motherboard: TYAN S8036GM2NE-LE (V2.00.B21 BIOS), Chipset: AMD Starship/Matisse, Memory: 64GB, Disk: 1000GB Western Digital WD\_BLACK SN850 1TB, Graphics: ASPEED, Monitor: VE228, Network: 2 x Broadcom NetXtreme BCM5720 PCIe

OS: Debian 10, Kernel: 4.19.0-17-amd64 (x86\_64), Desktop: GNOME Shell 3.30.2, Display Server: X Server, Compiler:

## EPYC Tyan Server

GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: always  
 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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --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 --with-tune=generic --without-cuda-driver -v  
 Processor Notes: Scaling Governor: acpi-cpufreq ondemand (Boost: Enabled) - CPU Microcode: 0xa001119  
 Python Notes: Python 2.7.16 + Python 3.7.3  
 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 Full AMD retrpoline IBPB: conditional IBRS\_FW STIBP: always-on RSB filling + srbs: Not affected + tsx\_async\_abort: Not affected

## Debian Bullseye

Processor: AMD EPYC 7543 32-Core @ 2.80GHz (32 Cores / 64 Threads), Motherboard: TYAN S8036GM2NE-LE (V2.00.B21 BIOS), Chipset: AMD Starship/Matisse, Memory: 64GB, Disk: 1000GB Western Digital WD\_BLACK SN850 1TB, Graphics: ASPEED, Monitor: VE228, Network: 2 x Broadcom NetXtreme BCM5720 2-port PCIe

OS: Debian 11, Kernel: 5.10.0-7-amd64 (x86\_64), Desktop: GNOME Shell 3.38.4, Display Server: X Server, Vulkan: 1.0.2, Compiler: GCC 10.2.1 20210110, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: always  
 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-Km9U7s/gcc-10-10.2.1/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-Km9U7s/gcc-10-10.2.1/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: acpi-cpufreq schedutil (Boost: Enabled) - CPU Microcode: 0xa001119  
 Python Notes: Python 3.9.2  
 Security Notes: itlb\_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Full AMD retrpoline IBPB: conditional IBRS\_FW STIBP: always-on RSB filling + srbs: Not affected + tsx\_async\_abort: Not affected

	Ubuntu 20.04.2 LTS	Fedora Server 34	Debian 10.10	Debian Bullseye
<b>High Performance Conjugate Gradient (GFLOP/s)</b>	<b>12.8778</b>	<b>11.7130</b>		11.7941
Normalized	100%	90.95%		91.58%
Standard Deviation	0.1%	17.8%		16.2%
<b>NAS Parallel Benchmarks - BT.C (Mop/s)</b>	<b>87955</b>	<b>20508</b>	87888	<b>89193</b>
Normalized	98.61%	22.99%	98.54%	100%
Standard Deviation	0.4%	7.1%	0.6%	0.1%
<b>NAS Parallel Benchmarks - CG.C (Mop/s)</b>	<b>29892</b>	<b>13588</b>		<b>30352</b>
Normalized	98.48%	44.77%		100%
Standard Deviation	1.6%	0.1%		1.4%
<b>NAS Parallel Benchmarks - EP.D (Mop/s)</b>	<b>2934</b>	<b>1601</b>		<b>2965</b>
Normalized	98.96%	54%		100%
Standard Deviation	2.6%	6.7%		0.5%

<b>NAS Parallel Benchmarks - FT.C</b>	47060	<b>17996</b>	<b>49076</b>
	(Mop/s)		
Normalized	95.89%	36.67%	100%
Standard Deviation	0.2%	0.4%	0.5%
<b>NAS Parallel Benchmarks - IS.D</b>	<b>1787</b>	<b>1092</b>	<b>1731</b>
Normalized	100%	61.12%	96.9%
Standard Deviation	0.8%	2.2%	1.1%
<b>NAS Parallel Benchmarks - LU.C</b>	102553	<b>21406</b>	<b>105457</b>
	(Mop/s)		
Normalized	97.25%	20.3%	100%
Standard Deviation	1%	0.3%	1.4%
<b>NAS Parallel Benchmarks - MG.C</b>	49265	<b>23155</b>	<b>50129</b>
	(Mop/s)		
Normalized	98.28%	46.19%	100%
Standard Deviation	0.3%	7.8%	0.2%
<b>NAS Parallel Benchmarks - SP.C</b>	33234	<b>10058</b>	<b>33844</b>
	(Mop/s)		
Normalized	98.2%	29.72%	97.81%
Standard Deviation	0.3%	0.8%	0.4%
<b>miniFE - Small (CG Mflops)</b>	11203	<b>10018</b>	<b>13355</b>
Normalized	83.88%	75.01%	100%
Standard Deviation	9%	7%	9.7%
<b>NAMD - ATPase Simulation - 327,506</b>	0.67252	<b>0.67355</b>	<b>0.67131</b>
	Atoms (days/ns)		
Normalized	99.82%	99.67%	100%
Standard Deviation	0.1%	0.1%	0.1%
<b>NWChem - C240 Buckyball (sec)</b>	<b>3117</b>		<b>3101</b>
Normalized	99.5%		100%
<b>Xcompact3d Incompact3d - i.i.1.C.P.D</b>	27.8769480	<b>29.0366478</b>	<b>27.7018650</b>
	(sec)		
Normalized	99.37%	95.4%	100%
Standard Deviation	2.5%	0.5%	2.8%
<b>OpenFOAM - Motorbike 30M (sec)</b>	<b>22.24</b>		<b>21.77</b>
Normalized	97.89%		100%
Standard Deviation	0.4%		0.6%
<b>OpenFOAM - Motorbike 60M (sec)</b>	<b>237.38</b>		<b>236.58</b>
Normalized	99.66%		100%
Standard Deviation	0.1%		0.1%
<b>Xmrig - Monero - 1M (H/s)</b>	<b>21915</b>		<b>23576</b>
Normalized	92.95%	94.73%	100%
Standard Deviation	0.3%	0.4%	0.2%
<b>Xmrig - Wownero - 1M (H/s)</b>	23123	<b>23003</b>	<b>24478</b>
Normalized	94.46%	93.97%	100%
Standard Deviation	0.3%	0.6%	0.2%
<b>LuxCoreRender - DLSC - CPU (M samples/sec)</b>	<b>5.45</b>	5.46	<b>5.45</b>
Normalized	99.63%	99.82%	99.63%
Standard Deviation	0.3%	1.2%	0.5%
<b>LuxCoreRender - Danish Mood - CPU (M samples/sec)</b>	<b>4.32</b>	4.39	<b>4.42</b>
Normalized	97.74%	99.32%	100%
Standard Deviation	0.7%	1.6%	0.3%

<b>LuxCoreRender - Orange Juice - CPU</b>	<b>8.29</b>	<b>8.29</b>	8.33	<b>8.39</b>
(M samples/sec)				
Normalized	98.81%	98.81%	99.28%	100%
Standard Deviation	0.1%	0.3%	0.2%	0.5%
<b>LuxCoreRender - LuxCore Benchmark - CPU (M samples/sec)</b>	<b>4.73</b>	<b>4.68</b>	4.74	<b>4.79</b>
Normalized	98.75%	97.7%	98.96%	100%
Standard Deviation	0.2%	0.3%	0.7%	0.6%
<b>LuxCoreRender - R.C.a.P - CPU (M samples/sec)</b>	<b>16.38</b>	<b>16.11</b>	<b>17.14</b>	16.75
Normalized	95.57%	93.99%	100%	97.72%
Standard Deviation	4.4%	1.1%	6.9%	5.9%
<b>OSPray - San Miguel - Path Tracer (FPS)</b>	<b>3.72</b>	<b>3.70</b>	3.73	<b>3.78</b>
Normalized	98.41%	97.88%	98.68%	100%
Standard Deviation	0%	0.6%	0%	0.2%
<b>OSPray - XFrog Forest - Path Tracer (FPS)</b>	<b>4.47</b>	<b>4.46</b>	4.48	<b>4.50</b>
Normalized	99.33%	99.11%	99.56%	100%
Standard Deviation	0.3%	0%	0%	0.3%
<b>OSPray - NASA Streamlines - Path Tracer (FPS)</b>	<b>12.35</b>	<b>12.35</b>	12.5	<b>12.66</b>
Normalized	97.55%	97.55%	98.74%	100%
Standard Deviation	0%	0%	0%	0%
<b>OSPray - M.R - Path Tracer (FPS)</b>	<b>500</b>	<b>500</b>	444.44	<b>422.22</b>
Normalized	100%	100%	88.89%	84.44%
Standard Deviation			18.3%	20.4%
<b>Embree - Pathtracer ISPC - Crown (FPS)</b>	33.3187	33.3893	<b>32.5872</b>	<b>33.5204</b>
Normalized	99.4%	99.61%	97.22%	100%
Standard Deviation	0.1%	0.3%	0.6%	0.4%
<b>Embree - Pathtracer ISPC - Asian (Dragon) (FPS)</b>	37.1865	<b>37.3838</b>	<b>32.4410</b>	37.3153
Normalized	99.47%	100%	86.78%	99.82%
Standard Deviation	1.2%	0.7%	7.6%	1%
<b>SVT-AV1 - Preset 4 - Bosphorus 4K (FPS)</b>	<b>1.931</b>	1.913	1.852	<b>1.707</b>
Normalized	100%	99.07%	95.91%	88.4%
Standard Deviation	0.1%	0.3%	0.3%	0.5%
<b>SVT-AV1 - Preset 8 - Bosphorus 4K (FPS)</b>	<b>20.851</b>	18.345	20.716	<b>14.875</b>
Normalized	100%	87.98%	99.35%	71.34%
Standard Deviation	1%	1%	0.9%	1.4%
<b>SVT-HEVC - 1 - Bosphorus 1080p (FPS)</b>	<b>24.65</b>	24.71	<b>25.19</b>	24.96
Normalized	97.86%	98.09%	100%	99.09%
Standard Deviation	0.6%	0.7%	0.3%	0.6%
<b>SVT-HEVC - 7 - Bosphorus 1080p</b>	282.38	281.37	<b>296.57</b>	<b>273.70</b>
Normalized	95.22%	94.87%	100%	92.29%
Standard Deviation	2.4%	1.4%	2%	2.2%
<b>SVT-HEVC - 10 - Bosphorus 1080p (FPS)</b>	458.18	434.07	<b>537.01</b>	<b>429.71</b>
Normalized	85.32%	80.83%	100%	80.02%
Standard Deviation	10.3%	5.5%	2.3%	7.4%

<b>SVT-VP9 - VMAF Optimized - Bosphorus 1080p (FPS)</b>	<b>349.16</b>	291.76	344.93	<b>256.35</b>
Normalized	100%	83.56%	98.79%	73.42%
Standard Deviation	4.2%	1.1%	2.9%	1.4%
<b>SVT-VP9 - P.S.O - Bosphorus 1080p (FPS)</b>	<b>353.98</b>	305.14	353.73	<b>259.56</b>
Normalized	100%	86.2%	99.93%	73.33%
Standard Deviation	1.1%	2.8%	0.7%	0.2%
<b>SVT-VP9 - V.Q.O - Bosphorus 1080p (FPS)</b>	264.89	272.55	<b>297.41</b>	<b>236.32</b>
Normalized	89.07%	91.64%	100%	79.46%
Standard Deviation	1.5%	1.4%	1.7%	2.5%
<b>VP9 libvpx Encoding - Speed 0 - Bosphorus 4K (FPS)</b>	6.16	<b>6.89</b>	<b>6.05</b>	6.52
Normalized	89.4%	100%	87.81%	94.63%
Standard Deviation	0.2%	0.9%	0.3%	1.4%
<b>VP9 libvpx Encoding - Speed 5 - Bosphorus 4K (FPS)</b>	13.63	<b>16.23</b>	13.03	<b>9.31</b>
Normalized	83.98%	100%	80.28%	57.36%
Standard Deviation	0.9%	1.4%	0.7%	0.8%
<b>Intel Open Image Denoise - Intel Open Image Denoise - 0.90</b>	0.90	<b>0.96</b>	<b>0.87</b>	0.89
<b>RT.hdr_alb_nrm.3840x2160 (Images / Sec)</b>				
Normalized	93.75%	100%	90.63%	92.71%
Standard Deviation	0.6%	0.4%	1%	2.2%
<b>Intel Open Image Denoise - 0.90</b>	0.90	<b>0.96</b>	<b>0.87</b>	0.94
<b>RT.ldr_alb_nrm.3840x2160 (Images / Sec)</b>				
Normalized	93.75%	100%	90.63%	97.92%
Standard Deviation	0.7%	0.2%	0.4%	2.5%
<b>Intel Open Image Denoise - 0.45</b>	0.45	<b>0.48</b>	<b>0.44</b>	0.46
<b>RTLightmap.hdr.4096x4096 (Images / Sec)</b>				
Normalized	93.75%	100%	91.67%	95.83%
Standard Deviation	1.2%	0.1%	1.3%	0.5%
<b>OpenVKL - vklBenchmark (Items / sec)</b>	<b>297</b>	296	<b>282</b>	287
Normalized	100%	99.66%	94.95%	96.63%
Standard Deviation	4.1%	0.8%	1.4%	2.1%
<b>libavif avifenc - 10 (sec)</b>	<b>3.817</b>	3.620	<b>2.785</b>	2.873
Normalized	72.96%	76.93%	100%	96.94%
Standard Deviation	0.8%	2.5%	2.3%	2.8%
<b>libavif avifenc - 6, Lossless (sec)</b>	<b>30.222</b>	27.881	<b>27.237</b>	27.395
Normalized	90.12%	97.69%	100%	99.42%
Standard Deviation	1.2%	0.1%	2%	0.6%
<b>libavif avifenc - 10, Lossless (sec)</b>	<b>6.287</b>	6.185	5.323	<b>5.298</b>
Normalized	84.27%	85.66%	99.53%	100%
Standard Deviation	2.4%	0.2%	5.7%	0.5%
<b>Timed Godot Game Engine</b>	57.907	54.948	<b>63.293</b>	<b>53.426</b>
<b>Compilation - Time To Compile (sec)</b>				
Normalized	92.26%	97.23%	84.41%	100%
Standard Deviation	0.8%	0.3%	1%	0.6%

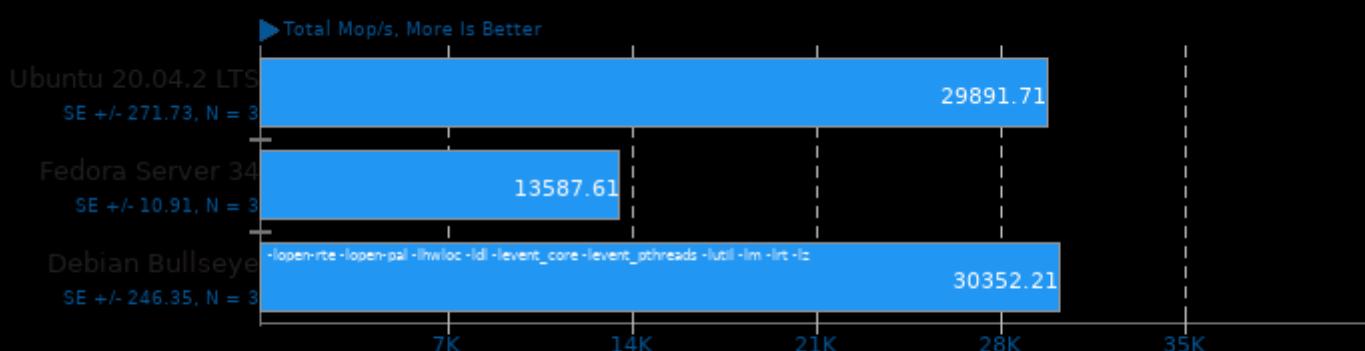
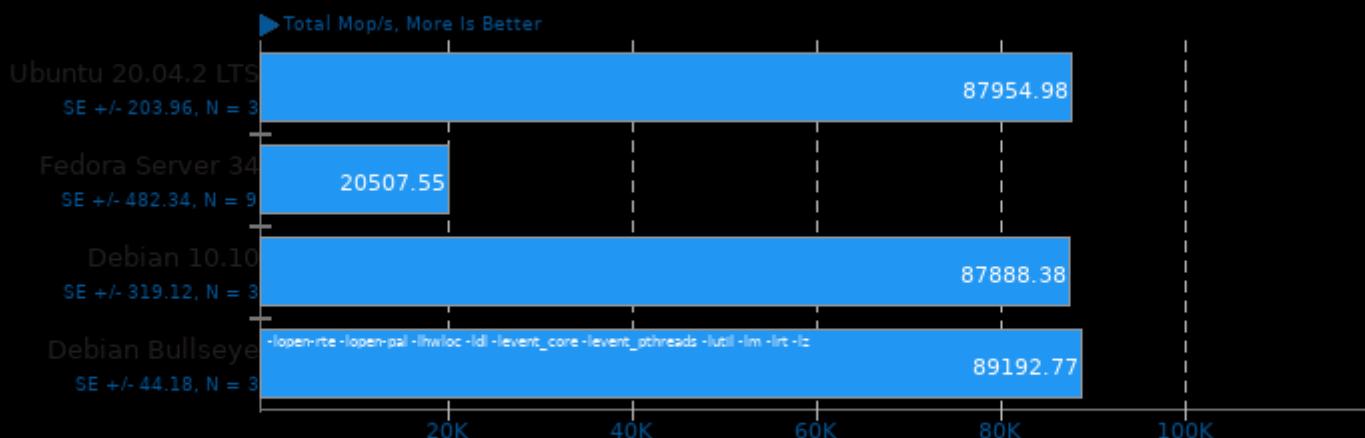
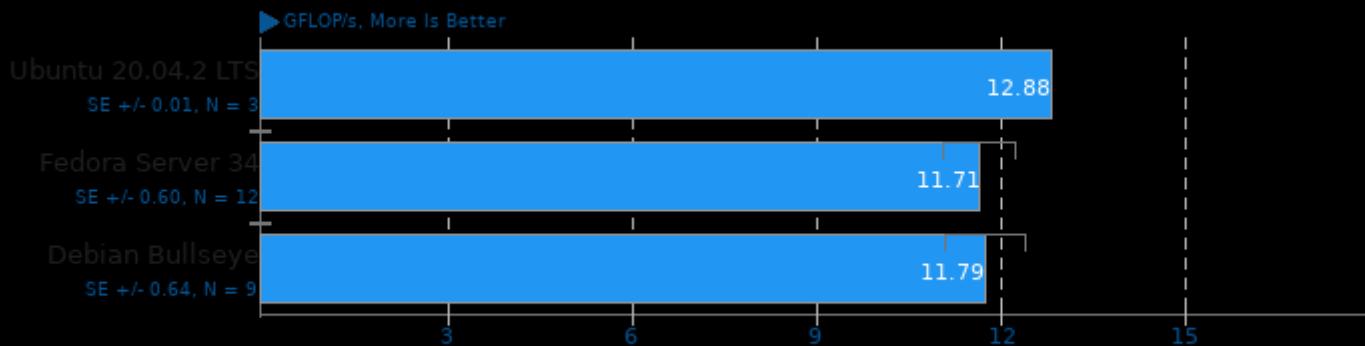
<b>Timed Linux Kernel Compilation - Time To Compile (sec)</b>	<b>35.137</b>	34.019	<b>29.492</b>	32.031
Normalized	83.93%	86.69%	100%	92.07%
Standard Deviation	2.3%	2.4%	2.4%	2.5%
<b>Timed LLVM Compilation - Ninja (sec)</b>	<b>232.758</b>	209.690	<b>185.201</b>	202.013
Normalized	79.57%	88.32%	100%	91.68%
Standard Deviation	0.6%	0.6%	0.1%	0.1%
<b>Timed LLVM Compilation - Unix Makefiles (sec)</b>	<b>286.375</b>	257.168	<b>223.264</b>	250.573
Normalized	77.96%	86.82%	100%	89.1%
Standard Deviation	0.9%	1.2%	2.5%	1.6%
<b>Timed Mesa Compilation - Time To Compile (sec)</b>	<b>22.747</b>			<b>20.273</b>
Normalized	89.12%		100%	
Standard Deviation	2.4%		0.9%	
<b>Timed Node.js Compilation - Time To Compile (sec)</b>	<b>151.647</b>	137.588	<b>123.139</b>	134.407
Normalized	81.2%	89.5%	100%	91.62%
Standard Deviation	0.1%	0.3%	0.2%	0.2%
<b>Timed Wasmer Compilation - Time To Compile (sec)</b>	<b>61.241</b>	<b>41.498</b>		60.641
Normalized	67.76%	100%		68.43%
Standard Deviation	1%	0.8%		1.6%
<b>GROMACS - MPI CPU - water_GMX50_bare (Ns/Day)</b>	<b>3.639</b>	3.640	<b>3.756</b>	
Normalized	96.88%	96.91%		100%
Standard Deviation	0.5%	0.4%		0.2%
<b>TensorFlow Lite - SqueezeNet (us)</b>	69193	<b>70454</b>	69846	<b>69107</b>
Normalized	99.88%	98.09%	98.94%	100%
Standard Deviation	0.5%	1.3%	0.9%	0.7%
<b>TensorFlow Lite - Inception V4 (us)</b>	936694	941892	<b>942408</b>	<b>932251</b>
Normalized	99.53%	98.98%	98.92%	100%
Standard Deviation	0.4%	1.1%	0.8%	0.3%
<b>TensorFlow Lite - NASNet Mobile (us)</b>	88673	<b>111782</b>	<b>75742</b>	84817
Normalized	85.42%	67.76%	100%	89.3%
Standard Deviation	6.6%	13.2%	0.8%	9.6%
<b>TensorFlow Lite - Mobilenet Float (us)</b>	<b>43688</b>	43886	<b>44223</b>	43712
Normalized	100%	99.55%	98.79%	99.95%
Standard Deviation	0.6%	0.4%	0.4%	0.4%
<b>TensorFlow Lite - Mobilenet Quant</b>	46473	46558	<b>46650</b>	<b>46350</b>
Normalized	99.74%	99.55%	99.36%	100%
Standard Deviation	0.3%	0.6%	0.4%	0.1%
<b>TensorFlow Lite - I.R.V (us)</b>	835539	<b>837065</b>	834724	<b>834703</b>
Normalized	99.9%	99.72%	100%	100%
Standard Deviation	0.3%	0.4%	0%	0.3%
<b>ASTC Encoder - Exhaustive (sec)</b>	<b>23.6779</b>	23.5167		<b>23.4605</b>
Normalized	99.08%	99.76%		100%
Standard Deviation	0.1%	0%		0.1%
<b>GPAW - Carbon Nanotube (sec)</b>	114.896			
Standard Deviation	1%			
<b>Mobile Neural Network - mobilenetV3 (ms)</b>	2.572	<b>2.535</b>	<b>2.906</b>	2.616
Normalized	98.56%	100%	87.23%	96.9%
Standard Deviation	2.3%	4.4%	6.5%	4.9%

<b>Mobile Neural Network - squeezeenetv1.1 (ms)</b>	4.144	<b>4.042</b>	<b>4.720</b>	4.676
Normalized	97.54%	100%	85.64%	86.44%
Standard Deviation	2%	3.4%	3.4%	2.4%
<b>Mobile Neural Network - resnet-v2-50 (ms)</b>	21.954	<b>18.933</b>	<b>23.736</b>	22.520
Normalized	86.24%	100%	79.76%	84.07%
Standard Deviation	0.9%	5.7%	4.1%	6.6%
<b>Mobile Neural Network - SqueezeNetV1.0 (ms)</b>	6.094	<b>5.767</b>	<b>6.326</b>	6.204
Normalized	94.63%	100%	91.16%	92.96%
Standard Deviation	3.5%	3.3%	5.4%	5.8%
<b>Mobile Neural Network - MobileNetV2_224 (ms)</b>	3.947	3.975	<b>4.242</b>	4.034
Normalized	100%	99.3%	93.05%	97.84%
Standard Deviation	5.4%	4.3%	5.9%	10.3%
<b>Mobile Neural Network - mobilenet-v1-1.0 (ms)</b>	2.849	2.894	3.482	<b>3.796</b>
Normalized	100%	98.45%	81.82%	75.05%
Standard Deviation	6%	7.7%	8.5%	8.5%
<b>Mobile Neural Network - inception-v3 (ms)</b>	24.361	<b>22.603</b>	26.471	<b>27.651</b>
Normalized	92.78%	100%	85.39%	81.74%
Standard Deviation	2%	2.4%	3.1%	1.4%
<b>TNN - CPU - DenseNet (ms)</b>	2907	3043	<b>2822</b>	<b>3098</b>
Normalized	97.08%	92.75%	100%	91.09%
Standard Deviation	0%	1.2%	0.2%	0.5%
<b>TNN - CPU - MobileNet v2 (ms)</b>	290.337	296.547	<b>286.254</b>	<b>307.534</b>
Normalized	98.59%	96.53%	100%	93.08%
Standard Deviation	0.4%	1.5%	1.7%	2.3%
<b>TNN - CPU - SqueezeNet v2 (ms)</b>	62.597	<b>64.811</b>	62.217	<b>62.165</b>
Normalized	99.31%	95.92%	99.92%	100%
Standard Deviation	0.9%	0.2%	2.4%	1.3%
<b>TNN - CPU - SqueezeNet v1.1 (ms)</b>	269.182	<b>271.391</b>	<b>268.003</b>	269.358
Normalized	99.56%	98.75%	100%	99.5%
Standard Deviation	0.1%	0.1%	0.2%	0.4%
<b>PlaidML - No - Inference - VGG16 - CPU (FPS)</b>	<b>26.73</b>	26.96	33.54	<b>33.87</b>
Normalized	78.92%	79.6%	99.03%	100%
Standard Deviation	1.5%	1.2%	1.3%	2.4%
<b>PlaidML - No - Inference - VGG19 - CPU (FPS)</b>	22.49	<b>22.13</b>	<b>27.95</b>	27.67
Normalized	80.47%	79.18%	100%	99%
Standard Deviation	1.4%	2.4%	2%	1.5%
<b>PlaidML - No - Inference - ResNet 50 - CPU (FPS)</b>	9.04	<b>8.59</b>	9.60	<b>9.61</b>
Normalized	94.07%	89.39%	99.9%	100%
Standard Deviation	0.5%	0.5%	1.9%	0.4%
<b>OpenVINO - F.D.O.F - CPU (FPS)</b>	6.25			
Standard Deviation	0.2%			
<b>OpenVINO - F.D.O.F - CPU (ms)</b>	2548			
Standard Deviation	0%			
<b>OpenVINO - F.D.O.F - CPU (FPS)</b>	6.25			
Standard Deviation	0.4%			

<b>OpenVINO - F.D.O.F - CPU (ms)</b>	2551			
Standard Deviation	0.3%			
<b>OpenVINO - P.D.O.F - CPU (FPS)</b>	4.57			
Standard Deviation	0.1%			
<b>OpenVINO - P.D.O.F - CPU (ms)</b>	3486			
Standard Deviation	0.1%			
<b>OpenVINO - P.D.O.F - CPU (FPS)</b>	4.58			
Standard Deviation	0.2%			
<b>OpenVINO - P.D.O.F - CPU (ms)</b>	3449			
Standard Deviation	0.9%			
<b>OpenVINO - A.G.R.R.O.F - CPU (FPS)</b>	20274			
Standard Deviation	1.3%			
<b>OpenVINO - A.G.R.R.O.F - CPU (ms)</b>	0.76			
Standard Deviation	0%			
<b>OpenVINO - A.G.R.R.O.F - CPU (FPS)</b>	20459			
Standard Deviation	0.1%			
<b>OpenVINO - A.G.R.R.O.F - CPU (ms)</b>	0.76			
Standard Deviation	0%			
<b>Blender - BMW27 - CPU-Only (sec)</b>	52.85	<b>53.13</b>	<b>52.44</b>	52.55
Normalized	99.22%	98.7%	100%	99.79%
Standard Deviation	0.2%	0.3%	0.2%	0.2%
<b>Blender - Classroom - CPU-Only (sec)</b>	146.51	<b>146.65</b>	146.09	<b>145.38</b>
Normalized	99.23%	99.13%	99.51%	100%
Standard Deviation	0.2%	0.1%	0.3%	0.2%
<b>Blender - Barbershop - CPU-Only</b>	195.79	<b>196.64</b>	192.55	<b>189.90</b>
Normalized	96.99%	96.57%	98.62%	100%
Standard Deviation	0%	0.3%	0.9%	0.3%
<b>ONNX Runtime - yolov4 - OpenMP</b>	<b>291</b>	277	<b>233</b>	282
<b>CPU (Inferences/min)</b>				
Normalized	100%	95.19%	80.07%	96.91%
Standard Deviation	5.2%	1.2%	6.9%	5.1%
<b>ONNX Runtime - bertsquad-10 -</b>	<b>445</b>	440	432	<b>424</b>
<b>OpenMP CPU (Inferences/min)</b>				
Normalized	100%	98.88%	97.08%	95.28%
Standard Deviation	2.9%	3.3%	5.1%	3.5%
<b>ONNX Runtime - fcn-resnet101-11 -</b>	<b>93</b>	84	75	<b>73</b>
<b>OpenMP CPU (Inferences/min)</b>				
Normalized	100%	90.32%	80.65%	78.49%
Standard Deviation	13.3%	14%	8.9%	13.9%
<b>ONNX Runtime - shufflenet-v2-10 -</b>	<b>10866</b>	10911	11064	<b>11283</b>
<b>OpenMP CPU (Inferences/min)</b>				
Normalized	96.3%	96.7%	98.06%	100%
Standard Deviation	0.8%	1.3%	1.7%	0.8%
<b>ONNX Runtime - super-resolution-10 -</b>	4775	4884	<b>5018</b>	<b>4597</b>
<b>OpenMP CPU (Inferences/min)</b>				
Normalized	95.16%	97.33%	100%	91.61%
Standard Deviation	1.3%	0.9%	6.6%	0.9%
<b>Numenta Anomaly Benchmark -</b>	<b>1398</b>		<b>1121</b>	
<b>EXPoSE (sec)</b>				
Normalized	80.18%		100%	
Standard Deviation	1.9%		1%	

