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Xeon & EPYC Tests

Various Server CPU benchmarks

Automated Executive Summary

2 x Xeon Platinum 8280 had the most wins, coming in first place for 38% of the tests.

Based on the geometric mean of all complete results, the fastest (2 x Xeon Platinum 8280) was 2.277x the speed of the slowest (Xeon Silver 4216).

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

MKL-DNN DNNL (Harness: Deconvolution Batch deconv_1d - Data Type: u8s8f32) at 3188.851x
MKL-DNN DNNL (Harness: Convolution Batch conv_googlenet_v3 - Data Type: u8s8f32) at 97.89x
MKL-DNN DNNL (Harness: Convolution Batch conv_alexnet - Data Type: u8s8f32) at 67.176x
MKL-DNN DNNL (Harness: IP Batch All - Data Type: u8s8f32) at 53.682x
PostgreSQL pgbench (Scaling: Buffer Test - Test: Normal Load - Mode: Read Write) at 16.77x
ArrayFire (Test: BLAS CPU) at 8.263x
MKL-DNN DNNL (Harness: Convolution Batch conv_alexnet - Data Type: f32) at 7.934x
MKL-DNN DNNL (Harness: Convolution Batch conv_all - Data Type: u8s8f32) at 7.729x
MKL-DNN DNNL (Harness: Convolution Batch conv_googlenet_v3 - Data Type: f32) at 7.396x
MKL-DNN DNNL (Harness: Convolution Batch conv_all - Data Type: f32) at 6.776x.

Test Systems:

2 x Xeon Gold 5220R

Processor: 2 x Intel Xeon Gold 5220R @ 3.90GHz (36 Cores / 72 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: 1920x1080

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/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + tsx_async_abort: Mitigation of TSX disabled

Xeon Gold 5220R

Processor: Intel Xeon Gold 5220R @ 3.90GHz (18 Cores / 36 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/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + 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/swapgs 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/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + tsx_async_abort: Mitigation of TSX disabled

Xeon Gold 5218

Processor: Intel Xeon Gold 5218 @ 3.90GHz (16 Cores / 32 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: 2 x 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: 1920x1080

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/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + tsx_async_abort: Mitigation of TSX disabled

Xeon Silver 4216

Processor: Intel Xeon Silver 4216 @ 3.20GHz (16 Cores / 32 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: 3 x 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: 1920x1080

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/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + tsx_async_abort: Mitigation of TSX disabled

Xeon Gold 6226R

Processor: Intel Xeon Gold 6226R @ 3.90GHz (16 Cores / 32 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: 4 x 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: 1920x1080

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/swapgs 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 Gold 6226R

Processor: 2 x Intel Xeon Gold 6226R @ 3.90GHz (32 Cores / 64 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: 5 x 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: 1920x1080

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/swapgs 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 Silver 4216

Processor: 2 x Intel Xeon Silver 4216 @ 3.20GHz (32 Cores / 64 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: 6 x 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: 1920x1080

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/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + tsx_async_abort: Mitigation of TSX disabled

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/swapgs 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 8275CL

Processor: 2 x Intel Xeon Platinum 8275CL @ 3.90GHz (48 Cores / 96 Threads), Motherboard: ASRockRack EP2C621D12 WS (P2.10 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 32 GB + 32 GB + 16384 MB + 32 GB + 16384 MB + 32 GB + 32 GB + 32 GB DDR4-3200MT/s, Disk: 256GB TOSHIBA THNSNJ25 + 600GB INTEL SSDSC2BB60 + 6001GB HGST HUS726060AL, Graphics: llvmpipe 220GB, Audio: Creative Labs EMU20k2, Monitor: DELL UP2516D, Network: 4 x Intel X722 for 1GbE

OS: Ubuntu 19.10, Kernel: 5.3.0-55-generic (x86_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server, OpenGL: 3.3 Mesa 19.2.1 (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: 0x500002b
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 usercopy/swapgs 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 8275CL NUMA off

Processor: 2 x Intel Xeon Platinum 8275CL @ 3.90GHz (48 Cores / 96 Threads), Motherboard: ASRockRack EP2C621D12 WS (P2.10 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 32 GB + 32 GB + 16384 MB + 32 GB + 16384 MB + 32 GB + 32 GB + 32 GB DDR4-3200MT/s, Disk: 256GB TOSHIBA THNSNJ25 + 600GB INTEL SSDSC2BB60 + 6001GB HGST HUS726060AL, Graphics: llvmpipe 220GB, Audio: Creative Labs EMU20k2, Monitor: DELL UP2516D, Network: 4 x Intel X722 for 1GbE

OS: Ubuntu 19.10, Kernel: 5.3.0-55-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: 0x500002c
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 usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + tsx_async_abort: Mitigation of TSX disabled

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/swapgs 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

2 x Xeon Platinum 8259CL

2 x Xeon Platinum 8259CL NUMA off

Processor: 2 x Intel Xeon Platinum 8259L @ 3.50GHz (48 Cores / 96 Threads), Motherboard: ASRockRack 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

Xeon & EPYC Tests

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 + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Mitigation of TSX disabled

	2 x Xeon Gold 5220 R	Xeon Gold 5220 R	Xeon Platinum 8280	2 x Xeon Platinum 8280	Xeon Gold 5218	Xeon Silver 4216	Xeon Gold 6226 R	2 x Xeon Gold 6226 R	2 x Xeon Silver 4216	Xeon W-3275M	2 x Xeon Platinum 8275 CL	2 x Xeon Platinum 8275 CL NUMA off	EPYC 7R32	2 x Xeon Platinum 8259 CL	2 x Xeon Platinum 8259 CL NUMA off
High Performance Conjugate Gradient (GFLOP/s)	25.6303	13.3529	14.9097	**28.8542**	13.0138	11.8883	13.9581	26.5910	23.1574	14.1623	8.41405	**6.32971**	17.0608	27.1060	16.5171
Normalized	88.83%	46.28%	51.67%	100%	45.1%	41.2%	48.37%	92.16%	80.26%	49.08%	29.16%	21.94%	59.13%	93.94%	57.24%
Standard Deviation	1%	1.1%	0.5%	1.5%	0.2%	0.5%	0.3%	0.8%	0.1%	1.9%	21.5%	2.9%	0%	0.8%	0%
NAS Parallel Benchmarks - BT.C	100761	50788	71842	**136047**	48617	**46390**	56576	77471	65510	69348			106416	104108	84766
Normalized	74.06%	37.33%	52.81%	100%	35.74%	34.1%	41.59%	56.94%	48.15%	50.97%			78.22%	76.52%	62.31%
Standard Deviation	0.1%	0.2%	0.1%	0.1%	0.2%	0%	0.1%	0.2%	0.3%	0.3%			0.8%	0.2%	0.1%
NAS Parallel Benchmarks - EP.C	3769	1863	3194	**6105**	1621	**1546**	2044	4005	2984	3025			3486	5053	5059
Normalized	61.73%	30.52%	52.32%	100%	26.56%	25.32%	33.49%	65.61%	48.88%	49.55%			57.1%	82.76%	82.87%
Standard Deviation	1.5%	0.3%	2.4%	2.5%	0.3%	2.8%	3%	1.7%	2.6%	2.3%			1.5%	2.7%	1.2%
NAS Parallel Benchmarks - EP.D	3781	1967	3283	**6285**	1636	**1571**	2095	3970	3145	3211			3570	5310	5284
Normalized	60.16%	31.29%	52.24%	100%	26.03%	25.01%	33.33%	63.16%	50.04%	51.09%			56.81%	84.49%	84.08%
Standard Deviation	2.9%	0.6%	2.8%	8.2%	0.5%	0.7%	0.7%	10.8%	0.2%	0.2%			0.3%	2.9%	2.8%
NAS Parallel Benchmarks - LU.C	108883	56745	74256	**140090**	48143	**46723**	58595	106268	85607	69607			99822	120962	94643
Normalized	77.72%	40.51%	53.01%	100%	34.37%	33.35%	41.83%	75.86%	61.11%	49.69%			71.26%	86.35%	67.56%

Standard Deviation	0.2%	0.1%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%			0.2%	0.1%	0.1%
NAS Parallel Benchmarks - MG.C	58984	31197	37089	**69175**	30329	**28301**	31634	58681	52832	35376			49330	63393	43490
Normalized	85.27%	45.1%	53.62%	100%	43.84%	40.91%	45.73%	84.83%	76.37%	51.14%			71.31%	91.64%	62.87%
Standard Deviation	1.4%	0.6%	0.6%	2.8%	0.2%	0.4%	0.2%	0.6%	0.5%	0.2%			2.8%	0.8%	1.7%
NAS Parallel Benchmarks - SP.B	50933	23347	32682	**70893**	22329	**21150**	23860	49232	42221	31427			51225	53979	38494
Normalized	71.84%	32.93%	46.1%	100%	31.5%	29.83%	33.66%	69.45%	59.56%	44.33%			72.26%	76.14%	54.3%
Standard Deviation	0.1%	0.4%	0.8%	0.3%	0.1%	0.5%	0.2%	0.7%	0.6%	0.8%			3.9%	0.2%	0.2%
CloverLeaf - L.E.H (sec)	1.06	1.28	0.96	0.69	1.37	**1.49**	1.27	0.93	1.00	1.14			**0.36**	0.78	0.63
Normalized	33.96%	28.13%	37.5%	52.17%	26.28%	24.16%	28.35%	38.71%	36%	31.58%			100%	46.15%	57.14%
Standard Deviation	1.3%	0.9%	0.1%	9.2%	0.6%	1.2%	0.5%	15.4%	15.7%	6.1%			0.2%	14.8%	0.3%
NAMD - ATPase Simulation - 327,506 Atoms (days/ns)	0.603 33	1.157 45	0.707 09	**0.362 26**	1.511 68	**1.517 21**	1.135 86	0.582 37	0.769 82	0.814 34			0.486 14	0.445 51	0.454 22
Normalized	60.04%	31.3%	51.23%	100%	23.96%	23.88%	31.89%	62.2%	47.06%	44.49%			74.52%	81.31%	79.75%
Standard Deviation	1.8%	0.2%	0.1%	0.6%	0.1%	0.2%	0.2%	0.3%	0.4%	3.7%			0.3%	0.1%	0%
lzbench - Zstd 1 - Compression (MB/s)	437	444	457	449	446	365	445	437	**359**	**508**	439	443	418	399	407
Normalized	86.02%	87.4%	89.96%	88.39%	87.8%	71.85%	87.6%	86.02%	70.67%	100%	86.42%	87.2%	82.28%	78.54%	80.12%
Standard Deviation			0.2%							0.3%				1%	1%
lzbench - Zstd 1 - Decompression (MB/s)	1147	1180	1212	1168	1184	973	1182	1141	**943**	**1299**	1099	1090	1148	1027	1032
Normalized	88.3%	90.84%	93.3%	89.92%	91.15%	74.9%	90.99%	87.84%	72.59%	100%	84.6%	83.91%	88.38%	79.06%	79.45%
Standard Deviation	0.1%			0.3%	0%			0.1%	0.2%	0.4%	0.1%			0.1%	0.1%
lzbench - Zstd 8 - Compression (MB/s)	74	76	77	75	74	64	74	72	**63**	**84**	73	75	83	69	71
Normalized	88.1%	90.48%	91.67%	89.29%	88.1%	76.19%	88.1%	85.71%	75%	100%	86.9%	89.29%	98.81%	82.14%	84.52%

Xeon & EPYC Tests

lzbench - Zstd 8 - Decompression (MB/s)	1101	1194	1224	1124	1195	998	1193	1100	930	1298	1053	999	1266	1011	966
Normalized	84.82%	91.99%	94.3%	86.59%	92.06%	76.89%	91.91%	84.75%	71.65%	100%	81.12%	76.96%	97.53%	77.89%	74.42%
Standard Deviation	0.2%	0%	0.1%	0.2%	0.2%	0.3%			0.3%	0.2%		0.1%		0.3%	2.1%
lzbench - Crush 0 - Compression (MB/s)	93	98	101	96	96	82	95	91	80	109	94	95	81	88	86
Normalized	85.32%	89.91%	92.66%	88.07%	88.07%	75.23%	87.16%	83.49%	73.39%	100%	86.24%	87.16%	74.31%	80.73%	78.9%
Standard Deviation	0.6%	0.6%	0.6%		0.6%					1.6%			1.2%	0.7%	
lzbench - Crush 0 - Decompression (MB/s)	419	428	440	428	430	353	429	418	344	509	434	432	380	394	396
Normalized	82.32%	84.09%	86.44%	84.09%	84.48%	69.35%	84.28%	82.12%	67.58%	100%	85.27%	84.87%	74.66%	77.41%	77.8%
Standard Deviation				0.1%											
lzbench - Brotli 2 - Compression (MB/s)	172	176	181	176	176	146	176	172	142	196	170	172	165	157	159
Normalized	87.76%	89.8%	92.35%	89.8%	89.8%	74.49%	89.8%	87.76%	72.45%	100%	86.73%	87.76%	84.18%	80.1%	81.12%
Standard Deviation		0.3%							0.7%	0.3%		0.3%	0.7%	1.5%	
lzbench - Brotli 2 - Decompression (MB/s)	613	651	673	623	655	542	653	608	509	721	592	582	564	551	543
Normalized	85.02%	90.29%	93.34%	86.41%	90.85%	75.17%	90.57%	84.33%	70.6%	100%	82.11%	80.72%	78.22%	76.42%	75.31%
Standard Deviation		1.3%	0.2%	0.4%	0.2%	0.2%	0.2%			0.3%	0.4%	0.3%	0.3%	0.1%	0.1%
SMHasher - wyhash (cycles/hash	18.806	18.815	22.678	22.677	19.806	22.131	25.134	25.129	22.129	18.508	26.086	26.129		24.151	24.154
Normalized	98.42%	98.37%	81.61%	81.62%	93.45%	83.63%	73.64%	73.65%	83.64%	100%	70.95%	70.83%		76.63%	76.62%
Standard Deviation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.3%	0%	0.1%		0%	0%
Timed MrBayes Analysis - P.P.A (sec)	134.928	134.483	128.848	129.986	147.734	193.466	123.702	124.258	194.504	143.348	125.867	124.297	92.361	139.750	141.898
Normalized	68.45%	68.68%	71.68%	71.05%	62.52%	47.74%	74.66%	74.33%	47.49%	64.43%	73.38%	74.31%	100%	66.09%	65.09%
Standard Deviation	0.3%	0%	0%	0.5%	0.5%	0.1%	0.1%	0.4%	0.6%	0.2%	2.9%	0%	1.3%	0.4%	2.3%

Xeon & EPYC Tests

LAMMPS Molecular Dynamics Simulator - Rhodopsin Protein (ns/day)	17.378	9.535	15.314	24.788	8.158	7.810	10.325	18.150	14.161	14.562	22.301	20.984	20.821	22.535	21.887
Normalized	70.11%	38.47%	61.78%	100%	32.91%	31.51%	41.65%	73.22%	57.13%	58.75%	89.97%	84.65%	84%	90.91%	88.3%
Standard Deviation	0.5%	0.3%	2.2%	3.8%	0.1%	0.5%	0.4%	0.5%	0.2%	3.4%	1.2%	1.5%	6.9%	2.6%	2.6%
DaCapo Benchmark - Jython	4877	4834	4547	4711	5096	5768	4609	4806	5802	4321	4685	4759	5246	5172	5161
Normalized	88.6%	89.39%	95.03%	91.72%	84.79%	74.91%	93.75%	89.91%	74.47%	100%	92.23%	90.8%	82.37%	83.55%	83.72%
Standard Deviation	1%		0.7%	0.8%	1%	0.4%	0.5%	1.5%	1.3%	0.5%	0.9%	0.6%	0.4%	2.2%	0.4%
Renaissance - Scala Dotty (ms)	7415	7556	6664	6891	8286	8635	6999	7231	8583	6971	6733	7042	6577	7257	7566
Normalized	88.71%	87.04%	98.7%	95.45%	79.38%	76.17%	93.97%	90.96%	76.63%	94.35%	97.69%	93.4%	100%	90.64%	86.93%
Standard Deviation	1.9%	1.5%	0.6%	3%	1.1%	0.5%	1.5%	2.4%	2.9%	1%	0.7%	0.6%	1%	0.6%	1.6%
Renaissance - Apache Spark Bayes (ms)	3663	3150	2674	3229	3477	3589	2857	3405	4199	2744	5186	4511	3057	3496	3814
Normalized	73.01%	84.89%	100%	82.83%	76.9%	74.52%	93.61%	78.53%	63.68%	97.47%	51.57%	59.28%	87.48%	76.5%	70.12%
Standard Deviation	5.9%	2.7%	1.6%	5.6%	3.7%	5.2%	4.9%	5.7%	7.8%	2.9%	8.8%	6.4%	4.3%	6.8%	7.3%
Renaissance - Savina Reactors.IO (ms)	26257	22776	21975	26765	27198	22798	27199	27973	28596	25187	26907	27362	19304	28107	28252
Normalized	73.52%	84.75%	87.84%	72.12%	70.97%	84.67%	70.97%	69.01%	67.5%	76.64%	71.74%	70.55%	100%	68.68%	68.33%
Standard Deviation	9.5%	8.5%	13.5%	8.9%	9.5%	5.5%	7.8%	11.3%	7.6%	11.9%	10.6%	9.2%	8.5%	8.6%	8.9%
Renaissance - A.S.P (ms)	24541	21704	20621	23588	23703	25271	21743	24522	28046	21016	24506	24666	21642	25275	25637
Normalized	84.03%	95.01%	100%	87.42%	87%	81.6%	94.84%	84.09%	73.53%	98.12%	84.15%	83.6%	95.28%	81.59%	80.44%
Standard Deviation	2.3%	2.2%	1.8%	3%	1.6%	1.7%	0.3%	1.5%	3%	1.8%	3.7%	2.6%	2.1%	2.5%	2%
Nettle - aes256 (Mbyte/s)	6159	6134	6313	6320	6165	5024	6161	6157	5062	7071	6173	6184	4665	5513	5523
Normalized	87.11%	86.75%	89.29%	89.38%	87.19%	71.06%	87.14%	87.09%	71.59%	100%	87.3%	87.46%	65.98%	77.97%	78.12%
Standard Deviation	0.1%	0.1%	0.2%	0.1%	0%	0.4%	0.2%	0.2%	0.1%	1%	0.1%	0%	0%	0.8%	0.2%
Nettle - chacha (Mbyte/s)	1025	1020	1051	1052	1024	837.612	1025	1025	841.649	1172	1026	1028	750.357	917.750	917.505
Normalized	87.44%	87.03%	89.67%	89.74%	87.4%	71.46%	87.45%	87.48%	71.8%	100%	87.5%	87.67%	64.02%	78.3%	78.28%

Standard Deviation	0.1%	0.2%	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%	0%	0.9%	0.2%	0.1%	0%	0.8%	0.8%
Nettle - sha512 (Mbyte/s)	489.15	485.86	501.98	500.98	489.51	**399.99**	488.81	489.42	401.13	**550.93**	487.55	490.26	478.09	437.62	438.23
Normalized	88.79%	88.19%	91.12%	90.93%	88.85%	72.6%	88.72%	88.84%	72.81%	100%	88.5%	88.99%	86.78%	79.43%	79.54%
Standard Deviation	0.1%	0.4%	0.1%	0.3%	0.1%	0.2%	0.3%	0%	0.1%	0.9%	1%	0.2%	0.1%	1%	0.7%
Nettle - poly1305-aes (Mbyte/s)	2797	2780	2867	2869	2799	2292	2795	2797	2295	**3208**	2786	2804	**2046**	2498	2517
Normalized	87.2%	86.65%	89.39%	89.42%	87.24%	71.44%	87.14%	87.2%	71.53%	100%	86.85%	87.39%	63.79%	77.86%	78.46%
Standard Deviation	0.1%	0.4%	0.1%	0.1%	0%	0.3%	0.2%	0%	0.1%	1.3%	1.1%	0.1%	0.1%	1.1%	0%
ArrayFire - BLAS CPU (GFLOPS)	2359	1202	3432	3430	1002	**765.491**	2137	3912	1498	3128	6259	**6325**	990.798	5320	5651
Normalized	37.3%	19%	54.26%	54.23%	15.84%	12.1%	33.79%	61.85%	23.68%	49.46%	98.96%	100%	15.66%	84.1%	89.34%
Standard Deviation	0.3%	0.1%	1.3%	1%	0.1%	0.3%	0.3%	1.4%	0.1%	1.7%	1.7%	0.1%	1.1%	8%	0.4%
ArrayFire - C.G.C (ms)	9.898	6.409	**4.115**	7.481	7.042	7.819	6.451	7.155	16.92	4.423	13.22	9.654	**35.13**	8.430	7.604
Normalized	41.57%	64.21%	100%	55.01%	58.44%	52.63%	63.79%	57.51%	24.32%	93.04%	31.13%	42.62%	11.71%	48.81%	54.12%
Standard Deviation	3.9%	2.5%	2.8%	2.8%	2.9%	1%	0.7%	3.9%	8.5%	6.6%	2.9%	10.9%	1.1%	4.2%	12.4%
John The Ripper - Blowfish (Real C/S)	51324	25547	42864	**84084**	21403	**20424**	27126	53485	41021	40326	77771	78327	66475	70888	70955
Normalized	61.04%	30.38%	50.98%	100%	25.45%	24.29%	32.26%	63.61%	48.79%	47.96%	92.49%	93.15%	79.06%	84.31%	84.39%
Standard Deviation	0%	0.5%	0.4%	1.4%	0%	0.2%	0.4%	0.4%	0.4%	0.6%	1%	0.2%	0.5%	0.3%	0.1%
John The Ripper - MD5 (Real C/S)	4821000	2506000	4090000	**7880000**	1912667	**1893333**	2583000	4977667	3764000	3654000	7388333	7350667	3972000	6554667	6608333
Normalized	61.18%	31.8%	51.9%	100%	24.27%	24.03%	32.78%	63.17%	47.77%	46.37%	93.76%	93.28%	50.41%	83.18%	83.86%
Standard Deviation	0.3%	0.5%	0.6%	1.5%	0.7%	0.1%	0.7%	0.6%	0.2%	0.7%	0.1%	0.9%	1.3%	1.1%	0.3%
MKL-DNN DNNL - IP Batch 1D - f32 (ms)	2.23009	4.49985	2.39451	1.63986	4.75696	**5.16658**	4.41366	2.18975	2.66699	2.86715	1.95992	1.63599	1.67560	1.57687	**1.53729**
Normalized	68.93%	34.16%	64.2%	93.75%	32.32%	29.75%	34.83%	70.2%	57.64%	53.62%	78.44%	93.97%	91.75%	97.49%	100%
Standard Deviation	3.8%	0.4%	0.8%	3.4%	0.8%	0.5%	0.3%	1%	0.8%	0.3%	5.3%	0.6%	0.7%	3.6%	2.2%
MKL-DNN DNNL - IP Batch All - f32 (ms)	10.6348	8.90795	6.79509	9.52466	9.30959	10.1930	8.84233	10.5239	11.4215	7.54439	**19.1030**	12.6820	8.88390	9.97669	**6.65842**
Normalized	62.61%	74.75%	97.99%	69.91%	71.52%	65.32%	75.3%	63.27%	58.3%	88.26%	34.86%	52.5%	74.95%	66.74%	100%
Standard Deviation	0.4%	0.2%	0.2%	0.3%	0.5%	0.2%	0.3%	1%	0.8%	2.3%	0.6%	0.1%	0.2%	0.6%	0.2%

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MKL-DNN DNNL - IP Batch All - u8s8f32 (ms)	4.08605	4.61054	3.23121	3.11002	4.83875	5.59275	4.53821	4.11779	4.82603	3.59218	5.36708	3.84746	**149.339**	3.04866	**2.78193**
Normalized	68.08%	60.34%	86.1%	89.45%	57.49%	49.74%	61.3%	67.56%	57.64%	77.44%	51.83%	72.31%	1.86%	91.25%	100%
Standard Deviation	1.6%	0.9%	0.2%	2.7%	0.3%	1%	0.4%	1.7%	1.4%	1.6%	2%	0.8%	0.3%	0.8%	0.6%
MKL-DNN DNNL - IP Batch 1D - bf16bf16bf16 (ms)	5.72791	8.68590	4.83170	3.65964	8.8271	**10.9014**	5.71439	**3.21281**	5.56500	5.56304	4.10369	4.06041		4.48918	4.46440
Normalized	56.09%	36.99%	66.49%	87.79%	36.4%	29.47%	56.22%	100%	57.73%	57.75%	78.29%	79.13%		71.57%	71.97%
Standard Deviation	0.6%	0.4%	0.1%	0.6%	0%	0.4%	0.1%	0.3%	0.5%	0.8%	0.4%	0.2%		0.2%	0.4%
MKL-DNN DNNL - C.B.c - f32 (ms)	999.544	1949	765.745	496.816	2363	**3130**	1227	694.324	1578	878.390	1206	650.981	710.140	559.468	**461.935**
Normalized	46.21%	23.7%	60.32%	92.98%	19.55%	14.76%	37.65%	66.53%	29.27%	52.59%	38.3%	70.96%	65.05%	82.57%	100%
Standard Deviation	0%	0.1%	0.1%	0.3%	0%	0.1%	0.1%	0.2%	0.2%	0.1%	1%	1.6%	0.5%	0.1%	0.1%
MKL-DNN DNNL - C.B.c - u8s8f32 (ms)	4896	9697	5920	**3005**	11821	**12300**	9375	4821	6330	6183	3251	3252	3077	3551	3549
Normalized	61.38%	30.99%	50.77%	100%	25.42%	24.43%	32.06%	62.34%	47.48%	48.61%	92.45%	92.41%	97.68%	84.63%	84.69%
Standard Deviation	0.1%	0.2%	0.3%	0.5%	0%	0.2%	0.2%	0.4%	3%	1.1%	0.3%	0%	1.5%	0.4%	0.6%
MKL-DNN DNNL - D.B.d - f32 (ms)	2.12680	3.36432	1.46232	1.24029	3.99488	**5.31087**	2.23126	1.49724	3.06590	1.74515	1.33109	1.25116	2.22540	1.25795	**1.22589**
Normalized	57.64%	36.44%	83.83%	98.84%	30.69%	23.08%	54.94%	81.88%	39.98%	70.25%	92.1%	97.98%	55.09%	97.45%	100%
Standard Deviation	0.1%	0.3%	0.2%	0.4%	0.2%	0.4%	0.2%	0.5%	0.3%	1.3%	1.3%	0%	1.5%	1%	0.1%
MKL-DNN DNNL - D.B.d - f32 (ms)	2.69700	4.88966	1.96279	**1.13608**	5.80420	**7.63646**	3.13006	1.70749	3.85512	2.27526	1.17385	1.17278	2.20471	1.26649	1.26395
Normalized	42.12%	23.23%	57.88%	100%	19.57%	14.88%	36.3%	66.54%	29.47%	49.93%	96.78%	96.87%	51.53%	89.7%	89.88%
Standard Deviation	0.1%	0.7%	0%	0.6%	0.5%	0.3%	0.4%	0.2%	0.3%	1.4%	0.2%	0.2%	0.5%	0.2%	0.5%
MKL-DNN DNNL - C.B.c - f32 (ms)	122.761	244.745	94.1937	**49.8437**	298.300	**395.441**	155.368	81.1400	197.914	108.568	79.1109	57.5111	96.6881	56.6465	55.3565
Normalized	40.6%	20.37%	52.92%	100%	16.71%	12.6%	32.08%	61.43%	25.18%	45.91%	63%	86.67%	51.55%	87.99%	90.04%
Standard Deviation	0%	0.1%	0.1%	0.3%	0.1%	0.4%	0.1%	0.1%	0%	0.2%	1.9%	2.4%	2%	0.7%	0.6%

MKL-DNN DNNL - C.B.c - u8s8f32 (ms)	2479	4827	2846	1517	5840	6241	4479	2378	3215	2968	2023	1708	11729	1794	1734
Normalized	61.2%	31.44%	53.32%	100%	25.98%	24.31%	33.88%	63.81%	47.2%	51.13%	74.99%	88.84%	12.94%	84.6%	87.5%
Standard Deviation	0.1%	0.2%	0.1%	0.4%	0%	0.1%	0.3%	0.8%	1.3%	0.9%	0.3%	0%	0.3%	0.1%	0.1%
MKL-DNN DNNL - D.B.d - f32 (ms)	1278	1921	1114	881.783	1700	2201	983.913	711.389	1364	1293	981.058	910.142	1485	739.163	743.695
Normalized	55.65%	37.04%	63.89%	80.68%	41.85%	32.32%	72.3%	100%	52.14%	55.03%	72.51%	78.16%	47.89%	96.24%	95.66%
Standard Deviation	0.2%	0.1%	0.1%	0.1%	0%	0.6%	0.1%	0.2%	0%	2.8%	0.4%	0%	0.2%	0.2%	0.2%
MKL-DNN DNNL - D.B.d - u8s8f32 (ms)	0.560890	0.843709	0.371036	0.394455	0.976730	1.27375	0.528632	0.369060	0.770300	0.458422	0.355362	0.354714	1131	0.376222	0.361414
Normalized	63.24%	42.04%	95.6%	89.93%	36.32%	27.85%	67.1%	96.11%	46.05%	77.38%	99.82%	100%	0.03%	94.28%	98.15%
Standard Deviation	0.9%	0.2%	0.2%	3%	0.3%	0.2%	0.1%	0.9%	0.8%	0.5%	0.6%	0.8%	0.6%	0.4%	0.5%
MKL-DNN DNNL - D.B.d - u8s8f32 (ms)	3112	6073	3717	1894	7189	7458	5864	2987	3849	3852	2059	2058	1899	2238	2253
Normalized	60.85%	31.18%	50.95%	100%	26.34%	25.39%	32.29%	63.4%	49.2%	49.16%	91.97%	92.02%	99.71%	84.61%	84.07%
Standard Deviation	0.2%	0.2%	0.1%	0.5%	0.1%	0%	0.1%	0.1%	0.1%	2.2%	0%	0.2%	0.3%	0.2%	1.7%
MKL-DNN DNNL - C.B.c - bf16bf16bf16 (ms)	15.2177	29.9173	14.0780	7.92912	39.9985	40.0192	22.4243	11.6076	20.5163	16.5906	8.71234	8.64707		9.20665	9.18751
Normalized	52.1%	26.5%	56.32%	100%	19.82%	19.81%	35.36%	68.31%	38.65%	47.79%	91.01%	91.7%		86.12%	86.3%
Standard Deviation	0%	0.1%	0%	0.1%	0%	0%	0%	0.1%	0%	2.9%	0.2%	0.1%		0%	0.2%
MKL-DNN DNNL - C.B.c - u8s8f32 (ms)	35.9778	66.7352	26.8391	19.8143	81.0705	105.826	42.2202	26.5363	55.3361	31.9893	59.9040	30.6427	1301	22.3830	19.3723
Normalized	53.85%	29.03%	72.18%	97.77%	23.9%	18.31%	45.88%	73%	35.01%	60.56%	32.34%	63.22%	1.49%	86.55%	100%
Standard Deviation	0.1%	0.2%	0.1%	0.2%	0.1%	0.1%	0%	1.6%	0.4%	0.2%	2.1%	0.2%	0.4%	1.8%	0.1%
MKL-DNN DNNL - C.B.c - bf16bf16bf16 (ms)	3918	7840	3497	1766	10255	10258	5709	2871	5157	3880	1920	1918		2198	2198
Normalized	45.09%	22.53%	50.5%	100%	17.22%	17.22%	30.94%	61.52%	34.25%	45.52%	92.02%	92.08%		80.37%	80.36%
Standard Deviation	0.2%	0.1%	0%	0.1%	0%	0%	0%	0.2%	0.2%	0%	0%	0%		0%	0%

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MKL-DNN DNNL - C.B.c - f32 (ms)	54.81	108.1	42.07	**23.17**	131.0	**171.4**	69.14	36.37	87.54	49.87	33.63	25.05	42.54	25.77	25.06
	90	61	58	**72**	88	**28**	31	16	34	44	05	33	13	22	72
Normalized	42.28%	21.43%	55.08%	100%	17.68%	13.52%	33.52%	63.72%	26.48%	46.47%	68.92%	92.51%	54.48%	89.93%	92.46%
Standard Deviation	0.2%	0.4%	0.1%	0.7%	0%	0.1%	0.2%	0.1%	0.1%	0.2%	0.9%	0.1%	0.8%	0.7%	0.1%
MKL-DNN DNNL - D.B.d - bf16bf16bf16 (ms)	7.229	13.14	6.553	4.068	16.54	**16.55**	9.903	5.384	8.869	7.615	3.969	**3.965**		4.490	4.465
	75	28	74	47	84	**16**	62	02	13	95	06	**10**		39	23
Normalized	54.84%	30.17%	60.5%	97.46%	23.96%	23.96%	40.04%	73.65%	44.71%	52.06%	99.9%	100%		88.3%	88.8%
Standard Deviation	0.2%	0.6%	0%	0.3%	0%	0.1%	0.1%	0.2%	0.2%	0.9%	0.4%	0.2%		0.2%	0.1%
MKL-DNN DNNL - D.B.d - bf16bf16bf16 (ms)	9.425	16.82	7.696	**4.358**	21.42	**21.47**	12.32	6.296	10.93	8.462	4.379	4.360		4.871	4.856
	91	53	05	**17**	90	**55**	71	47	79	73	52	02		94	89
Normalized	46.24%	25.9%	56.63%	100%	20.34%	20.29%	35.35%	69.22%	39.84%	51.5%	99.51%	99.96%		89.45%	89.73%
Standard Deviation	0.3%	0%	0.1%	0.1%	0.4%	0.2%	0%	0%	0.1%	0.8%	0.6%	0.1%		0.3%	0.2%
MKL-DNN DNNL - C.B.c - bf16bf16bf16 (ms)	712.2	1433	637.3	**320.0**	1874	**1875**	1042	527.0	938.9	702.0	348.2	348.3		399.2	399.3
	01		74	**60**				17	10	65	43	26		98	08
Normalized	44.94%	22.33%	50.22%	100%	17.07%	17.07%	30.71%	60.73%	34.09%	45.59%	91.91%	91.89%		80.16%	80.15%
Standard Deviation	0%	0.2%	0%	0%	0%	0%	0%	1.4%	0%	0.3%	0%	0.2%		0.1%	0%
MKL-DNN DNNL - C.B.c - u8s8f32 (ms)	15.75	28.45	11.29	**7.460**	34.60	45.05	17.97	11.32	23.70	13.45	17.75	10.48	**730.3**	8.747	7.636
	42	32	00	**50**	31	02	35	82	28	04	49	41	**06**	94	51
Normalized	47.36%	26.22%	66.08%	100%	21.56%	16.56%	41.51%	65.86%	31.48%	55.47%	42.02%	71.16%	1.02%	85.28%	97.7%
Standard Deviation	0.1%	0.1%	0.2%	0.8%	0.1%	0.1%	0.2%	0.2%	0.1%	0.2%	2.9%	0.4%	1.7%	0.5%	0.4%
MKL-DNN DNNL - D.B.d - bf16bf16bf16 (ms)	3152	5696	2936	1779	6721	**6722**	3967	2170	3601	3294	1731	**1705**		1904	1904
Normalized	54.1%	29.94%	58.08%	95.85%	25.37%	25.37%	42.99%	78.59%	47.36%	51.77%	98.53%	100%		89.55%	89.55%
Standard Deviation	0.2%	0.1%	0.3%	0.1%	0%	0%	0%	0.4%	0.2%	0.2%	1.6%	0.4%		0%	0%

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MKL-DNN DNNL - C.B.c - bf16bf16bf16 (ms)	187.168	369.287	166.984	**86.5391**	484.594	**484.895**	269.991	137.734	246.446	188.611	93.3596	93.2842		106.893	106.714
Normalized	46.24%	23.43%	51.82%	100%	17.86%	17.85%	32.05%	62.83%	35.11%	45.88%	92.69%	92.77%		80.96%	81.09%
Standard Deviation	0%	0.2%	0%	0%	0%	0%	0.1%	0%	0%	0.2%	0%	0.1%		0%	0%
dav1d - Summer Nature 4K (FPS)	177.89	160.59	199.08	221.31	136.86	**132.46**	170.07	203.10	159.60	256.60	218.14	216.86	**321.17**	215.64	212.99
Normalized	55.39%	50%	61.99%	68.91%	42.61%	41.24%	52.95%	63.24%	49.69%	79.9%	67.92%	67.52%	100%	67.14%	66.32%
Standard Deviation	0.8%	0.8%	1%	2.9%	0.4%	0.2%	1.2%	1.4%	2%	0.8%	0.9%	0.5%	0.5%	1.4%	1.4%
dav1d - S.N.1 (FPS)	321.84	274.98	323.20	409.88	265.46	**232.35**	307.75	358.62	272.55	537.84	422.89	406.66	**676.16**	431.76	400.24
Normalized	47.6%	40.67%	47.8%	60.62%	39.26%	34.36%	45.51%	53.04%	40.31%	79.54%	62.54%	60.14%	100%	63.85%	59.19%
Standard Deviation	2.9%	1.5%	0.3%	3.5%	0.8%	1.5%	0.5%	0.9%	2.9%	0.7%	2%	1.5%	0.6%	1.5%	3.6%
dav1d - C.1.1.b (FPS)	70.81	58.05	65.40	85.14	55.88	**50.10**	62.32	73.95	59.51	81.60	90.28	90.78	**140.14**	89.55	88.66
Normalized	50.53%	41.42%	46.67%	60.75%	39.87%	35.75%	44.47%	52.77%	42.46%	58.23%	64.42%	64.78%	100%	63.9%	63.27%
Standard Deviation	1.1%	0.4%	0.3%	0.1%	0.1%	0.2%	0.7%	0.4%	0.5%	0.1%	0.8%	0.6%	0.7%	0.1%	1.1%
OSPray - San Miguel - SciVis (FPS)	43.48	23.26	38.46	**69.52**	18.87	**14.71**	22.69	42.27	27.84	34.48	63.54	66.67	58.82	62.5	61.58
Normalized	62.54%	33.46%	55.32%	100%	27.14%	21.16%	32.64%	60.8%	40.05%	49.6%	91.4%	95.9%	84.61%	89.9%	88.58%
Standard Deviation	0%	0%	0%	3.5%	0%	0%	0.6%	2.5%	0.8%	0%	3%	0%	0%	0%	3%
OSPray - XFrog Forest - SciVis	7.19	3.70	6.25	**12.05**	3.01	**2.34**	3.68	7.09	4.57	5.72	11.36	11.36	11.03	10.42	10.32
Normalized	59.67%	30.71%	51.87%	100%	24.98%	19.42%	30.54%	58.84%	37.93%	47.47%	94.27%	94.27%	91.54%	86.47%	85.64%
Standard Deviation	0%	0.2%	0%	0%	0%	0%	0%	0%	0%	0.2%	0%	0%	0.6%	0%	0.4%
OSPray - San Miguel - Path Tracer	3.95	2.14	3.52	**6.53**	1.75	**1.40**	2.02	3.71	2.63	3.25	5.82	5.87	4.73	5.58	5.54
Normalized	60.49%	32.77%	53.91%	100%	26.8%	21.44%	30.93%	56.81%	40.28%	49.77%	89.13%	89.89%	72.43%	85.45%	84.84%
Standard Deviation	0.1%	0.1%	0.2%	0.3%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.3%	0.3%	0.3%	0.3%
OSPray - NASA Streamlines - SciVis (FPS)	55.56	28.57	50	**90.91**	23.26	**18.18**	29.41	55.56	34.48	45.45	82.62	83.33	76.92	76.92	76.92
Normalized	61.12%	31.43%	55%	100%	25.59%	20%	32.35%	61.12%	37.93%	49.99%	90.88%	91.66%	84.61%	84.61%	84.61%
Standard Deviation	0%	0%		0%	0%	0%	0%	0%	0%	0%	2.6%	0%	0%	0%	0%

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OSPray - XFrog Forest - Path Tracer (FPS)	3.98	2.06	3.46	**6.67**	1.68	**1.31**	2.02	3.88	2.55	3.17	6.25	6.24	5.85	5.71	5.71
Normalized	59.67%	30.88%	51.87%	100%	25.19%	19.64%	30.28%	58.17%	38.23%	47.53%	93.7%	93.55%	87.71%	85.61%	85.61%
Standard Deviation	0%	0.1%	0.2%	0%	0.1%	0.1%	0.1%	0%	0.1%	0.1%	0%	0.4%	0.6%	0%	0.2%
OSPray - M.R - SciVis	47.62	27.03	42.87	**71.43**	22.22	**17.94**	25.48	45.45	32.53	40	50.88	58.82	40	62.5	62.5
Normalized	66.67%	37.84%	60.02%	100%	31.11%	25.12%	35.67%	63.63%	45.54%	56%	71.23%	82.35%	56%	87.5%	87.5%
Standard Deviation	0%	0%	2.4%	0%	0%	0.9%	1.3%	0%	1.7%		3%	0%		0%	0%
OSPray - NASA Streamlines - Path Tracer (FPS)	10.42	5.38	9.49	**18.18**	4.37	**3.41**	5.52	10.56	6.62	8.69	17.02	16.95	16.60	15.625	15.54
Normalized	57.32%	29.59%	52.2%	100%	24.04%	18.76%	30.36%	58.09%	36.41%	47.8%	93.62%	93.23%	91.31%	85.95%	85.48%
Standard Deviation	0%	0%	0.5%	0%	0.3%	0%	0.3%	0.6%	0%	0.2%	0.9%	0%	0.8%	0%	0.9%
Embree - Pathtracer - Crown (FPS)	29.51 53	16.05 14	26.28 00	45.61 21	**12.38 82**	12.43 16	15.99 43	28.96 02	23.26 74	24.55 03	41.78 99	41.39 44	**47.64 64**	38.12 22	38.10 33
Normalized	61.95%	33.69%	55.16%	95.73%	26%	26.09%	33.57%	60.78%	48.83%	51.53%	87.71%	86.88%	100%	80.01%	79.97%
Standard Deviation	0.3%	0.2%	0.3%	0.3%	0.1%	0.2%	0%	0.5%	0.2%	0.2%	0.5%	0.7%	0.3%	0.8%	0.7%
Embree - Pathtracer ISPC - Crown (FPS)	33.44 69	17.66 04	28.77 30	**53.23 04**	14.41 63	**11.38 27**	16.80 99	31.73 18	21.74 68	26.40 10	49.04 61	49.95 59	45.18 69	46.17 57	46.41 84
Normalized	62.83%	33.18%	54.05%	100%	27.08%	21.38%	31.58%	59.61%	40.85%	49.6%	92.14%	93.85%	84.89%	86.75%	87.2%
Standard Deviation	0.1%	0.1%	0.1%	0.2%	0.1%	0%	0.2%	0.2%	0.1%	0.2%	3.4%	0.1%	0.3%	1.4%	0.2%
Embree - Pathtracer - Asian Dragon	35.87 57	19.61 05	32.24 74	**57.48 70**	15.31 04	**15.27 96**	19.34 72	34.69 19	28.20 32	30.10 57	40.07 87	45.76 74	52.95 32	46.79 20	46.90 84
Normalized	62.41%	34.11%	56.1%	100%	26.63%	26.58%	33.65%	60.35%	49.06%	52.37%	69.72%	79.61%	92.11%	81.4%	81.6%
Standard Deviation	0.3%	0.3%	0.2%	0.5%	0.2%	0.4%	0.1%	0.1%	0.3%	0.3%	1.4%	0.7%	0.2%	1.4%	0.3%
Embree - Pathtracer - Asian Dragon Obj	32.33 01	17.79 57	29.20 61	**51.78 53**	**13.85 26**	13.88 27	17.42 23	31.31 17	25.49 71	27.19 52	35.66 76	40.85 02	47.58 06	42.76 13	42.49 46
Normalized	62.43%	34.36%	56.4%	100%	26.75%	26.81%	33.64%	60.46%	49.24%	52.52%	68.88%	78.88%	91.88%	82.57%	82.06%
Standard Deviation	0.3%	0.3%	0.3%	0.4%	0.3%	0.1%	0.3%	0.1%	0.3%	0.1%	1.6%	0.4%	0.1%	0.2%	0.2%

Embree - Pathtracer ISPC - Asian Dragon	43.0983	23.6042	38.3100	**68.4241**	19.4321	**15.5911**	22.4598	40.4325	28.9732	35.1495	38.7658	51.8741	52.3541	59.0563	59.0502
Normalized	62.99%	34.5%	55.99%	100%	28.4%	22.79%	32.82%	59.09%	42.34%	51.37%	56.66%	75.81%	76.51%	86.31%	86.3%
Standard Deviation	0.1%	0.2%	0.3%	0.1%	0.1%	0.1%	0.1%	0.3%	0.1%	0.4%	2.7%	0.1%	0.1%	0.2%	0.3%
Embree - Pathtracer ISPC - Asian Dragon Obj (FPS)	37.1498	20.3418	33.0490	**58.6945**	16.7685	**13.4918**	19.3228	34.8030	25.0678	30.3458	36.6652	44.7151	45.4330	50.9769	50.8648
Normalized	63.29%	34.66%	56.31%	100%	28.57%	22.99%	32.92%	59.3%	42.71%	51.7%	62.47%	76.18%	77.41%	86.85%	86.66%
Standard Deviation	0.2%	0.1%	0.1%	0.2%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%	3%	0%	0.1%	0%	0%
SVT-AV1 - Enc Mode 4 - 1080p (FPS)	5.302	4.285	6.030	**7.033**	3.339	**3.309**	4.340	5.431	4.216	6.389	5.243	5.942	5.714	5.955	5.996
Normalized	75.39%	60.93%	85.74%	100%	47.48%	47.05%	61.71%	77.22%	59.95%	90.84%	74.55%	84.49%	81.25%	84.67%	85.26%
Standard Deviation	0.6%	0.6%	0.9%	1.6%	0.2%	1.1%	0.7%	0.3%	0.4%	0.6%	1.3%	1.3%	2.8%	0.1%	2.5%
SVT-AV1 - Enc Mode 8 - 1080p (FPS)	49.209	33.088	51.917	**56.982**	27.193	**26.460**	34.636	51.710	40.548	53.819	55.374	56.122	54.472	53.040	52.314
Normalized	86.36%	58.07%	91.11%	100%	47.72%	46.44%	60.78%	90.75%	71.16%	94.45%	97.18%	98.49%	95.6%	93.08%	91.81%
Standard Deviation	0.6%	0.7%	0.2%	2%	0.4%	0.5%	0.5%	0.8%	0.4%	1.5%	0.5%	1.5%	2.4%	0.4%	0.9%
SVT-VP9 - V.Q.O - Bosphorus 1080p (FPS)	237.57	224.01	265.40	233.17	**172.82**	173.18	221.95	256.91	206.42	282.18	191.66	228.38	**291.17**	229.91	229.53
Normalized	81.59%	76.93%	91.15%	80.08%	59.35%	59.48%	76.23%	88.23%	70.89%	96.91%	65.82%	78.44%	100%	78.96%	78.83%
Standard Deviation	1.6%	0.9%	2.7%	2.5%	1.8%	2.4%	2.4%	2.9%	1.3%	0.6%	9.4%	12.5%	1.5%	12.1%	12.3%
Intel Open Image Denoise - Memorial (Images / Sec)	27.97	18.41	31.10	**34.49**	15.80	**12.85**	22.01	33.06	20.43	27.35	15.06	19.55	28.71	33.89	33.10
Normalized	81.1%	53.38%	90.17%	100%	45.81%	37.26%	63.82%	95.85%	59.23%	79.3%	43.66%	56.68%	83.24%	98.26%	95.97%
Standard Deviation	0.3%	0.1%	0.1%	0.8%	0.1%	0.2%	0.2%	1.9%	0.8%	1.9%	1.5%	0.4%	0.2%	0.6%	1.1%
LuxCoreRender - DLSC (M	4.44	2.32	3.79	7.19	**1.74**	1.77	2.35	4.5183	3.43	3.53	6.73	6.75	**7.28**	5.88	5.86
Normalized	60.99%	31.87%	52.06%	98.76%	23.9%	24.31%	32.28%	62.06%	47.12%	48.49%	92.45%	92.72%	100%	80.77%	80.49%
Standard Deviation	0.5%	1.8%	0.1%	2.3%	0.3%	1.6%	1.1%	0.1%	1.3%	0.2%	0.7%	0.4%	2.3%	1%	0.8%

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LuxCoreRender - R.C.a.P (M samples/sec)	4.46	2.48	4.11	7.15	1.88	1.88	2.51	4.32	3.65	3.79	7.09	7.31	8.12	6.40	5.52
Normalized	54.93%	30.54%	50.62%	88.05%	23.15%	23.15%	30.91%	53.2%	44.95%	46.67%	87.32%	90.02%	100%	78.82%	67.98%
Standard Deviation	23.1%	1.1%	1.7%	21.6%	0%	0.5%	0.9%	11.9%	0.2%	3%	6%	1.3%	1.2%	1%	25.6%
Himeno Benchmark - P.P.S (MFLOPS)	3405	3398	3510	3515	3405	2824	3401	3410	2818	3866	3441	3431	3770	3148	3131
Normalized	88.07%	87.9%	90.79%	90.91%	88.07%	73.03%	87.97%	88.21%	72.88%	100%	88.99%	88.74%	97.51%	81.42%	80.98%
Standard Deviation	0.3%	0.1%	0.2%	0.3%	0.1%	0.1%	0.1%	0%	0.1%	0.2%	0%	0.1%	1%	0.1%	0.2%
Stockfish - Total Time (Nodes/s)	74235829	38167326	62891312	119715795	32424332	31174576	39776292	75203729	60569696	61170651	10987 4307	10841 2514	11676 5028	10351 3853	10410 6676
Normalized	62.01%	31.88%	52.53%	100%	27.08%	26.04%	33.23%	62.82%	50.59%	51.1%	91.78%	90.56%	97.54%	86.47%	86.96%
Standard Deviation	0.7%	0.8%	2.3%	1.3%	1%	2.3%	1.4%	2.2%	1.6%	2%	1.2%	1.6%	1.8%	0.6%	0.2%
asmFish - 1.H.M.2.D (Nodes/s)	85501851	43217939	68762075	133839896	36561817	35085496	44614925	83894514	66895810	66225641	11954 9901	10303 3955	11327 8977	11991 2357	10507 0606
Normalized	63.88%	32.29%	51.38%	100%	27.32%	26.21%	33.33%	62.68%	49.98%	49.48%	89.32%	76.98%	84.64%	89.59%	78.5%
Standard Deviation	0.2%	1.5%	1.1%	0.6%	1.3%	1.4%	2.4%	2%	0.1%	2.6%	2.2%	1.1%	0.9%	2.5%	2.5%
Timed GCC Compilation - Time To Compile	1061	1168	1064	1006	1219	1398	1093	996.904	1269	994.583	966.599	1033	849.192	1012	1074
Normalized	80.07%	72.72%	79.83%	84.45%	69.67%	60.74%	77.72%	85.18%	66.93%	85.38%	87.85%	82.21%	100%	83.91%	79.09%
Standard Deviation	0.2%	0%	0%	0%	0%	0.1%	0.1%	0.1%	0.1%	0.1%	1.1%	0.2%	0.1%	0.1%	0.2%
Timed GDB GNU Debugger Compilation - Time To Compile	146.439	151.909	144.643	142.695	156.299	177.772	139.120	133.444	169.704	134.824	128.950	145.510	108.675	129.689	146.435
Normalized	74.21%	71.54%	75.13%	76.16%	69.53%	61.13%	78.12%	81.44%	64.04%	80.61%	84.28%	74.69%	100%	83.8%	74.21%
Standard Deviation	0.1%	0.1%	0.2%	0.2%	0.1%	0.1%	0.1%	0.2%	0.2%	0.1%	0.5%	0.3%	0.1%	0.6%	0.3%
Timed Linux Kernel Compilation - Time To Compile	36.699	59.012	40.898	27.309	67.156	71.770	57.772	36.595	45.315	36.367	27.100	29.258	24.005	27.581	29.276
Normalized	65.41%	40.68%	58.69%	87.9%	35.75%	33.45%	41.55%	65.6%	52.97%	66.01%	88.58%	82.05%	100%	87.03%	82%
Standard Deviation	3%	3%	2.9%	3.4%	2.6%	2.8%	2.7%	2.9%	2.9%	2.9%	3.2%	4.8%	2.8%	3.2%	4.7%

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Timed LLVM Compilation - Time To Compile	286.782	430.426	308.741	221.515	501.218	531.152	433.191	279.682	347.827	281.678	218.050	244.910	200.039	232.053	244.940
Normalized	69.75%	46.47%	64.79%	90.3%	39.91%	37.66%	46.18%	71.52%	57.51%	71.02%	91.74%	81.68%	100%	86.2%	81.67%
Standard Deviation	1.2%	0.7%	2.7%	0.8%	1.2%	0.8%	0.9%	2.2%	0.9%	1.6%	1.3%	2.5%	0.6%	0.8%	1%
Build2 - Time To Compile (sec)	72.151	91.641	74.118	62.776	101.716	109.699	88.977	70.608	86.325	66.415	64.503	64.421	59.956	66.667	69.195
Normalized	83.1%	65.42%	80.89%	95.51%	58.94%	54.66%	67.38%	84.91%	69.45%	90.27%	92.95%	93.07%	100%	89.93%	86.65%
Standard Deviation	0.3%	0.3%	0.3%	0.2%	0.1%	0.2%	0.1%	0.2%	0.2%	0.4%	2.9%	0.2%	1.2%	1.3%	0.5%
Tungsten Renderer - Hair (sec)	11.0726	18.9840	12.6863	7.82706	22.4866	23.6129	18.6129	10.6653	13.6031	12.7104	8.29067	8.19337	7.67455	9.26217	9.09073
Normalized	69.31%	40.43%	60.49%	98.05%	34.13%	32.5%	41.23%	71.96%	56.42%	60.38%	92.57%	93.67%	100%	82.86%	84.42%
Standard Deviation	0.6%	0.3%	0.5%	2.5%	0.2%	0.9%	0.6%	0.9%	0.8%	0.7%	0.8%	0.8%	1.2%	1.1%	1%
Tungsten Renderer - Water Caustic (sec)	23.3367	25.0080	22.0167	21.5896	25.9635	28.8979	24.0874	23.1916	27.3948	21.5517	22.7599	22.7088	22.3247	24.5437	24.7792
Normalized	92.35%	86.18%	97.89%	99.82%	83.01%	74.58%	89.47%	92.93%	78.67%	100%	94.69%	94.9%	96.54%	87.81%	86.97%
Standard Deviation	0.3%	0.5%	0.6%	0.5%	0.1%	0.7%	0.5%	0.4%	0.2%	0.8%	0.9%	0.5%	0.2%	0.6%	1.2%
Numpy Benchmark (Score)	300.73	313.76	330.33	321.82	315.14	272.12	318.87	304.16	262.78	367.56	338.44	315.66	323.58	310.40	293.53
Normalized	81.82%	85.36%	89.87%	87.56%	85.74%	74.03%	86.75%	82.75%	71.49%	100%	92.08%	85.88%	88.03%	84.45%	79.86%
Standard Deviation	0.4%	1.8%	1.3%	1.6%	1.1%	0.6%	0.3%	0.8%	1.3%	1.3%	1.2%	2.3%	0.6%	0.4%	2%
Zstd Compression - C.u.1.0.3.s.i.i.C.L.1 (sec)	10.449	10.355	8.203	9.137	11.122	11.430	10.330	10.206	10.978	8.380	10.945	10.289	9.230	9.949	10.294
Normalized	78.51%	79.22%	100%	89.78%	73.75%	71.77%	79.41%	80.37%	74.72%	97.89%	74.95%	79.73%	88.87%	82.45%	79.69%
Standard Deviation	1.9%	0.4%	0.3%	2.8%	0.5%	1.1%	0.9%	1.6%	3.7%	0.5%	4%	3%	2.6%	3.7%	2.8%
DeepSpeech - CPU (sec)	125.11863	126.07801	118.09377	122.22468	128.40692	135.99744	119.78717	123.38702	133.01160	123.85252	113.14396	138.25629	72.81599	117.72613	135.05100
Normalized	58.2%	57.75%	61.66%	59.58%	56.71%	53.54%	60.79%	59.01%	54.74%	58.79%	64.36%	52.67%	100%	61.85%	53.92%
Standard Deviation	0.6%	1.5%	2.3%	1.6%	1%	1.6%	2.7%	1.3%	0.9%	0.2%	1.6%	3%	0.2%	1%	1.3%
Radiance Benchmark - Serial (sec)	746.918	749.923	728.361	728.246	747.844	909.318	746.687	745.686	907.757	665.7	753.635	753.433	730.7	841.647	841.323
Normalized	89.13%	88.77%	91.4%	91.41%	89.02%	73.21%	89.15%	89.27%	73.33%	100%	88.33%	88.36%	91.1%	79.09%	79.13%

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Radiance Benchmark - SMP Parallel (sec)	230.561	242.515	235	226.076	241.897	299.739	242.002	233.042	281.251	219.836	232.695	227.159	219.652	258.343	255.588
Normalized	95.27%	90.57%	93.47%	97.16%	90.8%	73.28%	90.76%	94.25%	78.1%	99.92%	94.39%	96.7%	100%	85.02%	85.94%
Intel MPI Benchmarks - IMB-P2P PingPong (Msg/sec)	19650424	10276850	16653865	31821691	9066471	8923780	10620969	20467430	17176231	20246605	35954425	35888908	20348261	31988149	32444647
Normalized	54.65%	28.58%	46.32%	88.51%	25.22%	24.82%	29.54%	56.93%	47.77%	56.31%	100%	99.82%	56.59%	88.97%	90.24%
Standard Deviation	0.1%	0.4%	0.4%	0.4%	0.2%	0.1%	0.3%	0.3%	0.2%	0.5%	0.1%	0.6%	0.3%	0.4%	0.6%
PostgreSQL pgbench - Buffer Test - Normal Load - Read Only (TPS)	598799	383121	560888	909916	322052	313377	376860	587882	501697	567697	629985	725741	891303	795715	790828
Normalized	65.81%	42.11%	61.64%	100%	35.39%	34.44%	41.42%	64.61%	55.14%	62.39%	69.24%	79.76%	97.95%	87.45%	86.91%
Standard Deviation	0.6%	0.2%	0.5%	2%	0.1%	0.3%	0.2%	0.1%	0.2%	1.1%	6.5%	0.4%	0.2%	0.5%	0.3%
PostgreSQL pgbench - Buffer Test - Normal Load - Read Write (TPS)	34228	45519	53139	24467	40895	40373	46503	37715	34916	11704	3891	3198	6106	4009	3169
Normalized	64.41%	85.66%	100%	46.04%	76.96%	75.98%	87.51%	70.97%	65.71%	22.03%	7.32%	6.02%	11.49%	7.55%	5.96%
Standard Deviation	0.8%	0.2%	1.2%	0.1%	0%	0.6%	0.2%	0.5%	1.1%	1.3%	8.9%	2.1%	18.1%	2.4%	31.6%
Basis Universal - ETC1S (sec)	54.554	56.018	51.446	52.694	58.473	67.461	54.790	54.947	65.644	47.653	52.608	53.135	54.310	57.826	58.280
Normalized	87.35%	85.07%	92.63%	90.43%	81.5%	70.64%	86.97%	86.73%	72.59%	100%	90.58%	89.68%	87.74%	82.41%	81.77%
Standard Deviation	0.7%	0.7%	0.4%	0.4%	0.9%	0.2%	0.1%	0.6%	0.4%	1.7%	0.5%	0.1%	0.1%	0.3%	0.2%
Basis Universal - UASTC Level 3 (sec)	27.981	46.708	30.689	19.885	55.209	58.246	44.943	27.226	34.632	30.634	21.060	20.994	19.193	23.088	23.147
Normalized	68.59%	41.09%	62.54%	96.52%	34.76%	32.95%	42.71%	70.5%	55.42%	62.65%	91.13%	91.42%	100%	83.13%	82.92%
Standard Deviation	0.2%	0%	0.1%	0.2%	0.1%	0%	0.1%	0.3%	0%	0.1%	1.5%	0%	0.5%	0.6%	0.1%
Chaos Group V-RAY - CPU	40270	21886	34710	64331	16981	17105	22074	34749	27592	33014	58326	58525	62897	51803	53051
Normalized	62.6%	34.02%	53.96%	100%	26.4%	26.59%	34.31%	54.02%	42.89%	51.32%	90.67%	90.97%	97.77%	80.53%	82.47%
Standard Deviation	0.8%	0.4%	1.5%	1.3%	0.7%	0.3%	0.5%	1.8%	1.4%	2.1%	0.7%	1.2%	0.5%	1.1%	0.2%

Xeon & EPYC Tests

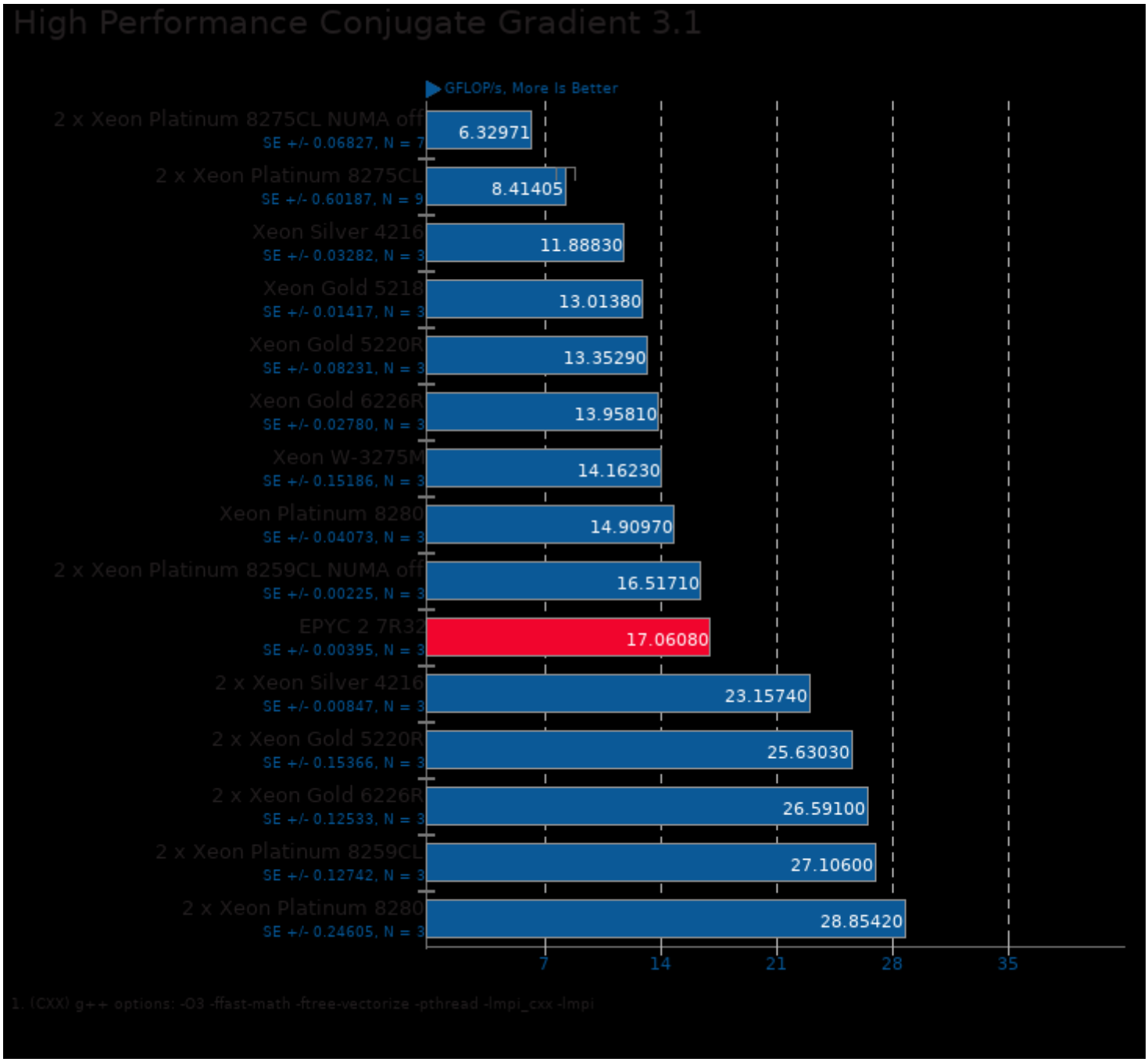
Blender - BMW27 - CPU-Only (sec)	60.67	113.30	69.80	**38.79**	**149.39**	149.02	111.82	59.45	78.72	74.96	41.68	41.72	41.76	47.63	48.00
Normalized	63.94%	34.24%	55.57%	100%	25.97%	26.03%	34.69%	65.25%	49.28%	51.75%	93.07%	92.98%	92.89%	81.44%	80.81%
Standard Deviation	0.4%	0.3%	0.2%	0.4%	0.3%	0.3%	0.3%	0.1%	0.3%	0.3%	0.6%	0.3%	0.4%	0.4%	0.2%
Blender - Classroom - CPU-Only (sec)	165.96	328.81	198.25	**100.47**	**433.42**	432.11	321.53	163.32	218.06	213.36	108.97	108.94	101.34	124.59	124.67
Normalized	60.54%	30.56%	50.68%	100%	23.18%	23.25%	31.25%	61.52%	46.07%	47.09%	92.2%	92.23%	99.14%	80.64%	80.59%
Standard Deviation	0.2%	0.2%	0.3%	0.4%	0.1%	0.1%	0.1%	0.5%	0.2%	0.3%	0.2%	0.5%	0.7%	0.1%	0.2%
Blender - Fishy Cat - CPU-Only (sec)	98.24	175.95	110.67	66.39	229.28	**229.71**	173.95	96.41	125.35	118.09	69.93	70.04	**65.67**	79.00	79.22
Normalized	66.85%	37.32%	59.34%	98.92%	28.64%	28.59%	37.75%	68.12%	52.39%	55.61%	93.91%	93.76%	100%	83.13%	82.9%
Standard Deviation	0.1%	0.1%	0.3%	0.1%	0%	0.1%	0%	0.4%	0.3%	0.1%	0.1%	0.3%	0.1%	0.2%	0.3%
Blender - Barbershop - CPU-Only (sec)	260.56	456.47	287.80	187.33	589.07	**593.13**	453.22	257.01	333.40	304.79	189.55	190.01	**177.79**	211.33	211.37
Normalized	68.23%	38.95%	61.78%	94.91%	30.18%	29.97%	39.23%	69.18%	53.33%	58.33%	93.8%	93.57%	100%	84.13%	84.11%
Standard Deviation	0.2%	0.1%	0.1%	0.4%	0.1%	0.1%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.5%	0.1%	0.1%
Blender - Pabellon Barcelona - CPU-Only (sec)	208.30	404.78	246.31	**129.01**	**531.98**	531.39	400.96	207.41	272.72	265.41	139.11	139.00	132.04	158.13	157.99
Normalized	61.93%	31.87%	52.38%	100%	24.25%	24.28%	32.18%	62.2%	47.3%	48.61%	92.74%	92.81%	97.71%	81.58%	81.66%
Standard Deviation	0.1%	0%	0%	0.3%	0.1%	0.1%	0.1%	0.1%	0.3%	0.5%	0.2%	0.1%	0.7%	0.1%	0.1%
PyBench - T.F.A.T.T (Millisecond	1100	1114	1076	1073	1101	1342	1103	1104	**1343**	**951**	1133	1123	1226	1252	1253
Normalized	86.45%	85.37%	88.38%	88.63%	86.38%	70.86%	86.22%	86.14%	70.81%	100%	83.94%	84.68%	77.57%	75.96%	75.9%
Standard Deviation	0.2%	1.9%	0.2%	0.2%		0.1%	0.5%	0.1%	0.1%	0.3%	0.7%	0.1%	0.4%	0.1%	0.2%
PyPerformance - float (Millisecond	113	114	109	109	114	**137**	115	113	**137**	**94.5**				123	123
Normalized	83.63%	82.89%	86.7%	86.7%	82.89%	68.98%	82.17%	83.63%	68.98%	100%				76.83%	76.83%
Standard Deviation	0.5%									0.2%					0.5%

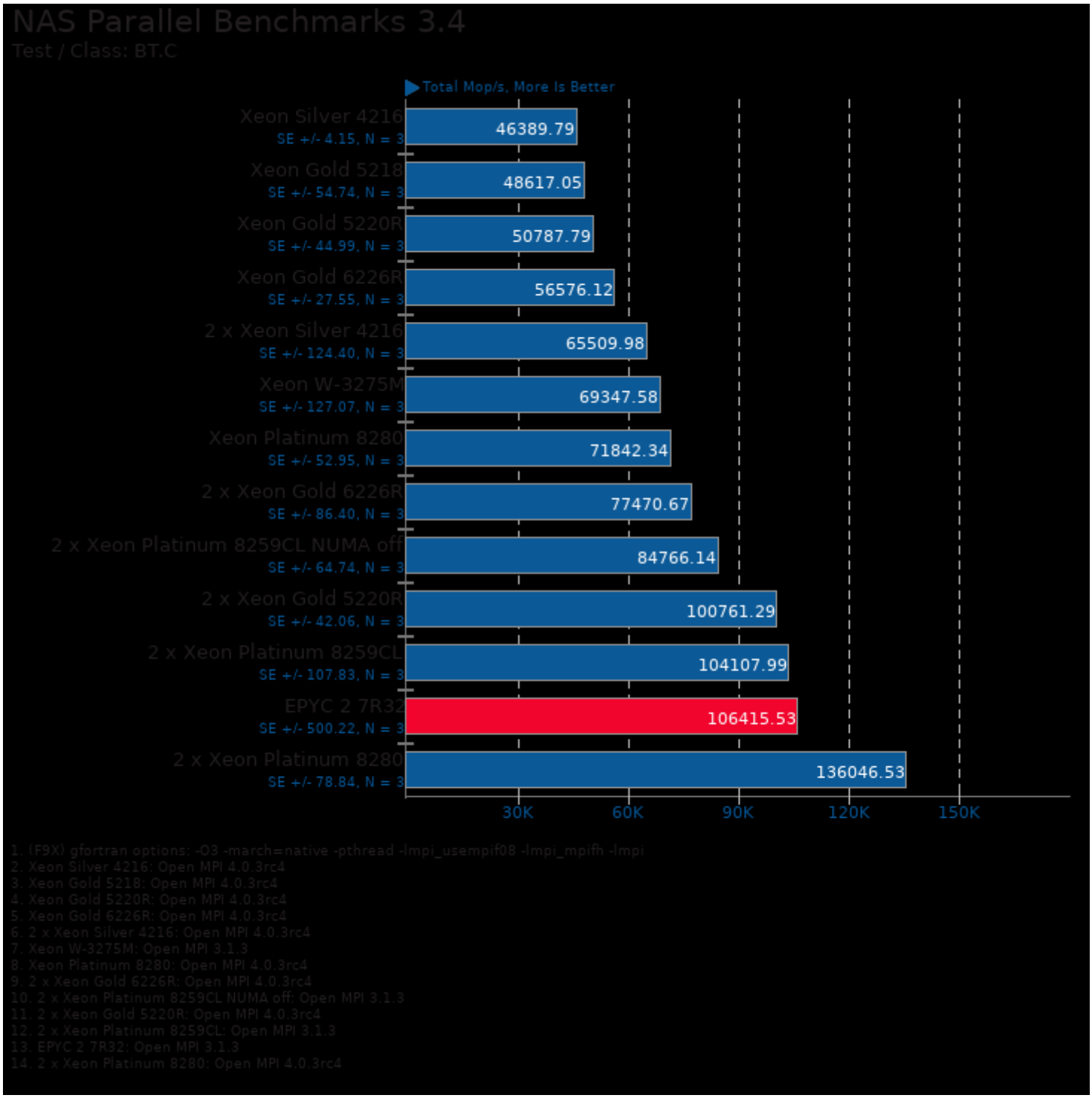
Xeon & EPYC Tests

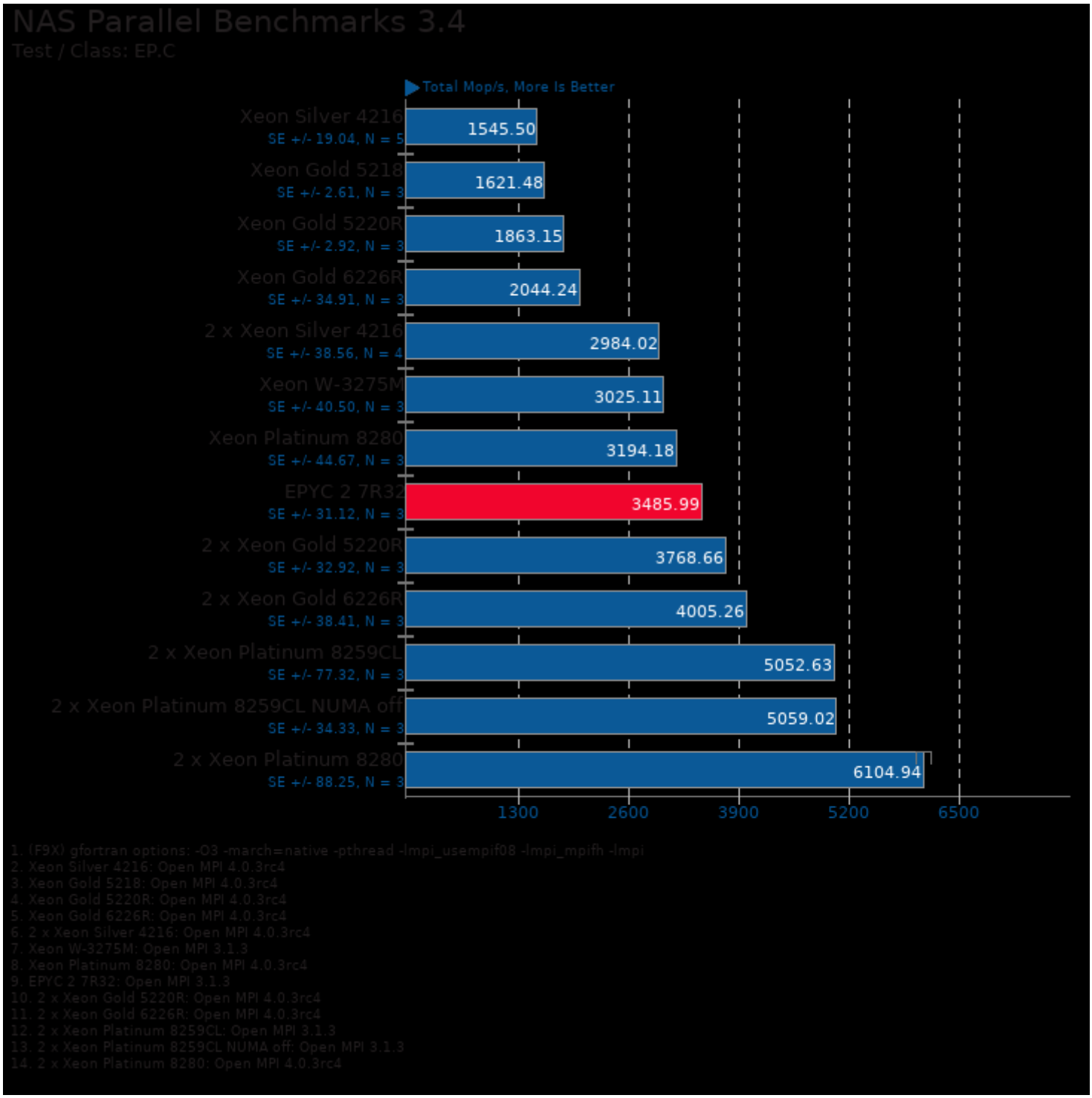
PyPerformance - regex_compile (Millisecond	167	168	164	164	167	204	168	167	204	157			213	200	200
Normalized	94.01%	93.45%	95.73%	95.73%	94.01%	76.96%	93.45%	94.01%	76.96%	100%			73.71%	78.5%	78.5%
Standard Deviation										1.3%			0.3%		
PyPerformance - python_startup (Millisecond	11.2	11.3	11.2	11.2	11.1	15.4	11.0	10.9	15.4	17.7			16.3	11.3	22.6
Normalized	97.32%	96.46%	97.32%	97.32%	98.2%	70.78%	99.09%	100%	70.78%	61.58%			66.87%	96.46%	48.23%
Standard Deviation	0%	0%	1%	0.5%	0.9%	0.4%	1.4%	0.5%	0.4%	0.9%			0%	0.5%	0.3%
PyPerformance - django_template (Millisecond	47.3	47.1	46.2	45.9	47.2	57.5	47.3	47.1	57.5	49.9			66.4	64.2	64.1
Normalized	97.04%	97.45%	99.35%	100%	97.25%	79.83%	97.04%	97.45%	79.83%	91.98%			69.13%	71.5%	71.61%
Standard Deviation	0.1%	0.2%	0.2%	0.3%	0%	0%	0.1%	0.1%	0.2%	2.3%			0.2%	0.2%	0.2%
Appleseed - Emily (sec)	180.6	284.2	197.6	154.9	328.1	345.3	276.7	177.6	222.9	196.9	152.9	152.0	147.6	161.8	163.7
	45797	7974	49505	80752	39133	89961	68654	61148	68514	29786	02049	93681	85856	46314	07232
Normalized	81.75%	51.95%	74.72%	95.29%	45.01%	42.76%	53.36%	83.13%	66.24%	74.99%	96.59%	97.1%	100%	91.25%	90.21%
Appleseed - Disney Material	88.85	158.7	103.8	68.61	182.5	194.4	155.2	84.84	107.4	106.6	68.60	68.20	62.43	73.58	73.21
	6634	7238	33099	8272	57972	01843	28014	4108	98089	43392	6542	2167	1047	1913	6224
Normalized	70.26%	39.32%	60.13%	90.98%	34.2%	32.11%	40.22%	73.58%	58.08%	58.54%	91%	91.54%	100%	84.85%	85.27%
Appleseed - Material Tester (sec)	189.4	162.8	123.9	193.4	179.7	188.7	156.6	185.3	197.7	124.1	189.2	194.8	175.1	185.2	197.2
	59653	60353	79103	4241	51505	76756	05614	57154	40442	47301	96166	46861	93708	29734	93774
Normalized	65.44%	76.13%	100%	64.09%	68.97%	65.67%	79.17%	66.89%	62.7%	99.86%	65.49%	63.63%	70.77%	66.93%	62.84%
PHPBench - P.B.S	63128	62969	64916	64969	63245	51569	63243	63260	51996	73433	64017	63902	50052	57348	57434
	3	0	4	3	5	7	1	1	4	9	3	6	4	3	8
Normalized	85.97%	85.75%	88.4%	88.47%	86.13%	70.23%	86.12%	86.15%	70.81%	100%	87.18%	87.02%	68.16%	78.1%	78.21%
Standard Deviation	0.3%	0.2%	0.1%	0.2%	0.2%	0.6%	0.2%	0%	0.1%	0.2%	0%	0.1%	0.4%	0.3%	0.1%
Mlpack Benchmark - scikit_ica (sec)	77.41	68.19	67.36	63.35	68.78	81.36	61.82	74.63	94.45	54.91	53.50	53.66	49.47	58.48	57.69
Normalized	63.91%	72.55%	73.44%	78.09%	71.92%	60.8%	80.02%	66.29%	52.38%	90.09%	92.47%	92.19%	100%	84.59%	85.75%
Standard Deviation	2.8%	0.6%	0.5%	1.6%	1.1%	1.7%	1.3%	0.7%	2.4%	0.3%	3.7%	0.8%	3.8%	2.4%	1.1%

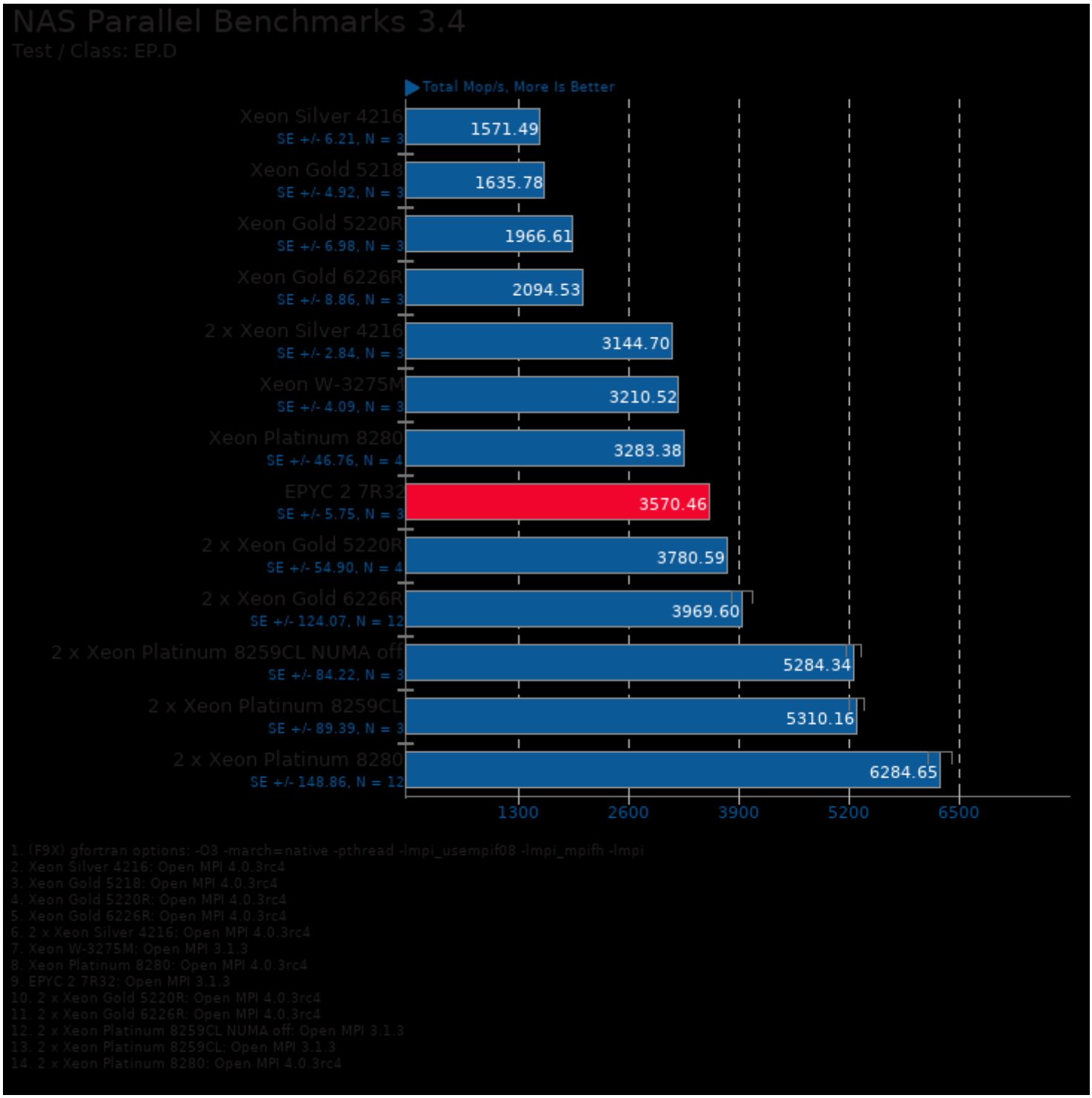
Xeon & EPYC Tests

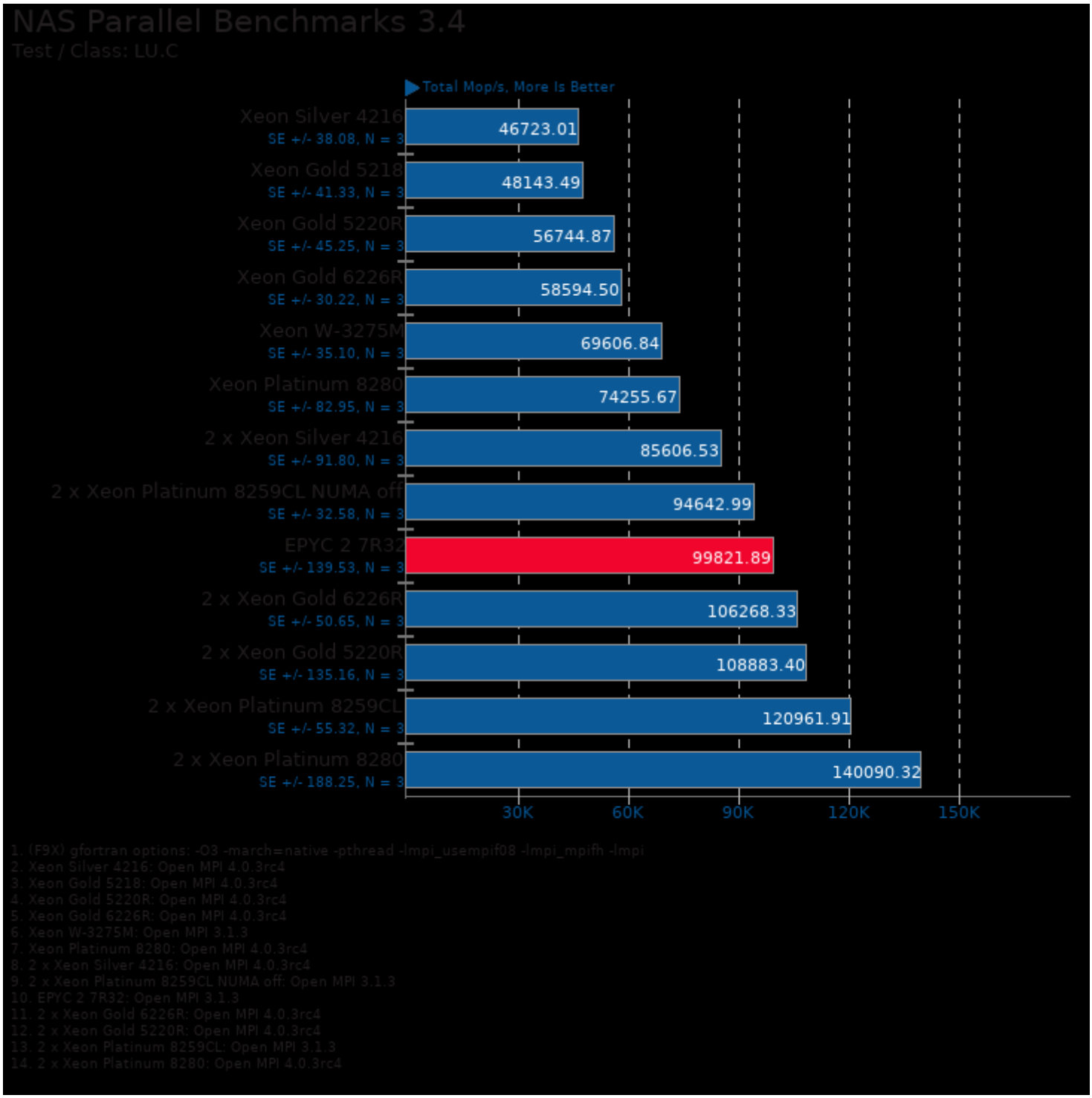
Mlpack Benchmark - scikit_qda (sec)	42.69	34.24	**30.45**	38.35	37.41	40.75	31.96	44.53	50.10	32.65	**62.02**	57.25	39.54	42.88	41.29
Normalized	71.33%	88.93%	100%	79.4%	81.4%	74.72%	95.28%	68.38%	60.78%	93.26%	49.1%	53.19%	77.01%	71.01%	73.75%
Standard Deviation	2.6%	2.9%	1.6%	1.5%	2.8%	1.7%	2.5%	0.8%	3.5%	1%	5.6%	1.6%	1.2%	4.4%	0.8%
Mlpack Benchmark - scikit_svm (sec)	17.92	17.82	17.19	17.19	17.98	20.89	17.92	17.77	**21.09**	15.78	16.87	18.42	**15.16**	18.76	19.62
Normalized	84.6%	85.07%	88.19%	88.19%	84.32%	72.57%	84.6%	85.31%	71.88%	96.07%	89.86%	82.3%	100%	80.81%	77.27%
Standard Deviation	0.4%	0.9%	0.7%	0.9%	0.2%	0.3%	0%	1.3%	0.5%	2.1%	0.6%	0.1%	1%	0.3%	0.2%
Mlpack Benchmark - scikit_linearridgeregression (sec)	2.39	2.25	**1.67**	1.82	2.46	2.97	1.93	2.08	**2.99**	1.99	2.36	2.46	1.79	2.30	2.42
Normalized	69.87%	74.22%	100%	91.76%	67.89%	56.23%	86.53%	80.29%	55.85%	83.92%	70.76%	67.89%	93.3%	72.61%	69.01%
Standard Deviation	8.1%	2.3%	2%	2.6%	2.9%	2.4%	2.4%	7.9%	1.1%	1.6%	6%	4.2%	2.1%	4%	2.9%
Scikit-Learn (sec)	10.458	10.112	**9.127**	9.392	10.286	12.030	9.924	10.449	12.549	9.661	11.065	11.490	10.419	12.459	**12.954**
Normalized	87.27%	90.26%	100%	97.18%	88.73%	75.87%	91.97%	87.35%	72.73%	94.47%	82.49%	79.43%	87.6%	73.26%	70.46%
Standard Deviation	0.4%	0.6%	0.8%	2.2%	0.7%	0.4%	0.5%	0.9%	0.5%	0.6%	0.8%	0.5%	0.6%	0.5%	0.6%
SMHasher - wyhash (MiB/sec)						22004	19430	19424	22011	**26299**	**18770**	18776		20225	20232
Normalized						83.67%	73.88%	73.86%	83.7%	100%	71.37%	71.39%		76.91%	76.93%
Standard Deviation						0%	0.1%	0%	0%	0.7%	0%	0%		0.1%	0%

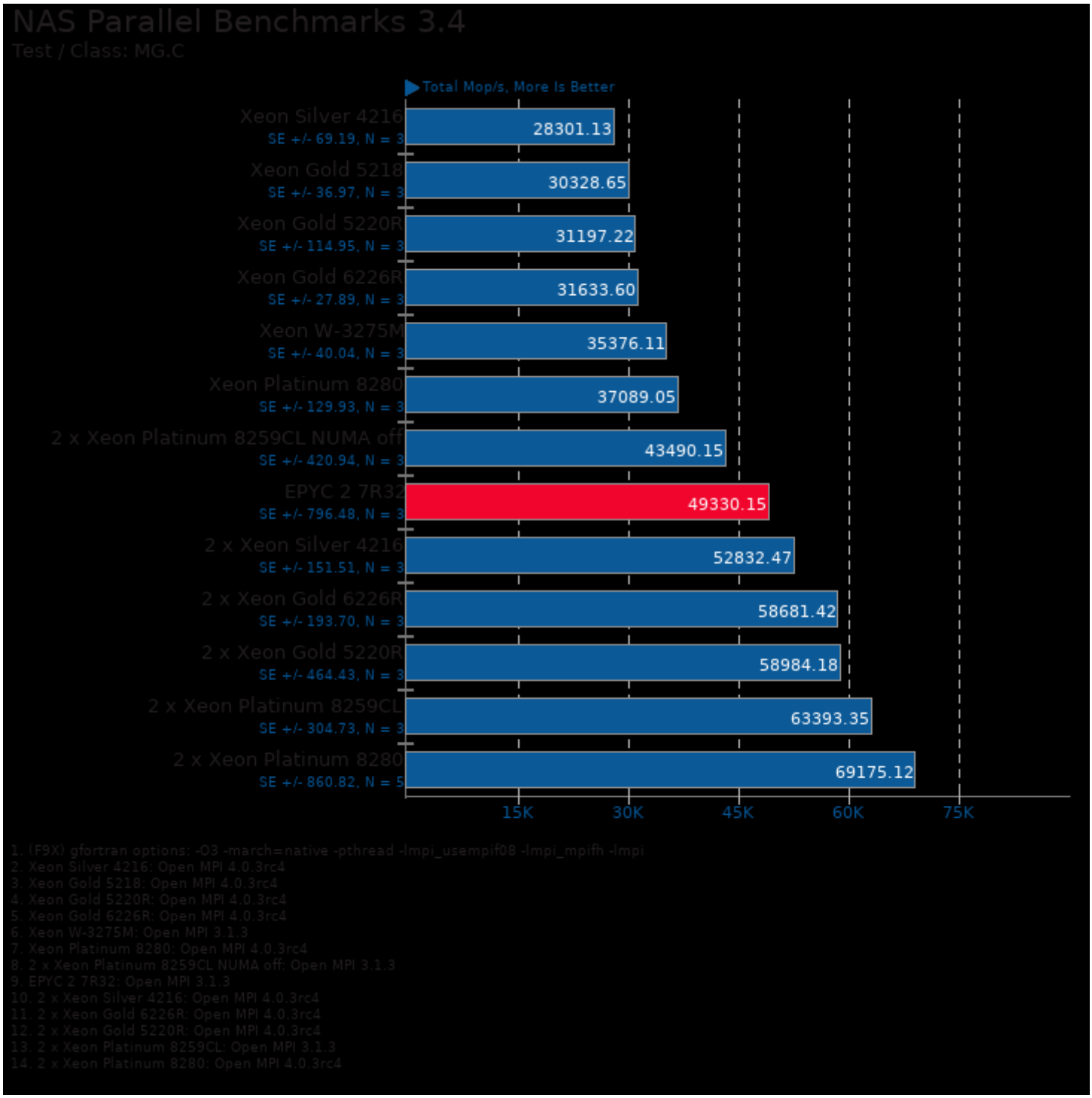

High Performance Conjugate Gradient 3.1
GFLOP/s, More Is Better
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.06827, N = 7
6.32971
2 x Xeon Platinum 8275CL
SE +/- 0.60187, N = 9
8.41405
Xeon Silver 4216
SE +/- 0.03282, N = 3
11.88830
Xeon Gold 5218
SE +/- 0.01417, N = 3
13.01380
Xeon Gold 5220R
SE +/- 0.08231, N = 3
13.35290
Xeon Gold 6226R
SE +/- 0.02780, N = 3
13.95810
Xeon W-3275M
SE +/- 0.15186, N = 3
14.16230
Xeon Platinum 8280
SE +/- 0.04073, N = 3
14.90970
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.00225, N = 3
16.51710
EPYC 2 7R32
SE +/- 0.00395, N = 3
17.06080
2 x Xeon Silver 4216
SE +/- 0.00847, N = 3
23.15740
2 x Xeon Gold 5220R
SE +/- 0.15366, N = 3
25.63030
2 x Xeon Gold 6226R
SE +/- 0.12533, N = 3
26.59100
2 x Xeon Platinum 8259CL
SE +/- 0.12742, N = 3
27.10600
2 x Xeon Platinum 8280
SE +/- 0.24605, N = 3
28.85420
7
14
21
28
35
1. (CXX) g++ options: -O3 -ffast-math -ftree-vectorize -pthread -lmpi_cxx -lmpi

