



## Xeon & EPYC Tests

Various Server CPU benchmarks

### Automated Executive Summary

*2 x Xeon Platinum 8375C NUMA off had the most wins, coming in first place for 21% of the tests.*

*Based on the geometric mean of all complete results, the fastest (2 x Xeon Platinum 8490H) was 1.97x the speed of the slowest (Xeon Platinum 8259CL).*

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

*MKL-DNN DNNL (Harness: Deconvolution Batch deconv\_1d - Data Type: u8s8f32) at 3777.068x*

*MKL-DNN DNNL (Harness: Convolution Batch conv\_googlenet\_v3 - Data Type: u8s8f32) at 154.866x*

*MKL-DNN DNNL (Harness: Convolution Batch conv\_alexnet - Data Type: u8s8f32) at 118.651x*

*MKL-DNN DNNL (Harness: IP Batch All - Data Type: u8s8f32) at 103.268x*

*Zstd Compression (Compressing ubuntu-16.04.3-server-i386.img, Compression Level 19) at 10.615x*

*MKL-DNN DNNL (Harness: Convolution Batch conv\_all - Data Type: u8s8f32) at 10.592x*

*ArrayFire (Test: BLAS CPU) at 6.39x*

*Blender (Blend File: Classroom - Compute: CPU-Only) at 5.508x*

*LuxCoreRender (Scene: DLSC) at 5.234x*

*LuxCoreRender (Scene: Rainbow Colors and Prism) at 4.83x.*

## Test Systems:

### EPYC 2 7R32

Processor: AMD EPYC 7R32 48-Core @ 2.80GHz (48 Cores / 96 Threads), Motherboard: Supermicro H11SSL-i v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 8 x 16384 MB DDR4-3200MT/s HMA82GR7CJR8N-XN, Disk: 32GB Mass Storage + 256GB TOSHIBA THNSNJ25 + 600GB INTEL SSDSC2BB60 + 6001GB HGST HUS726060AL, Graphics: llvmpipe 126GB, Monitor: Crystal View, Network: 2 x Intel I210

OS: Ubuntu 19.10, Kernel: 5.3.0-64-generic (x86\_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server, OpenGL: 3.3 Mesa 19.2.8 (LLVM 9.0 128 bits), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 800x600

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86\_64-linux-gnu --program-prefix=x86\_64-linux-gnu- --target=x86\_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0x8301034

Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-2ubuntu219.10)

Python Notes: Python 2.7.17 + Python 3.7.5

Security Notes: itlb\_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS\_FW STIBP: conditional RSB filling + srbds: Not affected + tsx\_async\_abort: Not affected

### Xeon W-3275M

Processor: Intel Xeon W-3275M @ 4.60GHz (28 Cores / 56 Threads), Motherboard: Supermicro X11SPA-T v1.01 (3.1 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 188GB, Disk: 2 x 1024GB Samsung SSD 970 PRO 1TB, Graphics: eVGA NVIDIA GeForce RTX 2080 Ti 11GB (1350/7000MHz), Audio: Realtek ALC888-VD, Monitor: BenQ SW271, Network: Intel I210 + Aquantia AQC107 NBase-T/IEEE

OS: Ubuntu 19.10, Kernel: 5.3.0-46-generic (x86\_64), Desktop: GNOME Shell 3.34.3, Display Server: X Server 1.20.5, Display Driver: NVIDIA 430.50, OpenGL: 4.6.0, Compiler: GCC 9.2.1 20191008 + CUDA 10.1, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,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: intel\_pstate powersave - CPU Microcode: 0x500002c

OpenCL Notes: GPU Compute Cores: 4352

Java Notes: OpenJDK Runtime Environment (build 11.0.6+10-post-Ubuntu-1ubuntu119.10.1)

Python Notes: Python 2.7.17 + Python 3.7.5

Security Notes: itlb\_multihit: KVM: Mitigation of Split huge pages + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + tsx\_async\_abort: Mitigation of TSX disabled

### Xeon Platinum 8259CL

Processor: Intel Xeon Platinum 8259L @ 3.50GHz (24 Cores / 48 Threads), Motherboard: ASRock Rack EP2C621D16-4LP (P2.20 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 6 x 16384 MB DDR4-3200MT/s Hynix HMA82GR7CJR8N-XN, Disk: 256GB TOSHIBA THNSNJ25, Graphics: llvmpipe 93GB, Audio: NVIDIA Device 10f8, Monitor: DELL UP2516D, Network: 4 x Intel X722 for 1GbE

OS: Ubuntu 19.10, Kernel: 5.3.0-64-generic (x86\_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server, OpenGL: 3.3 Mesa 19.2.8 (LLVM 9.0 256 bits), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 2560x1440

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,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: intel\_pstate powersave - CPU Microcode: 0x4002f01

Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-2ubuntu219.10)

Python Notes: Python 2.7.17 + Python 3.7.5

Security Notes: itlb\_multihit: KVM: Mitigation of Split huge pages + 11tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx\_async\_abort: Mitigation of TSX disabled

## 2 x Xeon Platinum 8259CL NUMA off

### 2 x Xeon Platinum 8259CL

Processor: 2 x Intel Xeon Platinum 8259L @ 3.50GHz (48 Cores / 96 Threads), Motherboard: ASRock Rack EP2C621D16-4LP (P2.20 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 12 x 16384 MB DDR4-3200MT/s Hynix HMA82GR7CJR8N-XN, Disk: 256GB TOSHIBA THNSNJ25, Graphics: llvmpipe 188GB, Audio: NVIDIA Device 10f8, Monitor: DELL UP2516D, Network: 4 x Intel X722 for 1GbE

OS: Ubuntu 19.10, Kernel: 5.3.0-64-generic (x86\_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server, OpenGL: 3.3 Mesa 19.2.8 (LLVM 9.0 256 bits), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 2560x1440

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,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: intel\_pstate powersave - CPU Microcode: 0x4002f01

Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-2ubuntu219.10)

Python Notes: Python 2.7.17 + Python 3.7.5

Security Notes: itlb\_multihit: KVM: Mitigation of Split huge pages + 11tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx\_async\_abort: Mitigation of TSX disabled

## Xeon Platinum 8272CL

Processor: Intel Xeon Platinum 8272CL @ 3.70GHz (26 Cores / 52 Threads), Motherboard: ASRock Rack EP2C621D16-4LP (P2.20 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 6 x 16384 MB DDR4-3200MT/s Hynix HMA82GR7CJR8N-XN, Disk: 256GB TOSHIBA THNSNJ25, Graphics: llvmpipe 93GB, Audio: NVIDIA Device 10f8, Monitor: DELL UP2516D, Network: 4 x Intel X722 for 1GbE

OS: Ubuntu 19.10, Kernel: 5.3.0-64-generic (x86\_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server, OpenGL: 3.3 Mesa 19.2.8 (LLVM 9.0 256 bits), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 2560x1440

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,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: intel\_pstate powersave - CPU Microcode: 0x5002f01

Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-2ubuntu219.10)

Python Notes: Python 2.7.17 + Python 3.7.5

Security Notes: itlb\_multihit: KVM: Mitigation of Split huge pages + 11tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx\_async\_abort: Mitigation of TSX disabled

## 2 x Xeon Platinum 8272CL NUMA off

Processor: 2 x Intel Xeon Platinum 8272CL @ 3.70GHz (52 Cores / 104 Threads), Motherboard: ASRock Rack

EP2C621D16-4LP (P2.20 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 12 x 16384 MB DDR4-3200MT/s Hynix HMA82GR7CJR8N-XN, Disk: 600GB INTEL SSDSC2B60 + 10001GB Seagate ST10000NM0016-1T + 256GB TOSHIBA THNSNJ25, Graphics: llvmpipe 188GB, Audio: NVIDIA Device 10f8, Monitor: DELL UP2516D, Network: 4 x Intel X722 for 1GbE

OS: Ubuntu 19.10, Kernel: 5.3.0-64-generic (x86\_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server, OpenGL: 3.3 Mesa 19.2.8 (LLVM 9.0 256 bits), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 2560x1440

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,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: intel\_pstate powersave - CPU Microcode: 0x5002f01

Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-2ubuntu219.10)

Python Notes: Python 2.7.17 + Python 3.7.5

Security Notes: itlb\_multihit: KVM: Mitigation of Split huge pages + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of userscopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx\_async\_abort: Mitigation of TSX disabled

## 2 x Xeon Platinum 8272CL

Processor: 2 x Intel Xeon Platinum 8272CL @ 3.70GHz (52 Cores / 104 Threads), Motherboard: ASRock Rack EP2C621D16-4LP (P2.20 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 12 x 16384 MB DDR4-3200MT/s Hynix HMA82GR7CJR8N-XN, Disk: 256GB TOSHIBA THNSNJ25, Graphics: llvmpipe 188GB, Audio: NVIDIA Device 10f8, Monitor: DELL UP2516D, Network: 4 x Intel X722 for 1GbE

OS: Ubuntu 19.10, Kernel: 5.3.0-64-generic (x86\_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server, OpenGL: 3.3 Mesa 19.2.8 (LLVM 9.0 256 bits), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 2560x1440

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,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: intel\_pstate powersave - CPU Microcode: 0x5002f01

Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-2ubuntu219.10)

Python Notes: Python 2.7.17 + Python 3.7.5

Security Notes: itlb\_multihit: KVM: Mitigation of Split huge pages + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of userscopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx\_async\_abort: Mitigation of TSX disabled

## Xeon Platinum 8280

Processor: Intel Xeon Platinum 8280 @ 4.00GHz (28 Cores / 56 Threads), Motherboard: GIGABYTE MD61-SC2-00 v01000100 (T15 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 6 x 32 GB DDR4-2933MT/s HMA84GR7CJR4N-WM, Disk: 280GB INTEL SSDPED1D280GA, Graphics: ASPEED, Monitor: VE228, Network: 2 x Intel X722 for 1GbE + 2 x QLogic FastLinQ QL41000 10/25/40/50GbE

OS: Ubuntu 20.04, Kernel: 5.4.0-18-generic (x86\_64), Desktop: GNOME Shell 3.36.0, Display Server: X Server 1.20.7, Display Driver: modesetting 1.20.7, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,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: intel\_pstate powersave - CPU Microcode: 0x500002c

Java Notes: OpenJDK Runtime Environment (build 11.0.6+10-post-Ubuntu-2ubuntu2)

Python Notes: + Python 3.8.2

Security Notes: itlb\_multihit: KVM: Mitigation of Split huge pages + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + tsx\_async\_abort: Mitigation of TSX disabled

## 2 x Xeon Platinum 8280

Processor: 2 x Intel Xeon Platinum 8280 @ 4.00GHz (56 Cores / 112 Threads), Motherboard: GIGABYTE MD61-SC2-00 v01000100 (T15 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 12 x 32 GB DDR4-2933MT/s HMA84GR7CJR4N-WM, Disk: 280GB INTEL SSDPED1D280GA, Graphics: ASPEED, Monitor: VE228, Network: 2 x Intel X722 for 1GbE + 2 x QLogic FastLinQ QL41000 10/25/40/50GbE

OS: Ubuntu 20.04, Kernel: 5.4.0-18-generic (x86\_64), Desktop: GNOME Shell 3.36.0, Display Server: X Server 1.20.7, Display Driver: modesetting 1.20.7, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,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: intel\_pstate powersave - CPU Microcode: 0x500002c

Java Notes: OpenJDK Runtime Environment (build 11.0.6+10-post-Ubuntu-2ubuntu2)

Python Notes: + Python 3.8.2

Security Notes: itlb\_multihit: KVM: Mitigation of Split huge pages + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + tsx\_async\_abort: Mitigation of TSX disabled

## Xeon Platinum 8375C

Processor: Intel Xeon Platinum 8375C @ 3.50GHz (32 Cores / 64 Threads), Motherboard: Supermicro X12DPi-N6 v1.00 (1.0a BIOS), Chipset: Intel Device 0998, Memory: 8 x 16384 MB DDR4-3200MT/s Samsung M393A2K43CB2-CWE, Disk: 600GB INTEL SSDSC2BB60 + 10001GB Seagate ST10000NM0016-1T + 256GB TOSHIBA THNSNJ25, Graphics: llvmpipe 126GB, Monitor: Crystal View, Network: 2 x Intel I350

OS: Ubuntu 19.10, Kernel: 5.3.0-64-generic (x86\_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server, OpenGL: 3.3 Mesa 19.2.8 (LLVM 9.0 256 bits), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 800x600

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86\_64-linux-gnu --program-prefix=x86\_64-linux-gnu- --target=x86\_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0xd0001b2

Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-2ubuntu219.10)

Python Notes: Python 2.7.17 + Python 3.7.5

Security Notes: itlb\_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx\_async\_abort: Not affected

## 2 x Xeon Platinum 8375C NUMA off

Processor: 2 x Intel Xeon Platinum 8375C @ 3.50GHz (64 Cores / 128 Threads), Motherboard: Supermicro X12DPi-N6 v1.00 (1.0a BIOS), Chipset: Intel Device 0998, Memory: 16 x 16384 MB DDR4-3200MT/s Samsung M393A2K43CB2-CWE, Disk: 600GB INTEL SSDSC2BB60 + 10001GB Seagate ST10000NM0016-1T + 256GB TOSHIBA THNSNJ25, Graphics: llvmpipe 251GB, Monitor: Crystal View, Network: 2 x Intel I350

OS: Ubuntu 19.10, Kernel: 5.3.0-64-generic (x86\_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server, OpenGL: 3.3 Mesa 19.2.8 (LLVM 9.0 256 bits), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 800x600

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86\_64-linux-gnu --program-prefix=x86\_64-linux-gnu- --target=x86\_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0xd0001b2

Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-2ubuntu219.10)

Python Notes: Python 2.7.17 + Python 3.7.5

Security Notes: itlb\_multihit: Not affected + 11tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx\_async\_abort: Not affected

## 2 x Xeon Platinum 8375C

Processor: 2 x Intel Xeon Platinum 8375C @ 3.50GHz (64 Cores / 128 Threads), Motherboard: Supermicro X12DPI-N6 v1.00 (1.0a BIOS), Chipset: Intel Device 0998, Memory: 16 x 16384 MB DDR4-3200MT/s Samsung M393A2K43CB2-CWE, Disk: 600GB INTEL SSDSC2BB60 + 10001GB Seagate ST10000NM0016-1T + 256GB TOSHIBA THNSNJ25, Graphics: llvmpipe 252GB, Monitor: Crystal View, Network: 2 x Intel I350

OS: Ubuntu 19.10, Kernel: 5.3.0-64-generic (x86\_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server, OpenGL: 3.3 Mesa 19.2.8 (LLVM 9.0 256 bits), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 800x600

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86\_64-linux-gnu --program-prefix=x86\_64-linux-gnu- --target=x86\_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0xd0001b2

Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-2ubuntu219.10)

Python Notes: Python 2.7.17 + Python 3.7.5

Security Notes: itlb\_multihit: Not affected + 11tf: Not affected + mds: Not affected + meltdown: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx\_async\_abort: Not affected

## 2 x Xeon Platinum 8490H SNC 2

Processor: 2 x Intel Xeon Platinum 8490H @ 1.90GHz (120 Cores / 240 Threads), Motherboard: Supermicro X13DDW-A v1.01 (1.0a BIOS), Chipset: Intel Device 1bce, Memory: 1008GB, Disk: 2 x 7682GB SAMSUNG MZWLJ7T6HALA-0007C + 400GB Micron\_7450\_MTFDKBA400TFS + 29990GB SlowStorage + 1917GB SASCache + 960GB EX-Calibur, Graphics: llvmpipe, Audio: NVIDIA GK107 HDMI Audio, Network: 2 x Intel I350

OS: Ubuntu 22.10, Kernel: 5.19.0-29-generic (x86\_64), Desktop: GNOME Shell 43.0, Display Server: X Server 1.21.1.4, Display Driver: modesetting 1.21.1, OpenGL: 4.5 Mesa 22.2.1 (LLVM 15.0.2 256 bits), Compiler: GCC 12.2.0, File-System: ext4, Screen Resolution: 1024x768

Environment Notes: DEBUGINFOD\_URLS=https://debuginfod.ubuntu.com

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-cet --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,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-defaulted --enable-offload-targets=nvptx-none=/build/gcc-12-U8K4Qv/gcc-12-12.2.0/debian/tmp-nvptx/usr,amdgc-nvptx=/build/gcc-12-U8K4Qv/gcc-12-12.2.0/debian/tmp-gcn/usr --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 - CPU Microcode: 0x2b0000a1

Java Notes: OpenJDK Runtime Environment (build 11.0.17+8-post-Ubuntu-1ubuntu2)

Python Notes: + Python 3.10.7

Security Notes: itlb\_multihit: Not affected + 11tf: Not affected + mds: Not affected + meltdown: Not affected + mmio\_stale\_data: Not affected + retbleed: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling PBRSE-eIBRS: SW sequence + srbds: Not affected + tsx\_async\_abort: Not affected

## 2 x Xeon Platinum 8490H

Processor: 2 x Intel Xeon Platinum 8490H @ 1.90GHz (120 Cores / 240 Threads), Motherboard: Supermicro

X13DDW-A v1.01 (1.0a BIOS), Chipset: Intel Device 1bce, Memory: 1008GB, Disk: 2 x 7682GB SAMSUNG MZWLJ7T6HALA-0007C + 400GB Micron\_7450\_MTFDKBA400TFS + 1917GB SASCACHE + 29990GB SlowStorage + 960GB EX-Calibur, Graphics: llvmpipe, Audio: NVIDIA GK107 HDMI Audio, Network: 2 x Intel I350

OS: Ubuntu 22.10, Kernel: 5.19.0-29-generic (x86\_64), Desktop: GNOME Shell 43.0, Display Server: X Server 1.21.1.4, Display Driver: modesetting 1.21.1, OpenGL: 4.5 Mesa 22.2.1 (LLVM 15.0.2 256 bits), Compiler: GCC 12.2.0, File-System: ext4, Screen Resolution: 1024x768

Environment Notes: DEBUGINFOD\_URLS=https://debuginfod.ubuntu.com

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-cet --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,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-defaulted --enable-offload-targets=nvptx-none=/build/gcc-12-U8K4Qv/gcc-12-12.2.0/debian/tmp-nvptx/usr,amdgc-amdhsa=/build/gcc-12-U8K4Qv/gcc-12-12.2.0/debian/tmp-gcn/usr --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 - CPU Microcode: 0x2b0000a1

Java Notes: OpenJDK Runtime Environment (build 11.0.17+8-post-Ubuntu-1ubuntu2)

Python Notes: + Python 3.10.7

Security Notes: itlb\_multihit: Not affected + I1tf: Not affected + mds: Not affected + meltdown: Not affected + mmio\_stale\_data: Not affected + retbleed: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling PBRSE-eIBRS: SW sequence + srbds: Not affected + tsx\_async\_abort: Not affected

	EPYC 2 7R32	Xeon W-32 75M	Xeon Platin 8259 CL	2 x Xeon Platin 8259 CL	2 x Xeon Platin 8272 CL	Xeon Platin 8272 CL	2 x Xeon Platin 8272 CL	2 x Xeon Platin 8280 C	Xeon Platin 8375 C	2 x Xeon Platin 8375 C	2 x Xeon Platin 8490 H	2 x Xeon Platin 8490 H		
<b>High Performance Conjugate Gradient (GFLOP/s)</b>	17.06	14.16	<b>13.64</b>	16.51	27.10	16.52	26.70	14.90	28.85	20.16	27.20	39.15	62.25	<b>63.07</b>
<b>Normalized Standard Deviation</b>	08	23	<b>25</b>	71	60	82	25	97	42	87	72	62	48	<b>11</b>
<b>NAS Parallel Benchmarks - BT.C</b>	10641	69348	<b>51975</b>	84766	10410	69011	10211	13179	71842	13604	96192	16456	<b>18835</b>	
<b>Normalized Standard Deviation</b>	56.5%	36.82%	27.59%	45%	55.27%	36.64%	54.21%	69.97%	38.14%	72.23%	51.07%	87.37%	100%	
<b>NAS Parallel Benchmarks - EP.C</b>	3486	3025	<b>2641</b>	5059	5053	2974	5668	5763	3194	6105	4004	<b>6745</b>	6352	
<b>Normalized Standard Deviation</b>	51.69%	44.85%	39.16%	75.01%	74.91%	44.1%	84.03%	85.45%	47.36%	90.52%	59.36%	100%	94.19%	

<b>NAS Parallel Benchmarks - EP.D</b>	3570	3211	<b>2678</b>	5284	5310	3033	5973	6088	3283	6285	4730	9334	<b>9339</b>				
Normalized Standard	38.23%	34.38%	28.67%	56.58%	56.86%	32.48%	63.96%	65.19%	35.16%	67.29%	50.65%	99.95%	100%				
Deviation	0.3%	0.2%	2.9%	2.8%	2.9%	2.9%	2.7%	2.5%	2.8%	8.2%	0.2%	2.7%	1.9%				
<b>NAS Parallel Benchmarks - L.U.C</b>	99822	69607	<b>65522</b>	94643	12096				74256	14009	97414	15279	<b>17738</b>				
Normalized Standard	56.27%	39.24%	36.94%	53.35%	68.19%				41.86%	78.97%	54.92%	86.14%	100%				
Deviation	0.2%	0.1%	0%	0.1%	0.1%				0.2%	0.2%	1.1%	1.2%	5.7%				
<b>NAS Parallel Benchmarks - MG.C</b>	49330	35376	<b>33490</b>	43490	63393	34709	45188	66471	37089	69175	50841	82390	<b>11194</b>				
Normalized Standard	44.07%	31.6%	29.92%	38.85%	56.63%	31.01%	40.37%	59.38%	33.13%	61.8%	45.42%	73.6%	100%				
Deviation	2.8%	0.2%	0.6%	1.7%	0.8%	0.1%	0.1%	0.6%	0.6%	2.8%	7.1%	0.3%	1.6%				
<b>NAS Parallel Benchmarks - SP.B</b>	51225	31427	<b>24288</b>	38494	53979	29919	46296	66865	32682	70893	46439	86029	<b>11235</b>				
Normalized Standard	45.59%	27.97%	21.62%	34.26%	48.05%	26.63%	41.21%	59.52%	29.09%	63.1%	41.33%	76.57%	100%				
Deviation	3.9%	0.8%	0.2%	0.2%	0.2%	0.7%	0.1%	0.2%	0.8%	0.3%	5.4%	4.7%	0.4%				
<b>CloverLeaf - L.E.H (sec)</b>	0.36	<b>1.14</b>	1.11	0.63	0.78	1.05	0.61	0.71	0.96	0.69	0.51	<b>0.33</b>	0.35	0.61	0.64		
Normalized Standard	91.67%	28.95%	29.73%	52.38%	42.31%	31.43%	54.1%	46.48%	34.38%	47.83%	64.71%	100%	94.29%	54.1%	51.56%		
Deviation	0.2%	6.1%	0.4%	0.3%	14.8%	0.2%	1%	13.3%	0.1%	9.2%	0.3%	2.8%	11.6%	22.6%	19.8%		
<b>NAMD - ATPase</b>	0.486	0.814	<b>0.869</b>	0.454	0.445	0.777	0.401	0.388	0.707	0.362	0.469	0.256	<b>0.249</b>	0.273	0.268		
Normalized Standard	14	34	<b>25</b>	22	51	24	73	40	09	26	48	32	<b>41</b>	11	65		
<b>Simulation - 327,506 Atoms (days/ns)</b>																	
Normalized Standard	51.3%	30.63%	28.69%	54.91%	55.98%	32.09%	62.08%	64.21%	35.27%	68.85%	53.12%	97.3%	100%	91.32%	92.84%		
Deviation	0.3%	3.7%	0.1%	0%	0.1%	2.9%	0.3%	0.1%	0.1%	0.6%	0%	0.7%	0.2%	8.1%	5.6%		
<b>Izbench - Zstd 1 - Compression (MB/s)</b>	418	<b>508</b>	410	407	<b>399</b>	430	430	423	457	449	464	461	453				
Normalized Standard	82.28%	100%	80.71%	80.12%	78.54%	84.65%	84.65%	83.27%	89.96%	88.39%	91.34%	90.75%	89.17%				
Deviation		0.3%	0.1%	1%	1%	0.9%		0.4%	0.2%			0.1%	0.1%				
<b>Izbench - Zstd 1 - Decompression (MB/s)</b>	1148	1299	1061	1032	<b>1027</b>	1122	1078	1088	1212	1168	<b>1321</b>	1271	1258				
Normalized Standard	86.9%	98.33%	80.32%	78.12%	77.74%	84.94%	81.6%	82.36%	91.75%	88.42%	100%	96.21%	95.23%				
Deviation		0.4%		0.1%	0.1%		1%	0.8%		0.3%	0.1%	0.1%	0.2%				

## Xeon & EPYC Tests

Izbench - Zstd 8 - Compression (MB/s)	83	84	71	71	69	75	74	73	77	75	89	88	86
Normalized	93.26%	94.38%	79.78%	79.78%	77.53%	84.27%	83.15%	82.02%	86.52%	84.27%	100%	98.88%	96.63%
Izbench - Zstd 8 - Decompression (MB/s)	1266	1298	1089	966	1011	1145	1022	1058	1224	1124	1412	1291	1320
Normalized	89.66%	91.93%	77.12%	68.41%	71.6%	81.09%	72.38%	74.93%	86.69%	79.6%	100%	91.43%	93.48%
Standard		0.2%	0.1%	2.1%	0.3%	0.1%	0.2%		0.1%	0.2%	0.1%		
Deviation													
Izbench - Crush 0 - Compression (MB/s)	81	109	91	86	88	97	93	93	101	96	111	109	106
Normalized	72.97%	98.2%	81.98%	77.48%	79.28%	87.39%	83.78%	83.78%	90.99%	86.49%	100%	98.2%	95.5%
Standard	1.2%	1.6%			0.7%			0.6%	0.6%			1.6%	0.5%
Deviation													
Izbench - Crush 0 - Decompression (MB/s)	380	509	404	396	394	427	412	415	440	428	422	416	413
Normalized	74.66%	100%	79.37%	77.8%	77.41%	83.89%	80.94%	81.53%	86.44%	84.09%	82.91%	81.73%	81.14%
Standard						0.2%	0.3%	0.1%		0.1%	0.1%		
Deviation													
Izbench - Brotli 2 - Compression (MB/s)	165	196	160	159	157	168	168	166	181	176	184	183	178
Normalized	84.18%	100%	81.63%	81.12%	80.1%	85.71%	85.71%	84.69%	92.35%	89.8%	93.88%	93.37%	90.82%
Standard	0.7%	0.3%	0.4%		1.5%	1.2%							
Deviation													
Izbench - Brotli 2 - Decompression (MB/s)	564	721	587	543	551	619	571	580	673	623	624	617	600
Normalized	78.22%	100%	81.41%	75.31%	76.42%	85.85%	79.2%	80.44%	93.34%	86.41%	86.55%	85.58%	83.22%
Standard	0.3%	0.3%		0.1%	0.1%	0.2%			0.2%	0.4%	0.9%	1.6%	0.3%
Deviation													
SMHasher - wyhash (cycles/hash)		18.50	24.18	24.15	24.15	23.67	23.67	23.64	22.67	22.67			
Normalized		100%	76.52%	76.62%	76.63%	78.17%	78.19%	78.27%	81.61%	81.62%			
Standard		0.3%	0.1%	0%	0%	0.1%	0%	0%	0%	0%			
Deviation													

## Xeon & EPYC Tests

<b>Timed</b>	92.36	<b>143.3</b>	138.8	141.8	139.7	133.4	134.8	134.9	128.8	129.9	99.68	103.1	101.8	85.71	<b>84.46</b>
<b>MrBayes</b>	1	<b>48</b>	46	98	50	83	83	97	48	86	8	12	72	1	<b>8</b>
<b>Analysis - P.P.A (sec)</b>															
<b>Normalized</b>	91.45%	58.93%	60.84%	59.53%	60.44%	63.28%	62.62%	62.57%	65.56%	64.98%	84.73%	81.92%	82.92%	98.55%	100%
<b>Standard</b>	1.3%	0.2%	0.2%	2.3%	0.4%	0.1%	0.6%	1.3%	0%	0.5%	0.7%	3.2%	1.1%	0.7%	1.6%
<b>Deviation</b>															
<b>LAMMPS</b>	20.82	14.56	<b>13.04</b>	21.88	22.53	14.01	22.66	23.43	15.31	24.78	15.90	27.34	25.98	<b>29.98</b>	25.60
<b>Molecular Dynamics Simulator - Rhodopsin Protein (ns/day)</b>	1	2	<b>0</b>	7	5	4	6	4	4	8	1	5	2	<b>7</b>	8
<b>Normalized</b>	69.43%	48.56%	43.49%	72.99%	75.15%	46.73%	75.59%	78.15%	51.07%	82.66%	53.03%	91.19%	86.64%	100%	85.4%
<b>Standard</b>	6.9%	3.4%	1.1%	2.6%	2.6%	0.3%	0.9%	2.7%	2.2%	3.8%	10.8%	13%	12.1%	8%	0.4%
<b>Deviation</b>															
<b>DaCapo</b>	5246	<b>4321</b>	5012	5161	5172	4786	5037	5013	4547	4711	5112	5400	5338	<b>5547</b>	4962
<b>Benchmark - Jython</b>															
<b>Normalized</b>	82.37%	100%	86.21%	83.72%	83.55%	90.28%	85.79%	86.2%	95.03%	91.72%	84.53%	80.02%	80.95%	77.9%	87.08%
<b>Standard</b>	0.4%	0.5%	0.9%	0.4%	2.2%	0.6%	1%	1.5%	0.7%	0.8%	0.3%	1.6%	0.9%	9.9%	15.8%
<b>Deviation</b>															
<b>Renaissance - Scala Dotty (ms)</b>	<b>6577</b>	6971	7201	7566	7257	6900	7347	6957	6664	6891	9000	9170	9329	<b>12165</b>	11137
<b>Normalized</b>	100%	94.35%	91.34%	86.93%	90.64%	95.32%	89.52%	94.54%	98.7%	95.45%	73.08%	71.73%	70.5%	54.07%	59.06%
<b>Standard</b>	1%	1%	1.1%	1.6%	0.6%	0.8%	2.9%	0.9%	0.6%	3%	2.2%	6.4%	6.2%	1.3%	20.3%
<b>Deviation</b>															
<b>Renaissance - Apache Spark Bayes (ms)</b>	3057	2744	3017	3814	3496	2739	3859	3402	<b>2674</b>	3229	3493	5550	4403	<b>12656</b>	11247
<b>Normalized</b>	87.48%	97.47%	88.63%	70.12%	76.5%	97.63%	69.29%	78.6%	100%	82.83%	76.56%	48.18%	60.74%	21.13%	23.78%
<b>Standard</b>	4.3%	2.9%	4.3%	7.3%	6.8%	3%	8.9%	6%	1.6%	5.6%	3%	15.5%	10.3%	2.9%	11%
<b>Deviation</b>															
<b>Renaissance - Savina Reactors.IO (ms)</b>	<b>19304</b>	25187	26711	28252	28107	23867	28366	27891	21975	26765	21743	29524	31369	<b>55610</b>	54541
<b>Normalized</b>	100%	76.64%	72.27%	68.33%	68.68%	80.88%	68.05%	69.21%	87.84%	72.12%	88.78%	65.38%	61.54%	34.71%	35.39%
<b>Standard</b>	8.5%	11.9%	8%	8.9%	8.6%	13.5%	10.9%	8.7%	13.5%	8.9%	9.5%	8%	9.9%	7.9%	7.5%
<b>Deviation</b>															
<b>Renaissance - A.S.P (ms)</b>	21642	21016	22227	25637	25275	21896	24910	23916	20621	23588	<b>19555</b>	22023	22457	<b>27292</b>	25735
<b>Normalized</b>	90.36%	93.05%	87.98%	76.28%	77.37%	89.31%	78.5%	81.76%	94.83%	82.9%	100%	88.79%	87.08%	71.65%	75.99%
<b>Standard</b>	2.1%	1.8%	1.6%	2%	2.5%	1.7%	1.8%	1.6%	1.8%	3%	2%	2.7%	3.8%	7.4%	2.6%
<b>Deviation</b>															

## Xeon & EPYC Tests

<b>Nettle - aes256 (Mbyte/s)</b>	4665	7071	5517	5523	5513	5830	5853	5852	6313	6320	8053	8007	8044		
Normalized	57.93%	87.8%	68.51%	68.59%	68.46%	72.4%	72.68%	72.67%	78.4%	78.48%	100%	99.43%	99.89%		
Standard	0%	1%	0.6%	0.2%	0.8%	0.3%	0.1%	0.2%	0.2%	0.1%	0.2%	0.7%	0.3%		
Deviation															
<b>Nettle - chacha (Mbyte/s)</b>	750.3	1172	920.5	917.5	917.7	970.3	975.0	974.4	1051	1052	822.1	815.1	821.1		
Normalized	64.02%	100%	78.53%	78.28%	78.3%	82.79%	83.19%	83.13%	89.67%	89.74%	70.14%	69.55%	70.06%		
Standard	0%	0.9%	0.3%	0.8%	0.8%	0.4%	0%	0.1%	0.1%	0.1%	2.1%	1.5%	1.8%		
Deviation															
<b>Nettle - sha512 (Mbyte/s)</b>	478.0	550.9	436.7	438.2	437.6	462.7	465.4	465.1	501.9	500.9	396.6	396.5	456.3		
Normalized	86.78%	100%	79.27%	79.54%	79.43%	84%	84.48%	84.44%	91.12%	90.93%	72%	71.97%	82.84%		
Standard	0.1%	0.9%	0.8%	0.7%	1%	0.6%	0.1%	0.1%	0.1%	0.3%	0%	0.1%	8.4%		
Deviation															
<b>Nettle - poly1305-aes (Mbyte/s)</b>	2046	3208	2492	2517	2498	2662	2658	2654	2867	2869	1910	1909	1963		
Normalized	63.79%	100%	77.7%	78.46%	77.86%	82.97%	82.85%	82.74%	89.39%	89.42%	59.53%	59.52%	61.19%		
Standard	0.1%	1.3%	0.9%	0%	1.1%	0.8%	0.2%	0.2%	0.1%	0.1%	0.2%	0.2%	7.1%		
Deviation															
<b>ArrayFire - BLAS CPU (GFLOPS)</b>	990.7	3128	2950	5651	5320	3282	6331	3972	3432	3430	4875	4631	4520	5997	5943
Normalized	15.65%	49.41%	46.6%	89.26%	84.03%	51.83%	100%	62.74%	54.21%	54.18%	77.01%	73.15%	71.4%	94.73%	93.88%
Standard	1.1%	1.7%	0.1%	0.4%	8%	0.4%	0.6%	21%	1.3%	1%	0.6%	1.1%	0.3%	0.6%	1.8%
Deviation															
<b>ArrayFire - C.G.C (ms)</b>	35.13	4.423	4.677	7.604	8.430	4.196	8.947	7.467	4.115	7.481	2.814	4.036	7.355	7.584	2.941
Normalized	8.01%	63.62%	60.17%	37.01%	33.38%	67.06%	31.45%	37.69%	68.38%	37.62%	100%	69.72%	38.26%	37.1%	95.68%
Standard	1.1%	6.6%	0.8%	12.4%	4.2%	0.2%	8.1%	3%	2.8%	2.8%	0.5%	7%	0.8%	13.4%	11.3%
Deviation															
<b>John The Ripper - Blowfish (Real C/S)</b>	66475	40326	35599	70955	70888	39604	78420	78301	42864	84084	56326	11184	10997		
Normalized	59.43%	36.05%	31.83%	63.44%	63.38%	35.41%	70.11%	70.01%	38.32%	75.18%	50.36%	100%	98.33%		
Standard	0.5%	0.6%	0%	0.1%	0.3%	1%	0.6%	0.8%	0.4%	1.4%	0.2%	0.1%	2.4%		
Deviation															
<b>John The Ripper - MD5 (Real C/S)</b>	39720	36540	33840	66083	65546	37276	71026	71500	40900	78800	57143	10714	10497		
Normalized	37.07%	34.1%	31.58%	61.68%	61.18%	34.79%	66.29%	66.73%	38.17%	73.55%	53.33%	100%	97.97%		
Standard	1.3%	0.7%	0.5%	0.3%	1.1%	1.6%	0.7%	0.8%	0.6%	1.5%	0.1%	0.5%	1.7%		
Deviation															

## Xeon & EPYC Tests

<b>MKL-DNN</b>	1.675	<b>2.867</b>	2.699	1.537	1.576	2.386	1.631	1.606	2.394	1.639	1.085	0.765	<b>0.731</b>
<b>DNNL - IP</b>	60	<b>15</b>	77	29	87	06	06	41	51	86	53	279	<b>753</b>
<b>Batch 1D - f32 (ms)</b>													
Normalized	43.67%	25.52%	27.1%	47.6%	46.41%	30.67%	44.86%	45.55%	30.56%	44.62%	67.41%	95.62%	100%
Standard	0.7%	0.3%	0.6%	2.2%	3.6%	0.4%	1%	3.6%	0.8%	3.4%	0.7%	1.8%	0.9%
Deviation													
<b>MKL-DNN</b>	8.883	7.544	7.890	6.658	<b>9.976</b>	7.407	6.386	9.713	6.795	9.524	4.595	<b>3.730</b>	6.002
<b>DNNL - IP</b>	90	39	71	42	<b>69</b>	04	52	55	09	66	50	<b>31</b>	64
<b>Batch All - f32 (ms)</b>													
Normalized	41.99%	49.44%	47.27%	56.02%	37.39%	50.36%	58.41%	38.4%	54.9%	39.16%	81.17%	100%	62.14%
Standard	0.2%	2.3%	0.7%	0.2%	0.6%	0.2%	0.2%	0.3%	0.2%	0.3%	0.1%	0.3%	0.2%
Deviation													
<b>MKL-DNN</b>	<b>149.3</b>	3.592	3.432	2.781	3.048	3.344	3.105	3.296	3.231	3.110	1.845	1.498	<b>1.446</b>
<b>DNNL - IP</b>	<b>39</b>	18	36	93	66	27	30	15	21	02	15	65	<b>13</b>
<b>Batch All - u8s8f32 (ms)</b>													
Normalized	0.97%	40.26%	42.13%	51.98%	47.43%	43.24%	46.57%	43.87%	44.76%	46.5%	78.37%	96.5%	100%
Standard	0.3%	1.6%	0.1%	0.6%	0.8%	0.3%	0.6%	1.7%	0.2%	2.7%	0.7%	1%	0.6%
Deviation													
<b>MKL-DNN</b>		5.563	<b>5.699</b>	4.464	4.489	5.596	2.853	2.890	4.831	3.659	2.419	1.742	<b>1.739</b>
<b>DNNL - IP</b>		04	<b>00</b>	40	18	80	10	86	70	64	06	13	<b>50</b>
<b>Batch 1D - bf16bf16bf16 (ms)</b>													
Normalized		31.27%	30.52%	38.96%	38.75%	31.08%	60.97%	60.17%	36%	47.53%	71.91%	99.85%	100%
Standard		0.8%	0.1%	0.4%	0.2%	0.4%	0.4%	0.2%	0.1%	0.6%	0.2%	0.4%	1.3%
Deviation													
<b>MKL-DNN</b>	710.1	<b>878.3</b>	874.2	461.9	559.4	821.9	436.8	534.3	765.7	496.8	598.1	<b>327.2</b>	399.2
<b>DNNL - C.B.c - f32 (ms)</b>	40	<b>90</b>	01	35	68	67	60	28	45	16	87	<b>76</b>	40
Normalized	46.09%	37.26%	37.44%	70.85%	58.5%	39.82%	74.92%	61.25%	42.74%	65.87%	54.71%	100%	81.97%
Standard	0.5%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%	0.3%	0.1%	0.1%	2.2%
Deviation													
<b>MKL-DNN</b>	3077	6183	<b>7096</b>	3549	3551	6438	3243	3271	5920	3005	4454	<b>2382</b>	2541
<b>DNNL - C.B.c - u8s8f32 (ms)</b>													
Normalized	77.42%	38.53%	33.57%	67.13%	67.08%	37%	73.45%	72.82%	40.24%	79.26%	53.48%	100%	93.76%
Standard	1.5%	1.1%	0.1%	0.6%	0.4%	0.4%	0.9%	0.8%	0.3%	0.5%	0%	0.8%	0.5%
Deviation													
<b>MKL-DNN</b>	<b>2.225</b>	1.745	1.639	1.225	1.257	1.470	1.303	1.344	1.462	1.240	1.240	1.031	<b>1.018</b>
<b>DNNL - D.B.d - f32 (ms)</b>	<b>40</b>	15	28	89	95	84	95	11	32	29	01	15	<b>90</b>
Normalized	45.79%	58.38%	62.16%	83.12%	81%	69.27%	78.14%	75.8%	69.68%	82.15%	82.17%	98.81%	100%
Standard	1.5%	1.3%	0.1%	0.1%	1%	0.1%	0.4%	0.2%	0.2%	0.4%	0.1%	0.8%	0.9%
Deviation													

## Xeon & EPYC Tests

<b>MKL-DNN</b>	2.204	<b>2.275</b>	2.200	1.263	1.266	2.165	1.252	1.251	1.962	1.136	1.340	<b>0.851</b>	0.852
<b>DNNL - D.B.d</b>	71	<b>26</b>	53	95	49	81	94	27	79	08	96	<b>007</b>	518
- f32 (ms)													
Normalized	38.6%	37.4%	38.67%	67.33%	67.19%	39.29%	67.92%	68.01%	43.36%	74.91%	63.46%	100%	99.82%
Standard	0.5%	1.4%	0.4%	0.5%	0.2%	0.2%	0.3%	0.4%	0%	0.6%	0.7%	0.2%	0.1%
Deviation													
<b>MKL-DNN</b>	96.68	<b>108.5</b>	107.8	55.35	56.64	98.66	51.44	52.99	94.19	49.84	83.36	<b>42.91</b>	43.85
<b>DNNL - C.B.c</b>	81	<b>68</b>	04	65	65	64	29	79	37	37	09	<b>03</b>	61
- f32 (ms)													
Normalized	44.38%	39.52%	39.8%	77.52%	75.75%	43.49%	83.41%	80.97%	45.56%	86.09%	51.48%	100%	97.84%
Standard	2%	0.2%	0.2%	0.6%	0.7%	0.2%	0.4%	1.6%	0.1%	0.3%	0.1%	0.1%	0.1%
Deviation													
<b>MKL-DNN</b>	<b>11729</b>	2968	3402	1734	1794	3089	1579	1640	2846	1517	2126	<b>1107</b>	1166
<b>DNNL - C.B.c</b>													
- u8s8f32 (ms)													
Normalized	9.44%	37.31%	32.55%	63.85%	61.73%	35.84%	70.12%	67.5%	38.91%	72.97%	52.09%	100%	94.94%
Standard	0.3%	0.9%	0.2%	0.1%	0.1%	0.6%	0.2%	0%	0.1%	0.4%	0.1%	0%	1.8%
Deviation													
<b>MKL-DNN</b>	<b>1485</b>	1293	1029	743.6	739.1	1124	877.2	881.0	1114	881.7	724.6	<b>458.4</b>	469.4
<b>DNNL - D.B.d</b>				95	63		07	87		83	02	<b>94</b>	28
- f32 (ms)													
Normalized	30.87%	35.47%	44.55%	61.65%	62.03%	40.8%	52.27%	52.04%	41.17%	52%	63.28%	100%	97.67%
Standard	0.2%	2.8%	0.2%	0.2%	0.2%	0.1%	0.2%	2%	0.1%	0.1%	0%	0.1%	0.4%
Deviation													
<b>MKL-DNN</b>	<b>1131</b>	0.458	0.415	0.361	0.376	0.378	0.336	0.351	0.371	0.394	0.301	0.306	<b>0.299</b>
<b>DNNL - D.B.d</b>		422	614	414	222	229	426	719	036	455	007	309	<b>473</b>
- u8s8f32 (ms)													
Normalized	0.03%	65.33%	72.06%	82.86%	79.6%	79.18%	89.02%	85.15%	80.71%	75.92%	99.49%	97.77%	100%
Standard	0.6%	0.5%	0.4%	0.5%	0.4%	0.1%	1.2%	0.6%	0.2%	3%	0.1%	0.8%	1.7%
Deviation													
<b>MKL-DNN</b>	1899	3852	<b>4426</b>	2253	2238	3985	2063	2064	3717	1894	2531	<b>1295</b>	1321
<b>DNNL - D.B.d</b>													
- u8s8f32 (ms)													
Normalized	68.21%	33.63%	29.27%	57.51%	57.88%	32.51%	62.79%	62.76%	34.85%	68.41%	51.19%	100%	98.1%
Standard	0.3%	2.2%	0%	1.7%	0.2%	0.4%	0%	0.1%	0.1%	0.5%	0.1%	0.1%	1.3%
Deviation													
<b>MKL-DNN</b>		16.59	<b>17.32</b>	9.187	9.206	14.07	7.655	7.675	14.07	7.929	10.75	<b>5.719</b>	5.812
<b>DNNL - C.B.c</b>		06	<b>17</b>	51	65	47	61	17	80	12	08	<b>63</b>	43
-													
<b>bf16bf16bf16</b>													
(ms)													
Normalized		34.48%	33.02%	62.25%	62.12%	40.64%	74.71%	74.52%	40.63%	72.13%	53.2%	100%	98.4%
Standard		2.9%	0%	0.2%	0%	0.1%	0.1%	0.3%	0%	0.1%	0.1%	0.1%	1.7%
Deviation													

## Xeon & EPYC Tests

<b>MKL-DNN</b>	<b>1301</b>	31.98	30.88	19.37	22.38	27.97	18.39	20.09	26.83	19.81	17.72	<b>10.96</b>	12.33
<b>DNNL - C.B.c</b>		93	00	23	30	79	29	09	91	43	41	<b>80</b>	17
<b>- u8s8f32</b>													
<b>(ms)</b>													
<b>Normalized</b>	0.84%	34.29%	35.52%	56.62%	49%	39.2%	59.63%	54.59%	40.87%	55.35%	61.88%	100%	88.94%
<b>Standard</b>	0.4%	0.2%	0.2%	0.1%	1.8%	0.4%	0.5%	1.3%	0.1%	0.2%	0.1%	0.2%	1.6%
<b>Deviation</b>													
<b>MKL-DNN</b>		3880	<b>4364</b>	2198	2198	3639	1843	1845	3497	1766	2712	<b>1381</b>	1422
<b>DNNL - C.B.c</b>													
<b>-</b>													
<b>bf16bf16bf16</b>													
<b>(ms)</b>													
<b>Normalized</b>		35.59%	31.65%	62.83%	62.84%	37.95%	74.94%	74.87%	39.49%	78.19%	50.93%	100%	97.14%
<b>Standard</b>		0%	0%	0%	0%	0%	0.1%	0.5%	0%	0.1%	0%	0.1%	0.5%
<b>Deviation</b>													
<b>MKL-DNN</b>	42.54	<b>49.87</b>	48.06	25.06	25.77	45.12	23.67	24.11	42.07	23.17	30.82	<b>17.34</b>	21.00
<b>DNNL - C.B.c</b>	13	<b>44</b>	40	72	22	71	29	47	58	72	79	<b>96</b>	65
<b>- f32 (ms)</b>													
<b>Normalized</b>	40.78%	34.79%	36.1%	69.21%	67.32%	38.45%	73.29%	71.95%	41.23%	74.86%	56.28%	100%	82.59%
<b>Standard</b>	0.8%	0.2%	0.1%	0.1%	0.7%	0.3%	0.6%	0.2%	0.1%	0.7%	0.1%	0.8%	3%
<b>Deviation</b>													
<b>MKL-DNN</b>		7.615	<b>7.982</b>	4.465	4.490	6.597	3.950	3.983	6.553	4.068	4.978	<b>2.914</b>	3.077
<b>DNNL - D.B.d</b>		95	<b>92</b>	23	39	78	67	93	74	47	88	<b>95</b>	97
<b>-</b>													
<b>bf16bf16bf16</b>													
<b>(ms)</b>													
<b>Normalized</b>		38.27%	36.51%	65.28%	64.92%	44.18%	73.78%	73.17%	44.48%	71.65%	58.55%	100%	94.7%
<b>Standard</b>		0.9%	0.5%	0.1%	0.2%	0%	0.1%	0.2%	0%	0.3%	0%	0.2%	0.2%
<b>Deviation</b>													
<b>MKL-DNN</b>		8.462	<b>9.371</b>	4.856	4.871	8.316	4.494	4.494	7.696	4.358	6.071	<b>3.777</b>	3.783
<b>DNNL - D.B.d</b>		73	<b>07</b>	89	94	77	64	05	05	17	17	<b>69</b>	19
<b>-</b>													
<b>bf16bf16bf16</b>													
<b>(ms)</b>													
<b>Normalized</b>		44.64%	40.31%	77.78%	77.54%	45.42%	84.05%	84.06%	49.09%	86.68%	62.22%	100%	99.85%
<b>Standard</b>		0.8%	0%	0.2%	0.3%	0%	0.1%	0.1%	0.1%	0.1%	3%	2.9%	2.8%
<b>Deviation</b>													
<b>MKL-DNN</b>		702.0	<b>796.7</b>	399.3	399.2	662.7	332.3	337.8	637.3	320.0	500.1	<b>251.8</b>	252.4
<b>DNNL - C.B.c</b>		65	<b>53</b>	08	98	55	19	83	74	60	20	<b>26</b>	06
<b>-</b>													
<b>bf16bf16bf16</b>													
<b>(ms)</b>													
<b>Normalized</b>		35.87%	31.61%	63.07%	63.07%	38%	75.78%	74.53%	39.51%	78.68%	50.35%	100%	99.77%
<b>Standard</b>		0.3%	0.1%	0%	0.1%	0%	0.1%	3%	0%	0%	1.9%	1.7%	1.8%
<b>Deviation</b>													

## Xeon & EPYC Tests

<b>MKL-DNN</b>	<b>730.3</b>	13.45	12.70	7.636	8.747	12.02	6.825	7.797	11.29	7.460	7.350	<b>4.715</b>	5.354		
<b>DNNL - C.B.c</b>	<b>06</b>	04	59	51	94	88	40	08	00	50	38	<b>74</b>	26		
<b>- u8s8f32</b>															
<b>(ms)</b>															
<b>Normalized</b>	0.65%	35.06%	37.11%	61.75%	53.91%	39.2%	69.09%	60.48%	41.77%	63.21%	64.16%	100%	88.07%		
<b>Standard</b>	1.7%	0.2%	0.1%	0.4%	0.5%	0.4%	0.1%	0.9%	0.2%	0.8%	0.2%	0.8%	3.1%		
<b>Deviation</b>															
<b>MKL-DNN</b>		3294	<b>3368</b>	1904	1904	2751	1833	1839	2936	1779	2063	<b>1167</b>	1211		
<b>DNNL - D.B.d</b>															
<b>-</b>															
<b>bf16bf16bf16</b>															
<b>(ms)</b>															
<b>Normalized</b>		35.42%	34.64%	61.26%	61.27%	42.41%	63.64%	63.46%	39.74%	65.58%	56.54%	100%	96.32%		
<b>Standard</b>		0.2%	0%	0%	0%	0.1%	0.3%	0.2%	0.3%	0.1%	0.6%	0.4%	0.2%		
<b>Deviation</b>															
<b>MKL-DNN</b>		188.6	<b>207.9</b>	106.7	106.8	173.3	90.26	90.39	166.9	86.53	129.5	<b>67.96</b>	71.00		
<b>DNNL - C.B.c</b>		11	<b>11</b>	14	93	81	36	82	84	91	95	<b>88</b>	60		
<b>-</b>															
<b>bf16bf16bf16</b>															
<b>(ms)</b>															
<b>Normalized</b>		36.04%	32.69%	63.69%	63.59%	39.2%	75.3%	75.19%	40.7%	78.54%	52.45%	100%	95.72%		
<b>Standard</b>		0.2%	0%	0%	0%	0.1%	0.2%	0.2%	0%	0%	0.1%	0.7%	0.6%		
<b>Deviation</b>															
<b>dav1d -</b>	<b>321.1</b>	256.6	205.6	212.9	215.6	208.5	211.0	216.0	199.0	221.3	247.8	246.9	251.6	133.3	<b>132.6</b>
<b>Summer</b>	<b>7</b>	0	3	9	4	0	5	0	8	1	6	6	3	1	<b>3</b>
<b>Nature 4K</b>															
<b>(FPS)</b>															
<b>Normalized</b>	100%	79.9%	64.03%	66.32%	67.14%	64.92%	65.71%	67.25%	61.99%	68.91%	77.17%	76.89%	78.35%	41.51%	41.3%
<b>Standard</b>	0.5%	0.8%	1.1%	1.4%	1.4%	0.6%	2.2%	1.9%	1%	2.9%	1.3%	2.8%	0.9%	3%	1.4%
<b>Deviation</b>															
<b>dav1d - S.N.1</b>	<b>676.1</b>	537.8	353.7	400.2	431.7	<b>315.5</b>	371.4	391.2	323.2	409.8	444.3	478.0	500.8	322.9	324.9
<b>(FPS)</b>	<b>6</b>	4	8	4	6	<b>1</b>	8	5	0	8	0	5	3	6	0
<b>Normalized</b>	100%	79.54%	52.32%	59.19%	63.85%	46.66%	54.94%	57.86%	47.8%	60.62%	65.71%	70.7%	74.07%	47.76%	48.05%
<b>Standard</b>	0.6%	0.7%	0.8%	3.6%	1.5%	1.2%	0.3%	2.8%	0.3%	3.5%	2.2%	0.4%	3.5%	2%	0.8%
<b>Deviation</b>															
<b>dav1d -</b>	<b>140.1</b>	81.60	67.33	88.66	89.55	<b>63.01</b>	82.65	82.87	65.40	85.14	96.93	118.8	118.3	73.96	73.77
<b>C.1.1.b (FPS)</b>	<b>4</b>											8	7		
<b>Normalized</b>	100%	58.23%	48.04%	63.27%	63.9%	44.96%	58.98%	59.13%	46.67%	60.75%	69.17%	84.83%	84.47%	52.78%	52.64%
<b>Standard</b>	0.7%	0.1%	0.3%	1.1%	0.1%	0.5%	0.6%	0.9%	0.3%	0.1%	1.1%	0.8%	0.3%	0.5%	0.2%
<b>Deviation</b>															
<b>OSPray -</b>	58.82	34.48	<b>32.97</b>	61.58	62.5	37.04	66.67	66.67	38.46	69.52	54.39	99.24	<b>100</b>	85.23	85.86
<b>San Miguel -</b>															
<b>SciVis (FPS)</b>															
<b>Normalized</b>	58.82%	34.48%	32.97%	61.58%	62.5%	37.04%	66.67%	66.67%	38.46%	69.52%	54.39%	99.24%	100%	85.23%	85.86%
<b>Standard</b>	0%	0%	1.9%	3%	0%	0%	0%	0%	0%	3.5%	2.9%	2.6%		4%	4.3%
<b>Deviation</b>															
<b>OSPray -</b>	11.03	5.72	<b>5.38</b>	10.32	10.42	6.02	11.63	11.63	6.25	12.05	9.38	17.86	17.86	20.69	<b>22.84</b>
<b>XFrog Forest</b>															
<b>- SciVis</b>															
<b>Normalized</b>	48.29%	25.04%	23.56%	45.18%	45.62%	26.36%	50.92%	50.92%	27.36%	52.76%	41.07%	78.2%	78.2%	90.59%	100%
<b>Standard</b>	0.6%	0.2%	0%	0.4%	0%	0%	0%	0%	0%	0%	0.5%	0%	0%	1.2%	4.4%
<b>Deviation</b>															

## Xeon & EPYC Tests

<b>OSPray -</b>	4.73	3.25	<b>3.00</b>	5.54	5.58	3.36	6.21	6.25	3.52	6.53	5.16	9.52	9.52	<b>13.89</b>	13.39
<b>San Miguel -</b>															
<b>Path Tracer</b>															
<b>Normalized</b>	34.05%	23.4%	21.6%	39.88%	40.17%	24.19%	44.71%	45%	25.34%	47.01%	37.15%	68.54%	68.54%	100%	96.4%
<b>Standard</b>	0.3%	0.1%	0.2%	0.3%	0.3%	0.2%	0%	0%	0.2%	0.3%	0.2%	0%	0%	1.4%	0.8%
<b>Deviation</b>															
<b>OSPray -</b>	76.92	45.45	<b>43.48</b>	76.92	76.92	47.62	90.91	90.91	50	90.91	71.43	136.9	<b>140.4</b>	95.93	97.07
<b>NASA</b>												0	<b>8</b>		
<b>Streamlines -</b>															
<b>SciVis (FPS)</b>															
<b>Normalized</b>	54.76%	32.35%	30.95%	54.76%	54.76%	33.9%	64.71%	64.71%	35.59%	64.71%	50.85%	97.45%	100%	68.29%	69.1%
<b>Standard</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6.4%	4.5%	8.3%	5.5%	
<b>Deviation</b>															
<b>OSPray -</b>	5.85	3.17	<b>2.96</b>	5.71	5.71	3.33	6.41	6.44	3.46	6.67	5.18	9.88	9.88	13.89	<b>13.95</b>
<b>XFrog Forest</b>															
<b>- Path Tracer</b>															
<b>(FPS)</b>															
<b>Normalized</b>	41.94%	22.72%	21.22%	40.93%	40.93%	23.87%	45.95%	46.16%	24.8%	47.81%	37.13%	70.82%	70.82%	99.57%	100%
<b>Standard</b>	0.6%	0.1%	0.1%	0.2%	0%	0.1%	0%	0.4%	0.2%	0%	0%	0.5%	0.4%	1.4%	0.8%
<b>Deviation</b>															
<b>OSPray -</b>	40	40	<b>37.04</b>	62.5	62.5	40	71.43	71.43	42.87	71.43	62.5	<b>111.1</b>	108.3	96.97	93.33
<b>M.R - SciVis</b>												<b>1</b>	3		
<b>Normalized</b>	36%	36%	33.34%	56.25%	56.25%	36%	64.29%	64.29%	38.58%	64.29%	56.25%	100%	97.5%	87.27%	84%
<b>Standard</b>			0%	0%	0%		0%	0%	2.4%	0%	0%	0%	4.6%	4.6%	4.5%
<b>Deviation</b>															
<b>OSPray -</b>	16.60	8.69	<b>8.09</b>	15.54	15.62	9.09	17.44	17.54	9.49	18.18	14.22	27.03	27.03	33.12	<b>33.72</b>
<b>NASA</b>					5										
<b>Streamlines -</b>															
<b>Path Tracer</b>															
<b>(FPS)</b>															
<b>Normalized</b>	49.23%	25.77%	23.99%	46.09%	46.34%	26.96%	51.72%	52.02%	28.14%	53.91%	42.17%	80.16%	80.16%	98.22%	100%
<b>Standard</b>	0.8%	0.2%	0.5%	0.9%	0%	0%	1%	0%	0.5%	0%	0.8%	0%	0%	1.5%	2%
<b>Deviation</b>															
<b>Embree -</b>	47.64	24.55	<b>21.38</b>	38.10	38.12	25.12	43.98	43.82	26.28	45.61	37.63	69.13	69.26	<b>90.87</b>	88.65
<b>Pathtracer -</b>	64	03	<b>29</b>	33	22	18	94	38	00	21	39	92	48	<b>86</b>	64
<b>Crown (FPS)</b>															
<b>Normalized</b>	52.43%	27.01%	23.53%	41.93%	41.95%	27.64%	48.4%	48.22%	28.92%	50.19%	41.41%	76.08%	76.22%	100%	97.55%
<b>Standard</b>	0.3%	0.2%	0.2%	0.7%	0.8%	0.3%	0.7%	1.2%	0.3%	0.3%	1.4%	0.2%	0.4%	1.2%	2.6%
<b>Deviation</b>															
<b>Embree -</b>	45.18	26.40	<b>24.72</b>	46.41	46.17	27.78	50.94	51.19	28.77	53.23	42.59	78.55	78.63	<b>101.5</b>	101.3
<b>Pathtracer</b>	69	10	<b>67</b>	84	57	44	60	82	30	04	75	35	42	<b>194</b>	213
<b>ISPC -</b>															
<b>Crown (FPS)</b>															
<b>Normalized</b>	44.51%	26.01%	24.36%	45.72%	45.48%	27.37%	50.18%	50.43%	28.34%	52.43%	41.96%	77.38%	77.46%	100%	99.8%
<b>Standard</b>	0.3%	0.2%	0.1%	0.2%	1.4%	0.1%	2.8%	1.6%	0.1%	0.2%	0.1%	0.1%	0.1%	1.1%	0.5%
<b>Deviation</b>															

## Xeon & EPYC Tests

<b>Embree</b> -	52.95	30.10	<b>26.06</b>	46.90	46.79	30.56	54.19	54.20	32.24	57.48	44.30	78.53	78.76	<b>116.1</b>	113.7
<b>Pathtracer</b> -	32	57	<b>38</b>	84	20	53	64	41	74	70	55	79	72	<b>626</b>	369
<b>Asian Dragon</b>															
<b>Normalized</b>	45.59%	25.92%	22.44%	40.38%	40.28%	26.31%	46.66%	46.66%	27.76%	49.49%	38.14%	67.61%	67.81%	100%	97.91%
<b>Standard</b>	0.2%	0.3%	0.3%	0.3%	1.4%	0.3%	0.4%	0.9%	0.2%	0.5%	0.3%	0.9%	0.3%	0.2%	0.3%
<b>Deviation</b>															
<b>Embree</b> -	47.58	27.19	<b>23.71</b>	42.49	42.76	27.66	49.10	49.28	29.20	51.78	40.18	70.05	70.38	<b>102.6</b>	100.6
<b>Pathtracer</b> -	06	52	<b>92</b>	46	13	85	61	15	61	53	46	43	83	<b>648</b>	363
<b>Asian Dragon Obj</b>															
<b>Normalized</b>	46.35%	26.49%	23.1%	41.39%	41.65%	26.95%	47.83%	48%	28.45%	50.44%	39.14%	68.24%	68.56%	100%	98.02%
<b>Standard</b>	0.1%	0.1%	0.1%	0.2%	0.2%	0.1%	0.2%	1%	0.3%	0.4%	0.1%	0.5%	0.1%	0.8%	1.3%
<b>Deviation</b>															
<b>Embree</b> -	52.35	35.14	<b>32.90</b>	59.05	59.05	36.75	65.54	65.36	38.31	68.42	53.57	95.98	95.27	<b>140.5</b>	140.5
<b>Pathtracer</b>	41	95	<b>88</b>	02	63	24	52	79	00	41	20	57	06	<b>892</b>	096
<b>ISPC - Asian Dragon</b>															
<b>Normalized</b>	37.24%	25%	23.41%	42%	42.01%	26.14%	46.62%	46.5%	27.25%	48.67%	38.11%	68.27%	67.77%	100%	99.94%
<b>Standard</b>	0.1%	0.4%	0.1%	0.3%	0.2%	0.2%	0.1%	0.3%	0.3%	0.1%	0.1%	0.1%	0.9%	2.8%	3%
<b>Deviation</b>															
<b>Embree</b> -	45.43	30.34	<b>28.29</b>	50.86	50.97	31.56	56.45	56.50	33.04	58.69	46.14	82.31	81.90	<b>116.1</b>	114.5
<b>Pathtracer</b>	30	58	<b>28</b>	48	69	75	95	67	90	45	37	64	09	<b>889</b>	708
<b>ISPC - Asian Dragon Obj (FPS)</b>															
<b>Normalized</b>	39.1%	26.12%	24.35%	43.78%	43.87%	27.17%	48.59%	48.63%	28.44%	50.52%	39.71%	70.85%	70.49%	100%	98.61%
<b>Standard</b>	0.1%	0.1%	0.1%	0%	0%	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.1%	0.1%	2.6%	0.4%
<b>Deviation</b>															
<b>SVT-AV1</b> -	5.714	6.389	5.112	5.996	5.955	5.653	6.455	6.399	6.030	<b>7.033</b>	<b>4.098</b>	5.204	4.837		
<b>Enc Mode 4 - 1080p (FPS)</b>															
<b>Normalized</b>	81.25%	90.84%	72.69%	85.26%	84.67%	80.38%	91.78%	90.99%	85.74%	100%	58.27%	73.99%	68.78%		
<b>Standard</b>	2.8%	0.6%	1.8%	2.5%	0.1%	1.6%	2.2%	1.7%	0.9%	1.6%	4%	8.2%	3%		
<b>Deviation</b>															
<b>SVT-AV1</b> -	54.47	53.81	46.87	52.31	53.04	51.59	53.96	54.13	51.91	56.98	<b>41.84</b>	<b>67.08</b>	65.29		
<b>Enc Mode 8 - 1080p (FPS)</b>															
<b>Normalized</b>	81.2%	80.23%	69.87%	77.98%	79.07%	76.91%	80.44%	80.7%	77.39%	84.94%	62.37%	100%	97.33%		
<b>Standard</b>	2.4%	1.5%	1.3%	0.9%	0.4%	1.2%	1.4%	1.1%	0.2%	2%	2.8%	2.8%	3.5%		
<b>Deviation</b>															
<b>SVT-VP9</b> -	<b>291.1</b>	282.1	256.2	229.5	229.9	256.0	227.9	<b>227.8</b>	265.4	233.1	266.2	243.2	249.7		
<b>V.Q.O</b> -	<b>7</b>	8	4	3	1	2	0	<b>9</b>	0	7	9	4	6		
<b>Bosphorus 1080p (FPS)</b>															
<b>Normalized</b>	100%	96.91%	88%	78.83%	78.96%	87.93%	78.27%	78.27%	91.15%	80.08%	91.46%	83.54%	85.78%		
<b>Standard</b>	1.5%	0.6%	0.9%	12.3%	12.1%	13.3%	12.6%	12.1%	2.7%	2.5%	1.1%	5.9%	2.9%		
<b>Deviation</b>															

## Xeon & EPYC Tests

<b>Intel Open Image Denoise - Memorial (Images / Sec)</b>	28.71	<b>27.35</b>	27.99	33.10	33.89	30.22	33.57	35.52	31.10	34.49	36.56	32.29	32.96	53.50	<b>57.74</b>
Normalized Standard	49.72%	47.37%	48.48%	57.33%	58.69%	52.34%	58.14%	61.52%	53.86%	59.73%	63.32%	55.92%	57.08%	92.66%	100%
Deviation	0.2%	1.9%	0.4%	1.1%	0.6%	0.6%	0.9%	0.7%	0.1%	0.8%	2.8%	2.9%	2.9%	16.6%	20.3%
<b>LuxCoreRender - DLSC (M)</b>	7.28	3.53	<b>3.04</b>	5.86	5.88	3.63	6.95	6.99	3.79	7.19	5.58	10.09	10.15	15.61	<b>15.91</b>
Normalized Standard	45.76%	22.19%	19.11%	36.83%	36.96%	22.82%	43.68%	43.93%	23.82%	45.19%	35.07%	63.42%	63.8%	98.11%	100%
Deviation	2.3%	0.2%	0.3%	0.8%	1%	0.8%	0.2%	1%	0.1%	2.3%	1.4%	1.6%	1.4%	2.6%	2.9%
<b>LuxCoreRender - R.C.a.P (M samples/sec)</b>	8.12	3.79	<b>3.30</b>	5.52	6.40	3.92	6.79	7.44	4.11	7.15	6.02	10.91	10.90	15.41	<b>15.94</b>
Normalized Standard	50.94%	23.78%	20.7%	34.63%	40.15%	24.59%	42.6%	46.68%	25.78%	44.86%	37.77%	68.44%	68.38%	96.68%	100%
Deviation	1.2%	3%	0.2%	25.6%	1%	0.6%	17.1%	0.8%	1.7%	21.6%	0.3%	1.1%	1.4%	2.9%	2.9%
<b>Benchmark - Himeno P.P.S (MFLOPS)</b>	3770	3866	3153	<b>3131</b>	3148	3319	3315	3331	3510	3515	4215	4199	4211	<b>6348</b>	6178
Normalized Standard	59.39%	60.9%	49.66%	49.32%	49.59%	52.29%	52.23%	52.48%	55.3%	55.37%	66.4%	66.14%	66.34%	100%	97.32%
Deviation	1%	0.2%	0.1%	0.2%	0.1%	0.3%	0.5%	0.1%	0.2%	0.3%	0.1%	0.3%	0%	0.1%	0.7%
<b>Stockfish - Total Time (Nodes/s)</b>	11676	61170	<b>54437</b>	10410	10351	58172	10975	11236	62891	11971	85313	15311	15290	22585	<b>22868</b>
Normalized Standard	5028	651	<b>117</b>	6676	3853	107	3377	2723	312	5795	242	3492	6860	1950	<b>6285</b>
Normalized Standard	51.06%	26.75%	23.8%	45.52%	45.26%	25.44%	47.99%	49.13%	27.5%	52.35%	37.31%	66.95%	66.86%	98.76%	100%
Deviation	1.8%	2%	0.4%	0.2%	0.6%	0.2%	2.5%	3%	2.3%	1.3%	1.7%	2.3%	1.4%	1.7%	3%
<b>asmFish - 1.H.M.2.D (Nodes/s)</b>	11327	66225	<b>59350</b>	10507	11991	64230	10738	12293	68762	13383	93896	14852	16455	<b>23091</b>	22119
Normalized Standard	8977	641	<b>794</b>	0606	2357	868	8344	3930	075	9896	899	1449	3317	<b>4570</b>	4398
Normalized Standard	49.06%	28.68%	25.7%	45.5%	51.93%	27.82%	46.51%	53.24%	29.78%	57.96%	40.66%	64.32%	71.26%	100%	95.79%
Deviation	0.9%	2.6%	0.3%	2.5%	2.5%	2.6%	0.8%	0.7%	1.1%	0.6%	1.1%	0.5%	0.8%	1.5%	2.2%
<b>Timed GCC Compilation - Time To Compile</b>	<b>849.1</b>	994.5	1068	1074	1012	1107	<b>1110</b>	1068	1064	1006	1007	1024	970.9	906.5	915.1
Normalized Standard	<b>92</b>	83											16	97	93
Normalized Standard	100%	85.38%	79.54%	79.09%	83.91%	76.69%	76.49%	79.48%	79.83%	84.45%	84.36%	82.92%	87.46%	93.67%	92.79%
Deviation	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.4%	0%	0%	0.2%	0%	0%	0.2%	0.1%

## Xeon & EPYC Tests

<b>Timed GDB</b>	<b>108.6</b>	134.8	132.2	146.4	129.6	142.5	<b>159.4</b>	143.6	144.6	142.6	139.3	149.8	140.6		
<b>GNU</b>	<b>75</b>	24	28	35	89	01	<b>98</b>	45	43	95	62	63	10		
<b>Debugger</b>															
<b>Compilation</b>															
<b>- Time To Compile</b>															
<b>Normalized</b>	100%	80.61%	82.19%	74.21%	83.8%	76.26%	68.14%	75.66%	75.13%	76.16%	77.98%	72.52%	77.29%		
<b>Standard</b>	0.1%	0.1%	0.1%	0.3%	0.6%	0.1%	0.2%	0.6%	0.2%	0.2%	0.3%	0.1%	0.3%		
<b>Deviation</b>															
<b>Timed Linux</b>	24.00	36.36	<b>41.13</b>	29.27	27.58	38.73	28.12	26.58	40.89	27.30	29.35	22.41	<b>21.39</b>		
<b>Kernel</b>	5	7	<b>7</b>	6	1	4	9	3	8	9	7	0	<b>9</b>		
<b>Compilation</b>															
<b>- Time To Compile</b>															
<b>Normalized</b>	89.14%	58.84%	52.02%	73.09%	77.59%	55.25%	76.07%	80.5%	52.32%	78.36%	72.89%	95.49%	100%		
<b>Standard</b>	2.8%	2.9%	2.8%	4.7%	3.2%	3.7%	3.7%	3.9%	2.9%	3.4%	4.3%	5.1%	5%		
<b>Deviation</b>															
<b>Timed LLVM</b>	200.0	281.6	<b>317.6</b>	244.9	232.0	301.5	230.8	216.8	308.7	221.5	215.8	178.7	<b>167.6</b>		
<b>Compilation</b>	39	78	<b>10</b>	40	53	31	54	86	41	15	37	51	<b>72</b>		
<b>- Time To Compile</b>															
<b>Normalized</b>	83.82%	59.53%	52.79%	68.45%	72.26%	55.61%	72.63%	77.31%	54.31%	75.69%	77.68%	93.8%	100%		
<b>Standard</b>	0.6%	1.6%	2.8%	1%	0.8%	0.6%	0.7%	0.7%	2.7%	0.8%	2.2%	0.6%	1.2%		
<b>Deviation</b>															
<b>Build2 - Time</b>	59.95	66.41	<b>76.14</b>	69.19	66.66	74.26	65.77	68.55	74.11	62.77	60.32	<b>56.01</b>	56.15		
<b>To Compile</b>	6	5	<b>7</b>	5	7	5	2	8	8	6	6	<b>4</b>	5		
<b>(sec)</b>															
<b>Normalized</b>	93.43%	84.34%	73.56%	80.95%	84.02%	75.42%	85.16%	81.7%	75.57%	89.23%	92.85%	100%	99.75%		
<b>Standard</b>	1.2%	0.4%	0.1%	0.5%	1.3%	1%	1.6%	1.2%	0.3%	0.2%	0.5%	0.4%	1.8%		
<b>Deviation</b>															
<b>Tungsten</b>	7.674	12.71	<b>14.80</b>	9.090	9.262	13.88	8.347	8.667	12.68	7.827	9.213	6.117	<b>6.056</b>	7.638	7.717
<b>Renderer -</b>	55	04	<b>46</b>	73	17	18	44	91	63	06	65	90	<b>68</b>	23	50
<b>Hair (sec)</b>															
<b>Normalized</b>	78.92%	47.65%	40.91%	66.62%	65.39%	43.63%	72.56%	69.87%	47.74%	77.38%	65.74%	99%	100%	79.29%	78.48%
<b>Standard</b>	1.2%	0.7%	0.4%	1%	1.1%	0.6%	0.1%	2.1%	0.5%	2.5%	0.3%	1.9%	0.7%	1.1%	2.5%
<b>Deviation</b>															
<b>Tungsten</b>	22.32	<b>21.55</b>	25.35	24.77	24.54	24.21	23.82	23.90	22.01	21.58	23.42	23.64	23.49	<b>33.17</b>	33.16
<b>Renderer -</b>	47	<b>17</b>	55	92	37	27	07	77	67	96	06	32	41	<b>25</b>	32
<b>Water</b>															
<b>Caustic (sec)</b>															
<b>Normalized</b>	96.54%	100%	85%	86.97%	87.81%	89.01%	90.47%	90.15%	97.89%	99.82%	92.02%	91.15%	91.73%	64.97%	64.99%
<b>Standard</b>	0.2%	0.8%	0.4%	1.2%	0.6%	0.5%	0.3%	1.1%	0.6%	0.5%	1.8%	1%	2%	0.7%	0.8%
<b>Deviation</b>															
<b>Numpy</b>	323.5	367.5	321.1	<b>293.5</b>	310.4	340.7	313.3	324.3	330.3	321.8	374.9	316.7	370.9	<b>387.7</b>	379.8
<b>Benchmark</b>	8	6	3	<b>3</b>	0	2	5	9	3	2	0	5	6	<b>6</b>	8
<b>(Score)</b>															
<b>Normalized</b>	83.45%	94.79%	82.82%	75.7%	80.05%	87.87%	80.81%	83.66%	85.19%	82.99%	96.68%	81.69%	95.67%	100%	97.97%
<b>Standard</b>	0.6%	1.3%	0.4%	2%	0.4%	0.2%	2.4%	0.6%	1.3%	1.6%	0.7%	2.3%	0.4%	3%	1.4%
<b>Deviation</b>															