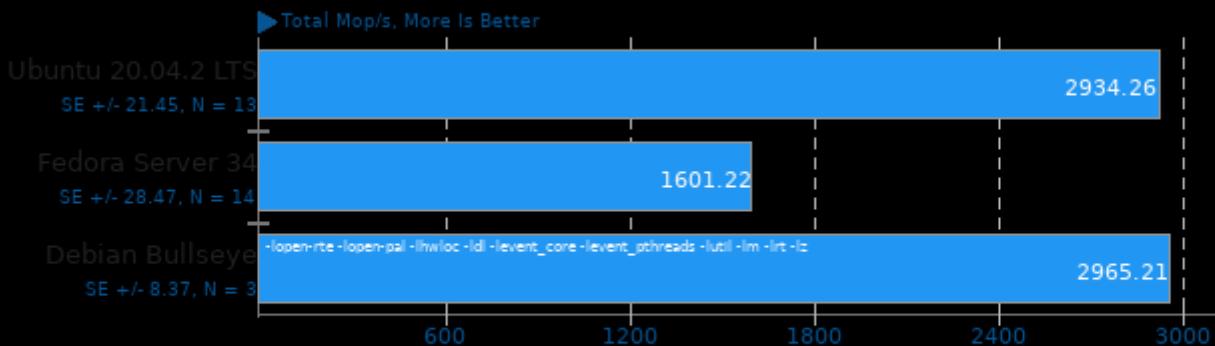


High Performance Conjugate Gradient 3.1



## NAS Parallel Benchmarks 3.4

Test / Class: EP.D



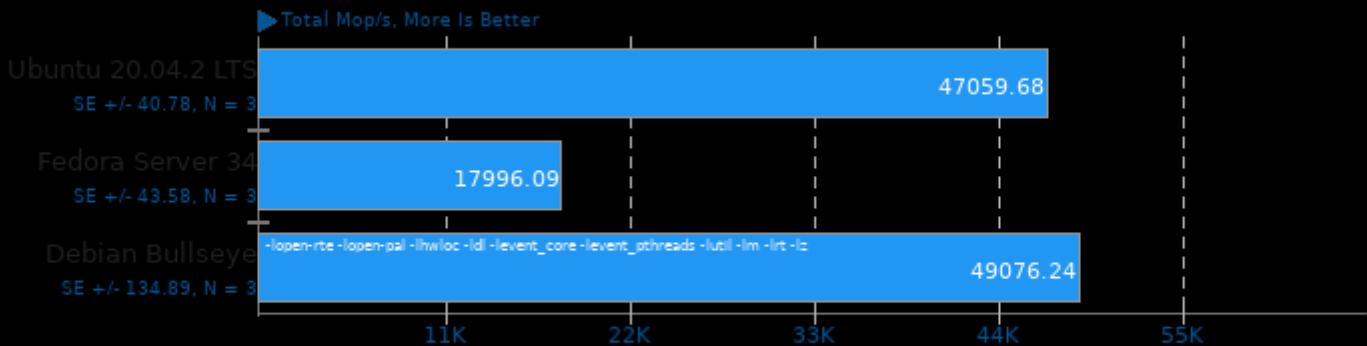
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi

2. Ubuntu 20.04.2 LTS: Open MPI 4.0.3

3. Debian Bullseye: Open MPI 4.1.0

## NAS Parallel Benchmarks 3.4

Test / Class: FT.C



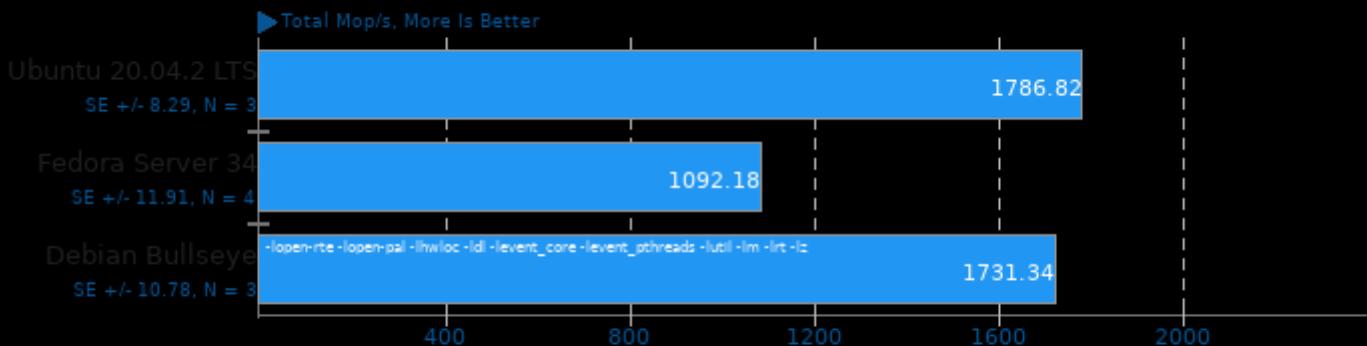
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi

2. Ubuntu 20.04.2 LTS: Open MPI 4.0.3

3. Debian Bullseye: Open MPI 4.1.0

## NAS Parallel Benchmarks 3.4

Test / Class: IS.D



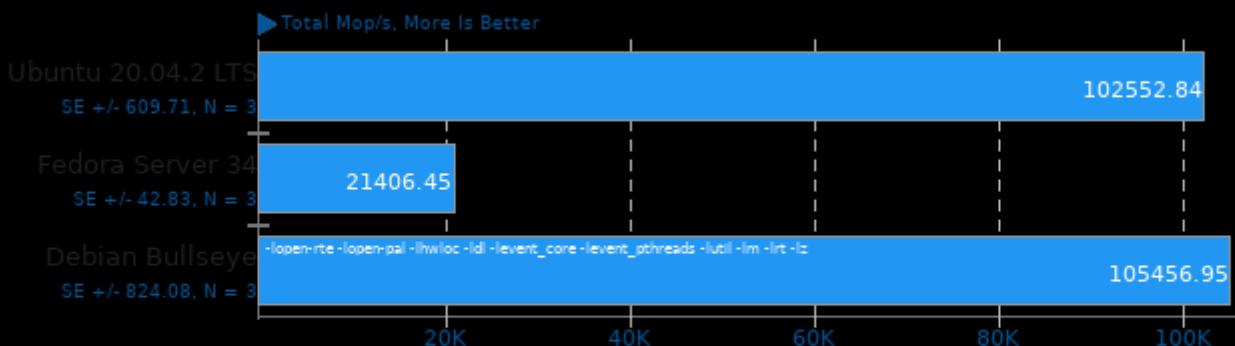
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi

2. Ubuntu 20.04.2 LTS: Open MPI 4.0.3

3. Debian Bullseye: Open MPI 4.1.0

## NAS Parallel Benchmarks 3.4

Test / Class: LU.C



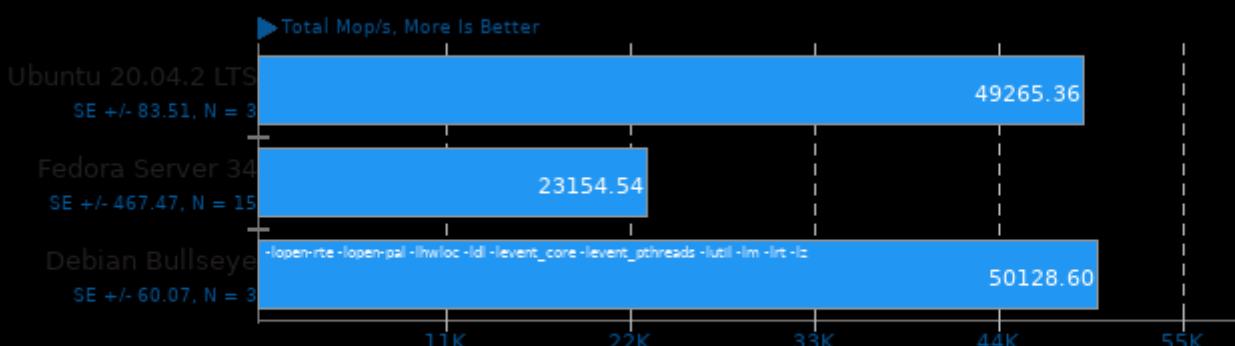
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi

2. Ubuntu 20.04.2 LTS: Open MPI 4.0.3

3. Debian Bullseye: Open MPI 4.1.0

## NAS Parallel Benchmarks 3.4

Test / Class: MG.C



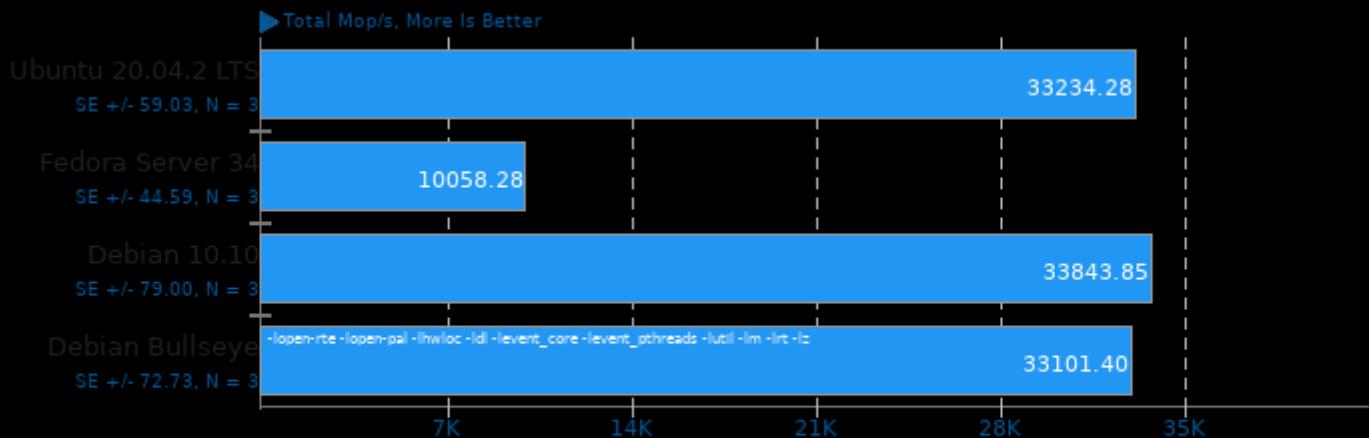
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi

2. Ubuntu 20.04.2 LTS: Open MPI 4.0.3

3. Debian Bullseye: Open MPI 4.1.0

## NAS Parallel Benchmarks 3.4

Test / Class: SPC



1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi

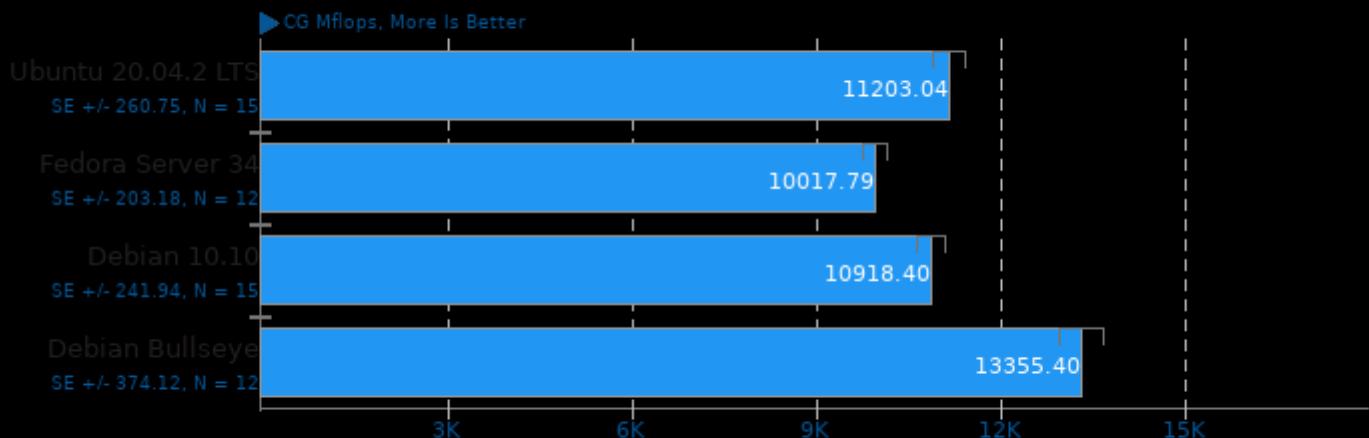
2. Ubuntu 20.04.2 LTS: Open MPI 4.0.3

3. Debian 10.10: Open MPI 3.1.3

4. Debian Bullseye: Open MPI 4.1.0

## miniFE 2.2

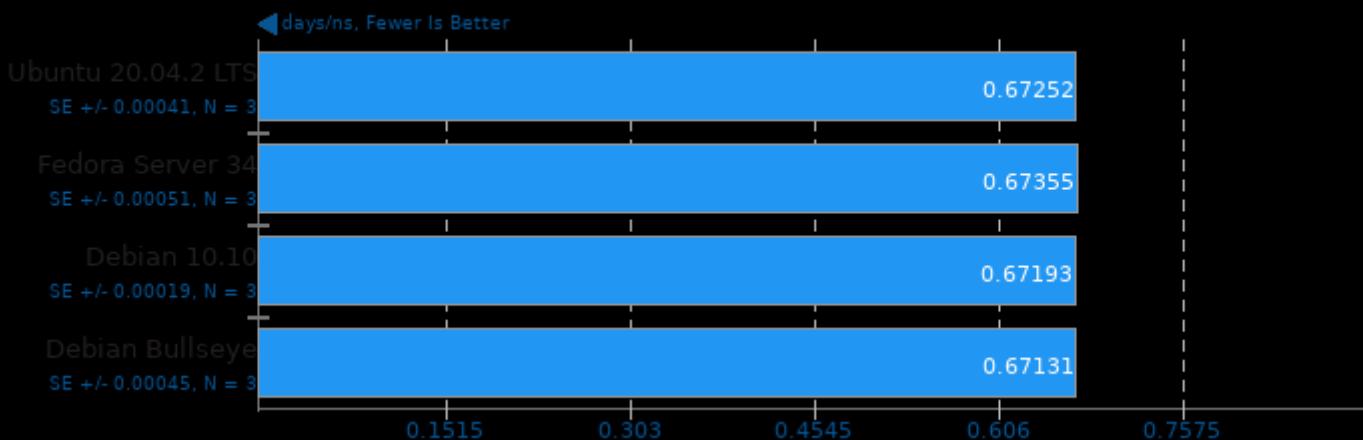
Problem Size: Small



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

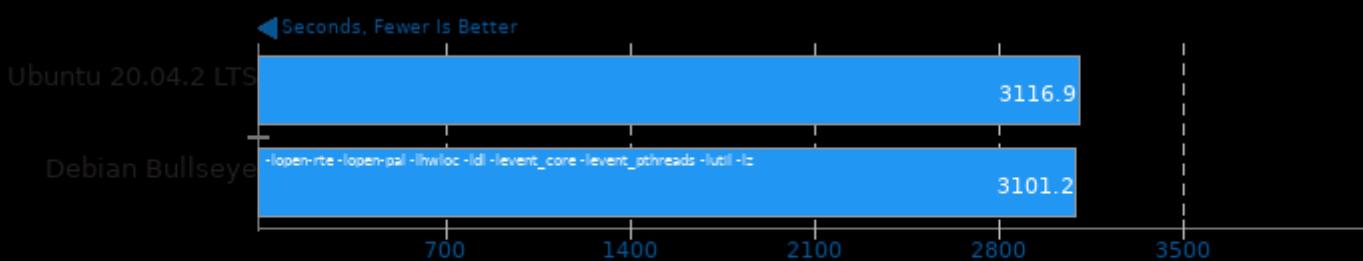
## NAMD 2.14

ATPase Simulation - 327,506 Atoms



## NWChem 7.0.2

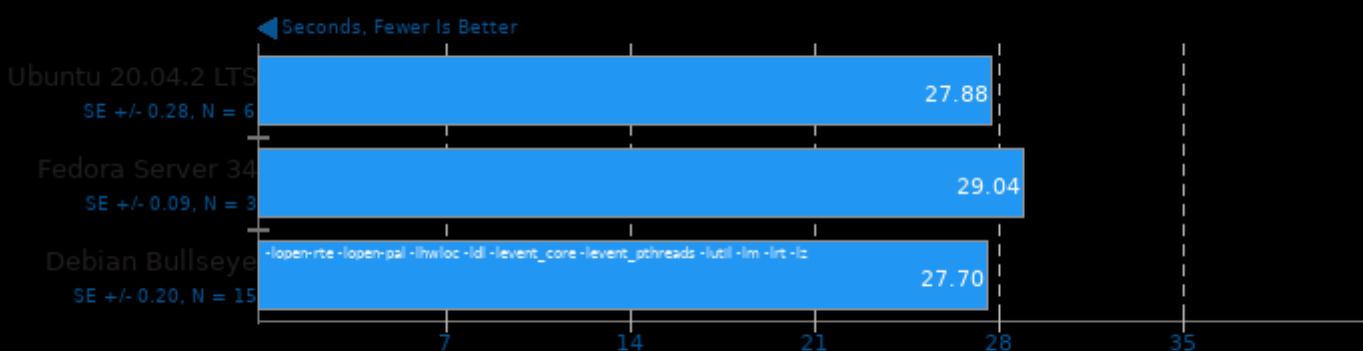
Input: C240 Buckyball



1. (F9X) gfortran options: -fopenrte -fopenpal -lhwloc -ldl -levent\_core -levent\_othreads -lutil -lz

## Xcompact3d Incompact3d 2021-03-11

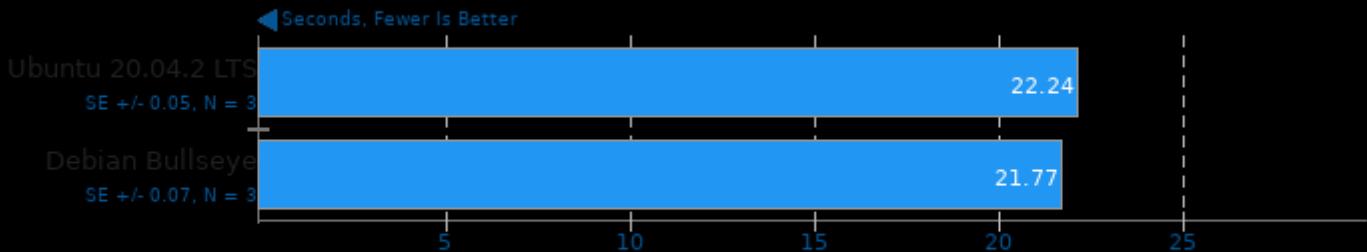
Input: input.i3d 193 Cells Per Direction



