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Large Intel AMD Linux CPU Benchmark Comparison vs. Amazon EC2 Cloud

Large CPU comparison versus various Amazon EC2 cloud public on-demand instance types. Tests being worked on by Michael Larabel for a future article.

Automated Executive Summary

c5.18xlarge had the most wins, coming in first place for 52% of the tests.

Based on the geometric mean of all complete results, the fastest (2 x Xeon Gold 6138) was 15.057x the speed of the slowest (m5.large).

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

POV-Ray (Performance / Cost - Trace Time) at 95.66x
OpenSSL (RSA 4096-bit Performance) at 53.216x
C-Ray (Total Time) at 48.43x
Rodinia (Performance / Cost - Test: OpenMP LavaMD) at 42.358x
Parboil (Test: OpenMP CUTCP) at 41.732x
NAS Parallel Benchmarks (Test / Class: EP.C) at 41.2x
NAS Parallel Benchmarks (Performance / Cost - Test / Class: EP.C) at 41.2x
John The Ripper (Test: Blowfish) at 38.608x
Java JMH (Throughput) at 38.335x

Rodinia (Test: OpenMP LavaMD) at 36.406x.

Test Systems:

Ryzen 3 1200

Processor: AMD Ryzen 3 1200 @ 3.10GHz (4 Cores), Motherboard: MSI B350M GAMING PRO (MS-7A39) v1.0 (2.90 BIOS), Chipset: AMD Device 1450, Memory: 8192MB, Disk: 525GB SABRENT + 120GB ADATA SU700, Graphics: AMD FirePro V3800 512MB, Audio: AMD Redwood HDMI Audio, Monitor: DELL S2409W, Network: Realtek RTL8111/8168/8411

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Server: Wayland, Display Driver: modesetting 1.19.5, OpenGL: 3.3 Mesa 17.2.4 (LLVM 5.0.0), Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: __user pointer sanitization + Full AMD retpoline Protection

Ryzen 3 1300X

Processor: AMD Ryzen 3 1300X @ 3.50GHz (4 Cores), Motherboard: ASRock AB350 Pro4 (P3.20 BIOS), Chipset: AMD Device 1450, Memory: 8192MB, Disk: 525GB SABRENT + 128GB ADATA SU800, Graphics: Sapphire AMD Radeon R7 260X/360 2048MB, Audio: AMD Tobago HDMI Audio, Monitor: VE228, Network: Realtek RTL8111/8168/8411

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Server: Wayland, Display Driver: modesetting 1.19.5, OpenGL: 4.5 Mesa 17.2.4 (LLVM 5.0.0), Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: __user pointer sanitization + Full AMD retpoline Protection

Ryzen 3 2200G

Processor: AMD Ryzen 3 2200G @ 3.50GHz (4 Cores), Motherboard: MSI X370 XPOWER GAMING TITANIUM (MS-7A31) v1.0 (1.C0 BIOS), Chipset: AMD Device 15d0, Memory: 14336MB, Disk: 525GB SABRENT + 525GB Crucial_CT525MX3 + 120GB Force MP500, Graphics: llvmpipe 14080MB, Audio: AMD Device 15de, Network: Intel I211 Gigabit Connection

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Driver: modesetting

1.19.5, OpenGL: 3.3 Mesa 18.1.0-devel- padoka PPA (LLVM 7.0 128 bits), Vulkan: 1.0.61, Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: __user pointer sanitization + Full AMD retpoline IBPB Protection

Ryzen 5 2400G

Processor: AMD Ryzen 5 2400G @ 3.60GHz (4 Cores / 8 Threads), Motherboard: MSI X370 XPOWER GAMING TITANIUM (MS-7A31) v1.0 (1.C0 BIOS), Chipset: AMD Device 15d0, Memory: 14336MB, Disk: 525GB SABRENT + 525GB Crucial_CT525MX3 + 120GB Force MP500, Graphics: llvmpipe 14080MB, Audio: AMD Device 15de, Network: Intel I211 Gigabit Connection

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Driver: modesetting 1.19.5, OpenGL: 3.3 Mesa 18.1.0-devel- padoka PPA (LLVM 7.0 128 bits), Vulkan: 1.0.61, Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: __user pointer sanitization + Full AMD retpoline IBPB Protection

Ryzen 7 1700

Processor: AMD Ryzen 7 1700 Eight-Core @ 3.00GHz (8 Cores / 16 Threads), Motherboard: MSI B350 TOMAHAWK (MS-7A34) v1.0 (1.90 BIOS), Chipset: AMD Device 1450, Memory: 16384MB, Disk: 525GB SABRENT + 120GB Samsung SSD 840, Graphics: llvmpipe 16128MB, Audio: AMD Cape Verde/Pitcairn, Network: Realtek RTL8111/8168/8411

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Driver: modesetting 1.19.5, OpenGL: 3.3 Mesa 17.2.4 (LLVM 5.0 128 bits), Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1280x1024

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: __user pointer sanitization + Full AMD retpoline Protection

Ryzen 7 1800X

Processor: AMD Ryzen 7 1800X Eight-Core @ 3.60GHz (8 Cores / 16 Threads), Motherboard: MSI X370 XPOWER GAMING TITANIUM (MS-7A31) v1.0 (1.90 BIOS), Chipset: AMD Device 1450, Memory: 16384MB, Disk: 525GB SABRENT, Graphics: NV134 8192MB, Audio: NVIDIA GP104 HD Audio, Monitor: DELL P2415Q, Network: Intel I211 Gigabit Connection

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Server: Wayland, Display Driver: modesetting 1.19.5, OpenGL: 4.3 Mesa 17.2.4, Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: __user pointer sanitization + Full AMD retpoline Protection

Threadripper 1950X

Processor: AMD Ryzen Threadripper 1950X 16-Core @ 3.40GHz (16 Cores / 32 Threads), Motherboard: Gigabyte X399 AORUS Gaming 7 (F3g BIOS), Chipset: AMD Device 1450, Memory: 16384MB, Disk: 525GB SABRENT + 120GB Force MP500, Graphics: MSI AMD Radeon R7 370 / R9 270/370 OEM 4096MB, Audio: Realtek ALC1220, Monitor: VE228, Network: Qualcomm Atheros Device e0b1 + Intel Wireless 8265 / 8275

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Server: Wayland, Display Driver: modesetting 1.19.5, OpenGL: 4.5 Mesa 17.2.4 (LLVM 5.0.0), Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: __user pointer sanitization + Full AMD retpoline Protection

EPYC 7601

Processor: AMD EPYC 7601 32-Core @ 2.20GHz (32 Cores / 64 Threads), Motherboard: TYAN B8026T70AE24HR (V0.05.B10 BIOS), Chipset: AMD Device 1450, Memory: 129024MB, Disk: 525GB SABRENT + 280GB INTEL SSDPE21D280GA, Graphics: ASPEED ASPEED Family, Monitor: VE228, Network: Broadcom Limited NetXtreme BCM5720 Gigabit PCIe

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Driver: modesetting 1.19.5, Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: __user pointer sanitization + Full AMD retpoline Protection

Core i3 8100

Processor: Intel Core i3-8100 @ 3.60GHz (4 Cores), Motherboard: ASRock Z370M-ITX/ac (P1.20 BIOS), Chipset: Intel Device 3e1f, Memory: 8192MB, Disk: 525GB SABRENT + 60GB DREVO X1 SSD, Graphics: Intel HD 3072MB (1100MHz), Audio: Realtek ALC892, Monitor: DELL S2409W, Network: Intel Connection + Intel Device 24fb

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Server: Wayland,

Display Driver: modesetting 1.19.5, OpenGL: 4.5 Mesa 17.2.4, Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

Core i5 7600K

Processor: Intel Core i5-7600K @ 4.20GHz (4 Cores), Motherboard: Gigabyte Z270M-D3H-CF (F1 BIOS), Chipset: Intel Device 591f + Z270, Memory: 8192MB, Disk: 250GB Samsung SSD 850 + 525GB SABRENT, Graphics: Intel HD 630 3072MB (1150MHz), Audio: Realtek ALC892, Monitor: DELL S2409W, Network: Intel Connection

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Server: Wayland, Display Driver: modesetting 1.19.5, OpenGL: 4.5 Mesa 17.2.4, Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

Core i5 8400

Processor: Intel Core i5-8400 @ 4.00GHz (6 Cores), Motherboard: MSI Z370M MORTAR (MS-7B54) v1.0 (1.10 BIOS), Chipset: Intel Device 3ec2, Memory: 8192MB, Disk: 525GB SABRENT + 128GB ADATA SX6000NP, Graphics: Intel HD 3072MB (1050MHz), Audio: Realtek ALC892, Monitor: DELL S2409W, Network: Intel Connection

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Server: Wayland, Display Driver: modesetting 1.19.5, OpenGL: 4.5 Mesa 17.2.4, Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

Core i7 4770K

Processor: Intel Core i7-4770K @ 3.90GHz (4 Cores / 8 Threads), Motherboard: Gigabyte Z97-HD3 (F10c BIOS), Chipset: Intel 4th Gen Core DRAM, Memory: 8192MB, Disk: 128GB Crucial_CT128MX1 + 525GB SABRENT, Graphics: Intel Haswell Desktop 1536MB (1250MHz), Audio: Intel Xeon E3-1200 v3/4th, Monitor: DELL S2409W, Network: Realtek RTL8111/8168/8411

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Server: Wayland, Display Driver: modesetting 1.19.5, OpenGL: 4.5 Mesa 17.2.4, Compiler: GCC 7.2.0, File-System: ext4, Screen

Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

Core i7 5960X

Processor: Intel Core i7-5960X @ 3.50GHz (8 Cores / 16 Threads), Motherboard: ASRock X99 Extreme3 (P3.50 BIOS), Chipset: Intel Xeon E7 v3/Xeon, Memory: 16384MB, Disk: 120GB INTEL SSDSC2BW12 + 525GB SABRENT, Graphics: AMD FirePro V7900 2048MB, Audio: Realtek ALC1150, Monitor: DELL S2409W, Network: Intel Connection

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Server: Wayland, Display Driver: modesetting 1.19.5, OpenGL: 4.1 Mesa 17.2.4 (LLVM 5.0.0), Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

Core i7 7740X

Processor: Intel Core i7-7740K @ 4.50GHz (4 Cores / 8 Threads), Motherboard: Gigabyte X299 AORUS Gaming-CF (F2d BIOS), Chipset: Intel Device 591f, Memory: 8192MB, Disk: 525GB SABRENT + 120GB Force MP500, Graphics: llvmpipe 7936MB, Audio: Realtek ALC1220, Monitor: VE228, Network: Intel Connection

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Server: Wayland, Display Driver: modesetting 1.19.5, OpenGL: 3.3 Mesa 17.2.4 (LLVM 5.0 256 bits), Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

Core i7 8700K

Processor: Intel Core i7-8700K @ 4.70GHz (6 Cores / 12 Threads), Motherboard: ASUS PRIME Z370-A (0606 BIOS), Chipset: Intel Device 3ec2, Memory: 16384MB, Disk: 525GB SABRENT + 525GB Crucial_CT525MX3 + Samsung SSD 950 PRO 256GB, Graphics: MSI AMD Radeon RX 580 8192MB, Audio: Realtek ALC1220, Monitor: DELL P2415Q, Network: Intel Connection

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Server: Wayland, OpenGL: 4.5 Mesa 17.2.4 (LLVM 5.0.0), Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie

--enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

Core i9 7980XE

Processor: Intel Core i9-7980XE @ 4.40GHz (18 Cores / 36 Threads), Motherboard: ASUS PRIME X299-A (1004 BIOS), Chipset: Intel Device 2020, Memory: 16384MB, Disk: 525GB SABRENT + 256GB INTEL SSDPEKKW256G8, Graphics: NV117 1024MB, Audio: Realtek ALC1220, Monitor: Acer B286HK, Network: Intel Connection

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Server: Wayland, OpenGL: 4.3 Mesa 17.2.4, Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

Xeon Silver 4108

Processor: Intel Xeon Silver 4108 @ 3.00GHz (8 Cores / 16 Threads), Motherboard: TYAN S7100AG2NR (V3.00 BIOS), Chipset: Intel Device 2020, Memory: 23552MB, Disk: 525GB SABRENT + 240GB Force MP500, Graphics: ASPEED ASPEED Family, Audio: Realtek ALC892, Monitor: VE228, Network: Intel I350 Gigabit Connection

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Driver: modesetting 1.19.5, Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

2 x Xeon Gold 6138

Processor: 2 x Intel Xeon Gold 6138 @ 3.70GHz (40 Cores / 80 Threads), Motherboard: TYAN S7106 (V1.00 BIOS), Chipset: Intel Device 2020, Memory: 96256MB, Disk: 525GB SABRENT + 256GB Samsung SSD 850 + 2000GB Seagate ST2000DM006-2DM1 + 2 x 120GB TOSHIBA-TR150, Graphics: ASPEED ASPEED Family, Monitor: VE228, Network: Intel I210 Gigabit Connection

OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Driver: modesetting 1.19.5, Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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
Python Notes: Python 2.7.14 + Python 3.6.3
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

t2.2xlarge

Processor: Intel Xeon E5-2676 v3 @ 2.39GHz (8 Cores), Motherboard: Xen HVM domU (4.2.amazon BIOS), Chipset: Intel 440FX- 82441FX PMC, Memory: 32768MB, Disk: 28GB, Graphics: Cirrus Logic GD 5446

OS: Ubuntu 16.04, Kernel: 4.4.0-1050-aws (x86_64), Compiler: GCC 5.4.0 20160609, File-System: ext4, System Layer: Xen HVM domU 4.2.amazon

Compiler Notes: --build=x86_64-linux-gnu --disable-browser-plugin --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-arch-directory=amd64 --with-default-libstdcxx-abi=new --with-multilib-list=m32,m64,mx32 --with-tune=generic -v
Python Notes: Python 2.7.12 + Python 3.5.2
Security Notes: KPTI Protection

m5.4xlarge

Processor: Intel Xeon Platinum 8175M @ 2.50GHz (8 Cores / 16 Threads), Motherboard: Amazon EC2 m5.4xlarge (1.0 BIOS), Chipset: Intel 440FX- 82441FX PMC, Memory: 63488MB, Disk: 30GB Amazon Elastic Block Store, Network: Device 1d0f:ec20

OS: Ubuntu 16.04, Kernel: 4.4.0-1050-aws (x86_64), Compiler: GCC 5.4.0 20160609, File-System: ext4, System Layer: KVM

Kernel Notes: nvme.io_timeout=4294967295
Compiler Notes: --build=x86_64-linux-gnu --disable-browser-plugin --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-arch-directory=amd64 --with-default-libstdcxx-abi=new --with-multilib-list=m32,m64,mx32 --with-tune=generic -v
Python Notes: Python 2.7.12 + Python 3.5.2
Security Notes: KPTI Protection

m5.12xlarge

Processor: Intel Xeon Platinum 8175M @ 2.50GHz (24 Cores / 48 Threads), Motherboard: Amazon EC2 m5.12xlarge (1.0 BIOS), Chipset: Intel 440FX- 82441FX PMC, Memory: 189440MB, Disk: 30GB Amazon Elastic Block Store, Network: Device 1d0f:ec20

OS: Ubuntu 16.04, Kernel: 4.4.0-1050-aws (x86_64), Compiler: GCC 5.4.0 20160609, File-System: ext4, System Layer: KVM

Kernel Notes: nvme.io_timeout=4294967295
Compiler Notes: --build=x86_64-linux-gnu --disable-browser-plugin --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-arch-directory=amd64 --with-default-libstdcxx-abi=new --with-multilib-list=m32,m64,mx32 --with-tune=generic -v
Python Notes: Python 2.7.12 + Python 3.5.2
Security Notes: KPTI Protection

c5.9xlarge

Processor: Intel Xeon Platinum 8124M @ 3.00GHz (18 Cores / 36 Threads), Motherboard: Amazon EC2 c5.9xlarge (1.0 BIOS), Chipset: Intel 440FX- 82441FX PMC, Memory: 70656MB, Disk: 30GB Amazon Elastic Block Store, Network: Device 1d0f:ec20

OS: Ubuntu 16.04, Kernel: 4.4.0-1050-aws (x86_64), Compiler: GCC 5.4.0 20160609, File-System: ext4, System Layer: KVM

Kernel Notes: nvme.io_timeout=4294967295
Compiler Notes: --build=x86_64-linux-gnu --disable-browser-plugin --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-arch-directory=amd64 --with-default-libstdcxx-abi=new --with-multilib-list=m32,m64,mx32 --with-tune=generic -v
Python Notes: Python 2.7.12 + Python 3.5.2
Security Notes: KPTI Protection

c5.18xlarge

Processor: 2 x Intel Xeon Platinum 8124M @ 3.00GHz (36 Cores / 72 Threads), Motherboard: Amazon EC2 c5.18xlarge (1.0 BIOS), Chipset: Intel 440FX- 82441FX PMC, Memory: 141312MB, Disk: 30GB Amazon Elastic Block Store, Network: Device 1d0f:ec20

OS: Ubuntu 16.04, Kernel: 4.4.0-1050-aws (x86_64), Compiler: GCC 5.4.0 20160609, File-System: ext4, System Layer: KVM

Kernel Notes: nvme.io_timeout=4294967295
Compiler Notes: --build=x86_64-linux-gnu --disable-browser-plugin --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-arch-directory=amd64 --with-default-libstdcxx-abi=new --with-multilib-list=m32,m64,mx32 --with-tune=generic -v
Python Notes: Python 2.7.12 + Python 3.5.2
Security Notes: KPTI Protection

m4.16xlarge

Processor: 2 x Intel Xeon E5-2686 v4 @ 3.00GHz (32 Cores / 64 Threads), Motherboard: Xen HVM domU (4.2.amazon BIOS), Chipset: Intel 440FX- 82441FX PMC, Memory: 258048MB, Disk: 28GB, Graphics: Cirrus Logic GD 5446, Network: Device 1d0f:ec20

OS: Ubuntu 16.04, Kernel: 4.4.0-1050-aws (x86_64), Compiler: GCC 5.4.0 20160609, File-System: ext4, System Layer: Xen HVM domU 4.2.amazon

Compiler Notes: --build=x86_64-linux-gnu --disable-browser-plugin --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-arch-directory=amd64 --with-default-libstdcxx-abi=new --with-multilib-list=m32,m64,mx32 --with-tune=generic -v
Processor Notes: Scaling Governor: intel_pstate powersave
Python Notes: Python 2.7.12 + Python 3.5.2
Security Notes: KPTI Protection

m5.large

Processor: Intel Xeon Platinum 8175M @ 2.50GHz (1 Core / 2 Threads), Motherboard: Amazon EC2 m5.large (1.0 BIOS), Chipset: Intel 440FX- 82441FX PMC, Memory: 8192MB, Disk: 30GB Amazon Elastic Block Store, Network: Device 1d0f:ec20

OS: Ubuntu 16.04, Kernel: 4.4.0-1050-aws (x86_64), Compiler: GCC 5.4.0 20160609, File-System: ext4, System Layer: KVM

Kernel Notes: nvme.io_timeout=4294967295
Compiler Notes: --build=x86_64-linux-gnu --disable-browser-plugin --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-arch-directory=amd64 --with-default-libstdcxx-abi=new --with-multilib-list=m32,m64,mx32 --with-tune=generic -v
Python Notes: Python 2.7.12 + Python 3.5.2
Security Notes: KPTI Protection

c4.8xlarge

Processor: 2 x Intel Xeon E5-2666 v3 @ 3.50GHz (18 Cores / 36 Threads), Motherboard: Xen HVM domU (4.2.amazon BIOS), Chipset: Intel 440FX- 82441FX PMC, Memory: 60416MB, Disk: 28GB, Graphics: Cirrus Logic GD 5446, Network: Intel 82599 Virtual Function

OS: Ubuntu 16.04, Kernel: 4.4.0-1050-aws (x86_64), Compiler: GCC 5.4.0 20160609, File-System: ext4, System Layer: Xen HVM domU 4.2.amazon

Compiler Notes: --build=x86_64-linux-gnu --disable-browser-plugin --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-arch-directory=amd64 --with-default-libstdcxx-abi=new --with-multilib-list=m32,m64,mx32 --with-tune=generic -v
Processor Notes: Scaling Governor: intel_pstate powersave
Python Notes: Python 2.7.12 + Python 3.5.2
Security Notes: KPTI Protection

m4.10xlarge

Processor: 2 x Intel Xeon E5-2676 v3 @ 3.00GHz (20 Cores / 40 Threads), Motherboard: Xen HVM domU (4.2.amazon BIOS), Chipset: Intel 440FX- 82441FX PMC, Memory: 161792MB, Disk: 28GB, Graphics: Cirrus Logic GD 5446, Network: Intel 82599 Virtual Function

OS: Ubuntu 16.04, Kernel: 4.4.0-1050-aws (x86_64), Compiler: GCC 5.4.0 20160609, File-System: ext4, System Layer: Xen HVM domU 4.2.amazon

Compiler Notes: --build=x86_64-linux-gnu --disable-browser-plugin --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-arch-directory=amd64 --with-default-libstdcxx-abi=new --with-multilib-list=m32,m64,mx32 --with-tune=generic -v
Processor Notes: Scaling Governor: intel_pstate powersave
Python Notes: Python 2.7.12 + Python 3.5.2
Security Notes: KPTI Protection

8 x Intel Xeon

Processor: 8 x Intel Xeon (Cascadelake) (8 Cores / 16 Threads), Motherboard: OpenStack Foundation Nova v21.1.0 (1.13.0-1ubuntu1 BIOS), Chipset: Intel 440FX 82441FX PMC, Memory: 2 x 16384 MB RAM QEMU, Disk: 97GB, Graphics: Cirrus Logic GD 5446, Network: Red Hat Virtio device

OS: Ubuntu 20.04, Kernel: 5.4.0-62-generic (x86_64), Compiler: GCC 9.3.0, File-System: ext4, System Layer: KVM

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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-9-HskZEa/gcc-9-9.3.0/debian/tmp-nvptx/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: CPU Microcode: 0x1
Java Notes: OpenJDK Runtime Environment (build 11.0.11+9-Ubuntu-0ubuntu2.20.04)
Python Notes: Python 3.8.5
Security Notes: itlb_multihit: KVM: Vulnerable + 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: Not affected

	Ryzen 3 1200	Ryzen 3 1300X	Ryzen 3 2200G	Ryzen 5 2400G	Ryzen 7 1700	Ryzen 7 1800X	Threadripper 1950X	EPYC 7601	Core i3 8100	Core i5 7600K	Core i5 8400	Core i7 4770K	Core i7 5960X	Core i7 7740X	Core i7 8700K	Core i9 7980XE	Xeon Silver 4108	2 x Xeon Gold 6138	t2.2xlarge	m5.4xlarge	m5.12xlarge	c5.9xlarge	c5.18xlarge	m4.16xlarge	m5.large	c4.8xlarge	m4.10xlarge	8 x Intel Xeon
7-Zip Compression - C.S.T (MIPS)	12601	15880	15744	17729	30627	33022	71592	95062	17221	17727	27028	21667	37236	28952	39039	91138	27888	131397	239917	364226	119926	919323	160822	115598	50990	78087	75762	267779
Normalized	7.84%	9.87%	9.79%	11.02%	19.04%	20.53%	44.52%	59.11%	10.71%	11.02%	16.81%	13.47%	23.15%	18%	24.27%	56.67%	17.34%	86.87%	14.87%	22.78%	70.08%	57.16%	10%	71.88%	3.16%	48.55%	47.11%	16.65%
Standard Deviation		1.8%	0.5%	3.3%	0.6%	1.5%	0.2%	0.6%	0.2%	0.3%	0.2%	1.3%	1.4%	2.9%	1%	0.5%	1.5%	2.6%	0.6%	1.3%	0.7%	0.4%	0.3%	0.7%	1%	0.8%	0.6%	1.5%
7-Zip Compression - Performance / Cost - C.S.T (MIPS/Dollar																			2391700	1832109	1698325	2298325	1462018	7706053		1561740	1082314	
Normalized																			10%	76.6%	67.32%	96.1%	61.13%	32.22%		65.3%	45.25%	
AOBench - 2048 x 2048 - Total Time (sec)																			62.18	65.48	66.21	58.70	58.42	64.56	65.51	55.39	67.24	38.374
Normalized																			61.71%	58.6%	57.96%	65.37%	65.69%	59.44%	58.58%	69.28%	57.07%	100%

Standard Deviation																			0.1%	0.4%	2.8%	1.1%	0.3%	2.8%	1.3%	0.4%	0.5%	0.1%
AOBench - Performance / Cost - 2048 x 2048 - Total Time (sec x																			1.24	2.62	8.61	4.70	8.76	11.62	0.66	4.43	7.40	
Normalized																			53.23%	25.19%	7.6%	14.04%	7.5%	5.6%	10%	14.9%	8.9%	
C-Ray - Total Time (sec)	24.95	21.50	21.07	19.48	11.23	9.70	5.16	3.47	24.65	22.25	15.57	24.51	13.97	18.69	12.78	5.46	19.69	3.14	16.52	29.48	9.94	11.00	5.72	4.16	15.07	6.09	6.46	12.485
Normalized	12.59%	14.6%	14.9%	16.12%	27.96%	32.37%	60.85%	90.49%	12.74%	14.11%	20.17%	12.81%	22.48%	16.8%	24.57%	57.51%	15.95%	100%	19.01%	10.65%	31.59%	28.55%	54.9%	75.48%	2.06%	51.56%	48.61%	25.15%
Standard Deviation	0.1%	0%	0.7%	1.4%	0%	0.1%	0.1%	0.7%	0.1%	0.1%	0.1%	0.1%	0.2%	1.5%	0.1%	0.3%	0.1%	0.2%	0%	0.2%	0.2%	0.1%	0.2%	0.2%	6.5%	0.2%	0.4%	0.3%
C-Ray - Performance / Cost - Total Time (sec x																			0.17	0.59	0.20	0.22	0.11	0.08	1.52	0.06	0.06	
Normalized																			35.29%	10.17%	30%	27.27%	54.55%	75%	3.95%	10%	10%	

Large Intel AMD Linux CPU Benchmark Comparison vs. Amazon EC2 Cloud

| | | |

Java JMH - Performance / Cost - Throughput (Ops/s/Dollar)																				10 54 35 77 59 68	27 16 38 25 55 99	27 43 93 82 79 78	33 85 60 49 47 00	33 84 16 41 99 47	22 10 58 74 71 13	31 78 03 61 99 44	31 44 63 47 83 86	22 96 58 18 10 96
Normalized																				31.14%	80.23%	81.05%	100%	99.96%	65.29%	93.87%	92.88%	67.83%
John The Ripper - Blowfish (Real C/S)	37 11	43 93	45 40	60 22	10 43 1	12 44 5	23 00 1	23 55 2	44 11	49 10	69 98	68 00	11 71 0	88 80	12 75 8	30 10 4	82 75	50 24 8	60 67	12 09 4	37 06 9	30 59 3	60 30 5	39 09 1	15 62	25 34 1	23 63 2	39 19
Normalized	6.15%	7.28%	7.53%	9.99%	17.43%	20.64%	38.14%	39.05%	7.31%	8.14%	11.46%	11.28%	19.42%	14.73%	21.16%	49.92%	13.72%	83.32%	10.06	20.05%	61.47%	50.73%	100%	64.82%	2.59%	42.02%	39.19%	6.5%
Standard Deviation	0.8%	0.3%	0.2%	3.9%	0.8%	0.1%	2%	0.5%	0.2%			3.2%	0%			0%		1.9%		0.3%	0.2%	0.1%	0.1%	0.9%	2.6%	0.3%	0.1%	1.7%

John The Ripper - Performance / Cost - Blowfish (Real C/S/Dollar)																				30	30	28	33	35	21	15	28	21
																				33	23	51	99	47	71	62	15	48
																				50	50	46	22	35	72	00	67	36
Normalized																				85.51%	85.23%	80.38%	95.82%	10 0%	61.22%	44.03%	79.37%	60.56%
LAME MP3 Encoding - WAV To MP3 (sec)	39.68	35.78	37.13	35.19	36.59	33.50	33.75	42.07	33.30	28.77	30.01	32.54	36.18	27.50	26.07	28.50	39.00	32.33	42.12	43.90	43.57	35.26	35.62	45.22	41.09	37.62	45.51	33.94
Normalized	65.7%	72.86%	70.21%	74.08%	71.25%	77.82%	77.24%	60.95%	78.29%	90.62%	86.87%	80.12%	72.06%	94.8%	10 0%	91.47%	65.34%	80.64%	61.89%	59.38%	59.83%	73.17%	73.19%	57.65%	63.45%	69.3%	57.28%	78.78%
Standard Deviation	0.1%	0.3%	0.2%	0.1%	0%	0.8%	0.9%	0%	0%	0.1%	0%	0.4%	0.2%	0.8%	1.3%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0%	0.7%	7.2%	0.2%	0.3%	0.1%

LAME MP3 Encoding - Performance / Cost - WAV To MP3 (sec x																				**0.42**	1.32	3.92	1.78	3.21	**5.43**		1.88	3.64
Normalized																				10.00%	31.82%	10.71%	23.6%	13.08%	7.73%		22.34%	11.54%
NAS Parallel Benchmarks - EP.C (Mop/s)	12.00	14.62	14.02	29.90	48.65	57.10	10.90	16.23	20.48	22.62	32.50	33.54	56.87	39.63	57.05	12.68	31.97	19.99	14.20	45.35	13.85	12.56	**25.13**	10.35	**60.99**	67.14	62.62
Normalized	4.8%	5.6%	5.7%	11.7%	19.49	22.73	43.39	64.58	8.0%	8.9%	12.79	13.19	22.48	15.7%	22.96	50.45	12.73	79.55	5.8%	18.28	55.14	49.99	10.0%	41.19	2.4%	26.79	24.98
Standard Deviation	0.5%	0.1%	0.3%	1%	2.5%	0.4%	0.5%	0.6%	0.3%	0.2%	0.1%	1%	0.2%	1.1%	0.6%	0.9%	0.4%	1.1%	0.1%	0.4%	0.2%	2.7%	2%	0.2%	8.6%	0.9%	0.3%

NAS Parallel Benchmarks - Performance / Cost - EP.C (Mop/s/Doll																			7310	4593	6927	1256	**2512**	3449	**6099**	3365	2092
Normalized																			2.91%	18.285%	27.575%	49.999%	100%	13.739%	2.43%	13.397%	8.33%
NGINX Benchmark - S.W.P.S (Reqs/sec)	29145	32633	33162	33045	29820	32964	31819	24020	36131	40483	40533	36374	28745	**45476**	44916	42184	31670	30959	18175	20161	25555	29996	24619	21411	**12133**	23091	21579	37951
Normalized	64.09%	71.76%	73.93%	73.55%	65.57%	72.49%	68.6%	52.82%	79.85%	89.02%	89.13%	79.98%	62.58%	100%	98.77%	94.21%	69.64%	68.08%	39.97%	44.33%	56.2%	65.97%	54.14%	47.08%	26.68%	50.78%	47.45%	82.75%
Standard Deviation	1.7%	0.2%			1.2%	0.1%	0.5%	0.8%	0.6%	1.6%	0.5%	0.4%	2.4%	1.1%	3.3%	2%	0.3%	0.9%	7.6%	0.8%	1%	0.3%	0.6%	2.3%	2.7%	3.4%	0.8%	9.7%

NGINX Benchmark - Performance / Cost - S.W.P.S (Reqs/sec/Dollar)																			45	28	15	33	11	79	12	19	12
																			43	80	97	33	19	29	13	24	69
																			81	10	20	22	06	8	25	23	37
																									1		
Normalized																			37.45%	23.74%	13.16%	27.47%	9.2%	6.4%	10%	15.86%	10.46%
Open FMM Nero2D - Total Time (sec)	10	94	92	90	57	50	30	26	92	83	61	98	60	76	54	27	86	21	87	11	48	60	32	26	53	36	41
	9.59	.3	.0	.5	.4	.1	.1	.1	.6	.9	.0	.2	.1	.3	.9	.9	.8	.4	.0	5.	.7	.1	.1	.1	4.	.9	.1
	59	9	9	6	8	5	6	5	1	8	4	1	3	6	8	9	4	4	4	44	8	5	9	3	08	1	8
Normalized	19.56%	22.71%	23.28%	23.67%	37.3%	42.75%	71.09%	81.99%	23.15%	25.53%	35.12%	21.83%	35.66%	28.08%	39%	76.6%	24.69%	10.0%	24.63%	18.57%	43.95%	35.64%	66.6%	82.05%	4.01%	58.09%	52.06%
Standard Deviation	0.3%	0.1%	0.3%	1%	0.5%	1.1%	3.3%	3%	0.7%	0.7%	1.2%	0.6%	0.7%	0.5%	1%	0.6%	0.4%	4.1%	0.8%	7.5%	28.1%	2.8%	26%	0.9%	2.9%	0.6%	3.4%

Open FMM Nero2D - Performance / Cost - Total Time (sec x																	2.61	8.08	4.88	4.81	2.90	1.83	21.36	1.85	2.88
Normalized																	70.11%	22.65%	37.5%	38.05%	63.1%	100%	8.57%	98.92%	63.54%
Open SSL - R.4.b.P (Signs /sec)	710.53	734.20	793.80	1380	1593	3021	4567	1043	1148	1671	689.30	1203	1313	1980	4695	1285	1858	174.83	1861	1669	1972	9304	639	2.00	2480	1911
Normalized	7.64%	7.89%	8.53%	14.83%	17.12	32.47%	49.09%	11.21%	12.34%	17.96%	7.41%	12.93%	14.11%	21.28%	50.47%	13.82%	84.46%	1.88%	20%	60.93%	50.21%	100%	42.59%	2.6%	27.73%	25.91%
Standard Deviation	6.4%	1.1%	2.1%	0.1%	0.1%	0.2%	0.9%	2.2%	2.8%	0%	0.1%	0%	2.7%	0.1%	0.2%	0.3%	0.6%	1.4%	0.2%	0.4%	0%	0.4%	0.2%	0.7%	0.2%	0.1%
Open SSL - Performance / Cost - R.4.b.P (Signs /sec/Dollar)																	1748.3	1860.93	1417.28	1557.17	1550.61	6605.04		8598.6	6026.4
Normalized																	9.39%	100%	76.16%	83.68%	83.32%	35.49%		46.21%	32.38%

Large Intel AMD Linux CPU Benchmark Comparison vs. Amazon EC2 Cloud

Parboil - OpenMP CUTCP (sec)	17.36	15.03	15.64	11.34	6.49	5.58	3.24	2.63	14.95	13.46	9.47	12.99	7.83	10.13	7.08	3.28	10.99	**2.35**	11.46	16.11	5.80	6.17	3.75	3.18	**98.07**	4.39	4.63
Normalized	13.54%	15.64%	15.03%	20.72%	36.21%	42.11%	72.53%	89.35%	15.72%	17.46%	24.82%	18.09%	30.01%	23.2%	33.19%	71.65%	21.38%	100%	20.51%	14.59%	40.52%	38.09%	62.67%	73.9%	2.4%	53.53%	50.76%
Standard Deviation	0.4%	0.1%	0.7%	0.6%	0.7%	0.4%	0.4%	1%	0%	0.2%	0.1%	1%	0.3%	1.7%	0.3%	0.4%	0.3%	1.1%	0%	0.4%	1.2%	0.4%	2.2%	3.1%	0.8%	1.7%	1.5%
Parboil - Performance / Cost - OpenMP CUTCP (sec x Dollar																				0.16	0.06	0.06	0.04	**0.03**	**0.98**	0.04	0.05
Normalized																				18.75%	50%	50%	75%	10.0%	3.06%	75%	60%
POV-Ray - Trace Time (sec)	18.19	15.29	15.63	10.39	64.0	56.1	30.0	21.7	13.02	12.90	87.4	13.09	70.7	87.4	60.6	32.5	19.83	25.0	56.33	87.0	29.7	32.5	**17.4**	24.2	**61.28**	35.8	37.4	73.79
Normalized	9.79%	11.35%	11.55%	16.52%	27.55%	31.56%	58.55%	80.75%	12.76%	14.09%	20.17%	13.53%	25.17%	20.1%	29.1%	54.17%	9.06%	69.03%	3.15%	20.37%	59.39%	54.84%	100%	73.55%	2.87%	50.57%	47.38%	23.98%
Standard Deviation	0.1%	0.2%	0.4%	0.3%	0%	0.1%	0.3%	0.6%	0.1%	0.9%	0.1%	0.2%	0.2%	0.1%	0.2%	0.6%	0.4%	17.3%	9%	0.3%	0.2%	0.9%	1.3%	0.5%	11.4%	0.7%	0.1%	2%

Large Intel AMD Linux CPU Benchmark Comparison vs. Amazon EC2 Cloud

POV-Ray - Performance / Cost - Trace Time (sec x Dollar																			101.40	5.23	2.09	1.62	1.06	1.93	30.86	1.75	2.62
Normalized																			1.05%	20.27%	50.72%	65.43%	100%	54.92%	3.43%	60.57%	40.46%
PyBench - T.F.A.T.T (Milliseconds	16	14	15	14	15	13	14	17	13	11	12	13	15	10	10	11	16	13	18	16	16	14	14	19	15	16	19
	55	98	47	58	18	95	20	81	40	49	09	56	14	75	31	50	15	07	37	37	04	59	53	92	59	43	87
Normalized	62.3%	68.83%	66.65	70.71	67.92	73.91	72.61	57.89	76.94	89.73	85.28	76.03	68.1%	95.91	100%	89.65	63.84	78.88	56.12	62.98	64.28	70.66	70.96	51.76	66.13	62.75	51.89
Standard Deviation	0.1%	0.3%	0.9%	0.2%	0.2%	0.4%	1.3%		0.1%		0.4%	0.2%	0.2%	0.1%	0.2%	0.1%		0.3%	0.5%	0.9%	1.2%	0.5%	0.9%	0.5%	0.2%	0.6%	
PyBench - Performance / Cost - T.F.A.T.T (Milliseconds x Dollar																			18.37	32.74	11.28	58.6	13.77	23.04		82.5	15.96
Normalized																			100%	56.11%	16.36%	31.48%	14.05%	7.68%		22.36%	11.56%

Large Intel AMD Linux CPU Benchmark Comparison vs. Amazon EC2 Cloud

PyBench - T.F.A. T.T (Milliseconds)																			20044	17792	17707	16607	16109	**22239**	17021	18919	22525	**11186**
Normalized																			58.02%	66.18%	66.74%	73.8%	73.71%	52.97%	68.91%	65.2%	53.3%	100%
Standard Deviation																			0%	0.4%	0.4%	0.4%	0.4%	0.2%	1.5%	0.8%	0.3%	0.2%
PyBench - Performance / Cost - T.F.A. T.T (Milliseconds x Dollars)																			**20.44**	53.7	14.216	80.35	16.090	**31.46**		10.919	20.14	
Normalized																			10%	38.02%	14.38%	25.44%	12.7%	6.52%		18.73%	10.21%	
Rodinia - OpenMP LavaMD (sec)	25	22	21	16	95	82	45	31	22	20	14	19	11	15	10	46	17	28	21	11	39	44	**22.7**	34.1	**82.97**	52.7	56.5	74.3
Normalized	8.8%	10.2%	10.49%	14.21%	23.93%	27.64%	49.55%	72.1%	10.07%	11.2%	15.91%	11.42%	19.91%	14.75%	21.24%	48.82%	13.33%	79.84%	10.66%	19.77%	57.6%	51.1%	10%	66.77%	2.75%	43.13%	40.24%	30.62%
Standard Deviation	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	2.1%	1.5%	0%	0.1%	0.1%	0%	0.4%	0.9%	0.1%	0.3%	0.6%	1.9%	0%	3.3%	3.5%	1.3%	1.2%	0.2%	1.6%	0.4%	0.1%	0.3%

