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Low-End EOY2019 Ubuntu Linux CPU Comparison

Core i5 8500T

Automated Executive Summary

Core i3 8100 had the most wins, coming in first place for 31% of the tests.

Based on the geometric mean of all complete results, the fastest (Ryzen 5 2400G) was 1.962x the speed of the slowest (A10-7850K).

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

Intel Open Image Denoise (Scene: Memorial) at 605.244x
OSPray (Demo: Magnetic Reconnection - Renderer: SciVis) at 132.759x
ctx_clock (Context Switch Time) at 7.95x
DeepSpeech (Acceleration: CPU) at 4.598x
GraphicsMagick (Operation: Sharpen) at 4.133x
Core-Latency (Average Latency Between CPU Cores) at 4.113x
NeatBench (Acceleration: CPU) at 3.834x
Embree (Binary: Pathtracer - Model: Asian Dragon) at 3.697x
Selenium (Benchmark: PSPDFKit WASM - Browser: Firefox) at 3.68x
Embree (Binary: Pathtracer ISPC - Model: Asian Dragon) at 3.446x.

Test Systems:

Athlon 200GE

Processor: AMD Athlon 200GE @ 3.20GHz (2 Cores / 4 Threads), Motherboard: ASUS PRIME B350M-E (5220 BIOS), Chipset: AMD Raven/Raven2, Memory: 8192MB, Disk: 525GB 2115, Graphics: ASUS AMD Radeon Vega / Mobile 2GB (1000/1067MHz), Audio: AMD Raven/Raven2/Fenghuang, Monitor: DELL S2409W, Network: Realtek RTL8111/8168/8411

OS: Ubuntu 19.10, Kernel: 5.3.0-24-generic (x86_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server 1.20.5, Display Driver: modesetting 1.20.5, OpenGL: 4.5 Mesa 19.2.1 (LLVM 9.0.0), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0x8101016
Java Notes: OpenJDK Runtime Environment (build 11.0.5+10-post-Ubuntu-0ubuntu1.1)
Python Notes: Python 2.7.17 + Python 3.7.5
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional STIBP: disabled RSB filling + tsx_async_abort: Not affected

Athlon 3000G

Processor: AMD Athlon 3000G @ 3.50GHz (2 Cores / 4 Threads), Motherboard: ASUS PRIME B350M-E (5220 BIOS), Chipset: AMD Raven/Raven2, Memory: 8192MB, Disk: 525GB 2115, Graphics: ASUS AMD Picasso 2GB (1100MHz), Audio: AMD Raven/Raven2/Fenghuang, Monitor: DELL S2409W, Network: Realtek RTL8111/8168/8411

OS: Ubuntu 19.10, Kernel: 5.3.0-24-generic (x86_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server 1.20.5, Display Driver: modesetting 1.20.5, OpenGL: 4.5 Mesa 19.2.1 (LLVM 9.0.0), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0x8108109
Java Notes: OpenJDK Runtime Environment (build 11.0.5+10-post-Ubuntu-0ubuntu1.1)
Python Notes: Python 2.7.17 + Python 3.7.5
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional STIBP: disabled RSB filling + tsx_async_abort: Not affected

A10-7850K

Processor: AMD A10-7850K APU @ 3.70GHz (2 Cores / 4 Threads), Motherboard: Gigabyte F2A88XM-D3H (F5 BIOS), Chipset: AMD 15h, Memory: 8192MB, Disk: 120GB KINGSTON SV300S3 + 525GB 2115, Graphics: AMD Radeon R7 1GB, Audio: AMD Kaveri HDMI/DP, Monitor: VA2431, Network: Realtek RTL8111/8168/8411

OS: Ubuntu 19.10, Kernel: 5.3.0-24-generic (x86_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server 1.20.5, Display Driver: modesetting 1.20.5, OpenGL: 4.5 Mesa 19.2.1 (LLVM 9.0.0), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch

--enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0x6003103
Java Notes: OpenJDK Runtime Environment (build 11.0.5+10-post-Ubuntu-0ubuntu1.1)
Python Notes: Python 2.7.17 + Python 3.7.5
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline STIBP: disabled RSB filling + tsx_async_abort: Not affected

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 17h, Memory: 8192MB, Disk: 525GB 2115 + 120GB ADATA SU700, Graphics: AMD FirePro V3800 512MB, Audio: AMD Redwood HDMI Audio, Monitor: VA2431, Network: Realtek RTL8111/8168/8411

OS: Ubuntu 19.10, Kernel: 5.3.0-24-generic (x86_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server 1.20.5, Display Driver: modesetting 1.20.5, OpenGL: 3.3 Mesa 19.2.1 (LLVM 9.0.0), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0x8001129
Java Notes: OpenJDK Runtime Environment (build 11.0.5+10-post-Ubuntu-0ubuntu1.1)
Python Notes: Python 2.7.17 + Python 3.7.5
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline STIBP: disabled RSB filling + tsx_async_abort: Not affected

Ryzen 3 2200G

Processor: AMD Ryzen 3 2200G @ 3.50GHz (4 Cores), Motherboard: ASUS PRIME B350M-E (5220 BIOS), Chipset: AMD Raven/Raven2, Memory: 8192MB, Disk: 14GB INTEL MEMPEK1W016GA + 525GB 2115, Graphics: ASUS AMD Radeon Vega / Mobile 2GB (1100/1600MHz), Audio: AMD Raven/Raven2/Fenghuang, Monitor: DELL S2409W, Network: Realtek RTL8111/8168/8411

OS: Ubuntu 19.10, Kernel: 5.3.0-24-generic (x86_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server 1.20.5, Display Driver: modesetting 1.20.5, OpenGL: 4.5 Mesa 19.2.1 (LLVM 9.0.0), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0x8101016
Java Notes: OpenJDK Runtime Environment (build 11.0.5+10-post-Ubuntu-0ubuntu1.1)
Python Notes: Python 2.7.17 + Python 3.7.5
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional STIBP: disabled RSB filling + tsx_async_abort: Not affected

Ryzen 5 2400G

Processor: AMD Ryzen 5 2400G @ 3.60GHz (4 Cores / 8 Threads), Motherboard: MSI B350M GAMING PRO (MS-7A39) v1.0 (2.NM BIOS), Chipset: AMD Raven/Raven2, Memory: 8192MB, Disk: 120GB Force MP500 + 525GB 2115, Graphics: MSI AMD Radeon Vega / Mobile 2GB (1250/1600MHz), Audio: AMD Raven/Raven2/Fenghuang, Monitor: DELL S2409W, Network: Realtek RTL8111/8168/8411

OS: Ubuntu 19.10, Kernel: 5.3.0-24-generic (x86_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server 1.20.5, Display Driver: modesetting 1.20.5, OpenGL: 4.5 Mesa 19.2.1 (LLVM 9.0.0), Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0x8101016
Java Notes: OpenJDK Runtime Environment (build 11.0.5+10-post-Ubuntu-0ubuntu1.1)
Python Notes: Python 2.7.17 + Python 3.7.5
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional STIBP: disabled RSB filling + tsx_async_abort: Not affected

Core i3 4130

Processor: Intel Core i3-4130 @ 3.40GHz (2 Cores / 4 Threads), Motherboard: Intel DH87RL (RLH8710H.86A.0332.2018.1026.1448 BIOS), Chipset: Intel 4th Gen Core DRAM, Memory: 8192MB, Disk: 128GB TOSHIBA THNSNH12 + 525GB 2115, Graphics: Intel Haswell 2GB (1150MHz), Audio: Intel Xeon E3-1200 v3/4th, Monitor: VA2431, Network: Intel I217-V

OS: Ubuntu 19.10, Kernel: 5.3.0-24-generic (x86_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server 1.20.5, Display Driver: modesetting 1.20.5, OpenGL: 4.5 Mesa 19.2.1, Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0x27
Java Notes: OpenJDK Runtime Environment (build 11.0.5+10-post-Ubuntu-0ubuntu1.1)
Python Notes: Python 2.7.17 + Python 3.7.5
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Mitigation of PTE Inversion; VMX: conditional cache flushes SMT vulnerable + mds: Mitigation of Clear buffers; SMT vulnerable + meltdown: Mitigation of PTI + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling + tsx_async_abort: Not affected

Core i3 7100

Processor: Intel Core i3-7100 @ 3.90GHz (2 Cores / 4 Threads), Motherboard: Gigabyte B250M-DS3H-CF (F9 BIOS), Chipset: Intel Xeon E3-1200 v6/7th + B250, Memory: 8192MB, Disk: 250GB Western Digital WDS250G1B0A + 525GB 2115, Graphics: Gigabyte Intel HD 630 3GB (1100MHz), Audio: Realtek ALC887-VD, Monitor: VA2431, Network: Realtek RTL8111/8168/8411

OS: Ubuntu 19.10, Kernel: 5.3.0-24-generic (x86_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server 1.20.5, Display Driver: modesetting 1.20.5, OpenGL: 4.5 Mesa 19.2.1, Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0xca
Java Notes: OpenJDK Runtime Environment (build 11.0.5+10-post-Ubuntu-0ubuntu1.1)
Python Notes: Python 2.7.17 + Python 3.7.5
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Mitigation of PTE Inversion; VMX: conditional cache flushes SMT vulnerable + mds: Mitigation of Clear buffers; SMT vulnerable + meltdown: Mitigation of PTI + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling + tsx_async_abort: Not affected

Core i3 8100

Processor: Intel Core i3-8100 @ 3.60GHz (4 Cores), Motherboard: ASRock Z370M-ITX/ac (P4.10 BIOS), Chipset: Intel 8th Gen Core 4-core Desktop, Memory: 8192MB, Disk: 60GB DREVO X1 SSD + 525GB 2115, Graphics: Intel UHD 630 3GB (1100MHz), Audio: Realtek ALC892, Monitor: VA2431, Network: Intel I219-V + Intel I211 + Intel Dual Band-AC 3168NGW

OS: Ubuntu 19.10, Kernel: 5.3.0-24-generic (x86_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server 1.20.5, Display Driver: modesetting 1.20.5, OpenGL: 4.5 Mesa 19.2.1, Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0xca
Java Notes: OpenJDK Runtime Environment (build 11.0.5+10-post-Ubuntu-0ubuntu1.1)
Python Notes: Python 2.7.17 + Python 3.7.5
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Mitigation of PTE Inversion; VMX: conditional cache flushes SMT disabled + mds: Mitigation of Clear buffers; SMT disabled + meltdown: Mitigation of PTI + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retpoline IBPB: conditional IBRS_FW STIBP: disabled RSB filling + tsx_async_abort: Not affected

Core i5 4670

Processor: Intel Core i5-4670 @ 3.80GHz (4 Cores), Motherboard: MSI B85M-P33 (MS-7817) v1.0 (V4.9 BIOS), Chipset: Intel 4th Gen Core DRAM, Memory: 8192MB, Disk: 63GB SanDisk SDSSDP06 + 525GB 2115, Graphics: MSI Intel Haswell Desktop 2GB (1200MHz), Audio: Intel Xeon E3-1200 v3/4th, Monitor: VA2431, Network: Realtek RTL8111/8168/8411

OS: Ubuntu 19.10, Kernel: 5.3.0-24-generic (x86_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server 1.20.5, Display Driver: modesetting 1.20.5, OpenGL: 4.5 Mesa 19.2.1, Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0x27
Java Notes: OpenJDK Runtime Environment (build 11.0.5+10-post-Ubuntu-0ubuntu1.1)
Python Notes: Python 2.7.17 + Python 3.7.5
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Mitigation of PTE Inversion; VMX: conditional cache flushes SMT disabled + mds: Mitigation of Clear buffers; SMT disabled + meltdown: Mitigation of PTI + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retpoline IBPB: conditional IBRS_FW STIBP: disabled RSB filling + tsx_async_abort: Not affected

Pentium G4400

Processor: Intel Pentium G4400 @ 3.30GHz (2 Cores), Motherboard: MSI B150M MORTAR (MS-7972) v2.0 (C.40 BIOS), Chipset: Intel Xeon E3-1200 v5/E3-1500, Memory: 8192MB, Disk: 120GB Samsung SSD 850 + 525GB 2115, Graphics: MSI Intel HD 510 3GB (1000MHz), Audio: Realtek ALC892, Monitor: VA2431, Network: Realtek RTL8111/8168/8411

OS: Ubuntu 19.10, Kernel: 5.3.0-24-generic (x86_64), Desktop: GNOME Shell 3.34.1, Display Server: X Server 1.20.5, Display Driver: modesetting 1.20.5, OpenGL: 4.5 Mesa 19.2.1, Compiler: GCC 9.2.1 20191008, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch

--enable-multilib --enable-nls --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0xd6
Java Notes: OpenJDK Runtime Environment (build 11.0.5+10-post-Ubuntu-0ubuntu1.1)
Python Notes: Python 2.7.17 + Python 3.7.5
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Mitigation of PTE Inversion; VMX: conditional cache flushes SMT disabled + mds: Mitigation of Clear buffers; SMT disabled + meltdown: Mitigation of PTI + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retpoline IBPB: conditional IBRS_FW STIBP: disabled RSB filling + tsx_async_abort: Not affected

DellOptiplex3060Micro

Processor: Intel Core i5-8500T @ 3.50GHz (6 Cores), Motherboard: Dell 03KWTV, Chipset: Intel Cannon Lake PCH Shared SRAM, Memory: 8192MB, Disk: 240GB Western Digital WDS240G2G0A- + 3001GB EZRZ-00Z5HB0, Graphics: Intel Device 3e92, Audio: Realtek ALC3234, Network: Realtek RTL8111/8168/8411 + Intel Wireless-AC 9260

OS: Ubuntu 18.04, Kernel: 5.0.0-37-generic (x86_64), Desktop: GNOME Shell 3.28.4, OpenGL: 4.5 Mesa 19.0.8, 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
System Notes: Python 2.7.17.

	Athlon 200GE	Athlon 3000G	A10-7850K	Ryzen 3 1200	Ryzen 3 2200G	Ryzen 5 2400G	Core i3 4130	Core i3 7100	Core i3 8100	Core i5 4670	Pentium G4400	DellOptiplex3060Micro
Java SciMark - Composite (Mflops)	1969	2168	**1323**	2131	**2298**	2288	1925	2165	2007	2155	1893	2014
Normalized	85.68%	94.33%	57.57%	92.7%	100%	99.53%	83.77%	94.2%	87.33%	93.79%	82.38%	87.63%
Standard Deviation	1.6%	0.8%	0.6%	0.3%	0.3%	3.8%	0.4%	0.4%	0.5%	0.4%	0.5%	2%
GraphicsMagick - Sharpen (Iterations/min)	26	28	21	48	54	56	22	18	32	46	**15**	**62**
Normalized	41.94%	45.16%	33.87%	77.42%	87.1%	90.32%	35.48%	29.03%	51.61%	74.19%	24.19%	100%
Standard Deviation			2.9%			1%						0%
GraphicsMagick - Resizing (Iterations/min)	201	221	151	364	375	370	**136**	213	386	312	178	**468**
Normalized	42.95%	47.22%	32.26%	77.78%	80.13%	79.06%	29.06%	45.51%	82.48%	66.67%	38.03%	100%
Standard Deviation	0.3%		0.8%		0.8%	0.8%	0.7%		1.1%	0.2%	1.3%	0.6%
dav1d - S.N.1 (FPS)	116.38	125.42	98.72	144.58	162.96	**211.42**	99.39	154.76	203.60	174.80	**90.50**	
Normalized	55.05%	59.32%	46.69%	68.39%	77.08%	100%	47.01%	73.2%	96.3%	82.68%	42.81%	
Standard Deviation	0.1%	0.1%	0.5%	0.1%	1.7%	0.7%	0.9%	0.1%	0.1%	1.2%	0.2%	
OSPray - M.R - SciVis (FPS)	1.48	1.61	1.39	2.46	2.72	3.33	2.16	3.83	5.34	4.01	**1.16**	**154**
Normalized	0.96%	1.05%	0.9%	1.6%	1.77%	2.16%	1.4%	2.49%	3.47%	2.6%	0.75%	100%

Low-End EOY2019 Ubuntu Linux CPU Comparison

Standard Deviation	0.2%	0.1%	2.2%	0.1%	0.4%	0.8%	0.3%	0.2%	0.3%	0.2%	0.6%	0%
Embree - Pathtracer - Asian Dragon	2.0968	2.2503	1.7347	2.9690	3.3545	**4.9405**	1.8928	2.8692	3.6984	3.3897	**1.3363**	4.52
Normalized	42.44%	45.55%	35.11%	60.1%	67.9%	100%	38.31%	58.08%	74.86%	68.61%	27.05%	91.49%
Standard Deviation	0.2%	0.2%	0.9%	0.2%	0.2%	0.2%	0.3%	0.1%	0.2%	0.2%	0.1%	0.2%
Embree - Pathtracer ISPC - Asian Dragon (FPS)	2.0049	2.1626	1.6460	2.8838	3.2661	**4.7071**	2.1358	3.4536	4.4093	3.9679	**1.3661**	4.47
Normalized	42.59%	45.94%	34.97%	61.26%	69.39%	100%	45.37%	73.37%	93.67%	84.3%	29.02%	94.96%
Standard Deviation	0%	0.2%	0.3%	0.2%	0.1%	0%	0.6%	0.1%	0.2%	0.1%	0%	1%
SVT-VP9 - VMAF Optimized - Bosphorus 1080p (FPS)	33.96	36.36		56.31	59.85	65.76	**26.41**	52.74	**81.76**	65.18		72.63
Normalized	41.54%	44.47%		68.87%	73.2%	80.43%	32.3%	64.51%	100%	79.72%		88.83%
Standard Deviation	1.6%	2.4%		2.8%	2.9%	2.8%	1.1%	2.8%	3.6%	2.9%		4%
x264 - H.2.V.E (FPS)	17.12	18.75	15.00	23.53	25.84	34.48	**14.80**	23.06	30.43	28.35	16.82	**43.83**
Normalized	39.06%	42.78%	34.22%	53.68%	58.96%	78.67%	33.77%	52.61%	69.43%	64.68%	38.38%	100%
Standard Deviation	2.7%	2.6%	1.8%	2.9%	2.6%	2.9%	1.8%	2.9%	2.9%	3%	2.9%	4.9%
Intel Open Image Denoise - Memorial (Images / Sec)	0.88	0.96	**0.45**	1.58	1.55	1.60	1.50	1.95	3.56	3.26	0.46	**272.36**
Normalized	0.32%	0.35%	0.17%	0.58%	0.57%	0.59%	0.55%	0.72%	1.31%	1.2%	0.17%	100%
Standard Deviation	0.1%	0.2%	0.6%	0.1%	0.5%	0.3%	0.2%	0%	0.1%	0.3%	0%	0.7%
Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec)	63466	69326	64352	86731	103162	**147021**	66640	77272	108962	96602	**50596**	142897
Normalized	43.17%	47.15%	43.77%	58.99%	70.17%	100%	45.33%	52.56%	74.11%	65.71%	34.41%	97.2%
Standard Deviation	0.1%	0.1%	0.3%	0.4%	0.4%	0.1%	0.2%	0.8%	0.1%	0.9%	0.1%	0.2%
Himeno Benchmark - P.P.S (MFLOPS)	3587	3844	**2128**	3834	4177	**4364**	2231	3158	3002	3155	2757	2915
Normalized	82.2%	88.08%	48.78%	87.85%	95.73%	100%	51.12%	72.36%	68.8%	72.3%	63.19%	66.81%
Standard Deviation	1.8%	2.5%	0.1%	1.8%	0.5%	2%	1.3%	0.2%	0.3%	0.2%	0%	0.3%
7-Zip Compression - C.S.T (MIPS)	9394	10127	8800	14379	16670	19415	8857	12598	16708	16227	**7661**	**19956**
Normalized	47.07%	50.75%	44.1%	72.05%	83.53%	97.29%	44.38%	63.13%	83.72%	81.31%	38.39%	100%
Standard Deviation	1.9%	1.1%	1.1%	1.6%	0.4%	0.2%	1.5%	0.4%	0.3%	0.3%	0.5%	1%

Low-End EOY2019 Ubuntu Linux CPU Comparison

Timed Linux Kernel Compilation - Time To Compile (sec)	379.208	349.004	406.240	250.323	230.710	**179.165**	**548.808**	315.843	211.397	225.887	461.388	182.92
Normalized	47.25%	51.34%	44.1%	71.57%	77.66%	100%	32.65%	56.73%	84.75%	79.32%	38.83%	97.95%
Standard Deviation	0.4%	0.4%	0.3%	0.7%	0.9%	0.2%	0.5%	0.4%	0.8%	0.5%	0.3%	0.8%
Build2 - Time To Compile (sec)	510.768	472.070	506.362	319.812	300.206	255.369	**719.310**	405.822	266.377	287.610	571.821	**226.09**
Normalized	44.26%	47.89%	44.65%	70.69%	75.31%	88.53%	31.43%	55.71%	84.88%	78.61%	39.54%	100%
Standard Deviation	0%	0.3%	0.2%	0.2%	0.2%		0.3%	0.2%	0.4%	0.4%	0.1%	0.2%
Zstd Compression - C.u.1.0.3.s.i.i.C.L .1 (sec)	86.302	82.201	65.160	51.976	50.217	41.525	**98.554**	58.556	**40.689**	44.410	81.064	60.69
Normalized	47.15%	49.5%	62.44%	78.28%	81.03%	97.99%	41.29%	69.49%	100%	91.62%	50.19%	67.04%
Standard Deviation	0.4%	0.3%	0.1%	0.2%	0.2%	21.7%	2.8%	0.2%	0.2%	0.4%	0.3%	0.1%
DeepSpeech - CPU (sec)	83.2176 8	79.7162 1	**306.286 18**	74.3231 1	67.8957 2	74.7942 5	197.119 56	67.3495 9	**66.6178 2**	97.3815 9		97.29
Normalized	80.05%	83.57%	21.75%	89.63%	98.12%	89.07%	33.8%	98.91%	100%	68.41%		68.47%
Standard Deviation	0.9%	0.7%	0.5%	1.3%	1.1%	0.9%	0.3%	2.5%	1.9%	1%		1.4%
FLAC Audio Encoding - WAV To FLAC (sec)	12.801	11.872	**20.867**	11.531	10.912	10.772	12.974	**9.932**	11.162	11.163	12.580	11.49
Normalized	77.59%	83.66%	47.6%	86.13%	91.02%	92.2%	76.55%	100%	88.98%	88.97%	78.95%	86.44%
Standard Deviation	1.4%	1.9%	0.2%	0.4%	0.7%	1.2%	1.8%	0.5%	0.7%	1.2%	1.9%	3%
LAME MP3 Encoding - WAV To MP3 (sec)	10.972	9.880	**14.156**	9.987	9.290	**8.863**	11.115	9.270	9.971	9.869	10.882	10.48
Normalized	80.78%	89.71%	62.61%	88.75%	95.4%	100%	79.74%	95.61%	88.89%	89.81%	81.45%	84.57%
Standard Deviation	1.4%	0.5%	0.3%	0.1%	0.1%	0.4%	0.2%	0%	0.1%	0.1%	0%	0.1%
Perl Benchmarks - Pod2html (sec)	0.18846 585	0.17386 731	**0.22753 557**	0.17655 118	0.16336 353	0.15405 877	0.17321 866	**0.12531 321**	0.13521 119	0.12886 029	0.15250 590	0.14412 552
Normalized	66.49%	72.07%	55.07%	70.98%	76.71%	81.34%	72.34%	100%	92.68%	97.25%	82.17%	86.95%
Standard Deviation	1%	1.5%	0.5%	1.2%	0.8%	0.9%	1.9%	0.2%	0.4%	1%	0.9%	1.3%
Perl Benchmarks - Interpreter	0.00140 873	0.00120 668	0.00216 237	0.00157 415	0.00171 832	0.00170 840	0.00172 385	**0.00106 513**	0.00109 191	0.00123 535	0.00125 764	**0.00284 606**
Normalized	75.61%	88.27%	49.26%	67.66%	61.99%	62.35%	61.79%	100%	97.55%	86.22%	84.69%	37.42%
Standard Deviation	0.7%	0.7%	1.7%	2.1%	1.4%	0.8%	1%	0.4%	1.3%	1.5%	0.2%	3%
Radiance Benchmark - SMP Parallel	442.114	410.374	**645.594**	310.224	**253.06**	256.232	557.984	371.787	256.715	263.343	556.648	302.77
Normalized	57.24%	61.67%	39.2%	81.57%	100%	98.76%	45.35%	68.07%	98.58%	96.1%	45.46%	83.58%
R Benchmark (sec)	0.3270	0.3012	**0.4615**	0.2293	0.2141	0.2220	0.4073	0.2184	**0.1777**	0.1997	0.3867	
Normalized	54.34%	59%	38.5%	77.5%	83%	80.05%	43.63%	81.36%	100%	88.98%	45.95%	
Standard Deviation	0.5%	0.4%	1%	0.6%	0.7%	0.5%	0.6%	0.2%	0.4%	0.4%	0.2%	
Sudokut - Total Time (sec)	19.384	17.816	**21.348**	18.527	17.314	15.950	15.811	**11.195**	12.101	12.131	13.097	12.45
Normalized	57.75%	62.84%	52.44%	60.43%	64.66%	70.19%	70.81%	100%	92.51%	92.28%	85.48%	89.92%
Standard Deviation	0.3%	0.1%	0.4%	0.3%	0.3%	0.1%	0.3%	0.3%	0.2%	0.1%	0.2%	0%

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Core-Latency - A.L.B.C.C (ns)	80.892925	79.349475	**303.750375**	302.22175	82.5883	74.02	207.10545	**73.849275**	113.09325	136.229	106.307	147.69
Normalized	91.29%	93.07%	24.31%	24.44%	89.42%	99.77%	35.66%	100%	65.3%	54.21%	69.47%	50%
Cryptsetup - PBKDF2-sha512 (Iterations/sec)	**1138787**	1287130	1153142	1269976	1361787	1444985	1314554	**1597628**	1476175	1472719	1193824	
Normalized	71.28%	80.57%	72.18%	79.49%	85.24%	90.45%	82.28%	100%	92.4%	92.18%	74.72%	
Standard Deviation	4.1%	0.3%	0.5%	0.1%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	
Cryptsetup - PBKDF2-whirlpool	504858	555784	**361748**	546704	587111	620466	512667	**680011**	631672	575508	571121	
Normalized	74.24%	81.73%	53.2%	80.4%	86.34%	91.24%	75.39%	100%	92.89%	84.63%	83.99%	
Standard Deviation	2.1%	0.2%	0.4%	0.2%	0.3%	0.4%	0.1%	0.1%			0.2%	
libjpeg-turbo tjbench - D.T (Megapixels/sec)	134.370170	146.896674	**119.198110**	145.193665	155.623822	164.693605	150.779073	**175.588930**	162.219342	172.989698	134.126157	156.74
Normalized	76.53%	83.66%	67.88%	82.69%	88.63%	93.79%	85.87%	100%	92.39%	98.52%	76.39%	89.27%
Standard Deviation	0.6%	0.4%	0.2%	0.2%	0.4%	0%	0.3%	0%	0.1%	0.5%	0.5%	0.3%
SQLite Speedtest - Timed Time -	93.845	86.131	**136.021**	86.187	81.589	77.553	129.917	**76.275**	77.440	79.816	97.630	84.36
Normalized	81.28%	88.56%	56.08%	88.5%	93.49%	98.35%	58.71%	100%	98.5%	95.56%	78.13%	90.42%
Standard Deviation	0.5%	0.6%	0.1%	0.1%	0.9%	2.4%	0.2%	0.3%	0.5%	0.2%	0.4%	0.6%
Darktable - Boat - CPU-only (sec)	36.365	33.986	64.980	23.389	23.879	25.597	**73.628**	35.655	**22.788**	30.025	43.147	
Normalized	62.66%	67.05%	35.07%	97.43%	95.43%	89.03%	30.95%	63.91%	100%	75.9%	52.81%	
Standard Deviation	0.2%	0.1%	0.6%	0.5%	3%	0.1%	0.2%	0%	0%	0.1%	0.1%	
Darktable - Masskrug - CPU-only (sec)	34.342	31.773	**50.970**	22.981	22.716	**19.495**	45.407	30.085	19.884	23.102	40.819	
Normalized	56.77%	61.36%	38.25%	84.83%	85.82%	100%	42.93%	64.8%	98.04%	84.39%	47.76%	
Standard Deviation	0%	0.1%	1%	0.3%	0.6%	0.3%	2.1%	0.1%	0.1%	0.2%	0.1%	
Darktable - Server Room - CPU-only (sec)	29.452	27.114	45.621	18.289	18.907	17.501	**46.023**	25.841	**16.656**	20.420	34.364	
Normalized	56.55%	61.43%	36.51%	91.07%	88.09%	95.17%	36.19%	64.46%	100%	81.57%	48.47%	
Standard Deviation	0.1%	0.2%	0.3%	0.4%	0.6%	0.4%	2%	0.2%	0.2%	0.3%	0.3%	
GIMP - resize (sec)	14.792	13.589	**18.899**	12.990	11.084	**10.094**	17.747	12.716	10.670	10.742	15.637	
Normalized	68.24%	74.28%	53.41%	77.71%	91.07%	100%	56.88%	79.38%	94.6%	93.97%	64.55%	
Standard Deviation	1.6%	2.5%	1.9%	2.2%	2.5%	19.6%	1.5%	3%	2.7%	2.2%	1.9%	
GIMP - rotate (sec)	18.070	16.721	**26.633**	17.712	15.641	15.254	22.434	**14.807**	15.471	15.669	17.956	
Normalized	81.94%	88.55%	55.6%	83.6%	94.67%	97.07%	66%	100%	95.71%	94.5%	82.46%	
Standard Deviation	0.1%	0.3%	0.4%	0.3%	0.2%	0.3%	0.1%	0.4%	0.1%	0.2%	0.2%	
GIMP - auto-levels (sec)	22.028	20.440	**32.403**	20.555	18.081	17.763	27.420	18.238	**16.911**	17.773	22.447	
Normalized	76.77%	82.73%	52.19%	82.27%	93.53%	95.2%	61.67%	92.72%	100%	95.15%	75.34%	
Standard Deviation	0.7%	0.4%	0.6%	0.2%	1.3%	2%	0.2%	1%	0.2%	0.1%	0.2%	

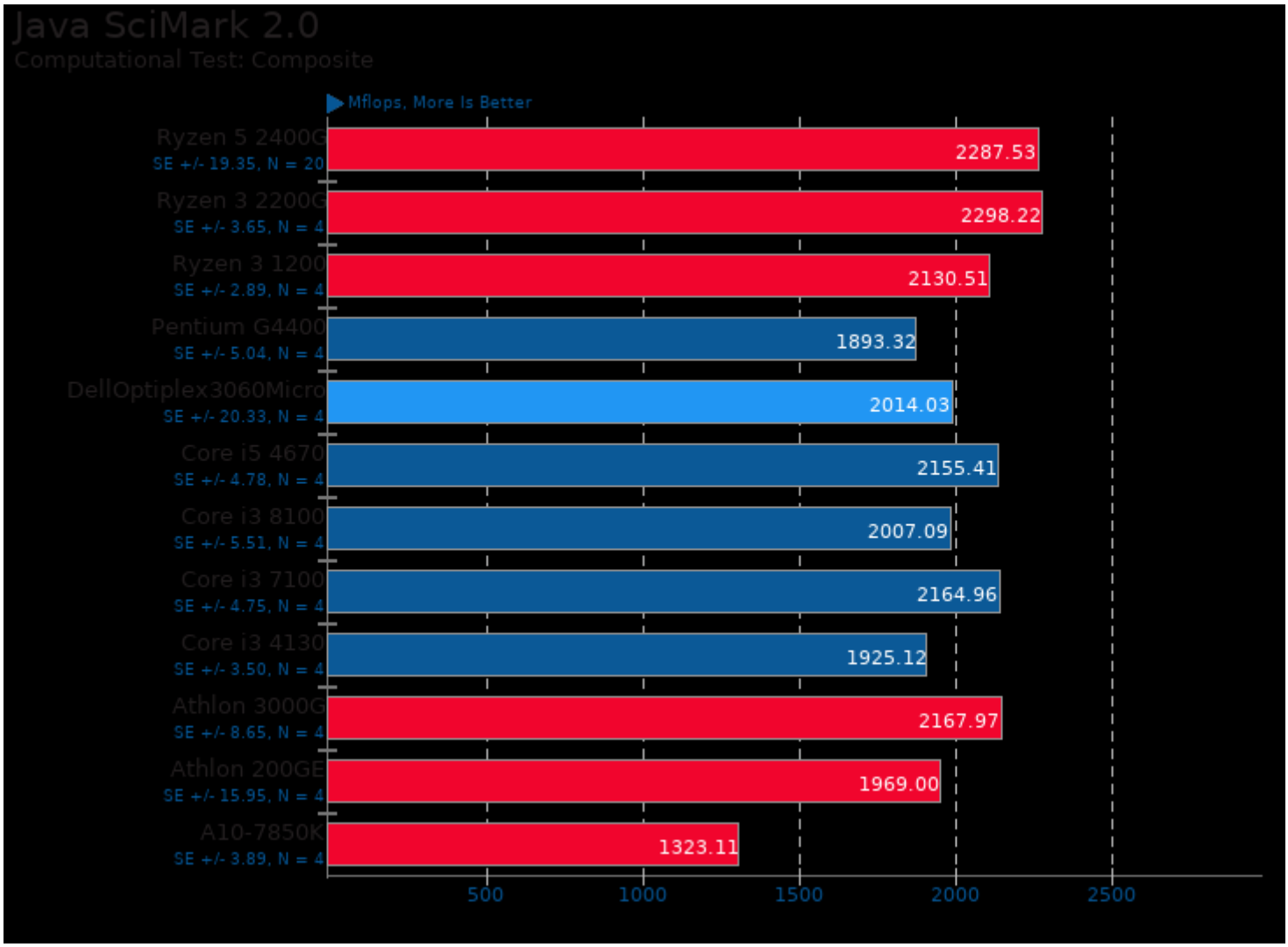
Low-End EOY2019 Ubuntu Linux CPU Comparison

