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Large Intel AMD Linux CPU Benchmark Comparison

Large CPU comparison. Tests being worked on by Michael Larabel.

Automated Executive Summary

2 x Xeon Gold 6138 had the most wins, coming in first place for 64% of the tests.

Based on the geometric mean of all complete results, the fastest (2 x Xeon Gold 6138) was 9.39x the speed of the slowest (A10-7800).

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

OpenSSL (RSA 4096-bit Performance) at 44.947x
Java JMH (Throughput) at 30.177x
POV-Ray (Trace Time) at 25.641x
NAS Parallel Benchmarks (Test / Class: EP.C) at 24.051x
C-Ray (Total Time) at 19.666x
John The Ripper (Test: Blowfish) at 16.794x
Timed Linux Kernel Compilation (Time To Compile) at 15.935x
Rodinia (Test: OpenMP LavaMD) at 15.653x
7-Zip Compression (Compress Speed Test) at 15.537x
Parboil (Test: OpenMP CUTCP) at 15.204x.

Test Systems:

A10-7800

Processor: AMD A10-7800 Radeon R7 12 Compute Cores 4C+8G @ 3.50GHz (2 Cores / 4 Threads), Motherboard: MSI A78M-E35 (MS-7721) v6.0 (V30.1 BIOS), Chipset: AMD Family 15h, Memory: 7168MB, Disk: 500GB Western Digital WD5000AZRX-0 + 525GB SABRENT, Graphics: MSI AMD Radeon R7 1024MB, Audio: AMD Kaveri HDMI/DP, 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 (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

A10-7870K

Processor: AMD A10-7870K Radeon R7 12 Compute Cores 4C+8G @ 3.90GHz (2 Cores / 4 Threads), Motherboard: ASUS A88XM-E (2001 BIOS), Chipset: AMD Family 15h, Memory: 15360MB, Disk: 250GB Samsung SSD 850 + 525GB SABRENT, Graphics: ASUS AMD Radeon R7 1024MB, Audio: AMD Kaveri HDMI/DP, 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

FX-8350

Processor: AMD FX-8350 Eight-Core @ 4.00GHz (4 Cores / 8 Threads), Motherboard: Gigabyte 970A-D3P (FB BIOS), Chipset: AMD RD9x0/RX980, Memory: 16384MB, Disk: 250GB Samsung SSD 850 + 525GB SABRENT, Graphics: HIS AMD Radeon HD 6450/7450/8450 / R5 230 OEM 1024MB, Audio: Realtek ALC892, 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 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 4130

Processor: Intel Core i3-4130 @ 3.40GHz (2 Cores / 4 Threads), Motherboard: Intel DH87RL (RLH8710H.86A.0317.2013.0426.1724 BIOS), Chipset: Intel 4th Gen Core DRAM, Memory: 1536MB, Disk: 128GB TOSHIBA THNSNH12 + 525GB SABRENT, Graphics: Intel Haswell 1536MB (1150MHz), Audio: Intel Xeon E3-1200 v3/4th, Monitor: DELL S2409W, Network: Intel Connection I217-V

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 i3 7100

Processor: Intel Core i3-7100 @ 3.90GHz (2 Cores / 4 Threads), Motherboard: Gigabyte B250M-DS3H-CF (F1 BIOS), Chipset: Intel Xeon E3-1200 v6/7th + B250, Memory: 8192MB, Disk: 250GB Western Digital WDS250G1B0A- + 525GB SABRENT, Graphics: Intel HD 630 3072MB (1100MHz), Audio: Realtek ALC887-VD, 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 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 3470

Processor: Intel Core i5-3470 @ 3.60GHz (4 Cores), Motherboard: ECS H61H2-I3 v1.0 (4.6.5 BIOS), Chipset: Intel Xeon E3-1200 v2/3rd, Memory: 4096MB, Disk: 120GB Samsung SSD 850 + 525GB SABRENT, Graphics: Intel Ivybridge Desktop 1536MB (1100MHz), Audio: VIA VT1705, 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: 4.2 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 4670

Processor: Intel Core i5-4670 @ 3.80GHz (4 Cores), Motherboard: MSI B85M-P33 (MS-7817) v1.0 (V4.5 BIOS), Chipset: Intel 4th Gen Core DRAM, Memory: 8192MB, Disk: 63GB SanDisk SDSSDP06 + 525GB SABRENT, Graphics: Intel Haswell Desktop 1536MB (1200MHz), 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 i5 6500

Processor: Intel Core i5-6500 @ 3.60GHz (4 Cores), Motherboard: Gigabyte Z170M-D3H-CF (F3 BIOS), Chipset: Intel Skylake, Memory: 8192MB, Disk: 250GB Samsung SSD 850 + 525GB SABRENT, Graphics: Intel HD 530 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 i5 6600K

Processor: Intel Core i5-6600K @ 3.90GHz (4 Cores), Motherboard: MSI Z170A GAMING PRO (MS-7984) v1.0 (1.00 BIOS), Chipset: Intel Skylake, Memory: 15360MB, Disk: 525GB SABRENT + 256GB TS256GSSD370S, Graphics: Intel HD 530 3072MB (1150MHz), Audio: Realtek ALC1150, 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 Driver: modesetting 1.19.5, OpenGL: 4.5 Mesa 18.1.0-devel- padoka PPA, Vulkan: 1.0.61, 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

Large Intel AMD Linux CPU Benchmark Comparison

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

	A10-7800	A10-7870K	FX-8350	Ryzen 3 1200	Ryzen 3 1300X	Ryzen 3 2200G	Ryzen 5 2400G	Ryzen 7 1700	Ryzen 7 1800X	Threadripper 1950X	EPYC 7601	Core i3 4130	Core i3 7100	Core i3 8100	Core i5 3470	Core i5 4670	Core i5 6500	Core i5 6600K	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
Cost To Run Tests - C.P.P.H (Cost / Price/ Crafty - Performance / Cost - Elapsed Time (Nodes/s/Dollar)																												0.95 58 24 04 50 0

Crafty - Elapsed Time (Node	58 24 04 5
Standard Deviation	0.1 %
AOBench - Performance / Cost - 2048 x 2048 - Total Time (sec x	1. 24
AOBench - 2048 x 2048 - Total Time (sec)	62 .1 8
Standard Deviation	0.1 %
Scikit-Learn - Performance / Cost - (sec x Dollar	10 .7 4
Scikit-Learn (sec)	17 9. 03
Standard Deviation	0.1 %

Numpy Benchmark - Performance / Cost - (Nanoseconds x Dollar	24 47 66 9
Numpy Benchmark (Nanoseconds)	71 99 02 6
PyBench - Performance / Cost - T.F.A.T.T (Milliseconds x Dollar	20 .4 4
PyBench - T.F.A.T.T (Millisecond	20 44
Standard Deviation	0%

| | | |

OpenSSL - Performance / Cost - R.4.b.P (Signs/sec/Dollar)	17 48 3
LAME MP3 Encoding - Performance / Cost - WAV To MP3 (sec x Dollar)	0. 42
POV-Ray - Performance / Cost - Trace Time (sec x Dollar)	10 1. 40

C-Ray - Performance / Cost - Total Time (sec x	0.17
Timed Linux Kernel Compilation - Performance / Cost - Time To Compile (sec	4.27
7-Zip Compression - Performance / Cost - C.S.T (MIPS/ Dollar)	23917700

x264 - Performance / Cost - H.2.V.E (FPS/Dollar	38 43
TTSIOD 3D Renderer - Performance / Cost - P.R.W.S.S.M (FPS/Dollar	23 10 7
Open FMM Nero2D - Performance / Cost - Total Time (sec x Dollar)	2. 61

John The Ripper - Performance / Cost - Blowfish (Real C/S/Dollar)	30 33 50
Rodinia - Performance / Cost - OpenMP LavaMD (sec x Dollar)	14 .9 6

NAS Parallel Benchmarks - Performance / Cost - EP.C (Mop/s/Doll																											73 10
NGINX Benchmark - S.W.P.S (Reqs/sec)	19 11 3	21 35 9	19 62 8	29 14 5	32 63 3	33 62 1	33 45 0	29 82 0	32 96 4	31 19 8	24 02 0	20 65 5	36 75 7	36 31 1	20 76 2	35 67 2	34 80 0	39 23 4	40 48 3	40 53 3	36 37 4	28 45 7	**45 47 6**	44 91 6	42 84 1	31 67 0	30 95 9	**18 17 5**
Normalized	42.03%	46.97%	43.16%	64.09%	71.76%	73.93%	73.55%	65.57%	72.49%	68.6%	52.82%	45.42%	80.83%	79.85%	45.65%	78.44%	76.52%	86.27%	89.02%	89.13%	79.98%	62.58%	10 0%	98.77%	94.21%	69.64%	68.08%	39.97%
Standard Deviation	0.7%	1.1%	0.5%	1.7%	0.2%			1.2%	0.1%	0.5%	0.8%	3%	0.4%	0.6%	0.2%	0.2%	0.5%	0.8%	1.6%	0.5%	0.4%	2.4%	1.1%	3.3%	2%	0.3%	0.9%	7.6%
PyBench - T.F.A.T.T (Milliseconds)	**22 64**	20 28	20 48	16 55	14 98	15 47	14 58	15 18	13 95	14 20	17 81	15 65	12 37	13 40	17 23	13 90	13 42	12 39	11 49	12 09	13 56	15 14	10 75	**10 31**	11 50	16 15	13 07	18 37
Normalized	45.54%	50.84%	50.34%	62.3%	68.83%	66.65%	70.71%	67.92%	73.91%	72.61%	57.89%	65.88%	83.35%	76.94%	59.84%	74.17%	76.83%	83.21%	89.73%	85.28%	76.03%	68.1%	95.91%	10 0%	89.65%	63.84%	78.88%	56.12%
Standard Deviation	0.3%	0.4%	0.1%	0.1%	0.3%	0.9%	0.2%	0.2%	0.4%	1.3%		0.3%	0.2%	0.1%	0.4%		0.1%	0.1%		0.4%	0.2%	0.2%	0.1%	0.2%	0.1%		0.3%	0.5%

Large Intel AMD Linux CPU Benchmark Comparison

Phoronix Test Suite

Java JMH - Throughput (Ops/s)	3487990508	3894393975	7556693480	6174307143	7109698874	7371093972	7445348045	1278883616	1478541784	2782593145	4183060681	6739822758	7790123625	1438337615	1239667932	3375157915	7218761820	7698911581	9263204963	1463541776	2449231754	1792034803	2575892408	6158755318	1624741753	1052307922	4317
Normalized	3.3%	3.7%	7.6%	5.8%	6.8%	7.0%	7.0%	12.15%	14.05%	26.44%	39.75%	6.4%	7.4%	13.67%	11.78%	13.62%	12.53%	14.81%	15.19%	21.64%	14.73%	24.93%	17.03%	24.48%	58.01%	15.91%	10%	4.0%
Open SSL - R.4.b.P (Signs/sec)	29973.7	33704.2	70520.3		71053.4	73420.8	79380.1	13801.7	15932.1	30021.7	45612.7	30978.4	59713.1	10432.3	49623.4	64510.2	94273.1	11443.2	11748.1	16712.1	68309.7	12303.4	13713.2	19801.3	46955.1	12858.5	78483.8	17483.3
Normalized	3.8%	4.3%	8.9%		9.0%	9.3%	10.1%	17.56%	20.27%	38.45%	58.12%	3.9%	7.6%	13.27%	6.3%	8.2%	12%	14.55%	14.61%	21.27%	8.7%	15.03%	16.13%	25.19%	59.75%	16.36%	10%	2.2%
Standard Deviation	1%	0.5%	0.1%		6.4%	1.1%	2.1%	0.1%	0.1%	0.2%	0.9%	0%	0.3%	2.2%	4%	0.2%	2.3%	0%	2.8%	0%	0.1%	0%	2.7%	0.1%	0.2%	0.3%	0.6%	1.4%
LAME MP3 Encoding - WAV To MP3 (sec)	54.17	48.37	47.03	39.68	35.78	37.13	35.19	36.59	33.50	33.77	42.75	38.94	31.08	33.30	37.63	33.25	33.51	30.94	28.77	30.01	32.58	36.15	27.50	26.07	28.50	39.90	32.33	42.12
Normalized	48.13%	53.9%	55.43%	65.7%	72.86%	70.21%	74.08%	71.25%	77.82%	77.24%	60.95%	66.95%	83.88%	78.29%	69.78%	78.41%	77.81%	84.23%	90.62%	86.87%	80.12%	72.06%	94.8%	100%	91.47%	65.34%	80.64%	61.89%
Standard Deviation	0.2%	0.1%	0.2%	0.1%	0.3%	0.2%	0.1%	0%	0.8%	0.9%	0%	3%	0.1%	0%	0.2%	0%	0%	0%	0.1%	0%	0.4%	0.2%	0.8%	1.3%	0.1%	0.1%	0.1%	0.1%
POV-Ray - Trace Time (sec)	27.86	24.07	13.01	18.19	15.29	15.63	10.39	64.40	56.21	30.30	21.97	26.70	20.73	13.02	22.83	14.13	14.84	12.84	12.90	87.4	13.09	70.7	87.4	60.6	32.5	19.83	25.70	56.33
Normalized	8.1%	9.0%	16.39%	12.13%	14.06%	14.63%	20.46%	34.11%	39.09%	72.51%	10%	8.2%	10.95%	15.8%	9.6%	14.93%	14.66%	17.32%	17.45%	24.98%	16.76%	31.27%	24.98%	36.04%	67.08%	11.22%	85.49%	3.9%
Standard Deviation	0.2%	0.1%	0.3%	0.1%	0.2%	0.4%	0.3%	0%	0.1%	0.3%	0.6%	0.2%	0.1%	0.1%	2.5%	0.1%	0.1%	0.1%	0.9%	0.1%	0.2%	0.2%	0.1%	0.2%	0.6%	0.4%	17.3%	9%

Large Intel AMD Linux CPU Benchmark Comparison

C-Ray - Total Time (sec)	61.75	55.09	28.01	24.95	21.50	21.07	19.48	11.23	9.70	5.16	3.47	54.28	41.97	24.65	39.00	27.40	26.97	22.83	22.25	15.57	24.51	13.97	18.69	12.78	5.46	19.69	3.14	16.52
Normalized	5.09%	5.7%	11.21%	12.59%	14.6%	14.9%	16.12%	27.96%	32.37%	60.85%	90.49%	5.8%	7.4%	12.74%	8.05%	11.46%	11.64%	13.75%	14.11%	20.17%	12.81%	22.48%	16.8%	24.57%	57.51%	15.95%	10%	19.01%
Standard Deviation	0%	0.1%	0%	0.1%	0%	0.7%	1.4%	0%	0.1%	0.1%	0.7%	0.2%	0.1%	0.1%	1.4%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.2%	1.5%	0.1%	0.3%	0.1%	0.2%	0%
Timed Linux Kernel Compilation - Time To Compile	342.48	300.76	168.53	484.57	458.00	201.48	153.49	95.7	85.2	48.4	38.9	426.59	246.44	167.81	264.97	180.98	181.66	158.43	157.58	108.02	150.12	898.5	106.0	79.1	39.0	127.47	30.41	106.83
Normalized	8.87%	10.11%	18.12%	6.28%	6.04%	15.09%	19.81%	31.95%	35.68%	62.73%	79.21%	7.3%	12.34%	18.12%	11.48%	16.8%	16.74%	19.3%	19.3%	28.15%	20.26%	34.11%	28.45%	38.86%	76.43%	23.86%	10%	28.47%
Standard Deviation	0.8%	1.1%	1.5%	0.2%	0.3%	1%	1.2%	2.2%	2%	3.2%	4.5%	0.5%	0.8%	1%	1.1%	1.2%	1.1%	1%	1%	1.7%	1%	2.3%	1%	7%	6.9%	2.3%	6.2%	1.3%
7-Zip Compression - C.S.T (MIPS)	99183	11143	22097	12601	15880	15074	17729	30627	33022	71592	95062	89926	12896	17221	14100	16595	15116	18079	17727	27202	21667	37236	28951	39032	91388	27978	13097	23917
Normalized	7.15%	8.18%	15.82%	9.02%	11.37%	11.27%	12.69%	21.92%	23.64%	51.24%	68.04%	6.4%	9.23%	12.33%	10.09%	11.88%	10.82%	12.94%	12.69%	19.35%	15.51%	26.65%	20.72%	27.94%	65.24%	19.96%	10%	17.12%
Standard Deviation	1.5%	1.4%	0.3%		1.8%	0.5%	3.3%	0.6%	1.5%	0.2%	0.6%	1.2%	0.1%	0.2%	3.1%	0.9%	0.1%	0.1%	0.3%	0.2%	1.3%	1.4%	2.9%	1%	0.5%	1.5%	2.6%	0.6%
x264 - H.2.V.E (FPS)	15.61	17.58	30.54	23.47	27.33	27.60	34.75	60.90	71.56	12.00	10.87	15.4	23.8	30.42	19.83	28.16	28.07	33.11	33.94	56.37	37.41	58.49	49.65	72.28	12.5	32.75	10.89	38.43
Normalized	12.29%	13.84%	24.08%	18.48%	21.52%	21.73%	27.36%	47.95%	56.27%	10%	85.09%	12.18%	18.81%	23.95%	15.61%	22.17%	22.42%	26.07%	26.37%	44.18%	29.64%	45.68%	39.33%	57.45%	98.65%	25.84%	84.95%	30.26%
Standard Deviation	0.1%	0%	0.2%	3.4%	0.2%	0.1%	3.3%	3.3%	0.5%	0.6%	0.7%	0.3%	0.2%	3.3%	18.4%	3.4%	0.4%	0.2%	0.1%	0.2%	0.1%	0.6%	0.6%	0.5%	0.4%	0.7%	2.5%	0.1%

Large Intel AMD Linux CPU Benchmark Comparison

TTSIOD 3D Renderer - P.R.W.S.S.M (FPS)	67.42	82.93	14.275	12.295	13.497	17.178	21.760	27.464	31.222	46.613	44.071	73.505	12.169	16.827	12.790	15.577	15.222	18.872	18.907	26.363	20.314	32.551	27.437	39.671	69.000	21.845	73.358	23.107
Normalized	9.19%	11.3%	19.46%	16.76%	18.4%	24.29%	28.84%	37.44%	42.56%	63.54%	61.03%	10.03%	16.59%	22.94%	17.71%	21.23%	21.57%	25.18%	25.61%	35.94%	27.85%	44.37%	37.82%	53.39%	94.06%	28.74%	10.0%	31.5%
Standard Deviation	0.3%	0.2%	1%	0.7%	0.2%	0.8%	1.4%	0.1%	0.2%	0.2%	0.2%	0.9%	0.3%	0.6%	2%	0.4%	0.1%	1.2%	0.2%	0.1%	1.7%	0.2%	1.8%	0.3%	0.8%	0.4%	3.2%	0.3%
Open FMM Nero2D - Total Time (sec)	28.43	25.40	11.89	10.59	94.9	92.9	90.6	57.8	50.15	30.16	26.15	20.51	16.73	92.1	14.12	10.83	10.83	85.1	83.8	61.4	98.1	60.3	76.6	54.8	27.9	86.9	21.4	87.4
Normalized	7.65%	8.53%	17.88%	19.56%	22.71%	23.28%	23.67%	37.3%	42.75%	71.09%	81.99%	10.23%	12.94%	23.15%	15.19%	20.85%	21.26%	25.01%	25.53%	35.12%	21.83%	35.66%	28.08%	39%	76.6%	24.69%	10.0%	24.63%
Standard Deviation	0.5%	0.5%	1.8%	0.3%	0.1%	0.3%	1%	0.5%	1.1%	3.3%	3%	0.9%	0.4%	0.7%	2.2%	1.1%	0.2%	0.4%	0.7%	1.2%	0.6%	0.7%	0.5%	1%	0.6%	0.4%	4.1%	0.8%
John The Ripper - Blowfish (Real C/S)	33737.5	37758.5	68260.0	37119.3	43934.0	45402.2	60221.0	10431.5	12445.1	23001.2	23552.0	30085.9	38594.0	44119.2	29920.0	40804.6	40468.5	47102.0	49107.5	69988.0	68000.0	11710.0	88804.0	12758.4	30104.0	82758.0	50248.0	60674.0
Normalized	6.71%	7.51%	13.58%	7.39%	8.74%	9.04%	11.98%	20.76%	24.77%	45.77%	46.87%	5.99%	7.68%	8.88%	5.95%	8.12%	8.05%	9.52%	9.77%	13.93%	13.53%	23.39%	17.67%	25.39%	59.91%	16.47%	10.0%	12.07%
Standard Deviation	0.3%	0.1%	0.6%	0.8%	0.3%	0.2%	3.9%	0.8%	0.1%	2%	0.5%	0.2%	2.7%	0.2%	0.1%	0.1%	3.2%	0%	0%	1.9%

Large Intel AMD Linux CPU Benchmark Comparison

Timed MAFFT Alignment - M.S.A (sec)	**11.96**	10.40	5.92	7.25	5.99	6.27	5.73	4.26	3.65	3.13	4.69	10.45	7.85	5.71	6.93	5.85	6.32	5.36	5.42	3.68	4.88	3.54	3.97	**3.04**	5.46	10.15	4.26
Normalized	25.42%	29.23%	51.35%	41.93%	50.75%	48.48%	53.05%	71.36%	83.29%	97.12%	64.82%	29.09%	38.73%	53.24%	43.87%	51.97%	48.1%	56.72%	56.09%	82.61%	62.3%	85.88%	76.57%	100%	55.68%	29.95%	71.36%
Standard Deviation	2%	7.5%	1.3%	0.4%	4.8%	5%	4.3%	3.1%	0.9%	4%	4.1%	3.7%	0.2%	6.4%	0.8%	6.8%	3.4%	3.9%	1%	4.7%	4.4%	3.1%	8.7%		3.8%	3.3%	0.6%
Rodinia - OpenMP LavaMD (sec)	**44.42**	39.52	21.52	25.67	22.34	21.13	16.28	95.5	82.9	45.5	31.8	44.27	35.52	22.21	40.13	32.61	24.20	20.84	20.35	14.15	19.36	11.38	15.42	10.19	46.4	17.83	**28.2**	21.70
Normalized	6.39%	7.17%	13.48%	11.03%	12.77%	13.13%	17.79%	29.97%	34.62%	62.07%	90.31%	6.48%	8.04%	12.61%	7.13%	8.84%	11.58%	13.66%	14.03%	19.92%	14.31%	24.93%	18.47%	26.61%	61.15%	16.69%	10.70%	13.35%
Standard Deviation	0.1%	0.4%	0.1%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	2.1%	1.5%	0.1%	0.3%	0%	0.8%	0.1%	0.1%	0%	0.1%	0.1%	0%	0.4%	0.9%	0.1%	0.3%	0.6%	1.9%	0%
Parboil - OpenMP CUTCP (sec)	**35.73**	31.60	16.90	17.36	15.03	15.64	11.34	6.49	5.58	3.24	2.63	30.51	22.87	14.95	17.82	15.80	16.21	13.82	13.46	9.47	12.99	7.83	10.13	7.08	3.28	10.99	**2.35**	11.46
Normalized	6.58%	7.48%	13.91%	13.54%	15.64%	15.03%	20.72%	36.21%	42.11%	72.53%	89.35%	7.7%	10.28%	15.72%	13.19%	14.87%	14.5%	17%	17.46%	24.82%	18.09%	30.01%	23.2%	33.19%	71.65%	21.38%	10%	20.51%
Standard Deviation	0.1%	0.3%	0.4%	0.4%	0.1%	0.7%	0.6%	0.7%	0.4%	0.4%	1%	0.4%	1.1%	0%	0.2%	0.2%	0.1%	0.1%	0.2%	0.1%	1%	0.3%	1.7%	0.3%	0.4%	0.3%	1.1%	0%

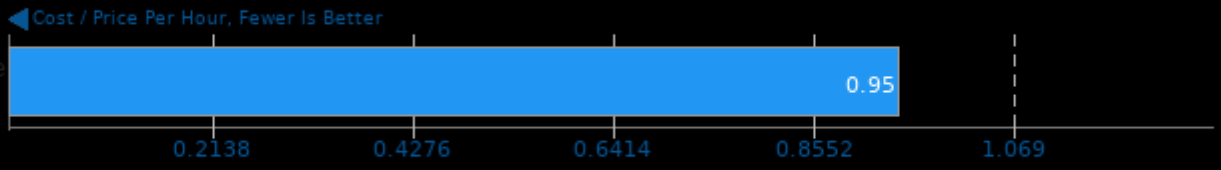
Large Intel AMD Linux CPU Benchmark Comparison

NAS Parallel Benchmarks - EP.C (Mop/s)	83.11	92.05	22.13	12.00	14.62	14.02	29.90	48.65	57.10	10.90	16.23	14.51	17.07	20.48	18.13	19.48	18.67	21.61	22.62	32.50	33.54	56.87	39.63	57.05	12.68	31.97	19.99	14.20
Normalized	4.16%	4.61%	11.06%	6.19%	7.09%	7.21%	14.47%	24.55%	28.57%	54.55%	81.18%	7.18%	8.76%	10.13%	9.01%	9.93%	9.29%	10.99%	11.29%	16.08%	16.59%	28.26%	19.74%	28.87%	63.42%	16.01%	10.00%	7.31%
Standard Deviation	1.8%	0.3%	1.6%	0.5%	0.1%	0.3%	1%	2.5%	0.4%	0.5%	0.6%	1.1%	0.8%	0.3%	0.4%	0.2%	0.1%	0.1%	0.2%	0.1%	1%	0.2%	1.1%	0.6%	0.9%	0.4%	1.1%	0.1%

Large Intel AMD Linux CPU Benchmark Comparison

Cost To Run Tests

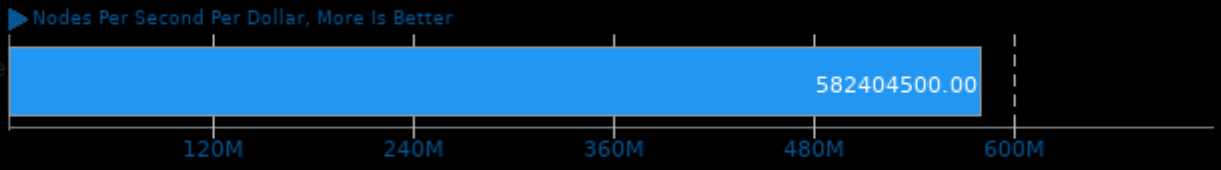
Cost / Price Per Hour



1. $0.3712 reported cost per hour, running tests consumed 2 Hours, 33 Minutes, 44 Seconds: cost approximately 0.95 dollar.

