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## Ryzen 9 3900X Memory Scaling Benchmarks

AMD Ryzen 9 3900X memory benchmarks on Linux for a future article.

### Automated Executive Summary

*DDR4-3800 had the most wins, coming in first place for 52% of the tests.*

*Based on the geometric mean of all complete results, the fastest (DDR4-3800) was 1.099x the speed of the slowest (DDR4-2600). DDR4-3600 was 0.999x the speed of DDR4-3800, DDR4-3400 was 0.977x the speed of DDR4-3600, DDR4-3200 was 0.988x the speed of DDR4-3400, DDR4-3000 was 0.986x the speed of DDR4-3200, DDR4-2933 was 0.99x the speed of DDR4-3000, DDR4-2600 was 0.967x the speed of DDR4-2933.*

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

*RAMspeed SMP (Type: Add - Benchmark: Floating Point) at 1.37x*

*RAMspeed SMP (Type: Scale - Benchmark: Integer) at 1.304x*

*RAMspeed SMP (Type: Triad - Benchmark: Integer) at 1.297x*

*RAMspeed SMP (Type: Average - Benchmark: Integer) at 1.295x*

*RAMspeed SMP (Type: Triad - Benchmark: Floating Point) at 1.285x*

*Tinymembench (Standard Memcpy) at 1.278x*

*RAMspeed SMP (Type: Average - Benchmark: Floating Point) at 1.276x*

*MBW (Test: Memory Copy - Array Size: 4096 MiB) at 1.274x*

RAMspeed SMP (Type: Add - Benchmark: Integer) at 1.272x  
RAMspeed SMP (Type: Copy - Benchmark: Floating Point) at 1.27x.

## Test Systems:

### DDR4-2600

#### DDR4-2933

Processor: AMD Ryzen 9 3900X 12-Core @ 3.80GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (0066 BIOS), Chipset: AMD Device 1480, Memory: 16384MB, Disk: 2000GB Force MP600, Graphics: Sapphire AMD Baffin [Polaris11] 4GB (1300/1750MHz), Audio: AMD Device aae0, Monitor: ASUS VP28U, Network: Realtek Device 8125 + Intel I211 + Intel Device 2723

OS: Ubuntu 18.04, Kernel: 5.2.0-999-generic (x86\_64) 20190627, Desktop: GNOME Shell 3.28.3, Display Server: X Server 1.20.1, Display Driver: modesetting 1.20.1, OpenGL: 4.5 Mesa 18.2.2 (LLVM 7.0.0), Compiler: GCC 7.4.0, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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

Java Notes: OpenJDK Runtime Environment (build 11.0.3+7-Ubuntu-1ubuntu218.04.1)

Python Notes: Python 2.7.15+ + Python 3.6.8

Security Notes: 11tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of \_\_user pointer sanitization + spectre\_v2: Mitigation of Full AMD retrpoline IBPB: conditional STIBP: always-on RSB filling

### DDR4-3000

### DDR4-3200

### DDR4-3400

### DDR4-3600

Processor: AMD Ryzen 9 3900X 12-Core @ 3.80GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (0066 BIOS), Chipset: AMD Device 1480, Memory: 16384MB, Disk: 2000GB Force MP600 + 64GB Flash Drive, Graphics: Sapphire AMD Baffin [Polaris11] 4GB (1300/1750MHz), Audio: AMD Device aae0, Monitor: ASUS VP28U, Network: Realtek Device 8125 + Intel I211 + Intel Device 2723

OS: Ubuntu 18.04, Kernel: 5.2.0-999-generic (x86\_64) 20190627, Desktop: GNOME Shell 3.28.3, Display Server: X Server 1.20.1, Display Driver: modesetting 1.20.1, OpenGL: 4.5 Mesa 18.2.2 (LLVM 7.0.0), Compiler: GCC 7.4.0, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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

Java Notes: OpenJDK Runtime Environment (build 11.0.3+7-Ubuntu-1ubuntu218.04.1)

Python Notes: Python 2.7.15+ + Python 3.6.8

Security Notes: I1tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of \_\_user pointer sanitization + spectre\_v2: Mitigation of Full AMD retpoline IBPB: conditional STIBP: always-on RSB filling

## DDR4-3800

Processor: AMD Ryzen 9 3900X 12-Core @ 3.80GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (0066 BIOS), Chipset: AMD Device 1480, Memory: 16384MB, Disk: 2000GB Force MP600, Graphics: Sapphire AMD Baffin [Polaris11] 4GB (1300/1750MHz), Audio: AMD Device aae0, Monitor: ASUS VP28U, Network: Realtek Device 8125 + Intel I211 + Intel Device 2723

OS: Ubuntu 18.04, Kernel: 5.2.0-999-generic (x86\_64) 20190627, Desktop: GNOME Shell 3.28.3, Display Server: X Server 1.20.1, Display Driver: modesetting 1.20.1, OpenGL: 4.5 Mesa 18.2.2 (LLVM 7.0.0), Compiler: GCC 7.4.0, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale-gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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  
 Java Notes: OpenJDK Runtime Environment (build 11.0.3+7-Ubuntu-1ubuntu218.04.1)  
 Python Notes: Python 2.7.15+ + Python 3.6.8  
 Security Notes: I1tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of \_\_user pointer sanitization + spectre\_v2: Mitigation of Full AMD retpoline IBPB: conditional STIBP: always-on RSB filling

	DDR4-2600	DDR4-2933	DDR4-3000	DDR4-3200	DDR4-3400	DDR4-3600	DDR4-3800
<b>Parboil - OpenMP LBM (sec)</b>	<b>159.09</b>	155.55	152.32	154.47	152.16	150.34	<b>145.00</b>
Normalized	91.14%	93.22%	95.19%	93.87%	95.29%	96.45%	100%
Standard Deviation	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%	0.3%
<b>NAS Parallel Benchmarks - L.U.C (Mop/s)</b>	<b>20554</b>	20906	21262	21040	21295	21491	<b>22301</b>
Normalized	92.17%	93.74%	95.34%	94.35%	95.49%	96.37%	100%
Standard Deviation	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
<b>VP9 libvpx Encoding - v.V.1.V.E (FPS)</b>	<b>166.05</b>	168.23	168.02	170.28	<b>170.69</b>	169.12	169.21
Normalized	97.28%	98.56%	98.44%	99.76%	100%	99.08%	99.13%
Standard Deviation	0.7%	0.6%	0.7%	0.8%	0.8%	0.2%	0.6%
<b>Apache Siege - 250 Transactions/sec)</b>	35421	35618	<b>36243</b>	35905	34742	34560	<b>27602</b>
Normalized	97.73%	98.28%	100%	99.07%	95.86%	95.36%	76.16%
Standard Deviation	7%	6.4%	1.8%	3.4%	10.3%	12.3%	1.4%
<b>PostgreSQL pgbench - 287832</b>	287832	<b>286246</b>	286902	287137	287496	287775	<b>288638</b>
<b>Buffer Test - Normal Load - Read Only (TPS)</b>							
Normalized	99.72%	99.17%	99.4%	99.48%	99.6%	99.7%	100%
Standard Deviation	0.1%	0.2%	0.2%	0.1%	0.2%	0.1%	0.2%

## Ryzen 9 3900X Memory Scaling Benchmarks

Tinymembench - Standard Memset (MB/s)	<b>12743</b>	13528	13945	14496	14548	<b>14896</b>	14842
Normalized	85.55%	90.82%	93.61%	97.31%	97.66%	100%	99.64%
Standard Deviation	0.8%	0.8%	0.7%	1.2%	0.7%	0.4%	3.2%
Tinymembench - Standard Memcpy (MB/s)	<b>15671</b>	16893	17282	18332	18922	20005	<b>20027</b>
Normalized	78.25%	84.35%	86.29%	91.54%	94.48%	99.89%	100%
Standard Deviation	0.1%	0.1%	0.4%	0.1%	0.4%	0.5%	0.4%
RAMspeed SMP - Scale - Integer (MB/s)	<b>21296</b>	23520	23110	24129	24913	27101	<b>27762</b>
Normalized	76.71%	84.72%	83.24%	86.91%	89.74%	97.62%	100%
Standard Deviation	0.7%	1%	2.2%	0.7%	1.6%		
RAMspeed SMP - Copy - Integer (MB/s)	<b>22450</b>	22991	24114	24350	25066	<b>27729</b>	25699
Normalized	80.96%	82.91%	86.96%	87.81%	90.39%	100%	92.68%
Standard Deviation	0.1%	2.7%	1.6%	1.5%	0.2%		
RAMspeed SMP - Add - Integer (MB/s)	<b>25918</b>	26243	26761	28103	31268	<b>32972</b>	31772
Normalized	78.61%	79.59%	81.16%	85.23%	94.83%	100%	96.36%
Standard Deviation	1.3%	1.1%	2.5%	1.8%	2.2%		
RAMspeed SMP - Average - Integer (MB/s)	<b>23492</b>	25662	26088	26046	27138	29842	<b>30422</b>
Normalized	77.22%	84.35%	85.75%	85.62%	89.2%	98.09%	100%
Standard Deviation	2.6%	0.1%	0.8%	1.4%	2.2%		
RAMspeed SMP - Add - Floating Point (MB/s)	<b>24408</b>	27703	28422	30133	28989	32701	<b>33449</b>
Normalized	72.97%	82.82%	84.97%	90.09%	86.67%	97.77%	100%
Standard Deviation	0.1%	2.6%	1.4%	0.6%	1.8%		
RAMspeed SMP - Triad - Integer (MB/s)	<b>24547</b>	27393	27791	29515	30159	<b>31843</b>	30647
Normalized	77.09%	86.02%	87.28%	92.69%	94.71%	100%	96.24%
Standard Deviation	2.4%	0.1%	1.4%	0.1%	1.9%		
RAMspeed SMP - Average - Floating Point (MB/s)	<b>24013</b>	25269	26061	27592	28360	28017	<b>30642</b>
Normalized	78.37%	82.46%	85.05%	90.05%	92.55%	91.44%	100%
Standard Deviation	0.2%	2.9%	1.9%	0.1%	1.7%		
RAMspeed SMP - Triad - Floating Point (MB/s)	<b>25785</b>	27664	28135	29679	30690	32479	<b>33134</b>
Normalized	77.82%	83.49%	84.91%	89.57%	92.62%	98.02%	100%
Standard Deviation	1.4%	2.2%	2.1%	2.2%	1.9%		
RAMspeed SMP - Copy - Floating Point (MB/s)	<b>22301</b>	23712	24048	25442	26065	27567	<b>28318</b>
Normalized	78.75%	83.73%	84.92%	89.84%	92.04%	97.35%	100%
Standard Deviation	0.1%	0.9%	1.8%	0.1%	0.9%		
RAMspeed SMP - Scale - Floating Point (MB/s)	<b>22067</b>	23464	23844	25112	25705	27230	<b>27971</b>
Normalized	78.89%	83.89%	85.24%	89.78%	91.9%	97.35%	100%
Standard Deviation	0.1%	0%	0.6%	0.1%	1.2%		
CP2K Molecular Dynamics - Fayalite-FIST	<b>338.84</b>	327.98	329.42	326.66	327.69	327.02	<b>323.90</b>
Normalized	95.59%	98.76%	98.32%	99.16%	98.84%	99.05%	100%
Standard Deviation	0.4%	0.1%	0.1%	0.8%	0.5%		

## Ryzen 9 3900X Memory Scaling Benchmarks

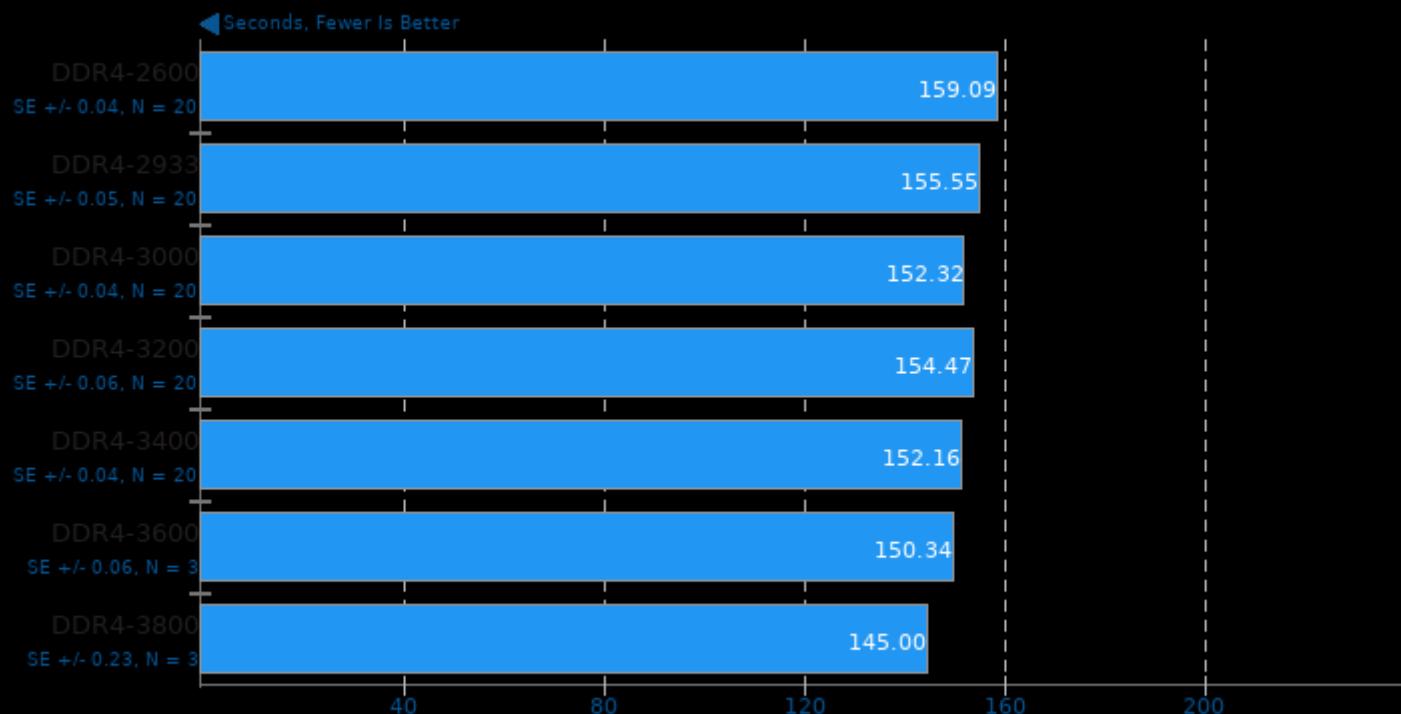
<b>DaCapo Benchmark - Tradebeans (msec)</b>	<b>4318</b>	4247	4236	4175	4141	<b>4140</b>	4161
Normalized	95.88%	97.48%	97.73%	99.16%	99.98%	100%	99.5%
Standard Deviation	1.2%	1.1%	0.9%	0.9%	0.9%	1.8%	0.7%
<b>Timed Linux Kernel</b>	47.96	47.70	47.83	<b>47.66</b>	47.90	48.12	<b>48.20</b>
<b>Compilation - Time To Compile (sec)</b>							
Normalized	99.37%	99.92%	99.64%	100%	99.5%	99.04%	98.88%
Standard Deviation	1.2%	1.2%	1.4%	1.4%	1.3%	2.2%	2.9%
<b>John The Ripper - Blowfish (Real C/S)</b>	<b>28240</b>	28535	28546	28498	28475	28476	<b>28688</b>
Normalized	98.44%	99.47%	99.51%	99.34%	99.26%	99.26%	100%
Standard Deviation	5.8%	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%
<b>Timed LLVM Compilation - Time To Compile (sec)</b>	293.52	<b>288.02</b>	288.77	291.47	288.74	292.10	<b>297.22</b>
Normalized	98.13%	100%	99.74%	98.82%	99.75%	98.6%	96.9%
Standard Deviation	2.2%	1.8%	1.7%	1.2%	1.1%		
<b>7-Zip Compression - C.S.T (MIPS)</b>	<b>75996</b>	77127	77403	77626	78070	78317	<b>78362</b>
Normalized	96.98%	98.42%	98.78%	99.06%	99.63%	99.94%	100%
Standard Deviation	0.4%	0.5%	0.6%	0.5%	0.4%	0.5%	0.6%
<b>NAS Parallel Benchmarks - BT.A (Mop/s)</b>	<b>6191</b>	6287	6302	6366	6378	<b>6448</b>	6355
Normalized	96.01%	97.5%	97.74%	98.72%	98.92%	100%	98.55%
Standard Deviation	0.5%	0.5%	0.3%	0.5%	0.5%	0.3%	0.3%
<b>Stream - Copy (MB/s)</b>	<b>29638</b>	30565	31245	31772	31772	32716	<b>32901</b>
Normalized	90.08%	92.9%	94.97%	96.57%	96.57%	99.44%	100%
Standard Deviation	0.1%	0.1%	0.1%	0.1%	0.7%	0.3%	0.1%
<b>Rodinia - O.S (sec)</b>	<b>21.91</b>	21.19	21.61	21.55	21.37	<b>21.01</b>	21.17
Normalized	95.89%	99.15%	97.22%	97.49%	98.32%	100%	99.24%
Standard Deviation	0.3%	0.5%	0.8%	0.4%	0.2%	0.7%	0.1%
<b>NAS Parallel Benchmarks - SP.A (Mop/s)</b>	<b>4012</b>	4157	4197	4297	4341	<b>4410</b>	4287
Normalized	90.97%	94.25%	95.16%	97.44%	98.43%	100%	97.21%
Standard Deviation	0.3%	0.4%	0.4%	0.3%	0.4%	0.2%	0.1%
<b>t-test1 - 1 (sec)</b>	20.57	<b>20.66</b>	20.53	20.40	20.50	<b>20.53</b>	<b>20.21</b>
Normalized	98.25%	97.82%	98.44%	99.07%	98.59%	98.44%	100%
Standard Deviation	0.3%	0.3%	0.4%	0.4%	0.3%	0.6%	0.4%
<b>Zstd Compression - C.u.1.0.3.s.i.i.C.L.1 (sec)</b>	<b>19.46</b>	18.81	18.64	18.62	18.24	<b>18.05</b>	18.47
Normalized	92.75%	95.96%	96.83%	96.94%	98.96%	100%	97.73%
Standard Deviation	0.4%	0.4%	0.2%	0.3%	0.3%	0.6%	0.5%
<b>NAS Parallel Benchmarks - EP.C (Mop/s)</b>	481.46	481.66	482.02	481.99	<b>480.79</b>	<b>482.27</b>	481.91
Normalized	99.83%	99.87%	99.95%	99.94%	99.69%	100%	99.93%
Standard Deviation	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%
<b>MBW - M.C.F.B.S - 4096 MiB (MiB/s)</b>	<b>8209</b>	8973	8918	9333	9572	<b>10142</b>	9846
Normalized	80.94%	88.47%	87.93%	92.02%	94.38%	100%	97.08%
Standard Deviation	2.1%	1.6%	1.2%	2.6%	1.7%	0.8%	2.8%
<b>DaCapo Benchmark - H2 (msec)</b>	<b>3247</b>	3215	3208	3169	3155	3183	<b>3136</b>
Normalized	96.58%	97.54%	97.76%	98.96%	99.4%	98.52%	100%

## Ryzen 9 3900X Memory Scaling Benchmarks

	Standard Deviation	2.6%	3%	3%	3.2%	1.7%	0.6%
<b>Darktable - Boat - CPU-only (sec)</b>	<b>11.92</b>	11.72	11.46	11.59	11.45	11.23	<b>10.87</b>
Normalized	91.19%	92.75%	94.85%	93.79%	94.93%	96.79%	100%
Standard Deviation	0.3%	0.2%	0.3%	0.2%	0.2%	0.1%	0.3%
<b>x265 - H.2.1.V.E (FPS)</b>	<b>51.65</b>	51.85	51.75	51.90	51.88	<b>51.92</b>	51.68
Normalized	99.48%	99.87%	99.67%	99.96%	99.92%	100%	99.54%
Standard Deviation	0.7%	0.8%	0.8%	0.5%	0.5%	1.1%	0.9%
<b>MBW - Memory Copy - 4096 MiB (MiB/s)</b>	<b>15049</b>	16762	16729	17615	18221	19077	<b>19171</b>
Normalized	78.5%	87.43%	87.26%	91.88%	95.04%	99.51%	100%
Standard Deviation	0.2%	0.5%	0.6%	0.6%	0.8%	0.5%	0.1%
<b>t-test1 - 2 (sec)</b>	<b>7.39</b>	7.27	7.23	7.20	<b>7.13</b>	7.27	7.19
Normalized	96.48%	98.07%	98.62%	99.03%	100%	98.07%	99.17%
Standard Deviation	0.6%	0.7%	0.6%	0.5%	0.5%	1.1%	0.3%
<b>Darktable - Masskrug - CPU-only (sec)</b>	<b>4.94</b>	4.82	4.77	4.75	4.72	<b>4.62</b>	4.72
Normalized	93.52%	95.85%	96.86%	97.26%	97.88%	100%	97.88%
Standard Deviation	0.8%	0.6%	0.5%	0.7%	0.5%	0.4%	0.6%
<b>DaCapo Benchmark - Jython (msec)</b>	4083	<b>4095</b>	4075	<b>4022</b>	4038	4039	4081
Normalized	98.51%	98.22%	98.7%	100%	99.6%	99.58%	98.55%
Standard Deviation	1.1%	1.2%	1%	1.4%	1.5%	1.2%	0.6%
<b>SVT-AV1 - 1.8.b.Y.T.A.V.E (FPS)</b>	<b>45.57</b>	45.75	45.84	45.85	<b>45.92</b>	45.69	45.60
Normalized	99.24%	99.63%	99.83%	99.85%	100%	99.5%	99.3%
Standard Deviation	0.6%	0.6%	0.4%	0.8%	0.7%	1.3%	0.7%
<b>Darktable - Server Room - CPU-only (sec)</b>	<b>3.69</b>	3.65	3.60	3.64	3.61	3.57	<b>3.47</b>
Normalized	94.04%	95.07%	96.39%	95.33%	96.12%	97.2%	100%
Standard Deviation	0.4%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%
<b>CloverLeaf - L.E.H (sec)</b>	<b>3.87</b>	3.78	3.69	3.76	3.69	3.67	<b>3.50</b>
Normalized	90.44%	92.59%	94.85%	93.09%	94.85%	95.37%	100%
Standard Deviation	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
<b>Parboil - OpenMP CUTCP (sec)</b>	<b>2.31</b>	2.26	2.25	2.23	<b>2.20</b>	<b>2.20</b>	2.21
Normalized	95.24%	97.35%	97.78%	98.65%	100%	100%	99.55%
Standard Deviation	0.6%	0.8%	0.8%	0.7%	0.7%	0.2%	1%
<b>Darktable - Server Rack - CPU-only (sec)</b>	<b>0.21</b>	0.20	0.20	0.20	0.20	<b>0.19</b>	<b>0.19</b>
Normalized	90.48%	95%	95%	95%	95%	100%	100%
Standard Deviation	0.9%	2%	1.1%	1.1%	1.2%	1.6%	1.5%
<b>Stream - Add (MB/s)</b>	<b>18201</b>	18473	18914	18559	18861	19210	<b>19972</b>
Normalized	91.13%	92.49%	94.7%	92.92%	94.44%	96.18%	100%
Standard Deviation	0.1%	0.1%	0.5%	0.2%	0.3%	0.2%	0.6%
<b>Stream - Triad (MB/s)</b>	<b>18127</b>	18423	18837	18471	18789	19113	<b>19968</b>
Normalized	90.78%	92.26%	94.34%	92.51%	94.1%	95.72%	100%
Standard Deviation	0.1%	0.1%	0.3%	0.1%	0.1%	0.1%	0.2%
<b>Stream - Scale (MB/s)</b>	<b>15735</b>	16042	16384	16156	16383	16602	<b>17173</b>
Normalized	91.63%	93.42%	95.41%	94.08%	95.4%	96.68%	100%
Standard Deviation	0%	0%	0%	0%	0.1%	0.1%	0.1%