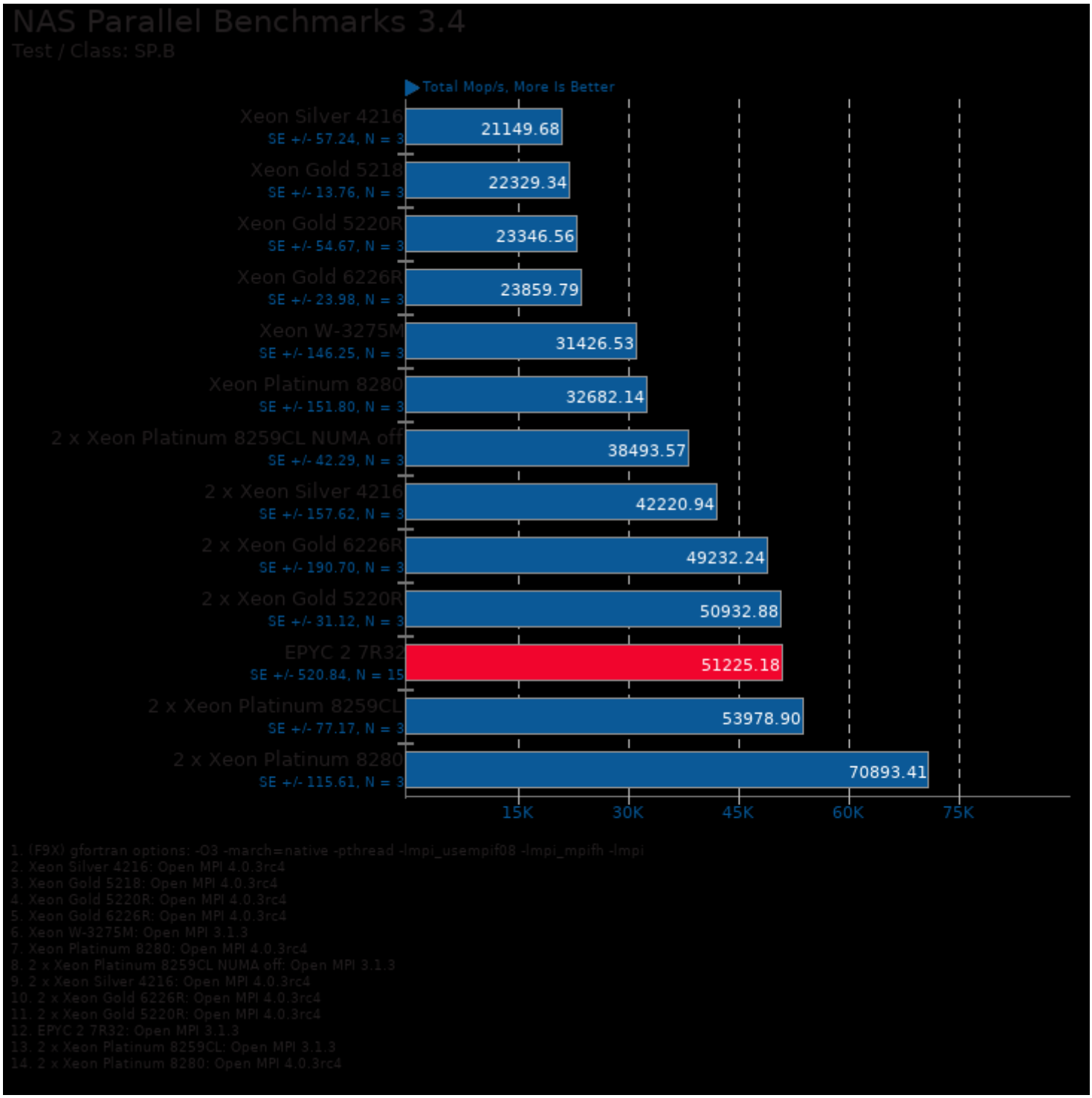

NAS Parallel Benchmarks 3.4
Test / Class: BT.C
Total Mop/s, More Is Better
Xeon Silver 4216
SE +/- 4.15, N = 3
46389.79
Xeon Gold 5218
SE +/- 54.74, N = 3
48617.05
Xeon Gold 5220R
SE +/- 44.99, N = 3
50787.79
Xeon Gold 6226R
SE +/- 27.55, N = 3
56576.12
2 x Xeon Silver 4216
SE +/- 124.40, N = 3
65509.98
Xeon W-3275M
SE +/- 127.07, N = 3
69347.58
Xeon Platinum 8280
SE +/- 52.95, N = 3
71842.34
2 x Xeon Gold 6226R
SE +/- 86.40, N = 3
77470.67
2 x Xeon Platinum 8259CL NUMA off
SE +/- 64.74, N = 3
84766.14
2 x Xeon Gold 5220R
SE +/- 42.06, N = 3
100761.29
2 x Xeon Platinum 8259CL
SE +/- 107.83, N = 3
104107.99
EPYC 2 7R32
SE +/- 500.22, N = 3
106415.53
2 x Xeon Platinum 8280
SE +/- 78.84, N = 3
136046.53
30K
60K
90K
120K
150K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Xeon Silver 4216: Open MPI 4.0.3rc4
3. Xeon Gold 5218: Open MPI 4.0.3rc4
4. Xeon Gold 5220R: Open MPI 4.0.3rc4
5. Xeon Gold 6226R: Open MPI 4.0.3rc4
6. 2 x Xeon Silver 4216: Open MPI 4.0.3rc4
7. Xeon W-3275M: Open MPI 3.1.3
8. Xeon Platinum 8280: Open MPI 4.0.3rc4
9. 2 x Xeon Gold 6226R: Open MPI 4.0.3rc4
10. 2 x Xeon Platinum 8259CL NUMA off: Open MPI 3.1.3
11. 2 x Xeon Gold 5220R: Open MPI 4.0.3rc4
12. 2 x Xeon Platinum 8259CL: Open MPI 3.1.3
13. EPYC 2 7R32: Open MPI 3.1.3
14. 2 x Xeon Platinum 8280: Open MPI 4.0.3rc4

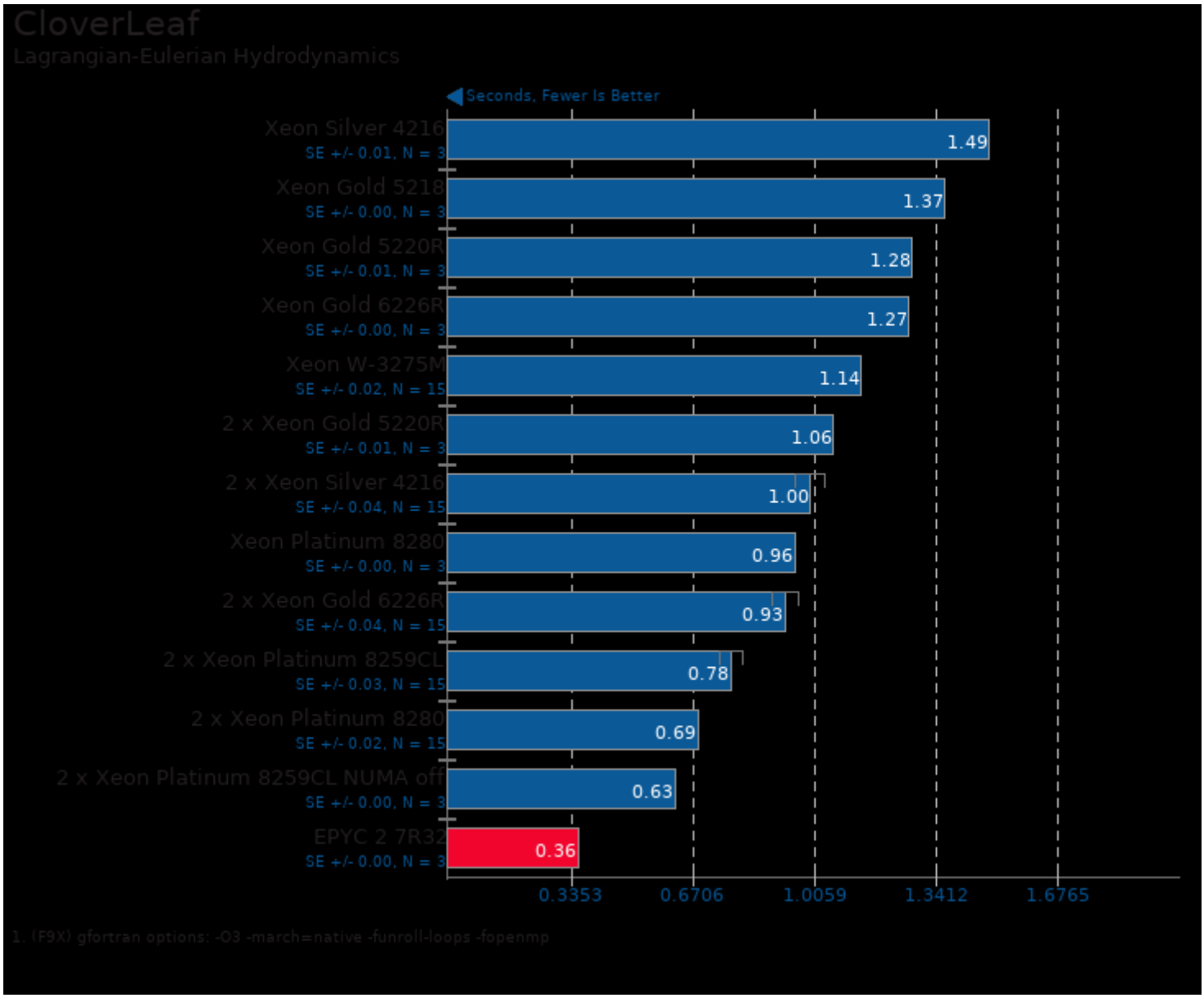

NAS Parallel Benchmarks 3.4
Test / Class: EP.C
Total Mop/s, More Is Better
Xeon Silver 4216
SE +/- 19.04, N = 5
1545.50
Xeon Gold 5218
SE +/- 2.61, N = 3
1621.48
Xeon Gold 5220R
SE +/- 2.92, N = 3
1863.15
Xeon Gold 6226R
SE +/- 34.91, N = 3
2044.24
2 x Xeon Silver 4216
SE +/- 38.56, N = 4
2984.02
Xeon W-3275M
SE +/- 40.50, N = 3
3025.11
Xeon Platinum 8280
SE +/- 44.67, N = 3
3194.18
EPYC 2 7R32
SE +/- 31.12, N = 3
3485.99
2 x Xeon Gold 5220R
SE +/- 32.92, N = 3
3768.66
2 x Xeon Gold 6226R
SE +/- 38.41, N = 3
4005.26
2 x Xeon Platinum 8259CL
SE +/- 77.32, N = 3
5052.63
2 x Xeon Platinum 8259CL NUMA off
SE +/- 34.33, N = 3
5059.02
2 x Xeon Platinum 8280
SE +/- 88.25, N = 3
6104.94
1300
2600
3900
5200
6500
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Xeon Silver 4216: Open MPI 4.0.3rc4
3. Xeon Gold 5218: Open MPI 4.0.3rc4
4. Xeon Gold 5220R: Open MPI 4.0.3rc4
5. Xeon Gold 6226R: Open MPI 4.0.3rc4
6. 2 x Xeon Silver 4216: Open MPI 4.0.3rc4
7. Xeon W-3275M: Open MPI 3.1.3
8. Xeon Platinum 8280: Open MPI 4.0.3rc4
9. EPYC 2 7R32: Open MPI 3.1.3
10. 2 x Xeon Gold 5220R: Open MPI 4.0.3rc4
11. 2 x Xeon Gold 6226R: Open MPI 4.0.3rc4
12. 2 x Xeon Platinum 8259CL: Open MPI 3.1.3
13. 2 x Xeon Platinum 8259CL NUMA off: Open MPI 3.1.3
14. 2 x Xeon Platinum 8280: Open MPI 4.0.3rc4

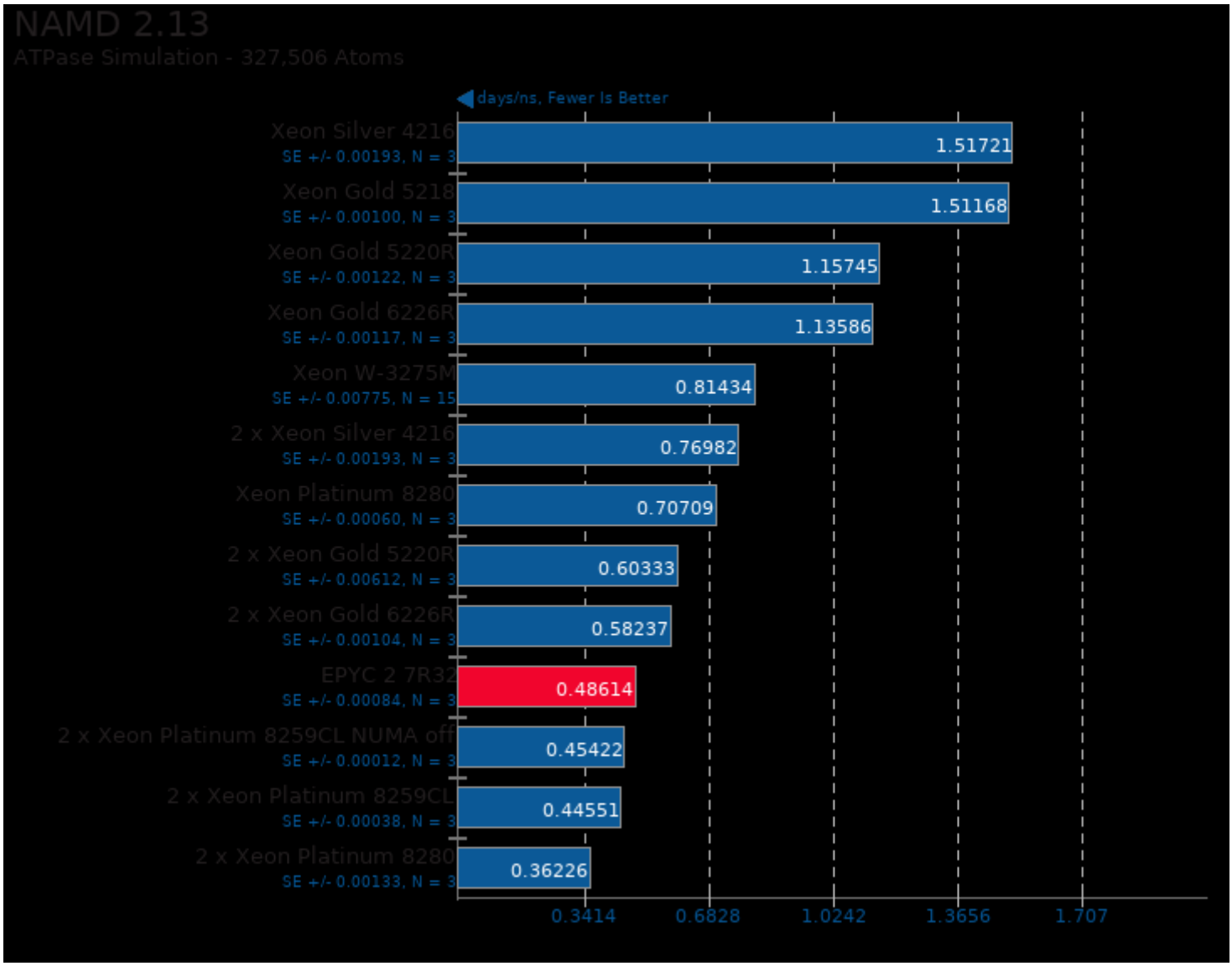

NAS Parallel Benchmarks 3.4
Test / Class: EP.D
Total Mop/s, More Is Better
Xeon Silver 4216
SE +/- 6.21, N = 3
1571.49
Xeon Gold 5218
SE +/- 4.92, N = 3
1635.78
Xeon Gold 5220R
SE +/- 6.98, N = 3
1966.61
Xeon Gold 6226R
SE +/- 8.86, N = 3
2094.53
2 x Xeon Silver 4216
SE +/- 2.84, N = 3
3144.70
Xeon W-3275M
SE +/- 4.09, N = 3
3210.52
Xeon Platinum 8280
SE +/- 46.76, N = 4
3283.38
EPYC 2 7R32
SE +/- 5.75, N = 3
3570.46
2 x Xeon Gold 5220R
SE +/- 54.90, N = 4
3780.59
2 x Xeon Gold 6226R
SE +/- 124.07, N = 12
3969.60
2 x Xeon Platinum 8259CL NUMA off
SE +/- 84.22, N = 3
5284.34
2 x Xeon Platinum 8259CL
SE +/- 89.39, N = 3
5310.16
2 x Xeon Platinum 8280
SE +/- 148.86, N = 12
6284.65
1300
2600
3900
5200
6500
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Xeon Silver 4216: Open MPI 4.0.3rc4
3. Xeon Gold 5218: Open MPI 4.0.3rc4
4. Xeon Gold 5220R: Open MPI 4.0.3rc4
5. Xeon Gold 6226R: Open MPI 4.0.3rc4
6. 2 x Xeon Silver 4216: Open MPI 4.0.3rc4
7. Xeon W-3275M: Open MPI 3.1.3
8. Xeon Platinum 8280: Open MPI 4.0.3rc4
9. EPYC 2 7R32: Open MPI 3.1.3
10. 2 x Xeon Gold 5220R: Open MPI 4.0.3rc4
11. 2 x Xeon Gold 6226R: Open MPI 4.0.3rc4
12. 2 x Xeon Platinum 8259CL NUMA off: Open MPI 3.1.3
13. 2 x Xeon Platinum 8259CL: Open MPI 3.1.3
14. 2 x Xeon Platinum 8280: Open MPI 4.0.3rc4

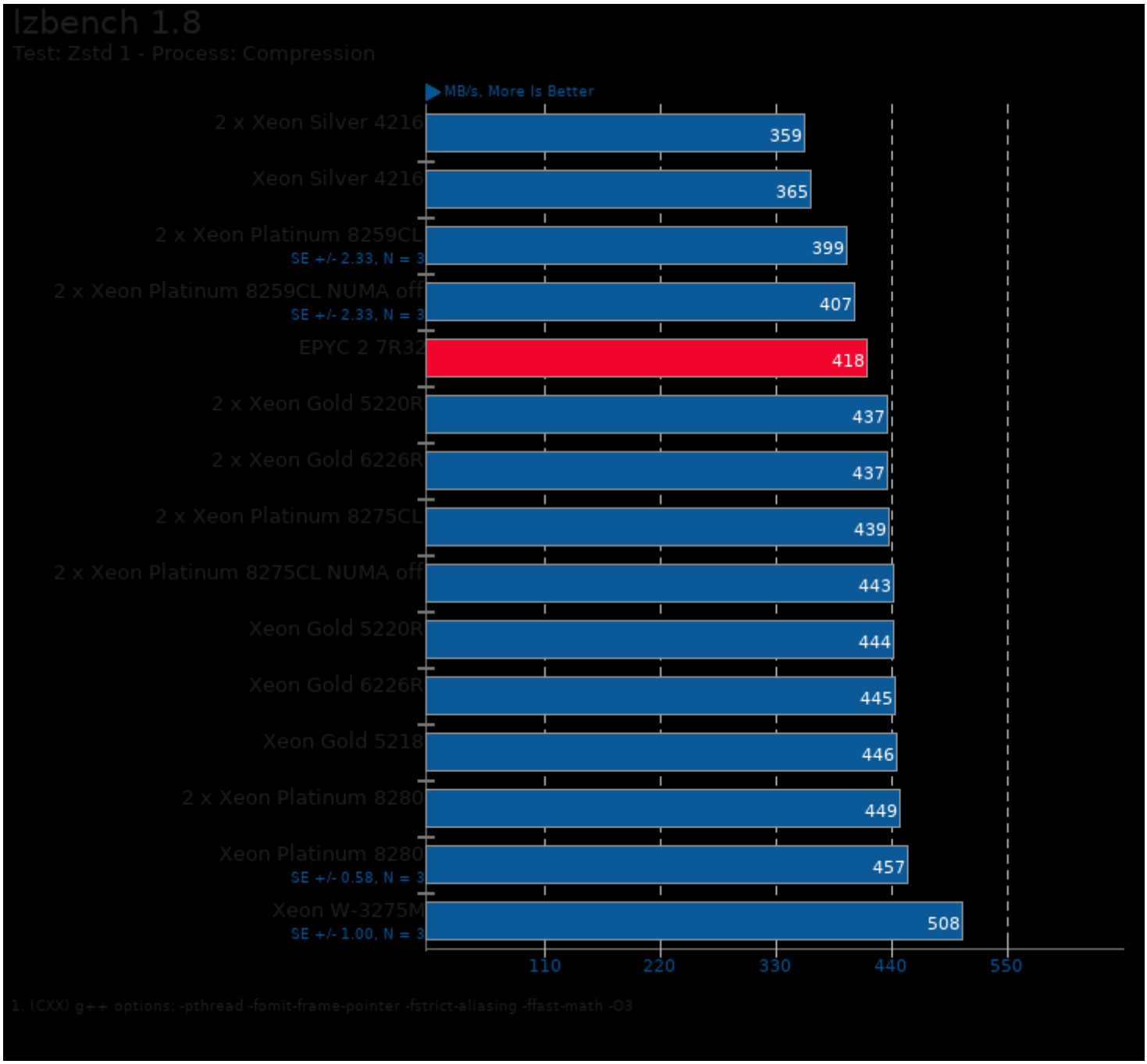

NAS Parallel Benchmarks 3.4
Test / Class: LU.C
Total Mop/s, More Is Better
Xeon Silver 4216
SE +/- 38.08, N = 3
46723.01
Xeon Gold 5218
SE +/- 41.33, N = 3
48143.49
Xeon Gold 5220R
SE +/- 45.25, N = 3
56744.87
Xeon Gold 6226R
SE +/- 30.22, N = 3
58594.50
Xeon W-3275M
SE +/- 35.10, N = 3
69606.84
Xeon Platinum 8280
SE +/- 82.95, N = 3
74255.67
2 x Xeon Silver 4216
SE +/- 91.80, N = 3
85606.53
2 x Xeon Platinum 8259CL NUMA off
SE +/- 32.58, N = 3
94642.99
EPYC 2 7R32
SE +/- 139.53, N = 3
99821.89
2 x Xeon Gold 6226R
SE +/- 50.65, N = 3
106268.33
2 x Xeon Gold 5220R
SE +/- 135.16, N = 3
108883.40
2 x Xeon Platinum 8259CL
SE +/- 55.32, N = 3
120961.91
2 x Xeon Platinum 8280
SE +/- 188.25, N = 3
140090.32
30K
60K
90K
120K
150K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Xeon Silver 4216: Open MPI 4.0.3rc4
3. Xeon Gold 5218: Open MPI 4.0.3rc4
4. Xeon Gold 5220R: Open MPI 4.0.3rc4
5. Xeon Gold 6226R: Open MPI 4.0.3rc4
6. Xeon W-3275M: Open MPI 3.1.3
7. Xeon Platinum 8280: Open MPI 4.0.3rc4
8. 2 x Xeon Silver 4216: Open MPI 4.0.3rc4
9. 2 x Xeon Platinum 8259CL NUMA off: Open MPI 3.1.3
10. EPYC 2 7R32: Open MPI 3.1.3
11. 2 x Xeon Gold 6226R: Open MPI 4.0.3rc4
12. 2 x Xeon Gold 5220R: Open MPI 4.0.3rc4
13. 2 x Xeon Platinum 8259CL: Open MPI 3.1.3
14. 2 x Xeon Platinum 8280: Open MPI 4.0.3rc4

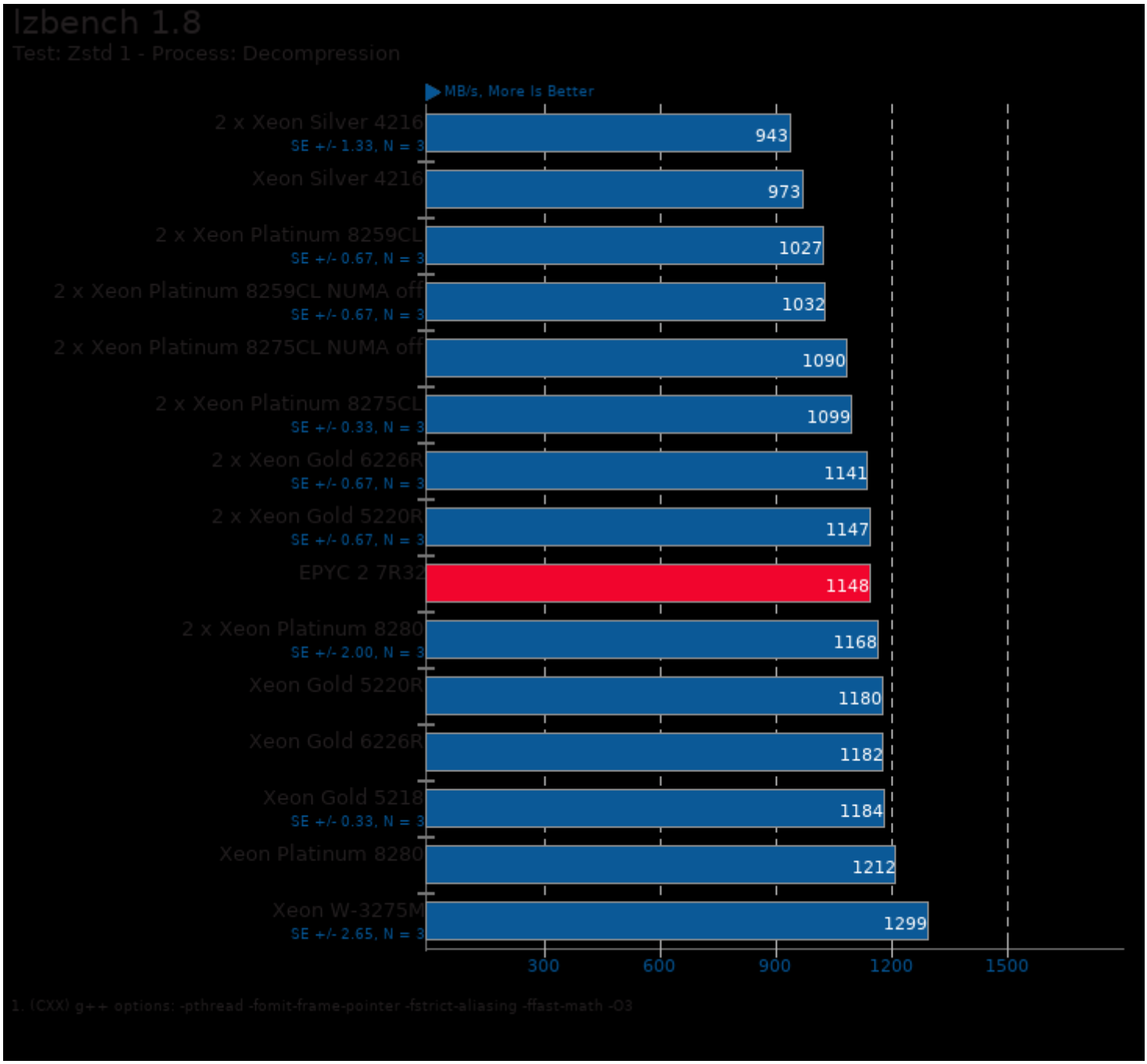

NAS Parallel Benchmarks 3.4
Test / Class: MG.C
Total Mop/s, More Is Better
Xeon Silver 4216
SE +/- 69.19, N = 3
28301.13
Xeon Gold 5218
SE +/- 36.97, N = 3
30328.65
Xeon Gold 5220R
SE +/- 114.95, N = 3
31197.22
Xeon Gold 6226R
SE +/- 27.89, N = 3
31633.60
Xeon W-3275M
SE +/- 40.04, N = 3
35376.11
Xeon Platinum 8280
SE +/- 129.93, N = 3
37089.05
2 x Xeon Platinum 8259CL NUMA off
SE +/- 420.94, N = 3
43490.15
EPYC 2 7R32
SE +/- 796.48, N = 3
49330.15
2 x Xeon Silver 4216
SE +/- 151.51, N = 3
52832.47
2 x Xeon Gold 6226R
SE +/- 193.70, N = 3
58681.42
2 x Xeon Gold 5220R
SE +/- 464.43, N = 3
58984.18
2 x Xeon Platinum 8259CL
SE +/- 304.73, N = 3
63393.35
2 x Xeon Platinum 8280
SE +/- 860.82, N = 5
69175.12
15K
30K
45K
60K
75K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Xeon Silver 4216: Open MPI 4.0.3rc4
3. Xeon Gold 5218: Open MPI 4.0.3rc4
4. Xeon Gold 5220R: Open MPI 4.0.3rc4
5. Xeon Gold 6226R: Open MPI 4.0.3rc4
6. Xeon W-3275M: Open MPI 3.1.3
7. Xeon Platinum 8280: Open MPI 4.0.3rc4
8. 2 x Xeon Platinum 8259CL NUMA off: Open MPI 3.1.3
9. EPYC 2 7R32: Open MPI 3.1.3
10. 2 x Xeon Silver 4216: Open MPI 4.0.3rc4
11. 2 x Xeon Gold 6226R: Open MPI 4.0.3rc4
12. 2 x Xeon Gold 5220R: Open MPI 4.0.3rc4
13. 2 x Xeon Platinum 8259CL: Open MPI 3.1.3
14. 2 x Xeon Platinum 8280: Open MPI 4.0.3rc4

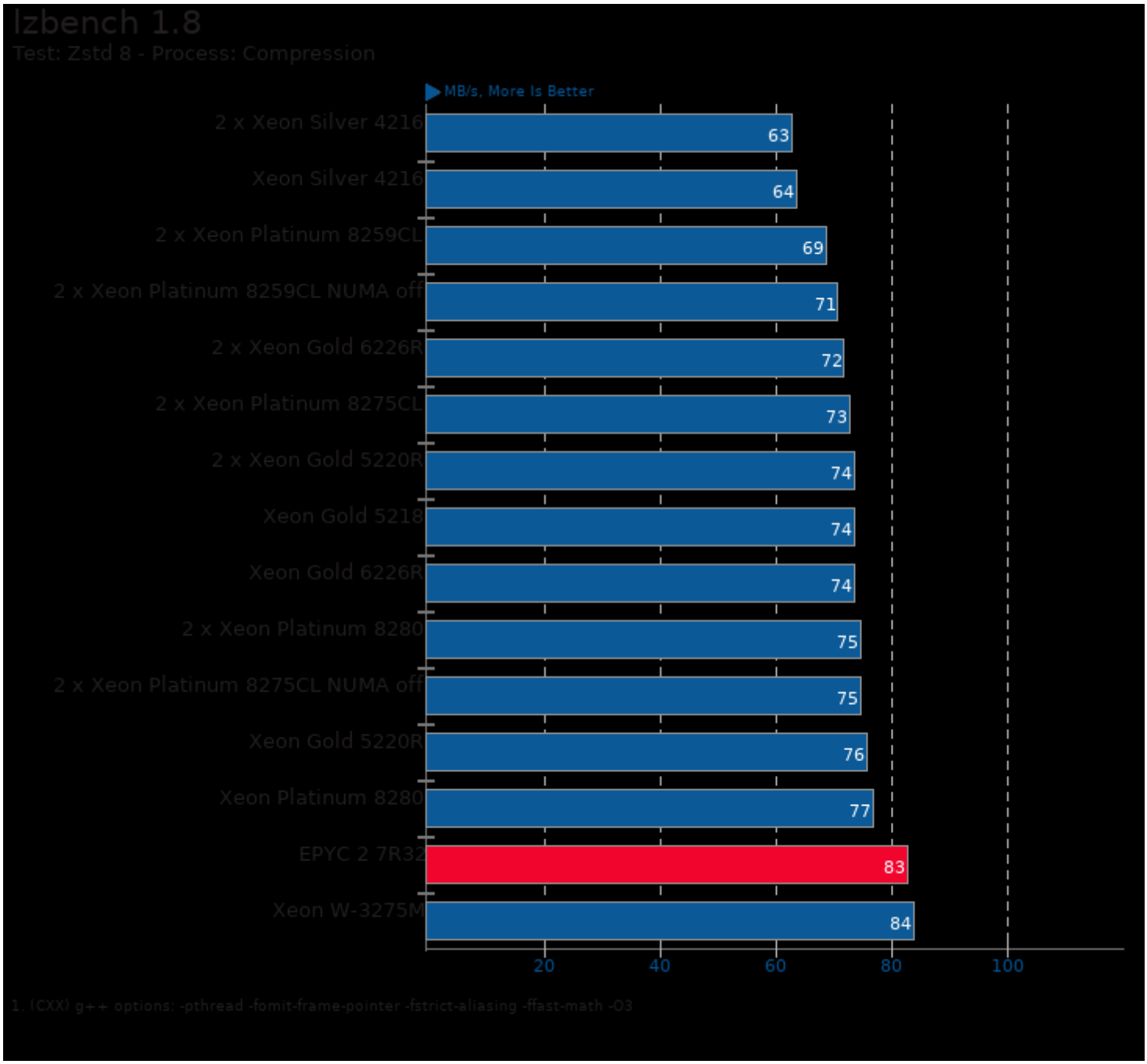

NAS Parallel Benchmarks 3.4
Test / Class: SP.B
Total Mop/s, More Is Better
Xeon Silver 4216
SE +/- 57.24, N = 3
21149.68
Xeon Gold 5218
SE +/- 13.76, N = 3
22329.34
Xeon Gold 5220R
SE +/- 54.67, N = 3
23346.56
Xeon Gold 6226R
SE +/- 23.98, N = 3
23859.79
Xeon W-3275M
SE +/- 146.25, N = 3
31426.53
Xeon Platinum 8280
SE +/- 151.80, N = 3
32682.14
2 x Xeon Platinum 8259CL NUMA off
SE +/- 42.29, N = 3
38493.57
2 x Xeon Silver 4216
SE +/- 157.62, N = 3
42220.94
2 x Xeon Gold 6226R
SE +/- 190.70, N = 3
49232.24
2 x Xeon Gold 5220R
SE +/- 31.12, N = 3
50932.88
EPYC 2 7R32
SE +/- 520.84, N = 15
51225.18
2 x Xeon Platinum 8259CL
SE +/- 77.17, N = 3
53978.90
2 x Xeon Platinum 8280
SE +/- 115.61, N = 3
70893.41
15K
30K
45K
60K
75K
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Xeon Silver 4216: Open MPI 4.0.3rc4
3. Xeon Gold 5218: Open MPI 4.0.3rc4
4. Xeon Gold 5220R: Open MPI 4.0.3rc4
5. Xeon Gold 6226R: Open MPI 4.0.3rc4
6. Xeon W-3275M: Open MPI 3.1.3
7. Xeon Platinum 8280: Open MPI 4.0.3rc4
8. 2 x Xeon Platinum 8259CL NUMA off: Open MPI 3.1.3
9. 2 x Xeon Silver 4216: Open MPI 4.0.3rc4
10. 2 x Xeon Gold 6226R: Open MPI 4.0.3rc4
11. 2 x Xeon Gold 5220R: Open MPI 4.0.3rc4
12. EPYC 2 7R32: Open MPI 3.1.3
13. 2 x Xeon Platinum 8259CL: Open MPI 3.1.3
14. 2 x Xeon Platinum 8280: Open MPI 4.0.3rc4

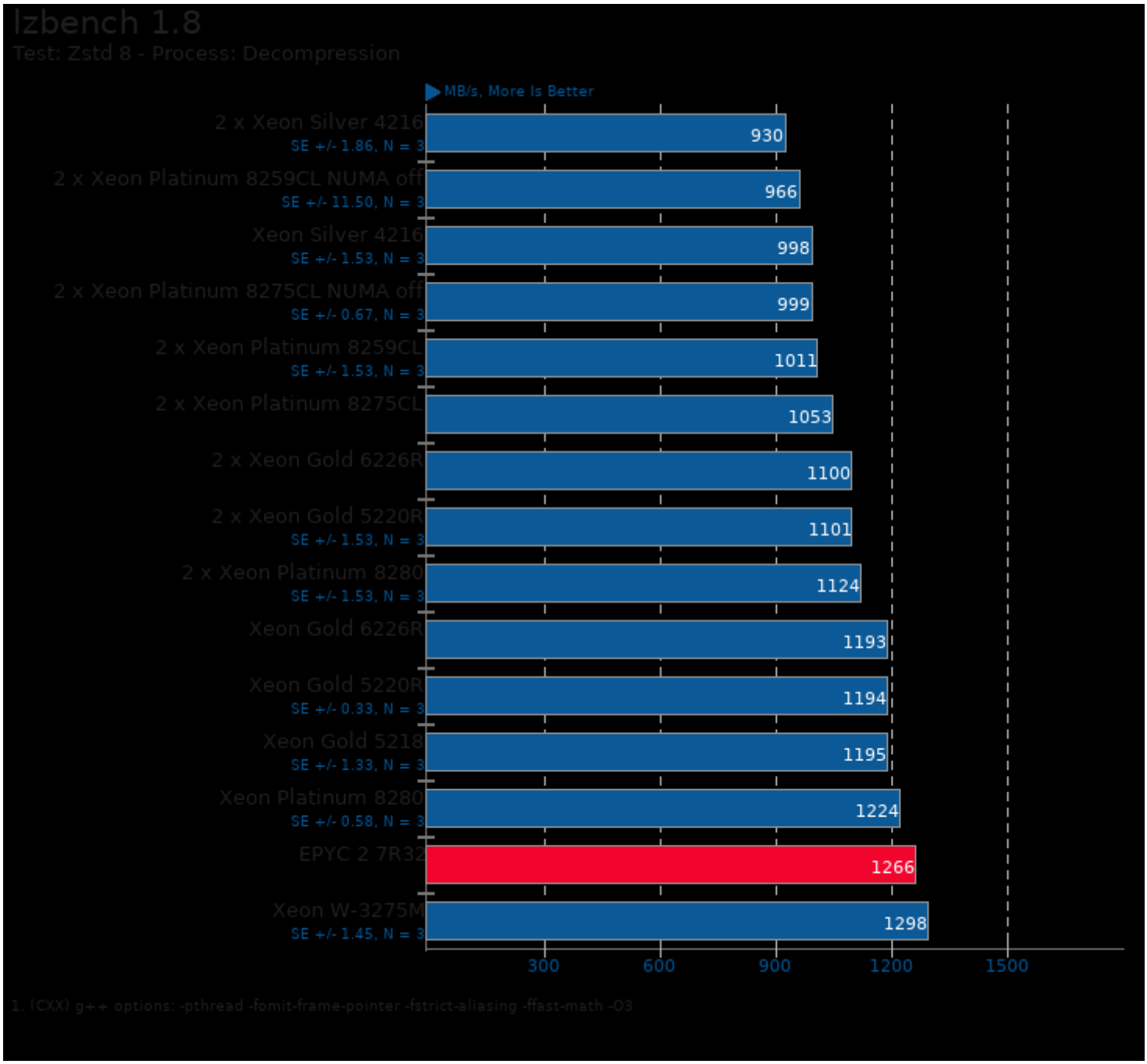

CloverLeaf
Lagrangian-Eulerian Hydrodynamics
Seconds, Fewer Is Better
Xeon Silver 4216
SE +/- 0.01, N = 3
1.49
Xeon Gold 5218
SE +/- 0.00, N = 3
1.37
Xeon Gold 5220R
SE +/- 0.01, N = 3
1.28
Xeon Gold 6226R
SE +/- 0.00, N = 3
1.27
Xeon W-3275M
SE +/- 0.02, N = 15
1.14
2 x Xeon Gold 5220R
SE +/- 0.01, N = 3
1.06
2 x Xeon Silver 4216
SE +/- 0.04, N = 15
1.00
Xeon Platinum 8280
SE +/- 0.00, N = 3
0.96
2 x Xeon Gold 6226R
SE +/- 0.04, N = 15
0.93
2 x Xeon Platinum 8259CL
SE +/- 0.03, N = 15
0.78
2 x Xeon Platinum 8280
SE +/- 0.02, N = 15
0.69
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.00, N = 3
0.63
EPYC 2 7R32
SE +/- 0.00, N = 3
0.36
0.3353
0.6706
1.0059
1.3412
1.6765
1. (F9X) gfortran options: -O3 -march=native -funroll-loops -fopenmp

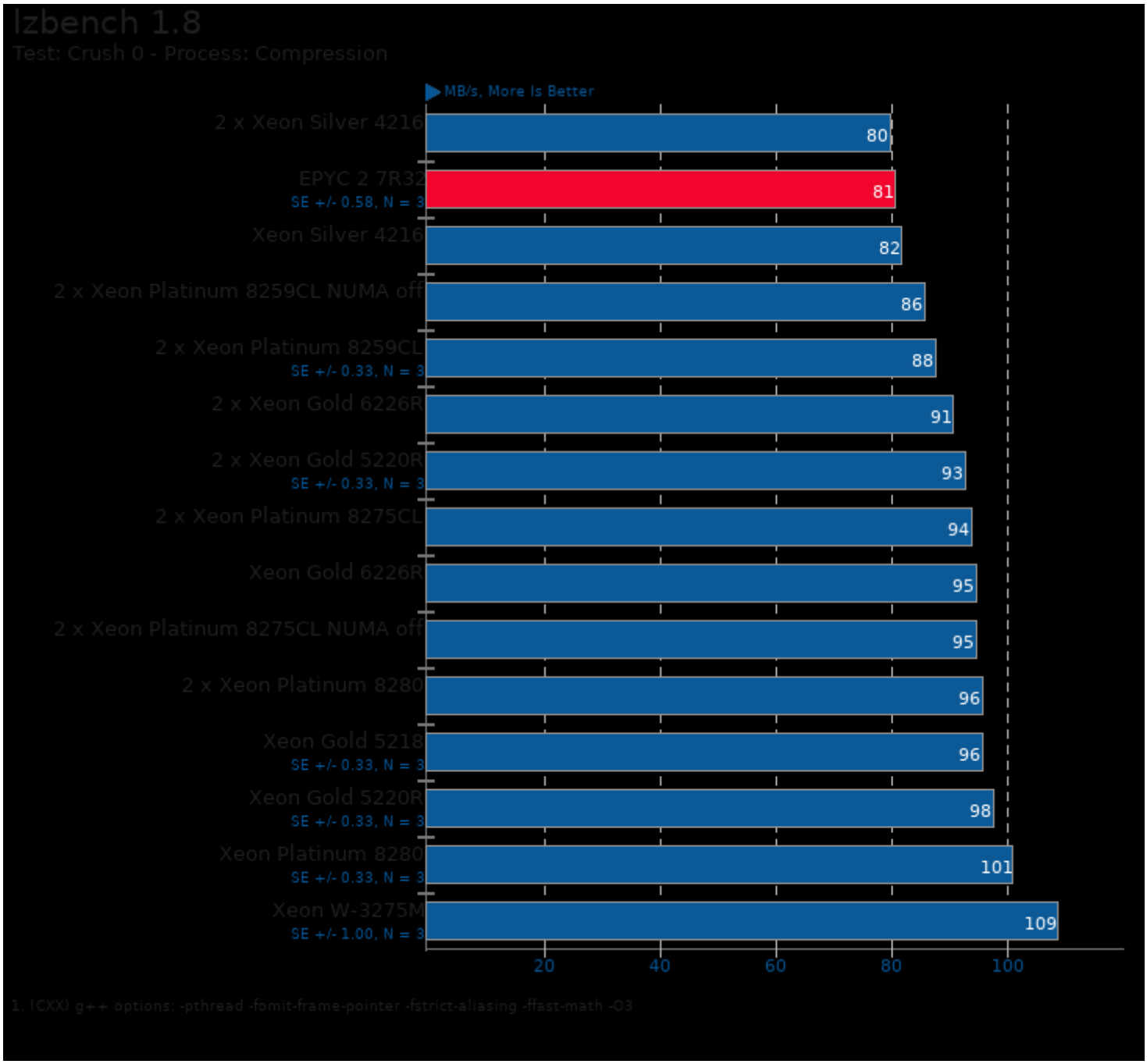

NAMD 2.13
ATPase Simulation - 327,506 Atoms
days/ns, Fewer Is Better
Xeon Silver 4216
SE +/- 0.00193, N = 3
1.51721
Xeon Gold 5218
SE +/- 0.00100, N = 3
1.51168
Xeon Gold 5220R
SE +/- 0.00122, N = 3
1.15745
Xeon Gold 6226R
SE +/- 0.00117, N = 3
1.13586
Xeon W-3275M
SE +/- 0.00775, N = 15
0.81434
2 x Xeon Silver 4216
SE +/- 0.00193, N = 3
0.76982
Xeon Platinum 8280
SE +/- 0.00060, N = 3
0.70709
2 x Xeon Gold 5220R
SE +/- 0.00612, N = 3
0.60333
2 x Xeon Gold 6226R
SE +/- 0.00104, N = 3
0.58237
EPYC 2 7R32
SE +/- 0.00084, N = 3
0.48614
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.00012, N = 3
0.45422
2 x Xeon Platinum 8259CL
SE +/- 0.00038, N = 3
0.44551
2 x Xeon Platinum 8280
SE +/- 0.00133, N = 3
0.36226
0.3414
0.6828
1.0242
1.3656
1.707

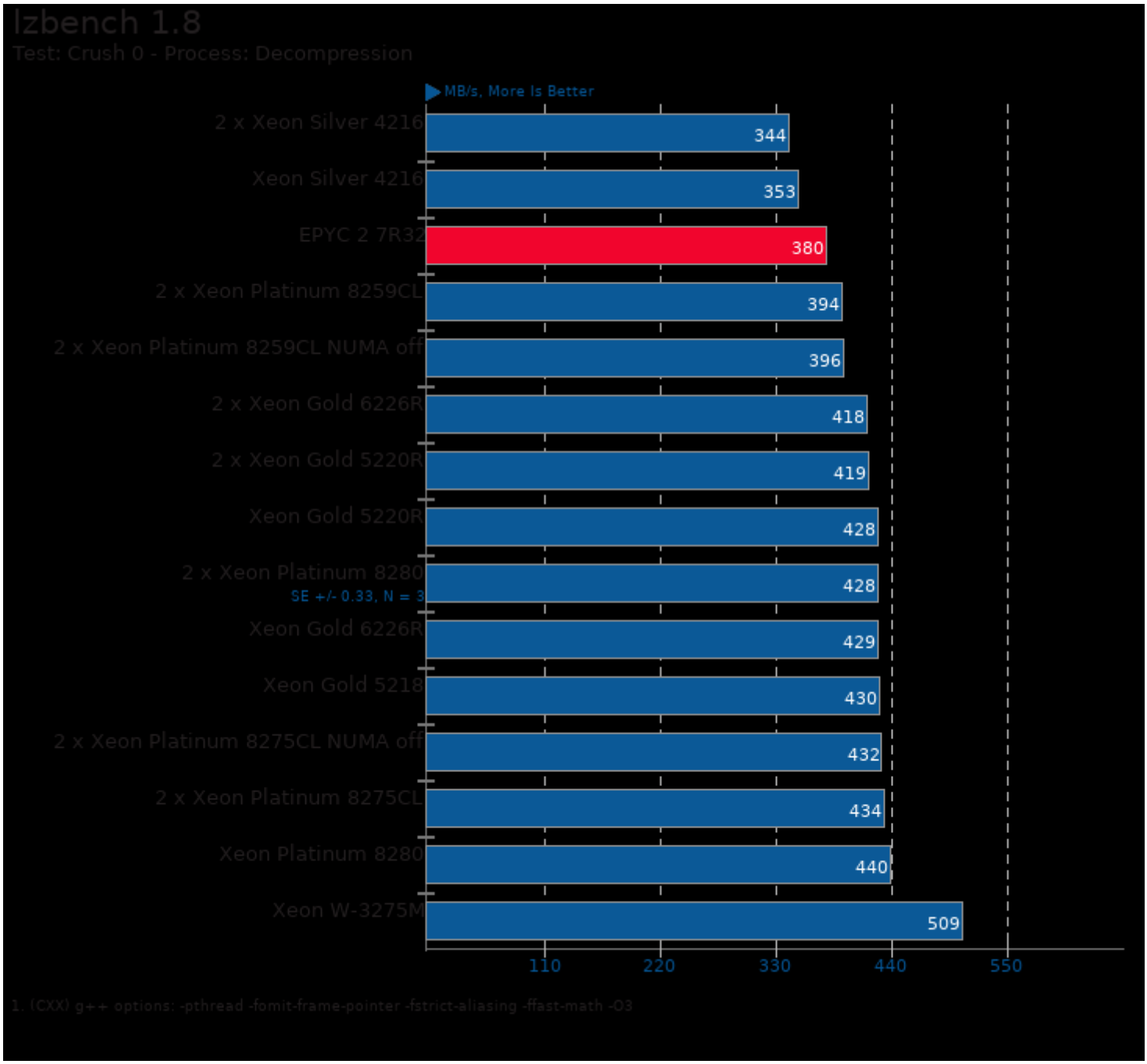

lzbench 1.8
Test: Zstd 1 - Process: Compression
MB/s, More Is Better
2 x Xeon Silver 4216
359
Xeon Silver 4216
365
2 x Xeon Platinum 8259CL
SE +/- 2.33, N = 3
399
2 x Xeon Platinum 8259CL NUMA off
SE +/- 2.33, N = 3
407
EPYC 2 7R32
418
2 x Xeon Gold 5220R
437
2 x Xeon Gold 6226R
437
2 x Xeon Platinum 8275CL
439
2 x Xeon Platinum 8275CL NUMA off
443
Xeon Gold 5220R
444
Xeon Gold 6226R
445
Xeon Gold 5218
446
2 x Xeon Platinum 8280
449
Xeon Platinum 8280
SE +/- 0.58, N = 3
457
Xeon W-3275M
SE +/- 1.00, N = 3
508
110
220
330
440
550
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3

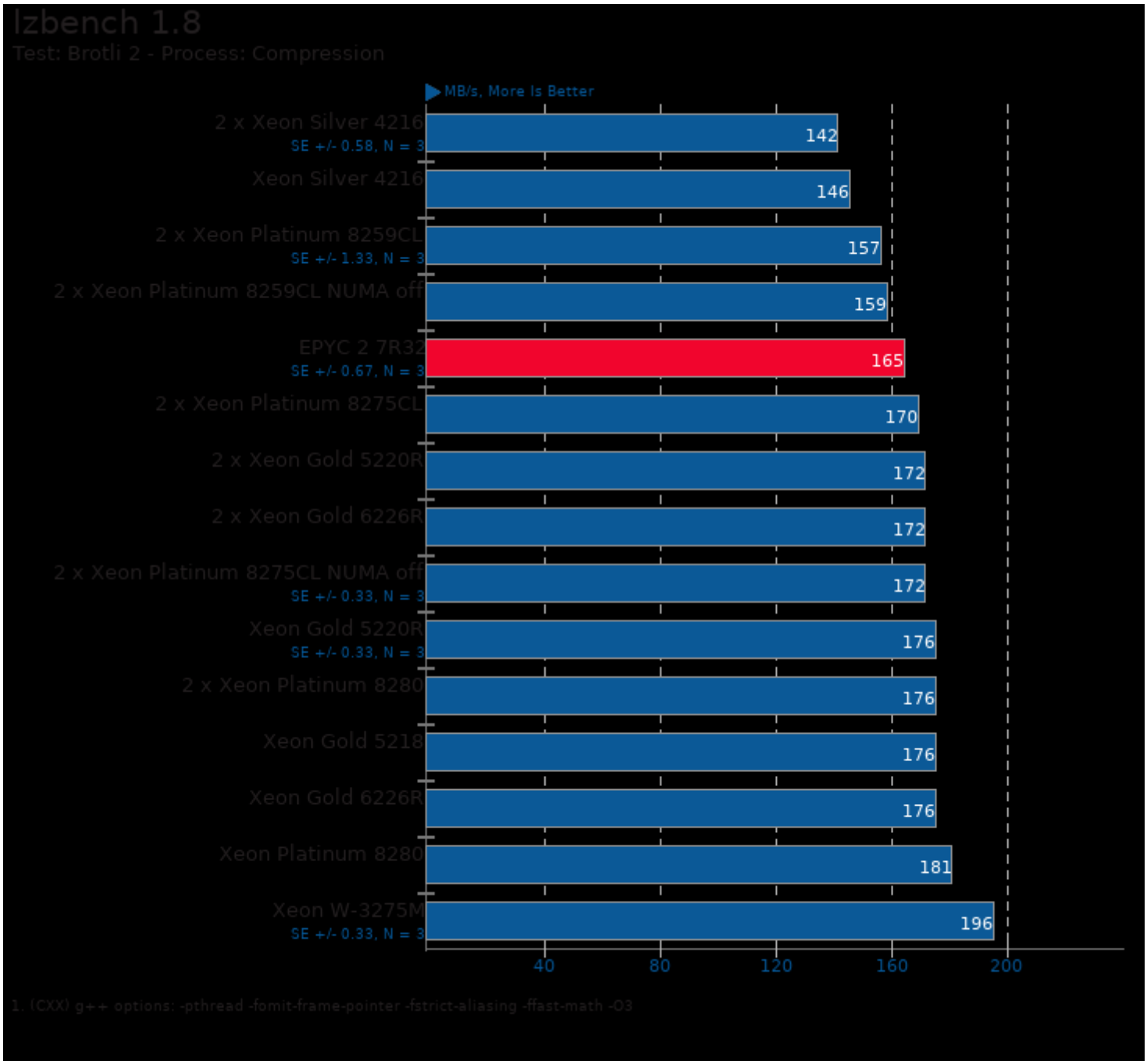

lzbench 1.8
Test: Zstd 1 - Process: Decompression
MB/s, More Is Better
2 x Xeon Silver 4216
SE +/- 1.33, N = 3
943
Xeon Silver 4216
973
2 x Xeon Platinum 8259CL
SE +/- 0.67, N = 3
1027
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.67, N = 3
1032
2 x Xeon Platinum 8275CL NUMA off
1090
2 x Xeon Platinum 8275CL
SE +/- 0.33, N = 3
1099
2 x Xeon Gold 6226R
SE +/- 0.67, N = 3
1141
2 x Xeon Gold 5220R
SE +/- 0.67, N = 3
1147
EPYC 2 7R32
1148
2 x Xeon Platinum 8280
SE +/- 2.00, N = 3
1168
Xeon Gold 5220R
1180
Xeon Gold 6226R
1182
Xeon Gold 5218
SE +/- 0.33, N = 3
1184
Xeon Platinum 8280
1212
Xeon W-3275M
SE +/- 2.65, N = 3
1299
300
600
900
1200
1500
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3

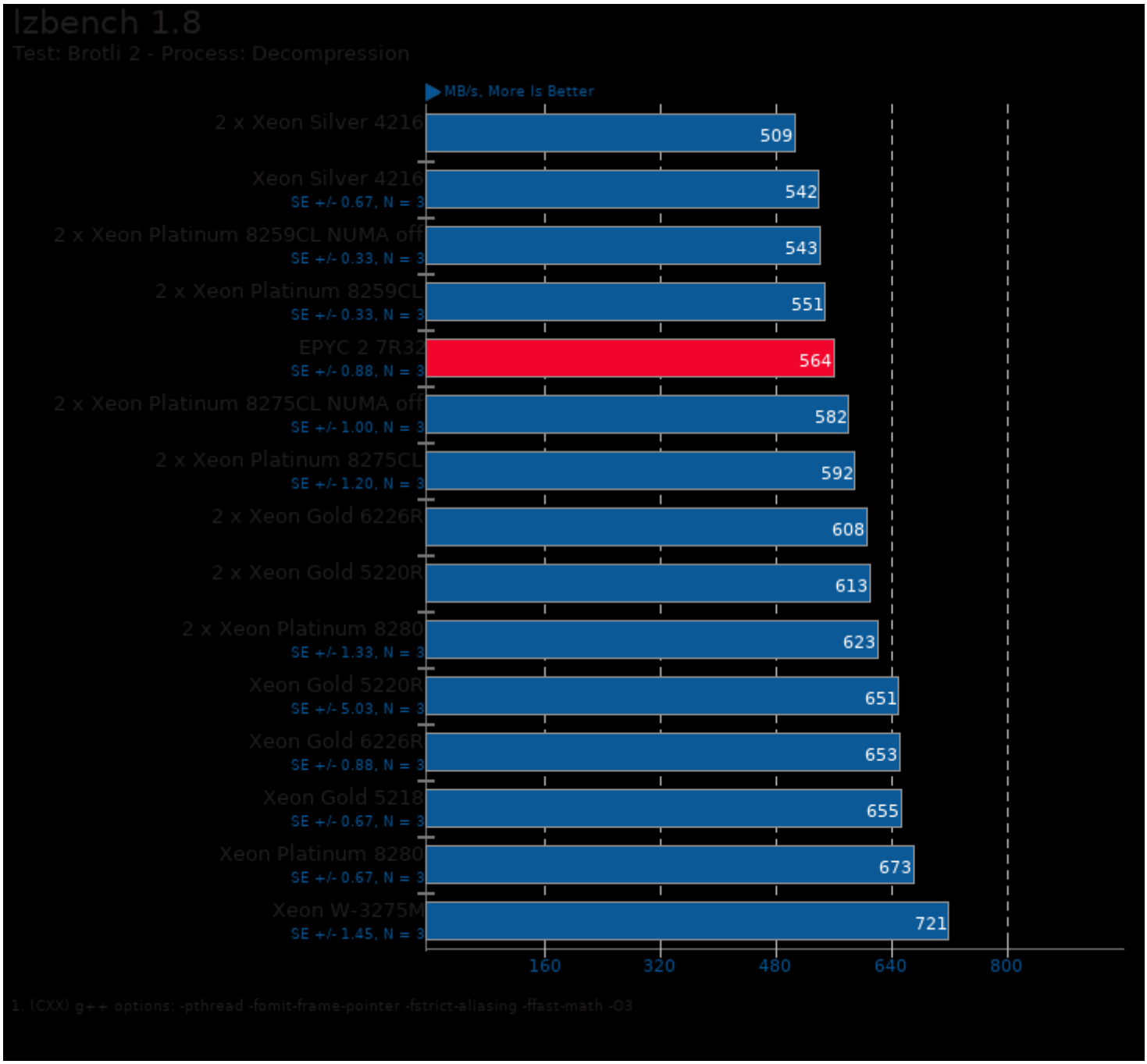

lzbench 1.8
Test: Zstd 8 - Process: Compression
MB/s, More Is Better
2 x Xeon Silver 4216
63
Xeon Silver 4216
64
2 x Xeon Platinum 8259CL
69
2 x Xeon Platinum 8259CL NUMA off
71
2 x Xeon Gold 6226R
72
2 x Xeon Platinum 8275CL
73
2 x Xeon Gold 5220R
74
Xeon Gold 5218
74
Xeon Gold 6226R
74
2 x Xeon Platinum 8280
75
2 x Xeon Platinum 8275CL NUMA off
75
Xeon Gold 5220R
76
Xeon Platinum 8280
77
EPYC 2 7R32
83
Xeon W-3275M
84
20
40
60
80
100
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3

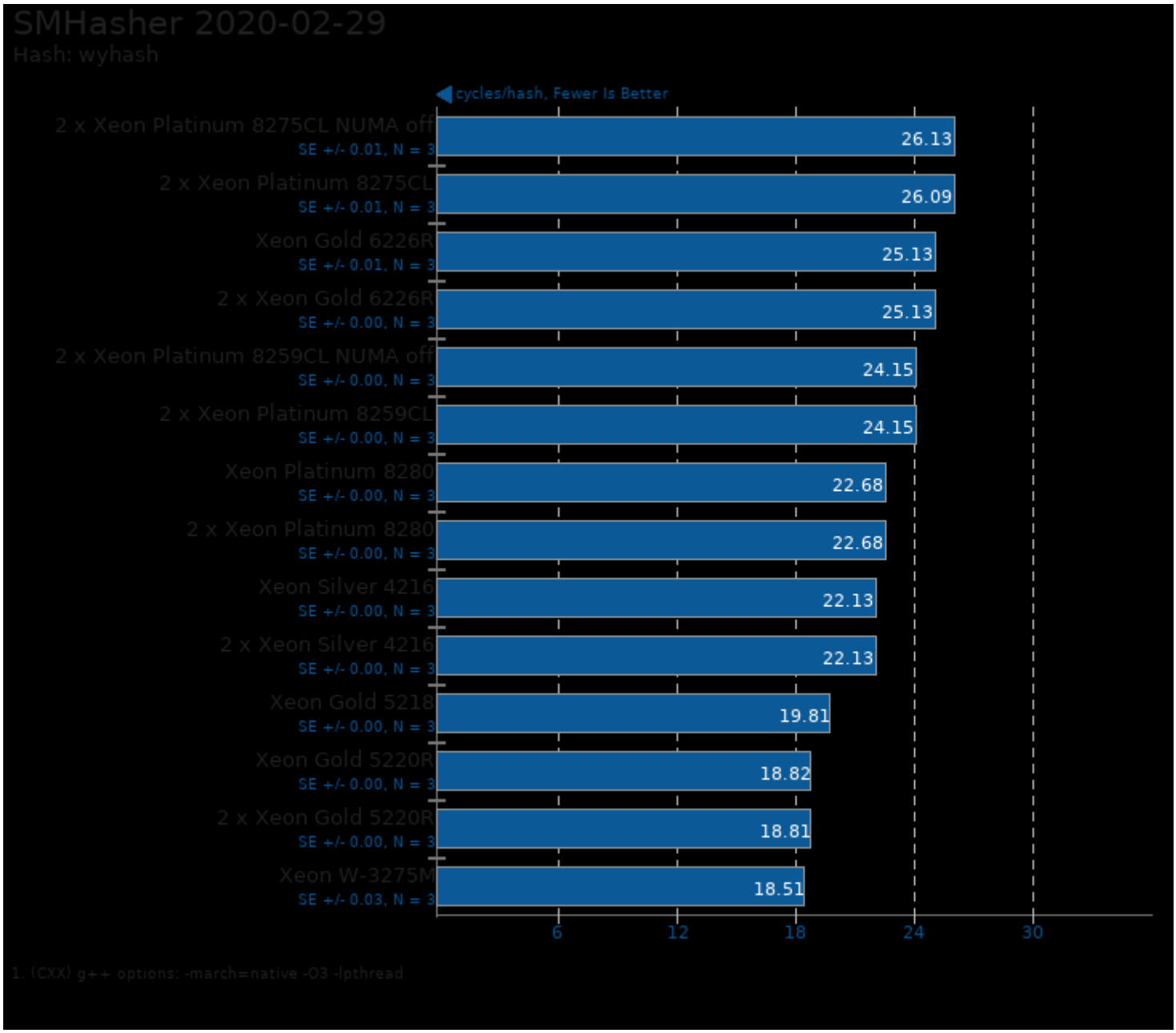

lzbench 1.8
Test: Zstd 8 - Process: Decompression
MB/s, More Is Better
2 x Xeon Silver 4216
SE +/- 1.86, N = 3
930
2 x Xeon Platinum 8259CL NUMA off
SE +/- 11.50, N = 3
966
Xeon Silver 4216
SE +/- 1.53, N = 3
998
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.67, N = 3
999
2 x Xeon Platinum 8259CL
SE +/- 1.53, N = 3
1011
2 x Xeon Platinum 8275CL
1053
2 x Xeon Gold 6226R
1100
2 x Xeon Gold 5220R
SE +/- 1.53, N = 3
1101
2 x Xeon Platinum 8280
SE +/- 1.53, N = 3
1124
Xeon Gold 6226R
1193
Xeon Gold 5220R
SE +/- 0.33, N = 3
1194
Xeon Gold 5218
SE +/- 1.33, N = 3
1195
Xeon Platinum 8280
SE +/- 0.58, N = 3
1224
EPYC 2 7R32
1266
Xeon W-3275M
SE +/- 1.45, N = 3
1298
300
600
900
1200
1500
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3

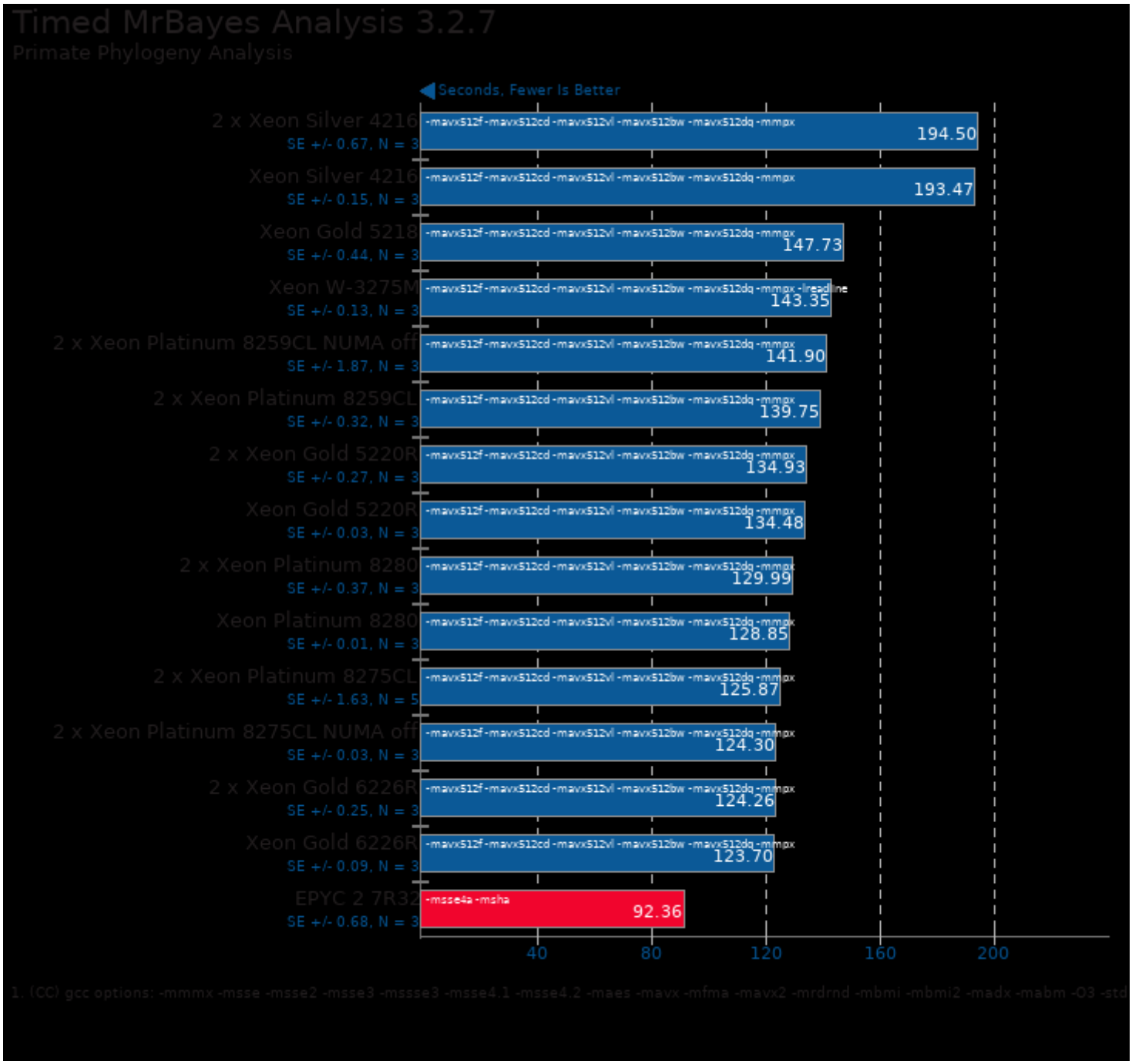

lzbench 1.8
Test: Crush 0 - Process: Compression
MB/s, More Is Better
2 x Xeon Silver 4216
80
EPYC 2 7R32
SE +/- 0.58, N = 3
81
Xeon Silver 4216
82
2 x Xeon Platinum 8259CL NUMA off
86
2 x Xeon Platinum 8259CL
SE +/- 0.33, N = 3
88
2 x Xeon Gold 6226R
91
2 x Xeon Gold 5220R
SE +/- 0.33, N = 3
93
2 x Xeon Platinum 8275CL
94
Xeon Gold 6226R
95
2 x Xeon Platinum 8275CL NUMA off
95
2 x Xeon Platinum 8280
96
Xeon Gold 5218
SE +/- 0.33, N = 3
96
Xeon Gold 5220R
SE +/- 0.33, N = 3
98
Xeon Platinum 8280
SE +/- 0.33, N = 3
101
Xeon W-3275M
SE +/- 1.00, N = 3
109
20
40
60
80
100
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3

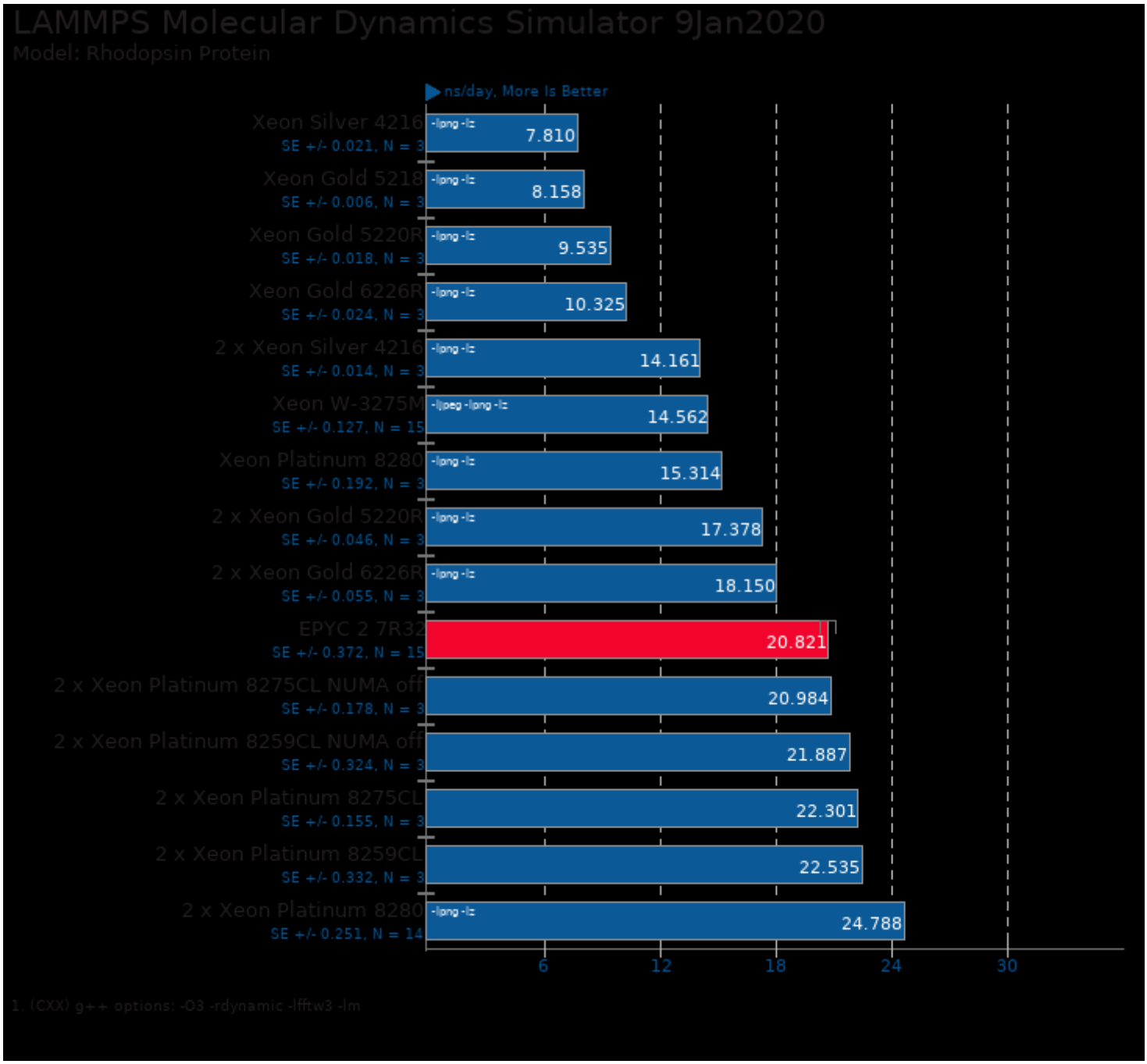

lzbench 1.8
Test: Crush 0 - Process: Decompression
MB/s, More Is Better
2 x Xeon Silver 4216
344
Xeon Silver 4216
353
EPYC 2 7R32
380
2 x Xeon Platinum 8259CL
394
2 x Xeon Platinum 8259CL NUMA off
396
2 x Xeon Gold 6226R
418
2 x Xeon Gold 5220R
419
Xeon Gold 5220R
428
2 x Xeon Platinum 8280
428
SE +/- 0.33, N = 3
Xeon Gold 6226R
429
Xeon Gold 5218
430
2 x Xeon Platinum 8275CL NUMA off
432
2 x Xeon Platinum 8275CL
434
Xeon Platinum 8280
440
Xeon W-3275M
509
110
220
330
440
550
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3

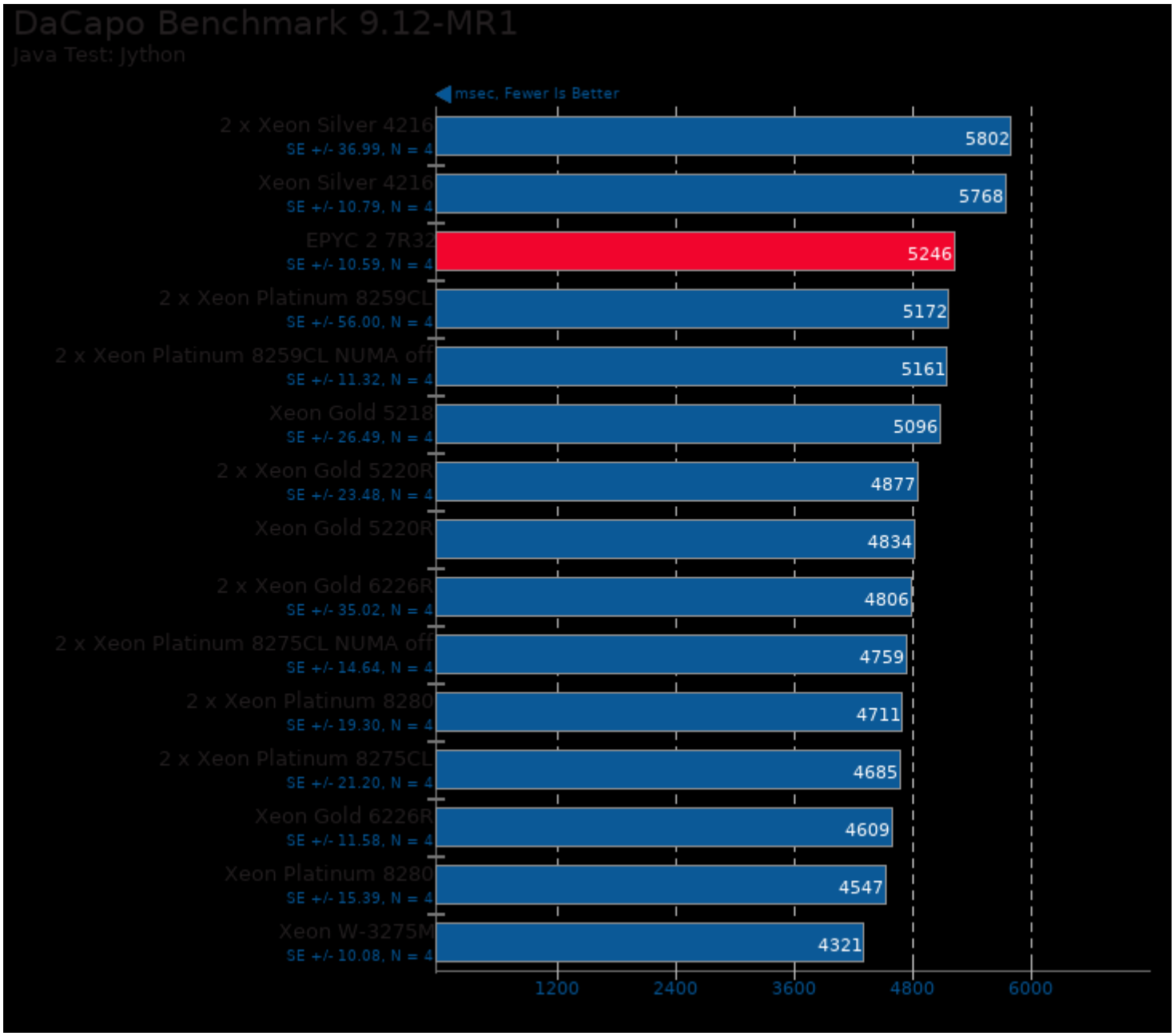

lzbench 1.8
Test: Brotli 2 - Process: Compression
MB/s, More Is Better
2 x Xeon Silver 4216
SE +/- 0.58, N = 3
142
Xeon Silver 4216
146
2 x Xeon Platinum 8259CL
SE +/- 1.33, N = 3
157
2 x Xeon Platinum 8259CL NUMA off
159
EPYC 2 7R32
SE +/- 0.67, N = 3
165
2 x Xeon Platinum 8275CL
170
2 x Xeon Gold 5220R
172
2 x Xeon Gold 6226R
172
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.33, N = 3
172
Xeon Gold 5220R
SE +/- 0.33, N = 3
176
2 x Xeon Platinum 8280
176
Xeon Gold 5218
176
Xeon Gold 6226R
176
Xeon Platinum 8280
181
Xeon W-3275M
SE +/- 0.33, N = 3
196
40
80
120
160
200
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3

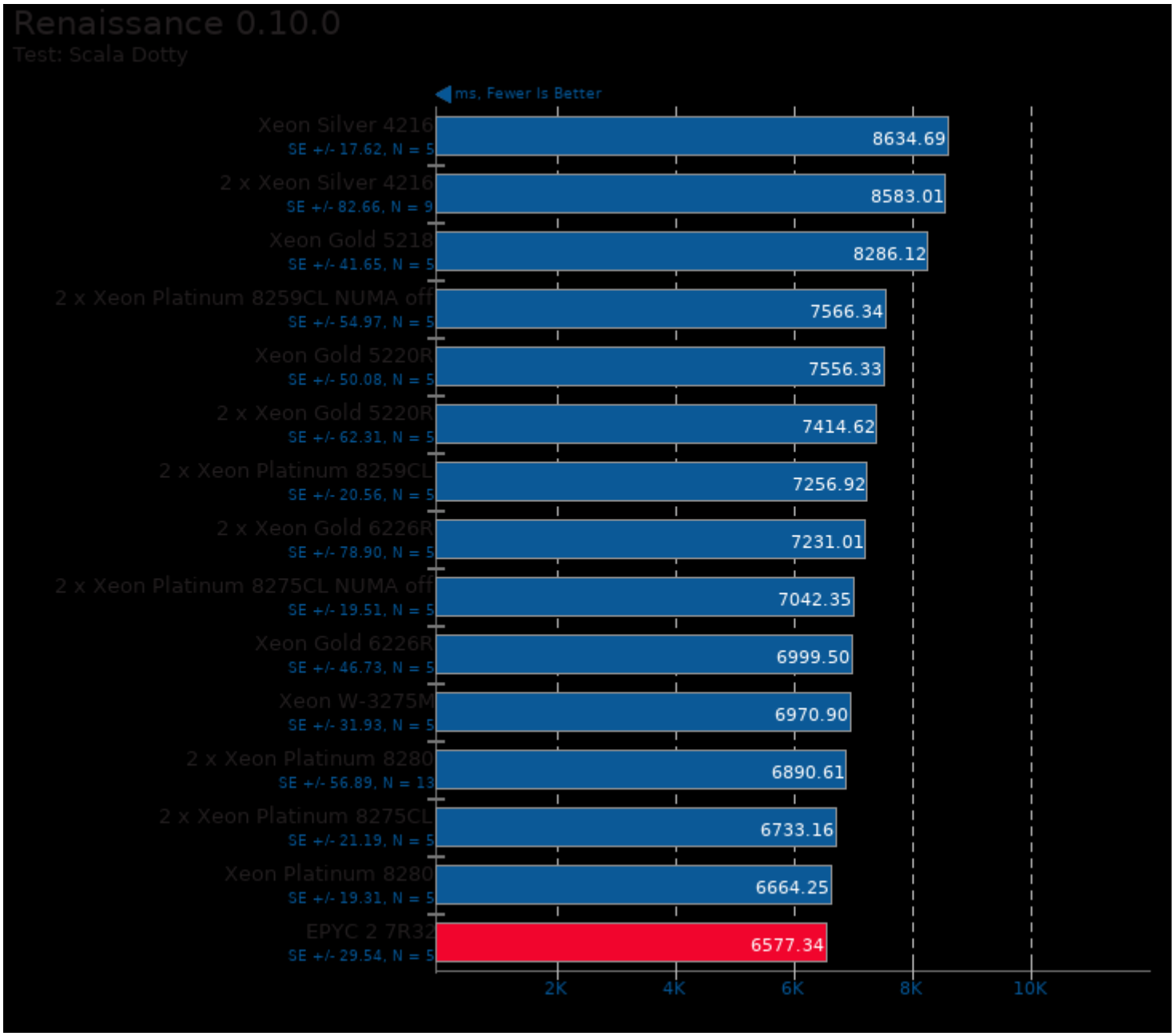

lzbench 1.8
Test: Brotli 2 - Process: Decompression
MB/s, More Is Better
2 x Xeon Silver 4216
509
Xeon Silver 4216
SE +/- 0.67, N = 3
542
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.33, N = 3
543
2 x Xeon Platinum 8259CL
SE +/- 0.33, N = 3
551
EPYC 2 7R32
SE +/- 0.88, N = 3
564
2 x Xeon Platinum 8275CL NUMA off
SE +/- 1.00, N = 3
582
2 x Xeon Platinum 8275CL
SE +/- 1.20, N = 3
592
2 x Xeon Gold 6226R
608
2 x Xeon Gold 5220R
613
2 x Xeon Platinum 8280
SE +/- 1.33, N = 3
623
Xeon Gold 5220R
SE +/- 5.03, N = 3
651
Xeon Gold 6226R
SE +/- 0.88, N = 3
653
Xeon Gold 5218
SE +/- 0.67, N = 3
655
Xeon Platinum 8280
SE +/- 0.67, N = 3
673
Xeon W-3275M
SE +/- 1.45, N = 3
721
160
320
480
640
800
1. (CXX) g++ options: -pthread -fomit-frame-pointer -fstrict-aliasing -ffast-math -O3

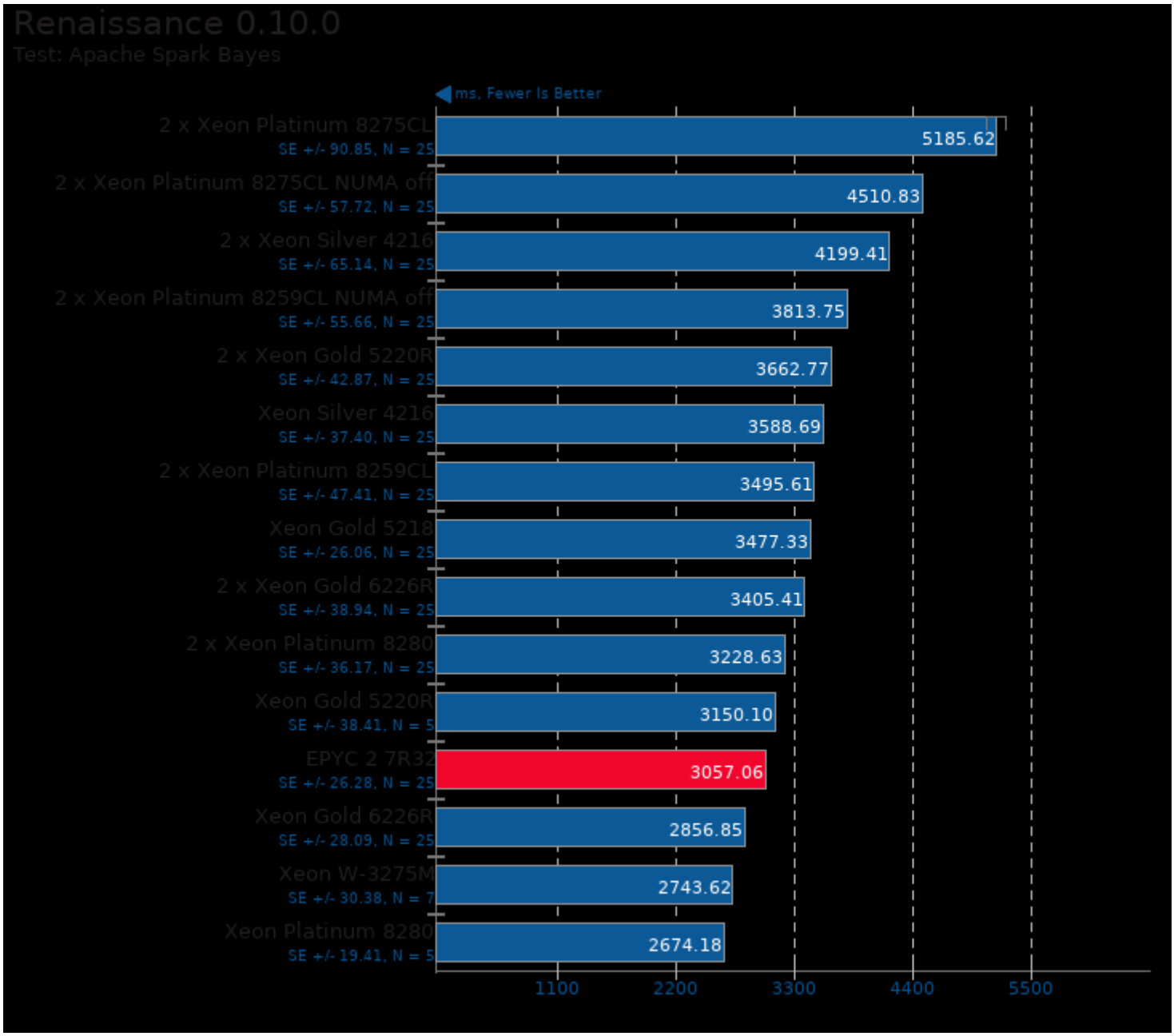

SMHasher 2020-02-29
Hash: wyhash
cycles/hash, Fewer Is Better
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.01, N = 3
26.13
2 x Xeon Platinum 8275CL
SE +/- 0.01, N = 3
26.09
Xeon Gold 6226R
SE +/- 0.01, N = 3
25.13
2 x Xeon Gold 6226R
SE +/- 0.00, N = 3
25.13
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.00, N = 3
24.15
2 x Xeon Platinum 8259CL
SE +/- 0.00, N = 3
24.15
Xeon Platinum 8280
SE +/- 0.00, N = 3
22.68
2 x Xeon Platinum 8280
SE +/- 0.00, N = 3
22.68
Xeon Silver 4216
SE +/- 0.00, N = 3
22.13
2 x Xeon Silver 4216
SE +/- 0.00, N = 3
22.13
Xeon Gold 5218
SE +/- 0.00, N = 3
19.81
Xeon Gold 5220R
SE +/- 0.00, N = 3
18.82
2 x Xeon Gold 5220R
SE +/- 0.00, N = 3
18.81
Xeon W-3275M
SE +/- 0.03, N = 3
18.51
6
12
18
24
30
1. (CXX) g++ options: -march=native -O3 -lpthread

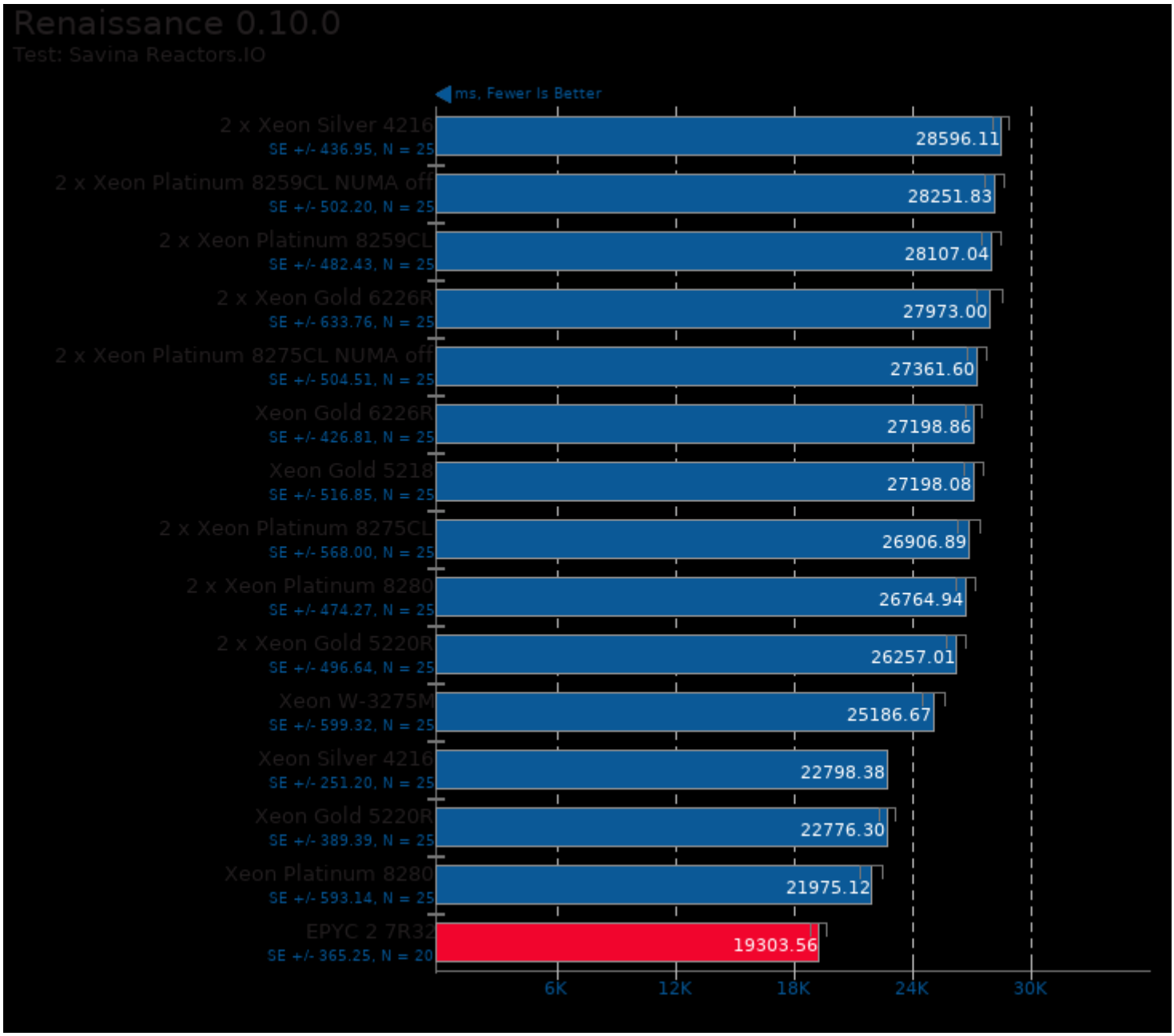

Timed MrBayes Analysis 3.2.7
Primate Phylogeny Analysis
Seconds, Fewer Is Better
2 x Xeon Silver 4216
SE +/- 0.67, N = 3
194.50
Xeon Silver 4216
SE +/- 0.15, N = 3
193.47
Xeon Gold 5218
SE +/- 0.44, N = 3
147.73
Xeon W-3275M
SE +/- 0.13, N = 3
143.35
2 x Xeon Platinum 8259CL NUMA off
SE +/- 1.87, N = 3
141.90
2 x Xeon Platinum 8259CL
SE +/- 0.32, N = 3
139.75
2 x Xeon Gold 5220R
SE +/- 0.27, N = 3
134.93
Xeon Gold 5220R
SE +/- 0.03, N = 3
134.48
2 x Xeon Platinum 8280
SE +/- 0.37, N = 3
129.99
Xeon Platinum 8280
SE +/- 0.01, N = 3
128.85
2 x Xeon Platinum 8275CL
SE +/- 1.63, N = 5
125.87
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.03, N = 3
124.30
2 x Xeon Gold 6226R
SE +/- 0.25, N = 3
124.26
Xeon Gold 6226R
SE +/- 0.09, N = 3
123.70
EPYC 2 7R32
SE +/- 0.68, N = 3
92.36
40
80
120
160
200
1. (CC) gcc options: -mmmx -msse -msse2 -msse3 -mssse3 -msse4.1 -msse4.2 -maes -mavx -mfma -mavx2 -mrdrnd -mbmi -mbmi2 -madx -mabm -O3 -std

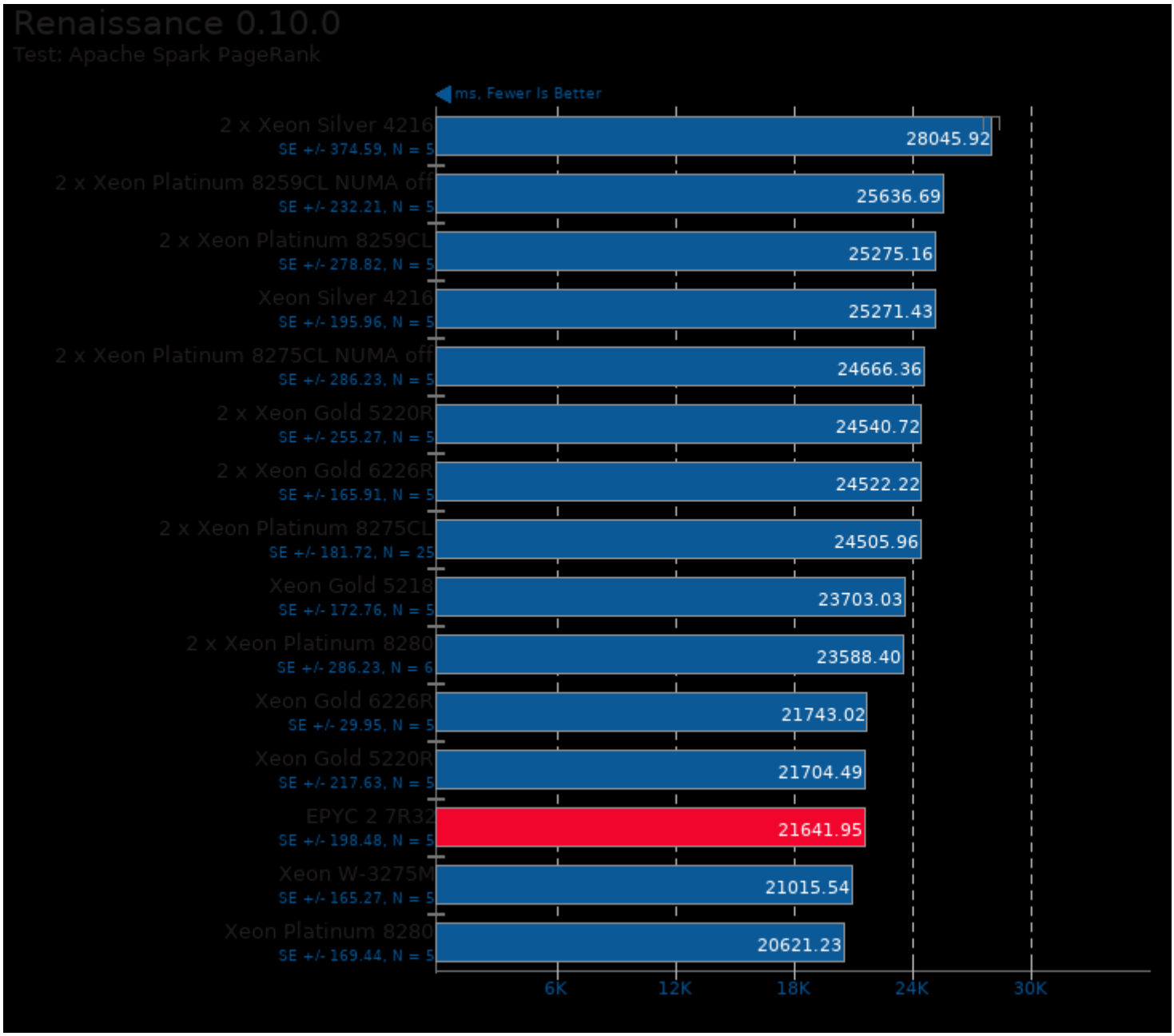

LAMMPS Molecular Dynamics Simulator 9Jan2020
Model: Rhodopsin Protein
ns/day, More Is Better
Xeon Silver 4216
SE +/- 0.021, N = 3
7.810
Xeon Gold 5218
SE +/- 0.006, N = 3
8.158
Xeon Gold 5220R
SE +/- 0.018, N = 3
9.535
Xeon Gold 6226R
SE +/- 0.024, N = 3
10.325
2 x Xeon Silver 4216
SE +/- 0.014, N = 3
14.161
Xeon W-3275M
SE +/- 0.127, N = 15
14.562
Xeon Platinum 8280
SE +/- 0.192, N = 3
15.314
2 x Xeon Gold 5220R
SE +/- 0.046, N = 3
17.378
2 x Xeon Gold 6226R
SE +/- 0.055, N = 3
18.150
EPYC 2 7R32
SE +/- 0.372, N = 15
20.821
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.178, N = 3
20.984
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.324, N = 3
21.887
2 x Xeon Platinum 8275CL
SE +/- 0.155, N = 3
22.301
2 x Xeon Platinum 8259CL
SE +/- 0.332, N = 3
22.535
2 x Xeon Platinum 8280
SE +/- 0.251, N = 14
24.788
6
12
18
24
30
1. (CXX) g++ options: -O3 -rdynamic -lfftw3 -lm