Crafty 25.2

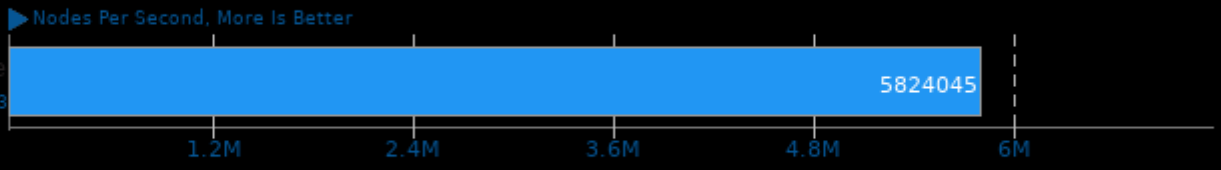
Performance / Cost - Elapsed Time



1. $0.3712 reported cost per hour, test consumed 1 Minute, 49 Seconds: cost approximately 0.01 dollar.

Crafty 25.2

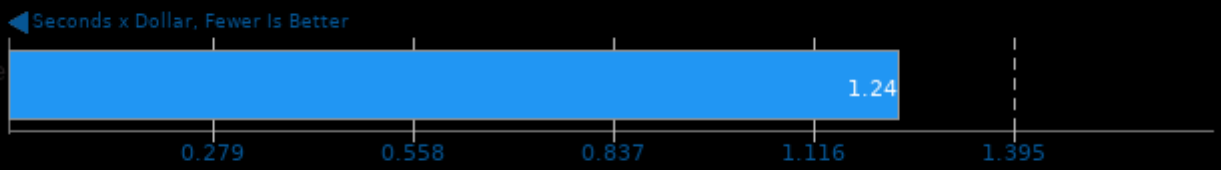
Elapsed Time



1. (CC) gcc options: -lstdc++ -fprofile-use -pthread -lm

AOBench

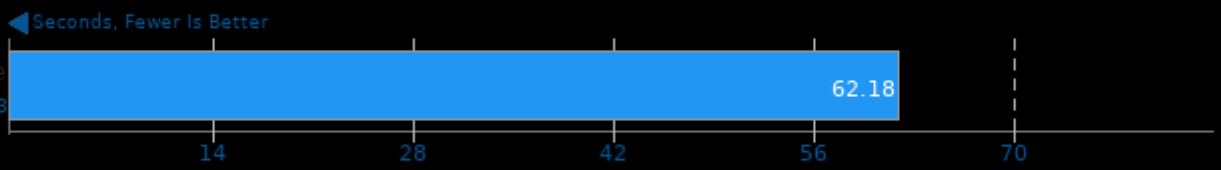
Performance / Cost - Size: 2048 x 2048 - Total Time



1. $0.3712 reported cost per hour, test consumed 3 Minutes, 11 Seconds: cost approximately 0.02 dollar.

AOBench

Size: 2048 x 2048 - Total Time

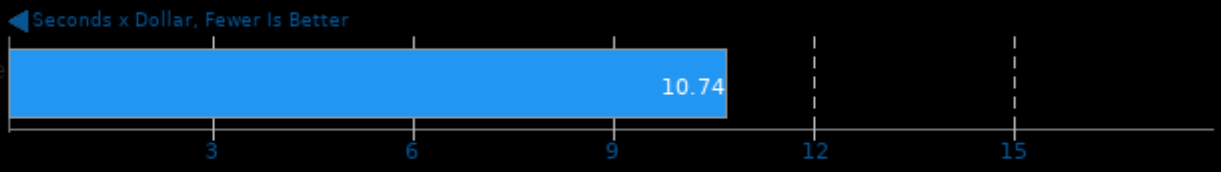


1. (CC) gcc options: -lm -O3

Large Intel AMD Linux CPU Benchmark Comparison

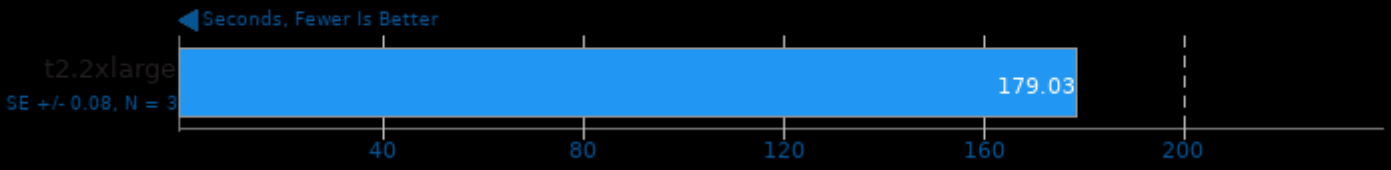
Scikit-Learn 0.17.1

Performance / Cost -



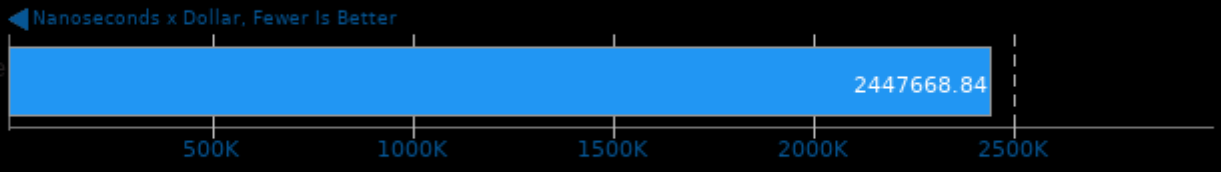
1. $0.3712 reported cost per hour, test consumed 9 Minutes, 2 Seconds: cost approximately 0.06 dollar.

Scikit-Learn 0.17.1



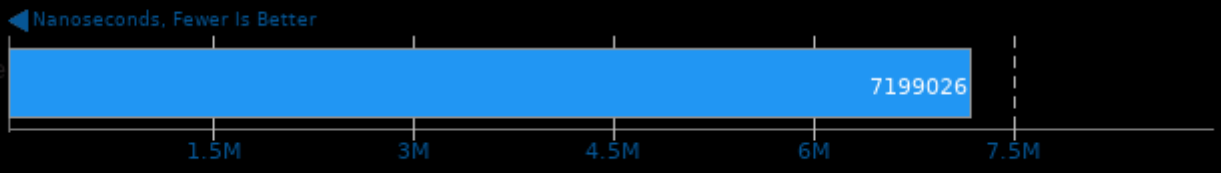
Numpy Benchmark

Performance / Cost -



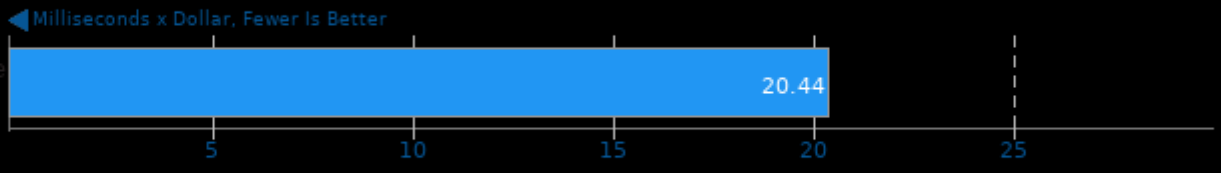
1. $0.3712 reported cost per hour, test consumed 55 Minutes, 39 Seconds: cost approximately 0.34 dollar.

Numpy Benchmark



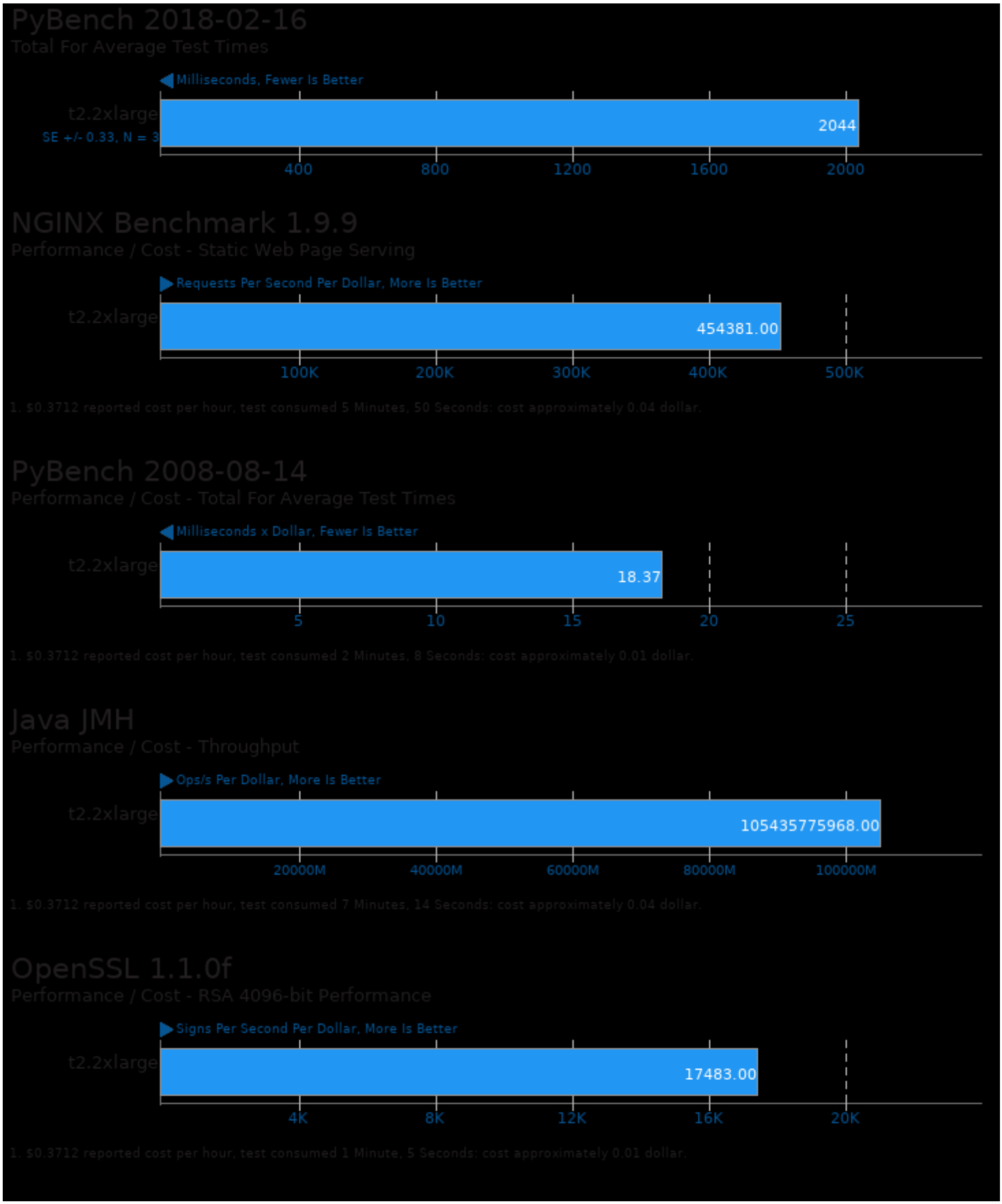
PyBench 2018-02-16

Performance / Cost - Total For Average Test Times



1. $0.3712 reported cost per hour, test consumed 2 Minutes, 24 Seconds: cost approximately 0.01 dollar.

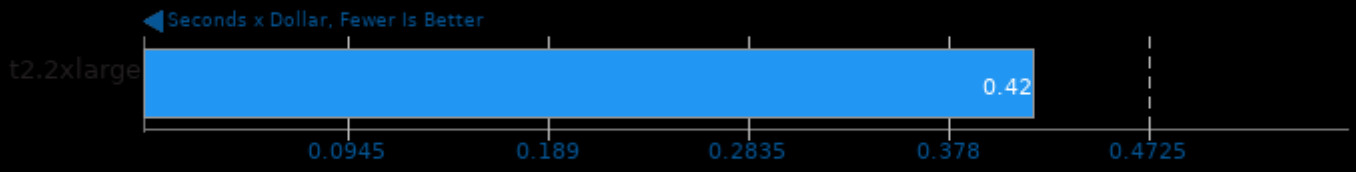
Large Intel AMD Linux CPU Benchmark Comparison



Large Intel AMD Linux CPU Benchmark Comparison

LAME MP3 Encoding 3.100

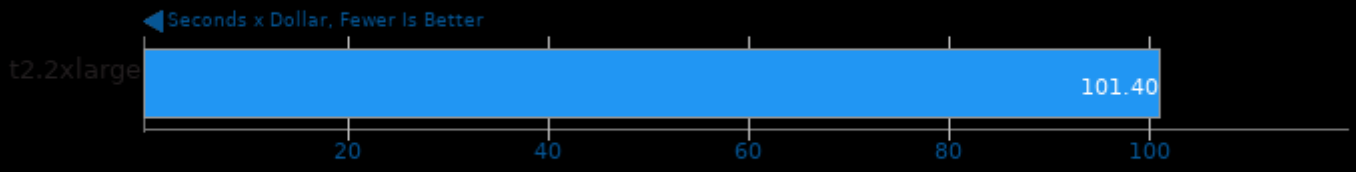
Performance / Cost - WAV To MP3



1. $0.3712 reported cost per hour, test consumed 2 Minutes, 10 Seconds: cost approximately 0.01 dollar.

POV-Ray 3.7.0.7

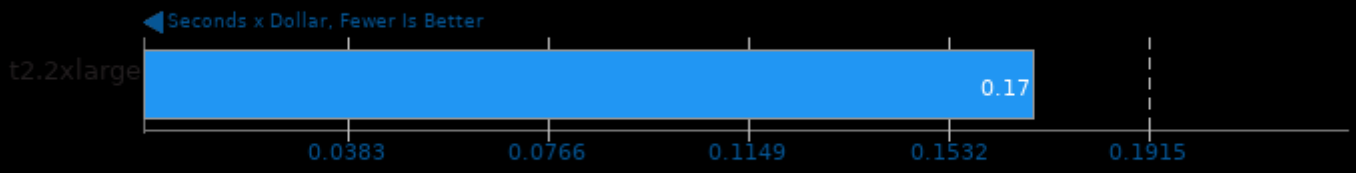
Performance / Cost - Trace Time



1. $0.3712 reported cost per hour, test consumed 28 Minutes, 22 Seconds: cost approximately 0.18 dollar.

C-Ray 1.1

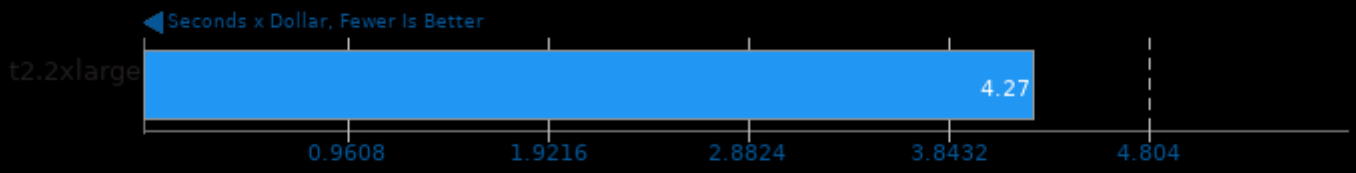
Performance / Cost - Total Time



1. $0.3712 reported cost per hour, test consumed 54 Seconds: cost approximately 0.01 dollar.

Timed Linux Kernel Compilation 4.13

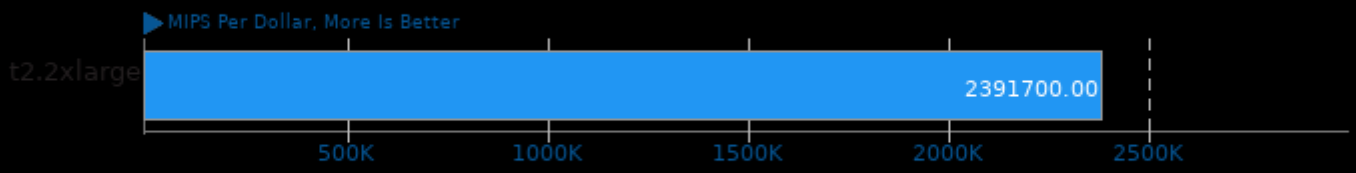
Performance / Cost - Time To Compile



1. $0.3712 reported cost per hour, test consumed 5 Minutes, 41 Seconds: cost approximately 0.04 dollar.

7-Zip Compression 9.20.1

Performance / Cost - Compress Speed Test

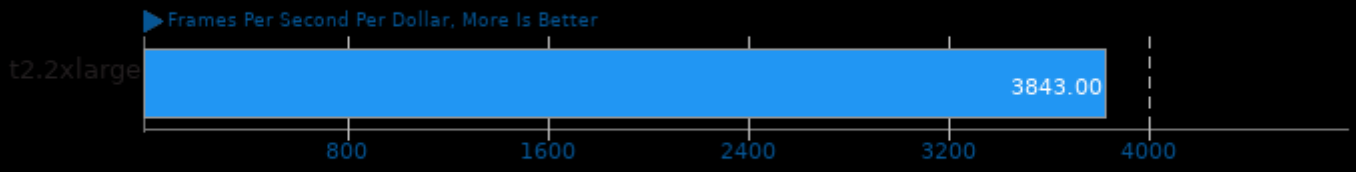


1. $0.3712 reported cost per hour, test consumed 1 Minute, 14 Seconds: cost approximately 0.01 dollar.

Large Intel AMD Linux CPU Benchmark Comparison

x264 2018-02-05

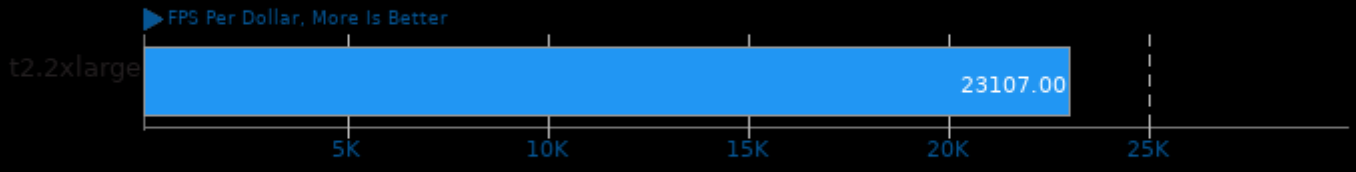
Performance / Cost - H.264 Video Encoding



1. $0.3712 reported cost per hour, test consumed 51 Seconds: cost approximately 0.01 dollar.

TTSIOD 3D Renderer 2.3a

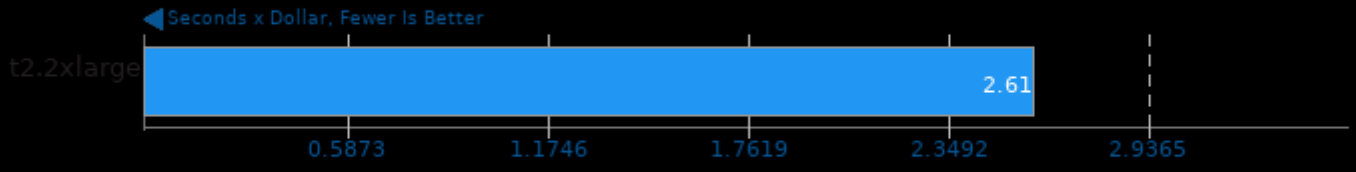
Performance / Cost - Phong Rendering With Soft-Shadow Mapping



1. $0.3712 reported cost per hour, test consumed 1 Minute, 26 Seconds: cost approximately 0.01 dollar.

Open FMM Nero2D 2.0.2

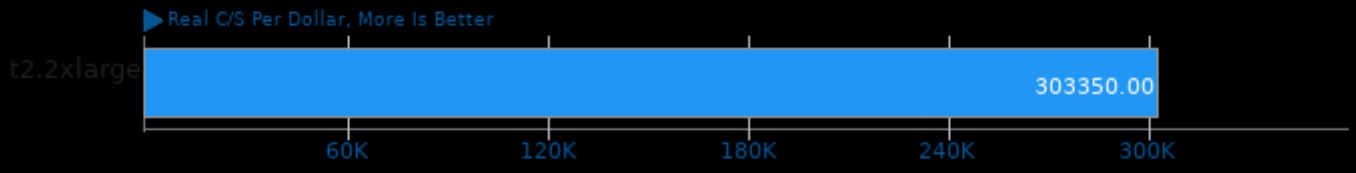
Performance / Cost - Total Time



1. $0.3712 reported cost per hour, test consumed 4 Minutes, 26 Seconds: cost approximately 0.03 dollar.