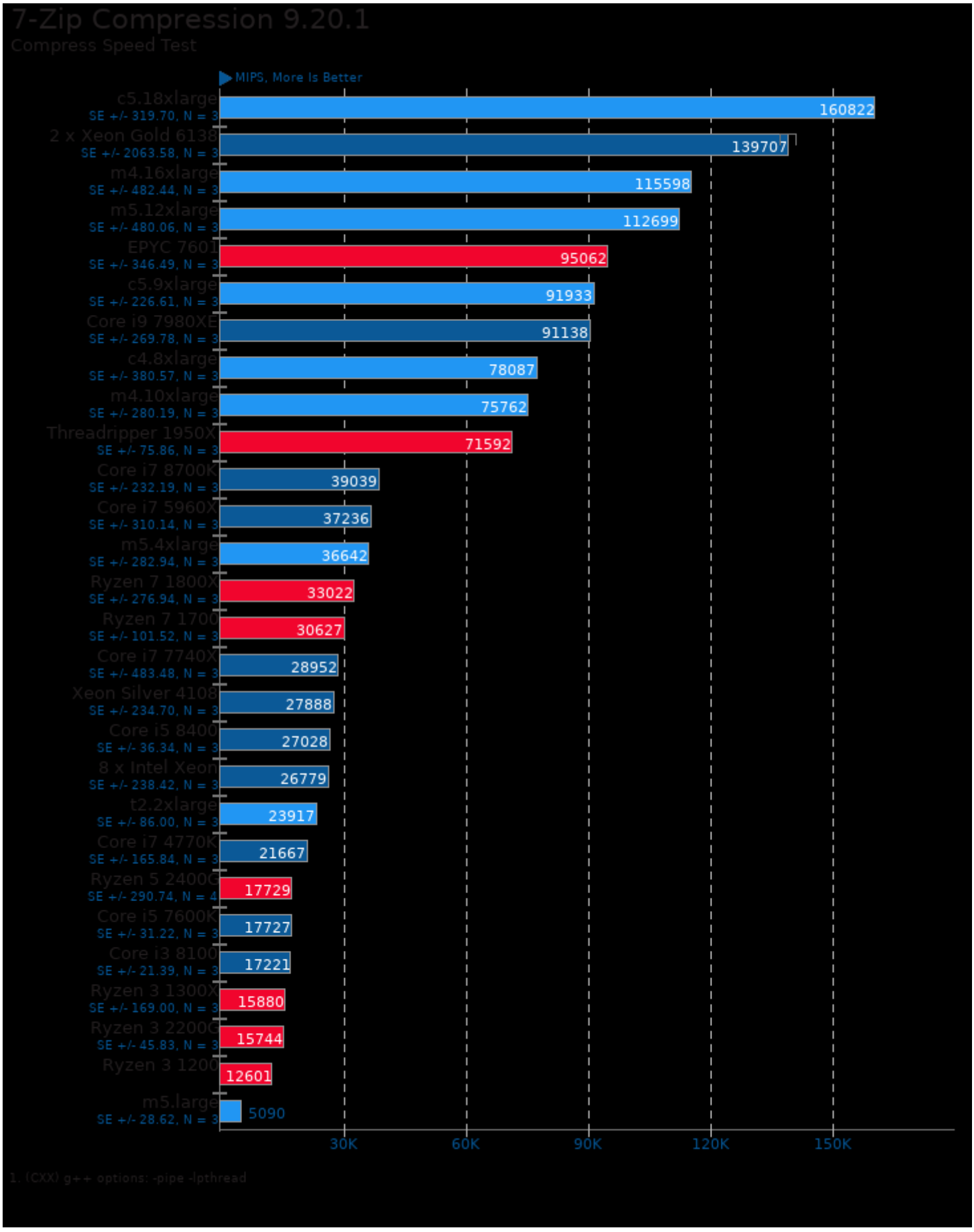
Rodinia - Performance / Cost - OpenMP LavaMD (sec x Dollar	14.96	8.06	3.16	2.67	**1.37**	3.41	**58.03**	3.70	5.66
Normalized	9.16%	17%	43.35%	51.31%	100%	40.18%	2.36%	37.03%	24.2%
Scikit-Learn (sec)	179.03	21.86	20.55	19.08	19.52	18.92	**21.77**	**16.09**	19.67
Normalized	91.66%	77.45%	80.22%	86.33%	86.13%	89.71%	76.4%	100%	85.61%
Standard Deviation	0.1%	0.1%	0%	0%	0.2%	0.1%	8%	0.6%	1.3%
Scikit-Learn - Performance / Cost - (sec x Dollar	10.74	29.6	79.7	45.6	**93.35**	89.63	**4.30**	36.10	61.33
Normalized	40.04%	14.5%	5.39%	9.43%	4.61%	4.8%	100%	11.91%	7.01%

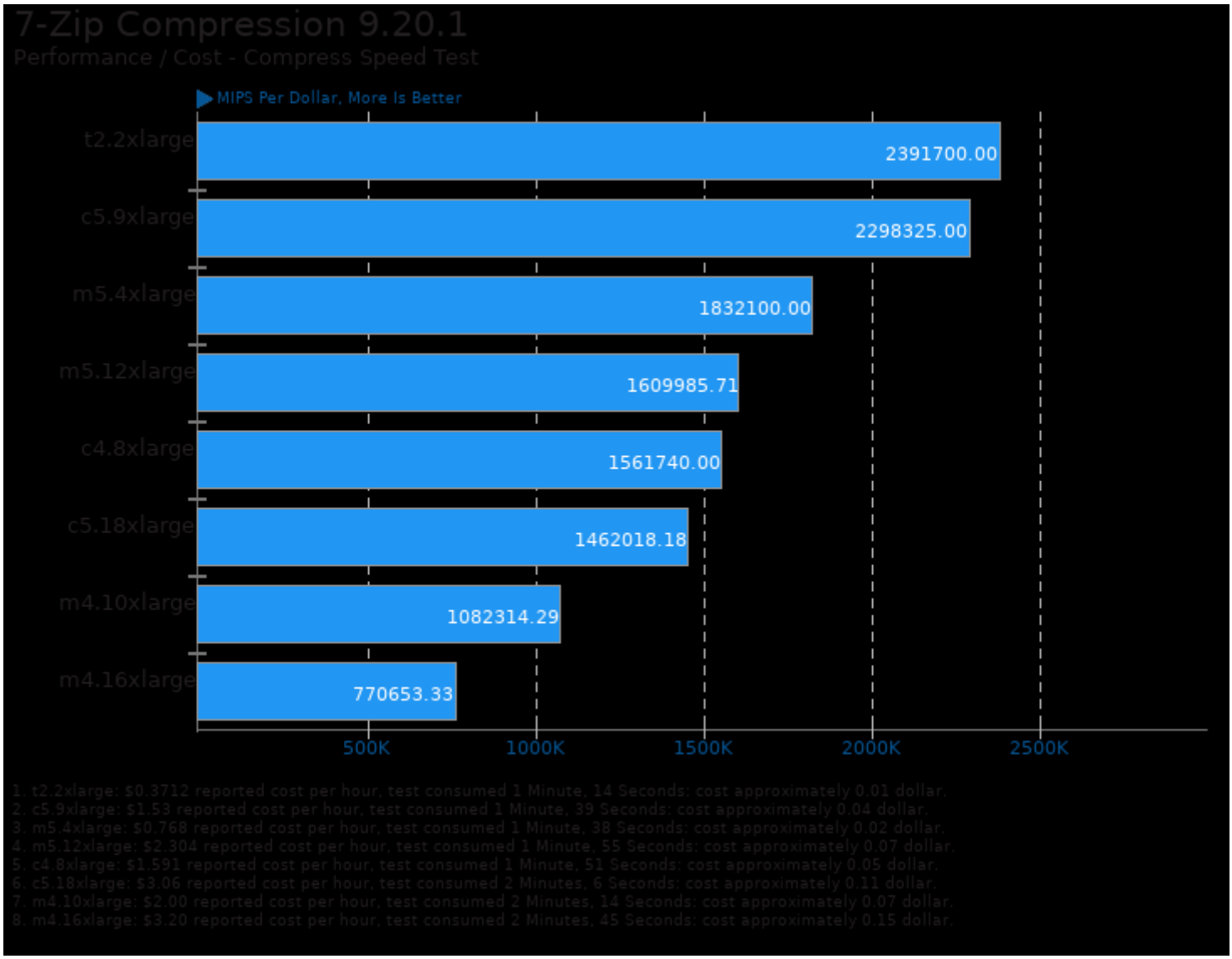
Large Intel AMD Linux CPU Benchmark Comparison vs. Amazon EC2 Cloud

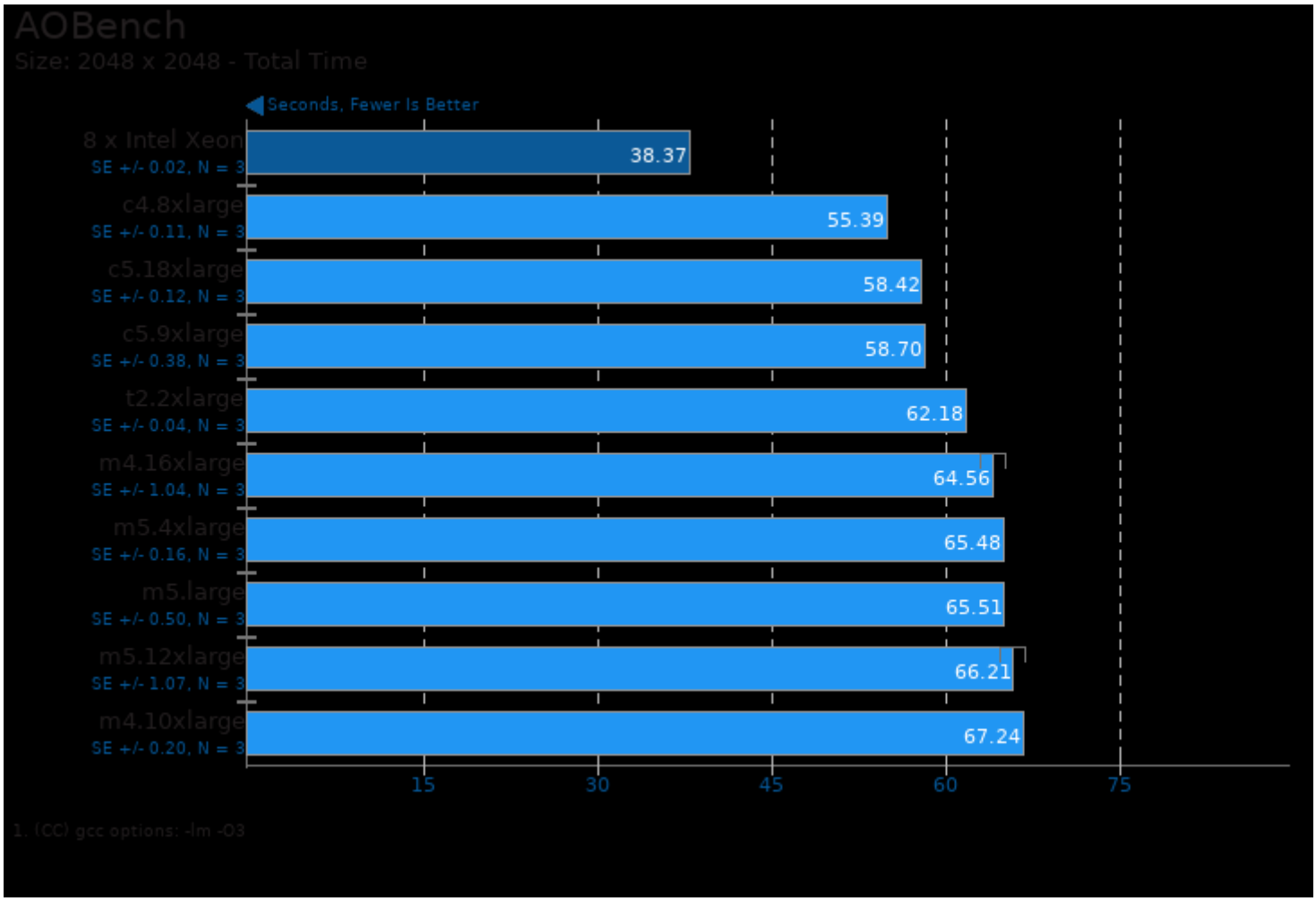
Timed Linux Kernel Compilation - Time To Compile	48 4.57	45 8.00	20 1.48	15 3.49	95 .1 7	85 .2 2	48 .4 8	38 .3 9	16 7.81	15 7.58	10 8.02	15 0.12	89 .1 5	10 6.97	79 .1 0	39 .7 0	12 7.47	30 .4 1	10 6.83	85 .7 7	35 .6 1	37 .9 9	**24 .4 8**	33 .9 0	**64 1.51**	43 .5 1	45 .9 1
Normalized	5.05%	5.34%	12.15%	15.95%	25.72%	28.73%	50.5%	63.77%	14.59%	15.53%	22.66%	16.31%	27.46%	22.88%	30.95%	61.66%	19.2%	80.5%	22.91%	28.54%	68.74%	64.44%	10 0%	72.21%	3.8 2%	56.26%	53.32%
Standard Deviation	0.2%	0.3%	1%	1.2%	2.2%	2%	3.2%	4.5%	1%	1%	1.7%	1%	2.3%	1%	7%	6.9%	2.3%	6.2%	1.3%	2.8%	7.6%	7.2%	10.4%	5.8%	12.6%	4.2%	4.4%
Timed Linux Kernel Compilation - Performance / Cost - Time To Compile (sec																			4.27	5.15	2.85	2.28	**1.96**	3.73	**32.08**	3.05	4.13
Normalized																			45.9%	38.06%	68.77%	85.96%	10 0%	52.55%	6.1 1%	64.26%	47.46%
Timed MAFFT Alignment - M.S.A (sec)	7.25	5.99	6.27	5.73	4.26	3.65	3.13	4.69	5.71	5.42	3.68	4.88	3.54	3.97		3.04	5.46	10 .15	4.26	4.35	3.18	**2.72**	4.23	8.84	**20.00**	4.42	5.78	3.689
Normalized	37.52%	45.41%	43.38%	47.47%	63.85%	74.52%	86.9%	58%	47.64%	50.18%	73.91%	55.74%	76.84%	68.51%		89.47%	49.82%	26.8%	63.85%	62.53%	85.53%	10 0%	64.3%	30.77%	13.6%	61.54%	47.06%	73.73%
Standard Deviation	0.4%	4.8%	5%	4.3%	3.1%	0.9%	4%	4.1%	6.4%	1%	4.7%	4.4%	3.1%	8.7%			3.8%	3.3%	0.6%	9.6%	7.2%	3.5%	8.6%	1.5%	0.6%	5.7%	17.5%	11.9%

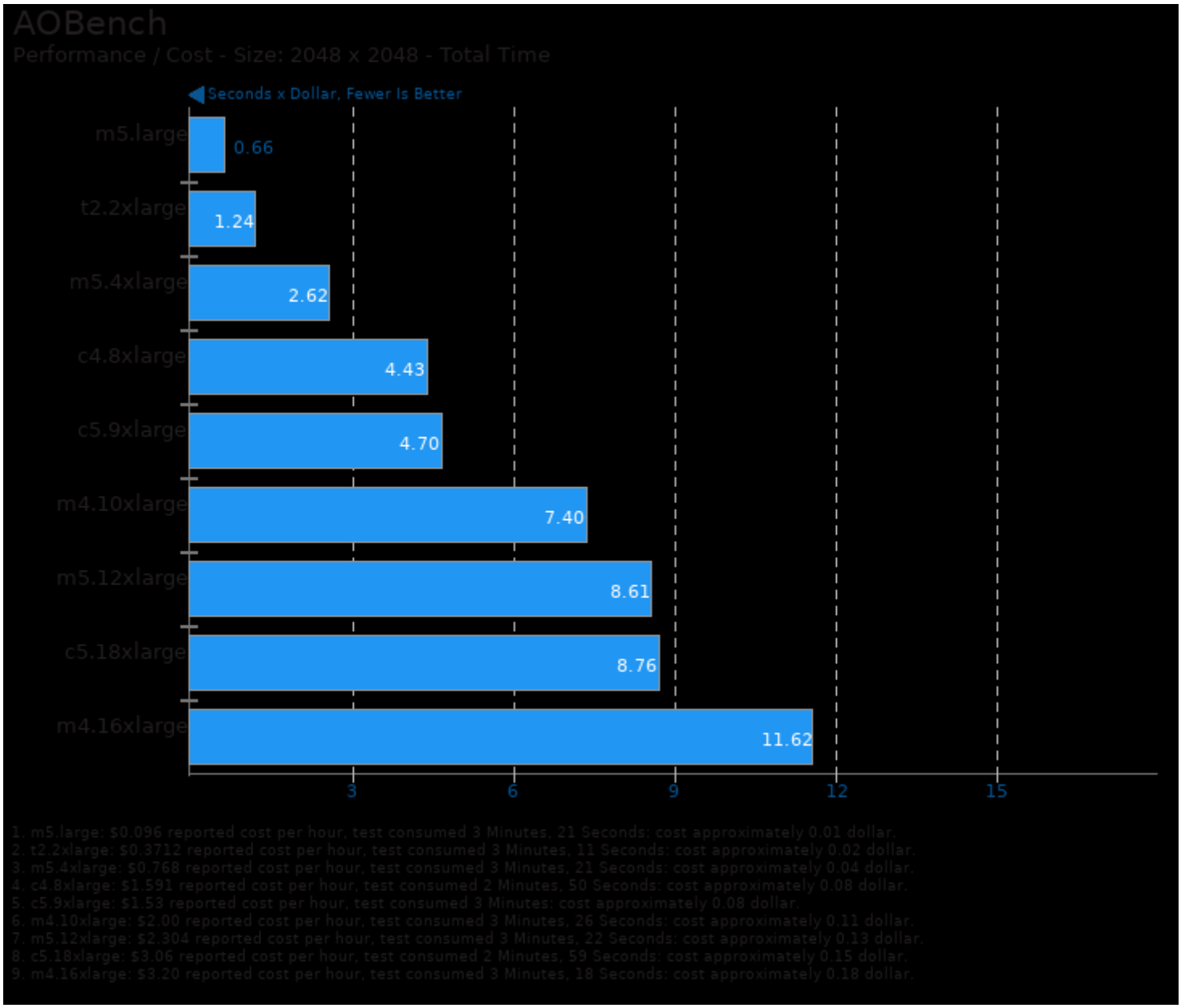
Timed MAFFT Alignment - Performance / Cost - M.S.A (sec x Dollar																				0.03	0.03	0.04	0.27		0.04	0.06	
Normalized																				100%	100%	75%	111%		75%	50%	
TTSIOD 3D Renderer - P.R.W.S.S.M (FPS)	12	13	17	21	27	31	46	44	16	18	26	20	32	27	39	69	21	73	23	18	50	46	33	46	26	41	39	12
	2.95	4.97	8.17	1.60	4.64	2.22	6.13	7.71	8.27	7.90	3.63	4.31	5.51	7.43	1.67	0.00	0.84	3.58	1.07	4.83	4.82	0.27	6.76	5.90	.88	9.30	4.52	4.428
Normalized	16.76	18.4%	24.29	28.84	37.44	42.56	63.54	61.03	22.94	25.61	35.94	27.85	44.37	37.82	53.39	94.06	28.74	100%	31.5%	25.2%	68.82	62.74	45.91	63.51	3.66%	57.16	53.78	16.96
Standard Deviation	0.7%	0.2%	0.8%	1.4%	0.1%	0.2%	0.2%	0.2%	0.6%	0.2%	0.1%	1.7%	0.2%	1.8%	0.3%	0.8%	0.4%	3.2%	0.3%	0.5%	1.6%	1.6%	6.4%	7.7%	14.8%	1.3%	1.4%	4%

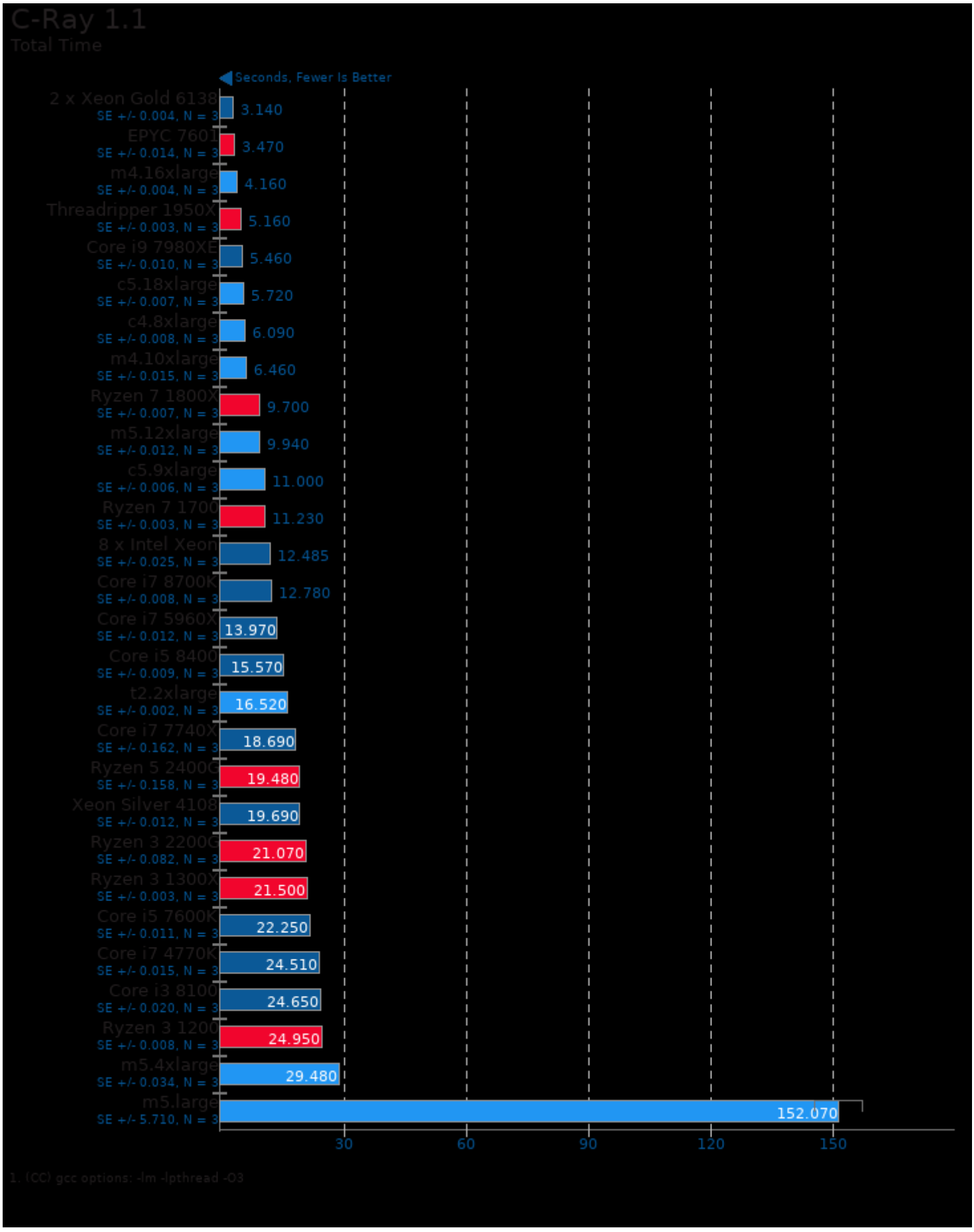
TTSIOD 3D Renderer - Performance / Cost - P.R.W.S.S.M (FPS/Dollar																			**2310742**	9242	16827	23014	5613	9318	**1344**	13977	15151
Normalized																			10.00%	39.99%	72.82%	99.64%	24.29%	40.33%	5.82%	60.49%	56.91%
x264 - H.2.V.E (FPS)	23.47	27.33	27.60	34.75	60.90	71.46	12.00	10.07	30.42	33.49	56.11	37.64	58.01	49.95	72.96	12.28	32.75	10.89	38.43	55.46	12.66	13.10	**17.03**	11.34	**11.02**	10.99	97.43
Normalized	13.33%	15.53%	15.68%	19.74%	34.60%	40.66%	72.15%	61.39%	17.28%	19.03%	31.88%	21.38%	32.95%	28.38%	41.45%	71.17%	18.61%	61.29%	21.83%	31.51%	73.66%	76.18%	10.00%	65.52%	6.26%	61.35%	55.35%
Standard Deviation	3.41%	0.23%	0.11%	3.33%	3.33%	0.56%	0.66%	0.71%	3.33%	0.11%	0.22%	0.11%	0.66%	0.66%	0.56%	0.45%	0.71%	2.52%	0.11%	1.72%	0.40%	0.66%	1.45%	1.92%	0.30%	0.50%	0.30%
x264 - Performance / Cost - H.2.V.E (FPS/Dollar																			**3843**	5546	12966	13410	**1760**	5767		10979	9743
Normalized																			21.83%	31.51%	73.66%	76.18%	10.00%	32.76%		61.35%	55.35%

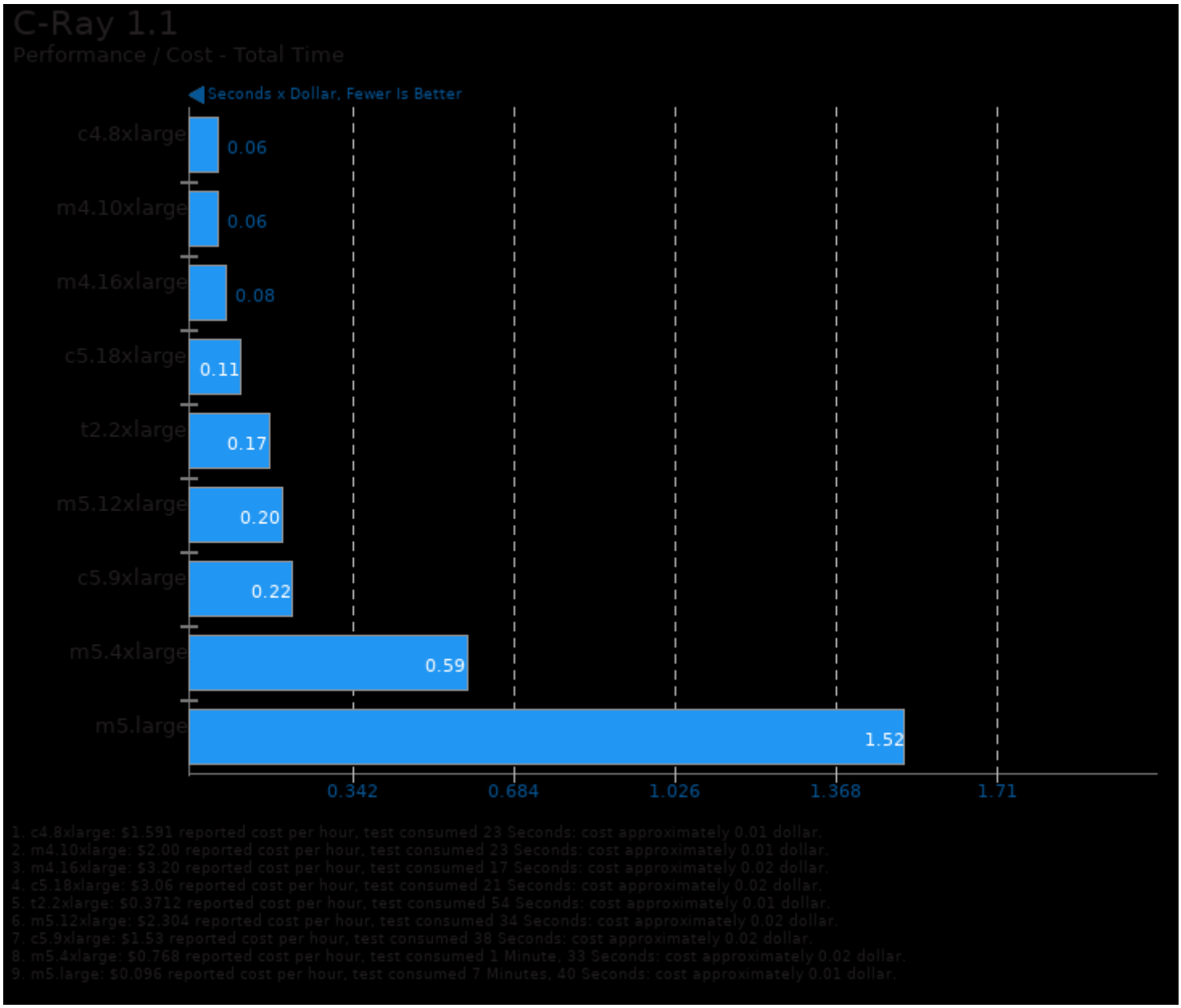

7-Zip Compression 9.20.1
Compress Speed Test
MIPS, More Is Better
c5.18xlarge
SE +/- 319.70, N = 3
160822
2 x Xeon Gold 6138
SE +/- 2063.58, N = 3
139707
m4.16xlarge
SE +/- 482.44, N = 3
115598
m5.12xlarge
SE +/- 480.06, N = 3
112699
EPYC 7601
SE +/- 346.49, N = 3
95062
c5.9xlarge
SE +/- 226.61, N = 3
91933
Core i9 7980XE
SE +/- 269.78, N = 3
91138
c4.8xlarge
SE +/- 380.57, N = 3
78087
m4.10xlarge
SE +/- 280.19, N = 3
75762
Threadripper 1950X
SE +/- 75.86, N = 3
71592
Core i7 8700K
SE +/- 232.19, N = 3
39039
Core i7 5960X
SE +/- 310.14, N = 3
37236
m5.4xlarge
SE +/- 282.94, N = 3
36642
Ryzen 7 1800X
SE +/- 276.94, N = 3
33022
Ryzen 7 1700
SE +/- 101.52, N = 3
30627
Core i7 7740X
SE +/- 483.48, N = 3
28952
Xeon Silver 4108
SE +/- 234.70, N = 3
27888
Core i5 8400
SE +/- 36.34, N = 3
27028
8 x Intel Xeon
SE +/- 238.42, N = 3
26779
t2.2xlarge
SE +/- 86.00, N = 3
23917
Core i7 4770K
SE +/- 165.84, N = 3
21667
Ryzen 5 2400G
SE +/- 290.74, N = 4
17729
Core i5 7600K
SE +/- 31.22, N = 3
17727
Core i3 8100
SE +/- 21.39, N = 3
17221
Ryzen 3 1300X
SE +/- 169.00, N = 3
15880
Ryzen 3 2200G
SE +/- 45.83, N = 3
15744
Ryzen 3 1200
12601
m5.large
SE +/- 28.62, N = 3
5090
30K
60K
90K
120K
150K
1. (CXX) g++ options: -pipe -lpthread

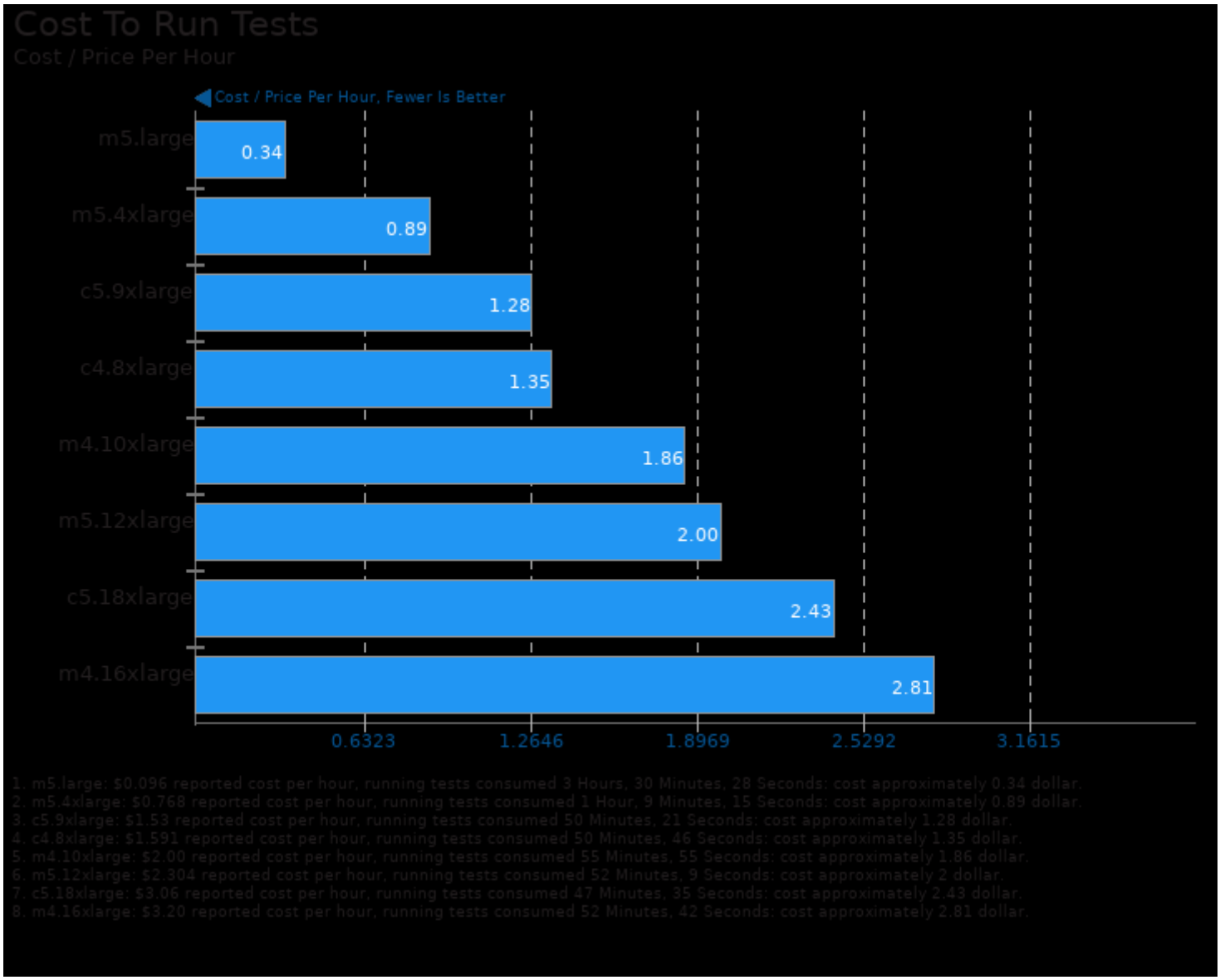

7-Zip Compression 9.20.1
Performance / Cost - Compress Speed Test
MIPS Per Dollar, More Is Better
t2.2xlarge
c5.9xlarge
m5.4xlarge
m5.12xlarge
c4.8xlarge
c5.18xlarge
m4.10xlarge
m4.16xlarge
2391700.00
2298325.00
1832100.00
1609985.71
1561740.00
1462018.18
1082314.29
770653.33
500K
1000K
1500K
2000K
2500K
1. t2.2xlarge: $0.3712 reported cost per hour, test consumed 1 Minute, 14 Seconds: cost approximately 0.01 dollar.
2. c5.9xlarge: $1.53 reported cost per hour, test consumed 1 Minute, 39 Seconds: cost approximately 0.04 dollar.
3. m5.4xlarge: $0.768 reported cost per hour, test consumed 1 Minute, 38 Seconds: cost approximately 0.02 dollar.
4. m5.12xlarge: $2.304 reported cost per hour, test consumed 1 Minute, 55 Seconds: cost approximately 0.07 dollar.
5. c4.8xlarge: $1.591 reported cost per hour, test consumed 1 Minute, 51 Seconds: cost approximately 0.05 dollar.
6. c5.18xlarge: $3.06 reported cost per hour, test consumed 2 Minutes, 6 Seconds: cost approximately 0.11 dollar.
7. m4.10xlarge: $2.00 reported cost per hour, test consumed 2 Minutes, 14 Seconds: cost approximately 0.07 dollar.
8. m4.16xlarge: $3.20 reported cost per hour, test consumed 2 Minutes, 45 Seconds: cost approximately 0.15 dollar.