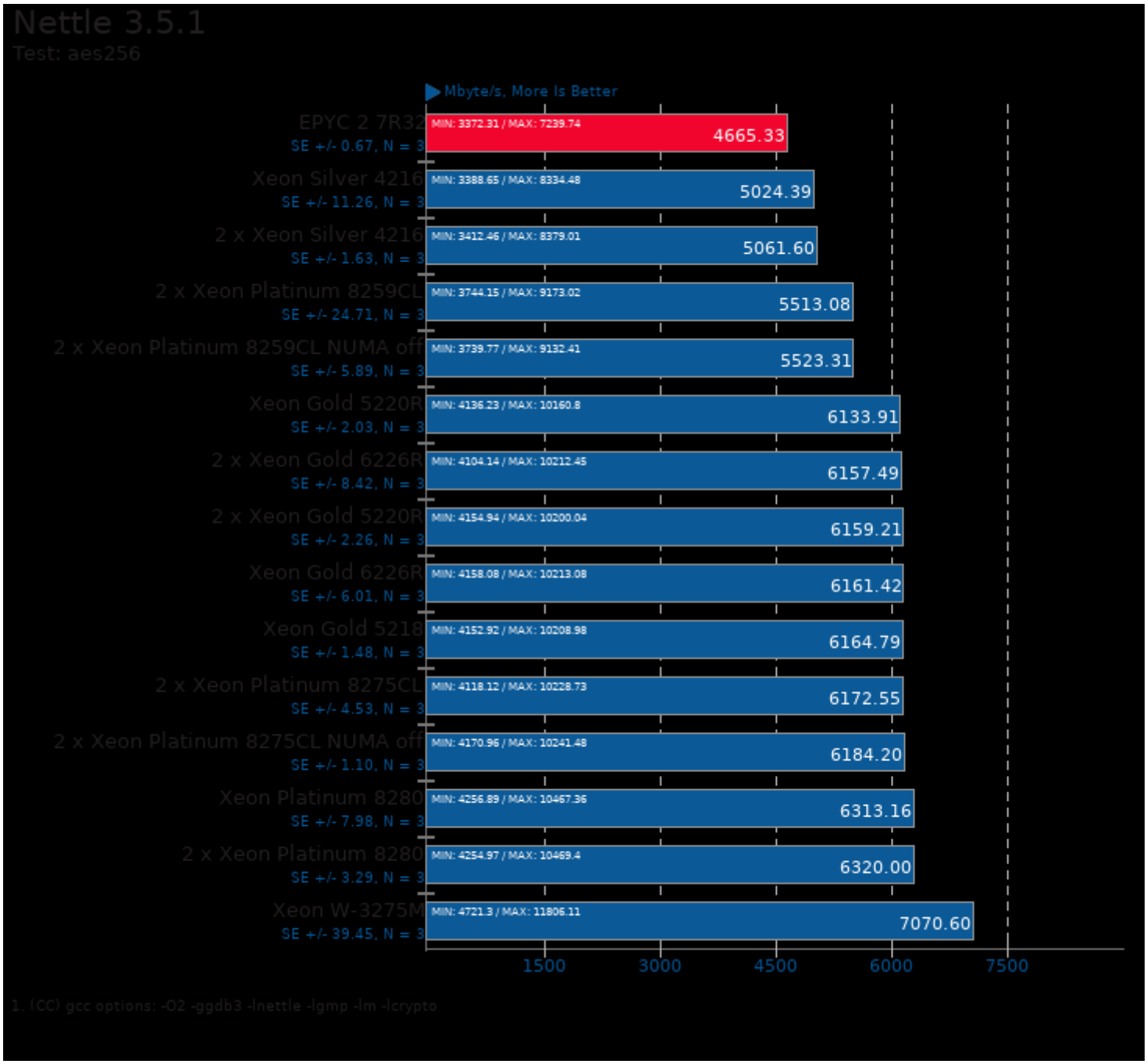

DaCapo Benchmark 9.12-MR1
Java Test: Jython
msec, Fewer Is Better
2 x Xeon Silver 4216
SE +/- 36.99, N = 4
5802
Xeon Silver 4216
SE +/- 10.79, N = 4
5768
EPYC 2 7R32
SE +/- 10.59, N = 4
5246
2 x Xeon Platinum 8259CL
SE +/- 56.00, N = 4
5172
2 x Xeon Platinum 8259CL NUMA off
SE +/- 11.32, N = 4
5161
Xeon Gold 5218
SE +/- 26.49, N = 4
5096
2 x Xeon Gold 5220R
SE +/- 23.48, N = 4
4877
Xeon Gold 5220R
4834
2 x Xeon Gold 6226R
SE +/- 35.02, N = 4
4806
2 x Xeon Platinum 8275CL NUMA off
SE +/- 14.64, N = 4
4759
2 x Xeon Platinum 8280
SE +/- 19.30, N = 4
4711
2 x Xeon Platinum 8275CL
SE +/- 21.20, N = 4
4685
Xeon Gold 6226R
SE +/- 11.58, N = 4
4609
Xeon Platinum 8280
SE +/- 15.39, N = 4
4547
Xeon W-3275M
SE +/- 10.08, N = 4
4321
1200
2400
3600
4800
6000

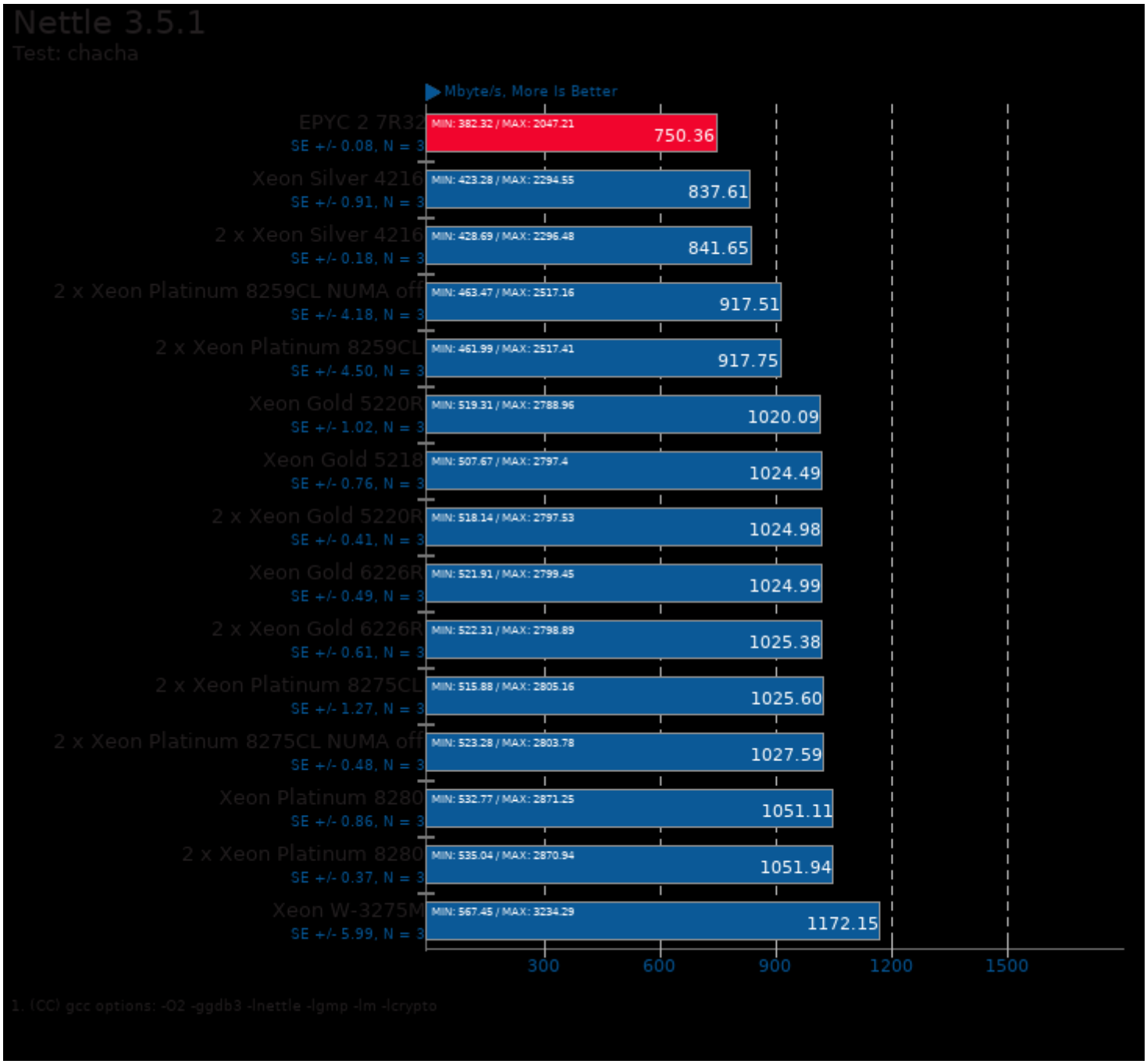

Renaissance 0.10.0
Test: Scala Dotty
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 17.62, N = 5
8634.69
2 x Xeon Silver 4216
SE +/- 82.66, N = 9
8583.01
Xeon Gold 5218
SE +/- 41.65, N = 5
8286.12
2 x Xeon Platinum 8259CL NUMA off
SE +/- 54.97, N = 5
7566.34
Xeon Gold 5220R
SE +/- 50.08, N = 5
7556.33
2 x Xeon Gold 5220R
SE +/- 62.31, N = 5
7414.62
2 x Xeon Platinum 8259CL
SE +/- 20.56, N = 5
7256.92
2 x Xeon Gold 6226R
SE +/- 78.90, N = 5
7231.01
2 x Xeon Platinum 8275CL NUMA off
SE +/- 19.51, N = 5
7042.35
Xeon Gold 6226R
SE +/- 46.73, N = 5
6999.50
Xeon W-3275M
SE +/- 31.93, N = 5
6970.90
2 x Xeon Platinum 8280
SE +/- 56.89, N = 13
6890.61
2 x Xeon Platinum 8275CL
SE +/- 21.19, N = 5
6733.16
Xeon Platinum 8280
SE +/- 19.31, N = 5
6664.25
EPYC 2 7R32
SE +/- 29.54, N = 5
6577.34
2K
4K
6K
8K
10K

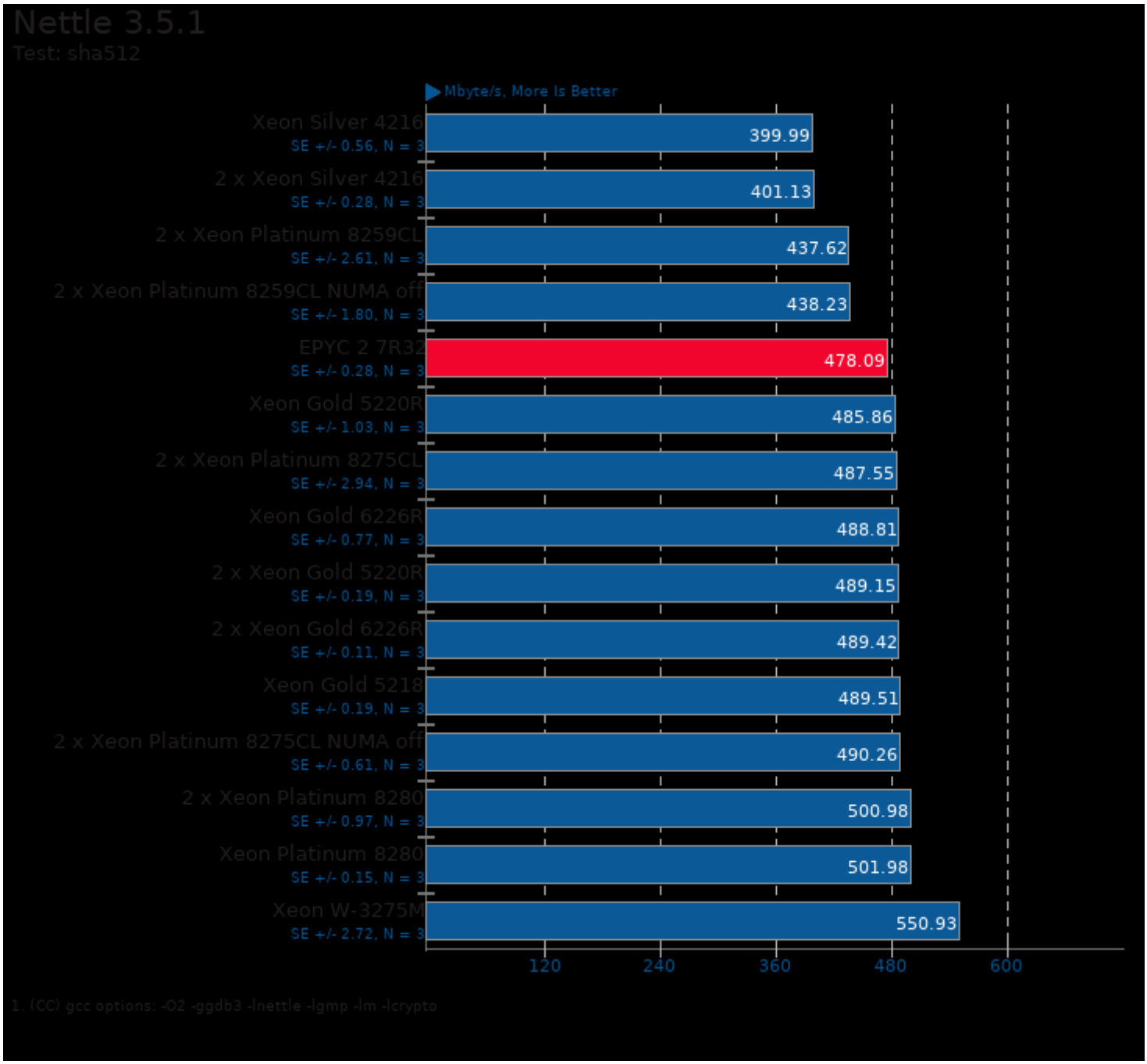

Renaissance 0.10.0
Test: Apache Spark Bayes
ms, Fewer Is Better
2 x Xeon Platinum 8275CL
SE +/- 90.85, N = 25
5185.62
2 x Xeon Platinum 8275CL NUMA off
SE +/- 57.72, N = 25
4510.83
2 x Xeon Silver 4216
SE +/- 65.14, N = 25
4199.41
2 x Xeon Platinum 8259CL NUMA off
SE +/- 55.66, N = 25
3813.75
2 x Xeon Gold 5220R
SE +/- 42.87, N = 25
3662.77
Xeon Silver 4216
SE +/- 37.40, N = 25
3588.69
2 x Xeon Platinum 8259CL
SE +/- 47.41, N = 25
3495.61
Xeon Gold 5218
SE +/- 26.06, N = 25
3477.33
2 x Xeon Gold 6226R
SE +/- 38.94, N = 25
3405.41
2 x Xeon Platinum 8280
SE +/- 36.17, N = 25
3228.63
Xeon Gold 5220R
SE +/- 38.41, N = 5
3150.10
EPYC 2 7R32
SE +/- 26.28, N = 25
3057.06
Xeon Gold 6226R
SE +/- 28.09, N = 25
2856.85
Xeon W-3275M
SE +/- 30.38, N = 7
2743.62
Xeon Platinum 8280
SE +/- 19.41, N = 5
2674.18
1100
2200
3300
4400
5500

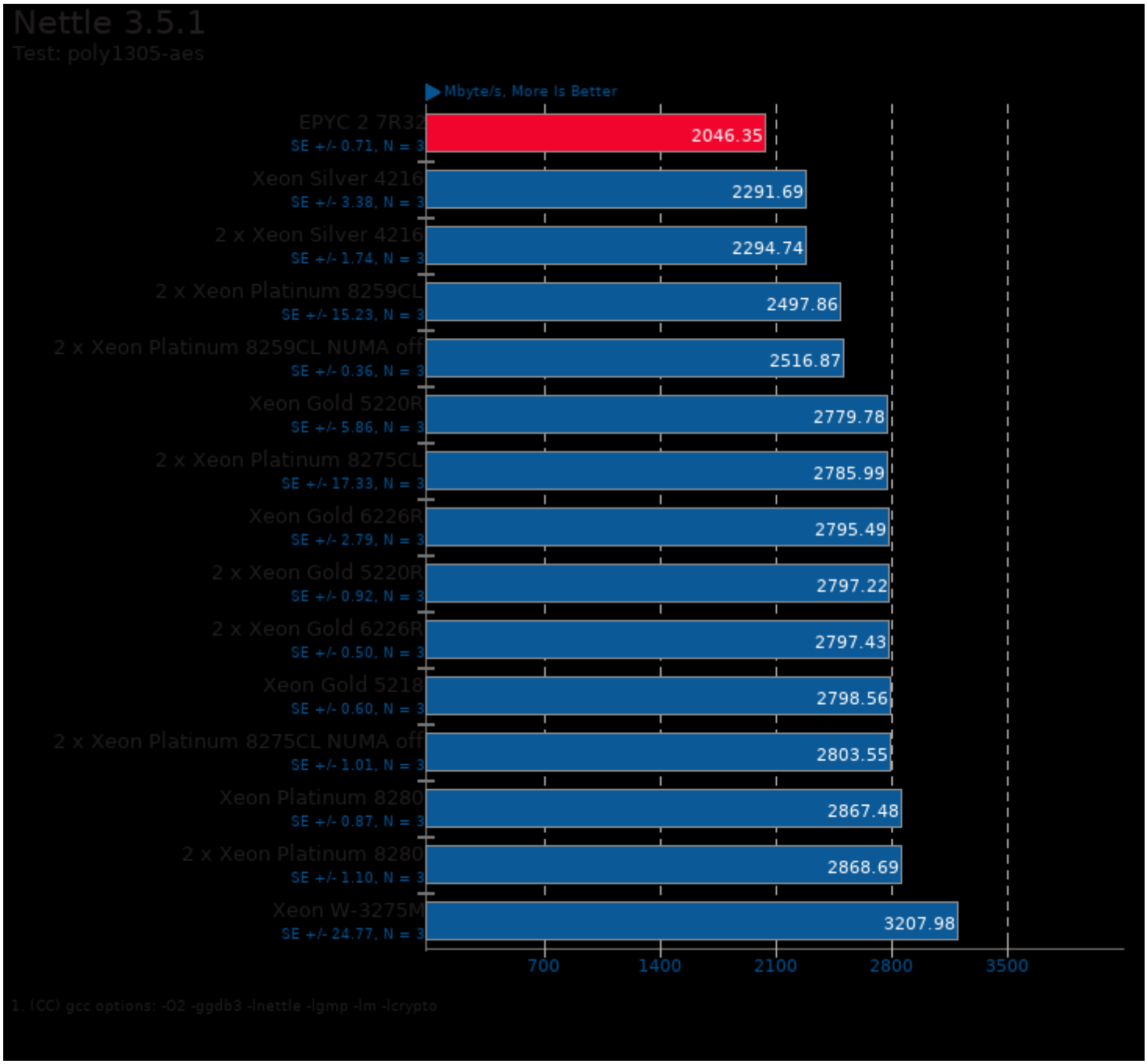

Renaissance 0.10.0
Test: Savina Reactors.IO
ms, Fewer Is Better
2 x Xeon Silver 4216
SE +/- 436.95, N = 25
28596.11
2 x Xeon Platinum 8259CL NUMA off
SE +/- 502.20, N = 25
28251.83
2 x Xeon Platinum 8259CL
SE +/- 482.43, N = 25
28107.04
2 x Xeon Gold 6226R
SE +/- 633.76, N = 25
27973.00
2 x Xeon Platinum 8275CL NUMA off
SE +/- 504.51, N = 25
27361.60
Xeon Gold 6226R
SE +/- 426.81, N = 25
27198.86
Xeon Gold 5218
SE +/- 516.85, N = 25
27198.08
2 x Xeon Platinum 8275CL
SE +/- 568.00, N = 25
26906.89
2 x Xeon Platinum 8280
SE +/- 474.27, N = 25
26764.94
2 x Xeon Gold 5220R
SE +/- 496.64, N = 25
26257.01
Xeon W-3275M
SE +/- 599.32, N = 25
25186.67
Xeon Silver 4216
SE +/- 251.20, N = 25
22798.38
Xeon Gold 5220R
SE +/- 389.39, N = 25
22776.30
Xeon Platinum 8280
SE +/- 593.14, N = 25
21975.12
EPYC 2 7R32
SE +/- 365.25, N = 20
19303.56
6K
12K
18K
24K
30K

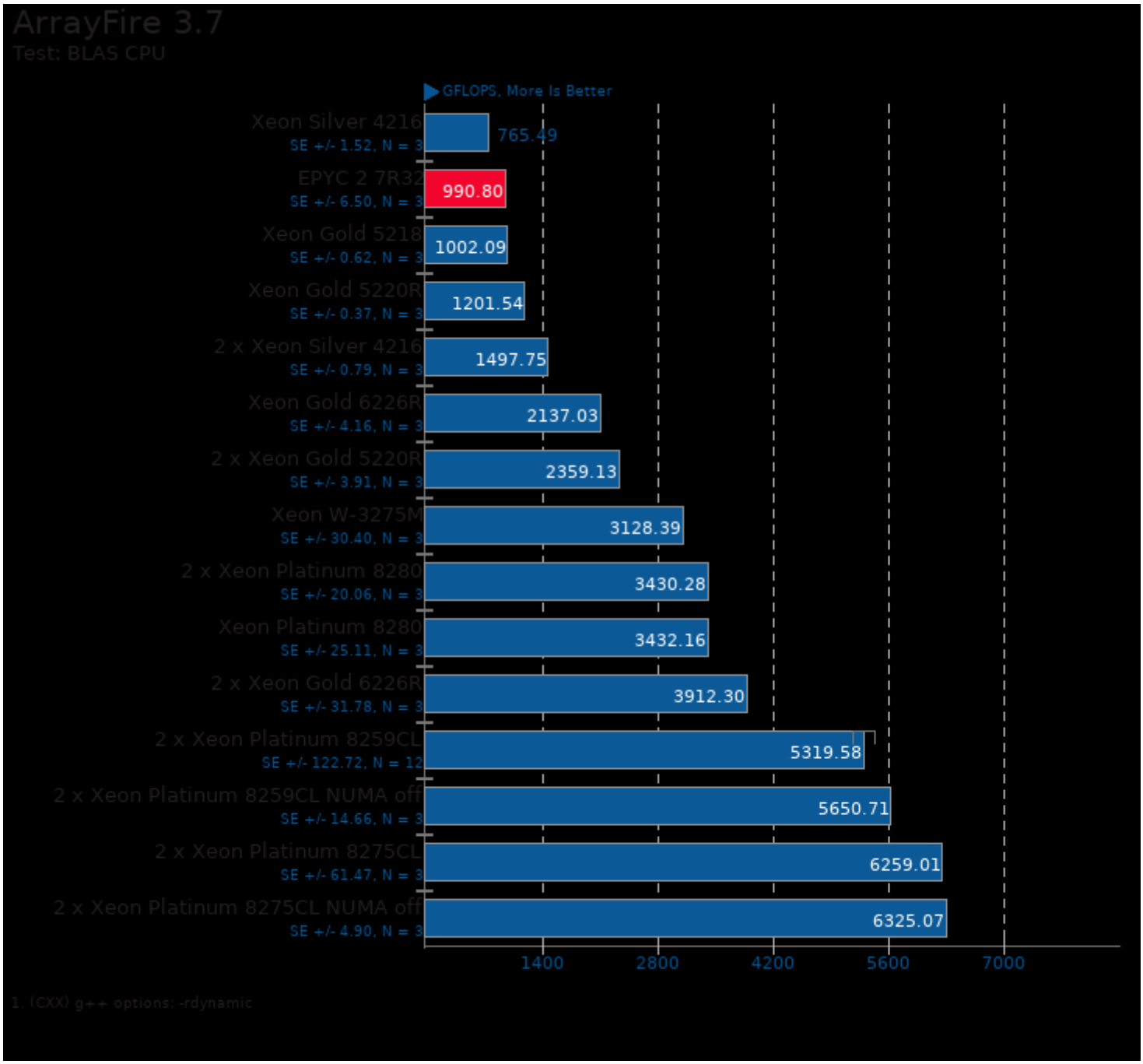

Renaissance 0.10.0
Test: Apache Spark PageRank
ms, Fewer Is Better
2 x Xeon Silver 4216
SE +/- 374.59, N = 5
28045.92
2 x Xeon Platinum 8259CL NUMA off
SE +/- 232.21, N = 5
25636.69
2 x Xeon Platinum 8259CL
SE +/- 278.82, N = 5
25275.16
Xeon Silver 4216
SE +/- 195.96, N = 5
25271.43
2 x Xeon Platinum 8275CL NUMA off
SE +/- 286.23, N = 5
24666.36
2 x Xeon Gold 5220R
SE +/- 255.27, N = 5
24540.72
2 x Xeon Gold 6226R
SE +/- 165.91, N = 5
24522.22
2 x Xeon Platinum 8275CL
SE +/- 181.72, N = 25
24505.96
Xeon Gold 5218
SE +/- 172.76, N = 5
23703.03
2 x Xeon Platinum 8280
SE +/- 286.23, N = 6
23588.40
Xeon Gold 6226R
SE +/- 29.95, N = 5
21743.02
Xeon Gold 5220R
SE +/- 217.63, N = 5
21704.49
EPYC 2 7R32
SE +/- 198.48, N = 5
21641.95
Xeon W-3275M
SE +/- 165.27, N = 5
21015.54
Xeon Platinum 8280
SE +/- 169.44, N = 5
20621.23
6K
12K
18K
24K
30K

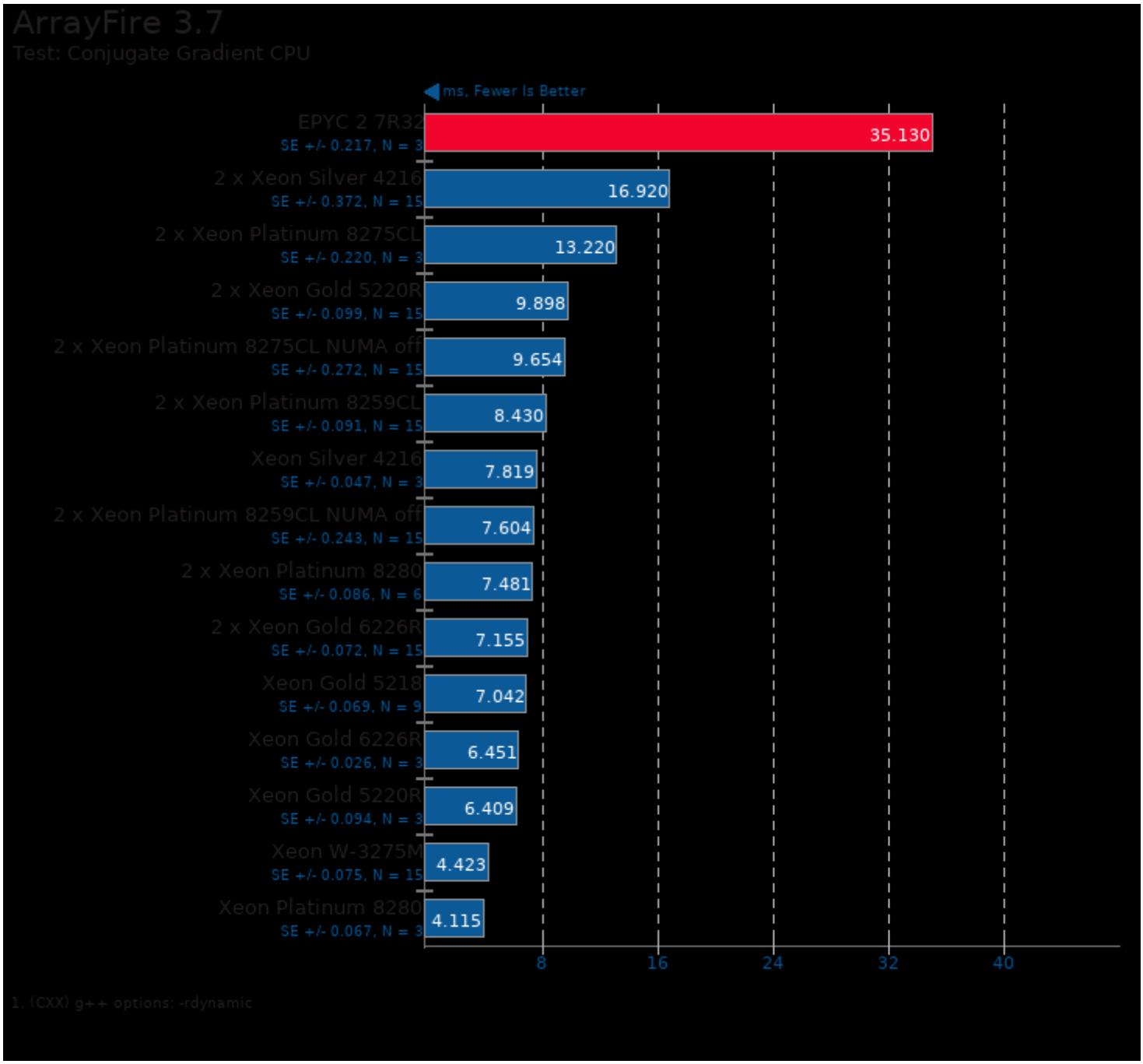

Nettle 3.5.1
Test: aes256
Mbyte/s, More Is Better
EPYC 2 7R32
SE +/- 0.67, N = 3
MIN: 3372.31 / MAX: 7239.74
4665.33
Xeon Silver 4216
SE +/- 11.26, N = 3
MIN: 3388.65 / MAX: 8334.48
5024.39
2 x Xeon Silver 4216
SE +/- 1.63, N = 3
MIN: 3412.46 / MAX: 8379.01
5061.60
2 x Xeon Platinum 8259CL
SE +/- 24.71, N = 3
MIN: 3744.15 / MAX: 9173.02
5513.08
2 x Xeon Platinum 8259CL NUMA off
SE +/- 5.89, N = 3
MIN: 3739.77 / MAX: 9132.41
5523.31
Xeon Gold 5220R
SE +/- 2.03, N = 3
MIN: 4136.23 / MAX: 10160.8
6133.91
2 x Xeon Gold 6226R
SE +/- 8.42, N = 3
MIN: 4104.14 / MAX: 10212.45
6157.49
2 x Xeon Gold 5220R
SE +/- 2.26, N = 3
MIN: 4154.94 / MAX: 10200.04
6159.21
Xeon Gold 6226R
SE +/- 6.01, N = 3
MIN: 4158.08 / MAX: 10213.08
6161.42
Xeon Gold 5218
SE +/- 1.48, N = 3
MIN: 4152.92 / MAX: 10208.98
6164.79
2 x Xeon Platinum 8275CL
SE +/- 4.53, N = 3
MIN: 4118.12 / MAX: 10228.73
6172.55
2 x Xeon Platinum 8275CL NUMA off
SE +/- 1.10, N = 3
MIN: 4170.96 / MAX: 10241.48
6184.20
Xeon Platinum 8280
SE +/- 7.98, N = 3
MIN: 4256.89 / MAX: 10467.36
6313.16
2 x Xeon Platinum 8280
SE +/- 3.29, N = 3
MIN: 4254.97 / MAX: 10469.4
6320.00
Xeon W-3275M
SE +/- 39.45, N = 3
MIN: 4721.3 / MAX: 11806.11
7070.60
1500
3000
4500
6000
7500
1. (CC) gcc options: -O2 -ggdb3 -lnettle -lgmp -lm -lcrypto

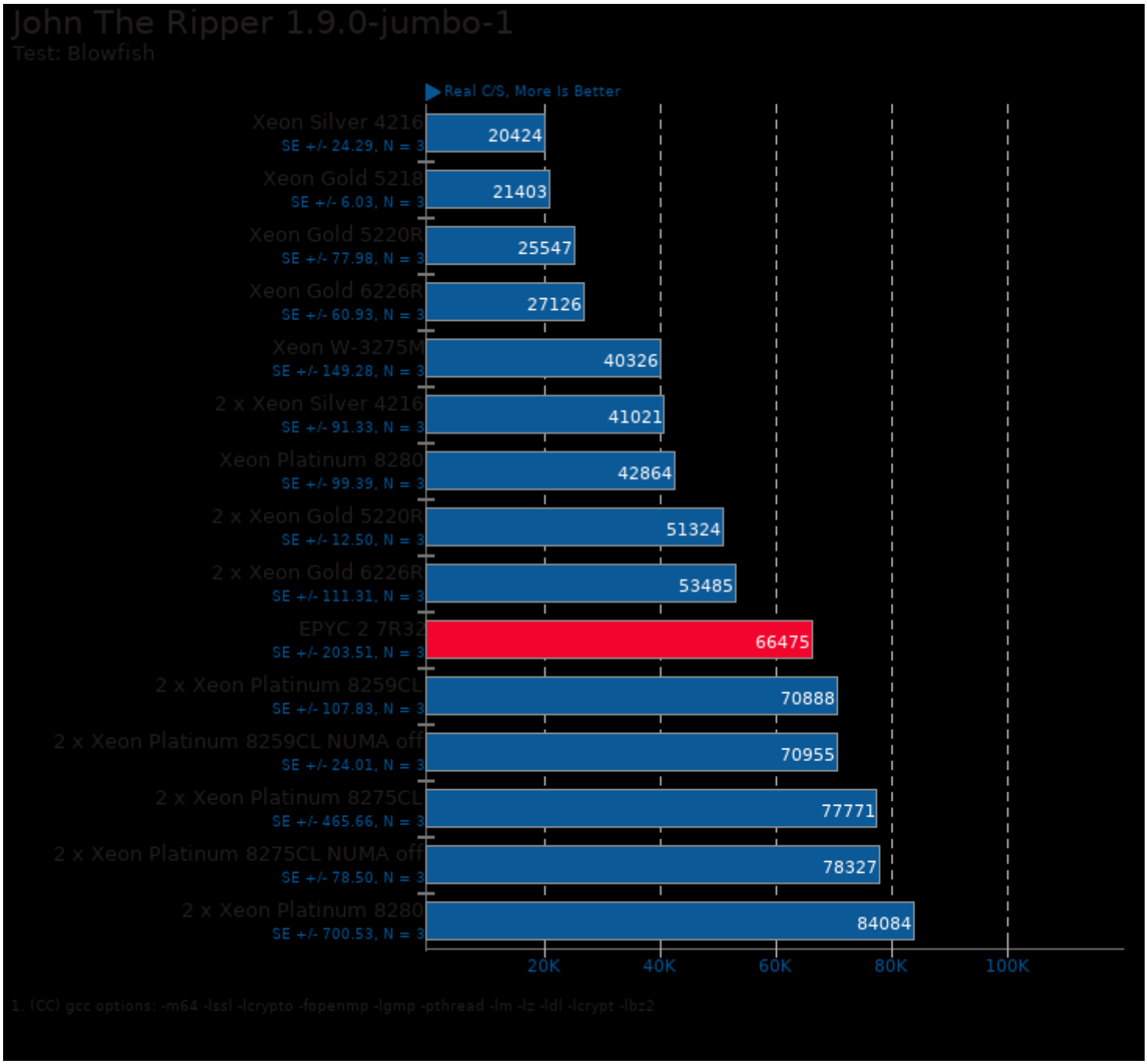

Nettle 3.5.1
Test: chacha
Mbyte/s, More Is Better
EPYC 2 7R32
SE +/- 0.08, N = 3
MIN: 382.32 / MAX: 2047.21
750.36
Xeon Silver 4216
SE +/- 0.91, N = 3
MIN: 423.28 / MAX: 2294.55
837.61
2 x Xeon Silver 4216
SE +/- 0.18, N = 3
MIN: 428.69 / MAX: 2296.48
841.65
2 x Xeon Platinum 8259CL NUMA off
SE +/- 4.18, N = 3
MIN: 463.47 / MAX: 2517.16
917.51
2 x Xeon Platinum 8259CL
SE +/- 4.50, N = 3
MIN: 461.99 / MAX: 2517.41
917.75
Xeon Gold 5220R
SE +/- 1.02, N = 3
MIN: 519.31 / MAX: 2788.96
1020.09
Xeon Gold 5218
SE +/- 0.76, N = 3
MIN: 507.67 / MAX: 2797.4
1024.49
2 x Xeon Gold 5220R
SE +/- 0.41, N = 3
MIN: 518.14 / MAX: 2797.53
1024.98
Xeon Gold 6226R
SE +/- 0.49, N = 3
MIN: 521.91 / MAX: 2799.45
1024.99
2 x Xeon Gold 6226R
SE +/- 0.61, N = 3
MIN: 522.31 / MAX: 2798.89
1025.38
2 x Xeon Platinum 8275CL
SE +/- 1.27, N = 3
MIN: 515.88 / MAX: 2805.16
1025.60
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.48, N = 3
MIN: 523.28 / MAX: 2803.78
1027.59
Xeon Platinum 8280
SE +/- 0.86, N = 3
MIN: 532.77 / MAX: 2871.25
1051.11
2 x Xeon Platinum 8280
SE +/- 0.37, N = 3
MIN: 535.04 / MAX: 2870.94
1051.94
Xeon W-3275M
SE +/- 5.99, N = 3
MIN: 567.45 / MAX: 3234.29
1172.15
300
600
900
1200
1500
1. (CC) gcc options: -O2 -ggdb3 -lnettle -lgmp -lm -lcrypto

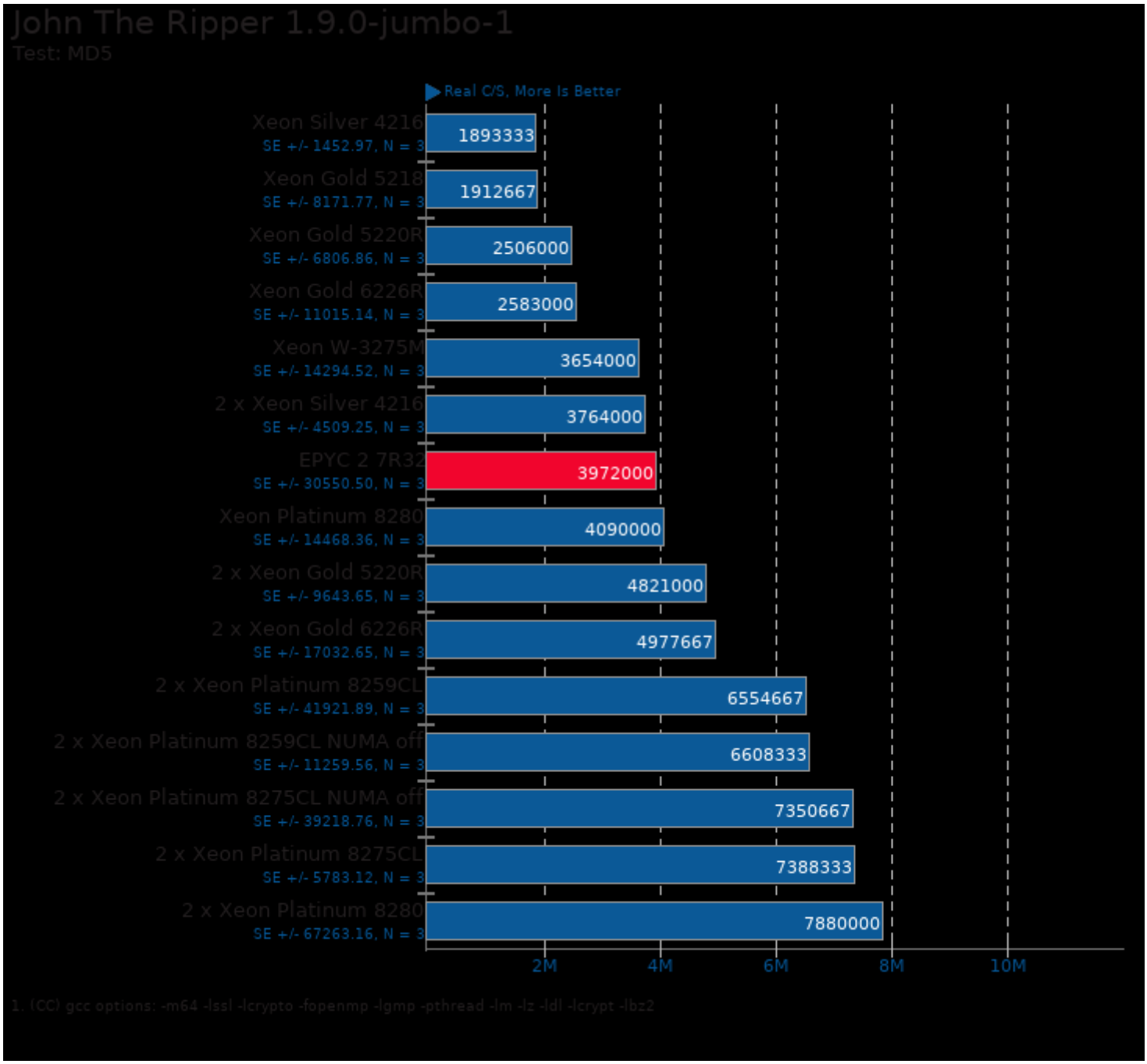

Nettle 3.5.1
Test: sha512
Mbyte/s, More Is Better
Xeon Silver 4216
SE +/- 0.56, N = 3
399.99
2 x Xeon Silver 4216
SE +/- 0.28, N = 3
401.13
2 x Xeon Platinum 8259CL
SE +/- 2.61, N = 3
437.62
2 x Xeon Platinum 8259CL NUMA off
SE +/- 1.80, N = 3
438.23
EPYC 2 7R32
SE +/- 0.28, N = 3
478.09
Xeon Gold 5220R
SE +/- 1.03, N = 3
485.86
2 x Xeon Platinum 8275CL
SE +/- 2.94, N = 3
487.55
Xeon Gold 6226R
SE +/- 0.77, N = 3
488.81
2 x Xeon Gold 5220R
SE +/- 0.19, N = 3
489.15
2 x Xeon Gold 6226R
SE +/- 0.11, N = 3
489.42
Xeon Gold 5218
SE +/- 0.19, N = 3
489.51
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.61, N = 3
490.26
2 x Xeon Platinum 8280
SE +/- 0.97, N = 3
500.98
Xeon Platinum 8280
SE +/- 0.15, N = 3
501.98
Xeon W-3275M
SE +/- 2.72, N = 3
550.93
120
240
360
480
600
1. (CC) gcc options: -O2 -ggdb3 -lnettle -lgmp -lm -lcrypto

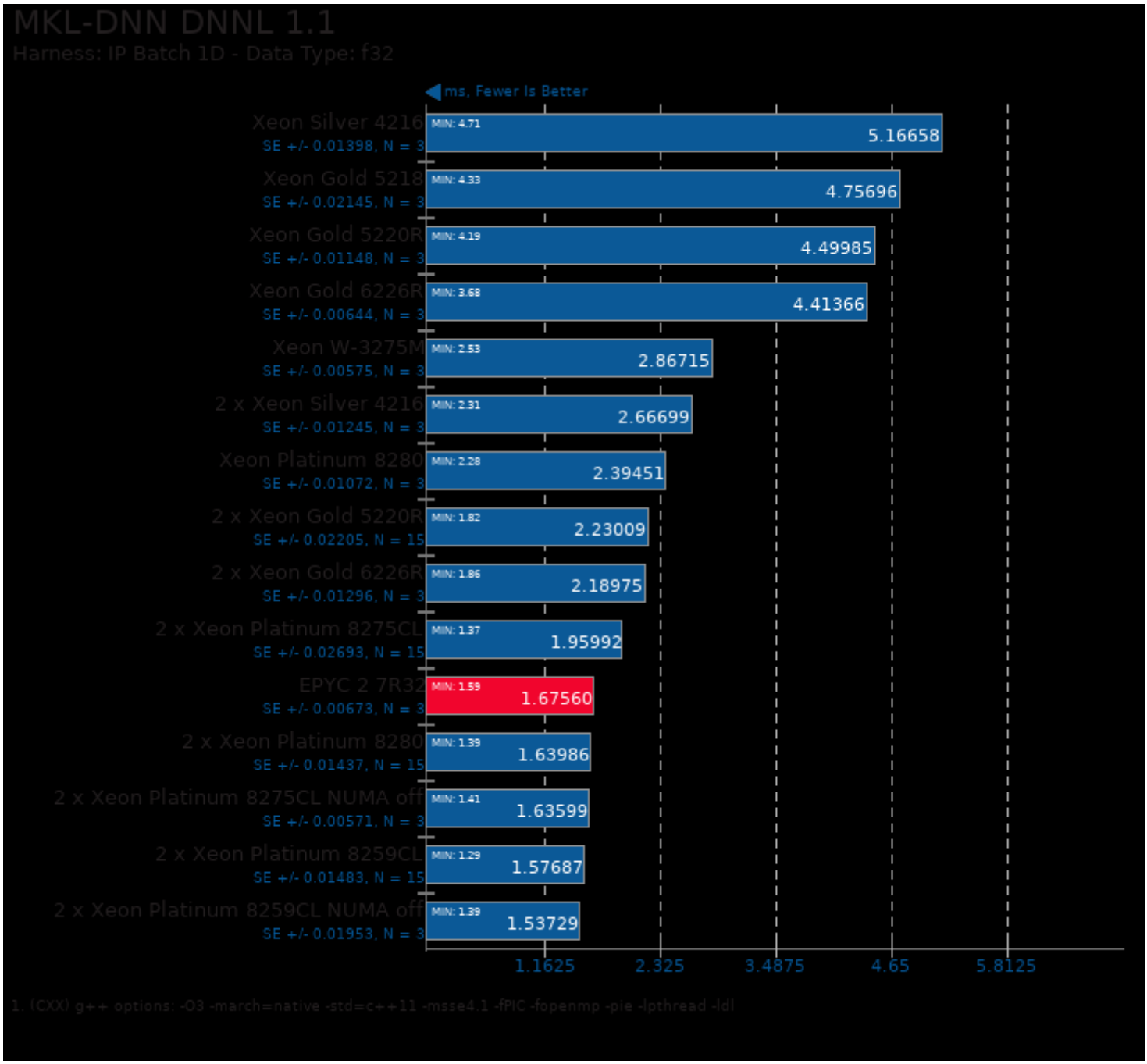

Nettle 3.5.1
Test: poly1305-aes
Mbyte/s, More Is Better
EPYC 2 7R32
SE +/- 0.71, N = 3
2046.35
Xeon Silver 4216
SE +/- 3.38, N = 3
2291.69
2 x Xeon Silver 4216
SE +/- 1.74, N = 3
2294.74
2 x Xeon Platinum 8259CL
SE +/- 15.23, N = 3
2497.86
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.36, N = 3
2516.87
Xeon Gold 5220R
SE +/- 5.86, N = 3
2779.78
2 x Xeon Platinum 8275CL
SE +/- 17.33, N = 3
2785.99
Xeon Gold 6226R
SE +/- 2.79, N = 3
2795.49
2 x Xeon Gold 5220R
SE +/- 0.92, N = 3
2797.22
2 x Xeon Gold 6226R
SE +/- 0.50, N = 3
2797.43
Xeon Gold 5218
SE +/- 0.60, N = 3
2798.56
2 x Xeon Platinum 8275CL NUMA off
SE +/- 1.01, N = 3
2803.55
Xeon Platinum 8280
SE +/- 0.87, N = 3
2867.48
2 x Xeon Platinum 8280
SE +/- 1.10, N = 3
2868.69
Xeon W-3275M
SE +/- 24.77, N = 3
3207.98
700
1400
2100
2800
3500
1. (CC) gcc options: -O2 -ggdb3 -lnettle -lgmp -lm -lcrypto

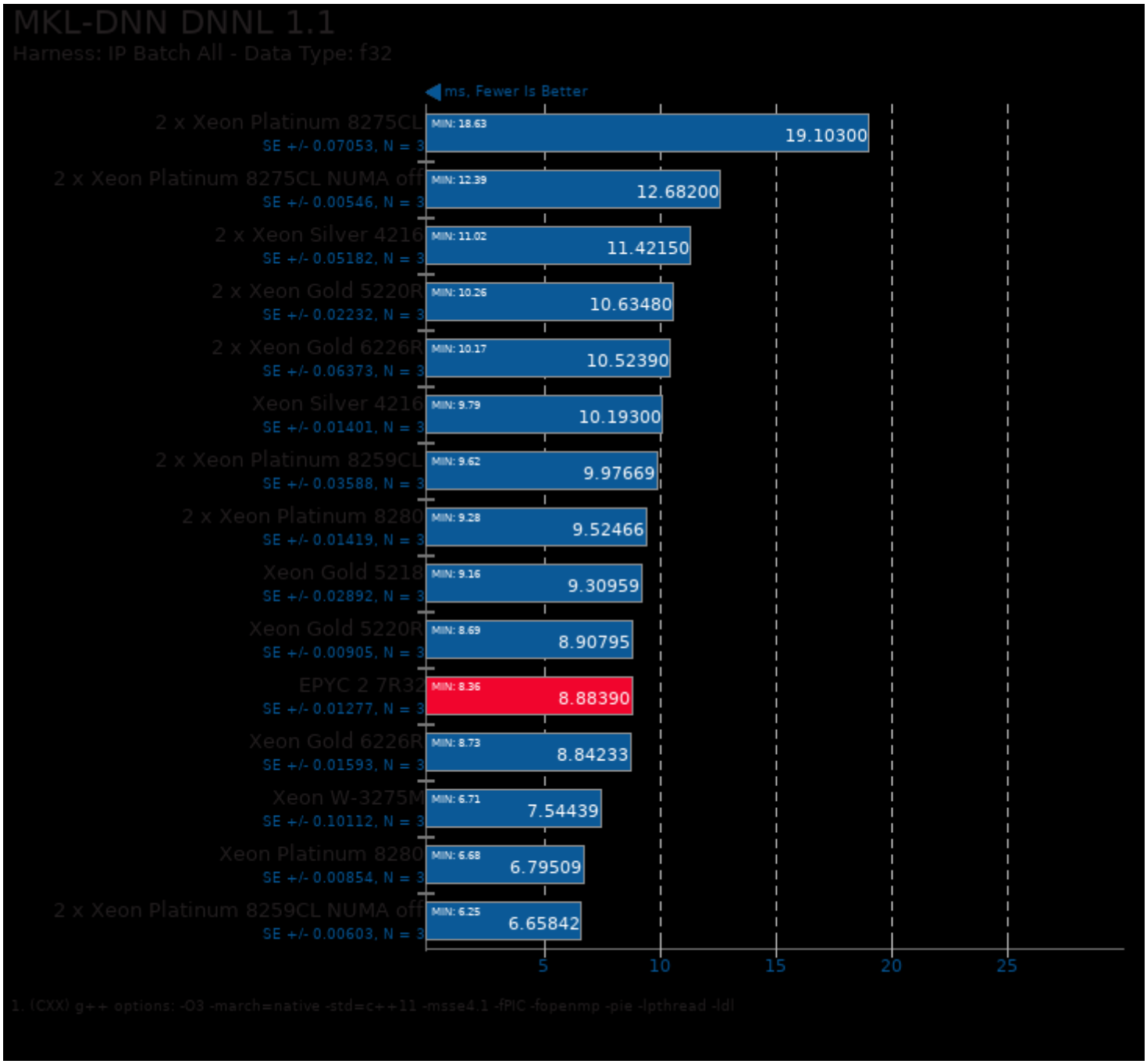

ArrayFire 3.7
Test: BLAS CPU
GFLOPS, More Is Better
Xeon Silver 4216
SE +/- 1.52, N = 3
765.49
EPYC 2 7R32
SE +/- 6.50, N = 3
990.80
Xeon Gold 5218
SE +/- 0.62, N = 3
1002.09
Xeon Gold 5220R
SE +/- 0.37, N = 3
1201.54
2 x Xeon Silver 4216
SE +/- 0.79, N = 3
1497.75
Xeon Gold 6226R
SE +/- 4.16, N = 3
2137.03
2 x Xeon Gold 5220R
SE +/- 3.91, N = 3
2359.13
Xeon W-3275M
SE +/- 30.40, N = 3
3128.39
2 x Xeon Platinum 8280
SE +/- 20.06, N = 3
3430.28
Xeon Platinum 8280
SE +/- 25.11, N = 3
3432.16
2 x Xeon Gold 6226R
SE +/- 31.78, N = 3
3912.30
2 x Xeon Platinum 8259CL
SE +/- 122.72, N = 12
5319.58
2 x Xeon Platinum 8259CL NUMA off
SE +/- 14.66, N = 3
5650.71
2 x Xeon Platinum 8275CL
SE +/- 61.47, N = 3
6259.01
2 x Xeon Platinum 8275CL NUMA off
SE +/- 4.90, N = 3
6325.07
1400
2800
4200
5600
7000
1. (CXX) g++ options: -rdynamic

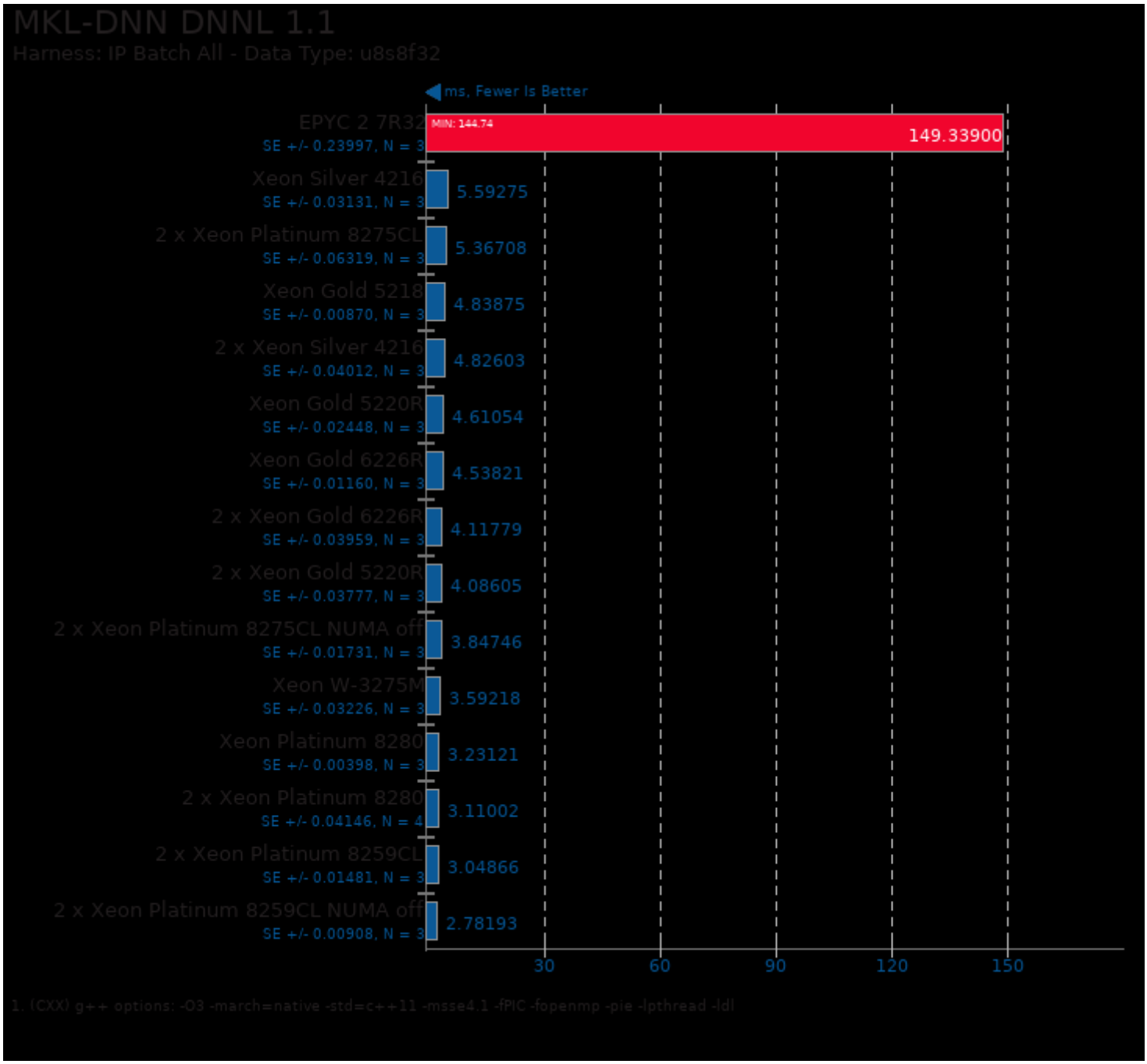

ArrayFire 3.7
Test: Conjugate Gradient CPU
ms, Fewer Is Better
EPYC 2 7R32
SE +/- 0.217, N = 3
35.130
2 x Xeon Silver 4216
SE +/- 0.372, N = 15
16.920
2 x Xeon Platinum 8275CL
SE +/- 0.220, N = 3
13.220
2 x Xeon Gold 5220R
SE +/- 0.099, N = 15
9.898
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.272, N = 15
9.654
2 x Xeon Platinum 8259CL
SE +/- 0.091, N = 15
8.430
Xeon Silver 4216
SE +/- 0.047, N = 3
7.819
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.243, N = 15
7.604
2 x Xeon Platinum 8280
SE +/- 0.086, N = 6
7.481
2 x Xeon Gold 6226R
SE +/- 0.072, N = 15
7.155
Xeon Gold 5218
SE +/- 0.069, N = 9
7.042
Xeon Gold 6226R
SE +/- 0.026, N = 3
6.451
Xeon Gold 5220R
SE +/- 0.094, N = 3
6.409
Xeon W-3275M
SE +/- 0.075, N = 15
4.423
Xeon Platinum 8280
SE +/- 0.067, N = 3
4.115
8
16
24
32
40
1. (CXX) g++ options: -rdynamic

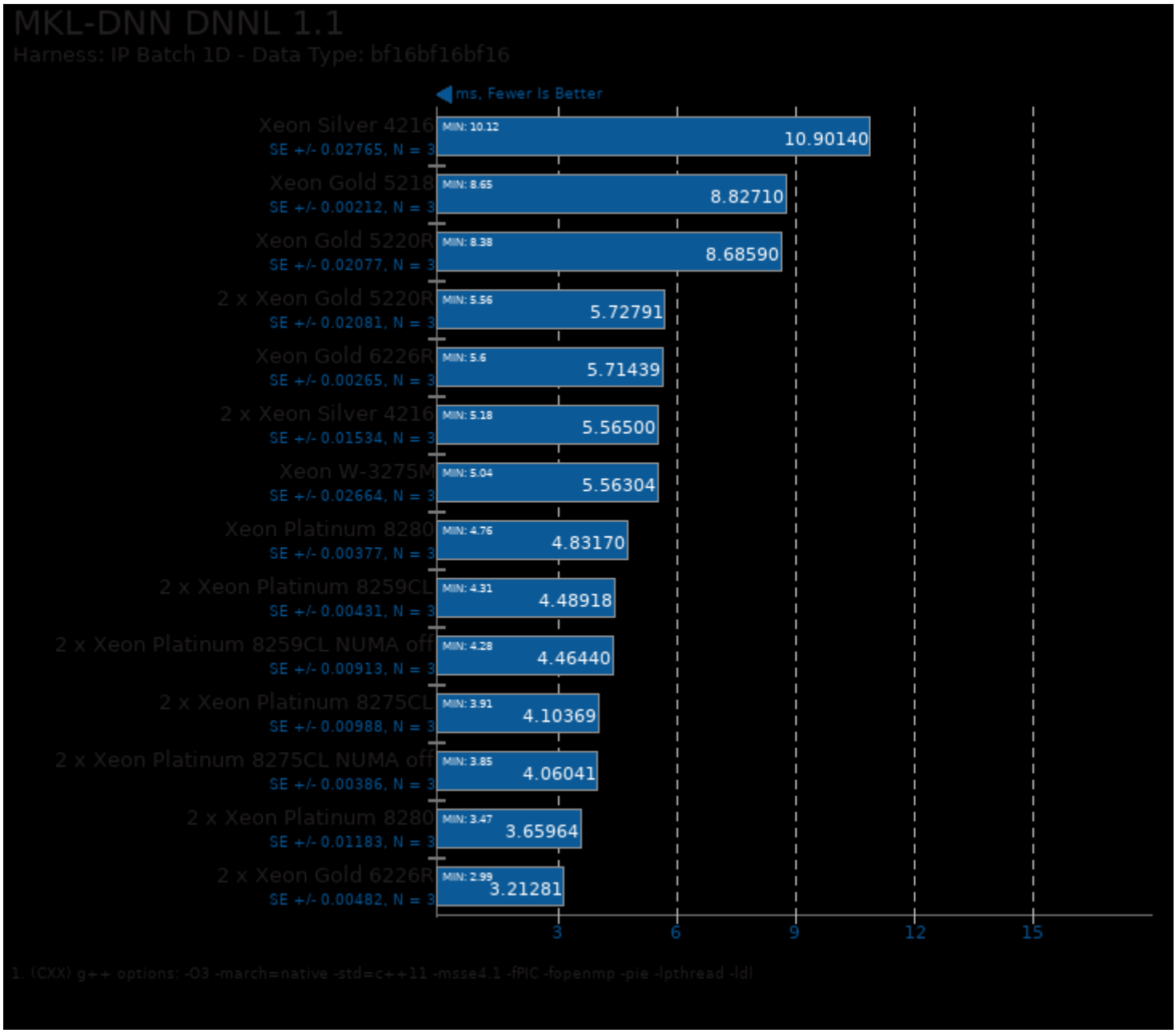

John The Ripper 1.9.0-jumbo-1
Test: Blowfish
Real C/S, More Is Better
Xeon Silver 4216
SE +/- 24.29, N = 3
20424
Xeon Gold 5218
SE +/- 6.03, N = 3
21403
Xeon Gold 5220R
SE +/- 77.98, N = 3
25547
Xeon Gold 6226R
SE +/- 60.93, N = 3
27126
Xeon W-3275M
SE +/- 149.28, N = 3
40326
2 x Xeon Silver 4216
SE +/- 91.33, N = 3
41021
Xeon Platinum 8280
SE +/- 99.39, N = 3
42864
2 x Xeon Gold 5220R
SE +/- 12.50, N = 3
51324
2 x Xeon Gold 6226R
SE +/- 111.31, N = 3
53485
EPYC 2 7R32
SE +/- 203.51, N = 3
66475
2 x Xeon Platinum 8259CL
SE +/- 107.83, N = 3
70888
2 x Xeon Platinum 8259CL NUMA off
SE +/- 24.01, N = 3
70955
2 x Xeon Platinum 8275CL
SE +/- 465.66, N = 3
77771
2 x Xeon Platinum 8275CL NUMA off
SE +/- 78.50, N = 3
78327
2 x Xeon Platinum 8280
SE +/- 700.53, N = 3
84084
20K
40K
60K
80K
100K
1. (CC) gcc options: -m64 -lssl -lcrypto -fopenmp -lgmp -pthread -lm -lz -ldl -lcrypt -lbz2

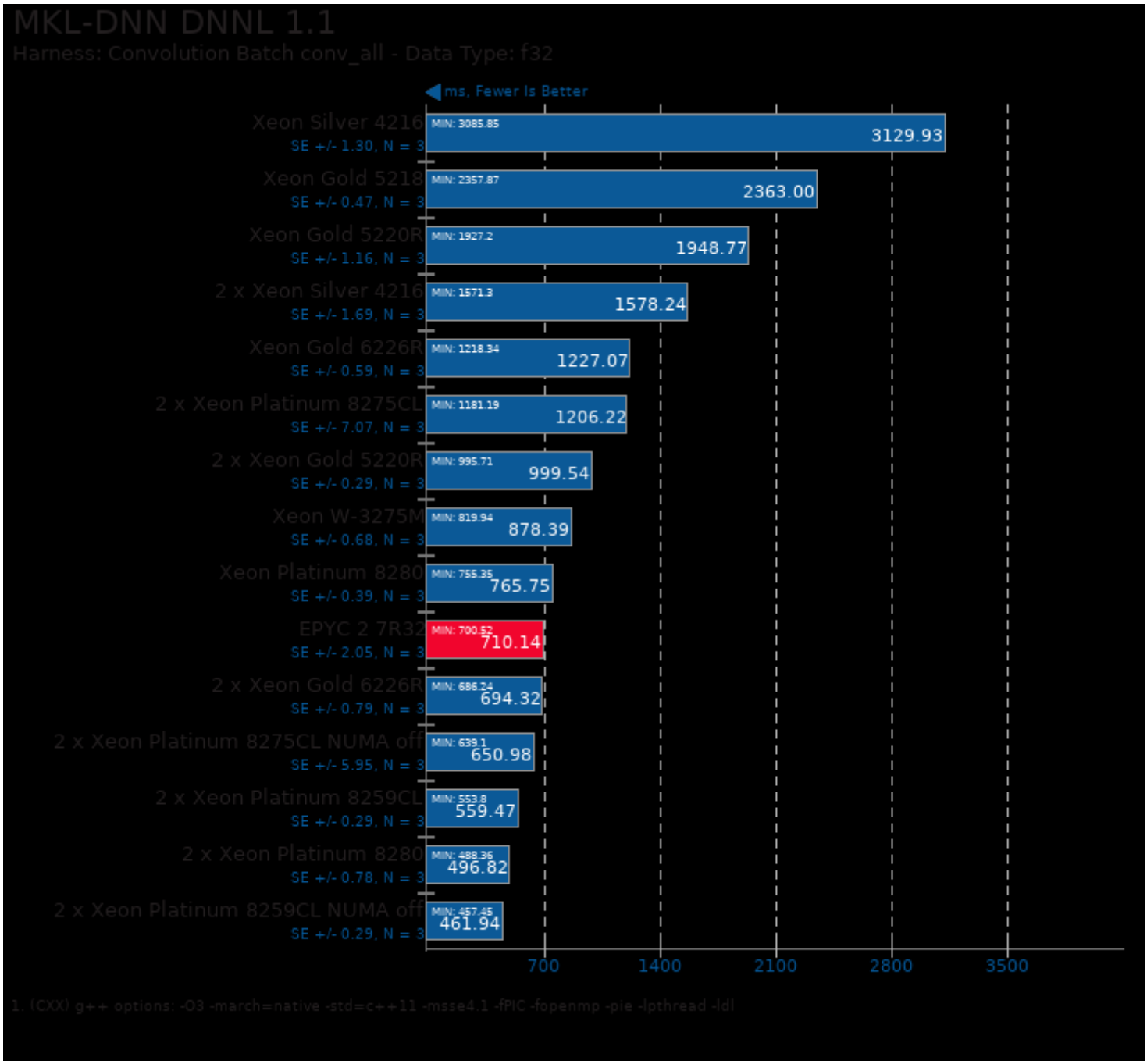

John The Ripper 1.9.0-jumbo-1
Test: MD5
Real C/S, More Is Better
Xeon Silver 4216
SE +/- 1452.97, N = 3
1893333
Xeon Gold 5218
SE +/- 8171.77, N = 3
1912667
Xeon Gold 5220R
SE +/- 6806.86, N = 3
2506000
Xeon Gold 6226R
SE +/- 11015.14, N = 3
2583000
Xeon W-3275M
SE +/- 14294.52, N = 3
3654000
2 x Xeon Silver 4216
SE +/- 4509.25, N = 3
3764000
EPYC 2 7R32
SE +/- 30550.50, N = 3
3972000
Xeon Platinum 8280
SE +/- 14468.36, N = 3
4090000
2 x Xeon Gold 5220R
SE +/- 9643.65, N = 3
4821000
2 x Xeon Gold 6226R
SE +/- 17032.65, N = 3
4977667
2 x Xeon Platinum 8259CL
SE +/- 41921.89, N = 3
6554667
2 x Xeon Platinum 8259CL NUMA off
SE +/- 11259.56, N = 3
6608333
2 x Xeon Platinum 8275CL NUMA off
SE +/- 39218.76, N = 3
7350667
2 x Xeon Platinum 8275CL
SE +/- 5783.12, N = 3
7388333
2 x Xeon Platinum 8280
SE +/- 67263.16, N = 3
7880000
2M
4M
6M
8M
10M
1. (CC) gcc options: -m64 -lssl -lcrypto -fopenmp -lgmp -pthread -lm -lz -ldl -lcrypt -lbz2

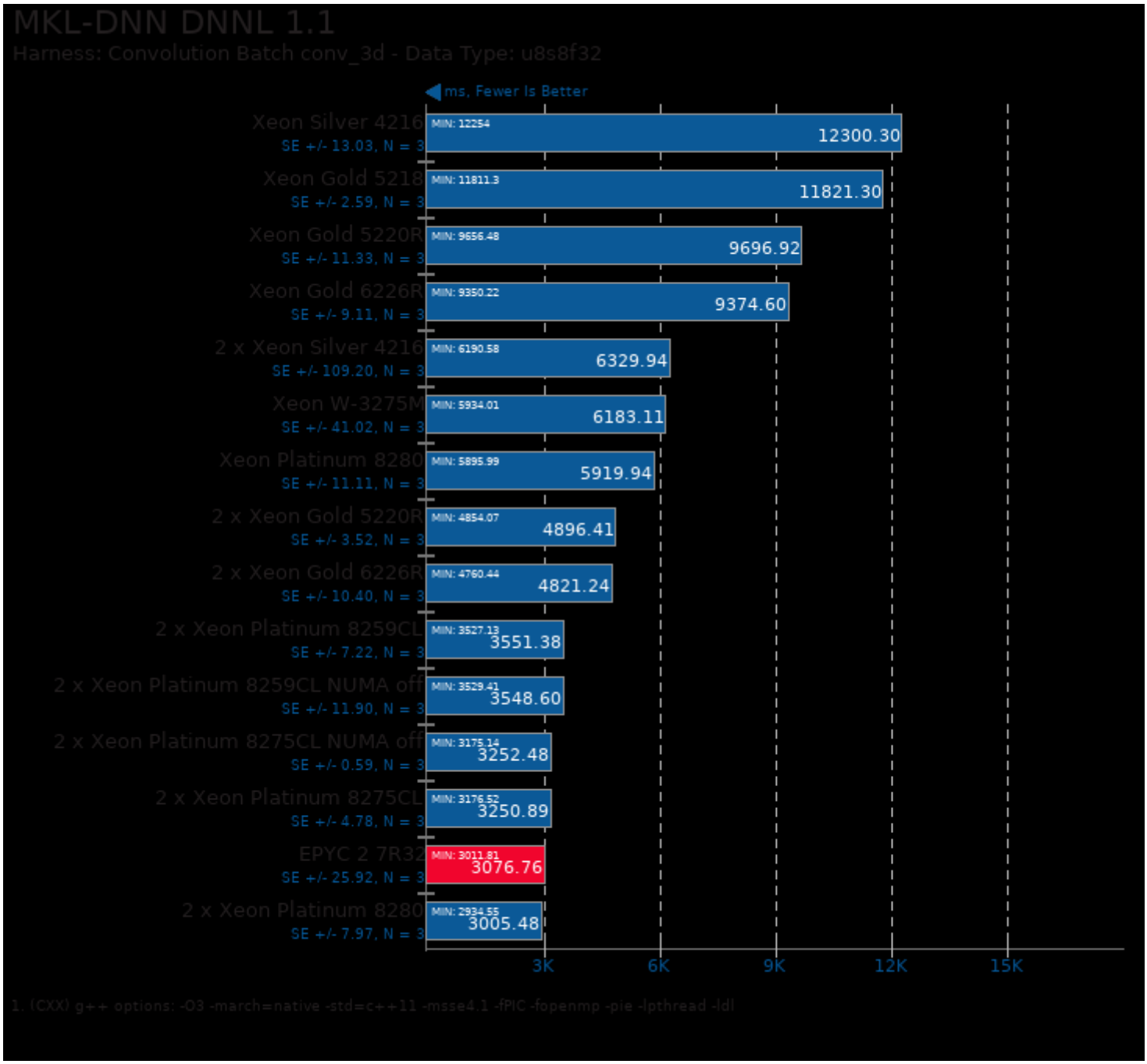

MKL-DNN DNNL 1.1
Harness: IP Batch 1D - Data Type: f32
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 0.01398, N = 3
MIN: 4.71
5.16658
Xeon Gold 5218
SE +/- 0.02145, N = 3
MIN: 4.33
4.75696
Xeon Gold 5220R
SE +/- 0.01148, N = 3
MIN: 4.19
4.49985
Xeon Gold 6226R
SE +/- 0.00644, N = 3
MIN: 3.68
4.41366
Xeon W-3275M
SE +/- 0.00575, N = 3
MIN: 2.53
2.86715
2 x Xeon Silver 4216
SE +/- 0.01245, N = 3
MIN: 2.31
2.66699
Xeon Platinum 8280
SE +/- 0.01072, N = 3
MIN: 2.28
2.39451
2 x Xeon Gold 5220R
SE +/- 0.02205, N = 15
MIN: 1.82
2.23009
2 x Xeon Gold 6226R
SE +/- 0.01296, N = 3
MIN: 1.86
2.18975
2 x Xeon Platinum 8275CL
SE +/- 0.02693, N = 15
MIN: 1.37
1.95992
EPYC 2 7R32
SE +/- 0.00673, N = 3
MIN: 1.59
1.67560
2 x Xeon Platinum 8280
SE +/- 0.01437, N = 15
MIN: 1.39
1.63986
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.00571, N = 3
MIN: 1.41
1.63599
2 x Xeon Platinum 8259CL
SE +/- 0.01483, N = 15
MIN: 1.29
1.57687
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.01953, N = 3
MIN: 1.39
1.53729
1.1625
2.325
3.4875
4.65
5.8125
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

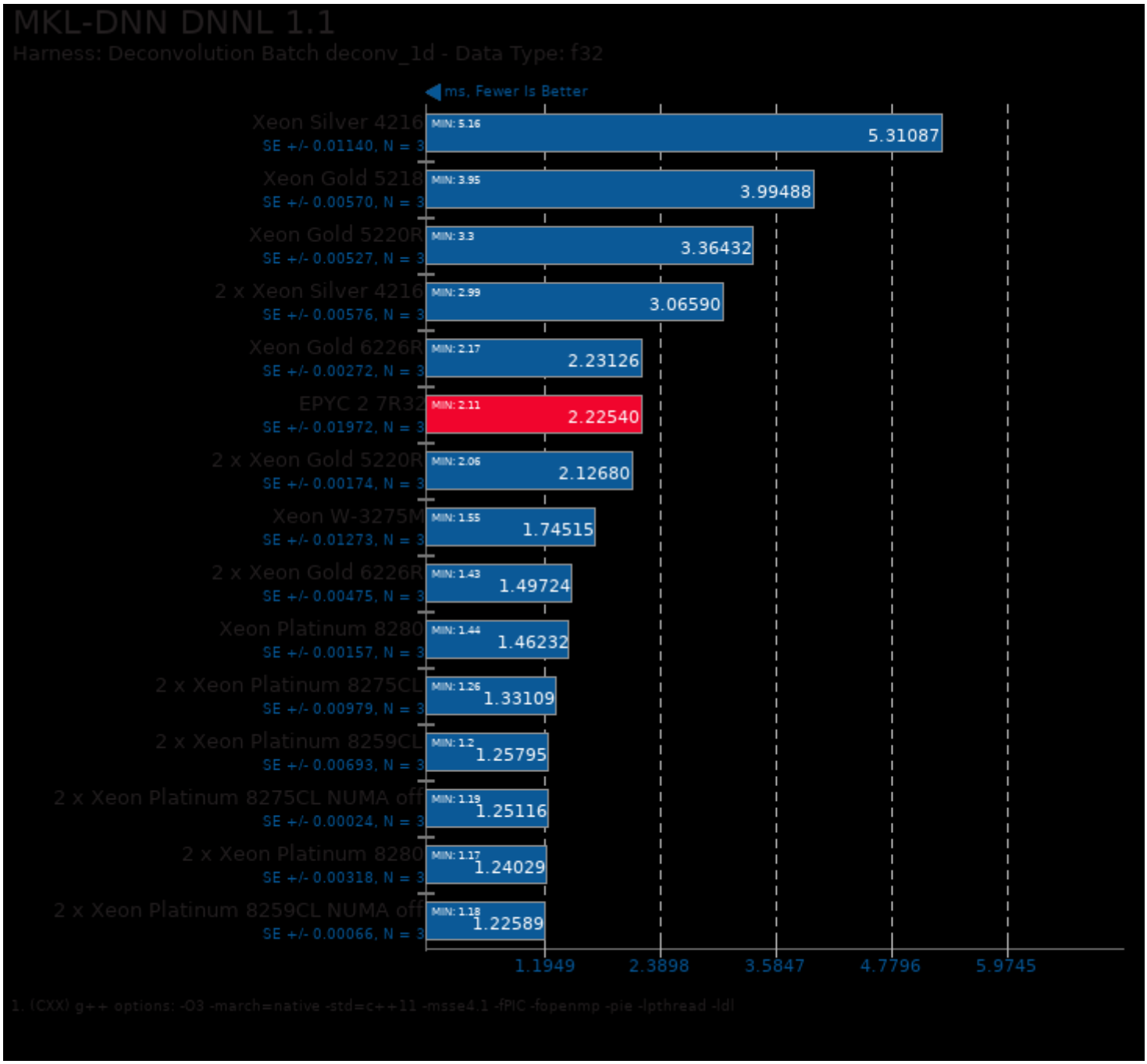

MKL-DNN DNNL 1.1
Harness: IP Batch All - Data Type: f32
ms, Fewer Is Better
2 x Xeon Platinum 8275CL
SE +/- 0.07053, N = 3
MIN: 18.63
19.10300
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.00546, N = 3
MIN: 12.39
12.68200
2 x Xeon Silver 4216
SE +/- 0.05182, N = 3
MIN: 11.02
11.42150
2 x Xeon Gold 5220R
SE +/- 0.02232, N = 3
MIN: 10.26
10.63480
2 x Xeon Gold 6226R
SE +/- 0.06373, N = 3
MIN: 10.17
10.52390
Xeon Silver 4216
SE +/- 0.01401, N = 3
MIN: 9.79
10.19300
2 x Xeon Platinum 8259CL
SE +/- 0.03588, N = 3
MIN: 9.62
9.97669
2 x Xeon Platinum 8280
SE +/- 0.01419, N = 3
MIN: 9.28
9.52466
Xeon Gold 5218
SE +/- 0.02892, N = 3
MIN: 9.16
9.30959
Xeon Gold 5220R
SE +/- 0.00905, N = 3
MIN: 8.69
8.90795
EPYC 2 7R32
SE +/- 0.01277, N = 3
MIN: 8.36
8.88390
Xeon Gold 6226R
SE +/- 0.01593, N = 3
MIN: 8.73
8.84233
Xeon W-3275M
SE +/- 0.10112, N = 3
MIN: 6.71
7.54439
Xeon Platinum 8280
SE +/- 0.00854, N = 3
MIN: 6.68
6.79509
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.00603, N = 3
MIN: 6.25
6.65842
5
10
15
20
25
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

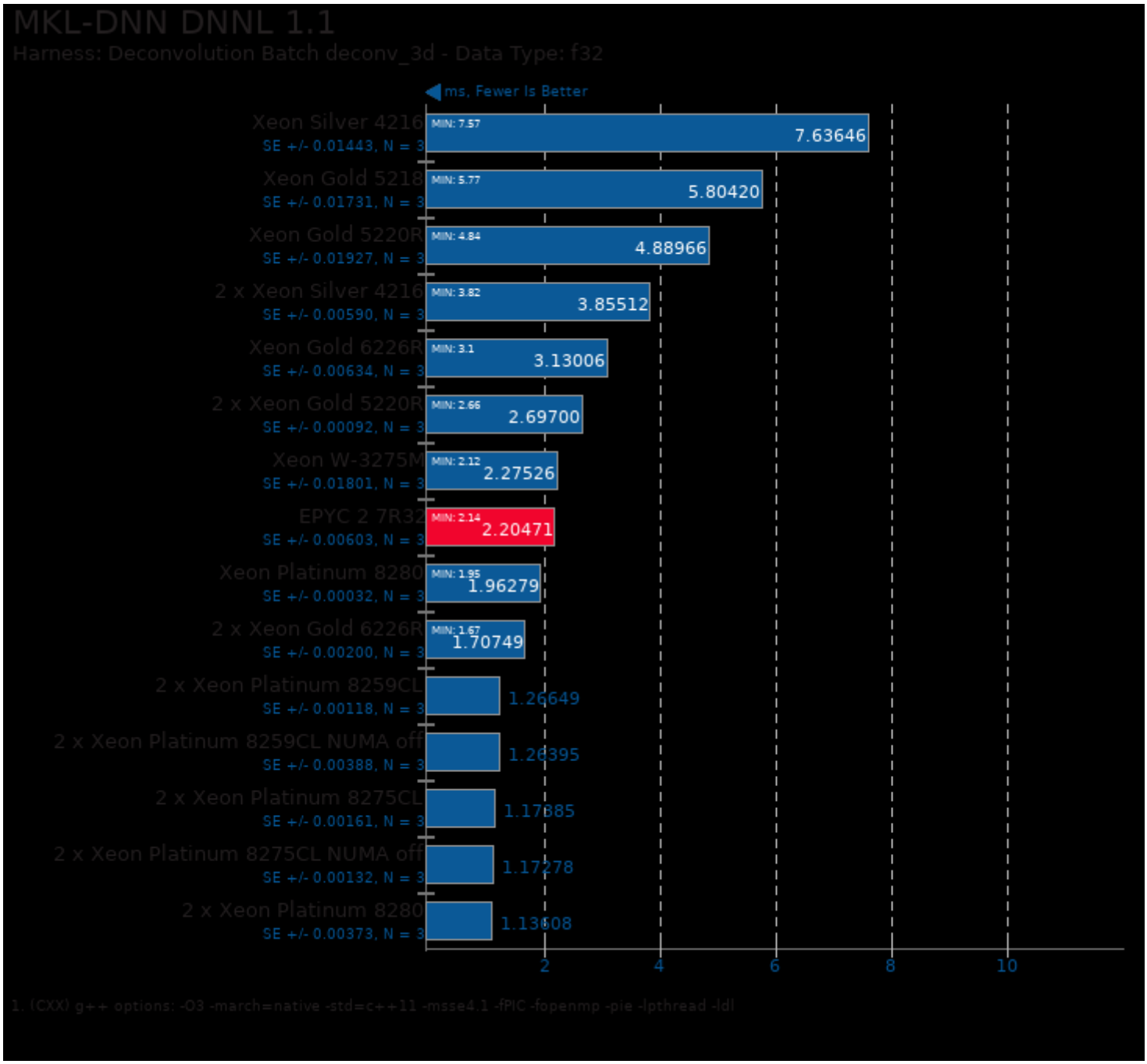

MKL-DNN DNNL 1.1
Harness: IP Batch All - Data Type: u8s8f32
ms, Fewer Is Better
EPYC 2 7R32
SE +/- 0.23997, N = 3
MIN: 144.74
149.33900
Xeon Silver 4216
SE +/- 0.03131, N = 3
5.59275
2 x Xeon Platinum 8275CL
SE +/- 0.06319, N = 3
5.36708
Xeon Gold 5218
SE +/- 0.00870, N = 3
4.83875
2 x Xeon Silver 4216
SE +/- 0.04012, N = 3
4.82603
Xeon Gold 5220R
SE +/- 0.02448, N = 3
4.61054
Xeon Gold 6226R
SE +/- 0.01160, N = 3
4.53821
2 x Xeon Gold 6226R
SE +/- 0.03959, N = 3
4.11779
2 x Xeon Gold 5220R
SE +/- 0.03777, N = 3
4.08605
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.01731, N = 3
3.84746
Xeon W-3275M
SE +/- 0.03226, N = 3
3.59218
Xeon Platinum 8280
SE +/- 0.00398, N = 3
3.23121
2 x Xeon Platinum 8280
SE +/- 0.04146, N = 4
3.11002
2 x Xeon Platinum 8259CL
SE +/- 0.01481, N = 3
3.04866
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.00908, N = 3
2.78193
30
60
90
120
150
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

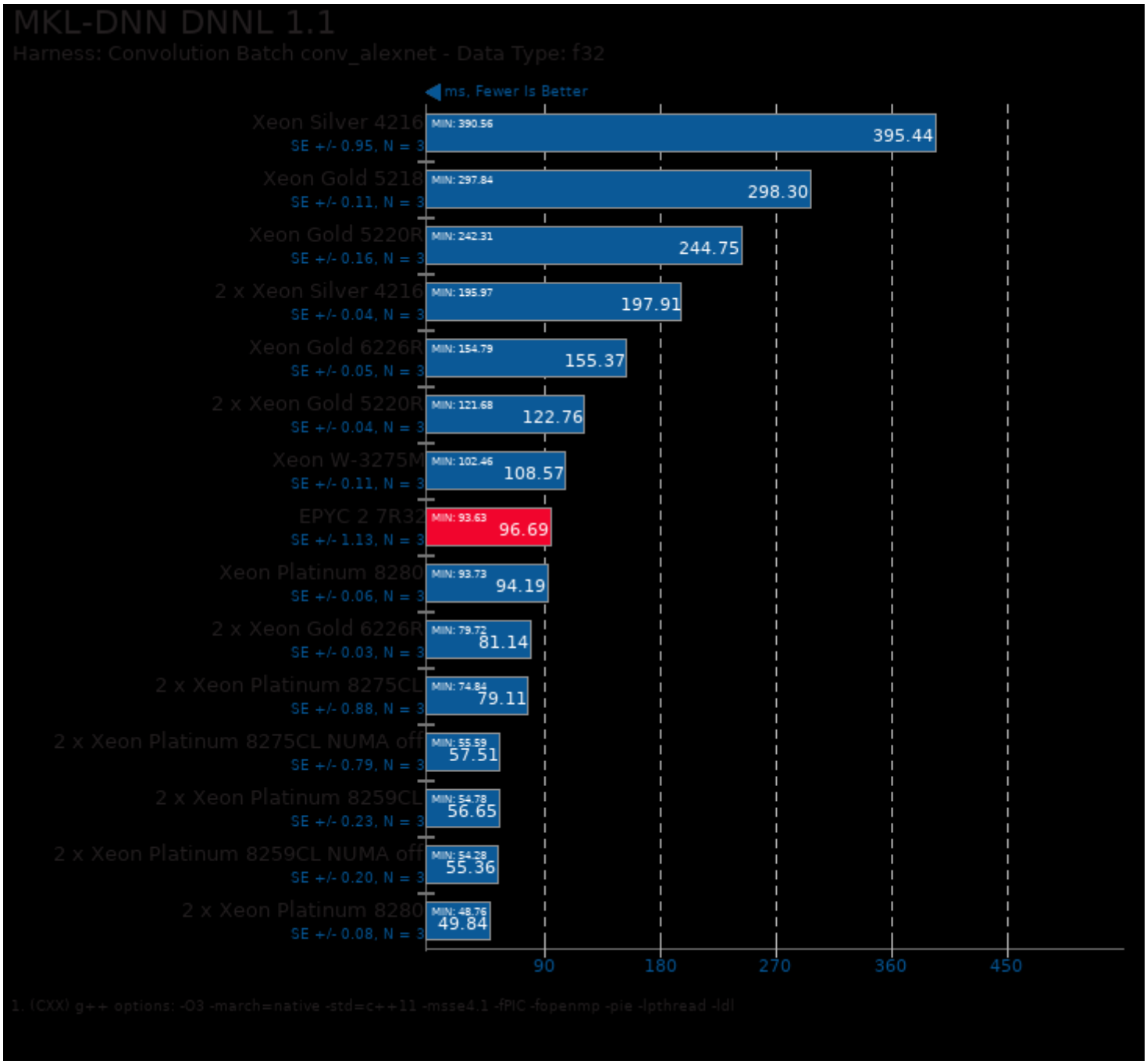

MKL-DNN DNNL 1.1
Harness: IP Batch 1D - Data Type: bf16bf16bf16
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 0.02765, N = 3
MIN: 10.12
10.90140
Xeon Gold 5218
SE +/- 0.00212, N = 3
MIN: 8.65
8.82710
Xeon Gold 5220R
SE +/- 0.02077, N = 3
MIN: 8.38
8.68590
2 x Xeon Gold 5220R
SE +/- 0.02081, N = 3
MIN: 5.56
5.72791
Xeon Gold 6226R
SE +/- 0.00265, N = 3
MIN: 5.6
5.71439
2 x Xeon Silver 4216
SE +/- 0.01534, N = 3
MIN: 5.18
5.56500
Xeon W-3275M
SE +/- 0.02664, N = 3
MIN: 5.04
5.56304
Xeon Platinum 8280
SE +/- 0.00377, N = 3
MIN: 4.76
4.83170
2 x Xeon Platinum 8259CL
SE +/- 0.00431, N = 3
MIN: 4.31
4.48918
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.00913, N = 3
MIN: 4.28
4.46440
2 x Xeon Platinum 8275CL
SE +/- 0.00988, N = 3
MIN: 3.91
4.10369
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.00386, N = 3
MIN: 3.85
4.06041
2 x Xeon Platinum 8280
SE +/- 0.01183, N = 3
MIN: 3.47
3.65964
2 x Xeon Gold 6226R
SE +/- 0.00482, N = 3
MIN: 2.99
3.21281
3
6
9
12
15
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

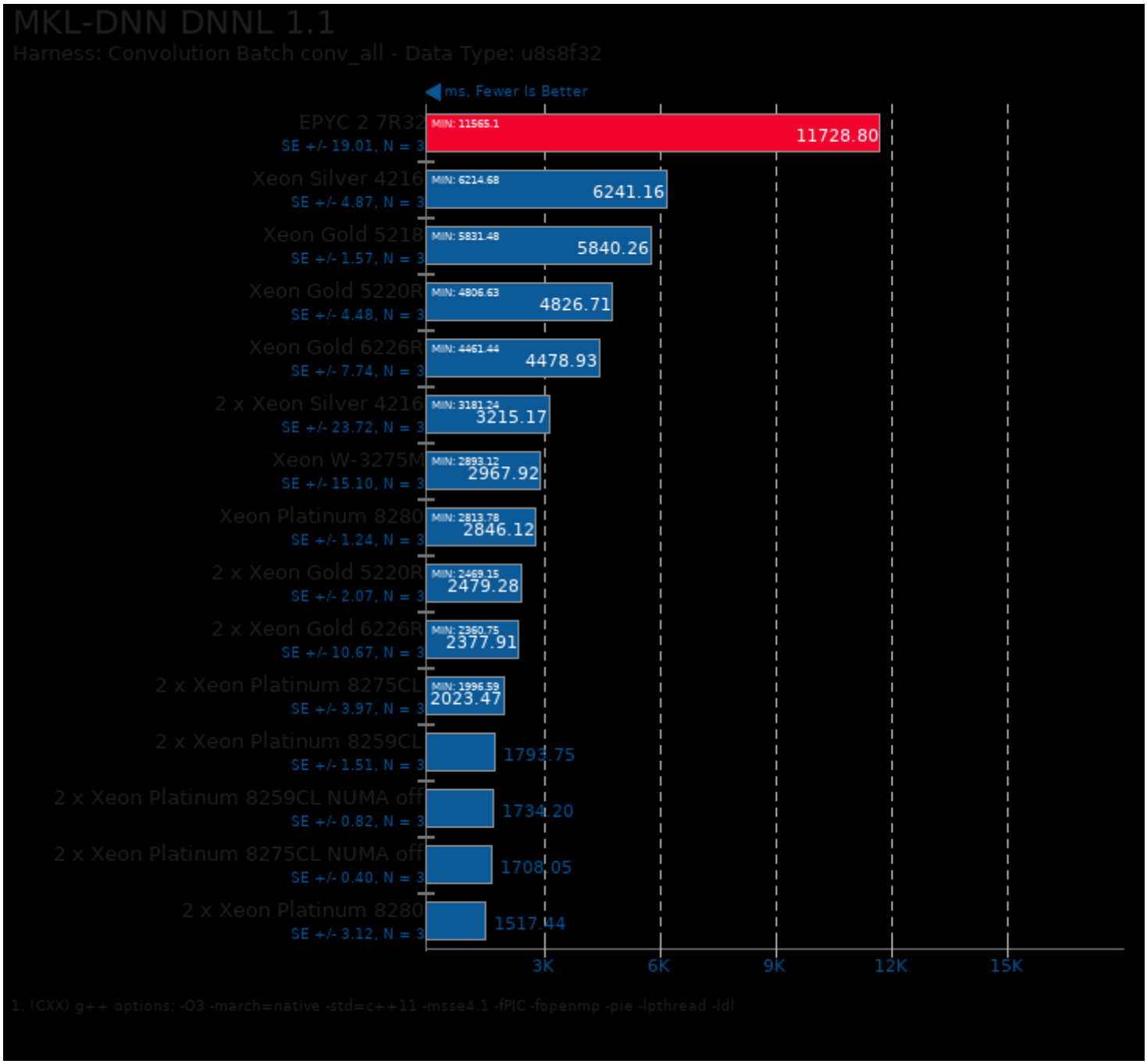

MKL-DNN DNNL 1.1
Harness: Convolution Batch conv_all - Data Type: f32
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 1.30, N = 3
MIN: 3085.85
3129.93
Xeon Gold 5218
SE +/- 0.47, N = 3
MIN: 2357.87
2363.00
Xeon Gold 5220R
SE +/- 1.16, N = 3
MIN: 1927.2
1948.77
2 x Xeon Silver 4216
SE +/- 1.69, N = 3
MIN: 1571.3
1578.24
Xeon Gold 6226R
SE +/- 0.59, N = 3
MIN: 1218.34
1227.07
2 x Xeon Platinum 8275CL
SE +/- 7.07, N = 3
MIN: 1181.19
1206.22
2 x Xeon Gold 5220R
SE +/- 0.29, N = 3
MIN: 995.71
999.54
Xeon W-3275M
SE +/- 0.68, N = 3
MIN: 819.94
878.39
Xeon Platinum 8280
SE +/- 0.39, N = 3
MIN: 755.35
765.75
EPYC 2 7R32
SE +/- 2.05, N = 3
MIN: 700.52
710.14
2 x Xeon Gold 6226R
SE +/- 0.79, N = 3
MIN: 686.24
694.32
2 x Xeon Platinum 8275CL NUMA off
SE +/- 5.95, N = 3
MIN: 639.1
650.98
2 x Xeon Platinum 8259CL
SE +/- 0.29, N = 3
MIN: 553.8
559.47
2 x Xeon Platinum 8280
SE +/- 0.78, N = 3
MIN: 488.36
496.82
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.29, N = 3
MIN: 457.45
461.94
700
1400
2100
2800
3500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

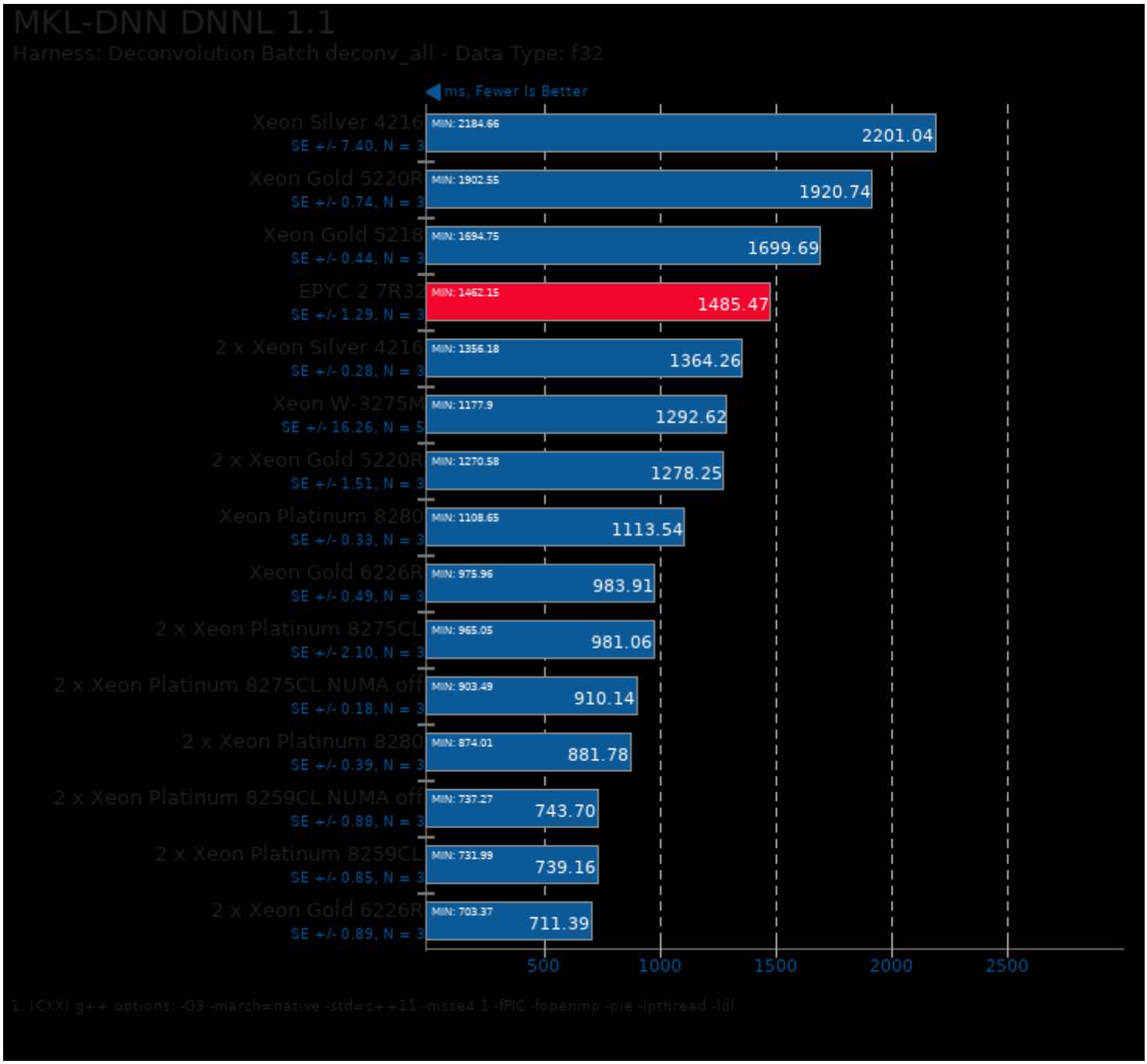

MKL-DNN DNNL 1.1
Harness: Convolution Batch conv_3d - Data Type: u8s8f32
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 13.03, N = 3
MIN: 12254
12300.30
Xeon Gold 5218
SE +/- 2.59, N = 3
MIN: 11811.3
11821.30
Xeon Gold 5220R
SE +/- 11.33, N = 3
MIN: 9656.48
9696.92
Xeon Gold 6226R
SE +/- 9.11, N = 3
MIN: 9350.22
9374.60
2 x Xeon Silver 4216
SE +/- 109.20, N = 3
MIN: 6190.58
6329.94
Xeon W-3275M
SE +/- 41.02, N = 3
MIN: 5934.01
6183.11
Xeon Platinum 8280
SE +/- 11.11, N = 3
MIN: 5895.99
5919.94
2 x Xeon Gold 5220R
SE +/- 3.52, N = 3
MIN: 4854.07
4896.41
2 x Xeon Gold 6226R
SE +/- 10.40, N = 3
MIN: 4760.44
4821.24
2 x Xeon Platinum 8259CL
SE +/- 7.22, N = 3
MIN: 3527.13
3551.38
2 x Xeon Platinum 8259CL NUMA off
SE +/- 11.90, N = 3
MIN: 3529.41
3548.60
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.59, N = 3
MIN: 3175.14
3252.48
2 x Xeon Platinum 8275CL
SE +/- 4.78, N = 3
MIN: 3176.52
3250.89
EPYC 2 7R32
SE +/- 25.92, N = 3
MIN: 3011.81
3076.76
2 x Xeon Platinum 8280
SE +/- 7.97, N = 3
MIN: 2934.55
3005.48
3K
6K
9K
12K
15K
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

