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AMD EPYC Milan Preliminary Test

2 x AMD EPYC 7663 64-Core and 2 x AMD EPYC 7543 32-Core testing with a AMD DAYTONA_X (RYM1001D BIOS) on Ubuntu 20.10 via the Phoronix Test Suite. Details: https://servernews.ru/1034705/

Automated Executive Summary

2 x AMD EPYC 7763 had the most wins, coming in first place for 87% of the tests.

Based on the geometric mean of all complete results, the fastest (2 x AMD EPYC 7763) was 4.278x the speed of the slowest (2 x EPYC 7F32).

Test Systems:

2 x AMD EPYC 7763

Processor: 2 x AMD EPYC 7763 64-Core @ 2.45GHz (128 Cores / 256 Threads), Motherboard: AMD DAYTONA_X (RYM1001D BIOS), Chipset: AMD Starship/Matisse, Memory: 1008GB, Disk: 3201GB HUSMR7632BDP3M1 + 256GB Micron_1100_MTFD, Graphics: ASPEED, Network: 2 x Mellanox MT27710

OS: Ubuntu 20.10, Kernel: 5.8.0-44-generic (x86_64), Compiler: GCC 10.2.0, File-System: xfs, Screen Resolution: 1024x768

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-gcn/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa001119
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

2 x AMD EPYC 7543

Processor: 2 x AMD EPYC 7543 32-Core @ 2.80GHz (64 Cores / 128 Threads), Motherboard: AMD DAYTONA_X (RYM1001D BIOS), Chipset: AMD Starship/Matisse, Memory: 504GB, Disk: 3201GB HUSMR7632BDP3M1 + 256GB Micron_1100_MTFD, Graphics: ASPEED, Network: 2 x Mellanox MT27710

OS: Ubuntu 20.10, Kernel: 5.8.0-44-generic (x86_64), Compiler: GCC 10.2.0, File-System: xfs, Screen Resolution: 1024x768

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-gcn/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Disk Notes: NONE / attr2,inode64,logbsize=32k,logbufs=8,noquota,relatime,rw / Block Size: 4096
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0xa001119
Java Notes: OpenJDK Runtime Environment (build 11.0.10+9-Ubuntu-0ubuntu1.20.10)
Python Notes: Python 2.7.18 + Python 3.8.6
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

2 x EPYC 7282

Processor: 2 x AMD EPYC 7282 16-Core @ 2.80GHz (32 Cores / 64 Threads), Motherboard: Supermicro H11DSi-NT v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 474GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe, Monitor: VGA HDMI, Network: 2 x Intel 10G X550T

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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: acpi-cpufreq performance - CPU Microcode: 0x8301034
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + Python 3.8.2
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 EPYC 7352

Processor: 2 x AMD EPYC 7352 24-Core @ 2.30GHz (48 Cores / 96 Threads), Motherboard: Supermicro H11DSi-NT v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 504GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe, Monitor: VGA HDMI, Network: 2 x Intel 10G X550T

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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: acpi-cpufreq ondemand - CPU Microcode: 0x8301034
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + Python 3.8.2
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 EPYC 7402

Processor: 2 x AMD EPYC 7402 24-Core @ 2.80GHz (48 Cores / 96 Threads), Motherboard: Supermicro H11DSi-NT v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 504GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe, Monitor: VGA HDMI, Network: 2 x Intel 10G X550T

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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: acpi-cpufreq performance - CPU Microcode: 0x8301034
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + Python 3.8.2
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 EPYC 7452

Processor: 2 x AMD EPYC 7452 32-Core @ 2.35GHz (64 Cores / 128 Threads), Motherboard: Supermicro H11DSi-NT v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 504GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe, Monitor: VGA HDMI, Network: 2 x Intel 10G X550T

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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: acpi-cpufreq performance - CPU Microcode: 0x8301034
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + Python 3.8.2

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 EPYC 7502

Processor: 2 x AMD EPYC 7502 32-Core @ 2.50GHz (64 Cores / 128 Threads), Motherboard: Supermicro H11DSi-NT v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 474GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe, Monitor: VGA HDMI, Network: 2 x Intel 10G X550T

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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: acpi-cpufreq performance - CPU Microcode: 0x8301034
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + Python 3.8.2
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 EPYC 7532

Processor: 2 x AMD EPYC 7532 32-Core @ 2.40GHz (64 Cores / 128 Threads), Motherboard: Supermicro H11DSi-NT v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 504GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe, Monitor: VGA HDMI, Network: 2 x Intel 10G X550T

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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: acpi-cpufreq performance - CPU Microcode: 0x8301034
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + Python 3.8.2
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 EPYC 7542

Processor: 2 x AMD EPYC 7542 32-Core @ 2.90GHz (64 Cores / 128 Threads), Motherboard: Supermicro H11DSi-NT v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 504GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe, Monitor: VGA HDMI, Network: 2 x Intel 10G X550T

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3

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: acpi-cpufreq performance - CPU Microcode: 0x8301034
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + Python 3.8.2
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 EPYC 7552

Processor: 2 x AMD EPYC 7552 48-Core @ 2.20GHz (96 Cores / 192 Threads), Motherboard: Supermicro H11DSi-NT v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 504GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe, Monitor: VGA HDMI, Network: 2 x Intel 10G X550T

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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: acpi-cpufreq performance - CPU Microcode: 0x8301034
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + Python 3.8.2
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 EPYC 7642

Processor: 2 x AMD EPYC 7642 48-Core @ 2.30GHz (96 Cores / 192 Threads), Motherboard: Supermicro H11DSi-NT v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 504GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe, Monitor: VGA HDMI, Network: 2 x Intel 10G X550T

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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: acpi-cpufreq performance - CPU Microcode: 0x8301034
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + Python 3.8.2
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 EPYC 7742

Processor: 2 x AMD EPYC 7742 64-Core @ 2.25GHz (128 Cores / 256 Threads), Motherboard: Supermicro H11DSi-NT v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 504GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe, Monitor: VGA HDMI, Network: 2 x Intel 10G X550T

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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: acpi-cpufreq performance - CPU Microcode: 0x8301034
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + Python 3.8.2
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 EPYC 7F32

Processor: 2 x AMD EPYC 7F32 8-Core @ 3.70GHz (16 Cores / 32 Threads), Motherboard: Supermicro H11DSi-NT v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 504GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe, Monitor: VGA HDMI, Network: 2 x Intel 10G X550T

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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: acpi-cpufreq performance - CPU Microcode: 0x8301034
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + Python 3.8.2
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 EPYC 7F52

Processor: 2 x AMD EPYC 7F52 16-Core @ 3.50GHz (32 Cores / 64 Threads), Motherboard: Supermicro H11DSi-NT v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 504GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe, Monitor: VGA HDMI, Network: 2 x Intel 10G X550T

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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: acpi-cpufreq performance - CPU Microcode: 0x8301034
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + Python 3.8.2
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 EPYC 7F72

Processor: 2 x AMD EPYC 7F72 24-Core @ 3.20GHz (48 Cores / 96 Threads), Motherboard: Supermicro H11DSi-NT v2.00 (2.1 BIOS), Chipset: AMD Starship/Matisse, Memory: 504GB, Disk: 280GB INTEL SSDPE21D280GA, Graphics: llvmpipe, Monitor: VGA HDMI, Network: 2 x Intel 10G X550T

OS: Ubuntu 20.04, Kernel: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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: acpi-cpufreq performance - CPU Microcode: 0x8301034
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + Python 3.8.2
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 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: 378GB, Disk: 280GB INTEL SSDPE21D280GA, 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: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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 performance - CPU Microcode: 0x500002c
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + 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 + srbds: Not affected + tsx_async_abort: Mitigation of TSX disabled

2 x Xeon Gold 6250

Processor: 2 x Intel Xeon Gold 6250 @ 4.50GHz (16 Cores / 32 Threads), Motherboard: GIGABYTE MD61-SC2-00 v01000100 (T15 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 378GB, Disk: 280GB INTEL SSDPE21D280GA, 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: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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 performance - CPU Microcode: 0x500002c
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + 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 + srbds: Not affected + tsx_async_abort: Mitigation of TSX disabled

2 x Xeon Gold 6258R

Processor: 2 x Intel Xeon Gold 6258R @ 4.00GHz (56 Cores / 112 Threads), Motherboard: GIGABYTE MD61-SC2-00 v01000100 (T15 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 378GB, Disk: 280GB INTEL SSDPE21D280GA, 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: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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 performance - CPU Microcode: 0x500002c
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + 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 + srbds: Not affected + 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: 378GB, Disk: 280GB INTEL SSDPE21D280GA, 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: 5.8.0-050800rc6daily20200721-generic (x86_64) 20200720, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Environment Notes: CXXFLAGS=-O3 CFLAGS=-O3
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
Disk Notes: NONE / errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate performance - CPU Microcode: 0x500002c
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: Python 2.7.18rc1 + 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 + srbds: Not affected + tsx_async_abort: Mitigation of TSX disabled