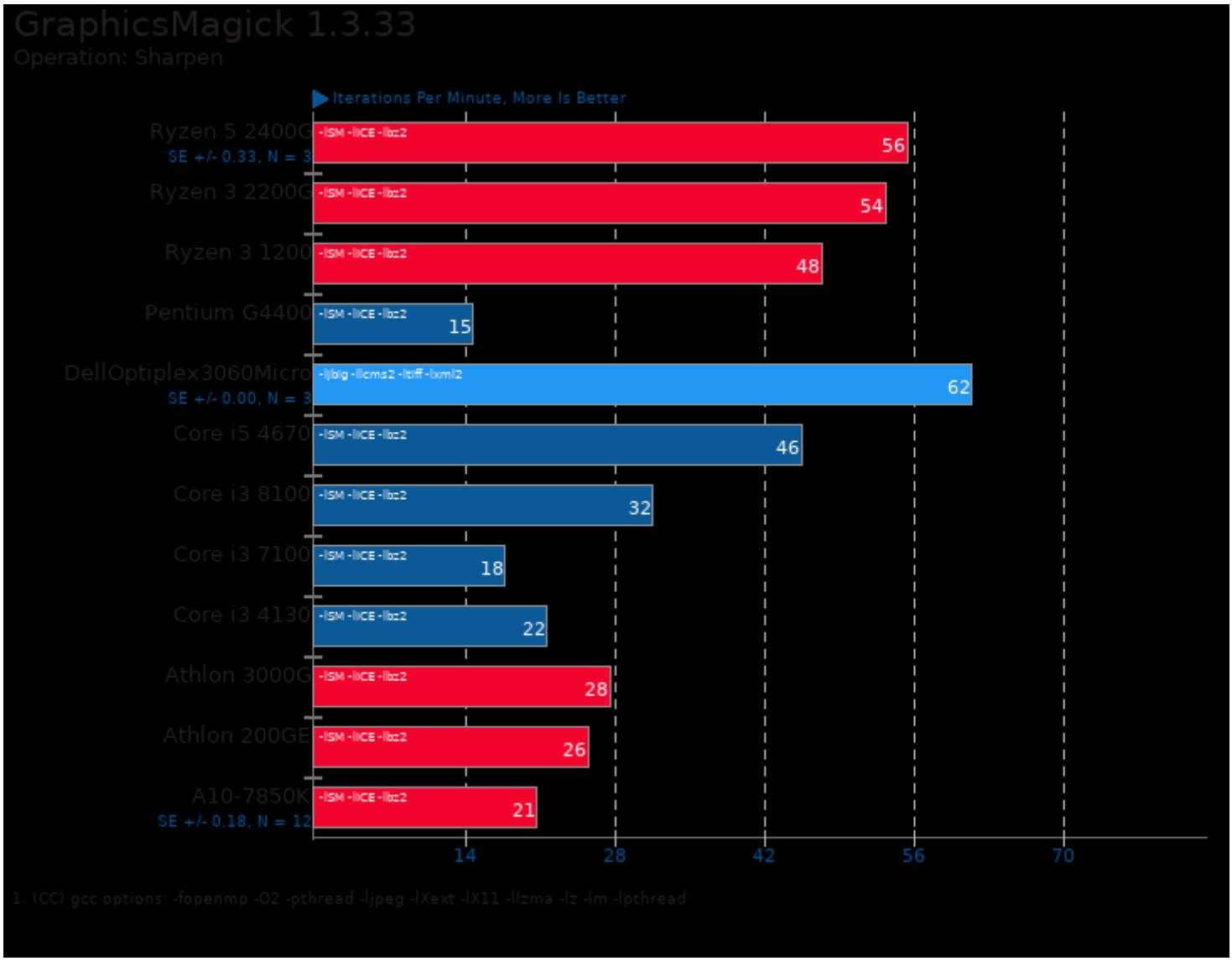
GIMP - unsharp-mask (sec)	24.438	22.627	**34.048**	22.071	19.252	19.844	32.299	21.115	**18.761**	19.787	26.986	
Normalized	76.77%	82.91%	55.1%	85%	97.45%	94.54%	58.09%	88.85%	100%	94.81%	69.52%	
Standard Deviation	0.2%	0.3%	0.6%	1.5%	1.2%	0.8%	1.5%	1.6%	0.4%	1.7%	0.2%	
LibreOffice - 2.D.T.P (sec)	11.158	10.222	**15.229**	10.359	9.513	9.081	12.460	8.800	9.122	**8.744**	10.291	11.51
Normalized	78.37%	85.54%	57.42%	84.41%	91.92%	96.29%	70.18%	99.36%	95.86%	100%	84.97%	75.97%
Standard Deviation	2.9%	3.3%	2.7%	3.1%	3.4%	3.6%	2.9%	5.8%	4.6%	3.7%	4%	9.4%
GNU Octave Benchmark (sec)	18.065	17.017	29.325	14.964	**13.457**	14.512	**37.768**	18.262	14.379	17.577	17.258	
Normalized	74.49%	79.08%	45.89%	89.93%	100%	92.73%	35.63%	73.69%	93.59%	76.56%	77.98%	
Standard Deviation	1.7%	0.6%	0.4%	1.4%	0.6%	0.8%	1%	0.7%	1.2%	0.6%	1%	
ctx_clock - C.S.T (Clocks)	224	210	429	186	210	**180**	1337	1267	1269	1125	**1431**	845
Normalized	80.36%	85.71%	41.96%	96.77%	85.71%	100%	13.46%	14.21%	14.18%	16%	12.58%	21.3%
Standard Deviation							0.2%	0.1%	0.2%	0.2%	0.1%	0.7%
PyBench - T.F.A.T.T (Milliseconds)	1466	1330	**1870**	1353	1254	1191	1344	**1103**	1192	1202	1323	1288
Normalized	75.24%	82.93%	58.98%	81.52%	87.96%	92.61%	82.07%	100%	92.53%	91.76%	83.37%	85.64%
Standard Deviation	0.9%		0.2%	0.2%	0.2%	0.3%	0.6%	0.4%	0.4%	0.1%	0.4%	0.2%
NeatBench - CPU (FPS)	3.35	3.52	2.56	6.44	6.07	5.55	**2.05**	4.57	**7.86**	5.61	3.05	
Normalized	42.62%	44.78%	32.57%	81.93%	77.23%	70.61%	26.08%	58.14%	100%	71.37%	38.8%	
Standard Deviation	0.9%	1.8%	0.6%	1.1%	0.6%	1.4%	1.3%	2.7%	1.5%	0.1%	0.2%	
PHPBench - P.B.S (Score)	415958	454813	**365799**	451544	482356	513232	552233	**635333**	585620	617530	531462	539785
Normalized	65.47%	71.59%	57.58%	71.07%	75.92%	80.78%	86.92%	100%	92.18%	97.2%	83.65%	84.96%
Standard Deviation	2%	2.2%	0.8%	0.4%	0.5%	0.6%	0.1%	0.1%	0.3%	0.3%	0.3%	1.2%
Selenium - ARES-6 - Firefox (ms)	79.74	72.72	**118.21**	76.18	67.57	65.65	98.90	67.31	**58.47**	61.54	65.75	65.32
Normalized	73.33%	80.4%	49.46%	76.75%	86.53%	89.06%	59.12%	86.87%	100%	95.01%	88.93%	89.51%
Standard Deviation	1.3%	1.2%	0.7%	0.9%	1.5%	0.4%	0.6%	0.3%	0.7%	0.5%	1.4%	0.5%
Selenium - Jetstream - Firefox (Score)	136.88	147.17	**89.872**	143.26	160.91	**168.96**	115.17	161.92	168.86	167.60	146.19	
Normalized	81.01%	87.1%	53.19%	84.79%	95.24%	100%	68.16%	95.83%	99.94%	99.2%	86.52%	
Standard Deviation	0.5%	0.2%	0.3%	0.3%	0.5%	0.6%	0.3%	0.1%	0.1%	0.4%	0.5%	
Selenium - StyleBench - Firefox (Runs / Minute)	47.3	50.3	**35.5**	49.2	54.5	65.3	40.1	64.9	**74.8**	69.2	42.7	72.70
Normalized	63.24%	67.25%	47.46%	65.78%	72.86%	87.3%	53.61%	86.76%	100%	92.51%	57.09%	97.19%
Standard Deviation	0.9%	0.3%	0.5%	0.8%	0.2%	0.6%	1.2%	0.2%	0.2%	0.7%	0.5%	0.9%

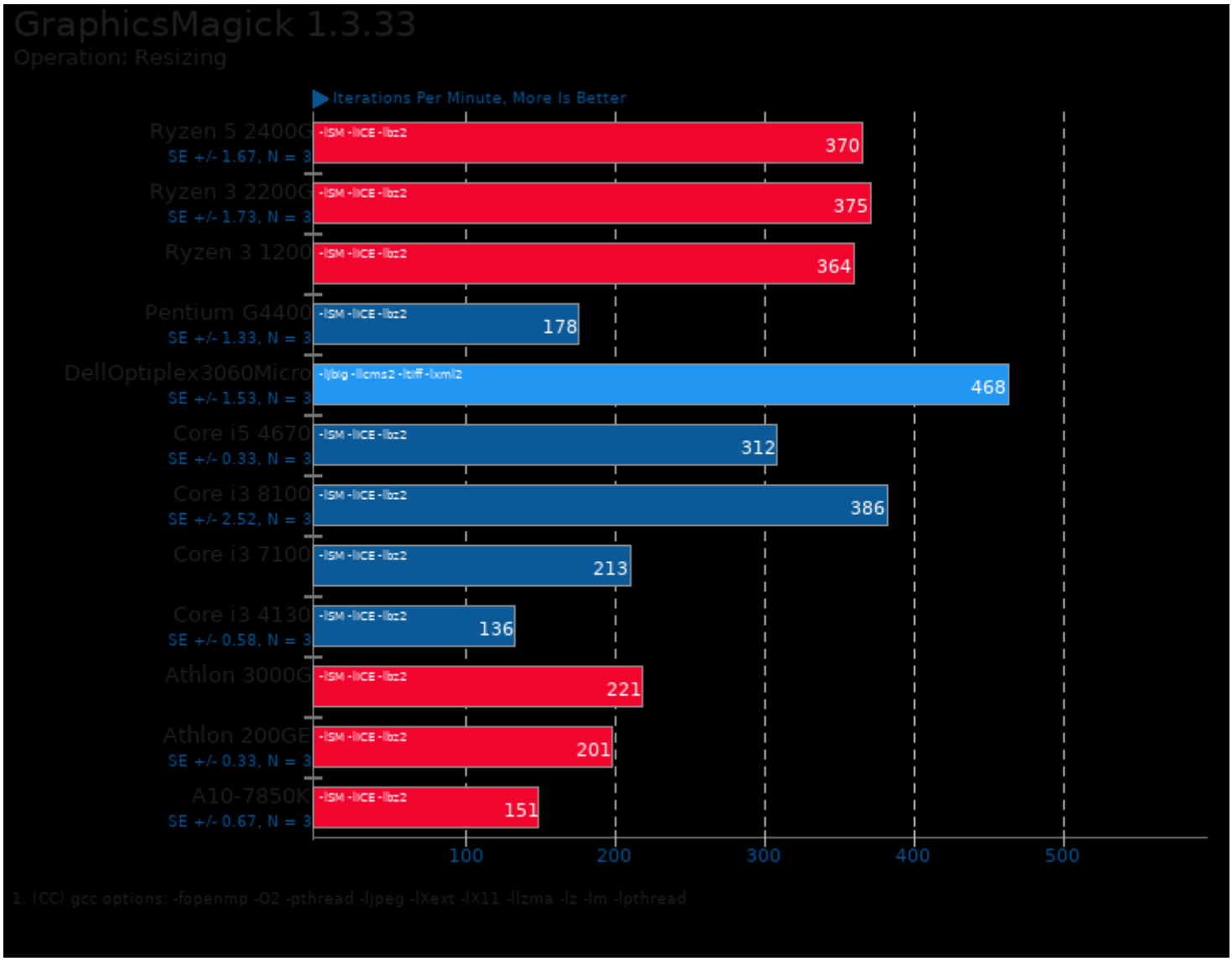
Low-End EOY2019 Ubuntu Linux CPU Comparison

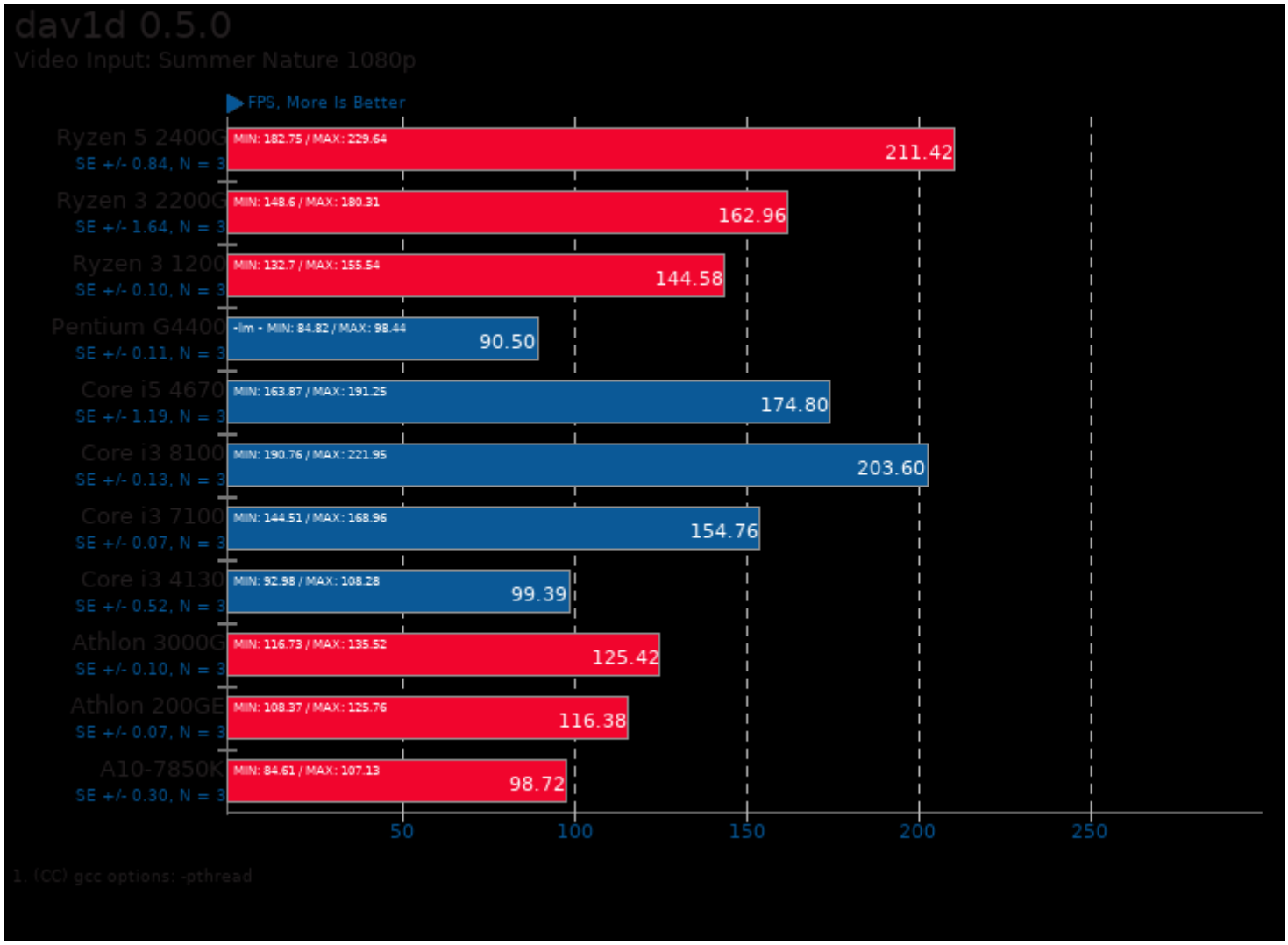
Selenium - Speedometer - Firefox (Runs/min)	49.74	53.9	39.0	53.1	60.8	62.6	**38.0**	64.5	**75.58**	71.8	60.73	68.90
Normalized	65.81%	71.32%	51.6%	70.26%	80.44%	82.83%	50.28%	85.34%	100%	95%	80.35%	91.16%
Standard Deviation	0.7%	0.4%	1.5%	0.7%	0.3%	0.2%	0.8%	0%	0.6%	0.1%	0.3%	0%
Selenium - ARES-6 - Google Chrome (ms)	35.23	32.86	**47.91**	30.44	26.57	27.59	42.40	33.05	**23.25**	23.32	31.57	
Normalized	65.99%	70.75%	48.53%	76.38%	87.5%	84.27%	54.83%	70.35%	100%	99.7%	73.65%	
Standard Deviation	2.2%	1.9%	0.6%	0.5%	0.1%	1%	1.1%	0.4%	0.5%	0.9%	1.1%	
Selenium - PSPDFKit WASM - Firefox (Score)	2449	2241	2926	2145	1888	1876	2897	1839	**1660**	1777	**6109**	1882
Normalized	67.78%	74.07%	56.73%	77.39%	87.92%	88.49%	57.3%	90.27%	100%	93.42%	27.17%	88.2%
Standard Deviation	1.5%	0.7%	0.5%	0.2%	0.6%	0.8%	0.6%	0.8%	0.6%	0.6%	1.7%	0.6%
Selenium - Jetstream - Google Chrome (Score)	138.21	151.32	**96.759**	149.76	169.44	170.19	116.97	145.82	179.65	**186.96**	150.36	
Normalized	73.92%	80.94%	51.75%	80.1%	90.63%	91.03%	62.56%	78%	96.09%	100%	80.42%	
Standard Deviation	0.5%	0.5%	0.2%	0.2%	0.1%	0.7%	0.3%	0.2%	0.5%	0.2%	0.9%	
Selenium - StyleBench - Google Chrome (Runs / Minute)	21.62	23.51	**16.26**	23.75	26.16	26.7	19.2	27.51	28.26	**28.75**	25.71	
Normalized	75.2%	81.77%	56.56%	82.61%	90.99%	92.87%	66.78%	95.69%	98.3%	100%	89.43%	
Standard Deviation	0.5%	0.4%	0.5%	0.4%	0.5%	0.4%	0.5%	0.1%	0.7%	1.1%	0.5%	
Selenium - Speedometer - Google Chrome (Runs/min)	69.87	75.8	55.0	78.39	87.77	87.88	**53.92**	80.0	**101**	97.93	81.8	
Normalized	69.18%	75.05%	54.46%	77.61%	86.9%	87.01%	53.39%	79.21%	100%	96.96%	80.99%	
Standard Deviation	0.4%	0.6%	0.2%	0.4%	0.6%	0.5%	0.5%	0.6%		1.6%	0.7%	
Selenium - PSPDFKit WASM - Google Chrome (Score)	3058	2795	**3443**	2450	2190	2274		3040	**2124**	2186	3176	
Normalized	69.46%	75.99%	61.69%	86.69%	96.99%	93.4%		69.87%	100%	97.16%	66.88%	
Standard Deviation	1%	1.3%	0.5%	0.7%	0.5%	1.3%		0.6%	1%	0.9%	2.9%	
Tesseract OCR - T.T.O.7.I (sec)	35.333	32.623	46.932	34.801	29.123	28.256	38.126	28.537	28.339	**28.001**	**58.053**	
Normalized	79.25%	85.83%	59.66%	80.46%	96.15%	99.1%	73.44%	98.12%	98.81%	100%	48.23%	
Standard Deviation	0.1%	0.2%	0.2%	0.3%	0.2%	0.2%	0.3%	0.3%	0.4%	0%	0.1%	
Cryptsetup - PBKDF2-whirlpool	507646	553827	**363584**	548037	587552	621931	512667		**630407**	574669	571534	
Normalized	80.53%	87.85%	57.67%	86.93%	93.2%	98.66%	81.32%		100%	91.16%	90.66%	
Standard Deviation	0.4%	0.3%	0.1%	0.2%	0.4%		0.1%		0.1%	0.3%	0.1%	

Low-End EOY2019 Ubuntu Linux CPU Comparison

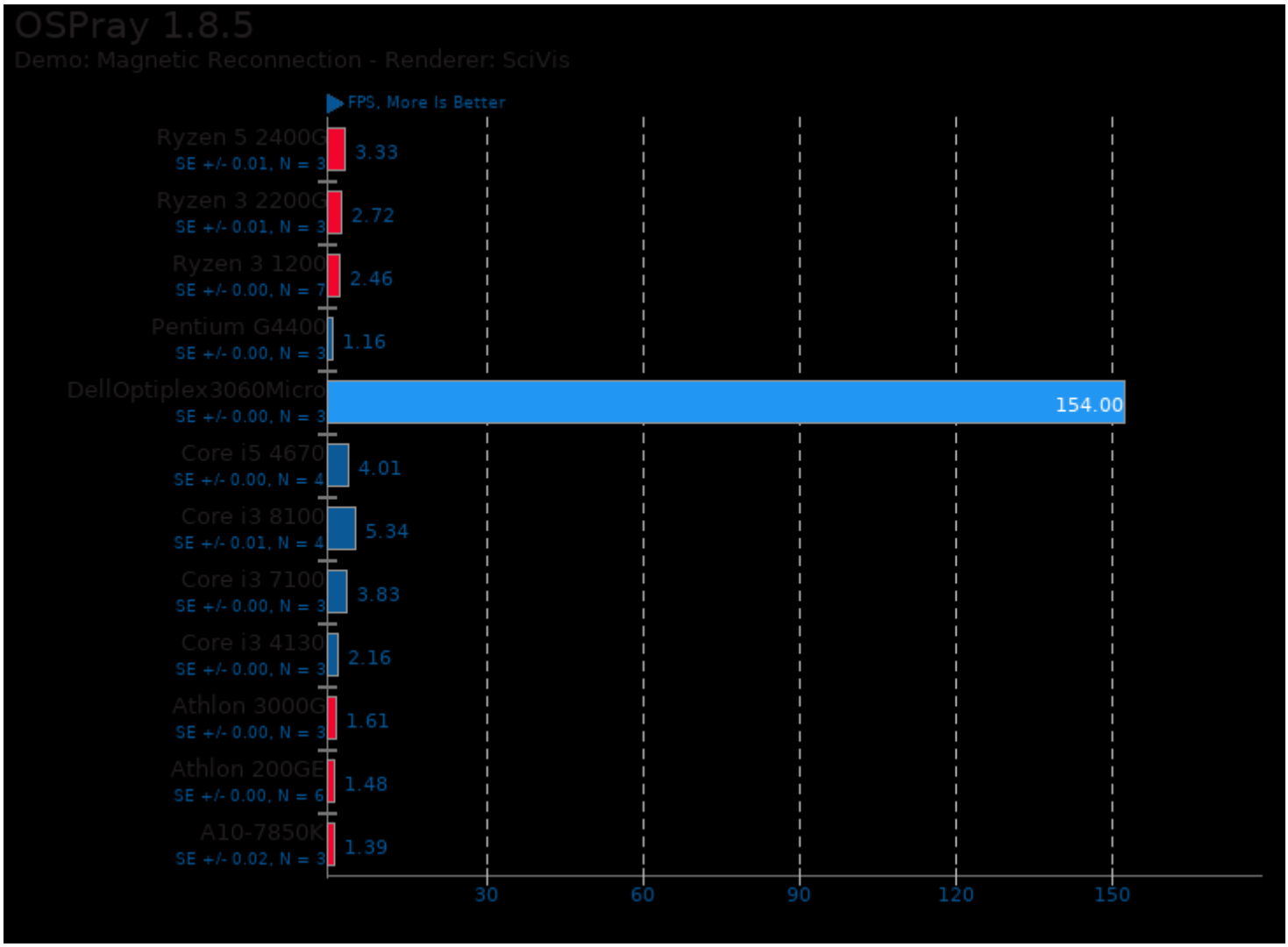


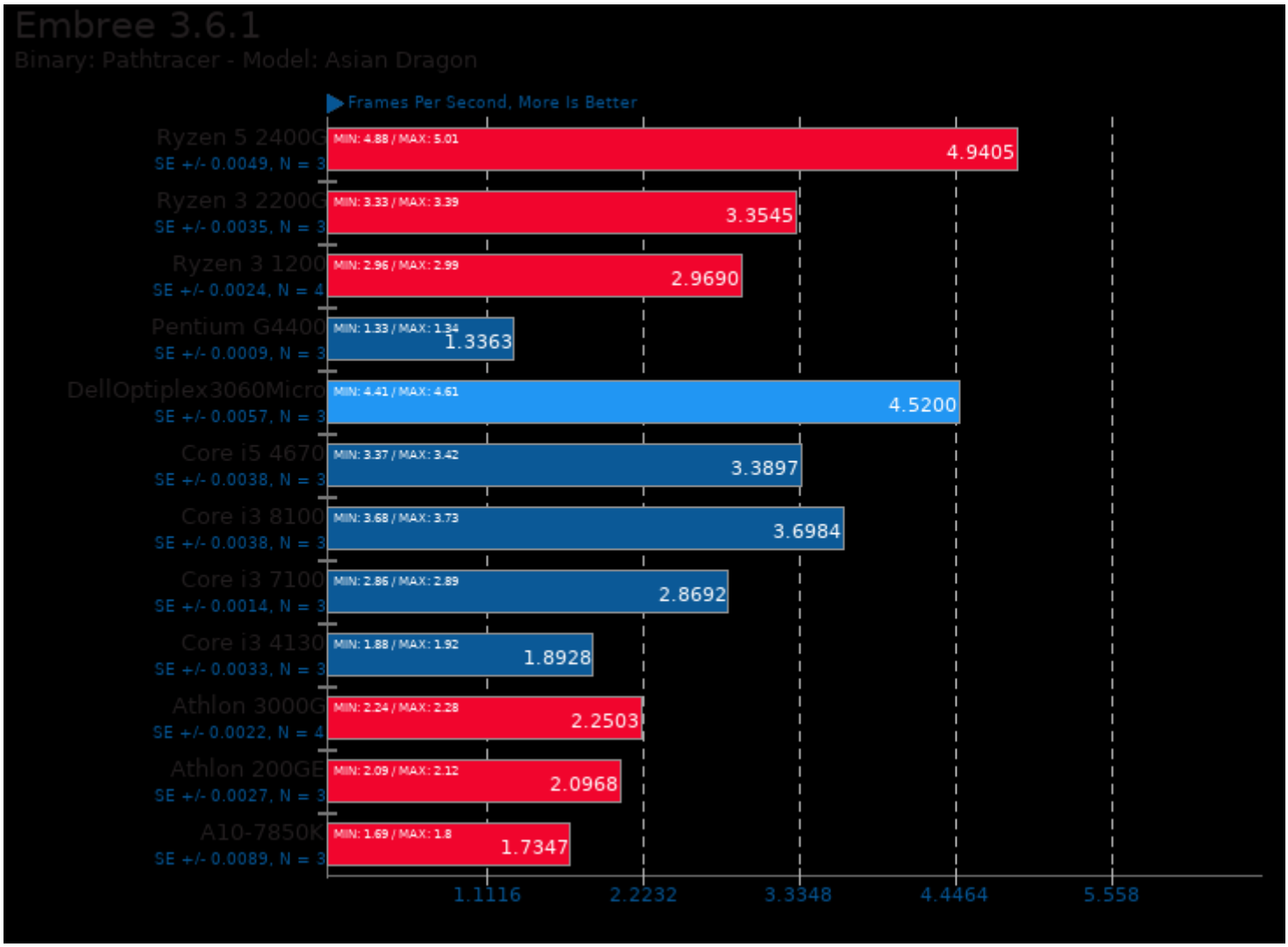

GraphicsMagick 1.3.33
Operation: Sharpen
Iterations Per Minute, More Is Better
Ryzen 5 2400G
SE +/- 0.33, N = 3
-ISM -lICE -lbz2
56
Ryzen 3 2200G
54
Ryzen 3 1200
48
Pentium G4400
15
DellOptiplex3060Micro
SE +/- 0.00, N = 3
-ljbig -llcms2 -ltiff -lxml2
62
Core i5 4670
46
Core i3 8100
32
Core i3 7100
18
Core i3 4130
22
Athlon 3000G
28
Athlon 200GE
26
A10-7850K
SE +/- 0.18, N = 12
21
14
28
42
56
70
1. (CC) gcc options: -fopenmp -O2 -pthread -ljpeg -lXext -lX11 -llzma -lz -lm -lpthread

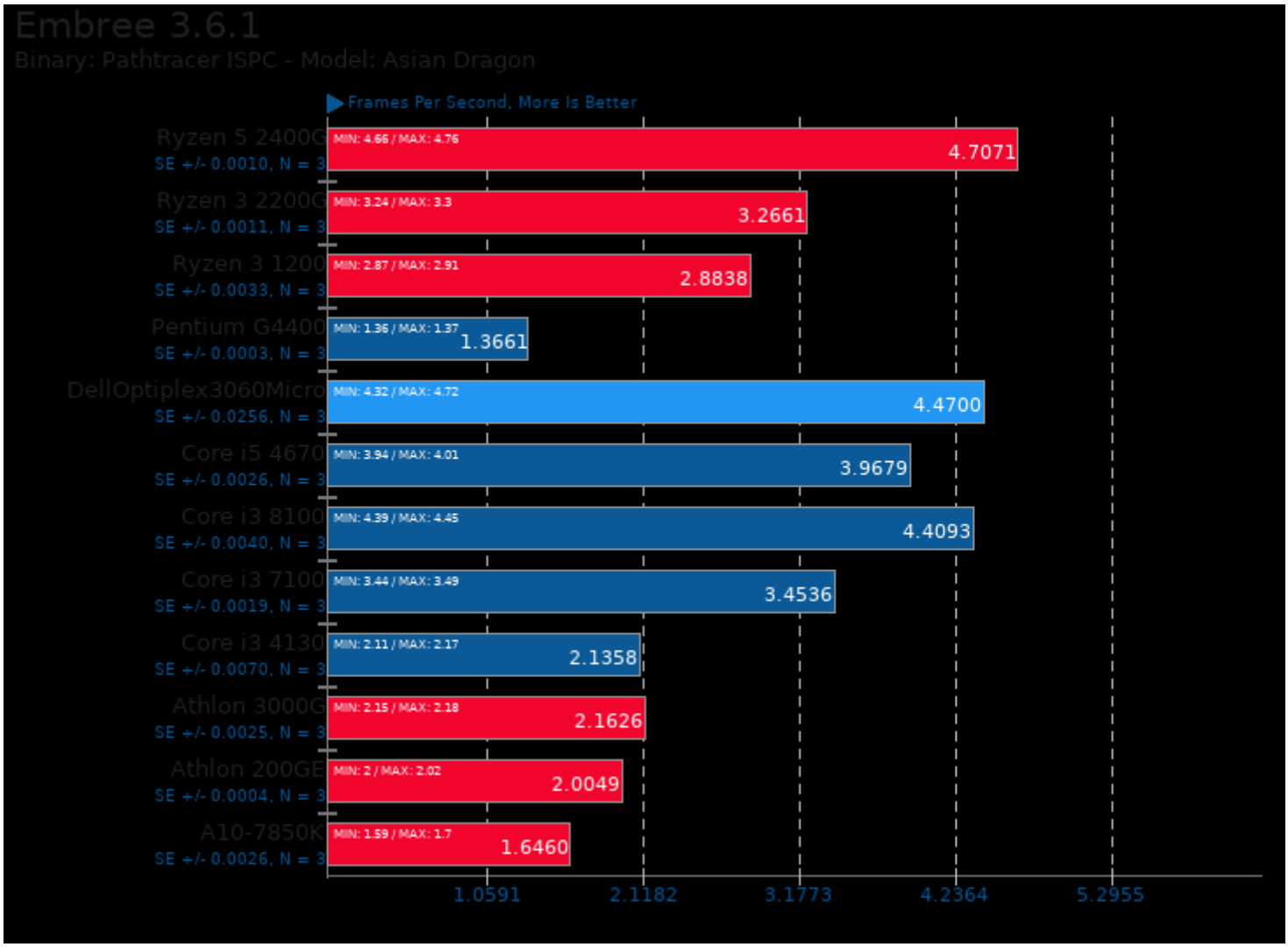

GraphicsMagick 1.3.33
Operation: Resizing
Iterations Per Minute, More Is Better
Ryzen 5 2400G
SE +/- 1.67, N = 3
-ISM -lICE -lbz2
370
Ryzen 3 2200G
SE +/- 1.73, N = 3
375
Ryzen 3 1200
364
Pentium G4400
SE +/- 1.33, N = 3
178
DellOptiplex3060Micro
SE +/- 1.53, N = 3
-ljbig -llcms2 -ltiff -lxml2
468
Core i5 4670
SE +/- 0.33, N = 3
312
Core i3 8100
SE +/- 2.52, N = 3
386
Core i3 7100
213
Core i3 4130
SE +/- 0.58, N = 3
136
Athlon 3000G
221
Athlon 200GE
SE +/- 0.33, N = 3
201
A10-7850K
SE +/- 0.67, N = 3
151
100
200
300
400
500
1. (CC) gcc options: -fopenmp -O2 -pthread -ljpeg -lXext -lX11 -llzma -lz -lm -lpthread

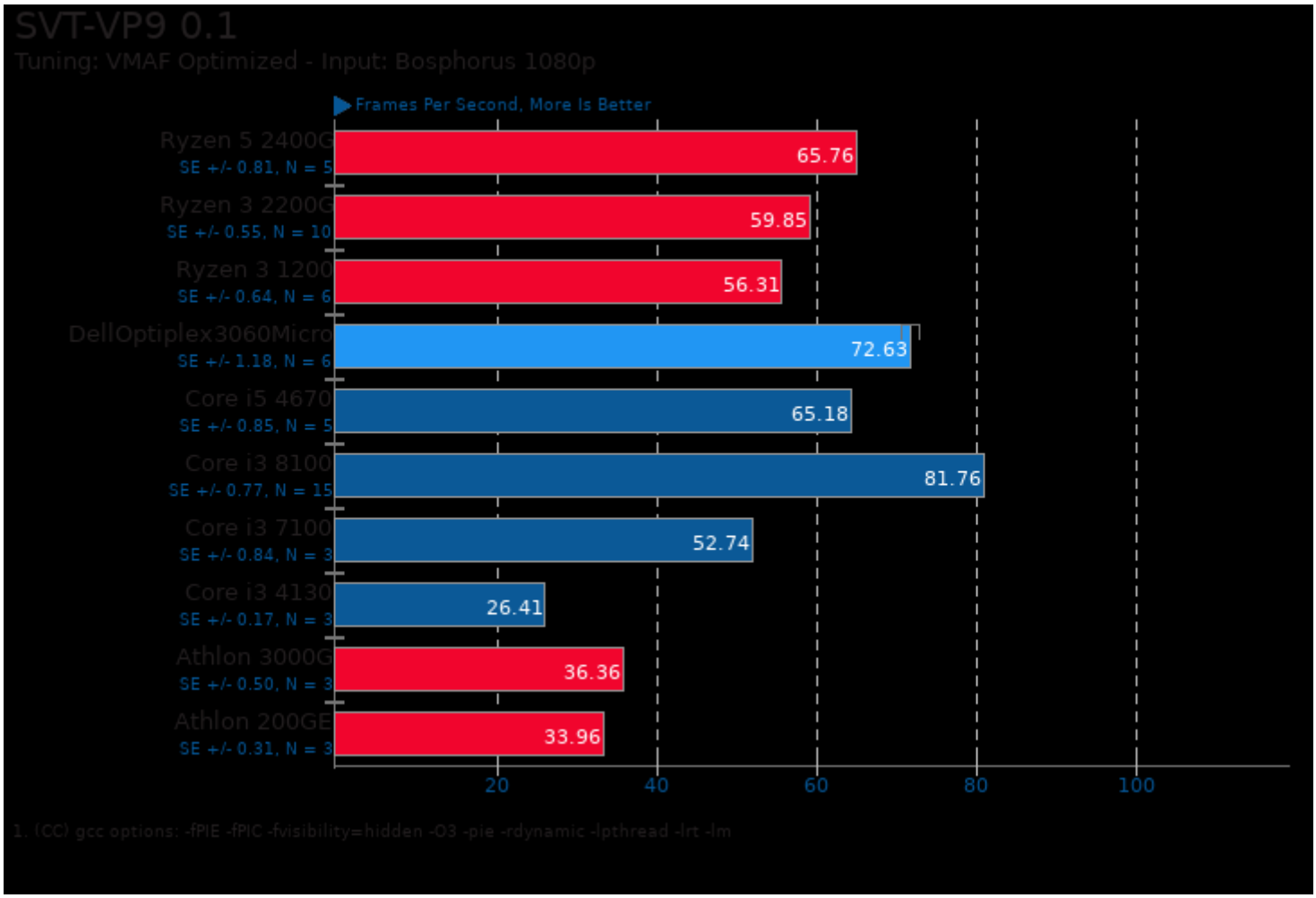

dav1d 0.5.0
Video Input: Summer Nature 1080p
FPS, More Is Better
Ryzen 5 2400G
SE +/- 0.84, N = 3
MIN: 182.75 / MAX: 229.64
211.42
Ryzen 3 2200G
SE +/- 1.64, N = 3
MIN: 148.6 / MAX: 180.31
162.96
Ryzen 3 1200
SE +/- 0.10, N = 3
MIN: 132.7 / MAX: 155.54
144.58
Pentium G4400
SE +/- 0.11, N = 3
-lm - MIN: 84.82 / MAX: 98.44
90.50
Core i5 4670
SE +/- 1.19, N = 3
MIN: 163.87 / MAX: 191.25
174.80
Core i3 8100
SE +/- 0.13, N = 3
MIN: 190.76 / MAX: 221.95
203.60
Core i3 7100
SE +/- 0.07, N = 3
MIN: 144.51 / MAX: 168.96
154.76
Core i3 4130
SE +/- 0.52, N = 3
MIN: 92.98 / MAX: 108.28
99.39
Athlon 3000G
SE +/- 0.10, N = 3
MIN: 116.73 / MAX: 135.52
125.42
Athlon 200GE
SE +/- 0.07, N = 3
MIN: 108.37 / MAX: 125.76
116.38
A10-7850K
SE +/- 0.30, N = 3
MIN: 84.61 / MAX: 107.13
98.72
50
100
150
200
250
1. (CC) gcc options: -pthread

