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zstd 5900X

AMD Ryzen 9 5900X 12-Core testing with a ASUS ROG CROSSHAIR VIII HERO (3202 BIOS) and Sapphire AMD Radeon RX 5600 OEM/5600 XT / 5700/5700 6GB on Ubuntu 20.10 via the Phoronix Test Suite.

Automated Executive Summary

1 had the most wins, coming in first place for 45% of the tests.

Based on the geometric mean of all complete results, the fastest (2) was 1.007x the speed of the slowest (1). 3 was 0.994x the speed of 2 and 1 was 0.999x the speed of 3.

Test Systems:

1

2

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3

Processor: AMD Ryzen 9 5900X 12-Core @ 6.44GHz (12 Cores / 24 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (3202 BIOS), Chipset: AMD Starship/Matisse, Memory: 16GB, Disk: 1000GB Sabrent Rocket 4.0 Plus + 32GB Flash Disk, Graphics: Sapphire AMD Radeon RX 5600 OEM/5600 XT / 5700/5700 6GB (1780/875MHz), Audio: AMD Navi 10 HDMI Audio, Monitor: ASUS VP28U, Network: Realtek RTL8125 2.5GbE + Intel I211

OS: Ubuntu 20.10, Kernel: 5.11.0-051100-generic (x86_64), Desktop: GNOME Shell 3.38.1, Display Server: X Server 1.20.9, OpenGL: 4.6 Mesa 20.2.1 (LLVM 11.0.0), Vulkan: 1.2.131, Compiler: GCC 10.2.0, File-System: ext4, Screen Resolution: 3840x2160

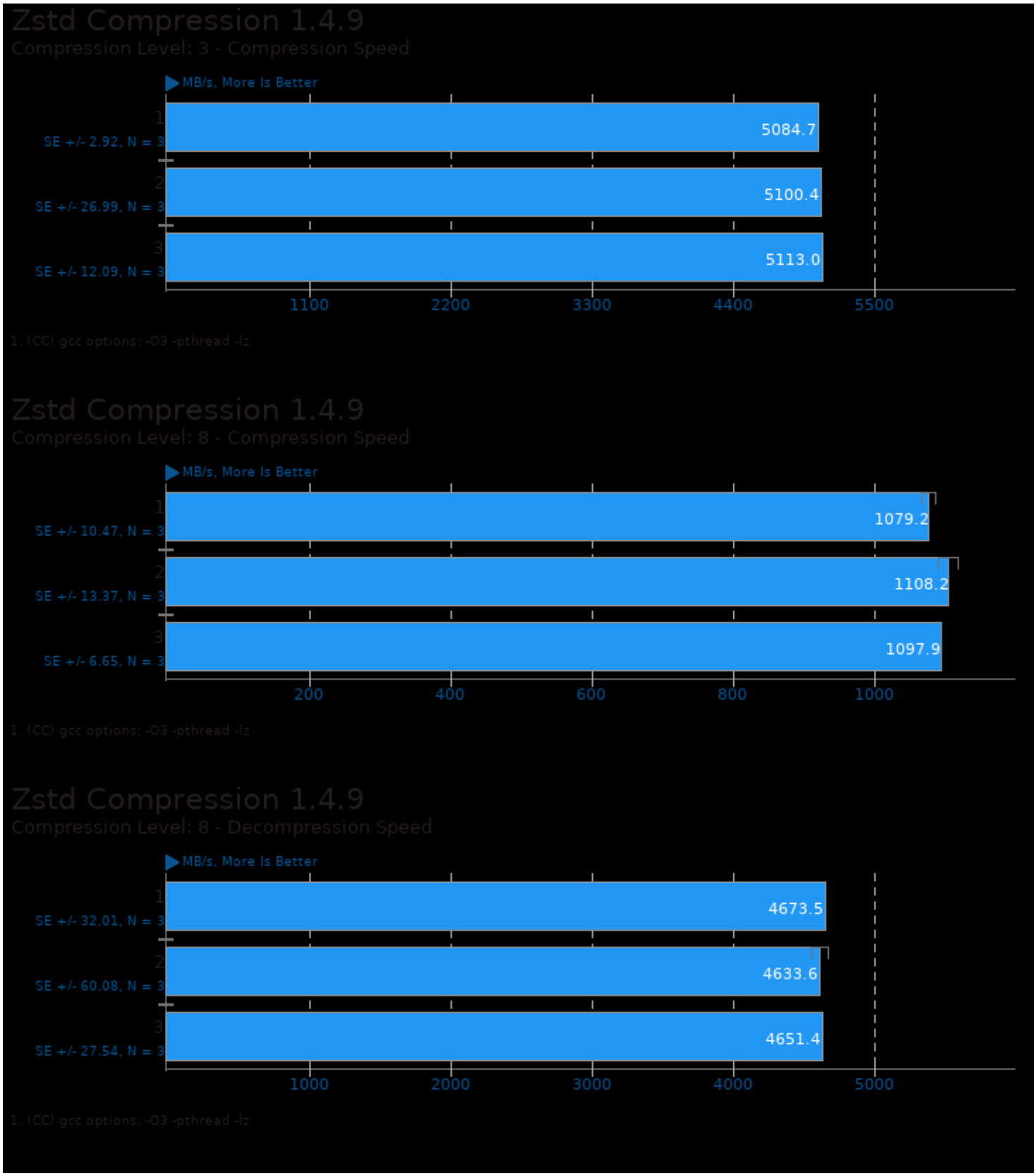
Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-gcn/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-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: 0xa201009
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 + srbds: Not affected + tsx_async_abort: Not affected

