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Core i9 7960X Linux 5.0 Kernel Benchmarks

Linux 4.12 to Linux 5.0 kernel benchmarks on an Intel Core i9 7960X. Benchmarks by Michael Larabel.

Automated Executive Summary

Linux 4.12 had the most wins, coming in first place for 30% of the tests.

Based on the geometric mean of all complete results, the fastest (Linux 4.13) was 1.07x the speed of the slowest (Linux 4.19). Linux 4.14 was 0.991x the speed of Linux 4.13, Linux 4.12 was 0.981x the speed of Linux 4.14, Linux 5.0 Git was 0.971x the speed of Linux 4.12, Linux 4.20 was 0.998x the speed of Linux 5.0 Git, Linux 4.16 was 0.999x the speed of Linux 4.20, Linux 4.17 was 0.995x the speed of Linux 4.16, Linux 4.15 was 1x the speed of Linux 4.17, Linux 4.18 was 0.999x the speed of Linux 4.15, Linux 4.19 was 1x the speed of Linux 4.18.

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

Stress-NG (Test: Context Switching) at 8.331x
ctx_clock (Context Switch Time) at 4.29x
Systemd Total Boot Time (Test: Kernel) at 3.287x
Stress-NG (Test: System V Message Passing) at 1.875x
Sockperf (Test: Throughput) at 1.697x
OSBench (Test: Create Threads) at 1.646x
Stress-NG (Test: Socket Activity) at 1.576x

Hackbench (Count: 32 - Type: Process) at 1.469x
GNU Octave Benchmark at 1.461x
OSBench (Test: Create Processes) at 1.306x.

Test Systems:

Linux 4.12

Processor: Intel Core i9-7960X @ 4.40GHz (16 Cores / 32 Threads), Motherboard: MSI X299 SLI PLUS (MS-7A93) v1.0 (1.A0 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 16384MB, Disk: 256GB INTEL SSDPEKKW256G8, Graphics: Gigabyte AMD Radeon RX 550/550X 2GB (1206/1750MHz), Audio: Realtek ALC1220, Monitor: ASUS VP28U, Network: Intel I219-V + Intel I211

OS: Ubuntu 18.10, Kernel: 4.12.0-041200-generic (x86_64), Desktop: GNOME Shell 3.30.1, 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 8.2.0, 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
Disk Notes: NONE / data=ordered,errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
Graphics Notes: GLAMOR
Python Notes: Python 2.7.15+ + Python 3.6.7

Linux 4.13

Processor: Intel Core i9-7960X @ 4.40GHz (16 Cores / 32 Threads), Motherboard: MSI X299 SLI PLUS (MS-7A93) v1.0 (1.A0 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 16384MB, Disk: 256GB INTEL SSDPEKKW256G8, Graphics: Gigabyte AMD Radeon RX 550/550X 2GB (1206/1750MHz), Audio: Realtek ALC1220, Monitor: ASUS VP28U, Network: Intel I219-V + Intel I211

OS: Ubuntu 18.10, Kernel: 4.13.0-041300-generic (x86_64), Desktop: GNOME Shell 3.30.1, 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 8.2.0, 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
Disk Notes: NONE / data=ordered,errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
Graphics Notes: GLAMOR
Python Notes: Python 2.7.15+ + Python 3.6.7

Linux 4.14

Processor: Intel Core i9-7960X @ 4.40GHz (16 Cores / 32 Threads), Motherboard: MSI X299 SLI PLUS (MS-7A93) v1.0 (1.A0 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 16384MB, Disk: 256GB INTEL SSDPEKKW256G8, Graphics: Gigabyte AMD Radeon RX 550/550X 2GB (1206/1750MHz), Audio: Realtek ALC1220, Monitor: ASUS

VP28U, Network: Intel I219-V + Intel I211

OS: Ubuntu 18.10, Kernel: 4.14.0-041400-generic (x86_64), Desktop: GNOME Shell 3.30.1, 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 8.2.0, 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
Disk Notes: NONE / data=ordered,errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
Graphics Notes: GLAMOR
Python Notes: Python 2.7.15+ + Python 3.6.7

Linux 4.15

Processor: Intel Core i9-7960X @ 4.40GHz (16 Cores / 32 Threads), Motherboard: MSI X299 SLI PLUS (MS-7A93) v1.0 (1.A0 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 16384MB, Disk: 256GB INTEL SSDPEKKW256G8, Graphics: Gigabyte AMD Radeon RX 550/550X 2GB (1206/1750MHz), Audio: Realtek ALC1220, Monitor: ASUS VP28U, Network: Intel I219-V + Intel I211

OS: Ubuntu 18.10, Kernel: 4.15.0-041500-generic (x86_64), Desktop: GNOME Shell 3.30.1, 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 8.2.0, 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
Disk Notes: NONE / data=ordered,errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
Graphics Notes: GLAMOR
Python Notes: Python 2.7.15+ + Python 3.6.7
Security Notes: KPTI + Full generic retpoline

Linux 4.16

Processor: Intel Core i9-7960X @ 4.40GHz (16 Cores / 32 Threads), Motherboard: MSI X299 SLI PLUS (MS-7A93) v1.0 (1.A0 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 16384MB, Disk: 256GB INTEL SSDPEKKW256G8, Graphics: Gigabyte AMD Radeon RX 550/550X 2GB (1206/1750MHz), Audio: Realtek ALC1220, Monitor: ASUS VP28U, Network: Intel I219-V + Intel I211

OS: Ubuntu 18.10, Kernel: 4.16.0-041600-generic (x86_64), Desktop: GNOME Shell 3.30.1, 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 8.2.0, 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
Disk Notes: NONE / data=ordered,errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
Graphics Notes: GLAMOR
Python Notes: Python 2.7.15+ + Python 3.6.7
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline IBPB IBRS_FW

Linux 4.17

Processor: Intel Core i9-7960X @ 4.40GHz (16 Cores / 32 Threads), Motherboard: MSI X299 SLI PLUS (MS-7A93) v1.0 (1.A0 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 16384MB, Disk: 256GB INTEL SSDPEKKW256G8, Graphics: Gigabyte AMD Radeon RX 550/550X 2GB (1206/1750MHz), Audio: Realtek ALC1220, Monitor: ASUS VP28U, Network: Intel I219-V + Intel I211

OS: Ubuntu 18.10, Kernel: 4.17.0-041700-generic (x86_64), Desktop: GNOME Shell 3.30.1, 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 8.2.0, 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
Disk Notes: NONE / errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
Graphics Notes: GLAMOR
Python Notes: Python 2.7.15+ + Python 3.6.7
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline IBPB IBRS_FW + SSB disabled via prctl and seccomp

Linux 4.18

Processor: Intel Core i9-7960X @ 4.40GHz (16 Cores / 32 Threads), Motherboard: MSI X299 SLI PLUS (MS-7A93) v1.0 (1.A0 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 16384MB, Disk: 256GB INTEL SSDPEKKW256G8, Graphics: Gigabyte AMD Radeon RX 550/550X 2GB (1206/1750MHz), Audio: Realtek ALC1220, Monitor: ASUS VP28U, Network: Intel I219-V + Intel I211

OS: Ubuntu 18.10, Kernel: 4.18.0-041800-generic (x86_64), Desktop: GNOME Shell 3.30.1, 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 8.2.0, 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
Disk Notes: NONE / errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
Graphics Notes: GLAMOR
Python Notes: Python 2.7.15+ + Python 3.6.7
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline IBPB IBRS_FW + SSB disabled via prctl and seccomp

Linux 4.19

Processor: Intel Core i9-7960X @ 4.40GHz (16 Cores / 32 Threads), Motherboard: MSI X299 SLI PLUS (MS-7A93) v1.0 (1.A0 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 16384MB, Disk: 256GB INTEL SSDPEKKW256G8, Graphics: Gigabyte AMD Radeon RX 550/550X 2GB (1206/1750MHz), Audio: Realtek ALC1220, Monitor: ASUS VP28U, Network: Intel I219-V + Intel I211

OS: Ubuntu 18.10, Kernel: 4.19.0-041900-generic (x86_64), Desktop: GNOME Shell 3.30.1, 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 8.2.0, 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
Disk Notes: NONE / errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
Graphics Notes: GLAMOR

Python Notes: Python 2.7.15+ + Python 3.6.7
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline IBPB IBRS_FW + SSB disabled via prctl and seccomp + PTE Inversion; VMX: conditional cache flushes SMT vulnerable

Linux 4.20

Processor: Intel Core i9-7960X @ 4.40GHz (16 Cores / 32 Threads), Motherboard: MSI X299 SLI PLUS (MS-7A93) v1.0 (1.A0 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 16384MB, Disk: 256GB INTEL SSDPEKKW256G8, Graphics: Gigabyte AMD Radeon RX 550/550X 2GB (1206/1750MHz), Audio: Realtek ALC1220, Monitor: ASUS VP28U, Network: Intel I219-V + Intel I211

OS: Ubuntu 18.10, Kernel: 4.20.0-042000-generic (x86_64), Desktop: GNOME Shell 3.30.1, 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 8.2.0, 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
Disk Notes: NONE / errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
Graphics Notes: GLAMOR
Python Notes: Python 2.7.15+ + Python 3.6.7
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling + SSB disabled via prctl and seccomp + PTE Inversion; VMX: conditional cache flushes SMT vulnerable

Linux 5.0 Git

Processor: Intel Core i9-7960X @ 4.40GHz (16 Cores / 32 Threads), Motherboard: MSI X299 SLI PLUS (MS-7A93) v1.0 (1.A0 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 16384MB, Disk: 256GB INTEL SSDPEKKW256G8, Graphics: Gigabyte AMD Radeon RX 550/550X 2GB (1206/1750MHz), Audio: Realtek ALC1220, Monitor: ASUS VP28U, Network: Intel I219-V + Intel I211

OS: Ubuntu 18.10, Kernel: 5.0.0-999-generic (x86_64) 20190217, Desktop: GNOME Shell 3.30.1, 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 8.2.0, 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
Disk Notes: NONE / errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
Graphics Notes: GLAMOR
Python Notes: Python 2.7.15+ + Python 3.6.7
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling + SSB disabled via prctl and seccomp + PTE Inversion; VMX: conditional cache flushes SMT vulnerable

	Linux 4.12	Linux 4.13	Linux 4.14	Linux 4.15	Linux 4.16	Linux 4.17	Linux 4.18	Linux 4.19	Linux 4.20	Linux 5.0 Git
SQLite - T.S.I (sec)	13.95	14.00	14.26	16.00	15.77	14.75	14.72	15.06	**16.61**	**12.51**
Normalized	89.68%	89.36%	87.73%	78.19%	79.33%	84.81%	84.99%	83.07%	75.32%	100%
Standard Deviation	16.2%	19.1%	11.8%	34.7%	24.2%	30.9%	37.9%	11.9%	23.5%	21.5%

Core i9 7960X Linux 5.0 Kernel Benchmarks

FS-Mark - 5.F.1.S.4.T (Files/s)	111	118	121	116	116	115	109	101	109	120
Normalized	91.74%	97.52%	100%	95.87%	95.87%	95.04%	90.08%	83.47%	90.08%	99.17%
Standard Deviation	2.5%	7.2%	8.2%	7.5%	7.5%	10.9%	10.9%	7.8%	13.3%	4.8%
FS-Mark - 4.F.3.S.D.1.S (Files/s)	68.56	68.84	68.49	68.88	70.25	66.93	68.77	66.62	68.24	67.65
Normalized	97.59%	97.99%	97.49%	98.05%	100%	95.27%	97.89%	94.83%	97.14%	96.3%
Standard Deviation	15.7%	13%	10.9%	12.3%	16.3%	5.7%	10.6%	4.7%	16%	15.5%
BlogBench - Read (Final Score)	1441338	1277929	1435431	1433530	1368724	1281157	1413307	1380708	1239923	1335880
Normalized	100%	88.66%	99.59%	99.46%	94.96%	88.89%	98.06%	95.79%	86.03%	92.68%
Standard Deviation	6.5%	10.9%	12.1%	14.9%	12.4%	12.2%	6.8%	11.7%	9.6%	12%
BlogBench - Write (Final Score)	7450	8340	8076	7848	7357	7772	7614	7531	7716	7437
Normalized	89.33%	100%	96.83%	94.1%	88.21%	93.19%	91.29%	90.3%	92.52%	89.17%
Standard Deviation	3.6%	3.1%	3.8%	2.5%	2.6%	3.2%	2%	2.5%	1.6%	3.8%
Compile Bench - Compile (MB/s)	934	937	937	849	844	843	855	847	854	855
Normalized	99.68%	100%	100%	90.61%	90.07%	89.97%	91.25%	90.39%	91.14%	91.25%
Standard Deviation	5.4%	2.8%	5.6%	3.7%	5%	3.2%	3.3%	3.2%	2.6%	3.8%
Compile Bench - Initial Create (MB/s)	626	682	643	518	549	613	586	555	625	627
Normalized	91.79%	100%	94.28%	75.95%	80.5%	89.88%	85.92%	81.38%	91.64%	91.94%
Standard Deviation	9.8%	9.2%	11.2%	10.8%	8%	6.1%	6.5%	5%	2.2%	7.8%
Tesseract - 3840 x 2160 (FPS)	72.31	72.16	72.42	70.37	70.97	71.35	71.10	71.23	71.22	70.92
Normalized	99.85%	99.64%	100%	97.17%	98%	98.52%	98.18%	98.36%	98.34%	97.93%
Standard Deviation	0.3%	0.3%	0.5%	0.2%	0.3%	0.4%	0.2%	1%	1.7%	0.3%
Xonotic - 3840 x 2160 - Ultimate (FPS)	66.51	66.54	66.80	64.08	64.44	64.52	64.47	64.88	64.69	64.59
Normalized	99.57%	99.61%	100%	95.93%	96.47%	96.59%	96.51%	97.13%	96.84%	96.69%
Standard Deviation	0.1%	0.3%	0.2%	0.3%	0.5%	0.2%	0.3%	0.5%	0.2%	0.4%
Sockperf - Throughput (Messages/sec)	774467	757001	789092	594603	643361	627930	614978	585818	464981	464915
Normalized	98.15%	95.93%	100%	75.35%	81.53%	79.58%	77.93%	74.24%	58.93%	58.92%
Standard Deviation	1.5%	1.8%	2.5%	1.4%	3.3%	1.9%	1.7%	2.7%	2%	2.4%
Sockperf - Latency Ping Pong (usec)	3.60	3.38	3.51	4.23	4.03	4.01	4.21	4.16	3.88	3.96
Normalized	93.89%	100%	96.3%	79.91%	83.87%	84.29%	80.29%	81.25%	87.11%	85.35%
Standard Deviation	2.1%	2.1%	2.2%	1.5%	1.6%	1.1%	1.5%	1%	1.2%	1.3%
Sockperf - Latency Under Load (usec)	29.52	29.84	29.24	31.32	32.68	32.19	33.94	32.45	26.39	31.61
Normalized	89.4%	88.44%	90.25%	84.26%	80.75%	81.98%	77.75%	81.33%	100%	83.49%
Standard Deviation	32.3%	22.1%	27.4%	22.5%	19.4%	20.6%	5.8%	22%	40.4%	31.6%
NAS Parallel Benchmarks - EP.C (Mop/s)	654	654	653	615	621	627	622	626	626	628
Normalized	100%	100%	99.85%	94.04%	94.95%	95.87%	95.11%	95.72%	95.72%	96.02%
Standard Deviation	0.2%	0.2%	0.1%	0.2%	0.3%	0.2%	1.4%	0.2%	0.3%	0.1%

Core i9 7960X Linux 5.0 Kernel Benchmarks

NAS Parallel Benchmarks - FT.A (Mop/s)	6441	5404	5449	5172	5199	5311	5204	5256	5352	5181
Normalized	100%	83.9%	84.6%	80.3%	80.72%	82.46%	80.79%	81.6%	83.09%	80.44%
Standard Deviation	0%	0.7%	0.2%	0.4%	0.7%	0.3%	0.6%	0.2%	1.1%	0.2%
NAS Parallel Benchmarks - LU.C (Mop/s)	11085	11108	11091	9912	10344	10669	10657	10655	10655	10654
Normalized	99.79%	100%	99.85%	89.23%	93.12%	96.05%	95.94%	95.92%	95.92%	95.91%
Standard Deviation	0.1%	0.1%	0.2%	0.5%	1.1%	0%	0.1%	0.1%	0.1%	0.3%
NAS Parallel Benchmarks - SP.A (Mop/s)	452	452	452	433	434	435	433	434	434	434
Normalized	100%	100%	100%	95.8%	96.02%	96.24%	95.8%	96.02%	96.02%	96.02%
Standard Deviation	0.1%	0.1%	0%	0.2%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%
LeelaChessZero - BLAS (Nodes/s)	279	284	283	269	267	273	272	272	271	273
Normalized	98.24%	100%	99.65%	94.72%	94.01%	96.13%	95.77%	95.77%	95.42%	96.13%
Standard Deviation	0%	1.8%	0.9%	3.3%	1.1%	2%	1.8%	1%	1.4%	1%
Parboil - OpenMP LBM (sec)	70.80	71.31	71.37	71.08	71.10	71.05	71.06	70.83	70.78	70.74
Normalized	99.92%	99.2%	99.12%	99.52%	99.49%	99.56%	99.55%	99.87%	99.94%	100%
Standard Deviation	0.1%	1.1%	1.1%	0%	0%	0%	0%	0%	0.1%	0%
Parboil - OpenMP CUTCP (sec)	2.42	2.39	2.40	2.50	2.50	2.49	2.51	2.49	2.51	2.51
Normalized	98.76%	100%	99.58%	95.6%	95.6%	95.98%	95.22%	95.98%	95.22%	95.22%
Standard Deviation	1.2%	0.2%	0.5%	1%	0.4%	0.4%	0.3%	0.6%	0.5%	0.8%
Parboil - OpenMP Stencil (sec)	7.28	7.76	7.11	7.47	7.45	7.43	7.41	7.80	7.74	7.86
Normalized	97.66%	91.62%	100%	95.18%	95.44%	95.69%	95.95%	91.15%	91.86%	90.46%
Standard Deviation	1.6%	6.9%	1.6%	0.8%	0.4%	1.2%	0.9%	1.1%	2.9%	2.4%
Rodinia - OpenMP LavaMD (sec)	21.43	21.36	21.49	21.76	21.30	21.35	21.45	21.50	21.36	21.32
Normalized	99.39%	99.72%	99.12%	97.89%	100%	99.77%	99.3%	99.07%	99.72%	99.91%
Standard Deviation	3.1%	3.3%	3.3%	2.2%	0.2%	0.5%	0.4%	0.9%	0.2%	0.1%
Rodinia - OpenMP CFD Solver (sec)	12.28	12.29	12.22	12.40	12.33	12.29	12.31	12.33	12.28	12.24
Normalized	99.51%	99.43%	100%	98.55%	99.11%	99.43%	99.27%	99.11%	99.51%	99.84%
Standard Deviation	5.9%	5.7%	5.6%	0.9%	0.2%	0.3%	0.6%	0.1%	0.6%	0.4%
NAMD - ATPase Simulation - 327,506 Atoms	1.02607	1.06390	1.07717	1.06693	1.06728	1.06732	1.06739	1.06557	1.06267	1.06771
Normalized	100%	96.44%	95.26%	96.17%	96.14%	96.14%	96.13%	96.29%	96.56%	96.1%
Standard Deviation	0.3%	6.8%	7.3%	0%	0.1%	0.1%	0.2%	0.1%	0%	0.2%
Timed HMMer Search - P.D.S (sec)	4.42	4.21	4.41	4.42	4.46	4.32	4.35	4.32	4.33	4.28
Normalized	95.25%	100%	95.46%	95.25%	94.39%	97.45%	96.78%	97.45%	97.23%	98.36%
Standard Deviation	11.9%	0.9%	11.9%	1.6%	1.2%	1.3%	1.1%	1.1%	1.9%	1.5%

Core i9 7960X Linux 5.0 Kernel Benchmarks

Timed MAFFT Alignment - M.S.A (sec)	2.11	**2.07**	**2.37**	2.20	2.20	2.17	2.21	2.29	2.22	2.21
Normalized	98.1%	100%	87.34%	94.09%	94.09%	95.39%	93.67%	90.39%	93.24%	93.67%
Standard Deviation	3.5%	0.2%	22.7%	0.5%	0.8%	0.4%	3.5%	7.6%	4.4%	0.2%
DaCapo Benchmark - H2	3028	**2901**	2946	3011	3054	3090	3008	3069	2982	**3136**
Normalized	95.81%	100%	98.47%	96.35%	94.99%	93.88%	96.44%	94.53%	97.28%	92.51%
Standard Deviation	11.8%	2.6%	2%	2.6%	2.9%	4.3%	1.7%	2.5%	1.6%	3.1%
DaCapo Benchmark -	**3257**	3435	3270	3427	3427	3451	**3458**	3441	3422	3449
Normalized	100%	94.82%	99.6%	95.04%	95.04%	94.38%	94.19%	94.65%	95.18%	94.43%
Standard Deviation	0.5%	13.9%	1%	0.7%	1%	1.5%	0.9%	0.9%	0.8%	0.8%
DaCapo Benchmark -	**3103**	3170	**3375**	3232	3270	3272	3282	3217	3222	3235
Normalized	100%	97.89%	91.94%	96.01%	94.89%	94.83%	94.55%	96.46%	96.31%	95.92%
Standard Deviation	11.1%	10.4%	16.2%	1.3%	2.1%	2.1%	1.3%	1.9%	3.1%	3.4%
DaCapo Benchmark -	2986	2852	**2836**	3004	3006	3040	3035	3065	**3085**	3068
Normalized	94.98%	99.44%	100%	94.41%	94.34%	93.29%	93.44%	92.53%	91.93%	92.44%
Standard Deviation	18.4%	1.3%	1.3%	1.2%	1.1%	1.8%	2.5%	1.2%	1.9%	0.3%
LuaJIT - Composite (Mflops)	1568	**1612**	**1517**	1544	1529	1593	1591	1592	1592	1593
Normalized	97.27%	100%	94.11%	95.78%	94.85%	98.82%	98.7%	98.76%	98.76%	98.82%
Standard Deviation	0.8%	1.9%	1.6%	0.3%	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%
Node.js Express HTTP Load Test (Reqs/sec)	11545	11599	**11761**	10657	10498	10545	10624	10443	**10312**	10361
Normalized	98.16%	98.62%	100%	90.61%	89.26%	89.66%	90.33%	88.79%	87.68%	88.1%
Standard Deviation	0.6%	1.1%	1.3%	1.5%	0.9%	1.3%		0.6%	0.9%	0.5%
TTSIOD 3D Renderer - P.R.W.S.S.M (FPS)	**672**	663	660	661	660	661	660	660	661	**658**
Normalized	100%	98.66%	98.21%	98.36%	98.21%	98.36%	98.21%	98.21%	98.36%	97.92%
Standard Deviation	4.6%	4.5%	4.5%	0.1%	0.4%	0.5%	0.7%	0.4%	0.1%	0.2%
SVT-HEVC - 1.8.b.Y.T.H.V.E (FPS)	299	306	**307**	296	**294**	295	296	296	295	295
Normalized	97.39%	99.67%	100%	96.42%	95.77%	96.09%	96.42%	96.42%	96.09%	96.09%
Standard Deviation	12.8%	1.9%	2.2%	1.9%	2%	1.4%	1.6%	2.1%	2.2%	1.9%
SVT-VP9 - 1.8.b.Y.T.V.V.E (FPS)	**317**	**295**	313	298	299	300	297	299	299	299
Normalized	100%	93.06%	98.74%	94.01%	94.32%	94.64%	93.69%	94.32%	94.32%	94.32%
Standard Deviation	3.4%	17.4%	3.4%	3.4%	3.2%	3.3%	3.4%	3.2%	3%	3.2%
x264 - H.2.V.E (FPS)	137	137	**138**	**132**	**132**	133	133	133	134	135
Normalized	99.28%	99.28%	100%	95.65%	95.65%	96.38%	96.38%	96.38%	97.1%	97.83%
Standard Deviation	4%	3.9%	3.7%	3.2%	3.4%	2.2%	1.5%	3.4%	1.1%	0.1%
x265 - H.2.1.V.E (FPS)	51.49	50.90	50.84	**50.81**	51.04	51.15	51.31	51.33	51.23	**51.51**
Normalized	99.96%	98.82%	98.7%	98.64%	99.09%	99.3%	99.61%	99.65%	99.46%	100%
Standard Deviation	5.5%	5.9%	5.7%	0.1%	0.5%	0.6%	0.3%	0.1%	0.2%	0.7%

Core i9 7960X Linux 5.0 Kernel Benchmarks

Himeno Benchmark - P.P.S (MFLOPS)	2859	2869	2822	2943	2924	3056	3043	3054	3043	3041
Normalized	93.55%	93.88%	92.34%	96.3%	95.68%	100%	99.57%	99.93%	99.57%	99.51%
Standard Deviation	0.5%	1.9%	1%	0.2%	1.3%	0.1%	0.2%	0.4%	0.6%	0.4%
ebizzy (Records/s)	457858	478703	469816	470012	489375	458116	492589	479383	482232	478733
Normalized	92.95%	97.18%	95.38%	95.42%	99.35%	93%	100%	97.32%	97.9%	97.19%
Standard Deviation	9%	7.3%	7.1%	5.4%	3.4%	0.7%	1.6%	2.4%	7.7%	2.3%
Timed Linux Kernel Compilation - Time To Compile (sec)	43.41	43.95	44.17	45.05	44.66	44.83	44.94	44.91	44.80	45.27
Normalized	100%	98.77%	98.28%	96.36%	97.2%	96.83%	96.6%	96.66%	96.9%	95.89%
Standard Deviation	3.6%	3.3%	3.3%	3.3%	3%	3.2%	2.6%	3%	3.1%	3.2%
Timed LLVM Compilation - Time To Compile (sec)	246	236	233	248	240	247	249	251	252	250
Normalized	94.72%	98.73%	100%	93.95%	97.08%	94.33%	93.57%	92.83%	92.46%	93.2%
Rust Mandelbrot - T.T.C.S.P.M (sec)	46.20	46.66	47.14	45.84	45.74	44.08	44.14	44.15	44.27	44.12
Normalized	95.41%	94.47%	93.51%	96.16%	96.37%	100%	99.86%	99.84%	99.57%	99.91%
Standard Deviation	3.2%	1.3%	2.1%	0.2%	0%	0%	0.1%	0%	0.4%	0%
Rust Prime Benchmark - P.N.T.T.2.0.0 (sec)	6.64	6.75	6.64	6.69	6.68	6.68	6.69	6.69	6.69	6.69
Normalized	100%	98.37%	100%	99.25%	99.4%	99.4%	99.25%	99.25%	99.25%	99.25%
Standard Deviation	7.9%	9%	7.9%	0.1%	0%	0%	0%	0.2%	0%	0.1%
Node.js Octane Benchmark (Score)	41724	45257	39198	43277	44320	45868	45929	45808	46166	45881
Normalized	90.38%	98.03%	84.91%	93.74%	96%	99.35%	99.49%	99.22%	100%	99.38%
Standard Deviation	9.7%	3.1%	11.5%	3.2%	0.4%	0.5%	0.5%	0.5%	0.5%	0.4%
XZ Compression - C.u.1.0.3.s.i.i.C.L.9 (sec)	85.07	86.30	86.20	85.18	84.58	85.50	84.98	85.51	85.55	85.27
Normalized	99.42%	98.01%	98.12%	99.3%	100%	98.92%	99.53%	98.91%	98.87%	99.19%
Standard Deviation	0.6%	0.9%	1.6%	0.5%	0.5%	0.1%	0.8%	0.5%	0.1%	0.3%
Zstd Compression - C.u.1.0.3.s.i.i.C.L.1 (sec)	10.45	10.56	10.47	10.59	10.53	10.57	10.53	10.58	10.60	10.61
Normalized	100%	98.96%	99.81%	98.68%	99.24%	98.86%	99.24%	98.77%	98.58%	98.49%
Standard Deviation	5.8%	6.5%	5.6%	0.4%	0.6%	0.3%	0.8%	0.4%	0.5%	0.3%
dav1d - Summer Nature 4K (sec)	21.97	21.46	21.97	21.84	21.89	21.74	21.72	21.72	21.77	21.77
Normalized	97.68%	100%	97.68%	98.26%	98.04%	98.71%	98.8%	98.8%	98.58%	98.58%
Standard Deviation	3.4%	3.4%	3.1%	0.2%	0.4%	0.6%	0.4%	0.6%	0.6%	0.6%
dav1d - S.N.1 (sec)	7.67	7.65	7.68	7.68	7.70	7.64	7.65	7.66	7.66	7.65
Normalized	99.61%	99.87%	99.48%	99.48%	99.22%	100%	99.87%	99.74%	99.74%	99.87%
Standard Deviation	8.1%	8.2%	8.2%	1.1%	0.8%	0.9%	0.8%	1%	1.1%	0.9%
Hackbench - 32 - Process (sec)	33.91	33.40	33.55	45.78	46.37	49.06	49.07	48.21	48.03	47.28
Normalized	98.5%	100%	99.55%	72.96%	72.03%	68.08%	68.07%	69.28%	69.54%	70.64%
Standard Deviation	0.3%	2.7%	0.3%	0.1%	0.3%	2.4%	2.8%	0.3%	2.7%	0.1%

Core i9 7960X Linux 5.0 Kernel Benchmarks

OpenSSL - R.4.b.P (Signs/sec)	4597	4609	4602	4424	4417	4401	4408	4413	4419	4404
Normalized	99.74%	100%	99.85%	95.99%	95.83%	95.49%	95.64%	95.75%	95.88%	95.55%
Standard Deviation	0%	0.1%	0.1%	0%	0.3%	0.2%	0.2%	0.1%	0.2%	0.3%
Cryptsetup - PBKDF2-sha512 (Iterations/sec)	1609799	1581770	1578102	1587255	1593588	1679542	1686718	1668836	1681349	1677741
Normalized	95.44%	93.78%	93.56%	94.1%	94.48%	99.57%	100%	98.94%	99.68%	99.47%
Standard Deviation	4.5%	6.5%	6.4%	1%	0.3%	0.5%	0.1%	0.4%	0.6%	0.4%
Cryptsetup - PBKDF2-whirlpool (Iterations/sec)	951646	957561	965007	938463	952595	983045	983042	984270	982426	983042
Normalized	96.69%	97.29%	98.04%	95.35%	96.78%	99.88%	99.88%	100%	99.81%	99.88%
Standard Deviation	3.3%	3.6%	3.5%	0.1%	2.8%	0.3%	0.2%	0.1%	0.1%	0.2%
PostgreSQL pgbench - Buffer Test - Normal Load - Read Only (TPS)	513316	527596	514126	483791	481499	481641	486733	484720	476537	471254
Normalized	97.29%	100%	97.45%	91.7%	91.26%	91.29%	92.25%	91.87%	90.32%	89.32%
Standard Deviation	0.5%	0.8%	0.4%	0.3%	0.7%	0.3%	0.7%	0.4%	1.6%	1.6%
Darktable - Boat - CPU-only (sec)	8.18	7.76	8.20	8.08	8.07	8.07	8.05	8.05	8.05	8.05
Normalized	94.87%	100%	94.63%	96.04%	96.16%	96.16%	96.4%	96.4%	96.4%	96.4%
Standard Deviation	7.4%	0.1%	8.2%	0.1%	0.1%	0.2%	0.3%	0.2%	0.2%	0.1%
Darktable - Masskrug - CPU-only (sec)	4.14	4.13	3.93	4.11	4.11	4.03	4.02	4.03	4.01	4.03
Normalized	94.93%	95.16%	100%	95.62%	95.62%	97.52%	97.76%	97.52%	98%	97.52%
Standard Deviation	12.4%	13.1%	1%	0.2%	0.3%	0.4%	0.3%	0.7%	0.5%	1%
Darktable - Server Rack - CPU-only (sec)	0.11	0.12	0.11	0.12	0.12	0.12	0.13	0.12	0.13	0.12
Normalized	100%	91.67%	100%	91.67%	91.67%	91.67%	84.62%	91.67%	84.62%	91.67%
Standard Deviation	0.5%	1%	0.5%	1.3%	0.5%	3.9%	7.1%	2%	5%	0.5%
Darktable - Server Room - CPU-only (sec)	2.73	2.54	2.54	2.64	2.64	2.64	2.62	2.63	2.63	2.63
Normalized	93.04%	100%	100%	96.21%	96.21%	96.21%	96.95%	96.58%	96.58%	96.58%
Standard Deviation	19.3%	0.2%	0.3%	0.2%	0.2%	0.3%	0.7%	0.3%	0.5%	0.2%
GIMP - resize (sec)	9.00	9.04	9.00	9.47	9.50	9.18	9.25	9.21	9.12	9.20
Normalized	100%	99.56%	100%	95.04%	94.74%	98.04%	97.3%	97.72%	98.68%	97.83%
Standard Deviation	6.6%	6.8%	6.9%	0.7%	1.6%	1.2%	1.7%	1.1%	1.1%	2%
GIMP - rotate (sec)	12.55	12.98	13.06	13.64	13.60	13.60	13.61	13.62	13.57	13.62
Normalized	100%	96.69%	96.09%	92.01%	92.28%	92.28%	92.21%	92.14%	92.48%	92.14%
Standard Deviation	0.2%	4.7%	5.1%	0.2%	0.3%	0.4%	0.1%	0.3%	0.2%	0.1%
GIMP - auto-levels (sec)	14.78	14.90	14.98	15.59	15.60	15.07	15.12	15.13	15.05	15.20
Normalized	100%	99.19%	98.66%	94.8%	94.74%	98.08%	97.75%	97.69%	98.21%	97.24%
Standard Deviation	4.7%	4.7%	4.7%	0.1%	0.1%	0.1%	0.2%	0.5%	0.3%	1%
GIMP - unsharp-mask (sec)	18.81	18.89	18.77	19.70	19.73	18.92	18.96	19.13	18.92	18.96
Normalized	99.79%	99.36%	100%	95.28%	95.13%	99.21%	99%	98.12%	99.21%	99%
Standard Deviation	3.7%	3.7%	3.8%	0.2%	0.3%	0.5%	0.2%	0.3%	0.1%	0.1%

Core i9 7960X Linux 5.0 Kernel Benchmarks

GNU Octave Benchmark (sec)	**12.28**	16.77	17.04	17.84	**17.94**	17.51	17.51	17.81	17.55	17.41
Normalized	100%	73.23%	72.07%	68.83%	68.45%	70.13%	70.13%	68.95%	69.97%	70.53%
Standard Deviation	5.5%	4.4%	4.4%	1%	0.4%	0.3%	0.1%	0.2%	0.5%	0.3%
Stress-NG - Forking (Bogo Ops/s)	96634	**103143**	96693	92400	91597	91170	**90244**	97350	93872	92840
Normalized	93.69%	100%	93.75%	89.58%	88.81%	88.39%	87.49%	94.38%	91.01%	90.01%
Standard Deviation	0.3%	0.3%	1.5%	1%	1.2%	0.7%	1.7%	0.4%	0.5%	0.4%
Stress-NG - Semaphores (Bogo Ops/s)	**3544177**	3021911	3149801	3170972	3125260	3029755	3124404	3124139	**2965774**	3116617
Normalized	100%	85.26%	88.87%	89.47%	88.18%	85.49%	88.16%	88.15%	83.68%	87.94%
Standard Deviation	1.6%	1.9%	1.2%	0.3%	0.3%	2.4%	2.5%	1.7%	1.7%	1.8%
Stress-NG - Socket Activity (Bogo	**16352**	15660	14206	**10375**	10957	10984	10849	10545	15252	15636
Normalized	100%	95.77%	86.88%	63.45%	67.01%	67.17%	66.35%	64.49%	93.27%	95.62%
Standard Deviation	5.4%	2.5%	3.3%	2.3%	2.3%	2.2%	2.8%	1.7%	10.3%	8%
Stress-NG - Context Switching (Bogo Ops/s)	**2313307**	1504818 6	9280054	1370403 8	1362400 4	1510955 0	1514364 5	1552505 8	1901069 9	**1927273 3**
Normalized	12%	78.08%	48.15%	71.11%	70.69%	78.4%	78.58%	80.55%	98.64%	100%
Standard Deviation	0.6%	23%	14.4%	1.8%	1.6%	0.9%	0.5%	0.8%	0.3%	0.2%
Stress-NG - S.V.M.P (Bogo Ops/s)	8222695	**1461829 2**	9809250	8120291	1005583 6	7989215	8224598	8250516	8158439	**7796583**
Normalized	56.25%	100%	67.1%	55.55%	68.79%	54.65%	56.26%	56.44%	55.81%	53.33%
Standard Deviation	0.2%	0.3%	0.4%	0.3%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
ctx_clock - C.S.T (Clocks)	**107**	119	115	449	**459**	418	422	422	407	403
Normalized	100%	89.92%	93.04%	23.83%	23.31%	25.6%	25.36%	25.36%	26.29%	26.55%
Standard Deviation	3.4%	3.4%	1.7%	0.3%	0.3%				0.2%	
Optcarrot - O.B (FPS)	135	134	136	**129**	131	137	**138**	136	137	136
Normalized	97.83%	97.1%	98.55%	93.48%	94.93%	99.28%	100%	98.55%	99.28%	98.55%
Standard Deviation	4.4%	2.2%	0.4%	1.4%	0.4%	0.2%	0.5%	0.8%	0.9%	1.7%
IndigoBench - Bedroom (M samples/s)	**2.33**	2.31	2.31	2.31	2.31	**2.30**	**2.30**	**2.30**	**2.30**	**2.30**
Normalized	100%	99.14%	99.14%	99.14%	99.14%	98.71%	98.71%	98.71%	98.71%	98.71%
Standard Deviation	0.1%	1.3%	1.3%	0.1%	0.2%	0.2%	0.1%	0%	0%	0.1%
IndigoBench - Supercar (M samples/s)	**5.72**	**5.45**	**5.45**	5.50	5.50	5.50	5.49	5.50	5.48	5.51
Normalized	100%	95.28%	95.28%	96.15%	96.15%	96.15%	95.98%	96.15%	95.8%	96.33%
Standard Deviation	0.4%	0.2%	0.1%	0.1%	0.2%	0.1%	0.1%	0.3%	0.3%	0.1%
Blender - BMW27 - CPU-Only (sec)	**119**	**124**	123	123	123	123	123	123	123	123
Normalized	100%	95.97%	96.75%	96.75%	96.75%	96.75%	96.75%	96.75%	96.75%	96.75%
Blender - Barbershop - CPU-Only (sec)	**577**	578	578	**579**	578	578	578	578	578	578
Normalized	100%	99.83%	99.83%	99.65%	99.83%	99.83%	99.83%	99.83%	99.83%	99.83%

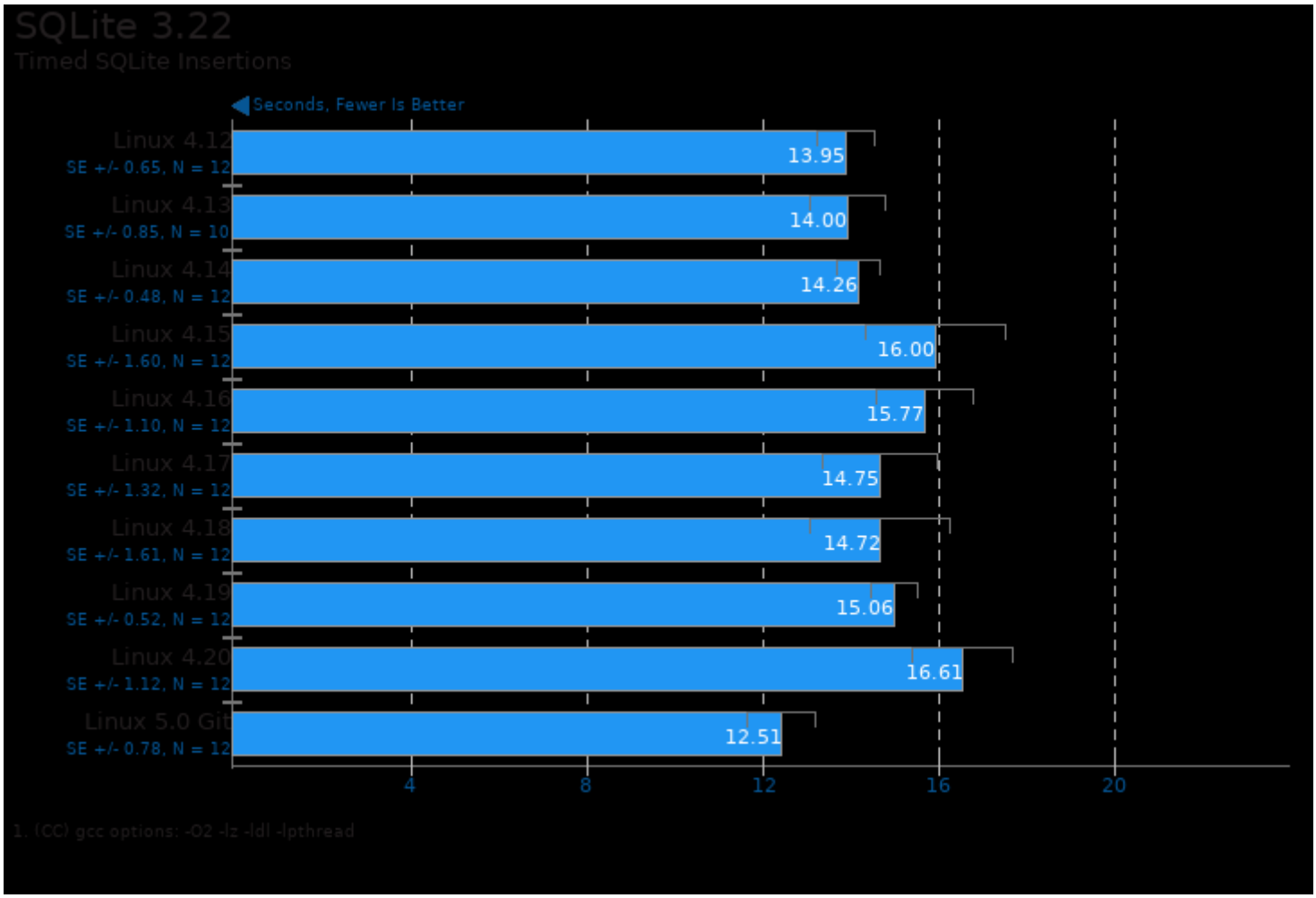
Core i9 7960X Linux 5.0 Kernel Benchmarks

PyBench - T.F.A.T.T (Milliseconds)	953	960	955	**998**	997	952	955	949	950	**947**
Normalized	99.37%	98.65%	99.16%	94.89%	94.98%	99.47%	99.16%	99.79%	99.68%	100%
Standard Deviation	0.4%	0.3%	0.4%	0.5%	0.4%	0.5%	0.3%	0.3%	0.3%	0.7%
PHPBench - P.B.S (Score)	687767	657535	**648147**	668188	673483	703272	702188	**705017**	702192	703748
Normalized	97.55%	93.27%	91.93%	94.78%	95.53%	99.75%	99.6%	100%	99.6%	99.82%
Standard Deviation	1.7%	8.2%	7.9%	1.4%	0.4%	0.2%	0%	0.2%	0.8%	0.1%
Tesseract OCR - T.T.O.7.I (sec)	26.89	26.73	**27.42**	26.75	26.77	26.35	26.37	26.34	**26.31**	26.59
Normalized	97.84%	98.43%	95.95%	98.36%	98.28%	99.85%	99.77%	99.89%	100%	98.95%
Standard Deviation	0.7%	3.3%	1.6%	0.3%	0.3%	0.1%	0.3%	0.3%	0.2%	1.4%
BRL-CAD - V.P.M (VGR Performance Metric)	**197740**	195417	195636	190789	189766	191202	189662	**189338**	189860	191503
Normalized	100%	98.83%	98.94%	96.48%	95.97%	96.69%	95.91%	95.75%	96.01%	96.85%
OSBench - Create Files (us/Event)	10.80	10.44	**10.42**	**12.72**	12.52	12.32	12.28	12.33	12.23	12.35
Normalized	96.48%	99.81%	100%	81.92%	83.23%	84.58%	84.85%	84.51%	85.2%	84.37%
Standard Deviation	2.8%	0.7%	2.1%	0.5%	2.2%	0.4%	0.6%	0.2%	0.3%	0.8%
OSBench - Create Threads (us/Event)	10.48	**9.87**	11.33	15.27	15.04	16.22	**16.25**	13.36	13.49	13.40
Normalized	94.18%	100%	87.11%	64.64%	65.63%	60.85%	60.74%	73.88%	73.17%	73.66%
Standard Deviation	9.9%	1.1%	0.7%	2.7%	0.6%	2.5%	2.6%	0.4%	0.4%	0.8%
OSBench - Launch Programs	29.02	**28.69**	29.65	32.57	34.30	35.23	35.48	34.26	34.96	**35.55**
Normalized	98.86%	100%	96.76%	88.09%	83.64%	81.44%	80.86%	83.74%	82.07%	80.7%
Standard Deviation	1%	0.6%	0.8%	1.9%	3.3%	0.8%	0.8%	0.7%	0.4%	0.8%
OSBench - Create Processes (us/Event)	**22.57**	23.05	23.57	28.79	28.98	29.16	29.09	29.19	**29.48**	29.31
Normalized	100%	97.92%	95.76%	78.4%	77.88%	77.4%	77.59%	77.32%	76.56%	77%
Standard Deviation	2.2%	2.3%	3%	1.4%	3.4%	0.8%	0.5%	3.9%	1.4%	1.7%
OSBench - Memory Allocations (Ns/Event)	67.08	**65.82**	65.97	72.14	**72.69**	71.63	71.53	72.08	71.62	71.79
Normalized	98.12%	100%	99.77%	91.24%	90.55%	91.89%	92.02%	91.32%	91.9%	91.68%
Standard Deviation	3.4%	0.3%	0.5%	0.2%	0.5%	0.5%	0.1%	0.2%	0.1%	0.1%
Schbench - 8 - 4 (usec, 99.9th Latency Percentile)	101	101	**100**	105	104	106	107	108	108	**110**
Normalized	99.01%	99.01%	100%	95.24%	96.15%	94.34%	93.46%	92.59%	92.59%	90.91%
Standard Deviation	3.3%		4%	2%	1.9%		0.5%	1.1%	1.9%	3.5%
Systemd Total Boot Time - Kernel (ms)	**7554**	5053	2711	2433	**2298**	5780	5340	5615	5330	5278
Normalized	30.42%	45.48%	84.77%	94.45%	100%	39.76%	43.03%	40.93%	43.11%	43.54%
Systemd Total Boot Time - Firmware (ms)	26400	26452	26416	**26636**	26383	26395	26454	26384	**26381**	26407
Normalized	99.93%	99.73%	99.87%	99.04%	99.99%	99.95%	99.72%	99.99%	100%	99.9%

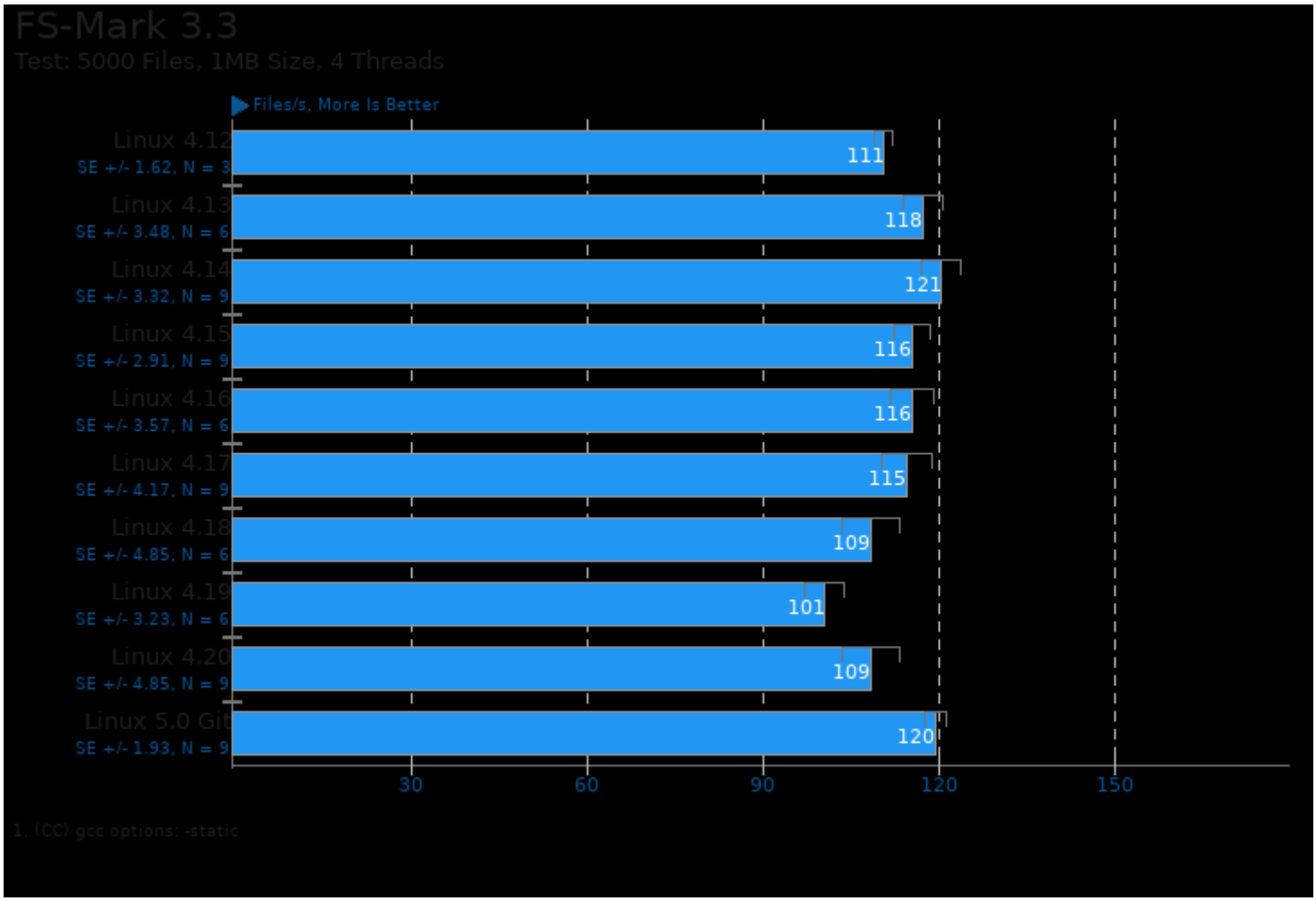
Core i9 7960X Linux 5.0 Kernel Benchmarks

Cryptsetup - PBKDF2-whirlpool (Iterations/sec)	960188	**930854**	936410	939024	937905	981821	**984270**	979372	982426
Normalized	97.55%	94.57%	95.14%	95.4%	95.29%	99.75%	100%	99.5%	99.81%
Standard Deviation	2.7%	6.1%	5.9%	0.1%	0.2%	0.4%	0.1%	0.3%	0.1%

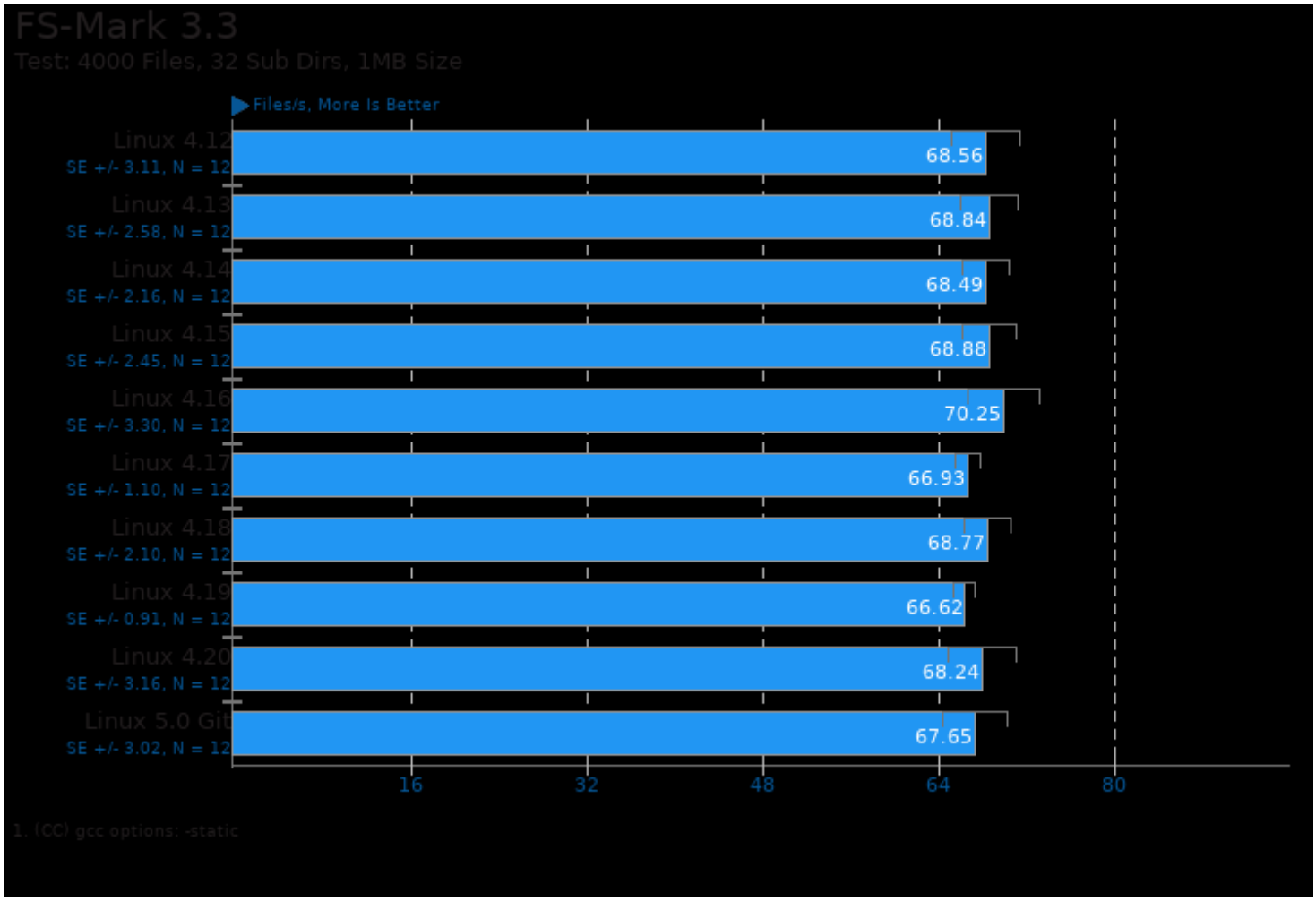
Core i9 7960X Linux 5.0 Kernel Benchmarks



Core i9 7960X Linux 5.0 Kernel Benchmarks



Core i9 7960X Linux 5.0 Kernel Benchmarks



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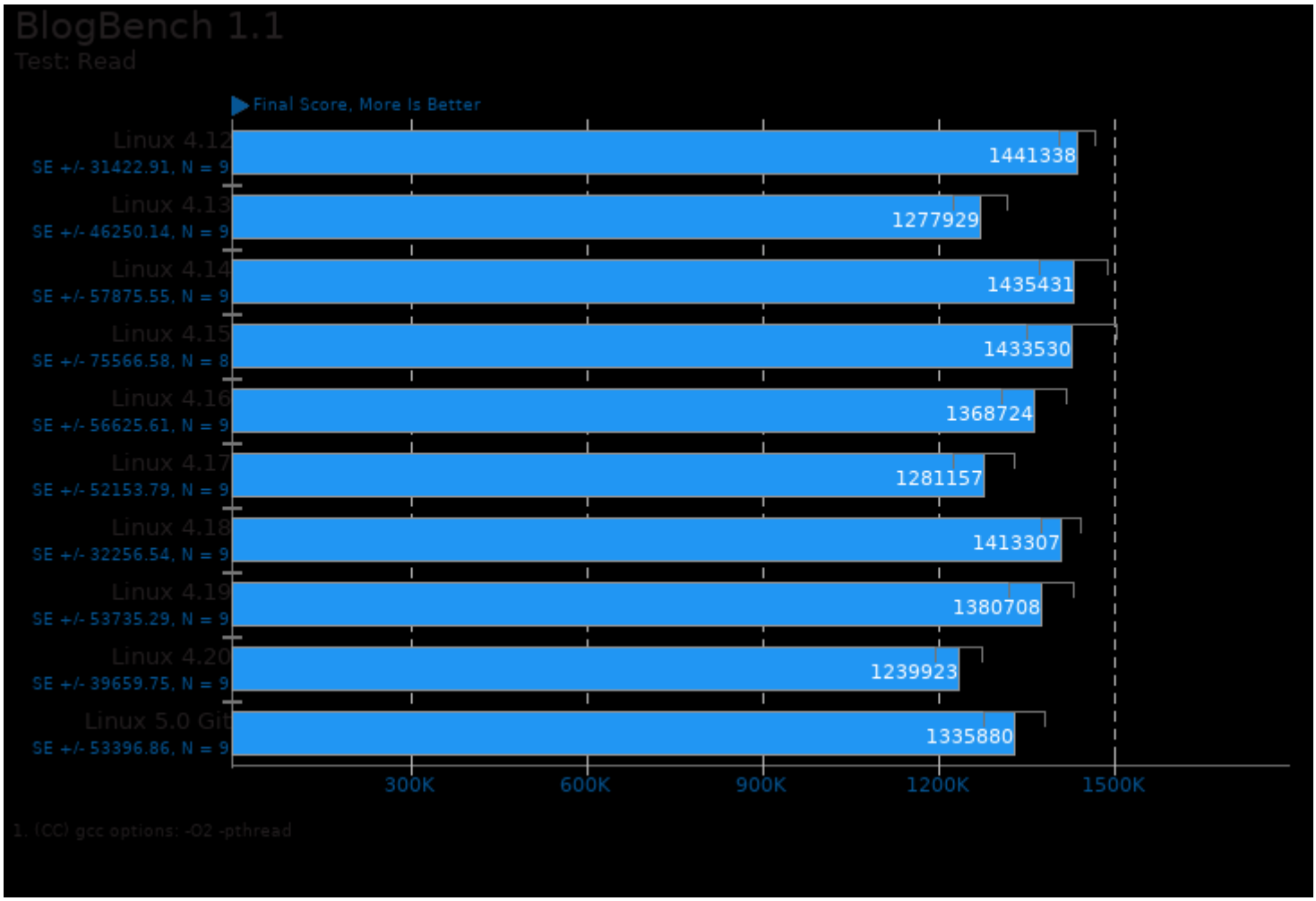

