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AMD EPYC 7302 / 7402 / 7502 / 7742 2P vs. Intel Xeon Linux Benchmarks

AMD EPYC 7302, 7402, 7502, 7742 1P and 2P Linux performance benchmarks by Michael Larabel for a future article.

Automated Executive Summary

EPYC 7742 2P had the most wins, coming in first place for 56% of the tests.

Based on the geometric mean of all complete results, the fastest (EPYC 7742 2P) was 6.266x the speed of the slowest (EPYC 7251).

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

MKL-DNN (Harness: Convolution Batch conv_alexnet - Data Type: f32) at 20.638x

MKL-DNN (Harness: Convolution Batch conv_all - Data Type: f32) at 20.272x

MKL-DNN (Harness: Convolution Batch conv_googlenet_v3 - Data Type: f32) at 20.252x

Coremark (CoreMark Size 666 - Iterations Per Second) at 15.851x

Blender (Blend File: Classroom - Compute: CPU-Only) at 15.205x

Stockfish (Total Time) at 14.78x

asmFish (1024 Hash Memory, 26 Depth) at 14.772x

MKL-DNN (Harness: Convolution Batch conv_3d - Data Type: f32) at 14.511x

Blender (Blend File: Pabellon Barcelona - Compute: CPU-Only) at 14.385x

John The Ripper (Test: Blowfish) at 14.179x.

Test Systems:

EPYC 7302

Processor: AMD EPYC 7302 16-Core @ 3.00GHz (16 Cores / 32 Threads), Motherboard: AMD DAYTONA_X (RDY1001C BIOS), Chipset: AMD Device 1480, Memory: 258048MB, Disk: 280GB INTEL SSDPE21D280GA + 256GB Micron_1100_MTFD, Graphics: llvmpipe 252GB, Monitor: VE228, Network: 2 x Mellanox MT27710

OS: Ubuntu 19.04, Kernel: 5.3.0-999-generic (x86_64) 20190907, Desktop: GNOME Shell 3.32.2, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 3.3 Mesa 19.0.8 (LLVM 8.0 128 bits), Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: acpi-cpufreq ondemand

Java Notes: OpenJDK Runtime Environment (build 11.0.4+11-post-Ubuntu-1ubuntu219.04)

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swaps barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling

EPYC 7302 2P

Processor: 2 x AMD EPYC 7302 16-Core @ 3.00GHz (32 Cores / 64 Threads), Motherboard: AMD DAYTONA_X (RDY1001C BIOS), Chipset: AMD Device 1480, Memory: 516096MB, Disk: 280GB INTEL SSDPED1D280GA + 280GB INTEL SSDPE21D280GA + 256GB Micron_1100_MTFD, Graphics: llvmpipe 504GB, Monitor: VE228, Network: 2 x Mellanox MT27710

OS: Ubuntu 19.04, Kernel: 5.3.0-999-generic (x86_64) 20190907, Desktop: GNOME Shell 3.32.2, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 3.3 Mesa 19.0.8 (LLVM 8.0 128 bits), Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: acpi-cpufreq ondemand

Java Notes: OpenJDK Runtime Environment (build 11.0.4+11-post-Ubuntu-1ubuntu219.04)

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swaps barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling

EPYC 7402

Processor: AMD EPYC 7402 24-Core @ 2.80GHz (24 Cores / 48 Threads), Motherboard: AMD DAYTONA_X (RDY1001C BIOS), Chipset: AMD Device 1480, Memory: 258048MB, Disk: 280GB INTEL SSDPE21D280GA + 256GB Micron_1100_MTFD, Graphics: llvmpipe 252GB, Monitor: VE228, Network: 2 x Mellanox MT27710

OS: Ubuntu 19.04, Kernel: 5.3.0-999-generic (x86_64) 20190907, Desktop: GNOME Shell 3.32.2, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 3.3 Mesa 19.0.8 (LLVM 8.0 128 bits), Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes

```
--enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix  
--host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new  
--with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
```

Processor Notes: Scaling Governor: acpi-cpufreq ondemand

Java Notes: OpenJDK Runtime Environment (build 11.0.4+11-post-Ubuntu-1ubuntu219.04)

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: 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

EPYC 7402 2P

Processor: 2 x AMD EPYC 7402 24-Core @ 2.80GHz (48 Cores / 96 Threads), Motherboard: AMD DAYTONA_X (RDY1001C BIOS), Chipset: AMD Device 1480, Memory: 516096MB, Disk: 280GB INTEL SSDPED1D280GA + 280GB INTEL SSDPE21D280GA + 256GB Micron_1100_MTFD, Graphics: llvmpipe 504GB, Monitor: VE228, Network: 2 x Mellanox MT27710

OS: Ubuntu 19.04, Kernel: 5.3.0-999-generic (x86_64) 20190907, Desktop: GNOME Shell 3.32.2, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 3.3 Mesa 19.0.8 (LLVM 8.0 128 bits), Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

```
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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes  
--enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix  
--host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new  
--with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
```

Processor Notes: Scaling Governor: acpi-cpufreq ondemand

Java Notes: OpenJDK Runtime Environment (build 11.0.4+11-post-Ubuntu-1ubuntu219.04)

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: 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

EPYC 7502

Processor: AMD EPYC 7502 32-Core @ 2.50GHz (32 Cores / 64 Threads), Motherboard: AMD DAYTONA_X (RDY1001C BIOS), Chipset: AMD Device 1480, Memory: 258048MB, Disk: 280GB INTEL SSDPE21D280GA + 256GB Micron_1100_MTFD, Graphics: llvmpipe 252GB, Monitor: VE228, Network: 2 x Mellanox MT27710

OS: Ubuntu 19.04, Kernel: 5.3.0-999-generic (x86_64) 20190907, Desktop: GNOME Shell 3.32.2, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 3.3 Mesa 19.0.8 (LLVM 8.0 128 bits), Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

```
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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes  
--enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix  
--host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new  
--with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
```

Processor Notes: Scaling Governor: acpi-cpufreq ondemand

Java Notes: OpenJDK Runtime Environment (build 11.0.4+11-post-Ubuntu-1ubuntu219.04)

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: 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

EPYC 7502 2P

Processor: 2 x AMD EPYC 7502 32-Core @ 2.50GHz (64 Cores / 128 Threads), Motherboard: AMD DAYTONA_X (RDY1001C BIOS), Chipset: AMD Device 1480, Memory: 516096MB, Disk: 280GB INTEL SSDPE21D280GA + 280GB INTEL SSDPED1D280GA + 256GB Micron_1100_MTFD, Graphics: llvmpipe 504GB, Monitor: VE228, Network: 2 x Mellanox MT27710

OS: Ubuntu 19.04, Kernel: 5.3.0-999-generic (x86_64) 20190907, Desktop: GNOME Shell 3.32.2, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 3.3 Mesa 19.0.8 (LLVM 8.0 128 bits), Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: acpi-cpufreq ondemand

Java Notes: OpenJDK Runtime Environment (build 11.0.4+11-post-Ubuntu-1ubuntu219.04)

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: 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

EPYC 7742

Processor: AMD EPYC 7742 64-Core @ 2.25GHz (64 Cores / 128 Threads), Motherboard: AMD DAYTONA_X (RDY1001C BIOS), Chipset: AMD Device 1480, Memory: 258048MB, Disk: 280GB INTEL SSDPE21D280GA + 256GB Micron_1100_MTFD, Graphics: llvmpipe 252GB, Monitor: VE228, Network: 2 x Mellanox MT27710

OS: Ubuntu 19.04, Kernel: 5.3.0-999-generic (x86_64) 20190907, Desktop: GNOME Shell 3.32.2, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 3.3 Mesa 19.0.8 (LLVM 8.0 128 bits), Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: acpi-cpufreq ondemand

Java Notes: OpenJDK Runtime Environment (build 11.0.4+11-post-Ubuntu-1ubuntu219.04)

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: 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

EPYC 7742 2P

Processor: 2 x AMD EPYC 7742 64-Core @ 2.25GHz (128 Cores / 256 Threads), Motherboard: AMD DAYTONA_X (RDY1001C BIOS), Chipset: AMD Device 1480, Memory: 516096MB, Disk: 280GB INTEL SSDPED1D280GA + 256GB Micron_1100_MTFD + 64GB Flash Drive, Graphics: llvmpipe 504GB, Monitor: VE228, Network: 2 x Mellanox MT27710

OS: Ubuntu 19.04, Kernel: 5.3.0-999-generic (x86_64) 20190907, Desktop: GNOME Shell 3.32.2, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 3.3 Mesa 19.0.8 (LLVM 8.0 128 bits), Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: acpi-cpufreq ondemand

Java Notes: OpenJDK Runtime Environment (build 11.0.4+11-post-Ubuntu-1ubuntu219.04)

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: 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

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: 386048MB, Disk: 280GB INTEL SSDPED1D280GA, Graphics: llvmpipe 377GB, Monitor: VE228, Network: 2 x Intel X722 for 1GbE + 2 x QLogic FastLinQ QL41000 10/25/40/50GbE

OS: Ubuntu 19.04, Kernel: 5.3.0-999-generic (x86_64) 20190902, Desktop: GNOME Shell 3.32.0, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 3.3 Mesa 19.0.8 (LLVM 8.0 256 bits), Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: intel_pstate powersave

Java Notes: OpenJDK Runtime Environment (build 11.0.4+11-post-Ubuntu-1ubuntu219.04)

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: Not affected + mds: 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

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: 192512MB, Disk: 280GB INTEL SSDPED1D280GA, Graphics: llvmpipe 188GB, Monitor: VE228, Network: 2 x Intel X722 for 1GbE + 2 x QLogic FastLinQ QL41000 10/25/40/50GbE

OS: Ubuntu 19.04, Kernel: 5.3.0-999-generic (x86_64) 20190902, Desktop: GNOME Shell 3.32.2, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 3.3 Mesa 19.0.8 (LLVM 8.0 256 bits), Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: intel_pstate powersave

Java Notes: OpenJDK Runtime Environment (build 11.0.4+11-post-Ubuntu-1ubuntu219.04)

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: Not affected + mds: 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

2 x EPYC 7601

Processor: 2 x AMD EPYC 7601 32-Core (64 Cores / 128 Threads), Motherboard: Dell 02MJ3T (1.2.5 BIOS), Chipset: AMD 17h, Memory: 516096MB, Disk: 280GB INTEL SSDPED1D280GA + 17 x 500GB Samsung SSD 860 + 120GB SSDSCKJB120G7R, Graphics: llvmpipe 504GB, Monitor: VE228, Network: 2 x Broadcom BCM57416 NetXtreme-E Dual-Media 10G RDMA + 2 x Broadcom NetXtreme BCM5720 PCIe

OS: Ubuntu 19.04, Kernel: 5.3.0-999-generic (x86_64) 20190902, Desktop: GNOME Shell 3.32.1, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 3.3 Mesa 19.0.2 (LLVM 8.0 128 bits), Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1600x1200

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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v

Java Notes: OpenJDK Runtime Environment (build 11.0.4+11-post-Ubuntu-1ubuntu219.04)

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: Not affected + mds: 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 retrpoline IBPB: conditional STIBP: disabled RSB filling

EPYC 7601

Processor: AMD EPYC 7601 32-Core @ 2.20GHz (32 Cores / 64 Threads), Motherboard: TYAN B8026T70AE24HR (V1.02.B10 BIOS), Chipset: AMD 17h, Memory: 129024MB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe 126GB, Monitor: VE228, Network: 2 x Broadcom NetXtreme BCM5720 PCIe

OS: Ubuntu 19.04, Kernel: 5.3.0-999-generic (x86_64) 20190907, Desktop: GNOME Shell 3.32.2, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 3.3 Mesa 19.0.8 (LLVM 8.0 128 bits), Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: acpi-cpufreq ondemand

Java Notes: OpenJDK Runtime Environment (build 11.0.4+11-post-Ubuntu-1ubuntu219.04)

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: 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 STIBP: disabled RSB filling

EPYC 7401P

Processor: AMD EPYC 7401P 24-Core @ 2.00GHz (24 Cores / 48 Threads), Motherboard: TYAN B8026T70AE24HR (V1.02.B10 BIOS), Chipset: AMD 17h, Memory: 129024MB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe 126GB, Monitor: VE228, Network: 2 x Broadcom NetXtreme BCM5720 PCIe

OS: Ubuntu 19.04, Kernel: 5.3.0-999-generic (x86_64) 20190907, Desktop: GNOME Shell 3.32.2, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 3.3 Mesa 19.0.8 (LLVM 8.0 128 bits), Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: acpi-cpufreq ondemand

Java Notes: OpenJDK Runtime Environment (build 11.0.4+11-post-Ubuntu-1ubuntu219.04)

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: 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 STIBP: disabled RSB filling

EPYC 7251

Processor: AMD EPYC 7251 8-Core @ 2.10GHz (8 Cores / 16 Threads), Motherboard: TYAN B8026T70AE24HR (V1.02.B10 BIOS), Chipset: AMD 17h, Memory: 129024MB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe 126GB, Monitor: VE228, Network: 2 x Broadcom NetXtreme BCM5720 PCIe

OS: Ubuntu 19.04, Kernel: 5.3.0-999-generic (x86_64) 20190907, Desktop: GNOME Shell 3.32.2, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 3.3 Mesa 19.0.8 (LLVM 8.0 128 bits), Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v

Processor Notes: Scaling Governor: acpi-cpufreq ondemand

Java Notes: OpenJDK Runtime Environment (build 11.0.4+11-post-Ubuntu-1ubuntu219.04)

Python Notes: Python 2.7.16 + Python 3.7.3

Security Notes: I1tf: 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 STIBP: disabled RSB filling

	EPYC 7302 2P	EPYC 7302 2P	EPYC 7402 2P	EPYC 7402 2P	EPYC 7502 2P	EPYC 7502 2P	EPYC 7742 2P	EPYC 7742 2P	2 x Xeon Platin um	Xeon Platin um	2 x Xeon Platin um	EPYC 7601 8280	EPYC 7601 8280	EPYC 7401P	EPYC 7251
NAMD - 1.2658	0.6615	0.8914	0.4706	0.7387	0.3905	0.4287	0.2639	0.3590	0.7006	0.4469	0.9104	1.2063	3.0753		
ATPase - 6	8	1	2	4	9		3	6	9	3	8	5	6		
Simulation - 327,506															
Atoms															
Normalized	20.85%	39.9%	29.61%	56.08%	35.73%	67.58%	61.55%	100%	73.51%	37.67%	59.05%	28.99%	21.88%	8.58%	
Standard	0.3%	0.2%	0.1%	0.2%	0.2%	0.2%	0.4%	0.7%	0.2%	0.2%	0.3%	0.3%	0.6%	0.2%	
John The - 31305	62398	46756	92216	57523	11099	97345	18346	84968	42924	81920	33399	27746	12939		
Ripper - 2							5								
Blowfish (Real C/S)															
Normalized	17.06%	34.01%	25.48%	50.26%	31.35%	60.5%	53.06%	100%	46.31%	23.4%	44.65%	18.2%	15.12%	7.05%	
Standard	0%	0%	0.1%	0.2%	0.1%	3.9%	0.1%	2.2%	0.7%	0.4%	7.4%	0.7%	7%	0.6%	
MKL-DNN - IP - 16.66	10.46	12.51	9.56	10.48	9.61	9.56	14.65	11.59	9.68	109.50	9.59	12.25	46.98		
Batch 1D - f32 (ms)															
Normalized	57.38%	91.4%	76.42%	100%	91.22%	99.48%	100%	65.26%	82.48%	98.76%	8.73%	99.69%	78.04%	20.35%	
Standard	1.9%	1.3%	1.9%	0.6%	0.3%	2.2%	1.5%	10.2%	2%	1%	1.6%	0.9%	1.5%	1.3%	
MKL-DNN - IP - 200.24	123.29	148.29	99.98	124.81	81.21	89.75	89.65	97.37	94.88	783.83	112.65	152.73	523.85		
Batch All - f32 (ms)															
Normalized	40.56%	65.87%	54.76%	81.23%	65.07%	100%	90.48%	90.59%	83.4%	85.59%	10.36%	72.09%	53.17%	15.5%	
Standard	0.4%	1.8%	0.3%	2.4%	0.2%	1.4%	1.6%	1.5%	1.1%	1%	2.4%	0.9%	0.2%	0.6%	
MKL-DNN - 9.62	5.48	6.91	3.86	5.80	3.42	3.62	2.72	3.30	8.14	6.48	12.88	16.54	39.47		
C.B.c - f32 (ms)															
Normalized	28.27%	49.64%	39.36%	70.47%	46.9%	79.53%	75.14%	100%	82.42%	33.42%	41.98%	21.12%	16.44%	6.89%	
Standard	1.8%	5.8%	2.9%	8.9%	0.5%	10.6%	2.7%	6.6%	0.4%	0.1%	2.7%	1.2%	0.6%	2%	
MKL-DNN - 1805	973.93	1285	687.40	1087	582.66	687.92	412.04	383.37	766.42	1205	2278	3096	7772		
C.B.c - f32 (ms)															
Normalized	21.24%	39.36%	29.84%	55.77%	35.27%	65.8%	55.73%	93.04%	100%	50.02%	31.81%	16.83%	12.38%	4.93%	
Standard	0.2%	1.9%	0.8%	1.8%	0.8%	2.2%	1.8%	3.2%	1.6%	2.1%	2.6%	0.8%	0.5%	1.4%	
MKL-DNN - 243.03	131.15	173.43	97.71	141.76	76.91	88.95	50.66	48.56	94.33	157.10	300.45	404.57	1002		
C.B.c - f32 (ms)															
Normalized	19.98%	37.03%	28%	49.7%	34.26%	63.14%	54.59%	95.85%	100%	51.48%	30.91%	16.16%	12%	4.85%	
Standard	1.6%	1.8%	2.2%	2.9%	1.1%	1.8%	1.8%	2.7%	0.1%	0%	2.7%	0.9%	0.9%	1%	
MKL-DNN - 101.56	60.16	70.94	41.01	59.54	34.31	37.98	23.75	21.18	41.74	70.10	130.93	175.29	428.94		
C.B.c - f32 (ms)															
Normalized	20.85%	35.21%	29.86%	51.65%	35.57%	61.73%	55.77%	89.18%	100%	50.74%	30.21%	16.18%	12.08%	4.94%	
Standard	0.8%	2.9%	2%	5.4%	0.2%	5.3%	1.4%	2.9%	0.4%	0.1%	1.5%	1.4%	1.4%	0.6%	
Deviation															

SVT-AV1 -	44.76	60.68	62.78	71.72	67.00	96.82	98.77	101.52	63.05	55.38	38.65	37.11	35.05	16.65
1.8.b.Y.T.A.V.														
E (FPS)														
Normalized	44.09%	59.77%	61.84%	70.65%	66%	95.37%	97.29%	100%	62.11%	54.55%	38.07%	36.55%	34.53%	16.4%
Standard	0.7%	2.9%	0.4%	1.7%	0.8%	2.8%	1%	0.5%	2.2%	1.4%	3.7%	1.2%	1.3%	0.8%
SVT-HEVC -	258.45	328.76	343.93	338.31	360.14	335.96	367.52	329.82	269.00	319.41	164.10	186.05	179.31	89.22
1.8.b.Y.T.H.V.														
E (FPS)														
Normalized	70.32%	89.45%	93.58%	92.05%	97.99%	91.41%	100%	89.74%	73.19%	86.91%	44.65%	50.62%	48.79%	24.28%
Standard	1%	2.3%	1.1%	1.2%	2.4%	2.5%	0.9%	2.9%	0.9%	3.7%	6.8%	7.7%	4.3%	0.6%
SVT-VP9 -	272.54	319.09	358.66	347.87	374.60	345.47	393.10	344.13	279.16	370.05	133.45	158.54	160.83	66.76
1.8.b.Y.T.V.V.														
E (FPS)														
Normalized	69.33%	81.17%	91.24%	88.49%	95.29%	87.88%	100%	87.54%	71.02%	94.14%	33.95%	40.33%	40.91%	16.98%
Standard	0.9%	2.7%	2.6%	3%	1.7%	1.5%	2.9%	4.9%	2.9%	2.3%	2.7%	4.2%	0.8%	1.7%
x264 - H.2.V.E	131.26	156.10	154.33	153.23	151.86	148.10	155.81	151.15	122.23	114.96	143.65	108.16	107.88	55.81
(FPS)														
Normalized	84.09%	100%	98.87%	98.16%	97.28%	94.88%	99.81%	96.83%	78.3%	73.65%	92.02%	69.29%	69.11%	35.75%
Standard	0.2%	1.1%	1.5%	1.1%	0.5%	0.7%	0.2%	2.1%	3%	1.1%	0.7%	0.5%	0.7%	0.4%
x265 -	44.96	45.04	45.39	45.47	43.48	43.79	44.15	45.03	32.76	33.33	35.59	28.80	28.43	20.38
H.2.1.V.E														
(FPS)														
Normalized	98.88%	99.05%	99.82%	100%	95.62%	96.31%	97.1%	99.03%	72.05%	73.3%	78.27%	63.34%	62.52%	44.82%
Standard	0.5%	0.5%	0.2%	0.6%	0.5%	0.4%	1%	1%	0.8%	1.1%	1.5%	0.7%	0.4%	0%
x265 -	50.55	49.20	50.81	49.41	48.93	47.86	48.95	48.45	34.88	35.44	39.34	33.44	32.90	25.01
H.2.1.V.E														
(FPS)														
Normalized	99.49%	96.83%	100%	97.24%	96.3%	94.19%	96.34%	95.36%	68.65%	69.75%	77.43%	65.81%	64.75%	49.22%
Standard	0.4%	0.2%	0.4%	1.7%	0.4%	0.1%	0.8%	2.4%	0.7%	0.3%	0.7%	0.5%	0.4%	0.9%
dav1d -	21.89	17.47	16.78	14.47	15.98	13.04	12.01	11.41	18.09	21.65	18.67	24.97	26.44	51.83
Summer														
Nature 4K														
(sec)														
Normalized	52.12%	65.31%	68%	78.85%	71.4%	87.5%	95%	100%	63.07%	52.7%	61.11%	45.69%	43.15%	22.01%
Standard	0.3%	0.4%	0.2%	0.5%	0.1%	1%	0.2%	2.8%	1.9%	0.6%	0.6%	0.5%	0.4%	0.4%
Coremark -	58863	11340	88032	16558	11094	21187	19662	37199	18836	96733	16555	82041	61829	23469
CoreMark Size 5	97	7	94	75	64	11	97	89	0	74	4	9	0	
666 - I.P.S														
(Iterations/Sec)														
Normalized	15.82%	30.49%	23.66%	44.51%	29.82%	56.96%	52.86%	100%	50.64%	26%	44.5%	22.05%	16.62%	6.31%
Standard	0.2%	0.6%	0.8%	1.2%	0.1%	0.9%	0.2%	0.2%	2%	0.6%	1.6%	1.1%	1%	0.1%
Stockfish -	42554	76602	62020	11390	75903	13907	13312	24118	12404	65150	10333	58216	42945	16318
Total Time	164	512	868	1411	528	0880	0860	5105	4462	665	0585	860	065	808
(Nodes/s)														
Normalized	17.64%	31.76%	25.72%	47.23%	31.47%	57.66%	55.19%	100%	51.43%	27.01%	42.84%	24.14%	17.81%	6.77%
Standard	0.3%	1.3%	0.2%	0.5%	2.3%	1.3%	1%	0.5%	2.7%	0.7%	1.8%	1.6%	1.4%	2%
asmFish -	42909	75783	62962	11267	78467	13547	13171	23960	13420	70136	11498	62241	46018	16219
1.H.M.2.D	829	369	855	2179	488	4285	0538	6281	5427	822	1990	924	875	903
(Nodes/s)														
Normalized	17.91%	31.63%	26.28%	47.02%	32.75%	56.54%	54.97%	100%	56.01%	29.27%	47.99%	25.98%	19.21%	6.77%
Standard	1%	1.7%	0.3%	3%	1%	0.3%	0.8%	0.7%	2.1%	0.9%	1.5%	0.6%	0.9%	2.7%
Deviation														

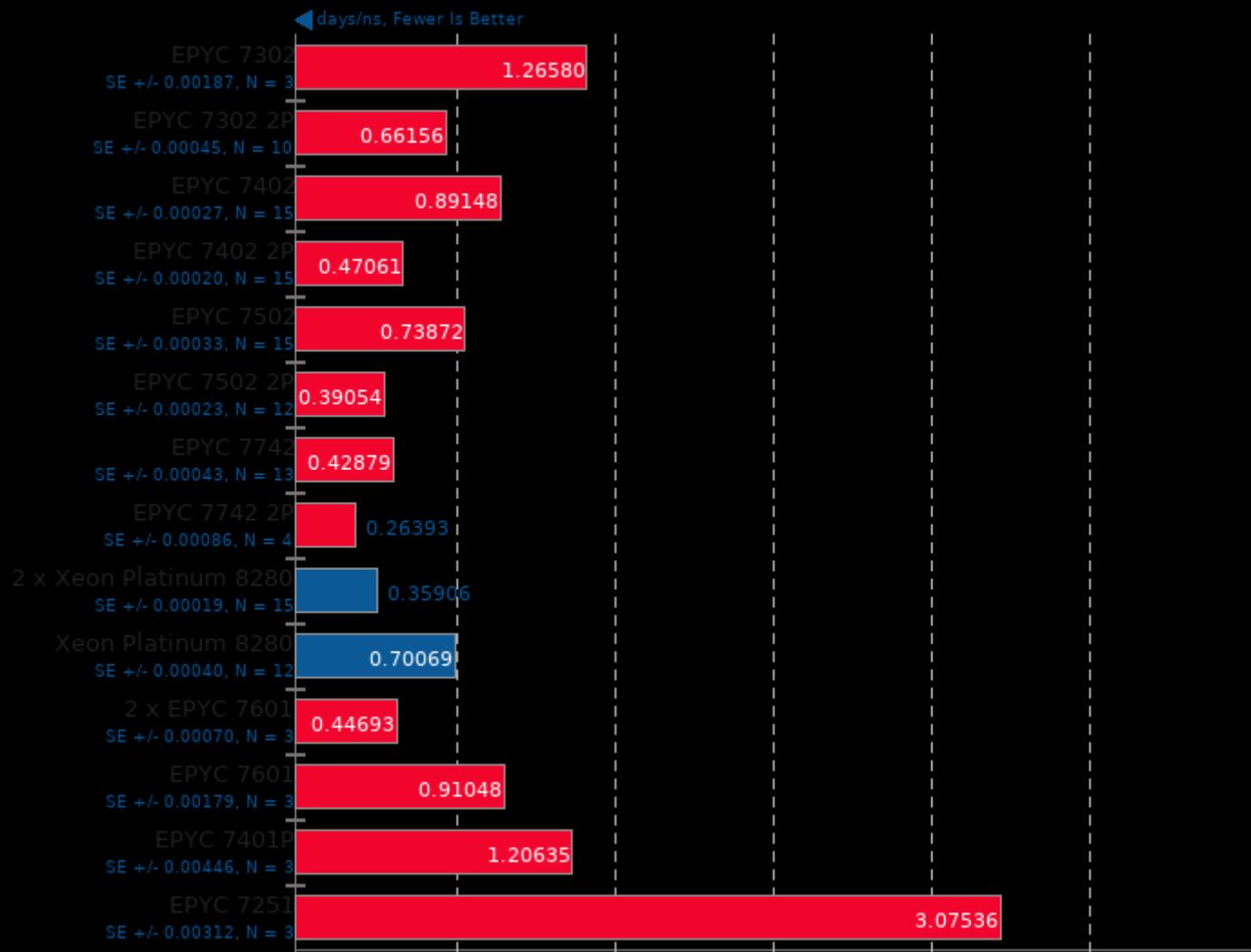
Timed Linux Kernel	41.67	27.40	32.73	22.62	29.01	20.83	22.36	16.07	21.31	31.22	23.45	39.30	47.49	102.34
Compilation - Time To Compile (sec)														
Normalized														
Standard	38.56%	58.65%	49.1%	71.04%	55.39%	77.15%	71.87%	100%	75.41%	51.47%	68.53%	40.89%	33.84%	15.7%
Standard	3%	3.5%	2.7%	3.8%	3.3%	4.4%	4.1%	6.2%	5.7%	3.9%	3.7%	2.7%	2.9%	2.2%
Timed LLVM	203.24	134.26	158.54	105.84	143.43	99.96	102.14	78.81	104.91	158.80	133.00	203.14	233.69	538.02
Compilation - Time To Compile (sec)														
Normalized														
C-Ray - Total	38.23	19.35	25.62	13.02	20.80	10.86	11.85	6.29	14.31	27.88	12.28	24.45	32.36	88.08
Time - 4.1.R.P.P (sec)														
Normalized	38.78%	58.7%	49.71%	74.46%	54.95%	78.84%	77.16%	100%	75.12%	49.63%	59.26%	38.8%	33.72%	14.65%
Standard	0.1%	0.3%	0.2%	0%	0.1%	0.8%	0.2%	2.6%	0.2%	0.1%	0.3%	1%	0.8%	0.1%
POV-Ray -	28.88	16.36	20.65	12.15	17.34	10.32	10.86	8.41	11.82	20.70	12.57	22.35	29.15	71.32
Trace Time (sec)														
Normalized	29.12%	51.41%	40.73%	69.22%	48.5%	81.49%	77.44%	100%	71.15%	40.63%	66.91%	37.63%	28.85%	11.79%
Standard	0.3%	1%	0.3%	0.9%	0.4%	1.1%	0.5%	3.4%	2.7%	0.2%	0.1%	0.4%	0.3%	0.2%
7-Zip	96539	15091	14023	21842	17111	25503	28057	35030	24114	13977	13409	90342	78308	30676
Compression - C.S.T (MIPS)														
Normalized	27.56%	43.08%	40.03%	62.35%	48.85%	72.8%	80.09%	100%	68.84%	39.9%	38.28%	25.79%	22.35%	8.76%
Standard	0.1%	2.4%	0.4%	0.3%	0.3%	1.2%	0.2%	1.7%	2.7%	0.9%	4.4%	2.4%	0.5%	1.7%
Blender -	101.34	54.63	70.54	40.52	60.95	35.41	37.39	26.84	37.84	68.31	47.93	83.46	109.37	277.45
BMW27 - CPU-Only (sec)														
Normalized	26.49%	49.13%	38.05%	66.24%	44.04%	75.8%	71.78%	100%	70.93%	39.29%	56%	32.16%	24.54%	9.67%
Standard	0.5%	0.2%	0.2%	0.5%	0%	1.1%	0.6%	0.9%	0.7%	0.2%	0.4%	0.7%	0.9%	0.4%
Blender -	264.66	136.31	181.58	94.41	152.52	78.17	86.25	46.33	95.00	188.04	98.92	204.36	275.15	704.46
Classroom - CPU-Only (sec)														
Normalized	17.51%	33.99%	25.51%	49.07%	30.38%	59.27%	53.72%	100%	48.77%	24.64%	46.84%	22.67%	16.84%	6.58%
Standard	0.1%	0.9%	0%	0.5%	0.4%	0.4%	0.4%	0.7%	0.1%	0.3%	0.4%	0.2%	0.3%	0.3%
Blender -	143.59	82.88	101.69	64.75	88.34	57.60	59.38	43.71	62.53	104.70	76.73	125.29	160.03	410.78
Fishy Cat - CPU-Only (sec)														
Normalized	30.44%	52.74%	42.98%	67.51%	49.48%	75.89%	73.61%	100%	69.9%	41.75%	56.97%	34.89%	27.31%	10.64%
Standard	0.1%	0.4%	0.3%	0.6%	0.1%	0.2%	0.3%	0.2%	0.1%	0.1%	0.7%	0.4%	0.2%	0.3%
Deviation														