John The Ripper 1.8.0

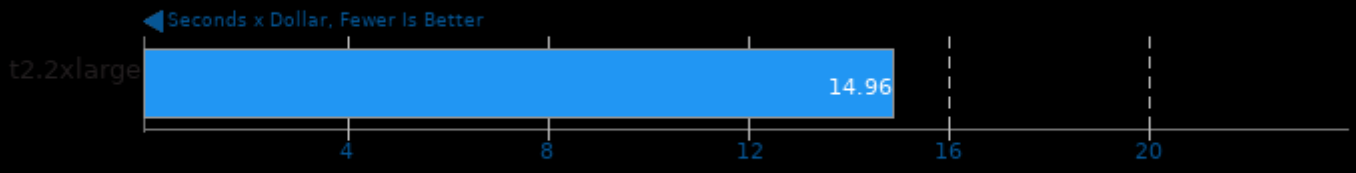
Performance / Cost - Test: Blowfish



1. $0.3712 reported cost per hour, test consumed 3 Minutes, 19 Seconds: cost approximately 0.02 dollar.

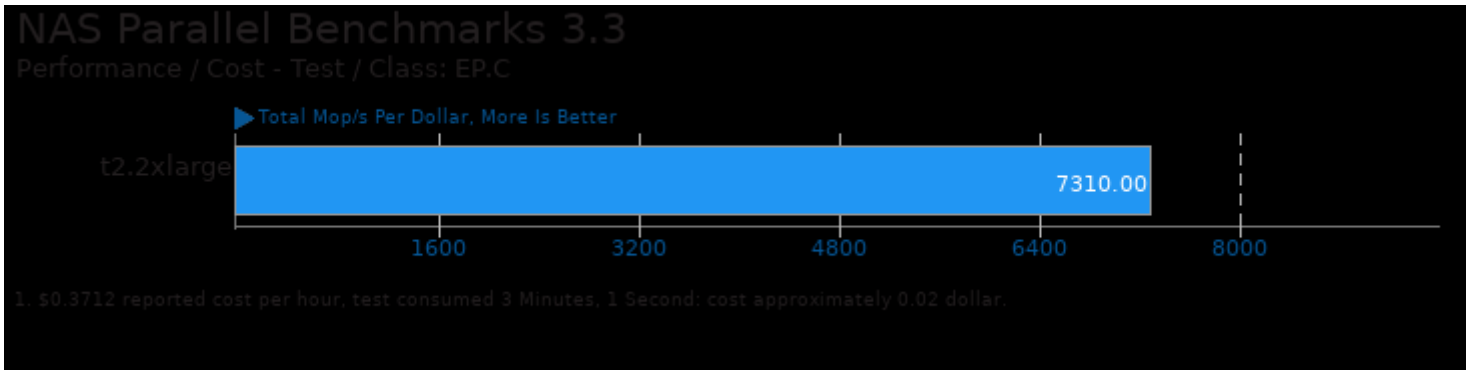
Rodinia 2.4

Performance / Cost - Test: OpenMP LavaMD

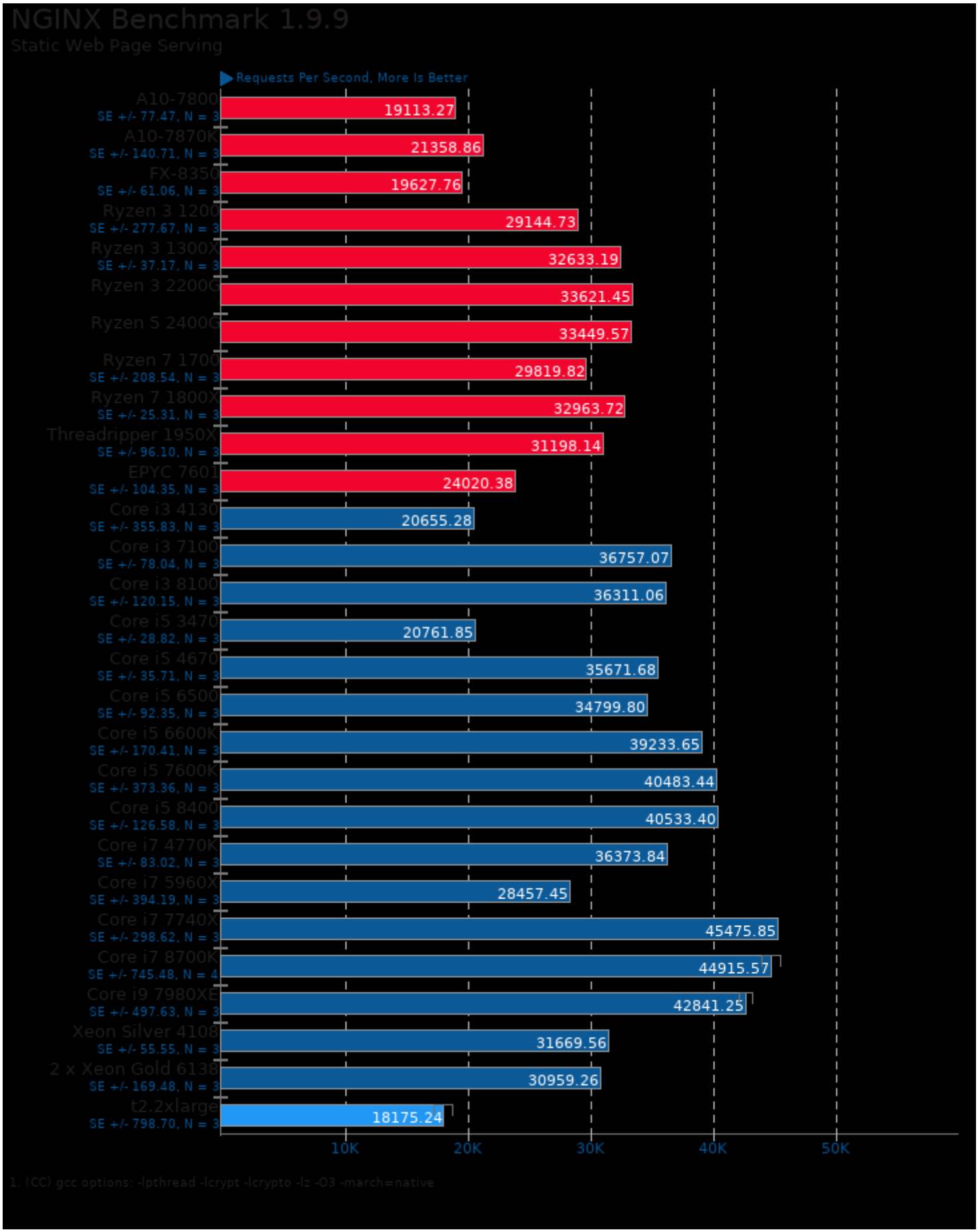


1. $0.3712 reported cost per hour, test consumed 10 Minutes, 46 Seconds: cost approximately 0.07 dollar.

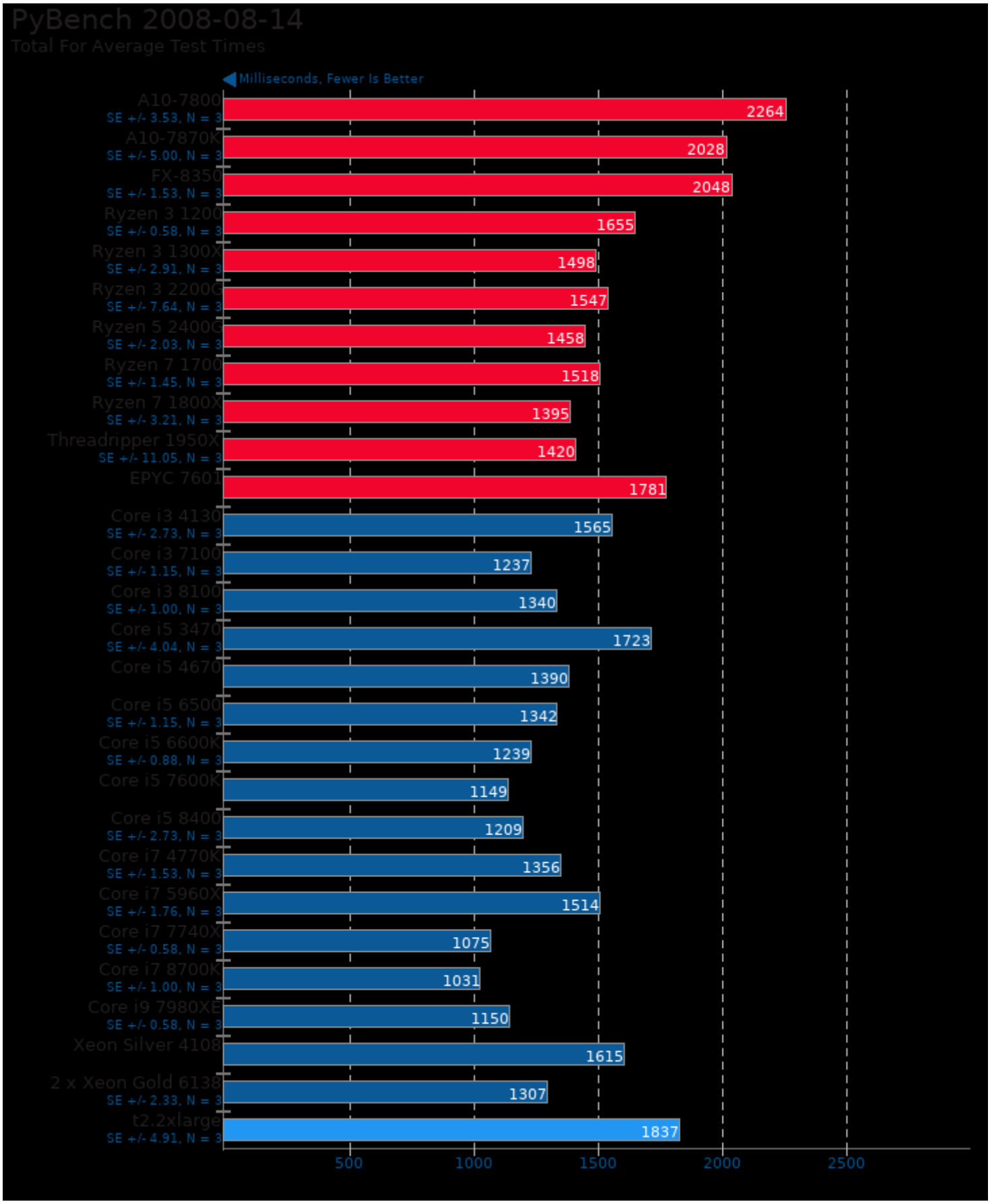
Large Intel AMD Linux CPU Benchmark Comparison



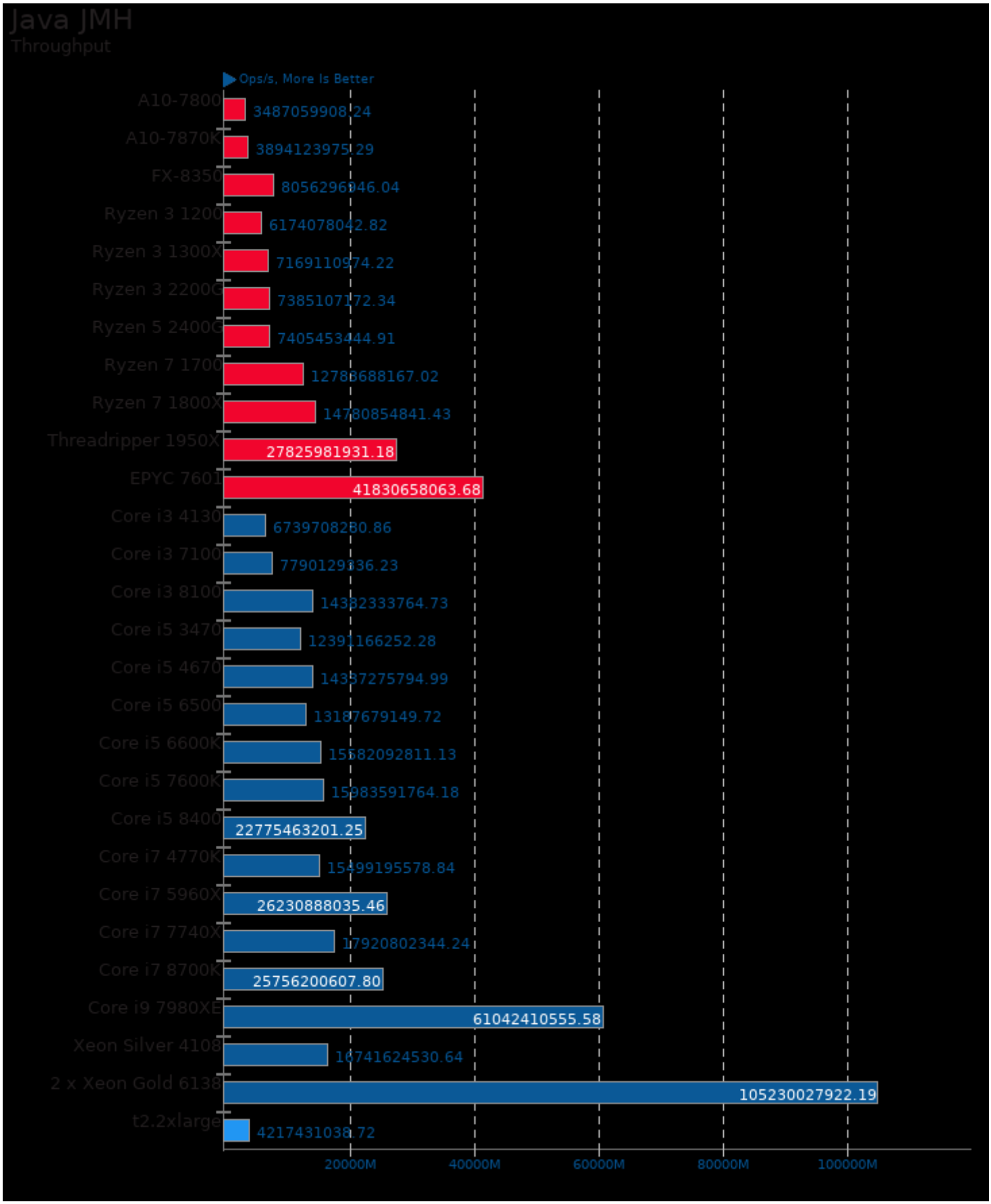
Large Intel AMD Linux CPU Benchmark Comparison

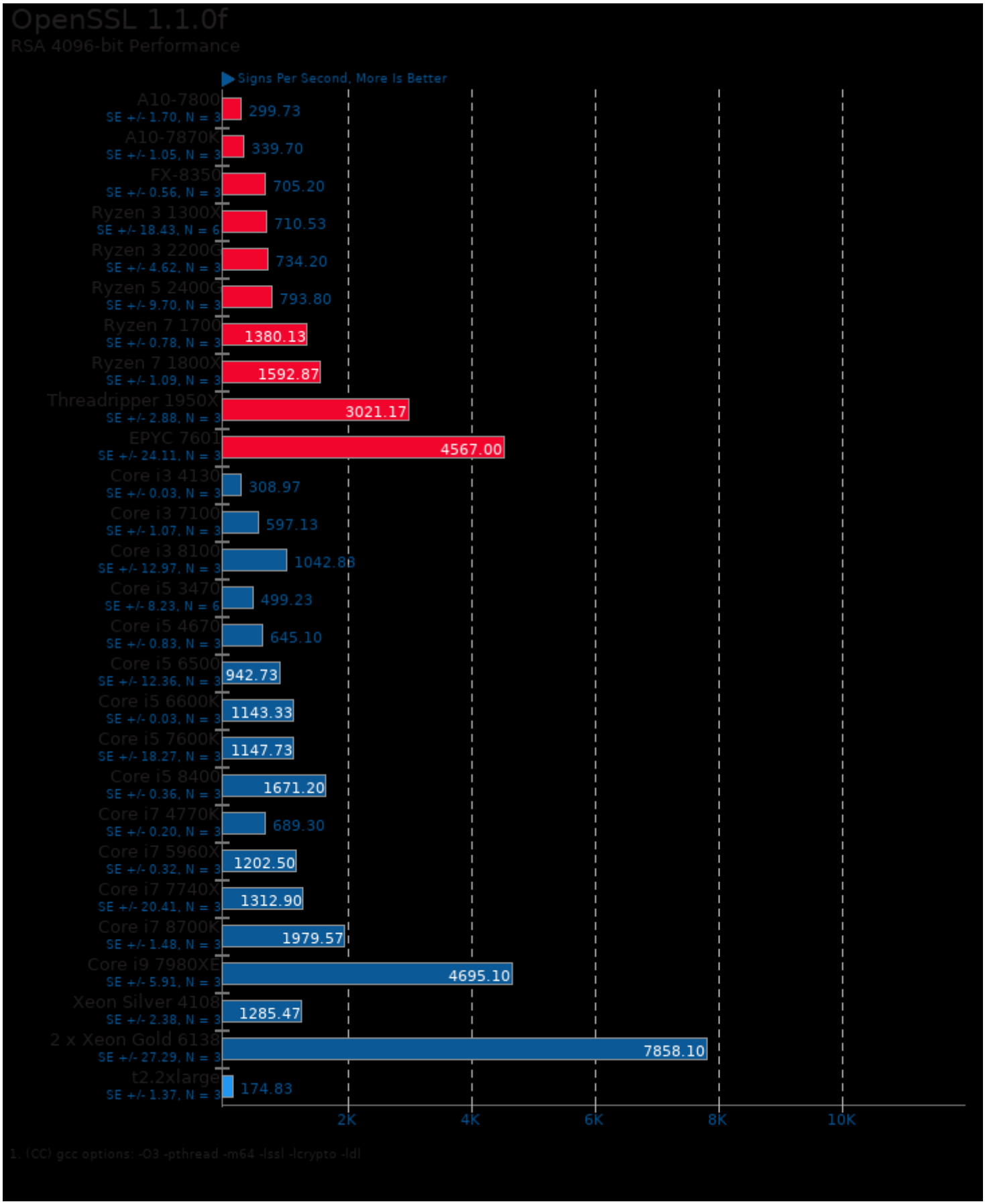


Large Intel AMD Linux CPU Benchmark Comparison

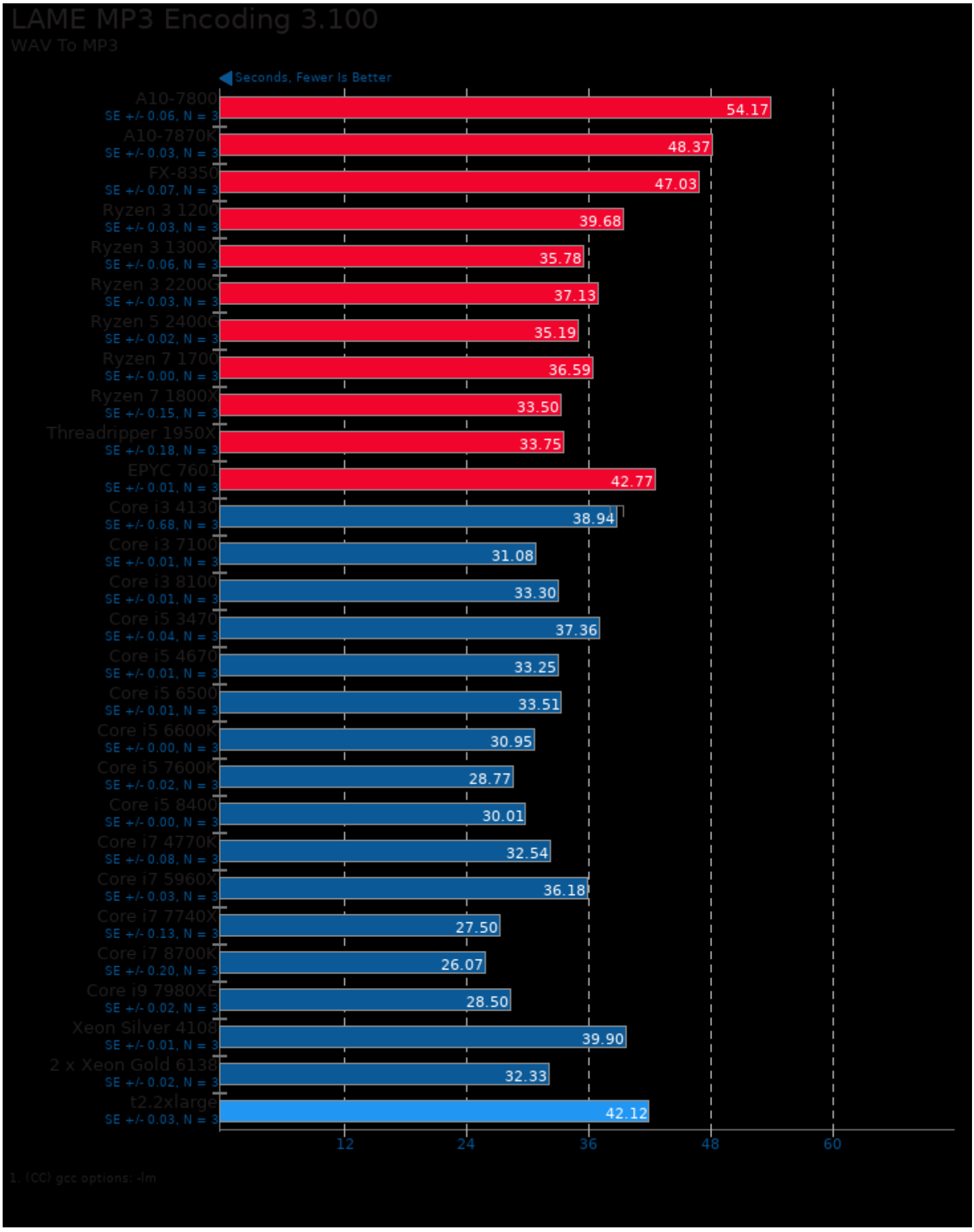


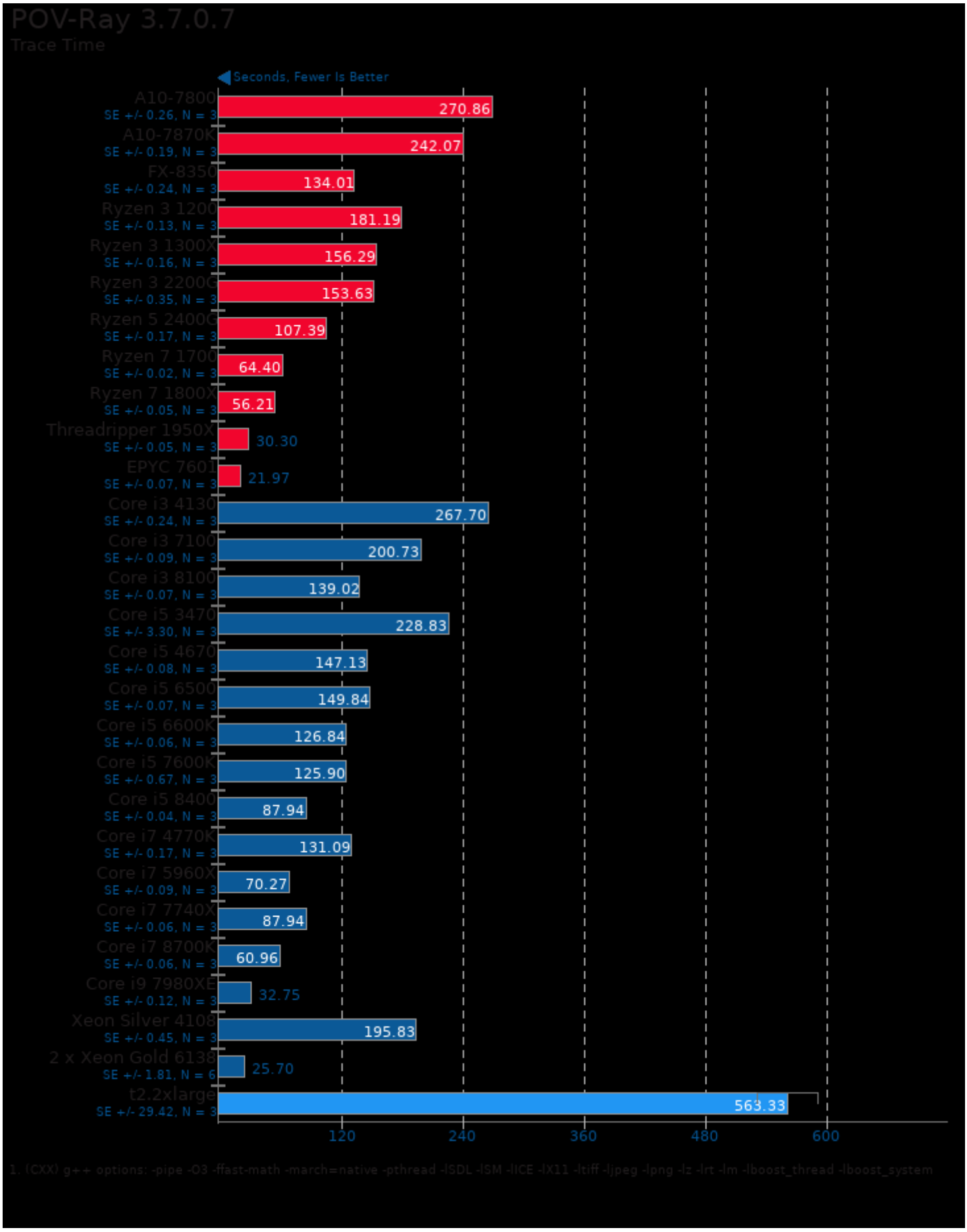
Large Intel AMD Linux CPU Benchmark Comparison