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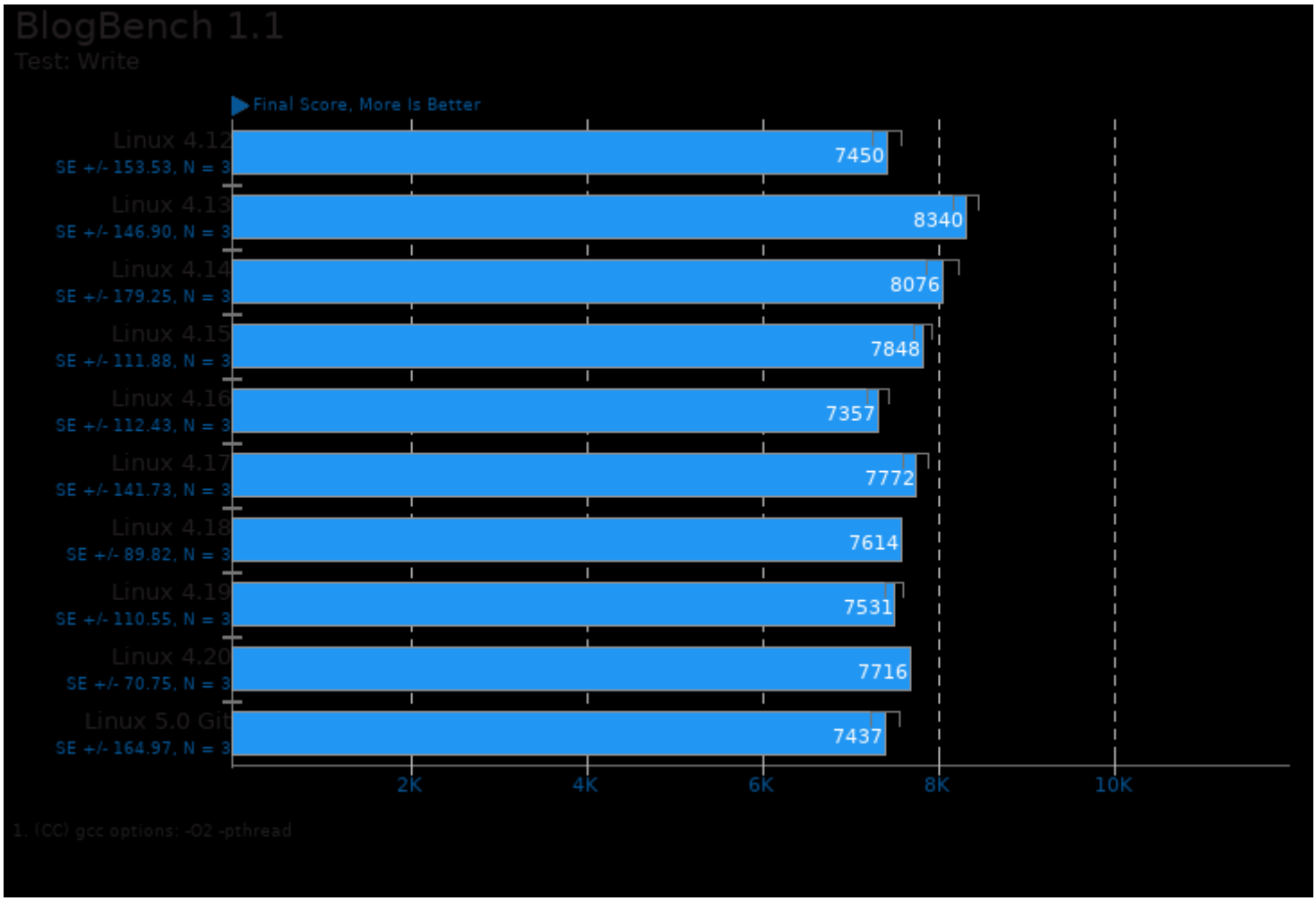

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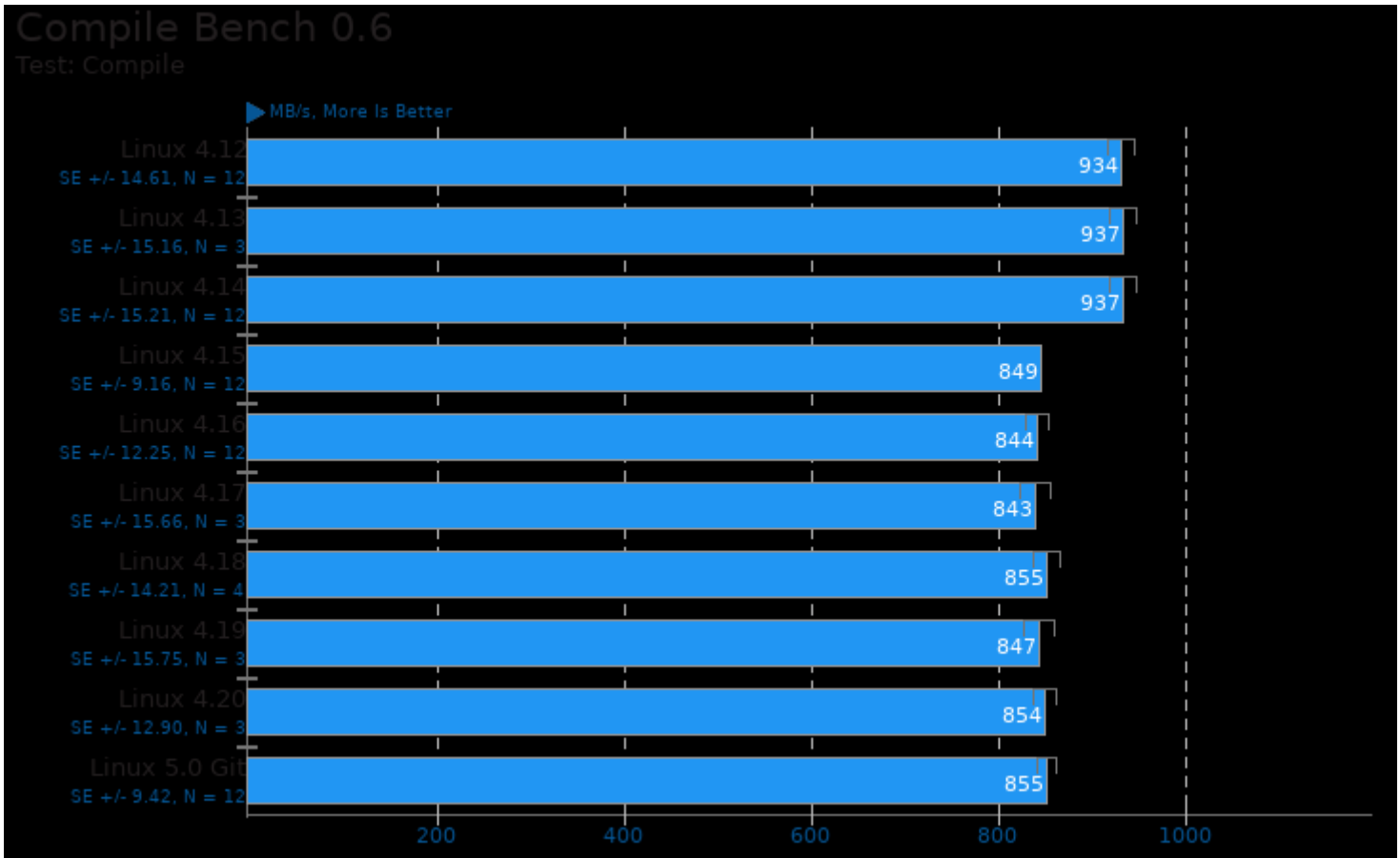

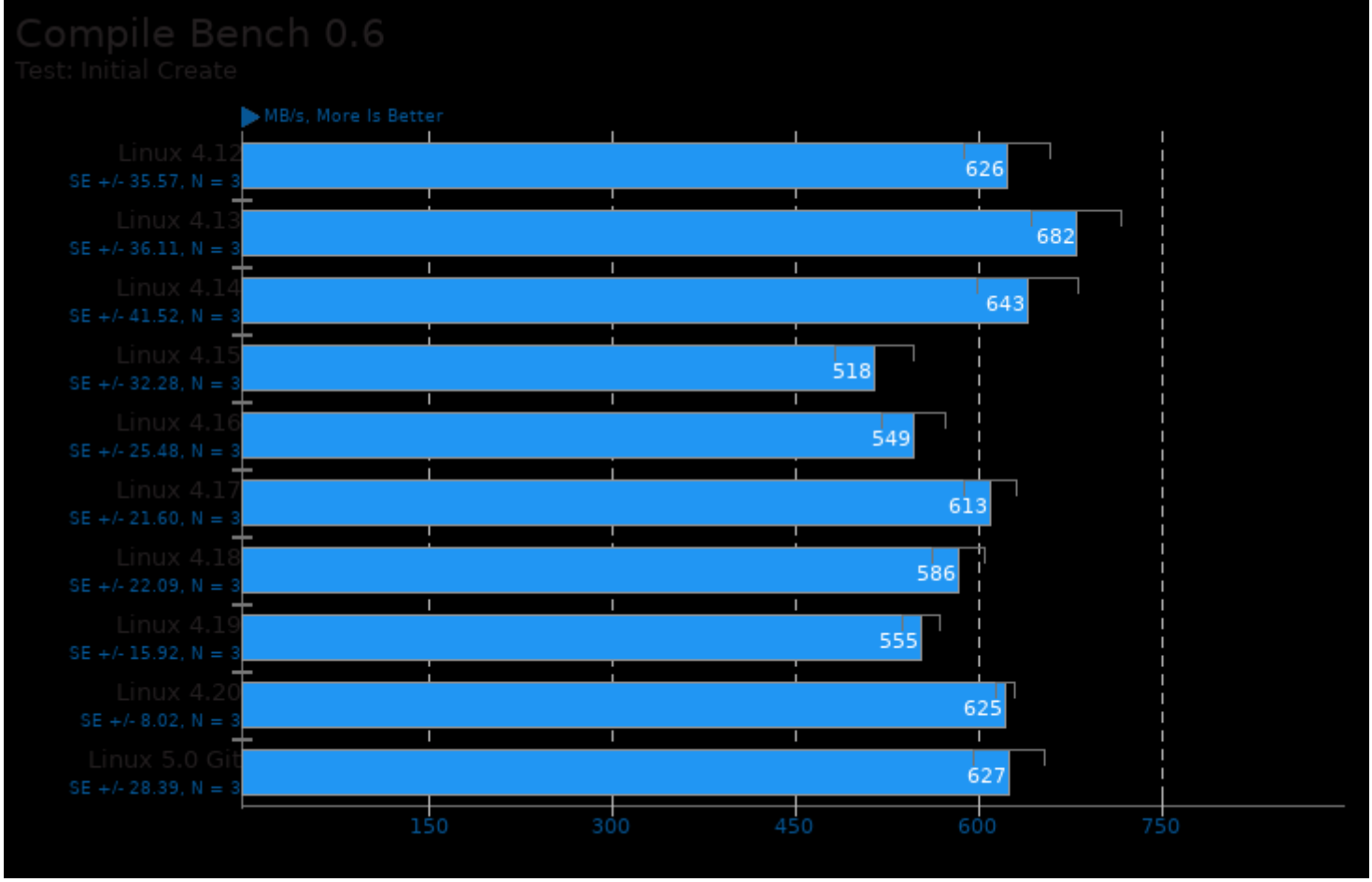

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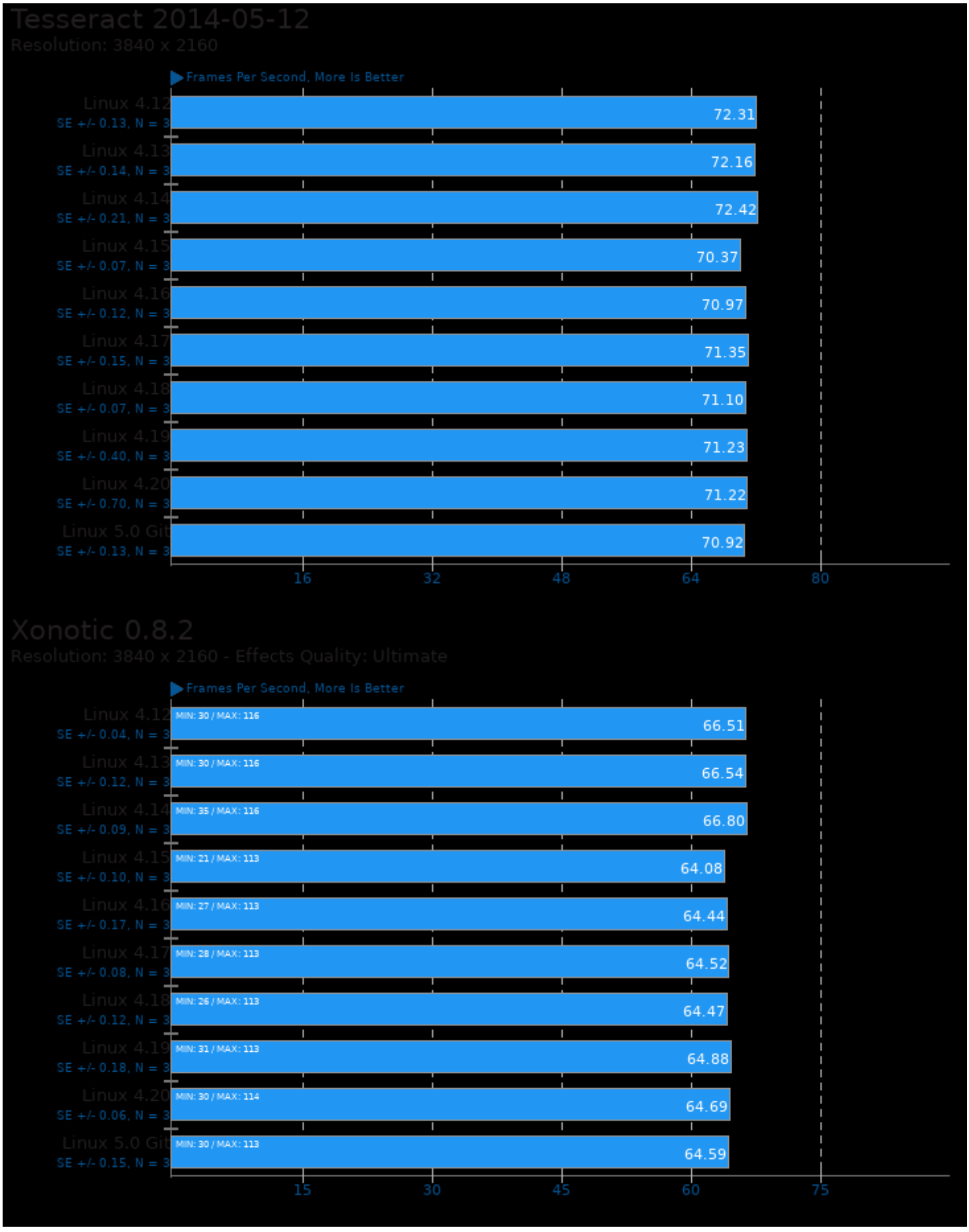

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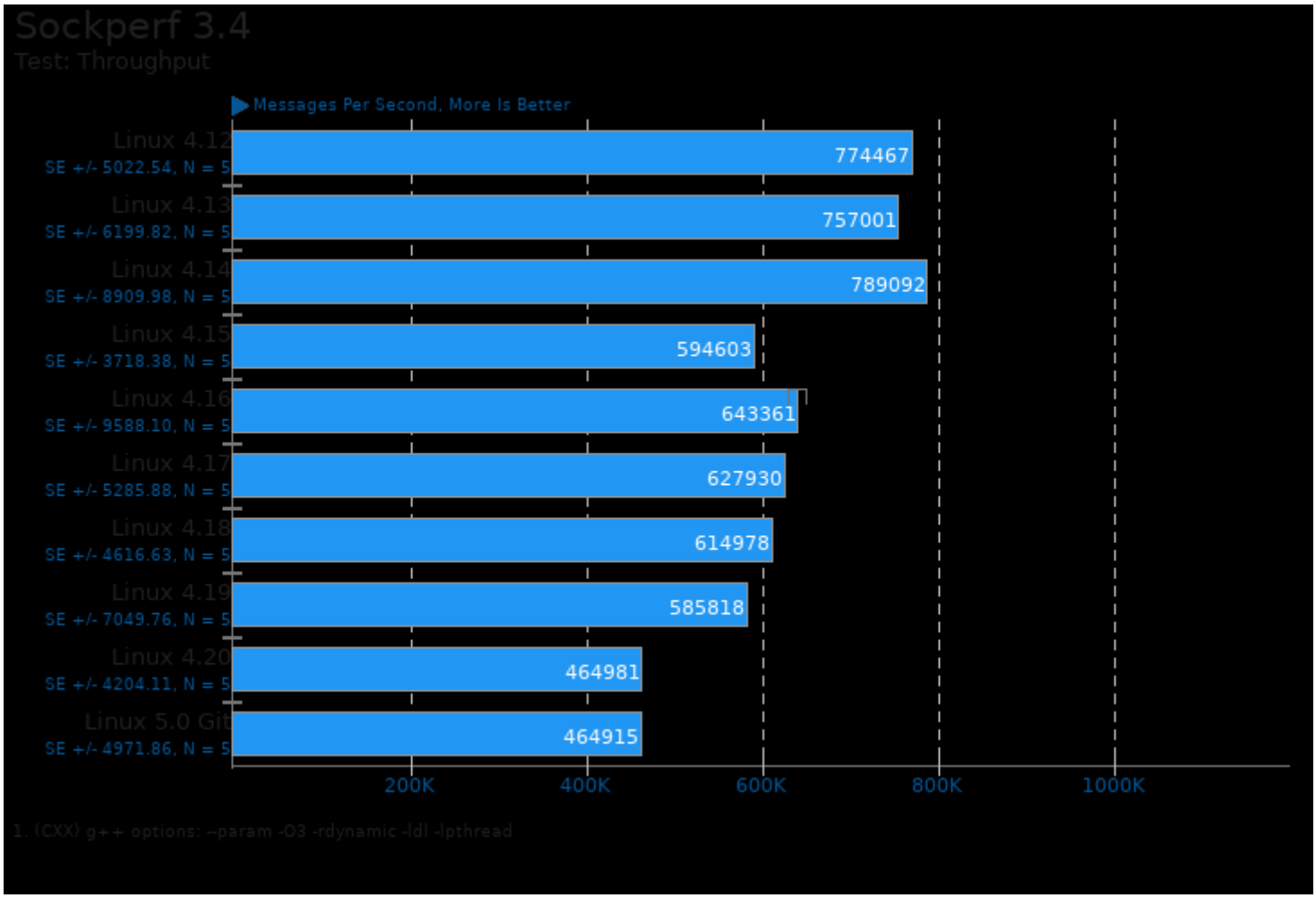

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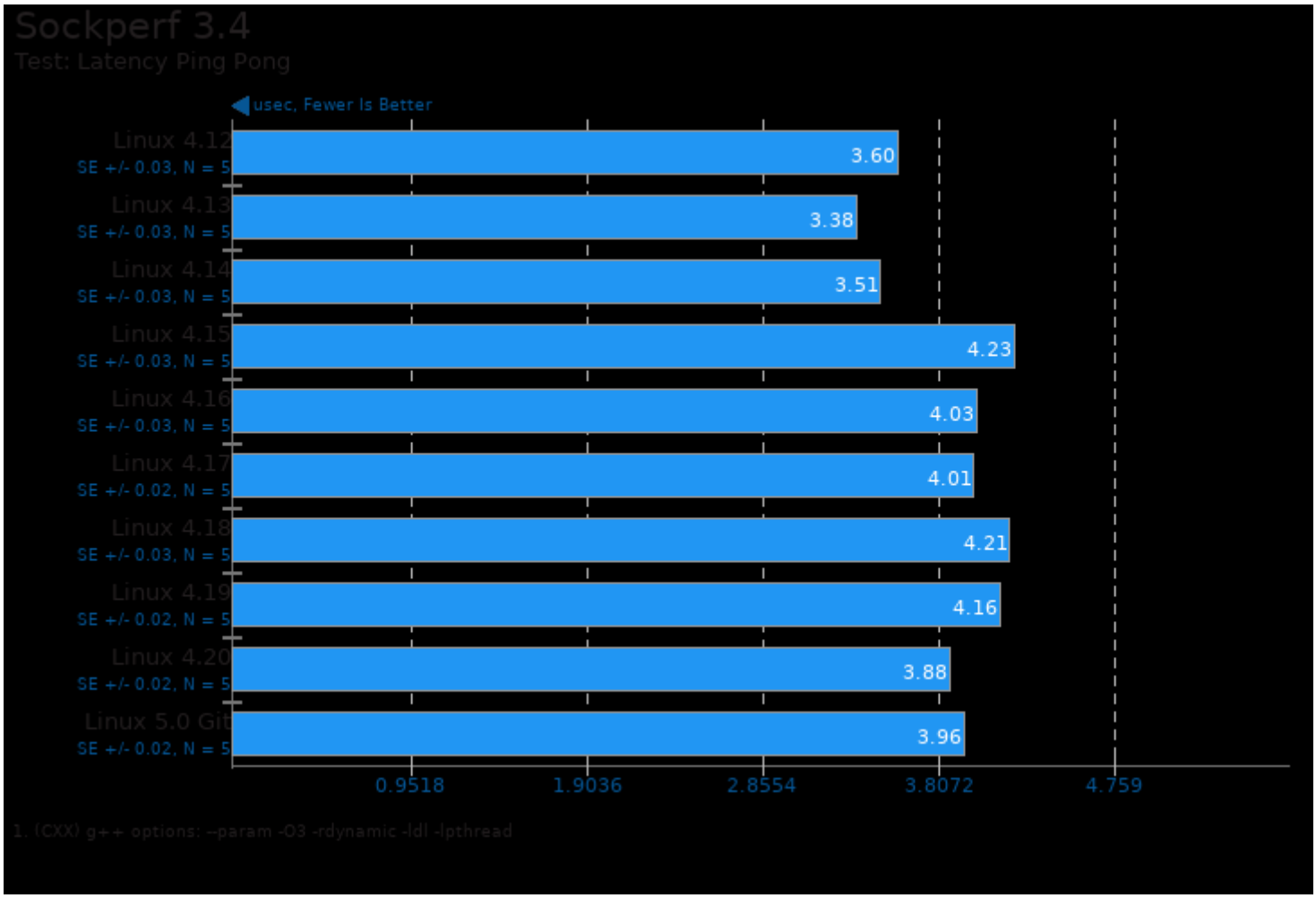

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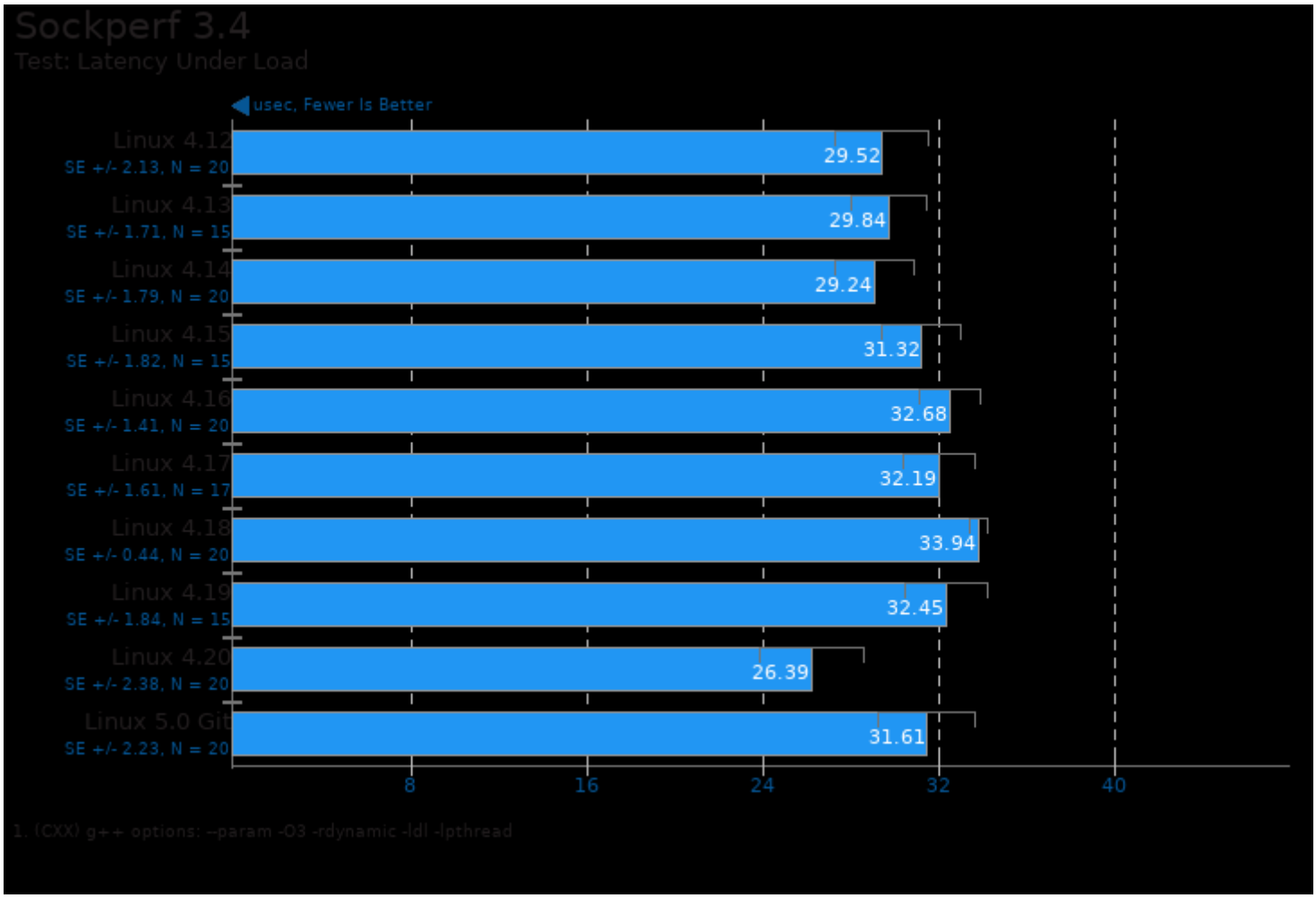

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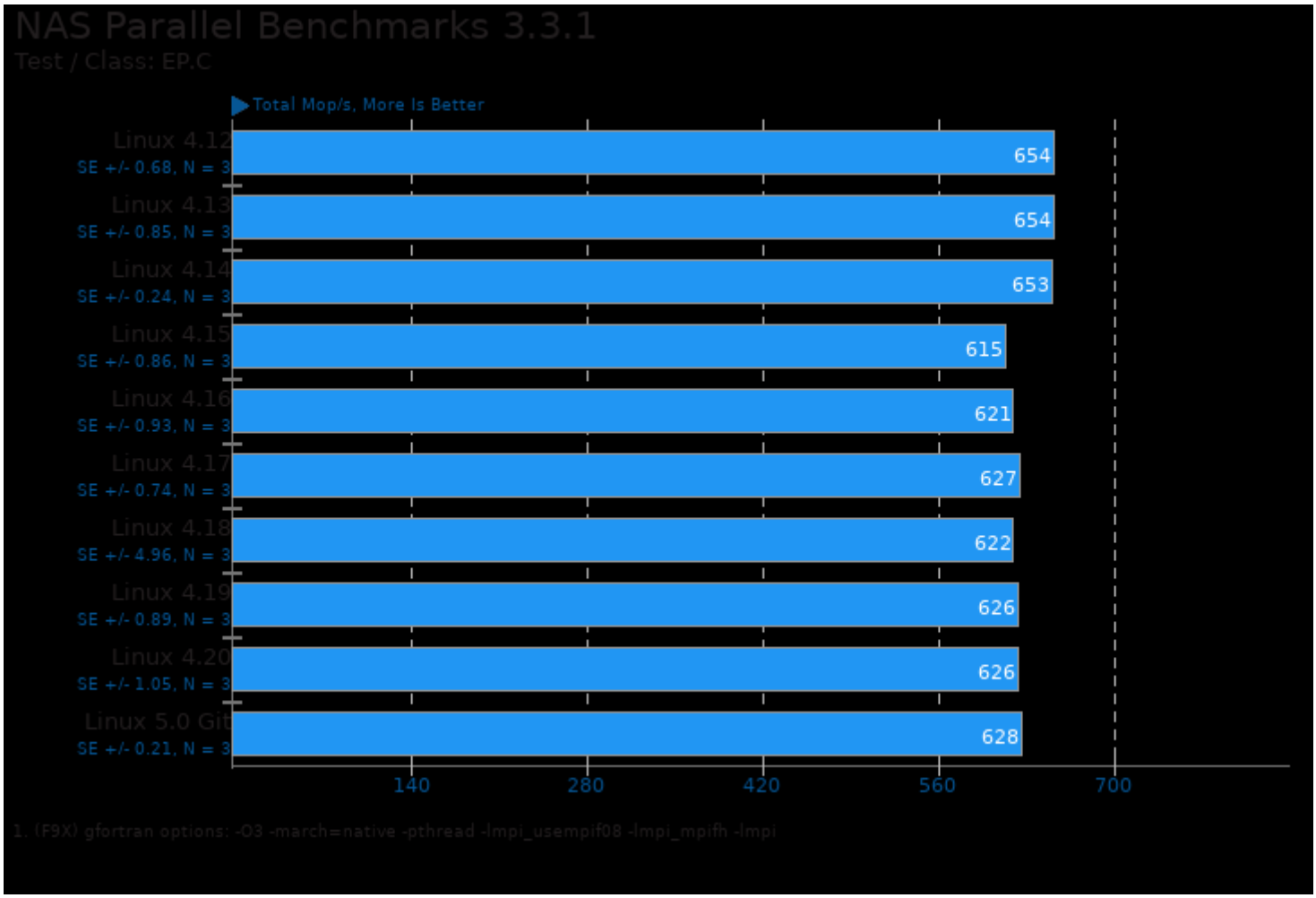

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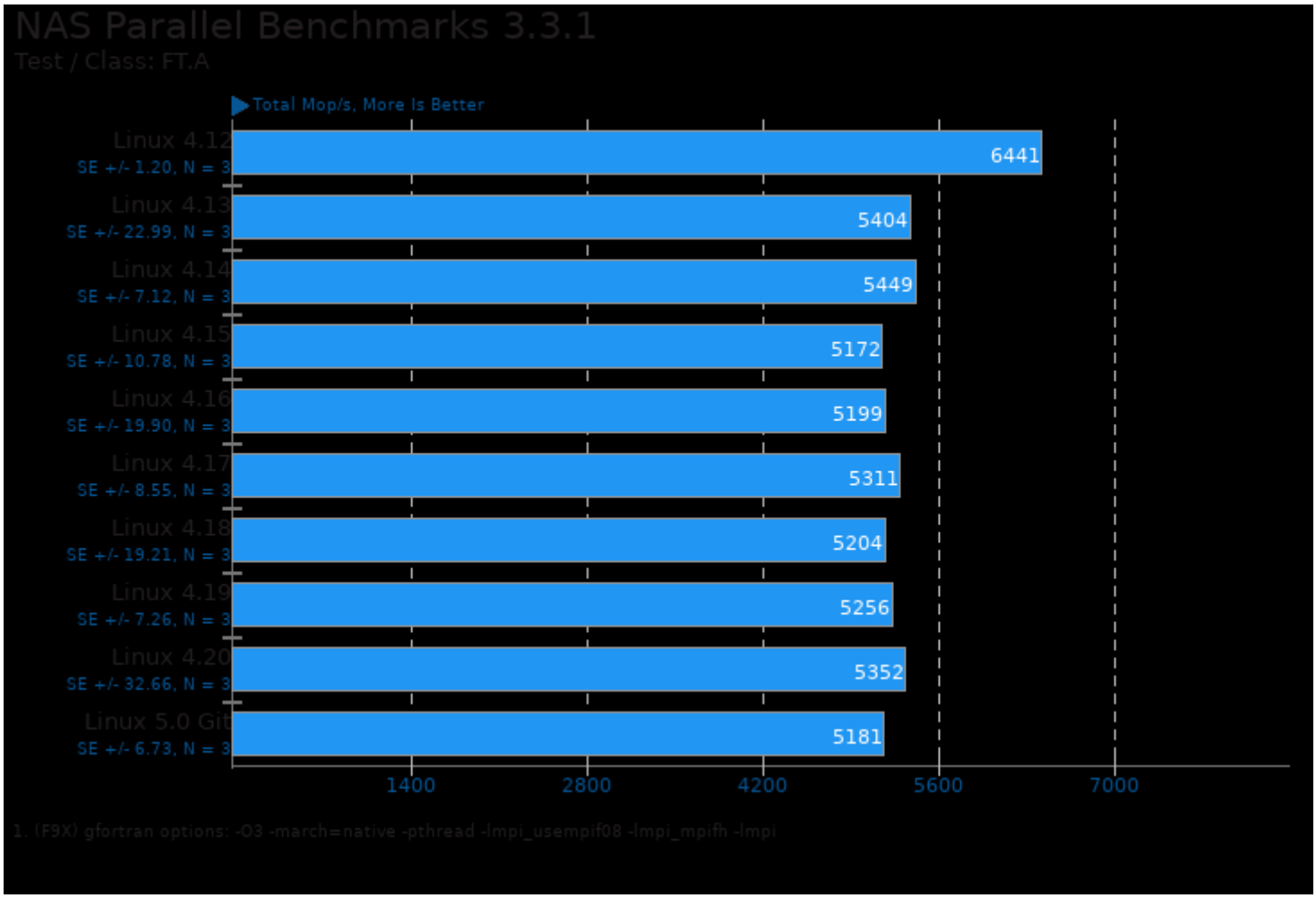

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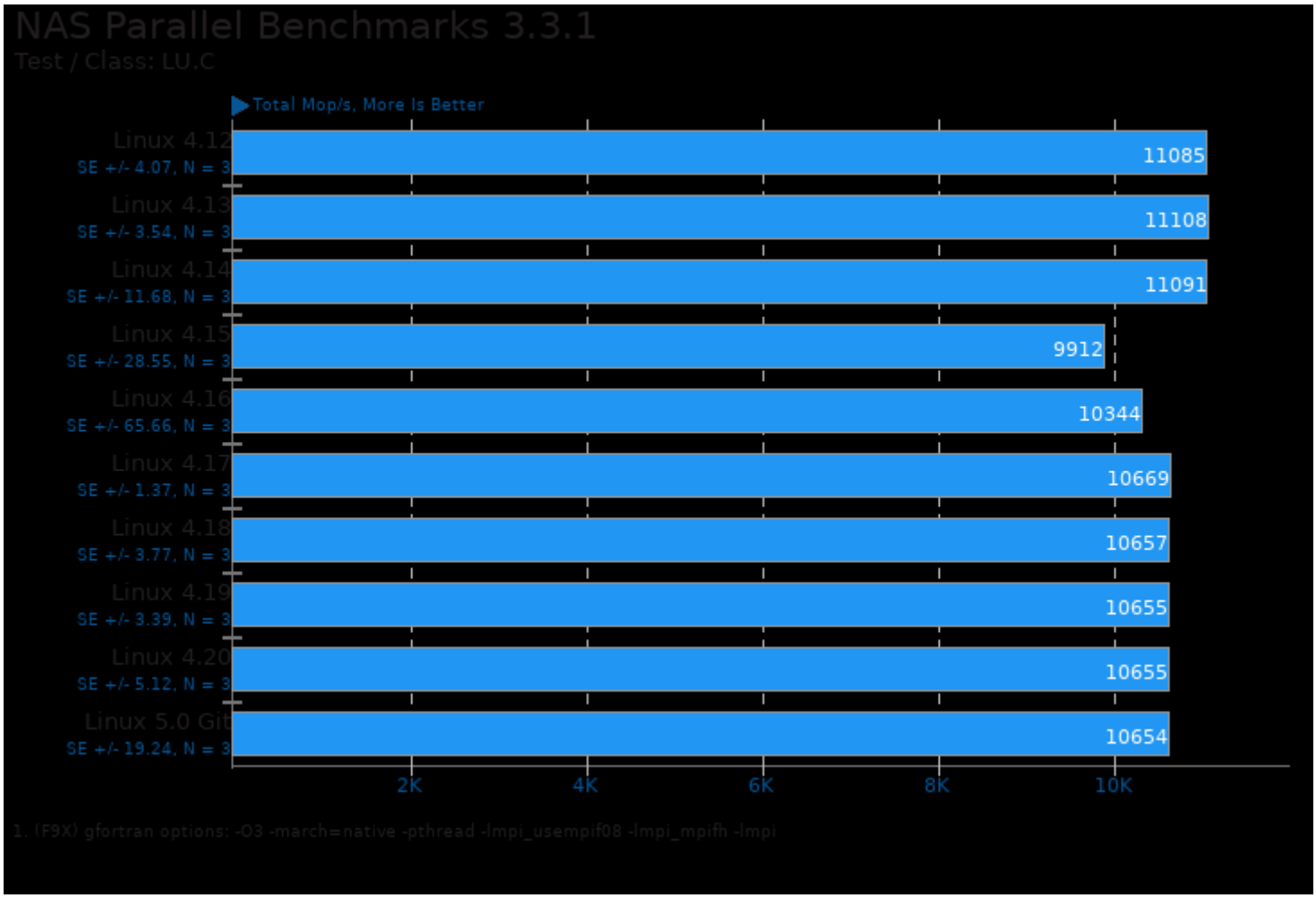

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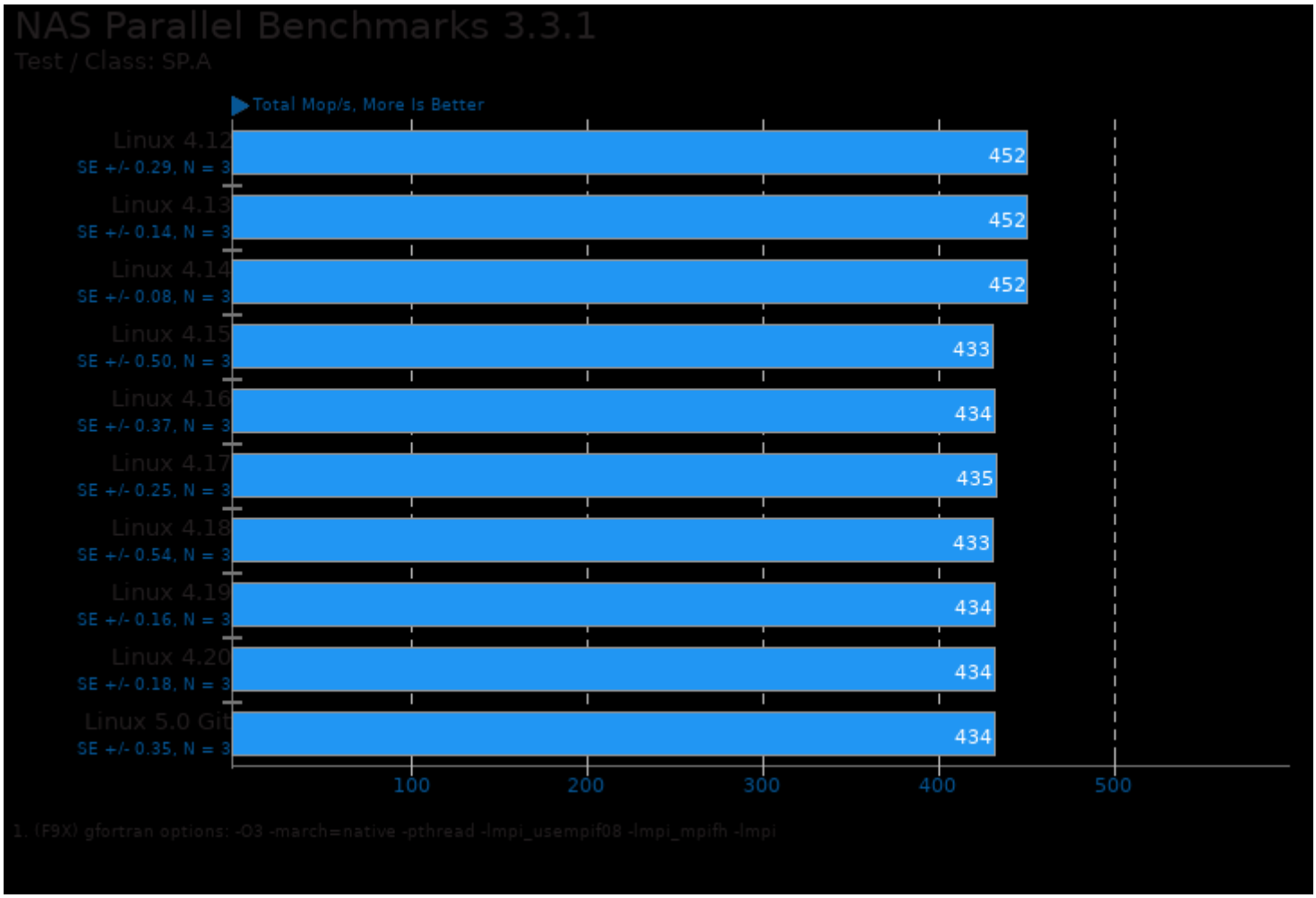

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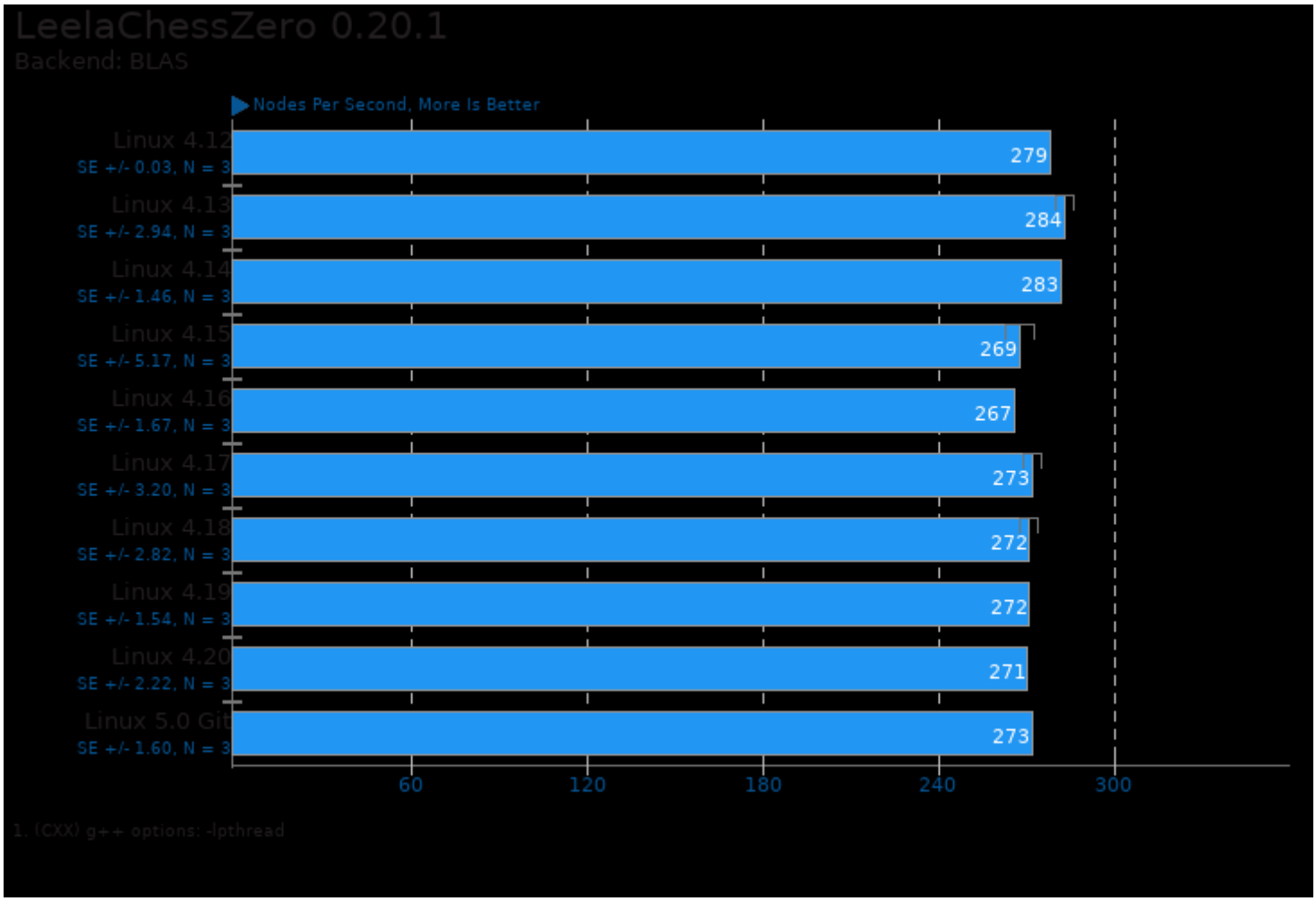

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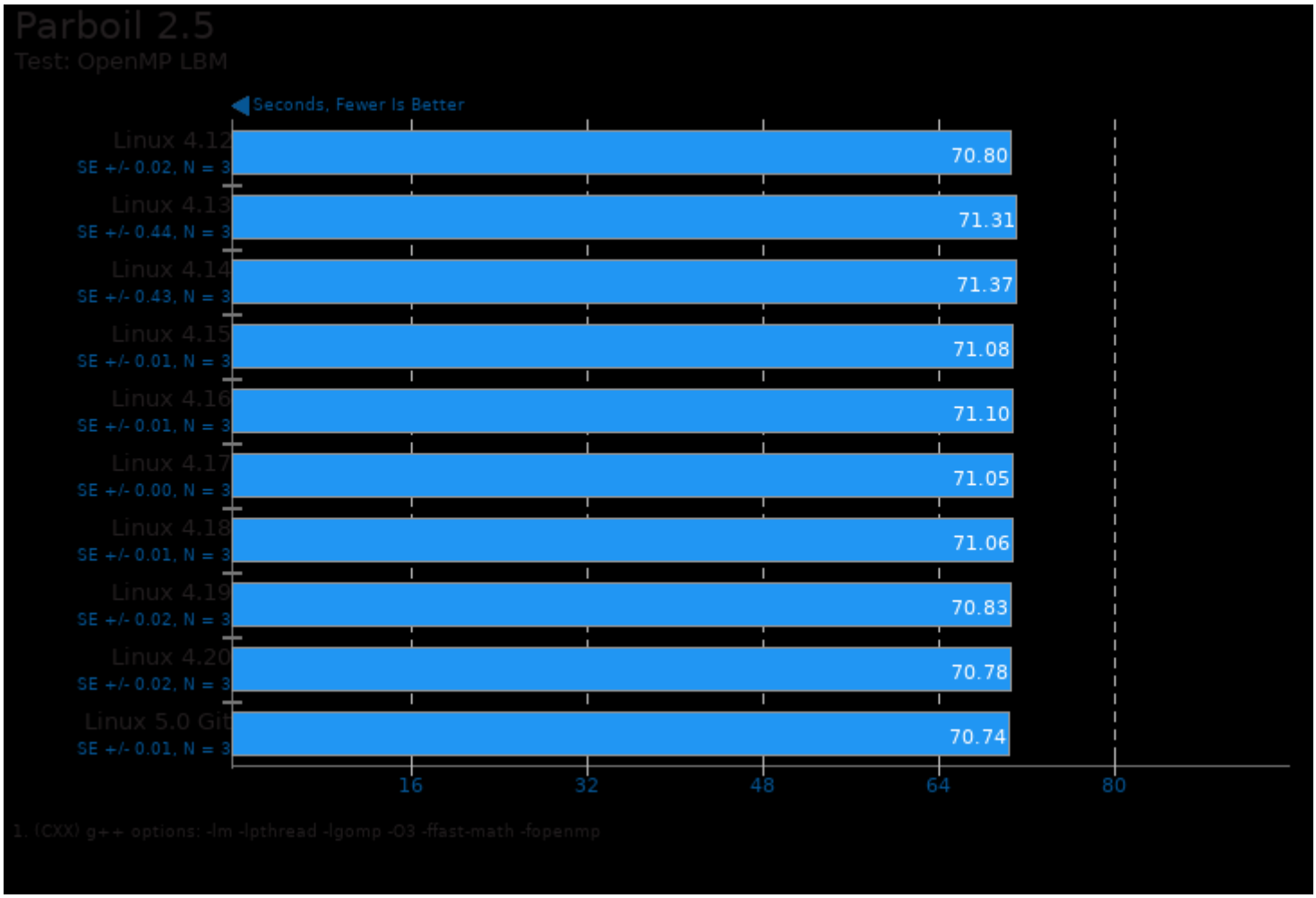

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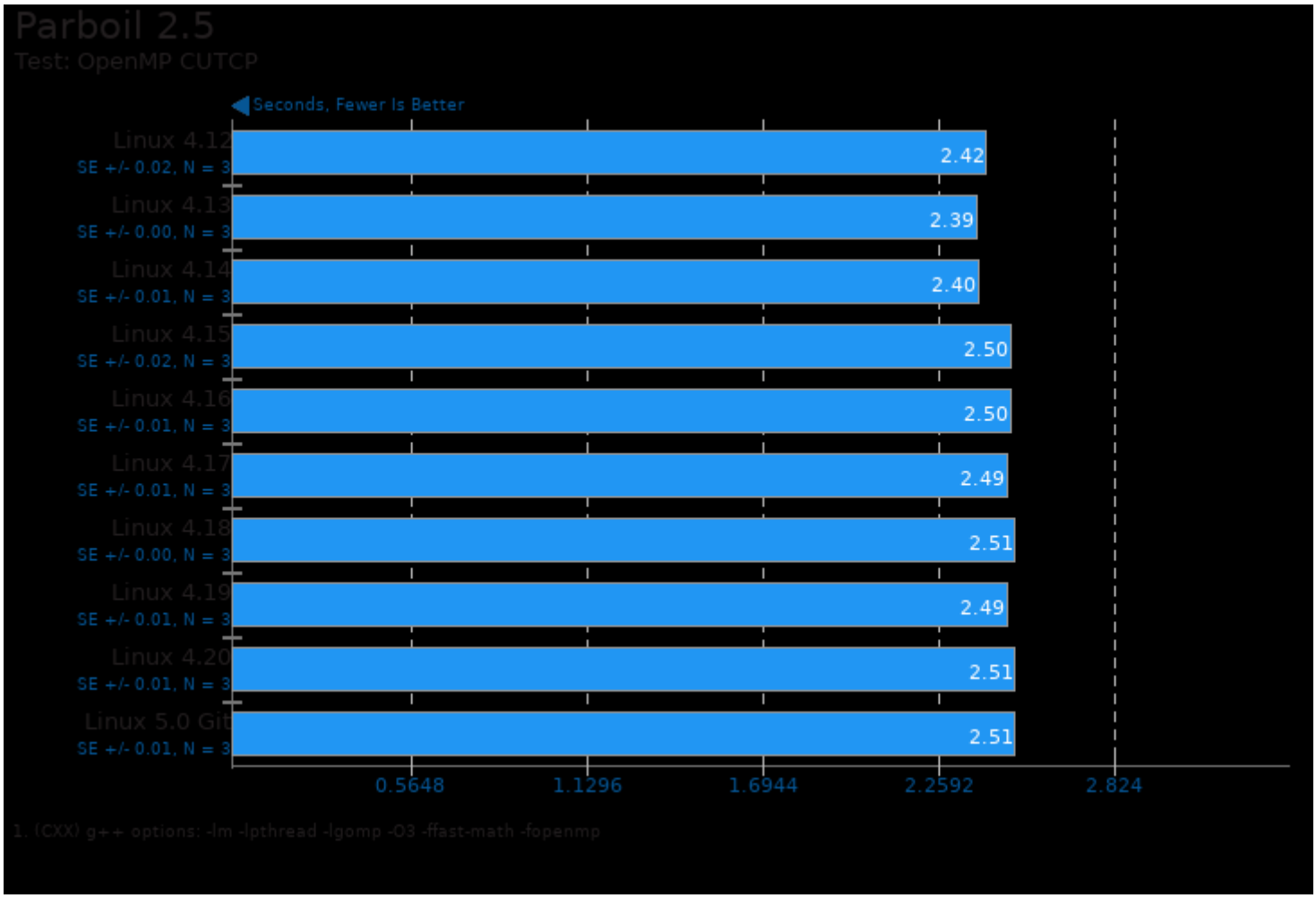

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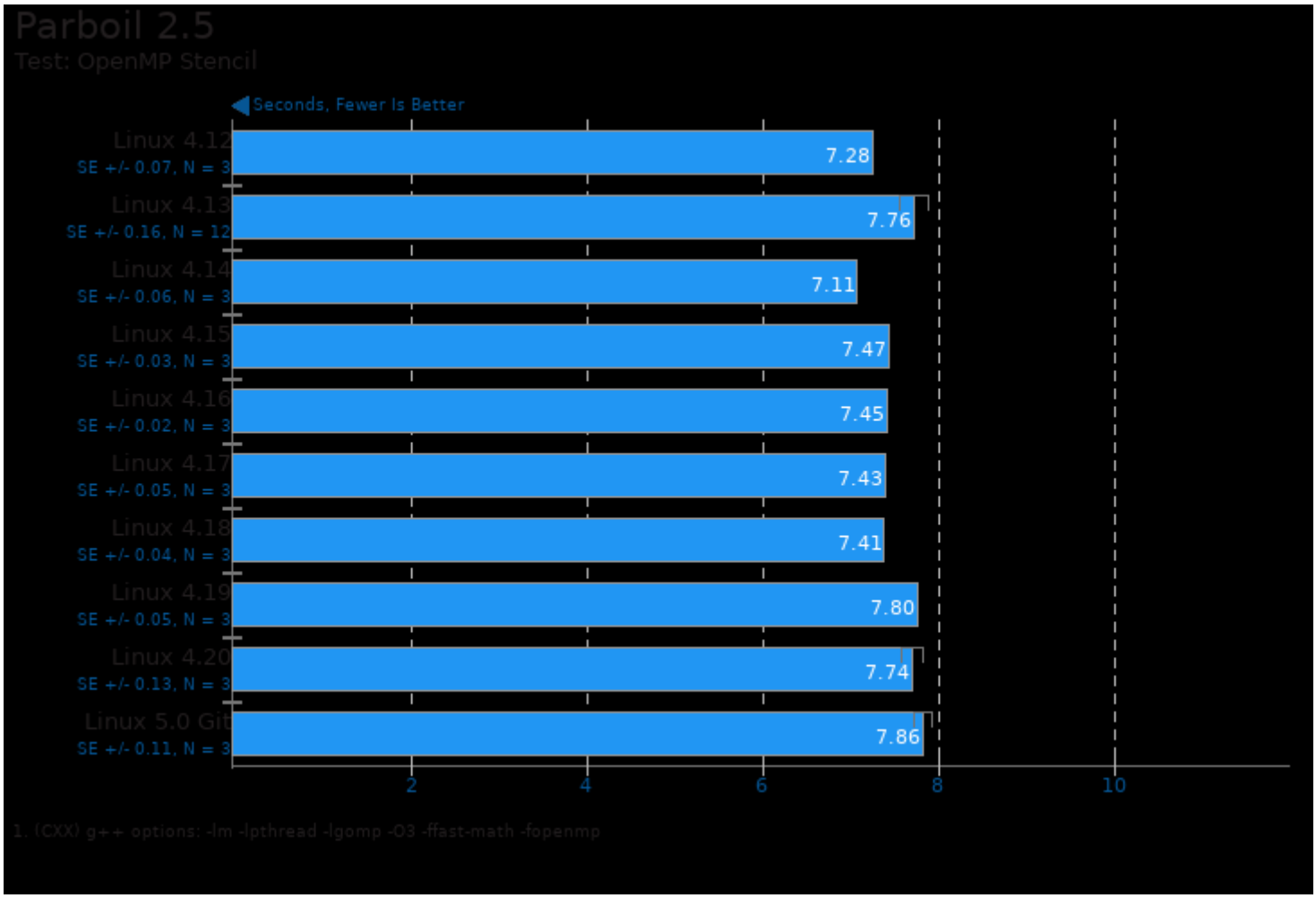

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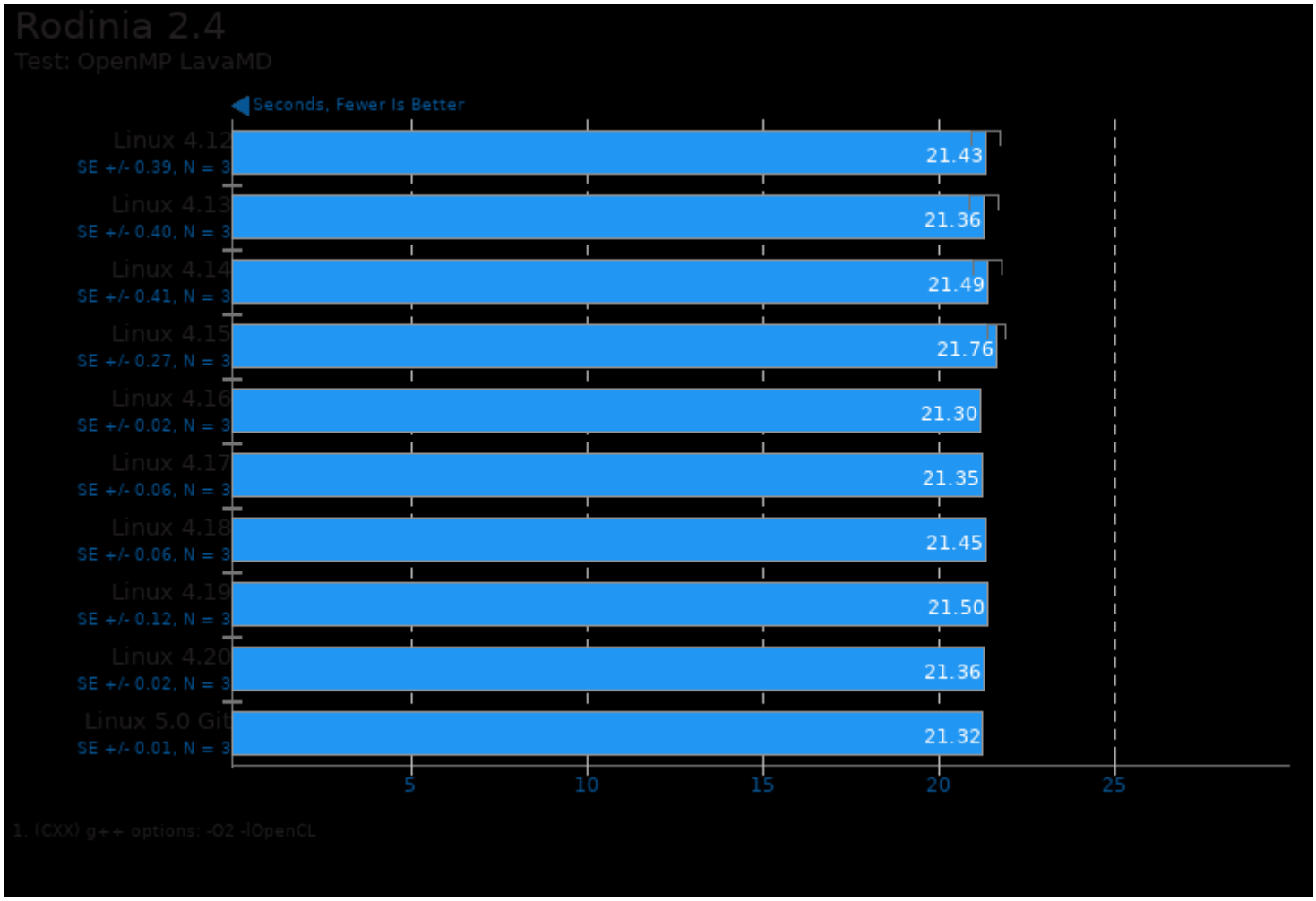