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

## OpenFOAM 8

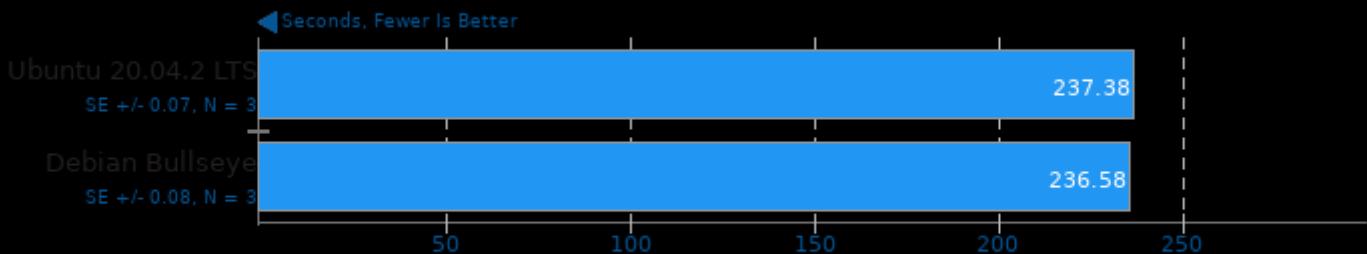
Input: Motorbike 30M



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

## OpenFOAM 8

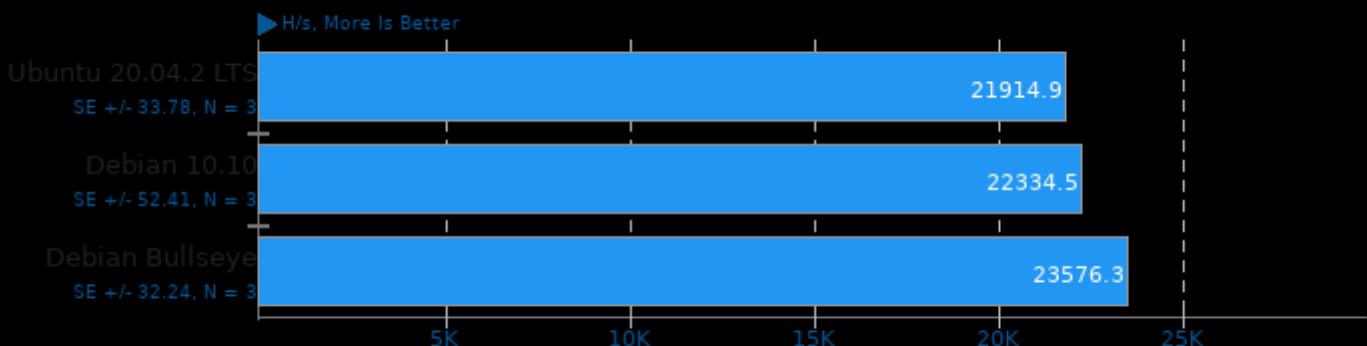
Input: Motorbike 60M



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

## Xmrig 6.12.1

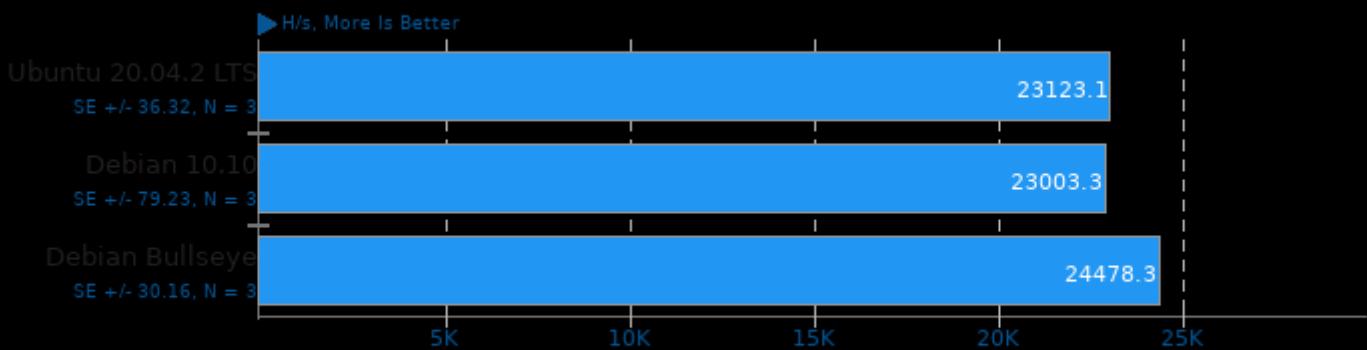
Variant: Monero - Hash Count: 1M



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

## Xmrig 6.12.1

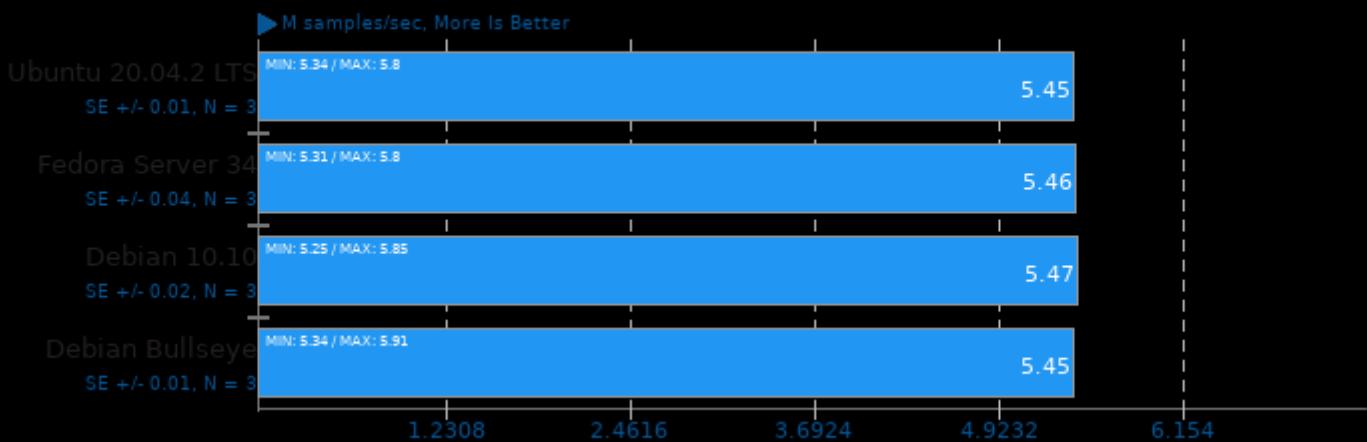
Variant: Wownero - Hash Count: 1M



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

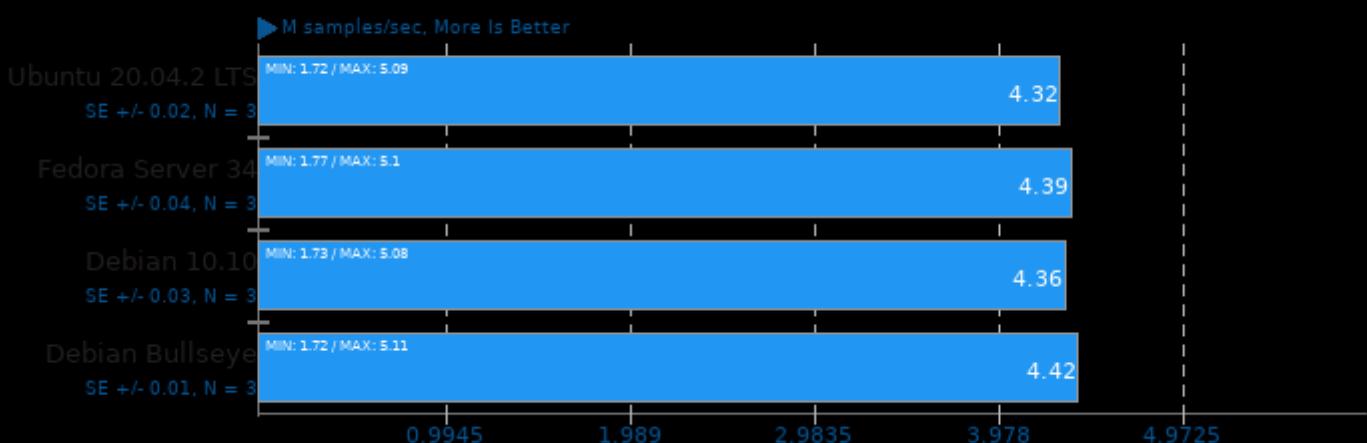
## LuxCoreRender 2.5

Scene: DLSC - Acceleration: CPU



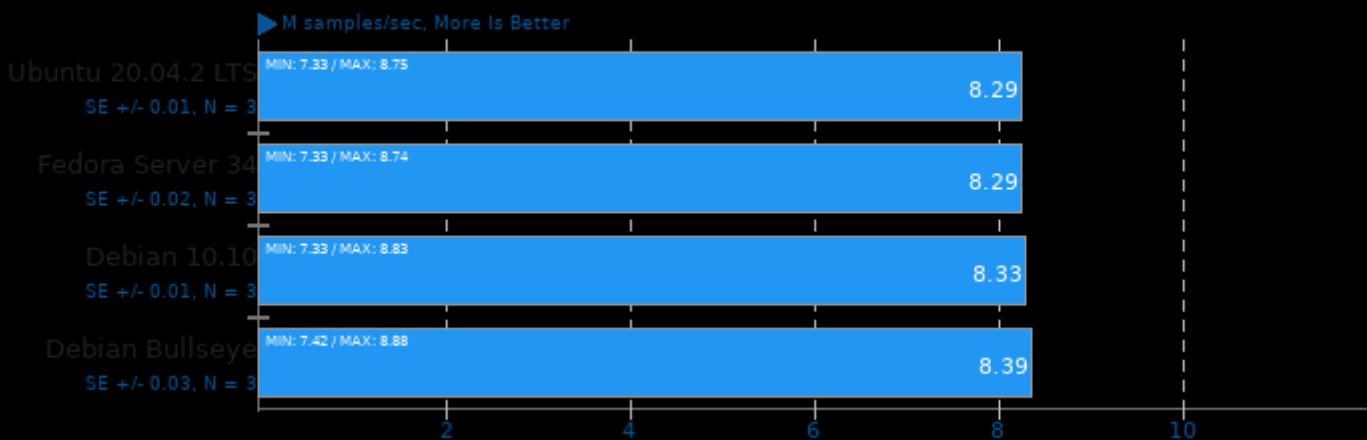
## LuxCoreRender 2.5

Scene: Danish Mood - Acceleration: CPU



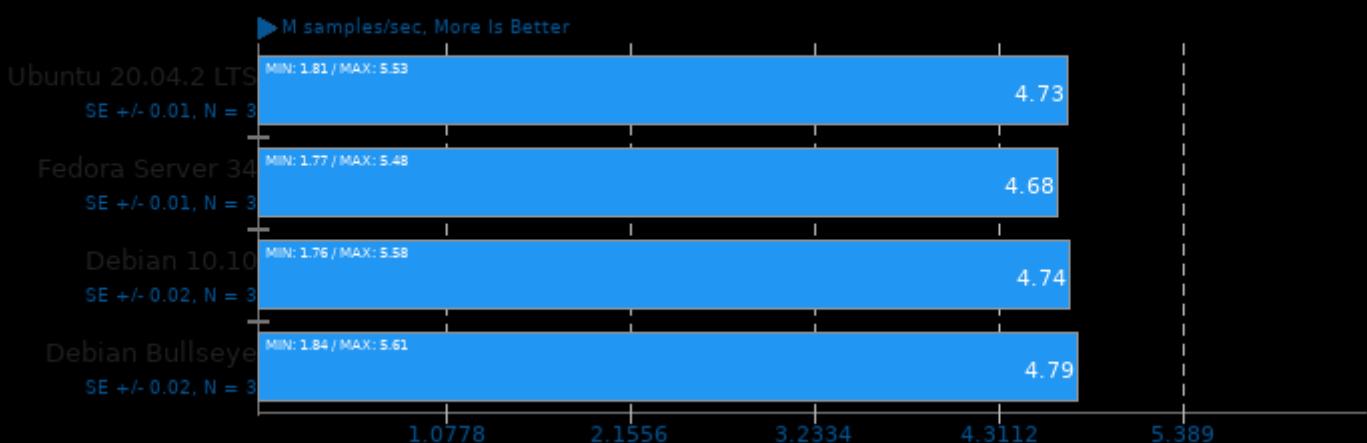
## LuxCoreRender 2.5

Scene: Orange Juice - Acceleration: CPU



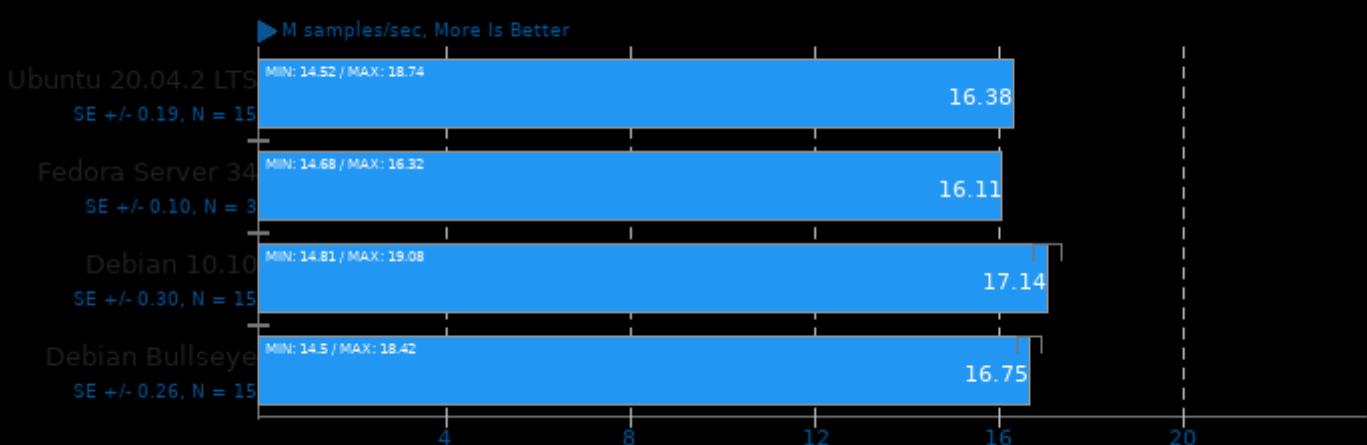
## LuxCoreRender 2.5

Scene: LuxCore Benchmark - Acceleration: CPU



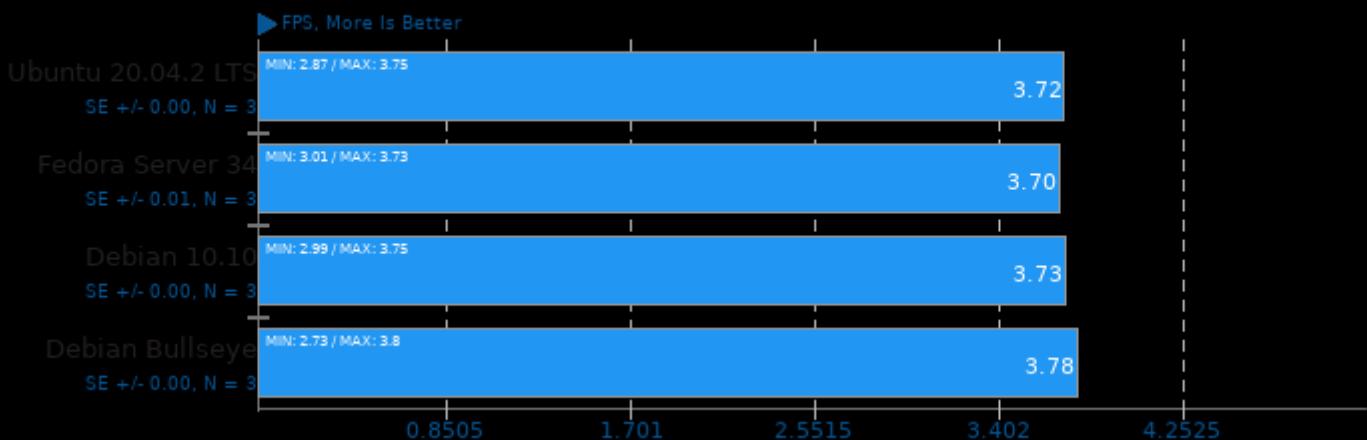
## LuxCoreRender 2.5

Scene: Rainbow Colors and Prism - Acceleration: CPU



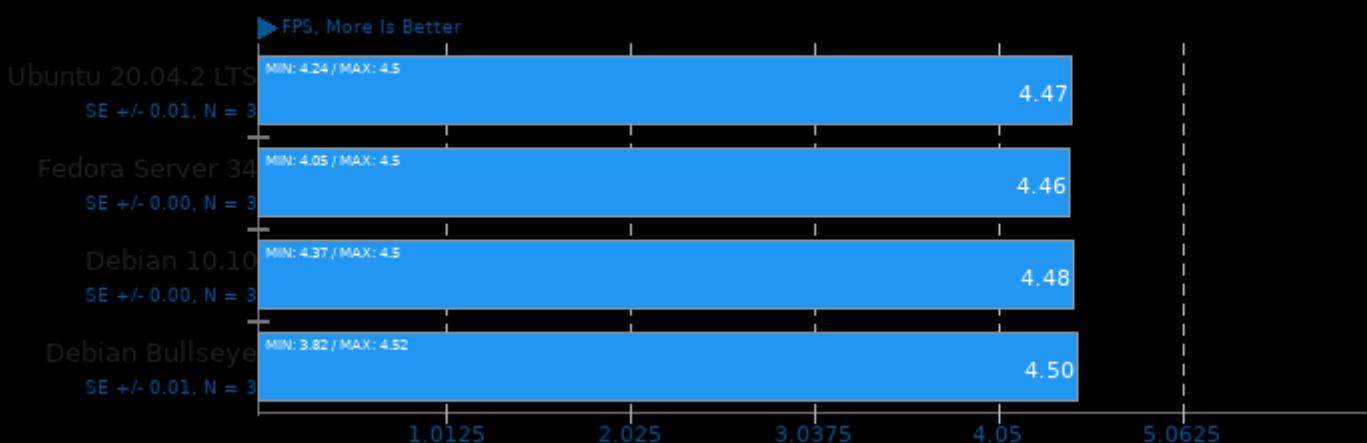
## OSPray 1.8.5

Demo: San Miguel - Renderer: Path Tracer



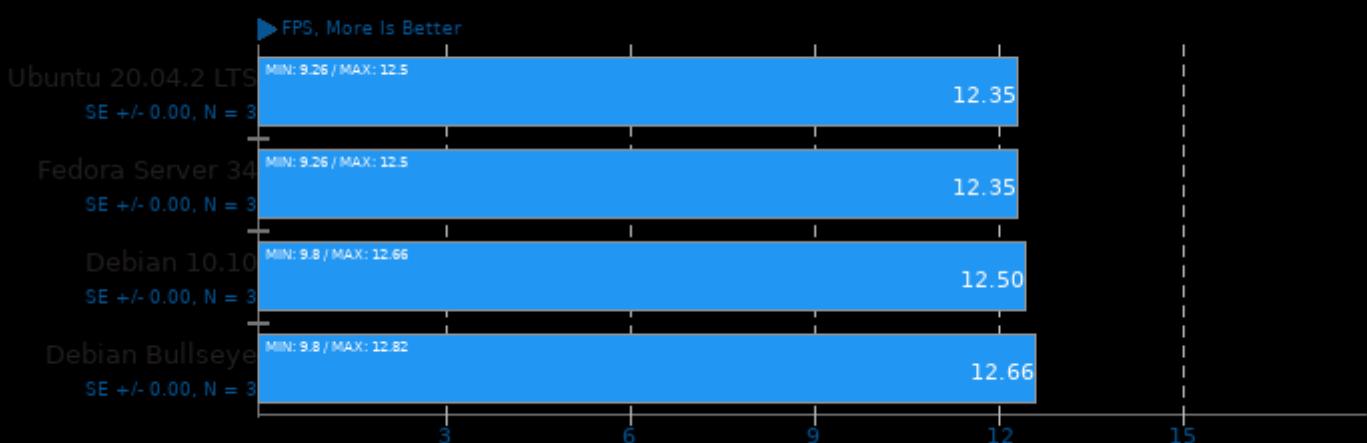
## OSPray 1.8.5

Demo: XFrog Forest - Renderer: Path Tracer



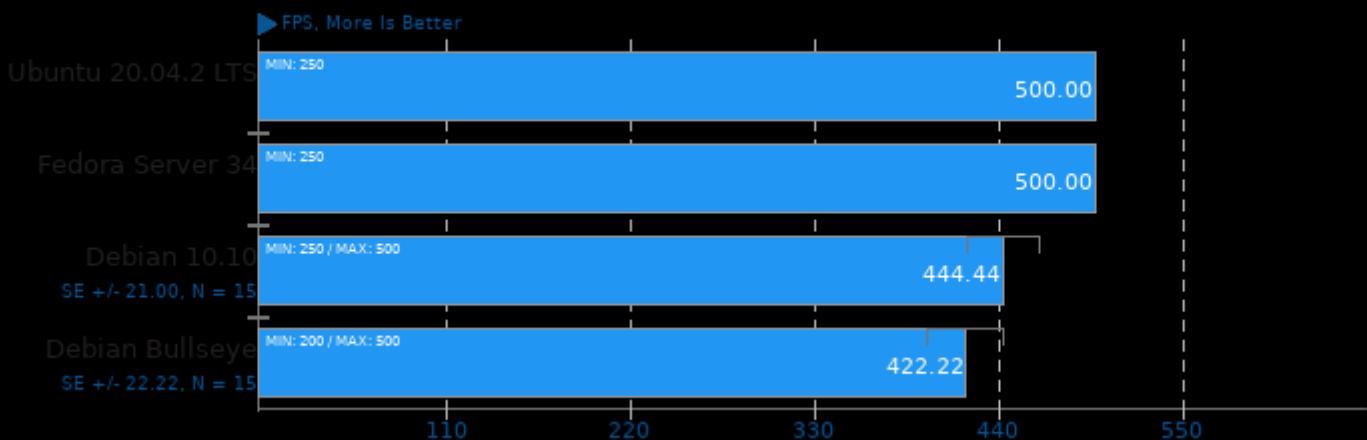
## OSPray 1.8.5

Demo: NASA Streamlines - Renderer: Path Tracer



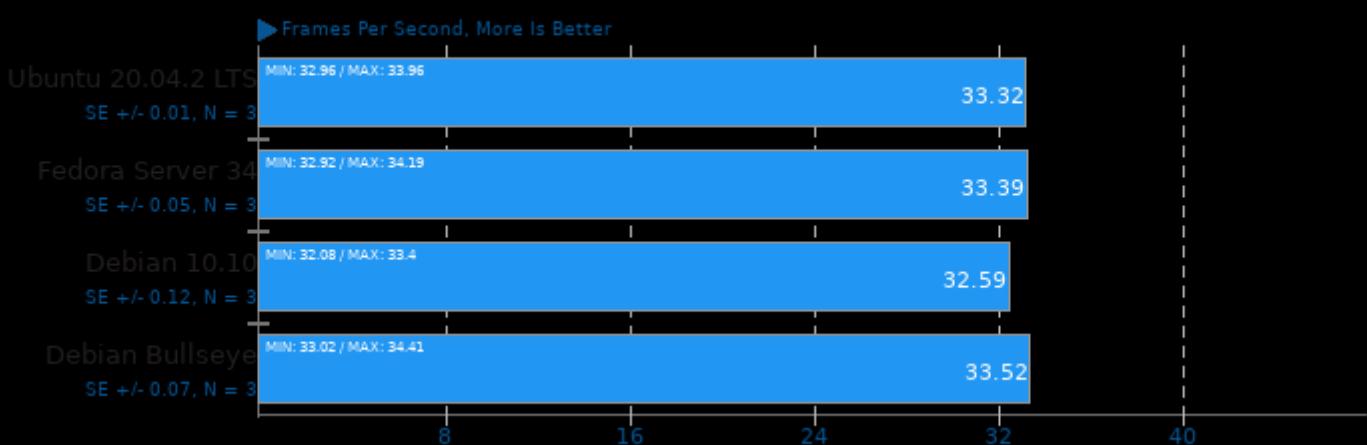
## OSPray 1.8.5

Demo: Magnetic Reconnection - Renderer: Path Tracer



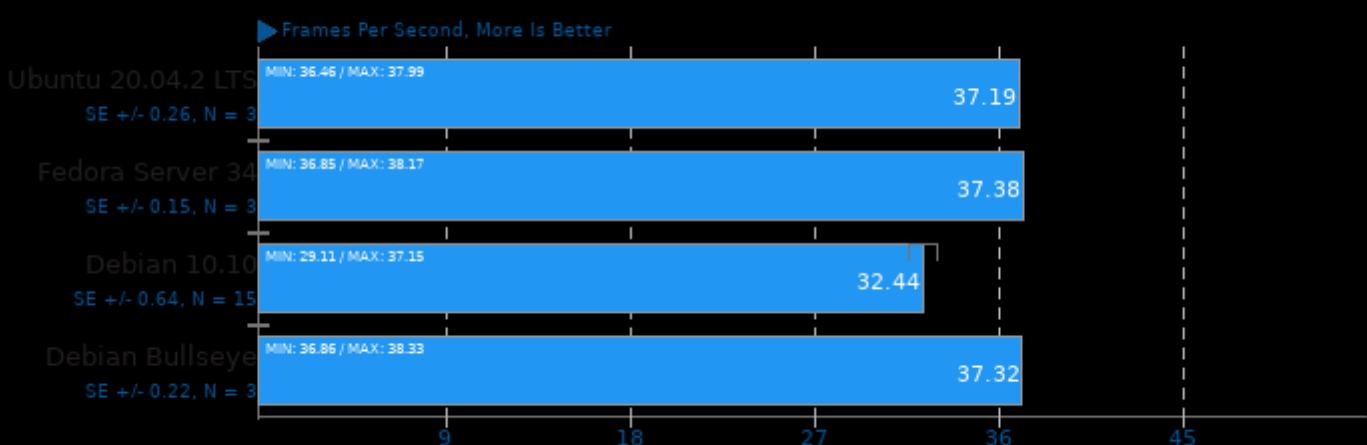
## Embree 3.13

Binary: Pathtracer ISPC - Model: Crown



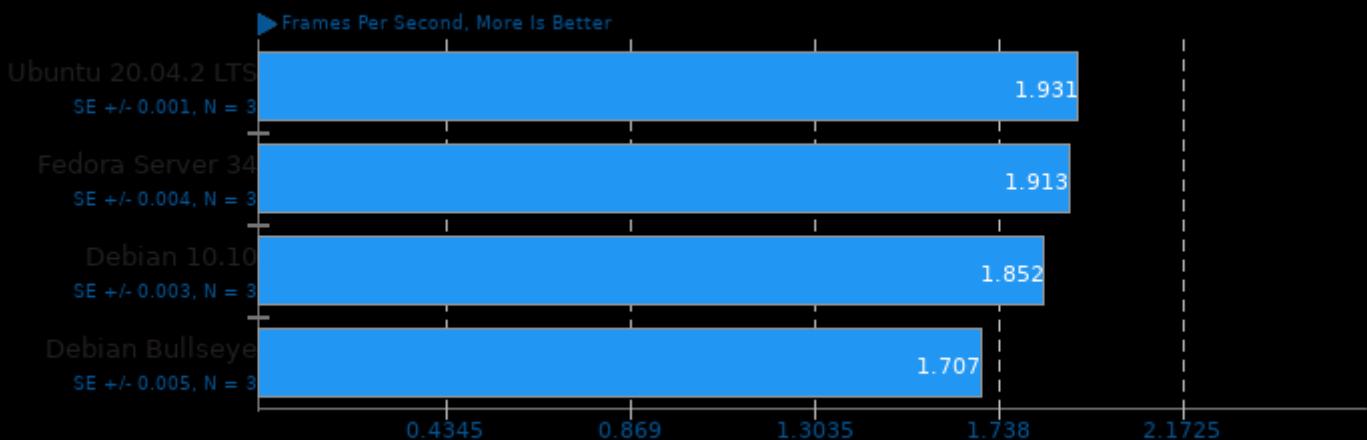
## Embree 3.13

Binary: Pathtracer ISPC - Model: Asian Dragon



## SVT-AV1 0.8.7

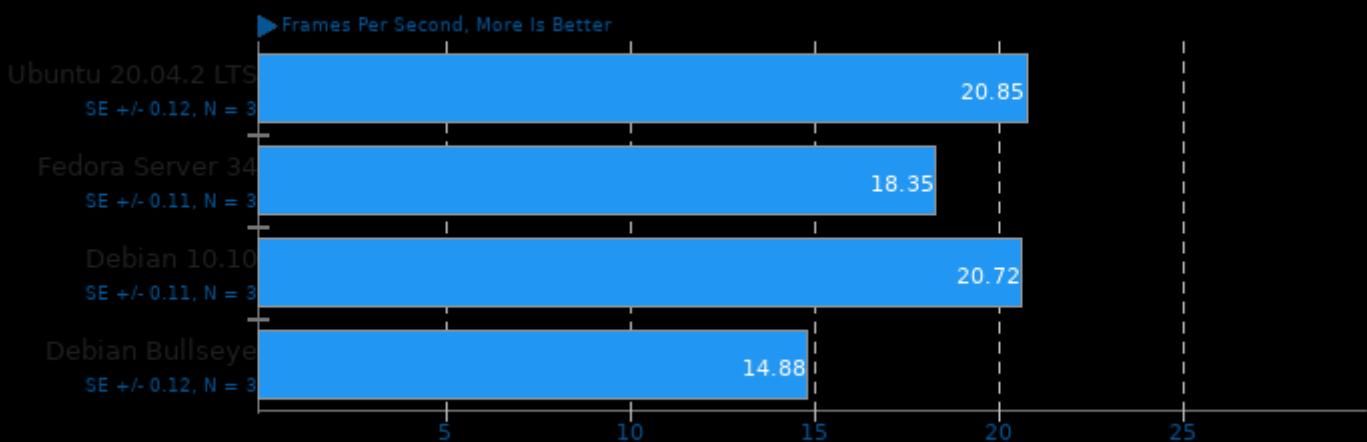
Encoder Mode: Preset 4 - Input: Bosphorus 4K



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

## SVT-AV1 0.8.7

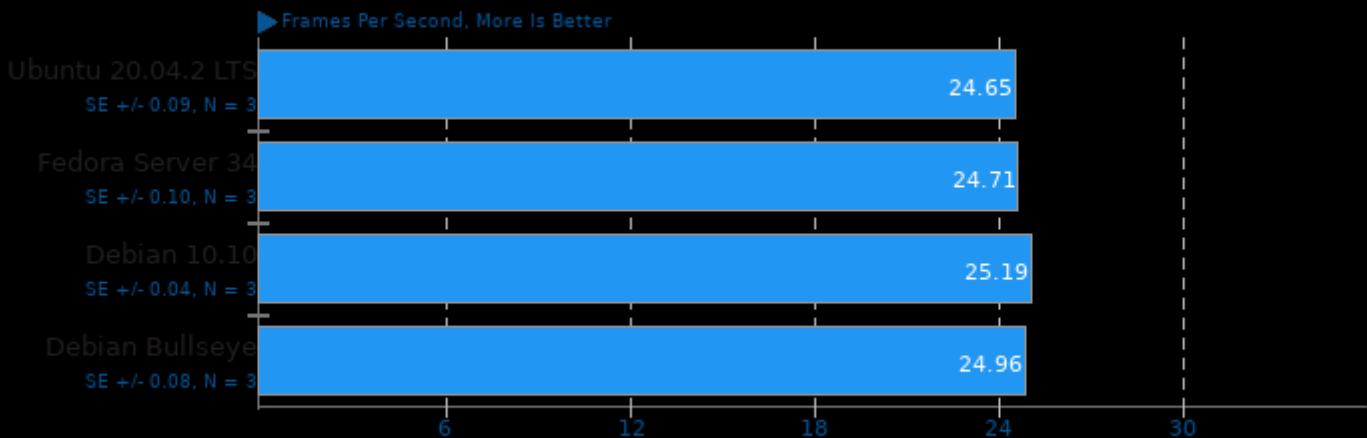
Encoder Mode: Preset 8 - Input: Bosphorus 4K



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

## SVT-HEVC 1.5.0

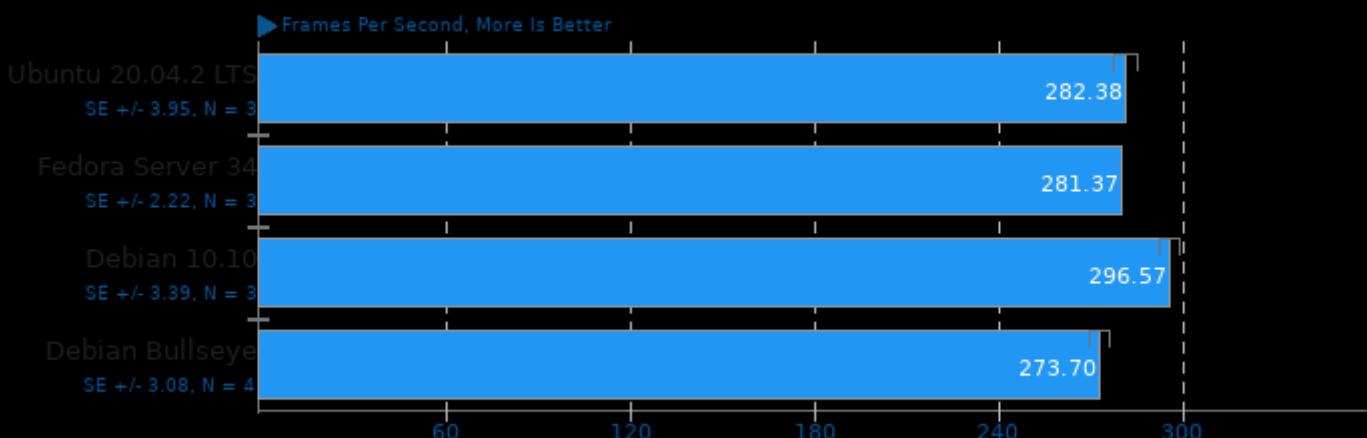
Tuning: 1 - Input: Bosphorus 1080p



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

## SVT-HEVC 1.5.0

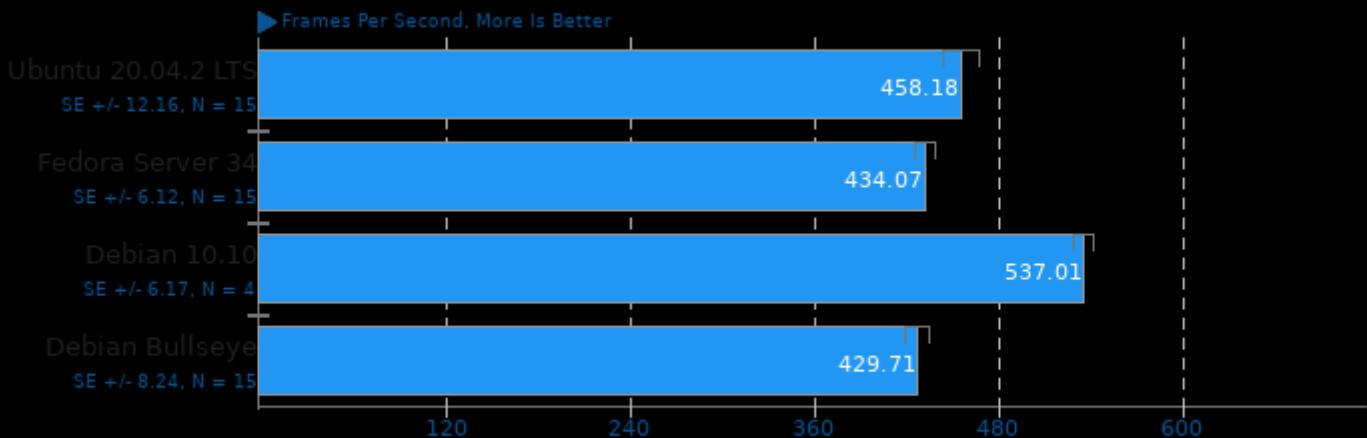
Tuning: 7 - Input: Bosphorus 1080p



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

## SVT-HEVC 1.5.0

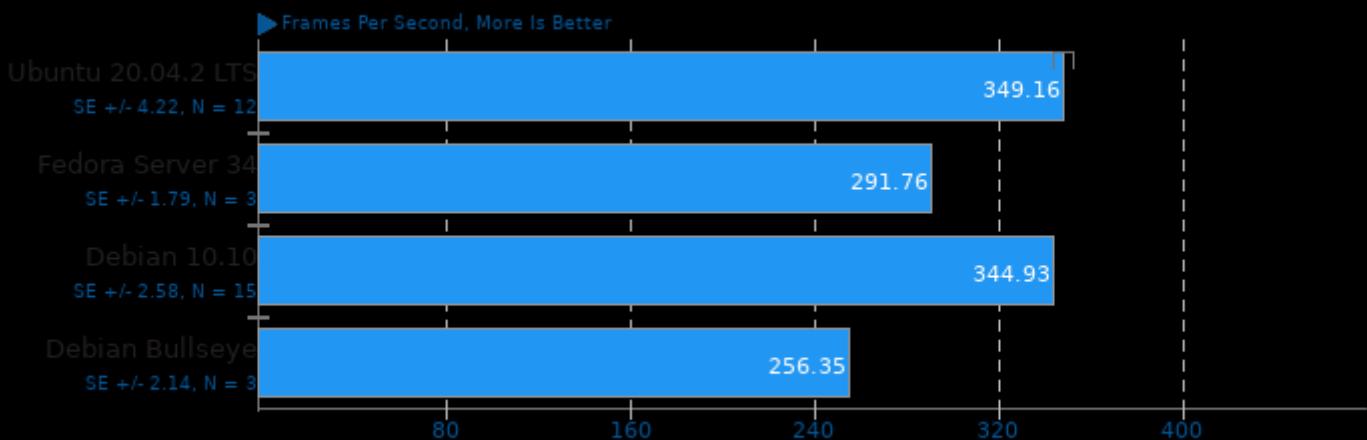
Tuning: 10 - Input: Bosphorus 1080p



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

## SVT-VP9 0.3

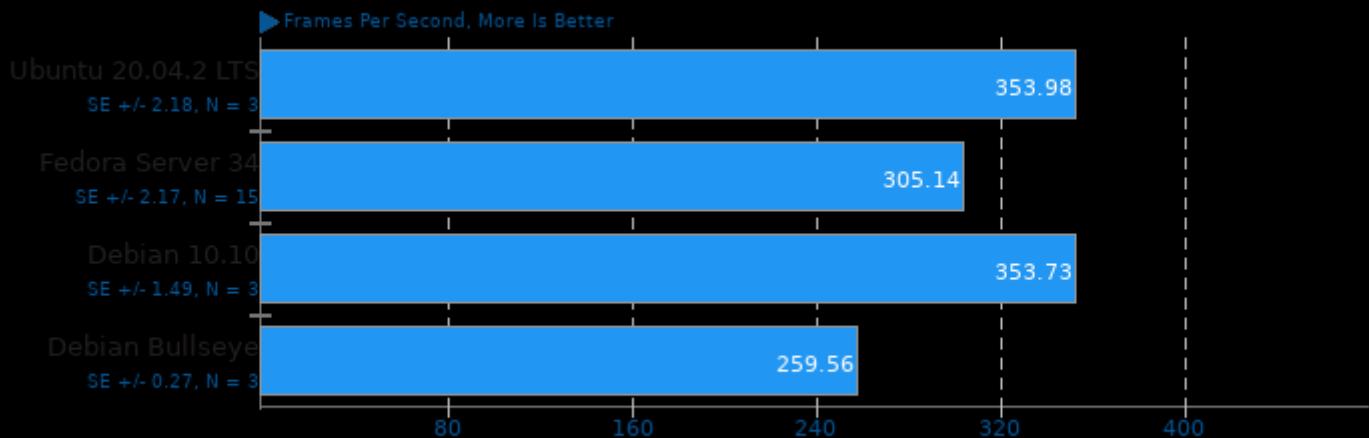
Tuning: VMAF Optimized - Input: Bosphorus 1080p



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

## SVT-VP9 0.3

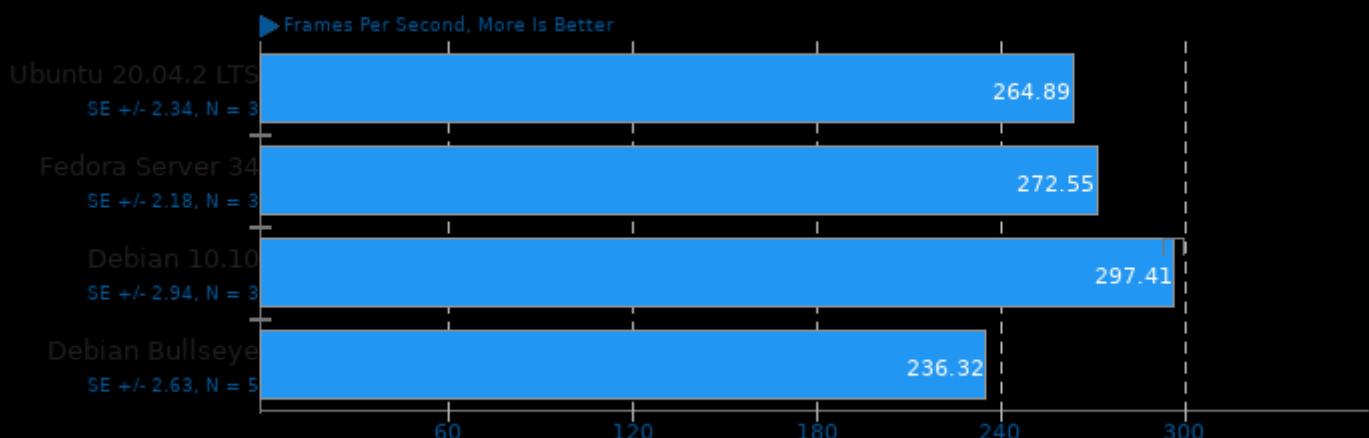
Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p



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

## SVT-VP9 0.3

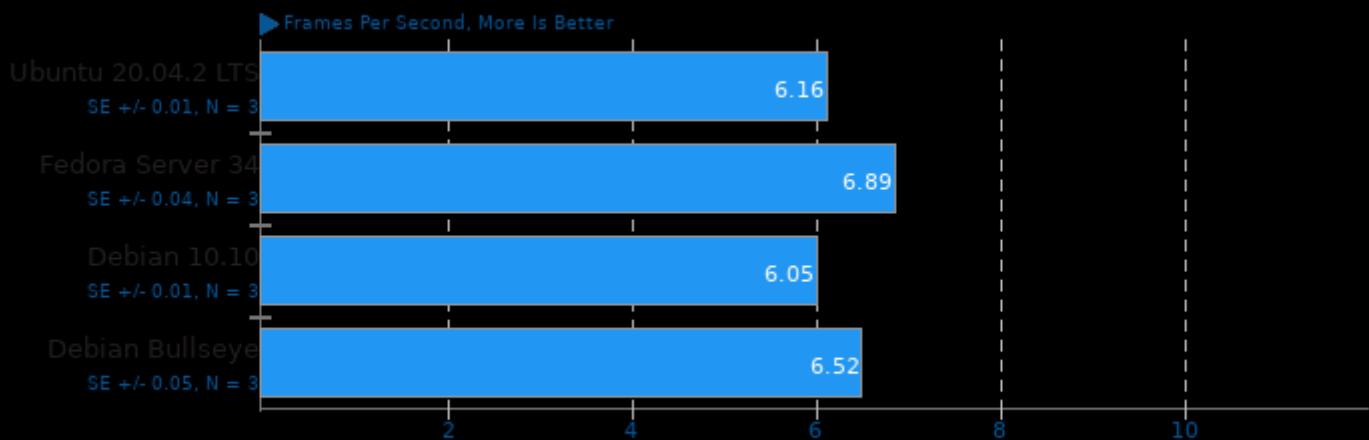
Tuning: Visual Quality Optimized - Input: Bosphorus 1080p



