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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: l1tf: 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

DDR4-3000

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

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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

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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)
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	DDR4-2600	DDR4-2933	DDR4-3000	DDR4-3200	DDR4-3400	DDR4-3600	DDR4-3800
RAMspeed SMP - Add - Integer (MB/s)	25918	26243	26761	28103	31268	32972	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 - Copy - Integer (MB/s)	22450	22991	24114	24350	25066	27729	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 - Scale - Integer (MB/s)	21296	23520	23110	24129	24913	27101	27762
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 - Triad - Integer (MB/s)	24547	27393	27791	29515	30159	31843	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 - Integer (MB/s)	23492	25662	26088	26046	27138	29842	30422
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)	24408	27703	28422	30133	28989	32701	33449
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%		

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RAMspeed SMP - Copy - Floating Point (MB/s)	**22301**	23712	24048	25442	26065	27567	**28318**
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)	**22067**	23464	23844	25112	25705	27230	**27971**
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%		
RAMspeed SMP - Triad - Floating Point (MB/s)	**25785**	27664	28135	29679	30690	32479	**33134**
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 - Average - Floating Point (MB/s)	**24013**	25269	26061	27592	28360	28017	**30642**
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%		
Stream - Copy (MB/s)	**29638**	30565	31245	31772	31772	32716	**32901**
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%
Stream - Scale (MB/s)	**15735**	16042	16384	16156	16383	16602	**17173**
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%
Stream - Triad (MB/s)	**18127**	18423	18837	18471	18789	19113	**19968**
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%
Stream - Add (MB/s)	**18201**	18473	18914	18559	18861	19210	**19972**
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%
Tinymembench - Standard Memcpy (MB/s)	**15671**	16893	17282	18332	18922	20005	**20027**
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%
Tinymembench - Standard Memset (MB/s)	**12743**	13528	13945	14496	14548	**14896**	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%
MBW - Memory Copy - 4096 MiB (MiB/s)	**15049**	16762	16729	17615	18221	19077	**19171**
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%
MBW - M.C.F.B.S - 4096 MiB (MiB/s)	**8209**	8973	8918	9333	9572	**10142**	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%
t-test1 - 1 (sec)	20.57	**20.66**	20.53	20.40	20.50	20.53	**20.21**
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%
t-test1 - 2 (sec)	**7.39**	7.27	7.23	7.20	**7.13**	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%
NAS Parallel Benchmarks - BT.A (Mop/s)	**6191**	6287	6302	6366	6378	**6448**	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%

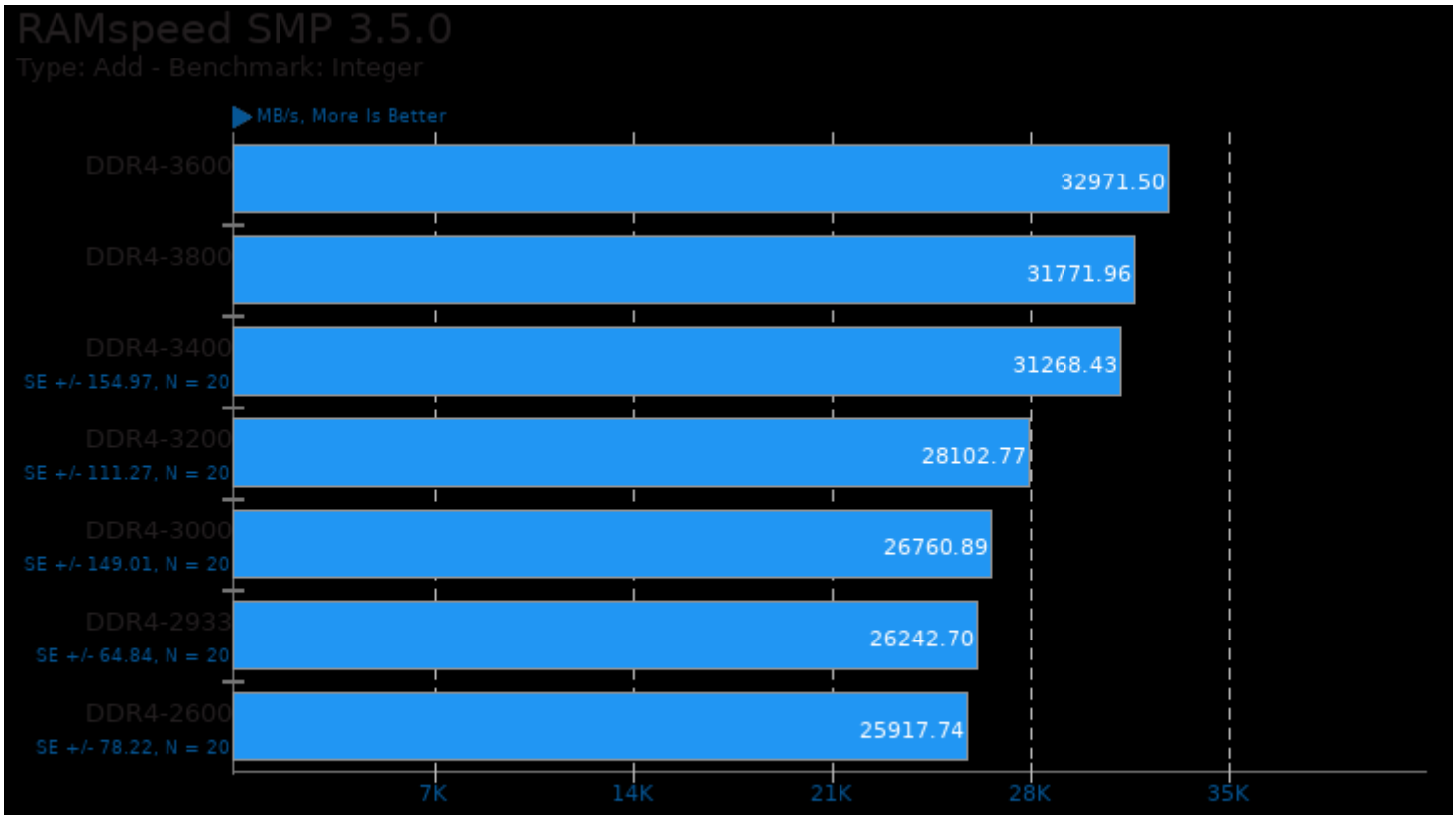
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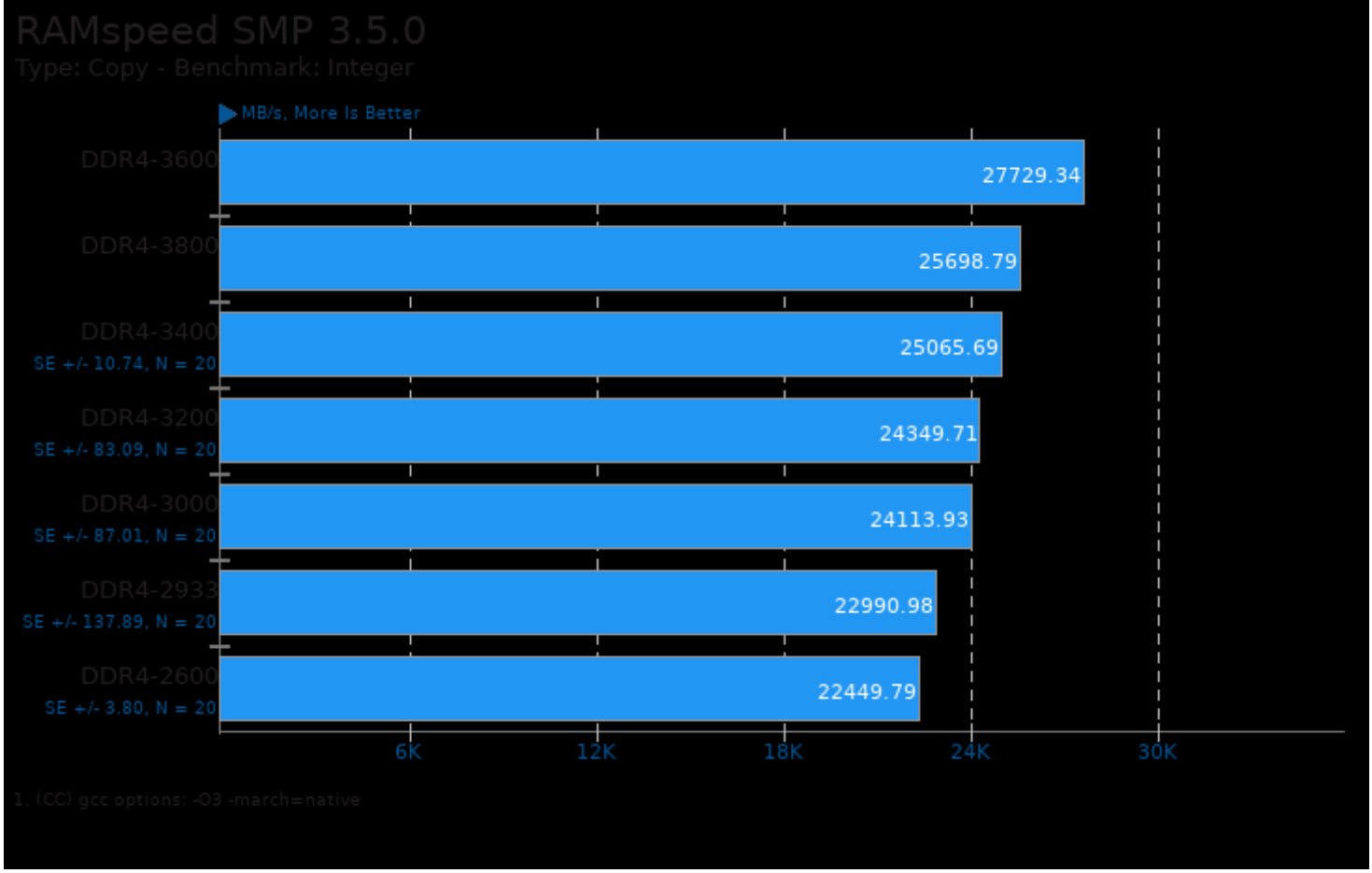
NAS Parallel Benchmarks - EP.C (Mop/s)	481.46	481.66	482.02	481.99	**480.79**	**482.27**	481.91
Normalized	99.83%	99.87%	99.95%	99.94%	99.69%	100%	99.93%
Standard Deviation	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%
NAS Parallel Benchmarks - LU.C (Mop/s)	**20554**	20906	21262	21040	21295	21491	**22301**
Normalized	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%
NAS Parallel Benchmarks - SP.A (Mop/s)	**4012**	4157	4197	4297	4341	**4410**	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%
Parboil - OpenMP LBM (sec)	**159.09**	155.55	152.32	154.47	152.16	150.34	**145.00**
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%
Parboil - OpenMP CUTCP (sec)	**2.31**	2.26	2.25	2.23	**2.20**	**2.20**	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%
CloverLeaf - L.E.H (sec)	**3.87**	3.78	3.69	3.76	3.69	3.67	**3.50**
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%
CP2K Molecular Dynamics - Fayalite-FIST	**338.84**	327.98	329.42	326.66	327.69	327.02	**323.90**
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%		
Rodinia - O.S (sec)	**21.91**	21.19	21.61	21.55	21.37	**21.01**	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%
DaCapo Benchmark - H2 (msec)	**3247**	3215	3208	3169	3155	3183	**3136**
Normalized	96.58%	97.54%	97.76%	98.96%	99.4%	98.52%	100%
Standard Deviation	3%	2.6%	3%	3%	3.2%	1.7%	0.6%
DaCapo Benchmark - Jython (msec)	4083	**4095**	4075	**4022**	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%
DaCapo Benchmark - Tradebeans (msec)	**4318**	4247	4236	4175	4141	**4140**	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%
John The Ripper - Blowfish (Real C/S)	**28240**	28535	28546	28498	28475	28476	**28688**
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%
SVT-AV1 - 1.8.b.Y.T.A.V.E (FPS)	**45.57**	45.75	45.84	45.85	**45.92**	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%
VP9 libvpx Encoding - v.V.1.V.E (FPS)	**166.05**	168.23	168.02	170.28	**170.69**	169.12	169.21
Normalized	97.28%	98.56%	98.44%	99.76%	100%	99.08%	99.13%

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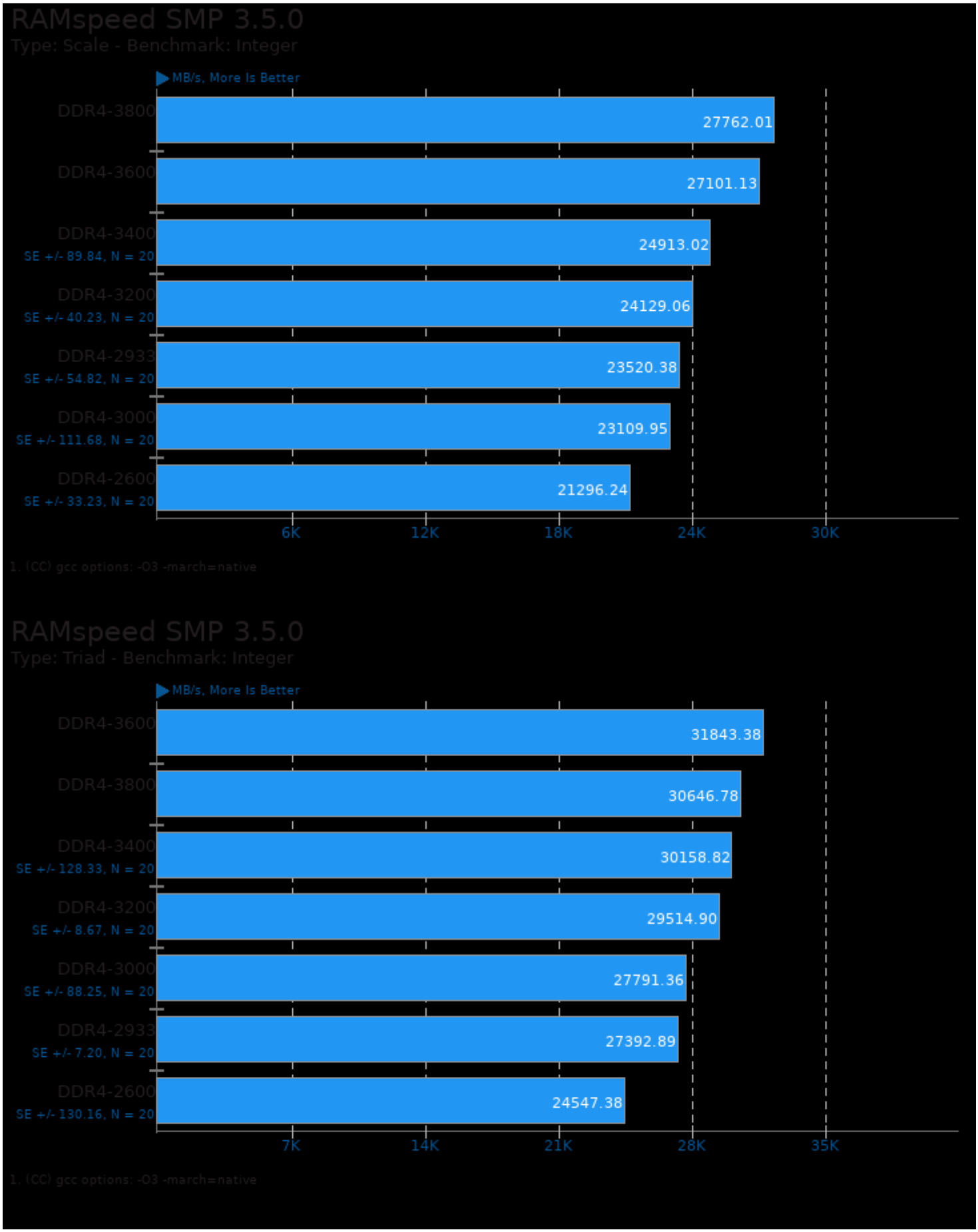
Standard Deviation	0.7%	0.6%	0.7%	0.8%	0.8%	0.2%	0.6%
x265 - H.2.1.V.E (FPS)	51.65	51.85	51.75	51.90	51.88	51.92	51.68
Normalized	99.48%	99.87%	99.67%	99.96%	99.92%	100%	99.54%
Standard Deviation	0.7%	0.8%	0.8%	0.5%	0.5%	1.1%	0.9%
7-Zip Compression - C.S.T (MIPS)	75996	77127	77403	77626	78070	78317	78362
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%
Timed Linux Kernel Compilation - Time To Compile (sec)	47.96	47.70	47.83	47.66	47.90	48.12	48.20
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%
Timed LLVM Compilation - Time To Compile (sec)	293.52	288.02	288.77	291.47	288.74	292.10	297.22
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%		
Zstd Compression - C.u.1.0.3.s.i.i.C.L.1 (sec)	19.46	18.81	18.64	18.62	18.24	18.05	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%
PostgreSQL pgbench - Buffer Test - Normal Load - Read Only (TPS)	287832	286246	286902	287137	287496	287775	288638
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%
Darktable - Boat - CPU-only (sec)	11.92	11.72	11.46	11.59	11.45	11.23	10.87
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%
Darktable - Masskrug - CPU-only (sec)	4.94	4.82	4.77	4.75	4.72	4.62	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%
Darktable - Server Rack - CPU-only (sec)	0.21	0.20	0.20	0.20	0.20	0.19	0.19
Normalized	90.48%	95%	95%	95%	95%	100%	100%
Standard Deviation	0.9%	2%	1.1%	1.1%	1.2%	1.6%	1.5%
Darktable - Server Room - CPU-only (sec)	3.69	3.65	3.60	3.64	3.61	3.57	3.47
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%
Apache Siege - 250 (Transactions/sec)	35421	35618	36243	35905	34742	34560	27602
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%