## Xeon & EPYC Tests

<b>Zstd</b>	9.230	8.380	9.672	10.29	9.949	8.307	10.08	9.653	8.203	9.137	<b>7.283</b>	8.422	8.179	<b>77.30</b>	74.18
<b>Compression - C.u.1.0.3.s.i.i .C.L.1 (sec)</b>				4			8							<b>6</b>	7
<b>Normalized Standard Deviation</b>	78.91%	86.91%	75.3%	70.75%	73.2%	87.67%	72.19%	75.45%	88.78%	79.71%	100%	86.48%	89.05%	9.42%	9.82%
<b>DeepSpeech - CPU (sec)</b>	<b>72.81</b>	123.8	117.3	135.0	117.7	117.8	<b>140.4</b>	123.8	118.0	122.2	103.0	113.2	108.1	131.4	126.9
<b>Normalized Standard Deviation</b>	100%	58.79%	62.05%	53.92%	61.85%	61.78%	51.85%	58.81%	61.66%	59.58%	70.64%	64.28%	67.32%	55.38%	57.36%
<b>Radiance Benchmark - Serial (sec)</b>	730.7	665.7	<b>842.0</b>	841.3	841.6	796.5	797.1	796.4	728.3	728.2	654.1	654.5	654.9	<b>571.5</b>	572.7
<b>Normalized Standard Deviation</b>	78.21%	85.85%	67.87%	67.93%	67.9%	71.75%	71.69%	71.76%	78.46%	78.48%	87.36%	87.31%	87.26%	100%	99.78%
<b>Radiance Benchmark - SMP Parallel (sec)</b>	219.6	219.8	<b>273.1</b>	255.5	258.3	257.2	241.0	246.1	235	226.0	201.2	198.5	200.8	184.0	<b>180.9</b>
<b>Normalized Standard Deviation</b>	52	36	<b>25</b>	88	43	32	63	59		76	24	01		84	<b>6</b>
<b>Normalized Standard Deviation</b>	82.38%	82.32%	66.26%	70.8%	70.05%	70.35%	75.07%	73.51%	77%	80.04%	89.93%	91.16%	90.12%	98.3%	100%
<b>Intel MPI Benchmarks - IMB-P2P PingPong (Msg/sec)</b>	20348	20246	16759	32444	31988	19096	36872	36807	<b>16653</b>	31821	24658	49151	50148	<b>67353</b>	58765
<b>Normalized Standard Deviation</b>	261	605	832	647	149	343	935	806	<b>865</b>	691	156	696	418	<b>264</b>	472
<b>Normalized Standard Deviation</b>	30.21%	30.06%	24.88%	48.17%	47.49%	28.35%	54.75%	54.65%	24.73%	47.25%	36.61%	72.98%	74.46%	100%	87.25%
<b>Standard Deviation</b>	0.3%	0.5%	0.3%	0.6%	0.4%	0.5%	0.9%	0.4%	0.4%	0.4%	1.5%	2%	1%	2.8%	2%
<b>PostgreSQL pgbench - Buffer Test - Normal Load - Read Only (TPS)</b>	89130	56769	51203	79082	79571	54602	87306	85706	56088	90991	75190	73555	<b>10634</b>	<b>28571</b>	54005
<b>Normalized Standard Deviation</b>	3	7	1	8	5	8	7	1	8	6	9	6	<b>48</b>	<b>2</b>	9
<b>Normalized Standard Deviation</b>	83.81%	53.38%	48.15%	74.36%	74.82%	51.35%	82.1%	80.59%	52.74%	85.56%	70.7%	69.17%	100%	26.87%	50.78%
<b>Standard Deviation</b>	0.2%	1.1%	0.1%	0.3%	0.5%	0.7%	3%	0.6%	0.5%	2%	0.9%	0.8%	23.6%	27.4%	16.7%
<b>PostgreSQL pgbench - Buffer Test - Normal Load - Read Write (TPS)</b>	6106	11704	5941	3169	4009	4087	4921	<b>2151</b>	<b>53139</b>	24467	3870	4149	3302	25348	37321
<b>Normalized Standard Deviation</b>	11.49%	22.03%	11.18%	5.96%	7.55%	7.69%	9.26%	4.05%	100%	46.04%	7.28%	7.81%	6.21%	47.7%	70.23%
<b>Standard Deviation</b>	18.1%	1.3%	14.3%	31.6%	2.4%	11.1%	14.4%	8.3%	1.2%	0.1%	12.1%	22.6%	5.6%	2.2%	3.8%

## Xeon & EPYC Tests

<b>Basis</b>	54.31	47.65	57.39	<b>58.28</b>	57.82	54.19	55.45	55.27	51.44	52.69	48.22	48.92	49.40	49.46	<b>42.38</b>
<b>Universal - ETC1S (sec)</b>	0	3	9	<b>0</b>	6	4	6	8	6	4	7	1	3	5	<b>1</b>
<b>Normalized</b>	78.04%	88.94%	73.84%	72.72%	73.29%	78.2%	76.42%	76.67%	82.38%	80.43%	87.88%	86.63%	85.79%	85.68%	100%
<b>Standard</b>	0.1%	1.7%	0.1%	0.2%	0.3%	0.4%	0.2%	0.3%	0.4%	0.4%	0.3%	0.1%	0.4%	1.8%	0.1%
<b>Deviation</b>															
<b>Basis</b>	19.19	30.63	<b>35.98</b>	23.14	23.08	32.19	21.12	21.40	30.68	19.88	26.59	17.34	16.91	12.84	<b>11.86</b>
<b>Universal - UASTC Level 3 (sec)</b>	3	4	<b>3</b>	7	8	9	0	4	9	5	7	1	5	9	<b>1</b>
<b>Normalized</b>	61.8%	38.72%	32.96%	51.24%	51.37%	36.84%	56.16%	55.41%	38.65%	59.65%	44.6%	68.4%	70.12%	92.31%	100%
<b>Standard</b>	0.5%	0.1%	0.1%	0.1%	0.6%	0.5%	0.2%	2.8%	0.1%	0.2%	0.4%	2.6%	0.5%	3%	0.4%
<b>Deviation</b>															
<b>Chaos Group</b>	62897	33014	<b>29061</b>	53051	51803	33947	62175	61378	34710	64331	44760	87937	87388	74975	<b>88189</b>
<b>V-RAY - CPU</b>															
<b>Normalized</b>	71.32%	37.44%	32.95%	60.16%	58.74%	38.49%	70.5%	69.6%	39.36%	72.95%	50.75%	99.71%	99.09%	85.02%	100%
<b>Standard</b>	0.5%	2.1%	0.5%	0.2%	1.1%	0.1%	0.6%	1.6%	1.5%	1.3%	2.8%	1.5%	1.5%	6.4%	2.8%
<b>Deviation</b>															
<b>Blender - BMW27 - CPU-Only (sec)</b>	41.76	74.96	<b>86.89</b>	48.00	47.63	75.86	41.22	41.33	69.80	38.79	52.28	31.09	31.10	25.69	<b>24.33</b>
<b>Normalized</b>	58.26%	32.46%	28%	50.69%	51.08%	32.07%	59.02%	58.87%	34.86%	62.72%	46.54%	78.26%	78.23%	94.71%	100%
<b>Standard</b>	0.4%	0.3%	0.3%	0.2%	0.4%	0.6%	0.3%	0.9%	0.2%	0.4%	0.3%	0.5%	0.8%	0.6%	1.1%
<b>Deviation</b>															
<b>Blender - Classroom - CPU-Only (sec)</b>	101.3	213.3	<b>246.8</b>	124.6	124.5	215.9	109.3	109.9	198.2	100.4	136.5	74.20	75.73	45.75	<b>44.81</b>
<b>Normalized</b>	44.22%	21%	18.16%	35.94%	35.97%	20.75%	40.98%	40.77%	22.6%	44.6%	32.82%	60.39%	59.17%	97.95%	100%
<b>Standard</b>	0.7%	0.3%	0.1%	0.2%	0.1%	0.3%	0.5%	0.1%	0.3%	0.4%	0.1%	2.1%	0.8%	0.4%	0.3%
<b>Deviation</b>															
<b>Blender - Fishy Cat - CPU-Only (sec)</b>	65.67	118.0	<b>134.2</b>	79.22	79.00	119.3	70.22	70.12	110.6	66.39	81.64	53.69	53.96	44.63	<b>40.19</b>
<b>Normalized</b>	61.2%	34.03%	29.94%	50.73%	50.87%	33.67%	57.23%	57.32%	36.32%	60.54%	49.23%	74.86%	74.48%	90.05%	100%
<b>Standard</b>	0.1%	0.1%	0.1%	0.3%	0.2%	0.2%	0.5%	0.6%	0.3%	0.1%	0.2%	0.3%	0.4%	0.5%	1.1%
<b>Deviation</b>															
<b>Blender - Barbershop - CPU-Only (sec)</b>	177.7	304.7	<b>350.4</b>	211.3	211.3	310.5	195.6	195.9	287.8	187.3	218.4	<b>158.7</b>	161.7	255.0	228.2
<b>Normalized</b>	89.27%	52.08%	45.29%	75.09%	75.11%	51.12%	81.14%	81%	55.15%	84.73%	72.67%	100%	98.15%	62.24%	69.53%
<b>Standard</b>	0.5%	0.1%	0%	0.1%	0.1%	0.1%	0.1%	0.5%	0.1%	0.4%	0.3%	0.4%	0.9%	1.5%	0.5%
<b>Deviation</b>															

## Xeon & EPYC Tests

<b>Blender -</b>	132.0	265.4	<b>305.2</b>	157.9	158.1	271.6	142.8	143.3	246.3	129.0	177.5	99.21	100.5	76.32	<b>74.37</b>
<b>  Pabellon</b>	4	1	<b>0</b>	9	3	8	1	1	1	1	7		1		
<b>Barcelona -</b>															
<b>  CPU-Only</b>															
<b>    (sec)</b>															
<b>  Normalized</b>	56.32%	28.02%	24.37%	47.07%	47.03%	27.37%	52.08%	51.89%	30.19%	57.65%	41.88%	74.96%	73.99%	97.44%	100%
<b>  Standard</b>	0.7%	0.5%	0%	0.1%	0.1%	0.2%	0.3%	0.6%	0%	0.3%	0.1%	1.4%	1.2%	0.2%	0.7%
<b>  Deviation</b>															
<b>PyBench -</b>	1226	951	1250	<b>1253</b>	1252	1184	1182	1182	1076	1073	978	979	980	<b>774</b>	<b>774</b>
<b>  T.F.A.T.T</b>															
<b>    (Millisecond)</b>															
<b>  Normalized</b>	63.13%	81.39%	61.92%	61.77%	61.82%	65.37%	65.48%	65.48%	71.93%	72.13%	79.14%	79.06%	78.98%	100%	100%
<b>  Standard</b>	0.4%	0.3%	0.1%	0.2%	0.1%	0.3%	0.1%	0.1%	0.2%	0.2%	0.6%	0.3%	0.3%	0.7%	
<b>  Deviation</b>															
<b>PyPerforman</b>		94.5	122	123	123		117	117	109	109	134	134	133	<b>147</b>	<b>77.3</b>
<b>  ce - float</b>															
<b>    (Millisecond)</b>															
<b>  Normalized</b>		81.8%	63.36%	62.85%	62.85%		66.07%	66.07%	70.92%	70.92%	57.69%	57.69%	58.12%	52.59%	100%
<b>  Standard</b>		0.2%	0.5%	0.5%									0.9%		0.3%
<b>  Deviation</b>															
<b>PyPerforman</b>	213	157	200	200	200		190	189	164	164	186	191	183	<b>226</b>	<b>132</b>
<b>  ce -</b>															
<b>  regex_compi</b>															
<b>  le</b>															
<b>    (Millisecond)</b>															
<b>  Normalized</b>	61.97%	84.08%	66%	66%	66%		69.47%	69.84%	80.49%	80.49%	70.97%	69.11%	72.13%	58.41%	100%
<b>  Standard</b>	0.3%	1.3%	0.3%								1.4%	1.9%	2%	9.1%	
<b>  Deviation</b>															
<b>PyPerforman</b>	16.3	17.7	11.4	22.6	11.3	11.6	<b>25.2</b>	11.8	<b>11.2</b>	<b>11.2</b>	19.8	20.4	19.8	19.4	18.2
<b>  ce -</b>															
<b>  python_start</b>															
<b>  up</b>															
<b>    (Millisecond)</b>															
<b>  Normalized</b>	68.71%	63.28%	98.25%	49.56%	99.12%	96.55%	44.44%	94.92%	100%	100%	56.57%	54.9%	56.57%	57.73%	61.54%
<b>  Standard</b>	0%	0.9%	0.5%	0.3%	0.5%	0%	0.2%	1%	1%	0.5%	0%	0%	0%	0.3%	0.8%
<b>  Deviation</b>															
<b>PyPerforman</b>	<b>66.4</b>	49.9	64.1	64.1	64.2	60.6	60.8	60.6	46.2	45.9	65.4	65.3	63.2	57.7	<b>35.4</b>
<b>  ce -</b>															
<b>  django_temp</b>															
<b>  late</b>															
<b>    (Millisecond)</b>															
<b>  Normalized</b>	53.31%	70.94%	55.23%	55.23%	55.14%	58.42%	58.22%	58.42%	76.62%	77.12%	54.13%	54.21%	56.01%	61.35%	100%
<b>  Standard</b>	0.2%	2.3%	0.2%	0.2%	0.2%	0.3%	0.2%	0%	0.2%	0.3%	0.9%	1.3%	4.6%	10.3%	0.3%
<b>  Deviation</b>															
<b>Appleseed -</b>	<b>147.6</b>	196.9	219.3	163.7	161.8	211.9	161.3	162.4	197.6	154.9	156.2	213.5	214.9	<b>310.8</b>	
<b>  Emily (sec)</b>	<b>85856</b>	29786	197	07232	46314	41251	76814	95615	49505	80752	15935	05962	54687	<b>56869</b>	
<b>  Normalized</b>	100%	74.99%	67.34%	90.21%	91.25%	69.68%	91.52%	90.89%	74.72%	95.29%	94.54%	69.17%	68.71%	47.51%	

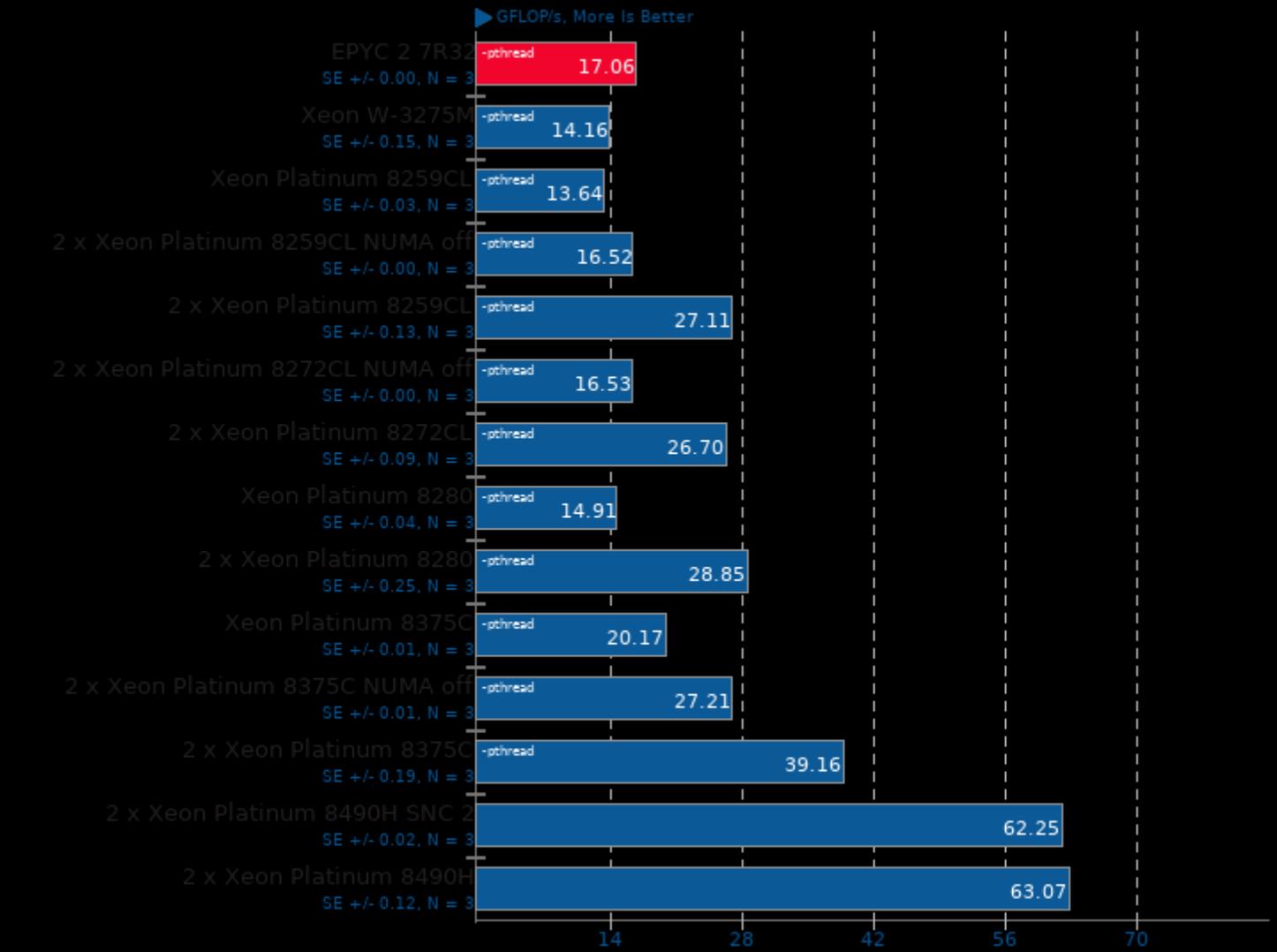
# Xeon & EPYC Tests

Appleseed -	62.43	106.6	120.1	73.21	73.58	117.1	72.84	73.50	103.8	68.61	78.57	64.97	64.75	86.47
Disney	1047	43392	69346	6224	1913	51798	8426	3828	33099	8272	949	0654	0754	3048
Material														
Normalized	100%	58.54%	51.95%	85.27%	84.85%	53.29%	85.7%	84.94%	60.13%	90.98%	79.45%	96.09%	96.42%	72.2%
Appleseed -	175.1	124.1	127.9	197.2	185.2	129.0	195.1	186.3	123.9	193.4	90.81	179.2	185.4	263.1
Material	93708	47301	96296	93774	29734	306	11486	06033	79103	4241	9752	40906	54977	09087
Tester (sec)														
Normalized	51.84%	73.15%	70.95%	46.03%	49.03%	70.39%	46.55%	48.75%	73.25%	46.95%	100%	50.67%	48.97%	34.52%
PHPBench -	50052	73433	56979	57434	57348	60485	60643	60654	64916	64969	71214	70445	70857	31128
P.B.S	4	9	3	8	3	7	6	8	4	3	0	3	1	4
Normalized	68.16%	100%	77.59%	78.21%	78.1%	82.37%	82.58%	82.6%	88.4%	88.47%	96.98%	95.93%	96.49%	42.39%
Standard	0.4%	0.2%	0.2%	0.1%	0.3%	0.4%	0.3%	0.1%	0.1%	0.2%	0.1%	0.4%	0.7%	1.5%
Deviation														
Mlpack	49.47	54.91	61.20	57.69	58.48	58.57	55.90	54.84	67.36	63.35	45.50	44.03	44.68	20.00
Benchmark -														
scikit_ica														
(sec)														
Normalized	40.43%	36.42%	32.68%	34.67%	34.2%	34.15%	35.78%	36.47%	29.69%	31.57%	43.96%	45.42%	44.76%	100%
Standard	3.8%	0.3%	1%	1.1%	2.4%	0.2%	1.6%	1.3%	0.5%	1.6%	0.5%	1.3%	0.7%	1.7%
Deviation														
Mlpack	39.54	32.65	31.98	41.29	42.88	31.51	40.35	40.64	30.45	38.35	26.51	29.53	29.92	21.77
Benchmark -														
scikit_qda														
(sec)														
Normalized	55.06%	66.68%	68.07%	52.72%	50.77%	69.09%	53.95%	53.57%	71.49%	56.77%	82.12%	73.72%	72.76%	100%
Standard	1.2%	1%	0.6%	0.8%	4.4%	1.1%	2.6%	2.7%	1.6%	1.5%	0.5%	2.3%	3%	0.2%
Deviation														
Mlpack	15.16	15.78	18.67	19.62	18.76	17.83	19.05	17.94	17.19	17.19	17.05	17.54	17.08	10.26
Benchmark -														
scikit_svm														
(sec)														
Normalized	67.68%	65.02%	54.95%	52.29%	54.69%	57.54%	53.86%	57.19%	59.69%	59.69%	60.18%	58.49%	60.07%	100%
Standard	1%	2.1%	0.2%	0.2%	0.3%	0.4%	0.5%	1.1%	0.7%	0.9%	0.2%	0.7%	0.4%	1.7%
Deviation														
Mlpack	1.79	1.99	2.00	2.42	2.30	1.91	2.13	2.16	1.67	1.82	2.54	2.75	2.60	5.59
Benchmark -														
scikit_linearr														
idgeregressi														
on (sec)														
Normalized	93.3%	83.92%	83.5%	69.01%	72.61%	87.43%	78.4%	77.31%	100%	91.76%	65.75%	60.73%	64.23%	29.87%
Standard	2.1%	1.6%	4.1%	2.9%	4%	2.3%	3%	2.5%	2%	2.6%	0.4%	0.8%	2.8%	4.7%
Deviation														
Scikit-Learn	10.41	9.661	12.08	12.95	12.45	11.21	12.05	11.76	9.127	9.392	9.566	9.472	9.332	7.165
(sec)	9		8	4	9	2	5	3						
Normalized	68.77%	74.16%	59.27%	55.31%	57.51%	63.9%	59.44%	60.91%	78.5%	76.29%	74.9%	75.64%	76.78%	100%
Standard	0.6%	0.6%	0.8%	0.6%	0.5%	0.4%	0.7%	0.4%	0.8%	2.2%	1%	1.1%	0.6%	4.5%
Deviation														
SMHasher -		26299	20221	20232	20225	20557	20555	20553						
wyhash														
(MiB/sec)														
Normalized		100%	76.89%	76.93%	76.91%	78.17%	78.16%	78.15%						

---

<b>Standard</b>	0.7%	0.1%	0%	0.1%	0%	0%	0%
<b>Deviation</b>							

## High Performance Conjugate Gradient 3.1

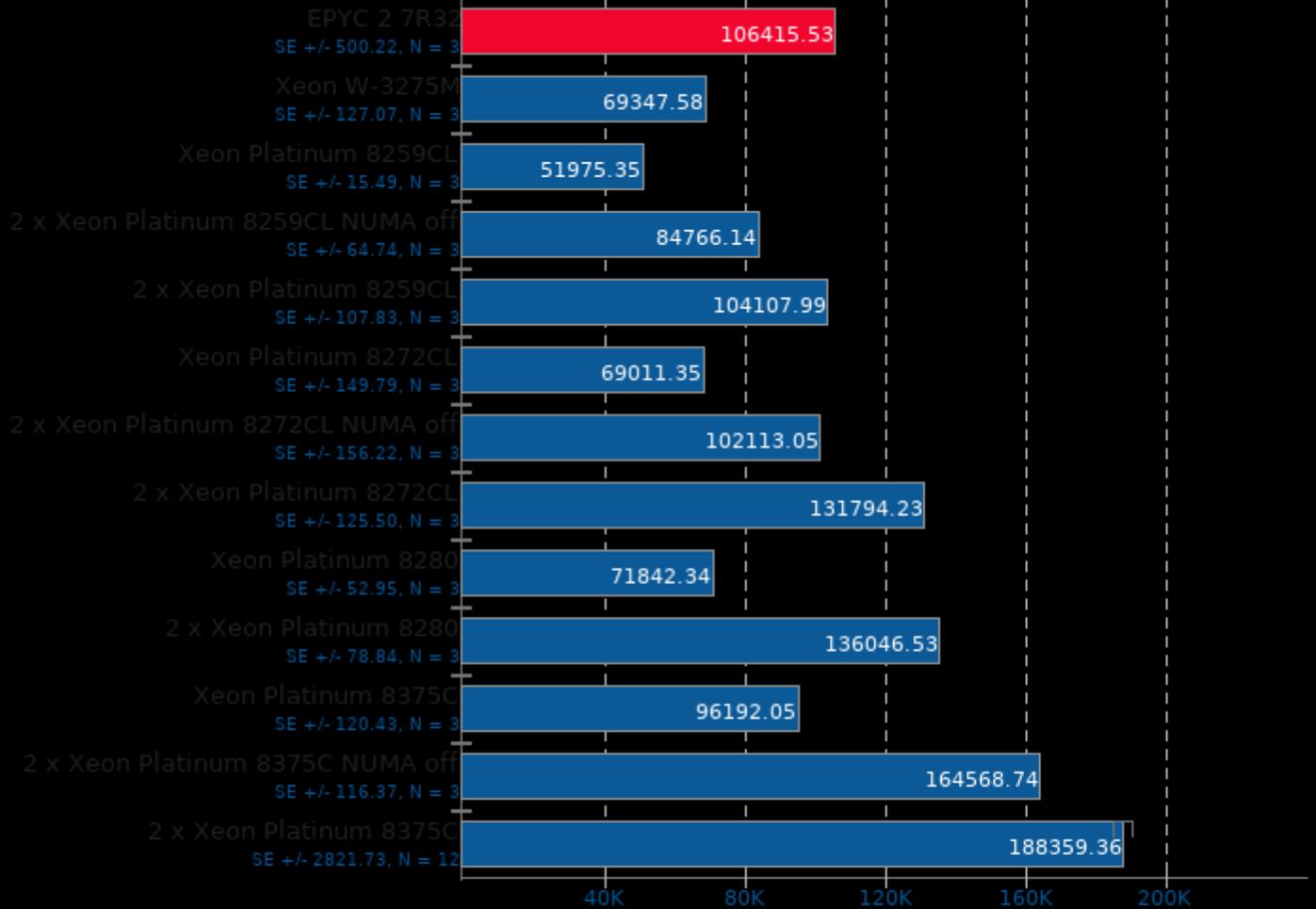


1. (CXX) g++ options: -O3 -ffast-math -fno-vectorize -lmpi\_cxx -lmpi

## NAS Parallel Benchmarks 3.4

Test / Class: BT.C

Total Mop/s, More Is Better

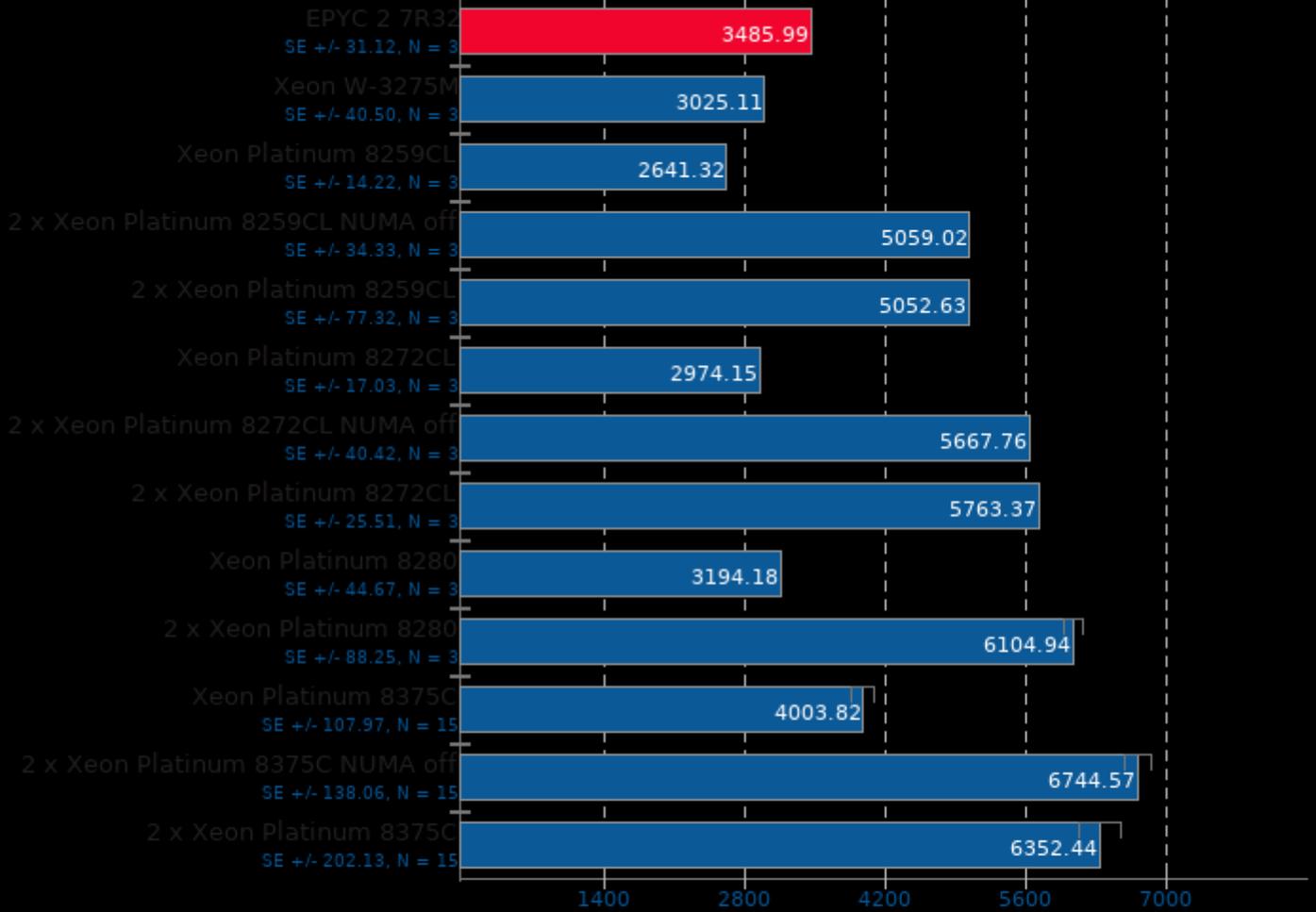


1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi
2. EPYC 2 7R32: Open MPI 3.1.3
3. Xeon W-3275M: Open MPI 3.1.3
4. Xeon Platinum 8259CL: Open MPI 3.1.3
5. 2 x Xeon Platinum 8259CL NUMA off: Open MPI 3.1.3
6. 2 x Xeon Platinum 8259CL: Open MPI 3.1.3
7. Xeon Platinum 8272CL: Open MPI 3.1.3
8. 2 x Xeon Platinum 8272CL NUMA off: Open MPI 3.1.3
9. 2 x Xeon Platinum 8272CL: Open MPI 3.1.3
10. Xeon Platinum 8280: Open MPI 4.0.3rc4
11. 2 x Xeon Platinum 8280: Open MPI 4.0.3rc4
12. Xeon Platinum 8375C: Open MPI 3.1.3
13. 2 x Xeon Platinum 8375C NUMA off: Open MPI 3.1.3
14. 2 x Xeon Platinum 8375C: Open MPI 3.1.3

# NAS Parallel Benchmarks 3.4

Test / Class: EP.C

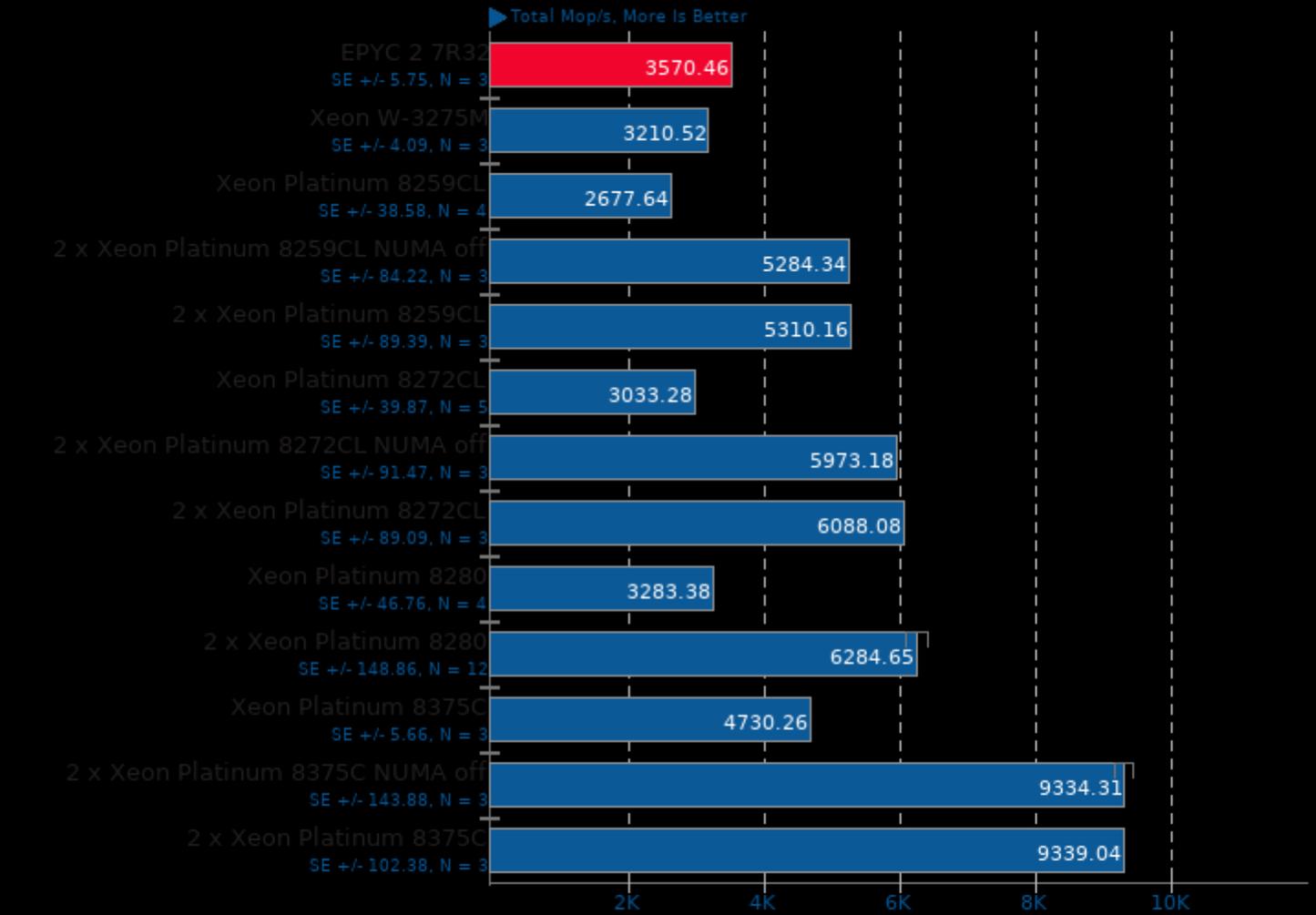
Total Mop/s, More Is Better



1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi
2. EPYC 2 7R32: Open MPI 3.1.3
3. Xeon W-3275M: Open MPI 3.1.3
4. Xeon Platinum 8259CL: Open MPI 3.1.3
5. 2 x Xeon Platinum 8259CL NUMA off: Open MPI 3.1.3
6. 2 x Xeon Platinum 8259CL: Open MPI 3.1.3
7. Xeon Platinum 8272CL: Open MPI 3.1.3
8. 2 x Xeon Platinum 8272CL NUMA off: Open MPI 3.1.3
9. 2 x Xeon Platinum 8272CL: Open MPI 3.1.3
10. Xeon Platinum 8280: Open MPI 4.0.3rc4
11. 2 x Xeon Platinum 8280: Open MPI 4.0.3rc4
12. Xeon Platinum 8375C: Open MPI 3.1.3
13. 2 x Xeon Platinum 8375C NUMA off: Open MPI 3.1.3
14. 2 x Xeon Platinum 8375C: Open MPI 3.1.3

## NAS Parallel Benchmarks 3.4

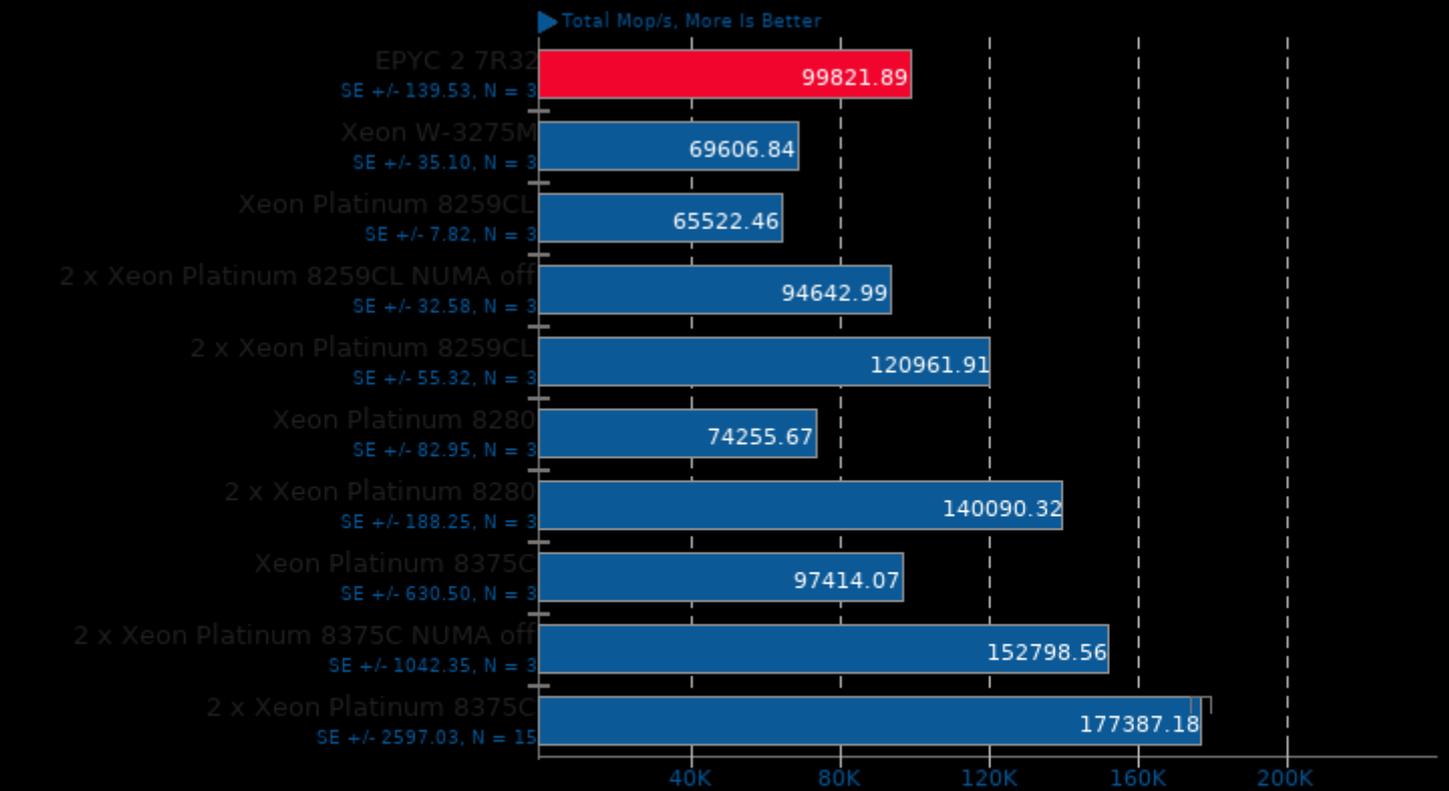
Test / Class: EP.D



1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi
2. EPYC 2 7R32: Open MPI 3.1.3
3. Xeon W-3275M: Open MPI 3.1.3
4. Xeon Platinum 8259CL: Open MPI 3.1.3
5. 2 x Xeon Platinum 8259CL NUMA off: Open MPI 3.1.3
6. 2 x Xeon Platinum 8259CL: Open MPI 3.1.3
7. Xeon Platinum 8272CL: Open MPI 3.1.3
8. 2 x Xeon Platinum 8272CL NUMA off: Open MPI 3.1.3
9. 2 x Xeon Platinum 8272CL: Open MPI 3.1.3
10. Xeon Platinum 8280: Open MPI 4.0.3rc4
11. 2 x Xeon Platinum 8280: Open MPI 4.0.3rc4
12. Xeon Platinum 8375C: Open MPI 3.1.3
13. 2 x Xeon Platinum 8375C NUMA off: Open MPI 3.1.3
14. 2 x Xeon Platinum 8375C: Open MPI 3.1.3

## NAS Parallel Benchmarks 3.4

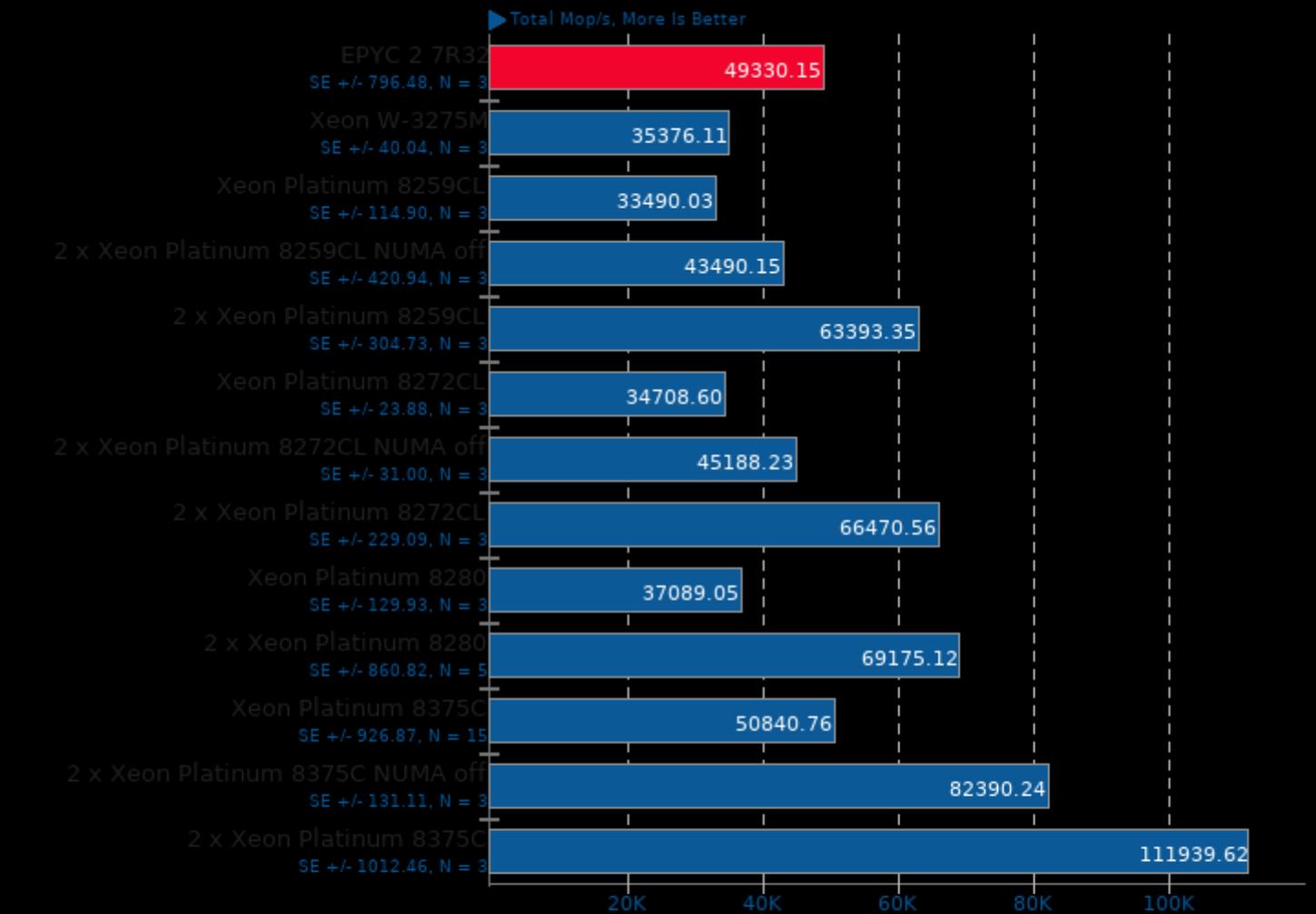
Test / Class: LU.C



1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpi fh -lmpi
2. EPYC 2 7R32: Open MPI 3.1.3
3. Xeon W-3275M: Open MPI 3.1.3
4. Xeon Platinum 8259CL: Open MPI 3.1.3
5. 2 x Xeon Platinum 8259CL NUMA off: Open MPI 3.1.3
6. 2 x Xeon Platinum 8259CL: Open MPI 3.1.3
7. Xeon Platinum 8280: Open MPI 4.0.3rc4
8. 2 x Xeon Platinum 8280: Open MPI 4.0.3rc4
9. Xeon Platinum 8375C: Open MPI 3.1.3
10. 2 x Xeon Platinum 8375C NUMA off: Open MPI 3.1.3
11. 2 x Xeon Platinum 8375C: Open MPI 3.1.3

## NAS Parallel Benchmarks 3.4

Test / Class: MG.C

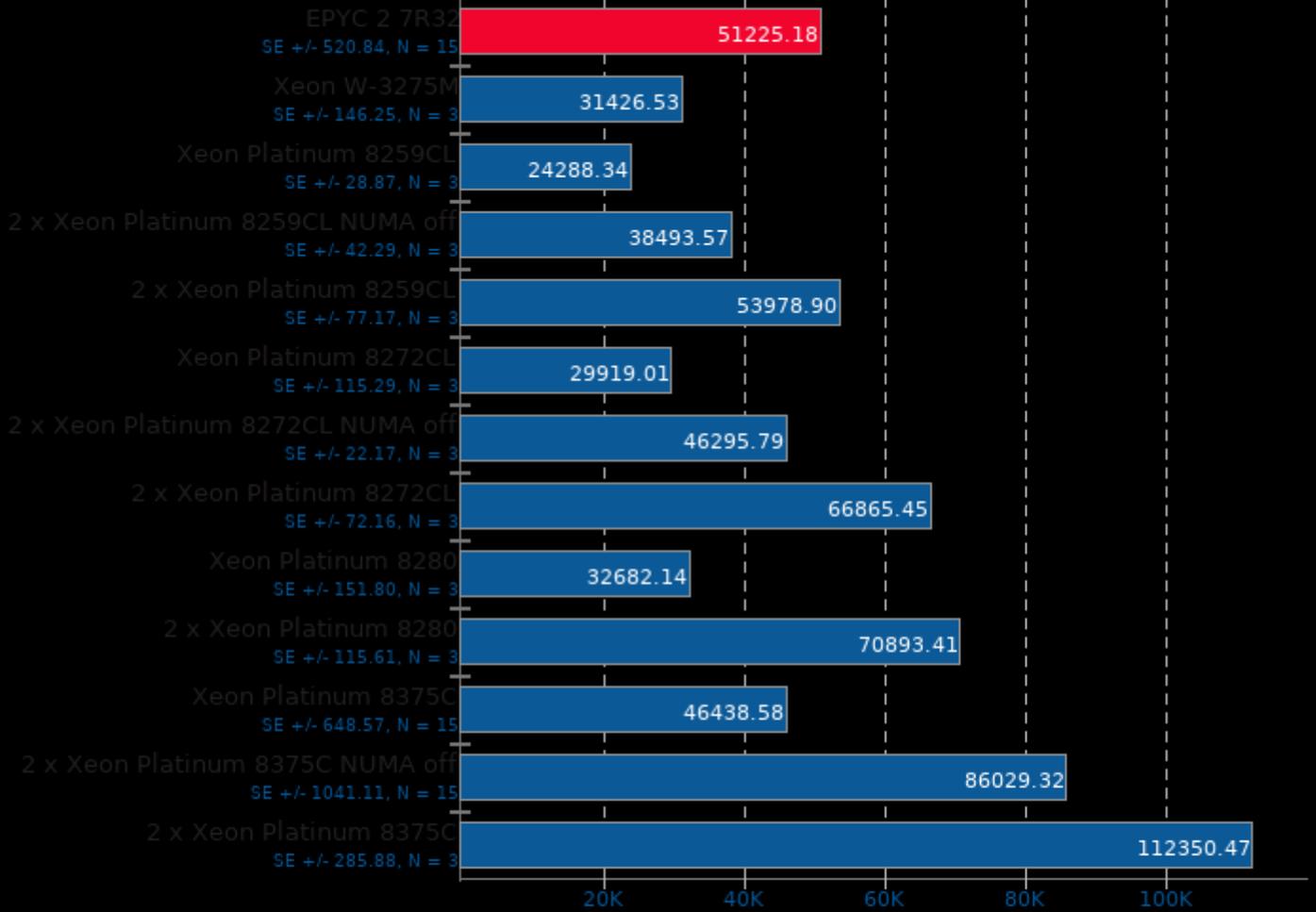


1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi
2. EPYC 2 7R32: Open MPI 3.1.3
3. Xeon W-3275M: Open MPI 3.1.3
4. Xeon Platinum 8259CL: Open MPI 3.1.3
5. 2 x Xeon Platinum 8259CL NUMA off: Open MPI 3.1.3
6. 2 x Xeon Platinum 8259CL: Open MPI 3.1.3
7. Xeon Platinum 8272CL: Open MPI 3.1.3
8. 2 x Xeon Platinum 8272CL NUMA off: Open MPI 3.1.3
9. 2 x Xeon Platinum 8272CL: Open MPI 3.1.3
10. Xeon Platinum 8280: Open MPI 4.0.3rc4
11. 2 x Xeon Platinum 8280: Open MPI 4.0.3rc4
12. Xeon Platinum 8375C: Open MPI 3.1.3
13. 2 x Xeon Platinum 8375C NUMA off: Open MPI 3.1.3
14. 2 x Xeon Platinum 8375C: Open MPI 3.1.3

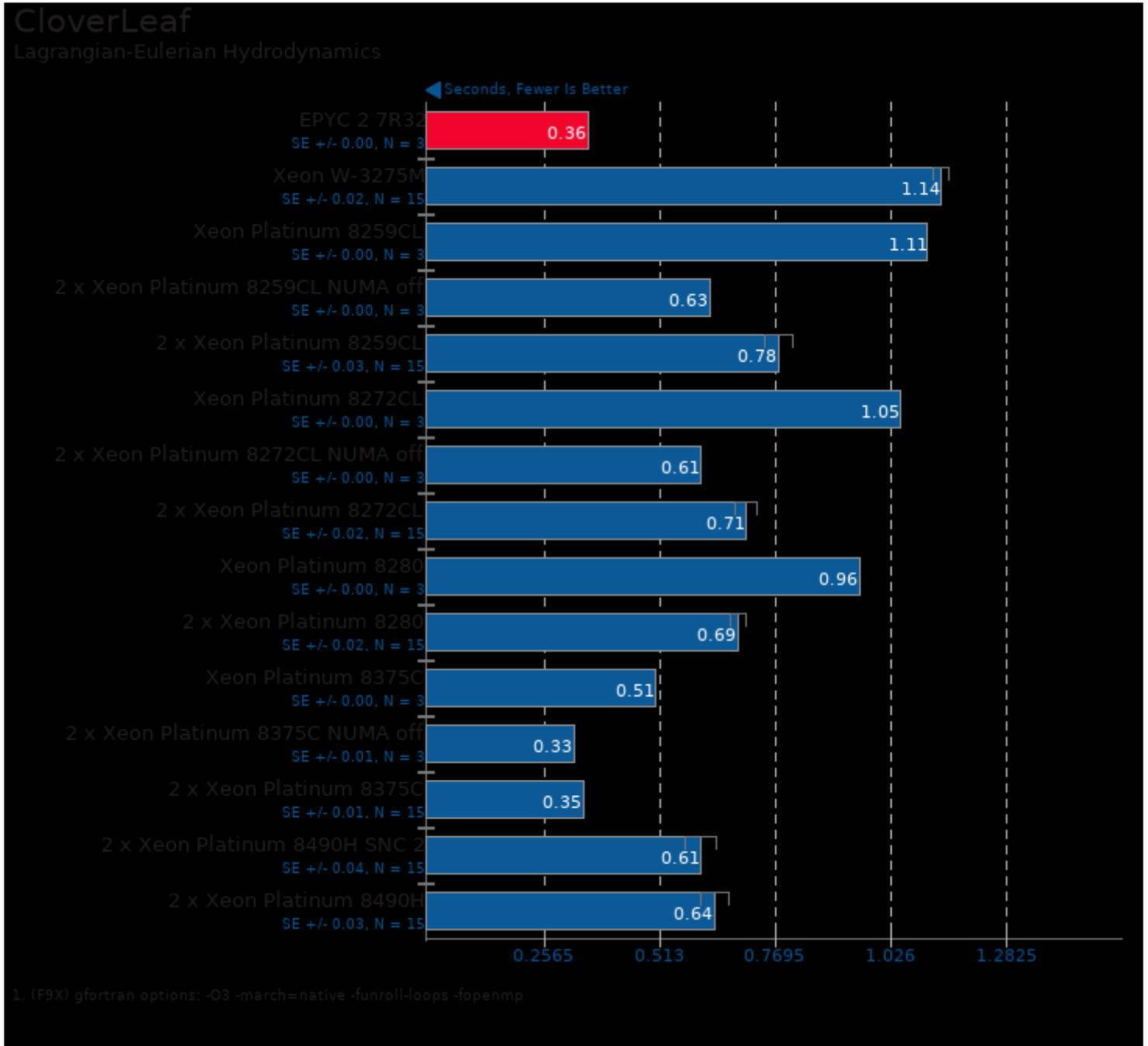
# NAS Parallel Benchmarks 3.4

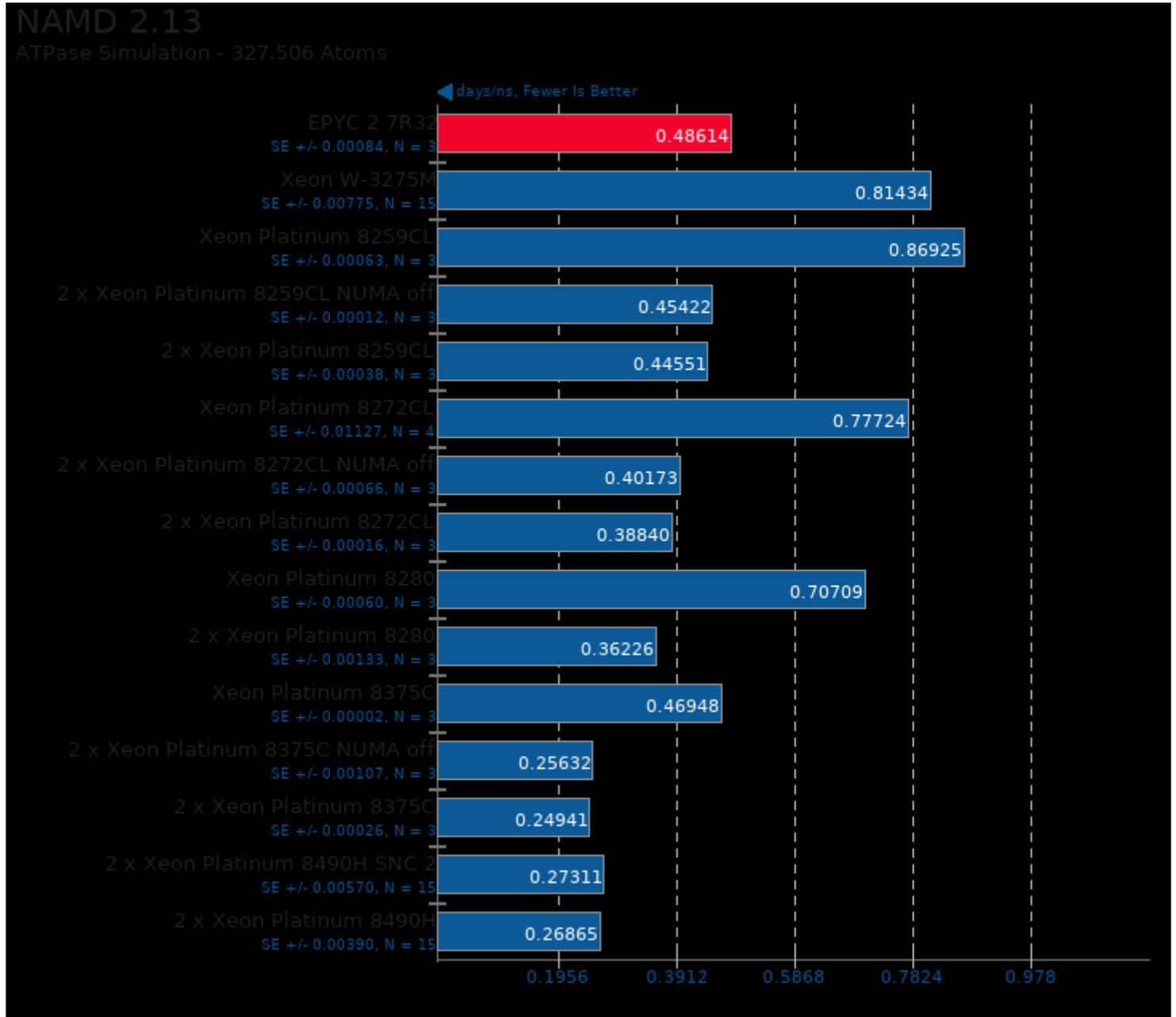
Test / Class: SP.B

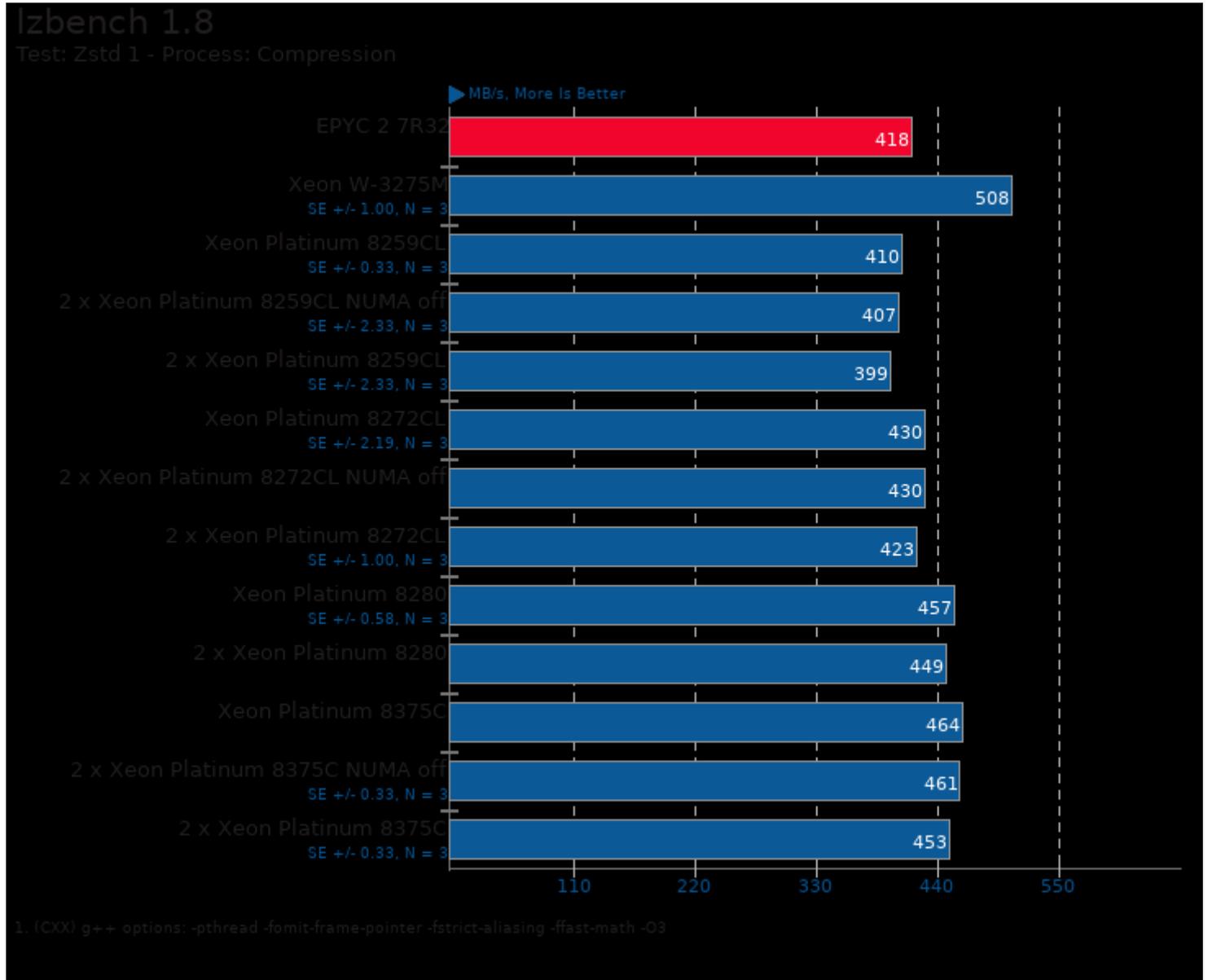
Total Mop/s, More Is Better

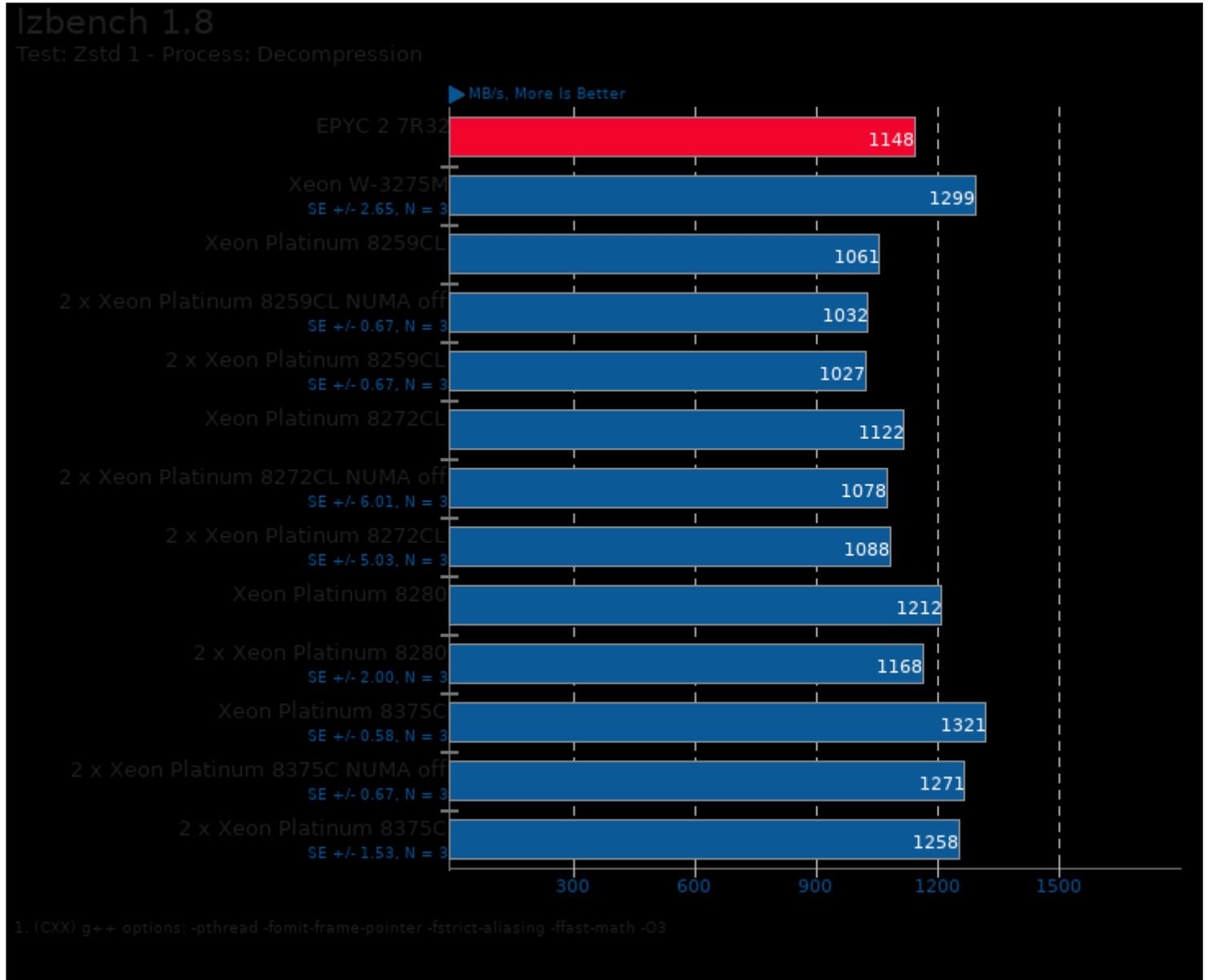


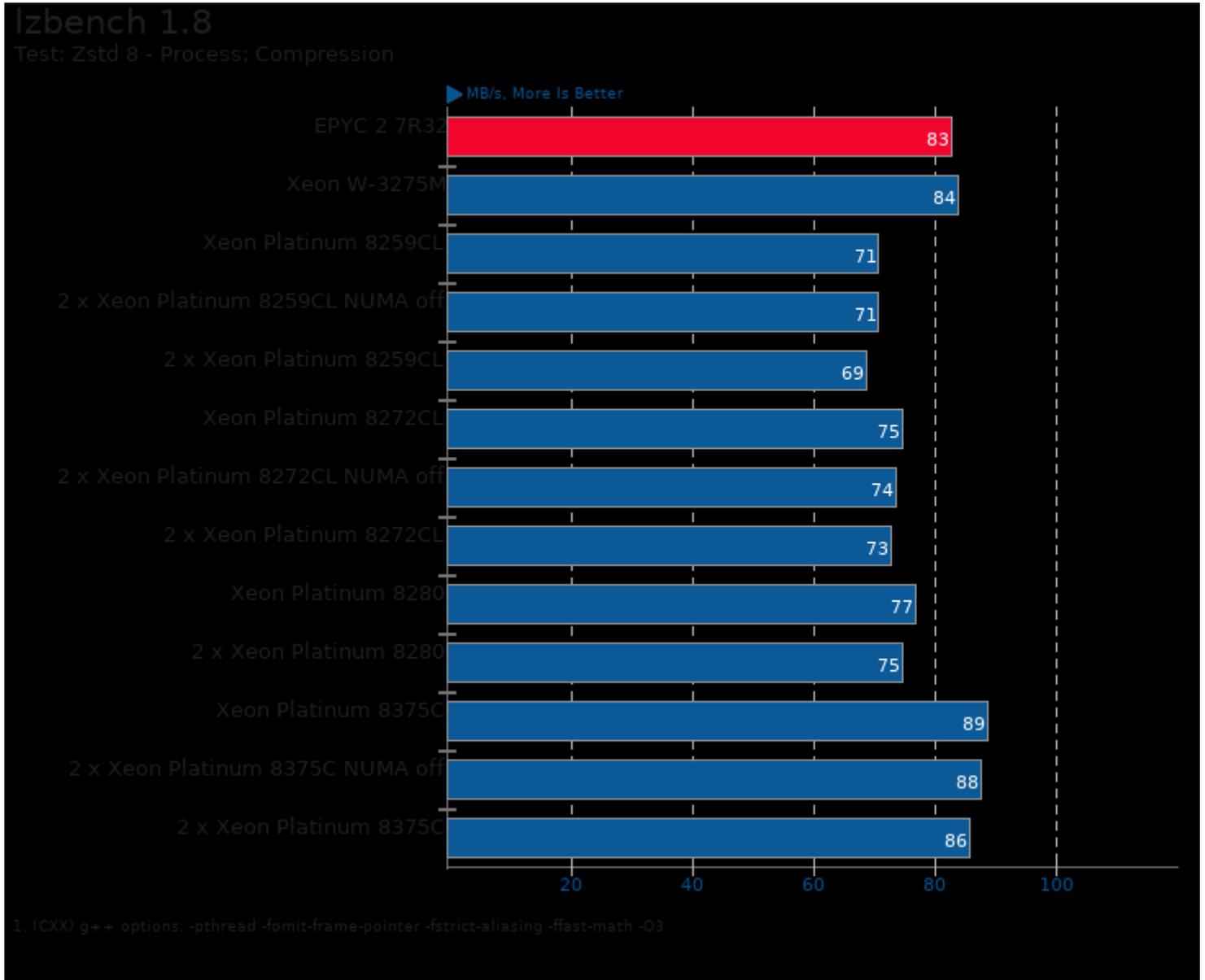
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi\_usempif08 -lmpi\_mpifh -lmpi
2. EPYC 2 7R32: Open MPI 3.1.3
3. Xeon W-3275M: Open MPI 3.1.3
4. Xeon Platinum 8259CL: Open MPI 3.1.3
5. 2 x Xeon Platinum 8259CL NUMA off: Open MPI 3.1.3
6. 2 x Xeon Platinum 8259CL: Open MPI 3.1.3
7. Xeon Platinum 8272CL: Open MPI 3.1.3
8. 2 x Xeon Platinum 8272CL NUMA off: Open MPI 3.1.3
9. 2 x Xeon Platinum 8272CL: Open MPI 3.1.3
10. Xeon Platinum 8280: Open MPI 4.0.3rc4
11. 2 x Xeon Platinum 8280: Open MPI 4.0.3rc4
12. Xeon Platinum 8375C: Open MPI 3.1.3
13. 2 x Xeon Platinum 8375C NUMA off: Open MPI 3.1.3
14. 2 x Xeon Platinum 8375C: Open MPI 3.1.3