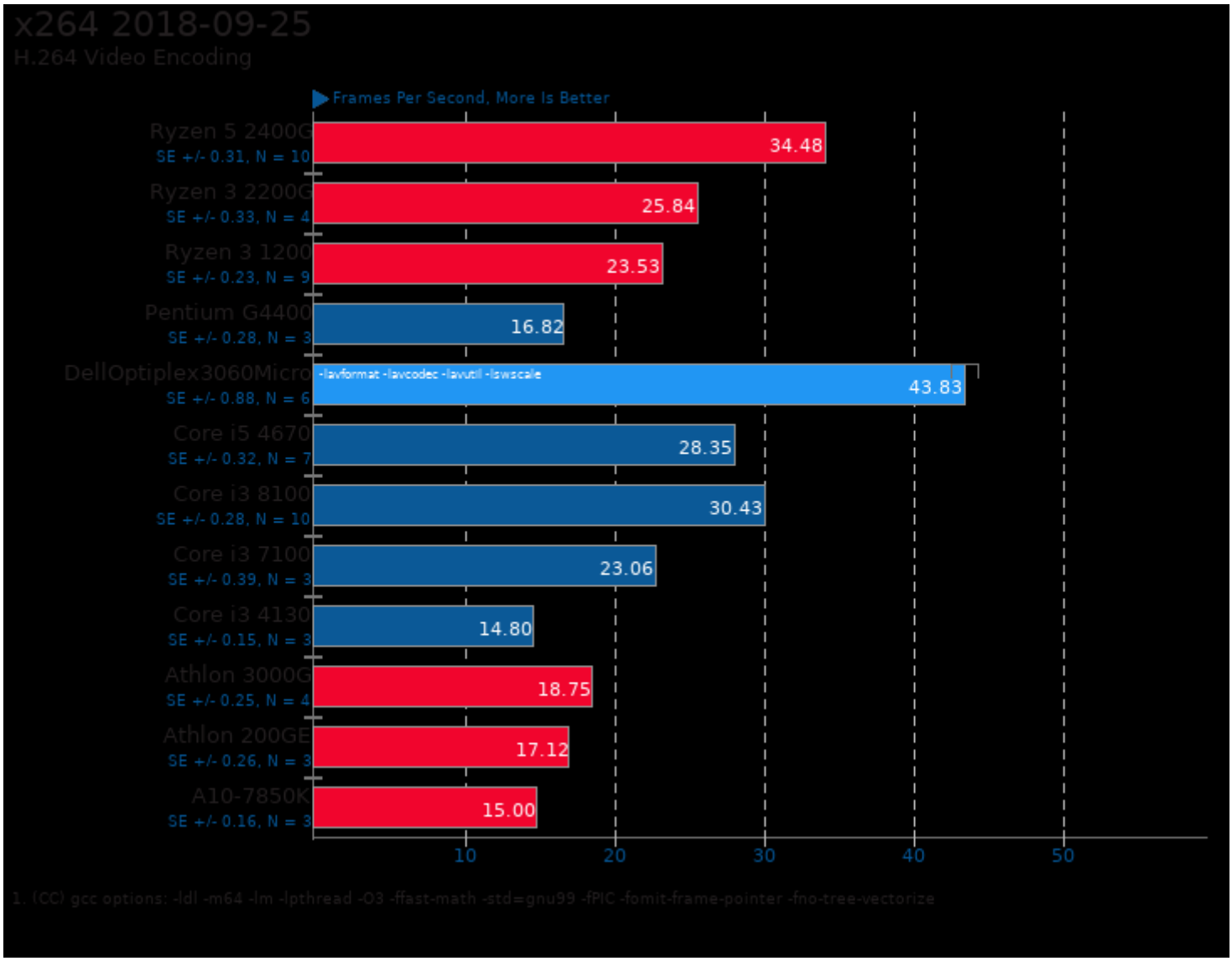
Low-End EOY2019 Ubuntu Linux CPU Comparison

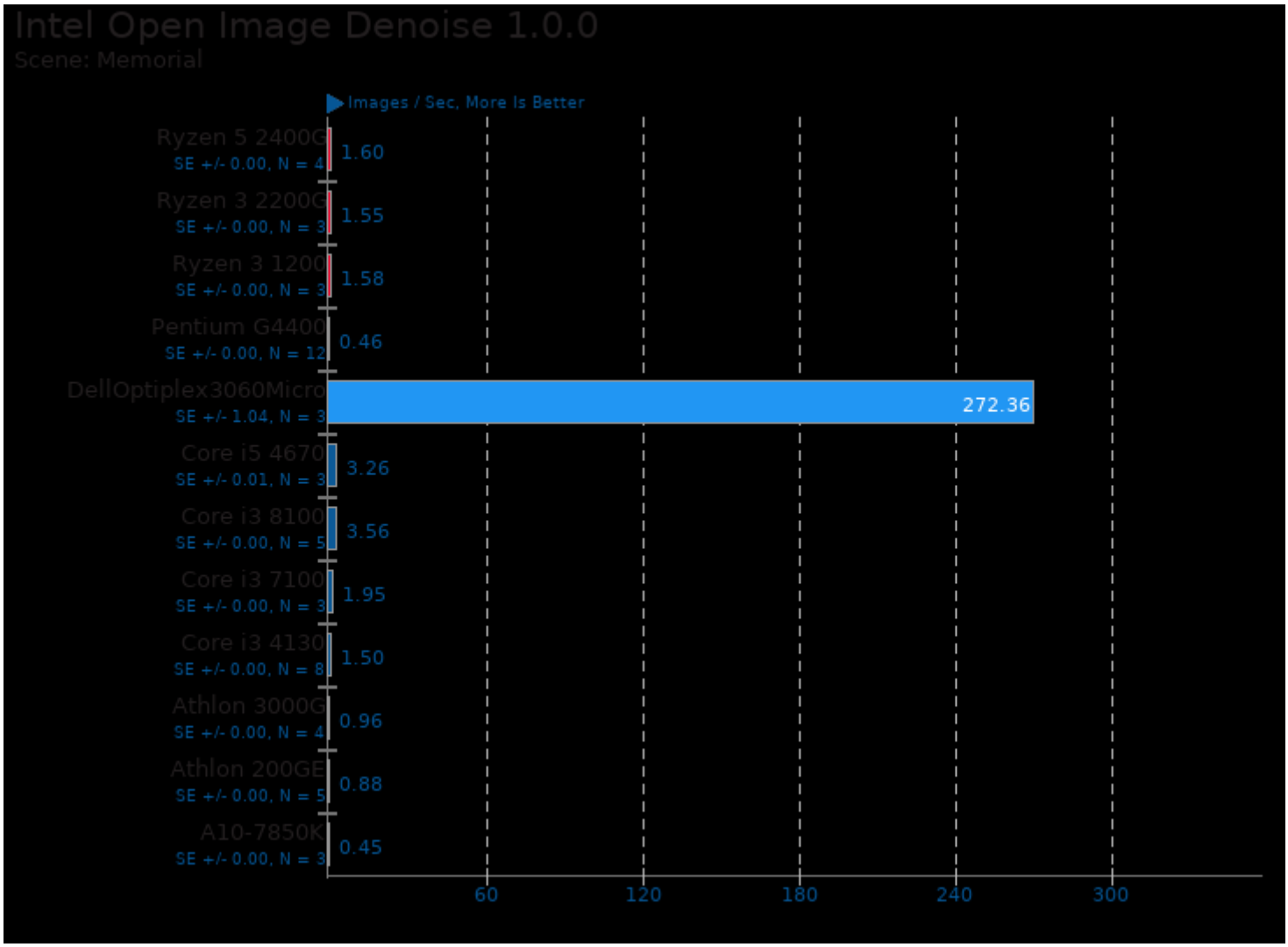


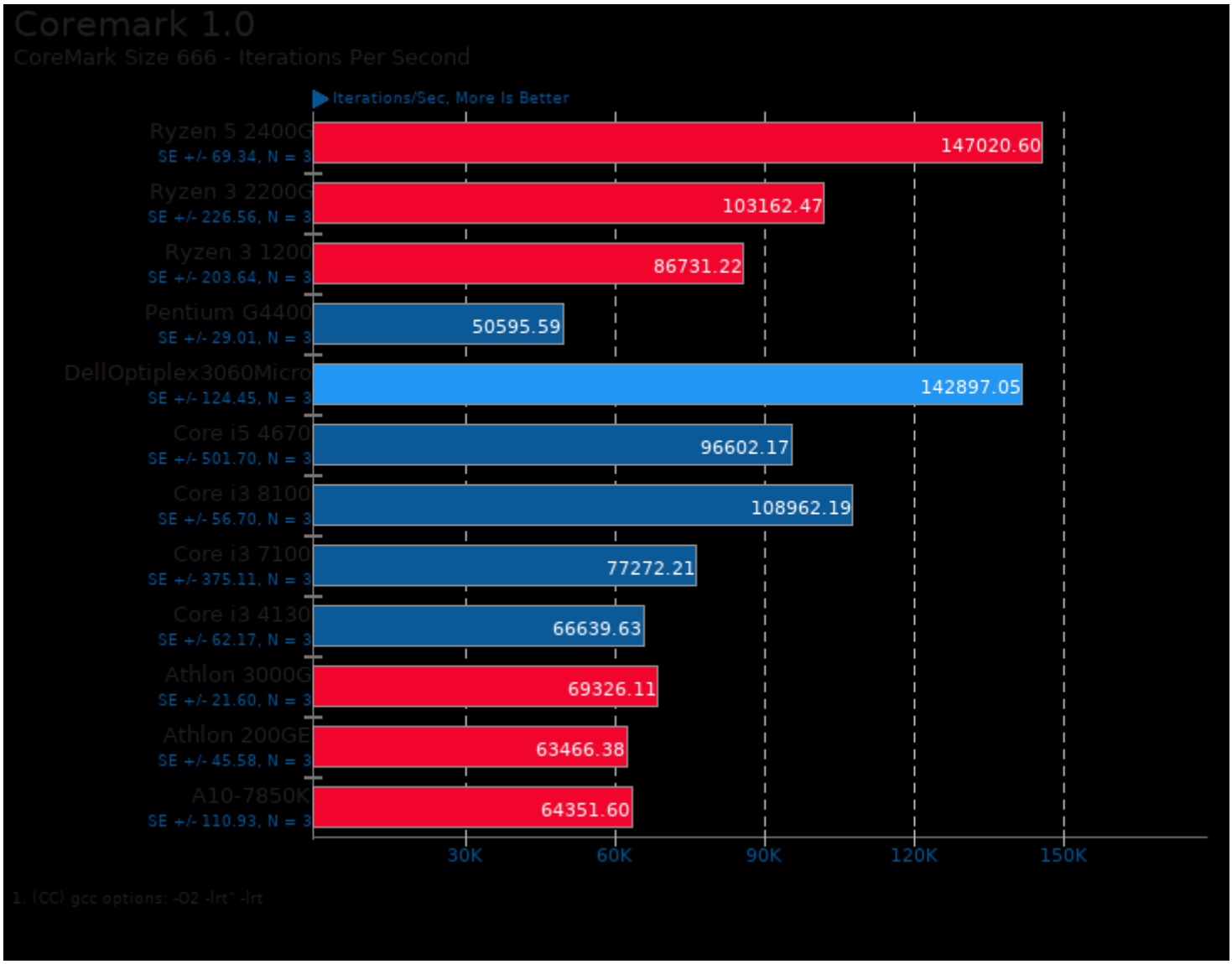

Embree 3.6.1
Binary: Pathtracer - Model: Asian Dragon
Frames Per Second, More Is Better
Ryzen 5 2400G
SE +/- 0.0049, N = 3
MIN: 4.88 / MAX: 5.01
4.9405
Ryzen 3 2200G
SE +/- 0.0035, N = 3
MIN: 3.33 / MAX: 3.39
3.3545
Ryzen 3 1200
SE +/- 0.0024, N = 4
MIN: 2.96 / MAX: 2.99
2.9690
Pentium G4400
SE +/- 0.0009, N = 3
MIN: 1.33 / MAX: 1.34
1.3363
DellOptiplex3060Micro
SE +/- 0.0057, N = 3
MIN: 4.41 / MAX: 4.61
4.5200
Core i5 4670
SE +/- 0.0038, N = 3
MIN: 3.37 / MAX: 3.42
3.3897
Core i3 8100
SE +/- 0.0038, N = 3
MIN: 3.68 / MAX: 3.73
3.6984
Core i3 7100
SE +/- 0.0014, N = 3
MIN: 2.86 / MAX: 2.89
2.8692
Core i3 4130
SE +/- 0.0033, N = 3
MIN: 1.88 / MAX: 1.92
1.8928
Athlon 3000G
SE +/- 0.0022, N = 4
MIN: 2.24 / MAX: 2.28
2.2503
Athlon 200GE
SE +/- 0.0027, N = 3
MIN: 2.09 / MAX: 2.12
2.0968
A10-7850K
SE +/- 0.0089, N = 3
MIN: 1.69 / MAX: 1.8
1.7347
1.1116
2.2232
3.3348
4.4464
5.558

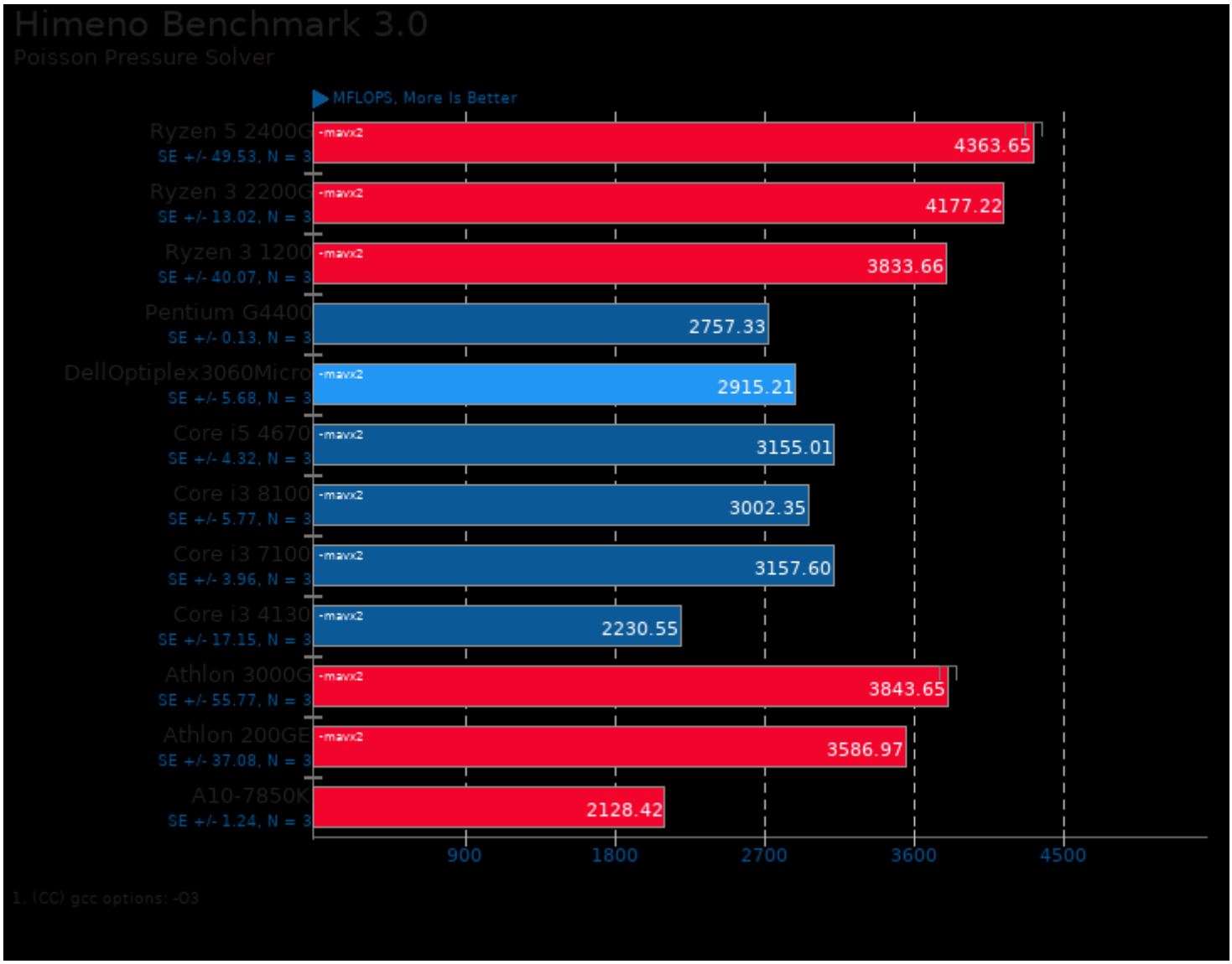

Embree 3.6.1
Binary: Pathtracer ISPC - Model: Asian Dragon
Frames Per Second, More Is Better
Ryzen 5 2400G
SE +/- 0.0010, N = 3
MIN: 4.66 / MAX: 4.76
4.7071
Ryzen 3 2200G
SE +/- 0.0011, N = 3
MIN: 3.24 / MAX: 3.3
3.2661
Ryzen 3 1200
SE +/- 0.0033, N = 3
MIN: 2.87 / MAX: 2.91
2.8838
Pentium G4400
SE +/- 0.0003, N = 3
MIN: 1.36 / MAX: 1.37
1.3661
DellOptiplex3060Micro
SE +/- 0.0256, N = 3
MIN: 4.32 / MAX: 4.72
4.4700
Core i5 4670
SE +/- 0.0026, N = 3
MIN: 3.94 / MAX: 4.01
3.9679
Core i3 8100
SE +/- 0.0040, N = 3
MIN: 4.39 / MAX: 4.45
4.4093
Core i3 7100
SE +/- 0.0019, N = 3
MIN: 3.44 / MAX: 3.49
3.4536
Core i3 4130
SE +/- 0.0070, N = 3
MIN: 2.11 / MAX: 2.17
2.1358
Athlon 3000G
SE +/- 0.0025, N = 3
MIN: 2.15 / MAX: 2.18
2.1626
Athlon 200GE
SE +/- 0.0004, N = 3
MIN: 2 / MAX: 2.02
2.0049
A10-7850K
SE +/- 0.0026, N = 3
MIN: 1.59 / MAX: 1.7
1.6460
1.0591
2.1182
3.1773
4.2364
5.2955

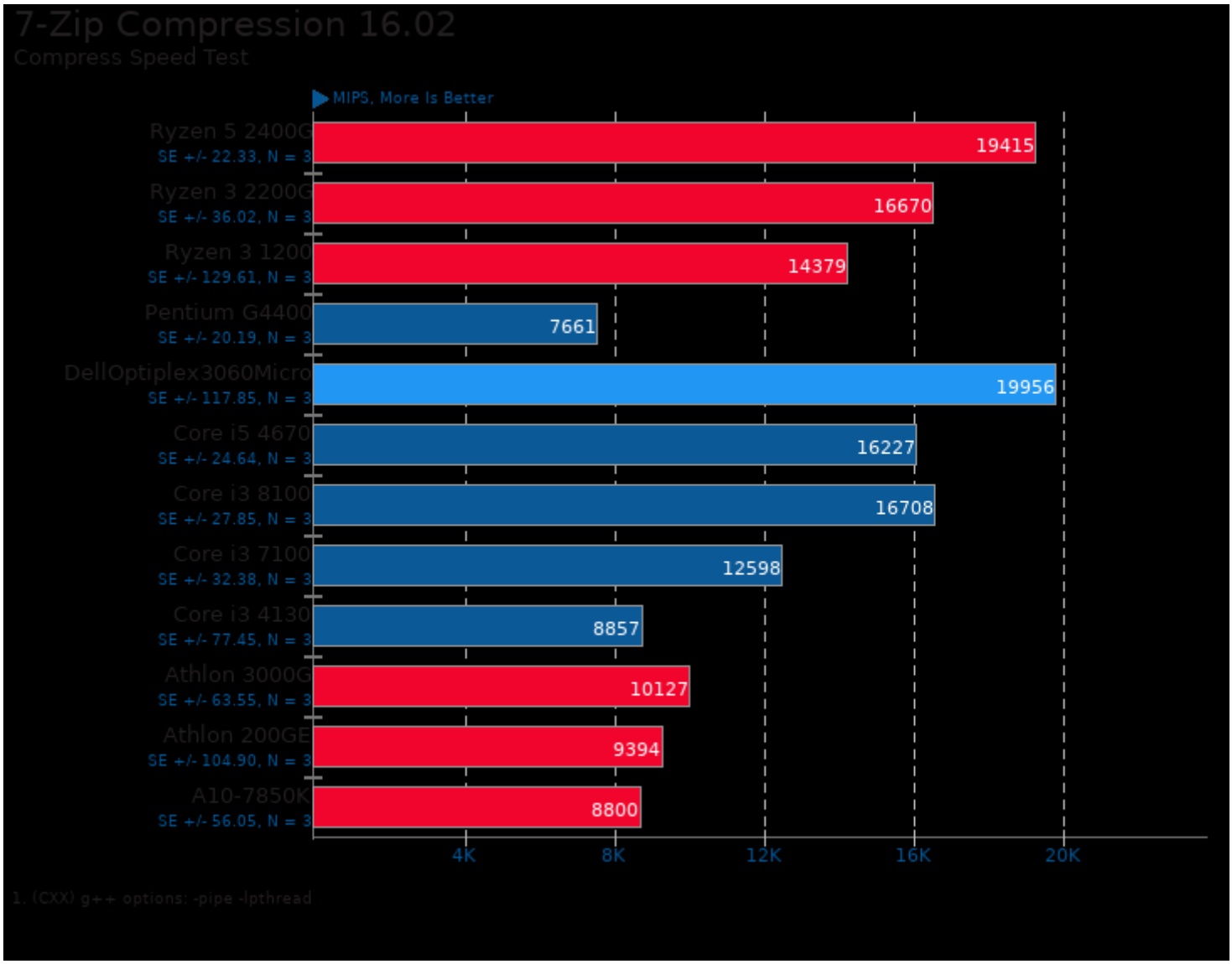

SVT-VP9 0.1
Tuning: VMAF Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
Ryzen 5 2400G
SE +/- 0.81, N = 5
65.76
Ryzen 3 2200G
SE +/- 0.55, N = 10
59.85
Ryzen 3 1200
SE +/- 0.64, N = 6
56.31
DellOptiplex3060Micro
SE +/- 1.18, N = 6
72.63
Core i5 4670
SE +/- 0.85, N = 5
65.18
Core i3 8100
SE +/- 0.77, N = 15
81.76
Core i3 7100
SE +/- 0.84, N = 3
52.74
Core i3 4130
SE +/- 0.17, N = 3
26.41
Athlon 3000G
SE +/- 0.50, N = 3
36.36
Athlon 200GE
SE +/- 0.31, N = 3
33.96
20
40
60
80
100
1. (CC) gcc options: -fPIE -fPIC -fvisibility=hidden -O3 -pie -rdynamic -lpthread -lrt -lm


x264 2018-09-25
H.264 Video Encoding
Frames Per Second, More Is Better
Ryzen 5 2400G
SE +/- 0.31, N = 10
34.48
Ryzen 3 2200G
SE +/- 0.33, N = 4
25.84
Ryzen 3 1200
SE +/- 0.23, N = 9
23.53
Pentium G4400
SE +/- 0.28, N = 3
16.82
DellOptiplex3060Micro
SE +/- 0.88, N = 6
-lavformat -lavcodec -lavutil -lswscale
43.83
Core i5 4670
SE +/- 0.32, N = 7
28.35
Core i3 8100
SE +/- 0.28, N = 10
30.43
Core i3 7100
SE +/- 0.39, N = 3
23.06
Core i3 4130
SE +/- 0.15, N = 3
14.80
Athlon 3000G
SE +/- 0.25, N = 4
18.75
Athlon 200GE
SE +/- 0.26, N = 3
17.12
A10-7850K
SE +/- 0.16, N = 3
15.00
10
20
30
40
50
1. (CC) gcc options: -ldl -m64 -lm -lpthread -O3 -ffast-math -std=gnu99 -fPIC -fomit-frame-pointer -fno-tree-vectorize

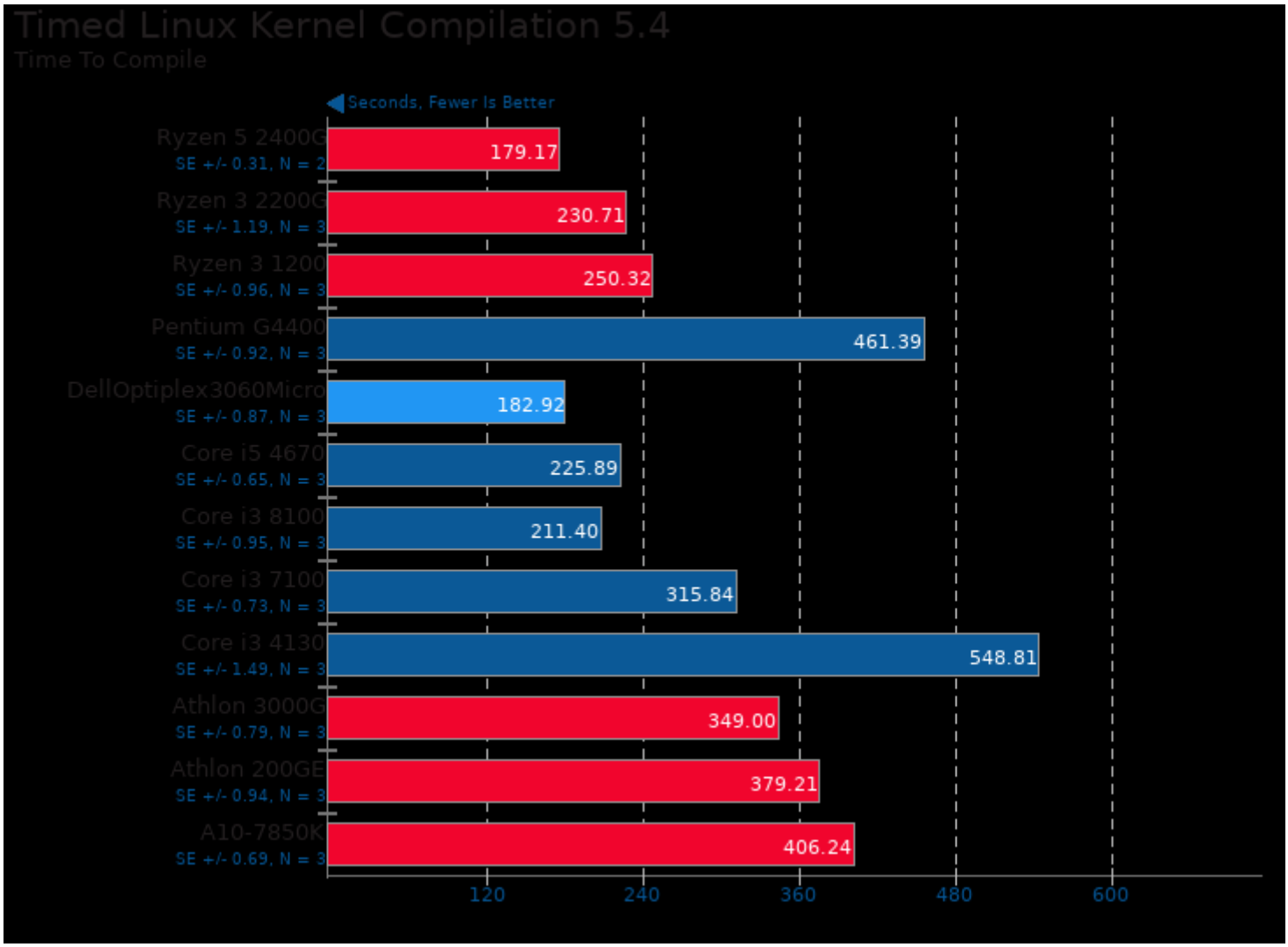

Intel Open Image Denoise 1.0.0
Scene: Memorial
Images / Sec, More Is Better
Ryzen 5 2400G
SE +/- 0.00, N = 4
1.60
Ryzen 3 2200G
SE +/- 0.00, N = 3
1.55
Ryzen 3 1200
SE +/- 0.00, N = 3
1.58
Pentium G4400
SE +/- 0.00, N = 12
0.46
DellOptiplex3060Micro
SE +/- 1.04, N = 3
272.36
Core i5 4670
SE +/- 0.01, N = 3
3.26
Core i3 8100
SE +/- 0.00, N = 5
3.56
Core i3 7100
SE +/- 0.00, N = 3
1.95
Core i3 4130
SE +/- 0.00, N = 8
1.50
Athlon 3000G
SE +/- 0.00, N = 4
0.96
Athlon 200GE
SE +/- 0.00, N = 5
0.88
A10-7850K
SE +/- 0.00, N = 3
0.45
60
120
180
240
300


Coremark 1.0
CoreMark Size 666 - Iterations Per Second
Iterations/Sec, More Is Better
Ryzen 5 2400G
SE +/- 69.34, N = 3
147020.60
Ryzen 3 2200G
SE +/- 226.56, N = 3
103162.47
Ryzen 3 1200
SE +/- 203.64, N = 3
86731.22
Pentium G4400
SE +/- 29.01, N = 3
50595.59
DellOptiplex3060Micro
SE +/- 124.45, N = 3
142897.05
Core i5 4670
SE +/- 501.70, N = 3
96602.17
Core i3 8100
SE +/- 56.70, N = 3
108962.19
Core i3 7100
SE +/- 375.11, N = 3
77272.21
Core i3 4130
SE +/- 62.17, N = 3
66639.63
Athlon 3000G
SE +/- 21.60, N = 3
69326.11
Athlon 200GE
SE +/- 45.58, N = 3
63466.38
A10-7850K
SE +/- 110.93, N = 3
64351.60
30K
60K
90K
120K
150K
1. (CC) gcc options: -O2 -lrt -lrt

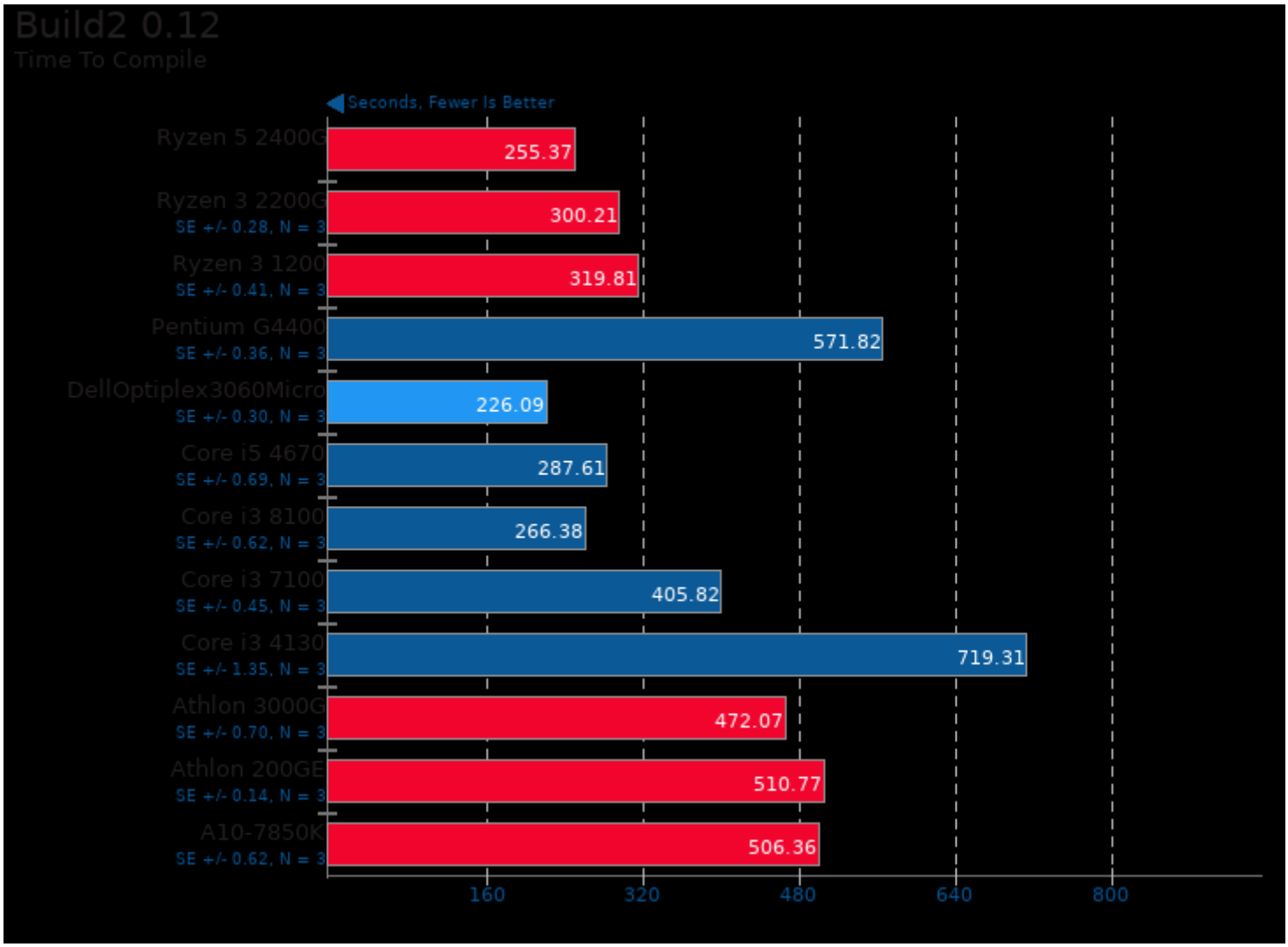

Himeno Benchmark 3.0
Poisson Pressure Solver
MFLOPS, More Is Better
Ryzen 5 2400G
SE +/- 49.53, N = 3
-mavx2
4363.65
Ryzen 3 2200G
SE +/- 13.02, N = 3
-mavx2
4177.22
Ryzen 3 1200
SE +/- 40.07, N = 3
-mavx2
3833.66
Pentium G4400
SE +/- 0.13, N = 3
2757.33
DellOptiplex3060Micro
SE +/- 5.68, N = 3
-mavx2
2915.21
Core i5 4670
SE +/- 4.32, N = 3
-mavx2
3155.01
Core i3 8100
SE +/- 5.77, N = 3
-mavx2
3002.35
Core i3 7100
SE +/- 3.96, N = 3
-mavx2
3157.60
Core i3 4130
SE +/- 17.15, N = 3
-mavx2
2230.55
Athlon 3000G
SE +/- 55.77, N = 3
-mavx2
3843.65
Athlon 200GE
SE +/- 37.08, N = 3
-mavx2
3586.97
A10-7850K
SE +/- 1.24, N = 3
2128.42
900
1800
2700
3600
4500
1. (CC) gcc options: -O3