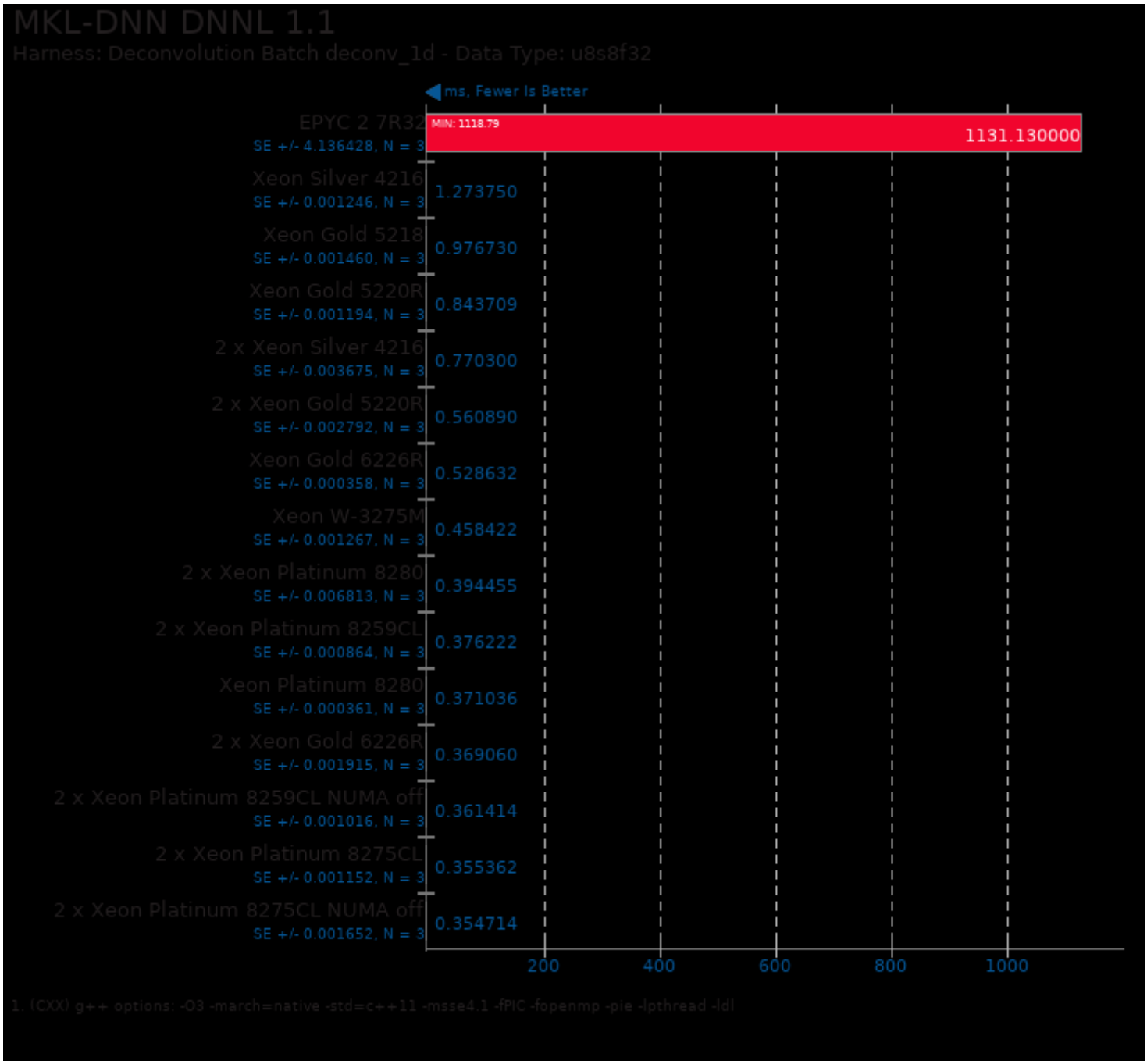

MKL-DNN DNNL 1.1
Harness: Deconvolution Batch deconv_1d - Data Type: f32
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 0.01140, N = 3
MIN: 5.16
5.31087
Xeon Gold 5218
SE +/- 0.00570, N = 3
MIN: 3.95
3.99488
Xeon Gold 5220R
SE +/- 0.00527, N = 3
MIN: 3.3
3.36432
2 x Xeon Silver 4216
SE +/- 0.00576, N = 3
MIN: 2.99
3.06590
Xeon Gold 6226R
SE +/- 0.00272, N = 3
MIN: 2.17
2.23126
EPYC 2 7R32
SE +/- 0.01972, N = 3
MIN: 2.11
2.22540
2 x Xeon Gold 5220R
SE +/- 0.00174, N = 3
MIN: 2.06
2.12680
Xeon W-3275M
SE +/- 0.01273, N = 3
MIN: 1.55
1.74515
2 x Xeon Gold 6226R
SE +/- 0.00475, N = 3
MIN: 1.43
1.49724
Xeon Platinum 8280
SE +/- 0.00157, N = 3
MIN: 1.44
1.46232
2 x Xeon Platinum 8275CL
SE +/- 0.00979, N = 3
MIN: 1.26
1.33109
2 x Xeon Platinum 8259CL
SE +/- 0.00693, N = 3
MIN: 1.2
1.25795
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.00024, N = 3
MIN: 1.19
1.25116
2 x Xeon Platinum 8280
SE +/- 0.00318, N = 3
MIN: 1.17
1.24029
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.00066, N = 3
MIN: 1.18
1.22589
1.1949
2.3898
3.5847
4.7796
5.9745
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

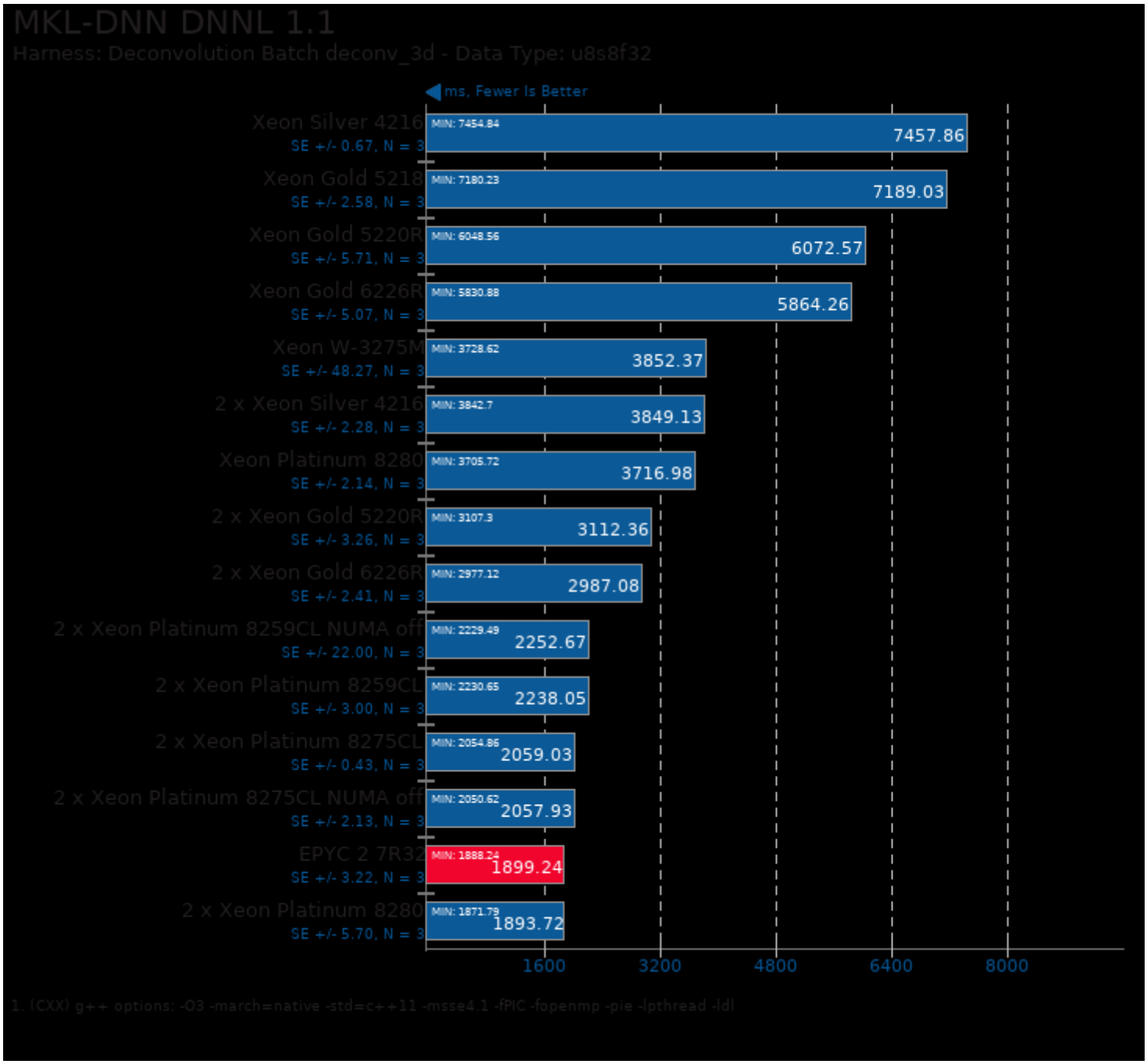

MKL-DNN DNNL 1.1
Harness: Deconvolution Batch deconv_3d - Data Type: f32
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 0.01443, N = 3
MIN: 7.57
7.63646
Xeon Gold 5218
SE +/- 0.01731, N = 3
MIN: 5.77
5.80420
Xeon Gold 5220R
SE +/- 0.01927, N = 3
MIN: 4.84
4.88966
2 x Xeon Silver 4216
SE +/- 0.00590, N = 3
MIN: 3.82
3.85512
Xeon Gold 6226R
SE +/- 0.00634, N = 3
MIN: 3.1
3.13006
2 x Xeon Gold 5220R
SE +/- 0.00092, N = 3
MIN: 2.66
2.69700
Xeon W-3275M
SE +/- 0.01801, N = 3
MIN: 2.12
2.27526
EPYC 2 7R32
SE +/- 0.00603, N = 3
MIN: 2.14
2.20471
Xeon Platinum 8280
SE +/- 0.00032, N = 3
MIN: 1.95
1.96279
2 x Xeon Gold 6226R
SE +/- 0.00200, N = 3
MIN: 1.67
1.70749
2 x Xeon Platinum 8259CL
SE +/- 0.00118, N = 3
1.26649
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.00388, N = 3
1.26395
2 x Xeon Platinum 8275CL
SE +/- 0.00161, N = 3
1.17885
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.00132, N = 3
1.17278
2 x Xeon Platinum 8280
SE +/- 0.00373, N = 3
1.13608
2
4
6
8
10
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

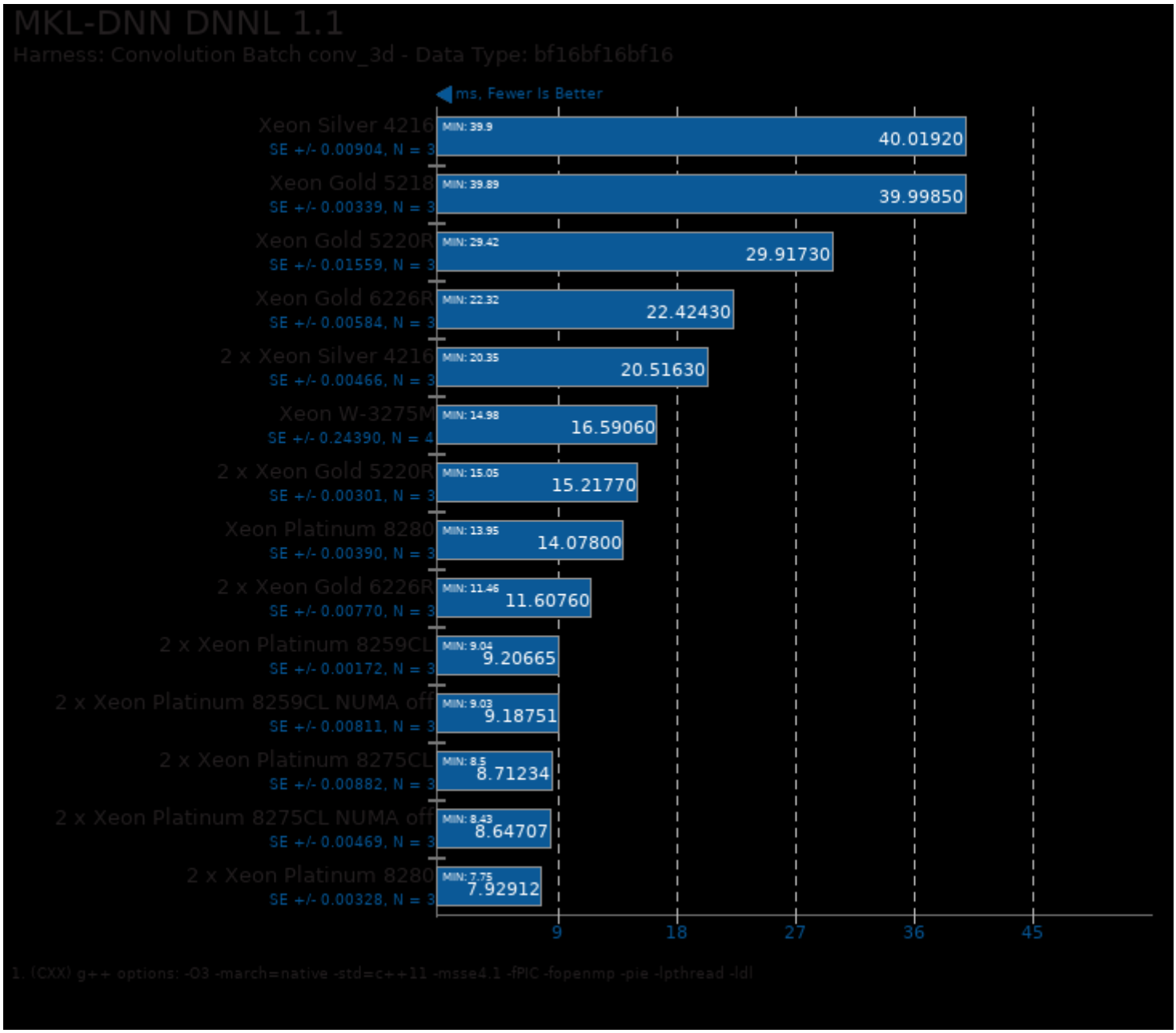

MKL-DNN DNNL 1.1
Harness: Convolution Batch conv_alexnet - Data Type: f32
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 0.95, N = 3
MIN: 390.56
395.44
Xeon Gold 5218
SE +/- 0.11, N = 3
MIN: 297.84
298.30
Xeon Gold 5220R
SE +/- 0.16, N = 3
MIN: 242.31
244.75
2 x Xeon Silver 4216
SE +/- 0.04, N = 3
MIN: 195.97
197.91
Xeon Gold 6226R
SE +/- 0.05, N = 3
MIN: 154.79
155.37
2 x Xeon Gold 5220R
SE +/- 0.04, N = 3
MIN: 121.68
122.76
Xeon W-3275M
SE +/- 0.11, N = 3
MIN: 102.46
108.57
EPYC 2 7R32
SE +/- 1.13, N = 3
MIN: 93.63
96.69
Xeon Platinum 8280
SE +/- 0.06, N = 3
MIN: 93.73
94.19
2 x Xeon Gold 6226R
SE +/- 0.03, N = 3
MIN: 79.72
81.14
2 x Xeon Platinum 8275CL
SE +/- 0.88, N = 3
MIN: 74.84
79.11
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.79, N = 3
MIN: 55.59
57.51
2 x Xeon Platinum 8259CL
SE +/- 0.23, N = 3
MIN: 54.78
56.65
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.20, N = 3
MIN: 54.28
55.36
2 x Xeon Platinum 8280
SE +/- 0.08, N = 3
MIN: 48.76
49.84
90
180
270
360
450
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

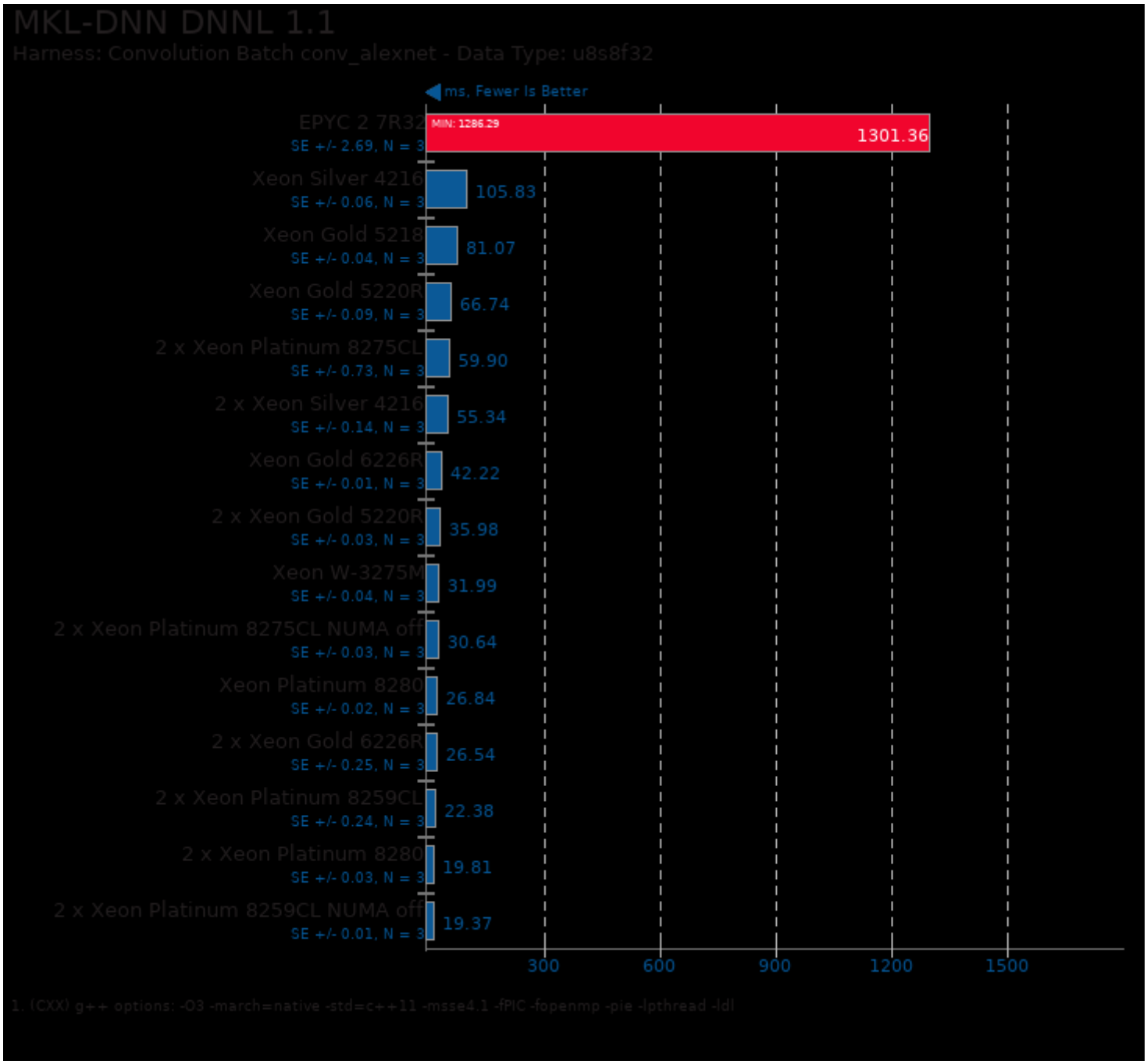

MKL-DNN DNNL 1.1
Harness: Convolution Batch conv_all - Data Type: u8s8f32
ms, Fewer Is Better
EPYC 2 7R32
SE +/- 19.01, N = 3
MIN: 11565.1
11728.80
Xeon Silver 4216
SE +/- 4.87, N = 3
MIN: 6214.68
6241.16
Xeon Gold 5218
SE +/- 1.57, N = 3
MIN: 5831.48
5840.26
Xeon Gold 5220R
SE +/- 4.48, N = 3
MIN: 4806.63
4826.71
Xeon Gold 6226R
SE +/- 7.74, N = 3
MIN: 4461.44
4478.93
2 x Xeon Silver 4216
SE +/- 23.72, N = 3
MIN: 3181.24
3215.17
Xeon W-3275M
SE +/- 15.10, N = 3
MIN: 2893.12
2967.92
Xeon Platinum 8280
SE +/- 1.24, N = 3
MIN: 2813.78
2846.12
2 x Xeon Gold 5220R
SE +/- 2.07, N = 3
MIN: 2469.15
2479.28
2 x Xeon Gold 6226R
SE +/- 10.67, N = 3
MIN: 2360.75
2377.91
2 x Xeon Platinum 8275CL
SE +/- 3.97, N = 3
MIN: 1996.59
2023.47
2 x Xeon Platinum 8259CL
SE +/- 1.51, N = 3
1793.75
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.82, N = 3
1734.20
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.40, N = 3
1708.05
2 x Xeon Platinum 8280
SE +/- 3.12, N = 3
1517.44
3K
6K
9K
12K
15K
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

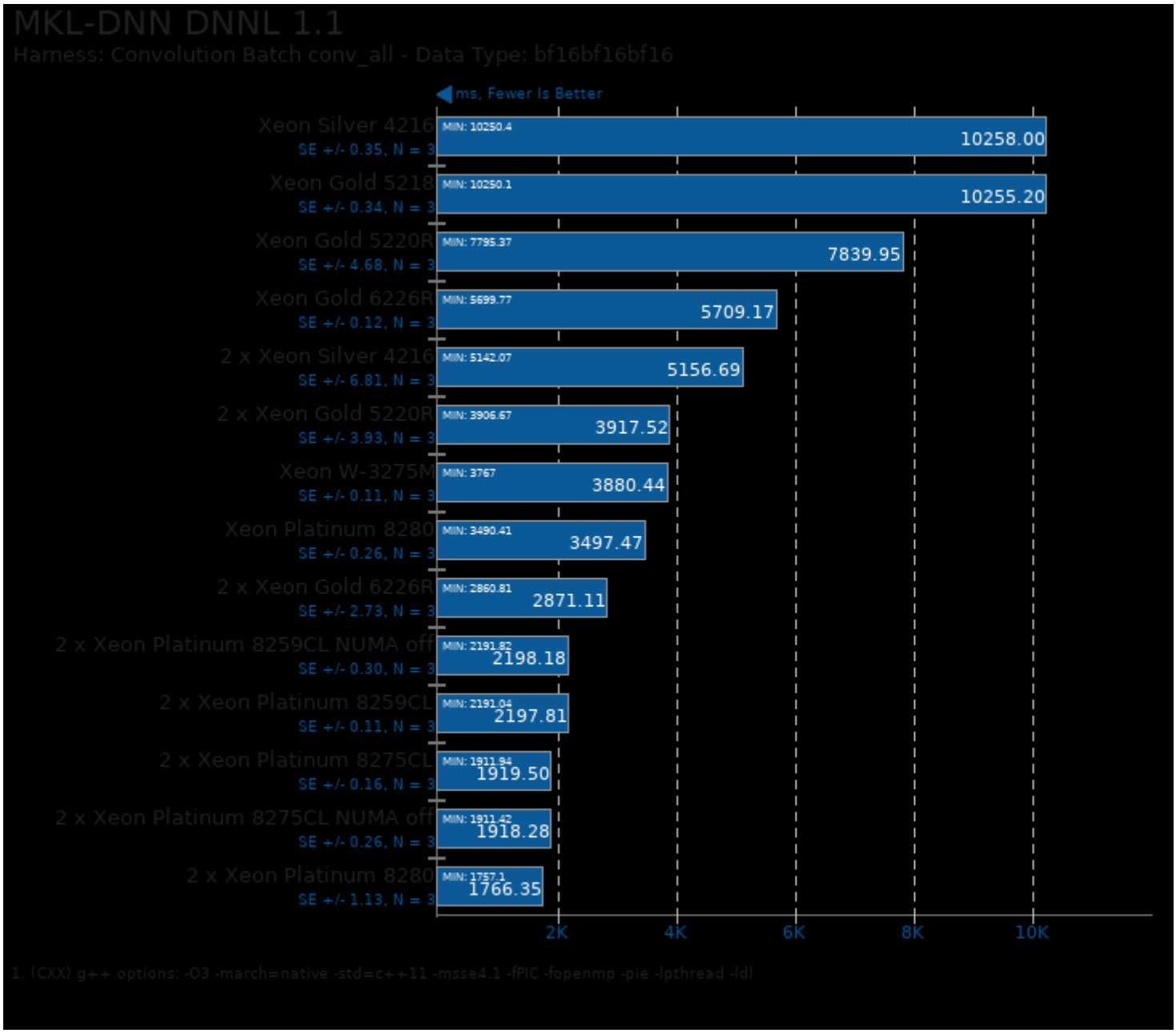

MKL-DNN DNNL 1.1
Harness: Deconvolution Batch deconv_all - Data Type: f32
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 7.40, N = 3
MIN: 2184.66
2201.04
Xeon Gold 5220R
SE +/- 0.74, N = 3
MIN: 1902.55
1920.74
Xeon Gold 5218
SE +/- 0.44, N = 3
MIN: 1694.75
1699.69
EPYC 2 7R32
SE +/- 1.29, N = 3
MIN: 1462.15
1485.47
2 x Xeon Silver 4216
SE +/- 0.28, N = 3
MIN: 1356.18
1364.26
Xeon W-3275M
SE +/- 16.26, N = 5
MIN: 1177.9
1292.62
2 x Xeon Gold 5220R
SE +/- 1.51, N = 3
MIN: 1270.58
1278.25
Xeon Platinum 8280
SE +/- 0.33, N = 3
MIN: 1108.65
1113.54
Xeon Gold 6226R
SE +/- 0.49, N = 3
MIN: 975.96
983.91
2 x Xeon Platinum 8275CL
SE +/- 2.10, N = 3
MIN: 965.05
981.06
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.18, N = 3
MIN: 903.49
910.14
2 x Xeon Platinum 8280
SE +/- 0.39, N = 3
MIN: 874.01
881.78
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.88, N = 3
MIN: 737.27
743.70
2 x Xeon Platinum 8259CL
SE +/- 0.85, N = 3
MIN: 731.99
739.16
2 x Xeon Gold 6226R
SE +/- 0.89, N = 3
MIN: 703.37
711.39
500
1000
1500
2000
2500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

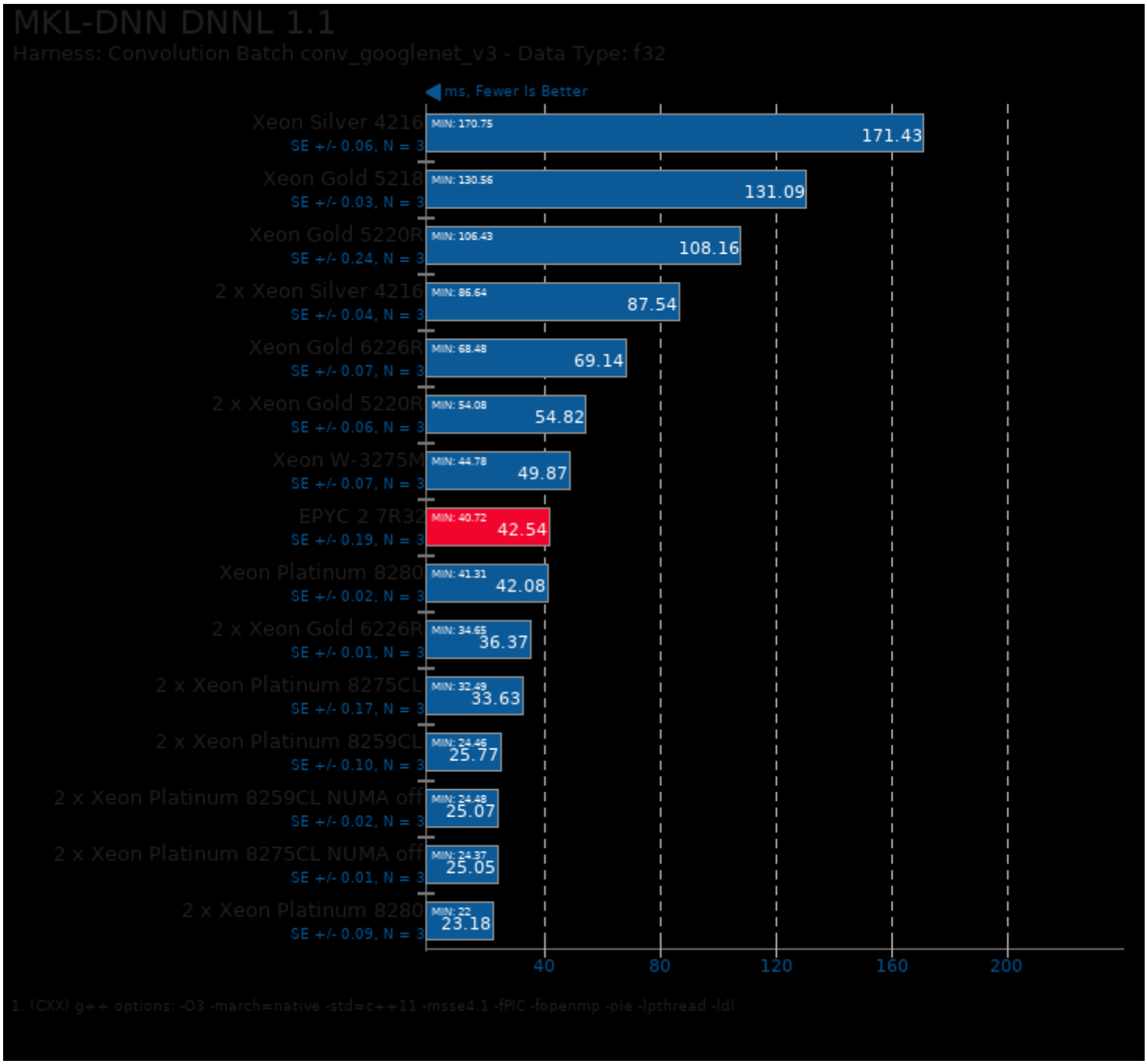

MKL-DNN DNNL 1.1
Harness: Deconvolution Batch deconv_1d - Data Type: u8s8f32
ms, Fewer Is Better
EPYC 2 7R32
SE +/- 4.136428, N = 3
MIN: 1118.79
1131.130000
Xeon Silver 4216
SE +/- 0.001246, N = 3
1.273750
Xeon Gold 5218
SE +/- 0.001460, N = 3
0.976730
Xeon Gold 5220R
SE +/- 0.001194, N = 3
0.843709
2 x Xeon Silver 4216
SE +/- 0.003675, N = 3
0.770300
2 x Xeon Gold 5220R
SE +/- 0.002792, N = 3
0.560890
Xeon Gold 6226R
SE +/- 0.000358, N = 3
0.528632
Xeon W-3275M
SE +/- 0.001267, N = 3
0.458422
2 x Xeon Platinum 8280
SE +/- 0.006813, N = 3
0.394455
2 x Xeon Platinum 8259CL
SE +/- 0.000864, N = 3
0.376222
Xeon Platinum 8280
SE +/- 0.000361, N = 3
0.371036
2 x Xeon Gold 6226R
SE +/- 0.001915, N = 3
0.369060
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.001016, N = 3
0.361414
2 x Xeon Platinum 8275CL
SE +/- 0.001152, N = 3
0.355362
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.001652, N = 3
0.354714
200
400
600
800
1000
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

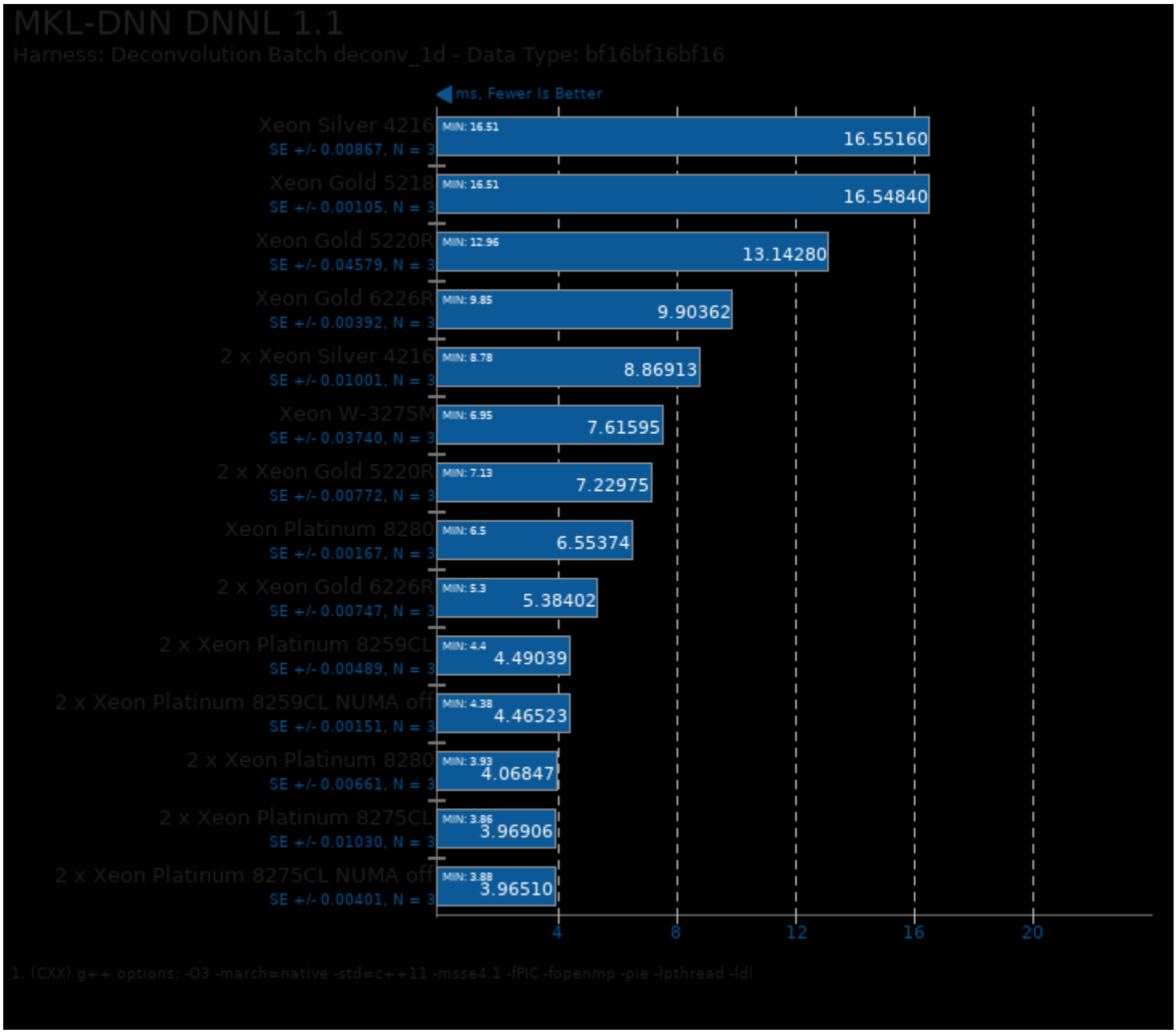

MKL-DNN DNNL 1.1
Harness: Deconvolution Batch deconv_3d - Data Type: u8s8f32
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 0.67, N = 3
MIN: 7454.84
7457.86
Xeon Gold 5218
SE +/- 2.58, N = 3
MIN: 7180.23
7189.03
Xeon Gold 5220R
SE +/- 5.71, N = 3
MIN: 6048.56
6072.57
Xeon Gold 6226R
SE +/- 5.07, N = 3
MIN: 5830.88
5864.26
Xeon W-3275M
SE +/- 48.27, N = 3
MIN: 3728.62
3852.37
2 x Xeon Silver 4216
SE +/- 2.28, N = 3
MIN: 3842.7
3849.13
Xeon Platinum 8280
SE +/- 2.14, N = 3
MIN: 3705.72
3716.98
2 x Xeon Gold 5220R
SE +/- 3.26, N = 3
MIN: 3107.3
3112.36
2 x Xeon Gold 6226R
SE +/- 2.41, N = 3
MIN: 2977.12
2987.08
2 x Xeon Platinum 8259CL NUMA off
SE +/- 22.00, N = 3
MIN: 2229.49
2252.67
2 x Xeon Platinum 8259CL
SE +/- 3.00, N = 3
MIN: 2230.65
2238.05
2 x Xeon Platinum 8275CL
SE +/- 0.43, N = 3
MIN: 2054.86
2059.03
2 x Xeon Platinum 8275CL NUMA off
SE +/- 2.13, N = 3
MIN: 2050.62
2057.93
EPYC 2 7R32
SE +/- 3.22, N = 3
MIN: 1888.24
1899.24
2 x Xeon Platinum 8280
SE +/- 5.70, N = 3
MIN: 1871.79
1893.72
1600
3200
4800
6400
8000
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

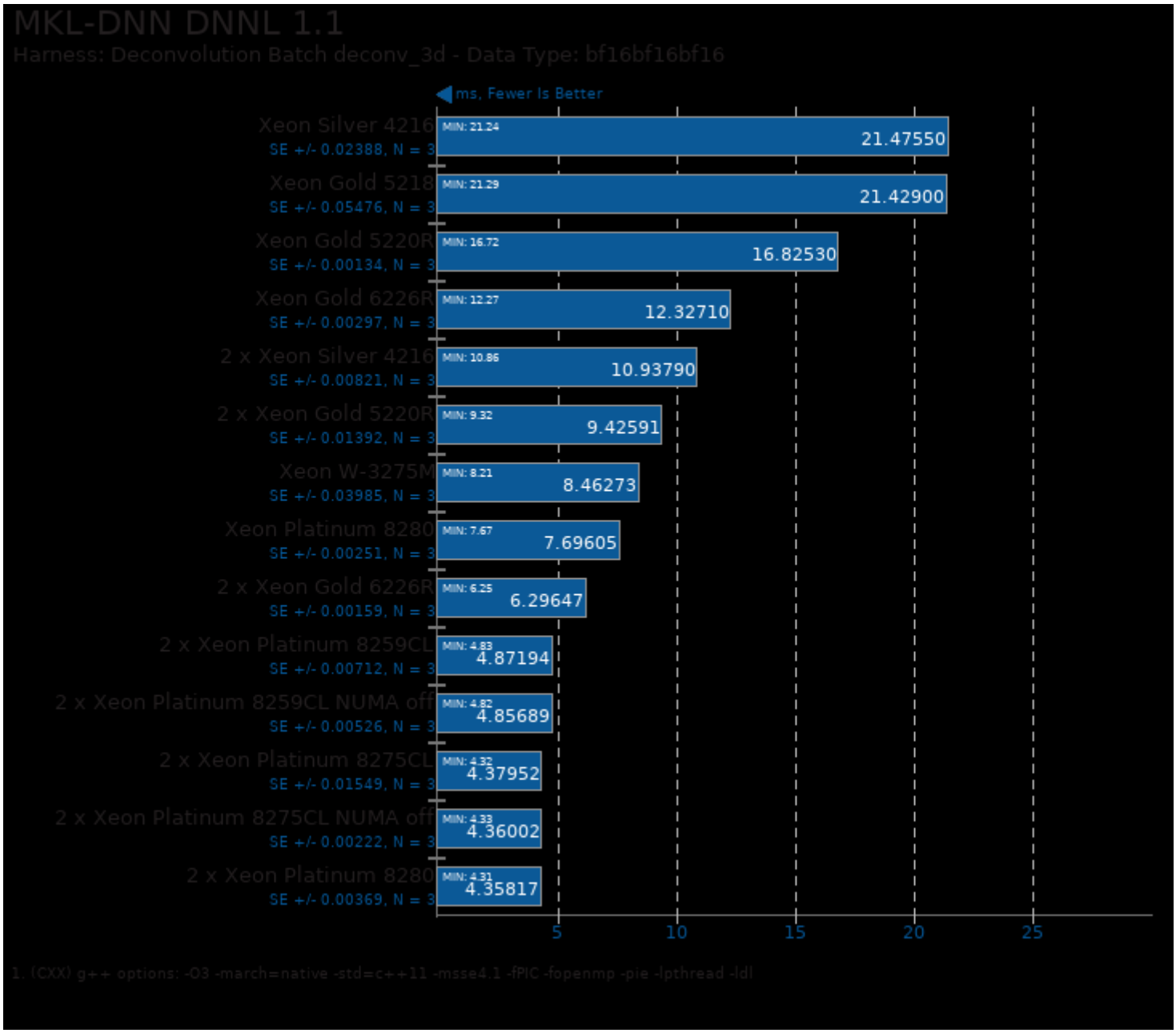

MKL-DNN DNNL 1.1
Harness: Convolution Batch conv_3d - Data Type: bf16bf16bf16
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 0.00904, N = 3
MIN: 39.9
40.01920
Xeon Gold 5218
SE +/- 0.00339, N = 3
MIN: 39.89
39.99850
Xeon Gold 5220R
SE +/- 0.01559, N = 3
MIN: 29.42
29.91730
Xeon Gold 6226R
SE +/- 0.00584, N = 3
MIN: 22.32
22.42430
2 x Xeon Silver 4216
SE +/- 0.00466, N = 3
MIN: 20.35
20.51630
Xeon W-3275M
SE +/- 0.24390, N = 4
MIN: 14.98
16.59060
2 x Xeon Gold 5220R
SE +/- 0.00301, N = 3
MIN: 15.05
15.21770
Xeon Platinum 8280
SE +/- 0.00390, N = 3
MIN: 13.95
14.07800
2 x Xeon Gold 6226R
SE +/- 0.00770, N = 3
MIN: 11.46
11.60760
2 x Xeon Platinum 8259CL
SE +/- 0.00172, N = 3
MIN: 9.04
9.20665
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.00811, N = 3
MIN: 9.03
9.18751
2 x Xeon Platinum 8275CL
SE +/- 0.00882, N = 3
MIN: 8.5
8.71234
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.00469, N = 3
MIN: 8.43
8.64707
2 x Xeon Platinum 8280
SE +/- 0.00328, N = 3
MIN: 7.75
7.92912
9
18
27
36
45
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

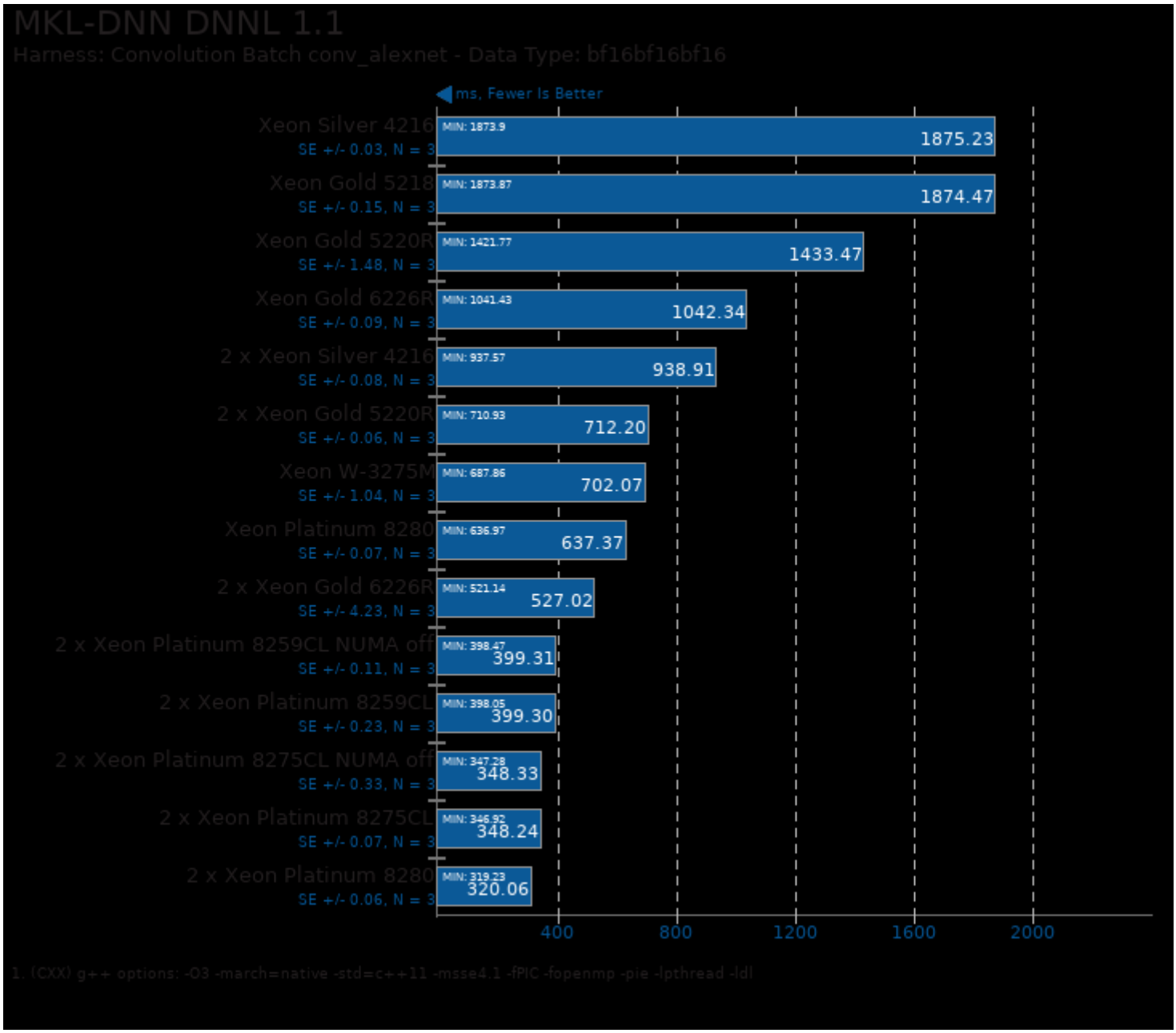

MKL-DNN DNNL 1.1
Harness: Convolution Batch conv_alexnet - Data Type: u8s8f32
ms, Fewer Is Better
EPYC 2 7R32
SE +/- 2.69, N = 3
MIN: 1286.29
1301.36
Xeon Silver 4216
SE +/- 0.06, N = 3
105.83
Xeon Gold 5218
SE +/- 0.04, N = 3
81.07
Xeon Gold 5220R
SE +/- 0.09, N = 3
66.74
2 x Xeon Platinum 8275CL
SE +/- 0.73, N = 3
59.90
2 x Xeon Silver 4216
SE +/- 0.14, N = 3
55.34
Xeon Gold 6226R
SE +/- 0.01, N = 3
42.22
2 x Xeon Gold 5220R
SE +/- 0.03, N = 3
35.98
Xeon W-3275M
SE +/- 0.04, N = 3
31.99
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.03, N = 3
30.64
Xeon Platinum 8280
SE +/- 0.02, N = 3
26.84
2 x Xeon Gold 6226R
SE +/- 0.25, N = 3
26.54
2 x Xeon Platinum 8259CL
SE +/- 0.24, N = 3
22.38
2 x Xeon Platinum 8280
SE +/- 0.03, N = 3
19.81
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.01, N = 3
19.37
300
600
900
1200
1500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

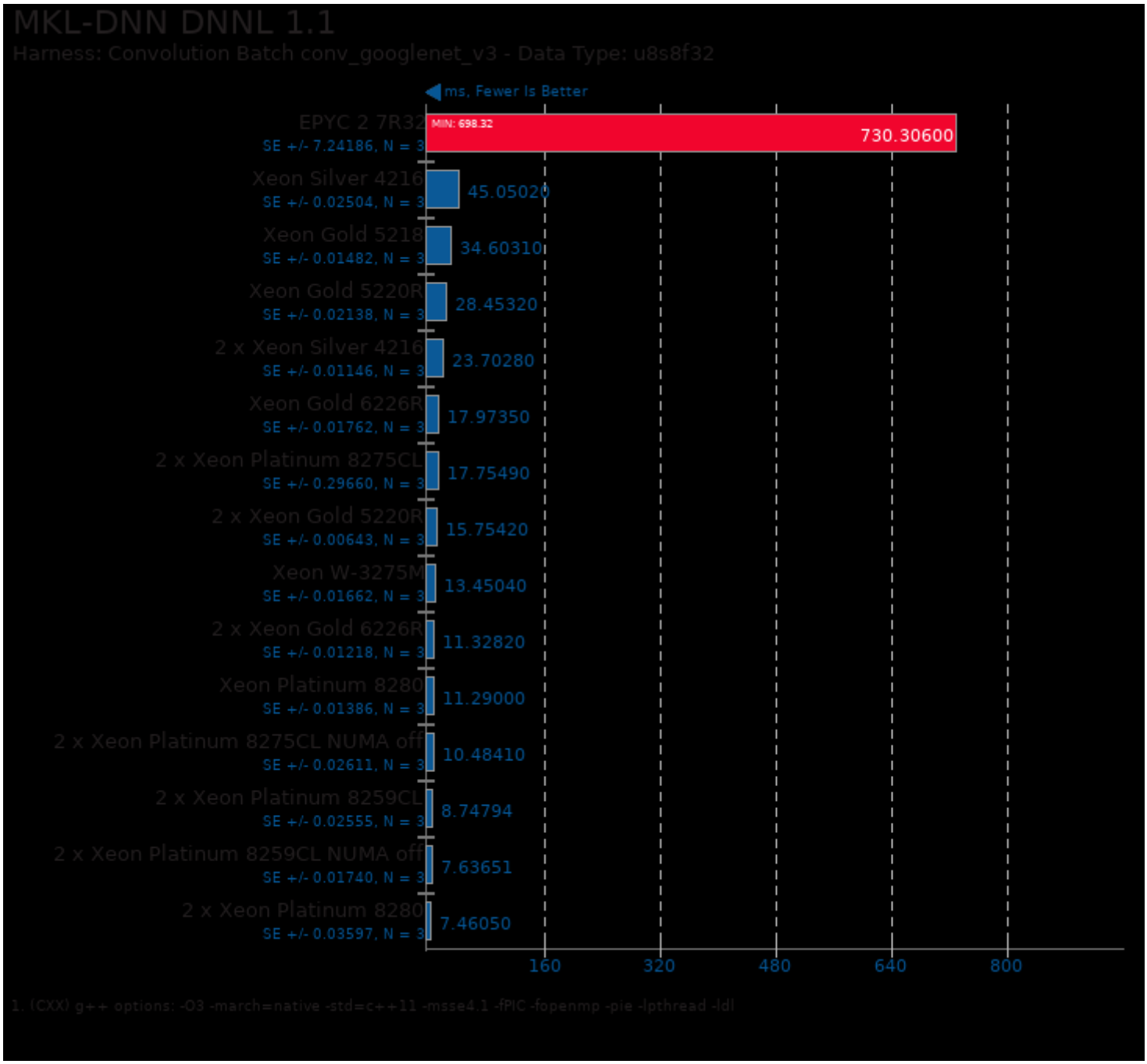

MKL-DNN DNNL 1.1
Harness: Convolution Batch conv_all - Data Type: bf16bf16bf16
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 0.35, N = 3
MIN: 10250.4
10258.00
Xeon Gold 5218
SE +/- 0.34, N = 3
MIN: 10250.1
10255.20
Xeon Gold 5220R
SE +/- 4.68, N = 3
MIN: 7795.37
7839.95
Xeon Gold 6226R
SE +/- 0.12, N = 3
MIN: 5699.77
5709.17
2 x Xeon Silver 4216
SE +/- 6.81, N = 3
MIN: 5142.07
5156.69
2 x Xeon Gold 5220R
SE +/- 3.93, N = 3
MIN: 3906.67
3917.52
Xeon W-3275M
SE +/- 0.11, N = 3
MIN: 3767
3880.44
Xeon Platinum 8280
SE +/- 0.26, N = 3
MIN: 3490.41
3497.47
2 x Xeon Gold 6226R
SE +/- 2.73, N = 3
MIN: 2860.81
2871.11
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.30, N = 3
MIN: 2191.82
2198.18
2 x Xeon Platinum 8259CL
SE +/- 0.11, N = 3
MIN: 2191.04
2197.81
2 x Xeon Platinum 8275CL
SE +/- 0.16, N = 3
MIN: 1911.94
1919.50
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.26, N = 3
MIN: 1911.42
1918.28
2 x Xeon Platinum 8280
SE +/- 1.13, N = 3
MIN: 1757.1
1766.35
2K
4K
6K
8K
10K
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

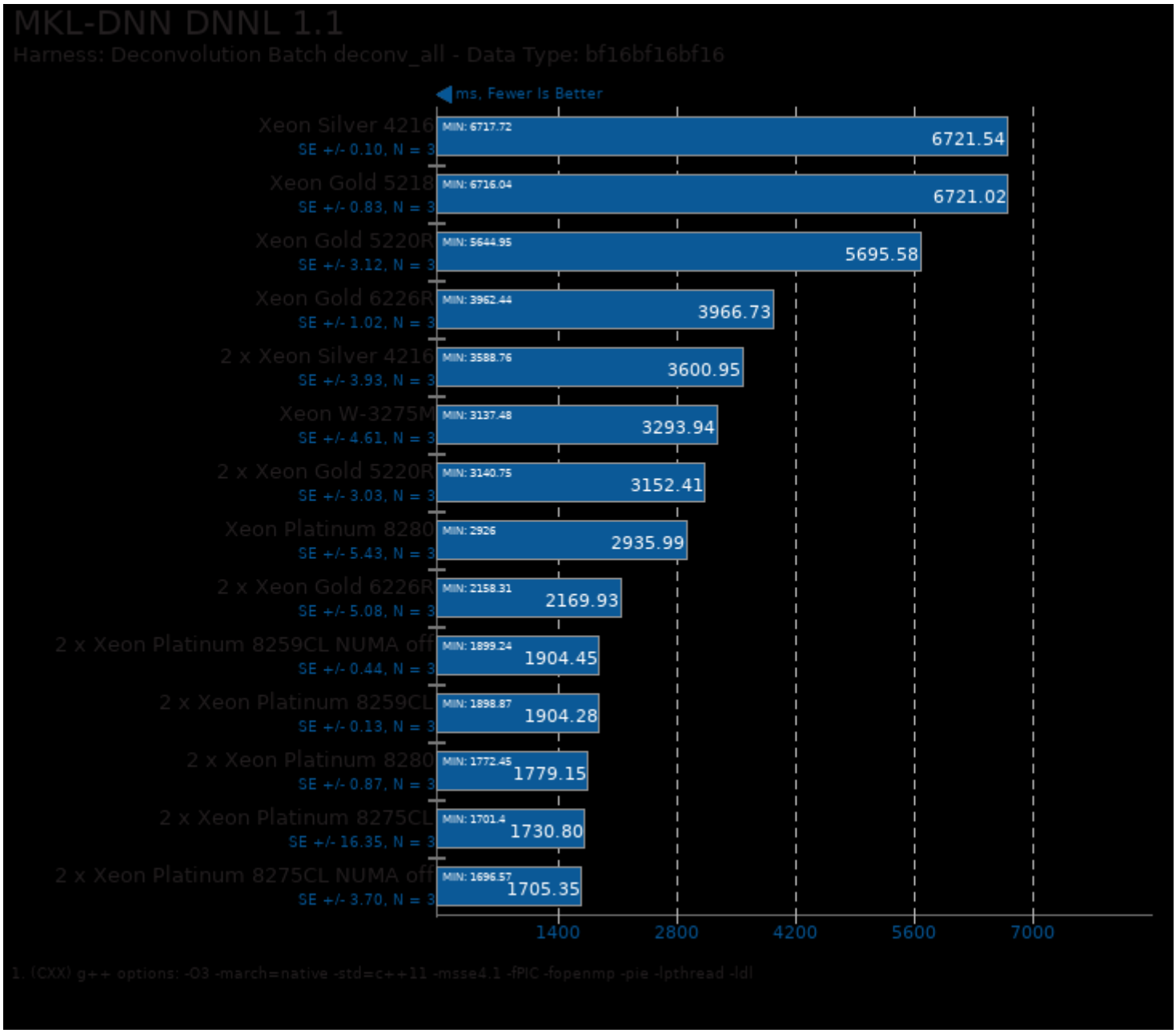

MKL-DNN DNNL 1.1
Harness: Convolution Batch conv_googlenet_v3 - Data Type: f32
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 0.06, N = 3
MIN: 170.75
171.43
Xeon Gold 5218
SE +/- 0.03, N = 3
MIN: 130.56
131.09
Xeon Gold 5220R
SE +/- 0.24, N = 3
MIN: 106.43
108.16
2 x Xeon Silver 4216
SE +/- 0.04, N = 3
MIN: 86.64
87.54
Xeon Gold 6226R
SE +/- 0.07, N = 3
MIN: 68.48
69.14
2 x Xeon Gold 5220R
SE +/- 0.06, N = 3
MIN: 54.08
54.82
Xeon W-3275M
SE +/- 0.07, N = 3
MIN: 44.78
49.87
EPYC 2 7R32
SE +/- 0.19, N = 3
MIN: 40.72
42.54
Xeon Platinum 8280
SE +/- 0.02, N = 3
MIN: 41.31
42.08
2 x Xeon Gold 6226R
SE +/- 0.01, N = 3
MIN: 34.65
36.37
2 x Xeon Platinum 8275CL
SE +/- 0.17, N = 3
MIN: 32.49
33.63
2 x Xeon Platinum 8259CL
SE +/- 0.10, N = 3
MIN: 24.46
25.77
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.02, N = 3
MIN: 24.48
25.07
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.01, N = 3
MIN: 24.37
25.05
2 x Xeon Platinum 8280
SE +/- 0.09, N = 3
MIN: 22
23.18
40
80
120
160
200
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

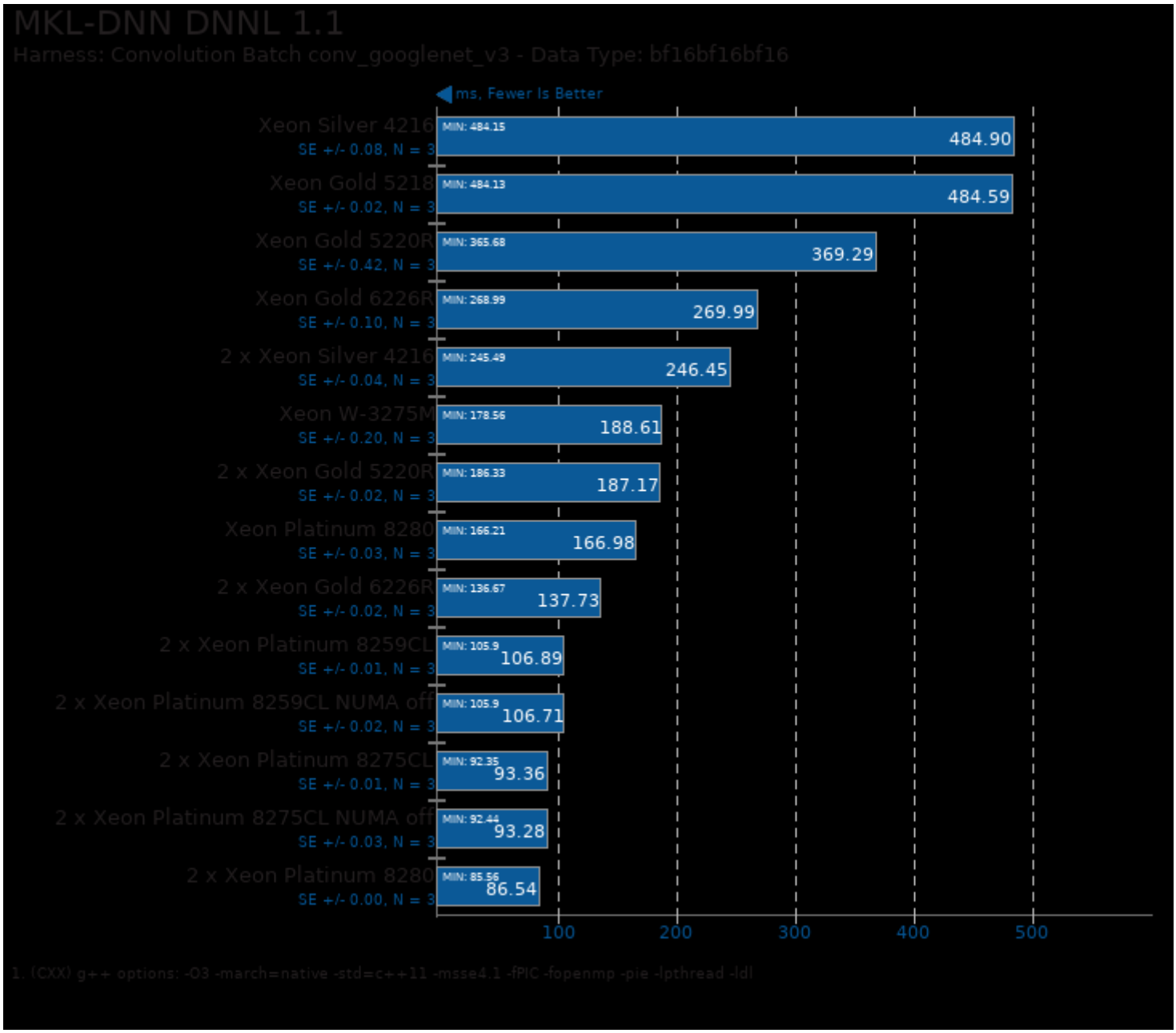

MKL-DNN DNNL 1.1
Harness: Deconvolution Batch deconv_1d - Data Type: bf16bf16bf16
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 0.00867, N = 3
MIN: 16.51
16.55160
Xeon Gold 5218
SE +/- 0.00105, N = 3
MIN: 16.51
16.54840
Xeon Gold 5220R
SE +/- 0.04579, N = 3
MIN: 12.96
13.14280
Xeon Gold 6226R
SE +/- 0.00392, N = 3
MIN: 9.85
9.90362
2 x Xeon Silver 4216
SE +/- 0.01001, N = 3
MIN: 8.78
8.86913
Xeon W-3275M
SE +/- 0.03740, N = 3
MIN: 6.95
7.61595
2 x Xeon Gold 5220R
SE +/- 0.00772, N = 3
MIN: 7.13
7.22975
Xeon Platinum 8280
SE +/- 0.00167, N = 3
MIN: 6.5
6.55374
2 x Xeon Gold 6226R
SE +/- 0.00747, N = 3
MIN: 5.3
5.38402
2 x Xeon Platinum 8259CL
SE +/- 0.00489, N = 3
MIN: 4.4
4.49039
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.00151, N = 3
MIN: 4.38
4.46523
2 x Xeon Platinum 8280
SE +/- 0.00661, N = 3
MIN: 3.93
4.06847
2 x Xeon Platinum 8275CL
SE +/- 0.01030, N = 3
MIN: 3.86
3.96906
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.00401, N = 3
MIN: 3.88
3.96510
4
8
12
16
20
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

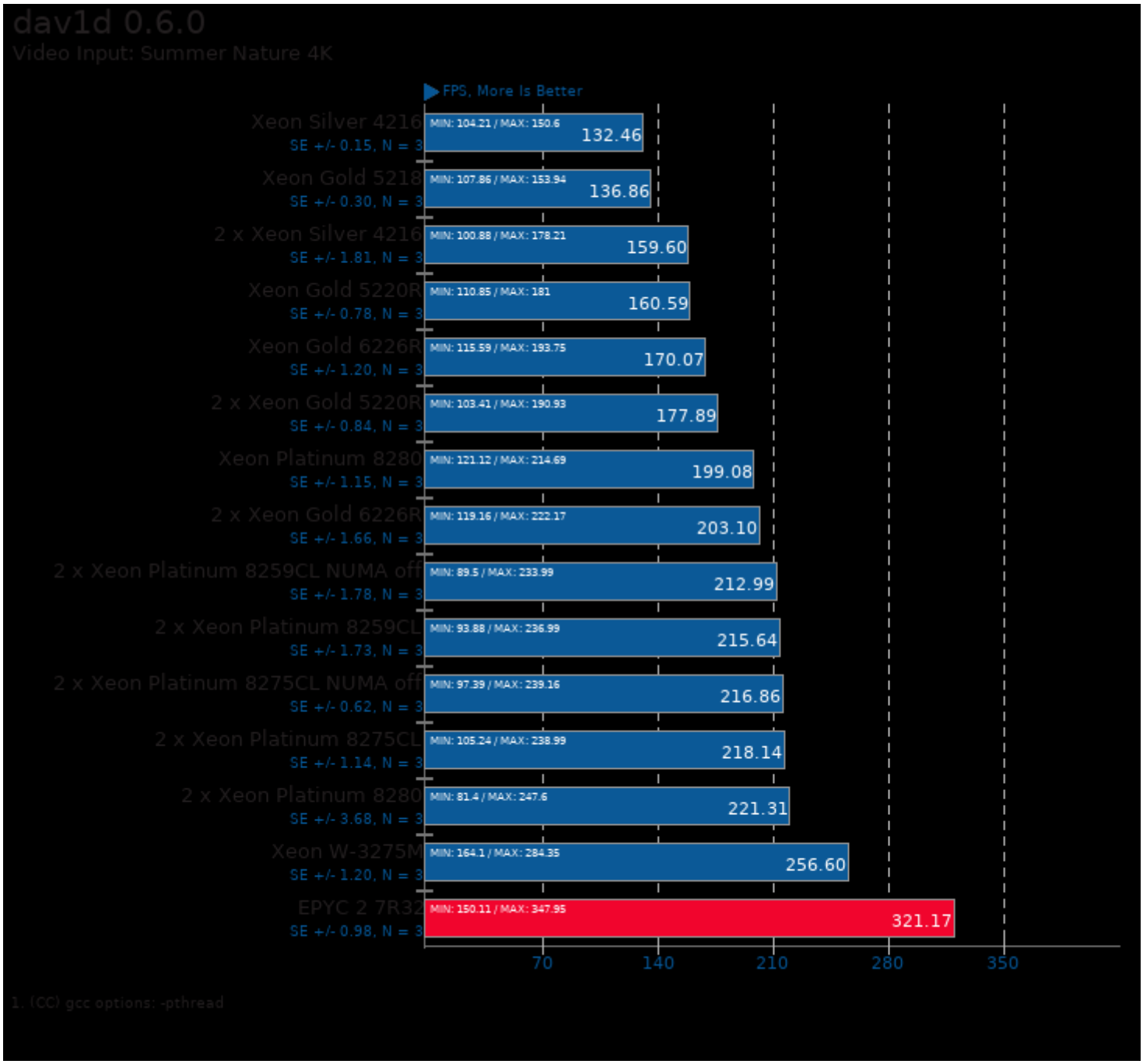

MKL-DNN DNNL 1.1
Harness: Deconvolution Batch deconv_3d - Data Type: bf16bf16bf16
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 0.02388, N = 3
MIN: 21.24
21.47550
Xeon Gold 5218
SE +/- 0.05476, N = 3
MIN: 21.29
21.42900
Xeon Gold 5220R
SE +/- 0.00134, N = 3
MIN: 16.72
16.82530
Xeon Gold 6226R
SE +/- 0.00297, N = 3
MIN: 12.27
12.32710
2 x Xeon Silver 4216
SE +/- 0.00821, N = 3
MIN: 10.86
10.93790
2 x Xeon Gold 5220R
SE +/- 0.01392, N = 3
MIN: 9.32
9.42591
Xeon W-3275M
SE +/- 0.03985, N = 3
MIN: 8.21
8.46273
Xeon Platinum 8280
SE +/- 0.00251, N = 3
MIN: 7.67
7.69605
2 x Xeon Gold 6226R
SE +/- 0.00159, N = 3
MIN: 6.25
6.29647
2 x Xeon Platinum 8259CL
SE +/- 0.00712, N = 3
MIN: 4.83
4.87194
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.00526, N = 3
MIN: 4.82
4.85689
2 x Xeon Platinum 8275CL
SE +/- 0.01549, N = 3
MIN: 4.32
4.37952
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.00222, N = 3
MIN: 4.33
4.36002
2 x Xeon Platinum 8280
SE +/- 0.00369, N = 3
MIN: 4.31
4.35817
5
10
15
20
25
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

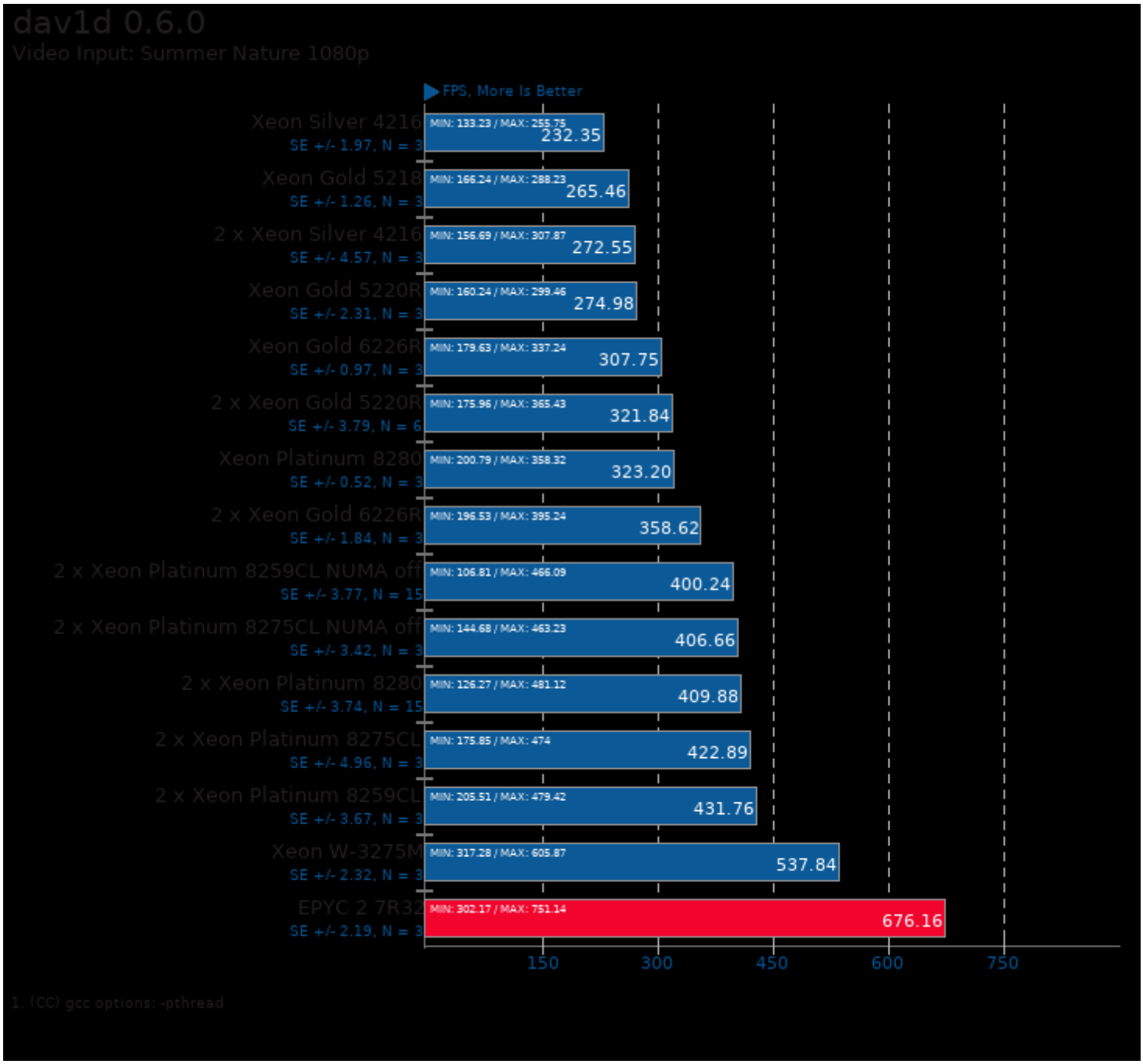

MKL-DNN DNNL 1.1
Harness: Convolution Batch conv_alexnet - Data Type: bf16bf16bf16
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 0.03, N = 3
MIN: 1873.9
1875.23
Xeon Gold 5218
SE +/- 0.15, N = 3
MIN: 1873.87
1874.47
Xeon Gold 5220R
SE +/- 1.48, N = 3
MIN: 1421.77
1433.47
Xeon Gold 6226R
SE +/- 0.09, N = 3
MIN: 1041.43
1042.34
2 x Xeon Silver 4216
SE +/- 0.08, N = 3
MIN: 937.57
938.91
2 x Xeon Gold 5220R
SE +/- 0.06, N = 3
MIN: 710.93
712.20
Xeon W-3275M
SE +/- 1.04, N = 3
MIN: 687.86
702.07
Xeon Platinum 8280
SE +/- 0.07, N = 3
MIN: 636.97
637.37
2 x Xeon Gold 6226R
SE +/- 4.23, N = 3
MIN: 521.14
527.02
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.11, N = 3
MIN: 398.47
399.31
2 x Xeon Platinum 8259CL
SE +/- 0.23, N = 3
MIN: 398.05
399.30
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.33, N = 3
MIN: 347.28
348.33
2 x Xeon Platinum 8275CL
SE +/- 0.07, N = 3
MIN: 346.92
348.24
2 x Xeon Platinum 8280
SE +/- 0.06, N = 3
MIN: 319.23
320.06
400
800
1200
1600
2000
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

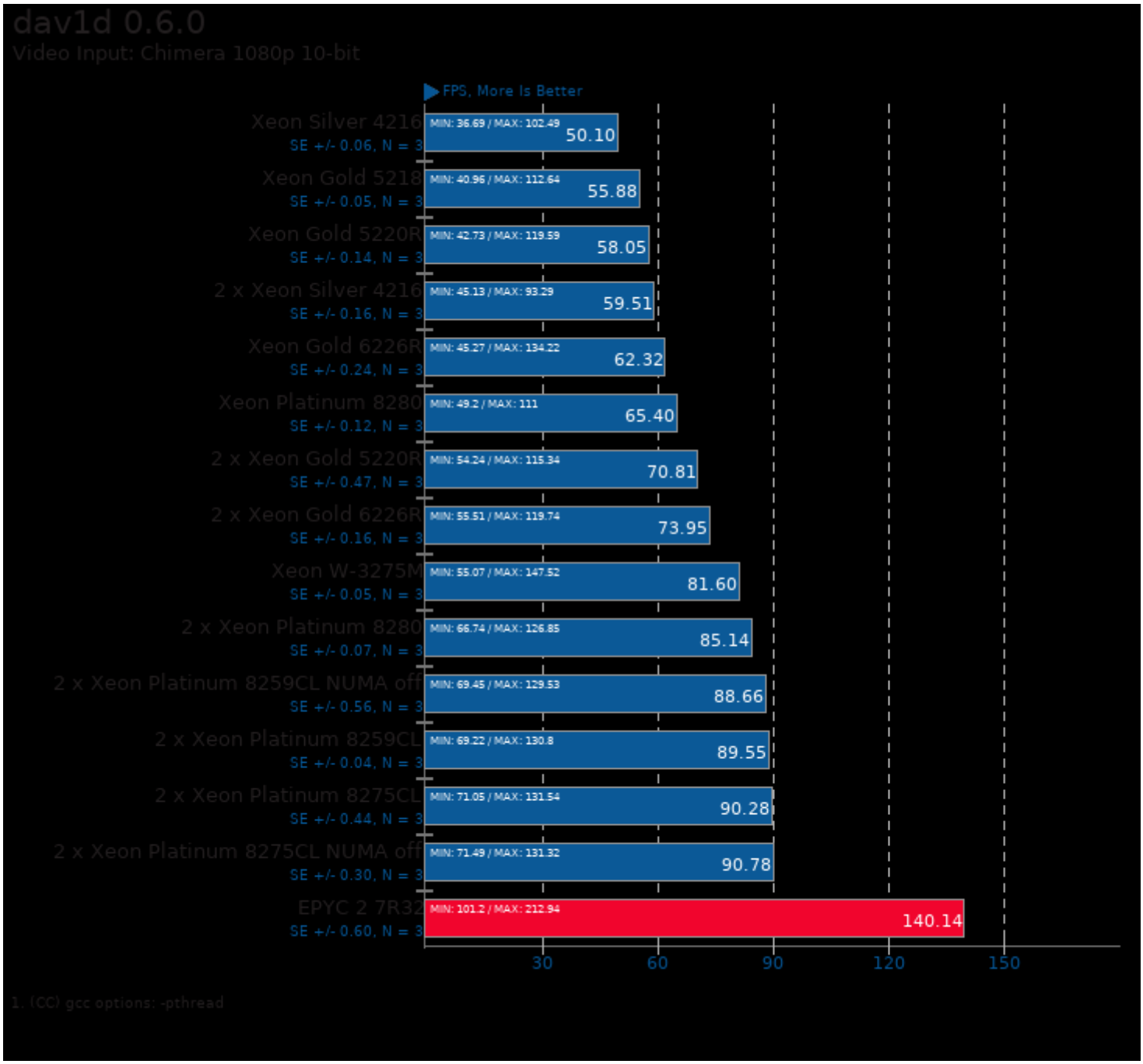

MKL-DNN DNNL 1.1
Harness: Convolution Batch conv_googlenet_v3 - Data Type: u8s8f32
ms, Fewer Is Better
EPYC 2 7R32
SE +/- 7.24186, N = 3
MIN: 698.32
730.30600
Xeon Silver 4216
SE +/- 0.02504, N = 3
45.05020
Xeon Gold 5218
SE +/- 0.01482, N = 3
34.60310
Xeon Gold 5220R
SE +/- 0.02138, N = 3
28.45320
2 x Xeon Silver 4216
SE +/- 0.01146, N = 3
23.70280
Xeon Gold 6226R
SE +/- 0.01762, N = 3
17.97350
2 x Xeon Platinum 8275CL
SE +/- 0.29660, N = 3
17.75490
2 x Xeon Gold 5220R
SE +/- 0.00643, N = 3
15.75420
Xeon W-3275M
SE +/- 0.01662, N = 3
13.45040
2 x Xeon Gold 6226R
SE +/- 0.01218, N = 3
11.32820
Xeon Platinum 8280
SE +/- 0.01386, N = 3
11.29000
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.02611, N = 3
10.48410
2 x Xeon Platinum 8259CL
SE +/- 0.02555, N = 3
8.74794
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.01740, N = 3
7.63651
2 x Xeon Platinum 8280
SE +/- 0.03597, N = 3
7.46050
160
320
480
640
800
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

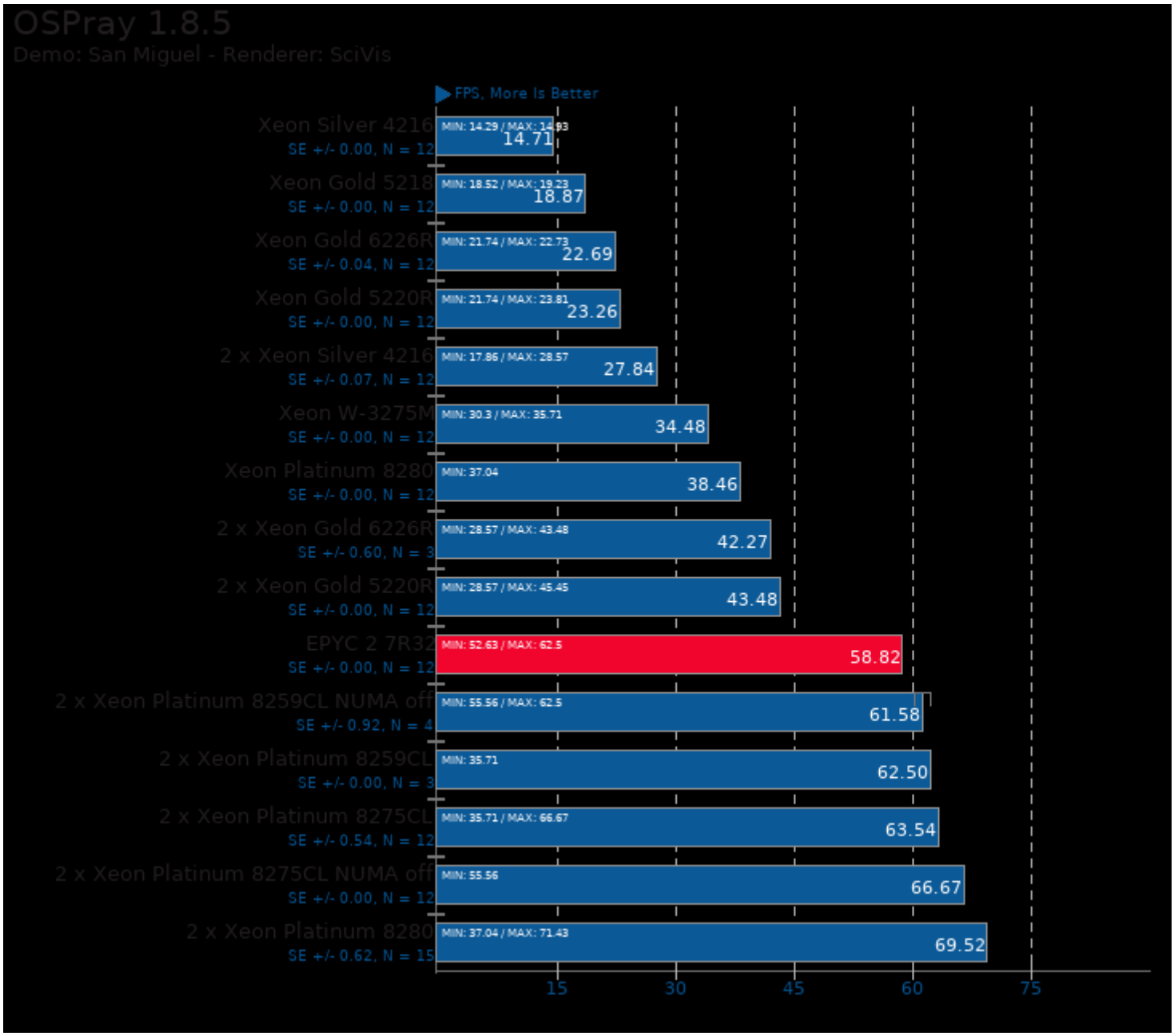

MKL-DNN DNNL 1.1
Harness: Deconvolution Batch deconv_all - Data Type: bf16bf16bf16
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 0.10, N = 3
MIN: 6717.72
6721.54
Xeon Gold 5218
SE +/- 0.83, N = 3
MIN: 6716.04
6721.02
Xeon Gold 5220R
SE +/- 3.12, N = 3
MIN: 5644.95
5695.58
Xeon Gold 6226R
SE +/- 1.02, N = 3
MIN: 3962.44
3966.73
2 x Xeon Silver 4216
SE +/- 3.93, N = 3
MIN: 3588.76
3600.95
Xeon W-3275M
SE +/- 4.61, N = 3
MIN: 3137.48
3293.94
2 x Xeon Gold 5220R
SE +/- 3.03, N = 3
MIN: 3140.75
3152.41
Xeon Platinum 8280
SE +/- 5.43, N = 3
MIN: 2926
2935.99
2 x Xeon Gold 6226R
SE +/- 5.08, N = 3
MIN: 2158.31
2169.93
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.44, N = 3
MIN: 1899.24
1904.45
2 x Xeon Platinum 8259CL
SE +/- 0.13, N = 3
MIN: 1898.87
1904.28
2 x Xeon Platinum 8280
SE +/- 0.87, N = 3
MIN: 1772.45
1779.15
2 x Xeon Platinum 8275CL
SE +/- 16.35, N = 3
MIN: 1701.4
1730.80
2 x Xeon Platinum 8275CL NUMA off
SE +/- 3.70, N = 3
MIN: 1696.57
1705.35
1400
2800
4200
5600
7000
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

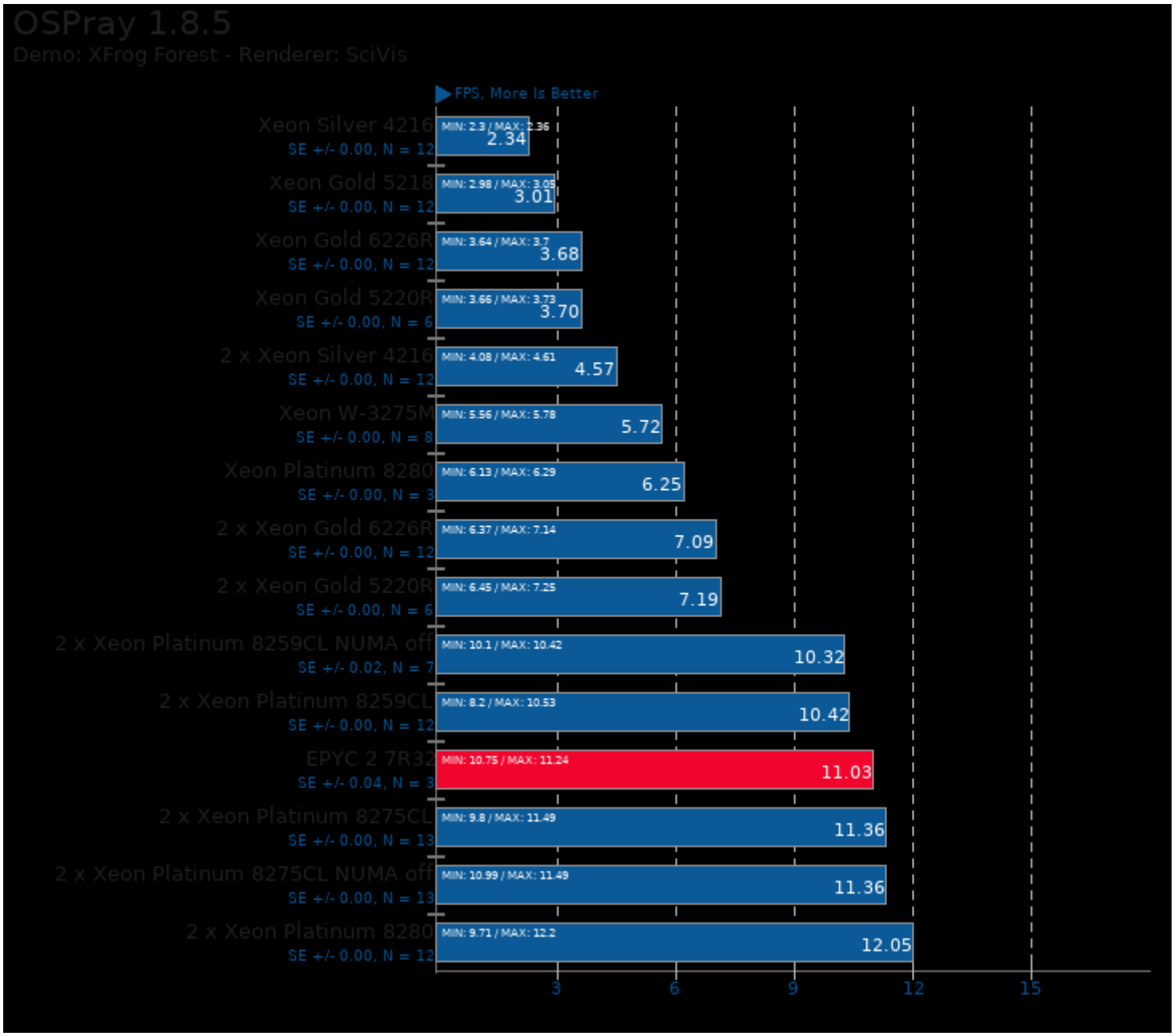

MKL-DNN DNNL 1.1
Harness: Convolution Batch conv_googlenet_v3 - Data Type: bf16bf16bf16
ms, Fewer Is Better
Xeon Silver 4216
SE +/- 0.08, N = 3
MIN: 484.15
484.90
Xeon Gold 5218
SE +/- 0.02, N = 3
MIN: 484.13
484.59
Xeon Gold 5220R
SE +/- 0.42, N = 3
MIN: 365.68
369.29
Xeon Gold 6226R
SE +/- 0.10, N = 3
MIN: 268.99
269.99
2 x Xeon Silver 4216
SE +/- 0.04, N = 3
MIN: 245.49
246.45
Xeon W-3275M
SE +/- 0.20, N = 3
MIN: 178.56
188.61
2 x Xeon Gold 5220R
SE +/- 0.02, N = 3
MIN: 186.33
187.17
Xeon Platinum 8280
SE +/- 0.03, N = 3
MIN: 166.21
166.98
2 x Xeon Gold 6226R
SE +/- 0.02, N = 3
MIN: 136.67
137.73
2 x Xeon Platinum 8259CL
SE +/- 0.01, N = 3
MIN: 105.9
106.89
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.02, N = 3
MIN: 105.9
106.71
2 x Xeon Platinum 8275CL
SE +/- 0.01, N = 3
MIN: 92.35
93.36
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.03, N = 3
MIN: 92.44
93.28
2 x Xeon Platinum 8280
SE +/- 0.00, N = 3
MIN: 85.56
86.54
100
200
300
400
500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -msse4.1 -fPIC -fopenmp -pie -lpthread -ldl

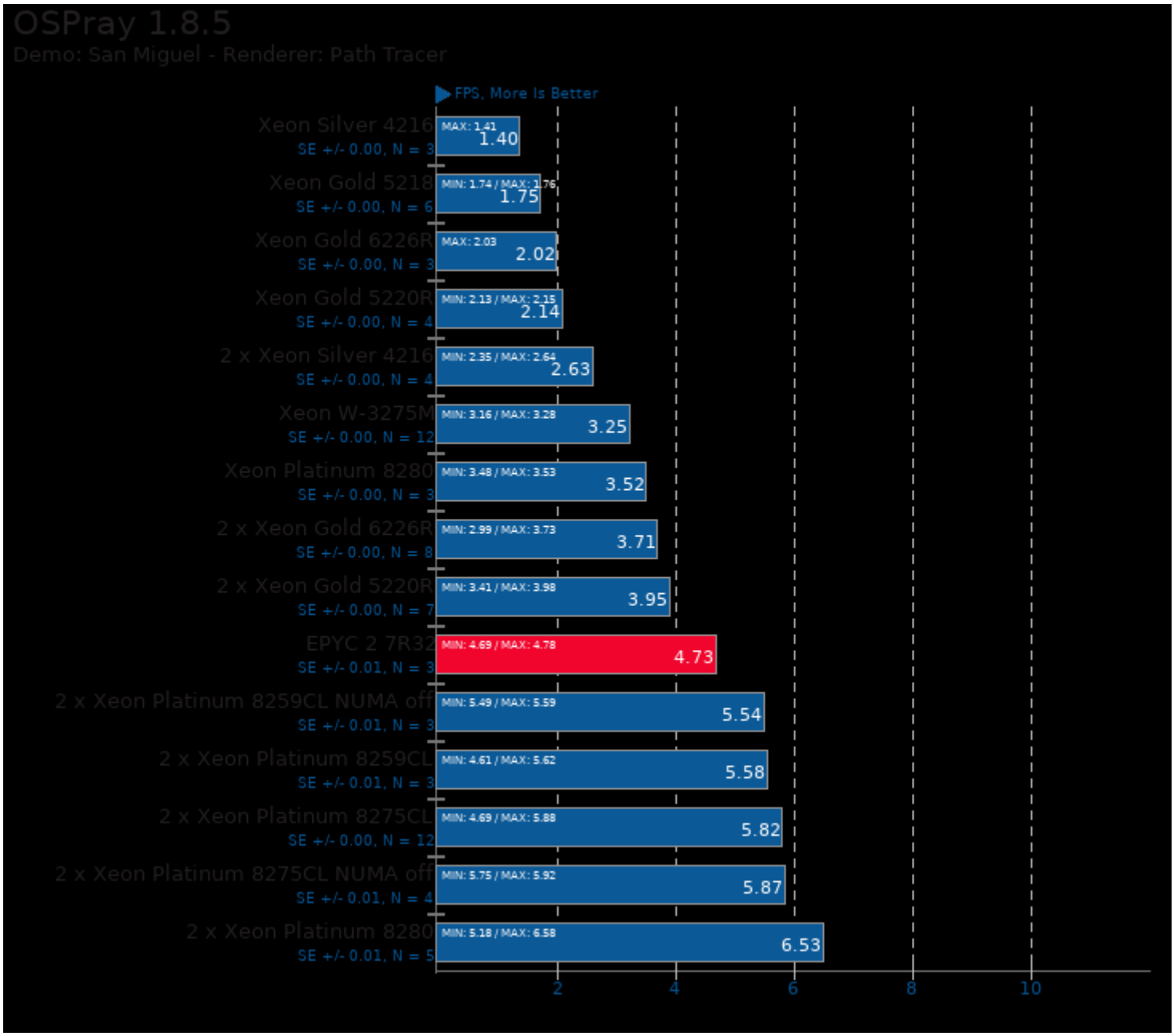

dav1d 0.6.0
Video Input: Summer Nature 4K
FPS, More Is Better
Xeon Silver 4216
SE +/- 0.15, N = 3
MIN: 104.21 / MAX: 150.6
132.46
Xeon Gold 5218
SE +/- 0.30, N = 3
MIN: 107.86 / MAX: 153.94
136.86
2 x Xeon Silver 4216
SE +/- 1.81, N = 3
MIN: 100.88 / MAX: 178.21
159.60
Xeon Gold 5220R
SE +/- 0.78, N = 3
MIN: 110.85 / MAX: 181
160.59
Xeon Gold 6226R
SE +/- 1.20, N = 3
MIN: 115.59 / MAX: 193.75
170.07
2 x Xeon Gold 5220R
SE +/- 0.84, N = 3
MIN: 103.41 / MAX: 190.93
177.89
Xeon Platinum 8280
SE +/- 1.15, N = 3
MIN: 121.12 / MAX: 214.69
199.08
2 x Xeon Gold 6226R
SE +/- 1.66, N = 3
MIN: 119.16 / MAX: 222.17
203.10
2 x Xeon Platinum 8259CL NUMA off
SE +/- 1.78, N = 3
MIN: 89.5 / MAX: 233.99
212.99
2 x Xeon Platinum 8259CL
SE +/- 1.73, N = 3
MIN: 93.88 / MAX: 236.99
215.64
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.62, N = 3
MIN: 97.39 / MAX: 239.16
216.86
2 x Xeon Platinum 8275CL
SE +/- 1.14, N = 3
MIN: 105.24 / MAX: 238.99
218.14
2 x Xeon Platinum 8280
SE +/- 3.68, N = 3
MIN: 81.4 / MAX: 247.6
221.31
Xeon W-3275M
SE +/- 1.20, N = 3
MIN: 164.1 / MAX: 284.35
256.60
EPYC 2 7R32
SE +/- 0.98, N = 3
MIN: 150.11 / MAX: 347.95
321.17
70
140
210
280
350
1. (CC) gcc options: -pthread