### Parboil 2.5

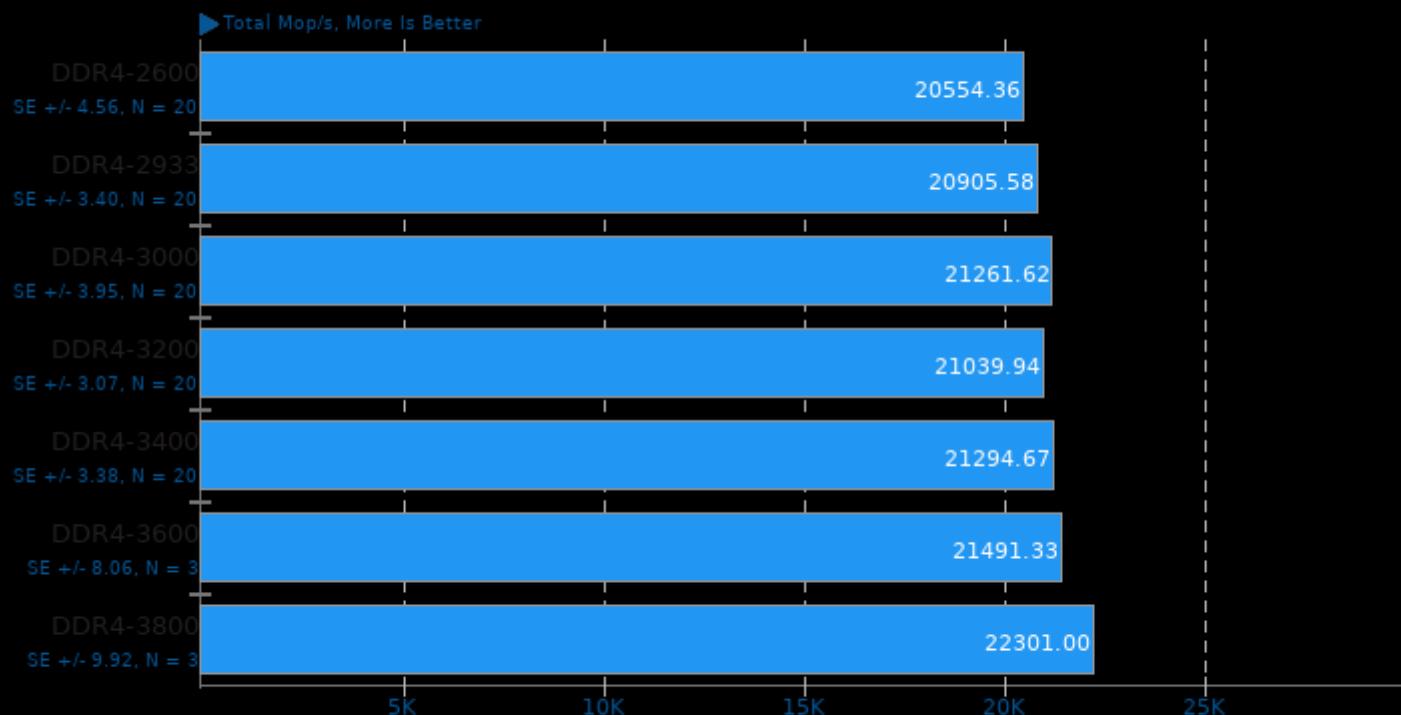
Test: OpenMP LBM



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

### NAS Parallel Benchmarks 3.3.1

Test / Class: LU.C

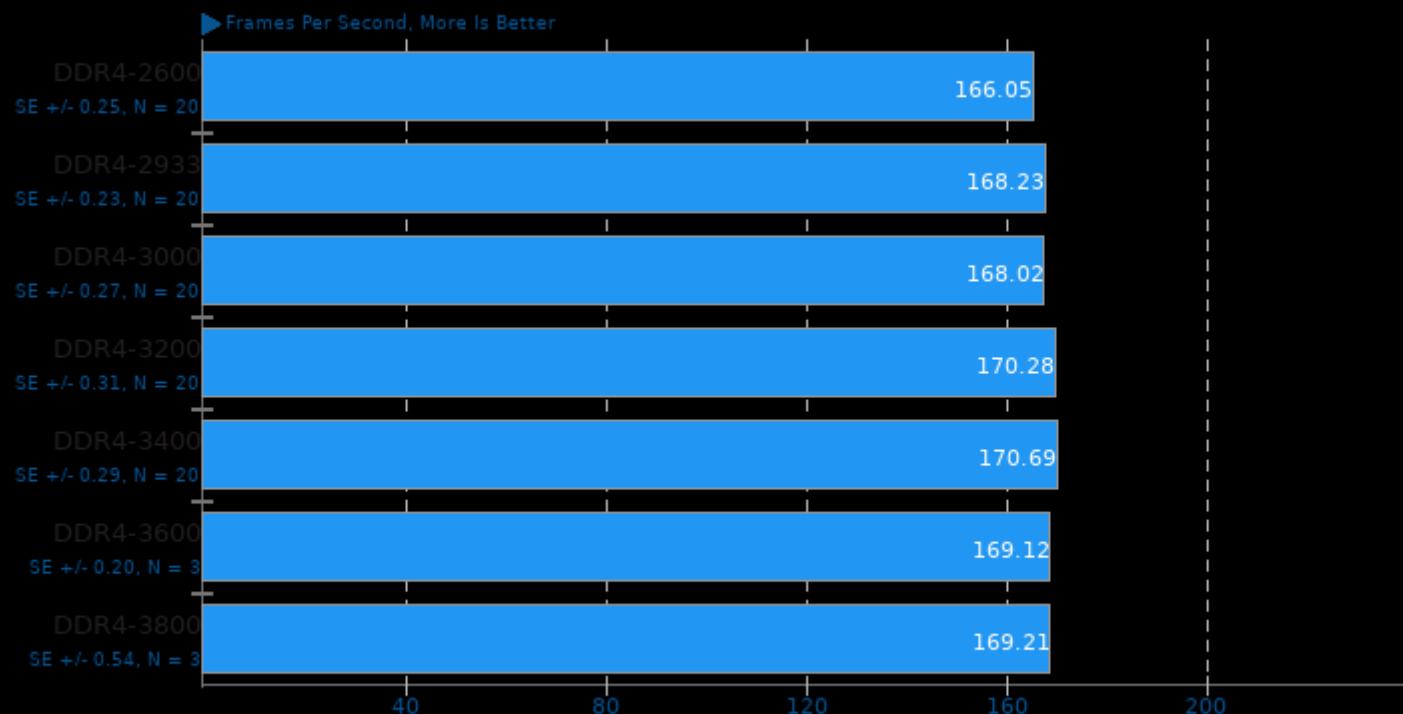


1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi

2. Open MPI 2.1.1

## VP9 libvpx Encoding 1.8.0

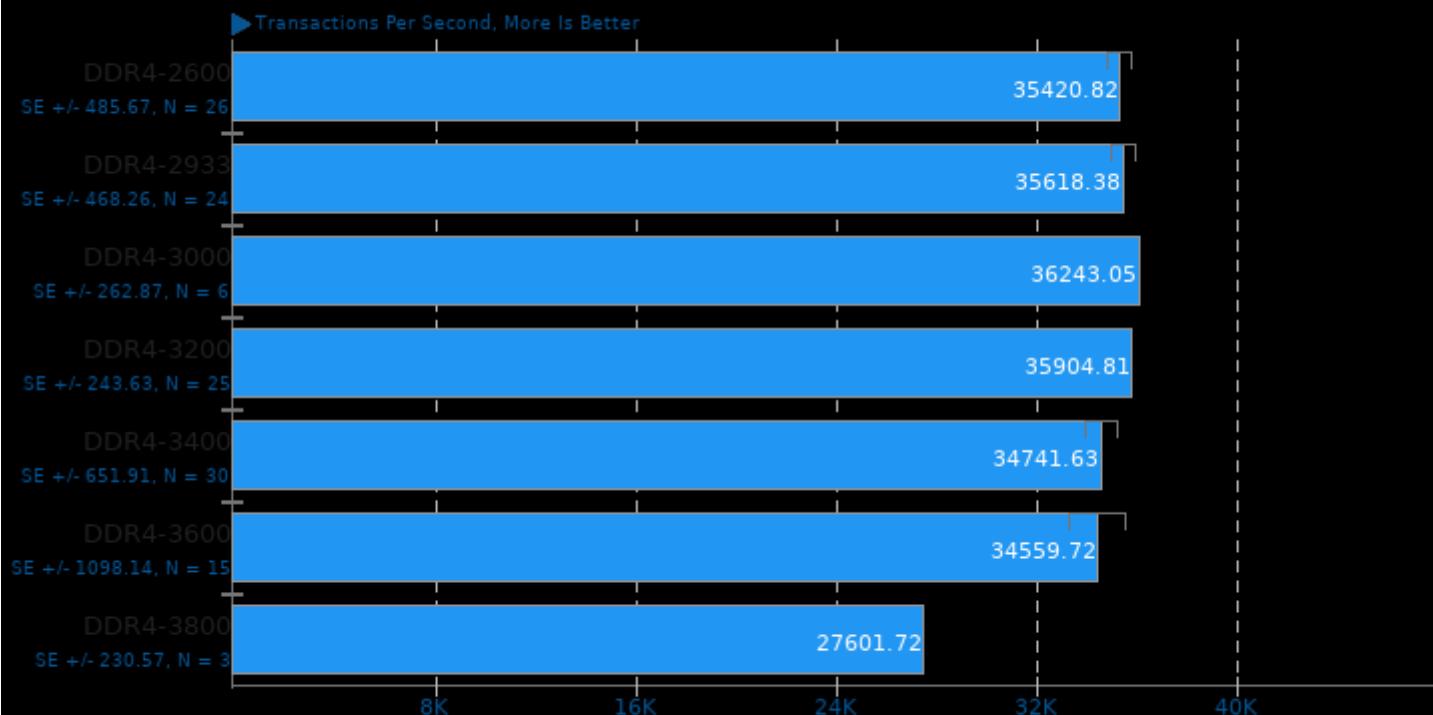
vpxenc VP9 1080p Video Encode



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

## Apache Siege 2.4.29

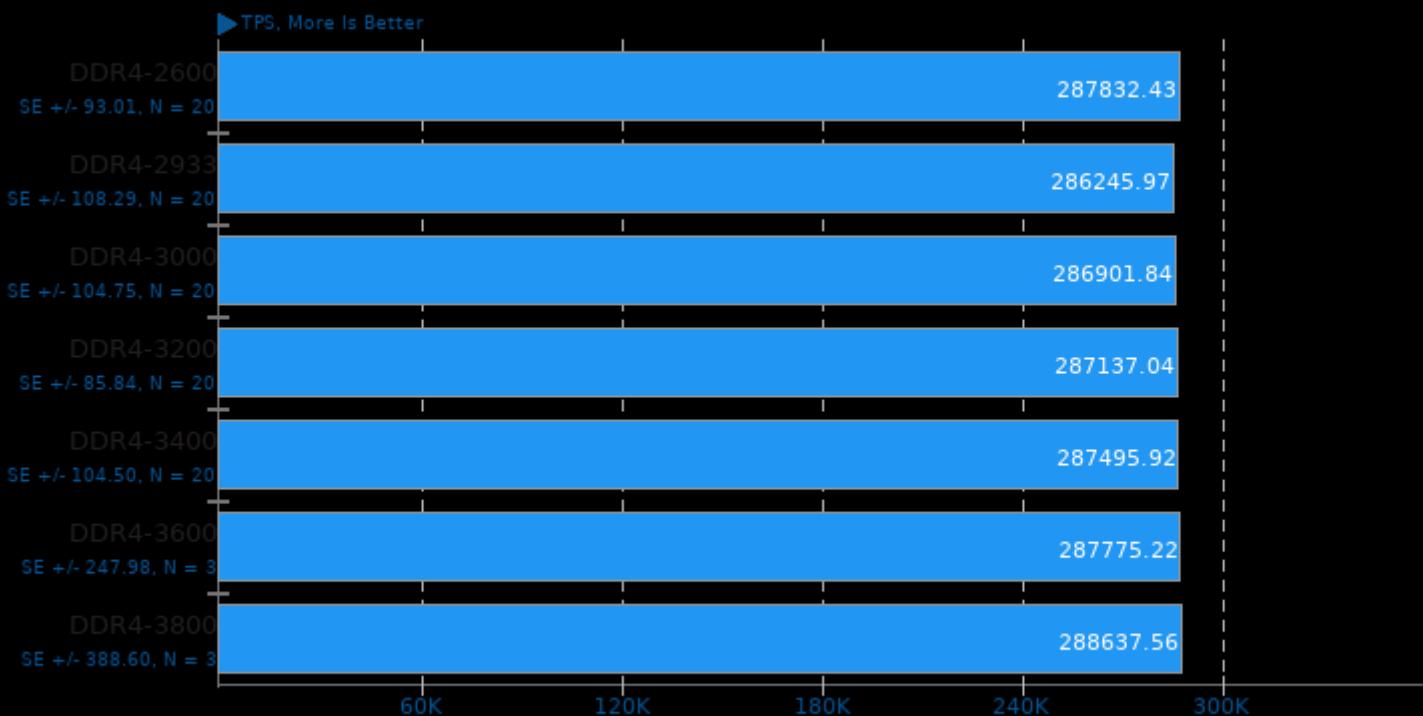
Concurrent Users: 250



1. (CC) gcc options: -O2 -fPIC -std=c++11

## PostgreSQL pgbench 10.3

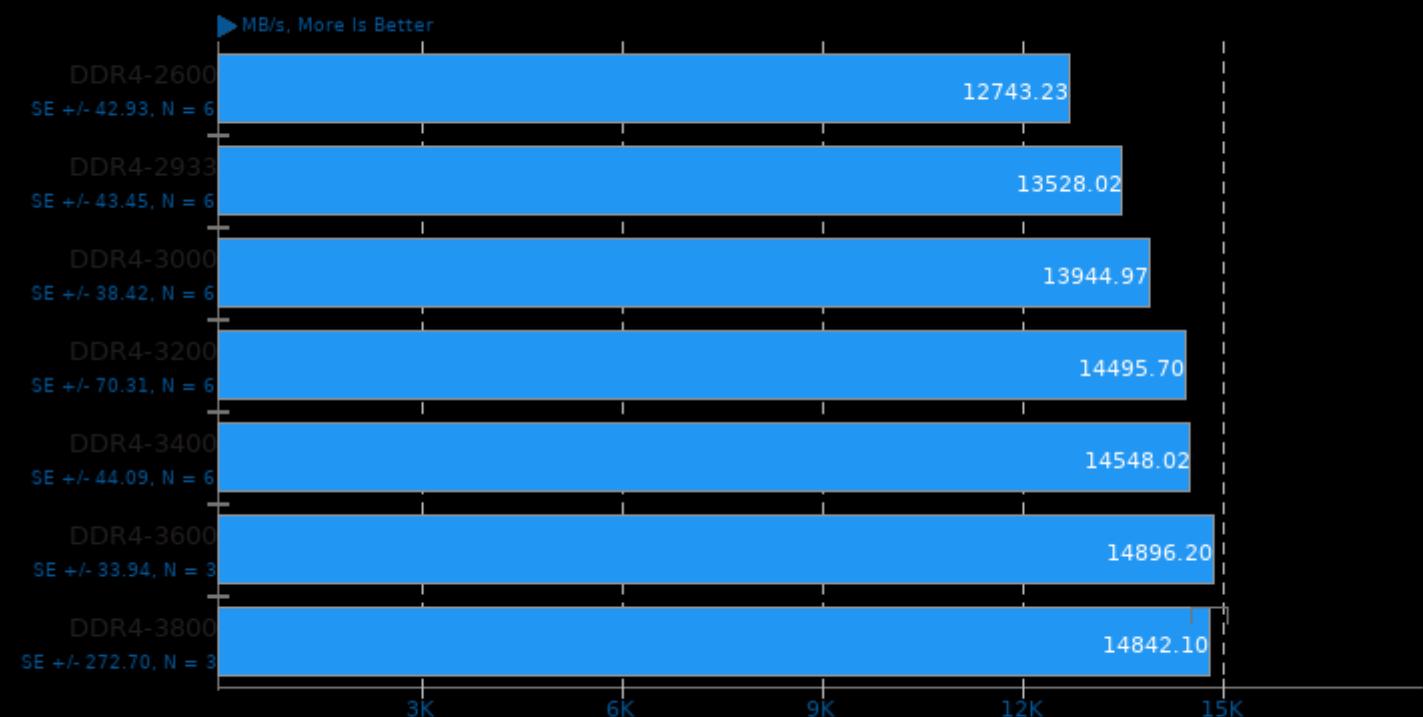
Scaling: Buffer Test - Test: Normal Load - Mode: Read Only