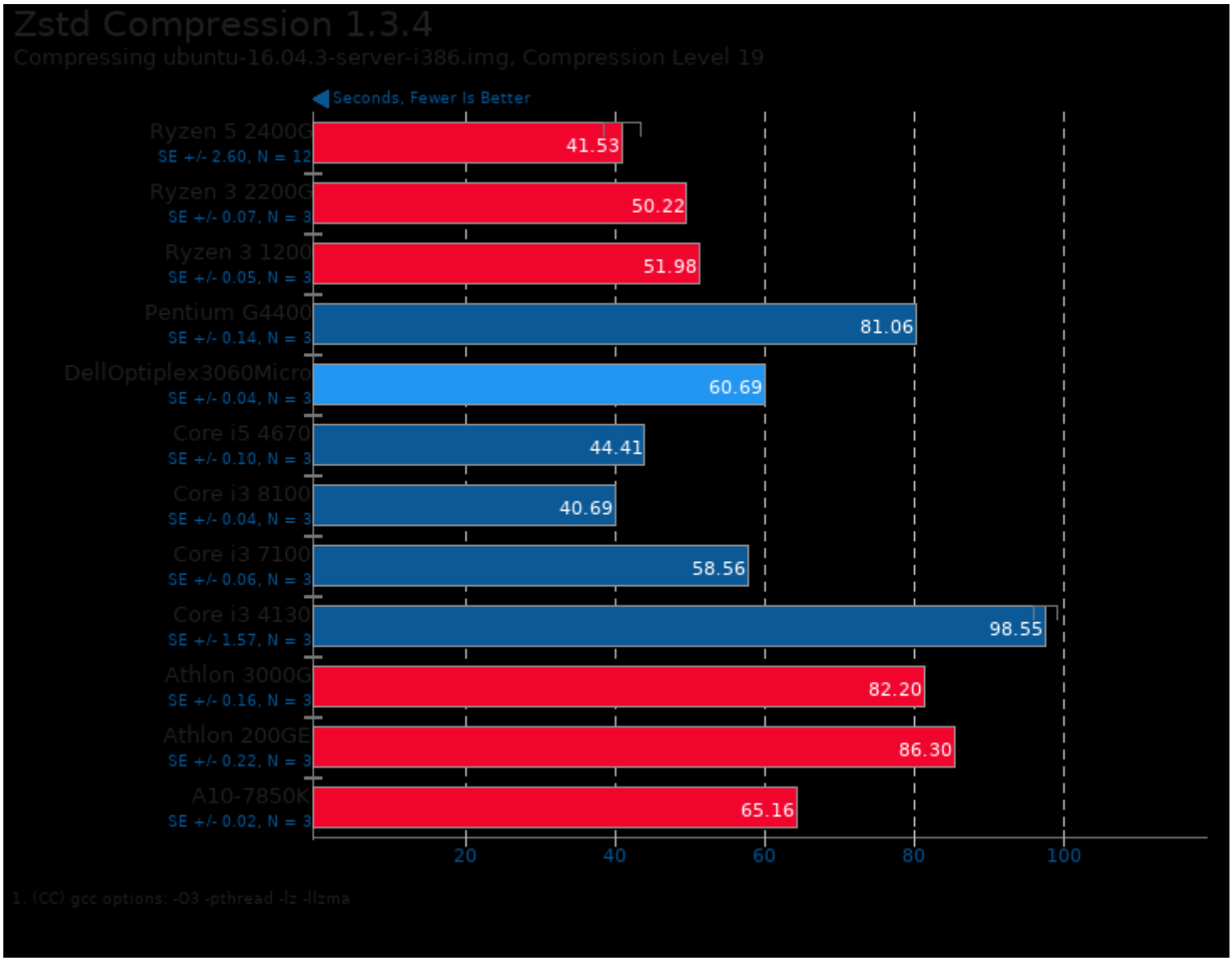

7-Zip Compression 16.02
Compress Speed Test
MIPS, More Is Better
Ryzen 5 2400G
SE +/- 22.33, N = 3
19415
Ryzen 3 2200G
SE +/- 36.02, N = 3
16670
Ryzen 3 1200
SE +/- 129.61, N = 3
14379
Pentium G4400
SE +/- 20.19, N = 3
7661
DellOptiplex3060Micro
SE +/- 117.85, N = 3
19956
Core i5 4670
SE +/- 24.64, N = 3
16227
Core i3 8100
SE +/- 27.85, N = 3
16708
Core i3 7100
SE +/- 32.38, N = 3
12598
Core i3 4130
SE +/- 77.45, N = 3
8857
Athlon 3000G
SE +/- 63.55, N = 3
10127
Athlon 200GE
SE +/- 104.90, N = 3
9394
A10-7850K
SE +/- 56.05, N = 3
8800
4K
8K
12K
16K
20K
1. (CXX) g++ options: -pipe -lpthread

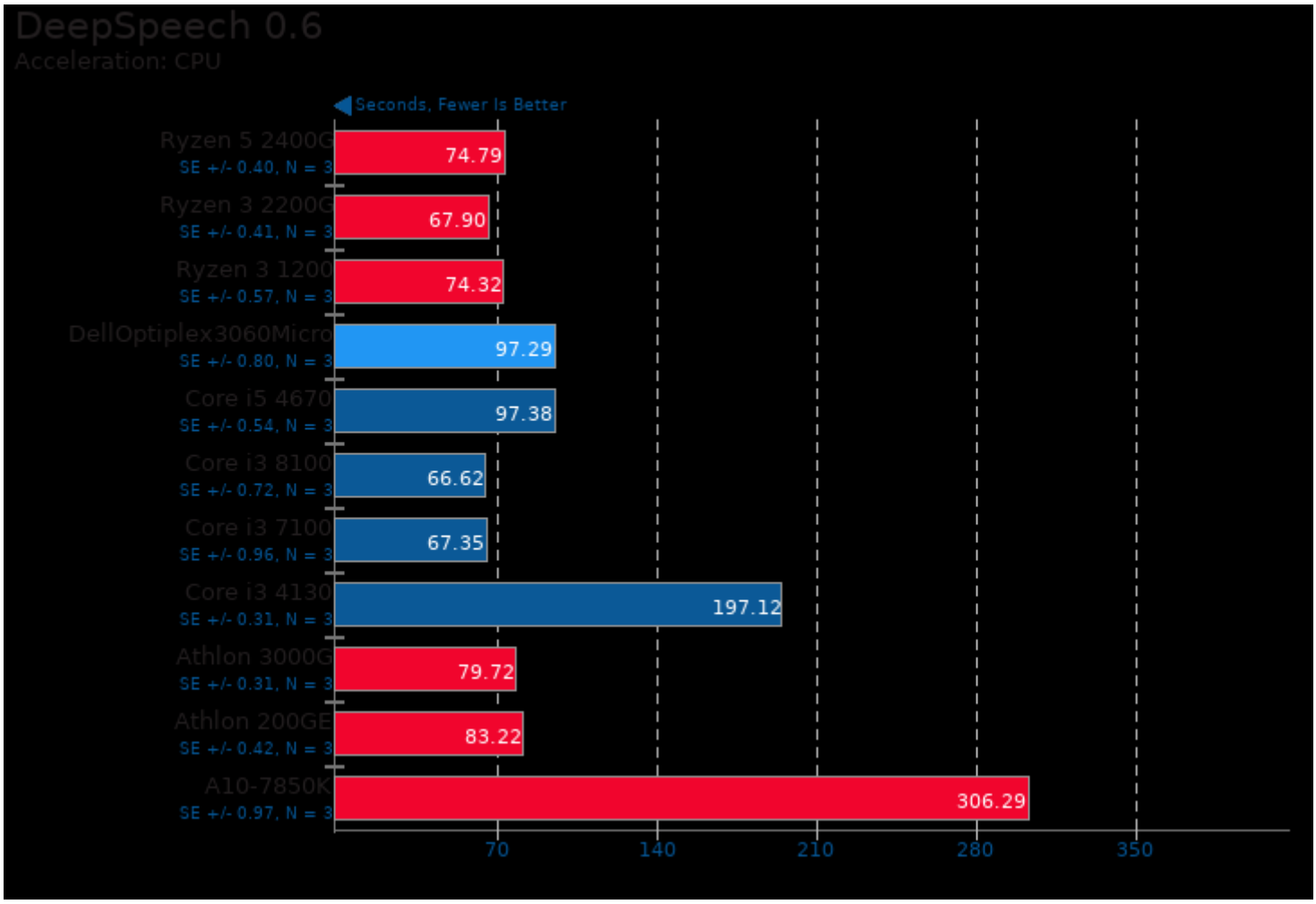
Low-End EOY2019 Ubuntu Linux CPU Comparison

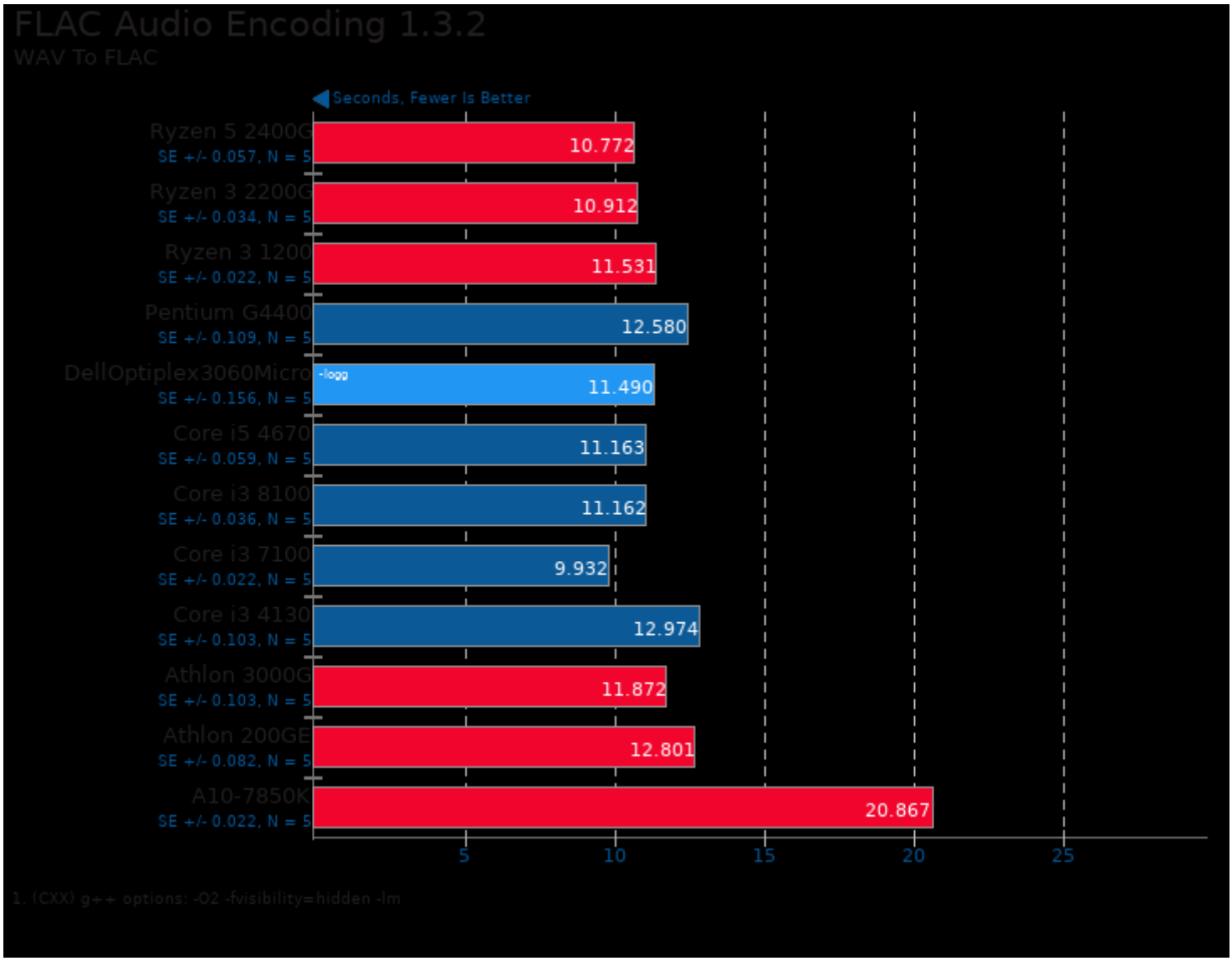


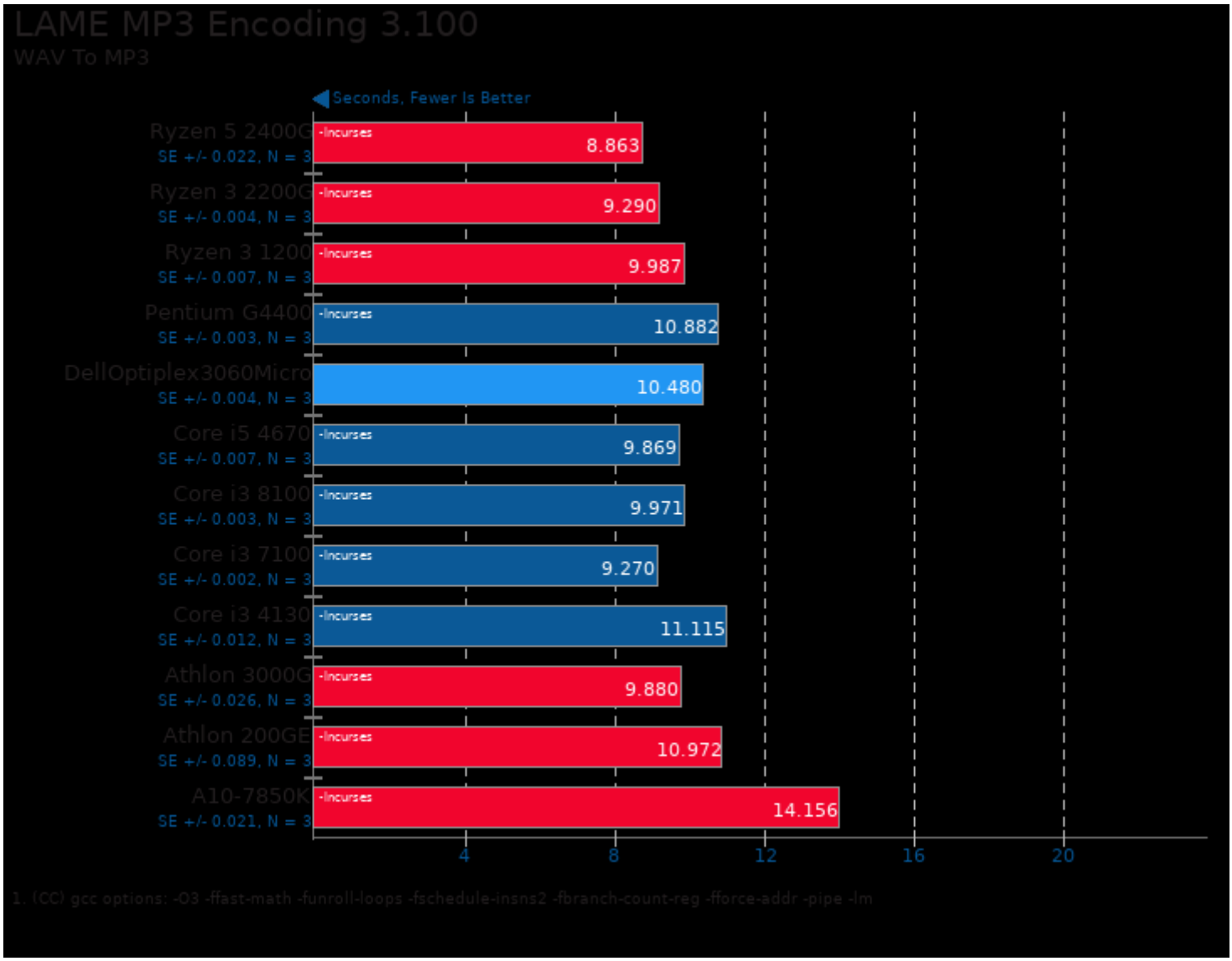
Low-End EOY2019 Ubuntu Linux CPU Comparison



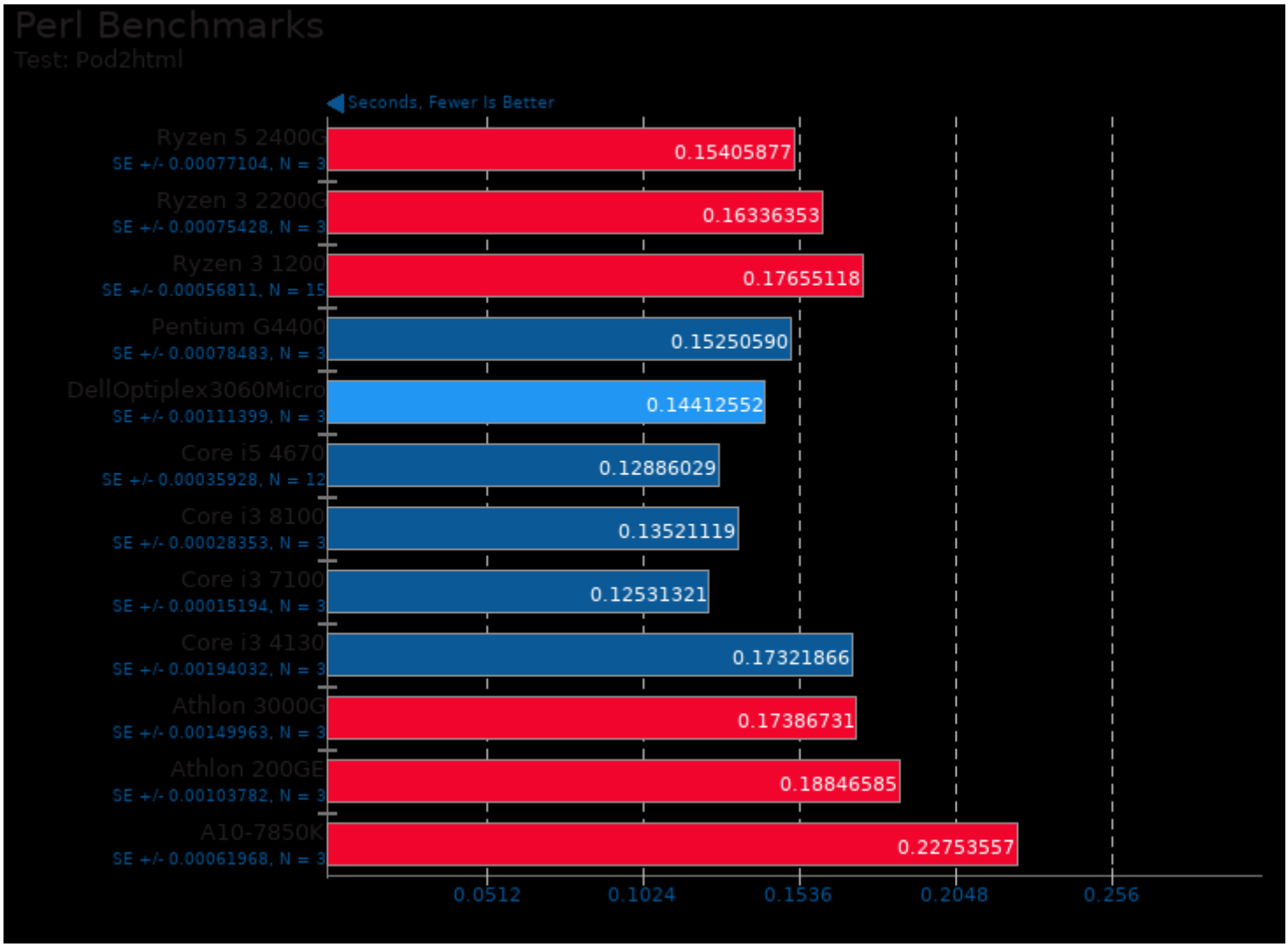

Zstd Compression 1.3.4
Compressing ubuntu-16.04.3-server-i386.img, Compression Level 19
Seconds, Fewer Is Better
Ryzen 5 2400G
SE +/- 2.60, N = 12
41.53
Ryzen 3 2200G
SE +/- 0.07, N = 3
50.22
Ryzen 3 1200
SE +/- 0.05, N = 3
51.98
Pentium G4400
SE +/- 0.14, N = 3
81.06
DellOptiplex3060Micro
SE +/- 0.04, N = 3
60.69
Core i5 4670
SE +/- 0.10, N = 3
44.41
Core i3 8100
SE +/- 0.04, N = 3
40.69
Core i3 7100
SE +/- 0.06, N = 3
58.56
Core i3 4130
SE +/- 1.57, N = 3
98.55
Athlon 3000G
SE +/- 0.16, N = 3
82.20
Athlon 200GE
SE +/- 0.22, N = 3
86.30
A10-7850K
SE +/- 0.02, N = 3
65.16
20
40
60
80
100
1. (CC) gcc options: -O3 -pthread -lz -llzma


DeepSpeech 0.6
Acceleration: CPU
Seconds, Fewer Is Better
Ryzen 5 2400G
SE +/- 0.40, N = 3
74.79
Ryzen 3 2200G
SE +/- 0.41, N = 3
67.90
Ryzen 3 1200
SE +/- 0.57, N = 3
74.32
DellOptiplex3060Micro
SE +/- 0.80, N = 3
97.29
Core i5 4670
SE +/- 0.54, N = 3
97.38
Core i3 8100
SE +/- 0.72, N = 3
66.62
Core i3 7100
SE +/- 0.96, N = 3
67.35
Core i3 4130
SE +/- 0.31, N = 3
197.12
Athlon 3000G
SE +/- 0.31, N = 3
79.72
Athlon 200GE
SE +/- 0.42, N = 3
83.22
A10-7850K
SE +/- 0.97, N = 3
306.29
70
140
210
280
350

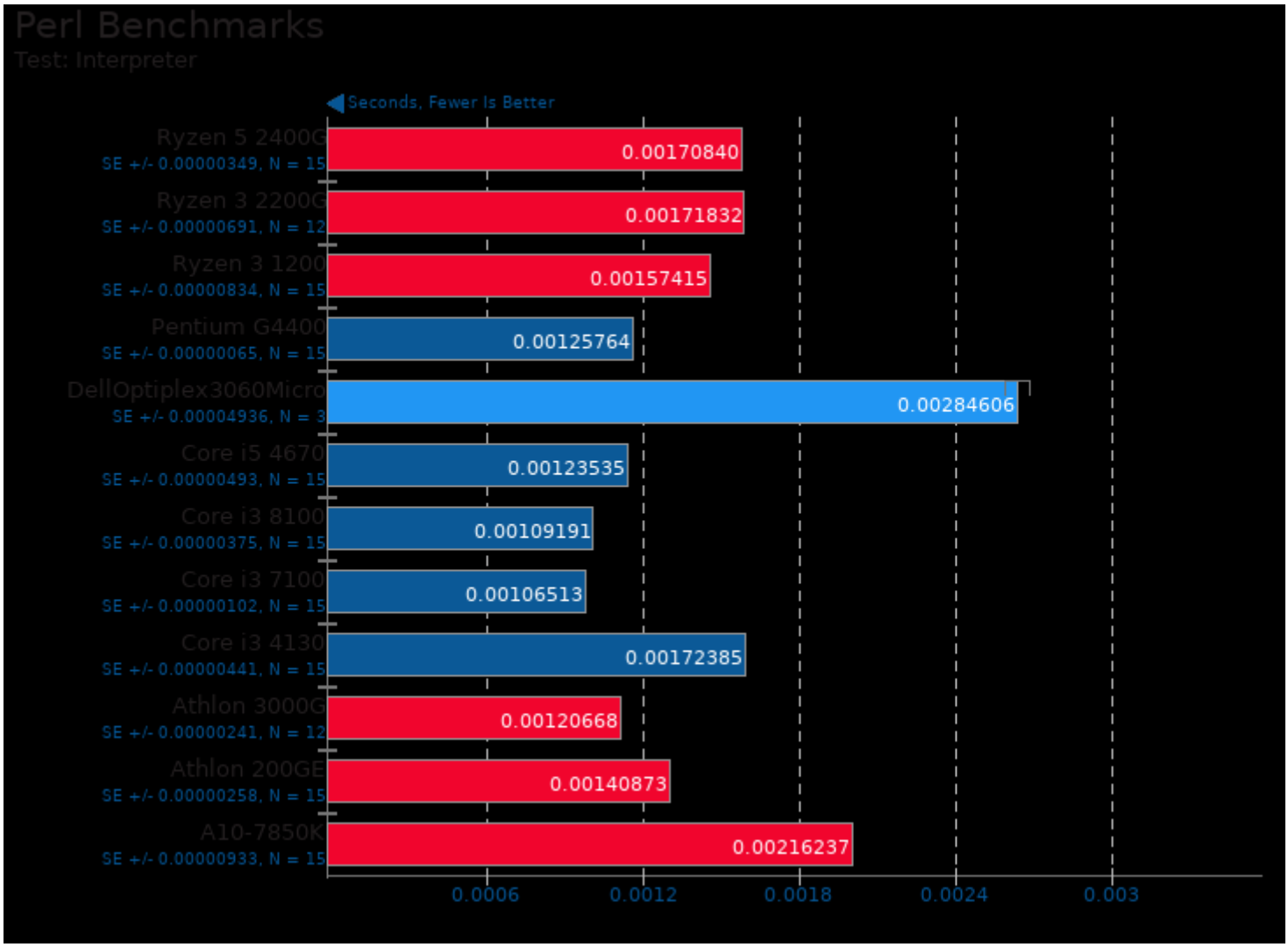

FLAC Audio Encoding 1.3.2
WAV To FLAC
Seconds, Fewer Is Better
Ryzen 5 2400G
SE +/- 0.057, N = 5
10.772
Ryzen 3 2200G
SE +/- 0.034, N = 5
10.912
Ryzen 3 1200
SE +/- 0.022, N = 5
11.531
Pentium G4400
SE +/- 0.109, N = 5
12.580
DellOptiplex3060Micro
SE +/- 0.156, N = 5
-logg
11.490
Core i5 4670
SE +/- 0.059, N = 5
11.163
Core i3 8100
SE +/- 0.036, N = 5
11.162
Core i3 7100
SE +/- 0.022, N = 5
9.932
Core i3 4130
SE +/- 0.103, N = 5
12.974
Athlon 3000G
SE +/- 0.103, N = 5
11.872
Athlon 200GE
SE +/- 0.082, N = 5
12.801
A10-7850K
SE +/- 0.022, N = 5
20.867
5
10
15
20
25
1. (CXX) g++ options: -O2 -fvisibility=hidden -lm

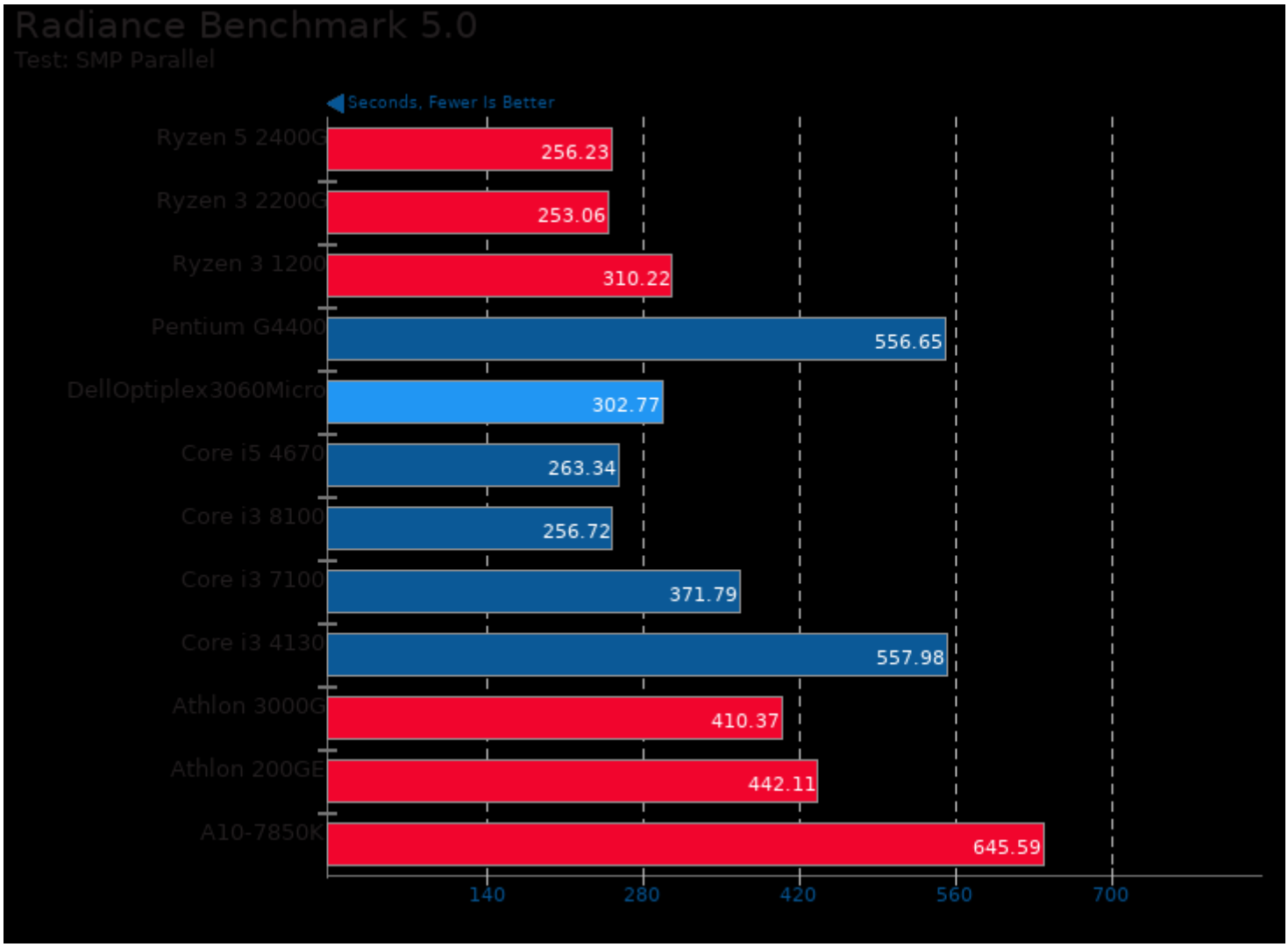

LAME MP3 Encoding 3.100
WAV To MP3
Seconds, Fewer Is Better
Ryzen 5 2400G
SE +/- 0.022, N = 3
-lncurses
8.863
Ryzen 3 2200G
SE +/- 0.004, N = 3
-lncurses
9.290
Ryzen 3 1200
SE +/- 0.007, N = 3
-lncurses
9.987
Pentium G4400
SE +/- 0.003, N = 3
-lncurses
10.882
DellOptiplex3060Micro
SE +/- 0.004, N = 3
10.480
Core i5 4670
SE +/- 0.007, N = 3
-lncurses
9.869
Core i3 8100
SE +/- 0.003, N = 3
-lncurses
9.971
Core i3 7100
SE +/- 0.002, N = 3
-lncurses
9.270
Core i3 4130
SE +/- 0.012, N = 3
-lncurses
11.115
Athlon 3000G
SE +/- 0.026, N = 3
-lncurses
9.880
Athlon 200GE
SE +/- 0.089, N = 3
-lncurses
10.972
A10-7850K
SE +/- 0.021, N = 3
-lncurses
14.156
4
8
12
16
20
1. (CC) gcc options: -O3 -ffast-math -funroll-loops -fschedule-insns2 -fbranch-count-reg -fforce-addr -pipe -lm