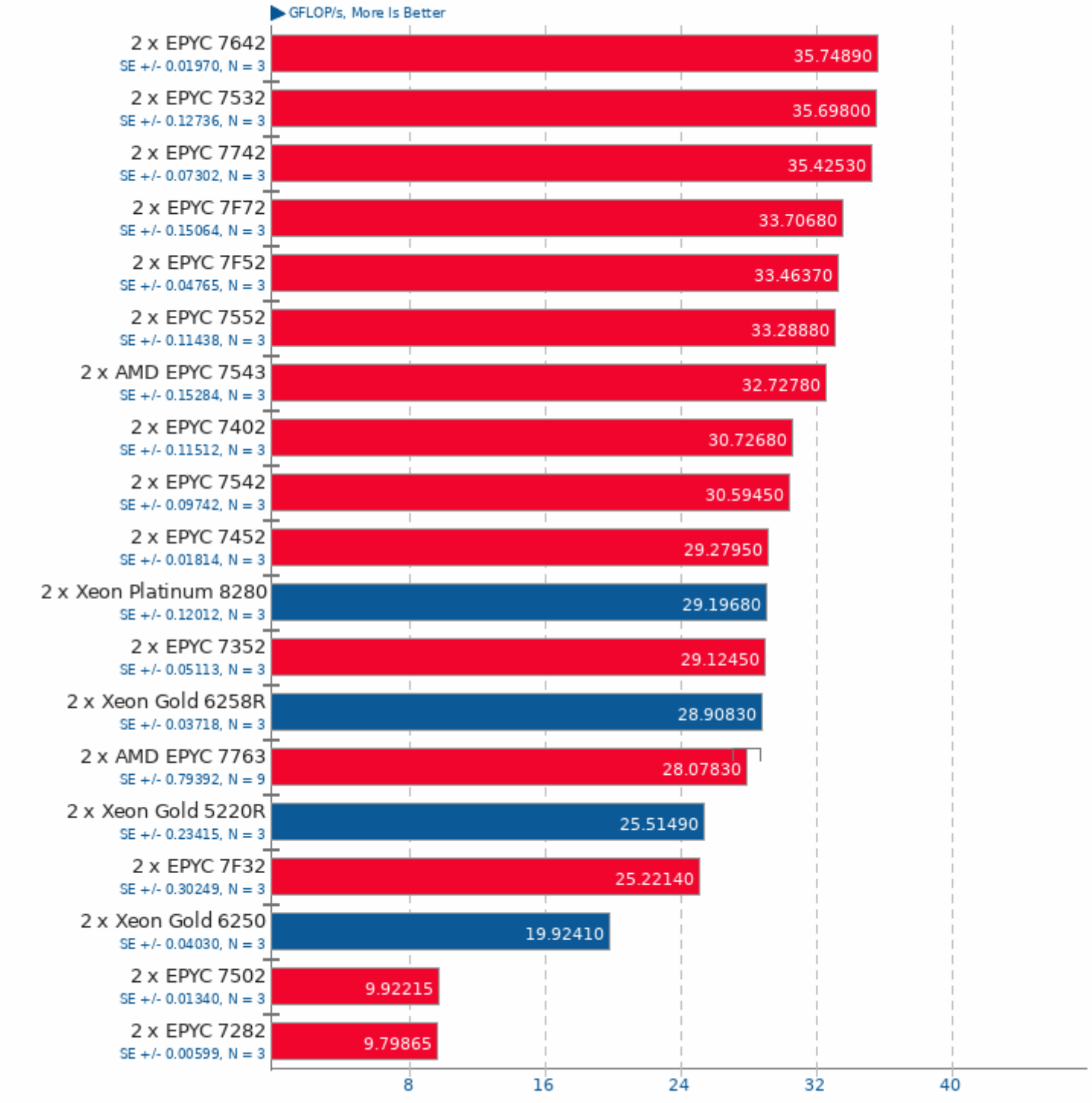
AMD EPYC Milan Preliminary Test

	2 x AMD EPYC 7763	2 x AMD EPYC 7543	2 x EPYC 7282	2 x EPYC 7352	2 x EPYC 7402	2 x EPYC 7452	2 x EPYC 7502	2 x EPYC 7532	2 x EPYC 7542	2 x EPYC 7552	2 x EPYC 7642	2 x EPYC 7742	2 x EPYC 7F32	2 x EPYC 7F52	2 x EPYC 7F72	2 x Xeon Gold 5220R	2 x Xeon Gold 6250	2 x Xeon Gold 6258R	2 x Xeon Platinum 8280
High Performance Conjugate Gradient (GFLOP/s)	28.0783	32.7278	9.79865	29.1245	30.7268	29.2795	9.92215	35.6980	30.5945	33.2888	35.7489	35.4253	25.2214	33.4637	33.7068	25.5149	19.9241	28.9083	29.1968
Normalized	78.54%	91.55%	27.41%	81.47%	85.95%	81.9%	27.76%	99.86%	85.58%	93.12%	100%	99.09%	70.55%	93.61%	94.29%	71.37%	55.73%	80.86%	81.67%
Standard Deviation	8.5%	0.8%	0.1%	0.3%	0.6%	0.1%	0.2%	0.6%	0.6%	0.6%	0.1%	0.4%	2.1%	0.2%	0.8%	1.6%	0.4%	0.2%	0.7%
Rodinia - OpenMP LavaMD (sec)	26.213	37.575	83.482	64.002	55.480	50.768	47.268	48.408	43.919	37.076	36.534	29.958	126.445	66.964	51.146	88.747	123.638	55.735	55.495
Normalized	100%	69.76%	31.4%	40.96%	47.25%	51.63%	55.46%	54.15%	59.68%	70.7%	71.75%	87.5%	20.73%	39.14%	51.25%	29.54%	21.2%	47.03%	47.23%
Standard Deviation	2.5%	2.4%	0.3%	0.2%	0.4%	0.4%	0.5%	0.5%	0.2%	1.8%	1.9%	3%	0.1%	0.1%	0.4%	1.7%	0.5%	0.5%	0.7%
ACES DGEMM - S.F.P.R (GFLOP/s)	37.60479	18.31647	5.83765	9.24168	9.84038	11.8619	13.1005	13.3276	12.3638	17.0474	19.0157	21.0502	4.304511	7.97582	9.46603	12.0547	7.92894	20.2857	19.7608
Normalized	100%	48.69%	15.52%	24.58%	26.17%	31.54%	34.84%	35.44%	32.88%	45.33%	50.57%	55.98%	11.45%	21.21%	25.17%	32.06%	21.08%	53.94%	52.55%
Standard Deviation	2.3%	2.1%	5.2%	4.3%	1.5%	2%	0.9%	2.9%	0.3%	1.4%	1.6%	9.9%	3%	3%	2.7%	1.2%	0.6%	2.8%	2.6%
John The Ripper - Blowfish (Real C/S)	177138	121560	43151	60284	66601	80190	85868	84304	87512	117426	119314	148233	26307	52455	71041	50842	34365	85817	85046
Normalized	100%	68.62%	24.36%	34.03%	37.6%	45.27%	48.48%	47.59%	49.4%	66.29%	67.36%	83.68%	14.85%	29.61%	40.1%	28.7%	19.4%	48.45%	48.01%
Standard Deviation	0.2%	0.4%	0.2%	0.1%	0.1%	0.1%	0.2%	0.1%	2%	0.2%	0.3%	0.2%	0.1%	0%	1.1%	0.1%	0.1%	0.1%	0.4%
John The Ripper - MD5 (Real C/S)	11282667	6787000	2694333	3561333	4145667	4545333	4968667	4842000	5396333	6705667	6737667	8375143	1732000	3387667	4117667	4899000	3343000	8225000	8129667
Normalized	100%	60.15%	23.88%	31.56%	36.74%	40.29%	44.04%	42.92%	47.83%	59.43%	59.7%	74.23%	15.35%	29.98%	36.47%	43.42%	29.63%	72.9%	72.05%
Standard Deviation	0.2%	0.7%	0.1%	0.4%	0.2%	0.3%	0.2%	1.6%	0.4%	0.5%	0.4%	2.8%	0.1%	0.3%	1.9%	0.3%	1.2%	0.6%	1.5%

AMD EPYC Milan Preliminary Test

Timed LLVM Compilation - Time To Compile (sec)	**187.095**	190.060	292.824	253.712	230.842	227.789	223.589	216.190	215.090	209.182	206.665	198.782	329.716	221.985	208.202	283.971	**350.480**	221.703	221.648
Normalized	100%	98.44%	63.89%	73.74%	81.05%	82.14%	83.68%	86.54%	86.98%	89.44%	90.53%	94.12%	56.74%	84.28%	89.86%	65.89%	53.38%	84.39%	84.41%
Standard Deviation	0.2%	1.1%	1.5%	1.2%	0.5%	0.6%	1.2%	0.5%	1.5%	0.9%	0.6%	0.1%	0.9%	1.6%	2.4%	2.6%	2.9%	2.4%	0.6%
C-Ray - Total Time - 4.1.R.P.P (sec)	**6.095**	10.079	20.189	14.993	13.179	11.817	10.886	11.136	10.158	8.569	8.620	7.270	32.599	16.546	12.090	24.890	**35.966**	14.615	15.418
Normalized	100%	60.47%	30.19%	40.65%	46.25%	51.58%	55.99%	54.73%	60%	71.13%	70.71%	83.84%	18.7%	36.84%	50.41%	24.49%	16.95%	41.7%	39.53%
Standard Deviation	1%	0.9%	0.3%	0.2%	0.3%	0.1%	0.4%	0.3%	0.7%	5.4%	5%	11.1%	0.2%	0.5%	0.9%	2%	0.2%	2.6%	8.3%
OpenSSL - R.4.b.P (Signs/sec	**26545**	15764	7528	10398	11706	13573	14669	14321	15496	19777	20347	25111	**4588**	9153	12682	8156	5471	13808	13637
Normalized	100%	59.39%	28.36%	39.17%	44.1%	51.13%	55.26%	53.95%	58.38%	74.51%	76.65%	94.6%	17.28%	34.48%	47.77%	30.73%	20.61%	52.02%	51.37%
Standard Deviation	0.1%	0.1%	0%	0%	0.1%	0%	0%	0.1%	0%	0.1%	0%	0.1%	0%	0.1%	0.2%	0.1%	0.2%	0.1%	0.4%
Geometric Mean Of All Test Results - Result Composite (Geometri	**456.138**	319.390	133.590	199.087	221.481	244.024	227.083	264.376	270.716	327.698	338.111	390.161	**106.620**	190.880	234.638	177.742	126.044	273.870	270.523
Normalized	100%	70.02%	29.29%	43.65%	48.56%	53.5%	49.78%	57.96%	59.35%	71.84%	74.12%	85.54%	23.37%	41.85%	51.44%	38.97%	27.63%	60.04%	59.31%