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

## VP9 libvpx Encoding 1.10.0

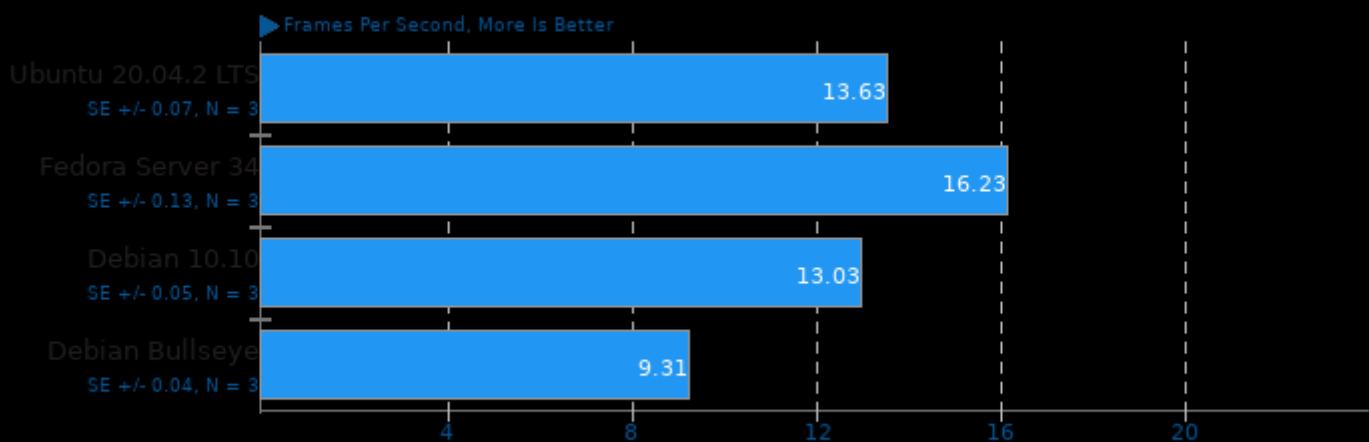
Speed: Speed 0 - Input: Bosphorus 4K



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

## VP9 libvpx Encoding 1.10.0

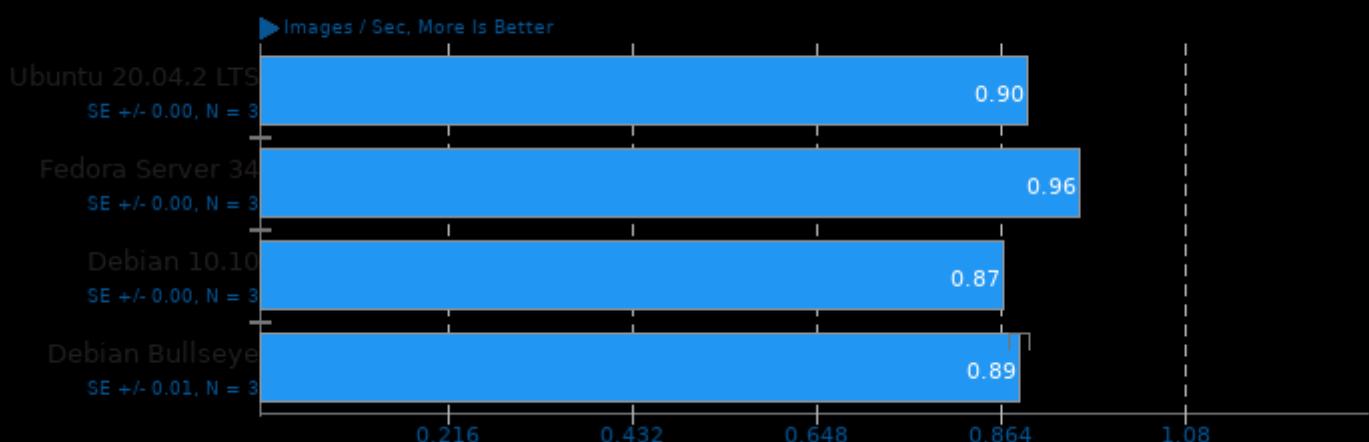
Speed: Speed 5 - Input: Bosphorus 4K



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

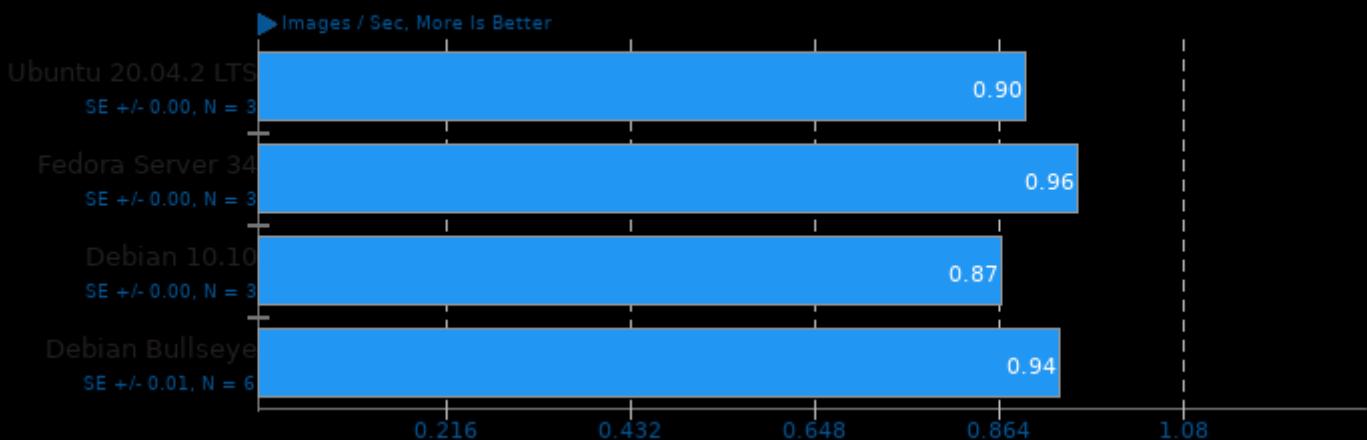
## Intel Open Image Denoise 1.4.0

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



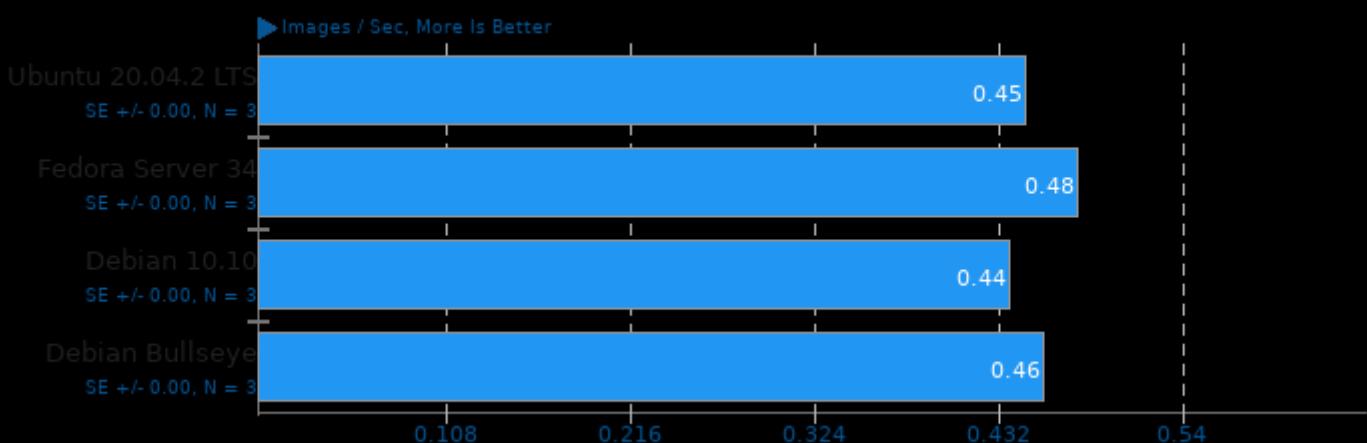
## Intel Open Image Denoise 1.4.0

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



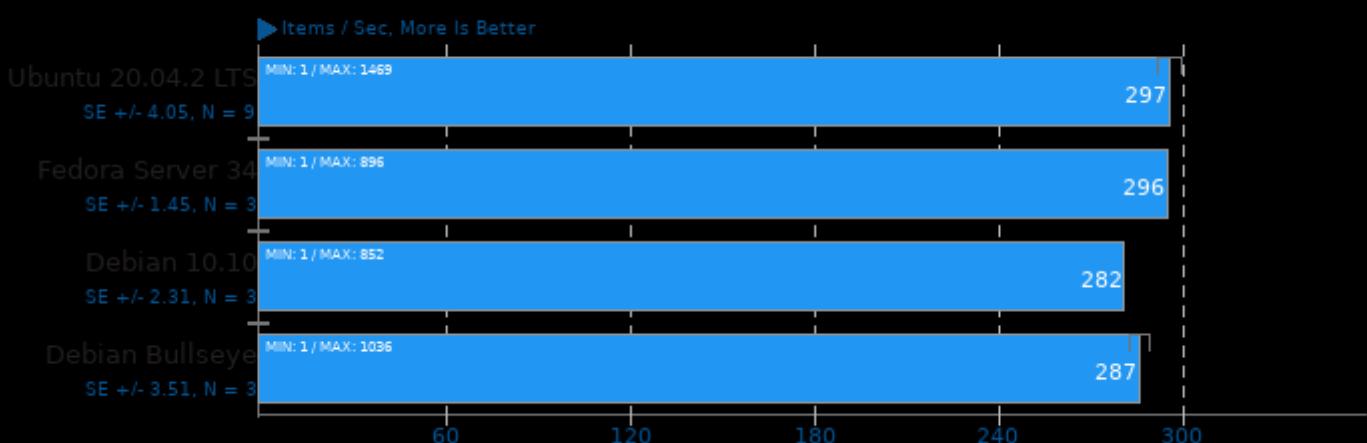
## Intel Open Image Denoise 1.4.0

Run: RTLightmap.hdr.4096x4096



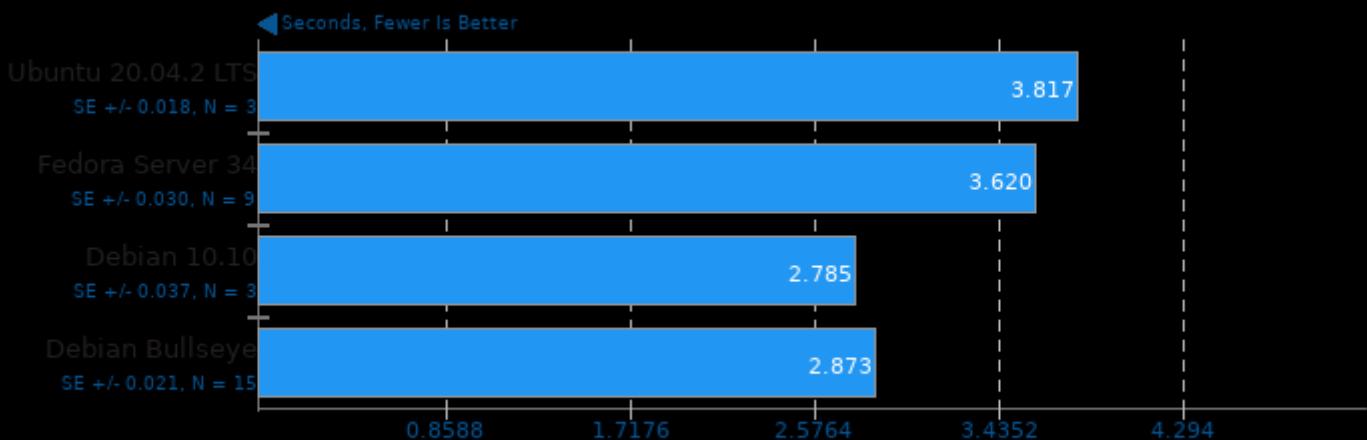
## OpenVKL 0.9

Benchmark: vklBenchmark



**libavif avifenc 0.9.0**

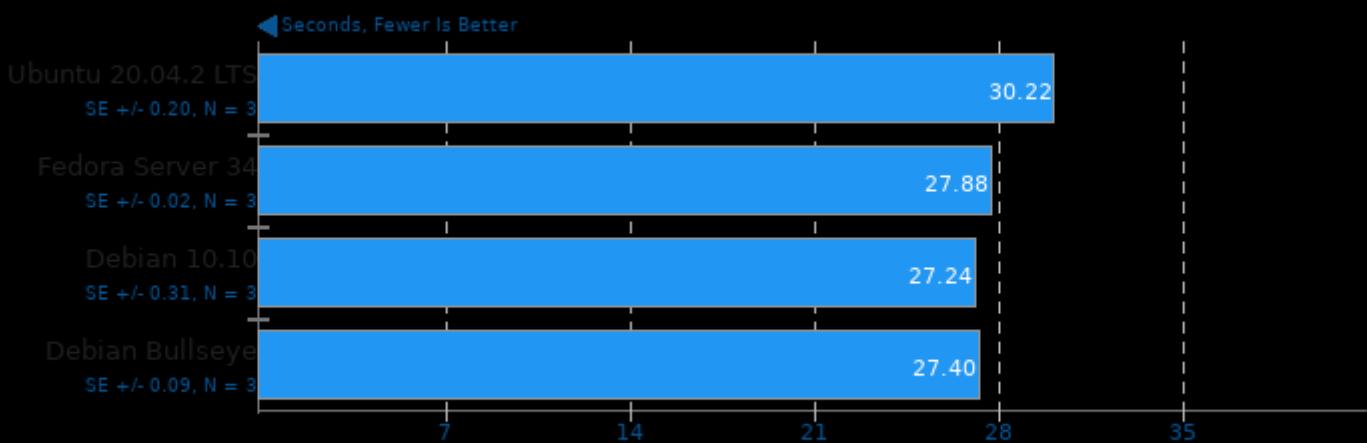
Encoder Speed: 10



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

**libavif avifenc 0.9.0**

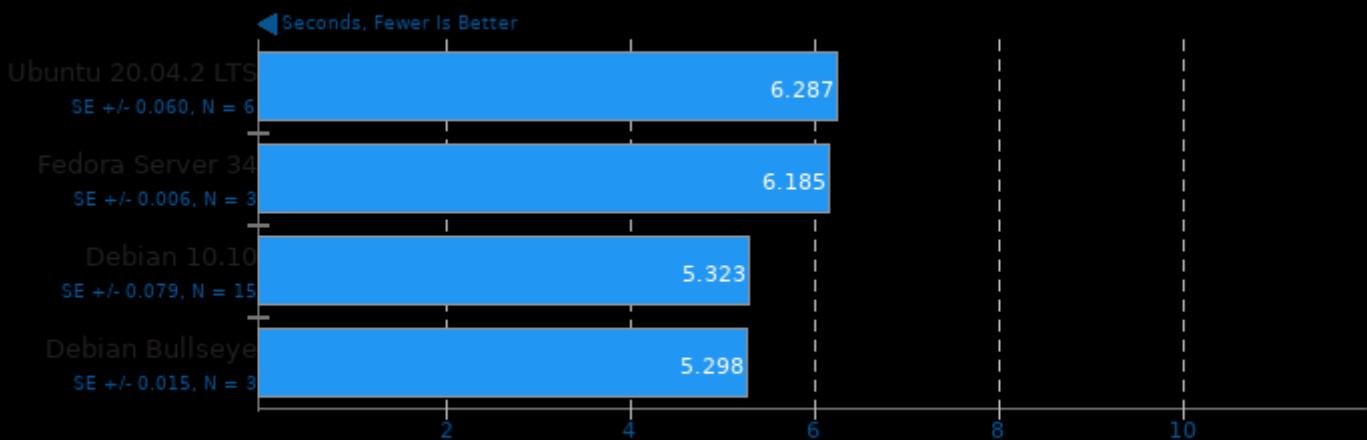
Encoder Speed: 6, Lossless



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

## libavif avifenc 0.9.0

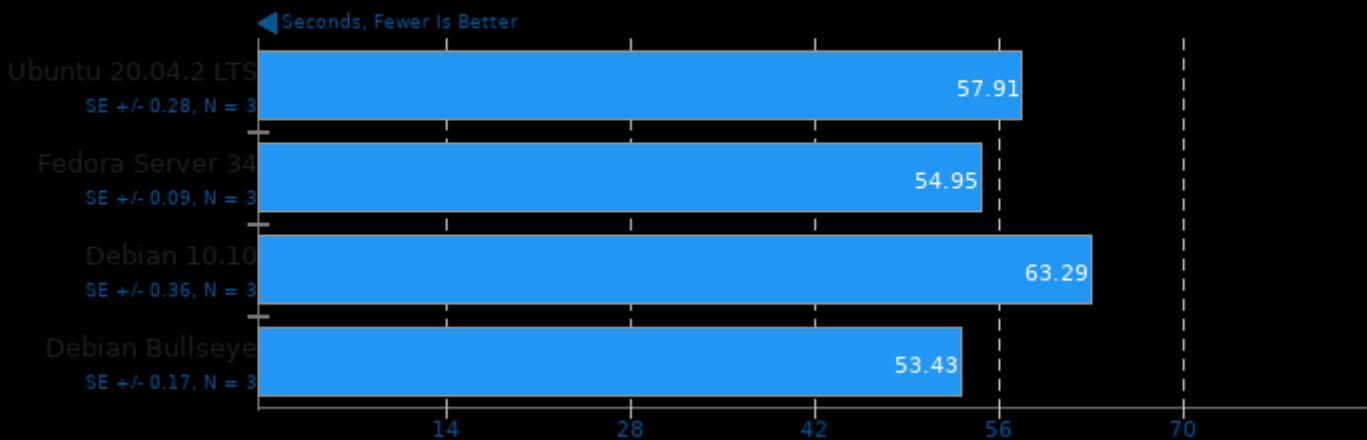
Encoder Speed: 10, Lossless



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

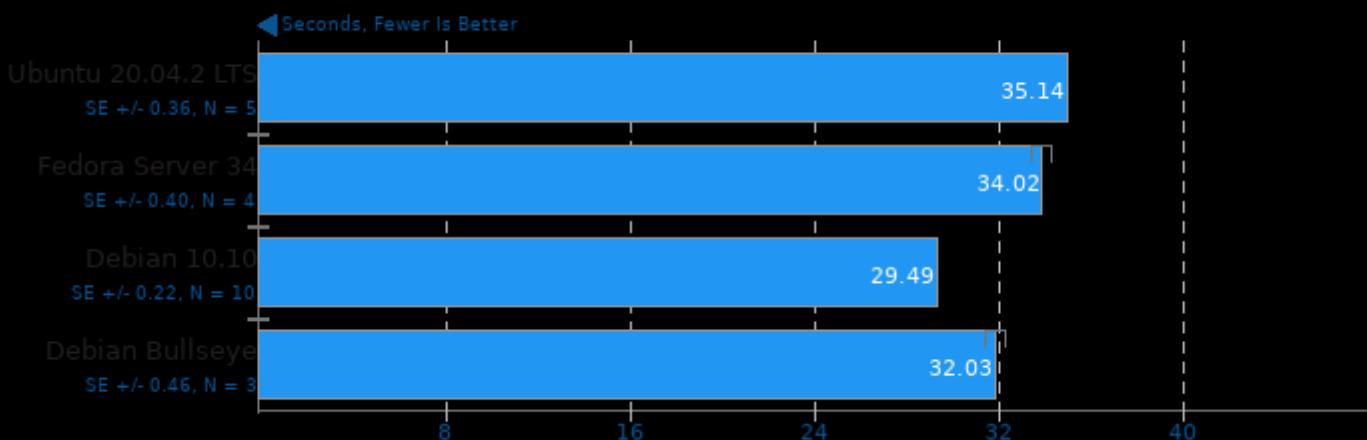
## Timed Godot Game Engine Compilation 3.2.3

Time To Compile



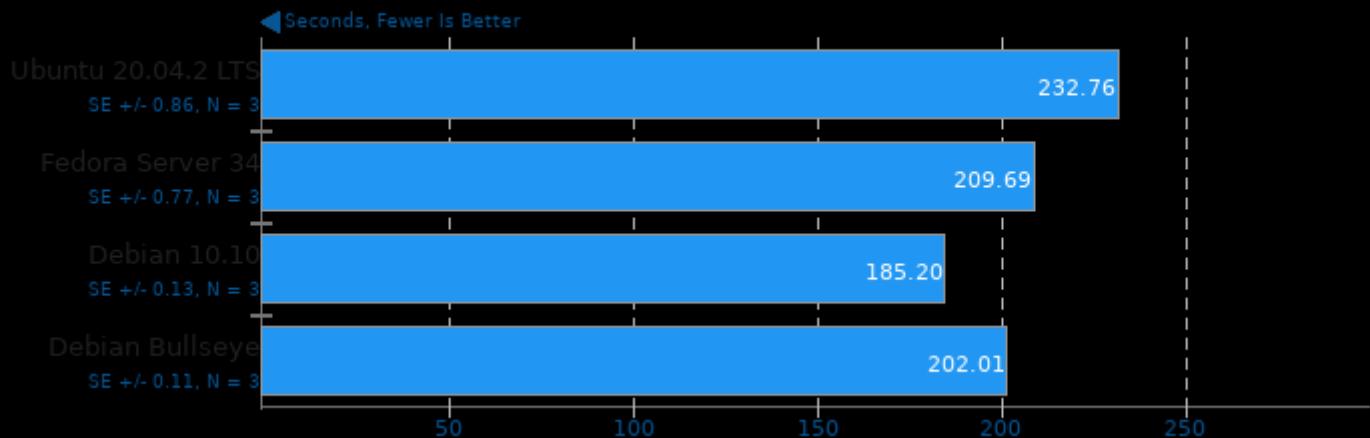
## Timed Linux Kernel Compilation 5.10.20

Time To Compile



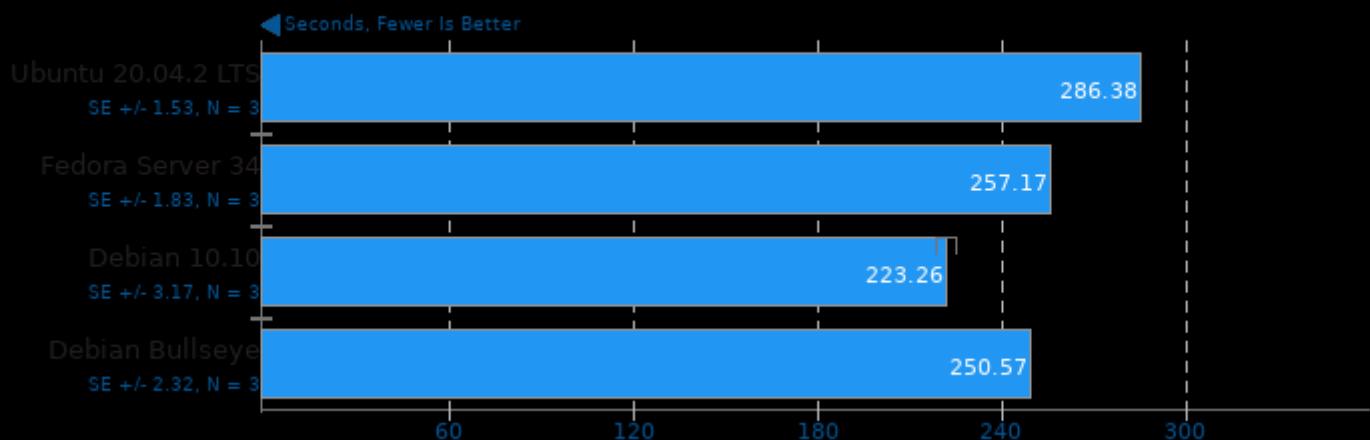
## Timed LLVM Compilation 12.0

Build System: Ninja



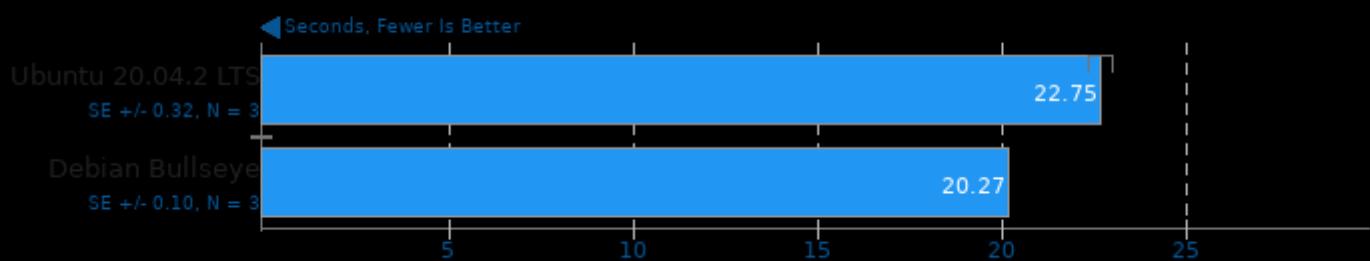
## Timed LLVM Compilation 12.0

Build System: Unix Makefiles



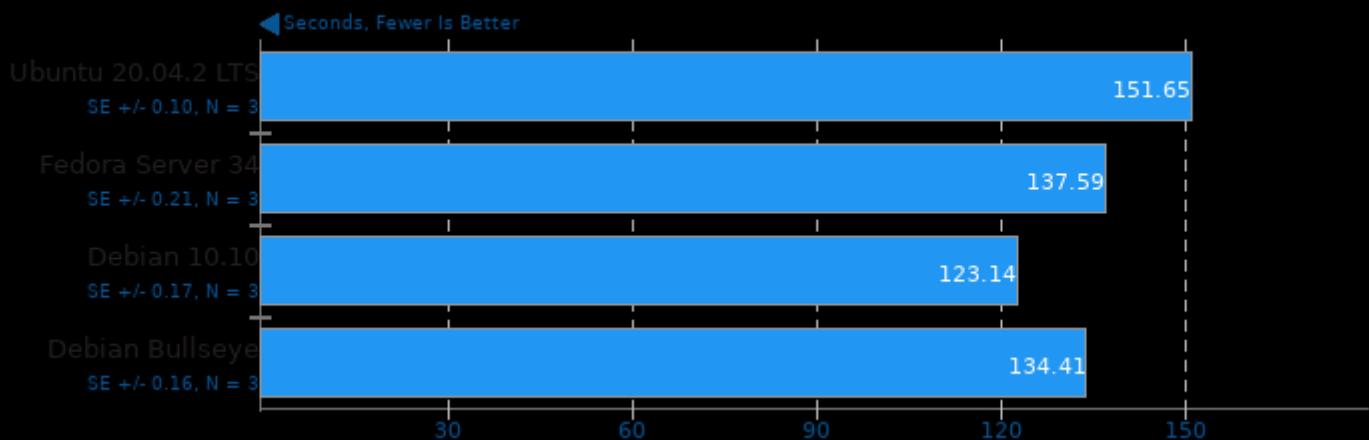
## Timed Mesa Compilation 21.0

Time To Compile



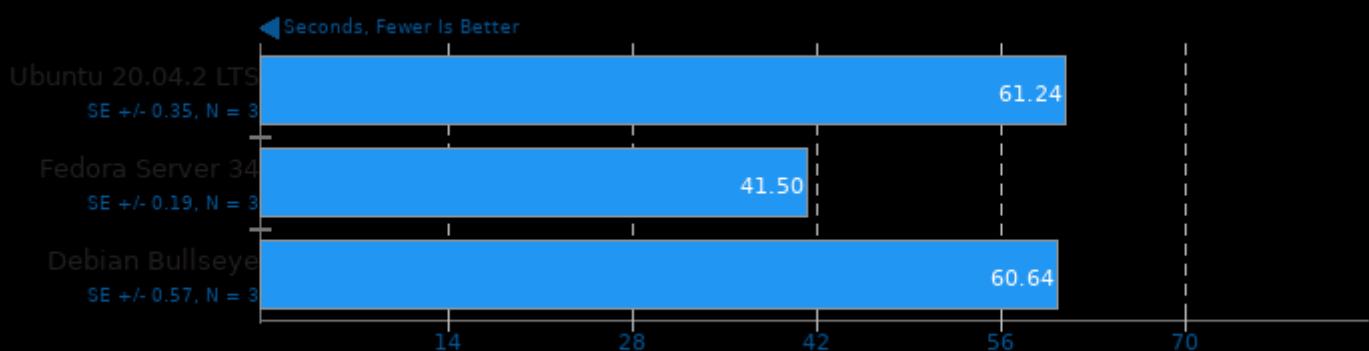
## Timed Node.js Compilation 15.11

Time To Compile



## Timed Wasmer Compilation 1.0.2

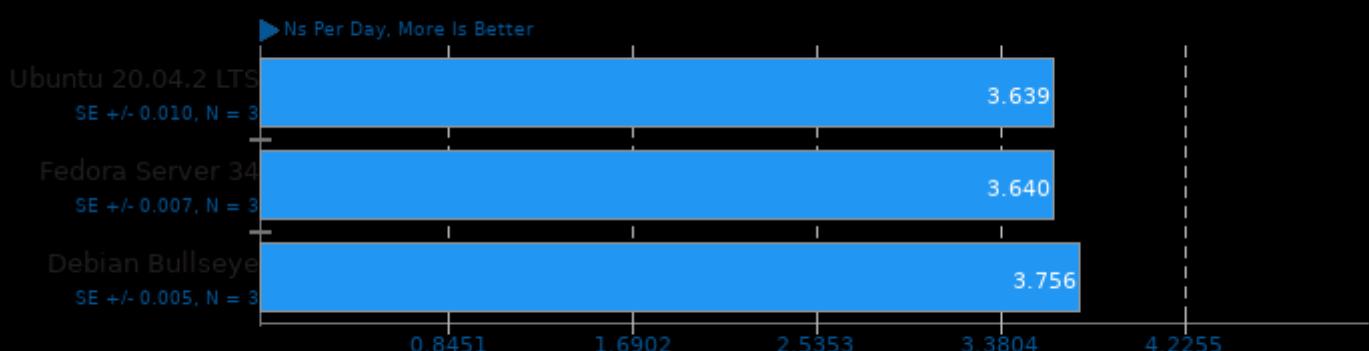
Time To Compile



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

## GROMACS 2021.2

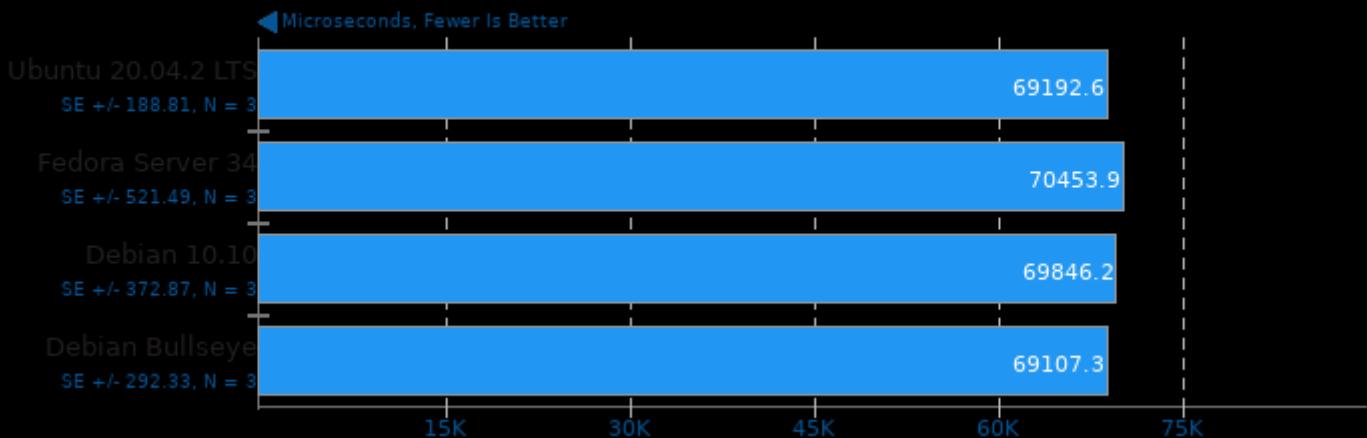
Implementation: MPI CPU - Input: water\_GMX50\_bare