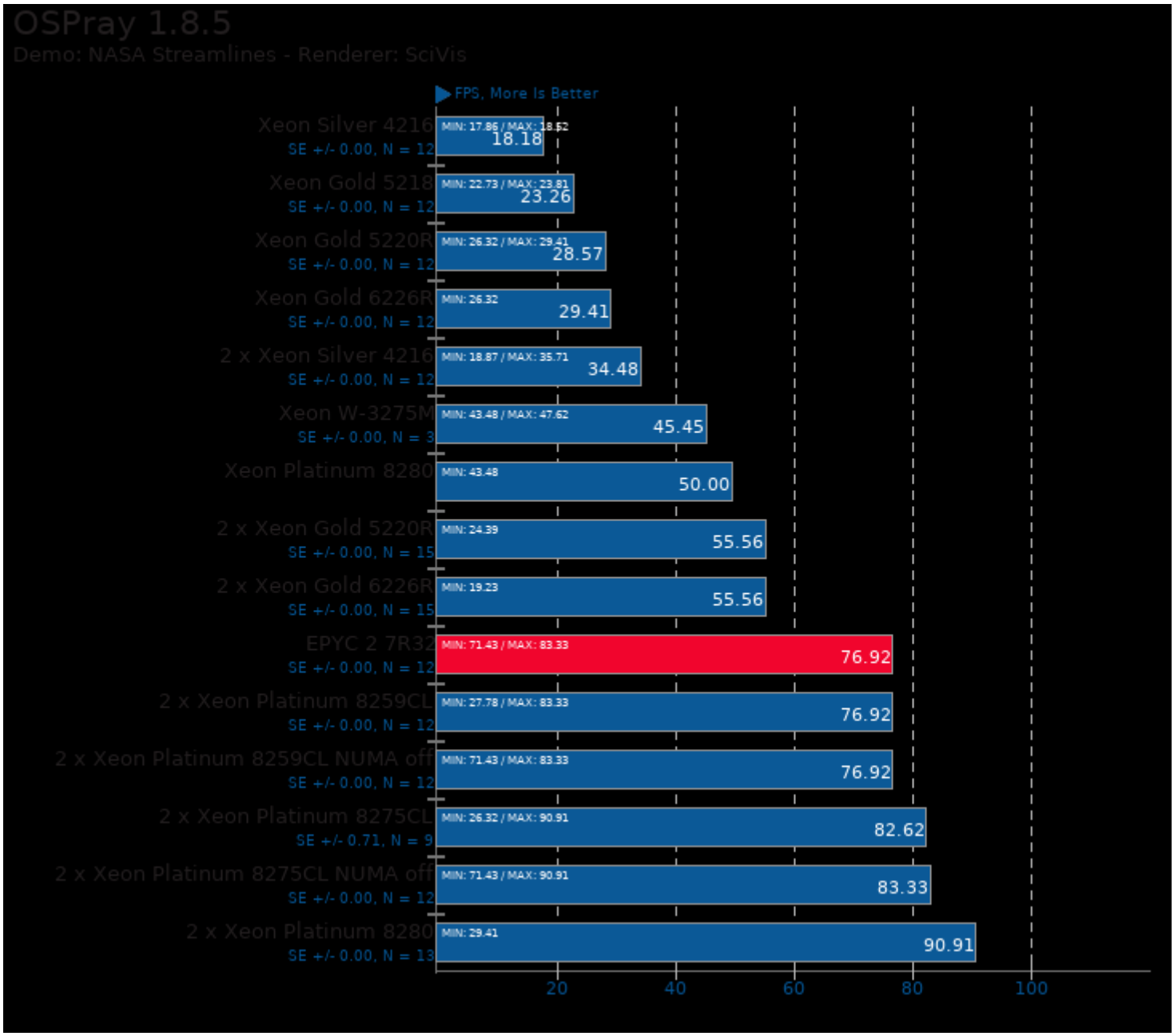

dav1d 0.6.0
Video Input: Summer Nature 1080p
FPS, More Is Better
Xeon Silver 4216
SE +/- 1.97, N = 3
MIN: 133.23 / MAX: 255.75
232.35
Xeon Gold 5218
SE +/- 1.26, N = 3
MIN: 166.24 / MAX: 288.23
265.46
2 x Xeon Silver 4216
SE +/- 4.57, N = 3
MIN: 156.69 / MAX: 307.87
272.55
Xeon Gold 5220R
SE +/- 2.31, N = 3
MIN: 160.24 / MAX: 299.46
274.98
Xeon Gold 6226R
SE +/- 0.97, N = 3
MIN: 179.63 / MAX: 337.24
307.75
2 x Xeon Gold 5220R
SE +/- 3.79, N = 6
MIN: 175.96 / MAX: 365.43
321.84
Xeon Platinum 8280
SE +/- 0.52, N = 3
MIN: 200.79 / MAX: 358.32
323.20
2 x Xeon Gold 6226R
SE +/- 1.84, N = 3
MIN: 196.53 / MAX: 395.24
358.62
2 x Xeon Platinum 8259CL NUMA off
SE +/- 3.77, N = 15
MIN: 106.81 / MAX: 466.09
400.24
2 x Xeon Platinum 8275CL NUMA off
SE +/- 3.42, N = 3
MIN: 144.68 / MAX: 463.23
406.66
2 x Xeon Platinum 8280
SE +/- 3.74, N = 15
MIN: 126.27 / MAX: 481.12
409.88
2 x Xeon Platinum 8275CL
SE +/- 4.96, N = 3
MIN: 175.85 / MAX: 474
422.89
2 x Xeon Platinum 8259CL
SE +/- 3.67, N = 3
MIN: 205.51 / MAX: 479.42
431.76
Xeon W-3275M
SE +/- 2.32, N = 3
MIN: 317.28 / MAX: 605.87
537.84
EPYC 2 7R32
SE +/- 2.19, N = 3
MIN: 302.17 / MAX: 751.14
676.16
150
300
450
600
750
1. (CC) gcc options: -pthread

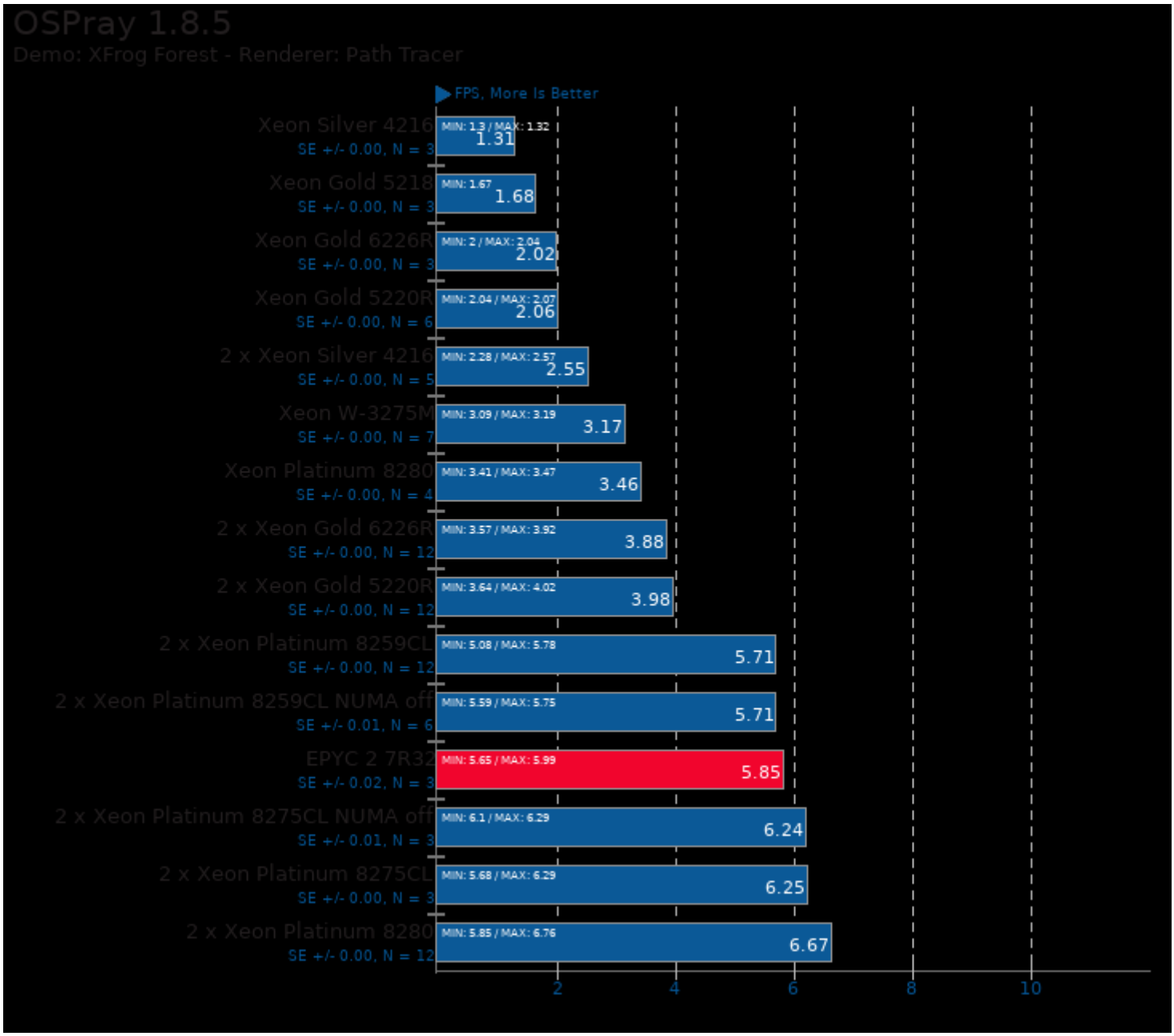

dav1d 0.6.0
Video Input: Chimera 1080p 10-bit
FPS, More Is Better
Xeon Silver 4216
SE +/- 0.06, N = 3
MIN: 36.69 / MAX: 102.49
50.10
Xeon Gold 5218
SE +/- 0.05, N = 3
MIN: 40.96 / MAX: 112.64
55.88
Xeon Gold 5220R
SE +/- 0.14, N = 3
MIN: 42.73 / MAX: 119.59
58.05
2 x Xeon Silver 4216
SE +/- 0.16, N = 3
MIN: 45.13 / MAX: 93.29
59.51
Xeon Gold 6226R
SE +/- 0.24, N = 3
MIN: 45.27 / MAX: 134.22
62.32
Xeon Platinum 8280
SE +/- 0.12, N = 3
MIN: 49.2 / MAX: 111
65.40
2 x Xeon Gold 5220R
SE +/- 0.47, N = 3
MIN: 54.24 / MAX: 115.34
70.81
2 x Xeon Gold 6226R
SE +/- 0.16, N = 3
MIN: 55.51 / MAX: 119.74
73.95
Xeon W-3275M
SE +/- 0.05, N = 3
MIN: 55.07 / MAX: 147.52
81.60
2 x Xeon Platinum 8280
SE +/- 0.07, N = 3
MIN: 66.74 / MAX: 126.85
85.14
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.56, N = 3
MIN: 69.45 / MAX: 129.53
88.66
2 x Xeon Platinum 8259CL
SE +/- 0.04, N = 3
MIN: 69.22 / MAX: 130.8
89.55
2 x Xeon Platinum 8275CL
SE +/- 0.44, N = 3
MIN: 71.05 / MAX: 131.54
90.28
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.30, N = 3
MIN: 71.49 / MAX: 131.32
90.78
EPYC 2 7R32
SE +/- 0.60, N = 3
MIN: 101.2 / MAX: 212.94
140.14
30
60
90
120
150
1. (CC) gcc options: -pthread

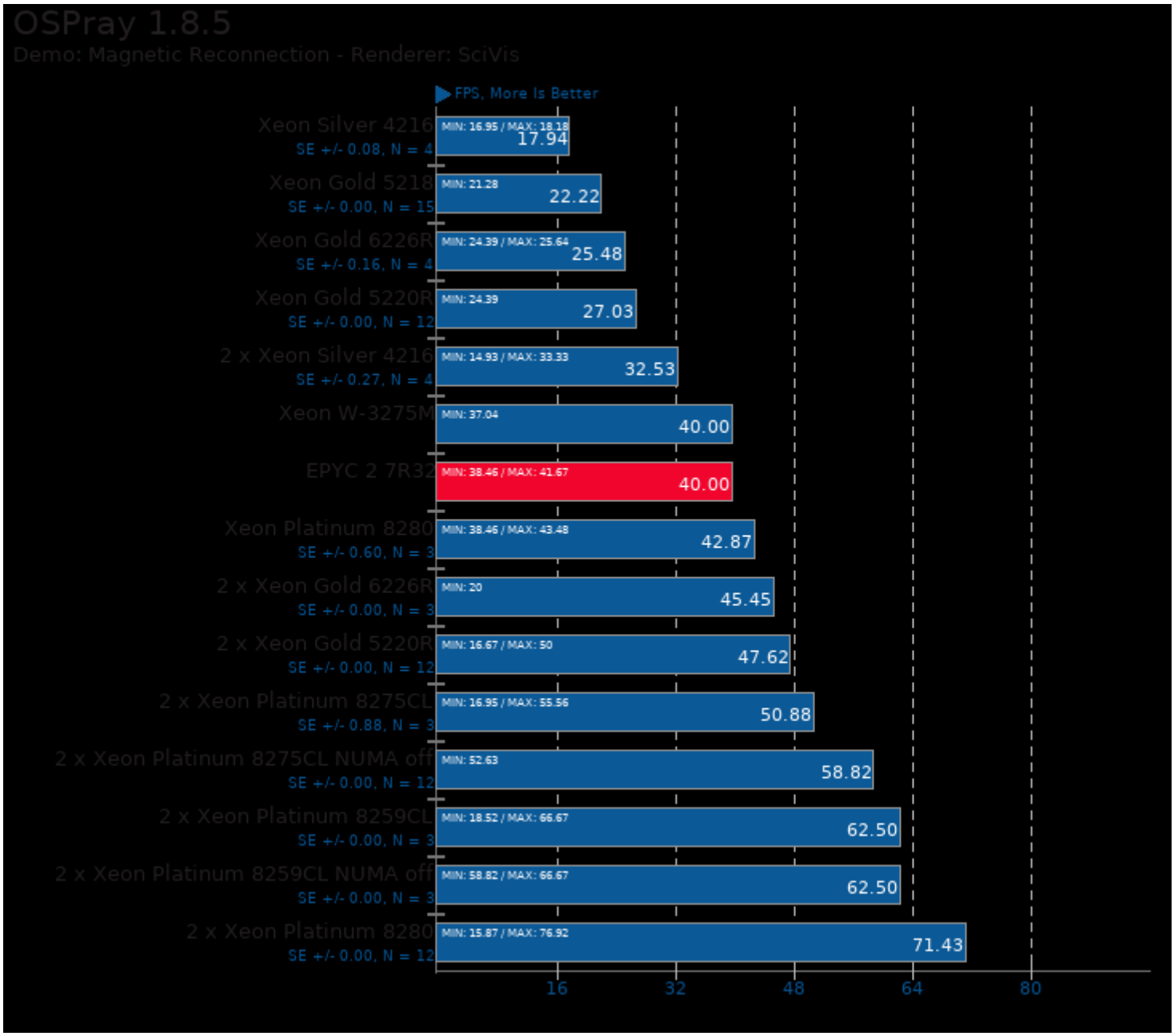

OSPray 1.8.5
Demo: San Miguel - Renderer: SciVis
FPS, More Is Better
Xeon Silver 4216
SE +/- 0.00, N = 12
MIN: 14.29 / MAX: 14.93
14.71
Xeon Gold 5218
SE +/- 0.00, N = 12
MIN: 18.52 / MAX: 19.23
18.87
Xeon Gold 6226R
SE +/- 0.04, N = 12
MIN: 21.74 / MAX: 22.73
22.69
Xeon Gold 5220R
SE +/- 0.00, N = 12
MIN: 21.74 / MAX: 23.81
23.26
2 x Xeon Silver 4216
SE +/- 0.07, N = 12
MIN: 17.86 / MAX: 28.57
27.84
Xeon W-3275M
SE +/- 0.00, N = 12
MIN: 30.3 / MAX: 35.71
34.48
Xeon Platinum 8280
SE +/- 0.00, N = 12
MIN: 37.04
38.46
2 x Xeon Gold 6226R
SE +/- 0.60, N = 3
MIN: 28.57 / MAX: 43.48
42.27
2 x Xeon Gold 5220R
SE +/- 0.00, N = 12
MIN: 28.57 / MAX: 45.45
43.48
EPYC 2 7R32
SE +/- 0.00, N = 12
MIN: 52.63 / MAX: 62.5
58.82
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.92, N = 4
MIN: 55.56 / MAX: 62.5
61.58
2 x Xeon Platinum 8259CL
SE +/- 0.00, N = 3
MIN: 35.71
62.50
2 x Xeon Platinum 8275CL
SE +/- 0.54, N = 12
MIN: 35.71 / MAX: 66.67
63.54
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.00, N = 12
MIN: 55.56
66.67
2 x Xeon Platinum 8280
SE +/- 0.62, N = 15
MIN: 37.04 / MAX: 71.43
69.52
15
30
45
60
75

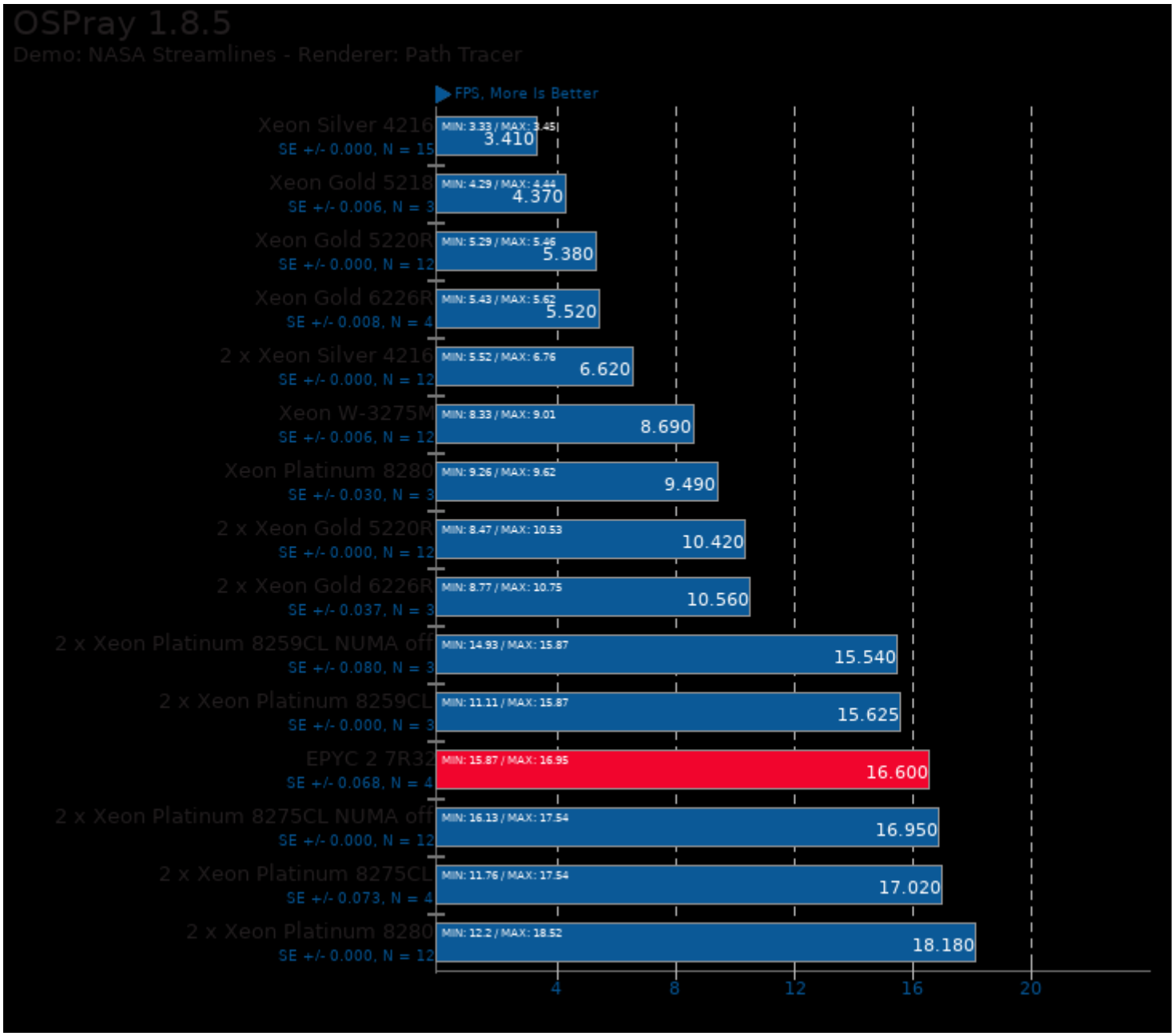

OSPray 1.8.5
Demo: XFrog Forest - Renderer: SciVis
FPS, More Is Better
Xeon Silver 4216
SE +/- 0.00, N = 12
MIN: 2.3 / MAX: 2.36
2.34
Xeon Gold 5218
SE +/- 0.00, N = 12
MIN: 2.98 / MAX: 3.05
3.01
Xeon Gold 6226R
SE +/- 0.00, N = 12
MIN: 3.64 / MAX: 3.7
3.68
Xeon Gold 5220R
SE +/- 0.00, N = 6
MIN: 3.66 / MAX: 3.73
3.70
2 x Xeon Silver 4216
SE +/- 0.00, N = 12
MIN: 4.08 / MAX: 4.61
4.57
Xeon W-3275M
SE +/- 0.00, N = 8
MIN: 5.56 / MAX: 5.78
5.72
Xeon Platinum 8280
SE +/- 0.00, N = 3
MIN: 6.13 / MAX: 6.29
6.25
2 x Xeon Gold 6226R
SE +/- 0.00, N = 12
MIN: 6.37 / MAX: 7.14
7.09
2 x Xeon Gold 5220R
SE +/- 0.00, N = 6
MIN: 6.45 / MAX: 7.25
7.19
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.02, N = 7
MIN: 10.1 / MAX: 10.42
10.32
2 x Xeon Platinum 8259CL
SE +/- 0.00, N = 12
MIN: 8.2 / MAX: 10.53
10.42
EPYC 2 7R32
SE +/- 0.04, N = 3
MIN: 10.75 / MAX: 11.24
11.03
2 x Xeon Platinum 8275CL
SE +/- 0.00, N = 13
MIN: 9.8 / MAX: 11.49
11.36
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.00, N = 13
MIN: 10.99 / MAX: 11.49
11.36
2 x Xeon Platinum 8280
SE +/- 0.00, N = 12
MIN: 9.71 / MAX: 12.2
12.05
3
6
9
12
15

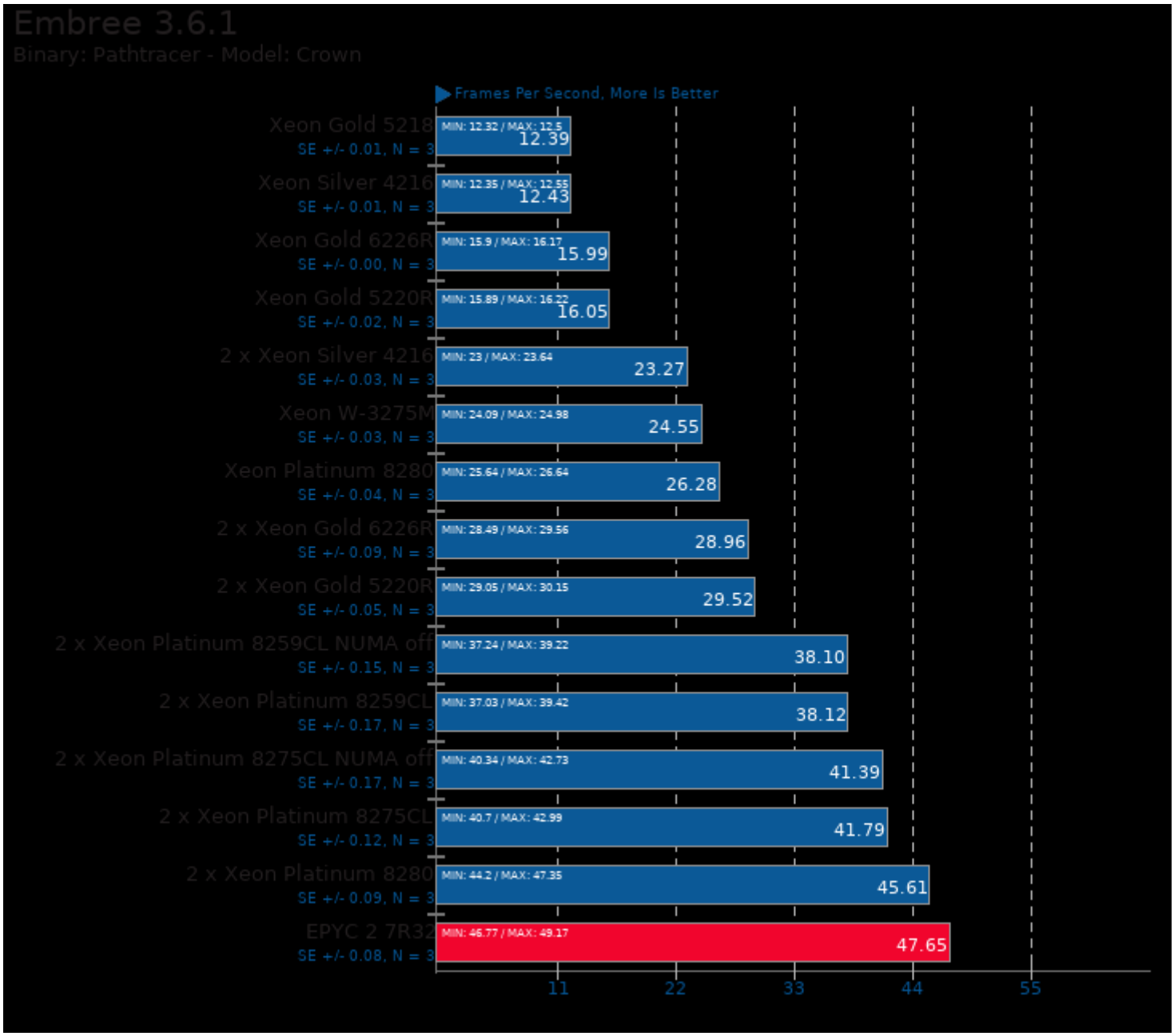

OSPray 1.8.5
Demo: San Miguel - Renderer: Path Tracer
FPS, More Is Better
Xeon Silver 4216
SE +/- 0.00, N = 3
MAX: 1.41
1.40
Xeon Gold 5218
SE +/- 0.00, N = 6
MIN: 1.74 / MAX: 1.76
1.75
Xeon Gold 6226R
SE +/- 0.00, N = 3
MAX: 2.03
2.02
Xeon Gold 5220R
SE +/- 0.00, N = 4
MIN: 2.13 / MAX: 2.15
2.14
2 x Xeon Silver 4216
SE +/- 0.00, N = 4
MIN: 2.35 / MAX: 2.64
2.63
Xeon W-3275M
SE +/- 0.00, N = 12
MIN: 3.16 / MAX: 3.28
3.25
Xeon Platinum 8280
SE +/- 0.00, N = 3
MIN: 3.48 / MAX: 3.53
3.52
2 x Xeon Gold 6226R
SE +/- 0.00, N = 8
MIN: 2.99 / MAX: 3.73
3.71
2 x Xeon Gold 5220R
SE +/- 0.00, N = 7
MIN: 3.41 / MAX: 3.98
3.95
EPYC 2 7R32
SE +/- 0.01, N = 3
MIN: 4.69 / MAX: 4.78
4.73
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.01, N = 3
MIN: 5.49 / MAX: 5.59
5.54
2 x Xeon Platinum 8259CL
SE +/- 0.01, N = 3
MIN: 4.61 / MAX: 5.62
5.58
2 x Xeon Platinum 8275CL
SE +/- 0.00, N = 12
MIN: 4.69 / MAX: 5.88
5.82
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.01, N = 4
MIN: 5.75 / MAX: 5.92
5.87
2 x Xeon Platinum 8280
SE +/- 0.01, N = 5
MIN: 5.18 / MAX: 6.58
6.53
2
4
6
8
10

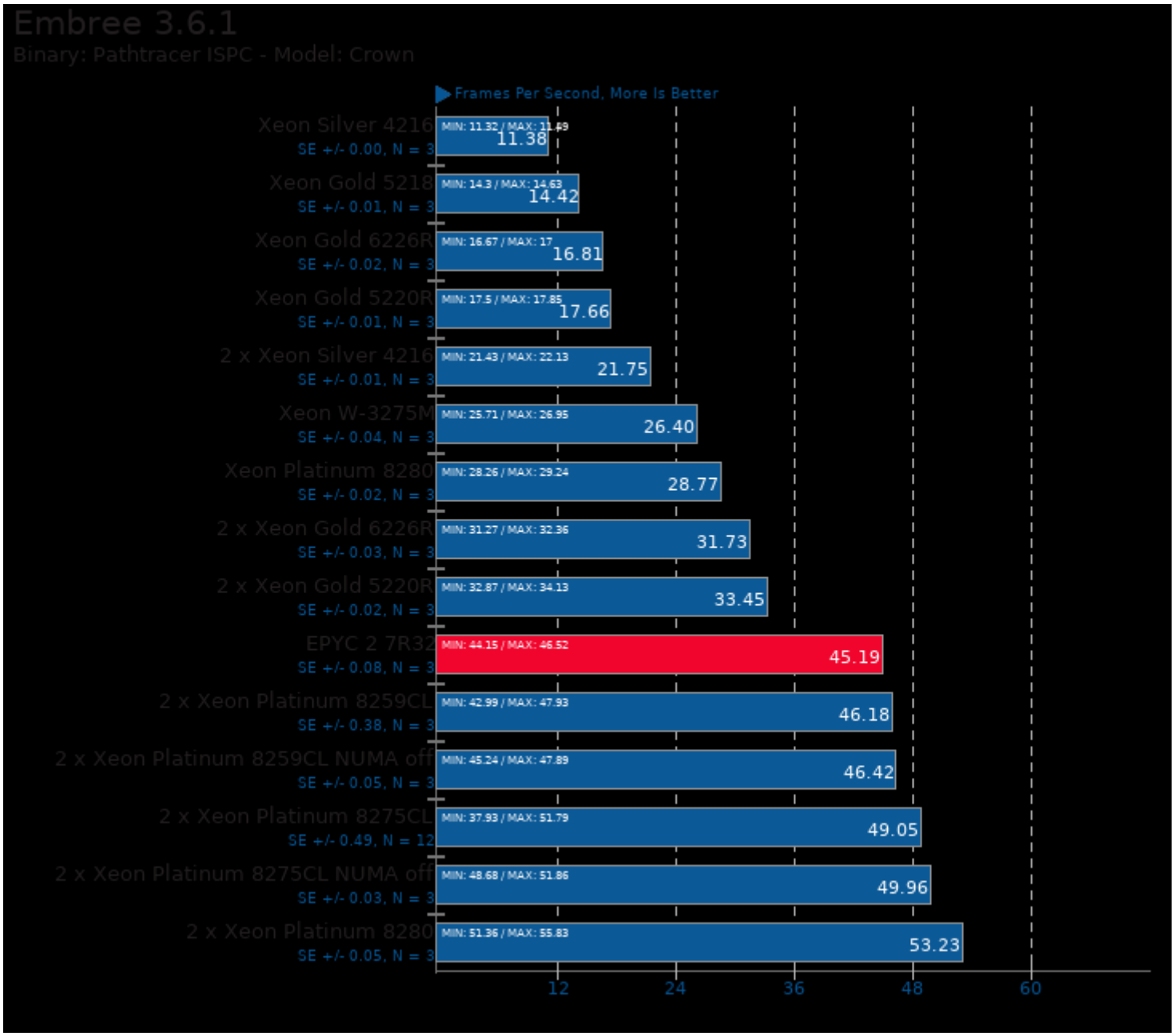

OSPray 1.8.5
Demo: NASA Streamlines - Renderer: SciVis
FPS, More Is Better
Xeon Silver 4216
SE +/- 0.00, N = 12
MIN: 17.86 / MAX: 18.52
18.18
Xeon Gold 5218
SE +/- 0.00, N = 12
MIN: 22.73 / MAX: 23.81
23.26
Xeon Gold 5220R
SE +/- 0.00, N = 12
MIN: 26.32 / MAX: 29.41
28.57
Xeon Gold 6226R
SE +/- 0.00, N = 12
MIN: 26.32
29.41
2 x Xeon Silver 4216
SE +/- 0.00, N = 12
MIN: 18.87 / MAX: 35.71
34.48
Xeon W-3275M
SE +/- 0.00, N = 3
MIN: 43.48 / MAX: 47.62
45.45
Xeon Platinum 8280
MIN: 43.48
50.00
2 x Xeon Gold 5220R
SE +/- 0.00, N = 15
MIN: 24.39
55.56
2 x Xeon Gold 6226R
SE +/- 0.00, N = 15
MIN: 19.23
55.56
EPYC 2 7R32
SE +/- 0.00, N = 12
MIN: 71.43 / MAX: 83.33
76.92
2 x Xeon Platinum 8259CL
SE +/- 0.00, N = 12
MIN: 27.78 / MAX: 83.33
76.92
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.00, N = 12
MIN: 71.43 / MAX: 83.33
76.92
2 x Xeon Platinum 8275CL
SE +/- 0.71, N = 9
MIN: 26.32 / MAX: 90.91
82.62
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.00, N = 12
MIN: 71.43 / MAX: 90.91
83.33
2 x Xeon Platinum 8280
SE +/- 0.00, N = 13
MIN: 29.41
90.91
20
40
60
80
100

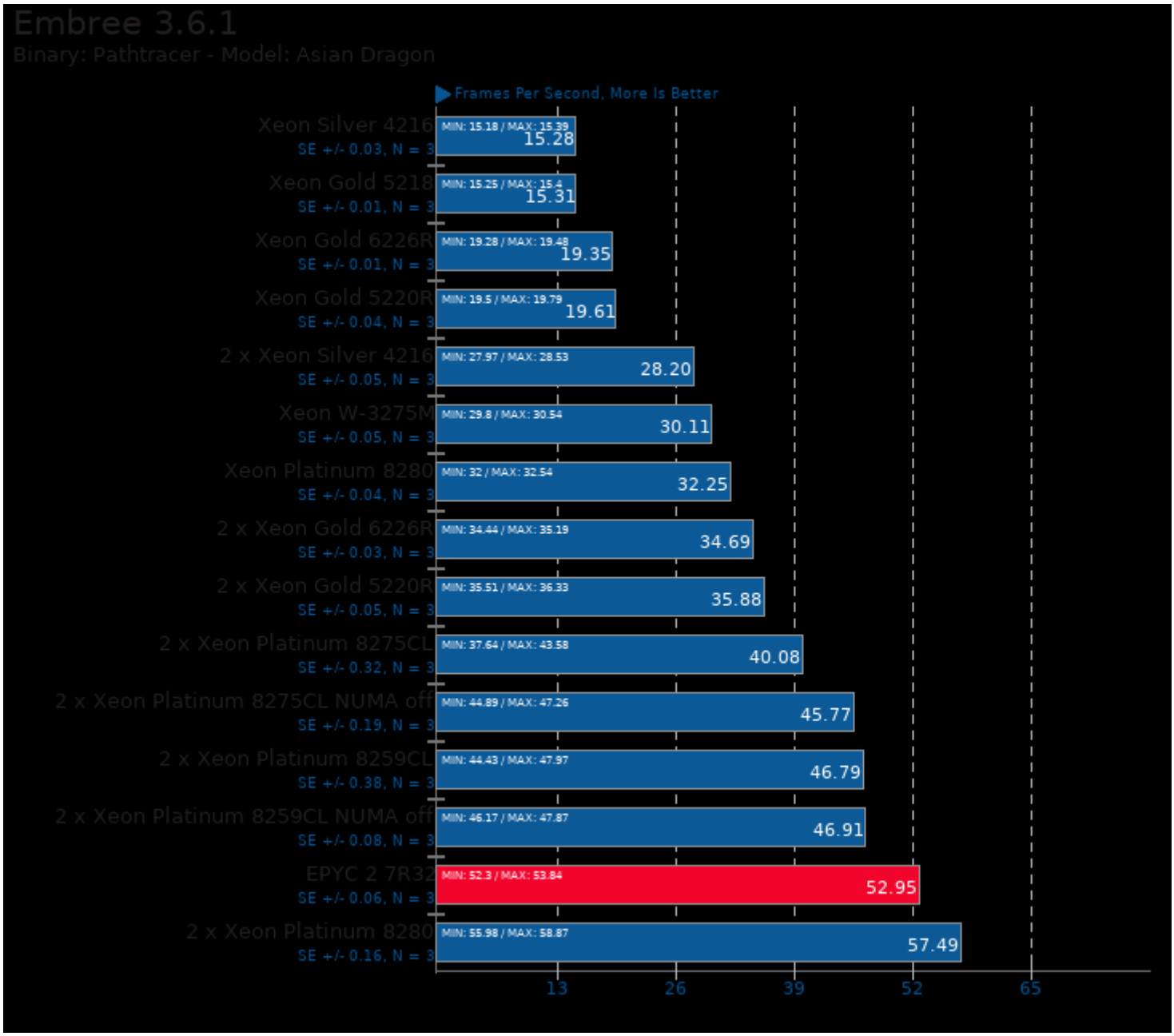

OSPray 1.8.5
Demo: XFrog Forest - Renderer: Path Tracer
FPS, More Is Better
Xeon Silver 4216
SE +/- 0.00, N = 3
MIN: 1.3 / MAX: 1.32
1.31
Xeon Gold 5218
SE +/- 0.00, N = 3
MIN: 1.67
1.68
Xeon Gold 6226R
SE +/- 0.00, N = 3
MIN: 2 / MAX: 2.04
2.02
Xeon Gold 5220R
SE +/- 0.00, N = 6
MIN: 2.04 / MAX: 2.07
2.06
2 x Xeon Silver 4216
SE +/- 0.00, N = 5
MIN: 2.28 / MAX: 2.57
2.55
Xeon W-3275M
SE +/- 0.00, N = 7
MIN: 3.09 / MAX: 3.19
3.17
Xeon Platinum 8280
SE +/- 0.00, N = 4
MIN: 3.41 / MAX: 3.47
3.46
2 x Xeon Gold 6226R
SE +/- 0.00, N = 12
MIN: 3.57 / MAX: 3.92
3.88
2 x Xeon Gold 5220R
SE +/- 0.00, N = 12
MIN: 3.64 / MAX: 4.02
3.98
2 x Xeon Platinum 8259CL
SE +/- 0.00, N = 12
MIN: 5.08 / MAX: 5.78
5.71
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.01, N = 6
MIN: 5.59 / MAX: 5.75
5.71
EPYC 2 7R32
SE +/- 0.02, N = 3
MIN: 5.65 / MAX: 5.99
5.85
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.01, N = 3
MIN: 6.1 / MAX: 6.29
6.24
2 x Xeon Platinum 8275CL
SE +/- 0.00, N = 3
MIN: 5.68 / MAX: 6.29
6.25
2 x Xeon Platinum 8280
SE +/- 0.00, N = 12
MIN: 5.85 / MAX: 6.76
6.67
2
4
6
8
10

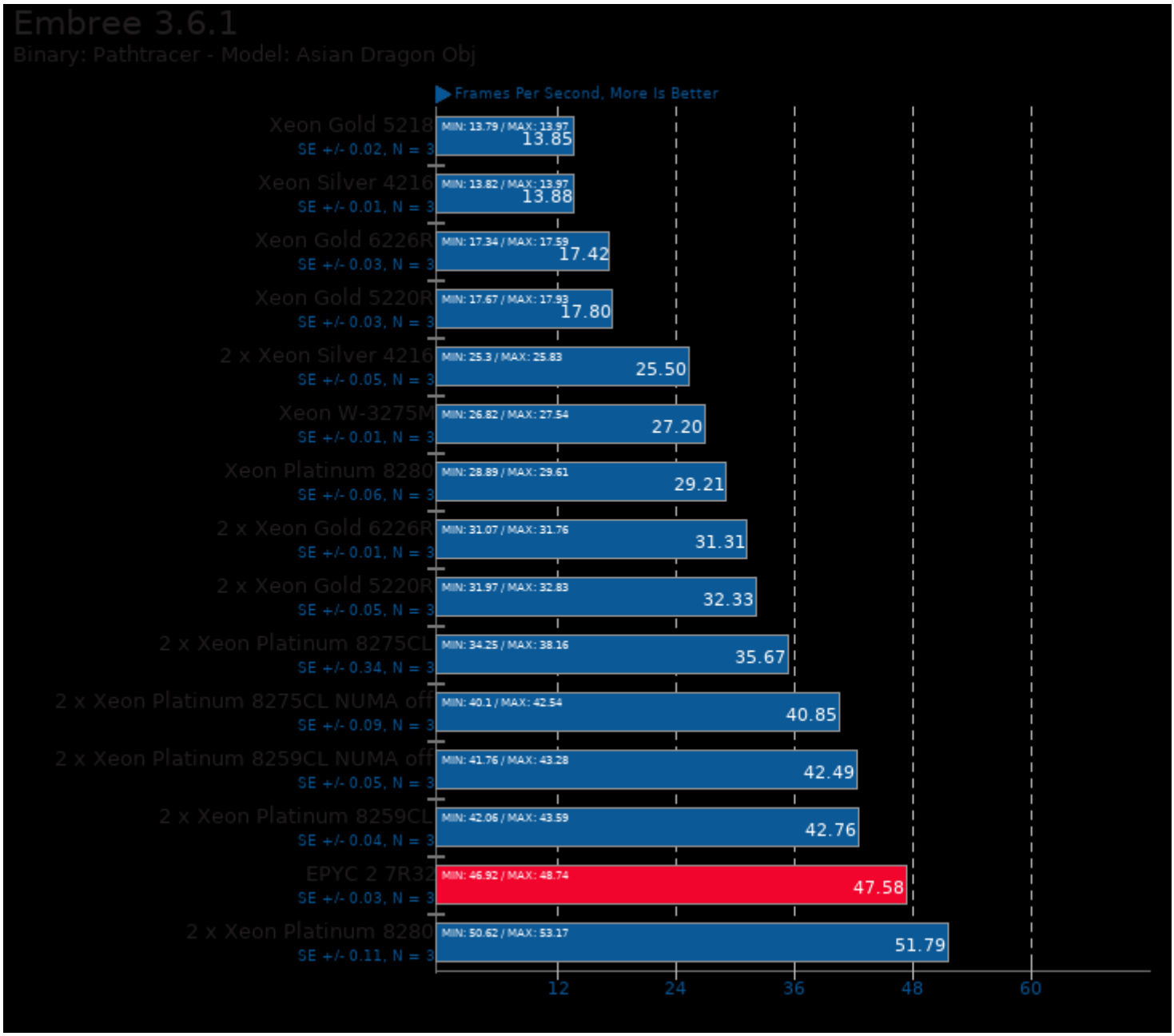

OSPray 1.8.5
Demo: Magnetic Reconnection - Renderer: SciVis
FPS, More Is Better
Xeon Silver 4216
SE +/- 0.08, N = 4
MIN: 16.95 / MAX: 18.18
17.94
Xeon Gold 5218
SE +/- 0.00, N = 15
MIN: 21.28
22.22
Xeon Gold 6226R
SE +/- 0.16, N = 4
MIN: 24.39 / MAX: 25.64
25.48
Xeon Gold 5220R
SE +/- 0.00, N = 12
MIN: 24.39
27.03
2 x Xeon Silver 4216
SE +/- 0.27, N = 4
MIN: 14.93 / MAX: 33.33
32.53
Xeon W-3275M
MIN: 37.04
40.00
EPYC 2 7R32
MIN: 38.46 / MAX: 41.67
40.00
Xeon Platinum 8280
SE +/- 0.60, N = 3
MIN: 38.46 / MAX: 43.48
42.87
2 x Xeon Gold 6226R
SE +/- 0.00, N = 3
MIN: 20
45.45
2 x Xeon Gold 5220R
SE +/- 0.00, N = 12
MIN: 16.67 / MAX: 50
47.62
2 x Xeon Platinum 8275CL
SE +/- 0.88, N = 3
MIN: 16.95 / MAX: 55.56
50.88
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.00, N = 12
MIN: 52.63
58.82
2 x Xeon Platinum 8259CL
SE +/- 0.00, N = 3
MIN: 18.52 / MAX: 66.67
62.50
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.00, N = 3
MIN: 58.82 / MAX: 66.67
62.50
2 x Xeon Platinum 8280
SE +/- 0.00, N = 12
MIN: 15.87 / MAX: 76.92
71.43
16
32
48
64
80

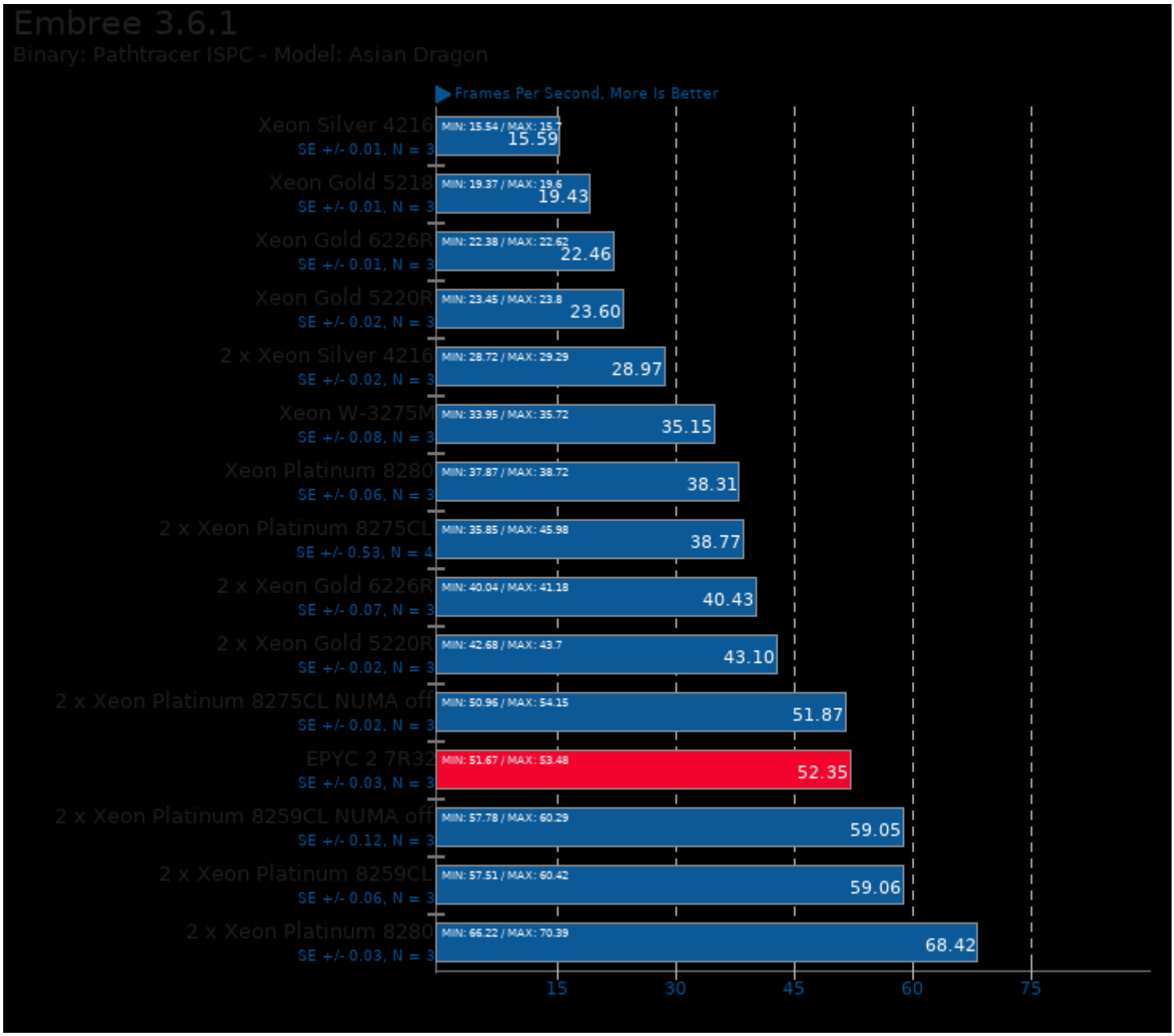

OSPray 1.8.5
Demo: NASA Streamlines - Renderer: Path Tracer
FPS, More Is Better
Xeon Silver 4216
SE +/- 0.000, N = 15
MIN: 3.33 / MAX: 3.45
3.410
Xeon Gold 5218
SE +/- 0.006, N = 3
MIN: 4.29 / MAX: 4.44
4.370
Xeon Gold 5220R
SE +/- 0.000, N = 12
MIN: 5.29 / MAX: 5.46
5.380
Xeon Gold 6226R
SE +/- 0.008, N = 4
MIN: 5.43 / MAX: 5.62
5.520
2 x Xeon Silver 4216
SE +/- 0.000, N = 12
MIN: 5.52 / MAX: 6.76
6.620
Xeon W-3275M
SE +/- 0.006, N = 12
MIN: 8.33 / MAX: 9.01
8.690
Xeon Platinum 8280
SE +/- 0.030, N = 3
MIN: 9.26 / MAX: 9.62
9.490
2 x Xeon Gold 5220R
SE +/- 0.000, N = 12
MIN: 8.47 / MAX: 10.53
10.420
2 x Xeon Gold 6226R
SE +/- 0.037, N = 3
MIN: 8.77 / MAX: 10.75
10.560
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.080, N = 3
MIN: 14.93 / MAX: 15.87
15.540
2 x Xeon Platinum 8259CL
SE +/- 0.000, N = 3
MIN: 11.11 / MAX: 15.87
15.625
EPYC 2 7R32
SE +/- 0.068, N = 4
MIN: 15.87 / MAX: 16.95
16.600
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.000, N = 12
MIN: 16.13 / MAX: 17.54
16.950
2 x Xeon Platinum 8275CL
SE +/- 0.073, N = 4
MIN: 11.76 / MAX: 17.54
17.020
2 x Xeon Platinum 8280
SE +/- 0.000, N = 12
MIN: 12.2 / MAX: 18.52
18.180
4
8
12
16
20

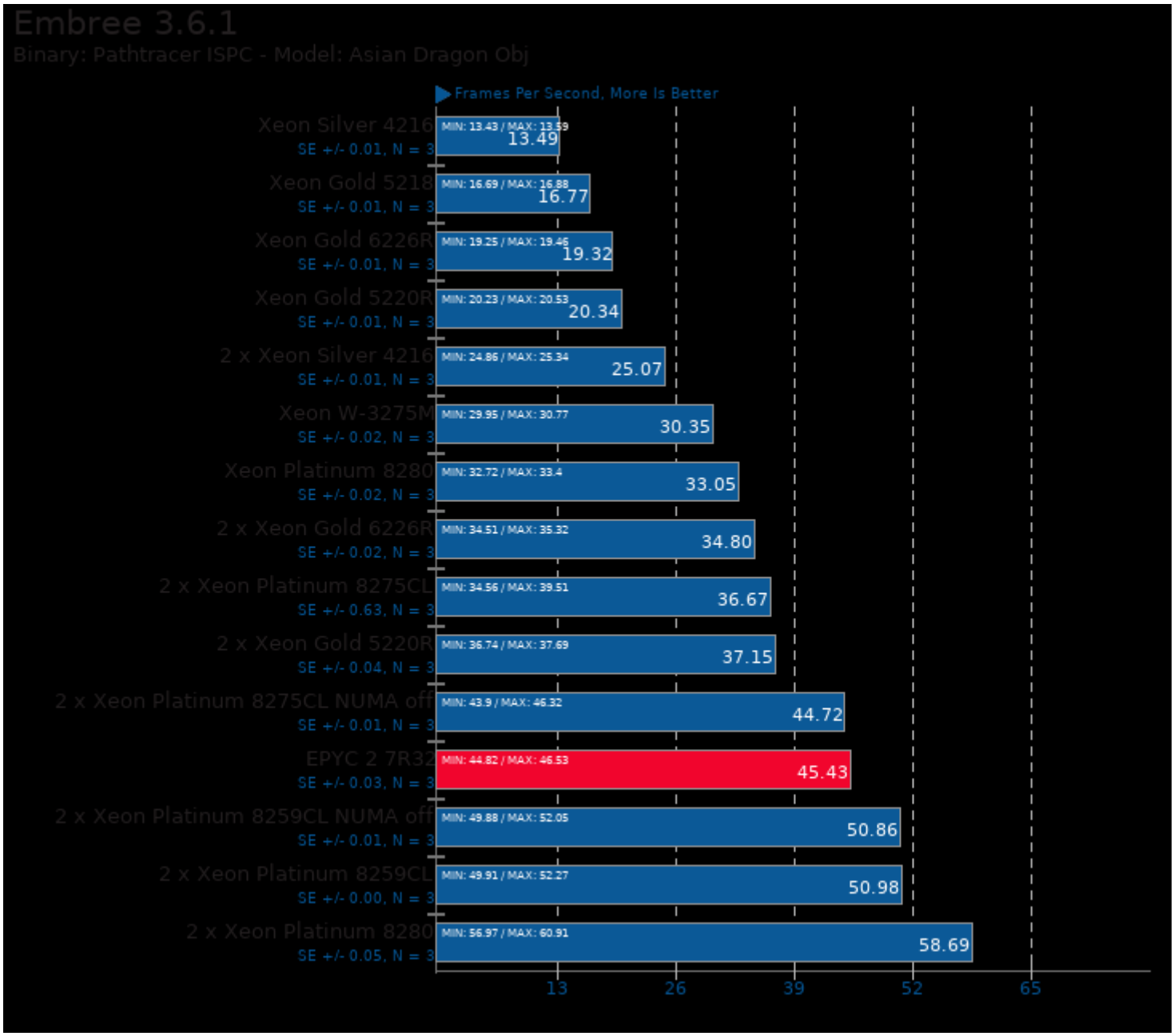

Embree 3.6.1
Binary: Pathtracer - Model: Crown
Frames Per Second, More Is Better
Xeon Gold 5218
SE +/- 0.01, N = 3
MIN: 12.32 / MAX: 12.5
12.39
Xeon Silver 4216
SE +/- 0.01, N = 3
MIN: 12.35 / MAX: 12.55
12.43
Xeon Gold 6226R
SE +/- 0.00, N = 3
MIN: 15.9 / MAX: 16.17
15.99
Xeon Gold 5220R
SE +/- 0.02, N = 3
MIN: 15.89 / MAX: 16.22
16.05
2 x Xeon Silver 4216
SE +/- 0.03, N = 3
MIN: 23 / MAX: 23.64
23.27
Xeon W-3275M
SE +/- 0.03, N = 3
MIN: 24.09 / MAX: 24.98
24.55
Xeon Platinum 8280
SE +/- 0.04, N = 3
MIN: 25.64 / MAX: 26.64
26.28
2 x Xeon Gold 6226R
SE +/- 0.09, N = 3
MIN: 28.49 / MAX: 29.56
28.96
2 x Xeon Gold 5220R
SE +/- 0.05, N = 3
MIN: 29.05 / MAX: 30.15
29.52
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.15, N = 3
MIN: 37.24 / MAX: 39.22
38.10
2 x Xeon Platinum 8259CL
SE +/- 0.17, N = 3
MIN: 37.03 / MAX: 39.42
38.12
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.17, N = 3
MIN: 40.34 / MAX: 42.73
41.39
2 x Xeon Platinum 8275CL
SE +/- 0.12, N = 3
MIN: 40.7 / MAX: 42.99
41.79
2 x Xeon Platinum 8280
SE +/- 0.09, N = 3
MIN: 44.2 / MAX: 47.35
45.61
EPYC 2 7R32
SE +/- 0.08, N = 3
MIN: 46.77 / MAX: 49.17
47.65
11
22
33
44
55

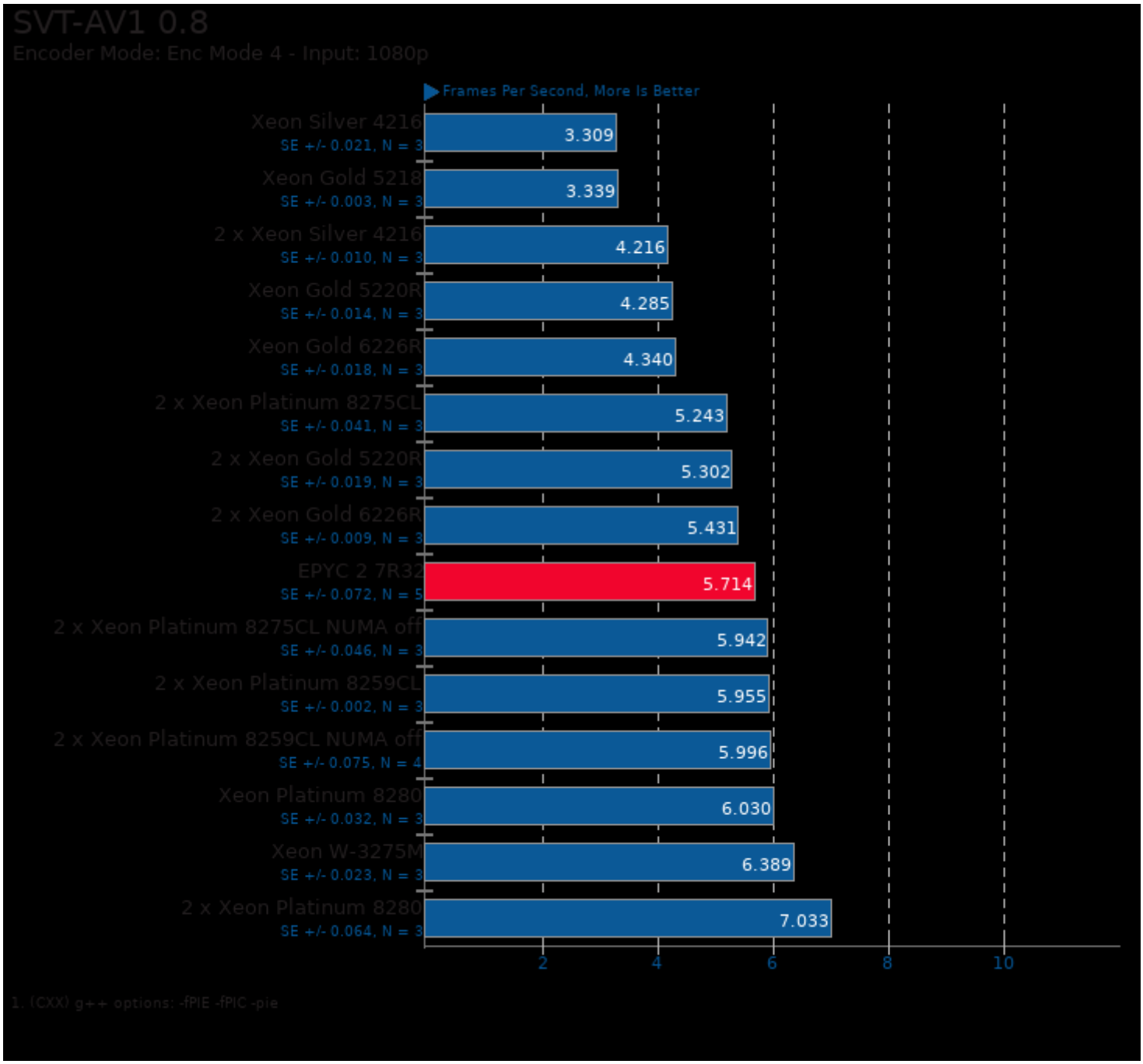

Embree 3.6.1
Binary: Pathtracer ISPC - Model: Crown
Frames Per Second, More Is Better
Xeon Silver 4216
SE +/- 0.00, N = 3
MIN: 11.32 / MAX: 11.49
11.38
Xeon Gold 5218
SE +/- 0.01, N = 3
MIN: 14.3 / MAX: 14.63
14.42
Xeon Gold 6226R
SE +/- 0.02, N = 3
MIN: 16.67 / MAX: 17
16.81
Xeon Gold 5220R
SE +/- 0.01, N = 3
MIN: 17.5 / MAX: 17.85
17.66
2 x Xeon Silver 4216
SE +/- 0.01, N = 3
MIN: 21.43 / MAX: 22.13
21.75
Xeon W-3275M
SE +/- 0.04, N = 3
MIN: 25.71 / MAX: 26.95
26.40
Xeon Platinum 8280
SE +/- 0.02, N = 3
MIN: 28.26 / MAX: 29.24
28.77
2 x Xeon Gold 6226R
SE +/- 0.03, N = 3
MIN: 31.27 / MAX: 32.36
31.73
2 x Xeon Gold 5220R
SE +/- 0.02, N = 3
MIN: 32.87 / MAX: 34.13
33.45
EPYC 2 7R32
SE +/- 0.08, N = 3
MIN: 44.15 / MAX: 46.52
45.19
2 x Xeon Platinum 8259CL
SE +/- 0.38, N = 3
MIN: 42.99 / MAX: 47.93
46.18
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.05, N = 3
MIN: 45.24 / MAX: 47.89
46.42
2 x Xeon Platinum 8275CL
SE +/- 0.49, N = 12
MIN: 37.93 / MAX: 51.79
49.05
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.03, N = 3
MIN: 48.68 / MAX: 51.86
49.96
2 x Xeon Platinum 8280
SE +/- 0.05, N = 3
MIN: 51.36 / MAX: 55.83
53.23
12
24
36
48
60

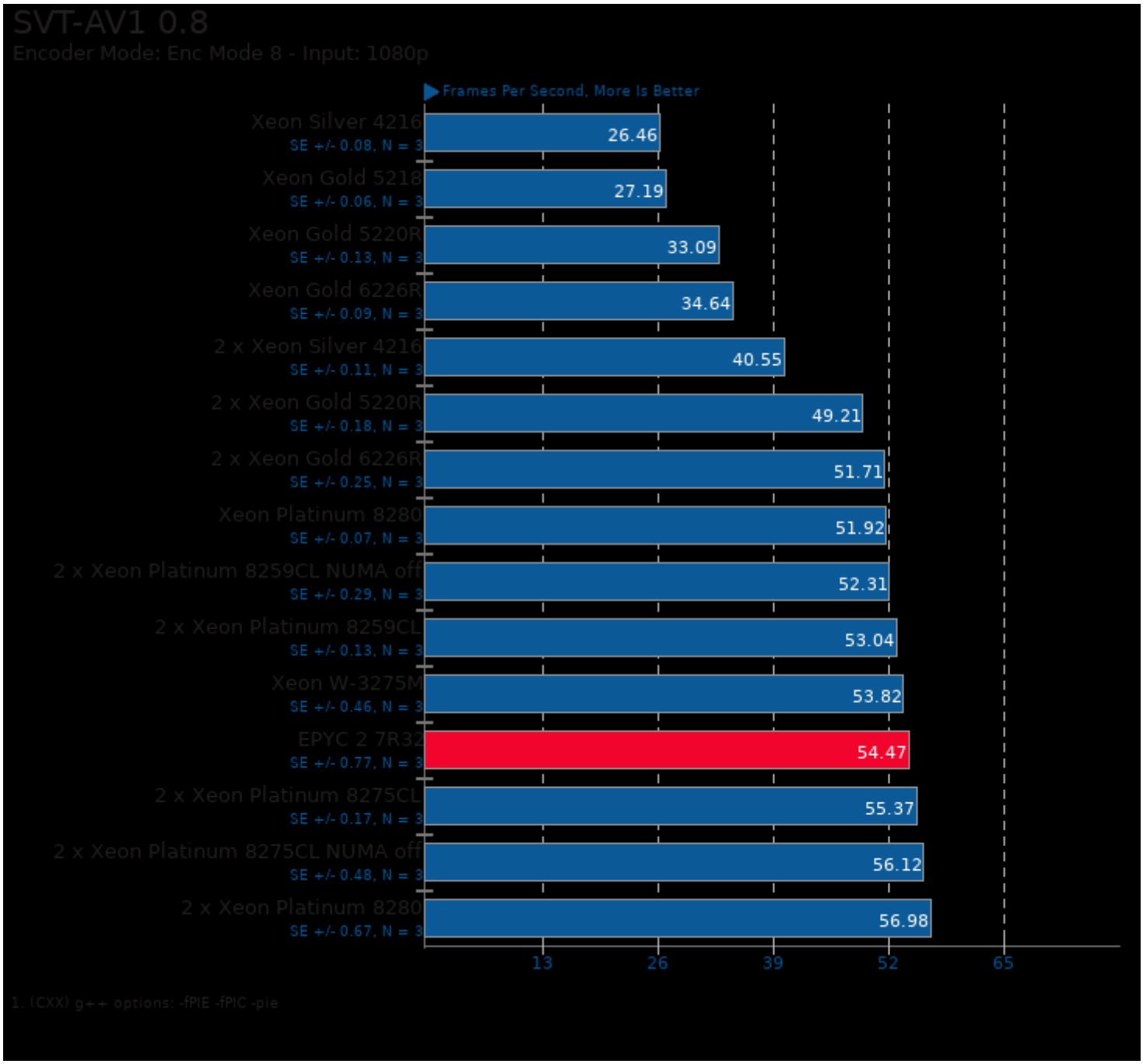

Embree 3.6.1
Binary: Pathtracer - Model: Asian Dragon
Frames Per Second, More Is Better
Xeon Silver 4216
SE +/- 0.03, N = 3
MIN: 15.18 / MAX: 15.39
15.28
Xeon Gold 5218
SE +/- 0.01, N = 3
MIN: 15.25 / MAX: 15.4
15.31
Xeon Gold 6226R
SE +/- 0.01, N = 3
MIN: 19.28 / MAX: 19.48
19.35
Xeon Gold 5220R
SE +/- 0.04, N = 3
MIN: 19.5 / MAX: 19.79
19.61
2 x Xeon Silver 4216
SE +/- 0.05, N = 3
MIN: 27.97 / MAX: 28.53
28.20
Xeon W-3275M
SE +/- 0.05, N = 3
MIN: 29.8 / MAX: 30.54
30.11
Xeon Platinum 8280
SE +/- 0.04, N = 3
MIN: 32 / MAX: 32.54
32.25
2 x Xeon Gold 6226R
SE +/- 0.03, N = 3
MIN: 34.44 / MAX: 35.19
34.69
2 x Xeon Gold 5220R
SE +/- 0.05, N = 3
MIN: 35.51 / MAX: 36.33
35.88
2 x Xeon Platinum 8275CL
SE +/- 0.32, N = 3
MIN: 37.64 / MAX: 43.58
40.08
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.19, N = 3
MIN: 44.89 / MAX: 47.26
45.77
2 x Xeon Platinum 8259CL
SE +/- 0.38, N = 3
MIN: 44.43 / MAX: 47.97
46.79
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.08, N = 3
MIN: 46.17 / MAX: 47.87
46.91
EPYC 2 7R32
SE +/- 0.06, N = 3
MIN: 52.3 / MAX: 53.84
52.95
2 x Xeon Platinum 8280
SE +/- 0.16, N = 3
MIN: 55.98 / MAX: 58.87
57.49
13
26
39
52
65

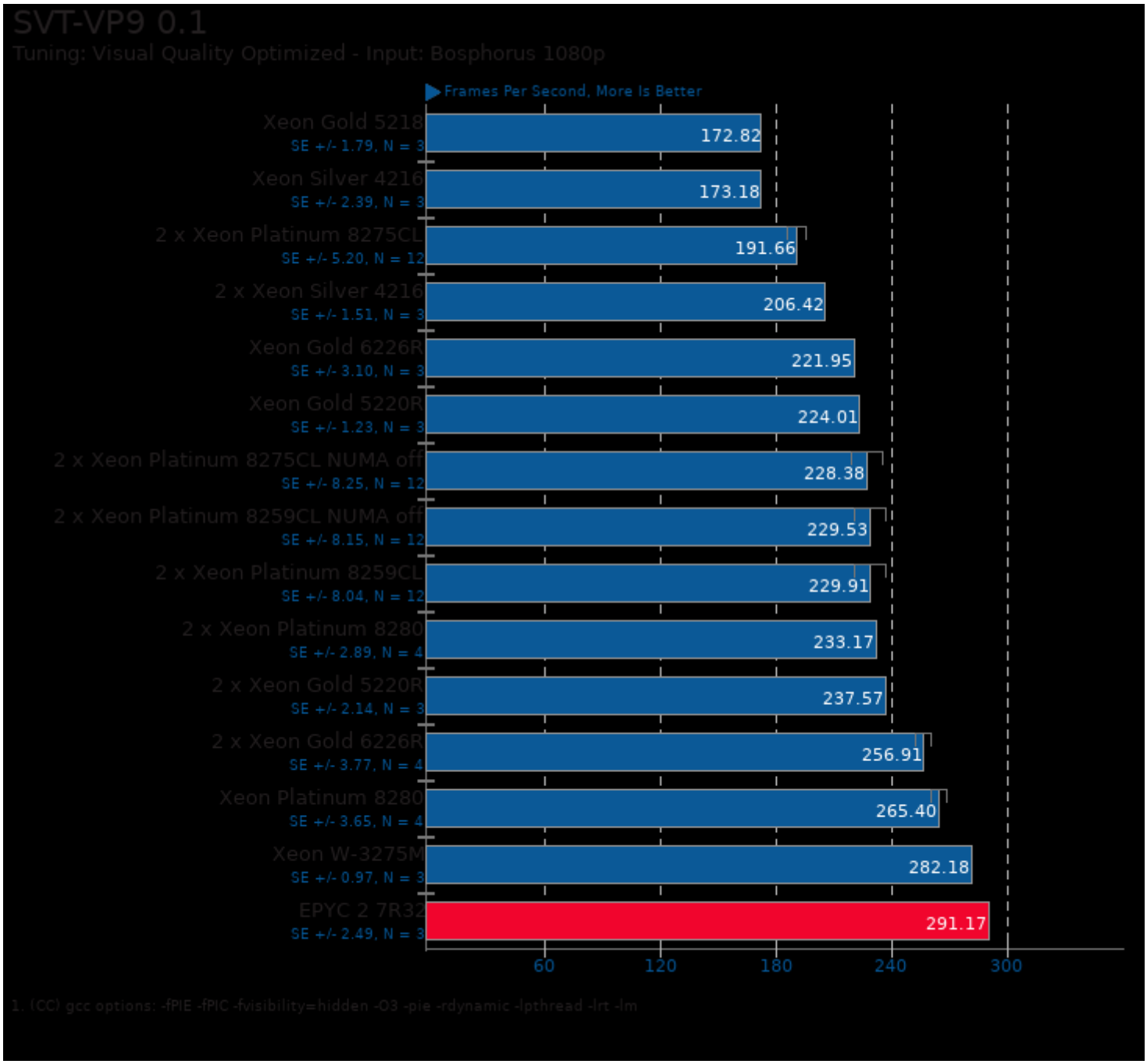

Embree 3.6.1
Binary: Pathtracer - Model: Asian Dragon Obj
Frames Per Second, More Is Better
Xeon Gold 5218
SE +/- 0.02, N = 3
MIN: 13.79 / MAX: 13.97
13.85
Xeon Silver 4216
SE +/- 0.01, N = 3
MIN: 13.82 / MAX: 13.97
13.88
Xeon Gold 6226R
SE +/- 0.03, N = 3
MIN: 17.34 / MAX: 17.59
17.42
Xeon Gold 5220R
SE +/- 0.03, N = 3
MIN: 17.67 / MAX: 17.93
17.80
2 x Xeon Silver 4216
SE +/- 0.05, N = 3
MIN: 25.3 / MAX: 25.83
25.50
Xeon W-3275M
SE +/- 0.01, N = 3
MIN: 26.82 / MAX: 27.54
27.20
Xeon Platinum 8280
SE +/- 0.06, N = 3
MIN: 28.89 / MAX: 29.61
29.21
2 x Xeon Gold 6226R
SE +/- 0.01, N = 3
MIN: 31.07 / MAX: 31.76
31.31
2 x Xeon Gold 5220R
SE +/- 0.05, N = 3
MIN: 31.97 / MAX: 32.83
32.33
2 x Xeon Platinum 8275CL
SE +/- 0.34, N = 3
MIN: 34.25 / MAX: 38.16
35.67
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.09, N = 3
MIN: 40.1 / MAX: 42.54
40.85
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.05, N = 3
MIN: 41.76 / MAX: 43.28
42.49
2 x Xeon Platinum 8259CL
SE +/- 0.04, N = 3
MIN: 42.06 / MAX: 43.59
42.76
EPYC 2 7R32
SE +/- 0.03, N = 3
MIN: 46.92 / MAX: 48.74
47.58
2 x Xeon Platinum 8280
SE +/- 0.11, N = 3
MIN: 50.62 / MAX: 53.17
51.79
12
24
36
48
60

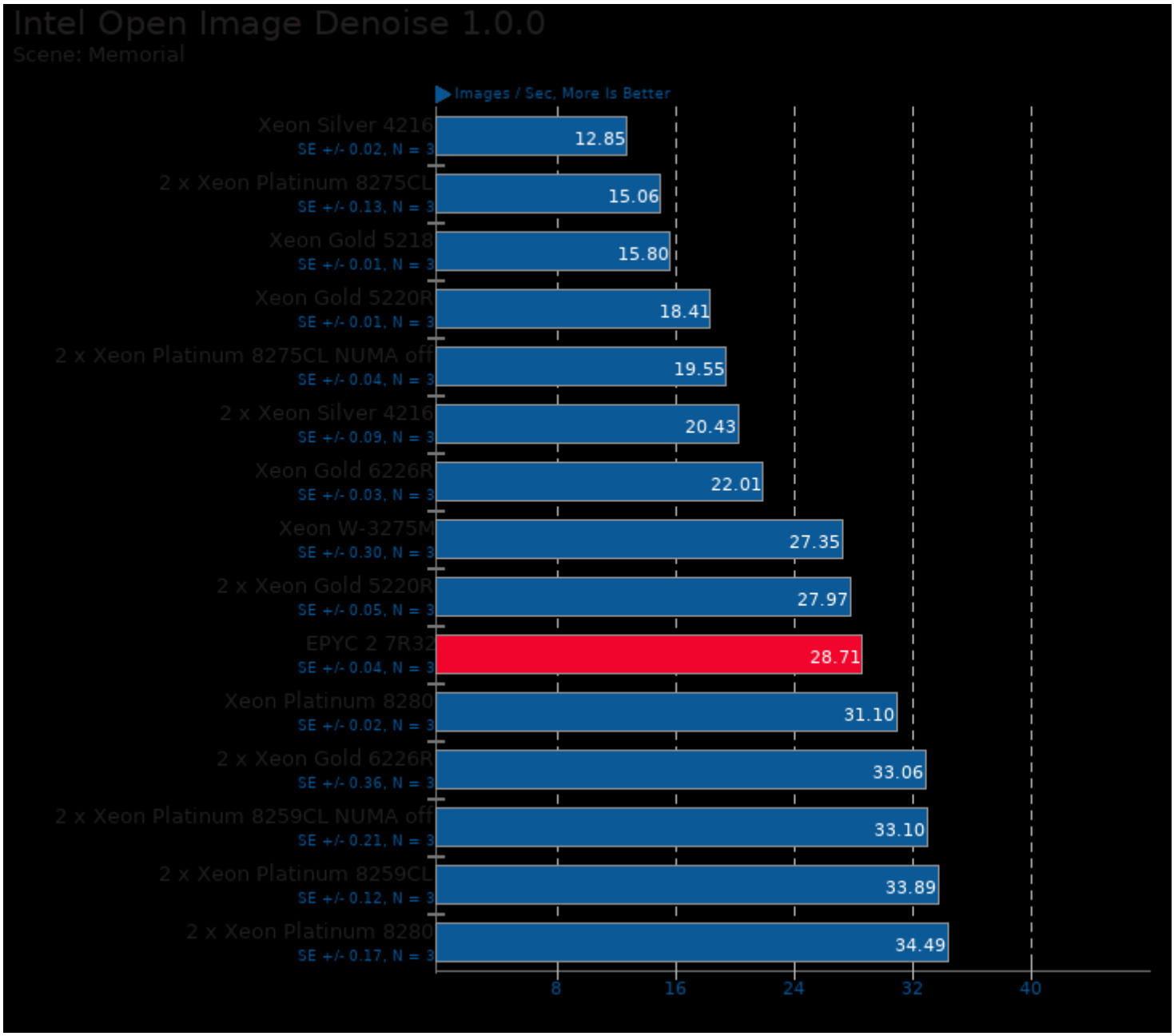

Embree 3.6.1
Binary: Pathtracer ISPC - Model: Asian Dragon
Frames Per Second, More Is Better
Xeon Silver 4216
SE +/- 0.01, N = 3
MIN: 15.54 / MAX: 15.7
15.59
Xeon Gold 5218
SE +/- 0.01, N = 3
MIN: 19.37 / MAX: 19.6
19.43
Xeon Gold 6226R
SE +/- 0.01, N = 3
MIN: 22.38 / MAX: 22.62
22.46
Xeon Gold 5220R
SE +/- 0.02, N = 3
MIN: 23.45 / MAX: 23.8
23.60
2 x Xeon Silver 4216
SE +/- 0.02, N = 3
MIN: 28.72 / MAX: 29.29
28.97
Xeon W-3275M
SE +/- 0.08, N = 3
MIN: 33.95 / MAX: 35.72
35.15
Xeon Platinum 8280
SE +/- 0.06, N = 3
MIN: 37.87 / MAX: 38.72
38.31
2 x Xeon Platinum 8275CL
SE +/- 0.53, N = 4
MIN: 35.85 / MAX: 45.98
38.77
2 x Xeon Gold 6226R
SE +/- 0.07, N = 3
MIN: 40.04 / MAX: 41.18
40.43
2 x Xeon Gold 5220R
SE +/- 0.02, N = 3
MIN: 42.68 / MAX: 43.7
43.10
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.02, N = 3
MIN: 50.96 / MAX: 54.15
51.87
EPYC 2 7R32
SE +/- 0.03, N = 3
MIN: 51.67 / MAX: 53.48
52.35
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.12, N = 3
MIN: 57.78 / MAX: 60.29
59.05
2 x Xeon Platinum 8259CL
SE +/- 0.06, N = 3
MIN: 57.51 / MAX: 60.42
59.06
2 x Xeon Platinum 8280
SE +/- 0.03, N = 3
MIN: 66.22 / MAX: 70.39
68.42
15
30
45
60
75

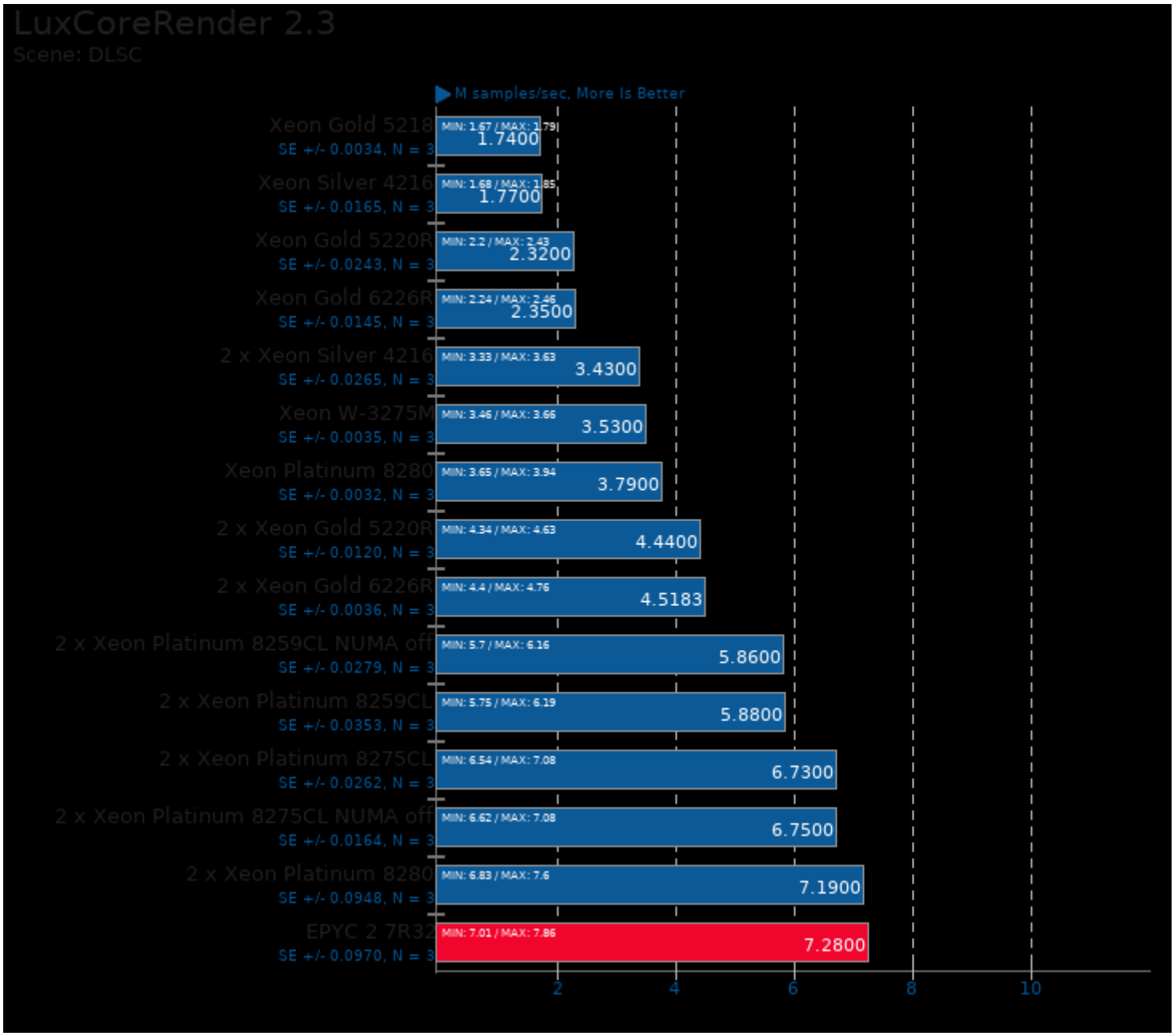

Embree 3.6.1
Binary: Pathtracer ISPC - Model: Asian Dragon Obj
Frames Per Second, More Is Better
Xeon Silver 4216
SE +/- 0.01, N = 3
MIN: 13.43 / MAX: 13.59
13.49
Xeon Gold 5218
SE +/- 0.01, N = 3
MIN: 16.69 / MAX: 16.88
16.77
Xeon Gold 6226R
SE +/- 0.01, N = 3
MIN: 19.25 / MAX: 19.46
19.32
Xeon Gold 5220R
SE +/- 0.01, N = 3
MIN: 20.23 / MAX: 20.53
20.34
2 x Xeon Silver 4216
SE +/- 0.01, N = 3
MIN: 24.86 / MAX: 25.34
25.07
Xeon W-3275M
SE +/- 0.02, N = 3
MIN: 29.95 / MAX: 30.77
30.35
Xeon Platinum 8280
SE +/- 0.02, N = 3
MIN: 32.72 / MAX: 33.4
33.05
2 x Xeon Gold 6226R
SE +/- 0.02, N = 3
MIN: 34.51 / MAX: 35.32
34.80
2 x Xeon Platinum 8275CL
SE +/- 0.63, N = 3
MIN: 34.56 / MAX: 39.51
36.67
2 x Xeon Gold 5220R
SE +/- 0.04, N = 3
MIN: 36.74 / MAX: 37.69
37.15
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.01, N = 3
MIN: 43.9 / MAX: 46.32
44.72
EPYC 2 7R32
SE +/- 0.03, N = 3
MIN: 44.82 / MAX: 46.53
45.43
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.01, N = 3
MIN: 49.88 / MAX: 52.05
50.86
2 x Xeon Platinum 8259CL
SE +/- 0.00, N = 3
MIN: 49.91 / MAX: 52.27
50.98
2 x Xeon Platinum 8280
SE +/- 0.05, N = 3
MIN: 56.97 / MAX: 60.91
58.69
13
26
39
52
65

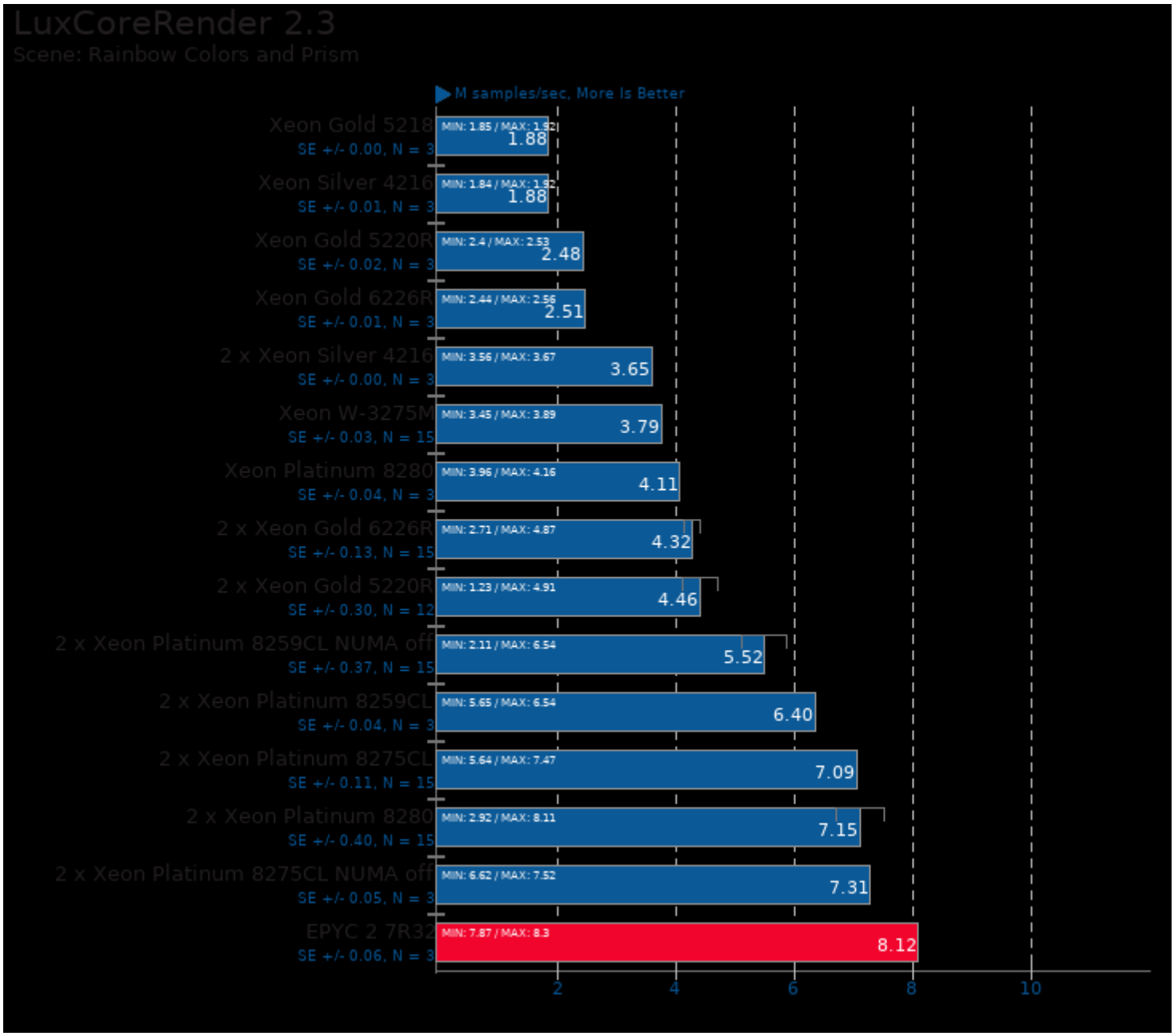

SVT-AV1 0.8
Encoder Mode: Enc Mode 4 - Input: 1080p
Frames Per Second, More Is Better
Xeon Silver 4216
SE +/- 0.021, N = 3
3.309
Xeon Gold 5218
SE +/- 0.003, N = 3
3.339
2 x Xeon Silver 4216
SE +/- 0.010, N = 3
4.216
Xeon Gold 5220R
SE +/- 0.014, N = 3
4.285
Xeon Gold 6226R
SE +/- 0.018, N = 3
4.340
2 x Xeon Platinum 8275CL
SE +/- 0.041, N = 3
5.243
2 x Xeon Gold 5220R
SE +/- 0.019, N = 3
5.302
2 x Xeon Gold 6226R
SE +/- 0.009, N = 3
5.431
EPYC 2 7R32
SE +/- 0.072, N = 5
5.714
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.046, N = 3
5.942
2 x Xeon Platinum 8259CL
SE +/- 0.002, N = 3
5.955
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.075, N = 4
5.996
Xeon Platinum 8280
SE +/- 0.032, N = 3
6.030
Xeon W-3275M
SE +/- 0.023, N = 3
6.389
2 x Xeon Platinum 8280
SE +/- 0.064, N = 3
7.033
2
4
6
8
10
1. (CXX) g++ options: -fPIE -fPIC -pie

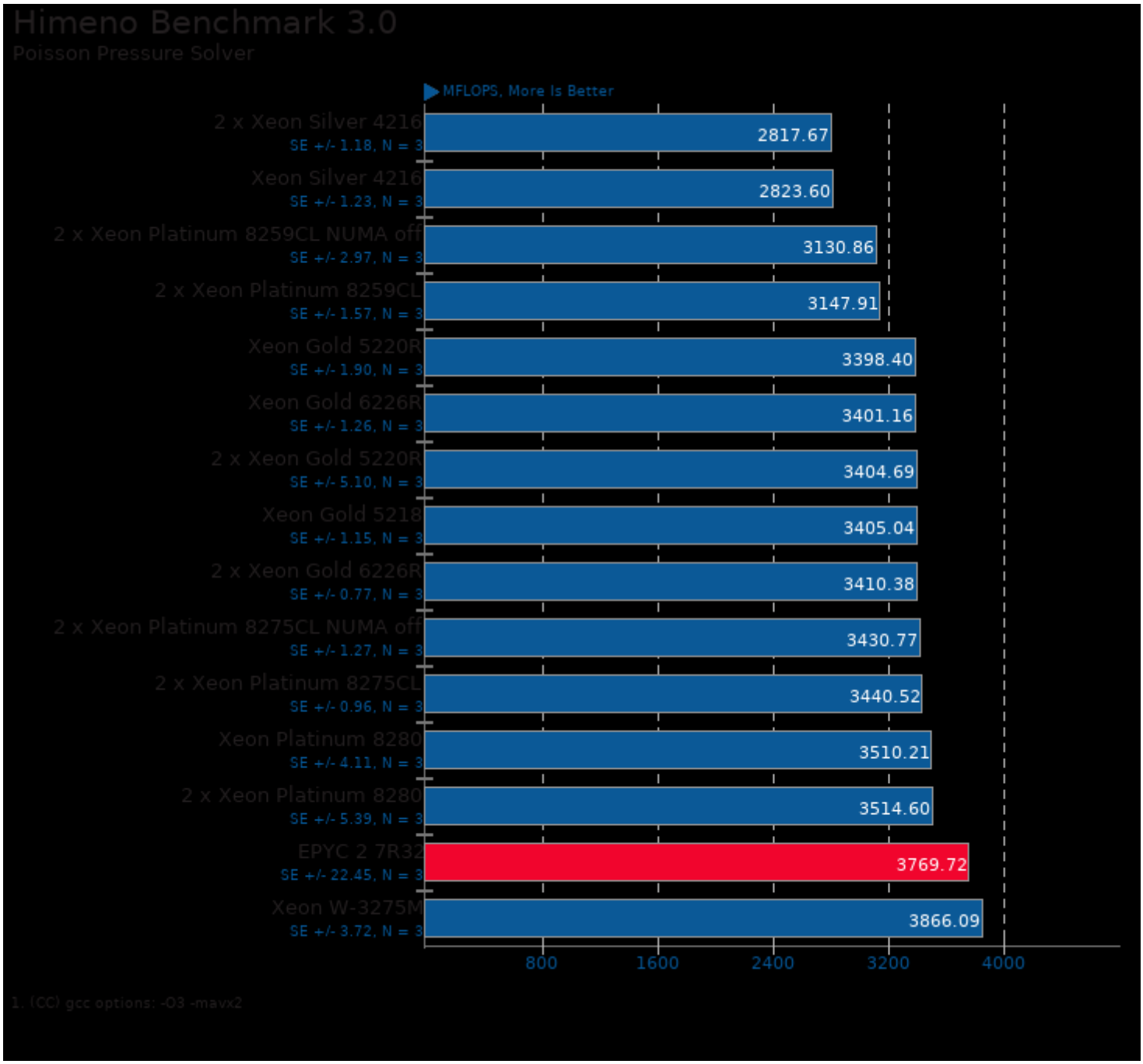

SVT-AV1 0.8
Encoder Mode: Enc Mode 8 - Input: 1080p
Frames Per Second, More Is Better
Xeon Silver 4216
SE +/- 0.08, N = 3
26.46
Xeon Gold 5218
SE +/- 0.06, N = 3
27.19
Xeon Gold 5220R
SE +/- 0.13, N = 3
33.09
Xeon Gold 6226R
SE +/- 0.09, N = 3
34.64
2 x Xeon Silver 4216
SE +/- 0.11, N = 3
40.55
2 x Xeon Gold 5220R
SE +/- 0.18, N = 3
49.21
2 x Xeon Gold 6226R
SE +/- 0.25, N = 3
51.71
Xeon Platinum 8280
SE +/- 0.07, N = 3
51.92
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.29, N = 3
52.31
2 x Xeon Platinum 8259CL
SE +/- 0.13, N = 3
53.04
Xeon W-3275M
SE +/- 0.46, N = 3
53.82
EPYC 2 7R32
SE +/- 0.77, N = 3
54.47
2 x Xeon Platinum 8275CL
SE +/- 0.17, N = 3
55.37
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.48, N = 3
56.12
2 x Xeon Platinum 8280
SE +/- 0.67, N = 3
56.98
13
26
39
52
65
1. (CXX) g++ options: -fPIE -fPIC -pie

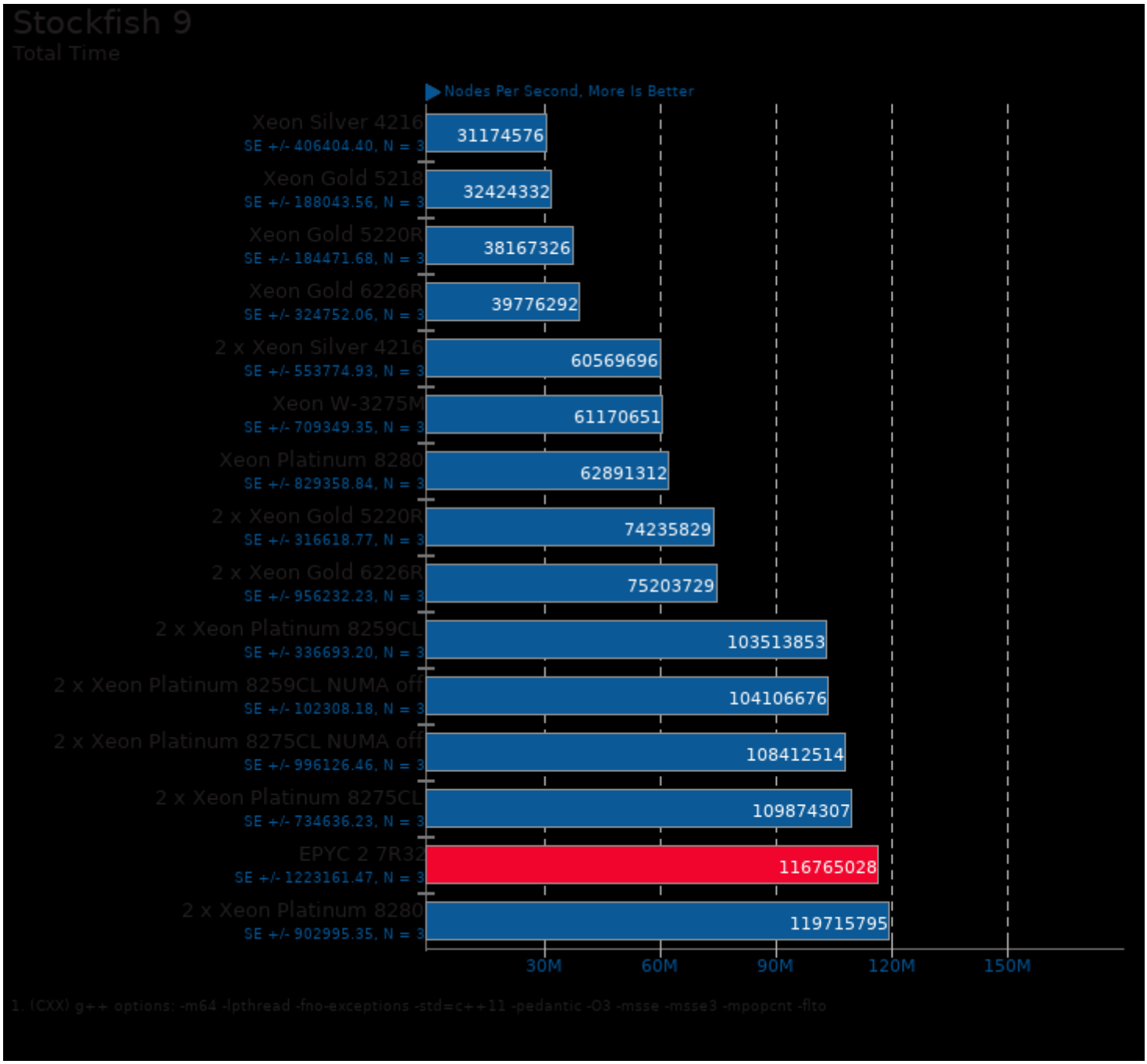

SVT-VP9 0.1
Tuning: Visual Quality Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
Xeon Gold 5218
SE +/- 1.79, N = 3
172.82
Xeon Silver 4216
SE +/- 2.39, N = 3
173.18
2 x Xeon Platinum 8275CL
SE +/- 5.20, N = 12
191.66
2 x Xeon Silver 4216
SE +/- 1.51, N = 3
206.42
Xeon Gold 6226R
SE +/- 3.10, N = 3
221.95
Xeon Gold 5220R
SE +/- 1.23, N = 3
224.01
2 x Xeon Platinum 8275CL NUMA off
SE +/- 8.25, N = 12
228.38
2 x Xeon Platinum 8259CL NUMA off
SE +/- 8.15, N = 12
229.53
2 x Xeon Platinum 8259CL
SE +/- 8.04, N = 12
229.91
2 x Xeon Platinum 8280
SE +/- 2.89, N = 4
233.17
2 x Xeon Gold 5220R
SE +/- 2.14, N = 3
237.57
2 x Xeon Gold 6226R
SE +/- 3.77, N = 4
256.91
Xeon Platinum 8280
SE +/- 3.65, N = 4
265.40
Xeon W-3275M
SE +/- 0.97, N = 3
282.18
EPYC 2 7R32
SE +/- 2.49, N = 3
291.17
60
120
180
240
300
1. (CC) gcc options: -fPIE -fPIC -fvisibility=hidden -O3 -pie -rdynamic -lpthread -lrt -lm