Ryzen 9 3900X Memory Scaling Benchmarks

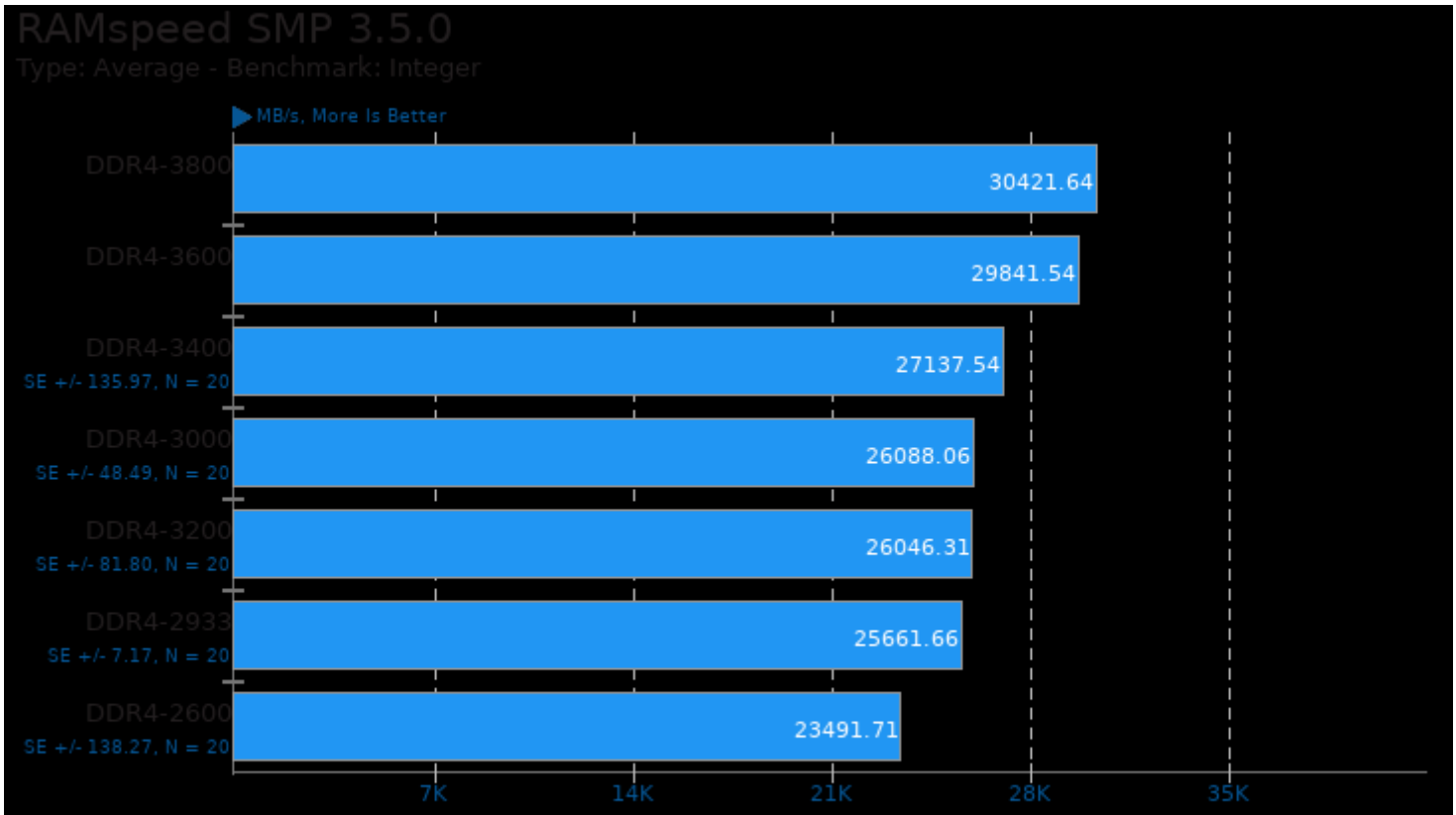


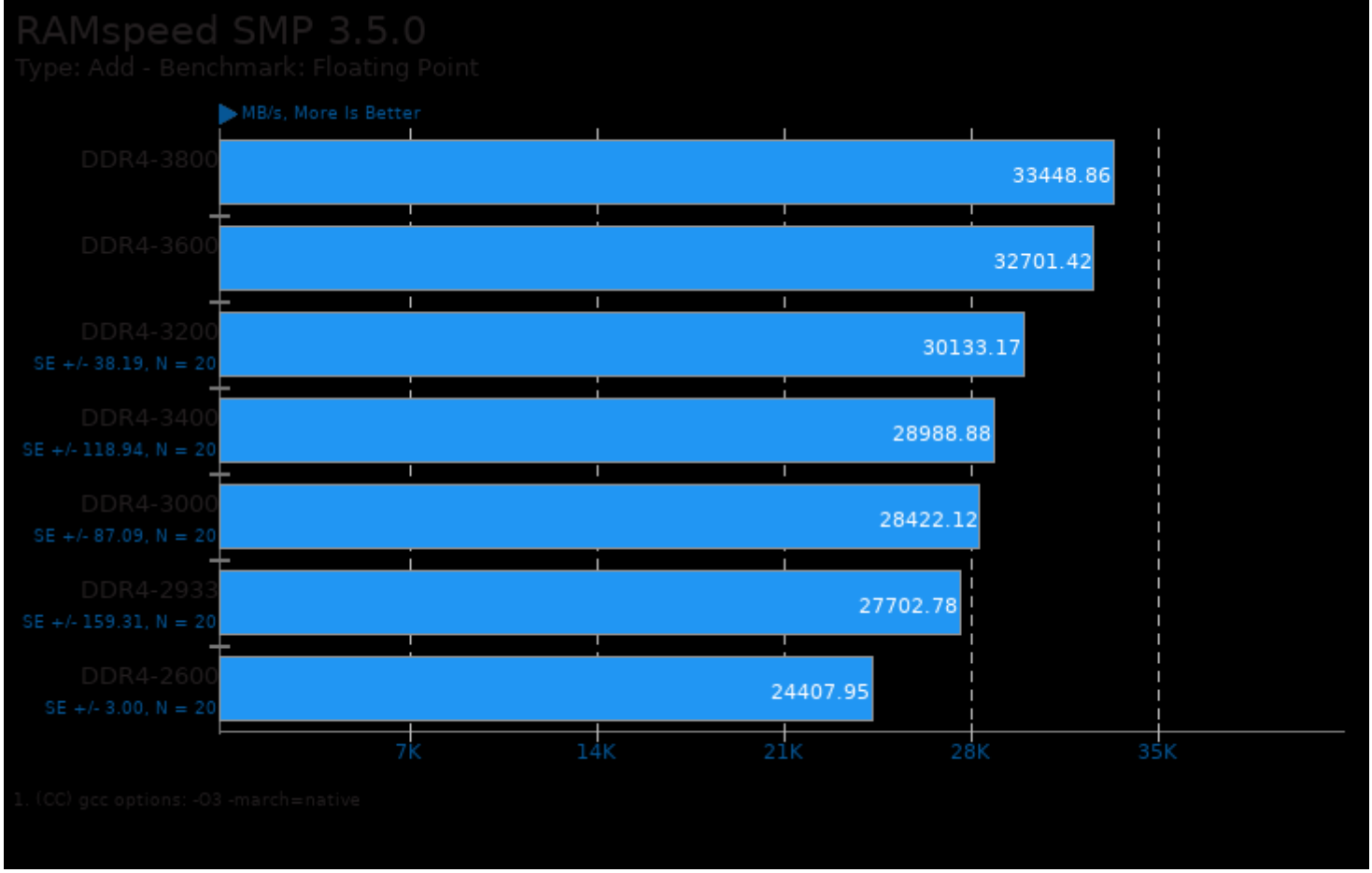


Ryzen 9 3900X Memory Scaling Benchmarks

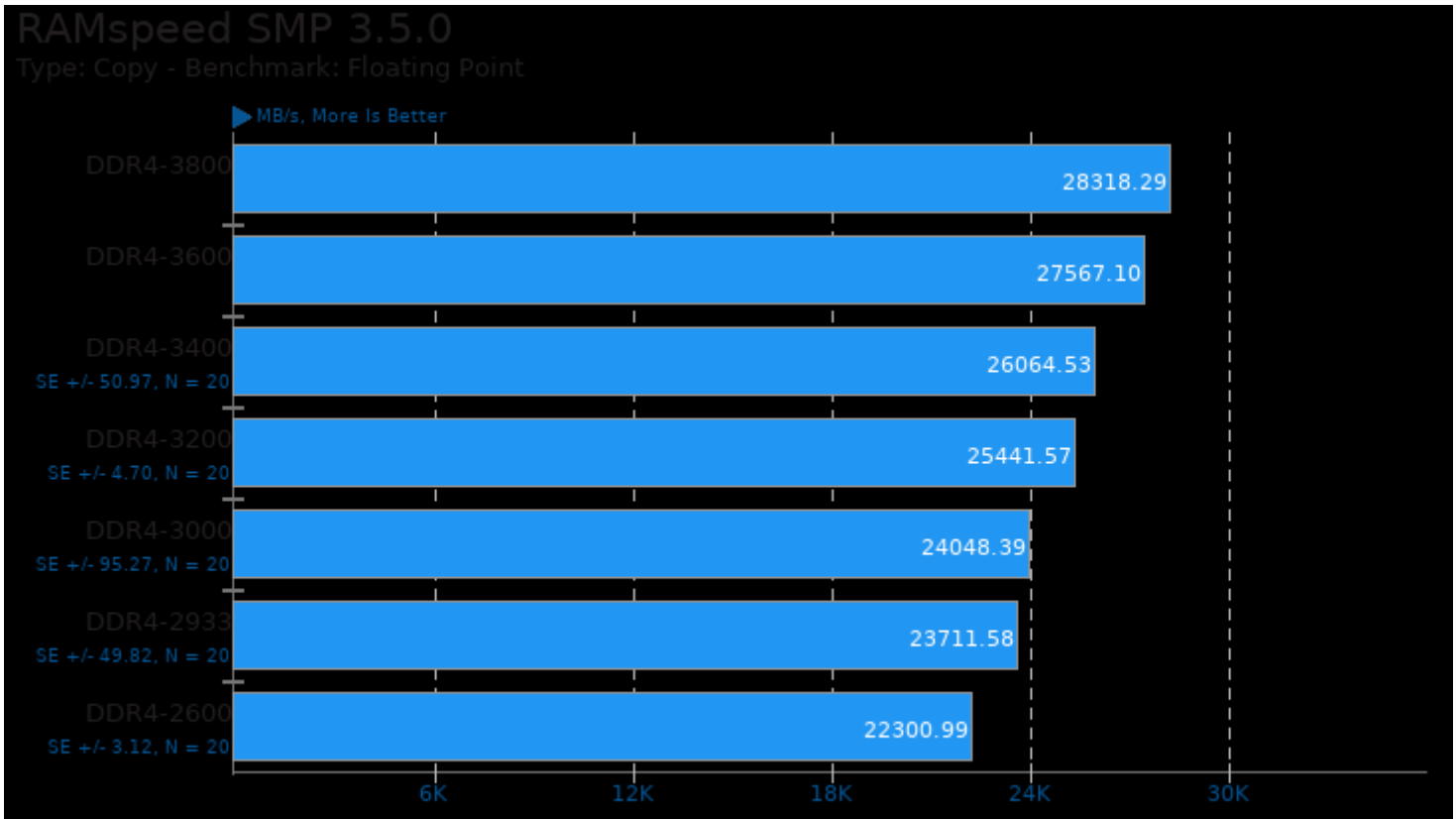


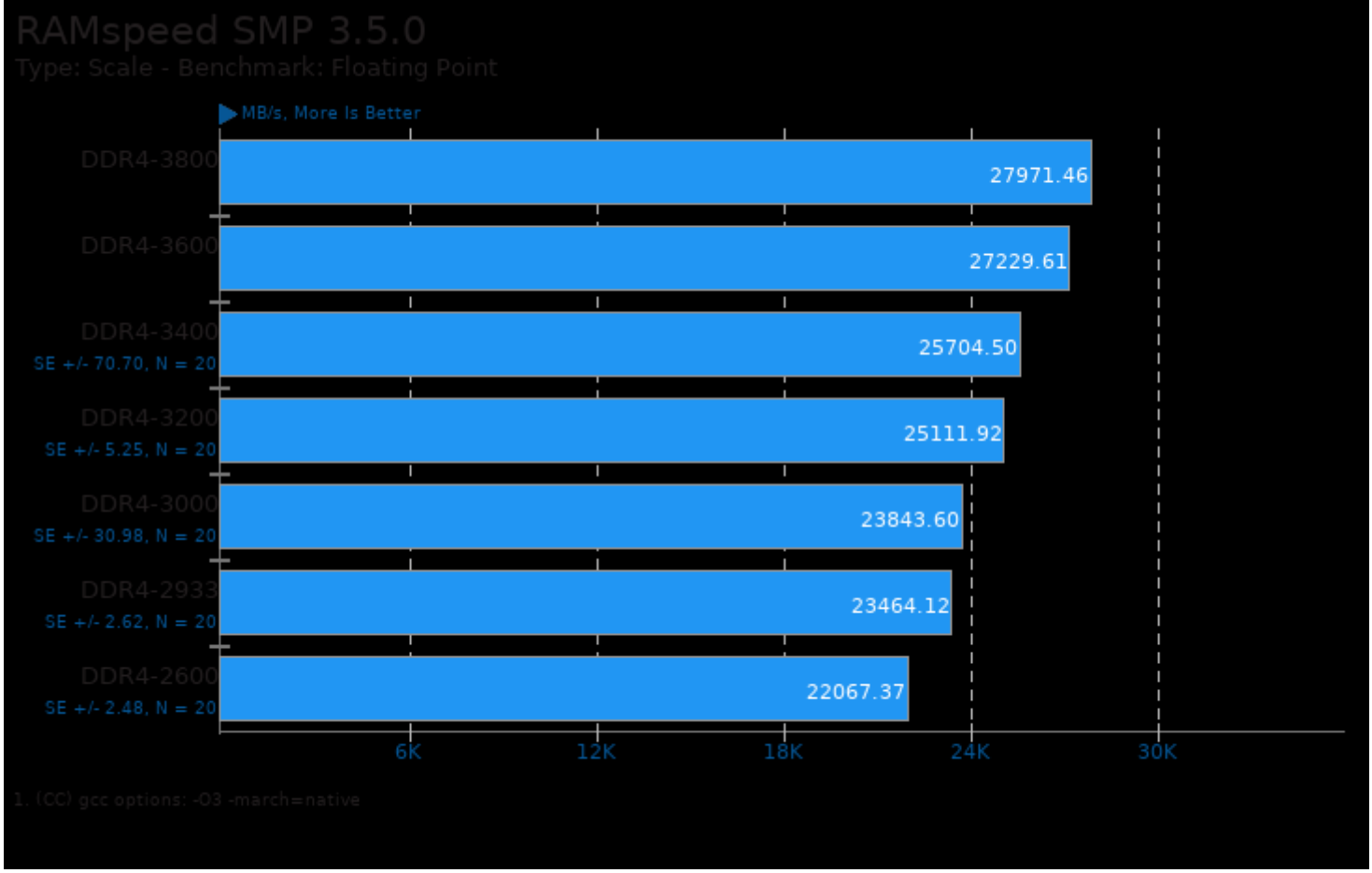
Ryzen 9 3900X Memory Scaling Benchmarks



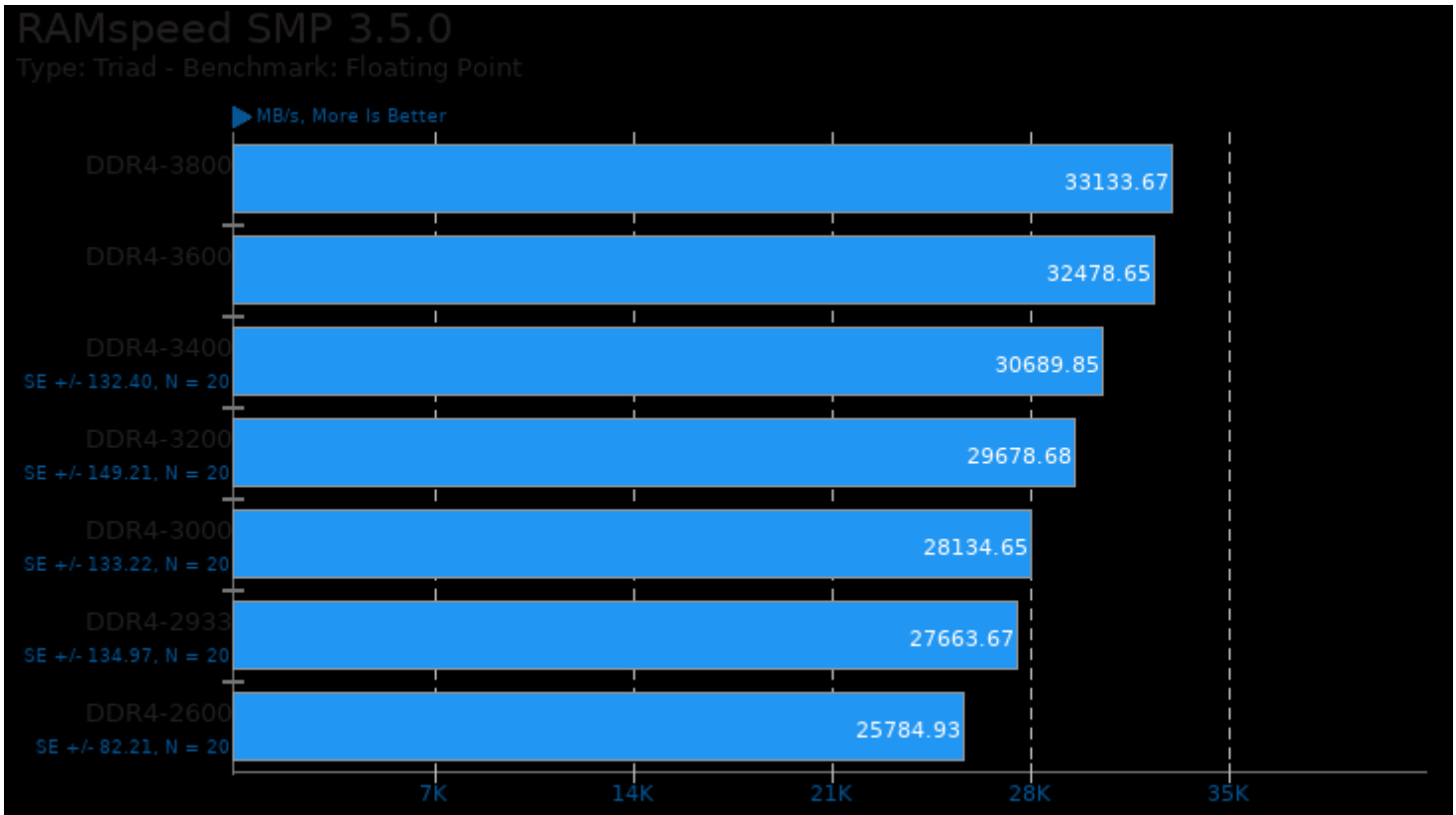


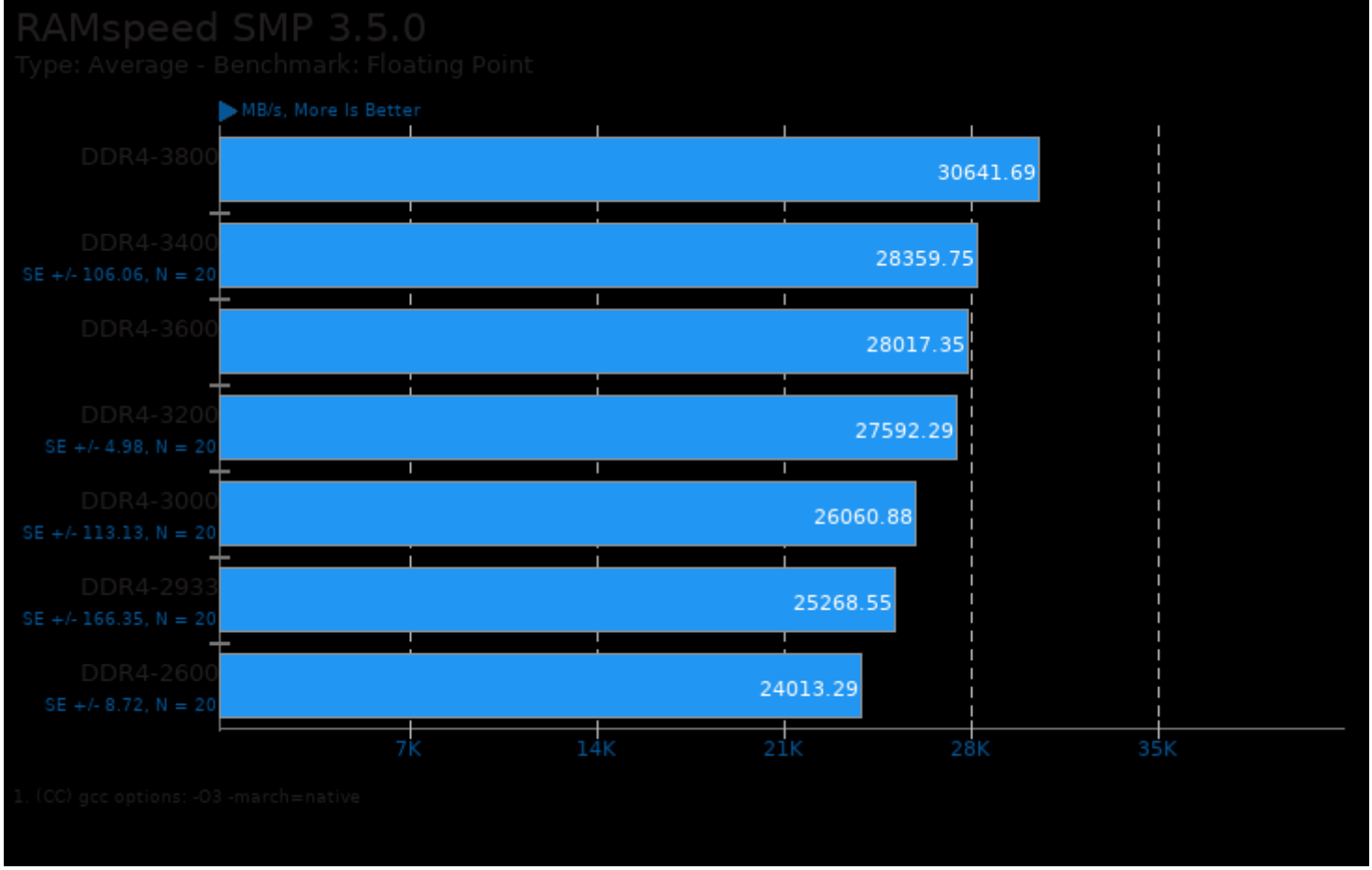
Ryzen 9 3900X Memory Scaling Benchmarks



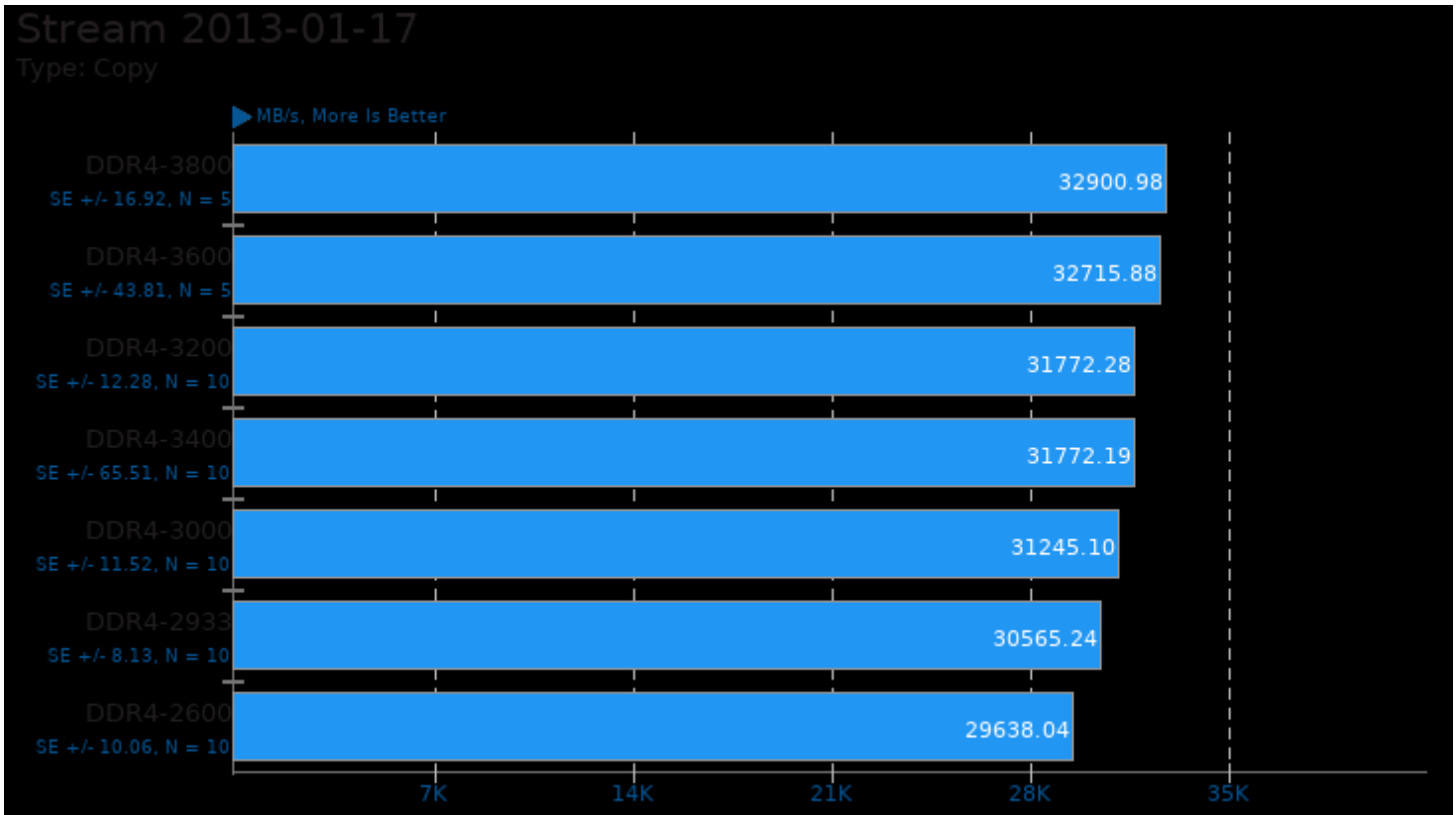


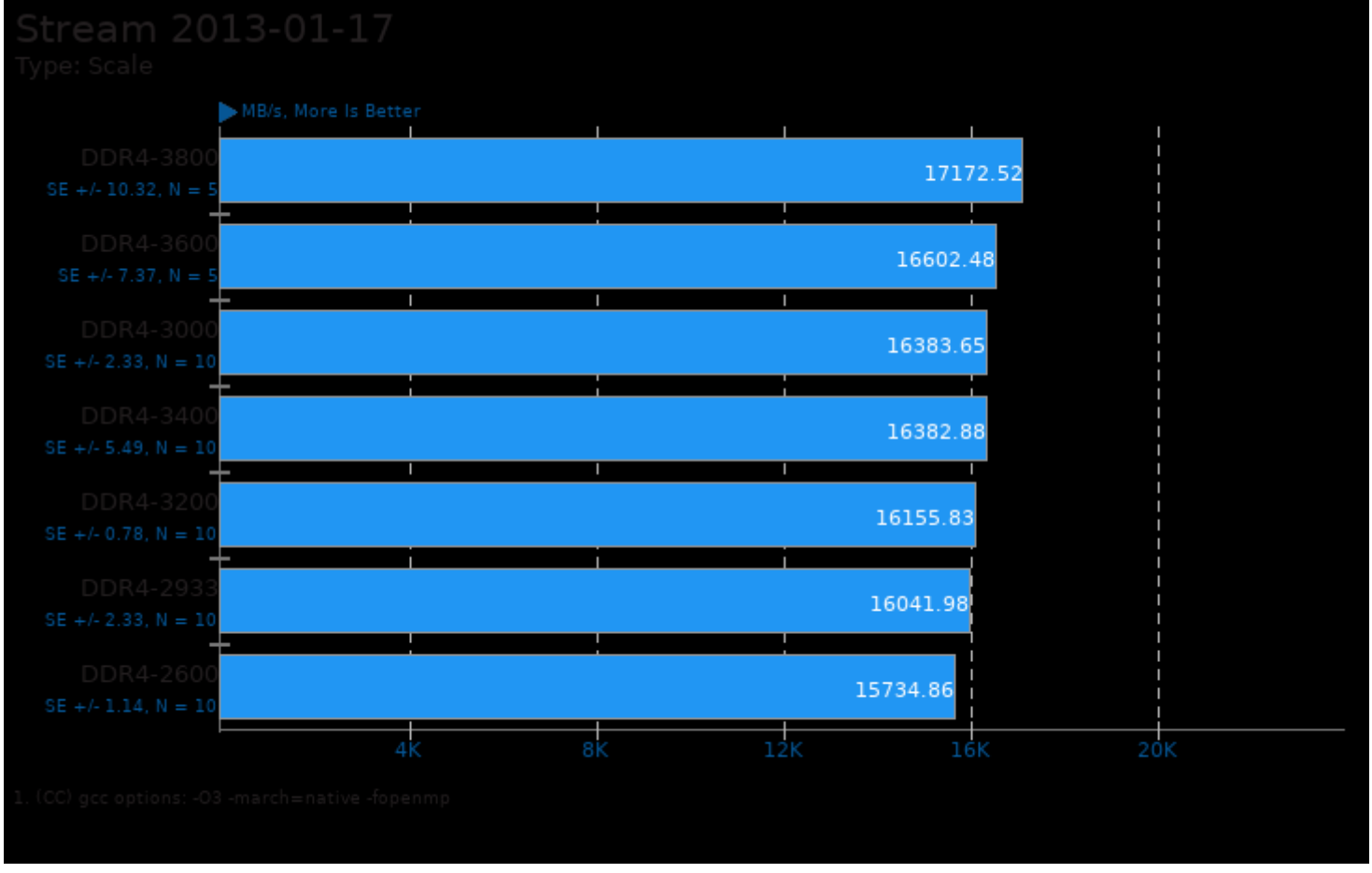
Ryzen 9 3900X Memory Scaling Benchmarks



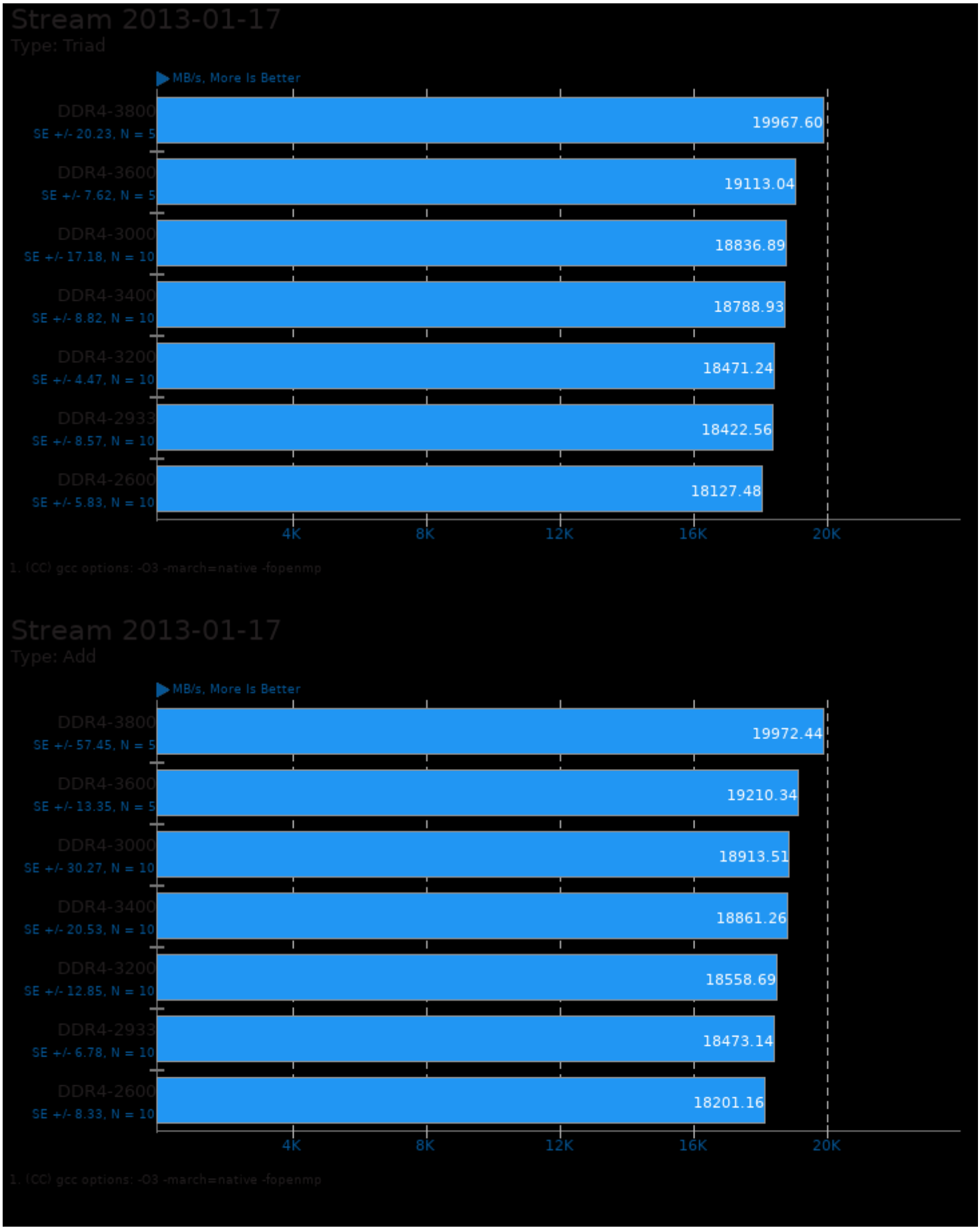


Ryzen 9 3900X Memory Scaling Benchmarks

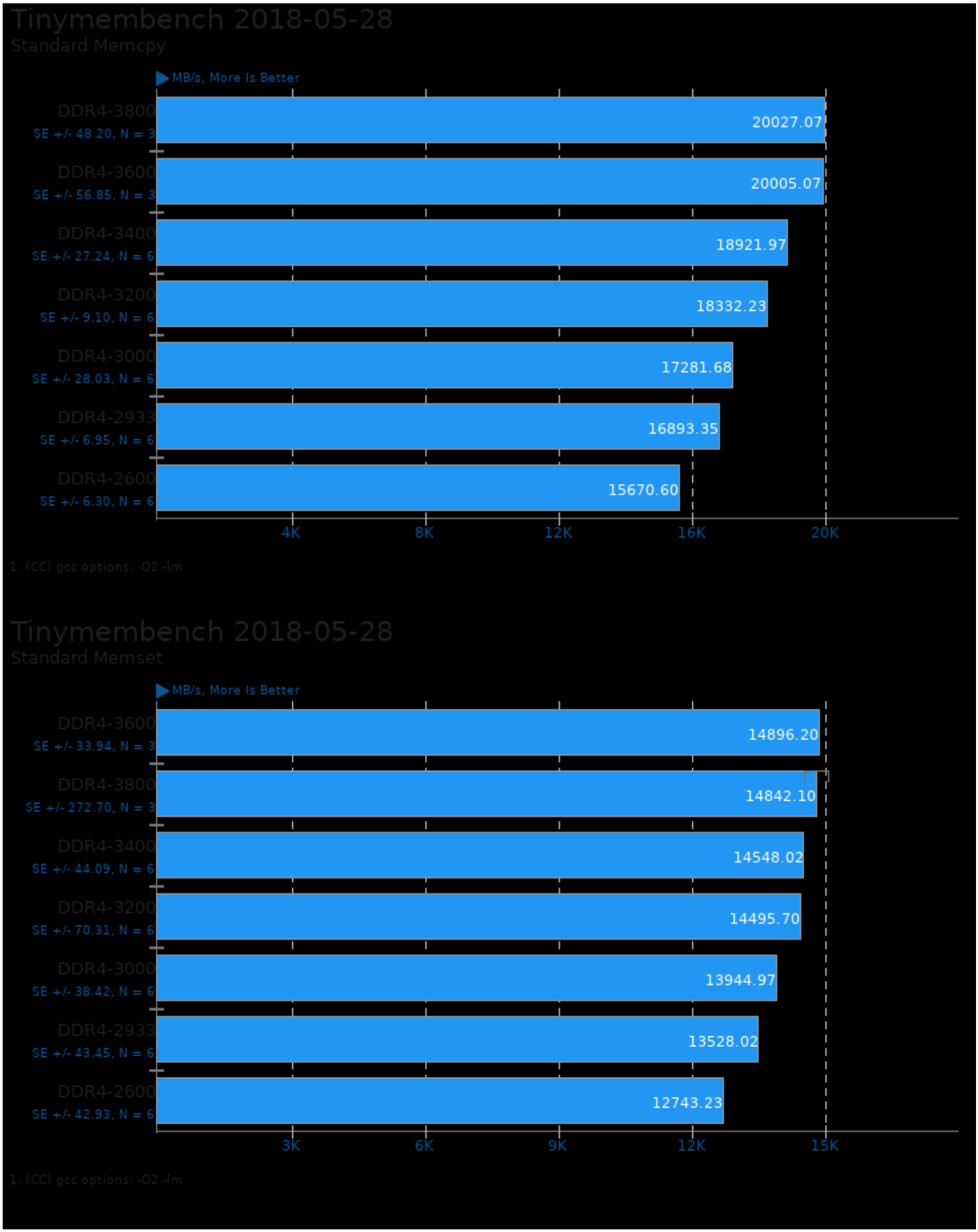