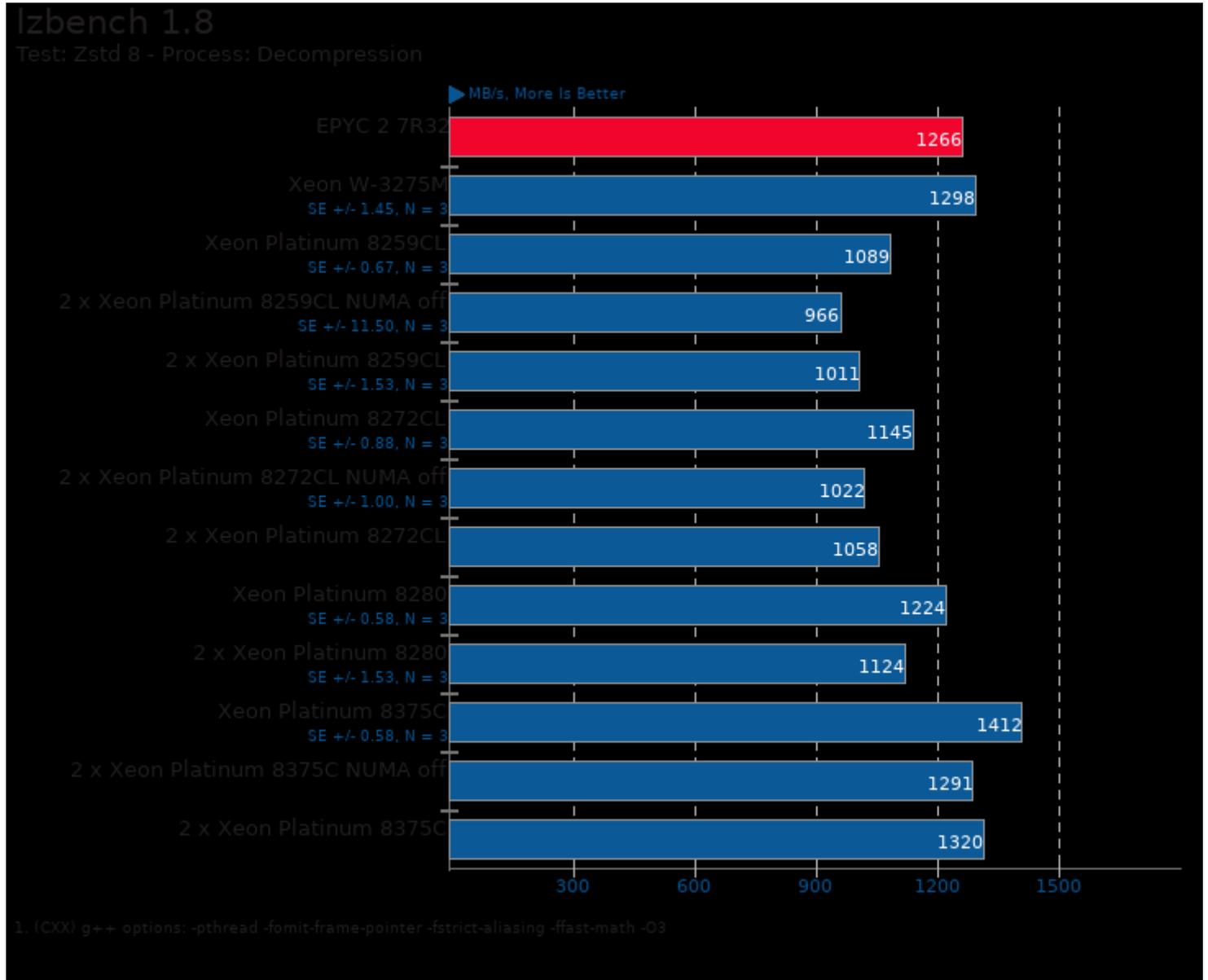


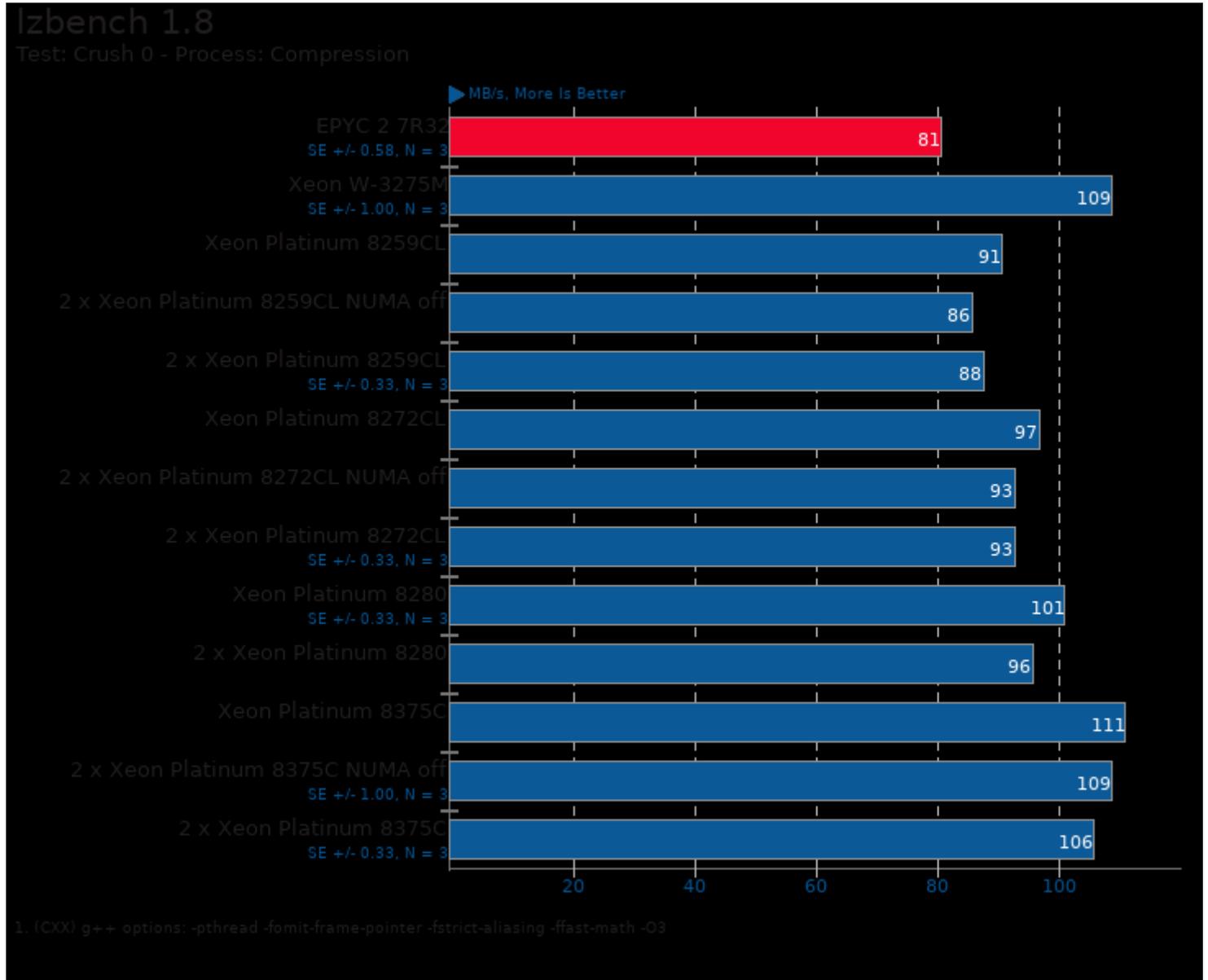


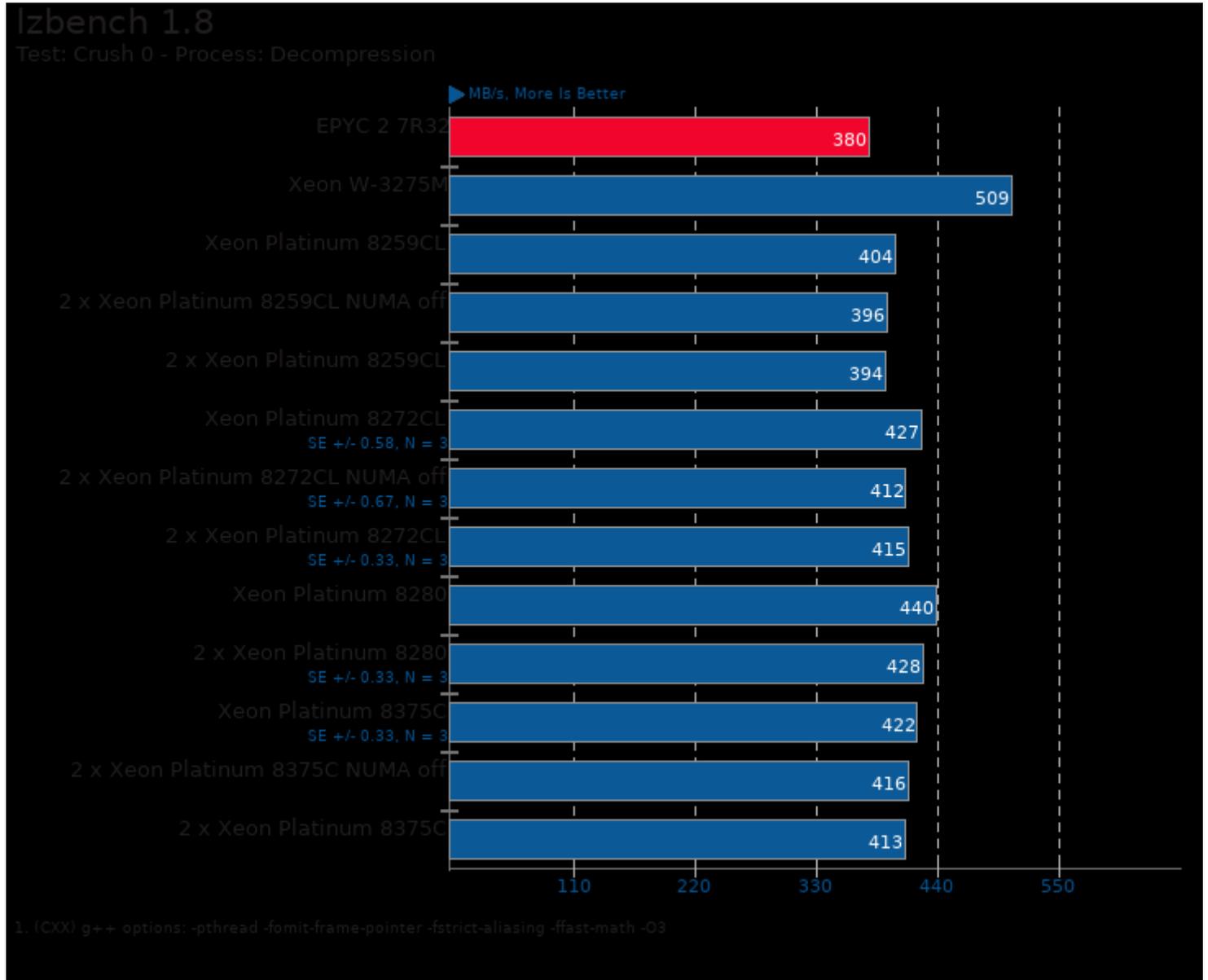


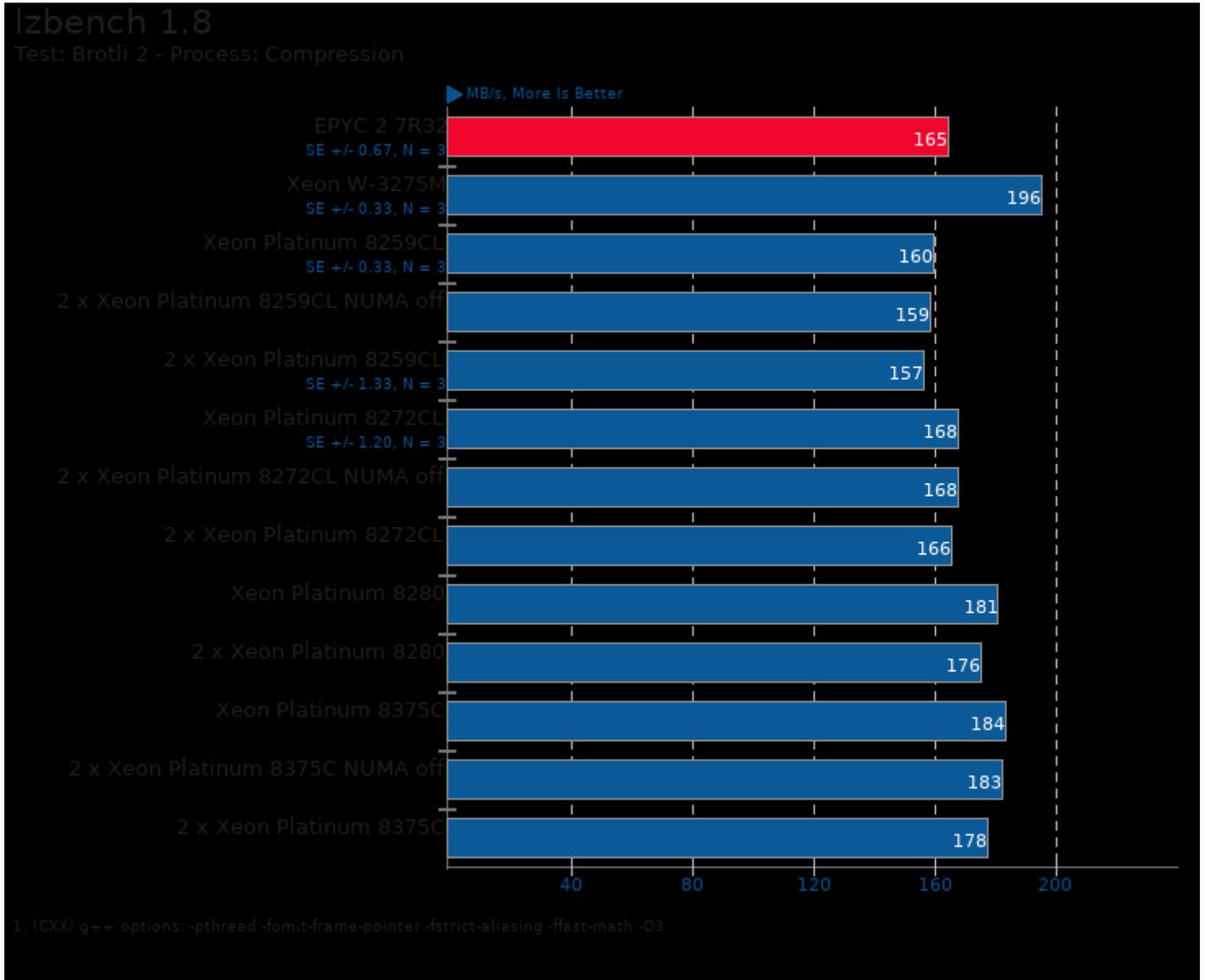


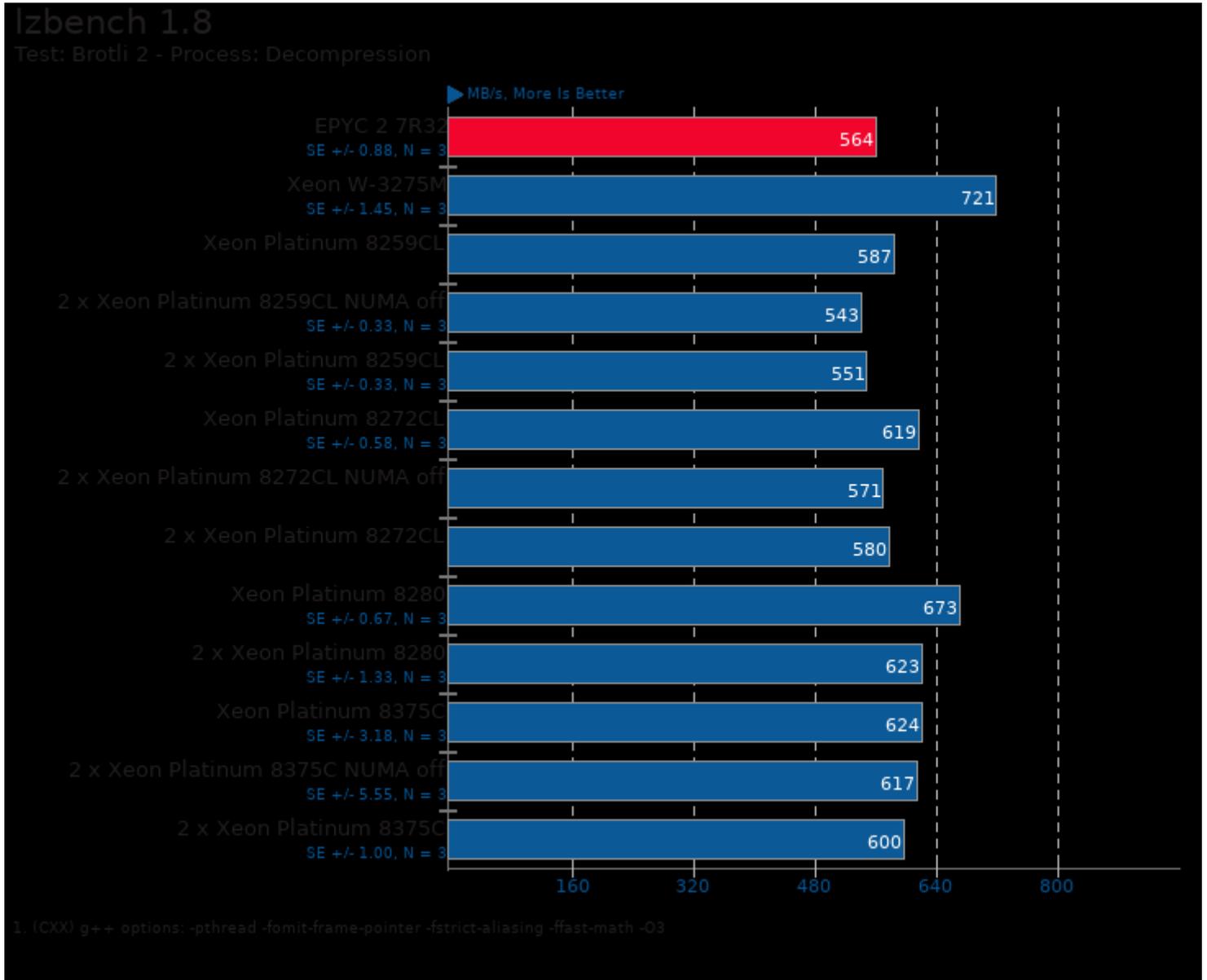


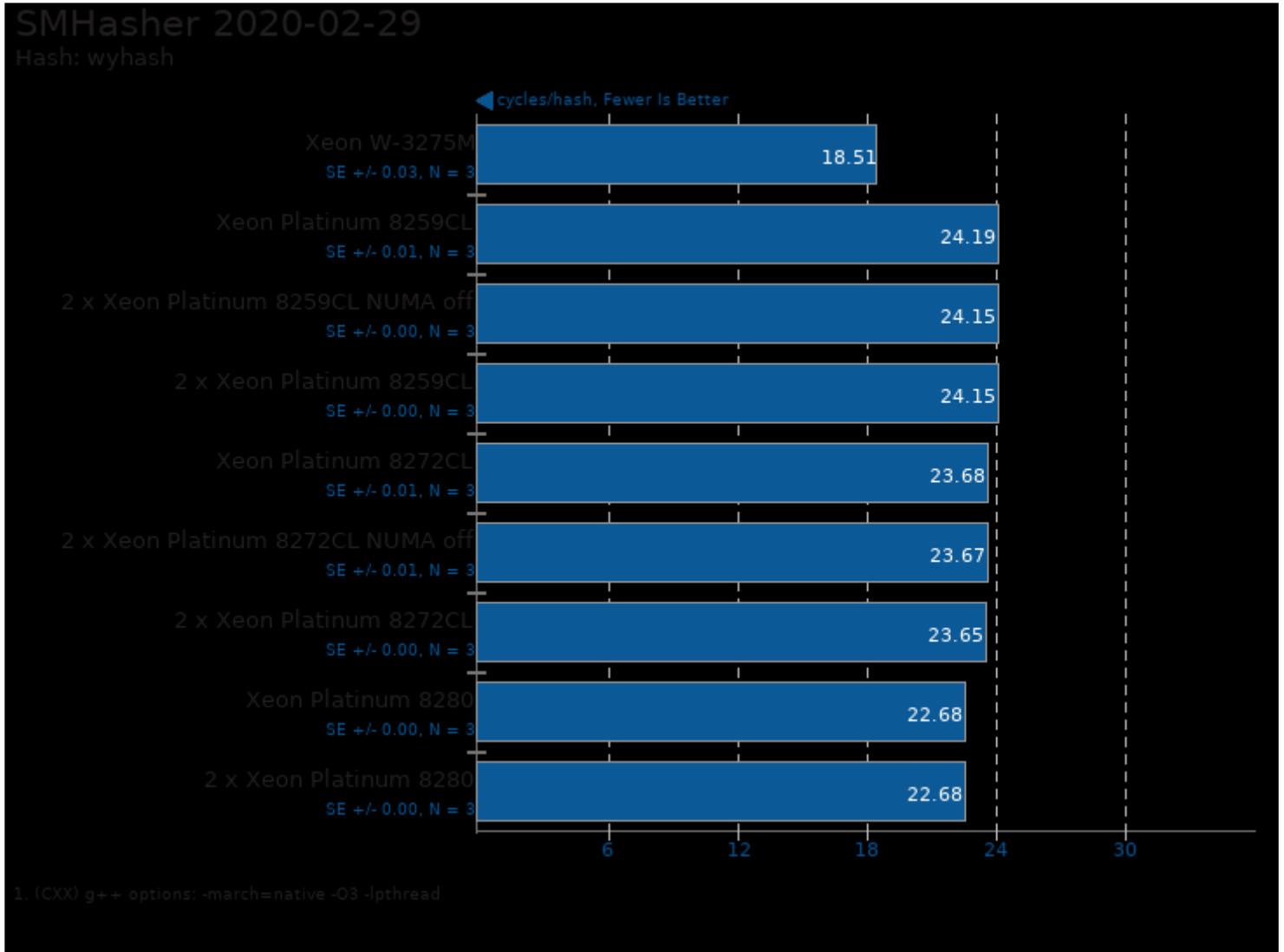






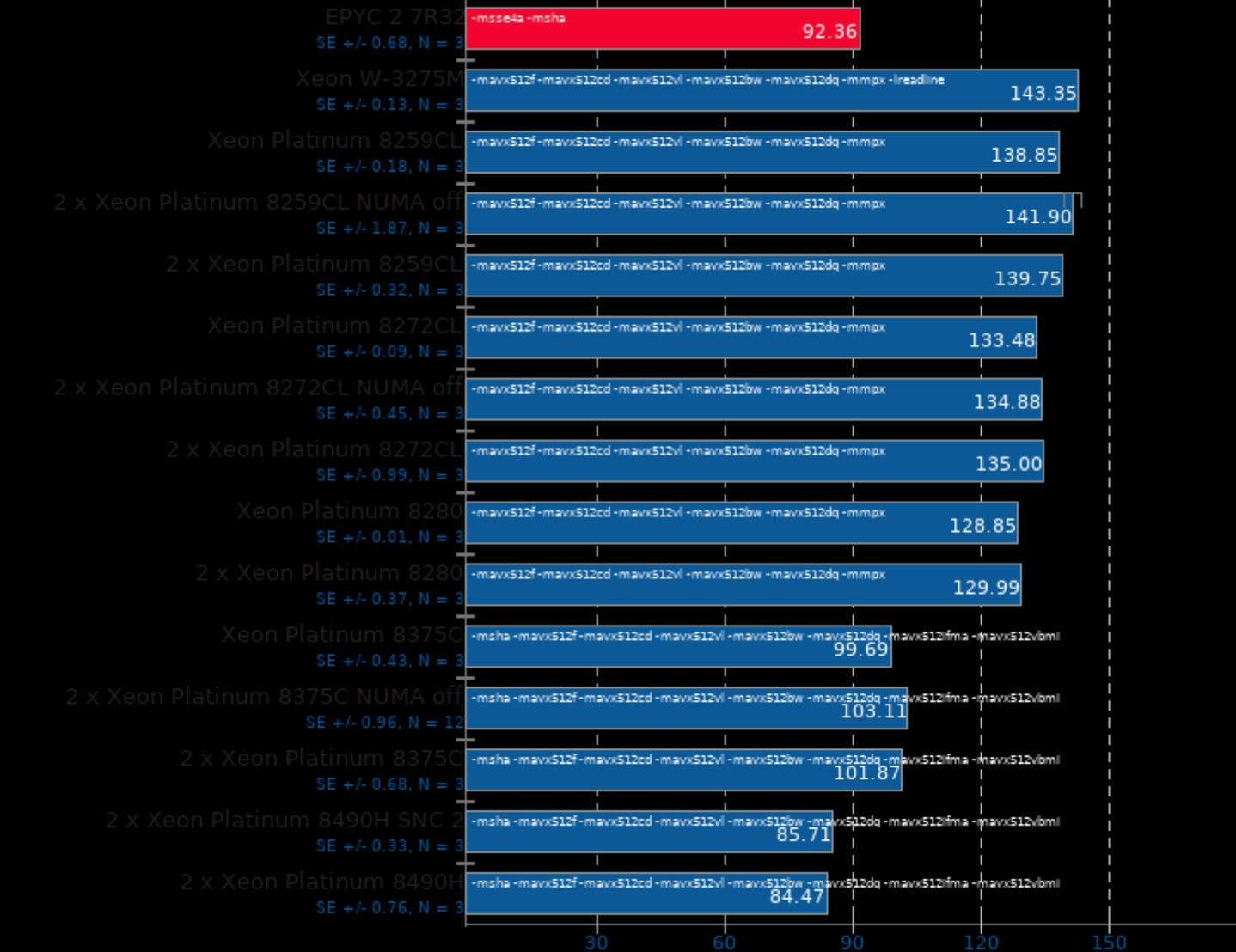




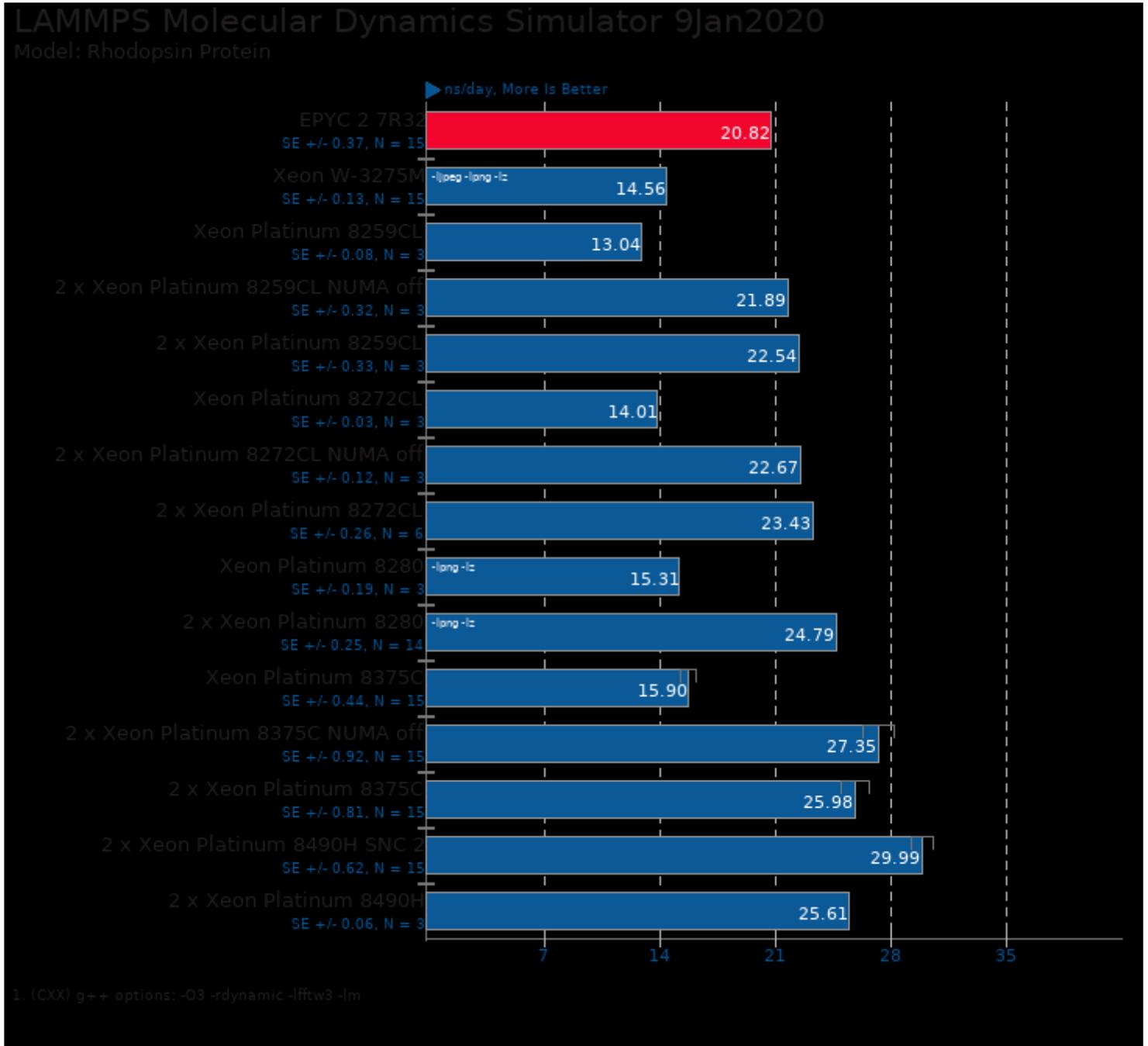


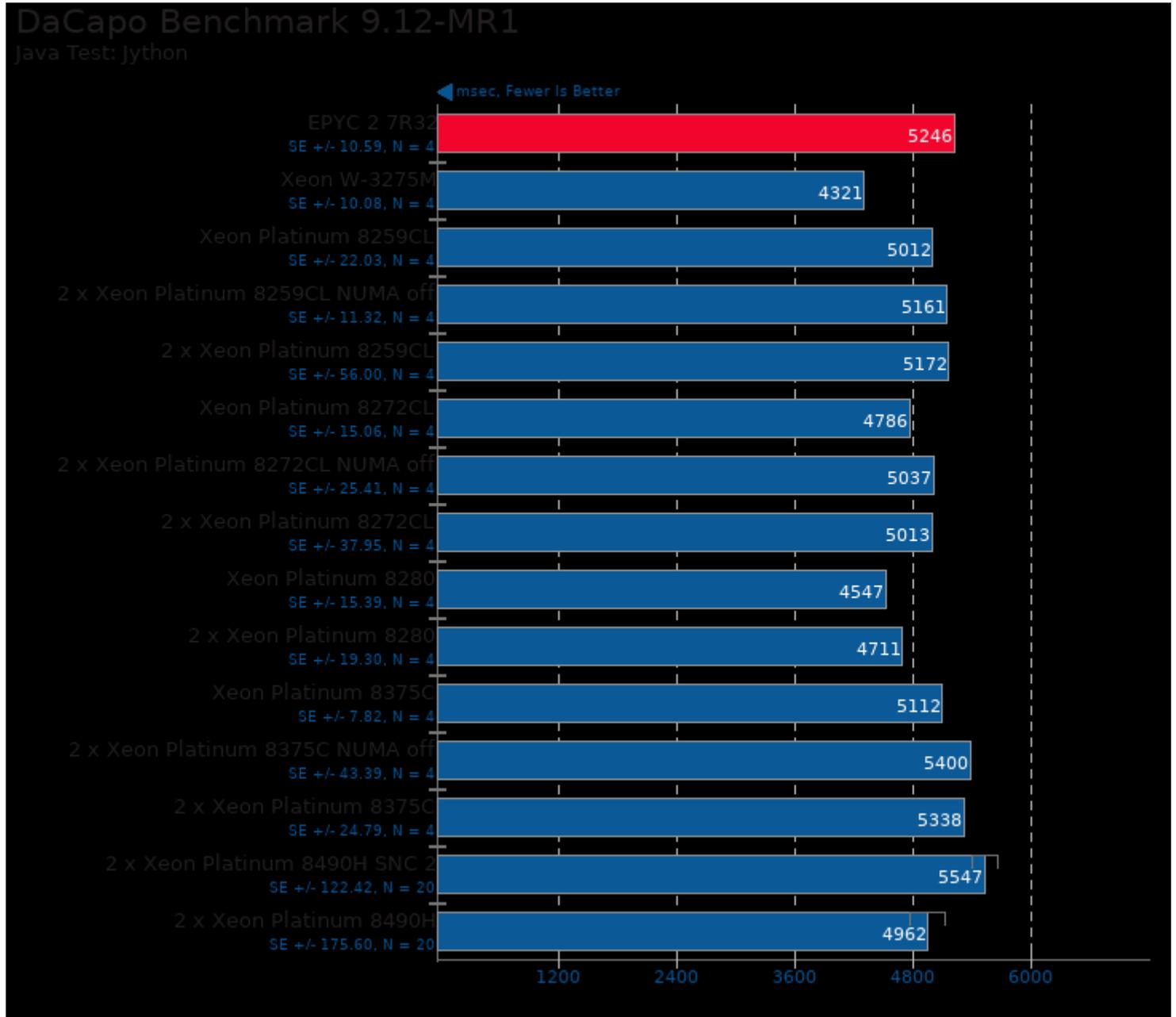
## Timed MrBayes Analysis 3.2.7 Primate Phylogeny Analysis

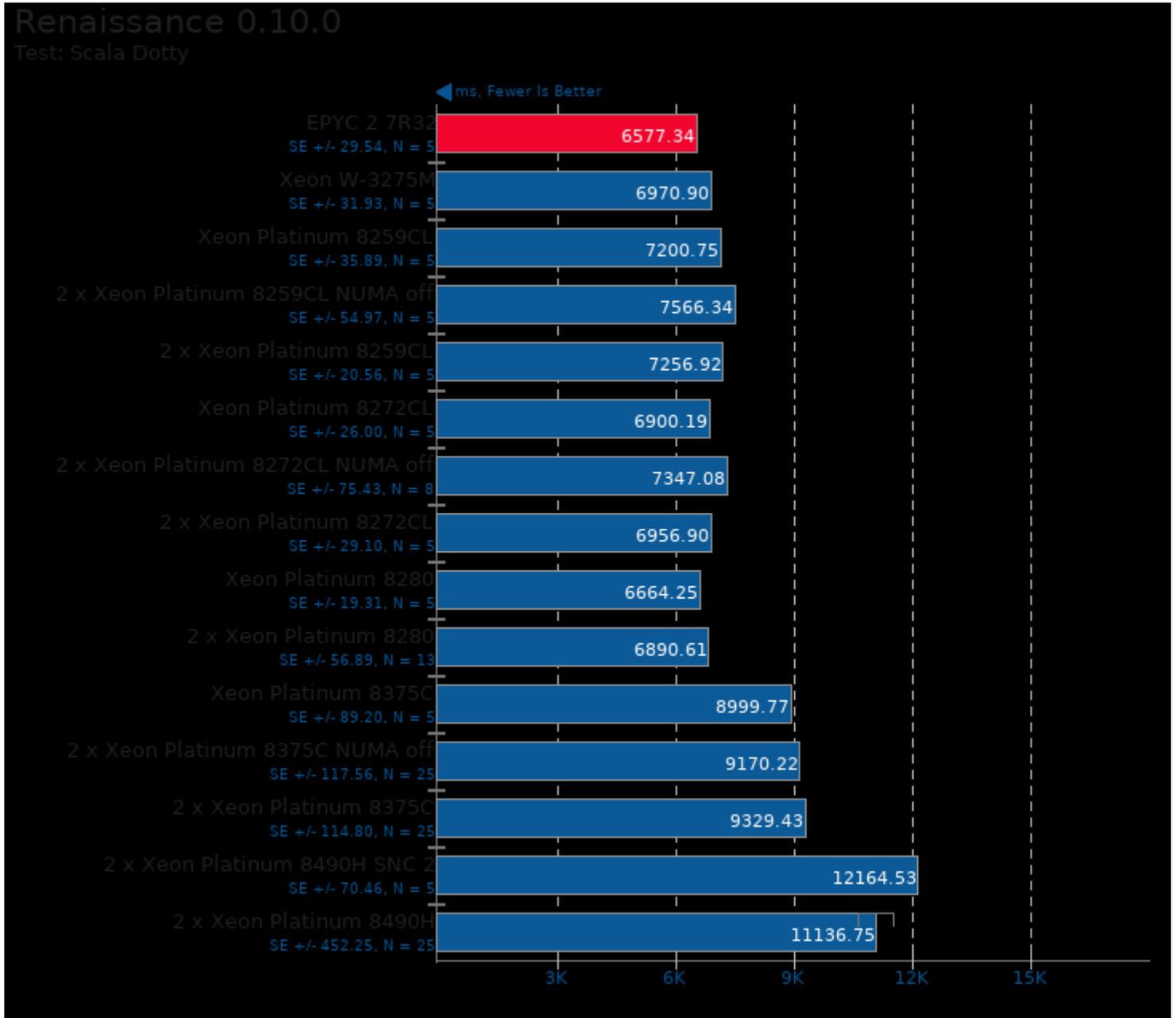
← Seconds, Fewer Is Better

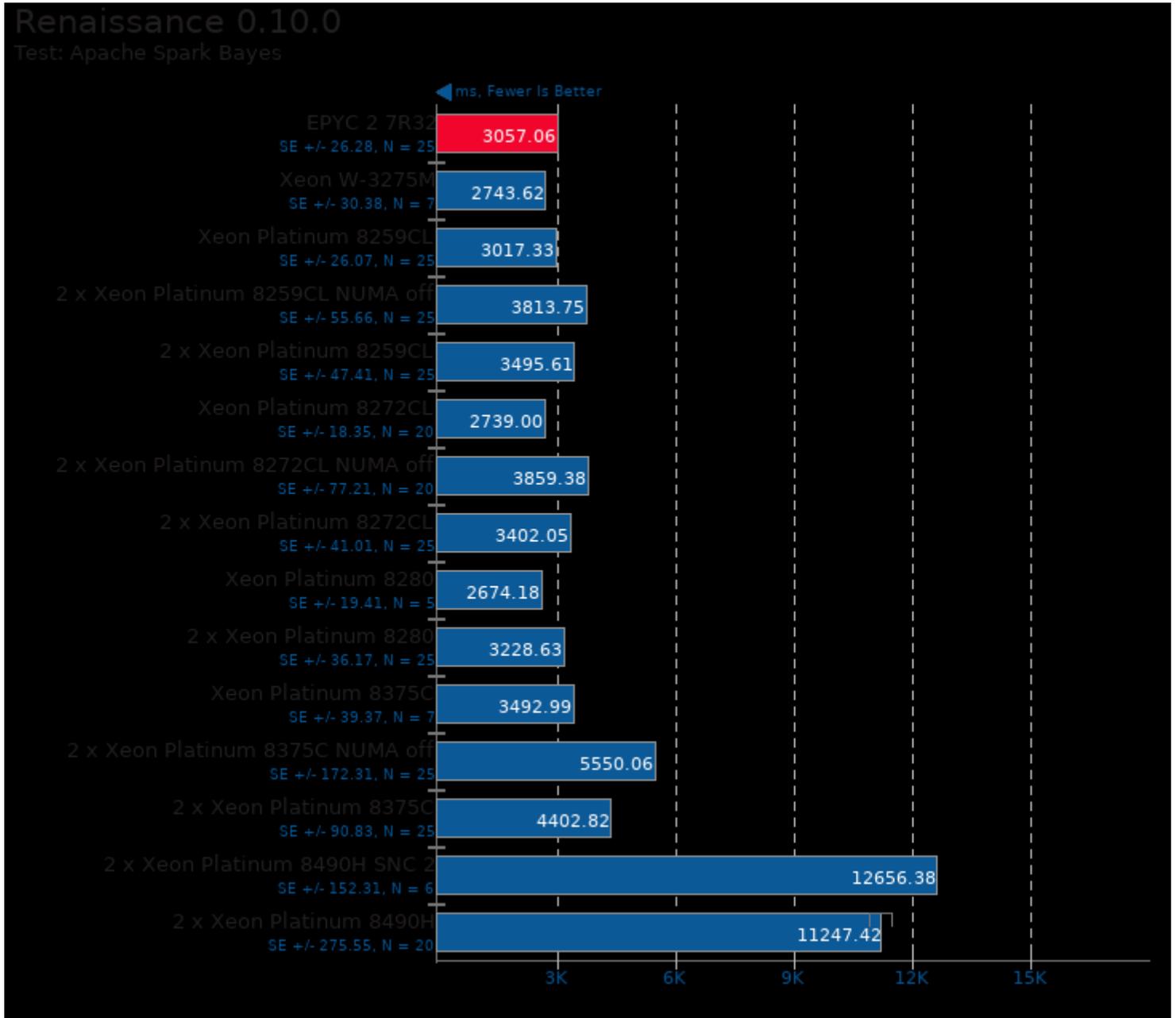


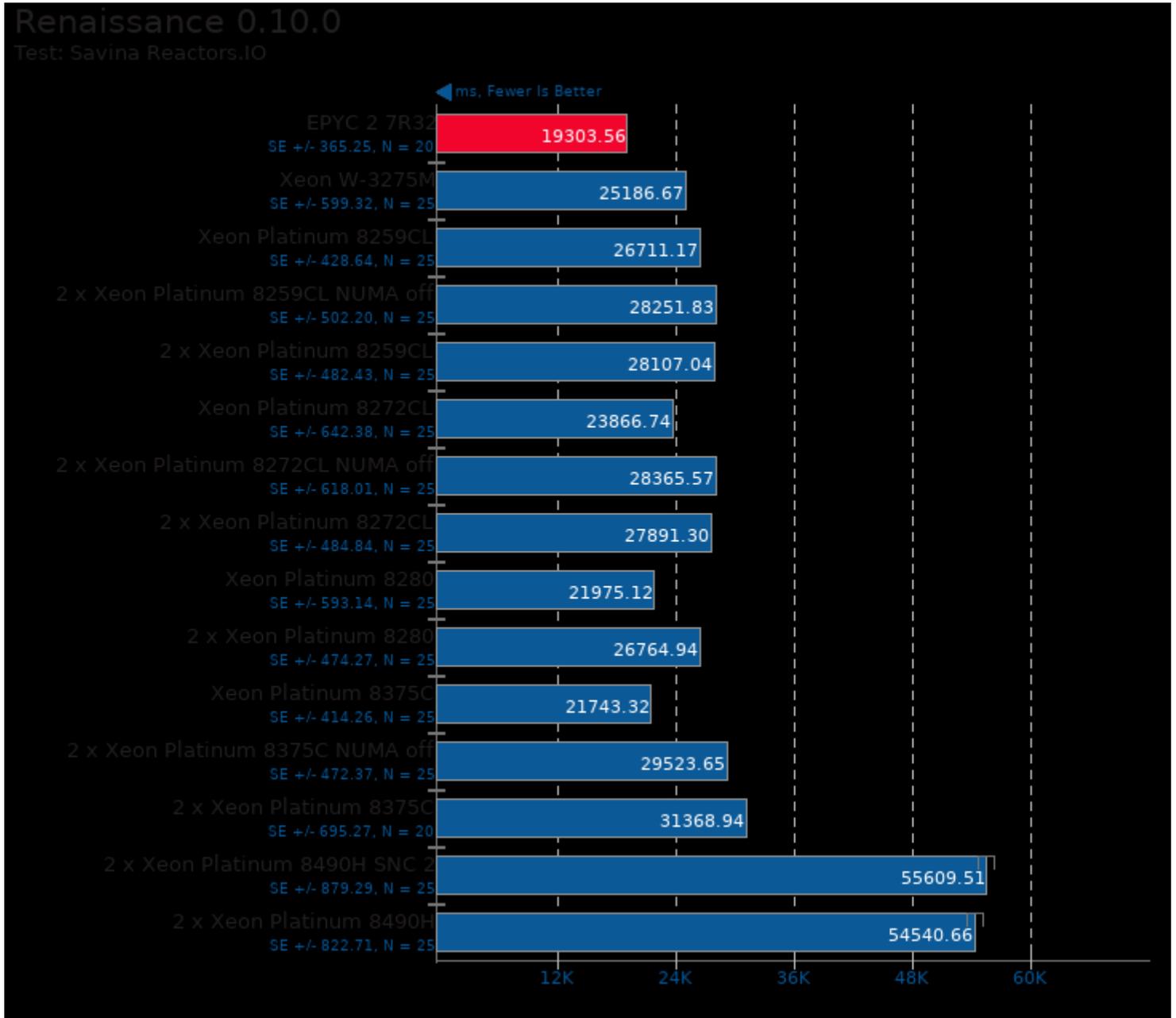
1. (CC) gcc options: -mmpx -msse -msse2 -msse3 -msse3.1 -msse4.1 -msse4.2 -maes -mavx -mfma -mavx2 -mrdnd -mbmi -mbmi2 -madv -mabm -O3 -std

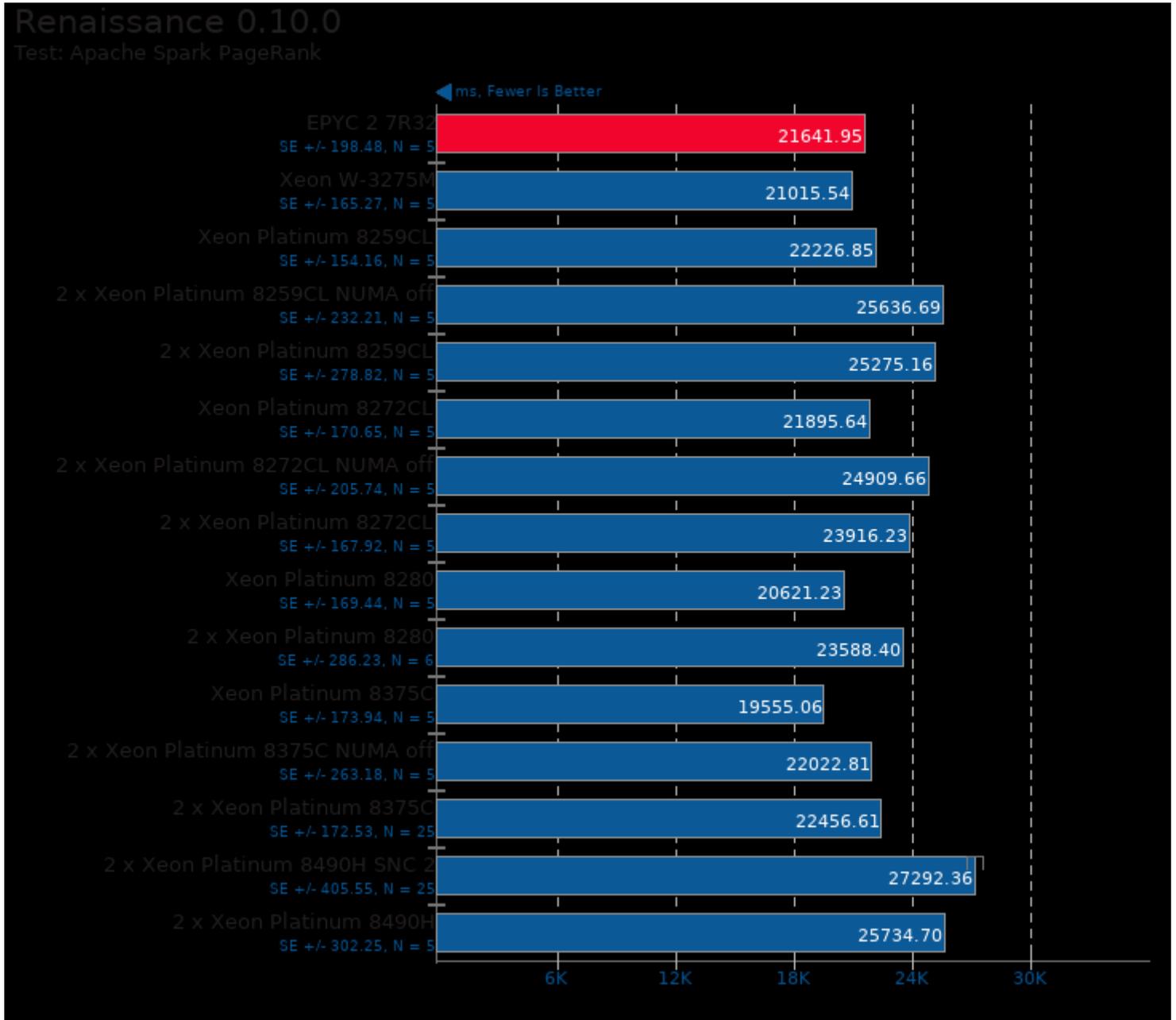








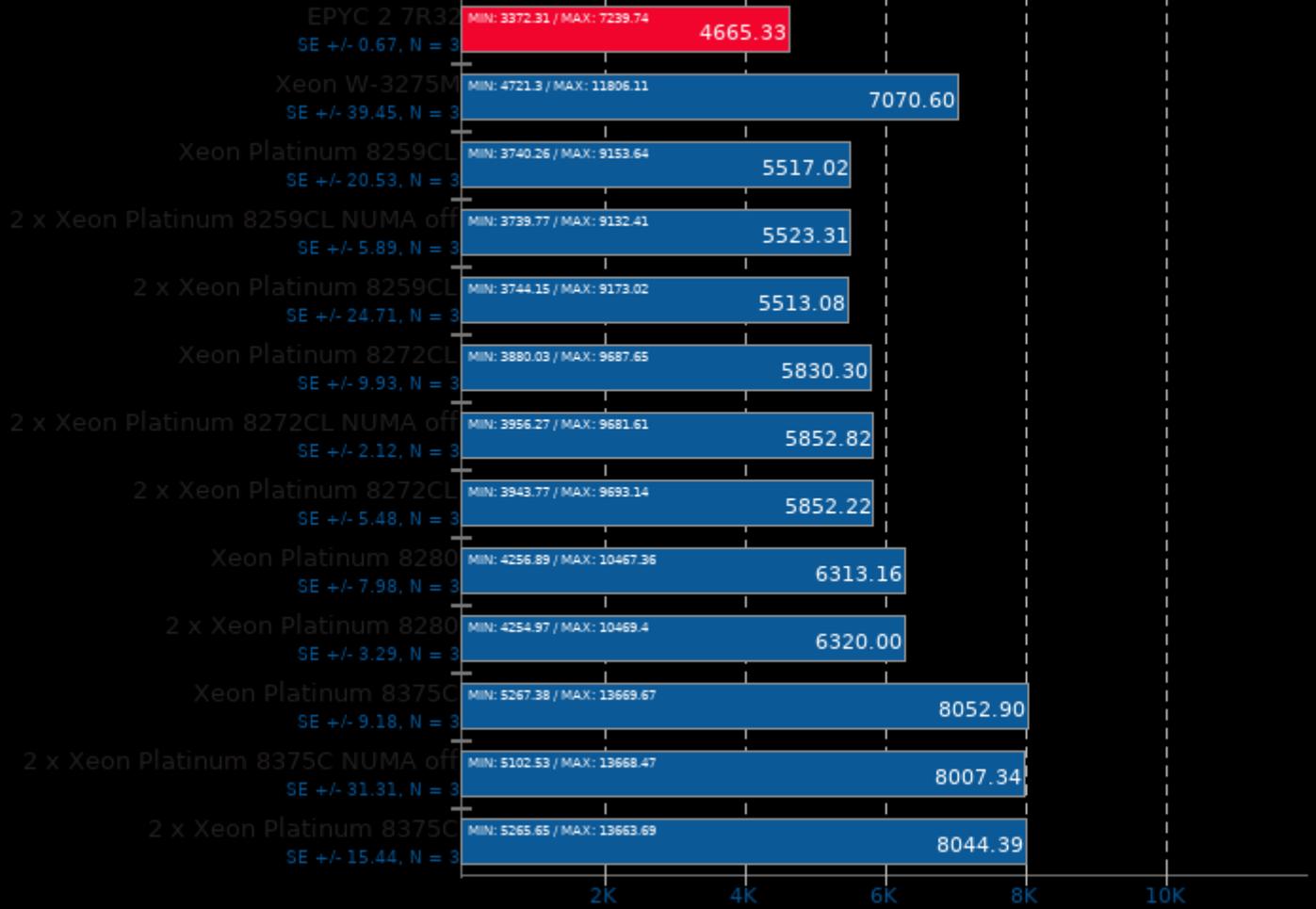




## Nettle 3.5.1

Test: aes256

► Mbyte/s, More Is Better

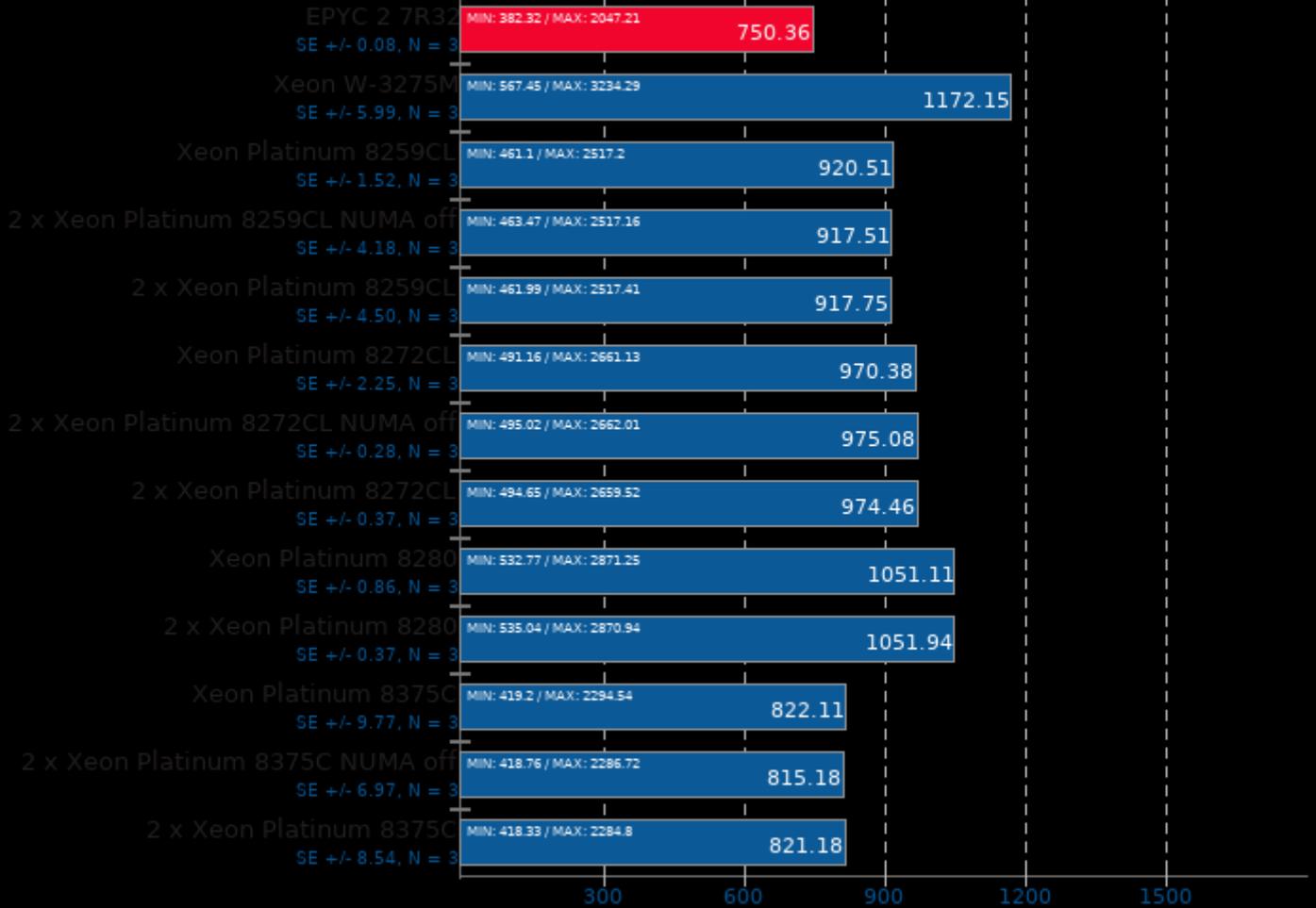


1. (CC) gcc options: -O2 -ggdb3 -lnettle -lgmp -lm -lcrypto

## Nettle 3.5.1

Test: chacha

► Mbyte/s, More Is Better

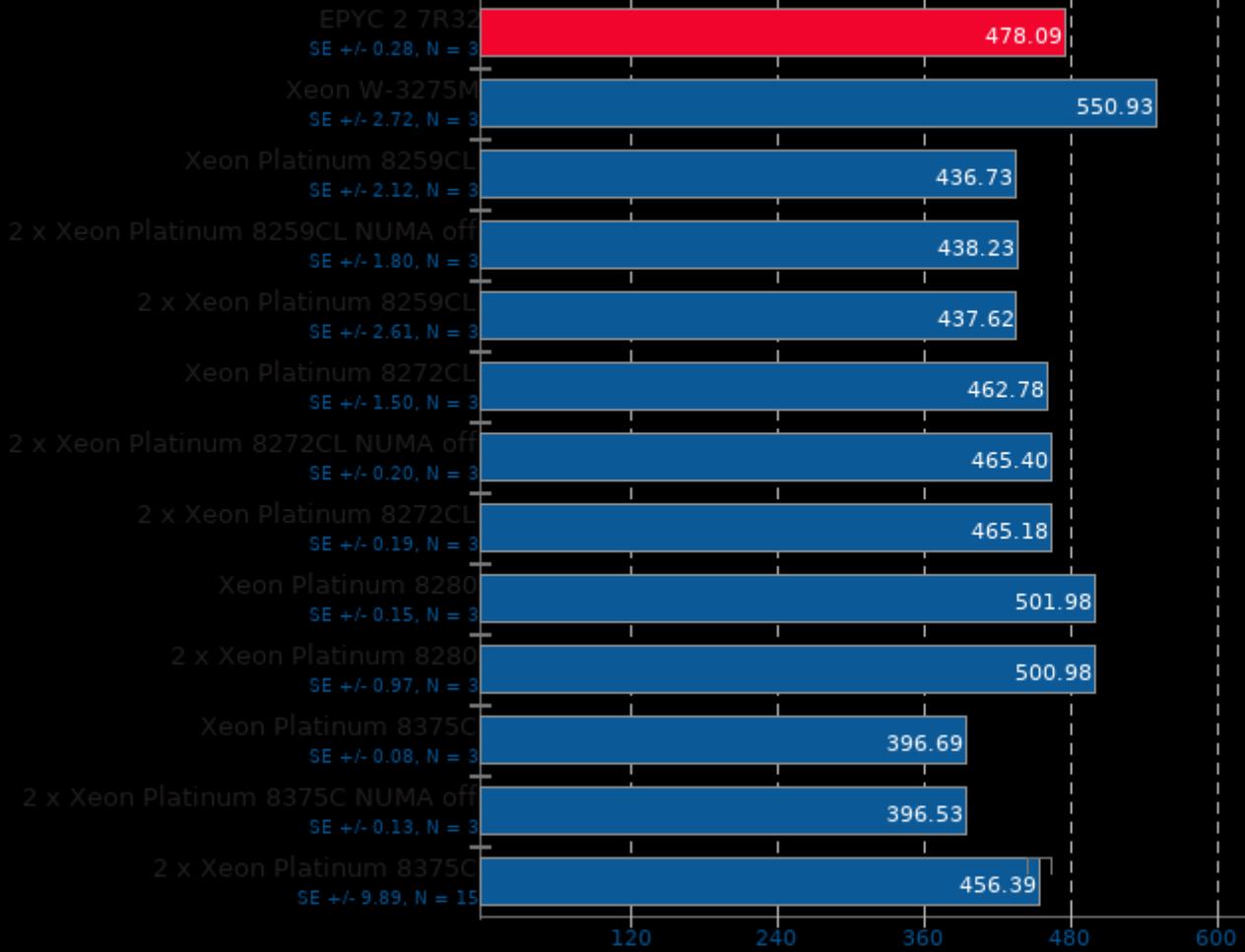


1. (CC) gcc options: -O2 -ggdb3 -lnettle -lgmp -lm -lcrypto

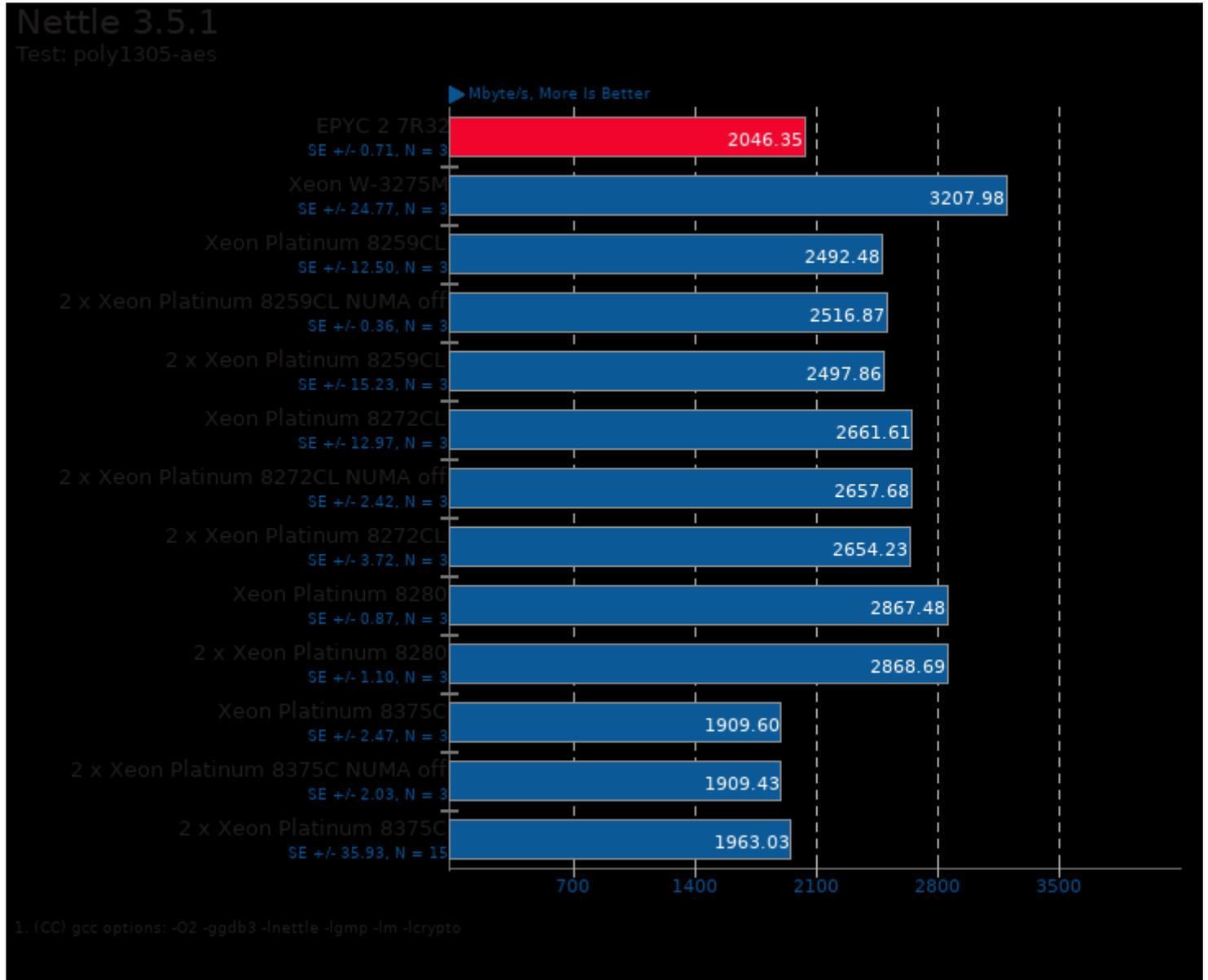
## Nettle 3.5.1

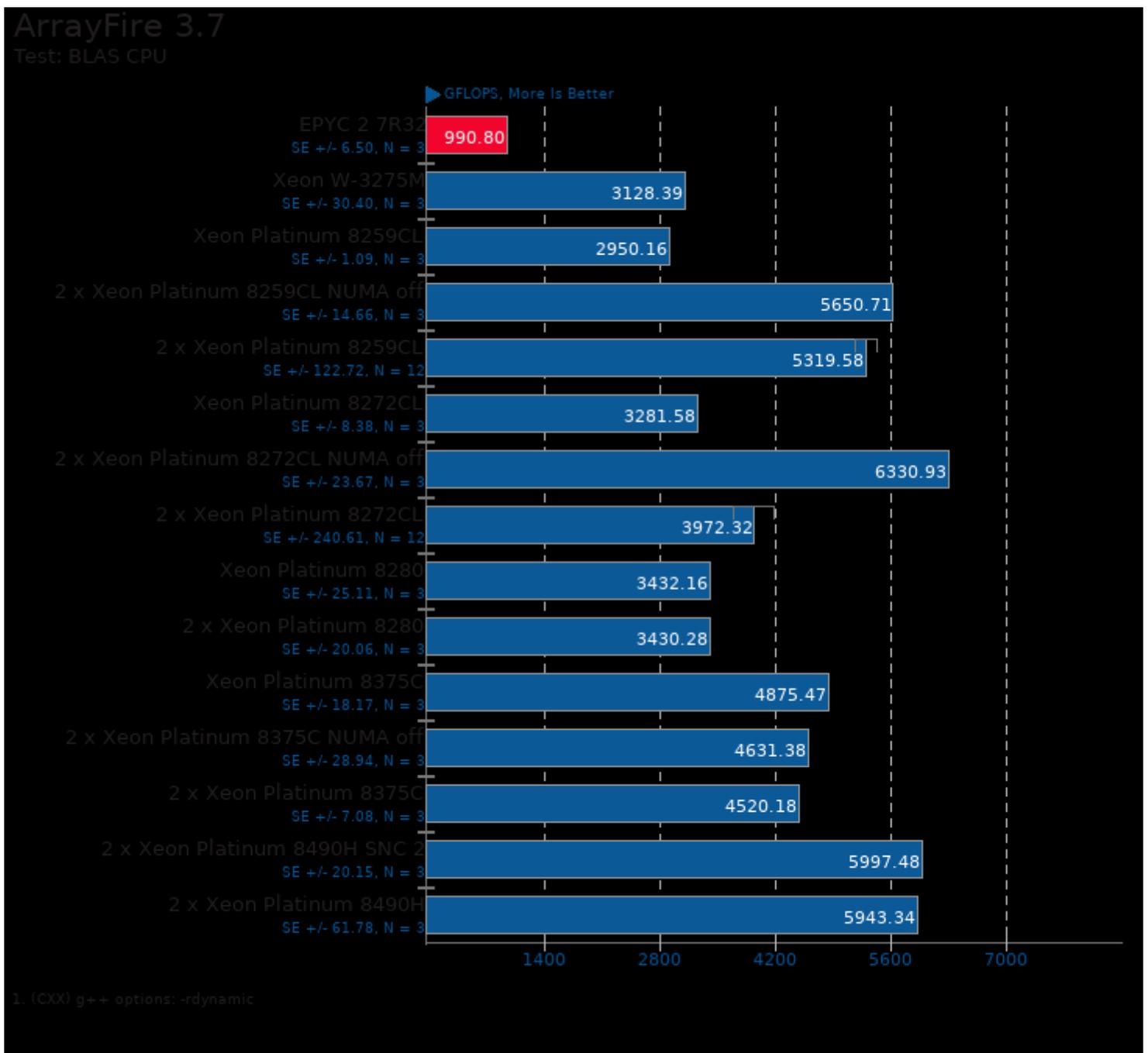
Test: sha512

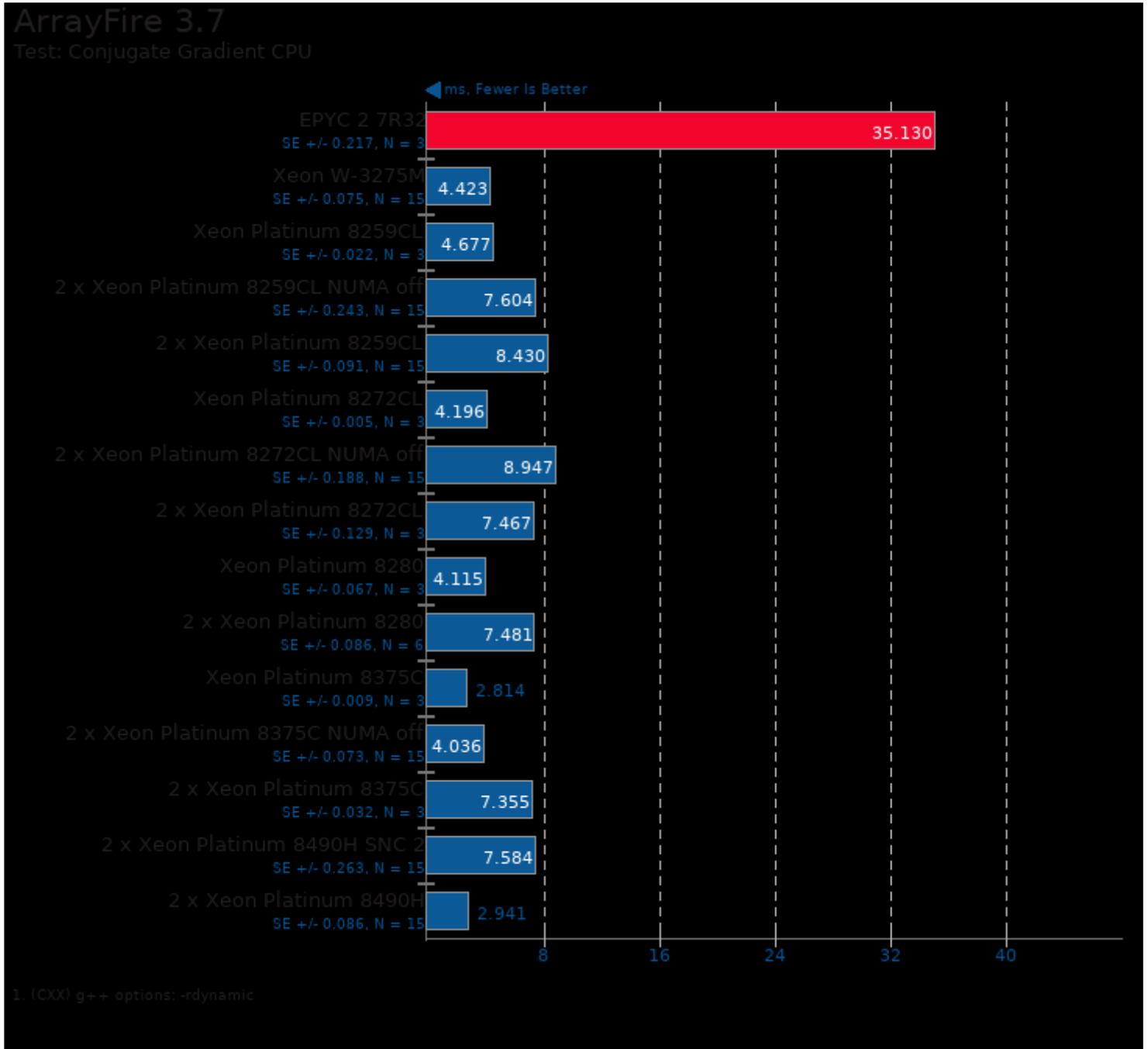
► Mbyte/s, More Is Better



1. (CC) gcc options: -O2 -ggdb3 -lnettle -lgmp -lm -lcrypto



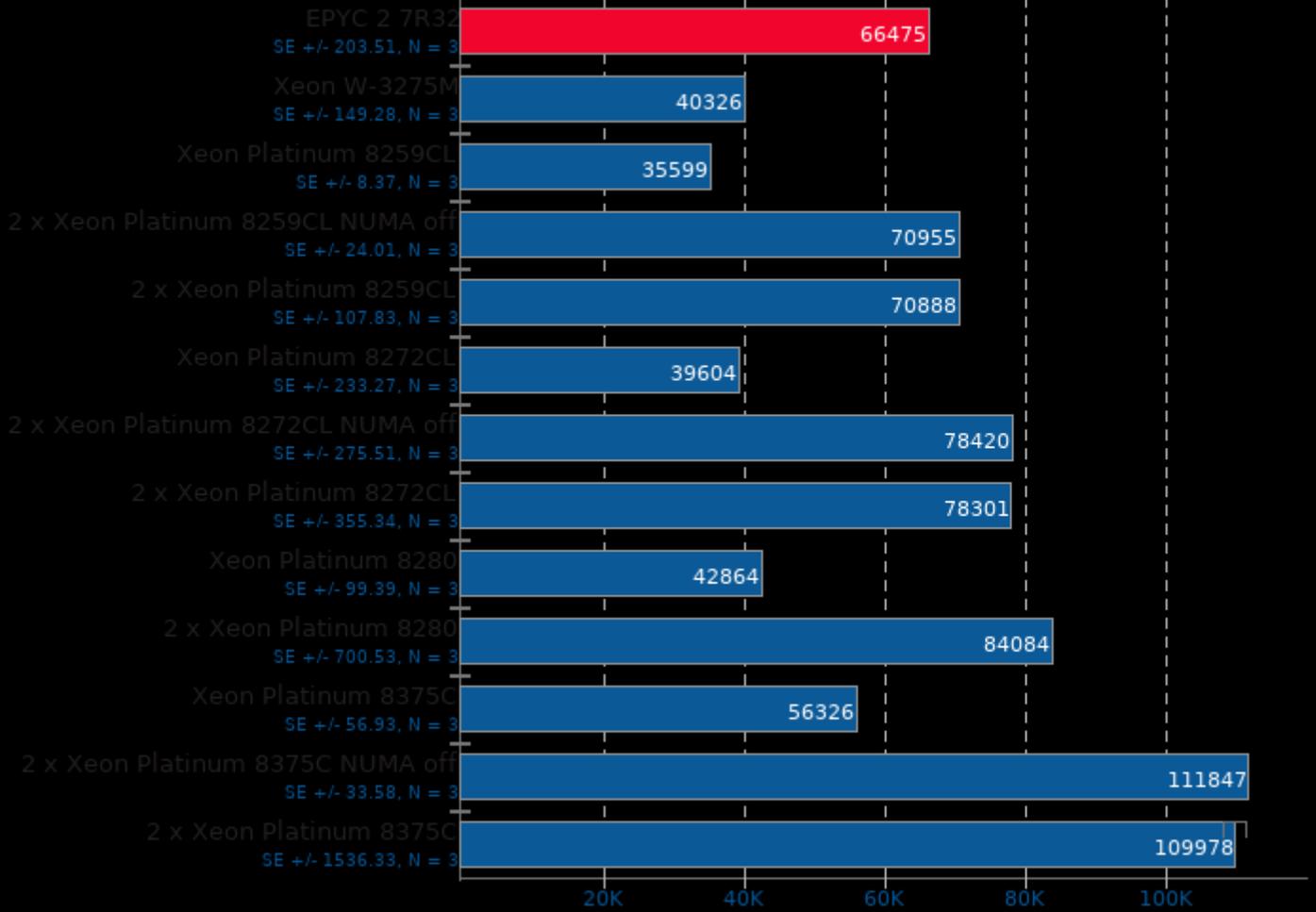




John The Ripper 1.9.0-jumbo-1

Test: Blowfish

▶ Real C/S, More Is Better

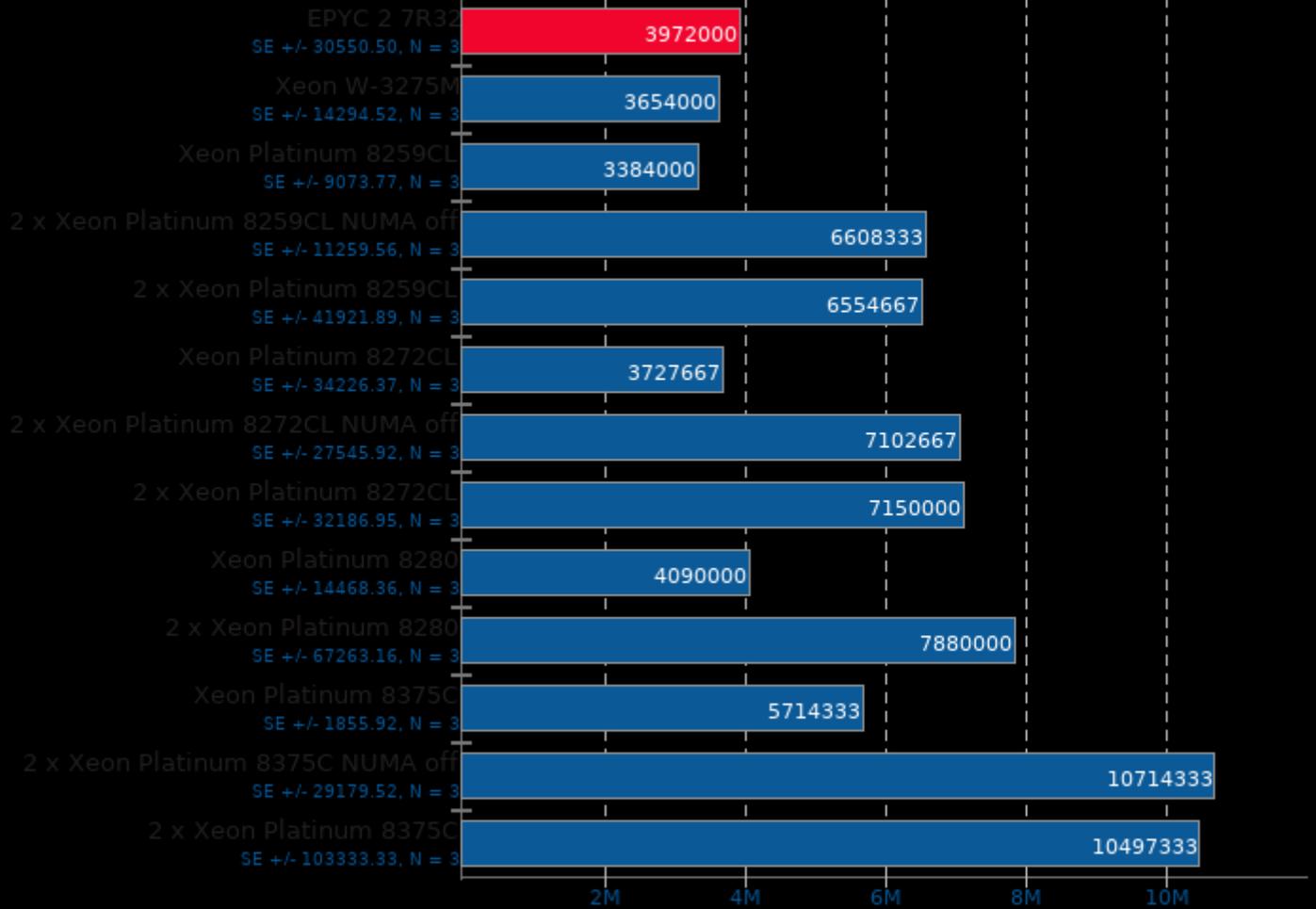


1. (CC) gcc options: -m64 -lssl -lcrypto -fopenmp -lgmp -pthread -lm -lz -ldl -lcrypt -lbz2