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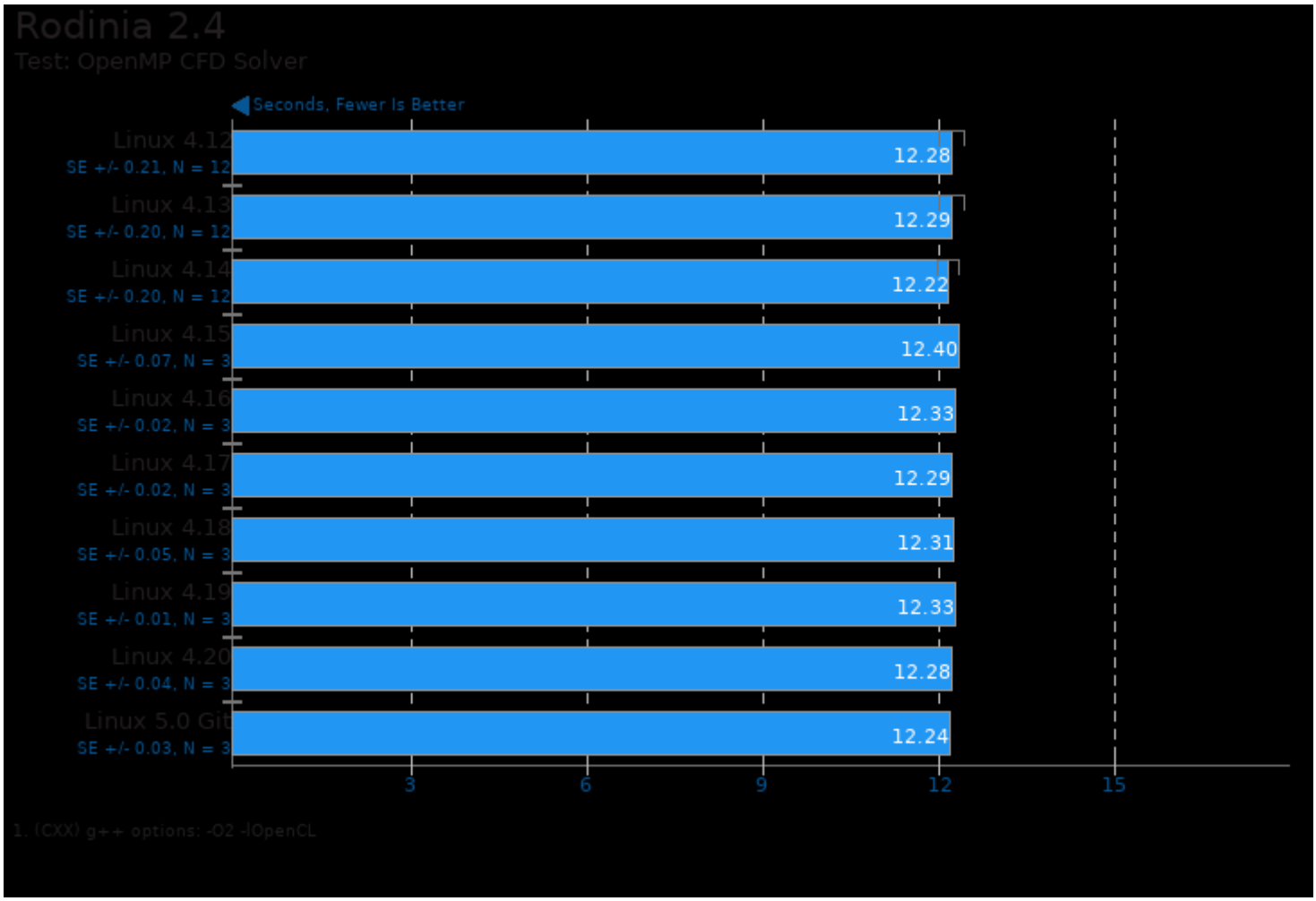

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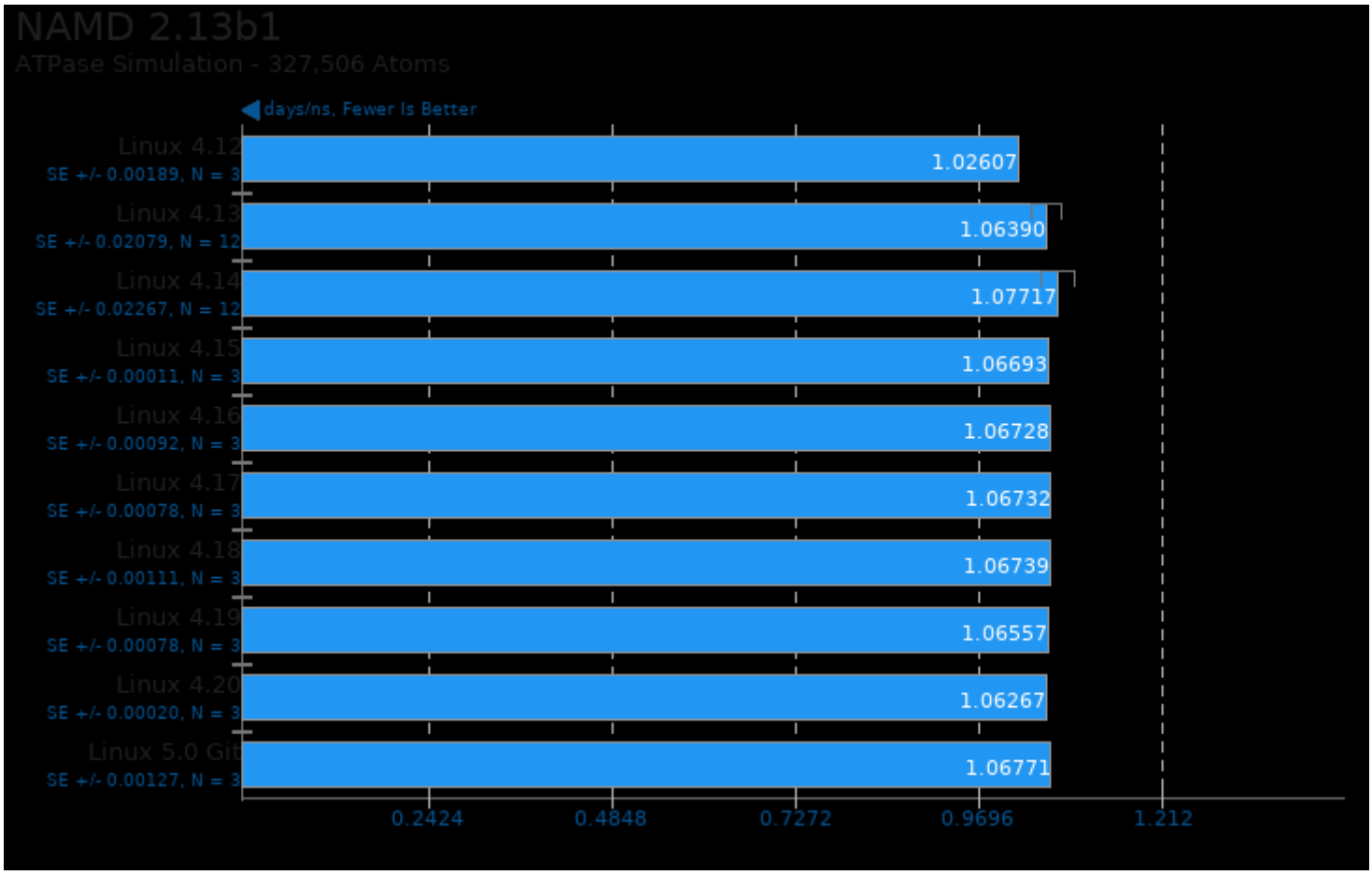

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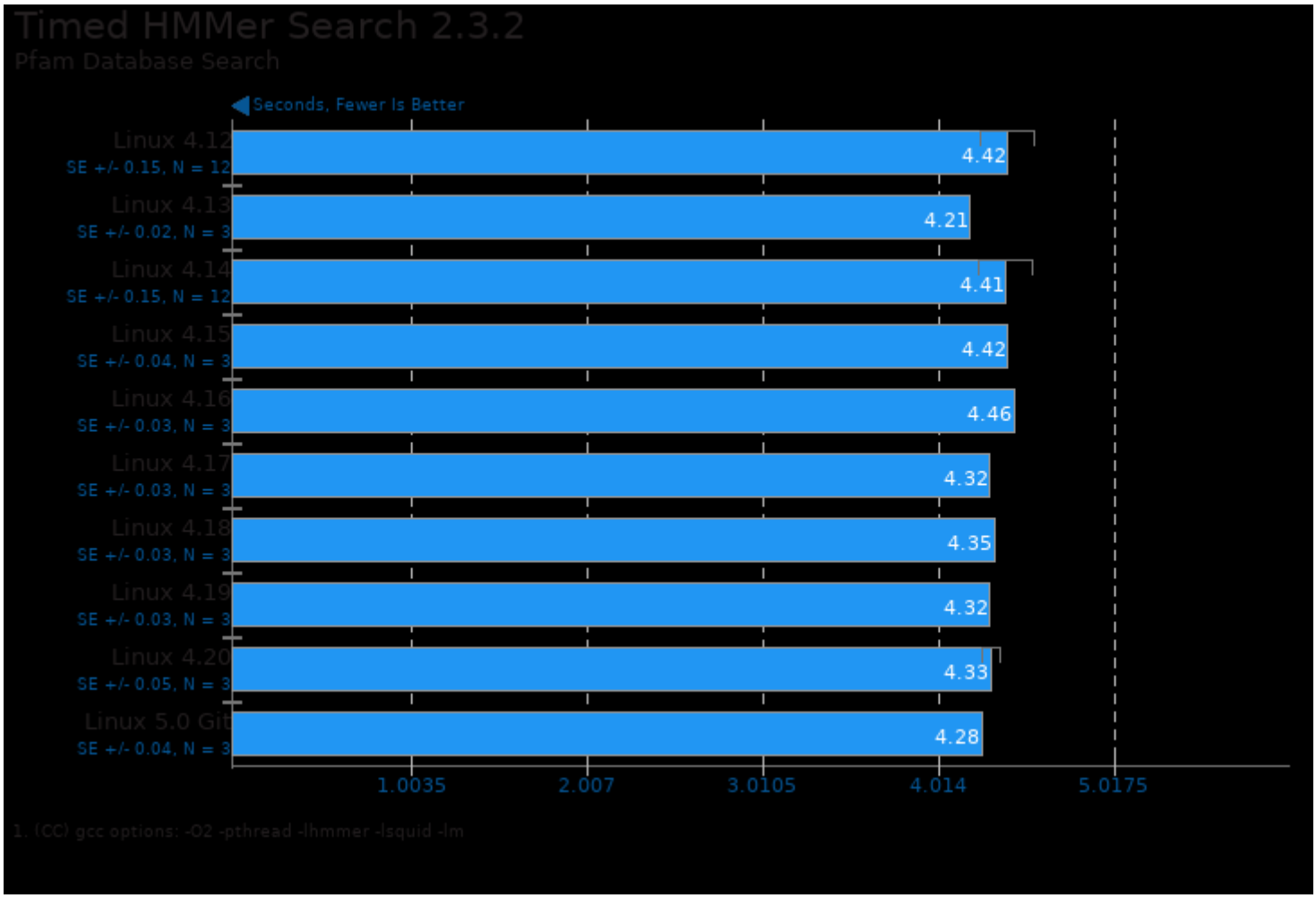

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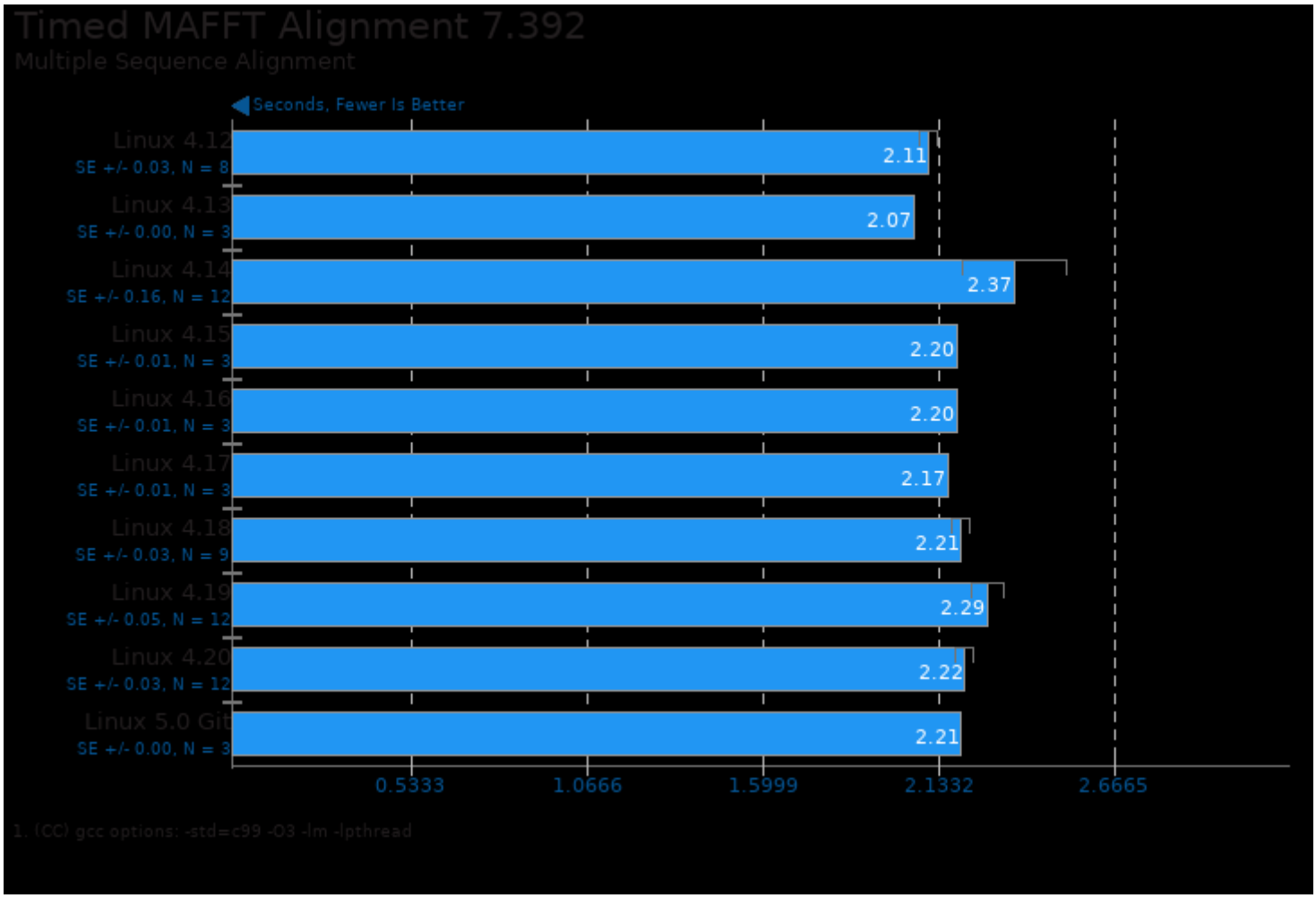

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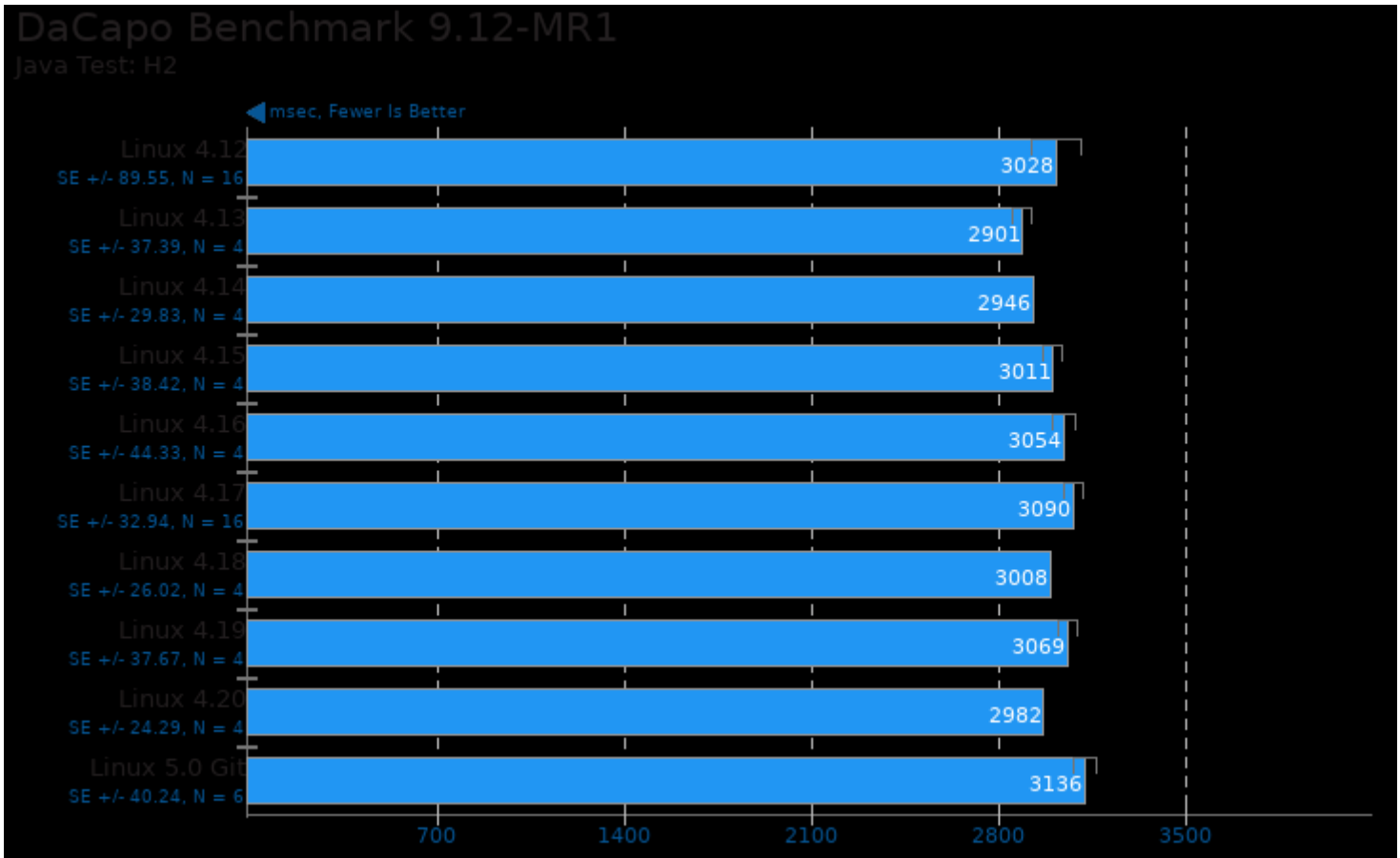

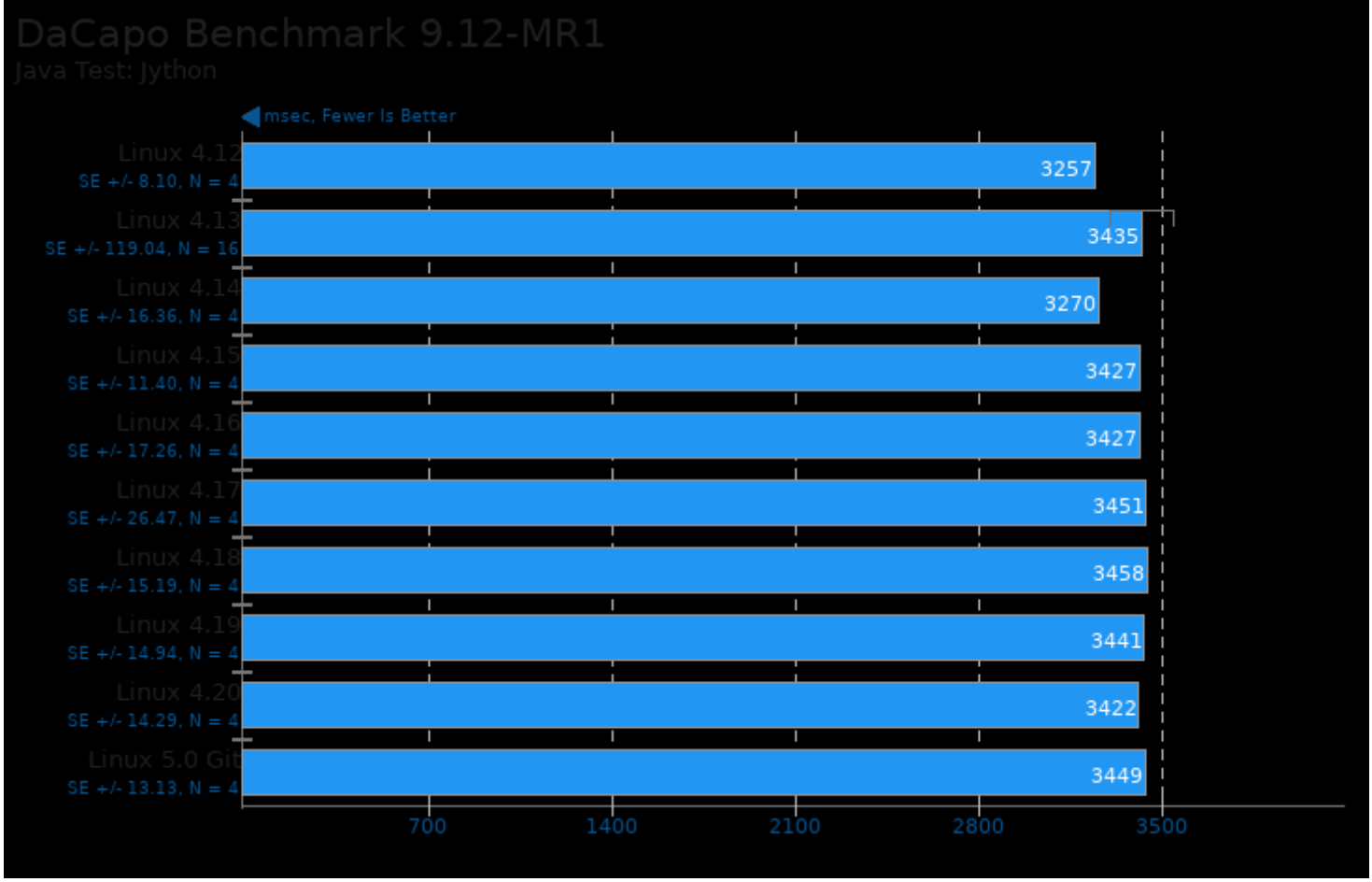

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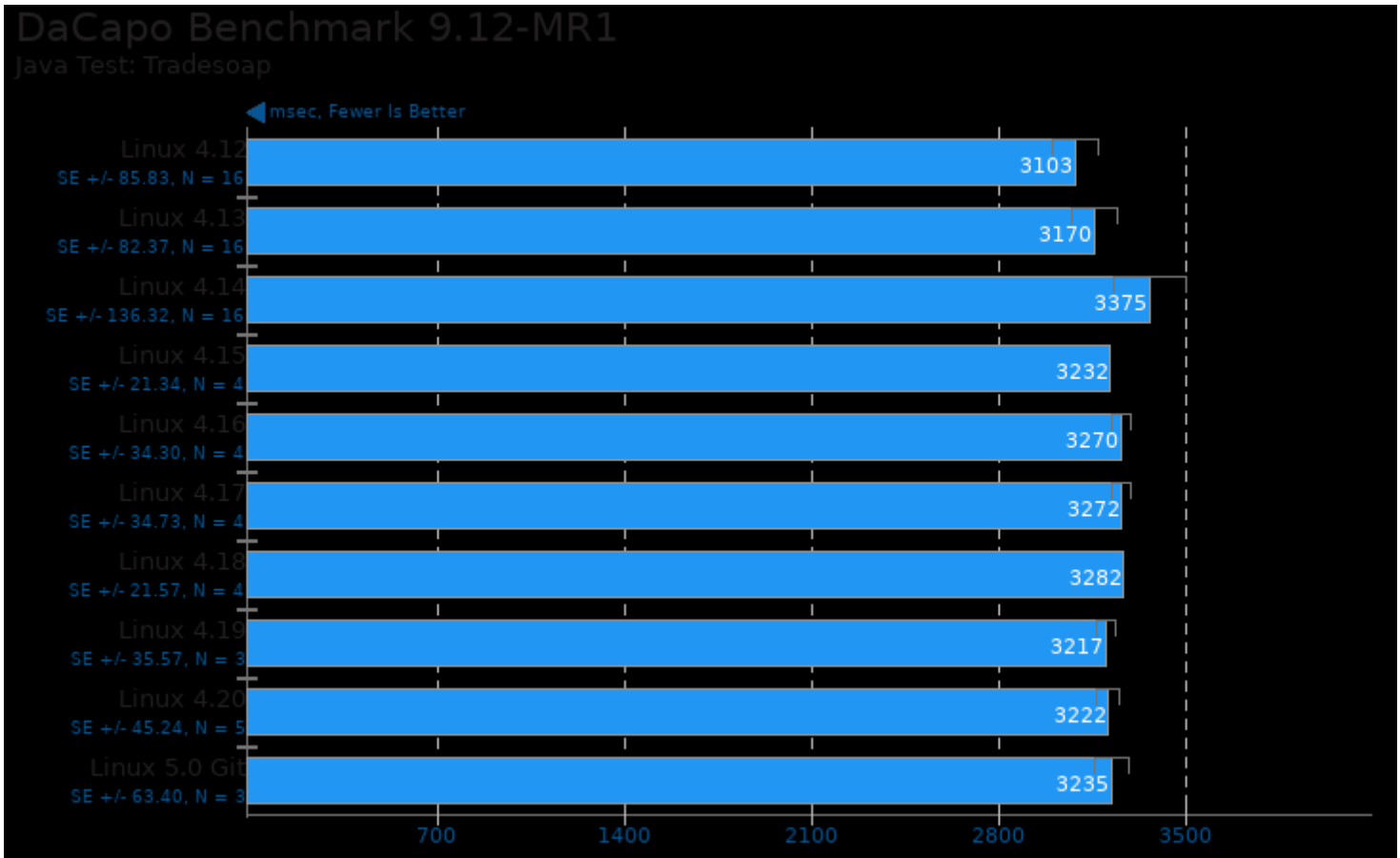
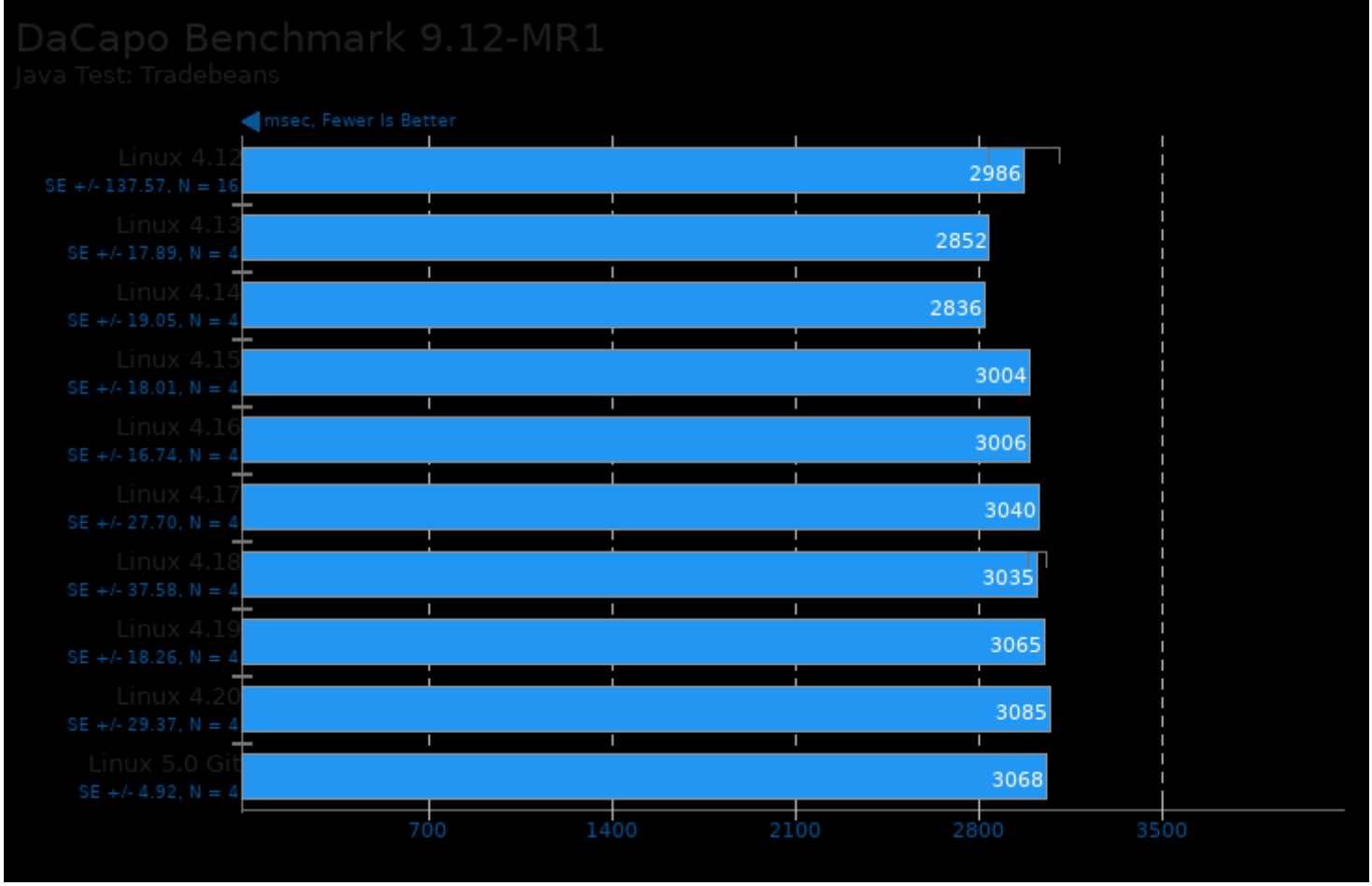
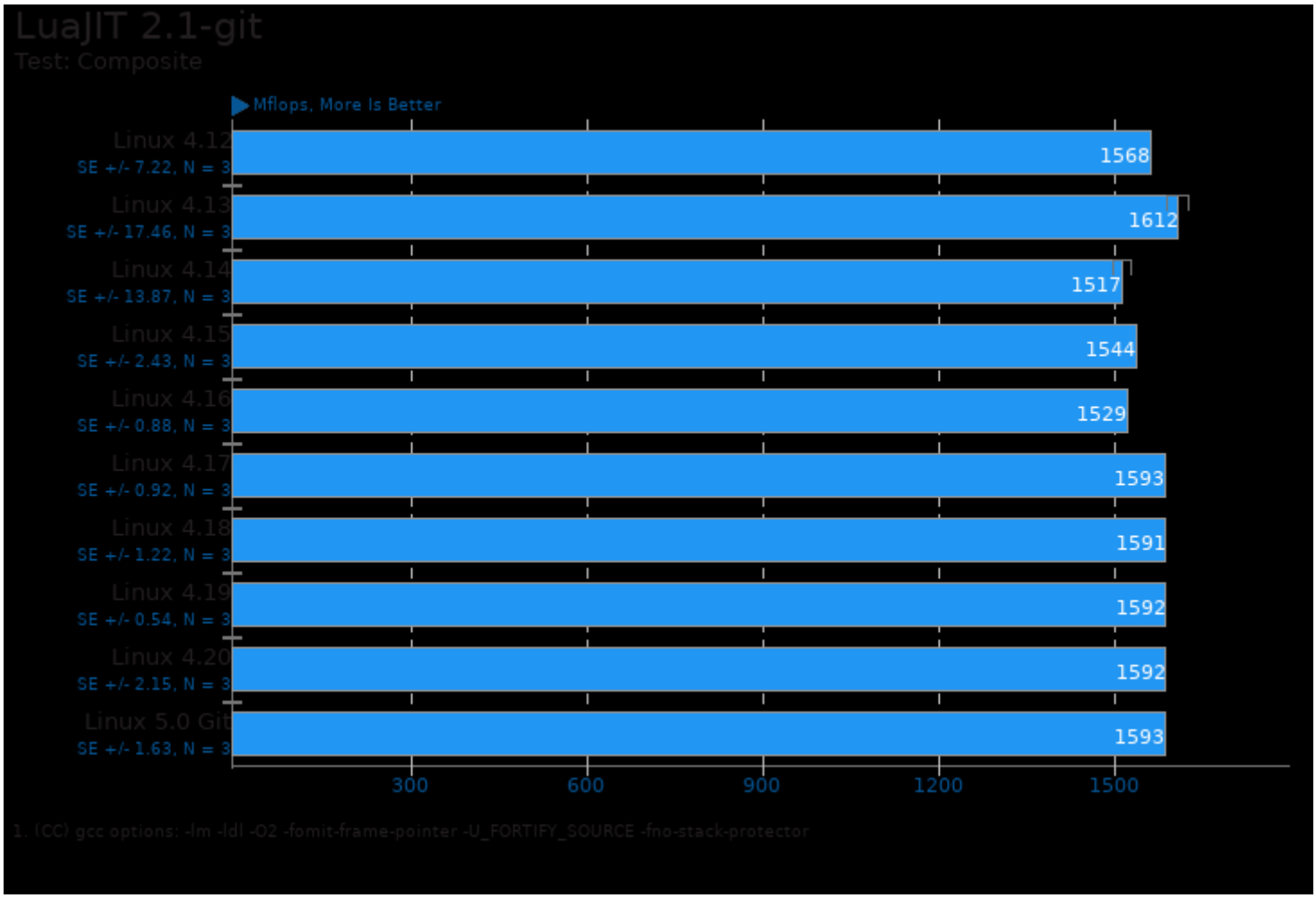
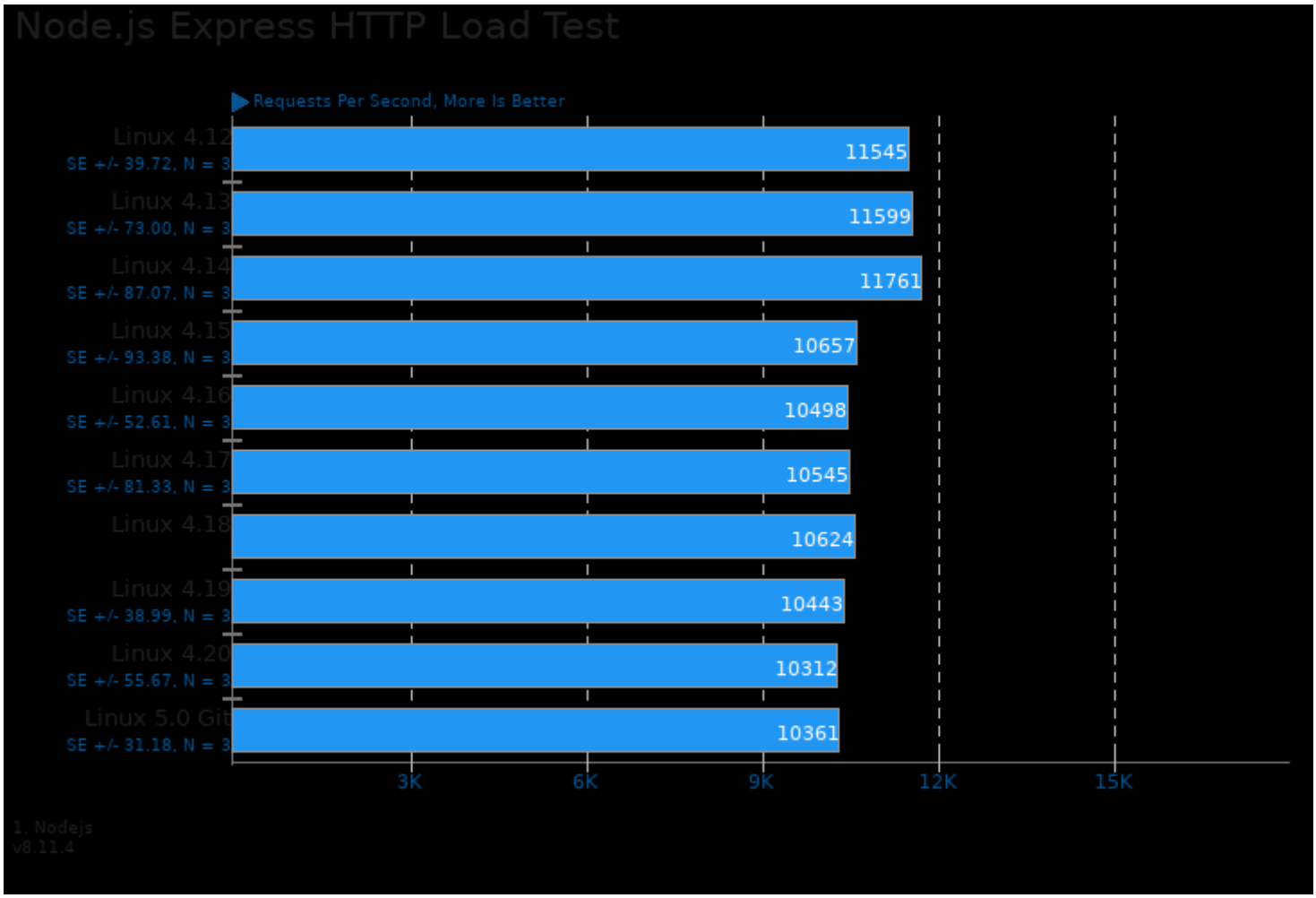




Core i9 7960X Linux 5.0 Kernel Benchmarks



Core i9 7960X Linux 5.0 Kernel Benchmarks



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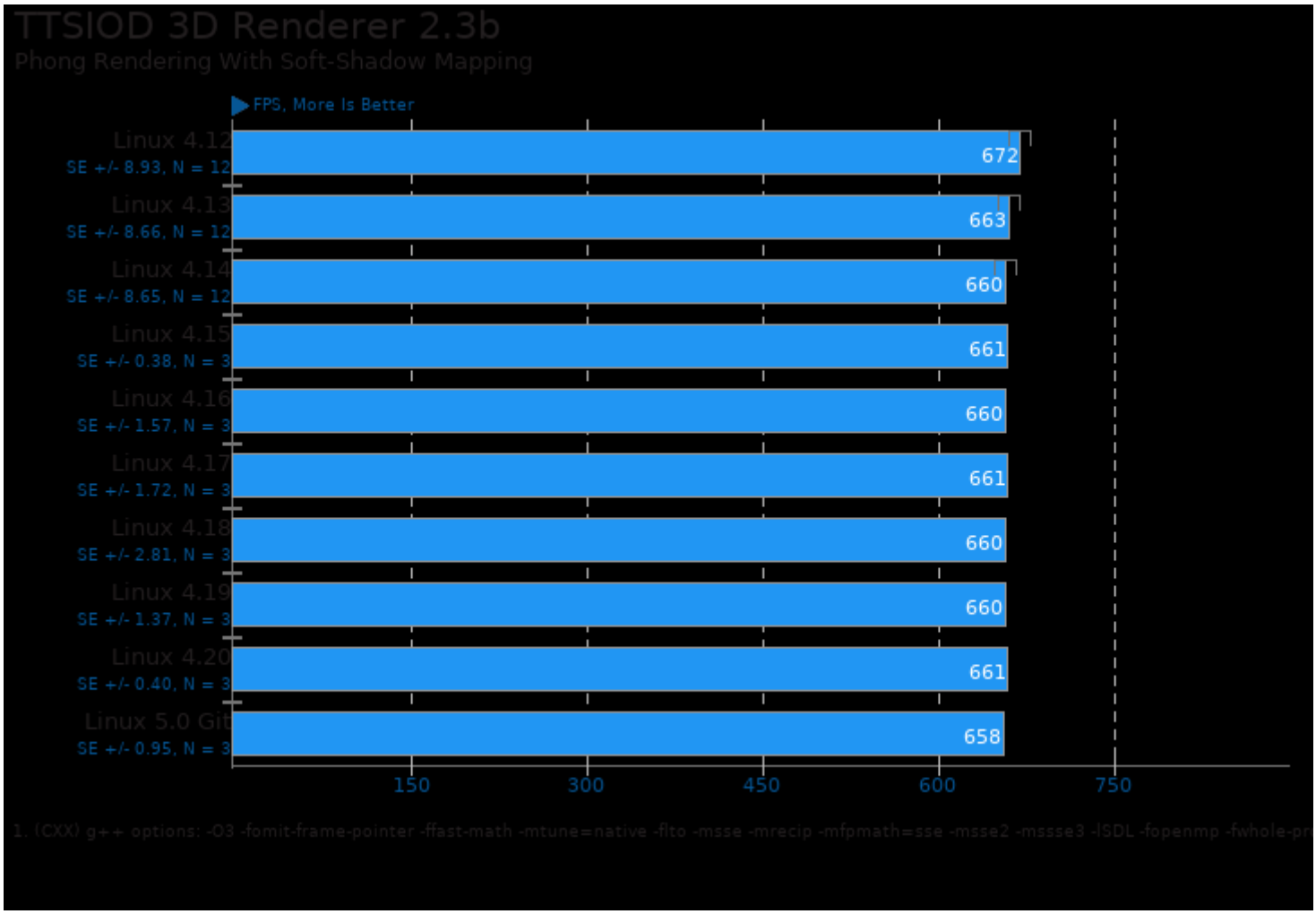

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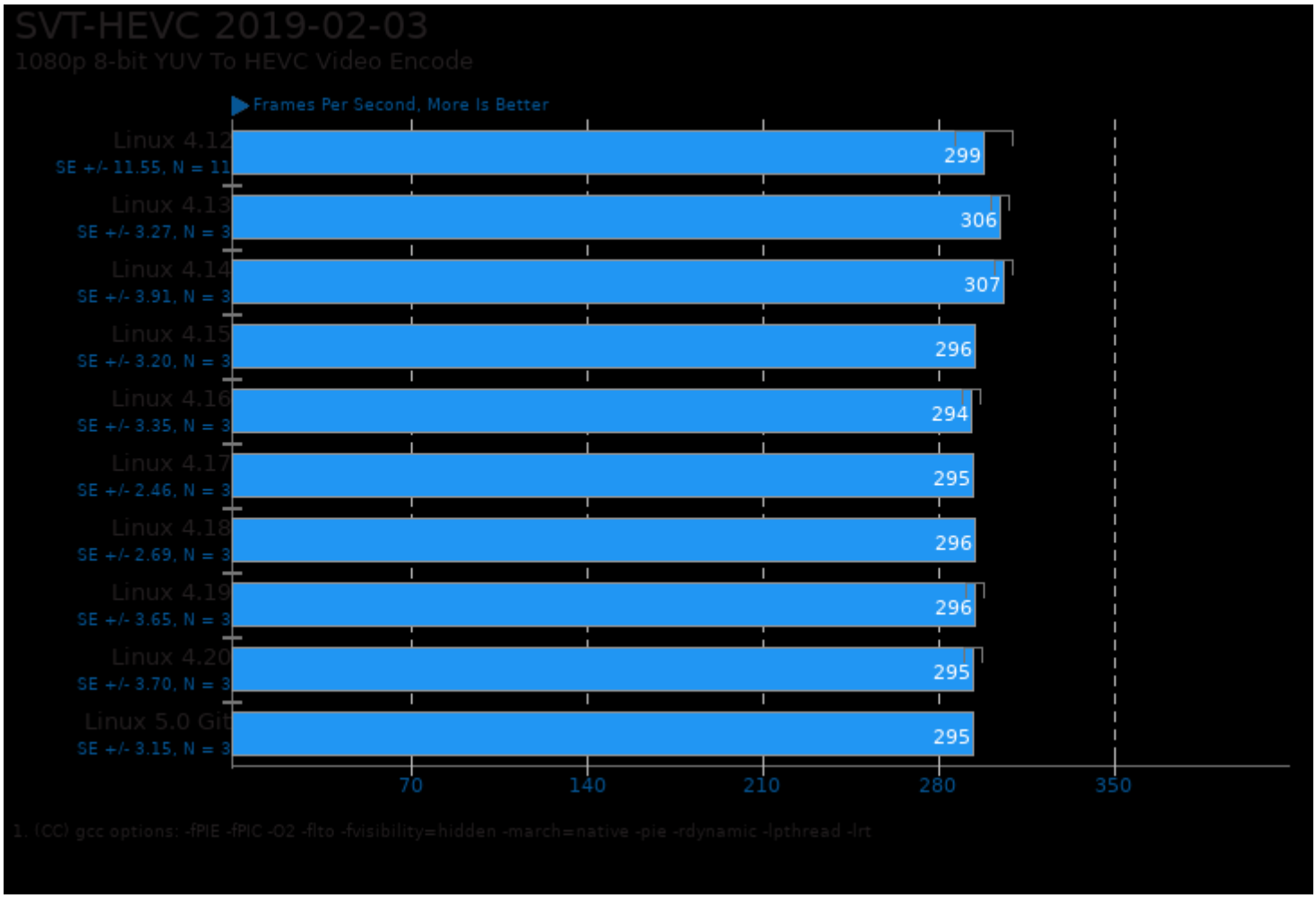
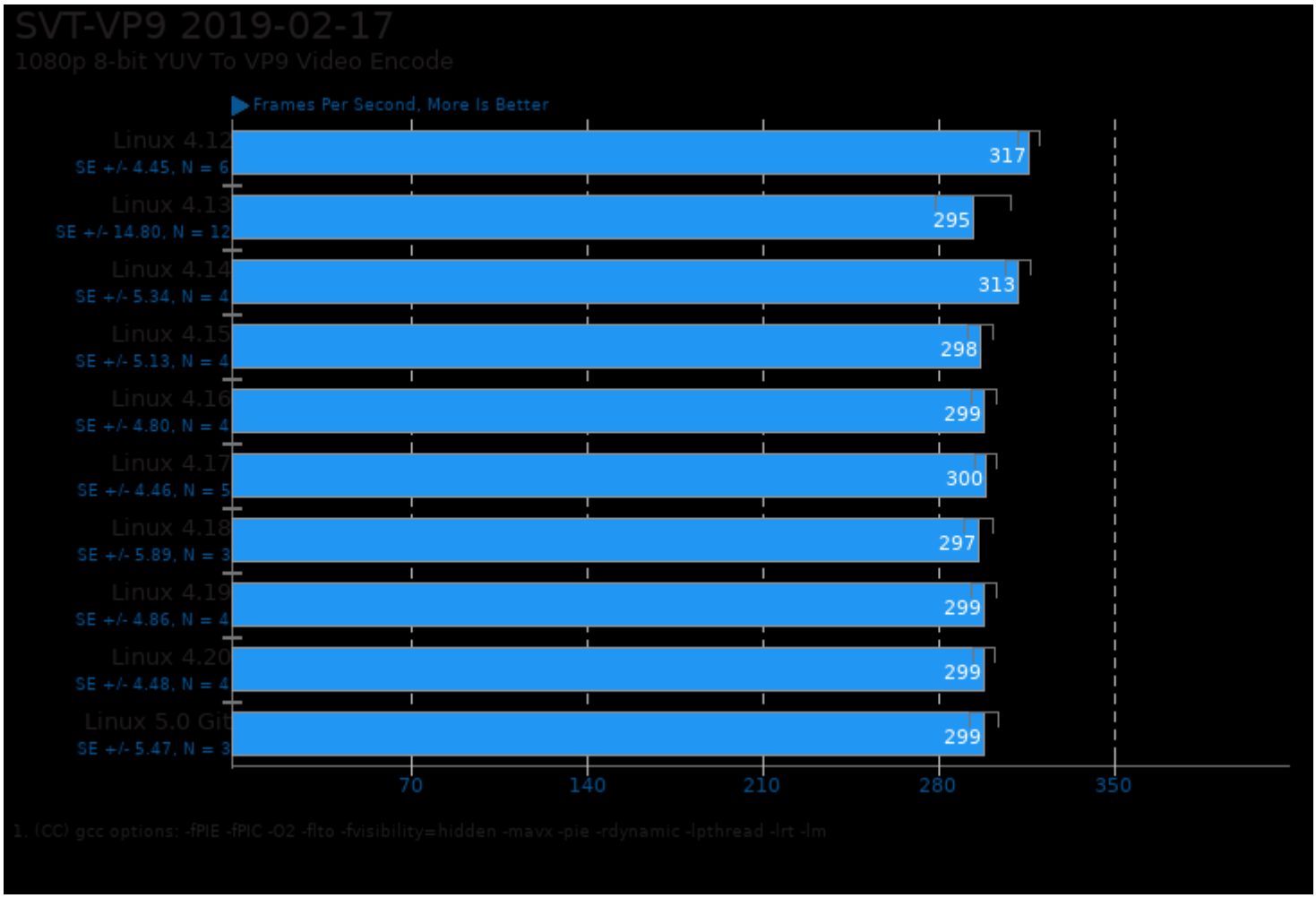


Core i9 7960X Linux 5.0 Kernel Benchmarks



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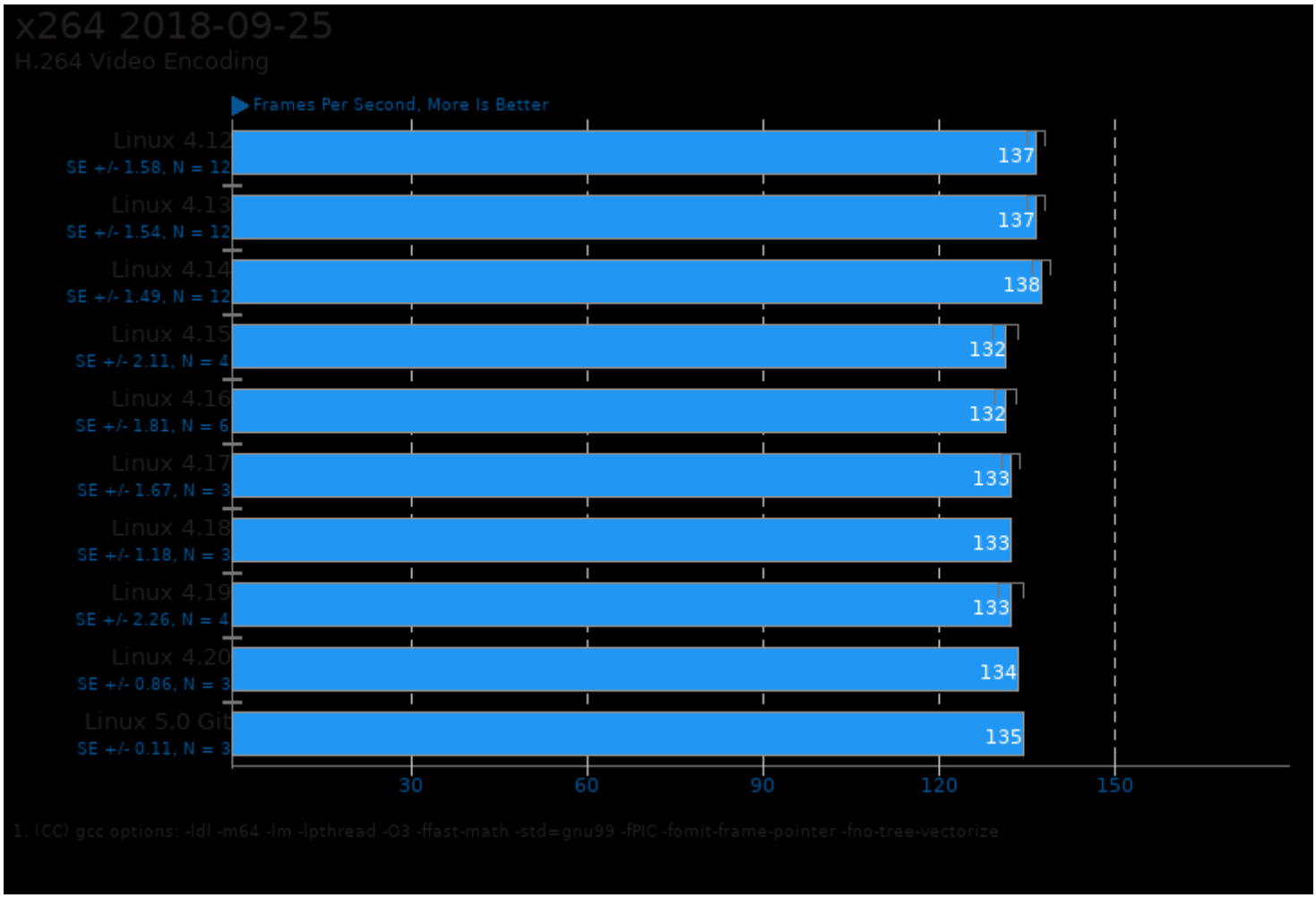
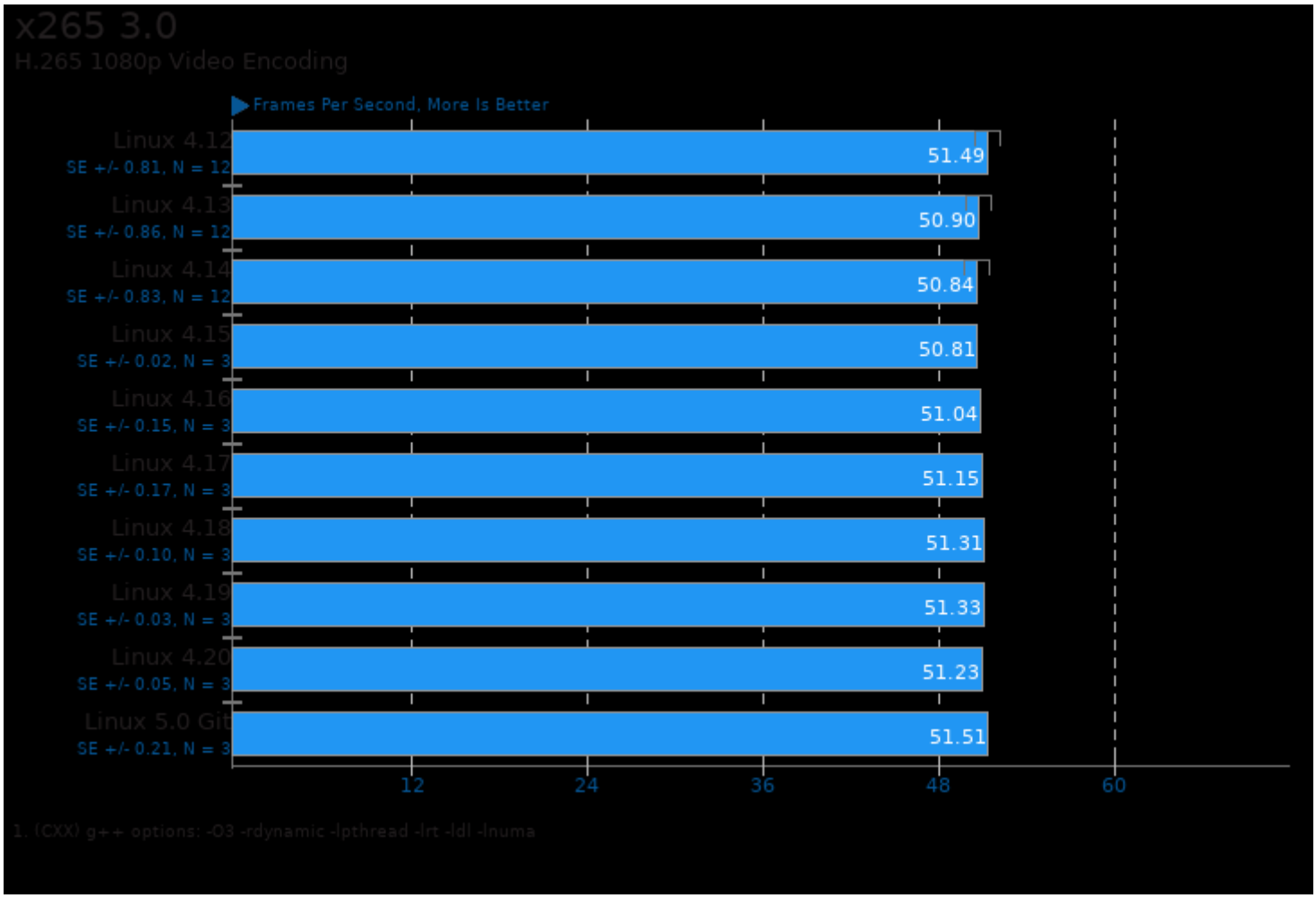
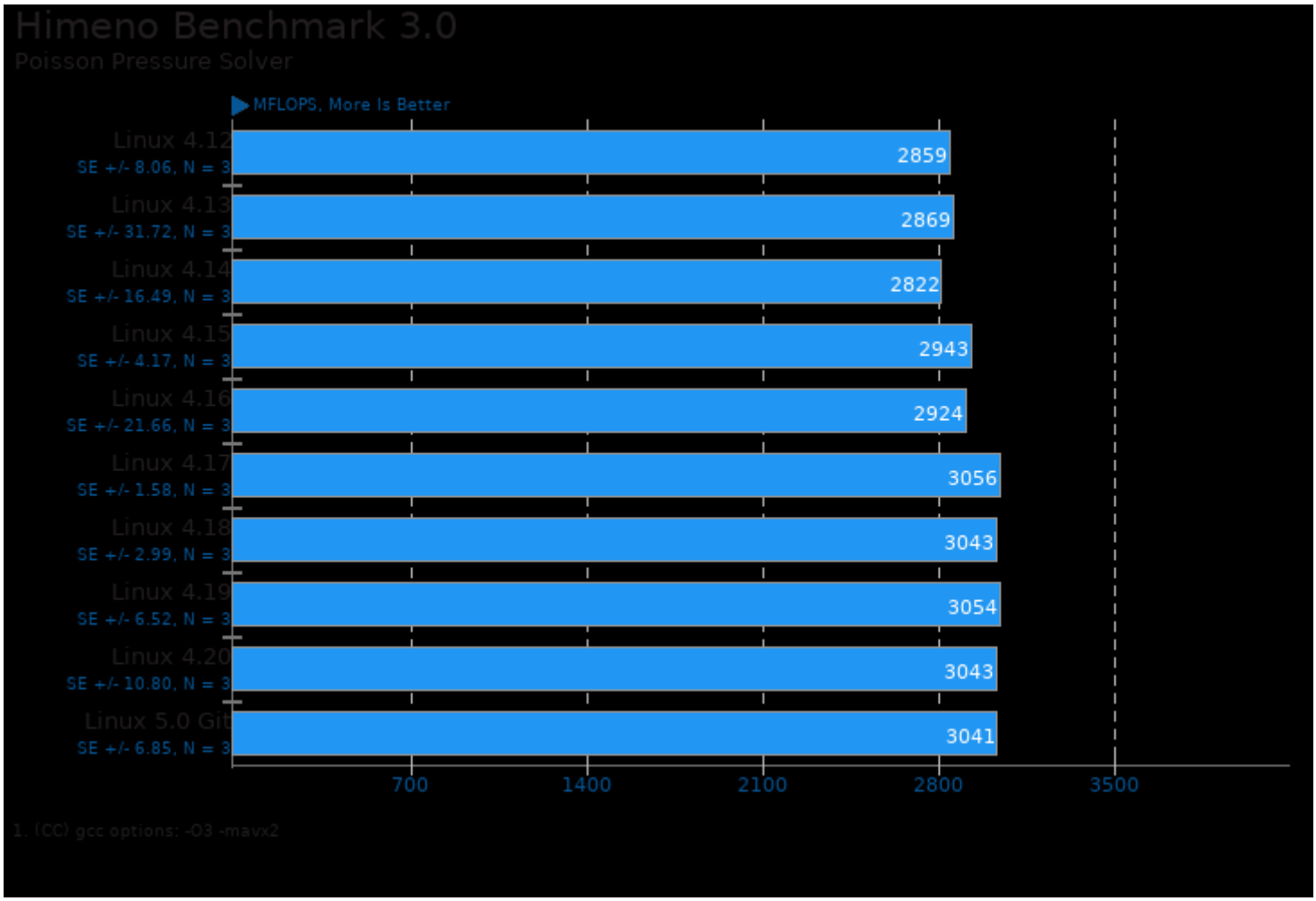


