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AMD Ryzen 3 2200G Linux CPU Benchmarks With Ryzen 5 2400G

Lenovo M73 Tiny /w Pentium G3220T & Performance Scaling

Automated Executive Summary

Core i7 8700K had the most wins, coming in first place for 60% of the tests.

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

Rodinia (Test: OpenMP LavaMD) at 10.83x
Hackbench (Count: 8 - Type: Process) at 9.671x
Parboil (Test: OpenMP CUTCP) at 8.907x
John The Ripper (Test: Blowfish) at 8.685x
OpenSSL (RSA 4096-bit Performance) at 8.499x
NAS Parallel Benchmarks (Test / Class: EP.C) at 8x
C-Ray (Total Time) at 7.837x
Java JMH (Throughput) at 7.828x
POV-Ray (Trace Time) at 7.82x
TTSIOD 3D Renderer (Phong Rendering With Soft-Shadow Mapping) at 7.51x.

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

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

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 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

Athlon II 630

Processor: AMD Athlon II X4 630 @ 2.80GHz (4 Cores), Motherboard: MSI MS-7388 v1.0, Chipset: AMD RD780 + SB600, Memory: 3072MB, Disk: 320GB Seagate ST3320613AS + 250GB Seagate ST3250310AS, Graphics: AMD RV770 (DRM 2.50.0 / 4.15.10-1-default LLVM 5.0.1) 512MB, Audio: Realtek ALC888, Monitor: W1943, Network: Realtek RTL8111/8168/8411

OS: openSUSE 20180320, Kernel: 4.15.10-1-default (x86_64), Desktop: KDE Frameworks 5, Display Server: X Server 1.19.6, Display Driver: radeon 18.0.0, OpenGL: 3.3 Mesa 18.0.0-rc4, File-System: ext4, Screen Resolution: 1360x768

Compiler Notes: --build=x86_64-suse-linux --disable-libcc1 --disable-libssp --disable-libstdcxx-pch --disable-libvtv --disable-werror --enable-__cxa_atexit --enable-checking=release --enable-gnu-indirect-function --enable-languages=c,c++,objc,fortran,obj-c++,ada,go --enable-libstdcxx-allocator=new --enable-linux-futex --enable-multilib --enable-offload-targets=hsa,nvptx-none=/usr/nvptx-none, --enable-plugin --enable-ssp --enable-version-specific-runtime-libs --host=x86_64-suse-linux --mandir=/usr/share/man --with-arch-32=x86-64 --with-gcc-major-version-only --with-slibdir=/lib64 --with-tune=generic --without-cuda-driver --without-system-libunwind
Processor Notes: Scaling Governor: acpi-cpufreq ondemand
System Notes: Python 2.7.14.

Intel Core i5-2320

Optiplex-390-i5-2320-ARCH

Processor: Intel Core i5-2320 @ 3.00GHz (4 Cores), Motherboard: Dell 0F6X5P (A11 BIOS), Chipset: Intel 2nd Generation Core Family DRAM, Memory: 12288MB, Disk: 320GB Seagate ST3320620AS + 500GB nal USB 3.0, Graphics: Gigabyte NVIDIA GeForce GT 1030 2048MB (1227/3003MHz), Audio: Conexant CX20641, Monitor: KA251Q, Network: Realtek RTL8111/8168/8411

OS: Antergos Linux 18.4-Minimal-ISO-Rolling, Kernel: 4.15.15-1-ARCH (x86_64), Desktop: GNOME Shell 3.28.1, Display Driver: NVIDIA 390.48, OpenGL: 4.6.0, Compiler: GCC 7.3.1 20180312, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --disable-libssp --disable-libstdcxx-pch --disable-libunwind-exceptions --disable-werror --enable-__cxa_atexit --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-default-ssp --enable-gnu-indirect-function --enable-gnu-unique-object --enable-install-libiberty --enable-languages=c,c++,ada,fortran,go,lto,objc,obj-c++ --enable-libmpx --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --mandir=/usr/share/man --with-isl --with-linker-hash-style=gnu
Processor Notes: Scaling Governor: intel_pstate powersave
OpenCL Notes: GPU Compute Cores: 384
Python Notes: Python 3.6.4
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline IBPB IBRS_FW Protection

Johns Ryzen 5 2400G

Processor: AMD Ryzen 5 2400G @ 3.85GHz (4 Cores / 8 Threads), Motherboard: MSI B350M GAMING PRO (MS-7A39) v1.0 (2.F0 BIOS), Chipset: AMD Device 15d0, Memory: 6144MB, Disk: Samsung SSD 960 EVO 250GB, Graphics: MSI AMD Radeon Vega / Radeon Vega Mobile 2048MB, Audio: AMD Device 15de, Monitor: DX-22L150A11, Network: Realtek RTL8111/8168/8411

OS: ManjaroLinux 17.1.8, Kernel: 4.17.0-1-MANJARO (x86_64), Desktop: KDE Plasma 5.12.4, Display Driver: modesetting 1.19.6, OpenGL: 4.5 Mesa 18.0.1 (LLVM 6.0.0), Compiler: GCC 7.3.1 20180312, File-System: ext4, Screen Resolution: 1360x768

Compiler Notes: --disable-libssp --disable-libstdcxx-pch --disable-libunwind-exceptions --disable-werror --enable-__cxa_atexit --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-default-ssp --enable-gnu-indirect-function --enable-gnu-unique-object --enable-install-libiberty --enable-languages=c,c++,ada,fortran,go,lto,objc,obj-c++ --enable-libmpx --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --mandir=/usr/share/man --with-isl --with-linker-hash-style=gnu
Processor Notes: Scaling Governor: acpi-cpufreq schedutil
Python Notes: Python 3.6.5
Security Notes: __user pointer sanitization + Full AMD retpoline IBPB Protection

Pentium G3220T

Pentium G3220T /w Performance Scaling

Processor: Intel Pentium G3220T @ 2.60GHz (2 Cores), Motherboard: LENOVO SHARKBAY (FHKT73AUS BIOS), Chipset: Intel 4th Gen Core DRAM, Memory: 8192MB, Disk: 128GB Samsung SSD 840, Graphics: Intel Haswell Desktop 1536MB (1100MHz), Audio: Intel Xeon E3-1200 v3/4th, Monitor: HP P221, Network: Intel Connection I217-V

OS: Ubuntu 18.04, Kernel: 4.15.0-15-generic (x86_64), Desktop: GNOME Shell 3.28.1, Display Driver: modesetting 1.19.6, OpenGL: 4.5 Mesa 18.0.0-rc5, Compiler: GCC 7.3.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --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-as=/usr/bin/x86_64-linux-gnu-as --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-ld=/usr/bin/x86_64-linux-gnu-ld --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate performance
Python Notes: Python 2.7.15rc1 + Python 3.6.5
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline 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	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 7740X	Core i7 8700K	Athlon II 630	Intel Core i5-2320	Optiplex-390-i5-2320-ARCH	Johns Ryzen 5 2400G	Pentium G3220T	Pentium G3220T /w Performance Scaling
NAS Parallel Benchmarks - EP.C (Mop/s)	83.11	92.05	22 1.13	12 2.00	14 1.62	14 4.02	29 3.90	48 9.65	57 1.10	14 3.51	17 5.07	20 2.48	18 0.13	19 8.48	18 5.67	21 9.61	22 5.62	32 1.50	33 1.54	39 4.63	**57 7.05**		10 6.00		72.26	**72 13**
Normalized	14.4%	15.9%	38.3%	21.1%	24.5%	24.9%	50.9%	84.8%	98.9%	24.8%	30.3%	35.0%	31.2%	34.4%	32.1%	38.0%	39.1%	55.7%	57.4%	68.3%	100%		18.3%		12.5%	12
Standard Deviation	1.8%	0.3%	1.6%	0.5%	0.1%	0.3%	1%	2.5%	0.4%	1.1%	0.8%	0.3%	0.4%	0.2%	0.1%	0.1%	0.2%	0.1%	1%	1.1%	0.6%		0.4%		0.4%	0.3

AMD Ryzen 3 2200G Linux CPU Benchmarks With Ryzen 5 2400G

Parboil - OpenMP CUTCP	35.73	31.60	16.90	17.36	15.03	15.64	11.34	6.49	5.58	30.51	22.87	14.95	17.82	15.80	16.21	13.82	13.46	9.47	12.99	10.13	7.08	49.70			41.80	41.82	
Normalized	15.6	17.6	33.0	32.1	37.1	35.6	49.2	85.9	100	18.2	24.4	37.3	31.3	35.3	34.4	40.3	41.4	58.9	42.9	55.0	78.8	11.2			13.3	13.4	
d	2%	6%	2%	4%	3%	8%	1%	8%	%	9%	%	2%	1%	2%	2%	8%	6%	2%	6%	8%	1%	3%			5%	4%	
Standard Deviation	0.1 %	0.3 %	0.4 %	0.4 %	0.1 %	0.7 %	0.6 %	0.7 %	0.4 %	0.4 %	1.1 %	0%	0.2 %	0.2 %	0.1 %	0.1 %	0.2 %	0.1 %	1%	1.7 %	0.3 %	0.7 %			0.2 %	0.1 %	
Rodinia - OpenMP LavaMD (sec)	44 6.42	39 7.52	21 1.52	25 8.67	22 3.34	21 7.13	16 0.28	95.15	82.39	44 0.27	35 4.52	22 6.21	40 0.13	32 2.61	24 6.20	20 8.04	20 3.35	14 3.15	19 9.32	15 4.42	10 7.19	63 3.77	44 2.10	16 2.36	89 2.29	89 0.38	
Normalized	18.4	20.7	38.9	31.8	36.8	37.9	51.4	86.5	100	18.7	23.2	36.4	20.5	25.5	33.4	39.4	40.5	57.5	41.3	53.3	76.8	13%	18.6	50.7	9.23	9.24	
d	6%	3%	5%	5%	9%	5%	%	9%	%	1%	4%	2%	9%	4%	6%	5%	2%	6%	3%	5%	6%		4%	5%	%	%	
Standard Deviation	0.1 %	0.4 %	0.1 %	0.2 %	0.2 %	0.2 %	0.1 %	0.1 %	0.1 %	0.1 %	0.3 %	0%	0.8 %	0.1 %	0.1 %	0%	0.1 %	0.1 %	0%	0.9 %	0.1 %	1.5 %	0%	0.6 %	0.3 %	0.1 %	
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	10.45	7.85	5.71	6.93	5.85	6.32	5.36	5.42	3.68	4.82	3.97		13.84	9.11	4.39	14.76	14.78	
Normalized	30.5	35.1	61.6	50.3	60.9	58.2	63.7	85.6	100	34.9	46.5	63.9	52.6	62.3	57.7	68.1	67.3	99.1	74.8	91.9		26.3	40.0	83.1	24.7	24.7	
d	2%	%	6%	4%	3%	1%	%	8%	%	3%	%	2%	7%	9%	5%	%	4%	8%	%	4%		7%	7%	4%	3%	%	
Standard Deviation	2% %	7.5 %	1.3 %	0.4 %	4.8 %	5%	4.3 %	3.1 %	0.9 %	3.7 %	0.2 %	6.4 %	0.8 %	6.8 %	3.4 %	3.9 %	1%	4.7 %	4.4 %	8.7 %		5.8 %	2.2 %	1.7 %	0.4 %	0.3 %	
John The Ripper - Blowfish (Real C/S)	33 73	37 75	68 26	37 11	43 93	45 40	60 22	10 43 1	12 44 5	30 08	38 59	44 11	29 92	40 80	40 46	47 85	49 10	69 98	68 00	88 80	12 75 8	21 85	27 64	63 57	14 71	14 69	
Normalized	26.4	29.5	53.5	29.0	34.4	35.5	47.2	81.7	97.5	23.5	30.2	34.5	23.4	31.9	31.7	37.5	38.4	54.8	53.3	69.6	100	17.1	21.6	49.8	11.5	11.5	
d	4%	9%	%	9%	3%	9%	%	6%	5%	8%	5%	7%	5%	8%	1%	1%	9%	5%	%	%	%	3%	6%	3%	3%	1%	
Standard Deviation	0.3 %	0.1 %	0.6 %	0.8 %	0.3 %	0.2 %	3.9 %	0.8 %	0.1 %			0.2 %	2.7 %	0.2 %	0.1 %	0.1 %			3.2 %			1.3 %		0.5 %		0.1 %	
Open FMM Nero2D - Total Time (sec)	28 0.43	25 1.40	11 9.80	10 9.59	94. 39	92. 09	90. 56	57. 48	50. 15	20 9.51	16 5.73	92. 61	14 1.12	10 2.83	10 0.83	85. 71	83. 98	61. 04	98. 21	76. 36	54. 98		15 3.93	87. 41	27 4.45	27 6.15	
Normalized	17.8	19.9	41.8	45.7	53.1	54.4	55.3	87.2	100	23.9	30.2	54.1	35.5	48.7	49.7	58.5	59.7	82.1	51.0	65.6	91.2		32.5	57.3	18.2	18.1	
d	8%	5%	3%	6%	3%	6%	8%	5%	%	4%	6%	5%	4%	7%	4%	1%	2%	6%	6%	8%	1%		8%	7%	7%	2%	
Standard Deviation	0.5 %	0.5 %	1.8 %	0.3 %	0.1 %	0.3 %	1%	0.5 %	1.1 %	0.9 %	0.4 %	0.7 %	2.2 %	1.1 %	0.2 %	0.4 %	0.7 %	1.2 %	0.6 %	0.5 %	1%		1%	0.1 %	0.8 %	2.9 %	

TTSIOD 3D Renderer - P.R.W. S.S.M (FPS)	67.42	82.93	14 2.7 5	12 2.9 5	13 4.9 7	17 8.1 7	21 1.6 0	27 4.6 4	31 2.2 2	73. 55	12 1.6 9	16 8.2 7	12 9.9 0	15 5.7 7	15 8.2 2	18 4.7 2	18 7.9 0	26 3.6 3	20 4.3 1	27 7.4 3	**39 1.6 7**	**52. 15**		11 7.8 5	23 8.6 8	56. 51	56 55
Normalize	17.2	21.1	36.4	31.3	34.4	45.4	54.0	70.1	79.7	18.7	31.0	42.9	33.1	39.7	40.4	47.1	47.9	67.3	52.1	70.8	100	13.3		30.0	60.9	14.4	14
d	1%	7%	5%	9%	6%	9%	3%	2%	2%	8%	7%	6%	7%	7%	%	6%	7%	1%	6%	3%	%	1%		9%	4%	3%	4%
Standard Deviation	0.3 %	0.2 %	1%	0.7 %	0.2 %	0.8 %	1.4 %	0.1 %	0.2 %	0.9 %	0.3 %	0.6 %	2%	0.4 %	0.1 %	1.2 %	0.2 %	0.1 %	1.7 %	1.8 %	0.3 %	4.3 %		0.2 %	0.4 %	0.9 %	0.9 %
x264 - H.2.V.E (FPS)	15.61	17.58	30. 58	23. 47	27. 33	27. 60	34. 75	60. 90	71. 46	15. 47	23. 89	30. 42	19. 83	28. 16	28. 47	33. 11	33. 49	56. 11	37. 64	49. 95	**72. 96**			17. 64	39. 50	**12. 18**	12 24
Normalize	21.4	24.1	41.9	32.1	37.4	37.8	47.6	83.4	97.9	21.2	32.7	41.6	27.1	38.6	39.0	45.3	45.9	76.9	51.5	68.4	100			24.1	54.1	16.6	16
d	%	%	1%	7%	6%	3%	3%	7%	4%	%	4%	9%	8%	%	2%	8%	%	1%	9%	6%	%			8%	4%	9%	8%
Standard Deviation	0.1 %	0%	0.2 %	3.4 %	0.2 %	0.1 %	3.3 %	3.3 %	0.5 %	0.3 %	0.2 %	3.3 %	18.4 %	3.4 %	0.4 %	0.2 %	0.1 %	0.2 %	0.1 %	0.6 %	0.5 %			0.9 %	2%	1.6 %	0.2 %
7-Zip Compression - C.S.T (MIPS)	99 83	11 43 1	22 09 7	12 60 1	15 88 0	15 74 4	17 72 9	30 62 7	33 02 2	89 92	12 89 6	17 22 1	14 10 0	16 59 5	15 11 6	18 07 9	17 72 7	27 02 8	21 66 7	28 95 2	**39 03 9**	81 57		11 87 4	18 91 8	61 10	**61 08**
Normalize	25.5	29.2	56.6	32.2	40.6	40.3	45.4	78.4	84.5	23.0	33.0	44.1	36.1	42.5	38.7	46.3	45.4	69.2	55.5	74.1	100	20.8		30.4	48.4	15.6	15
d	7%	8%	%	8%	8%	3%	1%	5%	9%	3%	3%	1%	2%	1%	2%	1%	1%	3%	%	6%	%	9%		2%	6%	5%	5%
Standard Deviation	1.5 %	1.4 %	0.3 %		1.8 %	0.5 %	3.3 %	0.6 %	1.5 %	1.2 %	0.1 %	0.2 %	3.1 %	0.9 %	0.1 %	0.1 %	0.3 %	0.2 %	1.3 %	2.9 %	1%	0.5 %		0.1 %	1%	0.9 %	2.2 %
asmFish - 1.H.M.2.D (Nodes/s)	54 33 89 3	62 14 00 6	11 70 53 26	73 23 74 9	82 86 13 4	85 79 59 7	12 35 67 82	20 10 16 05	22 67 84 79	49 07 45 8	67 83 02 8	98 41 58 6	73 66 18 2	95 72 74 4	89 67 52 3	10 05 11 65	10 26 93 51	15 91 35 82	12 32 10 19	15 89 58 69	**23 43 77 31**	48 68 59 3		72 27 97 9	12 42 04 13	32 91 55 2	**32 61 49 0**
Normalize	23.1	26.5	49.9	31.2	35.3	36.6	52.7	85.7	96.7	20.9	28.9	41.9	31.4	40.8	38.2	42.8	43.8	67.9	52.5	67.8	100	20.7		30.8	52.9	14.0	13
d	8%	1%	4%	5%	5%	1%	2%	7%	6%	4%	4%	9%	3%	4%	6%	8%	2%	%	7%	2%	%	7%		4%	9%	4%	2%
Standard Deviation	0.9 %	2.2 %	0.6 %	0.8 %	1.5 %	1.2 %	1.2 %	1.2 %	1.4 %	0.1 %	1.1 %	1.6 %	3.3 %	2.2 %	0.9 %	0.3 %	0.7 %	1.6 %	2%	1.2 %	0.7 %	1.2 %		0.9 %	0.8 %	1.4 %	0.1 %

AMD Ryzen 3 2200G Linux CPU Benchmarks With Ryzen 5 2400G

Timed Linux Kernel Compilation - Time To Compil	34	30	16	48	45	20	15	95.	85.	42	24	16	26	18	18	15	15	10	15	10	79.	40		28	16	50	50
	2.8	0.9	7.8	4.5	8.0	1.4	3.4	17	22	6.5	6.4	7.8	4.9	0.9	1.6	8.4	7.5	8.0	0.1	6.9	10	1.5		6.8	3.4	0.6	0.(
	1	2	5	7	0	8	9			9	4	1	7	8	6	3	8	2	2	7		1		3	1	6	1
Normalized	23.0	26.2	47.1	16.3	17.2	39.2	51.5	83.1	92.8	18.5	32.1	47.1	29.8	43.7	43.5	49.9	50.2	73.2	52.6	73.9	100	19.7		27.5	48.4	15.8	15.
d	7%	9%	3%	2%	7%	6%	3%	1%	2%	4%	%	4%	5%	1%	4%	3%	%	3%	9%	5%	%	%		8%	1%	%	2%
Standard Deviation	0.8 %	1.1 %	1.5 %	0.2 %	0.3 %	1%	1.2 %	2.2 %	2%	0.5 %	0.8 %	1%	1.1 %	1.2 %	1.1 %	1%	1%	1.7 %	1%	1%	7%	3.2 %		1.1 %	2.9 %	0.5 %	0.4 %
C-Ray - Total Time (sec)	61.	55.	28.	24.	21.	21.	19.	11.	**9.7**	54.	41.	24.	39.	27.	26.	22.	22.	15.	24.	18.	12.	58.		44.	19.	**76.**	76
	75	09	01	95	50	07	48	23	**0**	28	97	65	00	40	97	83	25	57	51	69	78	80		69	18	**02**	01
Normalize	15.7	17.6	34.6	38.8	45.1	46.0	49.7	86.3	100	17.8	23.1	39.3	24.8	35.4	35.9	42.4	43.6	62.3	39.5	51.9	75.9	16.5		21.7	50.5	12.7	12.
d	1%	1%	3%	8%	2%	4%	9%	8%	%	7%	1%	5%	7%	%	7%	9%	%	%	8%	%	%	%		1%	7%	6%	6%
Standard Deviation	0%	0.1 %	0%	0.1 %	0%	0.7 %	1.4 %	0%	0.1 %	0.2 %	0.1 %	0.1 %	1.4 %	0.1 %	0.1 %	0.2 %	0.1 %	0.1 %	0.1 %	1.5 %	0.1 %	0.1 %		0.1 %	1.9 %	0%	0%
POV-Ray - Trace Time (sec)	27	24	13	18	15	15	10	64.	**56.**	26	20	13	22	14	14	12	12	87.	13	87.	60.			22	10	**43**	43
	0.8	2.0	4.0	1.1	6.2	3.6	7.3	40	**21**	7.7	0.7	9.0	8.8	7.1	9.8	6.8	5.9	94	1.0	94	96			8.0	8.1	**9.5**	9.(
	6	7	1	9	9	3	9			0	3	2	3	3	4	4	0		9					8	8	**7**	9
Normalize	20.7	23.2	41.9	31.0	35.9	36.5	52.3	87.2	100	21%	28%	40.4	24.5	38.2	37.5	44.3	44.6	63.9	42.8	63.9	92.2			24.6	51.9	12.7	12.
d	5%	2%	4%	2%	7%	9%	4%	8%	%			3%	6%	%	1%	2%	5%	2%	8%	2%	1%			4%	6%	9%	%
Standard Deviation	0.2 %	0.1 %	0.3 %	0.1 %	0.2 %	0.4 %	0.3 %	0%	0.1 %	0.2 %	0.1 %	0.1 %	2.5 %	0.1 %	0.1 %	0.1 %	0.9 %	0.1 %	0.2 %	0.1 %	0.2 %			0.9 %	1.6 %	0%	0.1 %
LAME MP3 Encoding - WAV To MP3	54.	48.	47.	39.	35.	37.	35.	36.	33.	38.	31.	33.	37.	33.	33.	30.	28.	30.	32.	27.	**26.**	**80.**		47.	35.	48.	48
	17	37	03	68	78	13	19	59	50	94	08	30	36	25	51	95	77	01	54	50	**07**	**20**		24	97	17	15
Normalize	48.1	53.9	55.4	65.7	72.8	70.2	74.0	71.2	77.8	66.9	83.8	78.2	69.7	78.4	77.8	84.2	90.6	86.8	80.1	94.8	100	32.5		55.1	72.4	54.1	54.
d	3%	%	3%	%	6%	1%	8%	5%	2%	5%	8%	9%	8%	1%	%	3%	2%	7%	2%	%	%	1%		9%	8%	2%	4%
Standard Deviation	0.2 %	0.1 %	0.2 %	0.1 %	0.3 %	0.2 %	0.1 %	0%	0.8 %	3%	0.1 %	0%	0.2 %	0%	0%	0%	0.1 %	0%	0.4 %	0.8 %	1.3 %	0.2 %		0.1 %	0.3 %	0.1 %	0.1 %
Hackbench - 8 - Proces	97.	84.	50.		63.	50.	33.	20.	**17.**	11	72.	62.	81.	65.	67.	58.	57.	39.	37.	30.	22.	11		96.	48.	**17**	17
	81	26	73		63	24	29	07	**96**	9.9	50	18	17	19	41	19	63	66	72	45	50	5.6		49	47	**3.6**	3.(
										4												1				**9**	6
Normalize	18.3	21.3	35.4		28.2	35.7	53.9	89.4	100	14.9	24.7	28.8	22.1	27.5	26.6	30.8	31.1	45.2	47.6	58.9	79.8	15.5		18.6	37.0	10.3	10.
d	6%	1%	%		3%	5%	5%	9%	%	7%	7%	8%	3%	5%	4%	6%	6%	8%	1%	8%	2%	3%		1%	5%	4%	4%
Standard Deviation	0.4 %	0.1 %	0.1 %		2%	1.1 %	1.6 %	2.5 %	3.3 %	0.6 %	0.3 %	2.4 %	2.7 %	1.9 %	1.4 %	1.8 %	1.2 %	1.6 %	0.2 %	0.8 %	5.3 %	1%		3.4 %	14.8 %	0.5 %	0.5 %