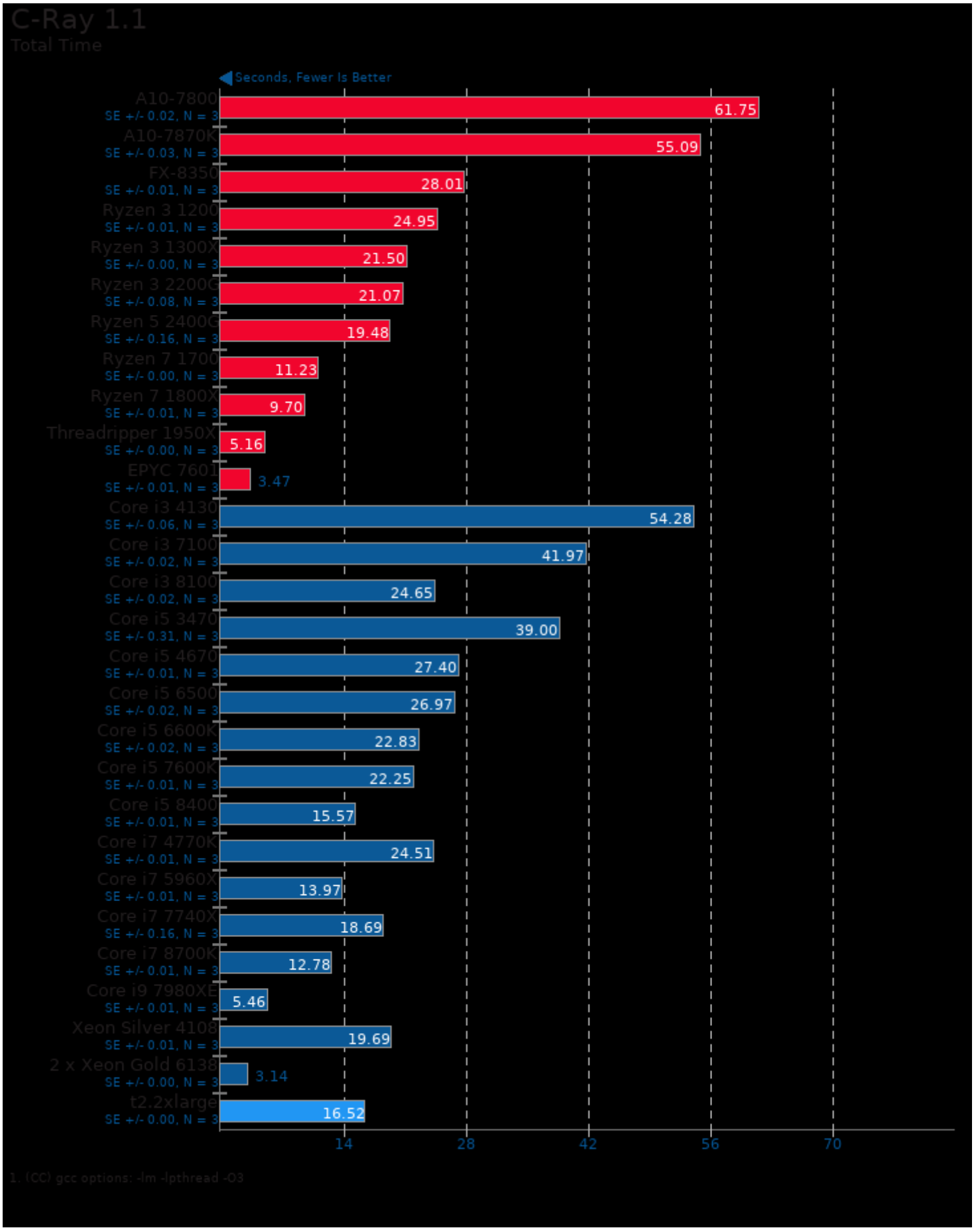

OpenSSL 1.1.0f
RSA 4096-bit Performance
Signs Per Second, More Is Better
A10-7800
SE +/- 1.70, N = 3
299.73
A10-7870K
SE +/- 1.05, N = 3
339.70
FX-8350
SE +/- 0.56, N = 3
705.20
Ryzen 3 1300X
SE +/- 18.43, N = 6
710.53
Ryzen 3 2200G
SE +/- 4.62, N = 3
734.20
Ryzen 5 2400G
SE +/- 9.70, N = 3
793.80
Ryzen 7 1700
SE +/- 0.78, N = 3
1380.13
Ryzen 7 1800X
SE +/- 1.09, N = 3
1592.87
Threadripper 1950X
SE +/- 2.88, N = 3
3021.17
EPYC 7601
SE +/- 24.11, N = 3
4567.00
Core i3 4130
SE +/- 0.03, N = 3
308.97
Core i3 7100
SE +/- 1.07, N = 3
597.13
Core i3 8100
SE +/- 12.97, N = 3
1042.88
Core i5 3470
SE +/- 8.23, N = 6
499.23
Core i5 4670
SE +/- 0.83, N = 3
645.10
Core i5 6500
SE +/- 12.36, N = 3
942.73
Core i5 6600K
SE +/- 0.03, N = 3
1143.33
Core i5 7600K
SE +/- 18.27, N = 3
1147.73
Core i5 8400
SE +/- 0.36, N = 3
1671.20
Core i7 4770K
SE +/- 0.20, N = 3
689.30
Core i7 5960X
SE +/- 0.32, N = 3
1202.50
Core i7 7740X
SE +/- 20.41, N = 3
1312.90
Core i7 8700K
SE +/- 1.48, N = 3
1979.57
Core i9 7980XE
SE +/- 5.91, N = 3
4695.10
Xeon Silver 4108
SE +/- 2.38, N = 3
1285.47
2 x Xeon Gold 6138
SE +/- 27.29, N = 3
7858.10
t2.2xlarge
SE +/- 1.37, N = 3
174.83
2K
4K
6K
8K
10K
1. (CC) gcc options: -O3 -pthread -m64 -lssl -lcrypto -ldl

Large Intel AMD Linux CPU Benchmark Comparison

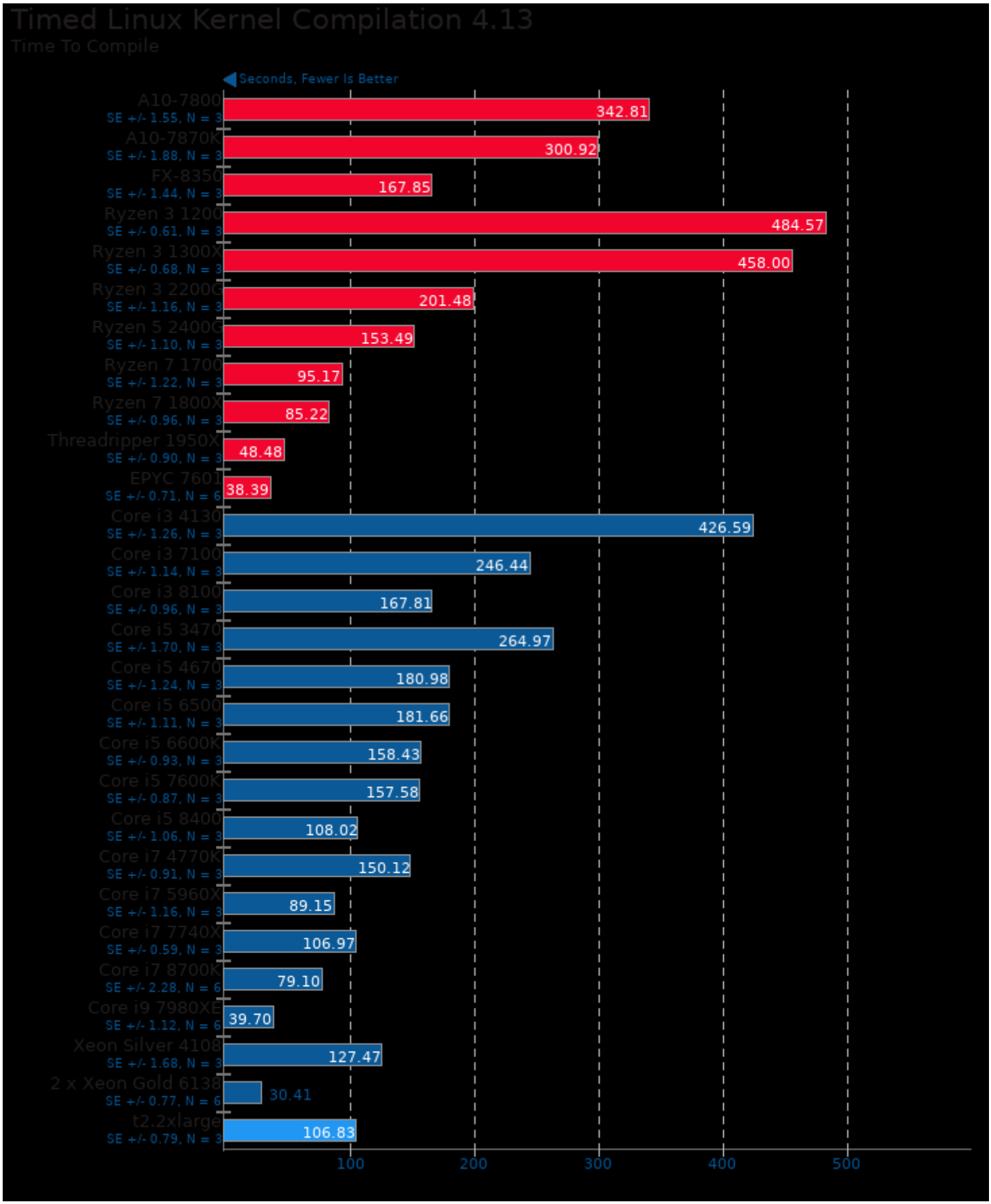



POV-Ray 3.7.0.7
Trace Time
Seconds, Fewer Is Better
A10-7800
SE +/- 0.26, N = 3
270.86
A10-7870K
SE +/- 0.19, N = 3
242.07
FX-8350
SE +/- 0.24, N = 3
134.01
Ryzen 3 1200
SE +/- 0.13, N = 3
181.19
Ryzen 3 1300X
SE +/- 0.16, N = 3
156.29
Ryzen 3 2200G
SE +/- 0.35, N = 3
153.63
Ryzen 5 2400G
SE +/- 0.17, N = 3
107.39
Ryzen 7 1700
SE +/- 0.02, N = 3
64.40
Ryzen 7 1800X
SE +/- 0.05, N = 3
56.21
Threadripper 1950X
SE +/- 0.05, N = 3
30.30
EPYC 7601
SE +/- 0.07, N = 3
21.97
Core i3 4130
SE +/- 0.24, N = 3
267.70
Core i3 7100
SE +/- 0.09, N = 3
200.73
Core i3 8100
SE +/- 0.07, N = 3
139.02
Core i5 3470
SE +/- 3.30, N = 3
228.83
Core i5 4670
SE +/- 0.08, N = 3
147.13
Core i5 6500
SE +/- 0.07, N = 3
149.84
Core i5 6600K
SE +/- 0.06, N = 3
126.84
Core i5 7600K
SE +/- 0.67, N = 3
125.90
Core i5 8400
SE +/- 0.04, N = 3
87.94
Core i7 4770K
SE +/- 0.17, N = 3
131.09
Core i7 5960X
SE +/- 0.09, N = 3
70.27
Core i7 7740X
SE +/- 0.06, N = 3
87.94
Core i7 8700K
SE +/- 0.06, N = 3
60.96
Core i9 7980XE
SE +/- 0.12, N = 3
32.75
Xeon Silver 4108
SE +/- 0.45, N = 3
195.83
2 x Xeon Gold 6138
SE +/- 1.81, N = 6
25.70
t2.2xlarge
SE +/- 29.42, N = 3
563.33
120
240
360
480
600
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

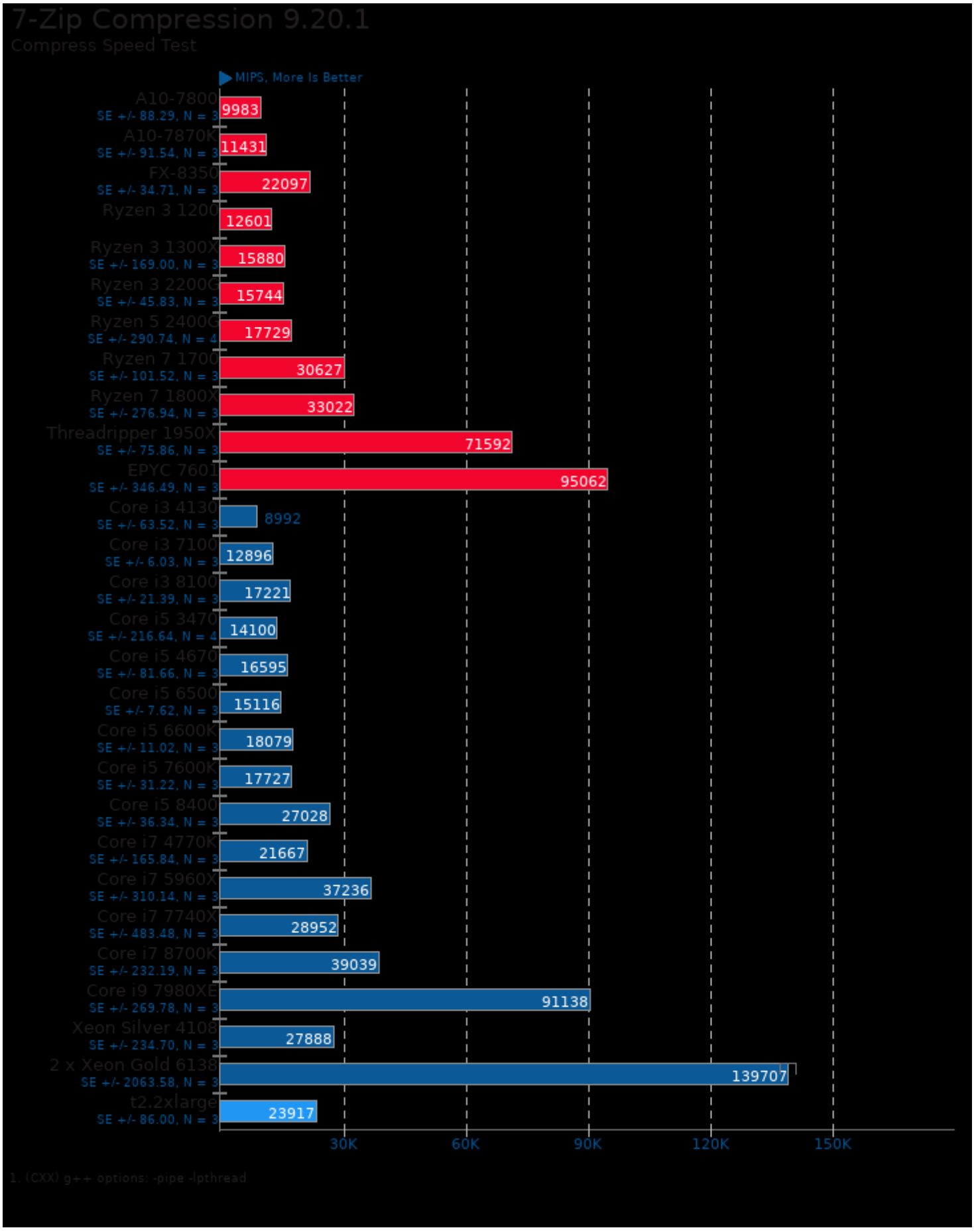
Large Intel AMD Linux CPU Benchmark Comparison



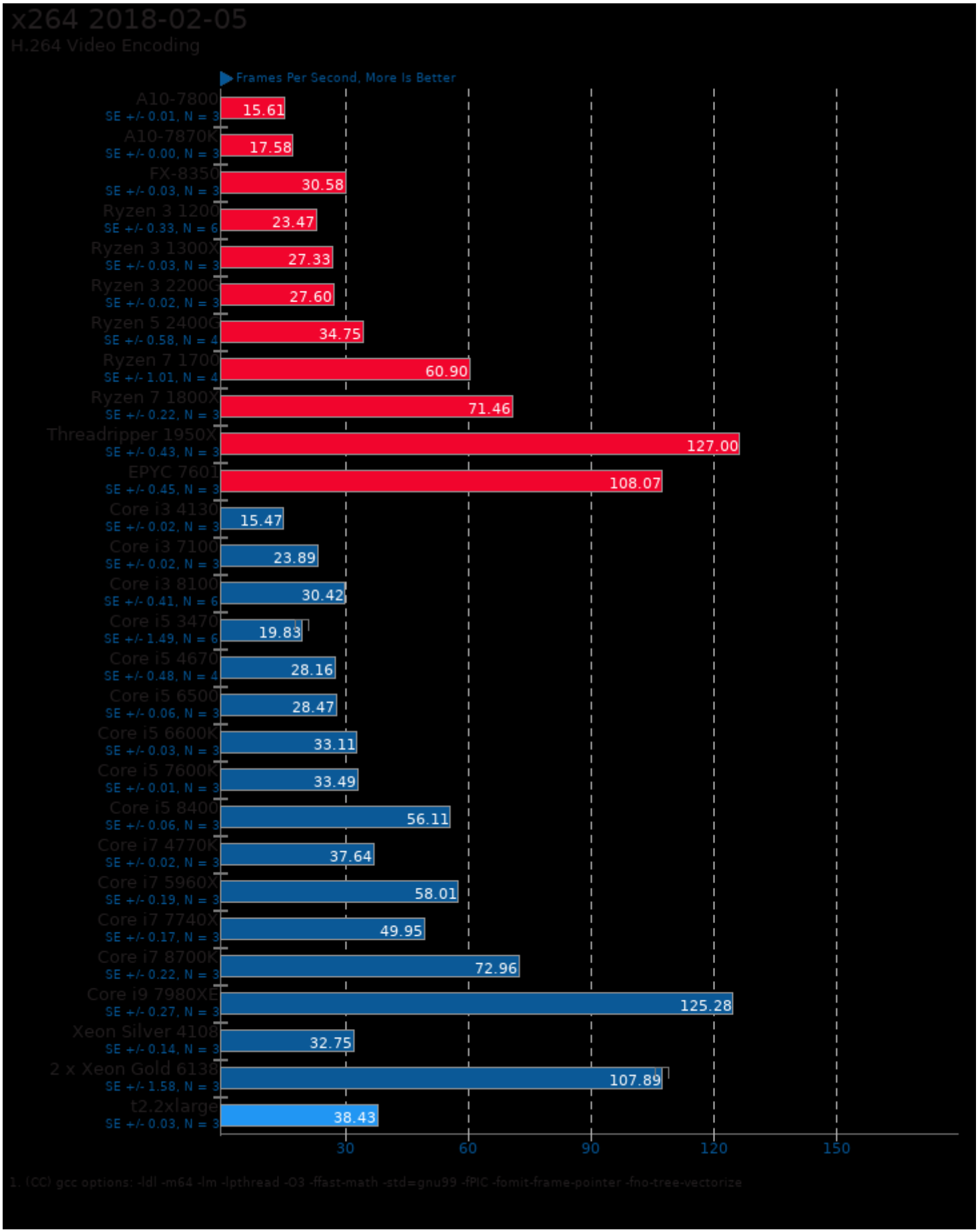
Large Intel AMD Linux CPU Benchmark Comparison



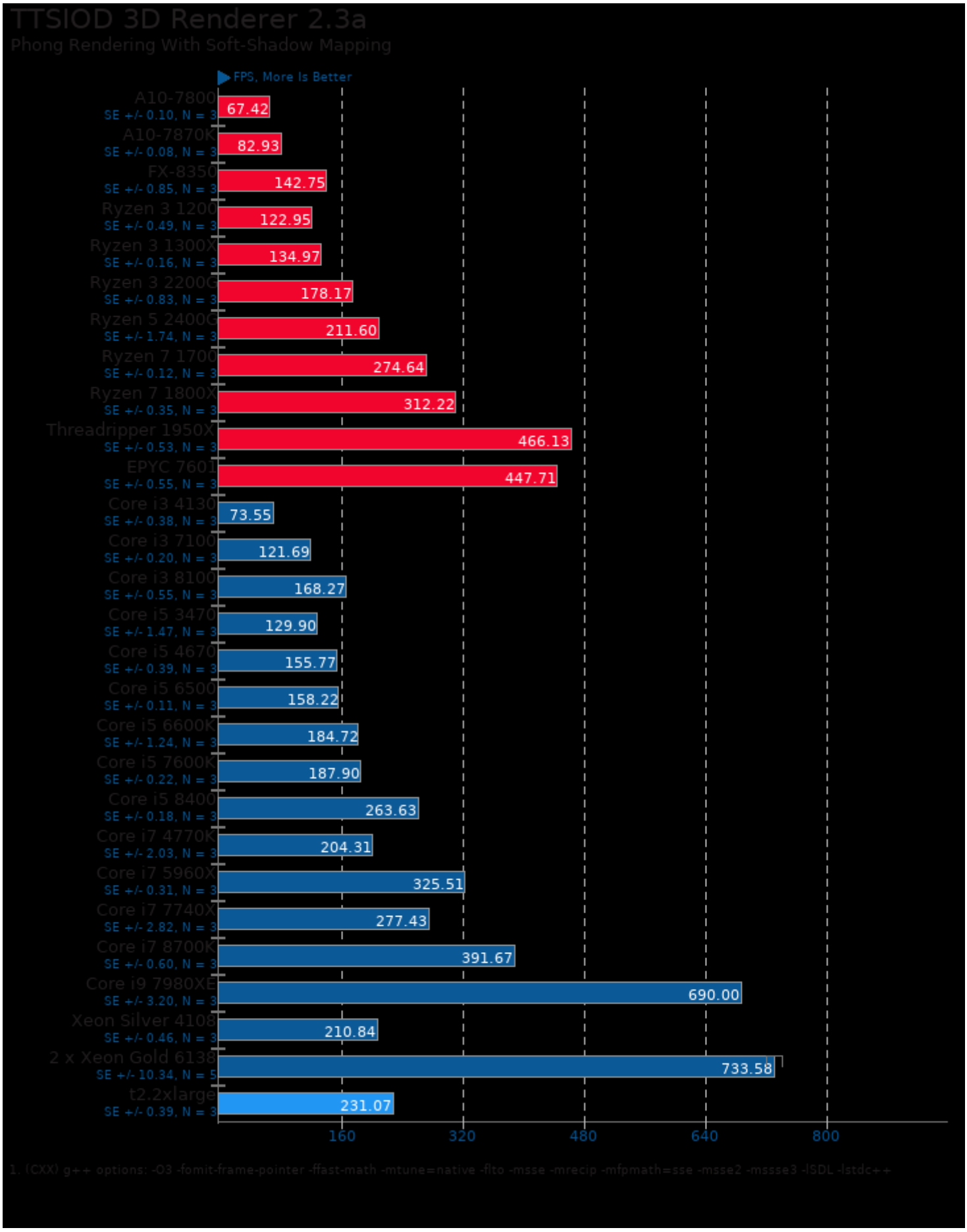
Large Intel AMD Linux CPU Benchmark Comparison