Blender -	400.29	238.10	284.20	179.77	242.81	164.45	168.95	141.73	181.43	279.39	219.95	346.99	453.42	1190
Barbershop -														
CPU-Only (sec)														
Normalized														
Normalized	35.41%	59.53%	49.87%	78.84%	58.37%	86.18%	83.89%	100%	78.12%	50.73%	64.44%	40.85%	31.26%	11.91%
Standard	0.1%	0.2%	0.1%	0.3%	0.3%	0.4%	0.2%	0.3%	0.3%	0.1%	0.6%	0.3%	0.3%	0.1%
Blender -	341.22	180.38	234.19	128.52	199.29	109.24	116.92	74.19	124.87	237.50	159.74	294.28	390.84	1067
Pabellon														
Barcelona -														
CPU-Only (sec)														
Normalized														
Normalized	21.74%	41.13%	31.68%	57.73%	37.23%	67.91%	63.45%	100%	59.41%	31.24%	46.44%	25.21%	18.98%	6.95%
Standard	0.2%	0.9%	0.6%	0.9%	0.7%	0.6%	0.8%	0.5%	0.2%	0.1%	0.1%	0.3%	0.1%	0.1%
Appleseed -	148.04	81.28	109.30	63.45	86.34	59.83	63.50	57.99	65.95	97.09	69.44	108.53	144.50	336.89
Disney														
Material (sec)														
Normalized														
Normalized	39.17%	71.35%	53.06%	91.39%	67.16%	96.92%	91.32%	100%	87.93%	59.73%	83.51%	53.43%	40.13%	17.21%
Tungsten	16.26	9.67	12.00	7.55	10.34	6.57	6.97	5.32	7.07	11.86	8.10	13.07	16.26	39.49
Renderer -														
Hair (sec)														
Normalized														
Normalized	32.72%	55.02%	44.33%	70.46%	51.45%	80.97%	76.33%	100%	75.25%	44.86%	65.68%	40.7%	32.72%	13.47%
Standard	0.9%	0.4%	0.3%	1.3%	0.4%	0.6%	0.2%	1.2%	1.4%	0.4%	0.8%	0.4%	0%	0.4%
Tungsten	6.38	5.30	5.74	2.97	4.43	2.28	2.17	1.52	7.91	5.42	3.23	5.87	7.67	18.53
Renderer -														
Non-Exponent														
rial (sec)														
Normalized														
Normalized	23.82%	28.68%	26.48%	51.18%	34.31%	66.67%	70.05%	100%	19.22%	28.04%	47.06%	25.89%	19.82%	8.2%
Standard	0.7%	0.5%	1.2%	12.3%	1.3%	1.6%	0.3%	2.6%	24.8%	10.3%	0.8%	0.4%	0.2%	1.8%
PyBench -	1221	1225	1207	1211	1212	1211	1202	1206	1013	1017	1462	1457	1551	1607
T.F.A.T.T														
(Milliseconds)														
Normalized														
Normalized	82.96%	82.69%	83.93%	83.65%	83.58%	83.65%	84.28%	84%	100%	99.61%	69.29%	69.53%	65.31%	63.04%
Standard	0.6%	0.2%	0.4%	0.3%	0.9%	0.3%	0.2%	0.3%	0.1%	0.2%	1.2%	0.3%	0.6%	0.6%
NeatBench -	28.97	27.40	32.93	31.63	33.70	31.57	34.43	32.53	31.71	34.30	10.38	11.57	13.05	10.37
CPU (FPS)														
Normalized														
Normalized	84.14%	79.58%	95.64%	91.87%	97.88%	91.69%	100%	94.48%	92.1%	99.62%	30.15%	33.6%	37.9%	30.12%
Standard	0.9%	1.3%	2.2%	1.9%	2.2%	1%	3%	0.2%	3.5%	2.9%	2.9%	5.7%	2.7%	0.6%
Apache Siege	88423	31601	53381	32589	39737	33488	36292	31578		58824	22745	32272	43073	43059
- 200														
(Transactions/sec)														
Normalized														
Normalized	100%	35.74%	60.37%	36.86%	44.94%	37.87%	41.04%	35.71%		66.53%	25.72%	36.5%	48.71%	48.7%
Standard	7.5%	1.9%	5.8%	2.7%	11.5%	3.4%	0.7%	1.9%		0.4%	0.1%	5%	2.9%	2.3%
PHPBench -	48963	48936	49529	49643	49546	49591	50205	50177	64562	63749	39558	39712	37315	35968
P.B.S (Score)														
Normalized														
Normalized	75.84%	75.8%	76.71%	76.89%	76.74%	76.81%	77.76%	77.72%	100%	98.74%	61.27%	61.51%	57.8%	55.71%
Standard	0.5%	0.7%	0.8%	0.3%	0.5%	0.3%	0.6%	0.3%	0.3%	1.4%	0.5%	0.2%	0.3%	0.3%
Deviation														

Geekbench -	17312	28823	23514	37477	27437	43436	42067	59066	36165	23734	28438	17829	14576	6571
CPU Multi														
Core (Score)														
Normalized														
Standard	29.31%	48.8%	39.81%	63.45%	46.45%	73.54%	71.22%	100%	61.23%	40.18%	48.15%	30.18%	24.68%	11.12%
Standard	0.5%	0.7%	0.2%	1.4%	0%	1.4%	0.9%	1.7%	1.3%	0.6%	2.6%	2.8%	1.7%	2%
Geekbench -	148.30	290.47	219.67	415.53	266.73	501.20	465.80	792.37	396.27	225.17	363.70	195.67	155.13	56.47
CPU Multi														
Core - Face														
Detection														
(images/sec)														
Normalized	18.72%	36.66%	27.72%	52.44%	33.66%	63.25%	58.79%	100%	50.01%	28.42%	45.9%	24.69%	19.58%	7.13%
Standard	0.8%	1.8%	0.8%	1.6%	1.2%	6.4%	3%	4.5%	8.5%	2.6%	3.9%	6.2%	1.3%	1.5%
Geekbench -	1005	991	1026	1006	1026	999	1041	1033	1135	1143	873	869	820	770
CPU Single														
Core (Score)														
Normalized	87.93%	86.7%	89.76%	88.01%	89.76%	87.4%	91.08%	90.38%	99.3%	100%	76.38%	76.03%	71.74%	67.37%
Standard	0.7%	0.6%	0.4%	0.7%	0.1%	0.5%	0.5%	0.1%	0.1%	0.1%	0.1%	0.3%	0.4%	0.4%
Geekbench -	63.17	62.60	64.33	63.47	64.40	63.73	65.67	64.43	42.13	42.53	60.97	60.53	56.63	55.27
CPU Single														
Core -														
Gaussian Blur														
(Mpixels/sec)														
Normalized	96.19%	95.33%	97.96%	96.65%	98.07%	97.05%	100%	98.11%	64.15%	64.76%	92.84%	92.17%	86.23%	84.16%
Standard	0.2%	0.5%	0.5%	0.6%	0.7%	0.2%	0.6%	0.2%	0.1%	1%	0.4%	0.2%	0.2%	0.3%
Geekbench -	8.18	8.19	8.31	8.28	8.31	8.31	8.45	8.28	8.31	8.33	6.68	6.68	6.25	6.04
CPU Single														
Core - Face														
Detection														
(images/sec)														
Normalized	96.8%	96.92%	98.34%	97.99%	98.34%	98.34%	100%	97.99%	98.34%	98.58%	79.05%	79.05%	73.96%	71.48%
Standard	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.3%	0.4%	0.5%	0.1%	0%	0.2%	0.3%
Geekbench -	23.50	22.83	23.80	23.10	23.83	23.30	24.10	24	25.10	25.40	18.40	18.77	18.03	17.70
CPU Single														
Core - Horizon														
Detection														
(Gpixels/sec)														
Normalized	92.52%	89.88%	93.7%	90.94%	93.82%	91.73%	94.88%	94.49%	98.82%	100%	72.44%	73.9%	70.98%	69.69%
Standard	0%	0.3%	1.1%	1.1%	0.5%	0.7%	0%	0.4%	0%	2.2%	4%	7.6%	10.9%	
Deviation														

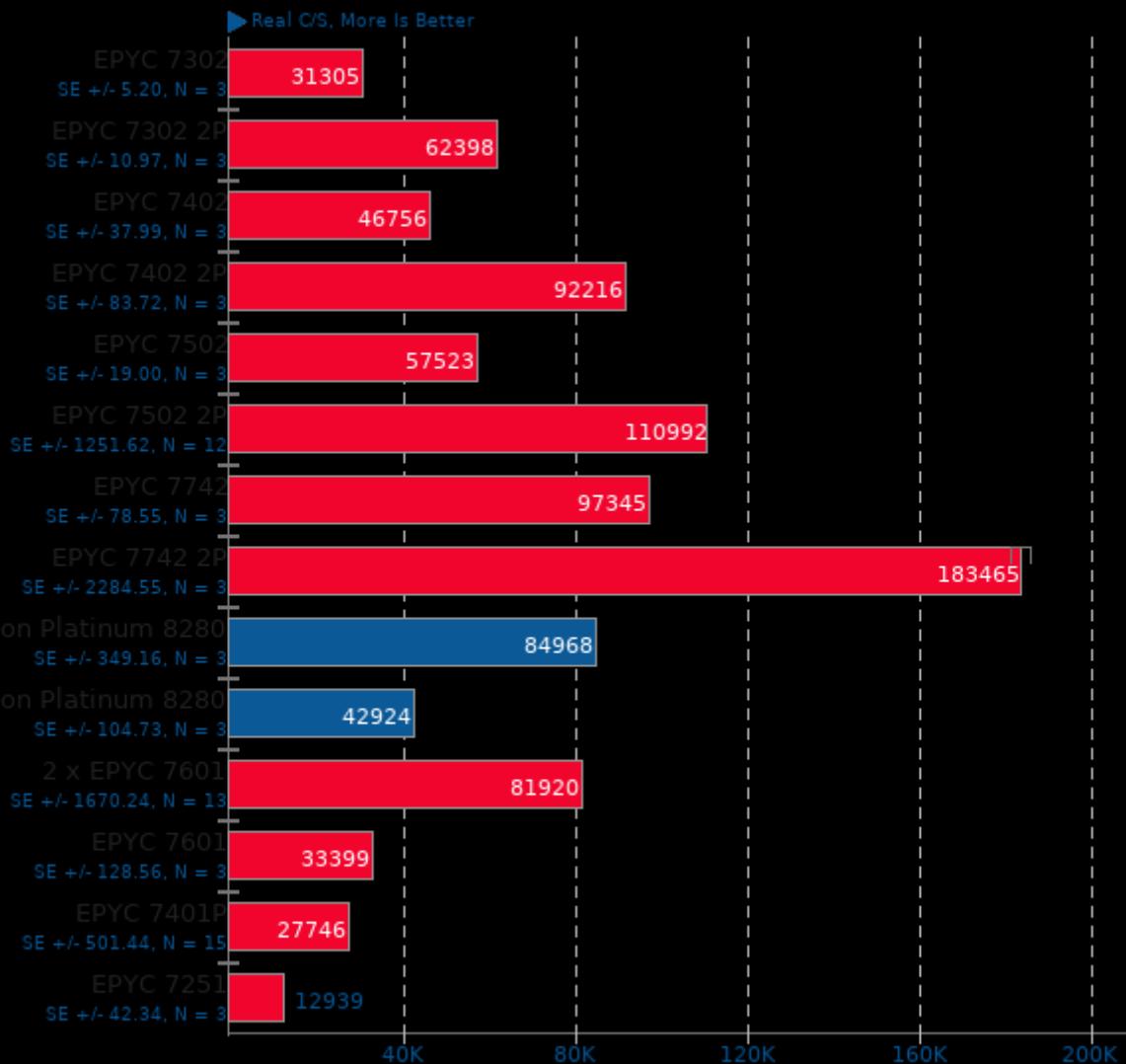
NAMD 2.13b1

ATPase Simulation - 327,506 Atoms



John The Ripper 1.9.0-jumbo-1

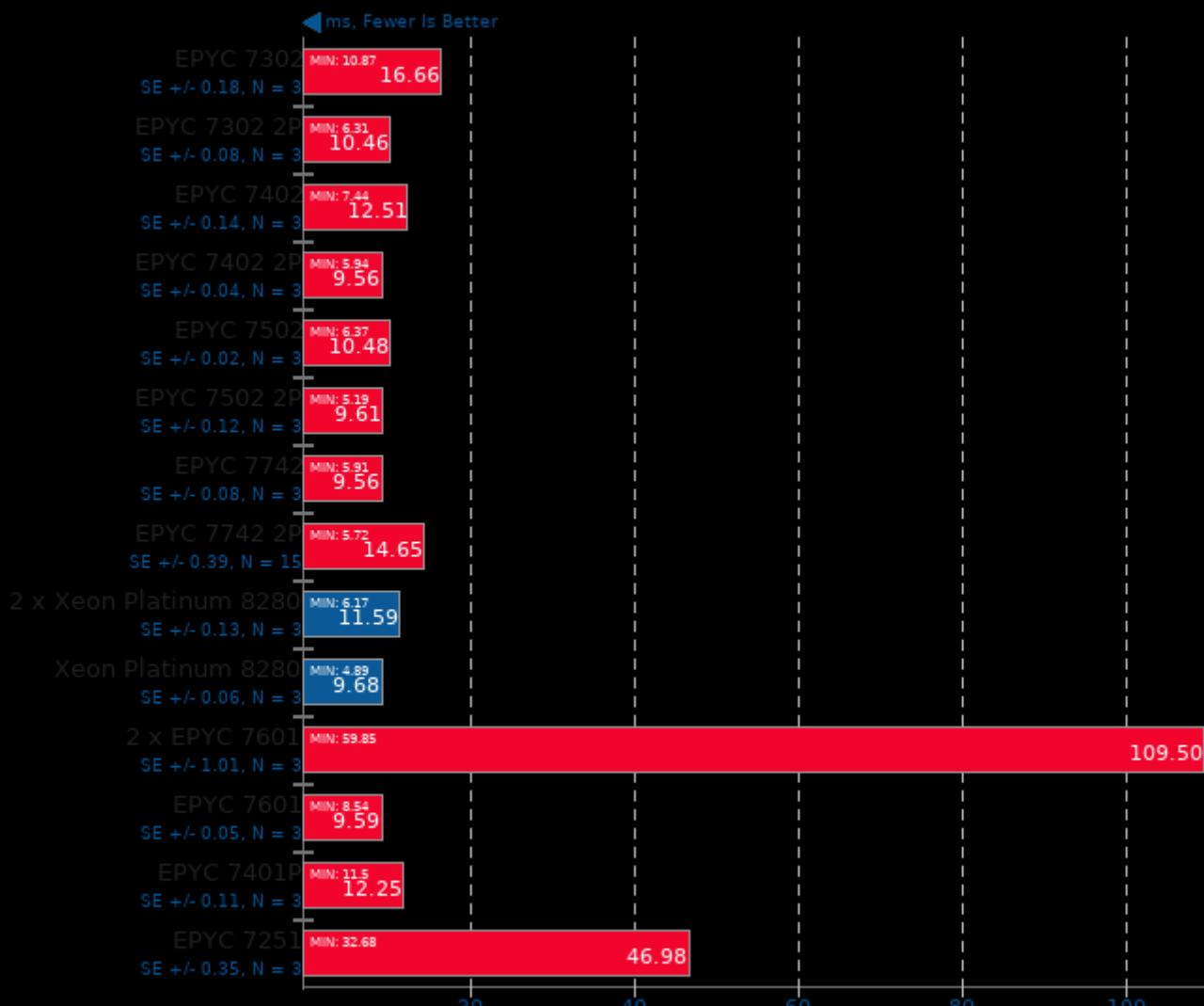
Test: Blowfish



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

MKL-DNN 2019-04-16

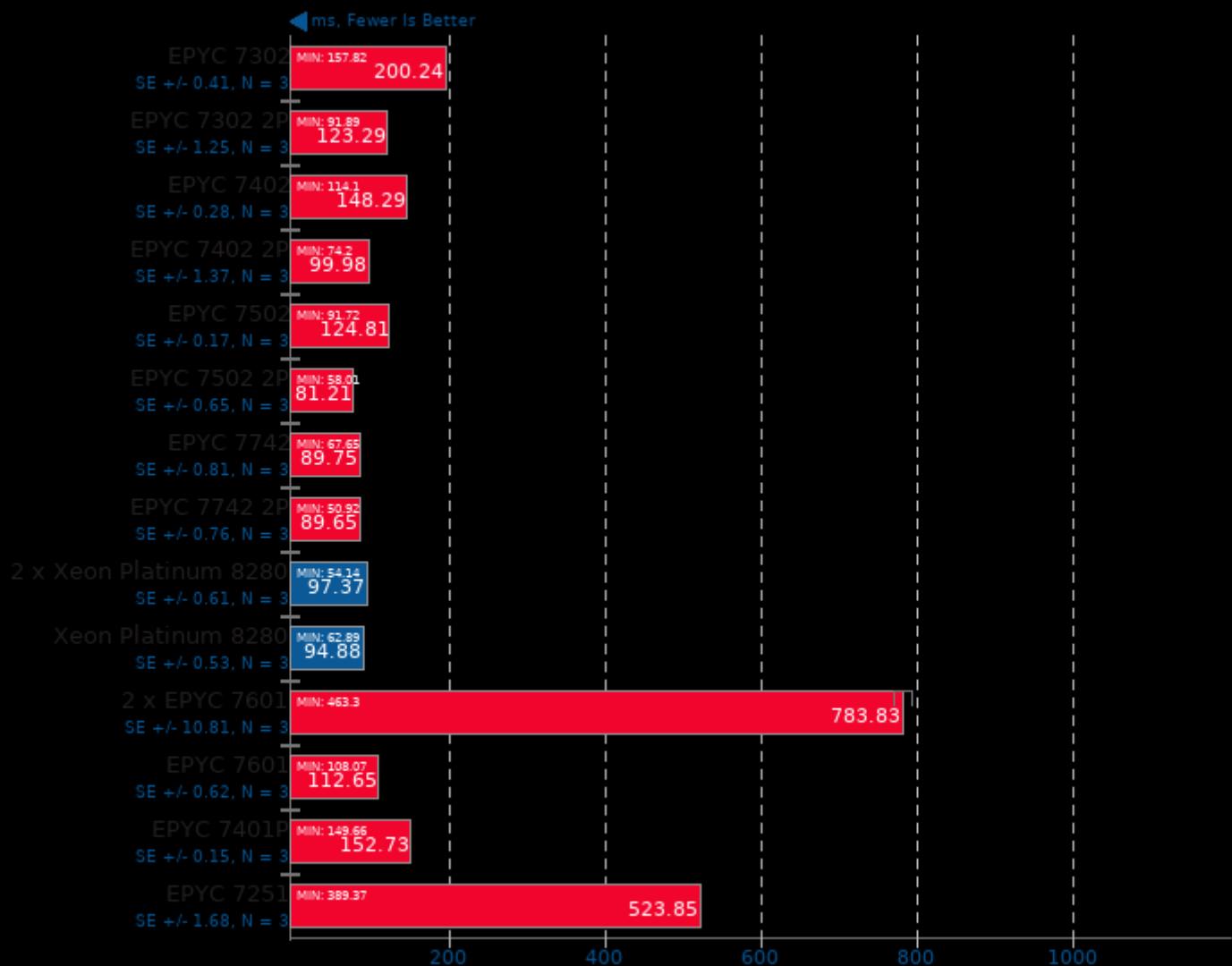
Harness: IP Batch 1D - Data Type: f32



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

MKL-DNN 2019-04-16

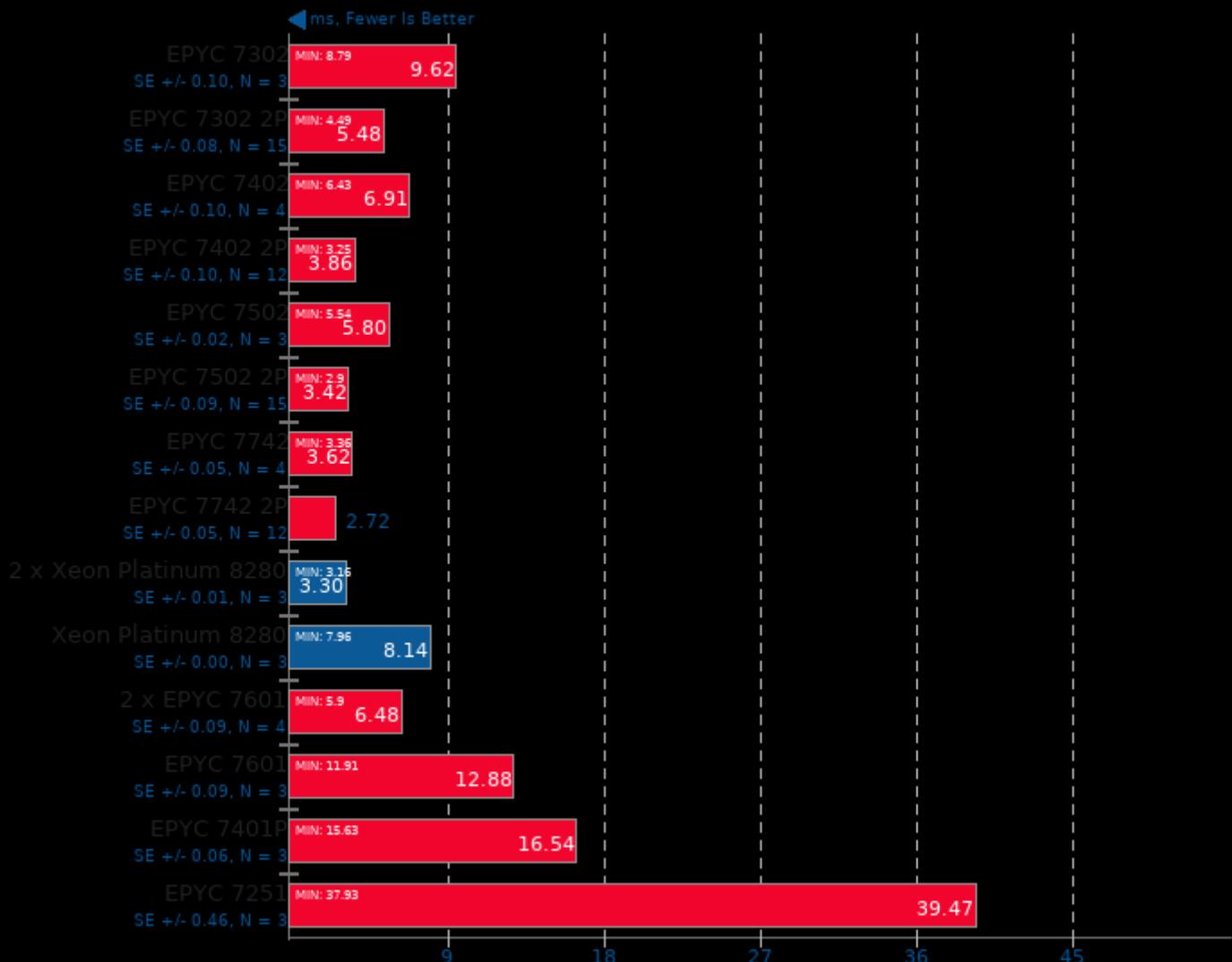
Harness: IP Batch All - Data Type: f32



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

MKL-DNN 2019-04-16

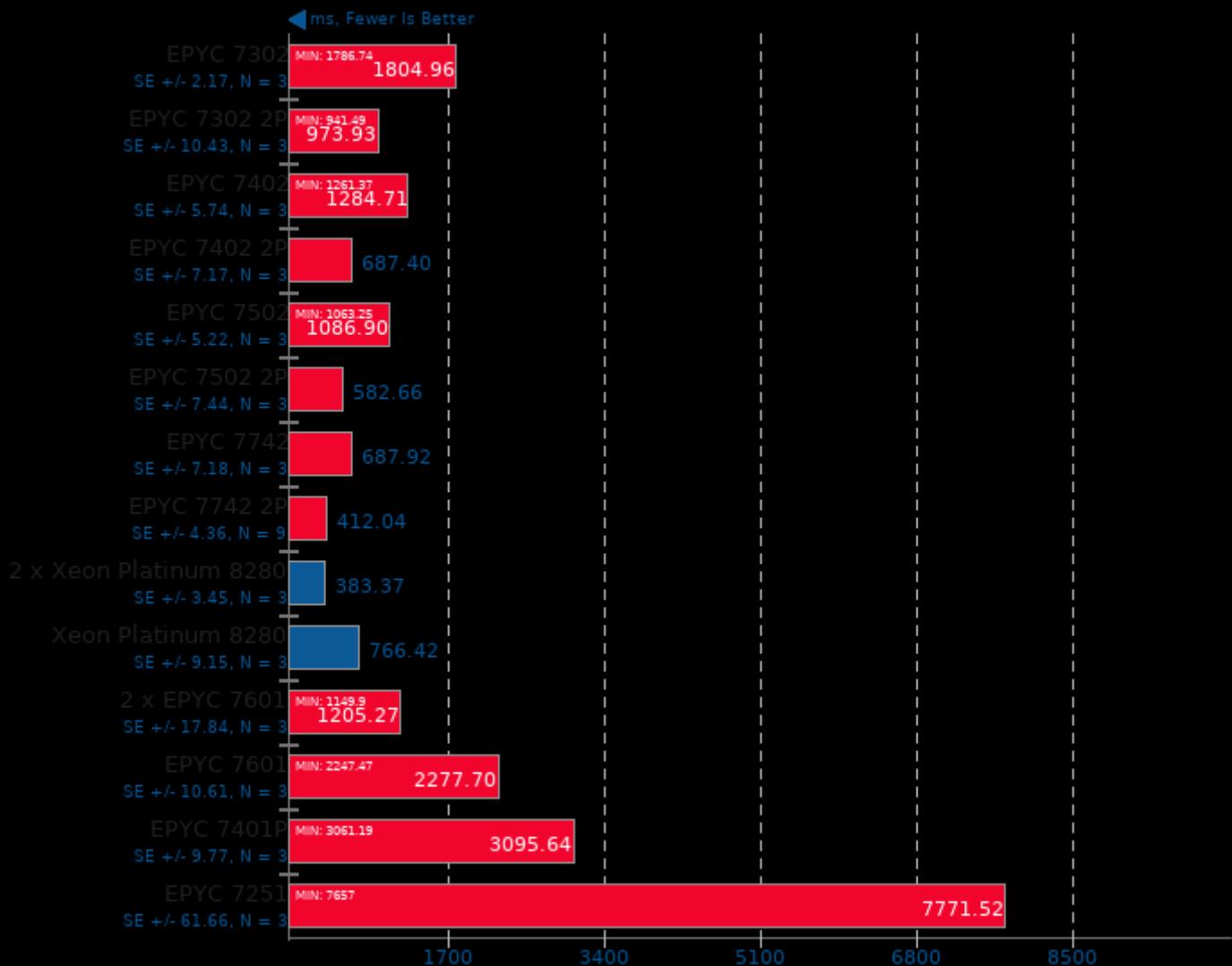
Harness: Convolution Batch conv_3d - Data Type: f32