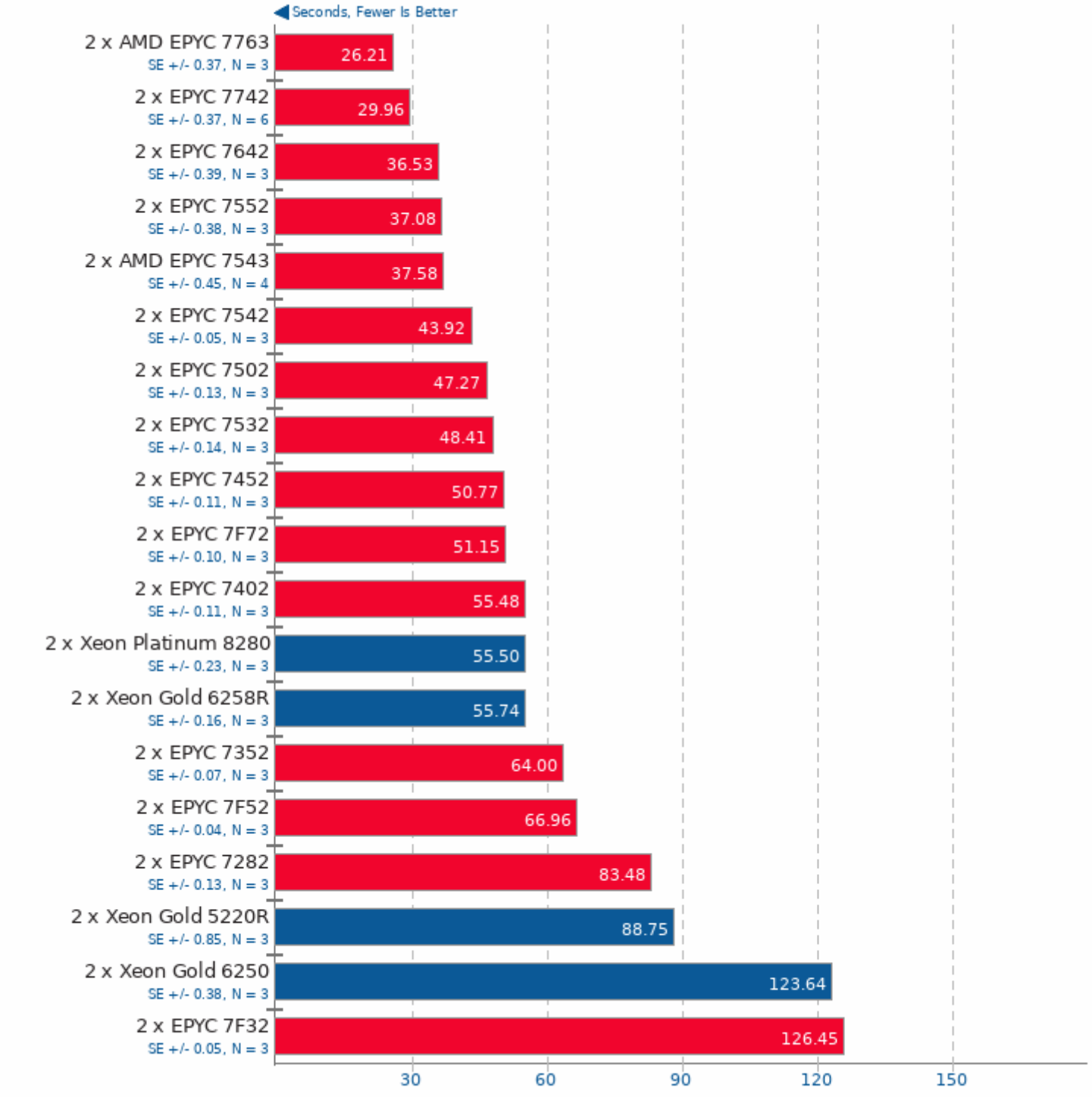
High Performance Conjugate Gradient 3.1



1. (CXX) g++ options: -O3 -ffast-math -ftree-vectorize -pthread -lmpi_cxx -lmpi

Rodinia 3.1

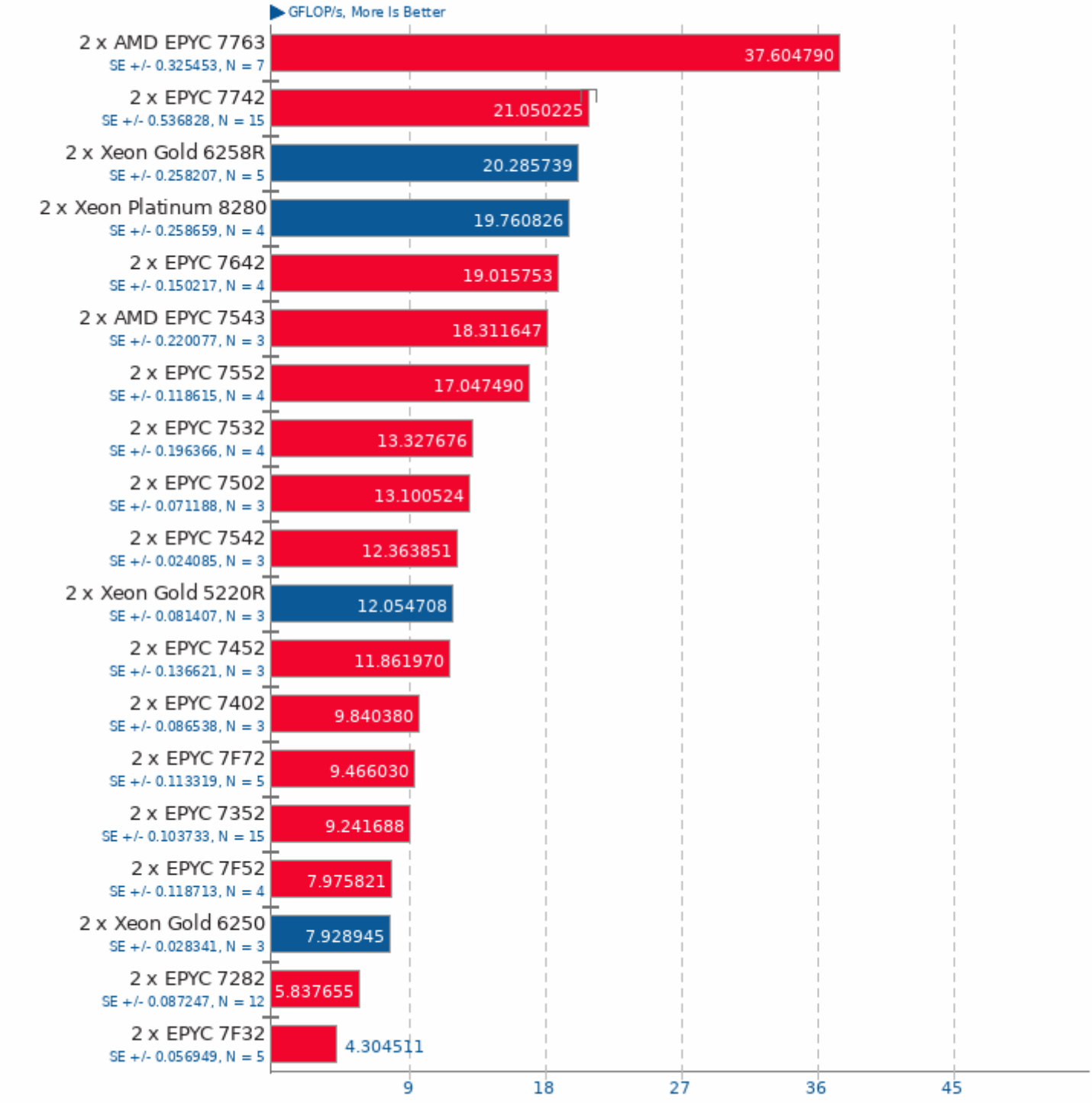