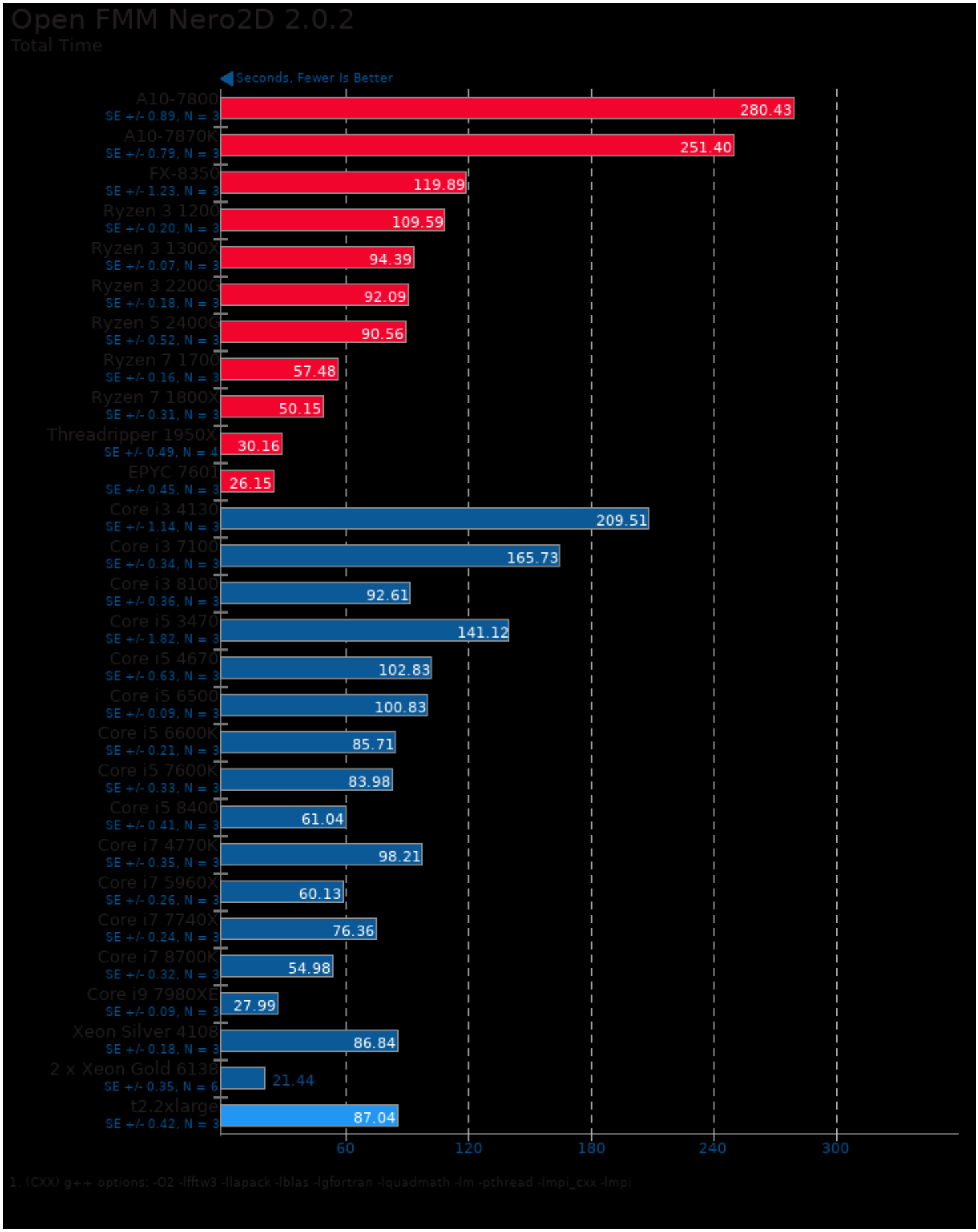


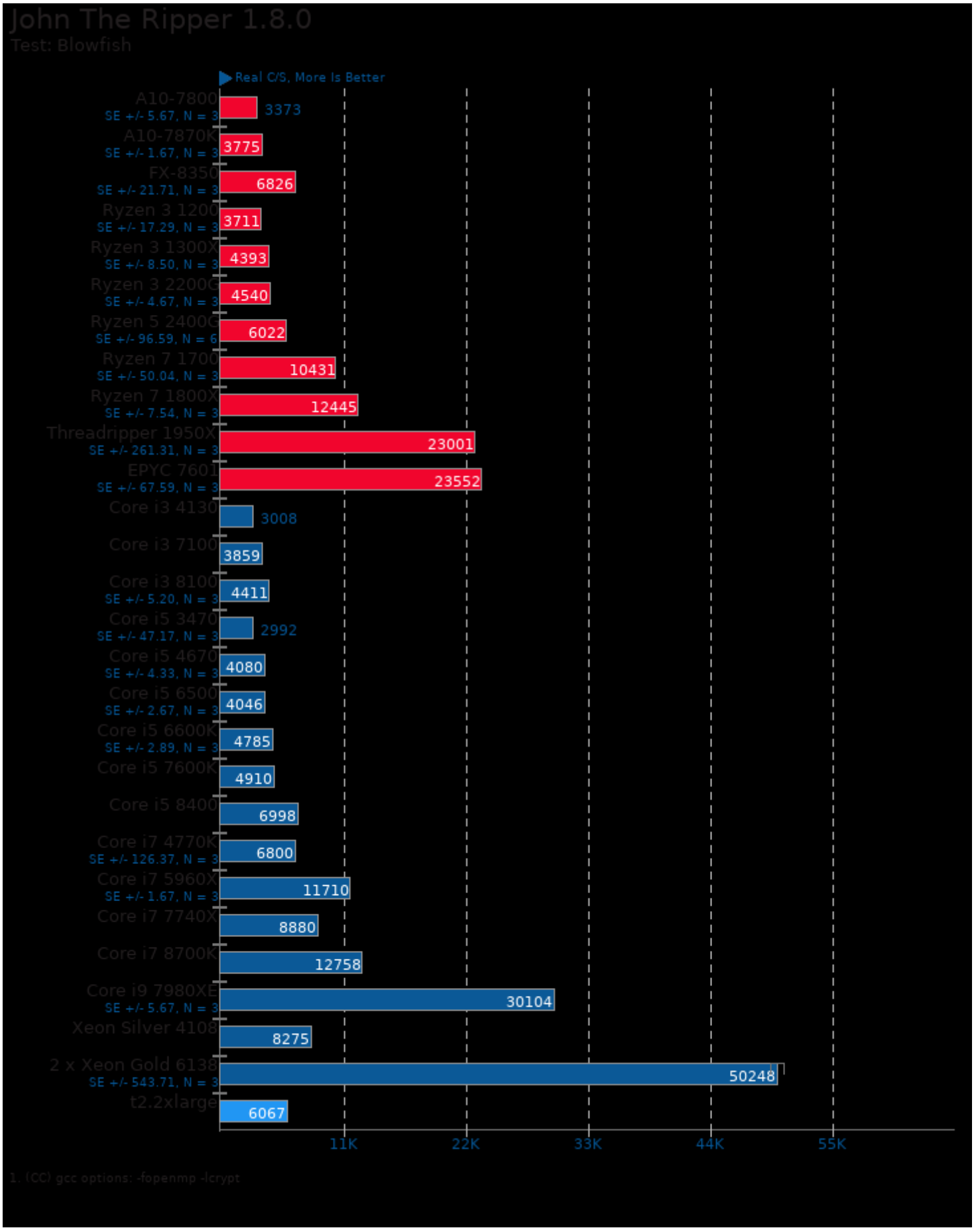
Large Intel AMD Linux CPU Benchmark Comparison

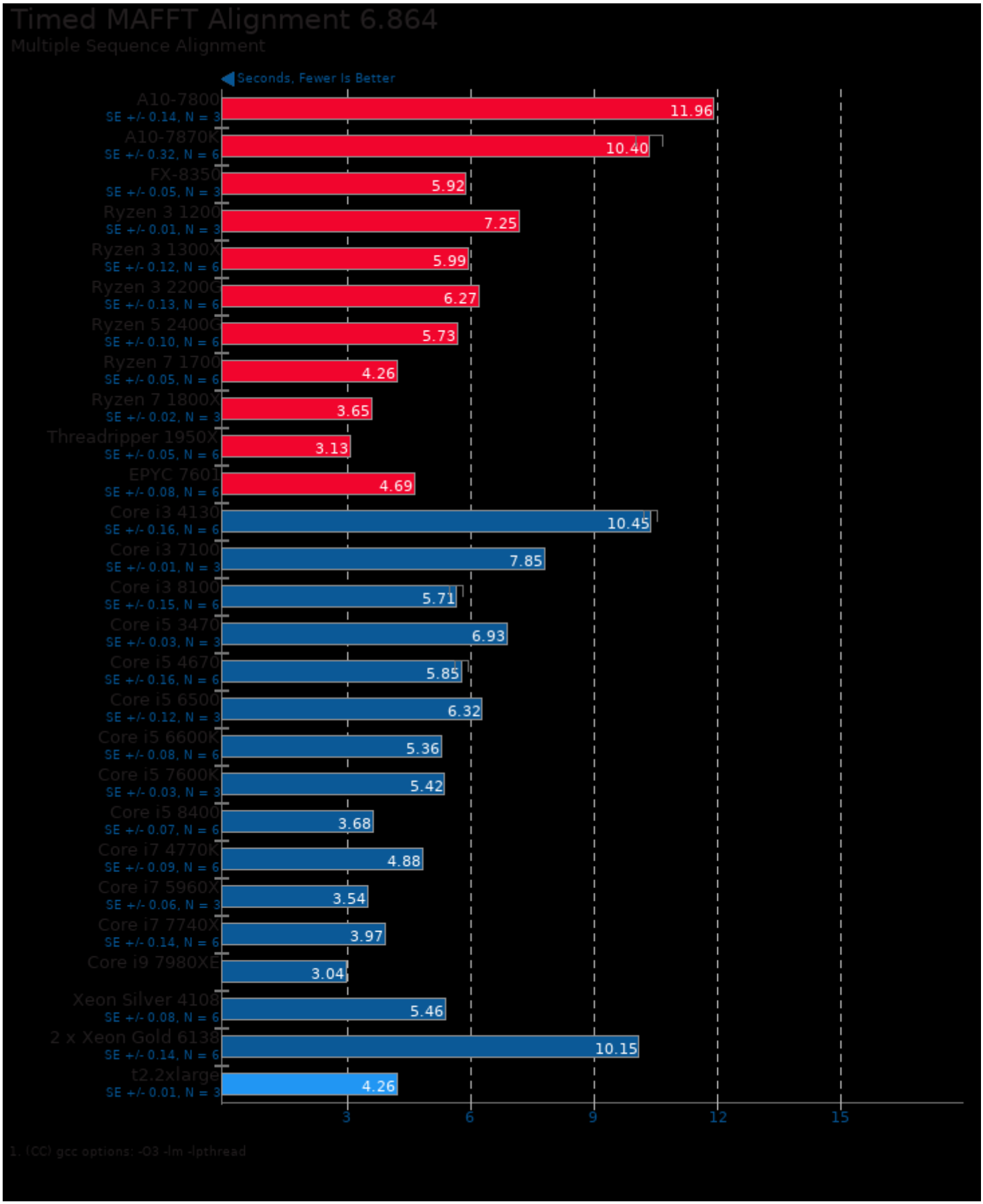


Large Intel AMD Linux CPU Benchmark Comparison

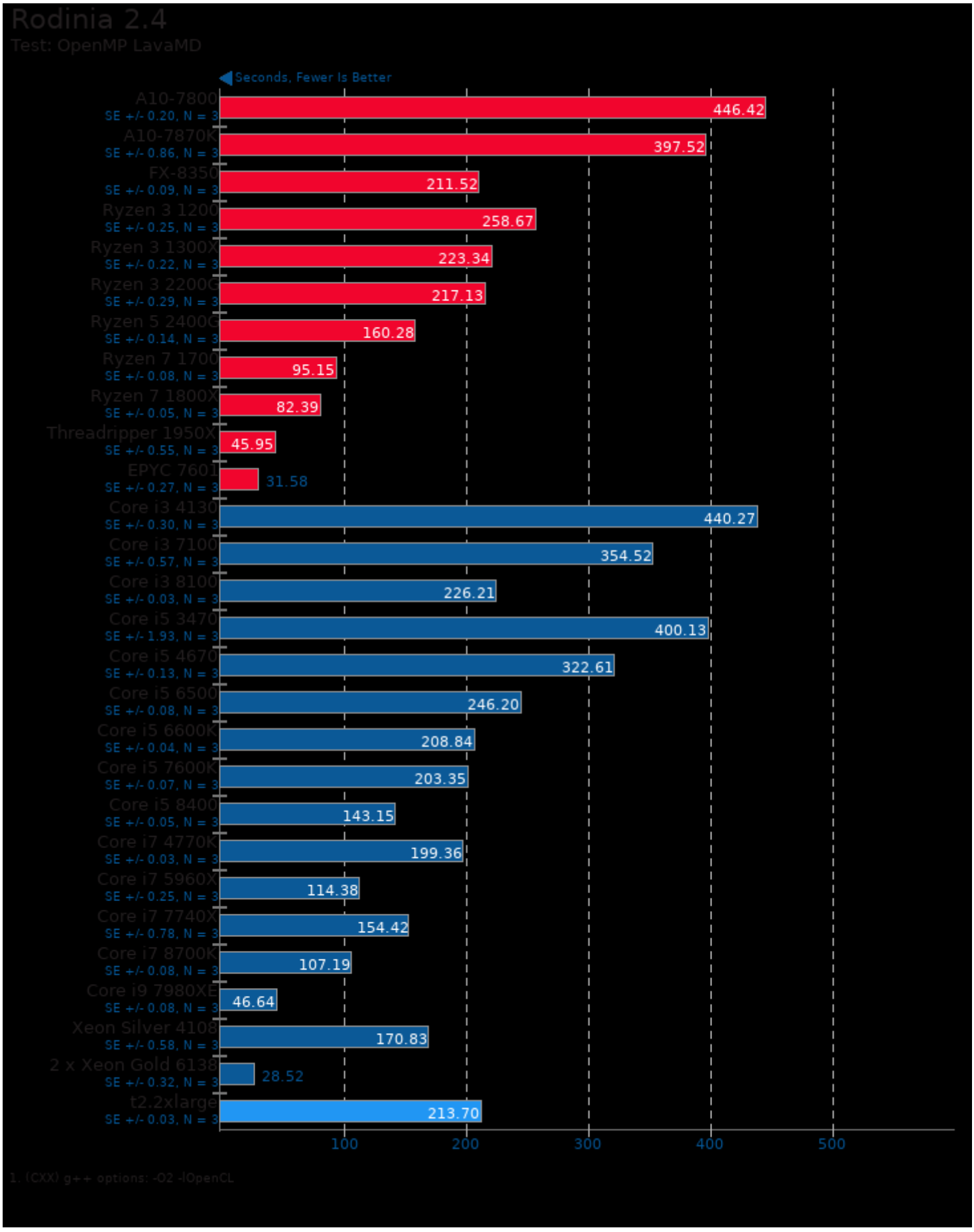



Open FMM Nero2D 2.0.2
Total Time
Seconds, Fewer Is Better
A10-7800
SE +/- 0.89, N = 3
280.43
A10-7870K
SE +/- 0.79, N = 3
251.40
FX-8350
SE +/- 1.23, N = 3
119.89
Ryzen 3 1200
SE +/- 0.20, N = 3
109.59
Ryzen 3 1300X
SE +/- 0.07, N = 3
94.39
Ryzen 3 2200G
SE +/- 0.18, N = 3
92.09
Ryzen 5 2400G
SE +/- 0.52, N = 3
90.56
Ryzen 7 1700
SE +/- 0.16, N = 3
57.48
Ryzen 7 1800X
SE +/- 0.31, N = 3
50.15
Threadripper 1950X
SE +/- 0.49, N = 4
30.16
EPYC 7601
SE +/- 0.45, N = 3
26.15
Core i3 4130
SE +/- 1.14, N = 3
209.51
Core i3 7100
SE +/- 0.34, N = 3
165.73
Core i3 8100
SE +/- 0.36, N = 3
92.61
Core i5 3470
SE +/- 1.82, N = 3
141.12
Core i5 4670
SE +/- 0.63, N = 3
102.83
Core i5 6500
SE +/- 0.09, N = 3
100.83
Core i5 6600K
SE +/- 0.21, N = 3
85.71
Core i5 7600K
SE +/- 0.33, N = 3
83.98
Core i5 8400
SE +/- 0.41, N = 3
61.04
Core i7 4770K
SE +/- 0.35, N = 3
98.21
Core i7 5960X
SE +/- 0.26, N = 3
60.13
Core i7 7740X
SE +/- 0.24, N = 3
76.36
Core i7 8700K
SE +/- 0.32, N = 3
54.98
Core i9 7980XE
SE +/- 0.09, N = 3
27.99
Xeon Silver 4108
SE +/- 0.18, N = 3
86.84
2 x Xeon Gold 6138
SE +/- 0.35, N = 6
21.44
t2.2xlarge
SE +/- 0.42, N = 3
87.04
60
120
180
240
300
1. (CXX) g++ options: -O2 -lfftw3 -llapack -lblas -lgfortran -lquadmath -lm -pthread -lmpi_cxx -lmpi

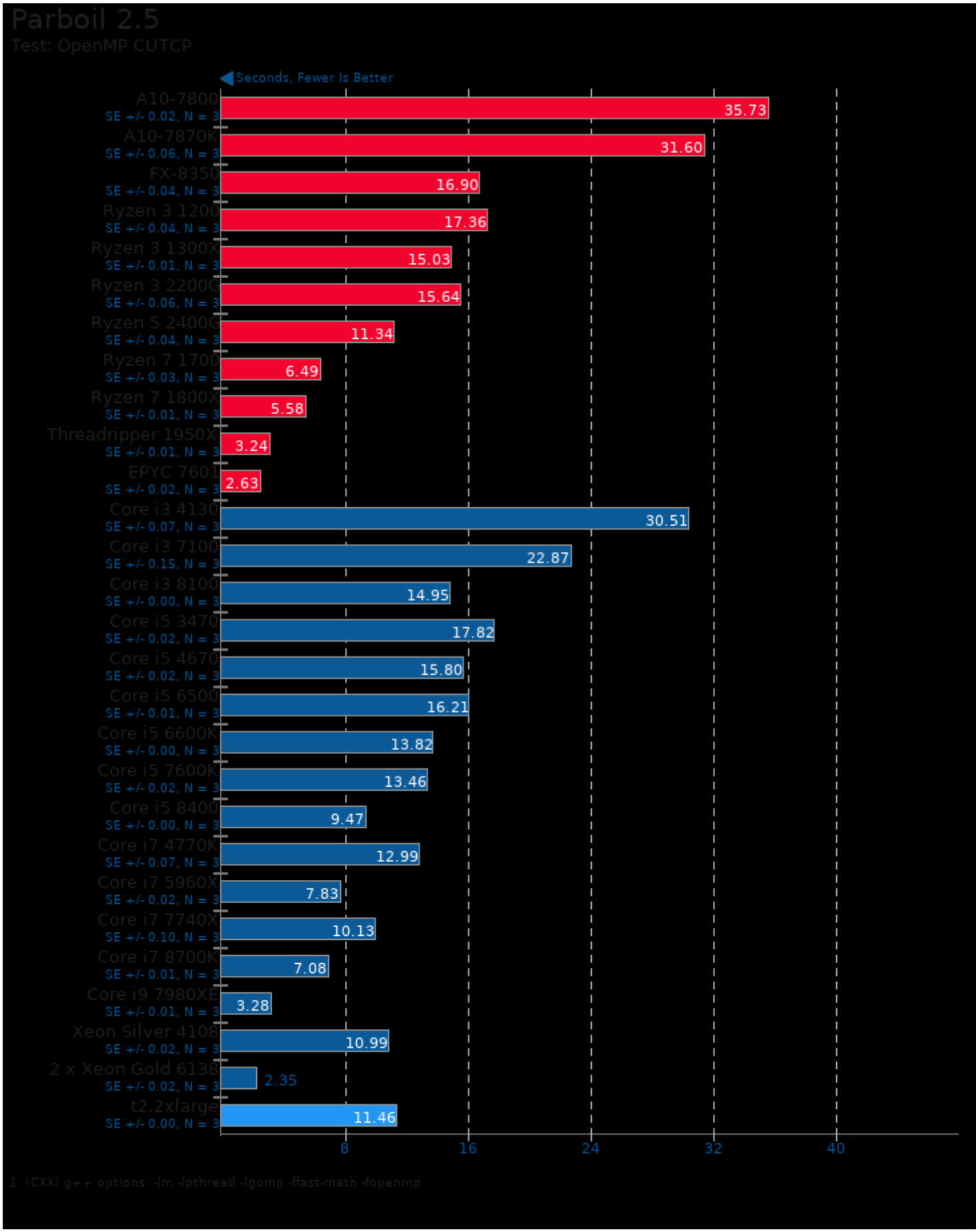

John The Ripper 1.8.0
Test: Blowfish
Real C/S, More Is Better
A10-7800
SE +/- 5.67, N = 3
3373
A10-7870K
SE +/- 1.67, N = 3
3775
FX-8350
SE +/- 21.71, N = 3
6826
Ryzen 3 1200
SE +/- 17.29, N = 3
3711
Ryzen 3 1300X
SE +/- 8.50, N = 3
4393
Ryzen 3 2200G
SE +/- 4.67, N = 3
4540
Ryzen 5 2400G
SE +/- 96.59, N = 6
6022
Ryzen 7 1700
SE +/- 50.04, N = 3
10431
Ryzen 7 1800X
SE +/- 7.54, N = 3
12445
Threadripper 1950X
SE +/- 261.31, N = 3
23001
EPYC 7601
SE +/- 67.59, N = 3
23552
Core i3 4130
3008
Core i3 7100
3859
Core i3 8100
SE +/- 5.20, N = 3
4411
Core i5 3470
SE +/- 47.17, N = 3
2992
Core i5 4670
SE +/- 4.33, N = 3
4080
Core i5 6500
SE +/- 2.67, N = 3
4046
Core i5 6600K
SE +/- 2.89, N = 3
4785
Core i5 7600K
4910
Core i5 8400
6998
Core i7 4770K
SE +/- 126.37, N = 3
6800
Core i7 5960X
SE +/- 1.67, N = 3
11710
Core i7 7740X
8880
Core i7 8700K
12758
Core i9 7980XE
SE +/- 5.67, N = 3
30104
Xeon Silver 4108
8275
2 x Xeon Gold 6138
SE +/- 543.71, N = 3
50248
t2.2xlarge
6067
11K
22K
33K
44K
55K
1. (CC) gcc options: -fopenmp -lcrypt