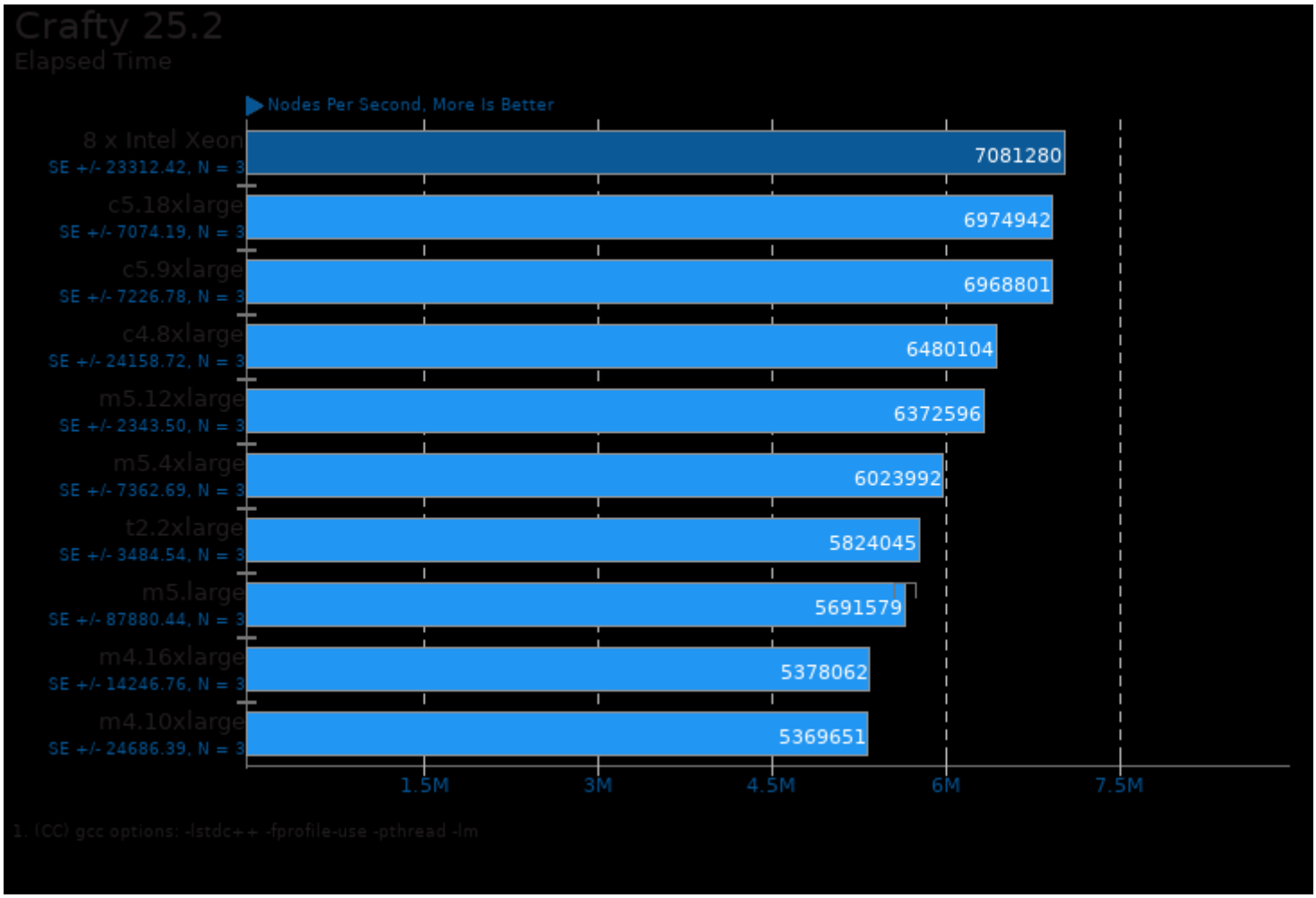

AOBench
Size: 2048 x 2048 - Total Time
Seconds, Fewer Is Better
8 x Intel Xeon
SE +/- 0.02, N = 3
38.37
c4.8xlarge
SE +/- 0.11, N = 3
55.39
c5.18xlarge
SE +/- 0.12, N = 3
58.42
c5.9xlarge
SE +/- 0.38, N = 3
58.70
t2.2xlarge
SE +/- 0.04, N = 3
62.18
m4.16xlarge
SE +/- 1.04, N = 3
64.56
m5.4xlarge
SE +/- 0.16, N = 3
65.48
m5.large
SE +/- 0.50, N = 3
65.51
m5.12xlarge
SE +/- 1.07, N = 3
66.21
m4.10xlarge
SE +/- 0.20, N = 3
67.24
15
30
45
60
75
1. (CC) gcc options: -lm -O3

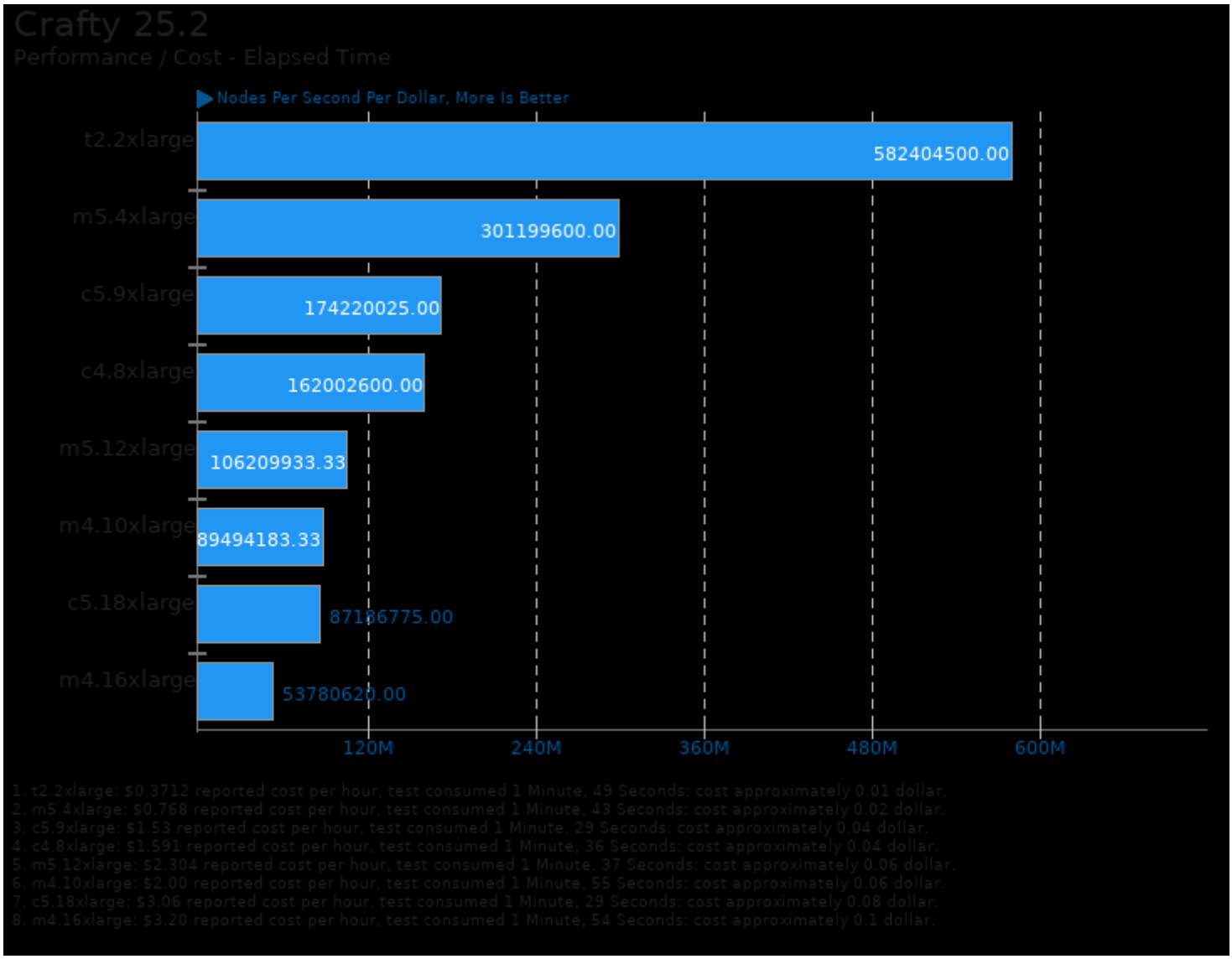

AOBench
Performance / Cost - Size: 2048 x 2048 - Total Time
Seconds x Dollar, Fewer Is Better
m5.large
0.66
t2.2xlarge
1.24
m5.4xlarge
2.62
c4.8xlarge
4.43
c5.9xlarge
4.70
m4.10xlarge
7.40
m5.12xlarge
8.61
c5.18xlarge
8.76
m4.16xlarge
11.62
3
6
9
12
15
1. m5.large: $0.096 reported cost per hour, test consumed 3 Minutes, 21 Seconds: cost approximately 0.01 dollar.
2. t2.2xlarge: $0.3712 reported cost per hour, test consumed 3 Minutes, 11 Seconds: cost approximately 0.02 dollar.
3. m5.4xlarge: $0.768 reported cost per hour, test consumed 3 Minutes, 21 Seconds: cost approximately 0.04 dollar.
4. c4.8xlarge: $1.591 reported cost per hour, test consumed 2 Minutes, 50 Seconds: cost approximately 0.08 dollar.
5. c5.9xlarge: $1.53 reported cost per hour, test consumed 3 Minutes: cost approximately 0.08 dollar.
6. m4.10xlarge: $2.00 reported cost per hour, test consumed 3 Minutes, 26 Seconds: cost approximately 0.11 dollar.
7. m5.12xlarge: $2.304 reported cost per hour, test consumed 3 Minutes, 22 Seconds: cost approximately 0.13 dollar.
8. c5.18xlarge: $3.06 reported cost per hour, test consumed 2 Minutes, 59 Seconds: cost approximately 0.15 dollar.
9. m4.16xlarge: $3.20 reported cost per hour, test consumed 3 Minutes, 18 Seconds: cost approximately 0.18 dollar.

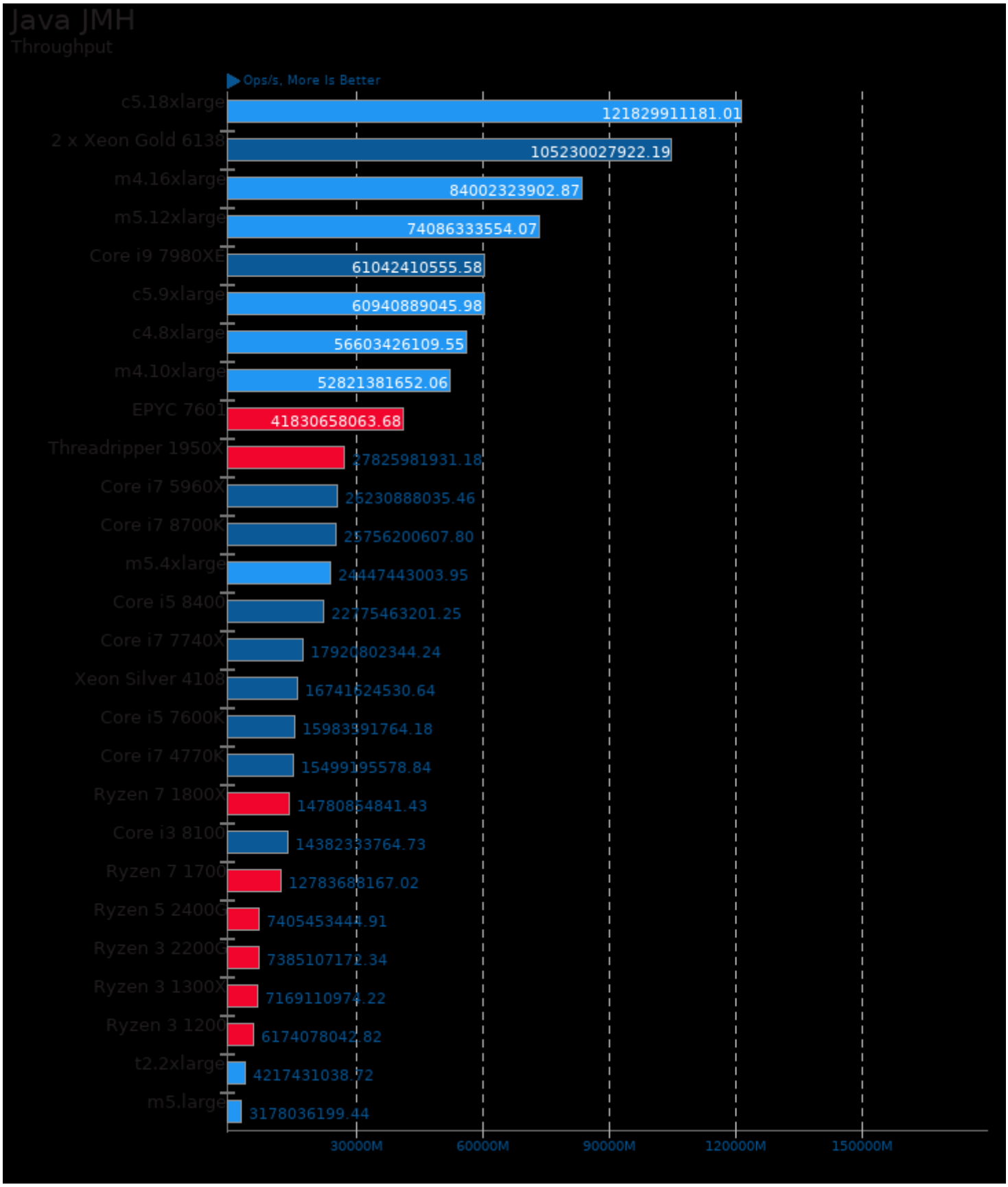

C-Ray 1.1
Total Time
Seconds, Fewer Is Better
2 x Xeon Gold 6138
SE +/- 0.004, N = 3
3.140
EPYC 7601
SE +/- 0.014, N = 3
3.470
m4.16xlarge
SE +/- 0.004, N = 3
4.160
Threadripper 1950X
SE +/- 0.003, N = 3
5.160
Core i9 7980XE
SE +/- 0.010, N = 3
5.460
c5.18xlarge
SE +/- 0.007, N = 3
5.720
c4.8xlarge
SE +/- 0.008, N = 3
6.090
m4.10xlarge
SE +/- 0.015, N = 3
6.460
Ryzen 7 1800X
SE +/- 0.007, N = 3
9.700
m5.12xlarge
SE +/- 0.012, N = 3
9.940
c5.9xlarge
SE +/- 0.006, N = 3
11.000
Ryzen 7 1700
SE +/- 0.003, N = 3
11.230
8 x Intel Xeon
SE +/- 0.025, N = 3
12.485
Core i7 8700K
SE +/- 0.008, N = 3
12.780
Core i7 5960X
SE +/- 0.012, N = 3
13.970
Core i5 8400
SE +/- 0.009, N = 3
15.570
t2.2xlarge
SE +/- 0.002, N = 3
16.520
Core i7 7740X
SE +/- 0.162, N = 3
18.690
Ryzen 5 2400G
SE +/- 0.158, N = 3
19.480
Xeon Silver 4108
SE +/- 0.012, N = 3
19.690
Ryzen 3 2200G
SE +/- 0.082, N = 3
21.070
Ryzen 3 1300X
SE +/- 0.003, N = 3
21.500
Core i5 7600K
SE +/- 0.011, N = 3
22.250
Core i7 4770K
SE +/- 0.015, N = 3
24.510
Core i3 8100
SE +/- 0.020, N = 3
24.650
Ryzen 3 1200
SE +/- 0.008, N = 3
24.950
m5.4xlarge
SE +/- 0.034, N = 3
29.480
m5.large
SE +/- 5.710, N = 3
152.070
30
60
90
120
150
1. (CC) gcc options: -lm -lpthread -O3

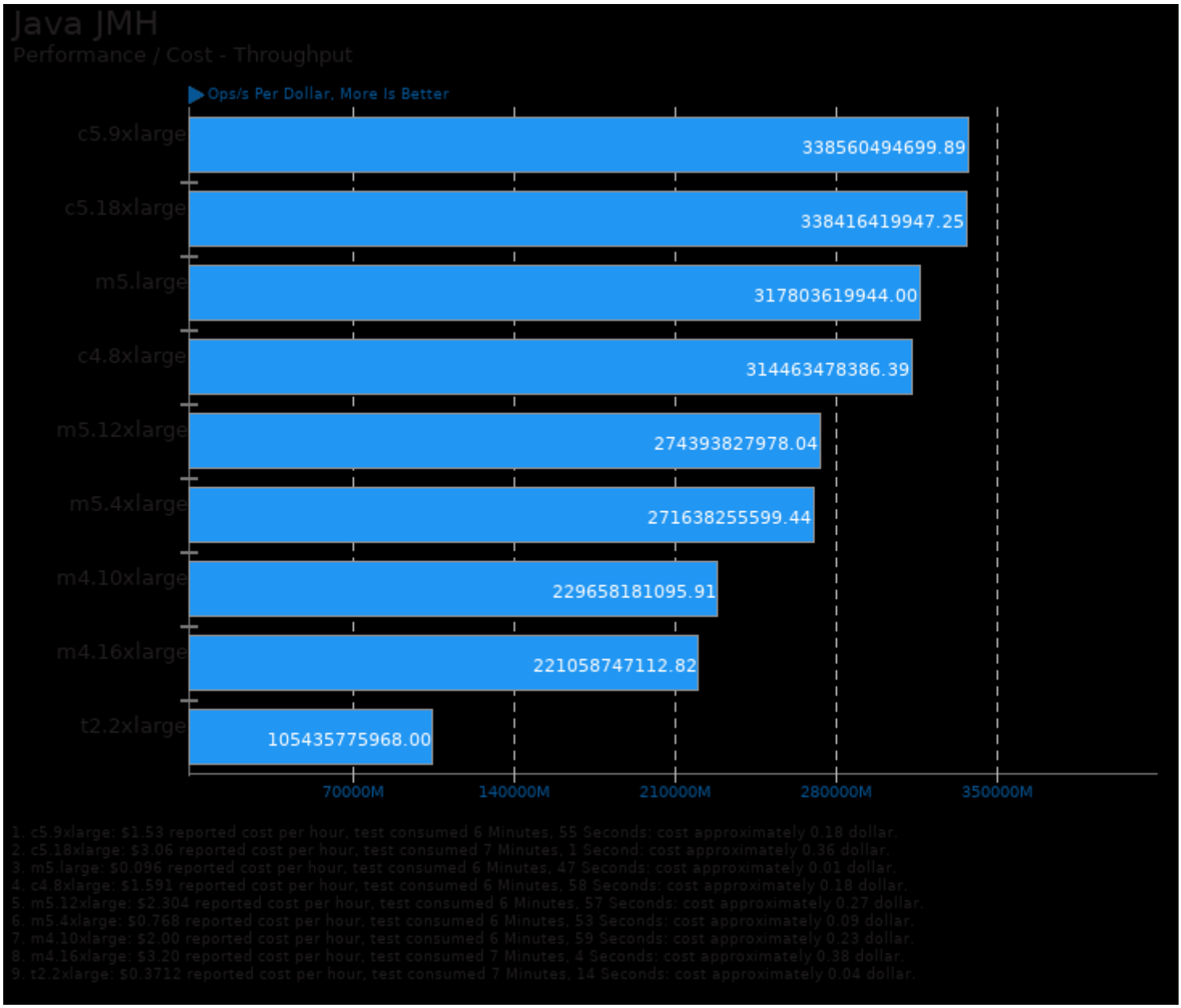

C-Ray 1.1
Performance / Cost - Total Time
Seconds x Dollar, Fewer Is Better
c4.8xlarge
0.06
m4.10xlarge
0.06
m4.16xlarge
0.08
c5.18xlarge
0.11
t2.2xlarge
0.17
m5.12xlarge
0.20
c5.9xlarge
0.22
m5.4xlarge
0.59
m5.large
1.52
0.342
0.684
1.026
1.368
1.71
1. c4.8xlarge: $1.591 reported cost per hour, test consumed 23 Seconds: cost approximately 0.01 dollar.
2. m4.10xlarge: $2.00 reported cost per hour, test consumed 23 Seconds: cost approximately 0.01 dollar.
3. m4.16xlarge: $3.20 reported cost per hour, test consumed 17 Seconds: cost approximately 0.02 dollar.
4. c5.18xlarge: $3.06 reported cost per hour, test consumed 21 Seconds: cost approximately 0.02 dollar.
5. t2.2xlarge: $0.3712 reported cost per hour, test consumed 54 Seconds: cost approximately 0.01 dollar.
6. m5.12xlarge: $2.304 reported cost per hour, test consumed 34 Seconds: cost approximately 0.02 dollar.
7. c5.9xlarge: $1.53 reported cost per hour, test consumed 38 Seconds: cost approximately 0.02 dollar.
8. m5.4xlarge: $0.768 reported cost per hour, test consumed 1 Minute, 33 Seconds: cost approximately 0.02 dollar.
9. m5.large: $0.096 reported cost per hour, test consumed 7 Minutes, 40 Seconds: cost approximately 0.01 dollar.

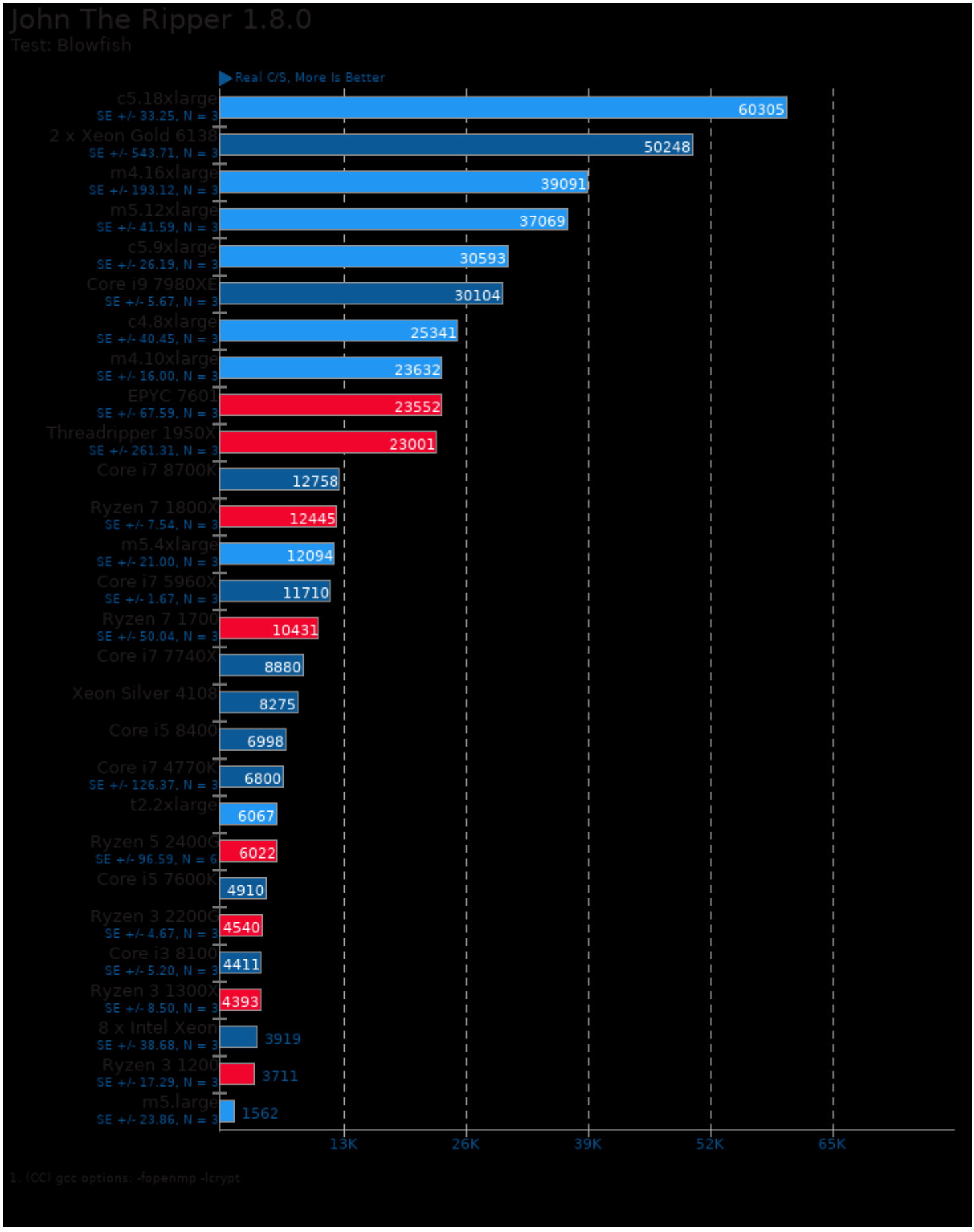

Cost To Run Tests
Cost / Price Per Hour
Cost / Price Per Hour, Fewer Is Better
m5.large
0.34
m5.4xlarge
0.89
c5.9xlarge
1.28
c4.8xlarge
1.35
m4.10xlarge
1.86
m5.12xlarge
2.00
c5.18xlarge
2.43
m4.16xlarge
2.81
0.6323
1.2646
1.8969
2.5292
3.1615
1. m5.large: $0.096 reported cost per hour, running tests consumed 3 Hours, 30 Minutes, 28 Seconds: cost approximately 0.34 dollar.
2. m5.4xlarge: $0.768 reported cost per hour, running tests consumed 1 Hour, 9 Minutes, 15 Seconds: cost approximately 0.89 dollar.
3. c5.9xlarge: $1.53 reported cost per hour, running tests consumed 50 Minutes, 21 Seconds: cost approximately 1.28 dollar.
4. c4.8xlarge: $1.591 reported cost per hour, running tests consumed 50 Minutes, 46 Seconds: cost approximately 1.35 dollar.
5. m4.10xlarge: $2.00 reported cost per hour, running tests consumed 55 Minutes, 55 Seconds: cost approximately 1.86 dollar.
6. m5.12xlarge: $2.304 reported cost per hour, running tests consumed 52 Minutes, 9 Seconds: cost approximately 2 dollar.
7. c5.18xlarge: $3.06 reported cost per hour, running tests consumed 47 Minutes, 35 Seconds: cost approximately 2.43 dollar.
8. m4.16xlarge: $3.20 reported cost per hour, running tests consumed 52 Minutes, 42 Seconds: cost approximately 2.81 dollar.

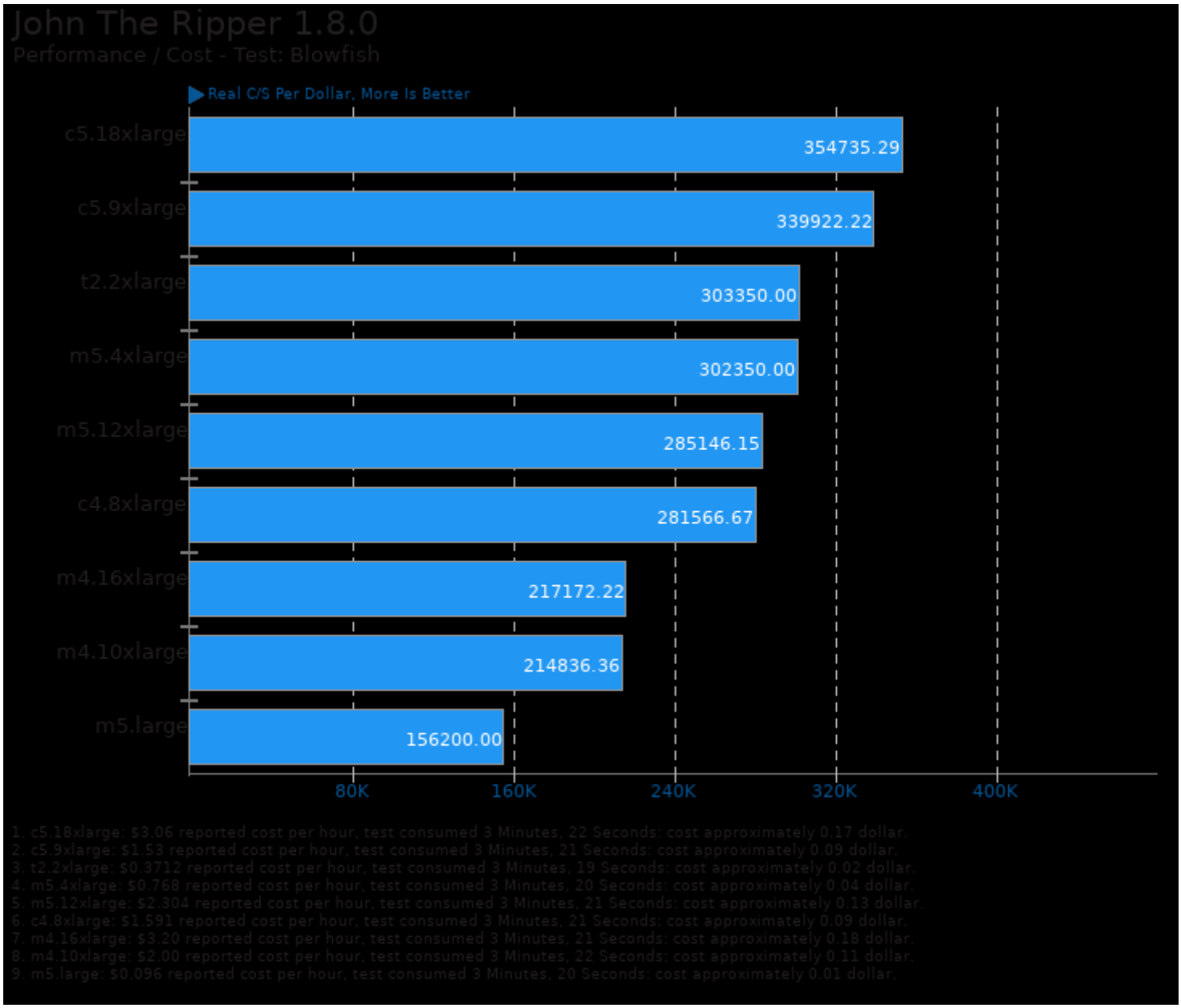

Crafty 25.2
Elapsed Time
Nodes Per Second, More Is Better
8 x Intel Xeon
SE +/- 23312.42, N = 3
7081280
c5.18xlarge
SE +/- 7074.19, N = 3
6974942
c5.9xlarge
SE +/- 7226.78, N = 3
6968801
c4.8xlarge
SE +/- 24158.72, N = 3
6480104
m5.12xlarge
SE +/- 2343.50, N = 3
6372596
m5.4xlarge
SE +/- 7362.69, N = 3
6023992
t2.2xlarge
SE +/- 3484.54, N = 3
5824045
m5.large
SE +/- 87880.44, N = 3
5691579
m4.16xlarge
SE +/- 14246.76, N = 3
5378062
m4.10xlarge
SE +/- 24686.39, N = 3
5369651
1.5M
3M
4.5M
6M
7.5M
1. (CC) gcc options: -lstdc++ -fprofile-use -pthread -lm

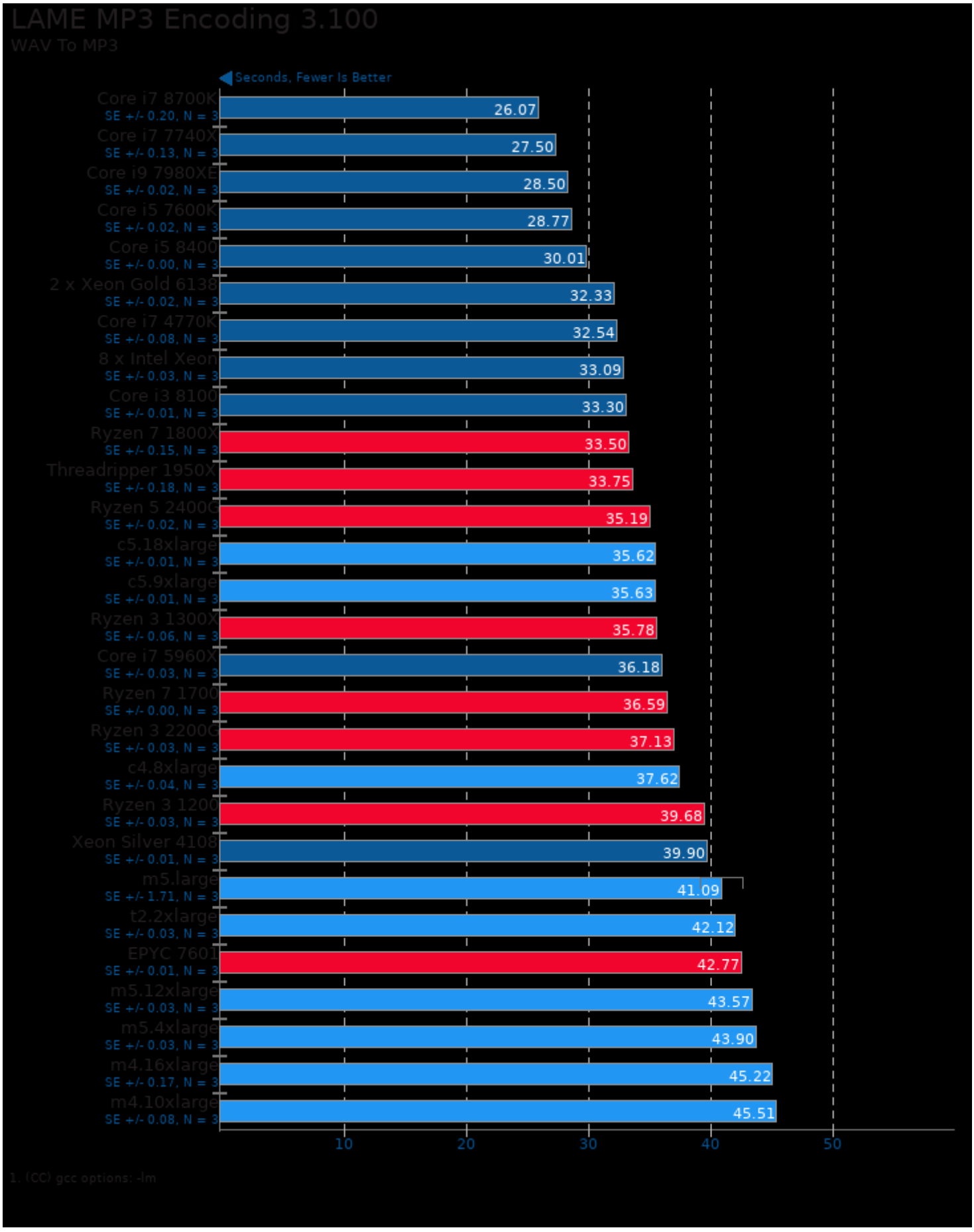

Crafty 25.2
Performance / Cost - Elapsed Time
Nodes Per Second Per Dollar, More Is Better
t2.2xlarge
582404500.00
m5.4xlarge
301199600.00
c5.9xlarge
174220025.00
c4.8xlarge
162002600.00
m5.12xlarge
106209933.33
m4.10xlarge
89494183.33
c5.18xlarge
87186775.00
m4.16xlarge
53780620.00
120M
240M
360M
480M
600M
1. t2.2xlarge: $0.3712 reported cost per hour, test consumed 1 Minute, 49 Seconds: cost approximately 0.01 dollar.
2. m5.4xlarge: $0.768 reported cost per hour, test consumed 1 Minute, 43 Seconds: cost approximately 0.02 dollar.
3. c5.9xlarge: $1.53 reported cost per hour, test consumed 1 Minute, 29 Seconds: cost approximately 0.04 dollar.
4. c4.8xlarge: $1.591 reported cost per hour, test consumed 1 Minute, 36 Seconds: cost approximately 0.04 dollar.
5. m5.12xlarge: $2.304 reported cost per hour, test consumed 1 Minute, 37 Seconds: cost approximately 0.06 dollar.
6. m4.10xlarge: $2.00 reported cost per hour, test consumed 1 Minute, 55 Seconds: cost approximately 0.06 dollar.
7. c5.18xlarge: $3.06 reported cost per hour, test consumed 1 Minute, 29 Seconds: cost approximately 0.08 dollar.
8. m4.16xlarge: $3.20 reported cost per hour, test consumed 1 Minute, 54 Seconds: cost approximately 0.1 dollar.