Core i9 7960X Linux 5.0 Kernel Benchmarks



Core i9 7960X Linux 5.0 Kernel Benchmarks



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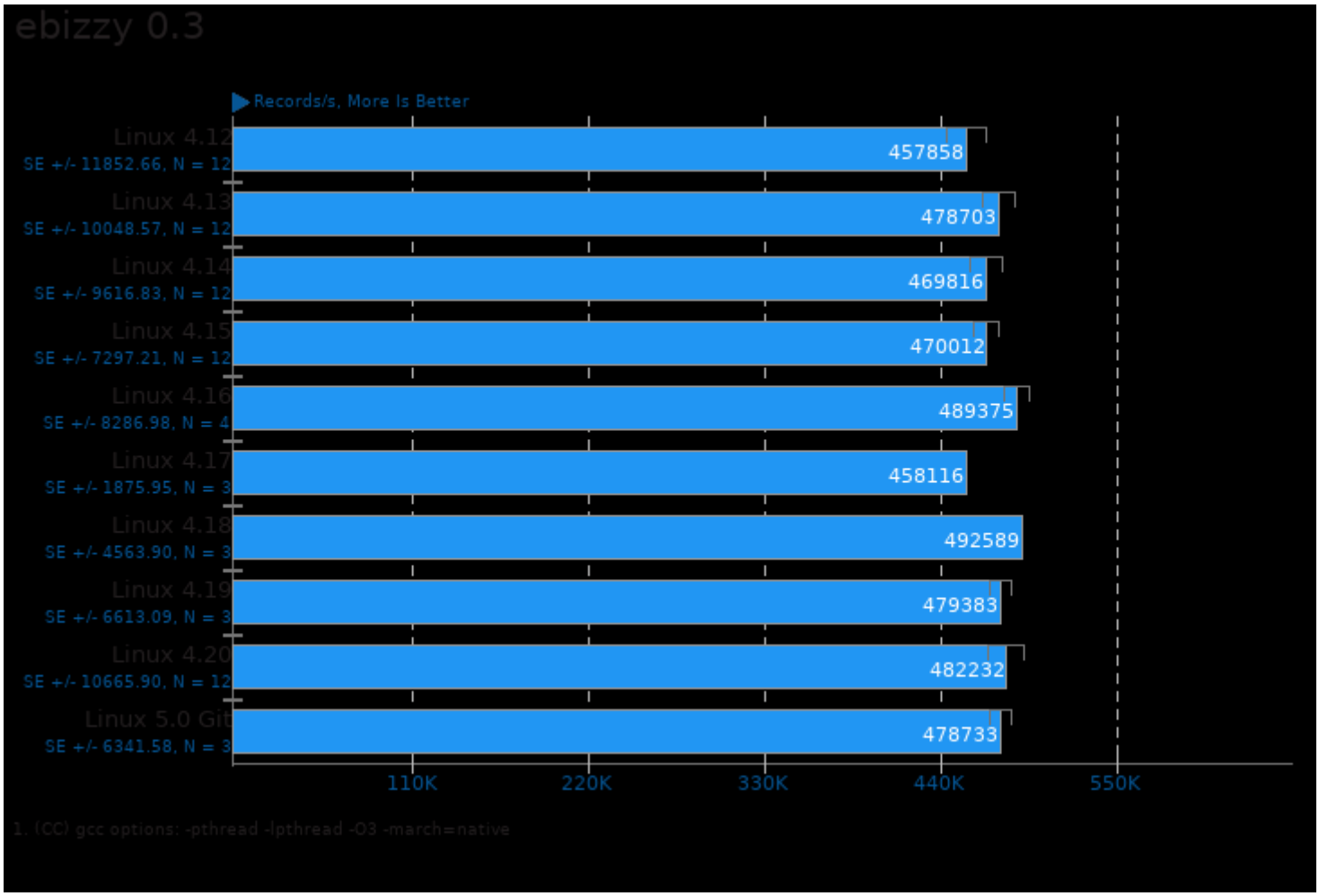
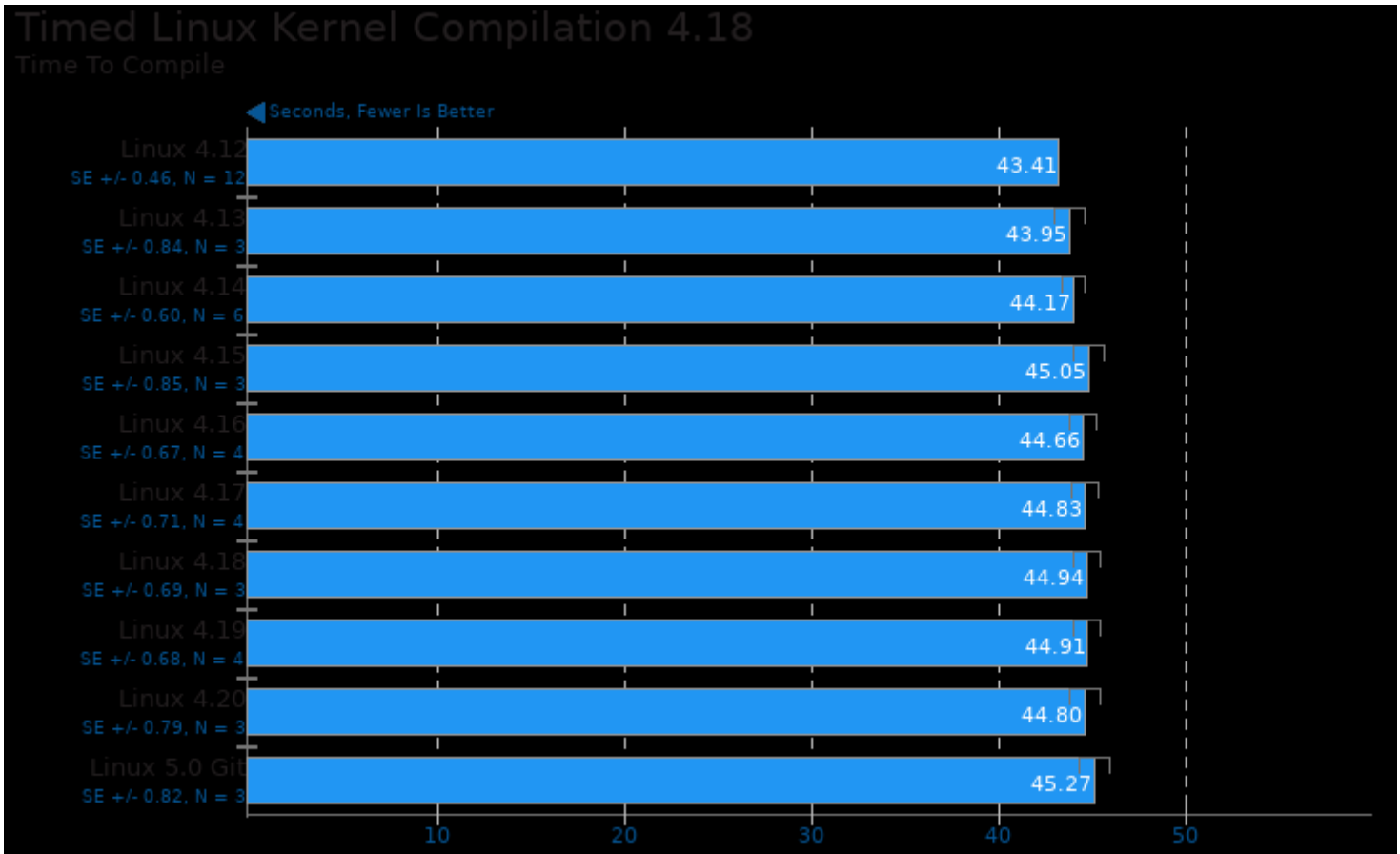
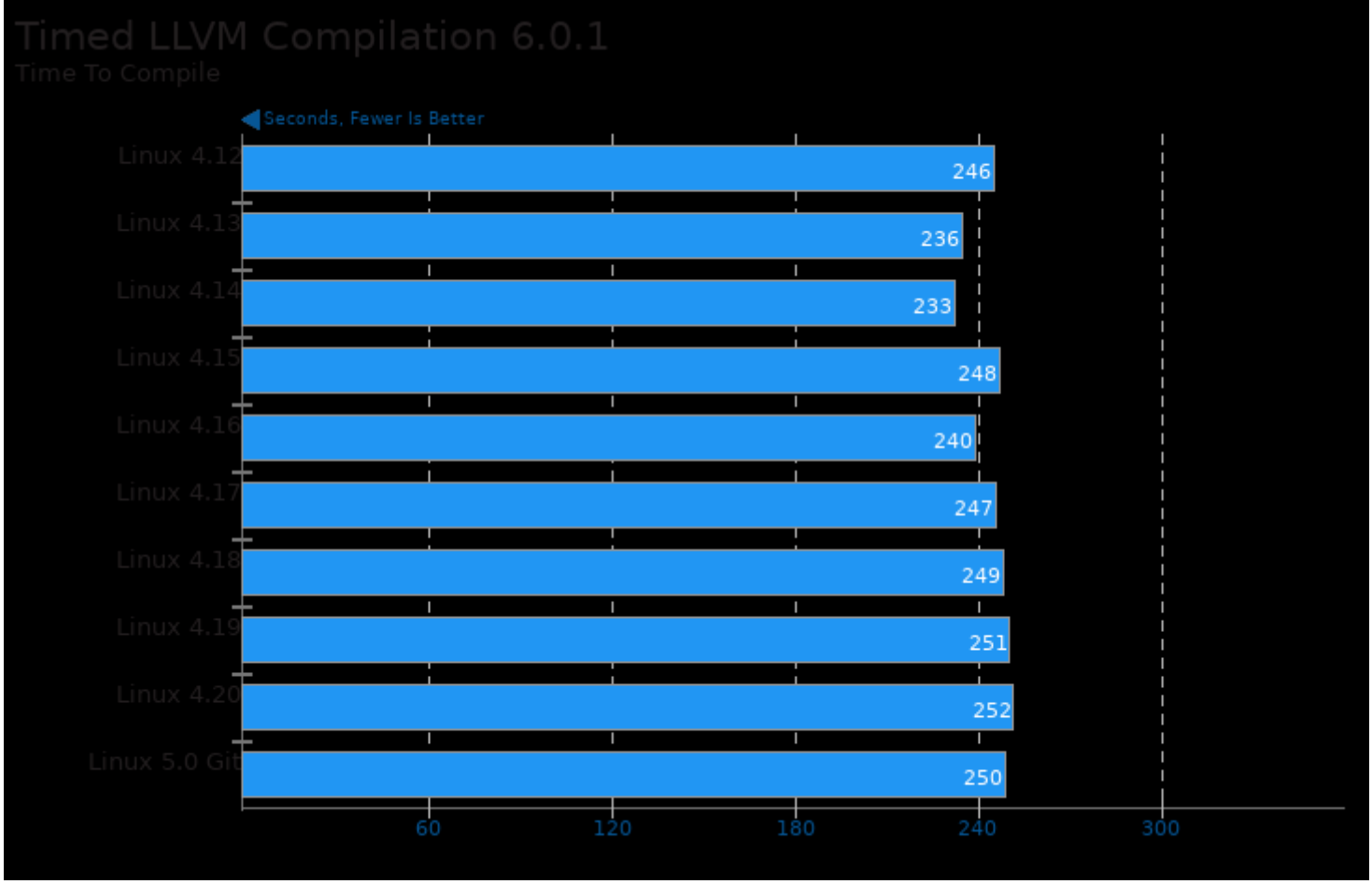


Core i9 7960X Linux 5.0 Kernel Benchmarks





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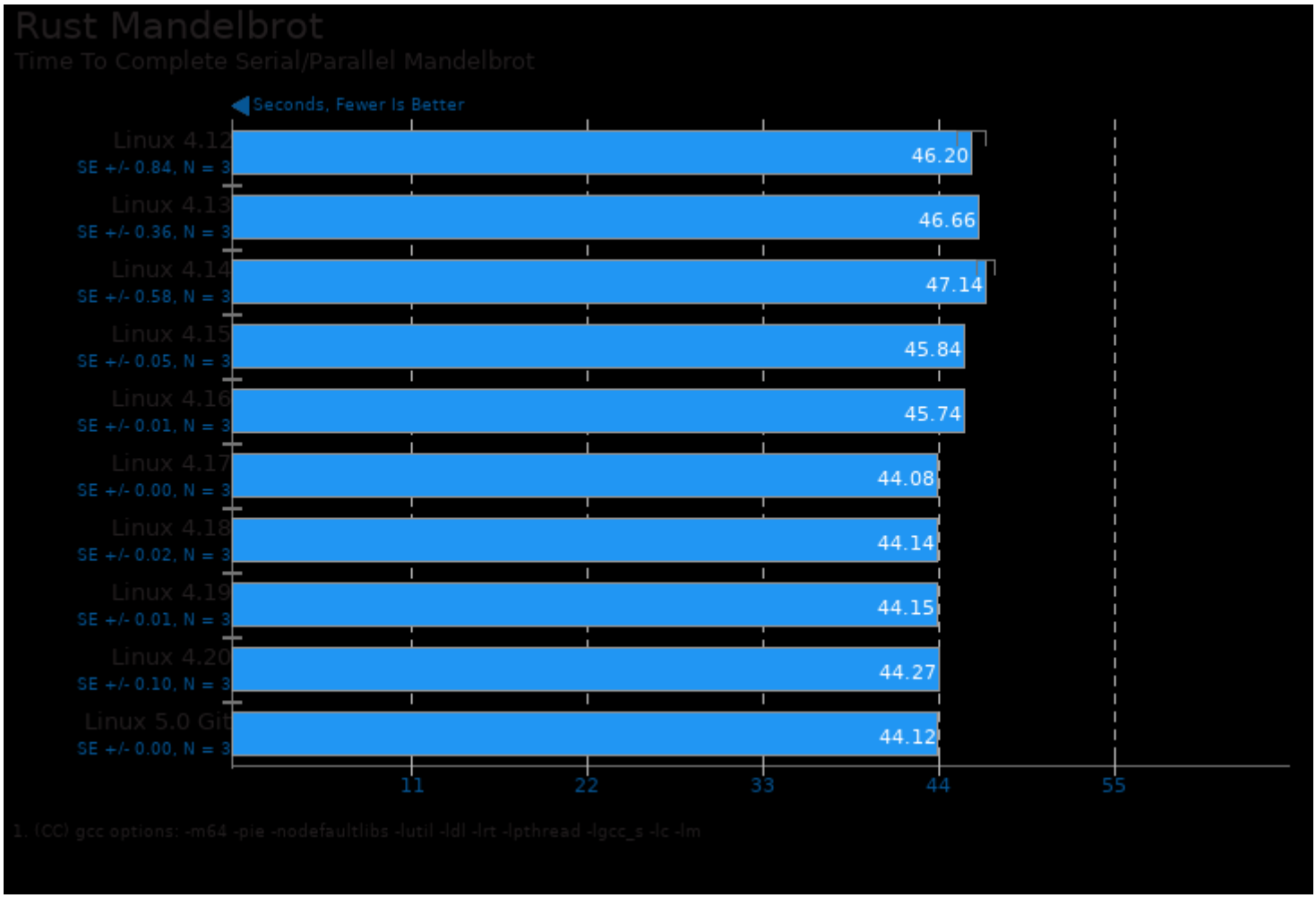
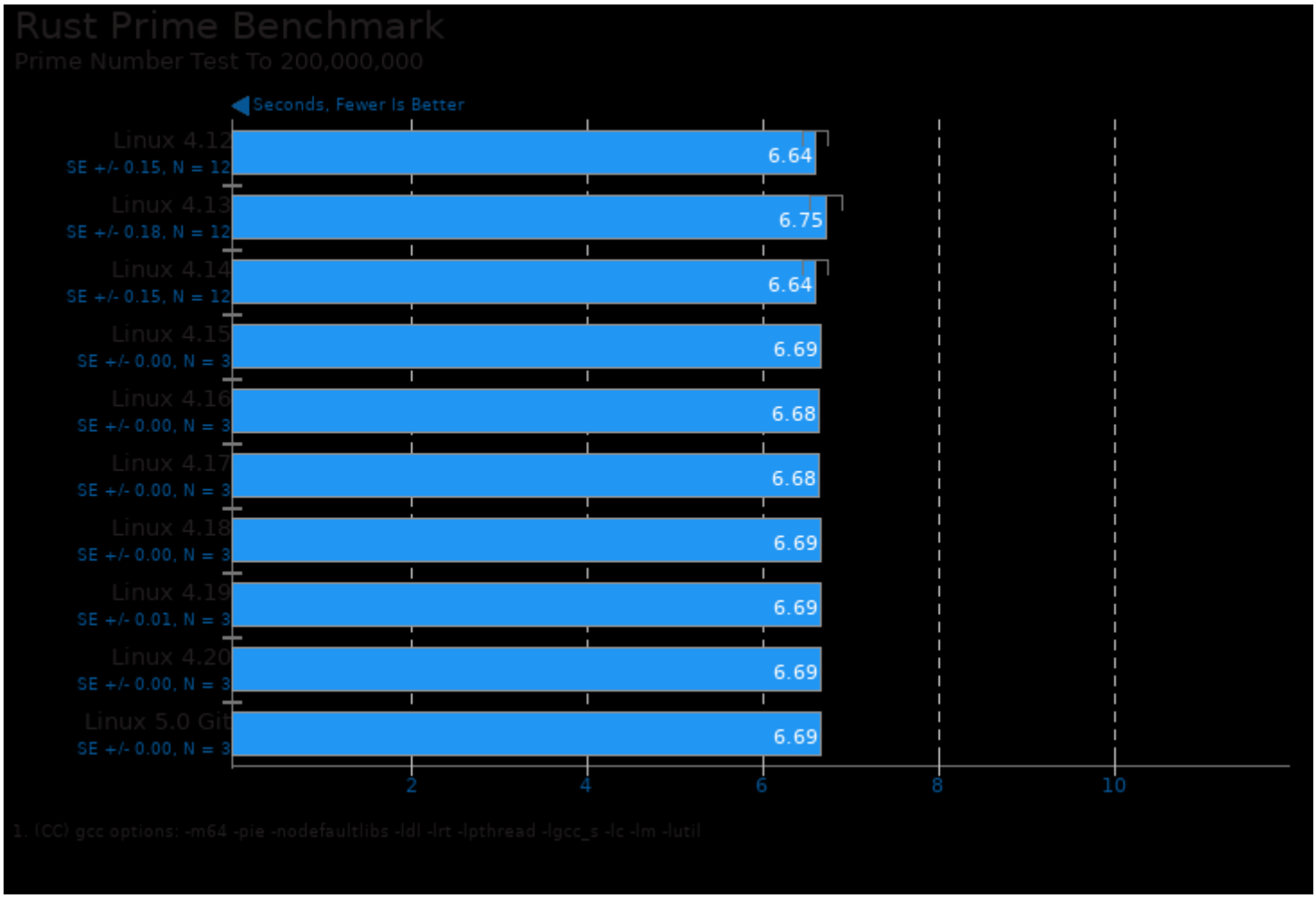


Core i9 7960X Linux 5.0 Kernel Benchmarks



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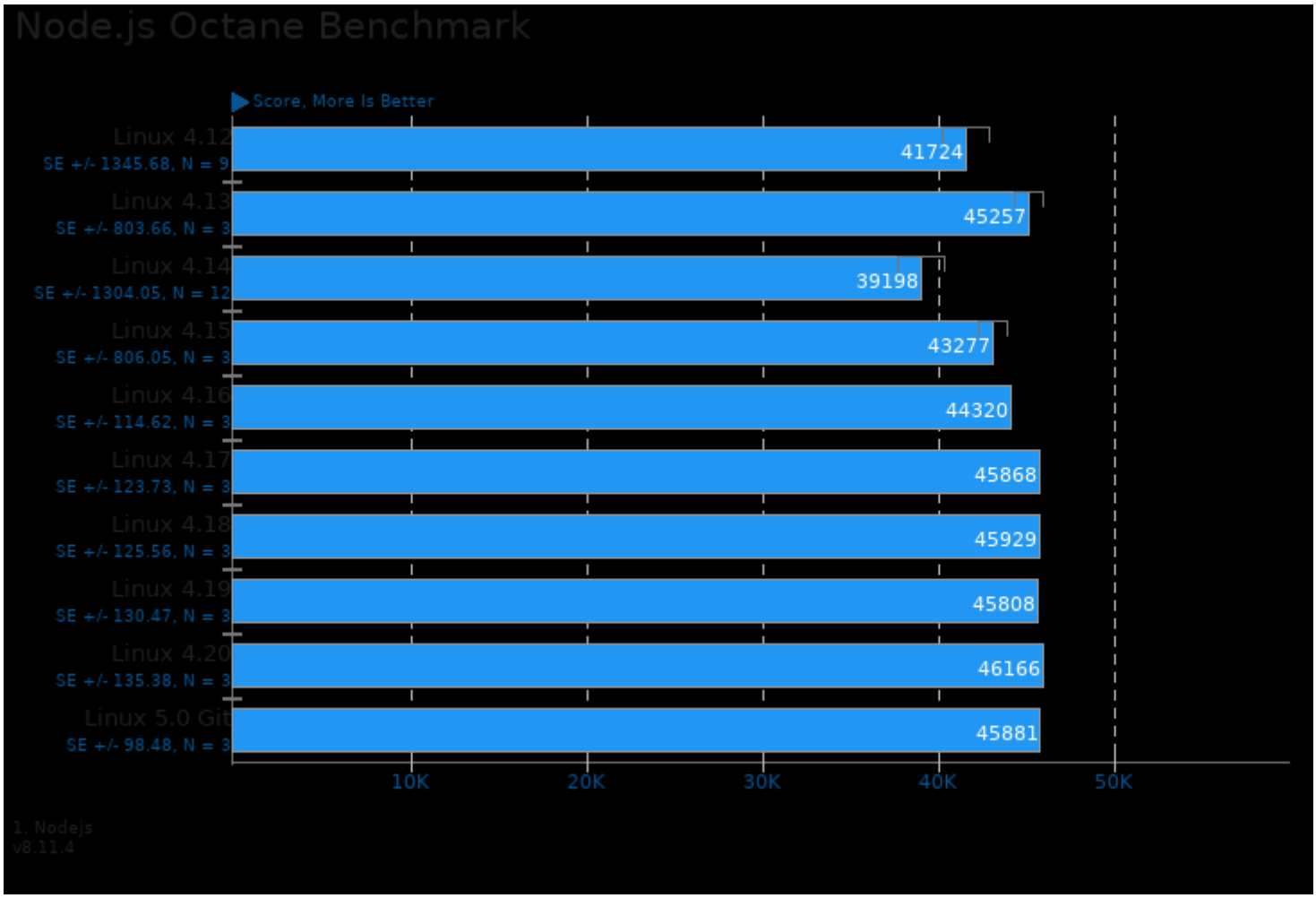

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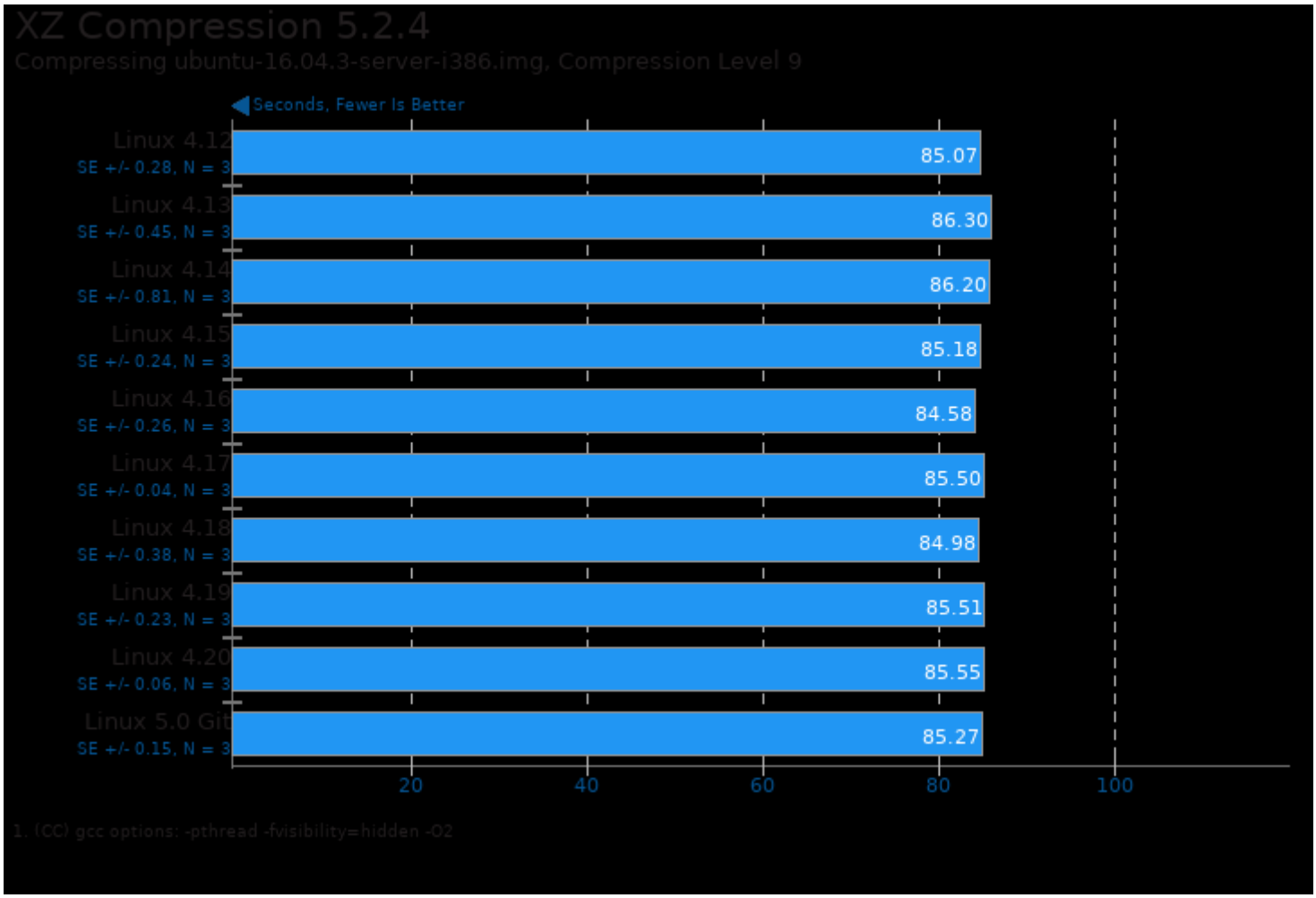

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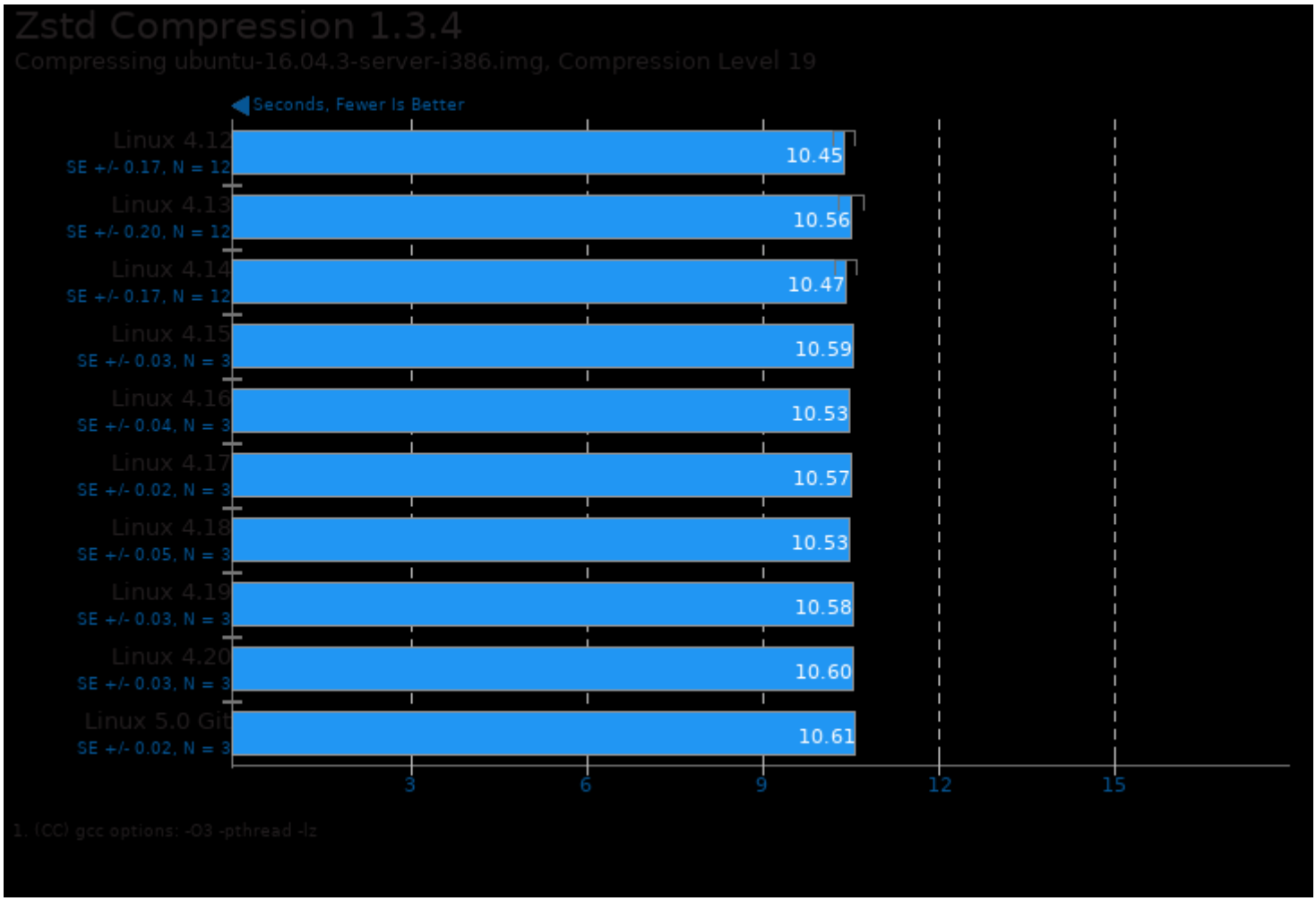

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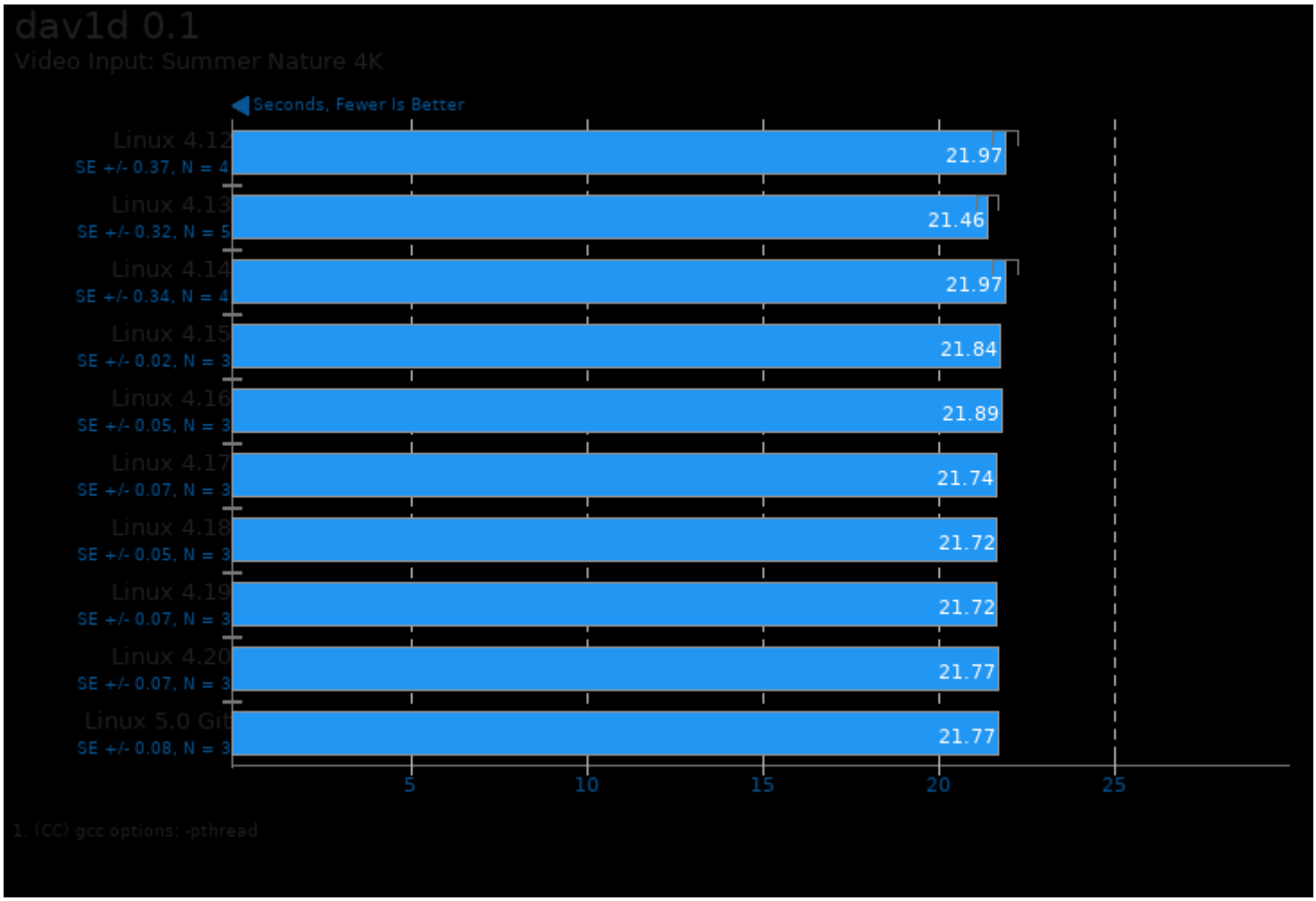

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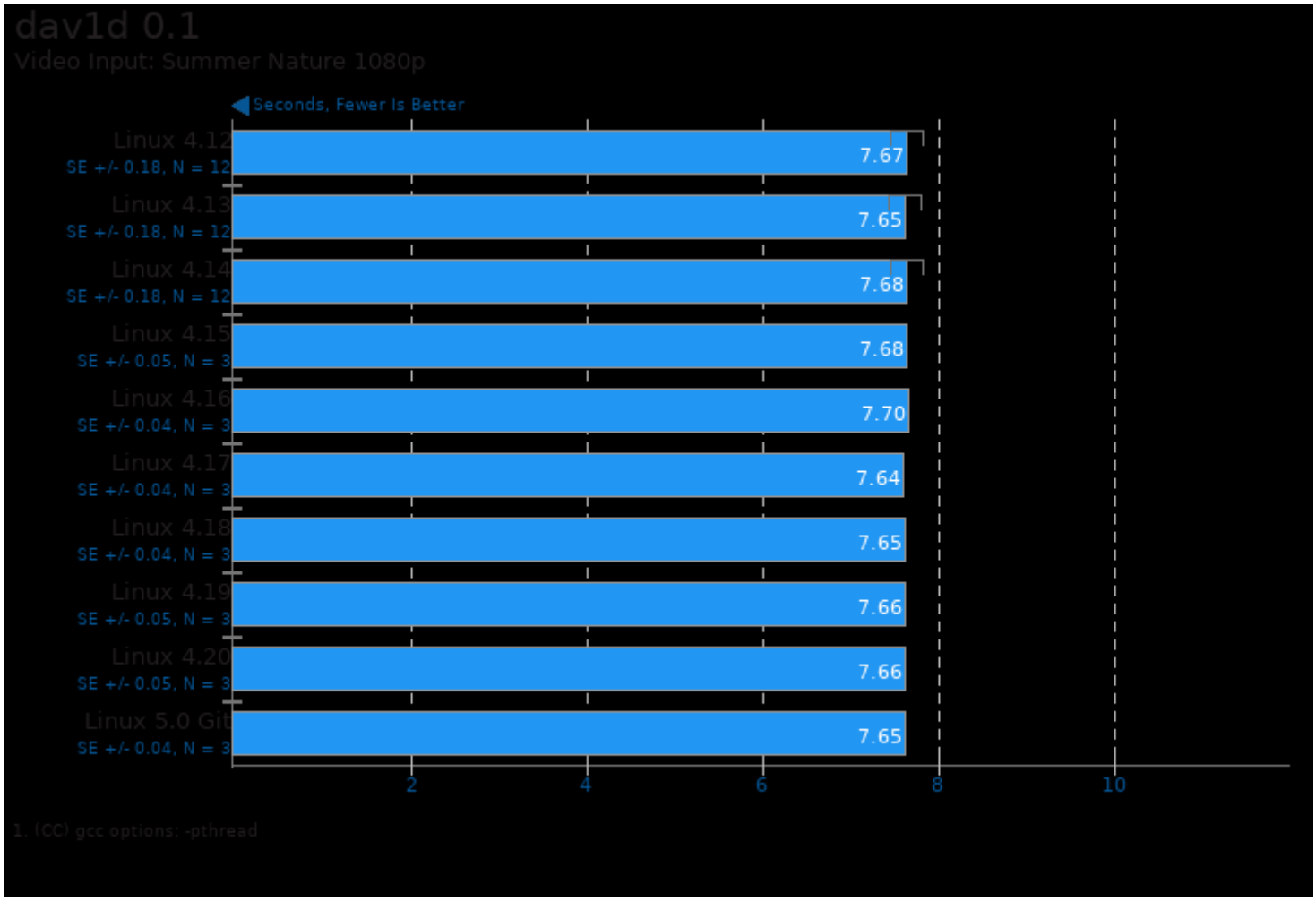

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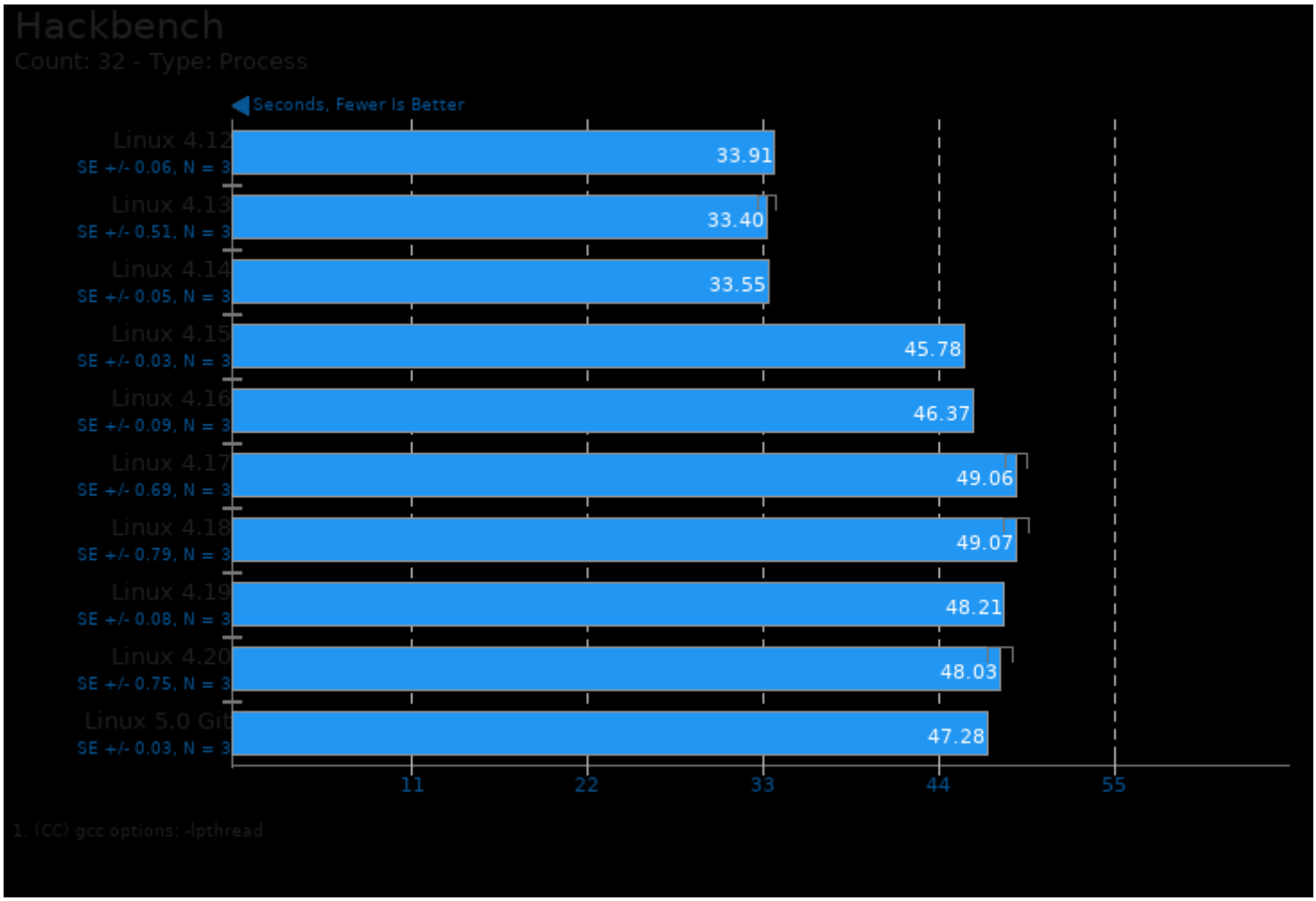
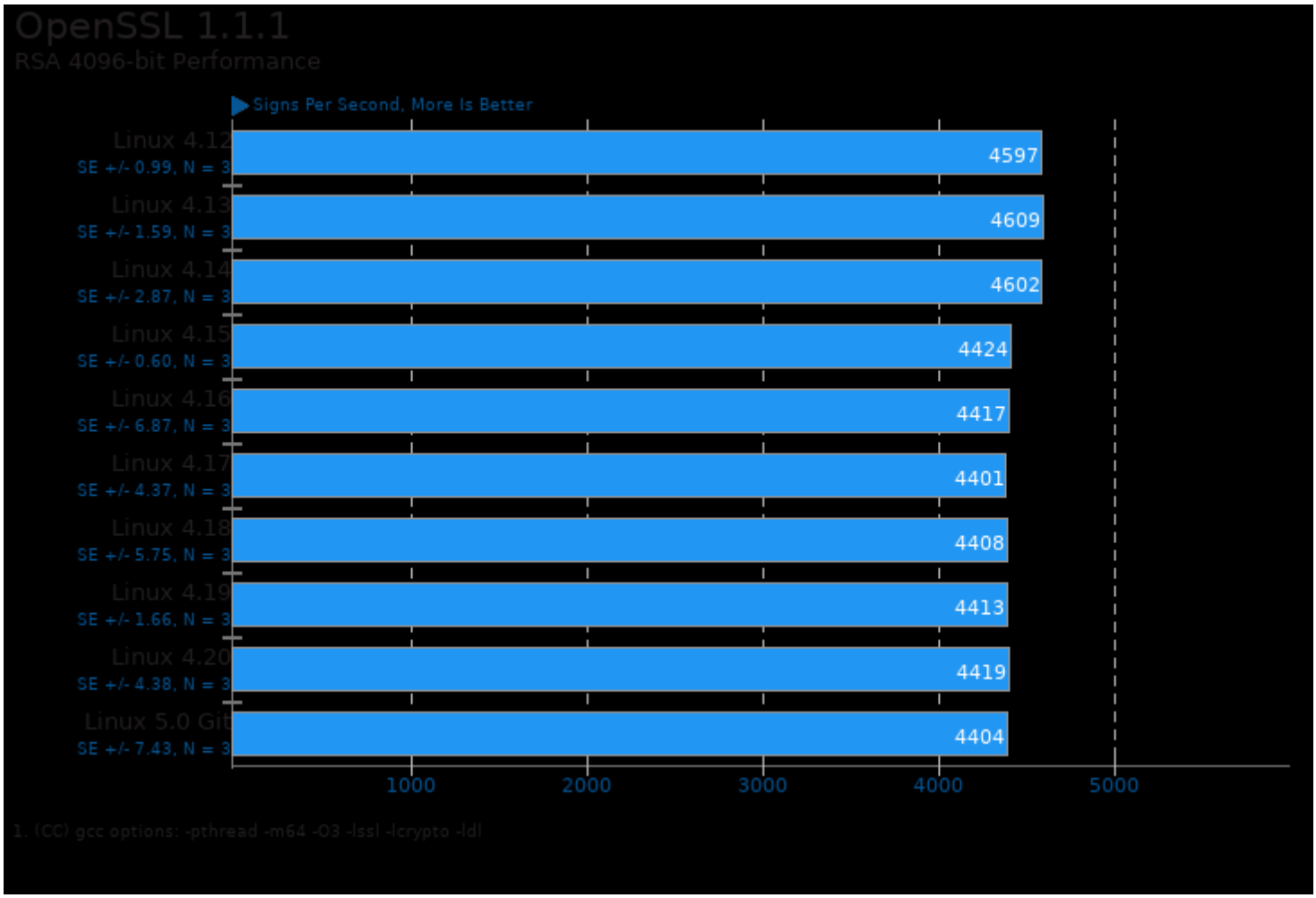


Core i9 7960X Linux 5.0 Kernel Benchmarks



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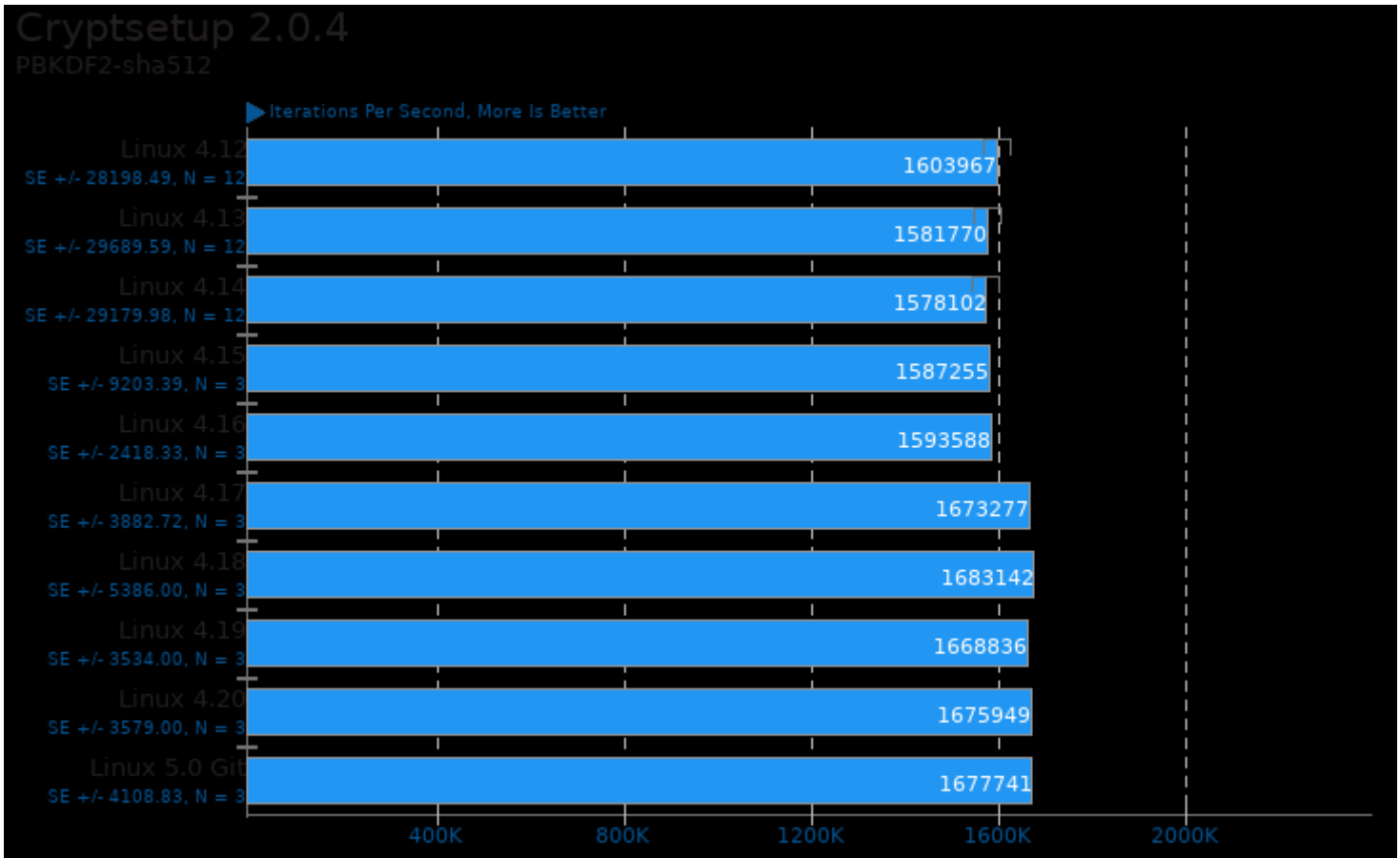
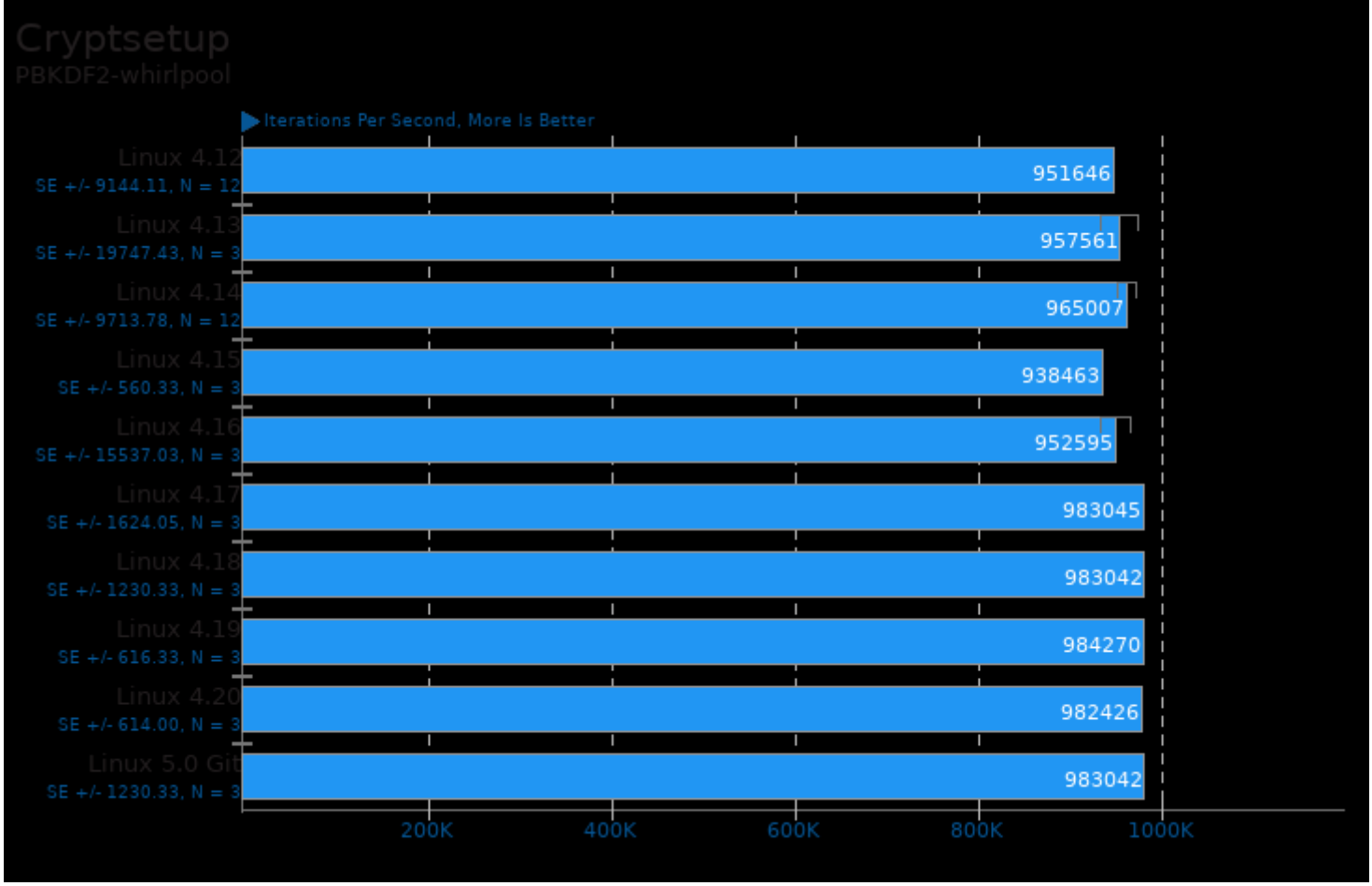
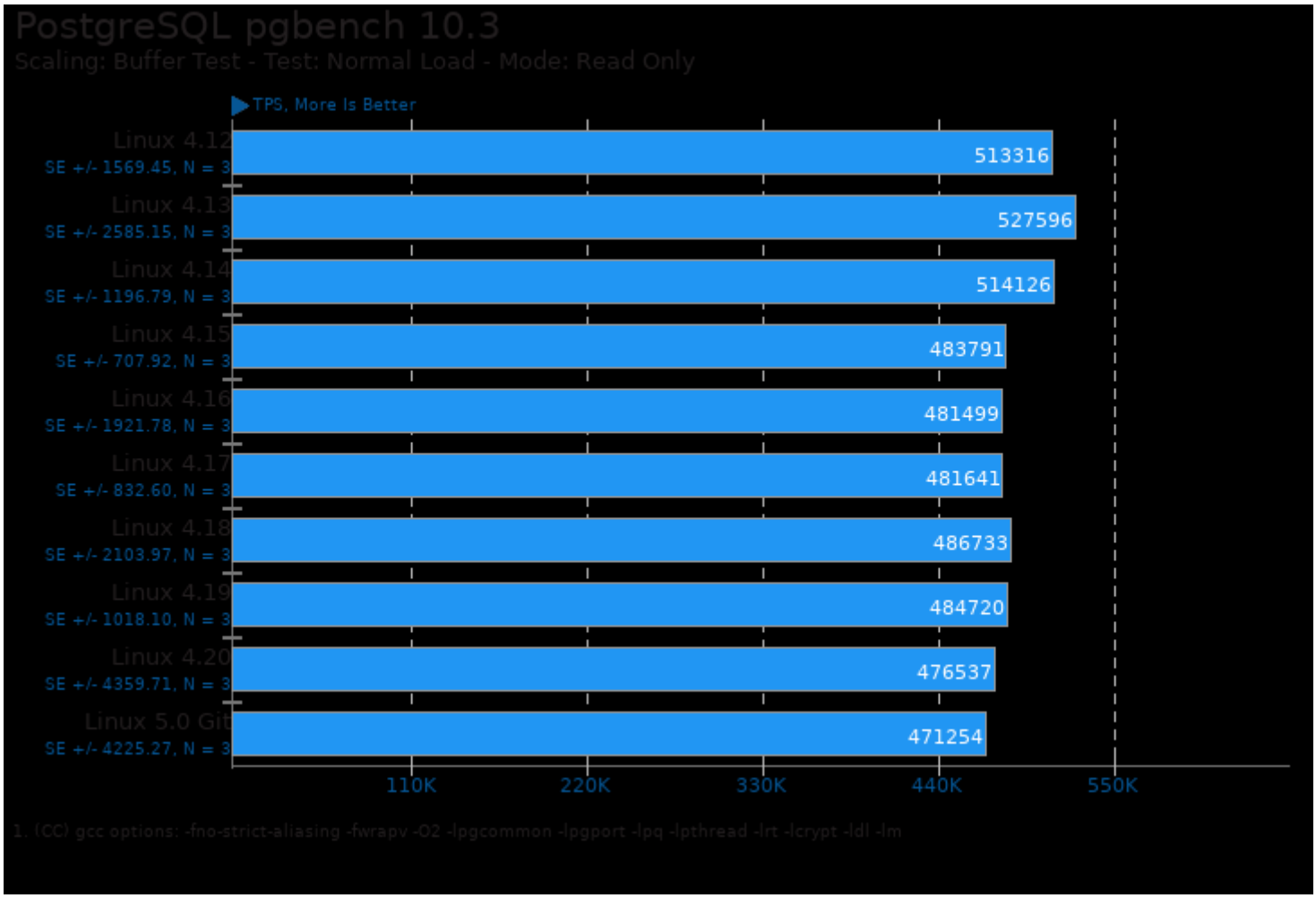