Low-End EOY2019 Ubuntu Linux CPU Comparison

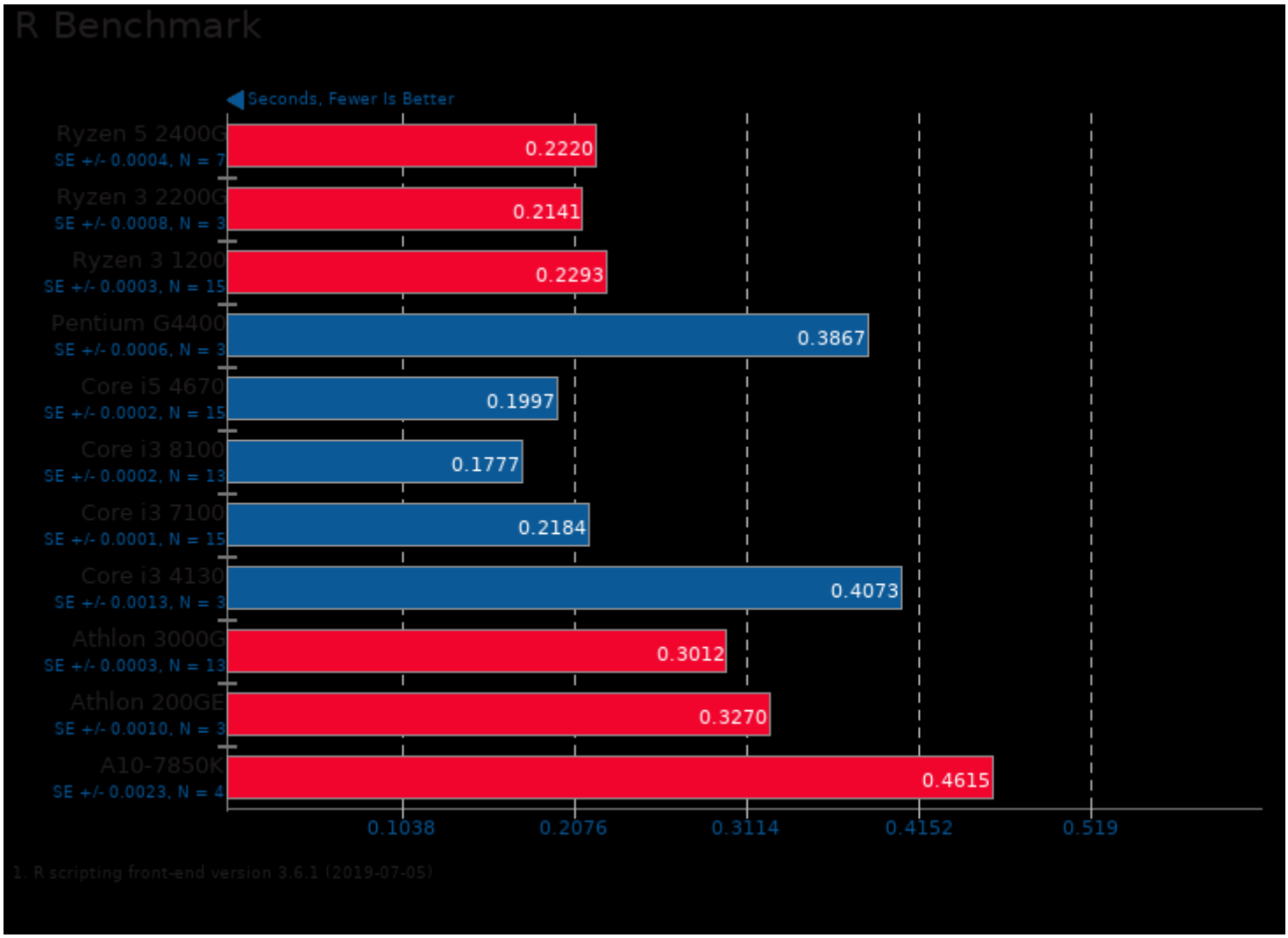


Low-End EOY2019 Ubuntu Linux CPU Comparison

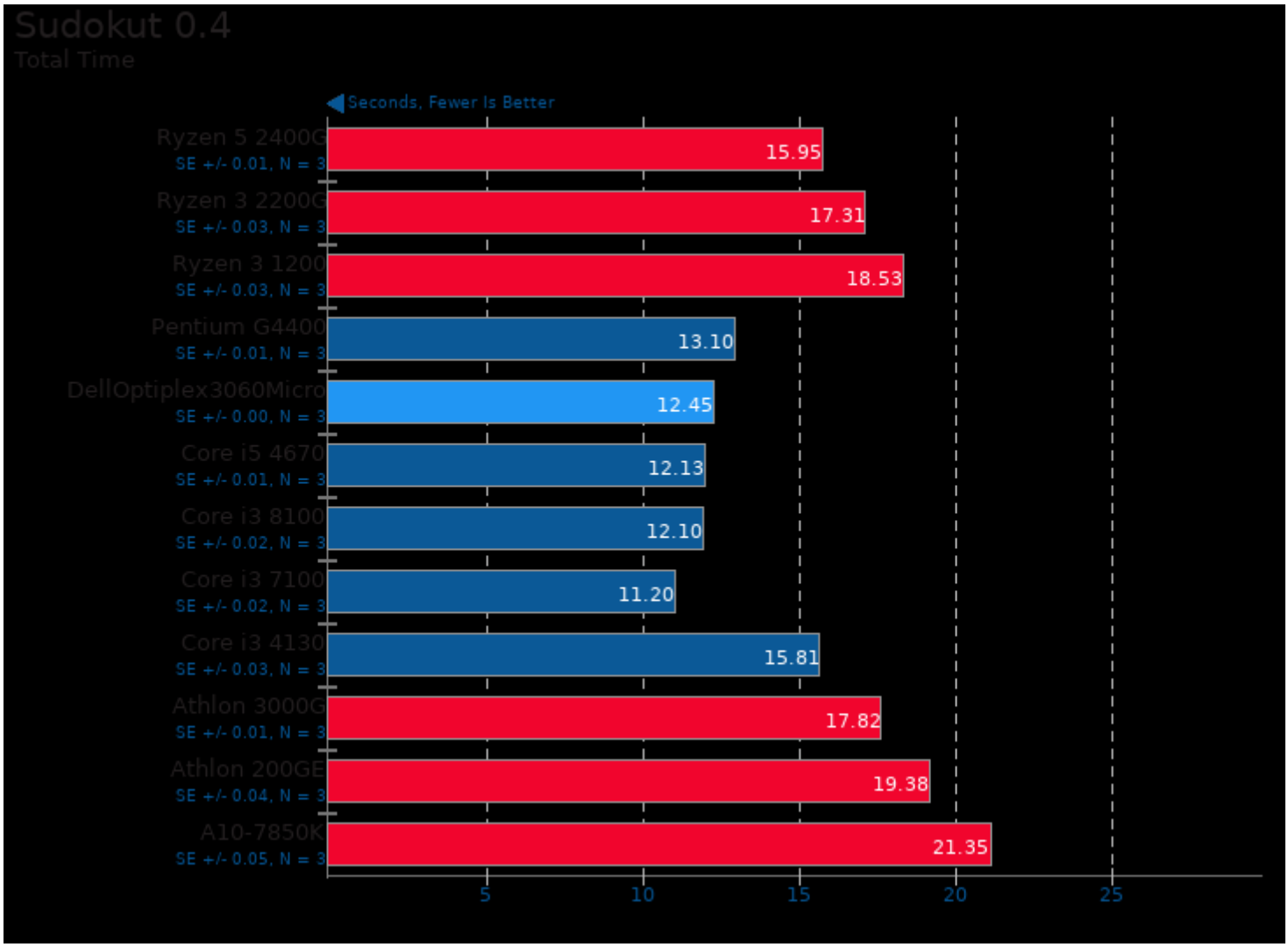


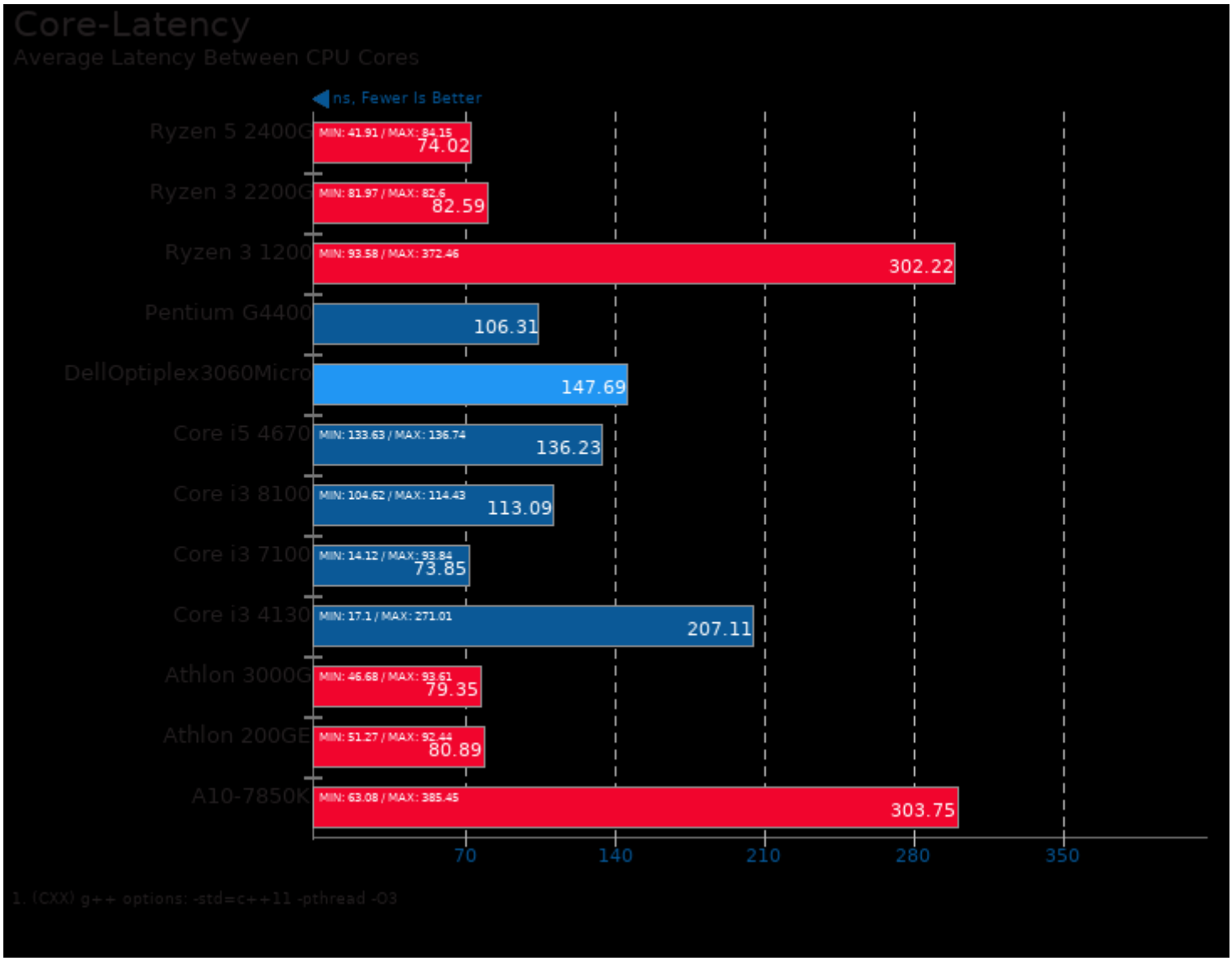

Radiance Benchmark 5.0
Test: SMP Parallel
Seconds, Fewer Is Better
Ryzen 5 2400G
256.23
Ryzen 3 2200G
253.06
Ryzen 3 1200
310.22
Pentium G4400
556.65
DellOptiplex3060Micro
302.77
Core i5 4670
263.34
Core i3 8100
256.72
Core i3 7100
371.79
Core i3 4130
557.98
Athlon 3000G
410.37
Athlon 200GE
442.11
A10-7850K
645.59
140
280
420
560
700

Low-End EOY2019 Ubuntu Linux CPU Comparison

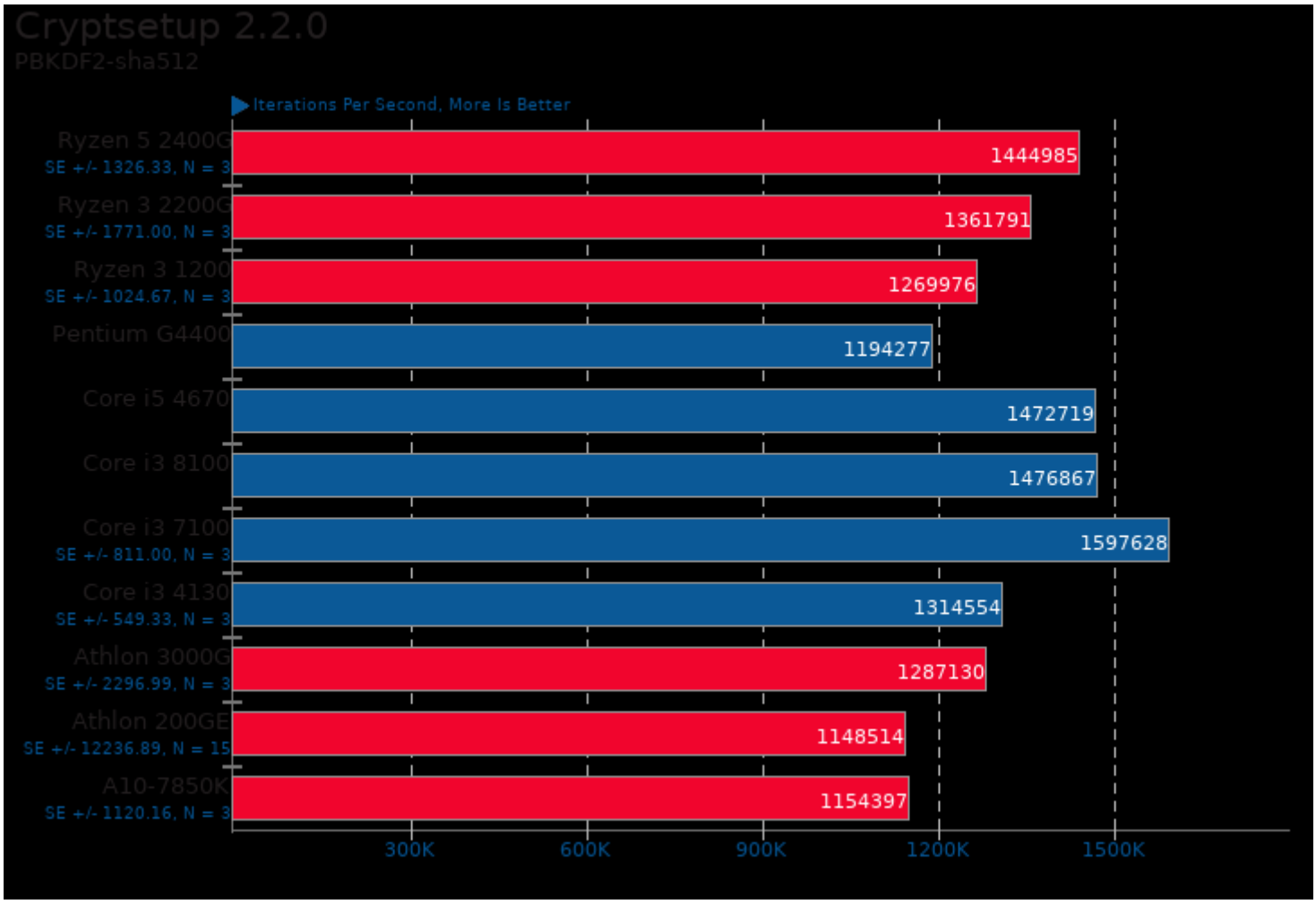


Low-End EOY2019 Ubuntu Linux CPU Comparison

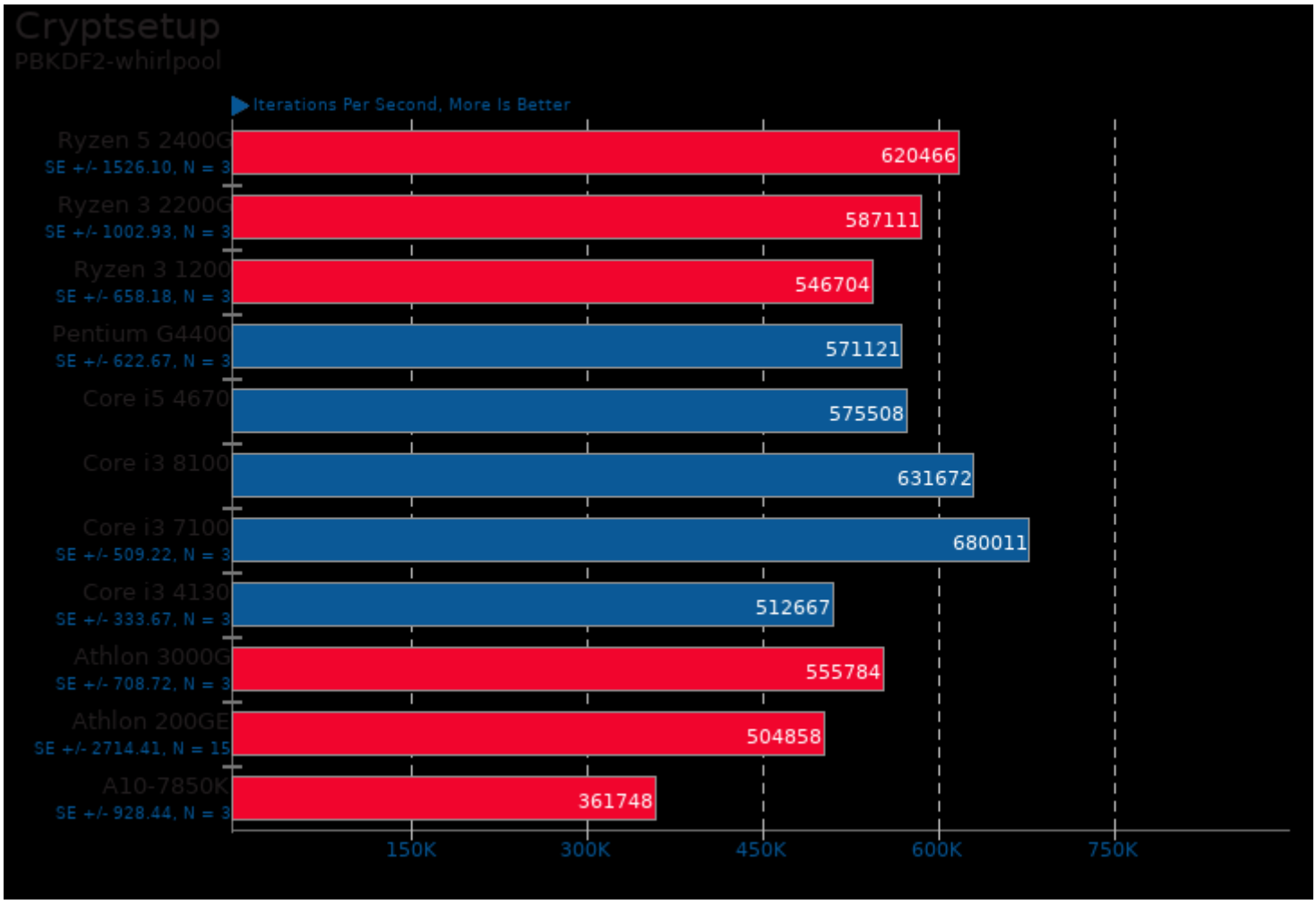


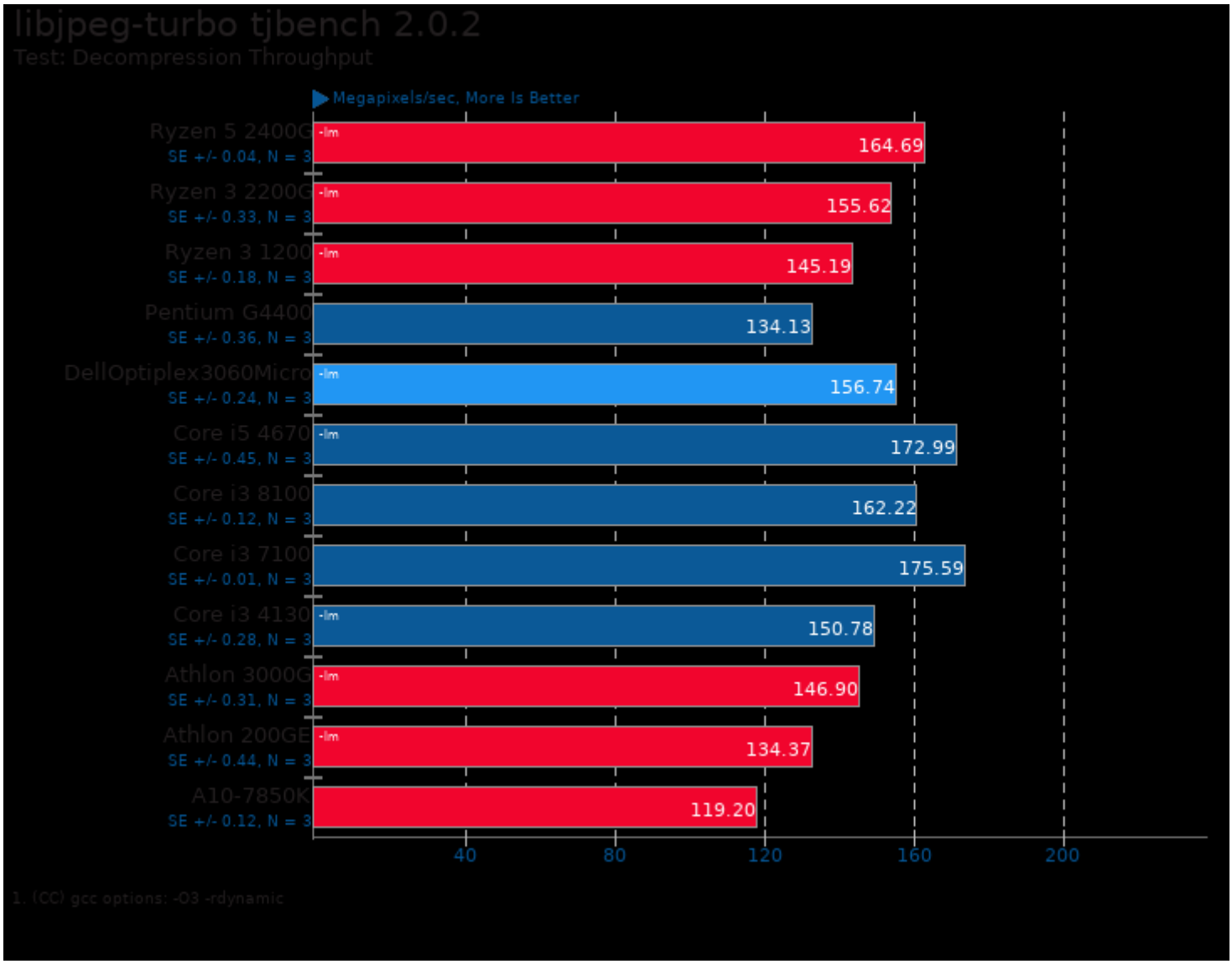

Core-Latency
Average Latency Between CPU Cores
ns, Fewer Is Better
Ryzen 5 2400G
MIN: 41.91 / MAX: 84.15
74.02
Ryzen 3 2200G
MIN: 81.97 / MAX: 82.6
82.59
Ryzen 3 1200
MIN: 93.58 / MAX: 372.46
302.22
Pentium G4400
106.31
DellOptiplex3060Micro
147.69
Core i5 4670
MIN: 133.63 / MAX: 136.74
136.23
Core i3 8100
MIN: 104.62 / MAX: 114.43
113.09
Core i3 7100
MIN: 14.12 / MAX: 93.84
73.85
Core i3 4130
MIN: 17.1 / MAX: 271.01
207.11
Athlon 3000G
MIN: 46.68 / MAX: 93.61
79.35
Athlon 200GE
MIN: 51.27 / MAX: 92.44
80.89
A10-7850K
MIN: 63.08 / MAX: 385.45
303.75
70
140
210
280
350
1. (CXX) g++ options: -std=c++11 -pthread -O3

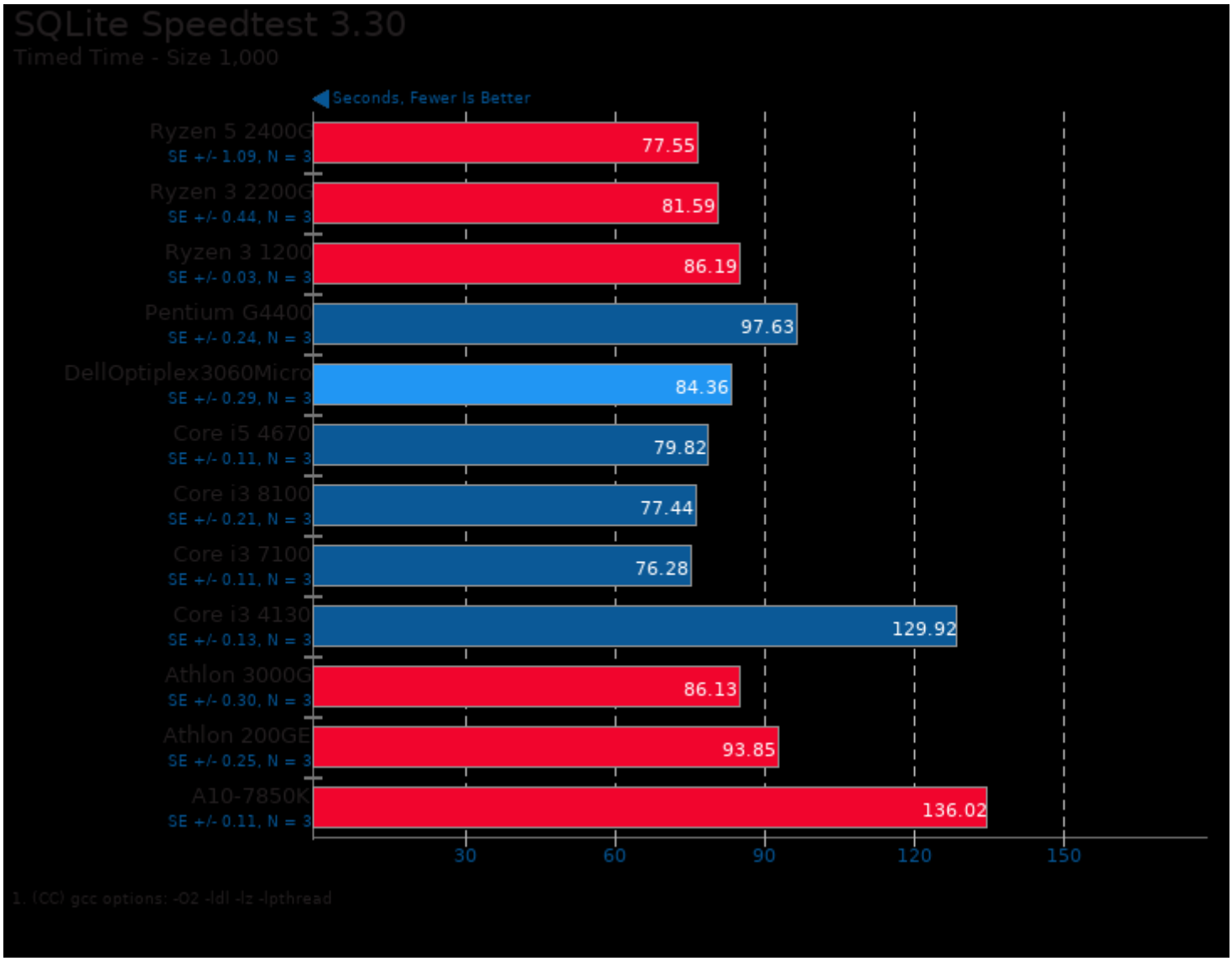
Low-End EOY2019 Ubuntu Linux CPU Comparison

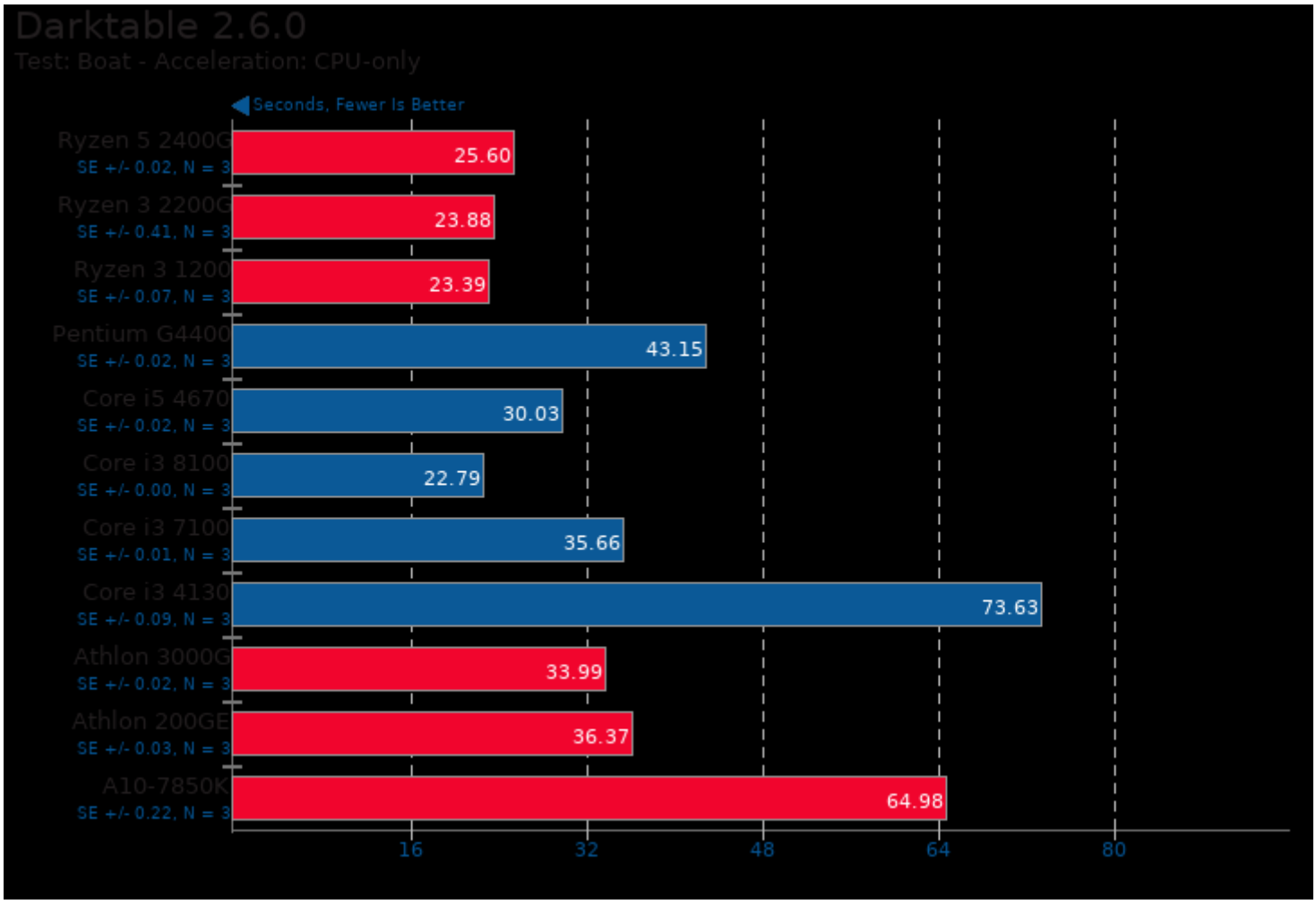


Low-End EOY2019 Ubuntu Linux CPU Comparison

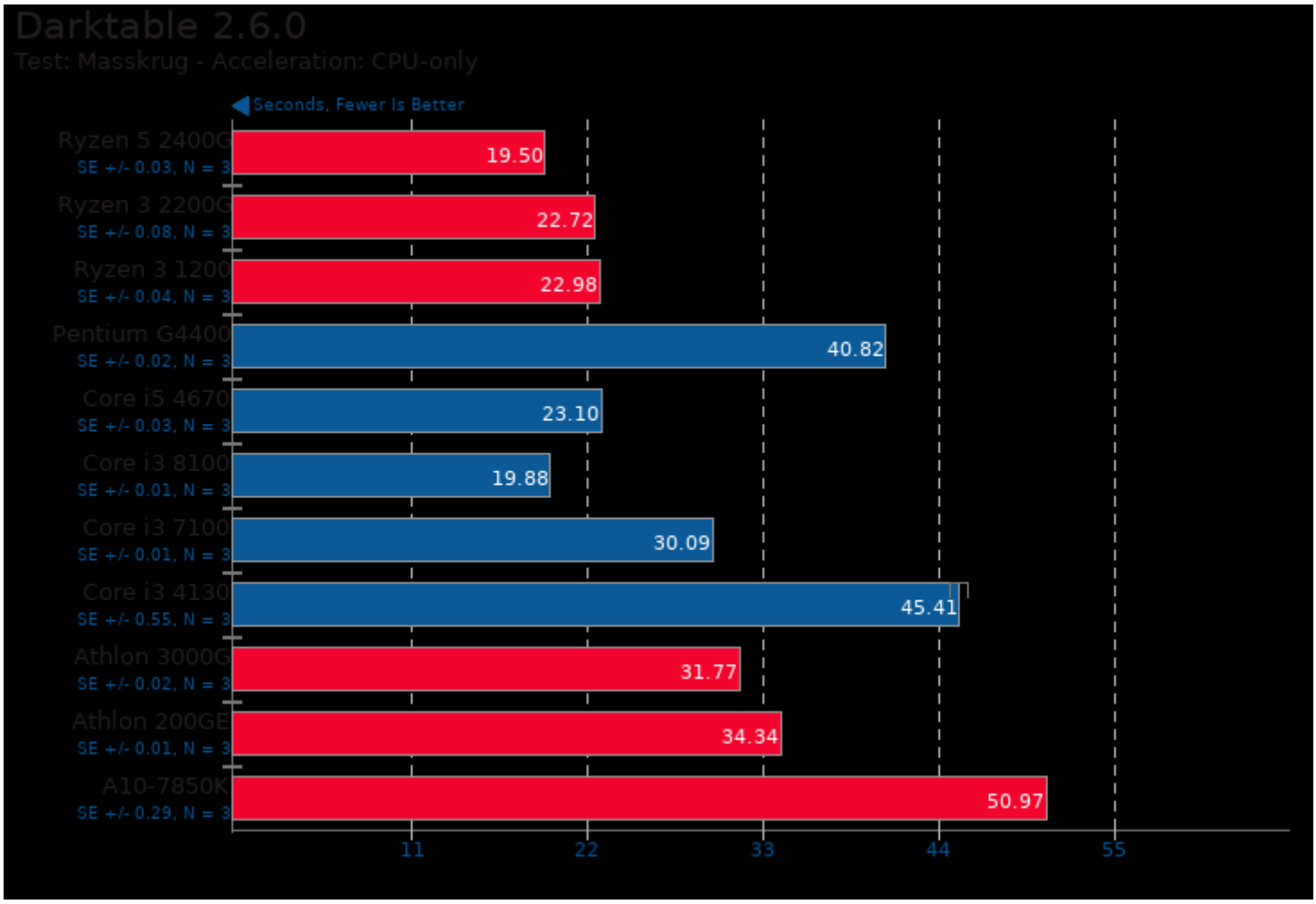



libjpeg-turbo tjbench 2.0.2
Test: Decompression Throughput
Megapixels/sec, More Is Better
Ryzen 5 2400G
SE +/- 0.04, N = 3
-lm
164.69
Ryzen 3 2200G
SE +/- 0.33, N = 3
-lm
155.62
Ryzen 3 1200
SE +/- 0.18, N = 3
-lm
145.19
Pentium G4400
SE +/- 0.36, N = 3
134.13
DellOptiplex3060Micro
SE +/- 0.24, N = 3
-lm
156.74
Core i5 4670
SE +/- 0.45, N = 3
-lm
172.99
Core i3 8100
SE +/- 0.12, N = 3
162.22
Core i3 7100
SE +/- 0.01, N = 3
175.59
Core i3 4130
SE +/- 0.28, N = 3
-lm
150.78
Athlon 3000G
SE +/- 0.31, N = 3
-lm
146.90
Athlon 200GE
SE +/- 0.44, N = 3
-lm
134.37
A10-7850K
SE +/- 0.12, N = 3
119.20
40
80
120
160
200
1. (CC) gcc options: -O3 -rdynamic

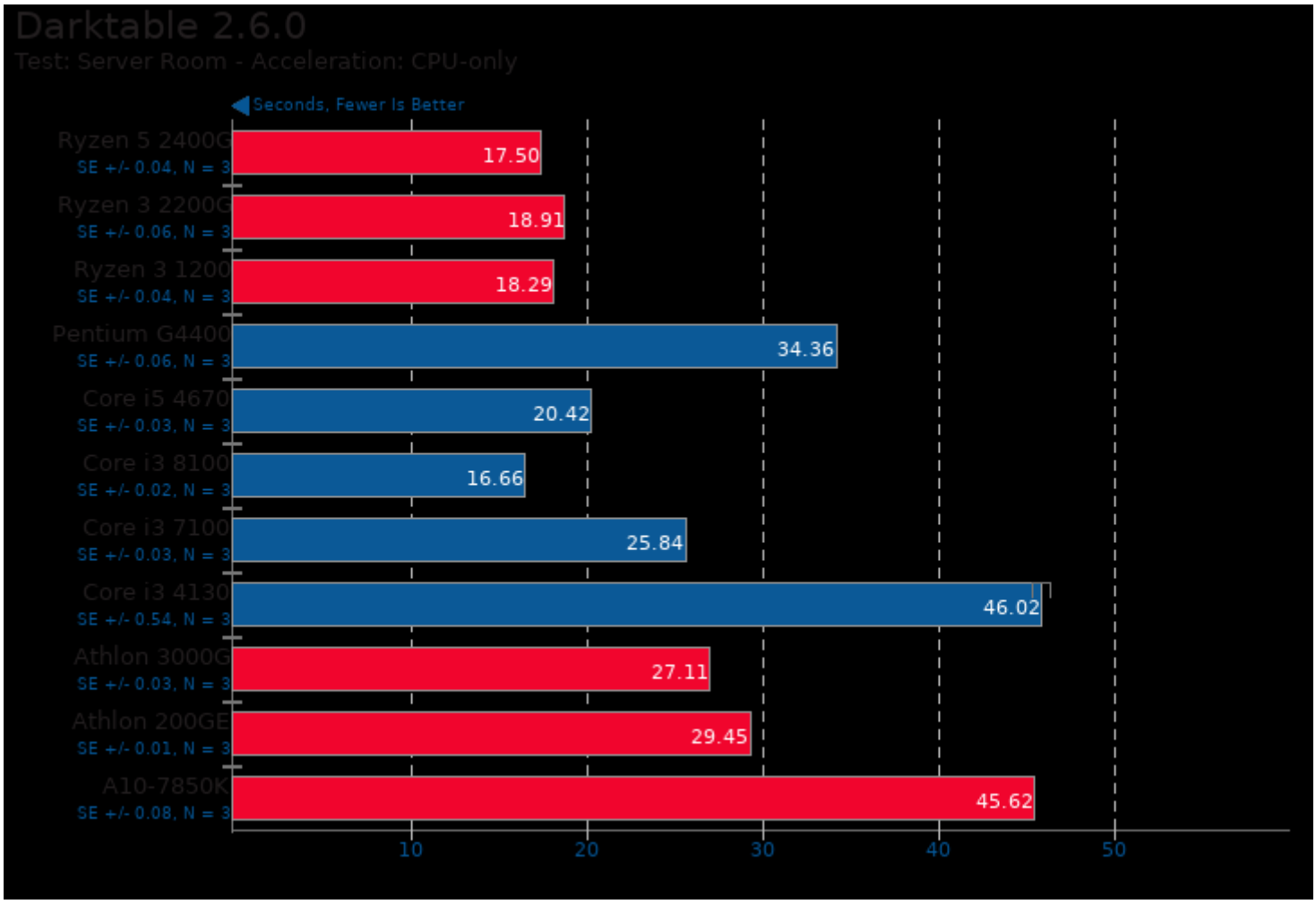

SQLite Speedtest 3.30
Timed Time - Size 1,000
Seconds, Fewer Is Better
Ryzen 5 2400G
SE +/- 1.09, N = 3
77.55
Ryzen 3 2200G
SE +/- 0.44, N = 3
81.59
Ryzen 3 1200
SE +/- 0.03, N = 3
86.19
Pentium G4400
SE +/- 0.24, N = 3
97.63
DellOptiplex3060Micro
SE +/- 0.29, N = 3
84.36
Core i5 4670
SE +/- 0.11, N = 3
79.82
Core i3 8100
SE +/- 0.21, N = 3
77.44
Core i3 7100
SE +/- 0.11, N = 3
76.28
Core i3 4130
SE +/- 0.13, N = 3
129.92
Athlon 3000G
SE +/- 0.30, N = 3
86.13
Athlon 200GE
SE +/- 0.25, N = 3
93.85
A10-7850K
SE +/- 0.11, N = 3
136.02
30
60
90
120
150
1. (CC) gcc options: -O2 -ldl -lz -lpthread