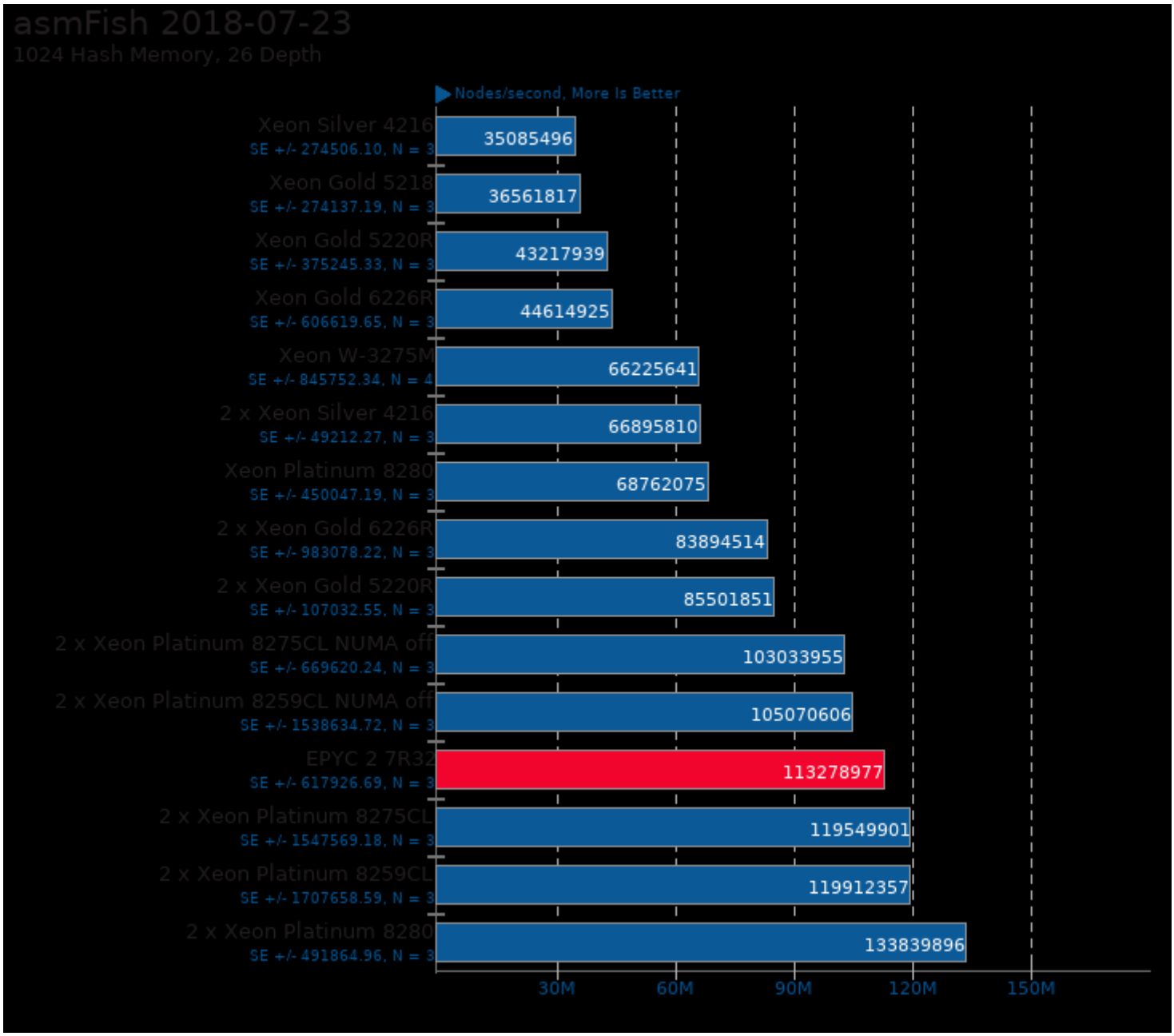

Intel Open Image Denoise 1.0.0
Scene: Memorial
Images / Sec, More Is Better
Xeon Silver 4216
SE +/- 0.02, N = 3
12.85
2 x Xeon Platinum 8275CL
SE +/- 0.13, N = 3
15.06
Xeon Gold 5218
SE +/- 0.01, N = 3
15.80
Xeon Gold 5220R
SE +/- 0.01, N = 3
18.41
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.04, N = 3
19.55
2 x Xeon Silver 4216
SE +/- 0.09, N = 3
20.43
Xeon Gold 6226R
SE +/- 0.03, N = 3
22.01
Xeon W-3275M
SE +/- 0.30, N = 3
27.35
2 x Xeon Gold 5220R
SE +/- 0.05, N = 3
27.97
EPYC 2 7R32
SE +/- 0.04, N = 3
28.71
Xeon Platinum 8280
SE +/- 0.02, N = 3
31.10
2 x Xeon Gold 6226R
SE +/- 0.36, N = 3
33.06
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.21, N = 3
33.10
2 x Xeon Platinum 8259CL
SE +/- 0.12, N = 3
33.89
2 x Xeon Platinum 8280
SE +/- 0.17, N = 3
34.49
8
16
24
32
40

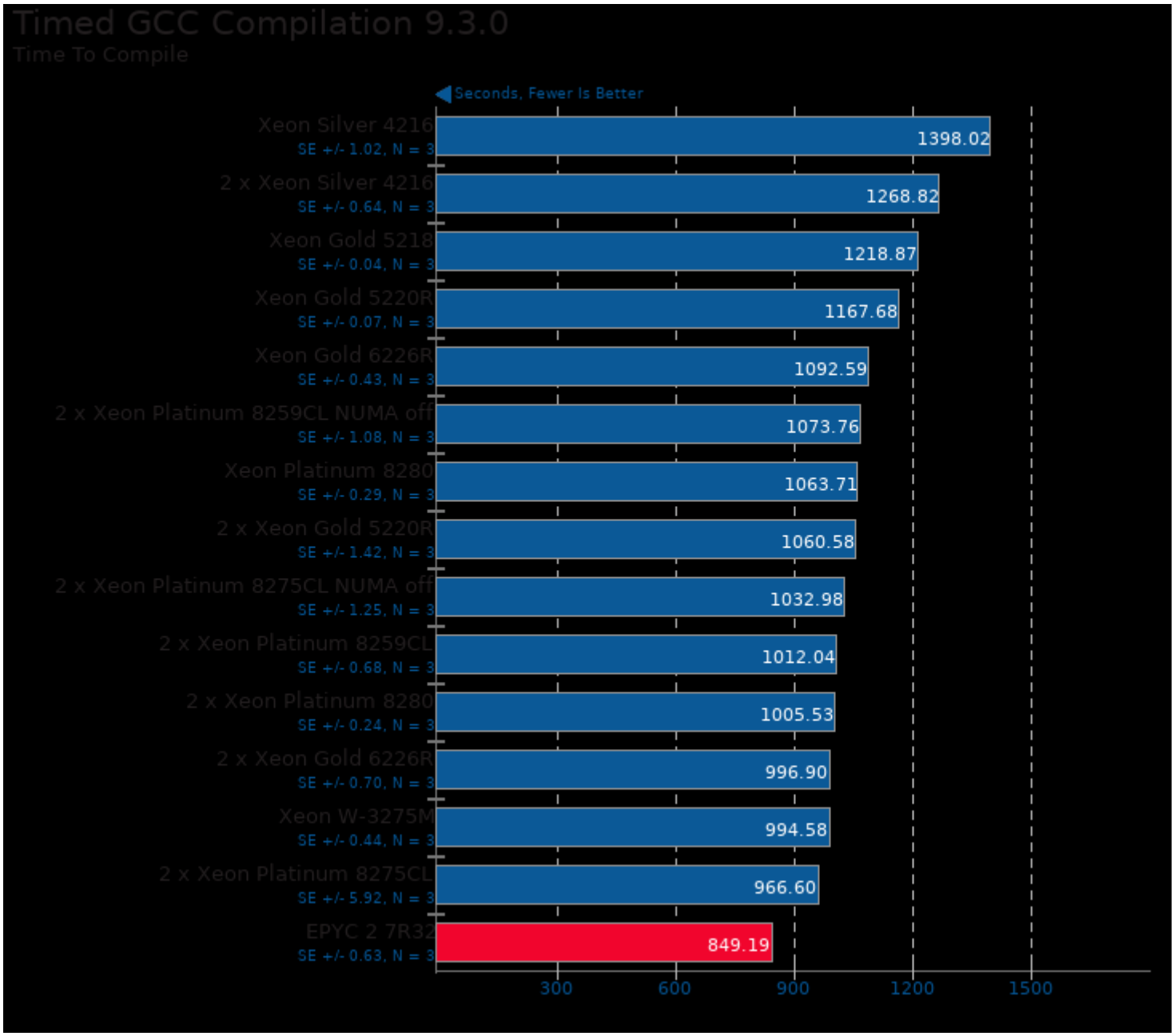

LuxCoreRender 2.3
Scene: DLSC
M samples/sec, More Is Better
Xeon Gold 5218
SE +/- 0.0034, N = 3
MIN: 1.67 / MAX: 1.79
1.7400
Xeon Silver 4216
SE +/- 0.0165, N = 3
MIN: 1.68 / MAX: 1.85
1.7700
Xeon Gold 5220R
SE +/- 0.0243, N = 3
MIN: 2.2 / MAX: 2.43
2.3200
Xeon Gold 6226R
SE +/- 0.0145, N = 3
MIN: 2.24 / MAX: 2.46
2.3500
2 x Xeon Silver 4216
SE +/- 0.0265, N = 3
MIN: 3.33 / MAX: 3.63
3.4300
Xeon W-3275M
SE +/- 0.0035, N = 3
MIN: 3.46 / MAX: 3.66
3.5300
Xeon Platinum 8280
SE +/- 0.0032, N = 3
MIN: 3.65 / MAX: 3.94
3.7900
2 x Xeon Gold 5220R
SE +/- 0.0120, N = 3
MIN: 4.34 / MAX: 4.63
4.4400
2 x Xeon Gold 6226R
SE +/- 0.0036, N = 3
MIN: 4.4 / MAX: 4.76
4.5183
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.0279, N = 3
MIN: 5.7 / MAX: 6.16
5.8600
2 x Xeon Platinum 8259CL
SE +/- 0.0353, N = 3
MIN: 5.75 / MAX: 6.19
5.8800
2 x Xeon Platinum 8275CL
SE +/- 0.0262, N = 3
MIN: 6.54 / MAX: 7.08
6.7300
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.0164, N = 3
MIN: 6.62 / MAX: 7.08
6.7500
2 x Xeon Platinum 8280
SE +/- 0.0948, N = 3
MIN: 6.83 / MAX: 7.6
7.1900
EPYC 2 7R32
SE +/- 0.0970, N = 3
MIN: 7.01 / MAX: 7.86
7.2800
2
4
6
8
10

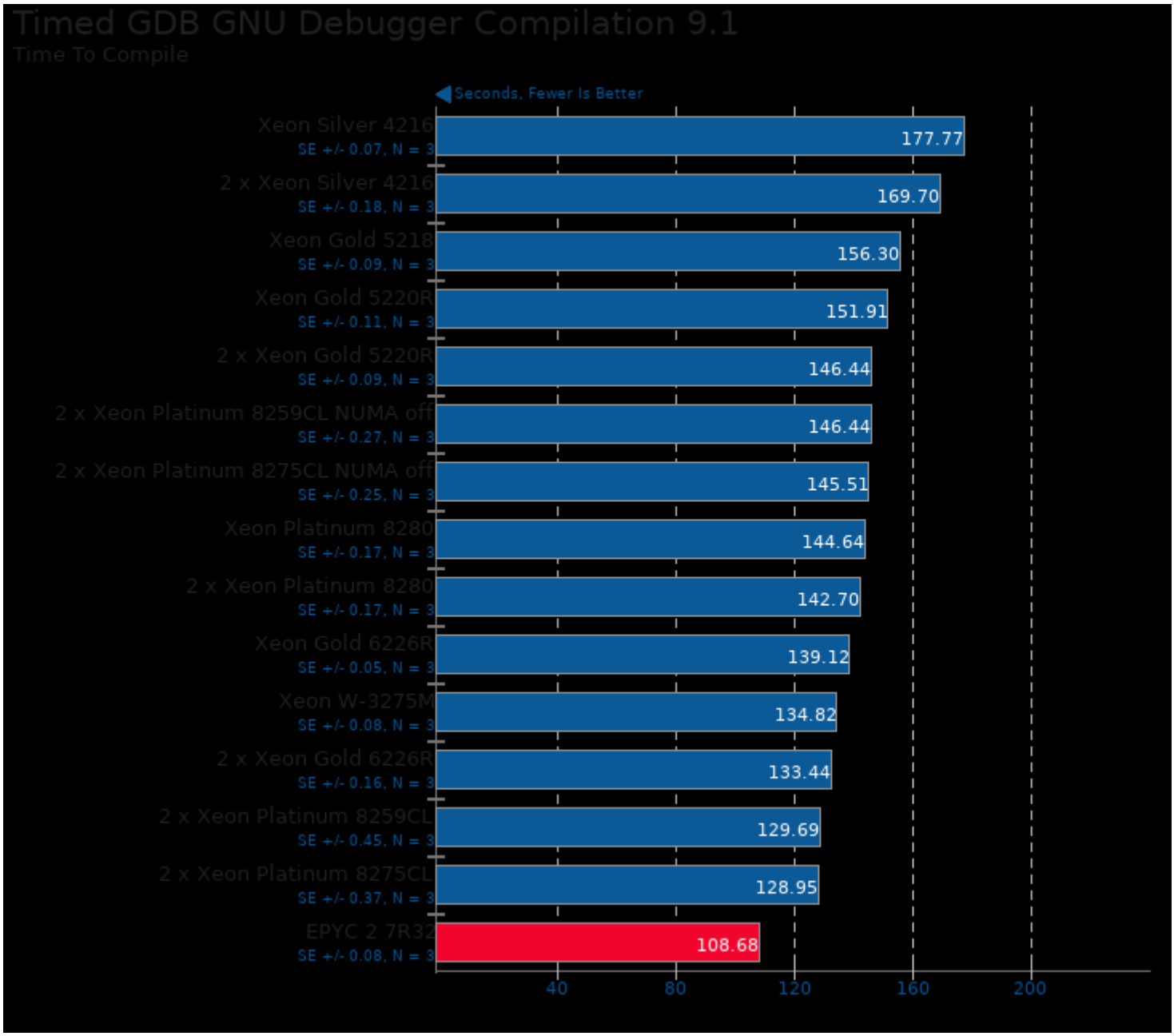

LuxCoreRender 2.3
Scene: Rainbow Colors and Prism
M samples/sec, More Is Better
Xeon Gold 5218
SE +/- 0.00, N = 3
MIN: 1.85 / MAX: 1.92
1.88
Xeon Silver 4216
SE +/- 0.01, N = 3
MIN: 1.84 / MAX: 1.92
1.88
Xeon Gold 5220R
SE +/- 0.02, N = 3
MIN: 2.4 / MAX: 2.53
2.48
Xeon Gold 6226R
SE +/- 0.01, N = 3
MIN: 2.44 / MAX: 2.56
2.51
2 x Xeon Silver 4216
SE +/- 0.00, N = 3
MIN: 3.56 / MAX: 3.67
3.65
Xeon W-3275M
SE +/- 0.03, N = 15
MIN: 3.45 / MAX: 3.89
3.79
Xeon Platinum 8280
SE +/- 0.04, N = 3
MIN: 3.96 / MAX: 4.16
4.11
2 x Xeon Gold 6226R
SE +/- 0.13, N = 15
MIN: 2.71 / MAX: 4.87
4.32
2 x Xeon Gold 5220R
SE +/- 0.30, N = 12
MIN: 1.23 / MAX: 4.91
4.46
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.37, N = 15
MIN: 2.11 / MAX: 6.54
5.52
2 x Xeon Platinum 8259CL
SE +/- 0.04, N = 3
MIN: 5.65 / MAX: 6.54
6.40
2 x Xeon Platinum 8275CL
SE +/- 0.11, N = 15
MIN: 5.64 / MAX: 7.47
7.09
2 x Xeon Platinum 8280
SE +/- 0.40, N = 15
MIN: 2.92 / MAX: 8.11
7.15
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.05, N = 3
MIN: 6.62 / MAX: 7.52
7.31
EPYC 2 7R32
SE +/- 0.06, N = 3
MIN: 7.87 / MAX: 8.3
8.12
2
4
6
8
10

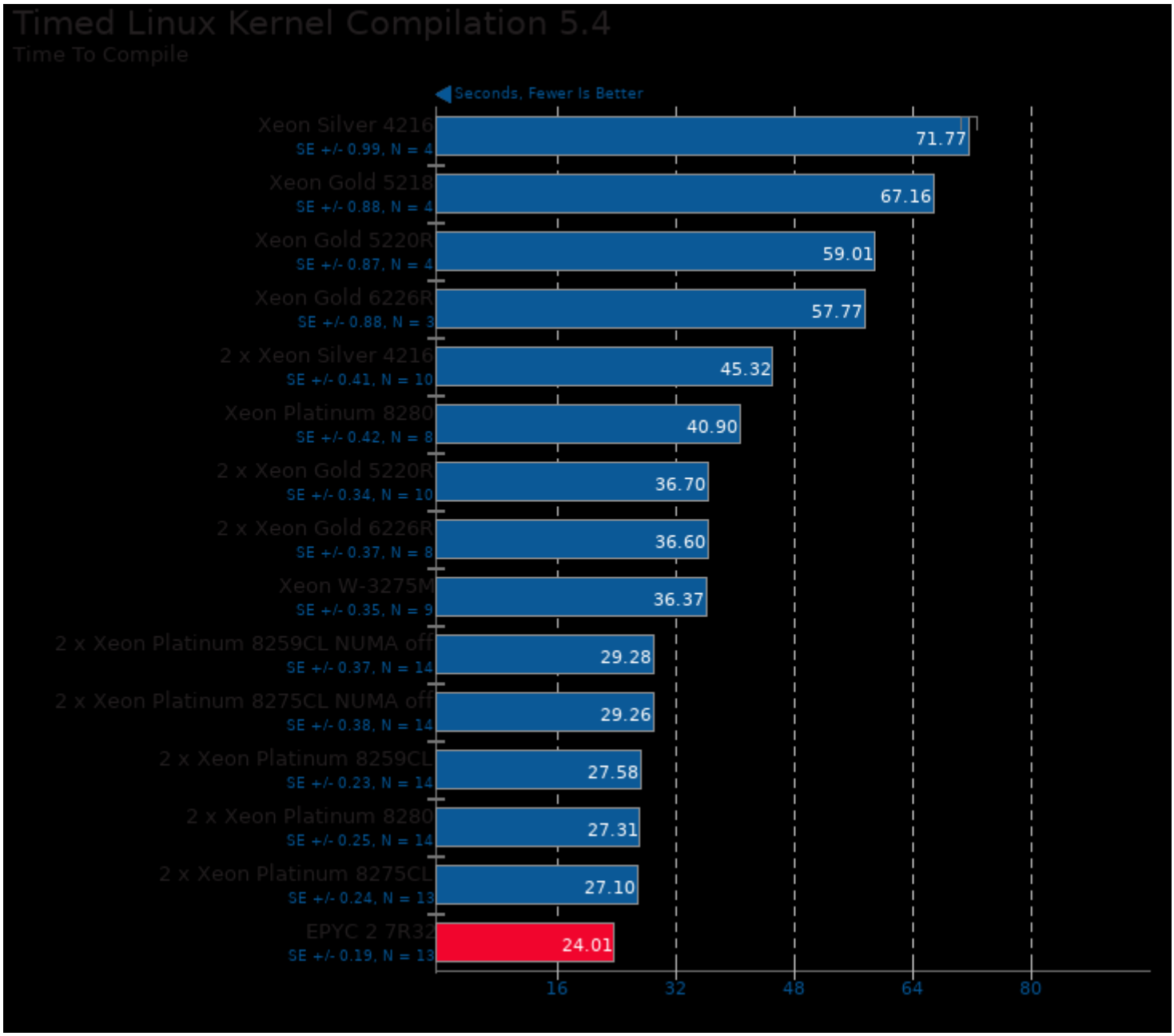

Himeno Benchmark 3.0
Poisson Pressure Solver
MFLOPS, More Is Better
2 x Xeon Silver 4216
SE +/- 1.18, N = 3
2817.67
Xeon Silver 4216
SE +/- 1.23, N = 3
2823.60
2 x Xeon Platinum 8259CL NUMA off
SE +/- 2.97, N = 3
3130.86
2 x Xeon Platinum 8259CL
SE +/- 1.57, N = 3
3147.91
Xeon Gold 5220R
SE +/- 1.90, N = 3
3398.40
Xeon Gold 6226R
SE +/- 1.26, N = 3
3401.16
2 x Xeon Gold 5220R
SE +/- 5.10, N = 3
3404.69
Xeon Gold 5218
SE +/- 1.15, N = 3
3405.04
2 x Xeon Gold 6226R
SE +/- 0.77, N = 3
3410.38
2 x Xeon Platinum 8275CL NUMA off
SE +/- 1.27, N = 3
3430.77
2 x Xeon Platinum 8275CL
SE +/- 0.96, N = 3
3440.52
Xeon Platinum 8280
SE +/- 4.11, N = 3
3510.21
2 x Xeon Platinum 8280
SE +/- 5.39, N = 3
3514.60
EPYC 2 7R32
SE +/- 22.45, N = 3
3769.72
Xeon W-3275M
SE +/- 3.72, N = 3
3866.09
800
1600
2400
3200
4000
1. (CC) gcc options: -O3 -mavx2

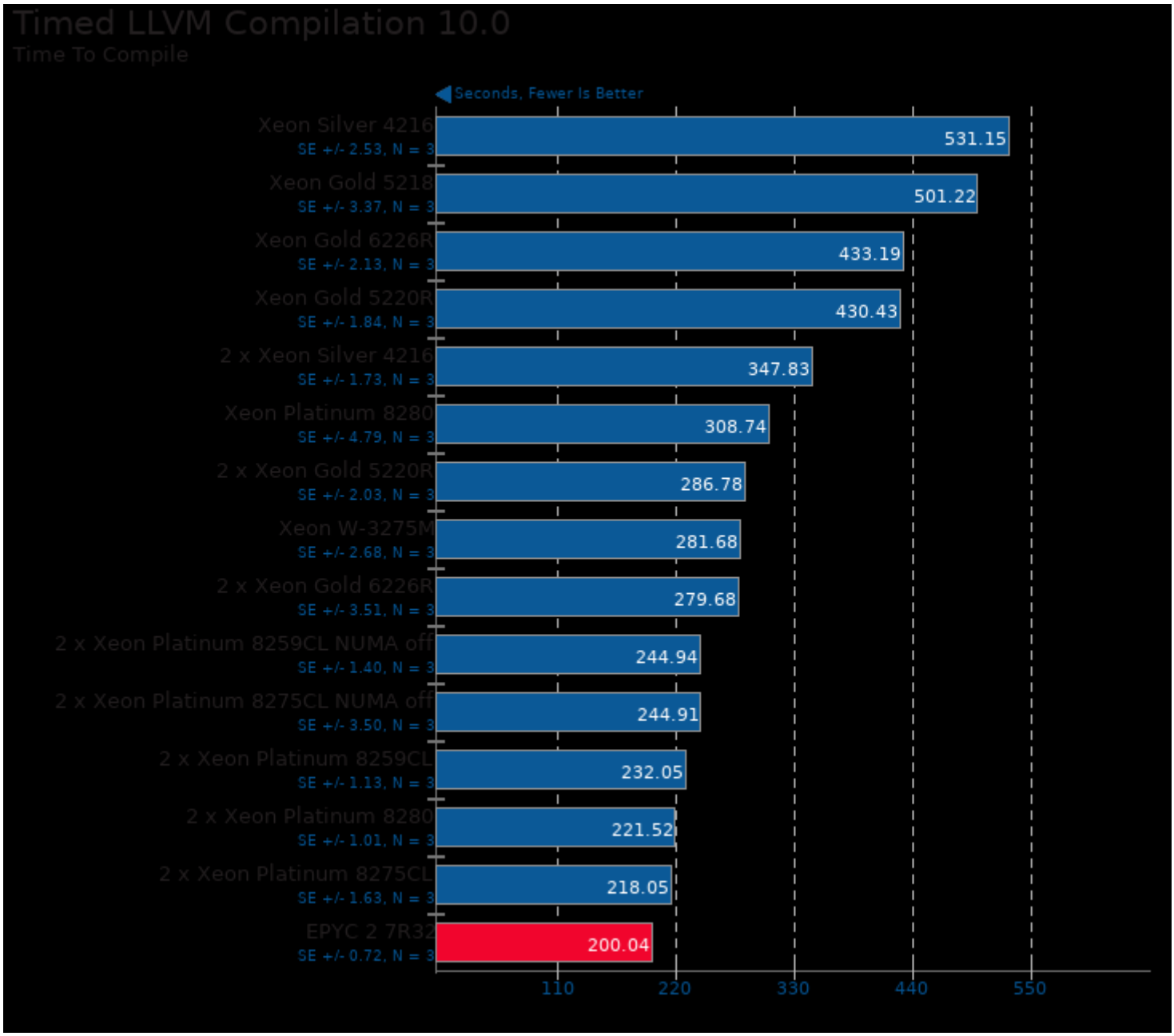

Stockfish 9
Total Time
Nodes Per Second, More Is Better
Xeon Silver 4216
SE +/- 406404.40, N = 3
31174576
Xeon Gold 5218
SE +/- 188043.56, N = 3
32424332
Xeon Gold 5220R
SE +/- 184471.68, N = 3
38167326
Xeon Gold 6226R
SE +/- 324752.06, N = 3
39776292
2 x Xeon Silver 4216
SE +/- 553774.93, N = 3
60569696
Xeon W-3275M
SE +/- 709349.35, N = 3
61170651
Xeon Platinum 8280
SE +/- 829358.84, N = 3
62891312
2 x Xeon Gold 5220R
SE +/- 316618.77, N = 3
74235829
2 x Xeon Gold 6226R
SE +/- 956232.23, N = 3
75203729
2 x Xeon Platinum 8259CL
SE +/- 336693.20, N = 3
103513853
2 x Xeon Platinum 8259CL NUMA off
SE +/- 102308.18, N = 3
104106676
2 x Xeon Platinum 8275CL NUMA off
SE +/- 996126.46, N = 3
108412514
2 x Xeon Platinum 8275CL
SE +/- 734636.23, N = 3
109874307
EPYC 2 7R32
SE +/- 1223161.47, N = 3
116765028
2 x Xeon Platinum 8280
SE +/- 902995.35, N = 3
119715795
30M
60M
90M
120M
150M
1. (CXX) g++ options: -m64 -lpthread -fno-exceptions -std=c++11 -pedantic -O3 -msse -msse3 -mpopcnt -flto

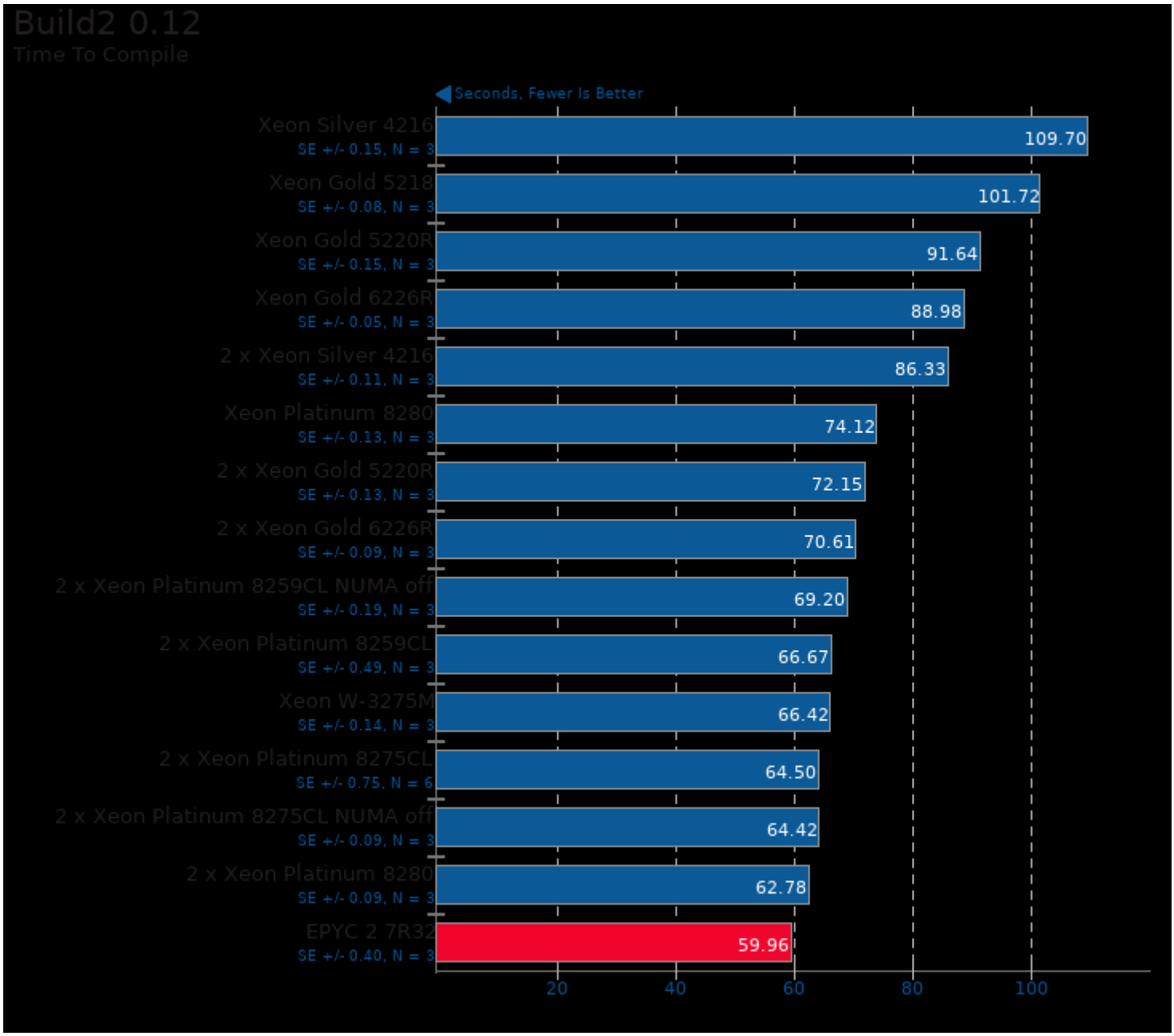

asmFish 2018-07-23
1024 Hash Memory, 26 Depth
Nodes/second, More Is Better
Xeon Silver 4216
SE +/- 274506.10, N = 3
35085496
Xeon Gold 5218
SE +/- 274137.19, N = 3
36561817
Xeon Gold 5220R
SE +/- 375245.33, N = 3
43217939
Xeon Gold 6226R
SE +/- 606619.65, N = 3
44614925
Xeon W-3275M
SE +/- 845752.34, N = 4
66225641
2 x Xeon Silver 4216
SE +/- 49212.27, N = 3
66895810
Xeon Platinum 8280
SE +/- 450047.19, N = 3
68762075
2 x Xeon Gold 6226R
SE +/- 983078.22, N = 3
83894514
2 x Xeon Gold 5220R
SE +/- 107032.55, N = 3
85501851
2 x Xeon Platinum 8275CL NUMA off
SE +/- 669620.24, N = 3
103033955
2 x Xeon Platinum 8259CL NUMA off
SE +/- 1538634.72, N = 3
105070606
EPYC 2 7R32
SE +/- 617926.69, N = 3
113278977
2 x Xeon Platinum 8275CL
SE +/- 1547569.18, N = 3
119549901
2 x Xeon Platinum 8259CL
SE +/- 1707658.59, N = 3
119912357
2 x Xeon Platinum 8280
SE +/- 491864.96, N = 3
133839896
30M
60M
90M
120M
150M

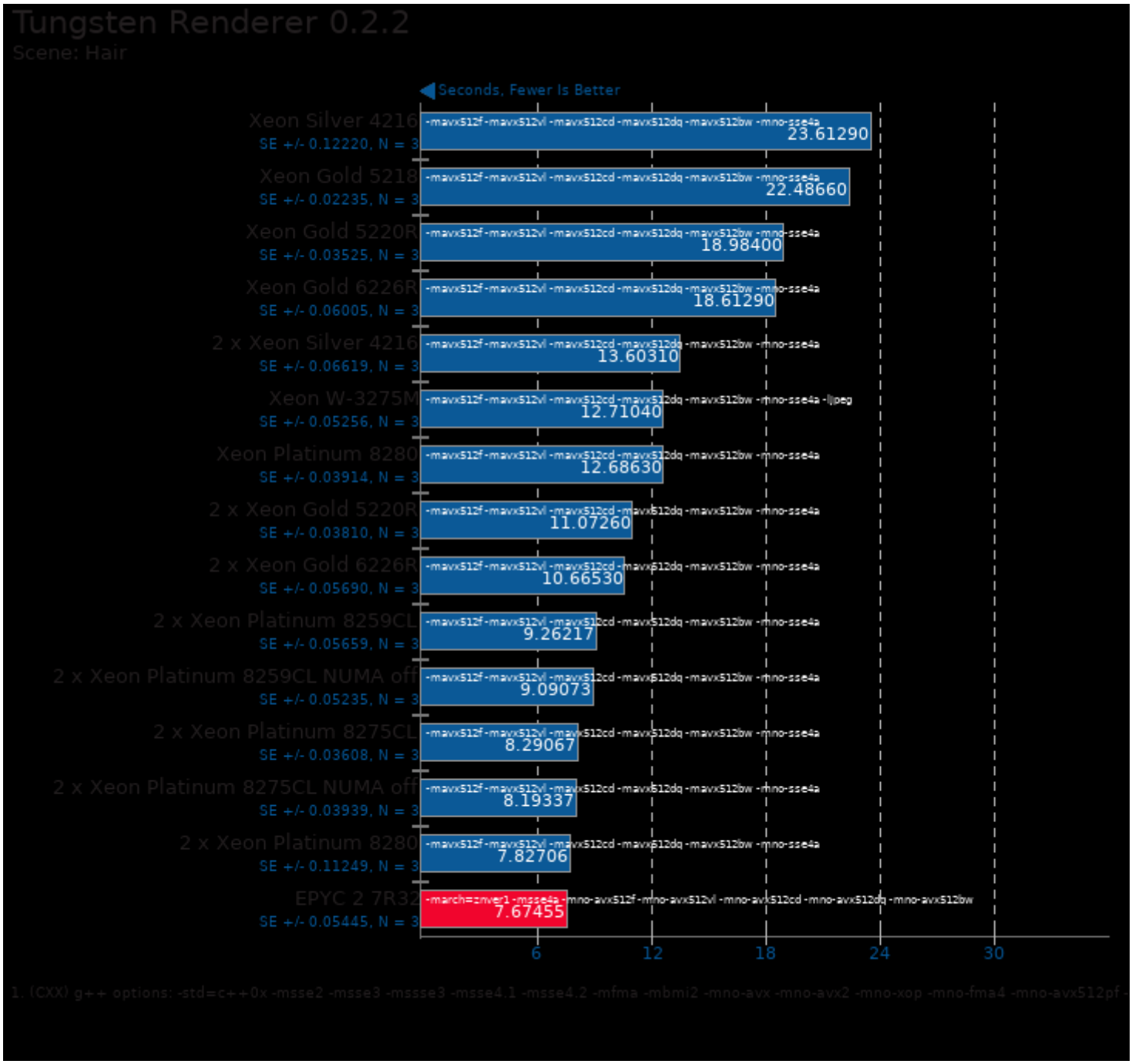

Timed GCC Compilation 9.3.0
Time To Compile
Seconds, Fewer Is Better
Xeon Silver 4216
SE +/- 1.02, N = 3
1398.02
2 x Xeon Silver 4216
SE +/- 0.64, N = 3
1268.82
Xeon Gold 5218
SE +/- 0.04, N = 3
1218.87
Xeon Gold 5220R
SE +/- 0.07, N = 3
1167.68
Xeon Gold 6226R
SE +/- 0.43, N = 3
1092.59
2 x Xeon Platinum 8259CL NUMA off
SE +/- 1.08, N = 3
1073.76
Xeon Platinum 8280
SE +/- 0.29, N = 3
1063.71
2 x Xeon Gold 5220R
SE +/- 1.42, N = 3
1060.58
2 x Xeon Platinum 8275CL NUMA off
SE +/- 1.25, N = 3
1032.98
2 x Xeon Platinum 8259CL
SE +/- 0.68, N = 3
1012.04
2 x Xeon Platinum 8280
SE +/- 0.24, N = 3
1005.53
2 x Xeon Gold 6226R
SE +/- 0.70, N = 3
996.90
Xeon W-3275M
SE +/- 0.44, N = 3
994.58
2 x Xeon Platinum 8275CL
SE +/- 5.92, N = 3
966.60
EPYC 2 7R32
SE +/- 0.63, N = 3
849.19
300
600
900
1200
1500

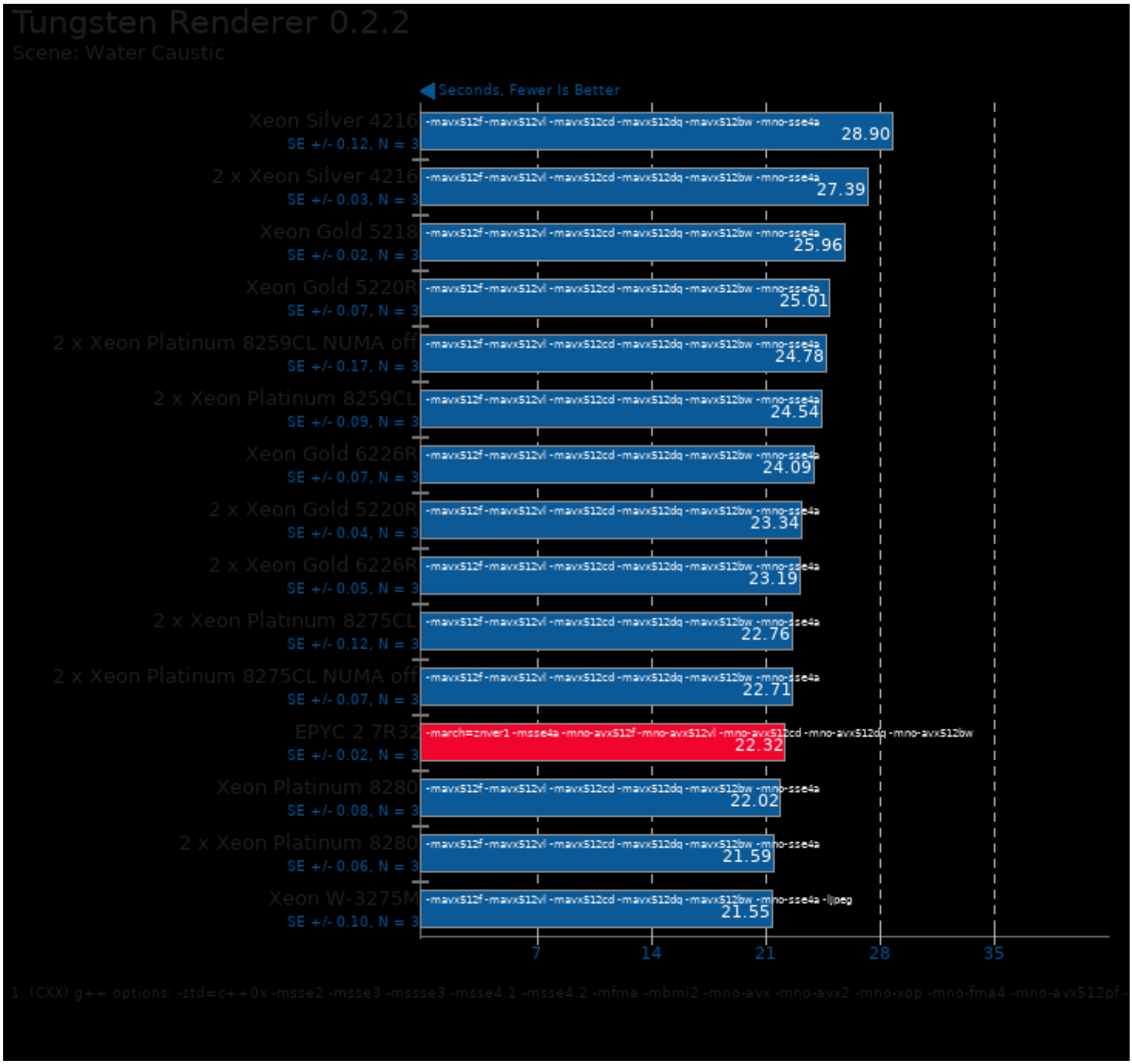

Timed GDB GNU Debugger Compilation 9.1
Time To Compile
Seconds, Fewer Is Better
Xeon Silver 4216
SE +/- 0.07, N = 3
177.77
2 x Xeon Silver 4216
SE +/- 0.18, N = 3
169.70
Xeon Gold 5218
SE +/- 0.09, N = 3
156.30
Xeon Gold 5220R
SE +/- 0.11, N = 3
151.91
2 x Xeon Gold 5220R
SE +/- 0.09, N = 3
146.44
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.27, N = 3
146.44
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.25, N = 3
145.51
Xeon Platinum 8280
SE +/- 0.17, N = 3
144.64
2 x Xeon Platinum 8280
SE +/- 0.17, N = 3
142.70
Xeon Gold 6226R
SE +/- 0.05, N = 3
139.12
Xeon W-3275M
SE +/- 0.08, N = 3
134.82
2 x Xeon Gold 6226R
SE +/- 0.16, N = 3
133.44
2 x Xeon Platinum 8259CL
SE +/- 0.45, N = 3
129.69
2 x Xeon Platinum 8275CL
SE +/- 0.37, N = 3
128.95
EPYC 2 7R32
SE +/- 0.08, N = 3
108.68
40
80
120
160
200

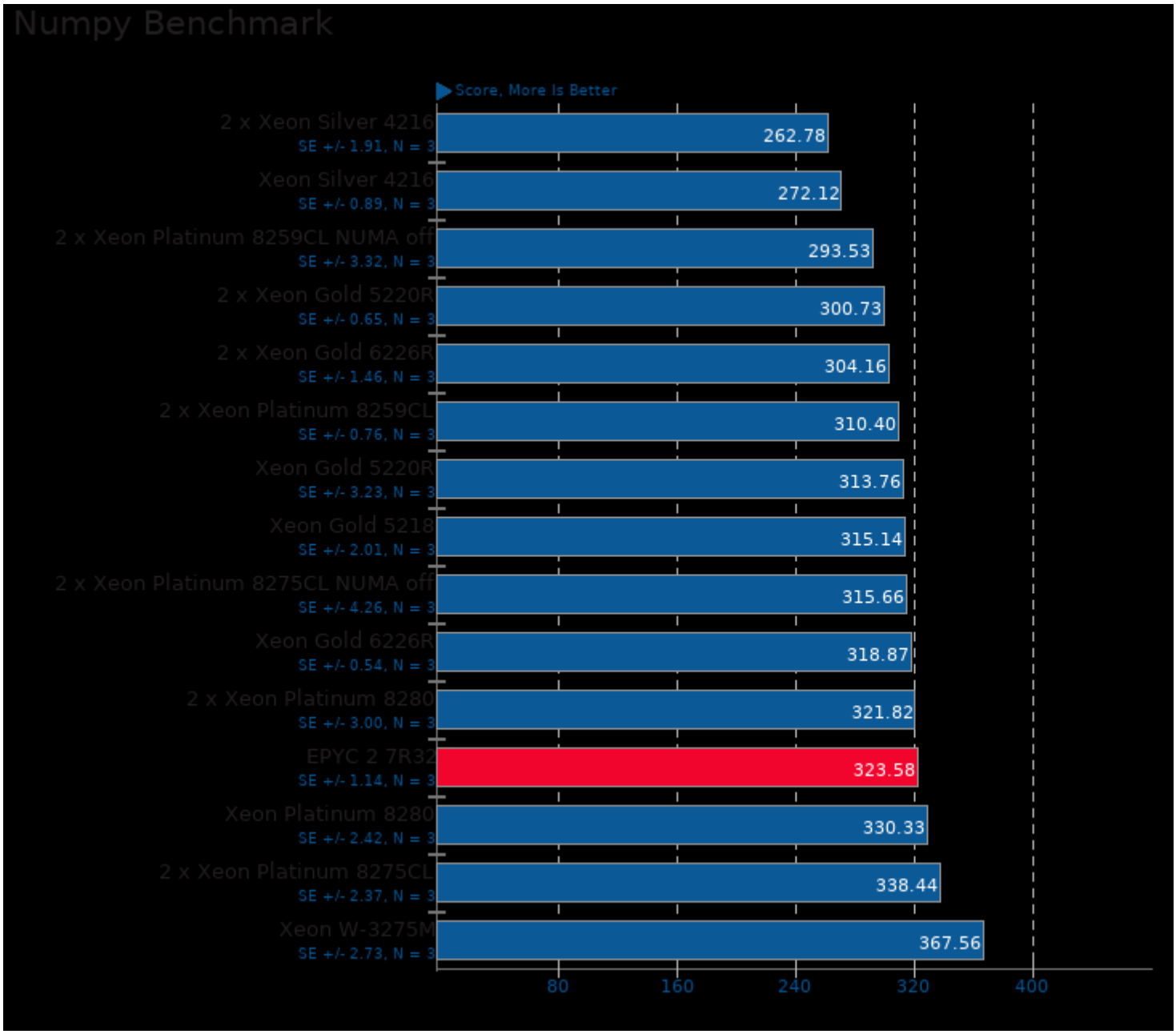

Timed Linux Kernel Compilation 5.4
Time To Compile
Seconds, Fewer Is Better
Xeon Silver 4216
SE +/- 0.99, N = 4
71.77
Xeon Gold 5218
SE +/- 0.88, N = 4
67.16
Xeon Gold 5220R
SE +/- 0.87, N = 4
59.01
Xeon Gold 6226R
SE +/- 0.88, N = 3
57.77
2 x Xeon Silver 4216
SE +/- 0.41, N = 10
45.32
Xeon Platinum 8280
SE +/- 0.42, N = 8
40.90
2 x Xeon Gold 5220R
SE +/- 0.34, N = 10
36.70
2 x Xeon Gold 6226R
SE +/- 0.37, N = 8
36.60
Xeon W-3275M
SE +/- 0.35, N = 9
36.37
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.37, N = 14
29.28
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.38, N = 14
29.26
2 x Xeon Platinum 8259CL
SE +/- 0.23, N = 14
27.58
2 x Xeon Platinum 8280
SE +/- 0.25, N = 14
27.31
2 x Xeon Platinum 8275CL
SE +/- 0.24, N = 13
27.10
EPYC 2 7R32
SE +/- 0.19, N = 13
24.01
16
32
48
64
80

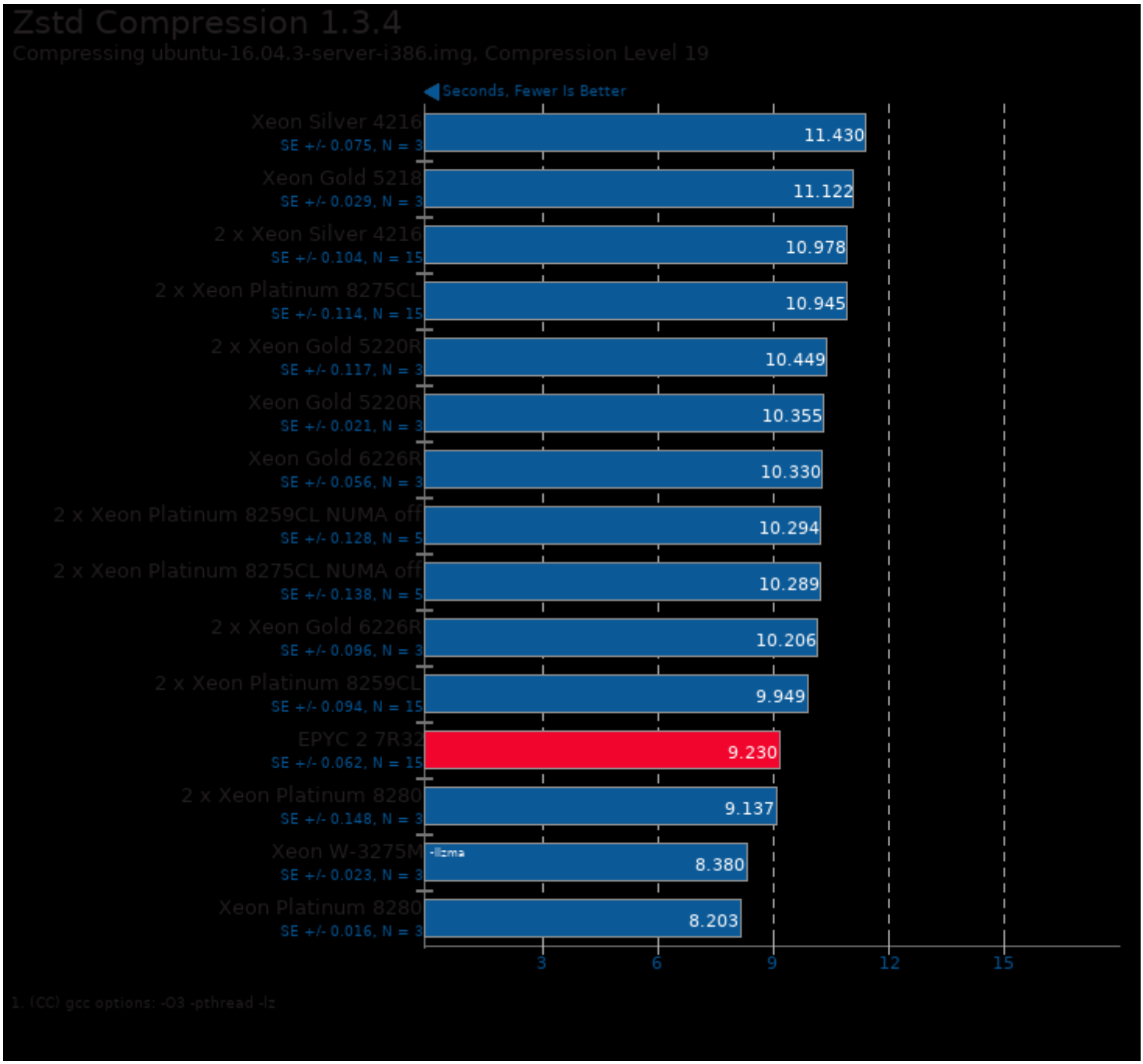

Timed LLVM Compilation 10.0
Time To Compile
Seconds, Fewer Is Better
Xeon Silver 4216
SE +/- 2.53, N = 3
531.15
Xeon Gold 5218
SE +/- 3.37, N = 3
501.22
Xeon Gold 6226R
SE +/- 2.13, N = 3
433.19
Xeon Gold 5220R
SE +/- 1.84, N = 3
430.43
2 x Xeon Silver 4216
SE +/- 1.73, N = 3
347.83
Xeon Platinum 8280
SE +/- 4.79, N = 3
308.74
2 x Xeon Gold 5220R
SE +/- 2.03, N = 3
286.78
Xeon W-3275M
SE +/- 2.68, N = 3
281.68
2 x Xeon Gold 6226R
SE +/- 3.51, N = 3
279.68
2 x Xeon Platinum 8259CL NUMA off
SE +/- 1.40, N = 3
244.94
2 x Xeon Platinum 8275CL NUMA off
SE +/- 3.50, N = 3
244.91
2 x Xeon Platinum 8259CL
SE +/- 1.13, N = 3
232.05
2 x Xeon Platinum 8280
SE +/- 1.01, N = 3
221.52
2 x Xeon Platinum 8275CL
SE +/- 1.63, N = 3
218.05
EPYC 2 7R32
SE +/- 0.72, N = 3
200.04
110
220
330
440
550

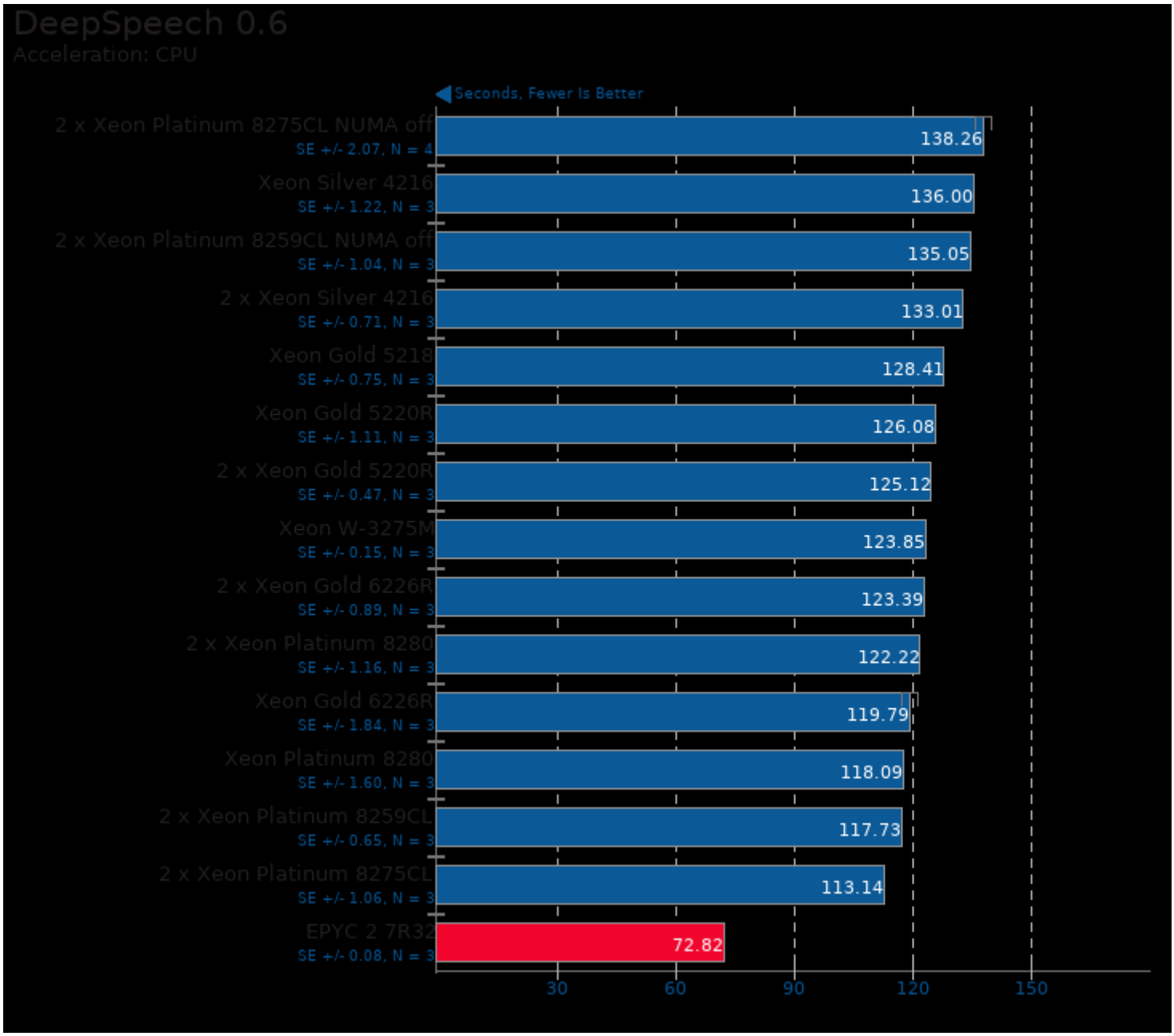

Build2 0.12
Time To Compile
Seconds, Fewer Is Better
Xeon Silver 4216
SE +/- 0.15, N = 3
109.70
Xeon Gold 5218
SE +/- 0.08, N = 3
101.72
Xeon Gold 5220R
SE +/- 0.15, N = 3
91.64
Xeon Gold 6226R
SE +/- 0.05, N = 3
88.98
2 x Xeon Silver 4216
SE +/- 0.11, N = 3
86.33
Xeon Platinum 8280
SE +/- 0.13, N = 3
74.12
2 x Xeon Gold 5220R
SE +/- 0.13, N = 3
72.15
2 x Xeon Gold 6226R
SE +/- 0.09, N = 3
70.61
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.19, N = 3
69.20
2 x Xeon Platinum 8259CL
SE +/- 0.49, N = 3
66.67
Xeon W-3275M
SE +/- 0.14, N = 3
66.42
2 x Xeon Platinum 8275CL
SE +/- 0.75, N = 6
64.50
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.09, N = 3
64.42
2 x Xeon Platinum 8280
SE +/- 0.09, N = 3
62.78
EPYC 2 7R32
SE +/- 0.40, N = 3
59.96
20
40
60
80
100

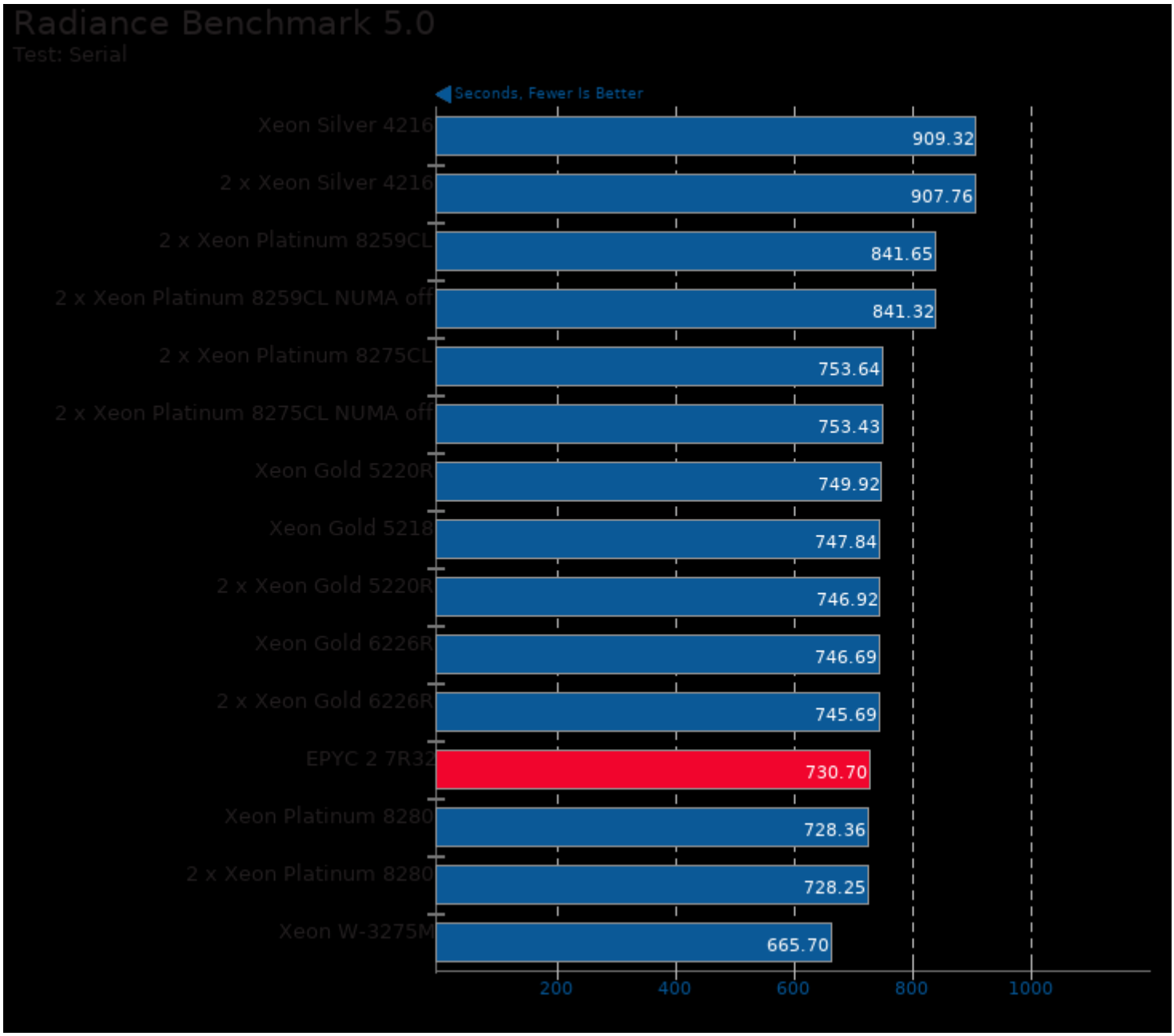

Tungsten Renderer 0.2.2
Scene: Hair
Seconds, Fewer Is Better
Xeon Silver 4216
SE +/- 0.12220, N = 3
-mavx512f -mavx512vl -mavx512cd -mavx512dq -mavx512bw -mno-sse4a
23.61290
Xeon Gold 5218
SE +/- 0.02235, N = 3
22.48660
Xeon Gold 5220R
SE +/- 0.03525, N = 3
18.98400
Xeon Gold 6226R
SE +/- 0.06005, N = 3
18.61290
2 x Xeon Silver 4216
SE +/- 0.06619, N = 3
13.60310
Xeon W-3275M
SE +/- 0.05256, N = 3
-ljpeg
12.71040
Xeon Platinum 8280
SE +/- 0.03914, N = 3
12.68630
2 x Xeon Gold 5220R
SE +/- 0.03810, N = 3
11.07260
2 x Xeon Gold 6226R
SE +/- 0.05690, N = 3
10.66530
2 x Xeon Platinum 8259CL
SE +/- 0.05659, N = 3
9.26217
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.05235, N = 3
9.09073
2 x Xeon Platinum 8275CL
SE +/- 0.03608, N = 3
8.29067
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.03939, N = 3
8.19337
2 x Xeon Platinum 8280
SE +/- 0.11249, N = 3
7.82706
EPYC 2 7R32
SE +/- 0.05445, N = 3
-march=znver1 -msse4a -mno-avx512f -mno-avx512vl -mno-avx512cd -mno-avx512dq -mno-avx512bw
7.67455
6
12
18
24
30
1. (CXX) g++ options: -std=c++0x -msse2 -msse3 -mssse3 -msse4.1 -msse4.2 -mfma -mbmi2 -mno-avx -mno-avx2 -mno-xop -mno-fma4 -mno-avx512pf

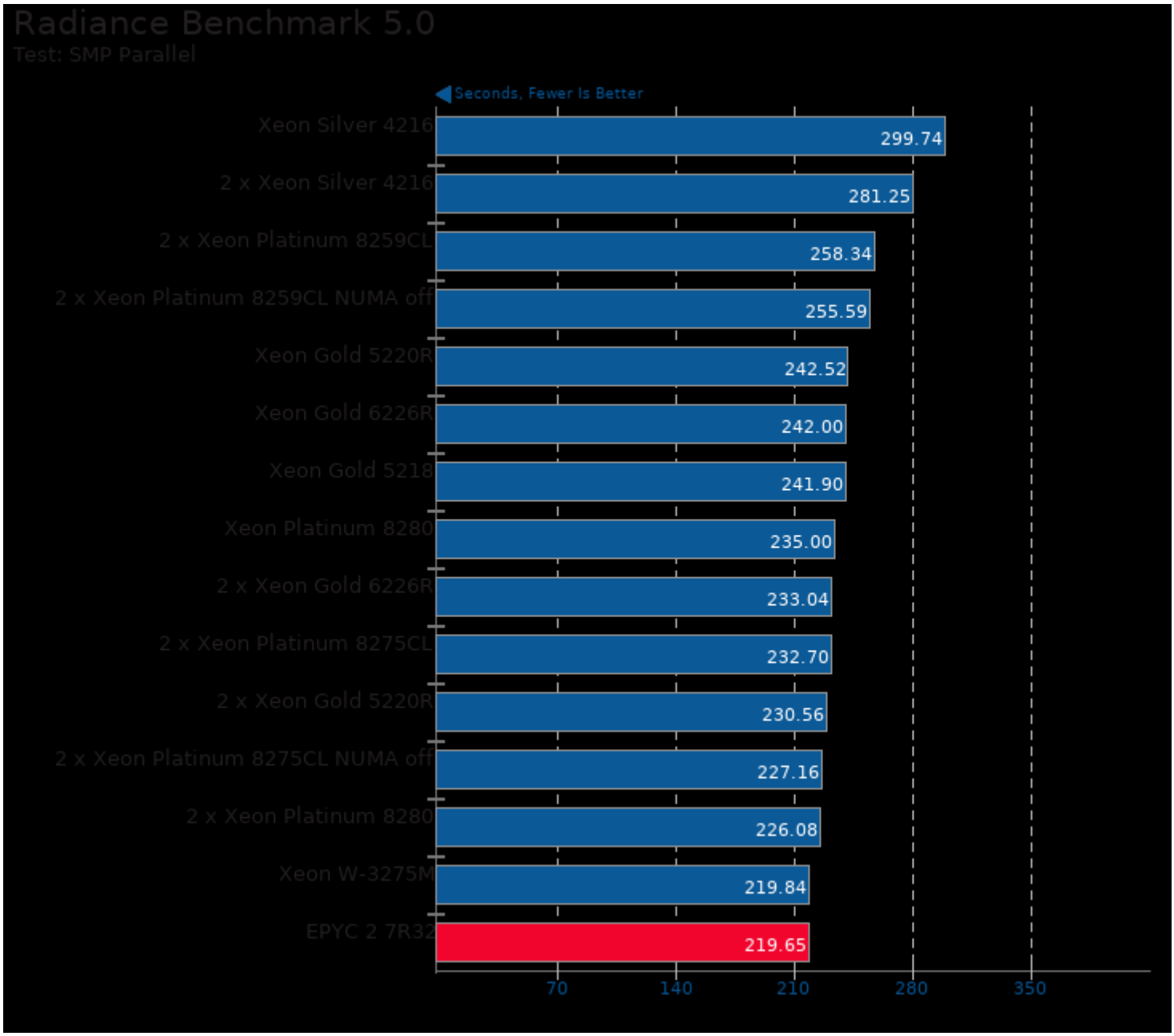

Tungsten Renderer 0.2.2
Scene: Water Caustic
Seconds, Fewer Is Better
Xeon Silver 4216
SE +/- 0.12, N = 3
-mavx512f -mavx512vl -mavx512cd -mavx512dq -mavx512bw -mno-sse4a
28.90
2 x Xeon Silver 4216
SE +/- 0.03, N = 3
27.39
Xeon Gold 5218
SE +/- 0.02, N = 3
25.96
Xeon Gold 5220R
SE +/- 0.07, N = 3
25.01
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.17, N = 3
24.78
2 x Xeon Platinum 8259CL
SE +/- 0.09, N = 3
24.54
Xeon Gold 6226R
SE +/- 0.07, N = 3
24.09
2 x Xeon Gold 5220R
SE +/- 0.04, N = 3
23.34
2 x Xeon Gold 6226R
SE +/- 0.05, N = 3
23.19
2 x Xeon Platinum 8275CL
SE +/- 0.12, N = 3
22.76
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.07, N = 3
22.71
EPYC 2 7R32
SE +/- 0.02, N = 3
-march=znver1 -msse4a -mno-avx512f -mno-avx512vl -mno-avx512cd -mno-avx512dq -mno-avx512bw
22.32
Xeon Platinum 8280
SE +/- 0.08, N = 3
22.02
2 x Xeon Platinum 8280
SE +/- 0.06, N = 3
21.59
Xeon W-3275M
SE +/- 0.10, N = 3
-mno-sse4a -ljpeg
21.55
7
14
21
28
35
1. (CXX) g++ options: -std=c++0x -msse2 -msse3 -mssse3 -msse4.1 -msse4.2 -mfma -mbmi2 -mno-avx -mno-avx2 -mno-xop -mno-fma4 -mno-avx512pf

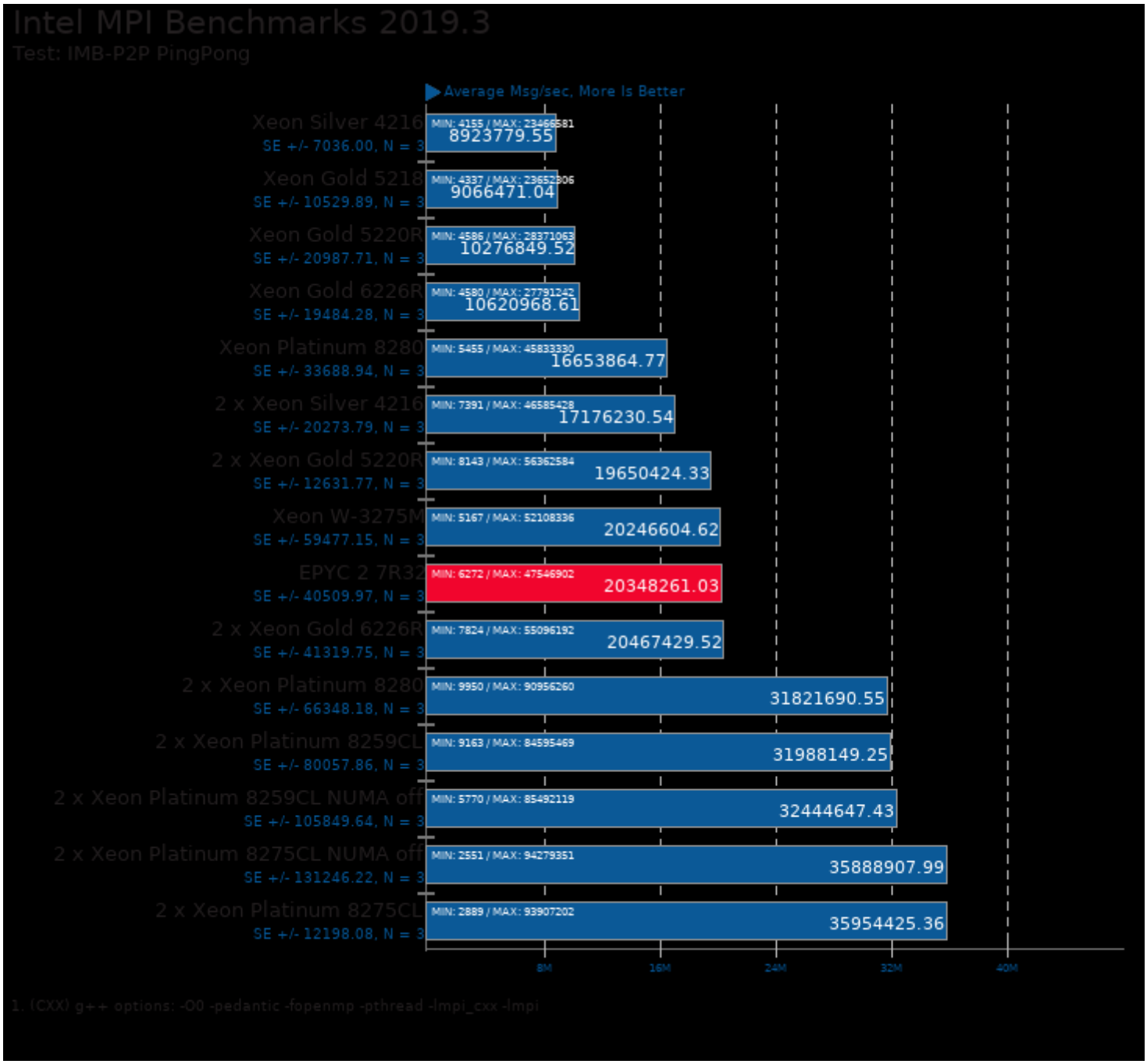

Numpy Benchmark
Score, More Is Better
2 x Xeon Silver 4216
SE +/- 1.91, N = 3
262.78
Xeon Silver 4216
SE +/- 0.89, N = 3
272.12
2 x Xeon Platinum 8259CL NUMA off
SE +/- 3.32, N = 3
293.53
2 x Xeon Gold 5220R
SE +/- 0.65, N = 3
300.73
2 x Xeon Gold 6226R
SE +/- 1.46, N = 3
304.16
2 x Xeon Platinum 8259CL
SE +/- 0.76, N = 3
310.40
Xeon Gold 5220R
SE +/- 3.23, N = 3
313.76
Xeon Gold 5218
SE +/- 2.01, N = 3
315.14
2 x Xeon Platinum 8275CL NUMA off
SE +/- 4.26, N = 3
315.66
Xeon Gold 6226R
SE +/- 0.54, N = 3
318.87
2 x Xeon Platinum 8280
SE +/- 3.00, N = 3
321.82
EPYC 2 7R32
SE +/- 1.14, N = 3
323.58
Xeon Platinum 8280
SE +/- 2.42, N = 3
330.33
2 x Xeon Platinum 8275CL
SE +/- 2.37, N = 3
338.44
Xeon W-3275M
SE +/- 2.73, N = 3
367.56
80
160
240
320
400

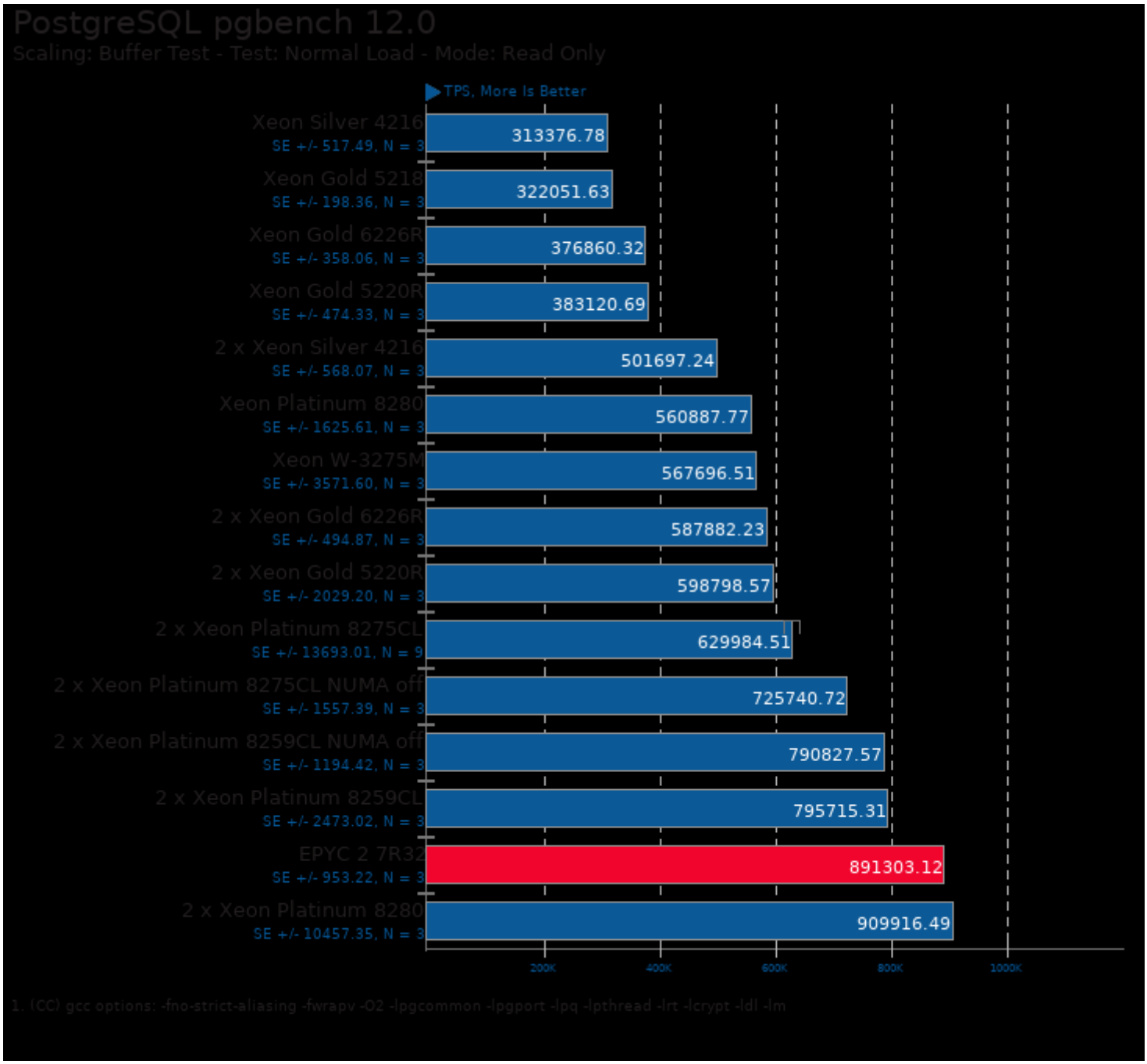

Zstd Compression 1.3.4
Compressing ubuntu-16.04.3-server-i386.img, Compression Level 19
Seconds, Fewer Is Better
Xeon Silver 4216
SE +/- 0.075, N = 3
11.430
Xeon Gold 5218
SE +/- 0.029, N = 3
11.122
2 x Xeon Silver 4216
SE +/- 0.104, N = 15
10.978
2 x Xeon Platinum 8275CL
SE +/- 0.114, N = 15
10.945
2 x Xeon Gold 5220R
SE +/- 0.117, N = 3
10.449
Xeon Gold 5220R
SE +/- 0.021, N = 3
10.355
Xeon Gold 6226R
SE +/- 0.056, N = 3
10.330
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.128, N = 5
10.294
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.138, N = 5
10.289
2 x Xeon Gold 6226R
SE +/- 0.096, N = 3
10.206
2 x Xeon Platinum 8259CL
SE +/- 0.094, N = 15
9.949
EPYC 2 7R32
SE +/- 0.062, N = 15
9.230
2 x Xeon Platinum 8280
SE +/- 0.148, N = 3
9.137
Xeon W-3275M
SE +/- 0.023, N = 3
-llzma
8.380
Xeon Platinum 8280
SE +/- 0.016, N = 3
8.203
3
6
9
12
15
1. (CC) gcc options: -O3 -pthread -lz

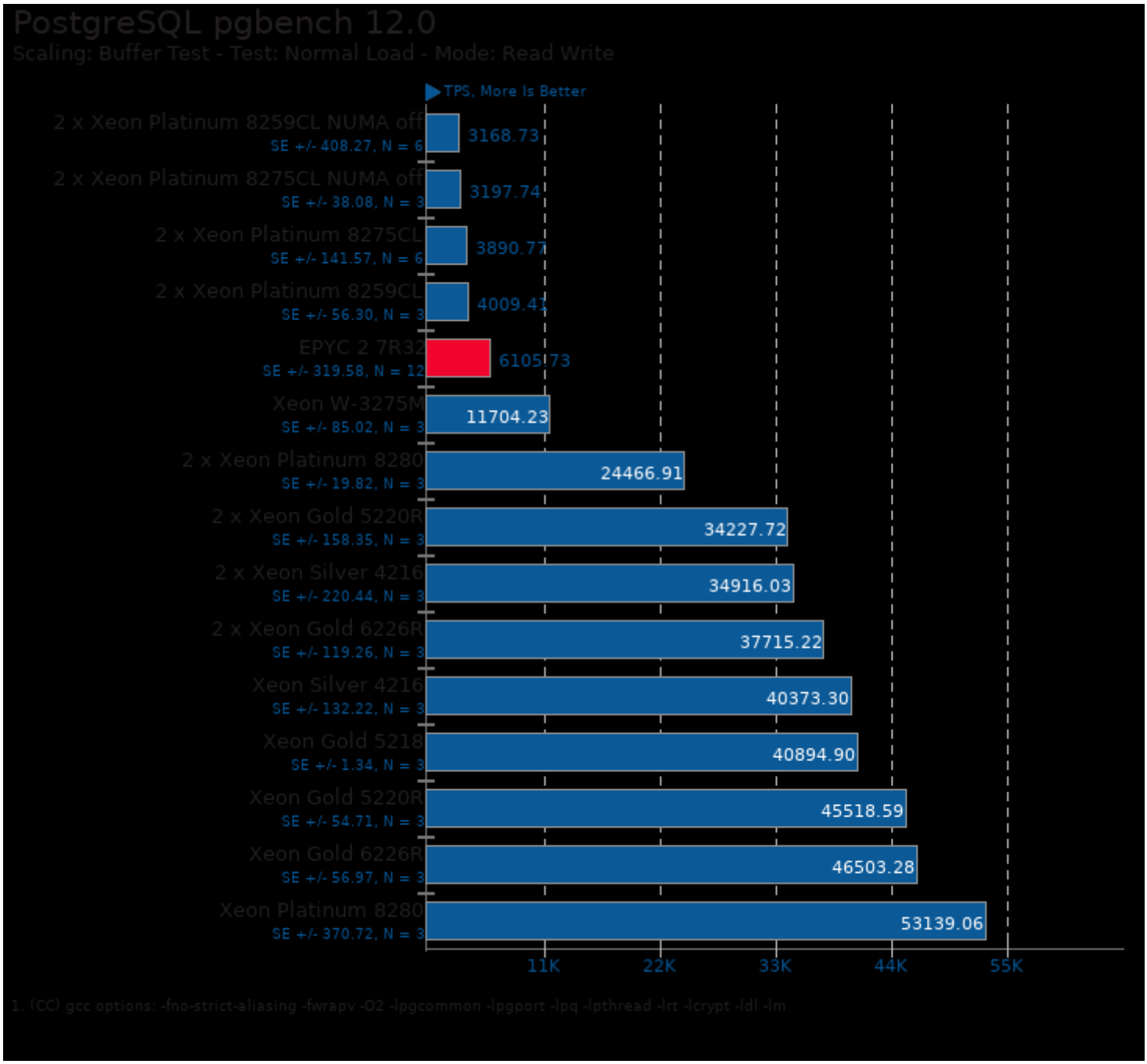

DeepSpeech 0.6
Acceleration: CPU
Seconds, Fewer Is Better
2 x Xeon Platinum 8275CL NUMA off
SE +/- 2.07, N = 4
138.26
Xeon Silver 4216
SE +/- 1.22, N = 3
136.00
2 x Xeon Platinum 8259CL NUMA off
SE +/- 1.04, N = 3
135.05
2 x Xeon Silver 4216
SE +/- 0.71, N = 3
133.01
Xeon Gold 5218
SE +/- 0.75, N = 3
128.41
Xeon Gold 5220R
SE +/- 1.11, N = 3
126.08
2 x Xeon Gold 5220R
SE +/- 0.47, N = 3
125.12
Xeon W-3275M
SE +/- 0.15, N = 3
123.85
2 x Xeon Gold 6226R
SE +/- 0.89, N = 3
123.39
2 x Xeon Platinum 8280
SE +/- 1.16, N = 3
122.22
Xeon Gold 6226R
SE +/- 1.84, N = 3
119.79
Xeon Platinum 8280
SE +/- 1.60, N = 3
118.09
2 x Xeon Platinum 8259CL
SE +/- 0.65, N = 3
117.73
2 x Xeon Platinum 8275CL
SE +/- 1.06, N = 3
113.14
EPYC 2 7R32
SE +/- 0.08, N = 3
72.82
30
60
90
120
150

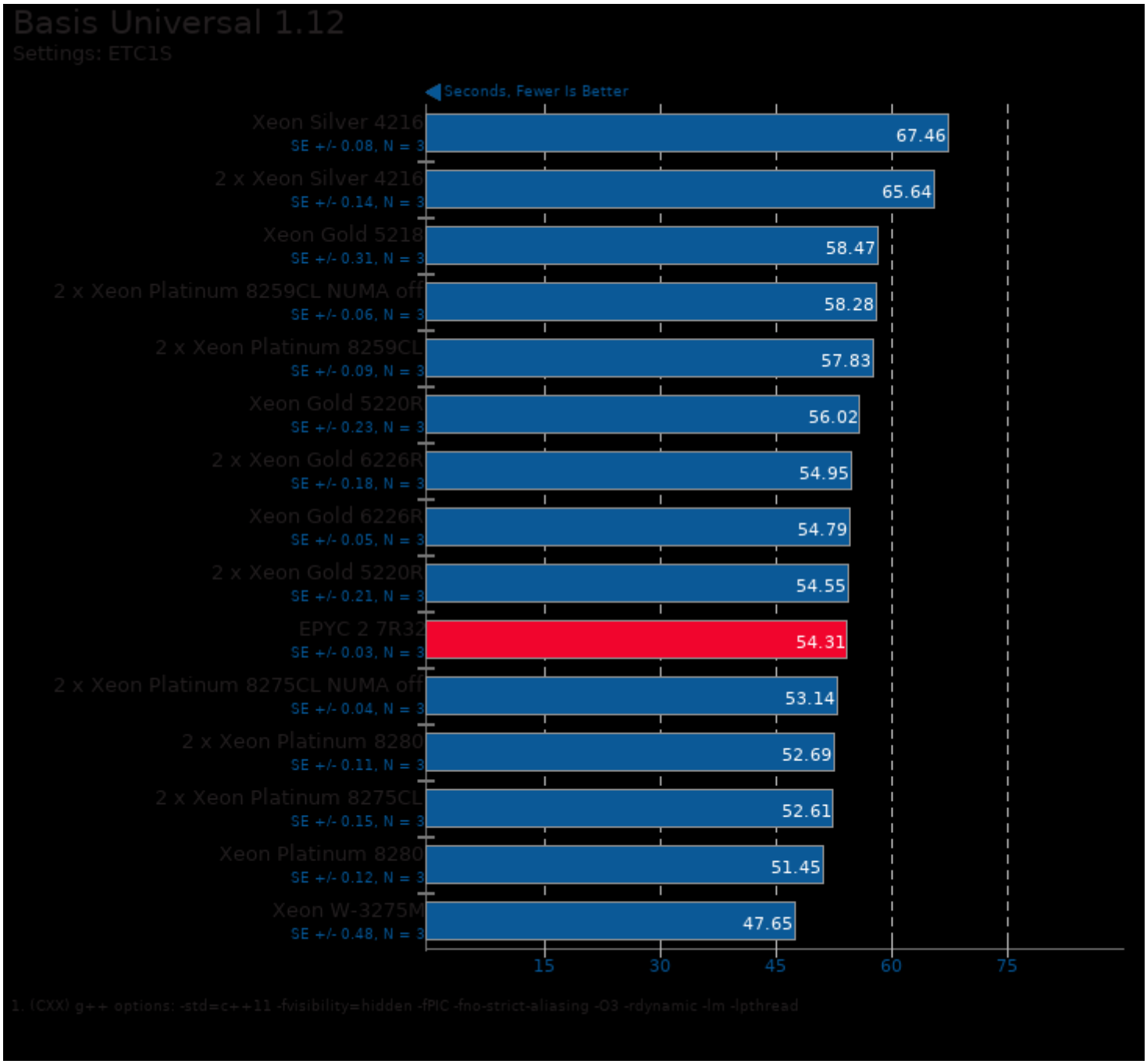

Radiance Benchmark 5.0
Test: Serial
Seconds, Fewer Is Better
Xeon Silver 4216
909.32
2 x Xeon Silver 4216
907.76
2 x Xeon Platinum 8259CL
841.65
2 x Xeon Platinum 8259CL NUMA off
841.32
2 x Xeon Platinum 8275CL
753.64
2 x Xeon Platinum 8275CL NUMA off
753.43
Xeon Gold 5220R
749.92
Xeon Gold 5218
747.84
2 x Xeon Gold 5220R
746.92
Xeon Gold 6226R
746.69
2 x Xeon Gold 6226R
745.69
EPYC 2 7R32
730.70
Xeon Platinum 8280
728.36
2 x Xeon Platinum 8280
728.25
Xeon W-3275M
665.70
200
400
600
800
1000

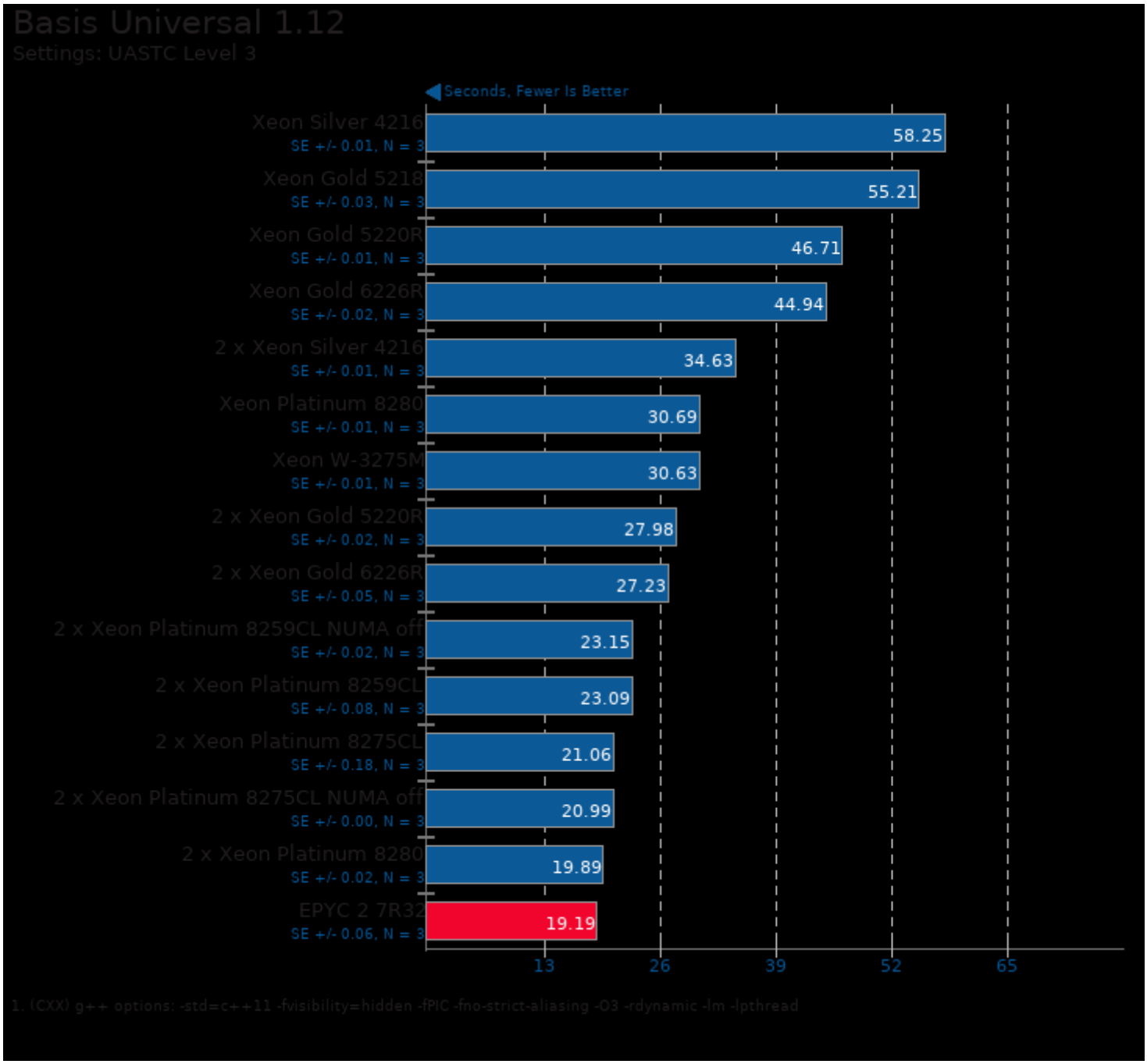

Radiance Benchmark 5.0
Test: SMP Parallel
Seconds, Fewer Is Better
Xeon Silver 4216
299.74
2 x Xeon Silver 4216
281.25
2 x Xeon Platinum 8259CL
258.34
2 x Xeon Platinum 8259CL NUMA off
255.59
Xeon Gold 5220R
242.52
Xeon Gold 6226R
242.00
Xeon Gold 5218
241.90
Xeon Platinum 8280
235.00
2 x Xeon Gold 6226R
233.04
2 x Xeon Platinum 8275CL
232.70
2 x Xeon Gold 5220R
230.56
2 x Xeon Platinum 8275CL NUMA off
227.16
2 x Xeon Platinum 8280
226.08
Xeon W-3275M
219.84
EPYC 2 7R32
219.65
70
140
210
280
350

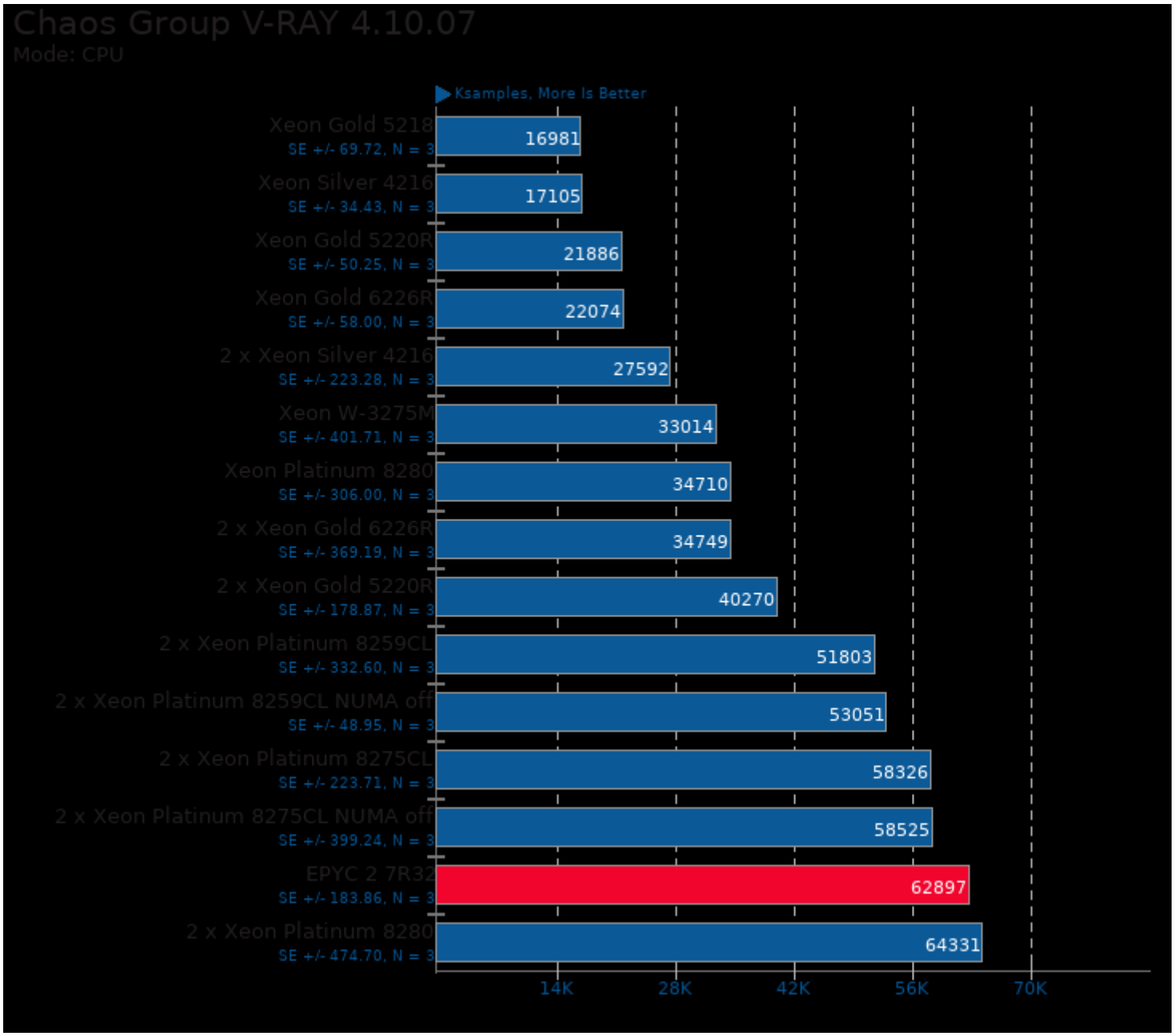

Intel MPI Benchmarks 2019.3
Test: IMB-P2P PingPong
Average Msg/sec, More Is Better
Xeon Silver 4216
SE +/- 7036.00, N = 3
MIN: 4155 / MAX: 23466581
8923779.55
Xeon Gold 5218
SE +/- 10529.89, N = 3
MIN: 4337 / MAX: 23652806
9066471.04
Xeon Gold 5220R
SE +/- 20987.71, N = 3
MIN: 4586 / MAX: 28371063
10276849.52
Xeon Gold 6226R
SE +/- 19484.28, N = 3
MIN: 4580 / MAX: 27791242
10620968.61
Xeon Platinum 8280
SE +/- 33688.94, N = 3
MIN: 5455 / MAX: 45833330
16653864.77
2 x Xeon Silver 4216
SE +/- 20273.79, N = 3
MIN: 7391 / MAX: 46585428
17176230.54
2 x Xeon Gold 5220R
SE +/- 12631.77, N = 3
MIN: 8143 / MAX: 56362584
19650424.33
Xeon W-3275M
SE +/- 59477.15, N = 3
MIN: 5167 / MAX: 52108336
20246604.62
EPYC 2 7R32
SE +/- 40509.97, N = 3
MIN: 6272 / MAX: 47546902
20348261.03
2 x Xeon Gold 6226R
SE +/- 41319.75, N = 3
MIN: 7824 / MAX: 55096192
20467429.52
2 x Xeon Platinum 8280
SE +/- 66348.18, N = 3
MIN: 9950 / MAX: 90956260
31821690.55
2 x Xeon Platinum 8259CL
SE +/- 80057.86, N = 3
MIN: 9163 / MAX: 84595469
31988149.25
2 x Xeon Platinum 8259CL NUMA off
SE +/- 105849.64, N = 3
MIN: 5770 / MAX: 85492119
32444647.43
2 x Xeon Platinum 8275CL NUMA off
SE +/- 131246.22, N = 3
MIN: 2551 / MAX: 94279351
35888907.99
2 x Xeon Platinum 8275CL
SE +/- 12198.08, N = 3
MIN: 2889 / MAX: 93907202
35954425.36
8M
16M
24M
32M
40M
1. (CXX) g++ options: -O0 -pedantic -fopenmp -pthread -lmpi_cxx -lmpi