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

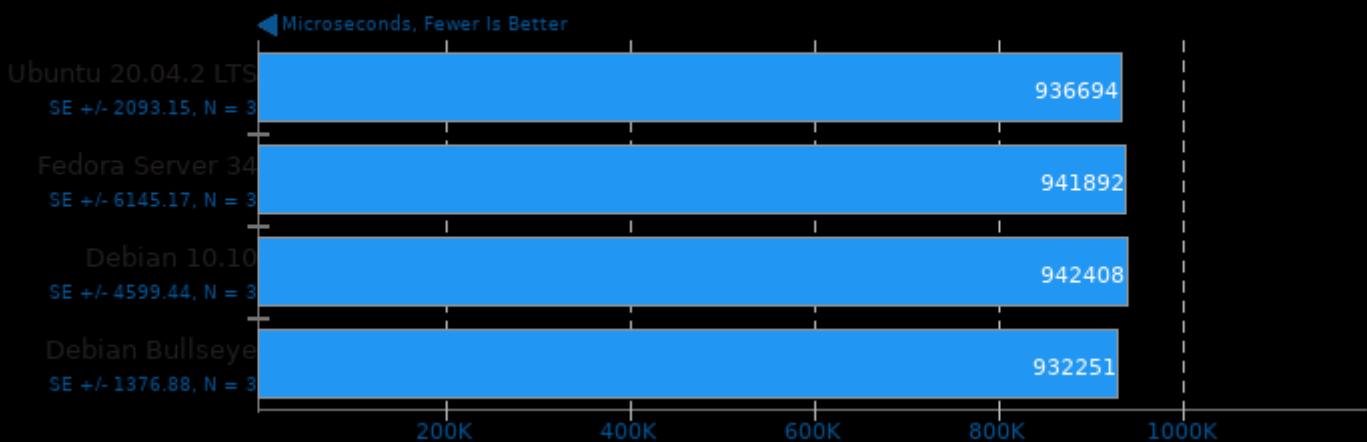
## TensorFlow Lite 2020-08-23

Model: SqueezeNet



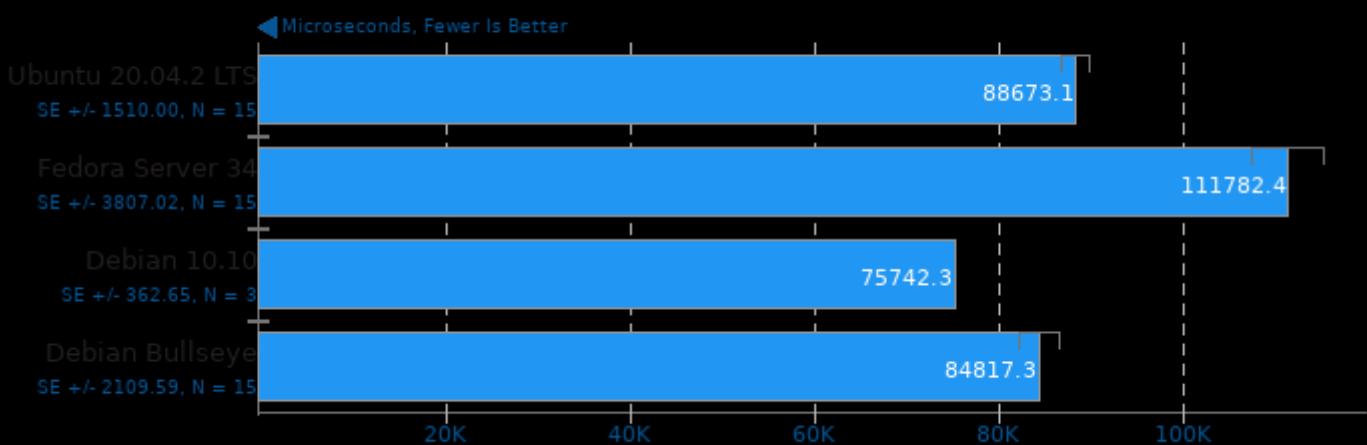
## TensorFlow Lite 2020-08-23

Model: Inception V4



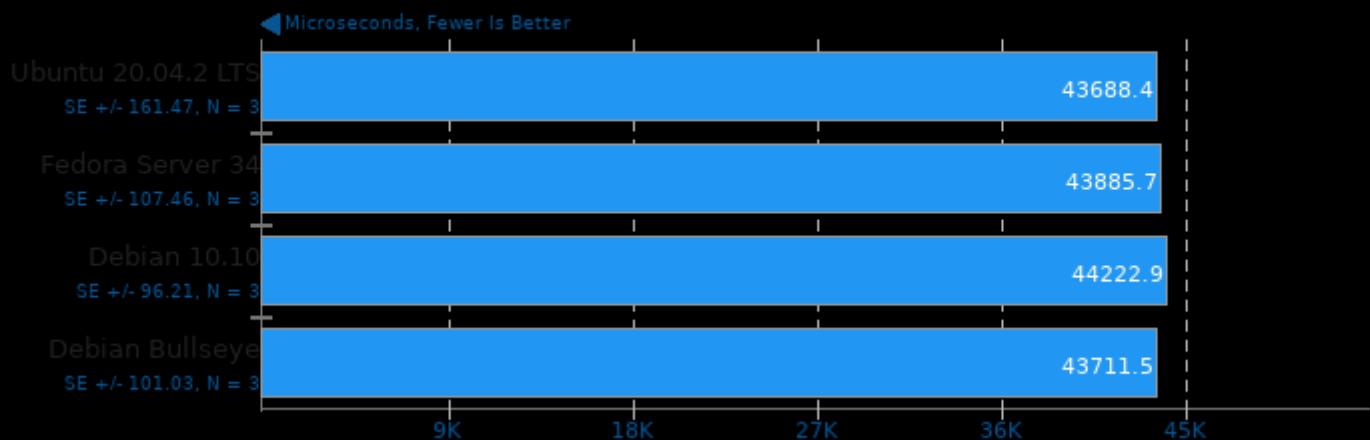
## TensorFlow Lite 2020-08-23

Model: NASNet Mobile



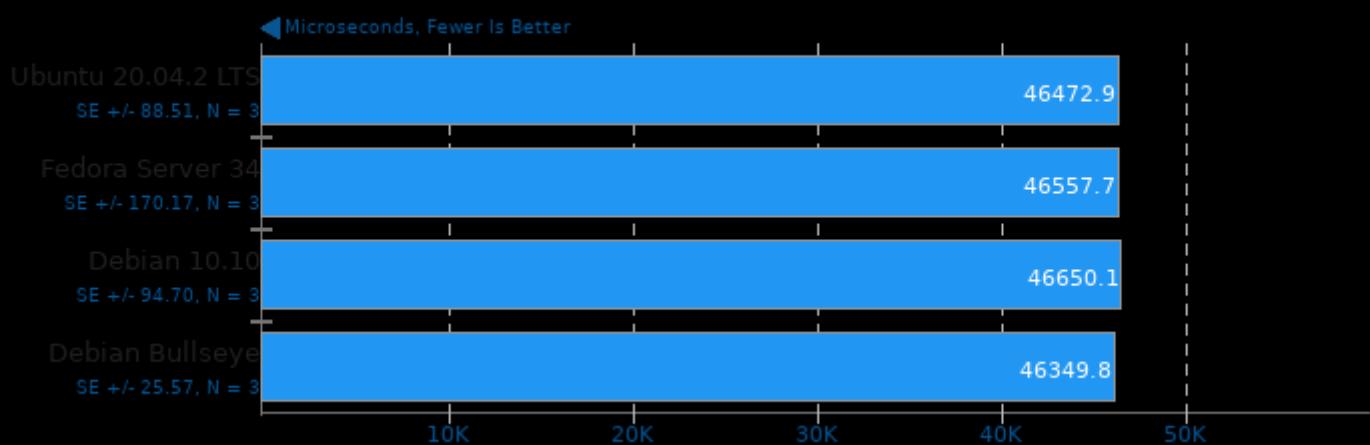
## TensorFlow Lite 2020-08-23

Model: Mobilenet Float



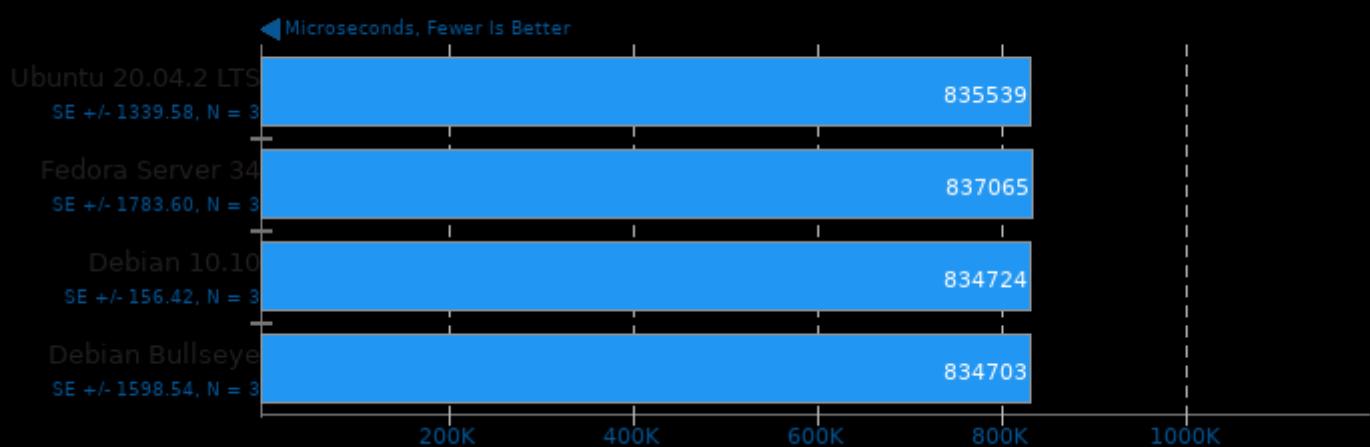
## TensorFlow Lite 2020-08-23

Model: Mobilenet Quant



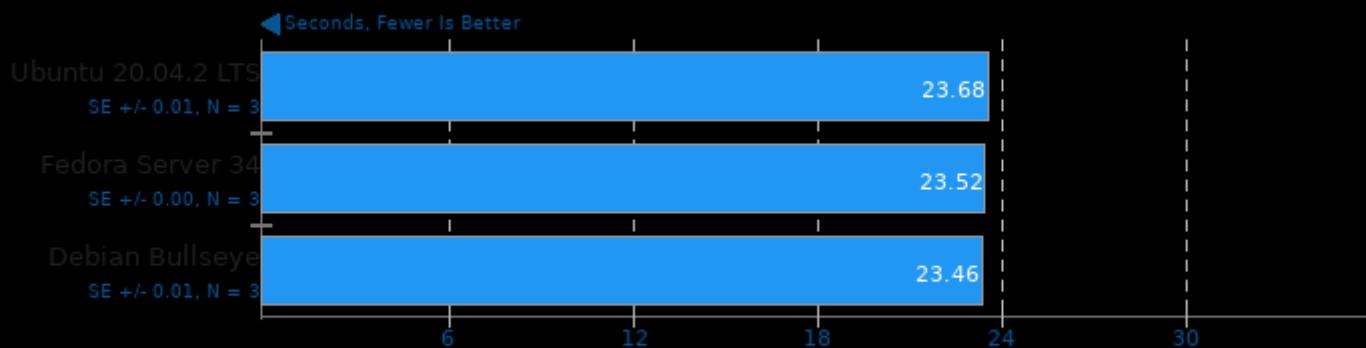
## TensorFlow Lite 2020-08-23

Model: Inception ResNet V2



## ASTC Encoder 3.0

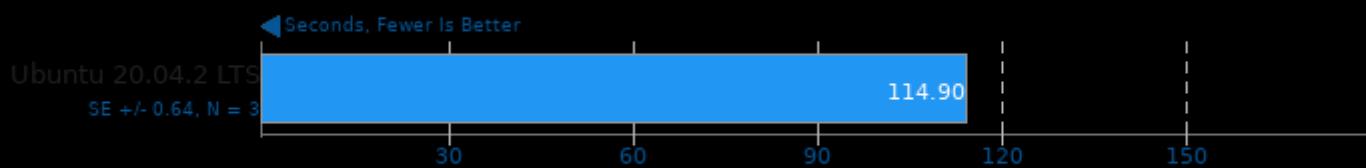
Preset: Exhaustive



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

## GPAW 20.1

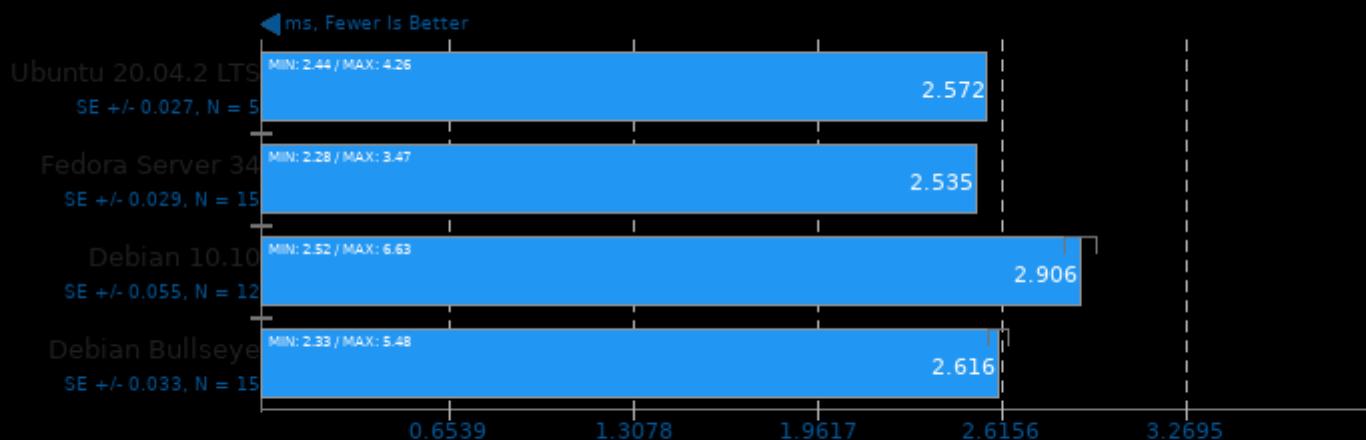
Input: Carbon Nanotube



1. (CC) gcc options: -pthread -shared -fwrapv -O2 -lxc -lblas -lmpi

## Mobile Neural Network 1.2

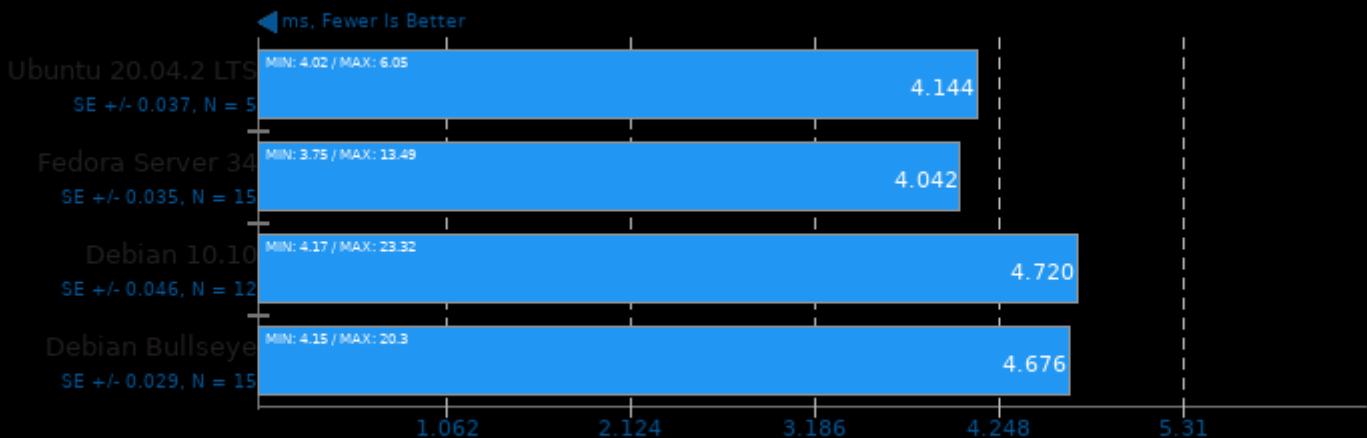
Model: mobilenetV3



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

## Mobile Neural Network 1.2

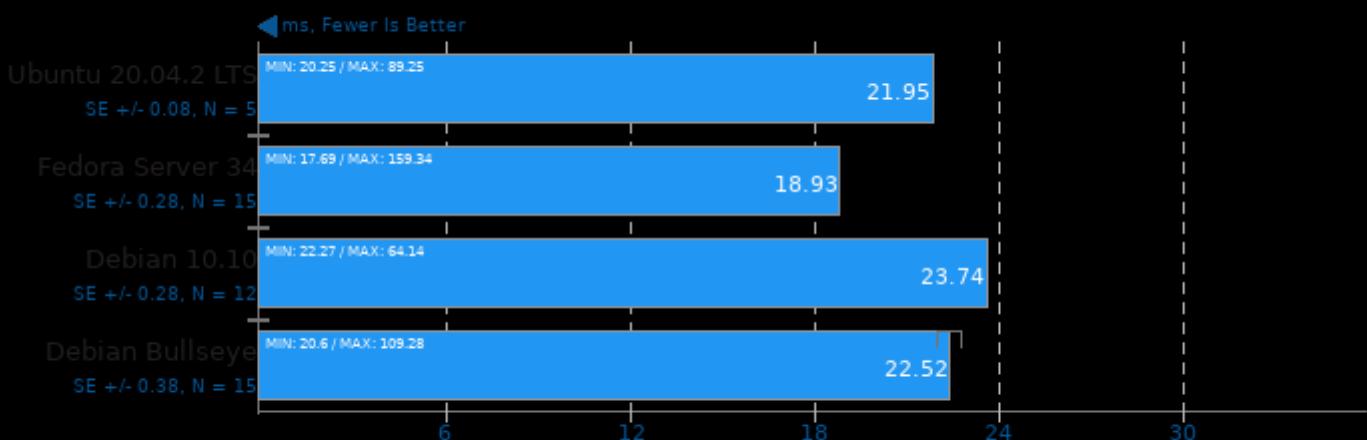
Model: squeezenetv1.1



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

## Mobile Neural Network 1.2

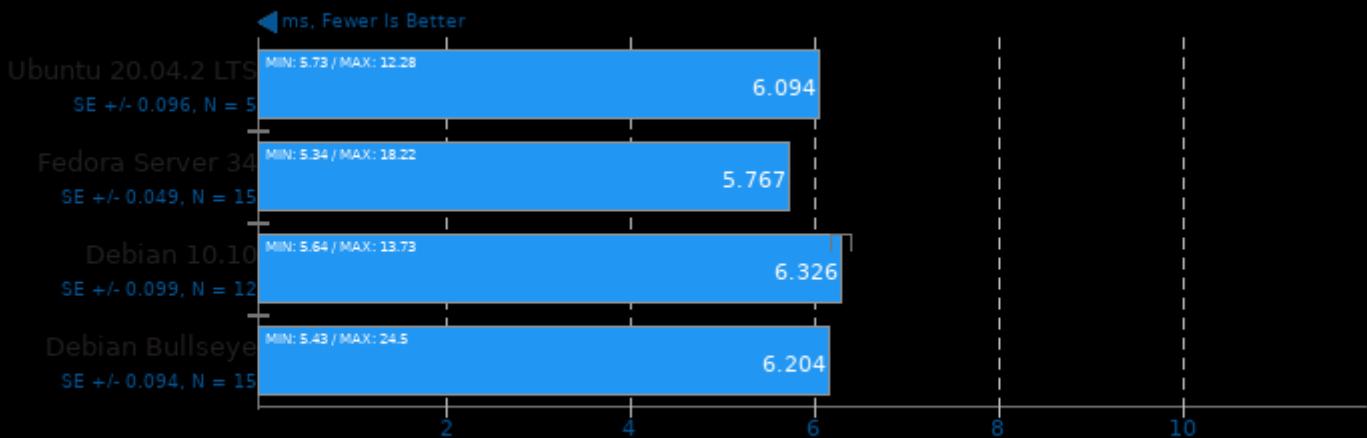
Model: resnet-v2-50



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

## Mobile Neural Network 1.2

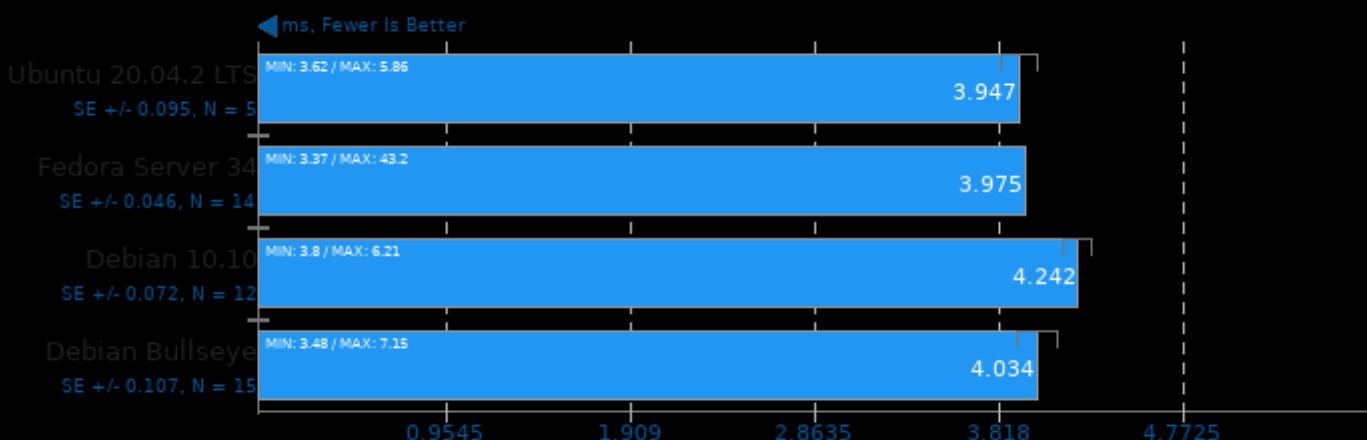
Model: SqueezeNetV1.0



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

## Mobile Neural Network 1.2

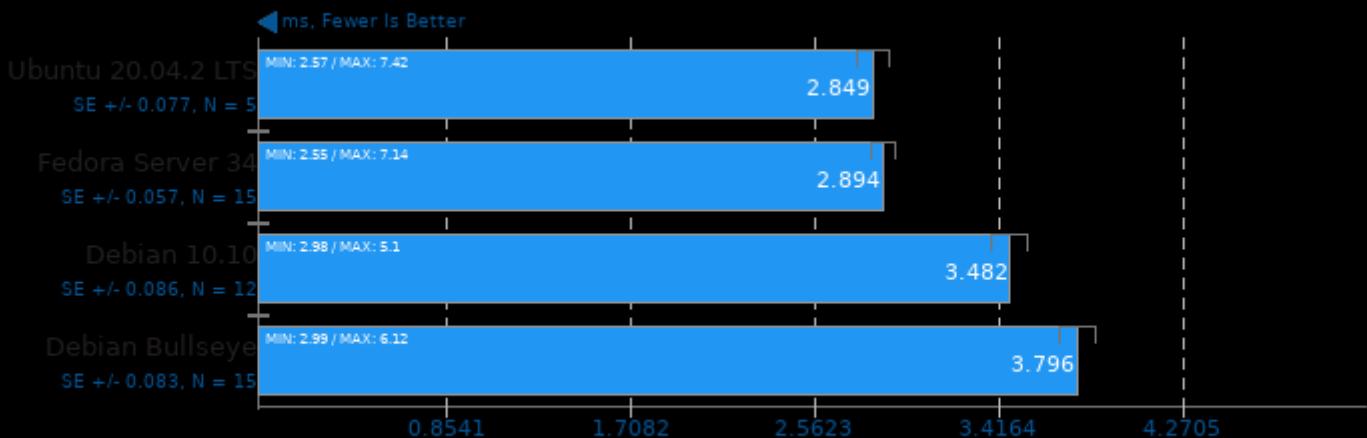
Model: MobileNetV2\_224



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

## Mobile Neural Network 1.2

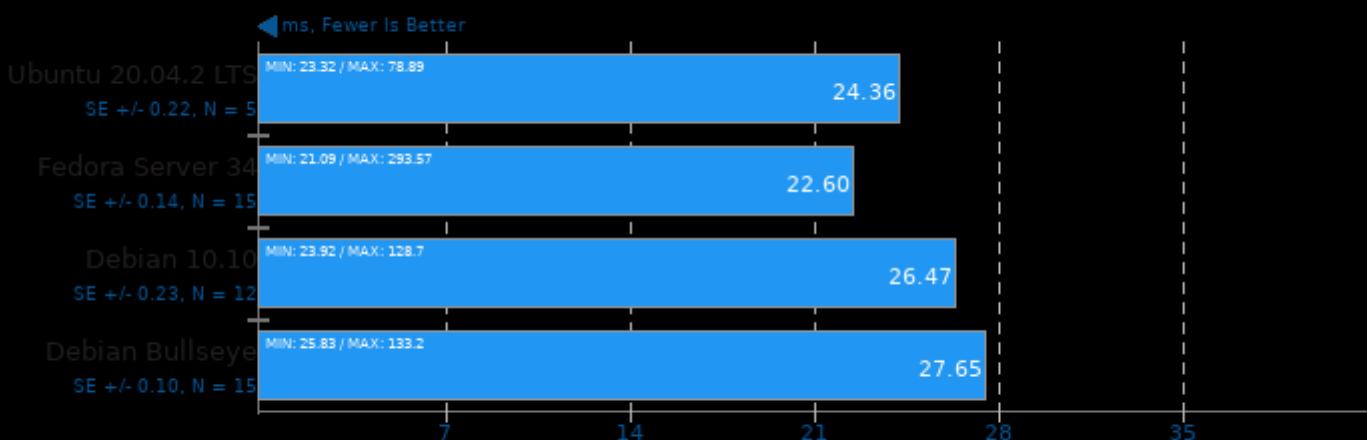
Model: mobilenet-v1-1.0



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

## Mobile Neural Network 1.2

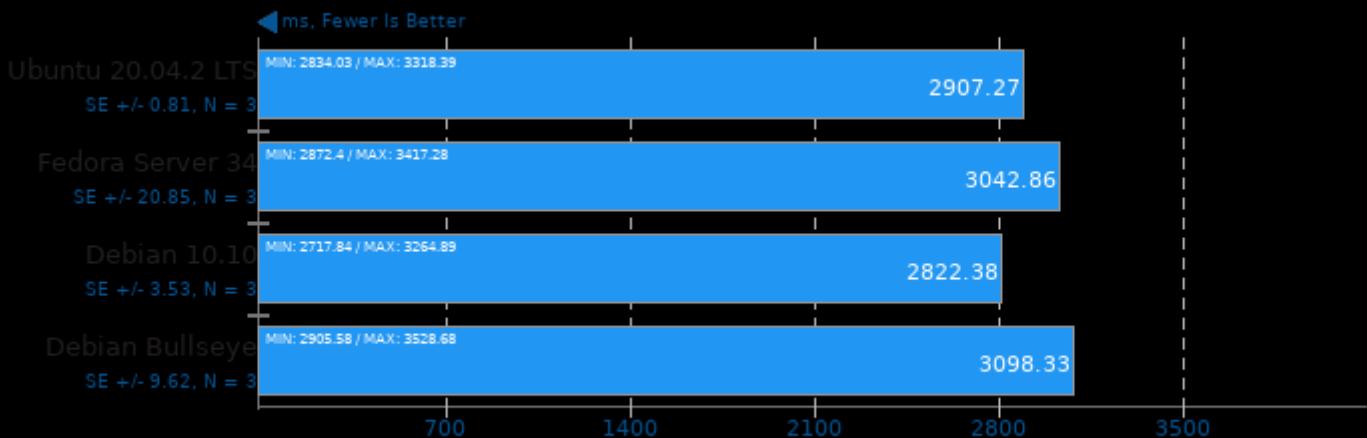
Model: inception-v3



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

## TNN 0.3

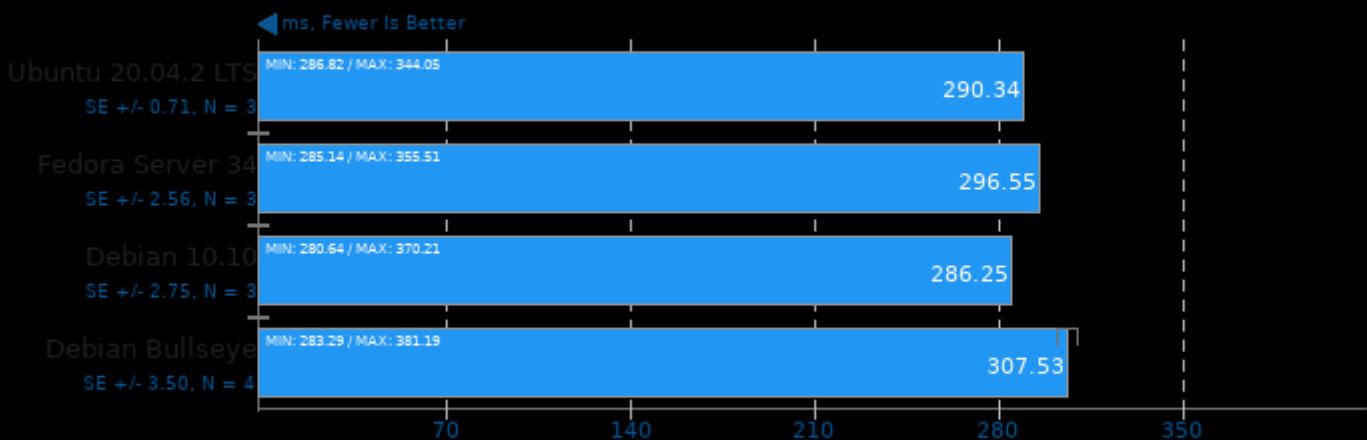
Target: CPU - Model: DenseNet



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

## TNN 0.3

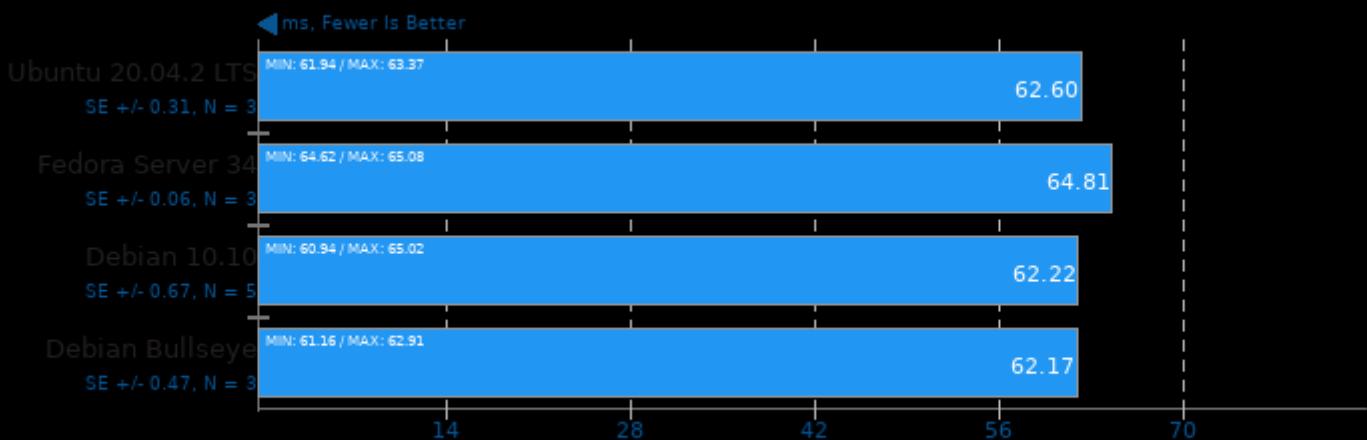
Target: CPU - Model: MobileNet v2



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

## TNN 0.3

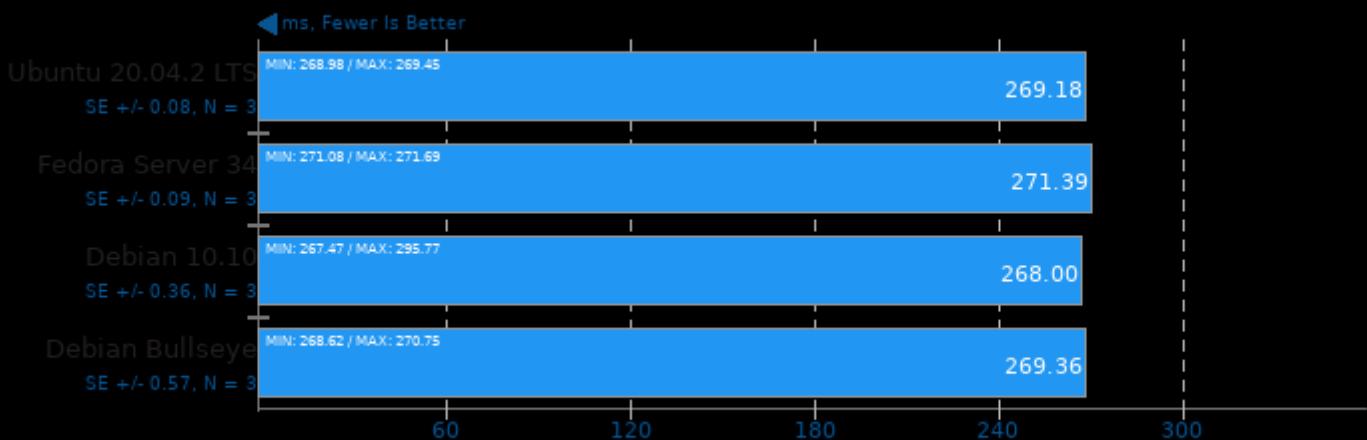
Target: CPU - Model: SqueezeNet v2



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