Test: OpenMP LavaMD



1. (CXX) g++ options: -O2 -lOpenCL

ACES DGEMM 1.0

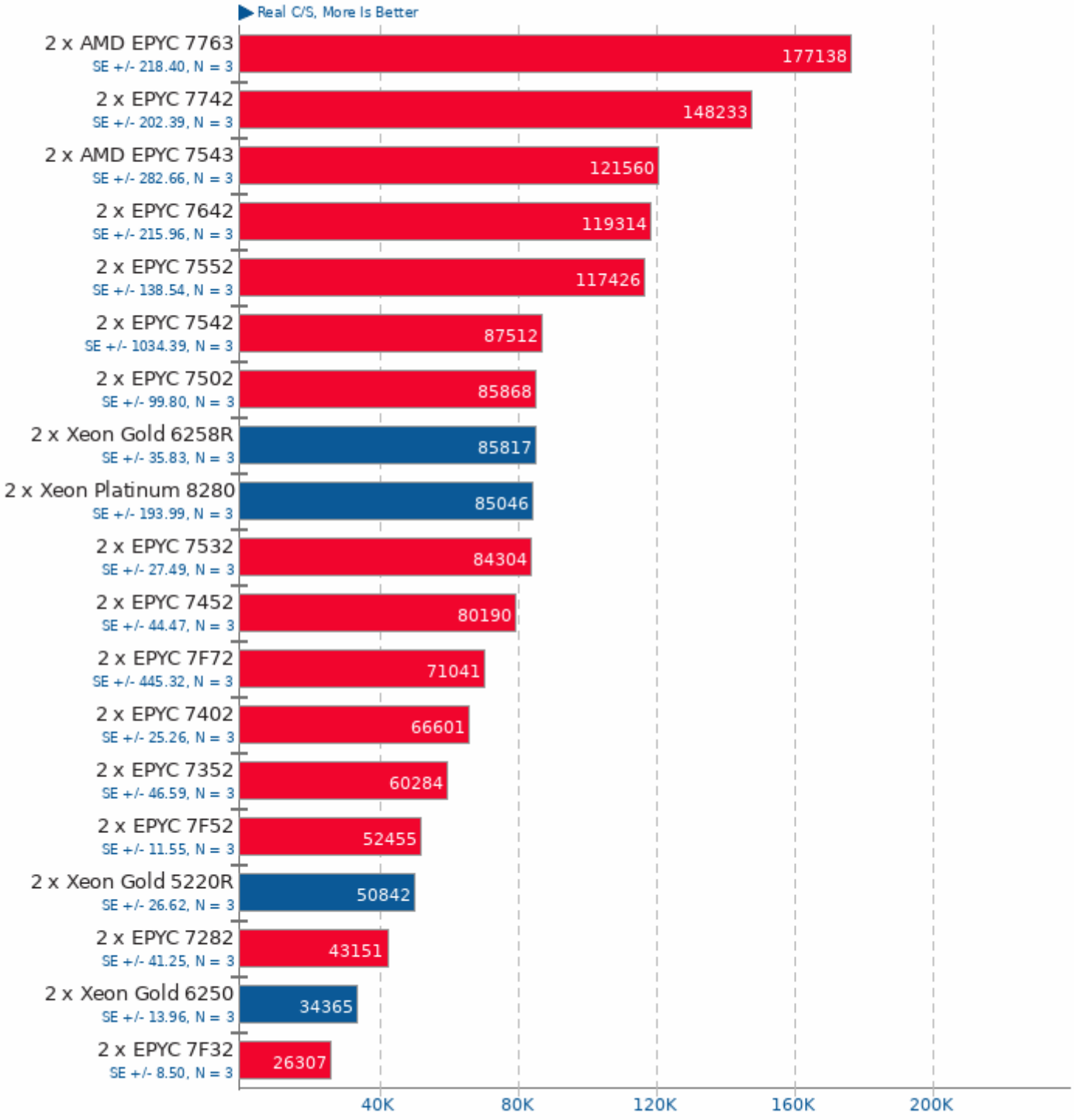
Sustained Floating-Point Rate



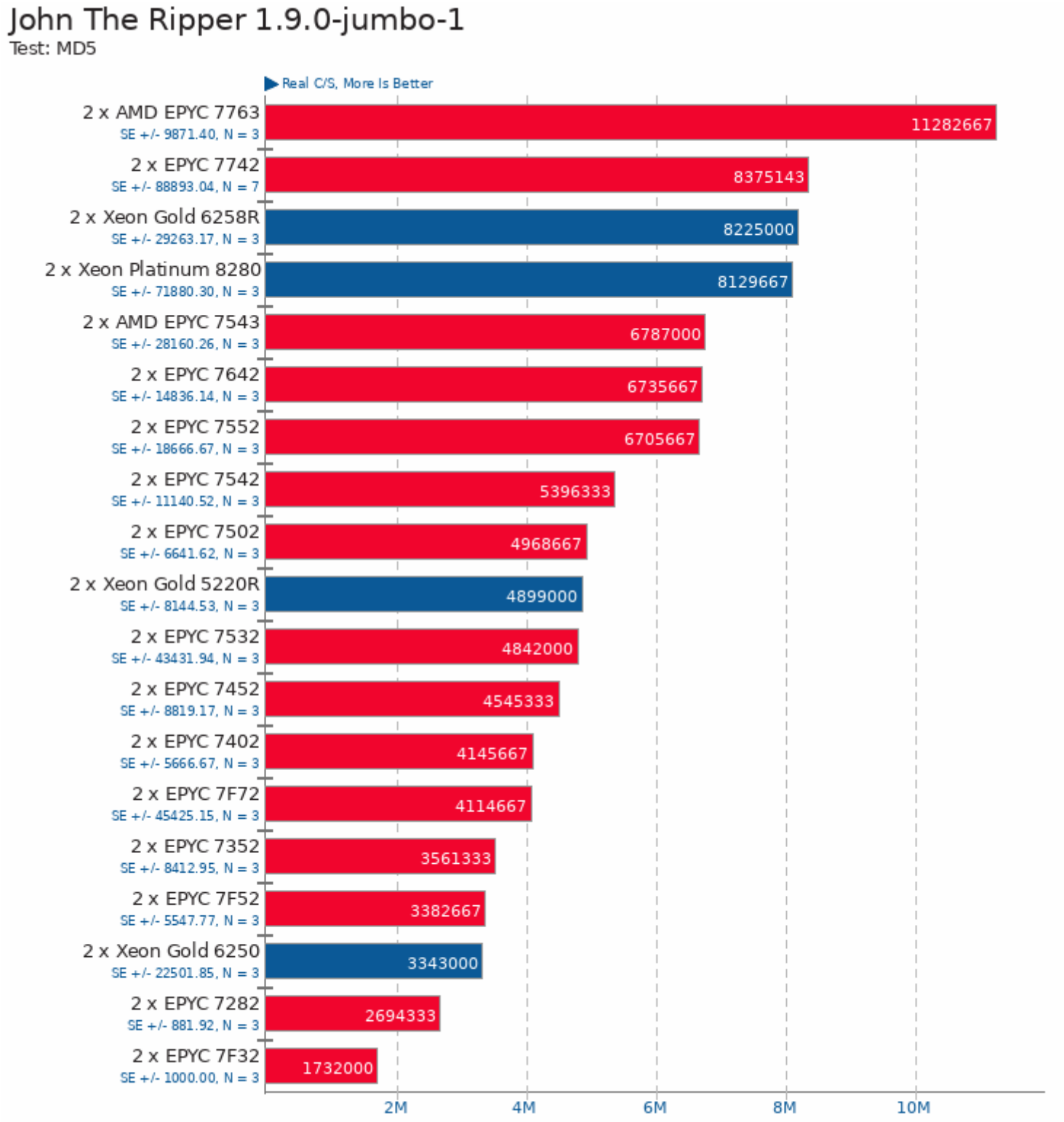
1. (CC) gcc options: -O3 -march=native -fopenmp