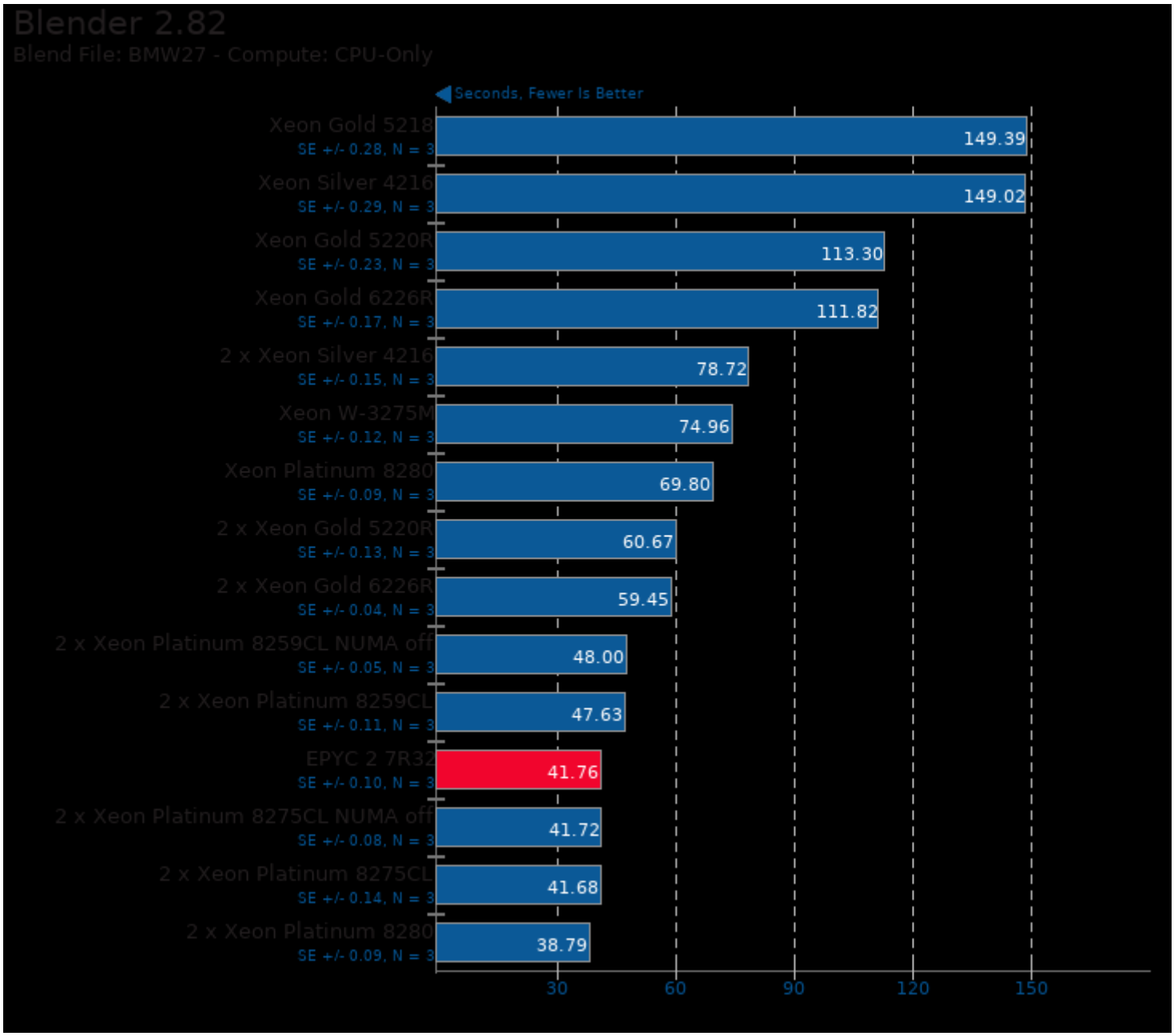

PostgreSQL pgbench 12.0
Scaling: Buffer Test - Test: Normal Load - Mode: Read Only
TPS, More Is Better
Xeon Silver 4216
SE +/- 517.49, N = 3
313376.78
Xeon Gold 5218
SE +/- 198.36, N = 3
322051.63
Xeon Gold 6226R
SE +/- 358.06, N = 3
376860.32
Xeon Gold 5220R
SE +/- 474.33, N = 3
383120.69
2 x Xeon Silver 4216
SE +/- 568.07, N = 3
501697.24
Xeon Platinum 8280
SE +/- 1625.61, N = 3
560887.77
Xeon W-3275M
SE +/- 3571.60, N = 3
567696.51
2 x Xeon Gold 6226R
SE +/- 494.87, N = 3
587882.23
2 x Xeon Gold 5220R
SE +/- 2029.20, N = 3
598798.57
2 x Xeon Platinum 8275CL
SE +/- 13693.01, N = 9
629984.51
2 x Xeon Platinum 8275CL NUMA off
SE +/- 1557.39, N = 3
725740.72
2 x Xeon Platinum 8259CL NUMA off
SE +/- 1194.42, N = 3
790827.57
2 x Xeon Platinum 8259CL
SE +/- 2473.02, N = 3
795715.31
EPYC 2 7R32
SE +/- 953.22, N = 3
891303.12
2 x Xeon Platinum 8280
SE +/- 10457.35, N = 3
909916.49
200K
400K
600K
800K
1000K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -lcrypt -ldl -lm

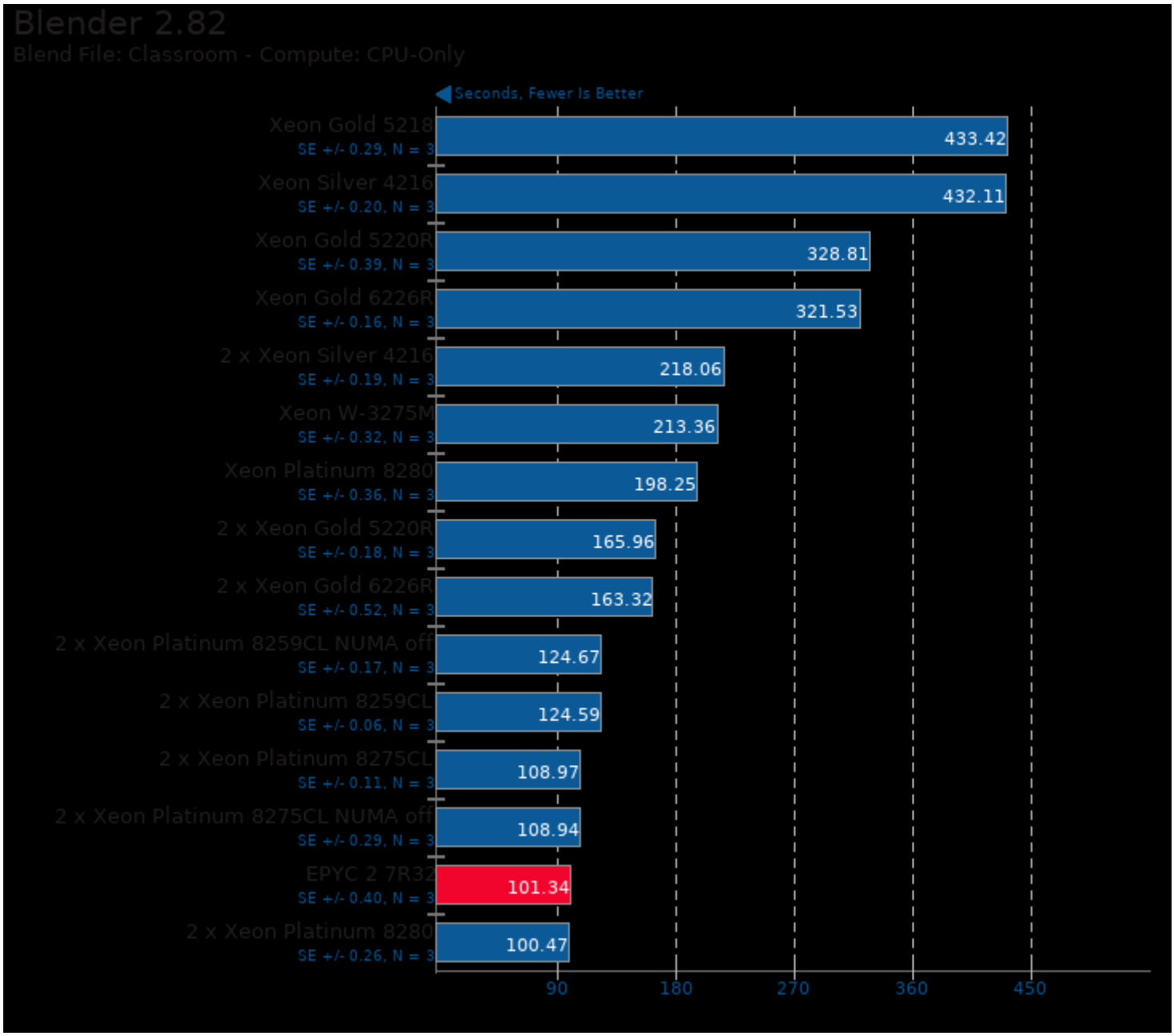

PostgreSQL pgbench 12.0
Scaling: Buffer Test - Test: Normal Load - Mode: Read Write
TPS, More Is Better
2 x Xeon Platinum 8259CL NUMA off
SE +/- 408.27, N = 6
3168.73
2 x Xeon Platinum 8275CL NUMA off
SE +/- 38.08, N = 3
3197.74
2 x Xeon Platinum 8275CL
SE +/- 141.57, N = 6
3890.77
2 x Xeon Platinum 8259CL
SE +/- 56.30, N = 3
4009.41
EPYC 2 7R32
SE +/- 319.58, N = 12
6105.73
Xeon W-3275M
SE +/- 85.02, N = 3
11704.23
2 x Xeon Platinum 8280
SE +/- 19.82, N = 3
24466.91
2 x Xeon Gold 5220R
SE +/- 158.35, N = 3
34227.72
2 x Xeon Silver 4216
SE +/- 220.44, N = 3
34916.03
2 x Xeon Gold 6226R
SE +/- 119.26, N = 3
37715.22
Xeon Silver 4216
SE +/- 132.22, N = 3
40373.30
Xeon Gold 5218
SE +/- 1.34, N = 3
40894.90
Xeon Gold 5220R
SE +/- 54.71, N = 3
45518.59
Xeon Gold 6226R
SE +/- 56.97, N = 3
46503.28
Xeon Platinum 8280
SE +/- 370.72, N = 3
53139.06
11K
22K
33K
44K
55K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -lcrypt -ldl -lm

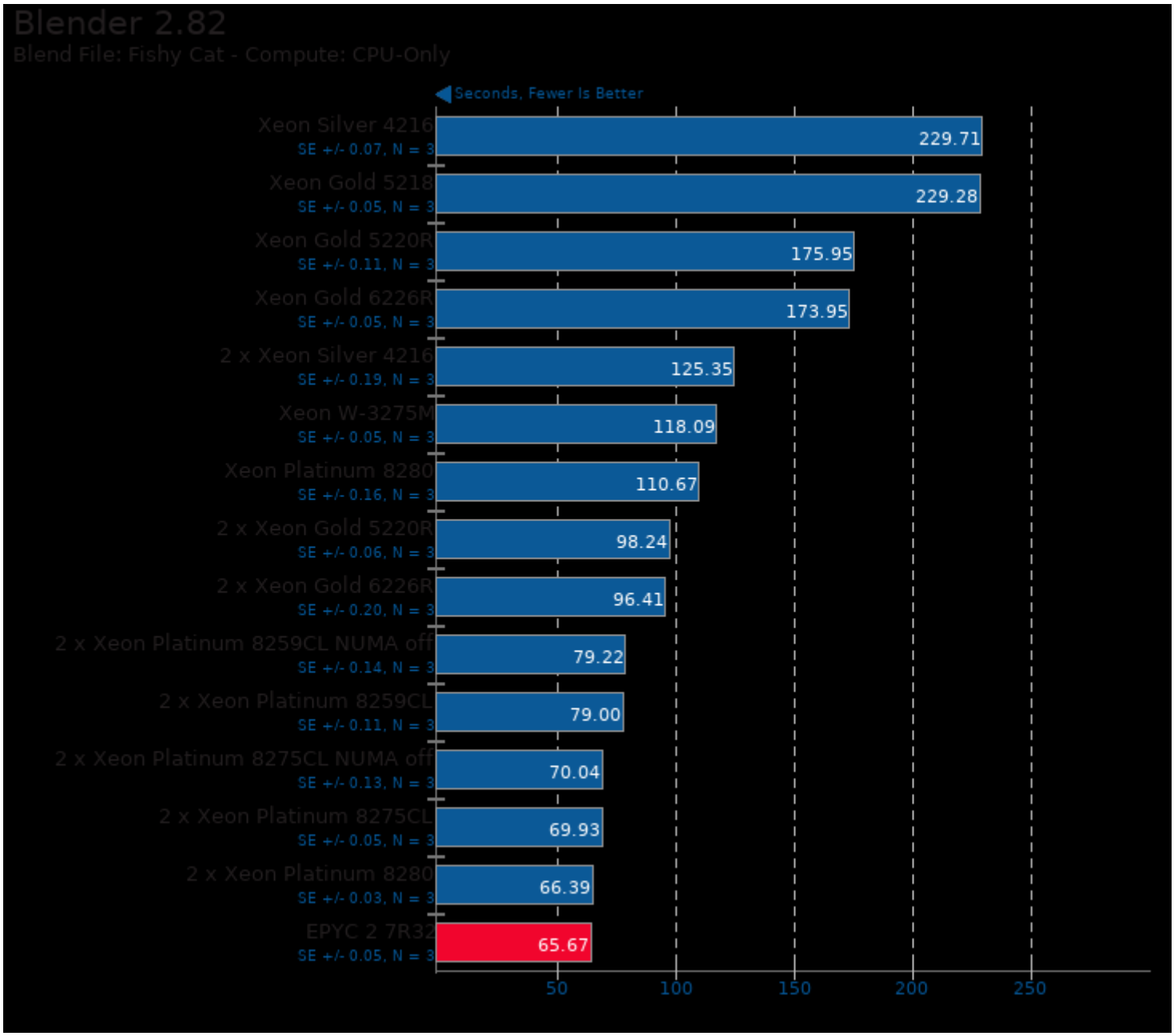

Basis Universal 1.12
Settings: ETC1S
Seconds, Fewer Is Better
Xeon Silver 4216
SE +/- 0.08, N = 3
67.46
2 x Xeon Silver 4216
SE +/- 0.14, N = 3
65.64
Xeon Gold 5218
SE +/- 0.31, N = 3
58.47
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.06, N = 3
58.28
2 x Xeon Platinum 8259CL
SE +/- 0.09, N = 3
57.83
Xeon Gold 5220R
SE +/- 0.23, N = 3
56.02
2 x Xeon Gold 6226R
SE +/- 0.18, N = 3
54.95
Xeon Gold 6226R
SE +/- 0.05, N = 3
54.79
2 x Xeon Gold 5220R
SE +/- 0.21, N = 3
54.55
EPYC 2 7R32
SE +/- 0.03, N = 3
54.31
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.04, N = 3
53.14
2 x Xeon Platinum 8280
SE +/- 0.11, N = 3
52.69
2 x Xeon Platinum 8275CL
SE +/- 0.15, N = 3
52.61
Xeon Platinum 8280
SE +/- 0.12, N = 3
51.45
Xeon W-3275M
SE +/- 0.48, N = 3
47.65
15
30
45
60
75
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

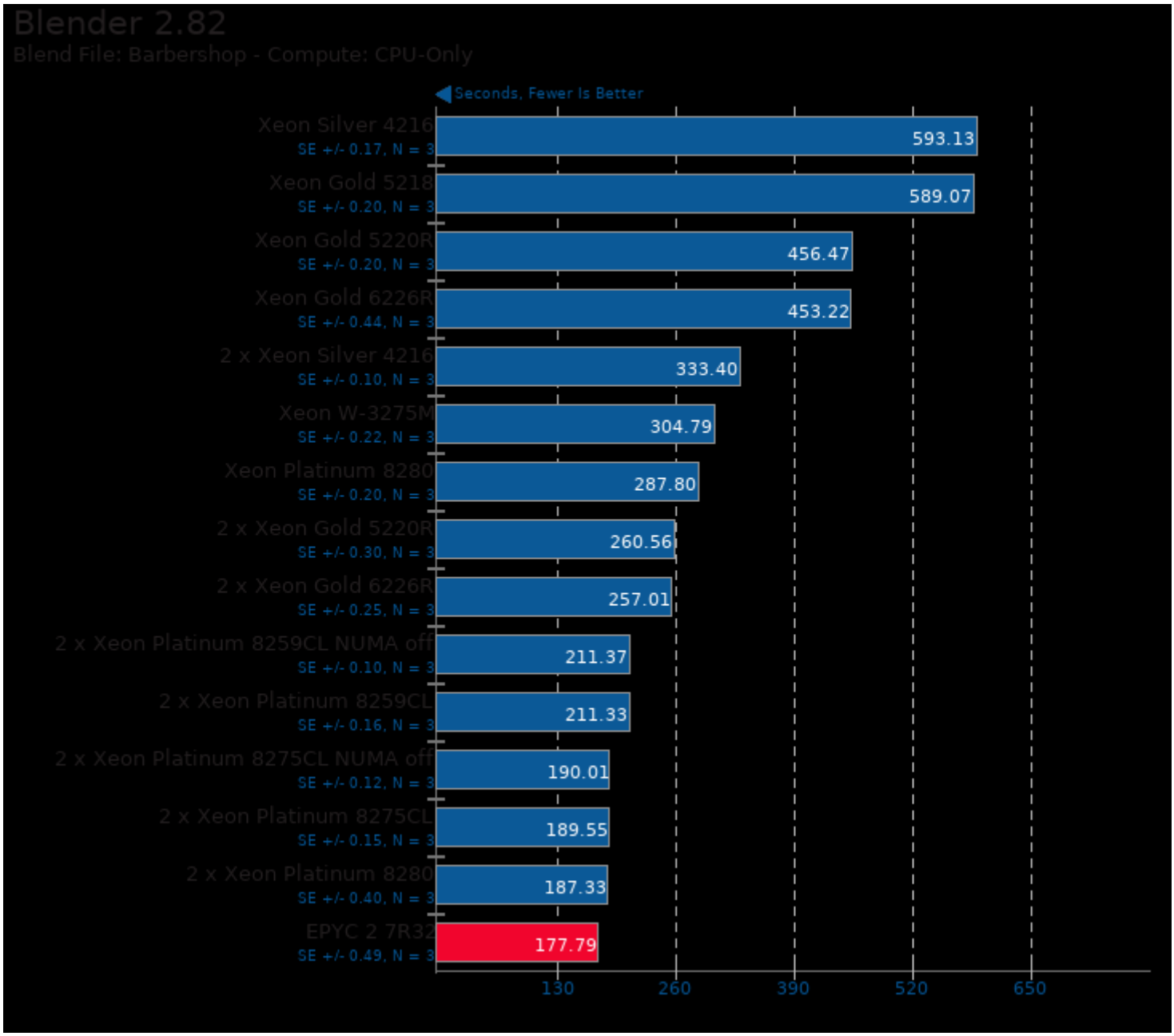

Basis Universal 1.12
Settings: UASTC Level 3
Seconds, Fewer Is Better
Xeon Silver 4216
SE +/- 0.01, N = 3
58.25
Xeon Gold 5218
SE +/- 0.03, N = 3
55.21
Xeon Gold 5220R
SE +/- 0.01, N = 3
46.71
Xeon Gold 6226R
SE +/- 0.02, N = 3
44.94
2 x Xeon Silver 4216
SE +/- 0.01, N = 3
34.63
Xeon Platinum 8280
SE +/- 0.01, N = 3
30.69
Xeon W-3275M
SE +/- 0.01, N = 3
30.63
2 x Xeon Gold 5220R
SE +/- 0.02, N = 3
27.98
2 x Xeon Gold 6226R
SE +/- 0.05, N = 3
27.23
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.02, N = 3
23.15
2 x Xeon Platinum 8259CL
SE +/- 0.08, N = 3
23.09
2 x Xeon Platinum 8275CL
SE +/- 0.18, N = 3
21.06
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.00, N = 3
20.99
2 x Xeon Platinum 8280
SE +/- 0.02, N = 3
19.89
EPYC 2 7R32
SE +/- 0.06, N = 3
19.19
13
26
39
52
65
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

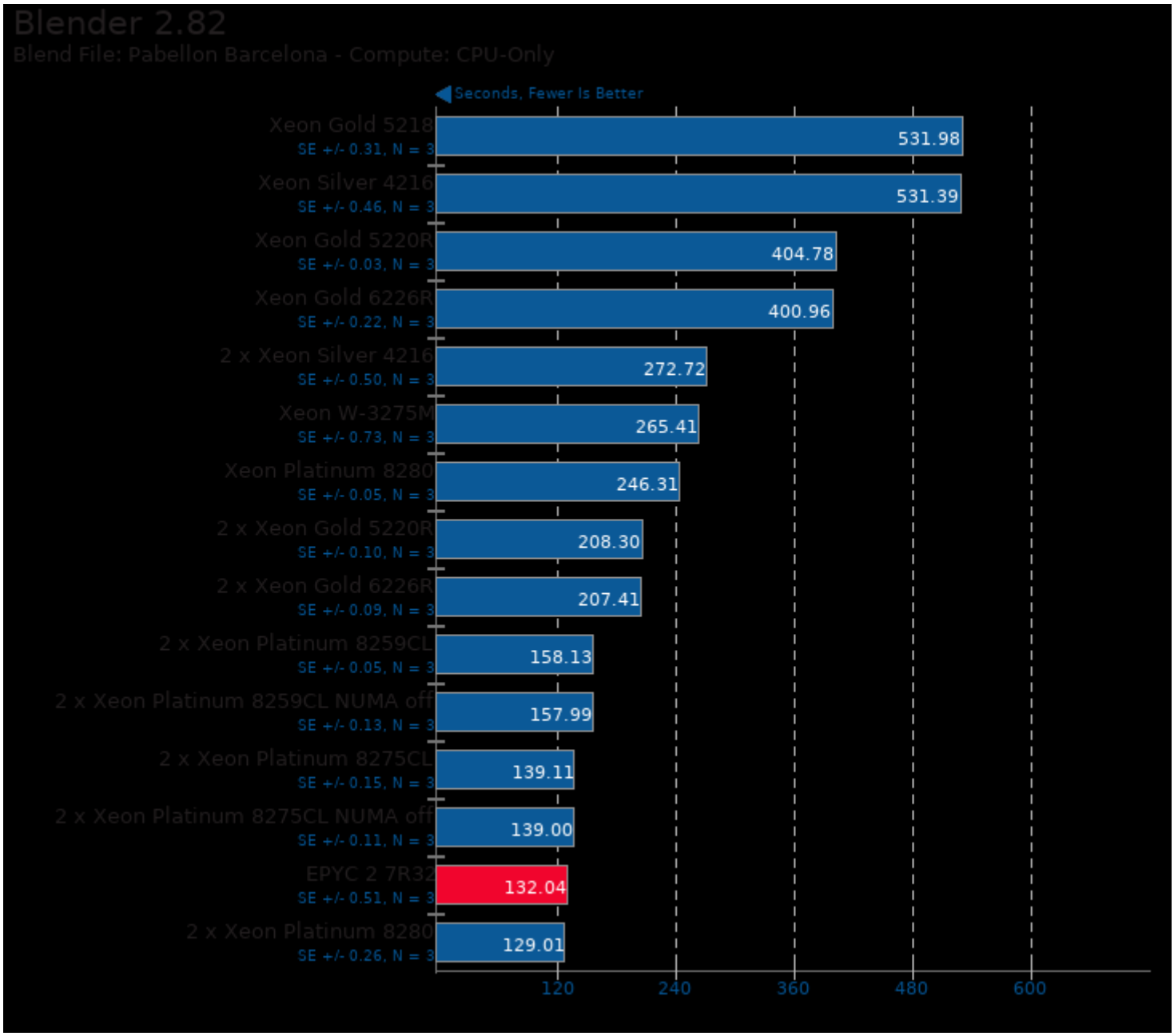

Chaos Group V-RAY 4.10.07
Mode: CPU
Ksamples, More Is Better
Xeon Gold 5218
SE +/- 69.72, N = 3
16981
Xeon Silver 4216
SE +/- 34.43, N = 3
17105
Xeon Gold 5220R
SE +/- 50.25, N = 3
21886
Xeon Gold 6226R
SE +/- 58.00, N = 3
22074
2 x Xeon Silver 4216
SE +/- 223.28, N = 3
27592
Xeon W-3275M
SE +/- 401.71, N = 3
33014
Xeon Platinum 8280
SE +/- 306.00, N = 3
34710
2 x Xeon Gold 6226R
SE +/- 369.19, N = 3
34749
2 x Xeon Gold 5220R
SE +/- 178.87, N = 3
40270
2 x Xeon Platinum 8259CL
SE +/- 332.60, N = 3
51803
2 x Xeon Platinum 8259CL NUMA off
SE +/- 48.95, N = 3
53051
2 x Xeon Platinum 8275CL
SE +/- 223.71, N = 3
58326
2 x Xeon Platinum 8275CL NUMA off
SE +/- 399.24, N = 3
58525
EPYC 2 7R32
SE +/- 183.86, N = 3
62897
2 x Xeon Platinum 8280
SE +/- 474.70, N = 3
64331
14K
28K
42K
56K
70K

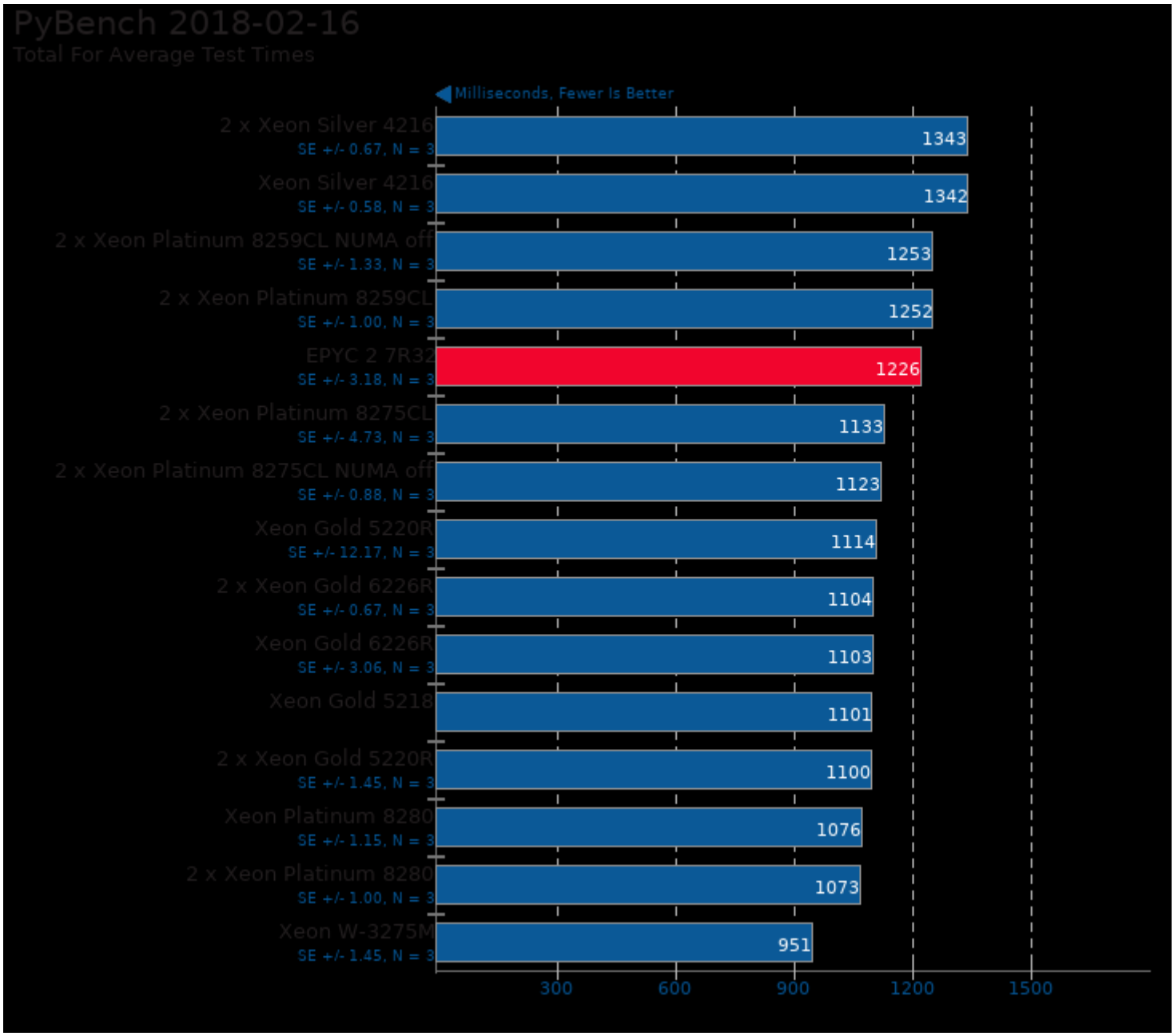

Blender 2.82
Blend File: BMW27 - Compute: CPU-Only
Seconds, Fewer Is Better
Xeon Gold 5218
SE +/- 0.28, N = 3
149.39
Xeon Silver 4216
SE +/- 0.29, N = 3
149.02
Xeon Gold 5220R
SE +/- 0.23, N = 3
113.30
Xeon Gold 6226R
SE +/- 0.17, N = 3
111.82
2 x Xeon Silver 4216
SE +/- 0.15, N = 3
78.72
Xeon W-3275M
SE +/- 0.12, N = 3
74.96
Xeon Platinum 8280
SE +/- 0.09, N = 3
69.80
2 x Xeon Gold 5220R
SE +/- 0.13, N = 3
60.67
2 x Xeon Gold 6226R
SE +/- 0.04, N = 3
59.45
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.05, N = 3
48.00
2 x Xeon Platinum 8259CL
SE +/- 0.11, N = 3
47.63
EPYC 2 7R32
SE +/- 0.10, N = 3
41.76
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.08, N = 3
41.72
2 x Xeon Platinum 8275CL
SE +/- 0.14, N = 3
41.68
2 x Xeon Platinum 8280
SE +/- 0.09, N = 3
38.79
30
60
90
120
150

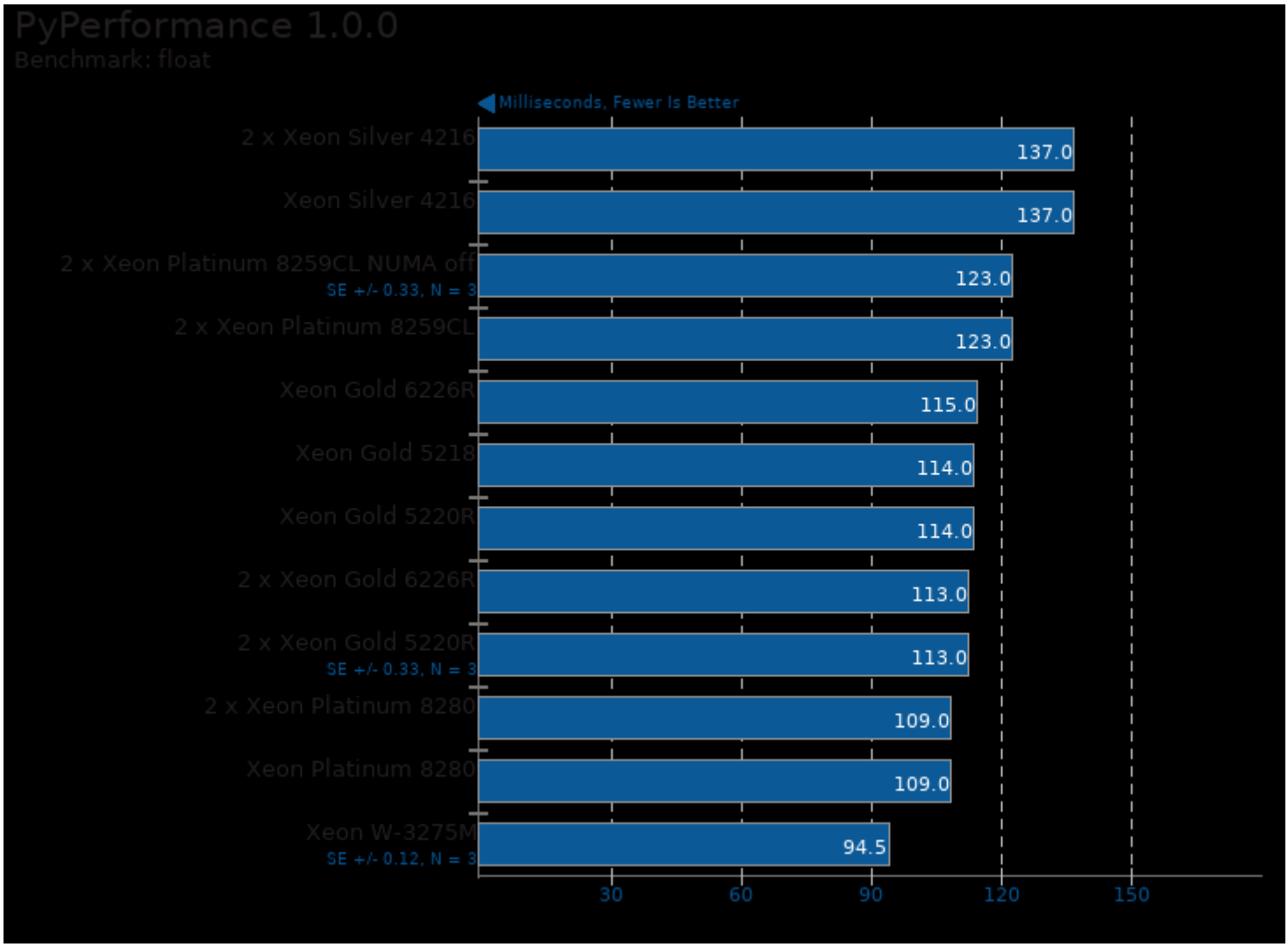

Blender 2.82
Blend File: Classroom - Compute: CPU-Only
Seconds, Fewer Is Better
Xeon Gold 5218
SE +/- 0.29, N = 3
433.42
Xeon Silver 4216
SE +/- 0.20, N = 3
432.11
Xeon Gold 5220R
SE +/- 0.39, N = 3
328.81
Xeon Gold 6226R
SE +/- 0.16, N = 3
321.53
2 x Xeon Silver 4216
SE +/- 0.19, N = 3
218.06
Xeon W-3275M
SE +/- 0.32, N = 3
213.36
Xeon Platinum 8280
SE +/- 0.36, N = 3
198.25
2 x Xeon Gold 5220R
SE +/- 0.18, N = 3
165.96
2 x Xeon Gold 6226R
SE +/- 0.52, N = 3
163.32
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.17, N = 3
124.67
2 x Xeon Platinum 8259CL
SE +/- 0.06, N = 3
124.59
2 x Xeon Platinum 8275CL
SE +/- 0.11, N = 3
108.97
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.29, N = 3
108.94
EPYC 2 7R32
SE +/- 0.40, N = 3
101.34
2 x Xeon Platinum 8280
SE +/- 0.26, N = 3
100.47
90
180
270
360
450

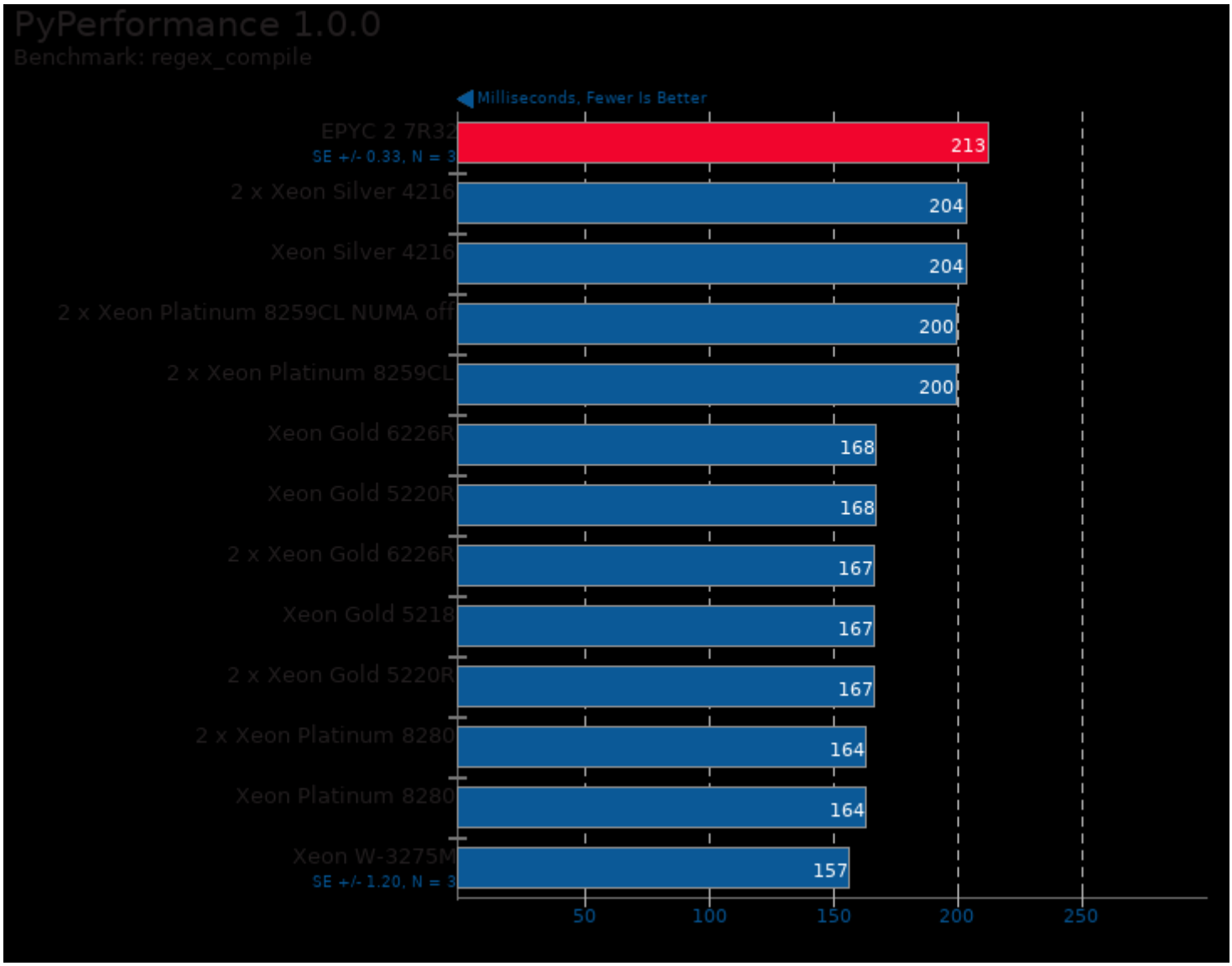

Blender 2.82
Blend File: Fishy Cat - Compute: CPU-Only
Seconds, Fewer Is Better
Xeon Silver 4216
SE +/- 0.07, N = 3
229.71
Xeon Gold 5218
SE +/- 0.05, N = 3
229.28
Xeon Gold 5220R
SE +/- 0.11, N = 3
175.95
Xeon Gold 6226R
SE +/- 0.05, N = 3
173.95
2 x Xeon Silver 4216
SE +/- 0.19, N = 3
125.35
Xeon W-3275M
SE +/- 0.05, N = 3
118.09
Xeon Platinum 8280
SE +/- 0.16, N = 3
110.67
2 x Xeon Gold 5220R
SE +/- 0.06, N = 3
98.24
2 x Xeon Gold 6226R
SE +/- 0.20, N = 3
96.41
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.14, N = 3
79.22
2 x Xeon Platinum 8259CL
SE +/- 0.11, N = 3
79.00
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.13, N = 3
70.04
2 x Xeon Platinum 8275CL
SE +/- 0.05, N = 3
69.93
2 x Xeon Platinum 8280
SE +/- 0.03, N = 3
66.39
EPYC 2 7R32
SE +/- 0.05, N = 3
65.67
50
100
150
200
250

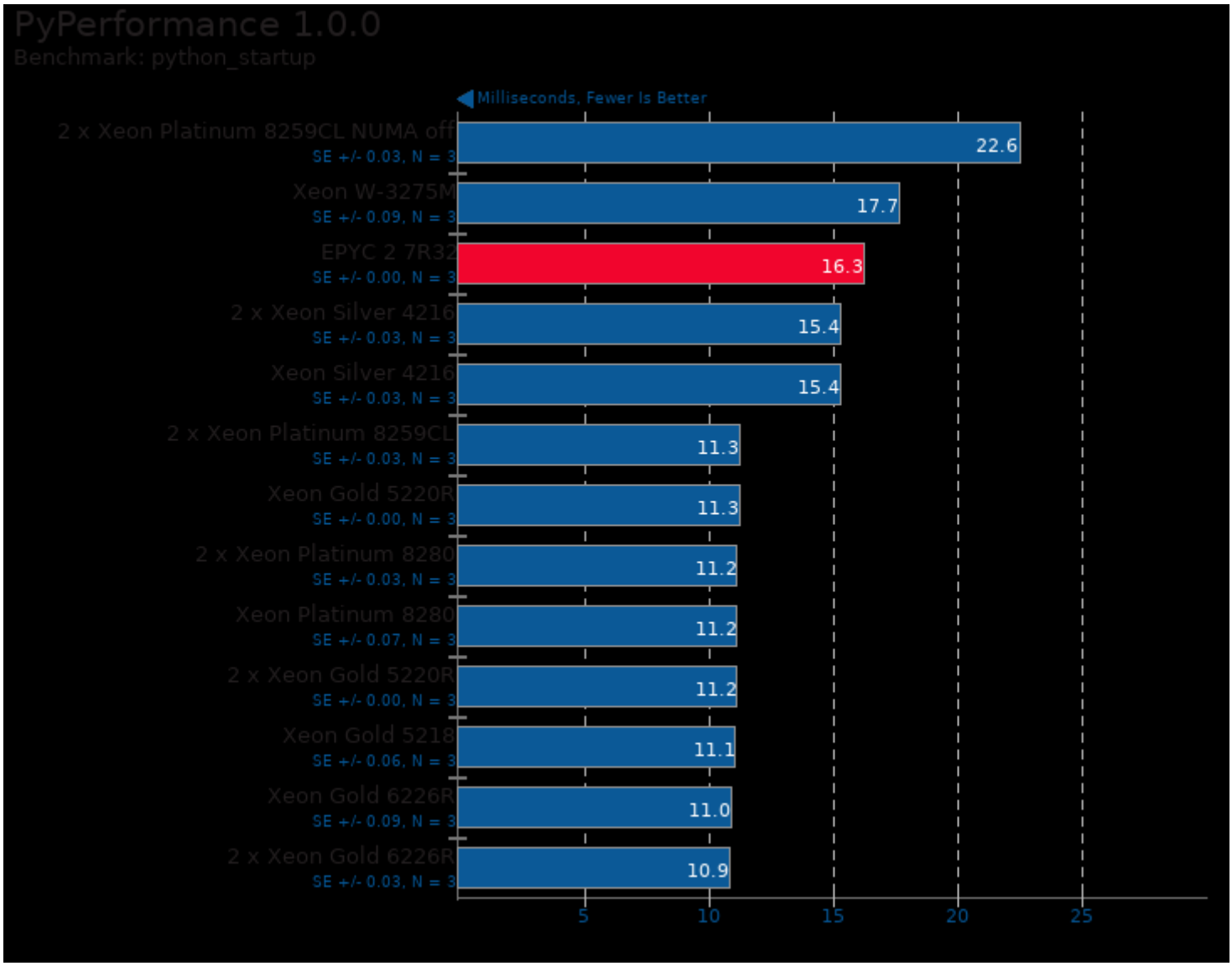

Blender 2.82
Blend File: Barbershop - Compute: CPU-Only
Seconds, Fewer Is Better
Xeon Silver 4216
SE +/- 0.17, N = 3
593.13
Xeon Gold 5218
SE +/- 0.20, N = 3
589.07
Xeon Gold 5220R
SE +/- 0.20, N = 3
456.47
Xeon Gold 6226R
SE +/- 0.44, N = 3
453.22
2 x Xeon Silver 4216
SE +/- 0.10, N = 3
333.40
Xeon W-3275M
SE +/- 0.22, N = 3
304.79
Xeon Platinum 8280
SE +/- 0.20, N = 3
287.80
2 x Xeon Gold 5220R
SE +/- 0.30, N = 3
260.56
2 x Xeon Gold 6226R
SE +/- 0.25, N = 3
257.01
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.10, N = 3
211.37
2 x Xeon Platinum 8259CL
SE +/- 0.16, N = 3
211.33
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.12, N = 3
190.01
2 x Xeon Platinum 8275CL
SE +/- 0.15, N = 3
189.55
2 x Xeon Platinum 8280
SE +/- 0.40, N = 3
187.33
EPYC 2 7R32
SE +/- 0.49, N = 3
177.79
130
260
390
520
650

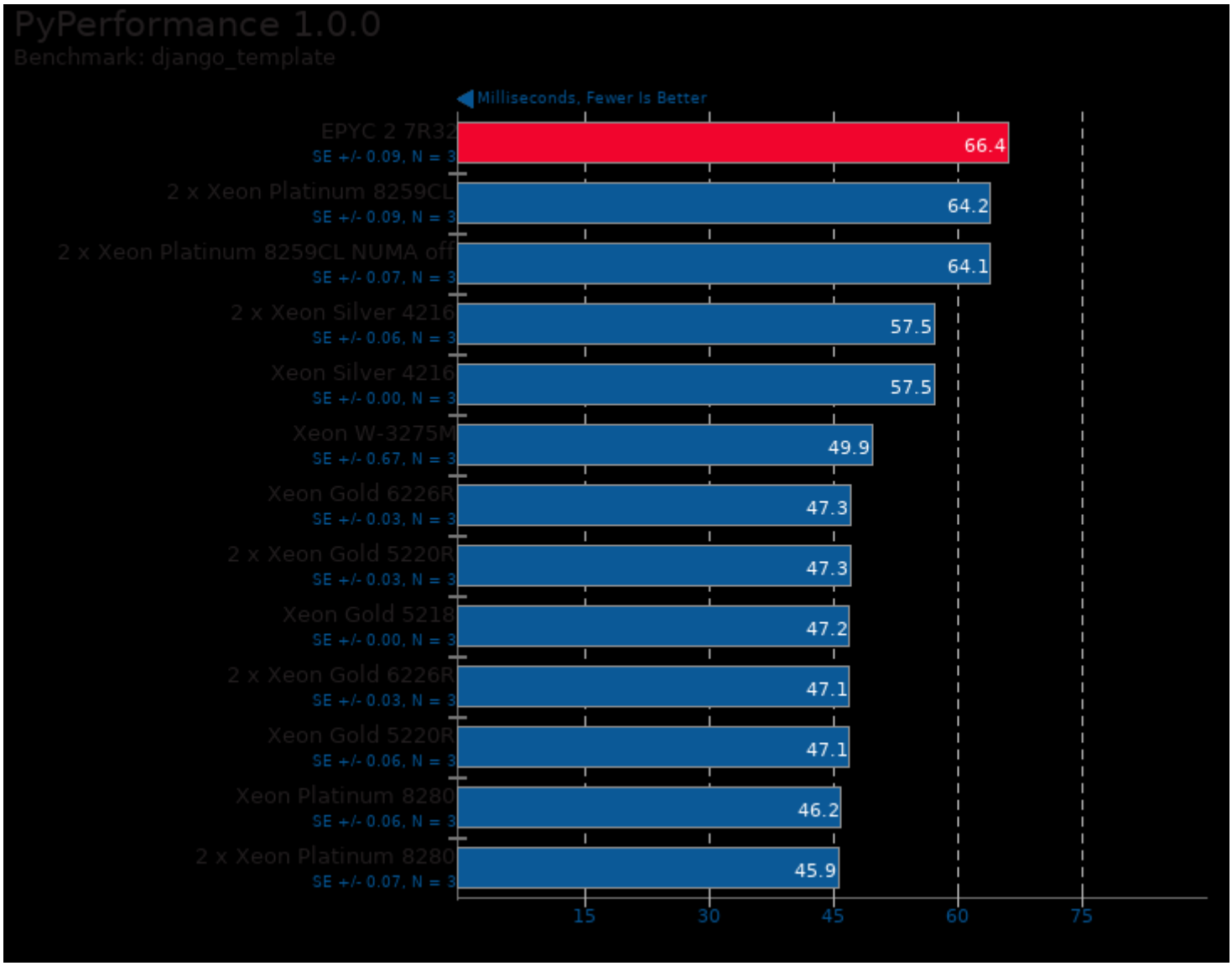

Blender 2.82
Blend File: Pabellon Barcelona - Compute: CPU-Only
Seconds, Fewer Is Better
Xeon Gold 5218
SE +/- 0.31, N = 3
531.98
Xeon Silver 4216
SE +/- 0.46, N = 3
531.39
Xeon Gold 5220R
SE +/- 0.03, N = 3
404.78
Xeon Gold 6226R
SE +/- 0.22, N = 3
400.96
2 x Xeon Silver 4216
SE +/- 0.50, N = 3
272.72
Xeon W-3275M
SE +/- 0.73, N = 3
265.41
Xeon Platinum 8280
SE +/- 0.05, N = 3
246.31
2 x Xeon Gold 5220R
SE +/- 0.10, N = 3
208.30
2 x Xeon Gold 6226R
SE +/- 0.09, N = 3
207.41
2 x Xeon Platinum 8259CL
SE +/- 0.05, N = 3
158.13
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.13, N = 3
157.99
2 x Xeon Platinum 8275CL
SE +/- 0.15, N = 3
139.11
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.11, N = 3
139.00
EPYC 2 7R32
SE +/- 0.51, N = 3
132.04
2 x Xeon Platinum 8280
SE +/- 0.26, N = 3
129.01
120
240
360
480
600

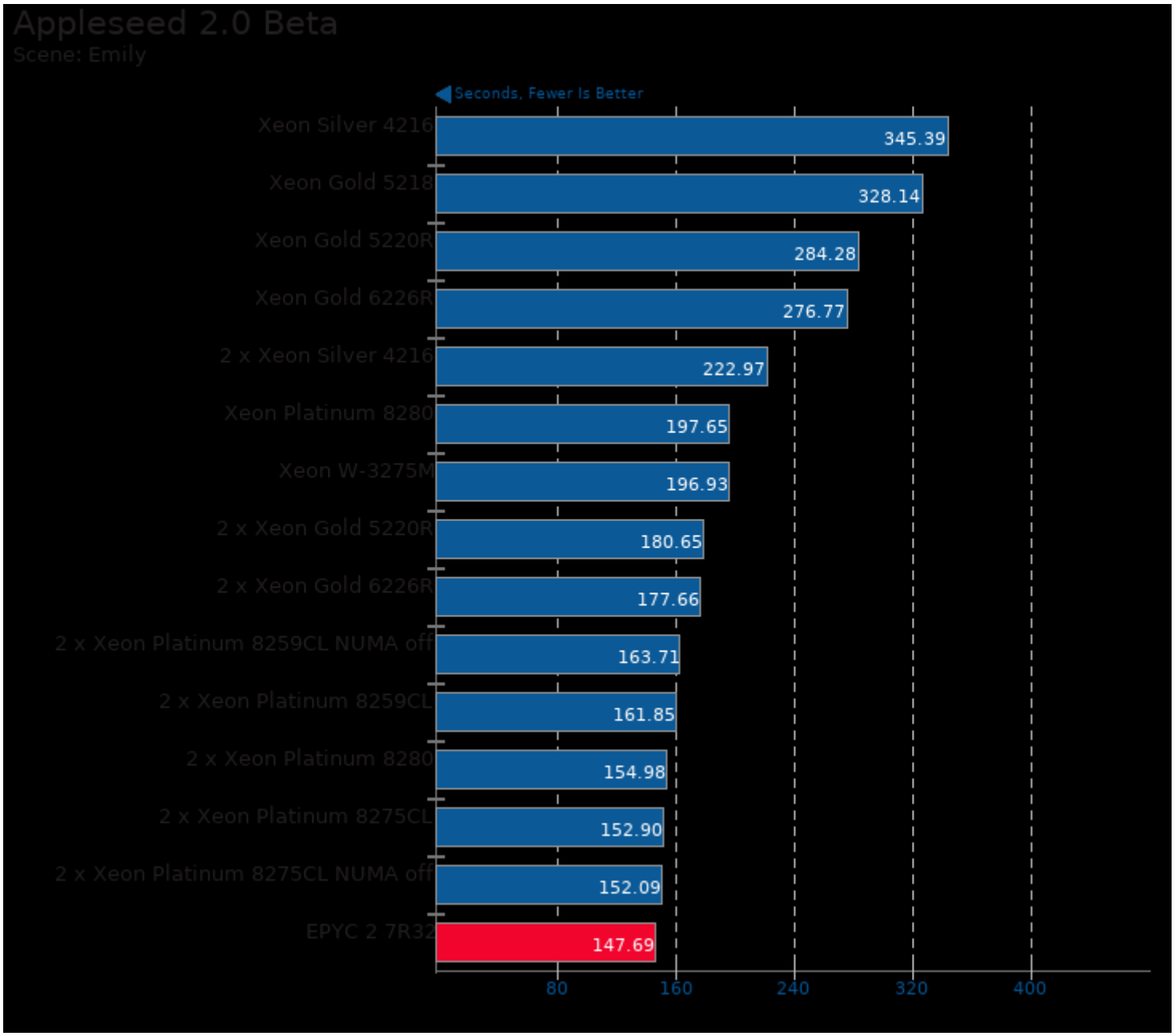

PyBench 2018-02-16
Total For Average Test Times
Milliseconds, Fewer Is Better
2 x Xeon Silver 4216
SE +/- 0.67, N = 3
1343
Xeon Silver 4216
SE +/- 0.58, N = 3
1342
2 x Xeon Platinum 8259CL NUMA off
SE +/- 1.33, N = 3
1253
2 x Xeon Platinum 8259CL
SE +/- 1.00, N = 3
1252
EPYC 2 7R32
SE +/- 3.18, N = 3
1226
2 x Xeon Platinum 8275CL
SE +/- 4.73, N = 3
1133
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.88, N = 3
1123
Xeon Gold 5220R
SE +/- 12.17, N = 3
1114
2 x Xeon Gold 6226R
SE +/- 0.67, N = 3
1104
Xeon Gold 6226R
SE +/- 3.06, N = 3
1103
Xeon Gold 5218
1101
2 x Xeon Gold 5220R
SE +/- 1.45, N = 3
1100
Xeon Platinum 8280
SE +/- 1.15, N = 3
1076
2 x Xeon Platinum 8280
SE +/- 1.00, N = 3
1073
Xeon W-3275M
SE +/- 1.45, N = 3
951
300
600
900
1200
1500

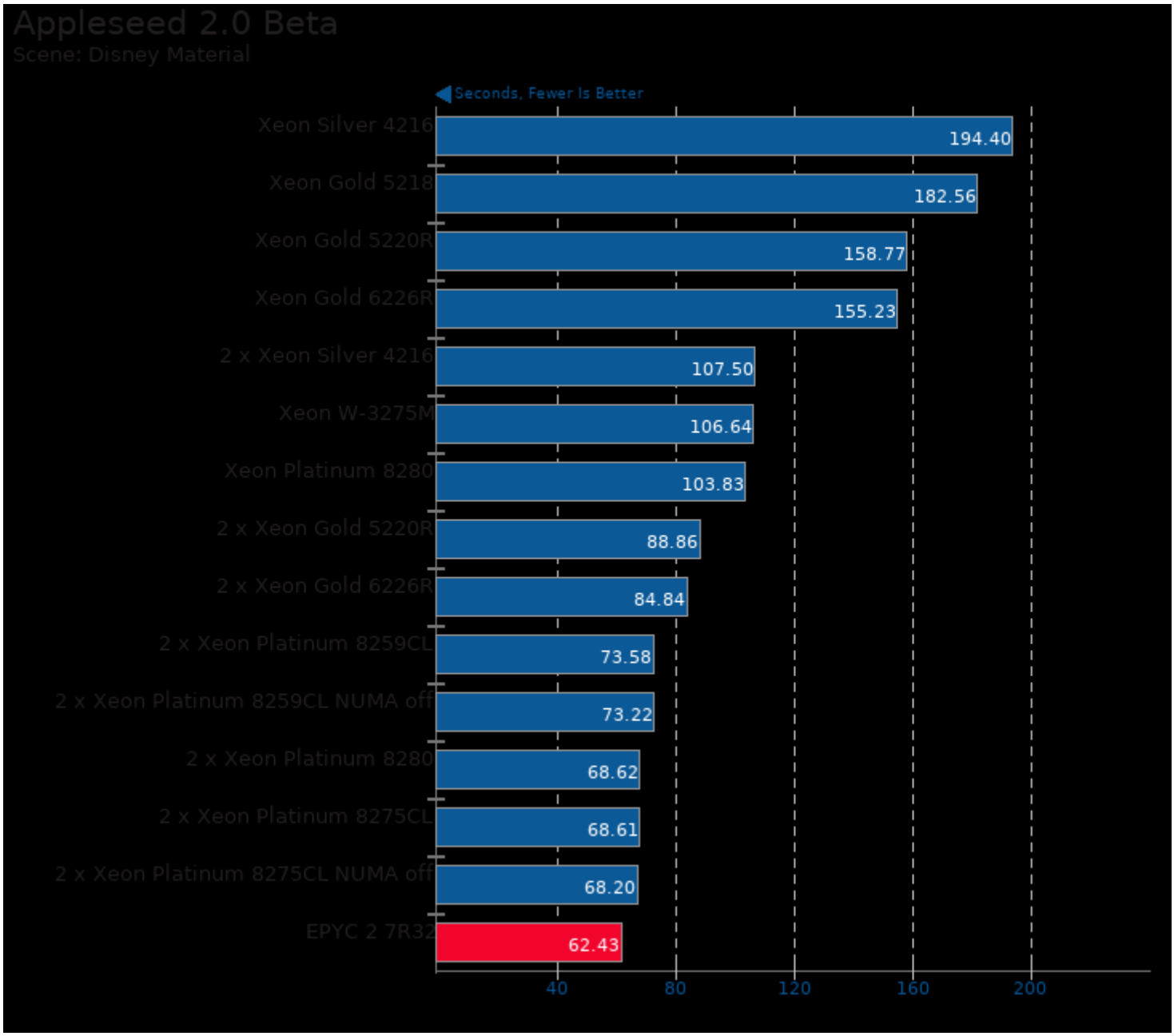

PyPerformance 1.0.0
Benchmark: float
Milliseconds, Fewer Is Better
2 x Xeon Silver 4216
137.0
Xeon Silver 4216
137.0
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.33, N = 3
123.0
2 x Xeon Platinum 8259CL
123.0
Xeon Gold 6226R
115.0
Xeon Gold 5218
114.0
Xeon Gold 5220R
114.0
2 x Xeon Gold 6226R
113.0
2 x Xeon Gold 5220R
SE +/- 0.33, N = 3
113.0
2 x Xeon Platinum 8280
109.0
Xeon Platinum 8280
109.0
Xeon W-3275M
SE +/- 0.12, N = 3
94.5
30
60
90
120
150

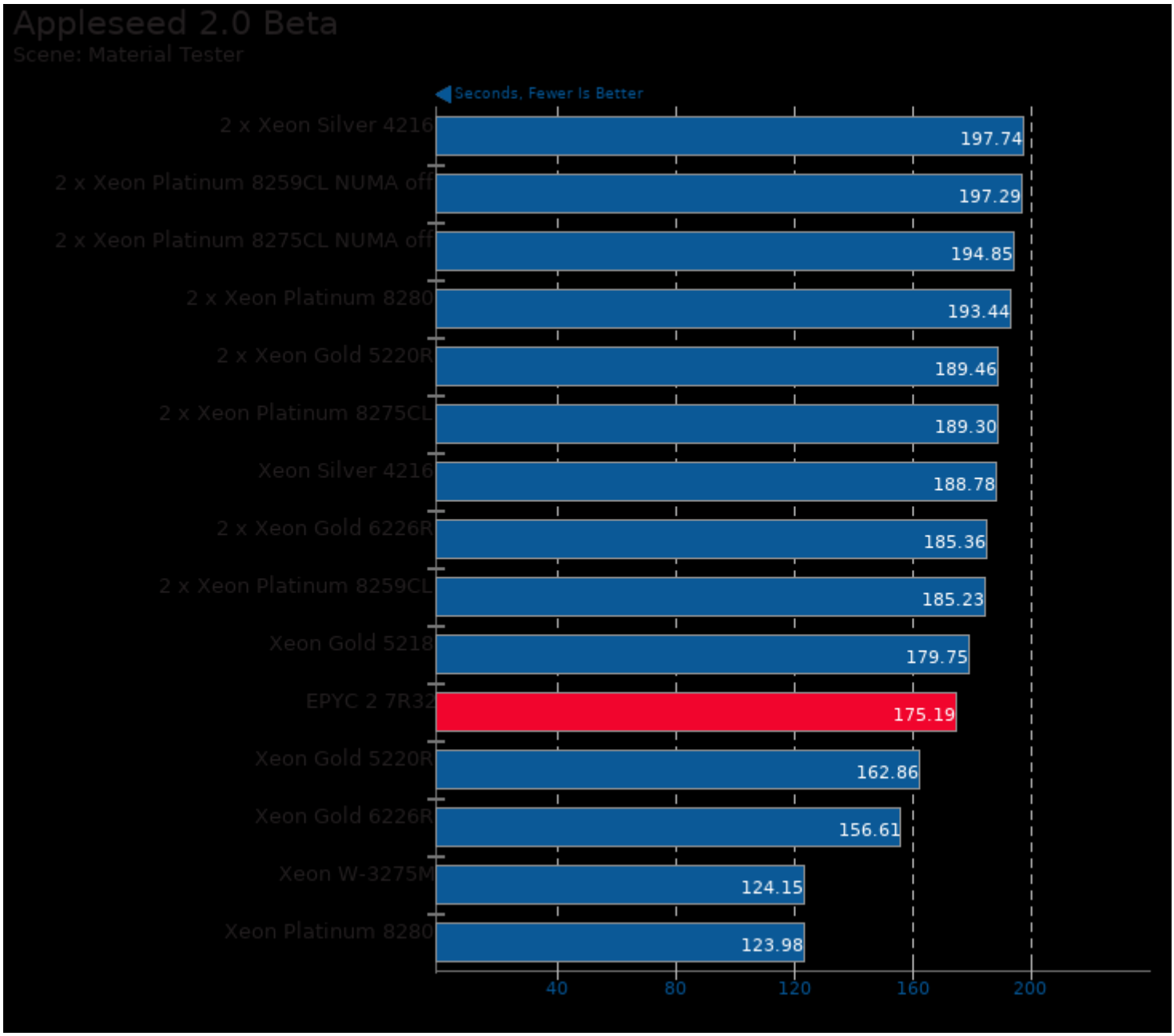

PyPerformance 1.0.0
Benchmark: regex_compile
Milliseconds, Fewer Is Better
EPYC 2 7R32
SE +/- 0.33, N = 3
213
2 x Xeon Silver 4216
204
Xeon Silver 4216
204
2 x Xeon Platinum 8259CL NUMA off
200
2 x Xeon Platinum 8259CL
200
Xeon Gold 6226R
168
Xeon Gold 5220R
168
2 x Xeon Gold 6226R
167
Xeon Gold 5218
167
2 x Xeon Gold 5220R
167
2 x Xeon Platinum 8280
164
Xeon Platinum 8280
164
Xeon W-3275M
SE +/- 1.20, N = 3
157
50
100
150
200
250

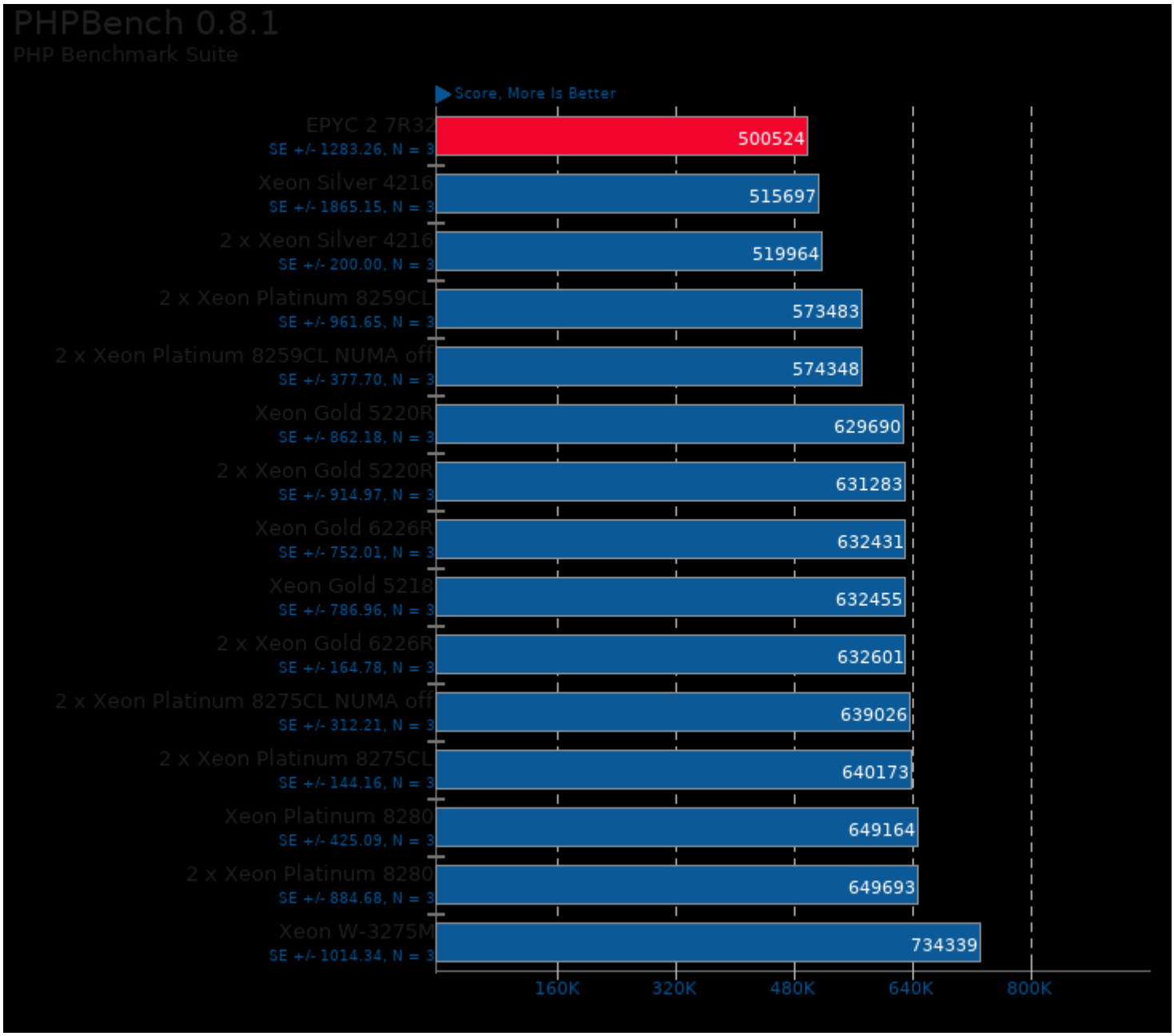

PyPerformance 1.0.0
Benchmark: python_startup
Milliseconds, Fewer Is Better
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.03, N = 3
22.6
Xeon W-3275M
SE +/- 0.09, N = 3
17.7
EPYC 2 7R32
SE +/- 0.00, N = 3
16.3
2 x Xeon Silver 4216
SE +/- 0.03, N = 3
15.4
Xeon Silver 4216
SE +/- 0.03, N = 3
15.4
2 x Xeon Platinum 8259CL
SE +/- 0.03, N = 3
11.3
Xeon Gold 5220R
SE +/- 0.00, N = 3
11.3
2 x Xeon Platinum 8280
SE +/- 0.03, N = 3
11.2
Xeon Platinum 8280
SE +/- 0.07, N = 3
11.2
2 x Xeon Gold 5220R
SE +/- 0.00, N = 3
11.2
Xeon Gold 5218
SE +/- 0.06, N = 3
11.1
Xeon Gold 6226R
SE +/- 0.09, N = 3
11.0
2 x Xeon Gold 6226R
SE +/- 0.03, N = 3
10.9
5
10
15
20
25

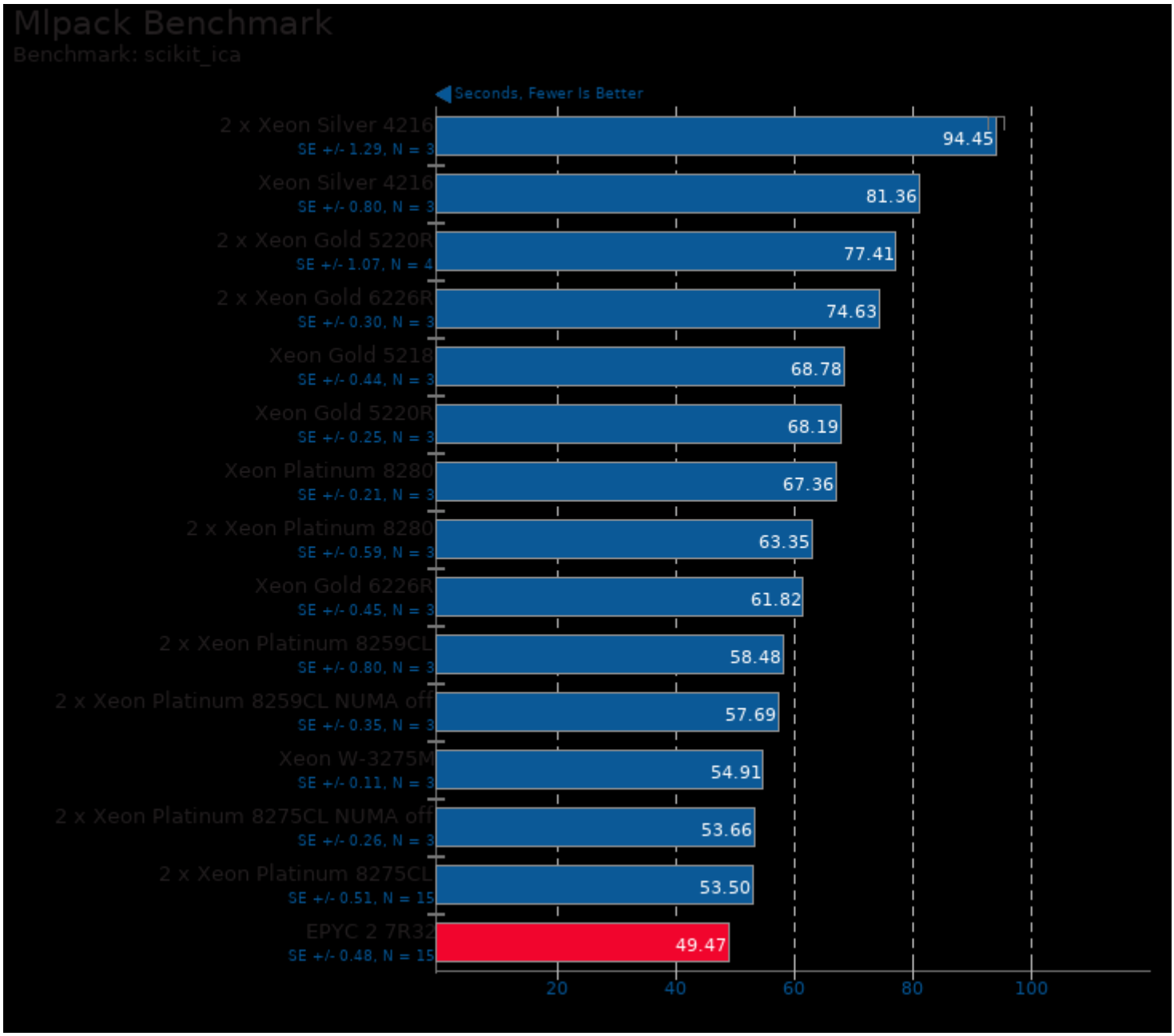

PyPerformance 1.0.0
Benchmark: django_template
Milliseconds, Fewer Is Better
EPYC 2 7R32
SE +/- 0.09, N = 3
66.4
2 x Xeon Platinum 8259CL
SE +/- 0.09, N = 3
64.2
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.07, N = 3
64.1
2 x Xeon Silver 4216
SE +/- 0.06, N = 3
57.5
Xeon Silver 4216
SE +/- 0.00, N = 3
57.5
Xeon W-3275M
SE +/- 0.67, N = 3
49.9
Xeon Gold 6226R
SE +/- 0.03, N = 3
47.3
2 x Xeon Gold 5220R
SE +/- 0.03, N = 3
47.3
Xeon Gold 5218
SE +/- 0.00, N = 3
47.2
2 x Xeon Gold 6226R
SE +/- 0.03, N = 3
47.1
Xeon Gold 5220R
SE +/- 0.06, N = 3
47.1
Xeon Platinum 8280
SE +/- 0.06, N = 3
46.2
2 x Xeon Platinum 8280
SE +/- 0.07, N = 3
45.9
15
30
45
60
75

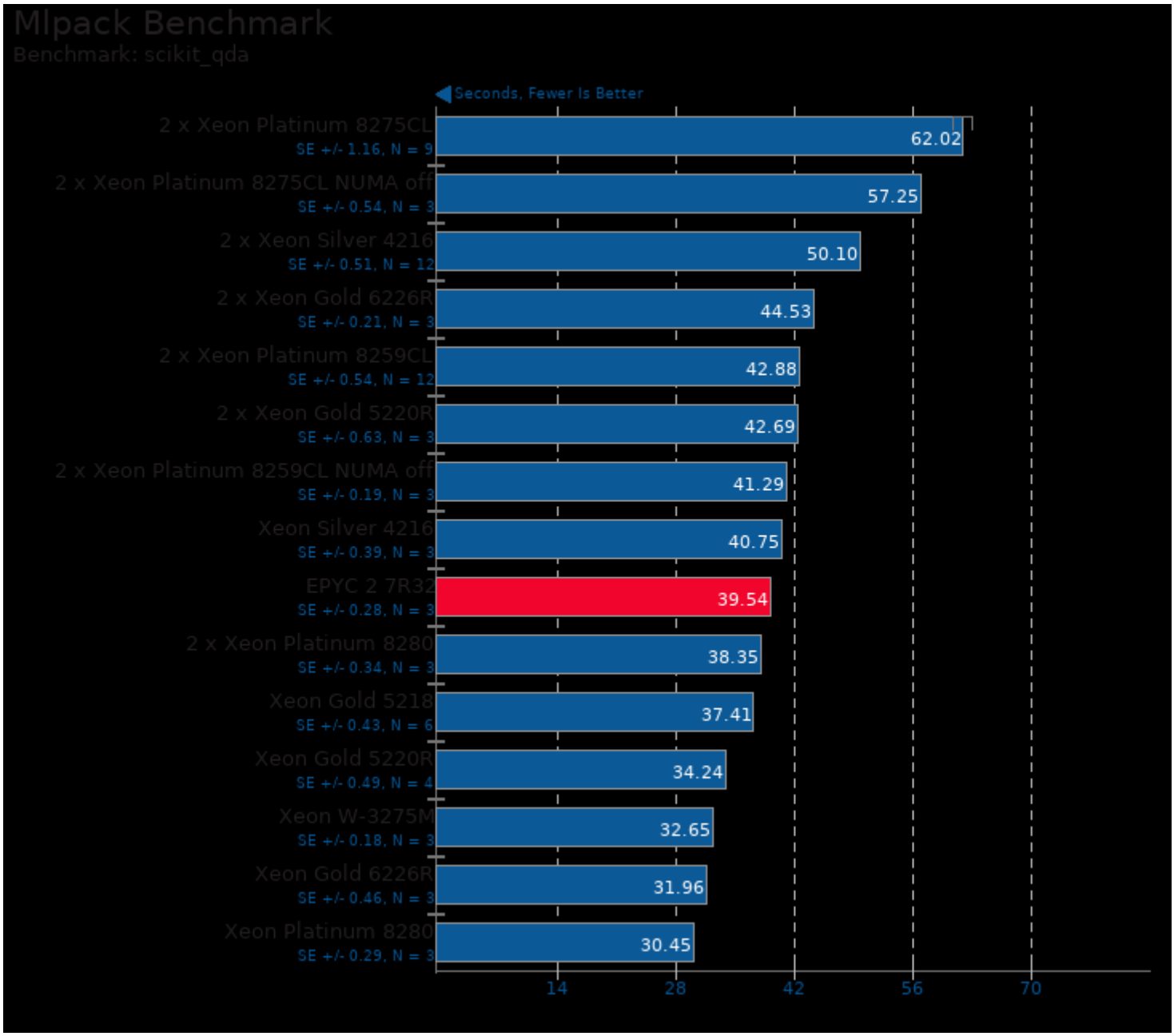

Appleseed 2.0 Beta
Scene: Emily
Seconds, Fewer Is Better
Xeon Silver 4216
345.39
Xeon Gold 5218
328.14
Xeon Gold 5220R
284.28
Xeon Gold 6226R
276.77
2 x Xeon Silver 4216
222.97
Xeon Platinum 8280
197.65
Xeon W-3275M
196.93
2 x Xeon Gold 5220R
180.65
2 x Xeon Gold 6226R
177.66
2 x Xeon Platinum 8259CL NUMA off
163.71
2 x Xeon Platinum 8259CL
161.85
2 x Xeon Platinum 8280
154.98
2 x Xeon Platinum 8275CL
152.90
2 x Xeon Platinum 8275CL NUMA off
152.09
EPYC 2 7R32
147.69
80
160
240
320
400

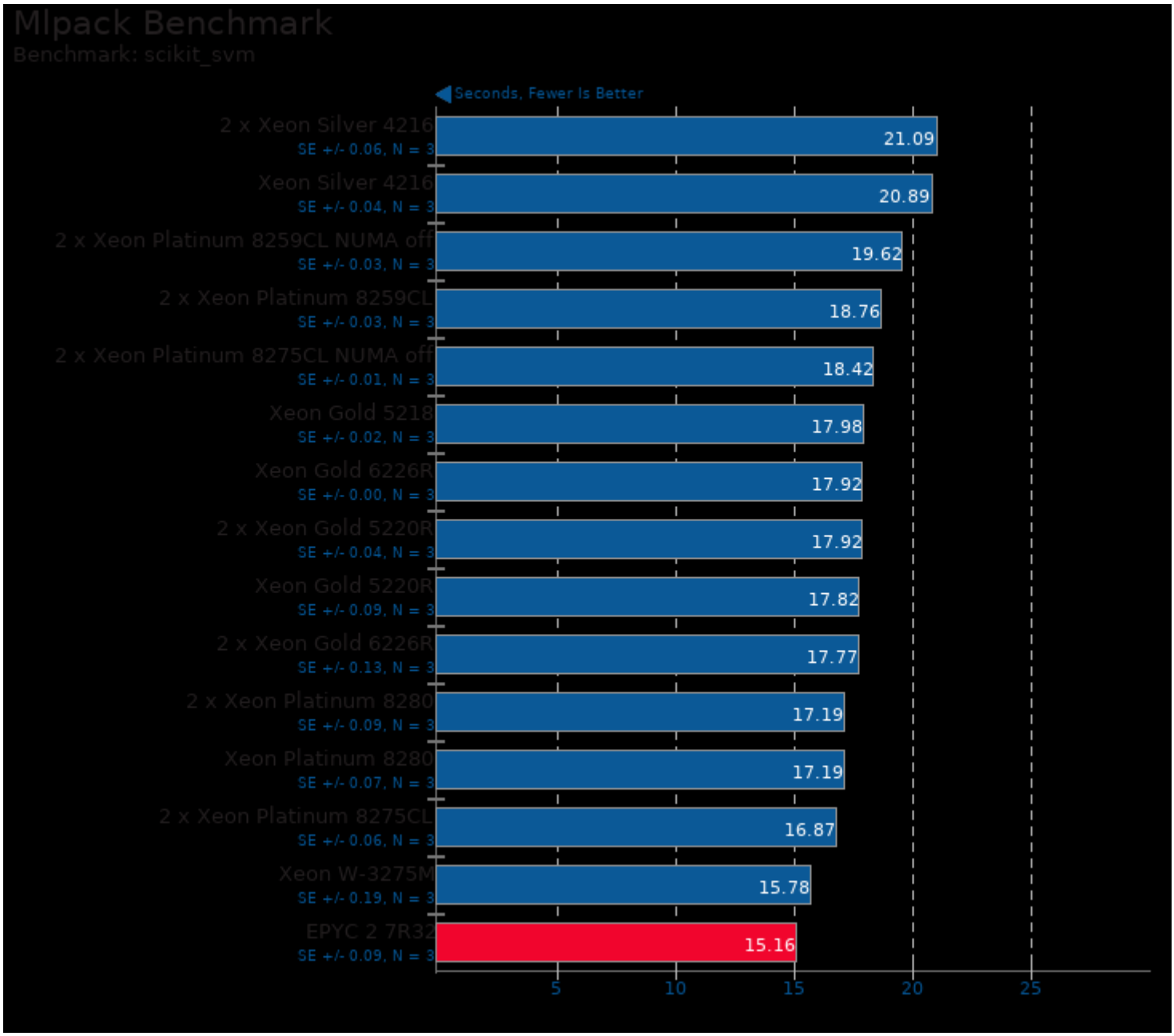

Appleseed 2.0 Beta
Scene: Disney Material
Seconds, Fewer Is Better
Xeon Silver 4216
194.40
Xeon Gold 5218
182.56
Xeon Gold 5220R
158.77
Xeon Gold 6226R
155.23
2 x Xeon Silver 4216
107.50
Xeon W-3275M
106.64
Xeon Platinum 8280
103.83
2 x Xeon Gold 5220R
88.86
2 x Xeon Gold 6226R
84.84
2 x Xeon Platinum 8259CL
73.58
2 x Xeon Platinum 8259CL NUMA off
73.22
2 x Xeon Platinum 8280
68.62
2 x Xeon Platinum 8275CL
68.61
2 x Xeon Platinum 8275CL NUMA off
68.20
EPYC 2 7R32
62.43
40
80
120
160
200

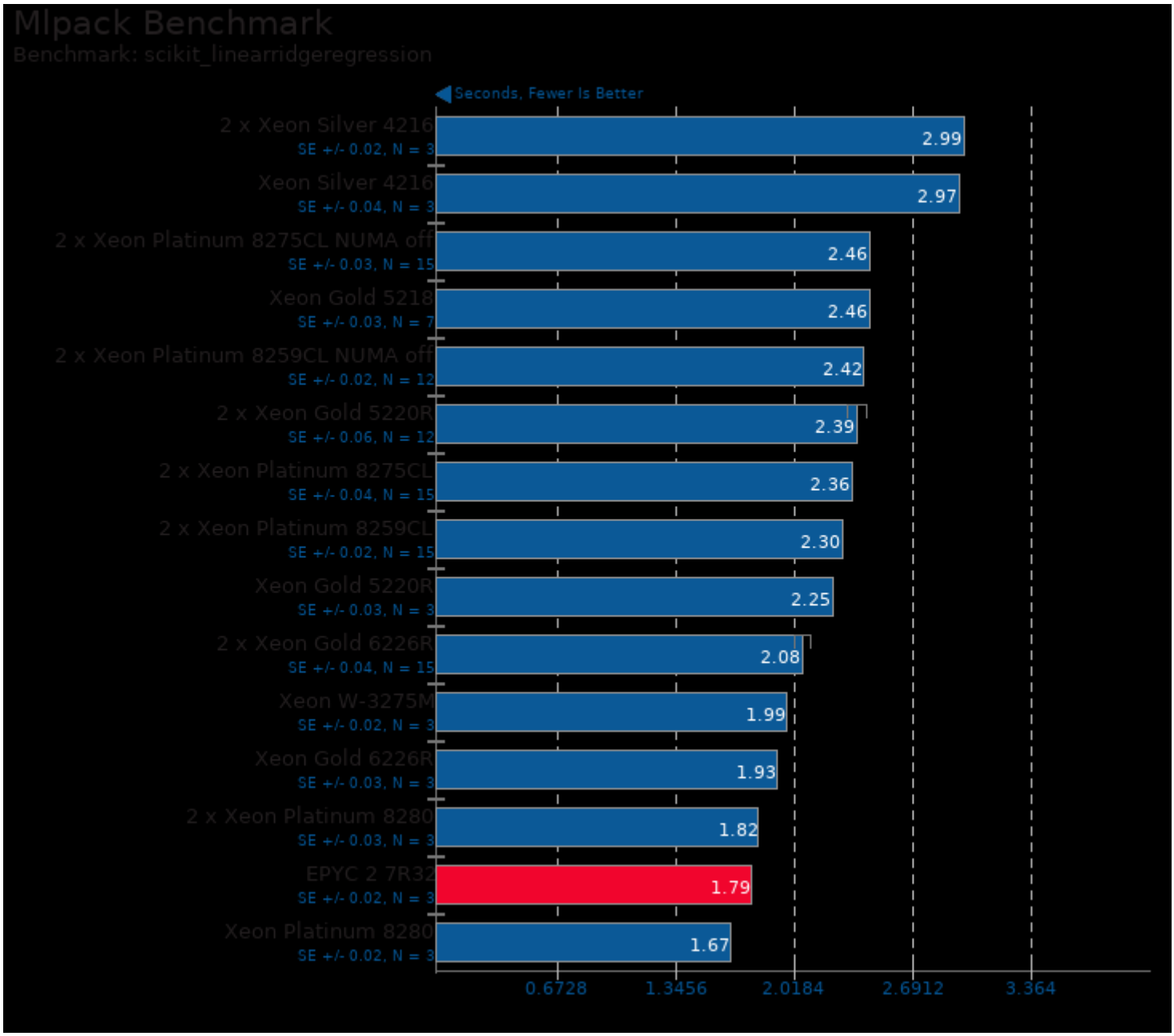

Appleseed 2.0 Beta
Scene: Material Tester
Seconds, Fewer Is Better
2 x Xeon Silver 4216
197.74
2 x Xeon Platinum 8259CL NUMA off
197.29
2 x Xeon Platinum 8275CL NUMA off
194.85
2 x Xeon Platinum 8280
193.44
2 x Xeon Gold 5220R
189.46
2 x Xeon Platinum 8275CL
189.30
Xeon Silver 4216
188.78
2 x Xeon Gold 6226R
185.36
2 x Xeon Platinum 8259CL
185.23
Xeon Gold 5218
179.75
EPYC 2 7R32
175.19
Xeon Gold 5220R
162.86
Xeon Gold 6226R
156.61
Xeon W-3275M
124.15
Xeon Platinum 8280
123.98
40
80
120
160
200

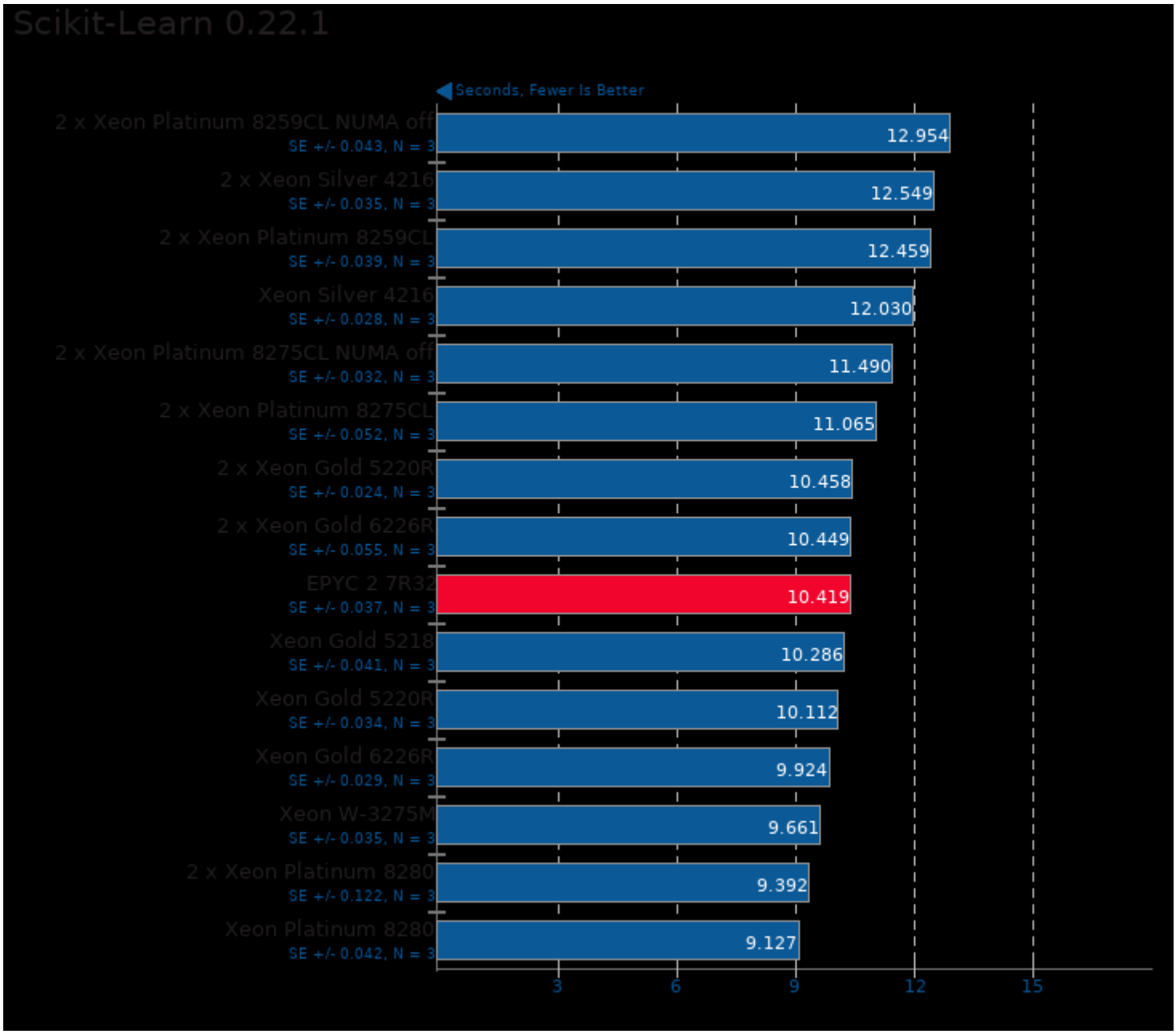

PHPBench 0.8.1
PHP Benchmark Suite
Score, More Is Better
EPYC 2 7R32
SE +/- 1283.26, N = 3
500524
Xeon Silver 4216
SE +/- 1865.15, N = 3
515697
2 x Xeon Silver 4216
SE +/- 200.00, N = 3
519964
2 x Xeon Platinum 8259CL
SE +/- 961.65, N = 3
573483
2 x Xeon Platinum 8259CL NUMA off
SE +/- 377.70, N = 3
574348
Xeon Gold 5220R
SE +/- 862.18, N = 3
629690
2 x Xeon Gold 5220R
SE +/- 914.97, N = 3
631283
Xeon Gold 6226R
SE +/- 752.01, N = 3
632431
Xeon Gold 5218
SE +/- 786.96, N = 3
632455
2 x Xeon Gold 6226R
SE +/- 164.78, N = 3
632601
2 x Xeon Platinum 8275CL NUMA off
SE +/- 312.21, N = 3
639026
2 x Xeon Platinum 8275CL
SE +/- 144.16, N = 3
640173
Xeon Platinum 8280
SE +/- 425.09, N = 3
649164
2 x Xeon Platinum 8280
SE +/- 884.68, N = 3
649693
Xeon W-3275M
SE +/- 1014.34, N = 3
734339
160K
320K
480K
640K
800K

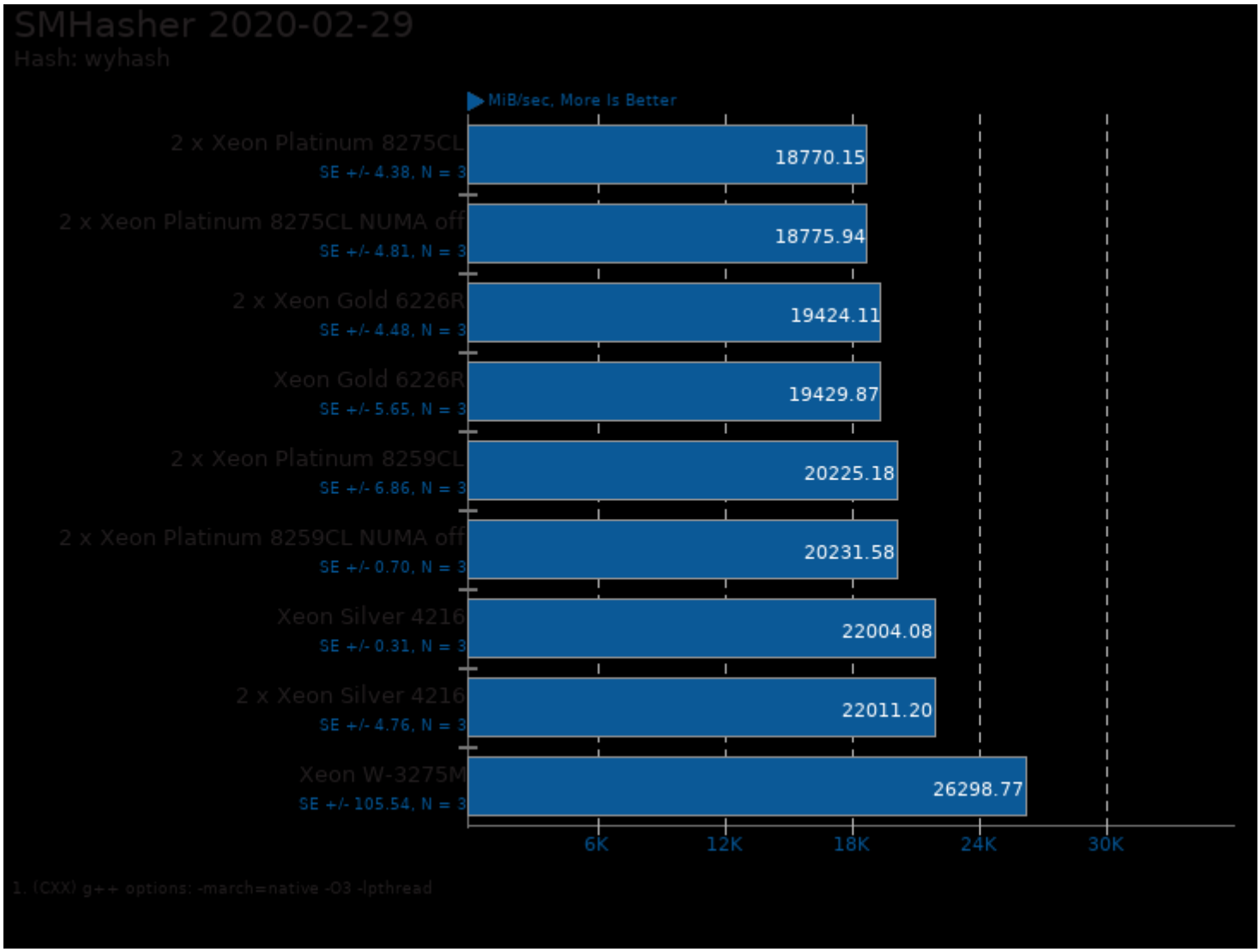

Mlpack Benchmark
Benchmark: scikit_ica
Seconds, Fewer Is Better
2 x Xeon Silver 4216
SE +/- 1.29, N = 3
94.45
Xeon Silver 4216
SE +/- 0.80, N = 3
81.36
2 x Xeon Gold 5220R
SE +/- 1.07, N = 4
77.41
2 x Xeon Gold 6226R
SE +/- 0.30, N = 3
74.63
Xeon Gold 5218
SE +/- 0.44, N = 3
68.78
Xeon Gold 5220R
SE +/- 0.25, N = 3
68.19
Xeon Platinum 8280
SE +/- 0.21, N = 3
67.36
2 x Xeon Platinum 8280
SE +/- 0.59, N = 3
63.35
Xeon Gold 6226R
SE +/- 0.45, N = 3
61.82
2 x Xeon Platinum 8259CL
SE +/- 0.80, N = 3
58.48
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.35, N = 3
57.69
Xeon W-3275M
SE +/- 0.11, N = 3
54.91
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.26, N = 3
53.66
2 x Xeon Platinum 8275CL
SE +/- 0.51, N = 15
53.50
EPYC 2 7R32
SE +/- 0.48, N = 15
49.47
20
40
60
80
100