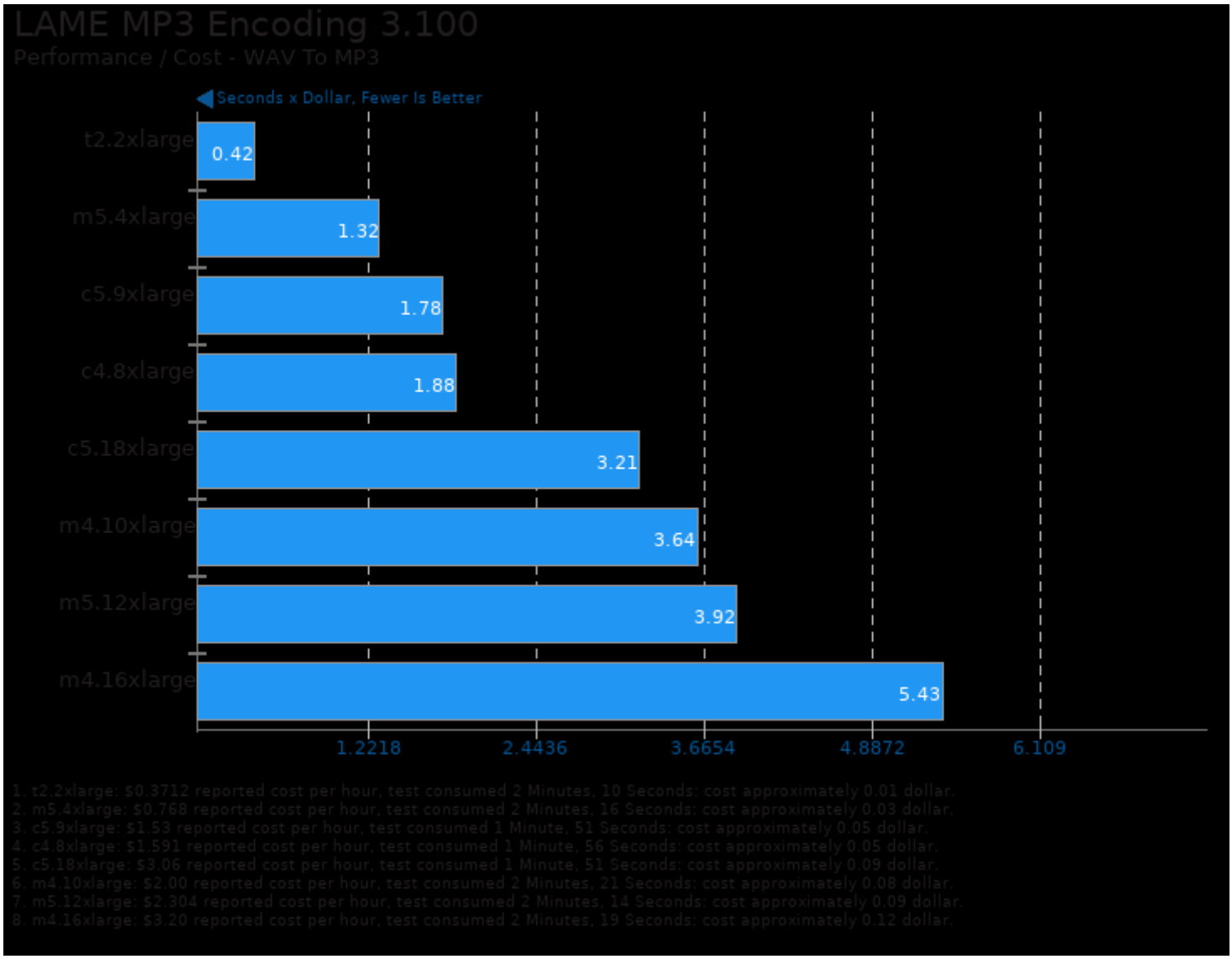

Java JMH
Throughput
Ops/s, More Is Better
c5.18xlarge
121829911181.01
2 x Xeon Gold 6138
105230027922.19
m4.16xlarge
84002323902.87
m5.12xlarge
74086333554.07
Core i9 7980XE
61042410555.58
c5.9xlarge
60940889045.98
c4.8xlarge
56603426109.55
m4.10xlarge
52821381652.06
EPYC 7601
41830658063.68
Threadripper 1950X
27825981931.18
Core i7 5960X
25230888035.46
Core i7 8700K
25756200607.80
m5.4xlarge
24447443003.95
Core i5 8400
22775463201.25
Core i7 7740X
17920802344.24
Xeon Silver 4108
16741524530.64
Core i5 7600K
15983391764.18
Core i7 4770K
15499195578.84
Ryzen 7 1800X
14780854841.43
Core i3 8100
14382333764.73
Ryzen 7 1700
12783688167.02
Ryzen 5 2400G
7405453444.91
Ryzen 3 2200G
7385107172.34
Ryzen 3 1300X
7169110974.22
Ryzen 3 1200
6174078042.82
t2.2xlarge
4217431038.72
m5.large
3178036199.44
30000M
60000M
90000M
120000M
150000M

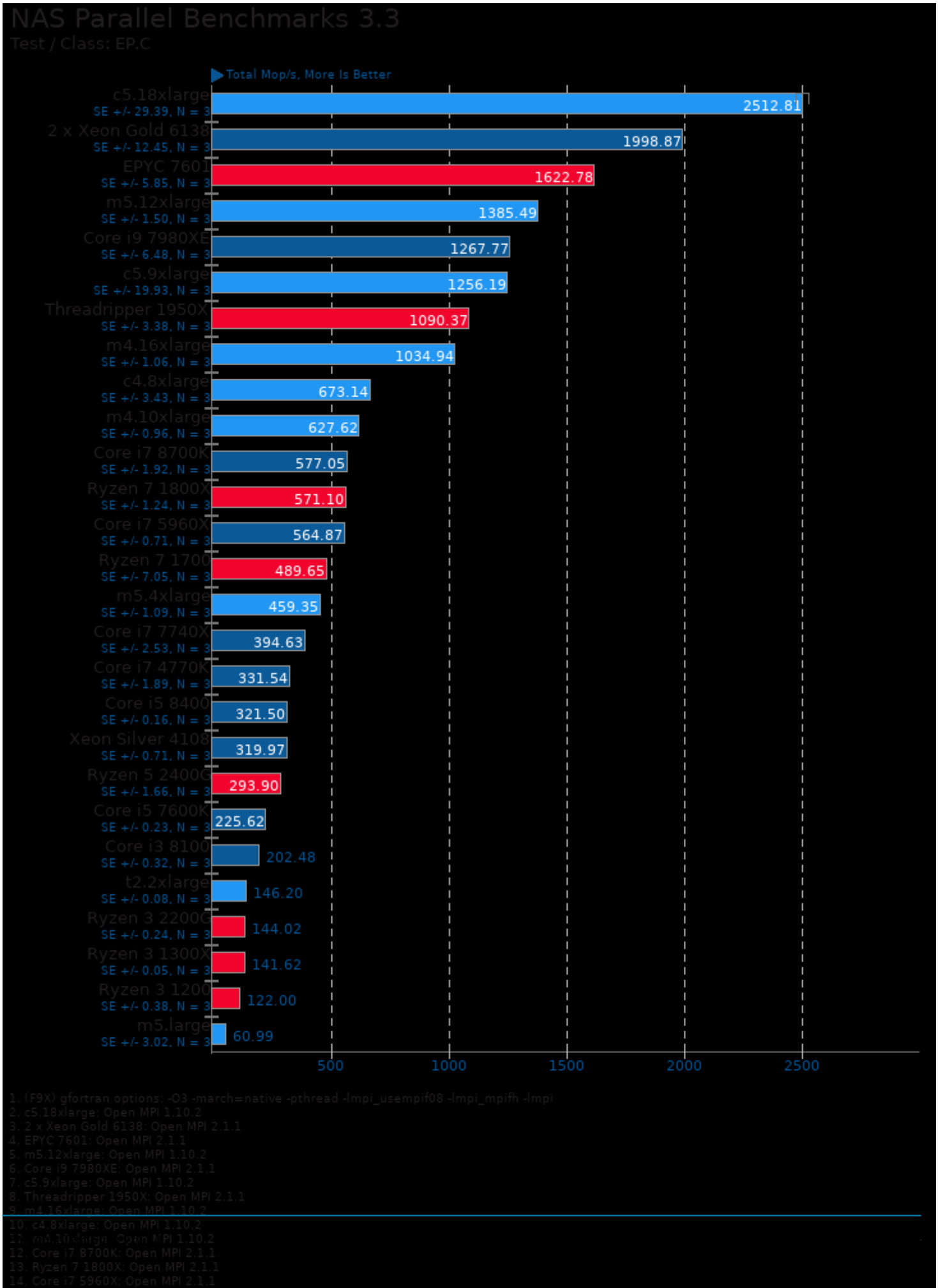

Java JMH
Performance / Cost - Throughput
Ops/s Per Dollar, More Is Better
c5.9xlarge
338560494699.89
c5.18xlarge
338416419947.25
m5.large
317803619944.00
c4.8xlarge
314463478386.39
m5.12xlarge
274393827978.04
m5.4xlarge
271638255599.44
m4.10xlarge
229658181095.91
m4.16xlarge
221058747112.82
t2.2xlarge
105435775968.00
70000M
140000M
210000M
280000M
350000M
1. c5.9xlarge: $1.53 reported cost per hour, test consumed 6 Minutes, 55 Seconds: cost approximately 0.18 dollar.
2. c5.18xlarge: $3.06 reported cost per hour, test consumed 7 Minutes, 1 Second: cost approximately 0.36 dollar.
3. m5.large: $0.096 reported cost per hour, test consumed 6 Minutes, 47 Seconds: cost approximately 0.01 dollar.
4. c4.8xlarge: $1.591 reported cost per hour, test consumed 6 Minutes, 58 Seconds: cost approximately 0.18 dollar.
5. m5.12xlarge: $2.304 reported cost per hour, test consumed 6 Minutes, 57 Seconds: cost approximately 0.27 dollar.
6. m5.4xlarge: $0.768 reported cost per hour, test consumed 6 Minutes, 53 Seconds: cost approximately 0.09 dollar.
7. m4.10xlarge: $2.00 reported cost per hour, test consumed 6 Minutes, 59 Seconds: cost approximately 0.23 dollar.
8. m4.16xlarge: $3.20 reported cost per hour, test consumed 7 Minutes, 4 Seconds: cost approximately 0.38 dollar.
9. t2.2xlarge: $0.3712 reported cost per hour, test consumed 7 Minutes, 14 Seconds: cost approximately 0.04 dollar.

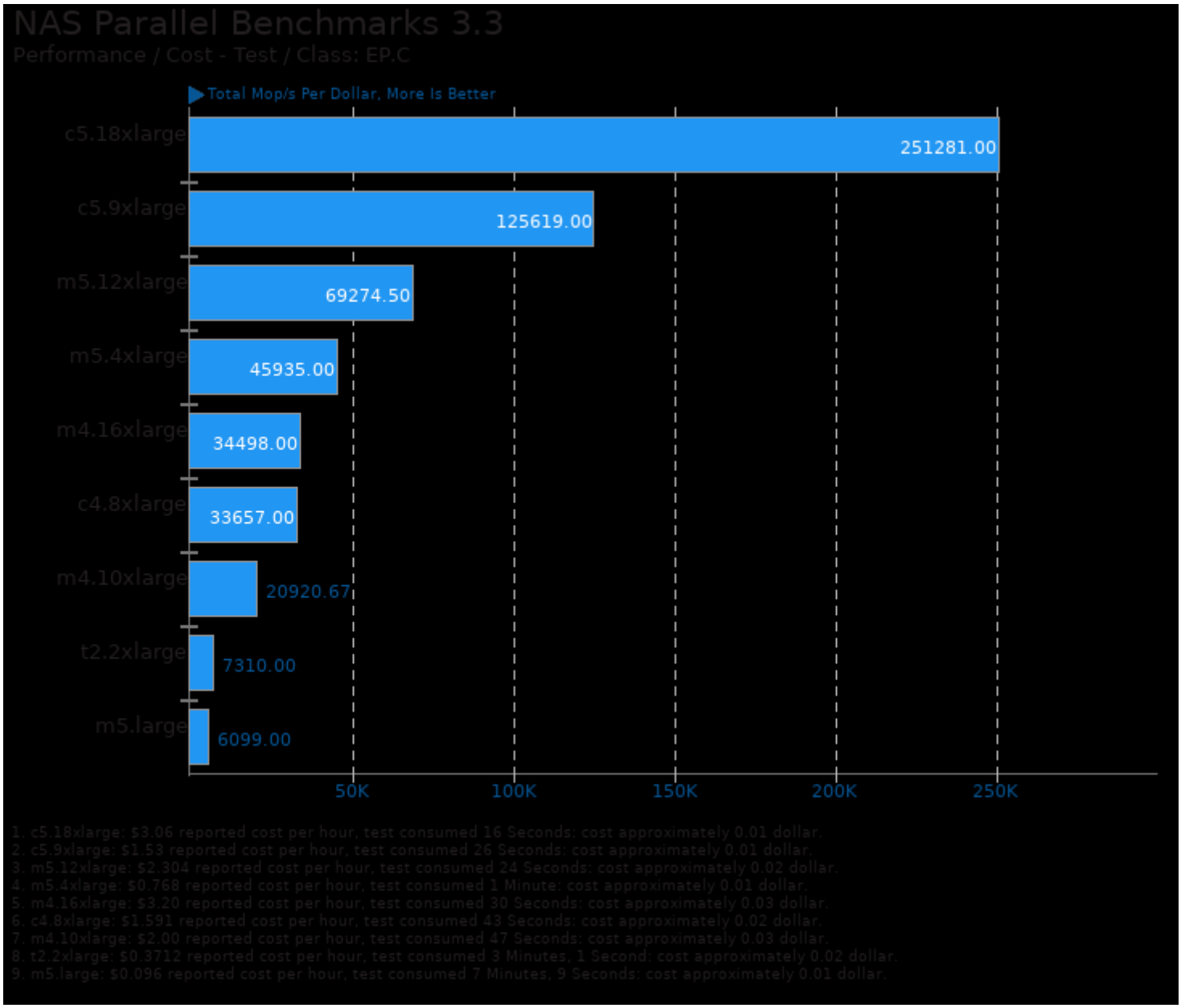

John The Ripper 1.8.0
Test: Blowfish
Real C/S, More Is Better
c5.18xlarge
SE +/- 33.25, N = 3
60305
2 x Xeon Gold 6138
SE +/- 543.71, N = 3
50248
m4.16xlarge
SE +/- 193.12, N = 3
39091
m5.12xlarge
SE +/- 41.59, N = 3
37069
c5.9xlarge
SE +/- 26.19, N = 3
30593
Core i9 7980XE
SE +/- 5.67, N = 3
30104
c4.8xlarge
SE +/- 40.45, N = 3
25341
m4.10xlarge
SE +/- 16.00, N = 3
23632
EPYC 7601
SE +/- 67.59, N = 3
23552
Threadripper 1950X
SE +/- 261.31, N = 3
23001
Core i7 8700K
12758
Ryzen 7 1800X
SE +/- 7.54, N = 3
12445
m5.4xlarge
SE +/- 21.00, N = 3
12094
Core i7 5960X
SE +/- 1.67, N = 3
11710
Ryzen 7 1700
SE +/- 50.04, N = 3
10431
Core i7 7740X
8880
Xeon Silver 4108
8275
Core i5 8400
6998
Core i7 4770K
SE +/- 126.37, N = 3
6800
t2.2xlarge
6067
Ryzen 5 2400G
SE +/- 96.59, N = 6
6022
Core i5 7600K
4910
Ryzen 3 2200G
SE +/- 4.67, N = 3
4540
Core i3 8100
SE +/- 5.20, N = 3
4411
Ryzen 3 1300X
SE +/- 8.50, N = 3
4393
8 x Intel Xeon
SE +/- 38.68, N = 3
3919
Ryzen 3 1200
SE +/- 17.29, N = 3
3711
m5.large
SE +/- 23.86, N = 3
1562
13K
26K
39K
52K
65K
1. (CC) gcc options: -fopenmp -lcrypt

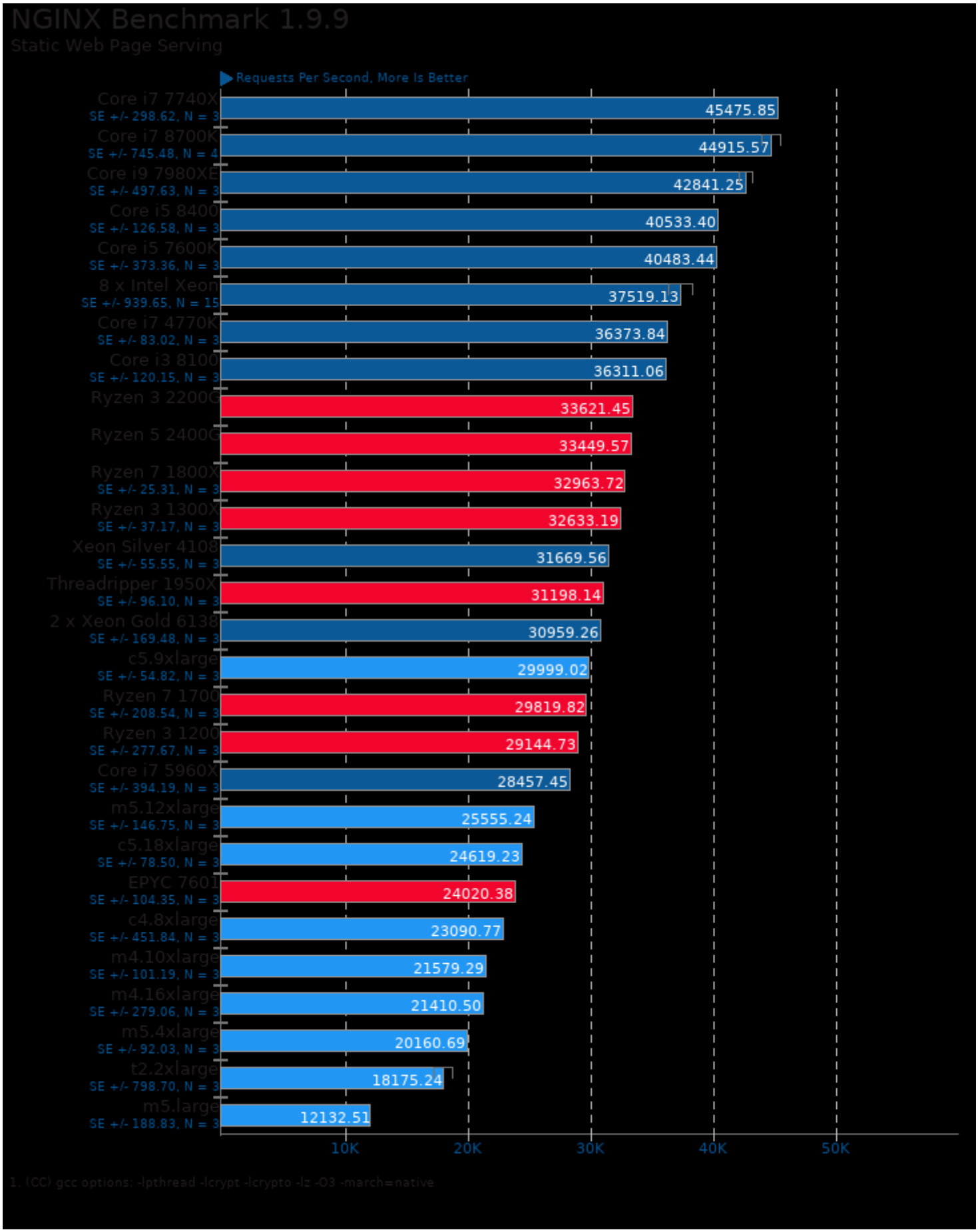

John The Ripper 1.8.0
Performance / Cost - Test: Blowfish
Real C/S Per Dollar, More Is Better
c5.18xlarge
354735.29
c5.9xlarge
339922.22
t2.2xlarge
303350.00
m5.4xlarge
302350.00
m5.12xlarge
285146.15
c4.8xlarge
281566.67
m4.16xlarge
217172.22
m4.10xlarge
214836.36
m5.large
156200.00
80K
160K
240K
320K
400K
1. c5.18xlarge: $3.06 reported cost per hour, test consumed 3 Minutes, 22 Seconds: cost approximately 0.17 dollar.
2. c5.9xlarge: $1.53 reported cost per hour, test consumed 3 Minutes, 21 Seconds: cost approximately 0.09 dollar.
3. t2.2xlarge: $0.3712 reported cost per hour, test consumed 3 Minutes, 19 Seconds: cost approximately 0.02 dollar.
4. m5.4xlarge: $0.768 reported cost per hour, test consumed 3 Minutes, 20 Seconds: cost approximately 0.04 dollar.
5. m5.12xlarge: $2.304 reported cost per hour, test consumed 3 Minutes, 21 Seconds: cost approximately 0.13 dollar.
6. c4.8xlarge: $1.591 reported cost per hour, test consumed 3 Minutes, 21 Seconds: cost approximately 0.09 dollar.
7. m4.16xlarge: $3.20 reported cost per hour, test consumed 3 Minutes, 21 Seconds: cost approximately 0.18 dollar.
8. m4.10xlarge: $2.00 reported cost per hour, test consumed 3 Minutes, 22 Seconds: cost approximately 0.11 dollar.
9. m5.large: $0.096 reported cost per hour, test consumed 3 Minutes, 20 Seconds: cost approximately 0.01 dollar.

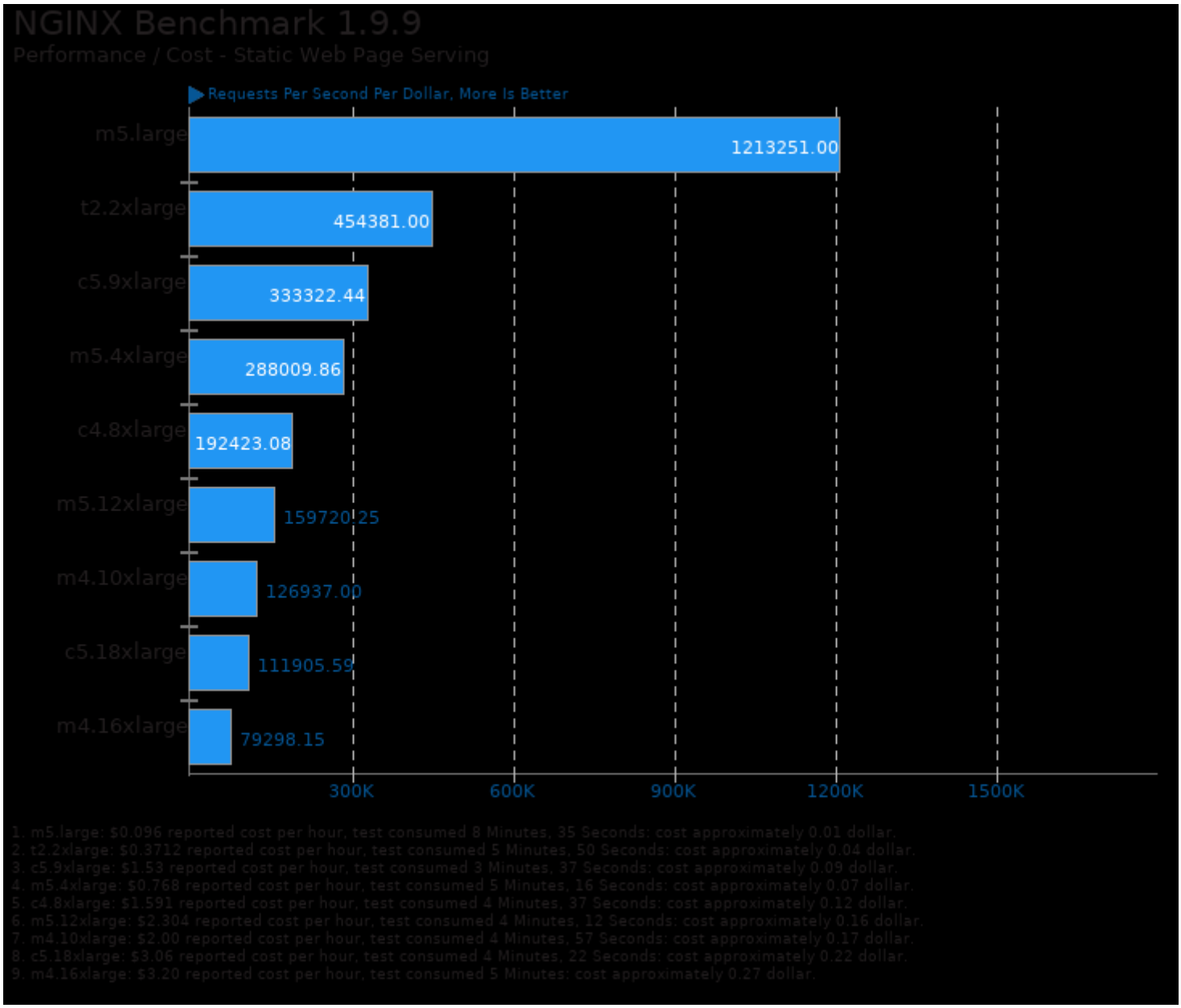

LAME MP3 Encoding 3.100
WAV To MP3
Seconds, Fewer Is Better
Core i7 8700K
SE +/- 0.20, N = 3
26.07
Core i7 7740X
SE +/- 0.13, N = 3
27.50
Core i9 7980XE
SE +/- 0.02, N = 3
28.50
Core i5 7600K
SE +/- 0.02, N = 3
28.77
Core i5 8400
SE +/- 0.00, N = 3
30.01
2 x Xeon Gold 6138
SE +/- 0.02, N = 3
32.33
Core i7 4770K
SE +/- 0.08, N = 3
32.54
8 x Intel Xeon
SE +/- 0.03, N = 3
33.09
Core i3 8100
SE +/- 0.01, N = 3
33.30
Ryzen 7 1800X
SE +/- 0.15, N = 3
33.50
Threadripper 1950X
SE +/- 0.18, N = 3
33.75
Ryzen 5 2400G
SE +/- 0.02, N = 3
35.19
c5.18xlarge
SE +/- 0.01, N = 3
35.62
c5.9xlarge
SE +/- 0.01, N = 3
35.63
Ryzen 3 1300X
SE +/- 0.06, N = 3
35.78
Core i7 5960X
SE +/- 0.03, N = 3
36.18
Ryzen 7 1700
SE +/- 0.00, N = 3
36.59
Ryzen 3 2200G
SE +/- 0.03, N = 3
37.13
c4.8xlarge
SE +/- 0.04, N = 3
37.62
Ryzen 3 1200
SE +/- 0.03, N = 3
39.68
Xeon Silver 4108
SE +/- 0.01, N = 3
39.90
m5.large
SE +/- 1.71, N = 3
41.09
t2.2xlarge
SE +/- 0.03, N = 3
42.12
EPYC 7601
SE +/- 0.01, N = 3
42.77
m5.12xlarge
SE +/- 0.03, N = 3
43.57
m5.4xlarge
SE +/- 0.03, N = 3
43.90
m4.16xlarge
SE +/- 0.17, N = 3
45.22
m4.10xlarge
SE +/- 0.08, N = 3
45.51
10
20
30
40
50
1. (CC) gcc options: -lm

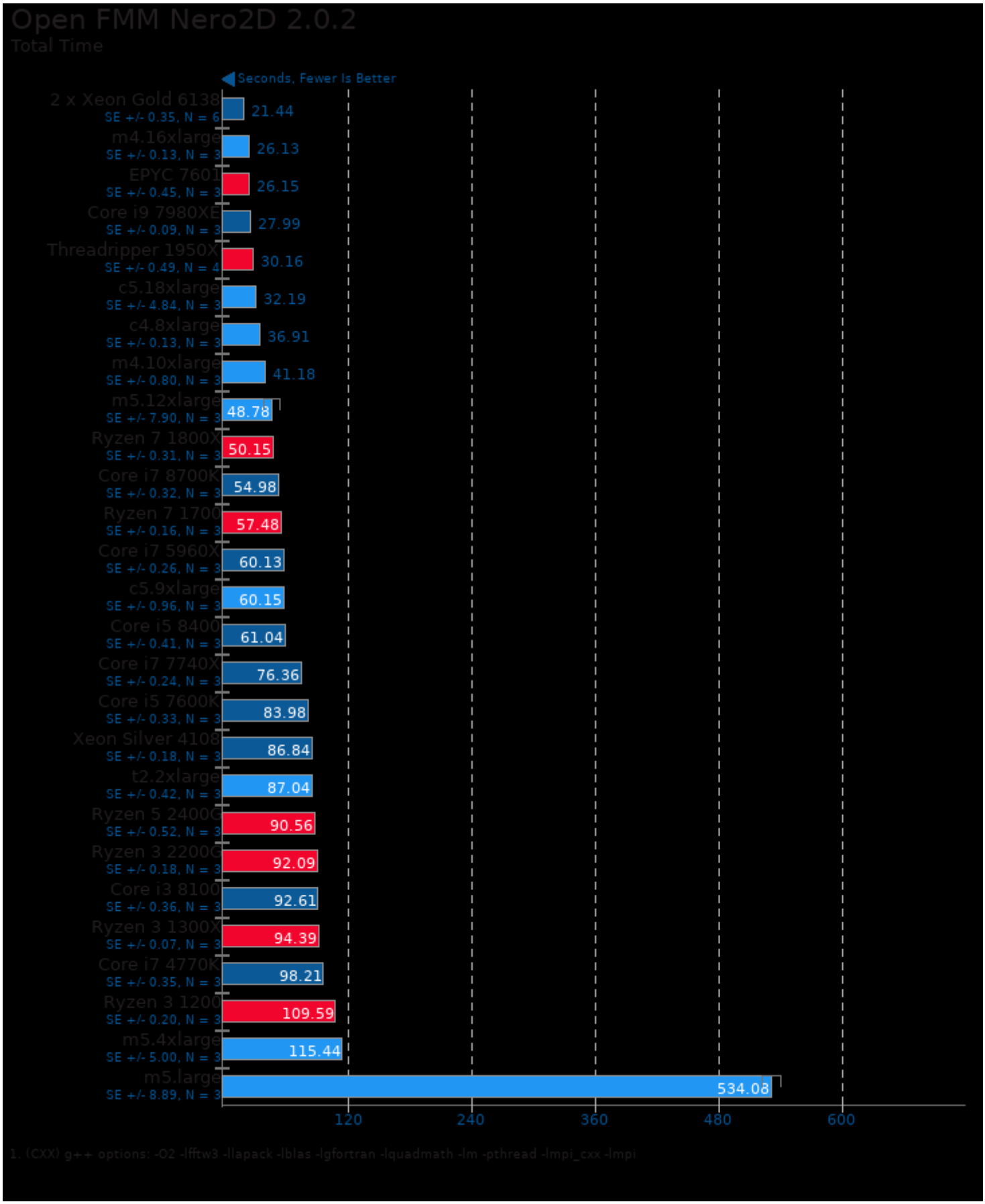

LAME MP3 Encoding 3.100
Performance / Cost - WAV To MP3
Seconds x Dollar, Fewer Is Better
t2.2xlarge
0.42
m5.4xlarge
1.32
c5.9xlarge
1.78
c4.8xlarge
1.88
c5.18xlarge
3.21
m4.10xlarge
3.64
m5.12xlarge
3.92
m4.16xlarge
5.43
1.2218
2.4436
3.6654
4.8872
6.109
1. t2.2xlarge: $0.3712 reported cost per hour, test consumed 2 Minutes, 10 Seconds: cost approximately 0.01 dollar.
2. m5.4xlarge: $0.768 reported cost per hour, test consumed 2 Minutes, 16 Seconds: cost approximately 0.03 dollar.
3. c5.9xlarge: $1.53 reported cost per hour, test consumed 1 Minute, 51 Seconds: cost approximately 0.05 dollar.
4. c4.8xlarge: $1.591 reported cost per hour, test consumed 1 Minute, 56 Seconds: cost approximately 0.05 dollar.
5. c5.18xlarge: $3.06 reported cost per hour, test consumed 1 Minute, 51 Seconds: cost approximately 0.09 dollar.
6. m4.10xlarge: $2.00 reported cost per hour, test consumed 2 Minutes, 21 Seconds: cost approximately 0.08 dollar.
7. m5.12xlarge: $2.304 reported cost per hour, test consumed 2 Minutes, 14 Seconds: cost approximately 0.09 dollar.
8. m4.16xlarge: $3.20 reported cost per hour, test consumed 2 Minutes, 19 Seconds: cost approximately 0.12 dollar.

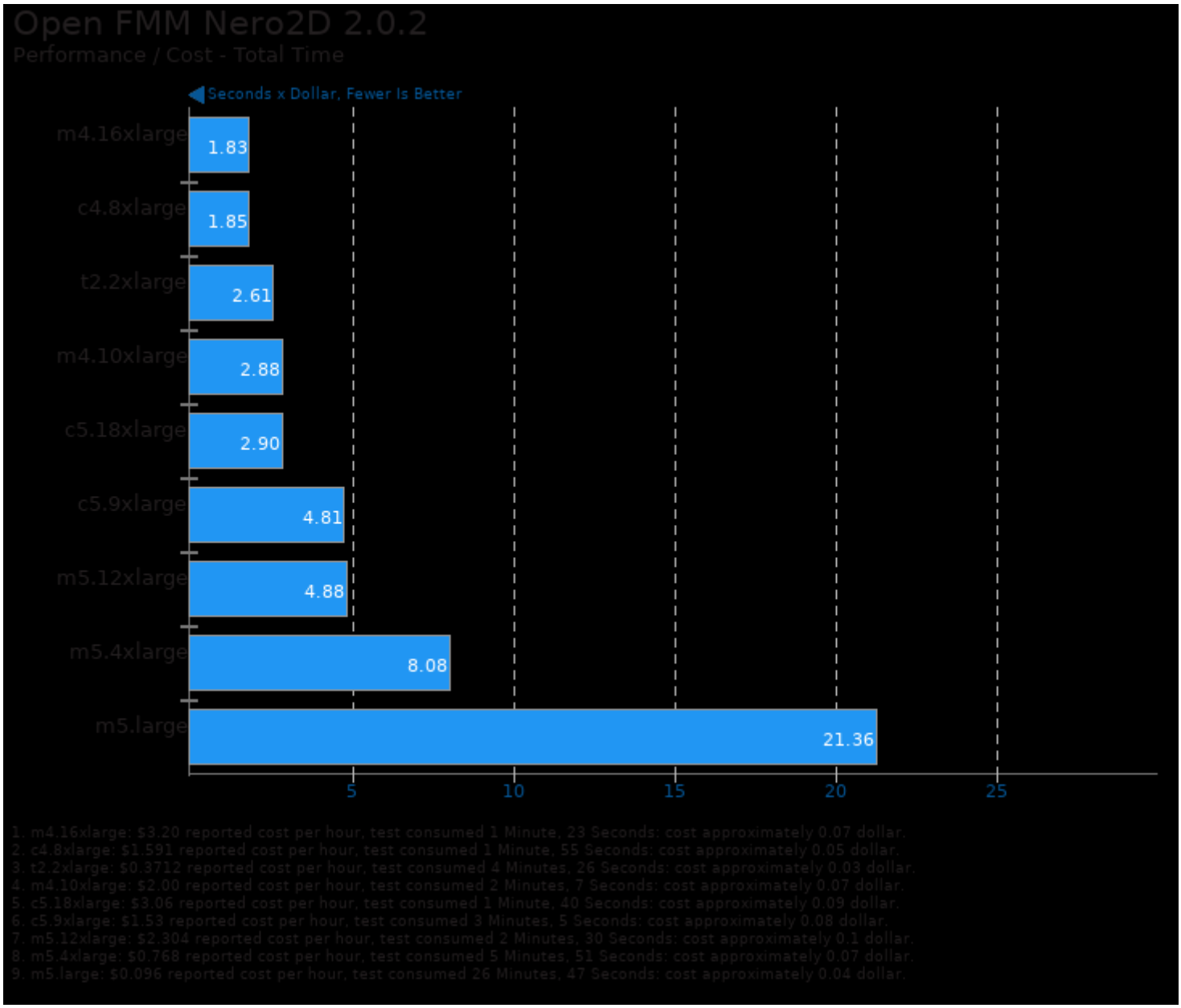

NAS Parallel Benchmarks 3.3
Test / Class: EP.C
Total Mop/s, More Is Better
c5.18xlarge
SE +/- 29.39, N = 3
2512.81
2 x Xeon Gold 6138
SE +/- 12.45, N = 3
1998.87
EPYC 7601
SE +/- 5.85, N = 3
1622.78
m5.12xlarge
SE +/- 1.50, N = 3
1385.49
Core i9 7980XE
SE +/- 6.48, N = 3
1267.77
c5.9xlarge
SE +/- 19.93, N = 3
1256.19
Threadripper 1950X
SE +/- 3.38, N = 3
1090.37
m4.16xlarge
SE +/- 1.06, N = 3
1034.94
c4.8xlarge
SE +/- 3.43, N = 3
673.14
m4.10xlarge
SE +/- 0.96, N = 3
627.62
Core i7 8700K
SE +/- 1.92, N = 3
577.05
Ryzen 7 1800X
SE +/- 1.24, N = 3
571.10
Core i7 5960X
SE +/- 0.71, N = 3
564.87
Ryzen 7 1700
SE +/- 7.05, N = 3
489.65
m5.4xlarge
SE +/- 1.09, N = 3
459.35
Core i7 7740X
SE +/- 2.53, N = 3
394.63
Core i7 4770K
SE +/- 1.89, N = 3
331.54
Core i5 8400
SE +/- 0.16, N = 3
321.50
Xeon Silver 4108
SE +/- 0.71, N = 3
319.97
Ryzen 5 2400G
SE +/- 1.66, N = 3
293.90
Core i5 7600K
SE +/- 0.23, N = 3
225.62
Core i3 8100
SE +/- 0.32, N = 3
202.48
t2.2xlarge
SE +/- 0.08, N = 3
146.20
Ryzen 3 2200G
SE +/- 0.24, N = 3
144.02
Ryzen 3 1300X
SE +/- 0.05, N = 3
141.62
Ryzen 3 1200
SE +/- 0.38, N = 3
122.00
m5.large
SE +/- 3.02, N = 3
60.99
500
1000
1500
2000
2500
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. c5.18xlarge: Open MPI 1.10.2
3. 2 x Xeon Gold 6138: Open MPI 2.1.1
4. EPYC 7601: Open MPI 2.1.1
5. m5.12xlarge: Open MPI 1.10.2
6. Core i9 7980XE: Open MPI 2.1.1
7. c5.9xlarge: Open MPI 1.10.2
8. Threadripper 1950X: Open MPI 2.1.1
9. m4.16xlarge: Open MPI 1.10.2
10. c4.8xlarge: Open MPI 1.10.2
11. m4.10xlarge: Open MPI 1.10.2
12. Core i7 8700K: Open MPI 2.1.1
13. Ryzen 7 1800X: Open MPI 2.1.1
14. Core i7 5960X: Open MPI 2.1.1

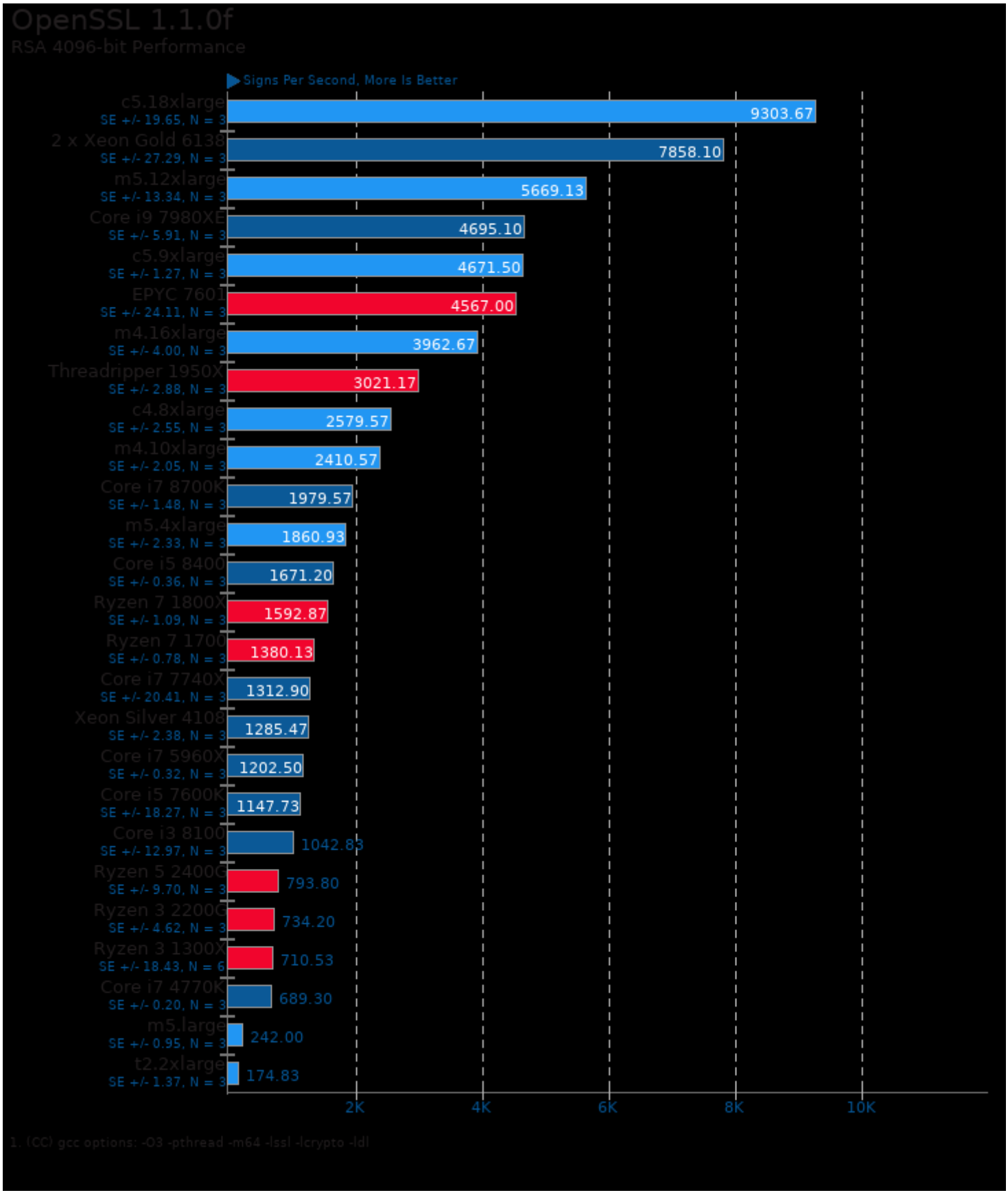

NAS Parallel Benchmarks 3.3
Performance / Cost - Test / Class: EP.C
Total Mop/s Per Dollar, More Is Better
c5.18xlarge
251281.00
c5.9xlarge
125619.00
m5.12xlarge
69274.50
m5.4xlarge
45935.00
m4.16xlarge
34498.00
c4.8xlarge
33657.00
m4.10xlarge
20920.67
t2.2xlarge
7310.00
m5.large
6099.00
50K
100K
150K
200K
250K
1. c5.18xlarge: $3.06 reported cost per hour, test consumed 16 Seconds: cost approximately 0.01 dollar.
2. c5.9xlarge: $1.53 reported cost per hour, test consumed 26 Seconds: cost approximately 0.01 dollar.
3. m5.12xlarge: $2.304 reported cost per hour, test consumed 24 Seconds: cost approximately 0.02 dollar.
4. m5.4xlarge: $0.768 reported cost per hour, test consumed 1 Minute: cost approximately 0.01 dollar.
5. m4.16xlarge: $3.20 reported cost per hour, test consumed 30 Seconds: cost approximately 0.03 dollar.
6. c4.8xlarge: $1.591 reported cost per hour, test consumed 43 Seconds: cost approximately 0.02 dollar.
7. m4.10xlarge: $2.00 reported cost per hour, test consumed 47 Seconds: cost approximately 0.03 dollar.
8. t2.2xlarge: $0.3712 reported cost per hour, test consumed 3 Minutes, 1 Second: cost approximately 0.02 dollar.
9. m5.large: $0.096 reported cost per hour, test consumed 7 Minutes, 9 Seconds: cost approximately 0.01 dollar.