John The Ripper 1.9.0-jumbo-1

Test: MD5

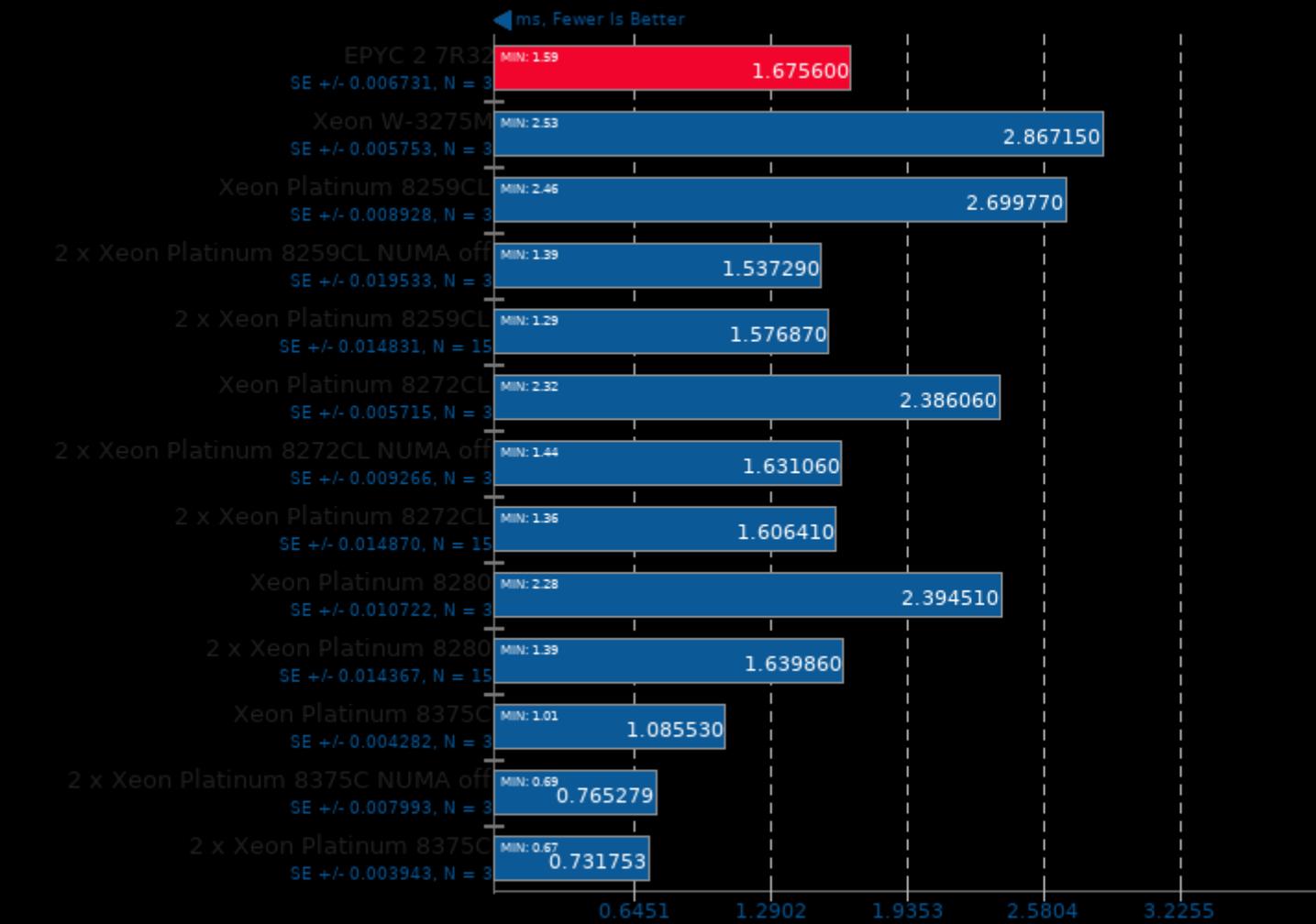
► Real C/S, More Is Better



1. (CC) gcc options: -m64 -lssl -lcrypto -fopenmp -lgmp -pthread -lm -lz -ldl -lcrypt -lbz2

## MKL-DNN DNNL 1.1

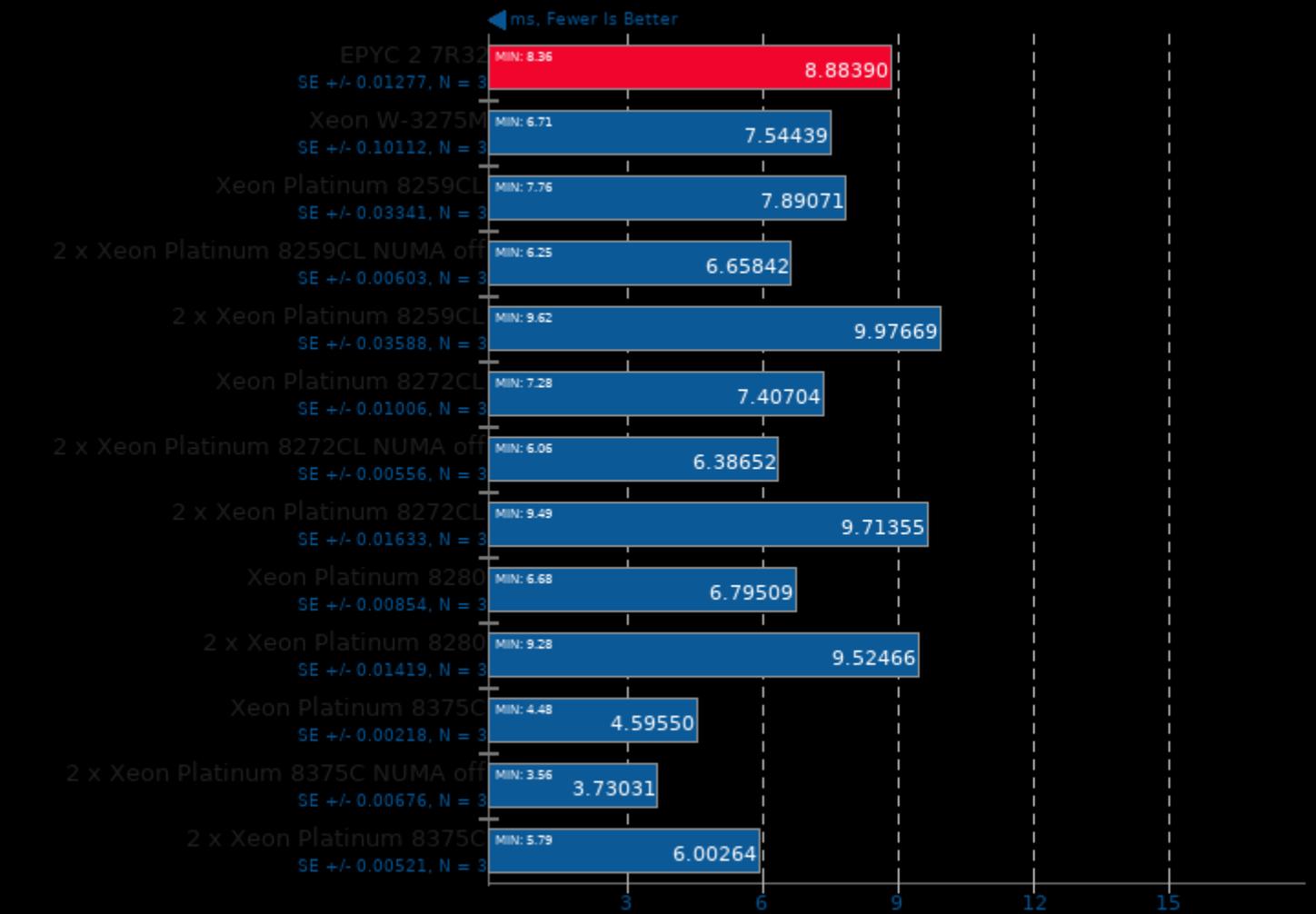
Harness: IP Batch 1D - Data Type: f32



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -pthread -ldl

## MKL-DNN DNNL 1.1

Harness: IP Batch All - Data Type: f32



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -pthread -ld

## MKL-DNN DNNL 1.1

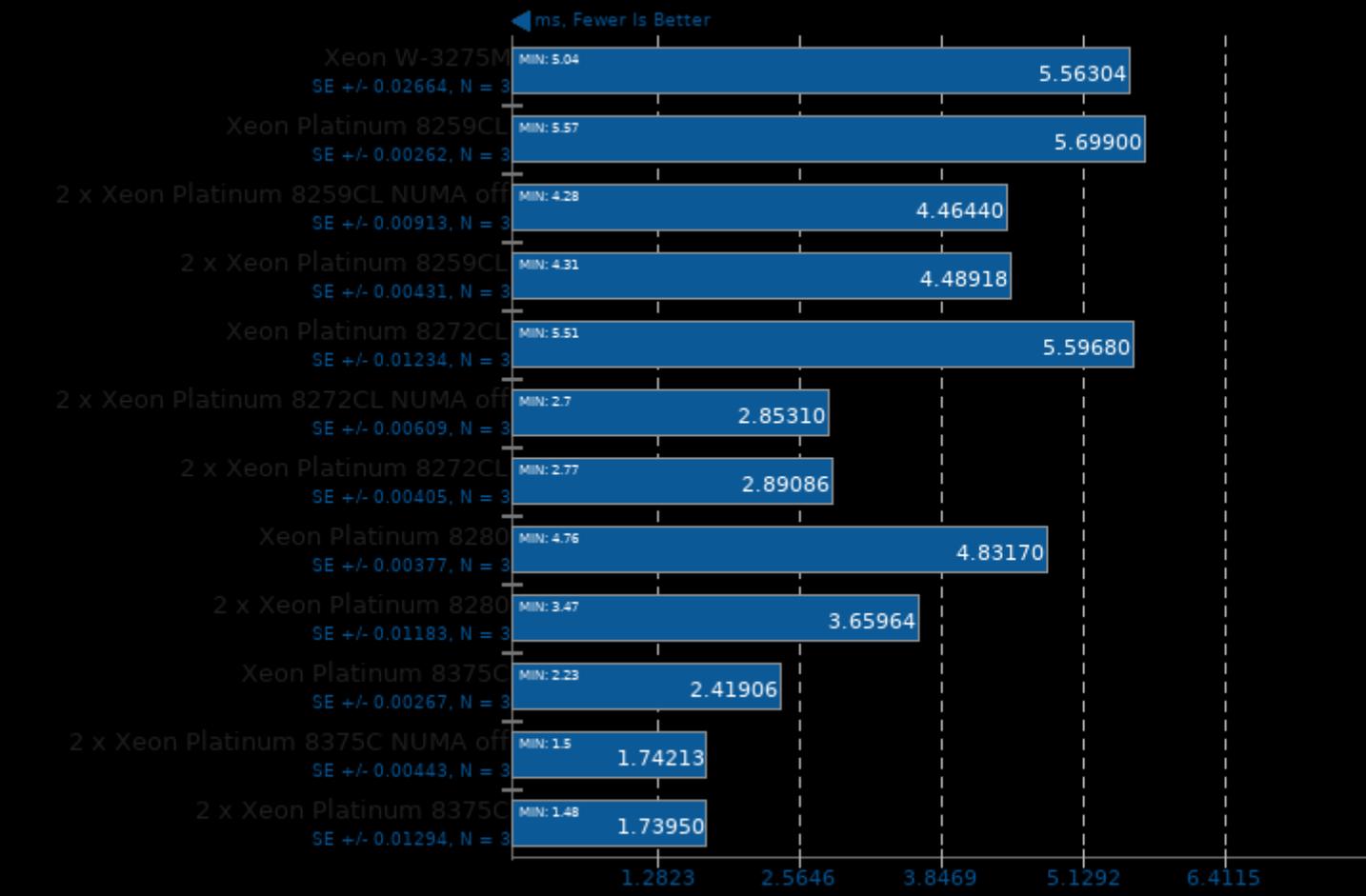
Harness: IP Batch All - Data Type: u8s8f32



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -lthread -ldl

## MKL-DNN DNNL 1.1

Harness: IP Batch 1D - Data Type: bf16bf16bf16



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -pthread -ldl

## MKL-DNN DNNL 1.1

Harness: Convolution Batch conv\_all - Data Type: f32

ms, Fewer Is Better

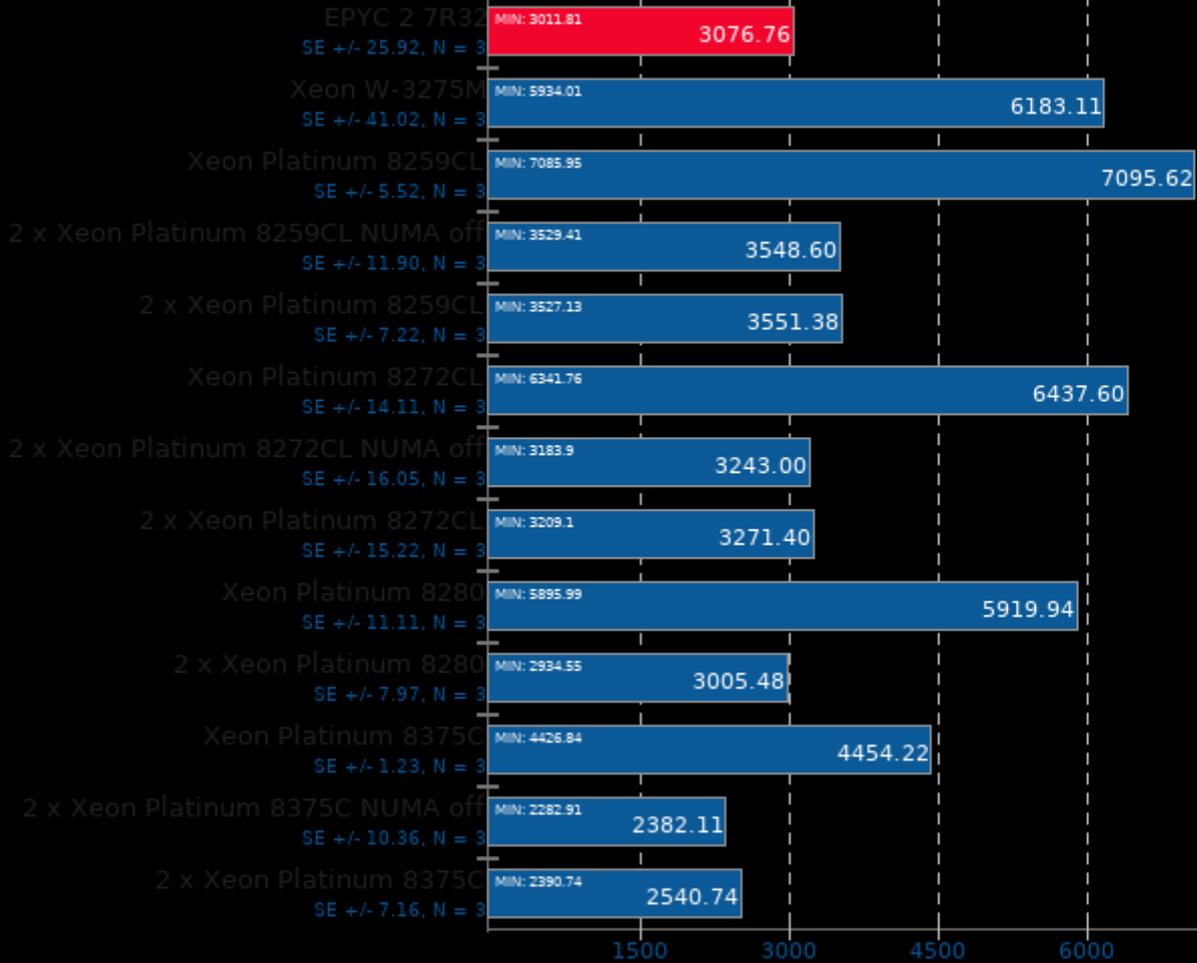


1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -pthread -ldl

## MKL-DNN DNNL 1.1

Harness: Convolution Batch conv\_3d - Data Type: u8s8f32

ms, Fewer Is Better



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -pthread -ldl

## MKL-DNN DNNL 1.1

Harness: Deconvolution Batch deconv\_1d - Data Type: f32

ms, Fewer Is Better

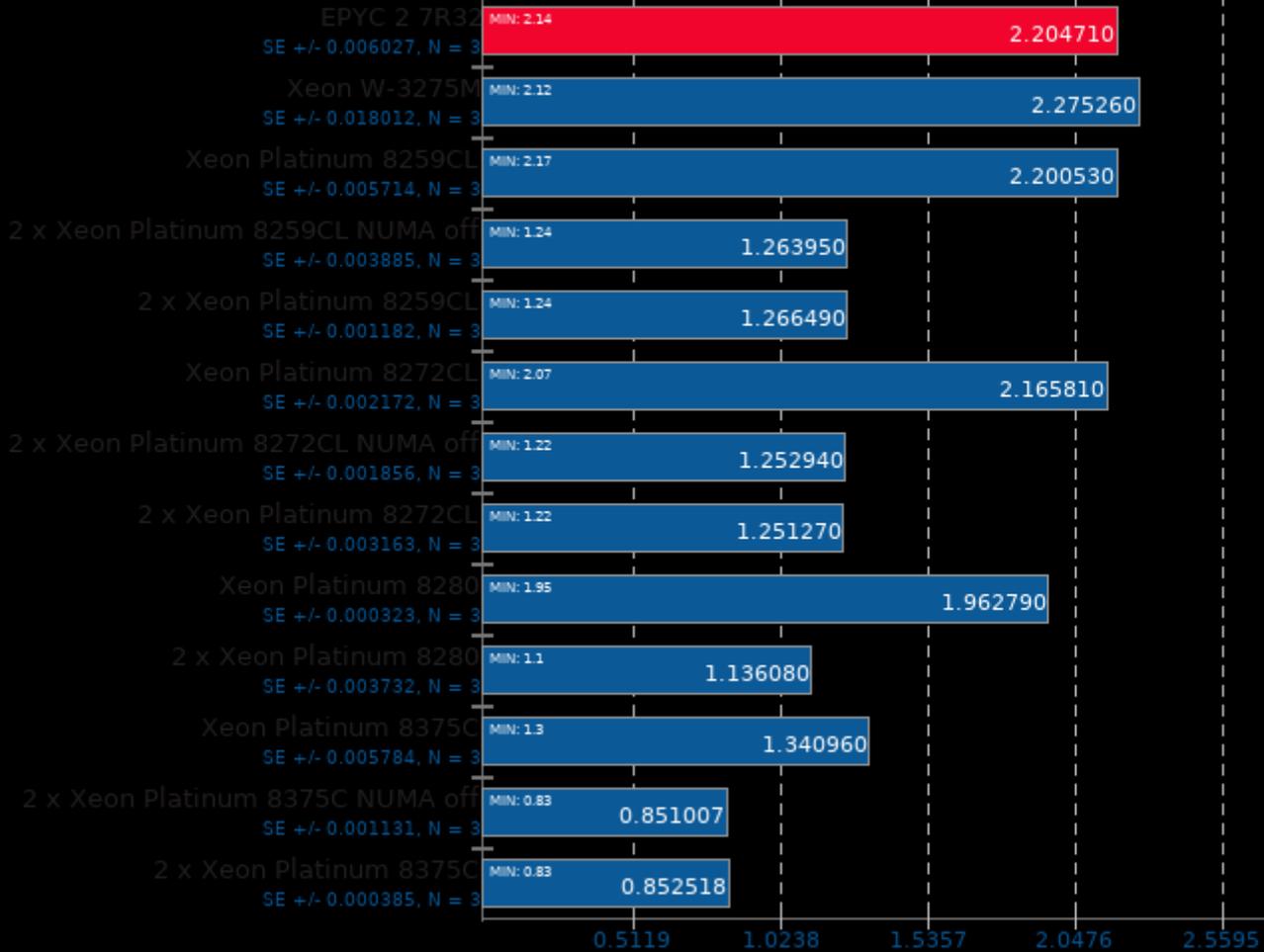


1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -pthread -ldl

## MKL-DNN DNNL 1.1

Harness: Deconvolution Batch deconv\_3d - Data Type: f32

ms, Fewer Is Better

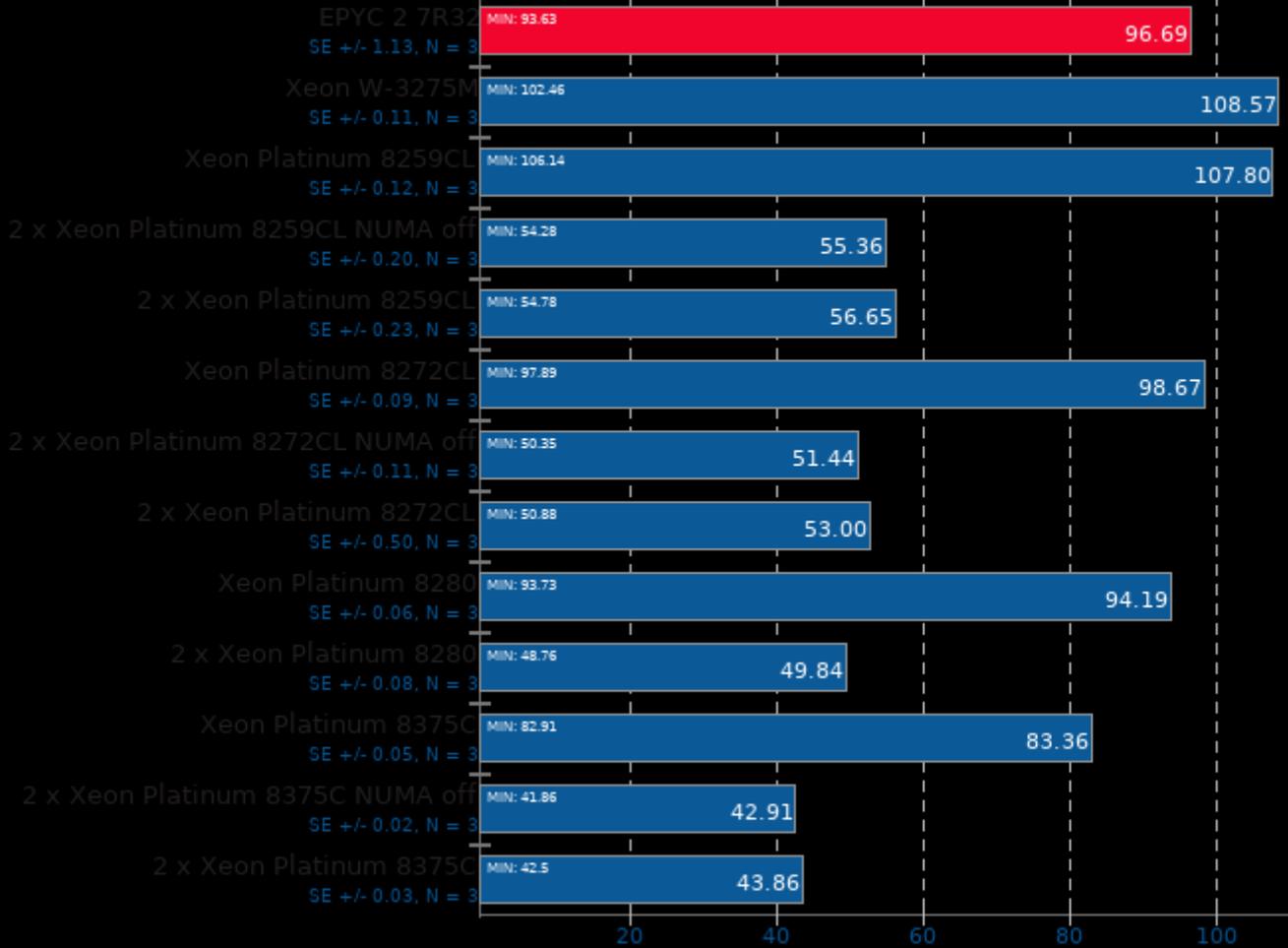


1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -pthread -ldl

## MKL-DNN DNNL 1.1

Harness: Convolution Batch conv\_alexnet - Data Type: f32

ms, Fewer Is Better

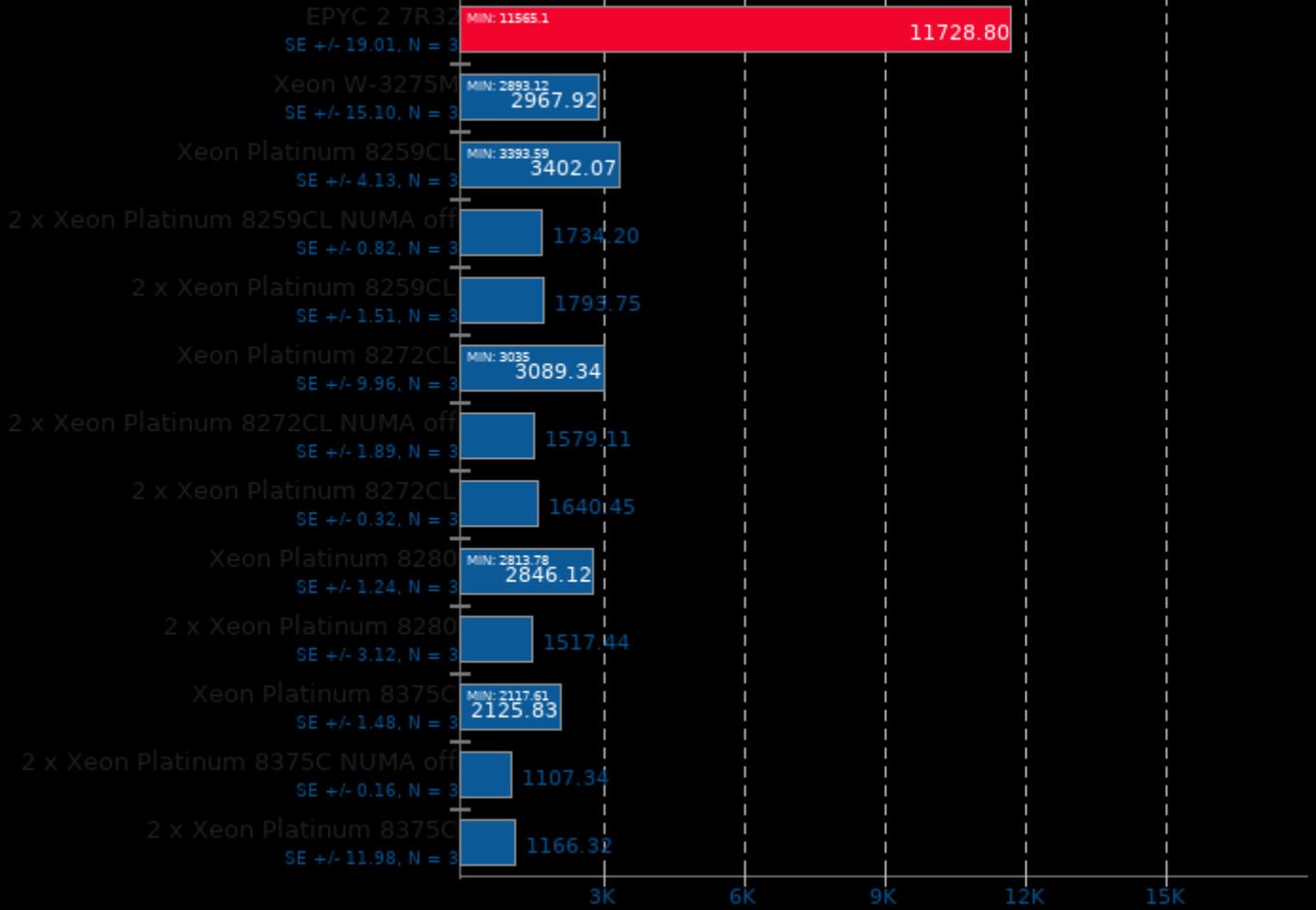


1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -pthread -ldl

## MKL-DNN DNNL 1.1

Harness: Convolution Batch conv\_all - Data Type: u8s8f32

ms, Fewer Is Better

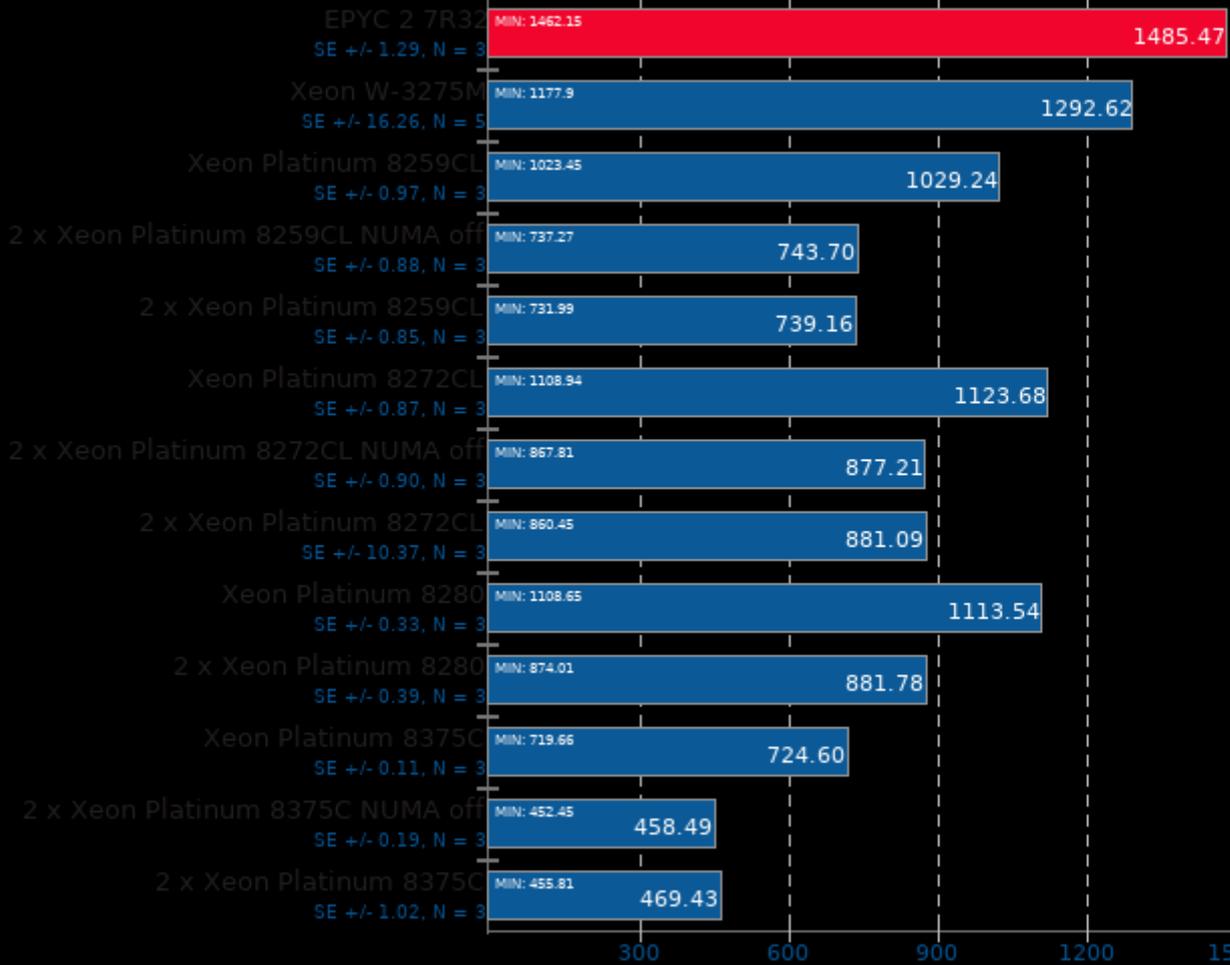


1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -pthread -ldl

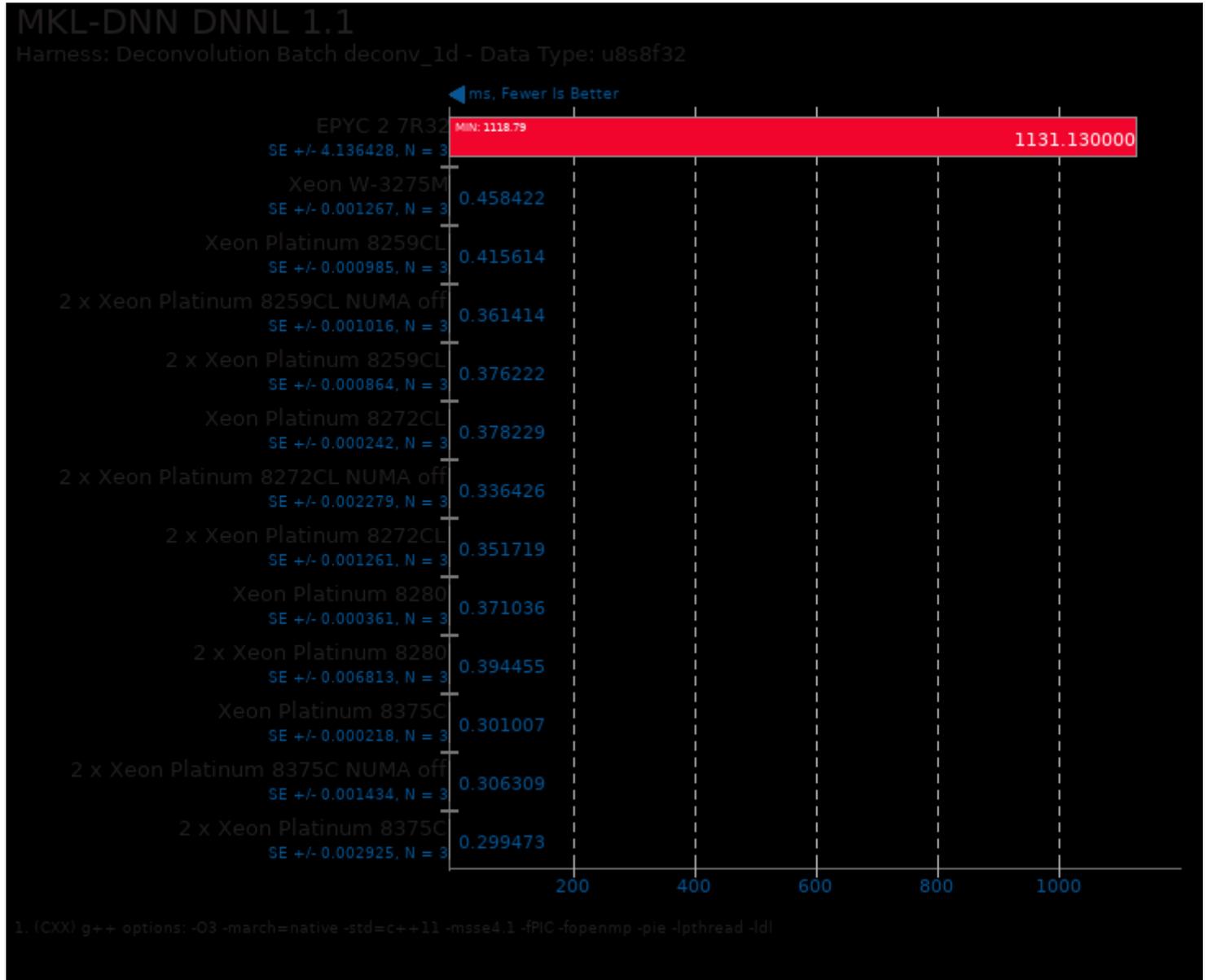
## MKL-DNN DNNL 1.1

Harness: Deconvolution Batch deconv\_all - Data Type: f32

ms, Fewer Is Better



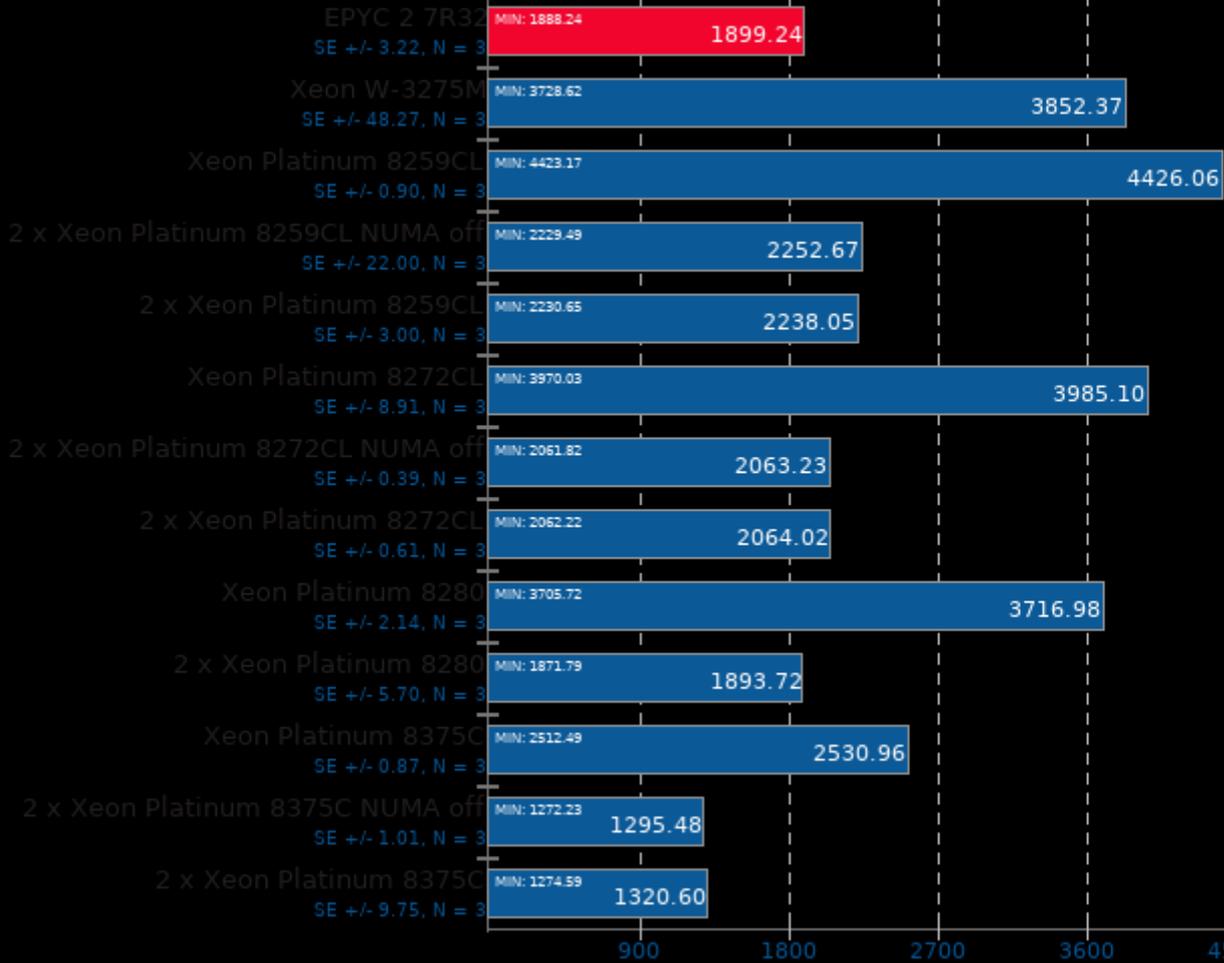
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -pthread -ldl



## MKL-DNN DNLL 1.1

Harness: Deconvolution Batch deconv\_3d - Data Type: u8s8f32

ms, Fewer Is Better

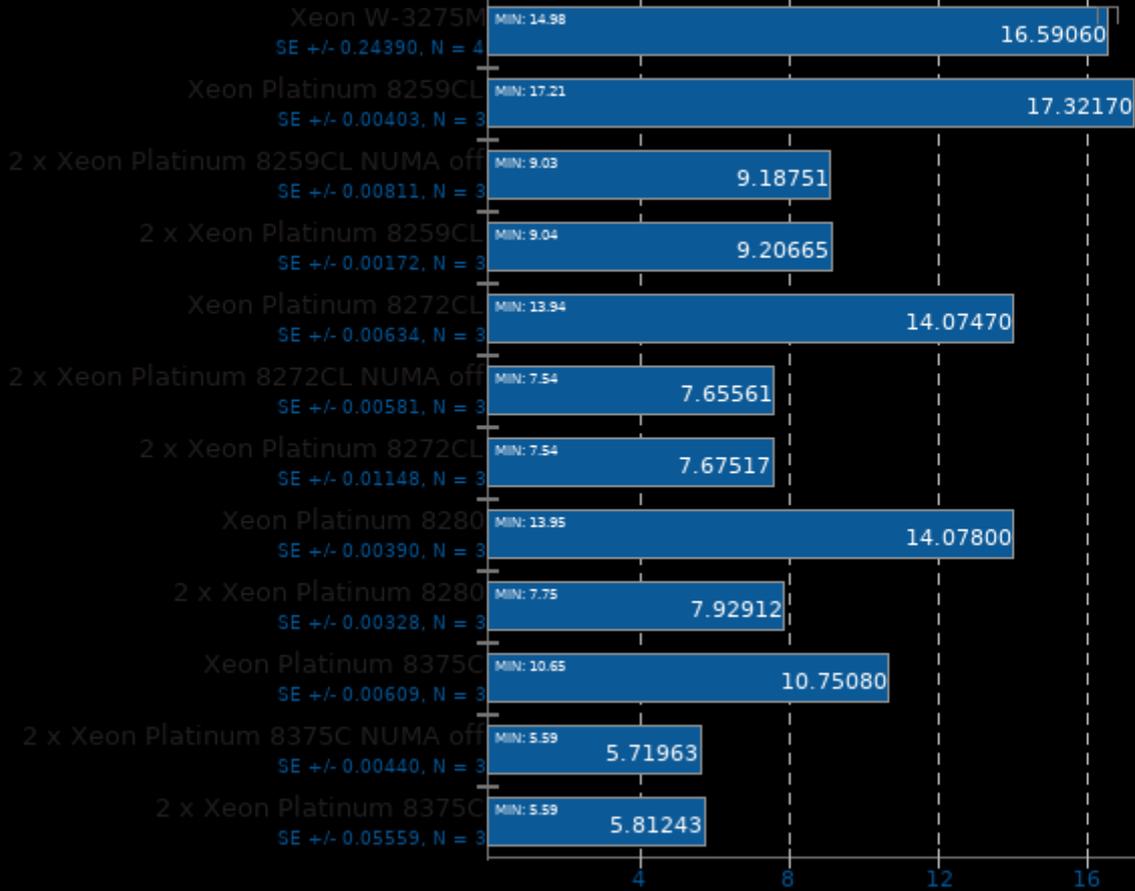


1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -pthread -ldl

## MKL-DNN DNNL 1.1

Harness: Convolution Batch conv\_3d - Data Type: bf16bf16bf16

ms, Fewer Is Better



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

## MKL-DNN DNNL 1.1

Harness: Convolution Batch conv\_alexnet - Data Type: u8s8f32



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -pthread -ldl

## MKL-DNN DNNL 1.1

Harness: Convolution Batch conv\_all - Data Type: bf16bf16bf16

ms, Fewer Is Better



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -pthread -ldl

## MKL-DNN DNNL 1.1

Harness: Convolution Batch conv\_googlenet\_v3 - Data Type: f32

ms, Fewer Is Better

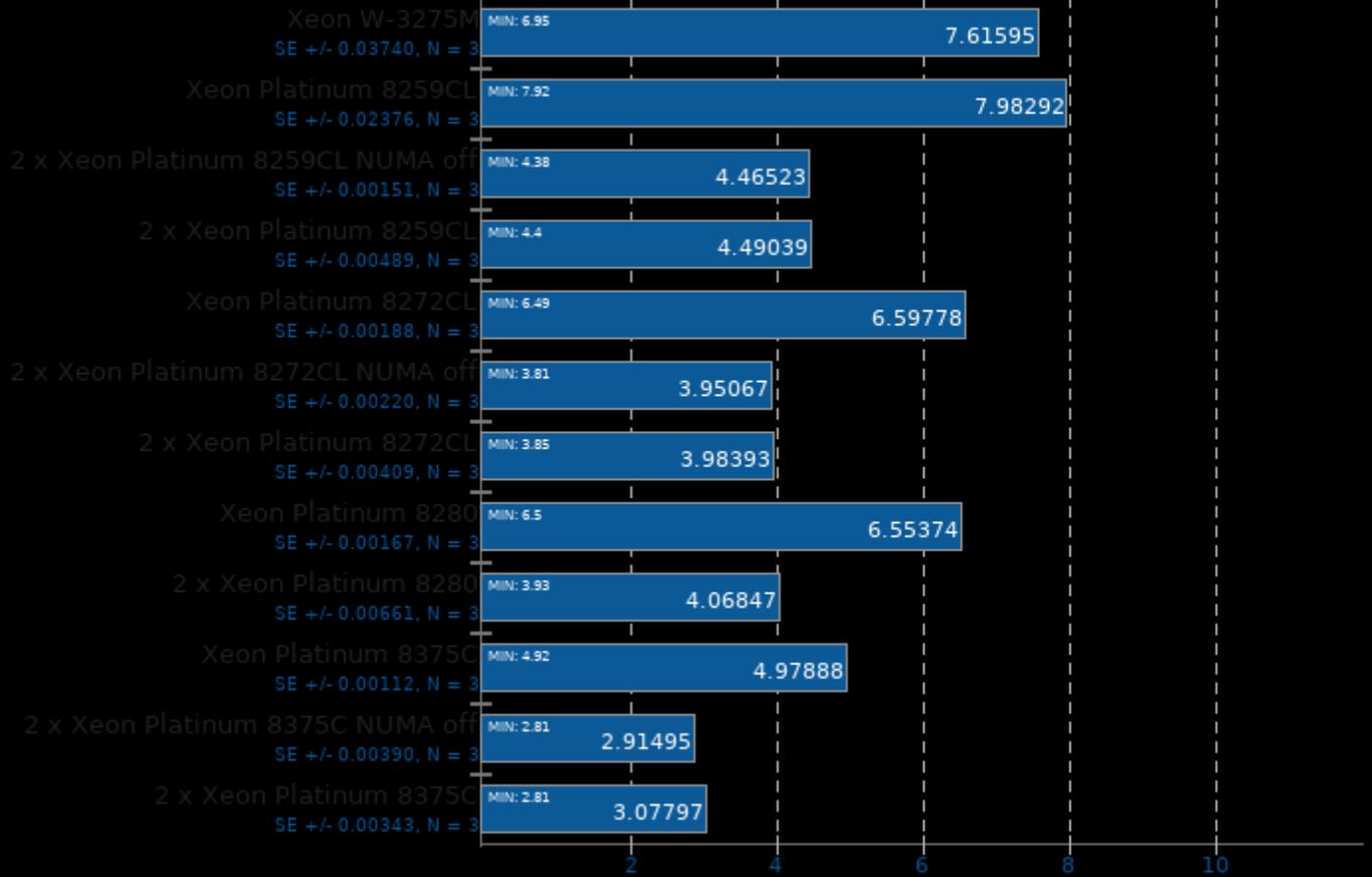


1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -pthread -ldl

## MKL-DNN DNLL 1.1

Harness: Deconvolution Batch deconv\_1d - Data Type: bf16bf16bf16

ms, Fewer Is Better



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -pthread -ldl

## MKL-DNN DNLL 1.1

Harness: Deconvolution Batch deconv\_3d - Data Type: bf16bf16bf16

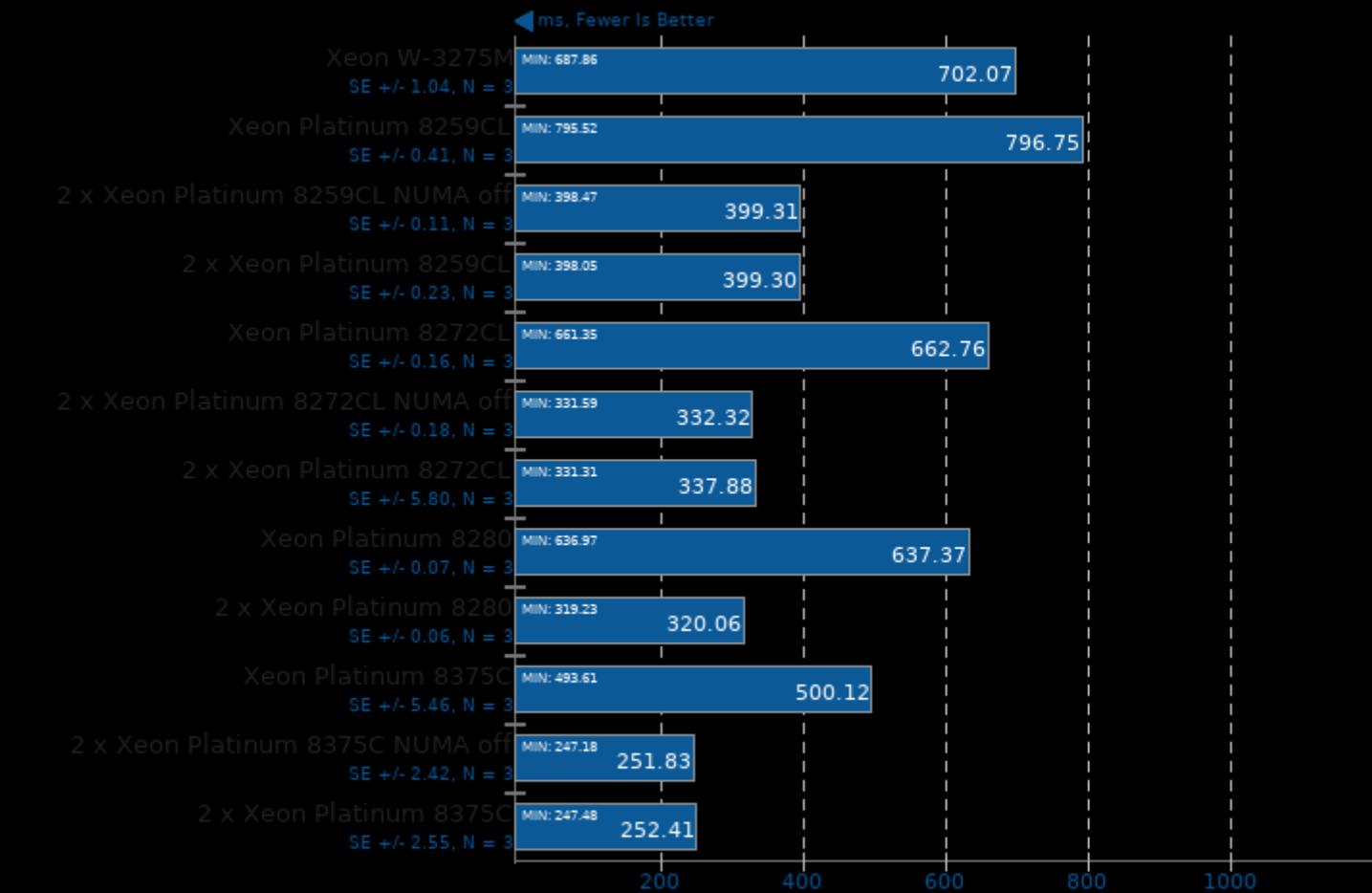
ms, Fewer Is Better



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

## MKL-DNN DNNL 1.1

Harness: Convolution Batch conv\_alexnet - Data Type: bf16bf16bf16



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -pthread -ldl

## MKL-DNN DNNL 1.1

Harness: Convolution Batch conv\_googlenet\_v3 - Data Type: u8s8f32

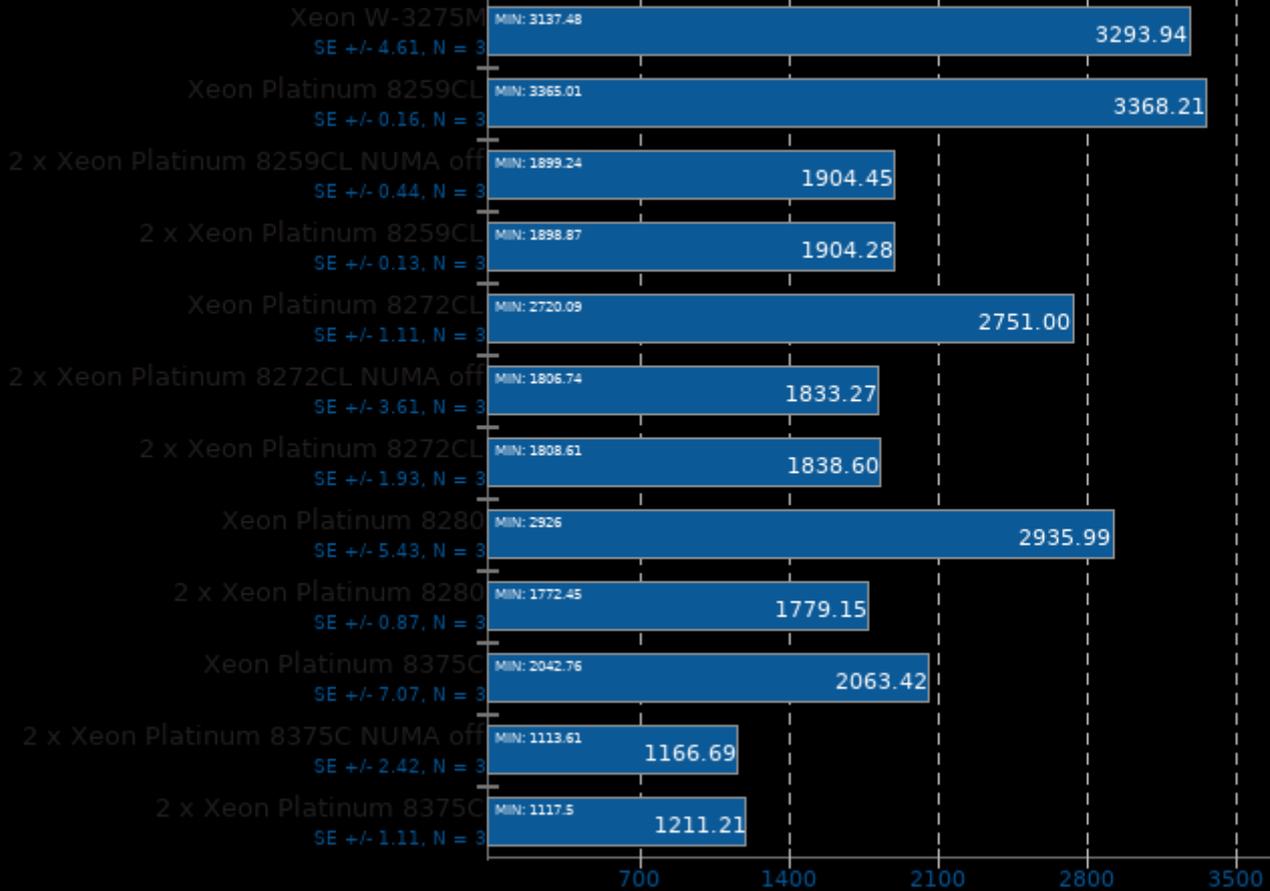


1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fpic -fopenmp -pie -pthread -ldl