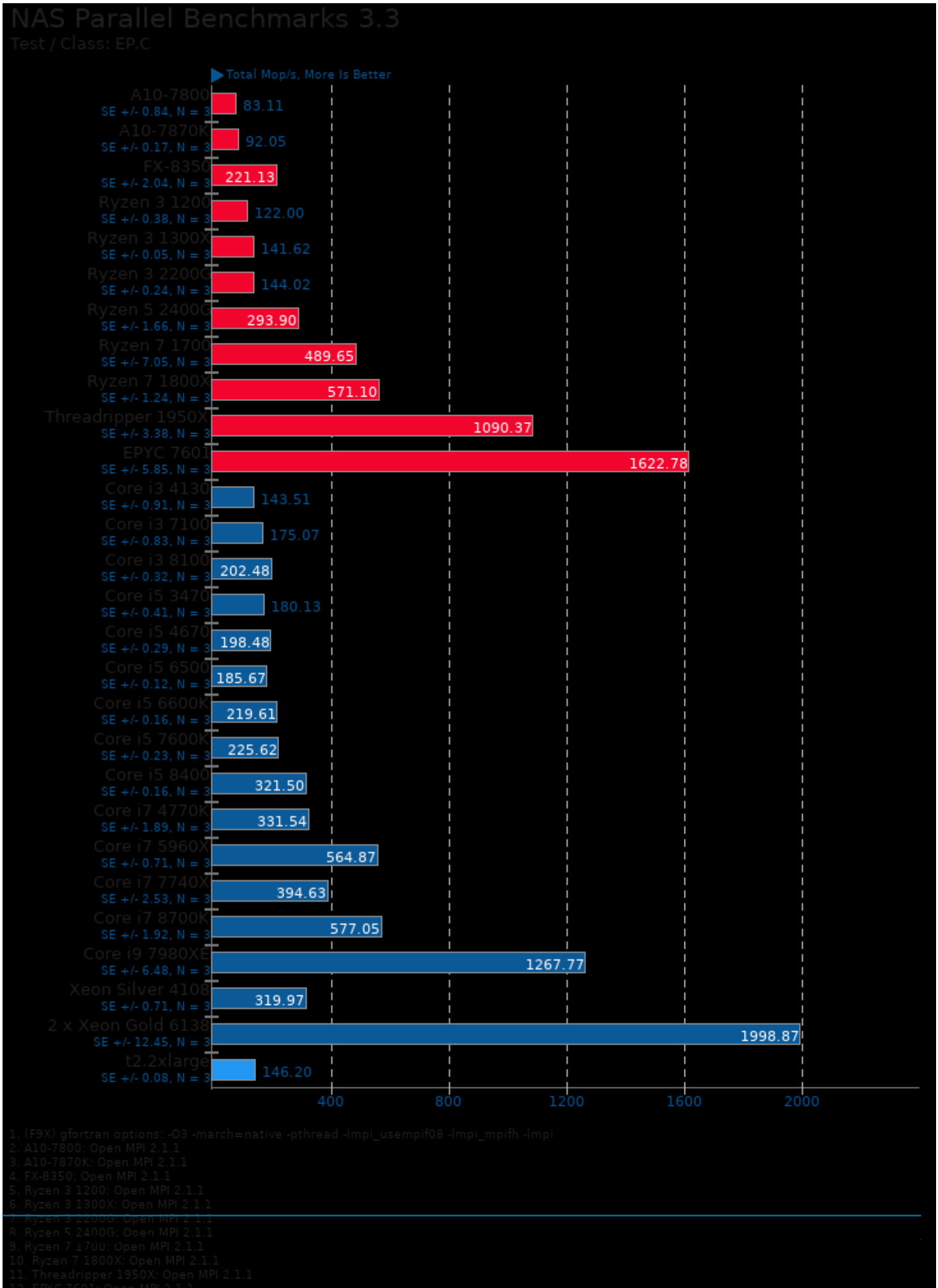

Timed MAFFT Alignment 6.864
Multiple Sequence Alignment
Seconds, Fewer Is Better
A10-7800
SE +/- 0.14, N = 3
11.96
A10-7870K
SE +/- 0.32, N = 6
10.40
FX-8350
SE +/- 0.05, N = 3
5.92
Ryzen 3 1200
SE +/- 0.01, N = 3
7.25
Ryzen 3 1300X
SE +/- 0.12, N = 6
5.99
Ryzen 3 2200G
SE +/- 0.13, N = 6
6.27
Ryzen 5 2400G
SE +/- 0.10, N = 6
5.73
Ryzen 7 1700
SE +/- 0.05, N = 6
4.26
Ryzen 7 1800X
SE +/- 0.02, N = 3
3.65
Threadripper 1950X
SE +/- 0.05, N = 6
3.13
EPYC 7601
SE +/- 0.08, N = 6
4.69
Core i3 4130
SE +/- 0.16, N = 6
10.45
Core i3 7100
SE +/- 0.01, N = 3
7.85
Core i3 8100
SE +/- 0.15, N = 6
5.71
Core i5 3470
SE +/- 0.03, N = 3
6.93
Core i5 4670
SE +/- 0.16, N = 6
5.85
Core i5 6500
SE +/- 0.12, N = 3
6.32
Core i5 6600K
SE +/- 0.08, N = 6
5.36
Core i5 7600K
SE +/- 0.03, N = 3
5.42
Core i5 8400
SE +/- 0.07, N = 6
3.68
Core i7 4770K
SE +/- 0.09, N = 6
4.88
Core i7 5960X
SE +/- 0.06, N = 3
3.54
Core i7 7740X
SE +/- 0.14, N = 6
3.97
Core i9 7980XE
3.04
Xeon Silver 4108
SE +/- 0.08, N = 6
5.46
2 x Xeon Gold 6138
SE +/- 0.14, N = 6
10.15
t2.2xlarge
SE +/- 0.01, N = 3
4.26
3
6
9
12
15
1. (CC) gcc options: -O3 -lm -lpthread

Large Intel AMD Linux CPU Benchmark Comparison



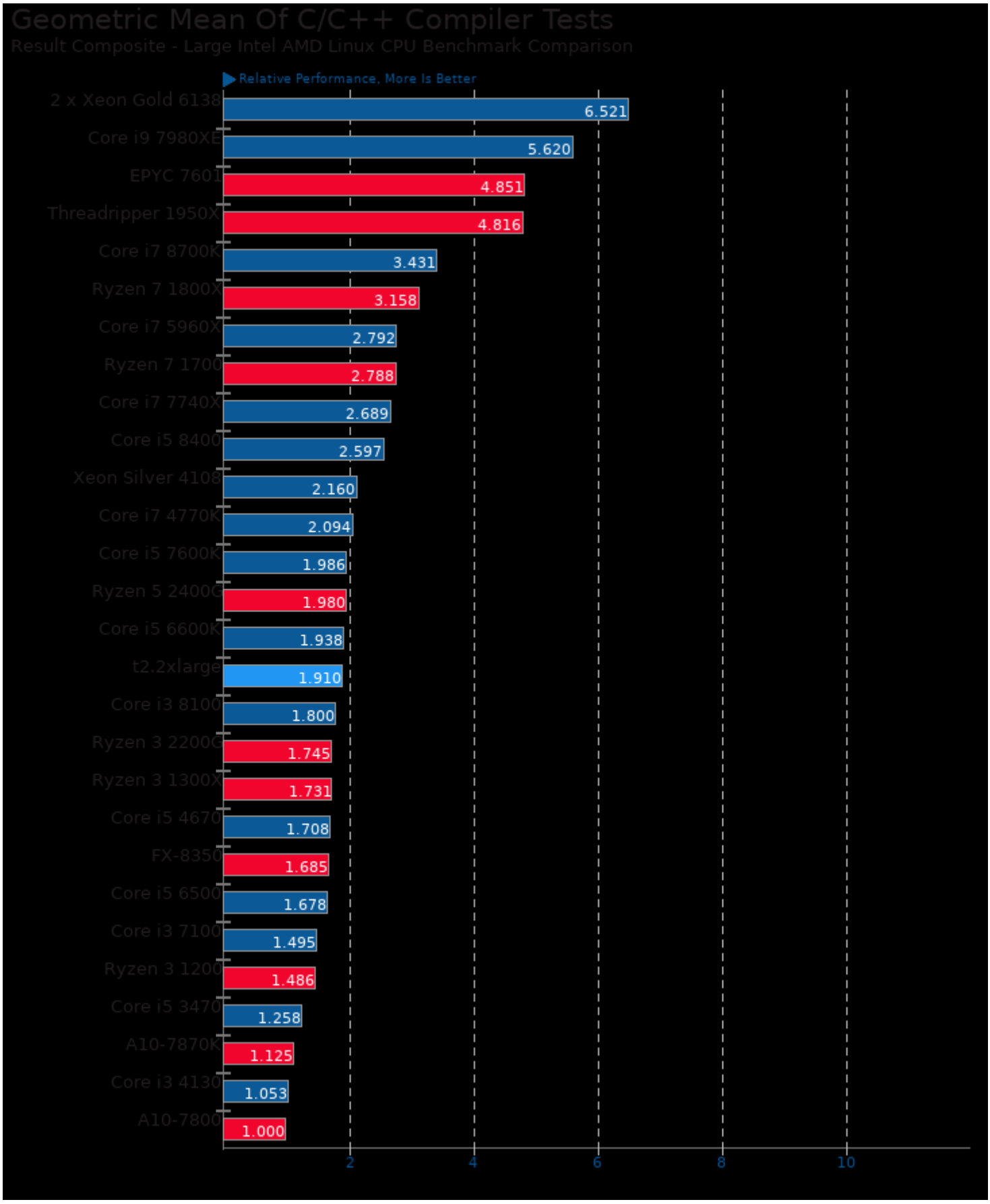
Large Intel AMD Linux CPU Benchmark Comparison




NAS Parallel Benchmarks 3.3
Test / Class: EP.C
Total Mop/s, More Is Better
A10-7800
SE +/- 0.84, N = 3
83.11
A10-7870K
SE +/- 0.17, N = 3
92.05
FX-8350
SE +/- 2.04, N = 3
221.13
Ryzen 3 1200
SE +/- 0.38, N = 3
122.00
Ryzen 3 1300X
SE +/- 0.05, N = 3
141.62
Ryzen 3 2200G
SE +/- 0.24, N = 3
144.02
Ryzen 5 2400G
SE +/- 1.66, N = 3
293.90
Ryzen 7 1700
SE +/- 7.05, N = 3
489.65
Ryzen 7 1800X
SE +/- 1.24, N = 3
571.10
Threadripper 1950X
SE +/- 3.38, N = 3
1090.37
EPYC 7601
SE +/- 5.85, N = 3
1622.78
Core i3 4130
SE +/- 0.91, N = 3
143.51
Core i3 7100
SE +/- 0.83, N = 3
175.07
Core i3 8100
SE +/- 0.32, N = 3
202.48
Core i5 3470
SE +/- 0.41, N = 3
180.13
Core i5 4670
SE +/- 0.29, N = 3
198.48
Core i5 6500
SE +/- 0.12, N = 3
185.67
Core i5 6600K
SE +/- 0.16, N = 3
219.61
Core i5 7600K
SE +/- 0.23, N = 3
225.62
Core i5 8400
SE +/- 0.16, N = 3
321.50
Core i7 4770K
SE +/- 1.89, N = 3
331.54
Core i7 5960X
SE +/- 0.71, N = 3
564.87
Core i7 7740X
SE +/- 2.53, N = 3
394.63
Core i7 8700K
SE +/- 1.92, N = 3
577.05
Core i9 7980XE
SE +/- 6.48, N = 3
1267.77
Xeon Silver 4108
SE +/- 0.71, N = 3
319.97
2 x Xeon Gold 6138
SE +/- 12.45, N = 3
1998.87
t2.2xlarge
SE +/- 0.08, N = 3
146.20
400
800
1200
1600
2000
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. A10-7800: Open MPI 2.1.1
3. A10-7870K: Open MPI 2.1.1
4. FX-8350: Open MPI 2.1.1
5. Ryzen 3 1200: Open MPI 2.1.1
6. Ryzen 3 1300X: Open MPI 2.1.1
7. Ryzen 3 2200G: Open MPI 2.1.1
8. Ryzen 5 2400G: Open MPI 2.1.1
9. Ryzen 7 1700: Open MPI 2.1.1
10. Ryzen 7 1800X: Open MPI 2.1.1
11. Threadripper 1950X: Open MPI 2.1.1

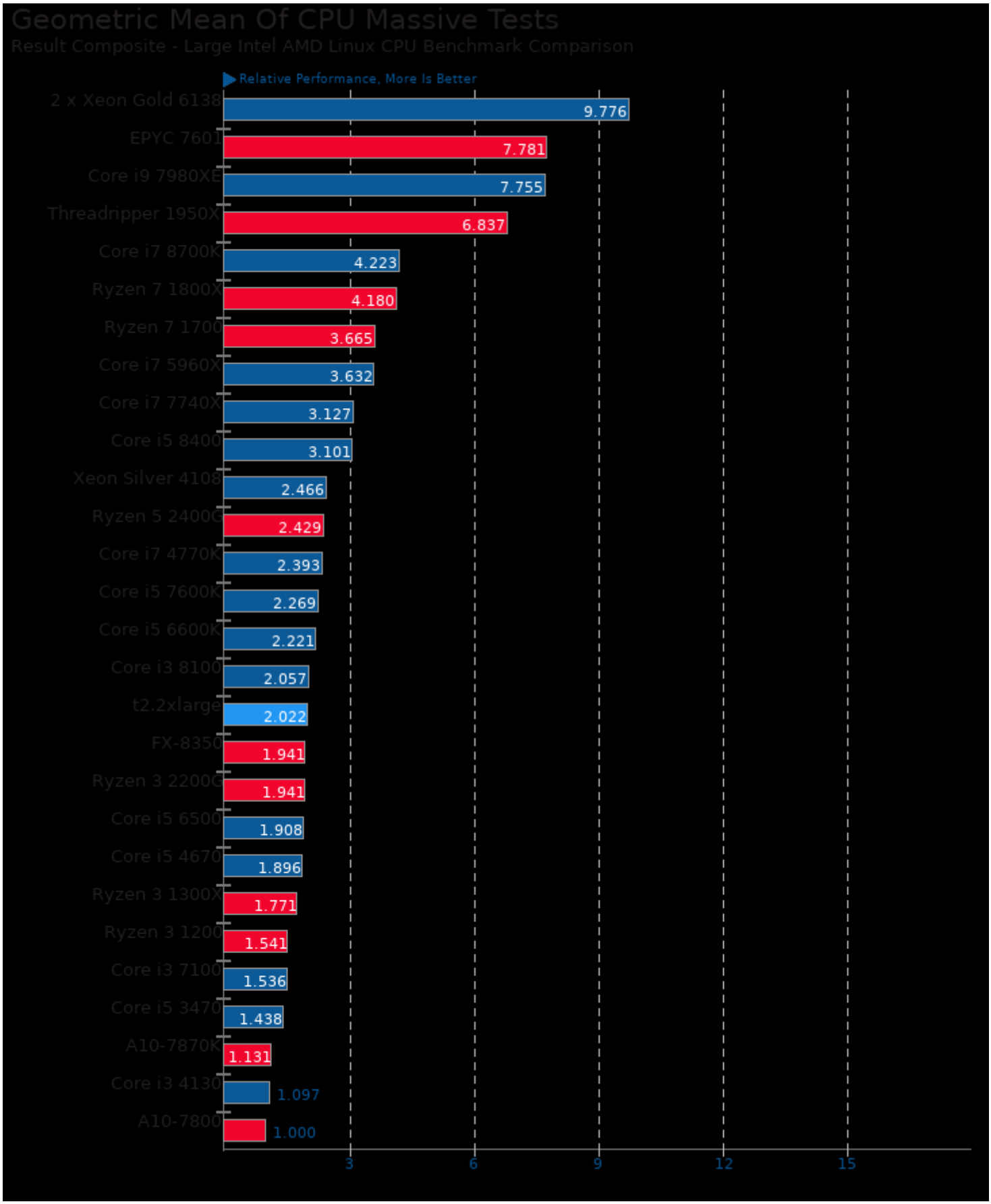
Large Intel AMD Linux CPU Benchmark Comparison

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



Large Intel AMD Linux CPU Benchmark Comparison

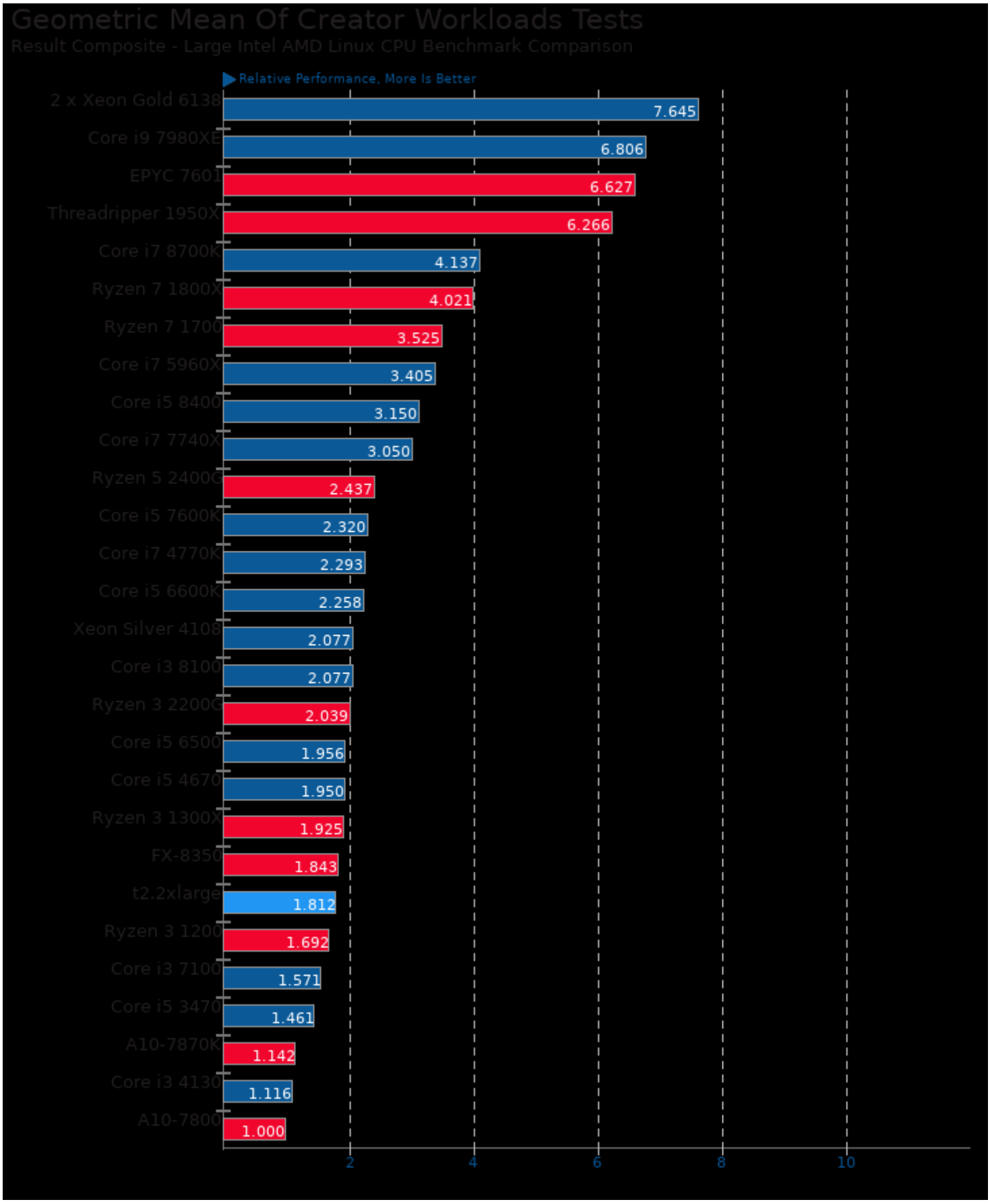
Geometric mean based upon tests: pts/mafft, pts/aobench, pts/c-ray, pts/compress-7zip, pts/encode-mp3, pts/john-the-ripper, pts/x264, pts/openssl and pts/nginx



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/numpy, pts/parboil,

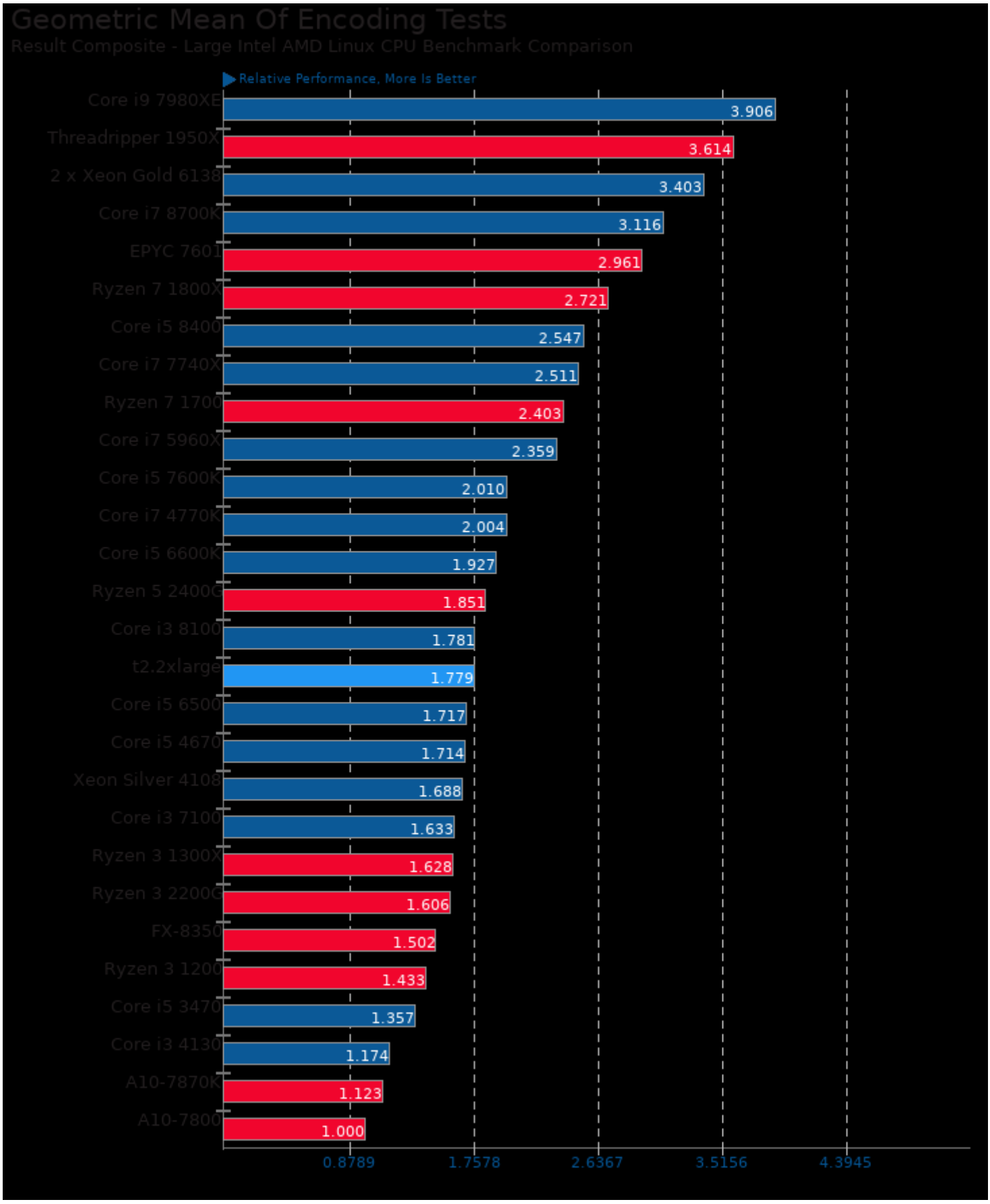
Large Intel AMD Linux CPU Benchmark Comparison