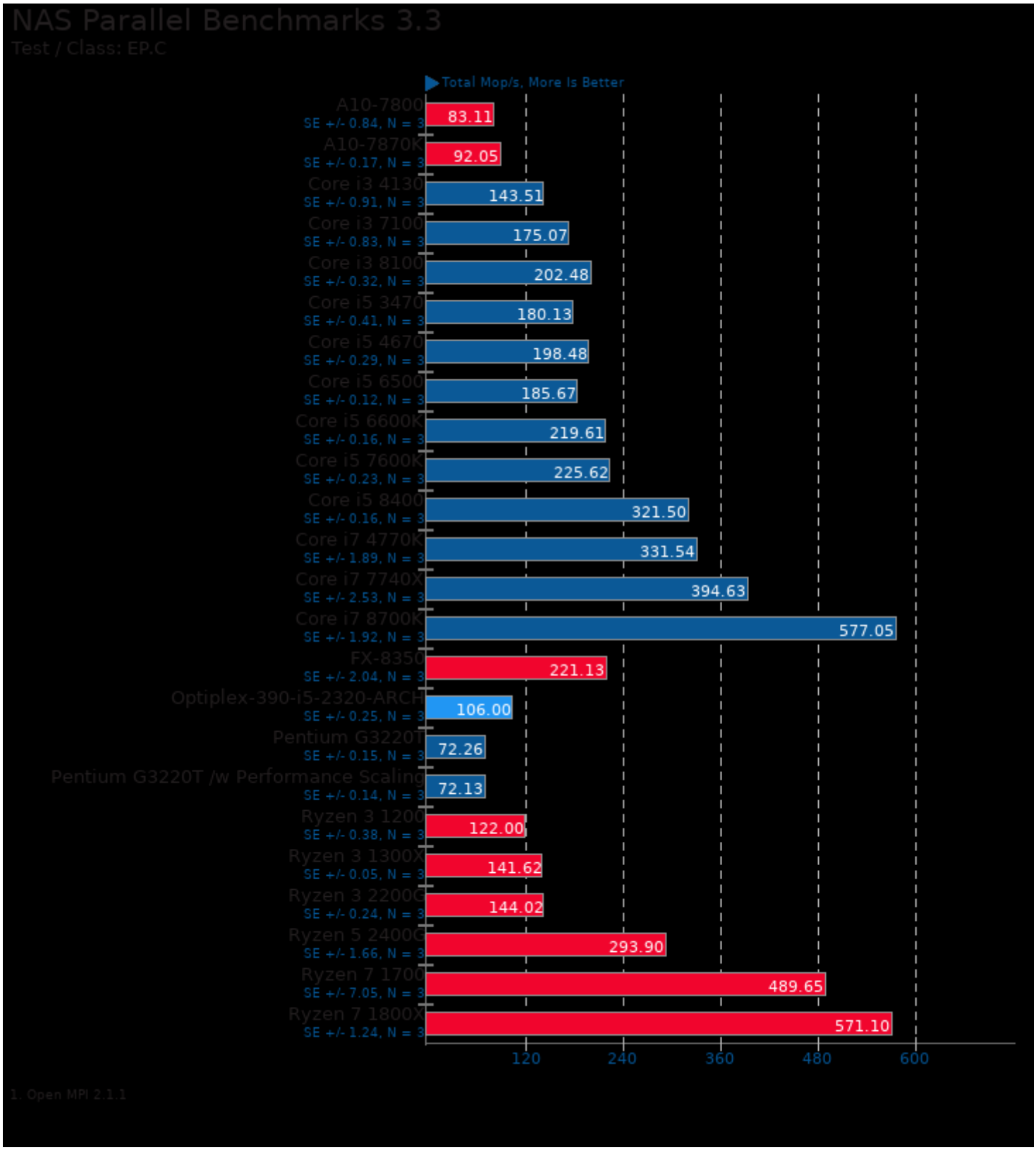
AMD Ryzen 3 2200G Linux CPU Benchmarks With Ryzen 5 2400G

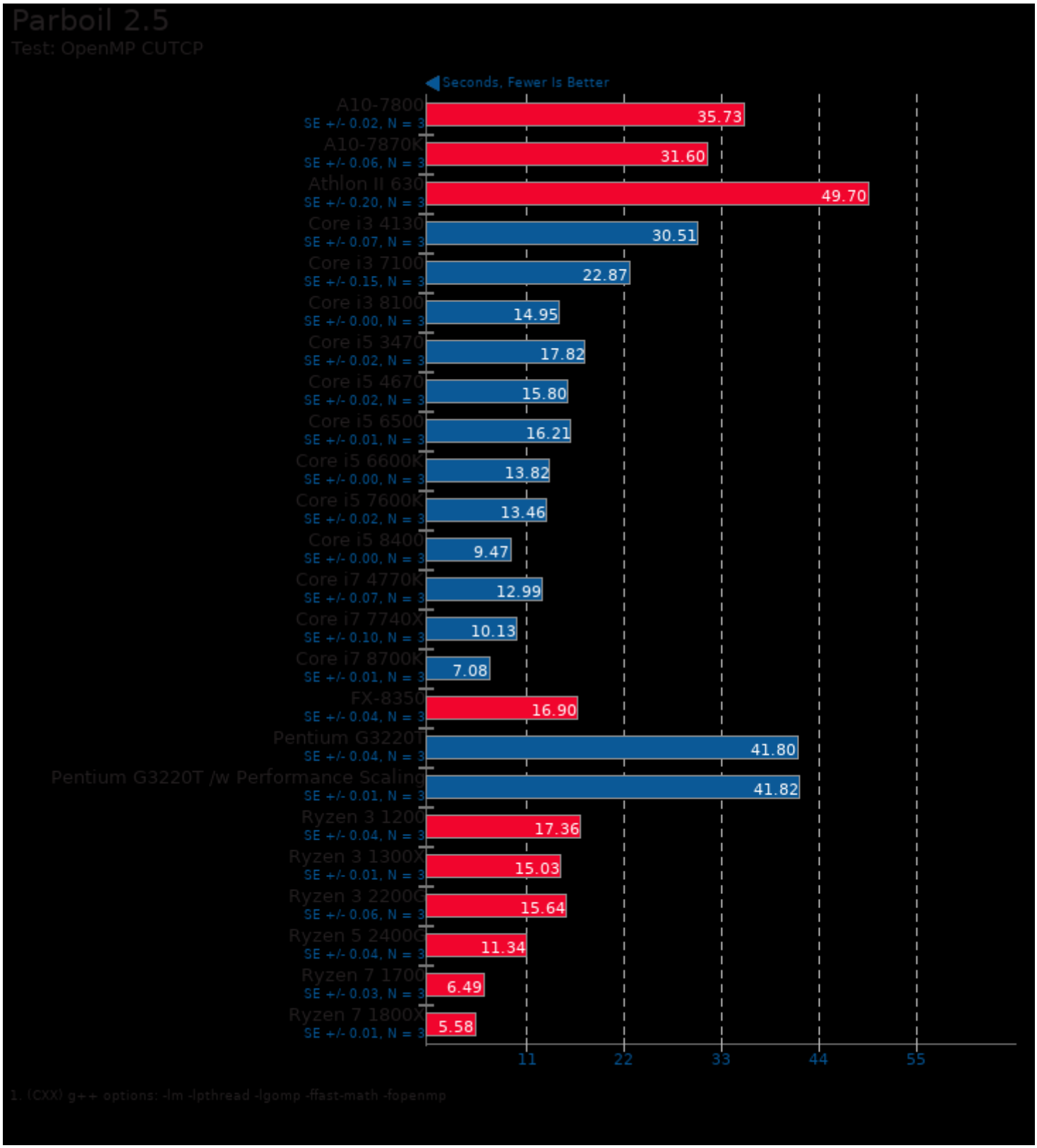
OpenSSL - R.4.b.P (Signs/sec)	29	33	70		71	73	79	13	15	30	59	10	49	64	94	11	11	16	68	13	19	31		41	82	23	23
	9.7	9.7	5.2		0.5	4.2	3.8	80	93	8.9	7.1	43	9.2	5.1	2.7	43	48	71	9.3	13	80	7.3		3.2	6.3	2.9	2.9
	3	0	0		3	0	0			7	3		3	0	3				0			7		7	3	3	7
Normalized	15.1	17.1	35.6		35.8	37.0	40.1	69.7	80.4	15.6	30.1	52.6	25.2	32.5	47.6	57.7	57.9	84.4	34.8	66.3	100	16.0		20.8	41.7	11.7	11.7
d	4%	6%	2%		9%	9%	%	2%	7%	1%	6%	8%	2%	9%	2%	6%	8%	2%	2%	2%	%	3%		8%	4%	7%	7%
Standard Deviation	1%	0.5 %	0.1 %		6.4 %	1.1 %	2.1 %	0.1 %	0.1 %	0%	0.3 %	2.2 %	4%	0.2 %	2.3 %	0%	2.8 %	0%	0.1 %	2.7 %	0.1 %	0.3 %		0%	0.4 %	0.2 %	0%
Java JMH - Throughput (Ops/s)	34	38	80	61	71	73	74	12	14	67	77	14	12	14	13	15	15	22	15	17	25			11	75	32	33
	87	94	56	74	69	85	05	78	78	39	90	38	39	33	18	58	98	77	49	92	75			94	40	90	08
	05	12	29	07	11	10	45	36	08	70	12	23	11	72	76	20	35	54	91	08	62			16	79	43	62
	99	39	69	80	09	71	34	88	54	82	93	33	66	75	79	92	91	63	95	02	00			42	18	55	30
	08	75	46	43	74	72	45	16	84	81	36	76	25	79	15	81	76	20	57	34	60			50	06	18	91
								7	1			5	2	5	0	1	4	1	9	4	8			2			
Normalized	13.5	15.1	31.2	23.9	27.8	28.6	28.7	49.6	57.3	26.1	30.2	55.8	48.1	55.6	51.2	60.5	62.0	88.4	60.1	69.5	100			46.3	29.2	12.7	12.7
d	4%	2%	8%	7%	3%	7%	5%	3%	9%	7%	5%	4%	1%	7%	%	%	6%	3%	8%	8%	%			6%	8%	8%	5%
PyBench - T.F.A.T.T (Milliseconds)	22	20	20	16	14	15	14	15	13	15	12	13	17	13	13	12	11	12	13	10	10	45				20	20
	64	28	48	55	98	47	58	18	95	65	37	40	23	90	42	39	49	09	56	75	31	38				52	50
Normalized	45.5	50.8	50.3	62.3	68.8	66.6	70.7	67.9	73.9	65.8	83.3	76.9	59.8	74.1	76.8	83.2	89.7	85.2	76.0	95.9	100	22.7				50.2	50.2
d	4%	4%	4%	%	3%	5%	1%	2%	1%	8%	5%	4%	4%	7%	3%	1%	3%	8%	3%	1%	%	2%				4%	9%
Standard Deviation	0.3 %	0.4 %	0.1 %	0.1 %	0.3 %	0.9 %	0.2 %	0.2 %	0.4 %	0.3 %	0.2 %	0.1 %	0.4 %		0.1 %	0.1 %		0.4 %	0.2 %	0.1 %	0.2 %	1.6 %					0.2 %
NGINX Benchmark - S.W.P.S (Reqs/sec)	19	21	19	29	32	33	33	29	32	20	36	36	20	35	34	39	40	40	36	45	44					22	22
	11	35	62	14	63	62	45	82	96	65	75	31	76	67	80	23	48	53	37	47	91					34	44
	3	9	8	5	3	1	0	0	4	5	7	1	2	2	0	4	3	3	4	6	6					4	7
Normalized	42.0	46.9	43.1	64.0	71.7	73.9	73.5	65.5	72.4	45.4	80.8	79.8	45.6	78.4	76.5	86.2	89.0	89.1	79.9	100	98.7					49.1	49.1
d	3%	7%	6%	9%	6%	3%	5%	7%	9%	2%	3%	5%	5%	4%	2%	7%	2%	3%	8%	%	7%					3%	6%
Standard Deviation	0.7 %	1.1 %	0.5 %	1.7 %	0.2 %			1.2 %	0.1 %	3%	0.4 %	0.6 %	0.2 %	0.2 %	0.5 %	0.8 %	1.6 %	0.5 %	0.4 %	1.1 %	3.3 %					0.8 %	0.7 %
PHPBench - P.B.S (Score)	30	33	34	36	40	39	41	39	43	42	56	53	36	51	52	57	61	58	50	64	67	23		34	47	38	38
	37	68	55	54	54	01	38	56	11	92	15	15	28	27	69	18	62	87	61	42	84	96		38	47	84	78
	43	31	60	19	18	05	82	09	08	58	62	84	07	18	13	80	81	30	77	93	65	68		98	11	82	23
Normalized	44.7	49.6	50.9	53.8	59.7	57.5	61%	58.3	63.5	63.2	82.7	78.3	53.4	75.5	77.6	84.2	90.8	86.7	74.6	94.9	100	35.3		50.6	69.9	57.2	57.2
d	7%	5%	3%	6%	6%	%		1%	4%	7%	7%	5%	7%	7%	6%	9%	3%	7%	1%	6%	%	3%		9%	7%	6%	6%
Standard Deviation	1.7 %	1.6 %	0.9 %	0.7 %	1%	2.4 %	1.5 %	1%	3.2 %	4.9 %	1.3 %	0.1 %	1.6 %	0.2 %	0.5 %	0.3 %	0.2 %	0.1 %	3.1 %	1.7 %	1.2 %	0.5 %		0.6 %	0.3 %	0.5 %	0.2 %

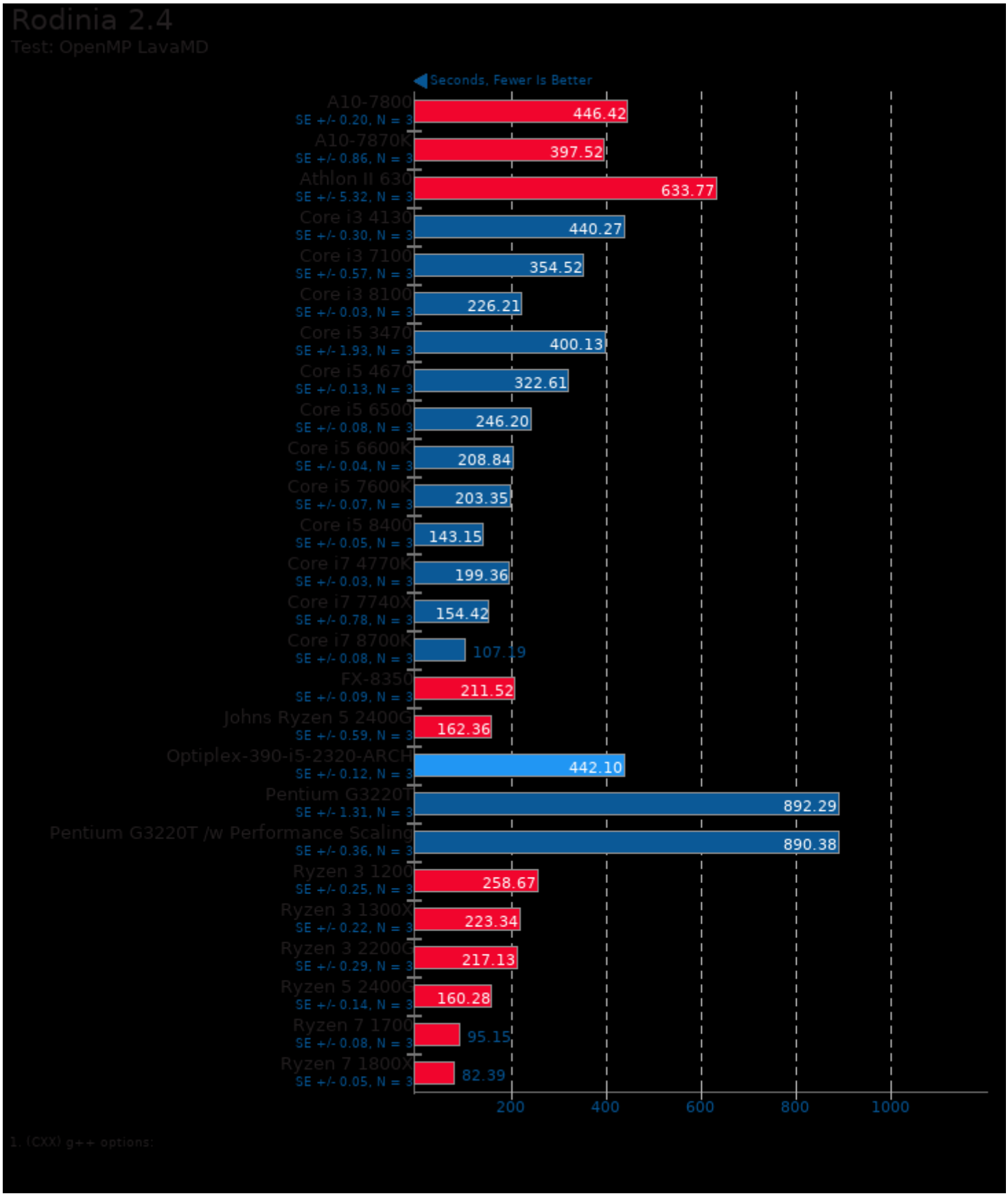
NAS Parallel Benchmarks - Performance / Cost - EP.C (Mop/s/Dollar)	1.16	1.13	**1.12**	1.56	1.69	1.64	**1.70**	**1.70**	1.61
Normalized	68.24%	66.47%	65.88%	91.76%	99.41%	96.47%	100%	100%	94.71%
John The Ripper - Performance / Cost - Blowfish (Real C/S/Dollar)	35.34	35.14	35.19	**31.86**	36.09	35.66	**37.07**	37.03	35.54
Normalized	95.33%	94.79%	94.93%	85.95%	97.36%	96.26%	100%	99.89%	95.87%
TTSIOD 3D Renderer - Performance / Cost - P.R.W.S.S.M (FPS/Dollar)	1.17	1.08	1.38	1.12	0.95	**0.89**	**1.41**	1.39	1.09
Normalized	82.98%	76.6%	97.87%	79.43%	67.38%	63.12%	100%	98.58%	77.38%

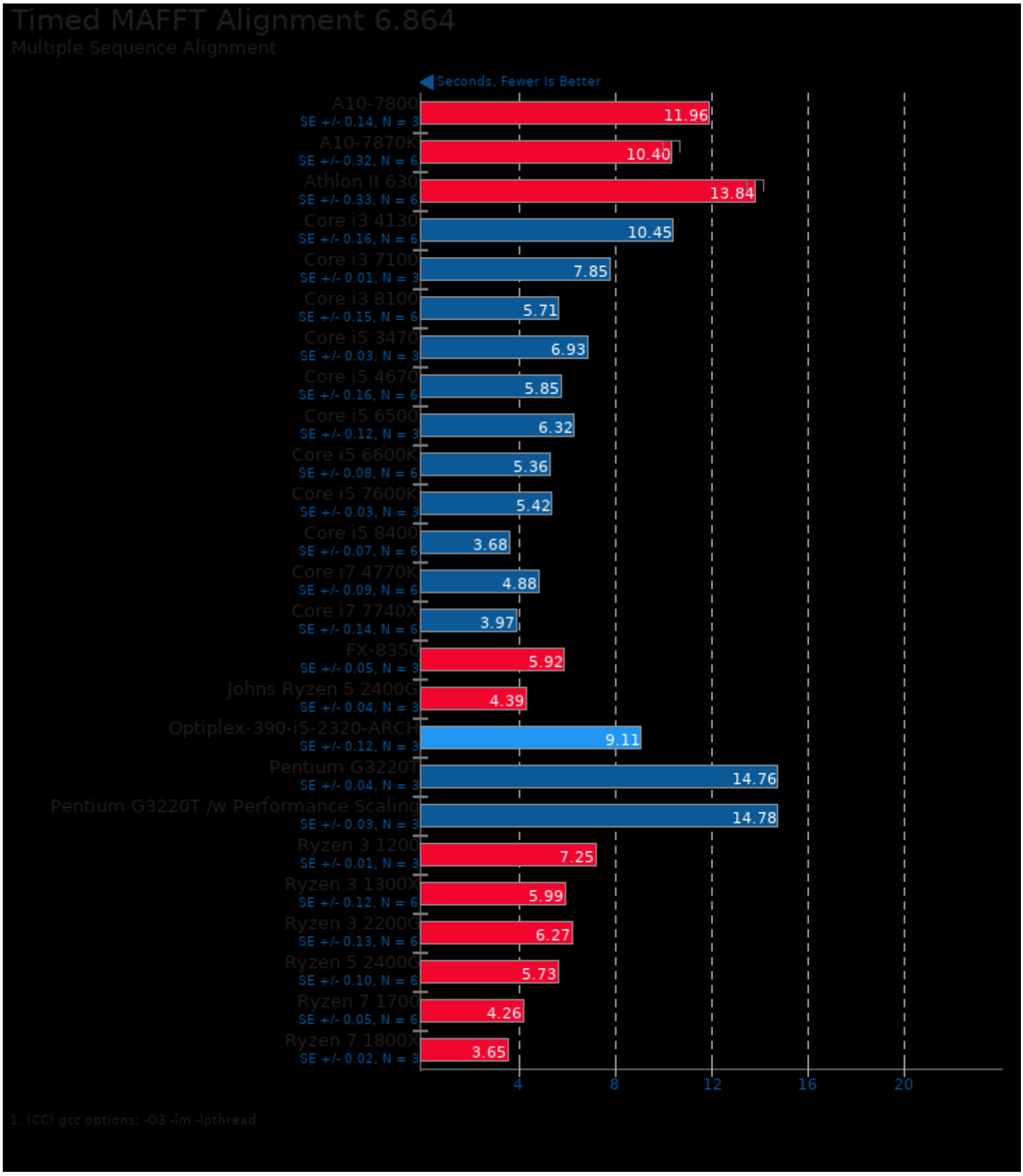
x264 - Performance / Cost - H.2.V.E (FPS/Dollar)	0.22	0.22	0.21	0.18	0.21	0.20	0.26	0.30	0.20
Normalized	73.33%	73.33%	70%	60%	70%	66.67%	86.67%	100%	66.67%
7-Zip Compression - Performance / Cost - C.S.T (MIPS/Dollar)	120.01	127.04	122.05	93.80	105.98	94.62	144.71	143.01	108.74
Normalized	82.93%	87.79%	84.34%	64.82%	73.24%	65.39%	100%	98.83%	75.14%
asmFish - Performance / Cost - 1.H.M.2.D (Nodes/s/Dollar	6975028099	6628509	6650099	6538061	6955661	6498411	8270702	8419296	6528286
Normalized	82.84%	78.73%	78.99%	77.65%	82.61%	77.18%	98.22%	100%	77.54%
Java JMH - Performance / Cost - Throughput (Ops/s/Dollar)	58807	57352	57248	39218	44232	42035	120859	120505	71474
Normalized	48.65%	47.45%	47.37%	32.43%	36.60%	35.04%	100%	99.71%	59.16%