	1	2	3
Zstd Compression - 3 - Compression Speed (MB/s)	**5085**	5100	**5113**
Normalized	99.45%	99.75%	100%
Standard Deviation	0.1%	0.9%	0.4%
Zstd Compression - 8 - Compression Speed (MB/s)	**1079**	**1108**	1098
Normalized	97.38%	100%	99.07%
Standard Deviation	1.7%	2.1%	1%
Zstd Compression - 8 - D.S (MB/s)	**4674**	**4634**	4651
Normalized	100%	99.15%	99.53%
Standard Deviation	1.2%	2.2%	1%
Zstd Compression - 19 - Compression Speed (MB/s)	**44.2**	44.0	**43.8**
Normalized	100%	99.55%	99.1%
Standard Deviation	1%	0.8%	0.8%
Zstd Compression - 19 - D.S (MB/s)	**4174**	**4326**	4240
Normalized	96.49%	100%	98.02%
Standard Deviation	2.9%	0.4%	1.6%
Zstd Compression - 3, Long Mode - Compression Speed (MB/s)	**898.8**	916.3	**933.9**
Normalized	96.24%	98.12%	100%
Standard Deviation	0.6%	3.4%	1.6%
Zstd Compression - 3, Long Mode - D.S	4707	**4755**	**4702**
Normalized	98.99%	100%	98.89%
Standard Deviation	0.7%	0.8%	1.8%
Zstd Compression - 8, Long Mode - Compression Speed (MB/s)	**1037**	1031	**1002**
Normalized	100%	99.42%	96.62%