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



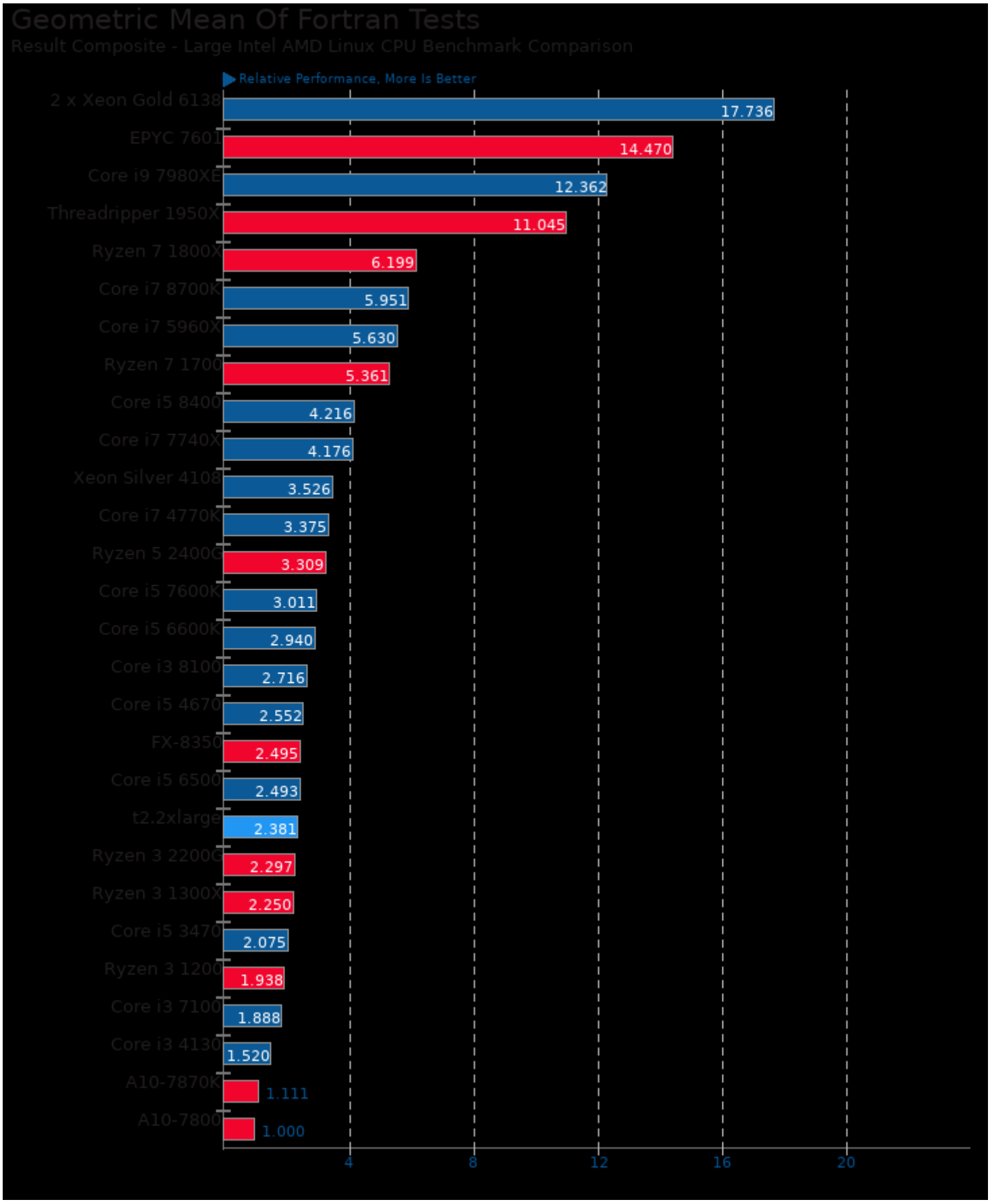
Large Intel AMD Linux CPU Benchmark Comparison

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



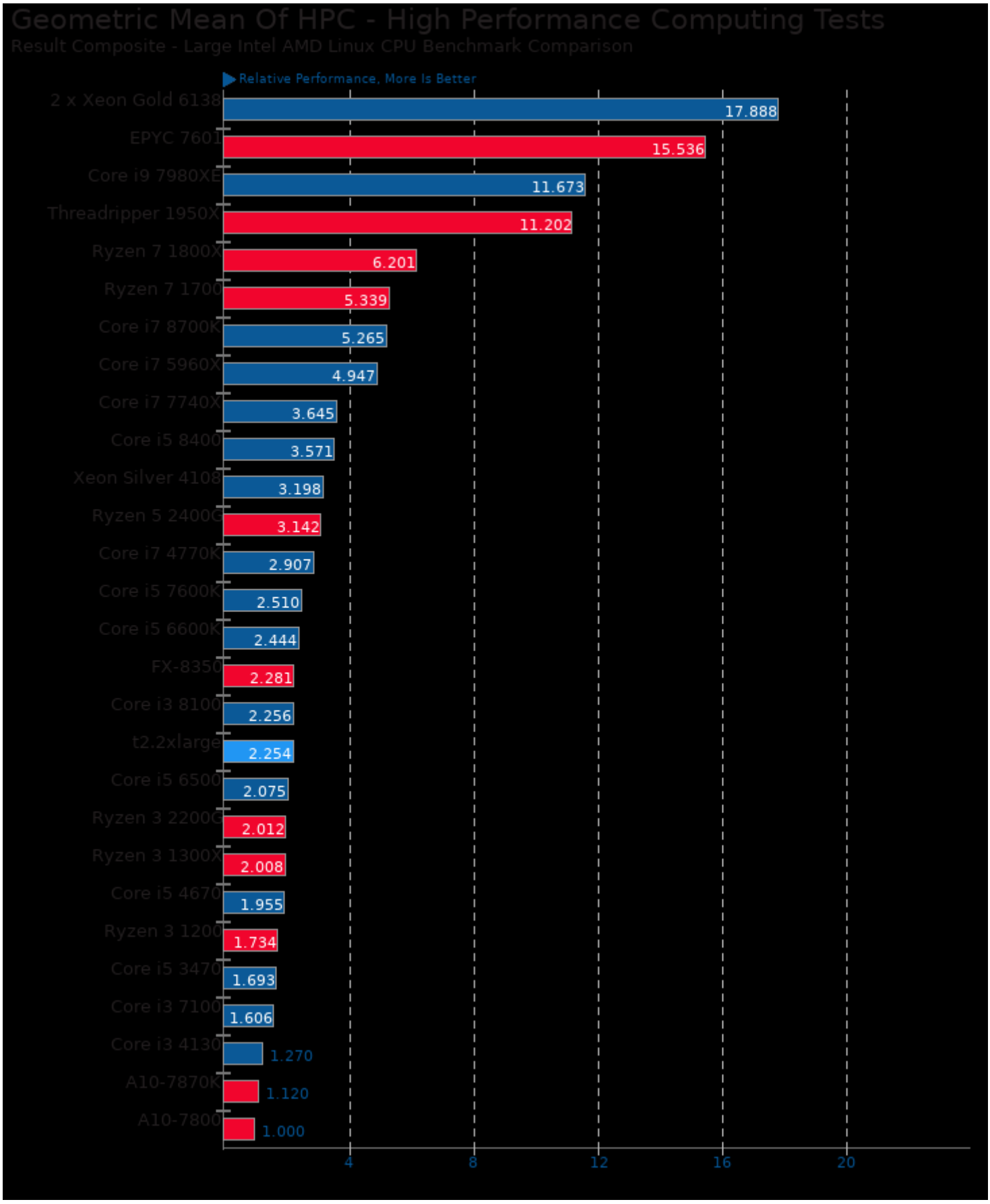
Large Intel AMD Linux CPU Benchmark Comparison

Geometric mean based upon tests: pts/encode-mp3 and pts/x264



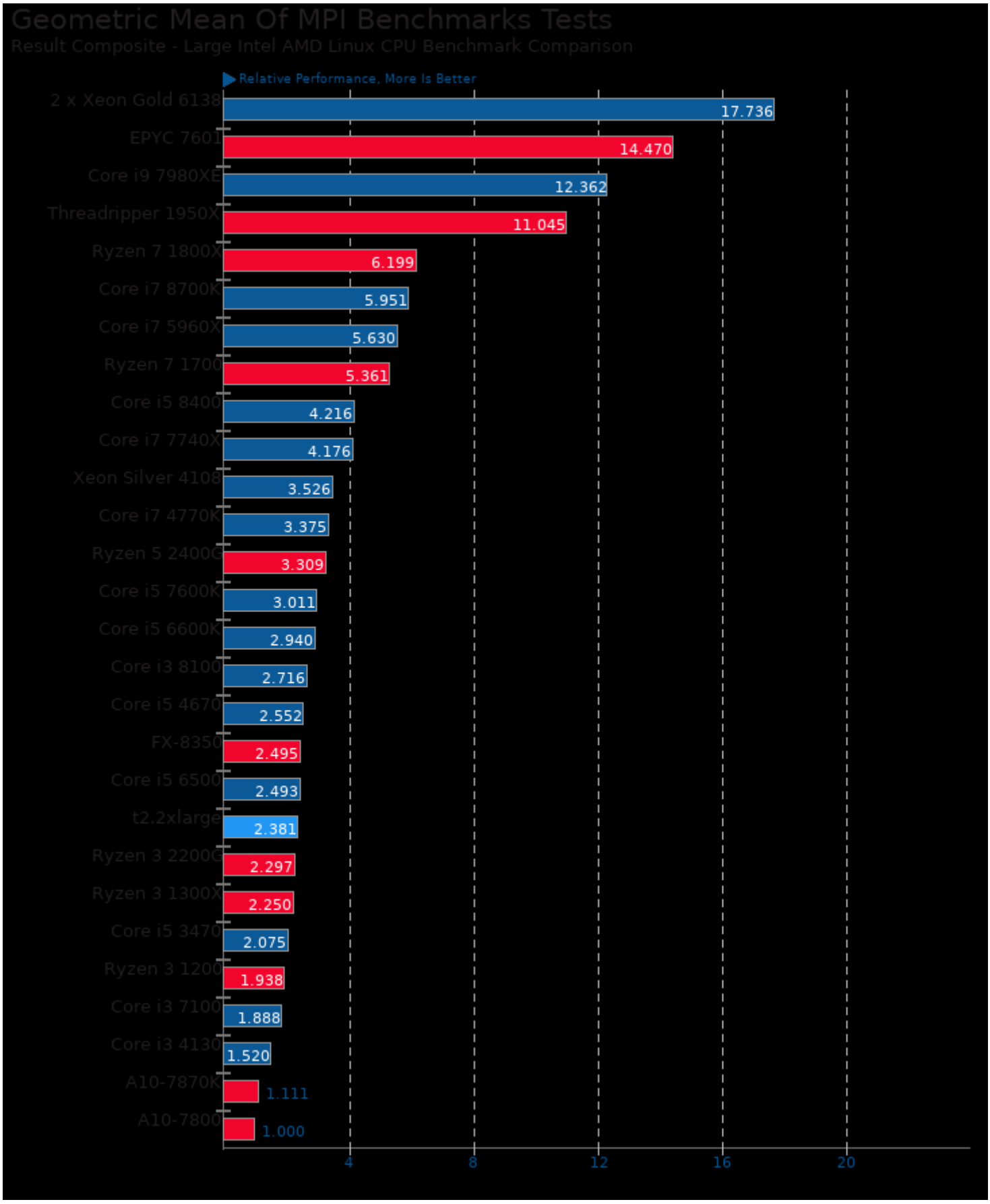
Large Intel AMD Linux CPU Benchmark Comparison

Geometric mean based upon tests: pts/nero2d and pts/npb



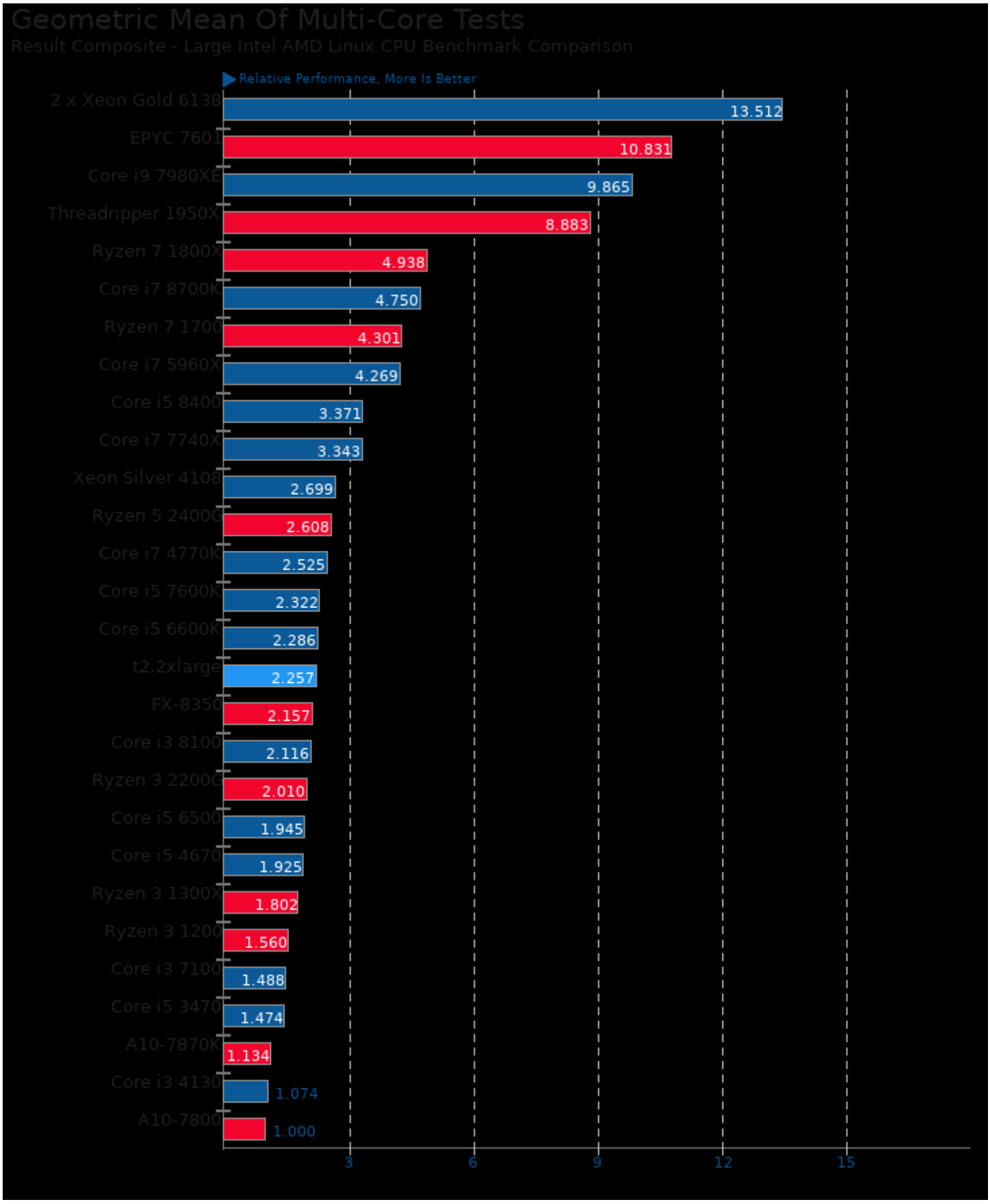
Large Intel AMD Linux CPU Benchmark Comparison

Geometric mean based upon tests: pts/npb, pts/rodinia, pts/parboil, pts/mafft, pts/numpy and pts/scikit-learn



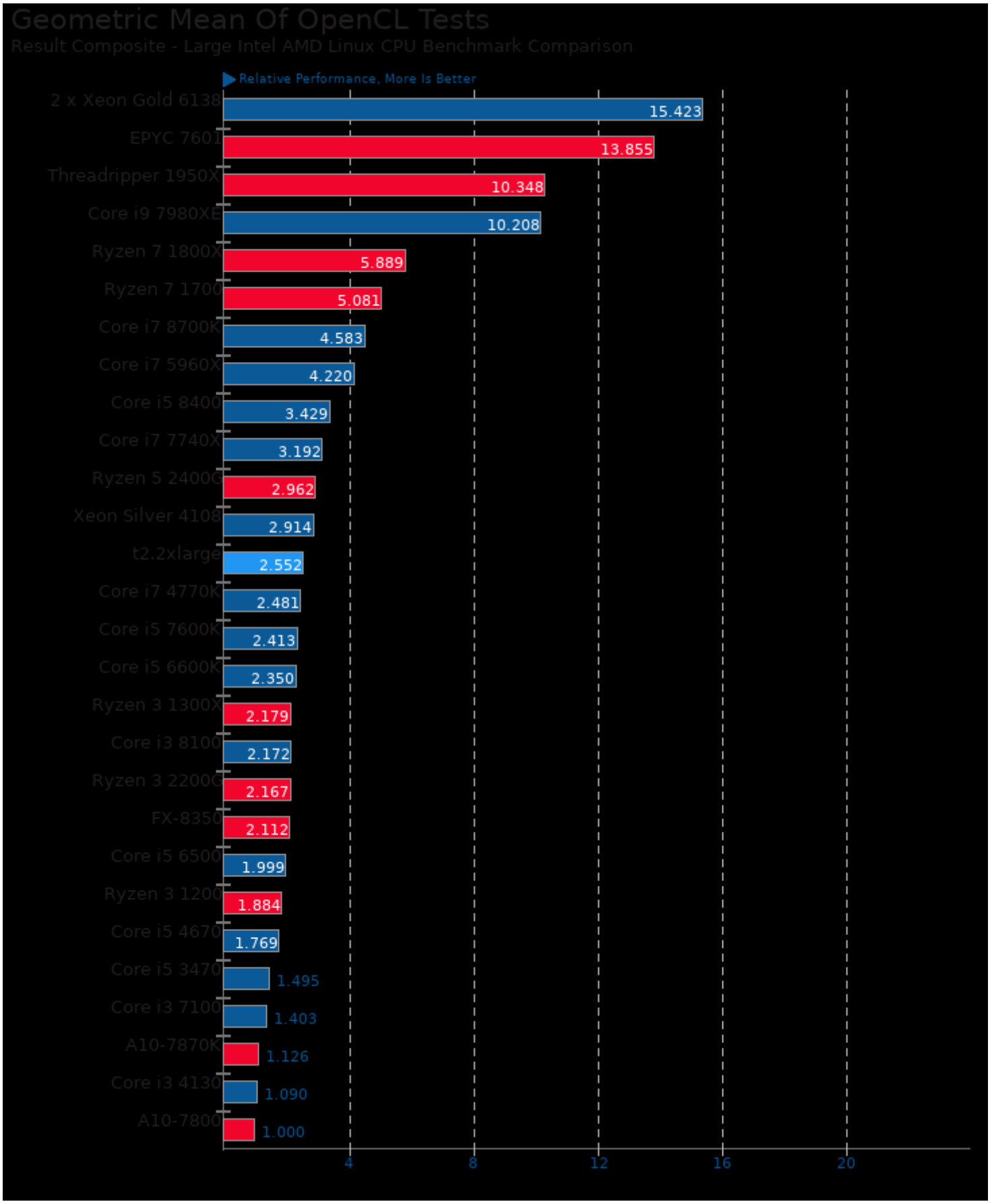
Large Intel AMD Linux CPU Benchmark Comparison