## MKL-DNN DNNL 1.1

Harness: Deconvolution Batch deconv\_all - Data Type: bf16bf16bf16

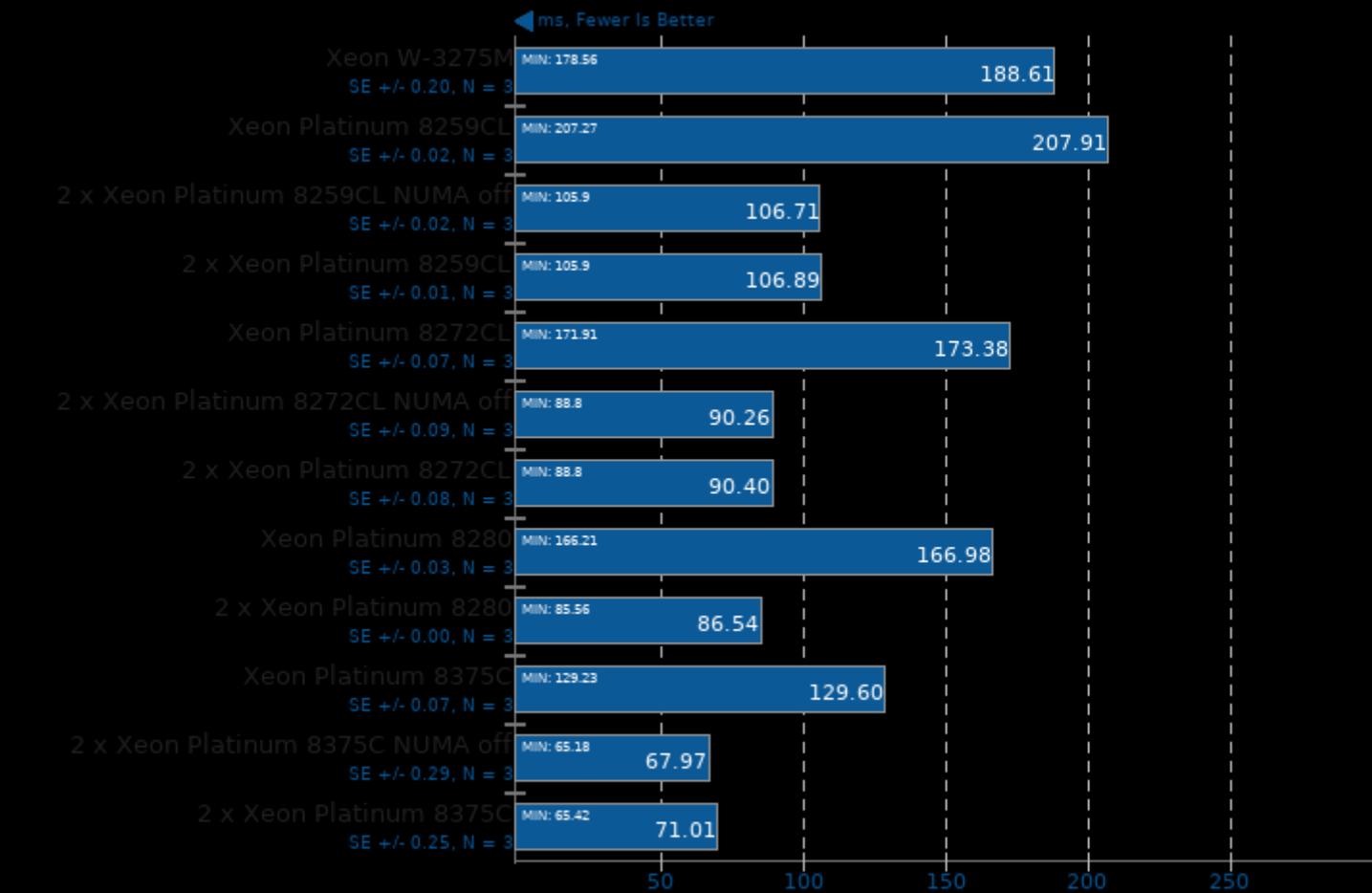
ms, Fewer Is Better



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

## MKL-DNN DNNL 1.1

Harness: Convolution Batch conv\_googlenet\_v3 - Data Type: bf16bf16bf16



1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

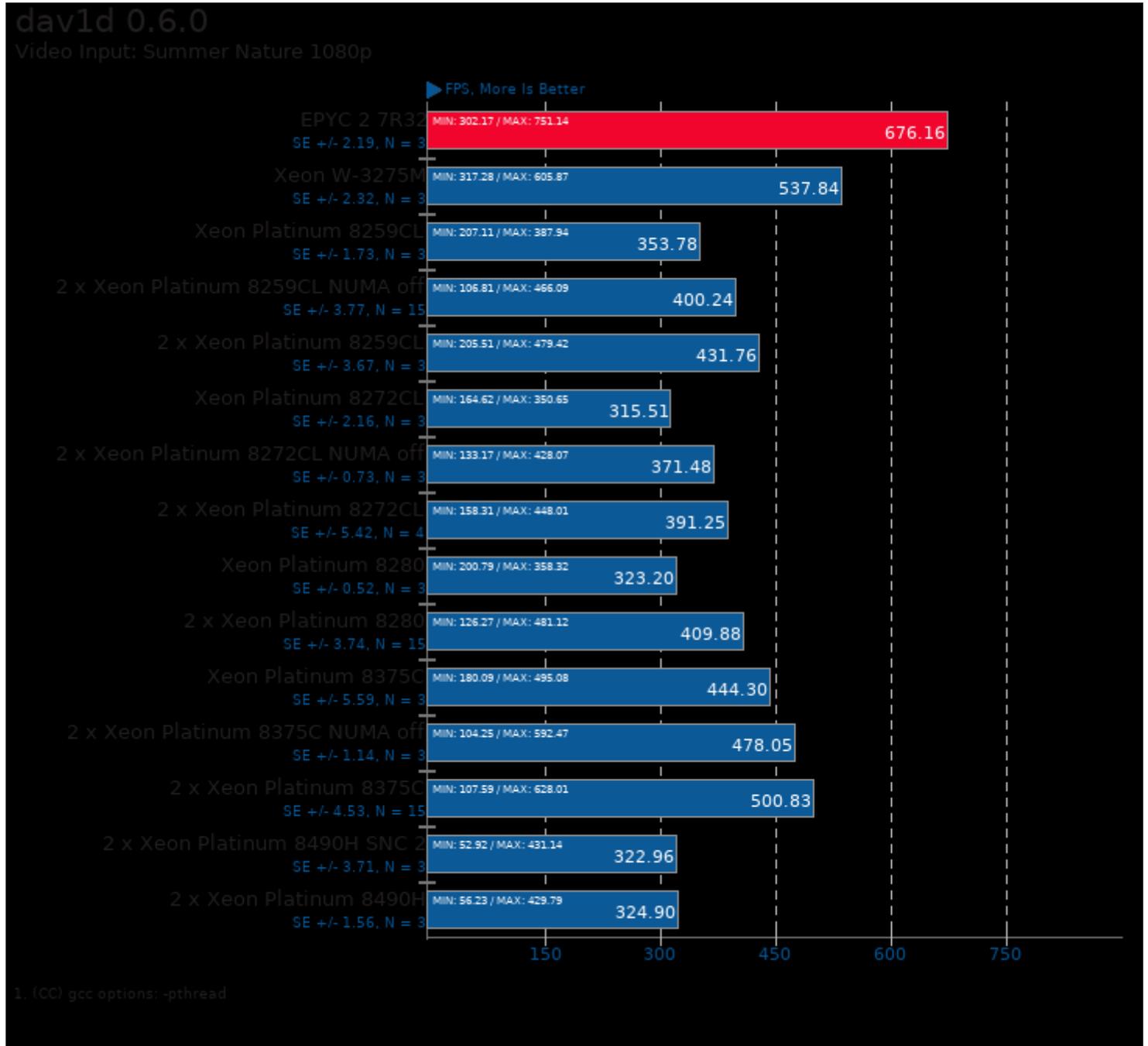
dav1d 0.6.0

Video Input: Summer Nature 4K

FPS, More Is Better



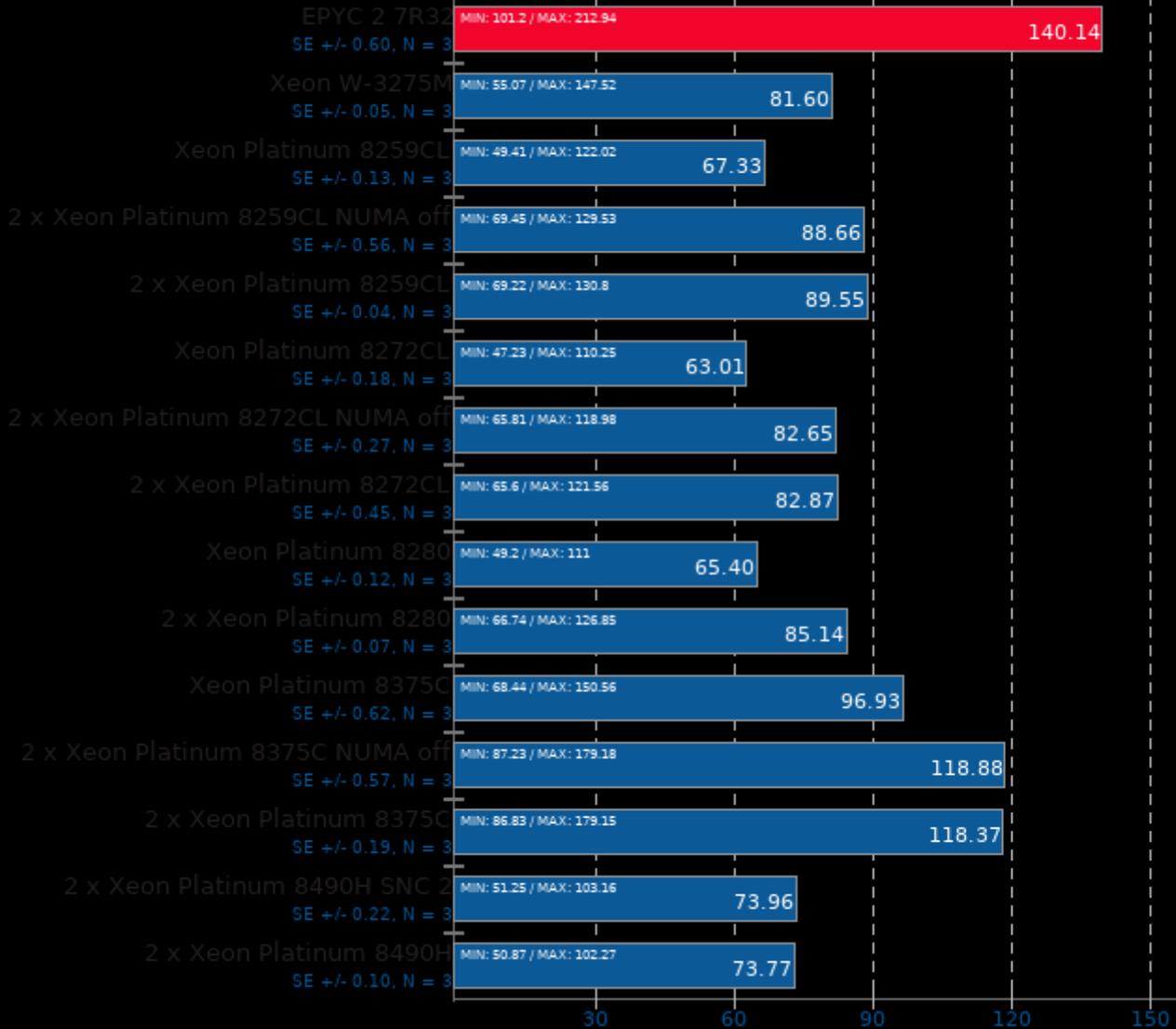
1. (CC) gcc options: -pthread



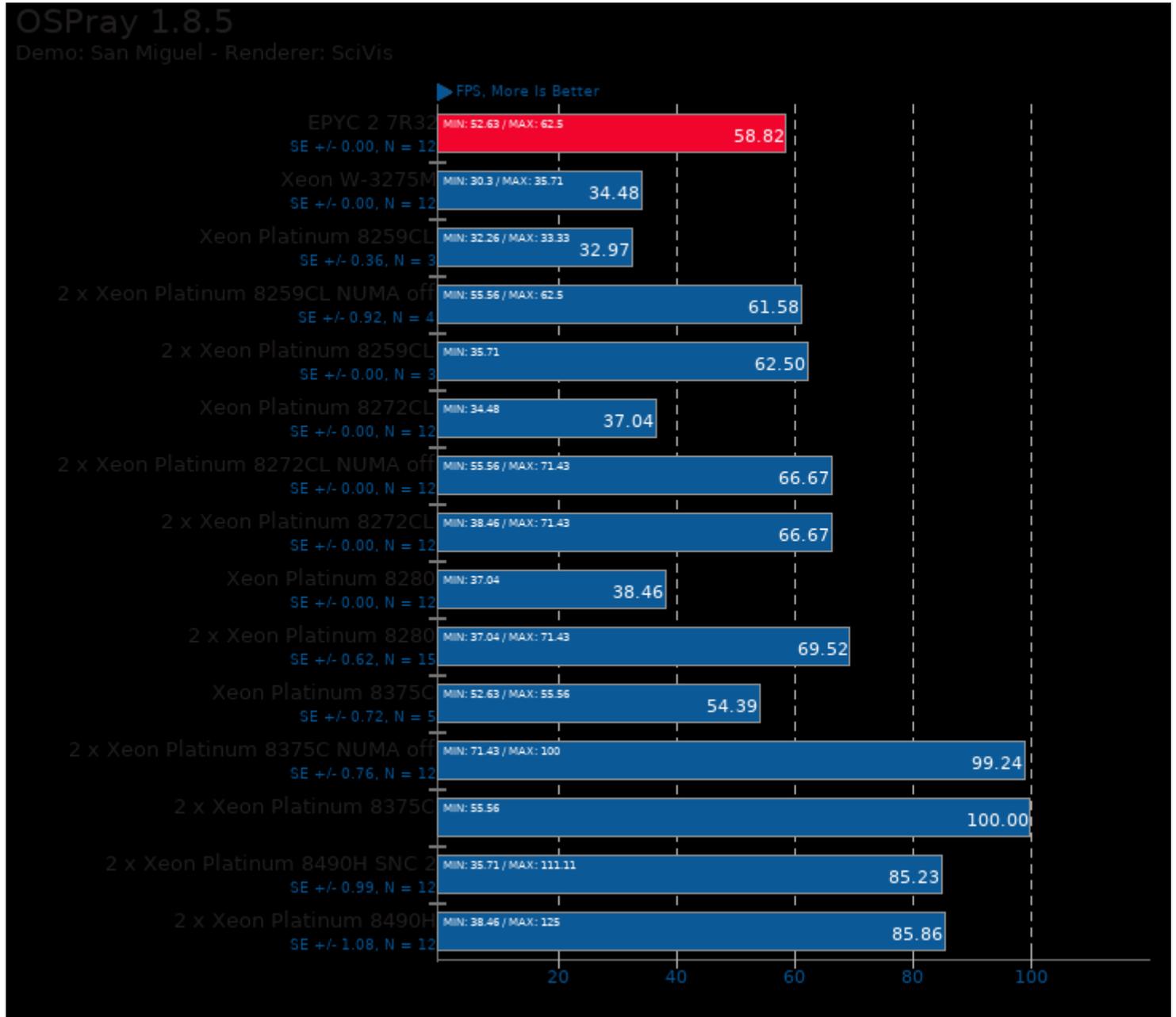
dav1d 0.6.0

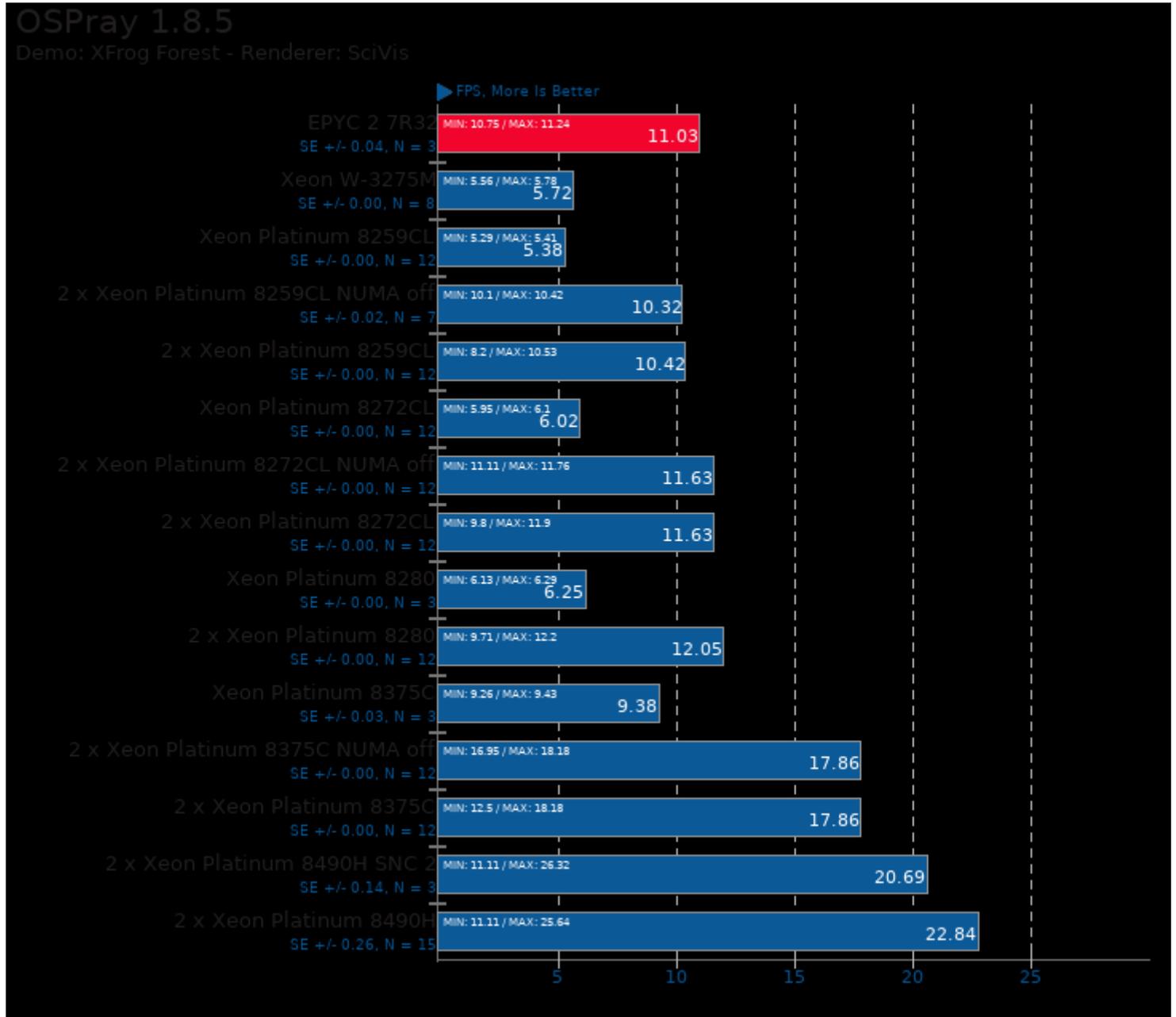
Video Input: Chimera 1080p 10-bit

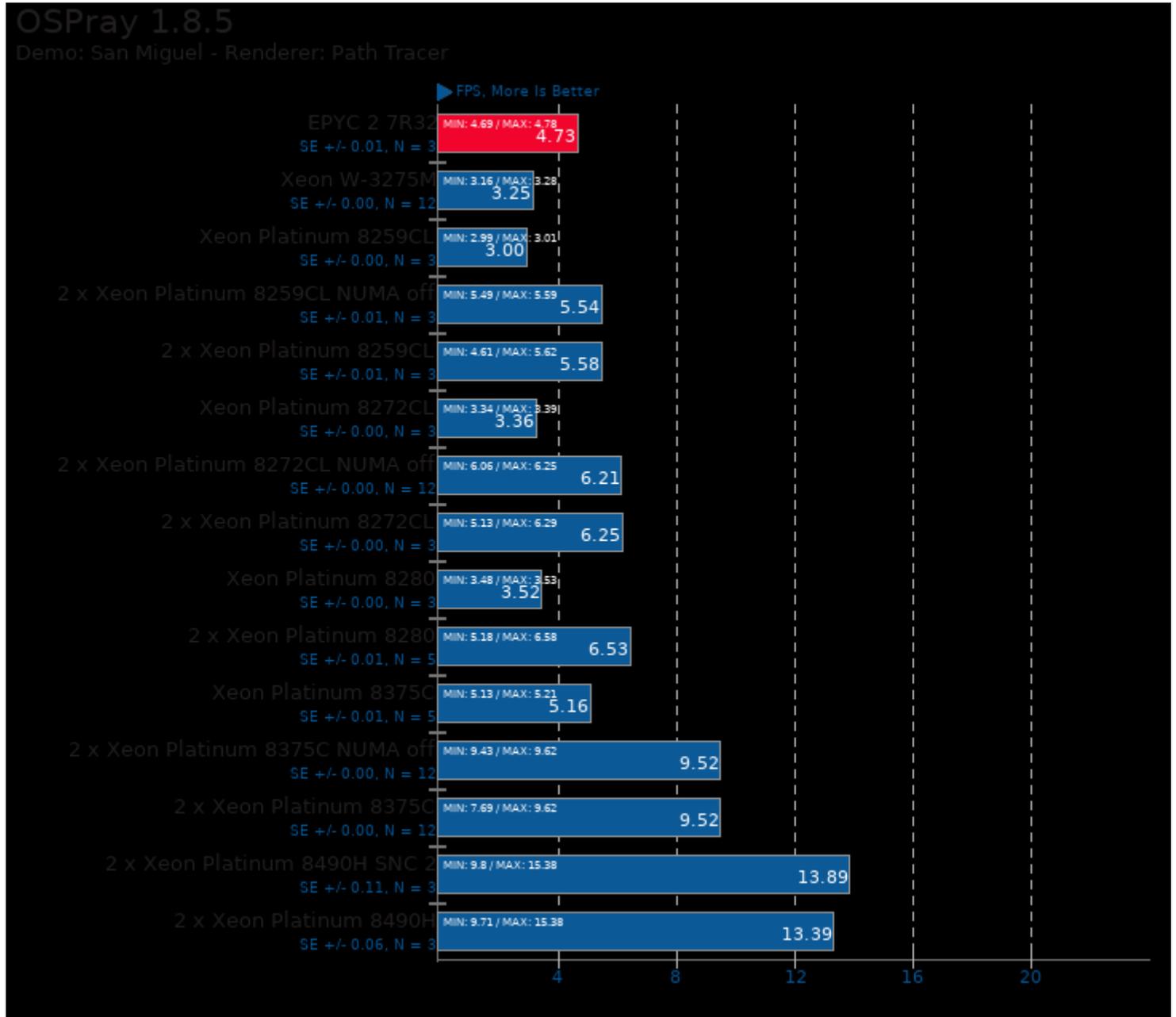
▶ FPS, More Is Better

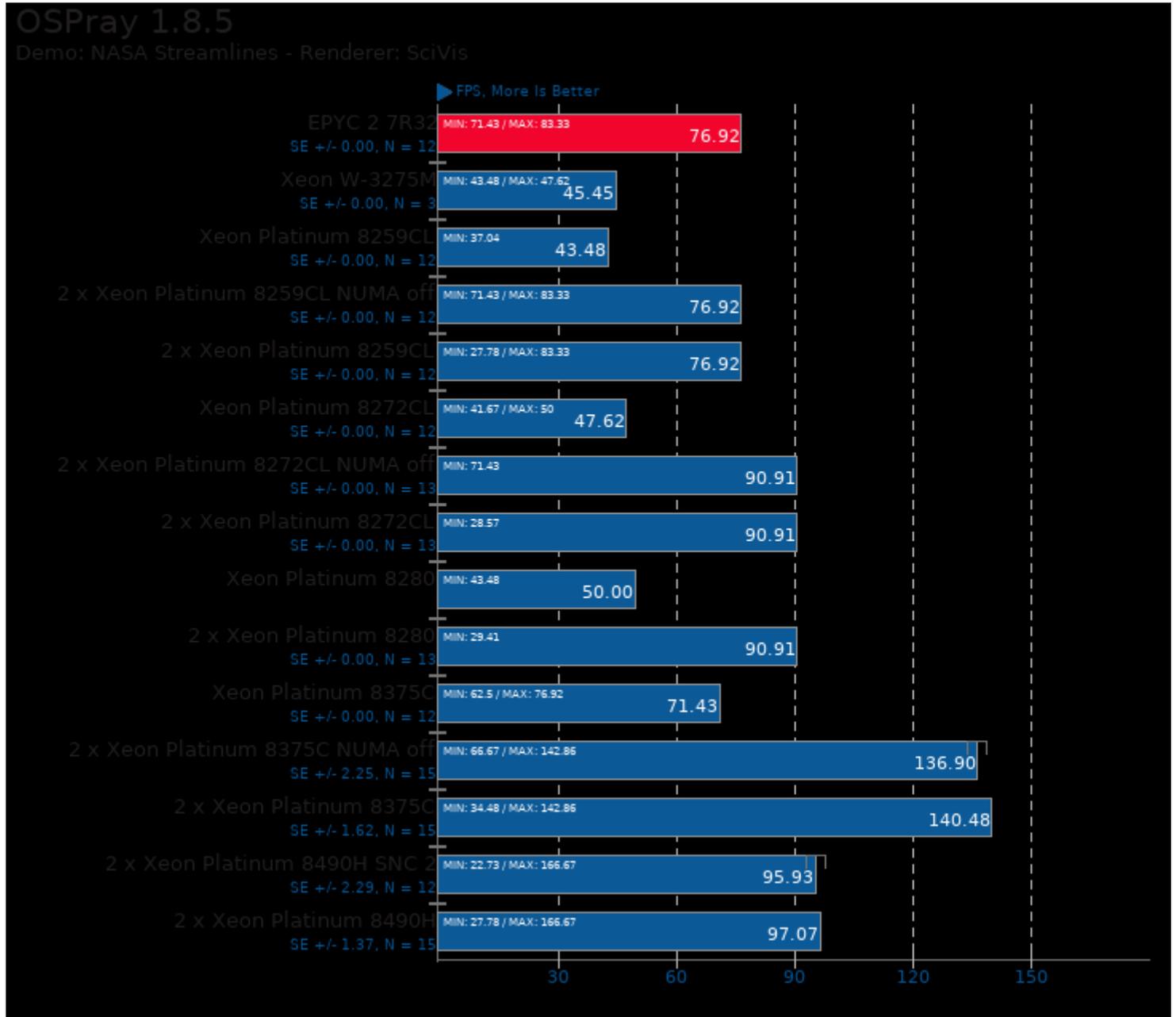


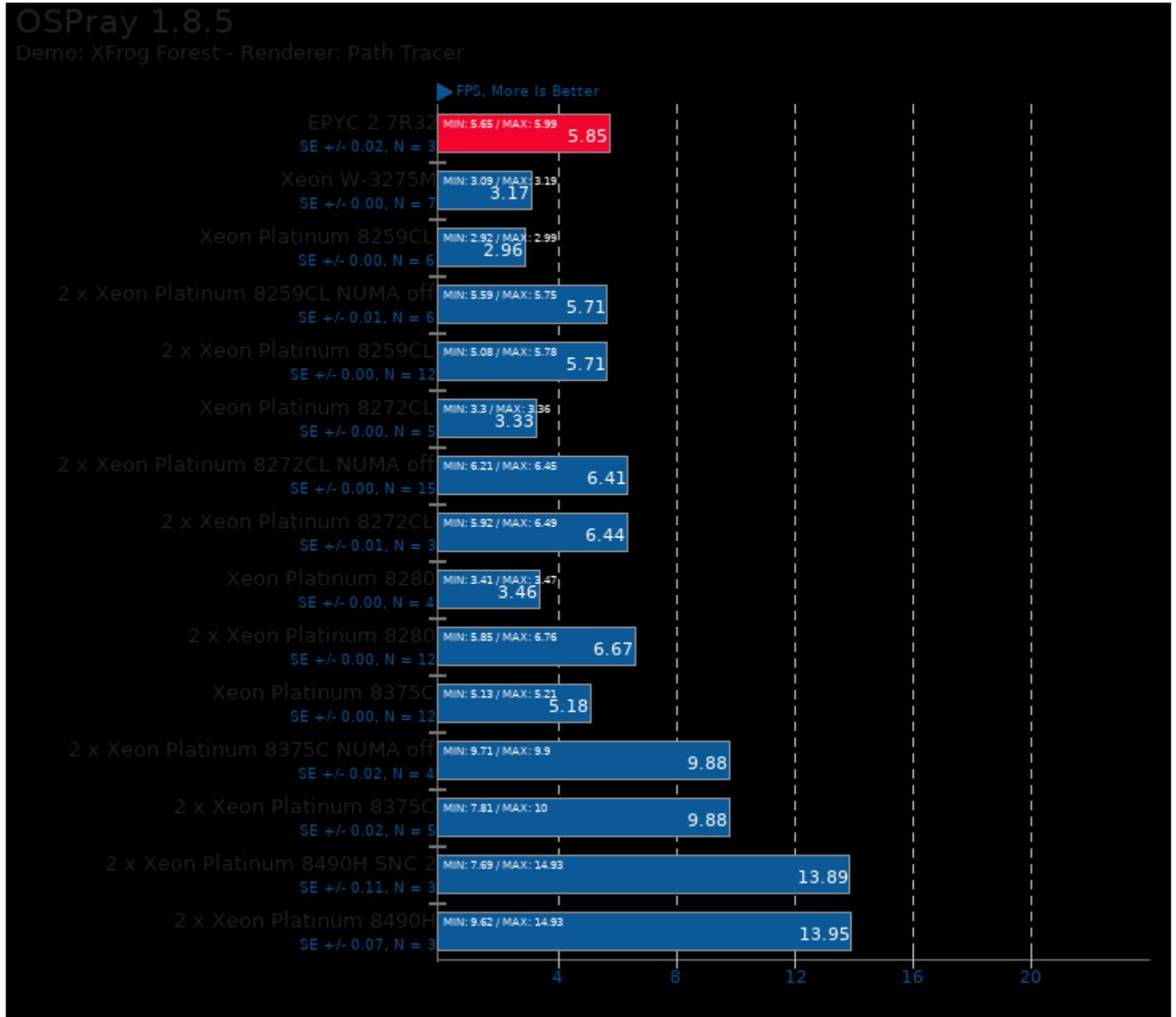
1. (CC) gcc options: -pthread

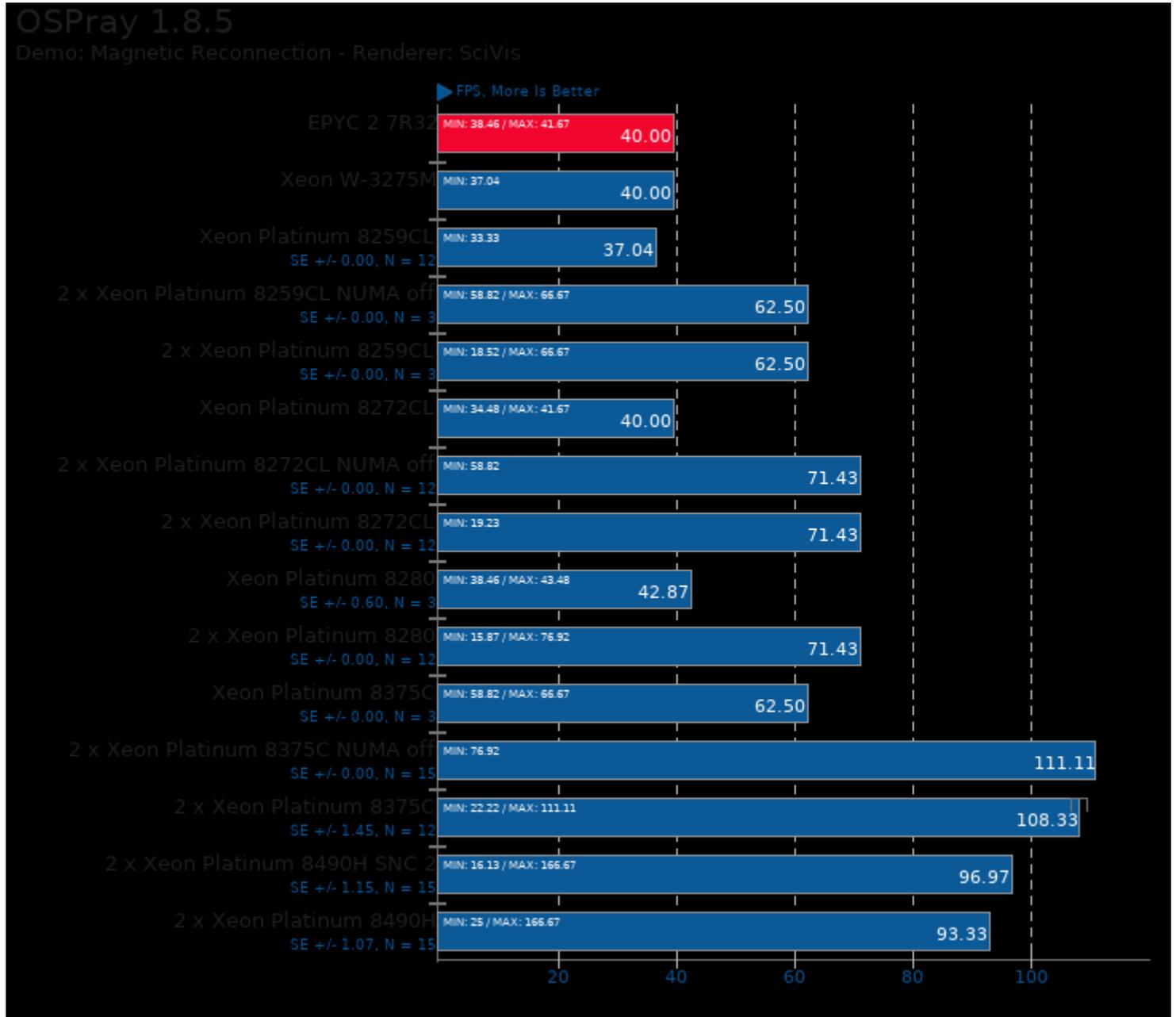


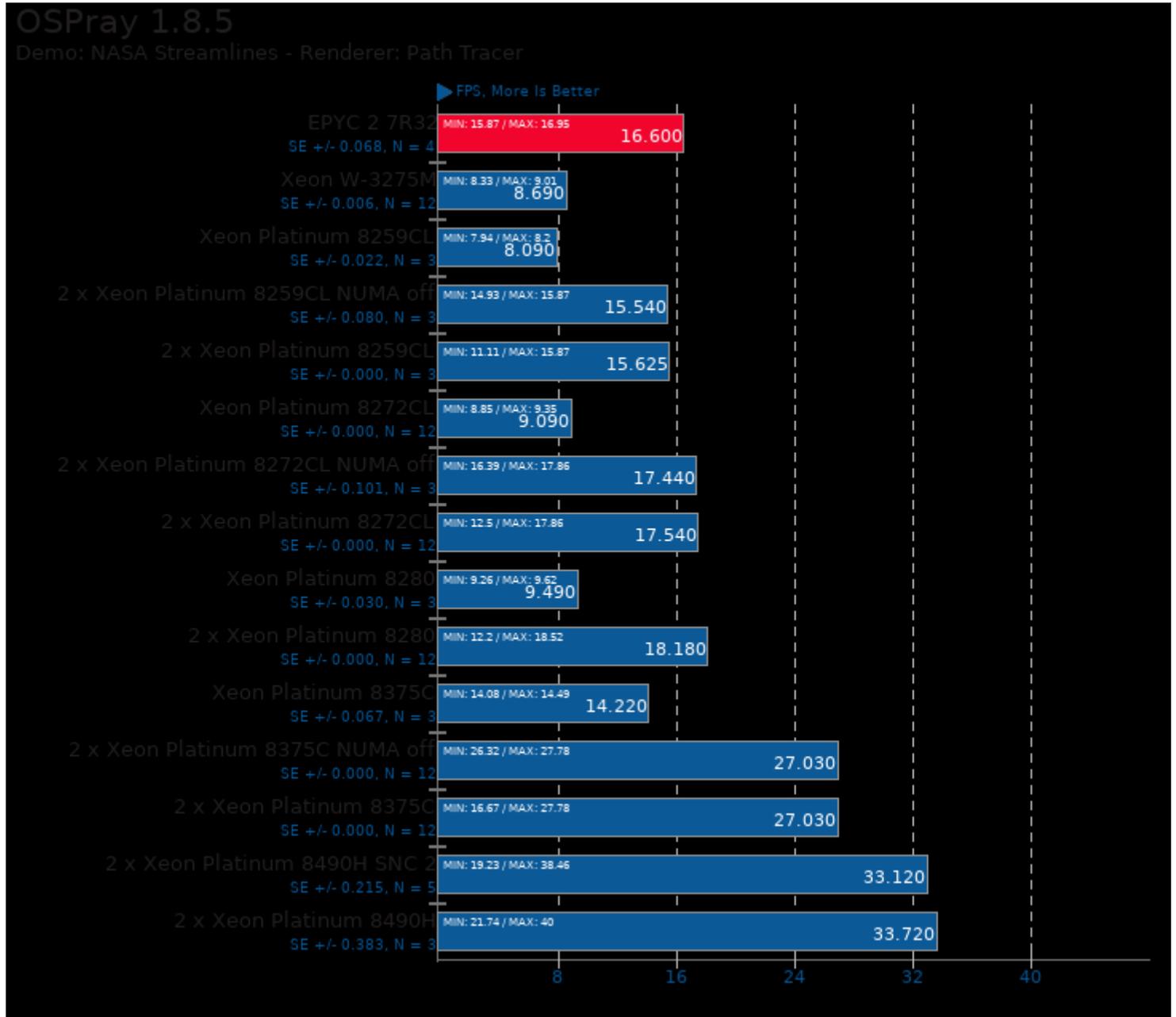








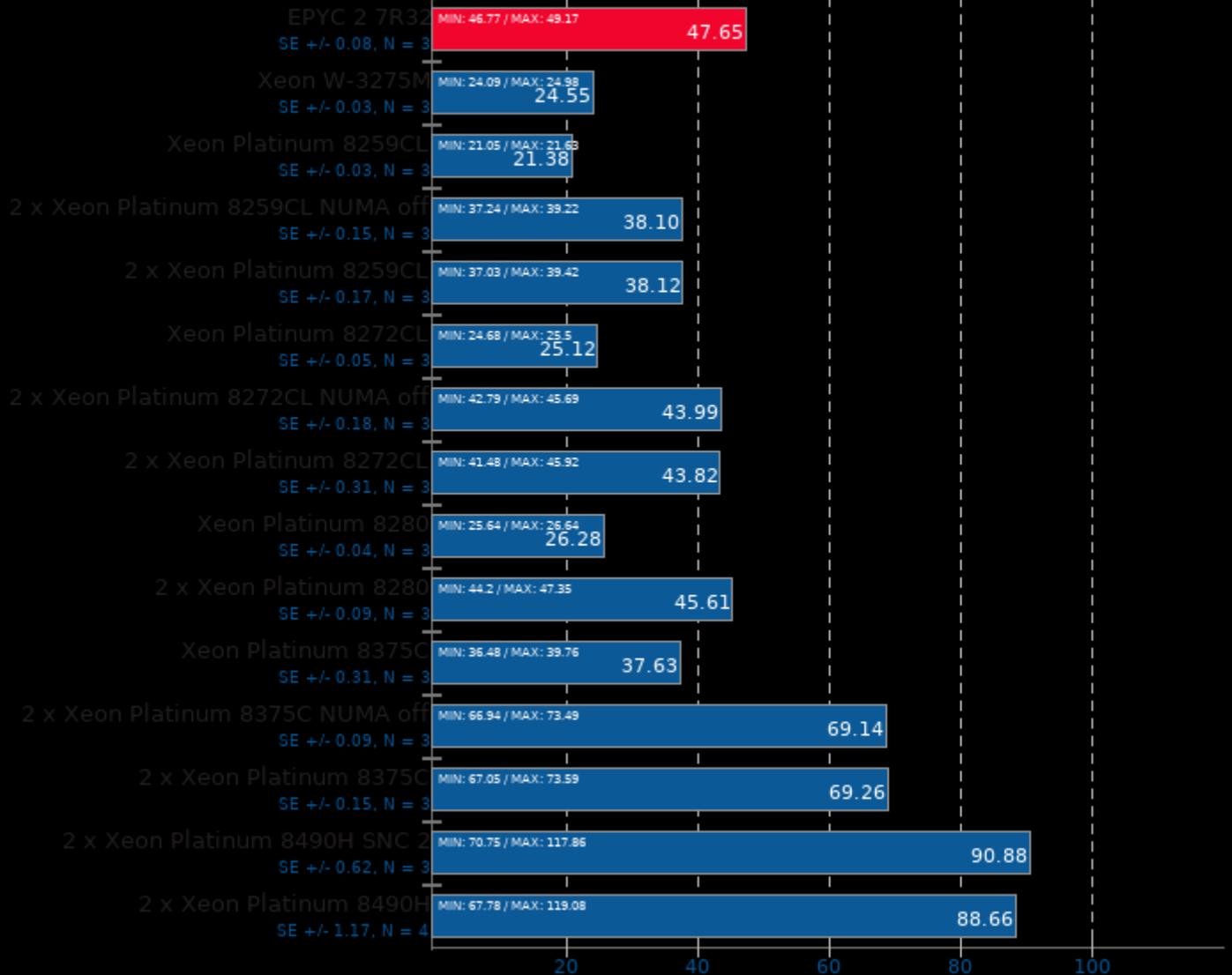




## Embree 3.6.1

Binary: Pathtracer - Model: Crown

▶ Frames Per Second, More Is Better



## Embree 3.6.1

Binary: Pathtracer ISPC - Model: Crown

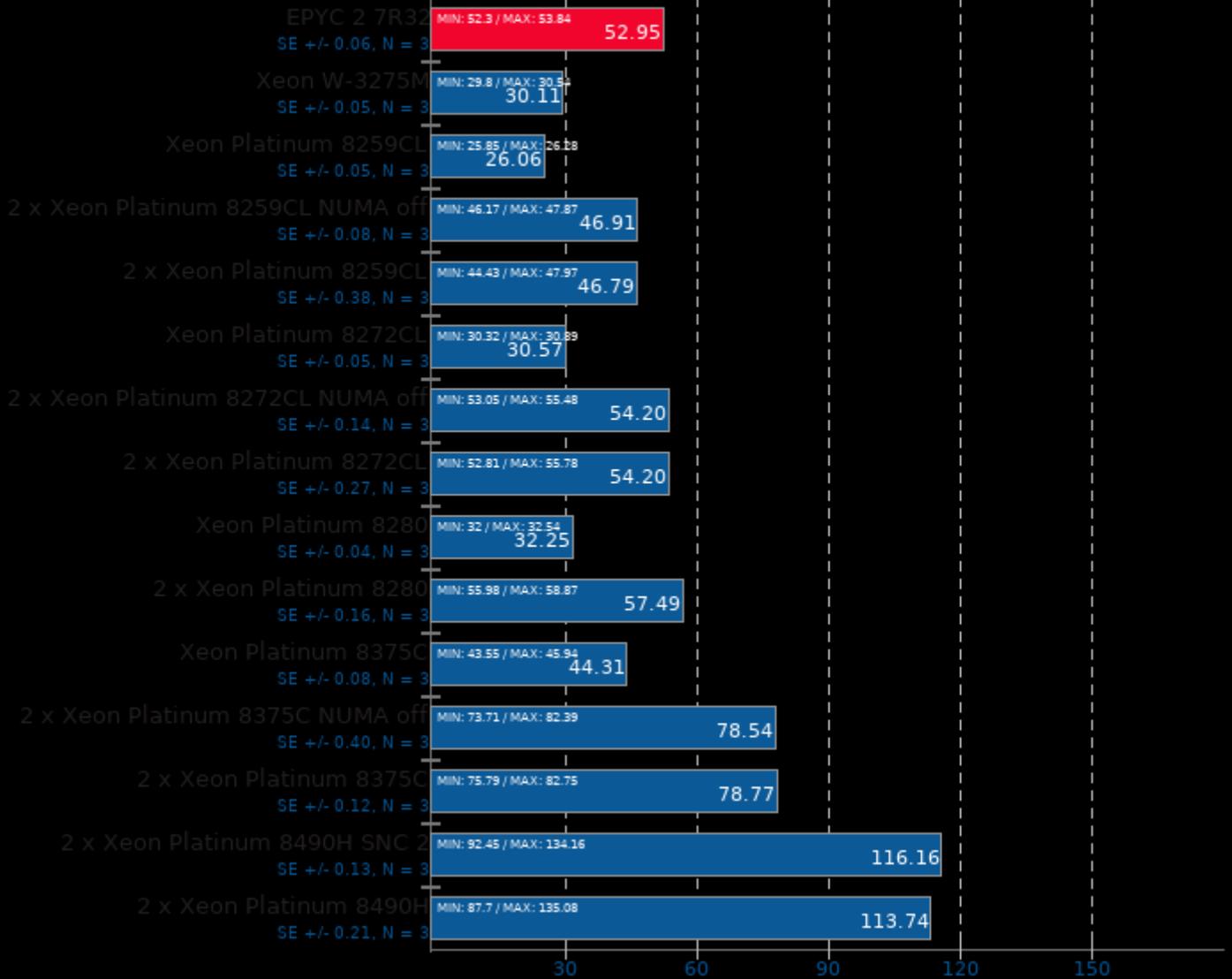
▶ Frames Per Second, More Is Better



## Embree 3.6.1

Binary: Pathtracer - Model: Asian Dragon

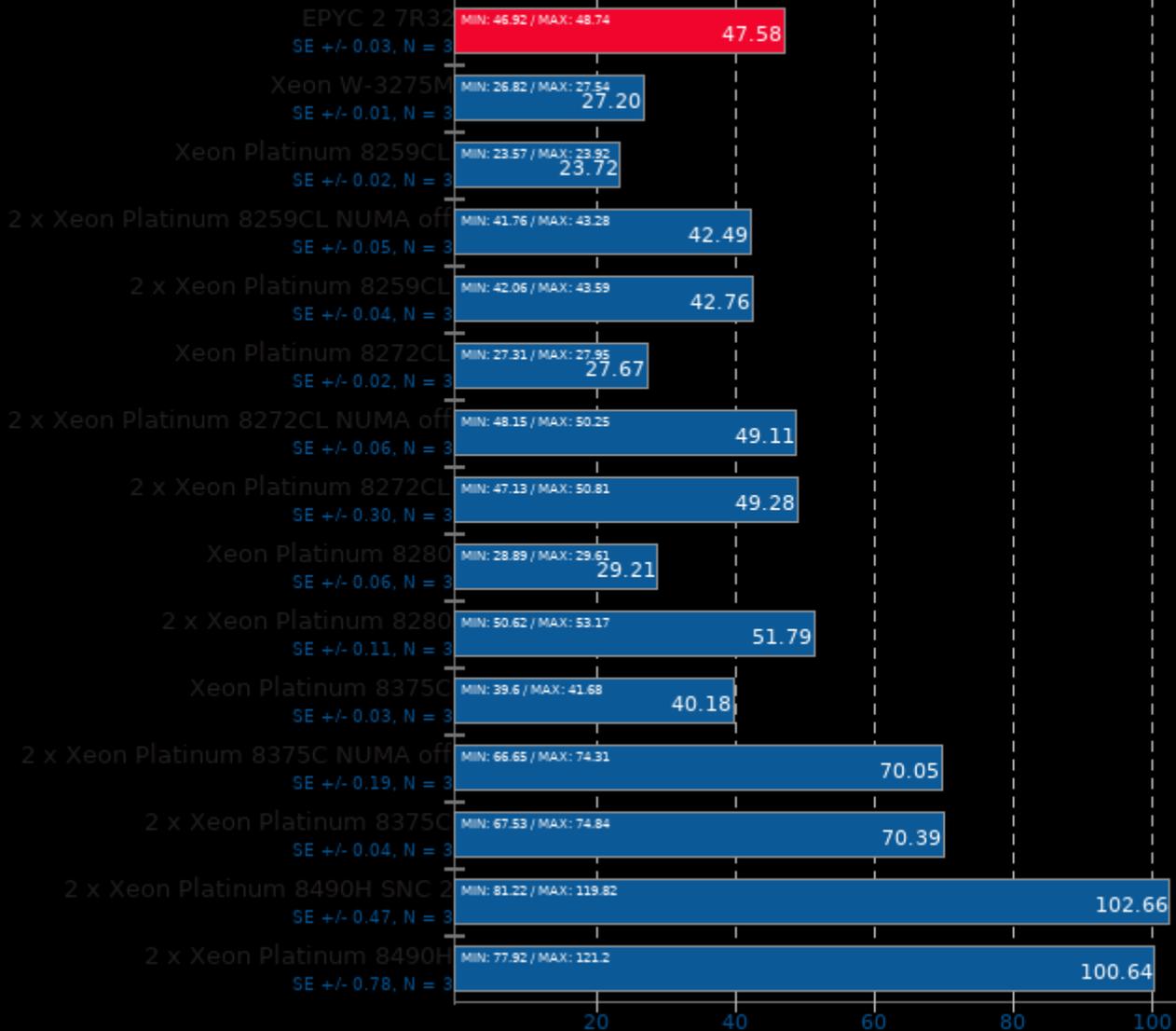
▶ Frames Per Second, More Is Better



## Embree 3.6.1

Binary: Pathtracer - Model: Asian Dragon Obj

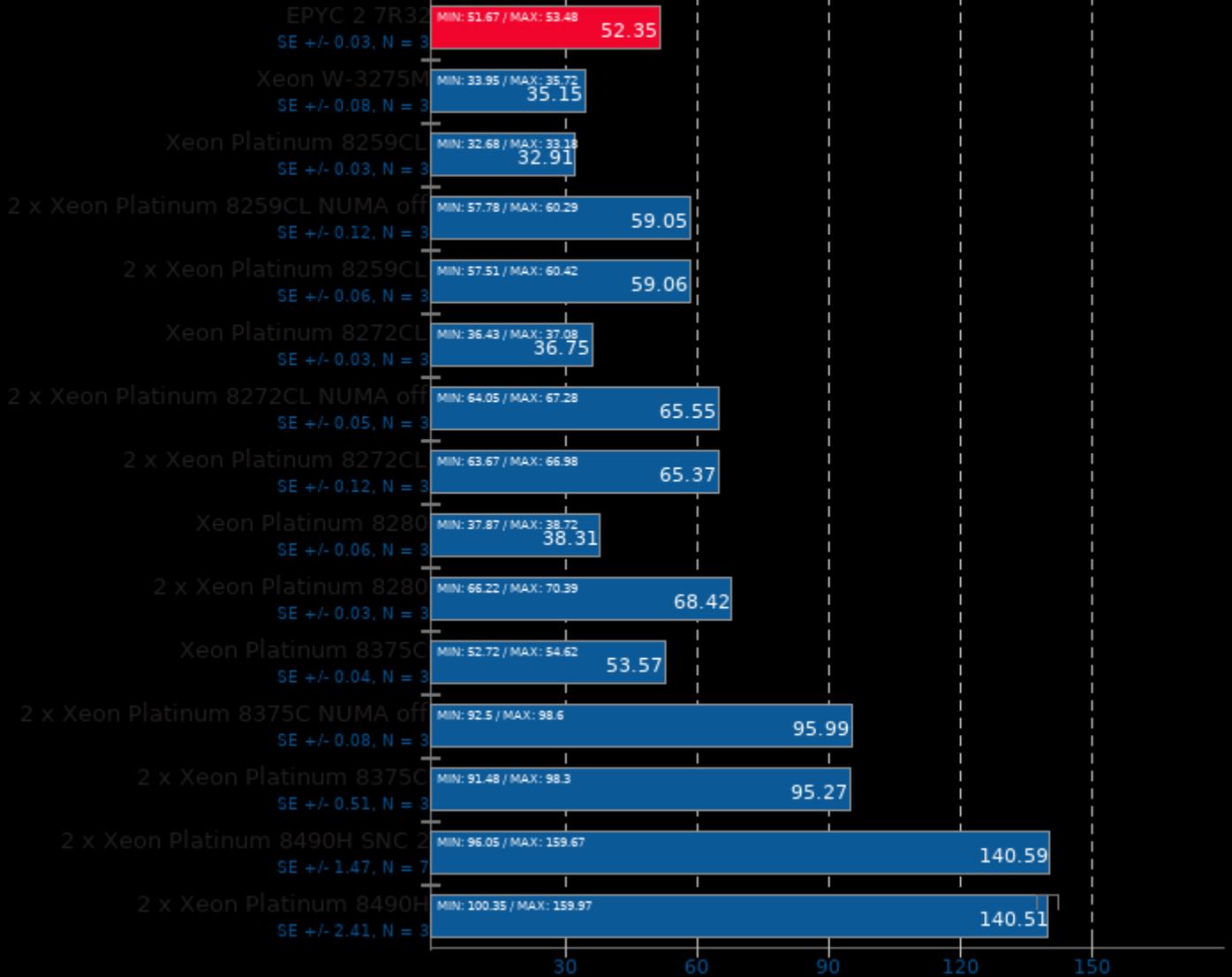
▶ Frames Per Second, More Is Better



## Embree 3.6.1

Binary: Pathtracer ISPC - Model: Asian Dragon

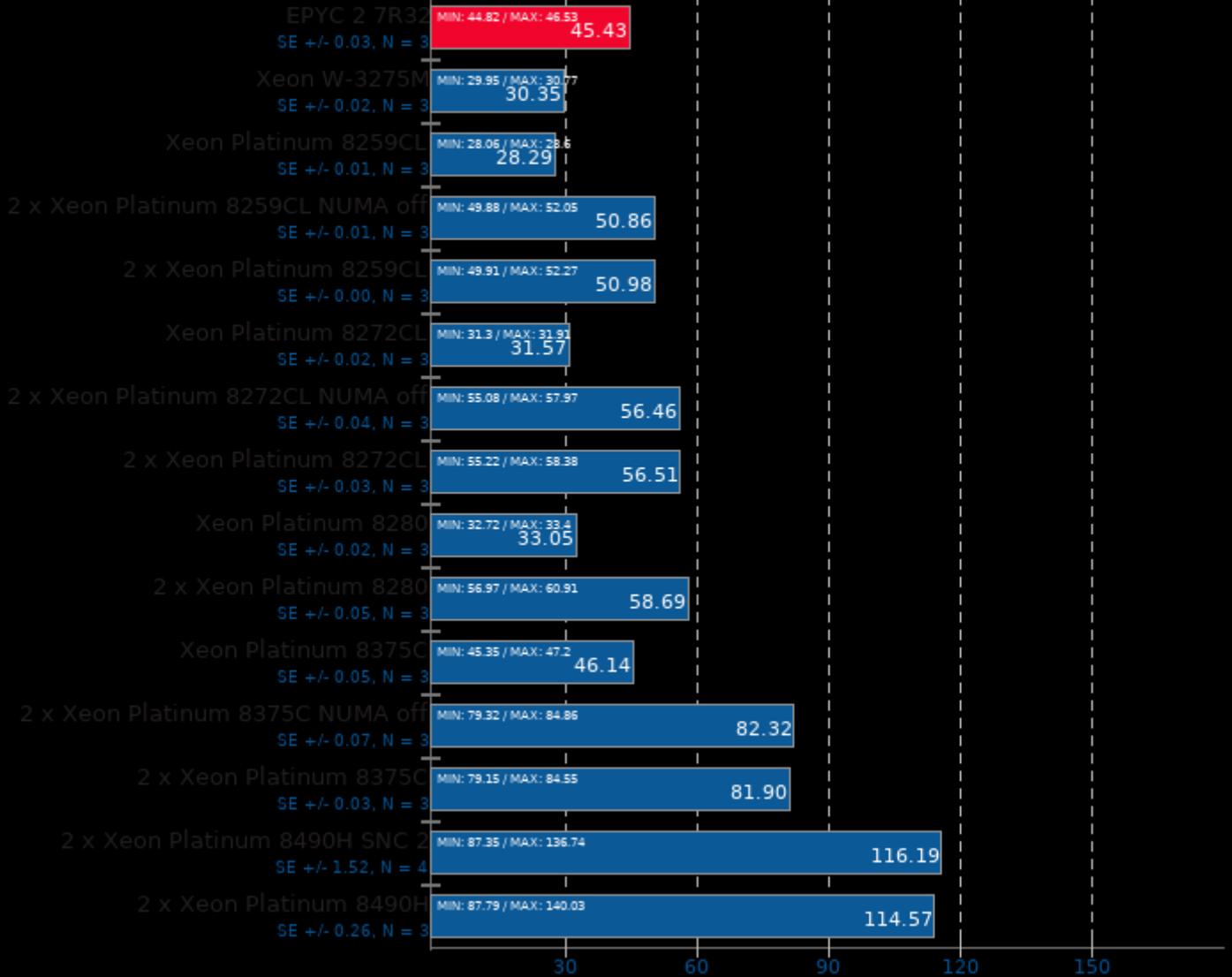
▶ Frames Per Second, More Is Better



## Embree 3.6.1

Binary: Pathtracer ISPC - Model: Asian Dragon Obj

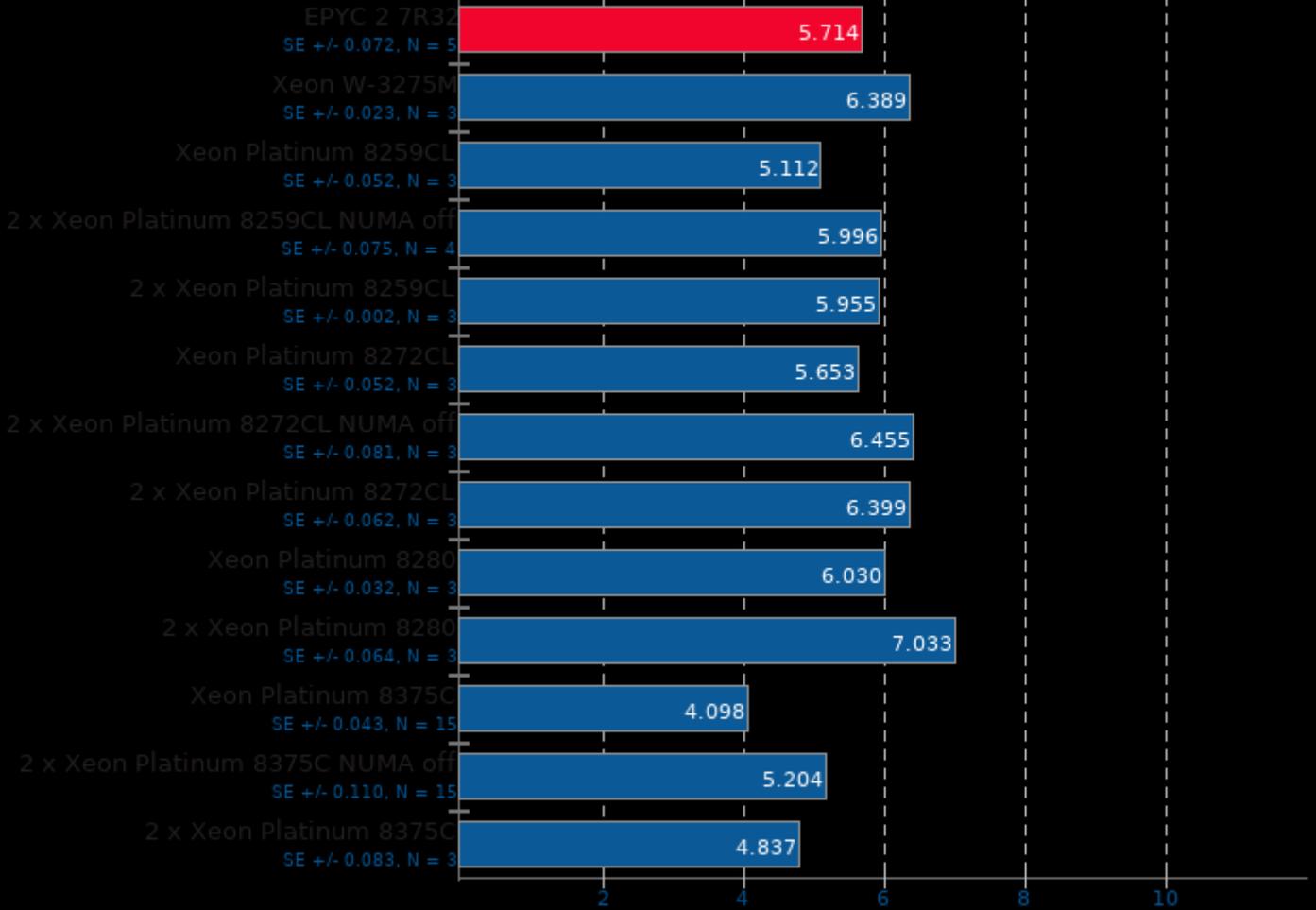
▶ Frames Per Second, More Is Better



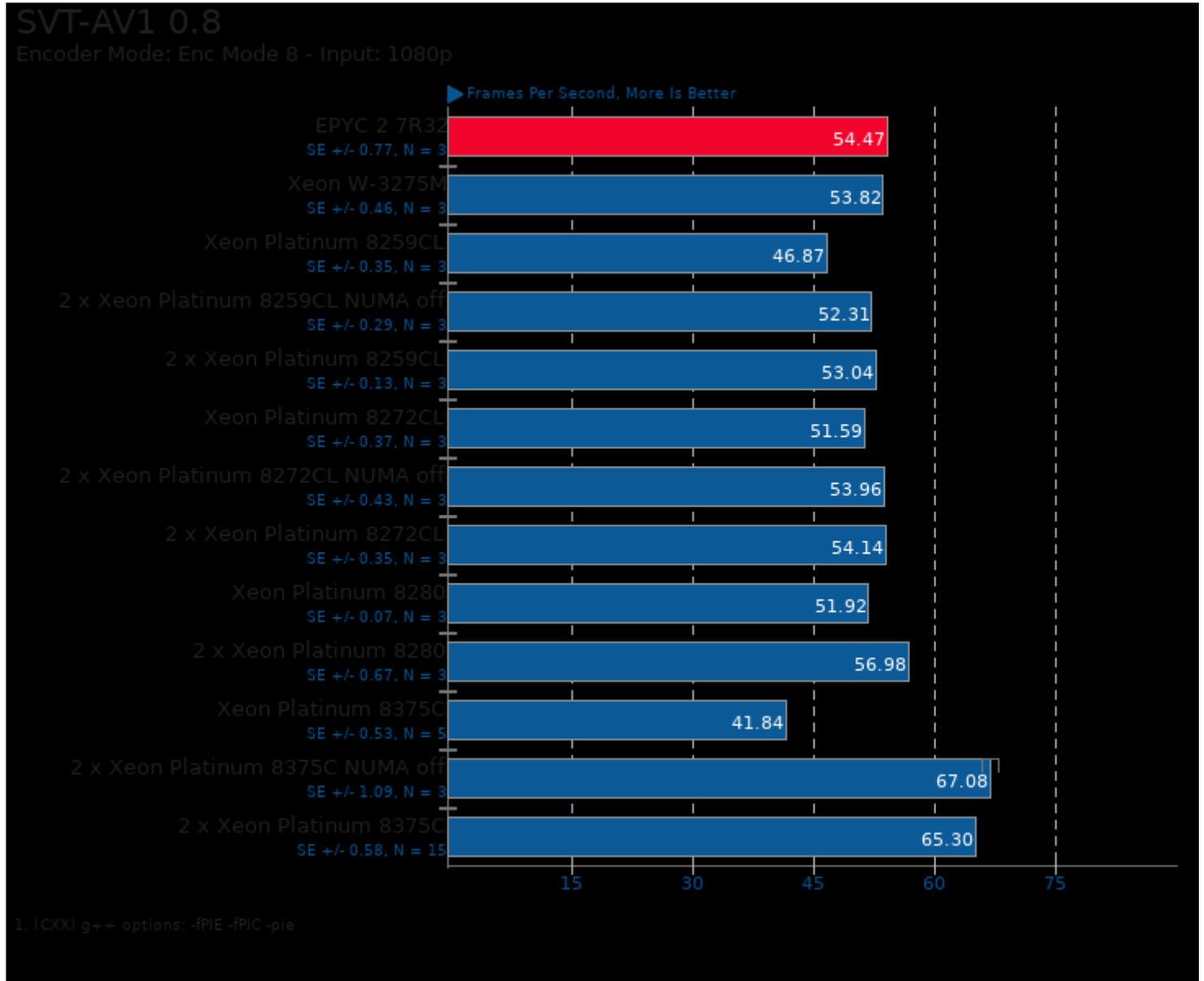
## SVT-AV1 0.8

Encoder Mode: Enc Mode 4 - Input: 1080p

▶ Frames Per Second, More Is Better



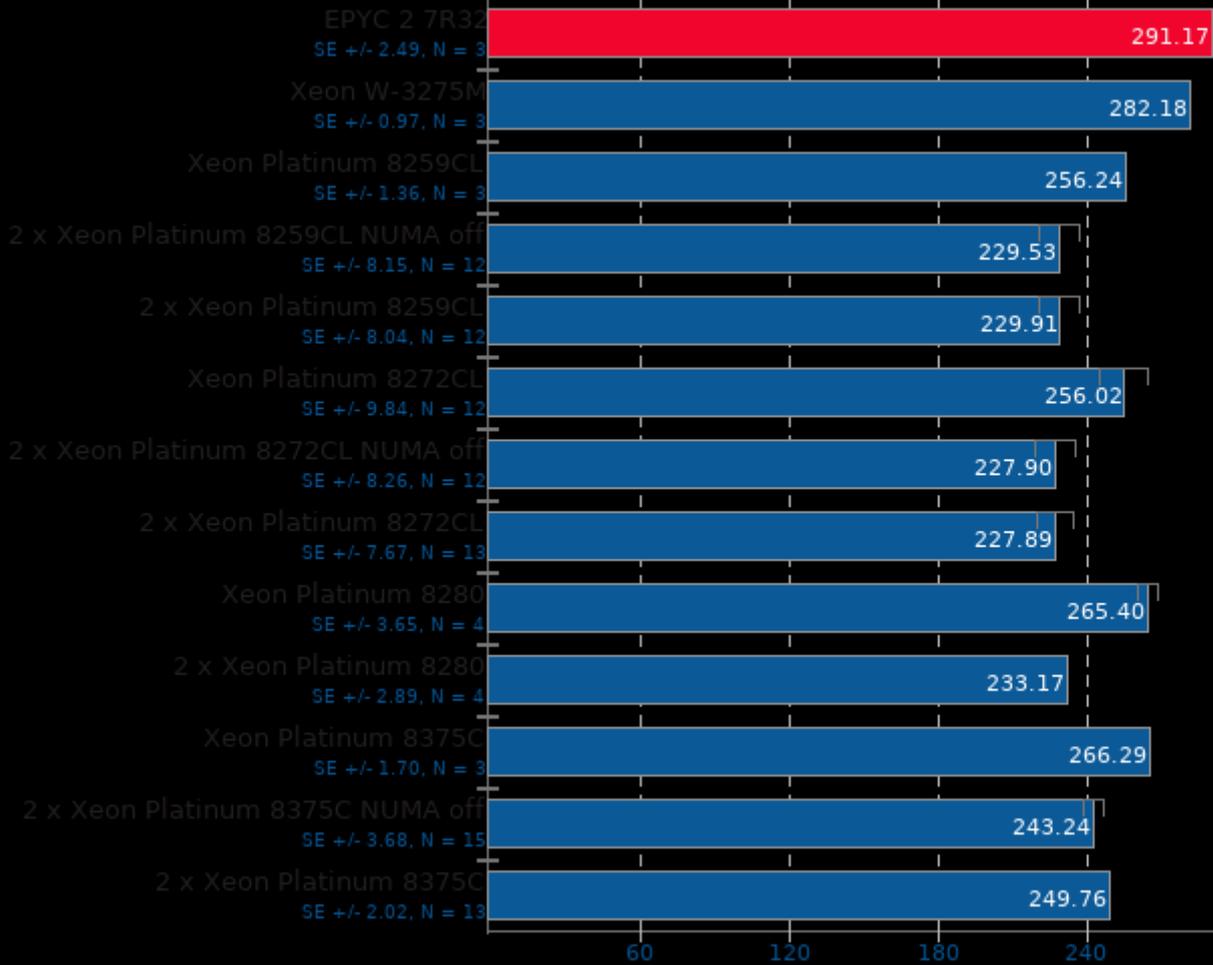
1. (CXX) g++ options: -fPIE -fPIC -pie



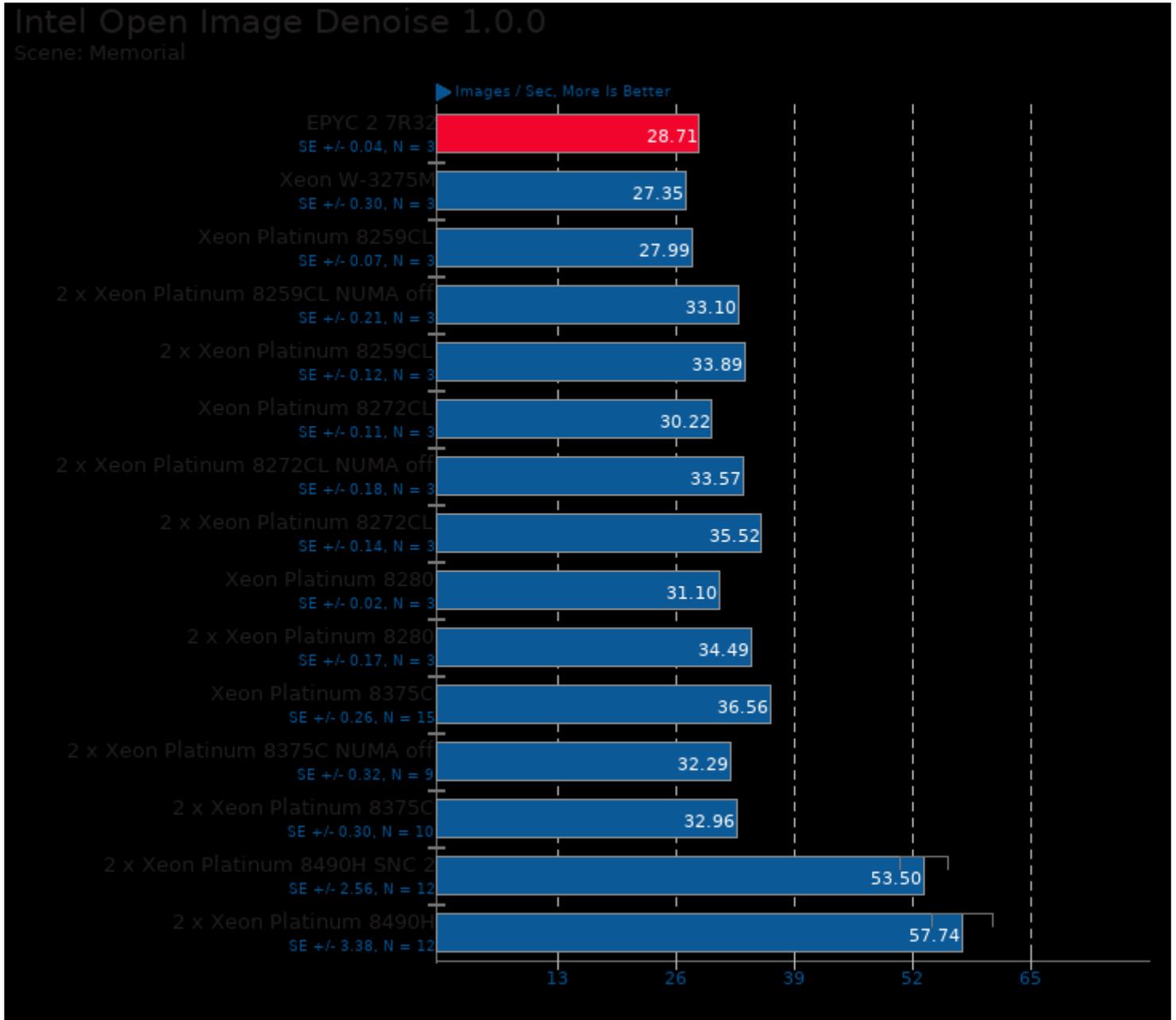
## SVT-VP9 0.1

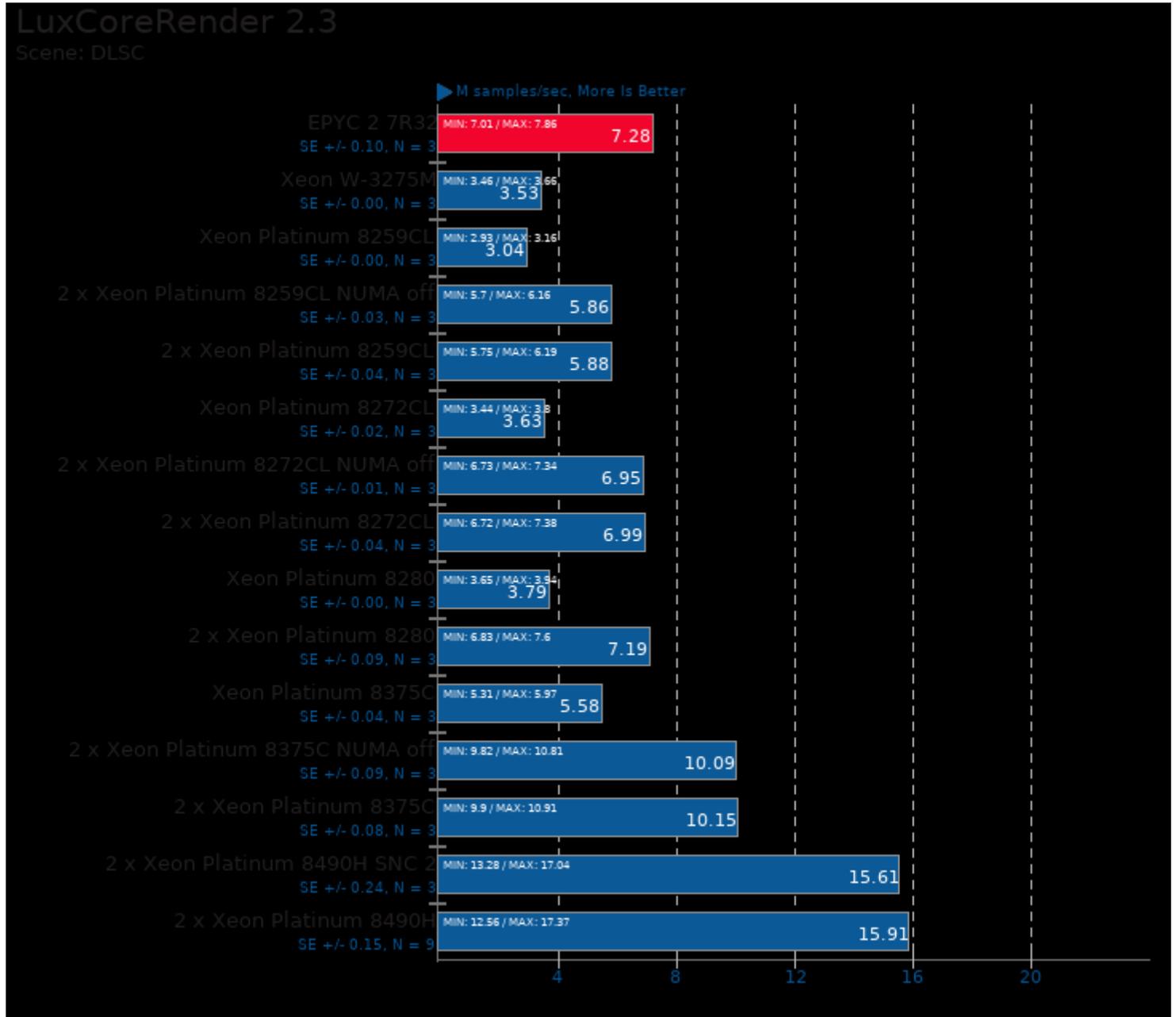
Tuning: Visual Quality Optimized - Input: Bosphorus 1080p

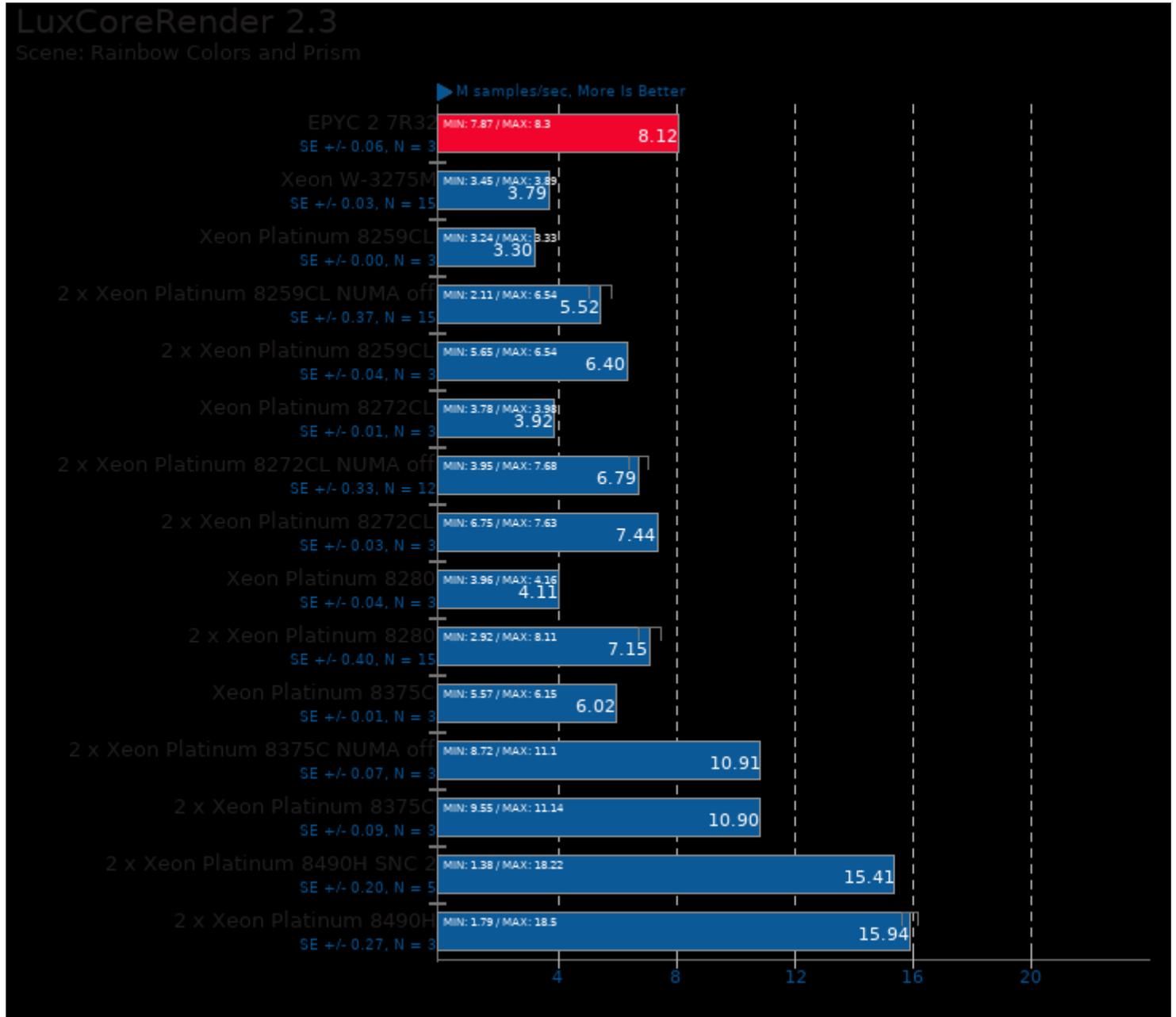
▶ Frames Per Second, More Is Better

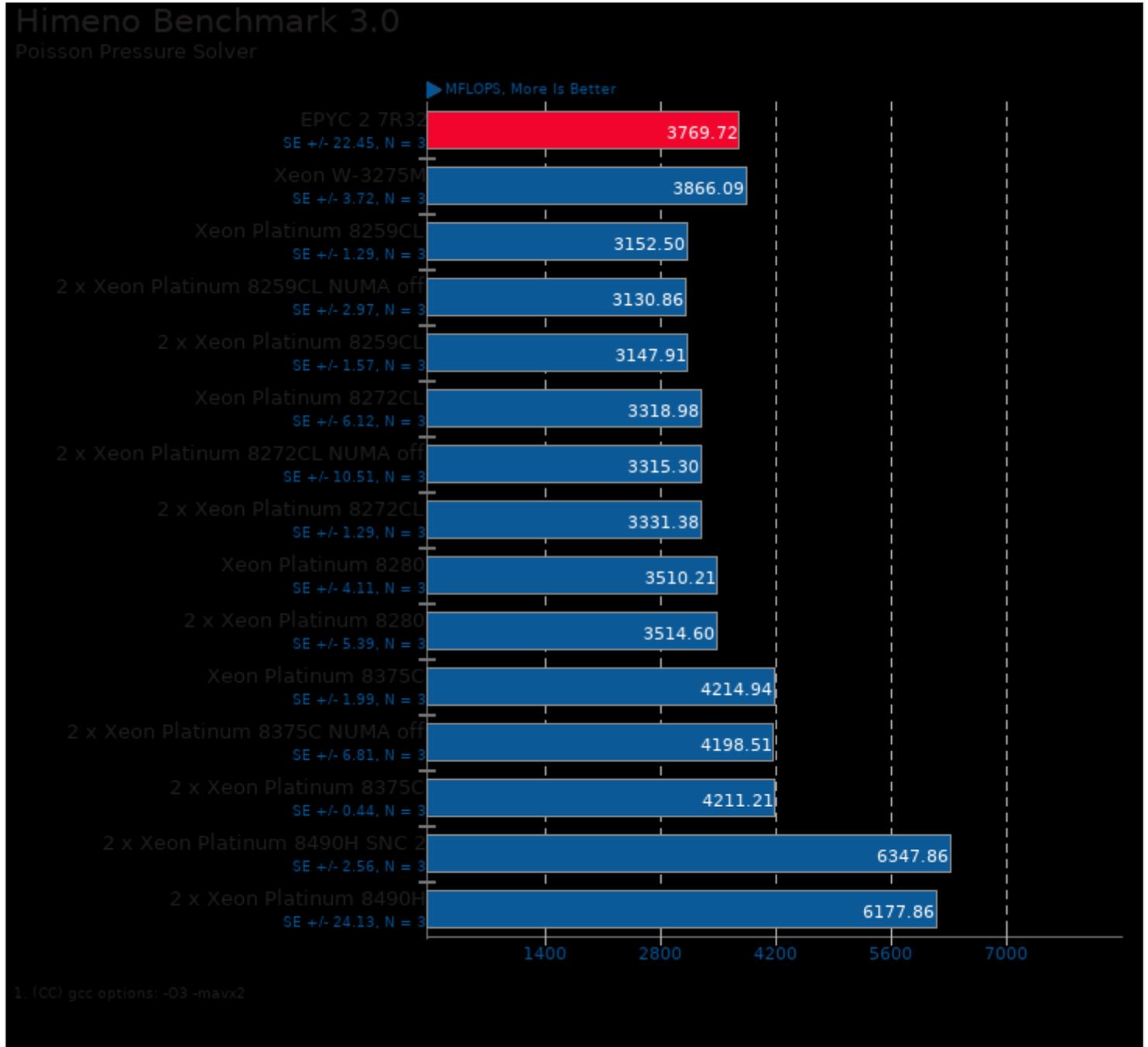


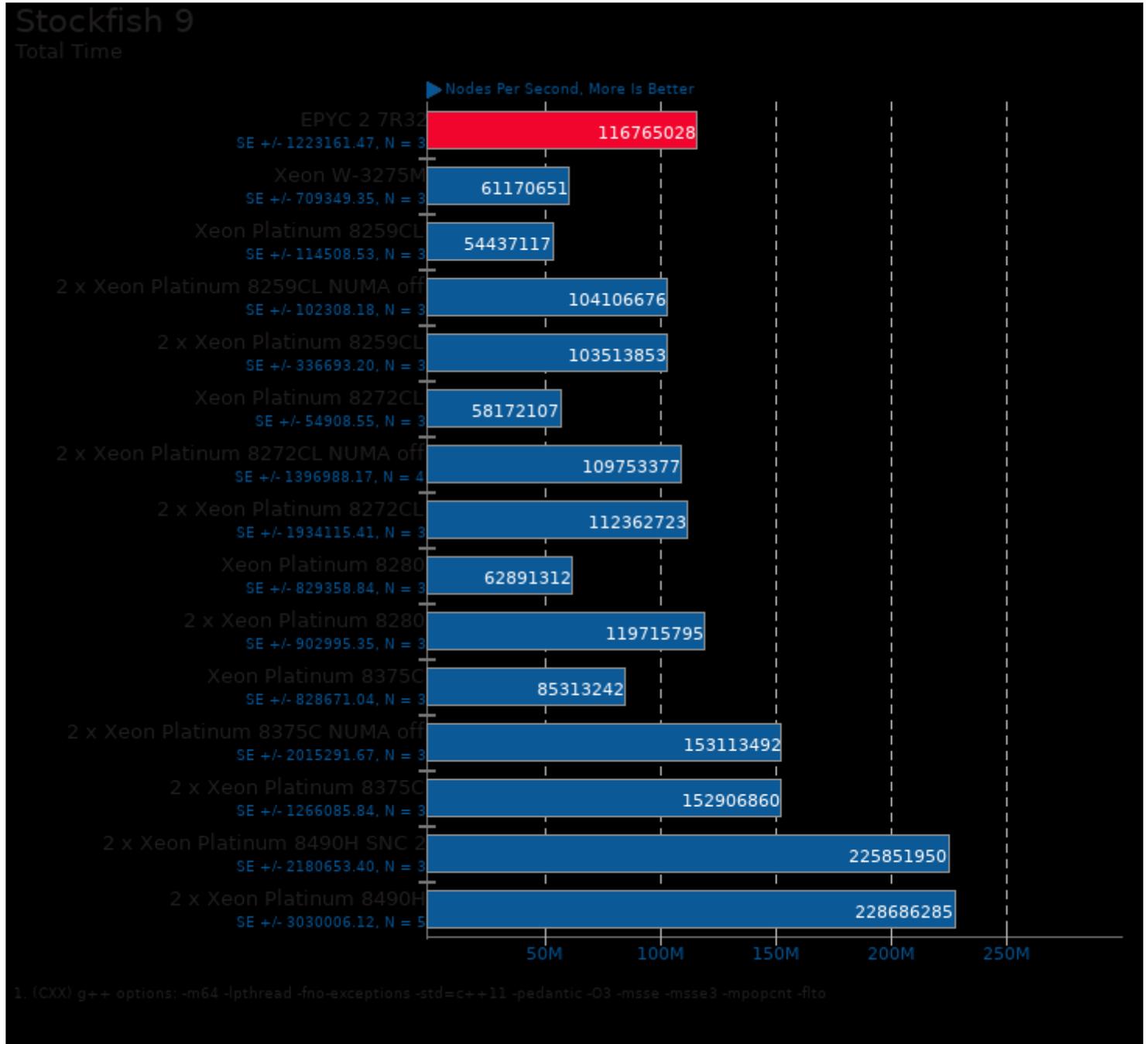
1. (CC) gcc options: -fPIE -fPIC -fvisibility=hidden -O3 -pie -rdynamic -pthread -lrt -lm