## TNN 0.3

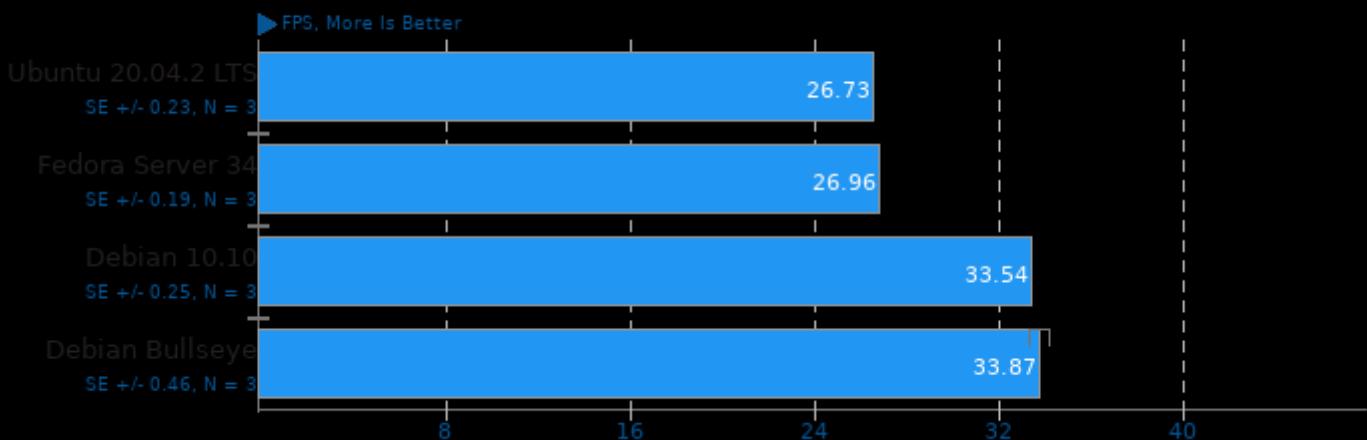
Target: CPU - Model: SqueezeNet v1.1



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

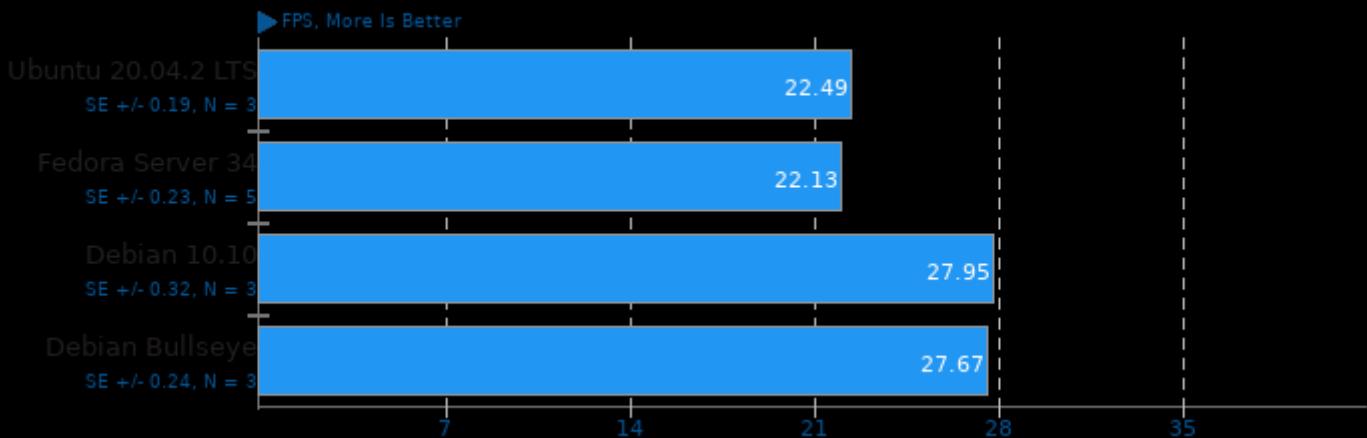
## PlaidML

FP16: No - Mode: Inference - Network: VGG16 - Device: CPU



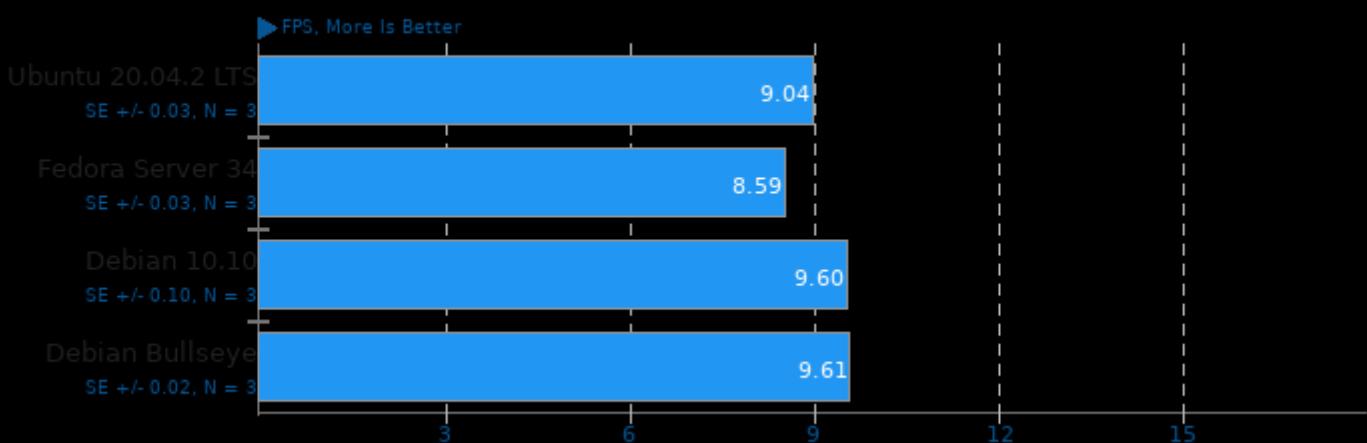
## PlaidML

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



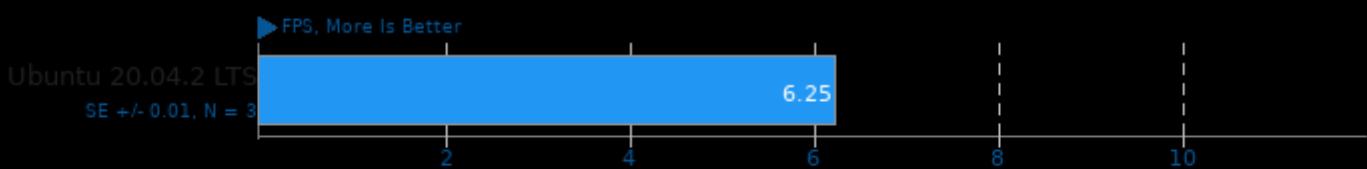
## PlaidML

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



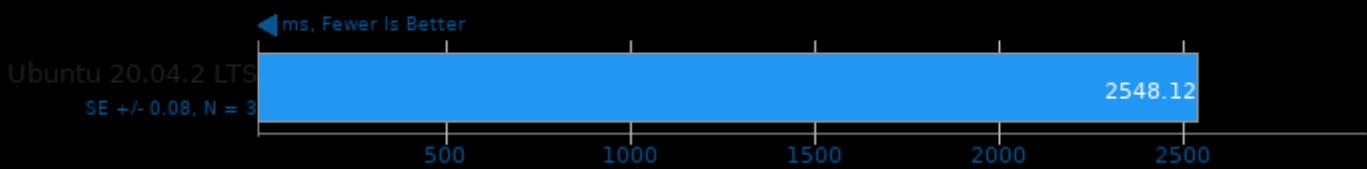
## OpenVINO 2021.1

Model: Face Detection 0106 FP16 - Device: CPU



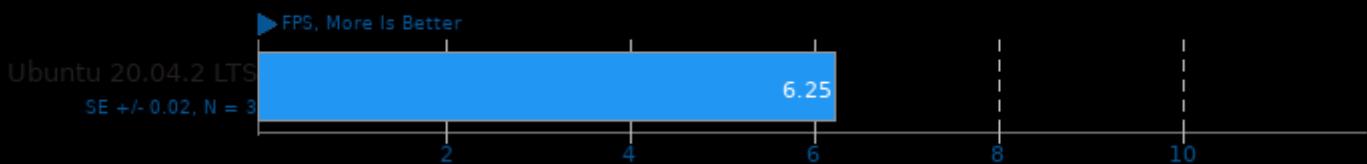
## OpenVINO 2021.1

Model: Face Detection 0106 FP16 - Device: CPU



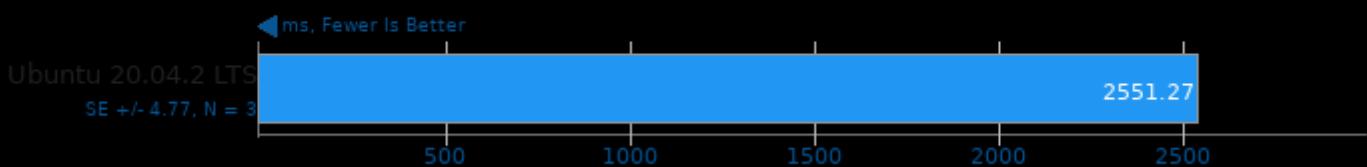
## OpenVINO 2021.1

Model: Face Detection 0106 FP32 - Device: CPU



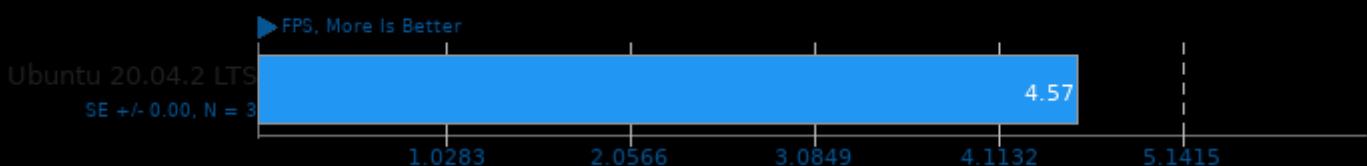
## OpenVINO 2021.1

Model: Face Detection 0106 FP32 - Device: CPU



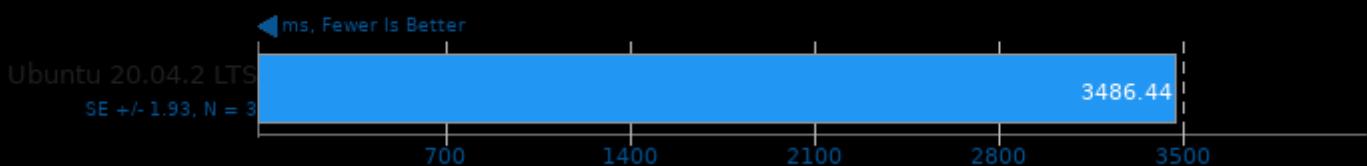
## OpenVINO 2021.1

Model: Person Detection 0106 FP16 - Device: CPU



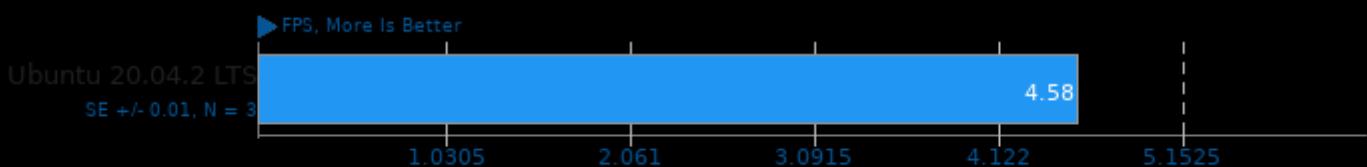
## OpenVINO 2021.1

Model: Person Detection 0106 FP16 - Device: CPU



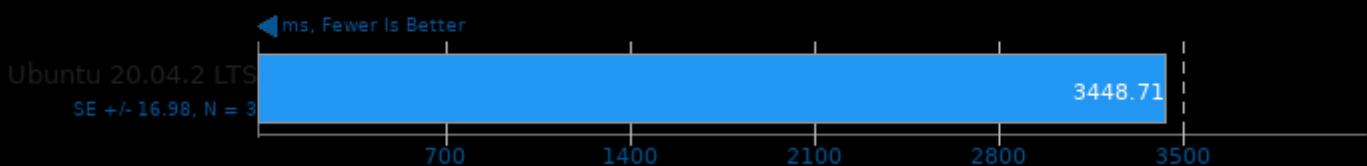
## OpenVINO 2021.1

Model: Person Detection 0106 FP32 - Device: CPU



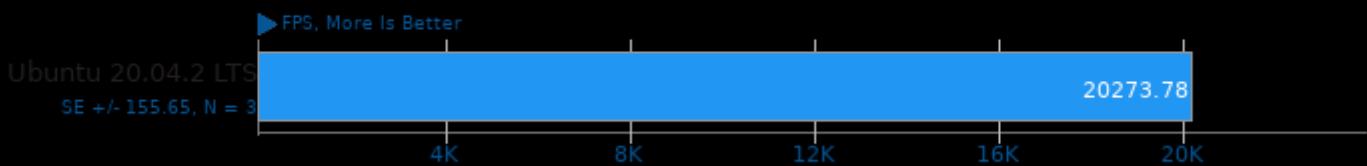
## OpenVINO 2021.1

Model: Person Detection 0106 FP32 - Device: CPU



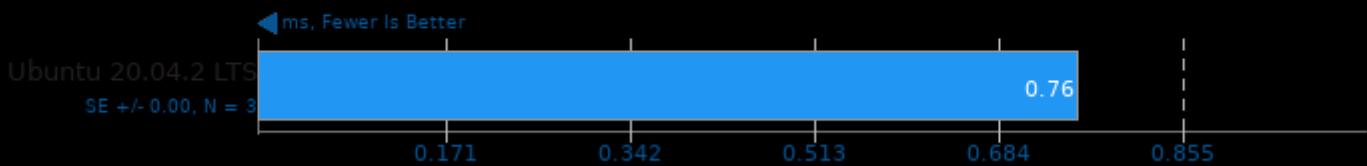
## OpenVINO 2021.1

Model: Age Gender Recognition Retail 0013 FP16 - Device: CPU



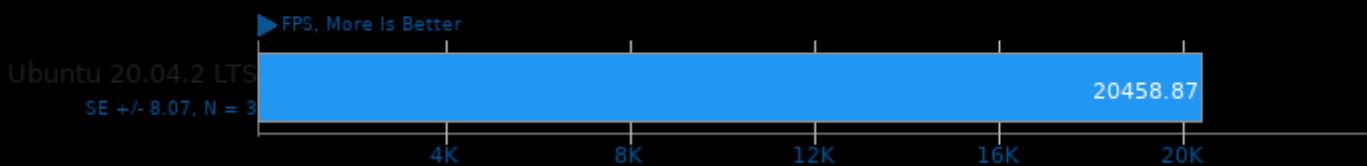
## OpenVINO 2021.1

Model: Age Gender Recognition Retail 0013 FP16 - Device: CPU



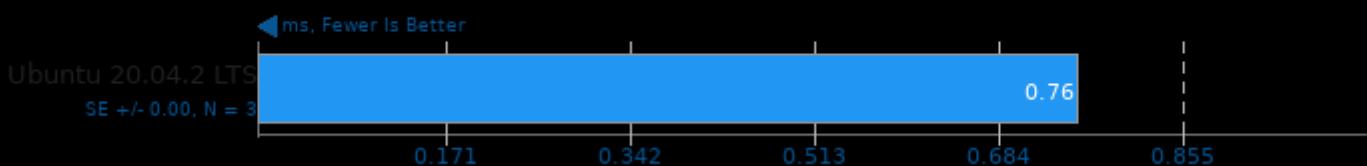
## OpenVINO 2021.1

Model: Age Gender Recognition Retail 0013 FP32 - Device: CPU



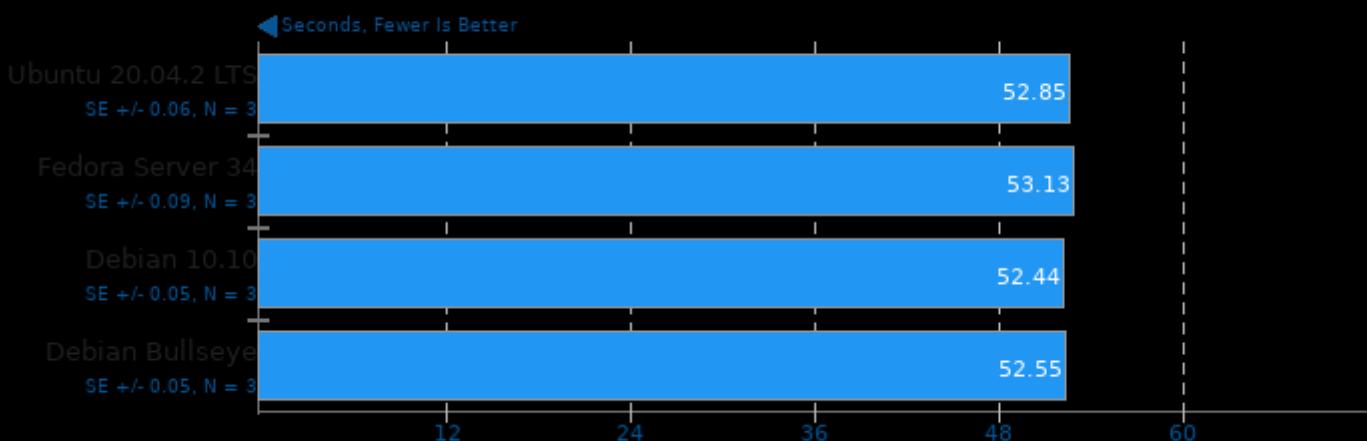
## OpenVINO 2021.1

Model: Age Gender Recognition Retail 0013 FP32 - Device: CPU



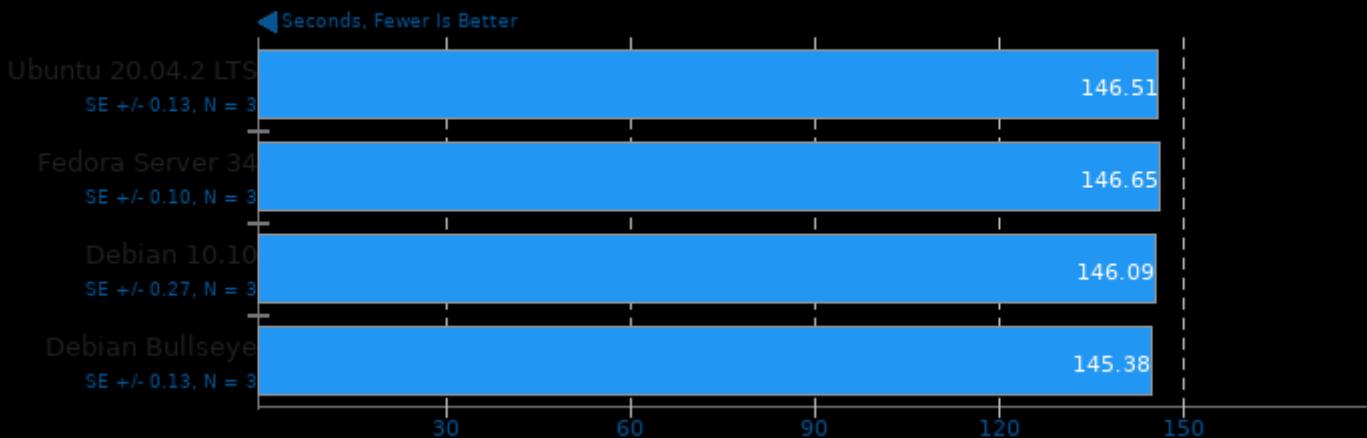
## Blender 2.92

Blend File: BMW27 - Compute: CPU-Only



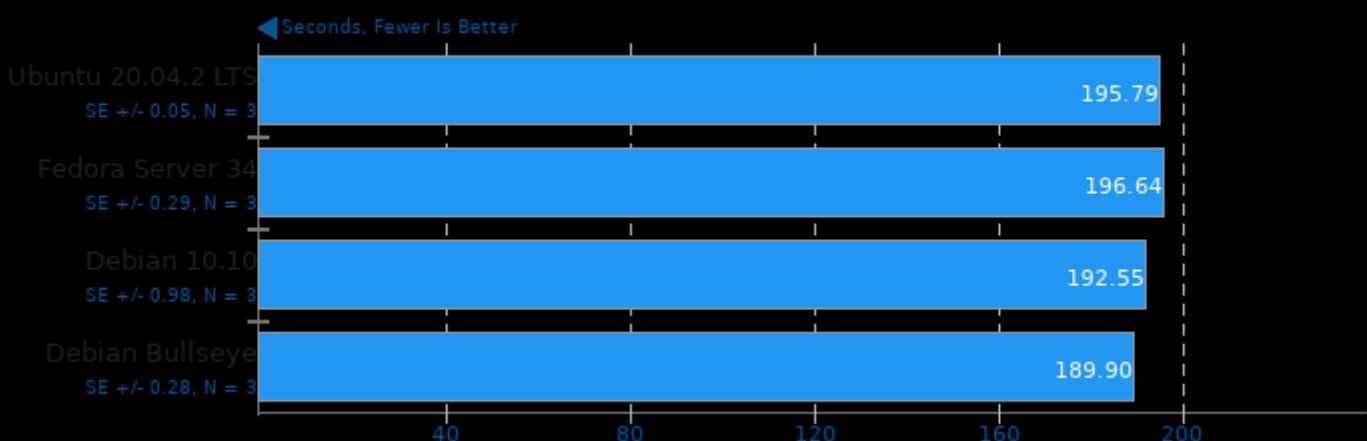
## Blender 2.92

Blend File: Classroom - Compute: CPU-Only



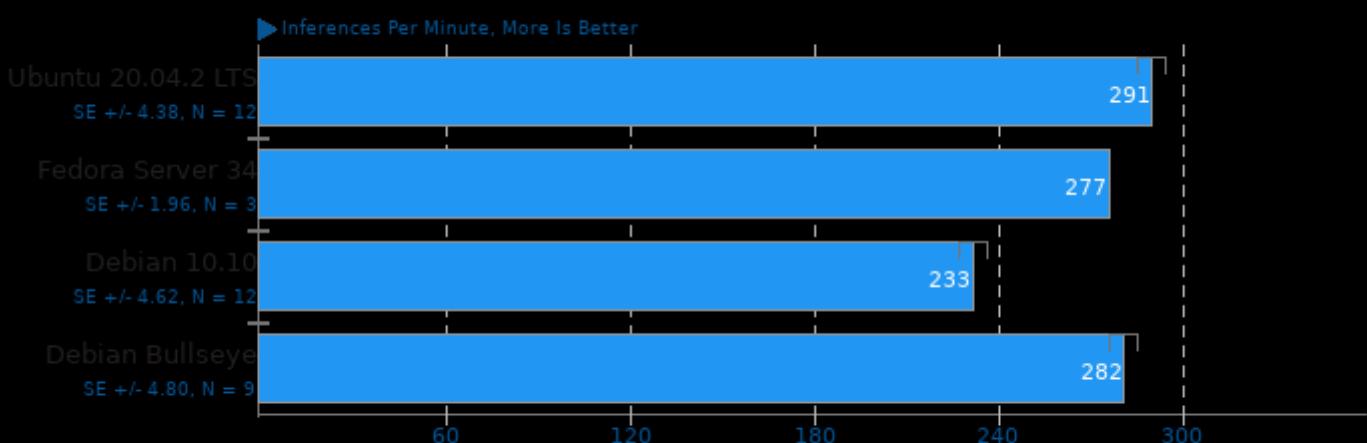
## Blender 2.92

Blend File: Barbershop - Compute: CPU-Only



## ONNX Runtime 1.6

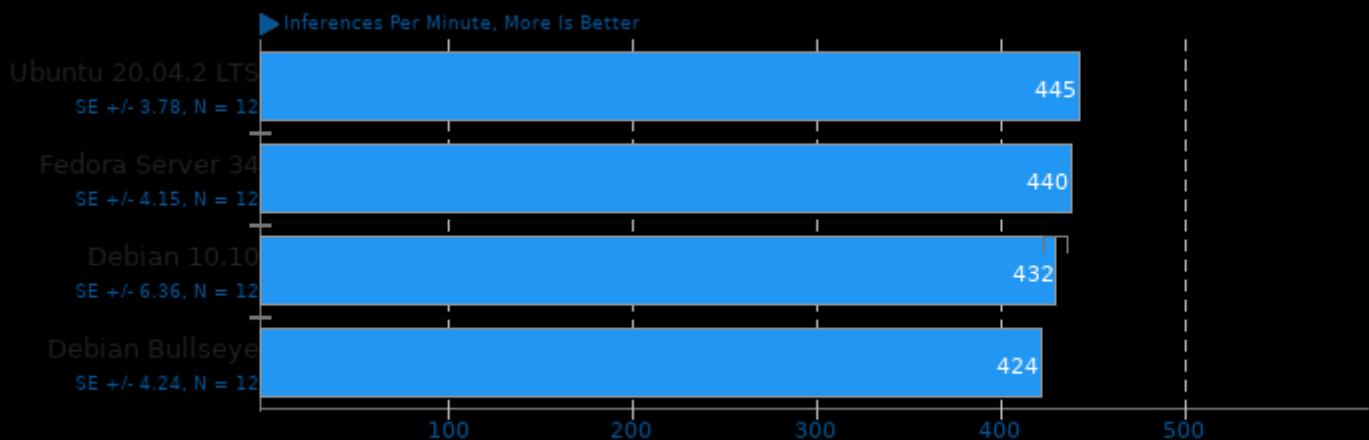
Model: yolov4 - Device: OpenMP CPU



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

## ONNX Runtime 1.6

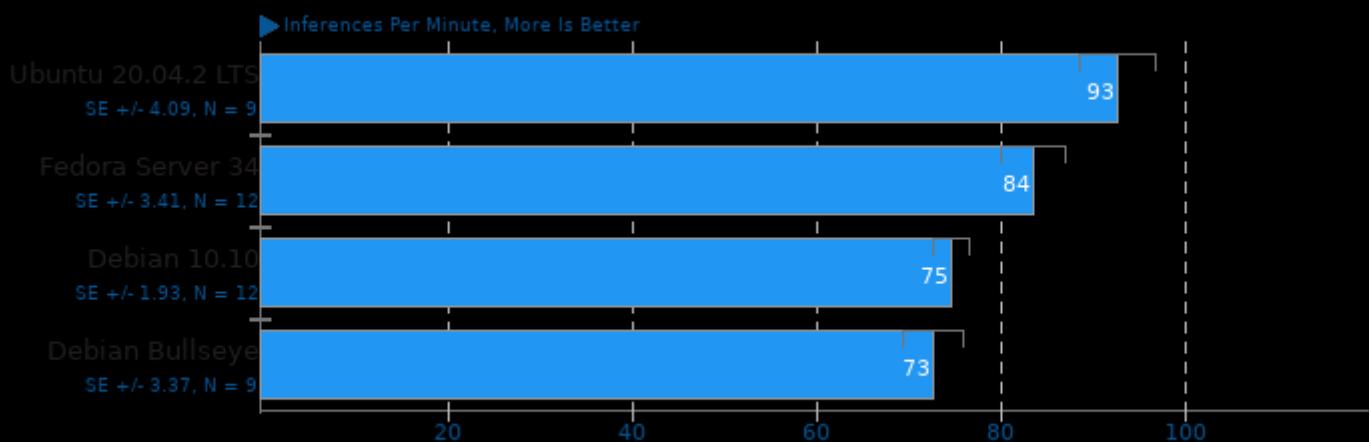
Model: bertsquad-10 - Device: OpenMP CPU