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

MKL-DNN 2019-04-16

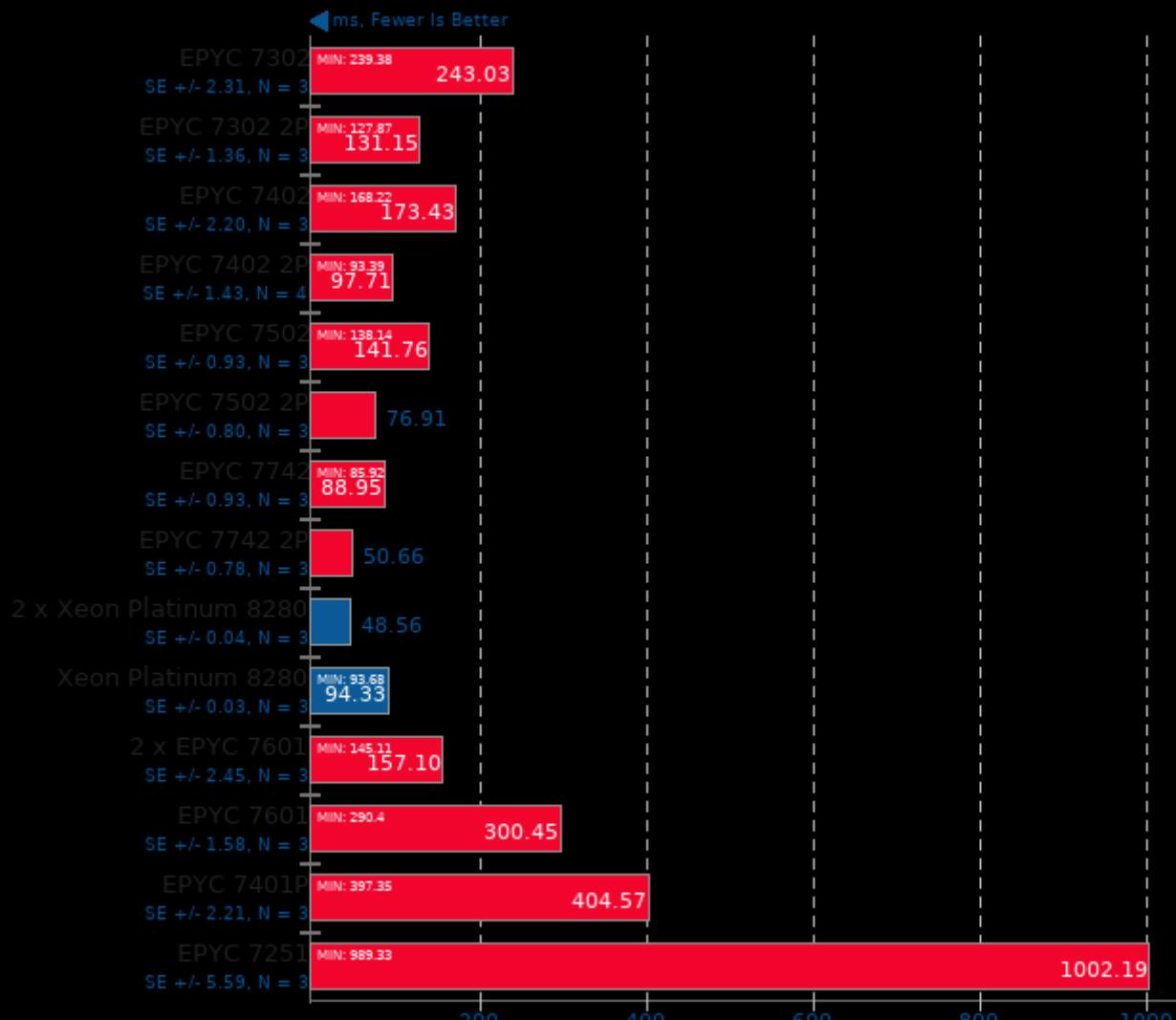
Harness: Convolution Batch conv_all - Data Type: f32



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

MKL-DNN 2019-04-16

Harness: Convolution Batch conv_alexnet - Data Type: f32



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

MKL-DNN 2019-04-16

Harness: Convolution Batch conv_googlenet_v3 - Data Type: f32



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

SVT-AV1 0.5

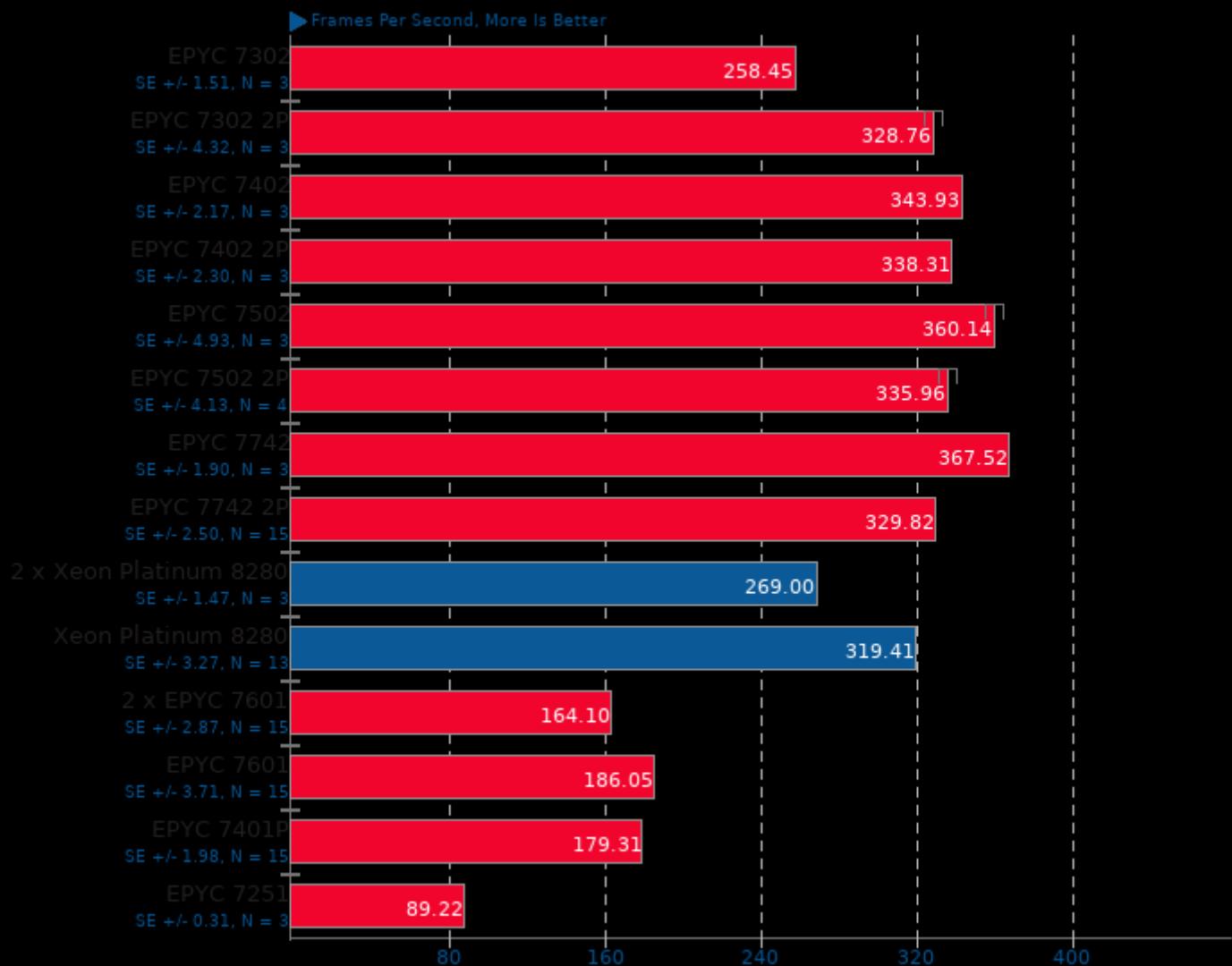
1080p 8-bit YUV To AV1 Video Encode



1. (CXX) g++ options: -O3 -pie -pthread -lm

SVT-HEVC 2019-02-03

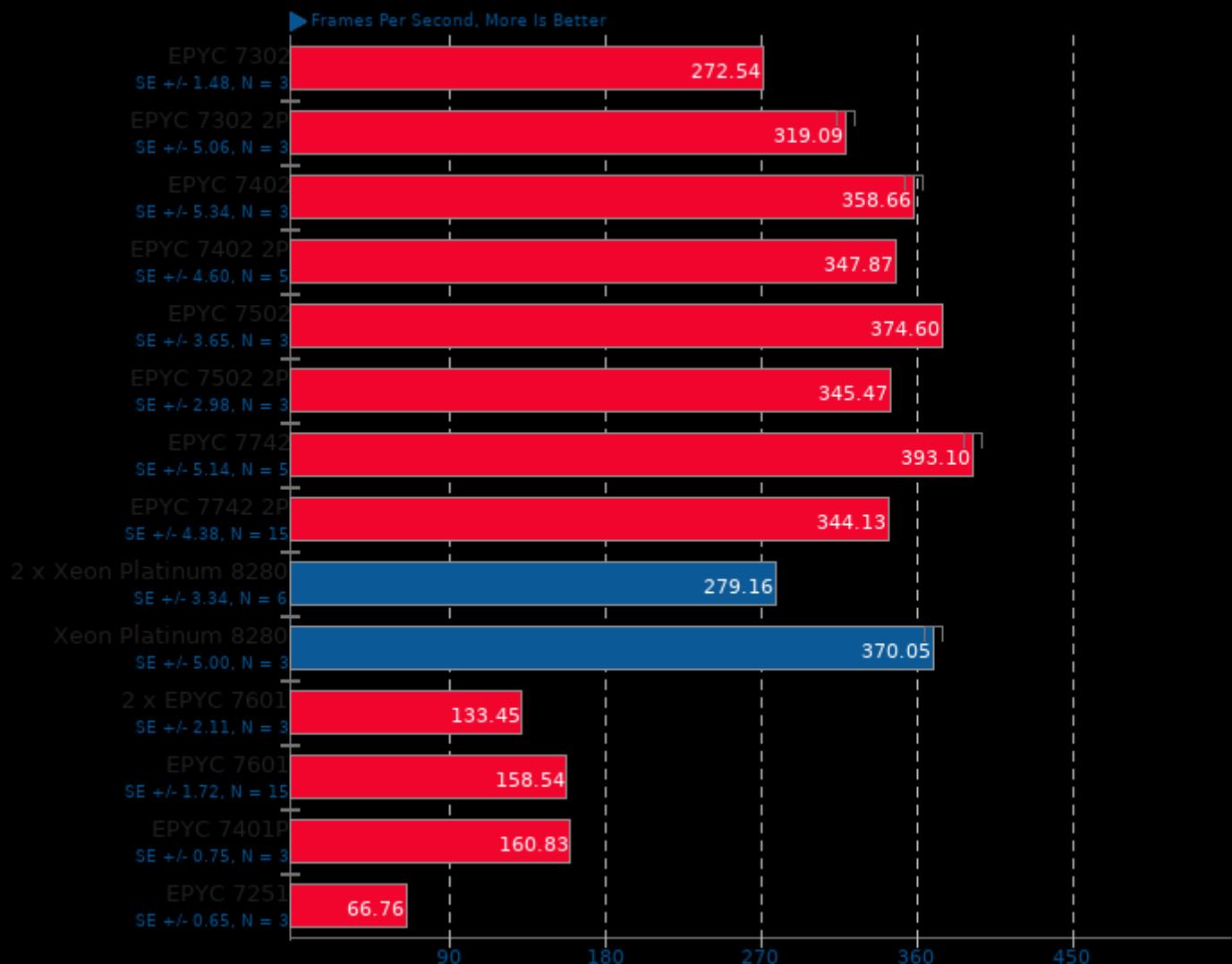
1080p 8-bit YUV To HEVC Video Encode



1. (CC) gcc options: -fPIE -fPIC -O2 -fno -fvisibility=hidden -march=native -pie -rdynamic -lpthread -lrt

SVT-VP9 2019-09-09

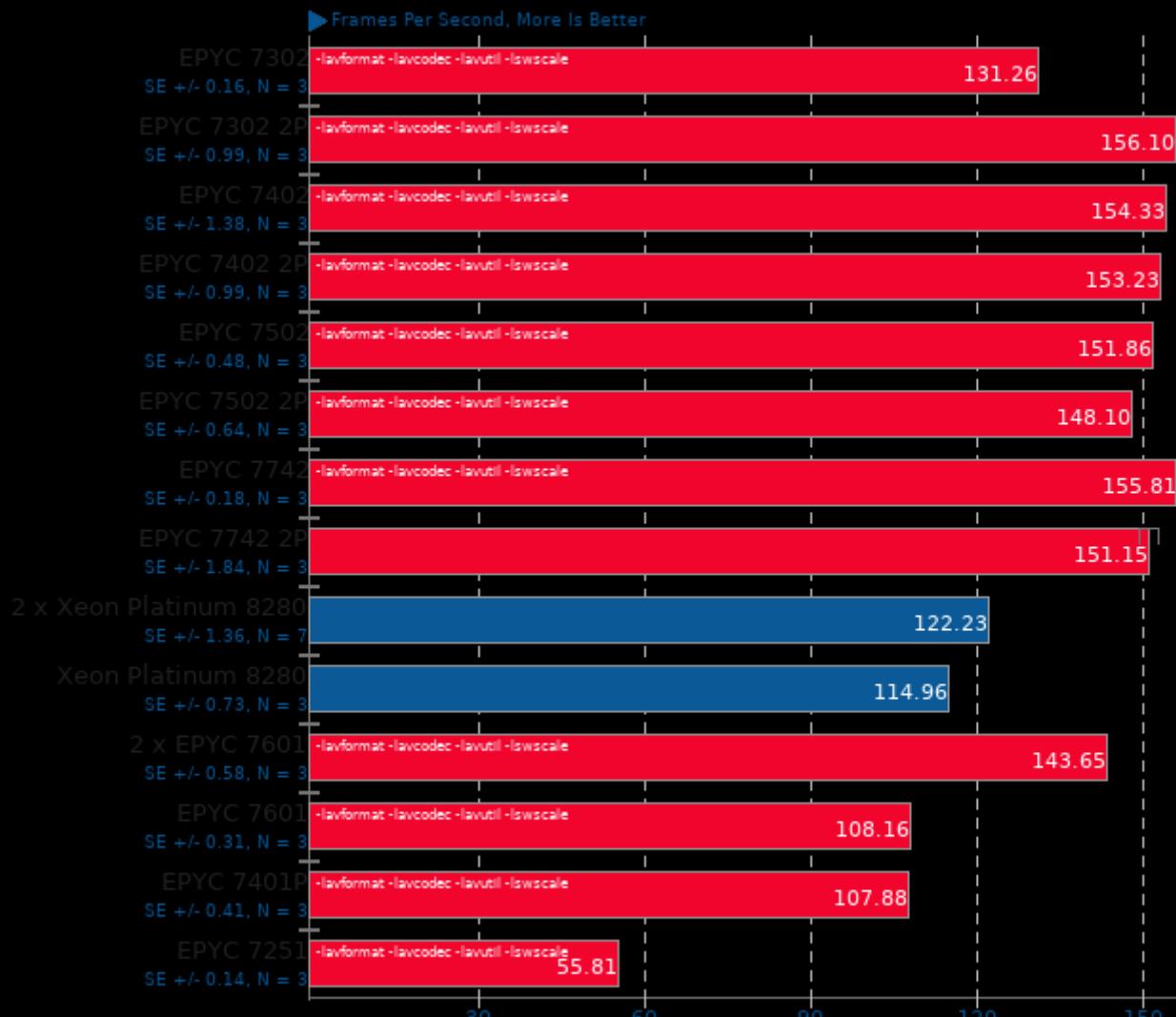
1080p 8-bit YUV To VP9 Video Encode



1. (CC) gcc options: -fPIE -fPIC -fno -O3 -O2 -pie -rdynamic -lpthread -lrt -lm

x264 2018-09-25

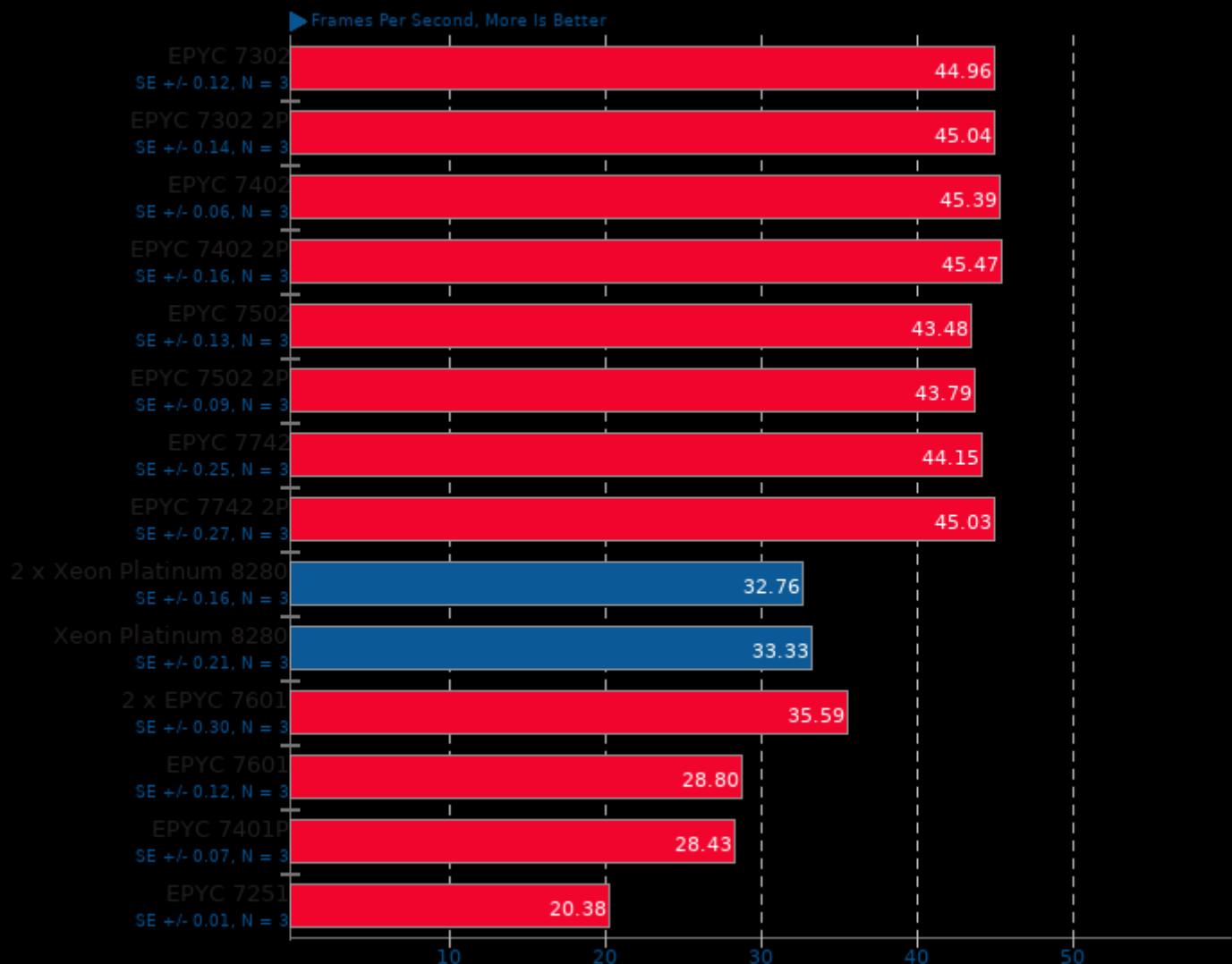
H.264 Video Encoding



1. (CC) gcc options: -fPIC -fno-tree-vectorize -fomit-frame-pointer -fno-tree-vectorize