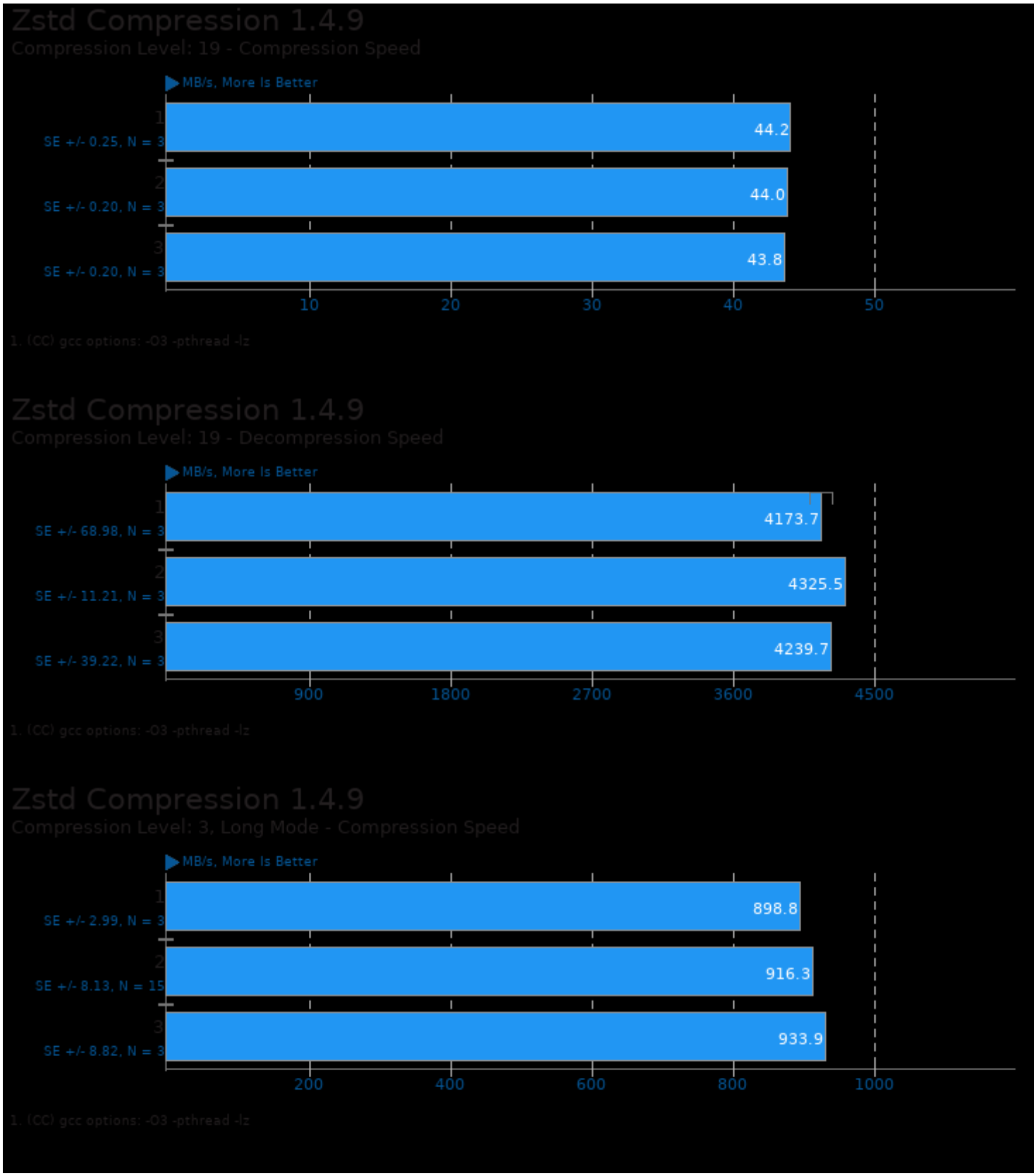
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Standard Deviation	0.2%	0.5%	1.5%
Zstd Compression - 8, Long Mode - D.S	**4965**	4961	**4929**
Normalized	100%	99.91%	99.27%
Standard Deviation	1.7%	1.9%	0.1%
Zstd Compression - 19, Long Mode - Compression Speed (MB/s)	**34.1**	**34.1**	**34.0**
Normalized	100%	100%	99.71%
Standard Deviation	0.2%	1.2%	2.1%
Zstd Compression - 19, Long Mode - D.S (MB/s)	4302	**4331**	**4285**
Normalized	99.31%	100%	98.92%
Standard Deviation	1.3%	1.7%	1.4%