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

## Tinymembench 2018-05-28

Standard Memset

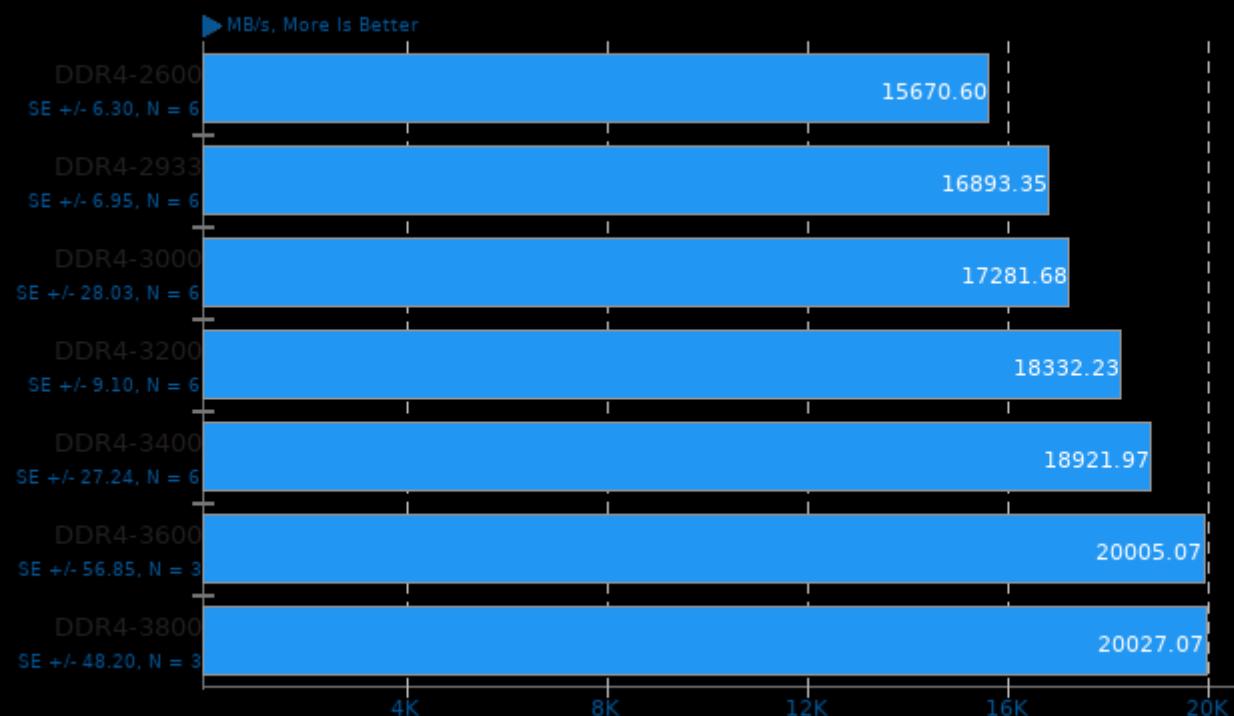


1. (CC) gcc options: -O2 -lm

## Ryzen 9 3900X Memory Scaling Benchmarks

### Tinymembench 2018-05-28

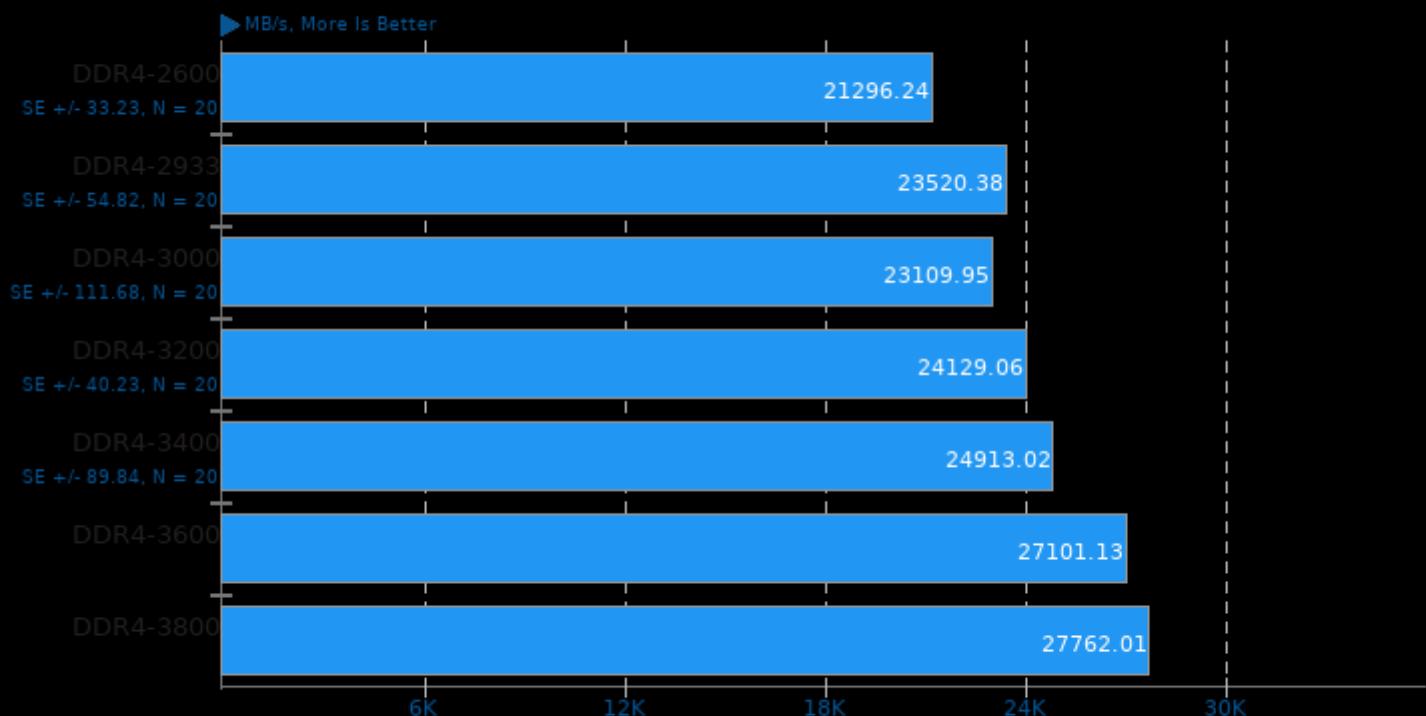
Standard Memcpy



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

### RAMspeed SMP 3.5.0

Type: Scale - Benchmark: Integer

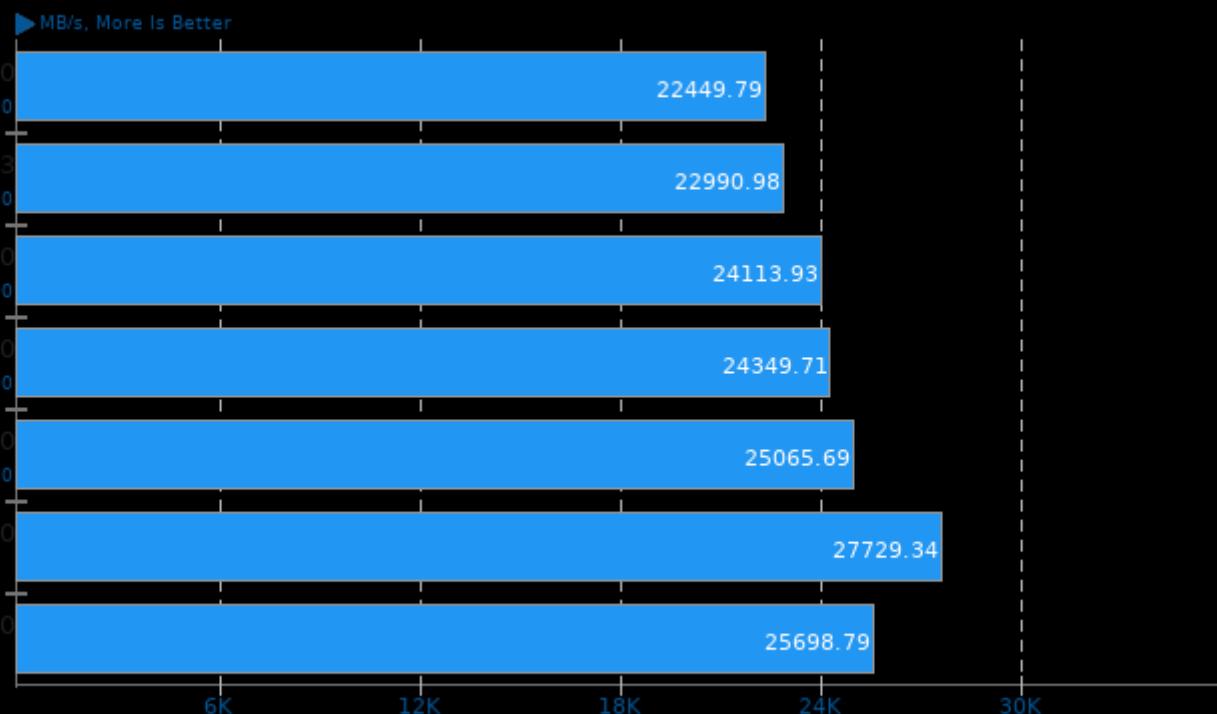


1. (CC) gcc options: -O3 -march=native

## Ryzen 9 3900X Memory Scaling Benchmarks

### RAMspeed SMP 3.5.0

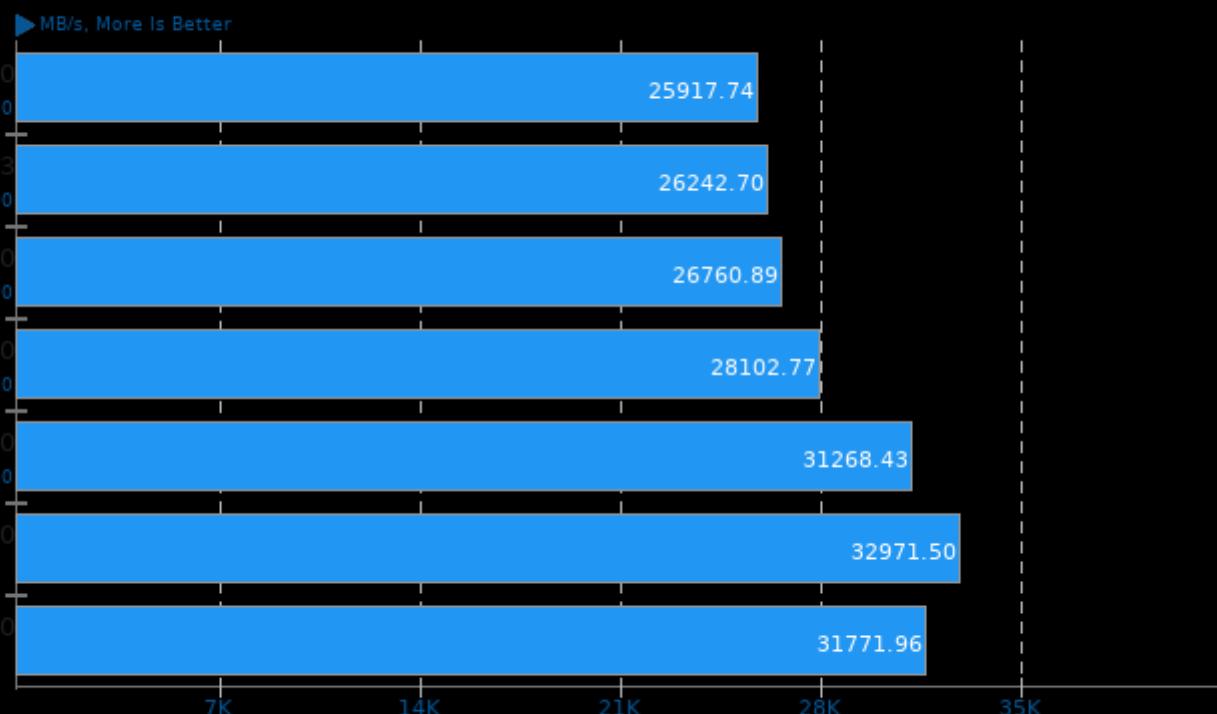
Type: Copy - Benchmark: Integer



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

### RAMspeed SMP 3.5.0

Type: Add - Benchmark: Integer

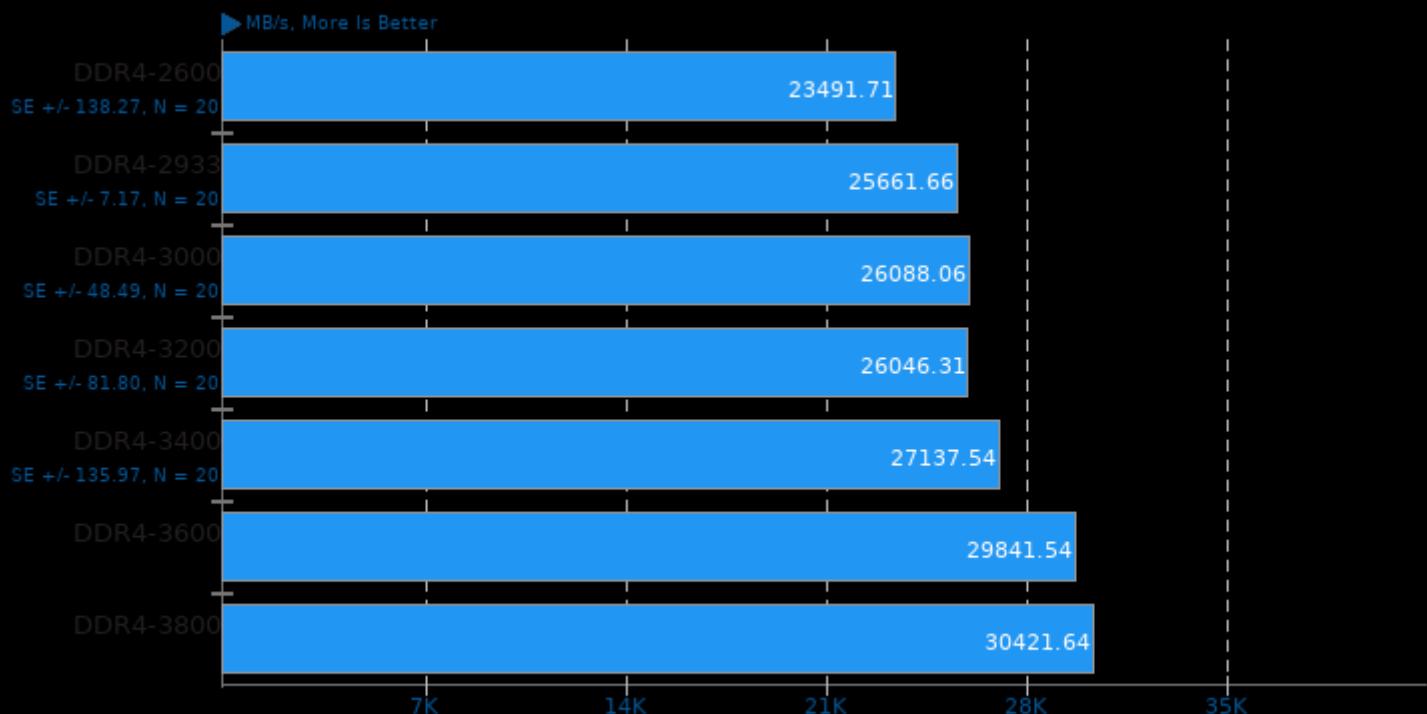


1. (CC) gcc options: -O3 -march=native

## Ryzen 9 3900X Memory Scaling Benchmarks

### RAMspeed SMP 3.5.0

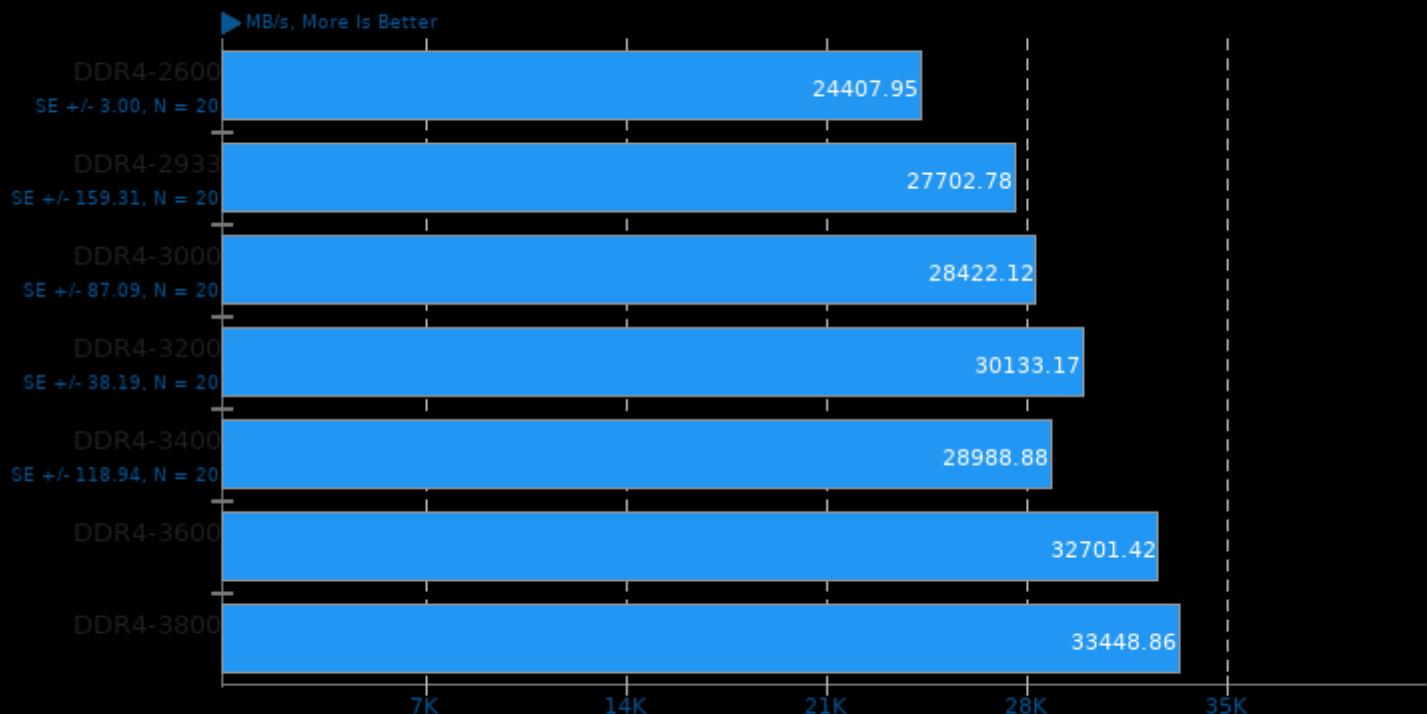
Type: Average - Benchmark: Integer



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

### RAMspeed SMP 3.5.0

Type: Add - Benchmark: Floating Point

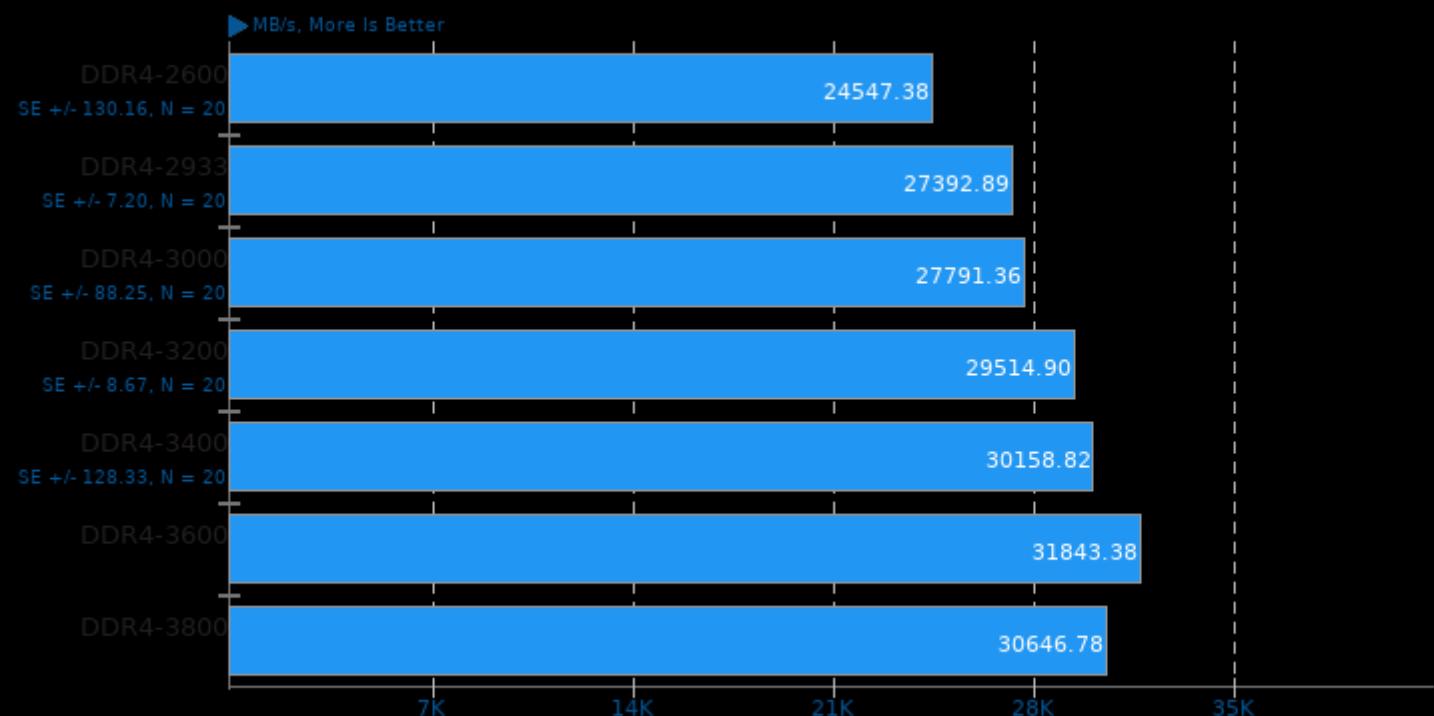


1. (CC) gcc options: -O3 -march=native

## Ryzen 9 3900X Memory Scaling Benchmarks

### RAMspeed SMP 3.5.0

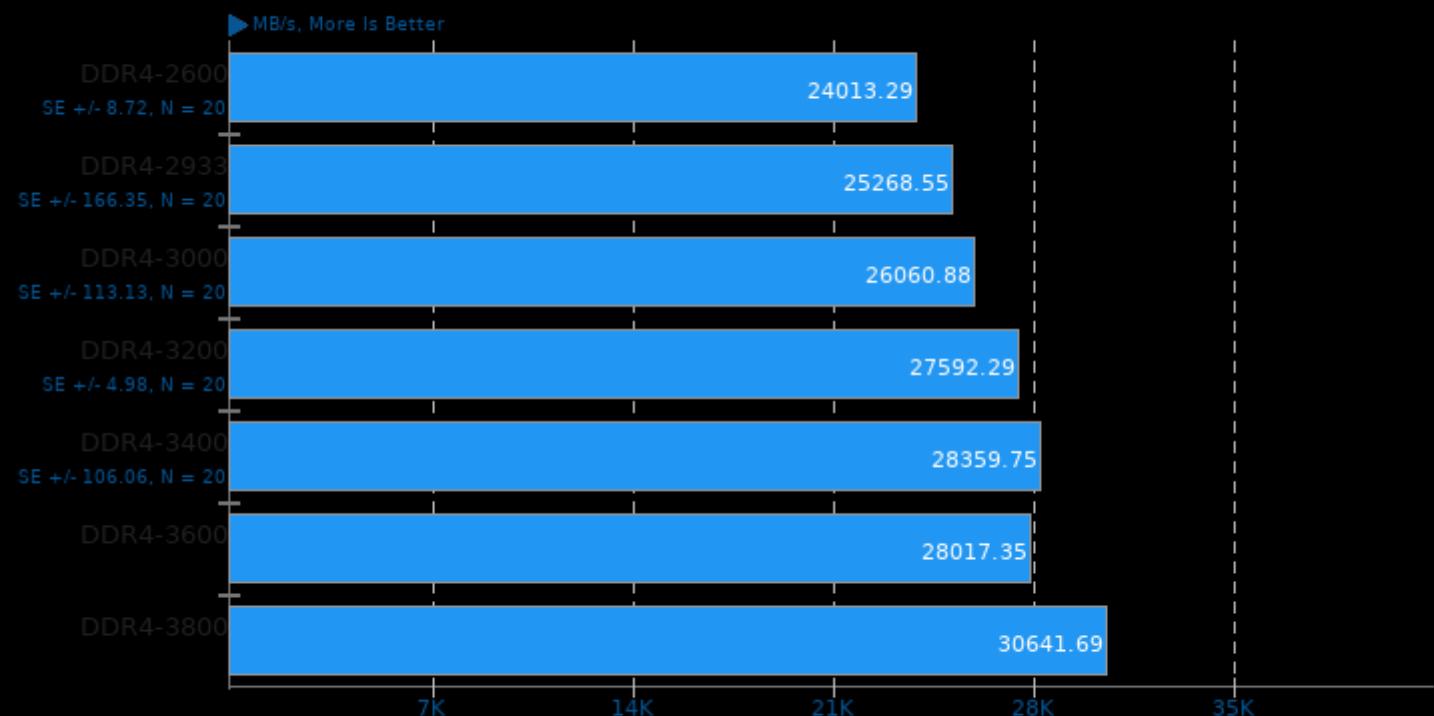
Type: Triad - Benchmark: Integer



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

### RAMspeed SMP 3.5.0

Type: Average - Benchmark: Floating Point

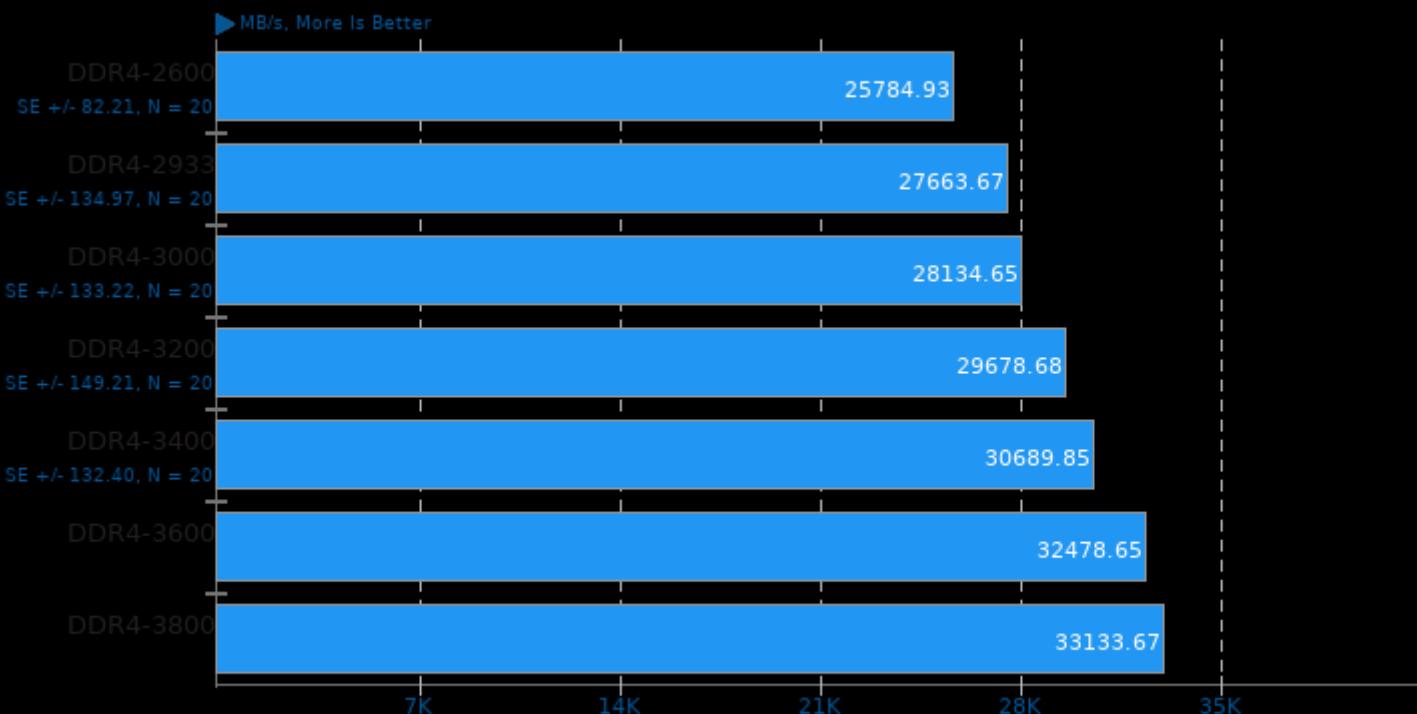


1. (CC) gcc options: -O3 -march=native

## Ryzen 9 3900X Memory Scaling Benchmarks

### RAMspeed SMP 3.5.0

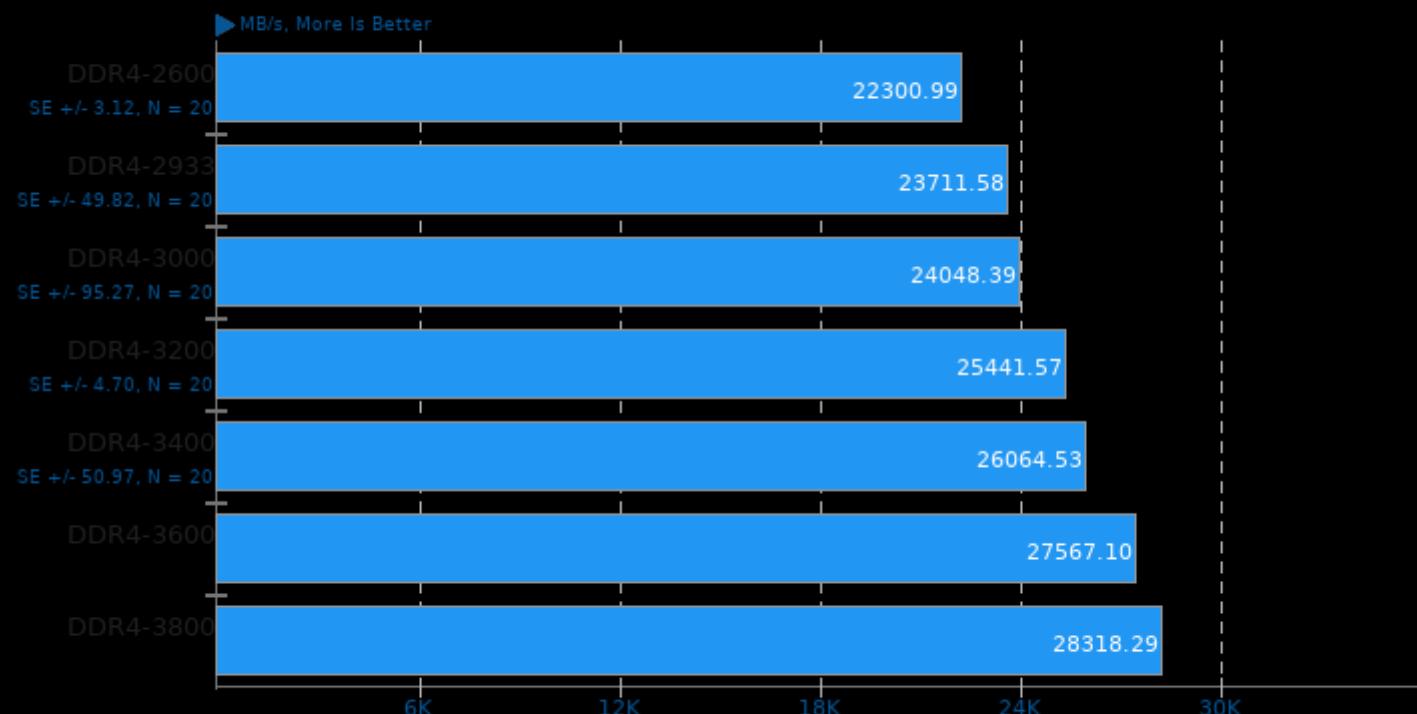
Type: Triad - Benchmark: Floating Point



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

### RAMspeed SMP 3.5.0

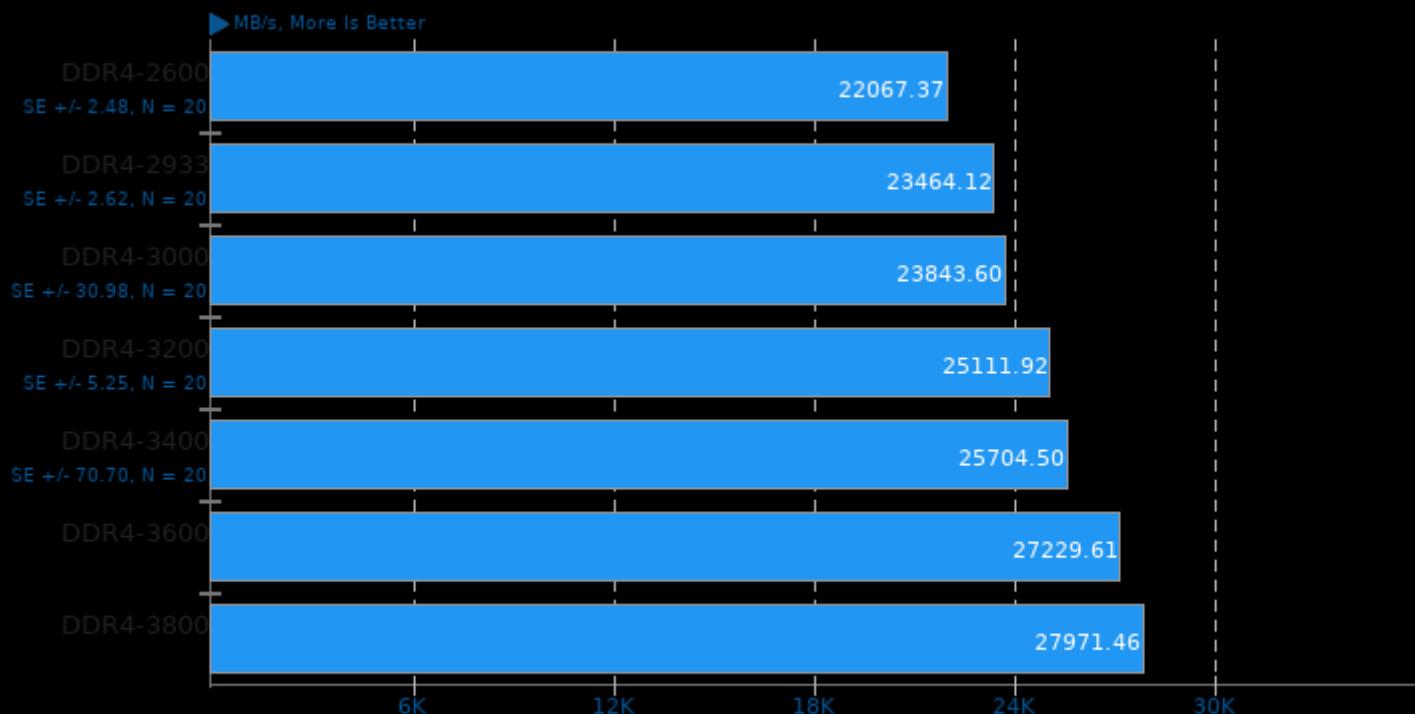