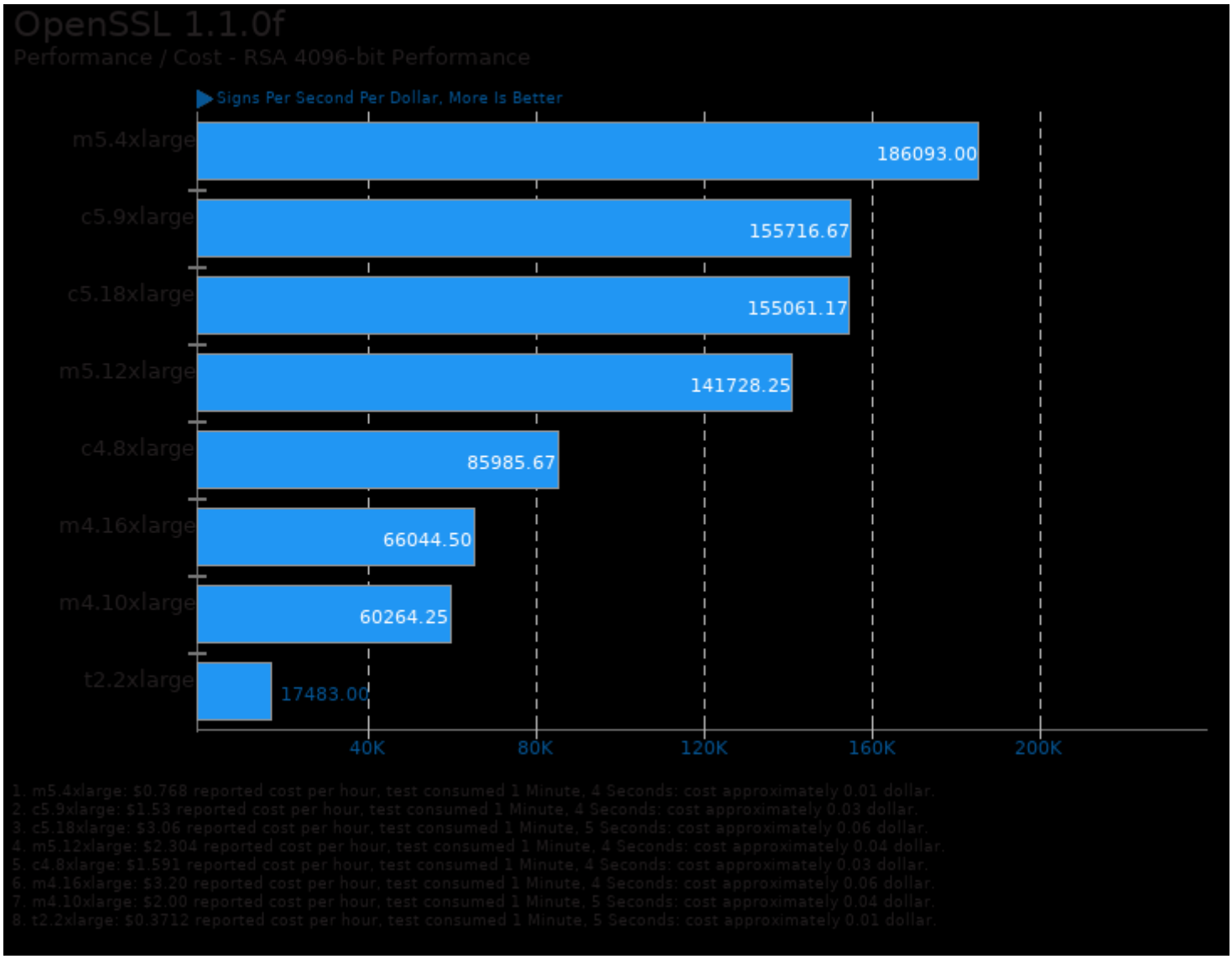

NGINX Benchmark 1.9.9
Static Web Page Serving
Requests Per Second, More Is Better
Core i7 7740X
SE +/- 298.62, N = 3
45475.85
Core i7 8700K
SE +/- 745.48, N = 4
44915.57
Core i9 7980XE
SE +/- 497.63, N = 3
42841.25
Core i5 8400
SE +/- 126.58, N = 3
40533.40
Core i5 7600K
SE +/- 373.36, N = 3
40483.44
8 x Intel Xeon
SE +/- 939.65, N = 15
37519.13
Core i7 4770K
SE +/- 83.02, N = 3
36373.84
Core i3 8100
SE +/- 120.15, N = 3
36311.06
Ryzen 3 2200G
33621.45
Ryzen 5 2400G
33449.57
Ryzen 7 1800X
SE +/- 25.31, N = 3
32963.72
Ryzen 3 1300X
SE +/- 37.17, N = 3
32633.19
Xeon Silver 4108
SE +/- 55.55, N = 3
31669.56
Threadripper 1950X
SE +/- 96.10, N = 3
31198.14
2 x Xeon Gold 6138
SE +/- 169.48, N = 3
30959.26
c5.9xlarge
SE +/- 54.82, N = 3
29999.02
Ryzen 7 1700
SE +/- 208.54, N = 3
29819.82
Ryzen 3 1200
SE +/- 277.67, N = 3
29144.73
Core i7 5960X
SE +/- 394.19, N = 3
28457.45
m5.12xlarge
SE +/- 146.75, N = 3
25555.24
c5.18xlarge
SE +/- 78.50, N = 3
24619.23
EPYC 7601
SE +/- 104.35, N = 3
24020.38
c4.8xlarge
SE +/- 451.84, N = 3
23090.77
m4.10xlarge
SE +/- 101.19, N = 3
21579.29
m4.16xlarge
SE +/- 279.06, N = 3
21410.50
m5.4xlarge
SE +/- 92.03, N = 3
20160.69
t2.2xlarge
SE +/- 798.70, N = 3
18175.24
m5.large
SE +/- 188.83, N = 3
12132.51
10K
20K
30K
40K
50K
1. (CC) gcc options: -lpthread -lcrypt -lcrypto -lz -O3 -march=native

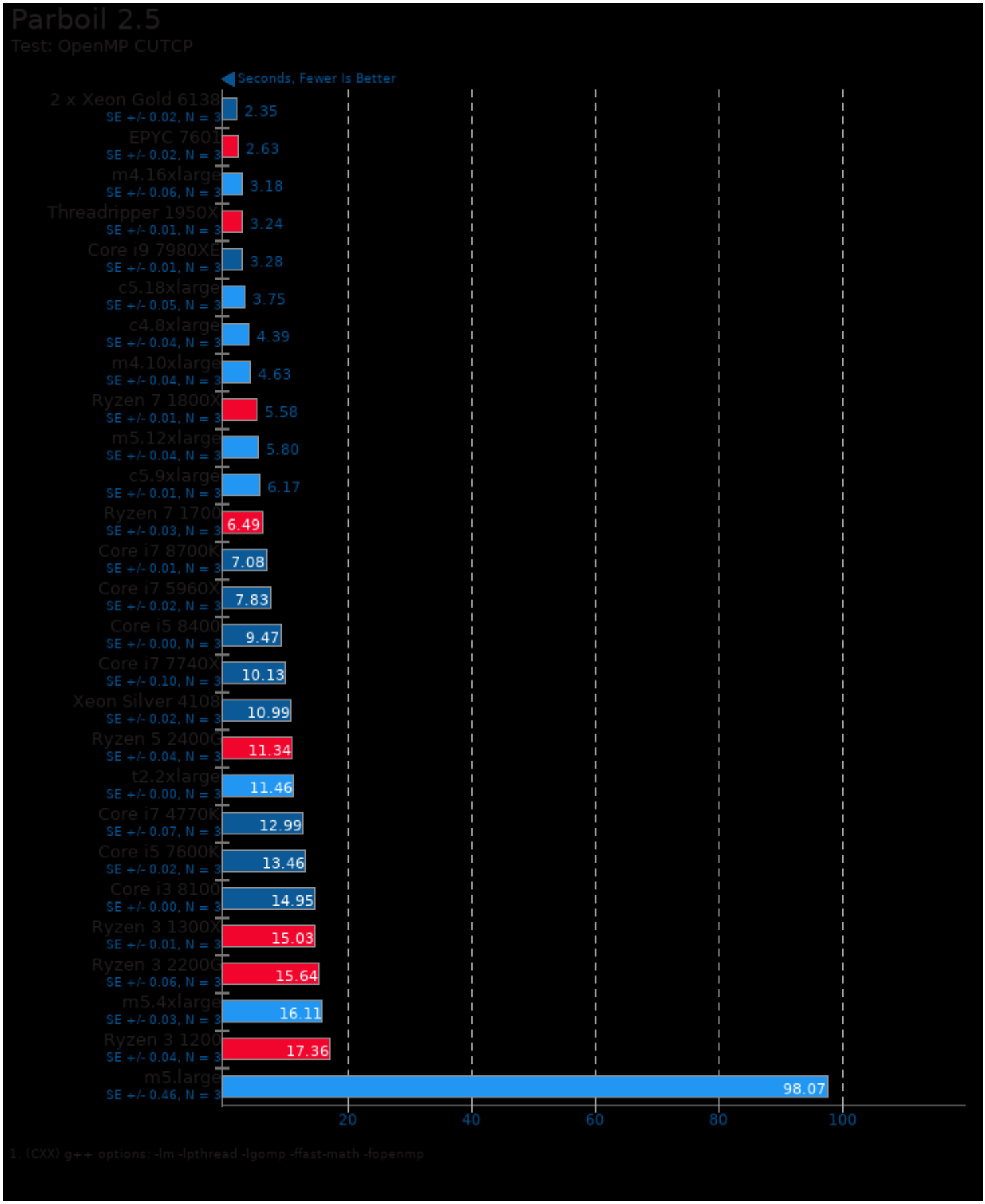

NGINX Benchmark 1.9.9
Performance / Cost - Static Web Page Serving
Requests Per Second Per Dollar, More Is Better
m5.large
1213251.00
t2.2xlarge
454381.00
c5.9xlarge
333322.44
m5.4xlarge
288009.86
c4.8xlarge
192423.08
m5.12xlarge
159720.25
m4.10xlarge
126937.00
c5.18xlarge
111905.59
m4.16xlarge
79298.15
300K
600K
900K
1200K
1500K
1. m5.large: $0.096 reported cost per hour, test consumed 8 Minutes, 35 Seconds: cost approximately 0.01 dollar.
2. t2.2xlarge: $0.3712 reported cost per hour, test consumed 5 Minutes, 50 Seconds: cost approximately 0.04 dollar.
3. c5.9xlarge: $1.53 reported cost per hour, test consumed 3 Minutes, 37 Seconds: cost approximately 0.09 dollar.
4. m5.4xlarge: $0.768 reported cost per hour, test consumed 5 Minutes, 16 Seconds: cost approximately 0.07 dollar.
5. c4.8xlarge: $1.591 reported cost per hour, test consumed 4 Minutes, 37 Seconds: cost approximately 0.12 dollar.
6. m5.12xlarge: $2.304 reported cost per hour, test consumed 4 Minutes, 12 Seconds: cost approximately 0.16 dollar.
7. m4.10xlarge: $2.00 reported cost per hour, test consumed 4 Minutes, 57 Seconds: cost approximately 0.17 dollar.
8. c5.18xlarge: $3.06 reported cost per hour, test consumed 4 Minutes, 22 Seconds: cost approximately 0.22 dollar.
9. m4.16xlarge: $3.20 reported cost per hour, test consumed 5 Minutes: cost approximately 0.27 dollar.

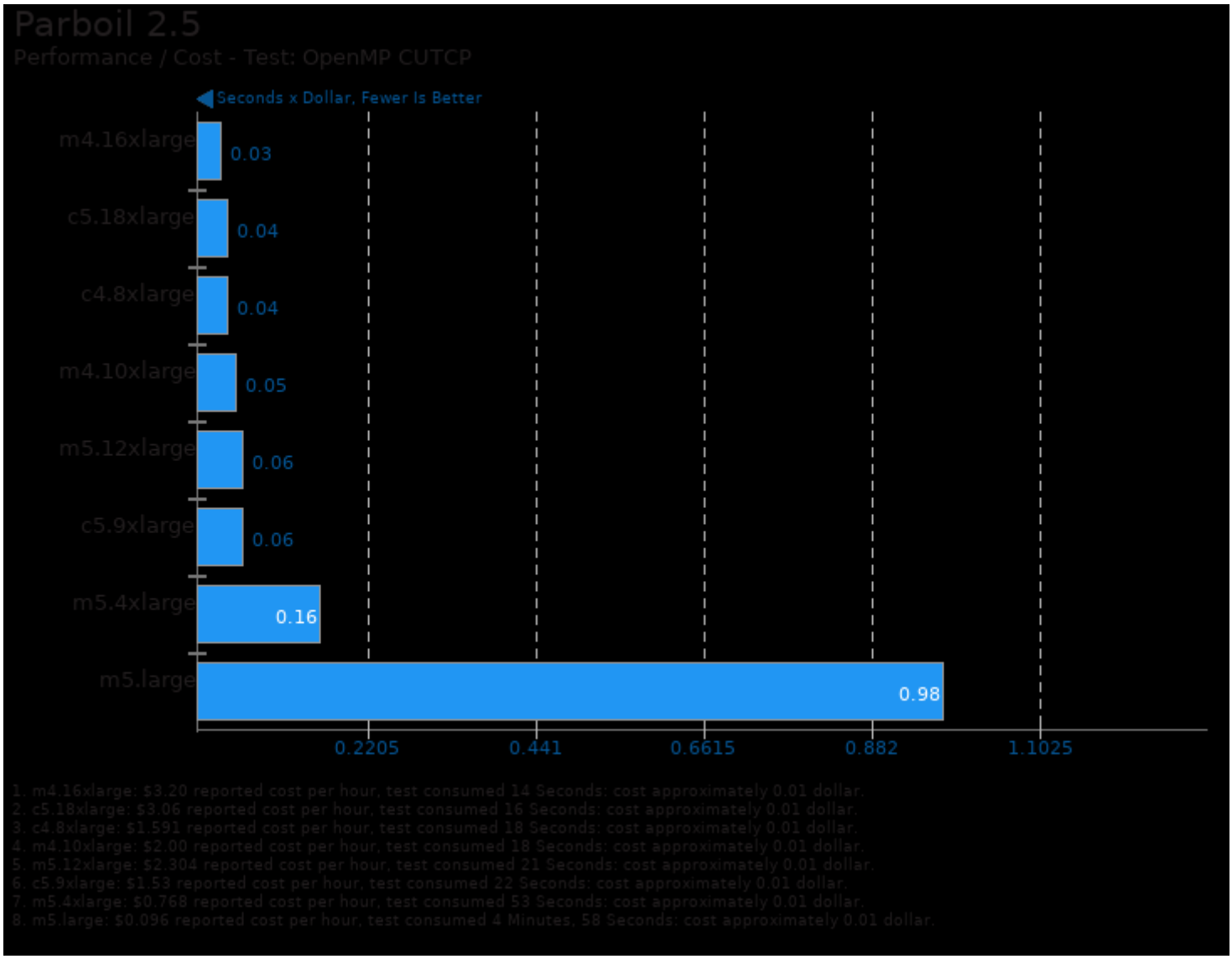

Open FMM Nero2D 2.0.2
Total Time
Seconds, Fewer Is Better
2 x Xeon Gold 6138
SE +/- 0.35, N = 6
21.44
m4.16xlarge
SE +/- 0.13, N = 3
26.13
EPYC 7601
SE +/- 0.45, N = 3
26.15
Core i9 7980XE
SE +/- 0.09, N = 3
27.99
Threadripper 1950X
SE +/- 0.49, N = 4
30.16
c5.18xlarge
SE +/- 4.84, N = 3
32.19
c4.8xlarge
SE +/- 0.13, N = 3
36.91
m4.10xlarge
SE +/- 0.80, N = 3
41.18
m5.12xlarge
SE +/- 7.90, N = 3
48.78
Ryzen 7 1800X
SE +/- 0.31, N = 3
50.15
Core i7 8700K
SE +/- 0.32, N = 3
54.98
Ryzen 7 1700
SE +/- 0.16, N = 3
57.48
Core i7 5960X
SE +/- 0.26, N = 3
60.13
c5.9xlarge
SE +/- 0.96, N = 3
60.15
Core i5 8400
SE +/- 0.41, N = 3
61.04
Core i7 7740X
SE +/- 0.24, N = 3
76.36
Core i5 7600K
SE +/- 0.33, N = 3
83.98
Xeon Silver 4108
SE +/- 0.18, N = 3
86.84
t2.2xlarge
SE +/- 0.42, N = 3
87.04
Ryzen 5 2400G
SE +/- 0.52, N = 3
90.56
Ryzen 3 2200G
SE +/- 0.18, N = 3
92.09
Core i3 8100
SE +/- 0.36, N = 3
92.61
Ryzen 3 1300X
SE +/- 0.07, N = 3
94.39
Core i7 4770K
SE +/- 0.35, N = 3
98.21
Ryzen 3 1200
SE +/- 0.20, N = 3
109.59
m5.4xlarge
SE +/- 5.00, N = 3
115.44
m5.large
SE +/- 8.89, N = 3
534.08
120
240
360
480
600
1. (CXX) g++ options: -O2 -lfftw3 -llapack -lblas -lgfortran -lquadmath -lm -pthread -lmpi_cxx -lmpi

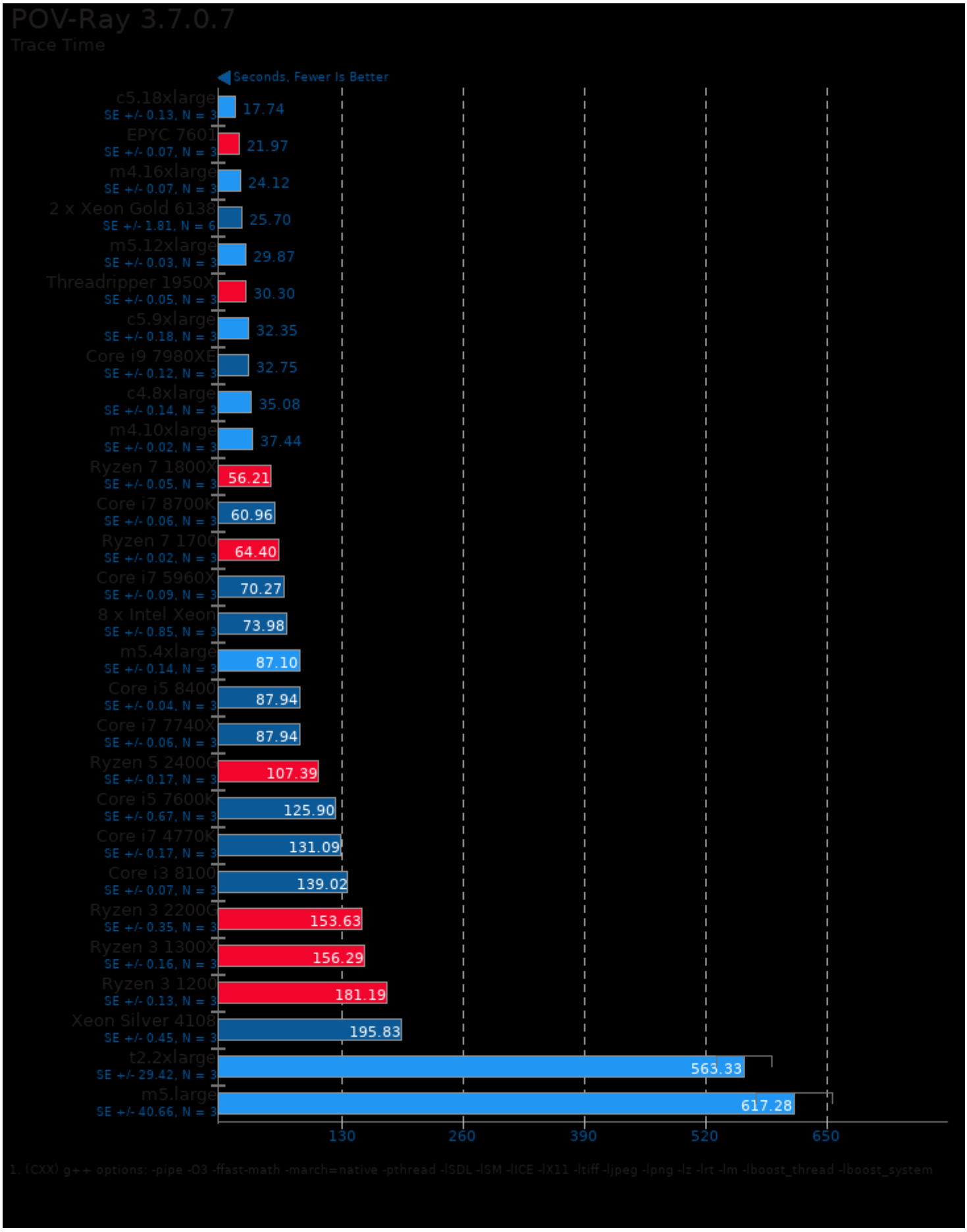

Open FMM Nero2D 2.0.2
Performance / Cost - Total Time
Seconds x Dollar, Fewer Is Better
m4.16xlarge
1.83
c4.8xlarge
1.85
t2.2xlarge
2.61
m4.10xlarge
2.88
c5.18xlarge
2.90
c5.9xlarge
4.81
m5.12xlarge
4.88
m5.4xlarge
8.08
m5.large
21.36
5
10
15
20
25
1. m4.16xlarge: $3.20 reported cost per hour, test consumed 1 Minute, 23 Seconds: cost approximately 0.07 dollar.
2. c4.8xlarge: $1.591 reported cost per hour, test consumed 1 Minute, 55 Seconds: cost approximately 0.05 dollar.
3. t2.2xlarge: $0.3712 reported cost per hour, test consumed 4 Minutes, 26 Seconds: cost approximately 0.03 dollar.
4. m4.10xlarge: $2.00 reported cost per hour, test consumed 2 Minutes, 7 Seconds: cost approximately 0.07 dollar.
5. c5.18xlarge: $3.06 reported cost per hour, test consumed 1 Minute, 40 Seconds: cost approximately 0.09 dollar.
6. c5.9xlarge: $1.53 reported cost per hour, test consumed 3 Minutes, 5 Seconds: cost approximately 0.08 dollar.
7. m5.12xlarge: $2.304 reported cost per hour, test consumed 2 Minutes, 30 Seconds: cost approximately 0.1 dollar.
8. m5.4xlarge: $0.768 reported cost per hour, test consumed 5 Minutes, 51 Seconds: cost approximately 0.07 dollar.
9. m5.large: $0.096 reported cost per hour, test consumed 26 Minutes, 47 Seconds: cost approximately 0.04 dollar.

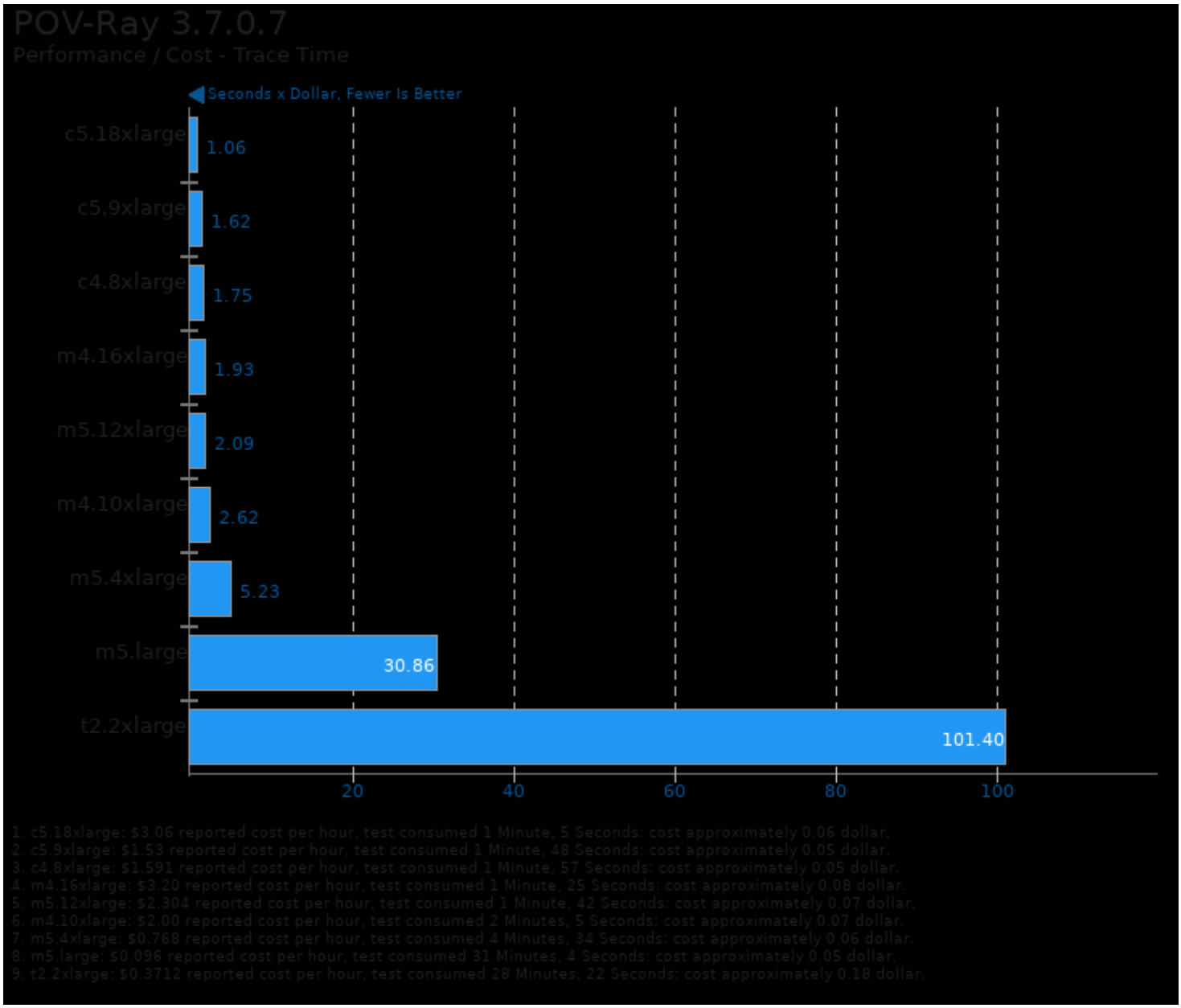

OpenSSL 1.1.0f
RSA 4096-bit Performance
Signs Per Second, More Is Better
c5.18xlarge
SE +/- 19.65, N = 3
9303.67
2 x Xeon Gold 6138
SE +/- 27.29, N = 3
7858.10
m5.12xlarge
SE +/- 13.34, N = 3
5669.13
Core i9 7980XE
SE +/- 5.91, N = 3
4695.10
c5.9xlarge
SE +/- 1.27, N = 3
4671.50
EPYC 7601
SE +/- 24.11, N = 3
4567.00
m4.16xlarge
SE +/- 4.00, N = 3
3962.67
Threadripper 1950X
SE +/- 2.88, N = 3
3021.17
c4.8xlarge
SE +/- 2.55, N = 3
2579.57
m4.10xlarge
SE +/- 2.05, N = 3
2410.57
Core i7 8700K
SE +/- 1.48, N = 3
1979.57
m5.4xlarge
SE +/- 2.33, N = 3
1860.93
Core i5 8400
SE +/- 0.36, N = 3
1671.20
Ryzen 7 1800X
SE +/- 1.09, N = 3
1592.87
Ryzen 7 1700
SE +/- 0.78, N = 3
1380.13
Core i7 7740X
SE +/- 20.41, N = 3
1312.90
Xeon Silver 4108
SE +/- 2.38, N = 3
1285.47
Core i7 5960X
SE +/- 0.32, N = 3
1202.50
Core i5 7600K
SE +/- 18.27, N = 3
1147.73
Core i3 8100
SE +/- 12.97, N = 3
1042.83
Ryzen 5 2400G
SE +/- 9.70, N = 3
793.80
Ryzen 3 2200G
SE +/- 4.62, N = 3
734.20
Ryzen 3 1300X
SE +/- 18.43, N = 6
710.53
Core i7 4770K
SE +/- 0.20, N = 3
689.30
m5.large
SE +/- 0.95, N = 3
242.00
t2.2xlarge
SE +/- 1.37, N = 3
174.83
2K
4K
6K
8K
10K
1. (CC) gcc options: -O3 -pthread -m64 -lssl -lcrypto -ldl

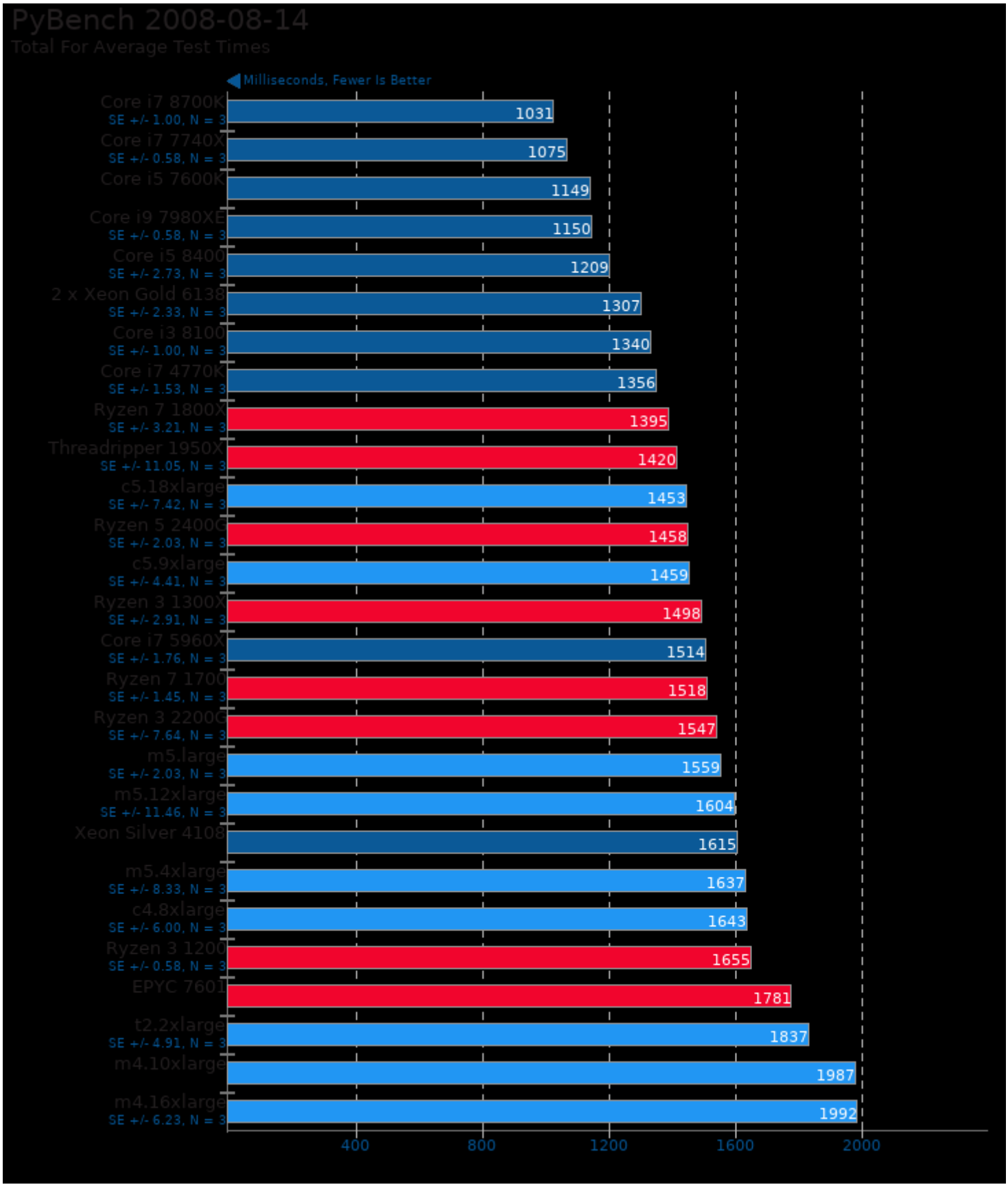

OpenSSL 1.1.0f
Performance / Cost - RSA 4096-bit Performance
Signs Per Second Per Dollar, More Is Better
m5.4xlarge
186093.00
c5.9xlarge
155716.67
c5.18xlarge
155061.17
m5.12xlarge
141728.25
c4.8xlarge
85985.67
m4.16xlarge
66044.50
m4.10xlarge
60264.25
t2.2xlarge
17483.00
40K
80K
120K
160K
200K
1. m5.4xlarge: $0.768 reported cost per hour, test consumed 1 Minute, 4 Seconds: cost approximately 0.01 dollar.
2. c5.9xlarge: $1.53 reported cost per hour, test consumed 1 Minute, 4 Seconds: cost approximately 0.03 dollar.
3. c5.18xlarge: $3.06 reported cost per hour, test consumed 1 Minute, 5 Seconds: cost approximately 0.06 dollar.
4. m5.12xlarge: $2.304 reported cost per hour, test consumed 1 Minute, 4 Seconds: cost approximately 0.04 dollar.
5. c4.8xlarge: $1.591 reported cost per hour, test consumed 1 Minute, 4 Seconds: cost approximately 0.03 dollar.
6. m4.16xlarge: $3.20 reported cost per hour, test consumed 1 Minute, 4 Seconds: cost approximately 0.06 dollar.
7. m4.10xlarge: $2.00 reported cost per hour, test consumed 1 Minute, 5 Seconds: cost approximately 0.04 dollar.
8. t2.2xlarge: $0.3712 reported cost per hour, test consumed 1 Minute, 5 Seconds: cost approximately 0.01 dollar.