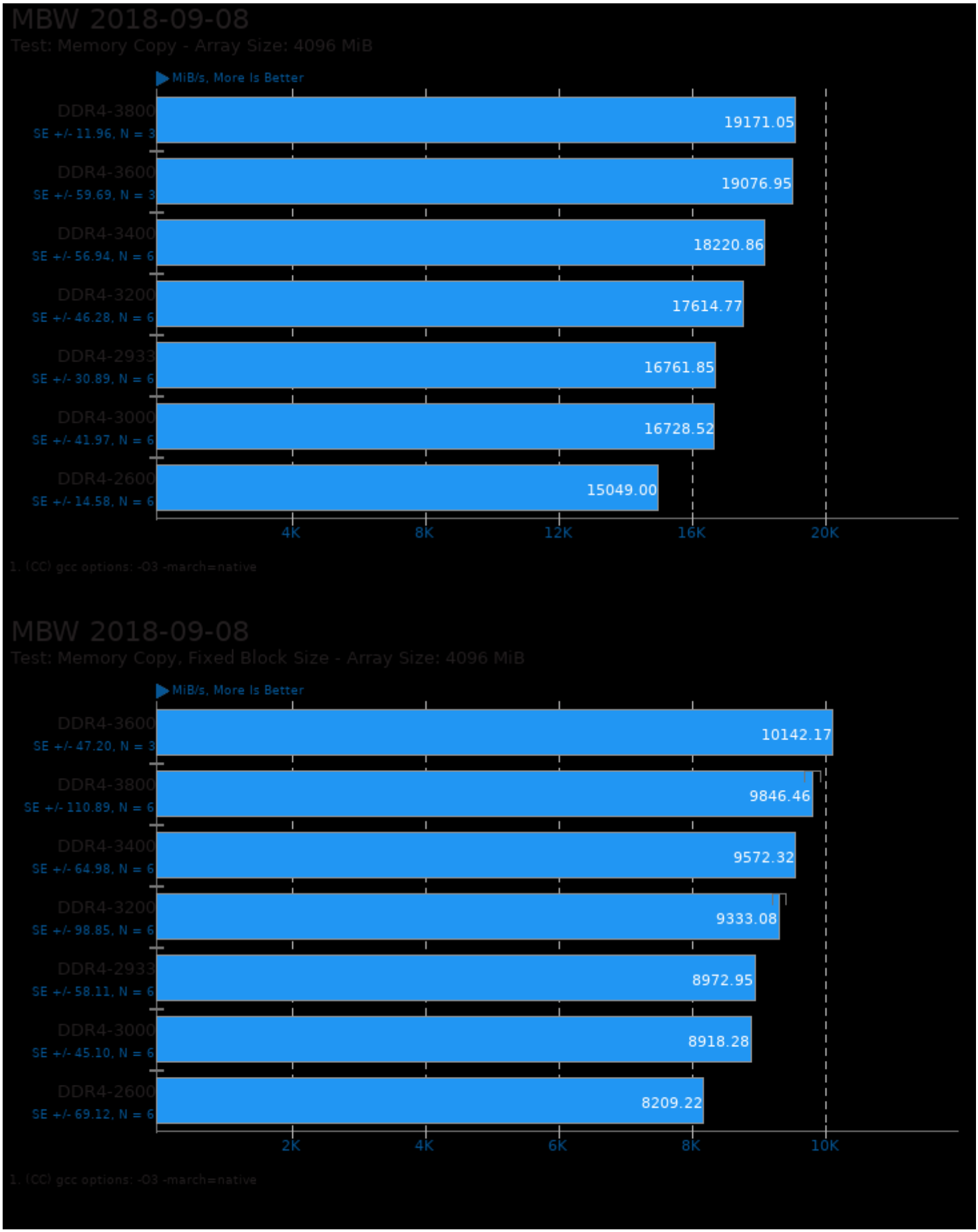
Ryzen 9 3900X Memory Scaling Benchmarks



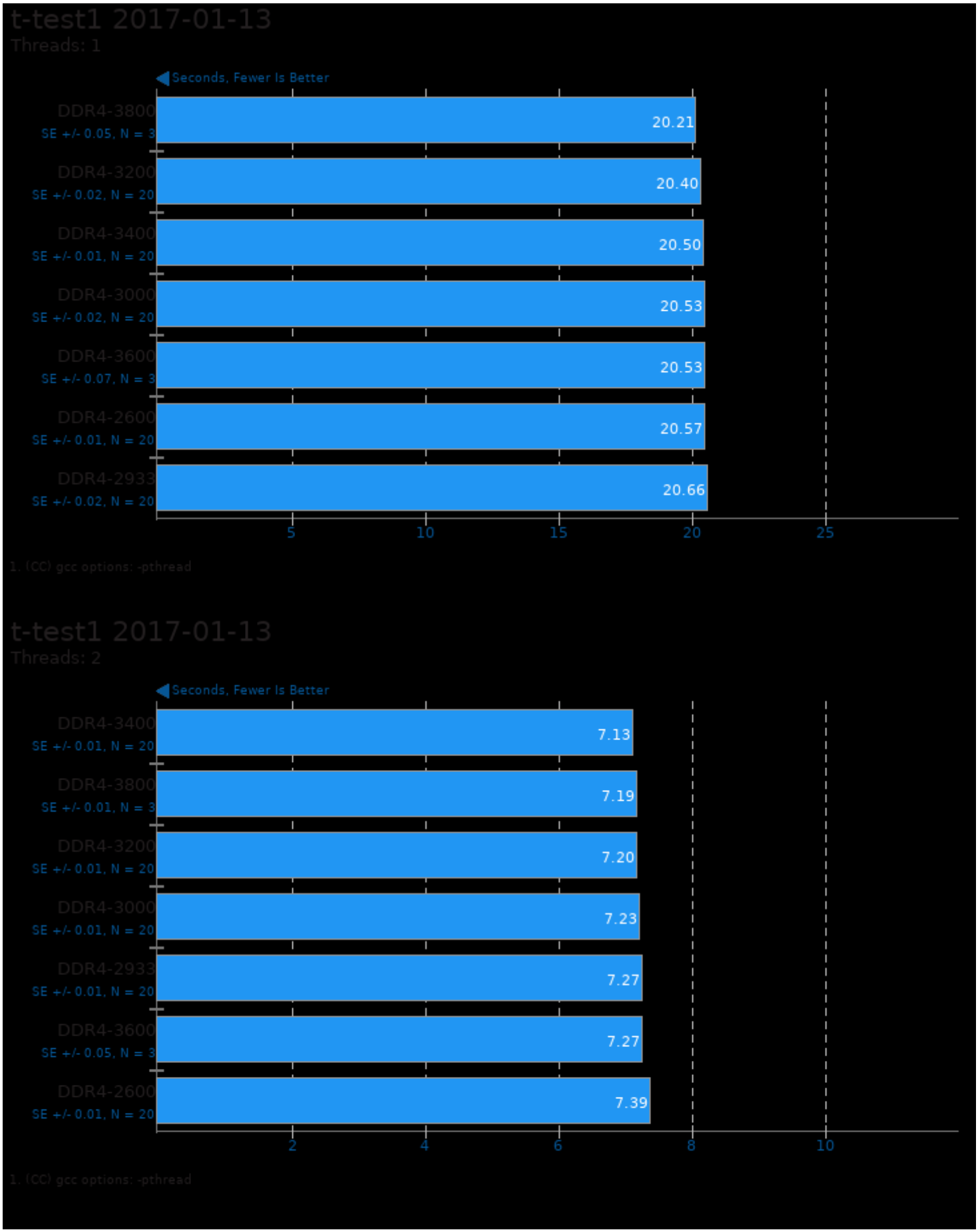
Ryzen 9 3900X Memory Scaling Benchmarks



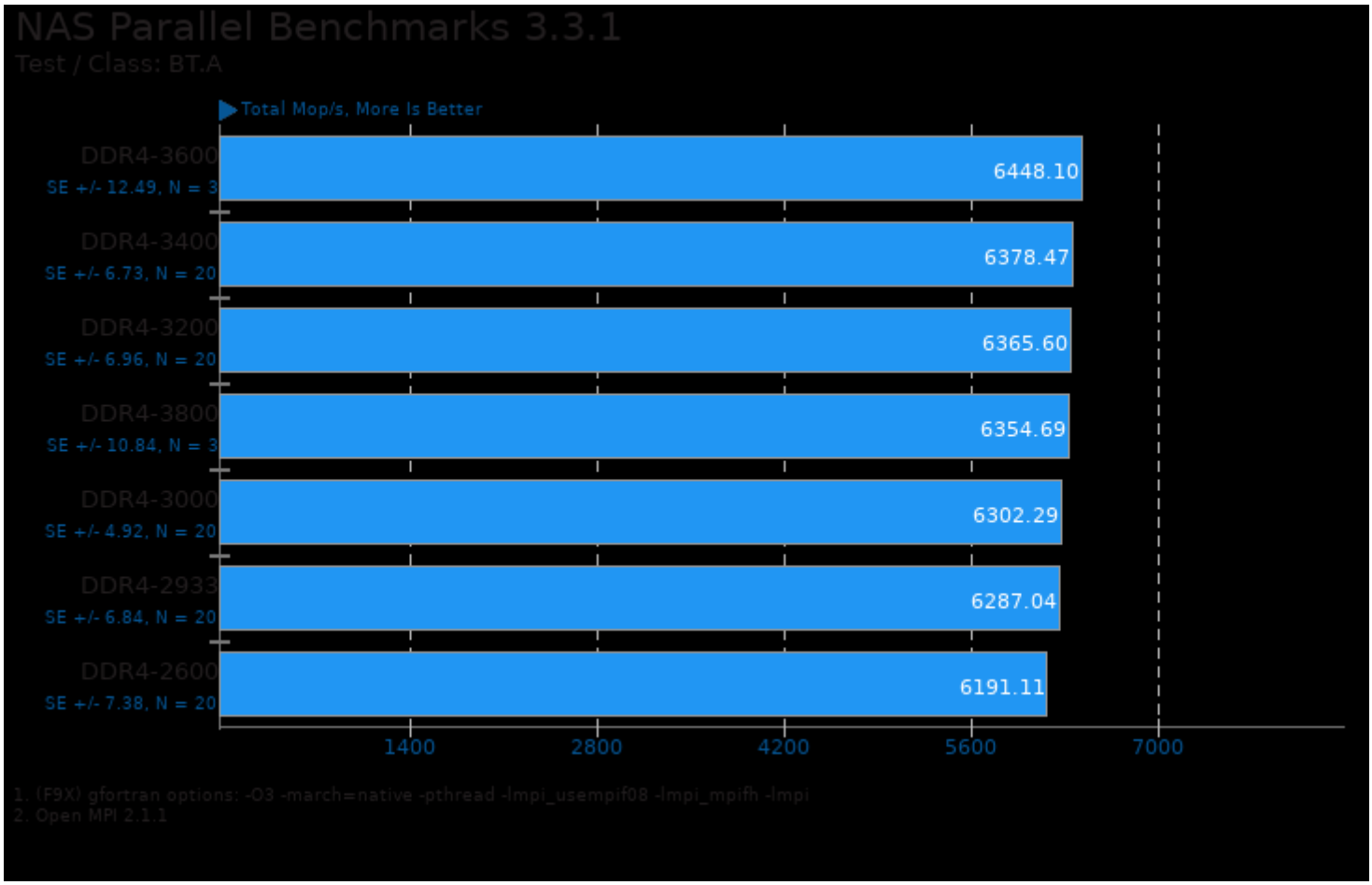
Ryzen 9 3900X Memory Scaling Benchmarks



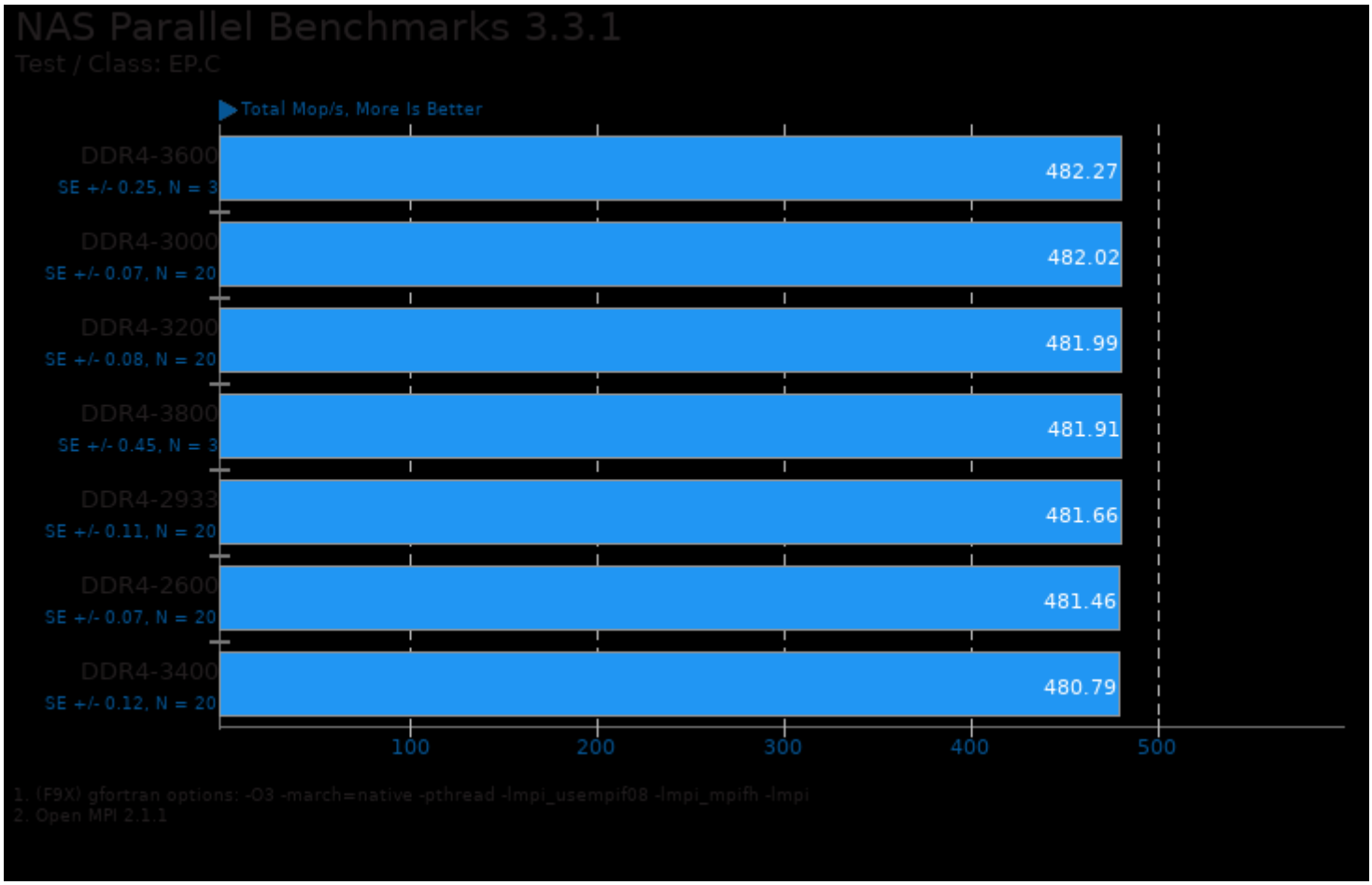
Ryzen 9 3900X Memory Scaling Benchmarks



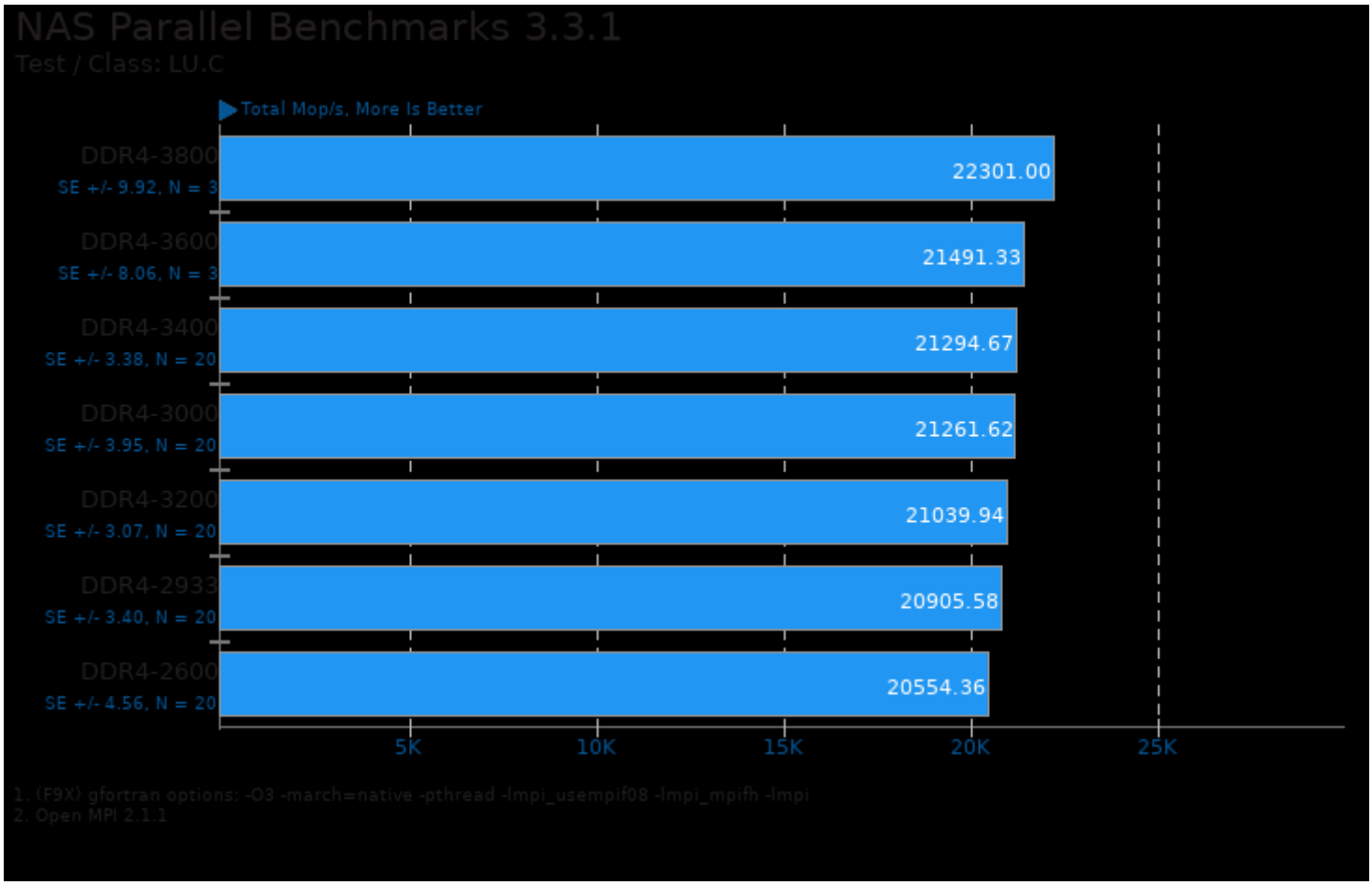
Ryzen 9 3900X Memory Scaling Benchmarks



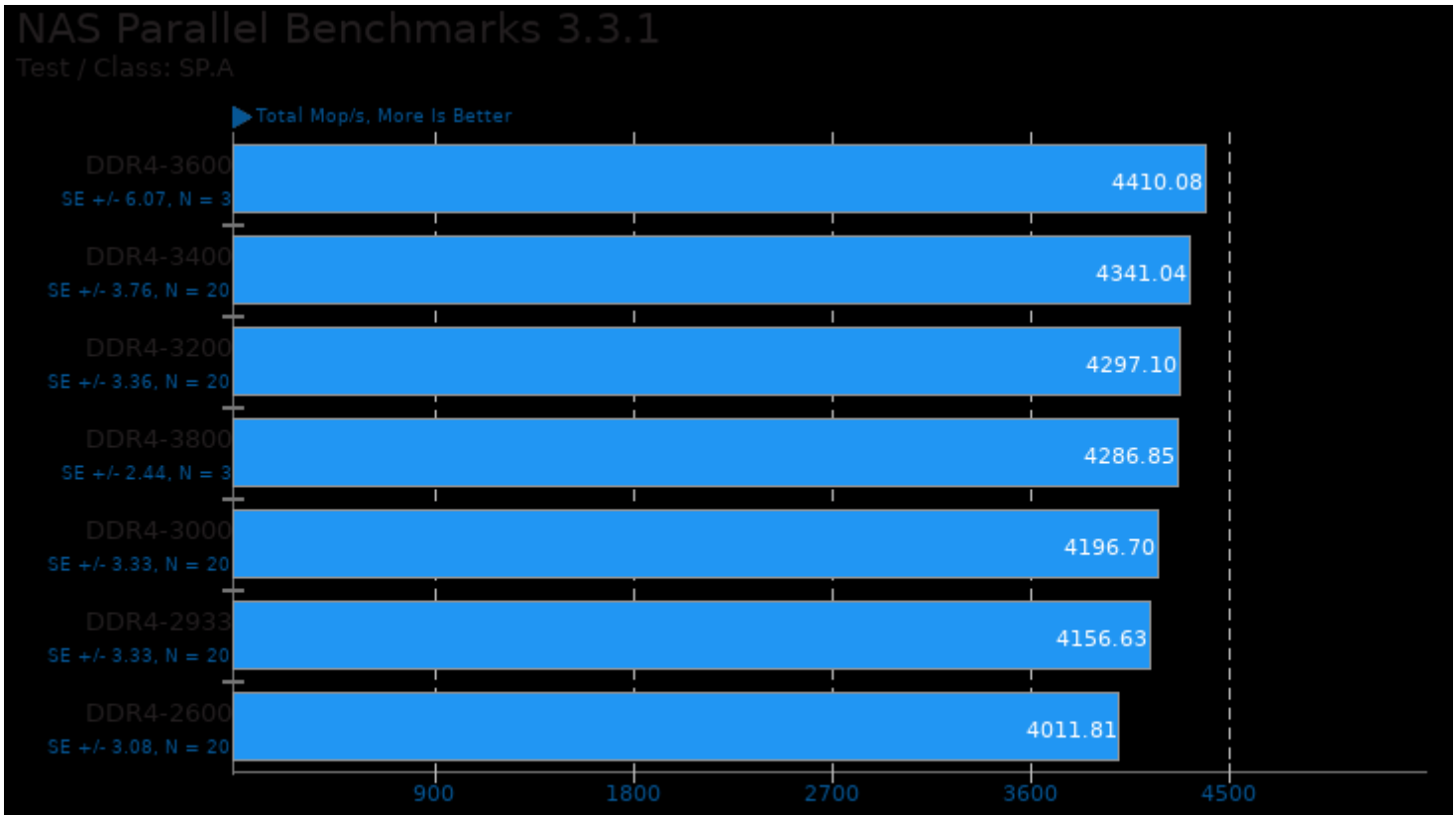
Ryzen 9 3900X Memory Scaling Benchmarks

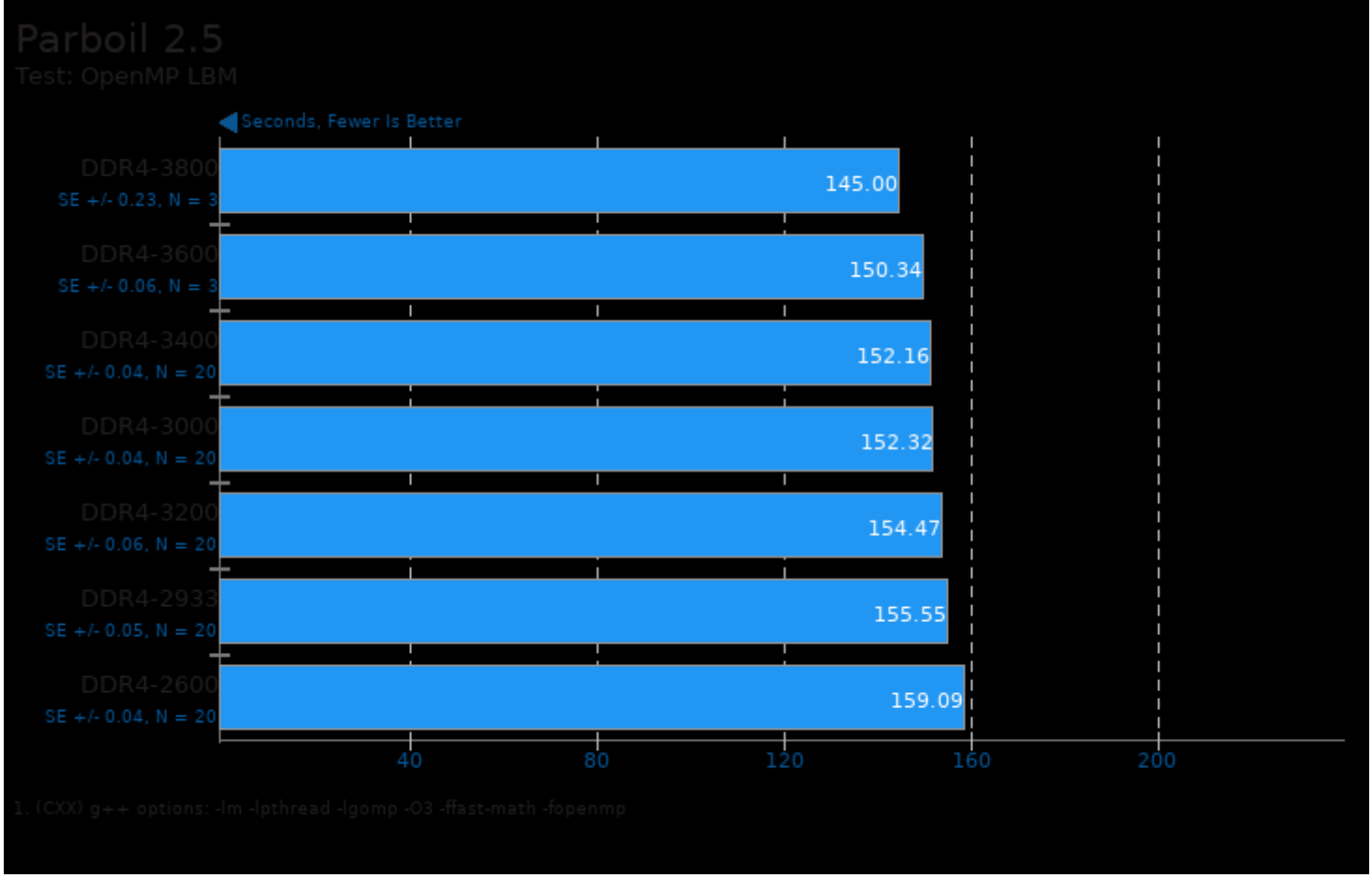


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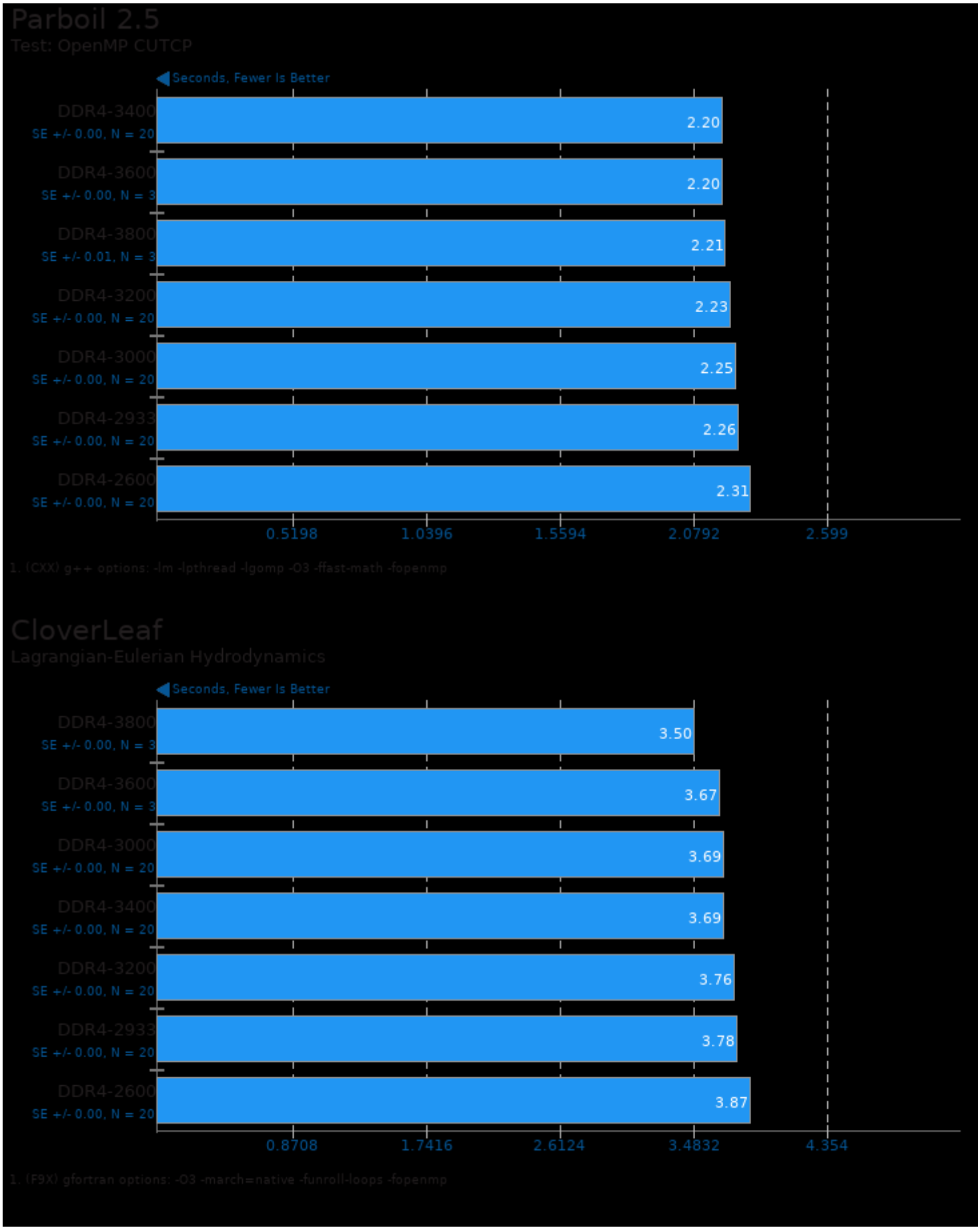