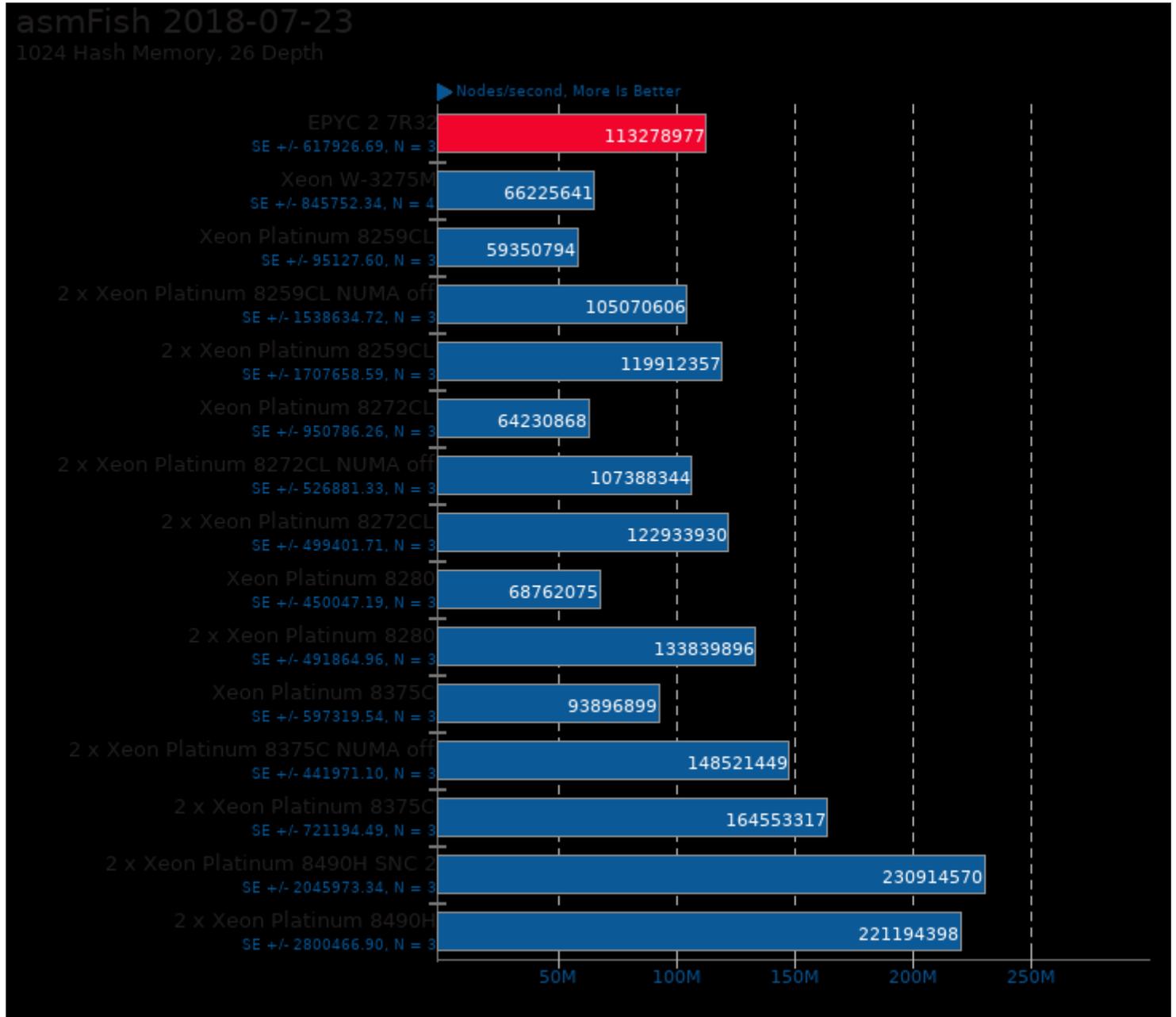


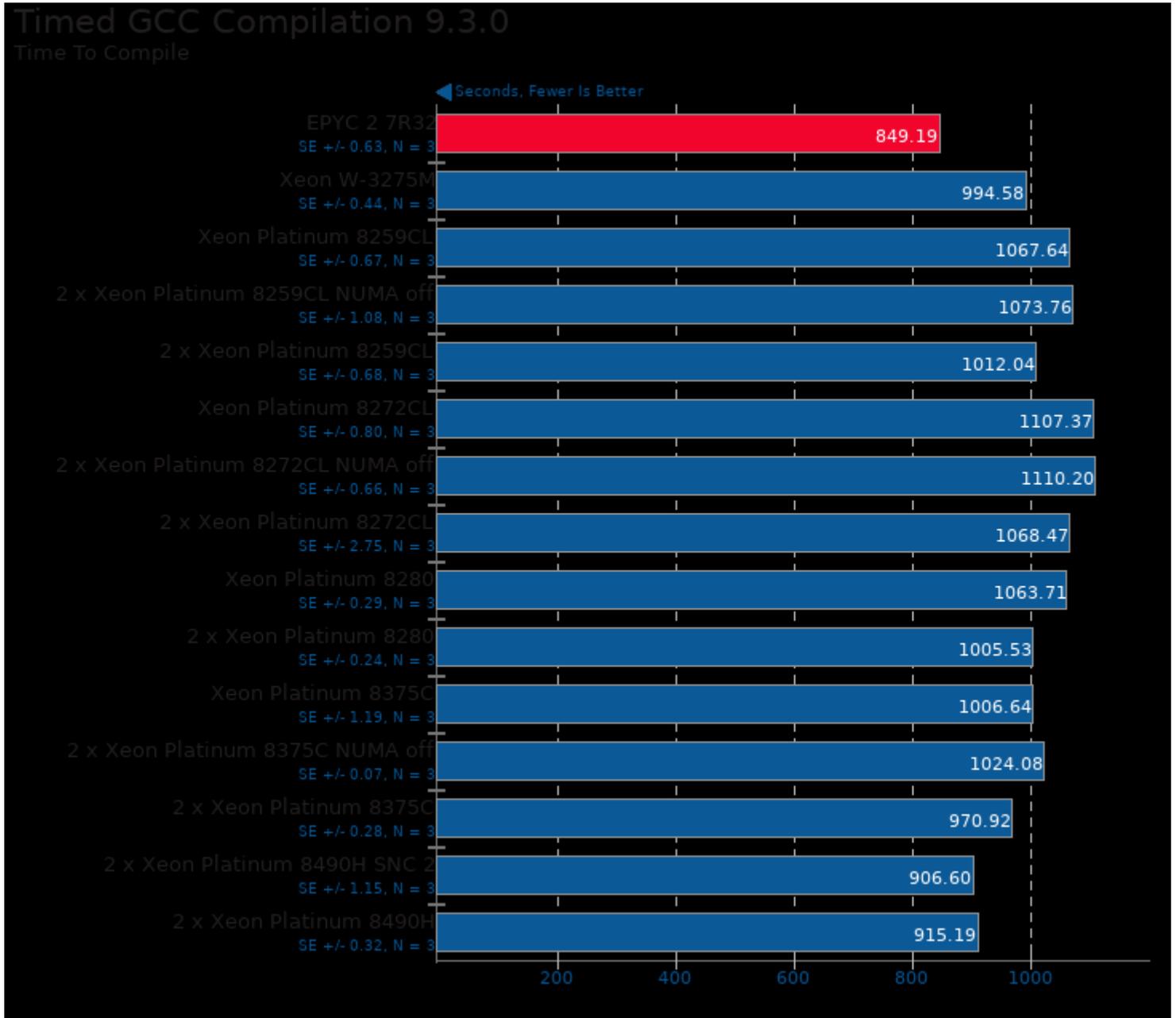


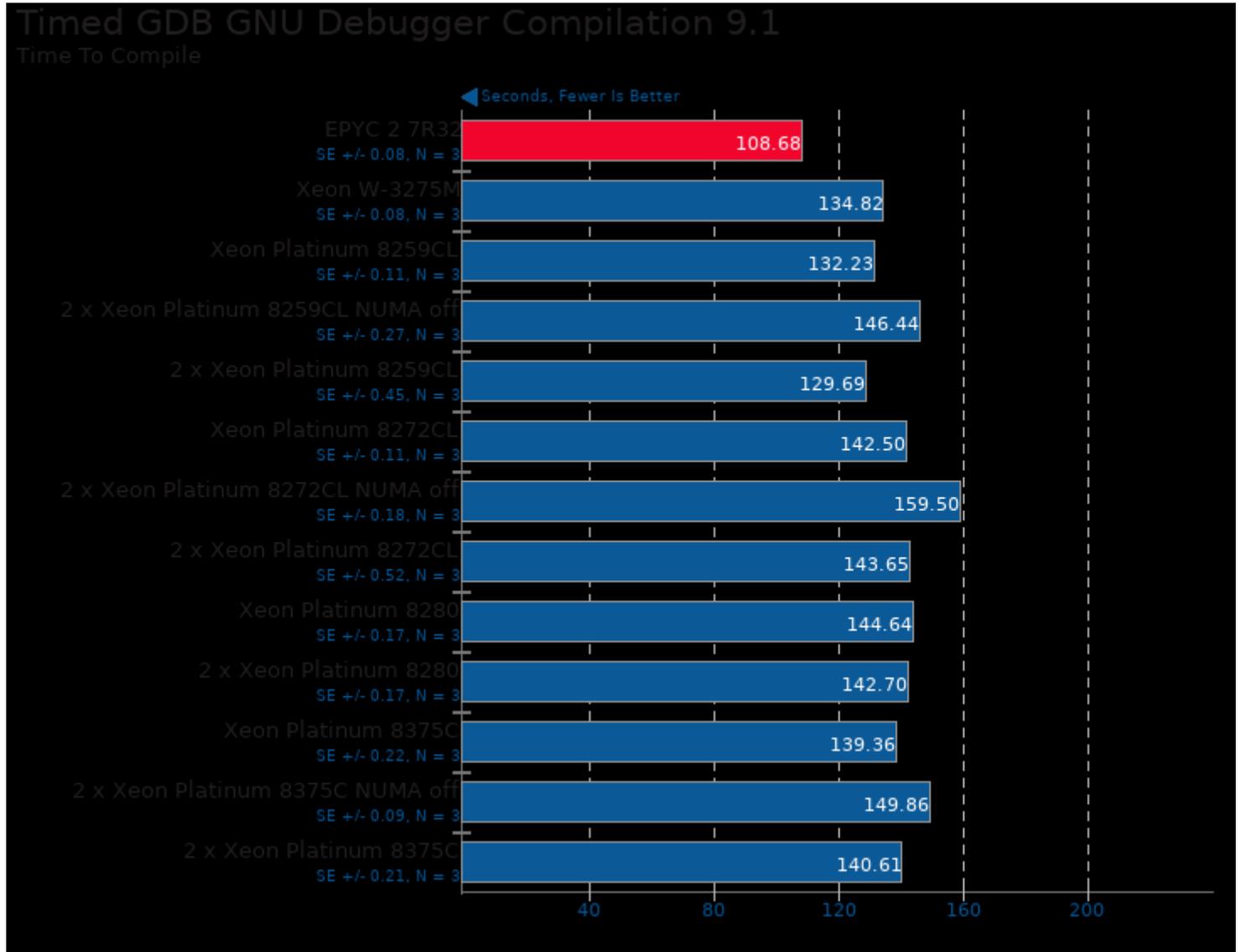


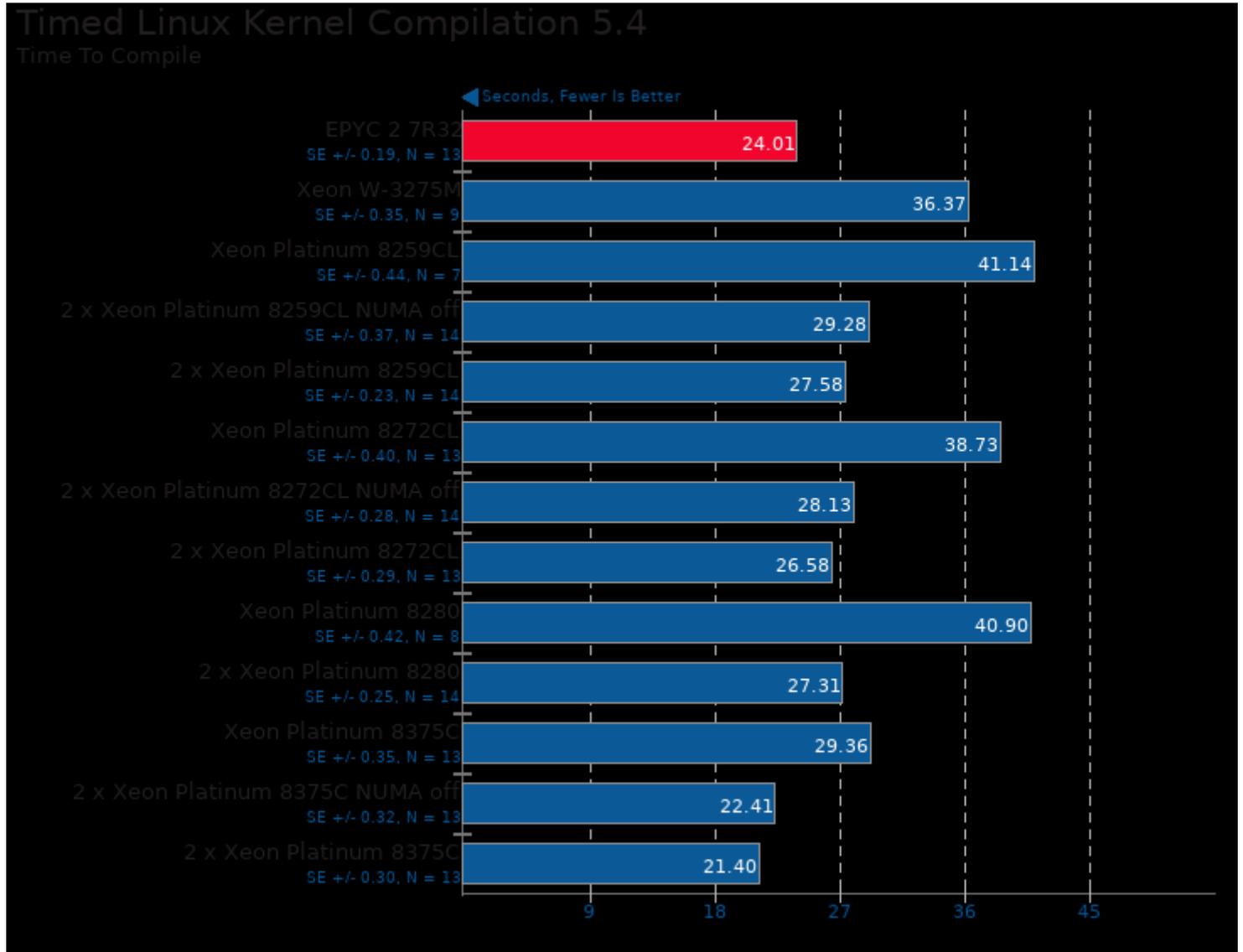


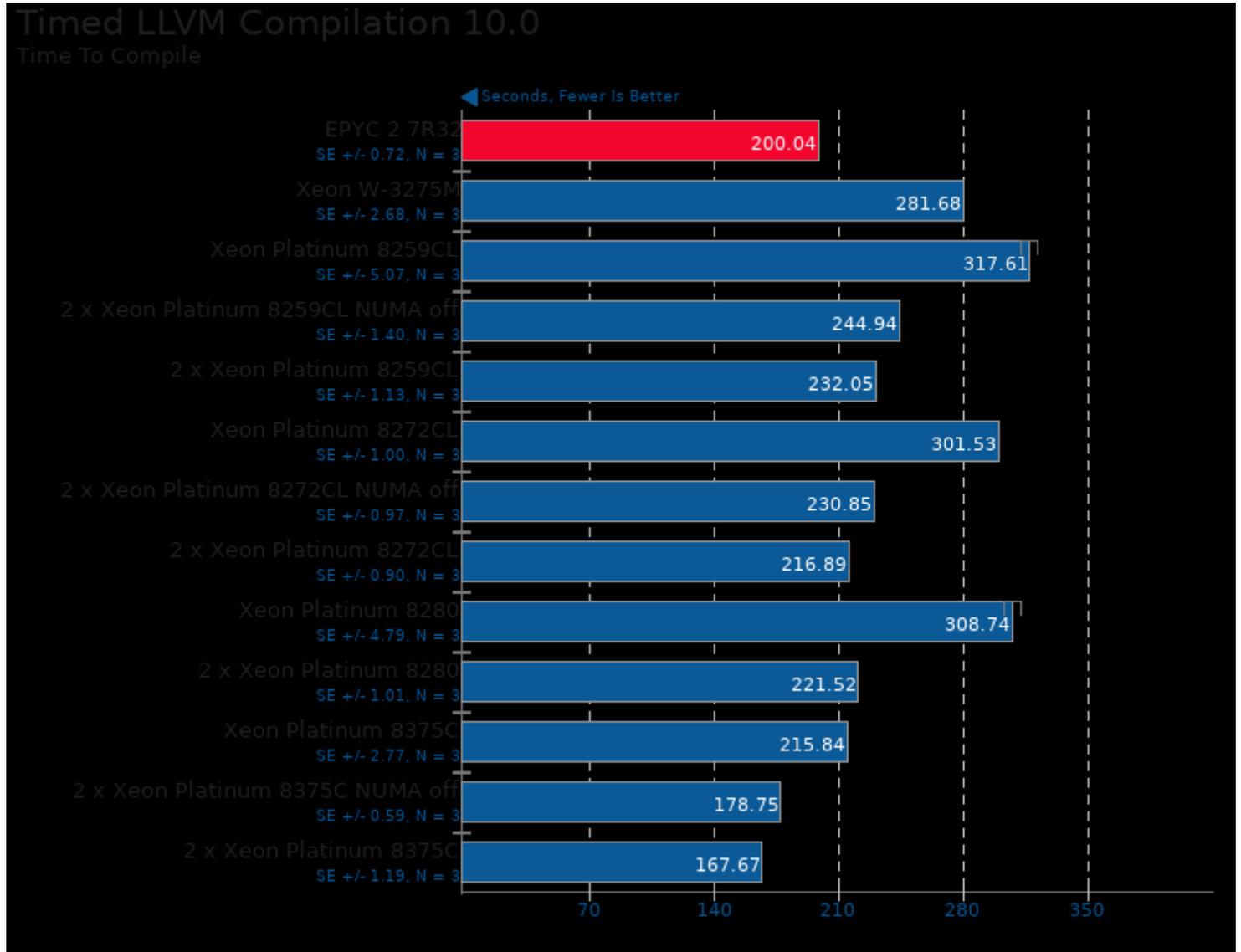


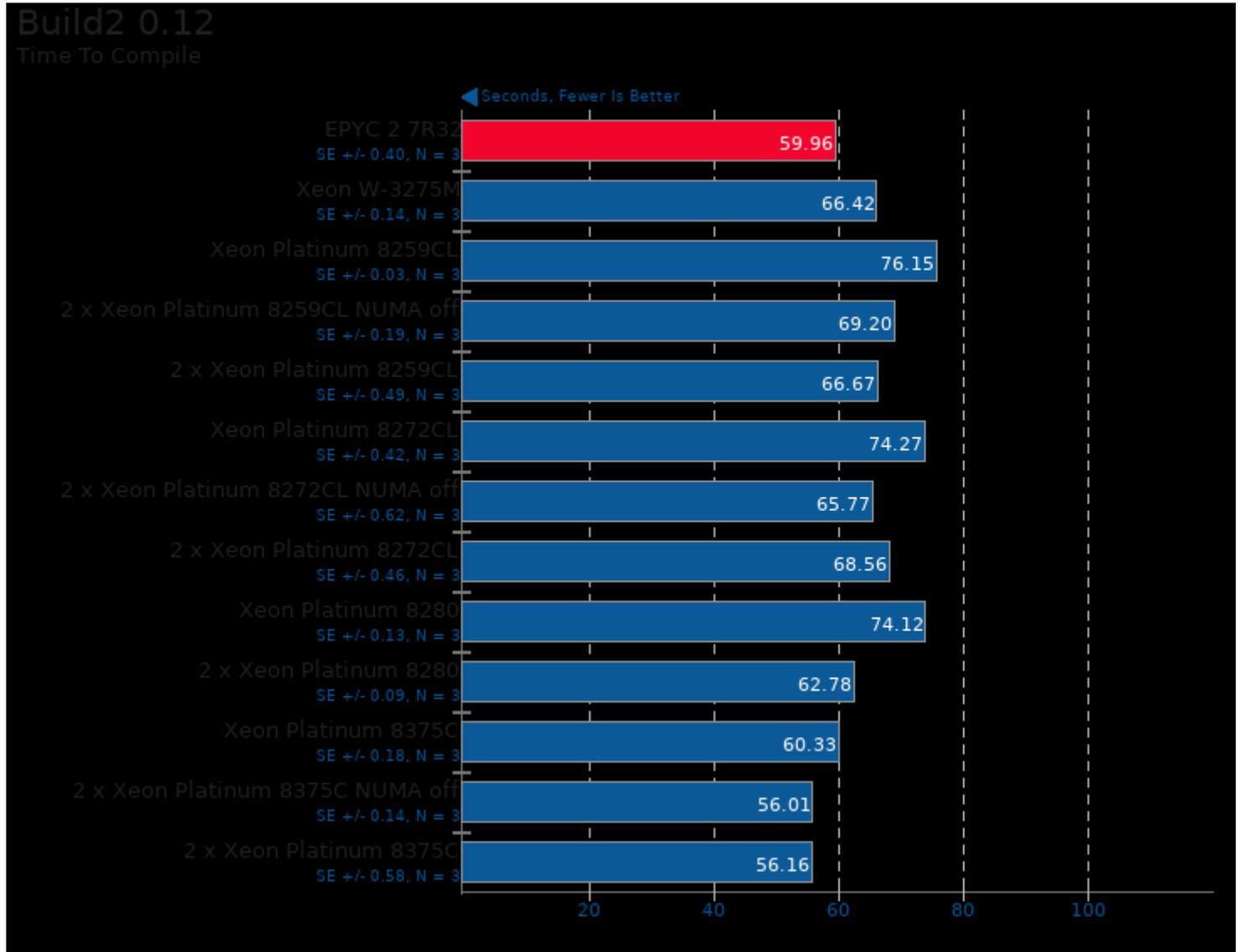








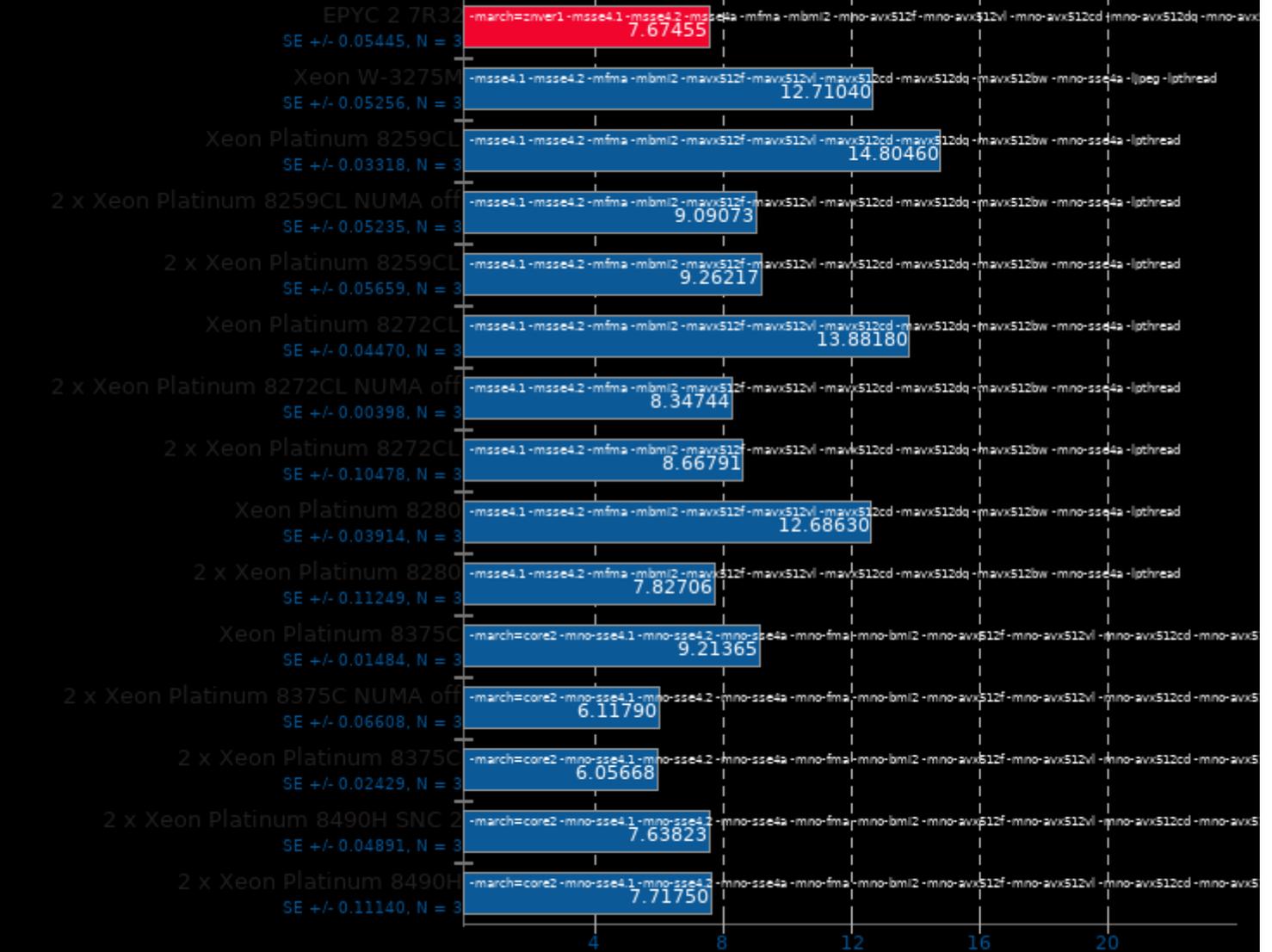




## Tungsten Renderer 0.2.2

Scene: Hair

Seconds, Fewer Is Better



1. (CXX) g++ options: -std=c++0x -msse2 -msse3 -mssse3 -mno-avx -mno-avx2 -mno-xop -mno-fma4 -mno-avx512pf -mno-avx512er -mno-avx512fma -m

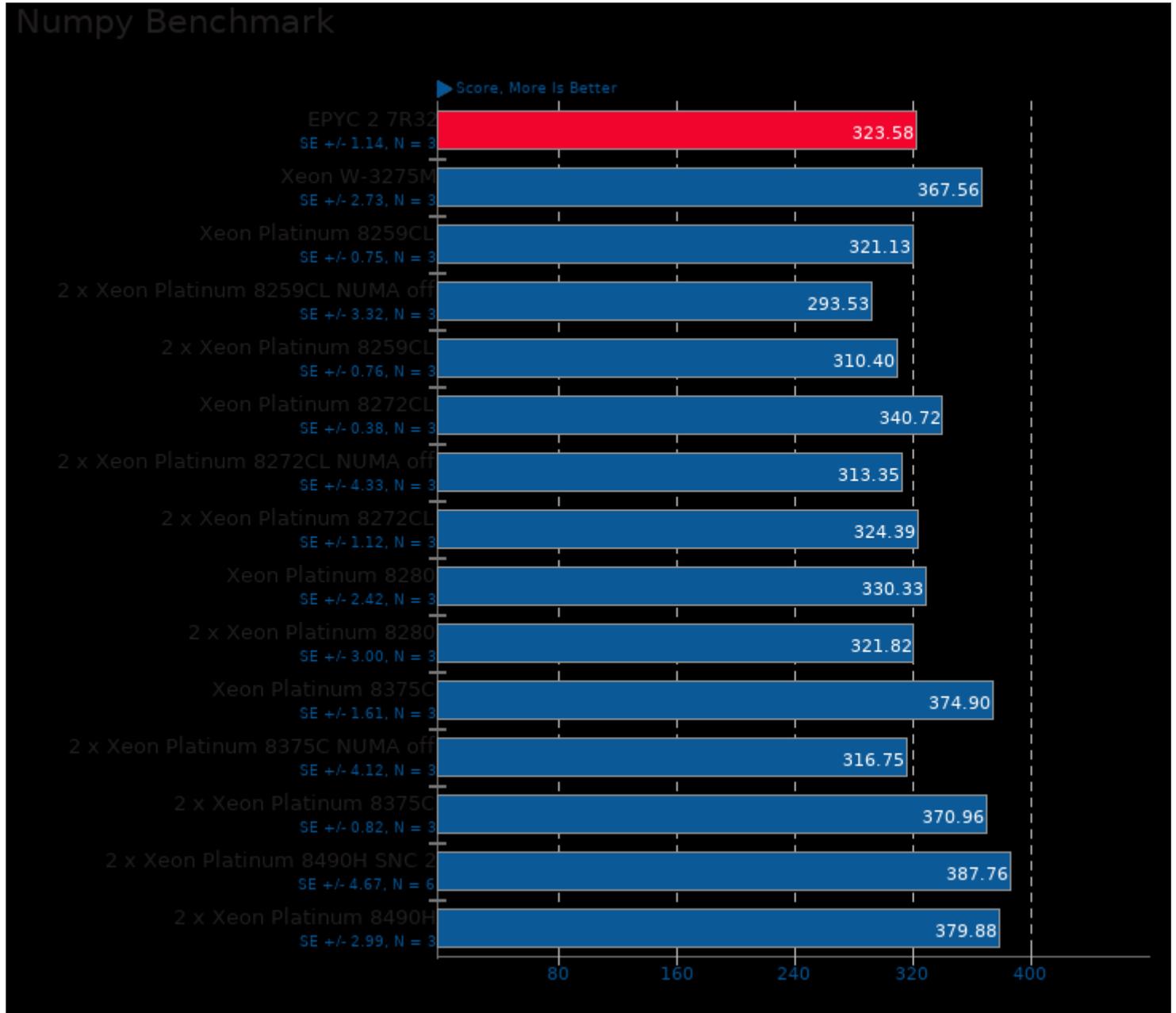
## Tungsten Renderer 0.2.2

Scene: Water Caustic

← Seconds, Fewer Is Better



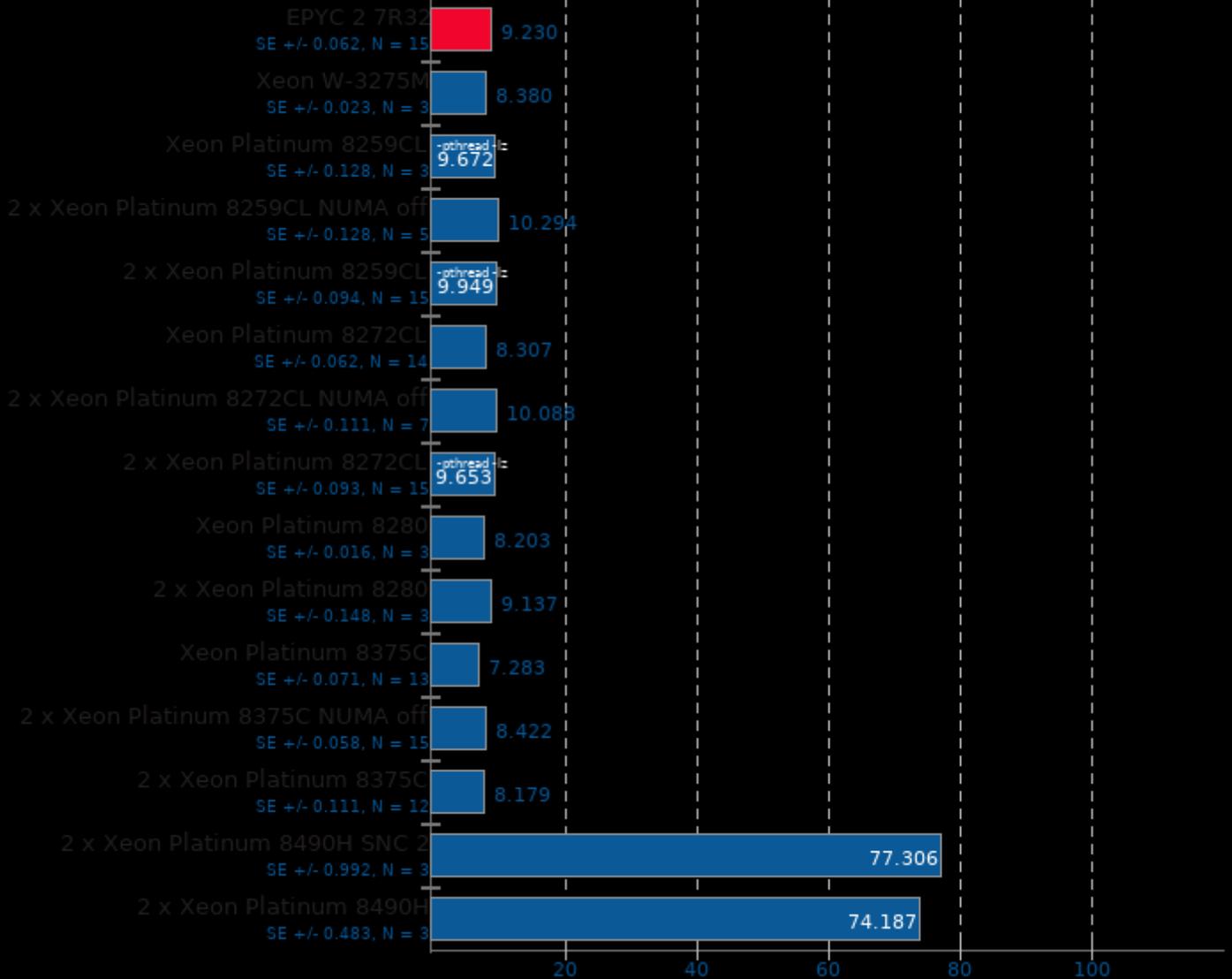
1. (CXX) g++ options: -std=c++0x -msse2 -msse3 -mssse3 -mno-avx -mno-avx2 -mno-xop -mno-fma4 -mno-avx512pf -mno-avx512er -mno-avx512fma -m



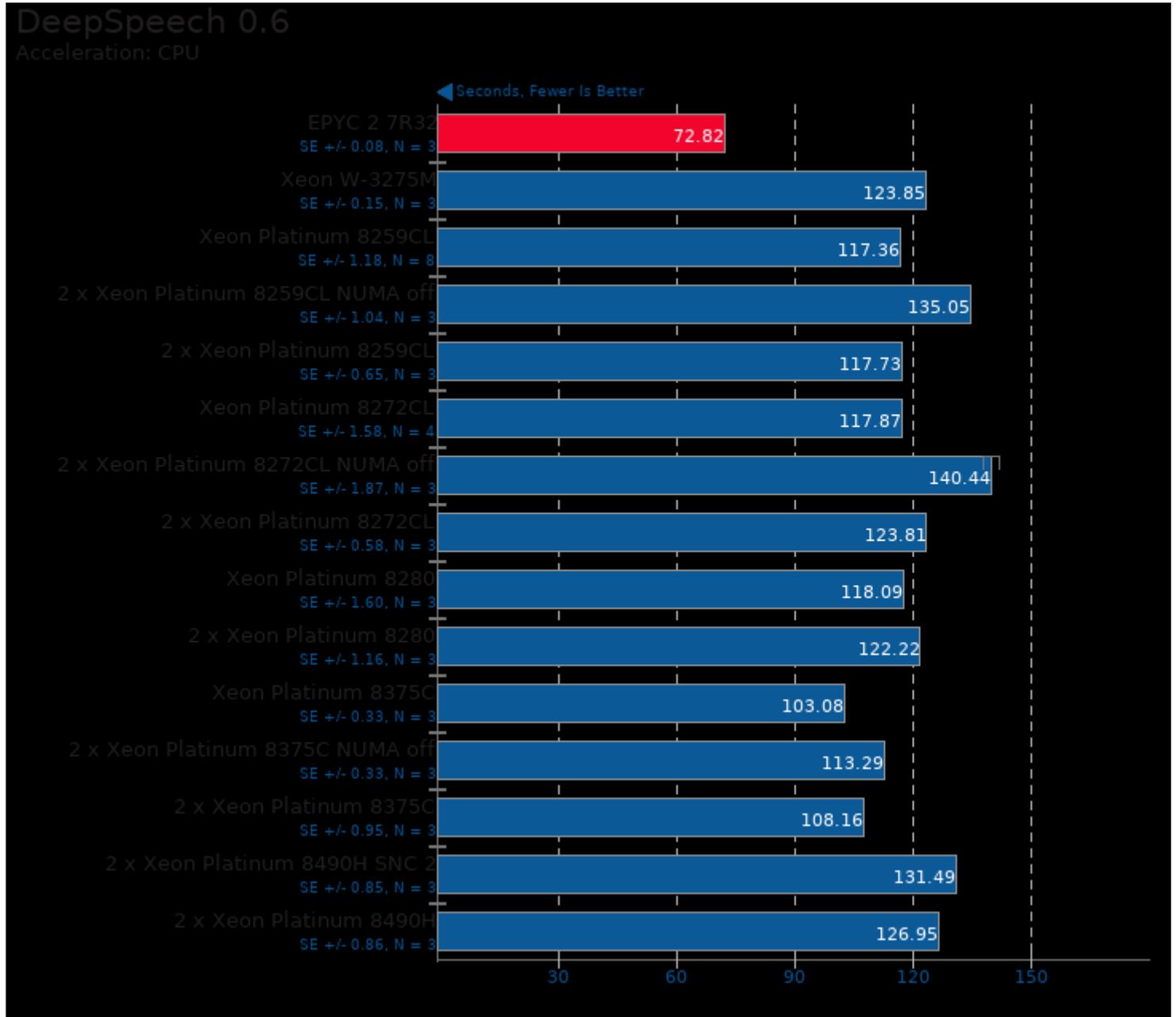
## Zstd Compression 1.3.4

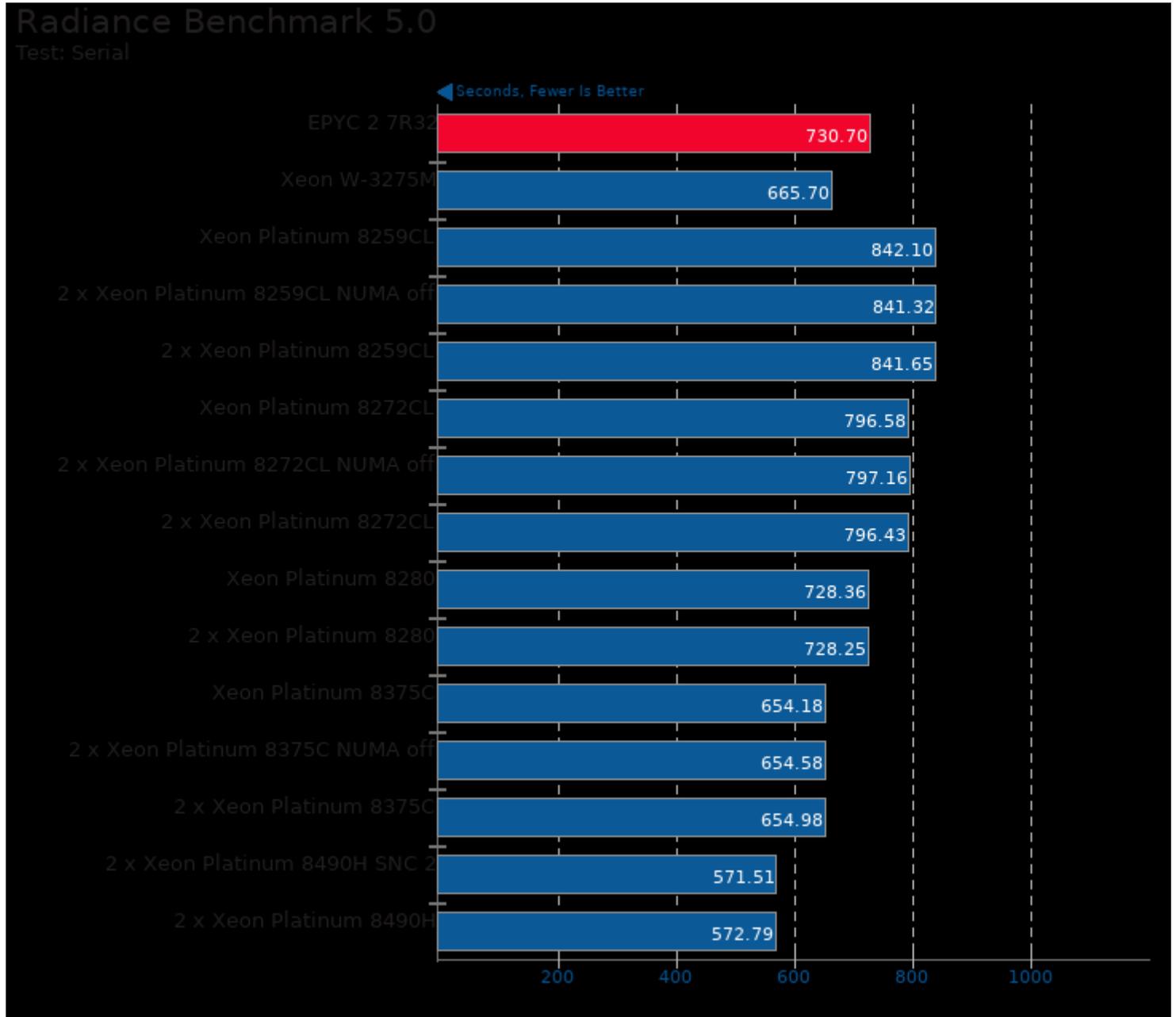
Compressing ubuntu-16.04.3-server-i386.img, Compression Level 19

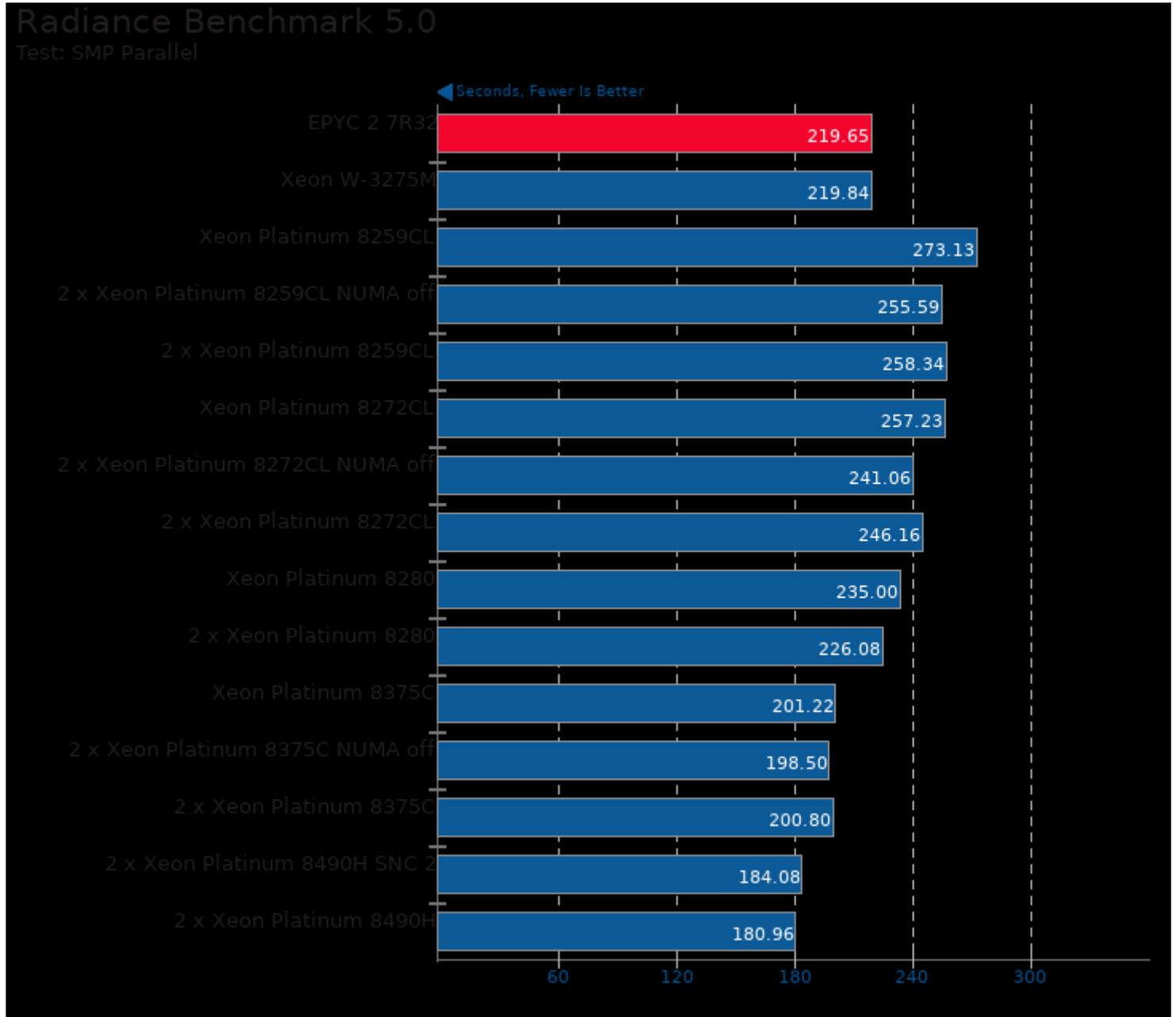
Seconds, Fewer Is Better



1. (CC) gcc options: -O3







## Intel MPI Benchmarks 2019.3

Test: IMB-P2P PingPong

Average Msg/sec, More Is Better

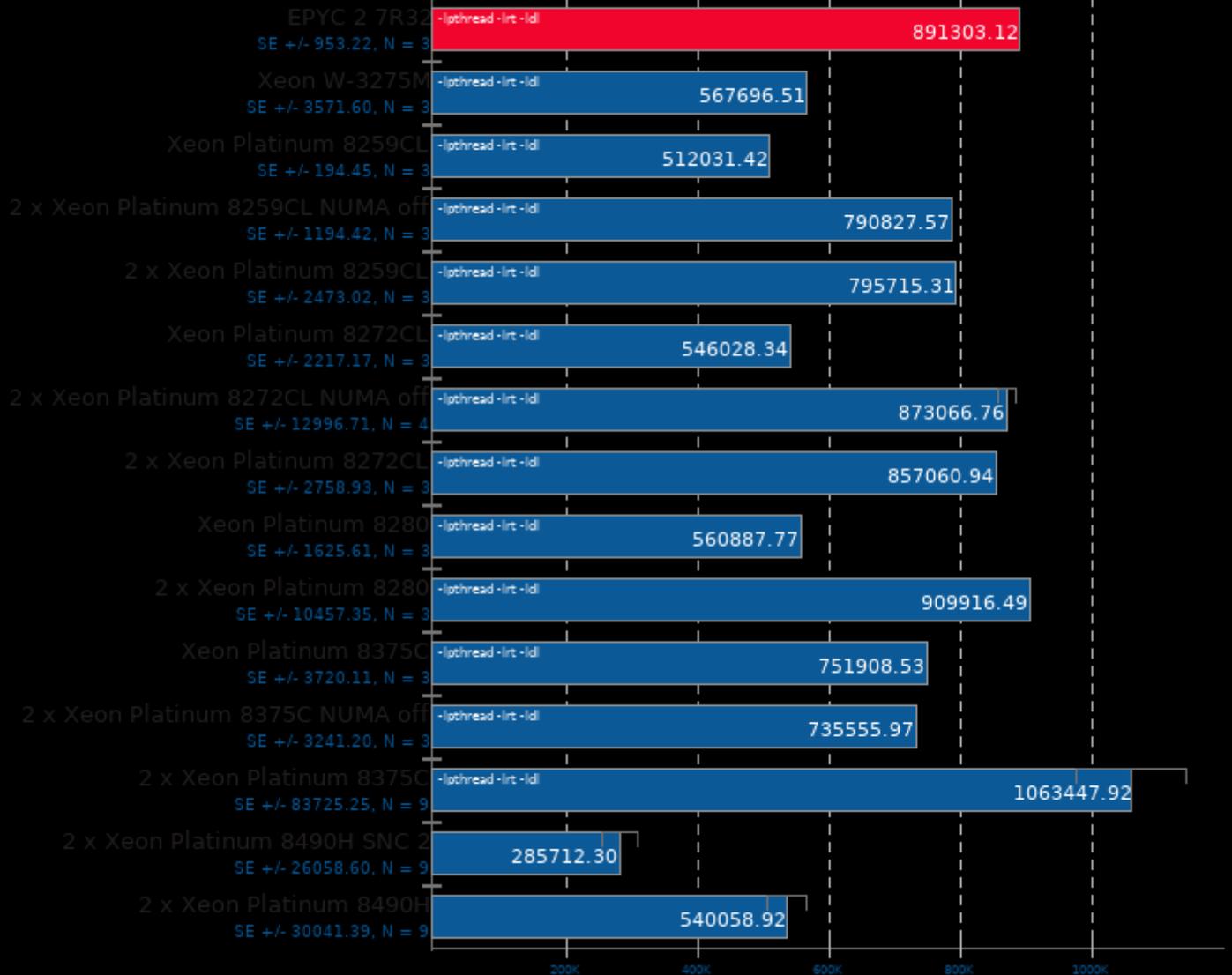


1. (CXX) g++ options: -O0 -pedantic -fopenmp -lmpi\_cxx -lmpi

## PostgreSQL pgbench 12.0

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

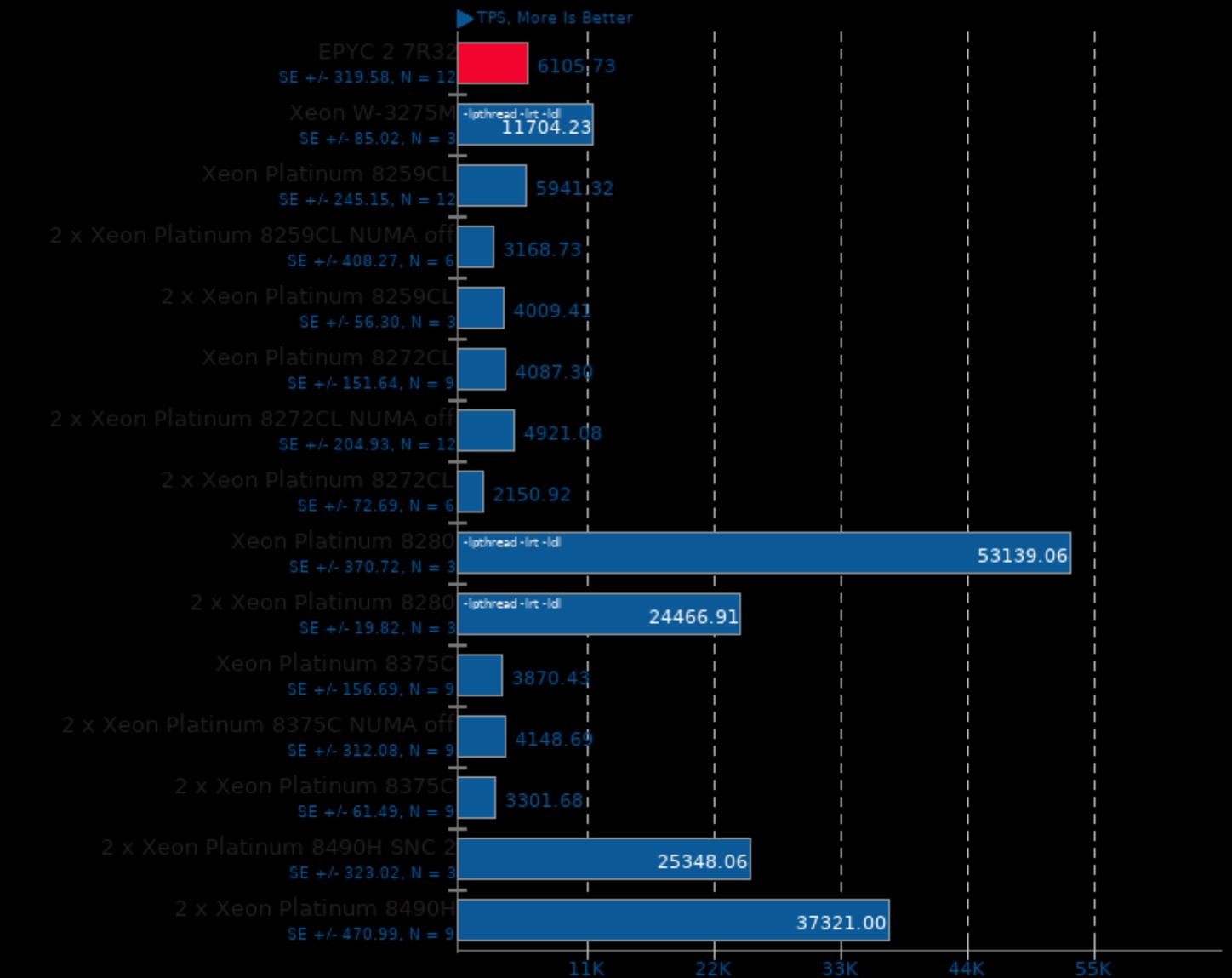
▶ TPS, More Is Better



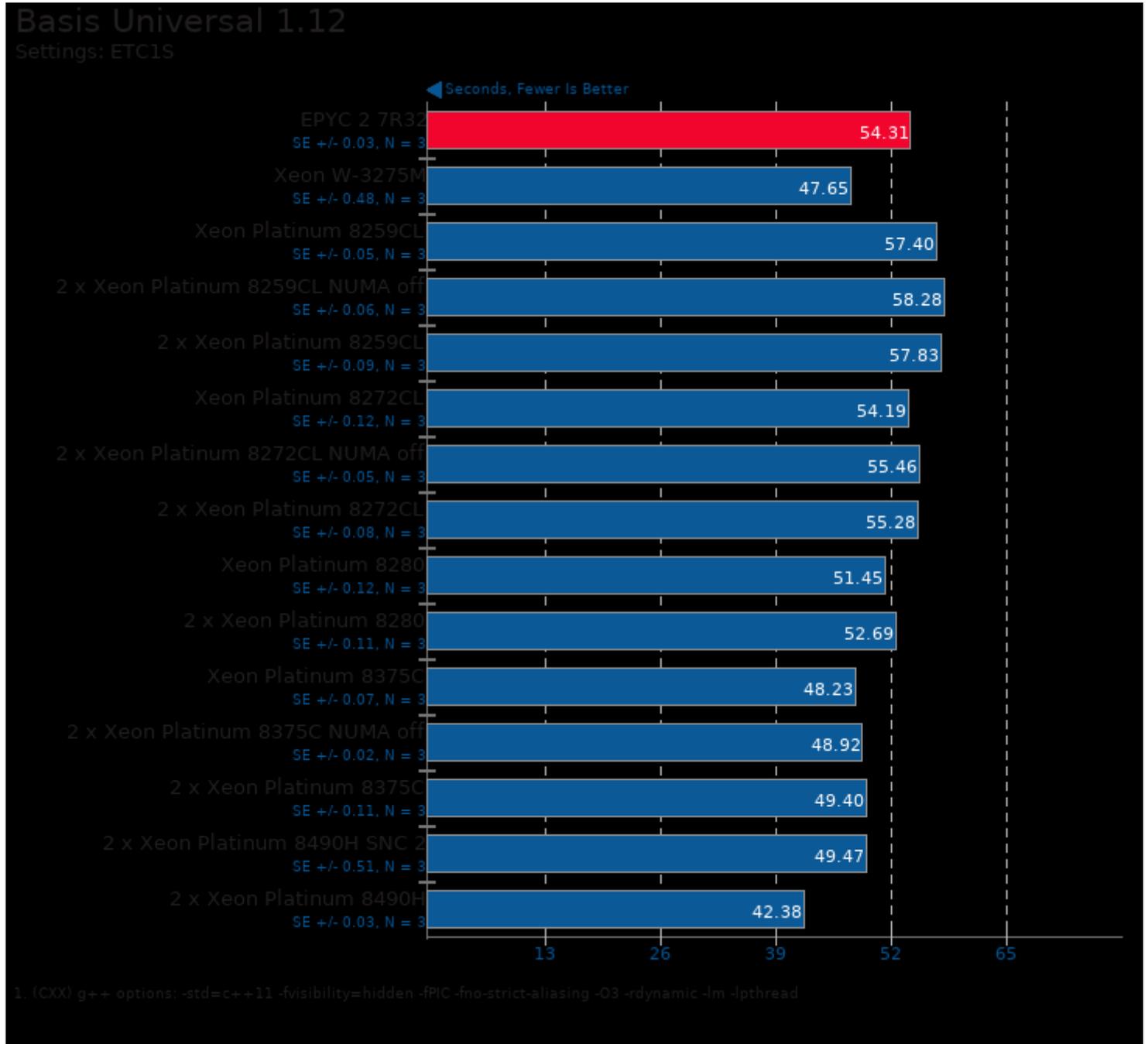
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lcrypt -lm

## PostgreSQL pgbench 12.0

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



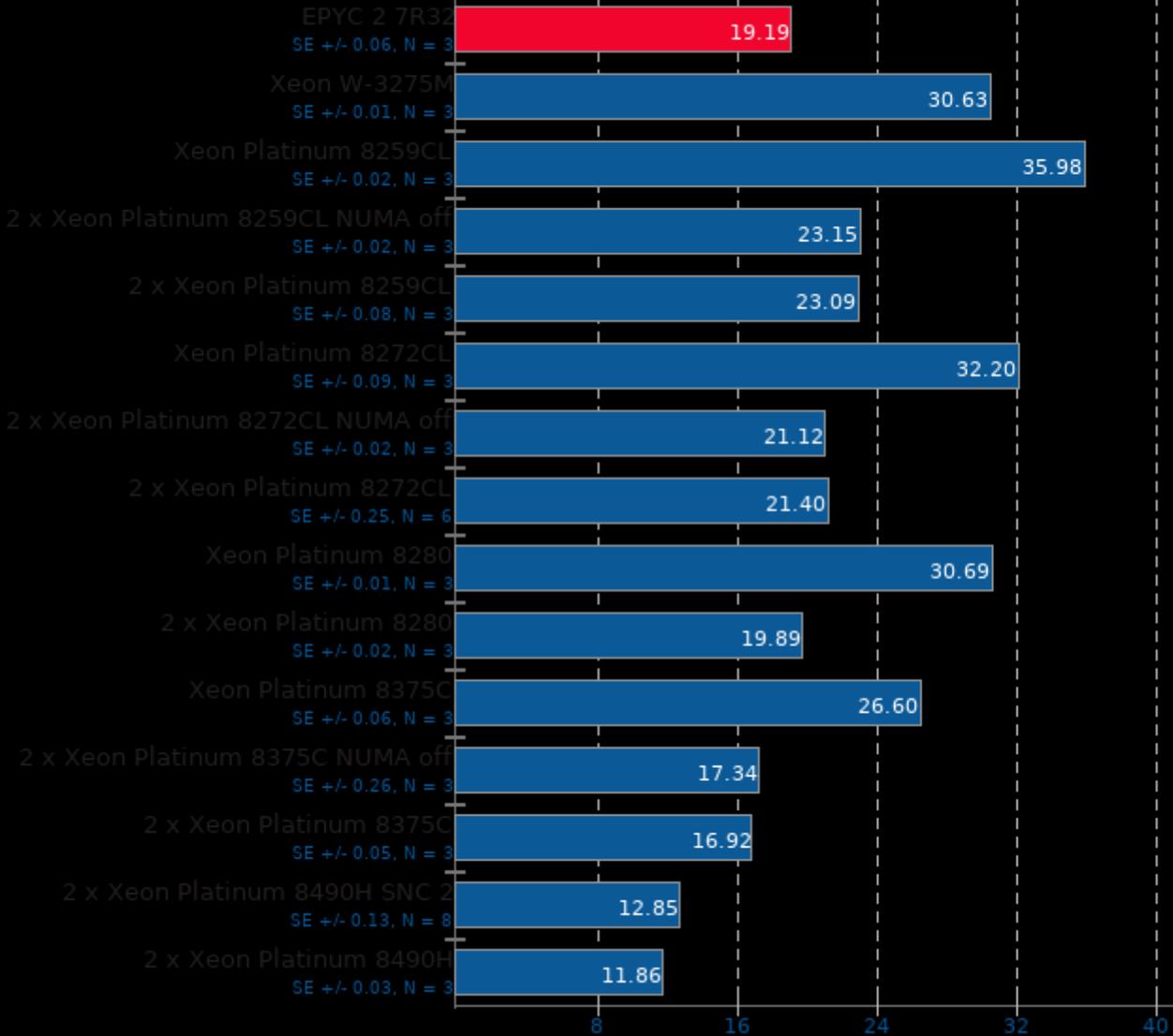
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lcrypt -lm



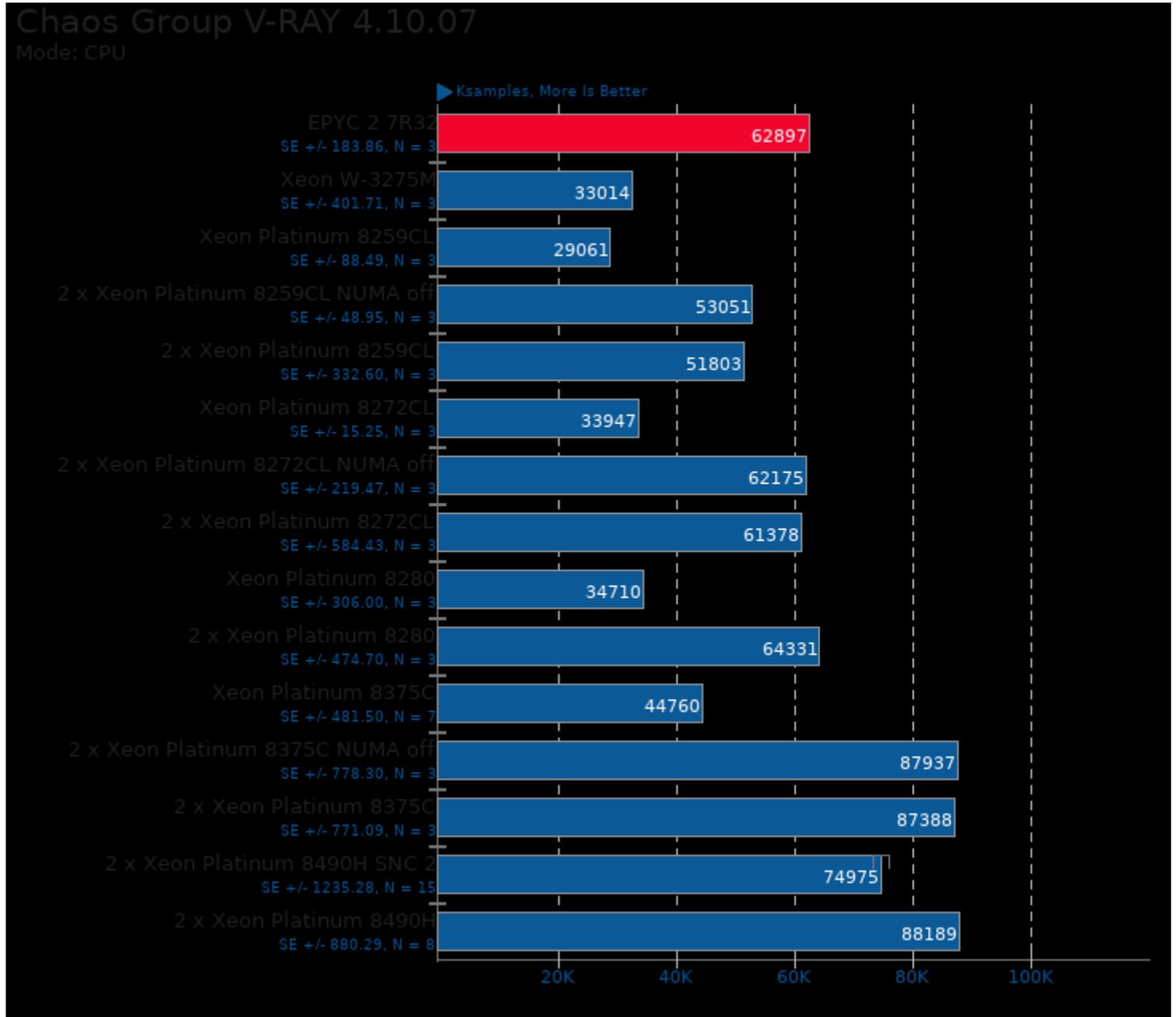
## Basis Universal 1.12

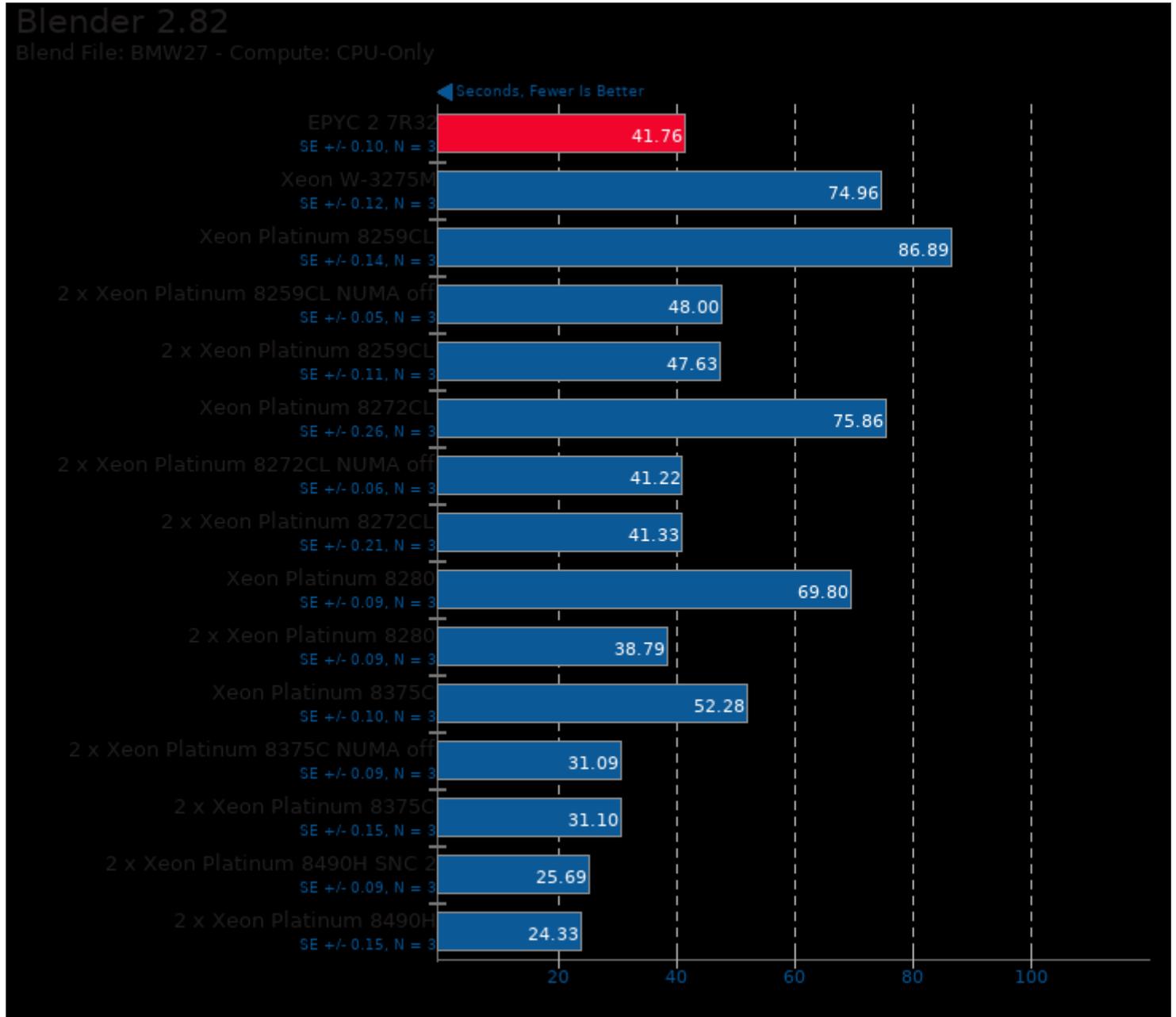
Settings: UASTC Level 3

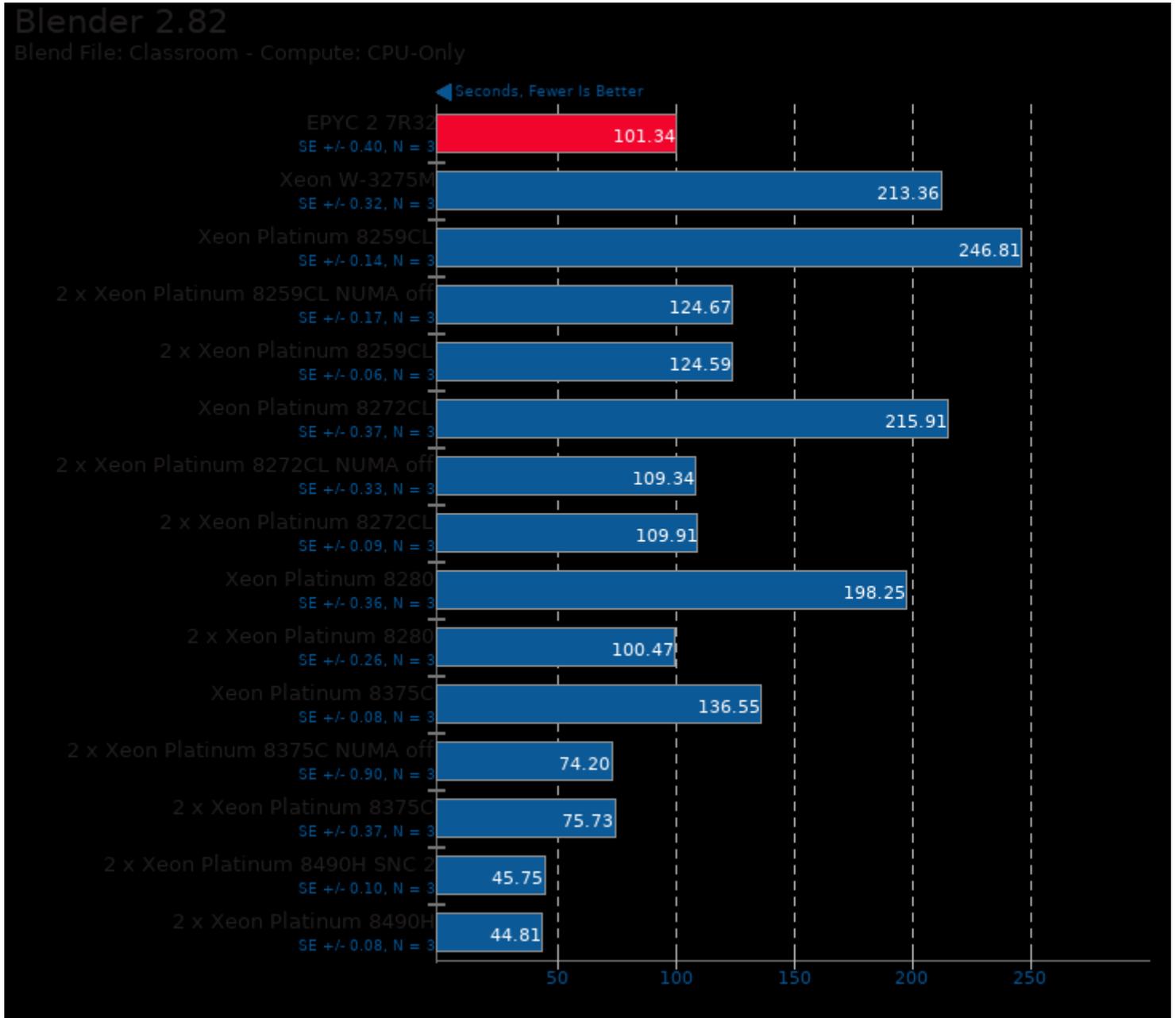
← Seconds, Fewer Is Better

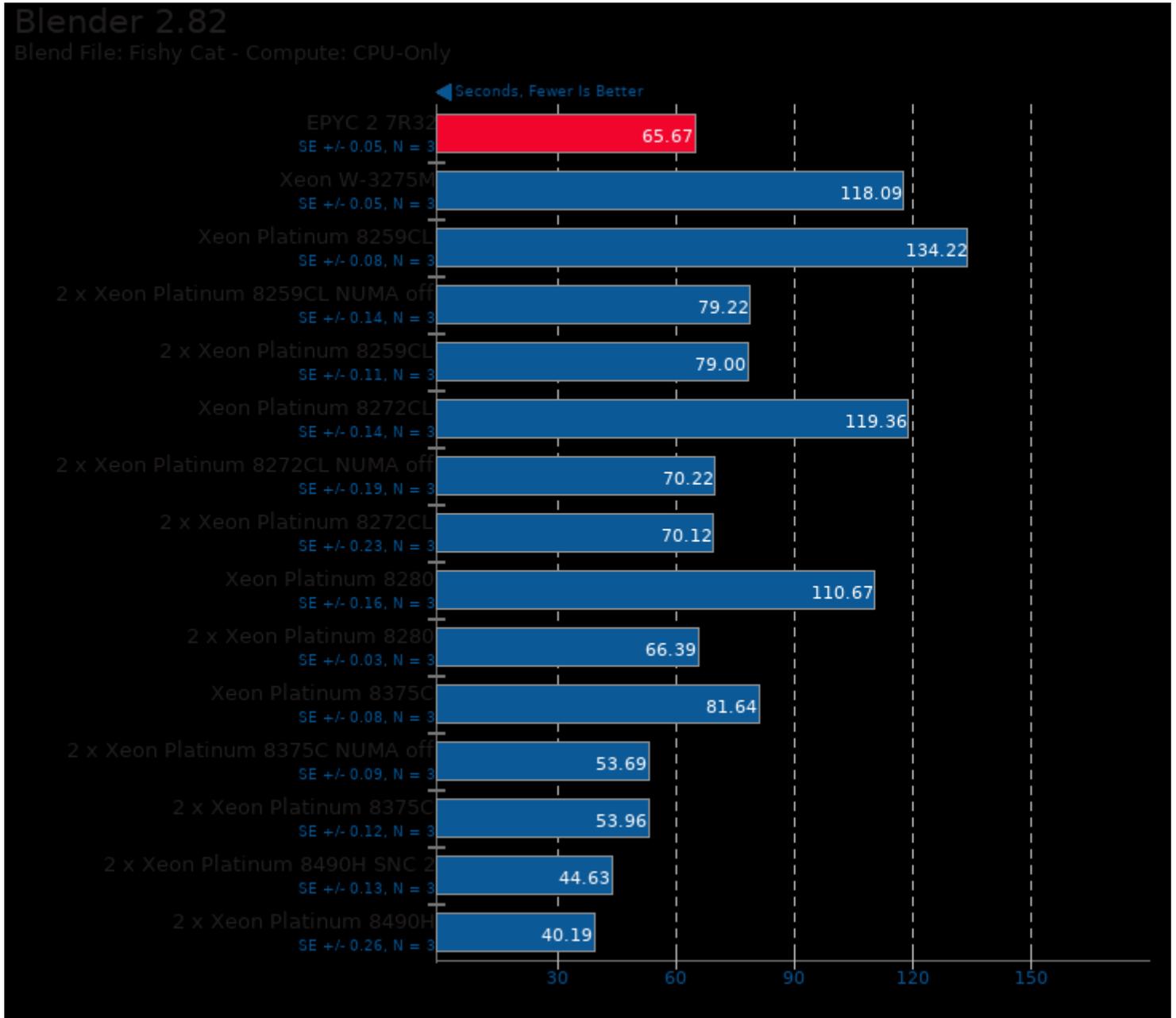


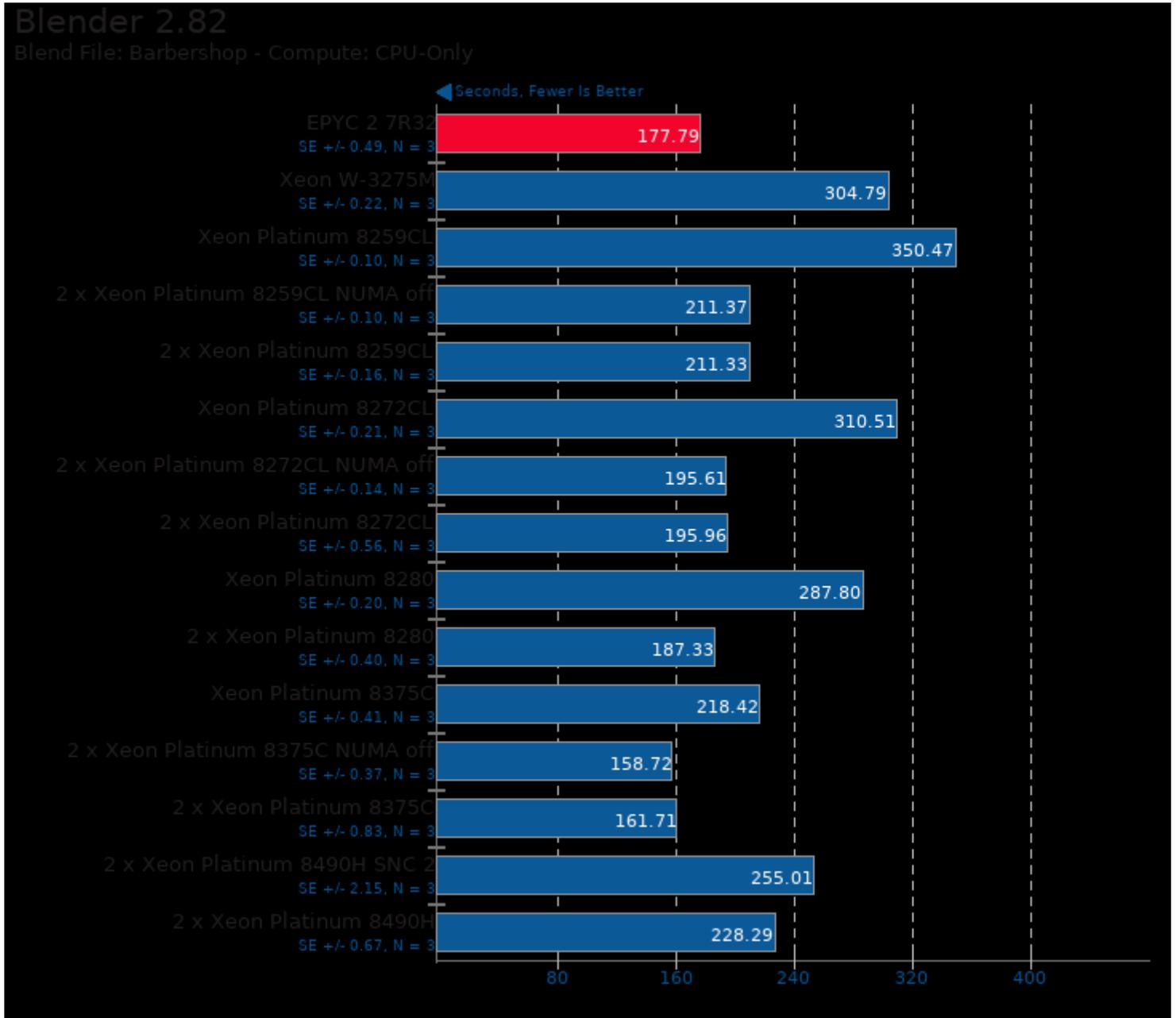
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