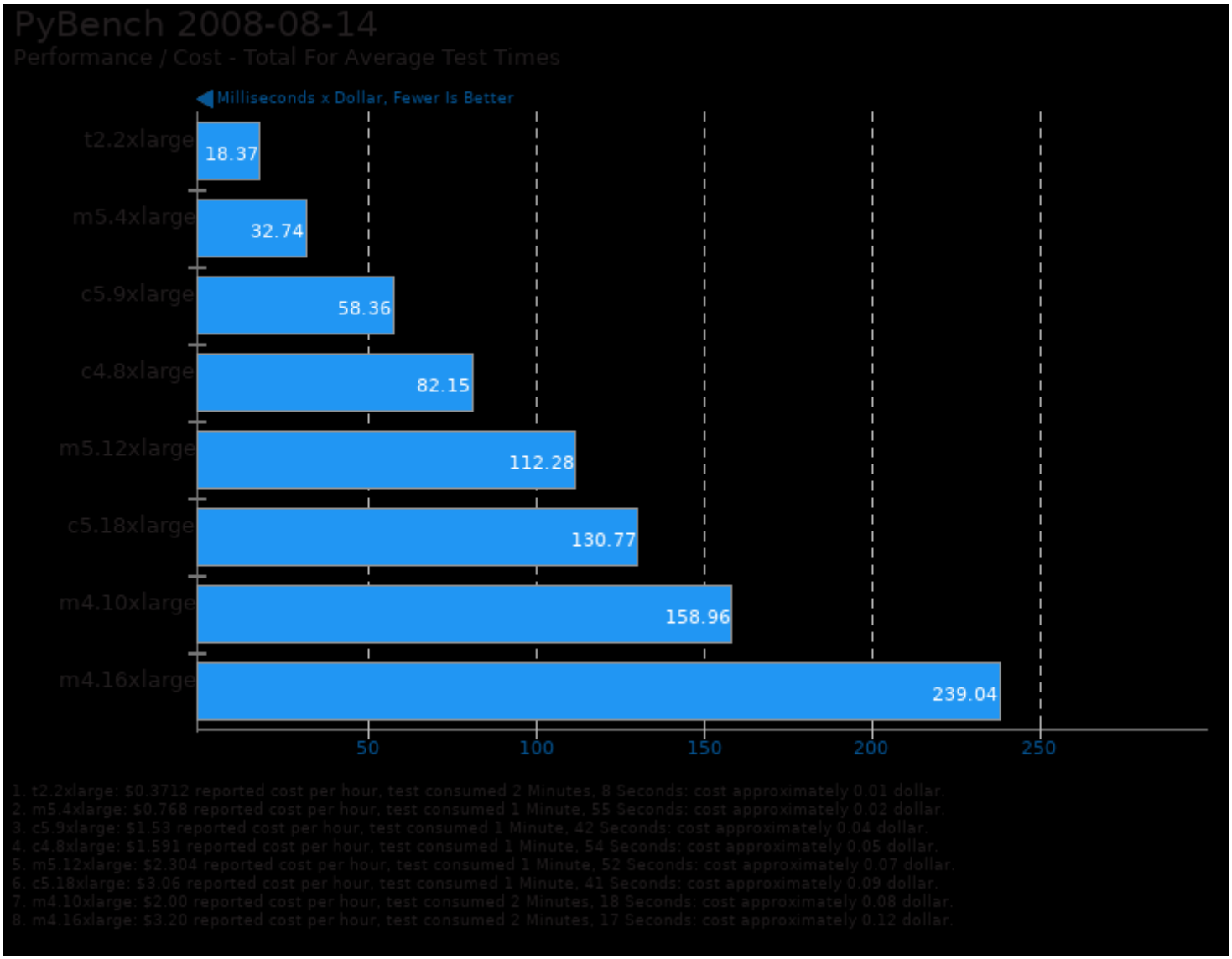

Parboil 2.5
Test: OpenMP CUTCP
Seconds, Fewer Is Better
2 x Xeon Gold 6138
SE +/- 0.02, N = 3
2.35
EPYC 7601
SE +/- 0.02, N = 3
2.63
m4.16xlarge
SE +/- 0.06, N = 3
3.18
Threadripper 1950X
SE +/- 0.01, N = 3
3.24
Core i9 7980XE
SE +/- 0.01, N = 3
3.28
c5.18xlarge
SE +/- 0.05, N = 3
3.75
c4.8xlarge
SE +/- 0.04, N = 3
4.39
m4.10xlarge
SE +/- 0.04, N = 3
4.63
Ryzen 7 1800X
SE +/- 0.01, N = 3
5.58
m5.12xlarge
SE +/- 0.04, N = 3
5.80
c5.9xlarge
SE +/- 0.01, N = 3
6.17
Ryzen 7 1700
SE +/- 0.03, N = 3
6.49
Core i7 8700K
SE +/- 0.01, N = 3
7.08
Core i7 5960X
SE +/- 0.02, N = 3
7.83
Core i5 8400
SE +/- 0.00, N = 3
9.47
Core i7 7740X
SE +/- 0.10, N = 3
10.13
Xeon Silver 4108
SE +/- 0.02, N = 3
10.99
Ryzen 5 2400G
SE +/- 0.04, N = 3
11.34
t2.2xlarge
SE +/- 0.00, N = 3
11.46
Core i7 4770K
SE +/- 0.07, N = 3
12.99
Core i5 7600K
SE +/- 0.02, N = 3
13.46
Core i3 8100
SE +/- 0.00, N = 3
14.95
Ryzen 3 1300X
SE +/- 0.01, N = 3
15.03
Ryzen 3 2200G
SE +/- 0.06, N = 3
15.64
m5.4xlarge
SE +/- 0.03, N = 3
16.11
Ryzen 3 1200
SE +/- 0.04, N = 3
17.36
m5.large
SE +/- 0.46, N = 3
98.07
20
40
60
80
100
1. (CXX) g++ options: -lm -lpthread -lgomp -ffast-math -fopenmp

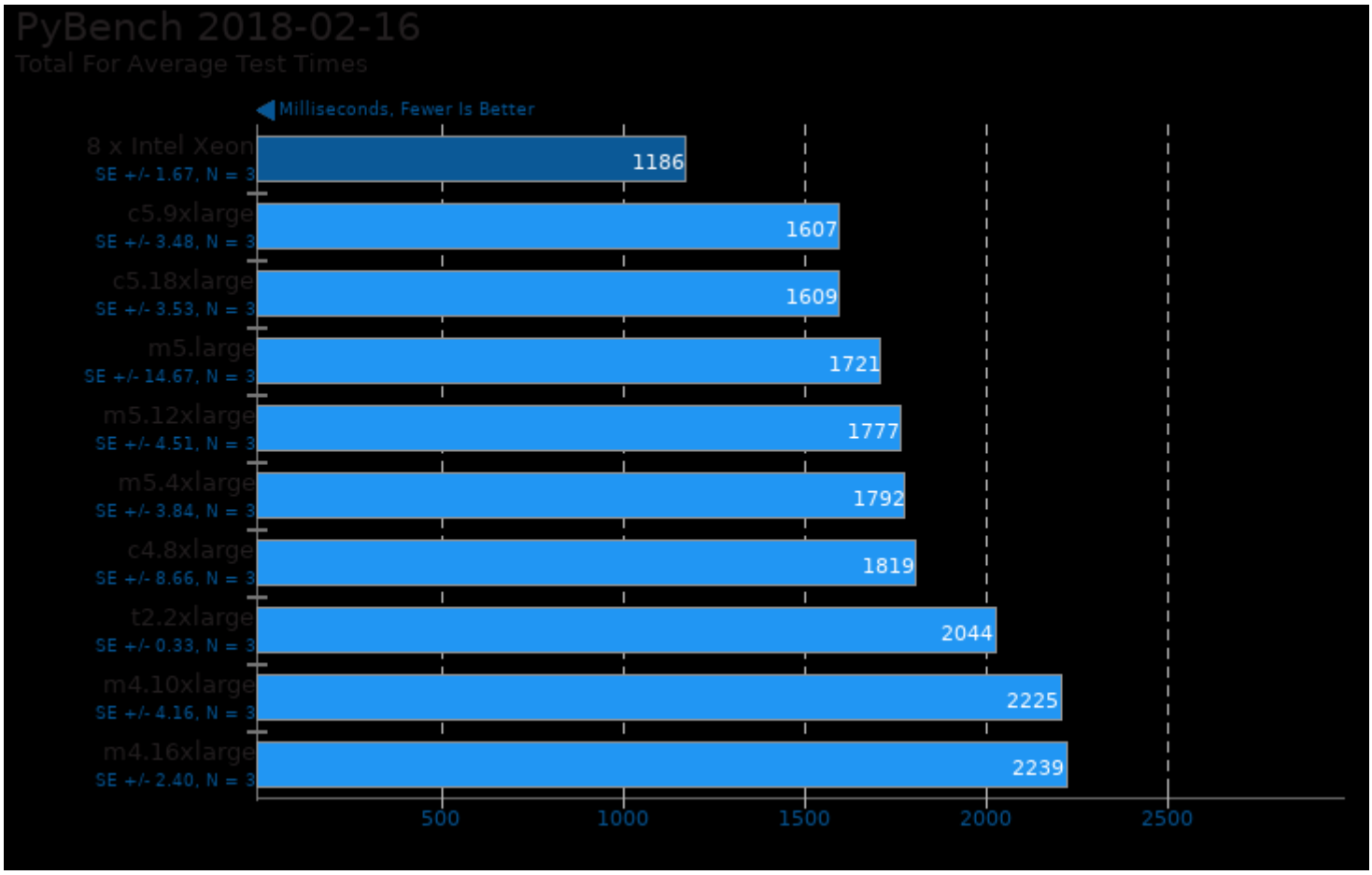

Parboil 2.5
Performance / Cost - Test: OpenMP CUTCP
Seconds x Dollar, Fewer Is Better
m4.16xlarge
0.03
c5.18xlarge
0.04
c4.8xlarge
0.04
m4.10xlarge
0.05
m5.12xlarge
0.06
c5.9xlarge
0.06
m5.4xlarge
0.16
m5.large
0.98
0.2205
0.441
0.6615
0.882
1.1025
1. m4.16xlarge: $3.20 reported cost per hour, test consumed 14 Seconds: cost approximately 0.01 dollar.
2. c5.18xlarge: $3.06 reported cost per hour, test consumed 16 Seconds: cost approximately 0.01 dollar.
3. c4.8xlarge: $1.591 reported cost per hour, test consumed 18 Seconds: cost approximately 0.01 dollar.
4. m4.10xlarge: $2.00 reported cost per hour, test consumed 18 Seconds: cost approximately 0.01 dollar.
5. m5.12xlarge: $2.304 reported cost per hour, test consumed 21 Seconds: cost approximately 0.01 dollar.
6. c5.9xlarge: $1.53 reported cost per hour, test consumed 22 Seconds: cost approximately 0.01 dollar.
7. m5.4xlarge: $0.768 reported cost per hour, test consumed 53 Seconds: cost approximately 0.01 dollar.
8. m5.large: $0.096 reported cost per hour, test consumed 4 Minutes, 58 Seconds: cost approximately 0.01 dollar.

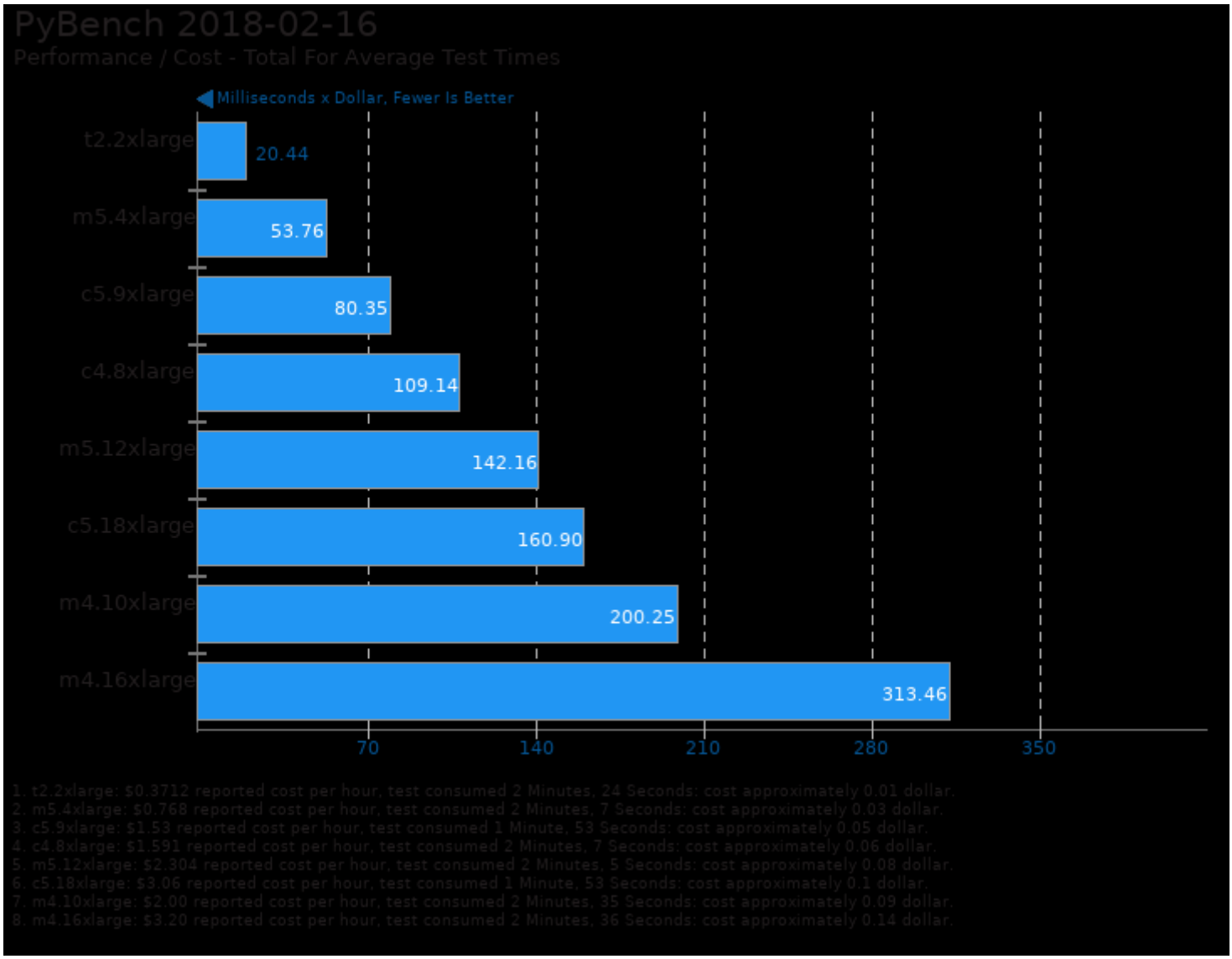

POV-Ray 3.7.0.7
Trace Time
Seconds, Fewer Is Better
c5.18xlarge
SE +/- 0.13, N = 3
17.74
EPYC 7601
SE +/- 0.07, N = 3
21.97
m4.16xlarge
SE +/- 0.07, N = 3
24.12
2 x Xeon Gold 6138
SE +/- 1.81, N = 6
25.70
m5.12xlarge
SE +/- 0.03, N = 3
29.87
Threadripper 1950X
SE +/- 0.05, N = 3
30.30
c5.9xlarge
SE +/- 0.18, N = 3
32.35
Core i9 7980XE
SE +/- 0.12, N = 3
32.75
c4.8xlarge
SE +/- 0.14, N = 3
35.08
m4.10xlarge
SE +/- 0.02, N = 3
37.44
Ryzen 7 1800X
SE +/- 0.05, N = 3
56.21
Core i7 8700K
SE +/- 0.06, N = 3
60.96
Ryzen 7 1700
SE +/- 0.02, N = 3
64.40
Core i7 5960X
SE +/- 0.09, N = 3
70.27
8 x Intel Xeon
SE +/- 0.85, N = 3
73.98
m5.4xlarge
SE +/- 0.14, N = 3
87.10
Core i5 8400
SE +/- 0.04, N = 3
87.94
Core i7 7740X
SE +/- 0.06, N = 3
87.94
Ryzen 5 2400G
SE +/- 0.17, N = 3
107.39
Core i5 7600K
SE +/- 0.67, N = 3
125.90
Core i7 4770K
SE +/- 0.17, N = 3
131.09
Core i3 8100
SE +/- 0.07, N = 3
139.02
Ryzen 3 2200G
SE +/- 0.35, N = 3
153.63
Ryzen 3 1300X
SE +/- 0.16, N = 3
156.29
Ryzen 3 1200
SE +/- 0.13, N = 3
181.19
Xeon Silver 4108
SE +/- 0.45, N = 3
195.83
t2.2xlarge
SE +/- 29.42, N = 3
563.33
m5.large
SE +/- 40.66, N = 3
617.28
130
260
390
520
650
1. (CXX) g++ options: -pipe -O3 -ffast-math -march=native -pthread -lSDL -lSM -lICE -lX11 -ltiff -ljpeg -lpng -lz -lrt -lm -lboost_thread -lboost_system

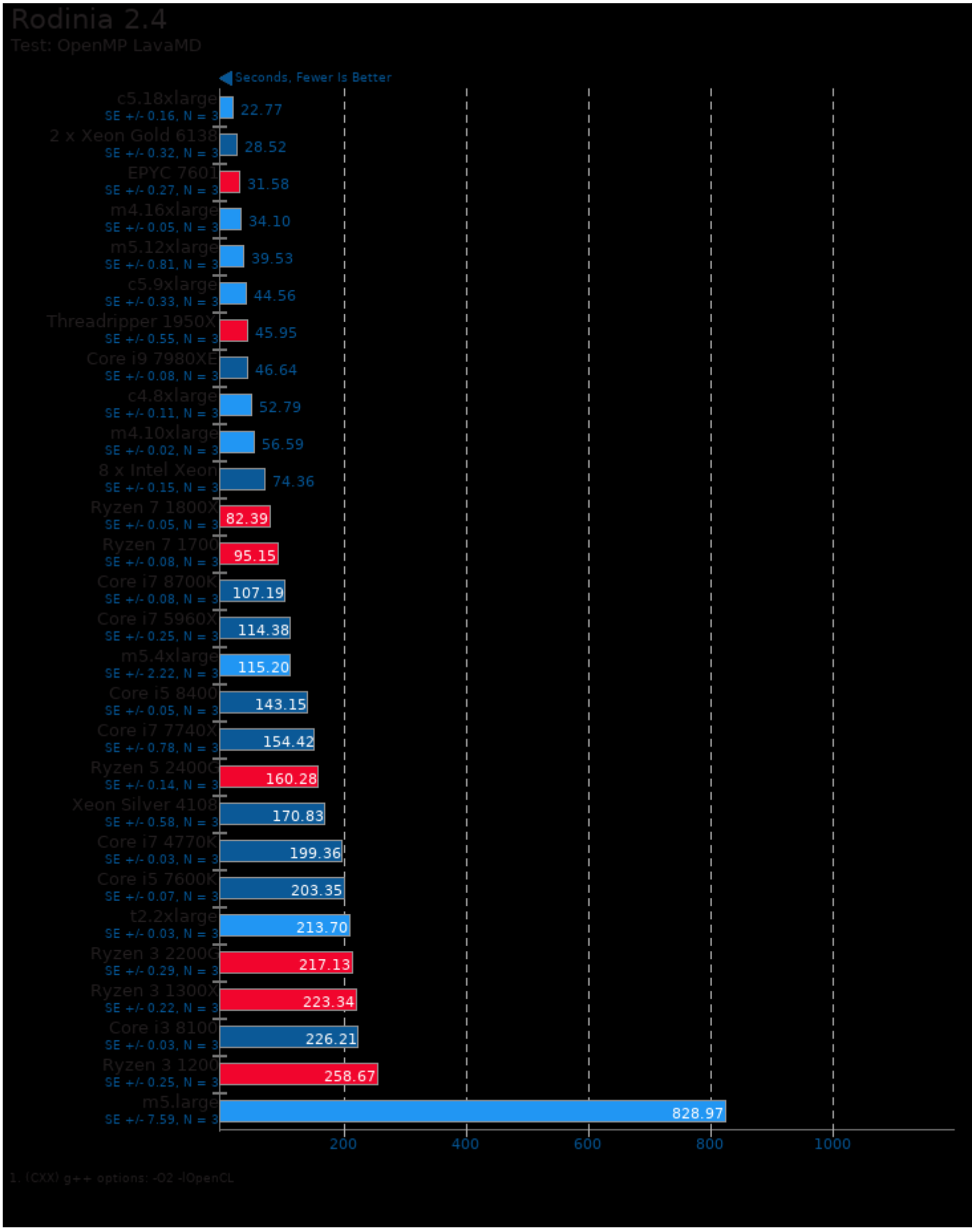

POV-Ray 3.7.0.7
Performance / Cost - Trace Time
Seconds x Dollar, Fewer Is Better
c5.18xlarge
1.06
c5.9xlarge
1.62
c4.8xlarge
1.75
m4.16xlarge
1.93
m5.12xlarge
2.09
m4.10xlarge
2.62
m5.4xlarge
5.23
m5.large
30.86
t2.2xlarge
101.40
20
40
60
80
100
1. c5.18xlarge: $3.06 reported cost per hour, test consumed 1 Minute, 5 Seconds: cost approximately 0.06 dollar.
2. c5.9xlarge: $1.53 reported cost per hour, test consumed 1 Minute, 48 Seconds: cost approximately 0.05 dollar.
3. c4.8xlarge: $1.591 reported cost per hour, test consumed 1 Minute, 57 Seconds: cost approximately 0.05 dollar.
4. m4.16xlarge: $3.20 reported cost per hour, test consumed 1 Minute, 25 Seconds: cost approximately 0.08 dollar.
5. m5.12xlarge: $2.304 reported cost per hour, test consumed 1 Minute, 42 Seconds: cost approximately 0.07 dollar.
6. m4.10xlarge: $2.00 reported cost per hour, test consumed 2 Minutes, 5 Seconds: cost approximately 0.07 dollar.
7. m5.4xlarge: $0.768 reported cost per hour, test consumed 4 Minutes, 34 Seconds: cost approximately 0.06 dollar.
8. m5.large: $0.096 reported cost per hour, test consumed 31 Minutes, 4 Seconds: cost approximately 0.05 dollar.
9. t2.2xlarge: $0.3712 reported cost per hour, test consumed 28 Minutes, 22 Seconds: cost approximately 0.18 dollar.

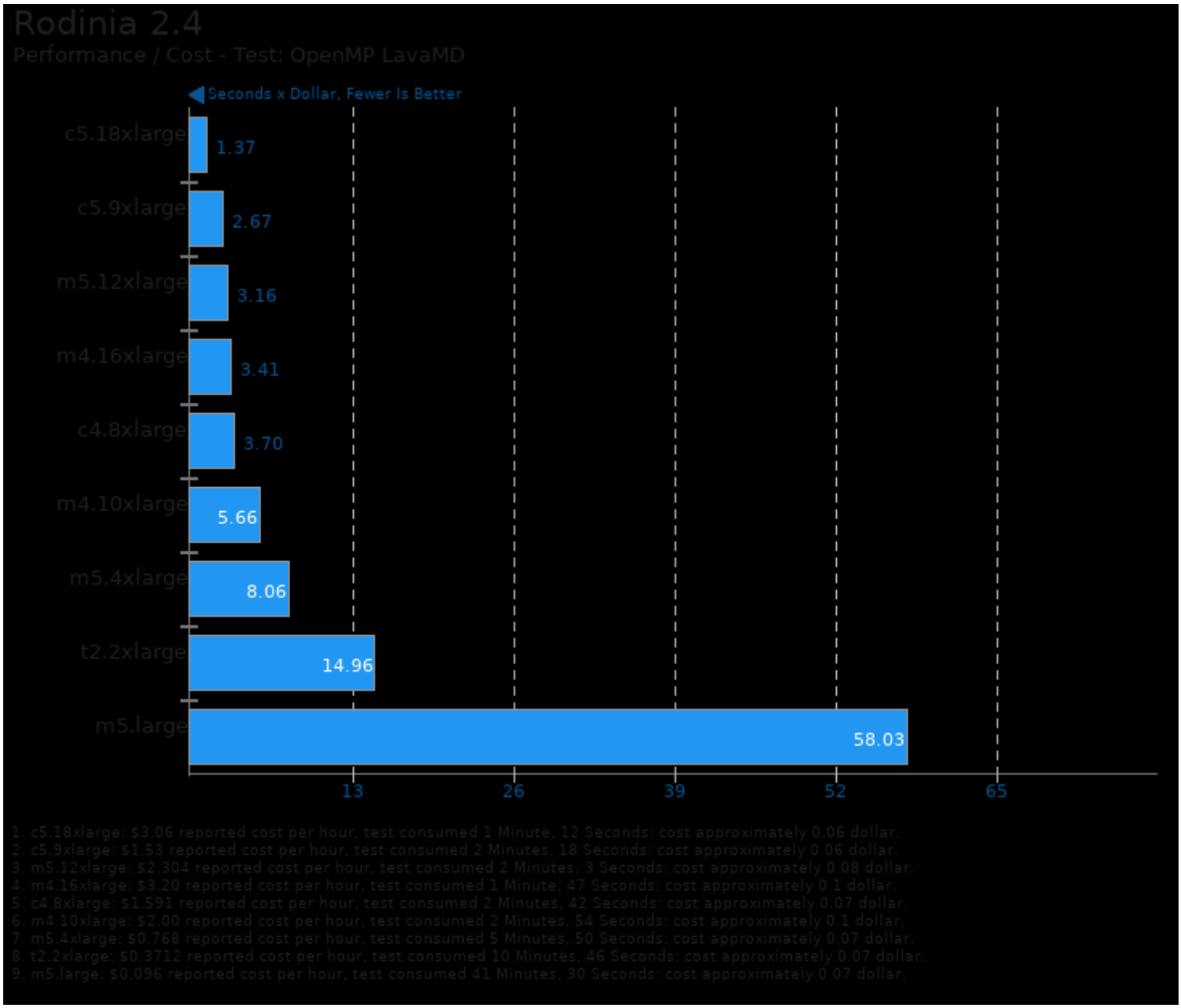

PyBench 2008-08-14
Total For Average Test Times
Milliseconds, Fewer Is Better
Core i7 8700K
SE +/- 1.00, N = 3
1031
Core i7 7740X
SE +/- 0.58, N = 3
1075
Core i5 7600K
1149
Core i9 7980XE
SE +/- 0.58, N = 3
1150
Core i5 8400
SE +/- 2.73, N = 3
1209
2 x Xeon Gold 6138
SE +/- 2.33, N = 3
1307
Core i3 8100
SE +/- 1.00, N = 3
1340
Core i7 4770K
SE +/- 1.53, N = 3
1356
Ryzen 7 1800X
SE +/- 3.21, N = 3
1395
Threadripper 1950X
SE +/- 11.05, N = 3
1420
c5.18xlarge
SE +/- 7.42, N = 3
1453
Ryzen 5 2400G
SE +/- 2.03, N = 3
1458
c5.9xlarge
SE +/- 4.41, N = 3
1459
Ryzen 3 1300X
SE +/- 2.91, N = 3
1498
Core i7 5960X
SE +/- 1.76, N = 3
1514
Ryzen 7 1700
SE +/- 1.45, N = 3
1518
Ryzen 3 2200G
SE +/- 7.64, N = 3
1547
m5.large
SE +/- 2.03, N = 3
1559
m5.12xlarge
SE +/- 11.46, N = 3
1604
Xeon Silver 4108
1615
m5.4xlarge
SE +/- 8.33, N = 3
1637
c4.8xlarge
SE +/- 6.00, N = 3
1643
Ryzen 3 1200
SE +/- 0.58, N = 3
1655
EPYC 7601
1781
t2.2xlarge
SE +/- 4.91, N = 3
1837
m4.10xlarge
1987
m4.16xlarge
SE +/- 6.23, N = 3
1992
400
800
1200
1600
2000

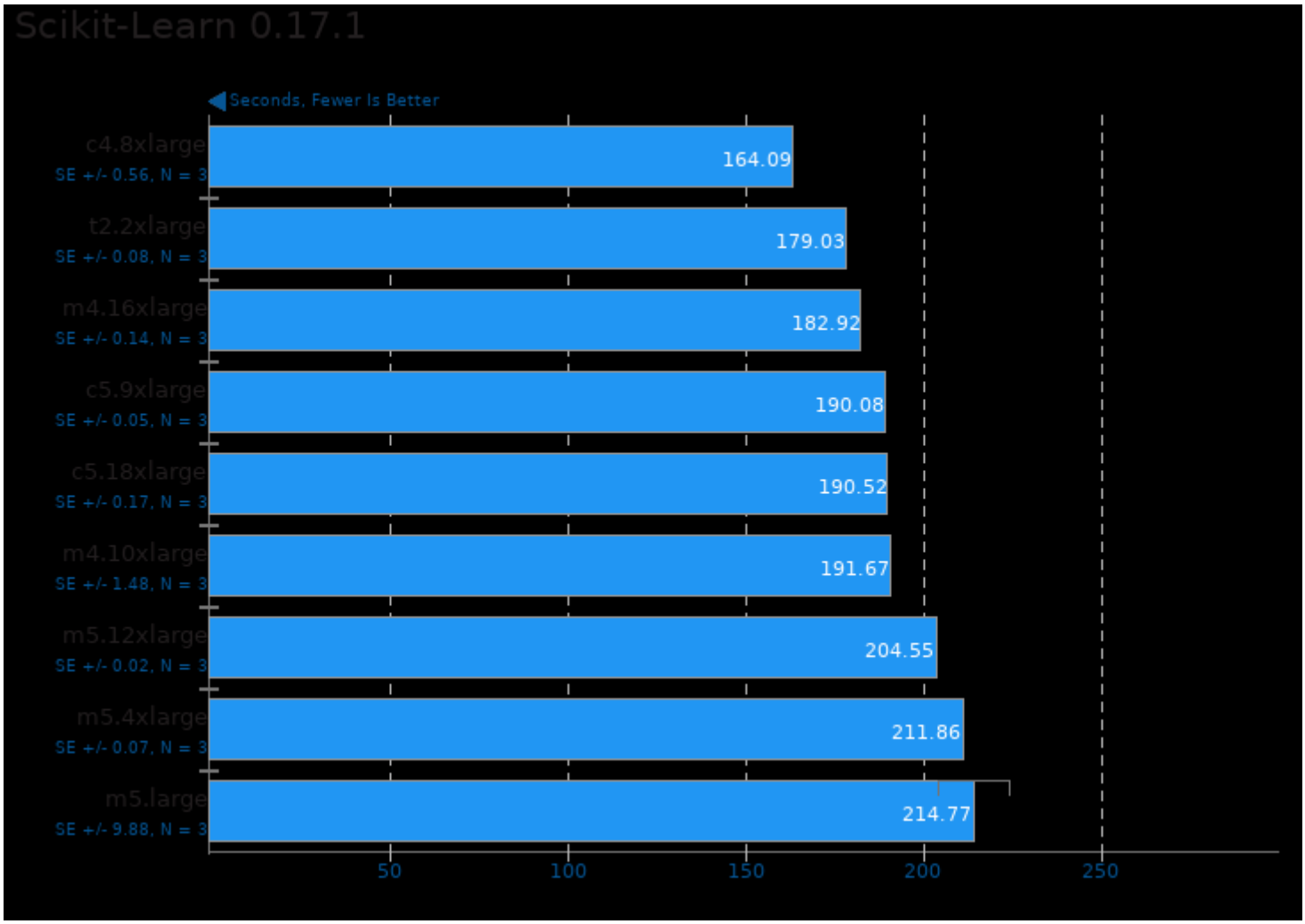

PyBench 2008-08-14
Performance / Cost - Total For Average Test Times
Milliseconds x Dollar, Fewer Is Better
t2.2xlarge
18.37
m5.4xlarge
32.74
c5.9xlarge
58.36
c4.8xlarge
82.15
m5.12xlarge
112.28
c5.18xlarge
130.77
m4.10xlarge
158.96
m4.16xlarge
239.04
50
100
150
200
250
1. t2.2xlarge: $0.3712 reported cost per hour, test consumed 2 Minutes, 8 Seconds: cost approximately 0.01 dollar.
2. m5.4xlarge: $0.768 reported cost per hour, test consumed 1 Minute, 55 Seconds: cost approximately 0.02 dollar.
3. c5.9xlarge: $1.53 reported cost per hour, test consumed 1 Minute, 42 Seconds: cost approximately 0.04 dollar.
4. c4.8xlarge: $1.591 reported cost per hour, test consumed 1 Minute, 54 Seconds: cost approximately 0.05 dollar.
5. m5.12xlarge: $2.304 reported cost per hour, test consumed 1 Minute, 52 Seconds: cost approximately 0.07 dollar.
6. c5.18xlarge: $3.06 reported cost per hour, test consumed 1 Minute, 41 Seconds: cost approximately 0.09 dollar.
7. m4.10xlarge: $2.00 reported cost per hour, test consumed 2 Minutes, 18 Seconds: cost approximately 0.08 dollar.
8. m4.16xlarge: $3.20 reported cost per hour, test consumed 2 Minutes, 17 Seconds: cost approximately 0.12 dollar.

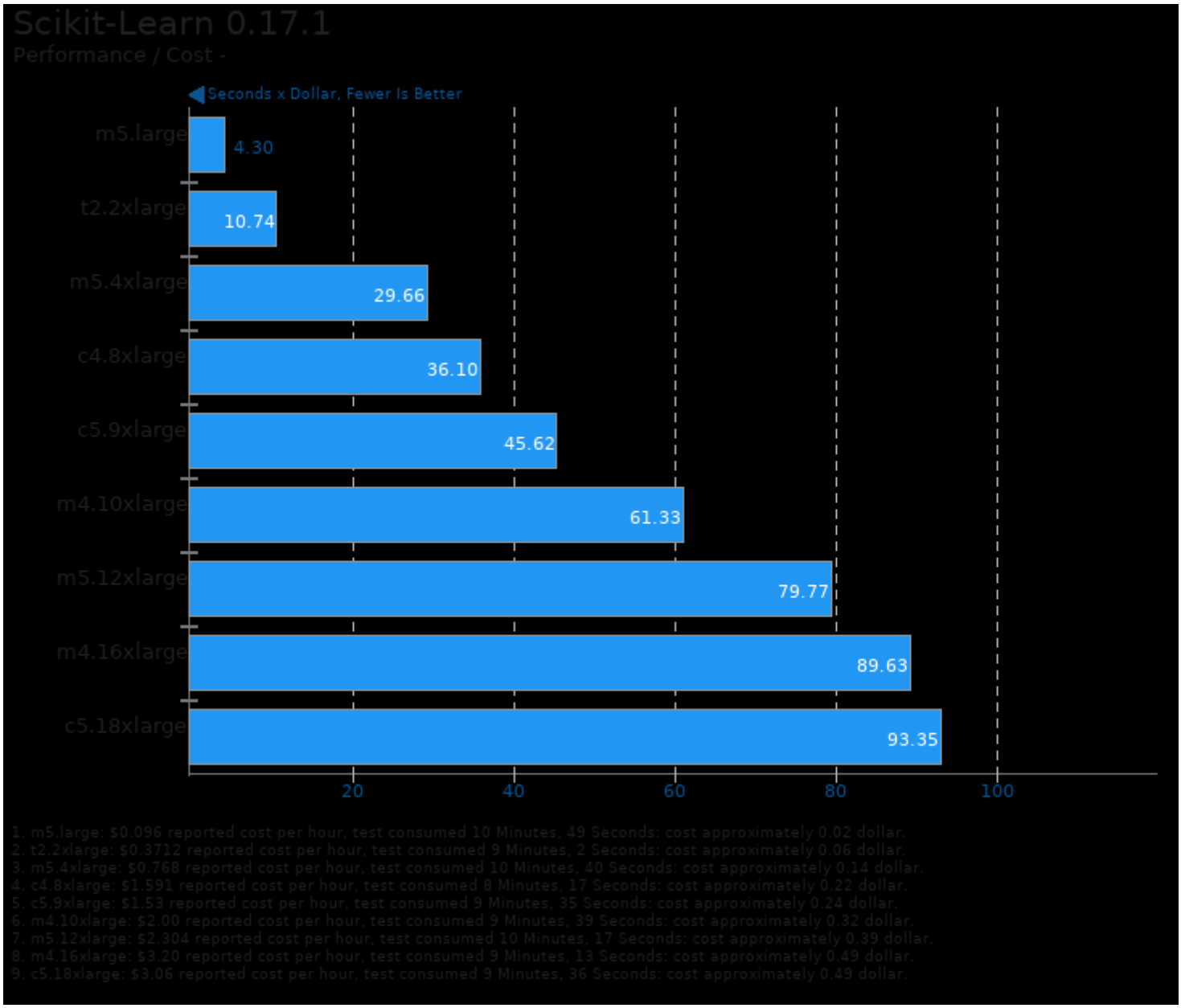

PyBench 2018-02-16
Total For Average Test Times
Milliseconds, Fewer Is Better
8 x Intel Xeon
SE +/- 1.67, N = 3
1186
c5.9xlarge
SE +/- 3.48, N = 3
1607
c5.18xlarge
SE +/- 3.53, N = 3
1609
m5.large
SE +/- 14.67, N = 3
1721
m5.12xlarge
SE +/- 4.51, N = 3
1777
m5.4xlarge
SE +/- 3.84, N = 3
1792
c4.8xlarge
SE +/- 8.66, N = 3
1819
t2.2xlarge
SE +/- 0.33, N = 3
2044
m4.10xlarge
SE +/- 4.16, N = 3
2225
m4.16xlarge
SE +/- 2.40, N = 3
2239
500
1000
1500
2000
2500

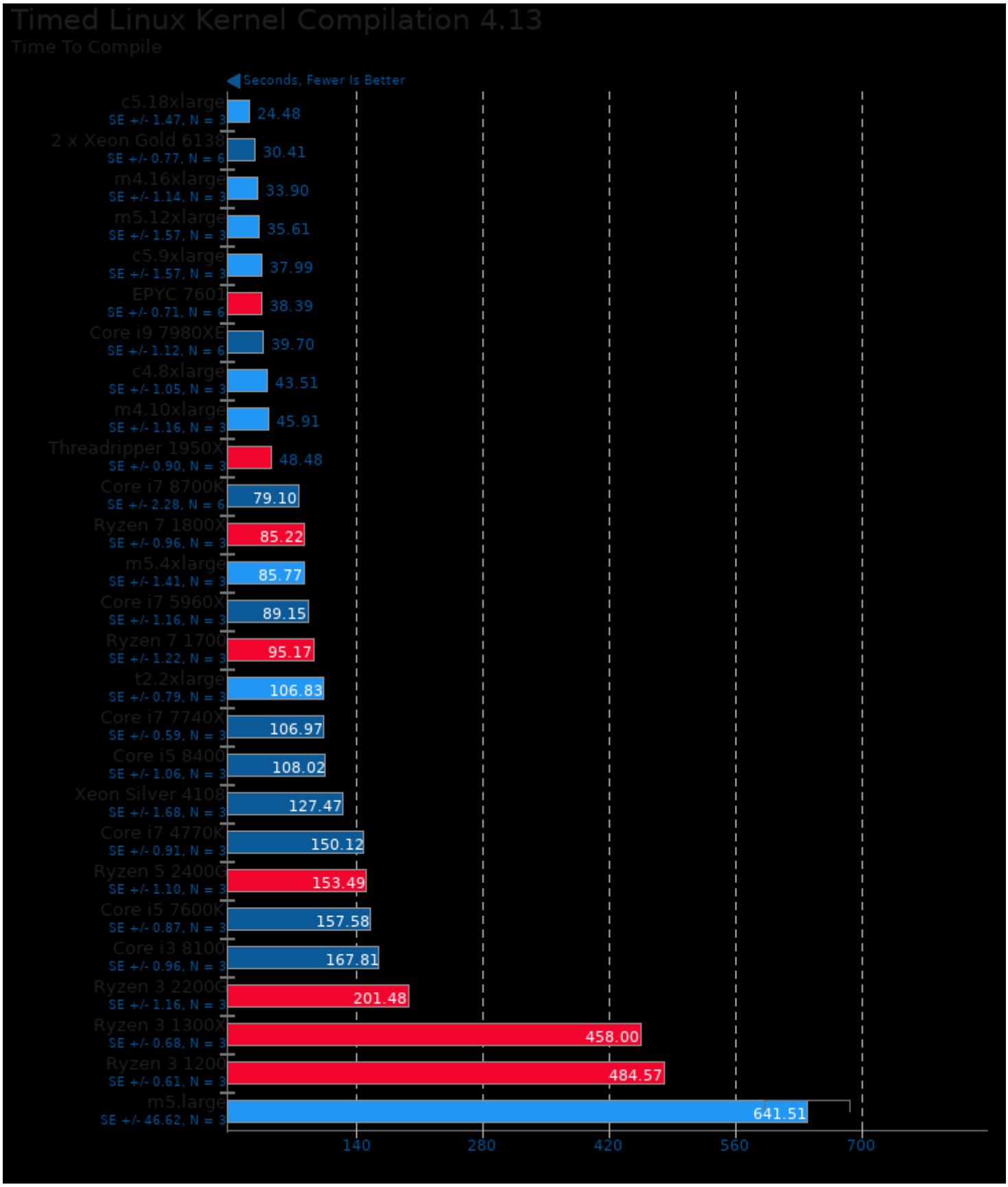

PyBench 2018-02-16
Performance / Cost - Total For Average Test Times
Milliseconds x Dollar, Fewer Is Better
t2.2xlarge
20.44
m5.4xlarge
53.76
c5.9xlarge
80.35
c4.8xlarge
109.14
m5.12xlarge
142.16
c5.18xlarge
160.90
m4.10xlarge
200.25
m4.16xlarge
313.46
70
140
210
280
350
1. t2.2xlarge: $0.3712 reported cost per hour, test consumed 2 Minutes, 24 Seconds: cost approximately 0.01 dollar.
2. m5.4xlarge: $0.768 reported cost per hour, test consumed 2 Minutes, 7 Seconds: cost approximately 0.03 dollar.
3. c5.9xlarge: $1.53 reported cost per hour, test consumed 1 Minute, 53 Seconds: cost approximately 0.05 dollar.
4. c4.8xlarge: $1.591 reported cost per hour, test consumed 2 Minutes, 7 Seconds: cost approximately 0.06 dollar.
5. m5.12xlarge: $2.304 reported cost per hour, test consumed 2 Minutes, 5 Seconds: cost approximately 0.08 dollar.
6. c5.18xlarge: $3.06 reported cost per hour, test consumed 1 Minute, 53 Seconds: cost approximately 0.1 dollar.
7. m4.10xlarge: $2.00 reported cost per hour, test consumed 2 Minutes, 35 Seconds: cost approximately 0.09 dollar.
8. m4.16xlarge: $3.20 reported cost per hour, test consumed 2 Minutes, 36 Seconds: cost approximately 0.14 dollar.