Core i9 7960X Linux 5.0 Kernel Benchmarks



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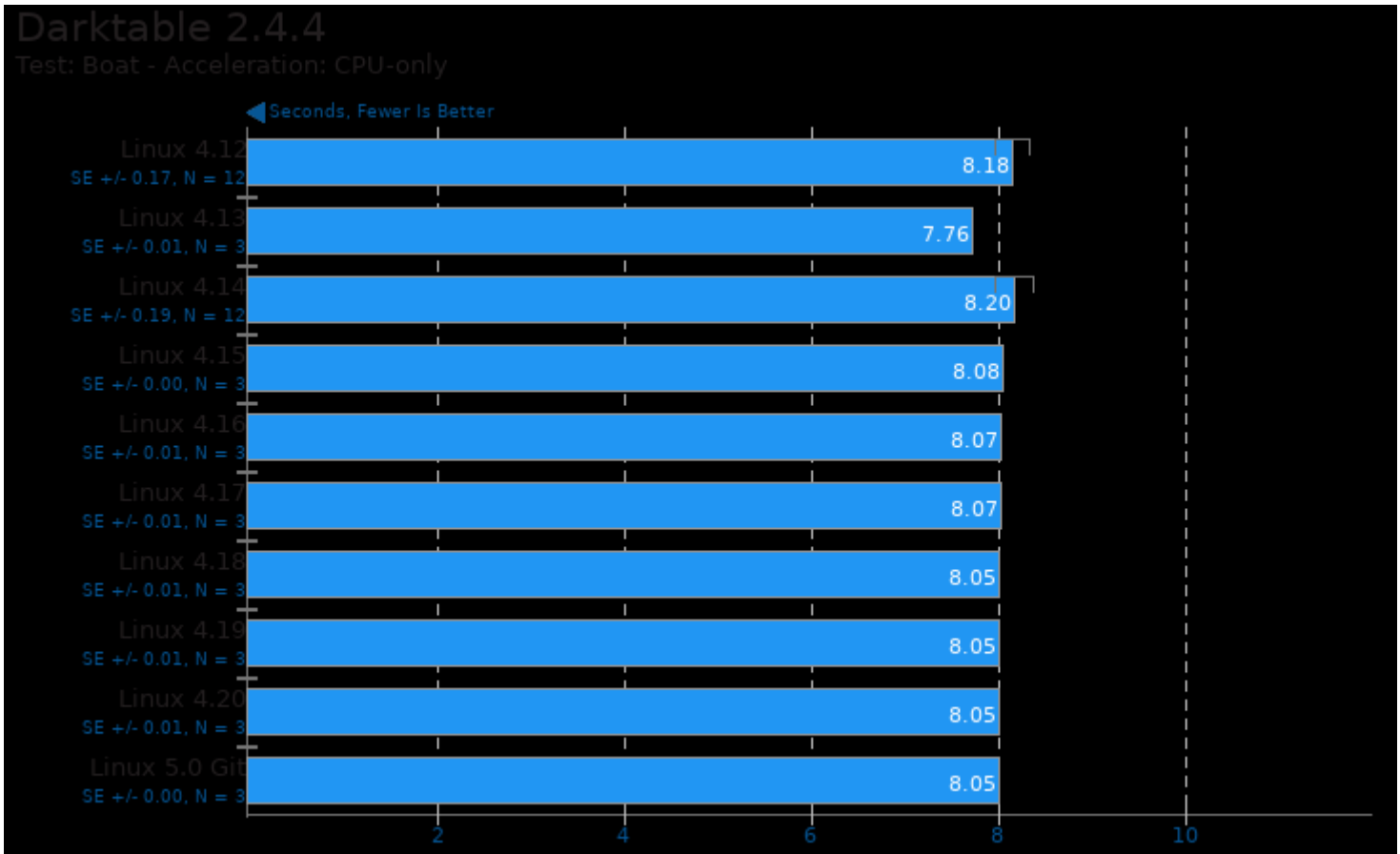
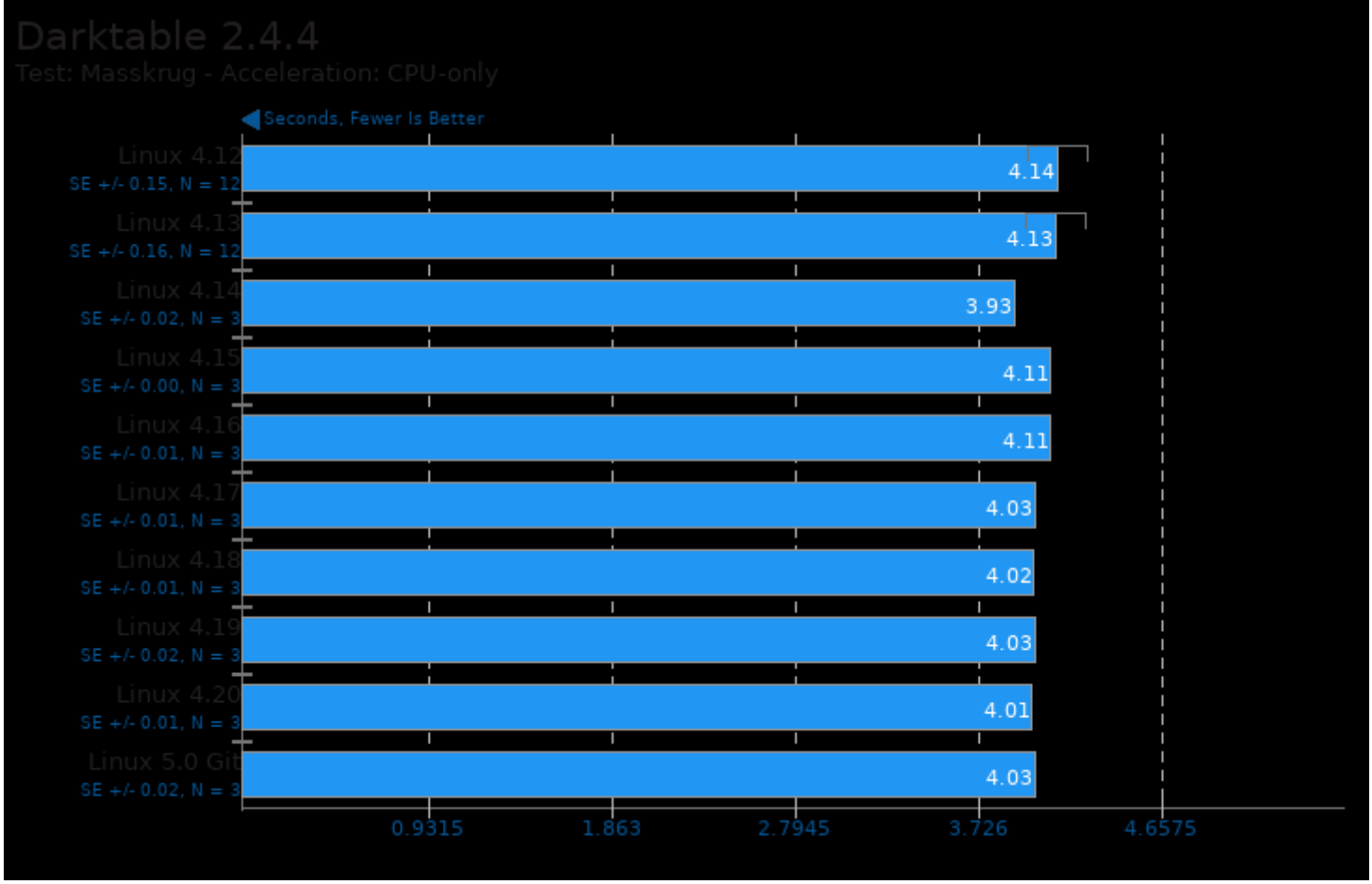
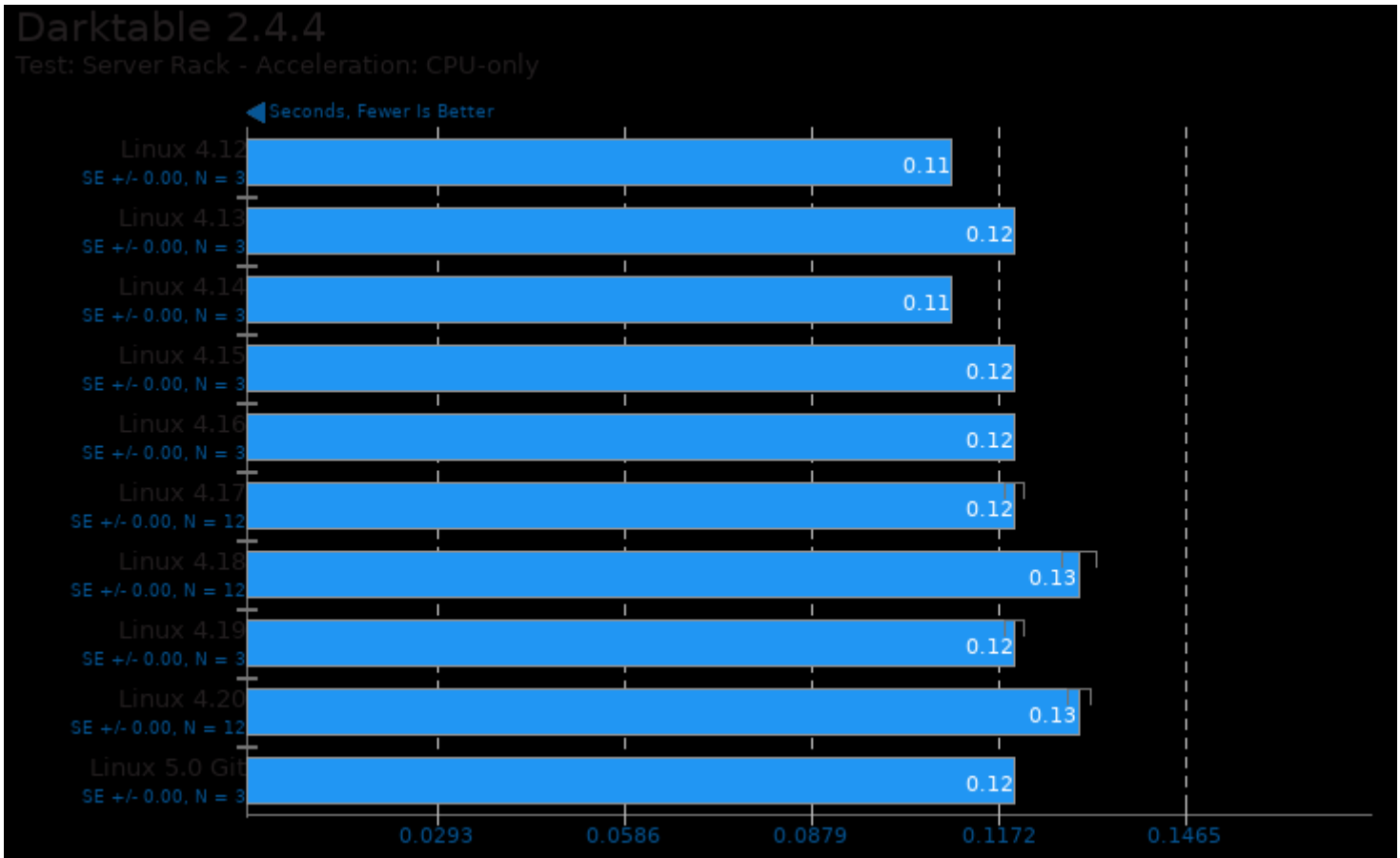
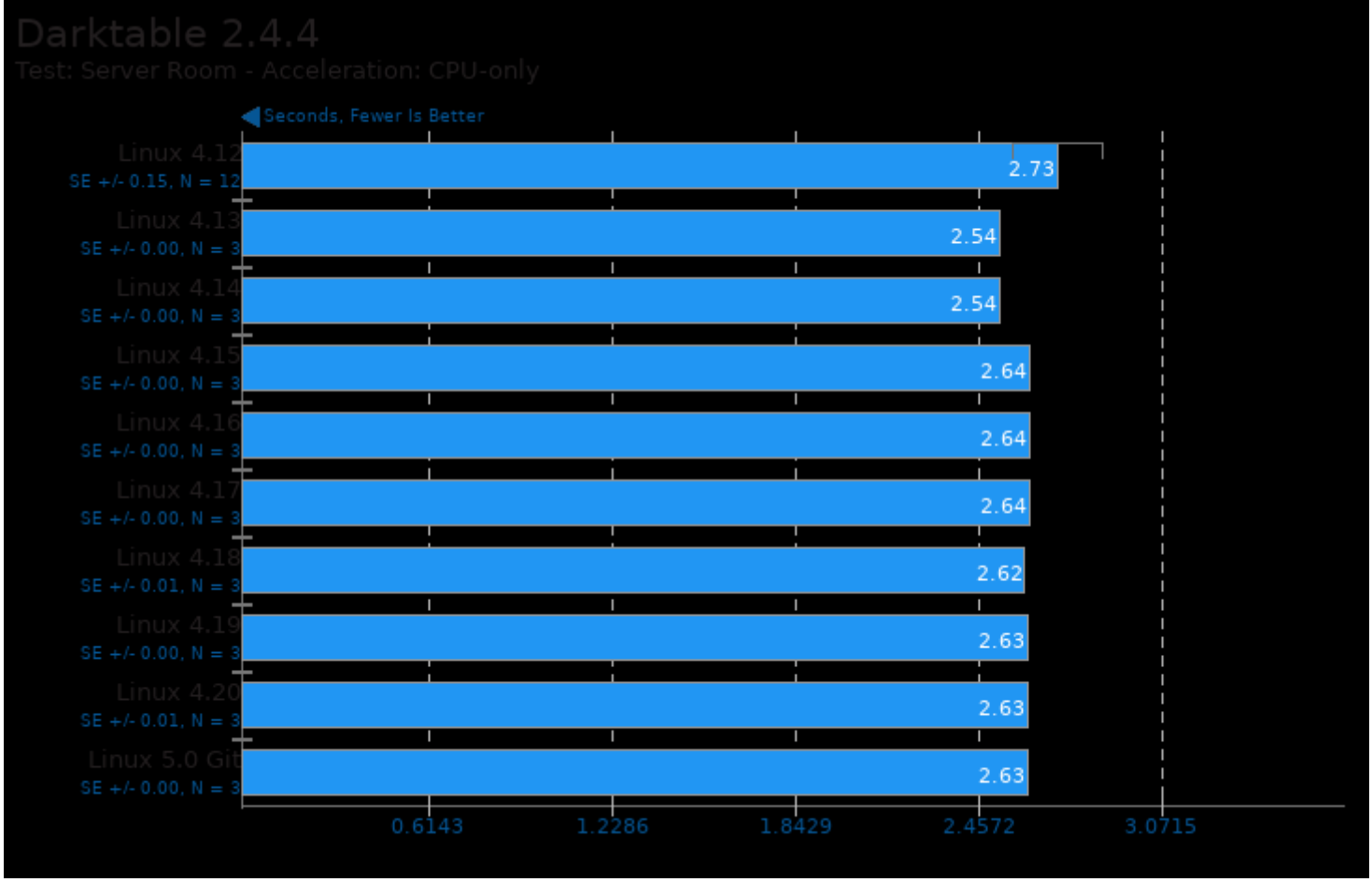
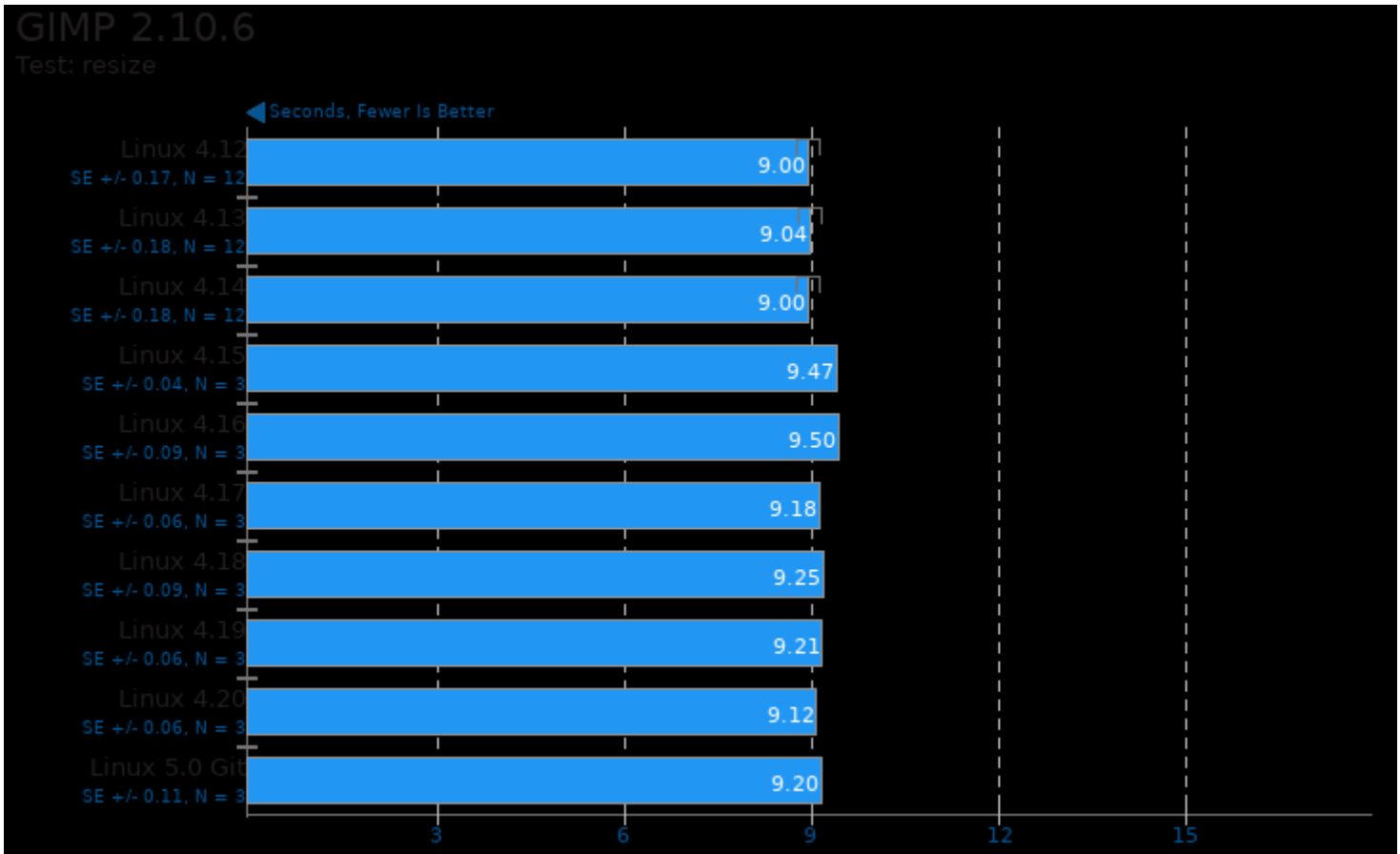


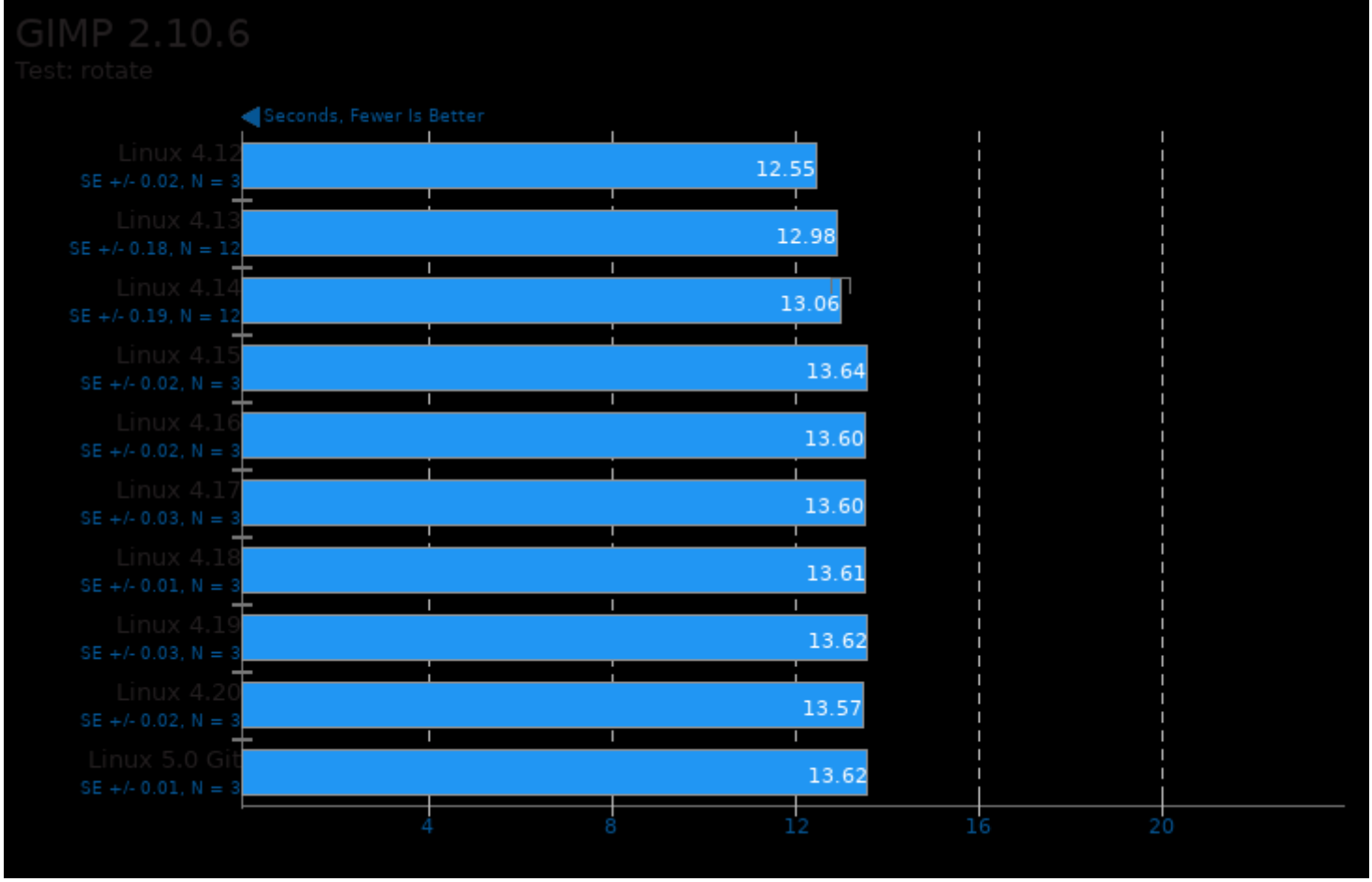



Darktable 2.4.4
Test: Server Rack - Acceleration: CPU-only
Seconds, Fewer Is Better
Linux 4.12
SE +/- 0.00, N = 3
0.11
Linux 4.13
SE +/- 0.00, N = 3
0.12
Linux 4.14
SE +/- 0.00, N = 3
0.11
Linux 4.15
SE +/- 0.00, N = 3
0.12
Linux 4.16
SE +/- 0.00, N = 3
0.12
Linux 4.17
SE +/- 0.00, N = 12
0.12
Linux 4.18
SE +/- 0.00, N = 12
0.13
Linux 4.19
SE +/- 0.00, N = 3
0.12
Linux 4.20
SE +/- 0.00, N = 12
0.13
Linux 5.0 Git
SE +/- 0.00, N = 3
0.12
0.0293
0.0586
0.0879
0.1172
0.1465

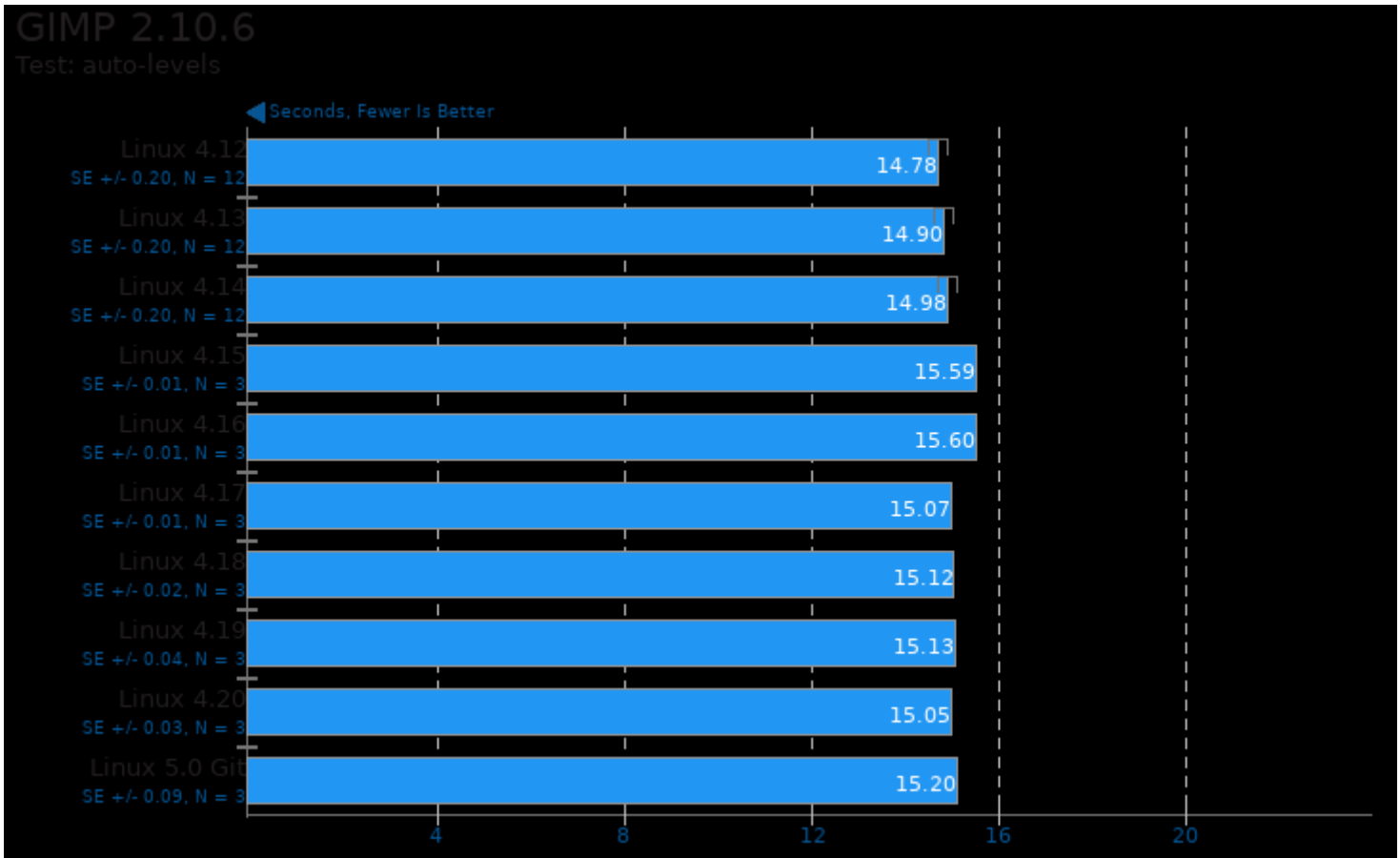

Darktable 2.4.4
Test: Server Room - Acceleration: CPU-only
Seconds, Fewer Is Better
Linux 4.12
SE +/- 0.15, N = 12
2.73
Linux 4.13
SE +/- 0.00, N = 3
2.54
Linux 4.14
SE +/- 0.00, N = 3
2.54
Linux 4.15
SE +/- 0.00, N = 3
2.64
Linux 4.16
SE +/- 0.00, N = 3
2.64
Linux 4.17
SE +/- 0.00, N = 3
2.64
Linux 4.18
SE +/- 0.01, N = 3
2.62
Linux 4.19
SE +/- 0.00, N = 3
2.63
Linux 4.20
SE +/- 0.01, N = 3
2.63
Linux 5.0 Git
SE +/- 0.00, N = 3
2.63
0.6143
1.2286
1.8429
2.4572
3.0715

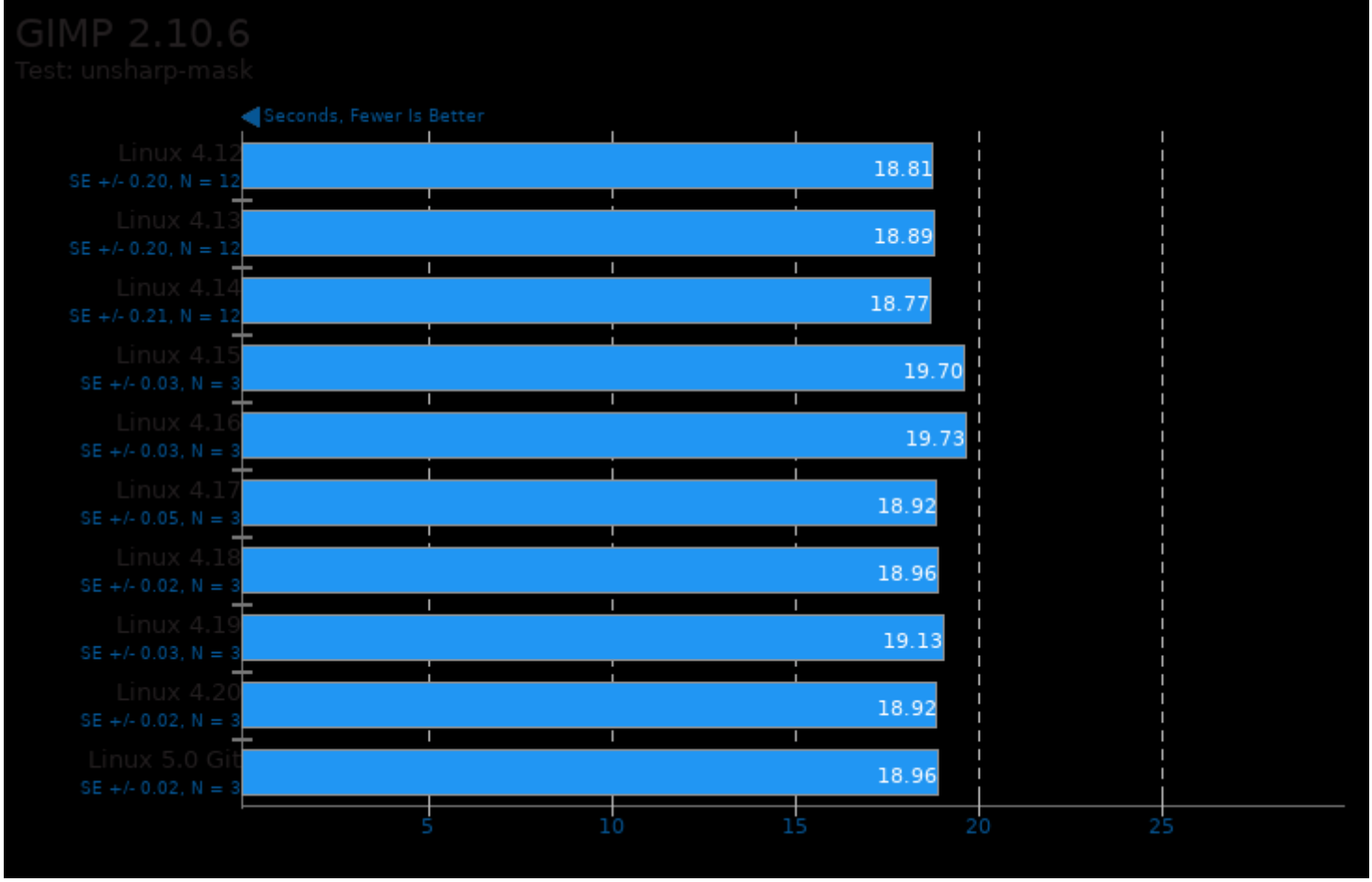
Core i9 7960X Linux 5.0 Kernel Benchmarks





Core i9 7960X Linux 5.0 Kernel Benchmarks





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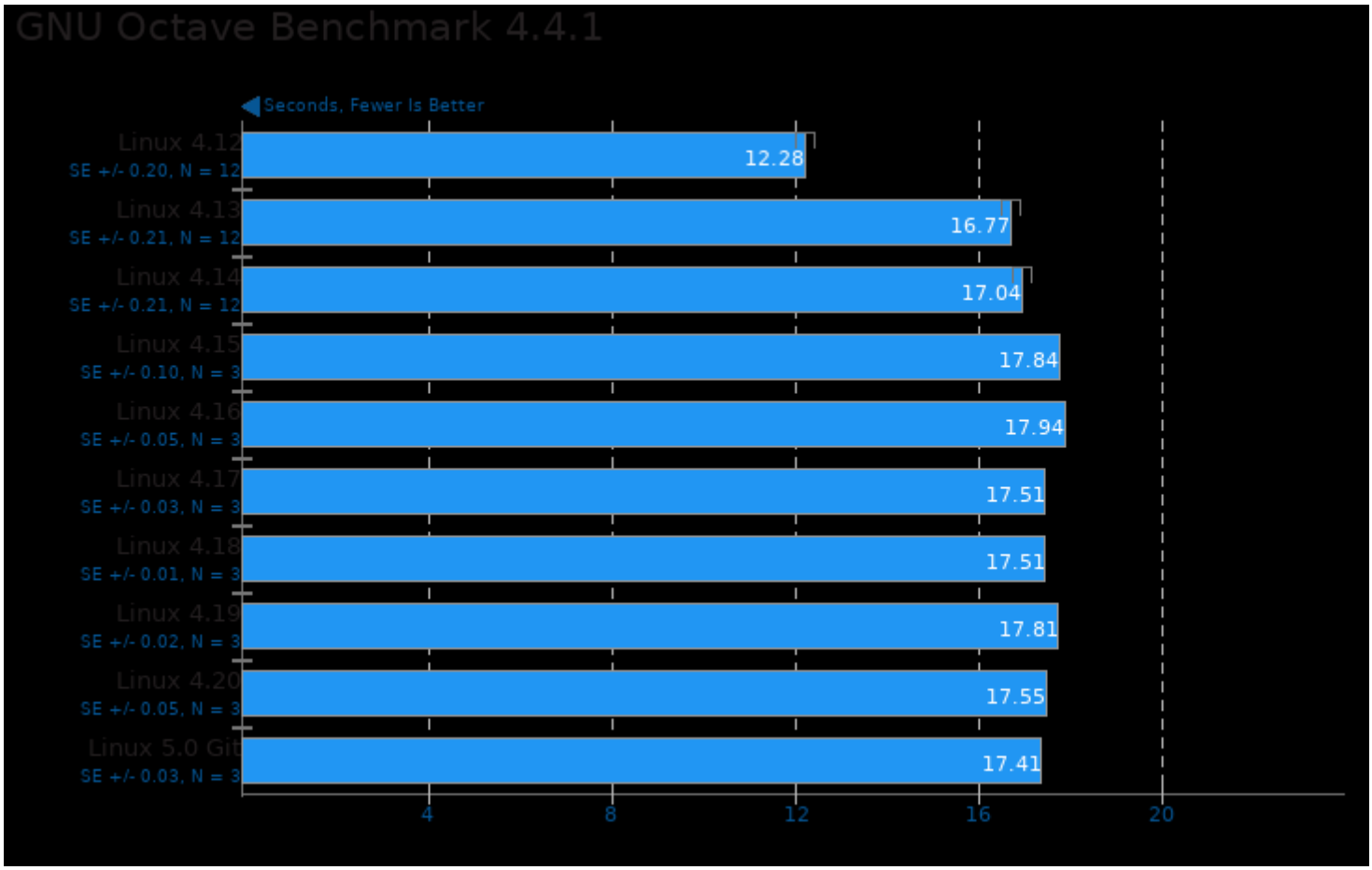

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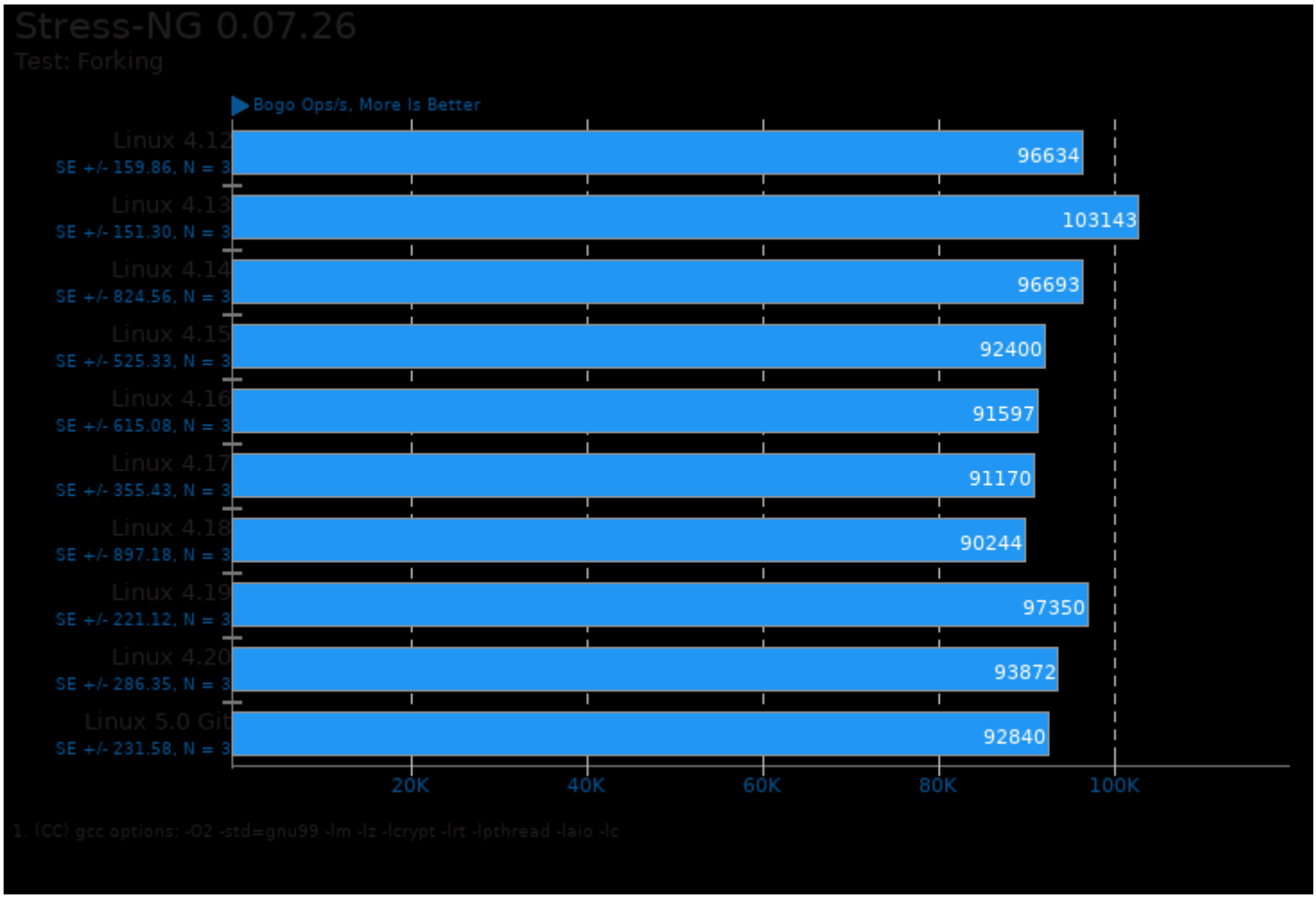

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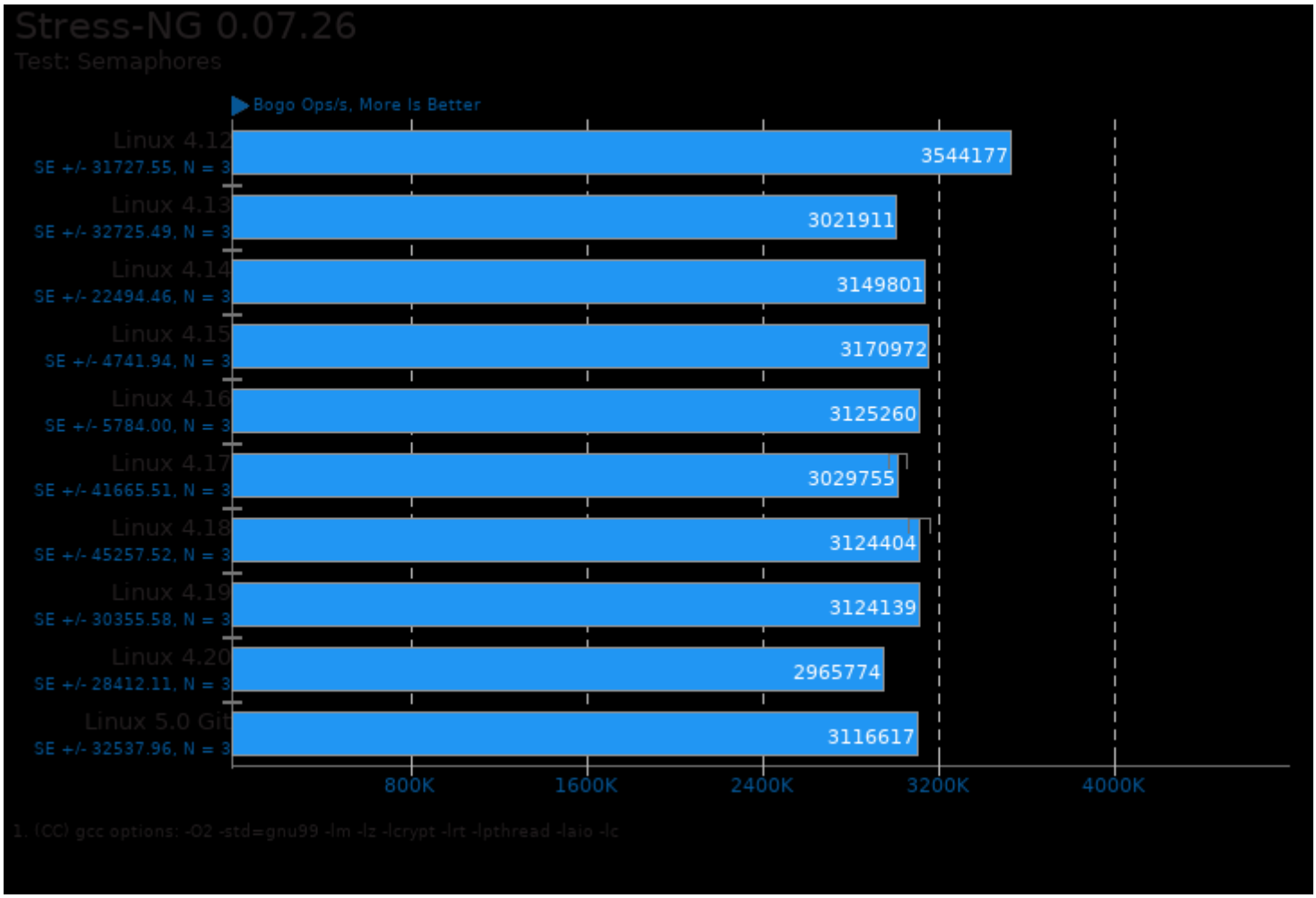

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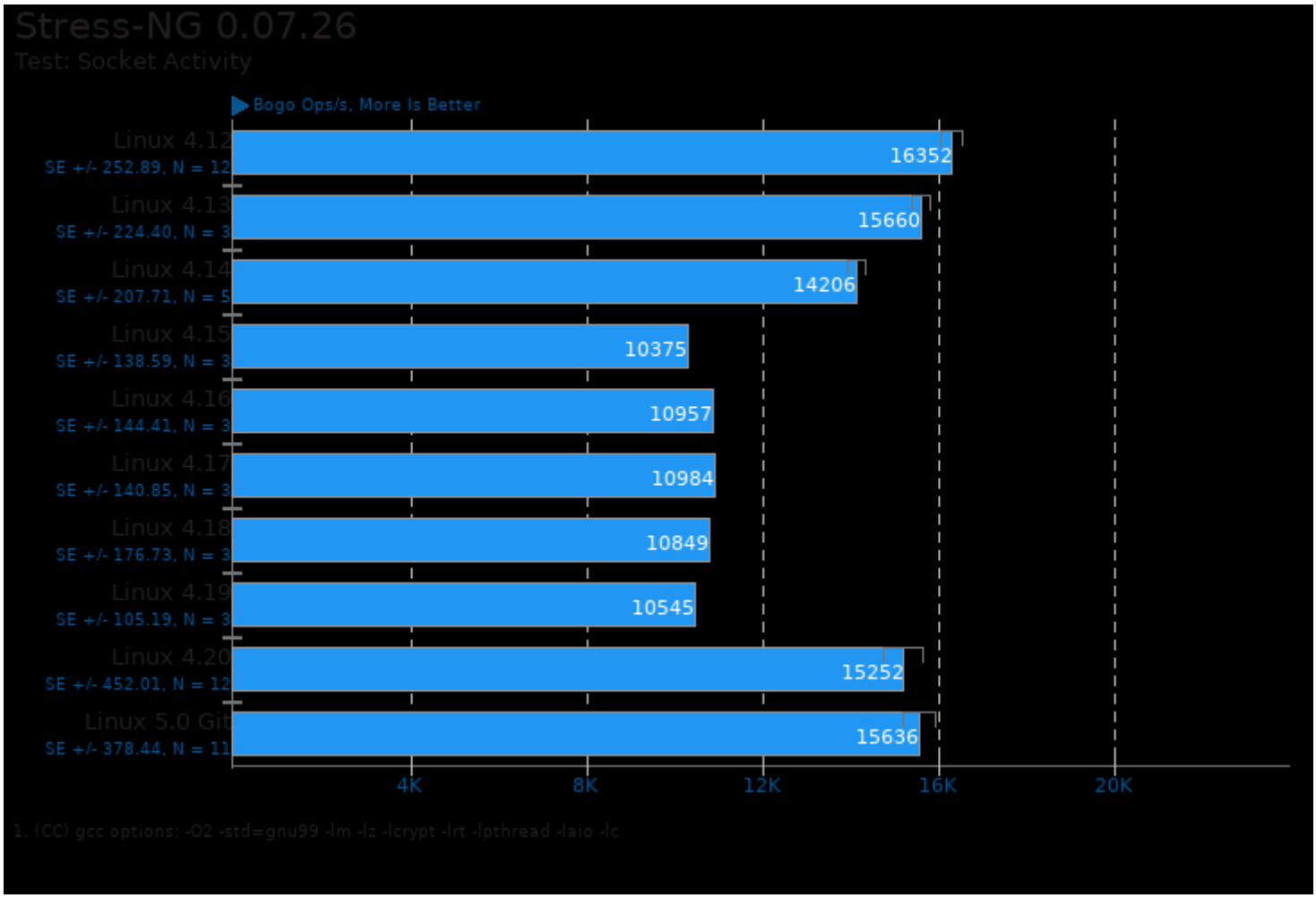

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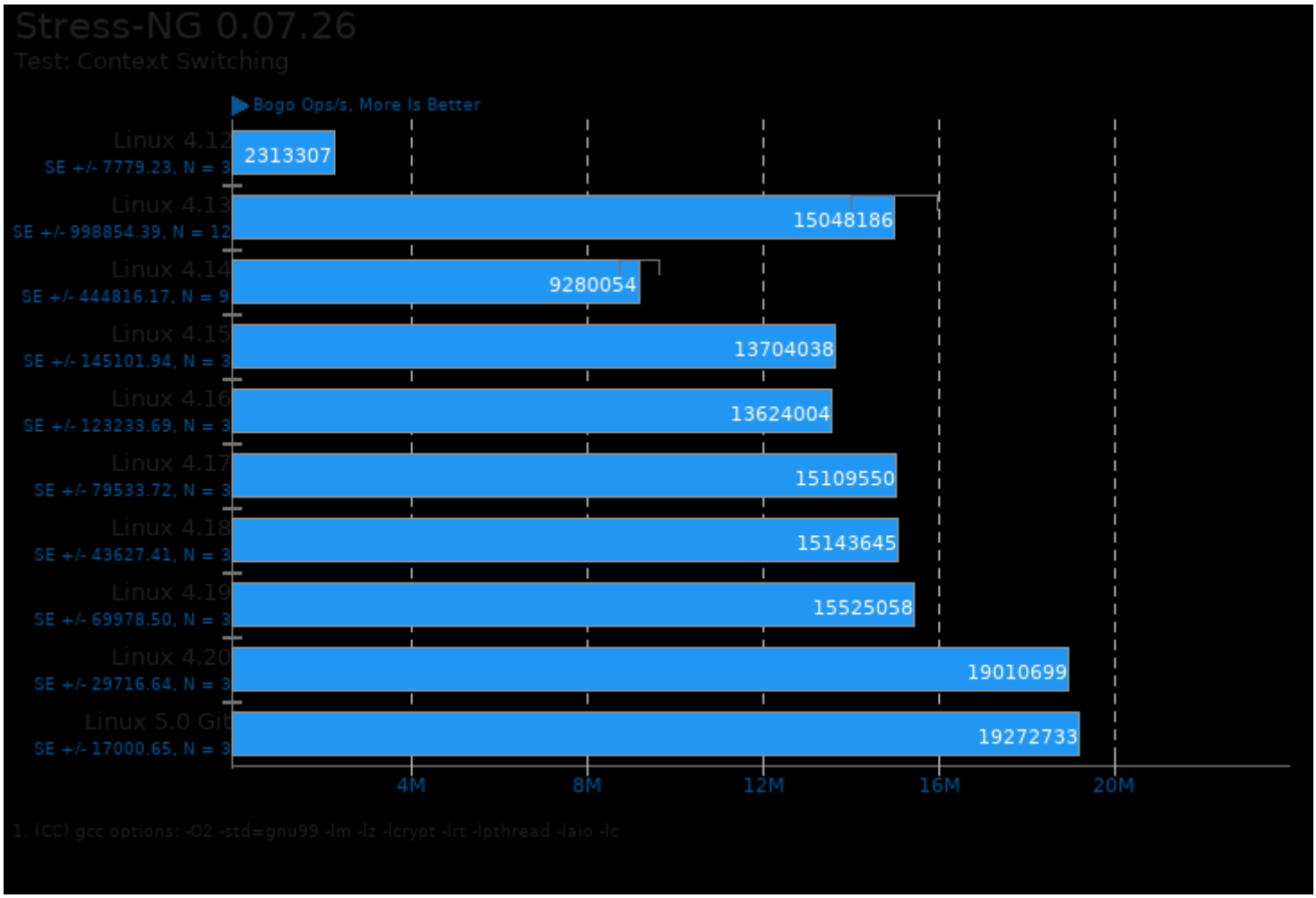

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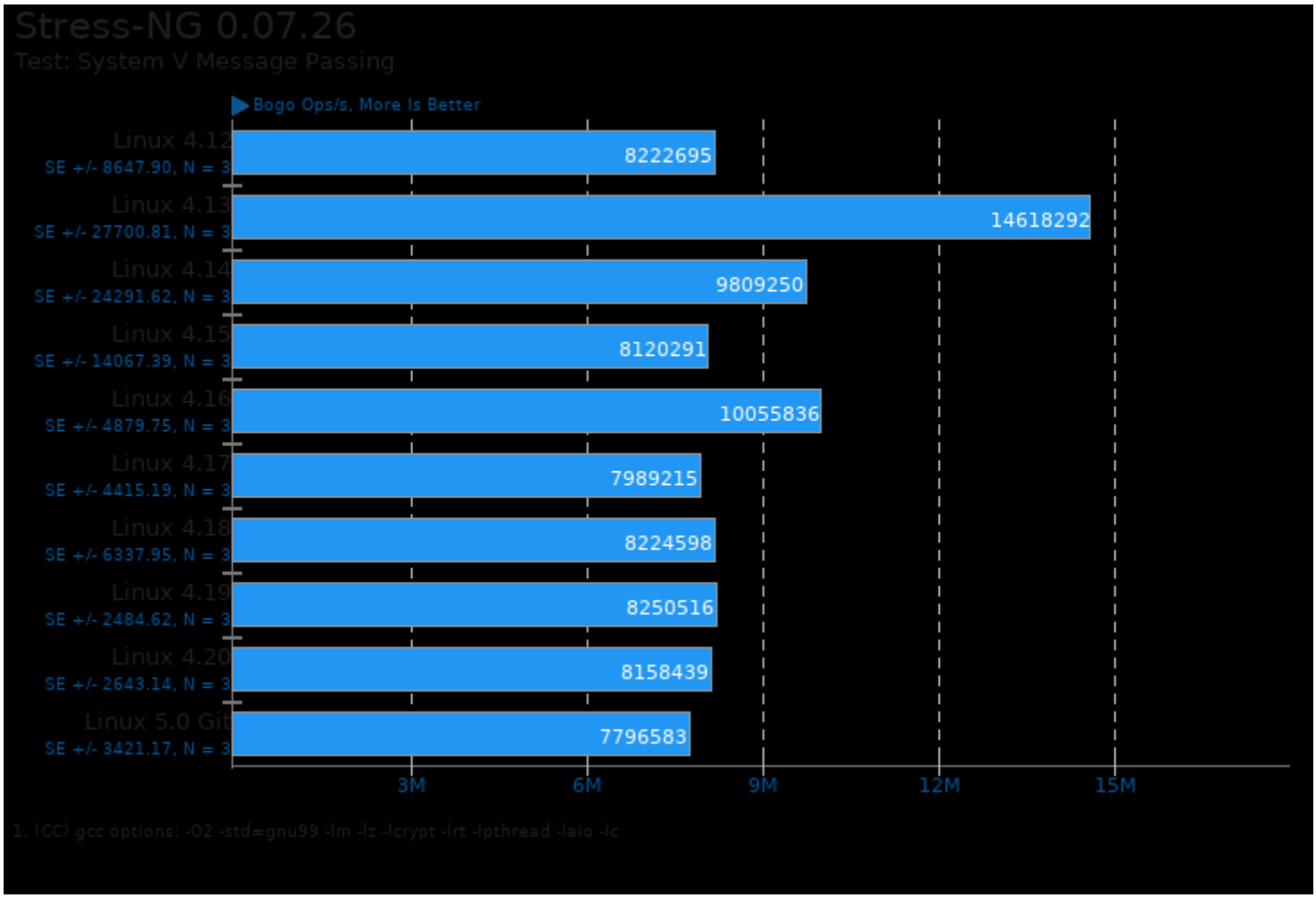
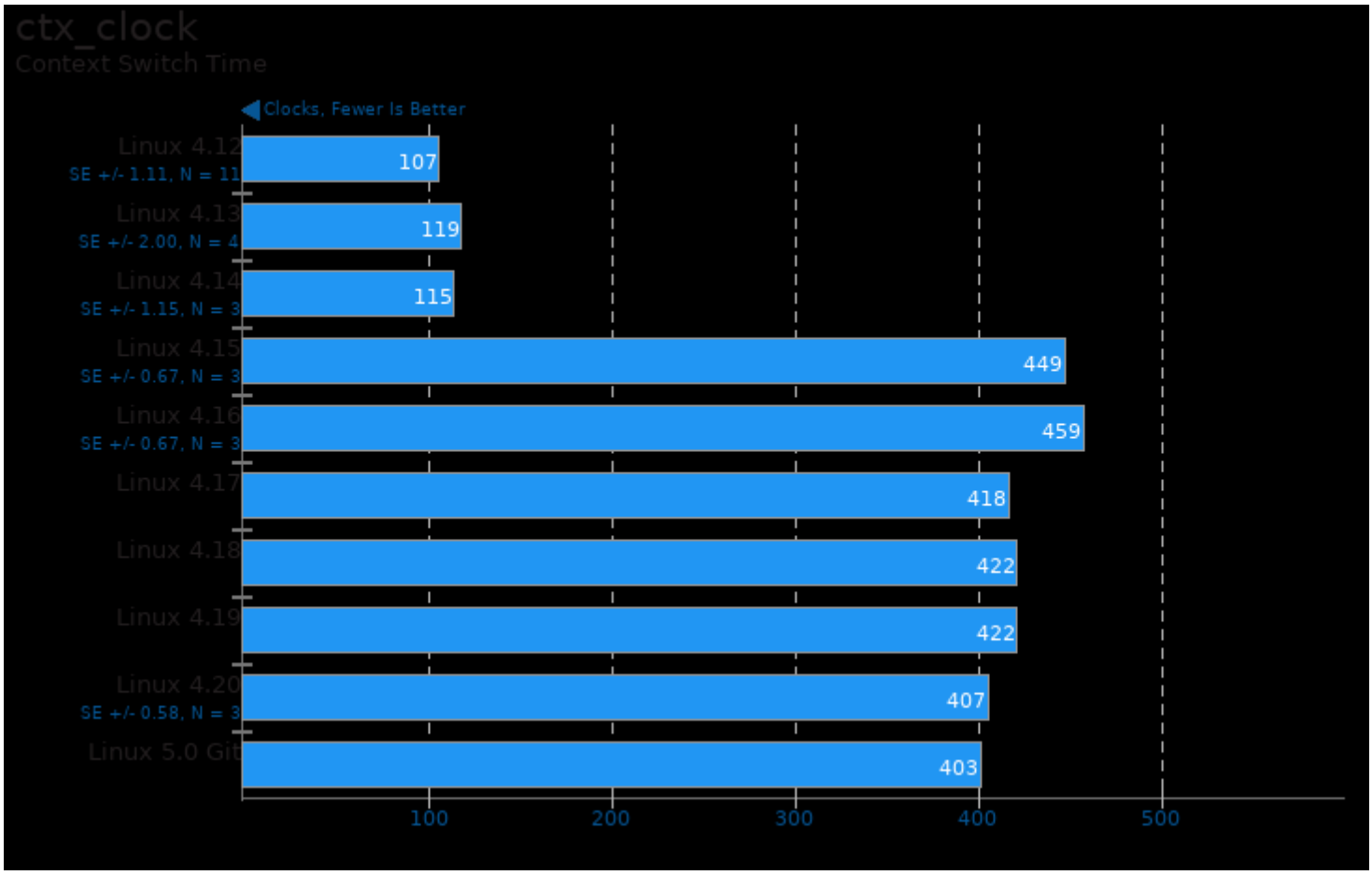