x265 3.0

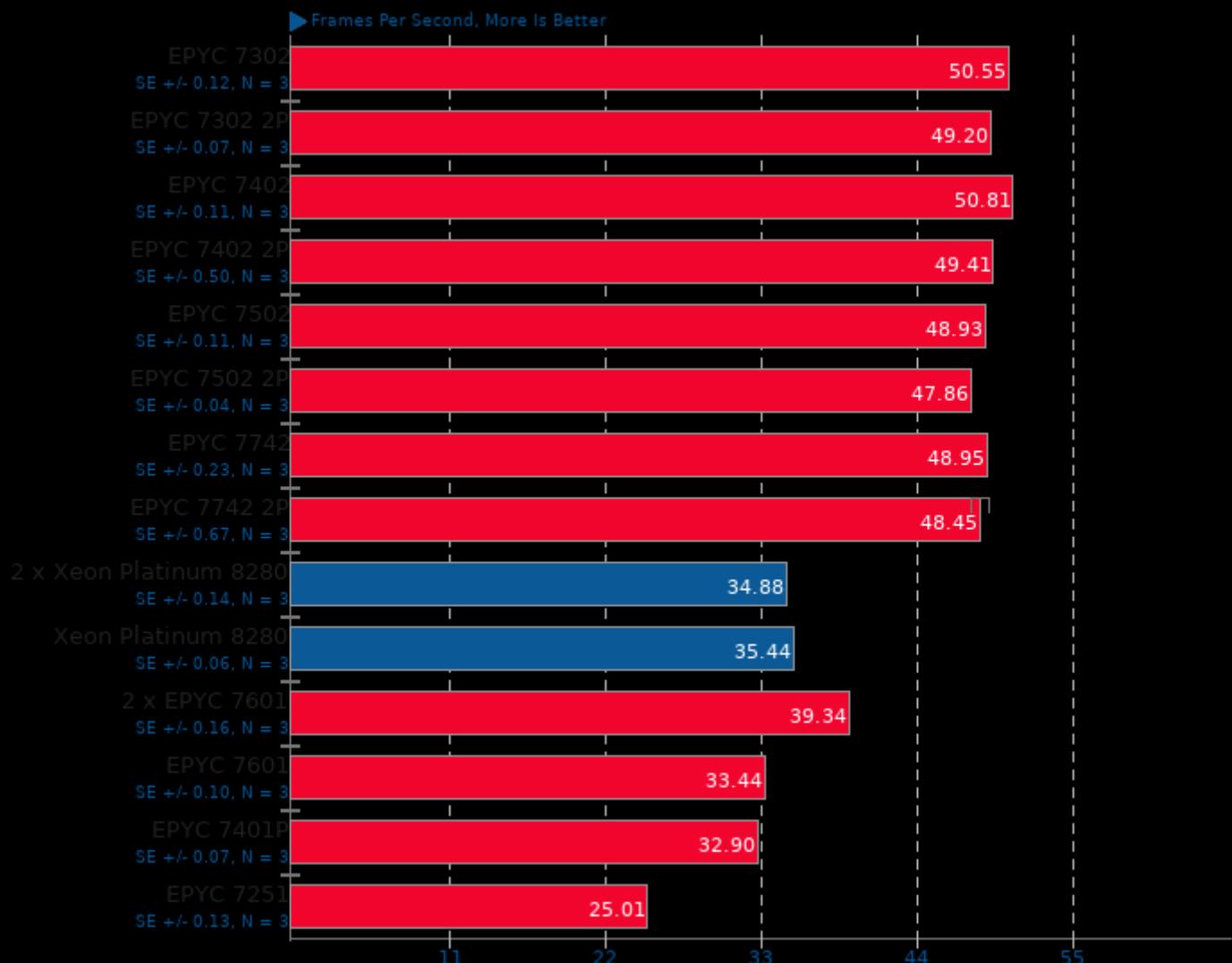
H.265 1080p Video Encoding



1. (CXX) g++ options: -O3 -rdynamic -lpthread -lrt -ldl -lnuma

x265 3.1.2

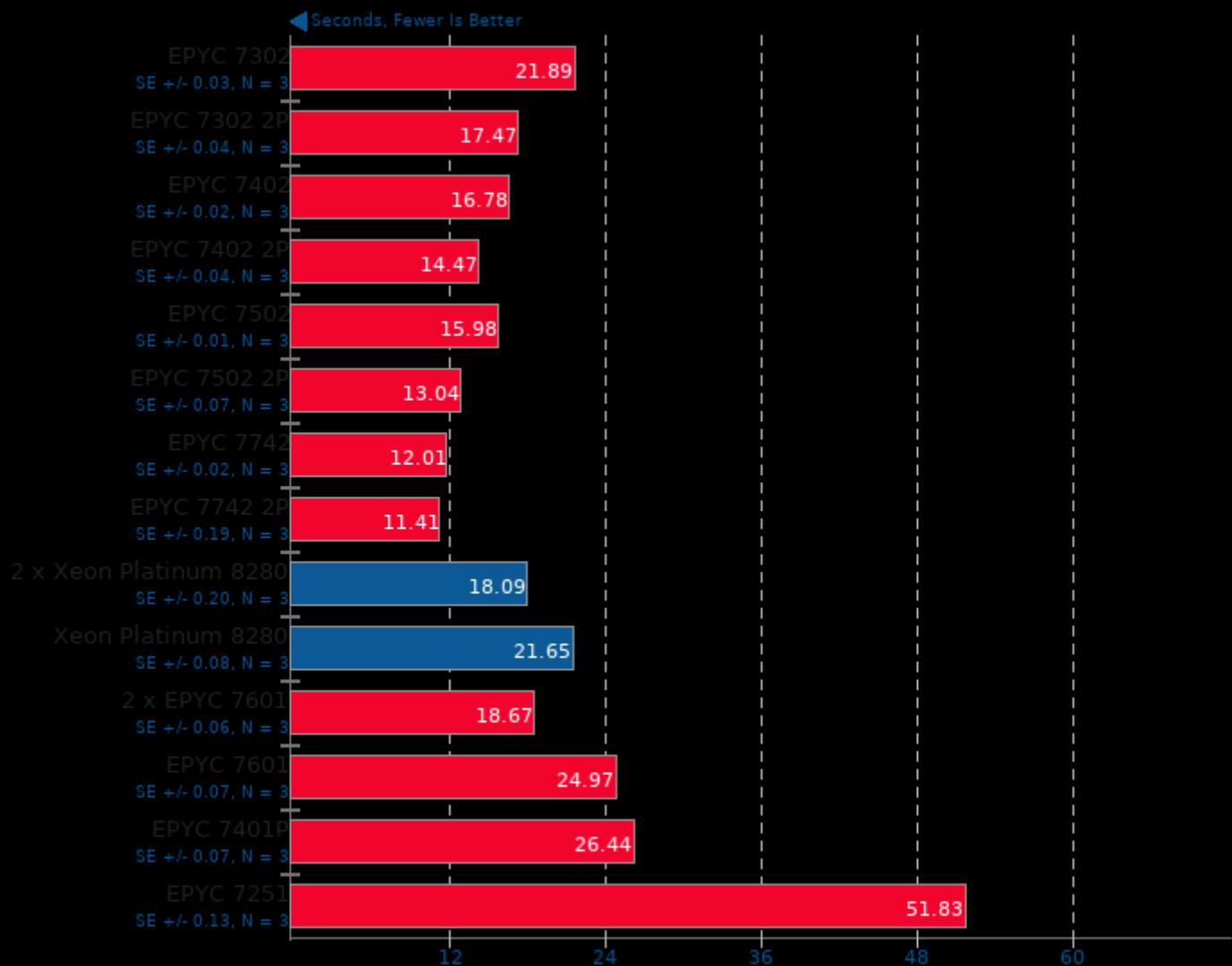
H.265 1080p Video Encoding



1. (CXX) g++ options: -O3 -rdynamic -lpthread -lrt -ldl -lnuma

dav1d 0.3

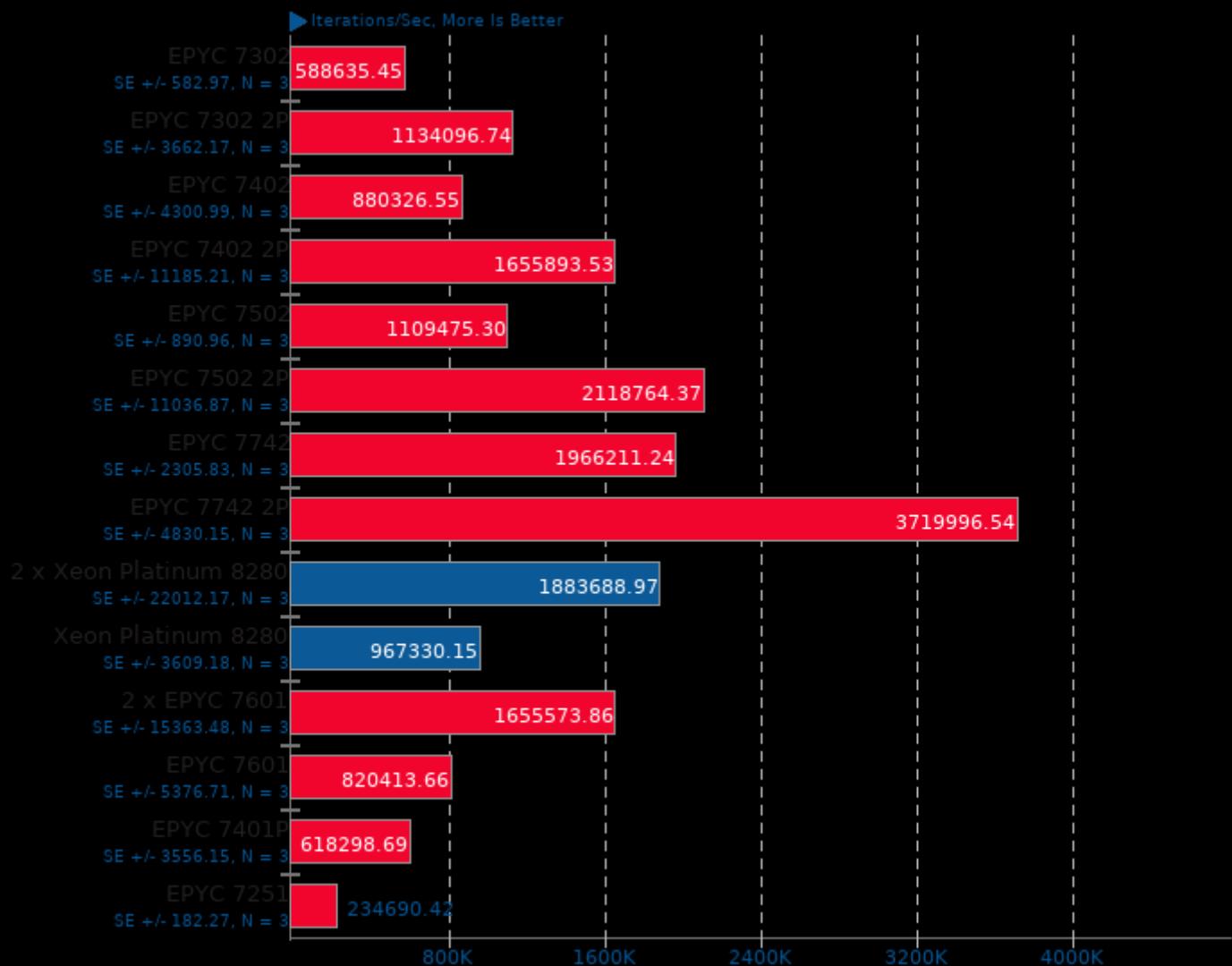
Video Input: Summer Nature 4K



1. (CC) gcc options: -pthread

Coremark 1.0

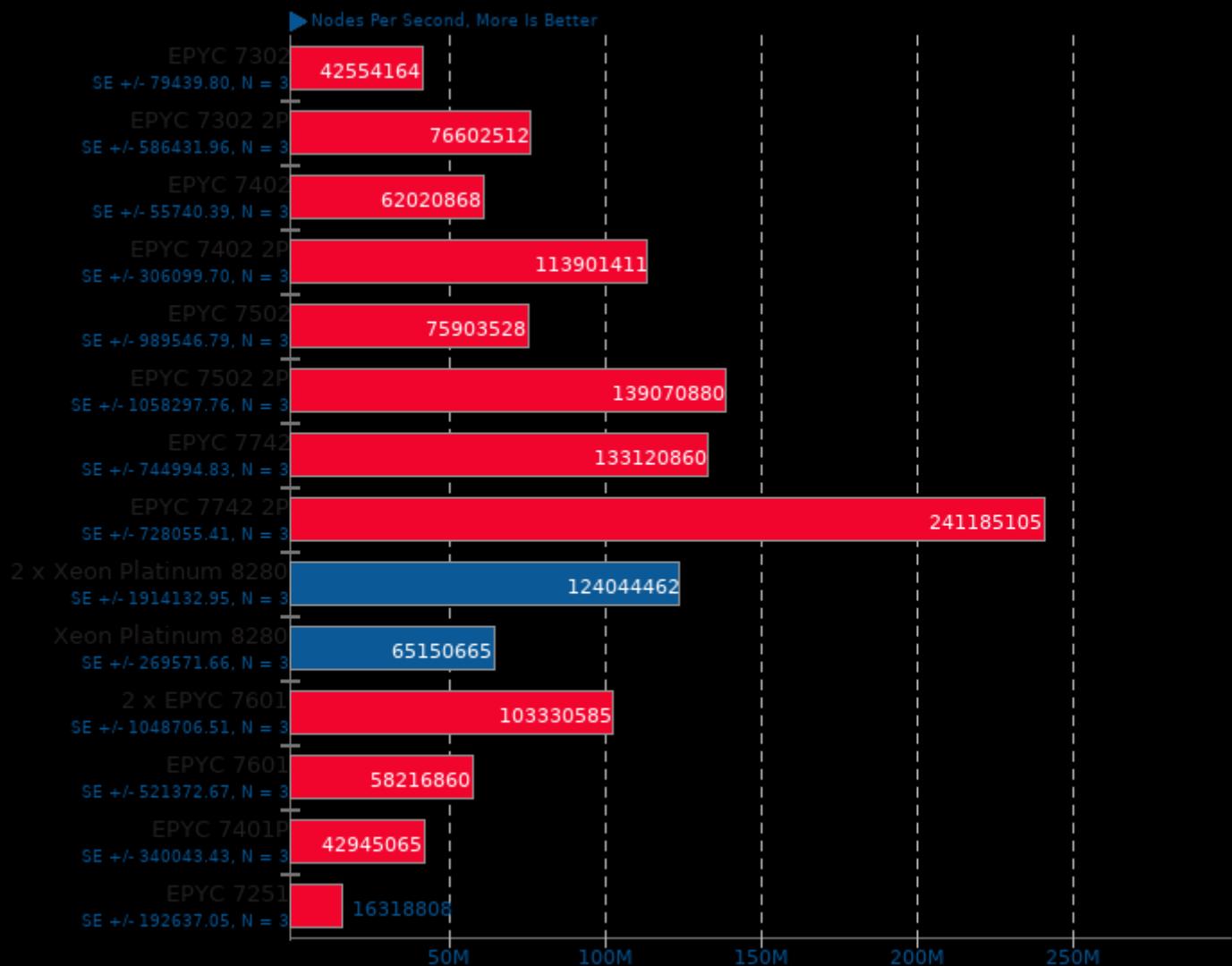
CoreMark Size 666 - Iterations Per Second



1. (CC) gcc options: -O2 -fomit-frame-pointer

Stockfish 9

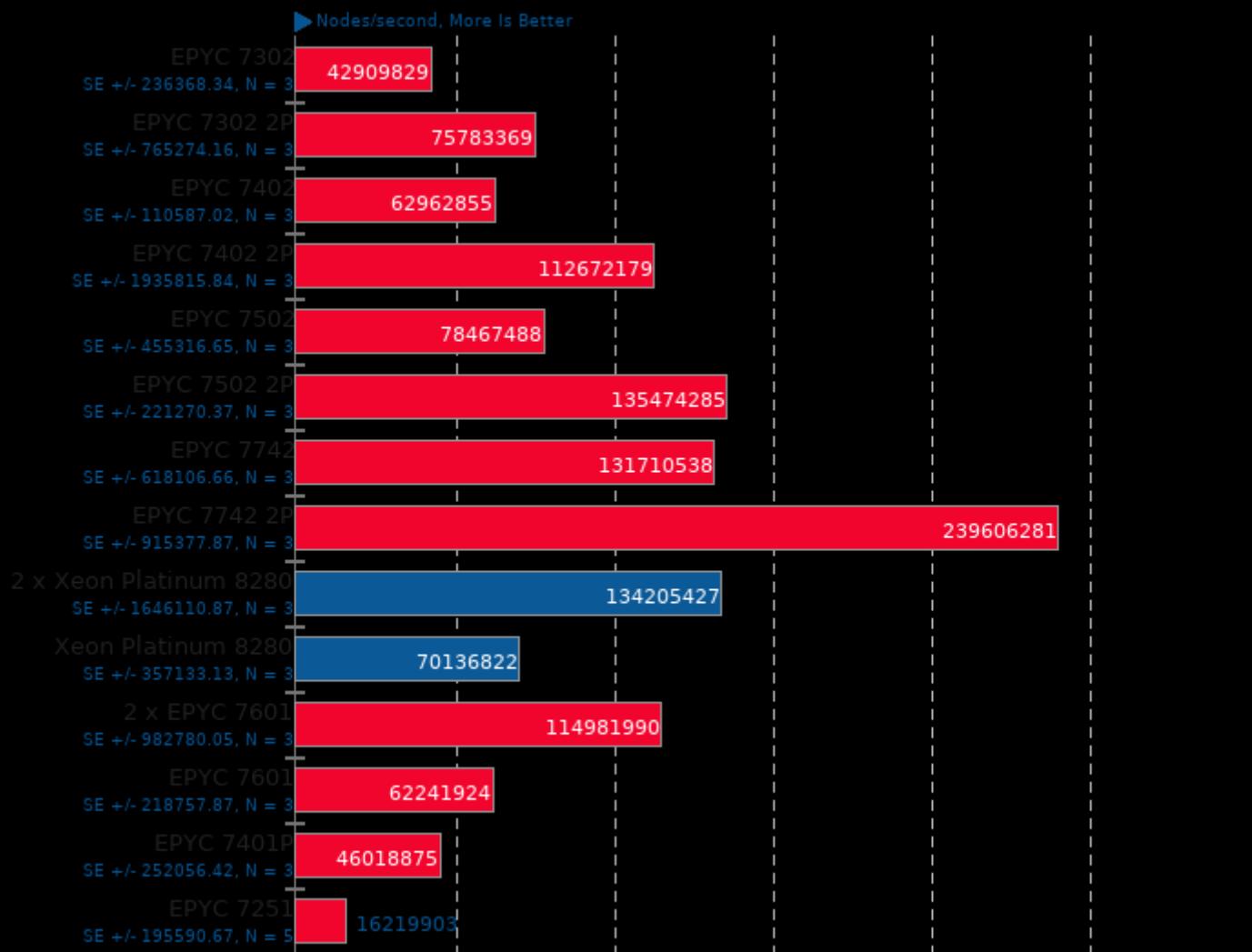
Total Time



1. (CXX) g++ options: -m64 -fthread -fno-exceptions -std=c++11 -pedantic -O3 -msse -msse3 -mpopcnt -fno-