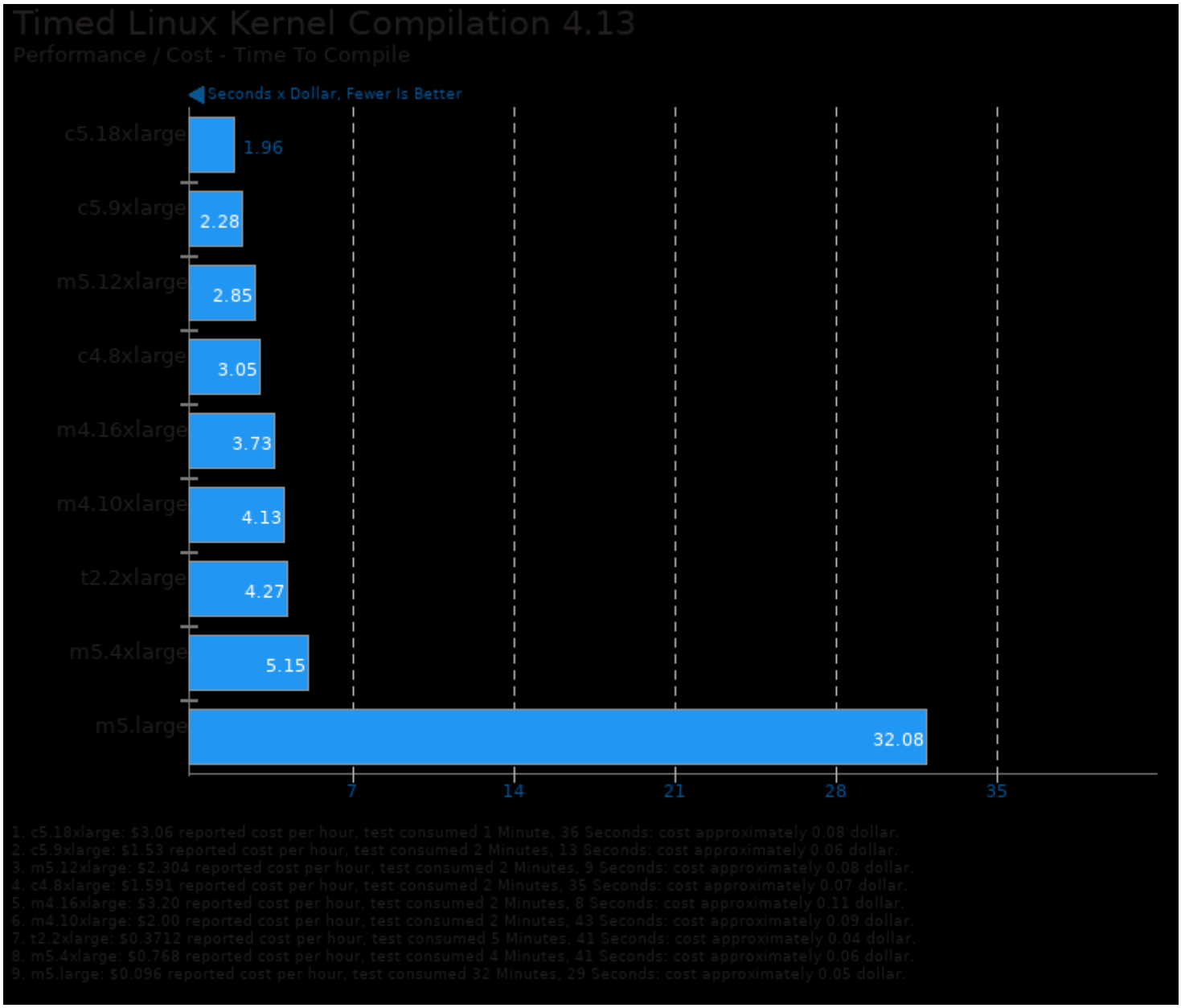

Rodinia 2.4
Test: OpenMP LavaMD
Seconds, Fewer Is Better
c5.18xlarge
SE +/- 0.16, N = 3
22.77
2 x Xeon Gold 6138
SE +/- 0.32, N = 3
28.52
EPYC 7601
SE +/- 0.27, N = 3
31.58
m4.16xlarge
SE +/- 0.05, N = 3
34.10
m5.12xlarge
SE +/- 0.81, N = 3
39.53
c5.9xlarge
SE +/- 0.33, N = 3
44.56
Threadripper 1950X
SE +/- 0.55, N = 3
45.95
Core i9 7980XE
SE +/- 0.08, N = 3
46.64
c4.8xlarge
SE +/- 0.11, N = 3
52.79
m4.10xlarge
SE +/- 0.02, N = 3
56.59
8 x Intel Xeon
SE +/- 0.15, N = 3
74.36
Ryzen 7 1800X
SE +/- 0.05, N = 3
82.39
Ryzen 7 1700
SE +/- 0.08, N = 3
95.15
Core i7 8700K
SE +/- 0.08, N = 3
107.19
Core i7 5960X
SE +/- 0.25, N = 3
114.38
m5.4xlarge
SE +/- 2.22, N = 3
115.20
Core i5 8400
SE +/- 0.05, N = 3
143.15
Core i7 7740X
SE +/- 0.78, N = 3
154.42
Ryzen 5 2400G
SE +/- 0.14, N = 3
160.28
Xeon Silver 4108
SE +/- 0.58, N = 3
170.83
Core i7 4770K
SE +/- 0.03, N = 3
199.36
Core i5 7600K
SE +/- 0.07, N = 3
203.35
t2.2xlarge
SE +/- 0.03, N = 3
213.70
Ryzen 3 2200G
SE +/- 0.29, N = 3
217.13
Ryzen 3 1300X
SE +/- 0.22, N = 3
223.34
Core i3 8100
SE +/- 0.03, N = 3
226.21
Ryzen 3 1200
SE +/- 0.25, N = 3
258.67
m5.large
SE +/- 7.59, N = 3
828.97
200
400
600
800
1000
1. (CXX) g++ options: -O2 -lOpenCL

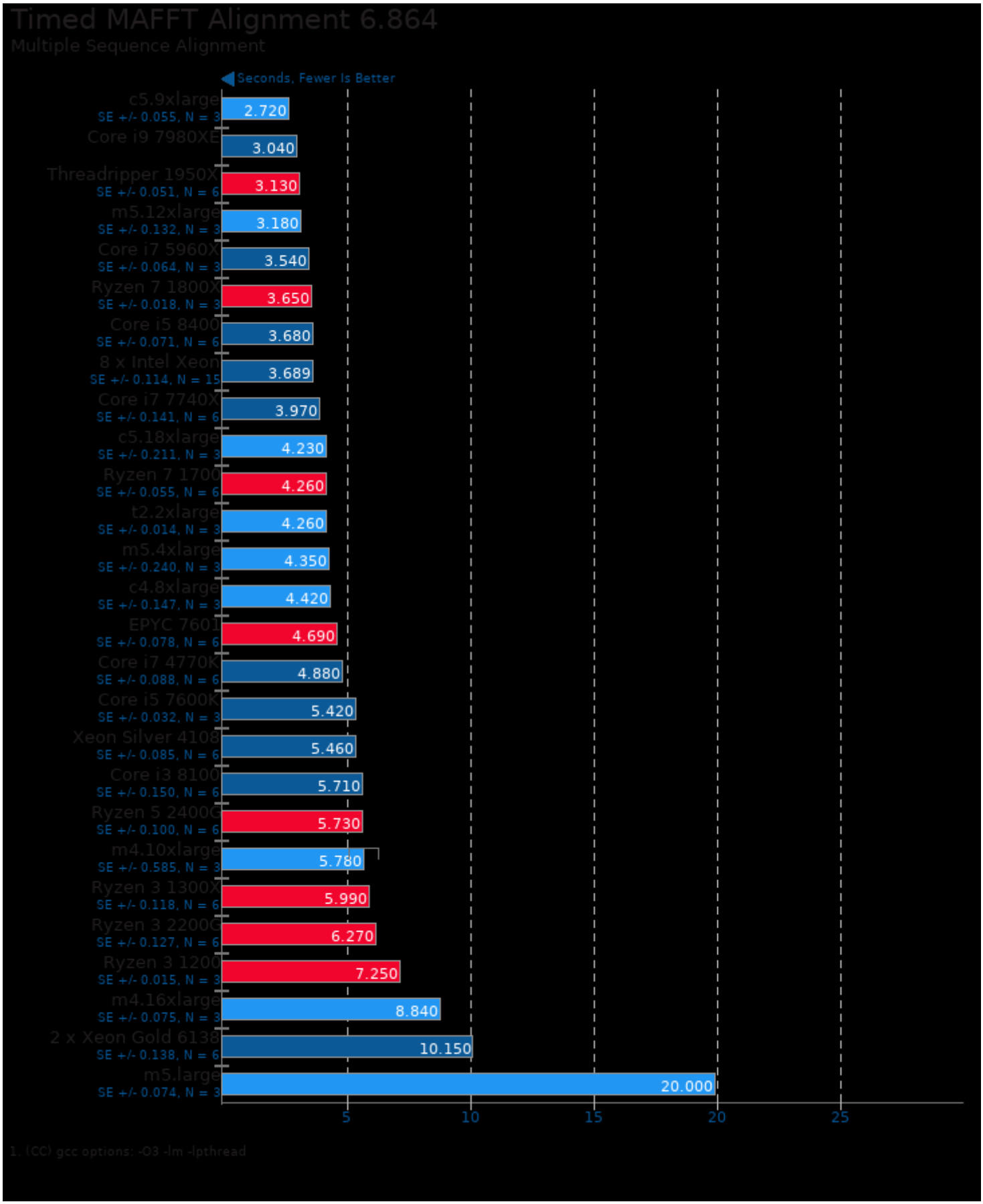

Rodinia 2.4
Performance / Cost - Test: OpenMP LavaMD
Seconds x Dollar, Fewer Is Better
c5.18xlarge
1.37
c5.9xlarge
2.67
m5.12xlarge
3.16
m4.16xlarge
3.41
c4.8xlarge
3.70
m4.10xlarge
5.66
m5.4xlarge
8.06
t2.2xlarge
14.96
m5.large
58.03
13
26
39
52
65
1. c5.18xlarge: $3.06 reported cost per hour, test consumed 1 Minute, 12 Seconds: cost approximately 0.06 dollar.
2. c5.9xlarge: $1.53 reported cost per hour, test consumed 2 Minutes, 18 Seconds: cost approximately 0.06 dollar.
3. m5.12xlarge: $2.304 reported cost per hour, test consumed 2 Minutes, 3 Seconds: cost approximately 0.08 dollar.
4. m4.16xlarge: $3.20 reported cost per hour, test consumed 1 Minute, 47 Seconds: cost approximately 0.1 dollar.
5. c4.8xlarge: $1.591 reported cost per hour, test consumed 2 Minutes, 42 Seconds: cost approximately 0.07 dollar.
6. m4.10xlarge: $2.00 reported cost per hour, test consumed 2 Minutes, 54 Seconds: cost approximately 0.1 dollar.
7. m5.4xlarge: $0.768 reported cost per hour, test consumed 5 Minutes, 50 Seconds: cost approximately 0.07 dollar.
8. t2.2xlarge: $0.3712 reported cost per hour, test consumed 10 Minutes, 46 Seconds: cost approximately 0.07 dollar.
9. m5.large: $0.096 reported cost per hour, test consumed 41 Minutes, 30 Seconds: cost approximately 0.07 dollar.

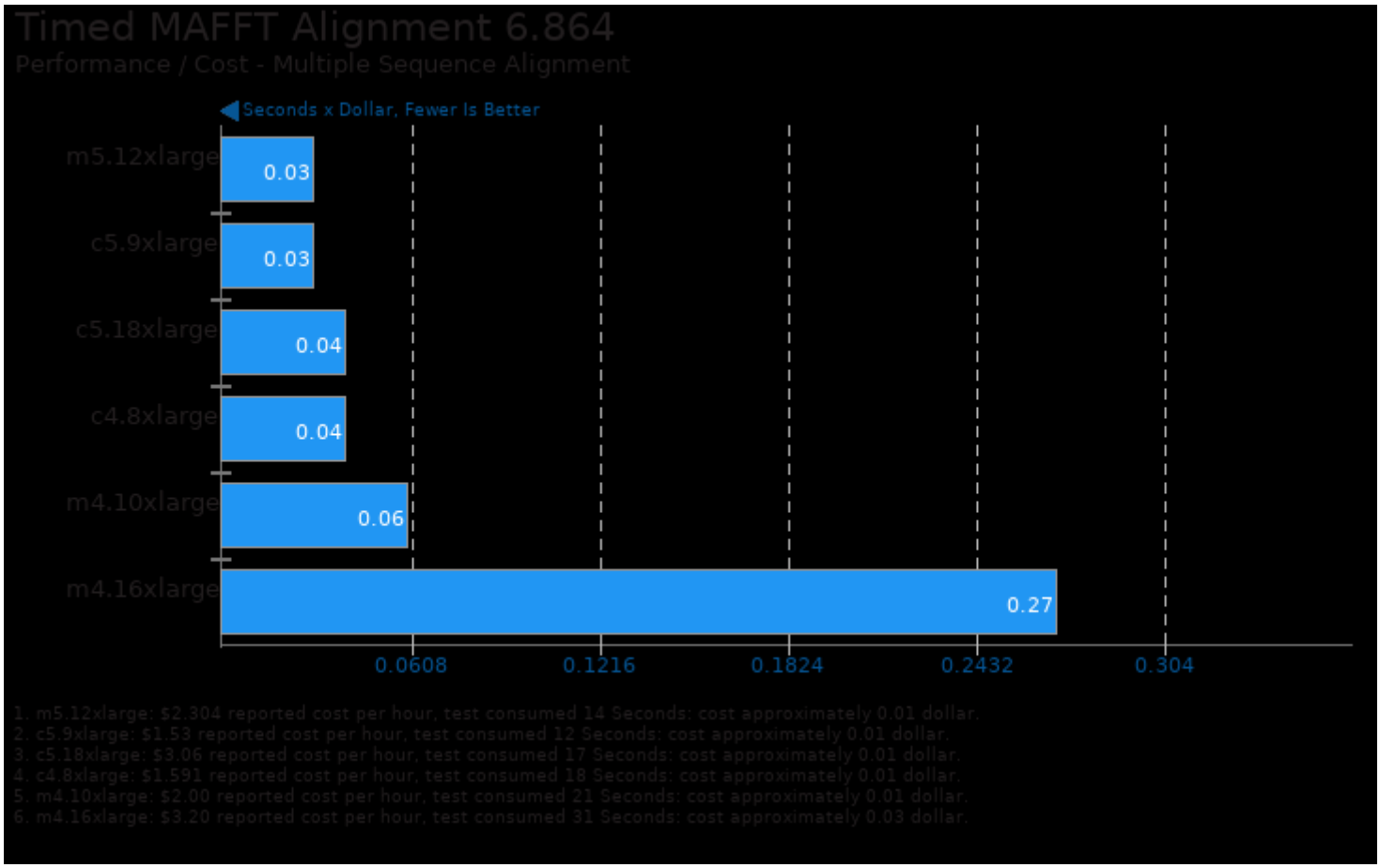

Scikit-Learn 0.17.1
Seconds, Fewer Is Better
c4.8xlarge
SE +/- 0.56, N = 3
164.09
t2.2xlarge
SE +/- 0.08, N = 3
179.03
m4.16xlarge
SE +/- 0.14, N = 3
182.92
c5.9xlarge
SE +/- 0.05, N = 3
190.08
c5.18xlarge
SE +/- 0.17, N = 3
190.52
m4.10xlarge
SE +/- 1.48, N = 3
191.67
m5.12xlarge
SE +/- 0.02, N = 3
204.55
m5.4xlarge
SE +/- 0.07, N = 3
211.86
m5.large
SE +/- 9.88, N = 3
214.77
50
100
150
200
250

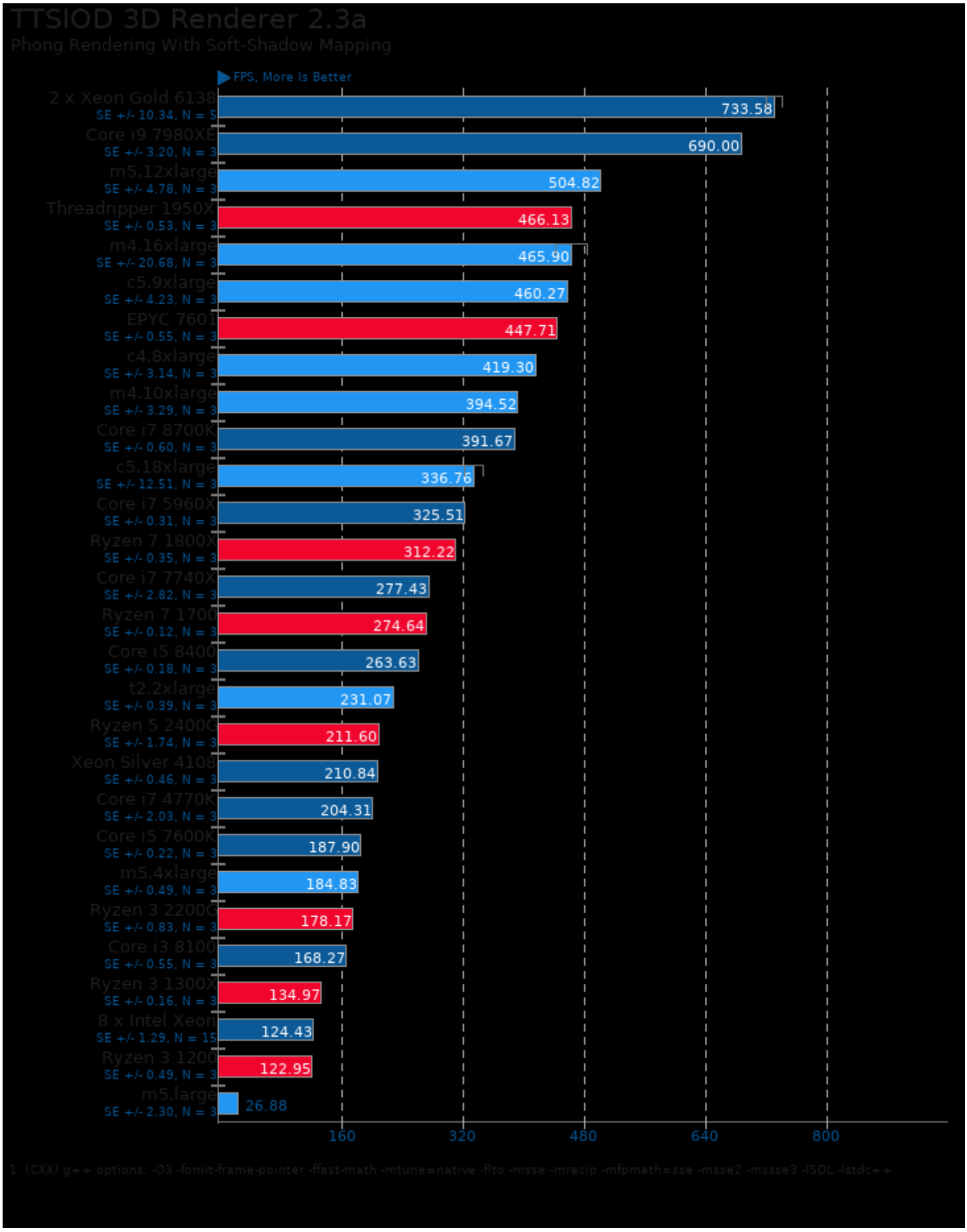

Scikit-Learn 0.17.1
Performance / Cost -
Seconds x Dollar, Fewer Is Better
m5.large
4.30
t2.2xlarge
10.74
m5.4xlarge
29.66
c4.8xlarge
36.10
c5.9xlarge
45.62
m4.10xlarge
61.33
m5.12xlarge
79.77
m4.16xlarge
89.63
c5.18xlarge
93.35
20
40
60
80
100
1. m5.large: $0.096 reported cost per hour, test consumed 10 Minutes, 49 Seconds: cost approximately 0.02 dollar.
2. t2.2xlarge: $0.3712 reported cost per hour, test consumed 9 Minutes, 2 Seconds: cost approximately 0.06 dollar.
3. m5.4xlarge: $0.768 reported cost per hour, test consumed 10 Minutes, 40 Seconds: cost approximately 0.14 dollar.
4. c4.8xlarge: $1.591 reported cost per hour, test consumed 8 Minutes, 17 Seconds: cost approximately 0.22 dollar.
5. c5.9xlarge: $1.53 reported cost per hour, test consumed 9 Minutes, 35 Seconds: cost approximately 0.24 dollar.
6. m4.10xlarge: $2.00 reported cost per hour, test consumed 9 Minutes, 39 Seconds: cost approximately 0.32 dollar.
7. m5.12xlarge: $2.304 reported cost per hour, test consumed 10 Minutes, 17 Seconds: cost approximately 0.39 dollar.
8. m4.16xlarge: $3.20 reported cost per hour, test consumed 9 Minutes, 13 Seconds: cost approximately 0.49 dollar.
9. c5.18xlarge: $3.06 reported cost per hour, test consumed 9 Minutes, 36 Seconds: cost approximately 0.49 dollar.

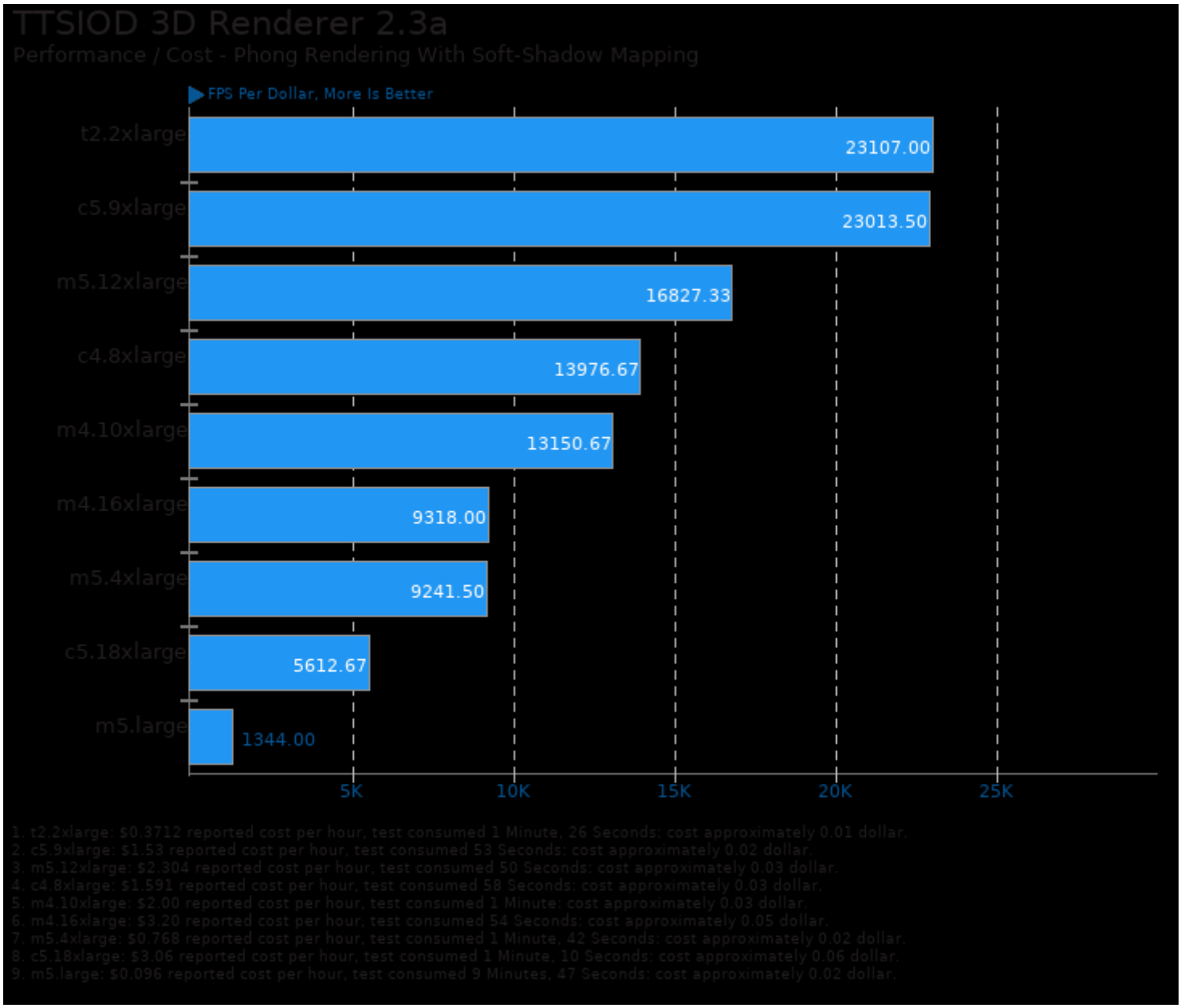

Timed Linux Kernel Compilation 4.13
Time To Compile
Seconds, Fewer Is Better
c5.18xlarge
SE +/- 1.47, N = 3
24.48
2 x Xeon Gold 6138
SE +/- 0.77, N = 6
30.41
m4.16xlarge
SE +/- 1.14, N = 3
33.90
m5.12xlarge
SE +/- 1.57, N = 3
35.61
c5.9xlarge
SE +/- 1.57, N = 3
37.99
EPYC 7601
SE +/- 0.71, N = 6
38.39
Core i9 7980XE
SE +/- 1.12, N = 6
39.70
c4.8xlarge
SE +/- 1.05, N = 3
43.51
m4.10xlarge
SE +/- 1.16, N = 3
45.91
Threadripper 1950X
SE +/- 0.90, N = 3
48.48
Core i7 8700K
SE +/- 2.28, N = 6
79.10
Ryzen 7 1800X
SE +/- 0.96, N = 3
85.22
m5.4xlarge
SE +/- 1.41, N = 3
85.77
Core i7 5960X
SE +/- 1.16, N = 3
89.15
Ryzen 7 1700
SE +/- 1.22, N = 3
95.17
t2.2xlarge
SE +/- 0.79, N = 3
106.83
Core i7 7740X
SE +/- 0.59, N = 3
106.97
Core i5 8400
SE +/- 1.06, N = 3
108.02
Xeon Silver 4108
SE +/- 1.68, N = 3
127.47
Core i7 4770K
SE +/- 0.91, N = 3
150.12
Ryzen 5 2400G
SE +/- 1.10, N = 3
153.49
Core i5 7600K
SE +/- 0.87, N = 3
157.58
Core i3 8100
SE +/- 0.96, N = 3
167.81
Ryzen 3 2200G
SE +/- 1.16, N = 3
201.48
Ryzen 3 1300X
SE +/- 0.68, N = 3
458.00
Ryzen 3 1200
SE +/- 0.61, N = 3
484.57
m5.large
SE +/- 46.62, N = 3
641.51
140
280
420
560
700

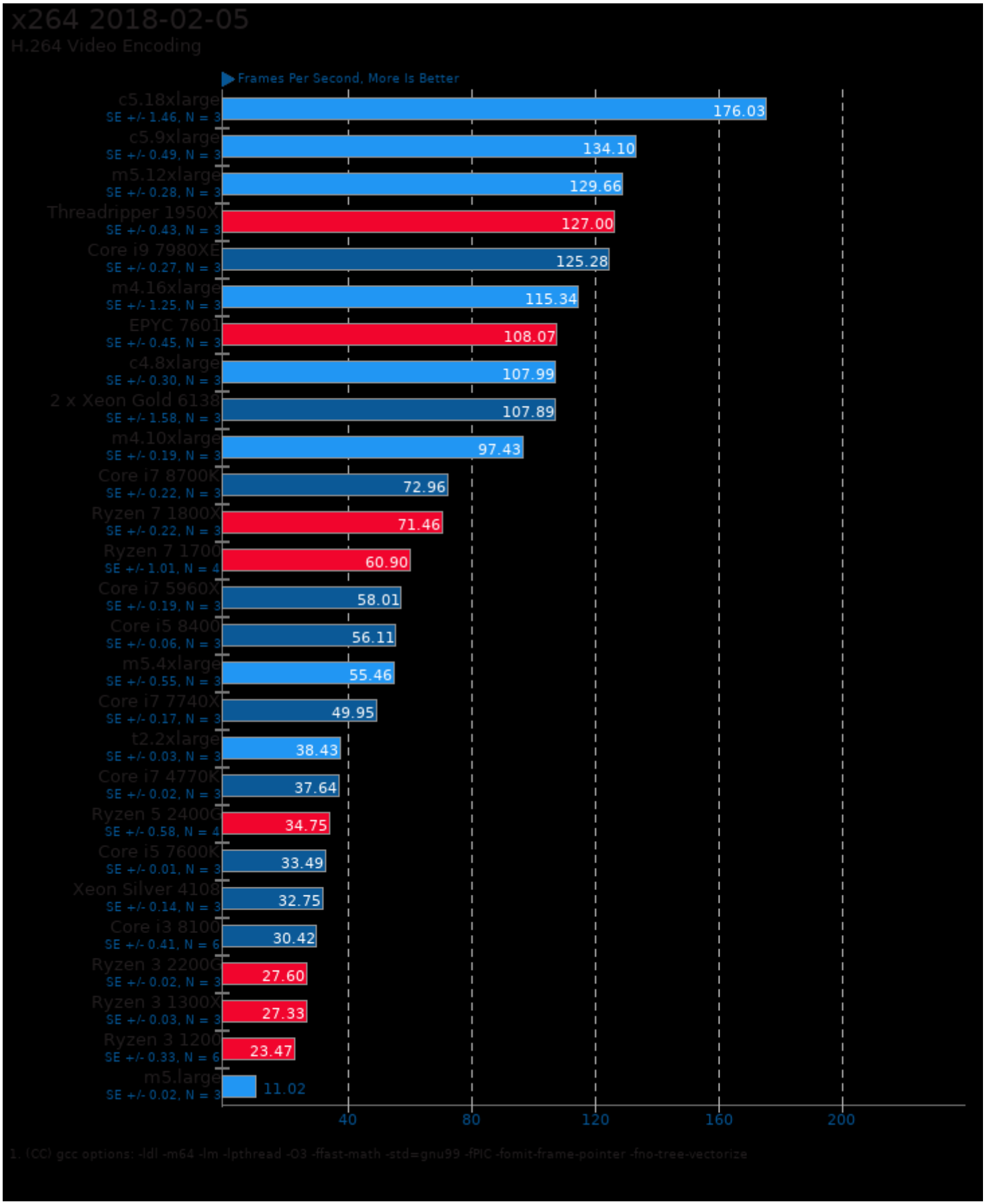

Timed Linux Kernel Compilation 4.13
Performance / Cost - Time To Compile
Seconds x Dollar, Fewer Is Better
c5.18xlarge
1.96
c5.9xlarge
2.28
m5.12xlarge
2.85
c4.8xlarge
3.05
m4.16xlarge
3.73
m4.10xlarge
4.13
t2.2xlarge
4.27
m5.4xlarge
5.15
m5.large
32.08
7
14
21
28
35
1. c5.18xlarge: $3.06 reported cost per hour, test consumed 1 Minute, 36 Seconds: cost approximately 0.08 dollar.
2. c5.9xlarge: $1.53 reported cost per hour, test consumed 2 Minutes, 13 Seconds: cost approximately 0.06 dollar.
3. m5.12xlarge: $2.304 reported cost per hour, test consumed 2 Minutes, 9 Seconds: cost approximately 0.08 dollar.
4. c4.8xlarge: $1.591 reported cost per hour, test consumed 2 Minutes, 35 Seconds: cost approximately 0.07 dollar.
5. m4.16xlarge: $3.20 reported cost per hour, test consumed 2 Minutes, 8 Seconds: cost approximately 0.11 dollar.
6. m4.10xlarge: $2.00 reported cost per hour, test consumed 2 Minutes, 43 Seconds: cost approximately 0.09 dollar.
7. t2.2xlarge: $0.3712 reported cost per hour, test consumed 5 Minutes, 41 Seconds: cost approximately 0.04 dollar.
8. m5.4xlarge: $0.768 reported cost per hour, test consumed 4 Minutes, 41 Seconds: cost approximately 0.06 dollar.
9. m5.large: $0.096 reported cost per hour, test consumed 32 Minutes, 29 Seconds: cost approximately 0.05 dollar.

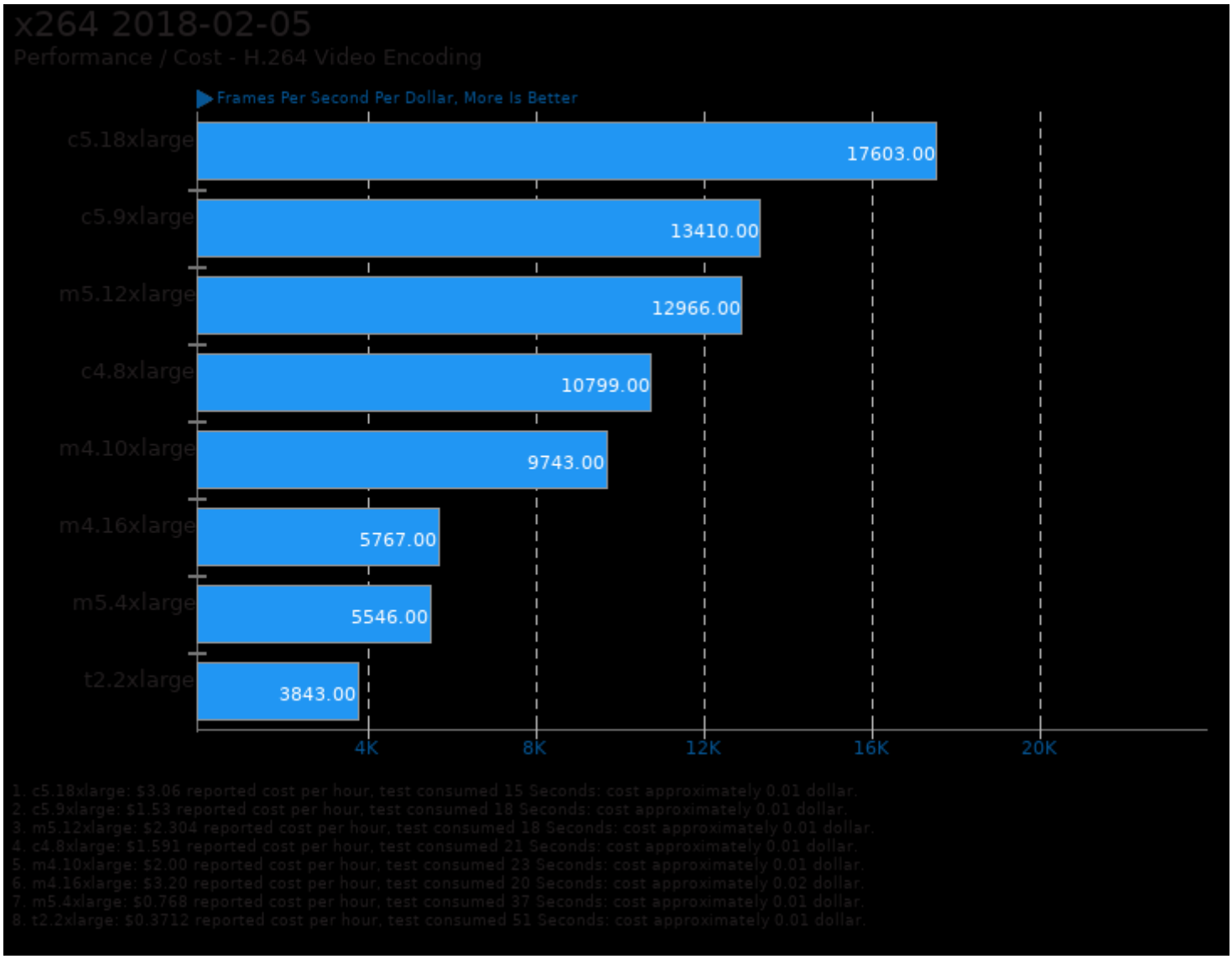

Timed MAFFT Alignment 6.864
Multiple Sequence Alignment
Seconds, Fewer Is Better
c5.9xlarge
SE +/- 0.055, N = 3
2.720
Core i9 7980XE
3.040
Threadripper 1950X
SE +/- 0.051, N = 6
3.130
m5.12xlarge
SE +/- 0.132, N = 3
3.180
Core i7 5960X
SE +/- 0.064, N = 3
3.540
Ryzen 7 1800X
SE +/- 0.018, N = 3
3.650
Core i5 8400
SE +/- 0.071, N = 6
3.680
8 x Intel Xeon
SE +/- 0.114, N = 15
3.689
Core i7 7740X
SE +/- 0.141, N = 6
3.970
c5.18xlarge
SE +/- 0.211, N = 3
4.230
Ryzen 7 1700
SE +/- 0.055, N = 6
4.260
t2.2xlarge
SE +/- 0.014, N = 3
4.260
m5.4xlarge
SE +/- 0.240, N = 3
4.350
c4.8xlarge
SE +/- 0.147, N = 3
4.420
EPYC 7601
SE +/- 0.078, N = 6
4.690
Core i7 4770K
SE +/- 0.088, N = 6
4.880
Core i5 7600K
SE +/- 0.032, N = 3
5.420
Xeon Silver 4108
SE +/- 0.085, N = 6
5.460
Core i3 8100
SE +/- 0.150, N = 6
5.710
Ryzen 5 2400G
SE +/- 0.100, N = 6
5.730
m4.10xlarge
SE +/- 0.585, N = 3
5.780
Ryzen 3 1300X
SE +/- 0.118, N = 6
5.990
Ryzen 3 2200G
SE +/- 0.127, N = 6
6.270
Ryzen 3 1200
SE +/- 0.015, N = 3
7.250
m4.16xlarge
SE +/- 0.075, N = 3
8.840
2 x Xeon Gold 6138
SE +/- 0.138, N = 6
10.150
m5.large
SE +/- 0.074, N = 3
20.000
5
10
15
20
25
1. (CC) gcc options: -O3 -lm -lpthread


Timed MAFFT Alignment 6.864
Performance / Cost - Multiple Sequence Alignment
Seconds x Dollar, Fewer Is Better
m5.12xlarge
0.03
c5.9xlarge
0.03
c5.18xlarge
0.04
c4.8xlarge
0.04
m4.10xlarge
0.06
m4.16xlarge
0.27
0.0608
0.1216
0.1824
0.2432
0.304
1. m5.12xlarge: $2.304 reported cost per hour, test consumed 14 Seconds: cost approximately 0.01 dollar.
2. c5.9xlarge: $1.53 reported cost per hour, test consumed 12 Seconds: cost approximately 0.01 dollar.
3. c5.18xlarge: $3.06 reported cost per hour, test consumed 17 Seconds: cost approximately 0.01 dollar.
4. c4.8xlarge: $1.591 reported cost per hour, test consumed 18 Seconds: cost approximately 0.01 dollar.
5. m4.10xlarge: $2.00 reported cost per hour, test consumed 21 Seconds: cost approximately 0.01 dollar.
6. m4.16xlarge: $3.20 reported cost per hour, test consumed 31 Seconds: cost approximately 0.03 dollar.