Core i9 7960X Linux 5.0 Kernel Benchmarks



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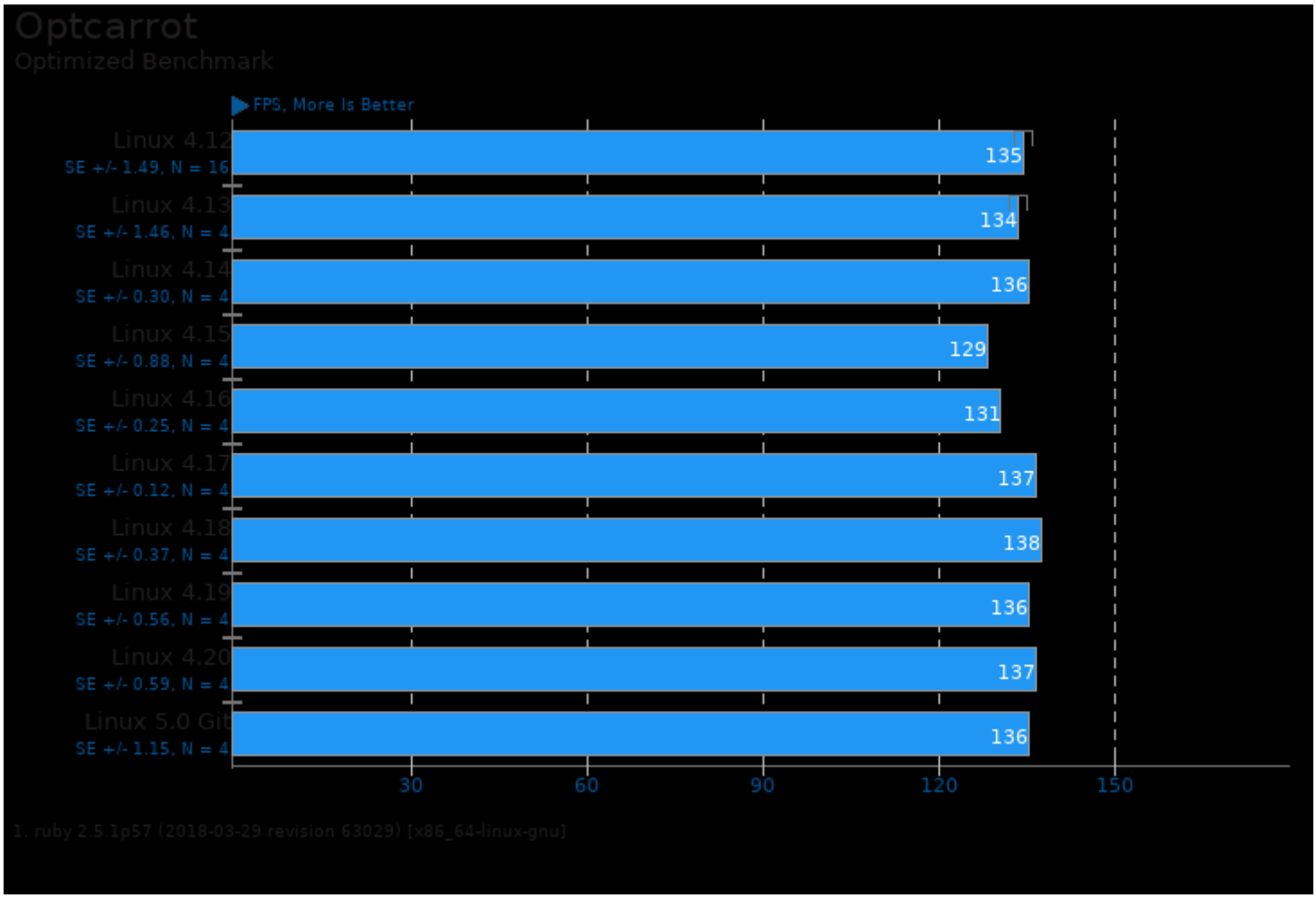
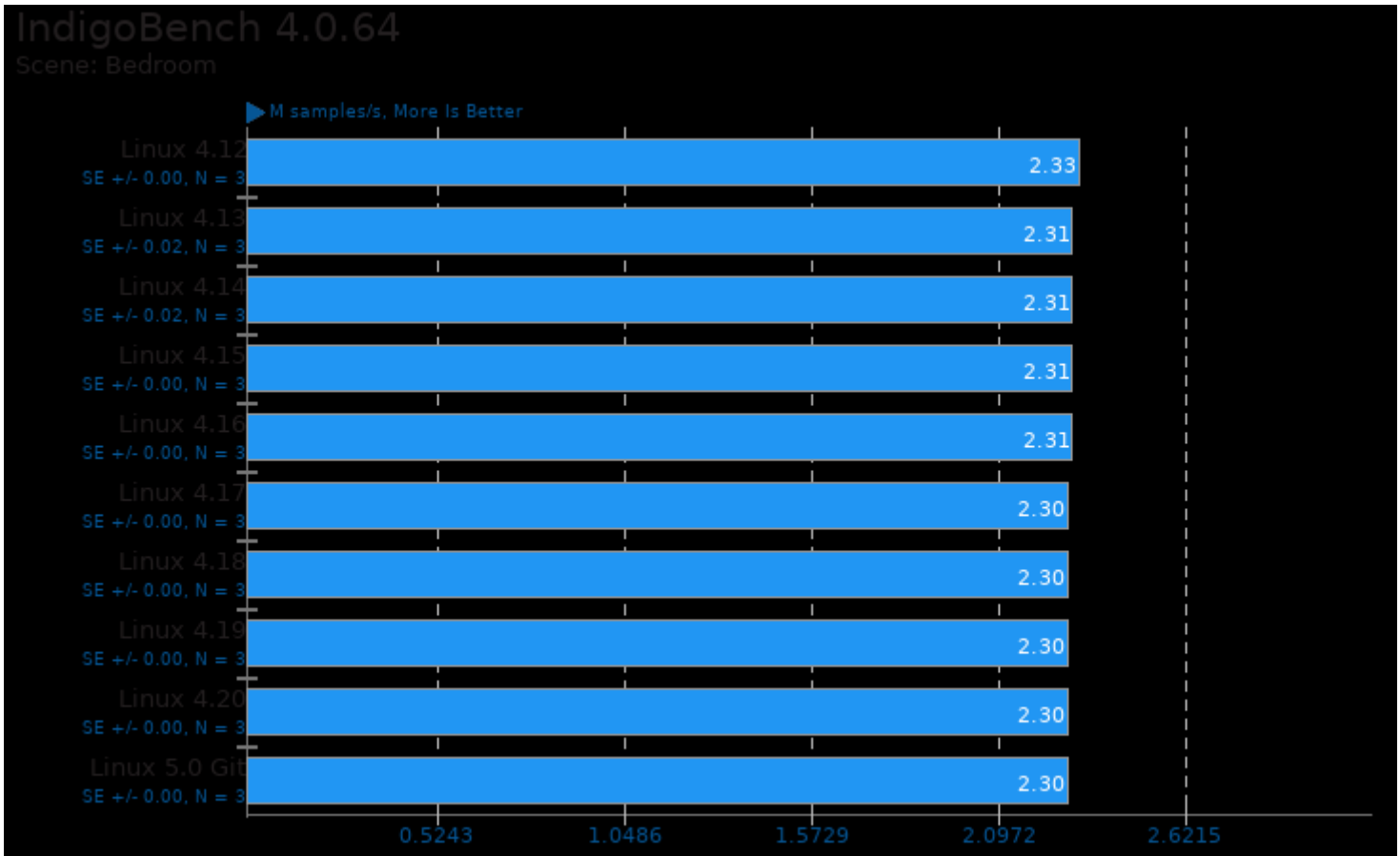
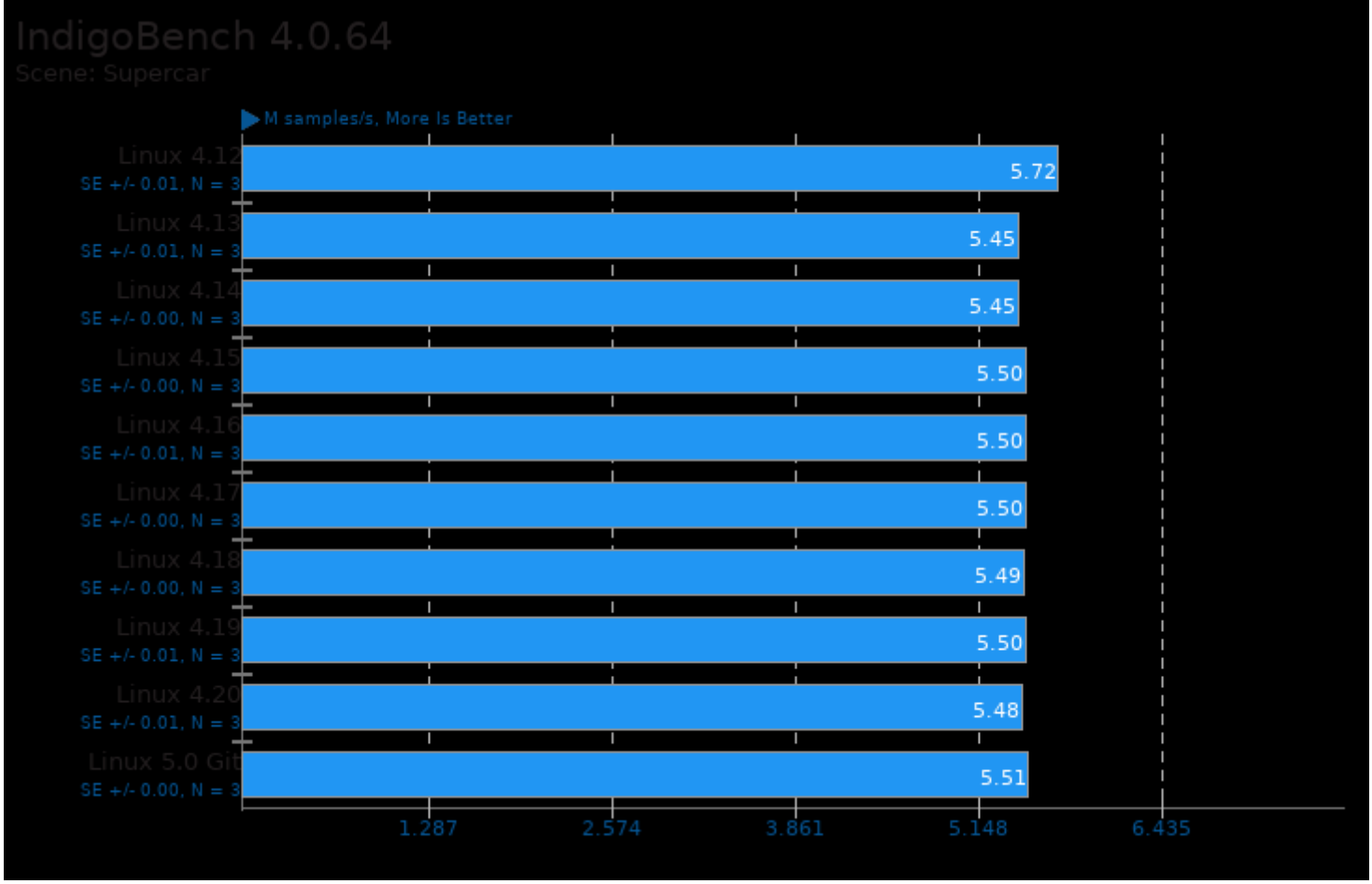


Core i9 7960X Linux 5.0 Kernel Benchmarks





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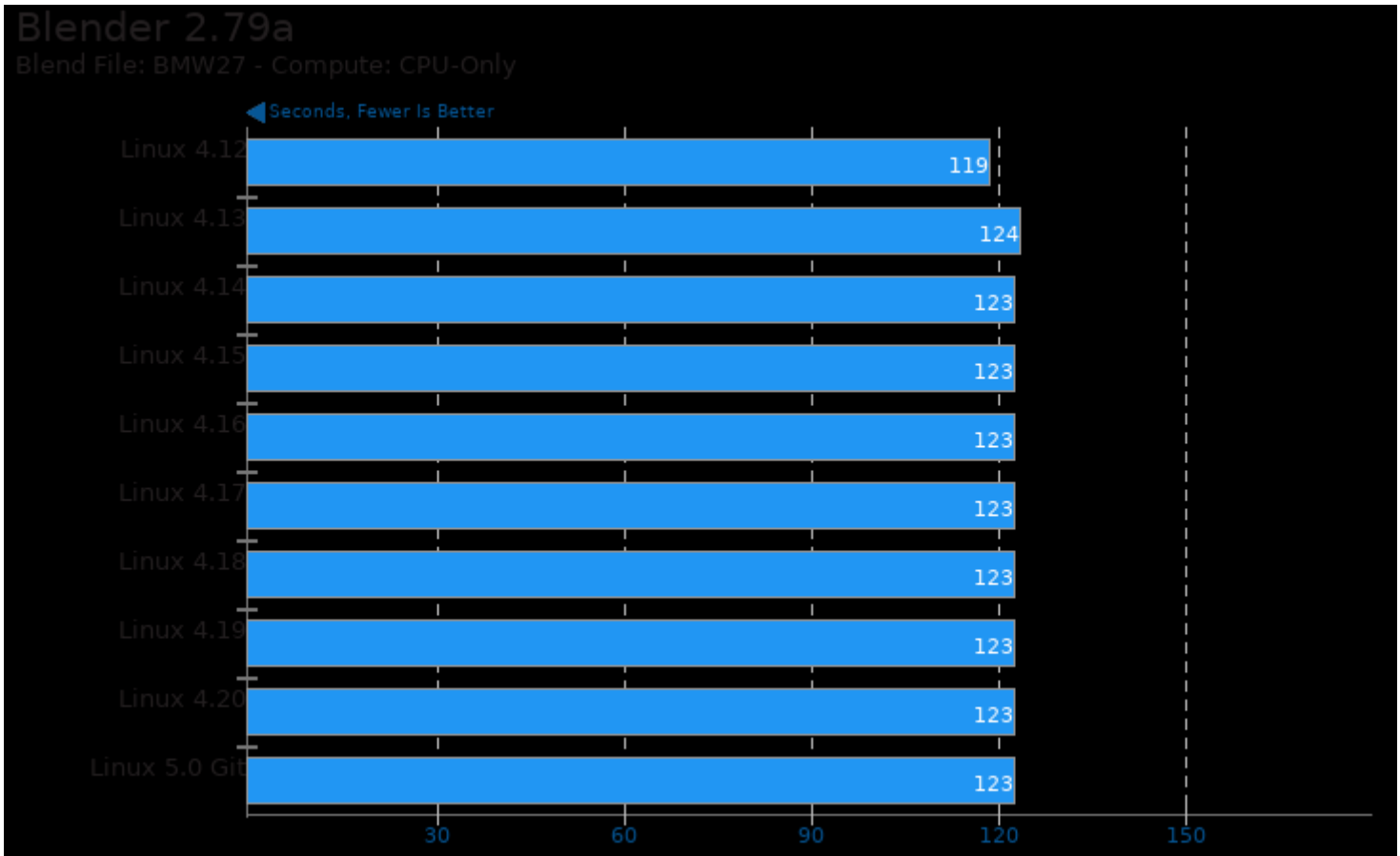

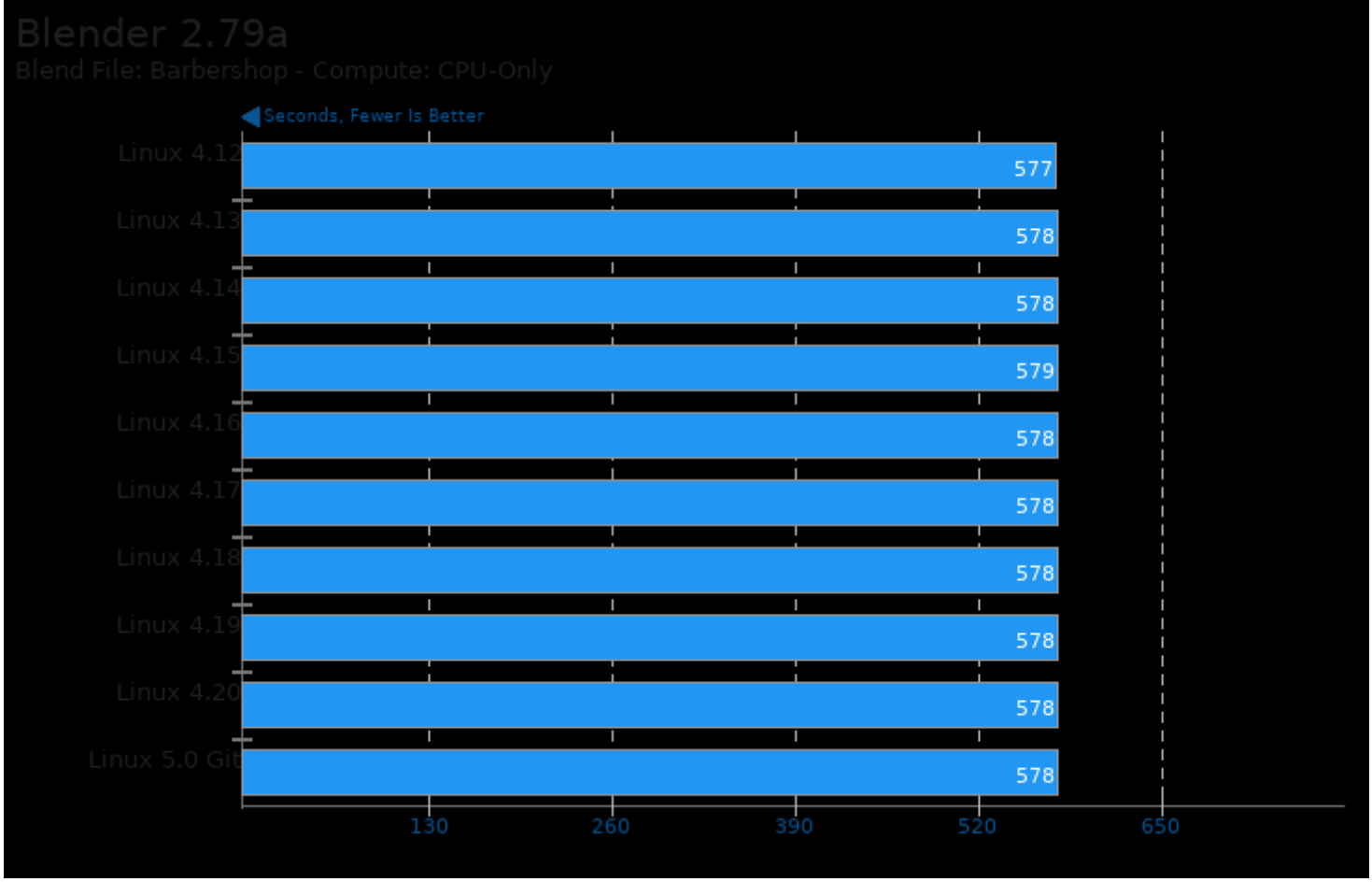

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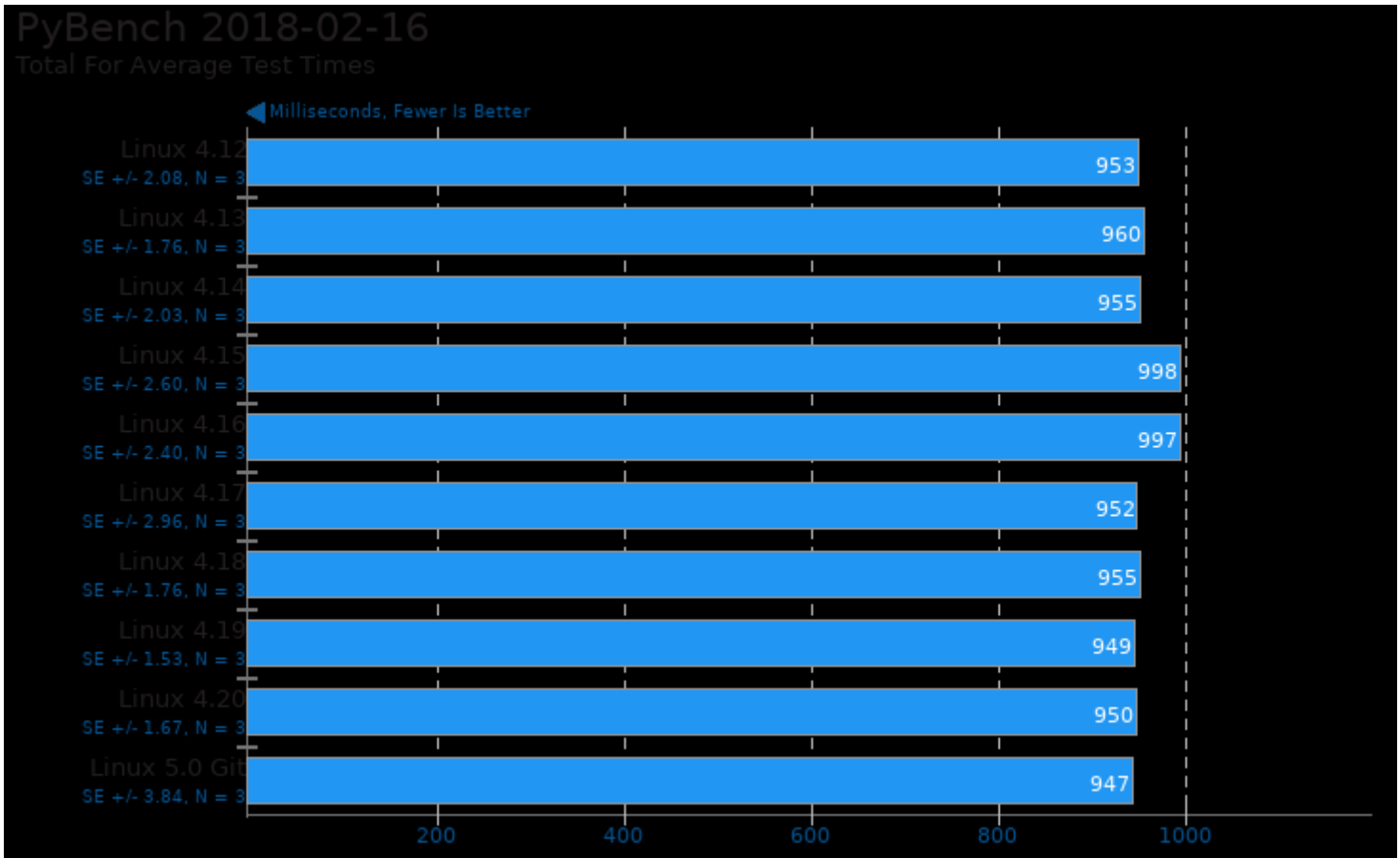

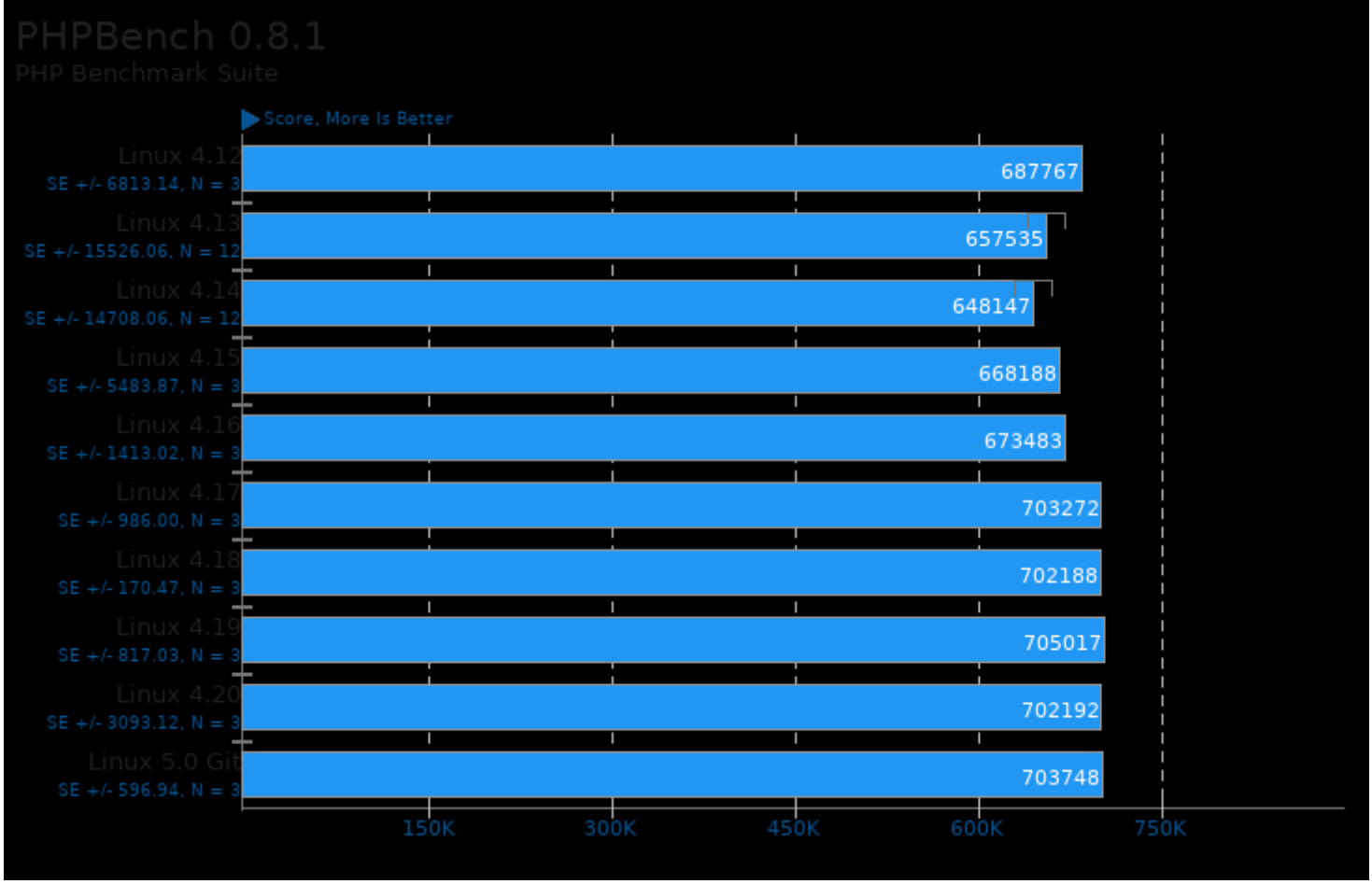

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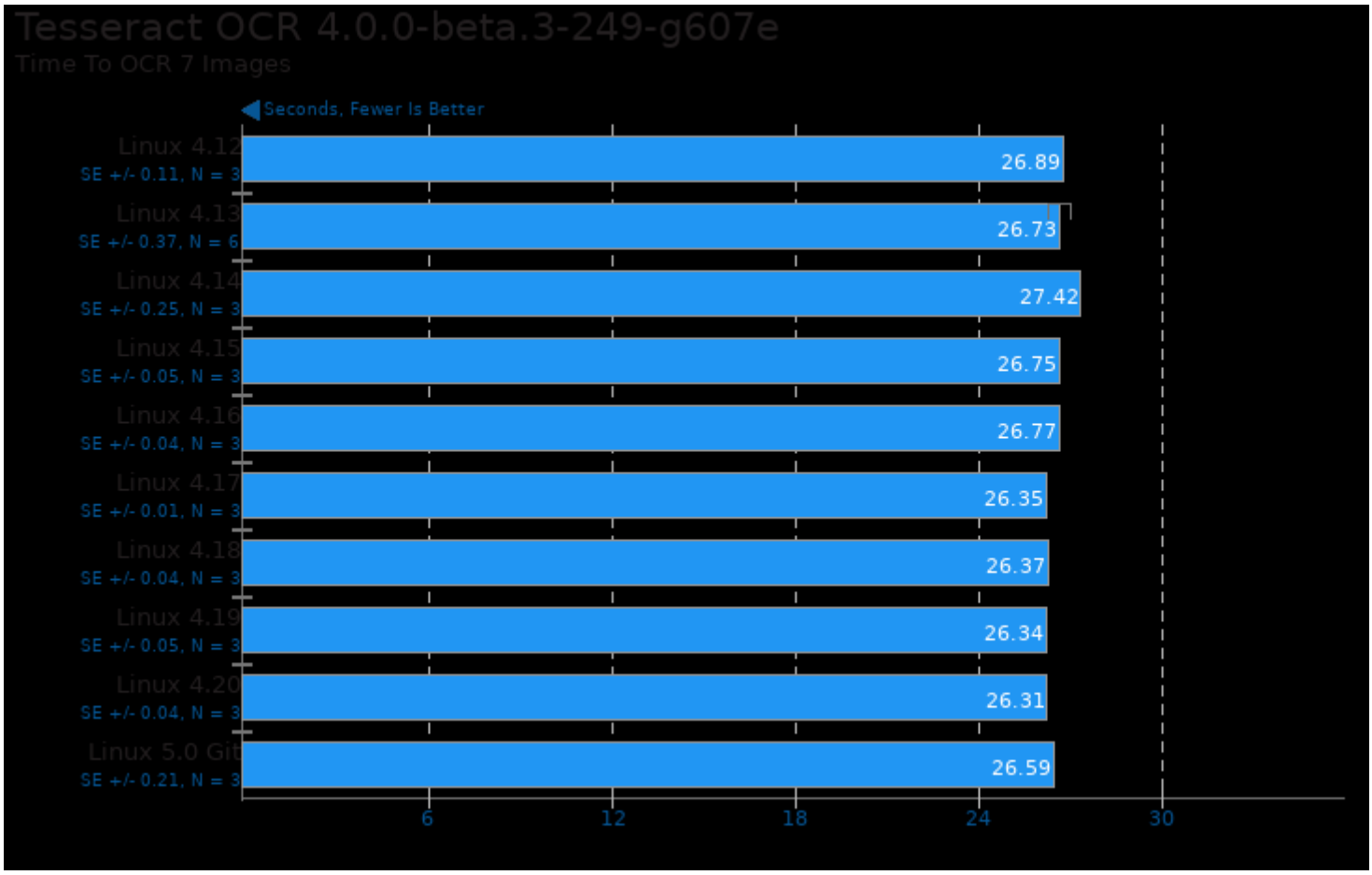

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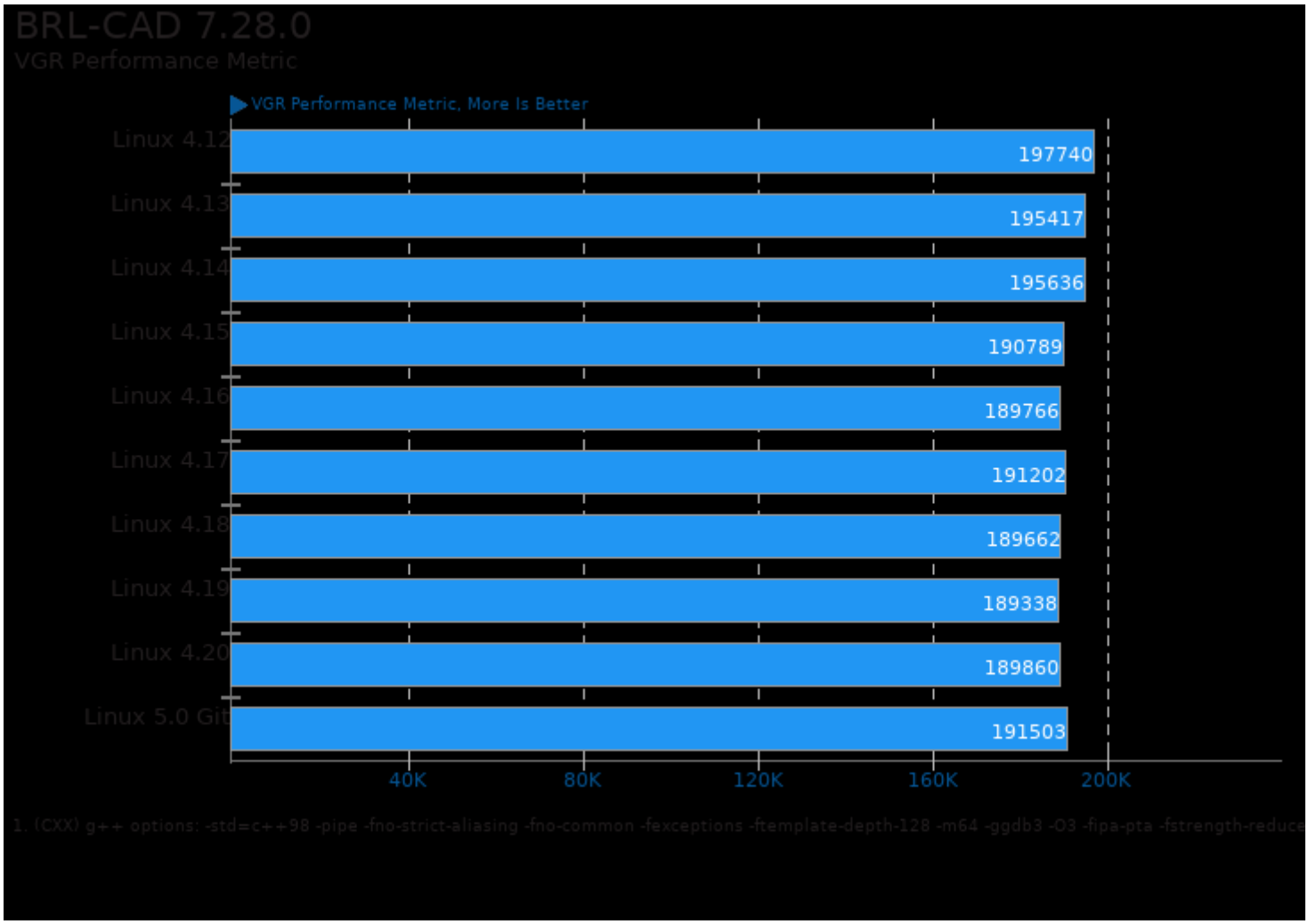

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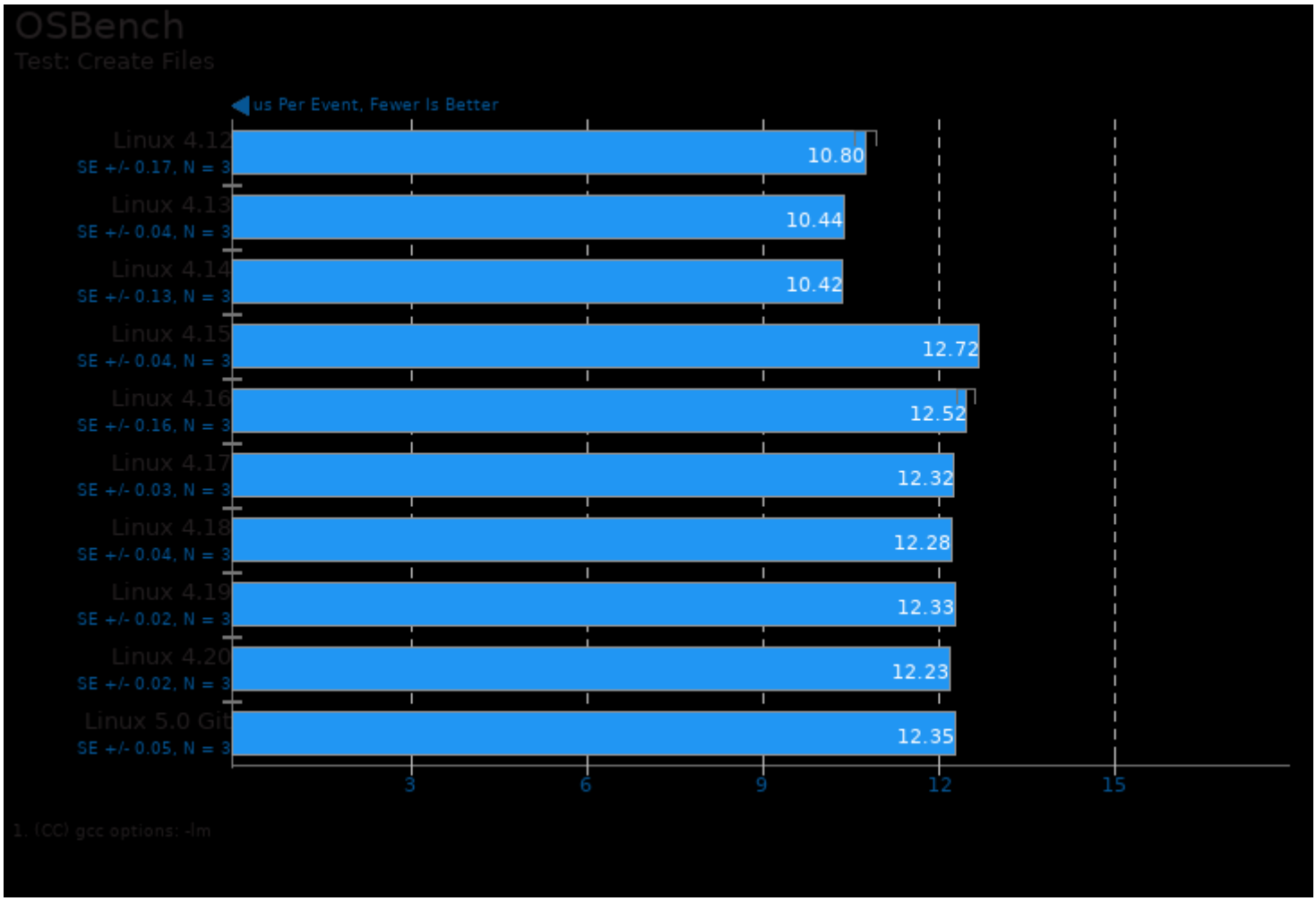
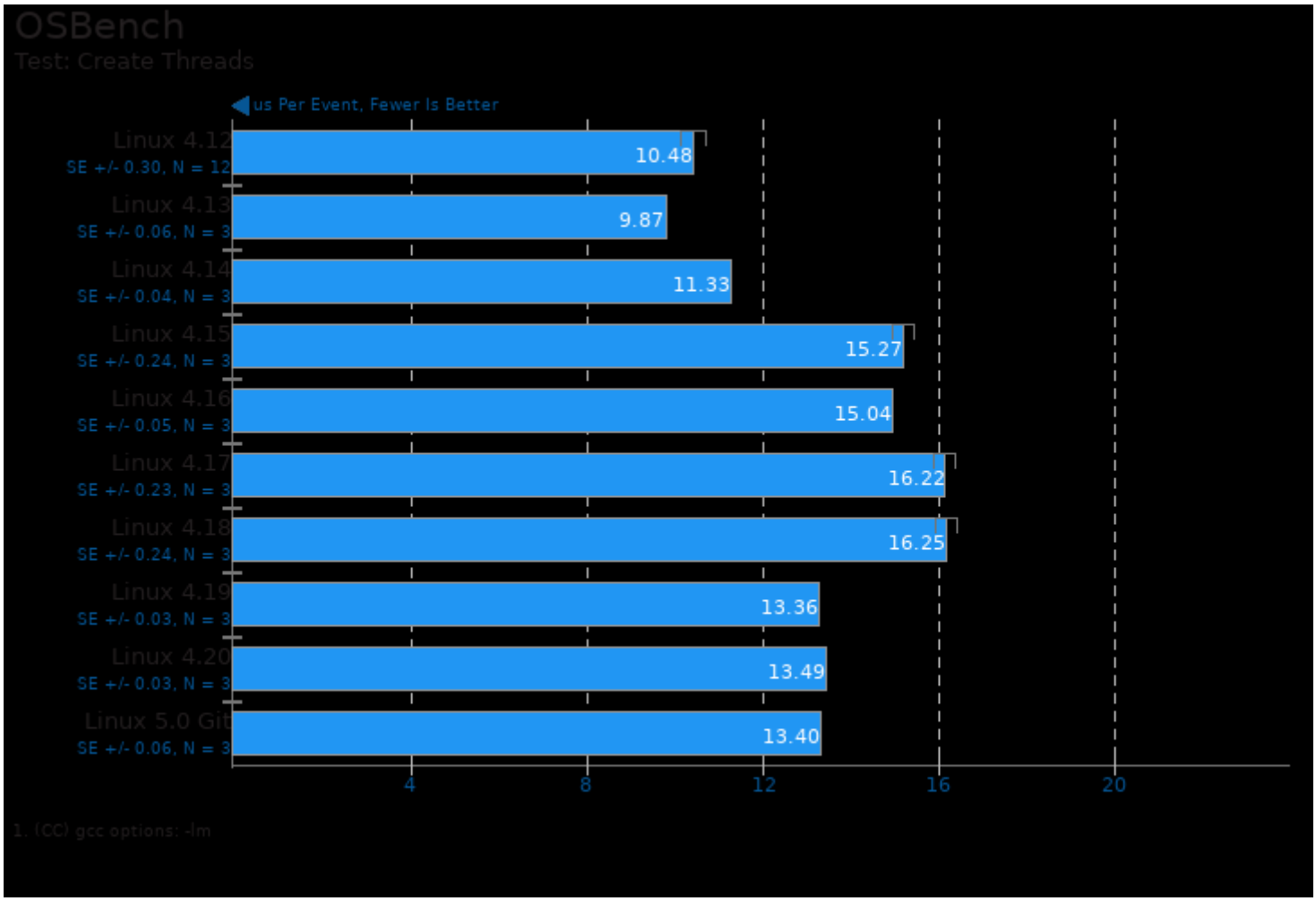
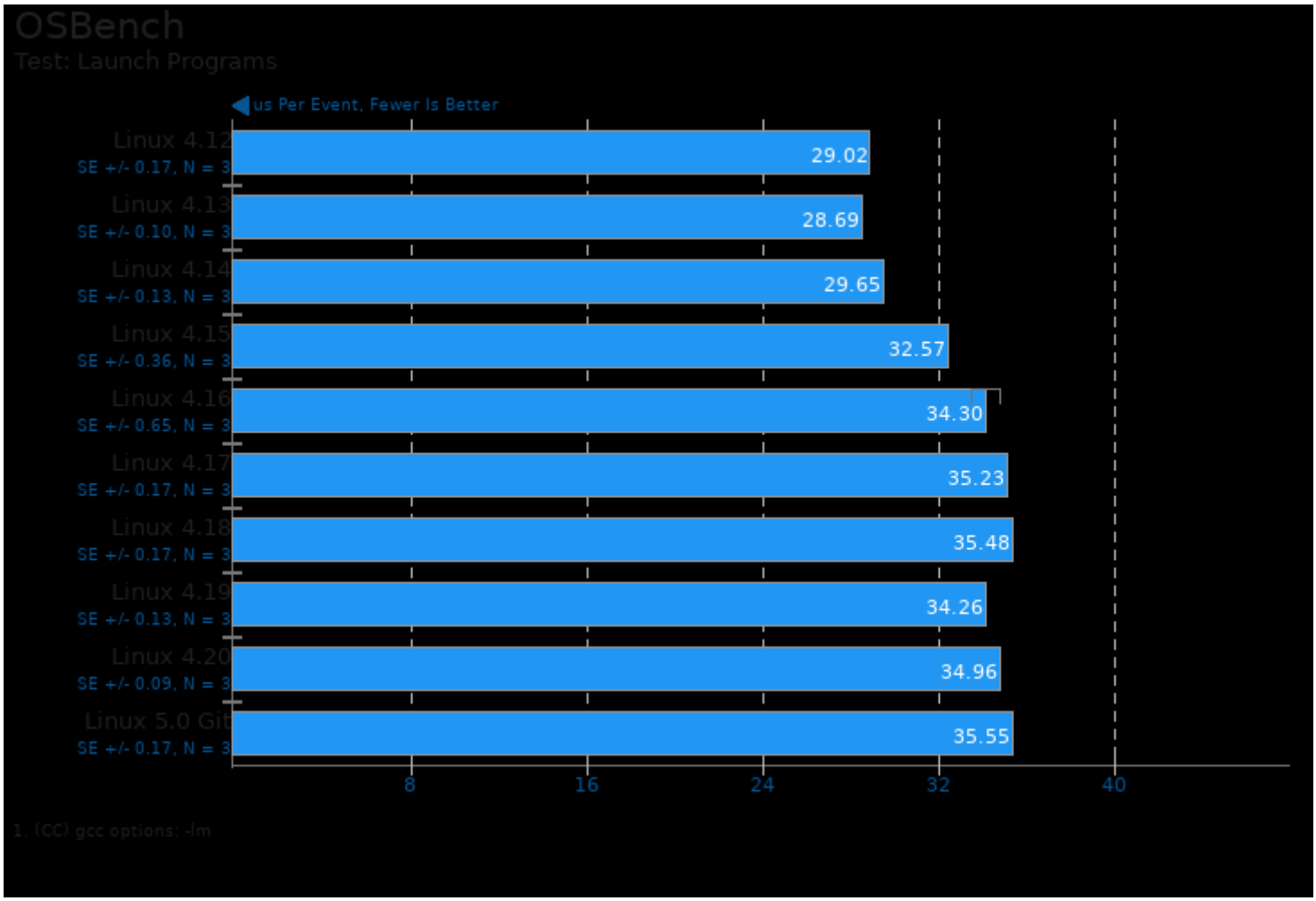


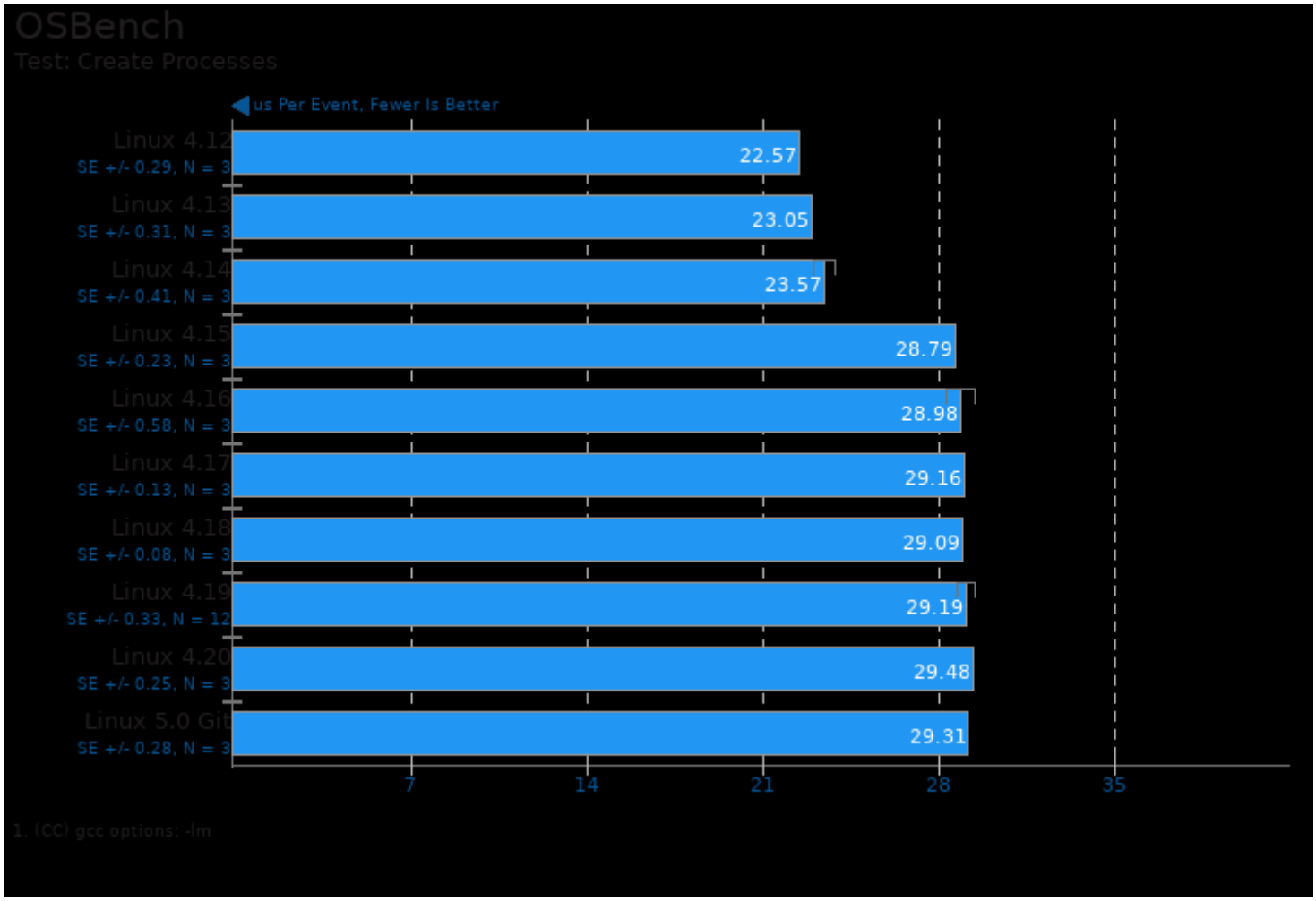
Core i9 7960X Linux 5.0 Kernel Benchmarks



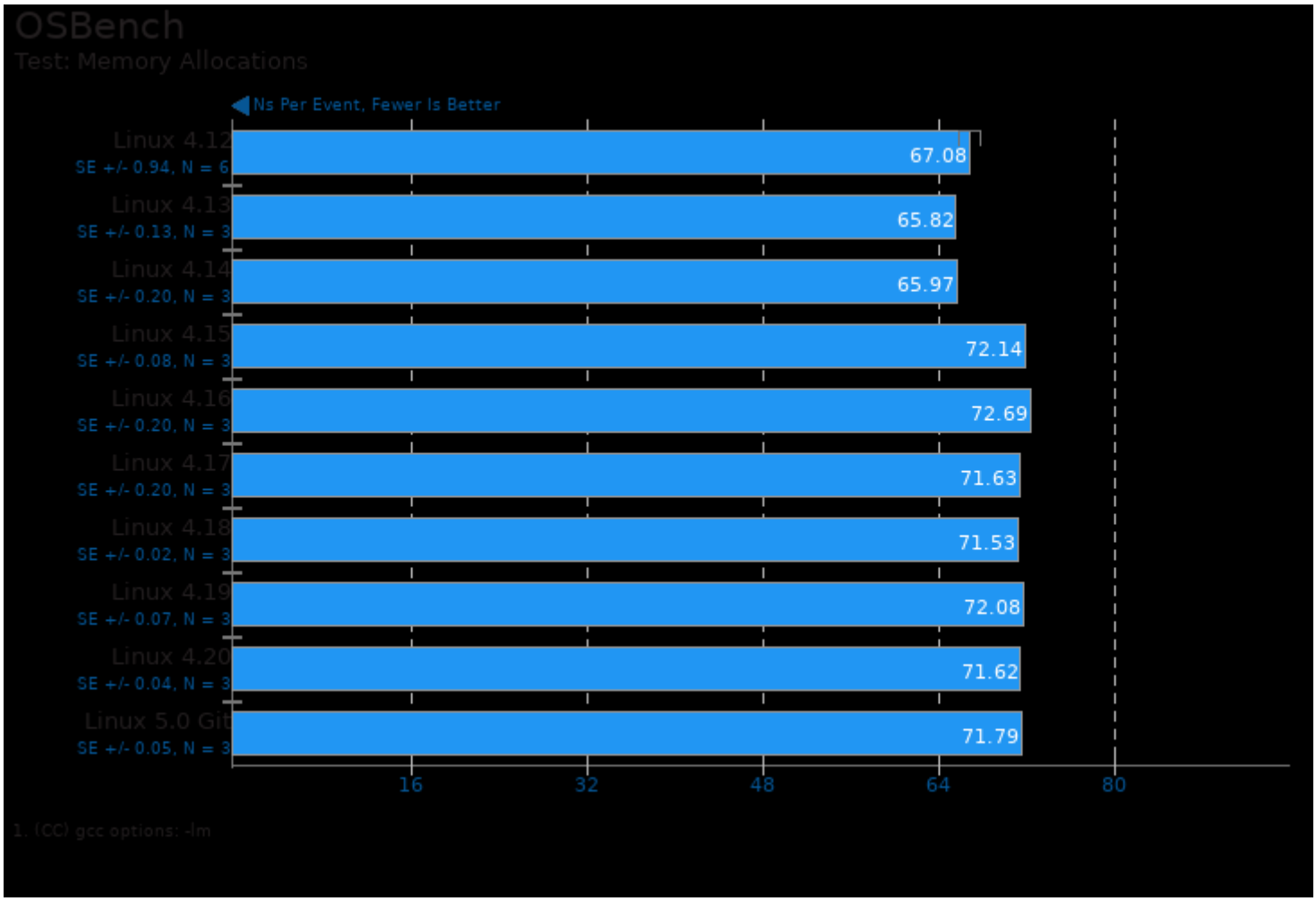
Core i9 7960X Linux 5.0 Kernel Benchmarks



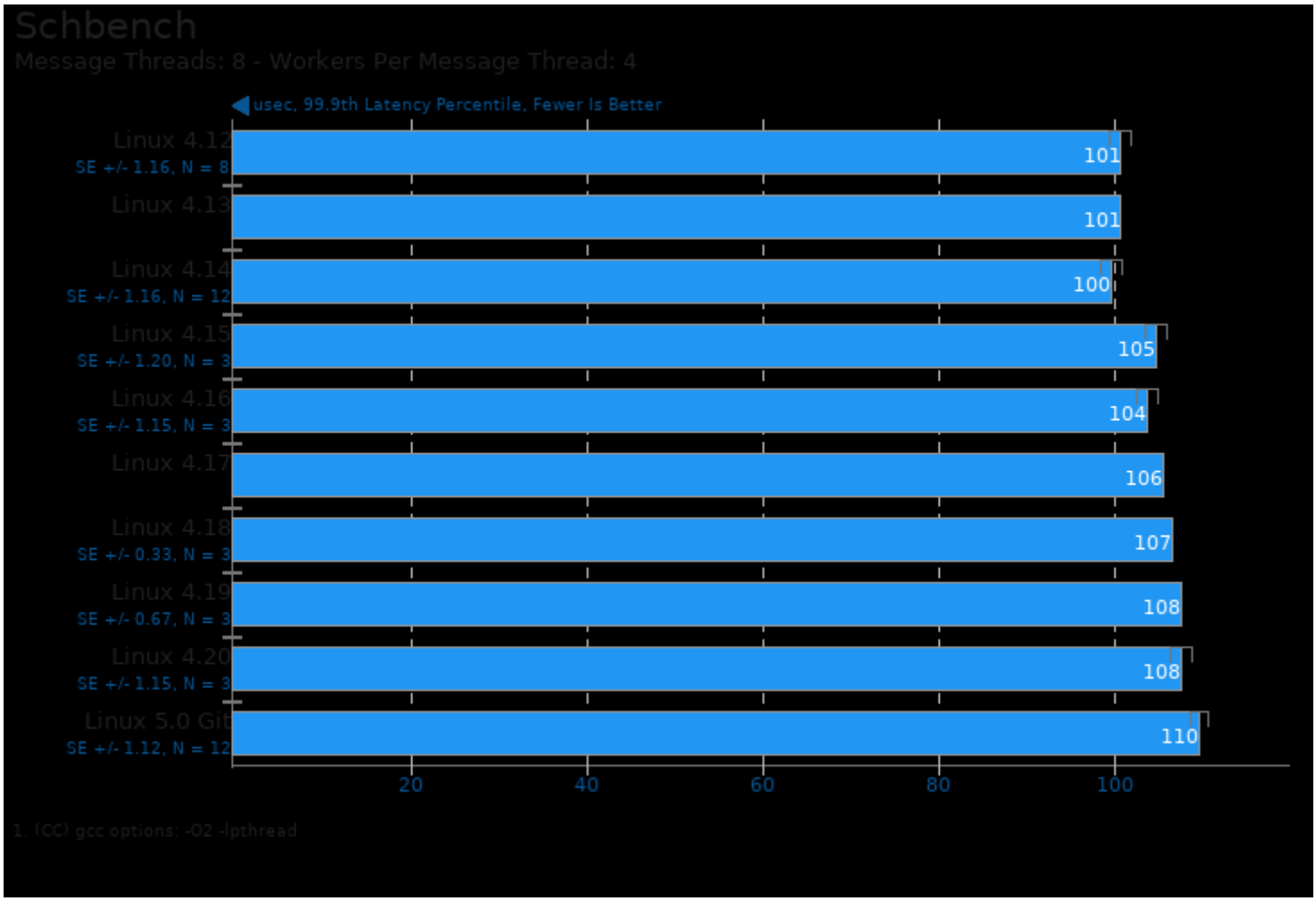
Core i9 7960X Linux 5.0 Kernel Benchmarks