Type: Copy - Benchmark: Floating Point



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

## RAMspeed SMP 3.5.0

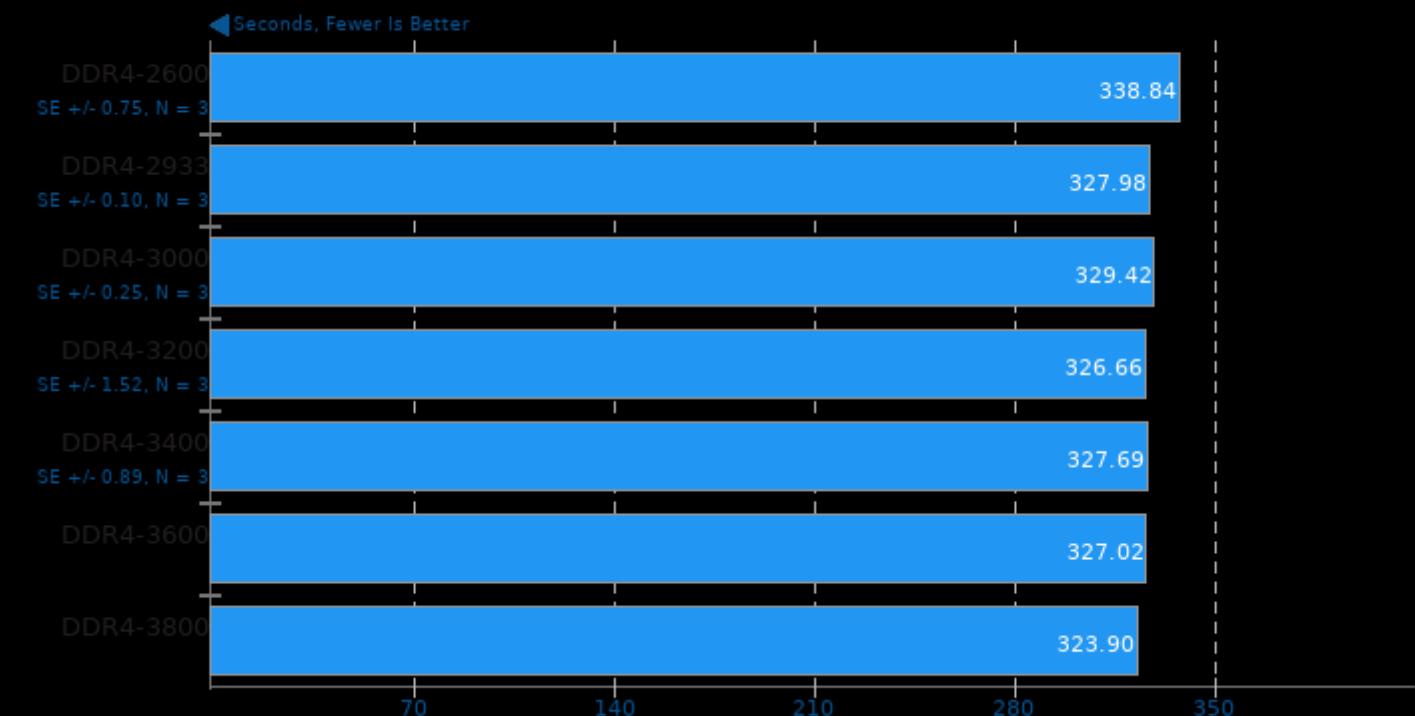
Type: Scale - Benchmark: Floating Point



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

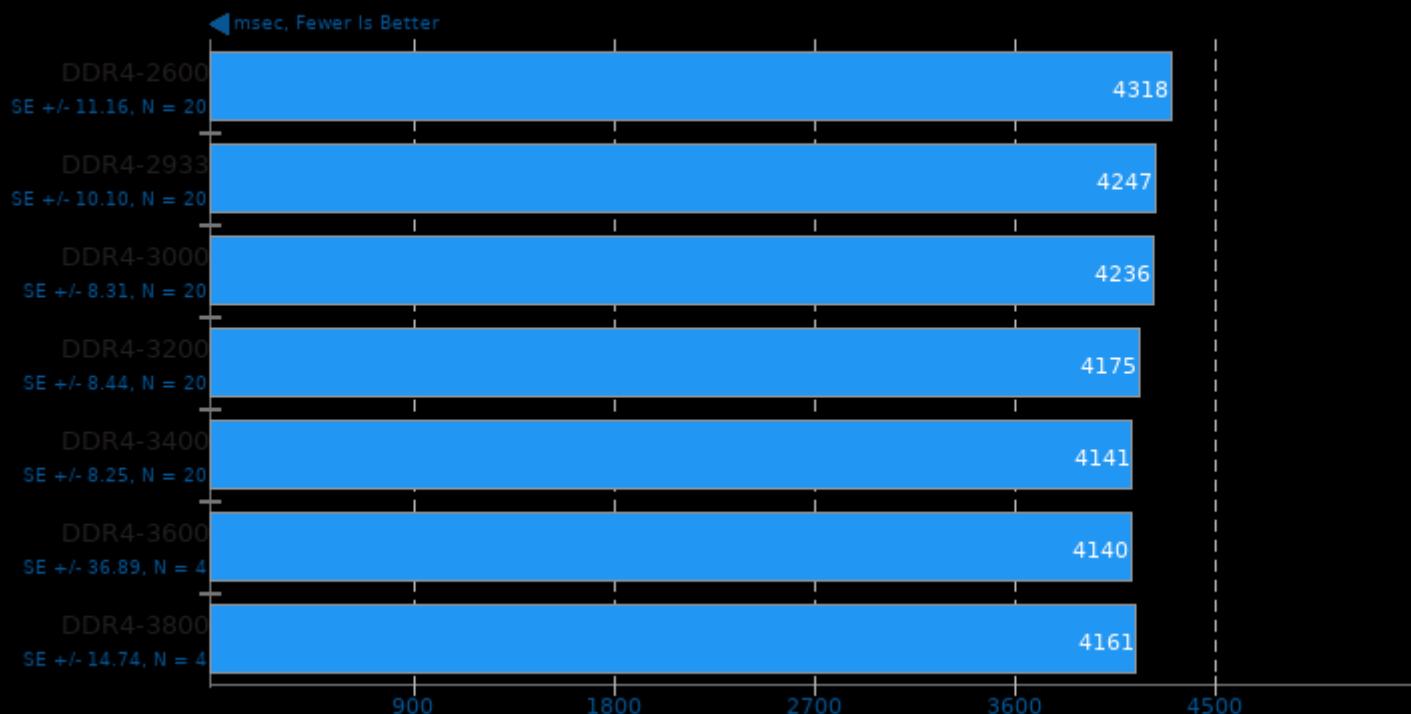
## CP2K Molecular Dynamics 6.1

Fayalite-FIST Data



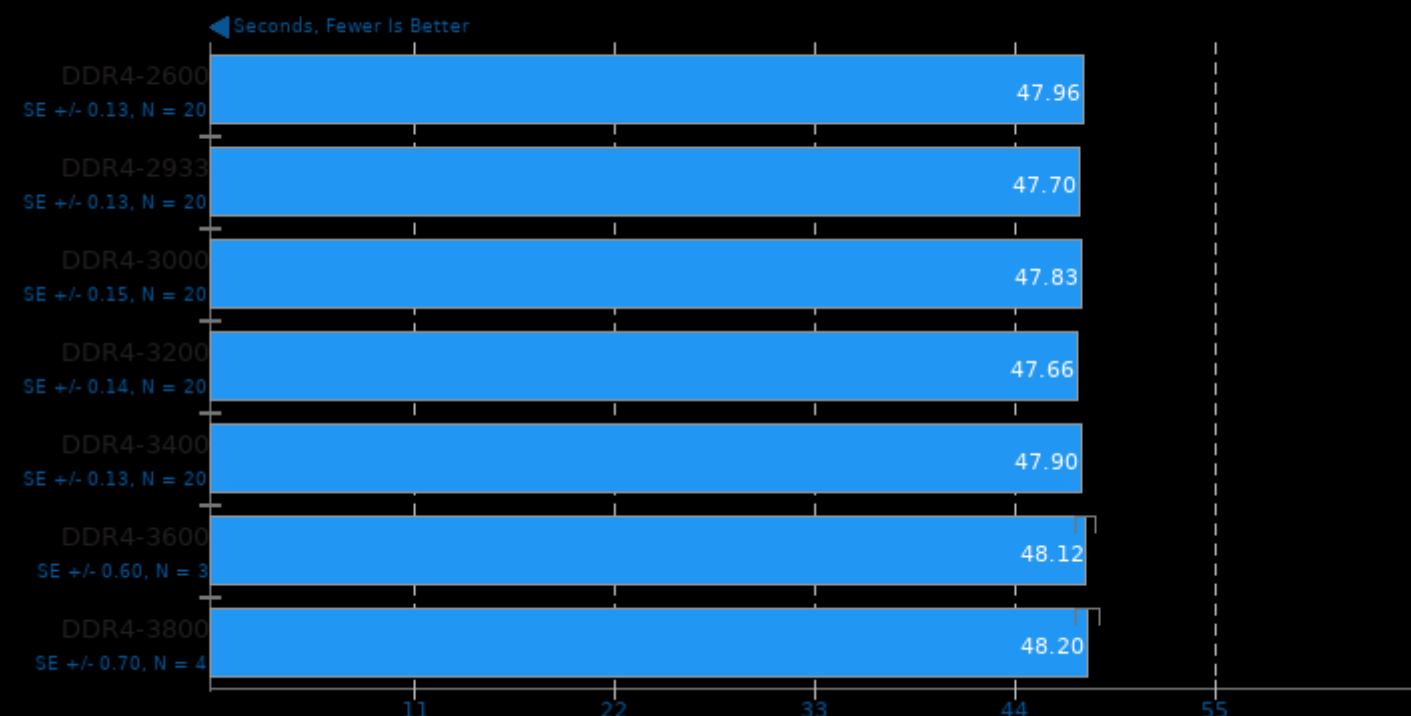
## DaCapo Benchmark 9.12-MR1

Java Test: Tradebeans



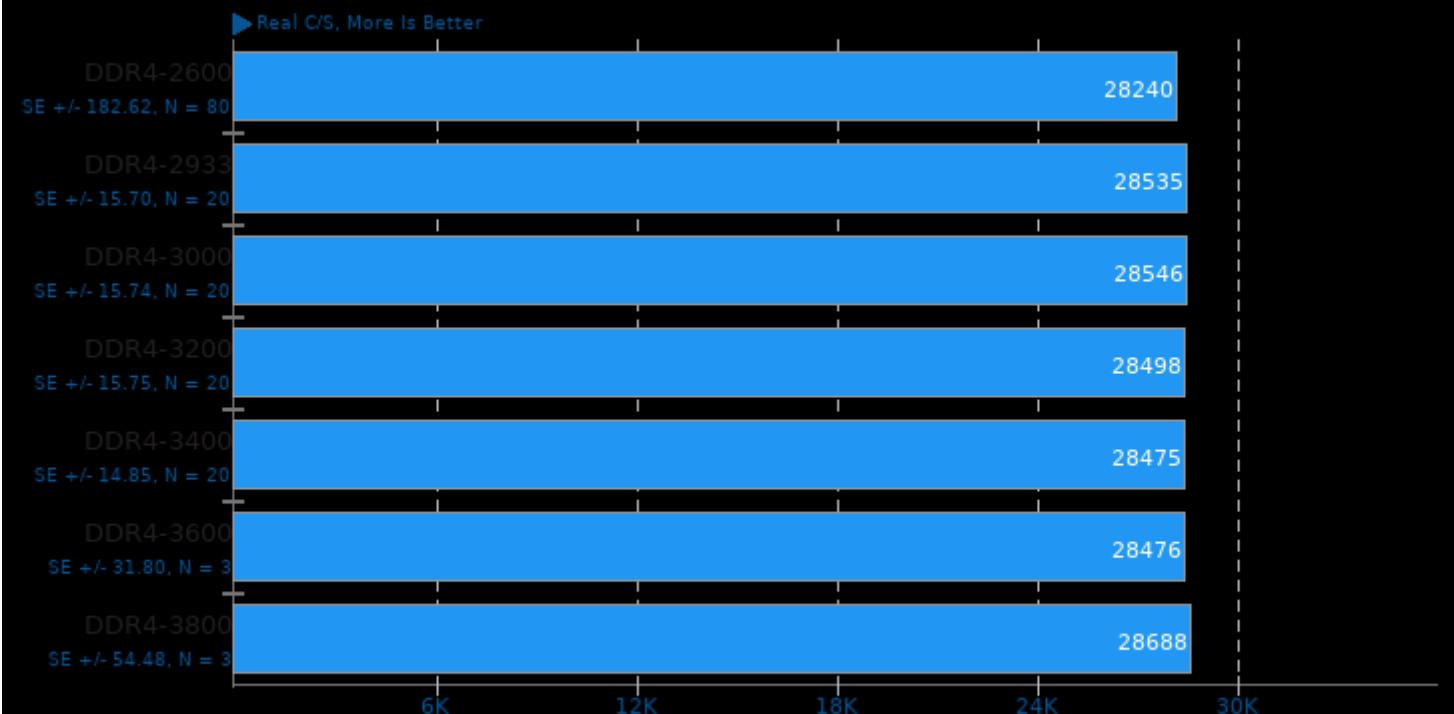
## Timed Linux Kernel Compilation 4.18

Time To Compile



## John The Ripper 1.9.0-jumbo-1

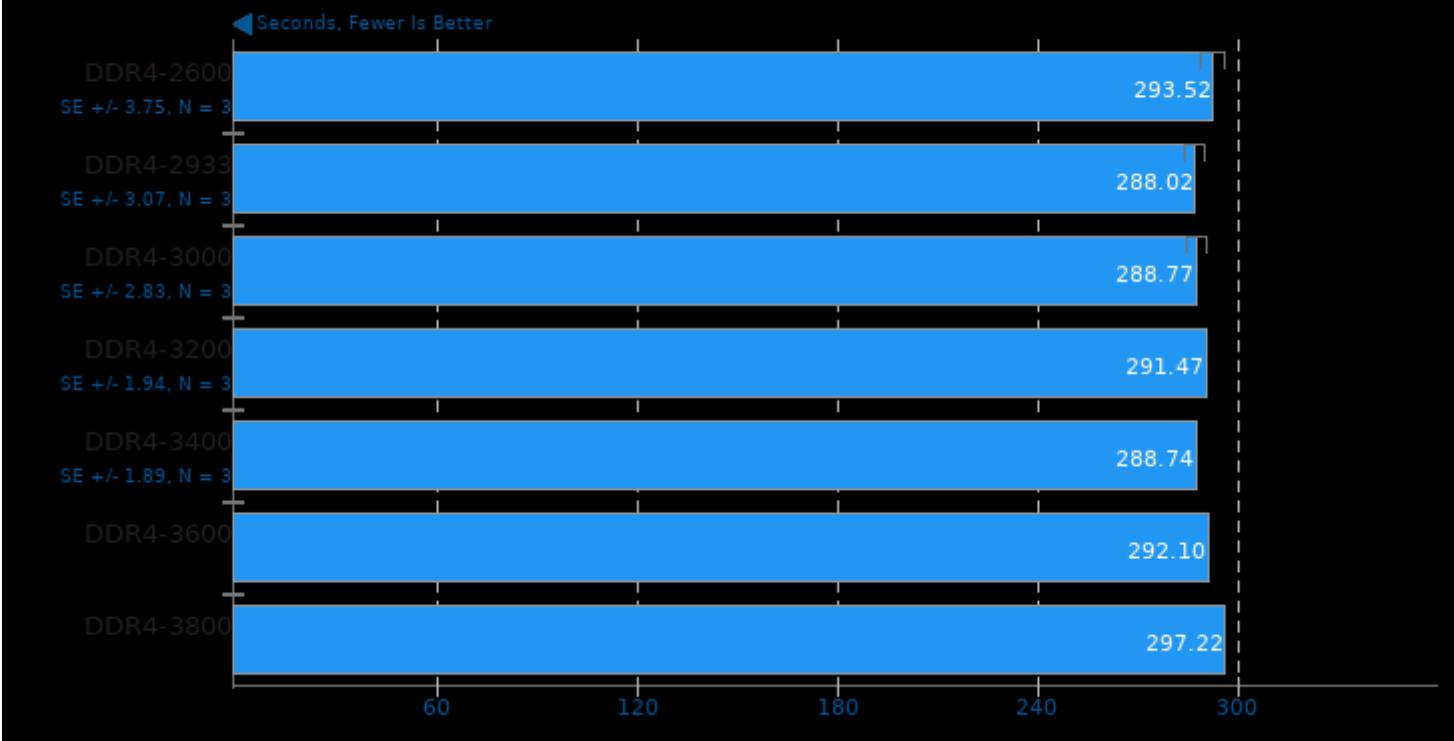
Test: Blowfish



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

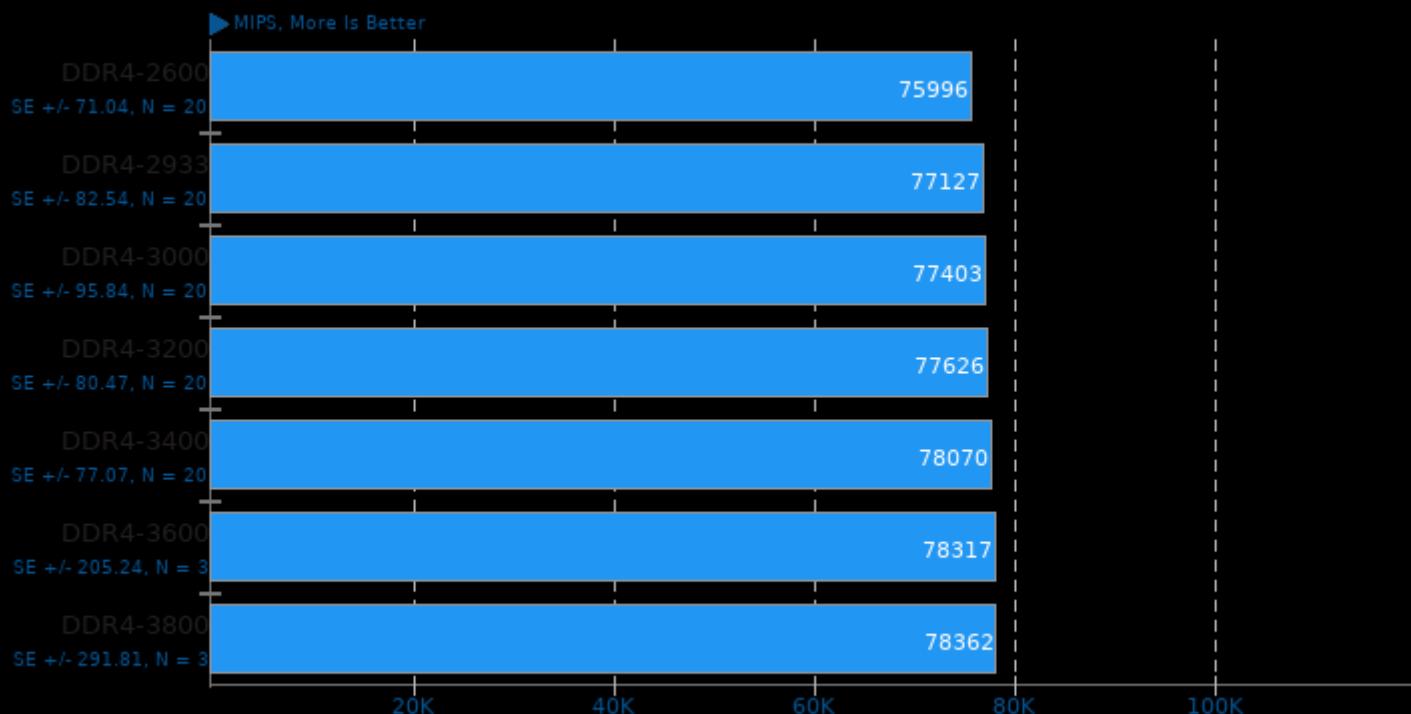
## Timed LLVM Compilation 6.0.1

Time To Compile



## 7-Zip Compression 16.02

Compress Speed Test



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

## NAS Parallel Benchmarks 3.3.1

Test / Class: BT.A

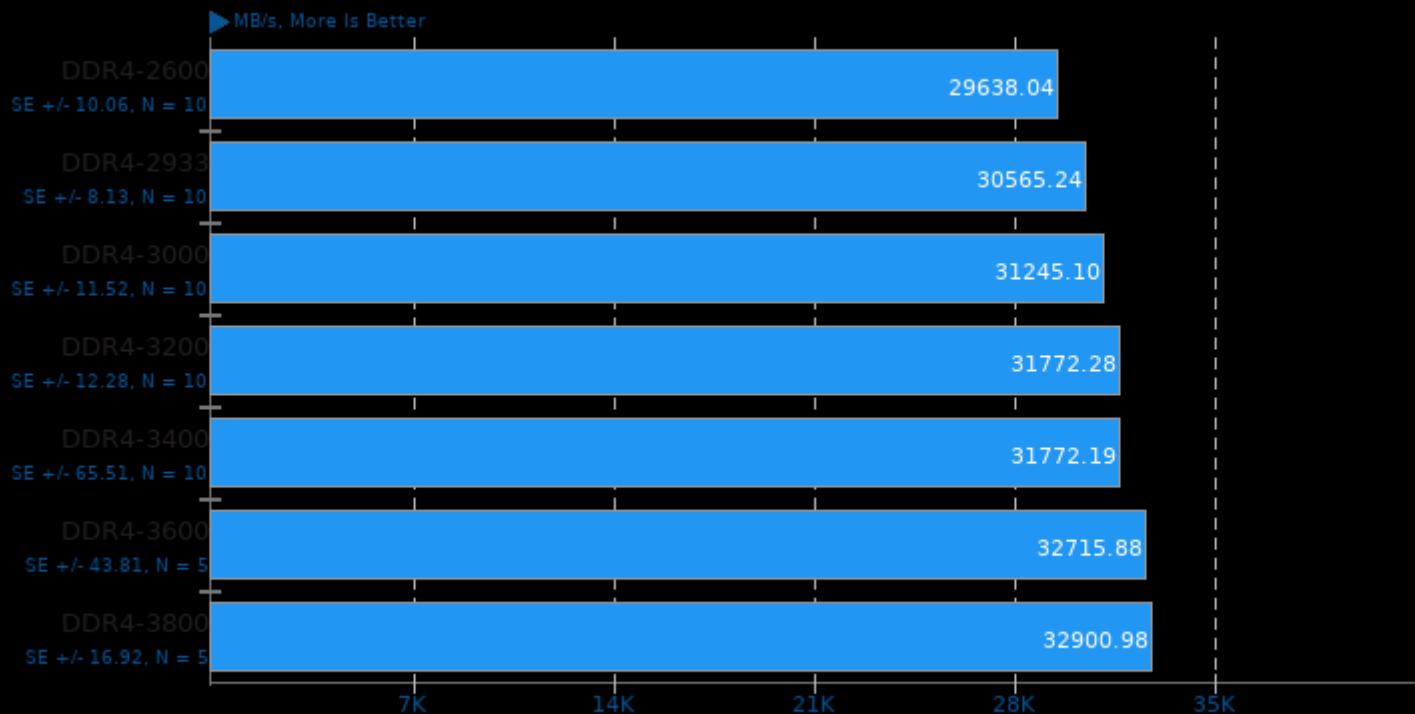


1. (F9X) gfortran options: -O3 -march=native -lpthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi

2. Open MPI 2.1.1

## Stream 2013-01-17

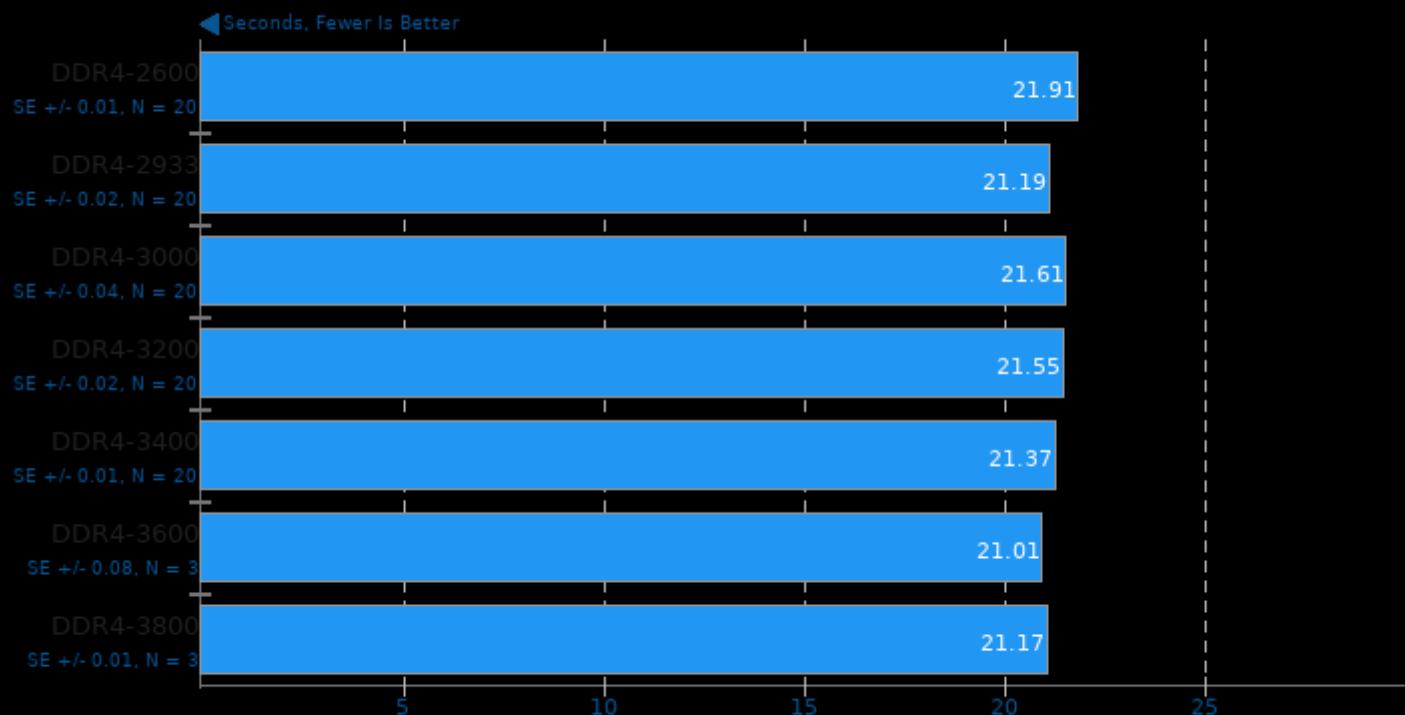
Type: Copy



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

## Rodinia 2.4

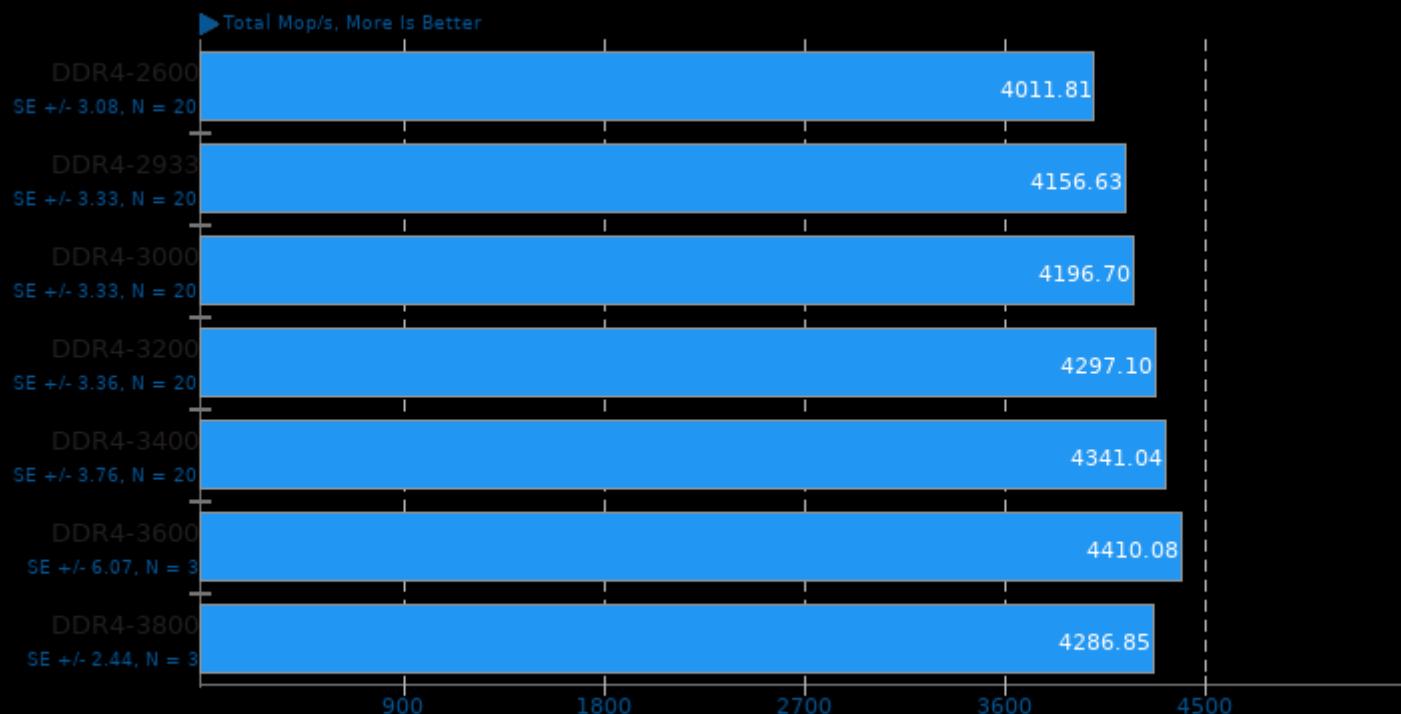
Test: OpenMP Streamcluster



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

## NAS Parallel Benchmarks 3.3.1

Test / Class: SP.A

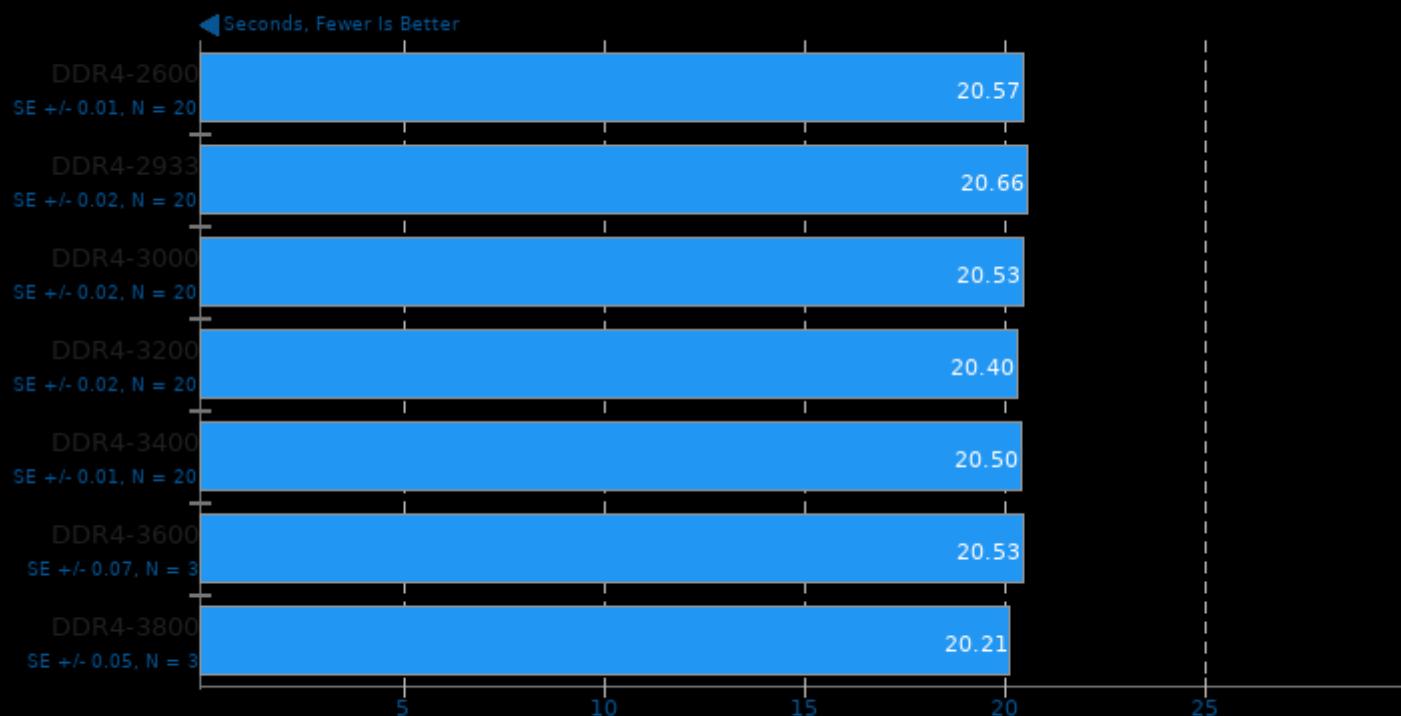


1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi

2. Open MPI 2.1.1

## t-test1 2017-01-13

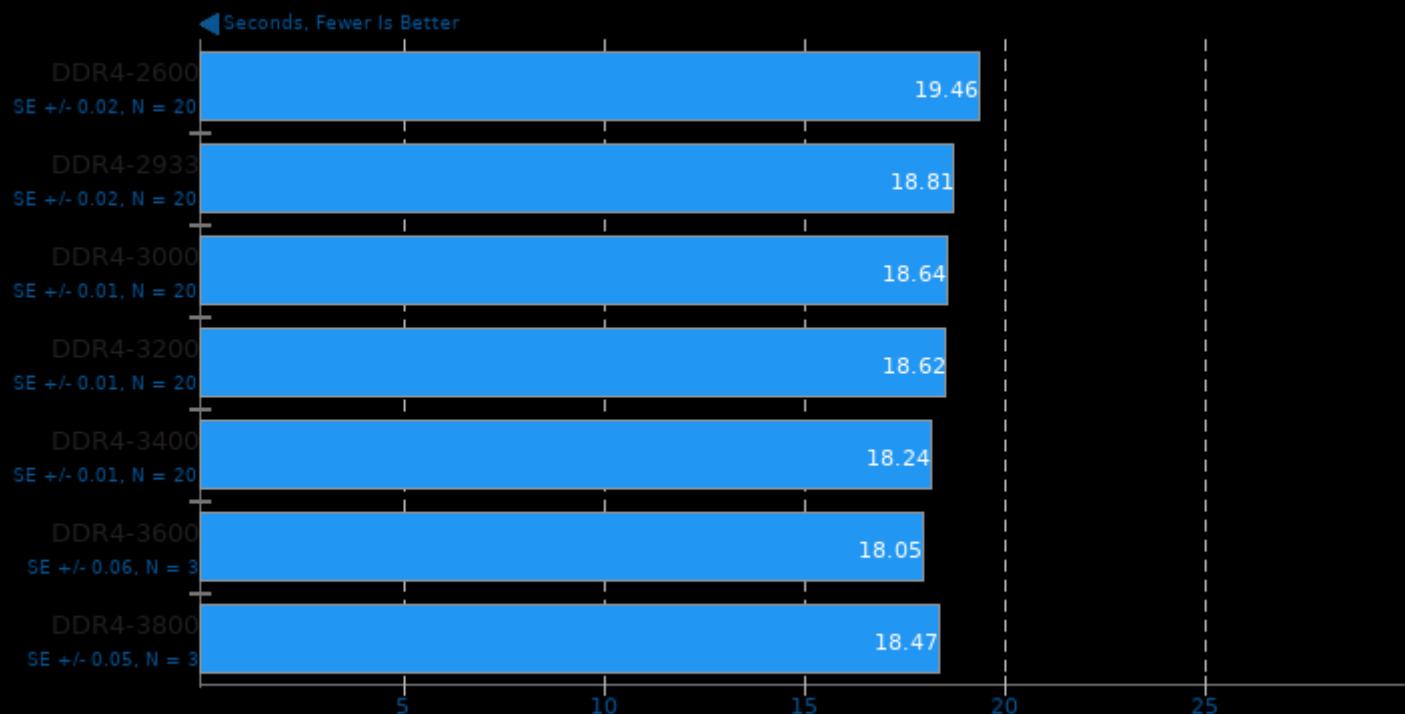
Threads: 1



1. (CC) gcc options: -pthread

## Zstd Compression 1.3.4

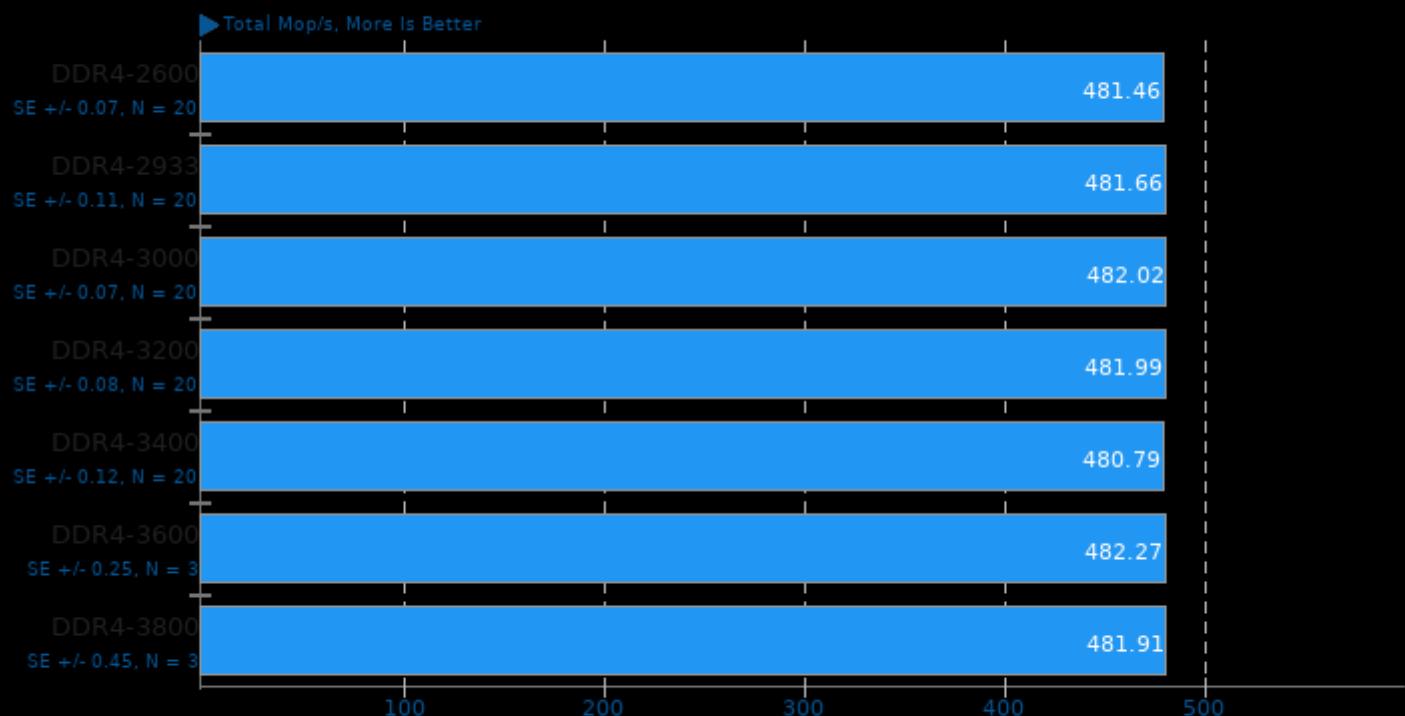
Compressing ubuntu-16.04.3-server-i386.img, Compression Level 19