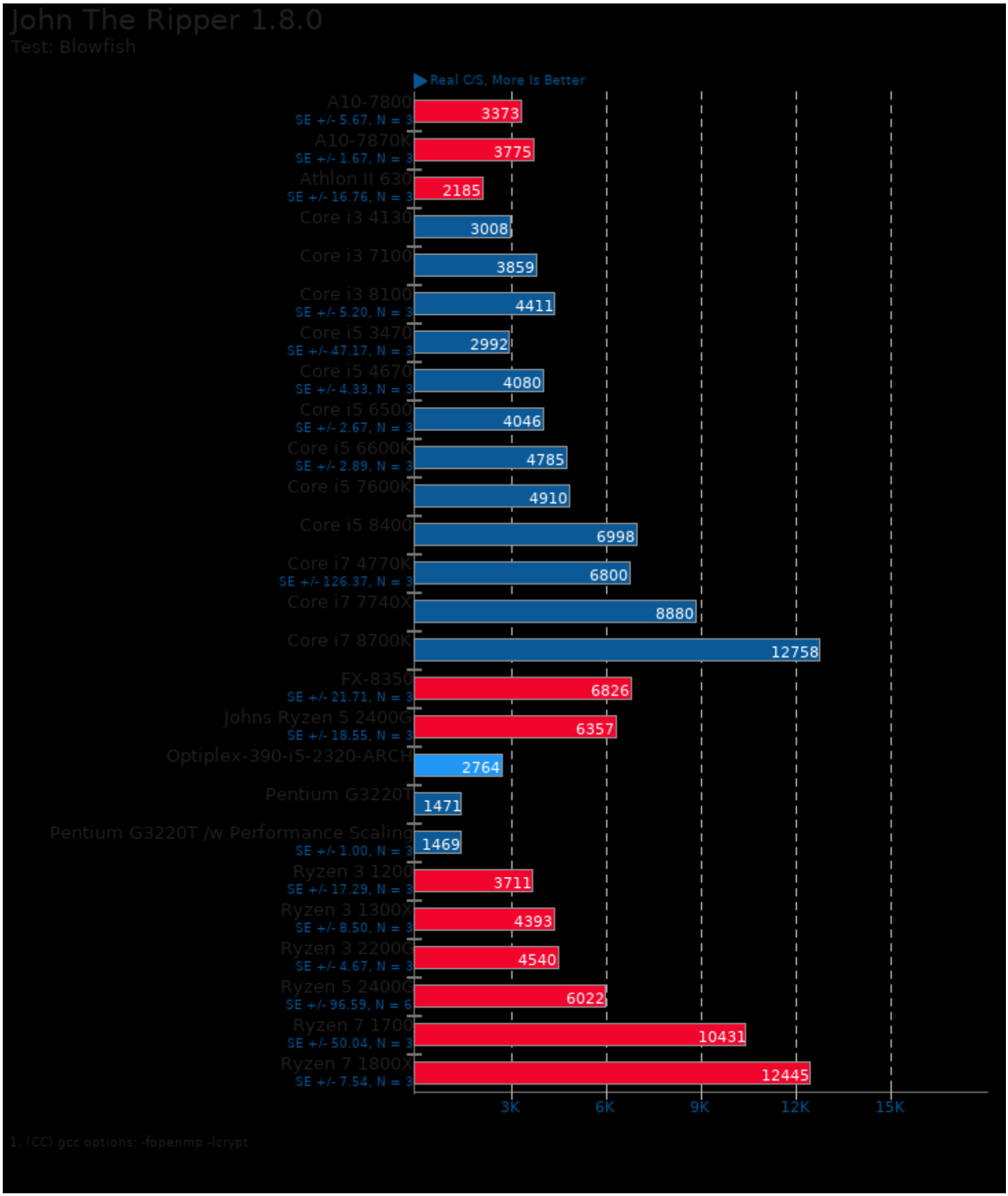
NGINX Benchmark - Performance / Cost - S.W.P.S (Reqs/sec/Dollar)	27	26	26	17	10	**94.45**	**30**		21	12
	7.57	1.07	0.63	6.98	3.18		**5.13**		4.46	5.11
Normalized	90.9%	85.5%	85.4%	58%	33.8%	30.9%	100%		70.2%	41%
PHPBench - Performance / Cost - P.B.S (Score/Dollar)	34	32	30	21	13	**12**	**44**		31	18
	80	43	24	90	69	**35**	**67**		15	90
Normalized	77.9%	72.6%	67.7%	49.0%	30.6%	27.6%	100%		69.7%	42.3%
OpenSSL - Performance / Cost - R.4.b.P (Signs/sec/Dollar)		5.68	5.69	**4.20**	4.78	4.56	8.76		**8.84**	5.51
Normalized		64.25%	64.37%	47.51%	54.07%	51.58%	99.1%		100%	62.33%

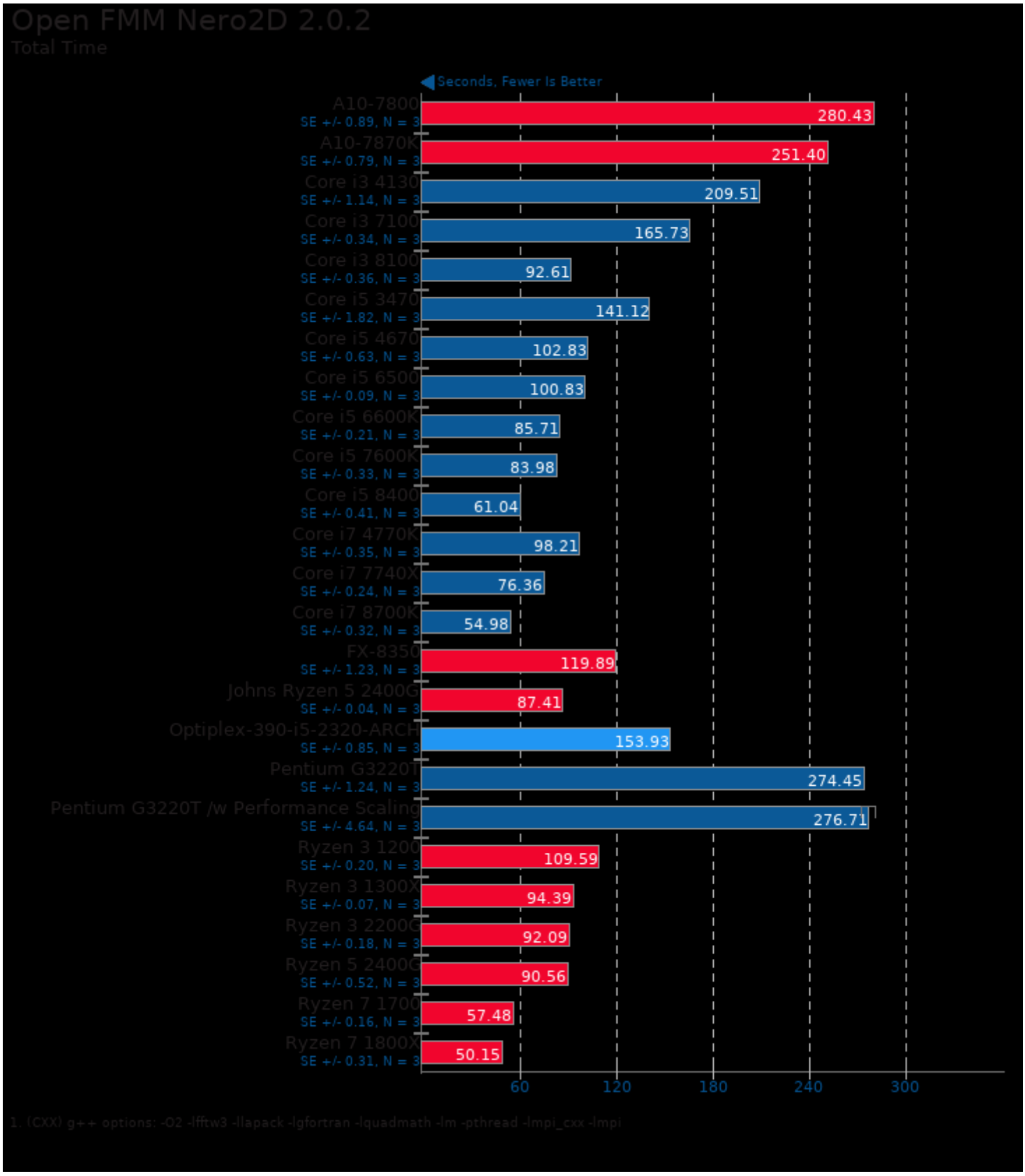

NAS Parallel Benchmarks 3.3
Test / Class: EP.C
Total Mop/s, More Is Better
A10-7800
SE +/- 0.84, N = 3
83.11
A10-7870K
SE +/- 0.17, N = 3
92.05
Core i3 4130
SE +/- 0.91, N = 3
143.51
Core i3 7100
SE +/- 0.83, N = 3
175.07
Core i3 8100
SE +/- 0.32, N = 3
202.48
Core i5 3470
SE +/- 0.41, N = 3
180.13
Core 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 7740X
SE +/- 2.53, N = 3
394.63
Core i7 8700K
SE +/- 1.92, N = 3
577.05
FX-8350
SE +/- 2.04, N = 3
221.13
Optiplex-390-i5-2320-ARCH
SE +/- 0.25, N = 3
106.00
Pentium G3220T
SE +/- 0.15, N = 3
72.26
Pentium G3220T /w Performance Scaling
SE +/- 0.14, N = 3
72.13
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
120
240
360
480
600
1. Open MPI 2.1.1

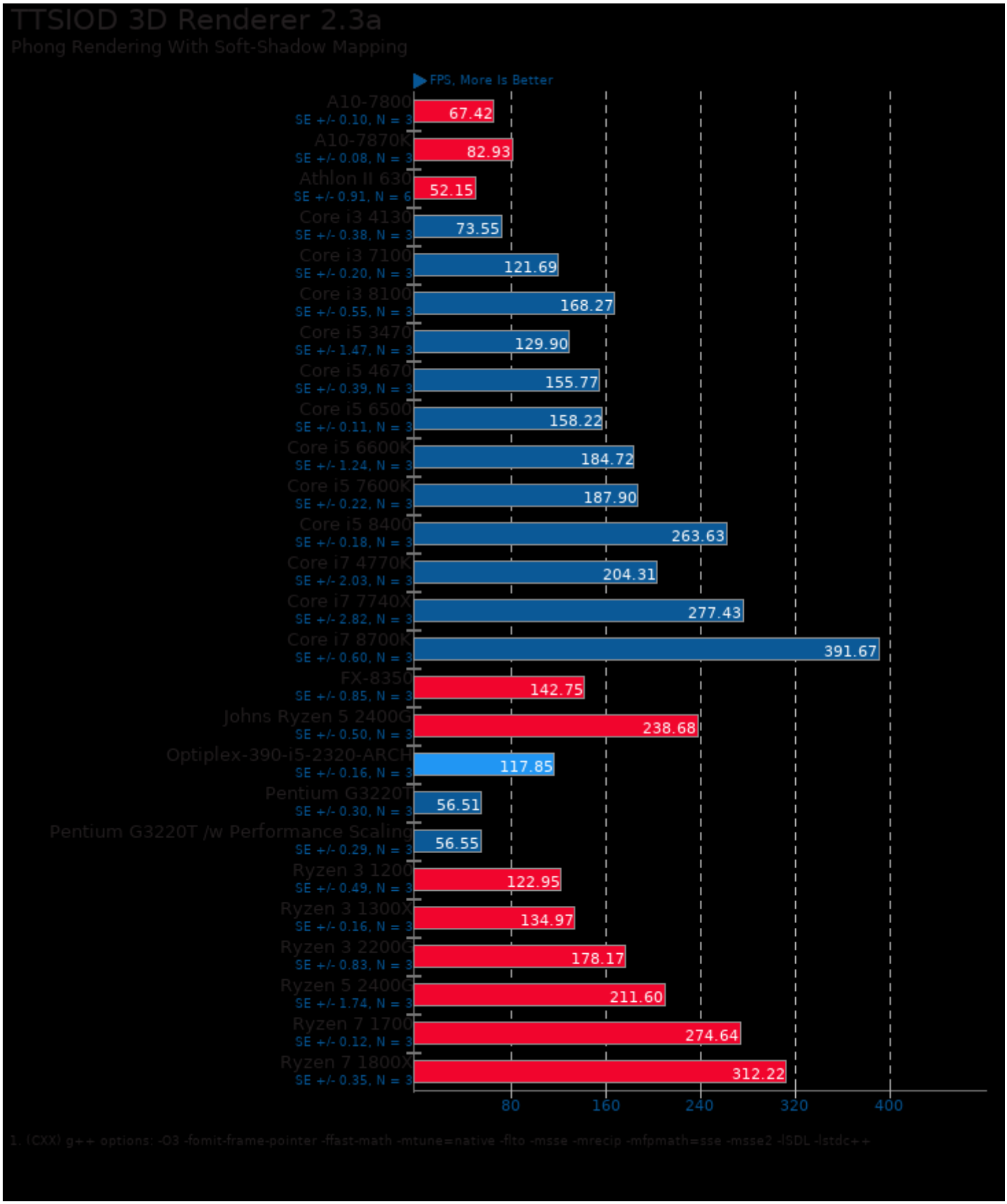

Parboil 2.5
Test: OpenMP CUTCP
Seconds, Fewer Is Better
A10-7800
SE +/- 0.02, N = 3
35.73
A10-7870K
SE +/- 0.06, N = 3
31.60
Athlon II 630
SE +/- 0.20, N = 3
49.70
Core i3 4130
SE +/- 0.07, N = 3
30.51
Core i3 7100
SE +/- 0.15, N = 3
22.87
Core i3 8100
SE +/- 0.00, N = 3
14.95
Core i5 3470
SE +/- 0.02, N = 3
17.82
Core i5 4670
SE +/- 0.02, N = 3
15.80
Core i5 6500
SE +/- 0.01, N = 3
16.21
Core i5 6600K
SE +/- 0.00, N = 3
13.82
Core i5 7600K
SE +/- 0.02, N = 3
13.46
Core i5 8400
SE +/- 0.00, N = 3
9.47
Core i7 4770K
SE +/- 0.07, N = 3
12.99
Core i7 7740X
SE +/- 0.10, N = 3
10.13
Core i7 8700K
SE +/- 0.01, N = 3
7.08
FX-8350
SE +/- 0.04, N = 3
16.90
Pentium G3220T
SE +/- 0.04, N = 3
41.80
Pentium G3220T /w Performance Scaling
SE +/- 0.01, N = 3
41.82
Ryzen 3 1200
SE +/- 0.04, N = 3
17.36
Ryzen 3 1300X
SE +/- 0.01, N = 3
15.03
Ryzen 3 2200G
SE +/- 0.06, N = 3
15.64
Ryzen 5 2400G
SE +/- 0.04, N = 3
11.34
Ryzen 7 1700
SE +/- 0.03, N = 3
6.49
Ryzen 7 1800X
SE +/- 0.01, N = 3
5.58
11
22
33
44
55
1. (CXX) g++ options: -lm -lpthread -lgomp -ffast-math -fopenmp

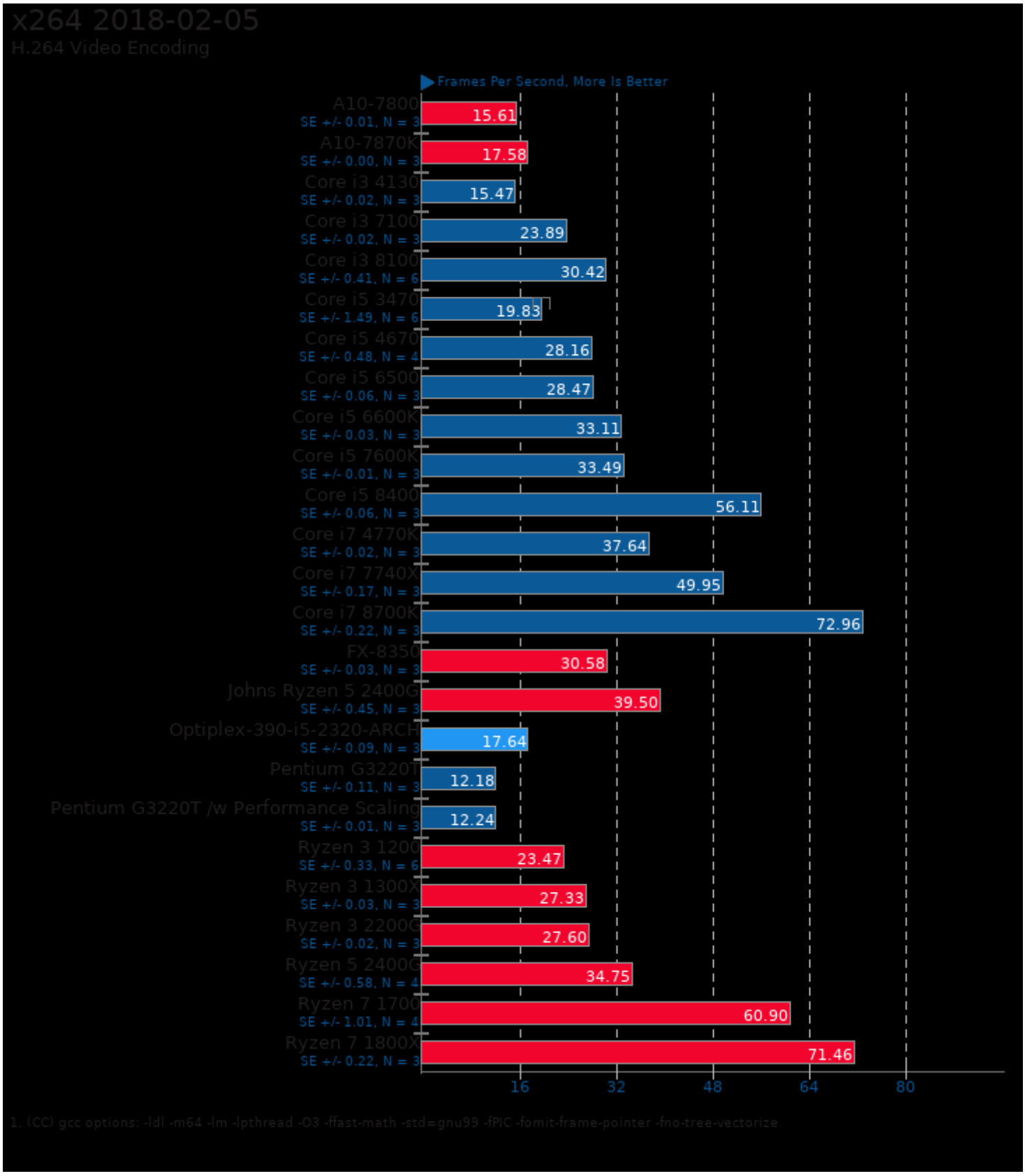

Rodinia 2.4
Test: OpenMP LavaMD
Seconds, Fewer Is Better
A10-7800
SE +/- 0.20, N = 3
446.42
A10-7870K
SE +/- 0.86, N = 3
397.52
Athlon II 630
SE +/- 5.32, N = 3
633.77
Core i3 4130
SE +/- 0.30, N = 3
440.27
Core i3 7100
SE +/- 0.57, N = 3
354.52
Core i3 8100
SE +/- 0.03, N = 3
226.21
Core i5 3470
SE +/- 1.93, N = 3
400.13
Core i5 4670
SE +/- 0.13, N = 3
322.61
Core i5 6500
SE +/- 0.08, N = 3
246.20
Core i5 6600K
SE +/- 0.04, N = 3
208.84
Core i5 7600K
SE +/- 0.07, N = 3
203.35
Core i5 8400
SE +/- 0.05, N = 3
143.15
Core i7 4770K
SE +/- 0.03, N = 3
199.36
Core i7 7740X
SE +/- 0.78, N = 3
154.42
Core i7 8700K
SE +/- 0.08, N = 3
107.19
FX-8350
SE +/- 0.09, N = 3
211.52
Johns Ryzen 5 2400G
SE +/- 0.59, N = 3
162.36
Optiplex-390-i5-2320-ARCH
SE +/- 0.12, N = 3
442.10
Pentium G3220T
SE +/- 1.31, N = 3
892.29
Pentium G3220T /w Performance Scaling
SE +/- 0.36, N = 3
890.38
Ryzen 3 1200
SE +/- 0.25, N = 3
258.67
Ryzen 3 1300X
SE +/- 0.22, N = 3
223.34
Ryzen 3 2200G
SE +/- 0.29, N = 3
217.13
Ryzen 5 2400G
SE +/- 0.14, N = 3
160.28
Ryzen 7 1700
SE +/- 0.08, N = 3
95.15
Ryzen 7 1800X
SE +/- 0.05, N = 3
82.39
200
400
600
800
1000
1. (CXX) g++ options:

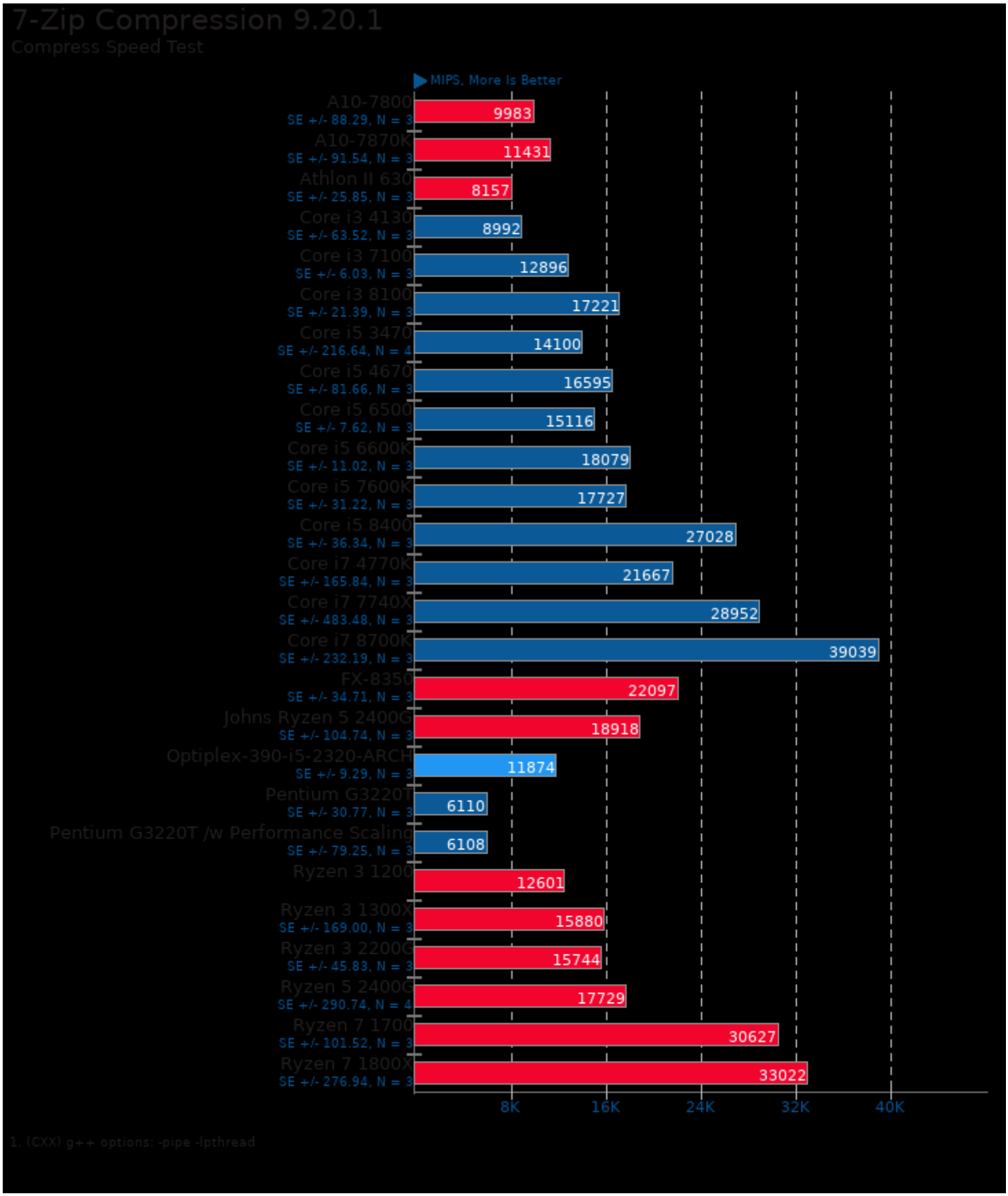

Timed MAFFT Alignment 6.864
Multiple Sequence Alignment
Seconds, Fewer Is Better
A10-7800
SE +/- 0.14, N = 3
11.96
A10-7870K
SE +/- 0.32, N = 6
10.40
Athlon II 630
SE +/- 0.33, N = 6
13.84
Core i3 4130
SE +/- 0.16, N = 6
10.45
Core i3 7100
SE +/- 0.01, N = 3
7.85
Core i3 8100
SE +/- 0.15, N = 6
5.71
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 7740X
SE +/- 0.14, N = 6
3.97
FX-8350
SE +/- 0.05, N = 3
5.92
Johns Ryzen 5 2400G
SE +/- 0.04, N = 3
4.39
Optiplex-390-i5-2320-ARCH
SE +/- 0.12, N = 3
9.11
Pentium G3220T
SE +/- 0.04, N = 3
14.76
Pentium G3220T /w Performance Scaling
SE +/- 0.03, N = 3
14.78
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
4
8
12
16
20
1. (CC) gcc options: -O3 -lm -lpthread

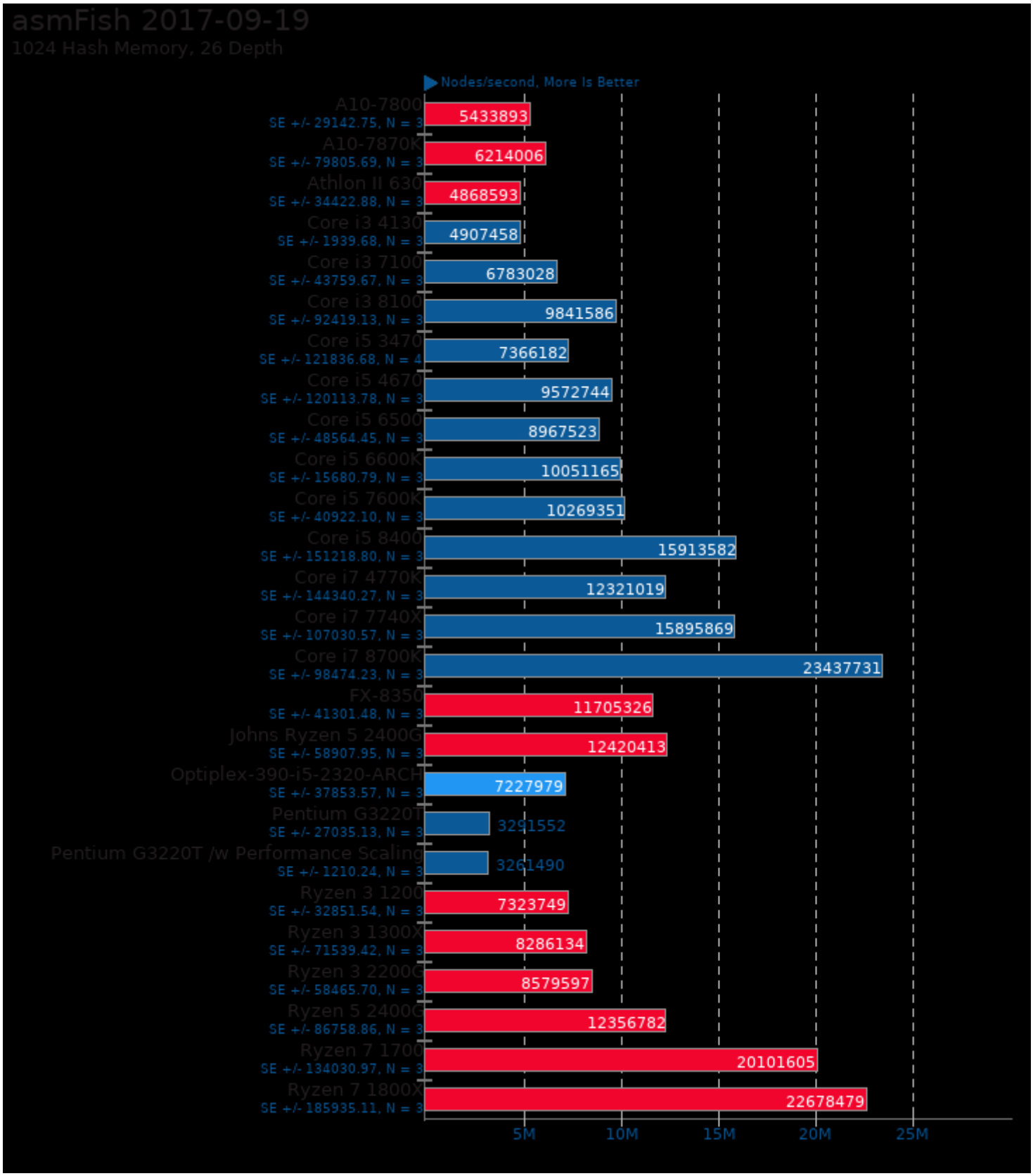

John The Ripper 1.8.0
Test: Blowfish
Real C/S, More Is Better
A10-7800
SE +/- 5.67, N = 3
3373
A10-7870K
SE +/- 1.67, N = 3
3775
Athlon II 630
SE +/- 16.76, N = 3
2185
Core i3 4130
3008
Core i3 7100
3859
Core i3 8100
SE +/- 5.20, N = 3
4411
Core i5 3470
SE +/- 47.17, N = 3
2992
Core i5 4670
SE +/- 4.33, 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 7740X
8880
Core i7 8700K
12758
FX-8350
SE +/- 21.71, N = 3
6826
Johns Ryzen 5 2400G
SE +/- 18.55, N = 3
6357
Optiplex-390-i5-2320-ARCH
2764
Pentium G3220T
1471
Pentium G3220T /w Performance Scaling
SE +/- 1.00, N = 3
1469
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
3K
6K
9K
12K
15K
1. (CC) gcc options: -fopenmp -lcrypt

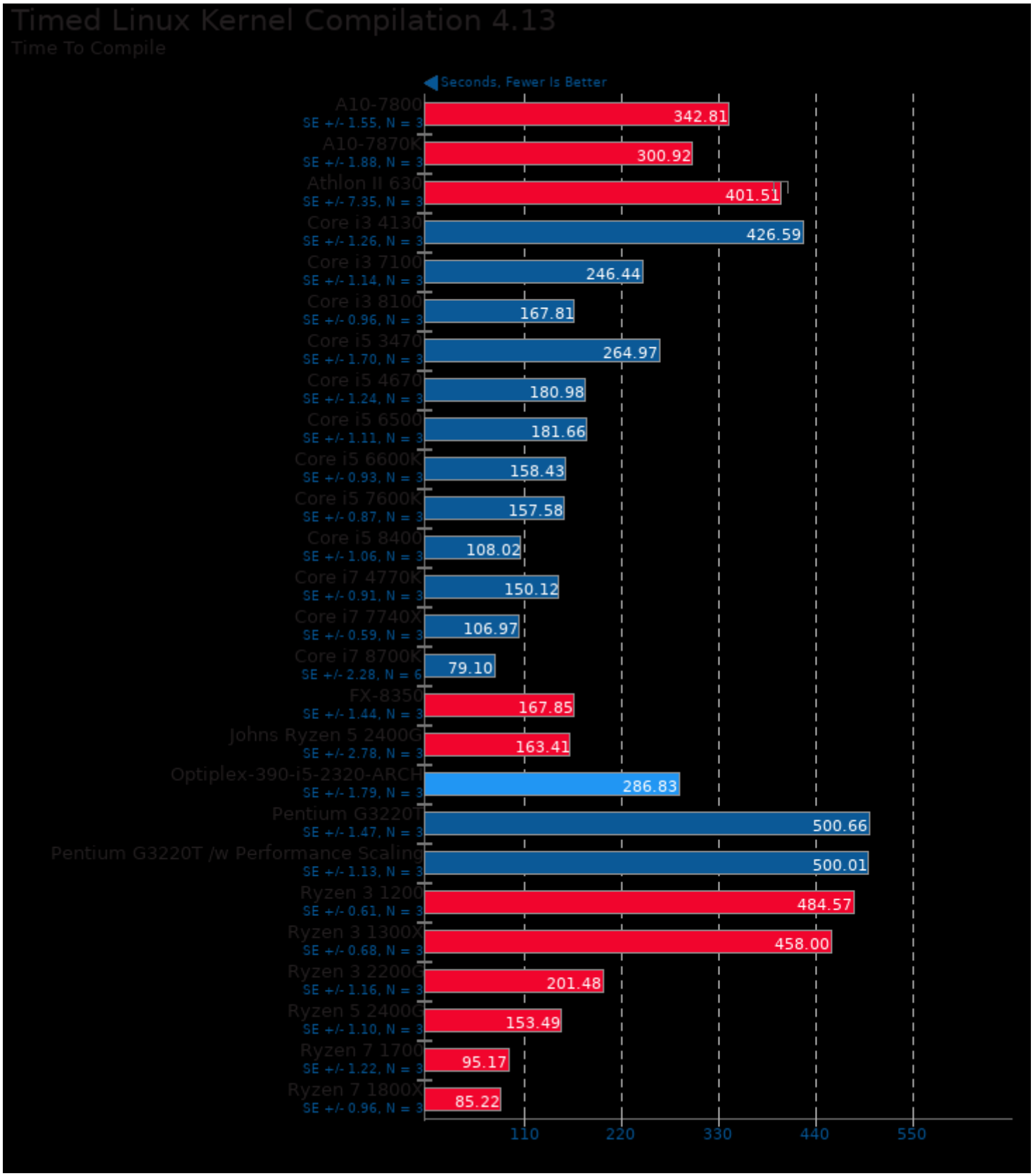

Open FMM Nero2D 2.0.2
Total Time
Seconds, Fewer Is Better
A10-7800
SE +/- 0.89, N = 3
280.43
A10-7870K
SE +/- 0.79, N = 3
251.40
Core i3 4130
SE +/- 1.14, N = 3
209.51
Core i3 7100
SE +/- 0.34, N = 3
165.73
Core i3 8100
SE +/- 0.36, N = 3
92.61
Core i5 3470
SE +/- 1.82, N = 3
141.12
Core i5 4670
SE +/- 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 7740X
SE +/- 0.24, N = 3
76.36
Core i7 8700K
SE +/- 0.32, N = 3
54.98
FX-8350
SE +/- 1.23, N = 3
119.89
Johns Ryzen 5 2400G
SE +/- 0.04, N = 3
87.41
Optiplex-390-i5-2320-ARCH
SE +/- 0.85, N = 3
153.93
Pentium G3220T
SE +/- 1.24, N = 3
274.45
Pentium G3220T /w Performance Scaling
SE +/- 4.64, N = 3
276.71
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
60
120
180
240
300
1. (CXX) g++ options: -O2 -lfftw3 -llapack -lgfortran -lquadmath -lm -pthread -lmpi_cxx -lmpi

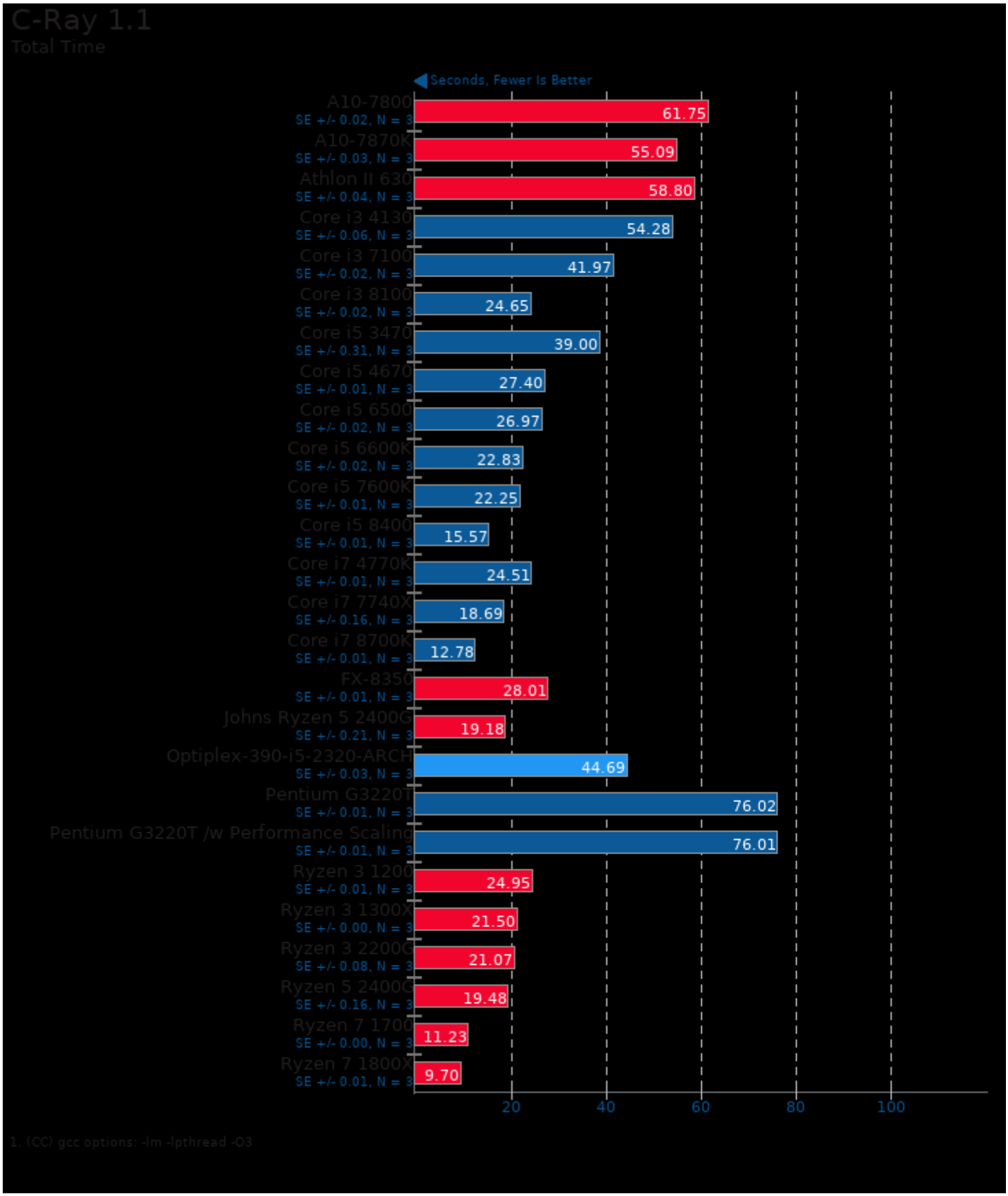

TTSIOD 3D Renderer 2.3a
Phong Rendering With Soft-Shadow Mapping
FPS, More Is Better
A10-7800
SE +/- 0.10, N = 3
67.42
A10-7870K
SE +/- 0.08, N = 3
82.93
Athlon II 630
SE +/- 0.91, N = 6
52.15
Core i3 4130
SE +/- 0.38, N = 3
73.55
Core i3 7100
SE +/- 0.20, N = 3
121.69
Core i3 8100
SE +/- 0.55, N = 3
168.27
Core i5 3470
SE +/- 1.47, N = 3
129.90
Core i5 4670
SE +/- 0.39, N = 3
155.77
Core i5 6500
SE +/- 0.11, N = 3
158.22
Core i5 6600K
SE +/- 1.24, N = 3
184.72
Core i5 7600K
SE +/- 0.22, N = 3
187.90
Core i5 8400
SE +/- 0.18, N = 3
263.63
Core i7 4770K
SE +/- 2.03, N = 3
204.31
Core i7 7740X
SE +/- 2.82, N = 3
277.43
Core i7 8700K
SE +/- 0.60, N = 3
391.67
FX-8350
SE +/- 0.85, N = 3
142.75
Johns Ryzen 5 2400G
SE +/- 0.50, N = 3
238.68
Optiplex-390-i5-2320-ARCH
SE +/- 0.16, N = 3
117.85
Pentium G3220T
SE +/- 0.30, N = 3
56.51
Pentium G3220T /w Performance Scaling
SE +/- 0.29, N = 3
56.55
Ryzen 3 1200
SE +/- 0.49, N = 3
122.95
Ryzen 3 1300X
SE +/- 0.16, N = 3
134.97
Ryzen 3 2200G
SE +/- 0.83, N = 3
178.17
Ryzen 5 2400G
SE +/- 1.74, N = 3
211.60
Ryzen 7 1700
SE +/- 0.12, N = 3
274.64
Ryzen 7 1800X
SE +/- 0.35, N = 3
312.22
80
160
240
320
400
1. (CXX) g++ options: -O3 -fomit-frame-pointer -ffast-math -mtune=native -flto -msse -mrecip -mfpmath=sse -msse2 -lSDL -lstdc++

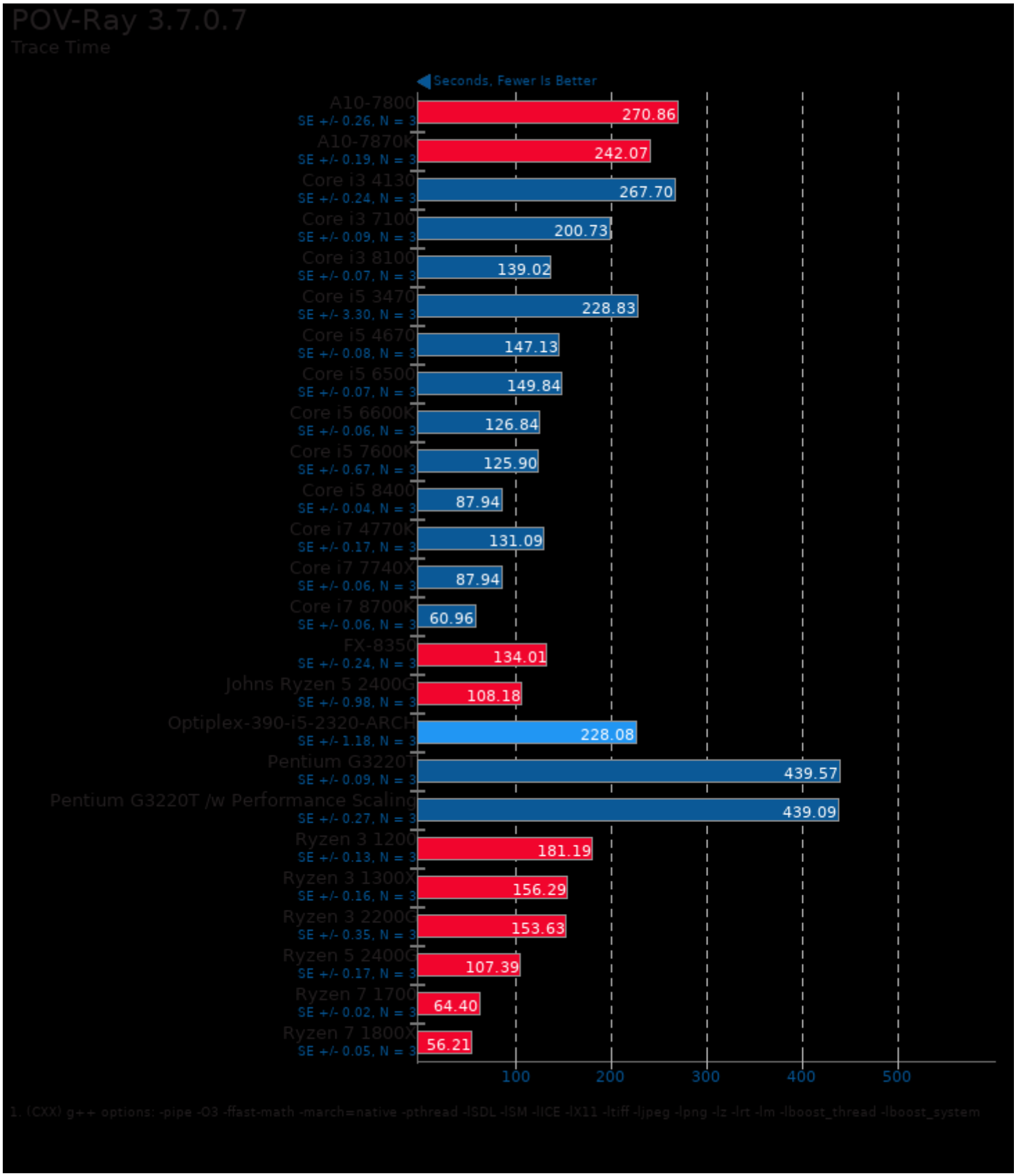

x264 2018-02-05
H.264 Video Encoding
Frames Per Second, More Is Better
A10-7800
SE +/- 0.01, N = 3
15.61
A10-7870K
SE +/- 0.00, N = 3
17.58
Core i3 4130
SE +/- 0.02, N = 3
15.47
Core i3 7100
SE +/- 0.02, N = 3
23.89
Core i3 8100
SE +/- 0.41, N = 6
30.42
Core i5 3470
SE +/- 1.49, N = 6
19.83
Core i5 4670
SE +/- 0.48, N = 4
28.16
Core i5 6500
SE +/- 0.06, N = 3
28.47
Core i5 6600K
SE +/- 0.03, N = 3
33.11
Core i5 7600K
SE +/- 0.01, N = 3
33.49
Core i5 8400
SE +/- 0.06, N = 3
56.11
Core i7 4770K
SE +/- 0.02, N = 3
37.64
Core i7 7740X
SE +/- 0.17, N = 3
49.95
Core i7 8700K
SE +/- 0.22, N = 3
72.96
FX-8350
SE +/- 0.03, N = 3
30.58
Johns Ryzen 5 2400G
SE +/- 0.45, N = 3
39.50
Optiplex-390-i5-2320-ARCH
SE +/- 0.09, N = 3
17.64
Pentium G3220T
SE +/- 0.11, N = 3
12.18
Pentium G3220T /w Performance Scaling
SE +/- 0.01, N = 3
12.24
Ryzen 3 1200
SE +/- 0.33, N = 6
23.47
Ryzen 3 1300X
SE +/- 0.03, N = 3
27.33
Ryzen 3 2200G
SE +/- 0.02, N = 3
27.60
Ryzen 5 2400G
SE +/- 0.58, N = 4
34.75
Ryzen 7 1700
SE +/- 1.01, N = 4
60.90
Ryzen 7 1800X
SE +/- 0.22, N = 3
71.46
16
32
48
64
80
1. (CC) gcc options: -ldl -m64 -lm -lpthread -O3 -ffast-math -std=gnu99 -fPIC -fomit-frame-pointer -fno-tree-vectorize