John The Ripper 1.9.0-jumbo-1

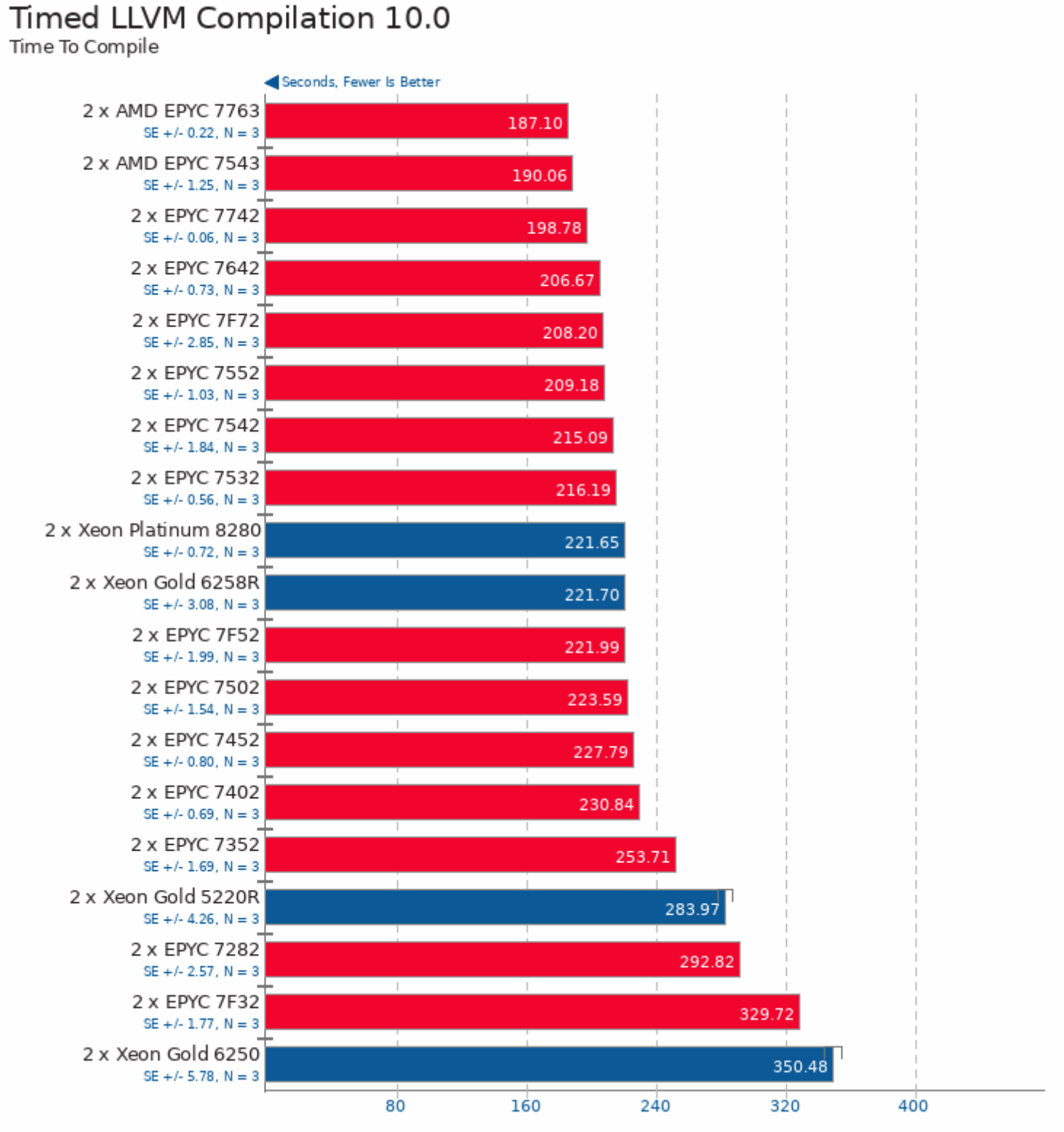
Test: Blowfish

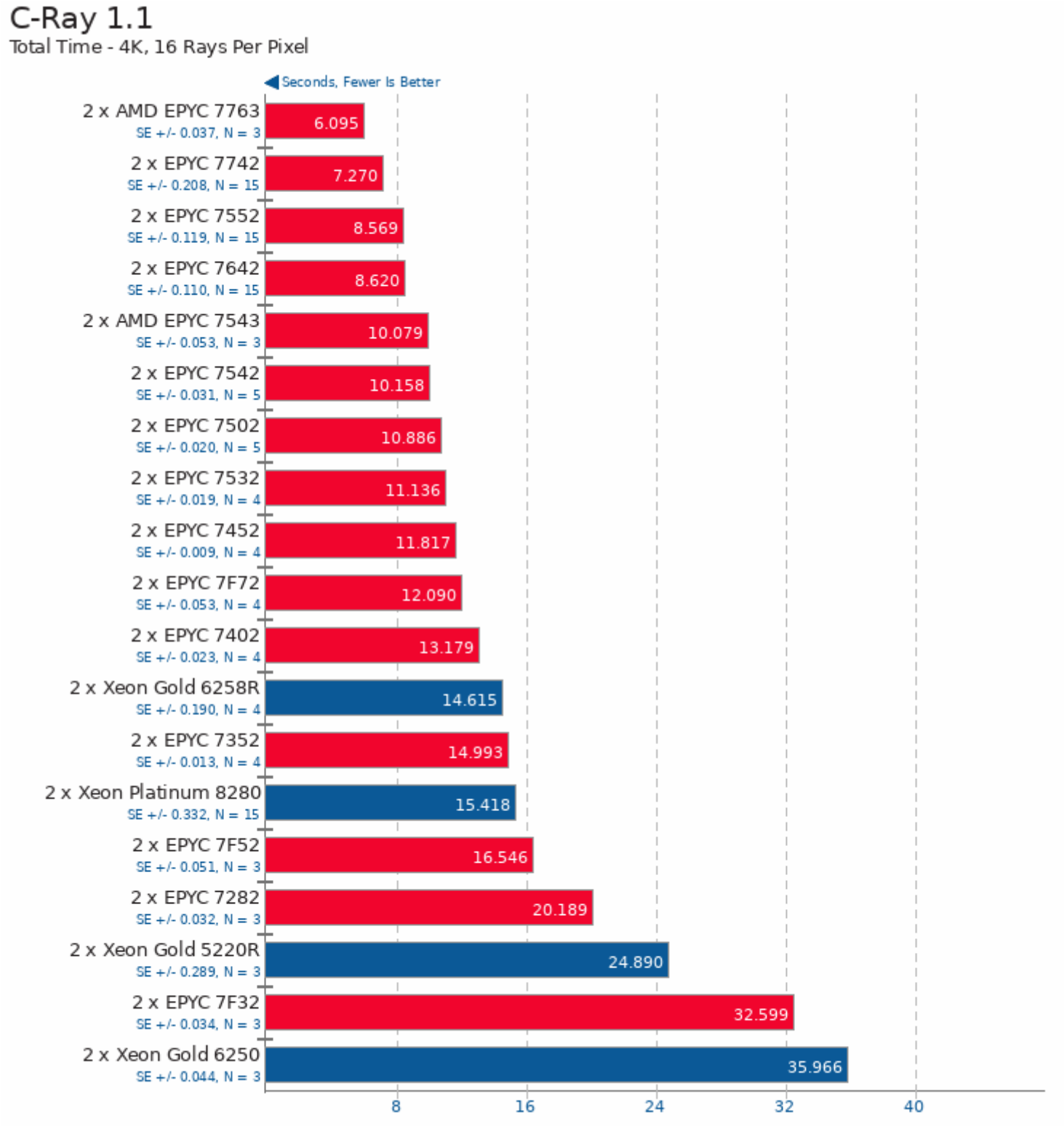


1. (CC) gcc options: -m64 -lssl -lcrypto -fopenmp -lgmp -pthread -lm -lz -ldl -lcrypt -lbz2

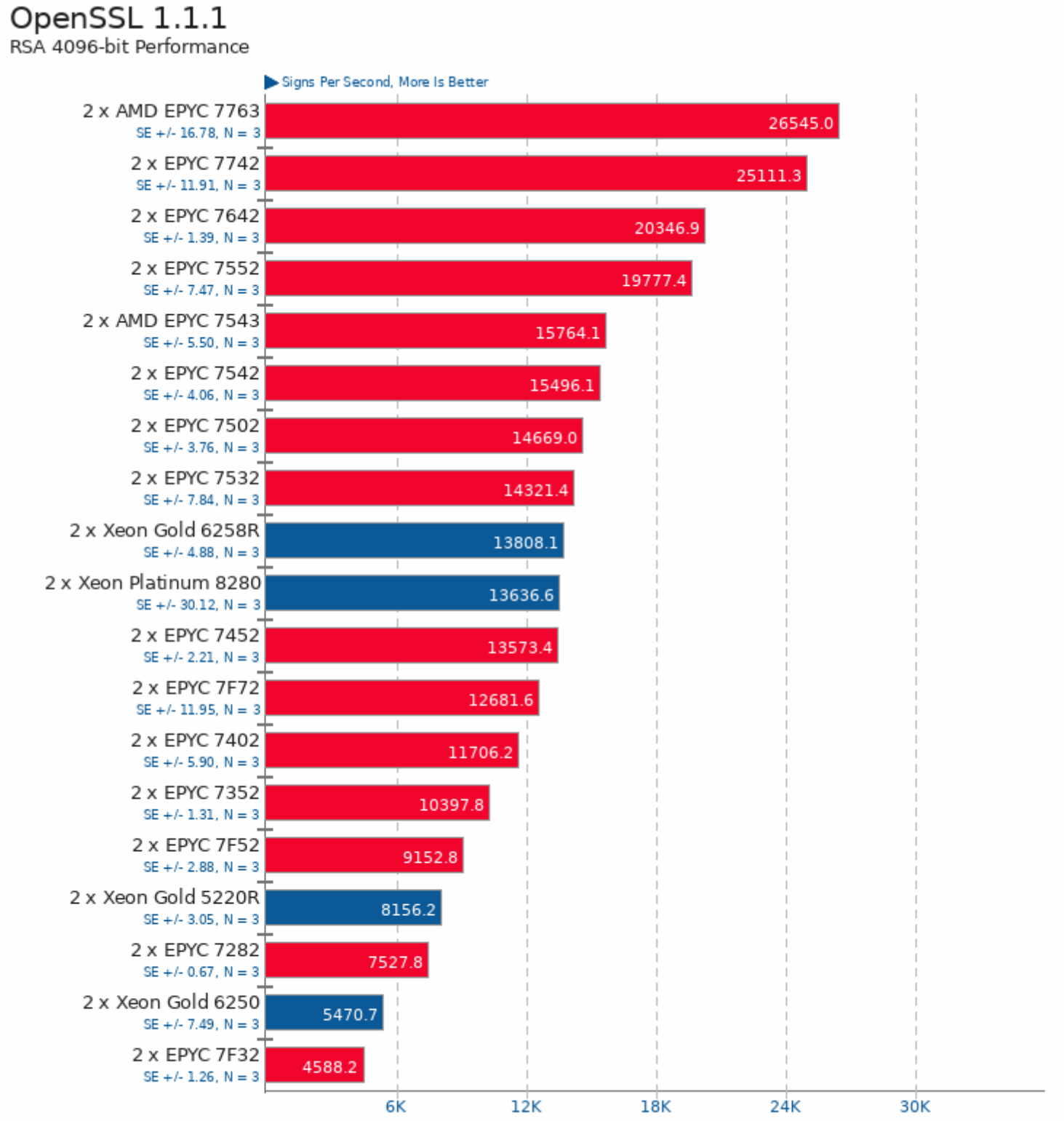


1. (CC) gcc options: -m64 -lssl -lcrypto -fopenmp -lgmp -pthread -lm -lz -ldl -lcrypt -lbz2