Ryzen 9 3900X Memory Scaling Benchmarks

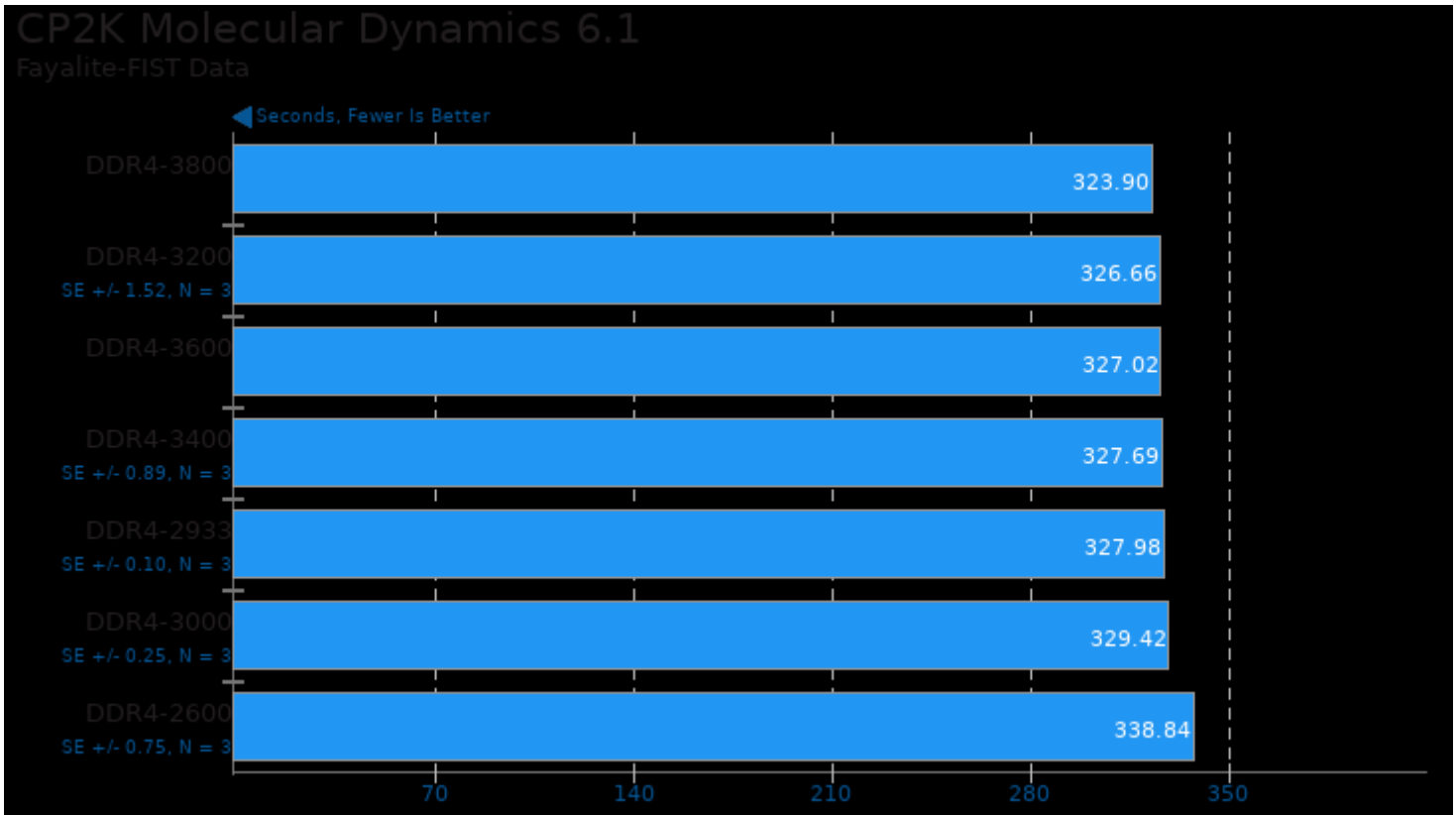


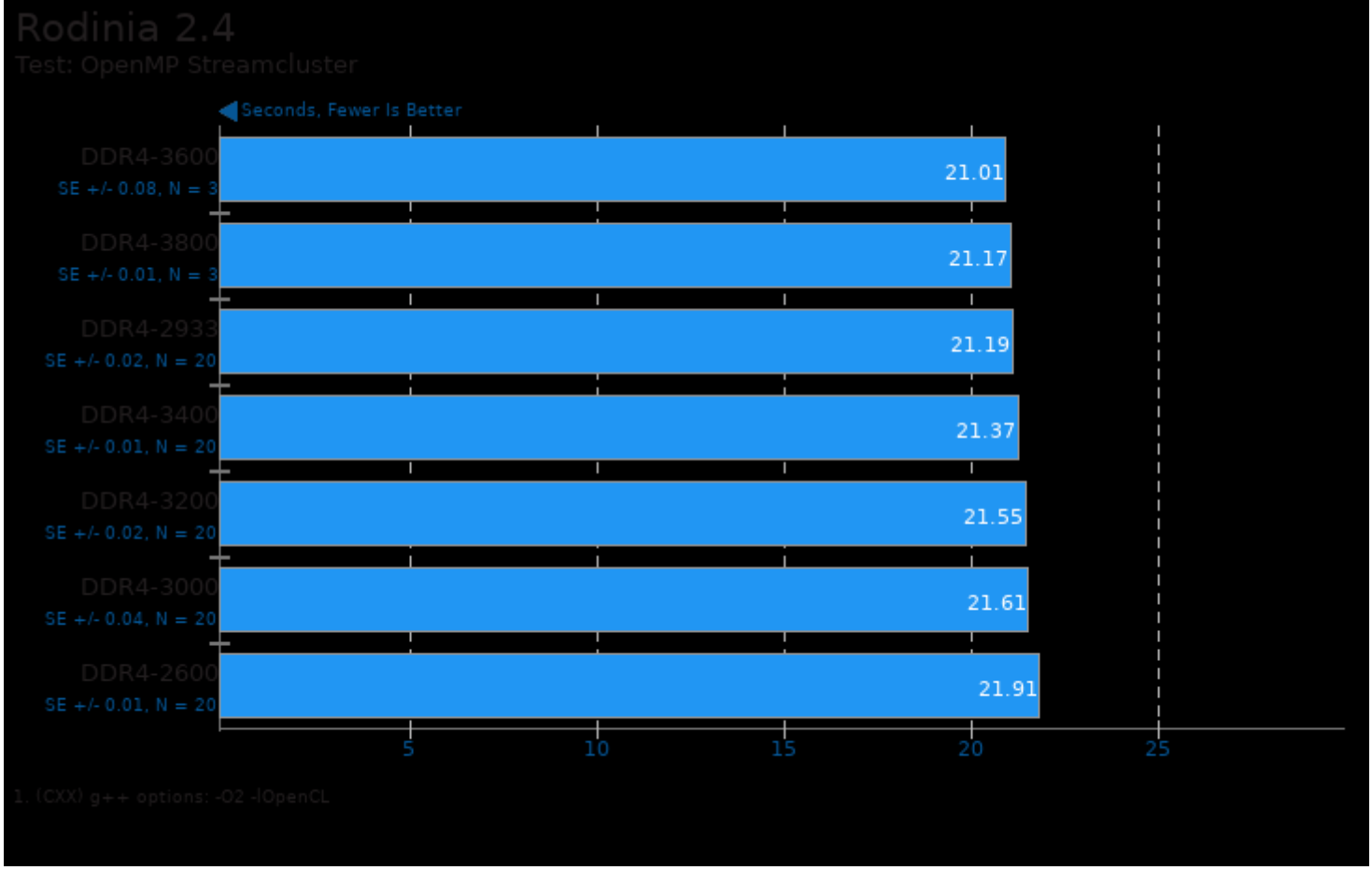


Ryzen 9 3900X Memory Scaling Benchmarks

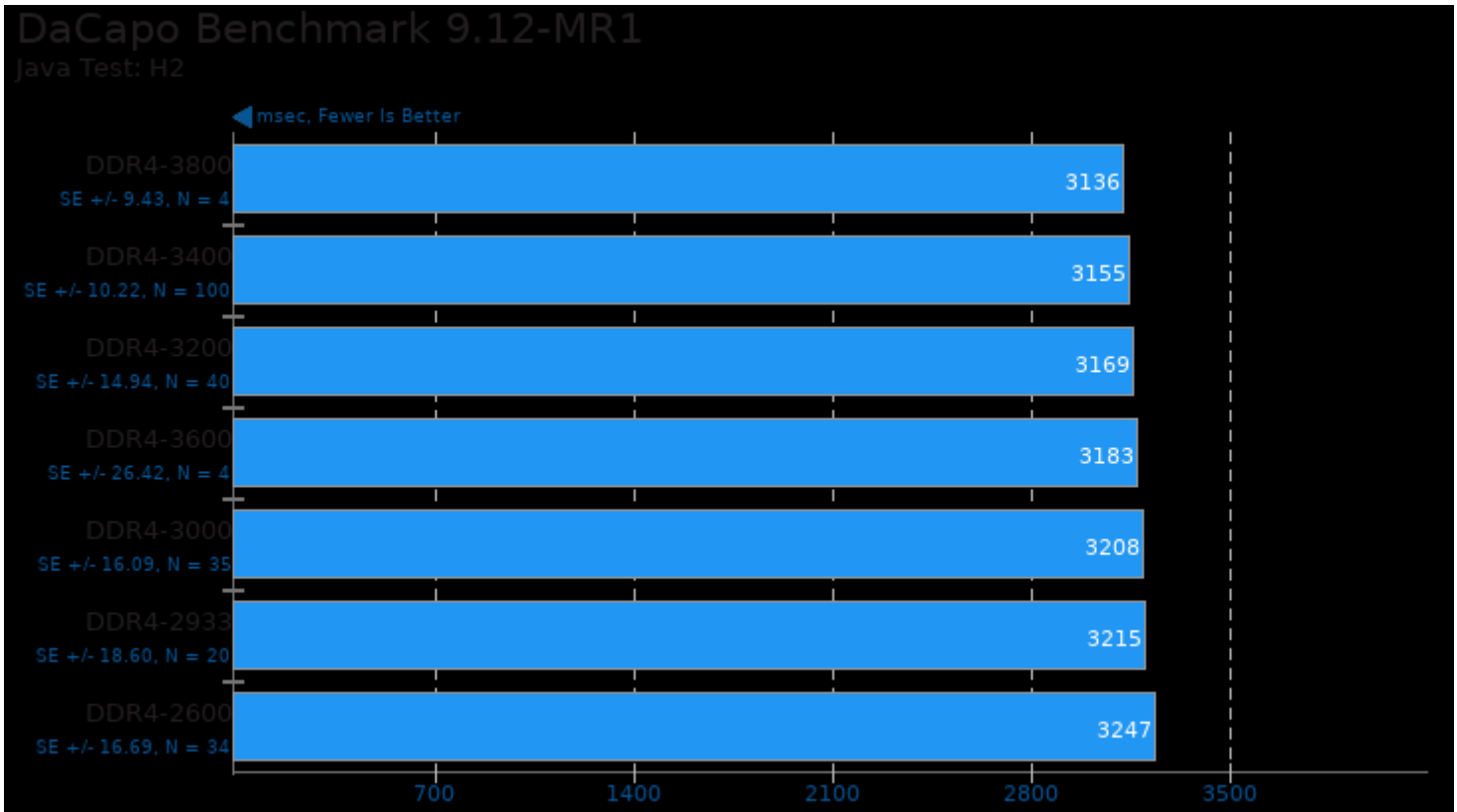


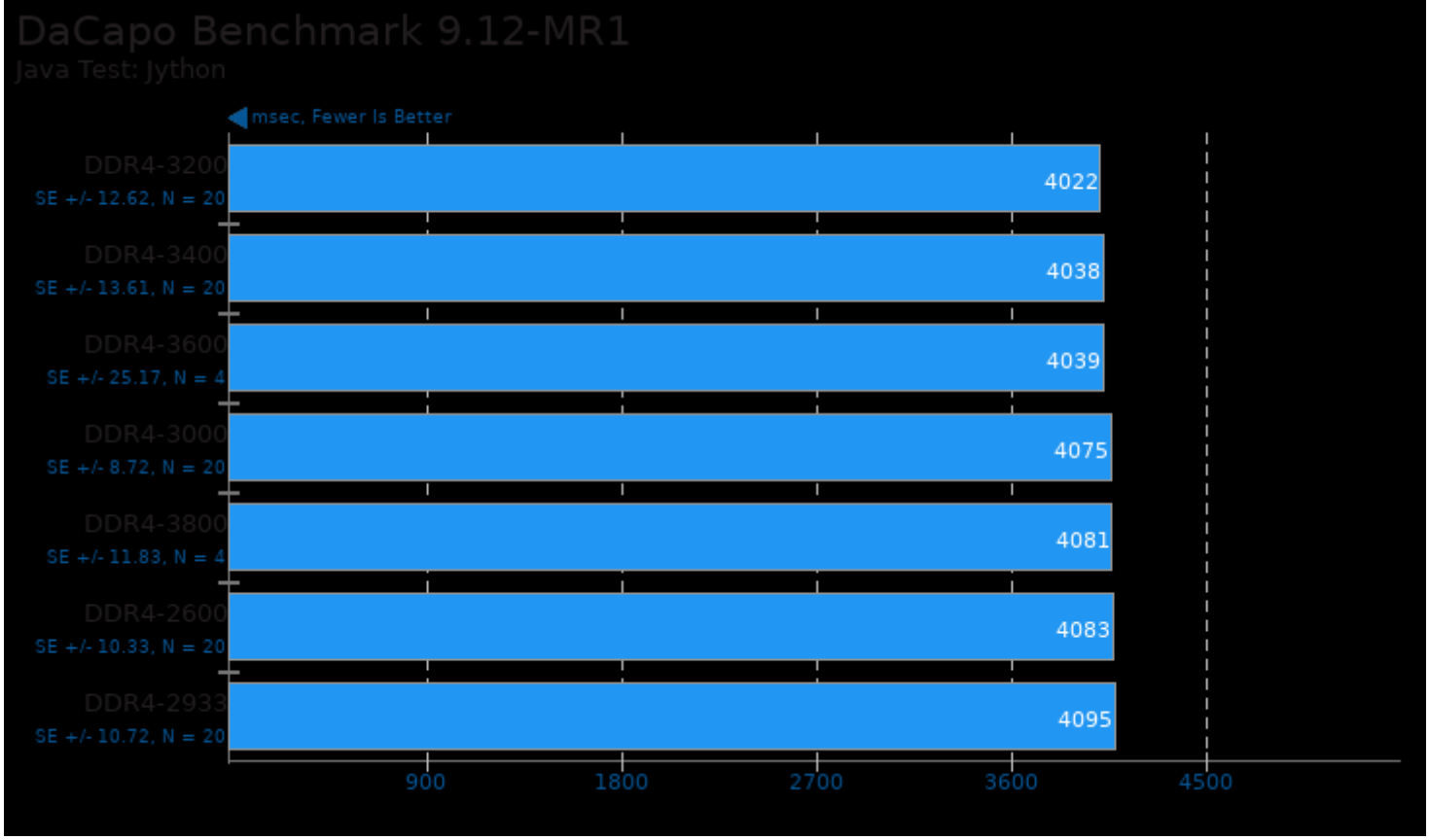
Ryzen 9 3900X Memory Scaling Benchmarks



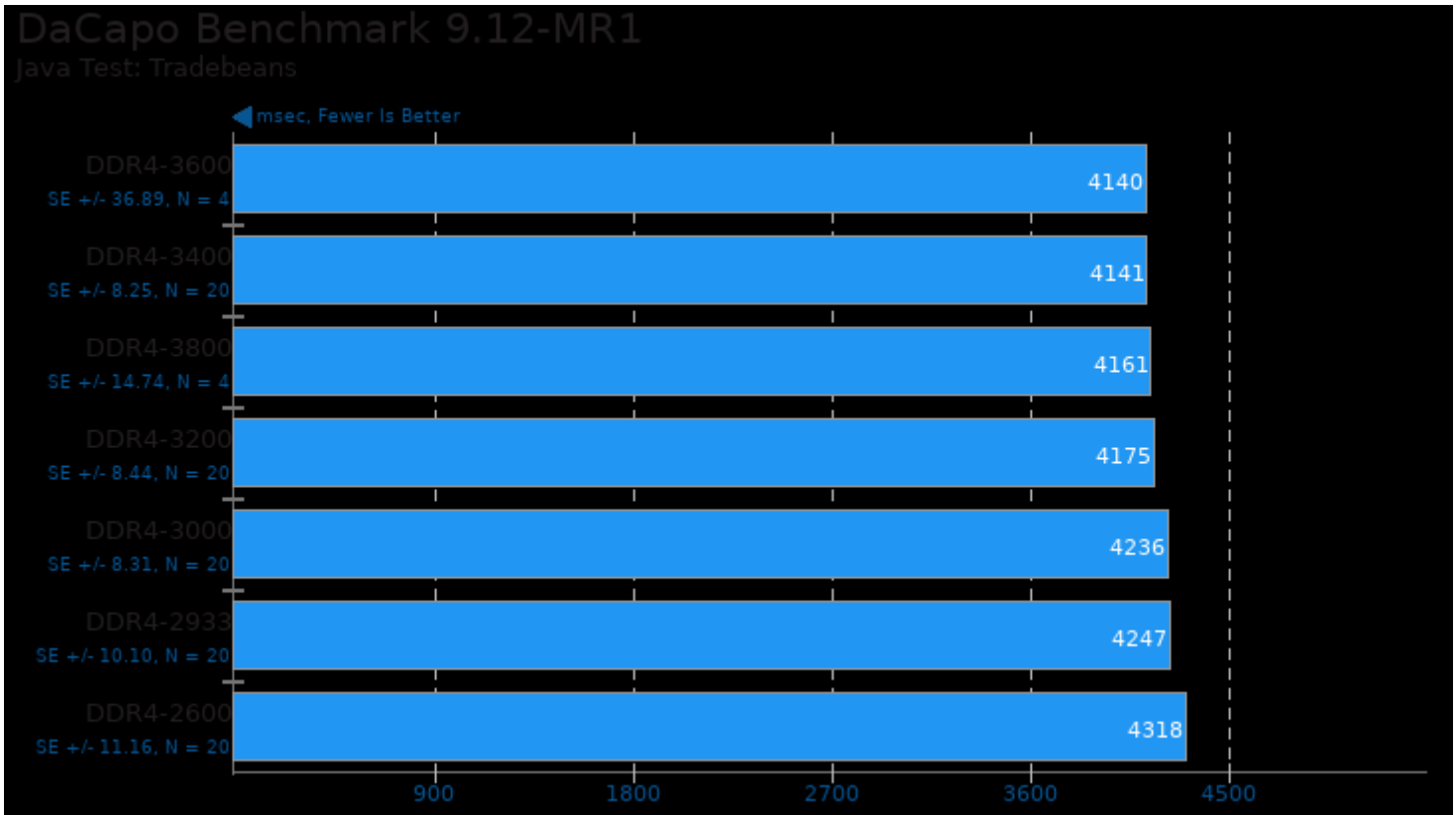


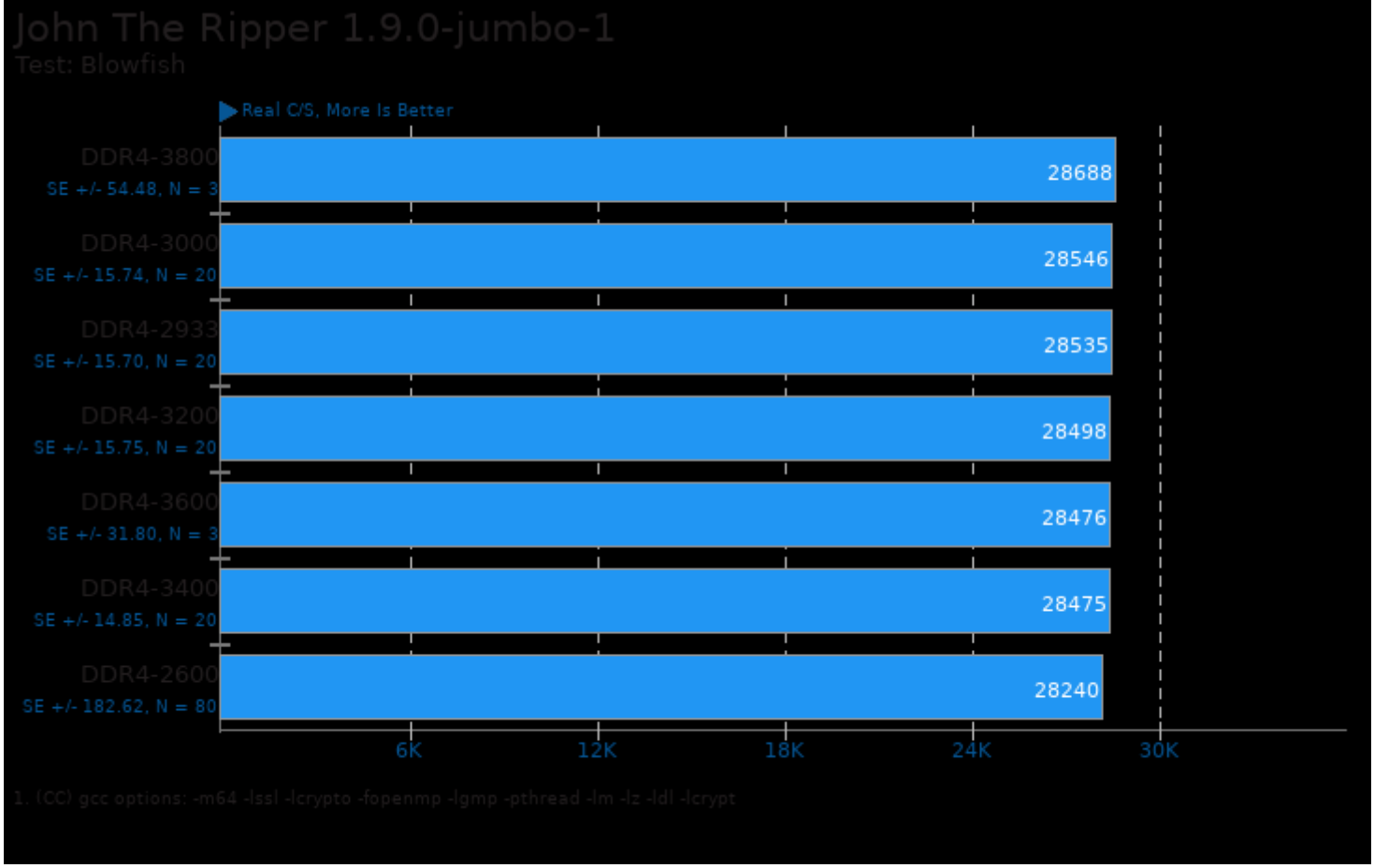
Ryzen 9 3900X Memory Scaling Benchmarks



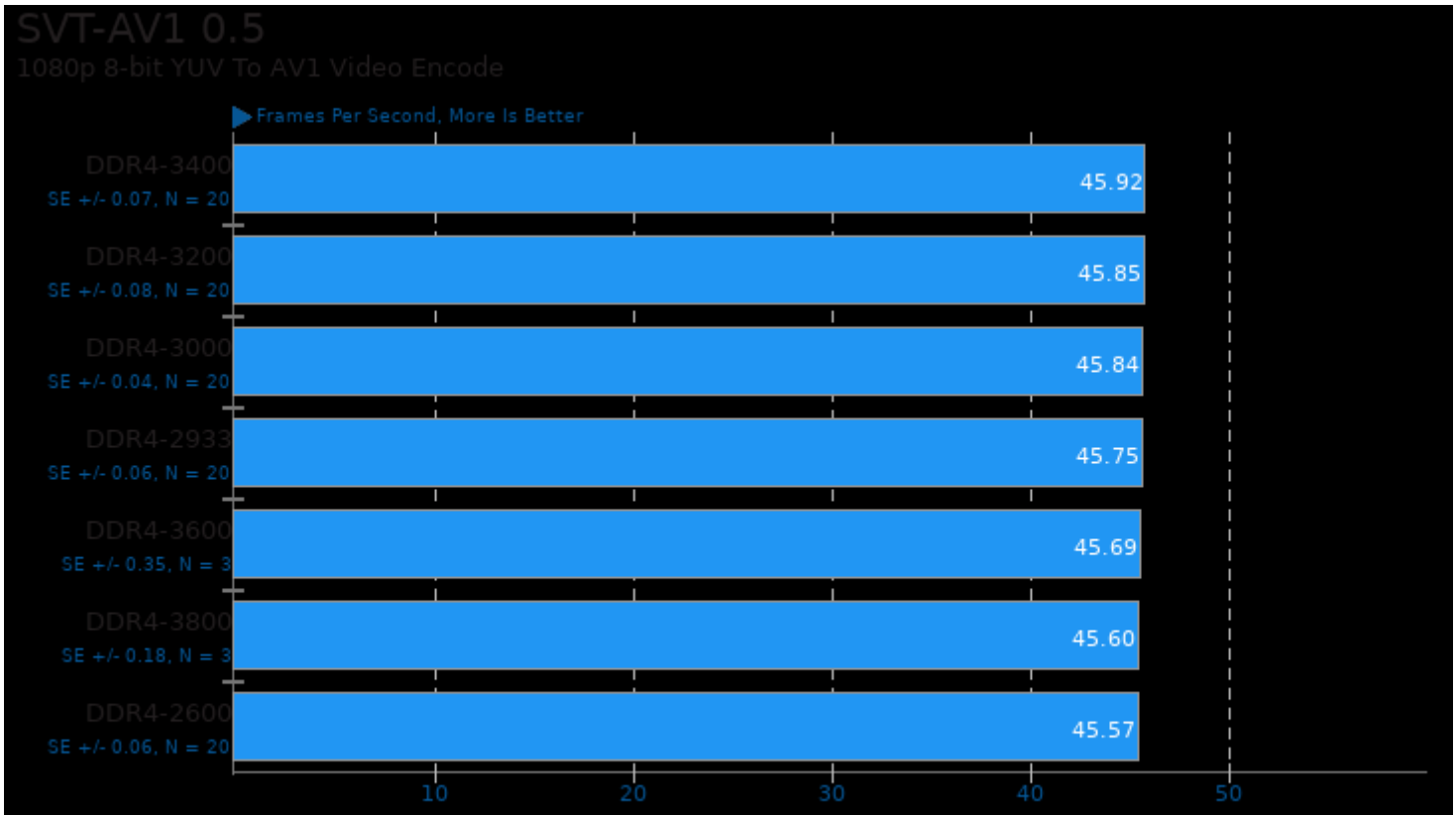


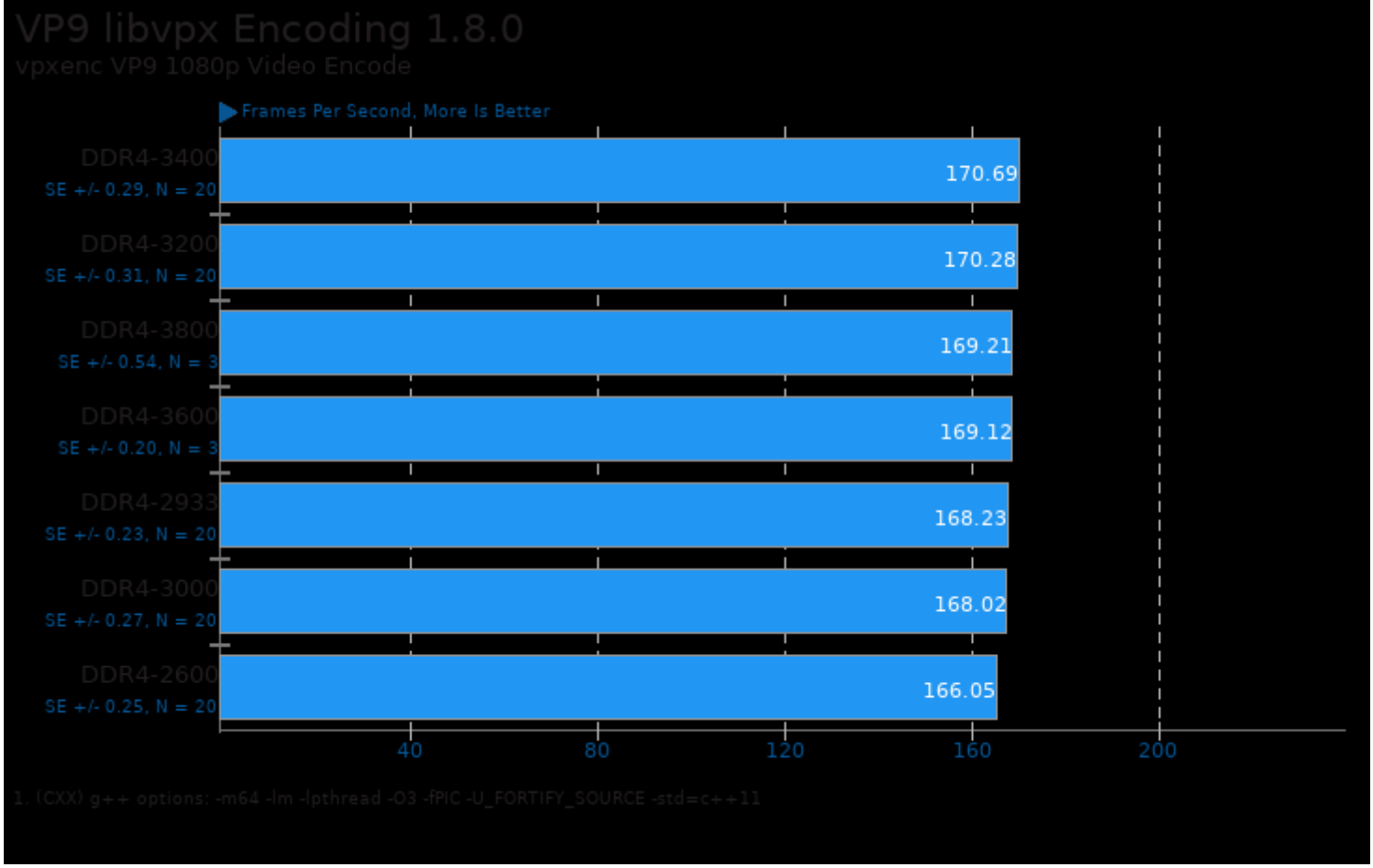
Ryzen 9 3900X Memory Scaling Benchmarks



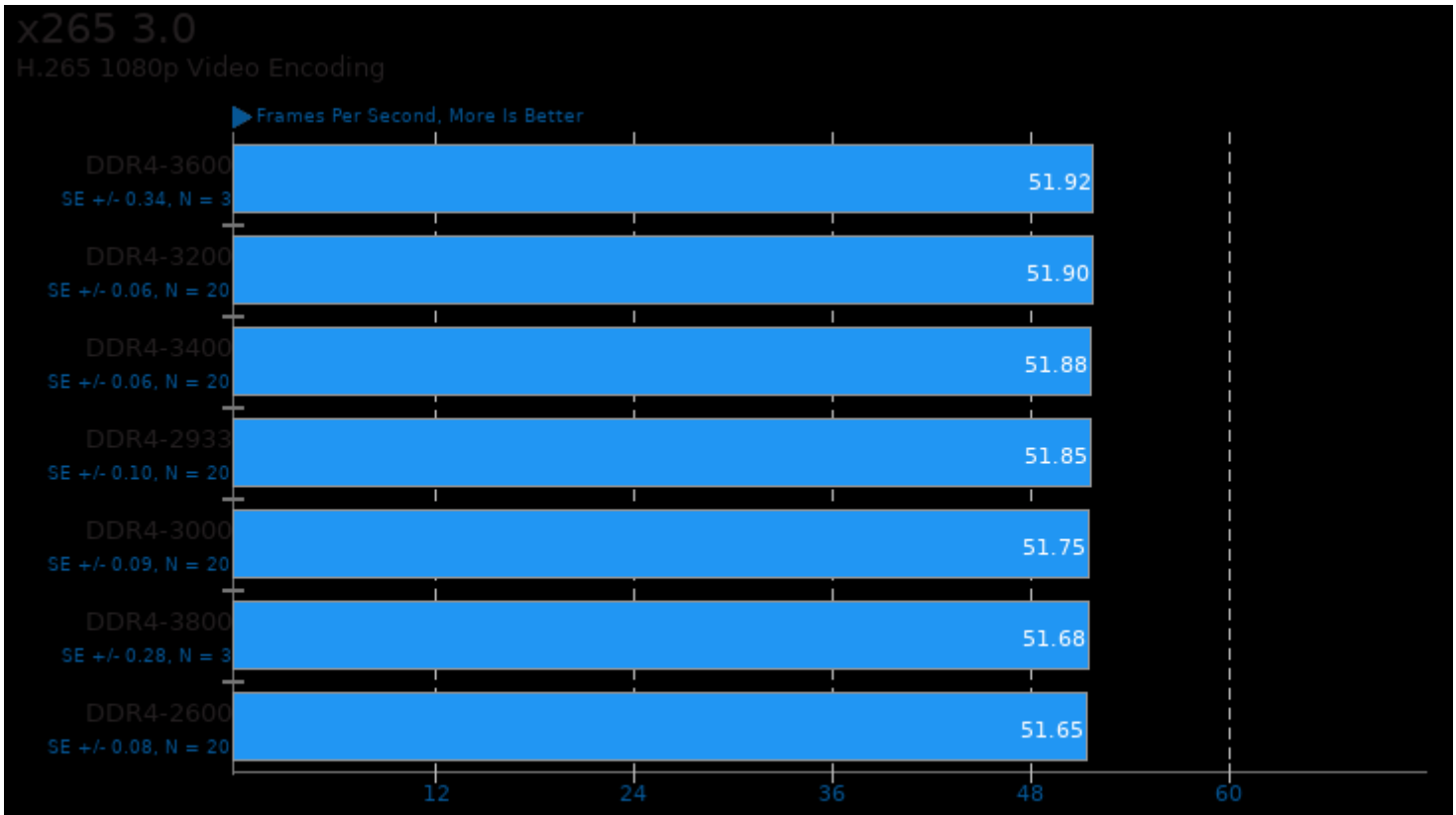


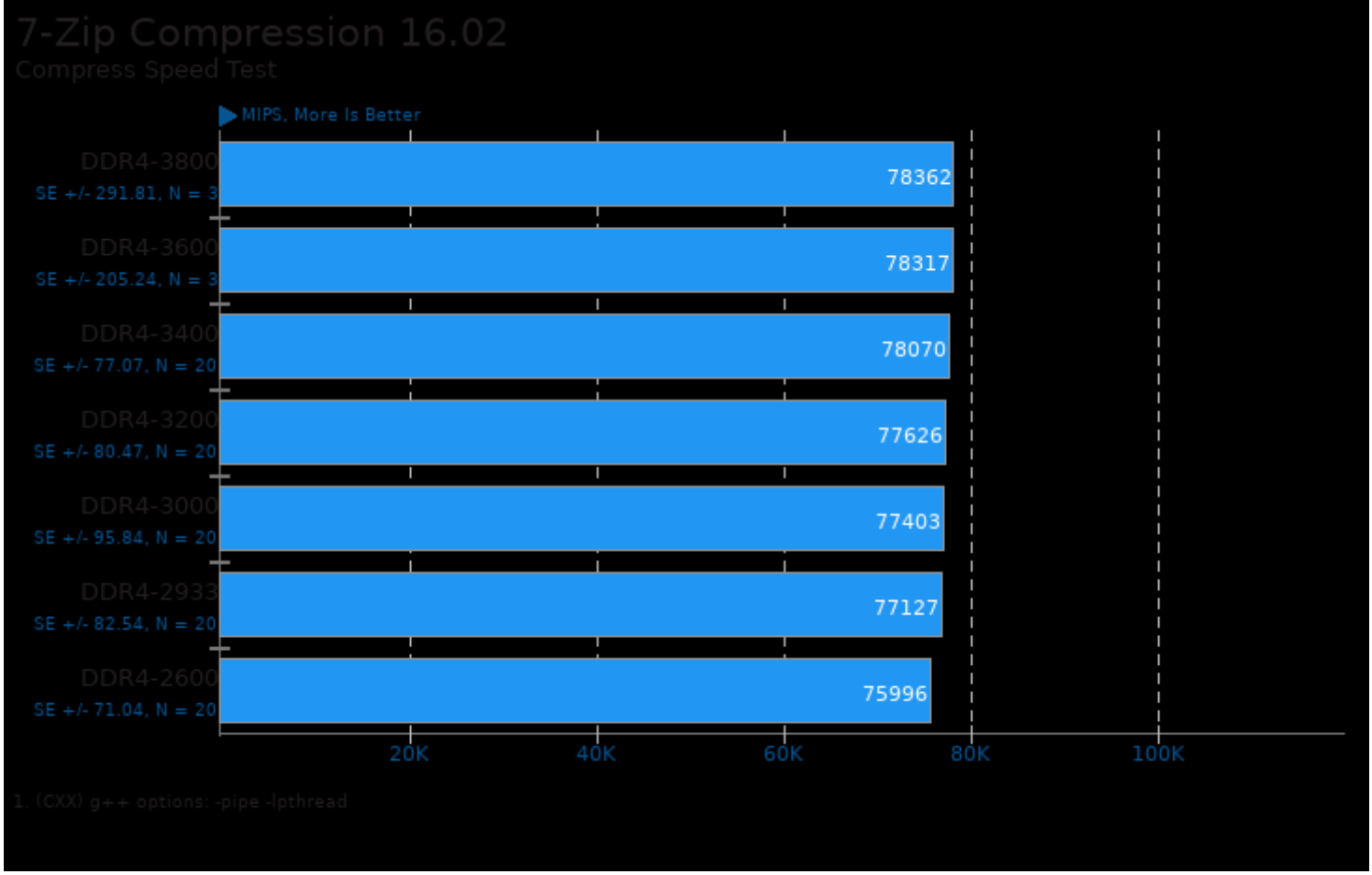
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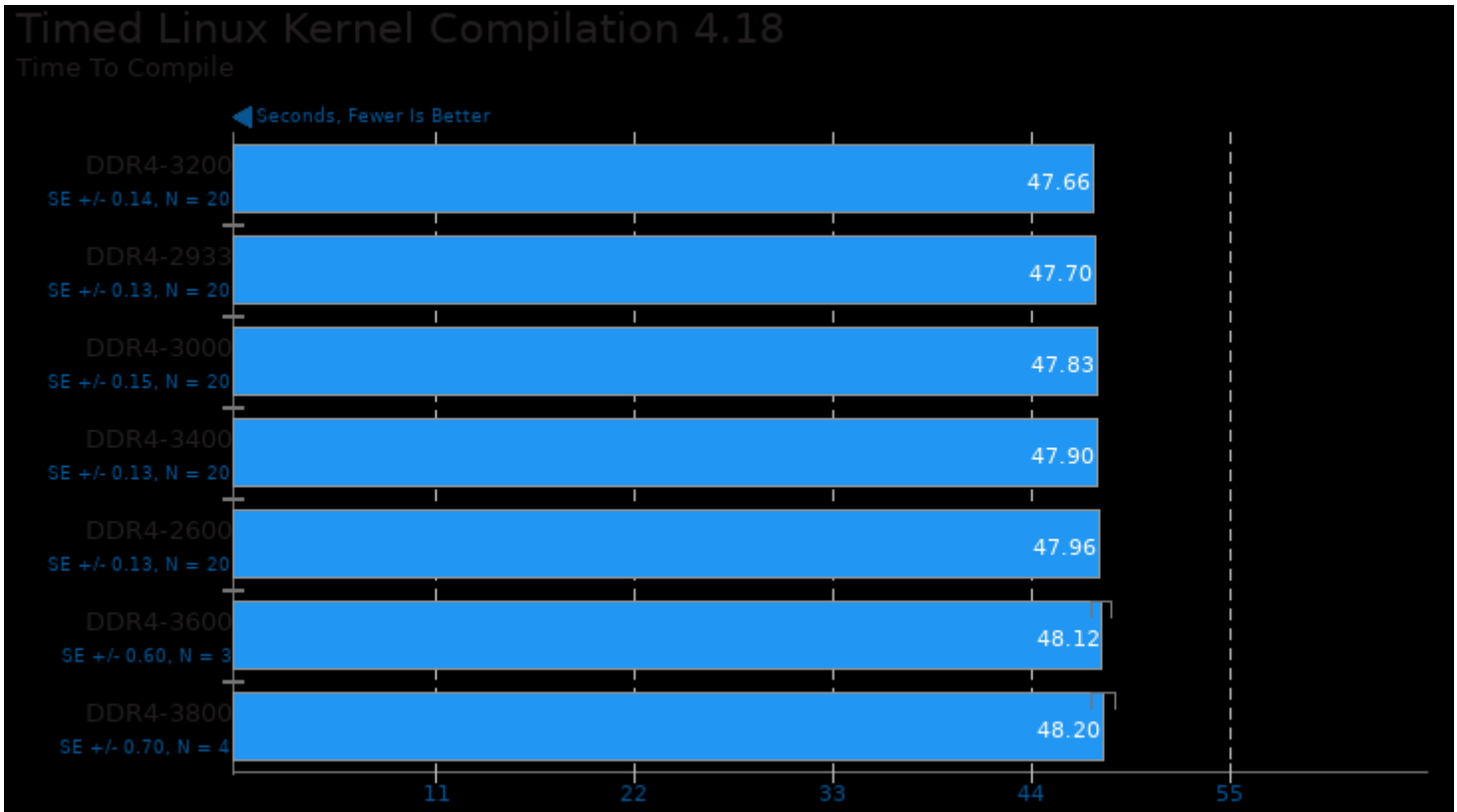