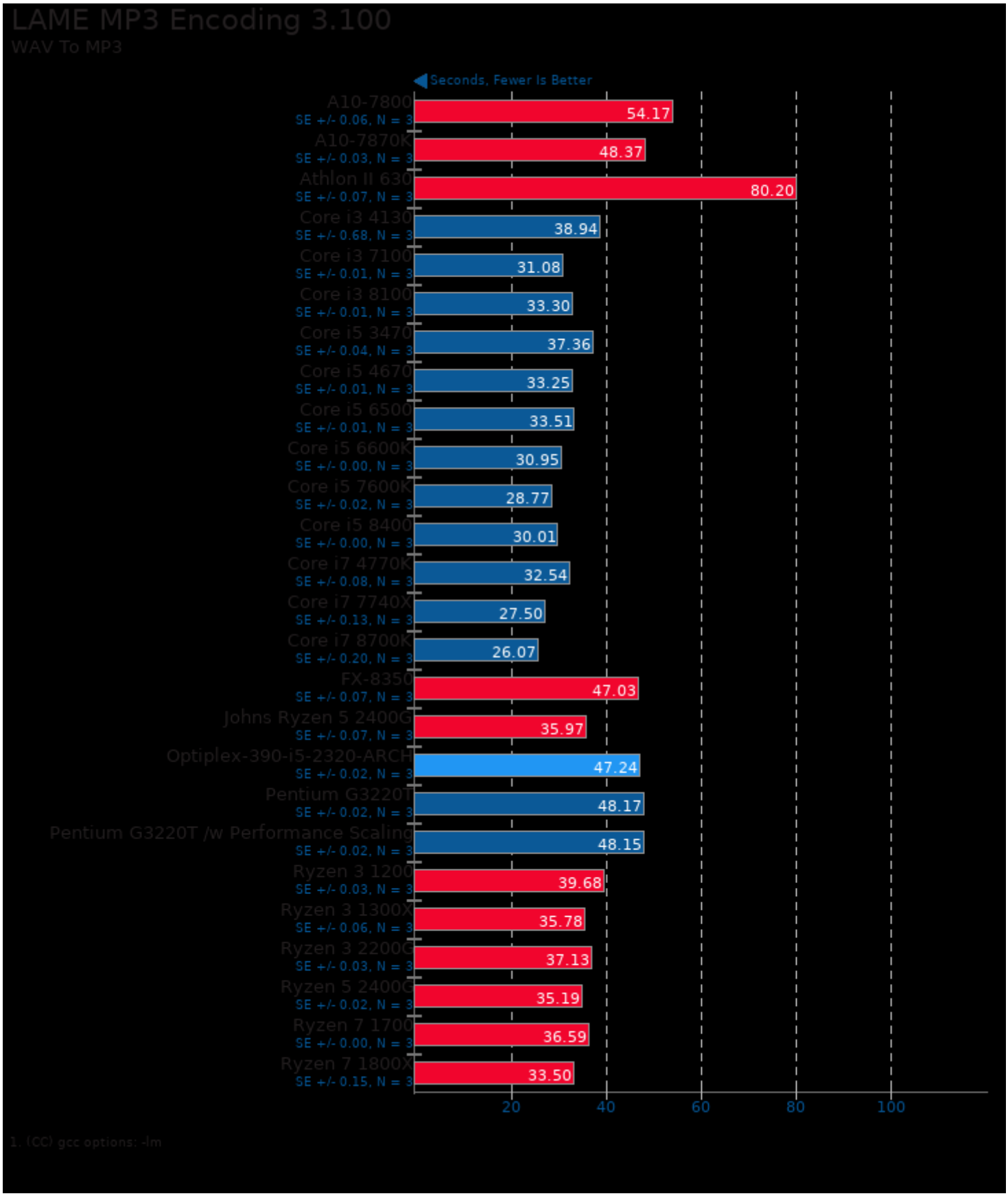

7-Zip Compression 9.20.1
Compress Speed Test
MIPS, More Is Better
A10-7800
SE +/- 88.29, N = 3
9983
A10-7870K
SE +/- 91.54, N = 3
11431
Athlon II 630
SE +/- 25.85, N = 3
8157
Core i3 4130
SE +/- 63.52, N = 3
8992
Core i3 7100
SE +/- 6.03, N = 3
12896
Core i3 8100
SE +/- 21.39, N = 3
17221
Core i5 3470
SE +/- 216.64, N = 4
14100
Core i5 4670
SE +/- 81.66, N = 3
16595
Core i5 6500
SE +/- 7.62, N = 3
15116
Core i5 6600K
SE +/- 11.02, N = 3
18079
Core i5 7600K
SE +/- 31.22, N = 3
17727
Core i5 8400
SE +/- 36.34, N = 3
27028
Core i7 4770K
SE +/- 165.84, N = 3
21667
Core i7 7740X
SE +/- 483.48, N = 3
28952
Core i7 8700K
SE +/- 232.19, N = 3
39039
FX-8350
SE +/- 34.71, N = 3
22097
Johns Ryzen 5 2400G
SE +/- 104.74, N = 3
18918
Optiplex-390-i5-2320-ARCH
SE +/- 9.29, N = 3
11874
Pentium G3220T
SE +/- 30.77, N = 3
6110
Pentium G3220T /w Performance Scaling
SE +/- 79.25, N = 3
6108
Ryzen 3 1200
12601
Ryzen 3 1300X
SE +/- 169.00, N = 3
15880
Ryzen 3 2200G
SE +/- 45.83, N = 3
15744
Ryzen 5 2400G
SE +/- 290.74, N = 4
17729
Ryzen 7 1700
SE +/- 101.52, N = 3
30627
Ryzen 7 1800X
SE +/- 276.94, N = 3
33022
8K
16K
24K
32K
40K
1. (CXX) g++ options: -pipe -lpthread

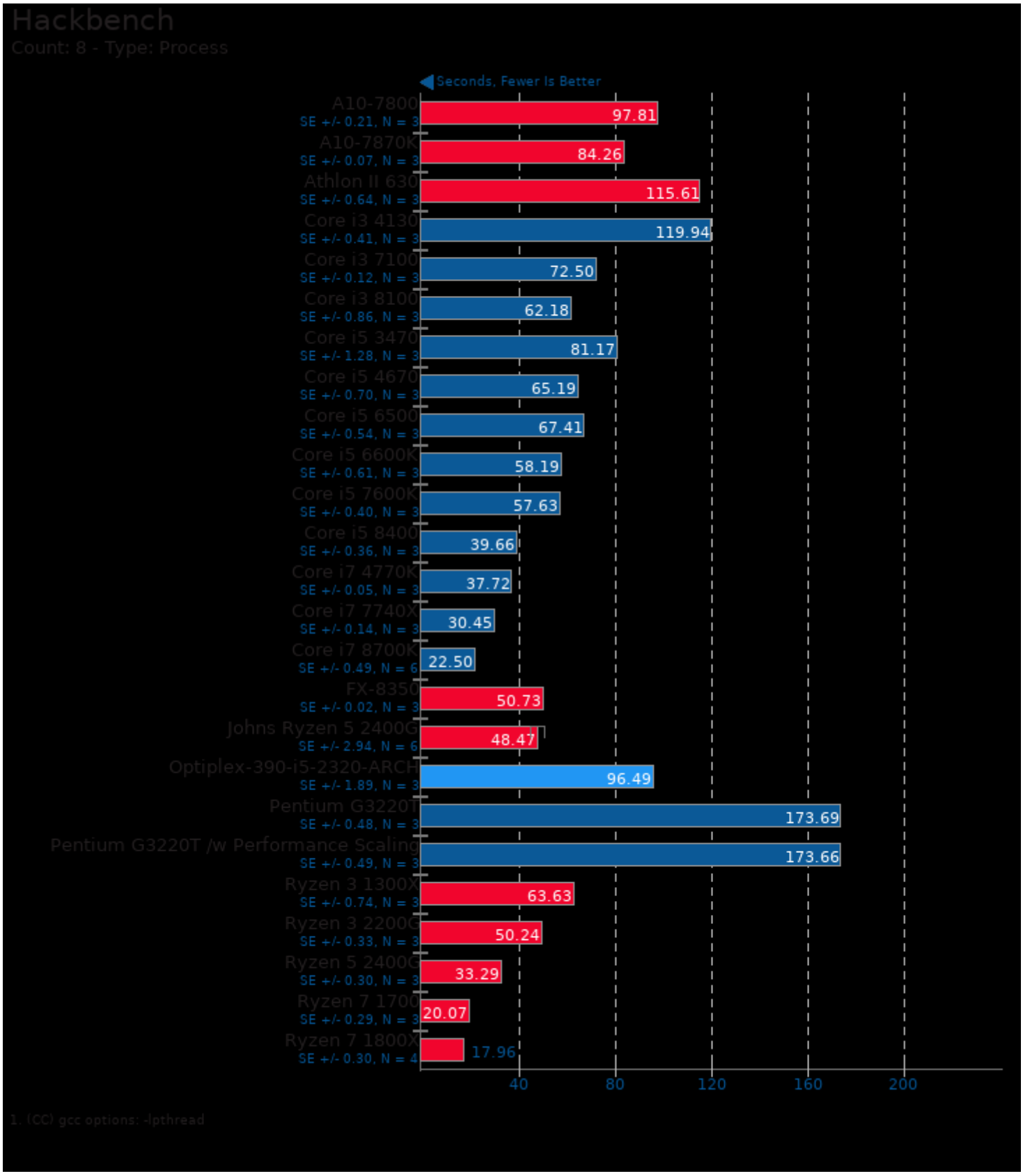

asmFish 2017-09-19
1024 Hash Memory, 26 Depth
Nodes/second, More Is Better
A10-7800
SE +/- 29142.75, N = 3
5433893
A10-7870K
SE +/- 79805.69, N = 3
6214006
Athlon II 630
SE +/- 34422.88, N = 3
4868593
Core i3 4130
SE +/- 1939.68, N = 3
4907458
Core i3 7100
SE +/- 43759.67, N = 3
6783028
Core i3 8100
SE +/- 92419.13, N = 3
9841586
Core i5 3470
SE +/- 121836.68, N = 4
7366182
Core i5 4670
SE +/- 120113.78, N = 3
9572744
Core i5 6500
SE +/- 48564.45, N = 3
8967523
Core i5 6600K
SE +/- 15680.79, N = 3
10051165
Core i5 7600K
SE +/- 40922.10, N = 3
10269351
Core i5 8400
SE +/- 151218.80, N = 3
15913582
Core i7 4770K
SE +/- 144340.27, N = 3
12321019
Core i7 7740X
SE +/- 107030.57, N = 3
15895869
Core i7 8700K
SE +/- 98474.23, N = 3
23437731
FX-8350
SE +/- 41301.48, N = 3
11705326
Johns Ryzen 5 2400G
SE +/- 58907.95, N = 3
12420413
Optiplex-390-i5-2320-ARCH
SE +/- 37853.57, N = 3
7227979
Pentium G3220T
SE +/- 27035.13, N = 3
3291552
Pentium G3220T /w Performance Scaling
SE +/- 1210.24, N = 3
3261490
Ryzen 3 1200
SE +/- 32851.54, N = 3
7323749
Ryzen 3 1300X
SE +/- 71539.42, N = 3
8286134
Ryzen 3 2200G
SE +/- 58465.70, N = 3
8579597
Ryzen 5 2400G
SE +/- 86758.86, N = 3
12356782
Ryzen 7 1700
SE +/- 134030.97, N = 3
20101605
Ryzen 7 1800X
SE +/- 185935.11, N = 3
22678479
5M
10M
15M
20M
25M

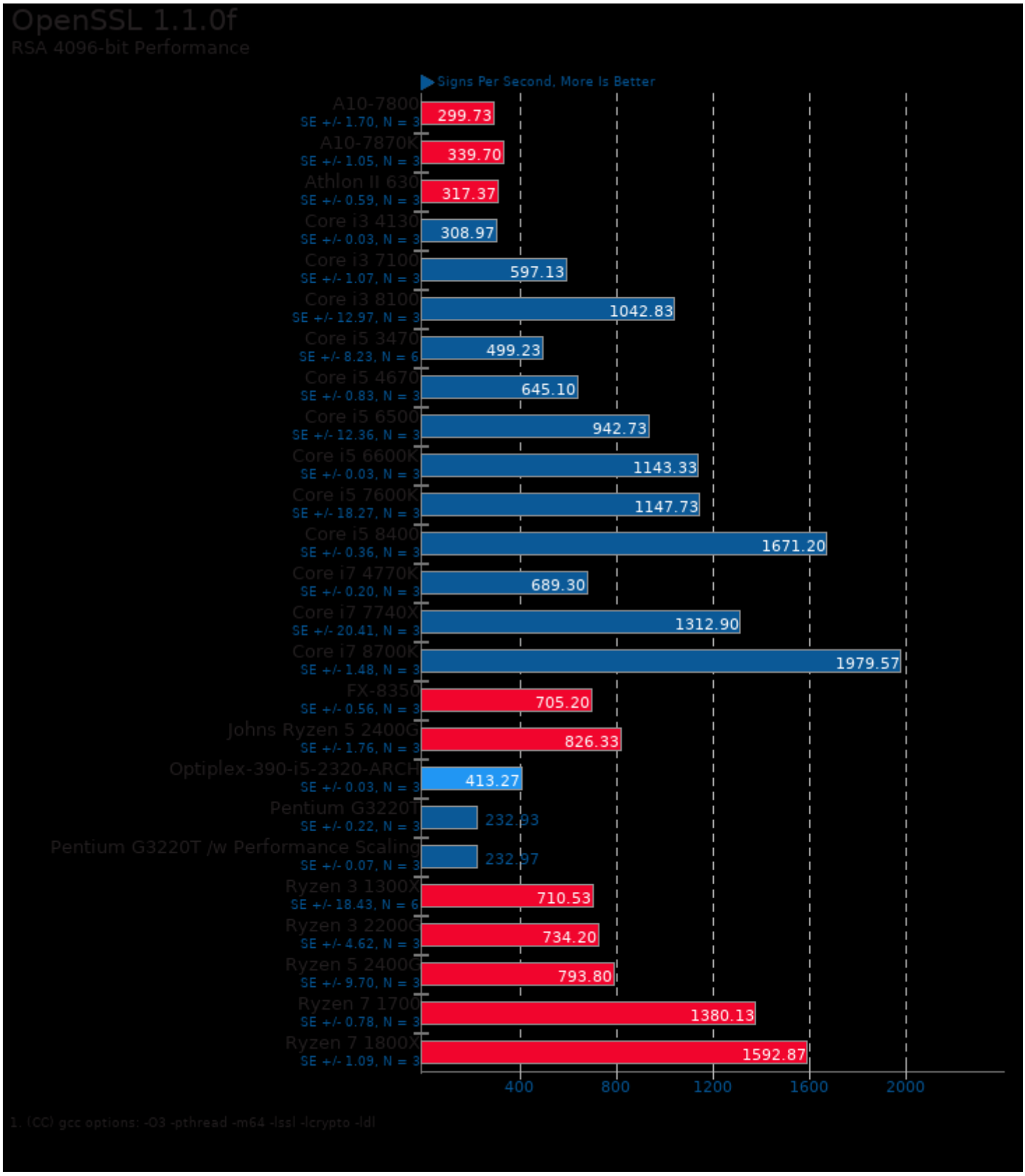

Timed Linux Kernel Compilation 4.13
Time To Compile
Seconds, Fewer Is Better
A10-7800
SE +/- 1.55, N = 3
342.81
A10-7870K
SE +/- 1.88, N = 3
300.92
Athlon II 630
SE +/- 7.35, N = 3
401.51
Core i3 4130
SE +/- 1.26, N = 3
426.59
Core i3 7100
SE +/- 1.14, N = 3
246.44
Core i3 8100
SE +/- 0.96, N = 3
167.81
Core i5 3470
SE +/- 1.70, N = 3
264.97
Core i5 4670
SE +/- 1.24, N = 3
180.98
Core i5 6500
SE +/- 1.11, N = 3
181.66
Core i5 6600K
SE +/- 0.93, N = 3
158.43
Core i5 7600K
SE +/- 0.87, N = 3
157.58
Core i5 8400
SE +/- 1.06, N = 3
108.02
Core i7 4770K
SE +/- 0.91, N = 3
150.12
Core i7 7740X
SE +/- 0.59, N = 3
106.97
Core i7 8700K
SE +/- 2.28, N = 6
79.10
FX-8350
SE +/- 1.44, N = 3
167.85
Johns Ryzen 5 2400G
SE +/- 2.78, N = 3
163.41
Optiplex-390-i5-2320-ARCH
SE +/- 1.79, N = 3
286.83
Pentium G3220T
SE +/- 1.47, N = 3
500.66
Pentium G3220T /w Performance Scaling
SE +/- 1.13, N = 3
500.01
Ryzen 3 1200
SE +/- 0.61, N = 3
484.57
Ryzen 3 1300X
SE +/- 0.68, N = 3
458.00
Ryzen 3 2200G
SE +/- 1.16, N = 3
201.48
Ryzen 5 2400G
SE +/- 1.10, N = 3
153.49
Ryzen 7 1700
SE +/- 1.22, N = 3
95.17
Ryzen 7 1800X
SE +/- 0.96, N = 3
85.22
110
220
330
440
550

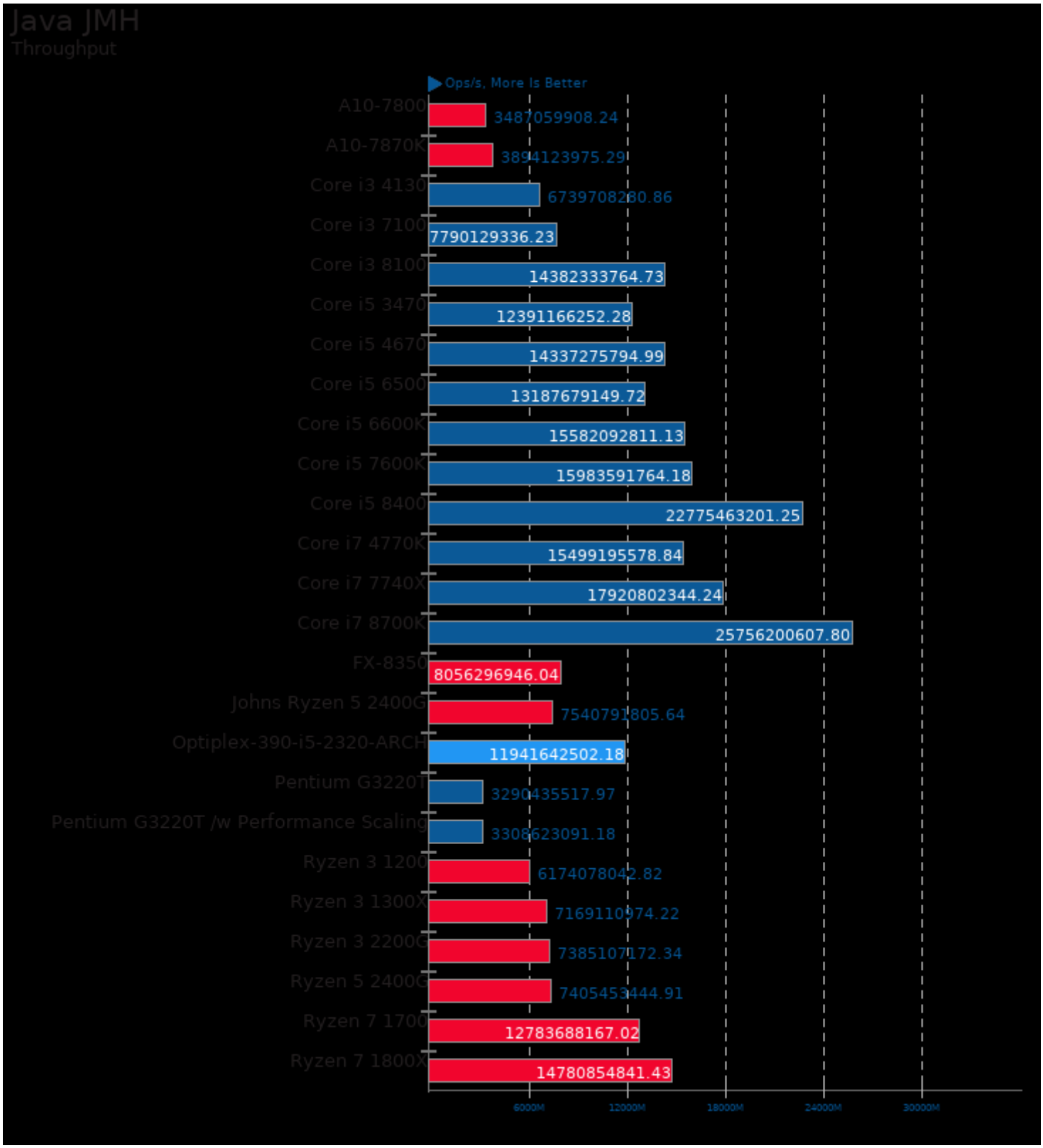

C-Ray 1.1
Total Time
Seconds, Fewer Is Better
A10-7800
SE +/- 0.02, N = 3
61.75
A10-7870K
SE +/- 0.03, N = 3
55.09
Athlon II 630
SE +/- 0.04, N = 3
58.80
Core i3 4130
SE +/- 0.06, N = 3
54.28
Core i3 7100
SE +/- 0.02, N = 3
41.97
Core i3 8100
SE +/- 0.02, N = 3
24.65
Core i5 3470
SE +/- 0.31, N = 3
39.00
Core i5 4670
SE +/- 0.01, N = 3
27.40
Core i5 6500
SE +/- 0.02, N = 3
26.97
Core i5 6600K
SE +/- 0.02, N = 3
22.83
Core i5 7600K
SE +/- 0.01, N = 3
22.25
Core i5 8400
SE +/- 0.01, N = 3
15.57
Core i7 4770K
SE +/- 0.01, N = 3
24.51
Core i7 7740X
SE +/- 0.16, N = 3
18.69
Core i7 8700K
SE +/- 0.01, N = 3
12.78
FX-8350
SE +/- 0.01, N = 3
28.01
Johns Ryzen 5 2400G
SE +/- 0.21, N = 3
19.18
Optiplex-390-i5-2320-ARCH
SE +/- 0.03, N = 3
44.69
Pentium G3220T
SE +/- 0.01, N = 3
76.02
Pentium G3220T /w Performance Scaling
SE +/- 0.01, N = 3
76.01
Ryzen 3 1200
SE +/- 0.01, N = 3
24.95
Ryzen 3 1300X
SE +/- 0.00, N = 3
21.50
Ryzen 3 2200G
SE +/- 0.08, N = 3
21.07
Ryzen 5 2400G
SE +/- 0.16, N = 3
19.48
Ryzen 7 1700
SE +/- 0.00, N = 3
11.23
Ryzen 7 1800X
SE +/- 0.01, N = 3
9.70
20
40
60
80
100
1. (CC) gcc options: -lm -lpthread -O3