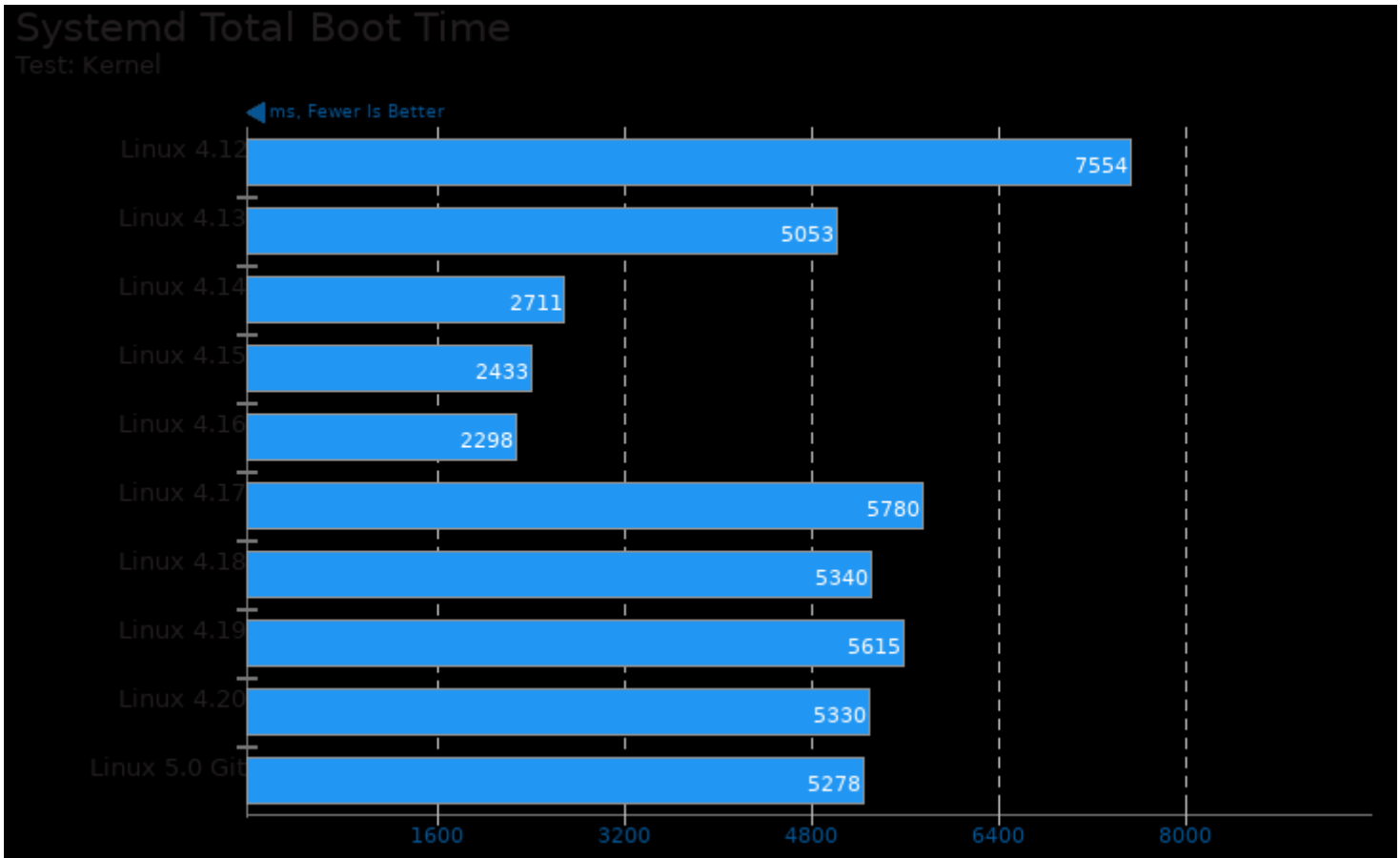
Core i9 7960X Linux 5.0 Kernel Benchmarks

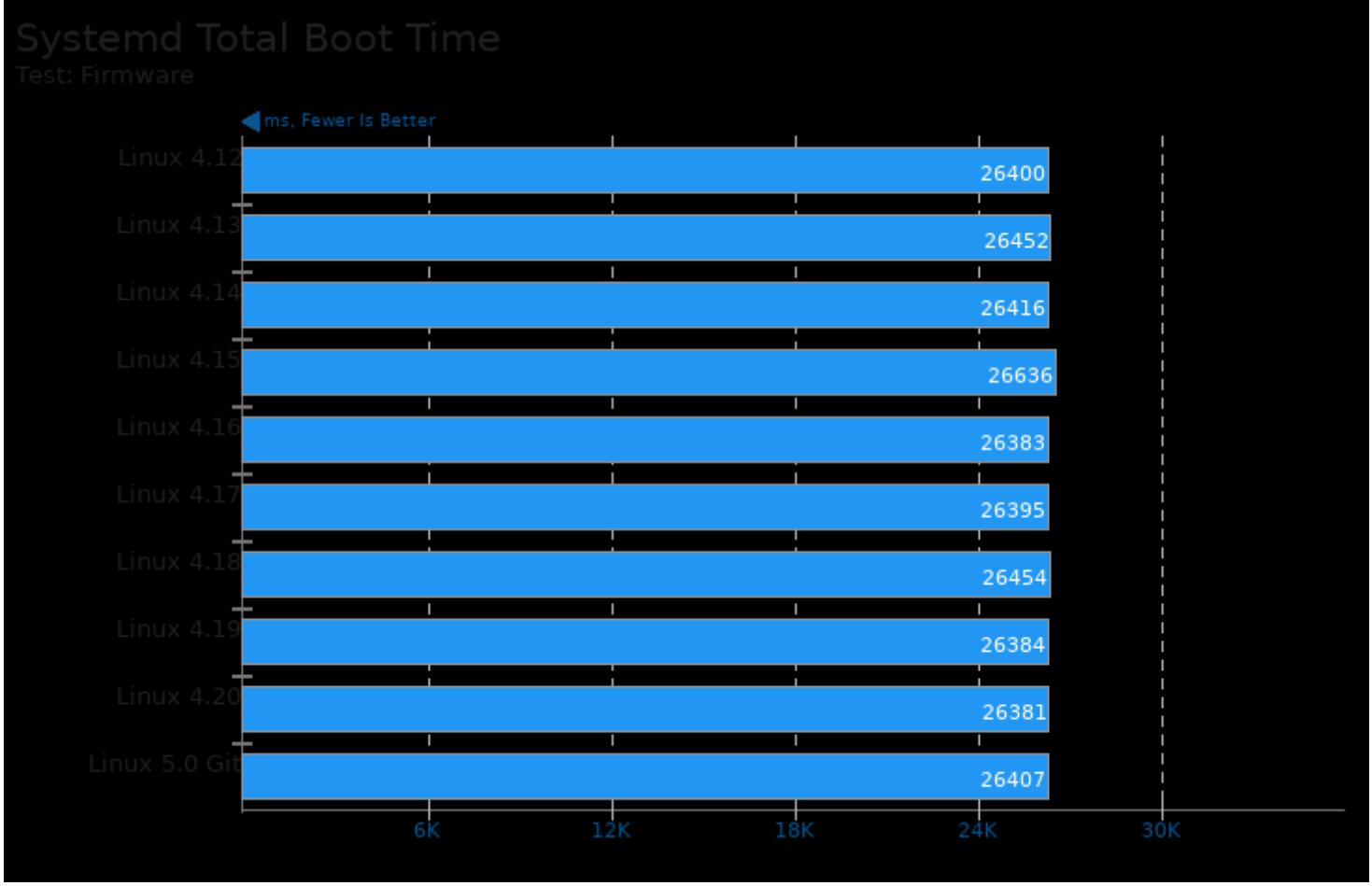


Core i9 7960X Linux 5.0 Kernel Benchmarks

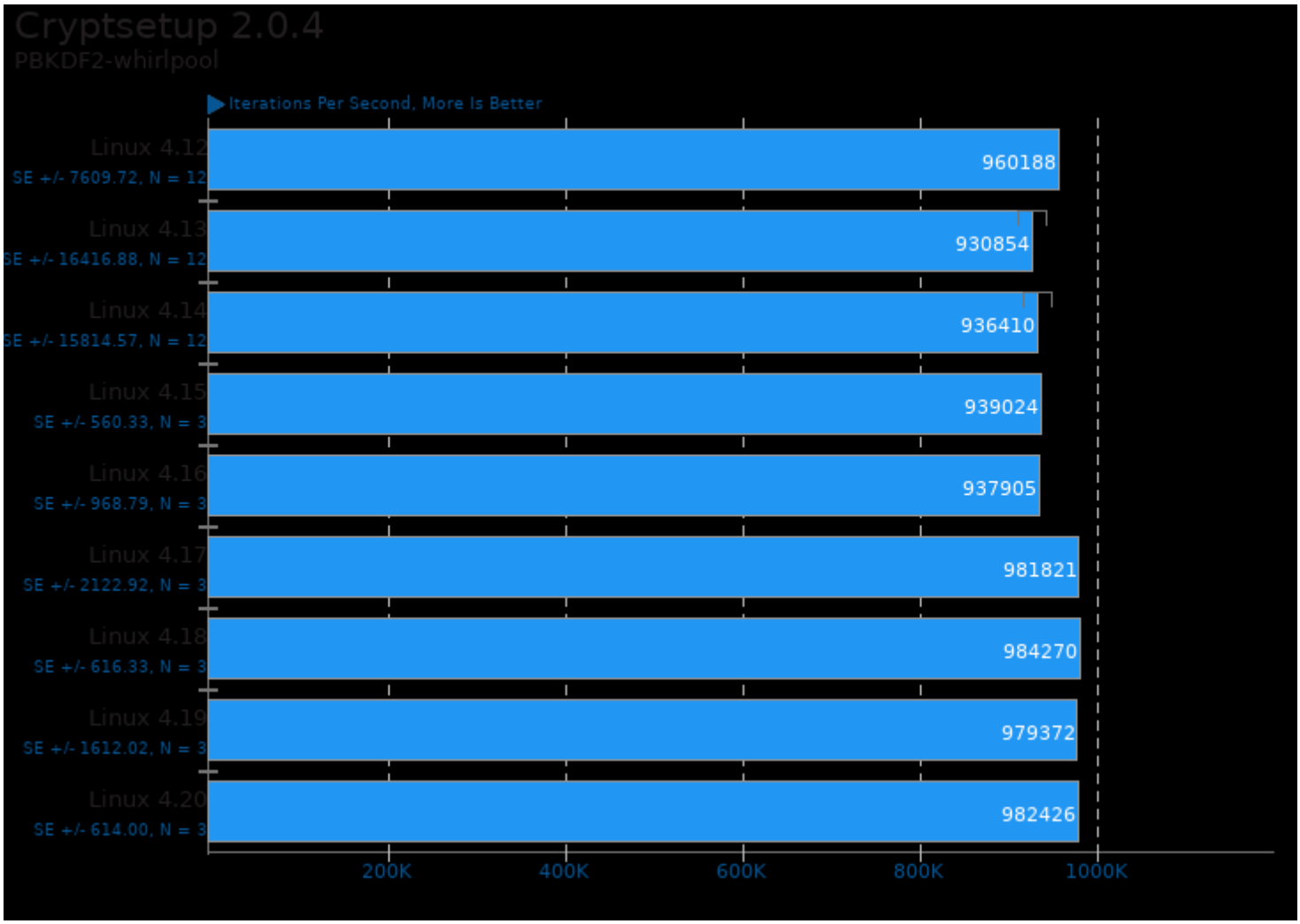


Core i9 7960X Linux 5.0 Kernel Benchmarks



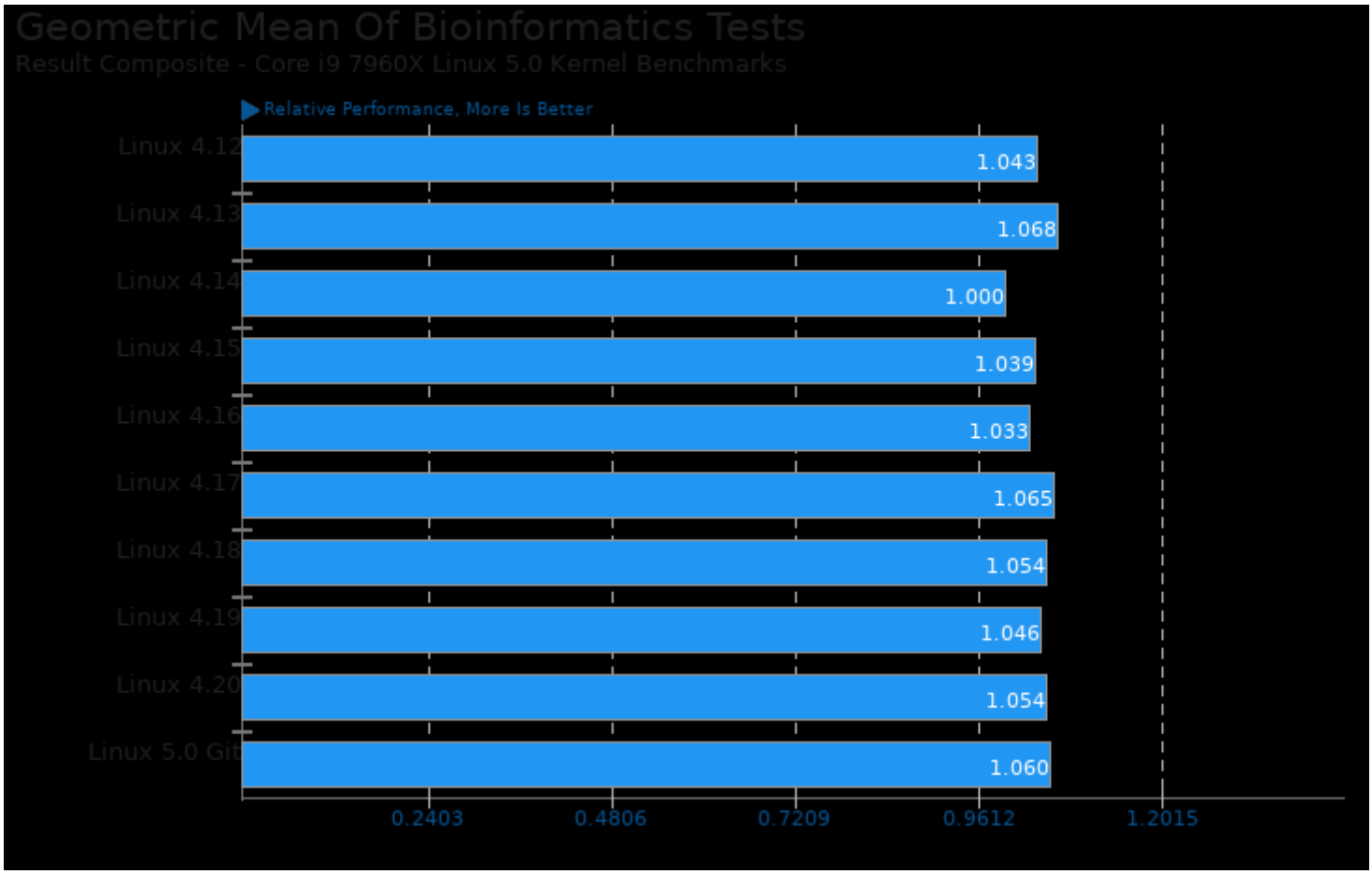


Core i9 7960X Linux 5.0 Kernel Benchmarks



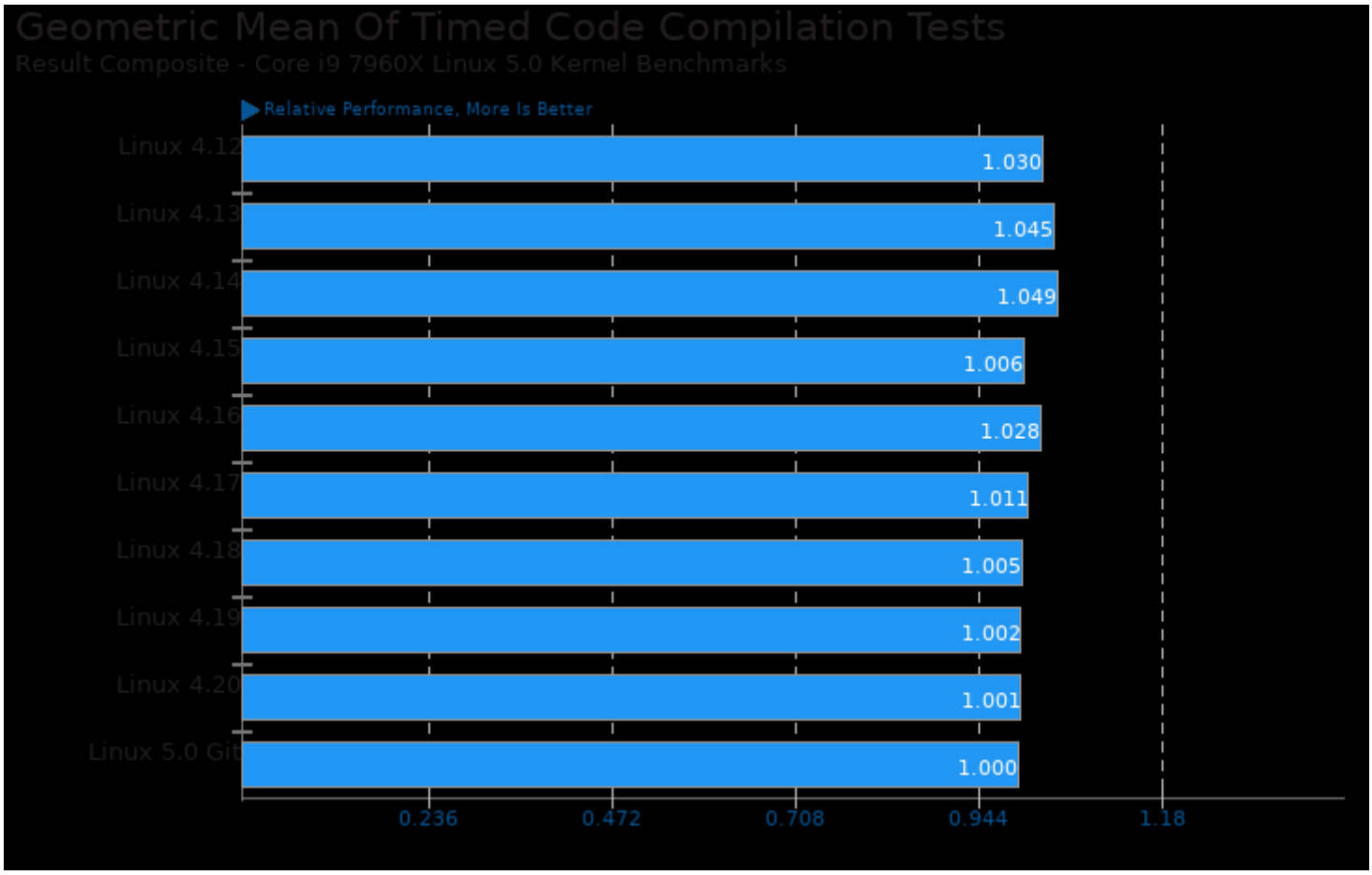
Core i9 7960X Linux 5.0 Kernel Benchmarks

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



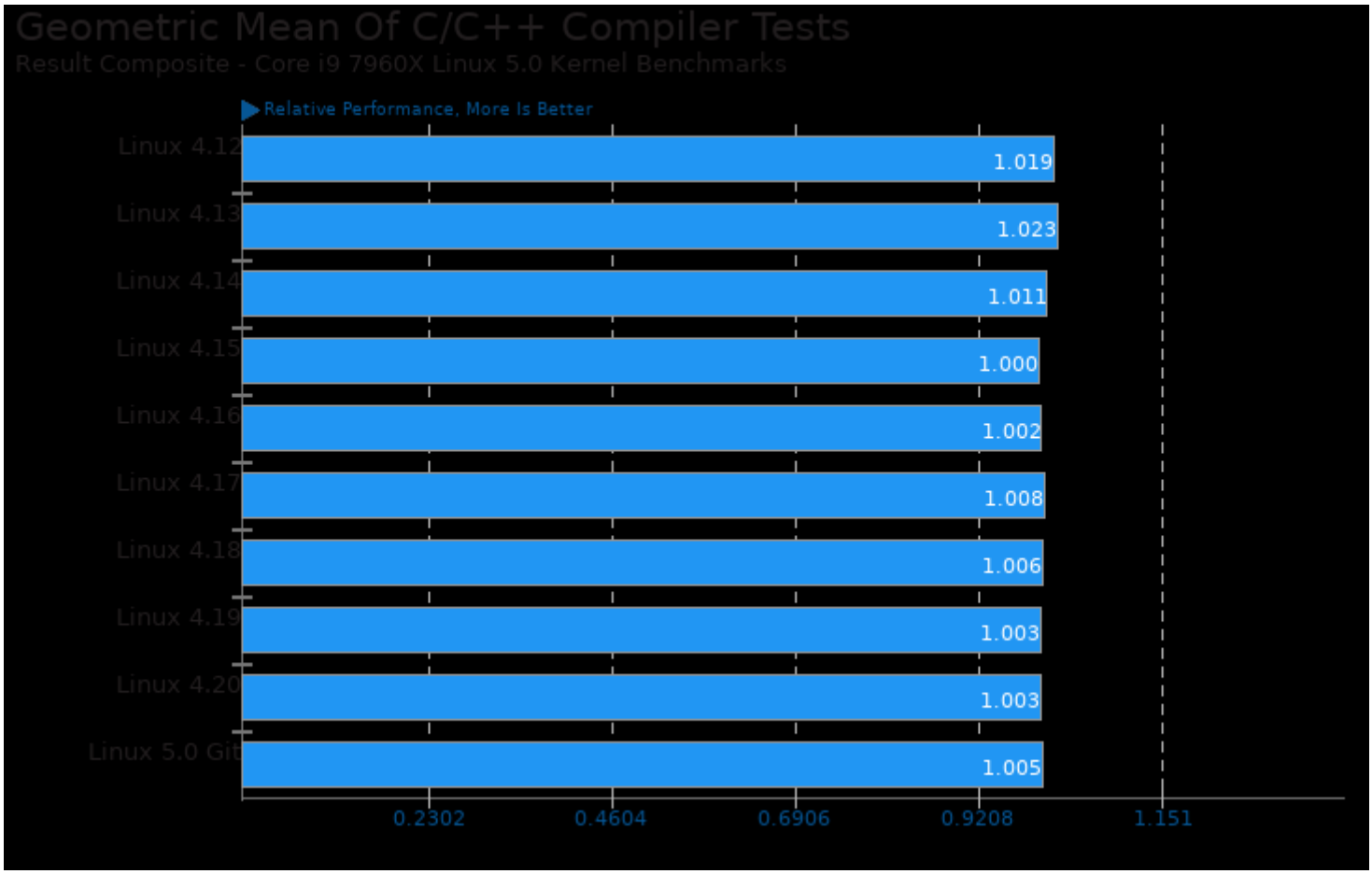
Geometric mean based upon tests: pts/himeno, pts/hmmer and pts/mafft

Core i9 7960X Linux 5.0 Kernel Benchmarks



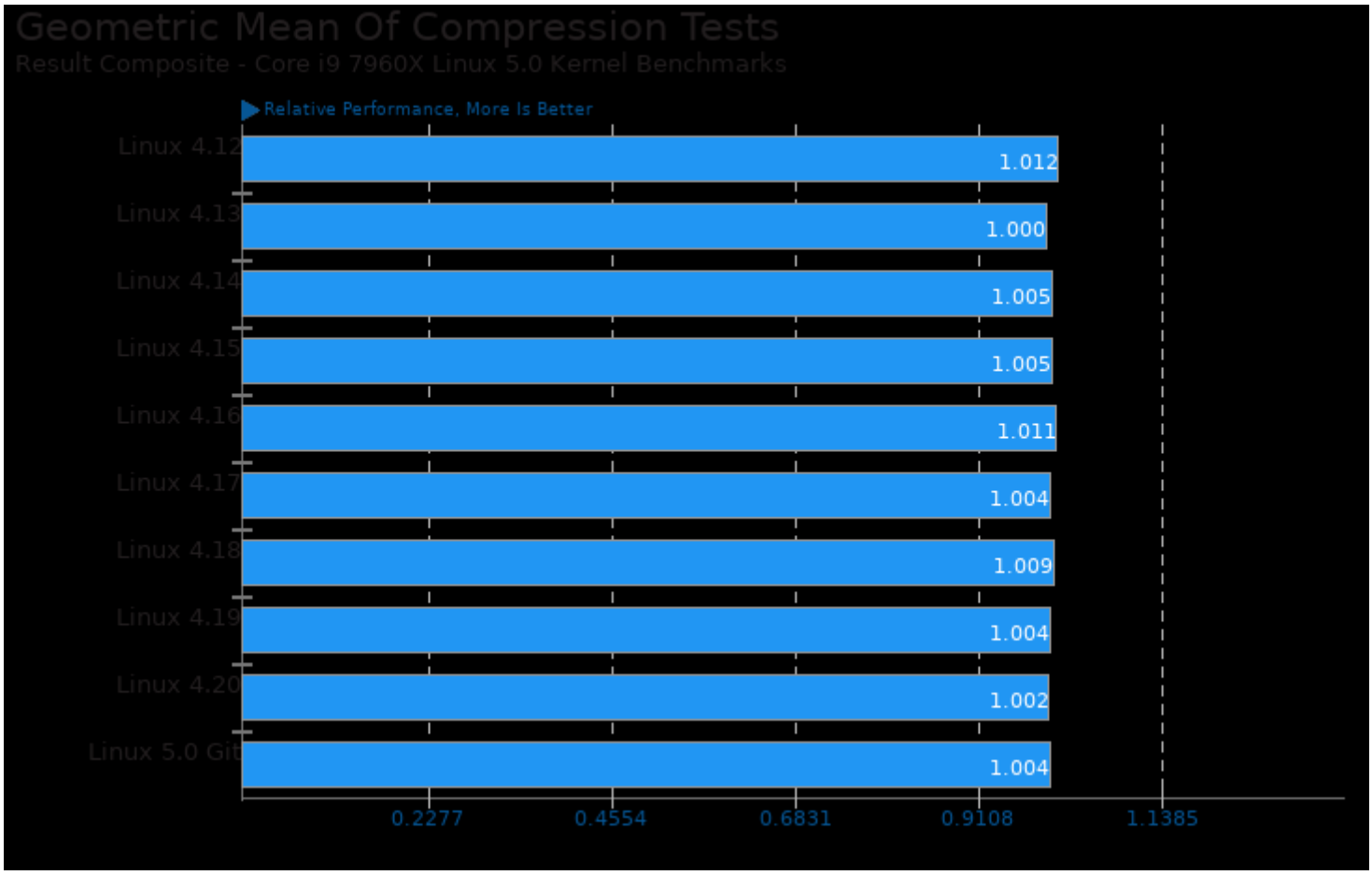
Geometric mean based upon tests: pts/build-linux-kernel and pts/build-llvm

Core i9 7960X Linux 5.0 Kernel Benchmarks



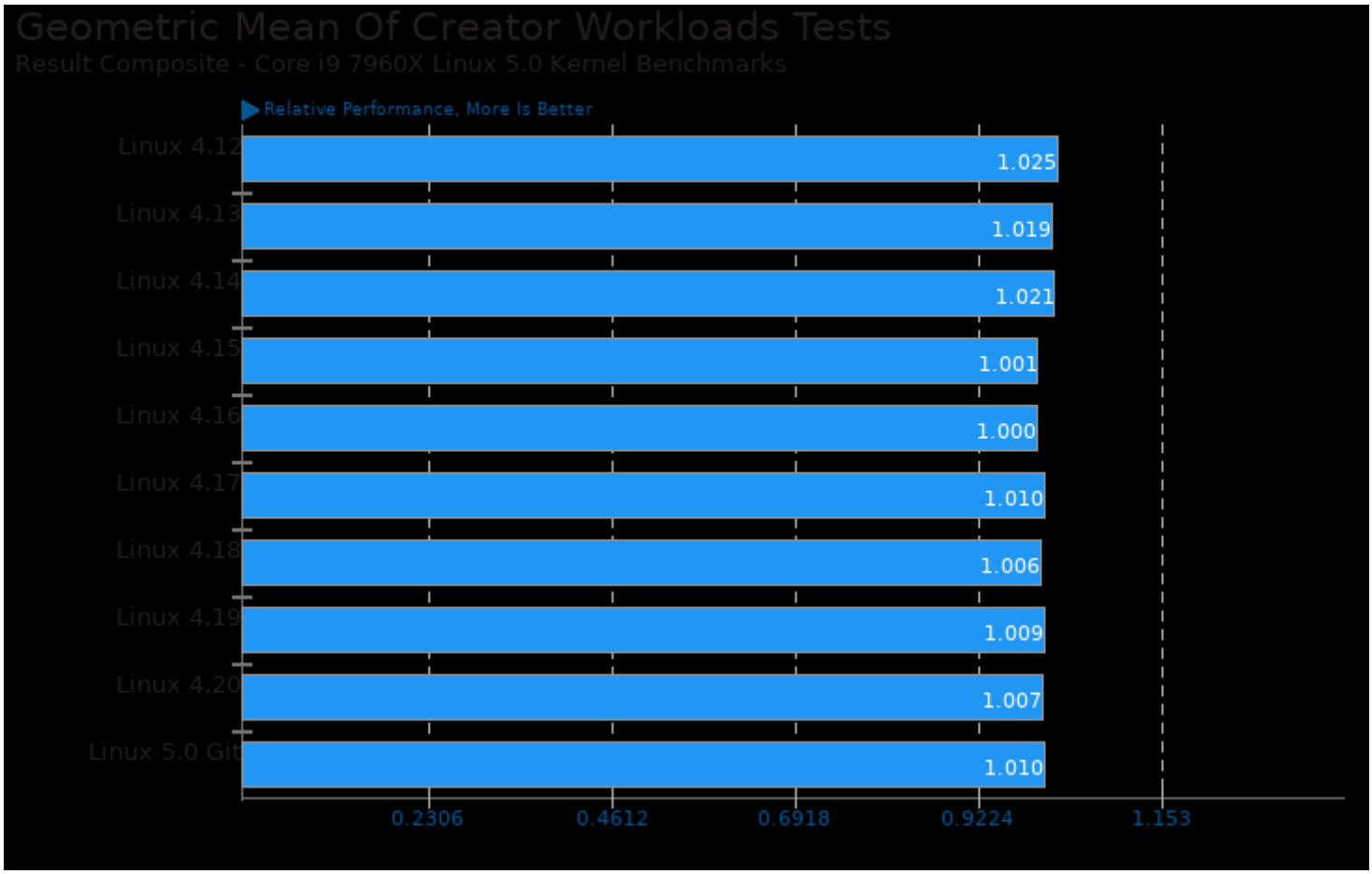
Geometric mean based upon tests: pts/mafft, pts/himeno, pts/hmmer, pts/build-llvm, pts/pgbench, pts/dav1d, pts/x264, pts/x265, pts/compress-xz, pts/compress-zstd, pts/openssl and pts/svt-vp9

Core i9 7960X Linux 5.0 Kernel Benchmarks



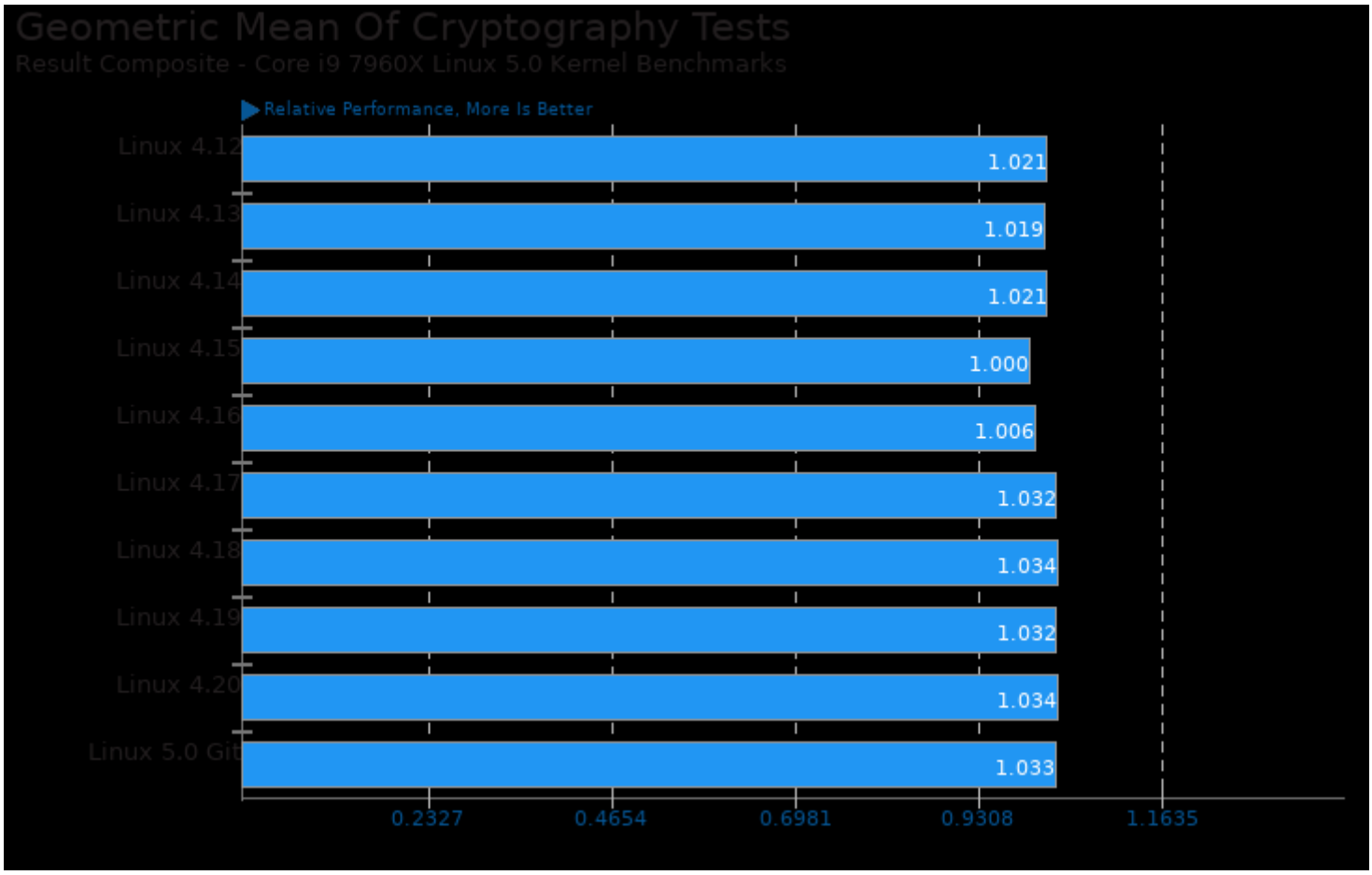
Geometric mean based upon tests: pts/compress-zstd and pts/compress-xz

Core i9 7960X Linux 5.0 Kernel Benchmarks



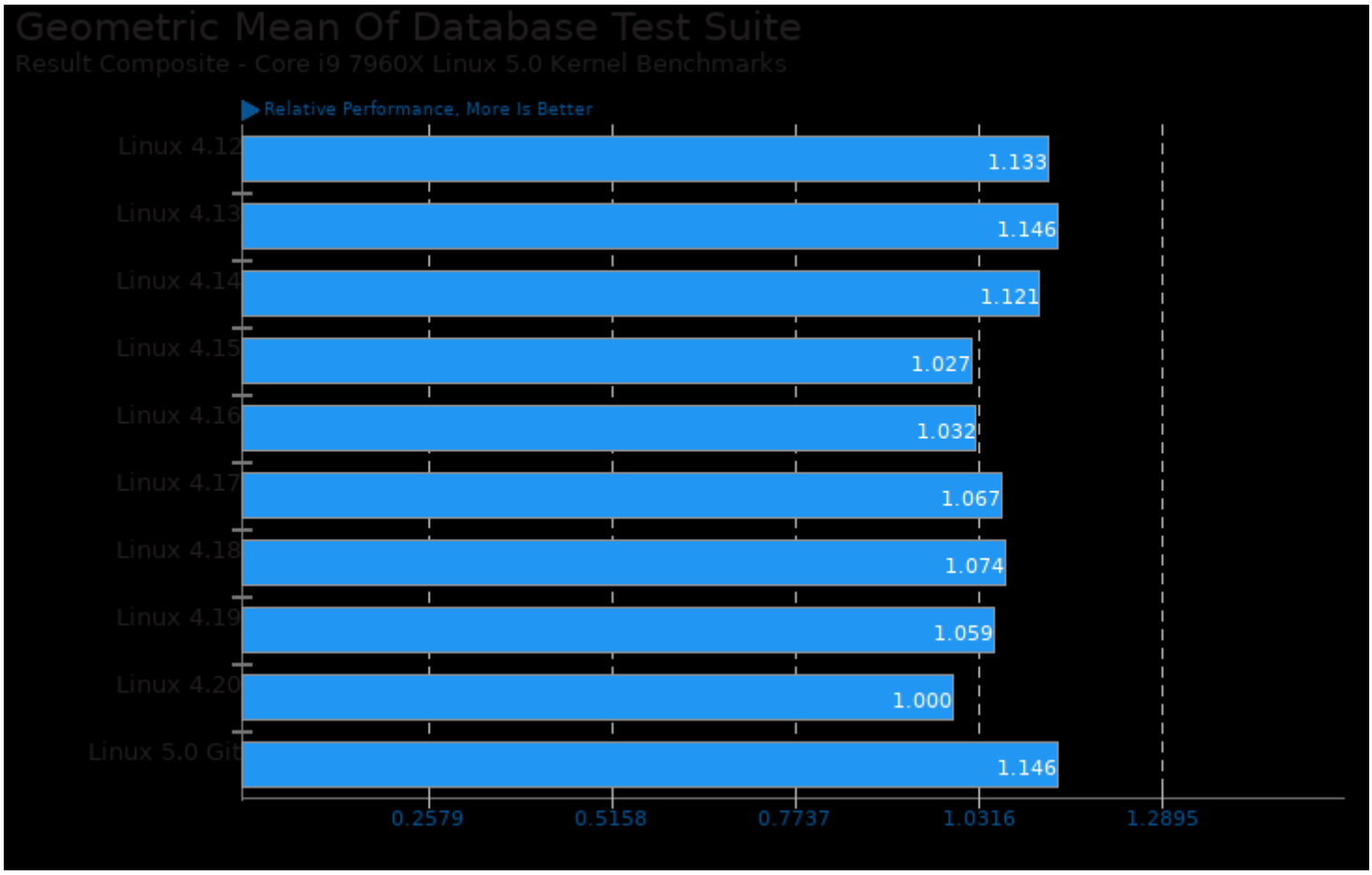
Geometric mean based upon tests: pts/blender, pts/ttsiod-renderer, pts/indigobench, system/tesseract-ocr, pts/svt-vp9, pts/svt-hevc, pts/x264, pts/x265, pts/dav1d, system/gimp, system/darktable, pts/luajit and pts/brl-cad

Core i9 7960X Linux 5.0 Kernel Benchmarks



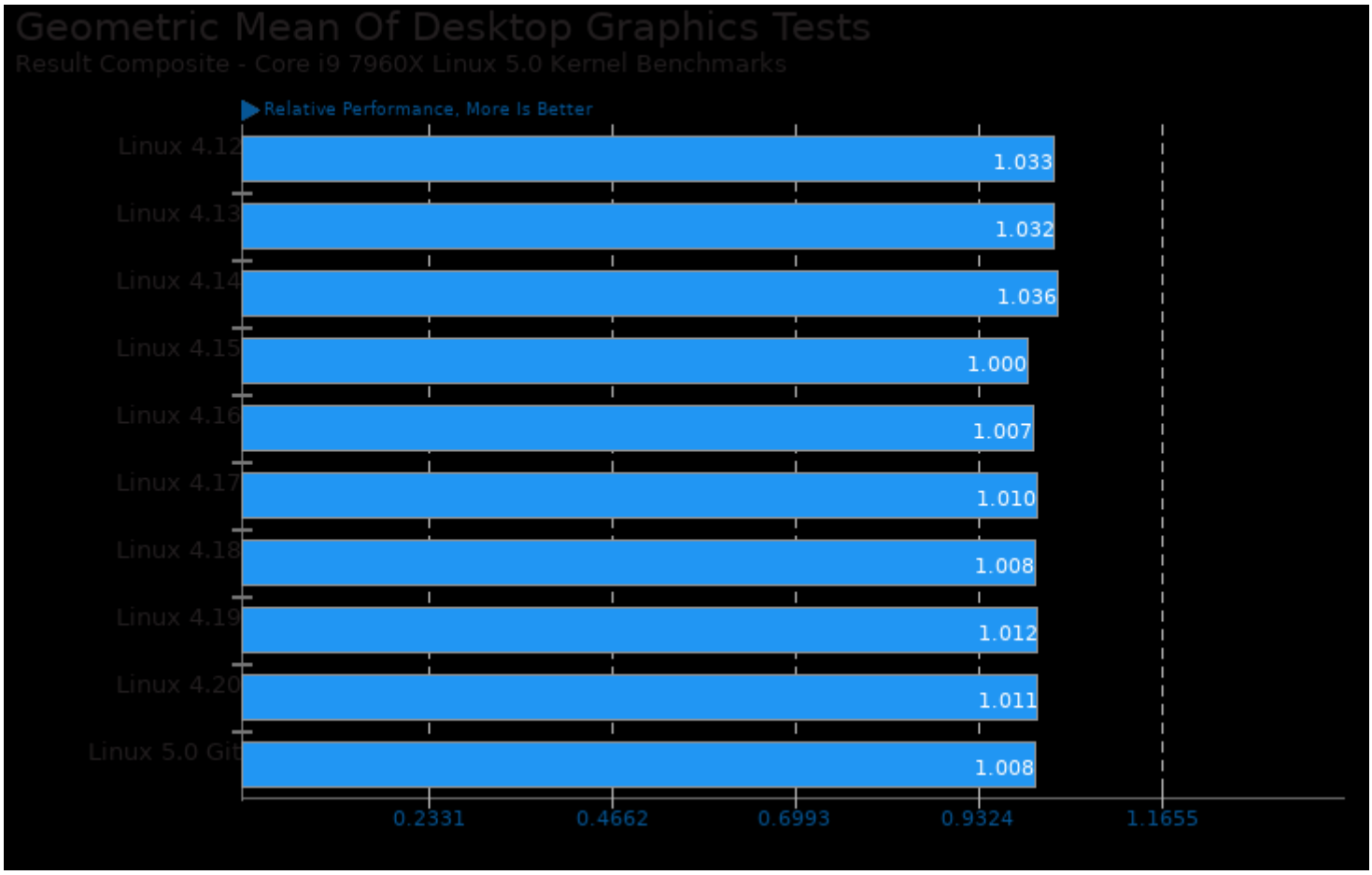
Geometric mean based upon tests: pts/openssl and system/cryptsetup

Core i9 7960X Linux 5.0 Kernel Benchmarks



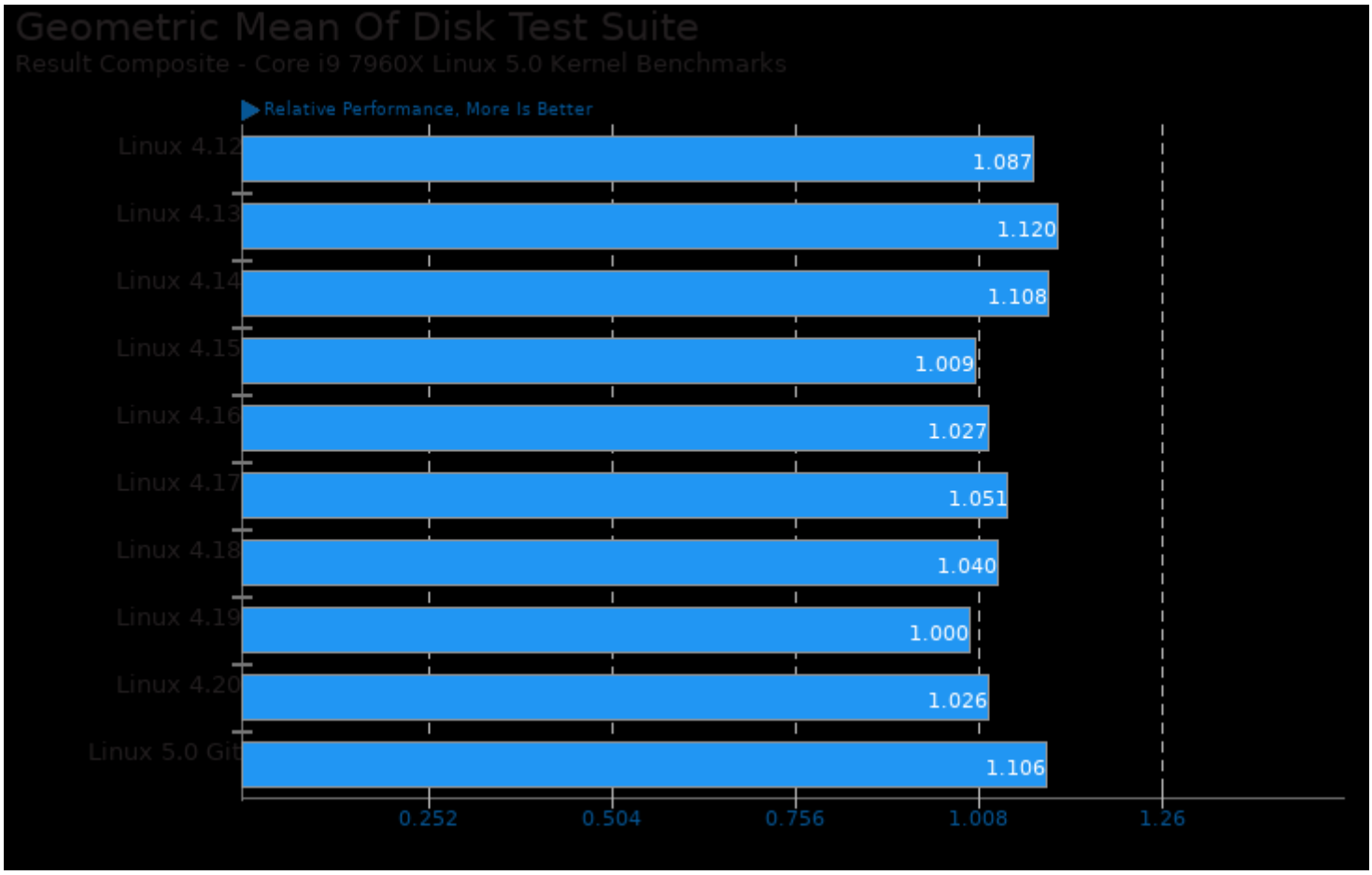
Geometric mean based upon tests: pts/sqlite and pts/pgbench

Core i9 7960X Linux 5.0 Kernel Benchmarks



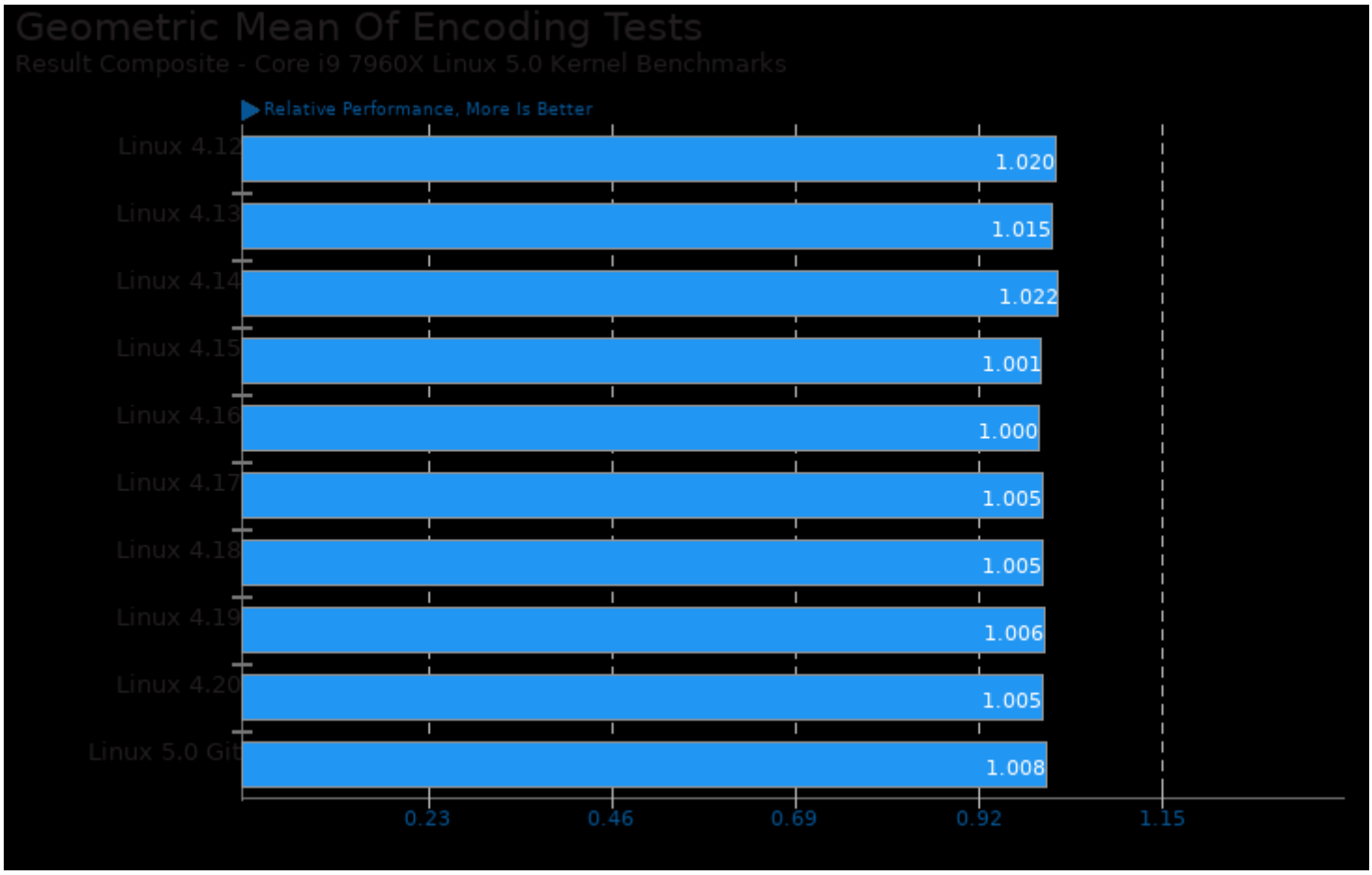
Geometric mean based upon tests: pts/xonotic and pts/tesseract

Core i9 7960X Linux 5.0 Kernel Benchmarks



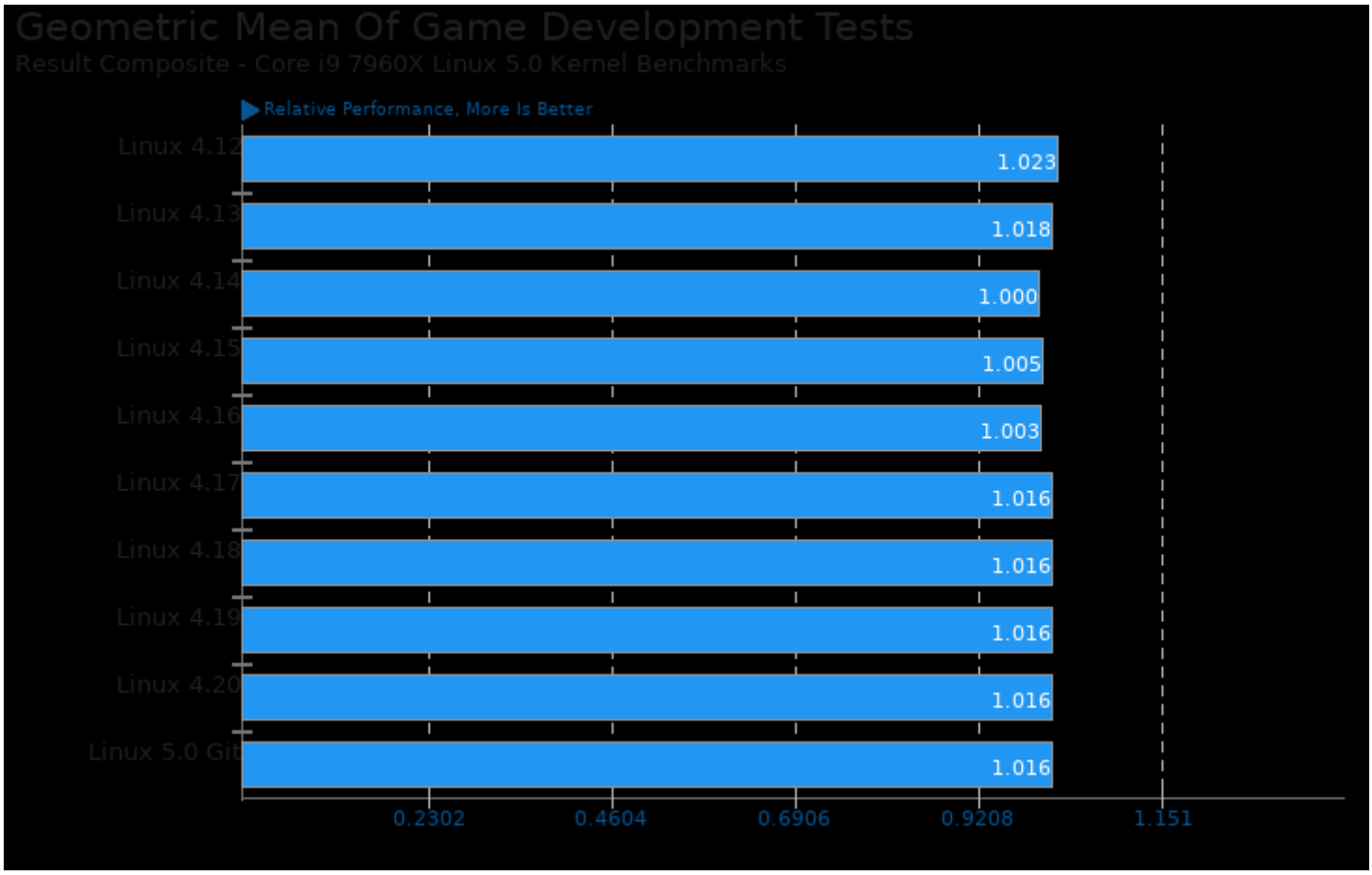
Geometric mean based upon tests: pts/sqlite, pts/fs-mark and pts/compilebench

Core i9 7960X Linux 5.0 Kernel Benchmarks



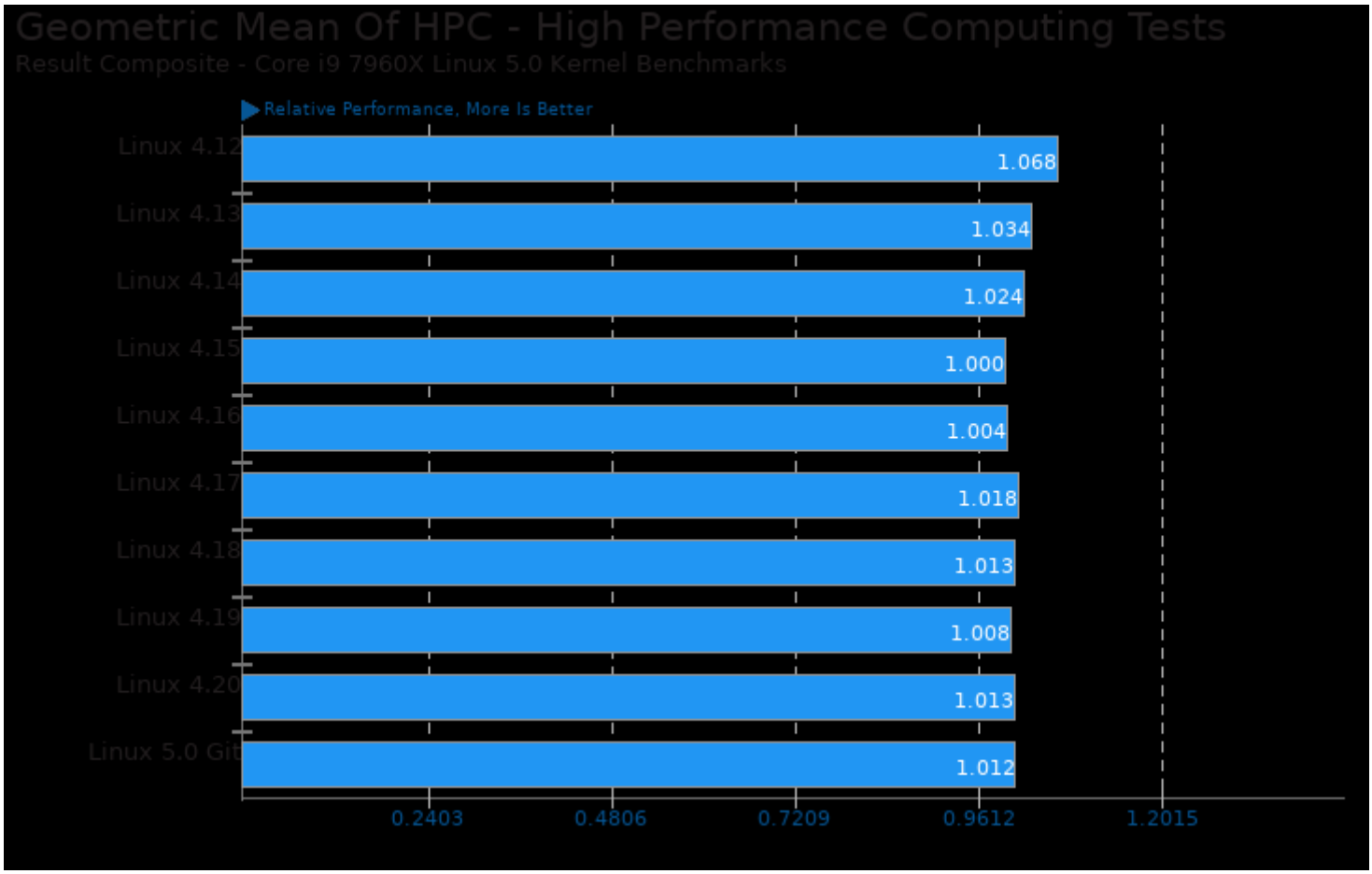
Geometric mean based upon tests: pts/svt-vp9, pts/svt-hevc, pts/x264, pts/x265 and pts/dav1d