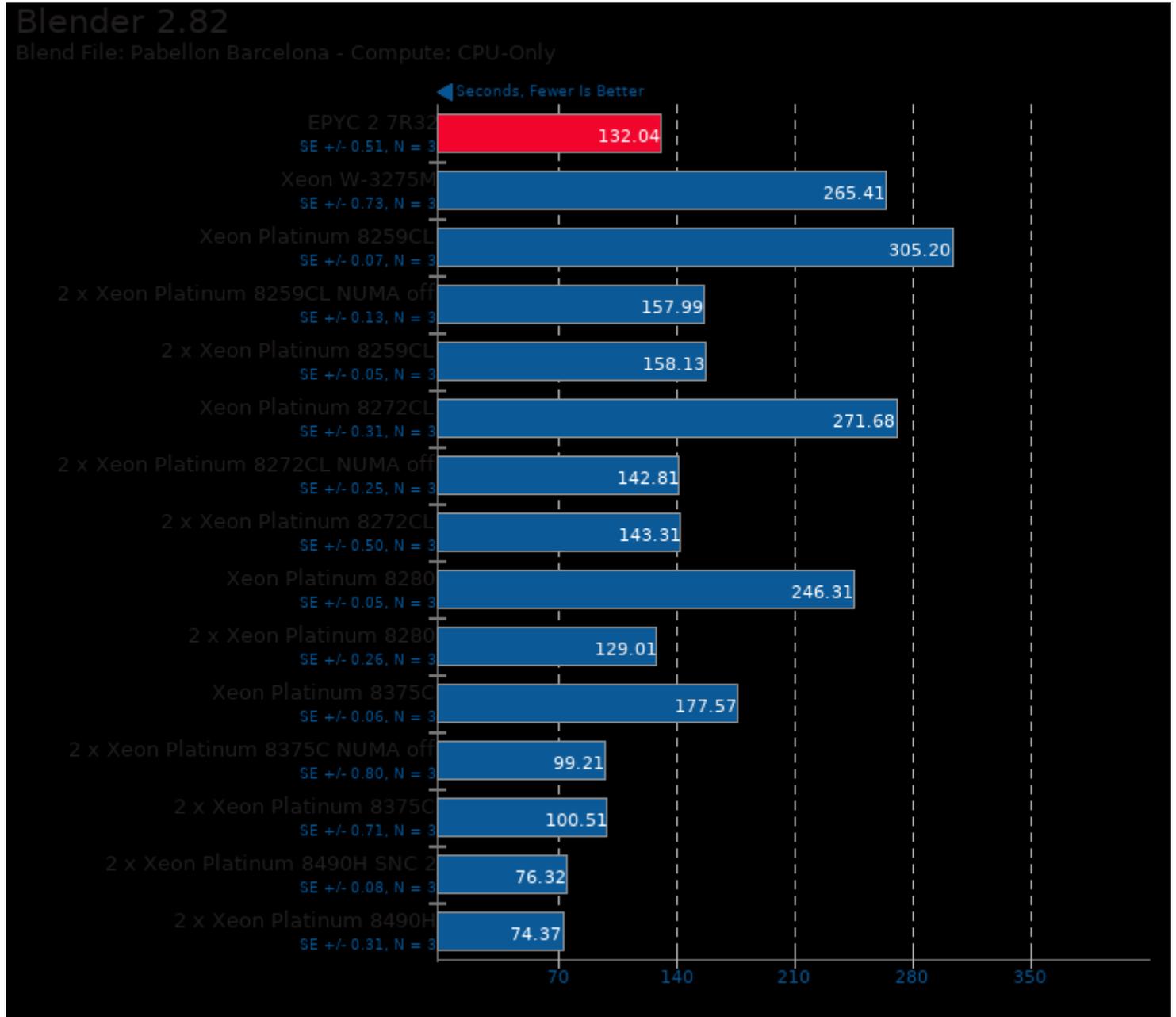


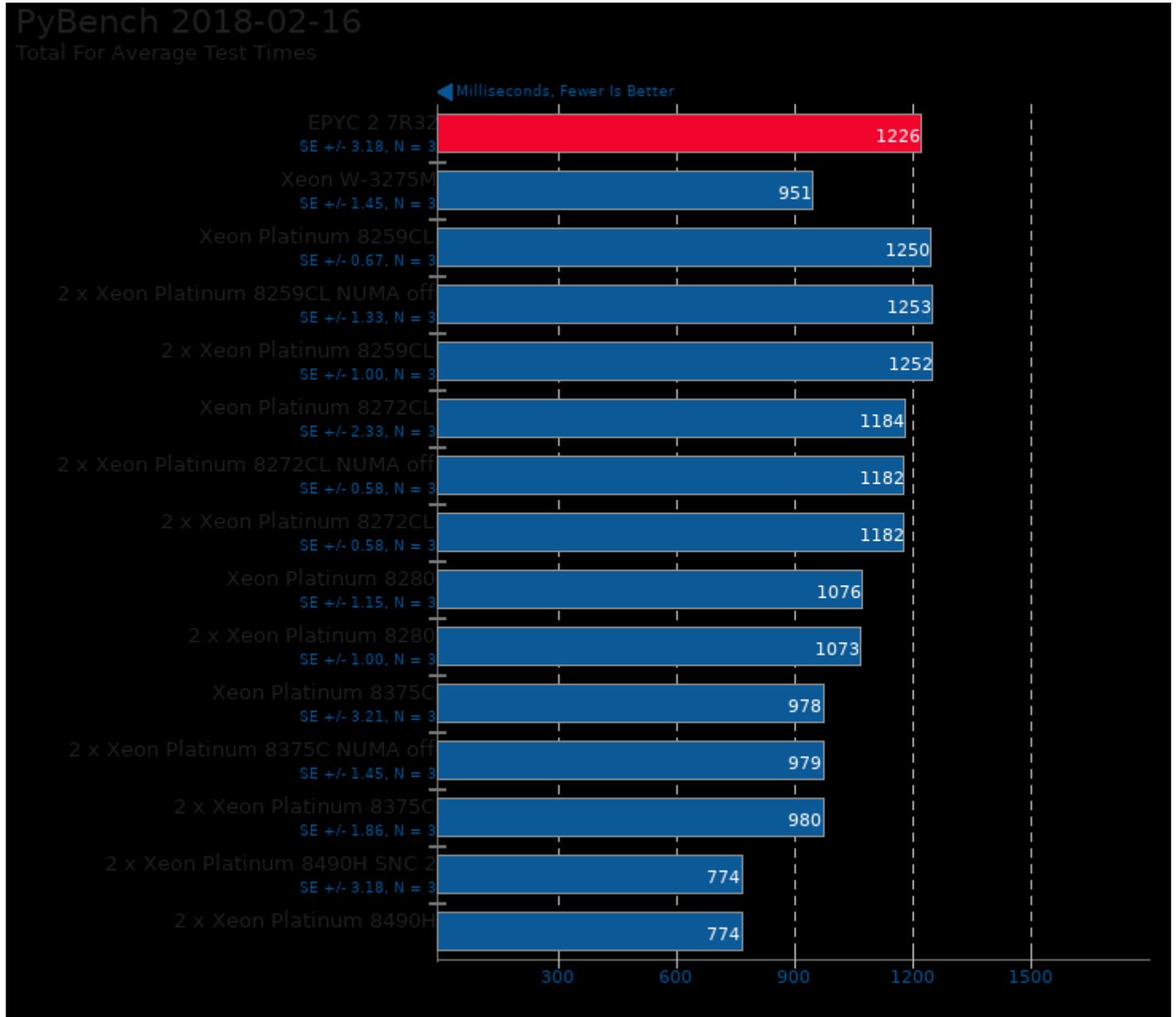


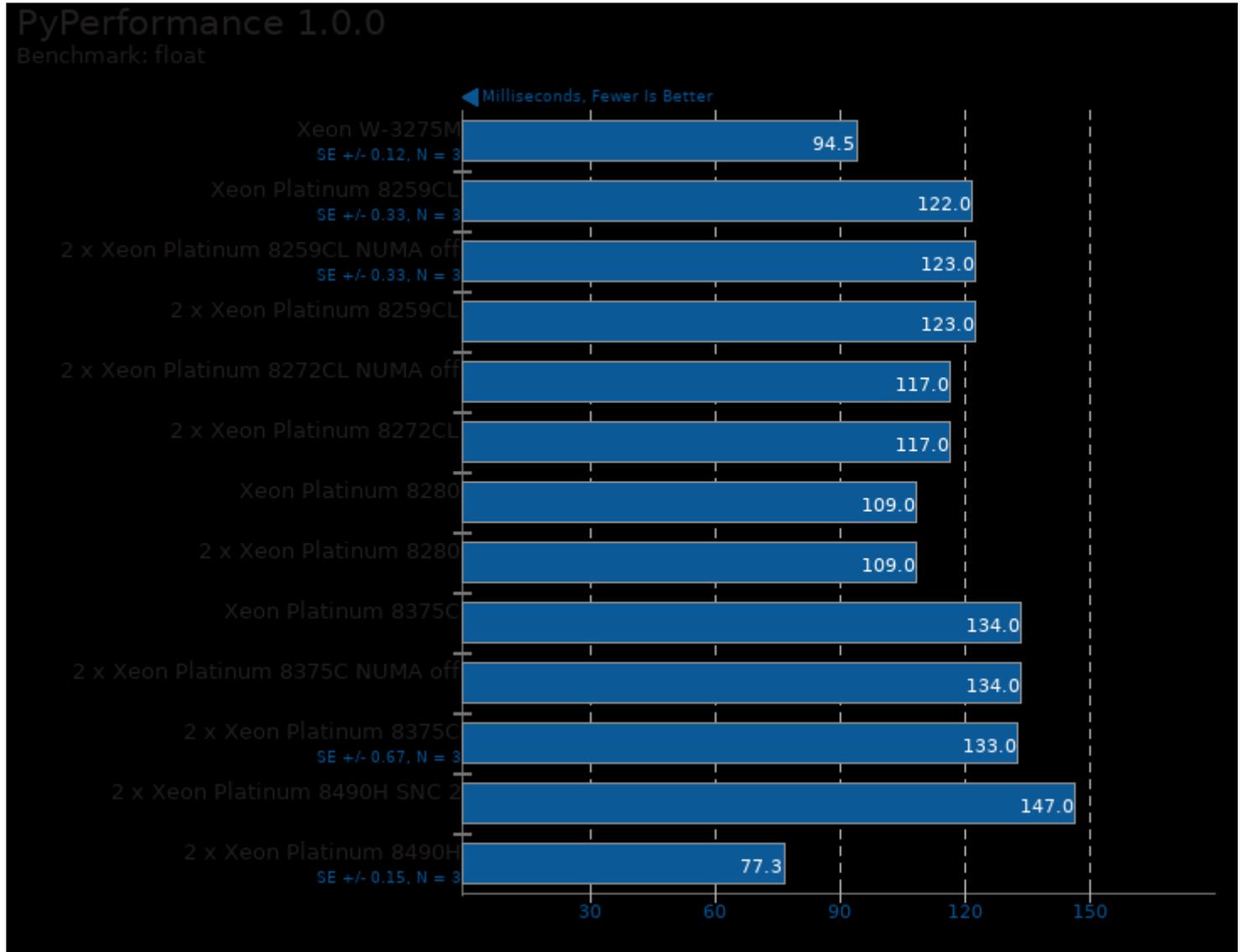


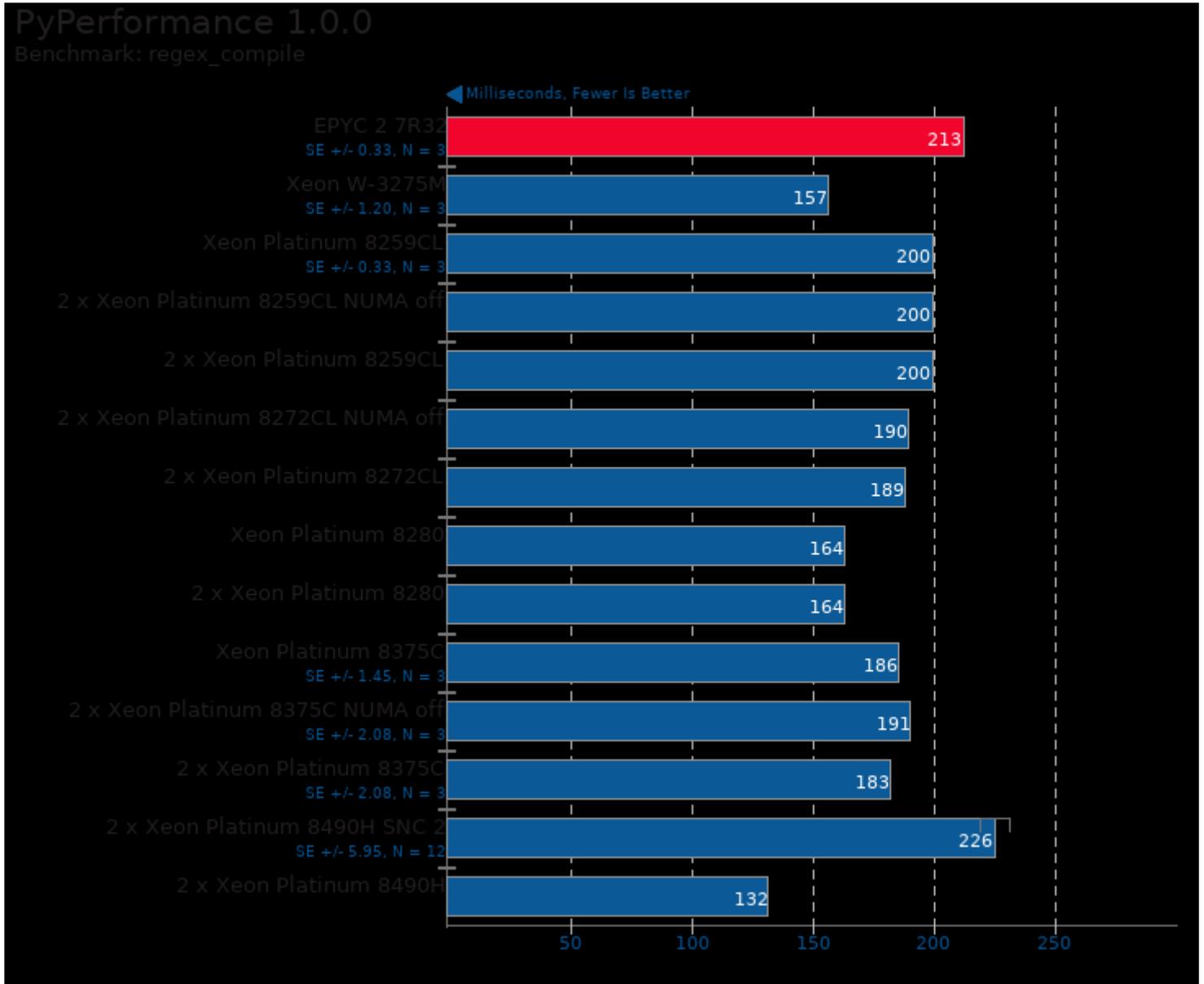


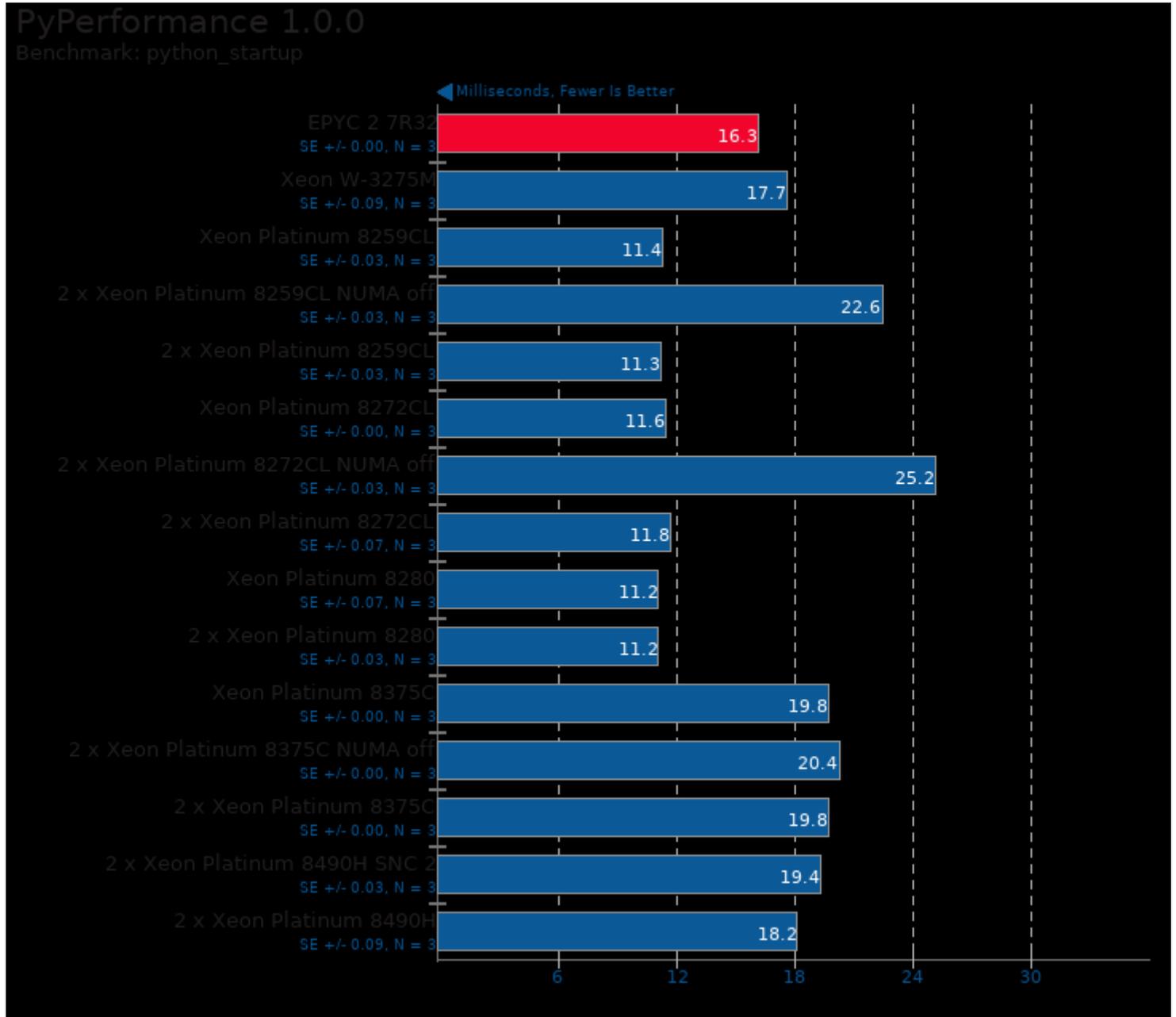


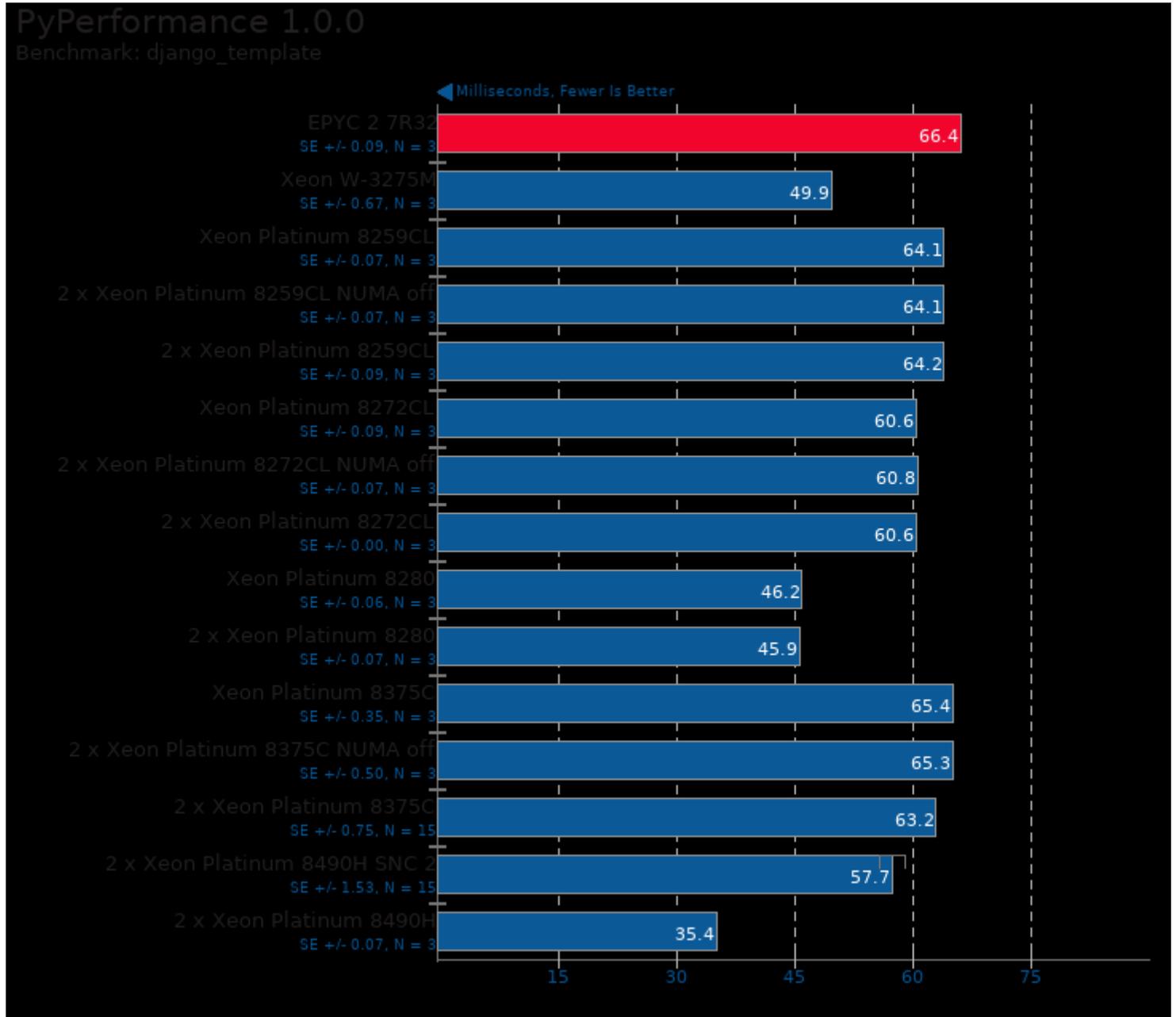


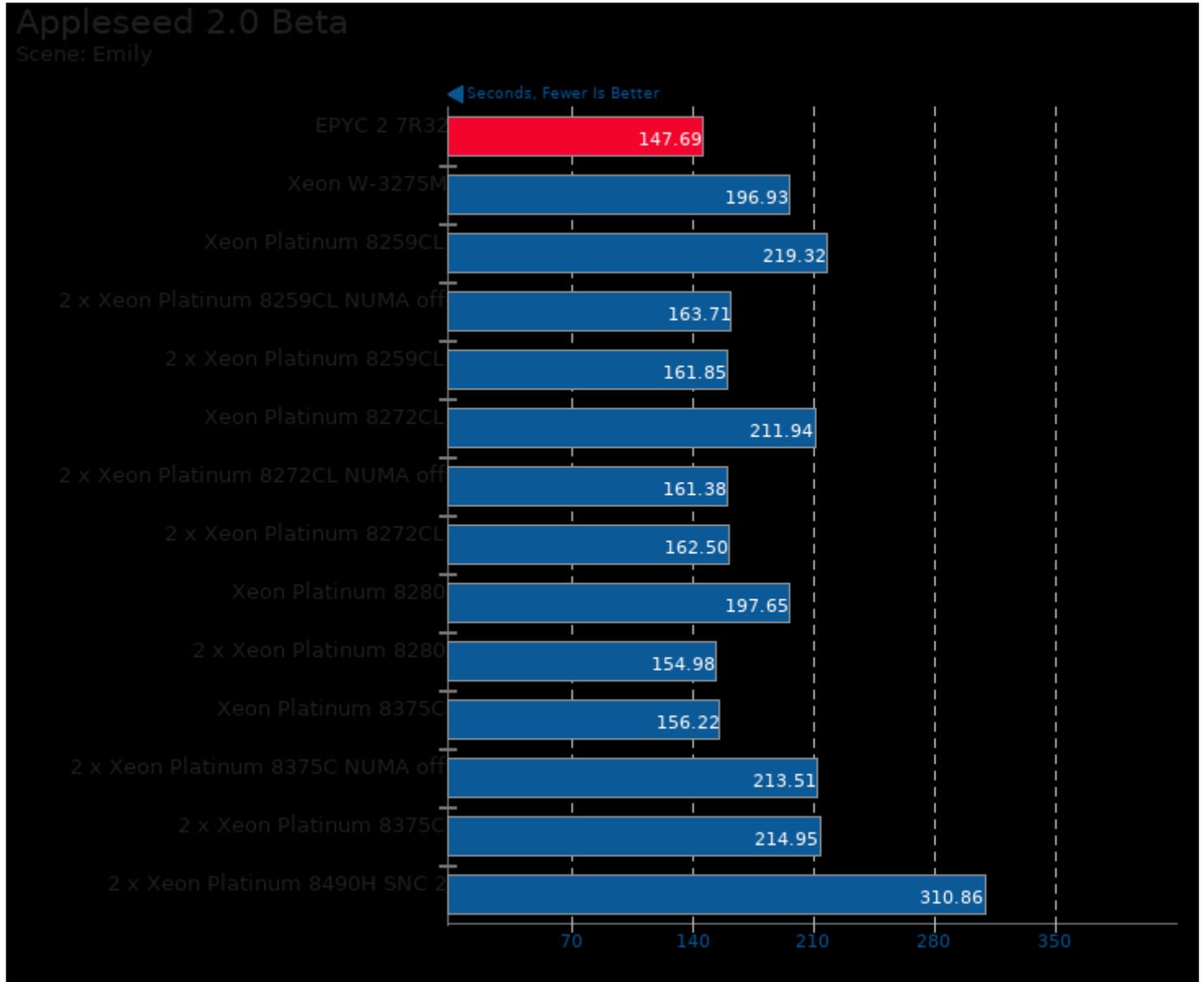


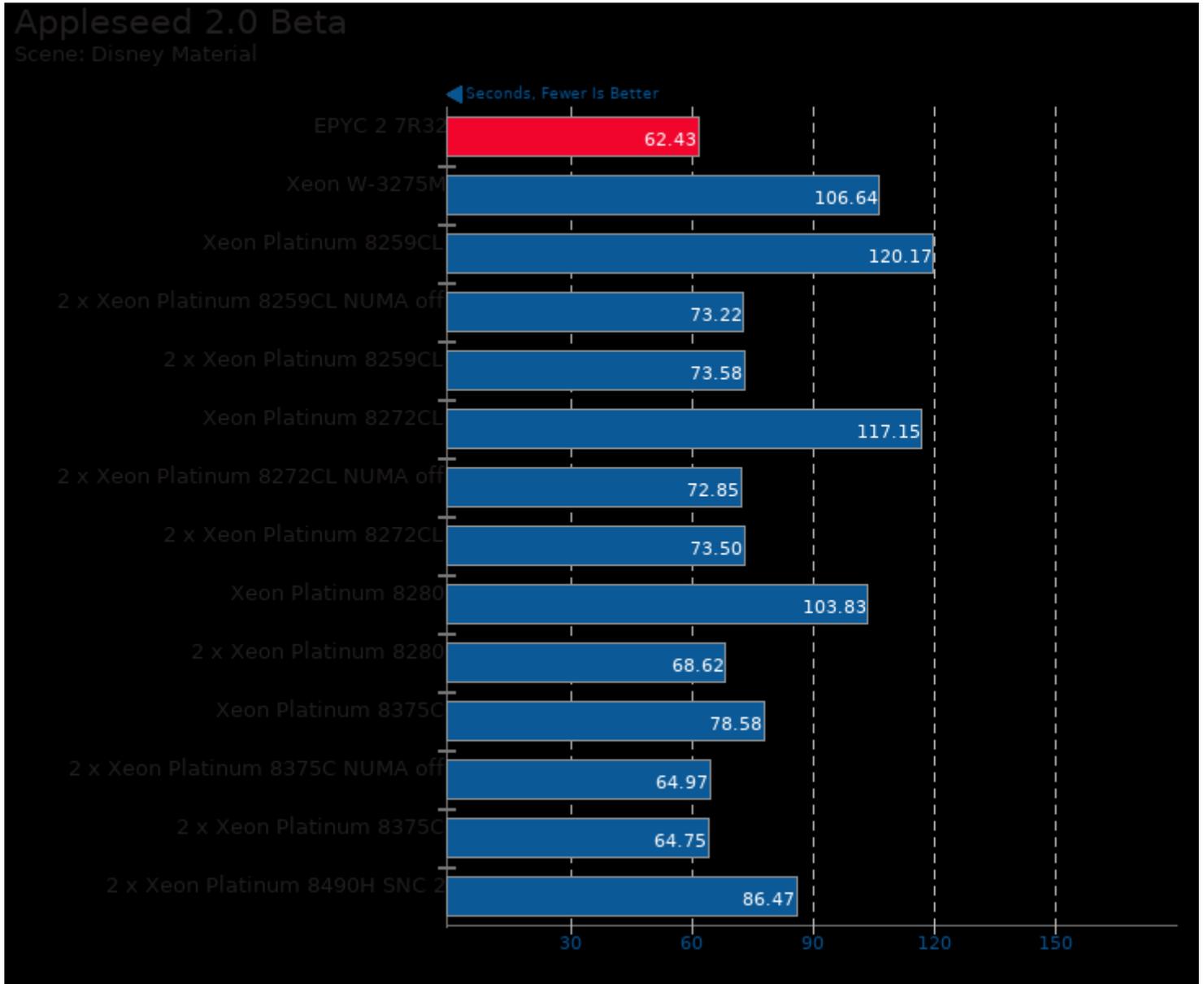


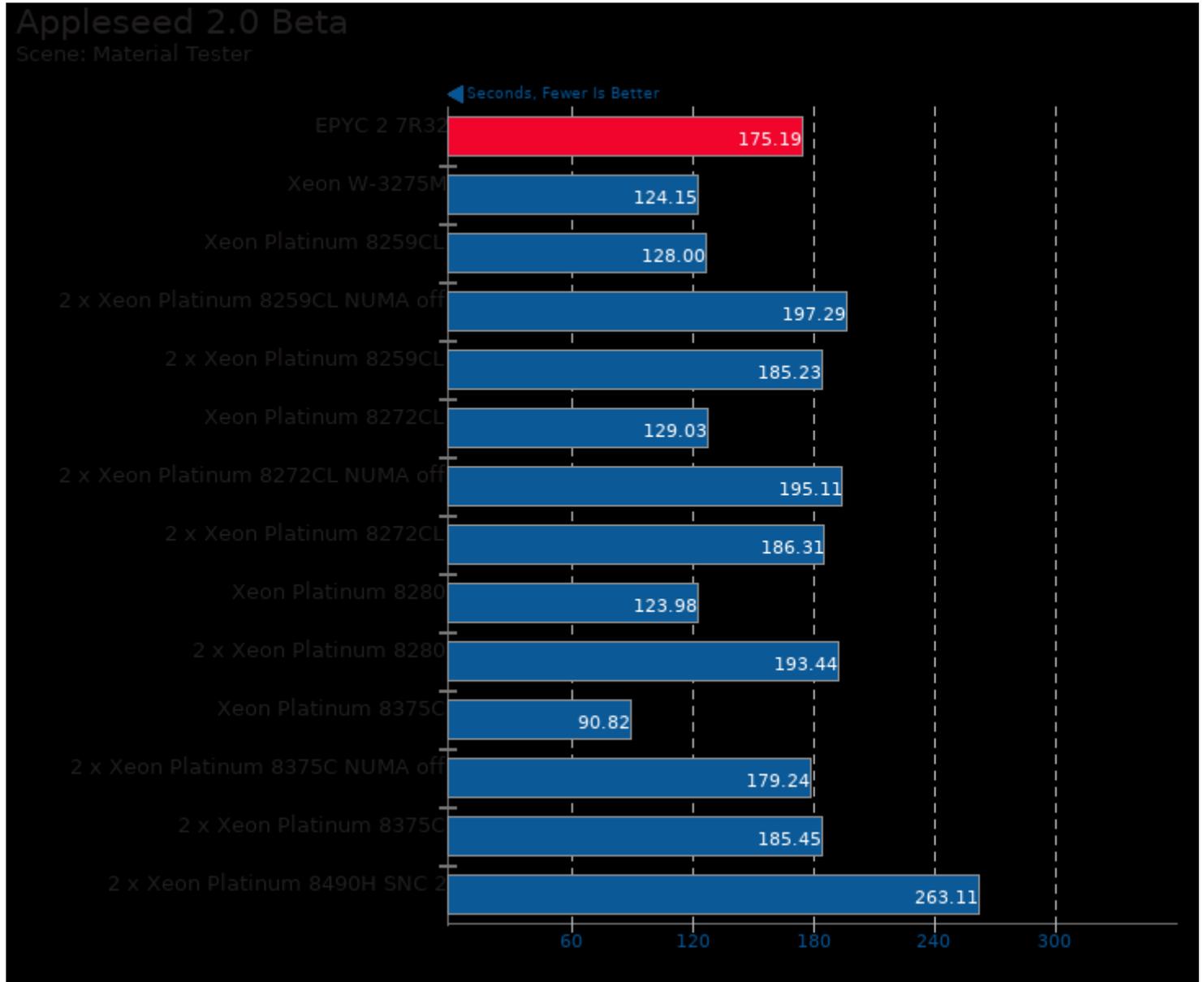


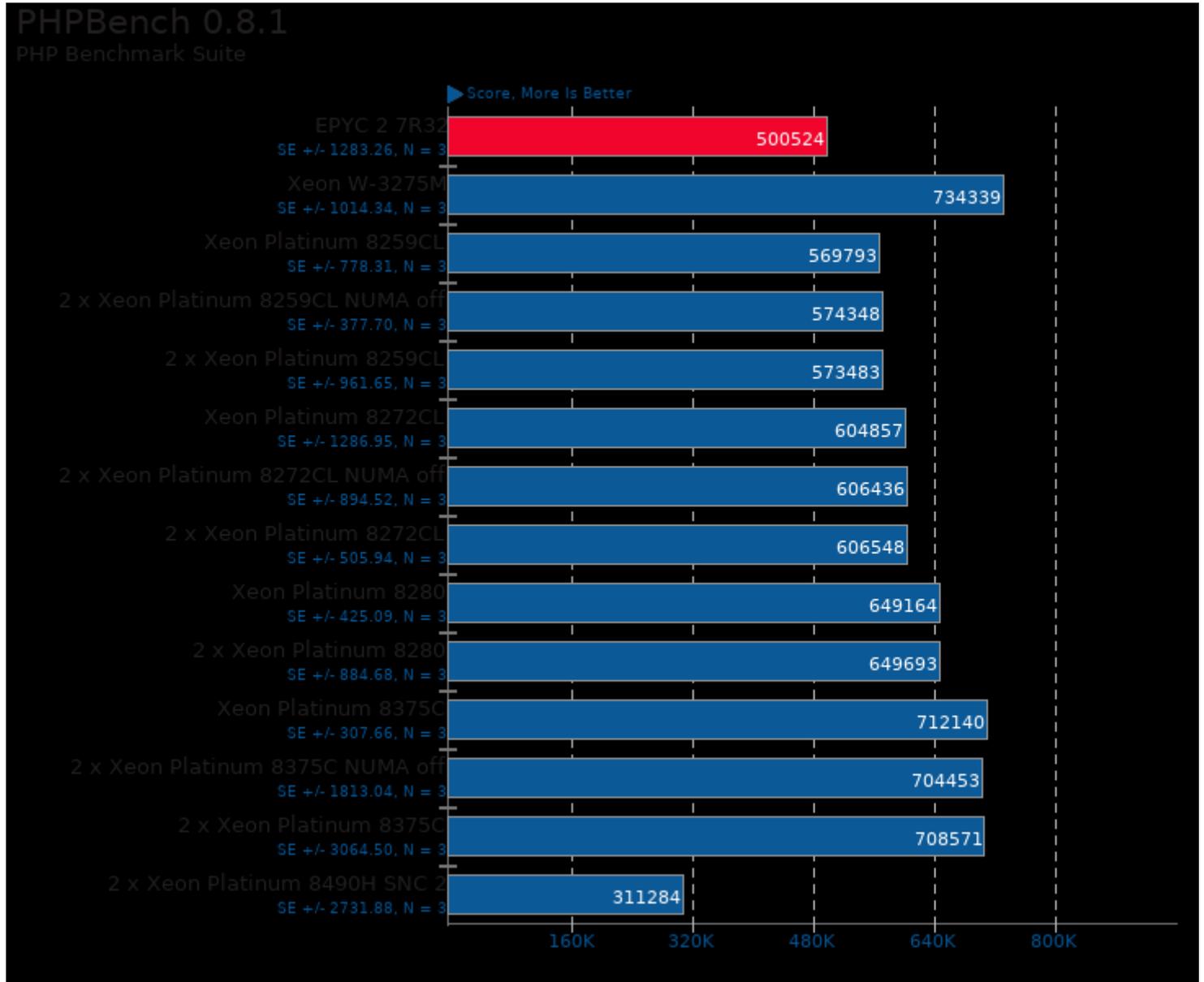


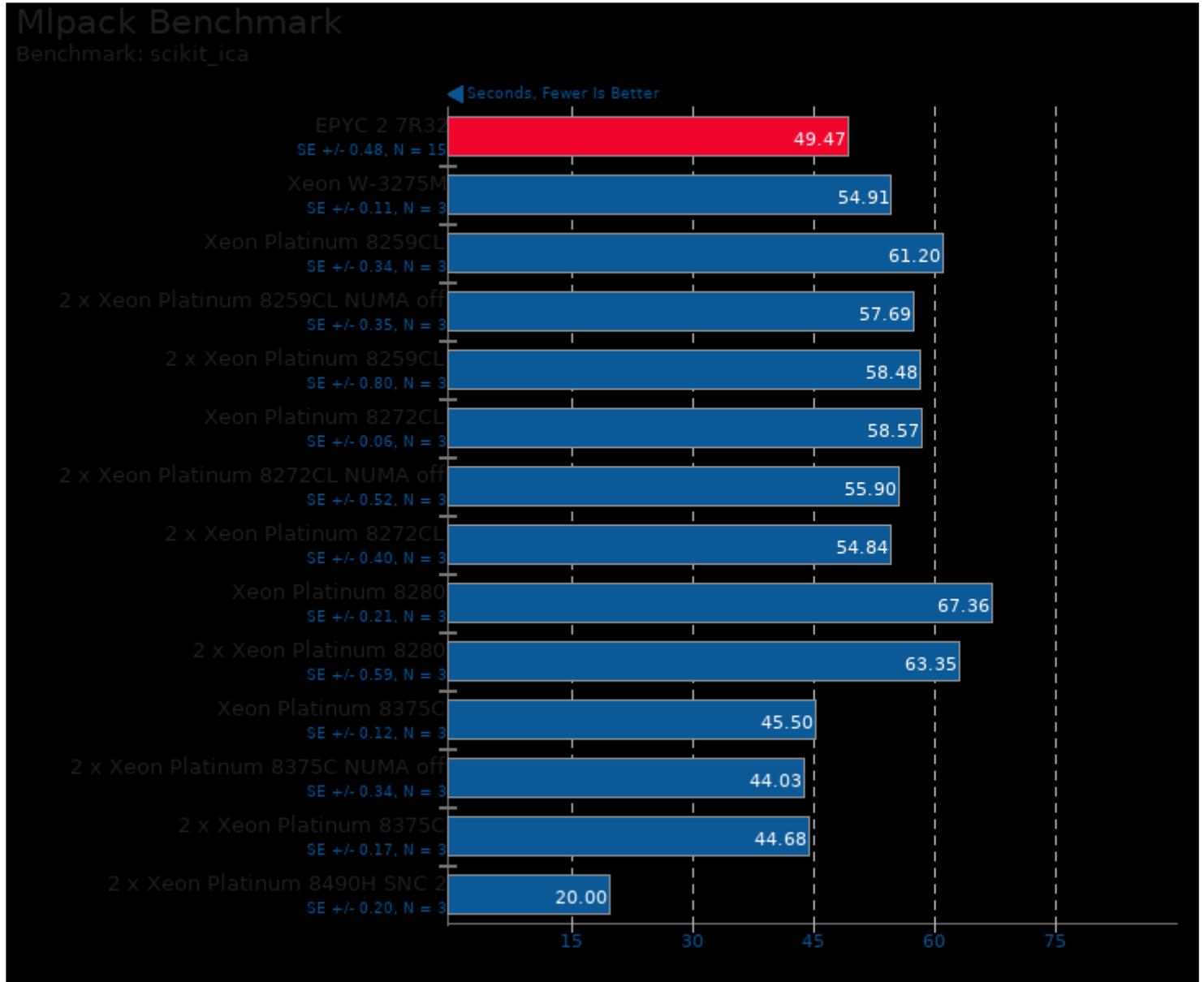


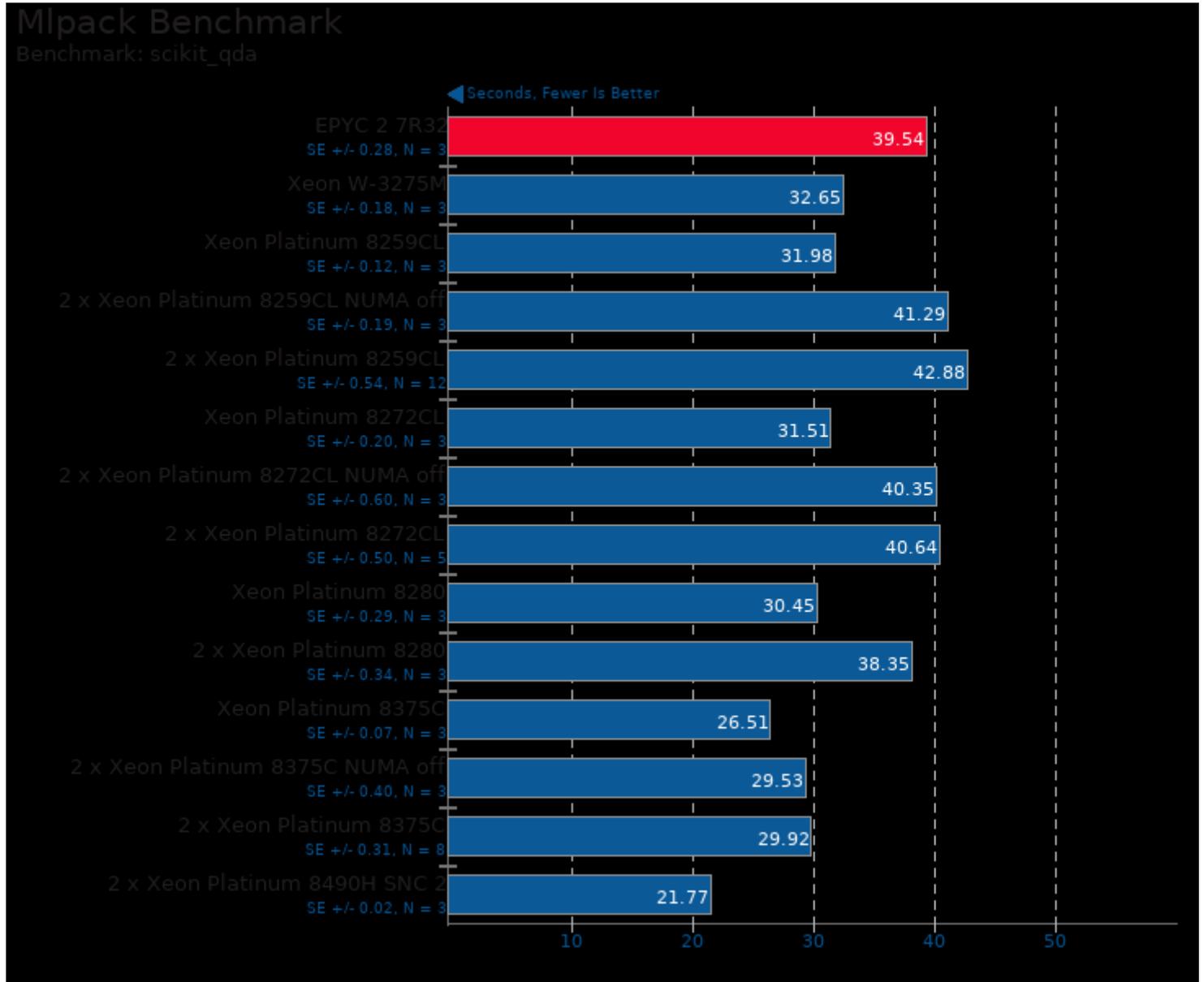


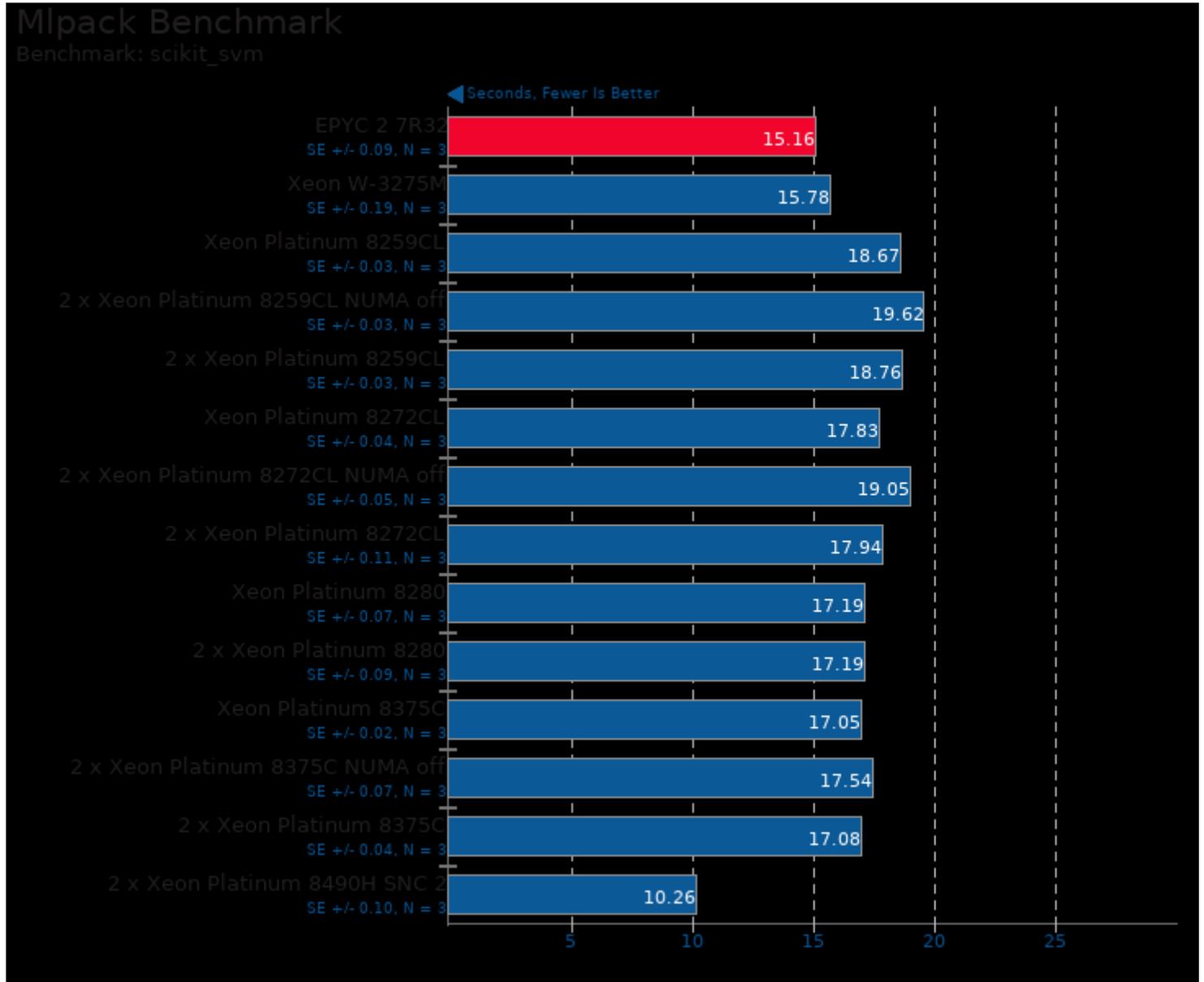


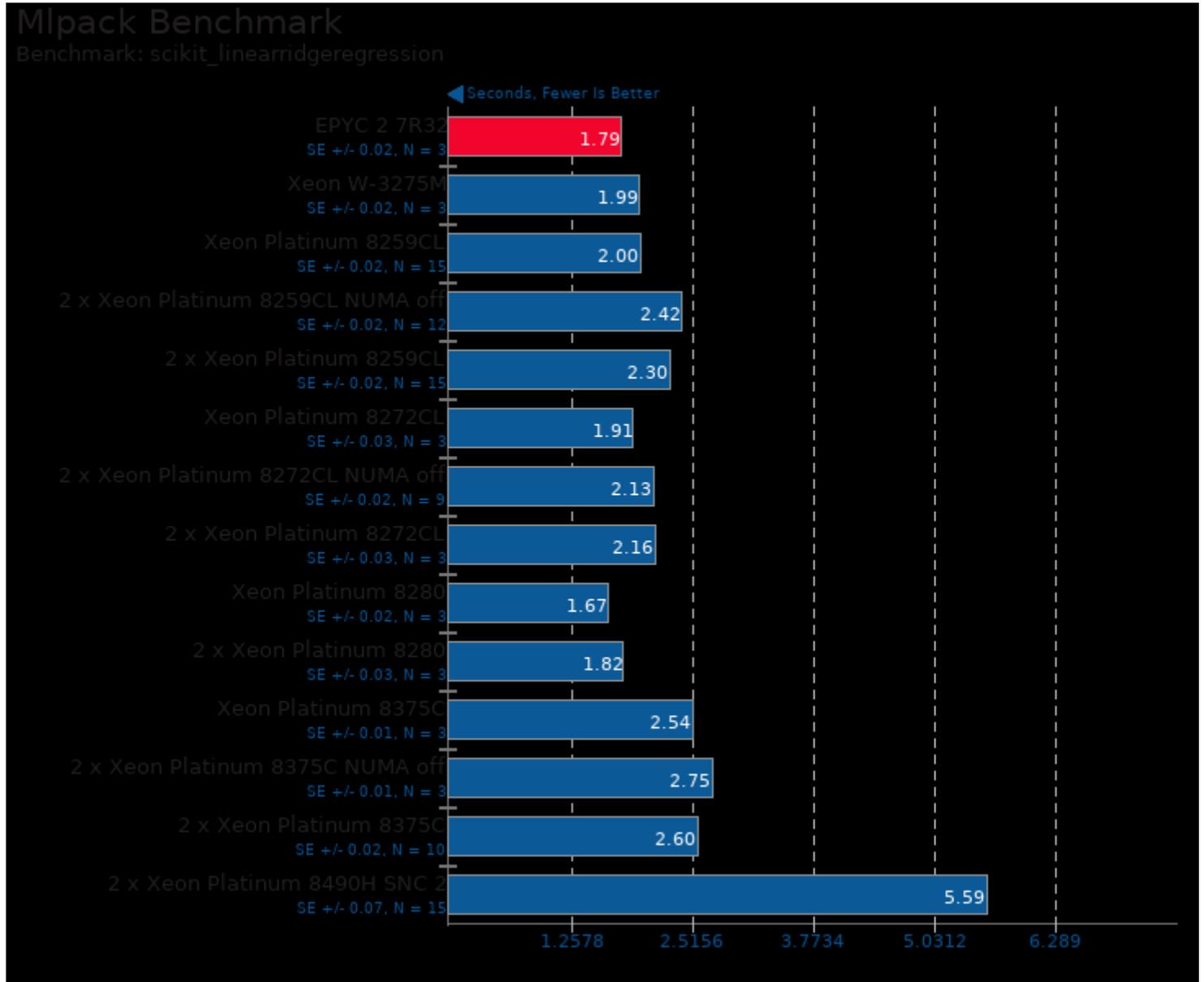


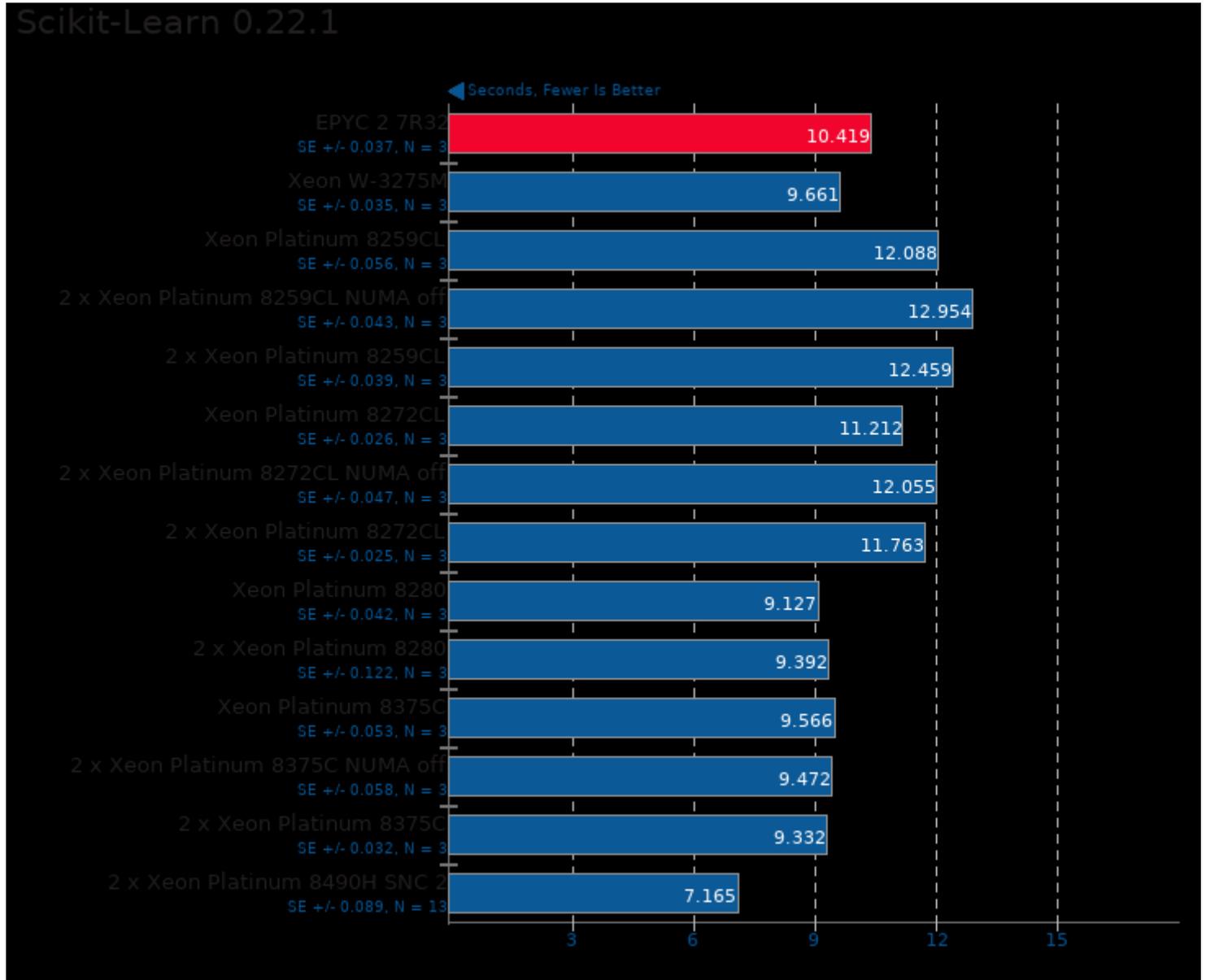


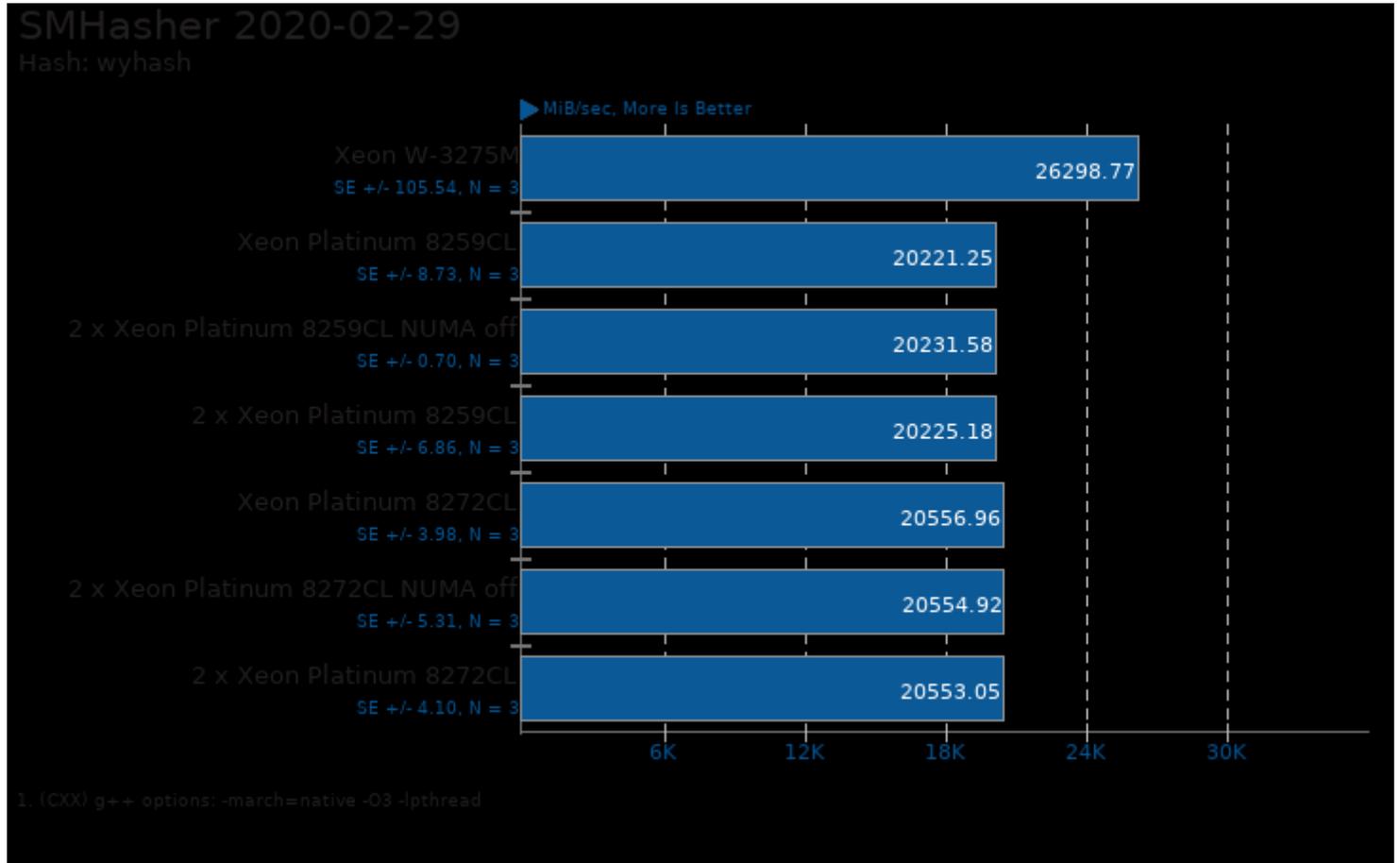




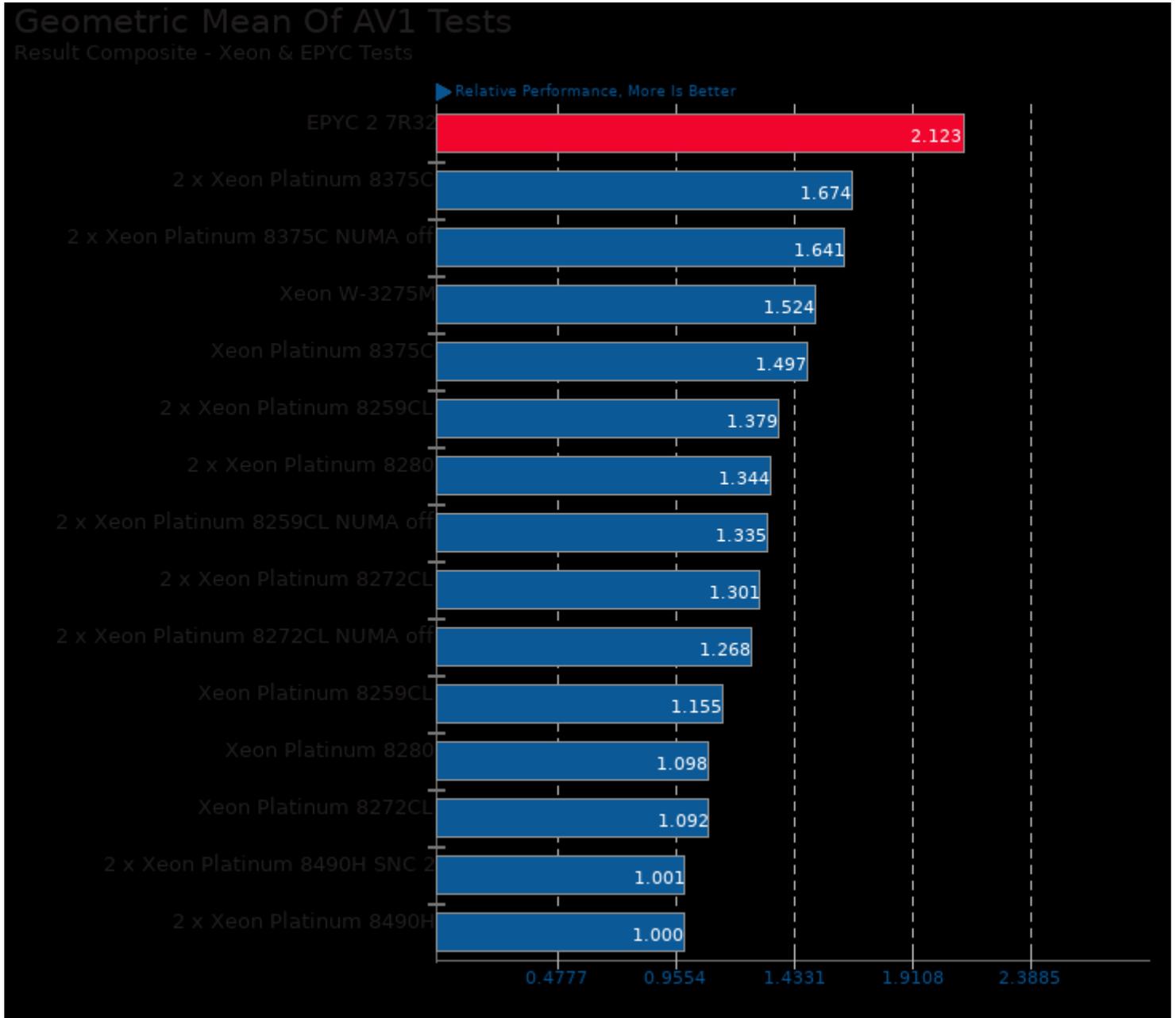




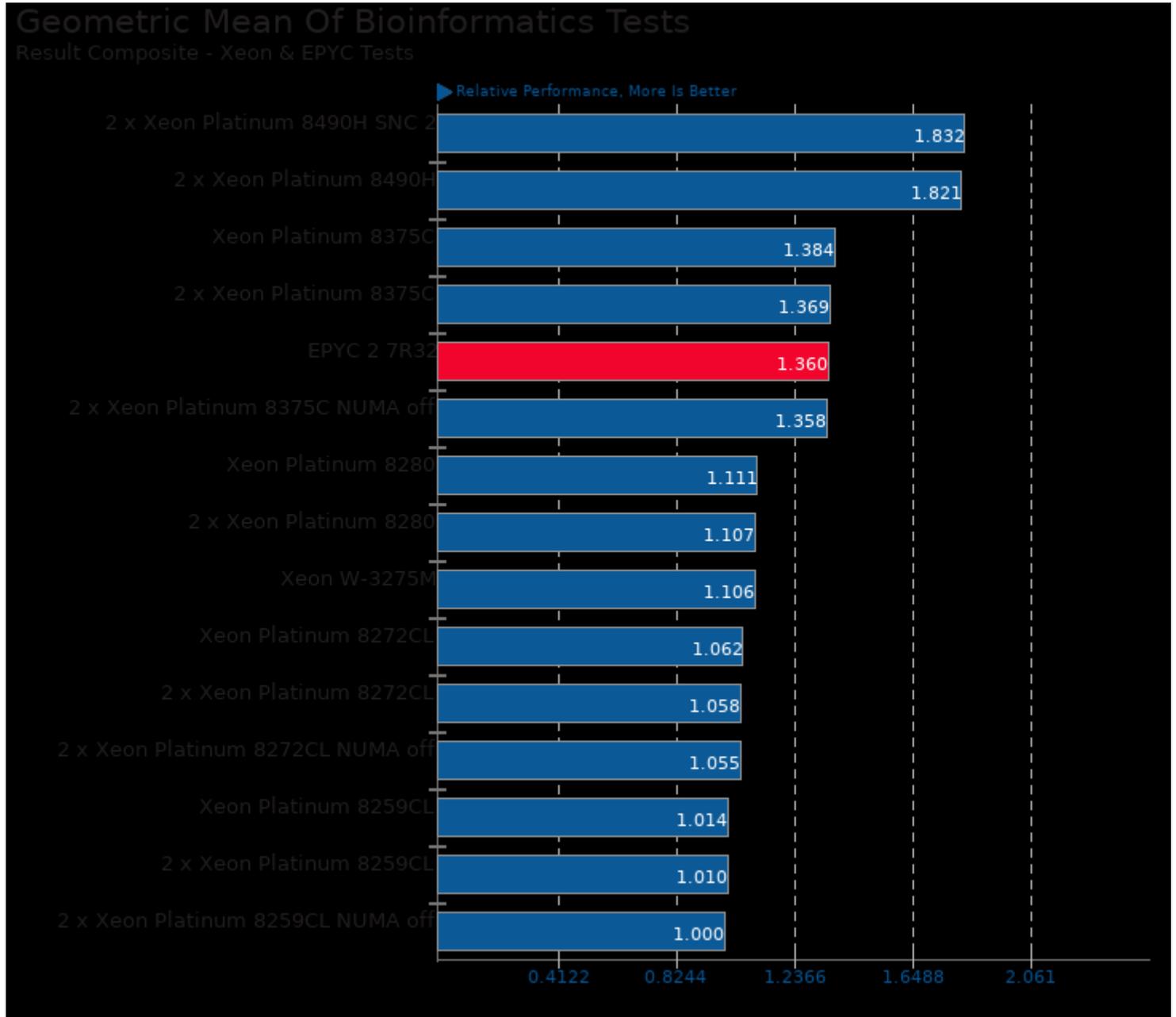




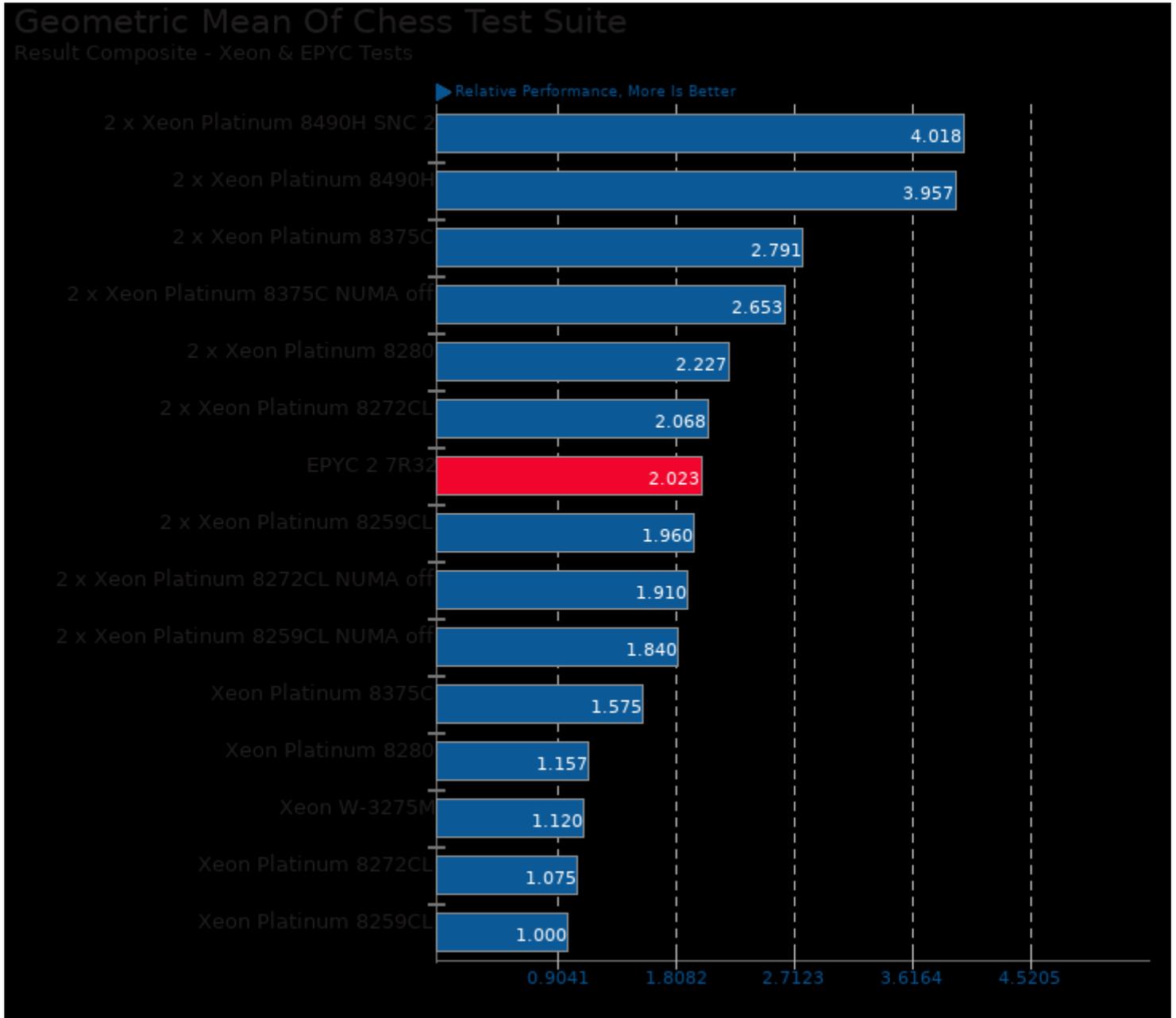
These geometric means are based upon test groupings / test suites for this result file.