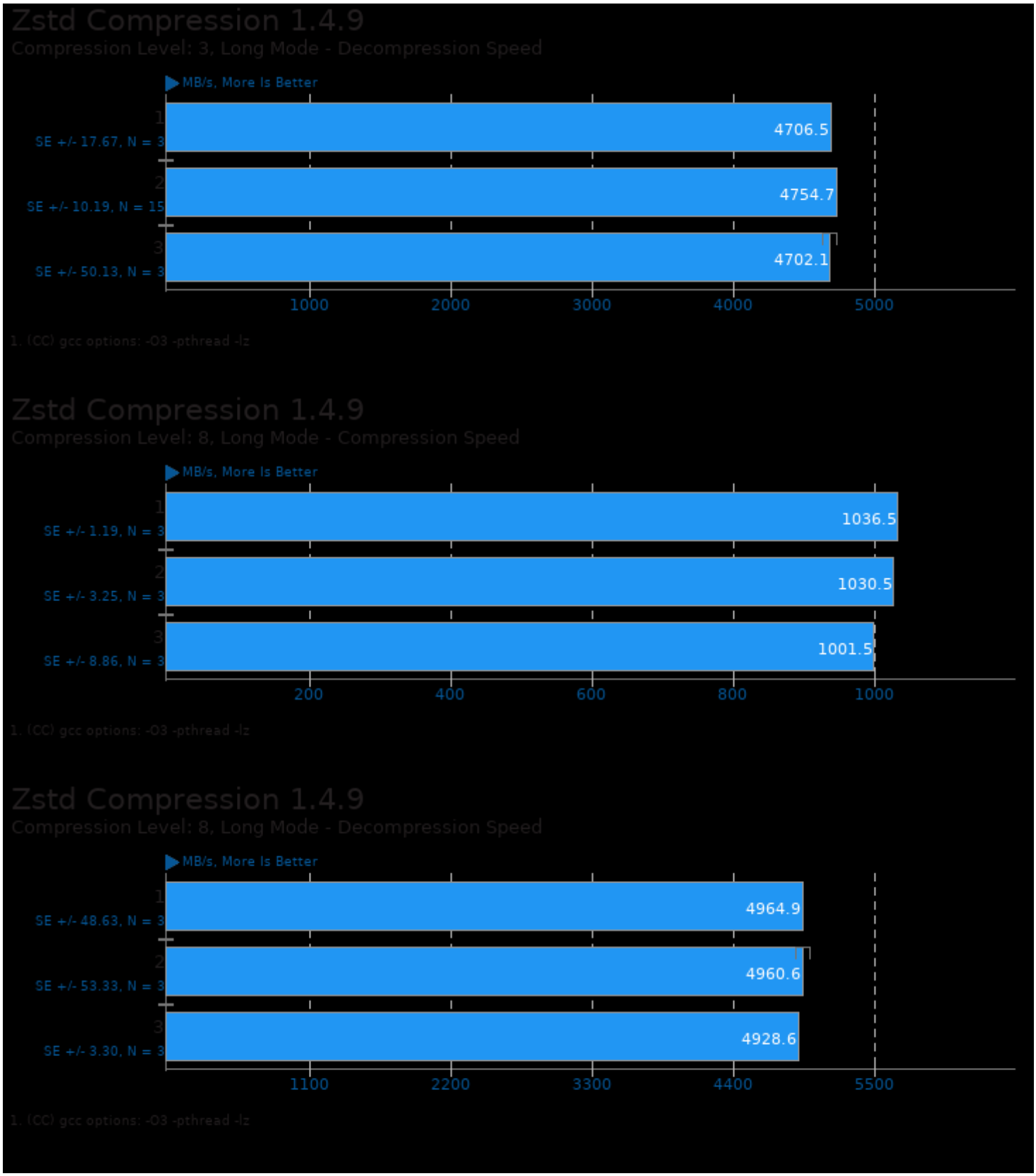
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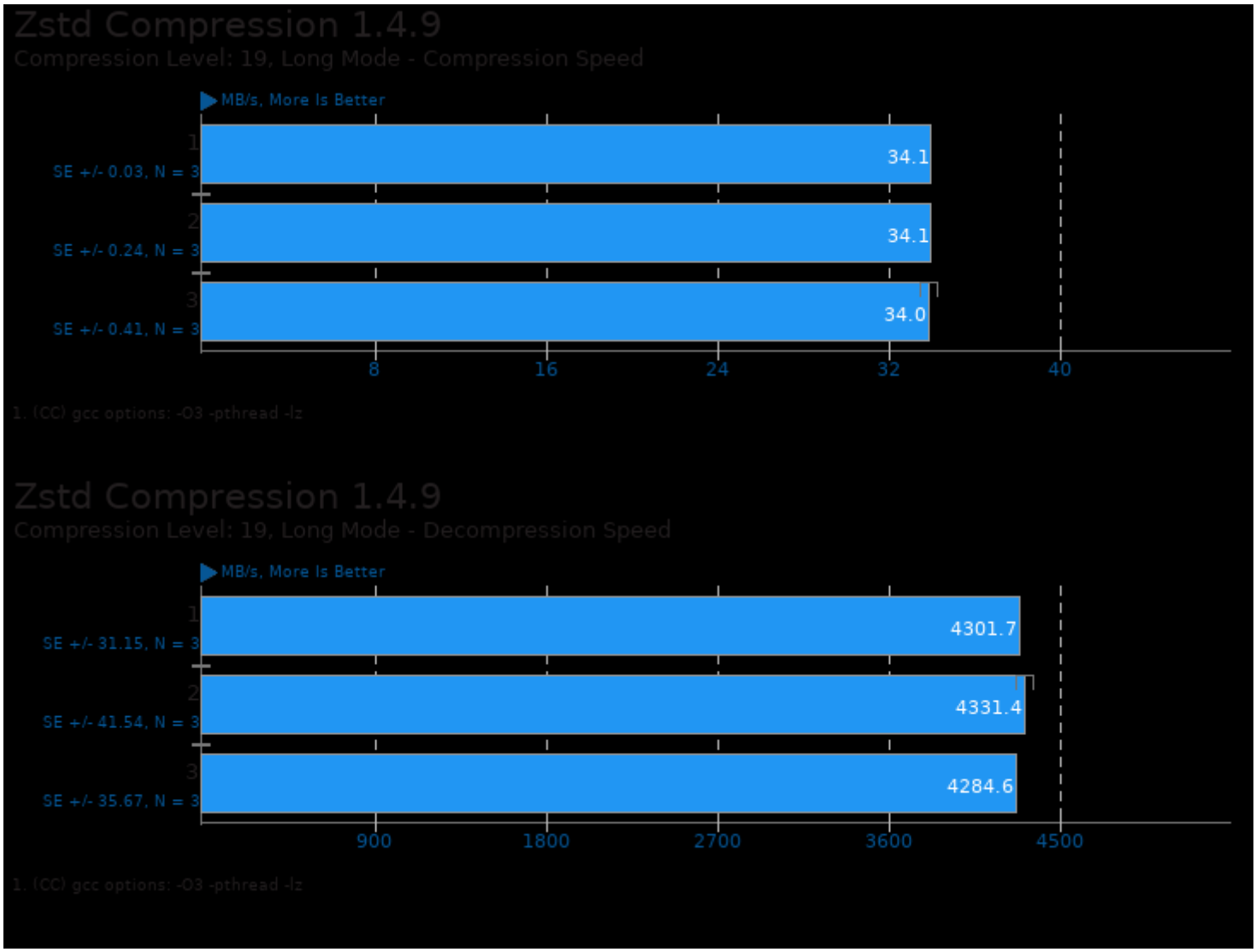