Timed LLVM Compilation 10.0
Time To Compile
Seconds, Fewer Is Better
2 x AMD EPYC 7763
SE +/- 0.22, N = 3
187.10
2 x AMD EPYC 7543
SE +/- 1.25, N = 3
190.06
2 x EPYC 7742
SE +/- 0.06, N = 3
198.78
2 x EPYC 7642
SE +/- 0.73, N = 3
206.67
2 x EPYC 7F72
SE +/- 2.85, N = 3
208.20
2 x EPYC 7552
SE +/- 1.03, N = 3
209.18
2 x EPYC 7542
SE +/- 1.84, N = 3
215.09
2 x EPYC 7532
SE +/- 0.56, N = 3
216.19
2 x Xeon Platinum 8280
SE +/- 0.72, N = 3
221.65
2 x Xeon Gold 6258R
SE +/- 3.08, N = 3
221.70
2 x EPYC 7F52
SE +/- 1.99, N = 3
221.99
2 x EPYC 7502
SE +/- 1.54, N = 3
223.59
2 x EPYC 7452
SE +/- 0.80, N = 3
227.79
2 x EPYC 7402
SE +/- 0.69, N = 3
230.84
2 x EPYC 7352
SE +/- 1.69, N = 3
253.71
2 x Xeon Gold 5220R
SE +/- 4.26, N = 3
283.97
2 x EPYC 7282
SE +/- 2.57, N = 3
292.82
2 x EPYC 7F32
SE +/- 1.77, N = 3
329.72
2 x Xeon Gold 6250
SE +/- 5.78, N = 3
350.48
80
160
240
320
400



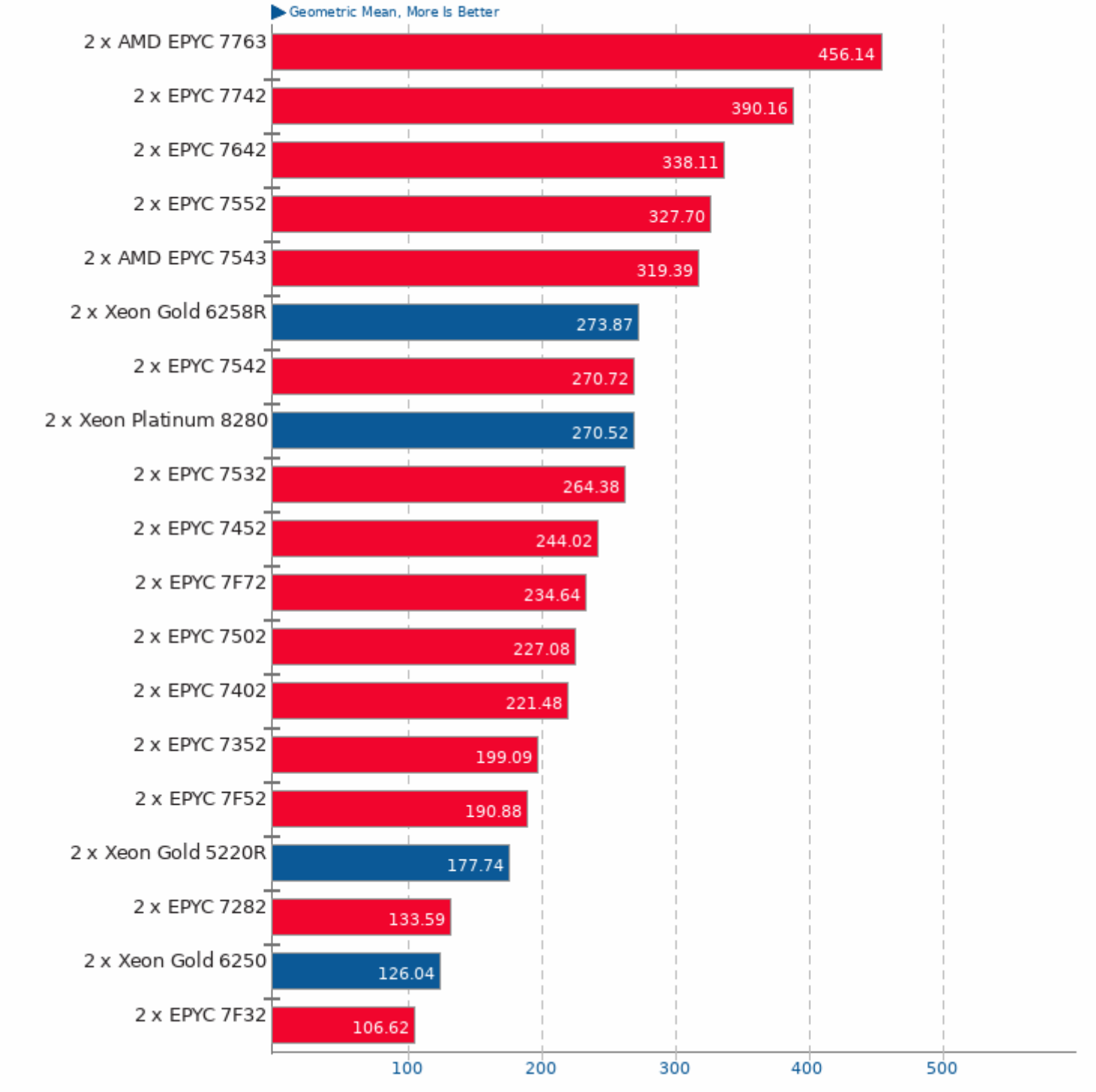
1. (CC) gcc options: -lm -lpthread -O3



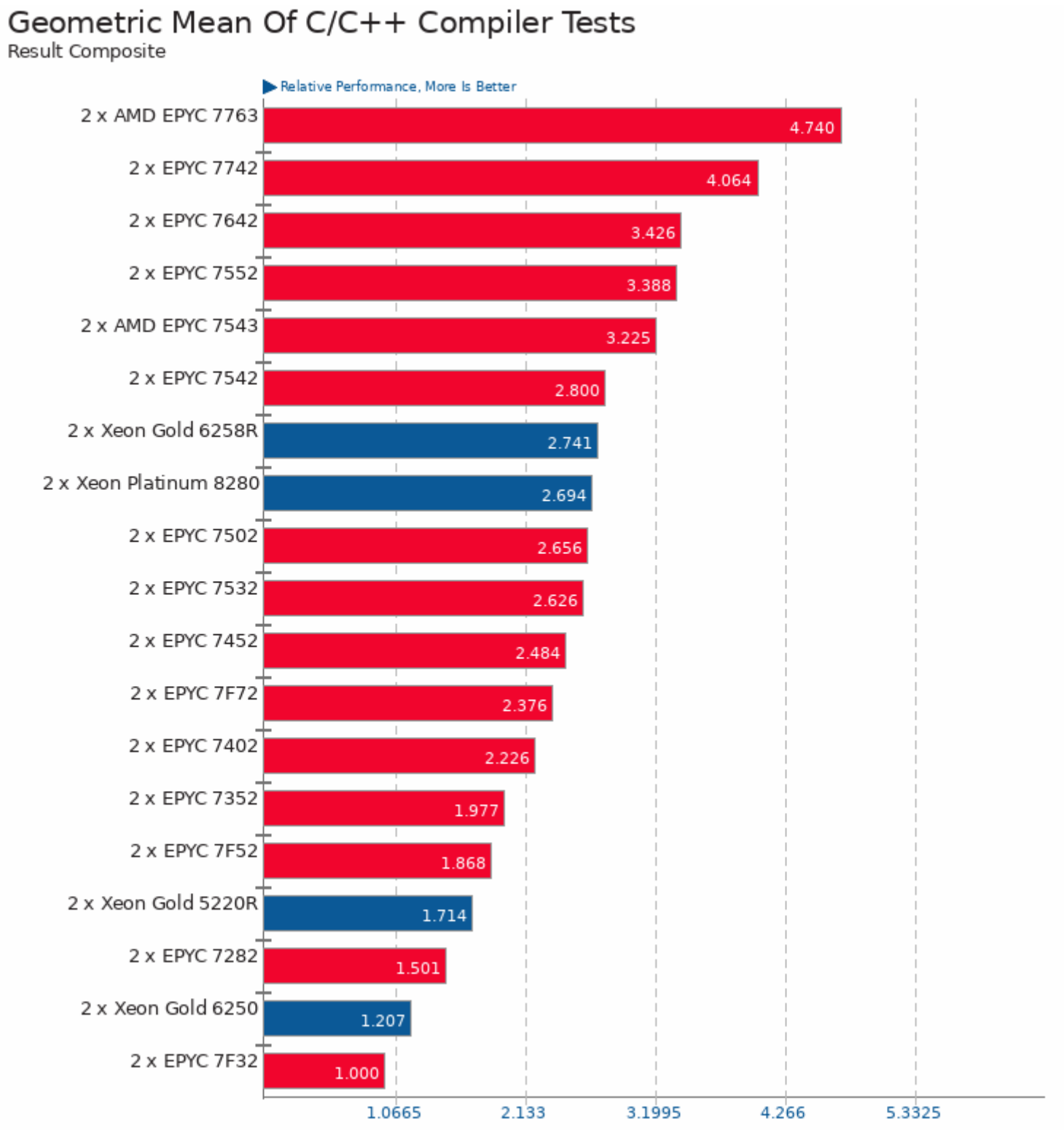
1. (CC) gcc options: -pthread -m64 -O3 -lssl -lcrypto -ldl