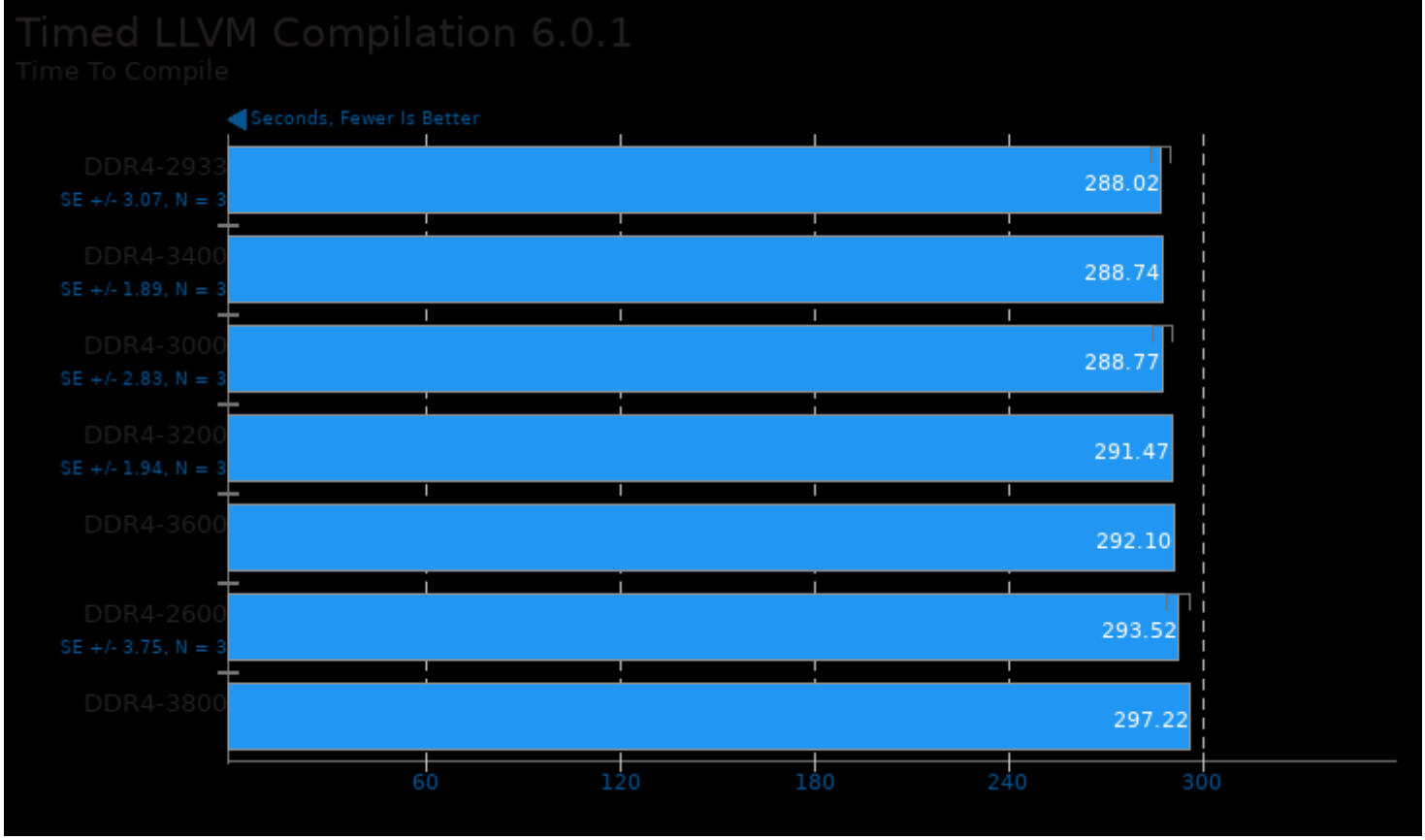
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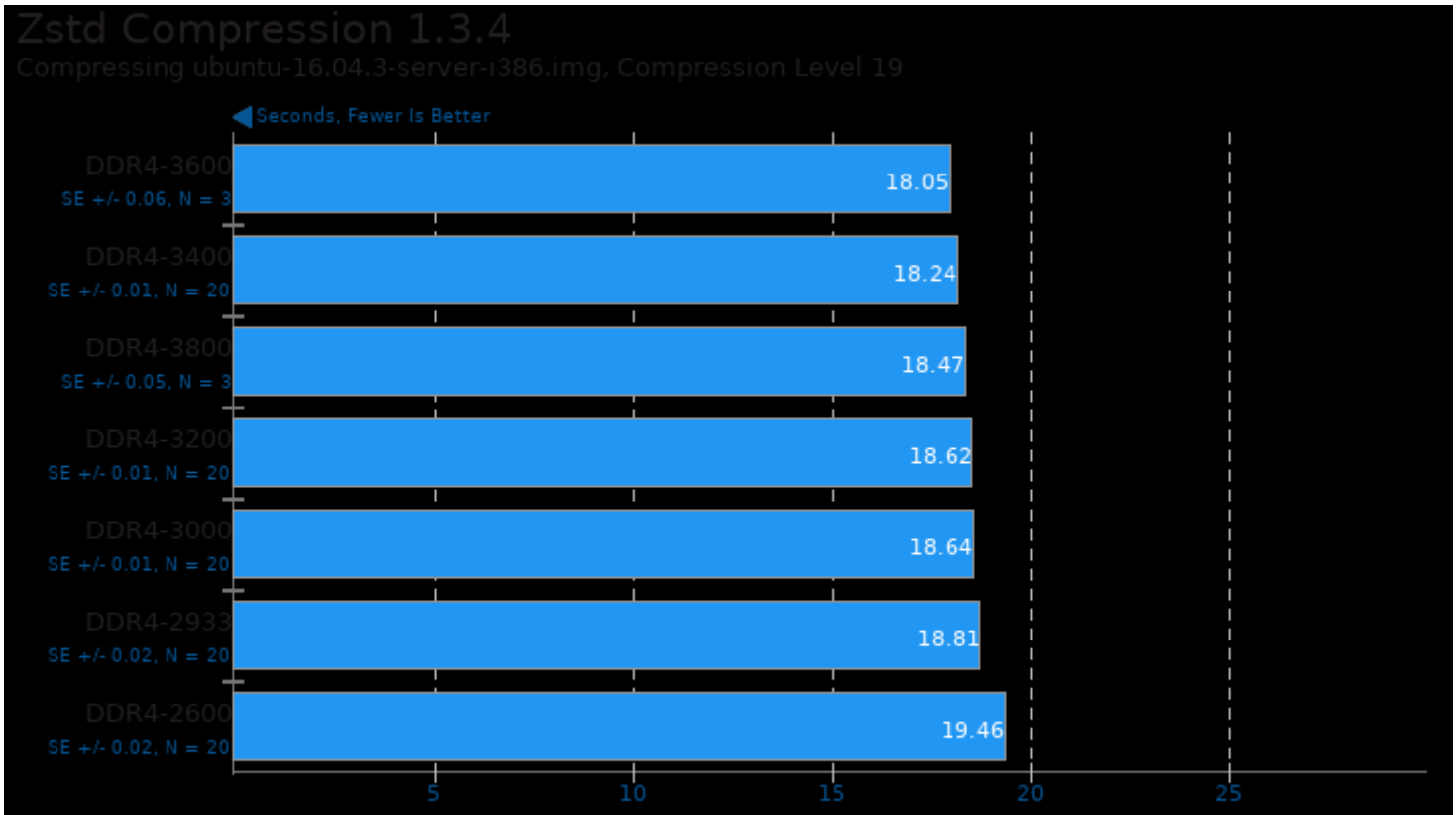


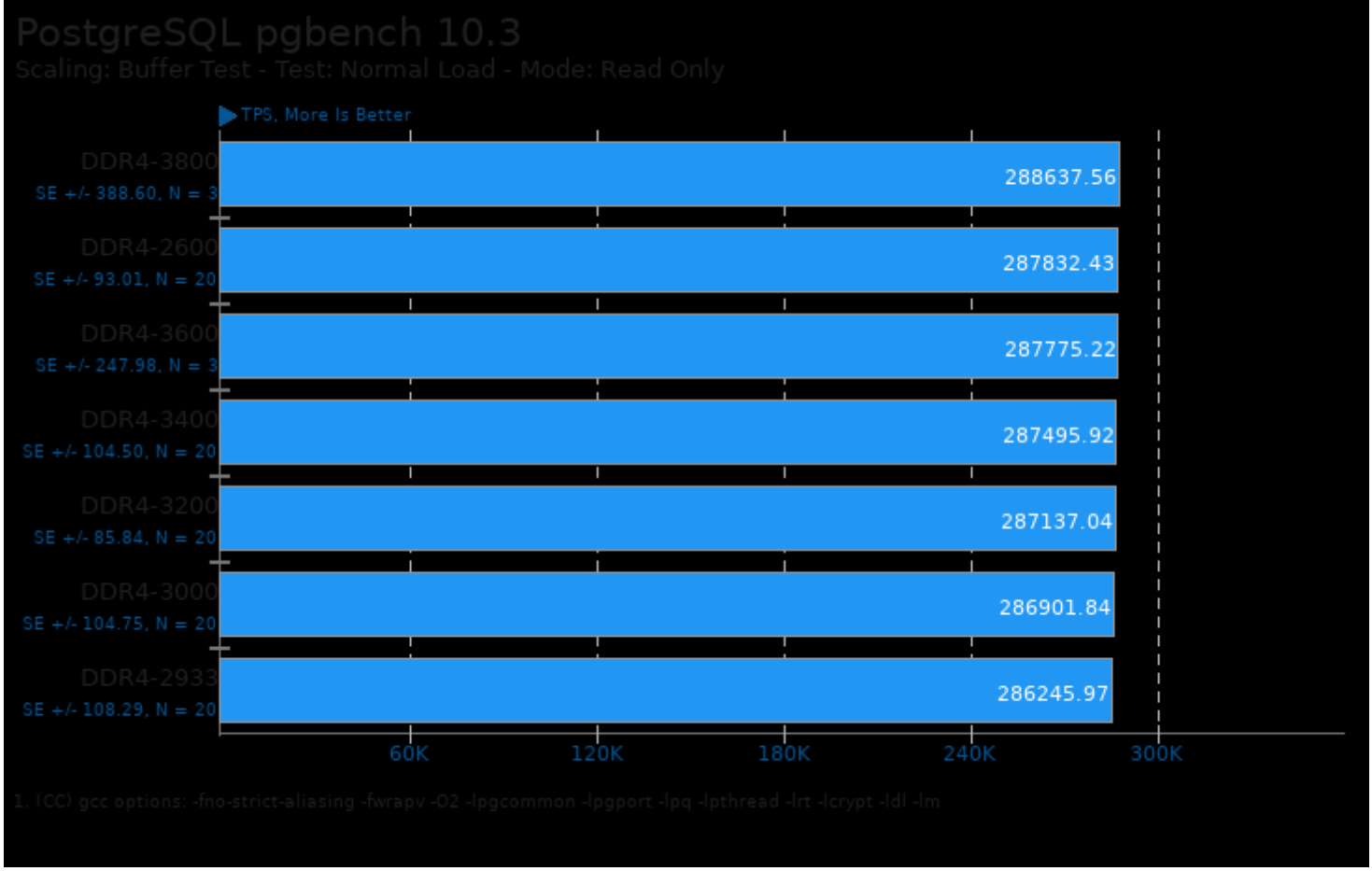


Ryzen 9 3900X Memory Scaling Benchmarks

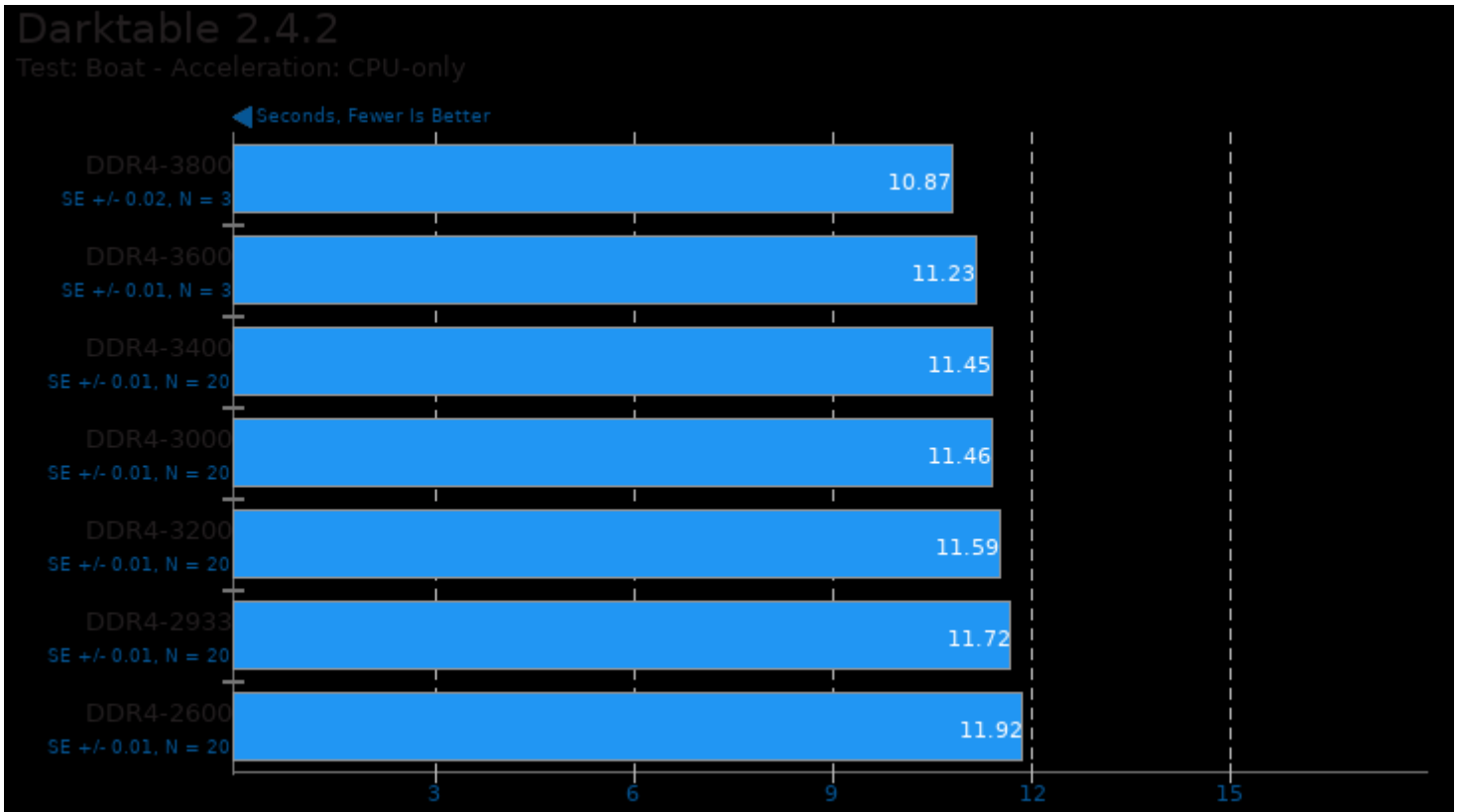


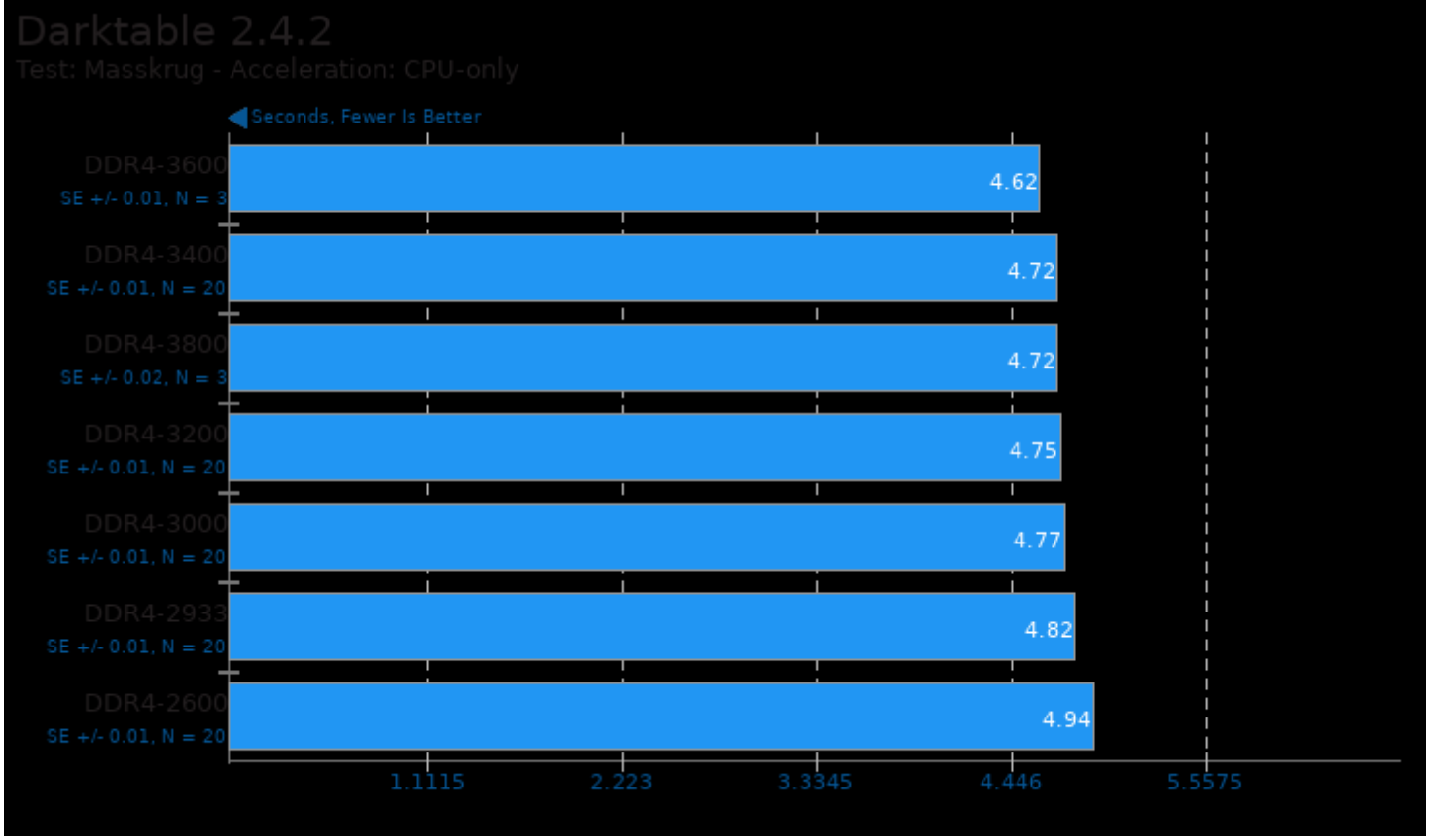



Zstd Compression 1.3.4
Compressing ubuntu-16.04.3-server-i386.img, Compression Level 19
Seconds, Fewer Is Better
DDR4-3600
SE +/- 0.06, N = 3
18.05
DDR4-3400
SE +/- 0.01, N = 20
18.24
DDR4-3800
SE +/- 0.05, N = 3
18.47
DDR4-3200
SE +/- 0.01, N = 20
18.62
DDR4-3000
SE +/- 0.01, N = 20
18.64
DDR4-2933
SE +/- 0.02, N = 20
18.81
DDR4-2600
SE +/- 0.02, N = 20
19.46
5
10
15
20
25
1. (CC) gcc options: -O3 -pthread -lz