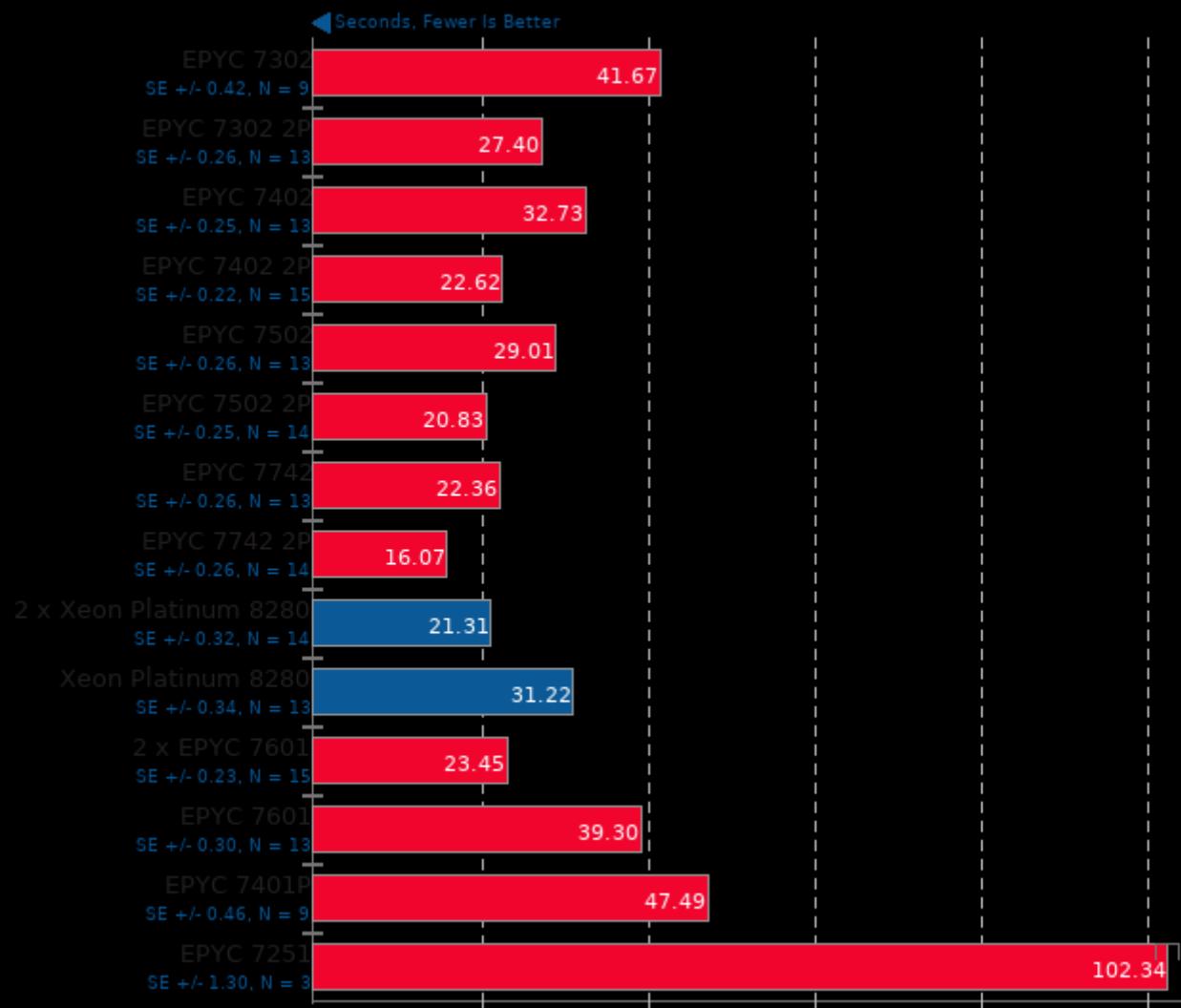
asmFish 2018-07-23

1024 Hash Memory, 26 Depth



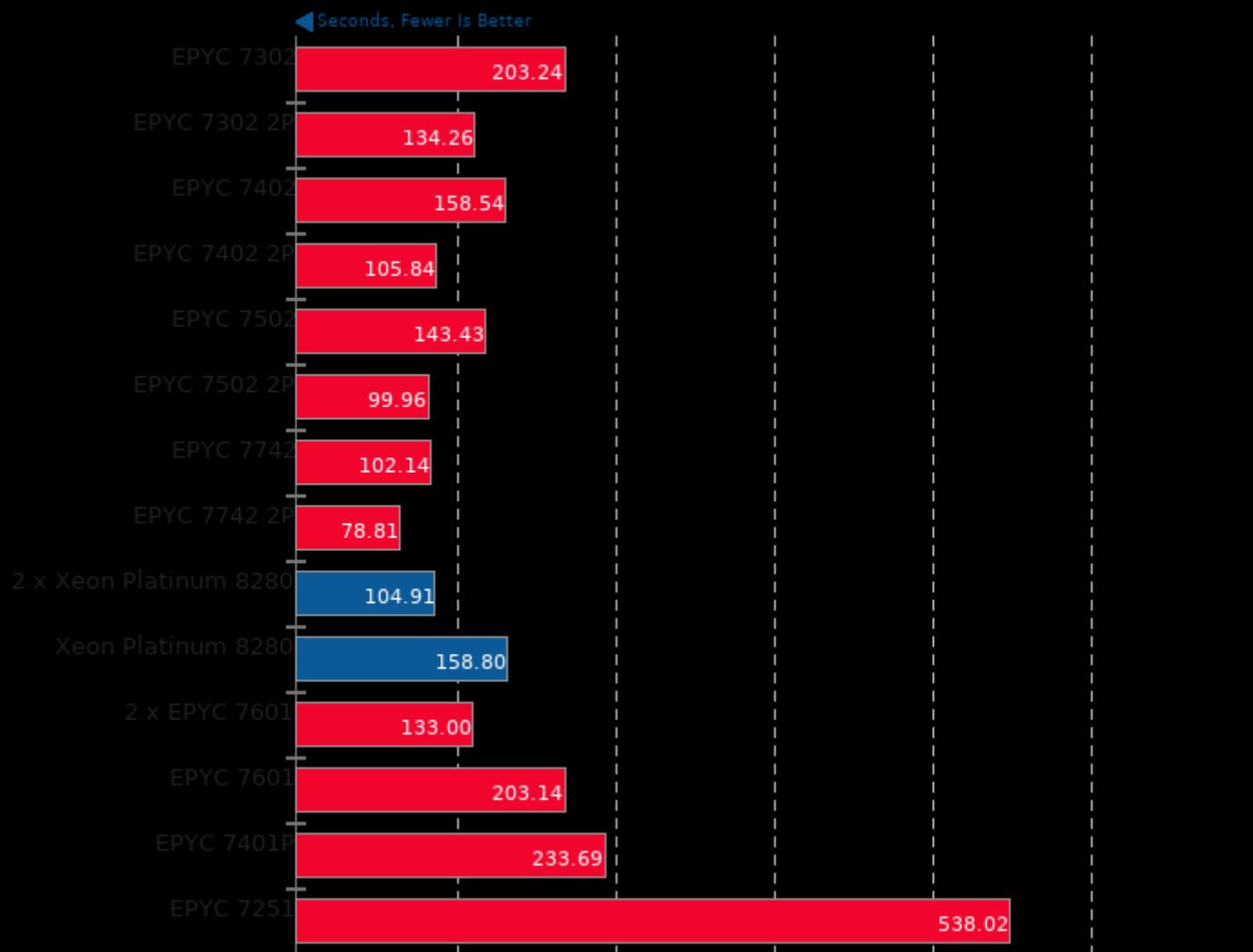
Timed Linux Kernel Compilation 4.18

Time To Compile



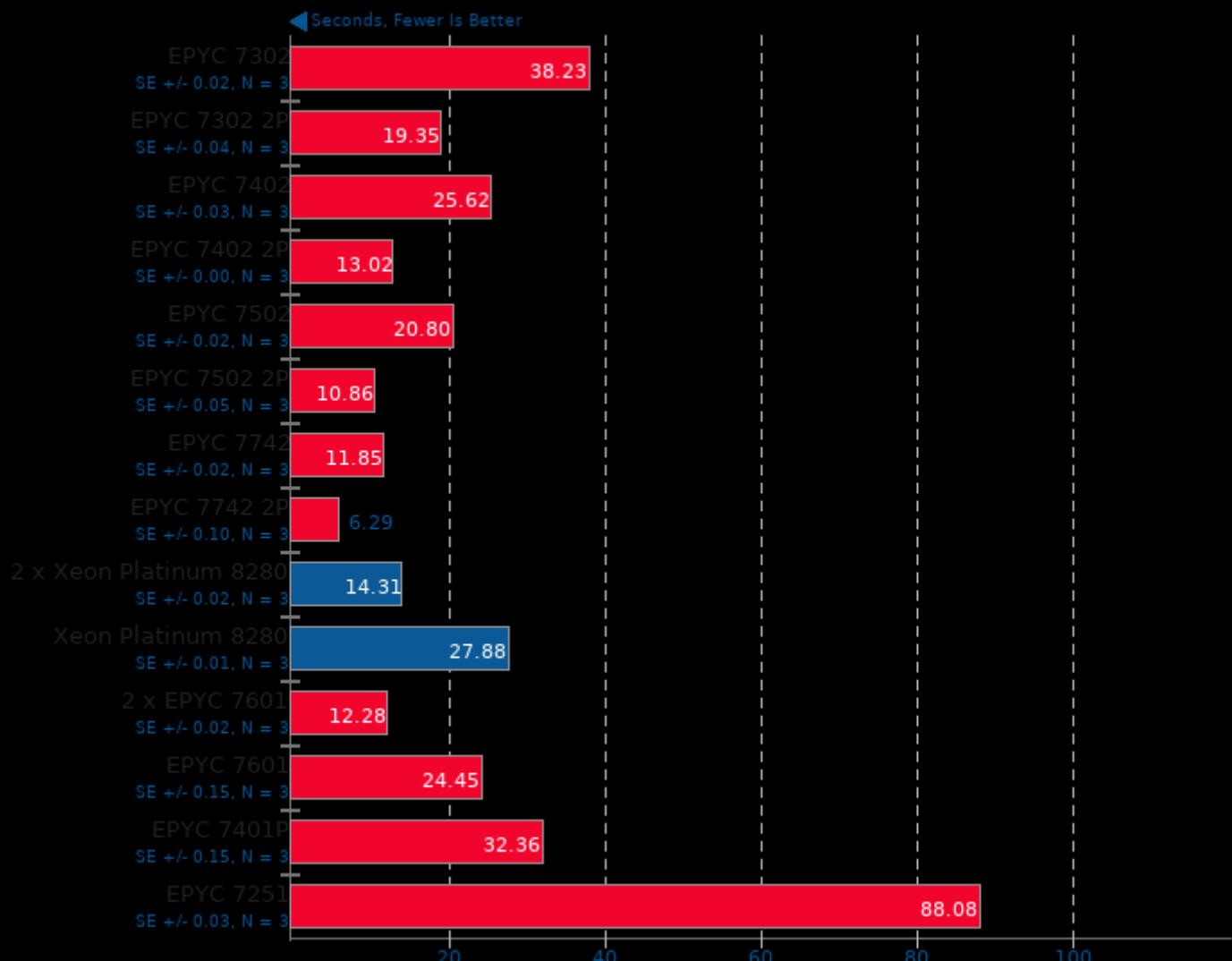
Timed LLVM Compilation 6.0.1

Time To Compile



C-Ray 1.1

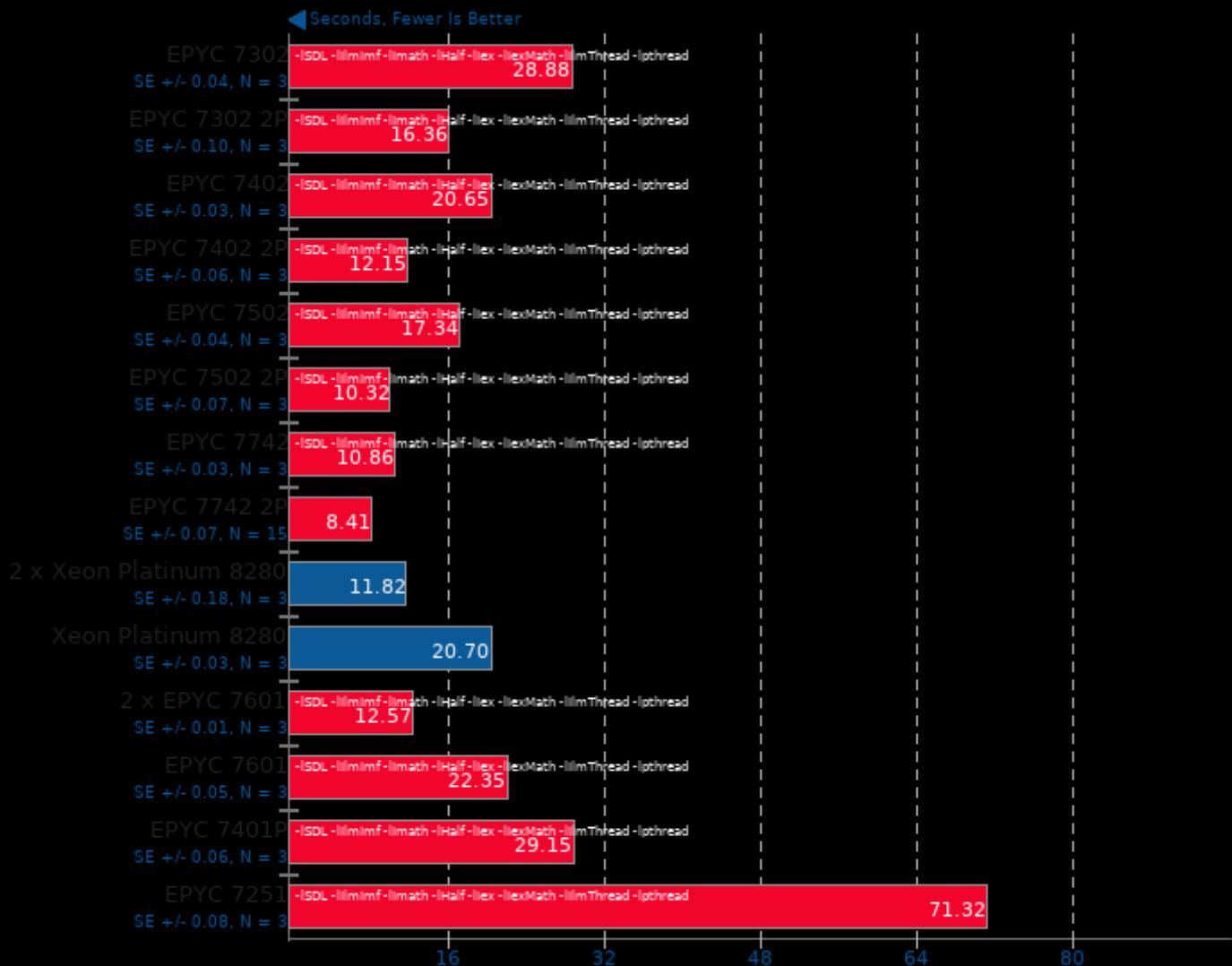
Total Time - 4K, 16 Rays Per Pixel



1. (CC) gcc options: -fno-omit-frame-pointer -O3

POV-Ray 3.7.0.7

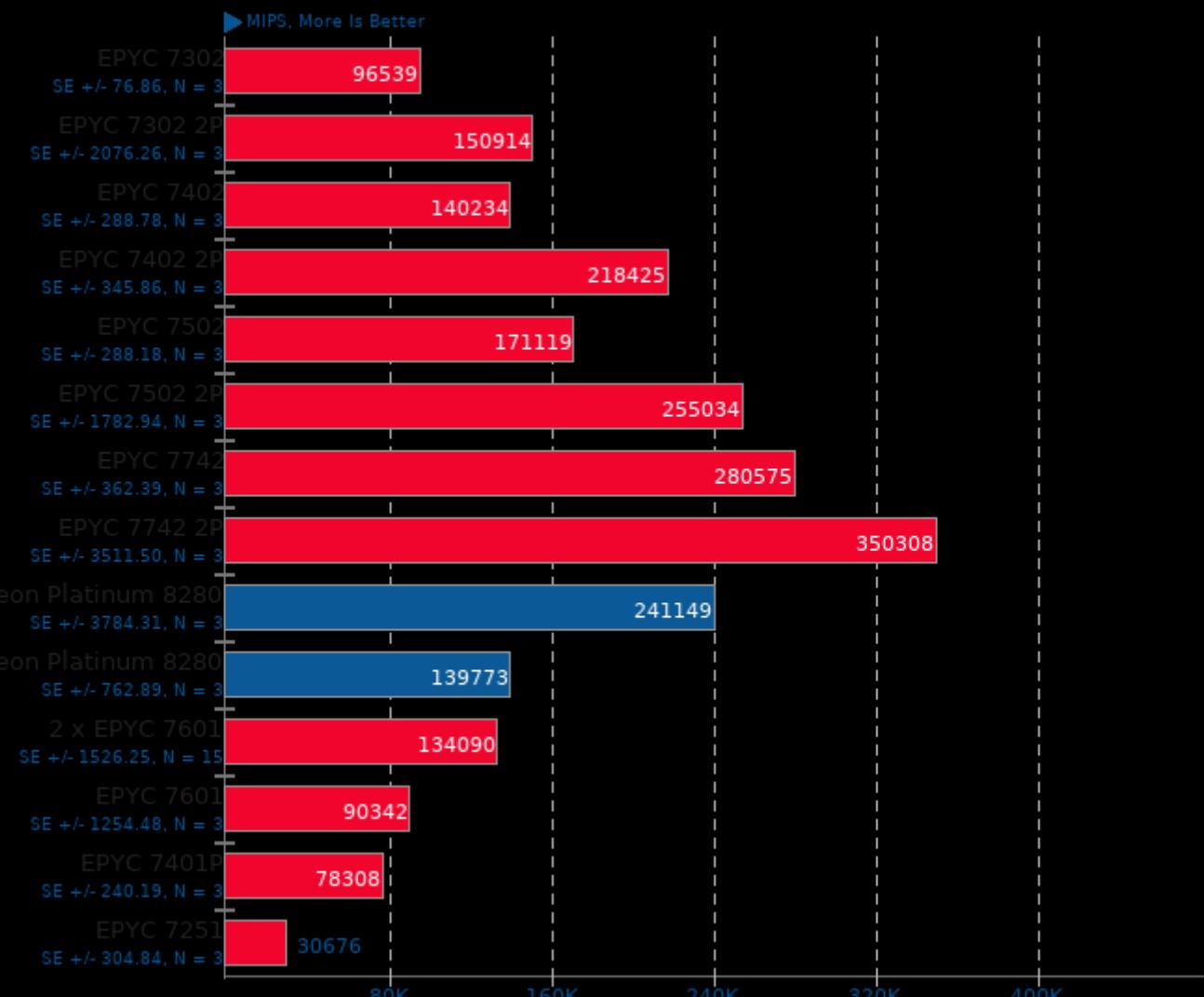
Trace Time



1. (CXX) g++ options: -pipe -O3 -ffast-math -march=native -pthread -fXpm -fSM -fICE -fX11 -ftiff -fjpeg -fpng -fz -frt -fim -fboost_thread -fboost_system