Mlpack Benchmark
Benchmark: scikit_qda
Seconds, Fewer Is Better
2 x Xeon Platinum 8275CL
SE +/- 1.16, N = 9
62.02
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.54, N = 3
57.25
2 x Xeon Silver 4216
SE +/- 0.51, N = 12
50.10
2 x Xeon Gold 6226R
SE +/- 0.21, N = 3
44.53
2 x Xeon Platinum 8259CL
SE +/- 0.54, N = 12
42.88
2 x Xeon Gold 5220R
SE +/- 0.63, N = 3
42.69
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.19, N = 3
41.29
Xeon Silver 4216
SE +/- 0.39, N = 3
40.75
EPYC 2 7R32
SE +/- 0.28, N = 3
39.54
2 x Xeon Platinum 8280
SE +/- 0.34, N = 3
38.35
Xeon Gold 5218
SE +/- 0.43, N = 6
37.41
Xeon Gold 5220R
SE +/- 0.49, N = 4
34.24
Xeon W-3275M
SE +/- 0.18, N = 3
32.65
Xeon Gold 6226R
SE +/- 0.46, N = 3
31.96
Xeon Platinum 8280
SE +/- 0.29, N = 3
30.45
14
28
42
56
70

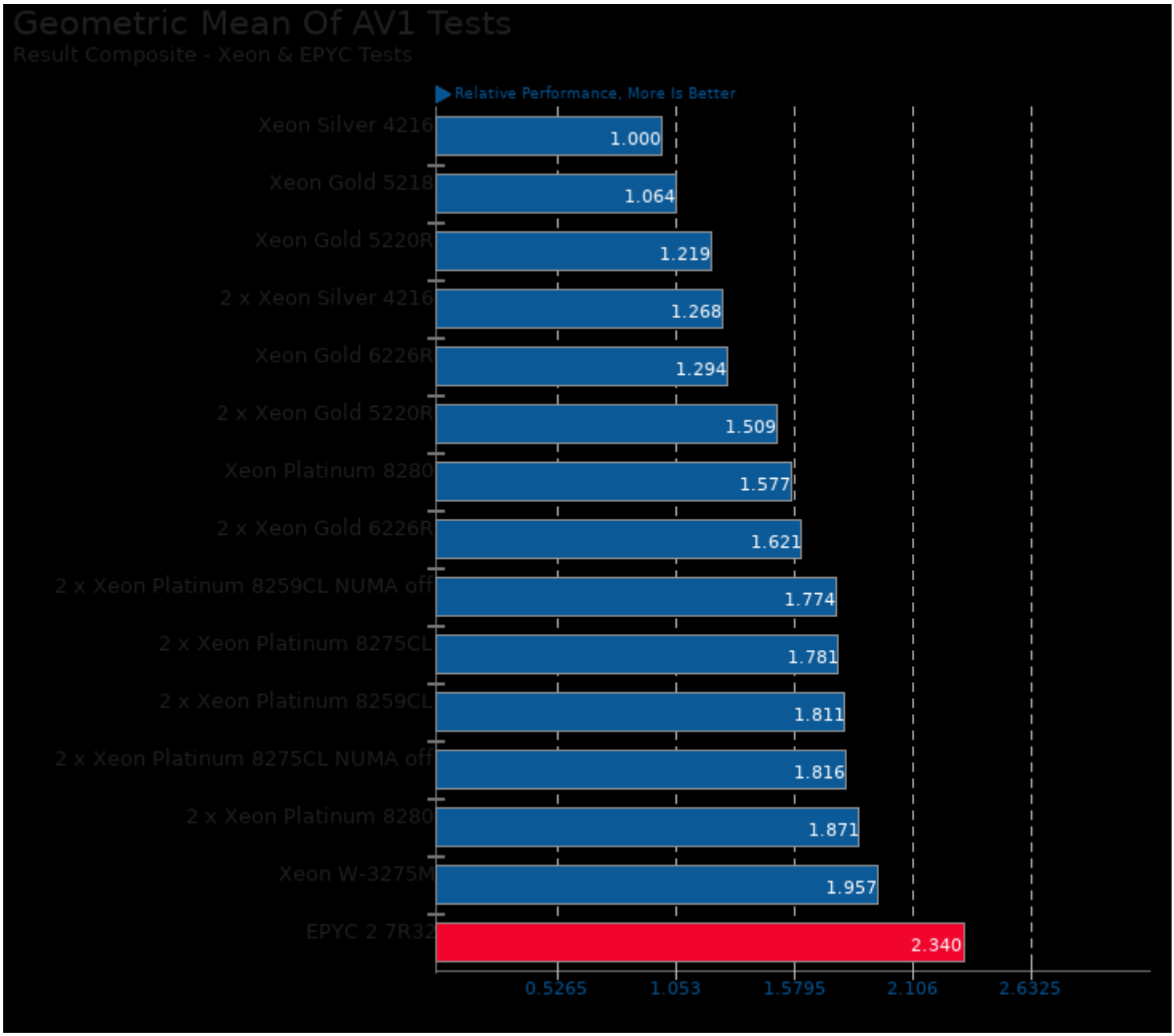

Mlpack Benchmark
Benchmark: scikit_svm
Seconds, Fewer Is Better
2 x Xeon Silver 4216
SE +/- 0.06, N = 3
21.09
Xeon Silver 4216
SE +/- 0.04, N = 3
20.89
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.03, N = 3
19.62
2 x Xeon Platinum 8259CL
SE +/- 0.03, N = 3
18.76
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.01, N = 3
18.42
Xeon Gold 5218
SE +/- 0.02, N = 3
17.98
Xeon Gold 6226R
SE +/- 0.00, N = 3
17.92
2 x Xeon Gold 5220R
SE +/- 0.04, N = 3
17.92
Xeon Gold 5220R
SE +/- 0.09, N = 3
17.82
2 x Xeon Gold 6226R
SE +/- 0.13, N = 3
17.77
2 x Xeon Platinum 8280
SE +/- 0.09, N = 3
17.19
Xeon Platinum 8280
SE +/- 0.07, N = 3
17.19
2 x Xeon Platinum 8275CL
SE +/- 0.06, N = 3
16.87
Xeon W-3275M
SE +/- 0.19, N = 3
15.78
EPYC 2 7R32
SE +/- 0.09, N = 3
15.16
5
10
15
20
25


Mlpack Benchmark
Benchmark: scikit_linearridgeregression
Seconds, Fewer Is Better
2 x Xeon Silver 4216
SE +/- 0.02, N = 3
2.99
Xeon Silver 4216
SE +/- 0.04, N = 3
2.97
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.03, N = 15
2.46
Xeon Gold 5218
SE +/- 0.03, N = 7
2.46
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.02, N = 12
2.42
2 x Xeon Gold 5220R
SE +/- 0.06, N = 12
2.39
2 x Xeon Platinum 8275CL
SE +/- 0.04, N = 15
2.36
2 x Xeon Platinum 8259CL
SE +/- 0.02, N = 15
2.30
Xeon Gold 5220R
SE +/- 0.03, N = 3
2.25
2 x Xeon Gold 6226R
SE +/- 0.04, N = 15
2.08
Xeon W-3275M
SE +/- 0.02, N = 3
1.99
Xeon Gold 6226R
SE +/- 0.03, N = 3
1.93
2 x Xeon Platinum 8280
SE +/- 0.03, N = 3
1.82
EPYC 2 7R32
SE +/- 0.02, N = 3
1.79
Xeon Platinum 8280
SE +/- 0.02, N = 3
1.67
0.6728
1.3456
2.0184
2.6912
3.364

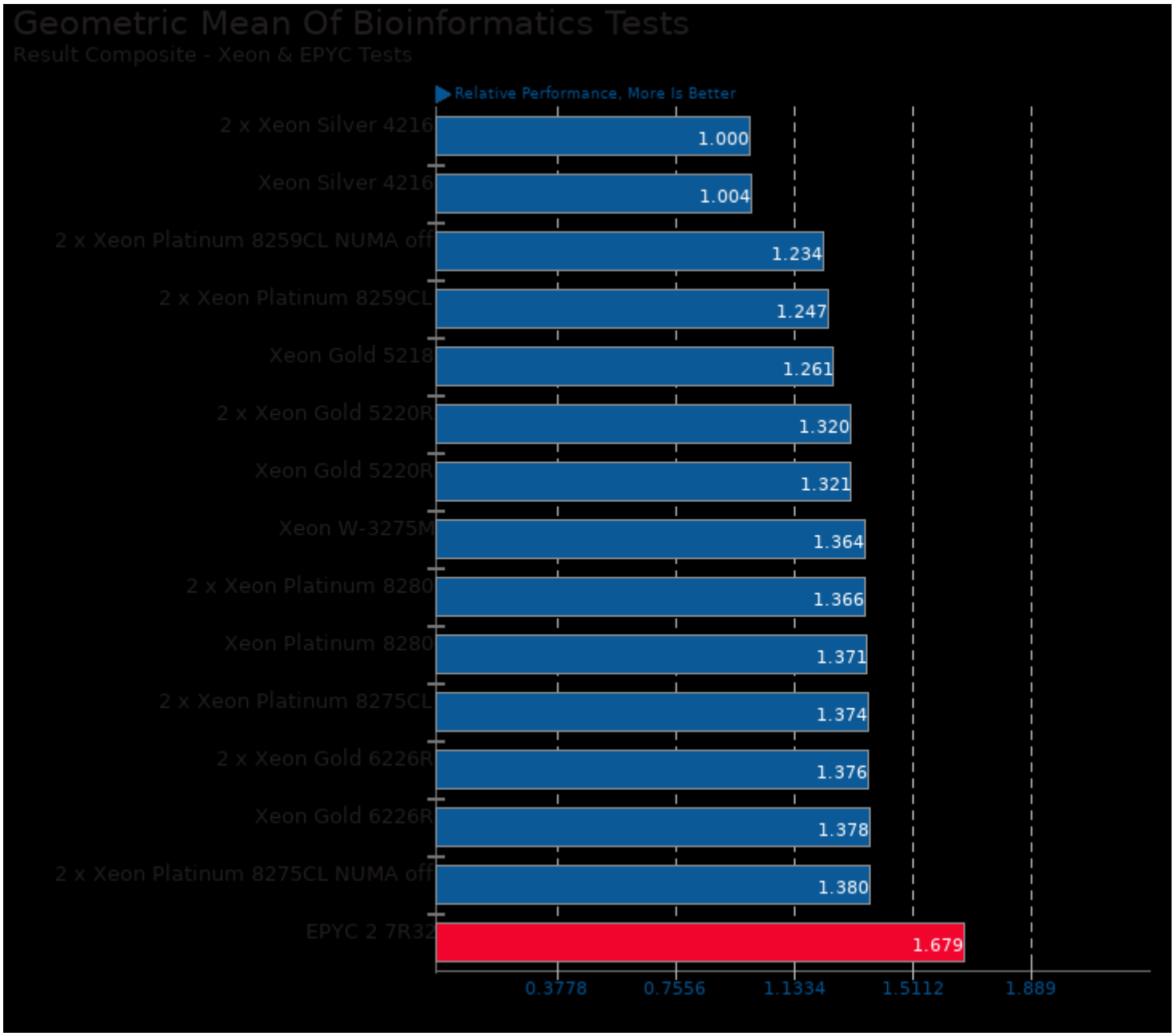

Scikit-Learn 0.22.1
Seconds, Fewer Is Better
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.043, N = 3
12.954
2 x Xeon Silver 4216
SE +/- 0.035, N = 3
12.549
2 x Xeon Platinum 8259CL
SE +/- 0.039, N = 3
12.459
Xeon Silver 4216
SE +/- 0.028, N = 3
12.030
2 x Xeon Platinum 8275CL NUMA off
SE +/- 0.032, N = 3
11.490
2 x Xeon Platinum 8275CL
SE +/- 0.052, N = 3
11.065
2 x Xeon Gold 5220R
SE +/- 0.024, N = 3
10.458
2 x Xeon Gold 6226R
SE +/- 0.055, N = 3
10.449
EPYC 2 7R32
SE +/- 0.037, N = 3
10.419
Xeon Gold 5218
SE +/- 0.041, N = 3
10.286
Xeon Gold 5220R
SE +/- 0.034, N = 3
10.112
Xeon Gold 6226R
SE +/- 0.029, N = 3
9.924
Xeon W-3275M
SE +/- 0.035, N = 3
9.661
2 x Xeon Platinum 8280
SE +/- 0.122, N = 3
9.392
Xeon Platinum 8280
SE +/- 0.042, N = 3
9.127
3
6
9
12
15


SMHasher 2020-02-29
Hash: wyhash
MiB/sec, More Is Better
2 x Xeon Platinum 8275CL
SE +/- 4.38, N = 3
18770.15
2 x Xeon Platinum 8275CL NUMA off
SE +/- 4.81, N = 3
18775.94
2 x Xeon Gold 6226R
SE +/- 4.48, N = 3
19424.11
Xeon Gold 6226R
SE +/- 5.65, N = 3
19429.87
2 x Xeon Platinum 8259CL
SE +/- 6.86, N = 3
20225.18
2 x Xeon Platinum 8259CL NUMA off
SE +/- 0.70, N = 3
20231.58
Xeon Silver 4216
SE +/- 0.31, N = 3
22004.08
2 x Xeon Silver 4216
SE +/- 4.76, N = 3
22011.20
Xeon W-3275M
SE +/- 105.54, N = 3
26298.77
6K
12K
18K
24K
30K
1. (CXX) g++ options: -march=native -O3 -lpthread

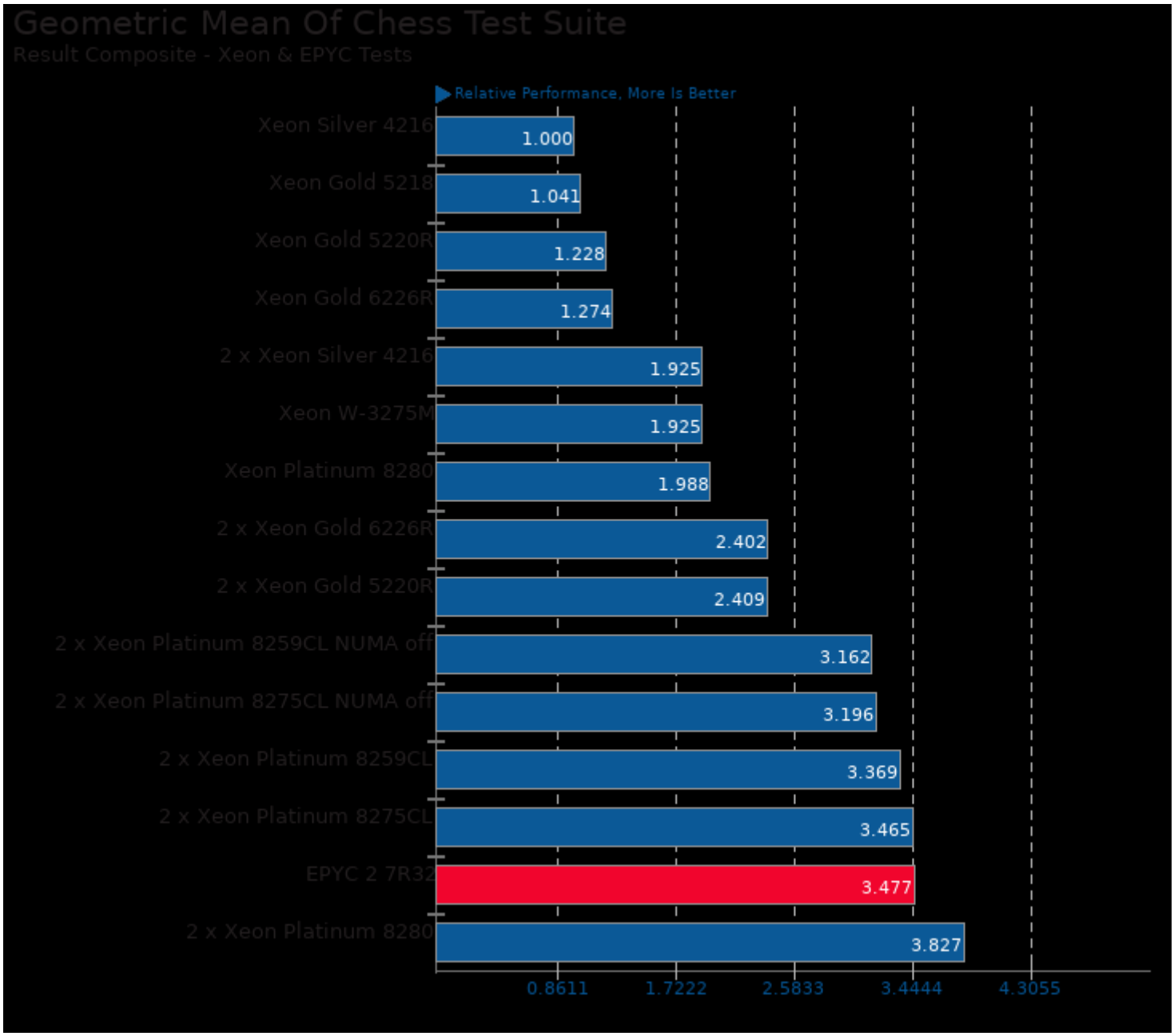
These geometric means are based upon test groupings / test suites for this result file.



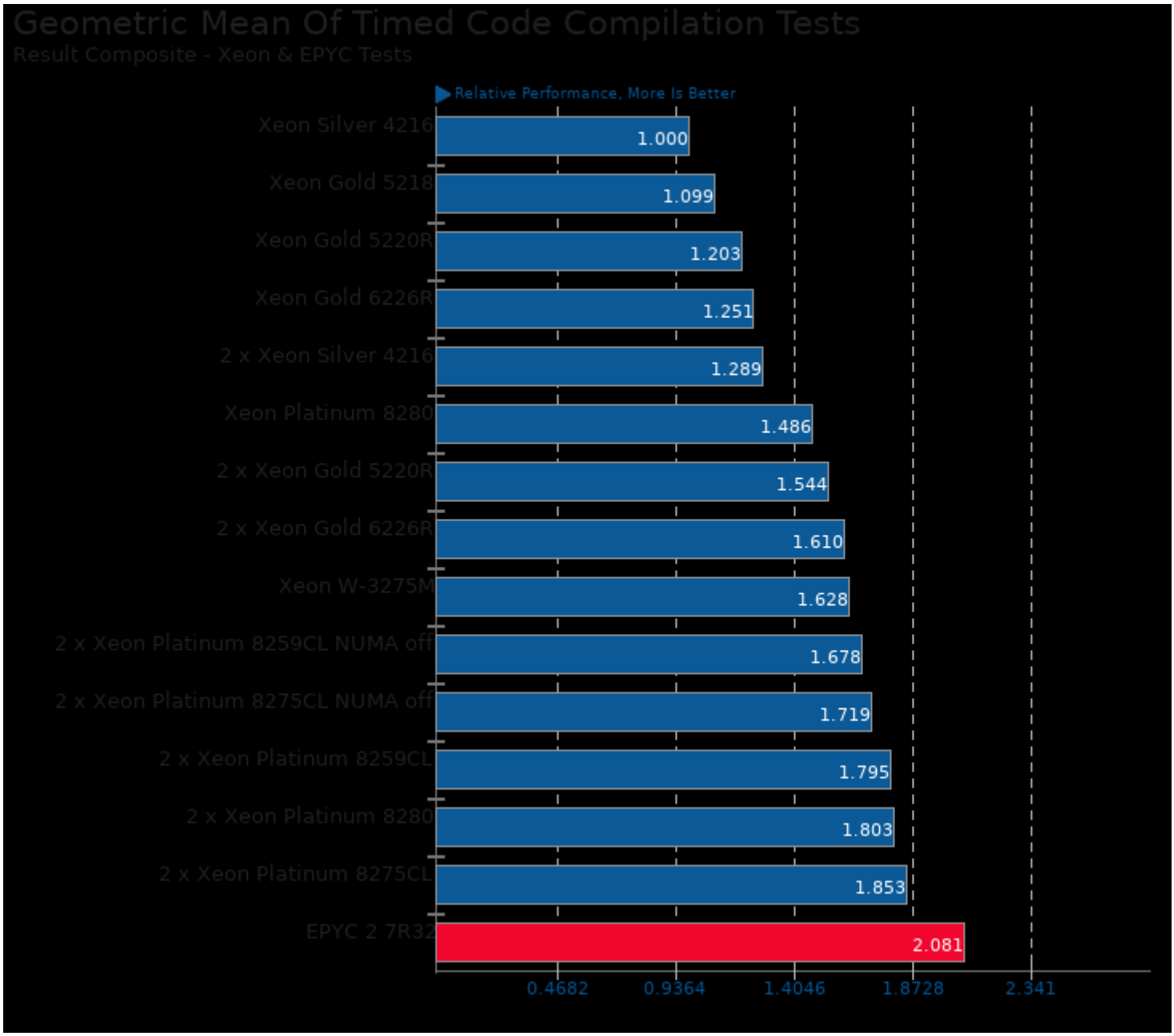
Geometric mean based upon tests: pts/dav1d and pts/svt-av1



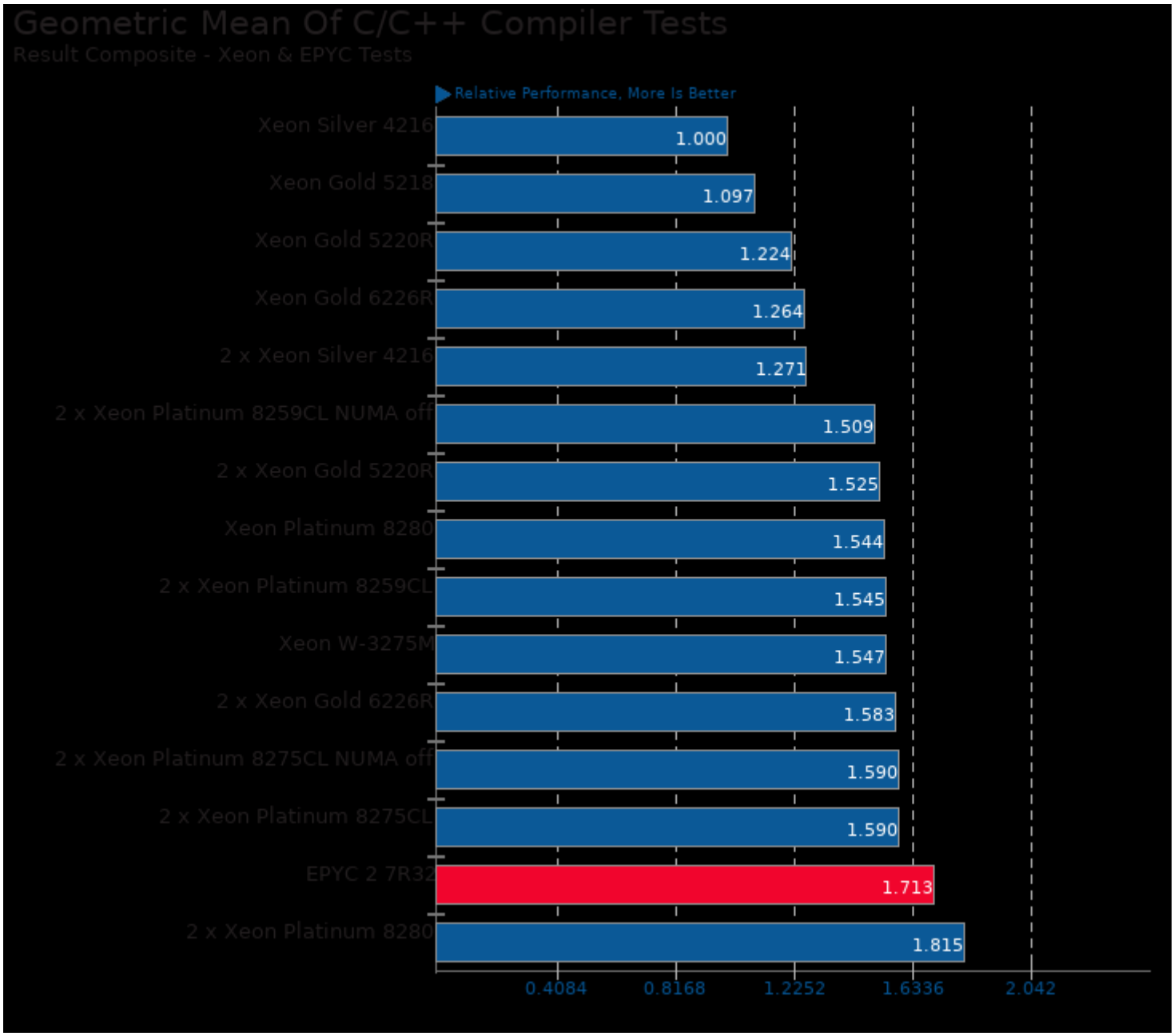
Geometric mean based upon tests: pts/himeno and pts/mrbayes



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



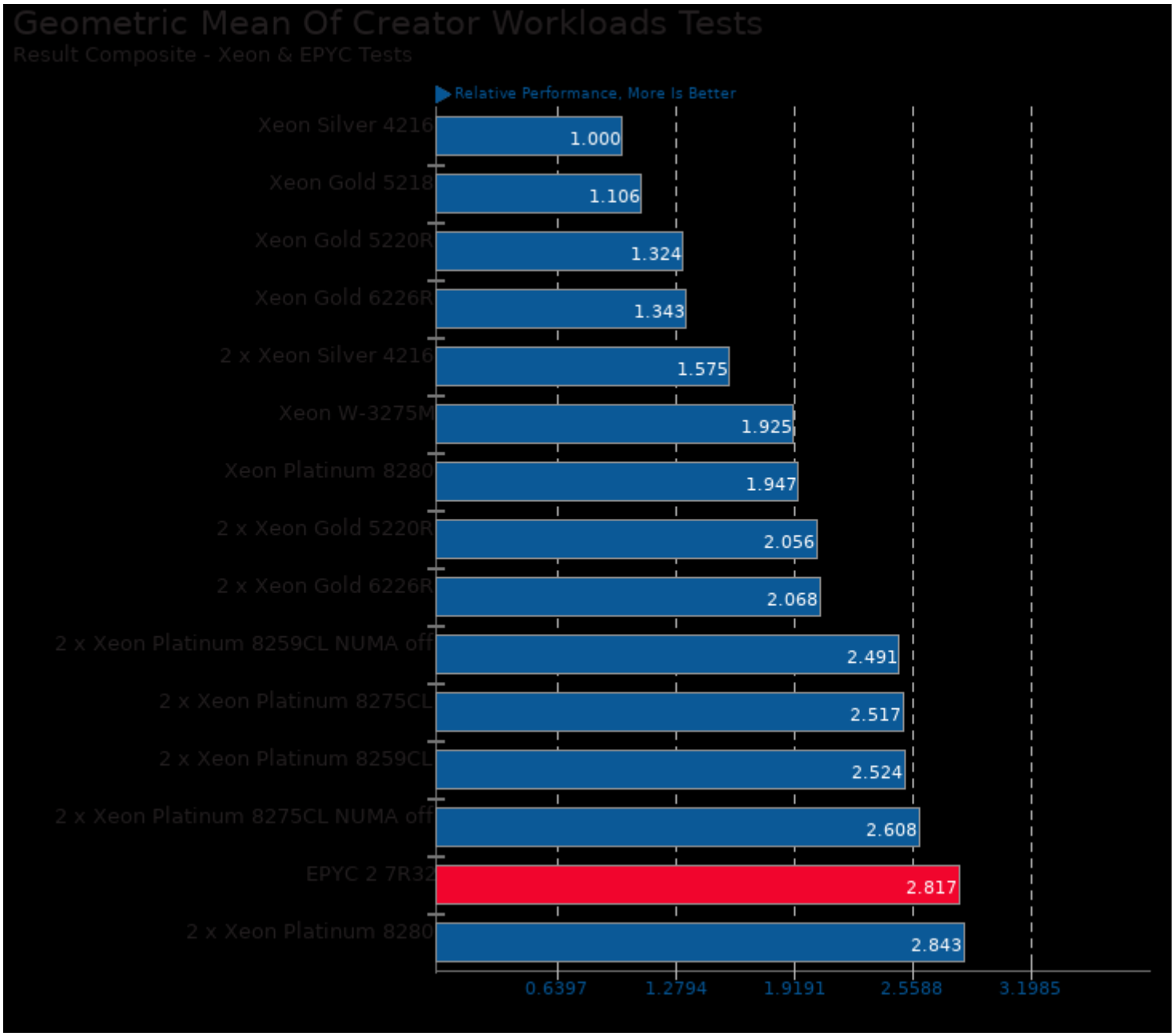
Geometric mean based upon tests: pts/build-linux-kernel, pts/build-gcc, pts/build-gdb, pts/build-llvm and pts/build2



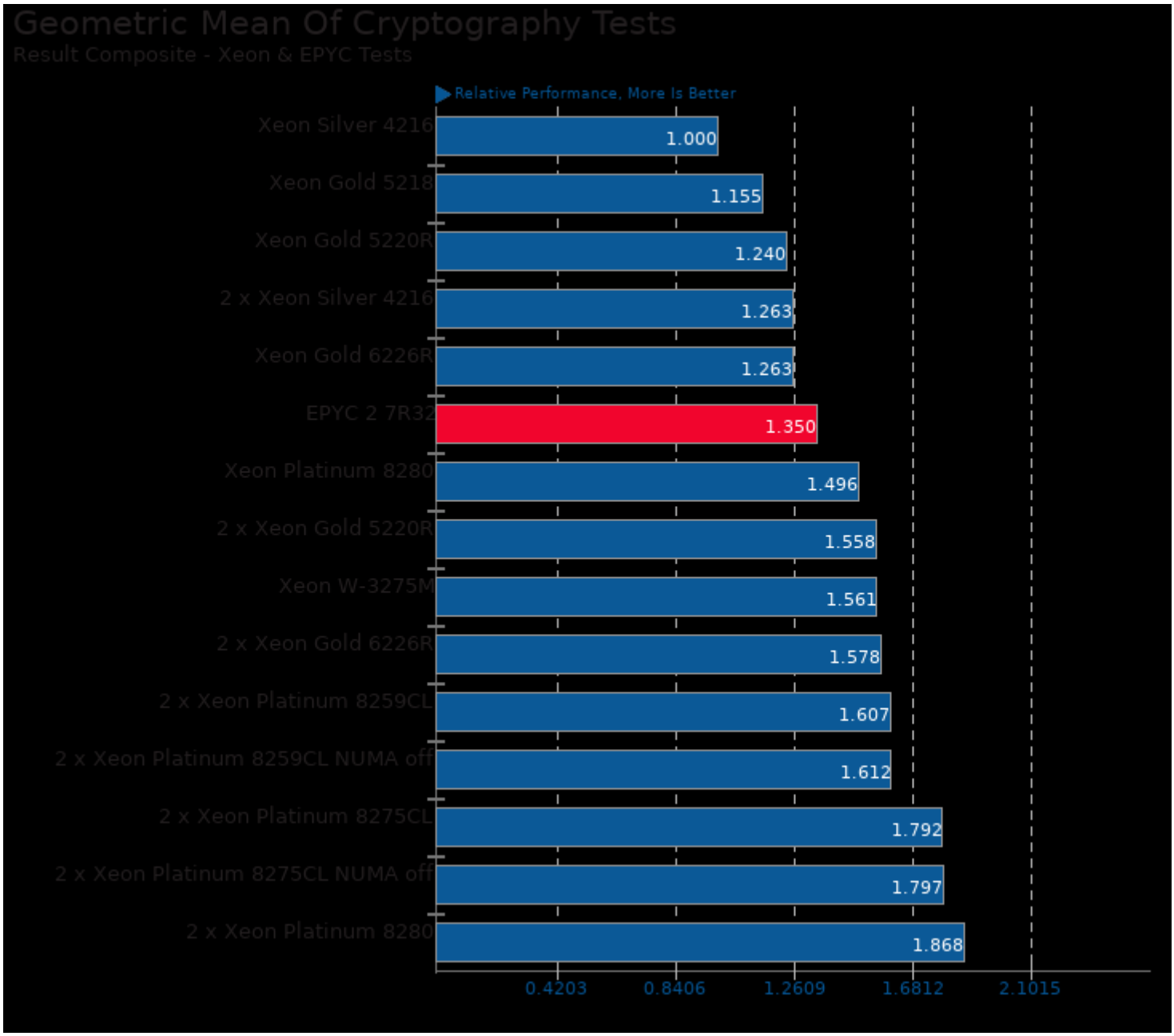
Geometric mean based upon tests: pts/himeno, pts/stockfish, pts/build-llvm, pts/pgbench, pts/mrbayes, pts/john-the-ripper, pts/dav1d, pts/tungsten, pts/compress-zstd, pts/lammps, pts/svt-av1, pts/svt-vp9, pts/build-gdb, pts/smhasher, pts/basis and pts/nettle



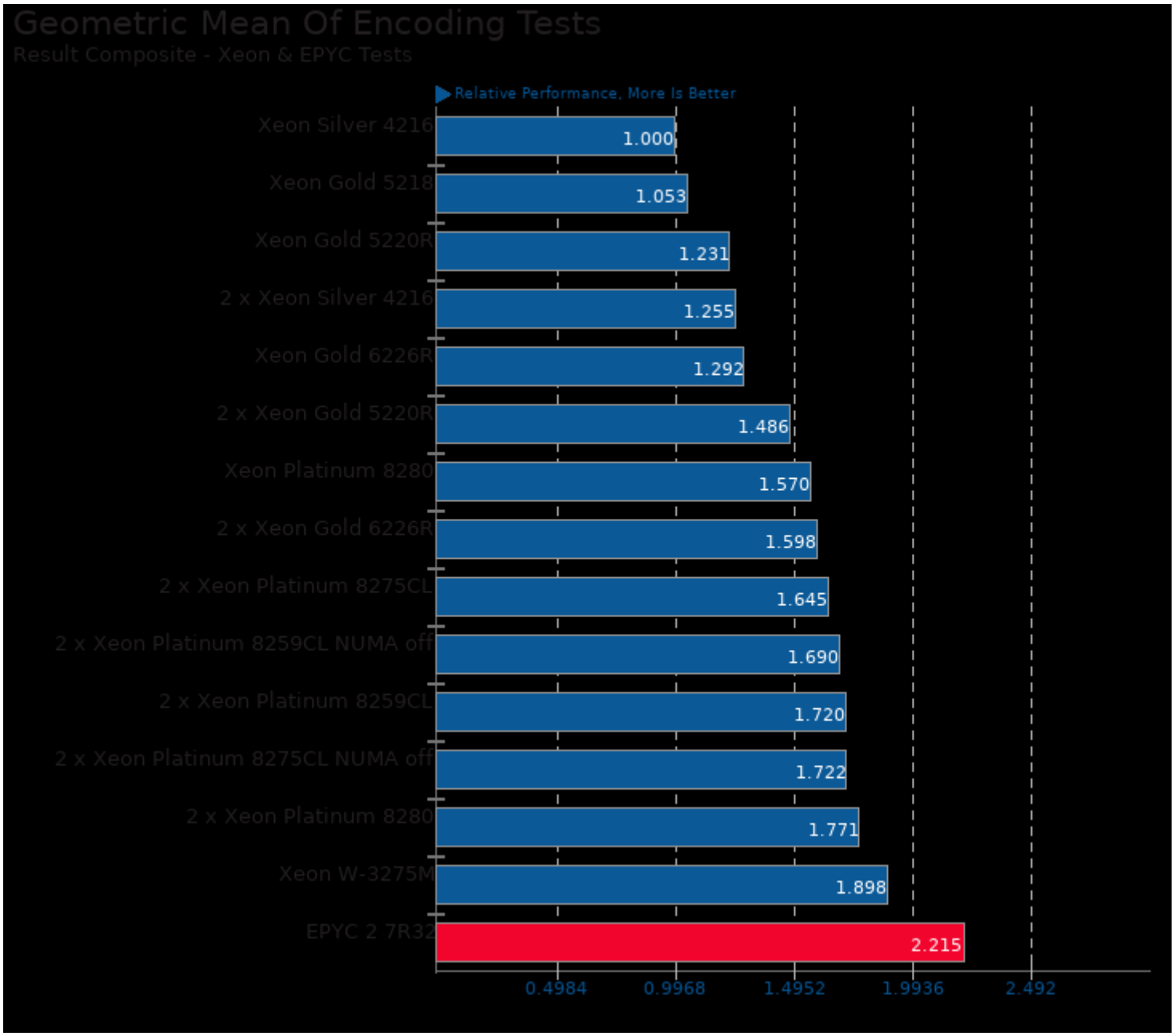
Geometric mean based upon tests: pts/compress-zstd and pts/lzbench



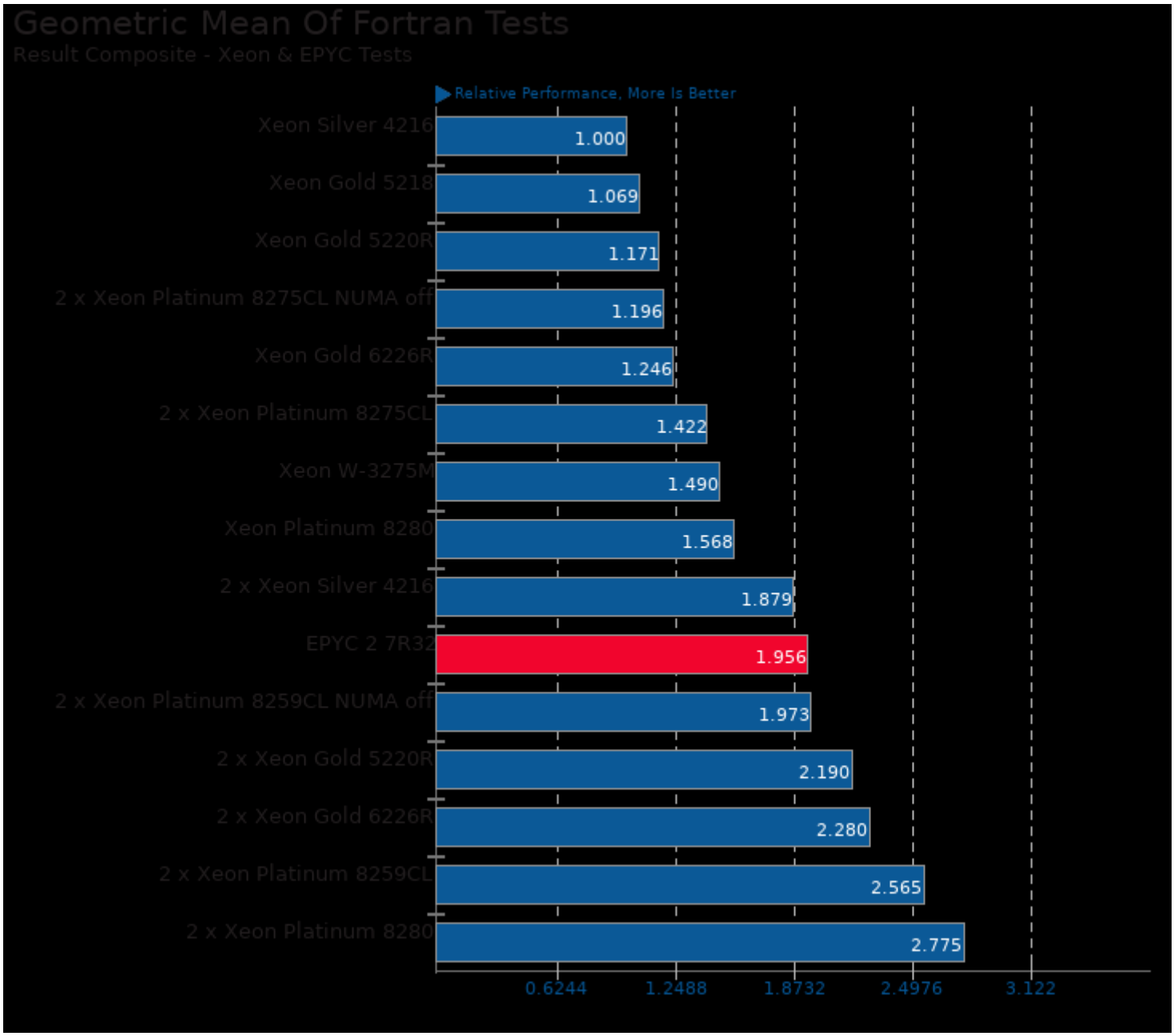
Geometric mean based upon tests: pts/ospray, pts/blender, pts/tungsten, pts/appleseed, pts/radiance, pts/luxcorerender, pts/v-ray, pts/svt-vp9, pts/dav1d, pts/svt-av1, pts/embree, pts/oidn, pts/basis and pts/deepspeech



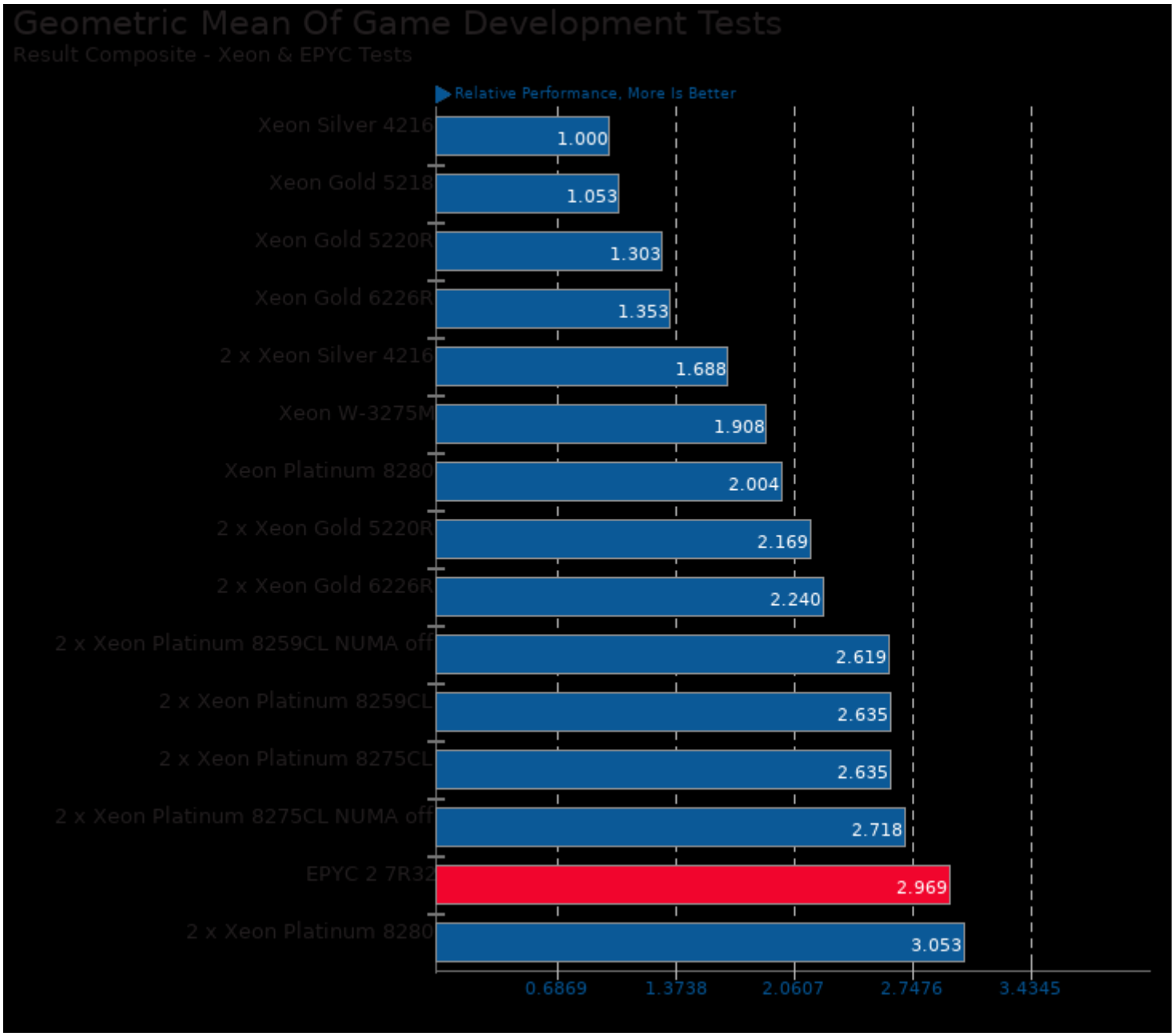
Geometric mean based upon tests: pts/john-the-ripper, pts/smhasher and pts/nettle



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



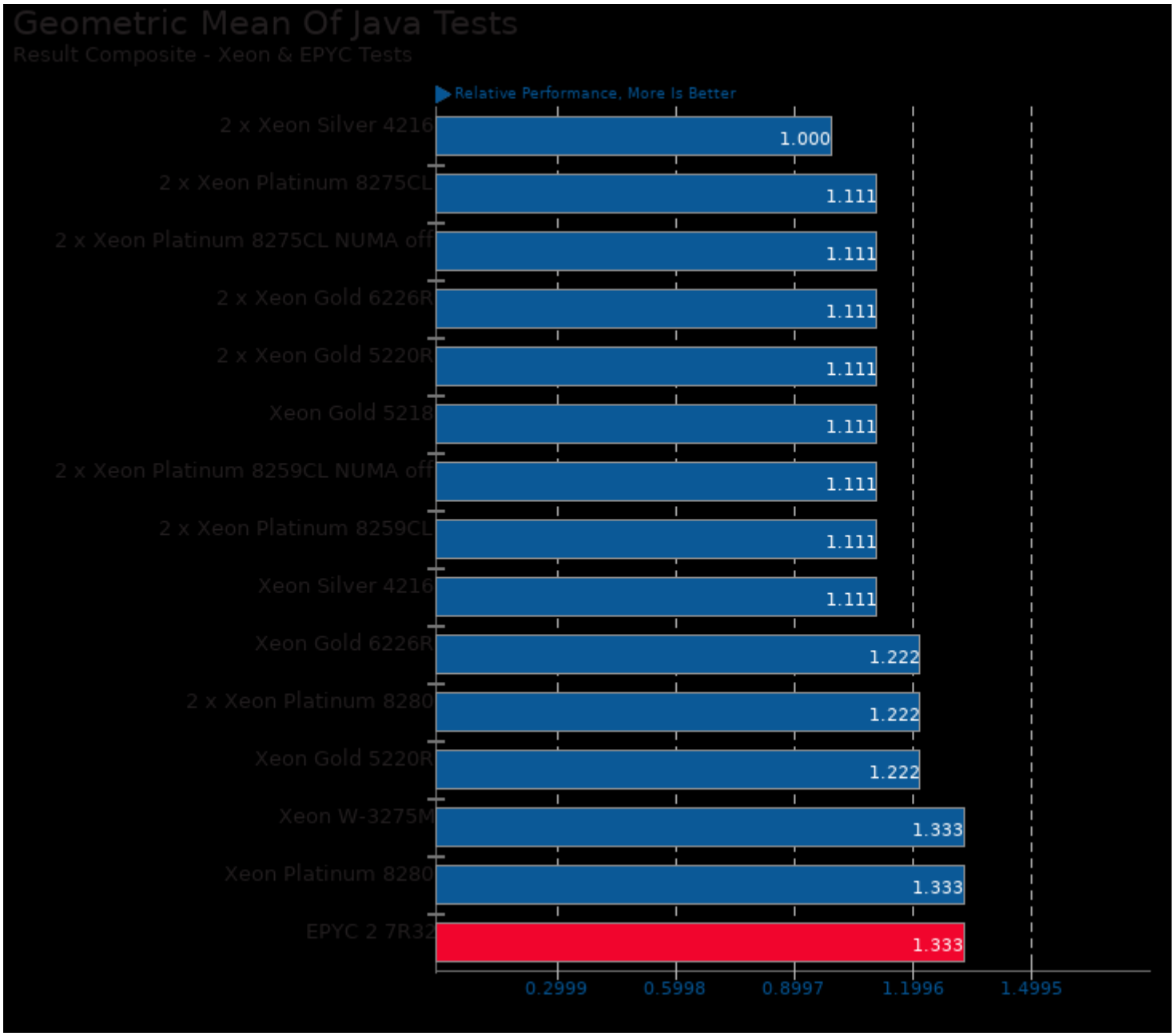
Geometric mean based upon tests: pts/hpcg, pts/npb, pts/cloverleaf and pts/lammps



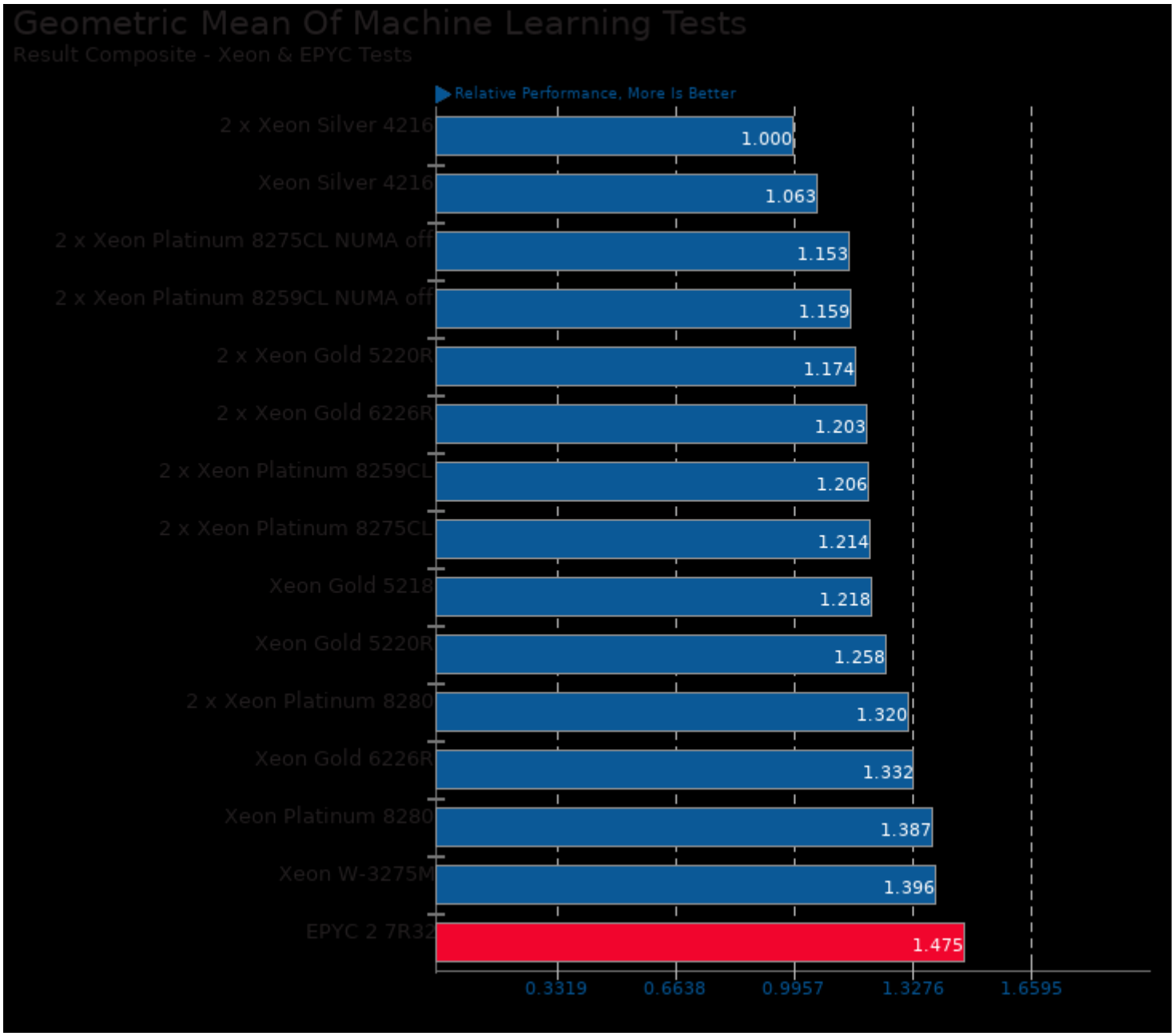
Geometric mean based upon tests: pts/basis, pts/blender and pts/oidn



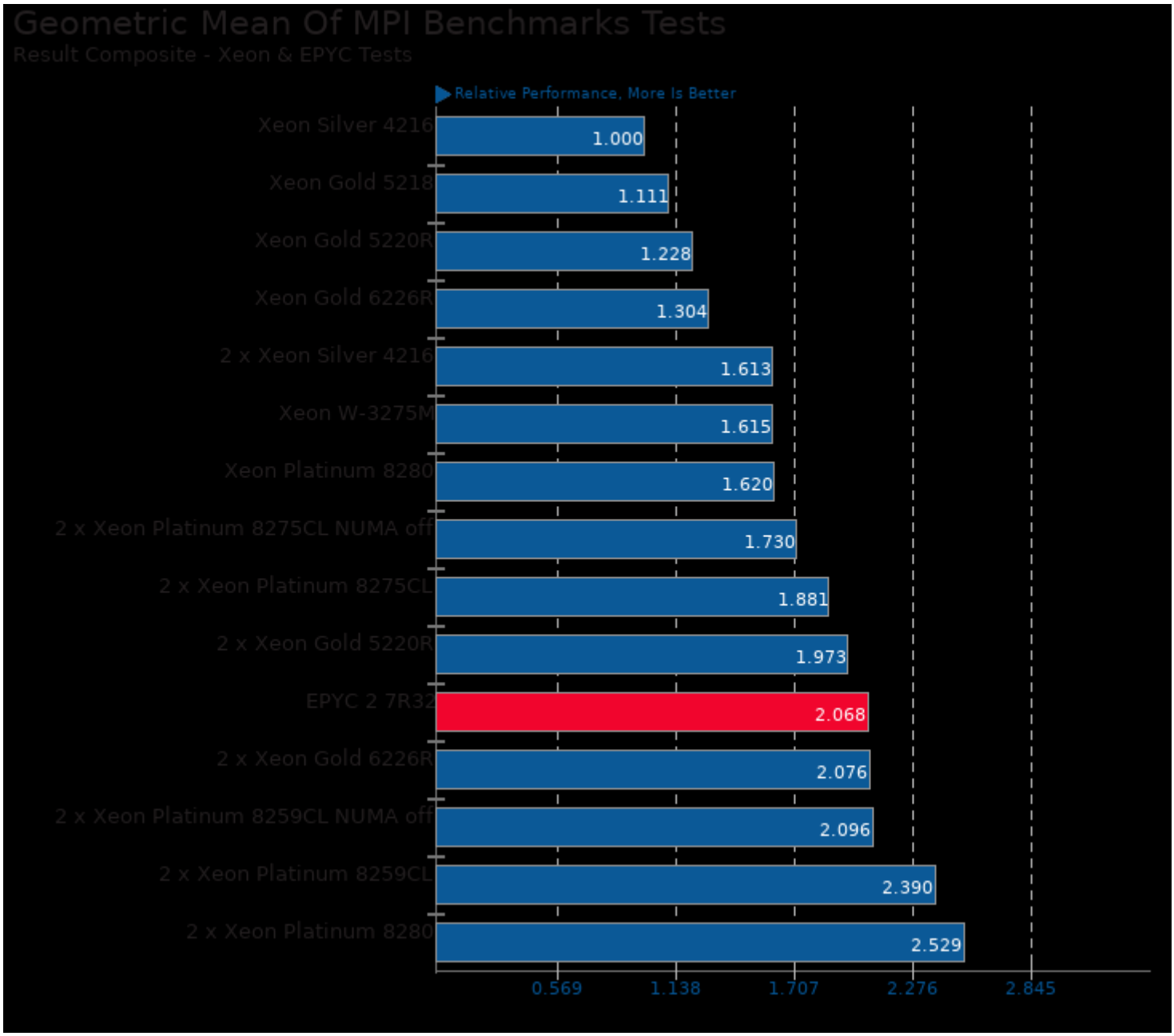
Geometric mean based upon tests: pts/npb, pts/hpcg, pts/intel-mpi, pts/arrayfire, pts/namd, pts/cloverleaf, pts/lammps, pts/himeno, pts/mrbayes, pts/numpy, pts/deepspeech, pts/scikit-learn and pts/mlpack



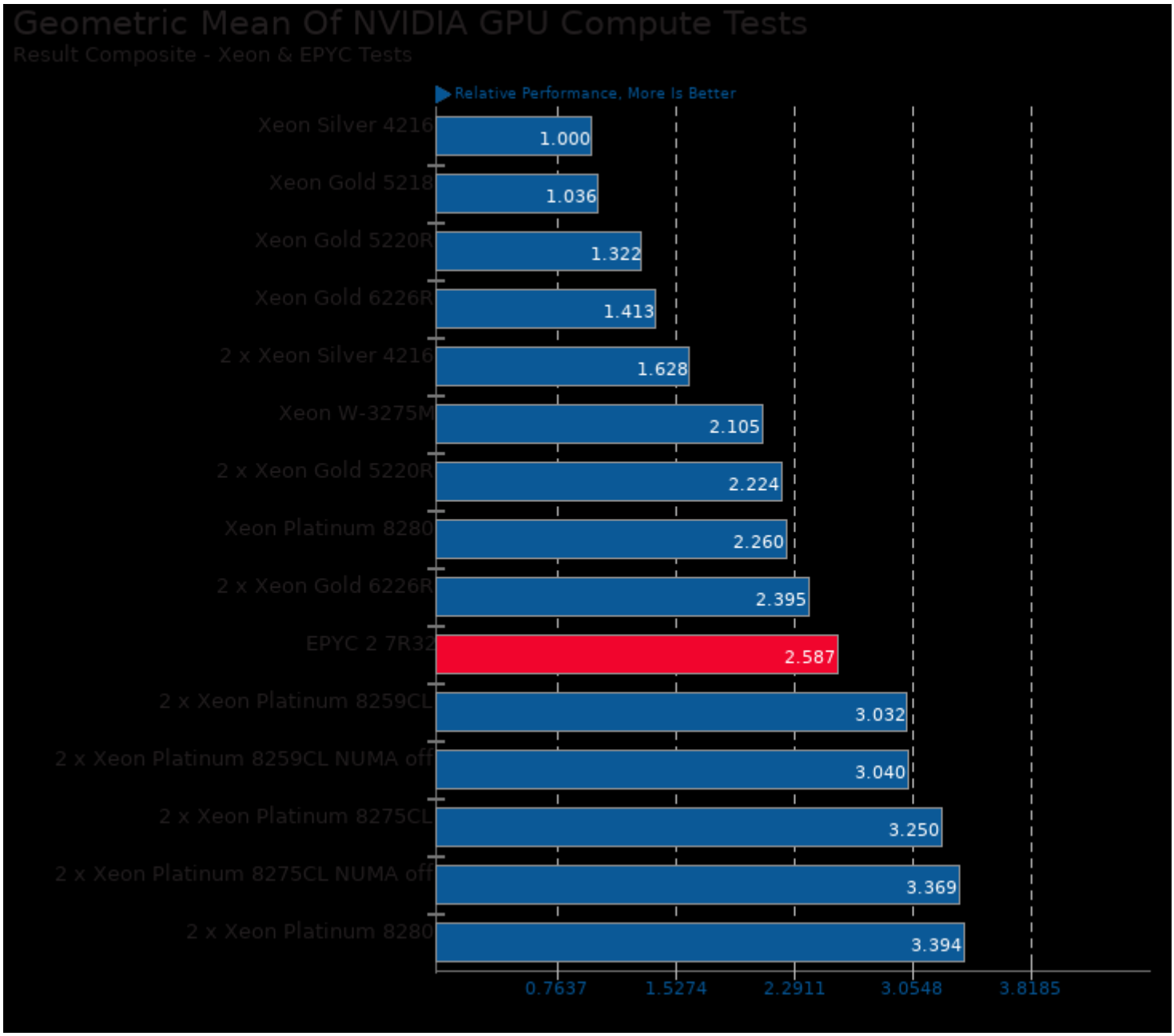
Geometric mean based upon tests: pts/dacapobench and pts/renaissance



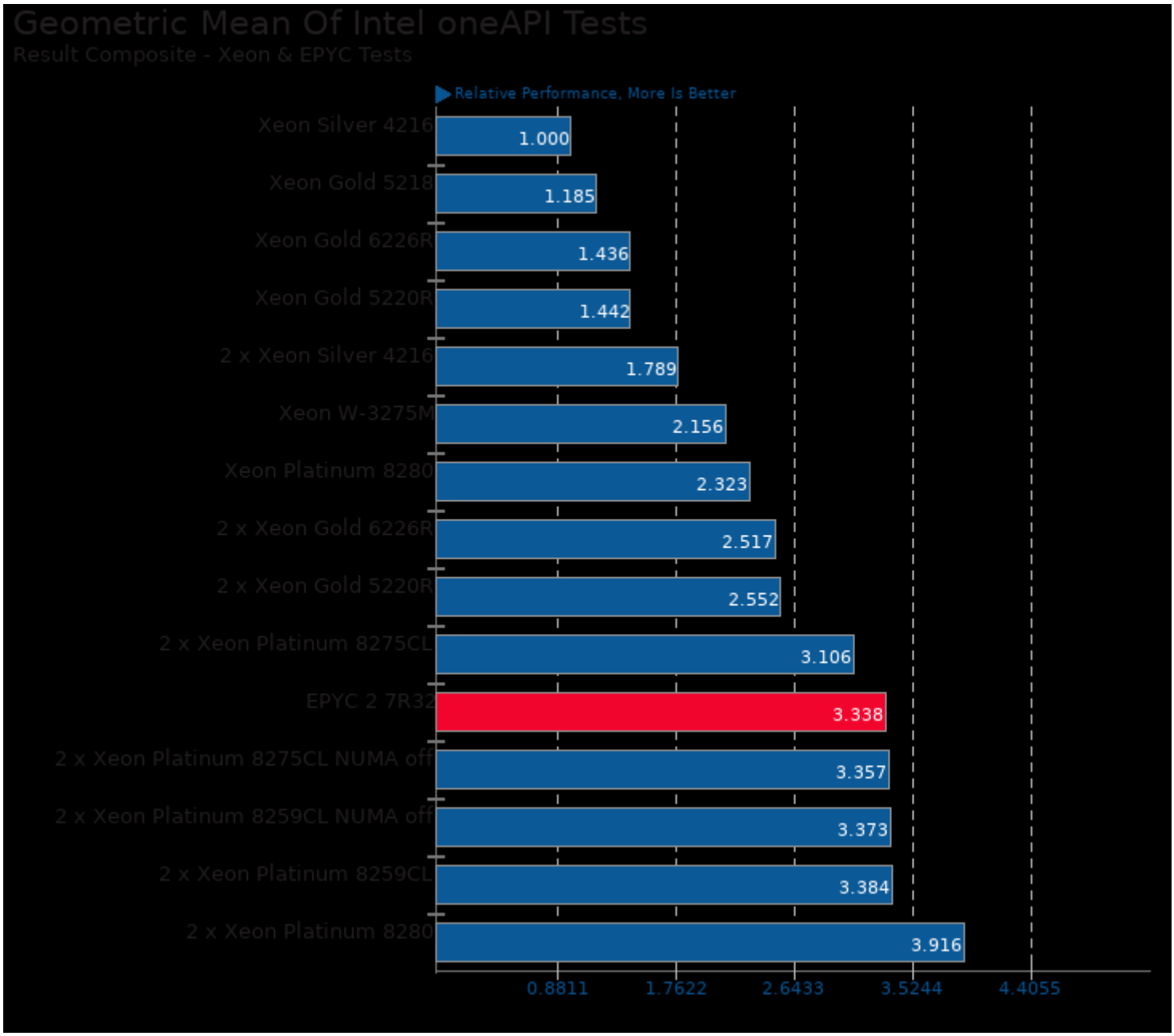
Geometric mean based upon tests: pts/numpy, pts/deepspeech, pts/scikit-learn and pts/mlpack



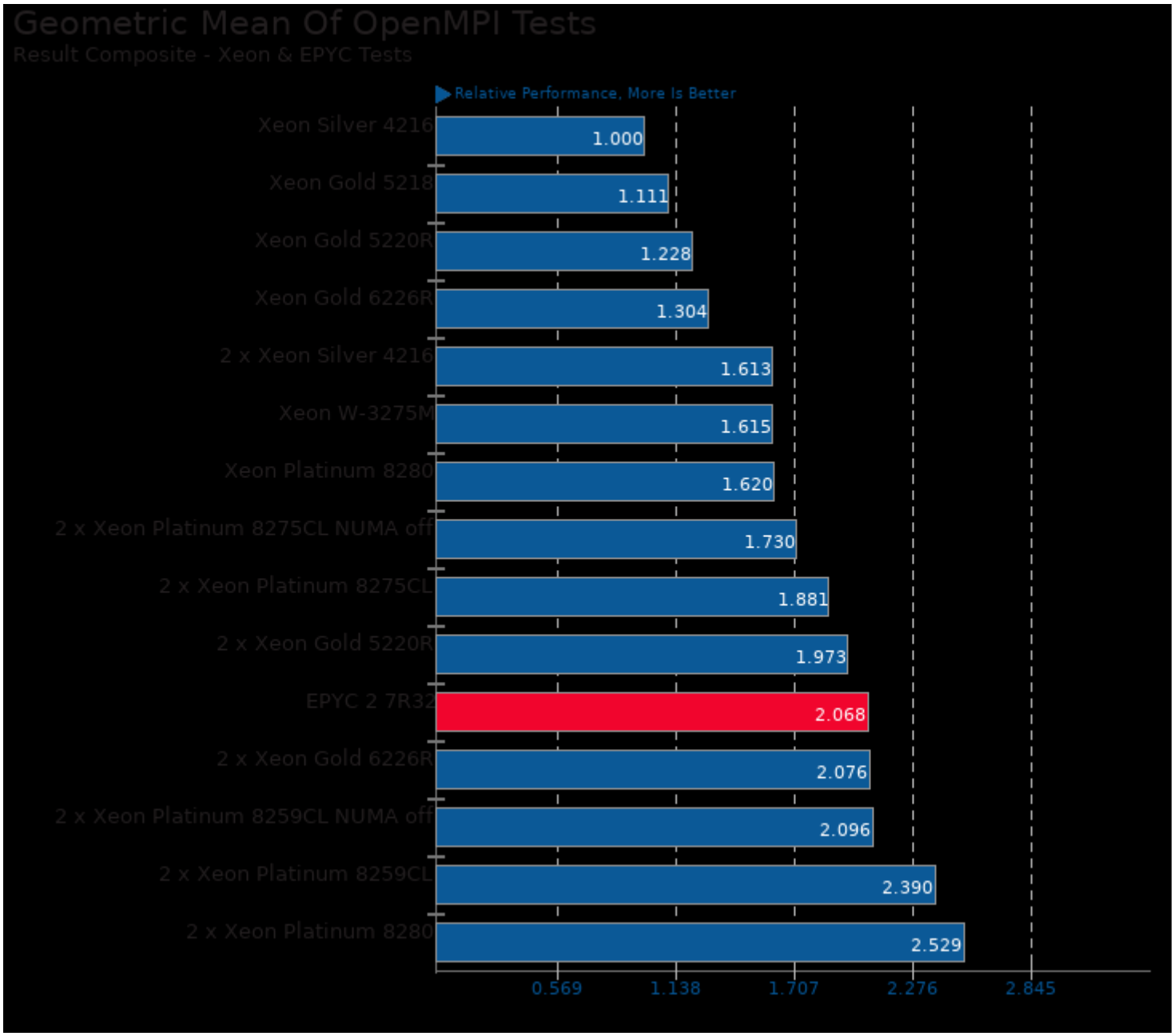
Geometric mean based upon tests: pts/lammps, pts/intel-mpi, pts/hpcg, pts/mrbayes and pts/npb



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



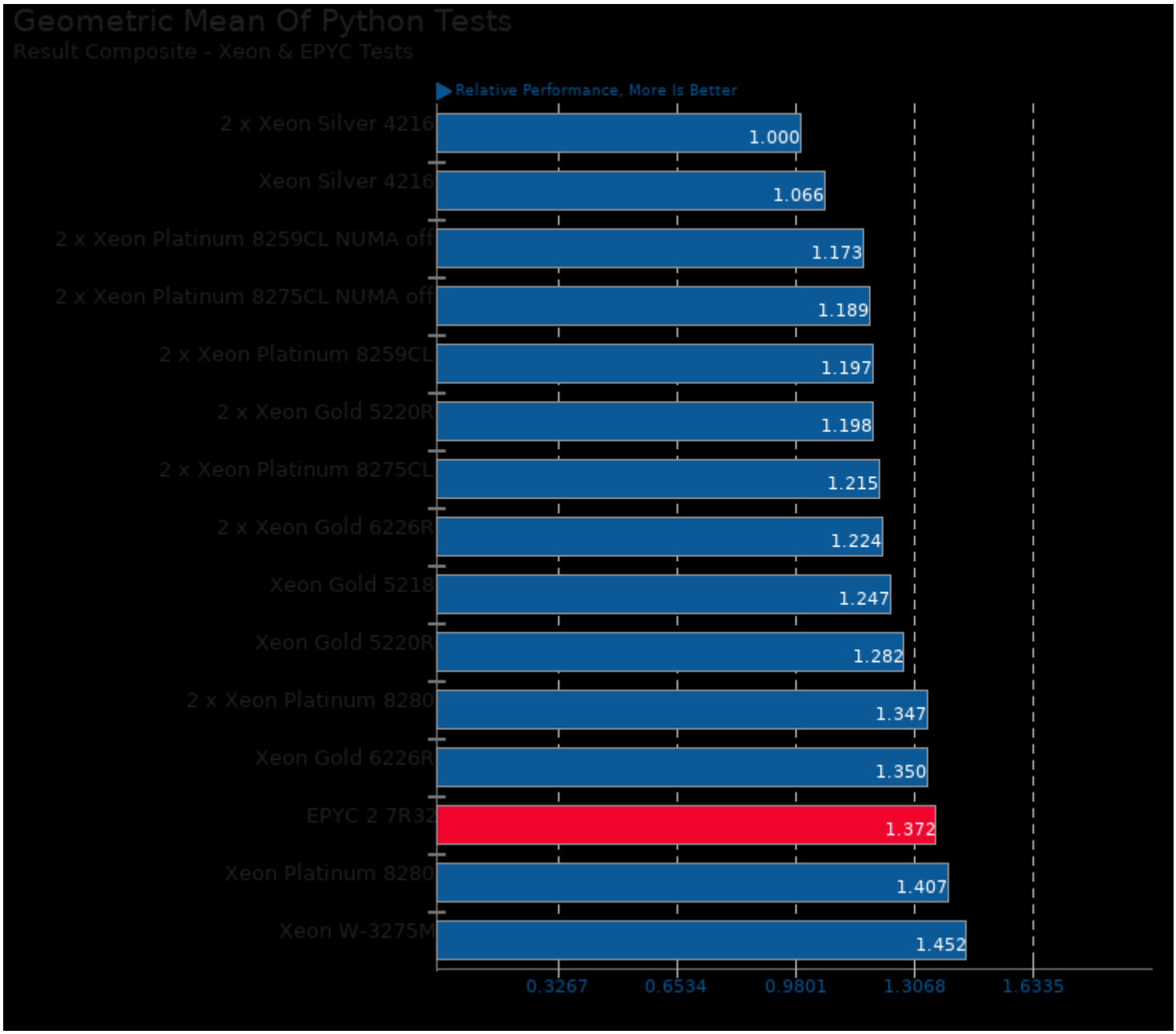
Geometric mean based upon tests: pts/embree, pts/oidn, pts/ospray and pts/tungsten



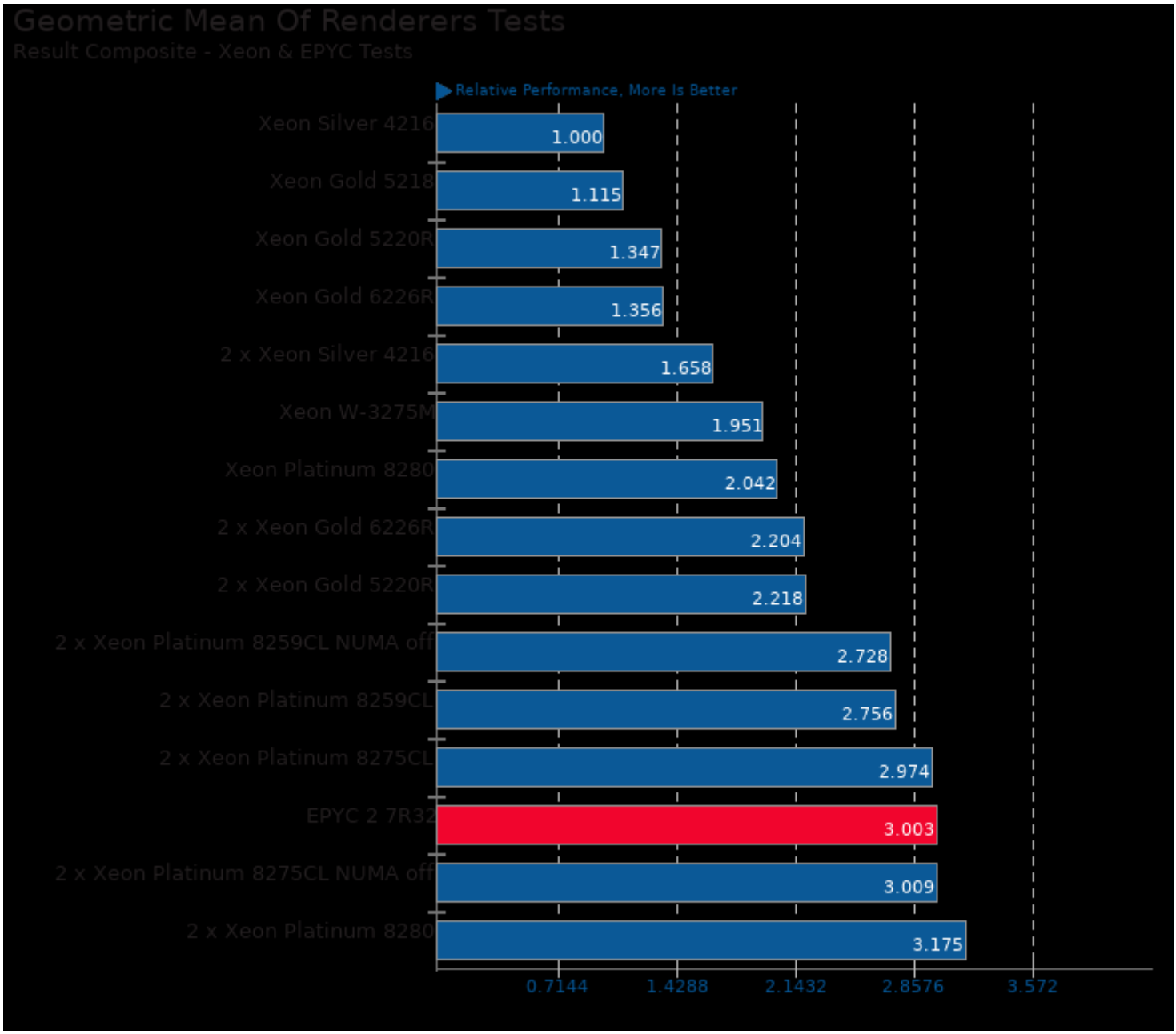
Geometric mean based upon tests: pts/hpcg, pts/npb, pts/cloverleaf, pts/mrbayes, pts/lammps and pts/intel-mpi



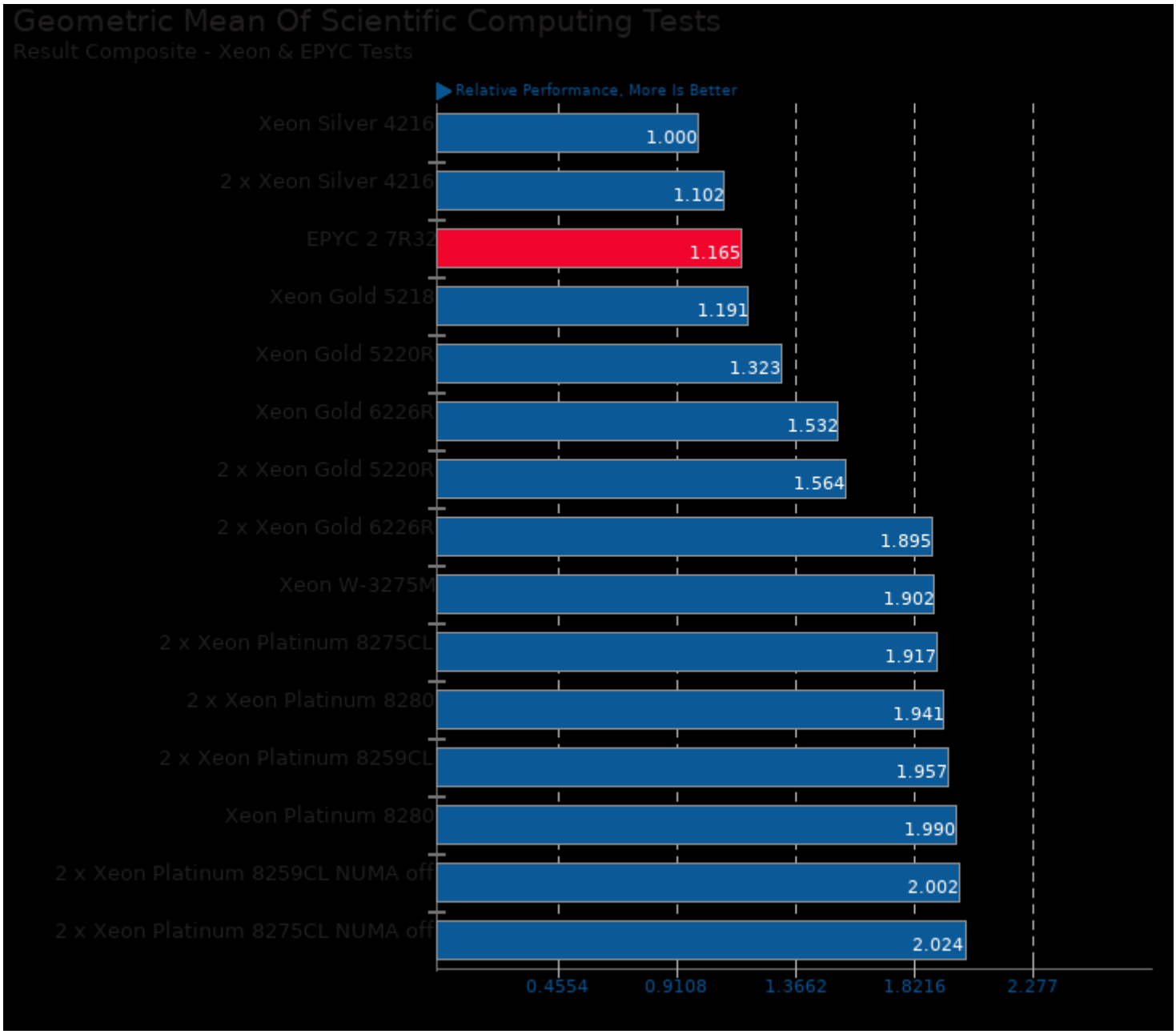
Geometric mean based upon tests: pts/compress-zstd, pts/pyperformance, pts/pybench, pts/build-linux-kernel, pts/build-gcc, pts/build-gdb, pts/build-llvm, pts/build2 and pts/arrayfire



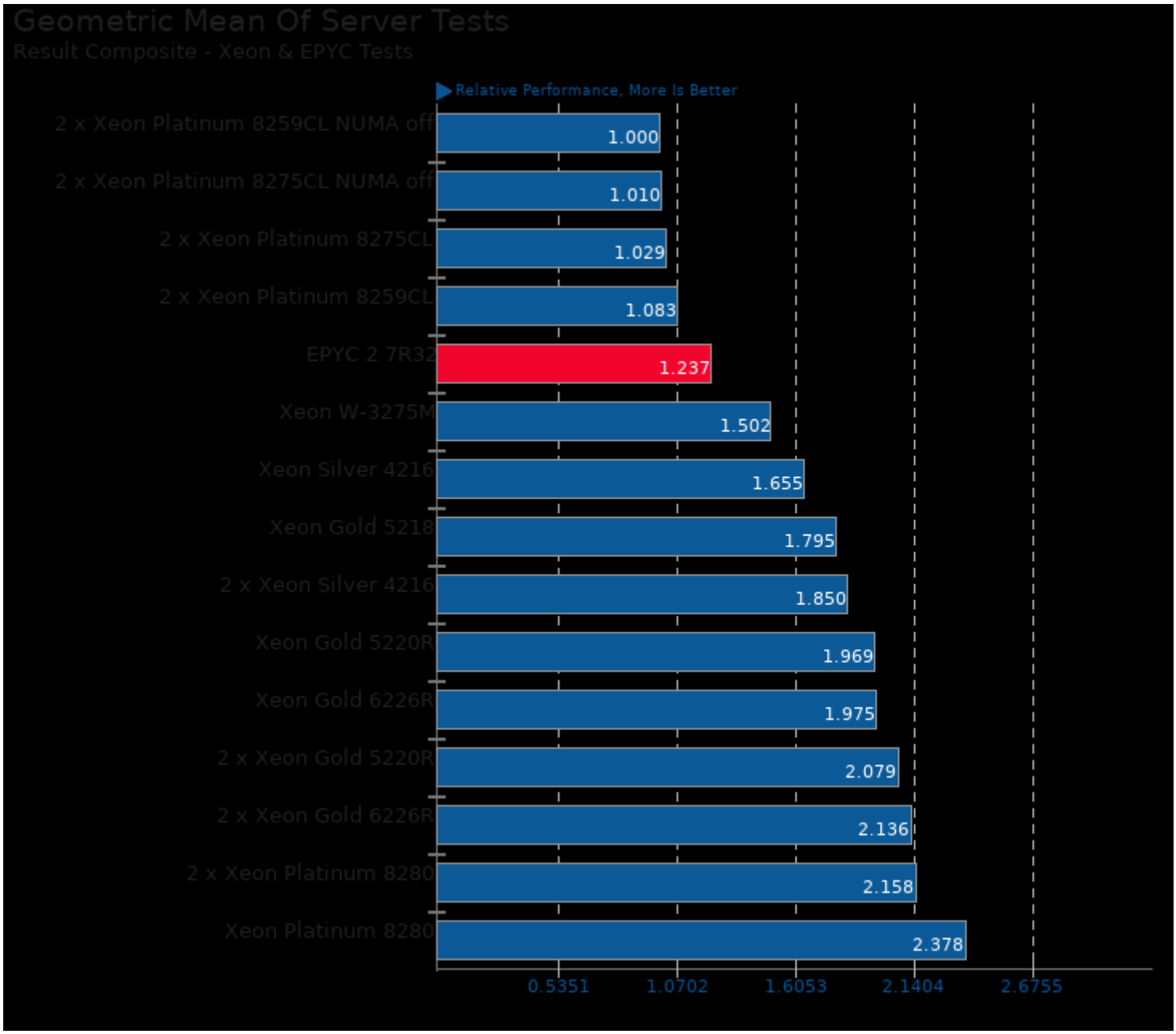
Geometric mean based upon tests: pts/pybench, pts/numpy, pts/mlpack, pts/scikit-learn and pts/pyperformance



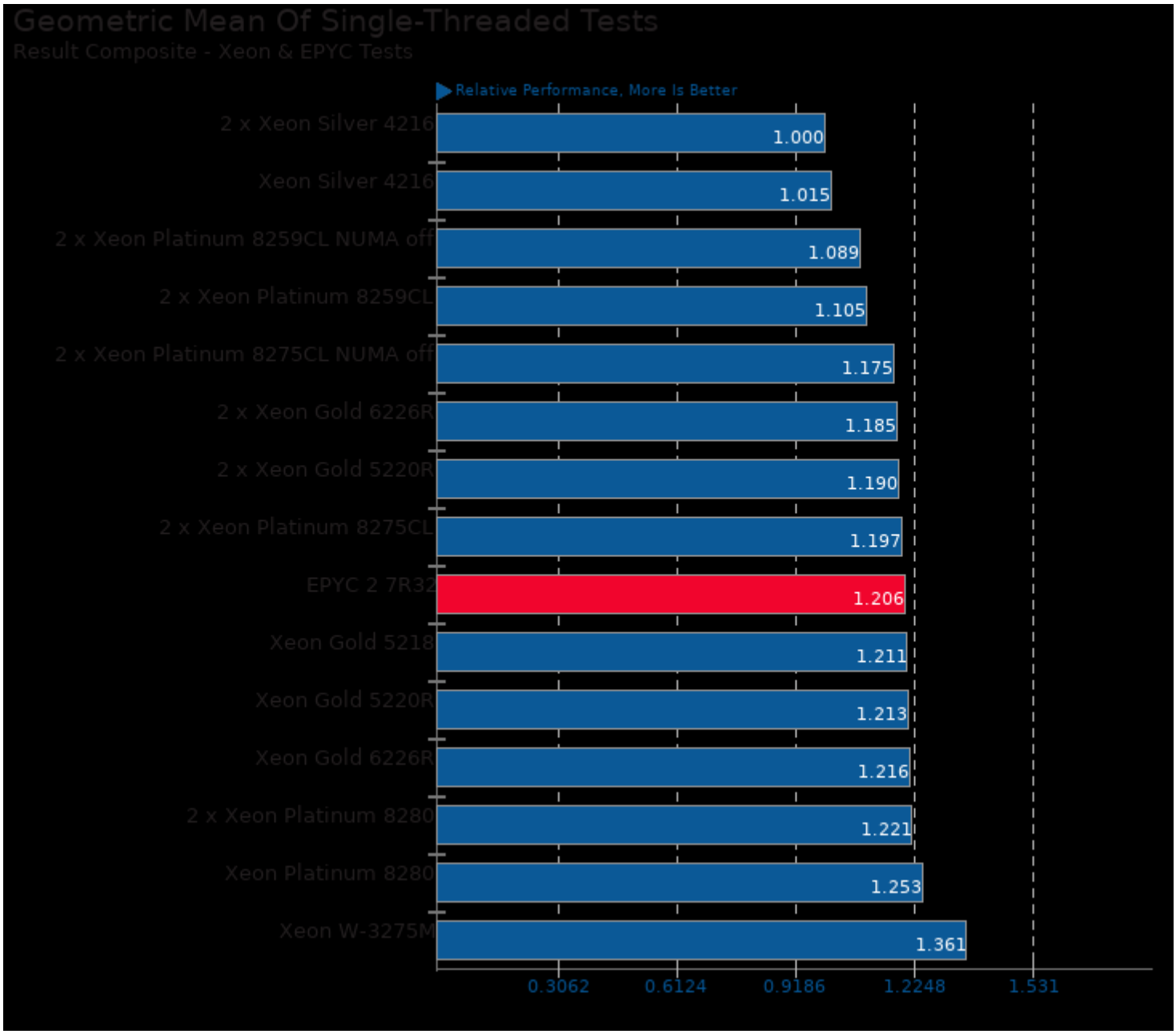
Geometric mean based upon tests: pts/ospray, pts/blender, pts/tungsten, pts/appleseed, pts/radiance, pts/luxcorerender and pts/v-ray



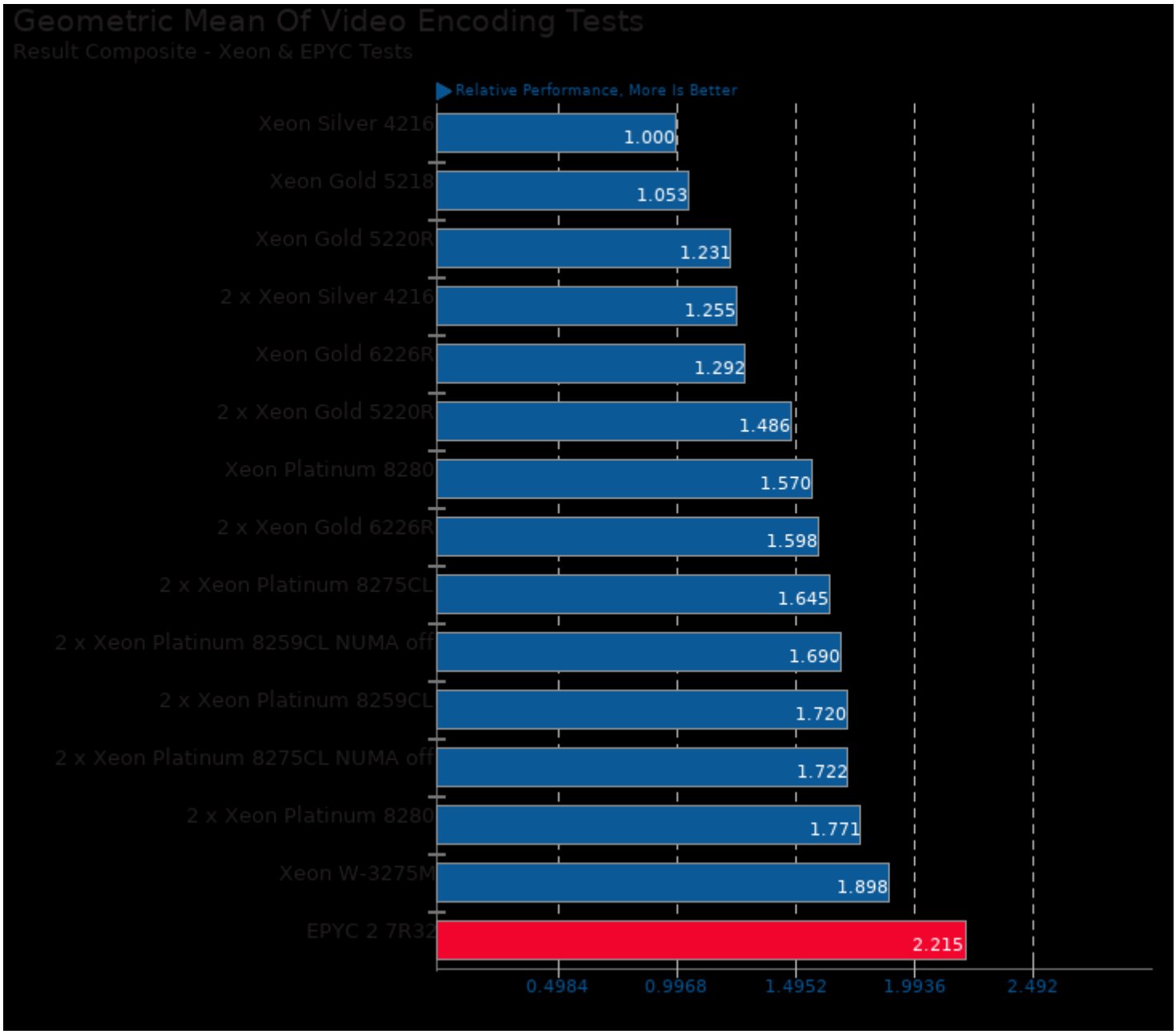
Geometric mean based upon tests: pts/arrayfire, pts/namd, pts/cloverleaf, pts/lammps, pts/himeno and pts/mrbayes



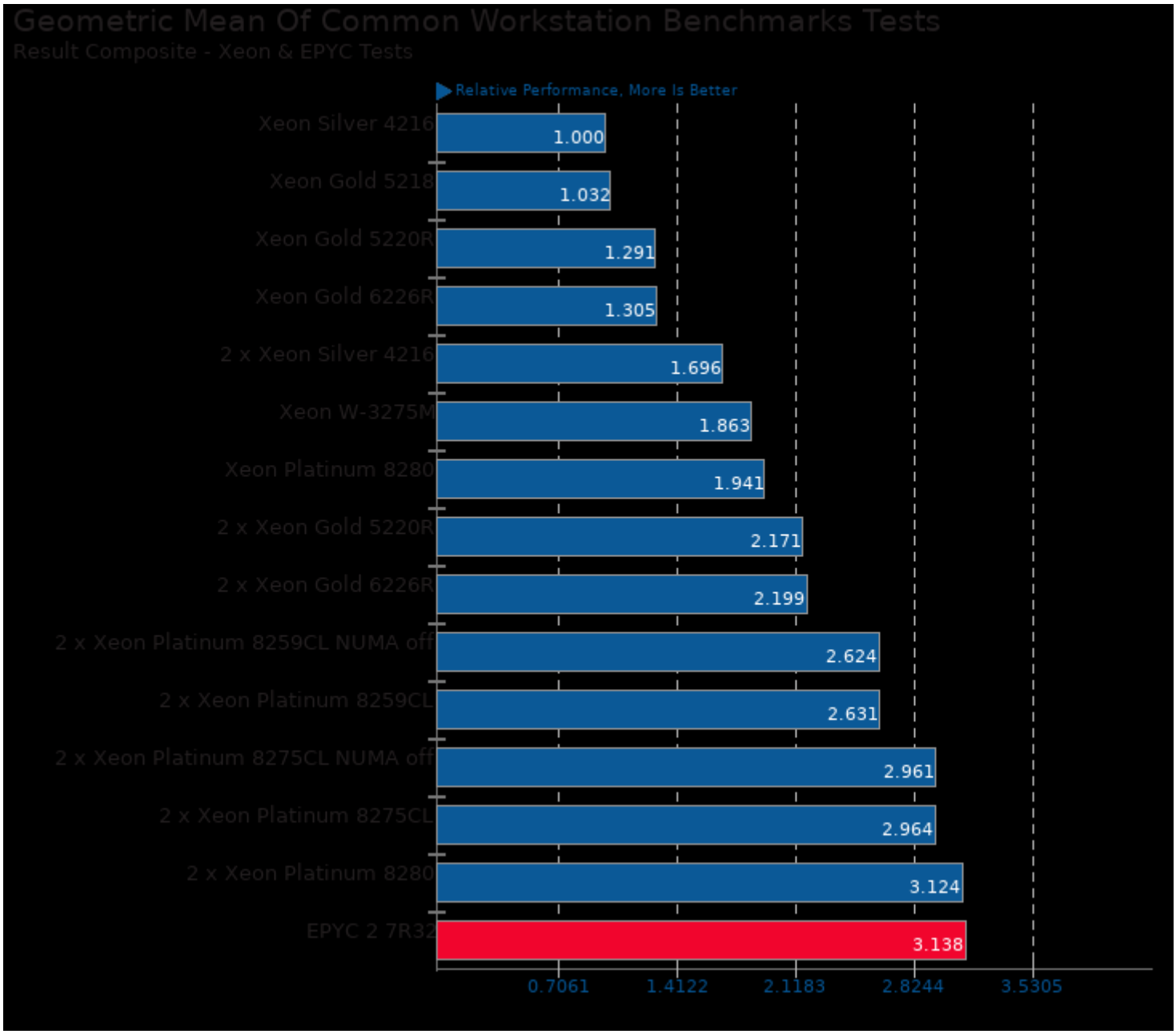
Geometric mean based upon tests: pts/pgbench and pts/phpbench



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 20:35.