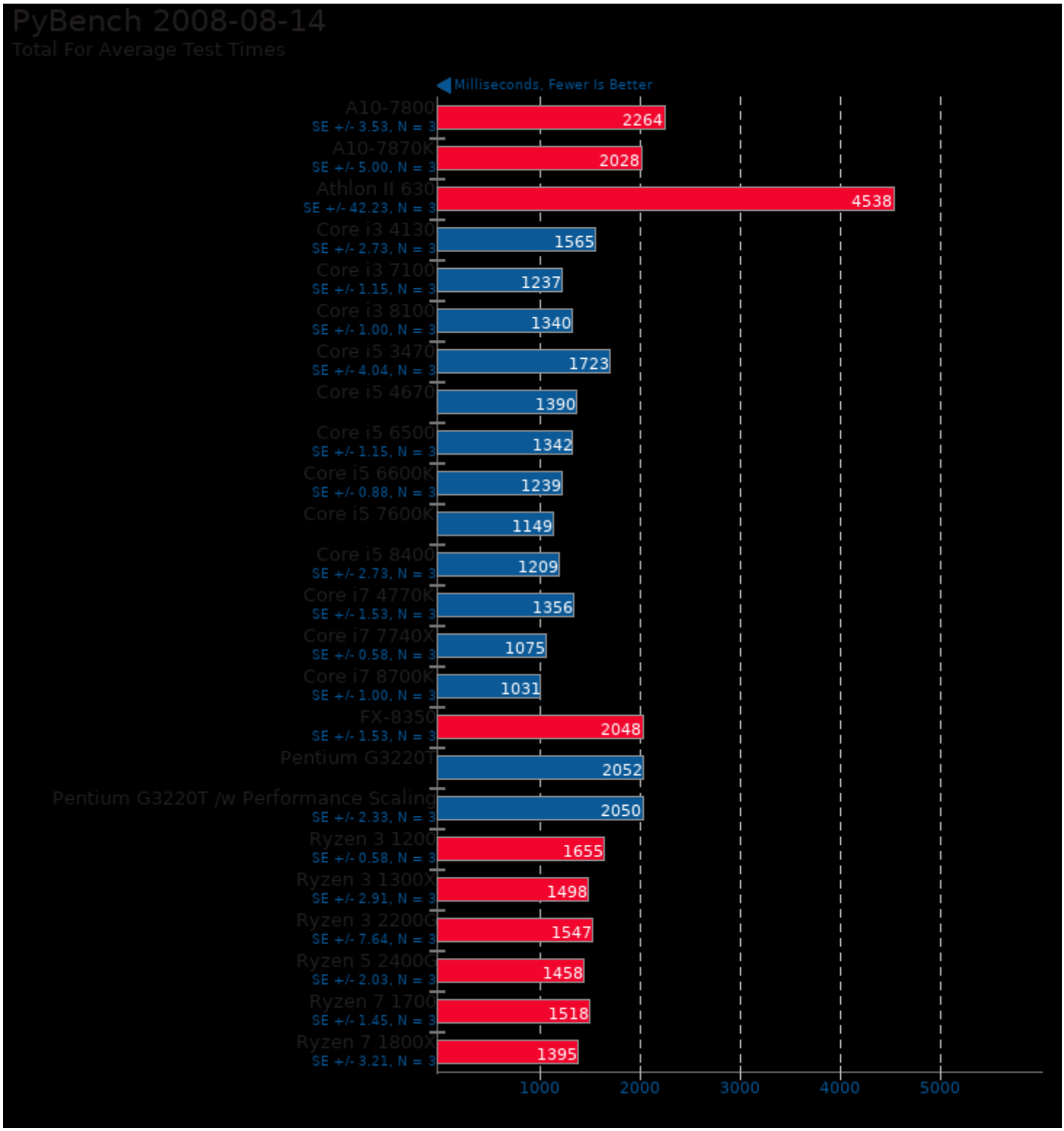

POV-Ray 3.7.0.7
Trace Time
Seconds, Fewer Is Better
A10-7800
SE +/- 0.26, N = 3
270.86
A10-7870K
SE +/- 0.19, N = 3
242.07
Core i3 4130
SE +/- 0.24, N = 3
267.70
Core i3 7100
SE +/- 0.09, N = 3
200.73
Core i3 8100
SE +/- 0.07, N = 3
139.02
Core i5 3470
SE +/- 3.30, N = 3
228.83
Core i5 4670
SE +/- 0.08, 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 7740X
SE +/- 0.06, N = 3
87.94
Core i7 8700K
SE +/- 0.06, N = 3
60.96
FX-8350
SE +/- 0.24, N = 3
134.01
Johns Ryzen 5 2400G
SE +/- 0.98, N = 3
108.18
Optiplex-390-i5-2320-ARCH
SE +/- 1.18, N = 3
228.08
Pentium G3220T
SE +/- 0.09, N = 3
439.57
Pentium G3220T /w Performance Scaling
SE +/- 0.27, N = 3
439.09
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
100
200
300
400
500
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

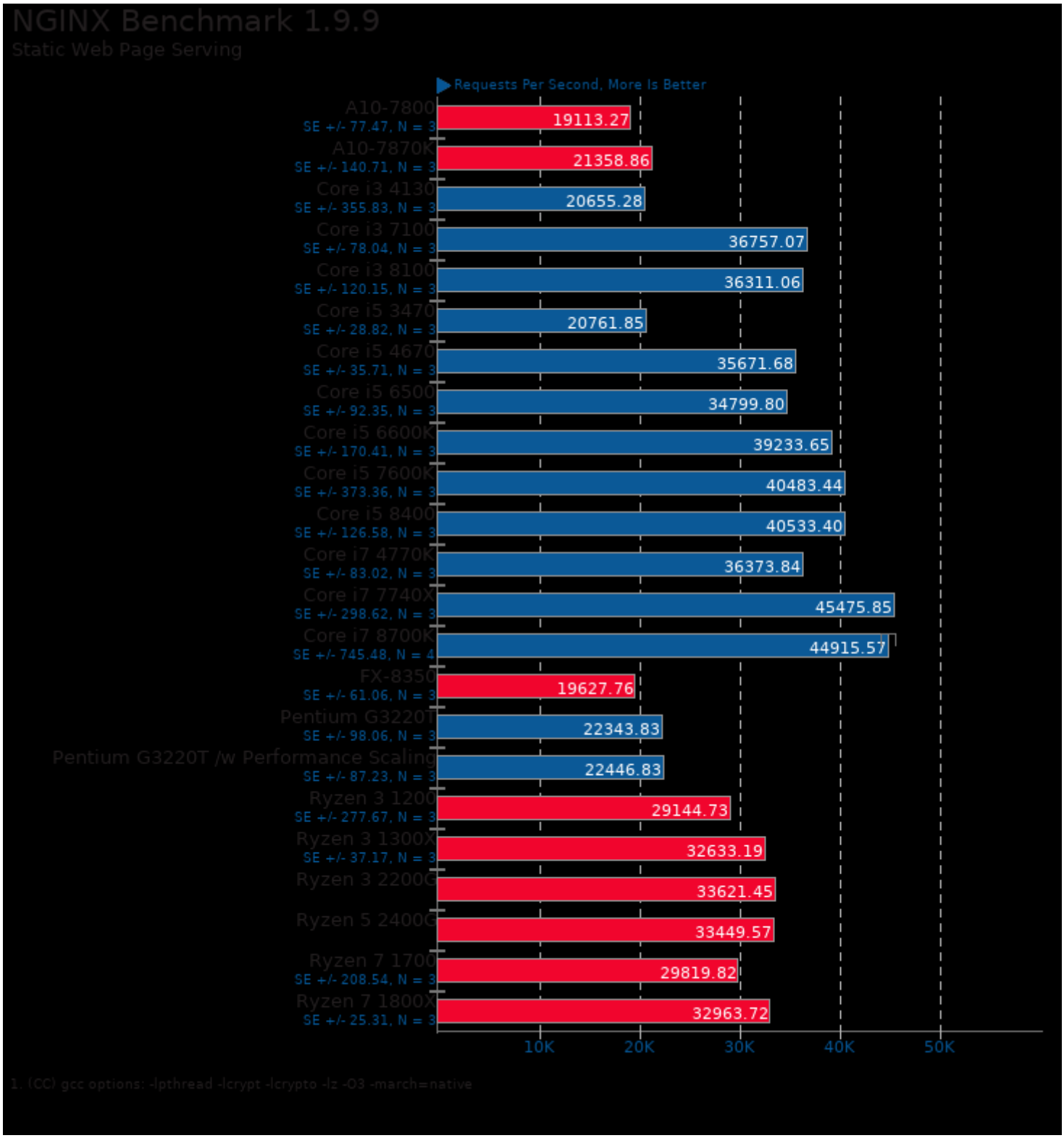

LAME MP3 Encoding 3.100
WAV To MP3
Seconds, Fewer Is Better
A10-7800
SE +/- 0.06, N = 3
54.17
A10-7870K
SE +/- 0.03, N = 3
48.37
Athlon II 630
SE +/- 0.07, N = 3
80.20
Core i3 4130
SE +/- 0.68, N = 3
38.94
Core i3 7100
SE +/- 0.01, N = 3
31.08
Core i3 8100
SE +/- 0.01, N = 3
33.30
Core i5 3470
SE +/- 0.04, N = 3
37.36
Core i5 4670
SE +/- 0.01, N = 3
33.25
Core i5 6500
SE +/- 0.01, N = 3
33.51
Core i5 6600K
SE +/- 0.00, N = 3
30.95
Core i5 7600K
SE +/- 0.02, N = 3
28.77
Core i5 8400
SE +/- 0.00, N = 3
30.01
Core i7 4770K
SE +/- 0.08, N = 3
32.54
Core i7 7740X
SE +/- 0.13, N = 3
27.50
Core i7 8700K
SE +/- 0.20, N = 3
26.07
FX-8350
SE +/- 0.07, N = 3
47.03
Johns Ryzen 5 2400G
SE +/- 0.07, N = 3
35.97
Optiplex-390-i5-2320-ARCH
SE +/- 0.02, N = 3
47.24
Pentium G3220T
SE +/- 0.02, N = 3
48.17
Pentium G3220T /w Performance Scaling
SE +/- 0.02, N = 3
48.15
Ryzen 3 1200
SE +/- 0.03, N = 3
39.68
Ryzen 3 1300X
SE +/- 0.06, N = 3
35.78
Ryzen 3 2200G
SE +/- 0.03, N = 3
37.13
Ryzen 5 2400G
SE +/- 0.02, N = 3
35.19
Ryzen 7 1700
SE +/- 0.00, N = 3
36.59
Ryzen 7 1800X
SE +/- 0.15, N = 3
33.50
20
40
60
80
100
1. (CC) gcc options: -lm

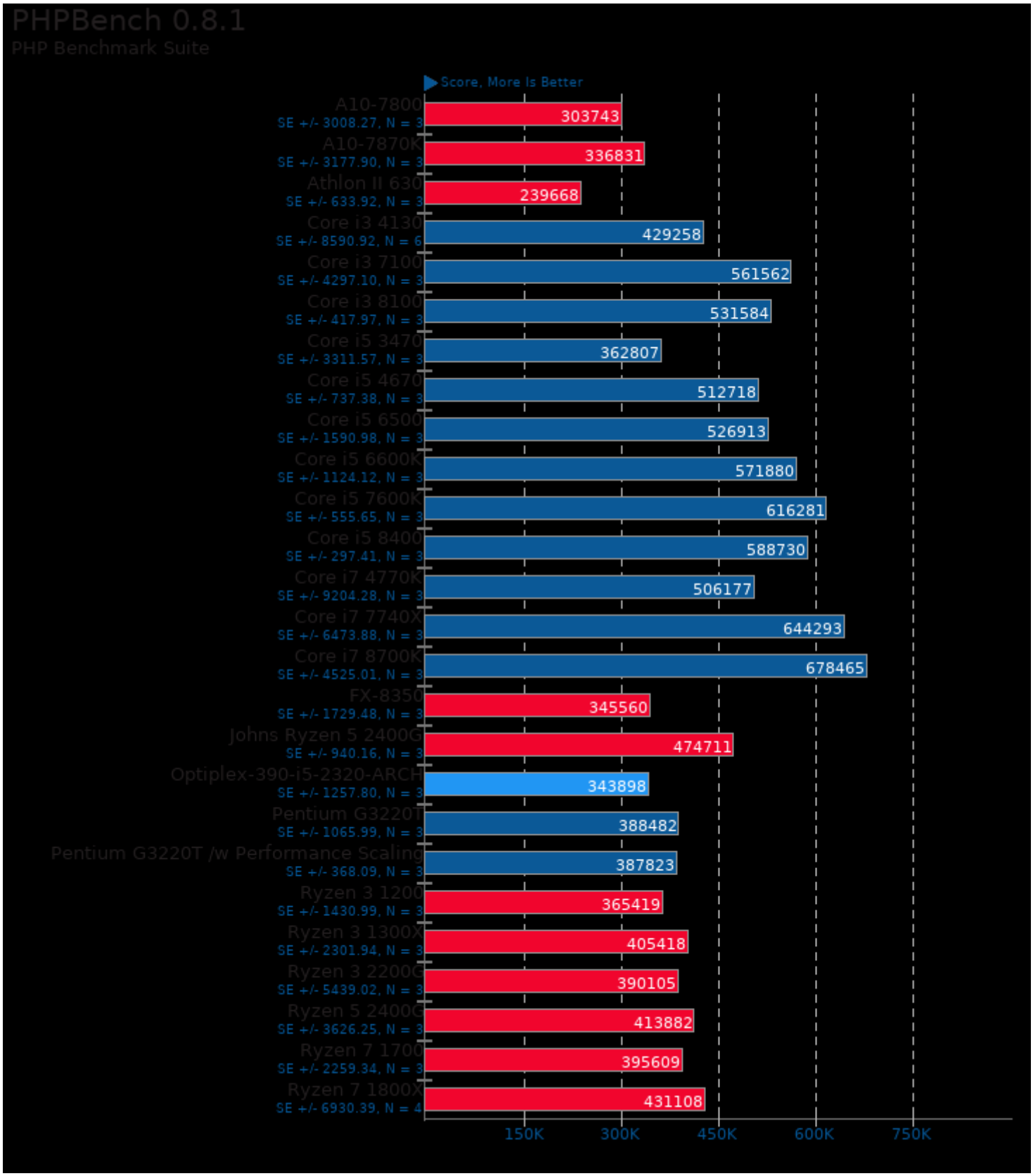

Hackbench
Count: 8 - Type: Process
Seconds, Fewer Is Better
A10-7800
SE +/- 0.21, N = 3
97.81
A10-7870K
SE +/- 0.07, N = 3
84.26
Athlon II 630
SE +/- 0.64, N = 3
115.61
Core i3 4130
SE +/- 0.41, N = 3
119.94
Core i3 7100
SE +/- 0.12, N = 3
72.50
Core i3 8100
SE +/- 0.86, N = 3
62.18
Core i5 3470
SE +/- 1.28, N = 3
81.17
Core i5 4670
SE +/- 0.70, N = 3
65.19
Core i5 6500
SE +/- 0.54, N = 3
67.41
Core i5 6600K
SE +/- 0.61, N = 3
58.19
Core i5 7600K
SE +/- 0.40, N = 3
57.63
Core i5 8400
SE +/- 0.36, N = 3
39.66
Core i7 4770K
SE +/- 0.05, N = 3
37.72
Core i7 7740X
SE +/- 0.14, N = 3
30.45
Core i7 8700K
SE +/- 0.49, N = 6
22.50
FX-8350
SE +/- 0.02, N = 3
50.73
Johns Ryzen 5 2400G
SE +/- 2.94, N = 6
48.47
Optiplex-390-i5-2320-ARCH
SE +/- 1.89, N = 3
96.49
Pentium G3220T
SE +/- 0.48, N = 3
173.69
Pentium G3220T /w Performance Scaling
SE +/- 0.49, N = 3
173.66
Ryzen 3 1300X
SE +/- 0.74, N = 3
63.63
Ryzen 3 2200G
SE +/- 0.33, N = 3
50.24
Ryzen 5 2400G
SE +/- 0.30, N = 3
33.29
Ryzen 7 1700
SE +/- 0.29, N = 3
20.07
Ryzen 7 1800X
SE +/- 0.30, N = 4
17.96
40
80
120
160
200
1. (CC) gcc options: -lpthread

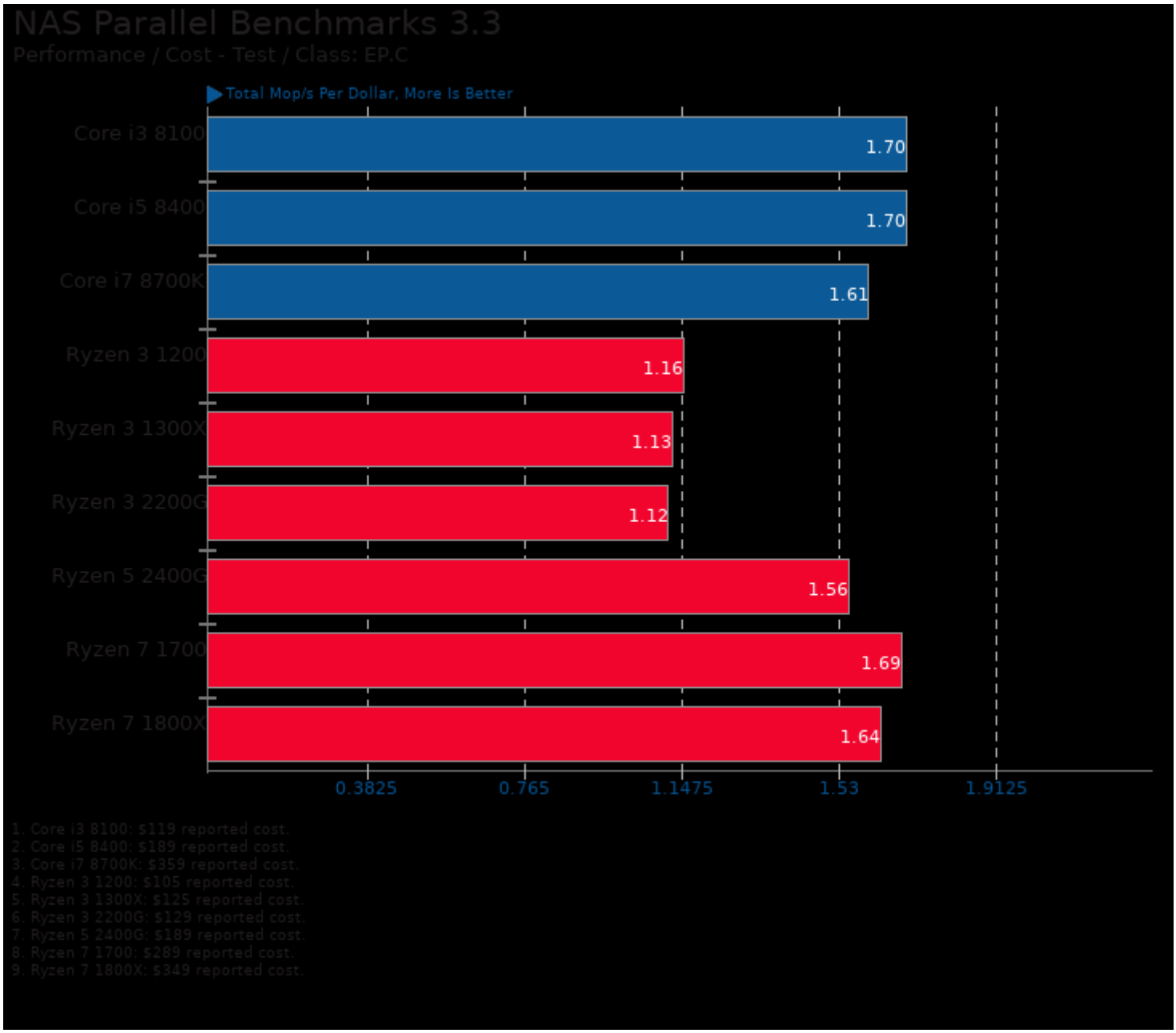

OpenSSL 1.1.0f
RSA 4096-bit Performance
Signs Per Second, More Is Better
A10-7800
SE +/- 1.70, N = 3
299.73
A10-7870K
SE +/- 1.05, N = 3
339.70
Athlon II 630
SE +/- 0.59, N = 3
317.37
Core i3 4130
SE +/- 0.03, N = 3
308.97
Core i3 7100
SE +/- 1.07, N = 3
597.13
Core i3 8100
SE +/- 12.97, N = 3
1042.83
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 7740X
SE +/- 20.41, N = 3
1312.90
Core i7 8700K
SE +/- 1.48, N = 3
1979.57
FX-8350
SE +/- 0.56, N = 3
705.20
Johns Ryzen 5 2400G
SE +/- 1.76, N = 3
826.33
Optiplex-390-i5-2320-ARCH
SE +/- 0.03, N = 3
413.27
Pentium G3220T
SE +/- 0.22, N = 3
232.93
Pentium G3220T /w Performance Scaling
SE +/- 0.07, N = 3
232.97
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
400
800
1200
1600
2000
1. (CC) gcc options: -O3 -pthread -m64 -lssl -lcrypto -ldl