7-Zip Compression 16.02

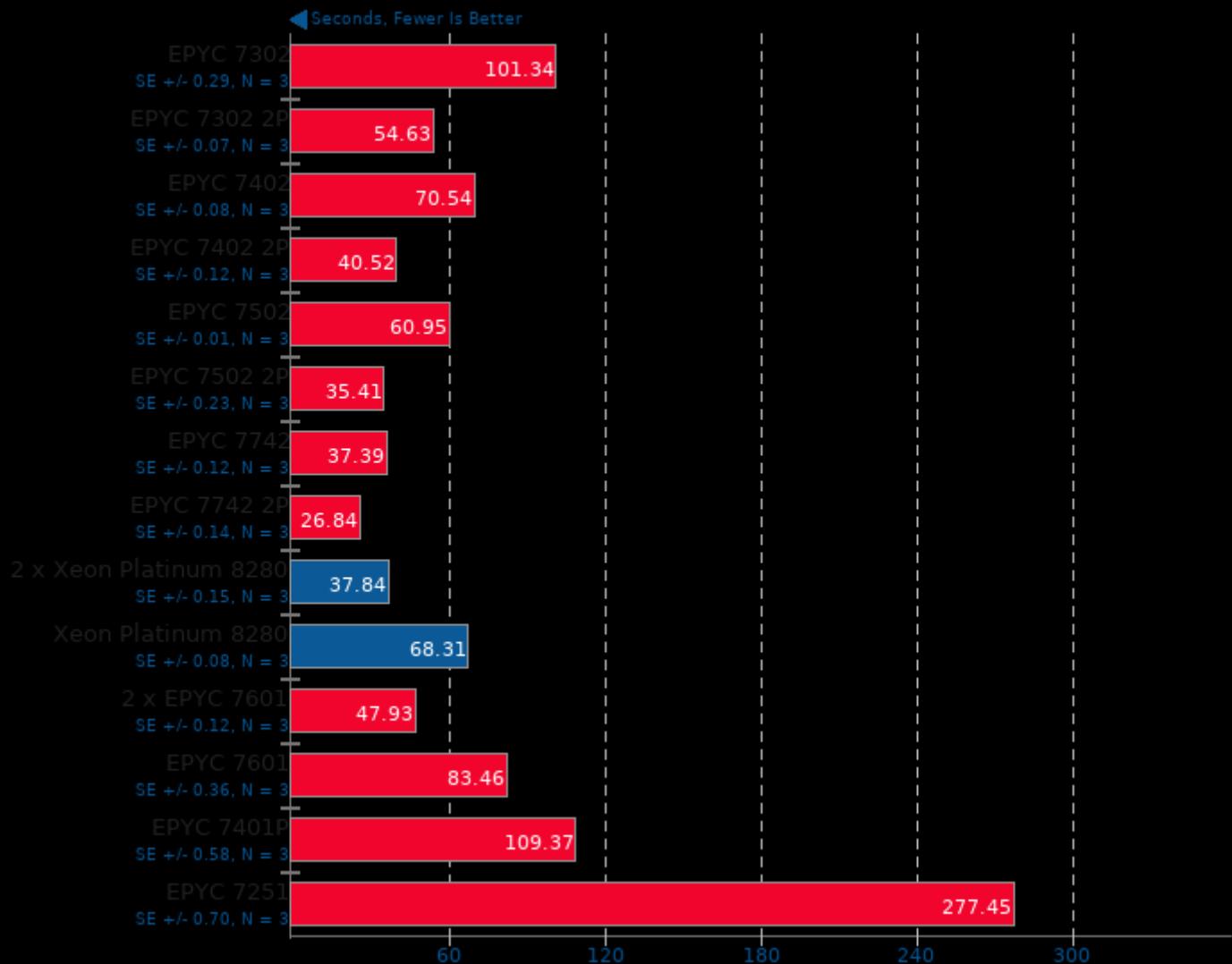
Compress Speed Test



1. (CXX) g++ options: -pipe -lpthread

Blender 2.80

Blend File: BMW27 - Compute: CPU-Only



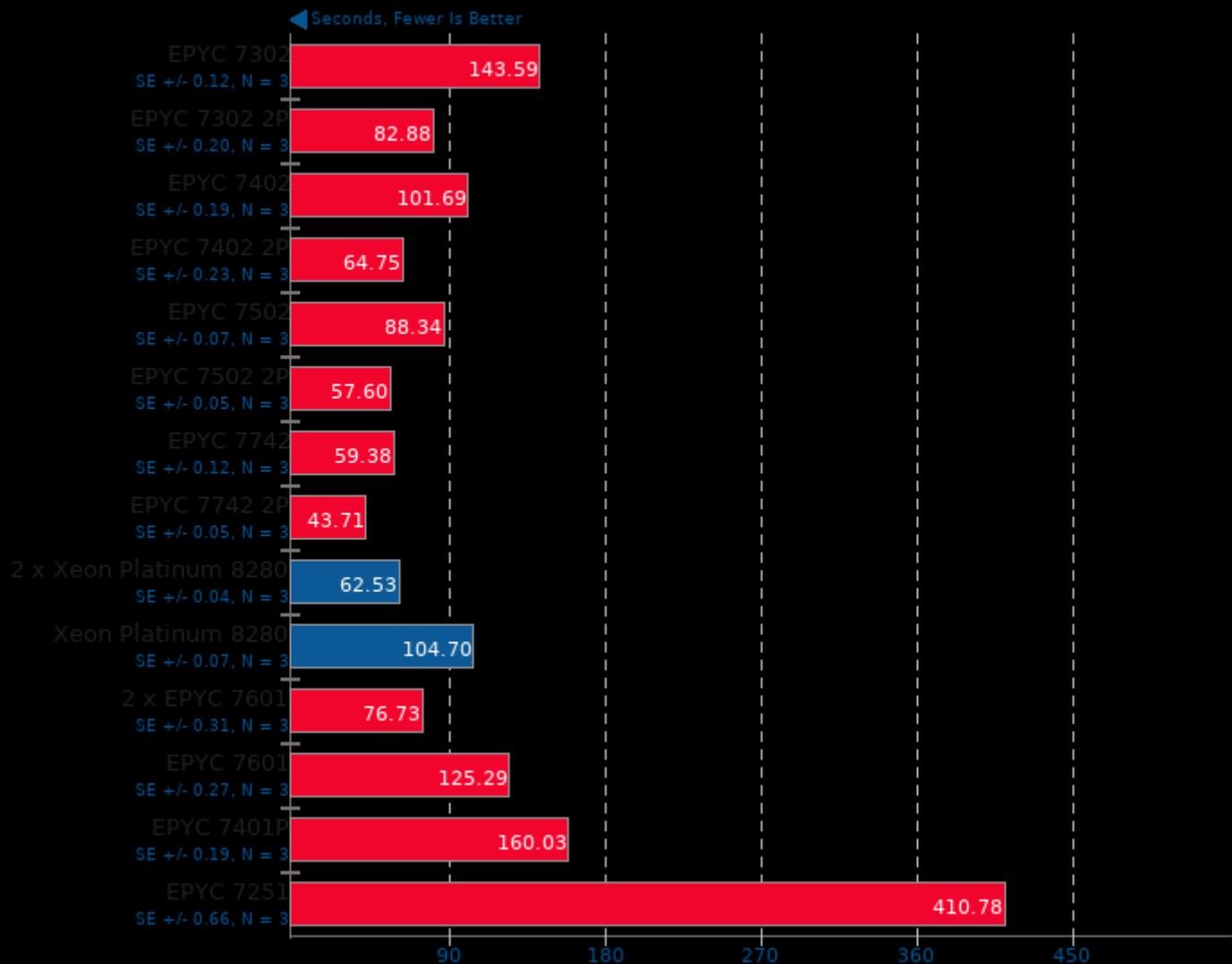
Blender 2.80

Blend File: Classroom - Compute: CPU-Only



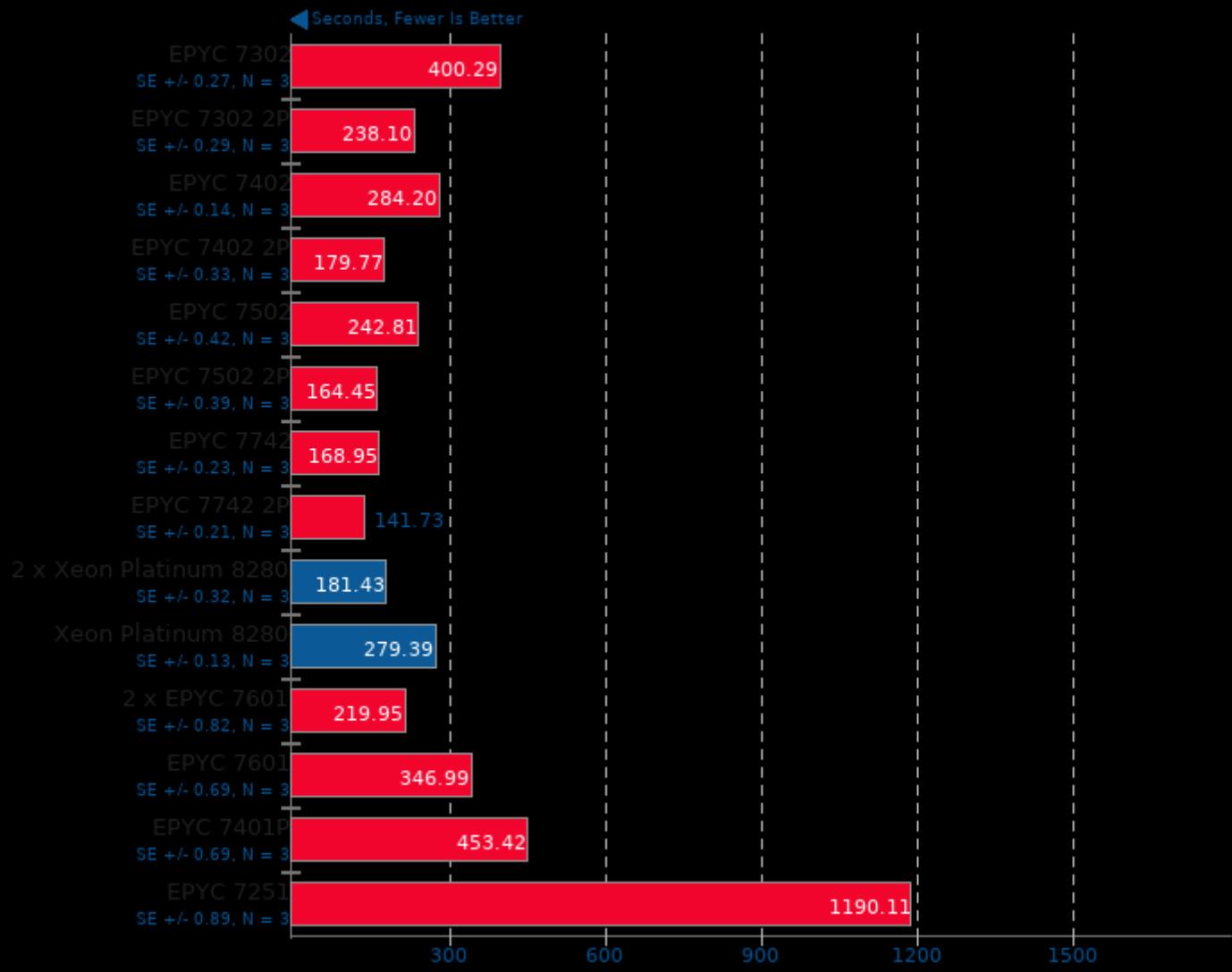
Blender 2.80

Blend File: Fishy Cat - Compute: CPU-Only



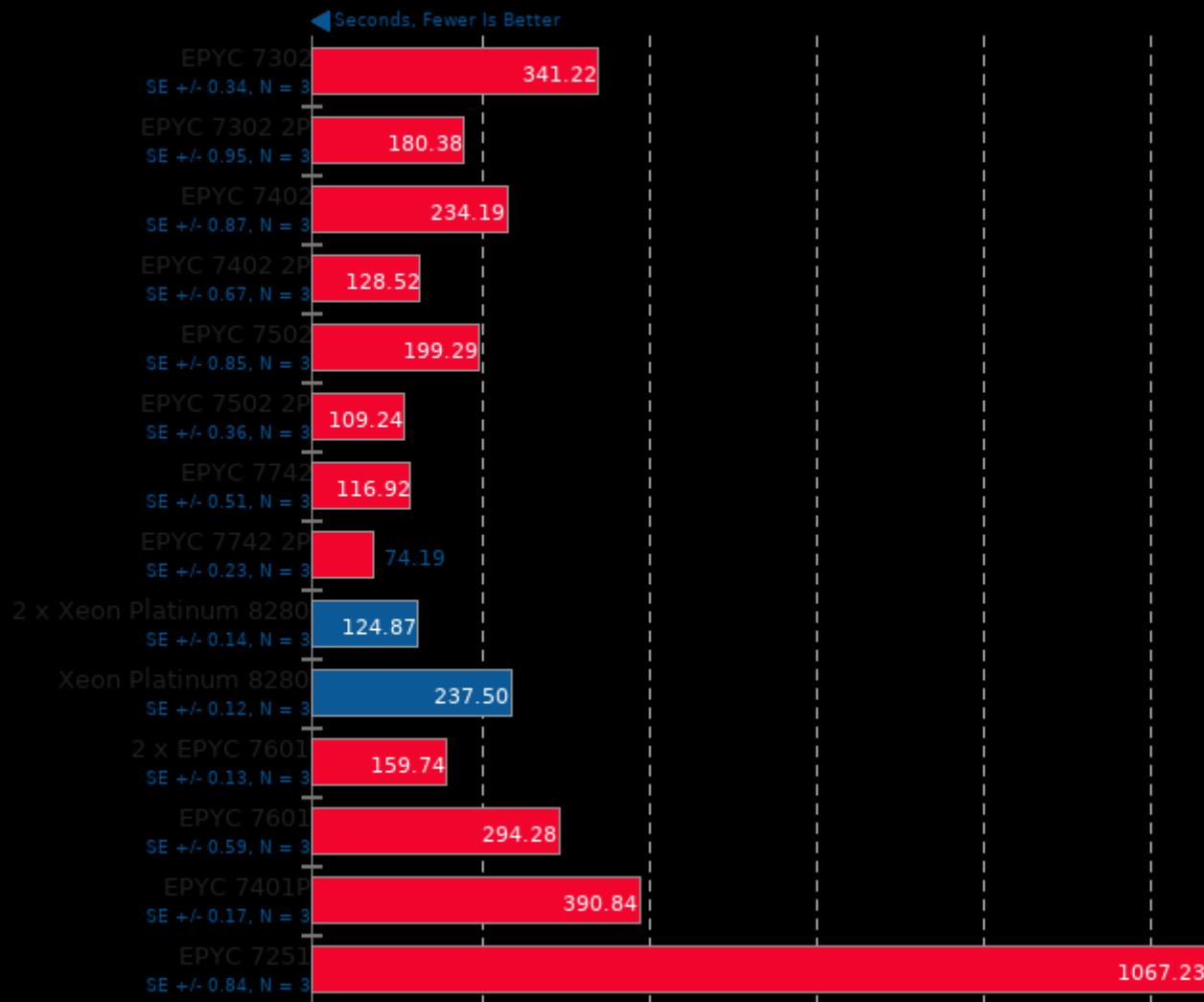
Blender 2.80

Blend File: Barbershop - Compute: CPU-Only



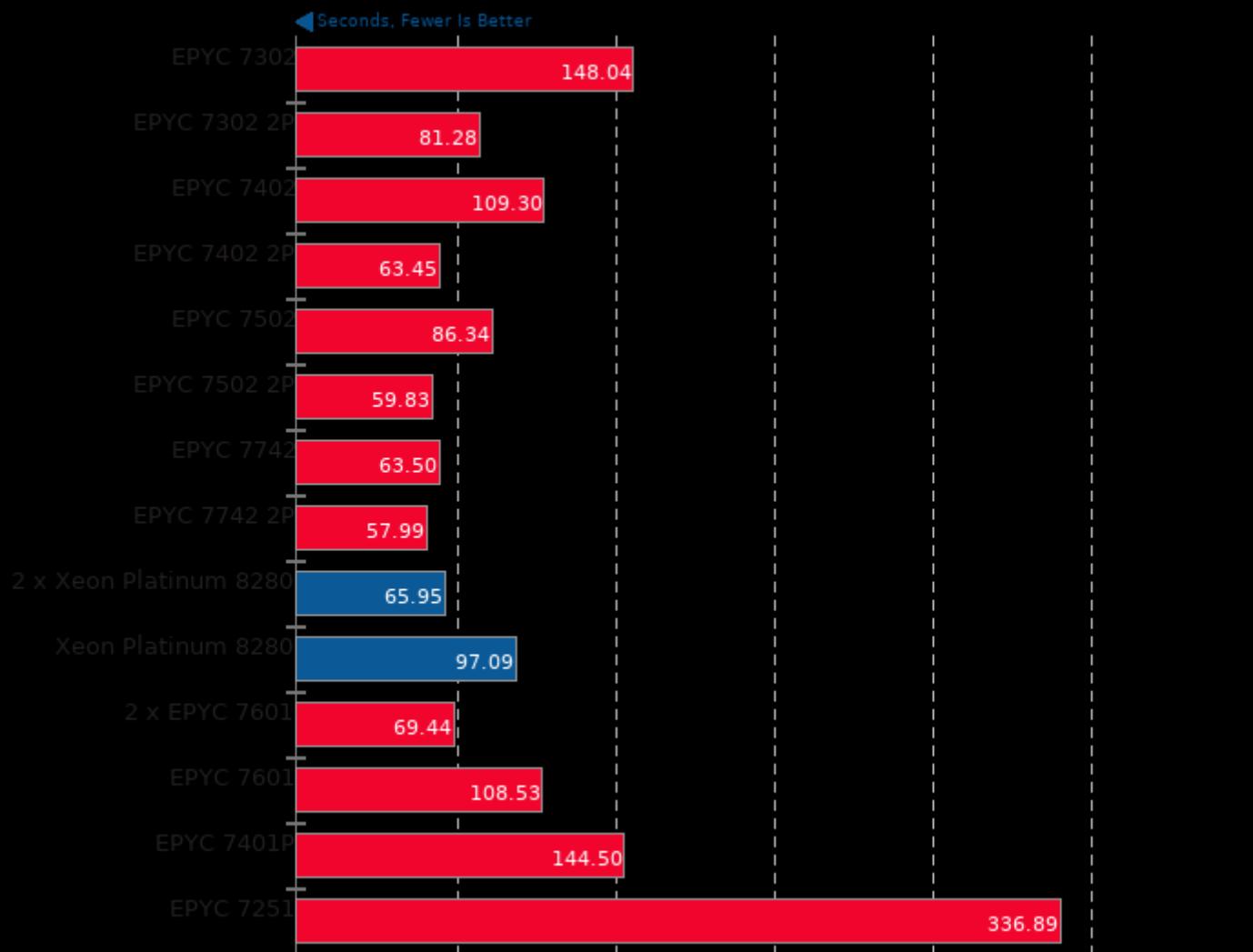
Blender 2.80

Blend File: Pabellon Barcelona - Compute: CPU-Only



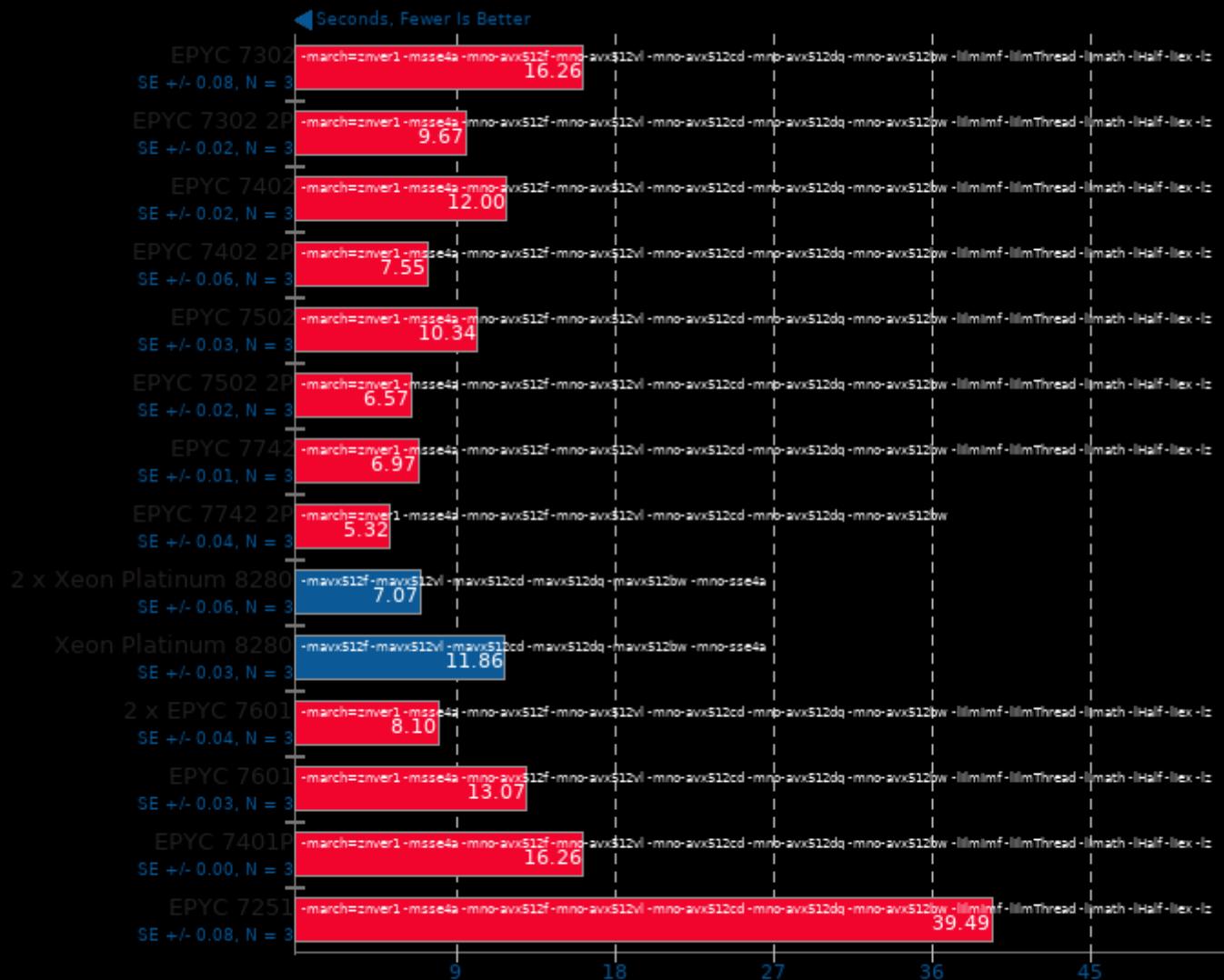
Appleseed 2.0 Beta

Scene: Disney Material



Tungsten Renderer 0.2.2

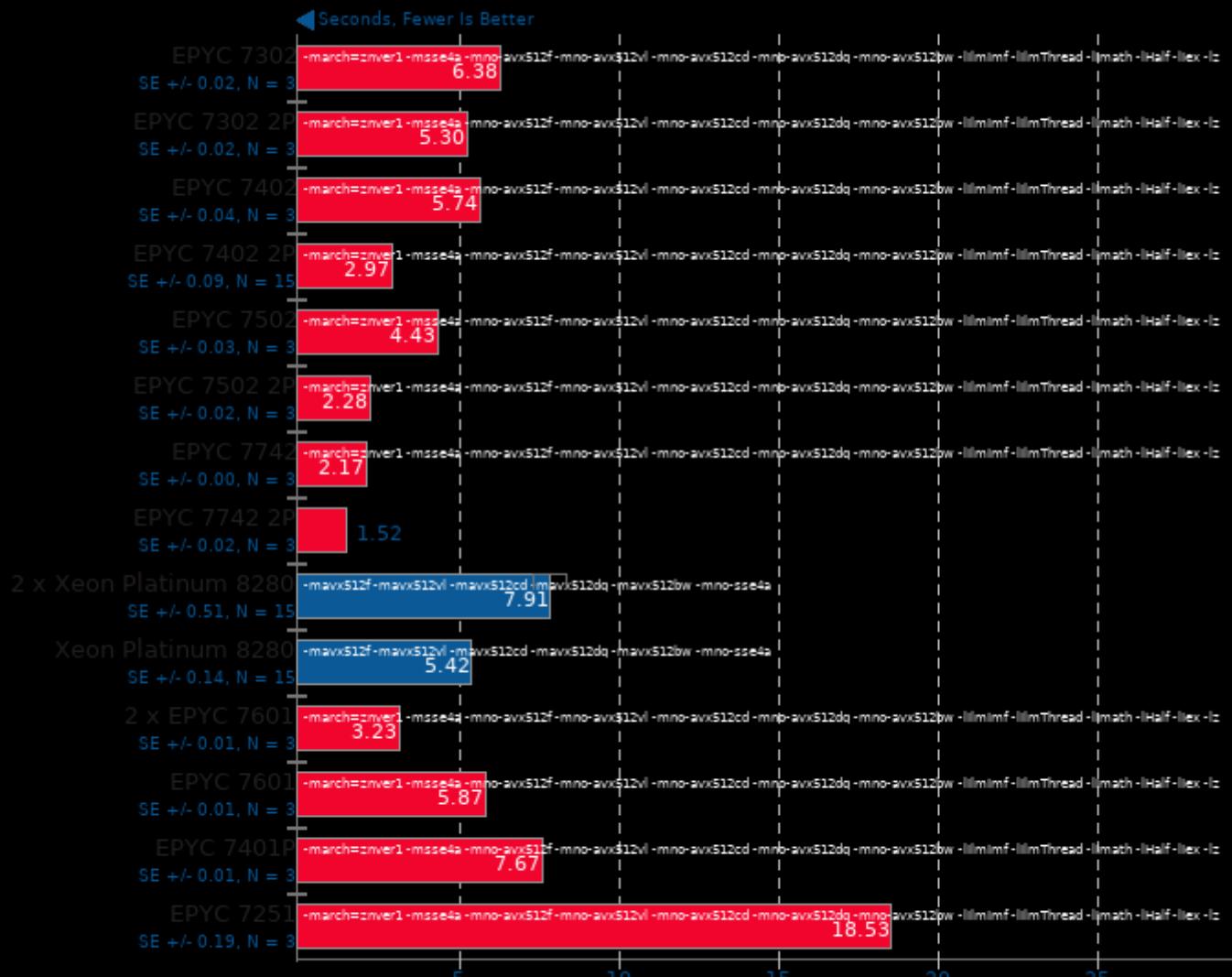
Scene: Hair



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

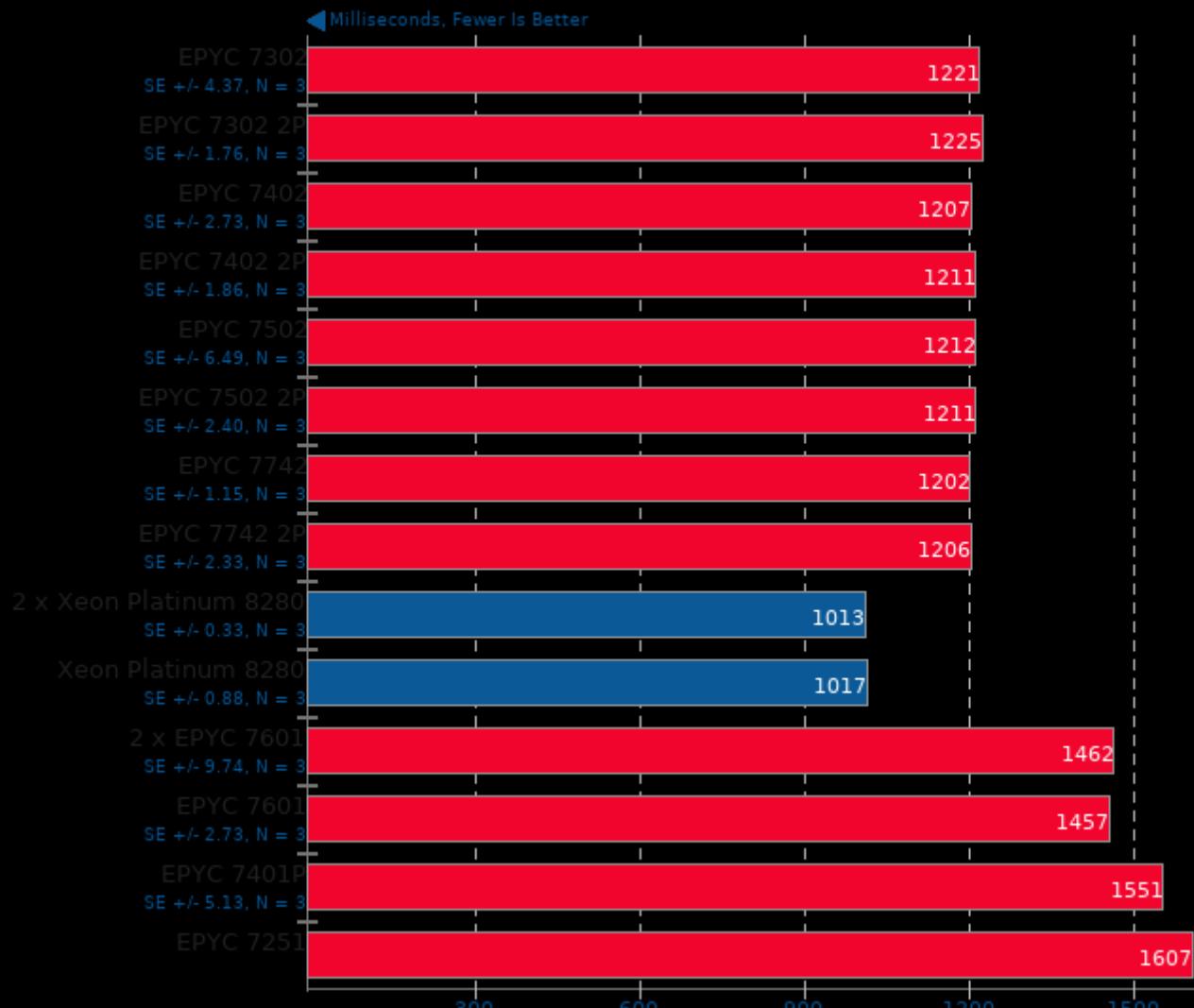
Scene: Non-Exponential



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 -

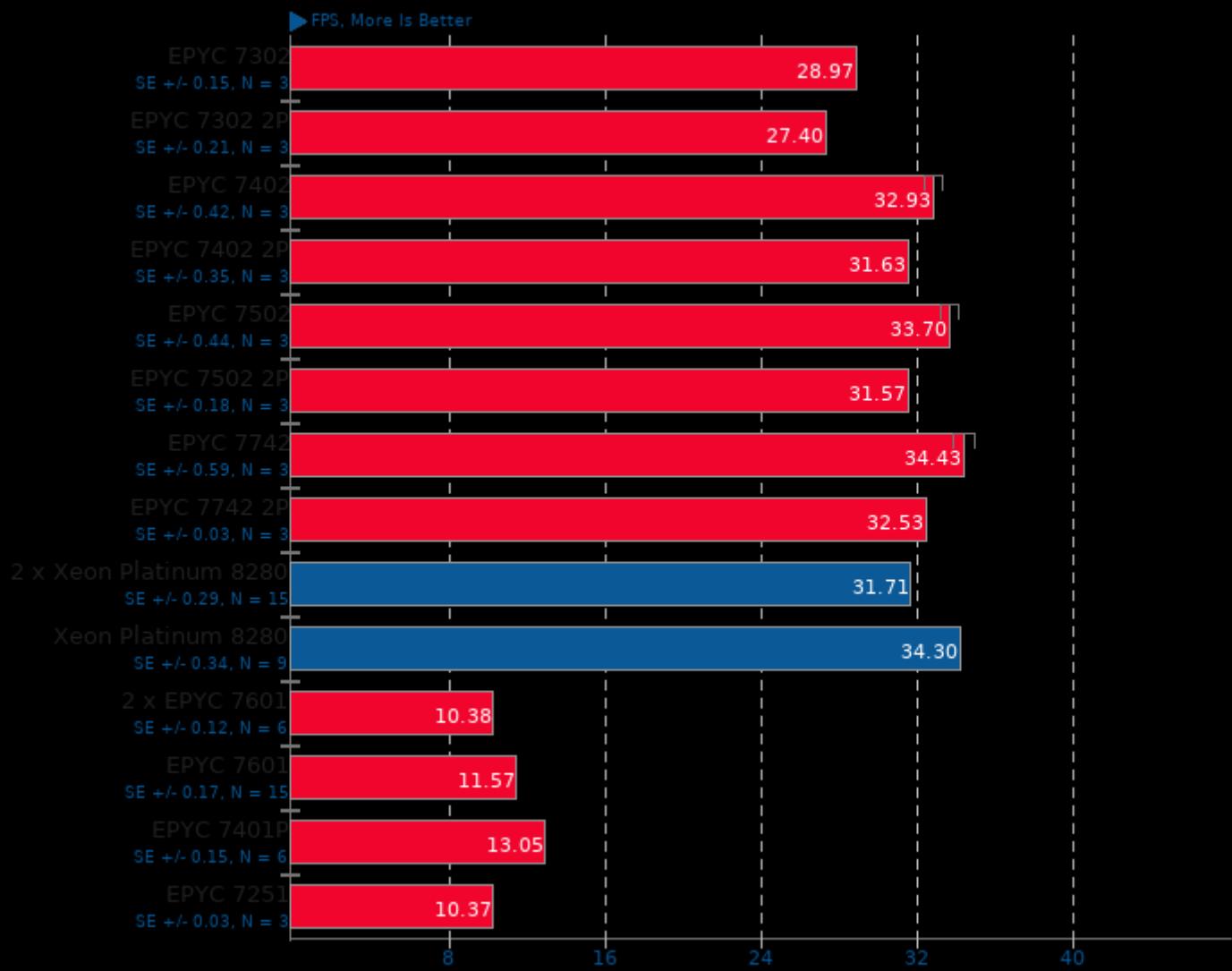
PyBench 2018-02-16

Total For Average Test Times



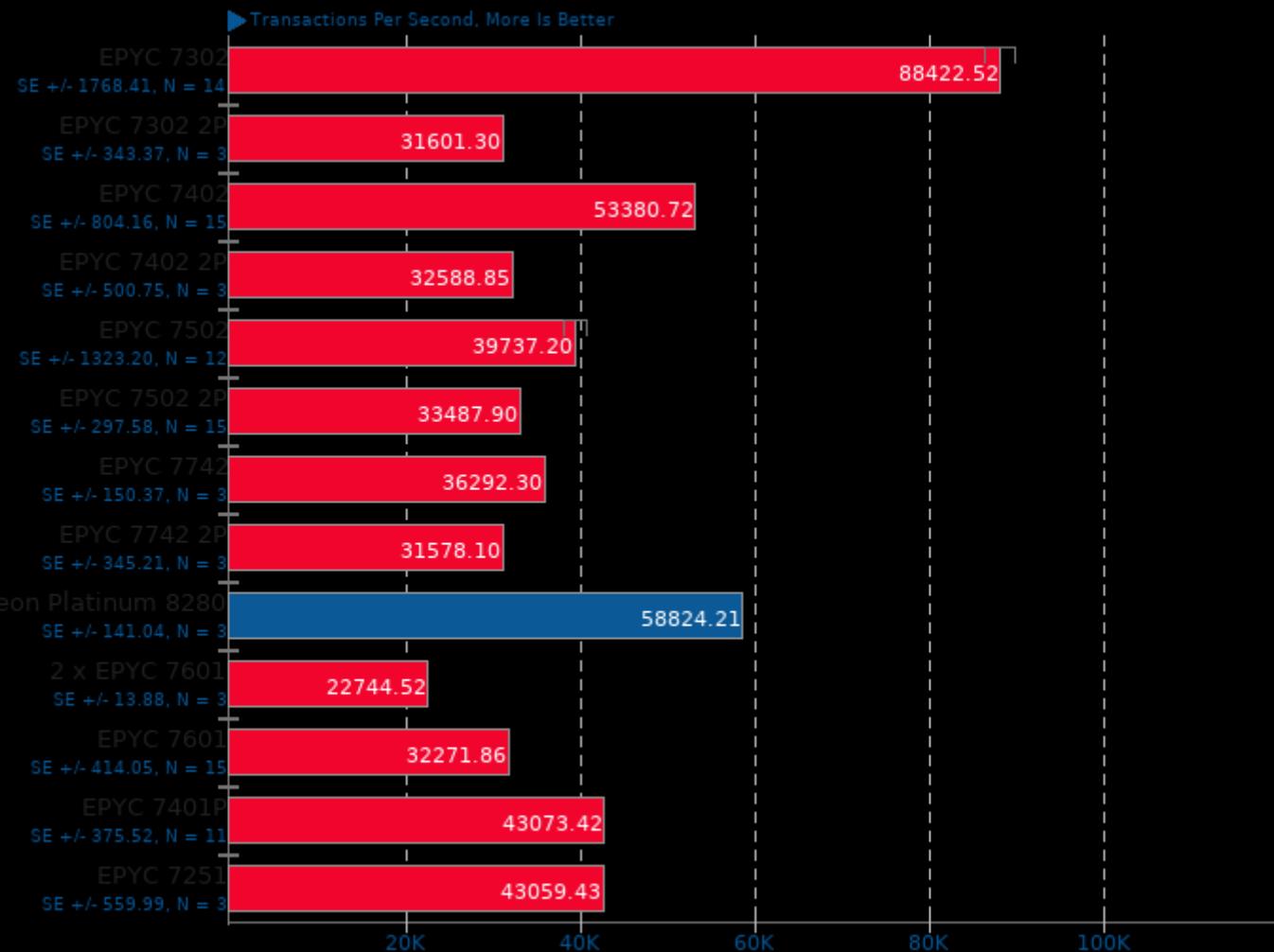
NeatBench 5

Acceleration: CPU



Apache Siege 2.4.29

Concurrent Users: 200



1. (CC) gcc options: -O2 -lpthread -ldl -lssl -lcrypto

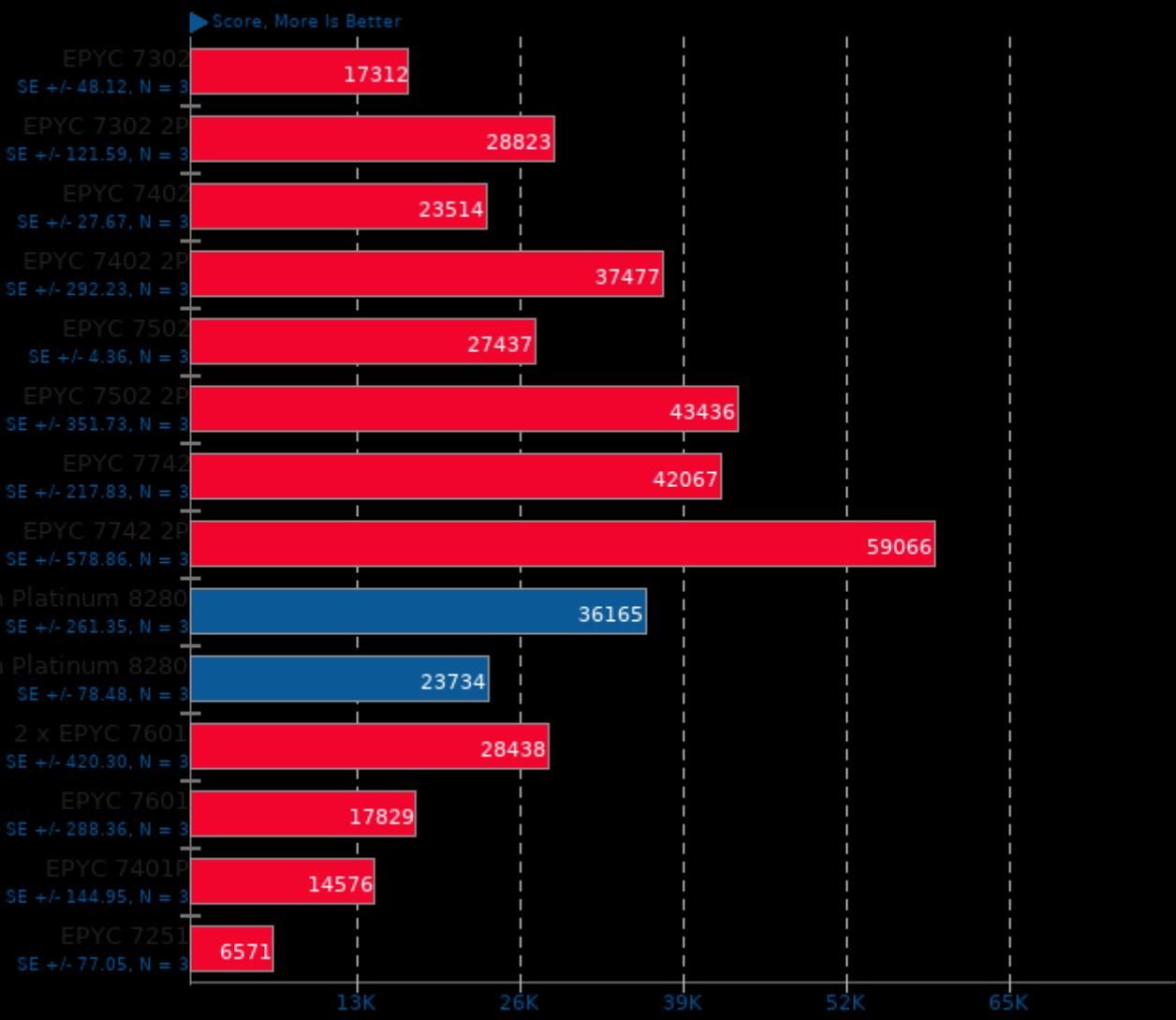
PHPBench 0.8.1

PHP Benchmark Suite



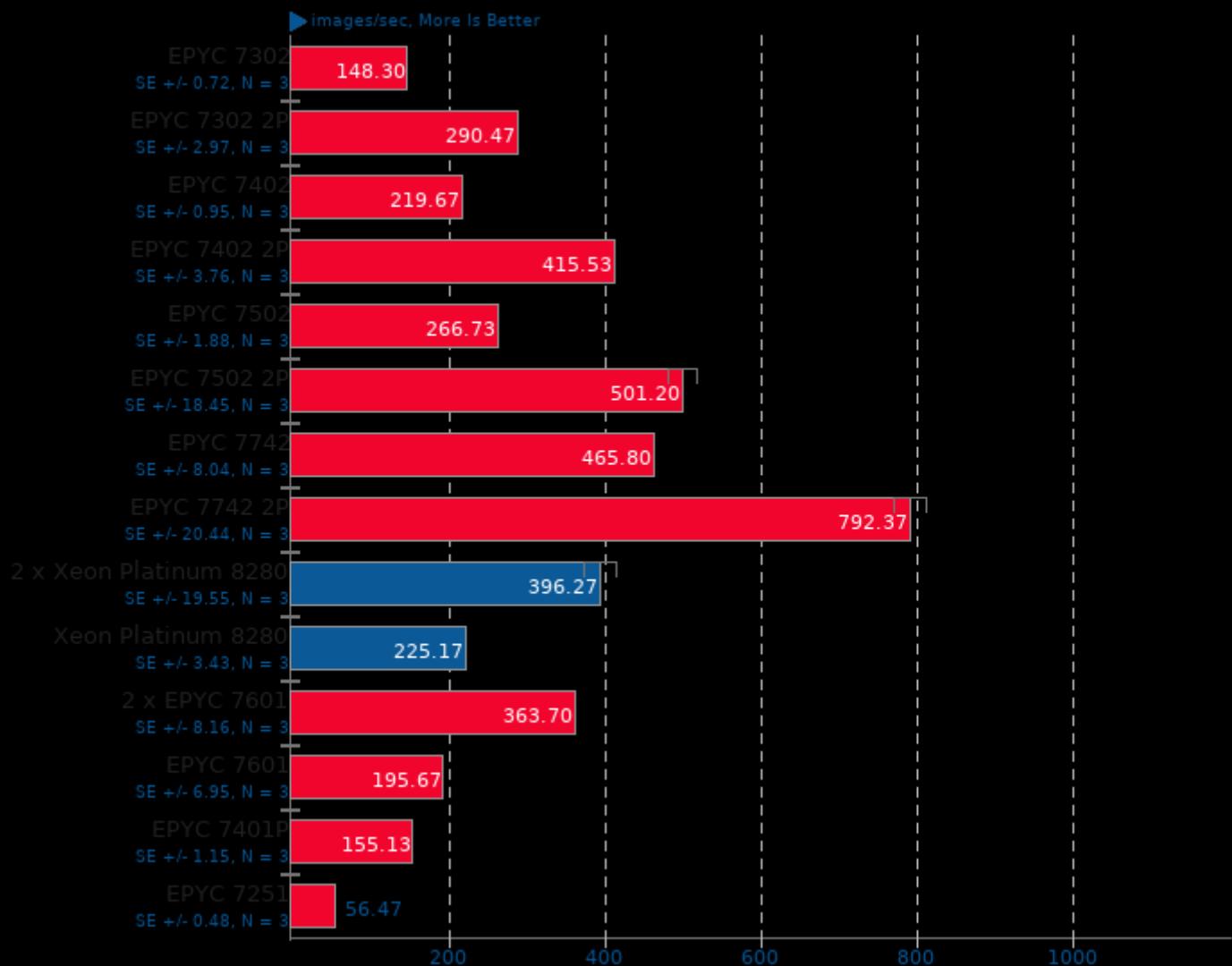
Geekbench 5.0

Test: CPU Multi Core



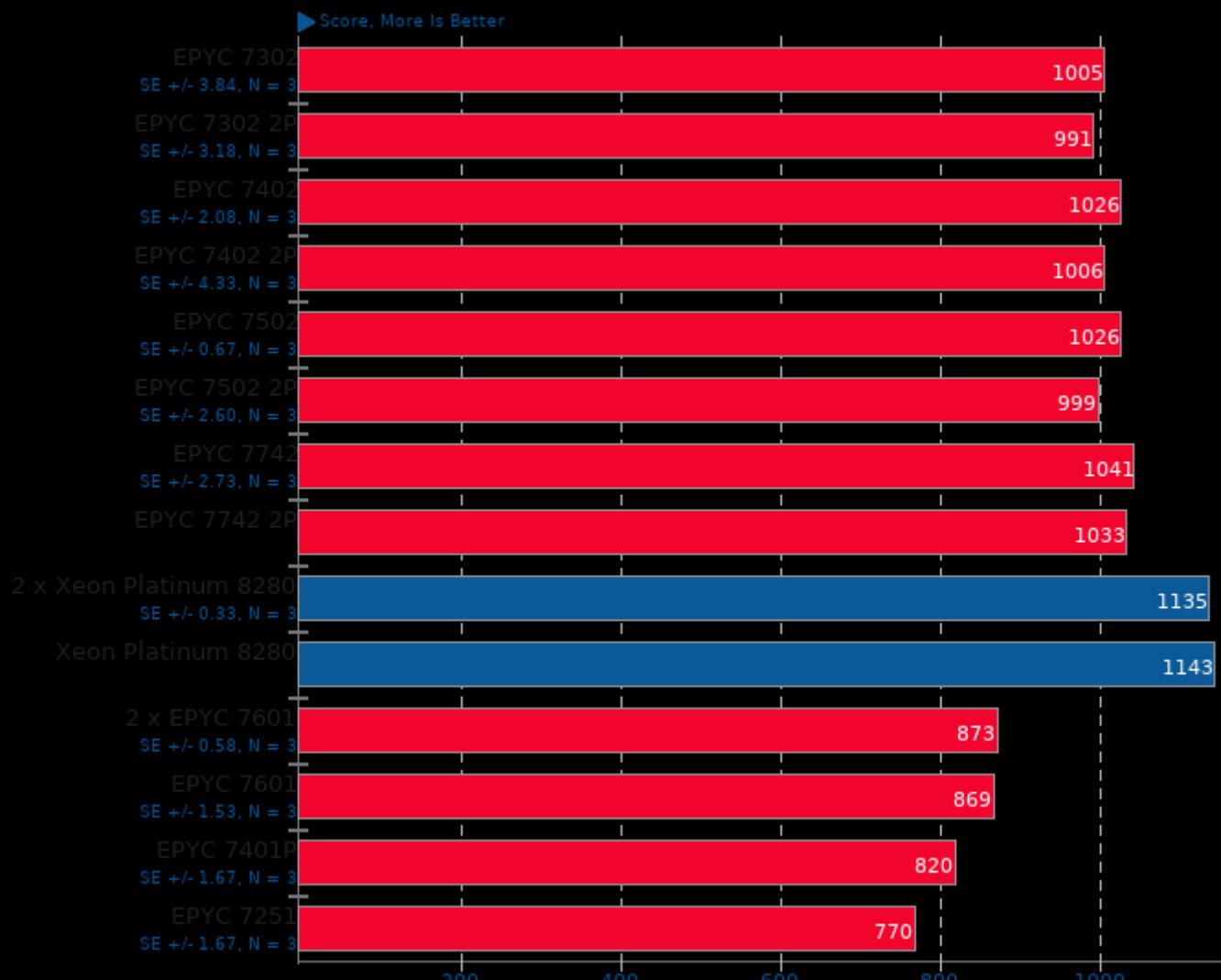
Geekbench 5.0

Test: CPU Multi Core - Face Detection



Geekbench 5.0

Test: CPU Single Core



Geekbench 5.0

Test: CPU Single Core - Gaussian Blur



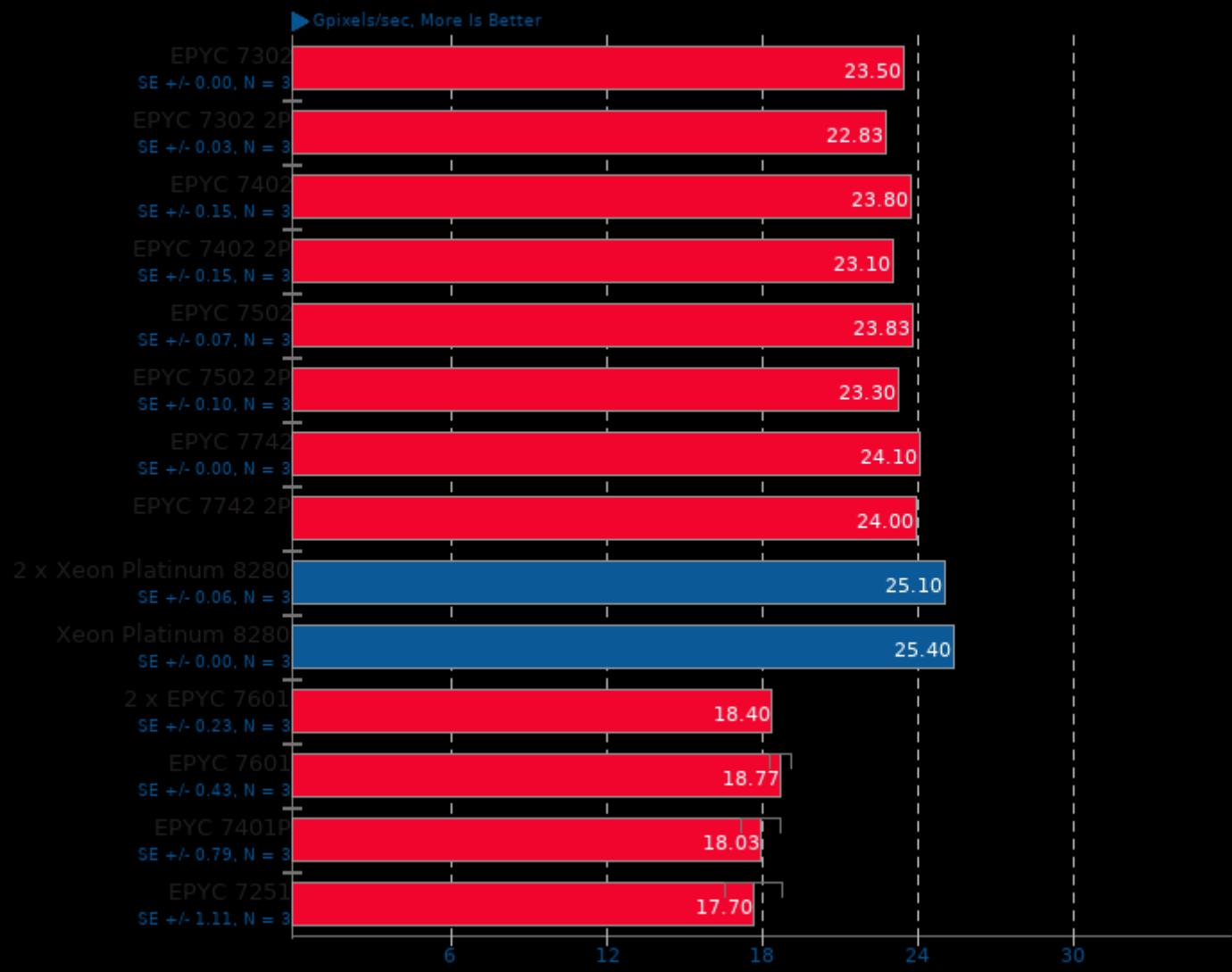
Geekbench 5.0

Test: CPU Single Core - Face Detection

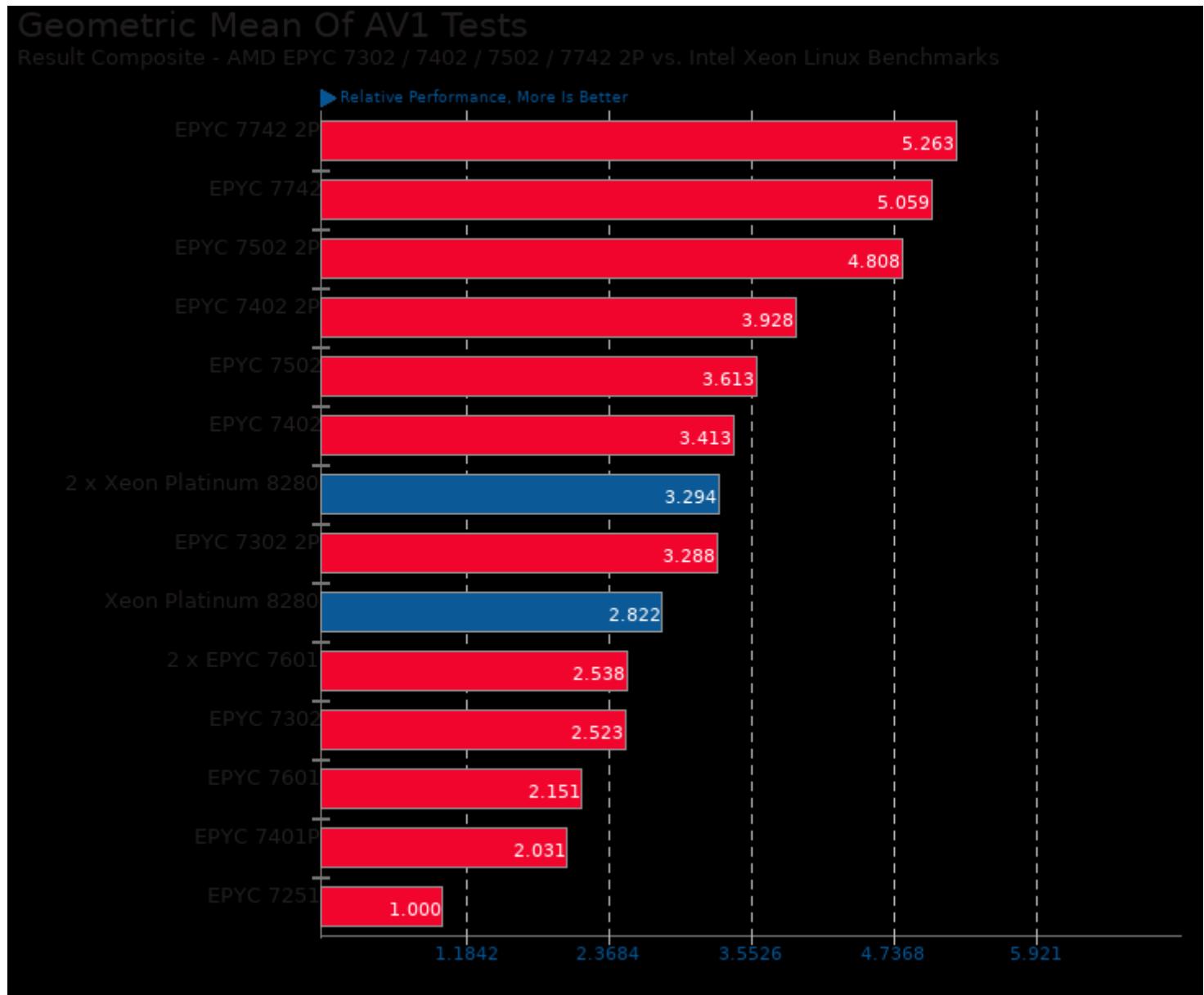