Core i9 7960X Linux 5.0 Kernel Benchmarks



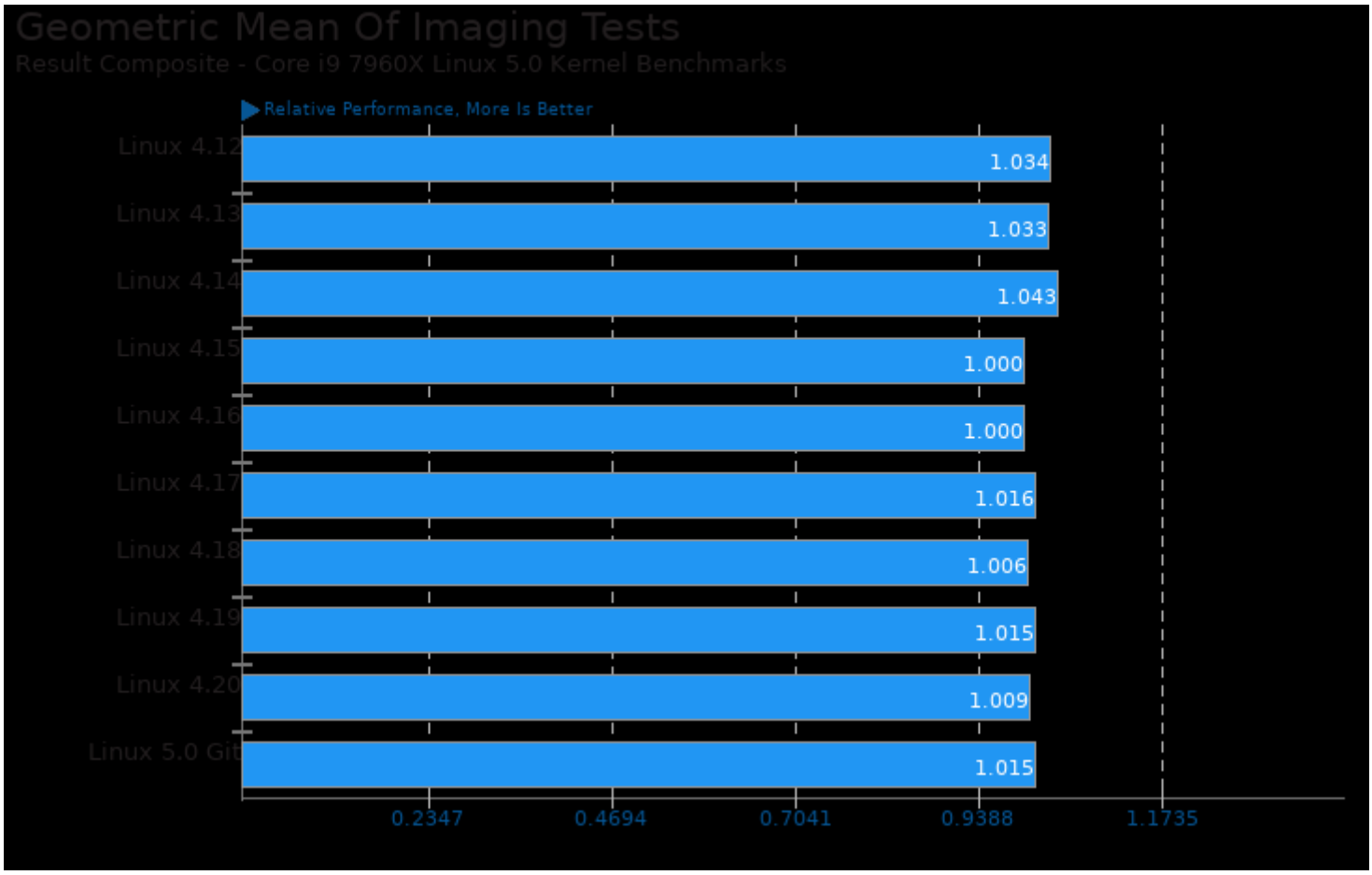
Geometric mean based upon tests: pts/luajit and pts/blender

Core i9 7960X Linux 5.0 Kernel Benchmarks



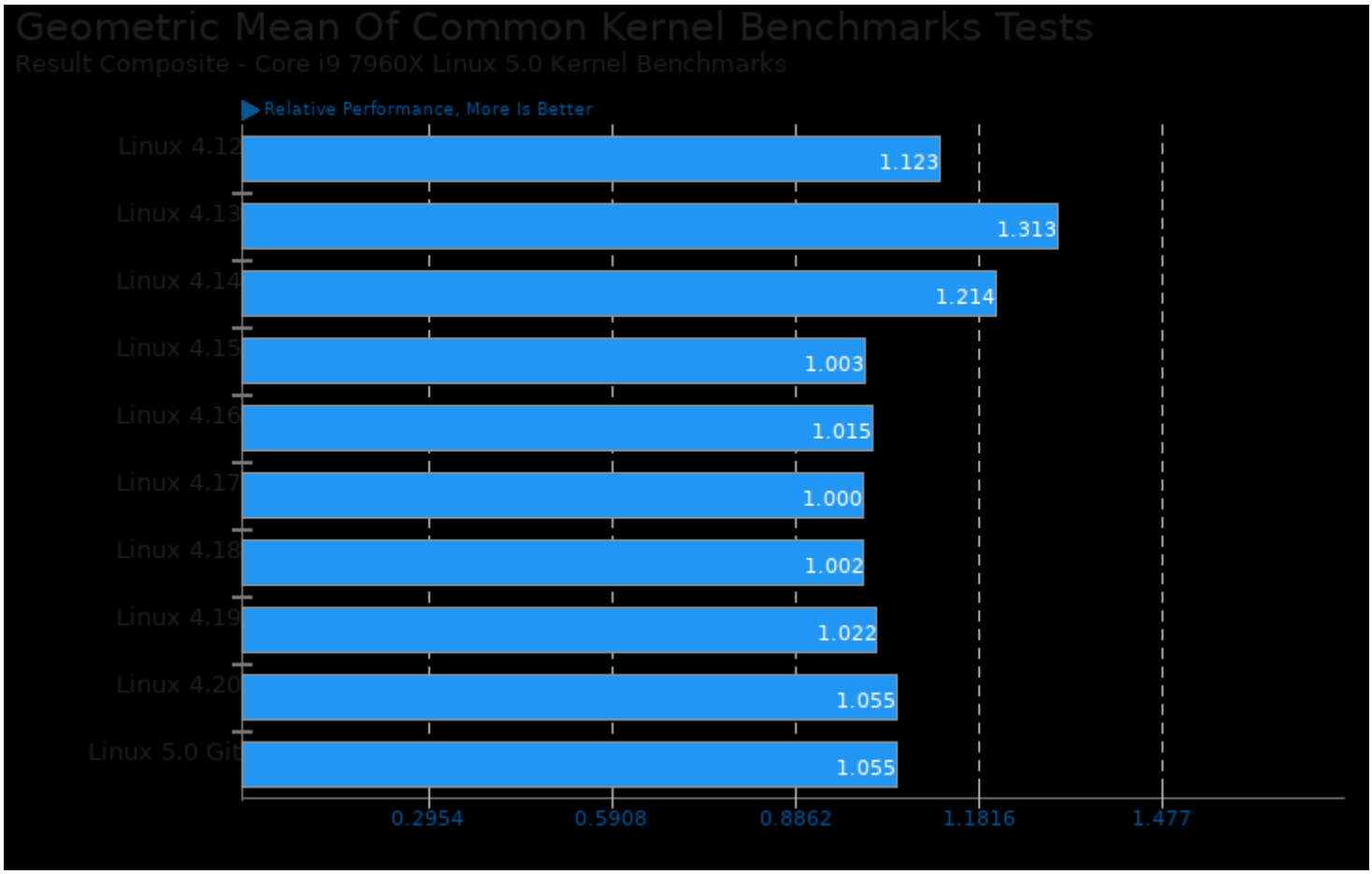
Geometric mean based upon tests: pts/npb, pts/rodinia, pts/parboil, system/octave-benchmark, pts/namd, pts/himeno, pts/hmmer, pts/mafft and pts/lczero

Core i9 7960X Linux 5.0 Kernel Benchmarks



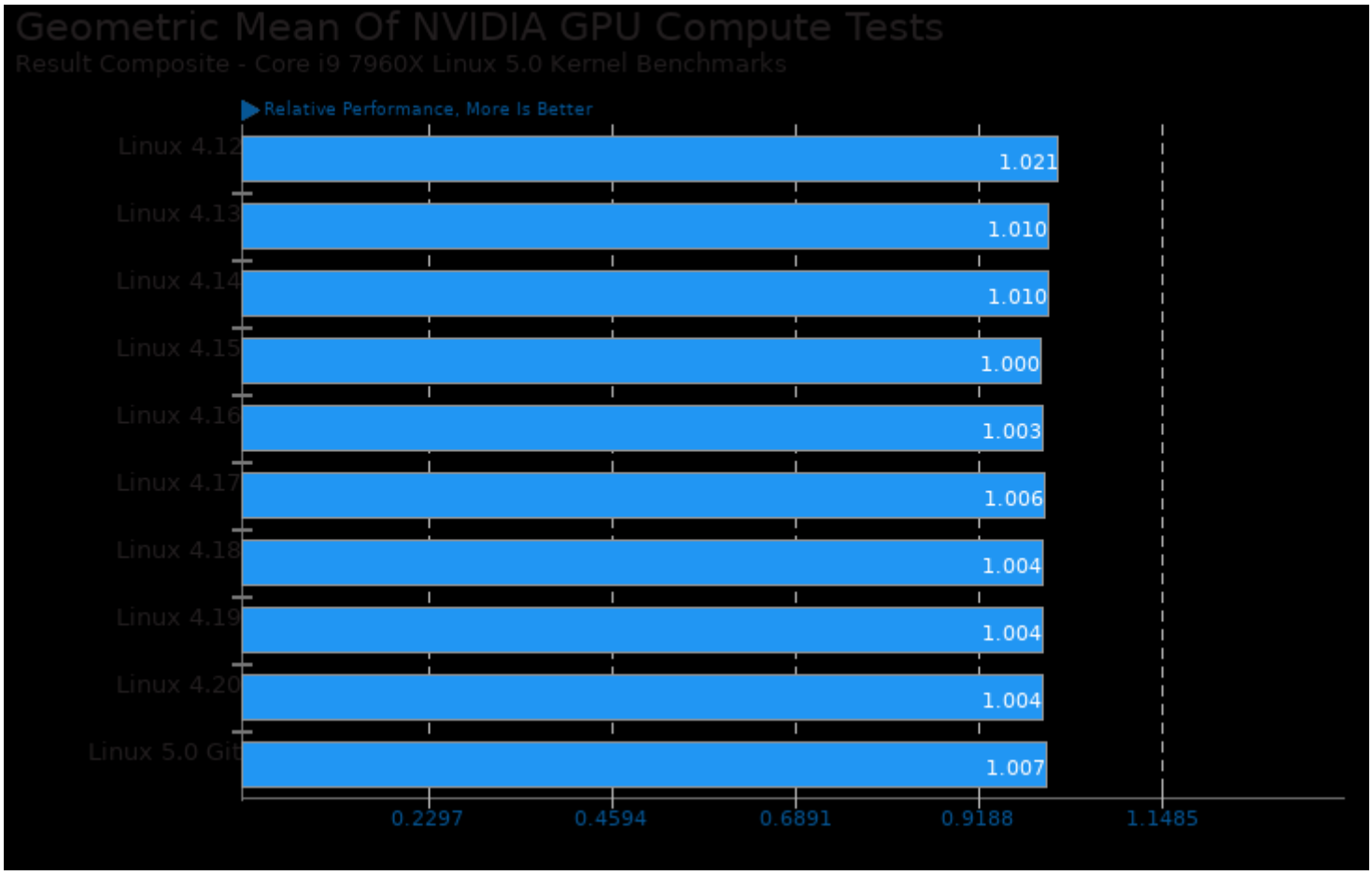
Geometric mean based upon tests: system/gimp and system/darktable

Core i9 7960X Linux 5.0 Kernel Benchmarks



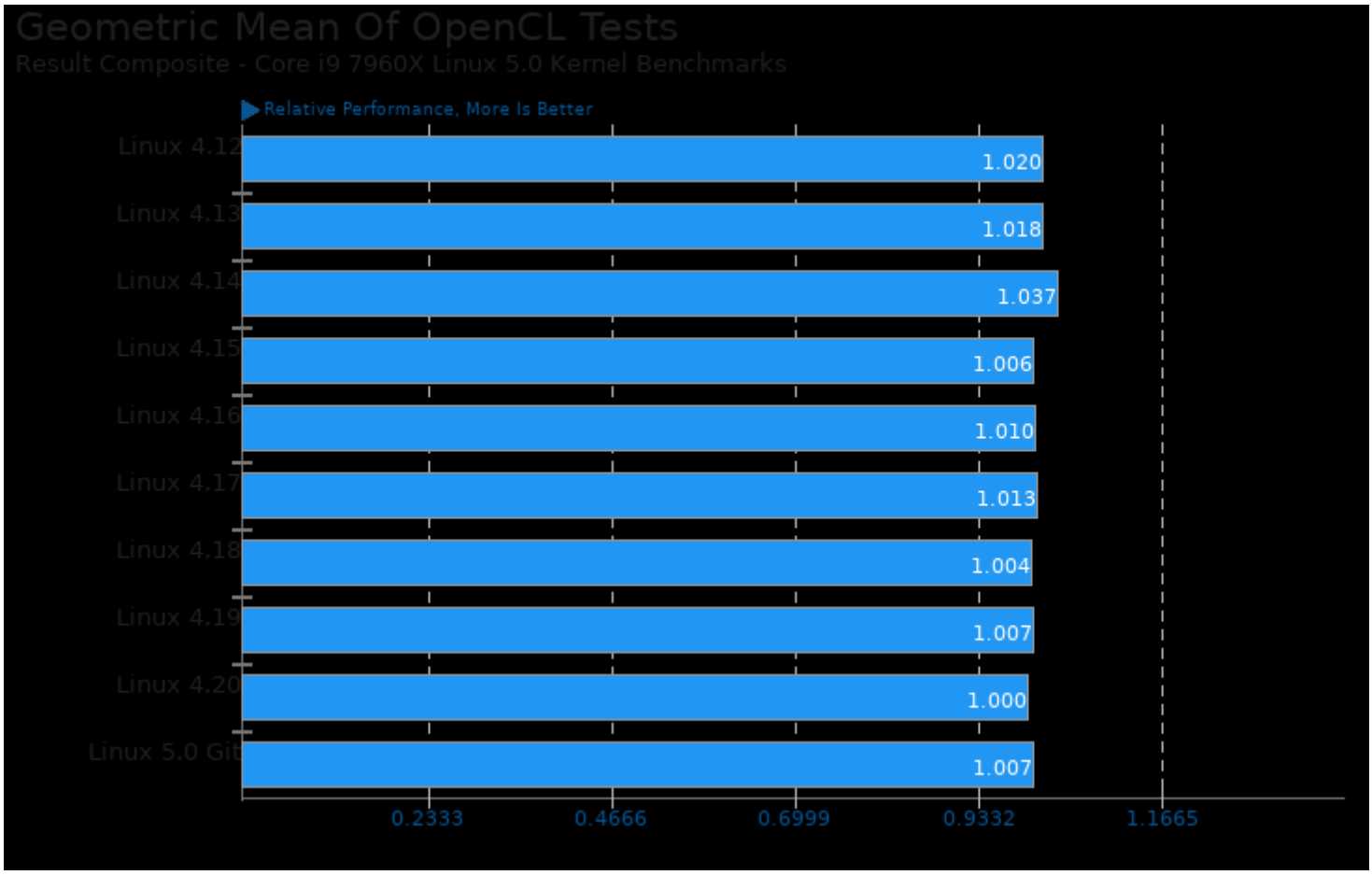
Geometric mean based upon tests: pts/pgbench, pts/openssl, pts/ctx-clock, pts/hackbench, pts/schbench, pts/stress-ng and pts/osbench

Core i9 7960X Linux 5.0 Kernel Benchmarks



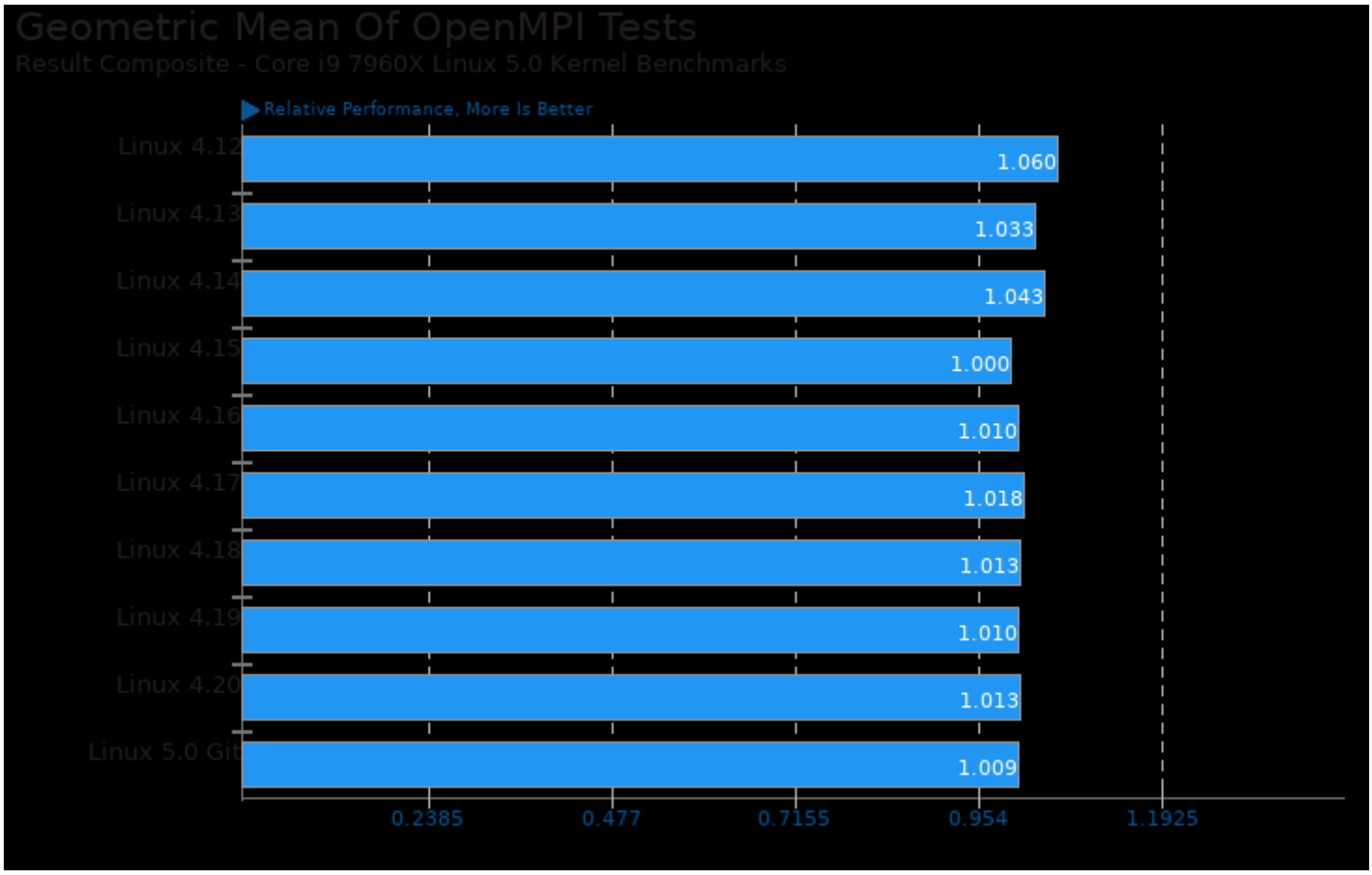
Geometric mean based upon tests: pts/rodinia, pts/lczero, pts/indigobench and pts/blender

Core i9 7960X Linux 5.0 Kernel Benchmarks



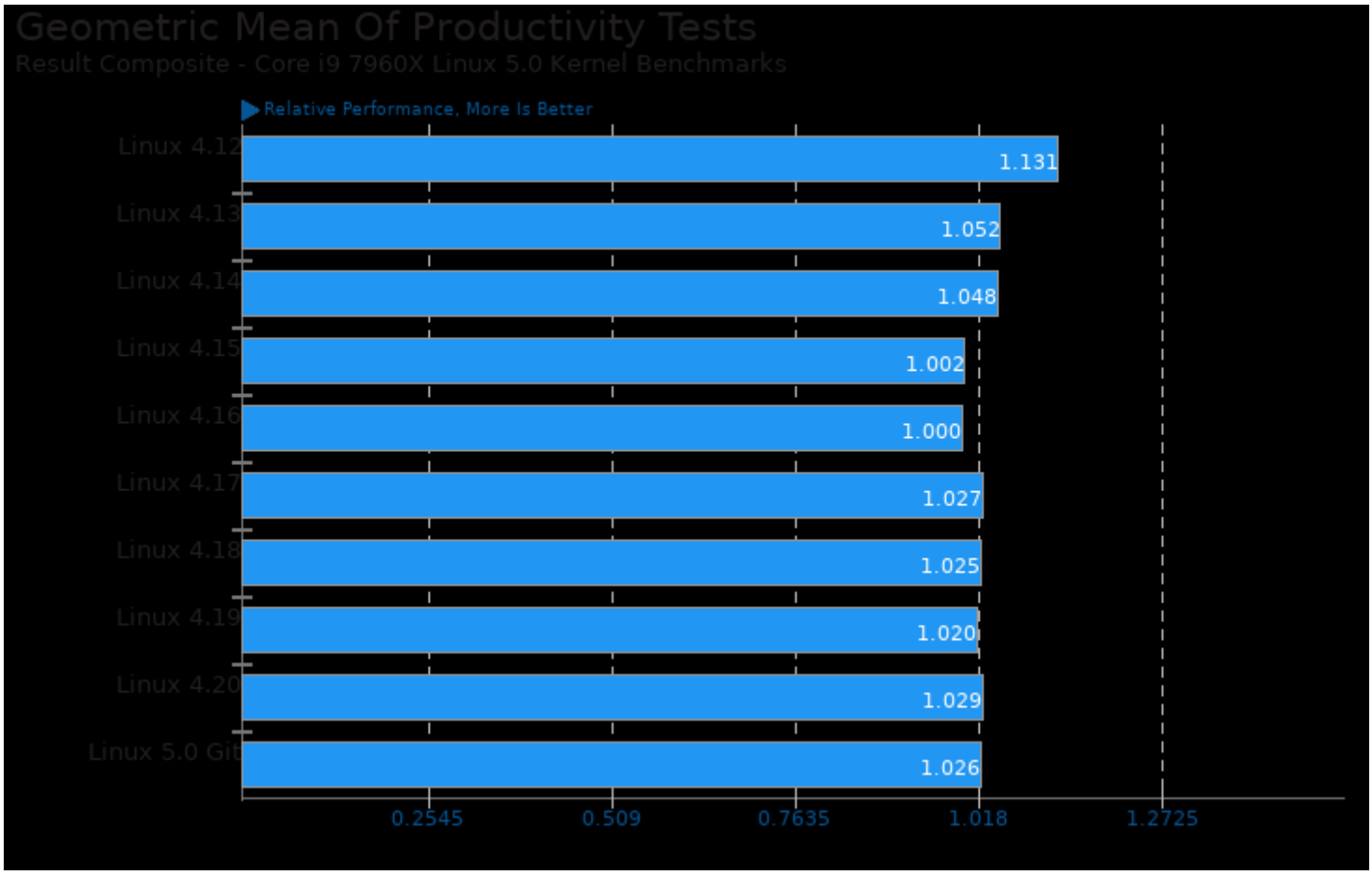
Geometric mean based upon tests: pts/rodinia, pts/parboil and system/darktable

Core i9 7960X Linux 5.0 Kernel Benchmarks



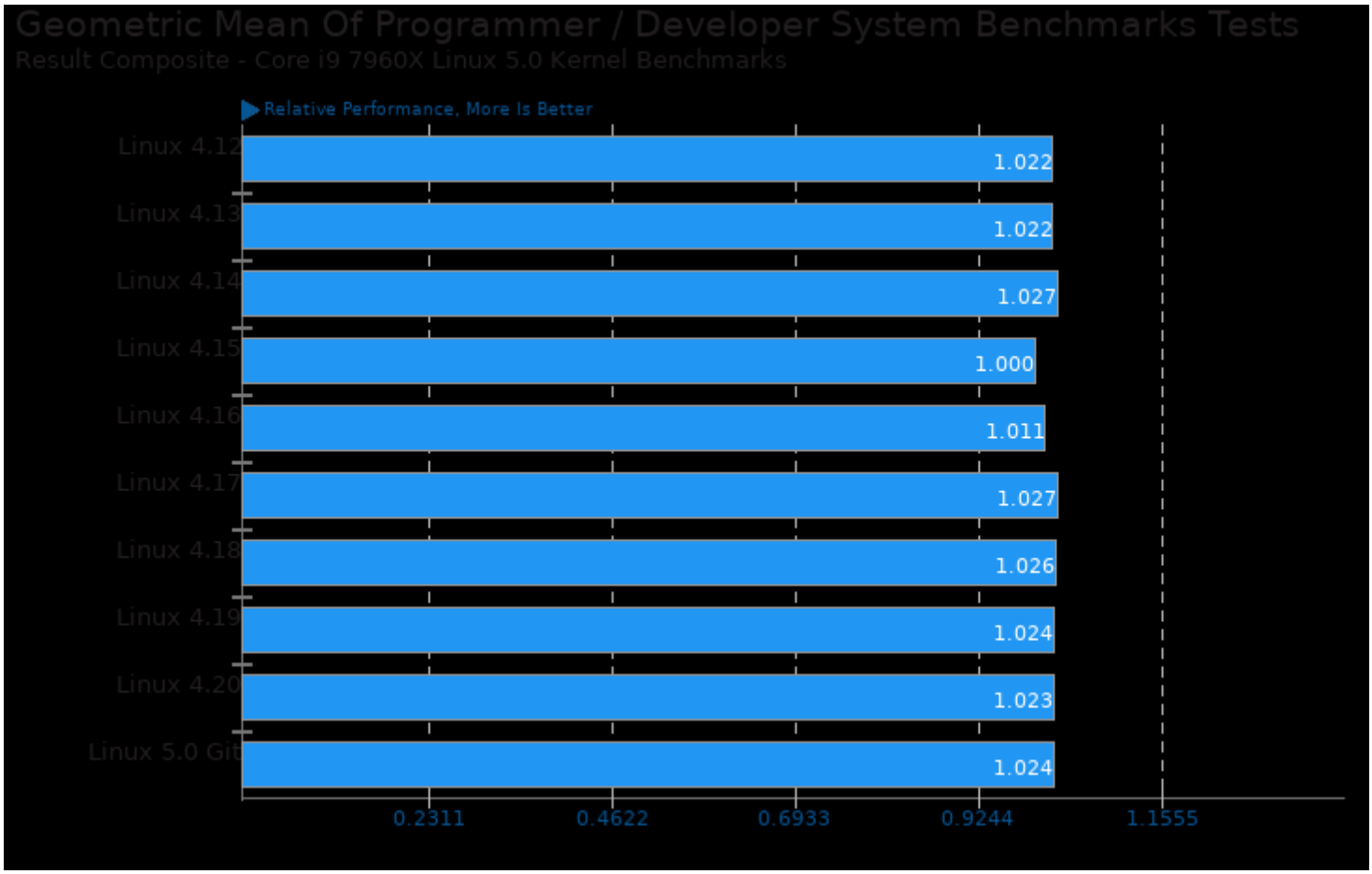
Geometric mean based upon tests: pts/npb, pts/parboil and pts/rodinia

Core i9 7960X Linux 5.0 Kernel Benchmarks



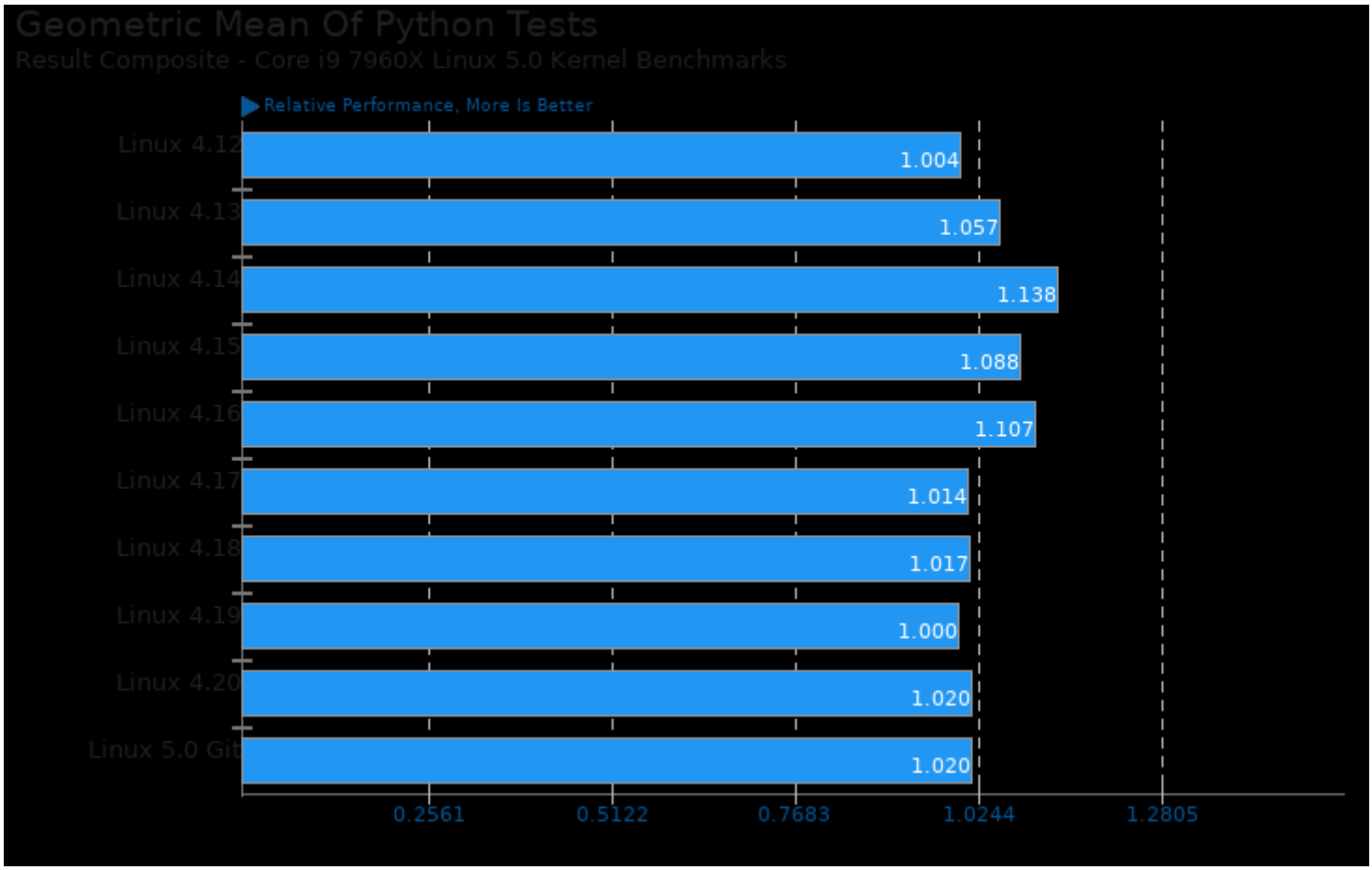
Geometric mean based upon tests: system/octave-benchmark and system/gimp

Core i9 7960X Linux 5.0 Kernel Benchmarks



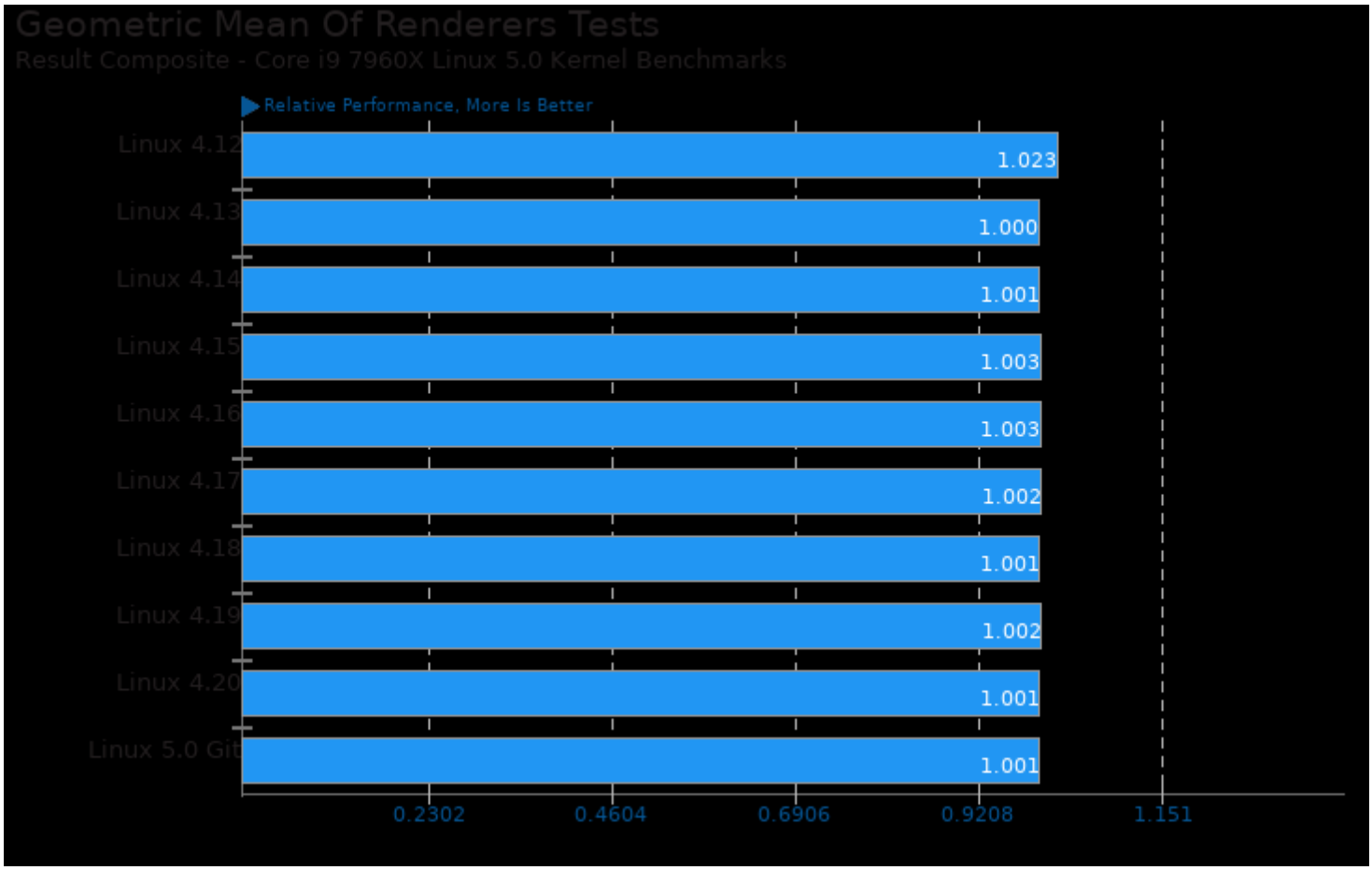
Geometric mean based upon tests: pts/compress-zstd, pts/pybench, system/cryptsetup, pts/build-linux-kernel and pts/build-llvm

Core i9 7960X Linux 5.0 Kernel Benchmarks



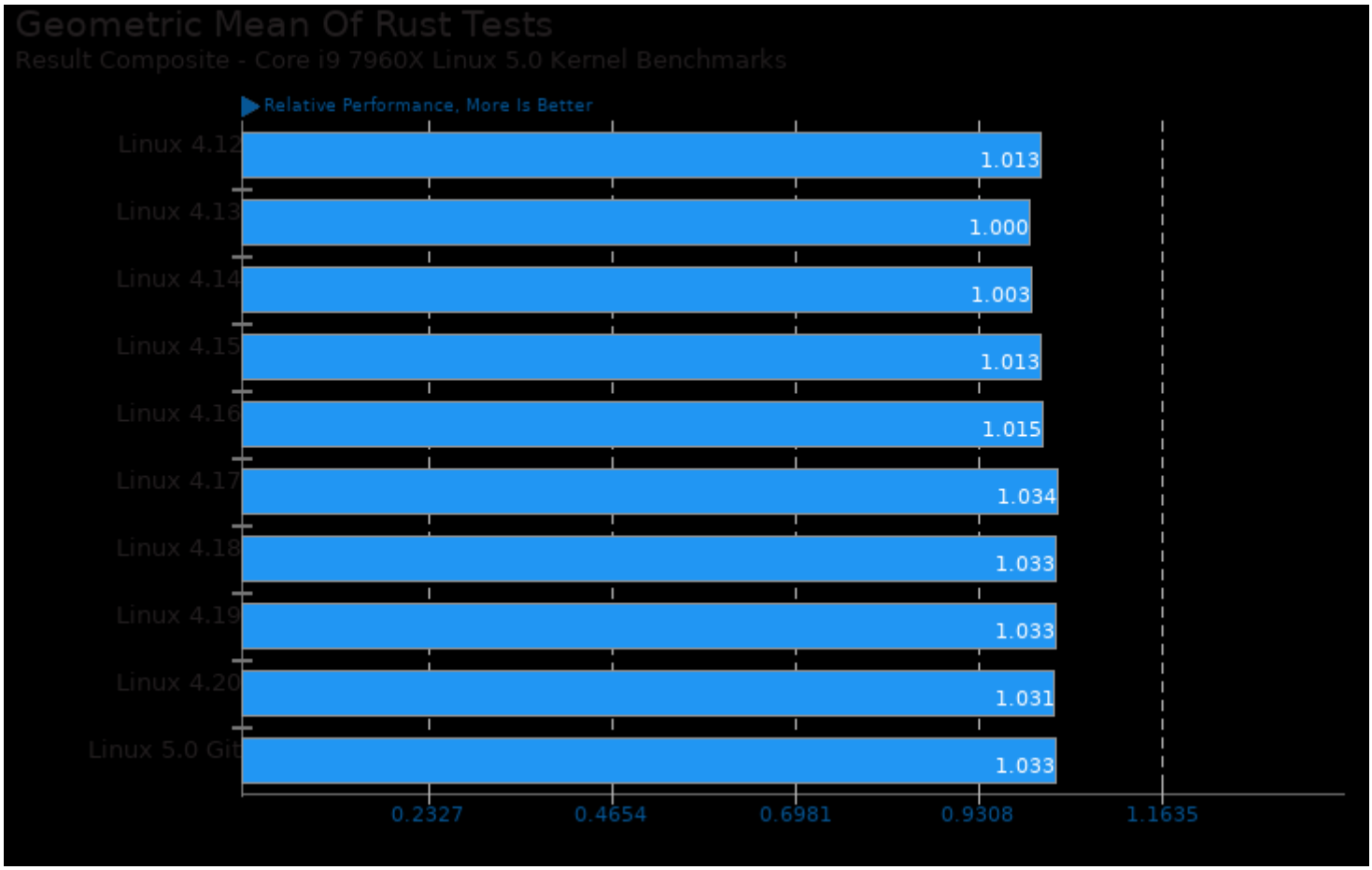
Geometric mean based upon tests: pts/compilebench, pts/parboil, pts/build-llvm, pts/pybench and pts/systemd-boot-total

Core i9 7960X Linux 5.0 Kernel Benchmarks



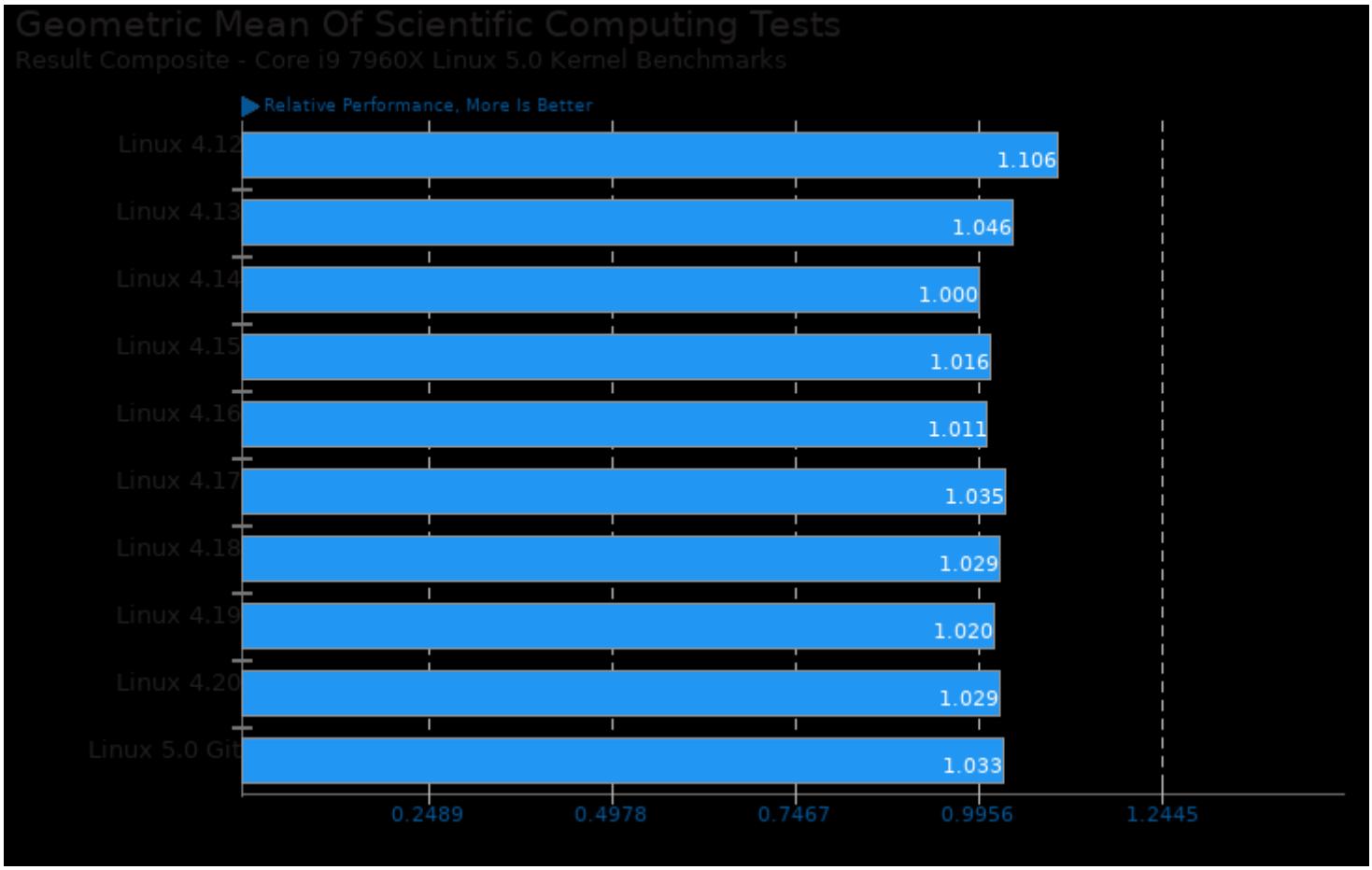
Geometric mean based upon tests: pts/blender, pts/ttsiod-renderer and pts/indigobench

Core i9 7960X Linux 5.0 Kernel Benchmarks



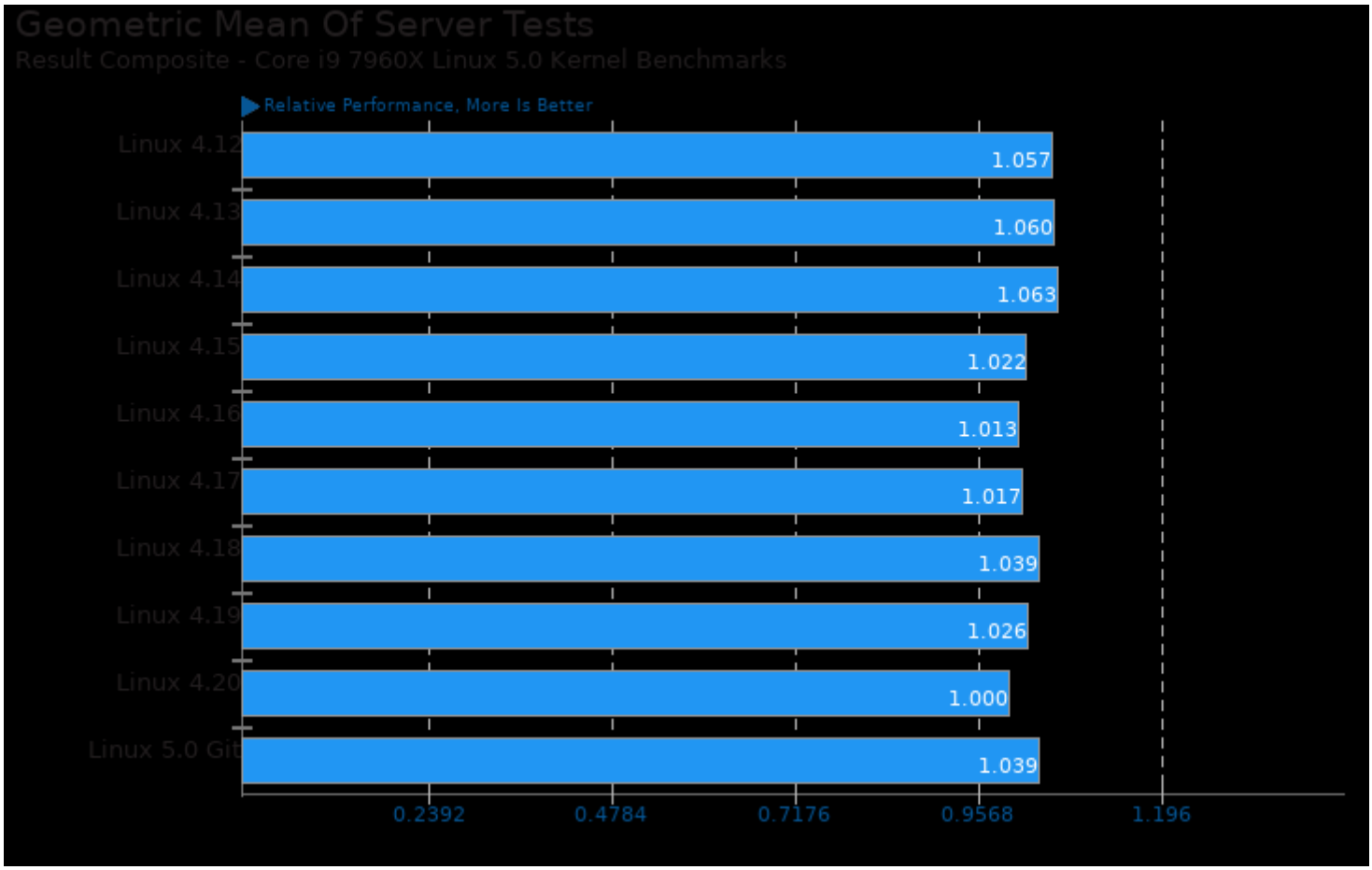
Geometric mean based upon tests: pts/rust-mandel and pts/rust-prime

Core i9 7960X Linux 5.0 Kernel Benchmarks



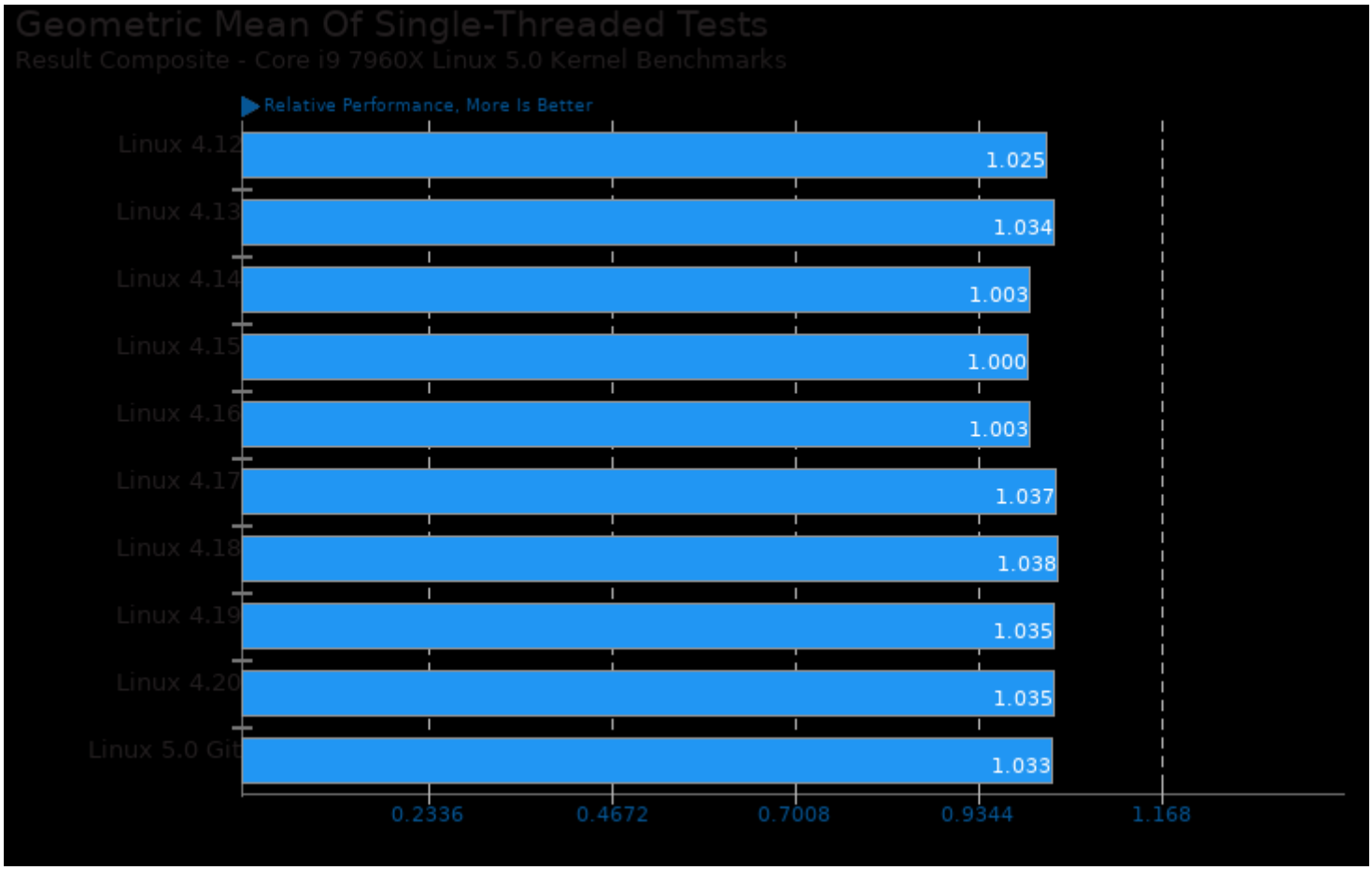
Geometric mean based upon tests: system/octave-benchmark, pts/namd, pts/himeno, pts/hmmer and pts/mafft

Core i9 7960X Linux 5.0 Kernel Benchmarks



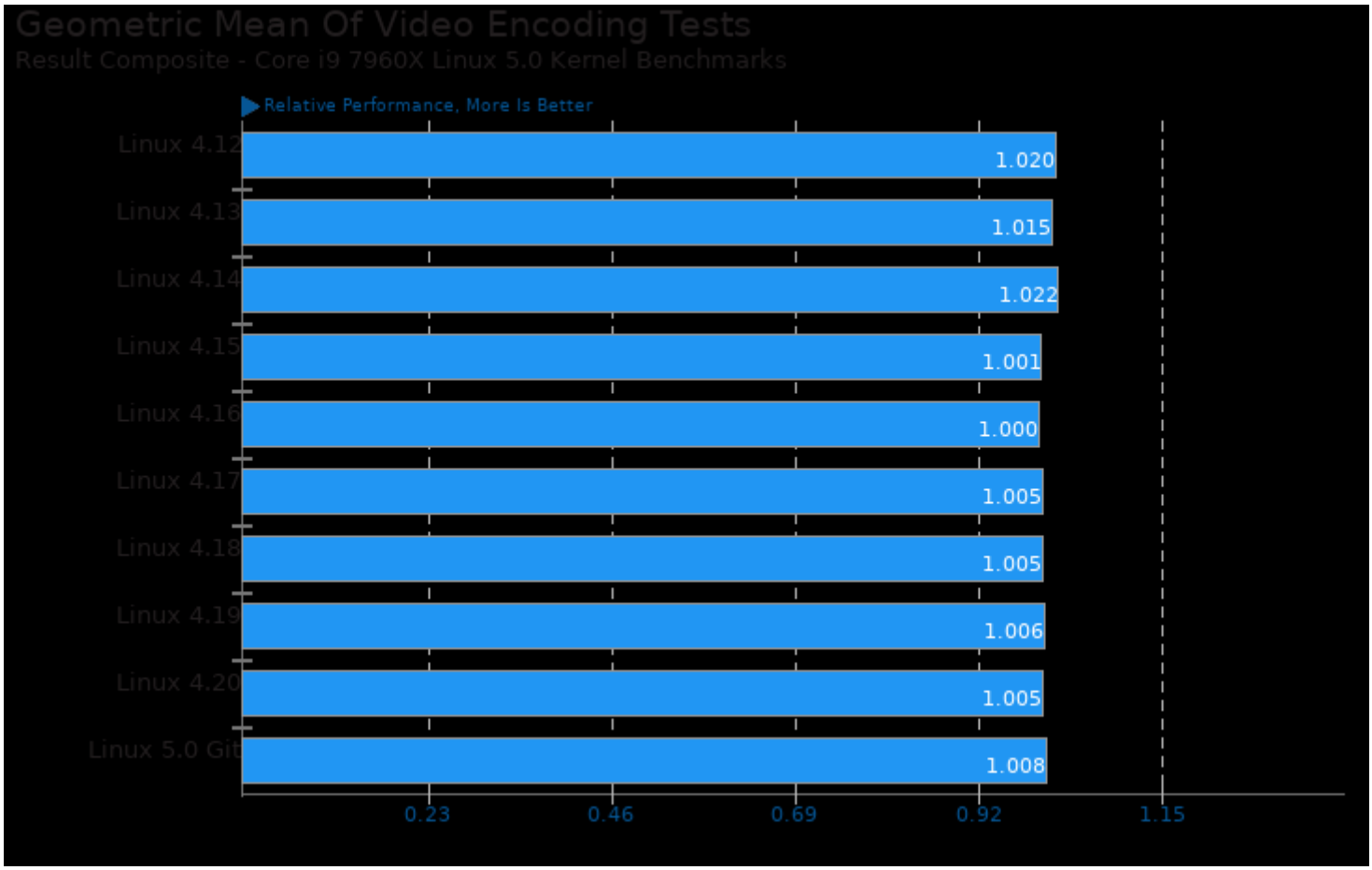
Geometric mean based upon tests: pts/blogbench, pts/ebizzy, pts/pgbench, pts/phpbench, pts/node-express-loadtest, pts/openssl and pts/sqlite

Core i9 7960X Linux 5.0 Kernel Benchmarks



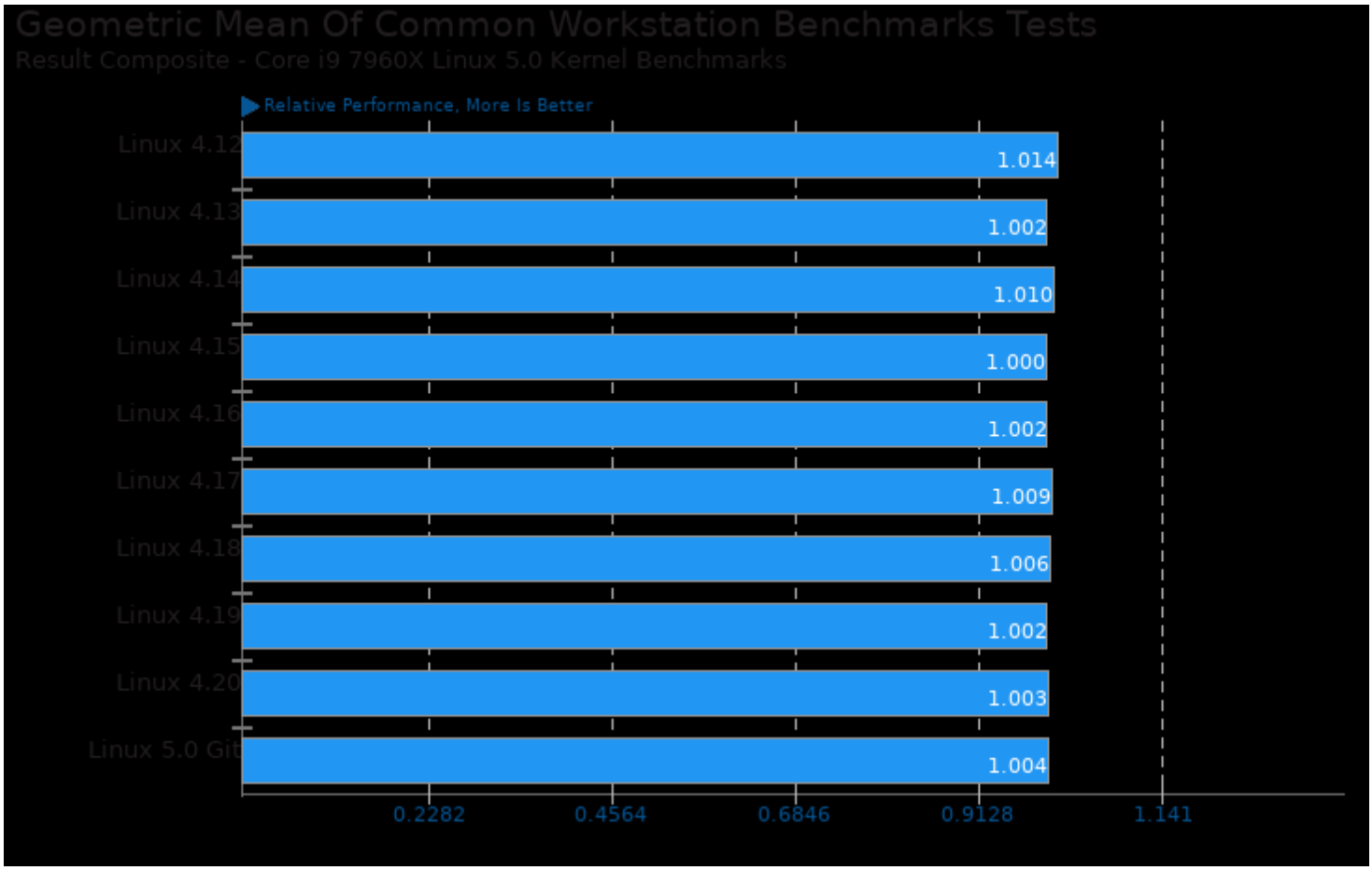
Geometric mean based upon tests: pts/luajit, pts/node-express-loadtest, pts/node-octane, pts/optcarrot, pts/pybench, pts/phpbench and system/tesseract-ocr

Core i9 7960X Linux 5.0 Kernel Benchmarks



Geometric mean based upon tests: pts/svt-vp9, pts/svt-hevc, pts/x264, pts/x265 and pts/dav1d

Core i9 7960X Linux 5.0 Kernel Benchmarks



Geometric mean based upon tests: pts/blender, pts/rodinia, pts/parboil, pts/himeno, pts/brl-cad and pts/x265

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 20:55.