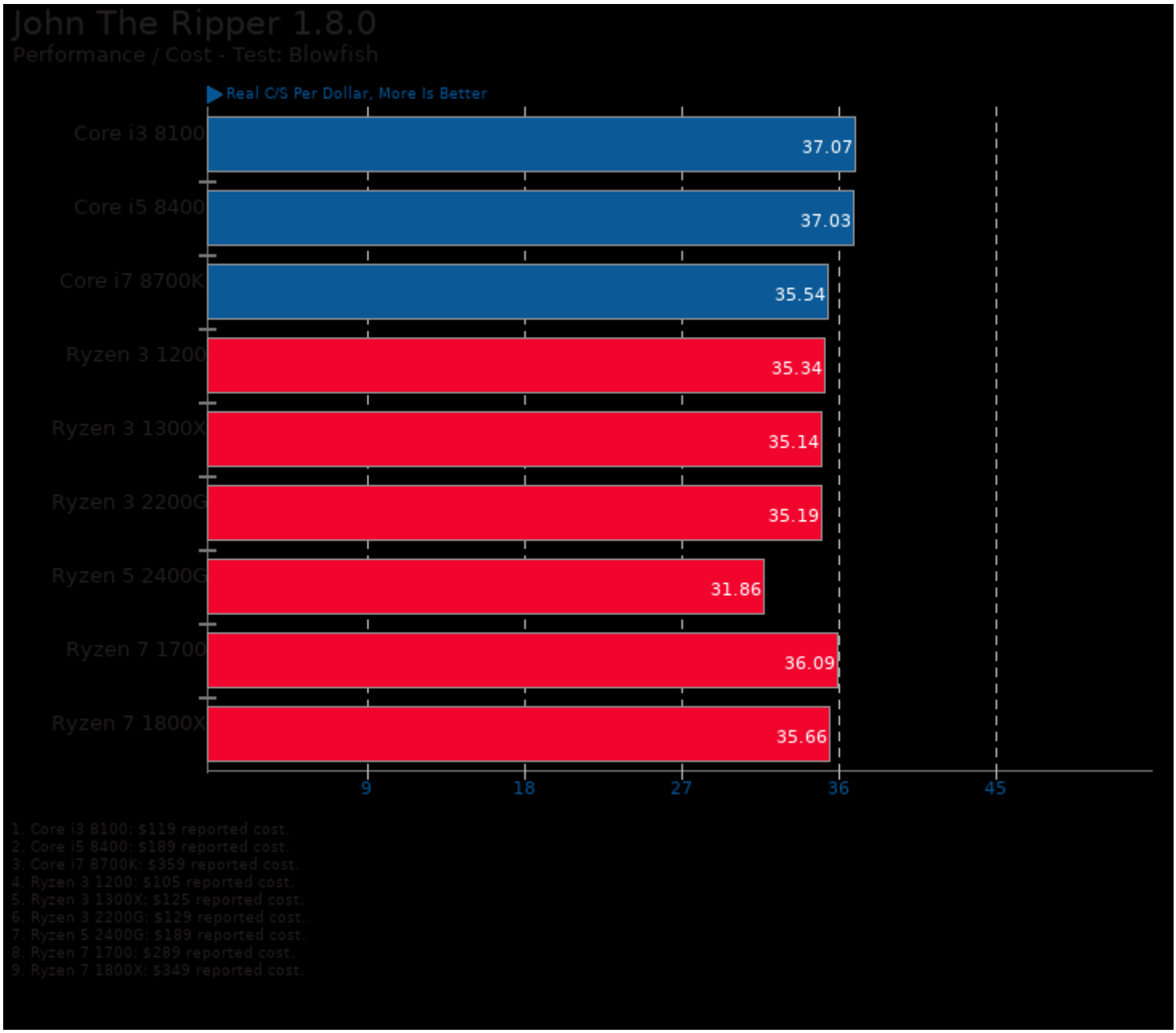

Java JMH
Throughput
Ops/s, More Is Better
A10-7800
3487059908.24
A10-7870K
3894123975.29
Core i3 4130
Core i3 7100
7790129336.23
Core i3 8100
14382333764.73
Core i5 3470
12391166252.28
Core i5 4670
14337275794.99
Core i5 6500
13187679149.72
Core i5 6600K
15582092811.13
Core i5 7600K
15983591764.18
Core i5 8400
22775463201.25
Core i7 4770K
15499195578.84
Core i7 7740X
17920802344.24
Core i7 8700K
25756200607.80
FX-8350
8056296946.04
Johns Ryzen 5 2400G
Optiplex-390-i5-2320-ARCH
11941642502.18
Pentium G3220T
Pentium G3220T /w Performance Scaling
Ryzen 3 1200
Ryzen 3 1300X
Ryzen 3 2200G
Ryzen 5 2400G
Ryzen 7 1700
12783688167.02
Ryzen 7 1800X
14780854841.43
6000M
12000M
18000M
24000M
30000M

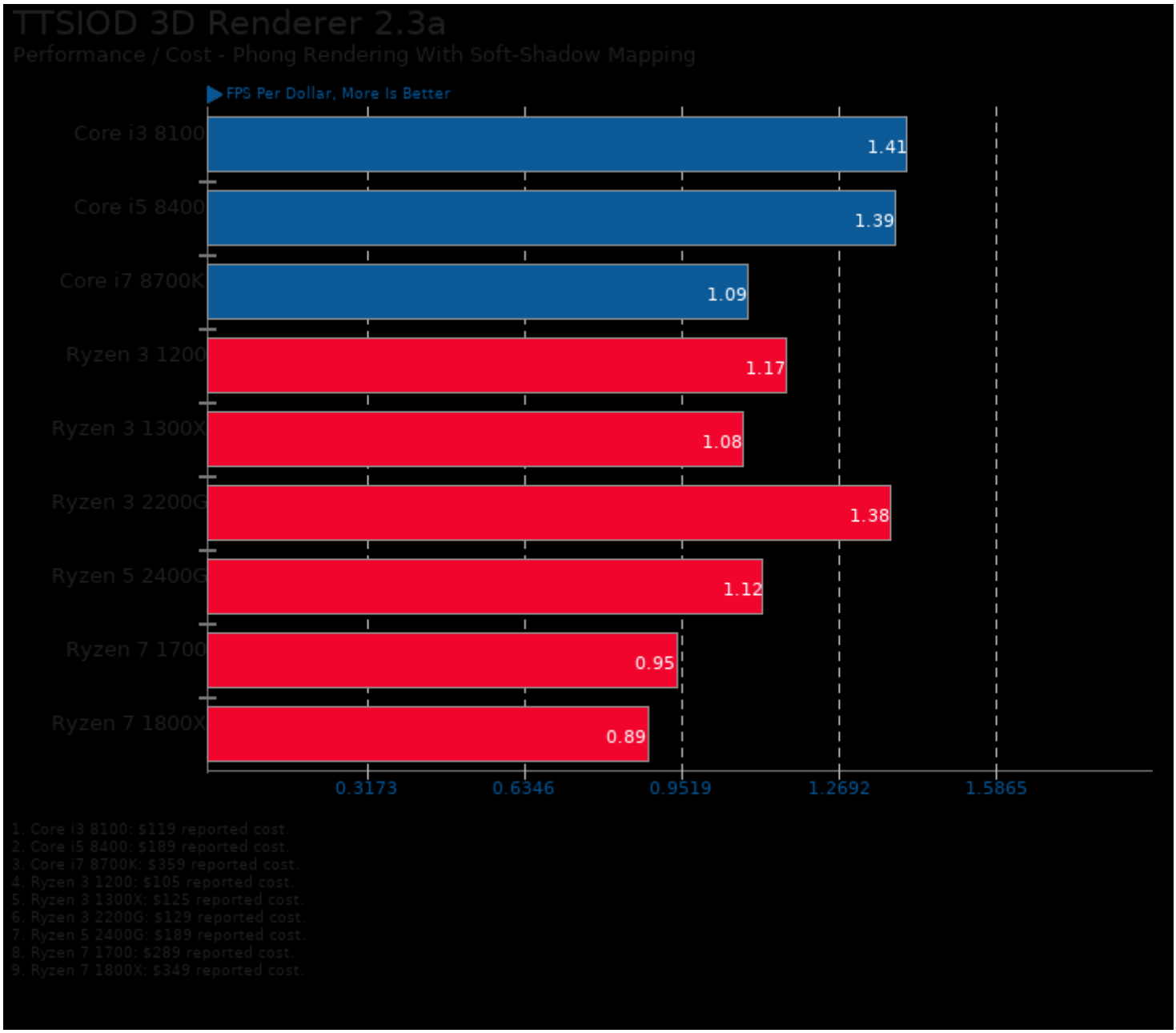

PyBench 2008-08-14
Total For Average Test Times
Milliseconds, Fewer Is Better
A10-7800
SE +/- 3.53, N = 3
2264
A10-7870K
SE +/- 5.00, N = 3
2028
Athlon II 630
SE +/- 42.23, N = 3
4538
Core i3 4130
SE +/- 2.73, N = 3
1565
Core i3 7100
SE +/- 1.15, N = 3
1237
Core i3 8100
SE +/- 1.00, N = 3
1340
Core i5 3470
SE +/- 4.04, N = 3
1723
Core i5 4670
1390
Core i5 6500
SE +/- 1.15, N = 3
1342
Core i5 6600K
SE +/- 0.88, N = 3
1239
Core i5 7600K
1149
Core i5 8400
SE +/- 2.73, N = 3
1209
Core i7 4770K
SE +/- 1.53, N = 3
1356
Core i7 7740X
SE +/- 0.58, N = 3
1075
Core i7 8700K
SE +/- 1.00, N = 3
1031
FX-8350
SE +/- 1.53, N = 3
2048
Pentium G3220T
2052
Pentium G3220T /w Performance Scaling
SE +/- 2.33, N = 3
2050
Ryzen 3 1200
SE +/- 0.58, N = 3
1655
Ryzen 3 1300X
SE +/- 2.91, N = 3
1498
Ryzen 3 2200G
SE +/- 7.64, N = 3
1547
Ryzen 5 2400G
SE +/- 2.03, N = 3
1458
Ryzen 7 1700
SE +/- 1.45, N = 3
1518
Ryzen 7 1800X
SE +/- 3.21, N = 3
1395
1000
2000
3000
4000
5000

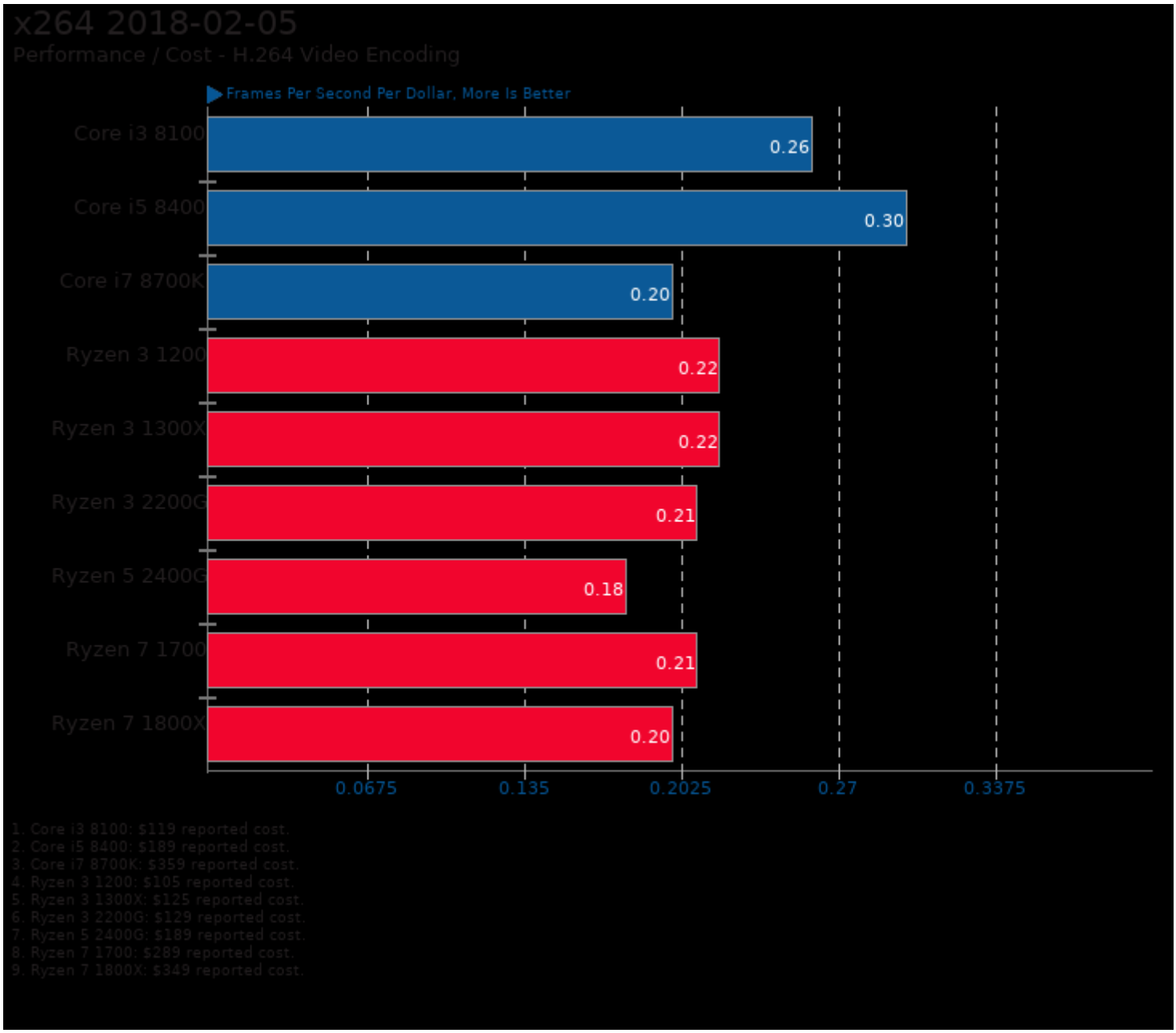

NGINX Benchmark 1.9.9
Static Web Page Serving
Requests Per Second, More Is Better
A10-7800
SE +/- 77.47, N = 3
19113.27
A10-7870K
SE +/- 140.71, N = 3
21358.86
Core i3 4130
SE +/- 355.83, N = 3
20655.28
Core i3 7100
SE +/- 78.04, N = 3
36757.07
Core i3 8100
SE +/- 120.15, N = 3
36311.06
Core i5 3470
SE +/- 28.82, N = 3
20761.85
Core i5 4670
SE +/- 35.71, N = 3
35671.68
Core i5 6500
SE +/- 92.35, N = 3
34799.80
Core i5 6600K
SE +/- 170.41, N = 3
39233.65
Core i5 7600K
SE +/- 373.36, N = 3
40483.44
Core i5 8400
SE +/- 126.58, N = 3
40533.40
Core i7 4770K
SE +/- 83.02, N = 3
36373.84
Core i7 7740X
SE +/- 298.62, N = 3
45475.85
Core i7 8700K
SE +/- 745.48, N = 4
44915.57
FX-8350
SE +/- 61.06, N = 3
19627.76
Pentium G3220T
SE +/- 98.06, N = 3
22343.83
Pentium G3220T /w Performance Scaling
SE +/- 87.23, N = 3
22446.83
Ryzen 3 1200
SE +/- 277.67, N = 3
29144.73
Ryzen 3 1300X
SE +/- 37.17, N = 3
32633.19
Ryzen 3 2200G
33621.45
Ryzen 5 2400G
33449.57
Ryzen 7 1700
SE +/- 208.54, N = 3
29819.82
Ryzen 7 1800X
SE +/- 25.31, N = 3
32963.72
10K
20K
30K
40K
50K
1. (CC) gcc options: -lpthread -lcrypt -lcrypto -lz -O3 -march=native

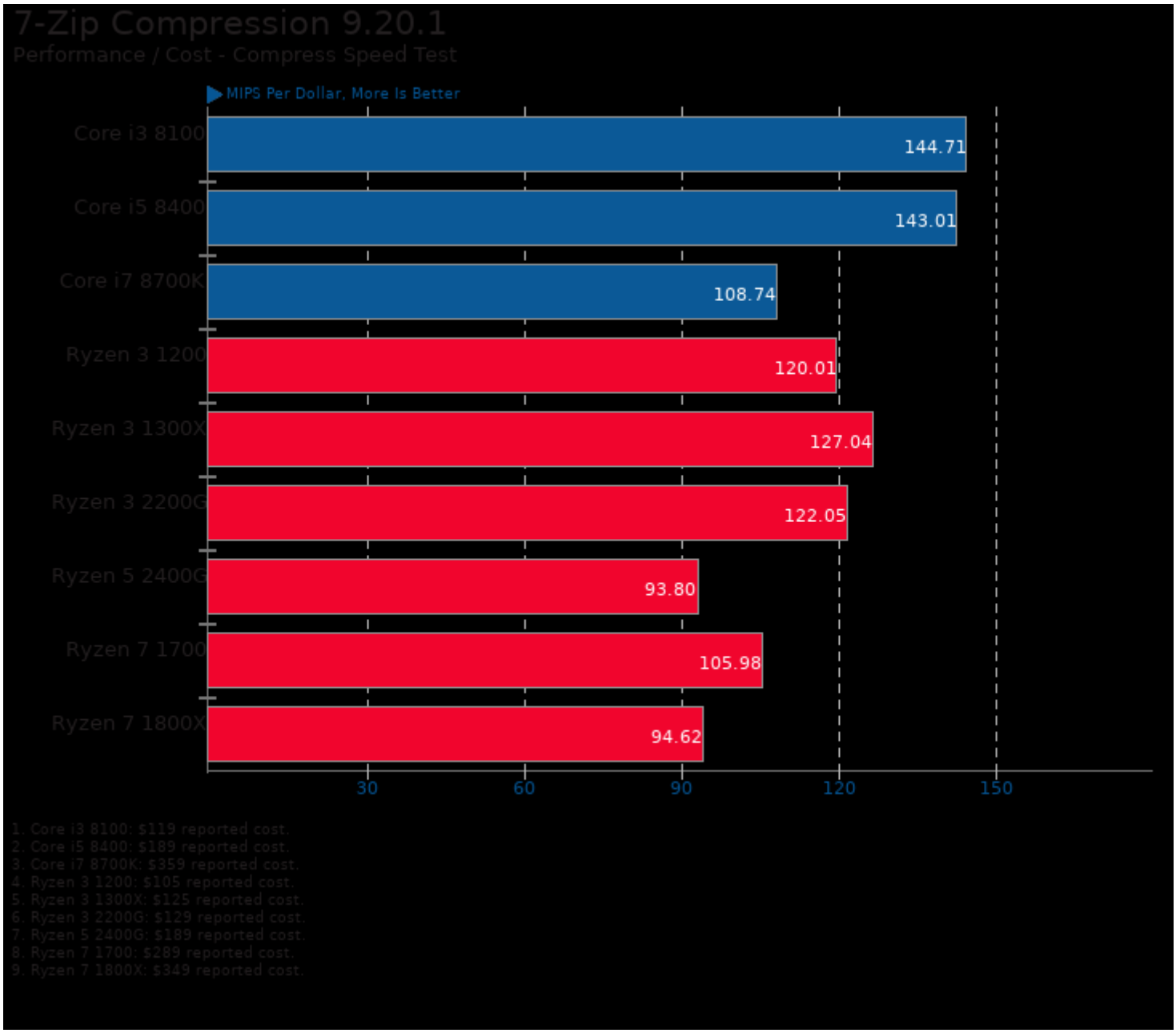

PHPBench 0.8.1
PHP Benchmark Suite
Score, More Is Better
A10-7800
SE +/- 3008.27, N = 3
303743
A10-7870K
SE +/- 3177.90, N = 3
336831
Athlon II 630
SE +/- 633.92, N = 3
239668
Core i3 4130
SE +/- 8590.92, N = 6
429258
Core i3 7100
SE +/- 4297.10, N = 3
561562
Core i3 8100
SE +/- 417.97, N = 3
531584
Core i5 3470
SE +/- 3311.57, N = 3
362807
Core i5 4670
SE +/- 737.38, N = 3
512718
Core i5 6500
SE +/- 1590.98, N = 3
526913
Core i5 6600K
SE +/- 1124.12, N = 3
571880
Core i5 7600K
SE +/- 555.65, N = 3
616281
Core i5 8400
SE +/- 297.41, N = 3
588730
Core i7 4770K
SE +/- 9204.28, N = 3
506177
Core i7 7740X
SE +/- 6473.88, N = 3
644293
Core i7 8700K
SE +/- 4525.01, N = 3
678465
FX-8350
SE +/- 1729.48, N = 3
345560
Johns Ryzen 5 2400G
SE +/- 940.16, N = 3
474711
Optiplex-390-i5-2320-ARCH
SE +/- 1257.80, N = 3
343898
Pentium G3220T
SE +/- 1065.99, N = 3
388482
Pentium G3220T /w Performance Scaling
SE +/- 368.09, N = 3
387823
Ryzen 3 1200
SE +/- 1430.99, N = 3
365419
Ryzen 3 1300X
SE +/- 2301.94, N = 3
405418
Ryzen 3 2200G
SE +/- 5439.02, N = 3
390105
Ryzen 5 2400G
SE +/- 3626.25, N = 3
413882
Ryzen 7 1700
SE +/- 2259.34, N = 3
395609
Ryzen 7 1800X
SE +/- 6930.39, N = 4
431108
150K
300K
450K
600K
750K

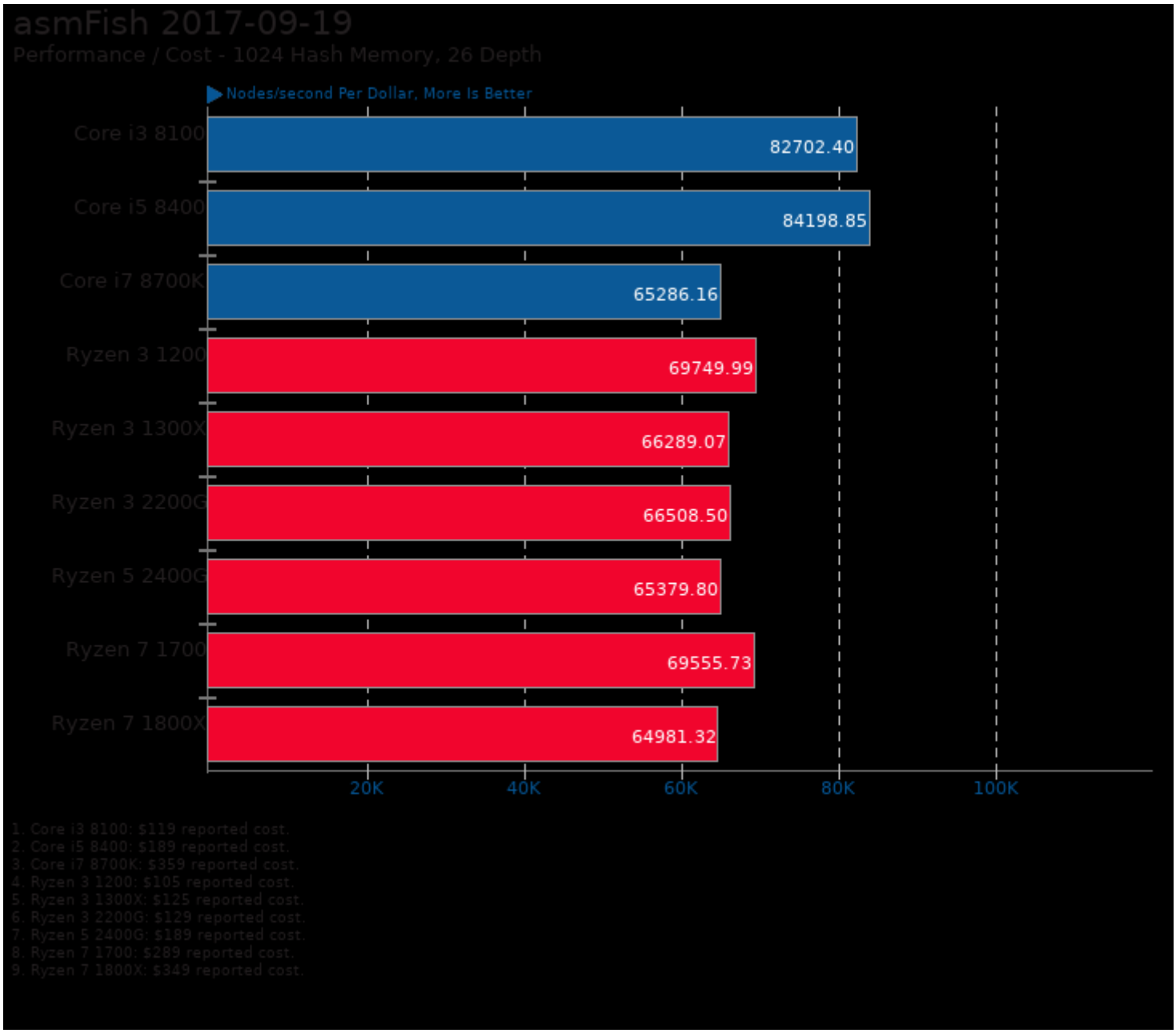

NAS Parallel Benchmarks 3.3
Performance / Cost - Test / Class: EP.C
Total Mop/s Per Dollar, More Is Better
Core i3 8100
1.70
Core i5 8400
1.70
Core i7 8700K
1.61
Ryzen 3 1200
1.16
Ryzen 3 1300X
1.13
Ryzen 3 2200G
1.12
Ryzen 5 2400G
1.56
Ryzen 7 1700
1.69
Ryzen 7 1800X
1.64
0.3825
0.765
1.1475
1.53
1.9125
1. Core i3 8100: $119 reported cost.
2. Core i5 8400: $189 reported cost.
3. Core i7 8700K: $359 reported cost.
4. Ryzen 3 1200: $105 reported cost.
5. Ryzen 3 1300X: $125 reported cost.
6. Ryzen 3 2200G: $129 reported cost.
7. Ryzen 5 2400G: $189 reported cost.
8. Ryzen 7 1700: $289 reported cost.
9. Ryzen 7 1800X: $349 reported cost.