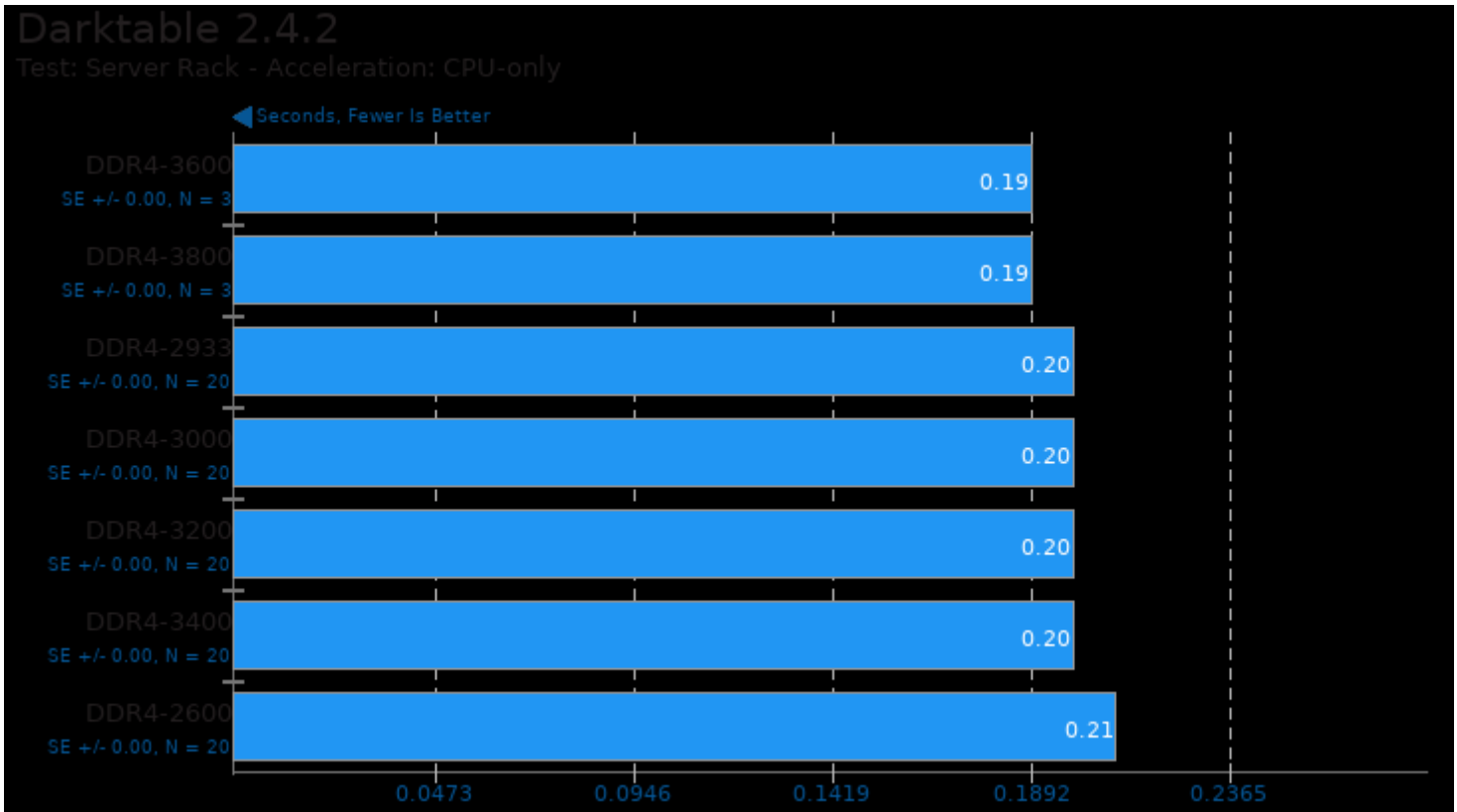

PostgreSQL pgbench 10.3
Scaling: Buffer Test - Test: Normal Load - Mode: Read Only
TPS, More Is Better
DDR4-3800
SE +/- 388.60, N = 3
288637.56
DDR4-2600
SE +/- 93.01, N = 20
287832.43
DDR4-3600
SE +/- 247.98, N = 3
287775.22
DDR4-3400
SE +/- 104.50, N = 20
287495.92
DDR4-3200
SE +/- 85.84, N = 20
287137.04
DDR4-3000
SE +/- 104.75, N = 20
286901.84
DDR4-2933
SE +/- 108.29, N = 20
286245.97
60K
120K
180K
240K
300K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -lcrypt -ldl -lm