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

## NAS Parallel Benchmarks 3.3.1

Test / Class: EP.C



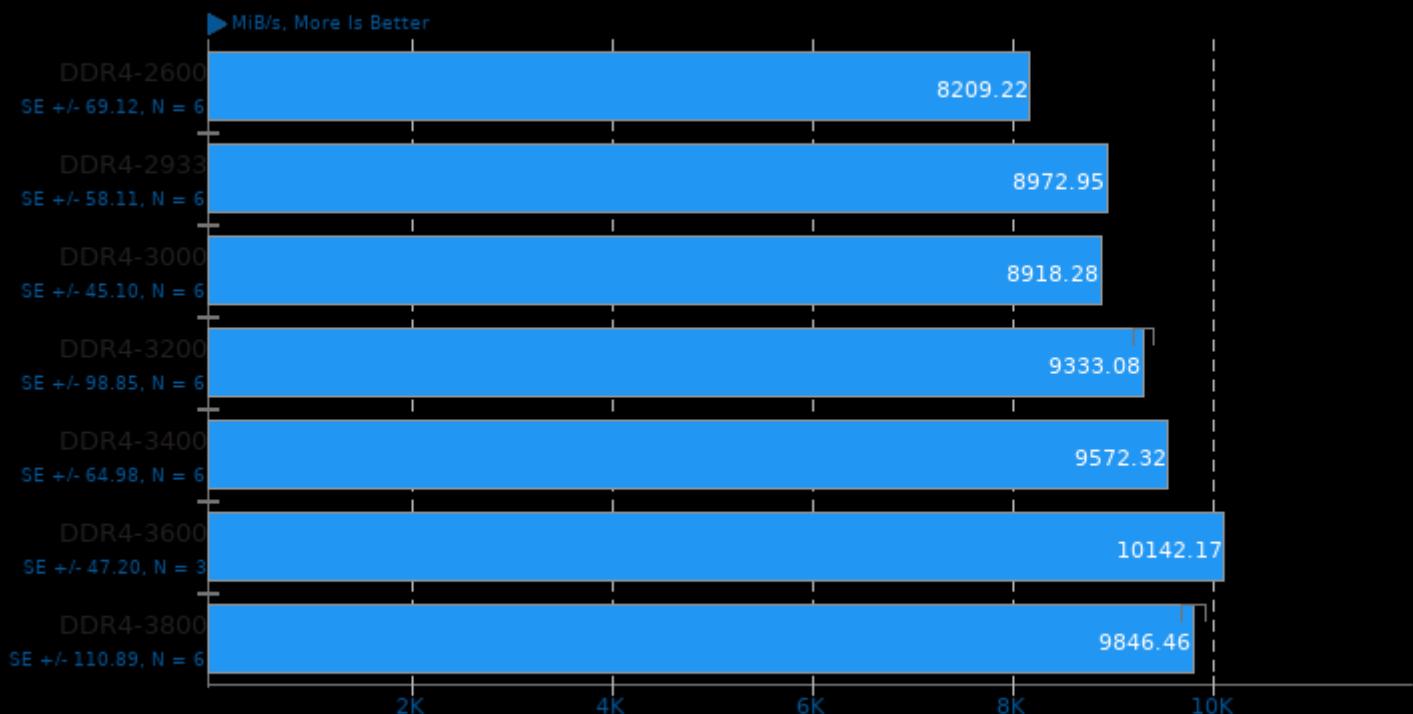
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi

2. Open MPI 2.1.1

## Ryzen 9 3900X Memory Scaling Benchmarks

### MBW 2018-09-08

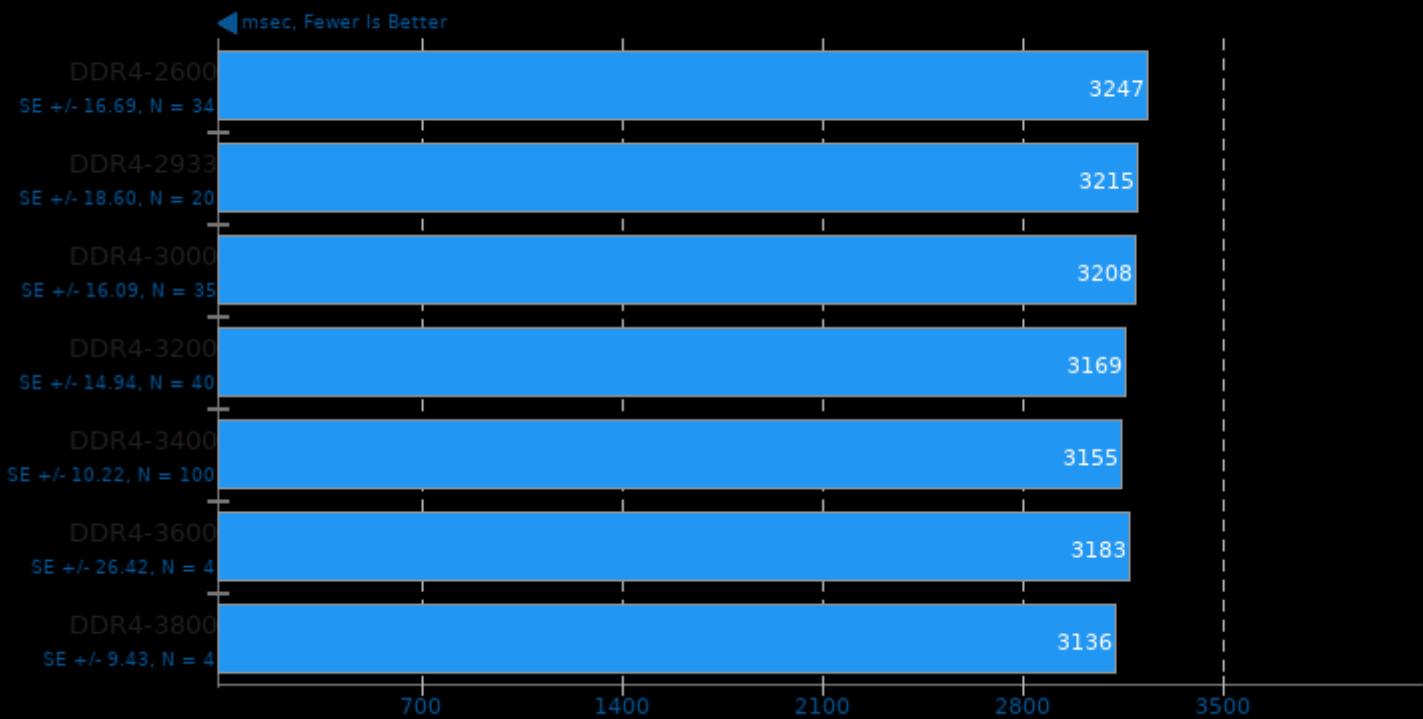
Test: Memory Copy, Fixed Block Size - Array Size: 4096 MiB



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

### DaCapo Benchmark 9.12-MR1

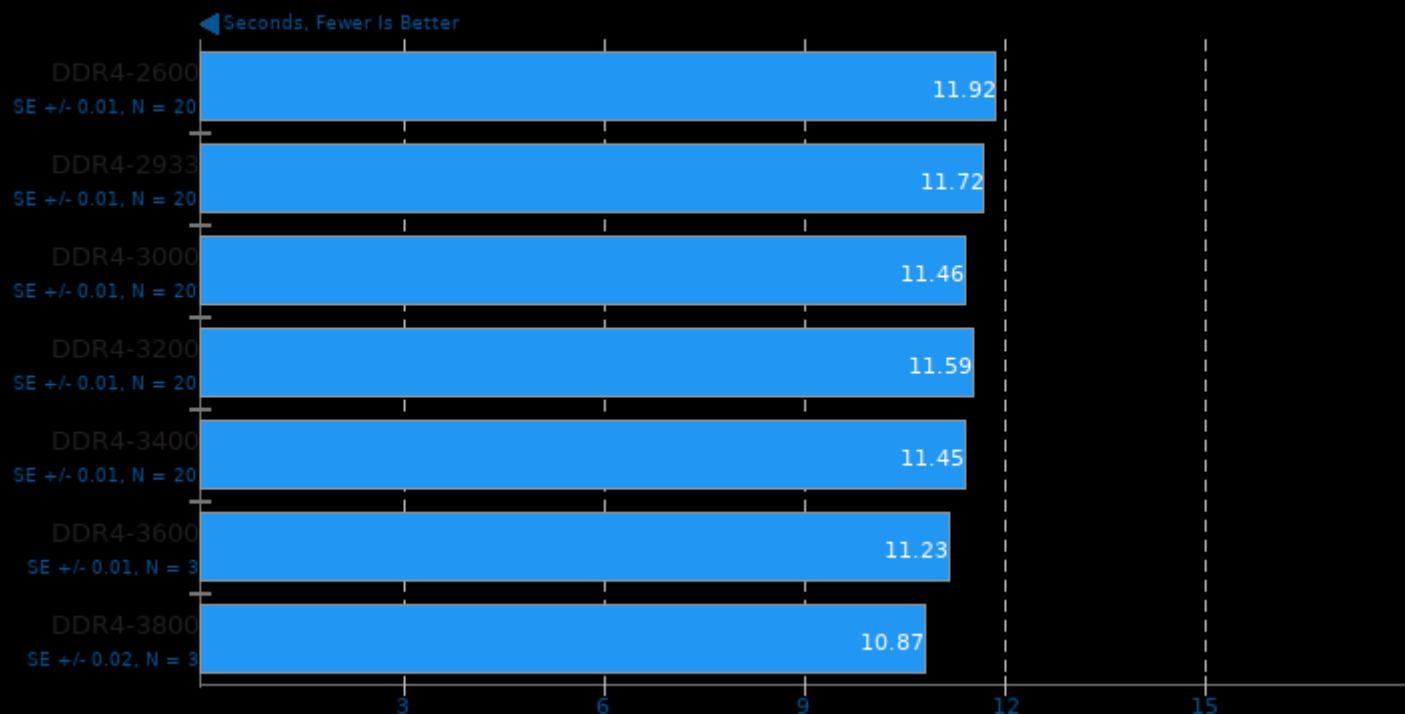
Java Test: H2



## Ryzen 9 3900X Memory Scaling Benchmarks

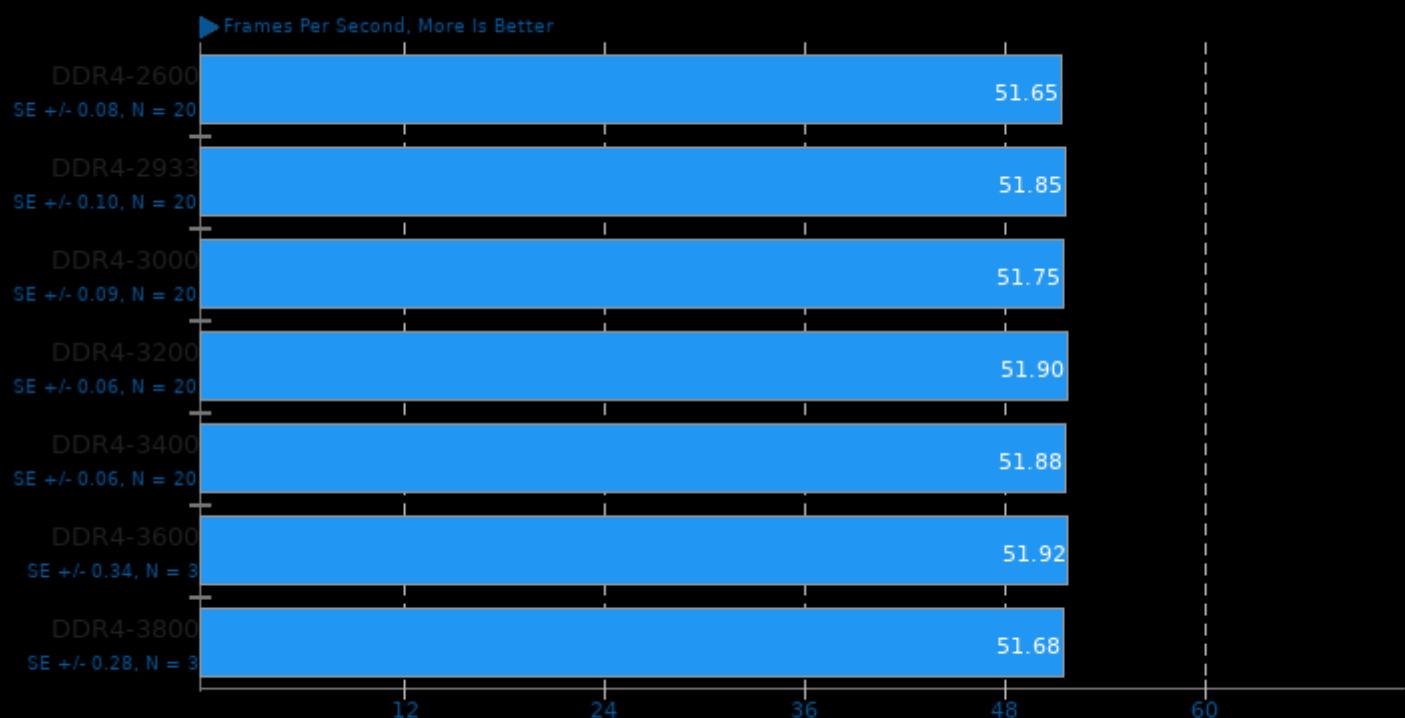
### Darktable 2.4.2

Test: Boat - Acceleration: CPU-only



### x265 3.0

H.265 1080p Video Encoding

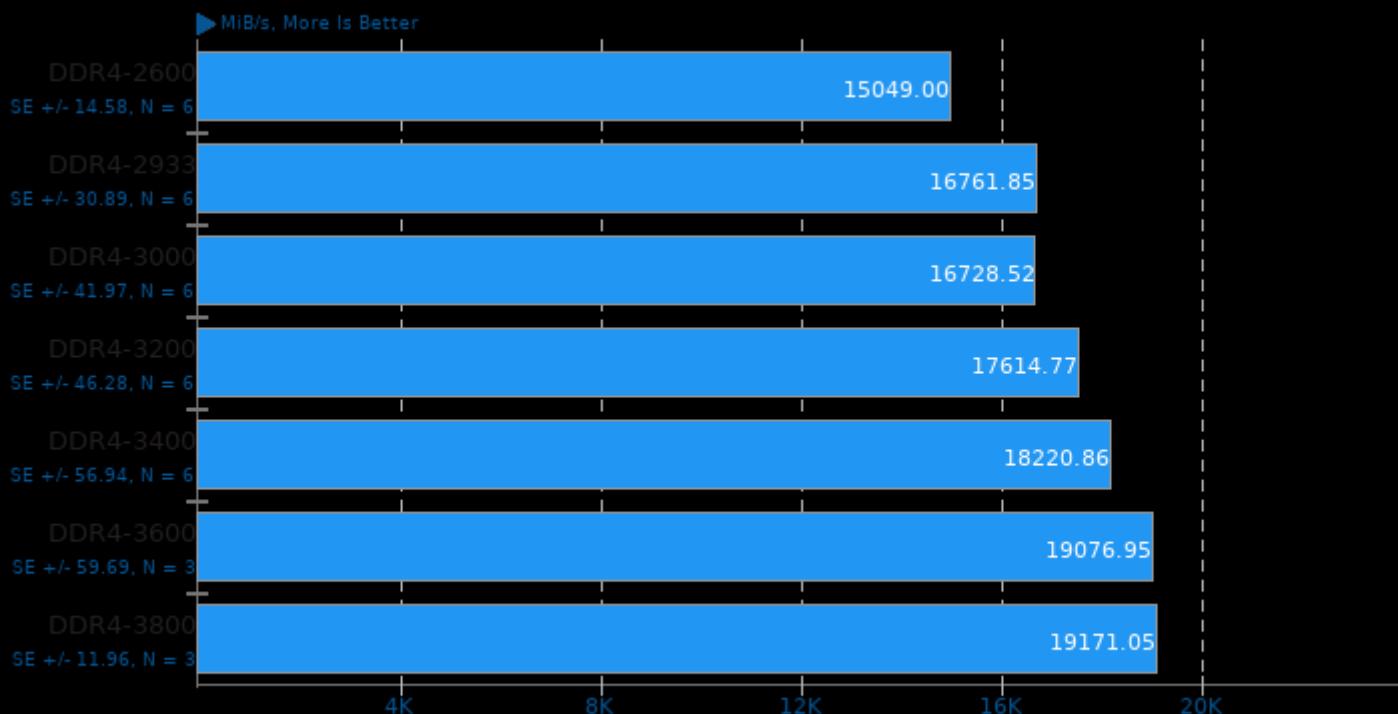


1. (CXX) g++ options: -O3 -rdynamic -lpthread -lrt -ldl -l numa

## Ryzen 9 3900X Memory Scaling Benchmarks

### MBW 2018-09-08

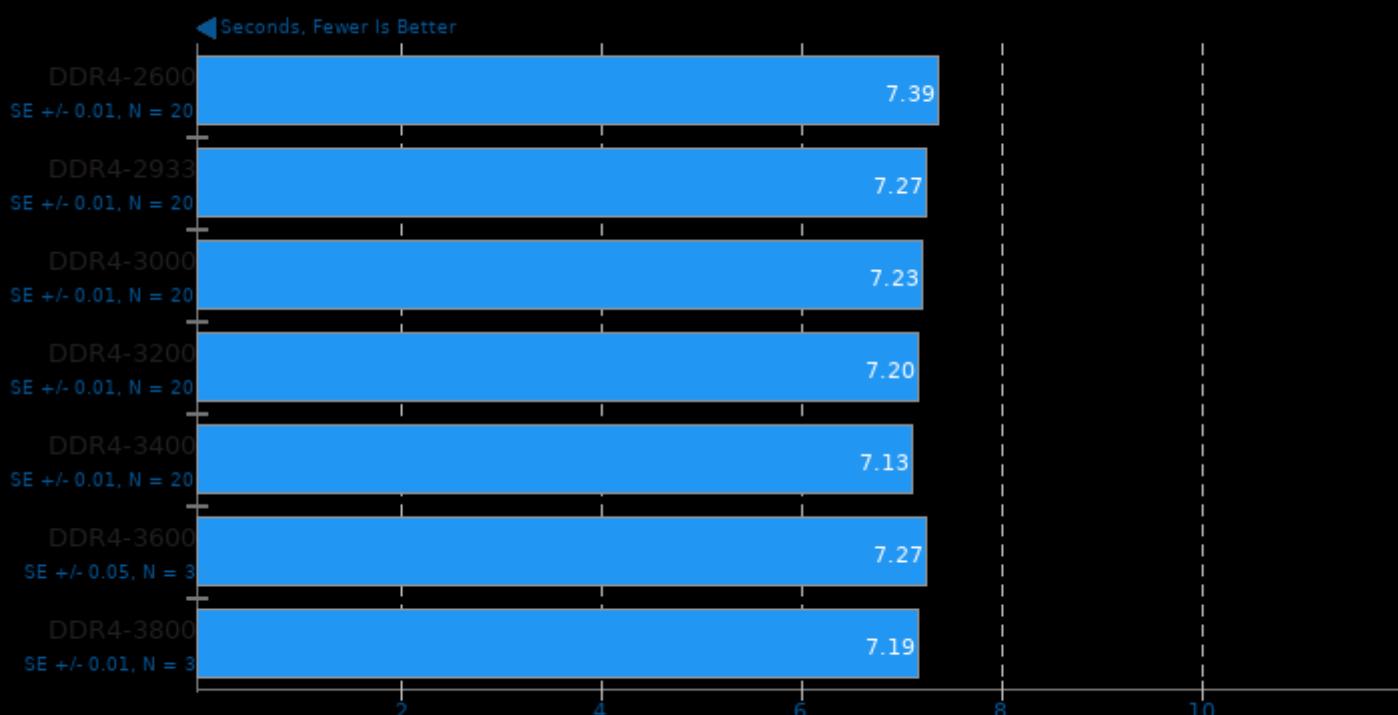
Test: Memory Copy - Array Size: 4096 MiB