Geekbench 5.0

Test: CPU Single Core - Horizon Detection



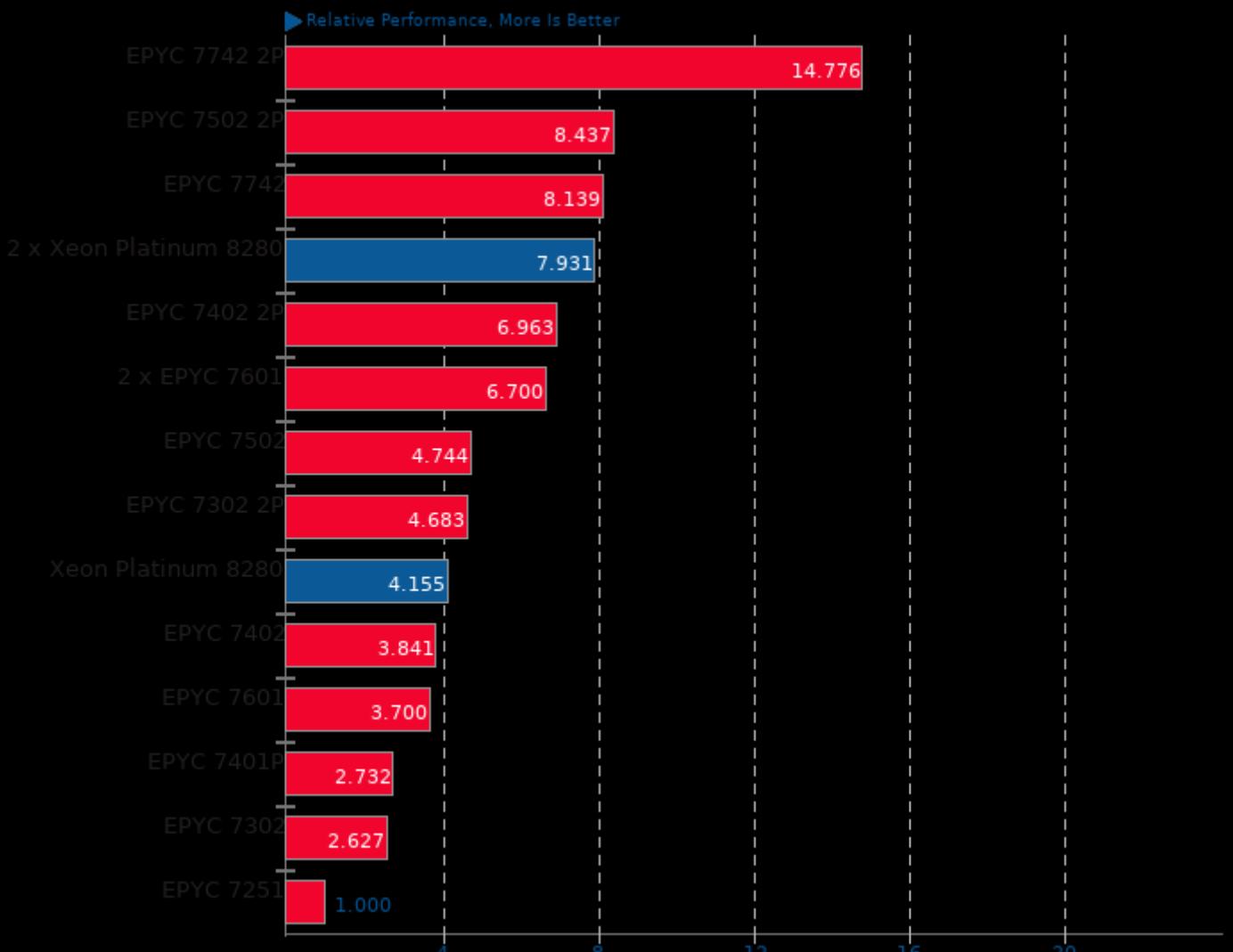
These geometric means are based upon test groupings / test suites for this result file.



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

Geometric Mean Of Chess Test Suite

Result Composite - AMD EPYC 7302 / 7402 / 7502 / 7742 2P vs. Intel Xeon Linux Benchmarks



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

Geometric Mean Of Timed Code Compilation Tests

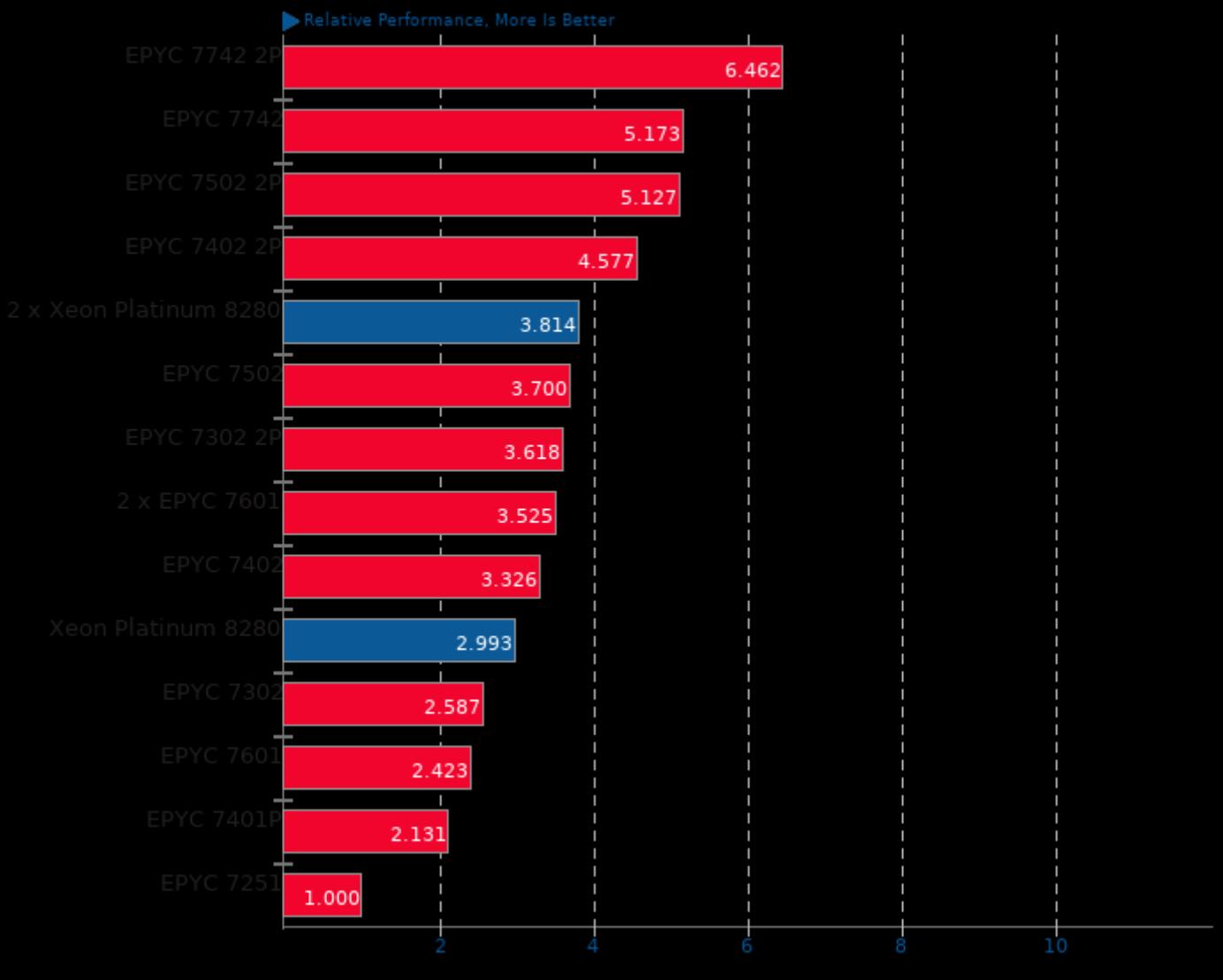
Result Composite - AMD EPYC 7302 / 7402 / 7502 / 7742 2P vs. Intel Xeon Linux Benchmarks



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

Geometric Mean Of C/C++ Compiler Tests

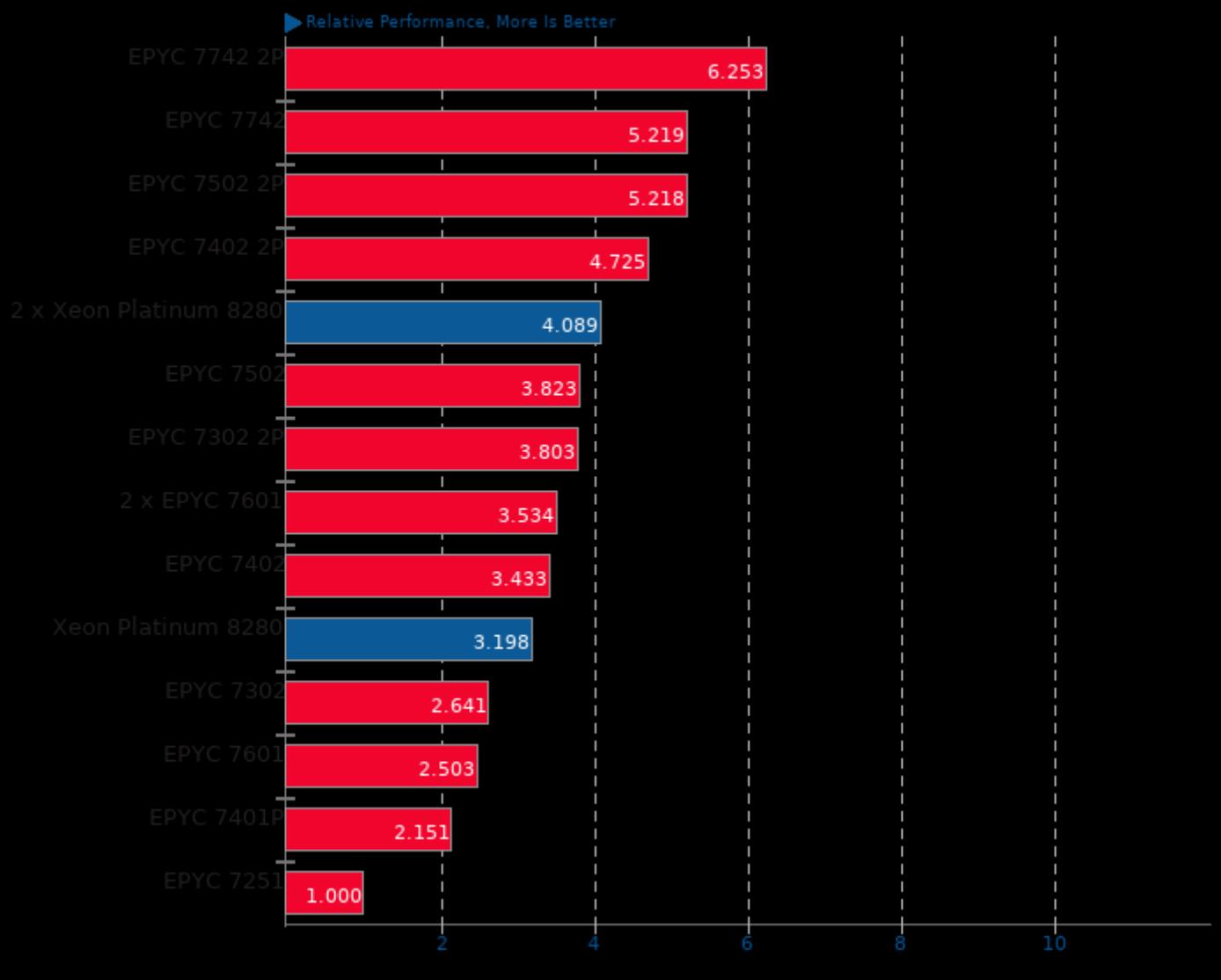
Result Composite - AMD EPYC 7302 / 7402 / 7502 / 7742 2P vs. Intel Xeon Linux Benchmarks



Geometric mean based upon tests: pts/stockfish, pts/build-llvm, pts/c-ray, pts/compress-7zip, pts/john-the-ripper, pts/dav1d, pts/x264, pts/x265, pts/tungsten, pts/svt-av1 and pts/svt-vp9

Geometric Mean Of Creator Workloads Tests

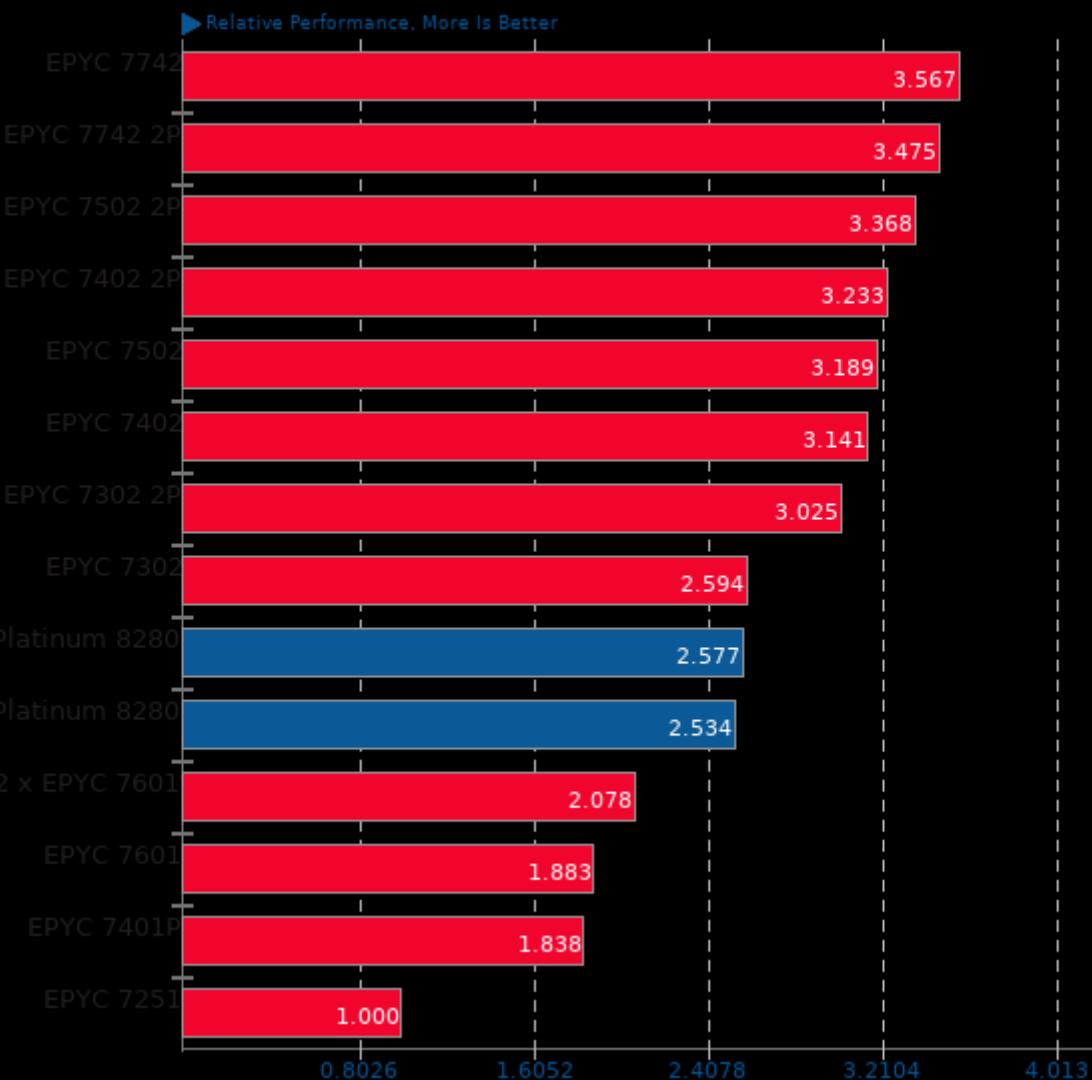
Result Composite - AMD EPYC 7302 / 7402 / 7502 / 7742 2P vs. Intel Xeon Linux Benchmarks



Geometric mean based upon tests: pts/c-ray, pts/povray, pts/blender, pts/tungsten, pts/appleseed, pts/svt-vp9, pts/svt-hevc, pts/x264, pts/x265, pts/dav1d, pts/svt-av1 and pts/neatbench

Geometric Mean Of Encoding Tests

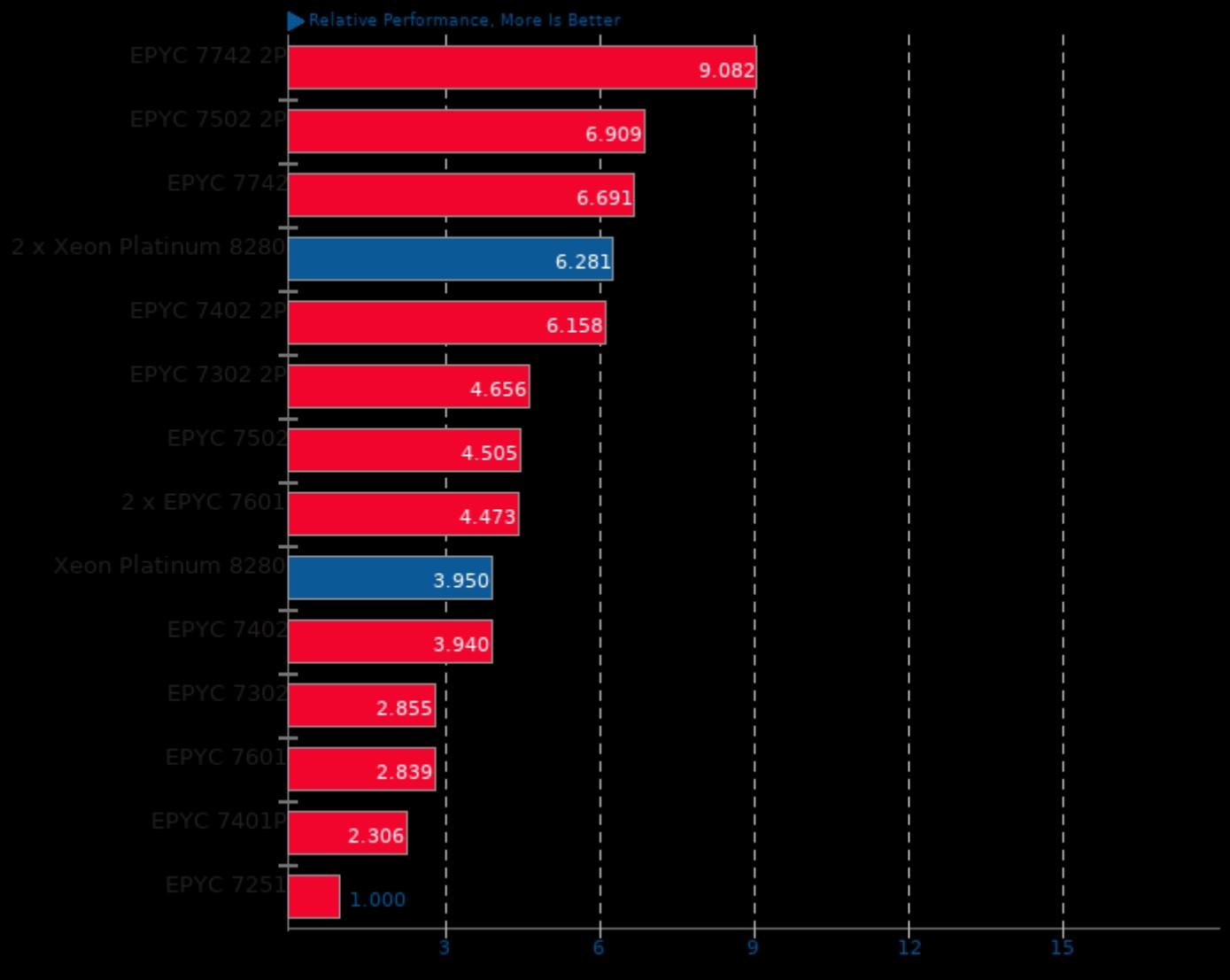
Result Composite - AMD EPYC 7302 / 7402 / 7502 / 7742 2P vs. Intel Xeon Linux Benchmarks



Geometric mean based upon tests: pts/svt-vp9, pts/svt-hevc, pts/x264, pts/x265, pts/dav1d and pts/svt-av1