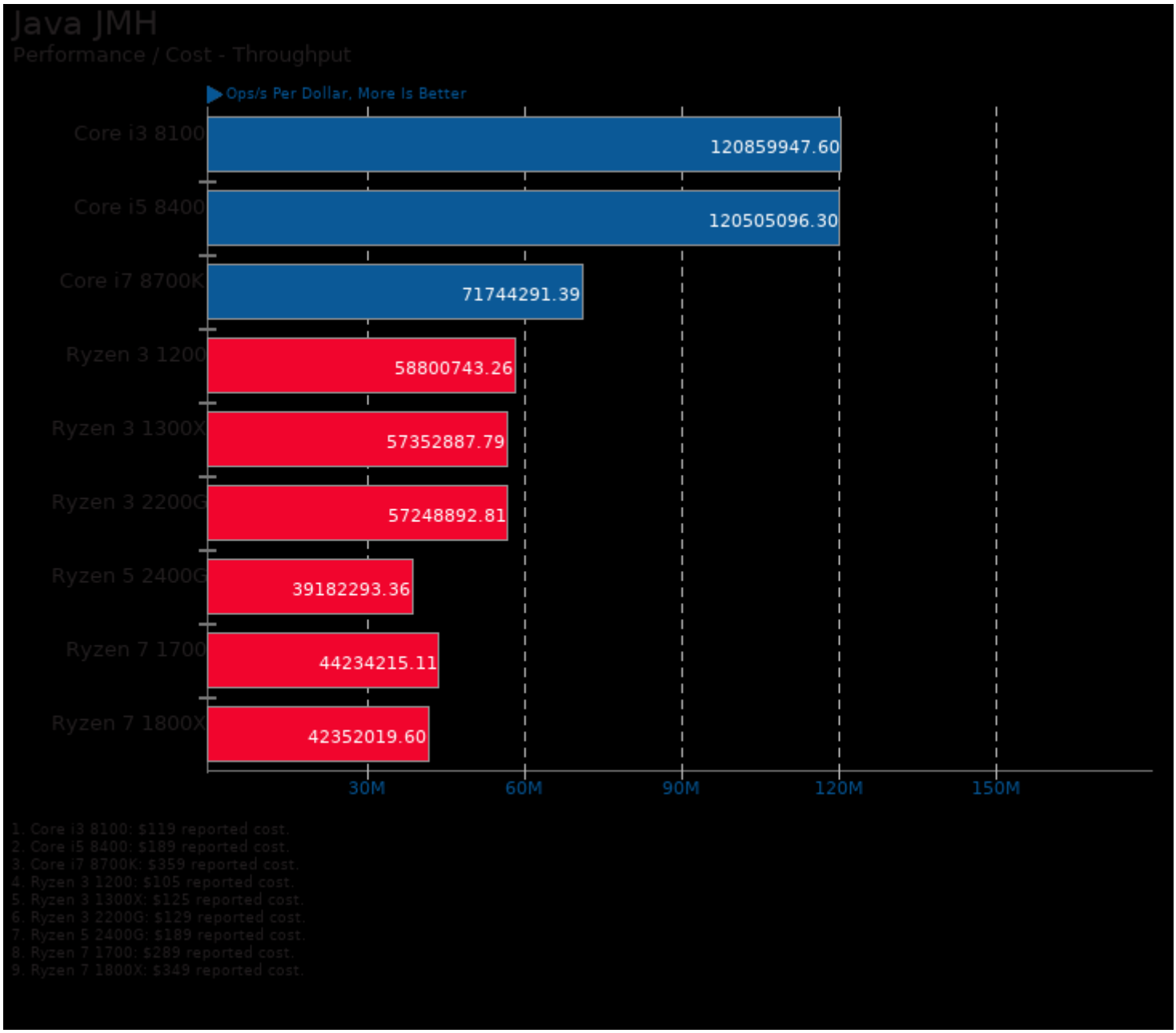

John The Ripper 1.8.0
Performance / Cost - Test: Blowfish
Real C/S Per Dollar, More Is Better
Core i3 8100
37.07
Core i5 8400
37.03
Core i7 8700K
35.54
Ryzen 3 1200
35.34
Ryzen 3 1300X
35.14
Ryzen 3 2200G
35.19
Ryzen 5 2400G
31.86
Ryzen 7 1700
36.09
Ryzen 7 1800X
35.66
9
18
27
36
45
1. Core i3 8100: $119 reported cost.
2. Core i5 8400: $189 reported cost.
3. Core i7 8700K: $359 reported cost.
4. Ryzen 3 1200: $105 reported cost.
5. Ryzen 3 1300X: $125 reported cost.
6. Ryzen 3 2200G: $129 reported cost.
7. Ryzen 5 2400G: $189 reported cost.
8. Ryzen 7 1700: $289 reported cost.
9. Ryzen 7 1800X: $349 reported cost.

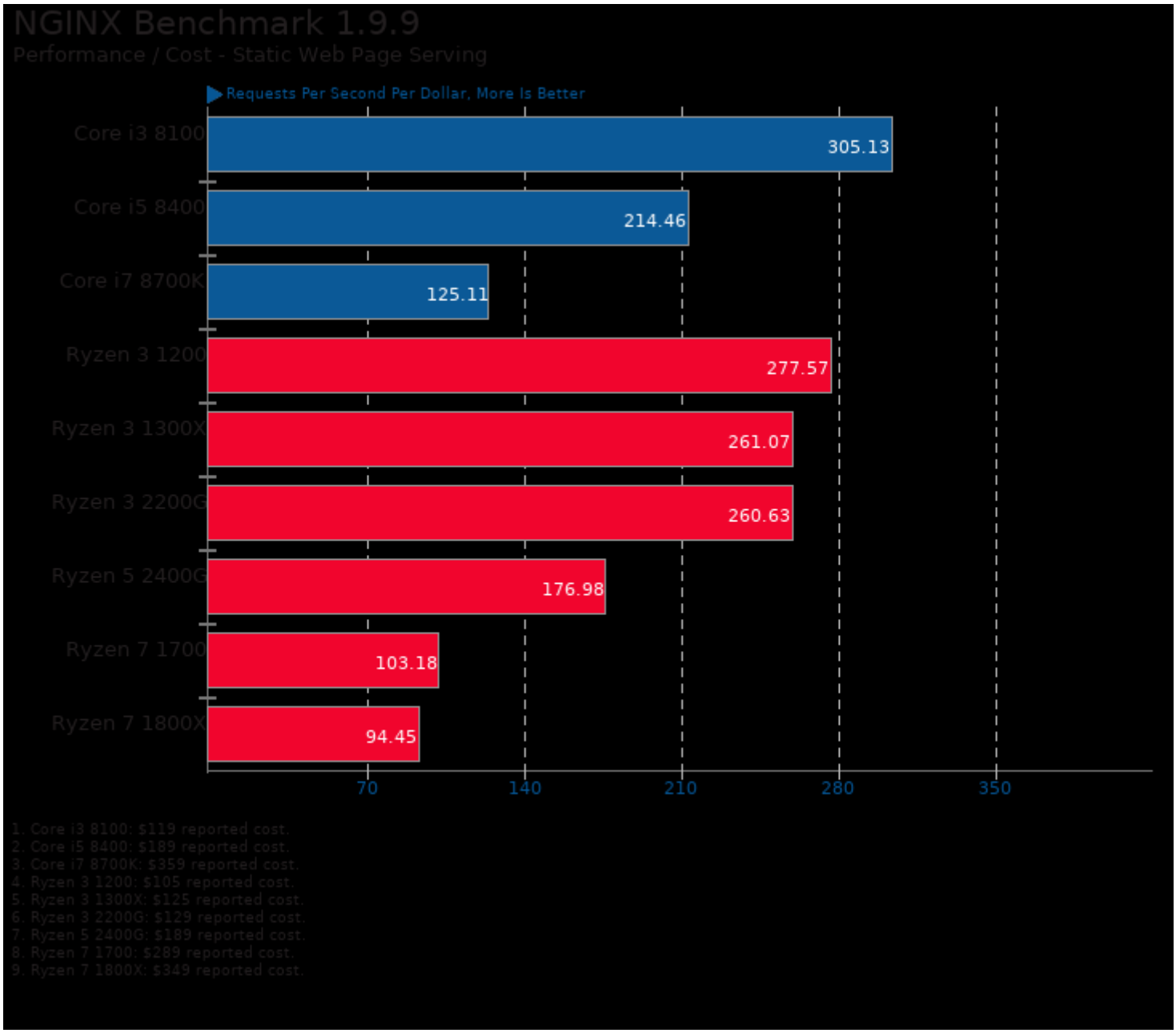

TTSIOD 3D Renderer 2.3a
Performance / Cost - Phong Rendering With Soft-Shadow Mapping
FPS Per Dollar, More Is Better
Core i3 8100
Core i5 8400
Core i7 8700K
Ryzen 3 1200
Ryzen 3 1300X
Ryzen 3 2200G
Ryzen 5 2400G
Ryzen 7 1700
Ryzen 7 1800X
1.41
1.39
1.09
1.17
1.08
1.38
1.12
0.95
0.89
0.3173
0.6346
0.9519
1.2692
1.5865
1. Core i3 8100: $119 reported cost.
2. Core i5 8400: $189 reported cost.
3. Core i7 8700K: $359 reported cost.
4. Ryzen 3 1200: $105 reported cost.
5. Ryzen 3 1300X: $125 reported cost.
6. Ryzen 3 2200G: $129 reported cost.
7. Ryzen 5 2400G: $189 reported cost.
8. Ryzen 7 1700: $289 reported cost.
9. Ryzen 7 1800X: $349 reported cost.

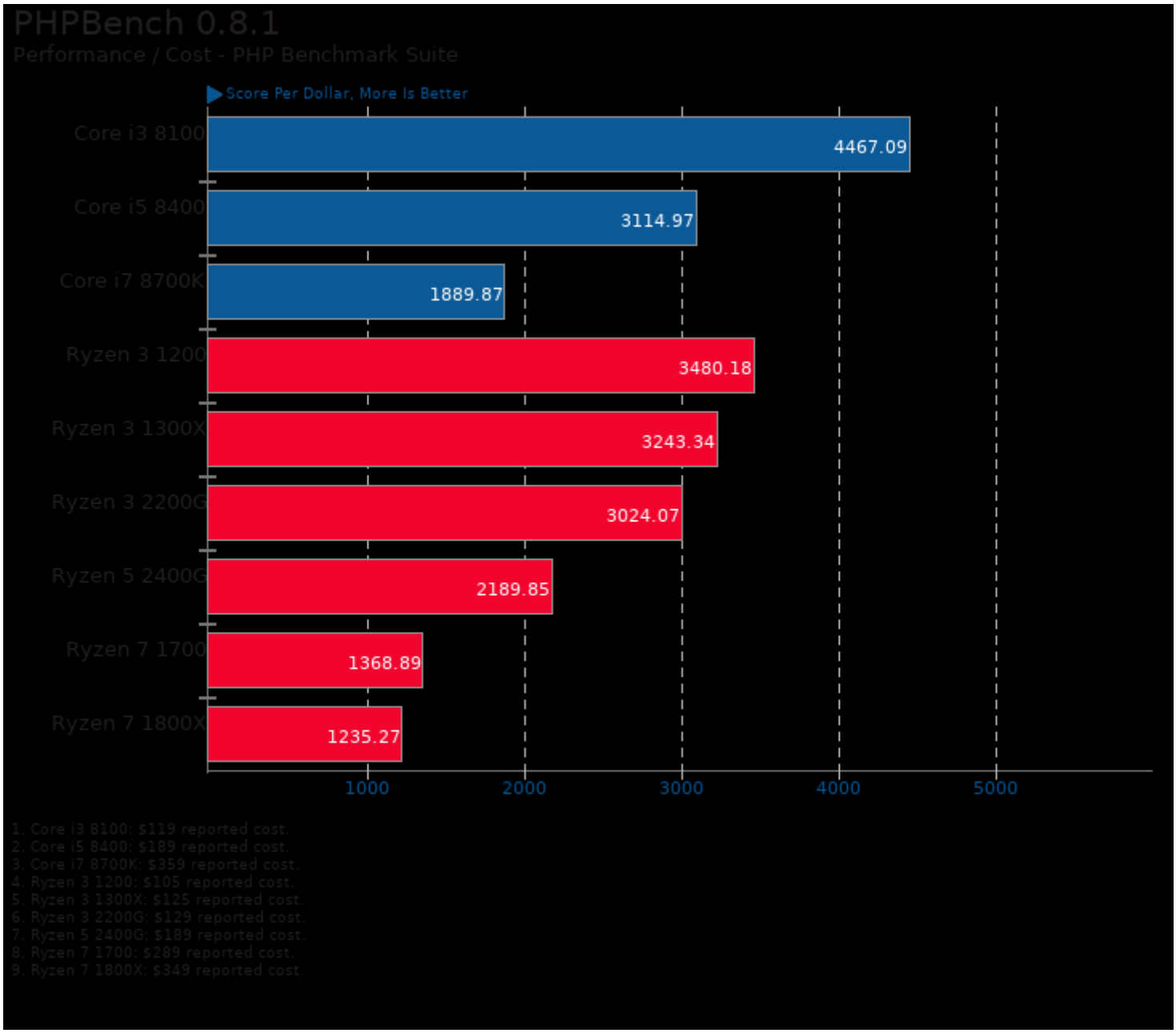

x264 2018-02-05
Performance / Cost - H.264 Video Encoding
Frames Per Second Per Dollar, More Is Better
Core i3 8100
0.26
Core i5 8400
0.30
Core i7 8700K
0.20
Ryzen 3 1200
0.22
Ryzen 3 1300X
0.22
Ryzen 3 2200G
0.21
Ryzen 5 2400G
0.18
Ryzen 7 1700
0.21
Ryzen 7 1800X
0.20
0.0675
0.135
0.2025
0.27
0.3375
1. Core i3 8100: $119 reported cost.
2. Core i5 8400: $189 reported cost.
3. Core i7 8700K: $359 reported cost.
4. Ryzen 3 1200: $105 reported cost.
5. Ryzen 3 1300X: $125 reported cost.
6. Ryzen 3 2200G: $129 reported cost.
7. Ryzen 5 2400G: $189 reported cost.
8. Ryzen 7 1700: $289 reported cost.
9. Ryzen 7 1800X: $349 reported cost.

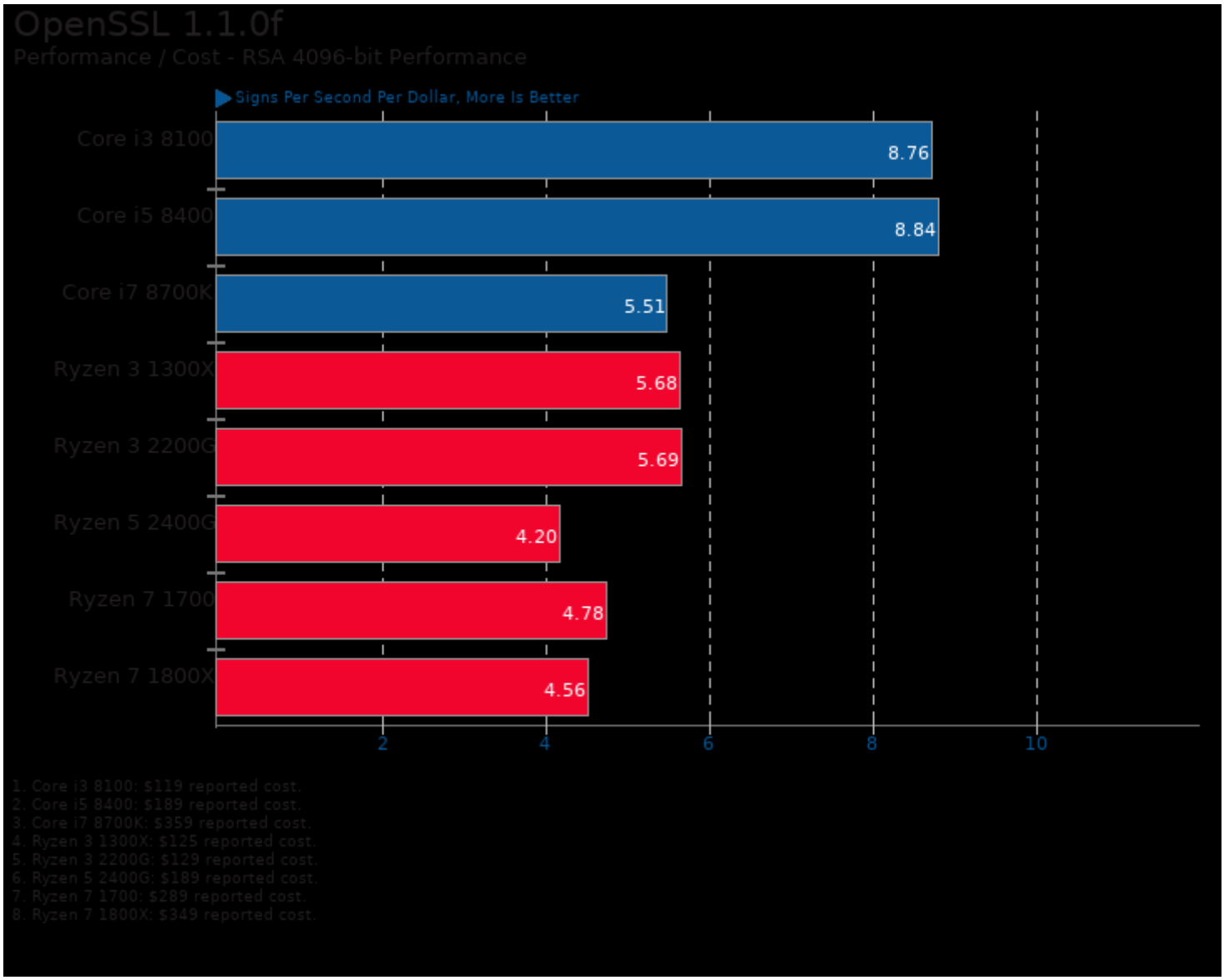

7-Zip Compression 9.20.1
Performance / Cost - Compress Speed Test
MIPS Per Dollar, More Is Better
Core i3 8100
144.71
Core i5 8400
143.01
Core i7 8700K
108.74
Ryzen 3 1200
120.01
Ryzen 3 1300X
127.04
Ryzen 3 2200G
122.05
Ryzen 5 2400G
93.80
Ryzen 7 1700
105.98
Ryzen 7 1800X
94.62
30
60
90
120
150
1. Core i3 8100: $119 reported cost.
2. Core i5 8400: $189 reported cost.
3. Core i7 8700K: $359 reported cost.
4. Ryzen 3 1200: $105 reported cost.
5. Ryzen 3 1300X: $125 reported cost.
6. Ryzen 3 2200G: $129 reported cost.
7. Ryzen 5 2400G: $189 reported cost.
8. Ryzen 7 1700: $289 reported cost.
9. Ryzen 7 1800X: $349 reported cost.


asmFish 2017-09-19
Performance / Cost - 1024 Hash Memory, 26 Depth
Nodes/second Per Dollar, More Is Better
Core i3 8100
82702.40
Core i5 8400
84198.85
Core i7 8700K
65286.16
Ryzen 3 1200
69749.99
Ryzen 3 1300X
66289.07
Ryzen 3 2200G
66508.50
Ryzen 5 2400G
65379.80
Ryzen 7 1700
69555.73
Ryzen 7 1800X
64981.32
20K
40K
60K
80K
100K
1. Core i3 8100: $119 reported cost.
2. Core i5 8400: $189 reported cost.
3. Core i7 8700K: $359 reported cost.
4. Ryzen 3 1200: $105 reported cost.
5. Ryzen 3 1300X: $125 reported cost.
6. Ryzen 3 2200G: $129 reported cost.
7. Ryzen 5 2400G: $189 reported cost.
8. Ryzen 7 1700: $289 reported cost.
9. Ryzen 7 1800X: $349 reported cost.


Java JMH
Performance / Cost - Throughput
Ops/s Per Dollar, More Is Better
Core i3 8100
120859947.60
Core i5 8400
120505096.30
Core i7 8700K
71744291.39
Ryzen 3 1200
58800743.26
Ryzen 3 1300X
57352887.79
Ryzen 3 2200G
57248892.81
Ryzen 5 2400G
39182293.36
Ryzen 7 1700
44234215.11
Ryzen 7 1800X
42352019.60
30M
60M
90M
120M
150M
1. Core i3 8100: $119 reported cost.
2. Core i5 8400: $189 reported cost.
3. Core i7 8700K: $359 reported cost.
4. Ryzen 3 1200: $105 reported cost.
5. Ryzen 3 1300X: $125 reported cost.
6. Ryzen 3 2200G: $129 reported cost.
7. Ryzen 5 2400G: $189 reported cost.
8. Ryzen 7 1700: $289 reported cost.
9. Ryzen 7 1800X: $349 reported cost.


NGINX Benchmark 1.9.9
Performance / Cost - Static Web Page Serving
Requests Per Second Per Dollar, More Is Better
Core i3 8100
305.13
Core i5 8400
214.46
Core i7 8700K
125.11
Ryzen 3 1200
277.57
Ryzen 3 1300X
261.07
Ryzen 3 2200G
260.63
Ryzen 5 2400G
176.98
Ryzen 7 1700
103.18
Ryzen 7 1800X
94.45
70
140
210
280
350
1. Core i3 8100: $119 reported cost.
2. Core i5 8400: $189 reported cost.
3. Core i7 8700K: $359 reported cost.
4. Ryzen 3 1200: $105 reported cost.
5. Ryzen 3 1300X: $125 reported cost.
6. Ryzen 3 2200G: $129 reported cost.
7. Ryzen 5 2400G: $189 reported cost.
8. Ryzen 7 1700: $289 reported cost.
9. Ryzen 7 1800X: $349 reported cost.


PHPBench 0.8.1
Performance / Cost - PHP Benchmark Suite
Score Per Dollar, More Is Better
Core i3 8100
4467.09
Core i5 8400
3114.97
Core i7 8700K
1889.87
Ryzen 3 1200
3480.18
Ryzen 3 1300X
3243.34
Ryzen 3 2200G
3024.07
Ryzen 5 2400G
2189.85
Ryzen 7 1700
1368.89
Ryzen 7 1800X
1235.27
1000
2000
3000
4000
5000
1. Core i3 8100: $119 reported cost.
2. Core i5 8400: $189 reported cost.
3. Core i7 8700K: $359 reported cost.
4. Ryzen 3 1200: $105 reported cost.
5. Ryzen 3 1300X: $125 reported cost.
6. Ryzen 3 2200G: $129 reported cost.
7. Ryzen 5 2400G: $189 reported cost.
8. Ryzen 7 1700: $289 reported cost.
9. Ryzen 7 1800X: $349 reported cost.



This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 29 March 2024 02:20.