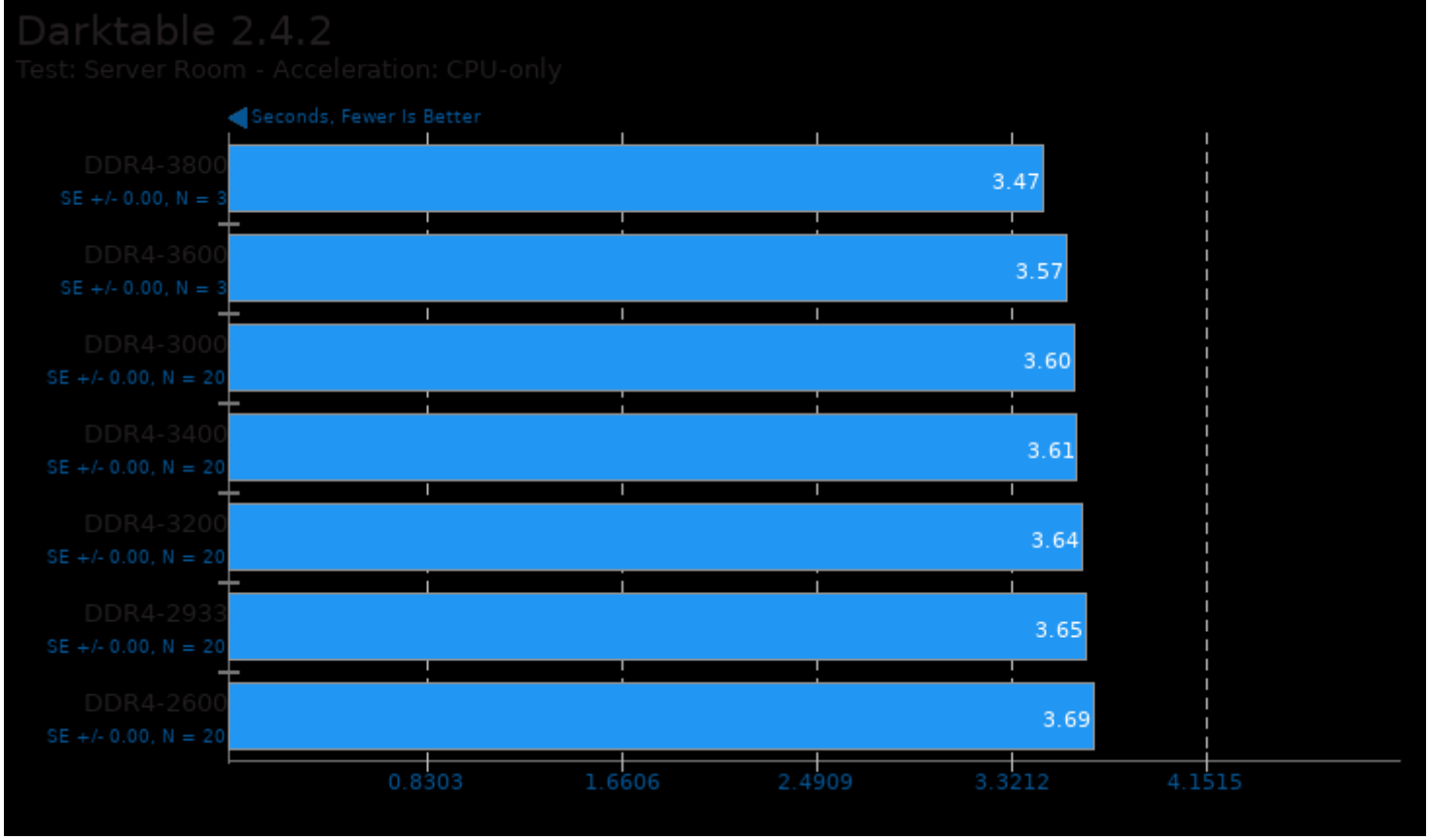
Ryzen 9 3900X Memory Scaling Benchmarks



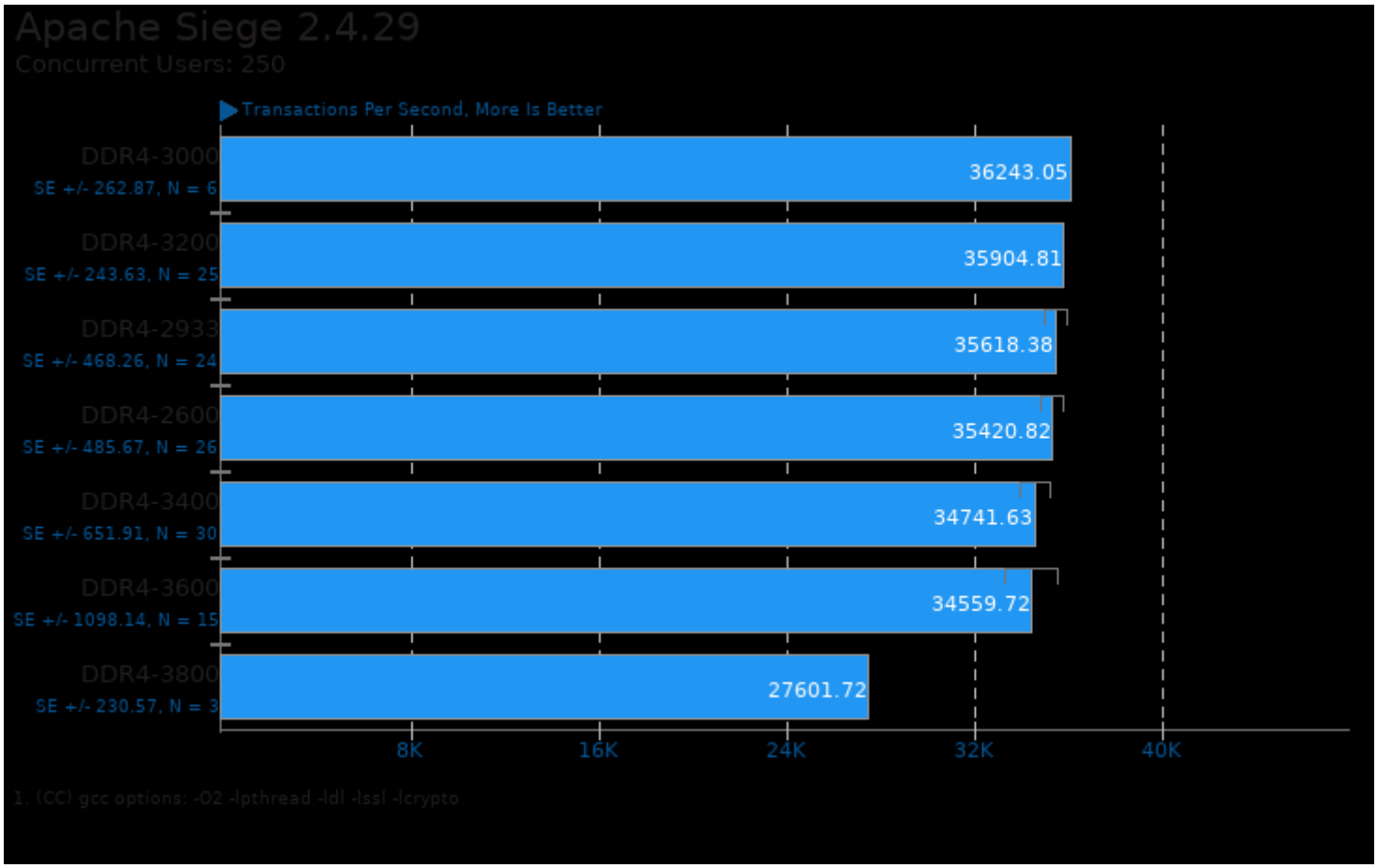


Ryzen 9 3900X Memory Scaling Benchmarks



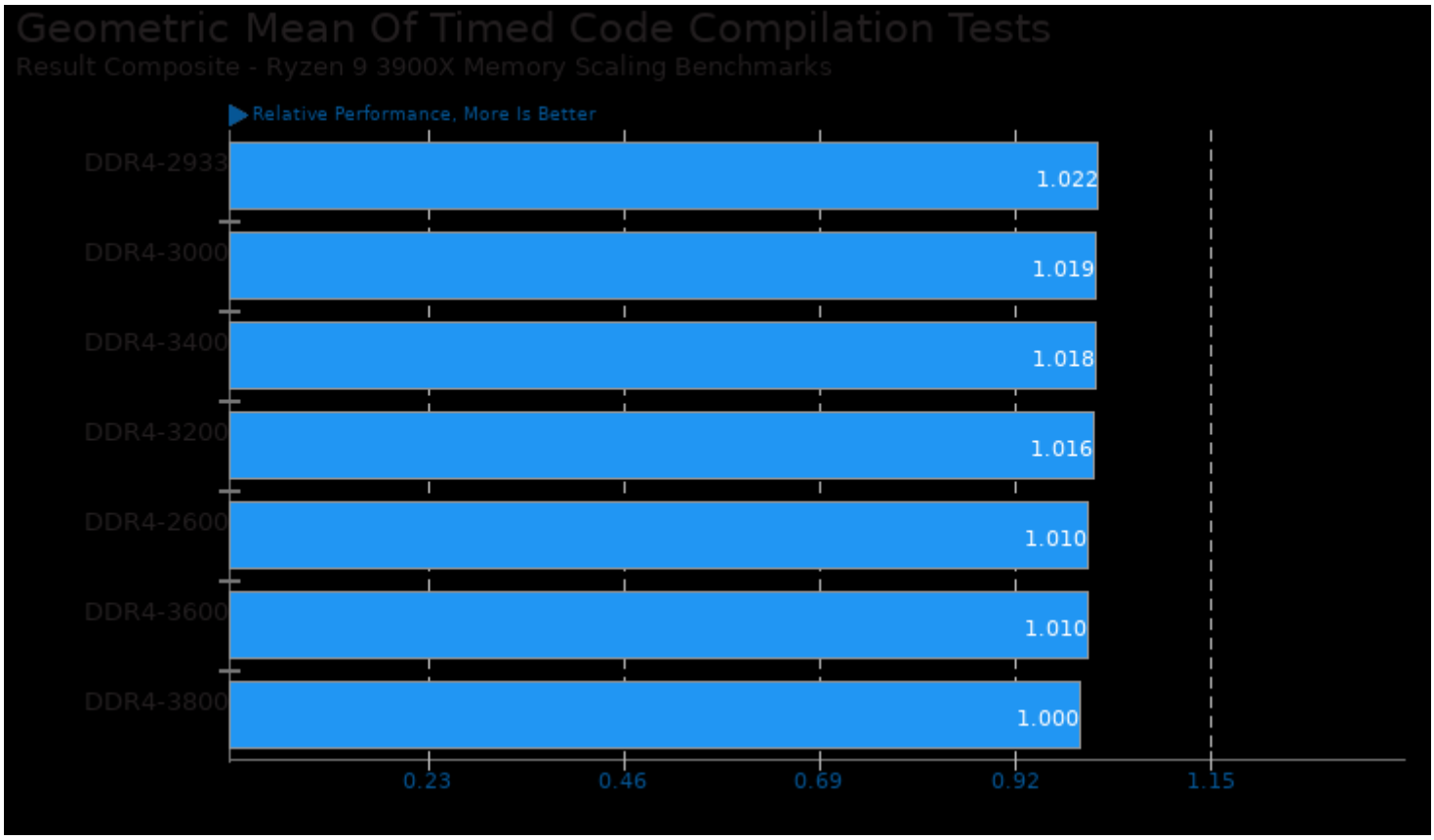


Ryzen 9 3900X Memory Scaling Benchmarks

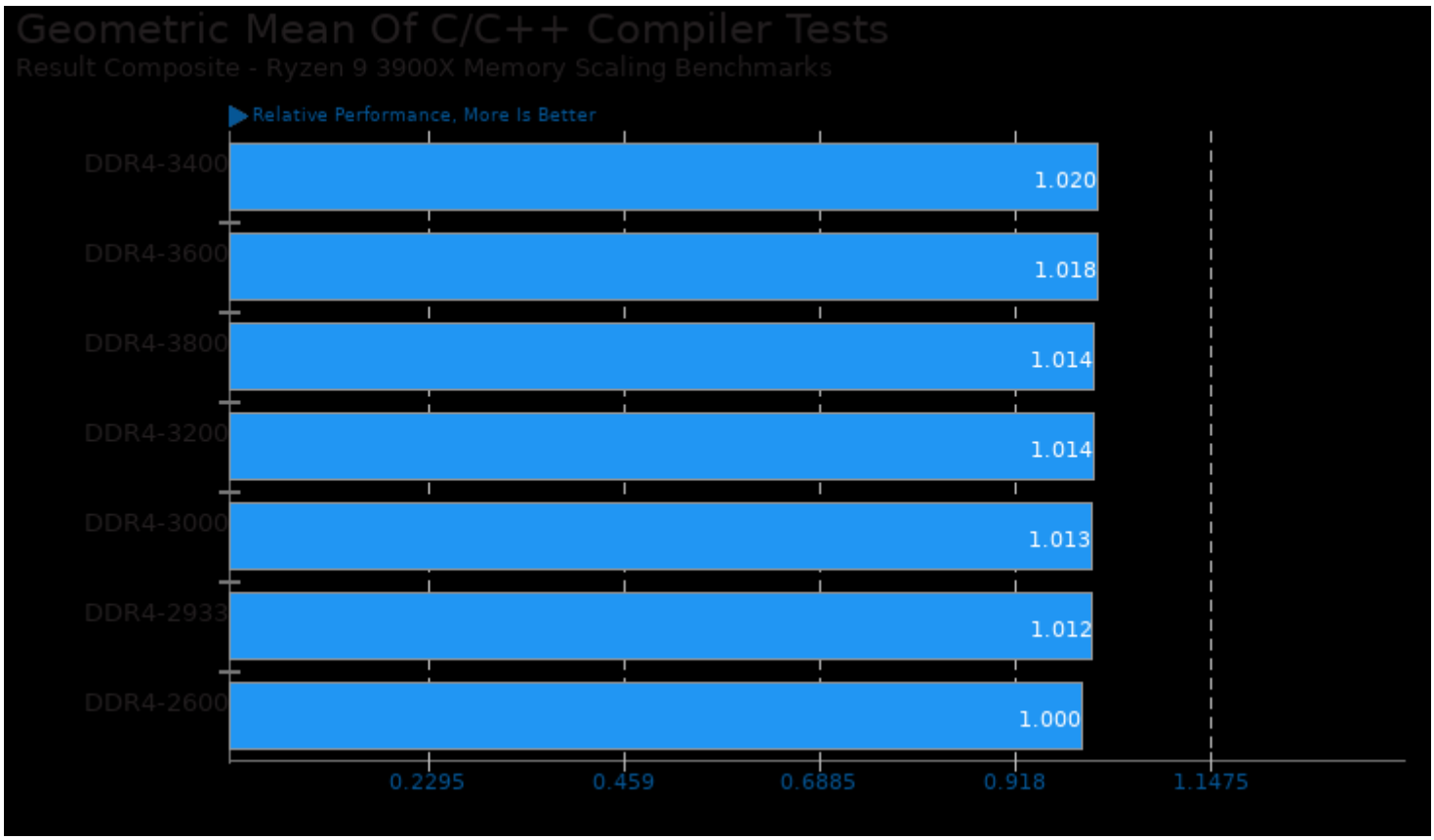


Ryzen 9 3900X Memory Scaling Benchmarks

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

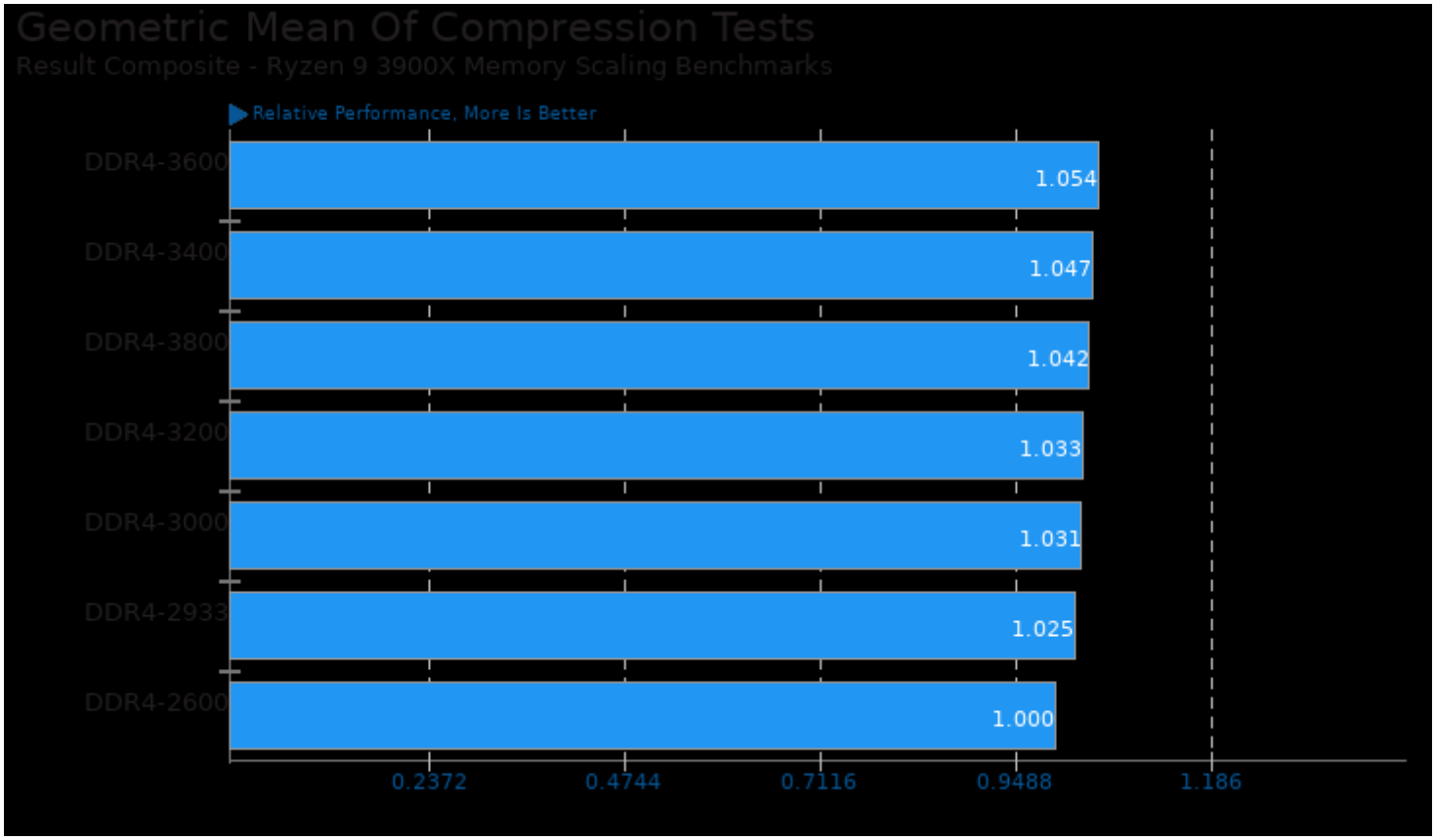


Geometric mean based upon tests: pts/build-linux-kernel and pts/build-llvm



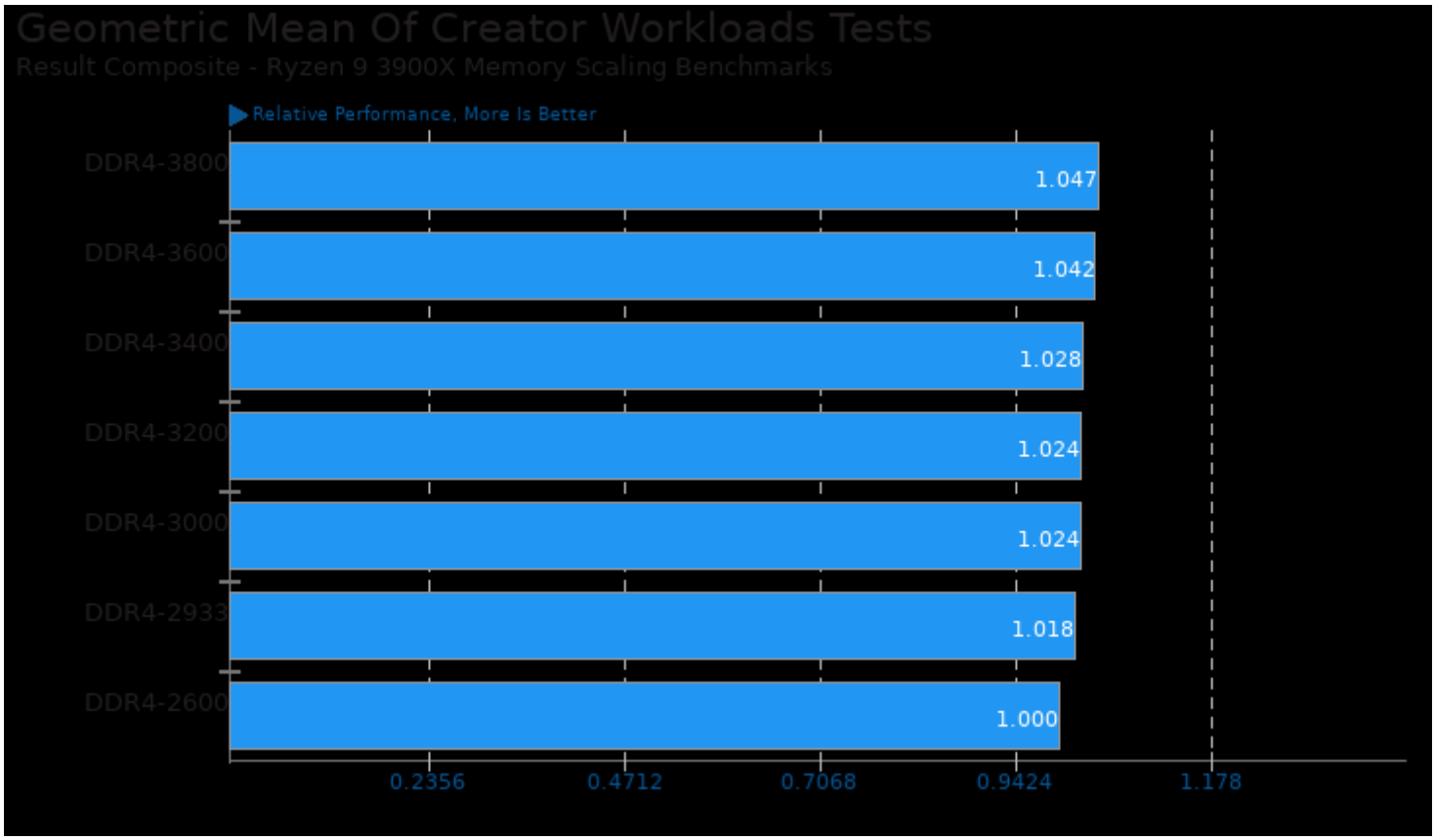
Ryzen 9 3900X Memory Scaling Benchmarks

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

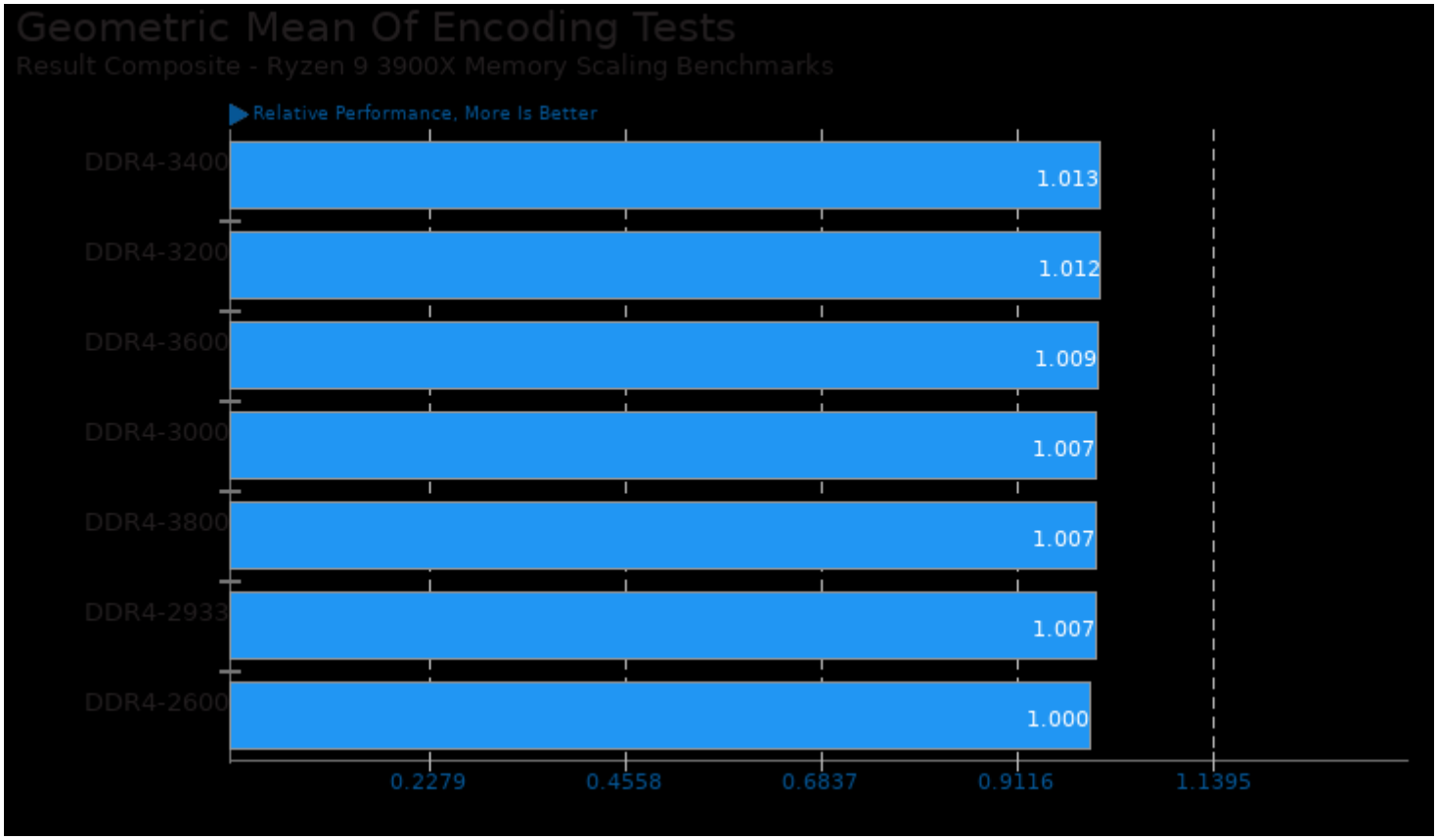


Geometric mean based upon tests: pts/compress-7zip and pts/compress-zstd

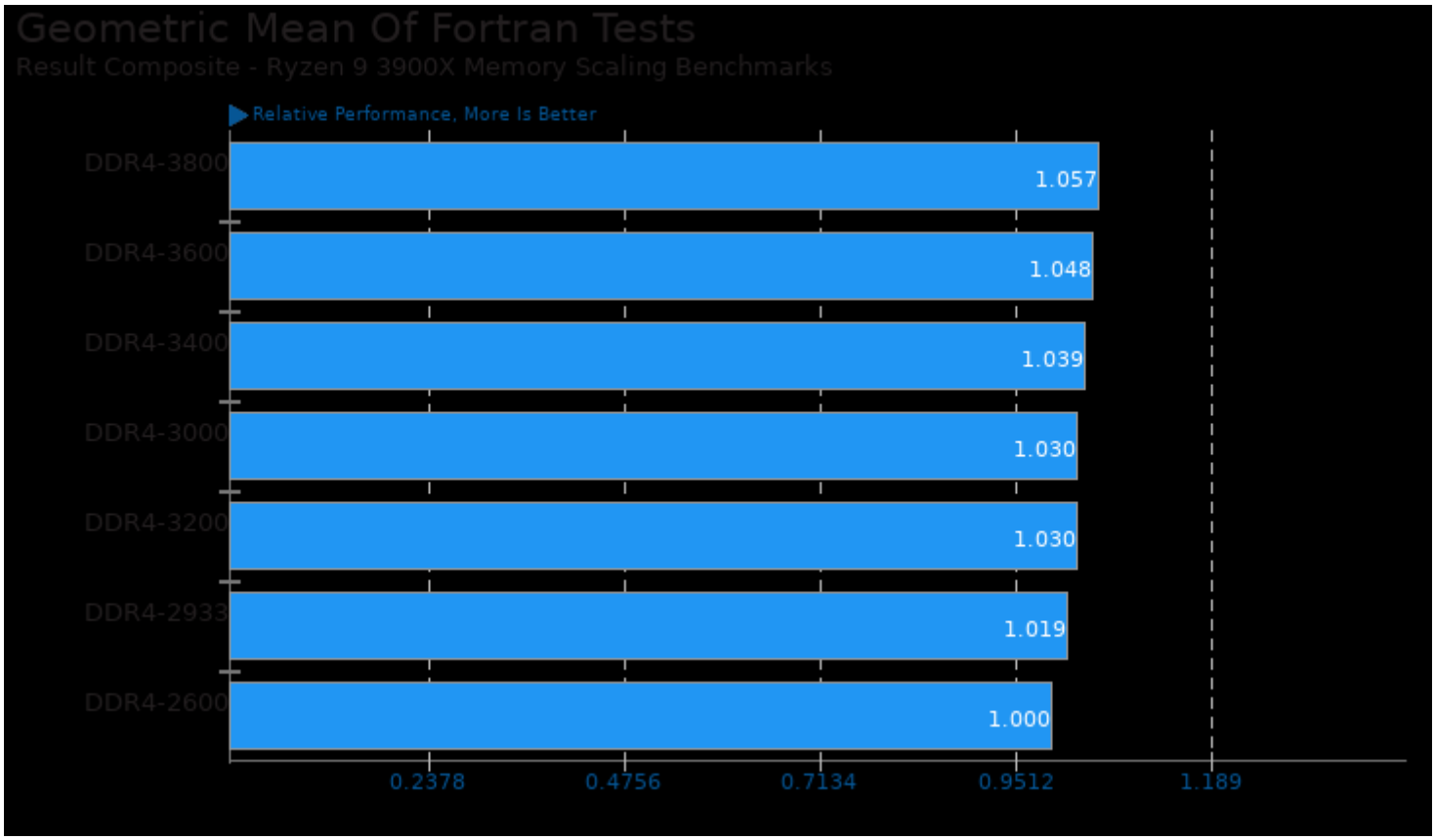
Ryzen 9 3900X Memory Scaling Benchmarks



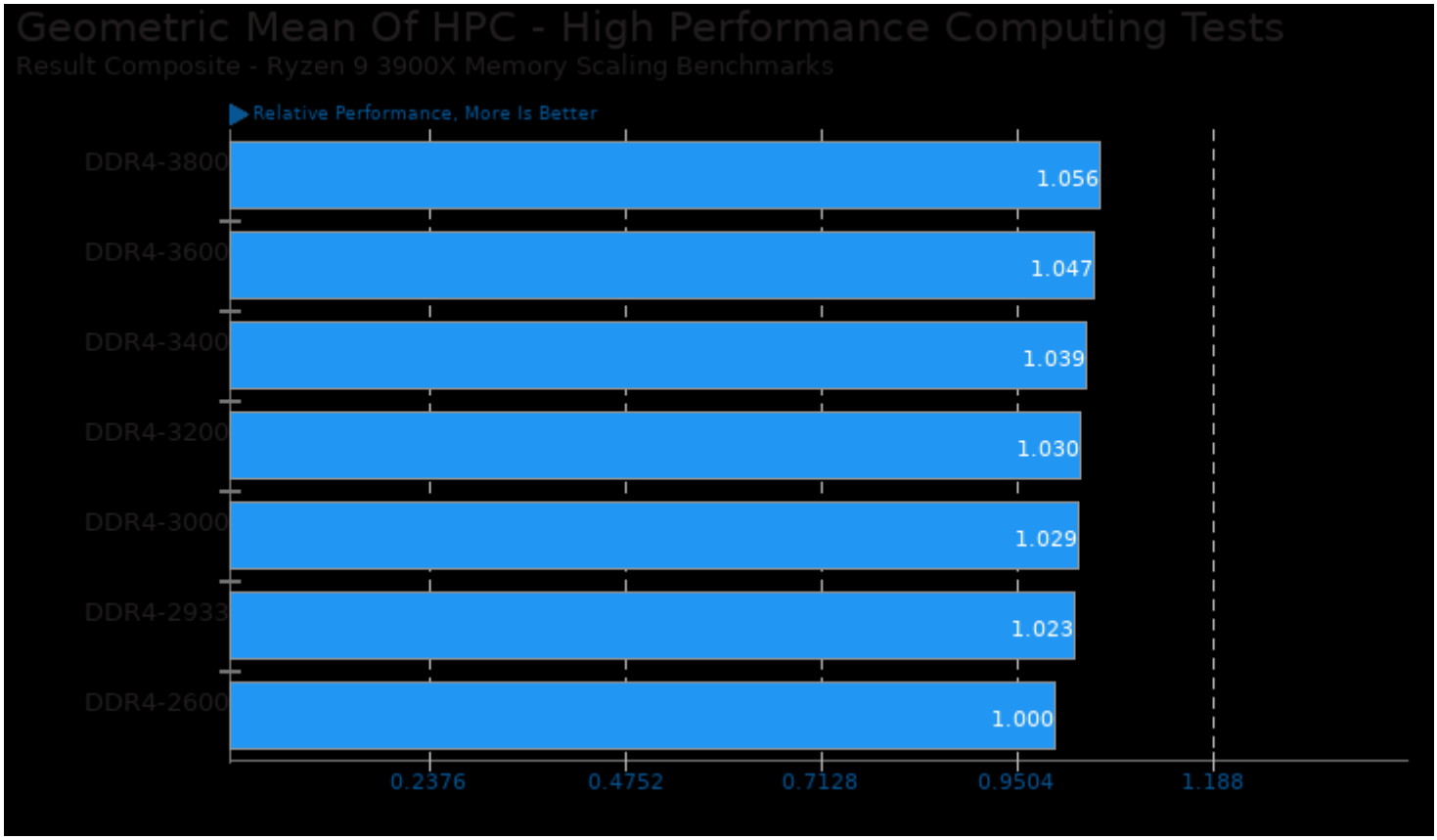
Geometric mean based upon tests: pts/x265, pts/vpxenc, pts/svt-av1 and system/darktable



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

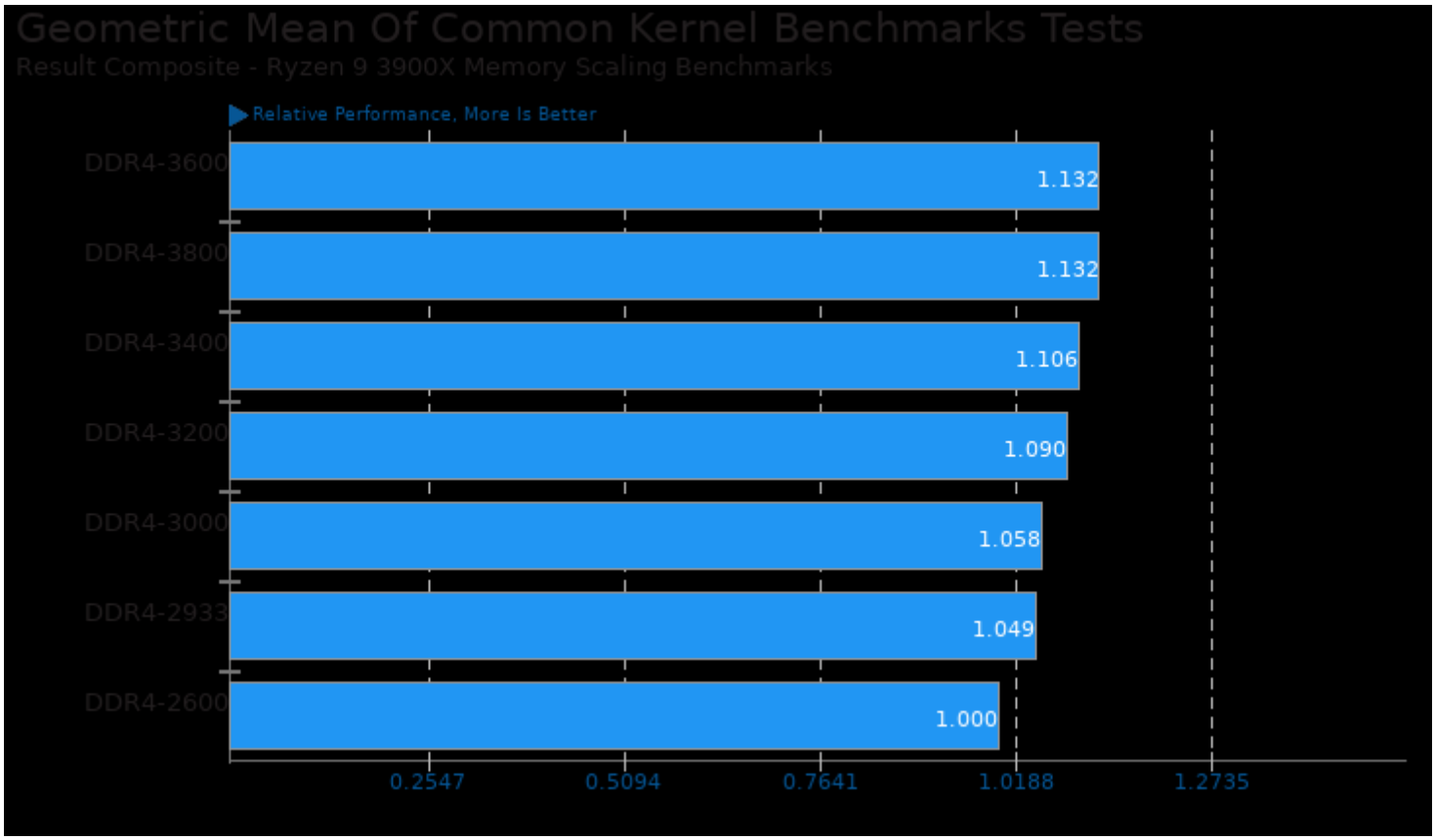


Geometric mean based upon tests: pts/npb and pts/cloverleaf

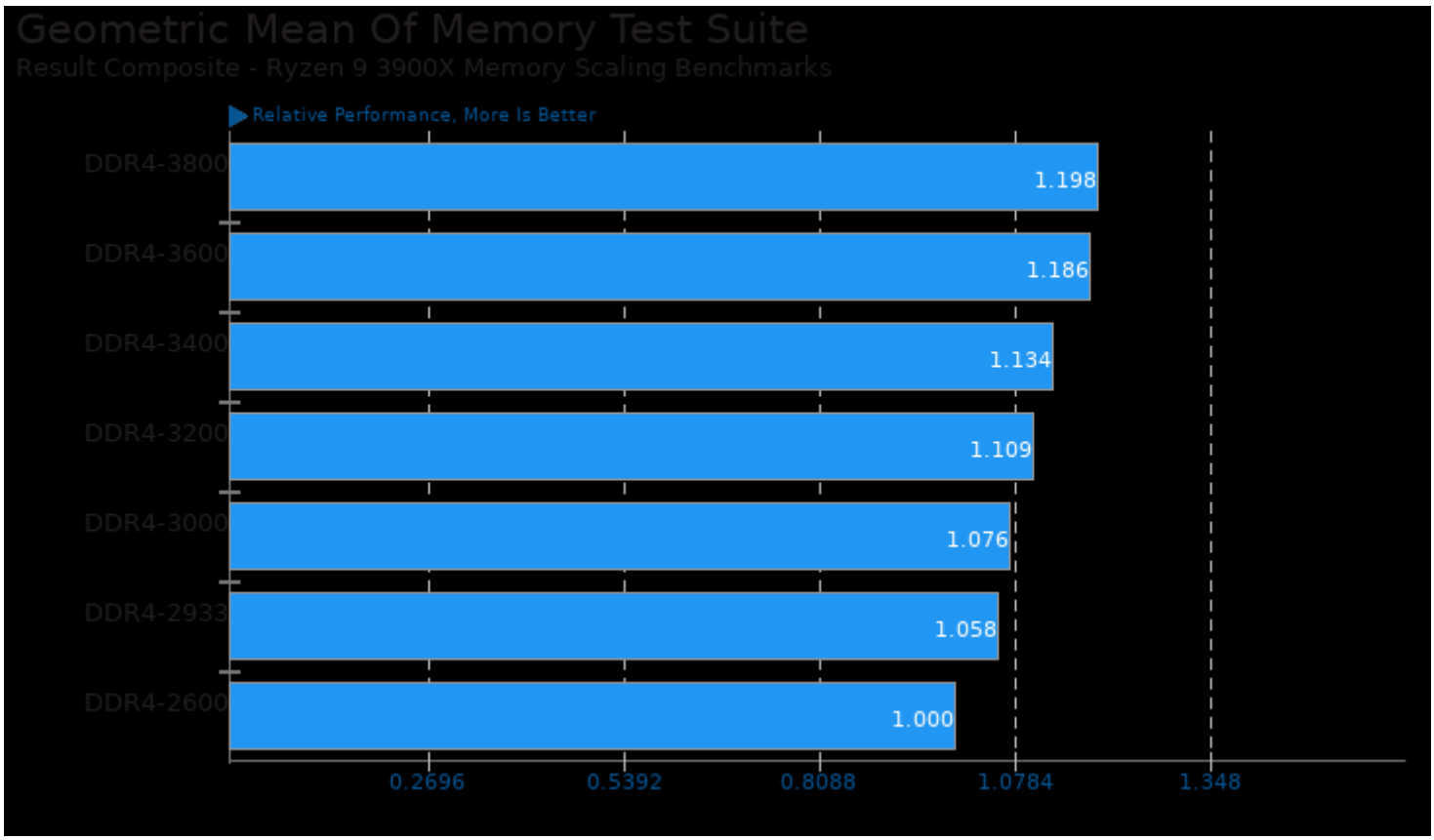


Geometric mean based upon tests: pts/npb, pts/rodinia, pts/parboil, pts/cp2k and pts/cloverleaf

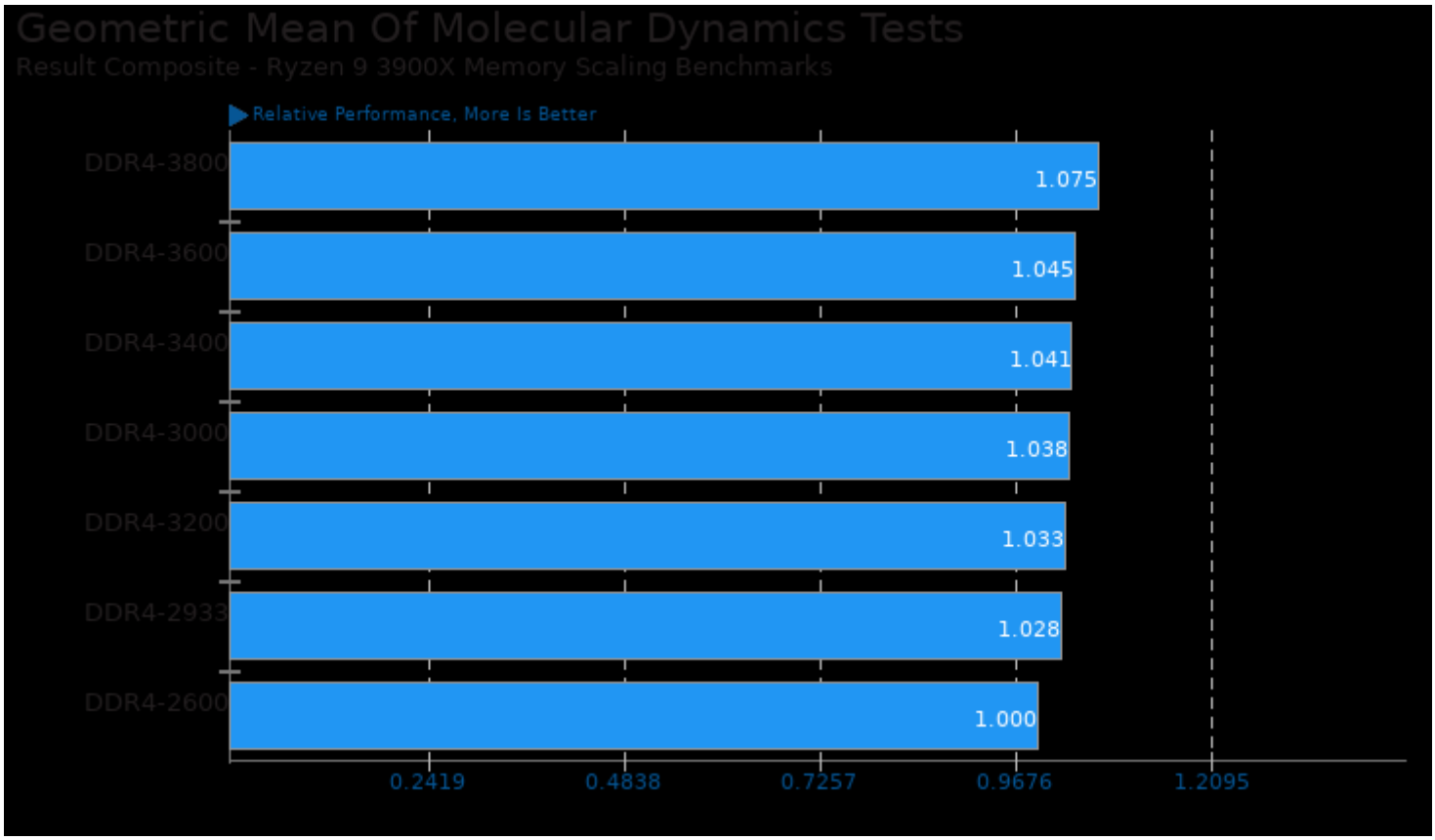
Ryzen 9 3900X Memory Scaling Benchmarks



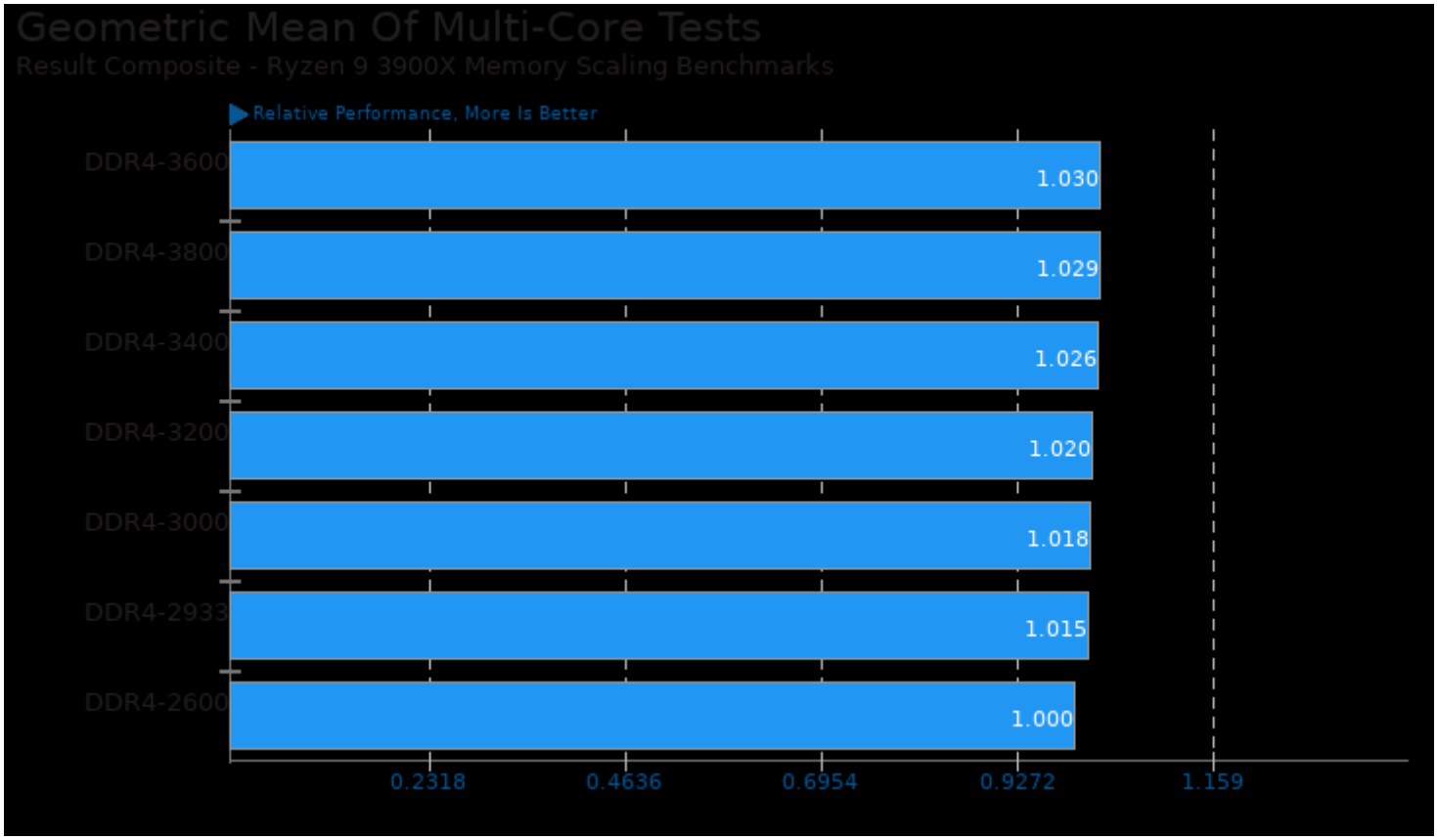
Geometric mean based upon tests: pts/pgbench, pts/tinymembench, pts/mbw and pts/t-test1



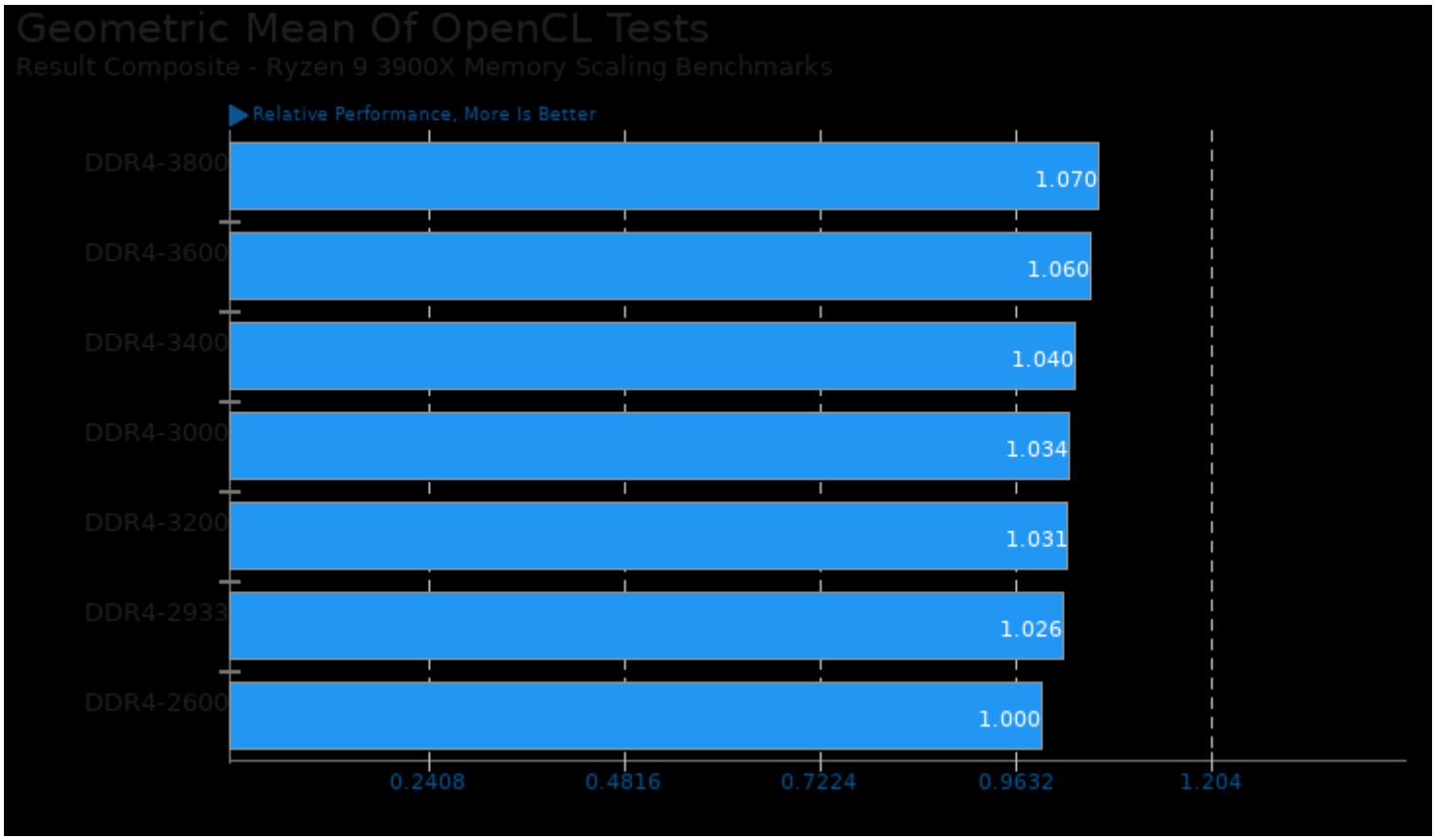
Geometric mean based upon tests: pts/ramspeed, pts/stream, pts/t-test1, pts/tinymembench and pts/mbw