Geometric Mean Of NVIDIA GPU Compute Tests

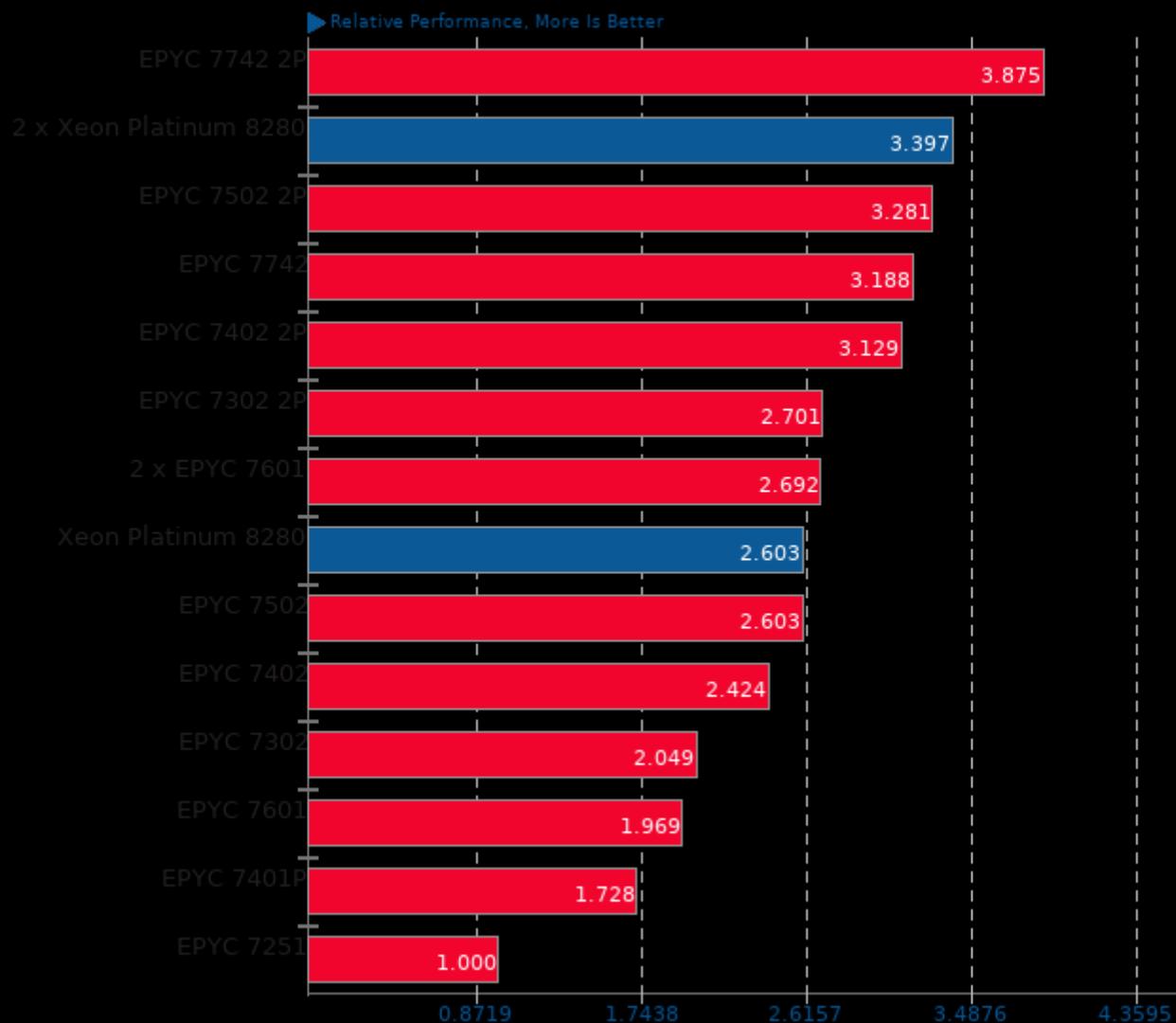
Result Composite - AMD EPYC 7302 / 7402 / 7502 / 7742 2P vs. Intel Xeon Linux Benchmarks



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

Geometric Mean Of Programmer / Developer System Benchmarks Tests

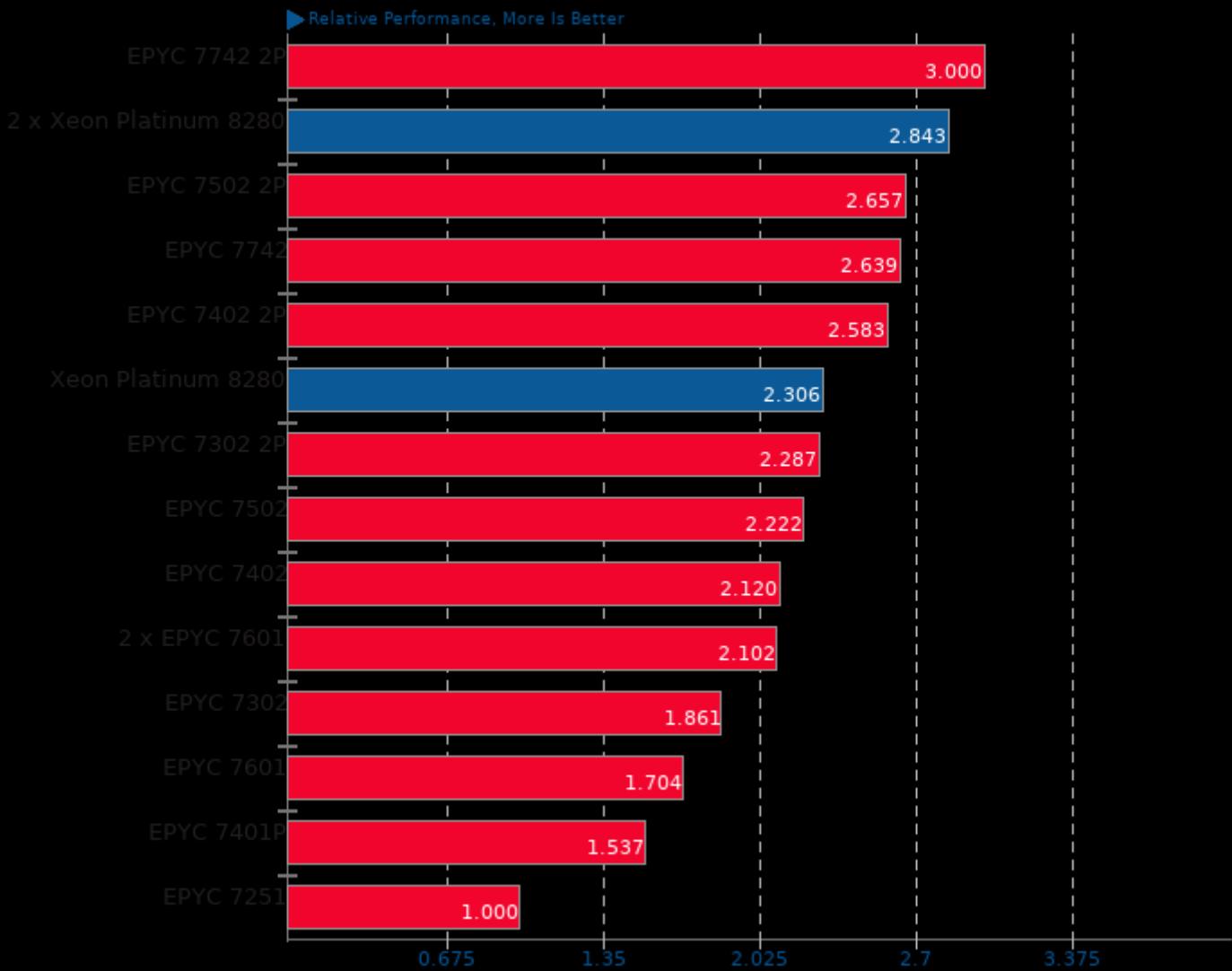
Result Composite - AMD EPYC 7302 / 7402 / 7502 / 7742 2P vs. Intel Xeon Linux Benchmarks



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

Geometric Mean Of Python Tests

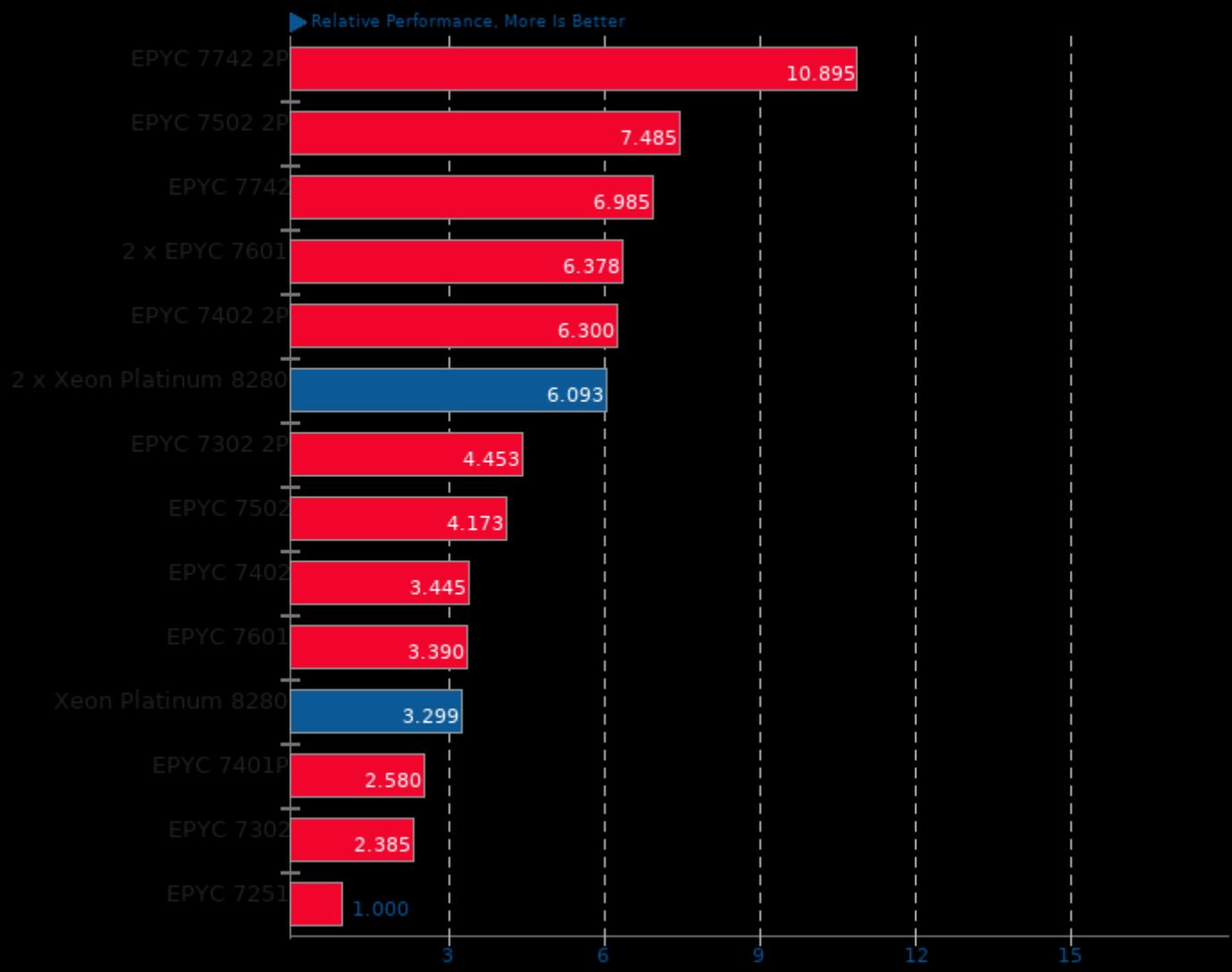
Result Composite - AMD EPYC 7302 / 7402 / 7502 / 7742 2P vs. Intel Xeon Linux Benchmarks



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

Geometric Mean Of Raytracing Tests

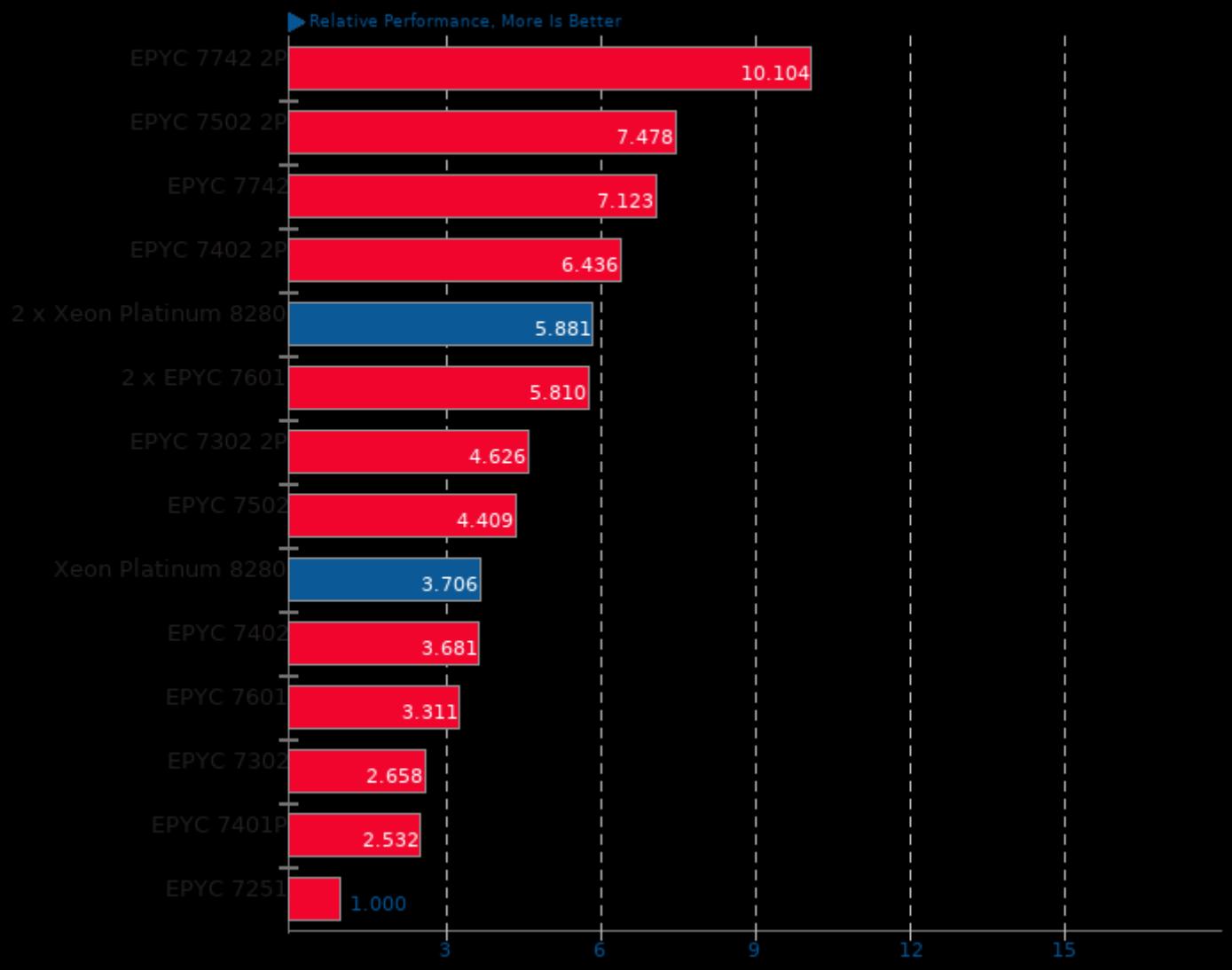
Result Composite - AMD EPYC 7302 / 7402 / 7502 / 7742 2P vs. Intel Xeon Linux Benchmarks



Geometric mean based upon tests: pts/c-ray and pts/povray

Geometric Mean Of Renderers Tests

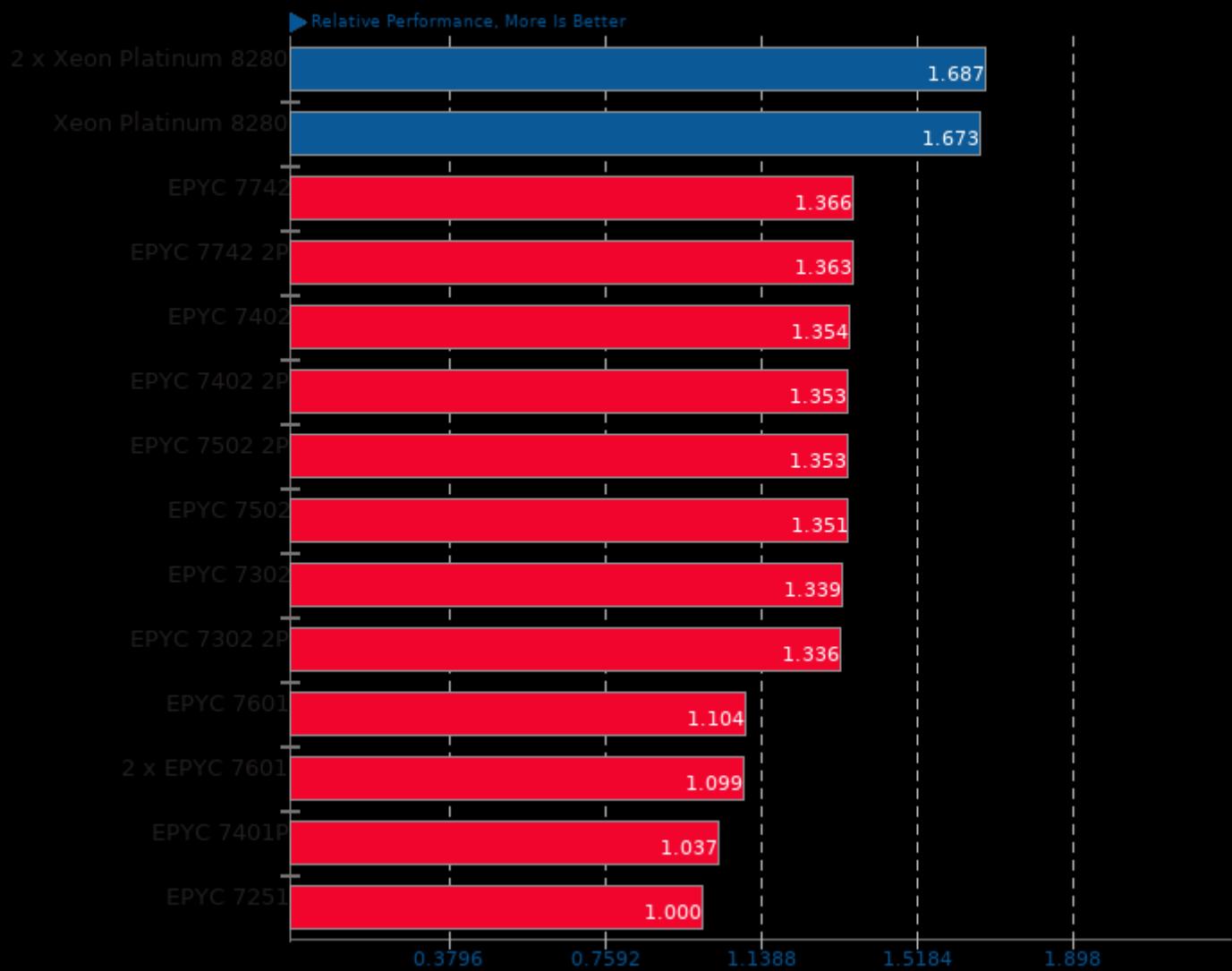
Result Composite - AMD EPYC 7302 / 7402 / 7502 / 7742 2P vs. Intel Xeon Linux Benchmarks



Geometric mean based upon tests: pts/c-ray, pts/povray, pts/blender, pts/tungsten and pts/appleseed

Geometric Mean Of Single-Threaded Tests

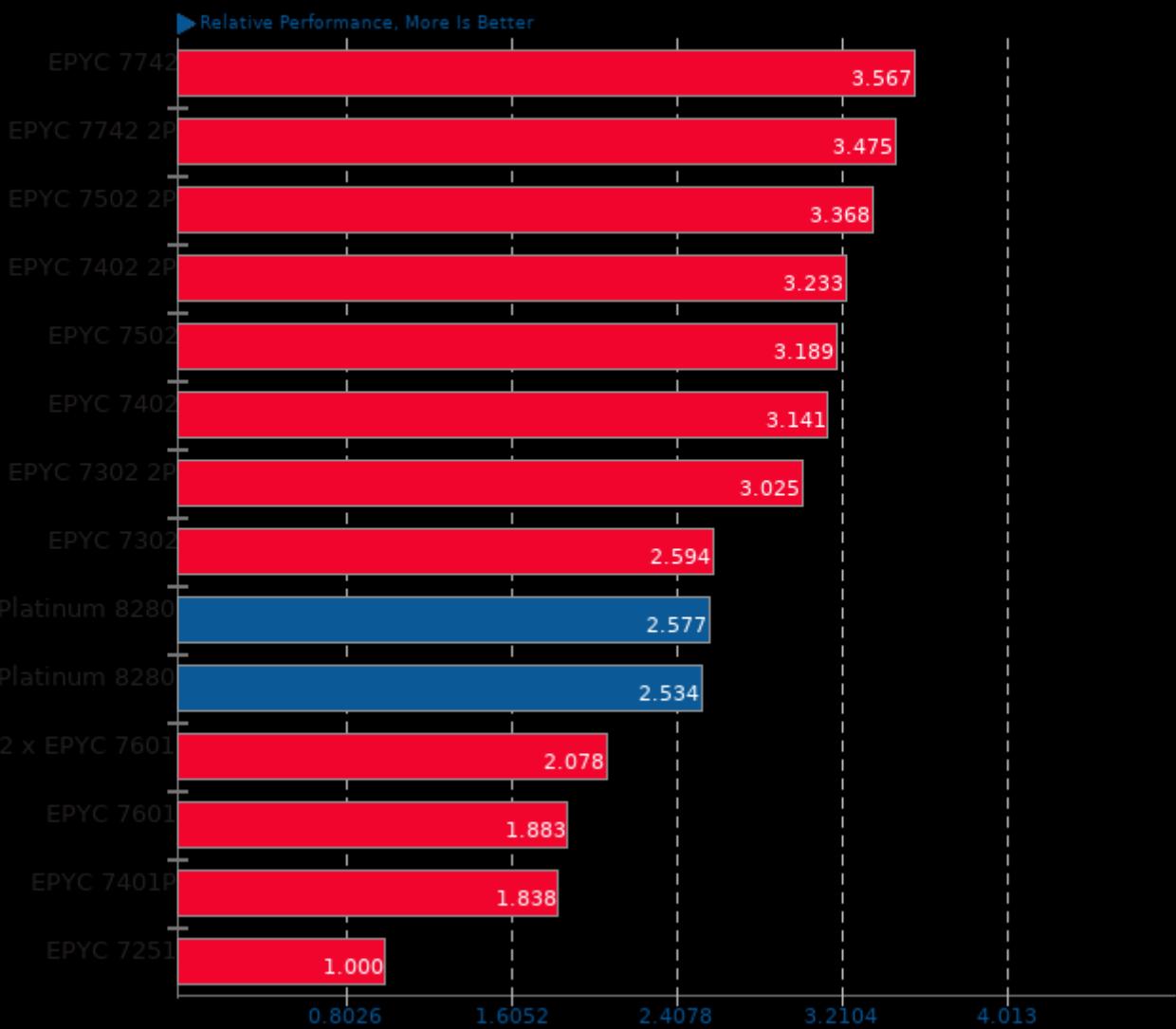
Result Composite - AMD EPYC 7302 / 7402 / 7502 / 7742 2P vs. Intel Xeon Linux Benchmarks



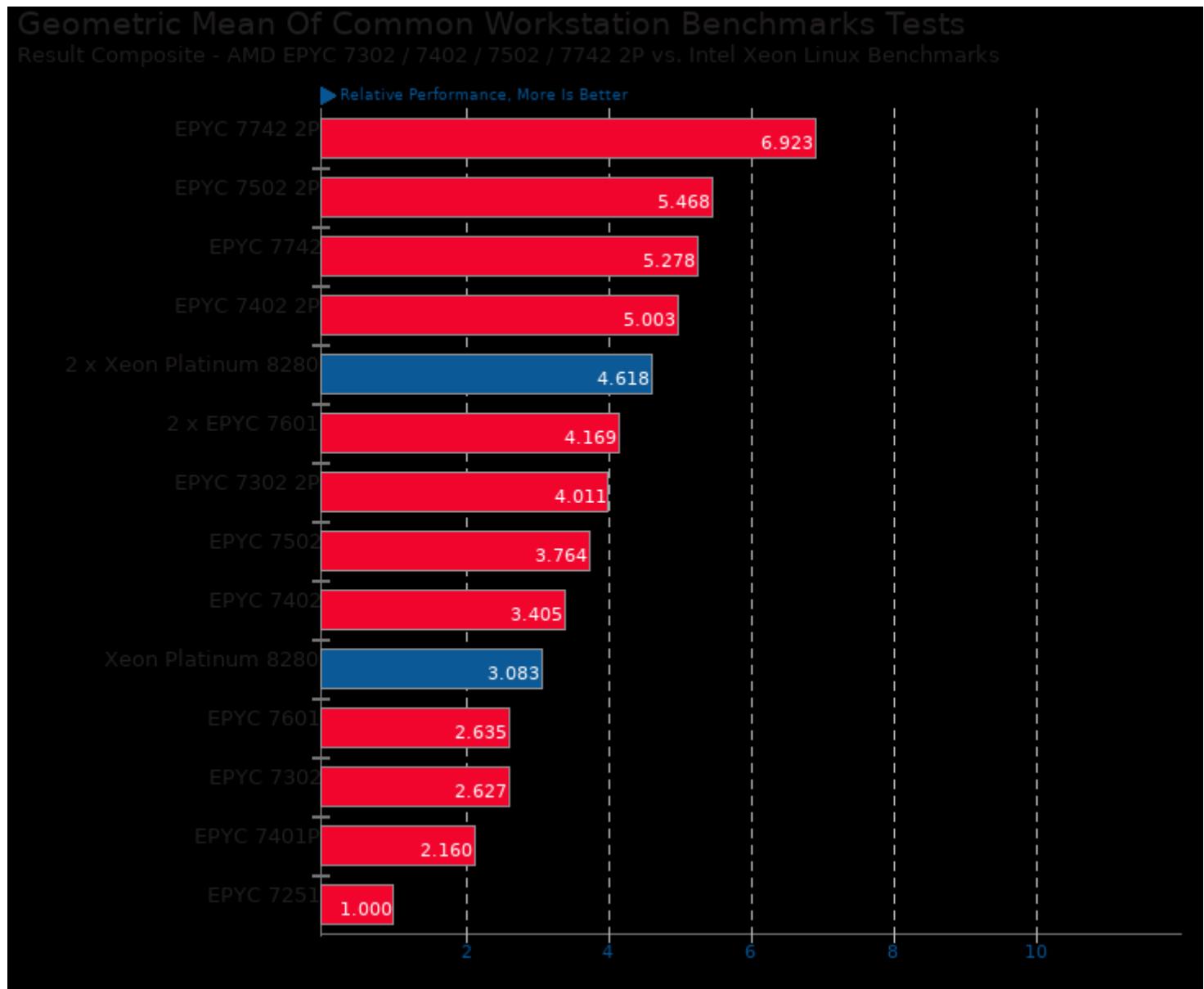
Geometric mean based upon tests: pts/pybench and pts/phpbench

Geometric Mean Of Video Encoding Tests

Result Composite - AMD EPYC 7302 / 7402 / 7502 / 7742 2P vs. Intel Xeon Linux Benchmarks



Geometric mean based upon tests: pts/svt-vp9, pts/svt-hevc, pts/x264, pts/x265, pts/dav1d and pts/svt-av1



Geometric mean based upon tests: pts/blender and pts/x265

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 04:22.