Darktable 2.6.0
Test: Boat - Acceleration: CPU-only
Seconds, Fewer Is Better
Ryzen 5 2400G
SE +/- 0.02, N = 3
25.60
Ryzen 3 2200G
SE +/- 0.41, N = 3
23.88
Ryzen 3 1200
SE +/- 0.07, N = 3
23.39
Pentium G4400
SE +/- 0.02, N = 3
43.15
Core i5 4670
SE +/- 0.02, N = 3
30.03
Core i3 8100
SE +/- 0.00, N = 3
22.79
Core i3 7100
SE +/- 0.01, N = 3
35.66
Core i3 4130
SE +/- 0.09, N = 3
73.63
Athlon 3000G
SE +/- 0.02, N = 3
33.99
Athlon 200GE
SE +/- 0.03, N = 3
36.37
A10-7850K
SE +/- 0.22, N = 3
64.98
16
32
48
64
80

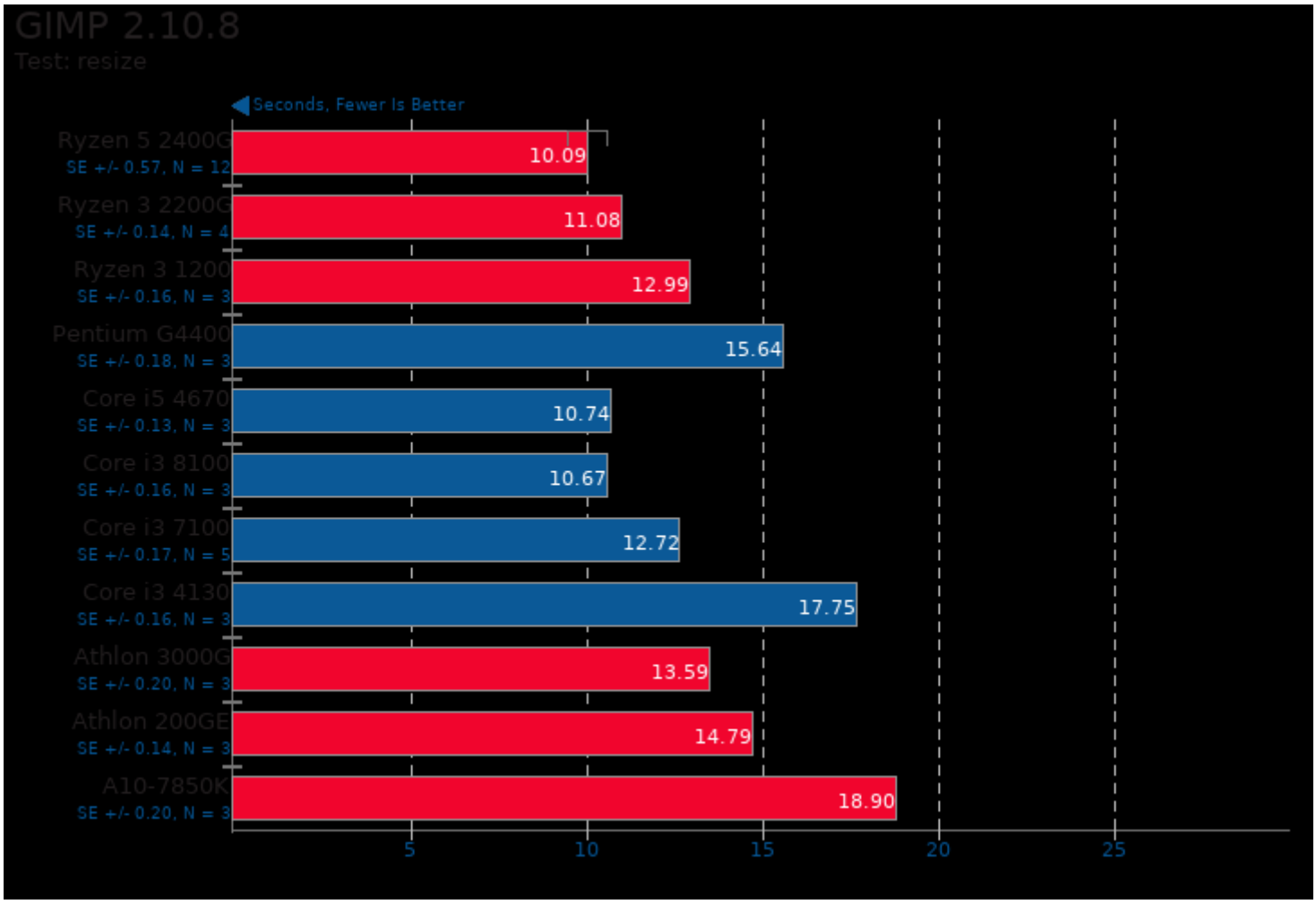
Low-End EOY2019 Ubuntu Linux CPU Comparison

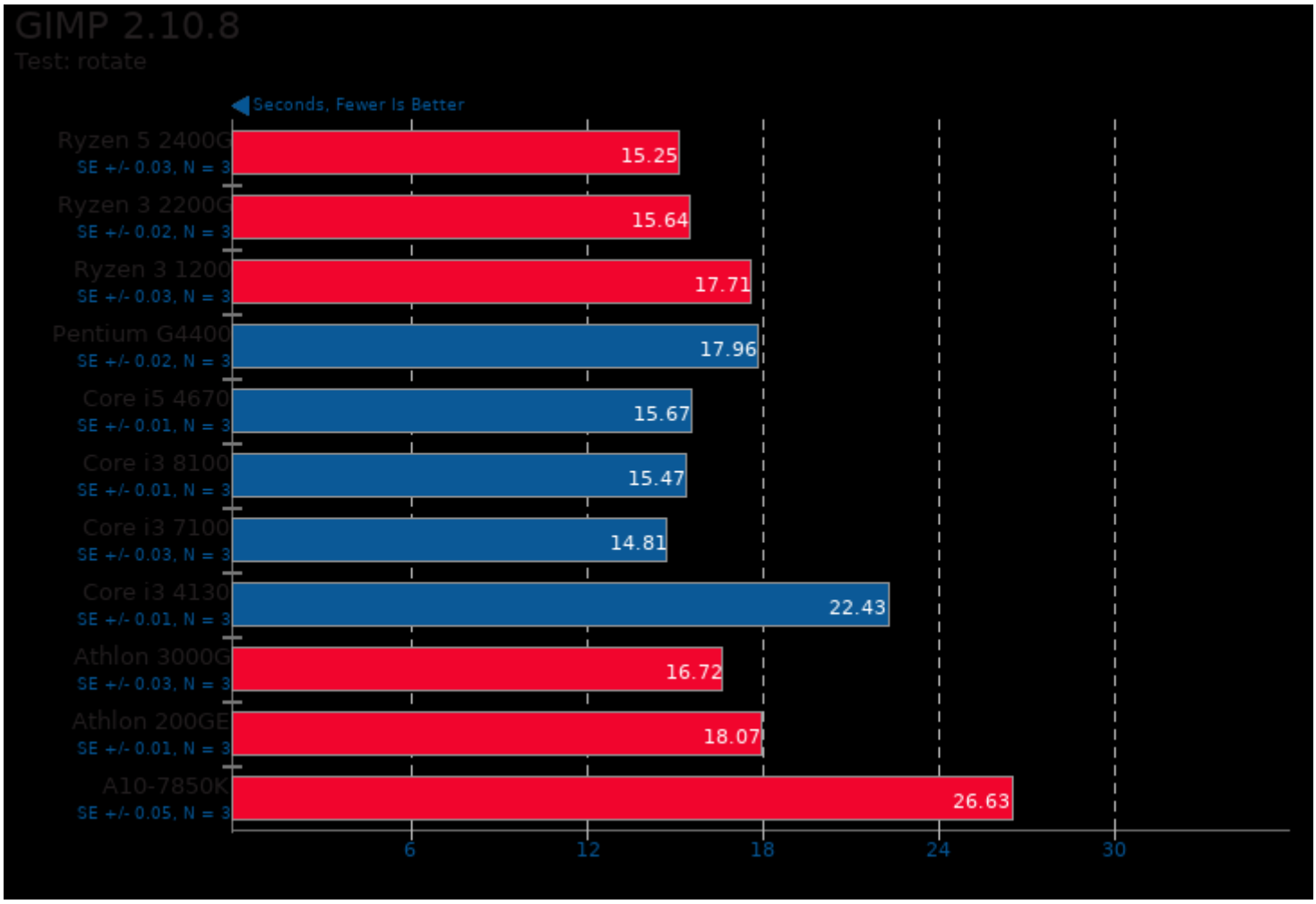


Low-End EOY2019 Ubuntu Linux CPU Comparison

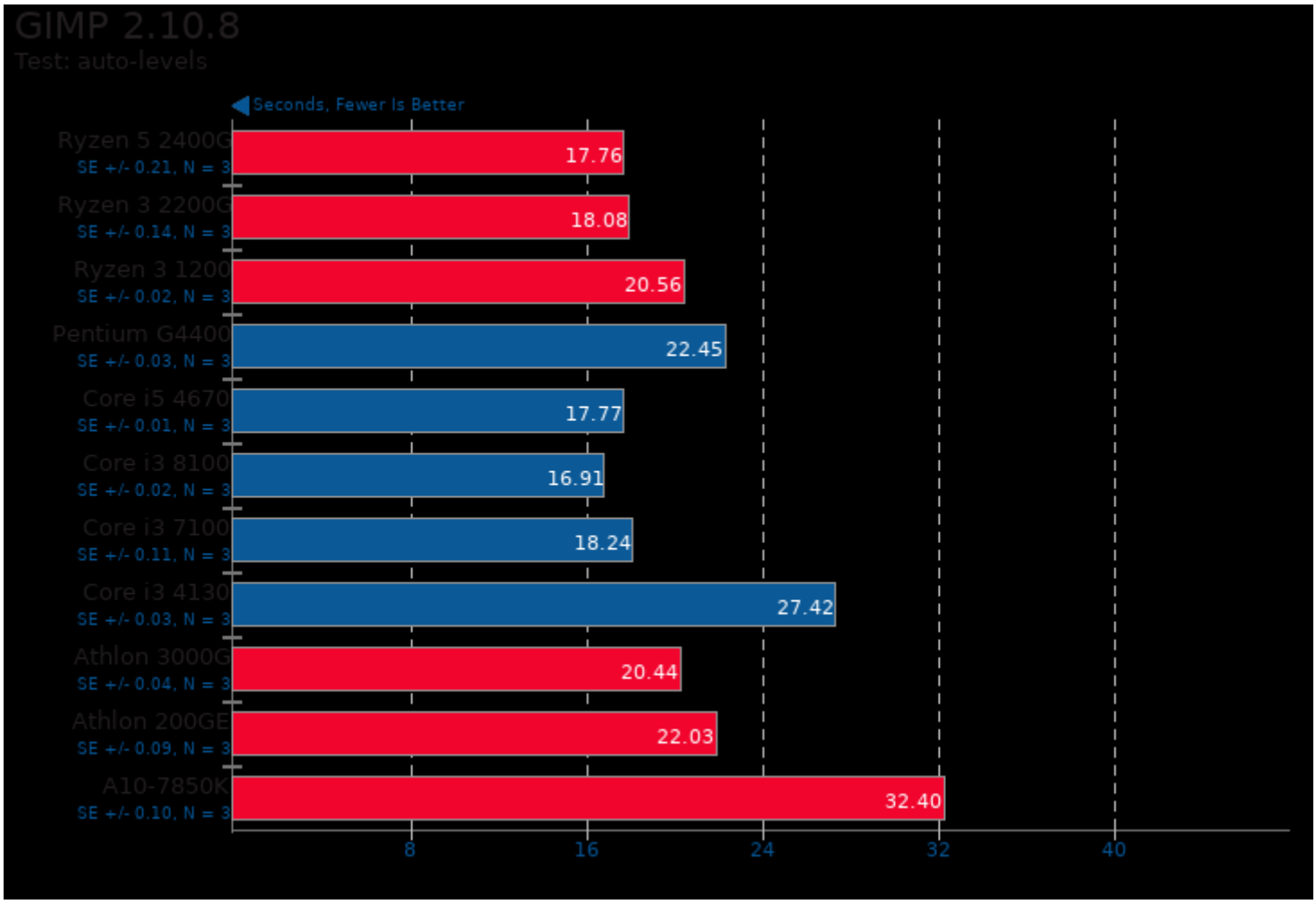


Low-End EOY2019 Ubuntu Linux CPU Comparison

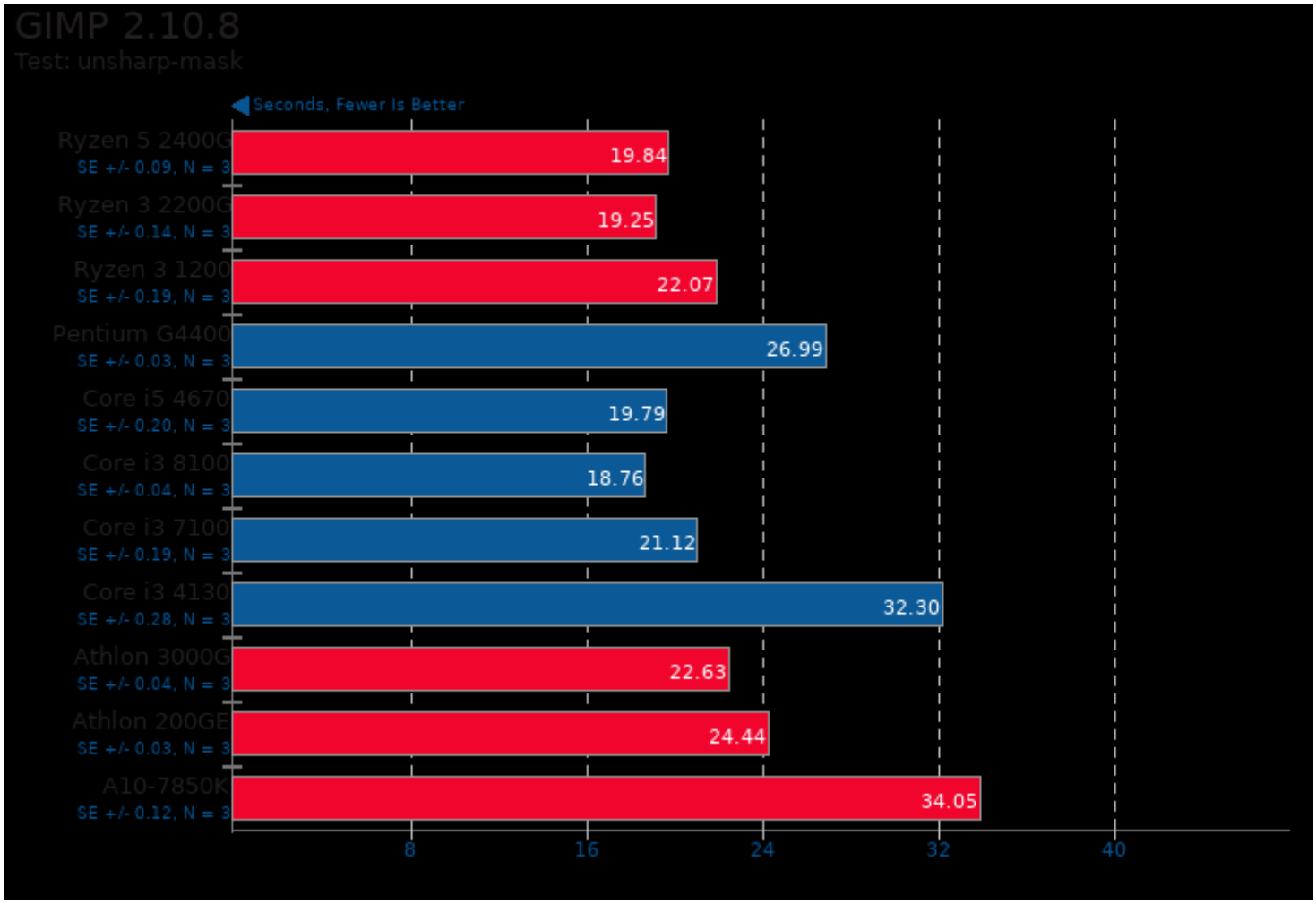



GIMP 2.10.8
Test: rotate
Seconds, Fewer Is Better
Ryzen 5 2400G
SE +/- 0.03, N = 3
15.25
Ryzen 3 2200G
SE +/- 0.02, N = 3
15.64
Ryzen 3 1200
SE +/- 0.03, N = 3
17.71
Pentium G4400
SE +/- 0.02, N = 3
17.96
Core i5 4670
SE +/- 0.01, N = 3
15.67
Core i3 8100
SE +/- 0.01, N = 3
15.47
Core i3 7100
SE +/- 0.03, N = 3
14.81
Core i3 4130
SE +/- 0.01, N = 3
22.43
Athlon 3000G
SE +/- 0.03, N = 3
16.72
Athlon 200GE
SE +/- 0.01, N = 3
18.07
A10-7850K
SE +/- 0.05, N = 3
26.63
6
12
18
24
30

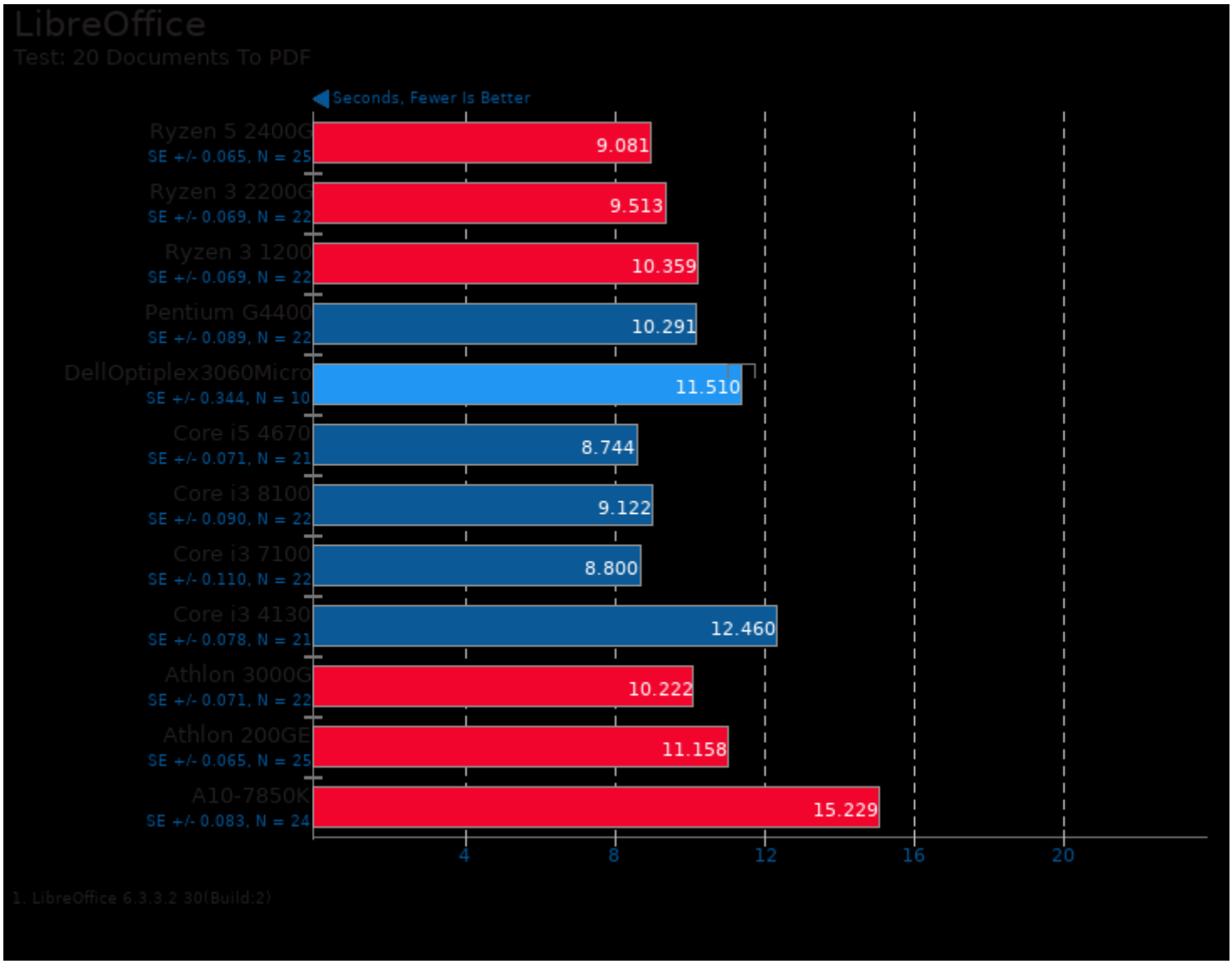
Low-End EOY2019 Ubuntu Linux CPU Comparison



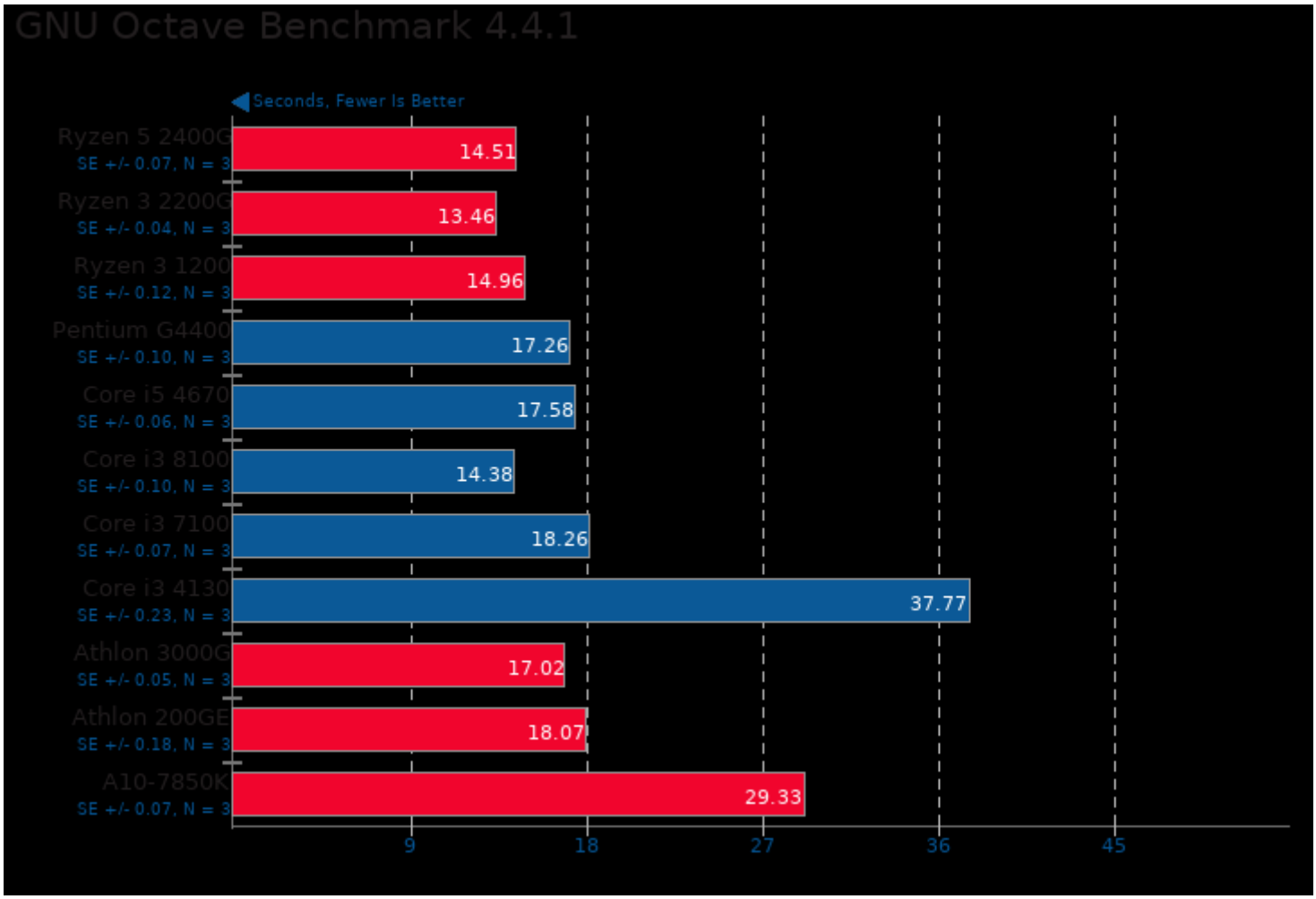
Low-End EOY2019 Ubuntu Linux CPU Comparison



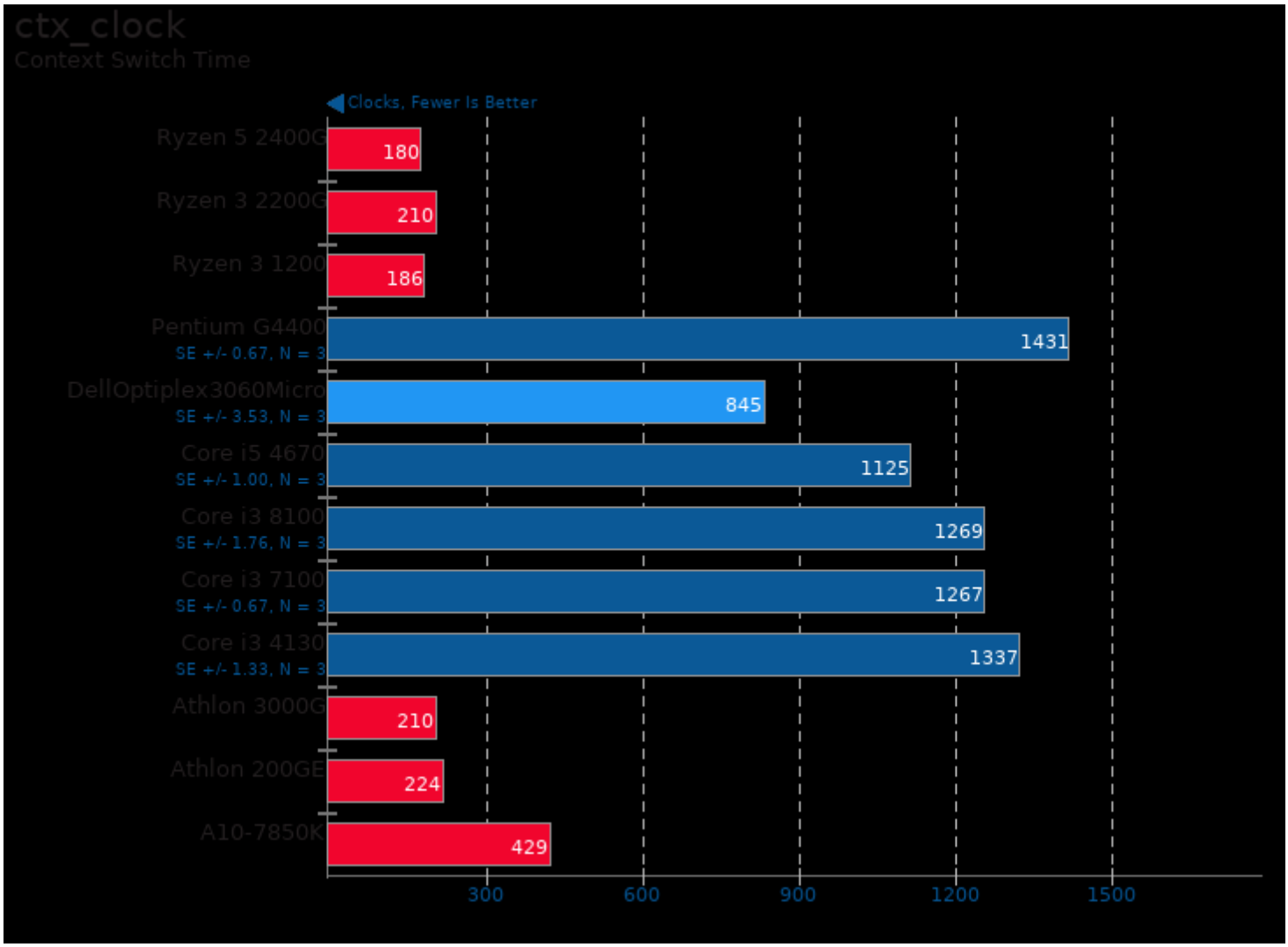
Low-End EOY2019 Ubuntu Linux CPU Comparison



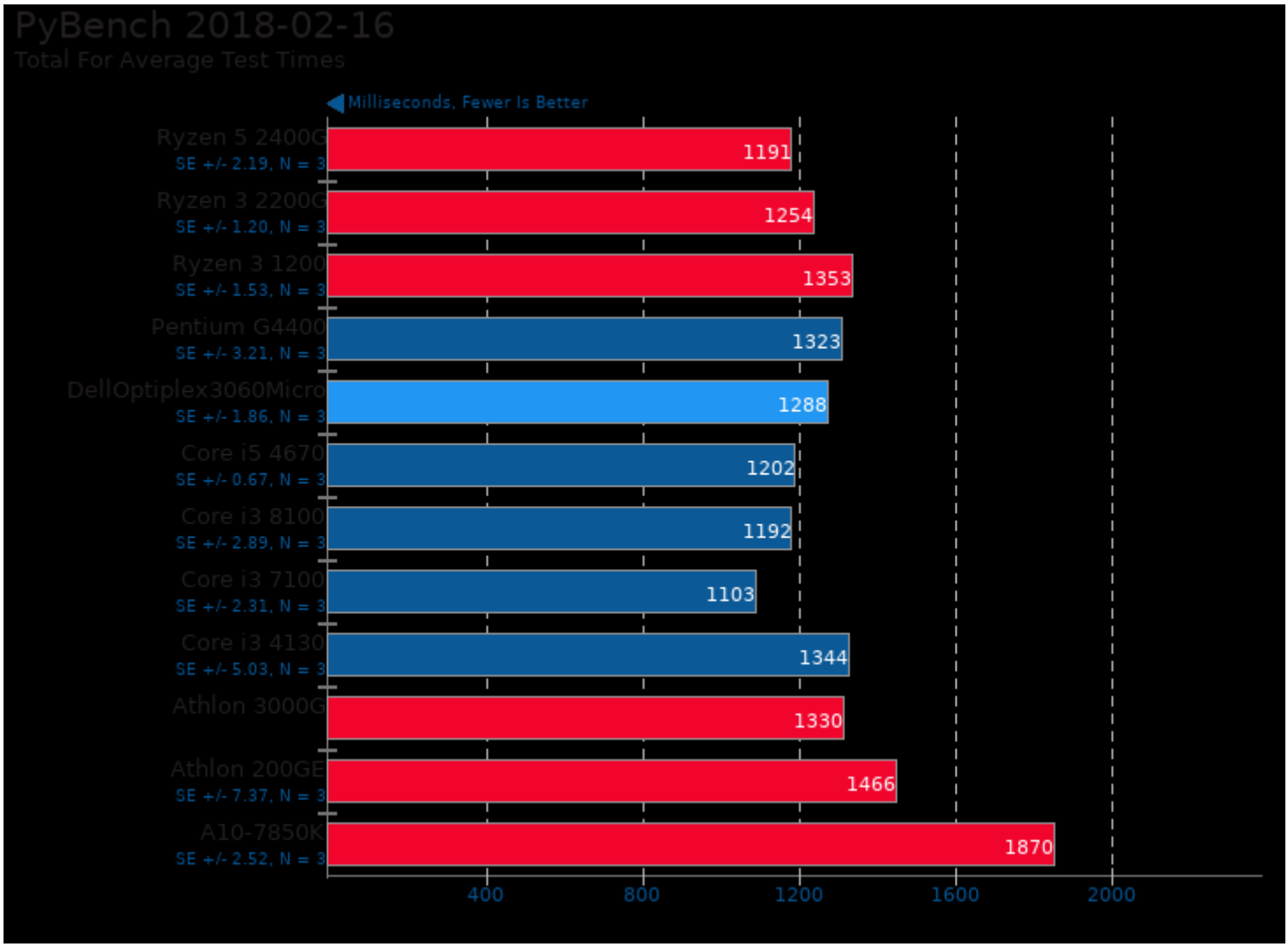
Low-End EOY2019 Ubuntu Linux CPU Comparison



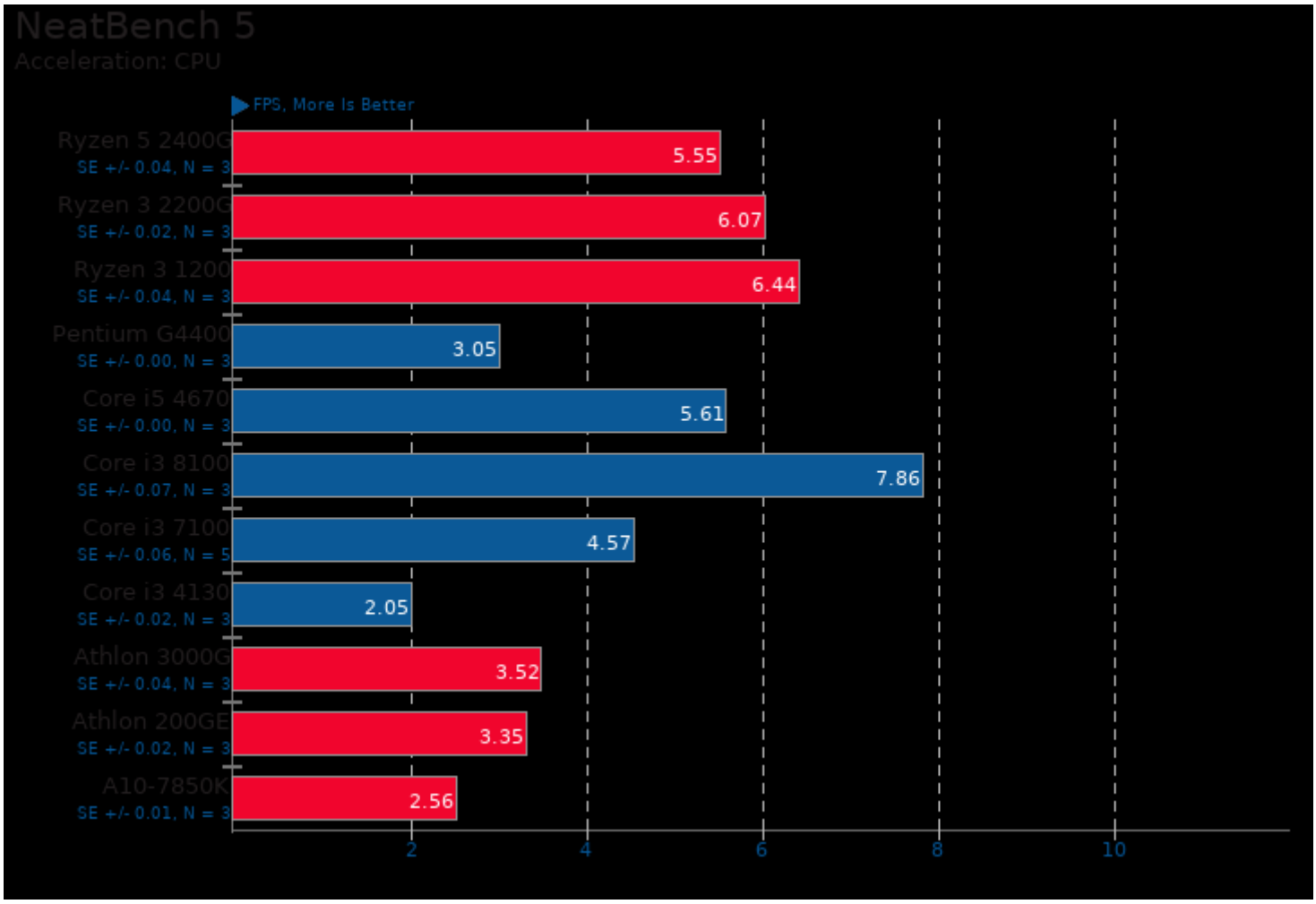
Low-End EOY2019 Ubuntu Linux CPU Comparison