Geometric mean based upon tests: pts/nero2d and pts/npb

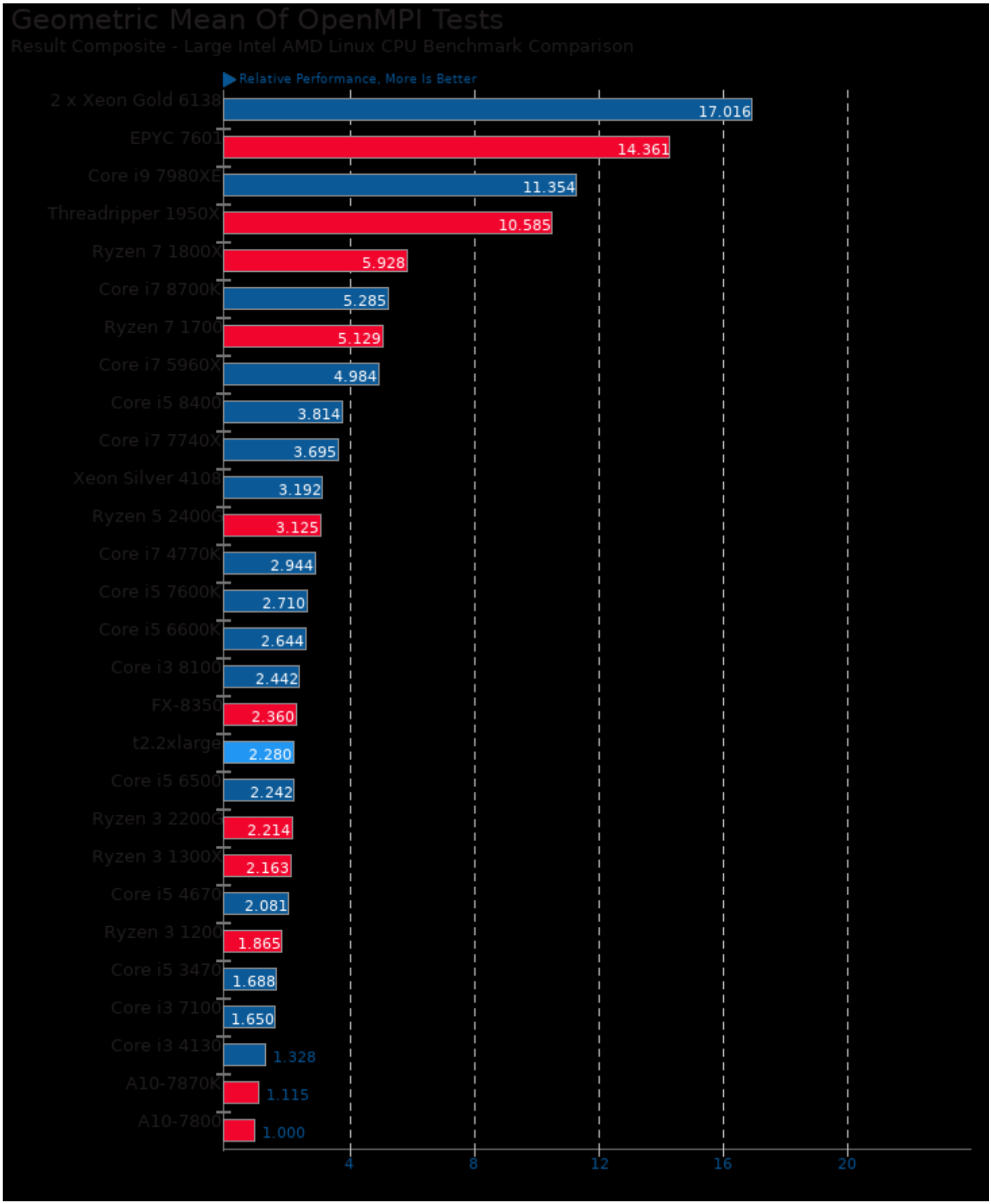


Large Intel AMD Linux CPU Benchmark Comparison

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

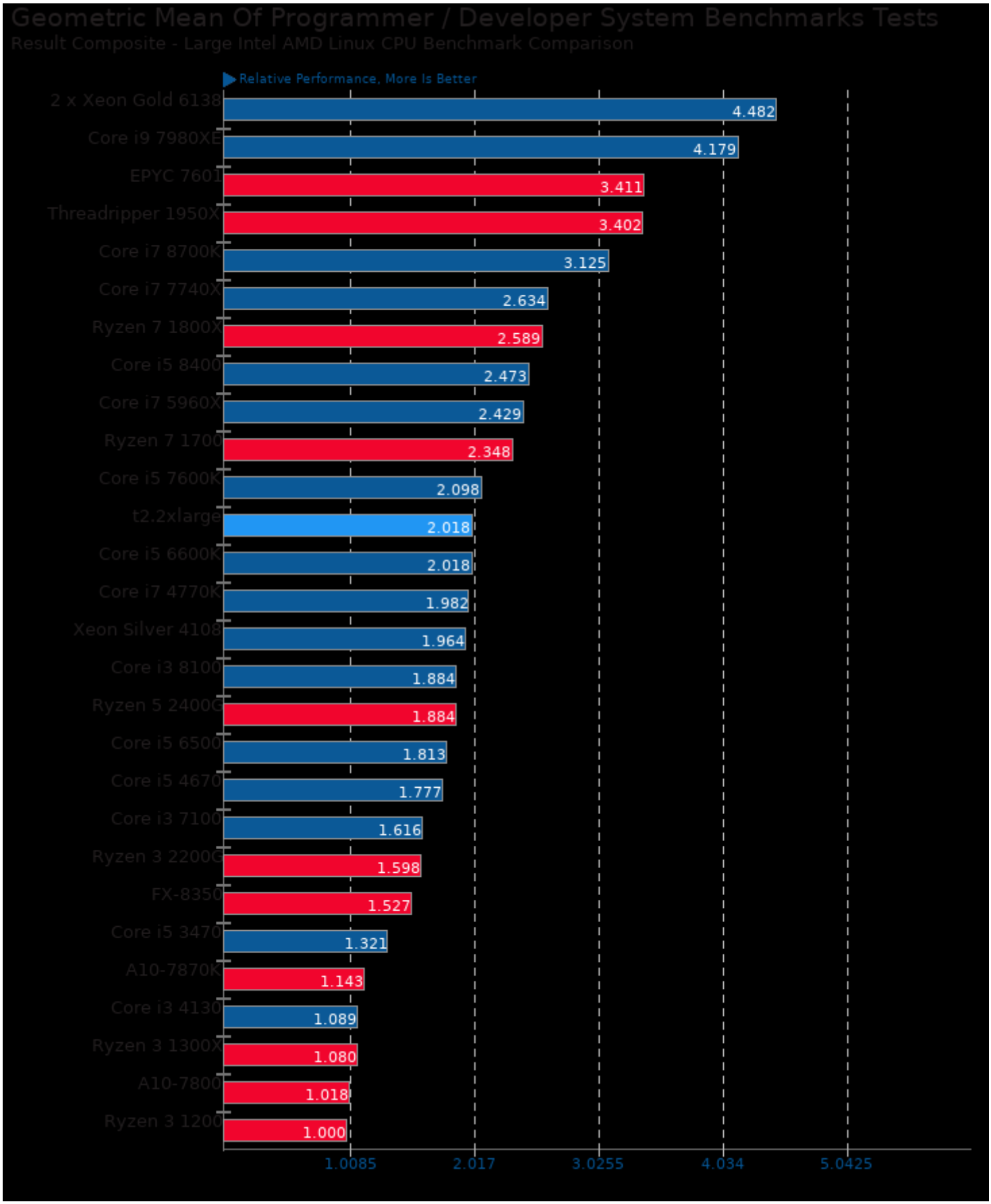


Geometric mean based upon tests: pts/rodinia and pts/parboil

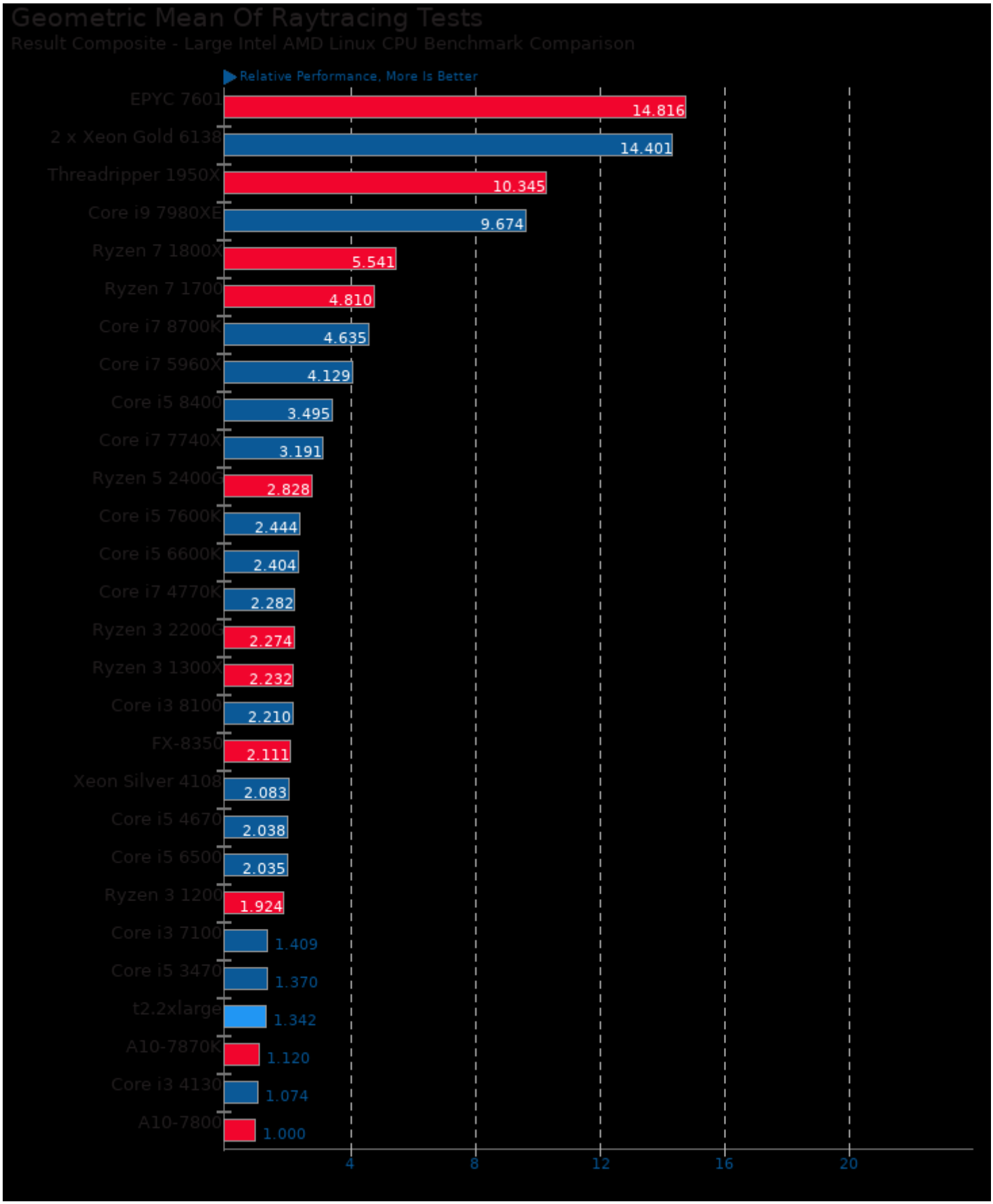


Geometric mean based upon tests: pts/nero2d, pts/rodinia and pts/npb

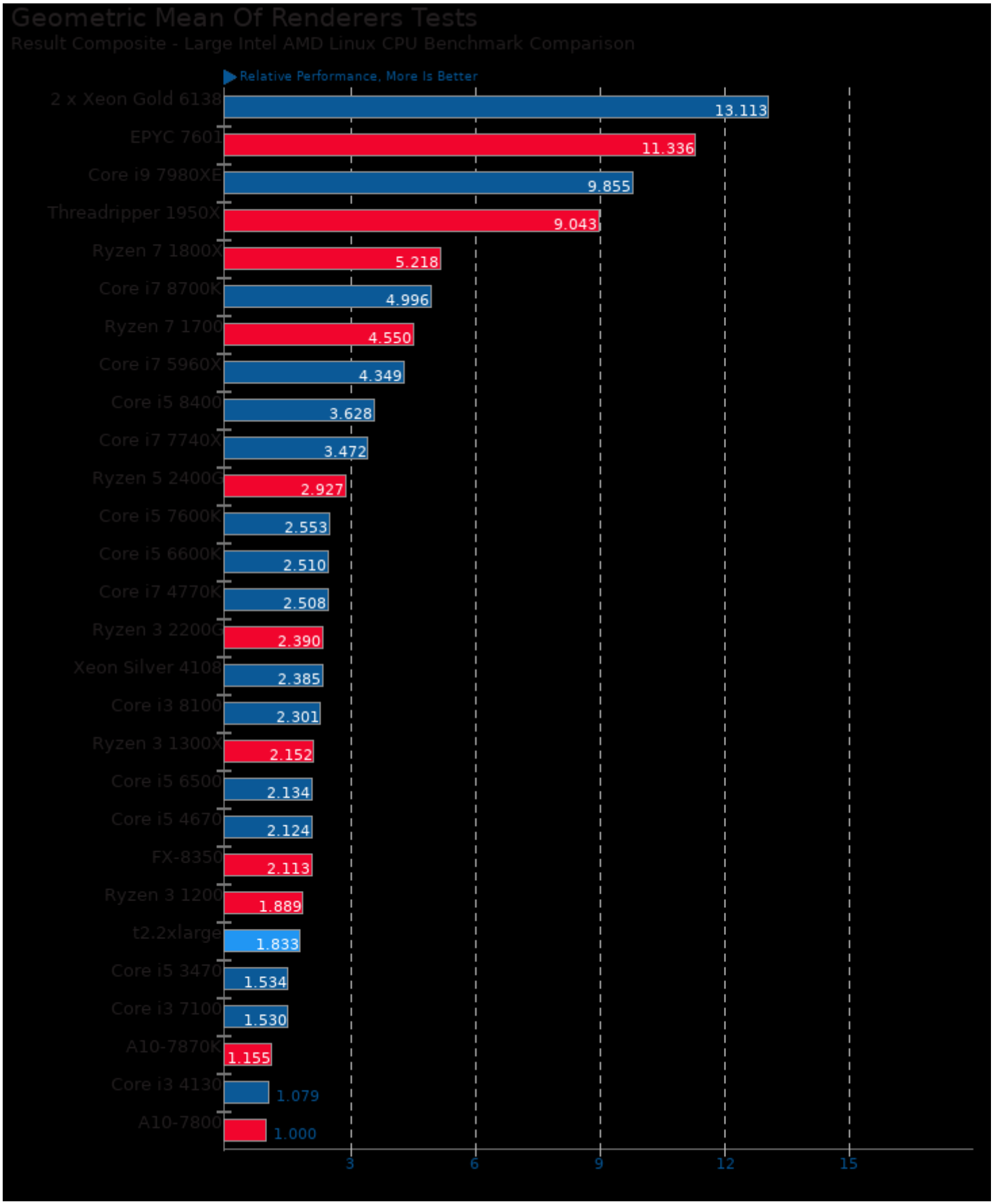
Large Intel AMD Linux CPU Benchmark Comparison



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

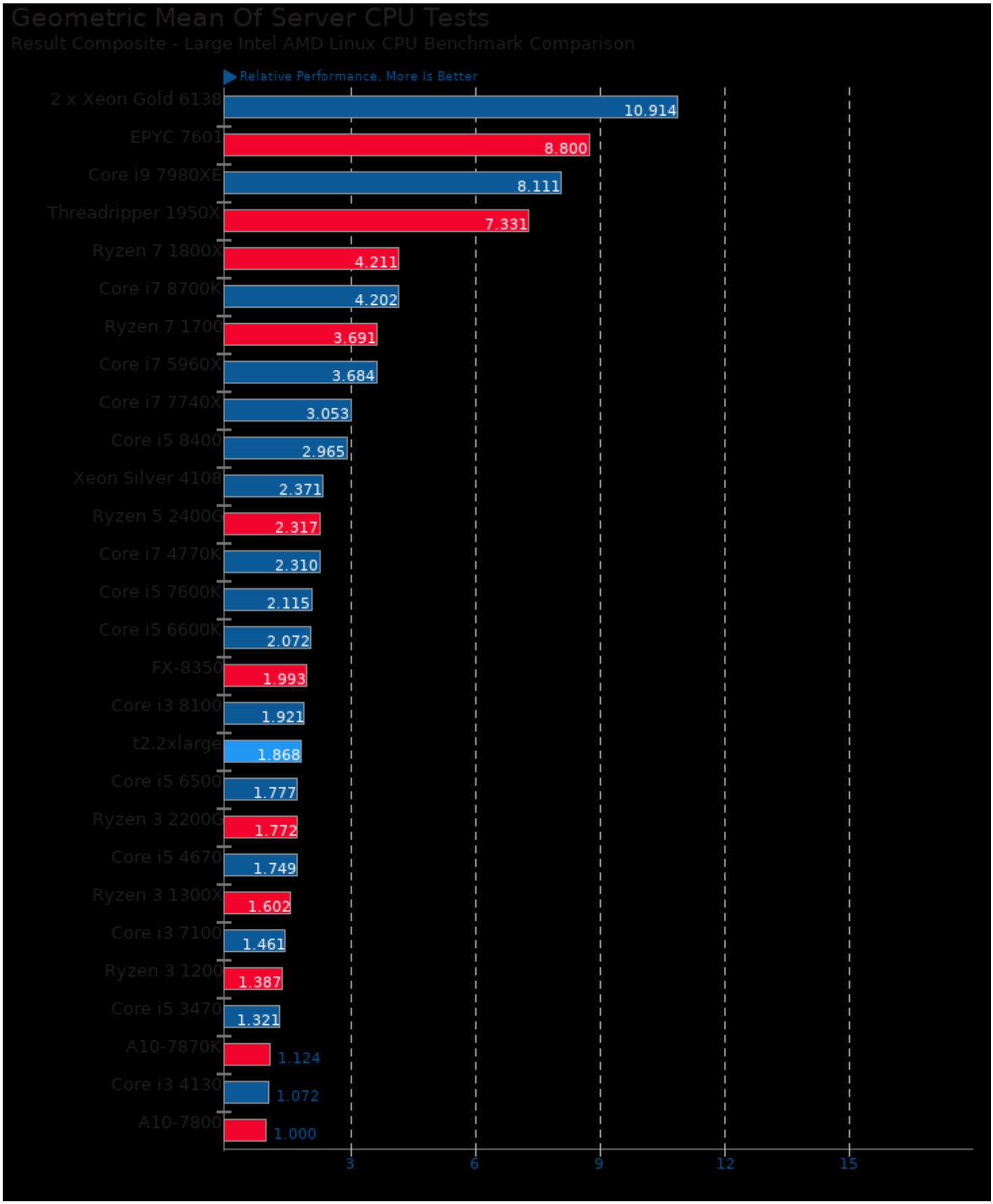


Geometric mean based upon tests: pts/c-ray and pts/povray



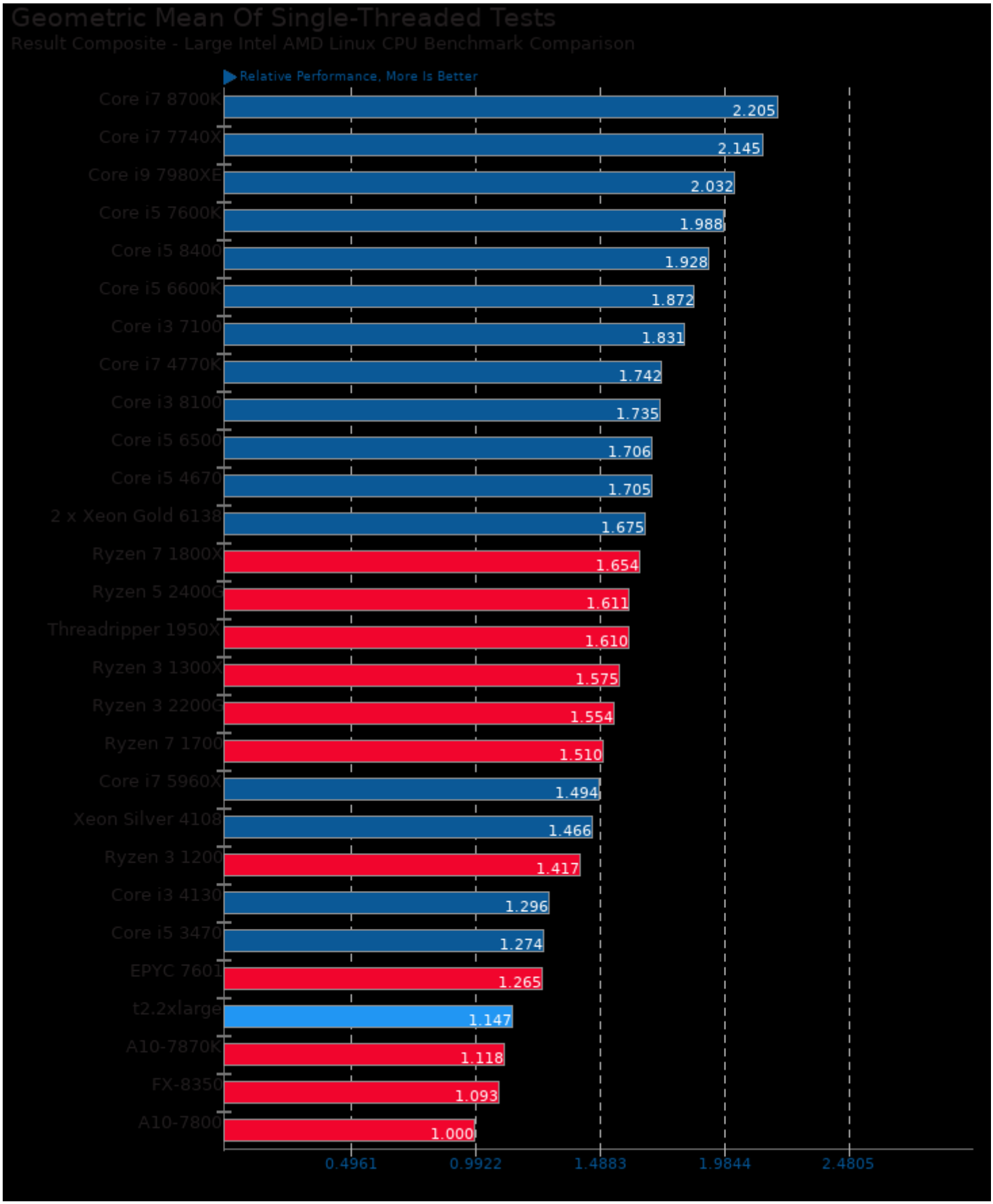
Geometric mean based upon tests: pts/c-ray, pts/povray, pts/aobench and pts/ttsiod-renderer

Large Intel AMD Linux CPU Benchmark Comparison



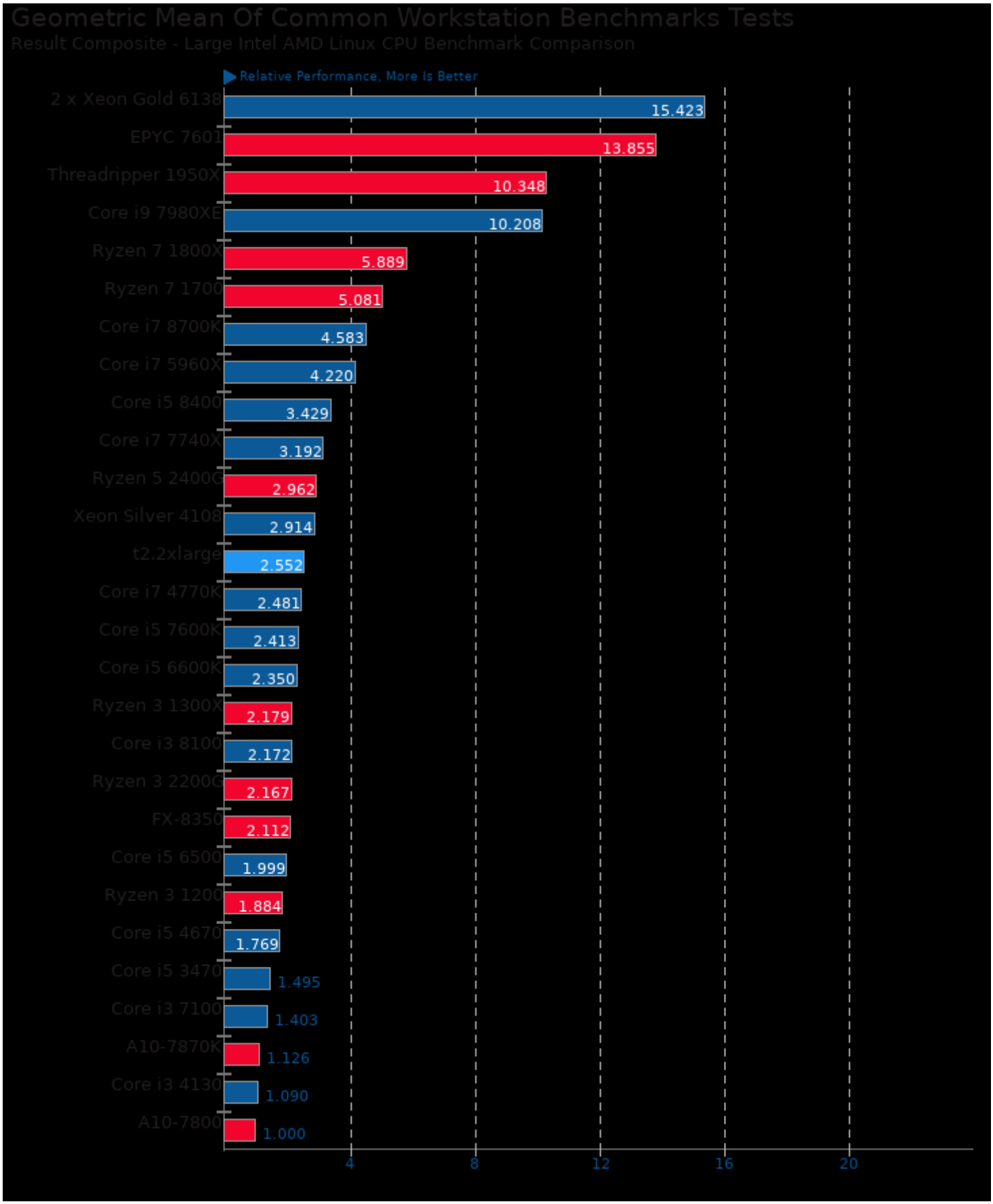
Geometric mean based upon tests: pts/npb, pts/rodinia, pts/john-the-ripper, pts/x264, pts/compress-7zip, pts/build-linux-kernel, pts/c-ray, pts/povray, pts/openssl, pts/pybench, pts/numpy and pts/scikit-learn

Large Intel AMD Linux CPU Benchmark Comparison



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

Large Intel AMD Linux CPU Benchmark Comparison



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

Large Intel AMD Linux CPU Benchmark Comparison

This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 29 March 2024 02:22.