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

### t-test1 2017-01-13

Threads: 2

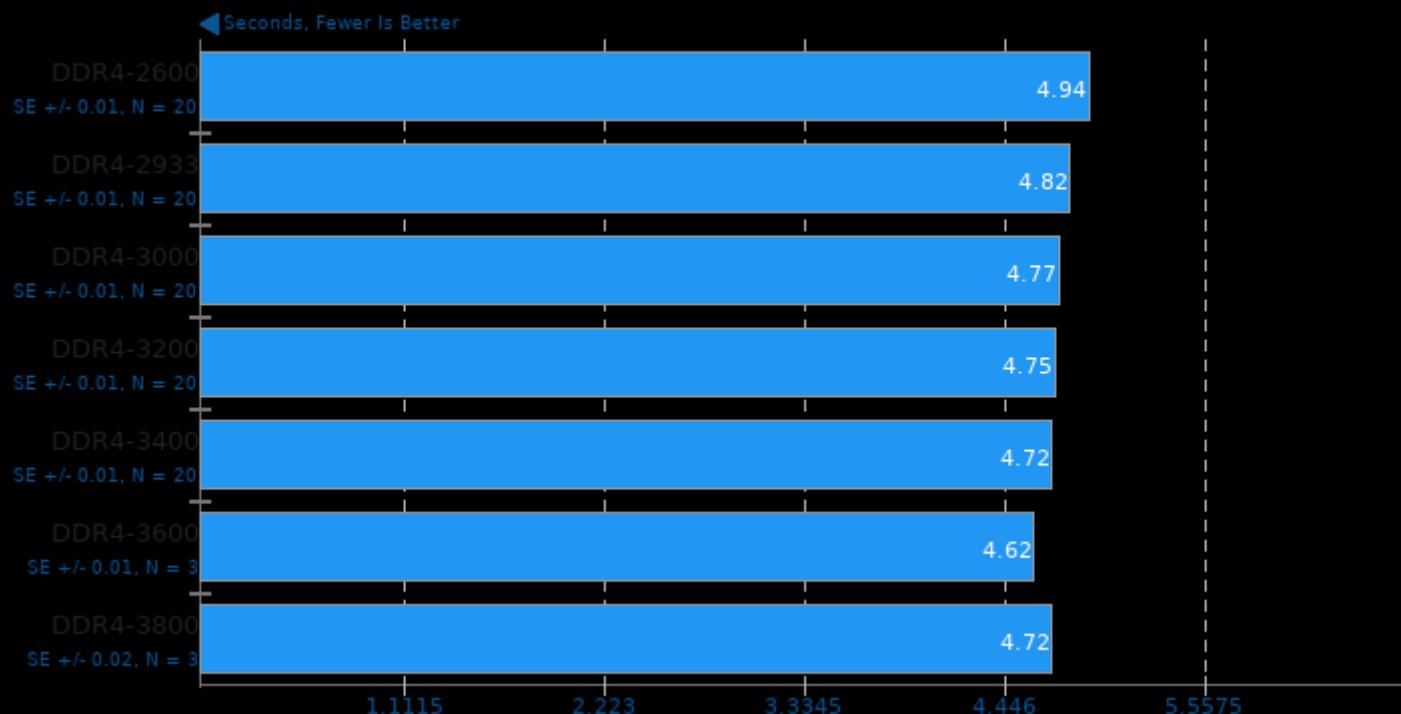


1. (CC) gcc options: -pthread

## Ryzen 9 3900X Memory Scaling Benchmarks

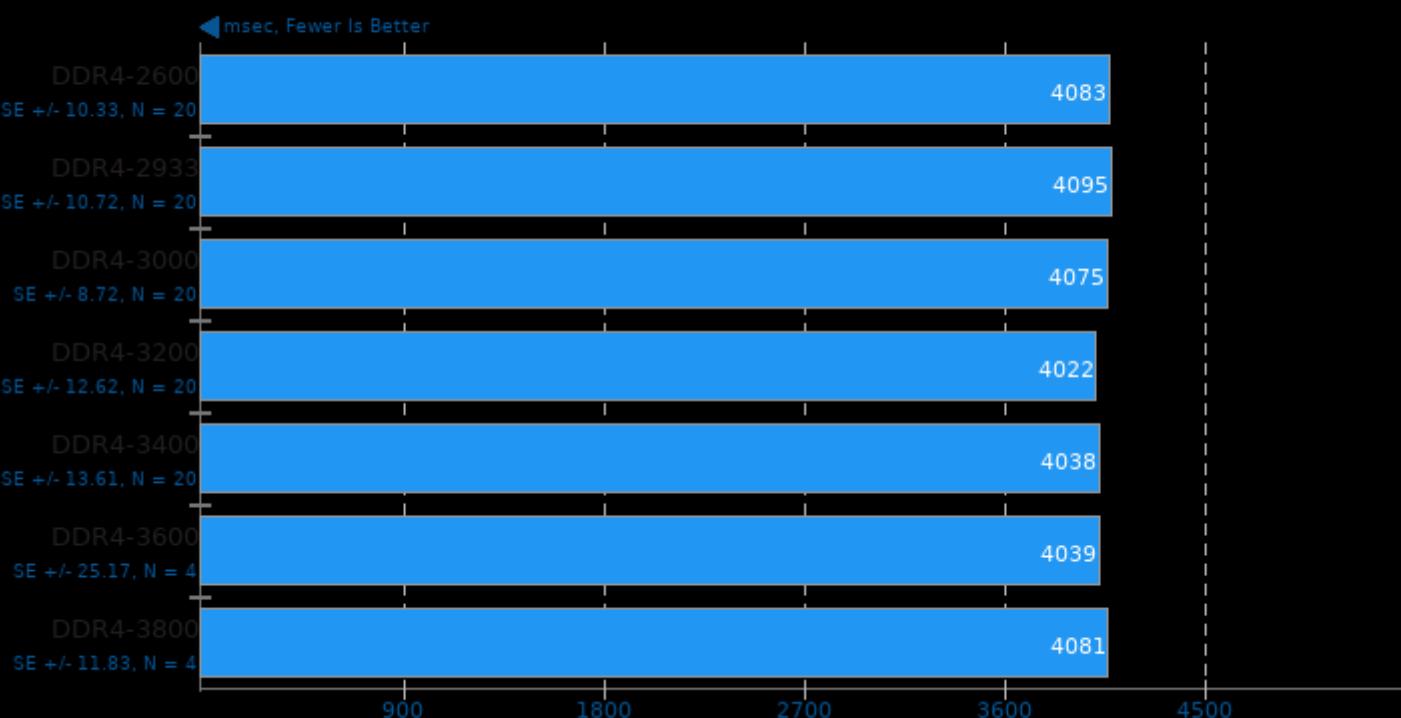
### Darktable 2.4.2

Test: Masskrug - Acceleration: CPU-only



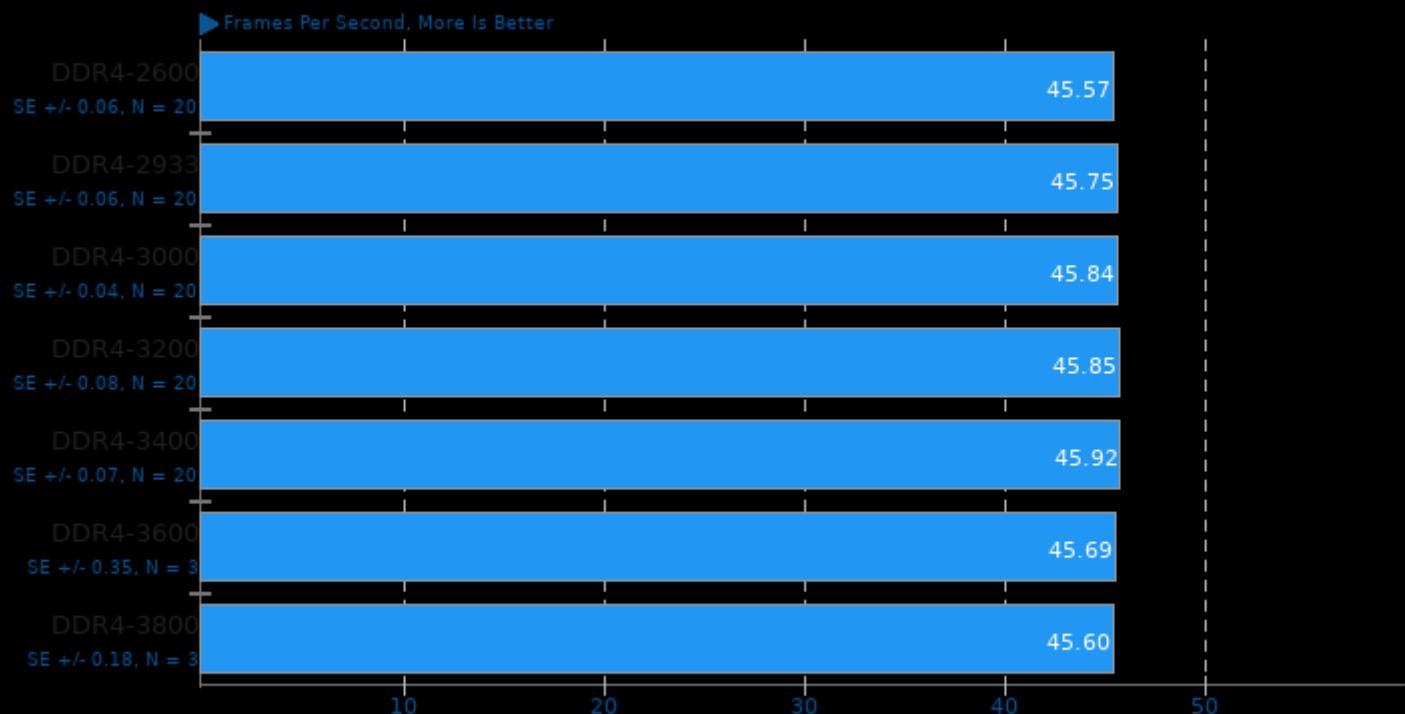
### DaCapo Benchmark 9.12-MR1

Java Test: Jython



## SVT-AV1 0.5

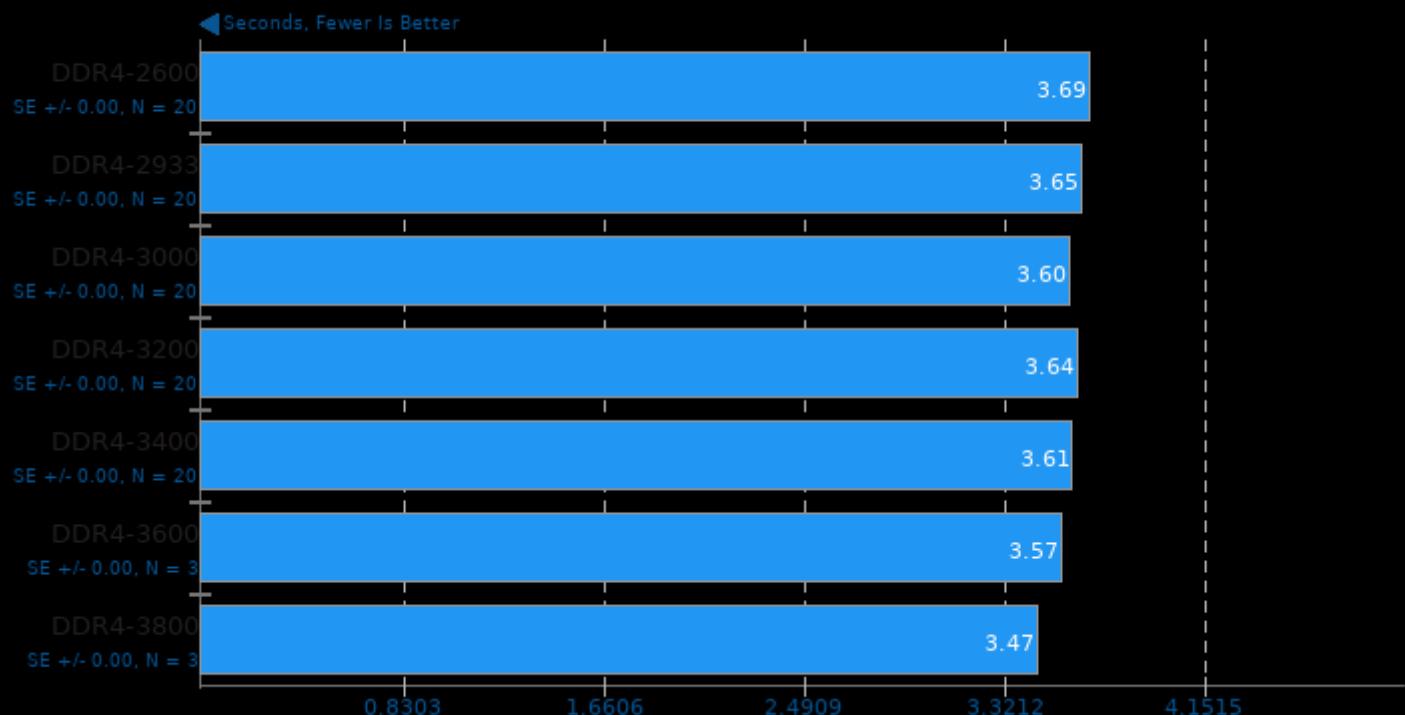
1080p 8-bit YUV To AV1 Video Encode



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

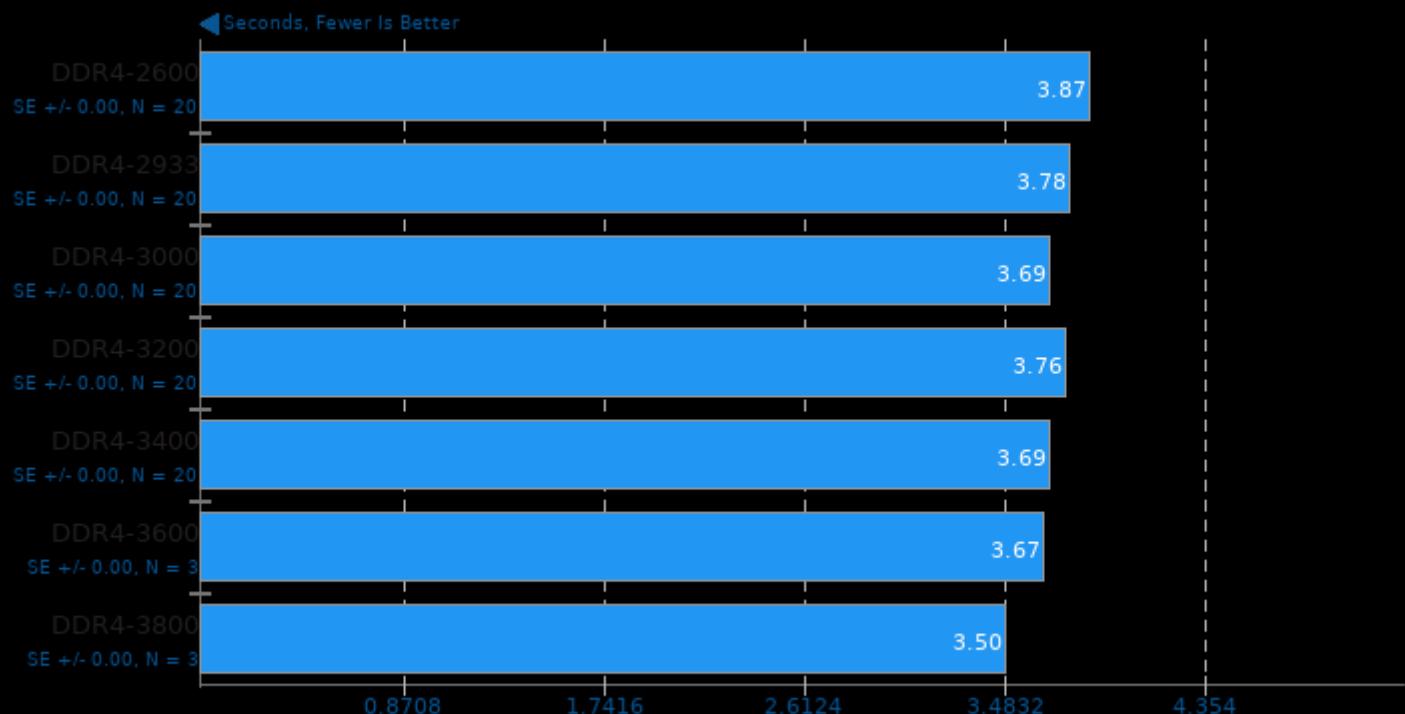
## Darktable 2.4.2

Test: Server Room - Acceleration: CPU-only



## CloverLeaf

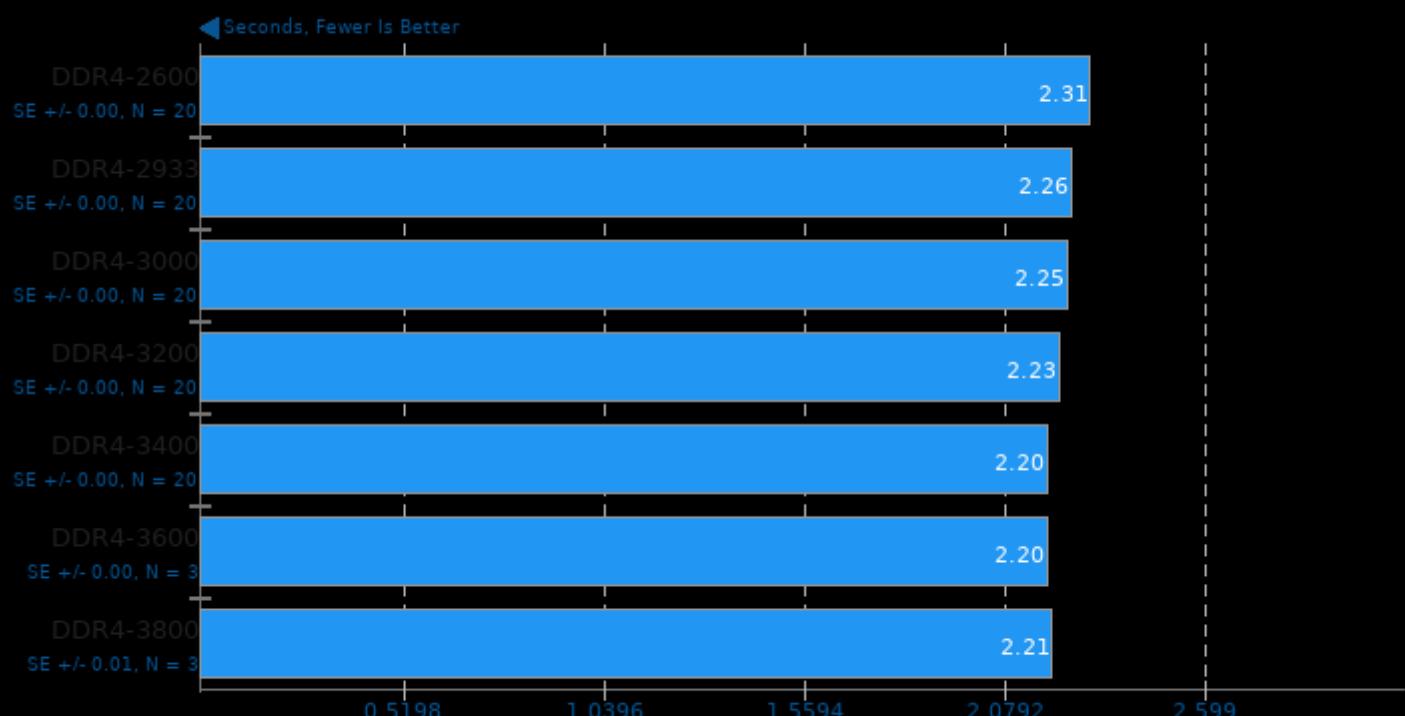
Lagrangian-Eulerian Hydrodynamics



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

## Parboil 2.5

Test: OpenMP CUTCP

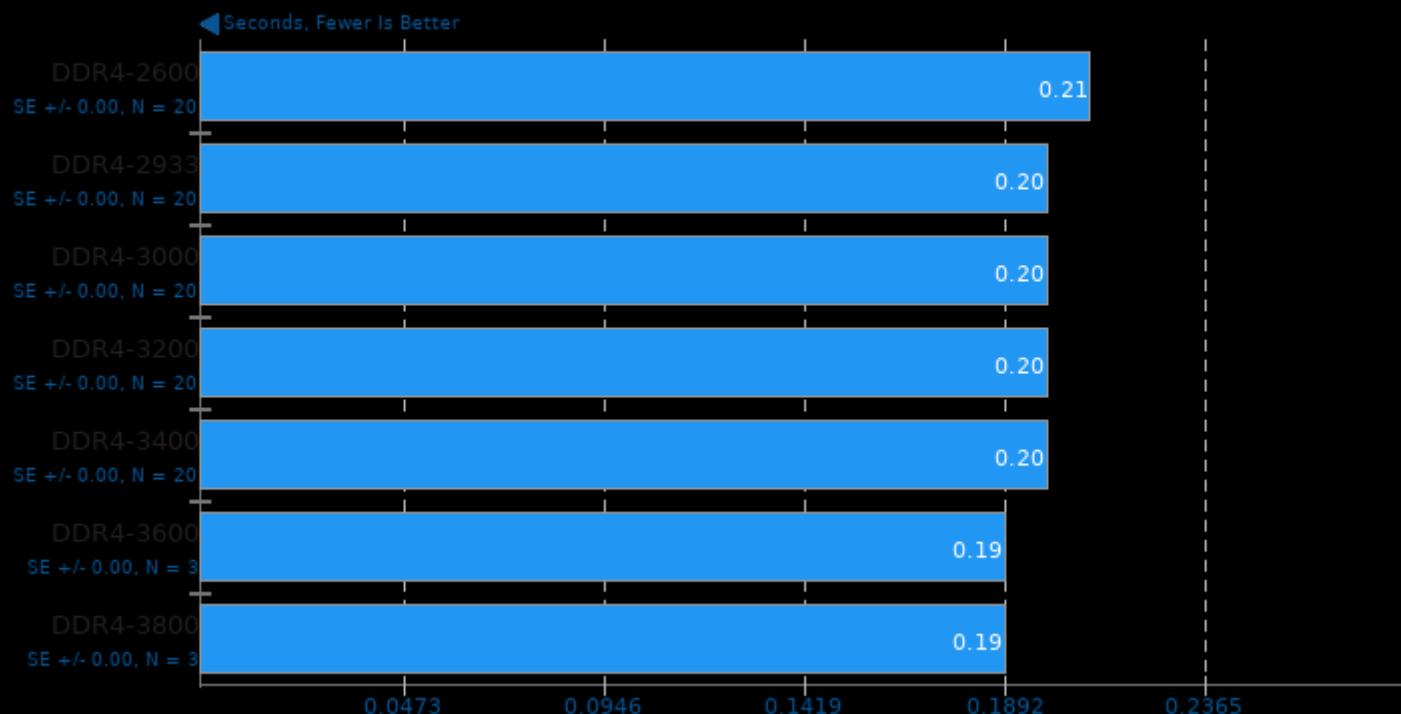


1. (CXX) g++ options: -lm -lpthread -lgomp -O3 -ffast-math -fopenmp

## Ryzen 9 3900X Memory Scaling Benchmarks

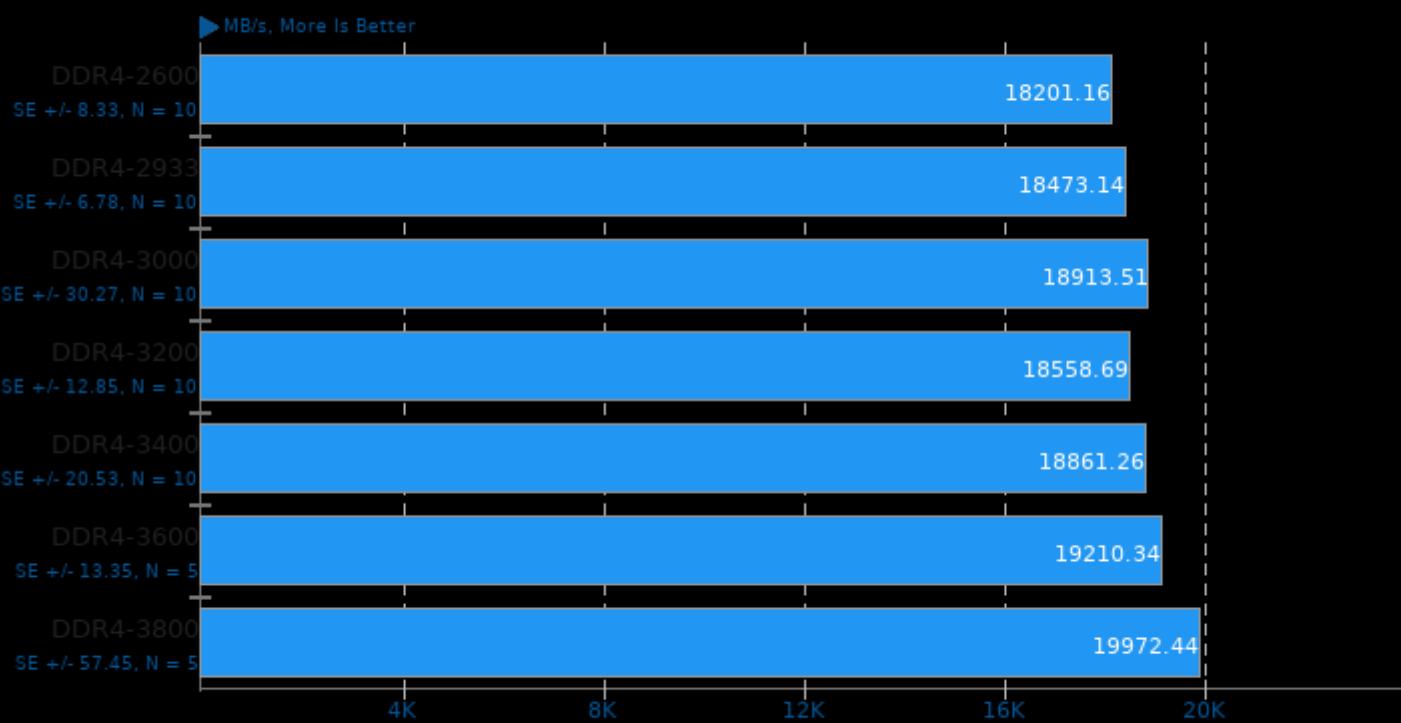
### Darktable 2.4.2

Test: Server Rack - Acceleration: CPU-only



### Stream 2013-01-17

Type: Add

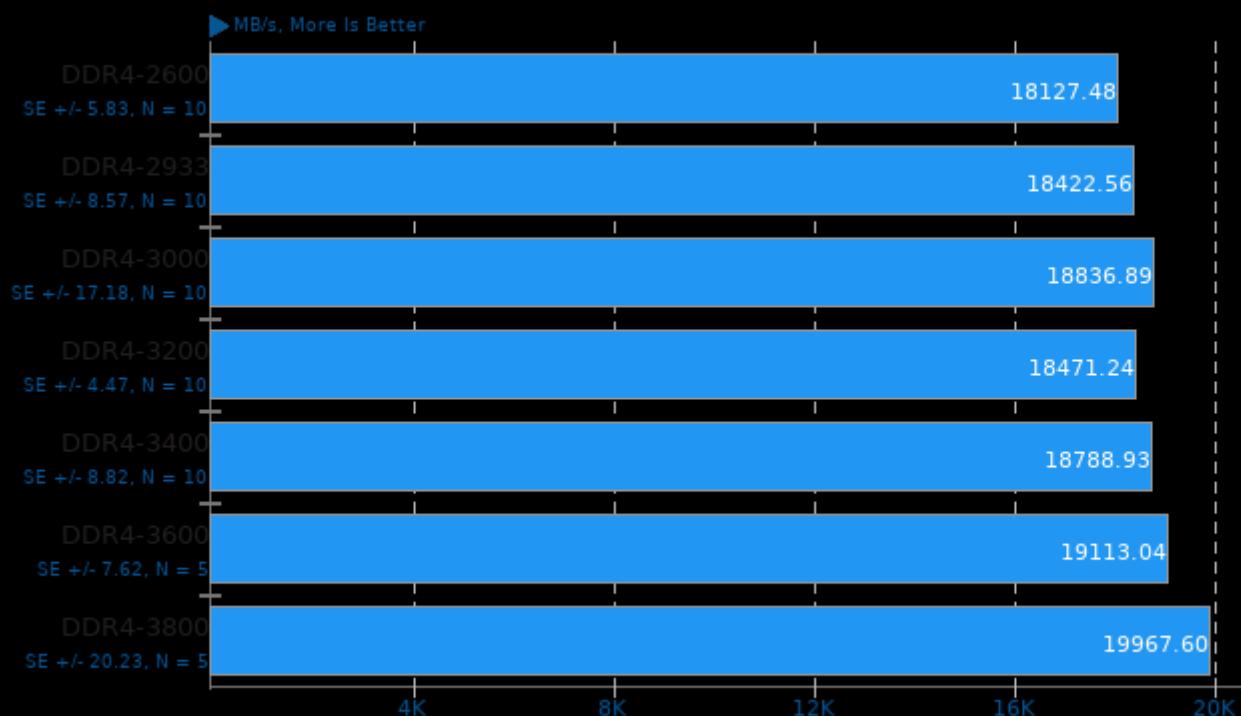


1. (CC) gcc options: -O3 -march=native -fopenmp

## Ryzen 9 3900X Memory Scaling Benchmarks

### Stream 2013-01-17

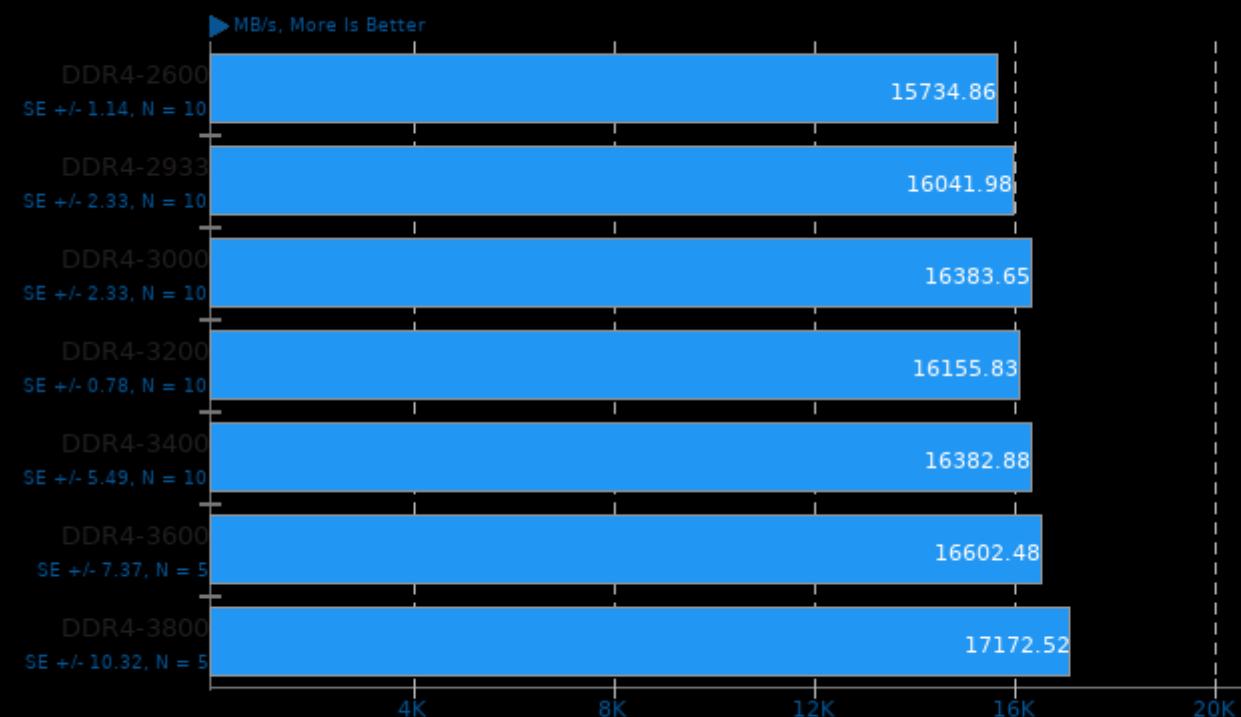
Type: Triad



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

### Stream 2013-01-17

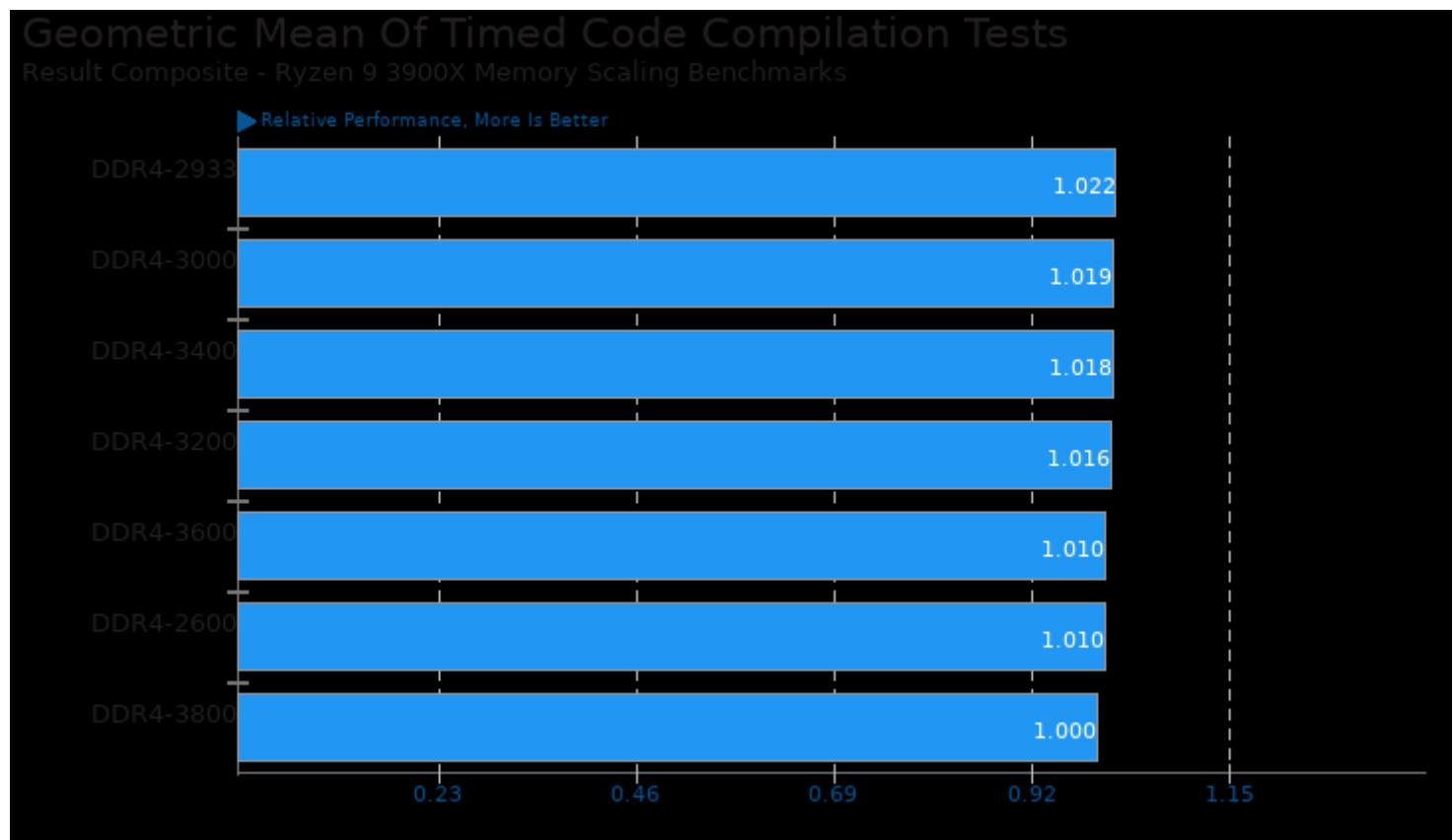
Type: Scale



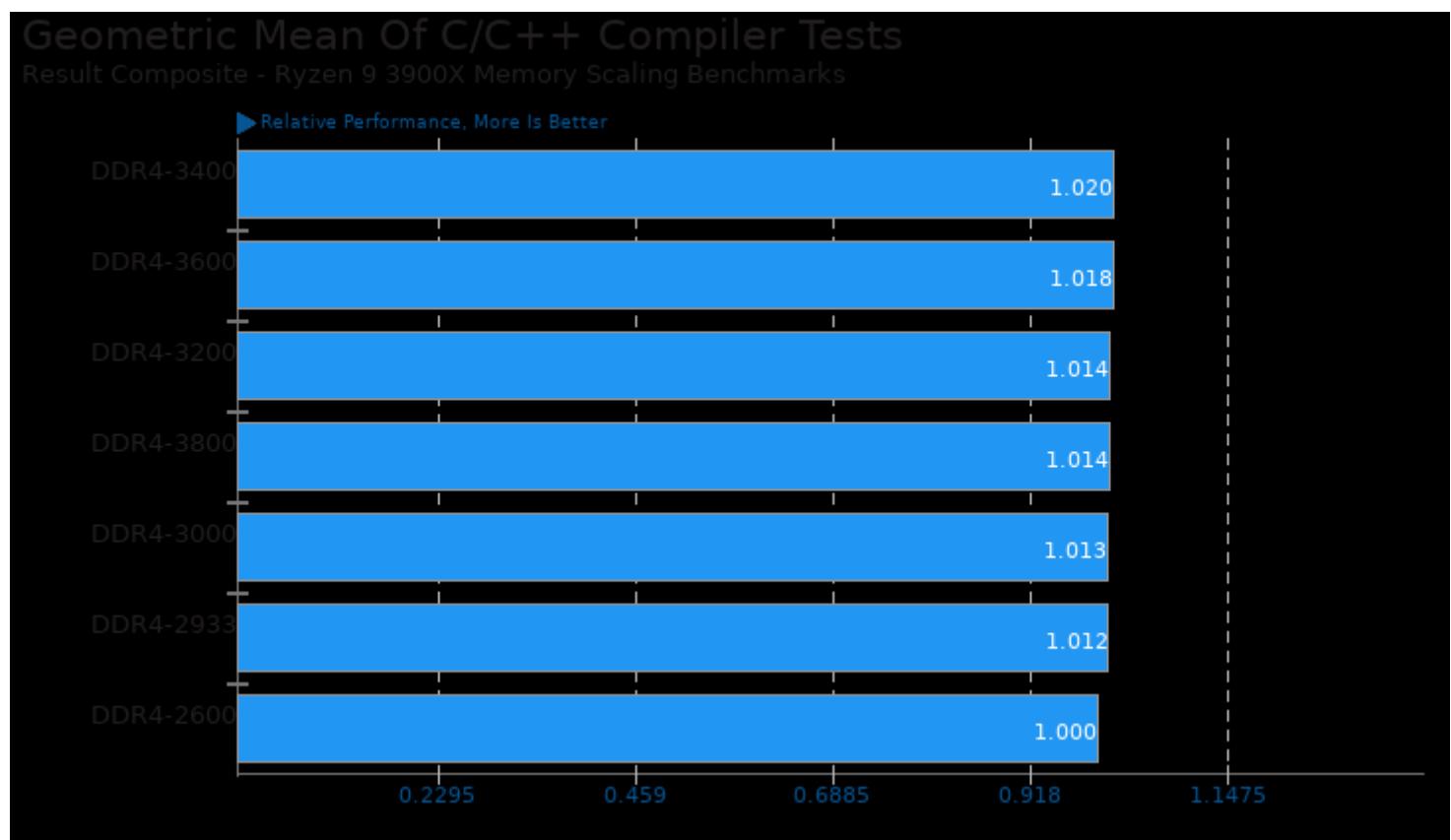
1. (CC) gcc options: -O3 -march=native -fopenmp

## Ryzen 9 3900X Memory Scaling Benchmarks

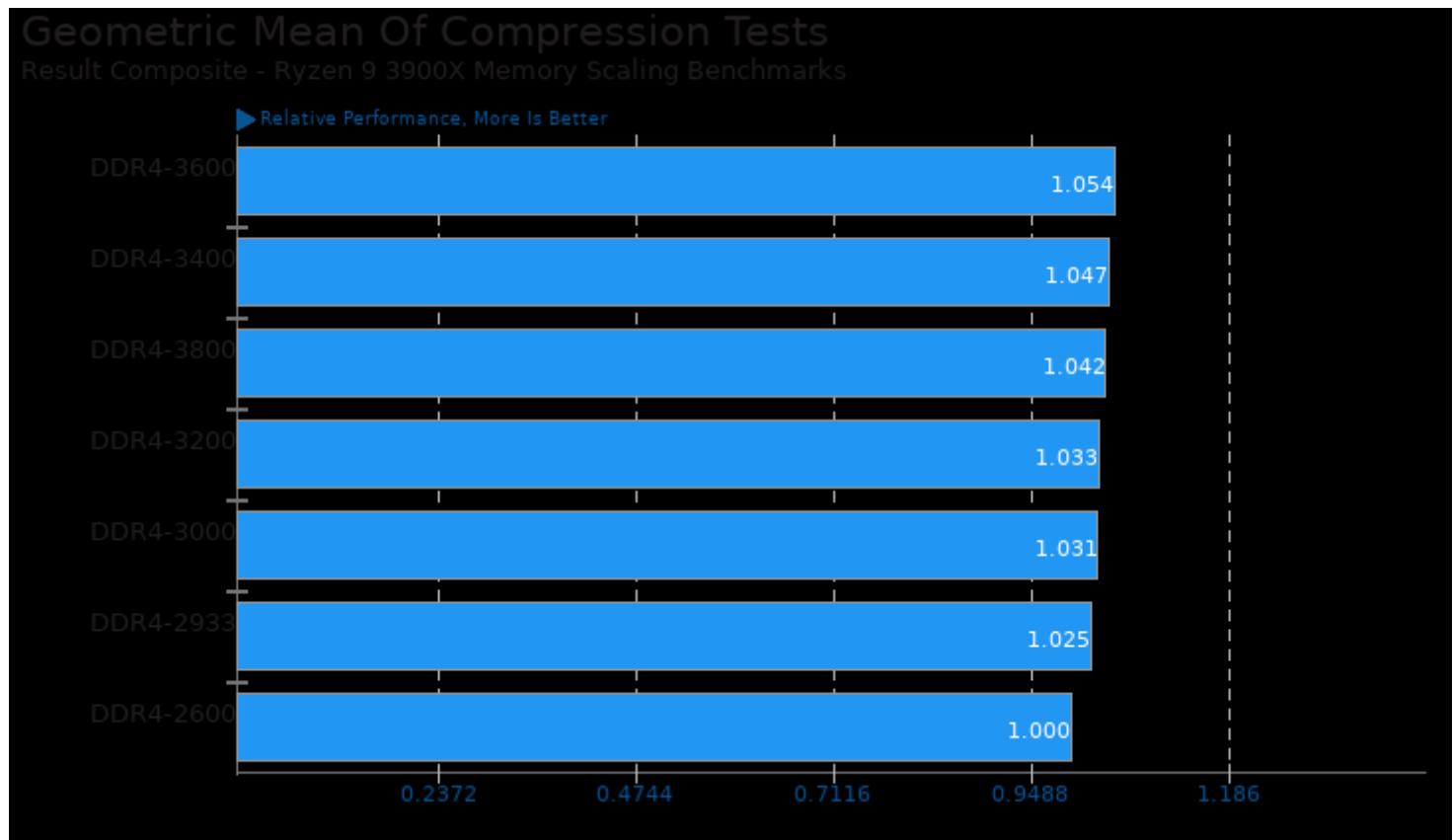
These geometric means are based upon test groupings / test suites for this result file.