Zstd Compression 1.4.9
Compression Level: 3 - Compression Speed
MB/s, More Is Better
1
SE +/- 2.92, N = 3
5084.7
2
SE +/- 26.99, N = 3
5100.4
3
SE +/- 12.09, N = 3
5113.0
1100
2200
3300
4400
5500
1. (CC) gcc options: -O3 -pthread -lz
Zstd Compression 1.4.9
Compression Level: 8 - Compression Speed
MB/s, More Is Better
1
SE +/- 10.47, N = 3
1079.2
2
SE +/- 13.37, N = 3
1108.2
3
SE +/- 6.65, N = 3
1097.9
200
400
600
800
1000
1. (CC) gcc options: -O3 -pthread -lz
Zstd Compression 1.4.9
Compression Level: 8 - Decompression Speed
MB/s, More Is Better
1
SE +/- 32.01, N = 3
4673.5
2
SE +/- 60.08, N = 3
4633.6
3
SE +/- 27.54, N = 3
4651.4
1000
2000
3000
4000
5000
1. (CC) gcc options: -O3 -pthread -lz

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Zstd Compression 1.4.9
Compression Level: 19 - Compression Speed
MB/s, More Is Better
1
SE +/- 0.25, N = 3
44.2
2
SE +/- 0.20, N = 3
44.0
3
SE +/- 0.20, N = 3
43.8
10
20
30
40
50
1. (CC) gcc options: -O3 -pthread -lz
Zstd Compression 1.4.9
Compression Level: 19 - Decompression Speed
MB/s, More Is Better
1
SE +/- 68.98, N = 3
4173.7
2
SE +/- 11.21, N = 3
4325.5
3
SE +/- 39.22, N = 3
4239.7
900
1800
2700
3600
4500
1. (CC) gcc options: -O3 -pthread -lz
Zstd Compression 1.4.9
Compression Level: 3, Long Mode - Compression Speed
MB/s, More Is Better
1
SE +/- 2.99, N = 3
898.8
2
SE +/- 8.13, N = 15
916.3
3
SE +/- 8.82, N = 3
933.9
200
400
600
800
1000
1. (CC) gcc options: -O3 -pthread -lz

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Zstd Compression 1.4.9
Compression Level: 3, Long Mode - Decompression Speed
MB/s, More Is Better
1
SE +/- 17.67, N = 3
4706.5
2
SE +/- 10.19, N = 15
4754.7
3
SE +/- 50.13, N = 3
4702.1
1000
2000
3000
4000
5000
1. (CC) gcc options: -O3 -pthread -lz
Zstd Compression 1.4.9
Compression Level: 8, Long Mode - Compression Speed
MB/s, More Is Better
1
SE +/- 1.19, N = 3
1036.5
2
SE +/- 3.25, N = 3
1030.5
3
SE +/- 8.86, N = 3
1001.5
200
400
600
800
1000
1. (CC) gcc options: -O3 -pthread -lz
Zstd Compression 1.4.9
Compression Level: 8, Long Mode - Decompression Speed
MB/s, More Is Better
1
SE +/- 48.63, N = 3
4964.9
2
SE +/- 53.33, N = 3
4960.6
3
SE +/- 3.30, N = 3
4928.6
1100
2200
3300
4400
5500
1. (CC) gcc options: -O3 -pthread -lz



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