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

## ONNX Runtime 1.6

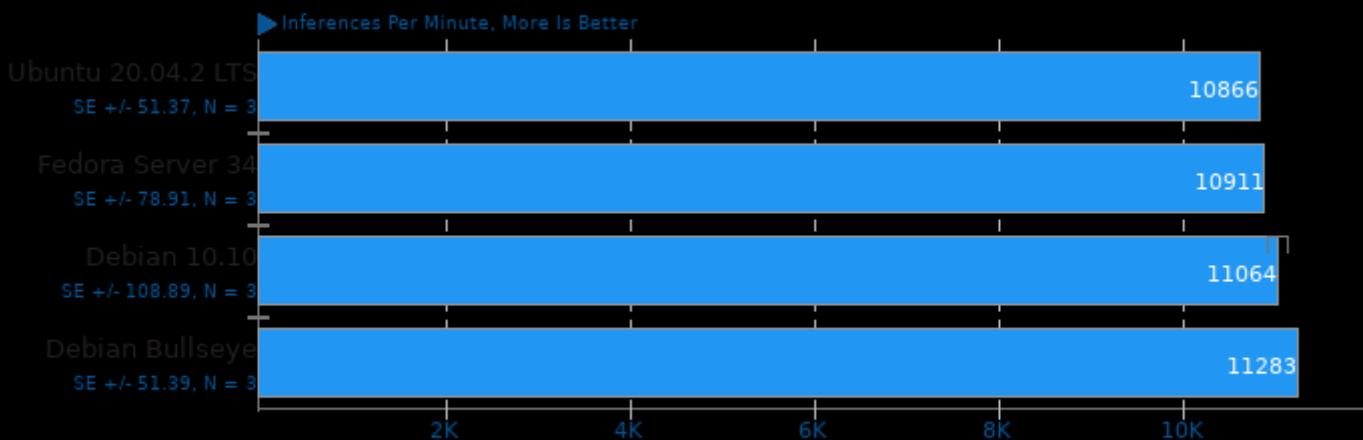
Model: fcn-resnet101-11 - Device: OpenMP CPU



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

## ONNX Runtime 1.6

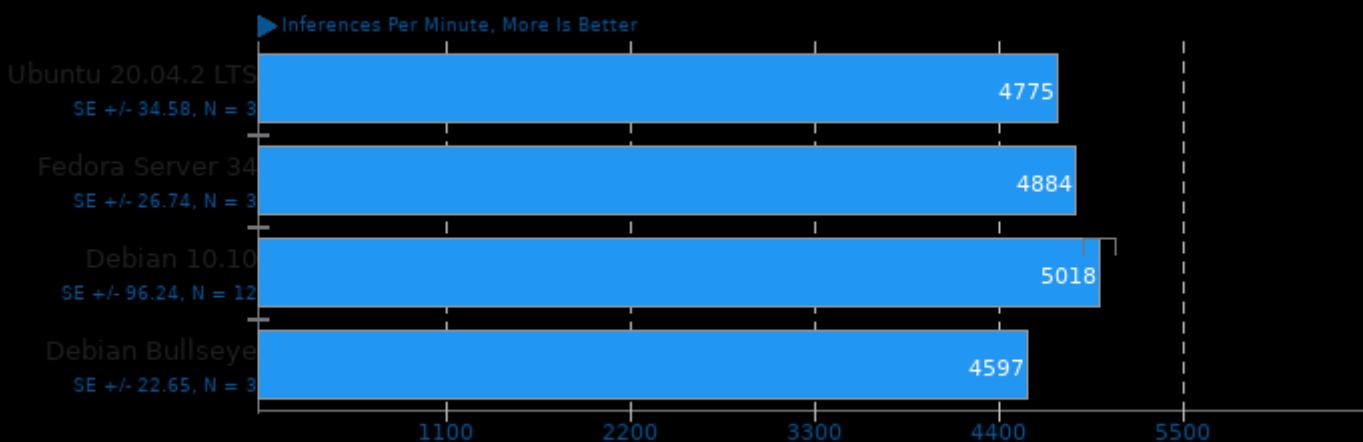
Model: shufflenet-v2-10 - Device: OpenMP CPU



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

## ONNX Runtime 1.6

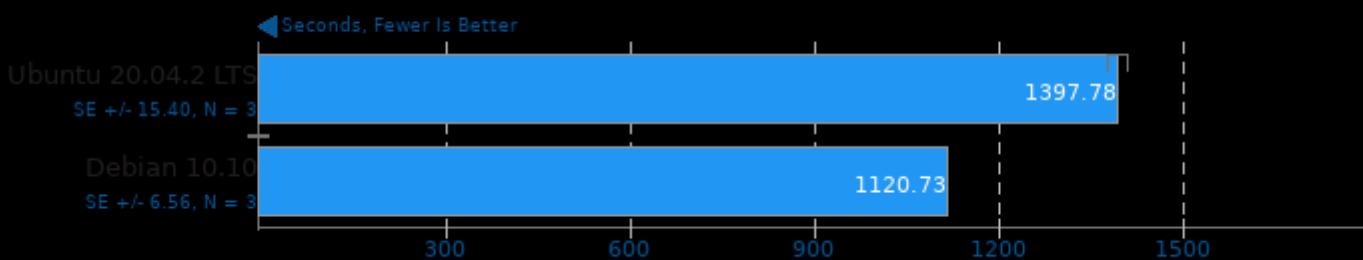
Model: super-resolution-10 - Device: OpenMP CPU



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

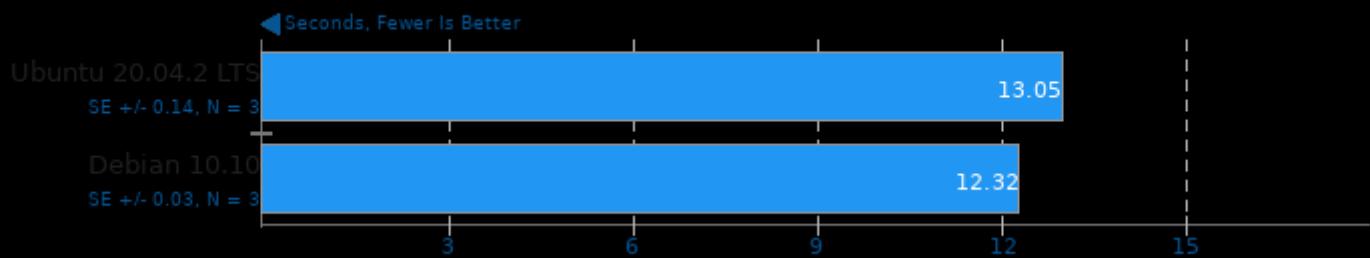
## Numenta Anomaly Benchmark 1.1

Detector: EXPoSE



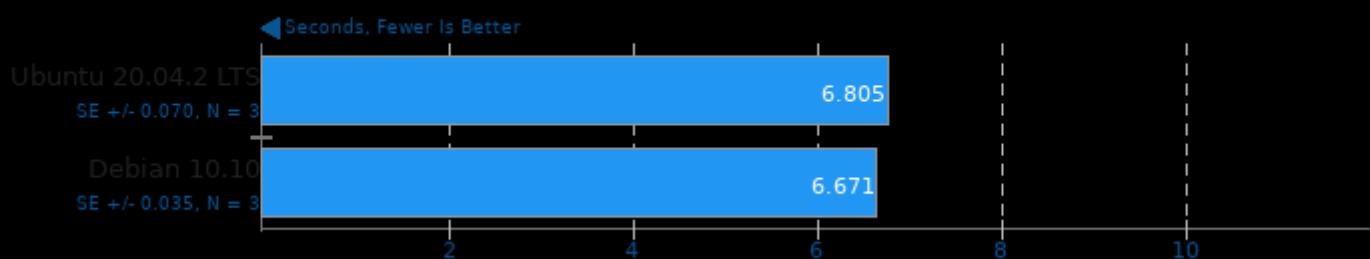
## Numenta Anomaly Benchmark 1.1

Detector: Relative Entropy



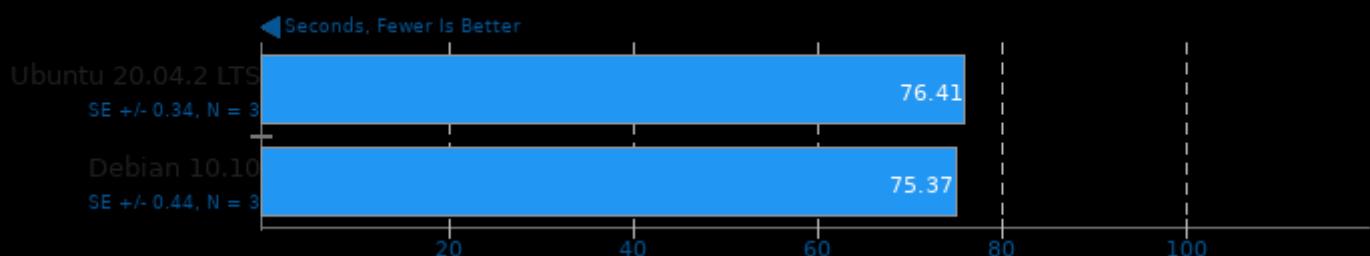
## Numenta Anomaly Benchmark 1.1

Detector: Windowed Gaussian



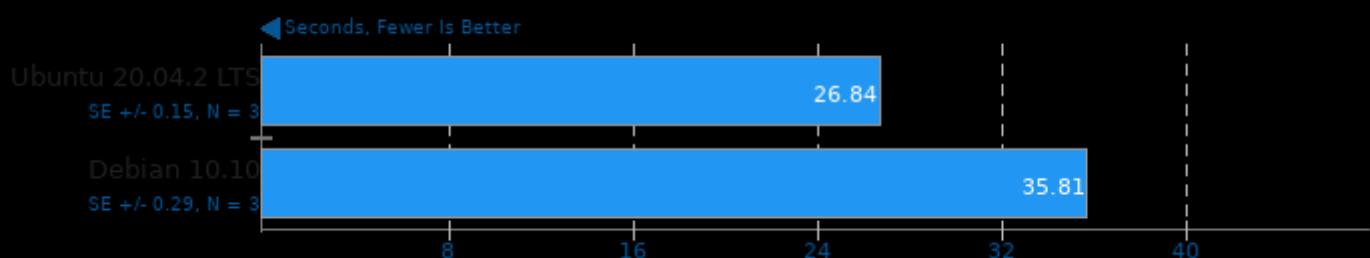
## Numenta Anomaly Benchmark 1.1

Detector: Earthgecko Skyline

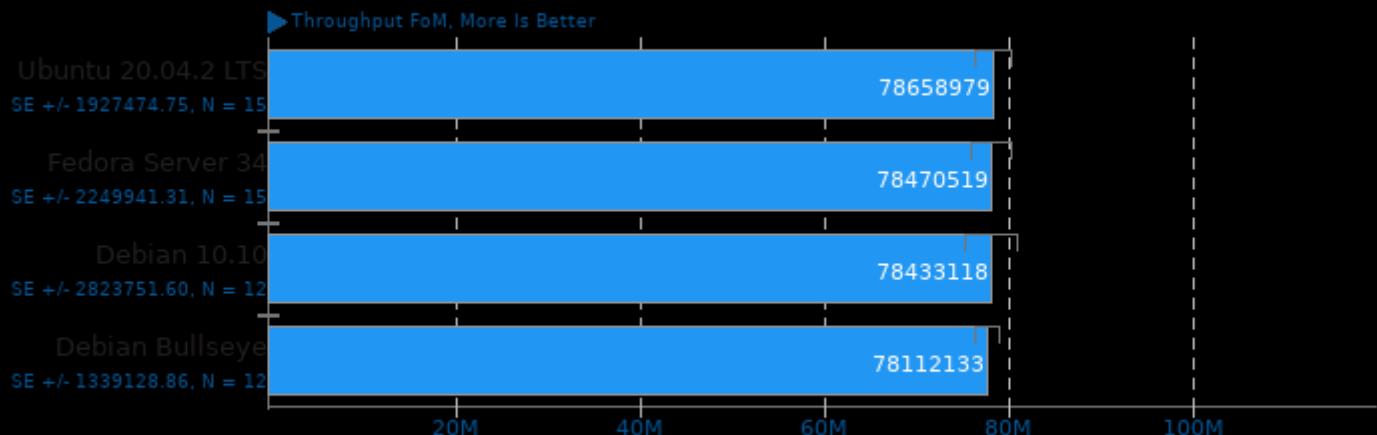


## Numenta Anomaly Benchmark 1.1

Detector: Bayesian Changepoint



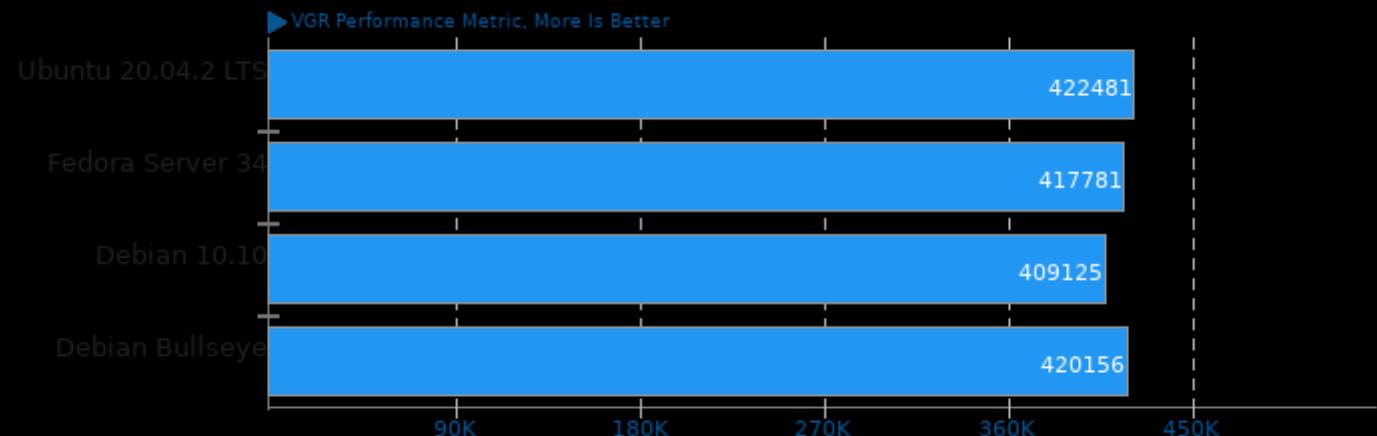
## Kripke 1.2.4



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

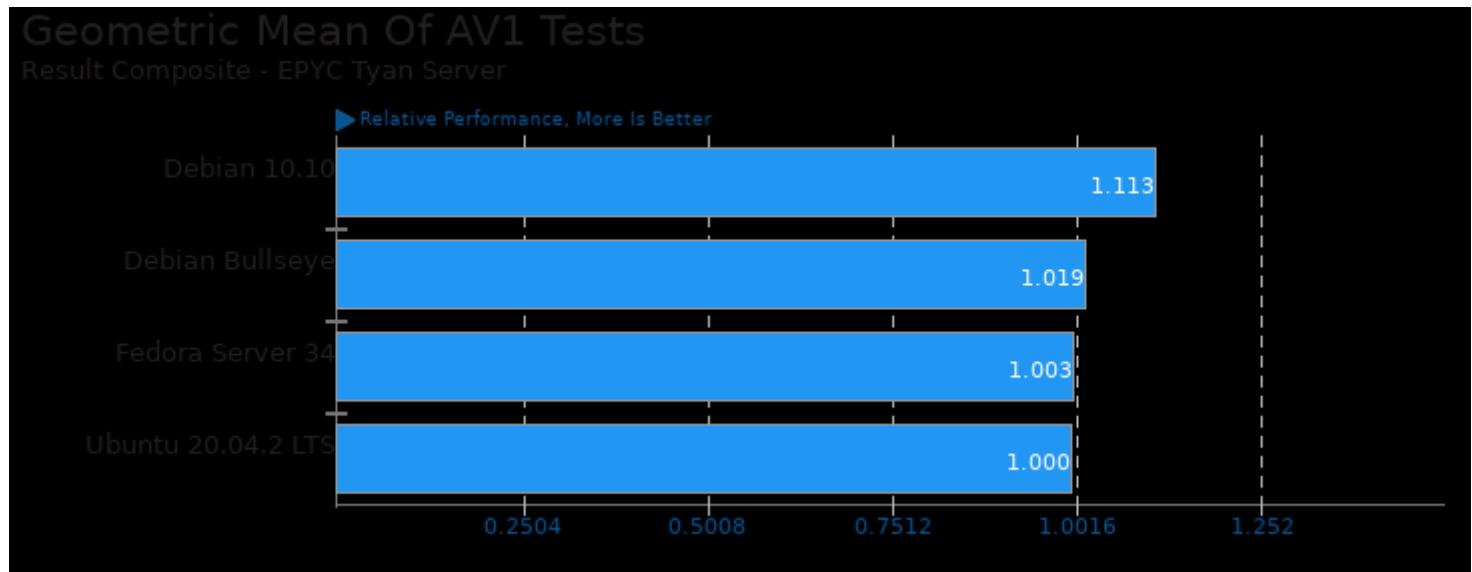
## BRL-CAD 7.32.2

VGR Performance Metric

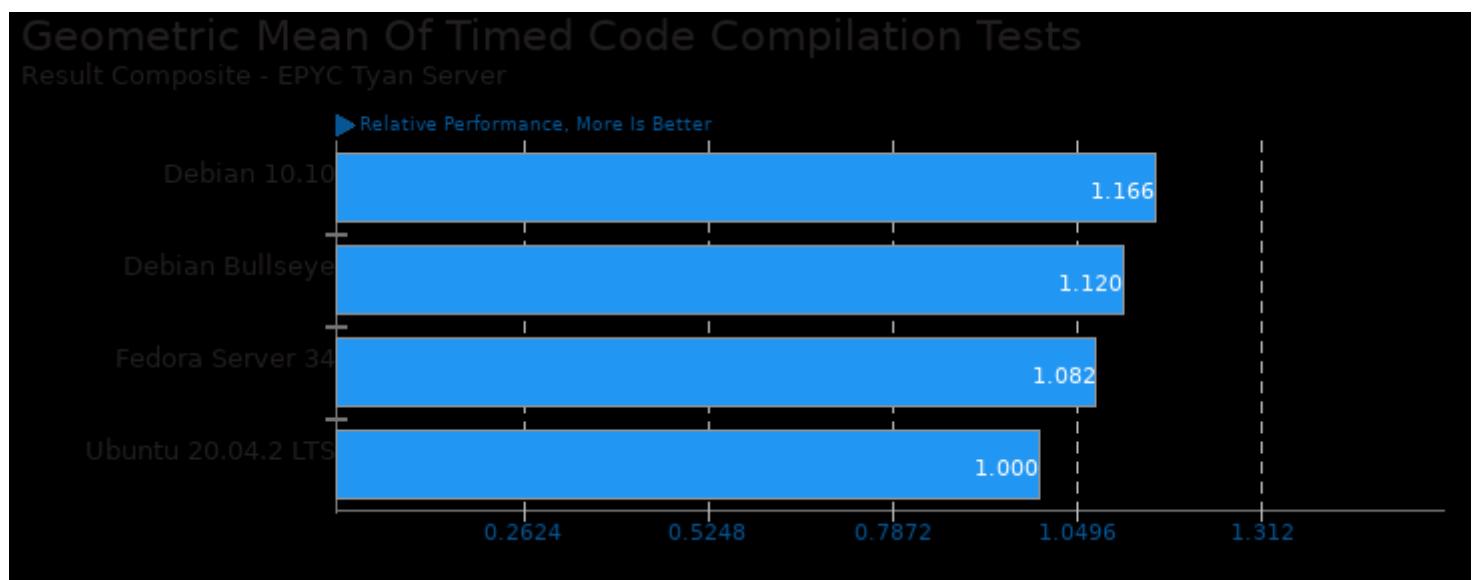


1. (CXX) g++ options: -std=c++11 -pipe -fvisibility=hidden -fno-strict-aliasing -fno-common -fexceptions -ftemplate-depth=128 -m64 -ggdb3 -O3 -fipa-pt

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



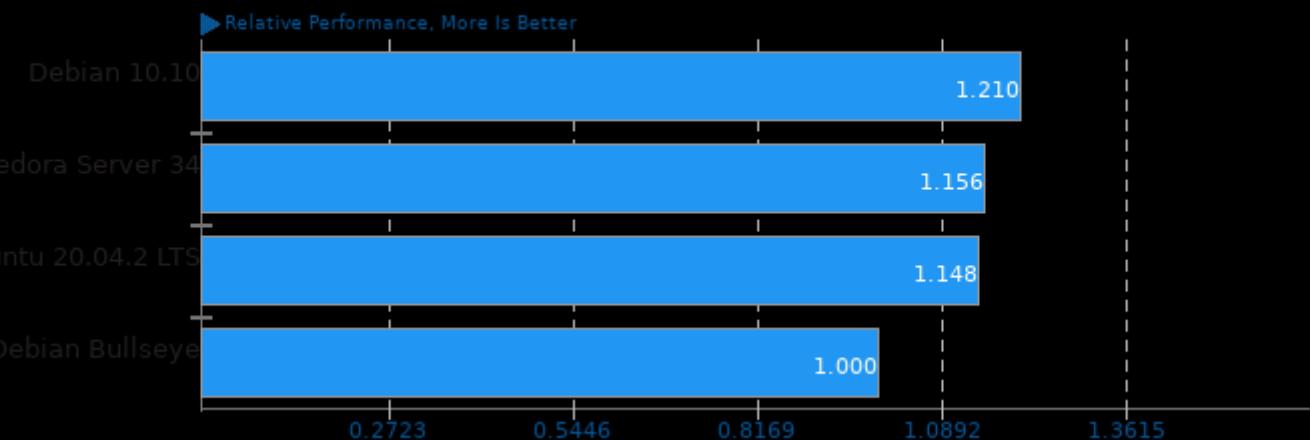
Geometric mean based upon tests: pts/svt-av1 and pts/avifenc



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

## Geometric Mean Of C/C++ Compiler Tests

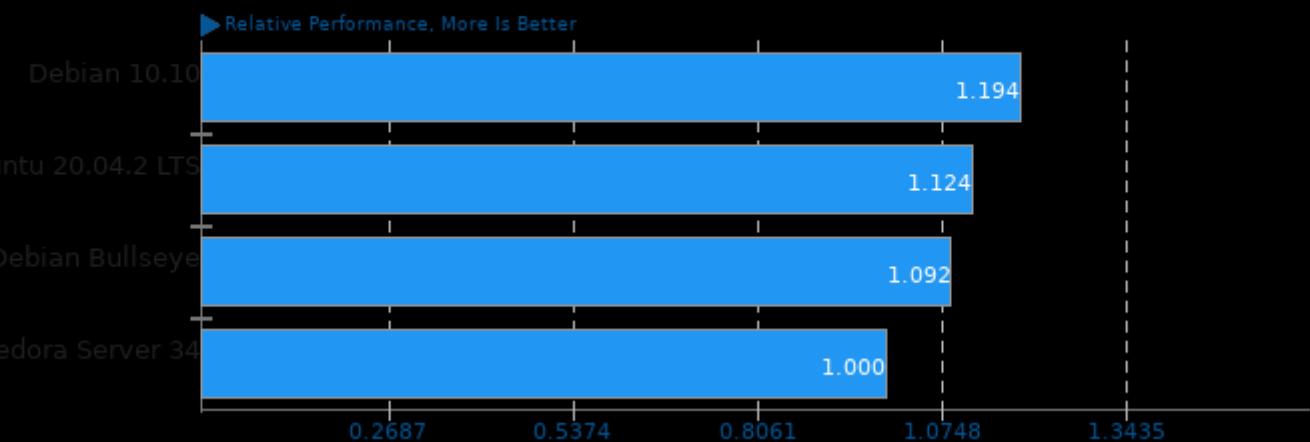
Result Composite - EPYC Tyan Server



Geometric mean based upon tests: pts/vpxenc, pts/build-llvm, pts/svt-av1, pts/svt-vp9 and pts/gromacs

## Geometric Mean Of CPU Massive Tests

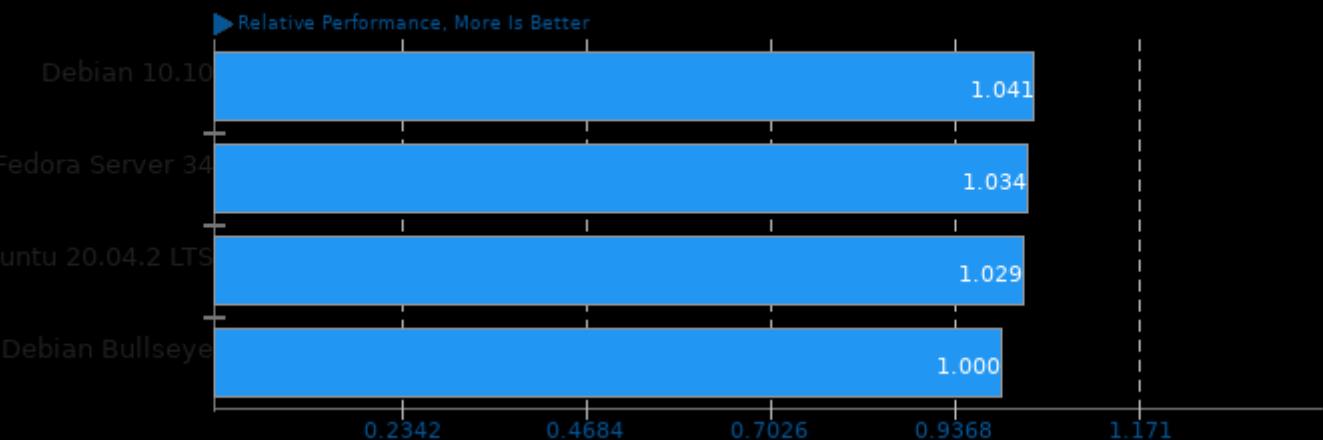
Result Composite - EPYC Tyan Server



Geometric mean based upon tests: pts/brl-cad, pts/build-llvm, pts/build-linux-kernel, pts/svt-av1, pts/svt-hevc, pts/svt-vp9, pts/vpxenc, pts/hpcg, pts/namd, pts/npb, pts/numenta-nab, pts/plaidml and pts/blender

## Geometric Mean Of Creator Workloads Tests

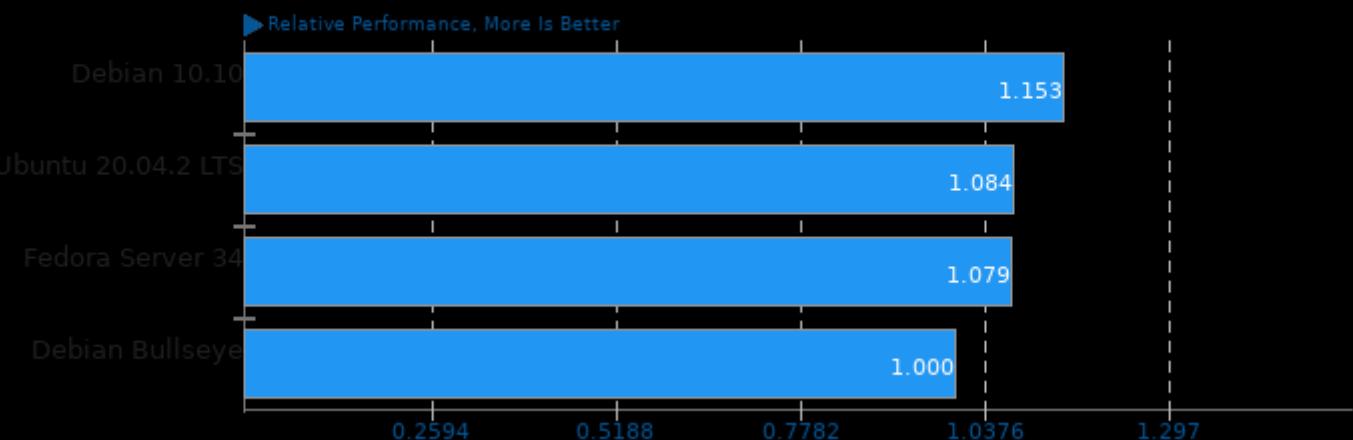
Result Composite - EPYC Tyan Server



Geometric mean based upon tests: pts/ospray, pts/blender, pts/luxcorerender, pts/svt-vp9, pts/svt-hevc, pts/vpxenc, pts/svt-av1, pts/avifenc, pts/embree, pts/oidn, pts/openvkl, pts/openvino, pts/astcenc, pts/build-godot and pts/brl-cad