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



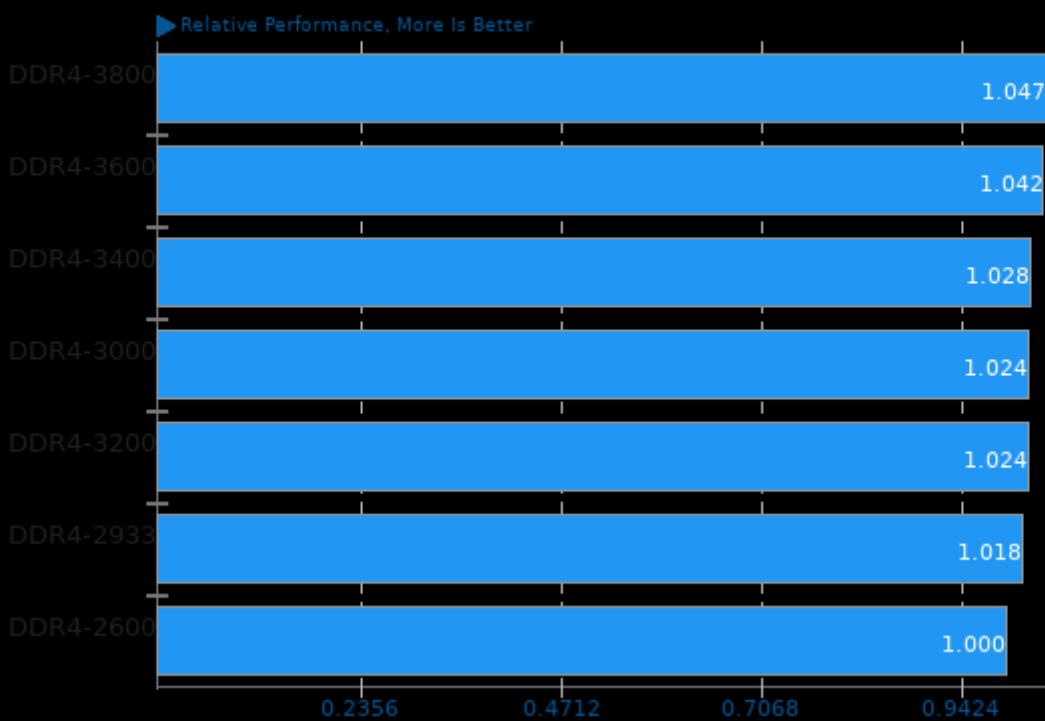
Geometric mean based upon tests: pts/vpxenc, pts/build-llvm, pts/compress-7zip, pts/pgbench, pts/john-the-ripper, pts/x265, pts/compress-zstd and pts/svt-av1



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

### Geometric Mean Of Creator Workloads Tests

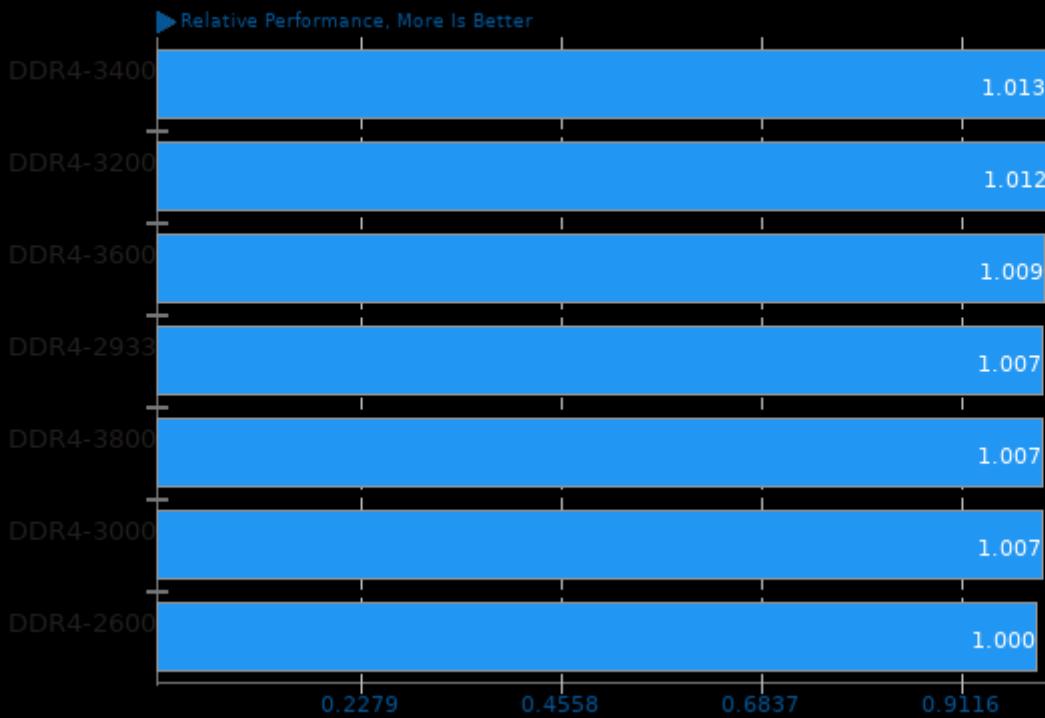
Result Composite - Ryzen 9 3900X Memory Scaling Benchmarks



Geometric mean based upon tests: pts/x265, pts/vpxenc, pts/svt-av1 and system/darktable

### Geometric Mean Of Encoding Tests

Result Composite - Ryzen 9 3900X Memory Scaling Benchmarks

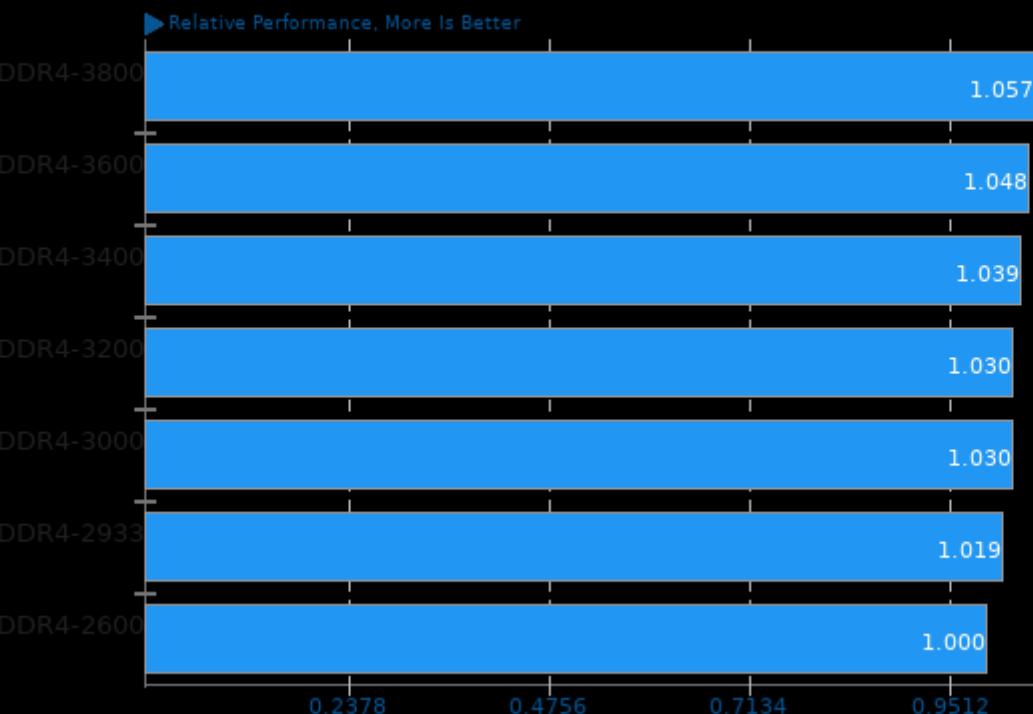


Geometric mean based upon tests: pts/x265, pts/vpxenc and pts/svt-av1

## Ryzen 9 3900X Memory Scaling Benchmarks

### Geometric Mean Of Fortran Tests

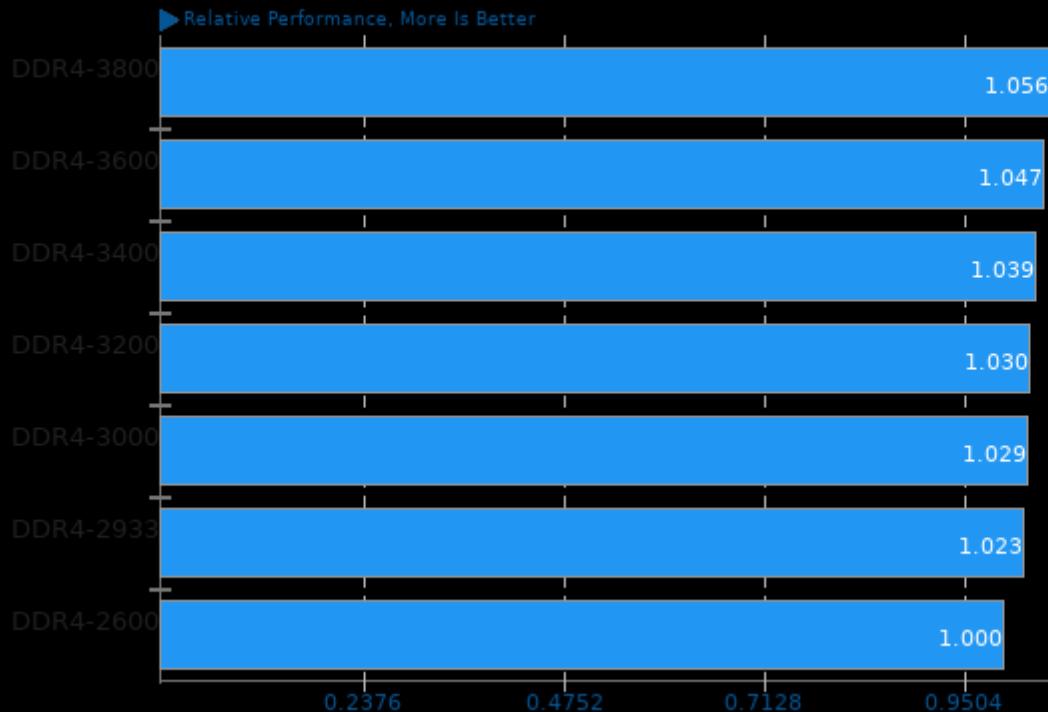
Result Composite - Ryzen 9 3900X Memory Scaling Benchmarks



Geometric mean based upon tests: pts/npb and pts/cloverleaf

### Geometric Mean Of HPC - High Performance Computing Tests

Result Composite - Ryzen 9 3900X Memory Scaling Benchmarks

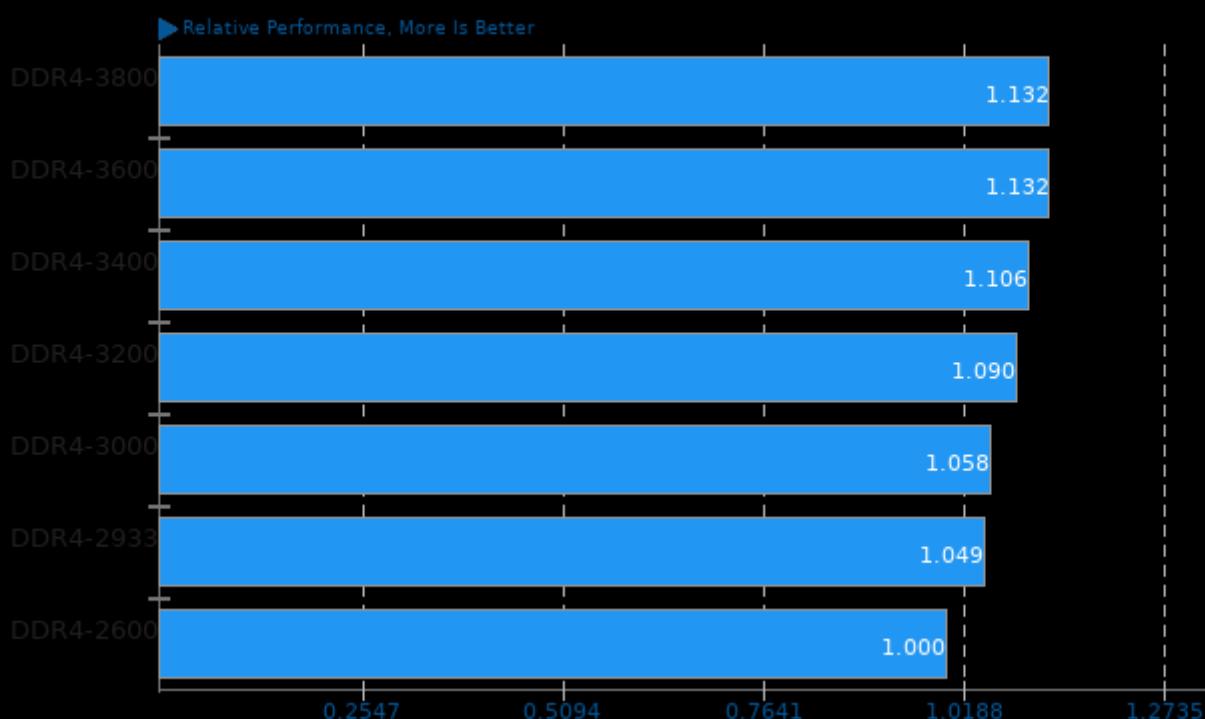


Geometric mean based upon tests: pts/npb, pts/rodinia, pts/parboil, pts/cp2k and pts/cloverleaf

## Ryzen 9 3900X Memory Scaling Benchmarks

### Geometric Mean Of Common Kernel Benchmarks Tests

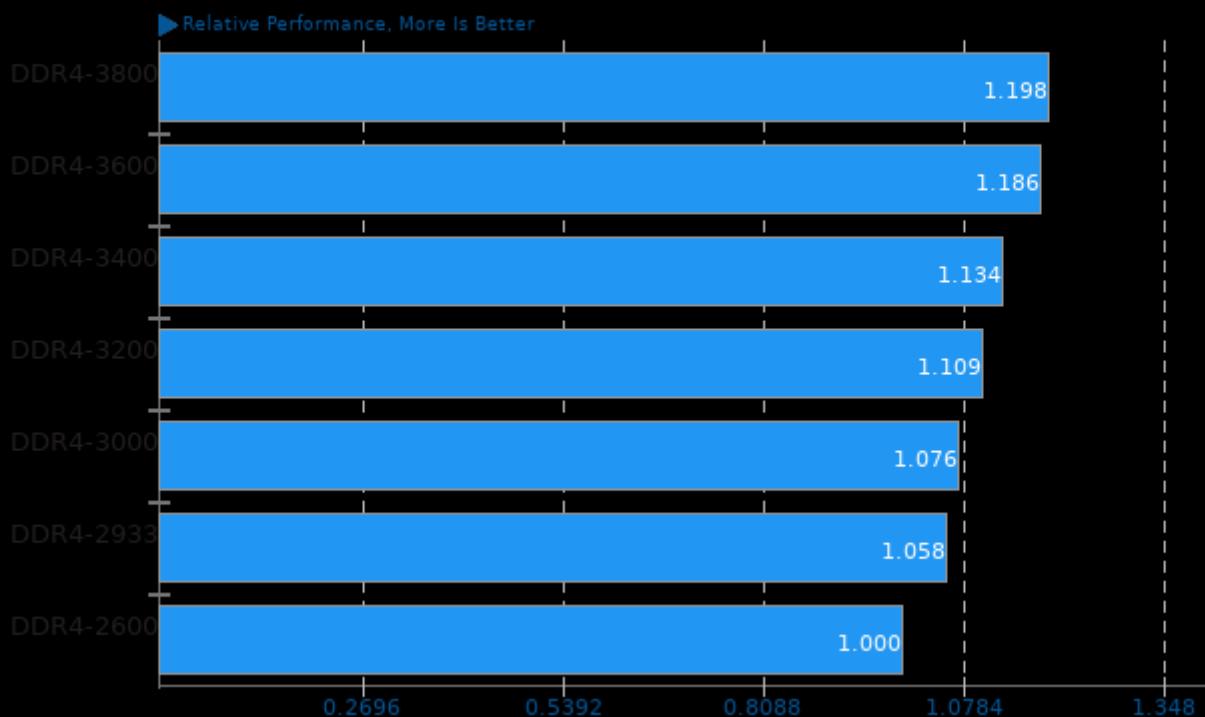
Result Composite - Ryzen 9 3900X Memory Scaling Benchmarks



Geometric mean based upon tests: pts/pgbench, pts/tinymembench, pts/mbw and pts/t-test1

### Geometric Mean Of Memory Test Suite

Result Composite - Ryzen 9 3900X Memory Scaling Benchmarks

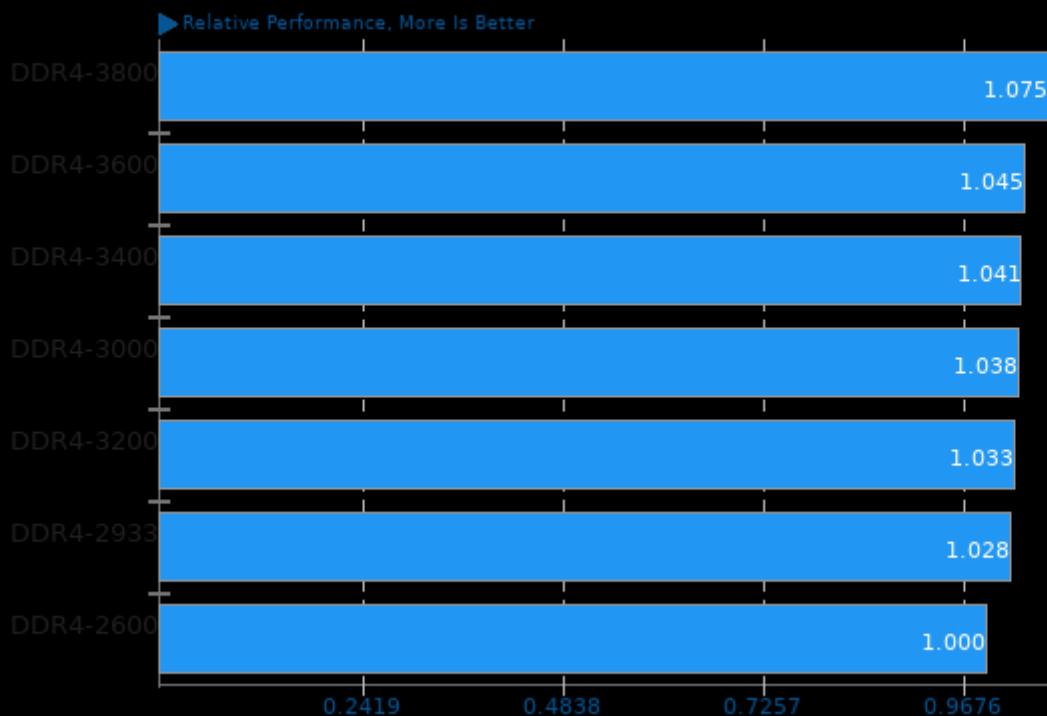


Geometric mean based upon tests: pts/ramspeed, pts/stream, pts/t-test1, pts/tinymembench and pts/mbw

## Ryzen 9 3900X Memory Scaling Benchmarks

### Geometric Mean Of Molecular Dynamics Tests

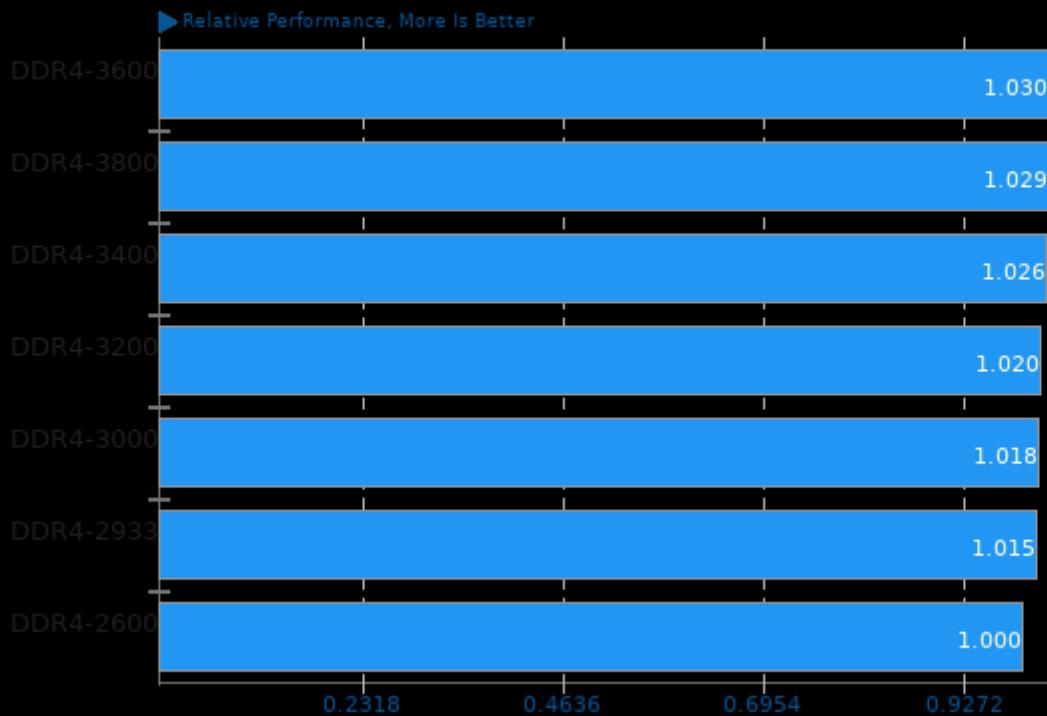
Result Composite - Ryzen 9 3900X Memory Scaling Benchmarks



Geometric mean based upon tests: pts/cp2k and pts/cloverleaf

### Geometric Mean Of Multi-Core Tests

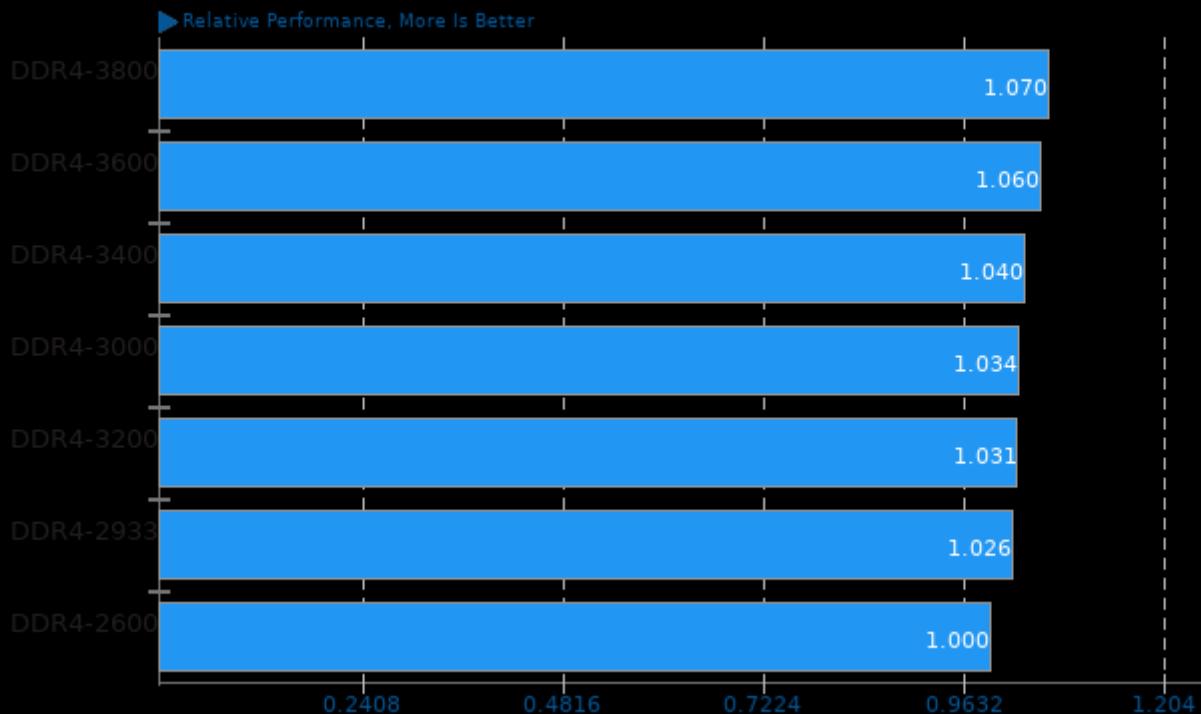
Result Composite - Ryzen 9 3900X Memory Scaling Benchmarks



Geometric mean based upon tests: pts/x265, pts/vpxenc, pts/svt-av1, pts/rodinia, pts/parboil, pts/npb, pts/john-the-ripper, pts/compress-7zip, pts/compress-zstd, pts/build-linux-kernel, pts/build-llvm and pts/pgbench