Geometric Mean Of All Test Results

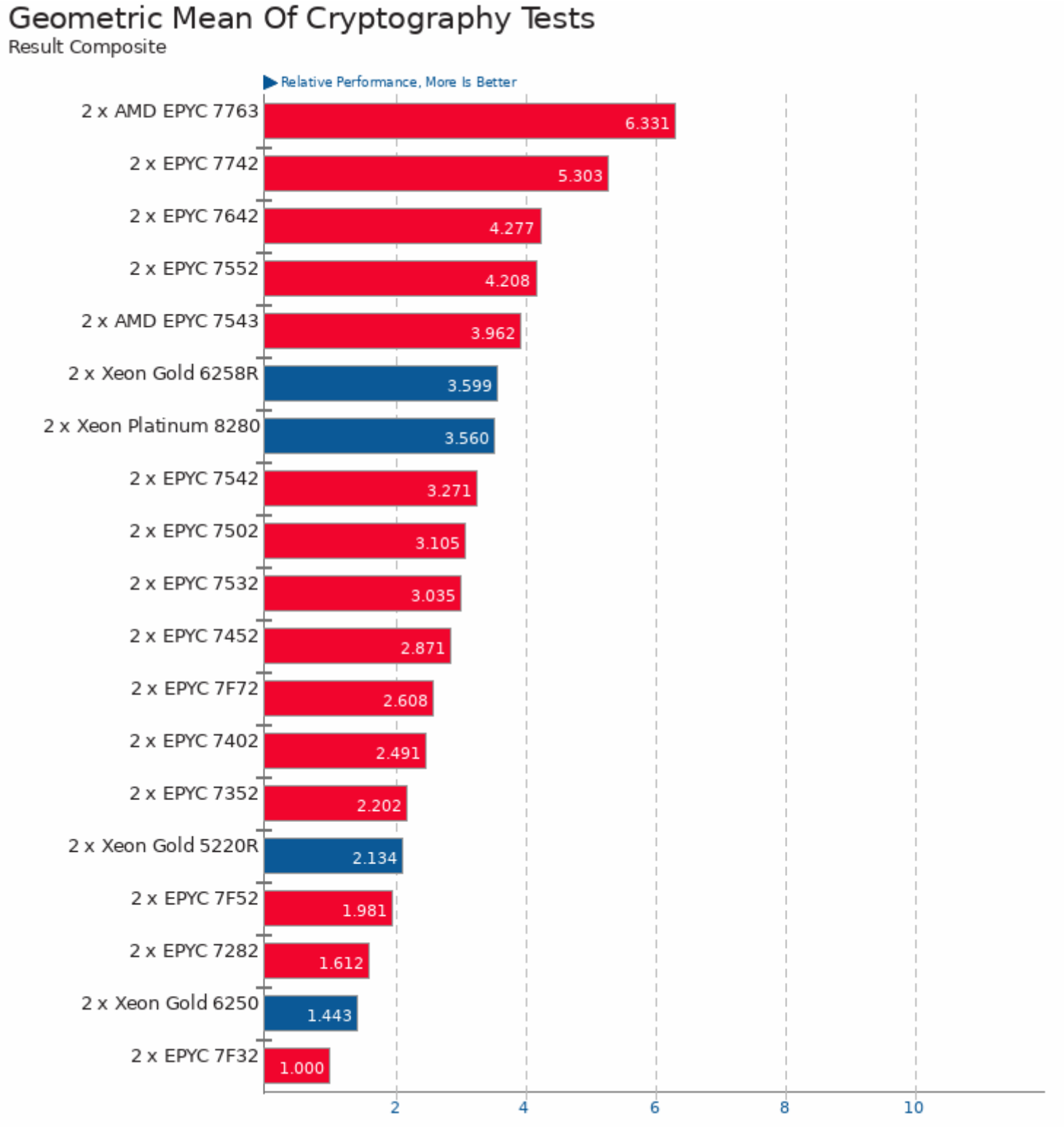
Result Composite



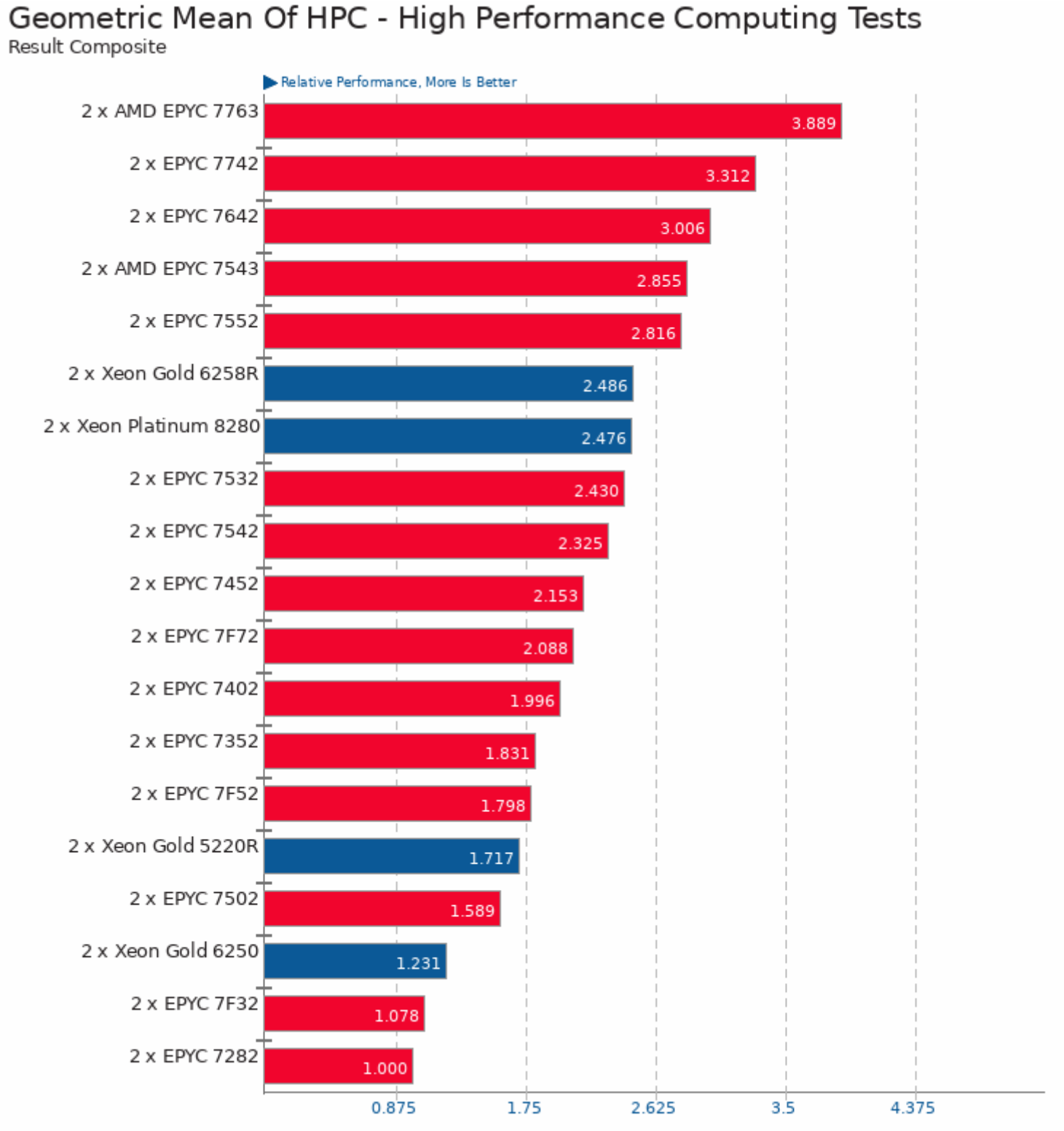
These geometric means are based upon test groupings / test suites for this result file.



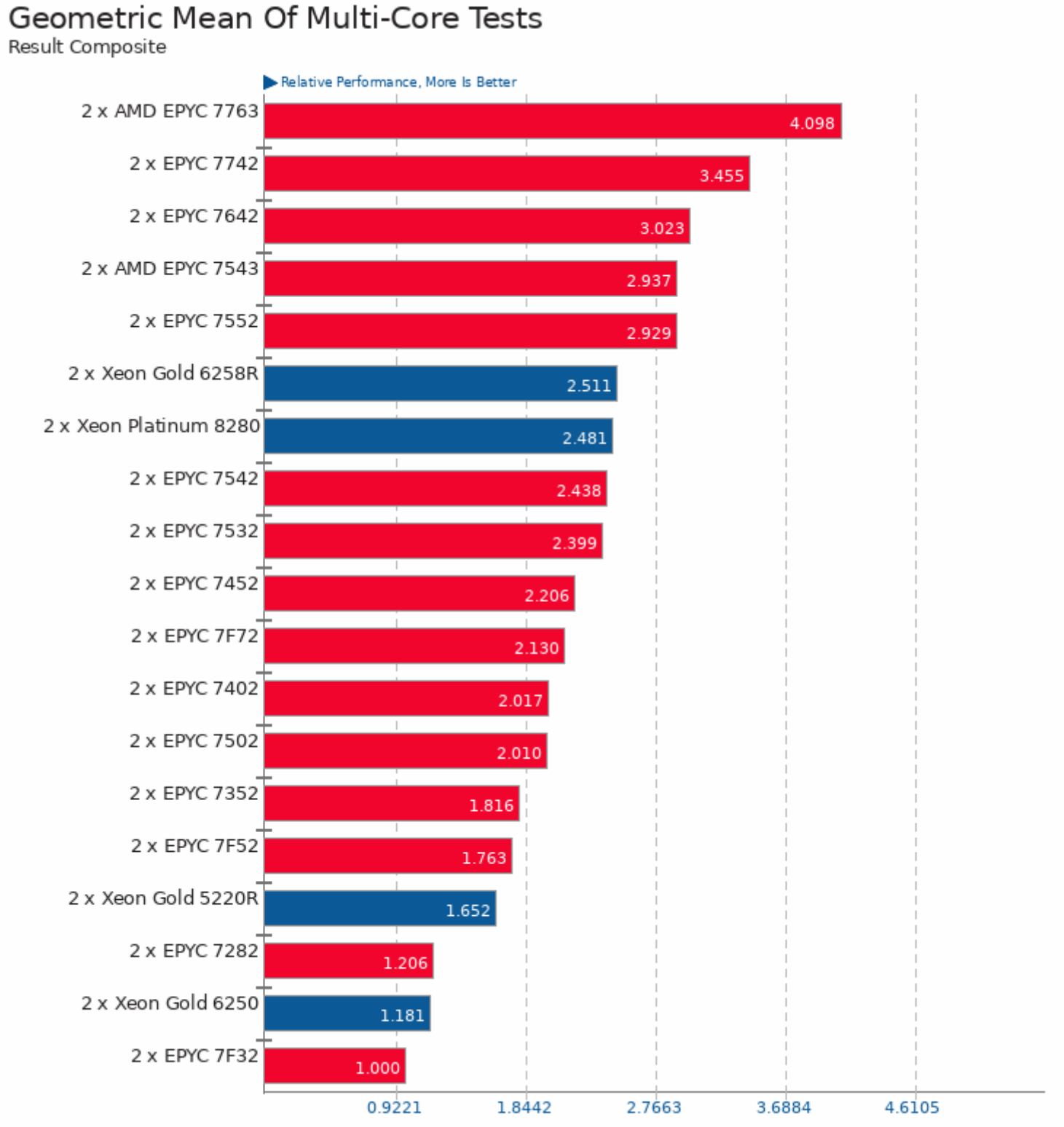
Geometric mean based upon tests: pts/build-llvm, pts/c-ray, pts/john-the-ripper and pts/openssl