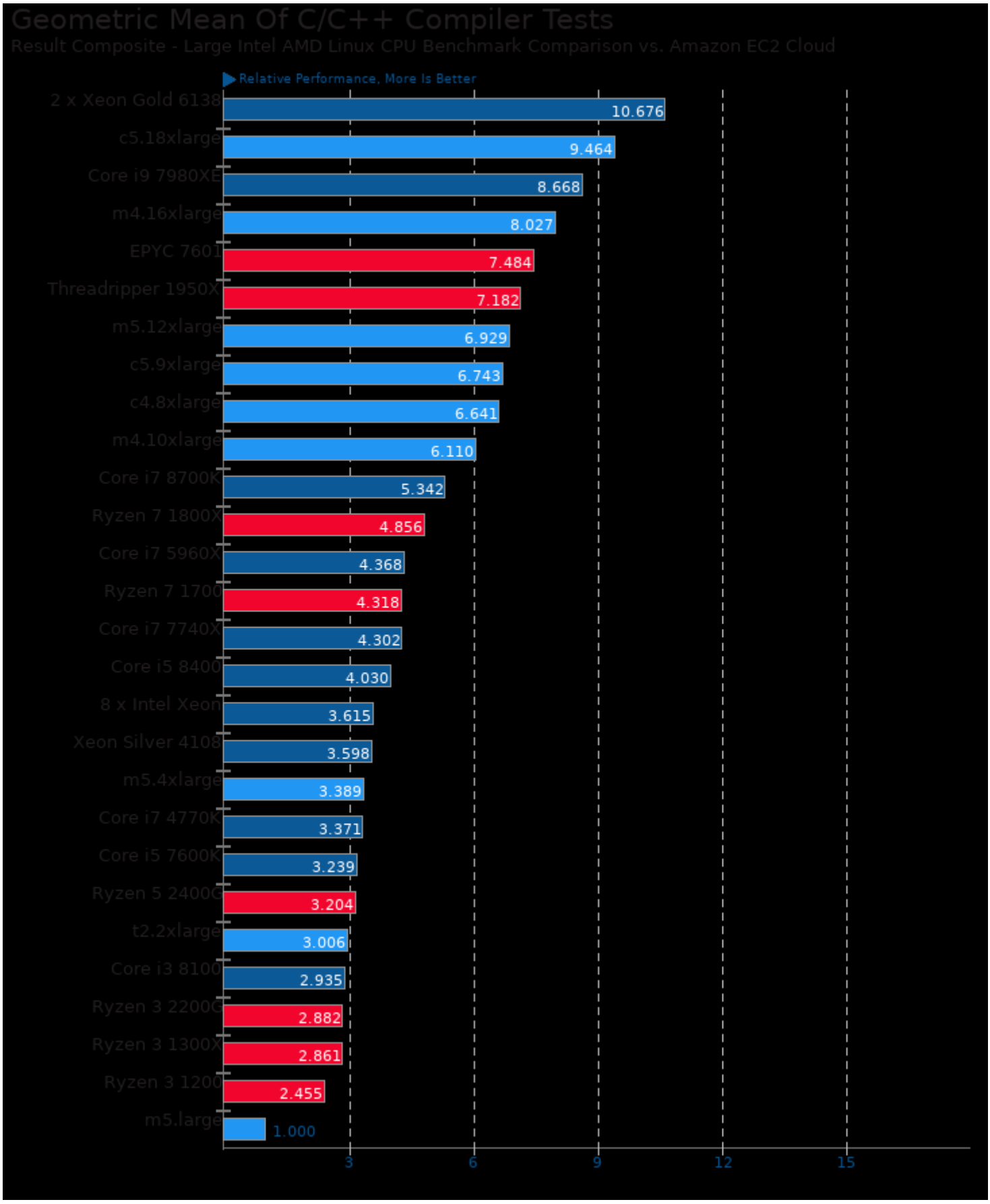

TTSIOD 3D Renderer 2.3a
Phong Rendering With Soft-Shadow Mapping
FPS, More Is Better
2 x Xeon Gold 6138
SE +/- 10.34, N = 5
733.58
Core i9 7980XE
SE +/- 3.20, N = 3
690.00
m5.12xlarge
SE +/- 4.78, N = 3
504.82
Threadripper 1950X
SE +/- 0.53, N = 3
466.13
m4.16xlarge
SE +/- 20.68, N = 3
465.90
c5.9xlarge
SE +/- 4.23, N = 3
460.27
EPYC 7601
SE +/- 0.55, N = 3
447.71
c4.8xlarge
SE +/- 3.14, N = 3
419.30
m4.10xlarge
SE +/- 3.29, N = 3
394.52
Core i7 8700K
SE +/- 0.60, N = 3
391.67
c5.18xlarge
SE +/- 12.51, N = 3
336.76
Core i7 5960X
SE +/- 0.31, N = 3
325.51
Ryzen 7 1800X
SE +/- 0.35, N = 3
312.22
Core i7 7740X
SE +/- 2.82, N = 3
277.43
Ryzen 7 1700
SE +/- 0.12, N = 3
274.64
Core i5 8400
SE +/- 0.18, N = 3
263.63
t2.2xlarge
SE +/- 0.39, N = 3
231.07
Ryzen 5 2400G
SE +/- 1.74, N = 3
211.60
Xeon Silver 4108
SE +/- 0.46, N = 3
210.84
Core i7 4770K
SE +/- 2.03, N = 3
204.31
Core i5 7600K
SE +/- 0.22, N = 3
187.90
m5.4xlarge
SE +/- 0.49, N = 3
184.83
Ryzen 3 2200G
SE +/- 0.83, N = 3
178.17
Core i3 8100
SE +/- 0.55, N = 3
168.27
Ryzen 3 1300X
SE +/- 0.16, N = 3
134.97
8 x Intel Xeon
SE +/- 1.29, N = 15
124.43
Ryzen 3 1200
SE +/- 0.49, N = 3
122.95
m5.large
SE +/- 2.30, N = 3
26.88
160
320
480
640
800
1. (CXX) g++ options: -O3 -fomit-frame-pointer -ffast-math -mtune=native -flto -msse -mrecip -mfpmath=sse -msse2 -mssse3 -lSDL -lstdc++


TTSIOD 3D Renderer 2.3a
Performance / Cost - Phong Rendering With Soft-Shadow Mapping
FPS Per Dollar, More Is Better
t2.2xlarge
c5.9xlarge
m5.12xlarge
c4.8xlarge
m4.10xlarge
m4.16xlarge
m5.4xlarge
c5.18xlarge
m5.large
23107.00
23013.50
16827.33
13976.67
13150.67
9318.00
9241.50
5612.67
1344.00
5K
10K
15K
20K
25K
1. t2.2xlarge: $0.3712 reported cost per hour, test consumed 1 Minute, 26 Seconds: cost approximately 0.01 dollar.
2. c5.9xlarge: $1.53 reported cost per hour, test consumed 53 Seconds: cost approximately 0.02 dollar.
3. m5.12xlarge: $2.304 reported cost per hour, test consumed 50 Seconds: cost approximately 0.03 dollar.
4. c4.8xlarge: $1.591 reported cost per hour, test consumed 58 Seconds: cost approximately 0.03 dollar.
5. m4.10xlarge: $2.00 reported cost per hour, test consumed 1 Minute: cost approximately 0.03 dollar.
6. m4.16xlarge: $3.20 reported cost per hour, test consumed 54 Seconds: cost approximately 0.05 dollar.
7. m5.4xlarge: $0.768 reported cost per hour, test consumed 1 Minute, 42 Seconds: cost approximately 0.02 dollar.
8. c5.18xlarge: $3.06 reported cost per hour, test consumed 1 Minute, 10 Seconds: cost approximately 0.06 dollar.
9. m5.large: $0.096 reported cost per hour, test consumed 9 Minutes, 47 Seconds: cost approximately 0.02 dollar.

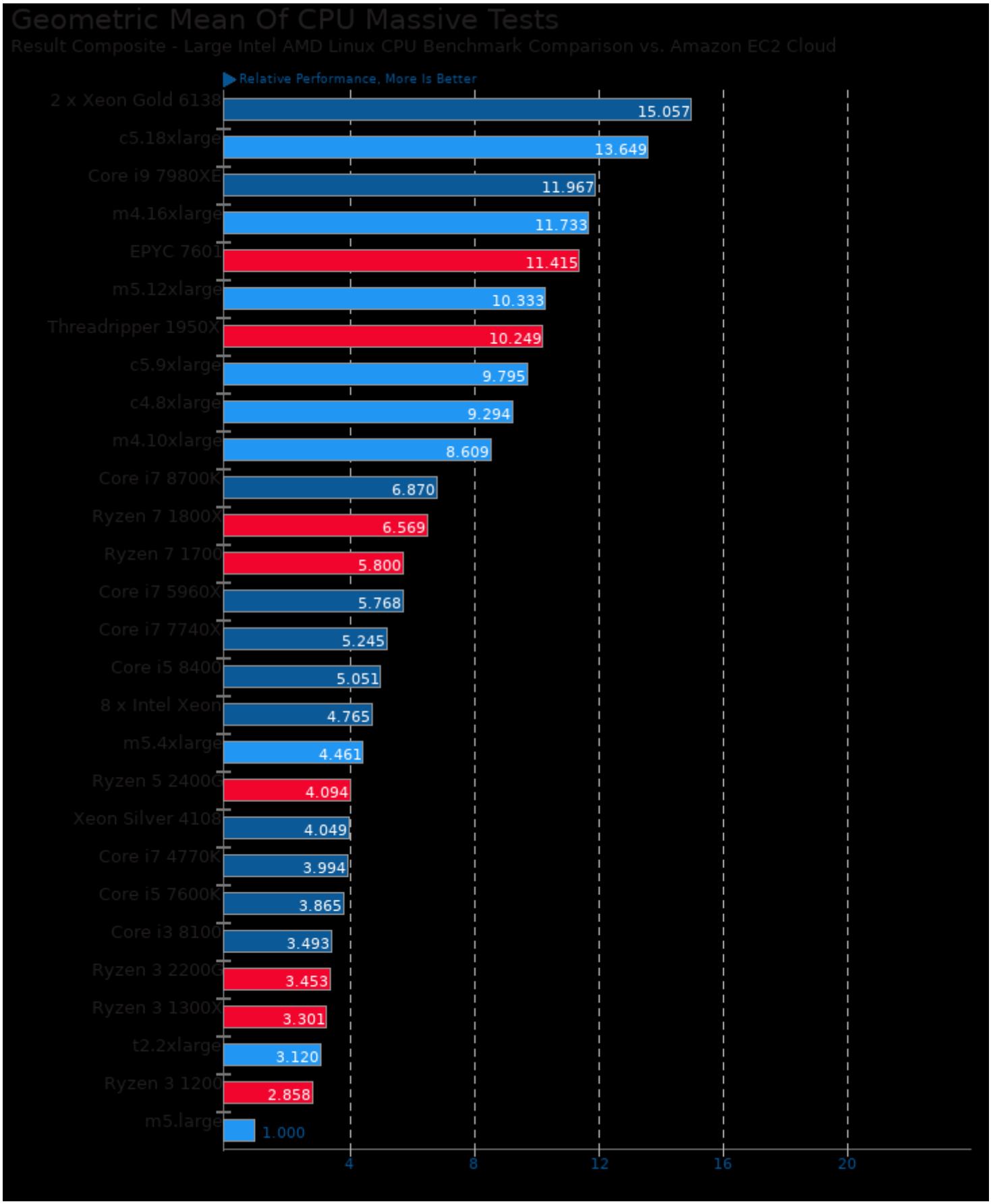

x264 2018-02-05
H.264 Video Encoding
Frames Per Second, More Is Better
c5.18xlarge
SE +/- 1.46, N = 3
176.03
c5.9xlarge
SE +/- 0.49, N = 3
134.10
m5.12xlarge
SE +/- 0.28, N = 3
129.66
Threadripper 1950X
SE +/- 0.43, N = 3
127.00
Core i9 7980XE
SE +/- 0.27, N = 3
125.28
m4.16xlarge
SE +/- 1.25, N = 3
115.34
EPYC 7601
SE +/- 0.45, N = 3
108.07
c4.8xlarge
SE +/- 0.30, N = 3
107.99
2 x Xeon Gold 6138
SE +/- 1.58, N = 3
107.89
m4.10xlarge
SE +/- 0.19, N = 3
97.43
Core i7 8700K
SE +/- 0.22, N = 3
72.96
Ryzen 7 1800X
SE +/- 0.22, N = 3
71.46
Ryzen 7 1700
SE +/- 1.01, N = 4
60.90
Core i7 5960X
SE +/- 0.19, N = 3
58.01
Core i5 8400
SE +/- 0.06, N = 3
56.11
m5.4xlarge
SE +/- 0.55, N = 3
55.46
Core i7 7740X
SE +/- 0.17, N = 3
49.95
t2.2xlarge
SE +/- 0.03, N = 3
38.43
Core i7 4770K
SE +/- 0.02, N = 3
37.64
Ryzen 5 2400G
SE +/- 0.58, N = 4
34.75
Core i5 7600K
SE +/- 0.01, N = 3
33.49
Xeon Silver 4108
SE +/- 0.14, N = 3
32.75
Core i3 8100
SE +/- 0.41, N = 6
30.42
Ryzen 3 2200G
SE +/- 0.02, N = 3
27.60
Ryzen 3 1300X
SE +/- 0.03, N = 3
27.33
Ryzen 3 1200
SE +/- 0.33, N = 6
23.47
m5.large
SE +/- 0.02, N = 3
11.02
40
80
120
160
200
1. (CC) gcc options: -ldl -m64 -lm -lpthread -O3 -ffast-math -std=gnu99 -fPIC -fomit-frame-pointer -fno-tree-vectorize


x264 2018-02-05
Performance / Cost - H.264 Video Encoding
Frames Per Second Per Dollar, More Is Better
c5.18xlarge
17603.00
c5.9xlarge
13410.00
m5.12xlarge
12966.00
c4.8xlarge
10799.00
m4.10xlarge
9743.00
m4.16xlarge
5767.00
m5.4xlarge
5546.00
t2.2xlarge
3843.00
4K
8K
12K
16K
20K
1. c5.18xlarge: $3.06 reported cost per hour, test consumed 15 Seconds: cost approximately 0.01 dollar.
2. c5.9xlarge: $1.53 reported cost per hour, test consumed 18 Seconds: cost approximately 0.01 dollar.
3. m5.12xlarge: $2.304 reported cost per hour, test consumed 18 Seconds: cost approximately 0.01 dollar.
4. c4.8xlarge: $1.591 reported cost per hour, test consumed 21 Seconds: cost approximately 0.01 dollar.
5. m4.10xlarge: $2.00 reported cost per hour, test consumed 23 Seconds: cost approximately 0.01 dollar.
6. m4.16xlarge: $3.20 reported cost per hour, test consumed 20 Seconds: cost approximately 0.02 dollar.
7. m5.4xlarge: $0.768 reported cost per hour, test consumed 37 Seconds: cost approximately 0.01 dollar.
8. t2.2xlarge: $0.3712 reported cost per hour, test consumed 51 Seconds: cost approximately 0.01 dollar.

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

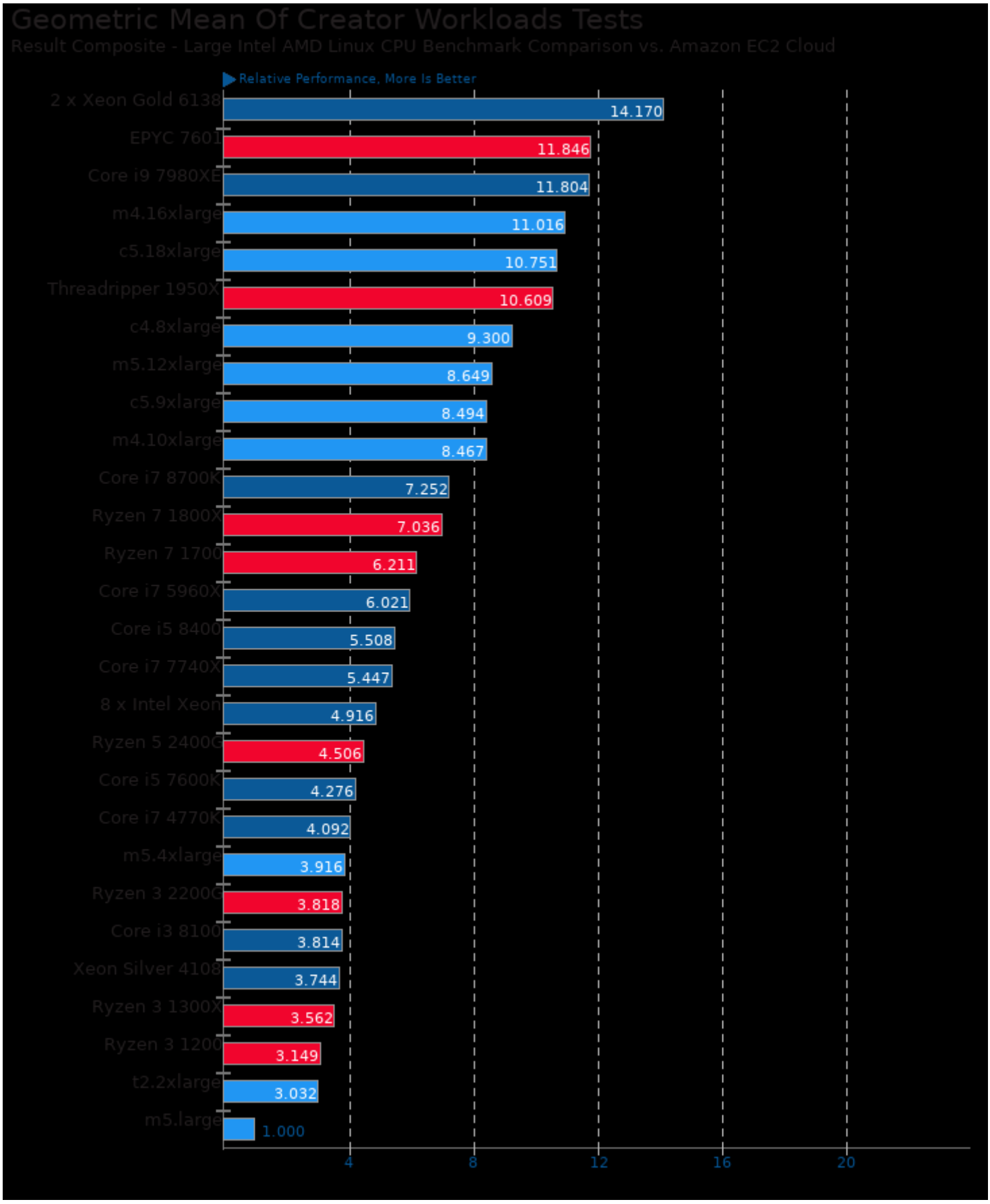


Geometric mean based upon tests: pts/mafft, pts/aobench, pts/c-ray, pts/compress-7zip, pts/encode-mp3, pts/john-the-ripper, pts/x264, pts/openssl and pts/nginx

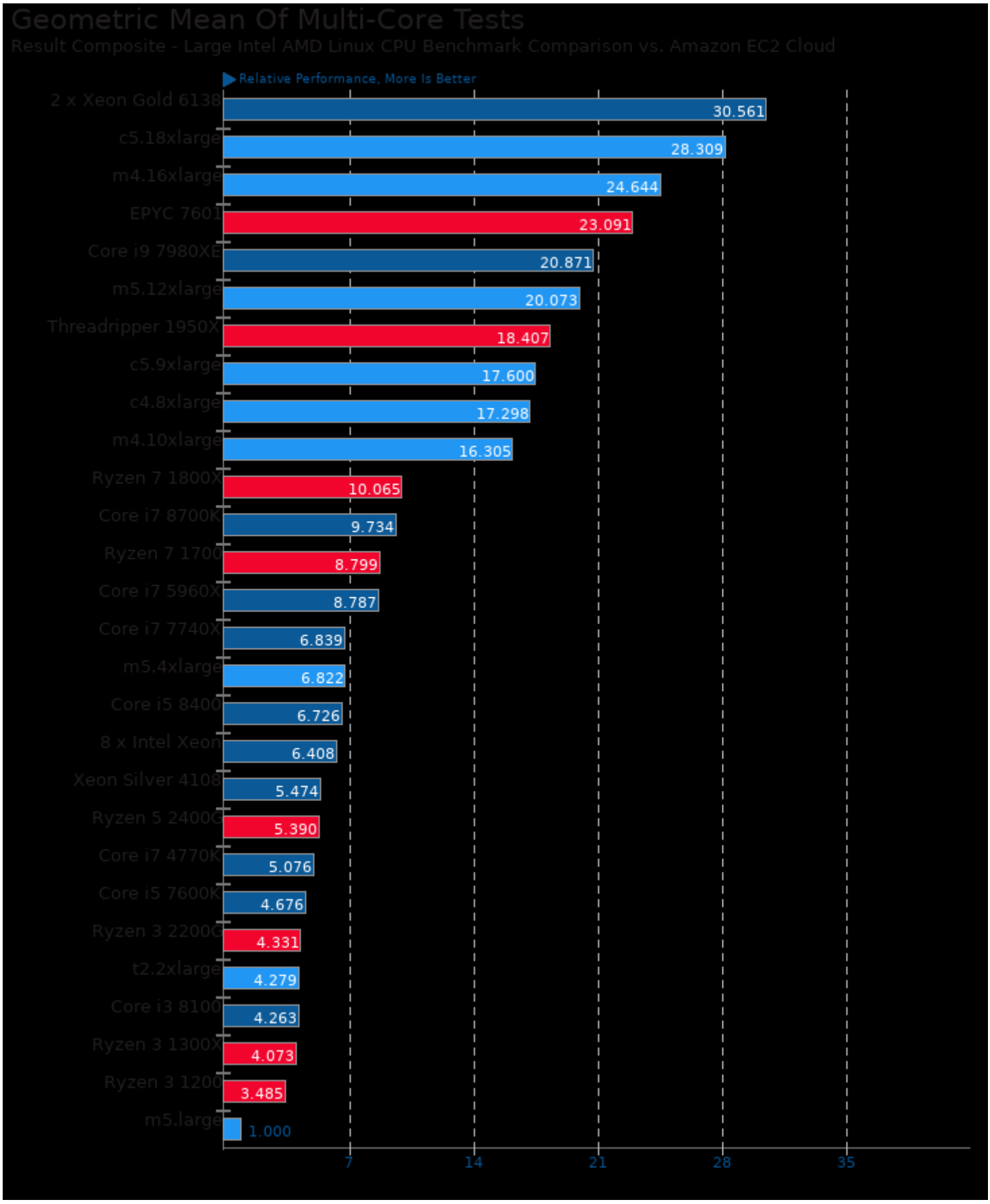


Geometric mean based upon tests: pts/build-linux-kernel, pts/c-ray, pts/compress-7zip, pts/crafty, pts/x264, pts/encode-mp3, pts/john-the-ripper, pts/openssl, pts/mafft, pts/nero2d, pts/nginx, pts/npb, pts/parboil, pts/povray,

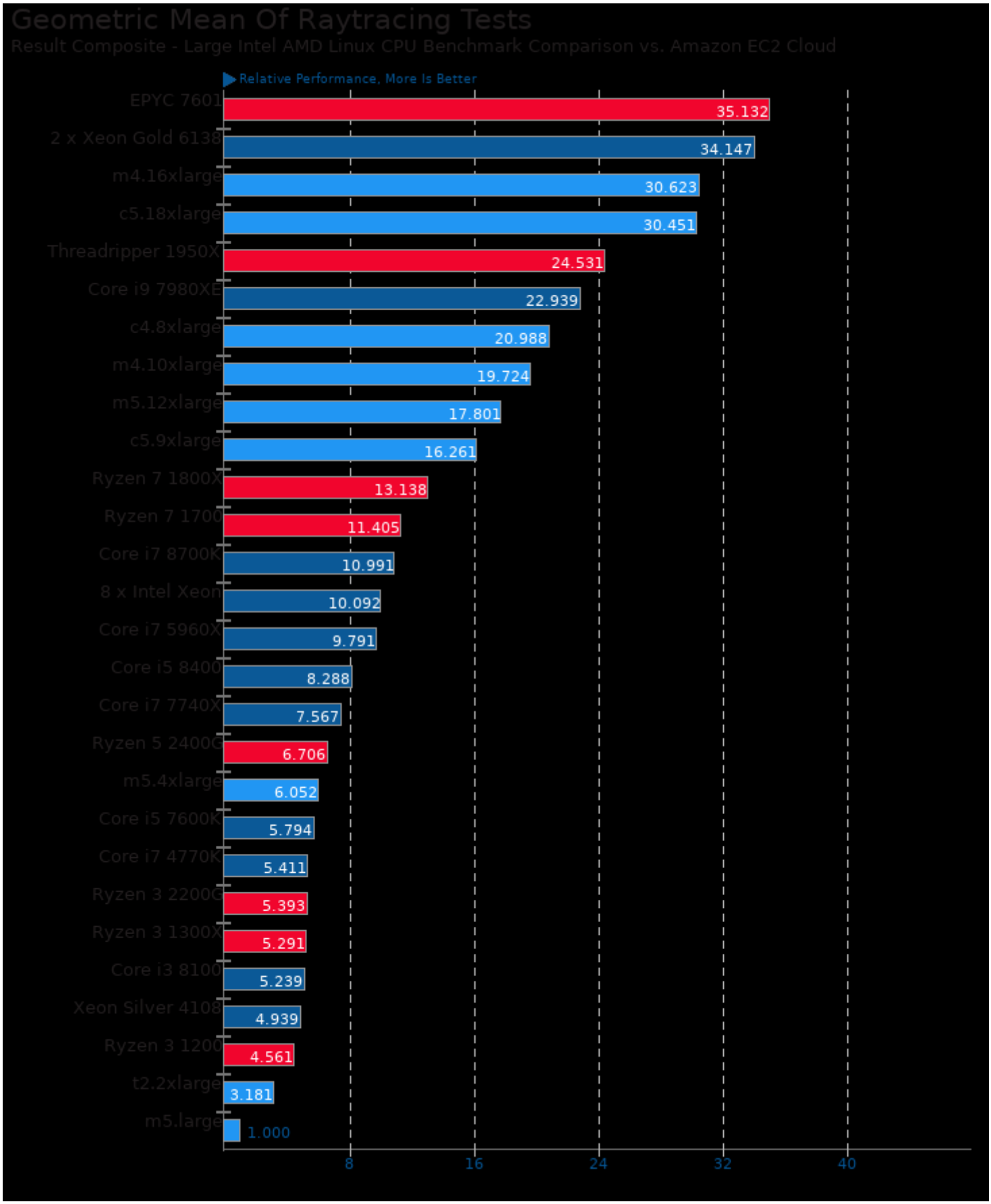
pts/rodinia, pts/scikit-learn and pts/ttsiod-renderer



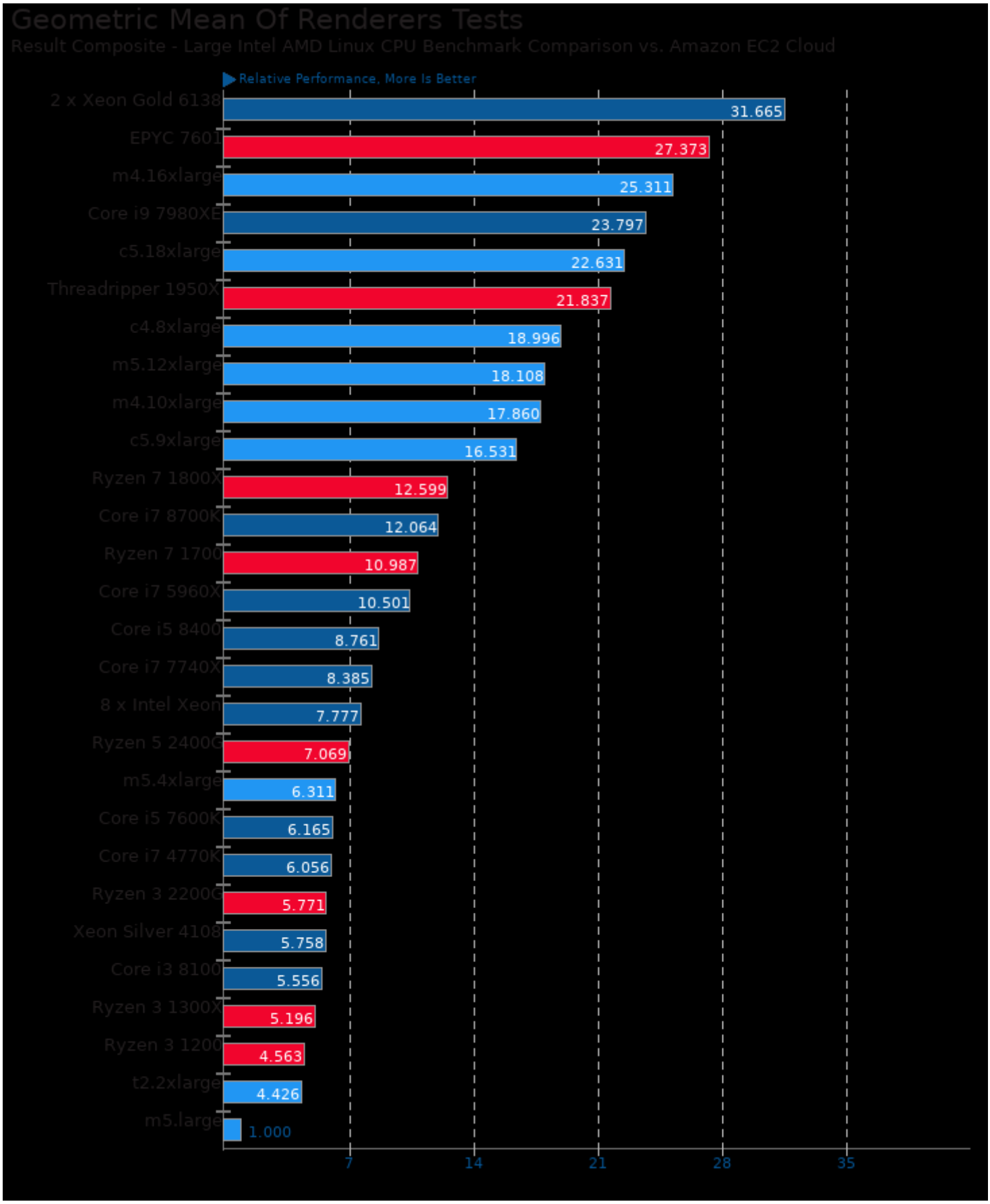
Geometric mean based upon tests: pts/c-ray, pts/povray, pts/aobench, pts/ttsiod-renderer, pts/x264 and pts/encode-mp3



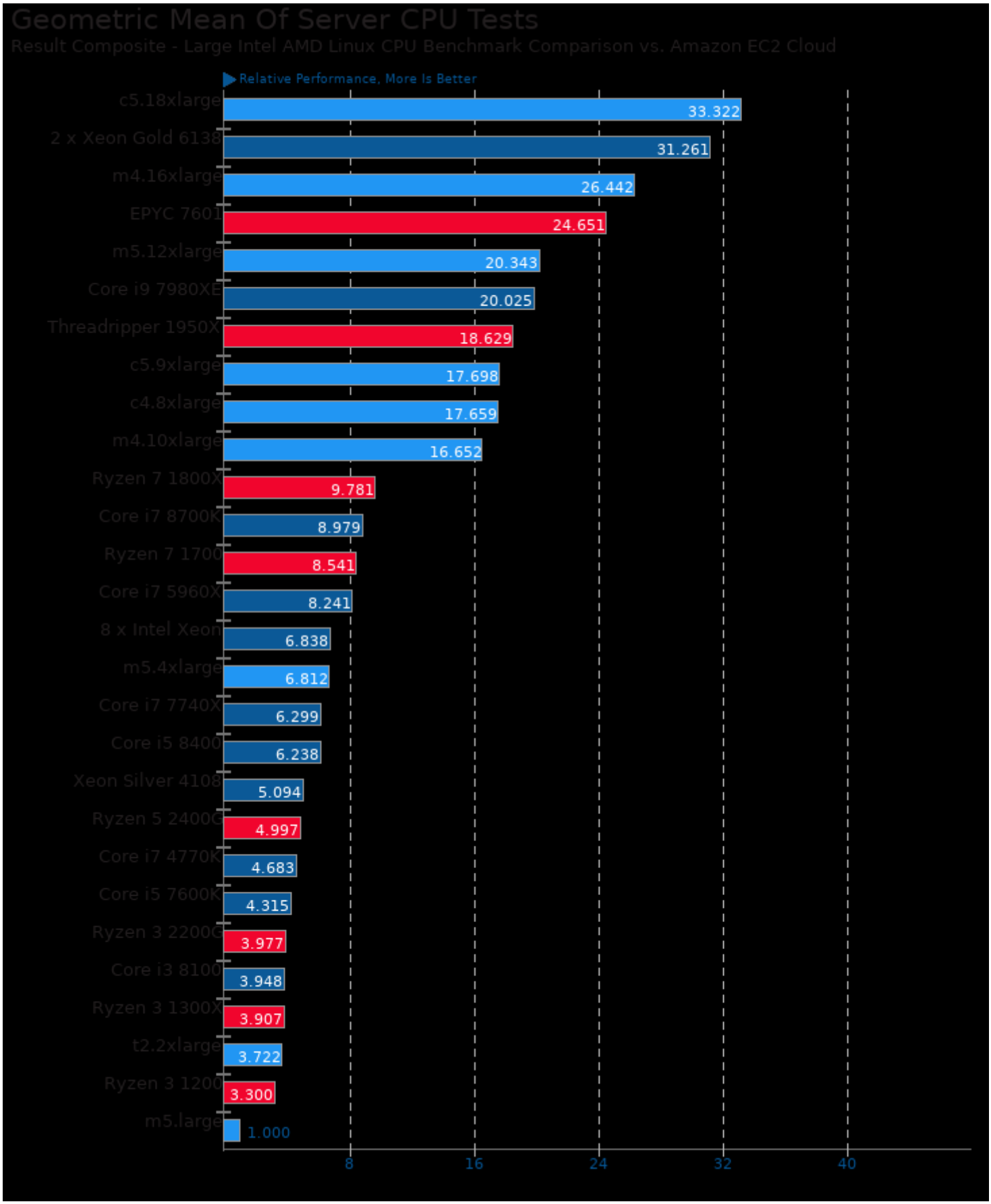
Geometric mean based upon tests: pts/c-ray, pts/povray, pts/x264, pts/rodinia, pts/parboil, pts/npb, pts/john-the-ripper, pts/nero2d, pts/compress-7zip, pts/build-linux-kernel, pts/aobench and pts/ttsiod-renderer



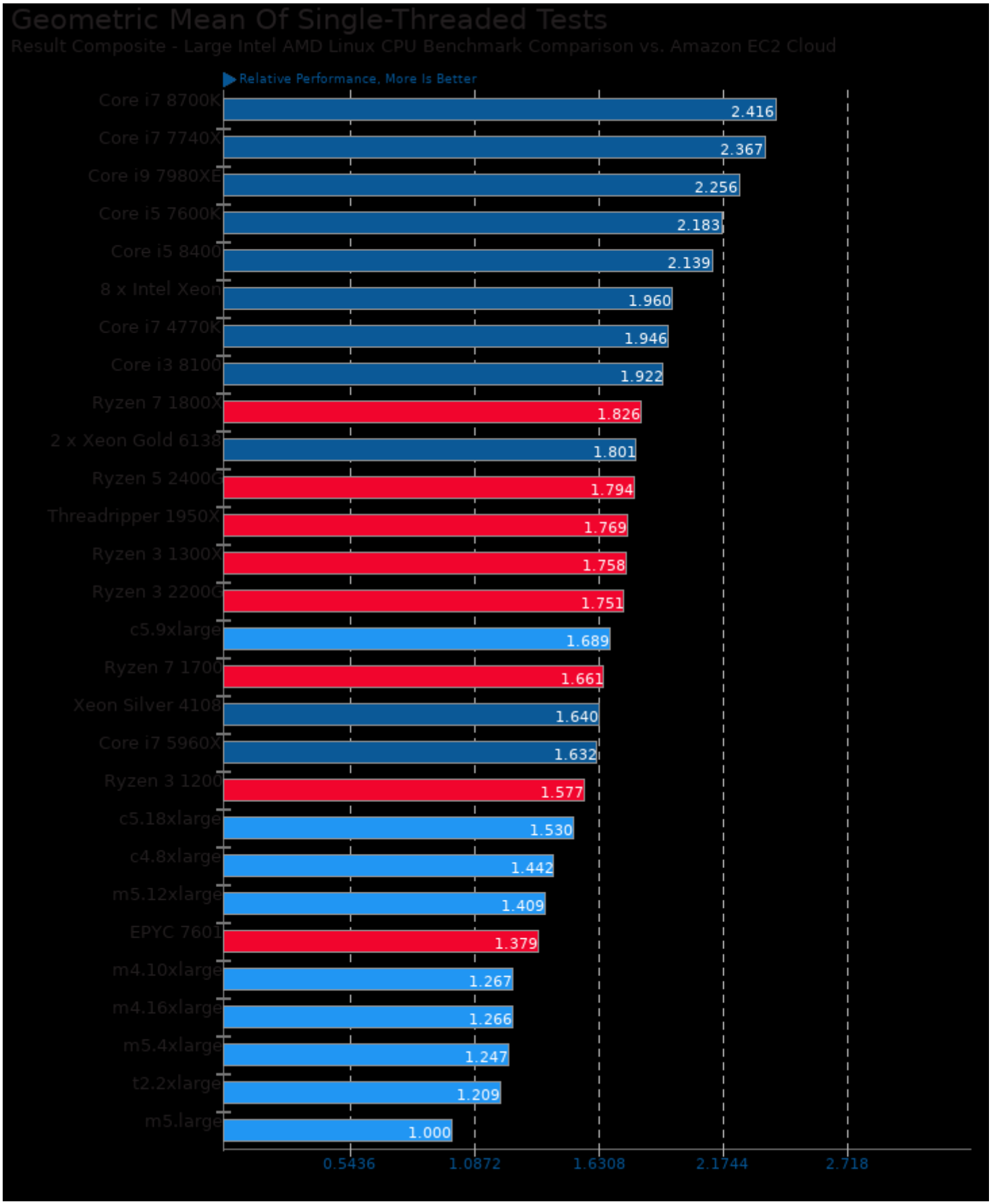
Geometric mean based upon tests: pts/c-ray and pts/povray



Geometric mean based upon tests: pts/c-ray, pts/povray, pts/aobench and pts/ttsiod-renderer



Geometric mean based upon tests: pts/npb, pts/rodinia, pts/john-the-ripper, pts/x264, pts/compress-7zip, pts/build-linux-kernel, pts/c-ray, pts/povray, pts/openssl, pts/pybench and pts/scikit-learn



Geometric mean based upon tests: pts/encode-mp3, pts/pybench and pts/nginx

This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 29 March 2024 02:43.