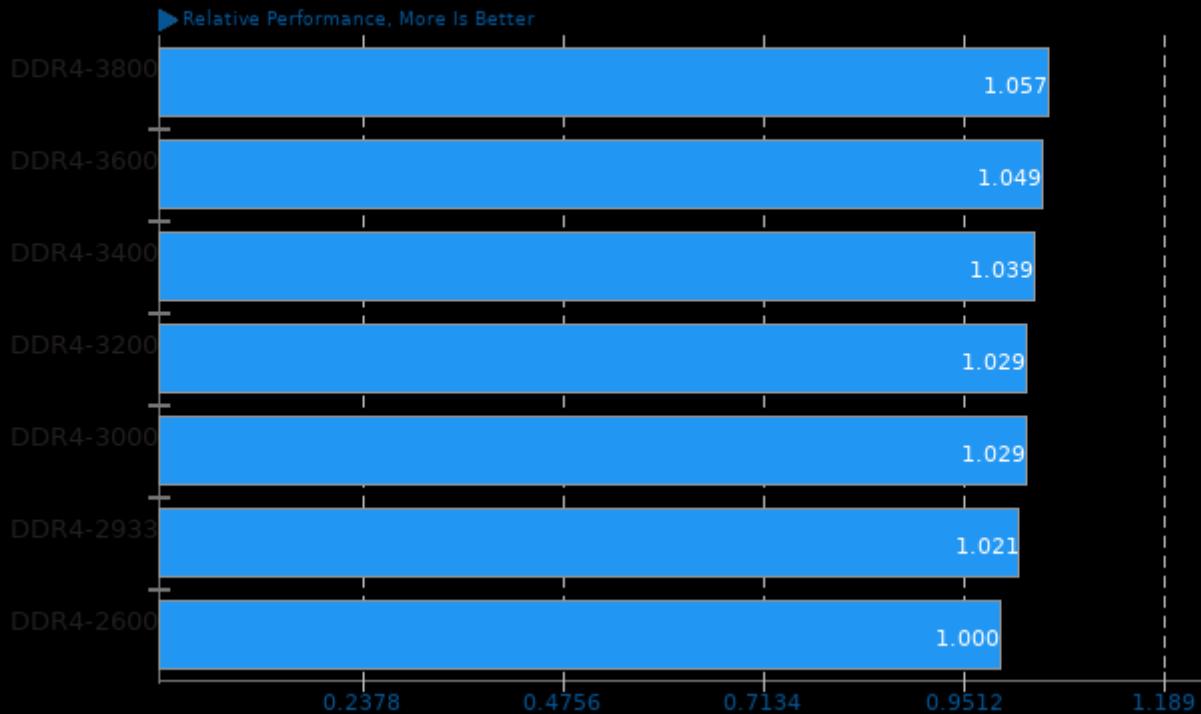
## Ryzen 9 3900X Memory Scaling Benchmarks

### Geometric Mean Of OpenCL Tests Result Composite - Ryzen 9 3900X Memory Scaling Benchmarks



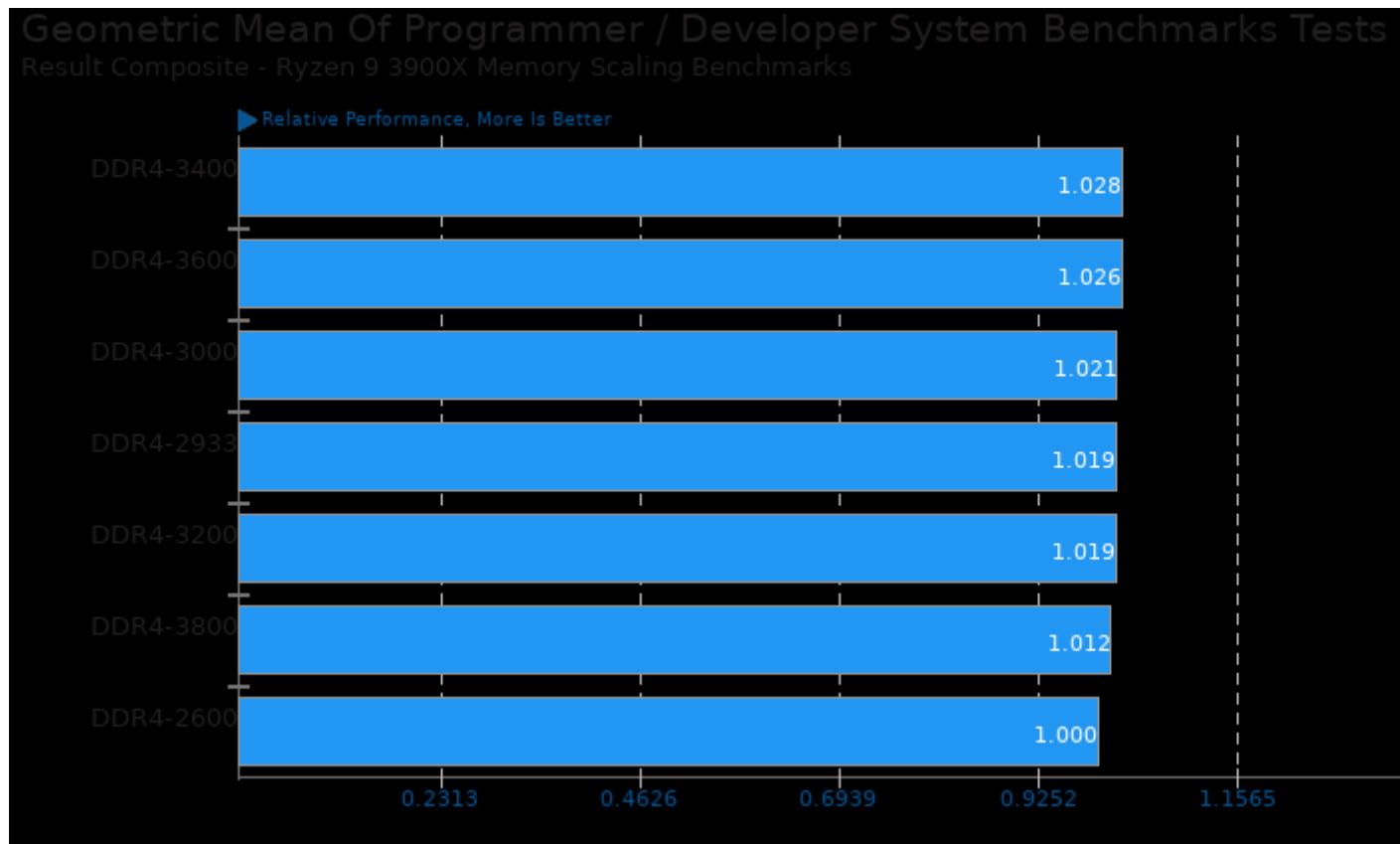
Geometric mean based upon tests: pts/rodinia, pts/parboil and system/darktable

### Geometric Mean Of OpenMPI Tests Result Composite - Ryzen 9 3900X Memory Scaling Benchmarks

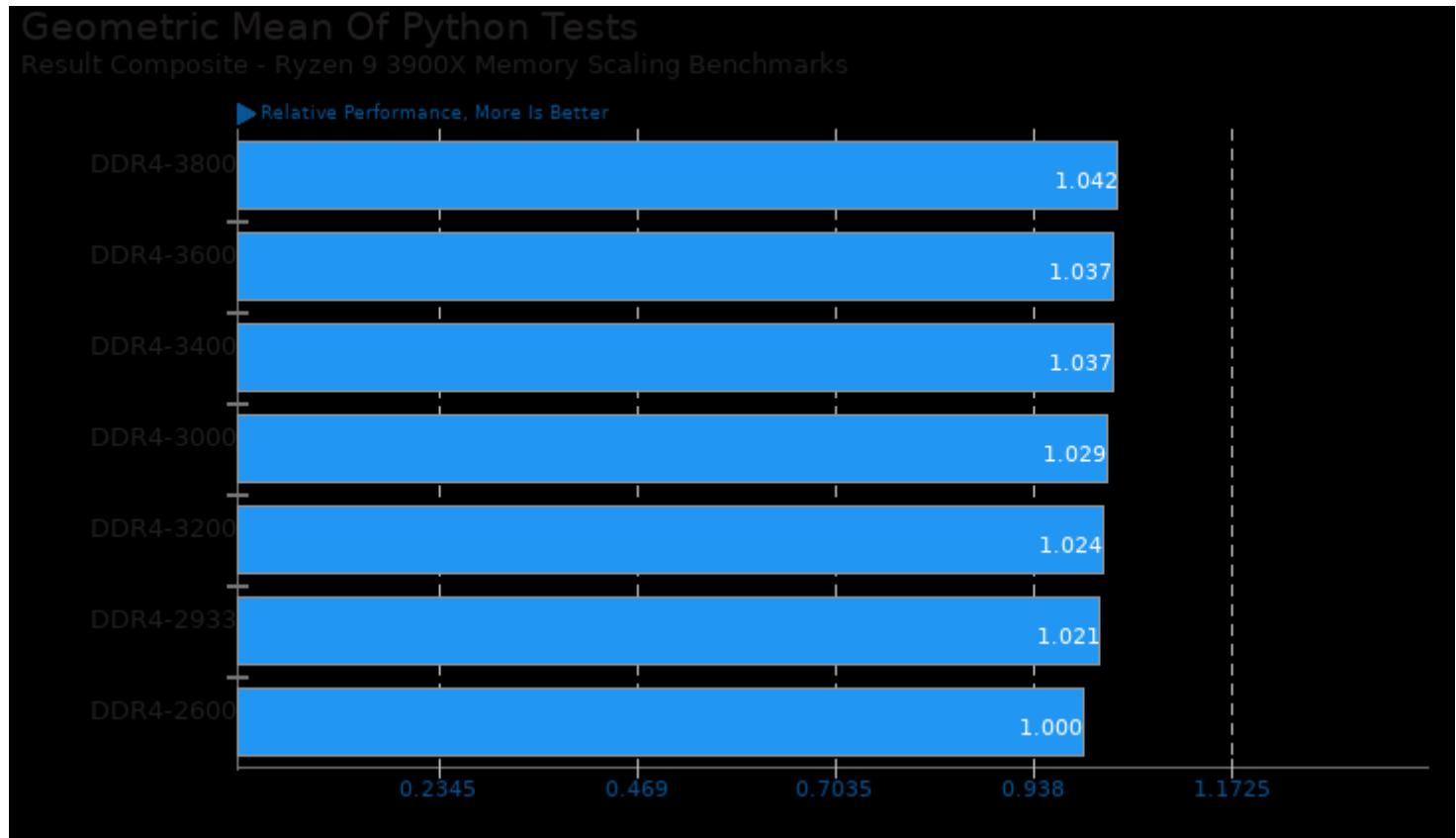


Geometric mean based upon tests: pts/parboil, pts/npb, pts/rodinia and pts/cloverleaf

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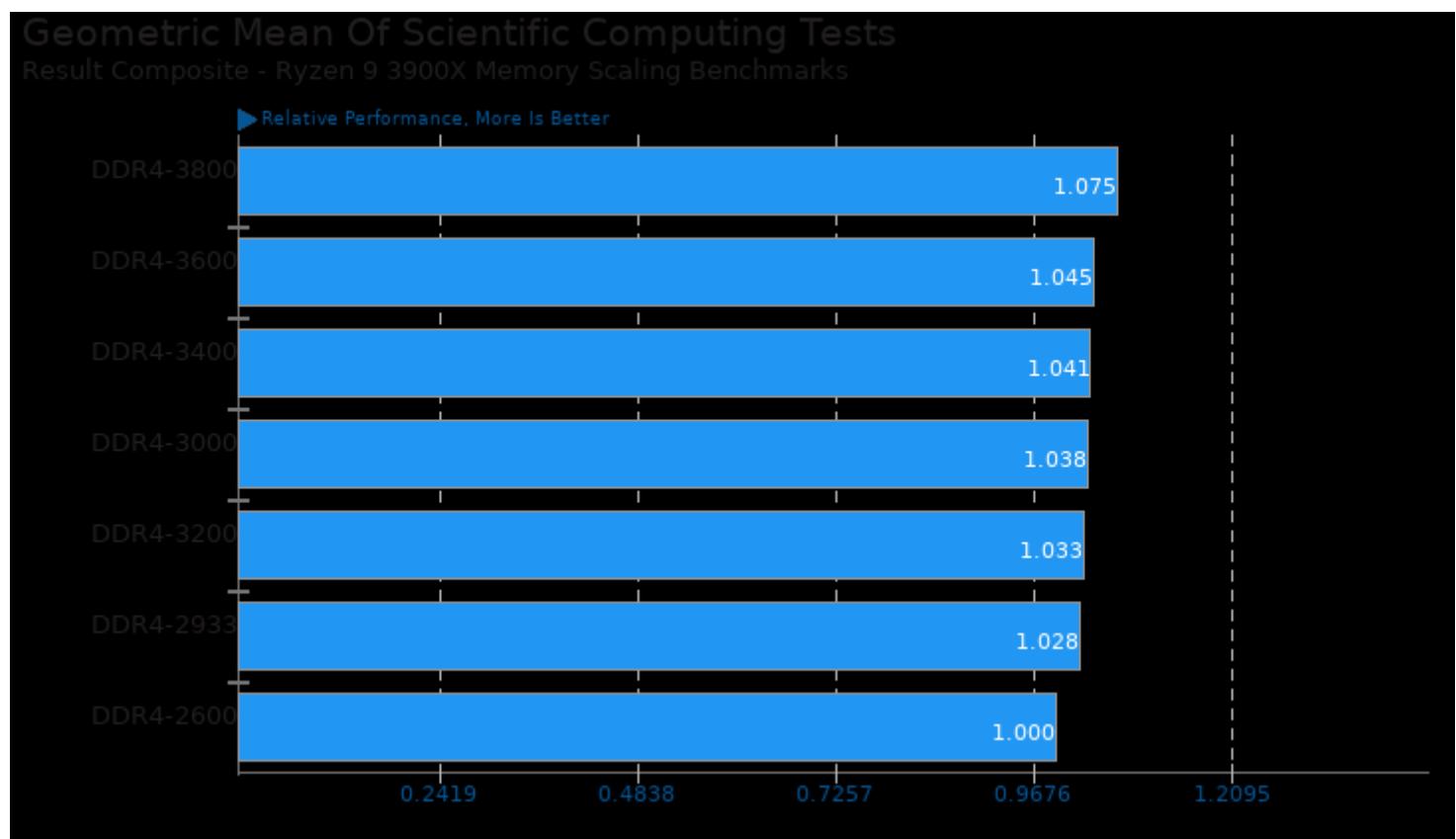


Geometric mean based upon tests: pts/compress-zstd, pts/build-linux-kernel and pts/build-llvm

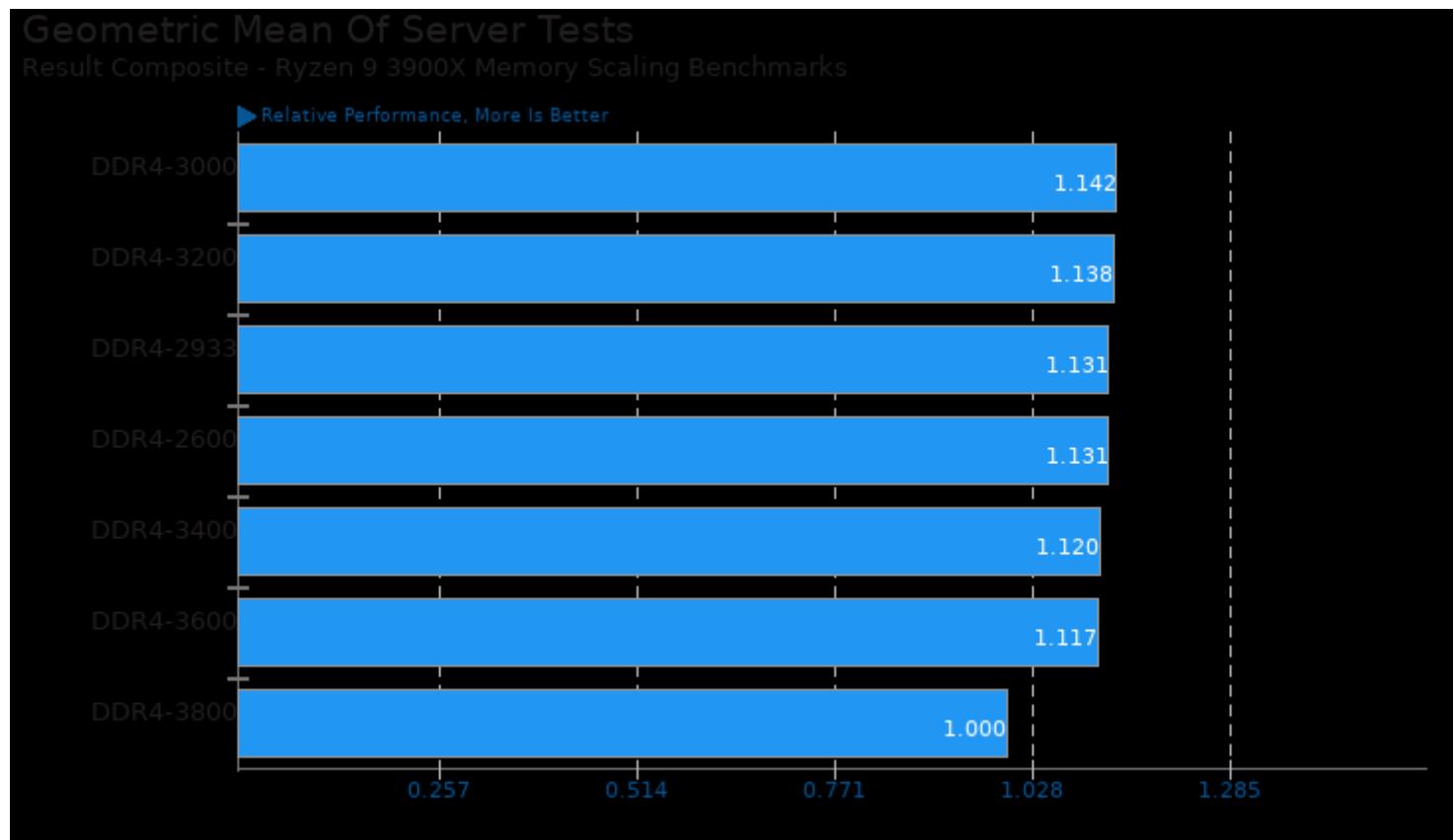


Geometric mean based upon tests: pts/parboil and pts/build-llvm

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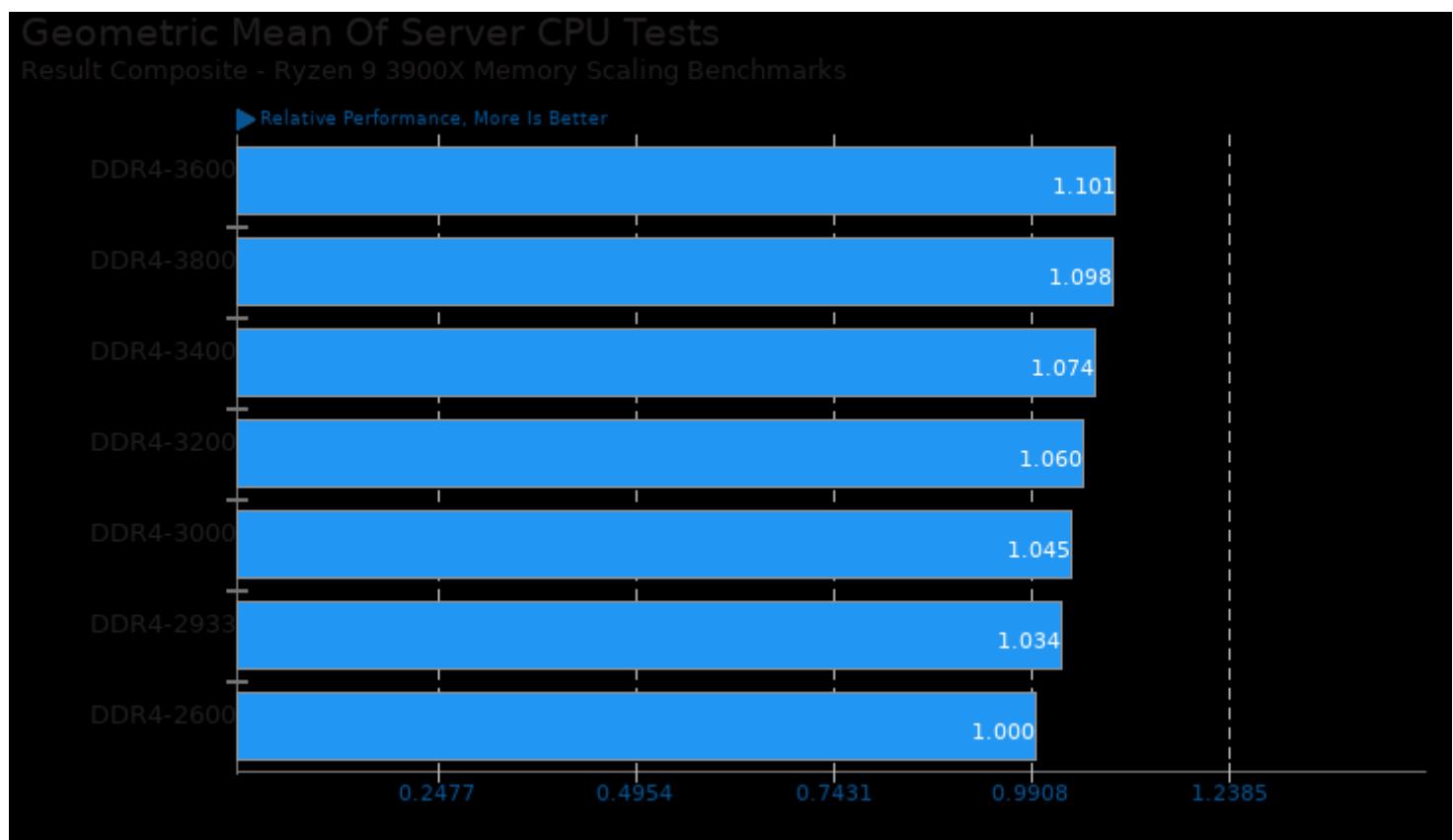


Geometric mean based upon tests: pts/cp2k and pts/cloverleaf

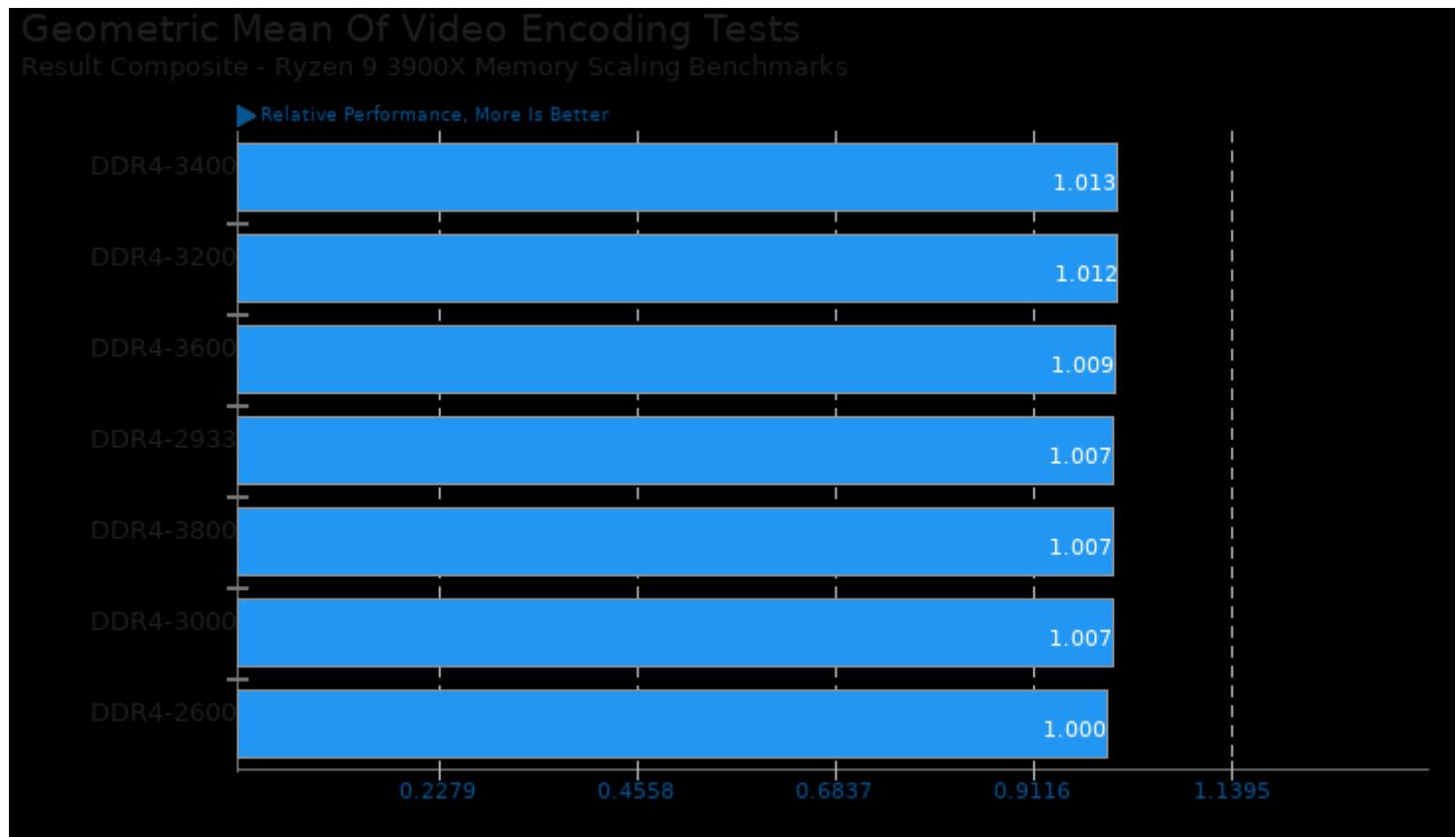


Geometric mean based upon tests: pts/apache-siege and pts/pgbench

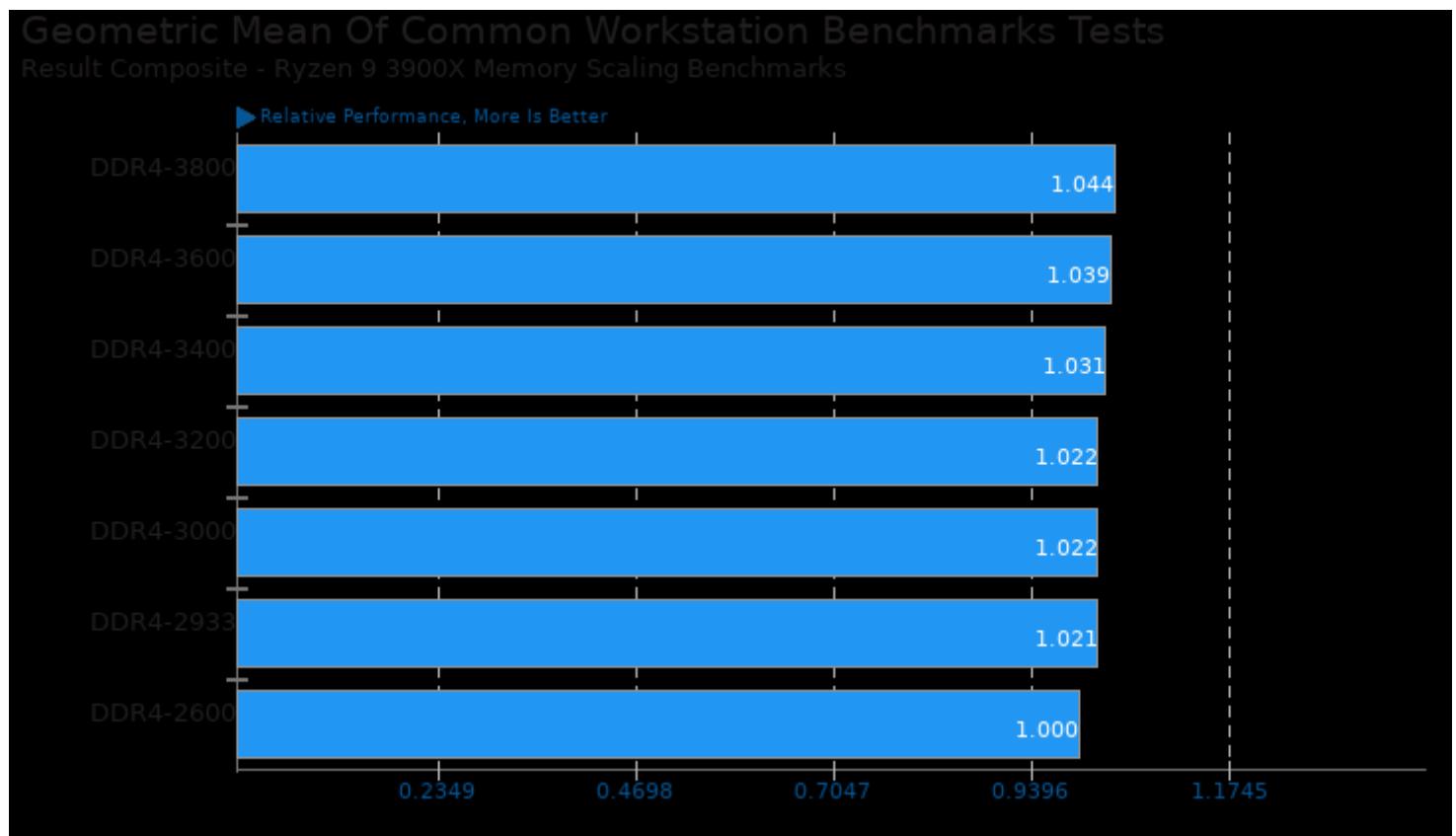
## Ryzen 9 3900X Memory Scaling Benchmarks



Geometric mean based upon tests: pts/npb, pts/cp2k, pts/rodinia, pts/dacapobench, pts/john-the-ripper, pts/svt-av1, pts/x265, pts/compress-7zip, pts/build-linux-kernel, pts/build-llvm, pts/compress-zstd, pts/apache-siege, pts/ramspeed and pts/stream



Geometric mean based upon tests: pts/x265, pts/vpxenc and pts/svt-av1



Geometric mean based upon tests: pts/rodinia, pts/parboil and pts/x265

*This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 29 March 2024 09:56.*