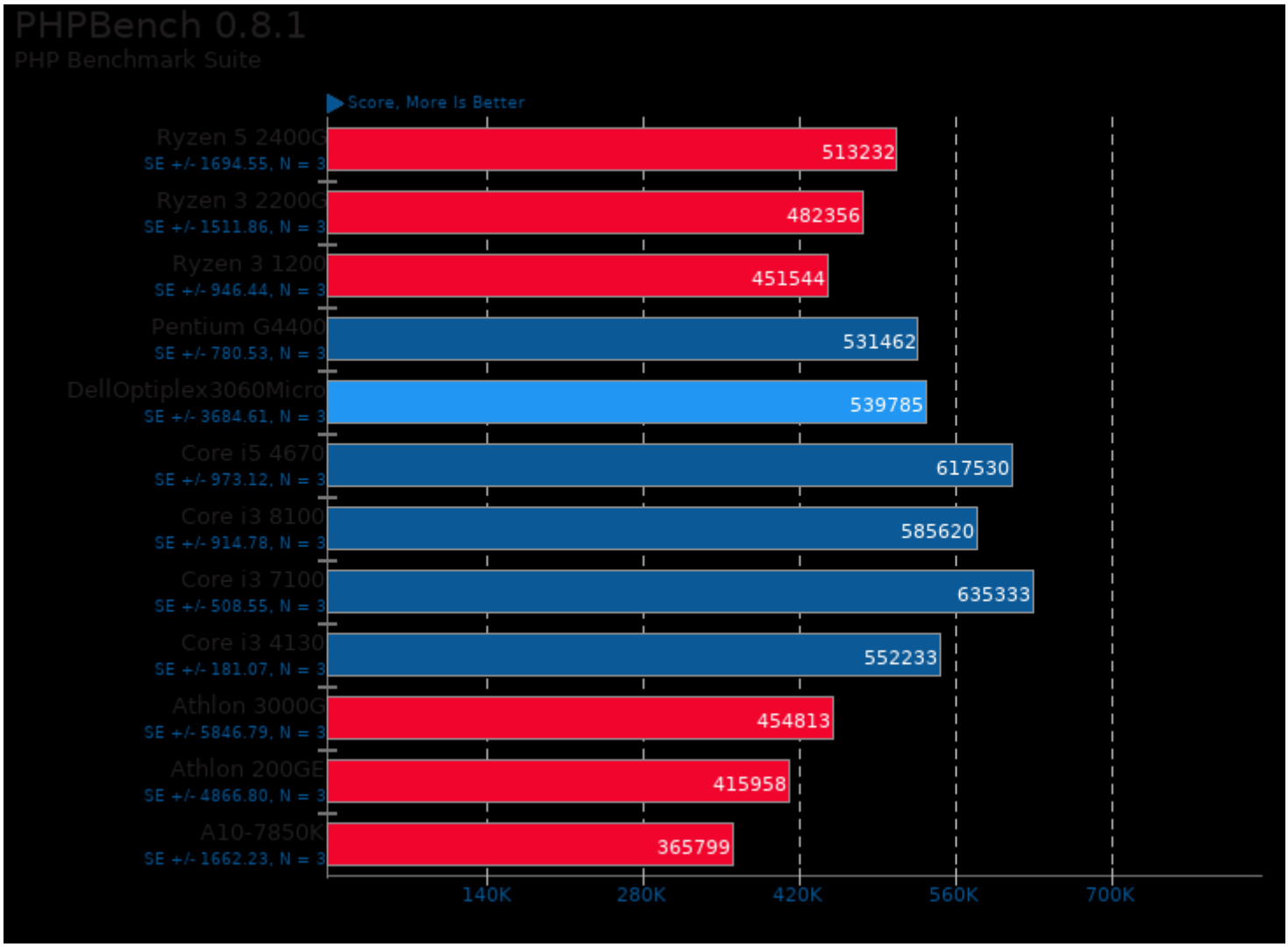
Low-End EOY2019 Ubuntu Linux CPU Comparison

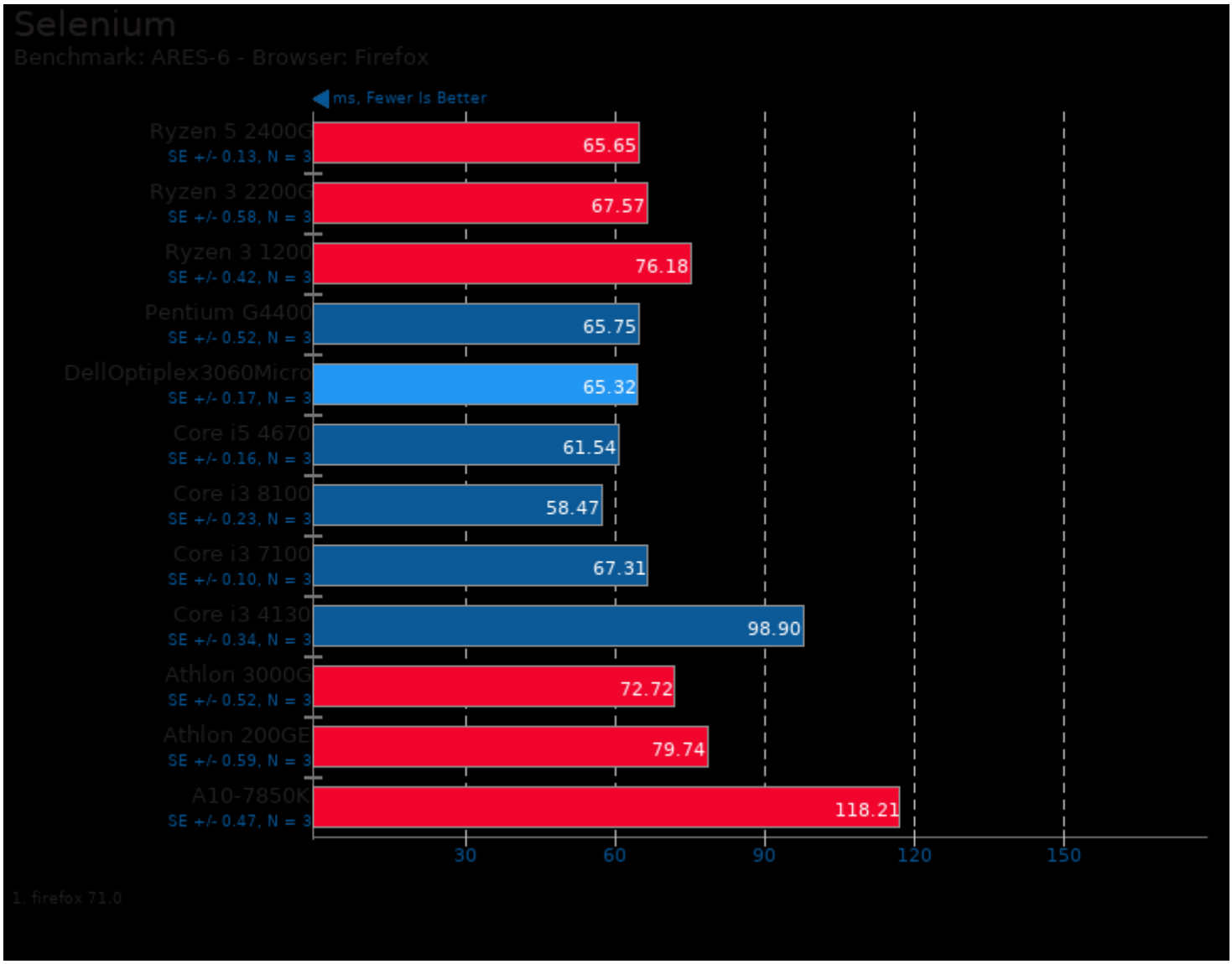


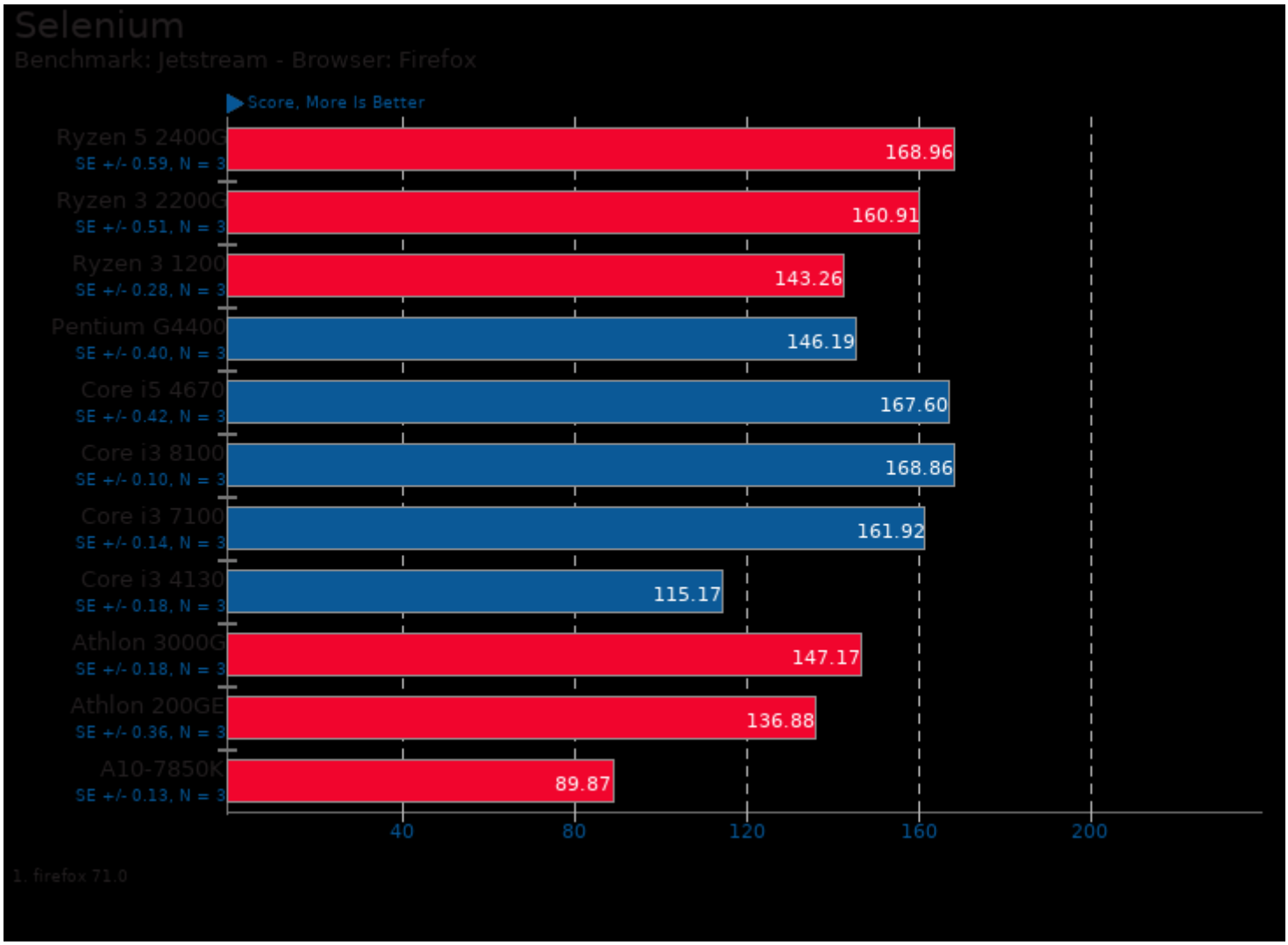
Low-End EOY2019 Ubuntu Linux CPU Comparison

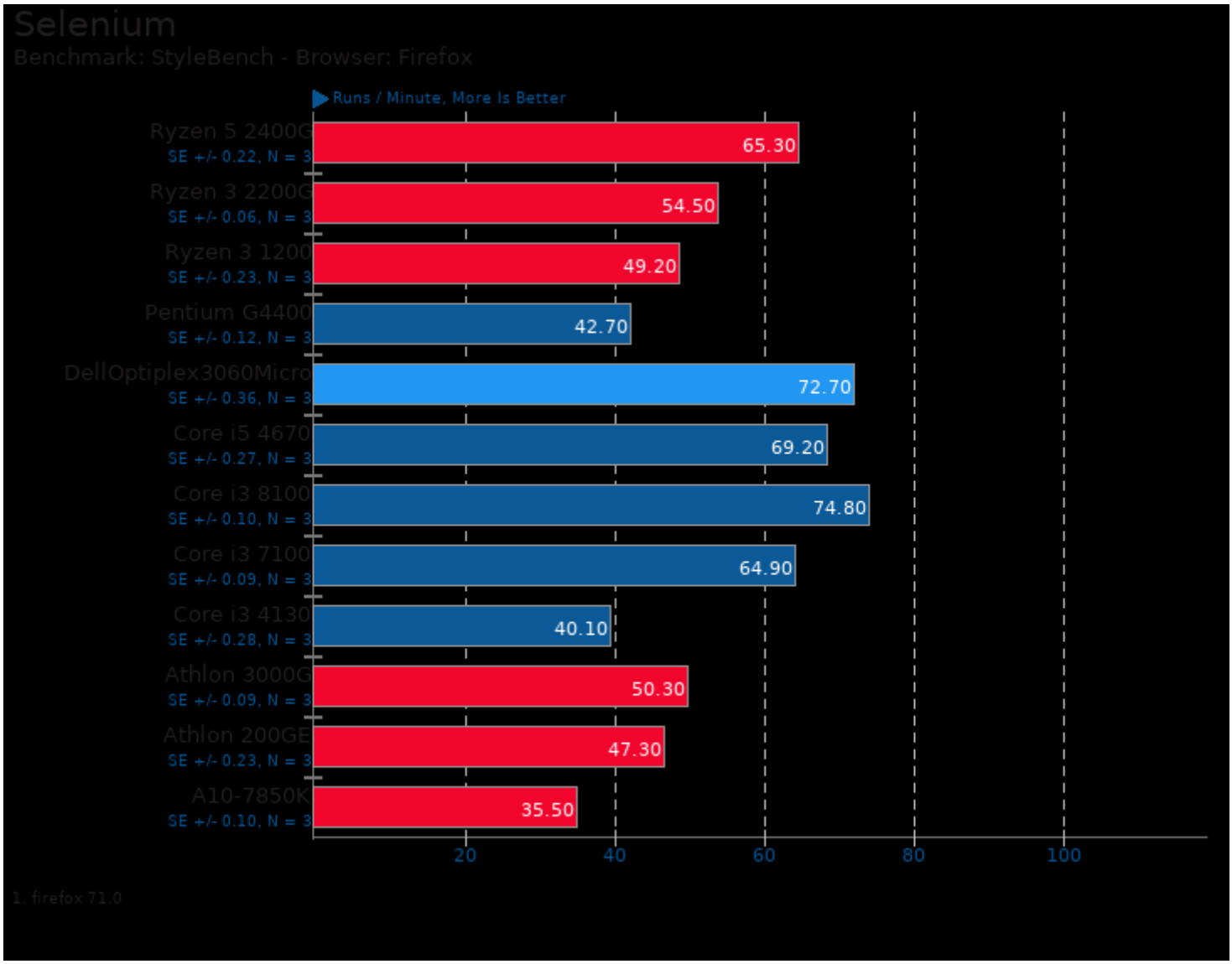


Low-End EOY2019 Ubuntu Linux CPU Comparison

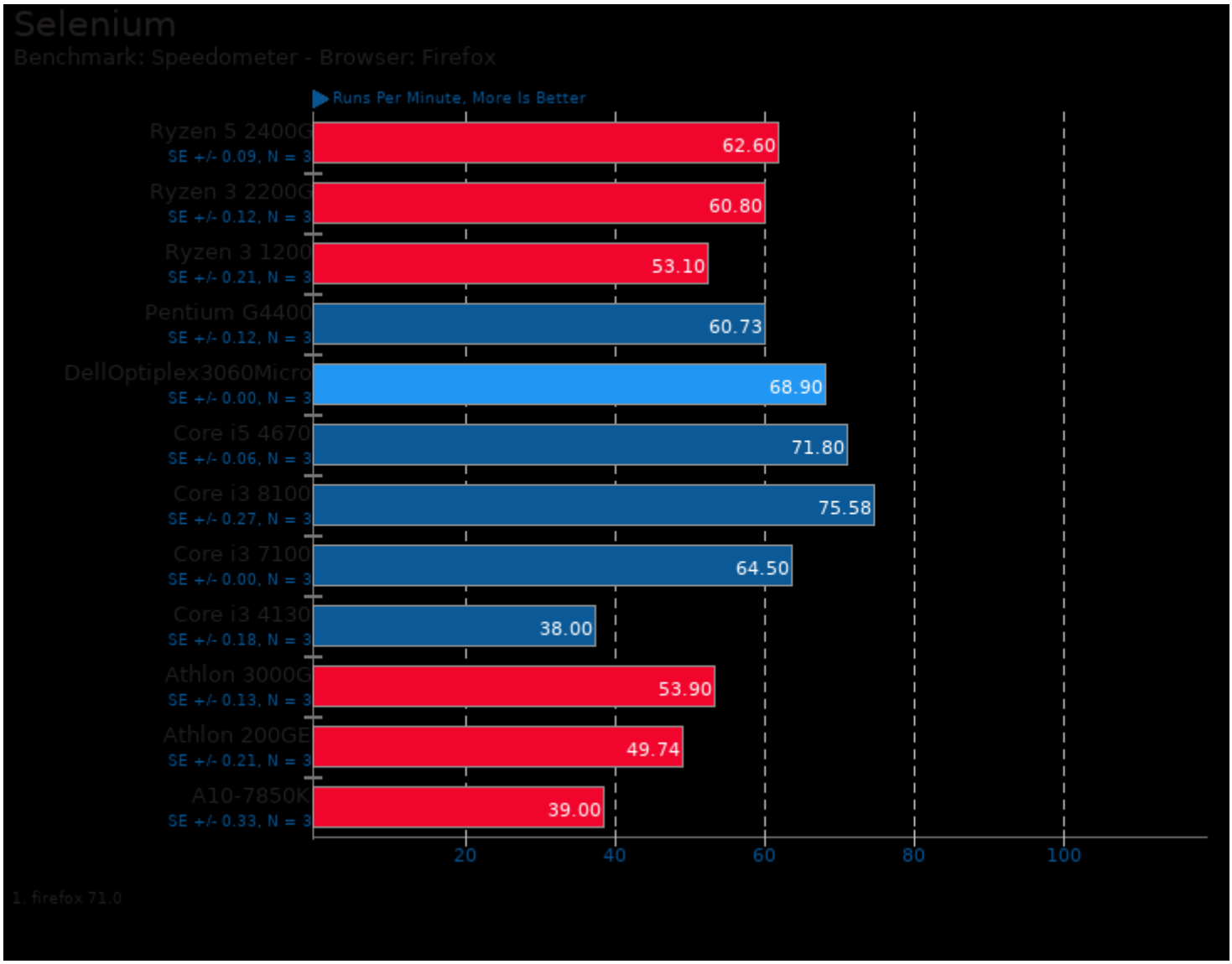


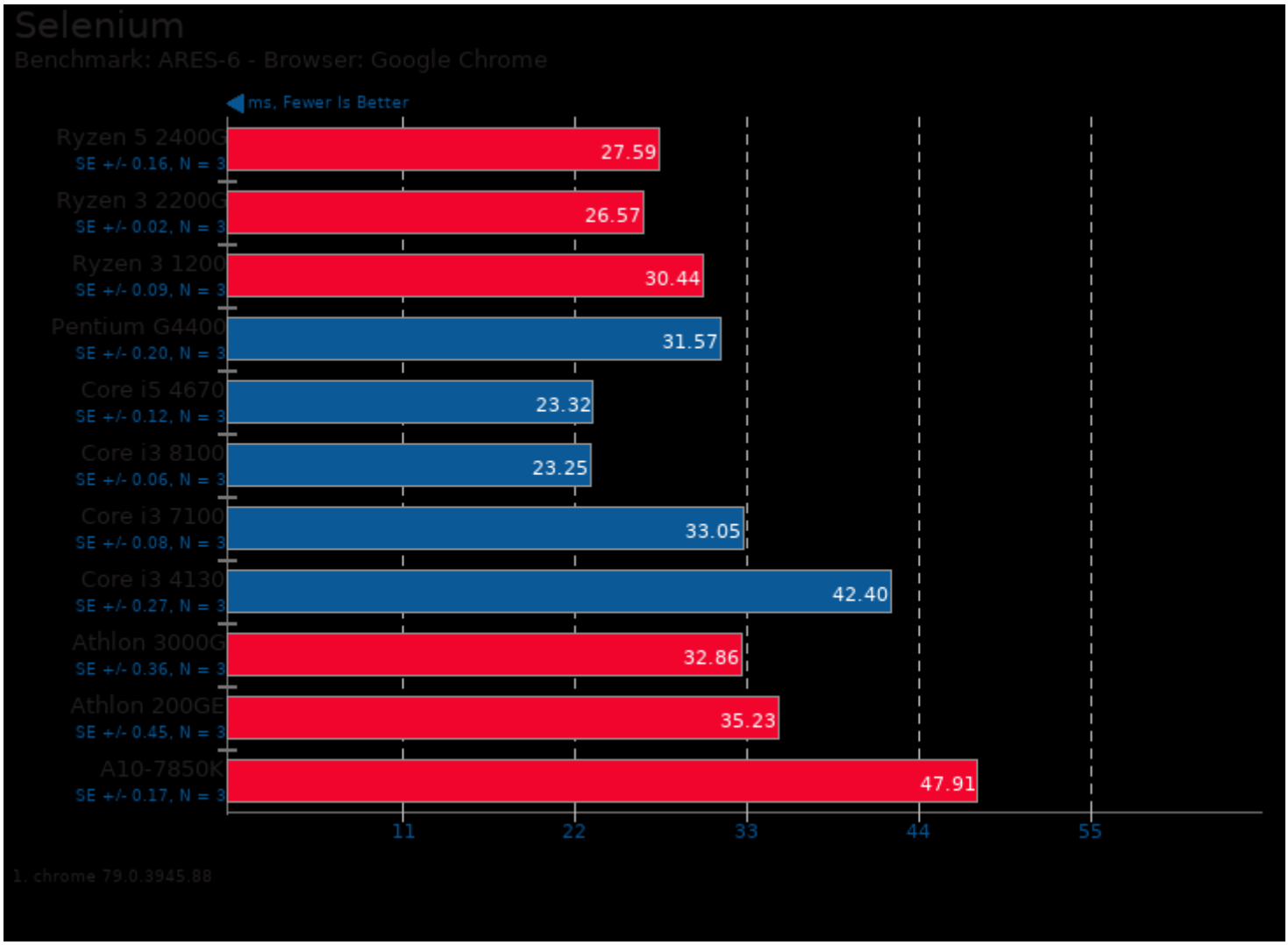

Selenium
Benchmark: ARES-6 - Browser: Firefox
ms, Fewer Is Better
Ryzen 5 2400G
SE +/- 0.13, N = 3
65.65
Ryzen 3 2200G
SE +/- 0.58, N = 3
67.57
Ryzen 3 1200
SE +/- 0.42, N = 3
76.18
Pentium G4400
SE +/- 0.52, N = 3
65.75
DellOptiplex3060Micro
SE +/- 0.17, N = 3
65.32
Core i5 4670
SE +/- 0.16, N = 3
61.54
Core i3 8100
SE +/- 0.23, N = 3
58.47
Core i3 7100
SE +/- 0.10, N = 3
67.31
Core i3 4130
SE +/- 0.34, N = 3
98.90
Athlon 3000G
SE +/- 0.52, N = 3
72.72
Athlon 200GE
SE +/- 0.59, N = 3
79.74
A10-7850K
SE +/- 0.47, N = 3
118.21
30
60
90
120
150
1. firefox 71.0

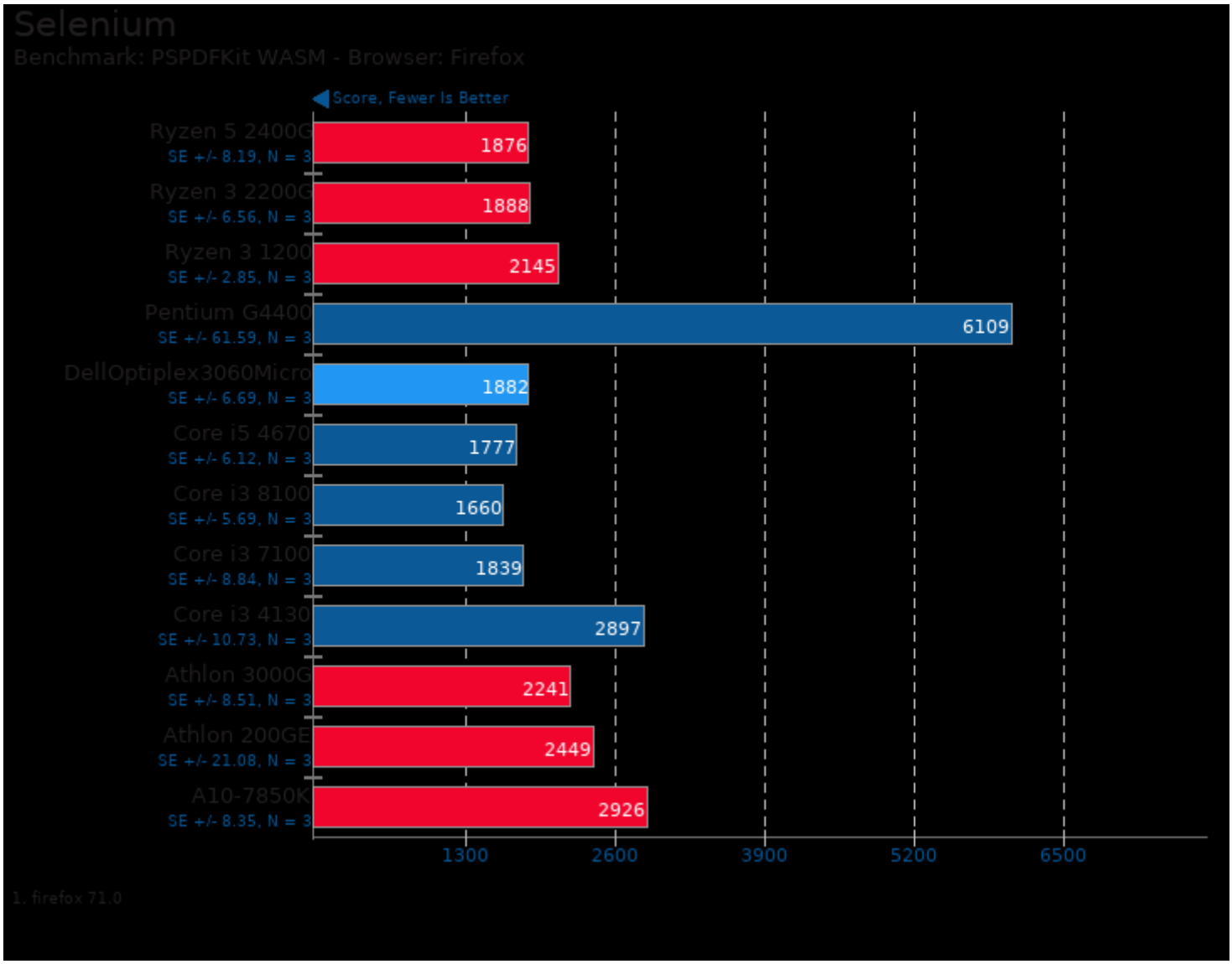

Selenium
Benchmark: Jetstream - Browser: Firefox
Score, More Is Better
Ryzen 5 2400G
SE +/- 0.59, N = 3
168.96
Ryzen 3 2200G
SE +/- 0.51, N = 3
160.91
Ryzen 3 1200
SE +/- 0.28, N = 3
143.26
Pentium G4400
SE +/- 0.40, N = 3
146.19
Core i5 4670
SE +/- 0.42, N = 3
167.60
Core i3 8100
SE +/- 0.10, N = 3
168.86
Core i3 7100
SE +/- 0.14, N = 3
161.92
Core i3 4130
SE +/- 0.18, N = 3
115.17
Athlon 3000G
SE +/- 0.18, N = 3
147.17
Athlon 200GE
SE +/- 0.36, N = 3
136.88
A10-7850K
SE +/- 0.13, N = 3
89.87
40
80
120
160
200
1. firefox 71.0

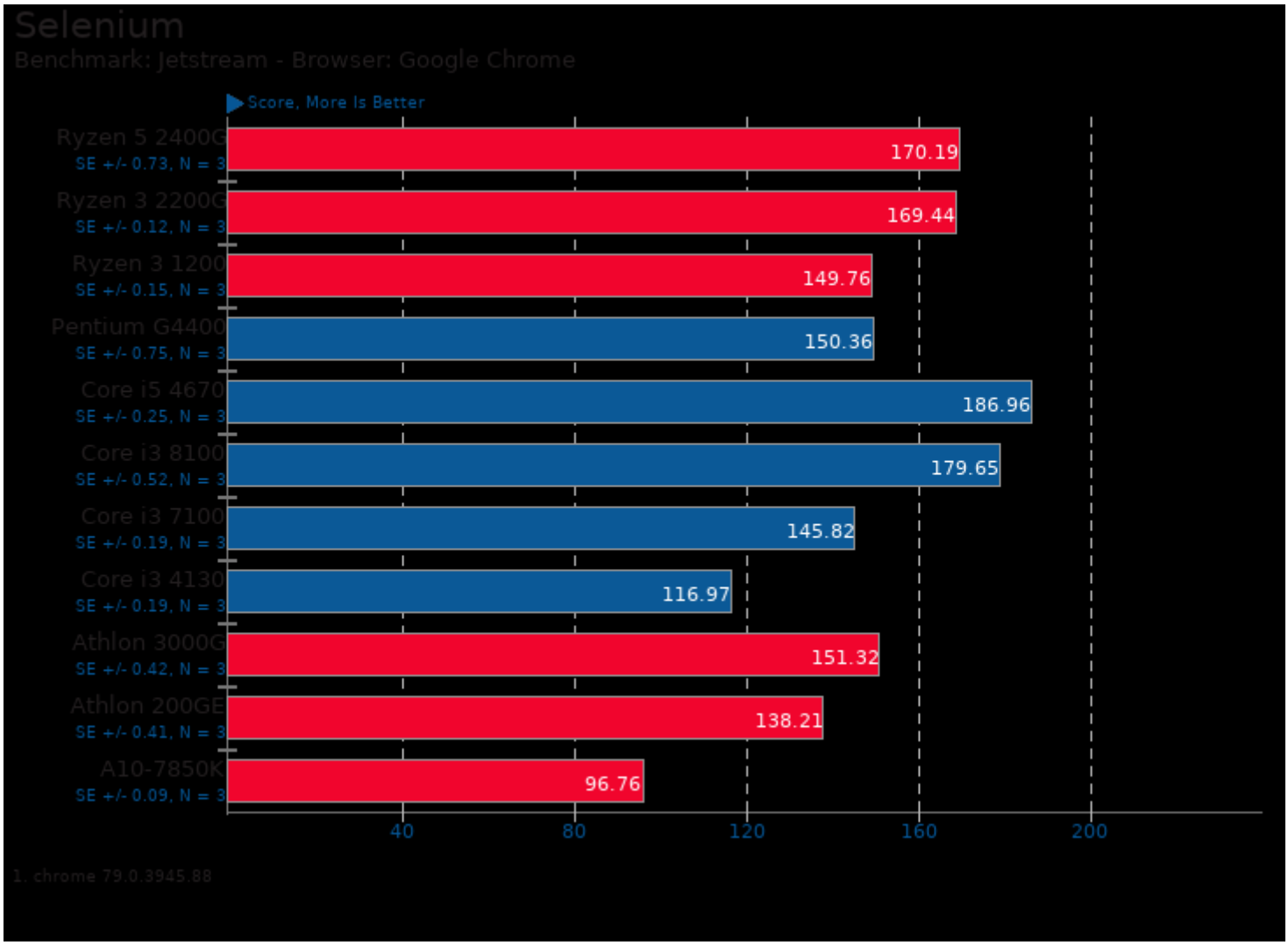

Selenium
Benchmark: StyleBench - Browser: Firefox
Runs / Minute, More Is Better
Ryzen 5 2400G
SE +/- 0.22, N = 3
65.30
Ryzen 3 2200G
SE +/- 0.06, N = 3
54.50
Ryzen 3 1200
SE +/- 0.23, N = 3
49.20
Pentium G4400
SE +/- 0.12, N = 3
42.70
DellOptiplex3060Micro
SE +/- 0.36, N = 3
72.70
Core i5 4670
SE +/- 0.27, N = 3
69.20
Core i3 8100
SE +/- 0.10, N = 3
74.80
Core i3 7100
SE +/- 0.09, N = 3
64.90
Core i3 4130
SE +/- 0.28, N = 3
40.10
Athlon 3000G
SE +/- 0.09, N = 3
50.30
Athlon 200GE
SE +/- 0.23, N = 3
47.30
A10-7850K
SE +/- 0.10, N = 3
35.50
20
40
60
80
100
1. firefox 71.0