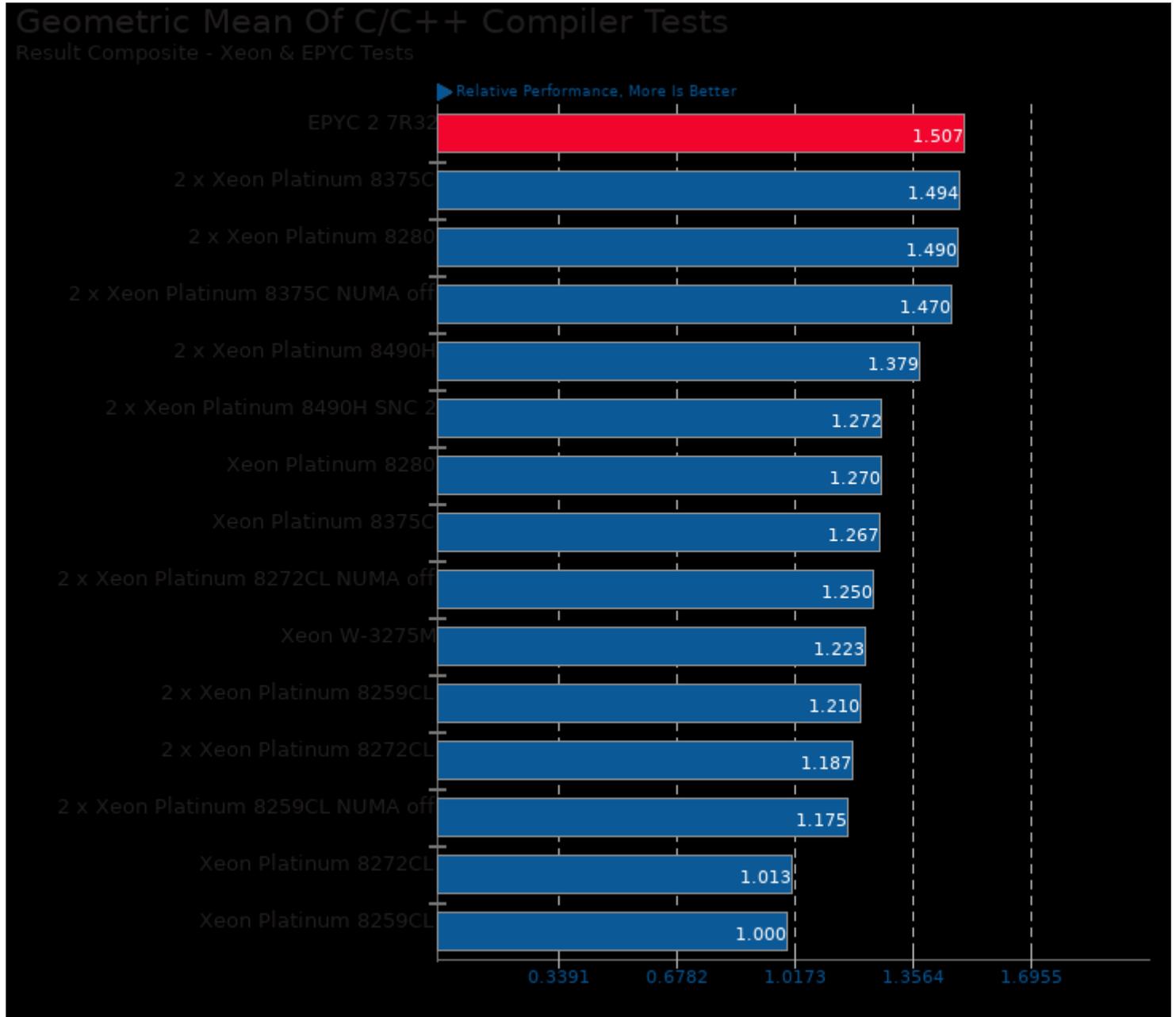
Geometric mean based upon tests: pts/dav1d and pts/svt-av1



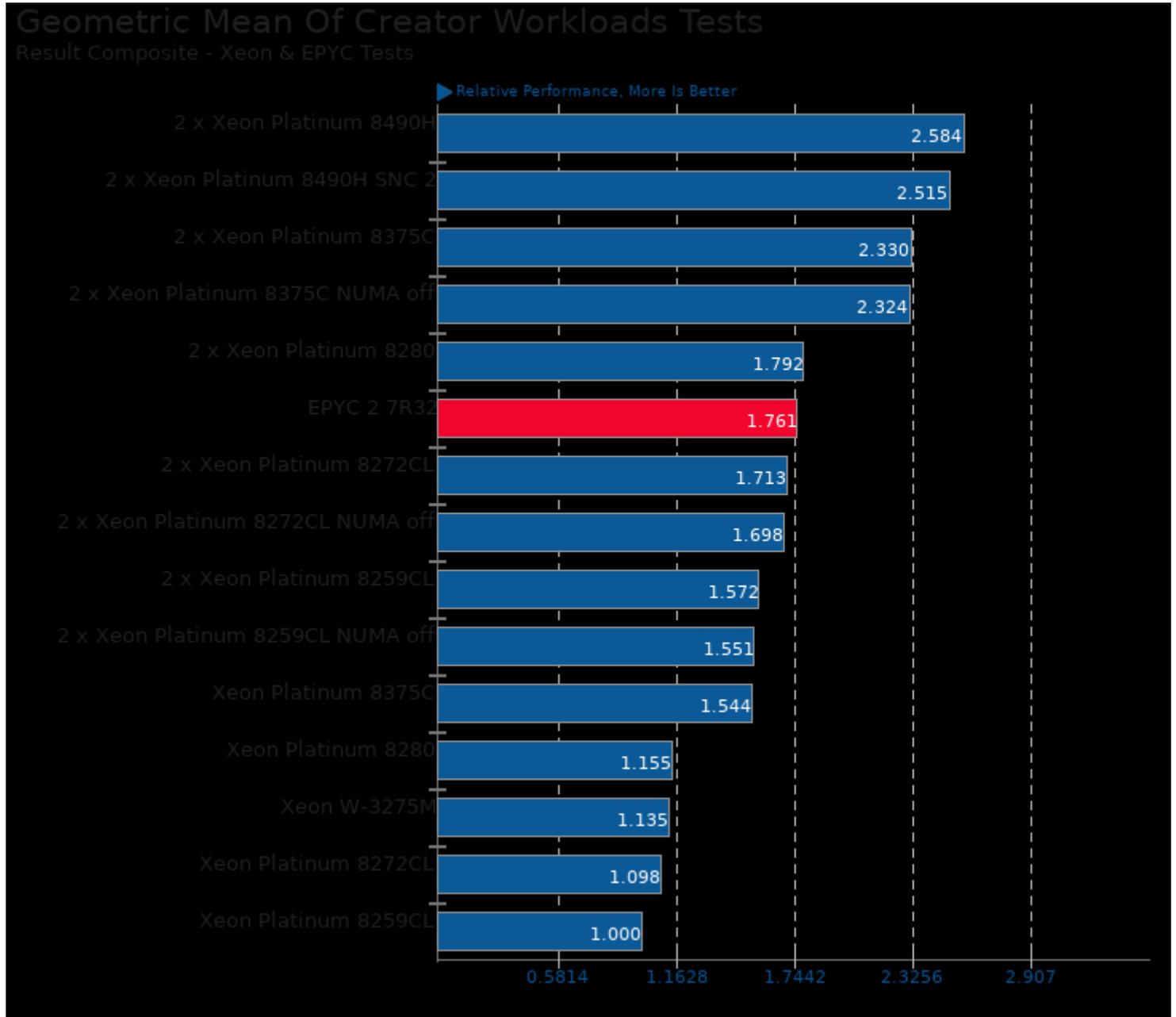
Geometric mean based upon tests: pts/himeno and pts/mrbayes



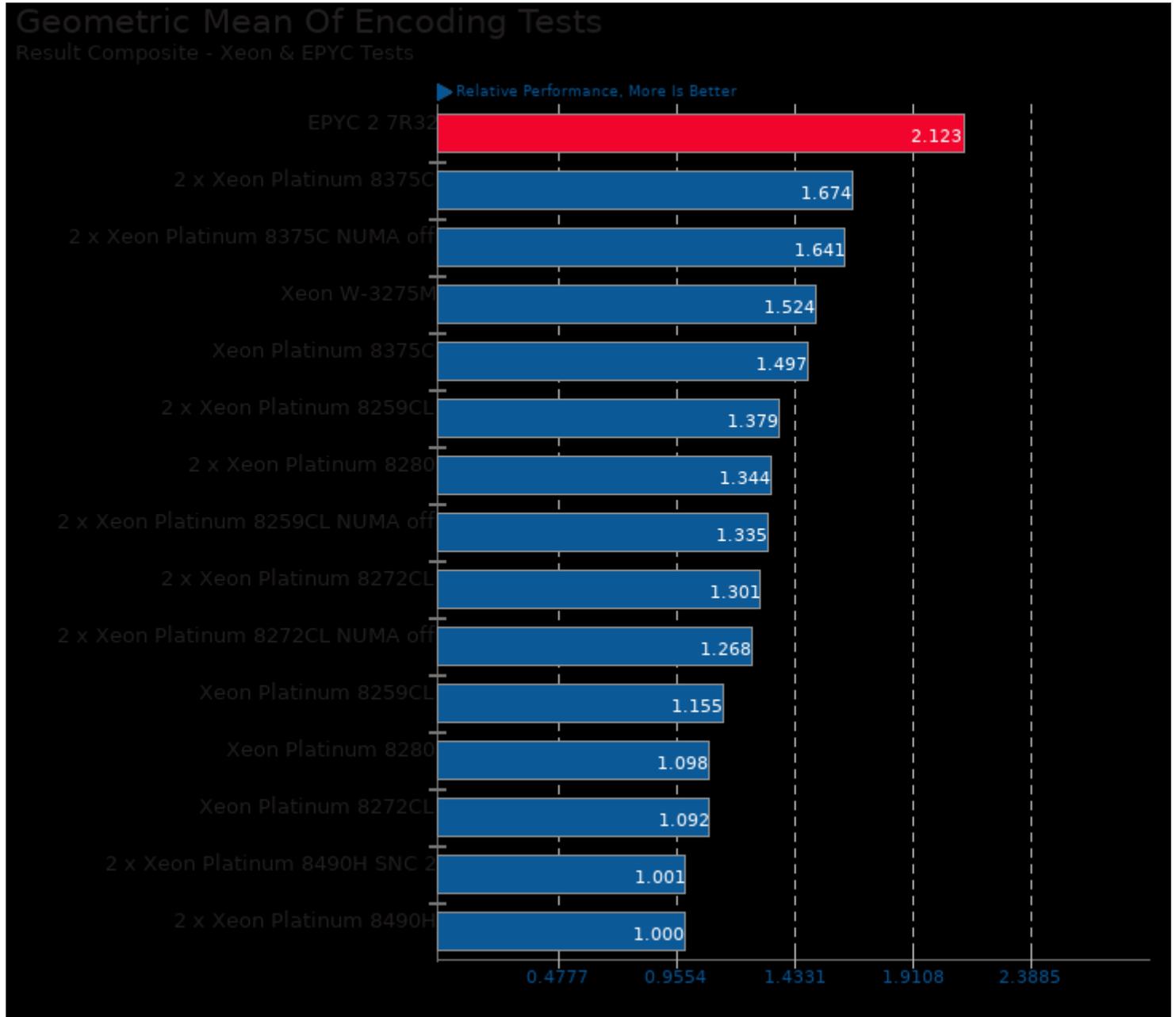
Geometric mean based upon tests: pts/stockfish and pts/asmfish



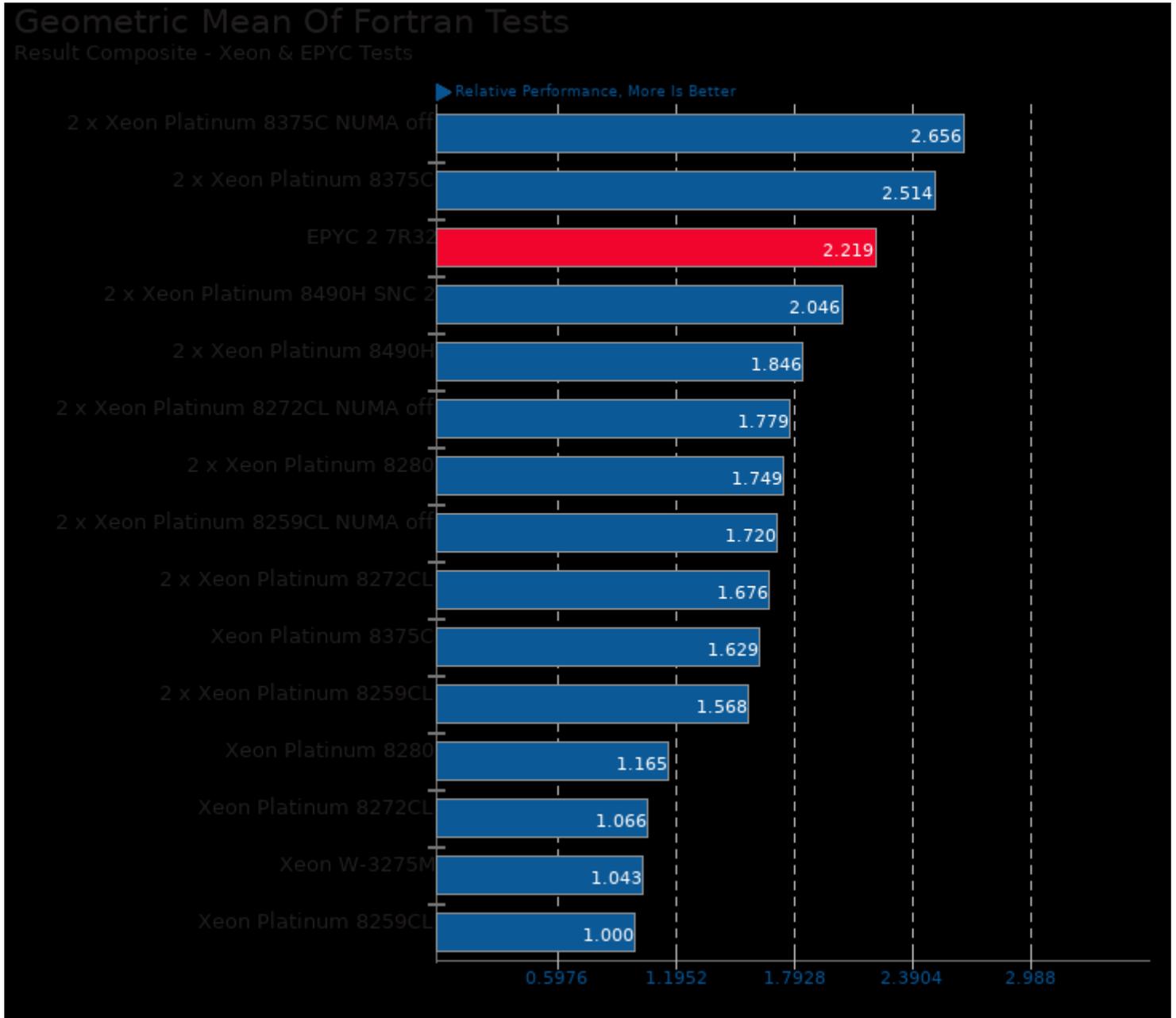
Geometric mean based upon tests: pts/himeno, pts/stockfish, pts/build-llvm, pts/pgbench, pts/mrbayes, pts/john-the-ripper, pts/dav1d, pts/tungsten, pts/compress-zstd, pts/lammps, pts/svt-av1, pts/svt-vp9, pts/build-gdb, pts/smhasher, pts/basis and pts/nettle



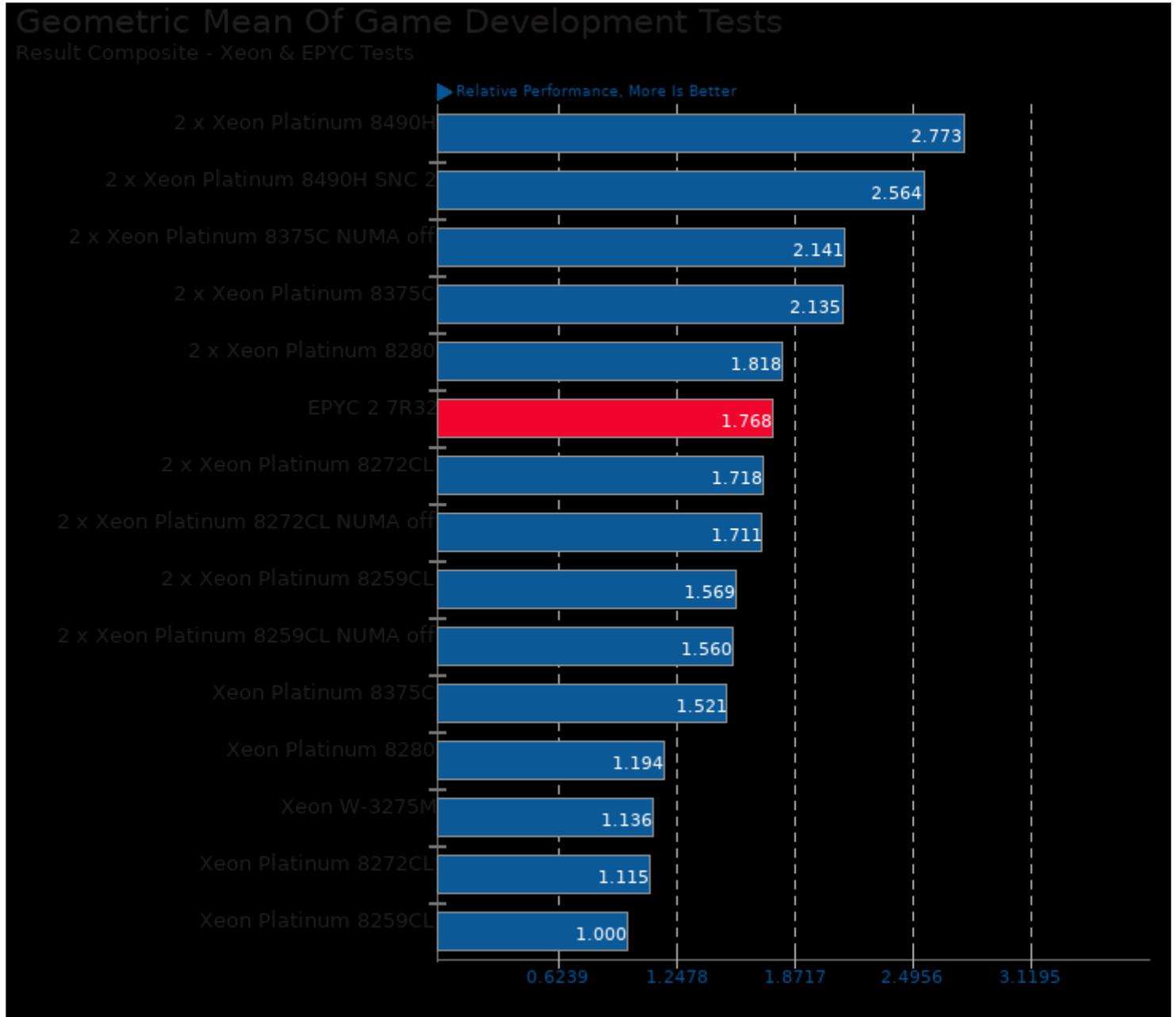
Geometric mean based upon tests: pts/ospray, pts/blender, pts/tungsten, pts/appleseed, pts/radiance, pts/luxcorerender, pts/v-ray, pts/svt-vp9, pts/dav1d, pts/svt-av1, pts/embree, pts/oidn, pts/basis and pts/deepspeech



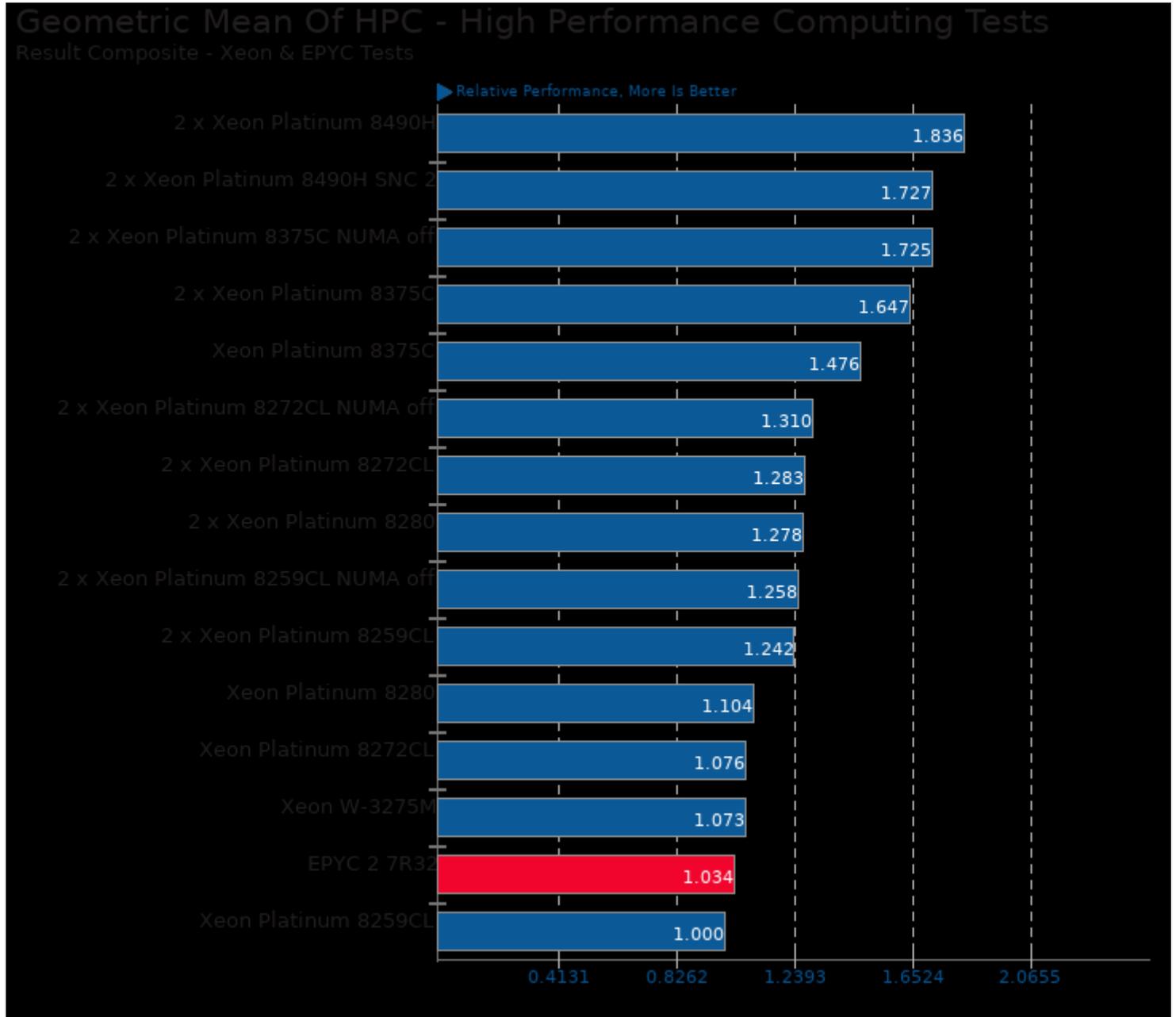
Geometric mean based upon tests: pts/svt-vp9, pts/dav1d and pts/svt-av1



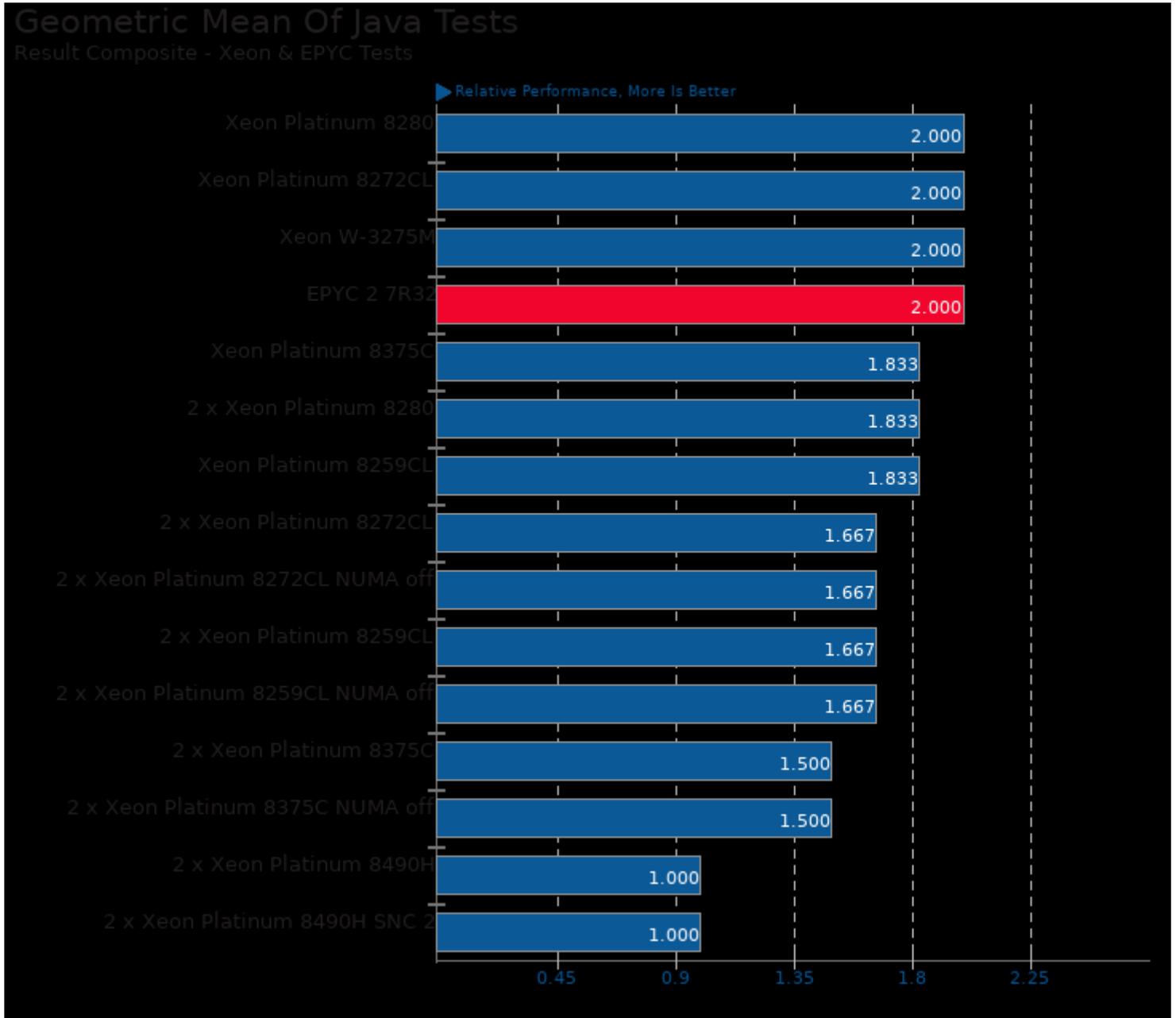
Geometric mean based upon tests: pts/hpcg, pts/npb, pts/cloverleaf and pts/lammps



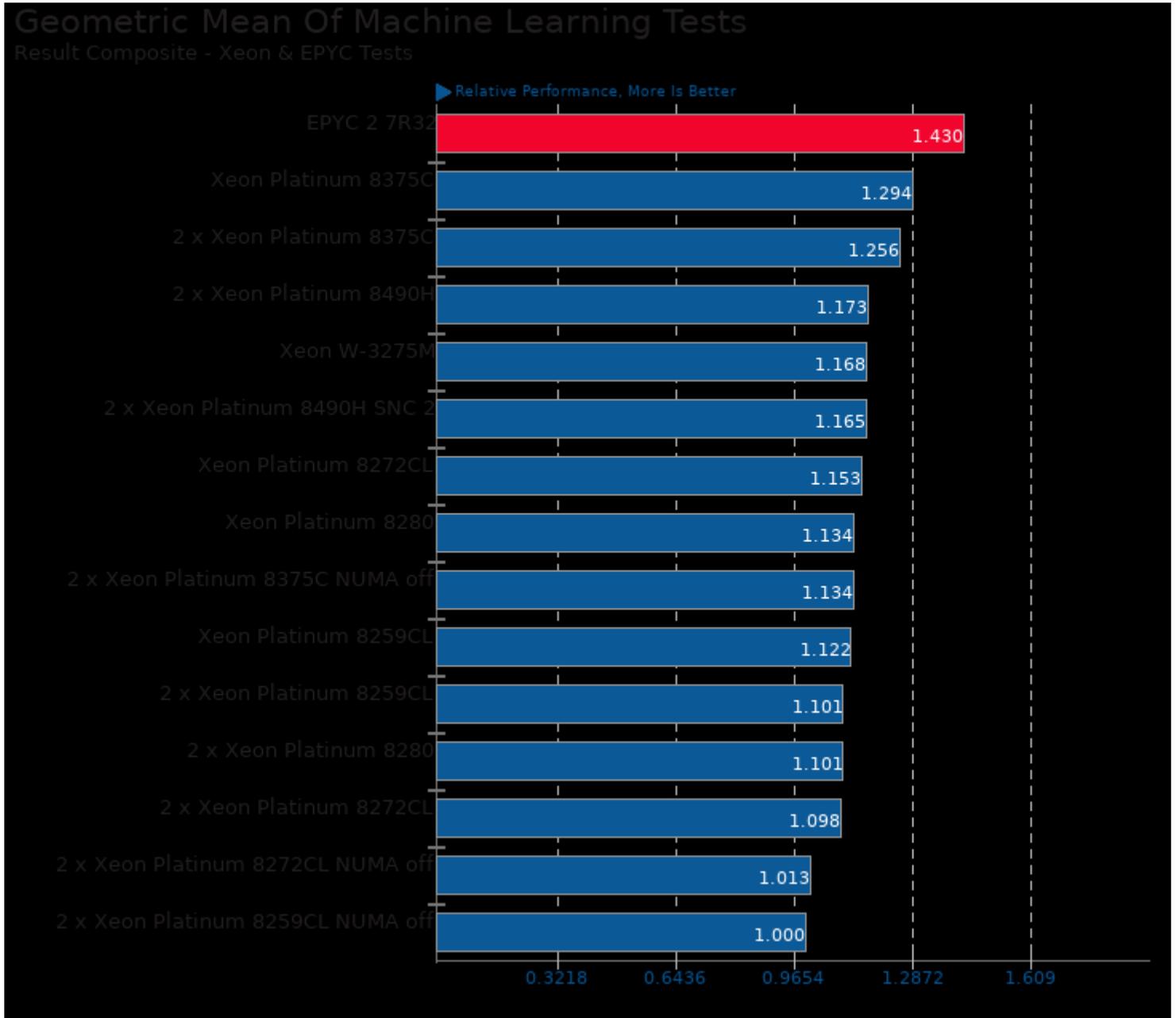
Geometric mean based upon tests: pts/basis, pts/blender and pts/oidn



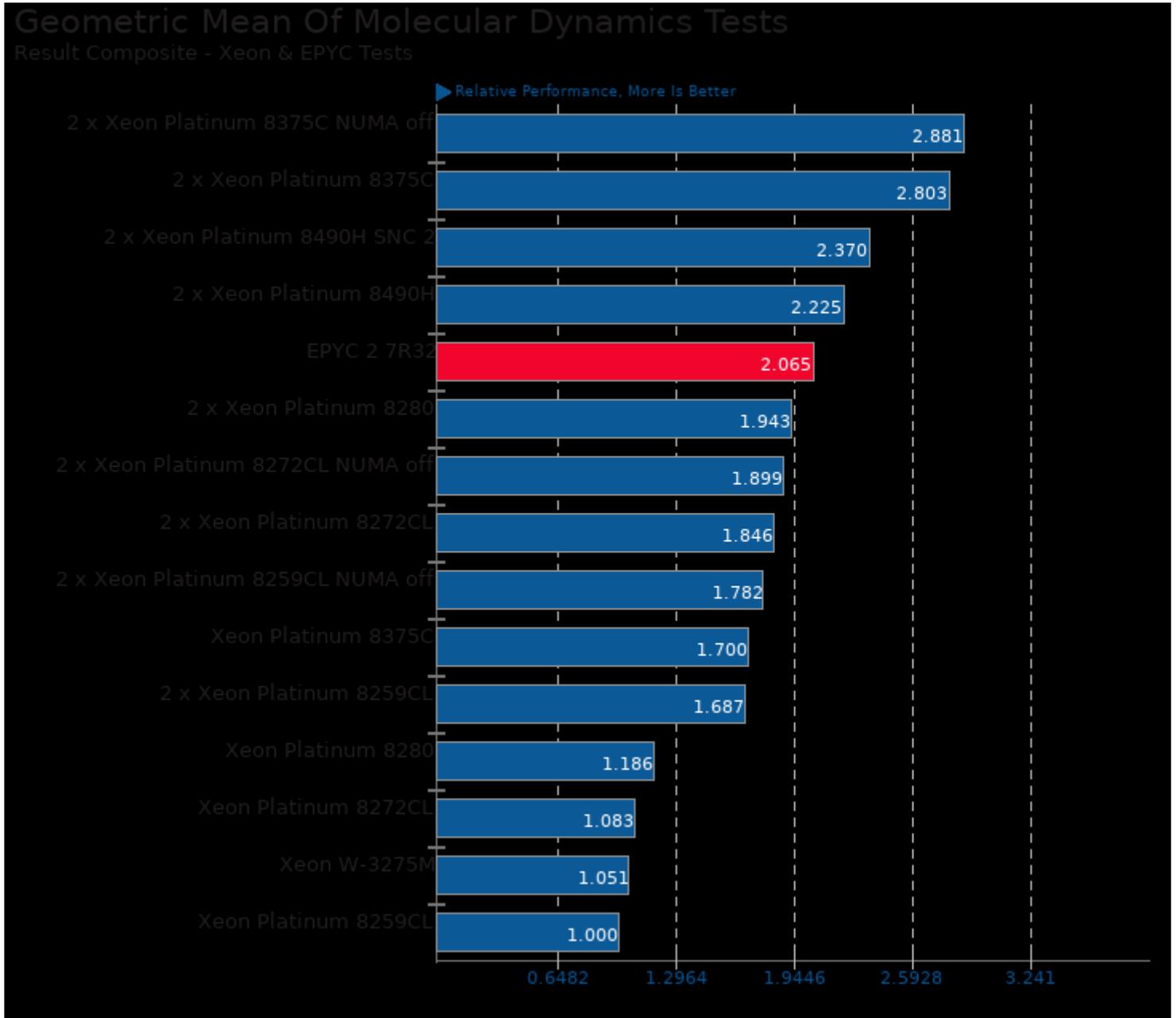
Geometric mean based upon tests: pts/npb, pts/hpcg, pts/intel-mpi, pts/arrayfire, pts/namd, pts/cloverleaf, pts/lammps, pts/himeno, pts/mrbayes, pts/numpy, pts/deepspeech, pts/scikit-learn and pts/mlpack



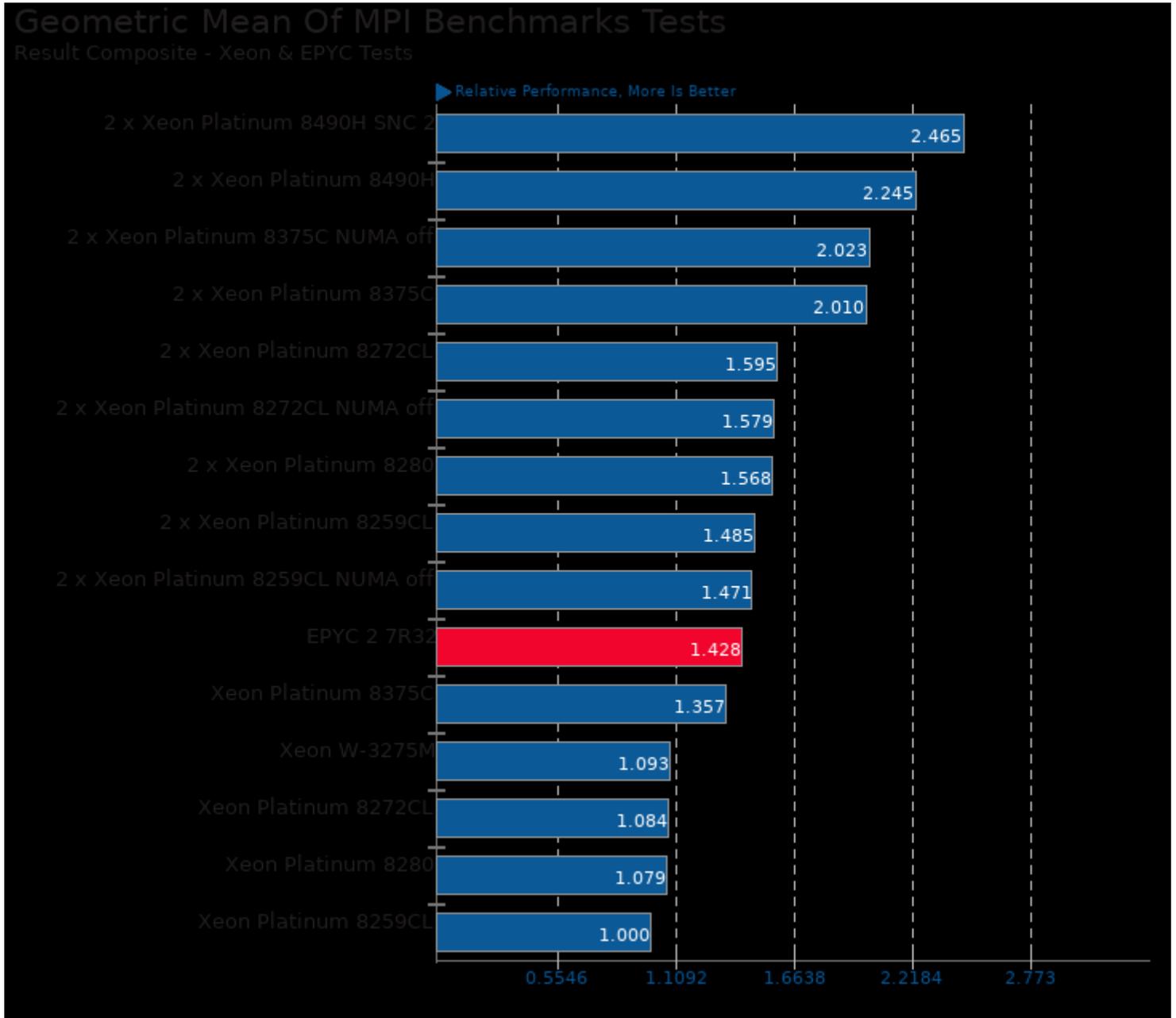
Geometric mean based upon tests: pts/dacapobench and pts/renaissance



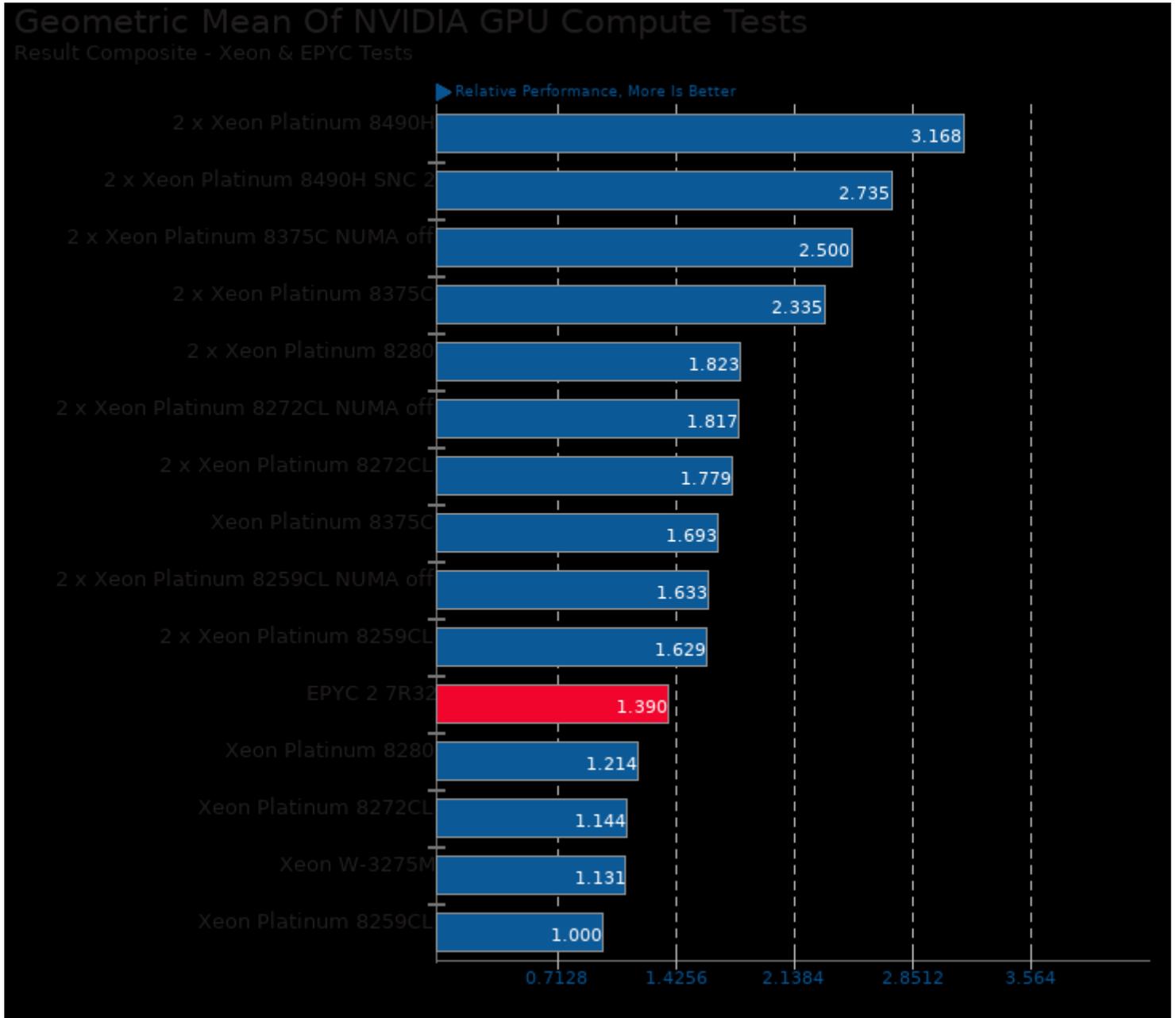
Geometric mean based upon tests: pts/numpy, pts/deepspeech, pts/scikit-learn and pts/mlpack



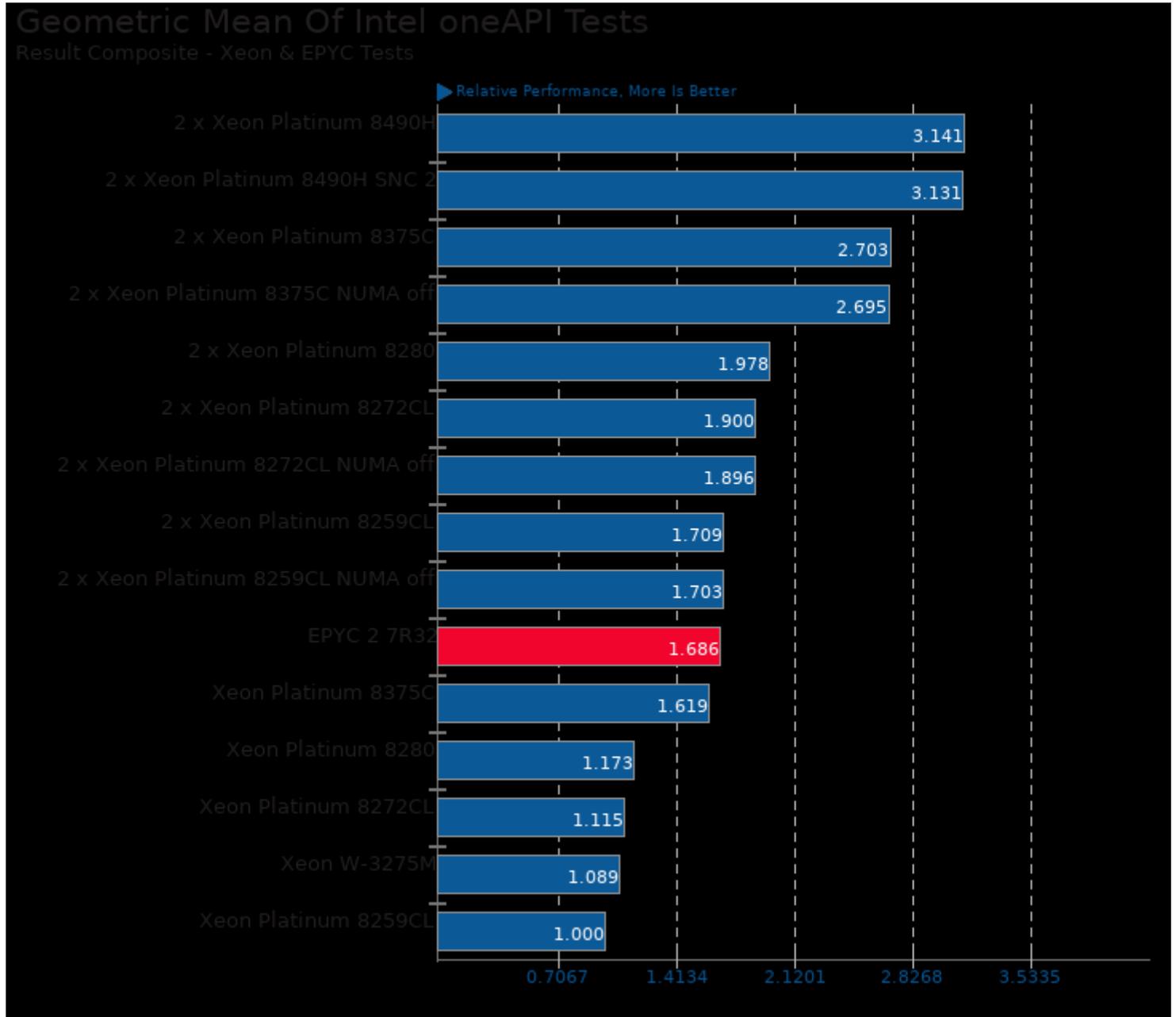
Geometric mean based upon tests: pts/namd, pts/cloverleaf and pts/lammps



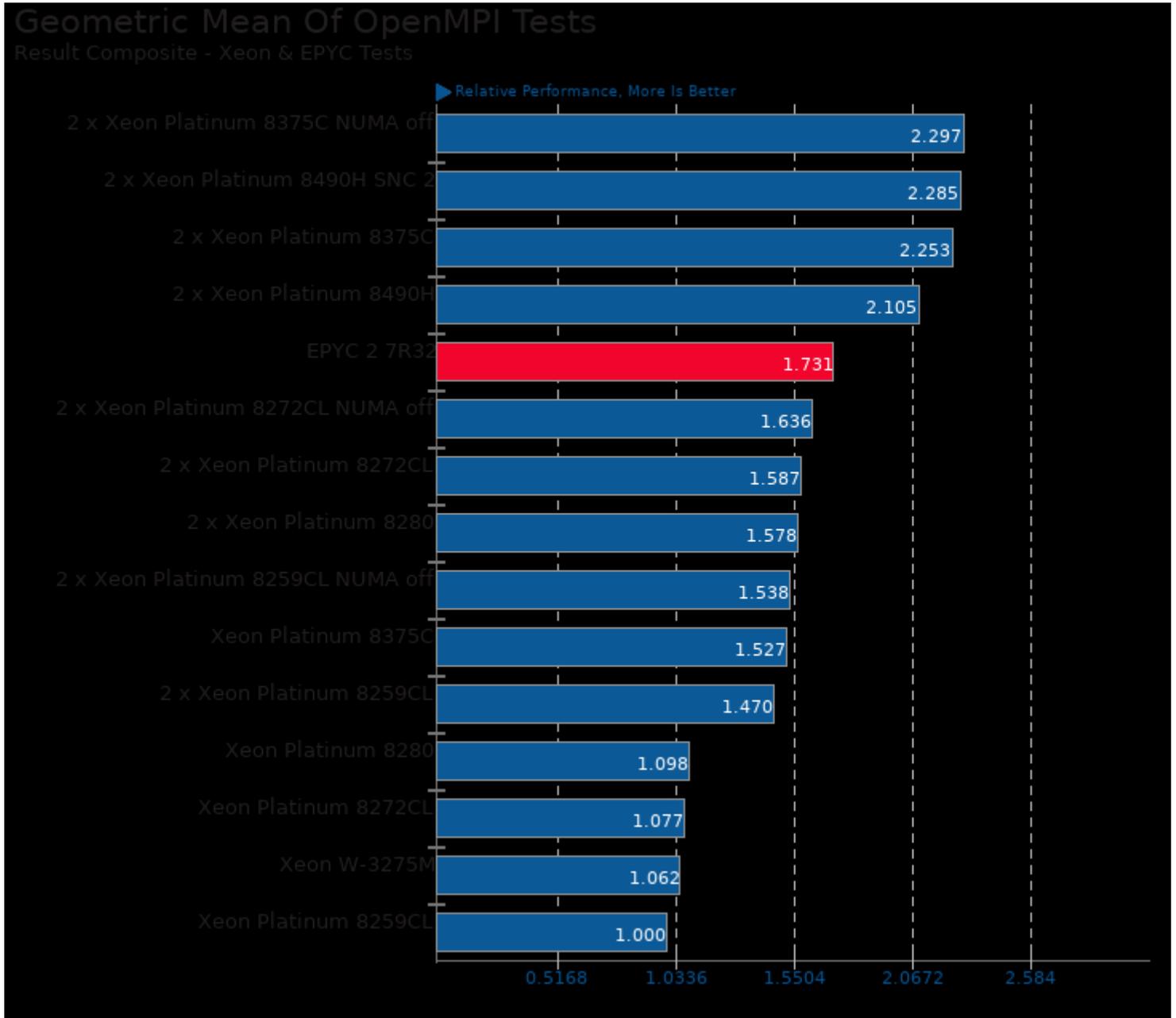
Geometric mean based upon tests: pts/lammps, pts/intel-mpi, pts/hpcg, pts/mrbyes and pts/npb



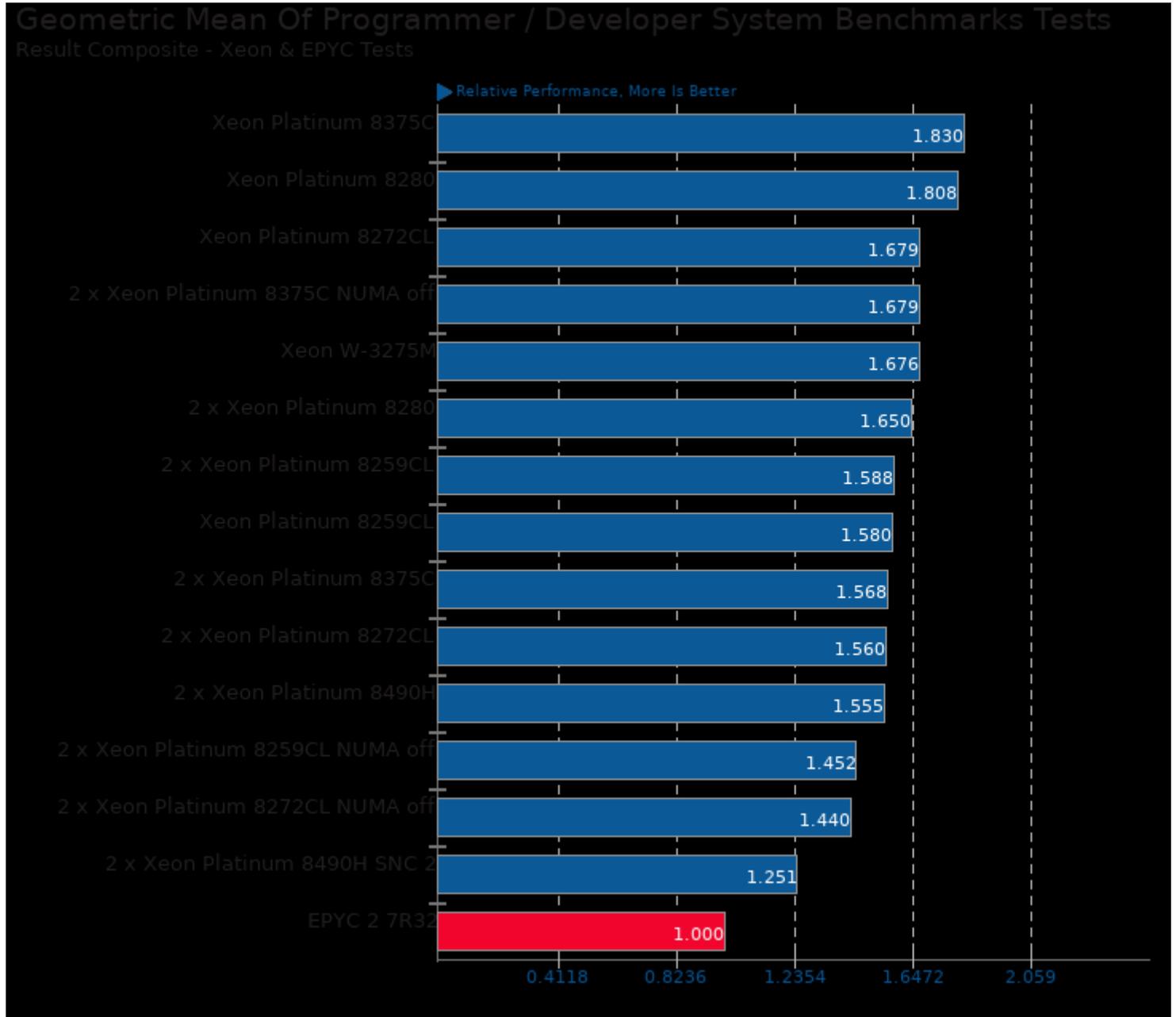
Geometric mean based upon tests: pts/luxcorerender, pts/arrayfire, pts/v-ray and pts/blender



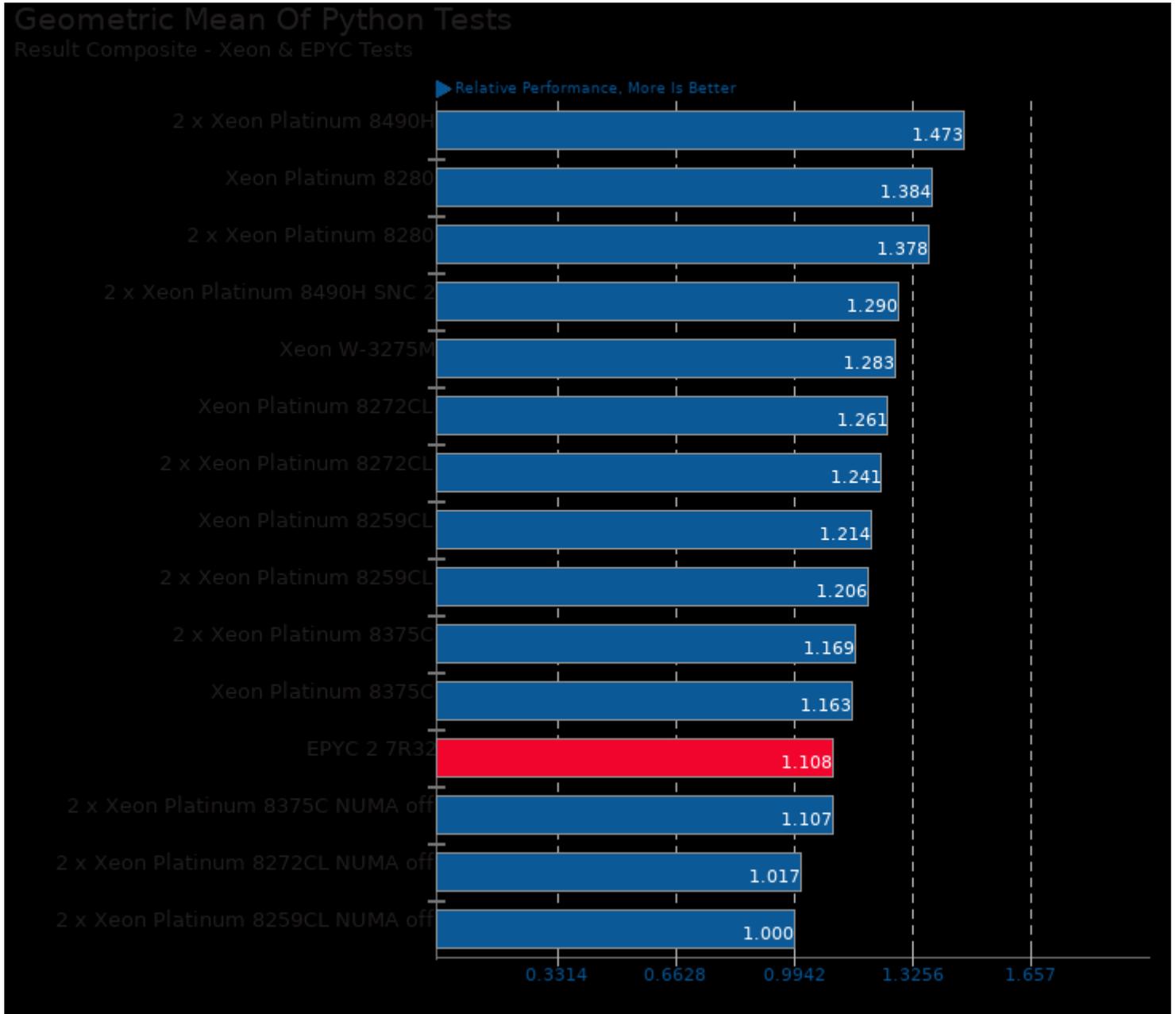
Geometric mean based upon tests: pts/embree, pts/oidn, pts/ospray and pts/tungsten



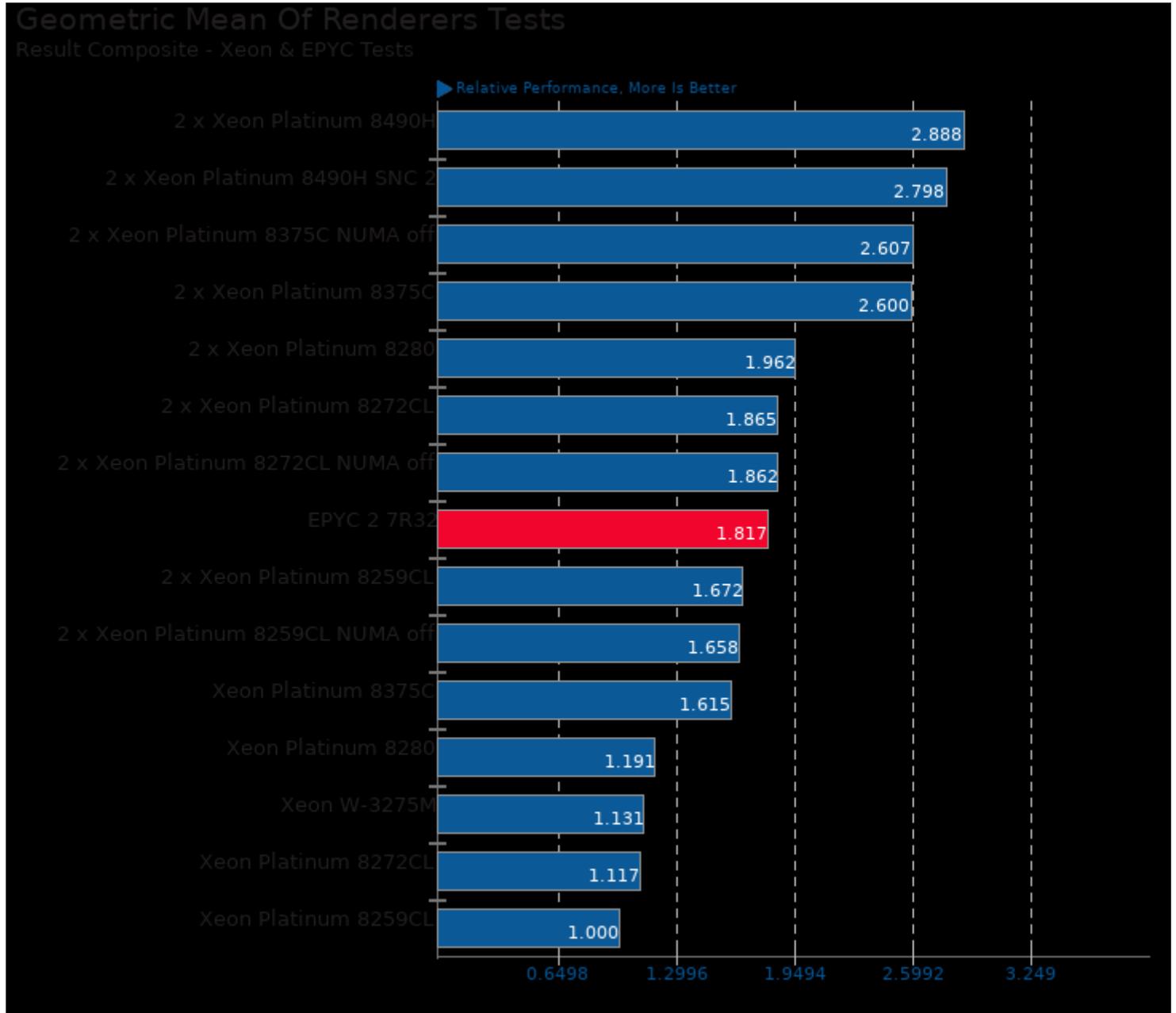
Geometric mean based upon tests: pts/hpcg, pts/npb, pts/cloverleaf, pts/mrbayes, pts/lammps and pts/intel-mpi



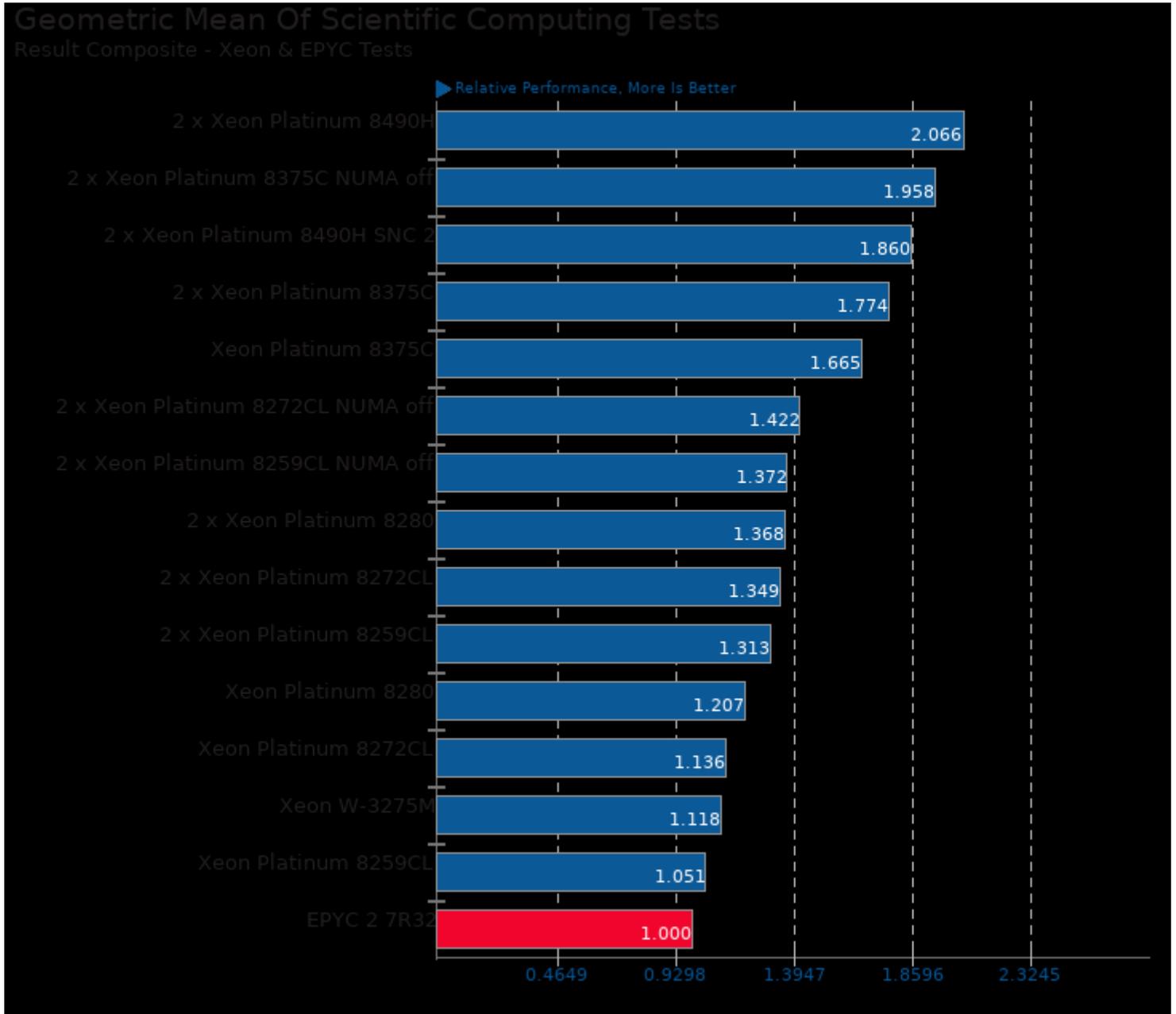
Geometric mean based upon tests: pts/compress-zstd, pts/pyperformance, pts/pybench, pts/build-linux-kernel, pts/build-gcc, pts/build-gdb, pts/build-llvm, pts/build2 and pts/arrayfire



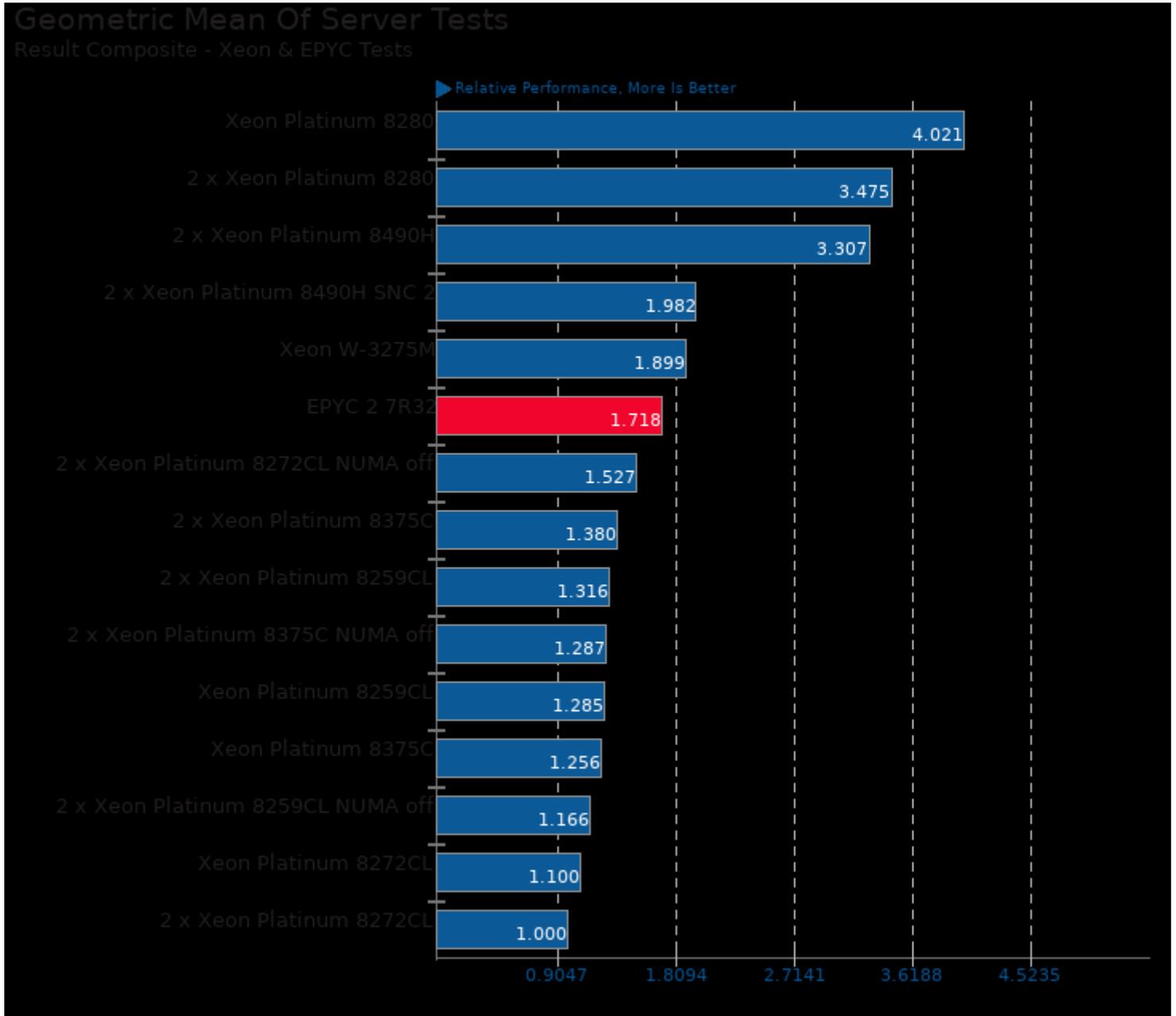
Geometric mean based upon tests: pts/pybench, pts/numpy, pts/mlpack, pts/scikit-learn and pts/pyperformance



Geometric mean based upon tests: pts/ospray, pts/blender, pts/tungsten, pts/appleseed, pts/radiance, pts/luxcorerender and pts/v-ray



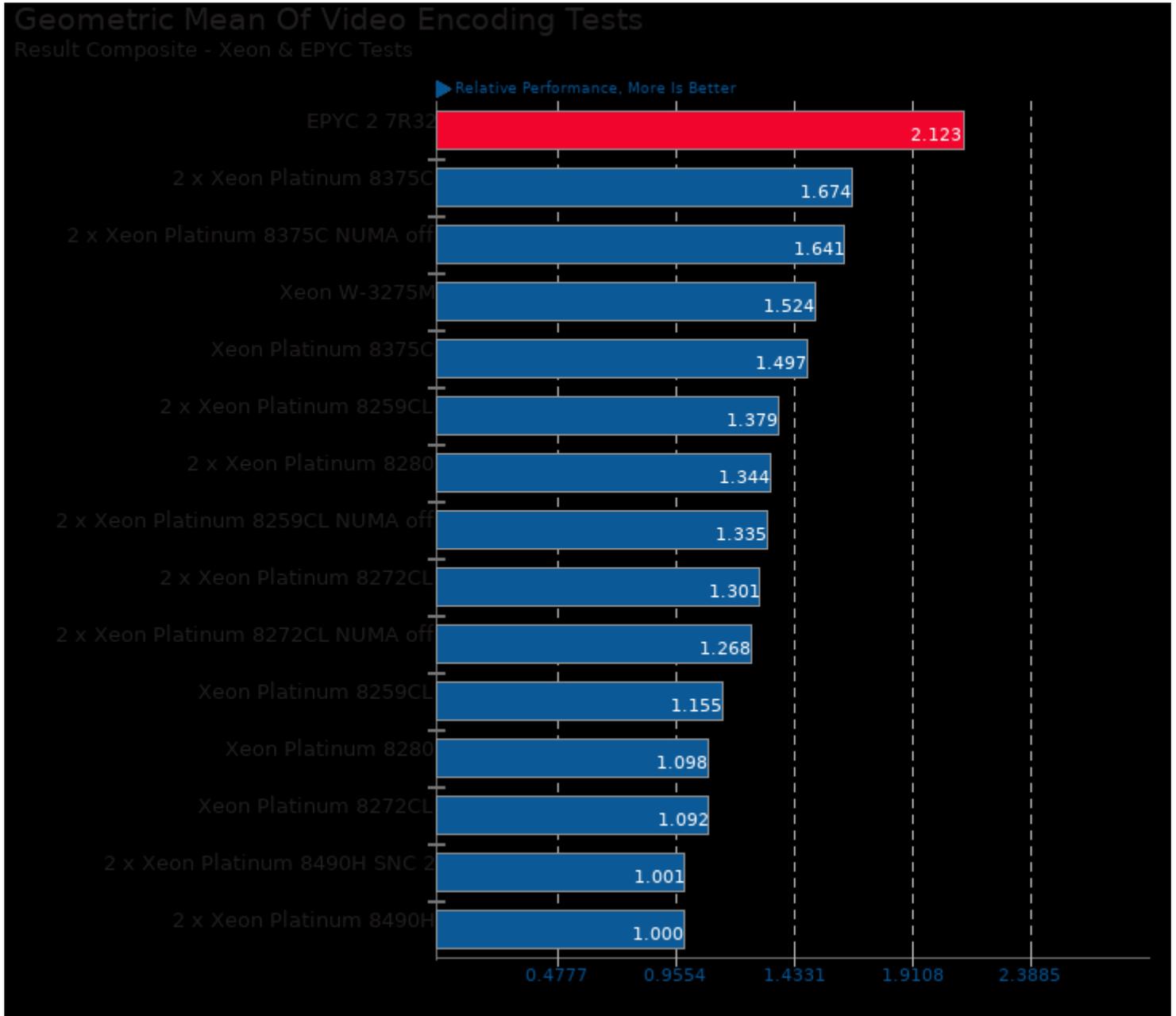
Geometric mean based upon tests: pts/arrayfire, pts/namd, pts/cloverleaf, pts/lammps, pts/himeno and pts/mrbayes



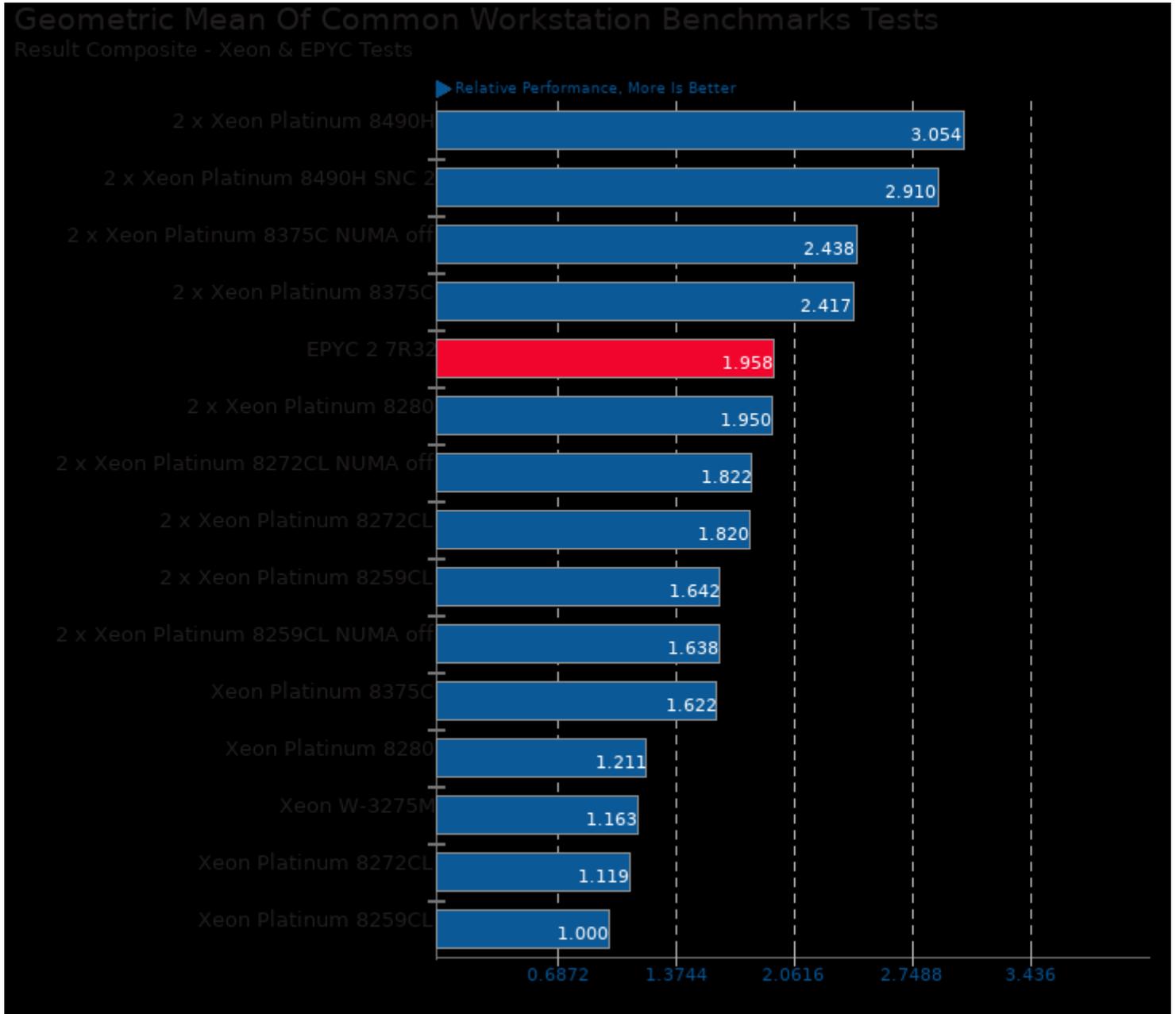
Geometric mean based upon tests: pts/pgbench and pts/phpbench



Geometric mean based upon tests: pts/lzbench, pts/numpy, pts/deepspeech, pts/radiance, pts/pybench and pts/phpbench



Geometric mean based upon tests: pts/svt-vp9, pts/dav1d and pts/svt-av1



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

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 14:43.