## Geometric Mean Of Encoding Tests

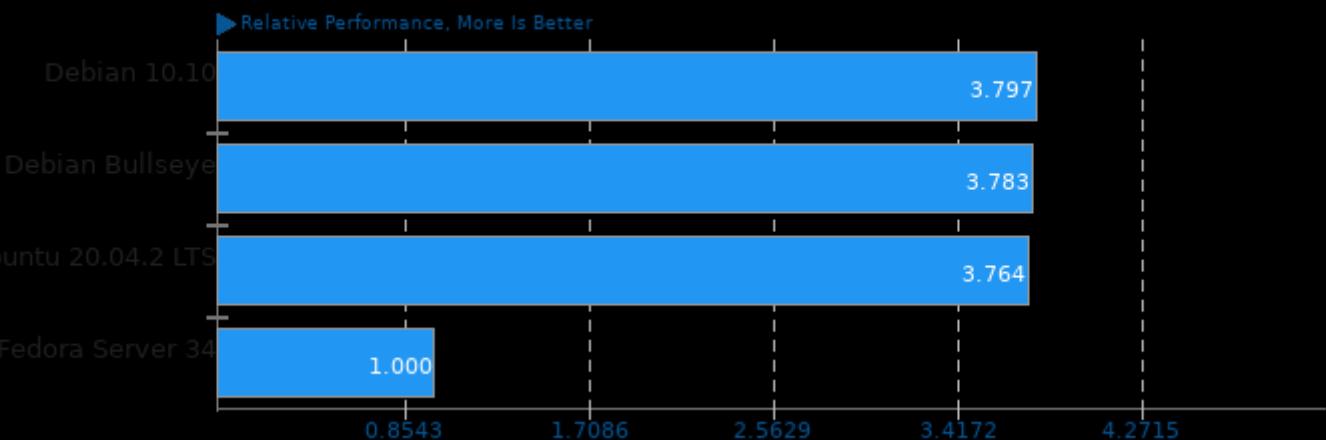
Result Composite - EPYC Tyan Server



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

## Geometric Mean Of Fortran Tests

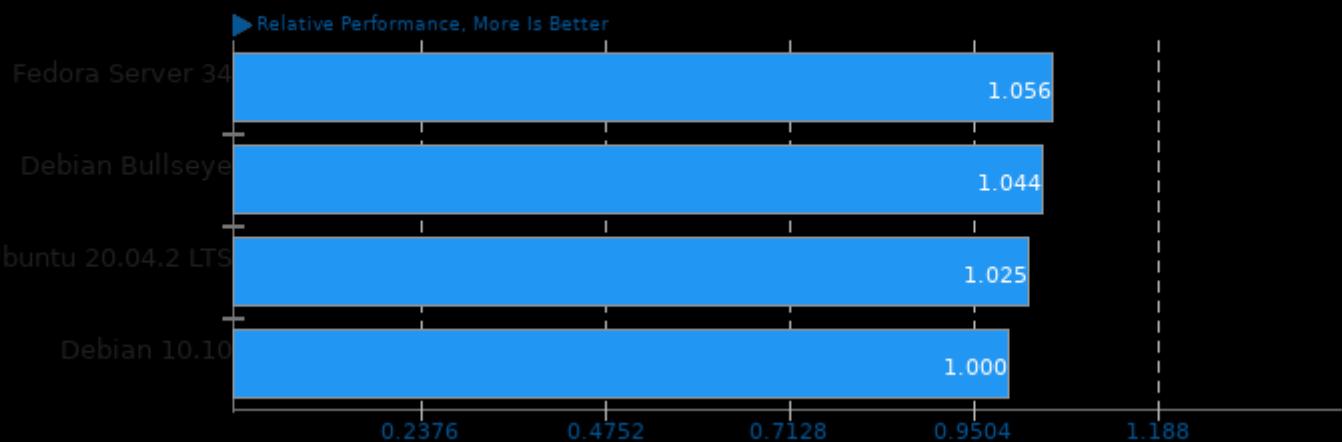
Result Composite - EPYC Tyan Server



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

## Geometric Mean Of Game Development Tests

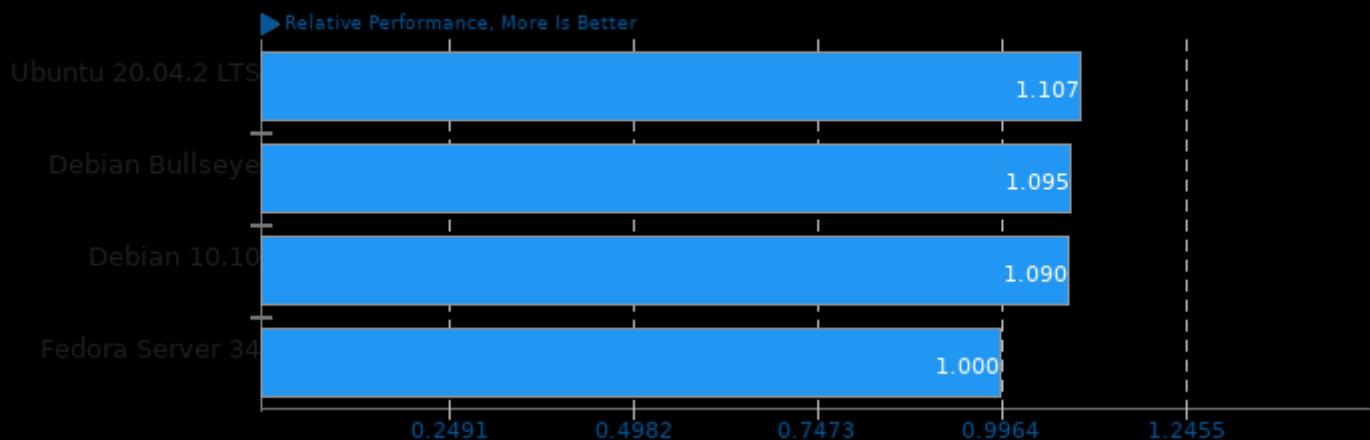
Result Composite - EPYC Tyan Server



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

## Geometric Mean Of HPC - High Performance Computing Tests

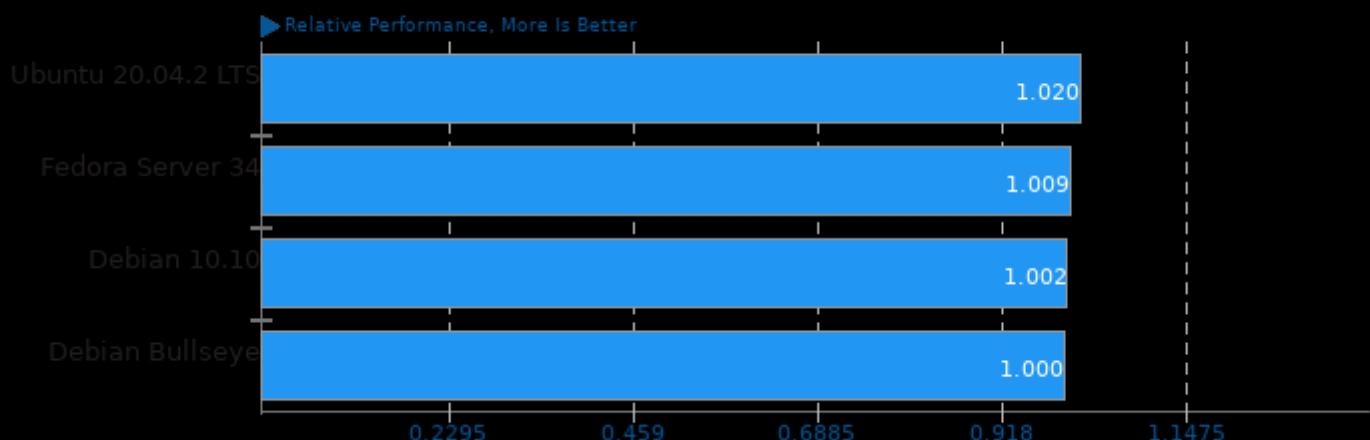
Result Composite - EPYC Tyan Server



Geometric mean based upon tests: pts/npb, pts/hpcg, pts/namd, pts/gromacs, pts/nwchem, pts/minife, pts/incompact3d, pts/openfoam, pts/gpaw, pts/kripke, pts/mnn, pts/tnn, pts/numenta-nab, pts/tensorflow-lite, pts/openvino, pts/onnx and pts/plaidml

## Geometric Mean Of Machine Learning Tests

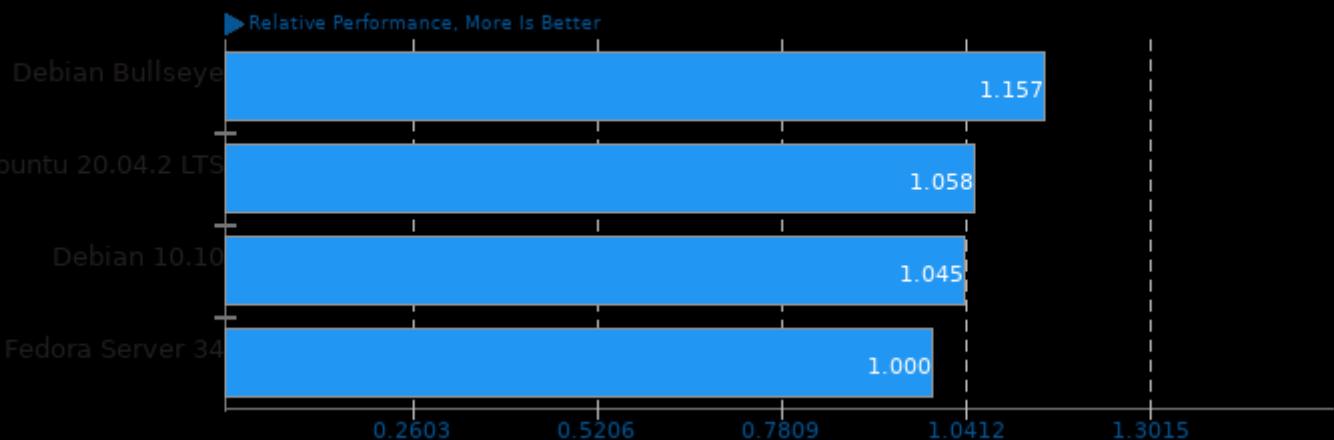
Result Composite - EPYC Tyan Server



Geometric mean based upon tests: pts/mnn, pts/tnn, pts/numenta-nab, pts/tensorflow-lite, pts/openvino, pts/onnx and pts/plaidml

## Geometric Mean Of Molecular Dynamics Tests

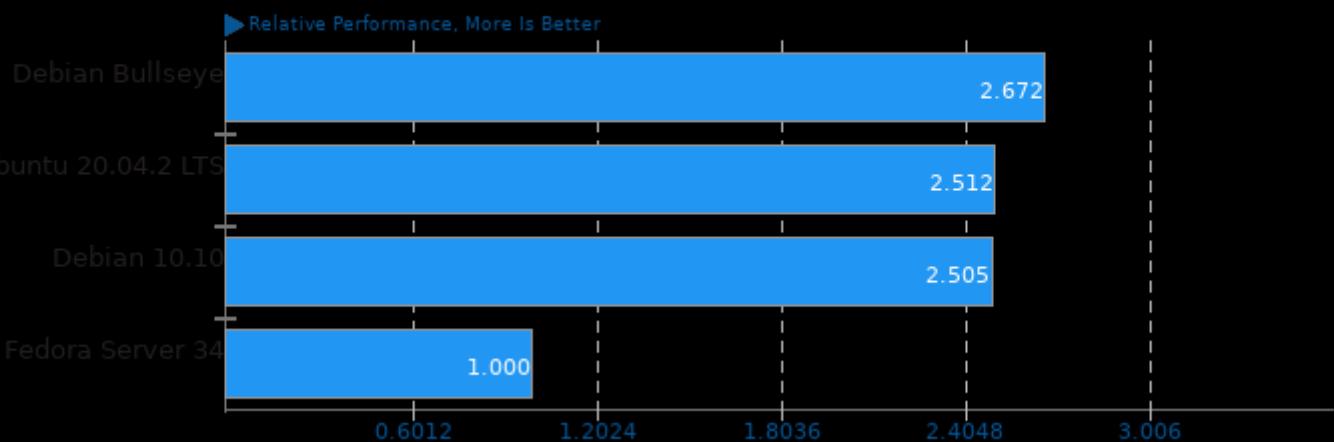
Result Composite - EPYC Tyan Server



Geometric mean based upon tests: pts/namd, pts/gromacs, pts/nwchem, pts/minife, pts/incompact3d and pts/openfoam

## Geometric Mean Of MPI Benchmarks Tests

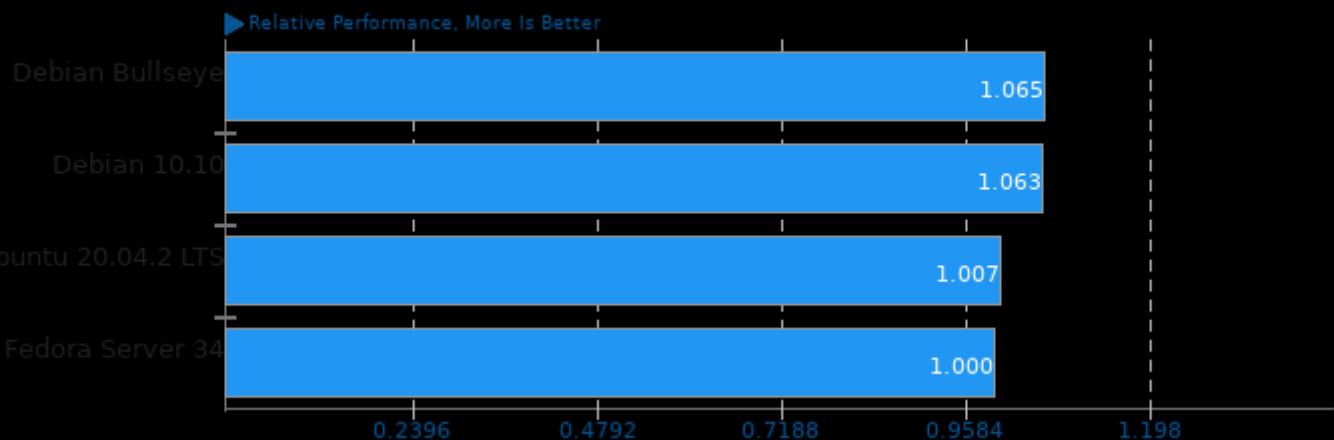
Result Composite - EPYC Tyan Server



Geometric mean based upon tests: pts/incompact3d, pts/gpaw, pts/gromacs, pts/hpcg, pts/npb and pts/minife

## Geometric Mean Of NVIDIA GPU Compute Tests

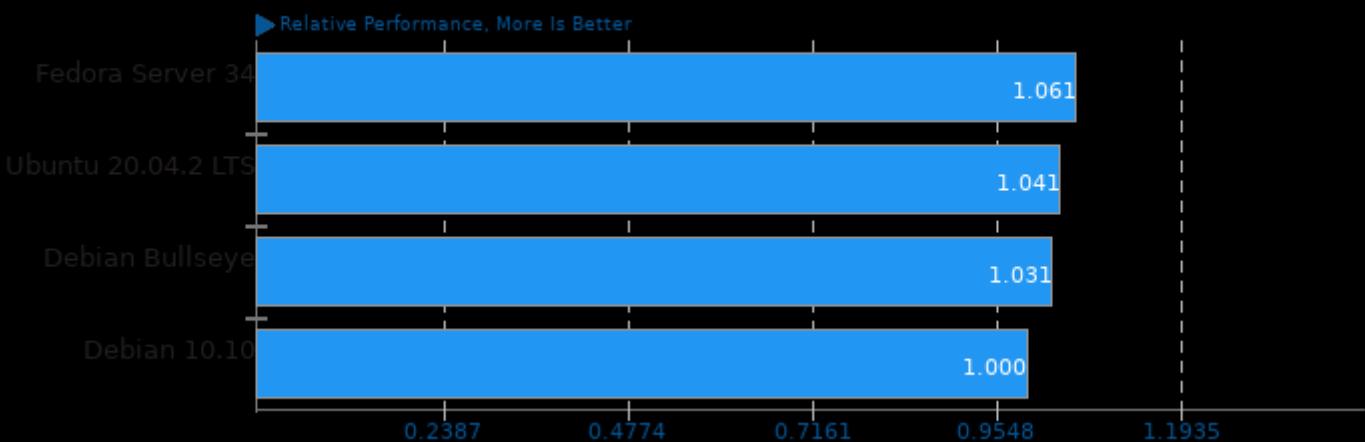
Result Composite - EPYC Tyan Server



Geometric mean based upon tests: pts/gromacs, pts/luxcorerender, pts/plaidml and pts/blender

## Geometric Mean Of Intel oneAPI Tests

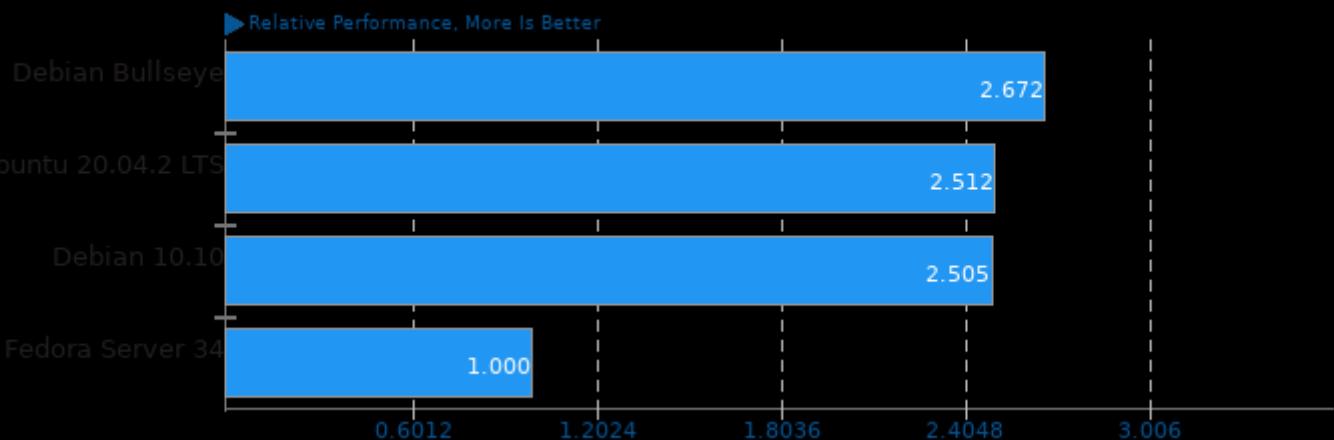
Result Composite - EPYC Tyan Server



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

## Geometric Mean Of OpenMPI Tests

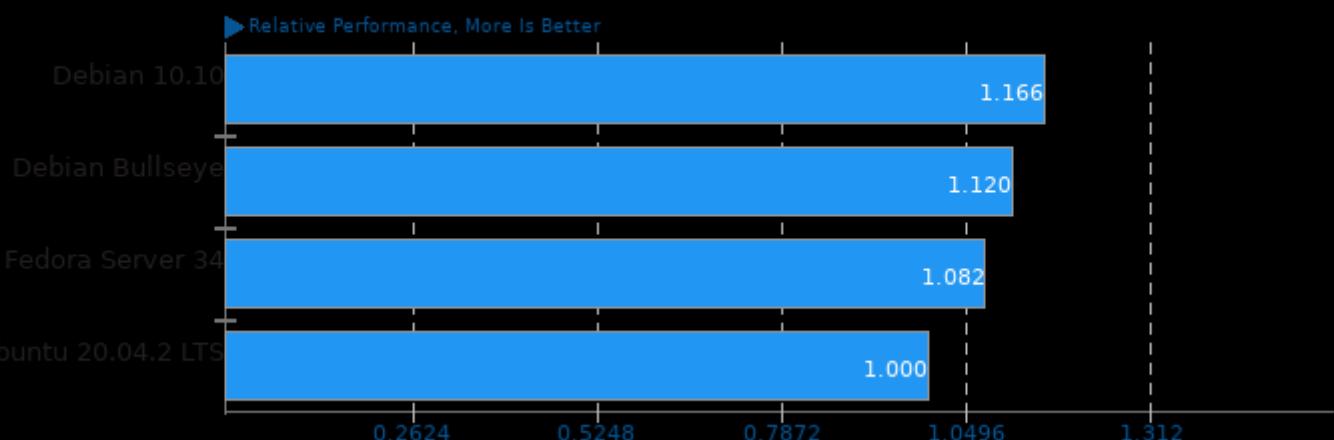
Result Composite - EPYC Tyan Server



Geometric mean based upon tests: pts/hpcg, pts/npb, pts/minife, pts/nwchem, pts/incompact3d, pts/openfoam, pts/gromacs and pts/gpaw

## Geometric Mean Of Programmer / Developer System Benchmarks Tests

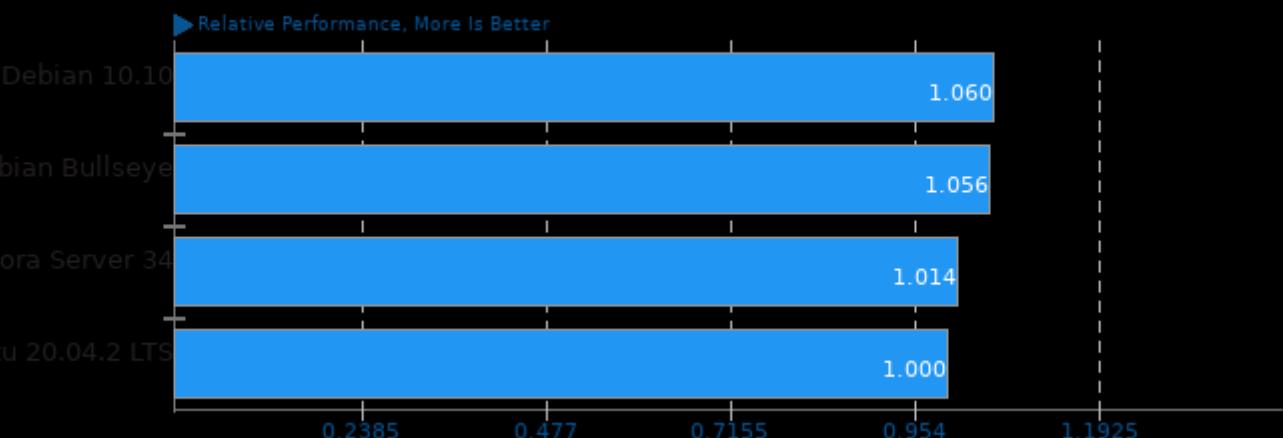
Result Composite - EPYC Tyan Server



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

### Geometric Mean Of Python Tests

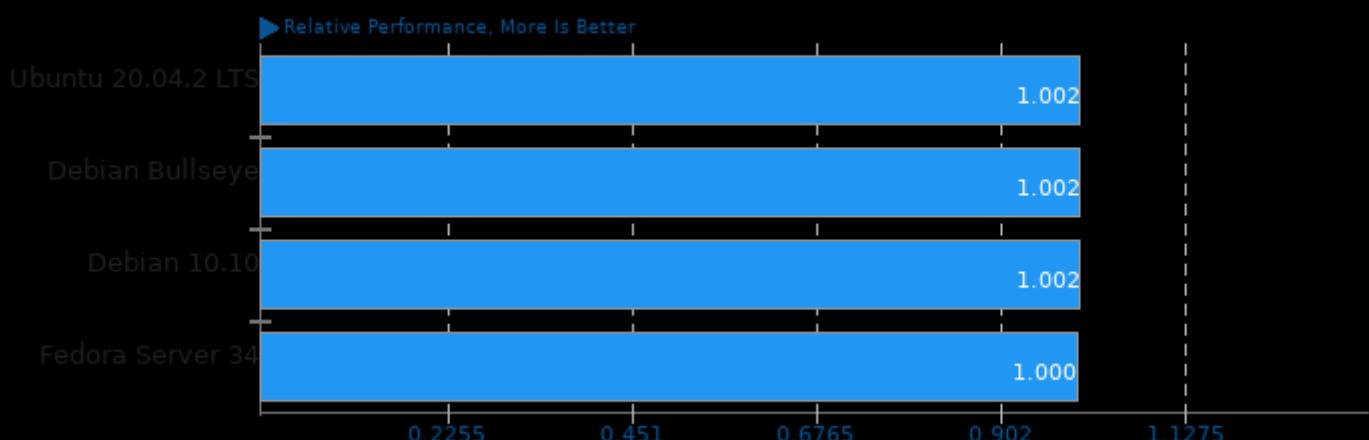
Result Composite - EPYC Tyan Server



Geometric mean based upon tests: pts/build-godot, pts/build-llvm, pts/build-mesa, pts/build-nodejs, pts/gpaw, pts/plaidml, pts/openvino, pts/onnx and pts/numamenta-nab

### Geometric Mean Of Renderers Tests

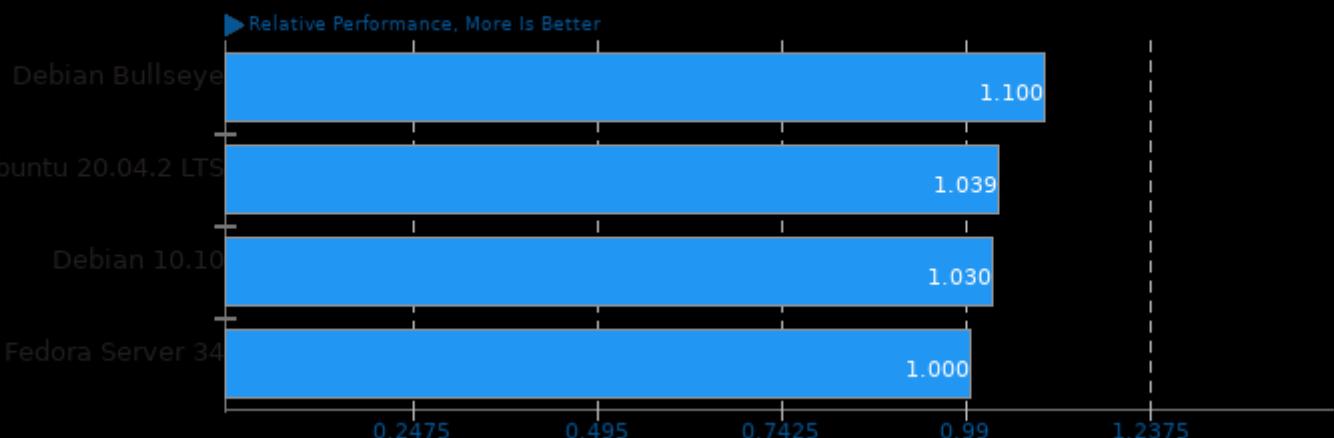
Result Composite - EPYC Tyan Server



Geometric mean based upon tests: pts/ospray, pts/blender and pts/luxcorerender

### Geometric Mean Of Scientific Computing Tests

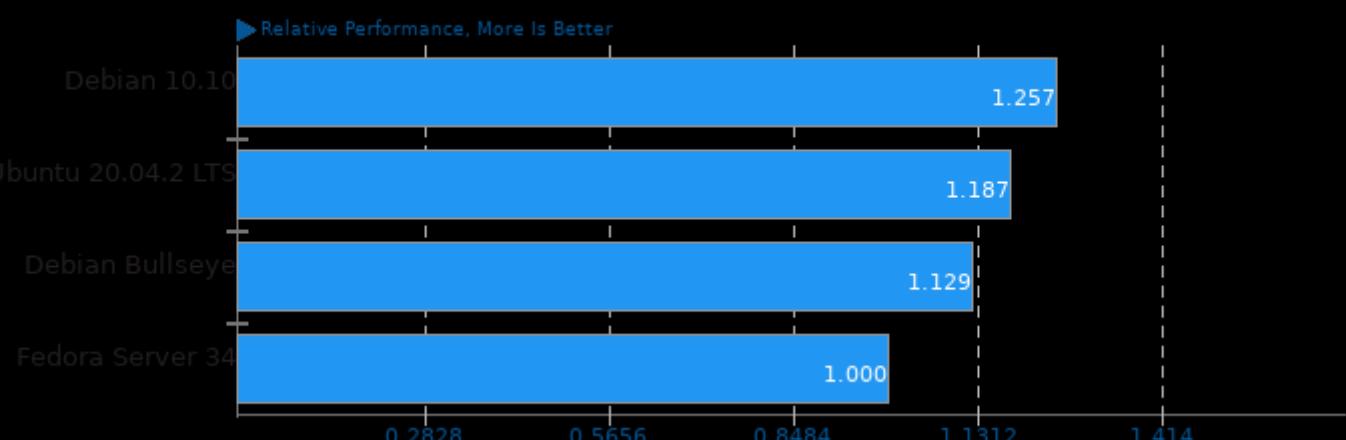
Result Composite - EPYC Tyan Server



Geometric mean based upon tests: pts/namd, pts/gromacs, pts/nwchem, pts/minife, pts/incompact3d, pts/openfoam, pts/gpaw and pts/kripke

### Geometric Mean Of Server CPU Tests

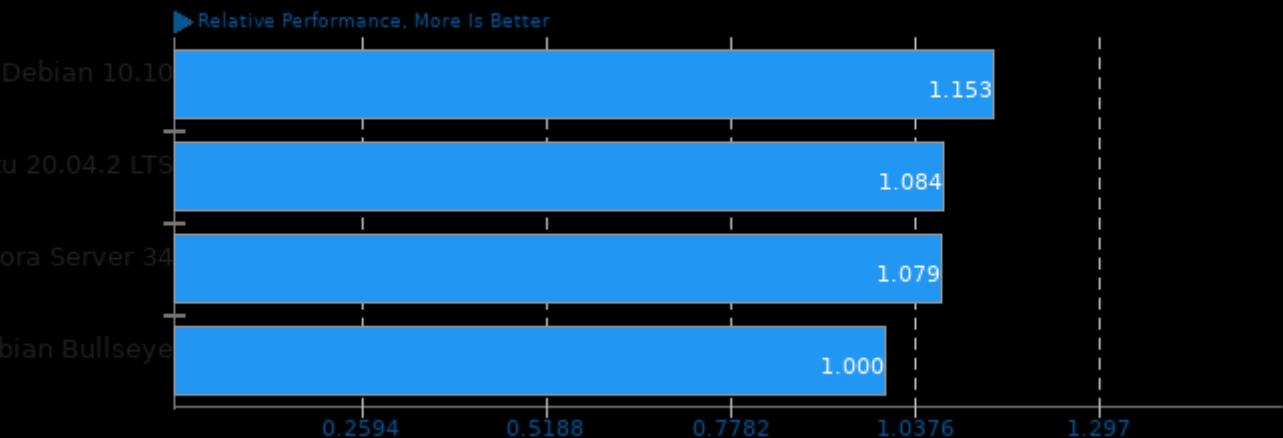
Result Composite - EPYC Tyan Server



Geometric mean based upon tests: pts/npb, pts/namd, pts/svt-av1, pts/svt-hevc, pts/svt-vp9, pts/build-linux-kernel, pts/build-llvm, pts/blender and pts/numamenta-nab

## Geometric Mean Of Video Encoding Tests

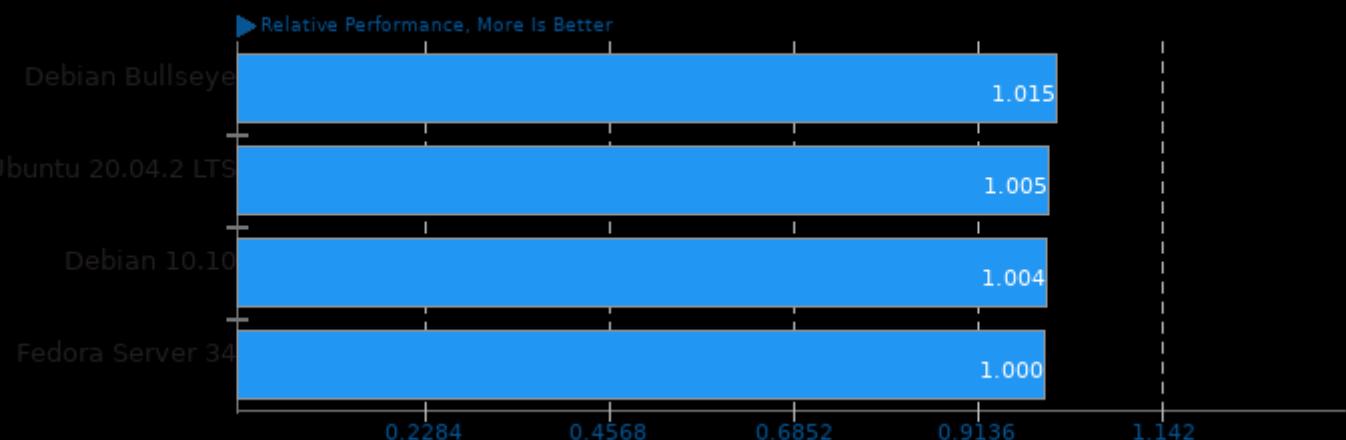
Result Composite - EPYC Tyan Server



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

## Geometric Mean Of Common Workstation Benchmarks Tests

Result Composite - EPYC Tyan Server



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

*This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 09:07.*