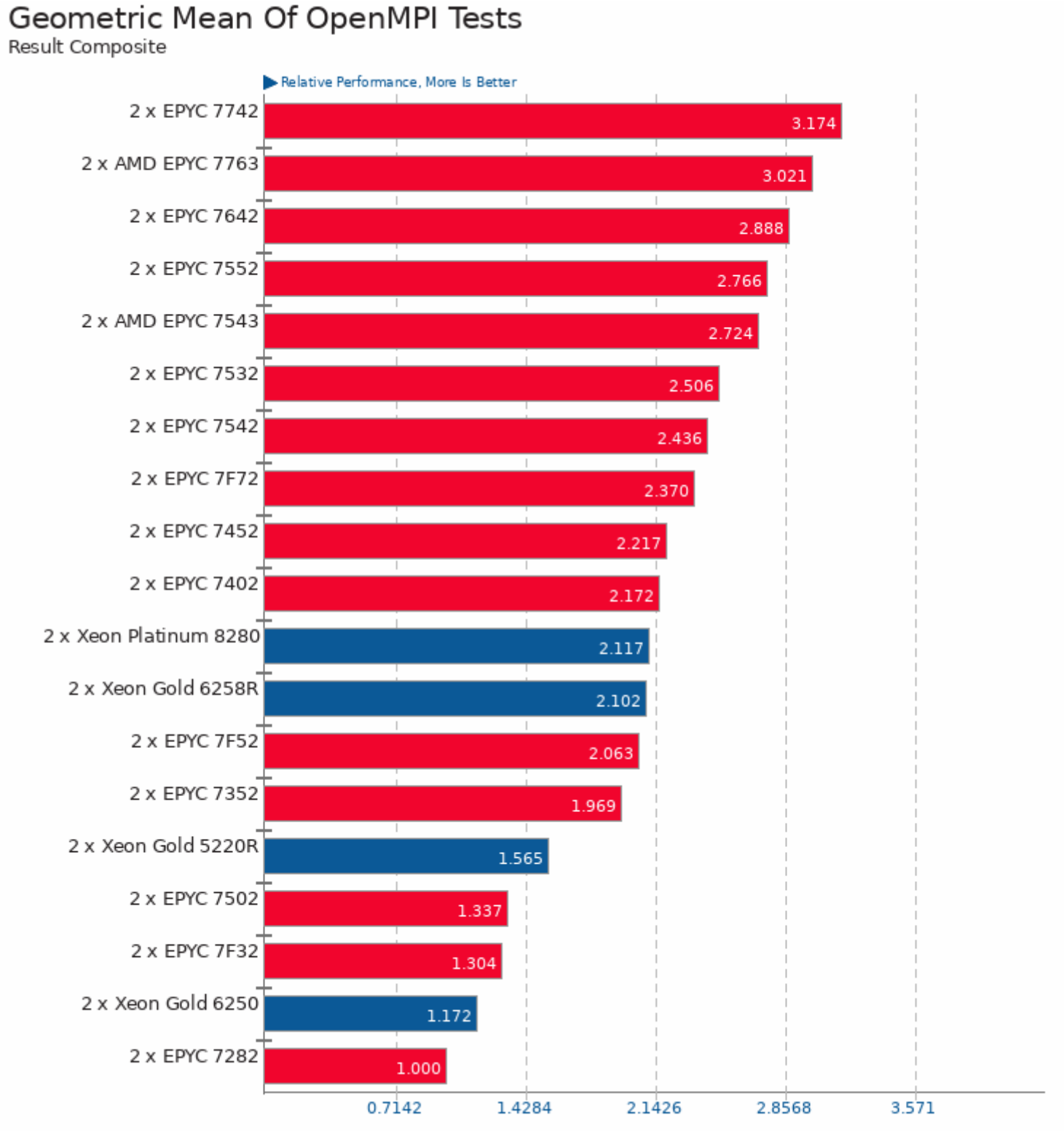
Geometric mean based upon tests: pts/openssl and pts/john-the-ripper



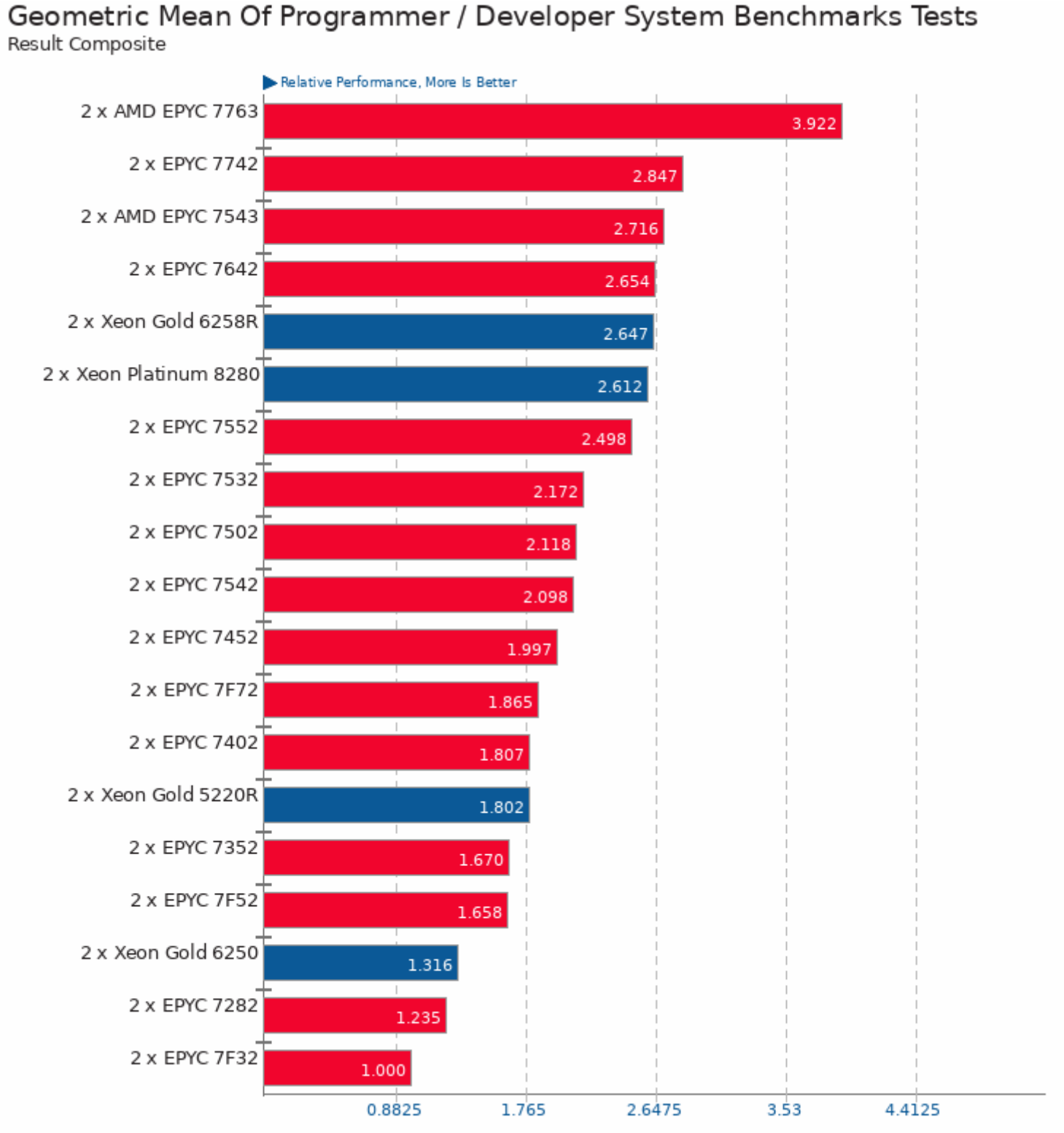
Geometric mean based upon tests: pts/rodinia, pts/hpcg and pts/mt-dgemm



Geometric mean based upon tests: pts/c-ray, pts/rodinia, pts/john-the-ripper, pts/mt-dgemm, pts/build-llvm and pts/hpcg



Geometric mean based upon tests: pts/hpcg and pts/rodinia



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

This file was automatically generated via the Phoronix Test Suite benchmarking software on Sunday, 14 March 2021 21:49.