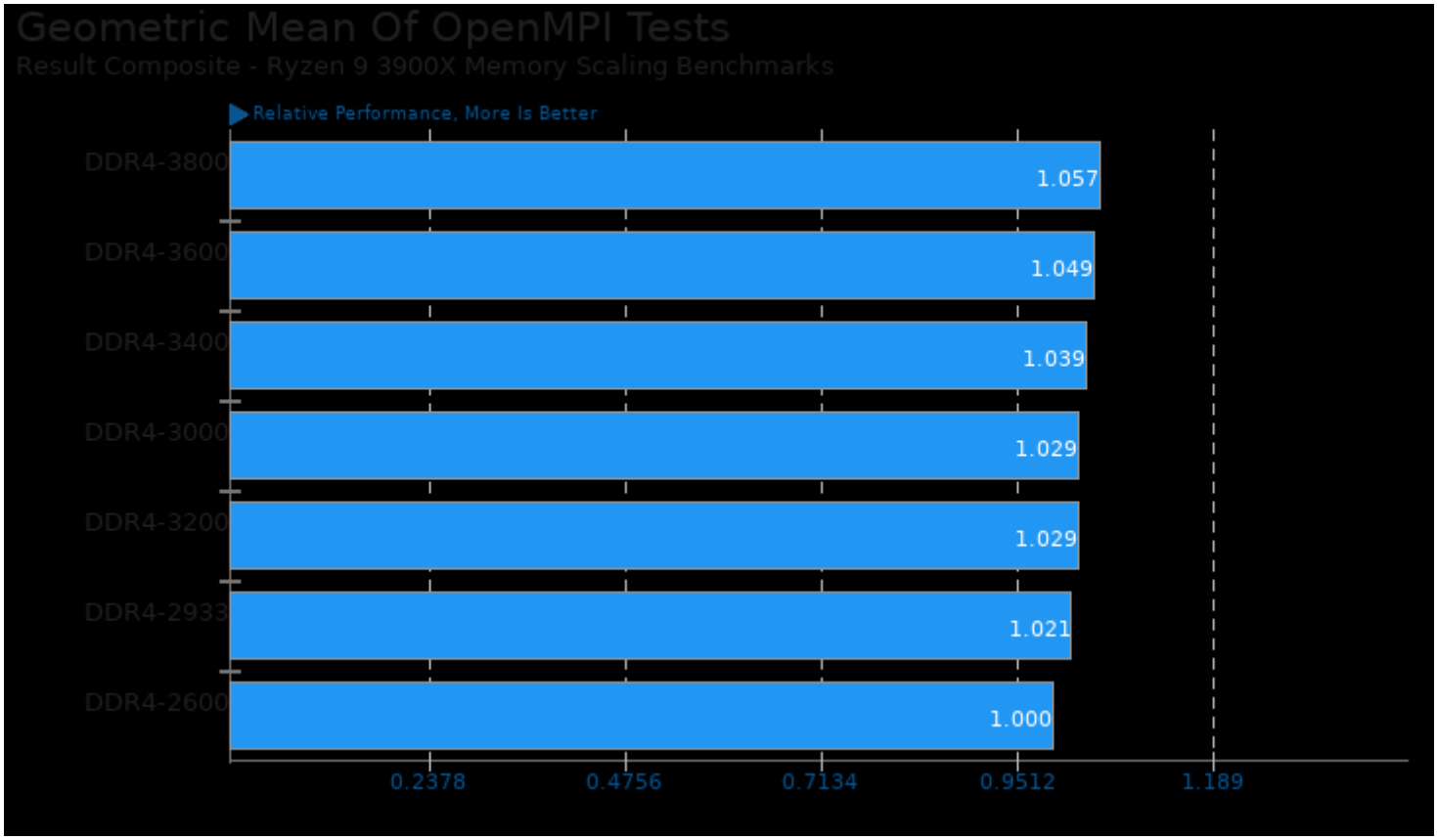
Geometric mean based upon tests: pts/cp2k and pts/cloverleaf



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

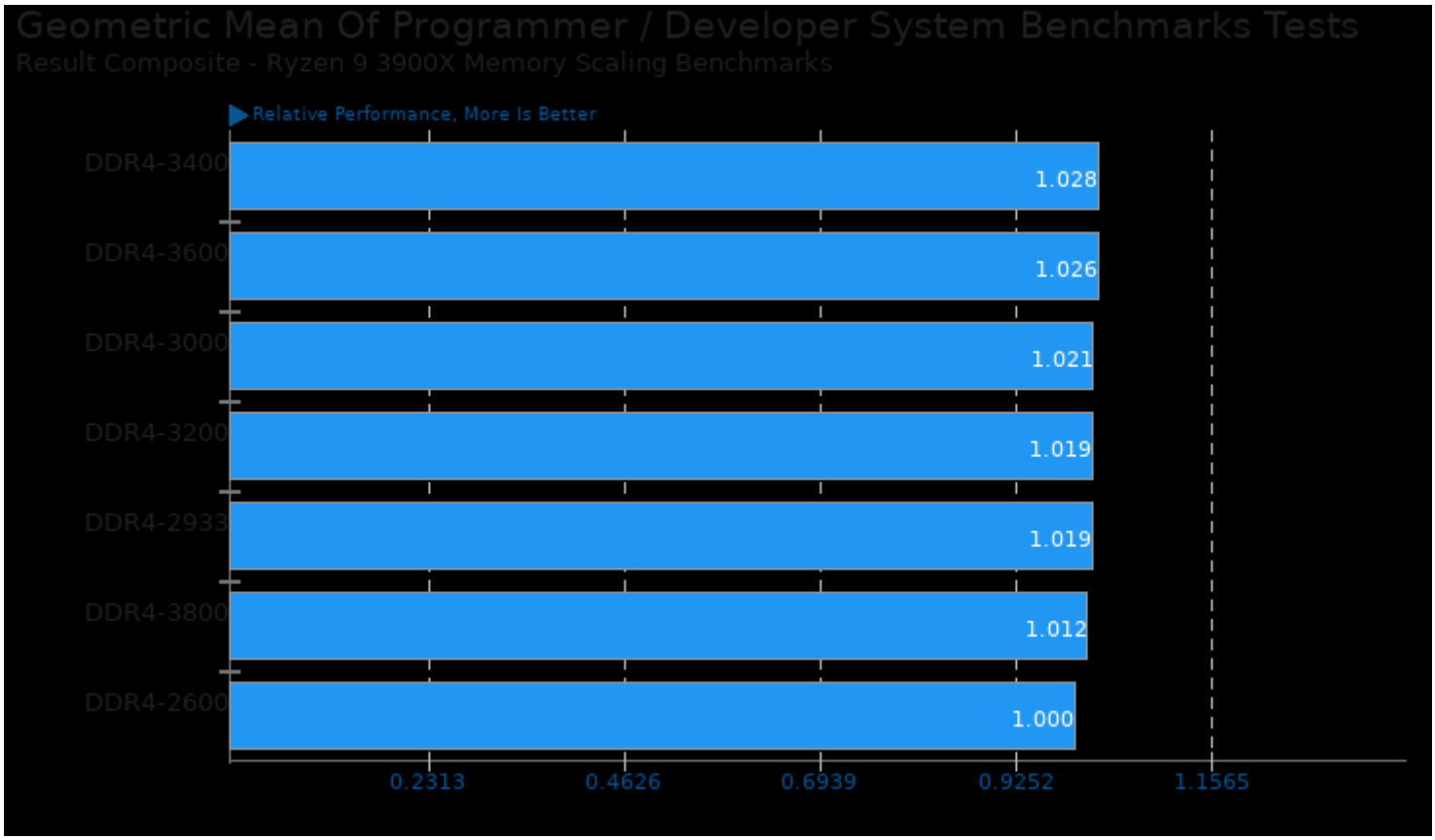


Geometric mean based upon tests: pts/rodinia, pts/parboil and system/darktable

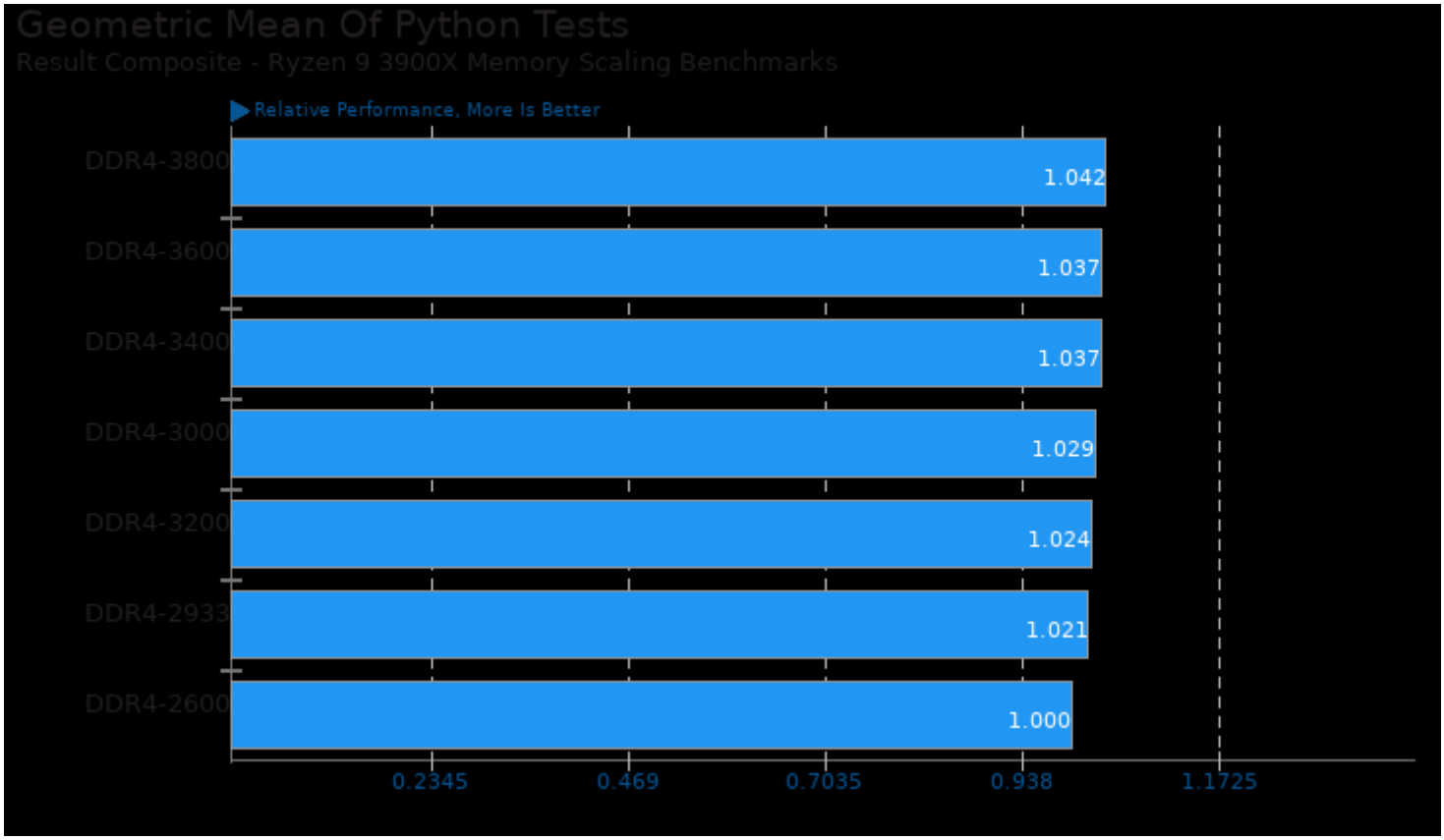


Geometric mean based upon tests: pts/npb, pts/parboil, pts/cloverleaf and pts/rodinia

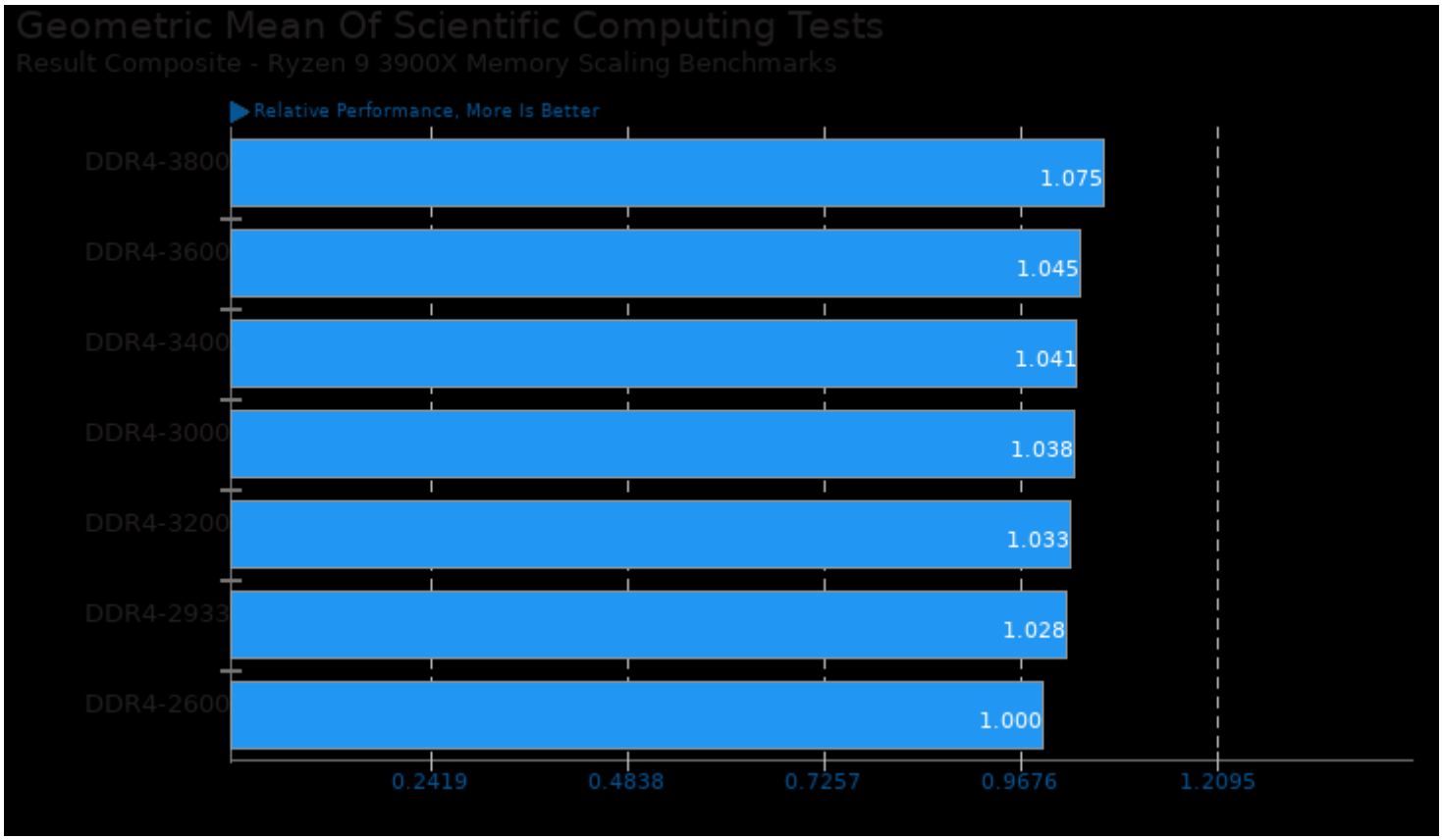
Ryzen 9 3900X Memory Scaling Benchmarks



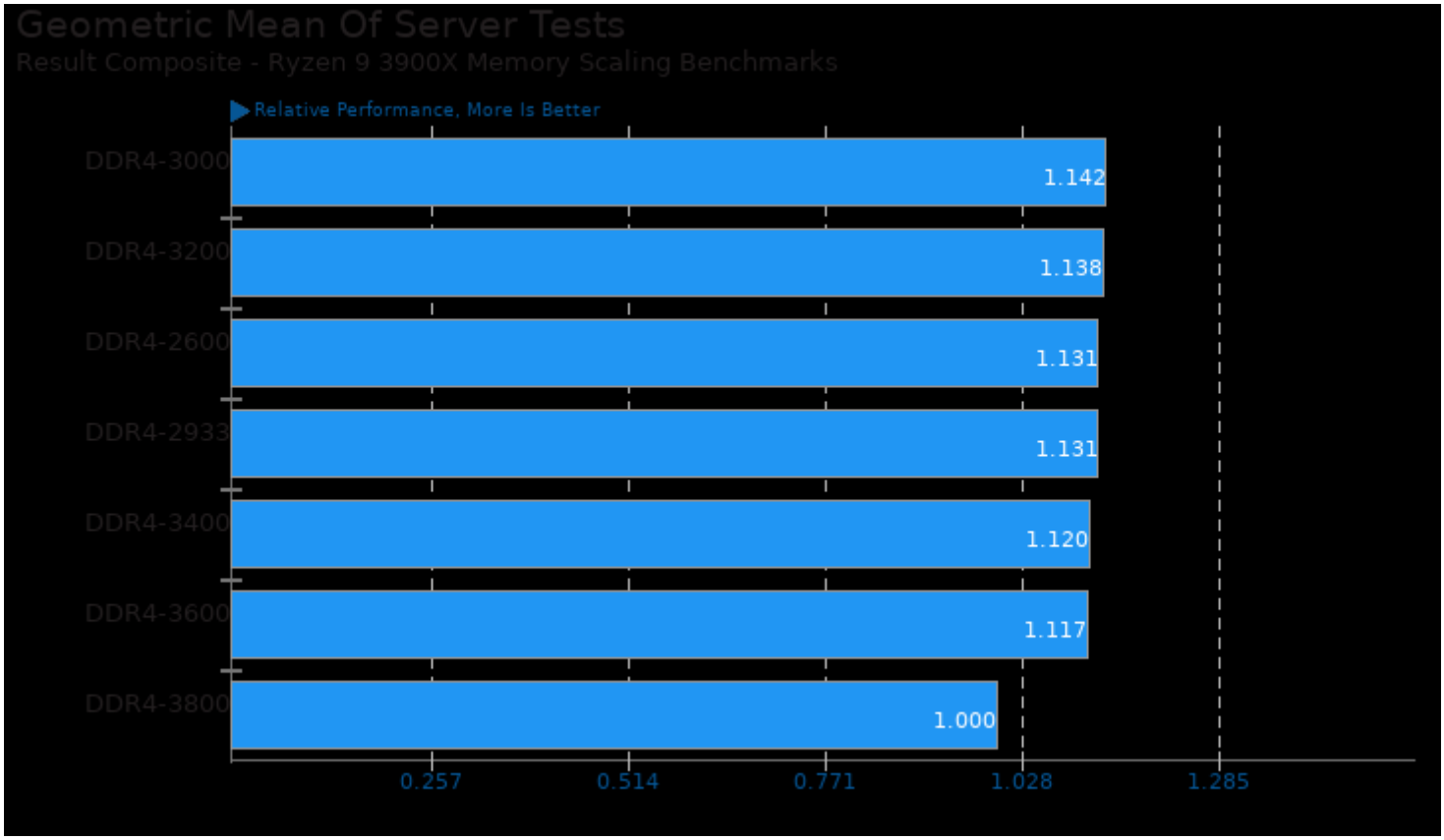
Geometric mean based upon tests: pts/compress-zstd, pts/build-linux-kernel and pts/build-llvm



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

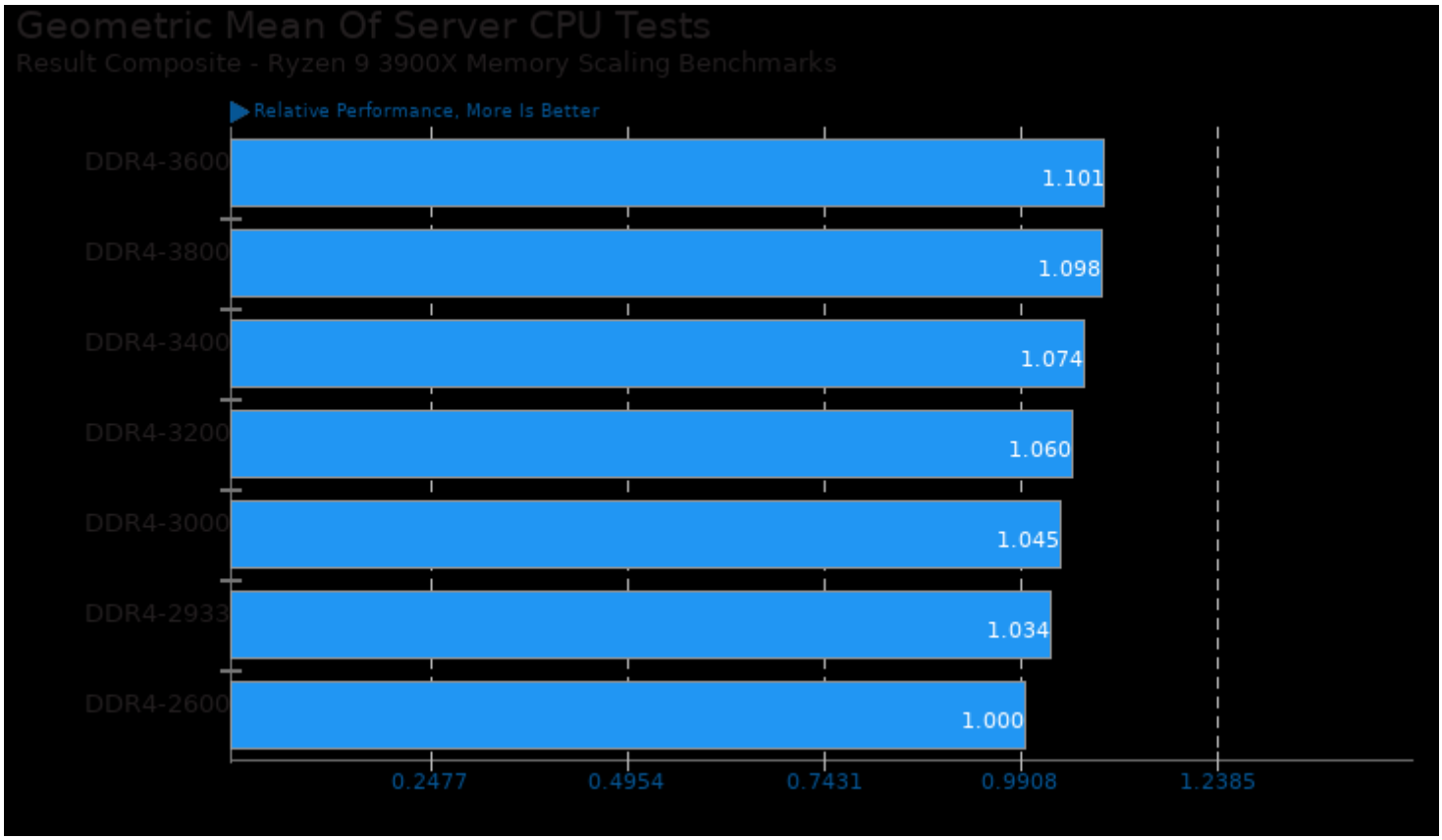


Geometric mean based upon tests: pts/cp2k and pts/cloverleaf

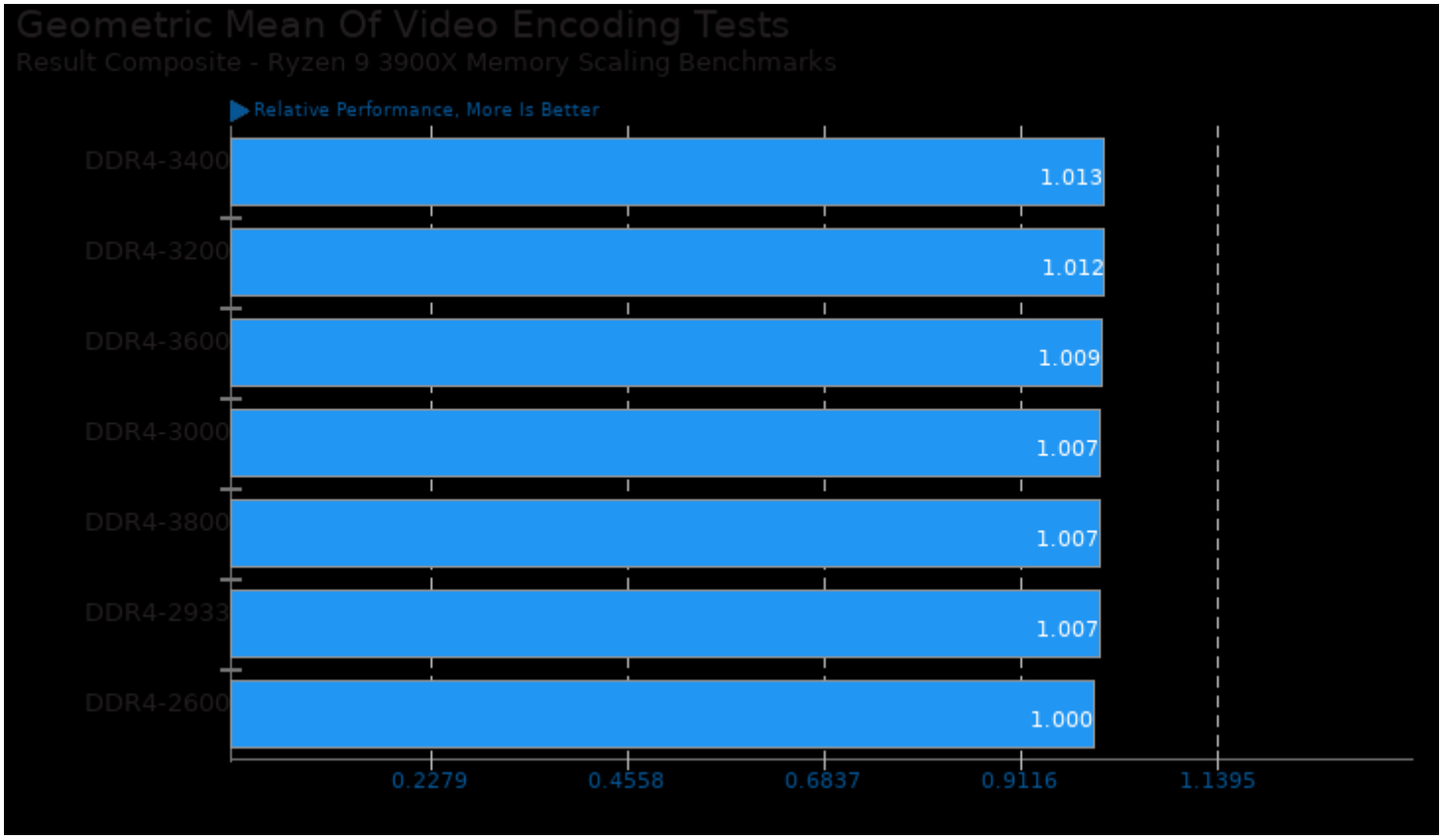


Geometric mean based upon tests: pts/apache-siege and pts/pgbench

Ryzen 9 3900X Memory Scaling Benchmarks

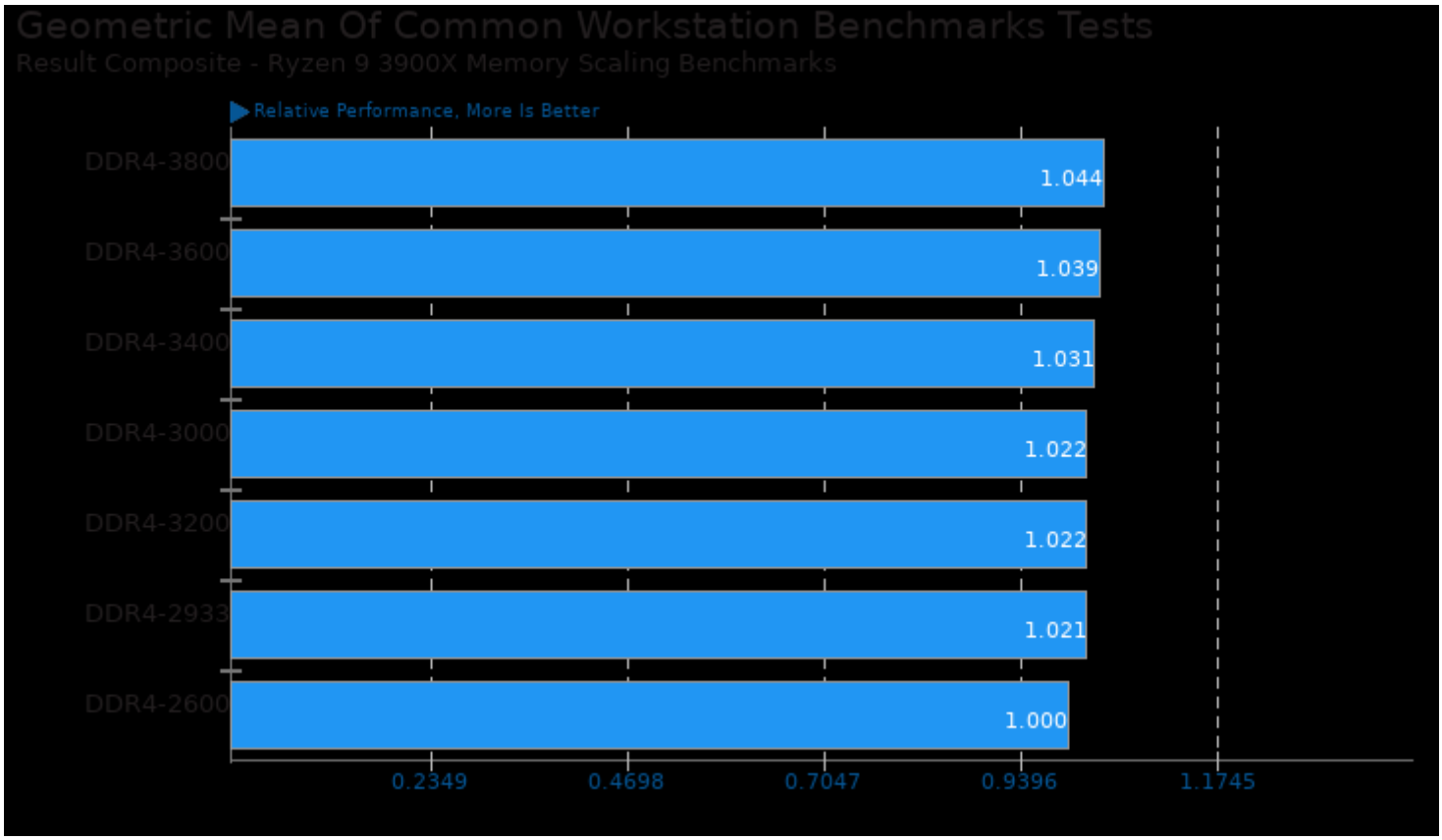


Geometric mean based upon tests: pts/npb, pts/cp2k, pts/rodinia, pts/dacapobench, pts/john-the-ripper, pts/svt-av1, pts/x265, pts/compress-7zip, pts/build-linux-kernel, pts/build-llvm, pts/compress-zstd, pts/apache-siege, pts/ramspeed and pts/stream



Ryzen 9 3900X Memory Scaling Benchmarks

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

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