Low-End EOY2019 Ubuntu Linux CPU Comparison

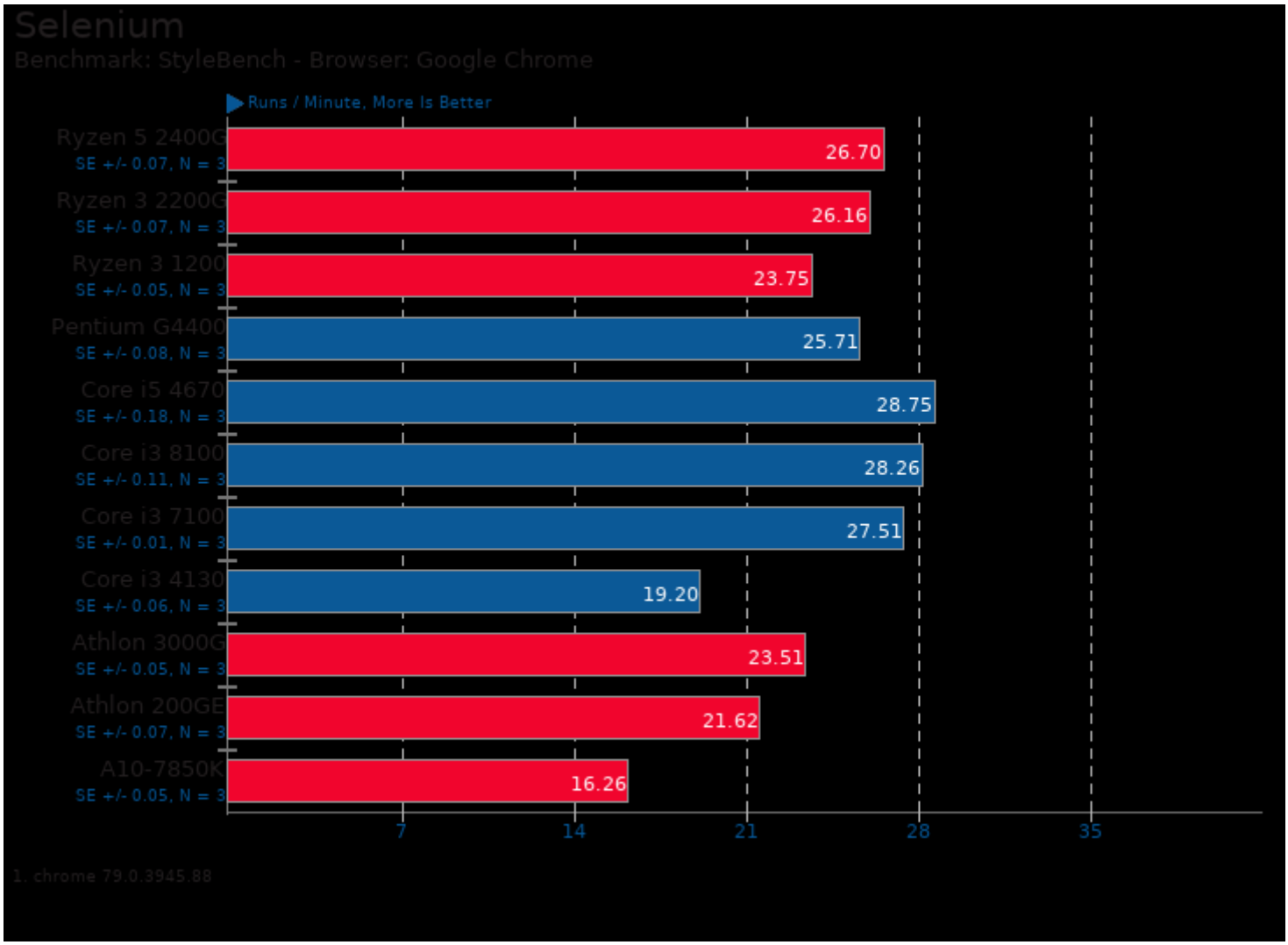


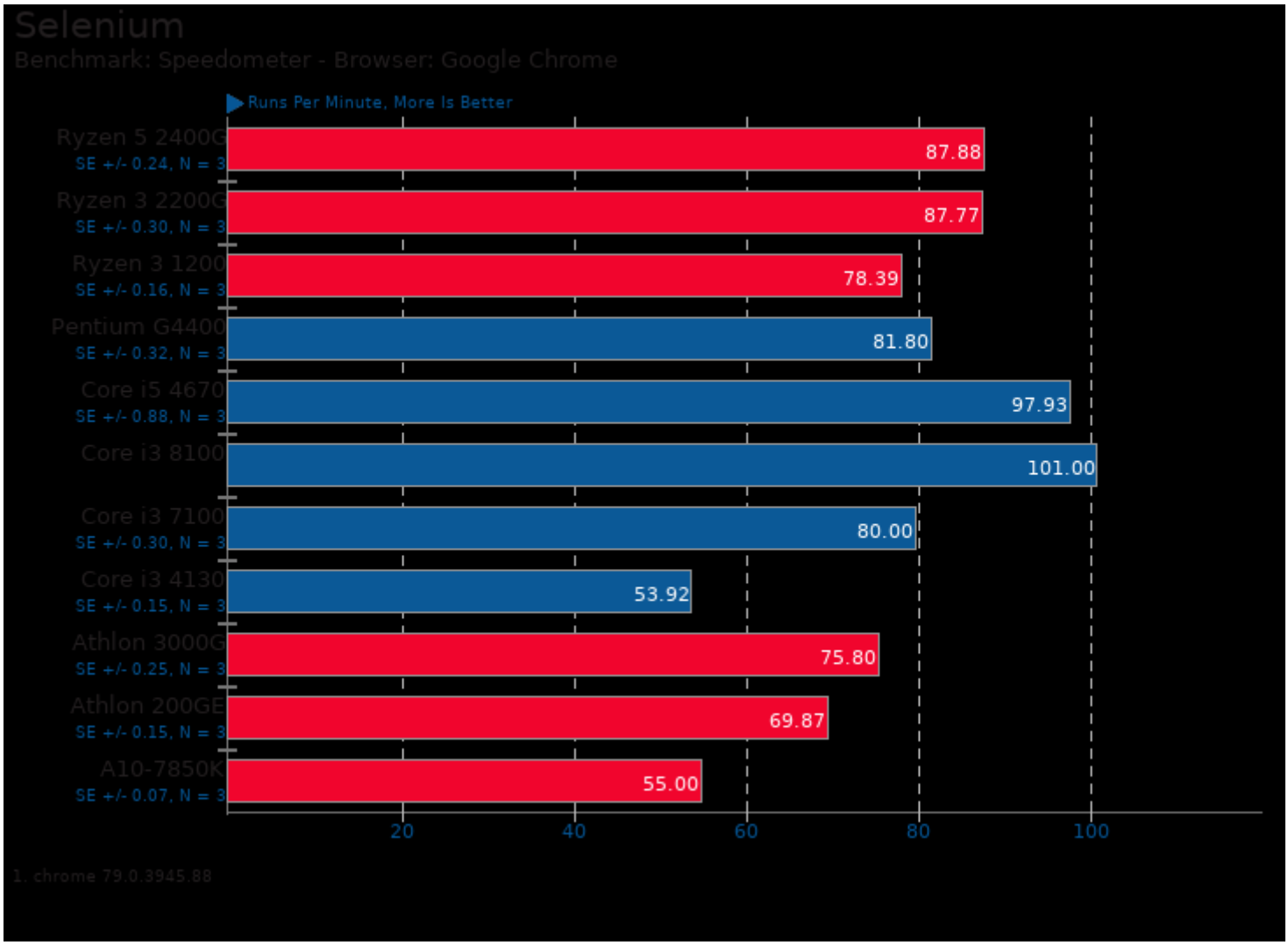

Selenium
Benchmark: ARES-6 - Browser: Google Chrome
ms, Fewer Is Better
Ryzen 5 2400G
SE +/- 0.16, N = 3
27.59
Ryzen 3 2200G
SE +/- 0.02, N = 3
26.57
Ryzen 3 1200
SE +/- 0.09, N = 3
30.44
Pentium G4400
SE +/- 0.20, N = 3
31.57
Core i5 4670
SE +/- 0.12, N = 3
23.32
Core i3 8100
SE +/- 0.06, N = 3
23.25
Core i3 7100
SE +/- 0.08, N = 3
33.05
Core i3 4130
SE +/- 0.27, N = 3
42.40
Athlon 3000G
SE +/- 0.36, N = 3
32.86
Athlon 200GE
SE +/- 0.45, N = 3
35.23
A10-7850K
SE +/- 0.17, N = 3
47.91
11
22
33
44
55
1. chrome 79.0.3945.88

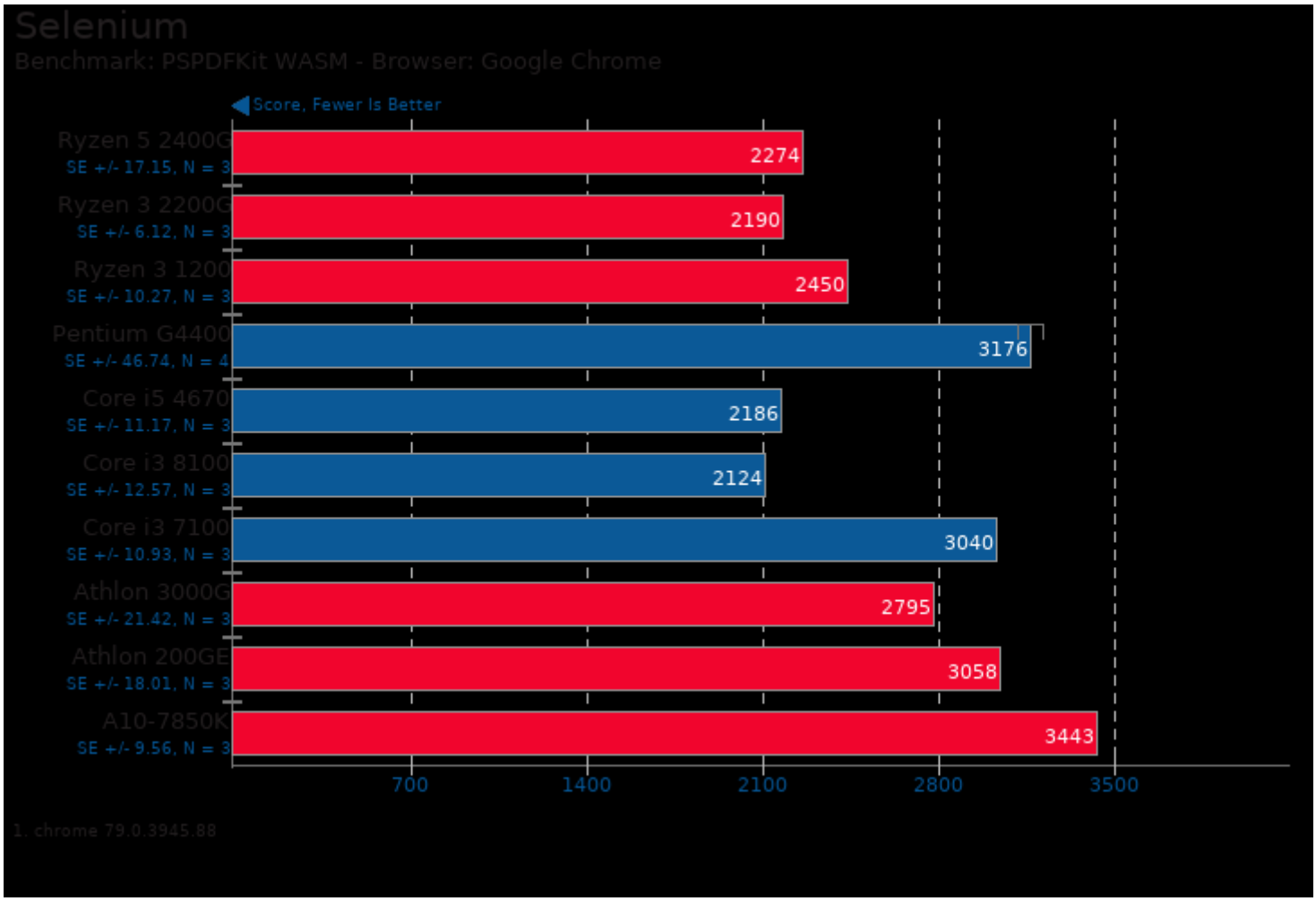

Selenium
Benchmark: PSPDFKit WASM - Browser: Firefox
Score, Fewer Is Better
Ryzen 5 2400G
SE +/- 8.19, N = 3
1876
Ryzen 3 2200G
SE +/- 6.56, N = 3
1888
Ryzen 3 1200
SE +/- 2.85, N = 3
2145
Pentium G4400
SE +/- 61.59, N = 3
6109
DellOptiplex3060Micro
SE +/- 6.69, N = 3
1882
Core i5 4670
SE +/- 6.12, N = 3
1777
Core i3 8100
SE +/- 5.69, N = 3
1660
Core i3 7100
SE +/- 8.84, N = 3
1839
Core i3 4130
SE +/- 10.73, N = 3
2897
Athlon 3000G
SE +/- 8.51, N = 3
2241
Athlon 200GE
SE +/- 21.08, N = 3
2449
A10-7850K
SE +/- 8.35, N = 3
2926
1300
2600
3900
5200
6500
1. firefox 71.0

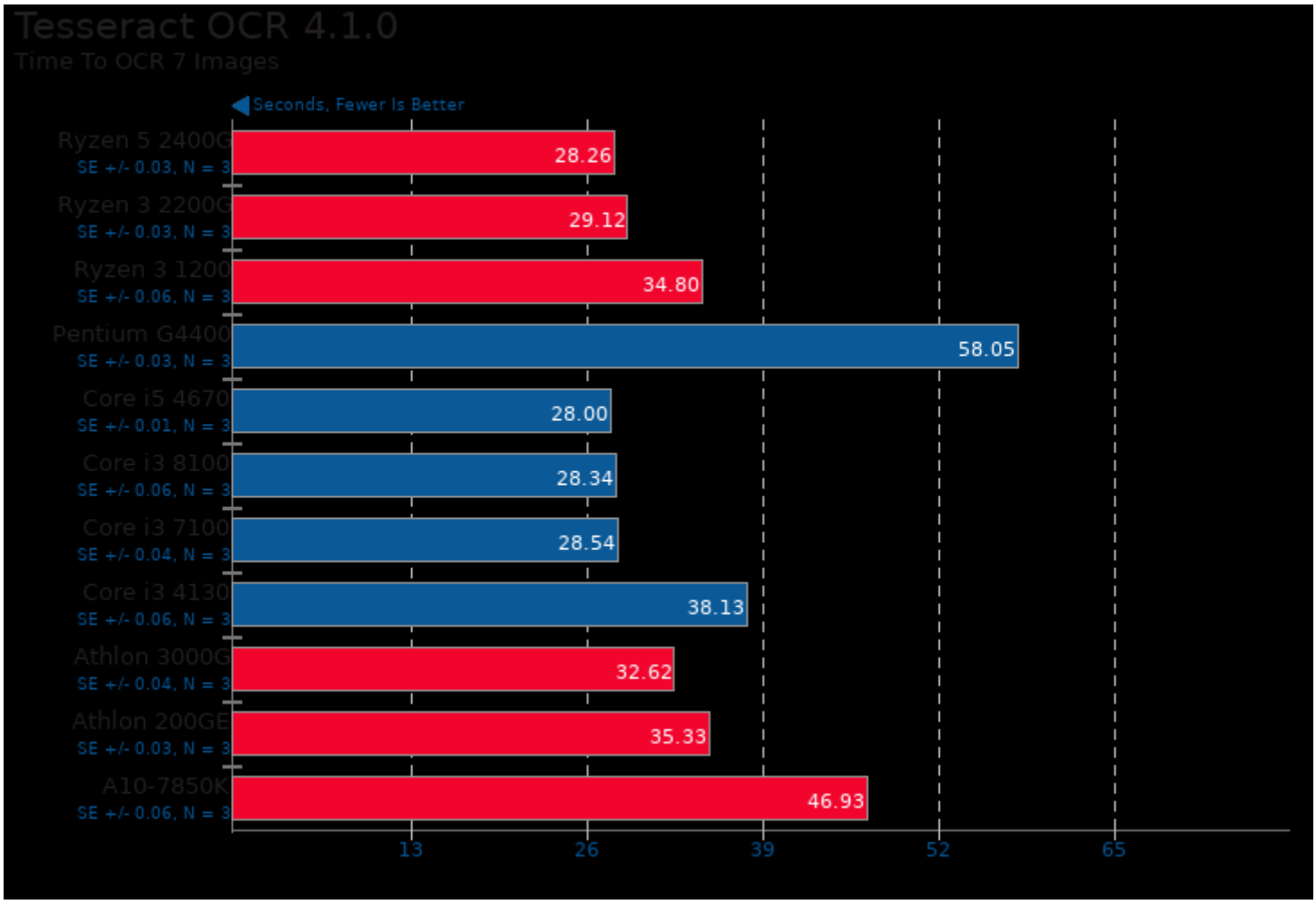

Selenium
Benchmark: Jetstream - Browser: Google Chrome
Score, More Is Better
Ryzen 5 2400G
SE +/- 0.73, N = 3
170.19
Ryzen 3 2200G
SE +/- 0.12, N = 3
169.44
Ryzen 3 1200
SE +/- 0.15, N = 3
149.76
Pentium G4400
SE +/- 0.75, N = 3
150.36
Core i5 4670
SE +/- 0.25, N = 3
186.96
Core i3 8100
SE +/- 0.52, N = 3
179.65
Core i3 7100
SE +/- 0.19, N = 3
145.82
Core i3 4130
SE +/- 0.19, N = 3
116.97
Athlon 3000G
SE +/- 0.42, N = 3
151.32
Athlon 200GE
SE +/- 0.41, N = 3
138.21
A10-7850K
SE +/- 0.09, N = 3
96.76
40
80
120
160
200
1. chrome 79.0.3945.88

Low-End EOY2019 Ubuntu Linux CPU Comparison

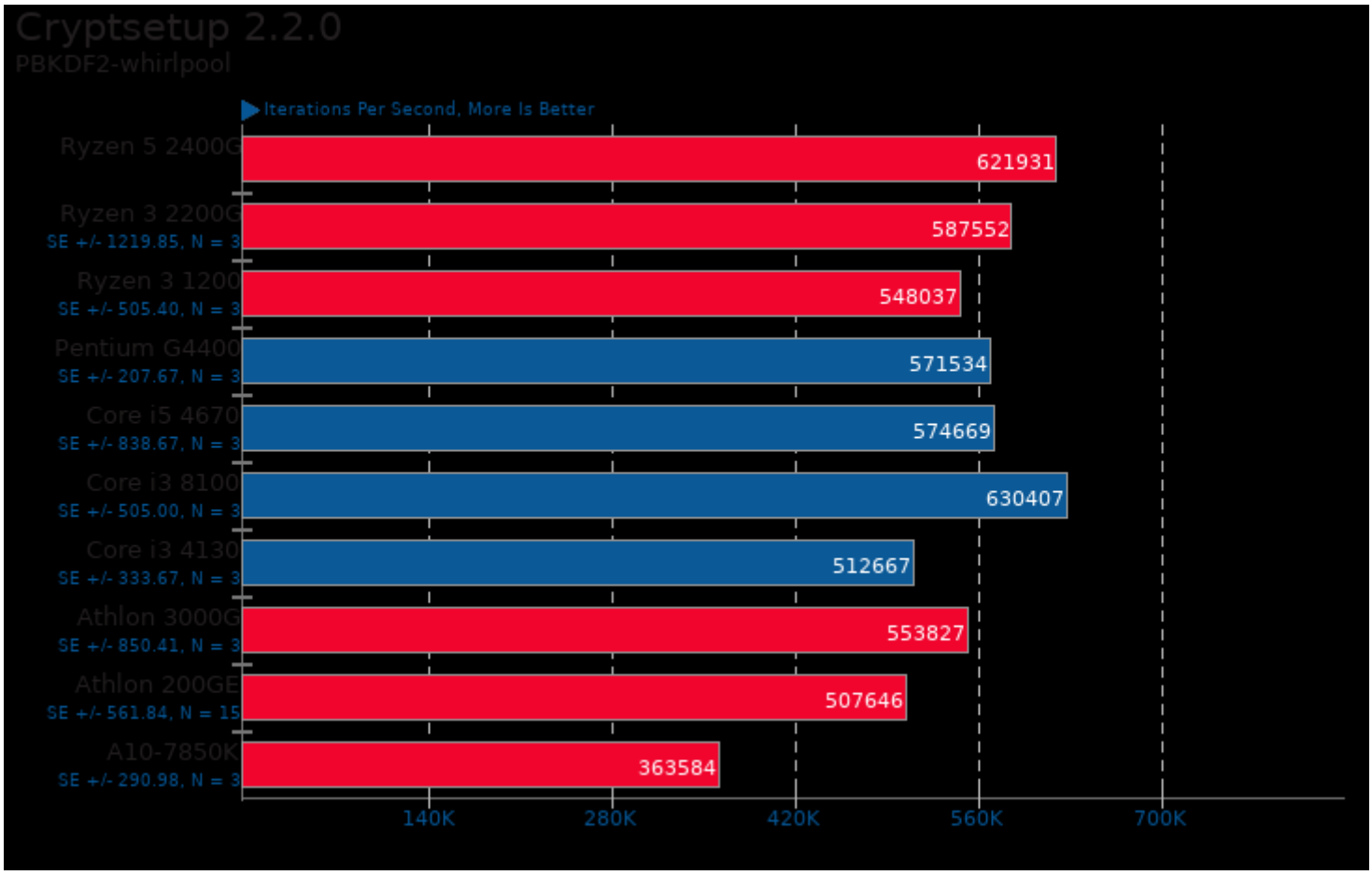



Selenium
Benchmark: Speedometer - Browser: Google Chrome
Runs Per Minute, More Is Better
Ryzen 5 2400G
SE +/- 0.24, N = 3
87.88
Ryzen 3 2200G
SE +/- 0.30, N = 3
87.77
Ryzen 3 1200
SE +/- 0.16, N = 3
78.39
Pentium G4400
SE +/- 0.32, N = 3
81.80
Core i5 4670
SE +/- 0.88, N = 3
97.93
Core i3 8100
101.00
Core i3 7100
SE +/- 0.30, N = 3
80.00
Core i3 4130
SE +/- 0.15, N = 3
53.92
Athlon 3000G
SE +/- 0.25, N = 3
75.80
Athlon 200GE
SE +/- 0.15, N = 3
69.87
A10-7850K
SE +/- 0.07, N = 3
55.00
20
40
60
80
100
1. chrome 79.0.3945.88

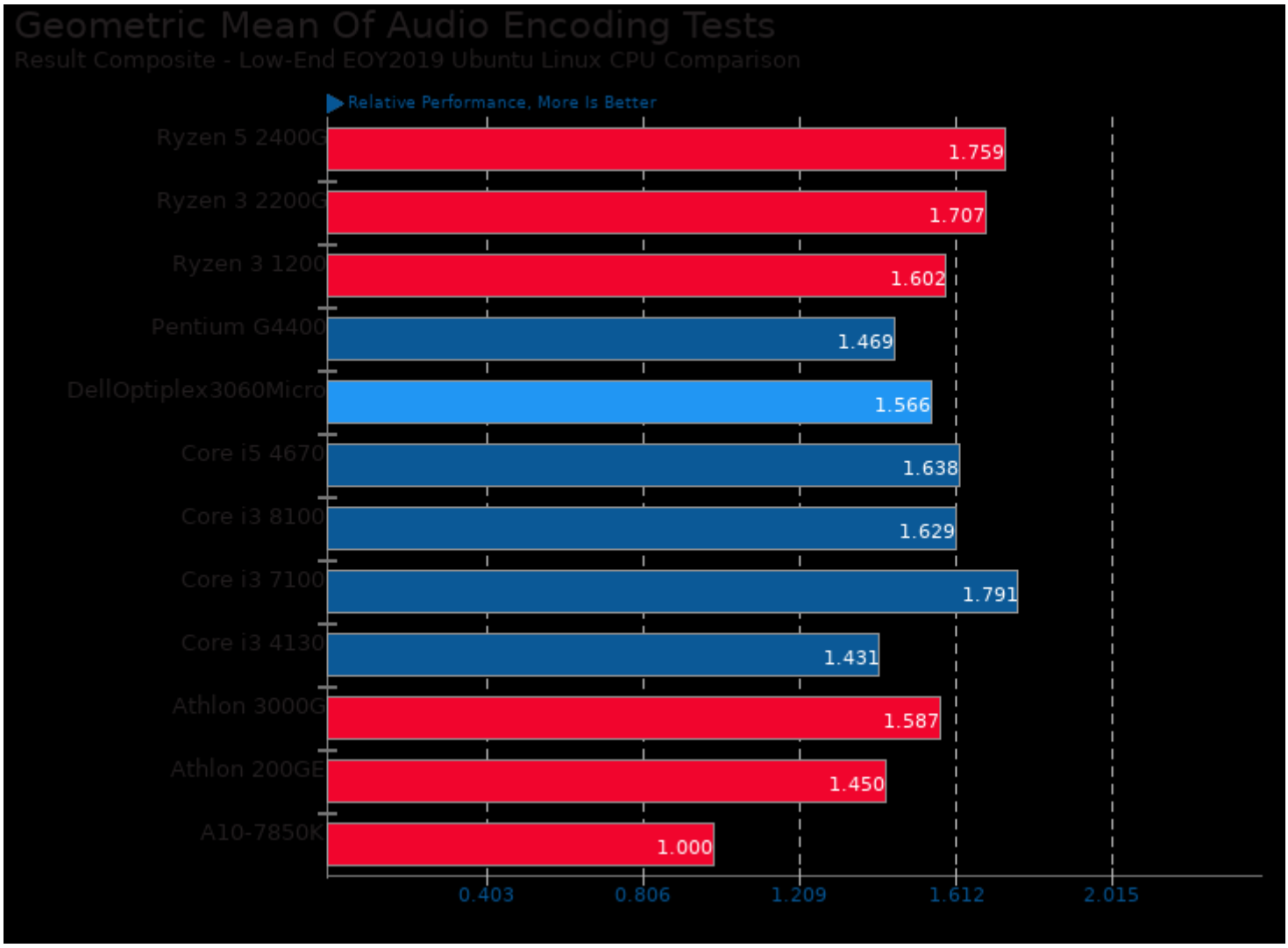

Selenium
Benchmark: PSPDFKit WASM - Browser: Google Chrome
Score, Fewer Is Better
Ryzen 5 2400G
SE +/- 17.15, N = 3
2274
Ryzen 3 2200G
SE +/- 6.12, N = 3
2190
Ryzen 3 1200
SE +/- 10.27, N = 3
2450
Pentium G4400
SE +/- 46.74, N = 4
3176
Core i5 4670
SE +/- 11.17, N = 3
2186
Core i3 8100
SE +/- 12.57, N = 3
2124
Core i3 7100
SE +/- 10.93, N = 3
3040
Athlon 3000G
SE +/- 21.42, N = 3
2795
Athlon 200GE
SE +/- 18.01, N = 3
3058
A10-7850K
SE +/- 9.56, N = 3
3443
700
1400
2100
2800
3500
1. chrome 79.0.3945.88


Tesseract OCR 4.1.0
Time To OCR 7 Images
Seconds, Fewer Is Better
Ryzen 5 2400G
SE +/- 0.03, N = 3
28.26
Ryzen 3 2200G
SE +/- 0.03, N = 3
29.12
Ryzen 3 1200
SE +/- 0.06, N = 3
34.80
Pentium G4400
SE +/- 0.03, N = 3
58.05
Core i5 4670
SE +/- 0.01, N = 3
28.00
Core i3 8100
SE +/- 0.06, N = 3
28.34
Core i3 7100
SE +/- 0.04, N = 3
28.54
Core i3 4130
SE +/- 0.06, N = 3
38.13
Athlon 3000G
SE +/- 0.04, N = 3
32.62
Athlon 200GE
SE +/- 0.03, N = 3
35.33
A10-7850K
SE +/- 0.06, N = 3
46.93
13
26
39
52
65

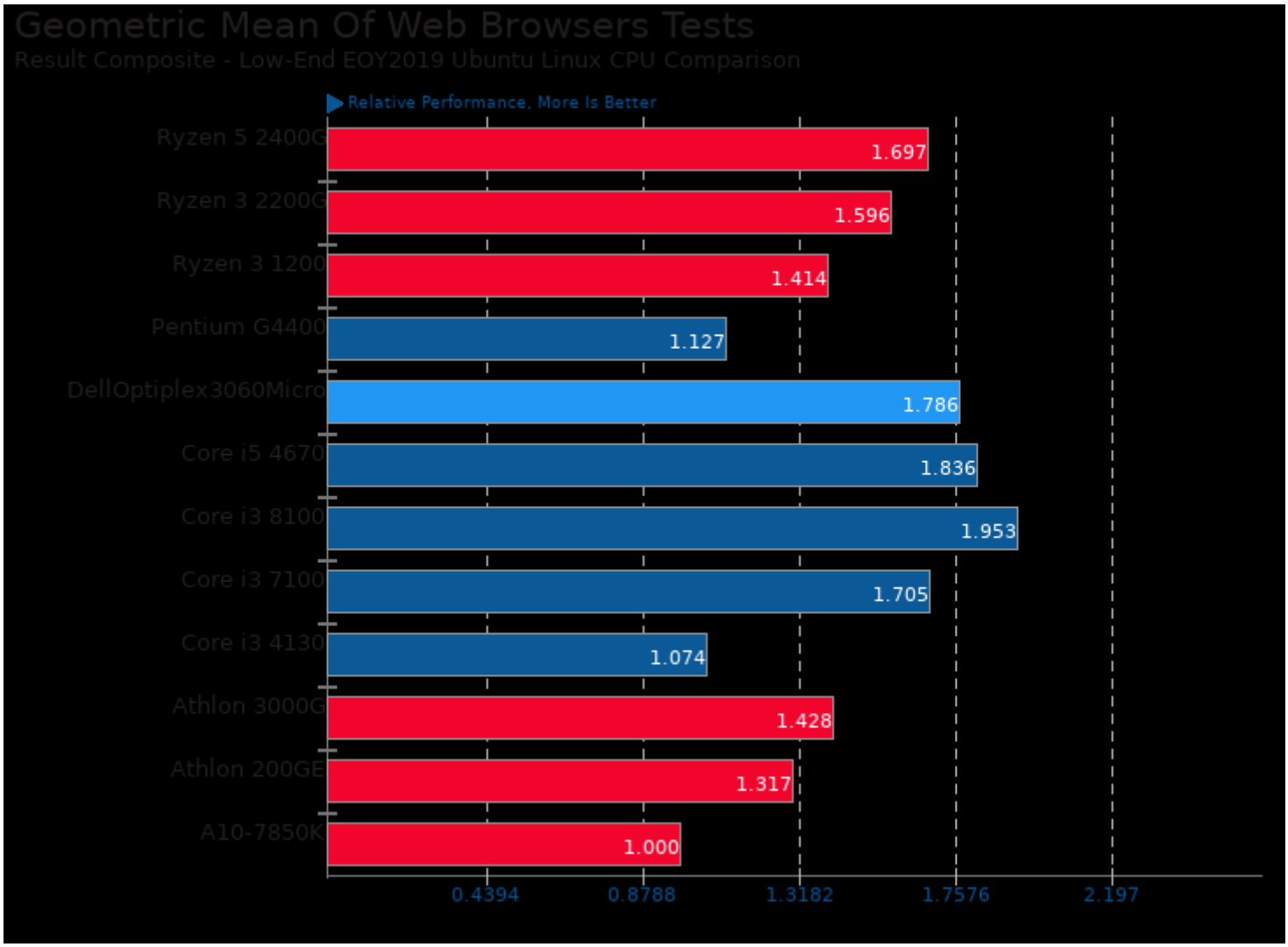
Low-End EOY2019 Ubuntu Linux CPU Comparison



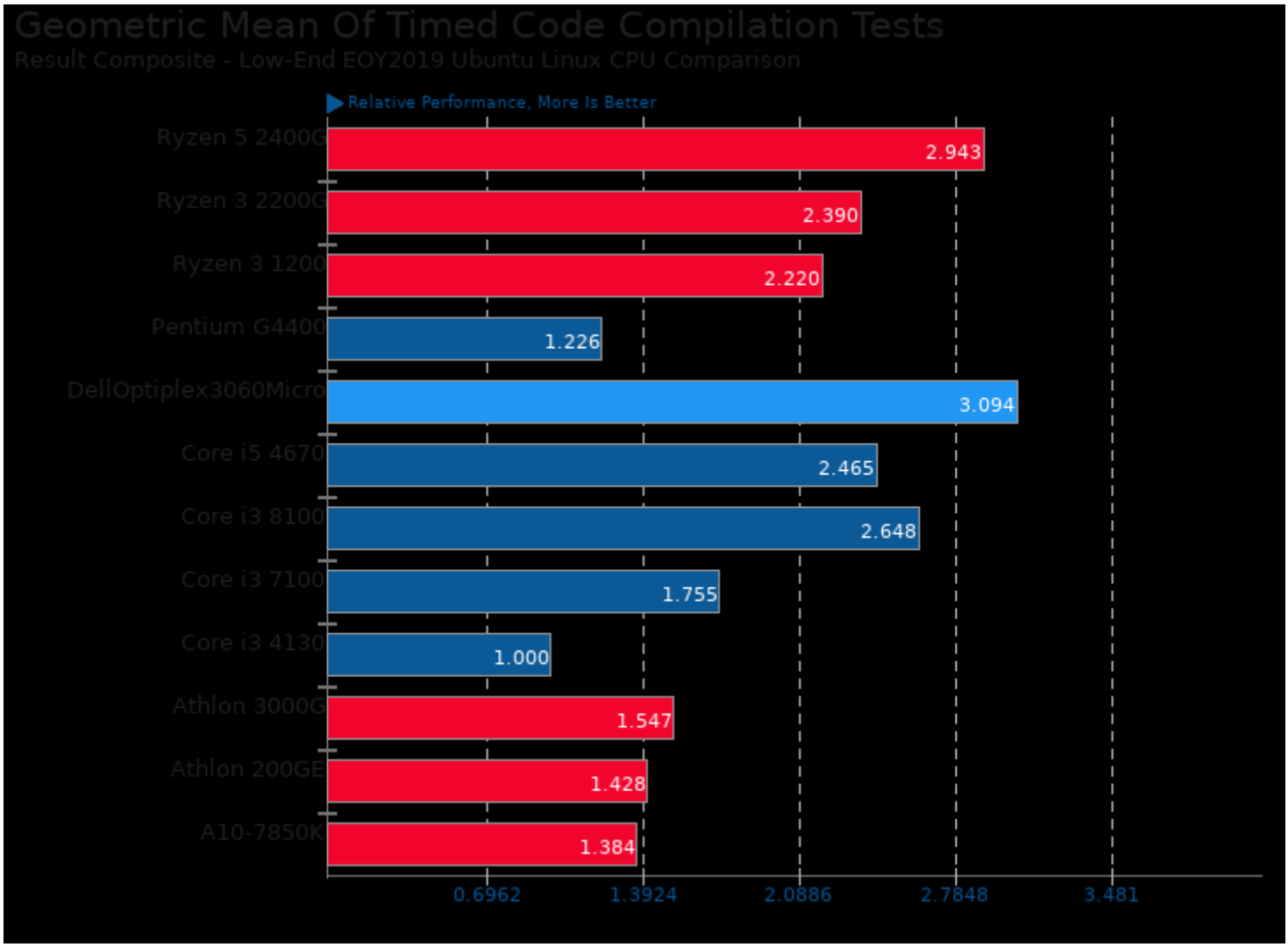
These geometric means are based upon test groupings / test suites for this result file.



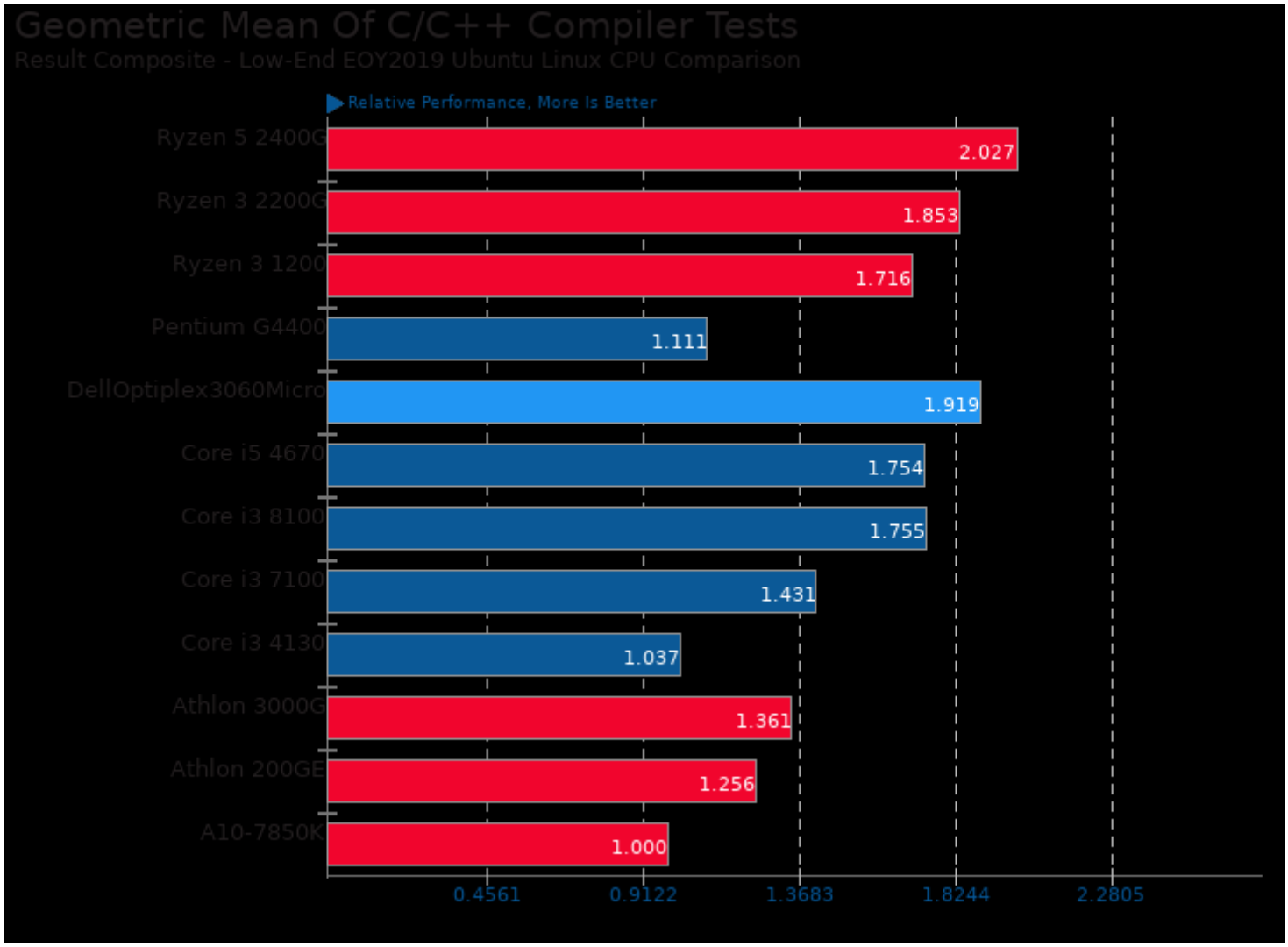
Geometric mean based upon tests: pts/encode-mp3 and pts/encode-flac



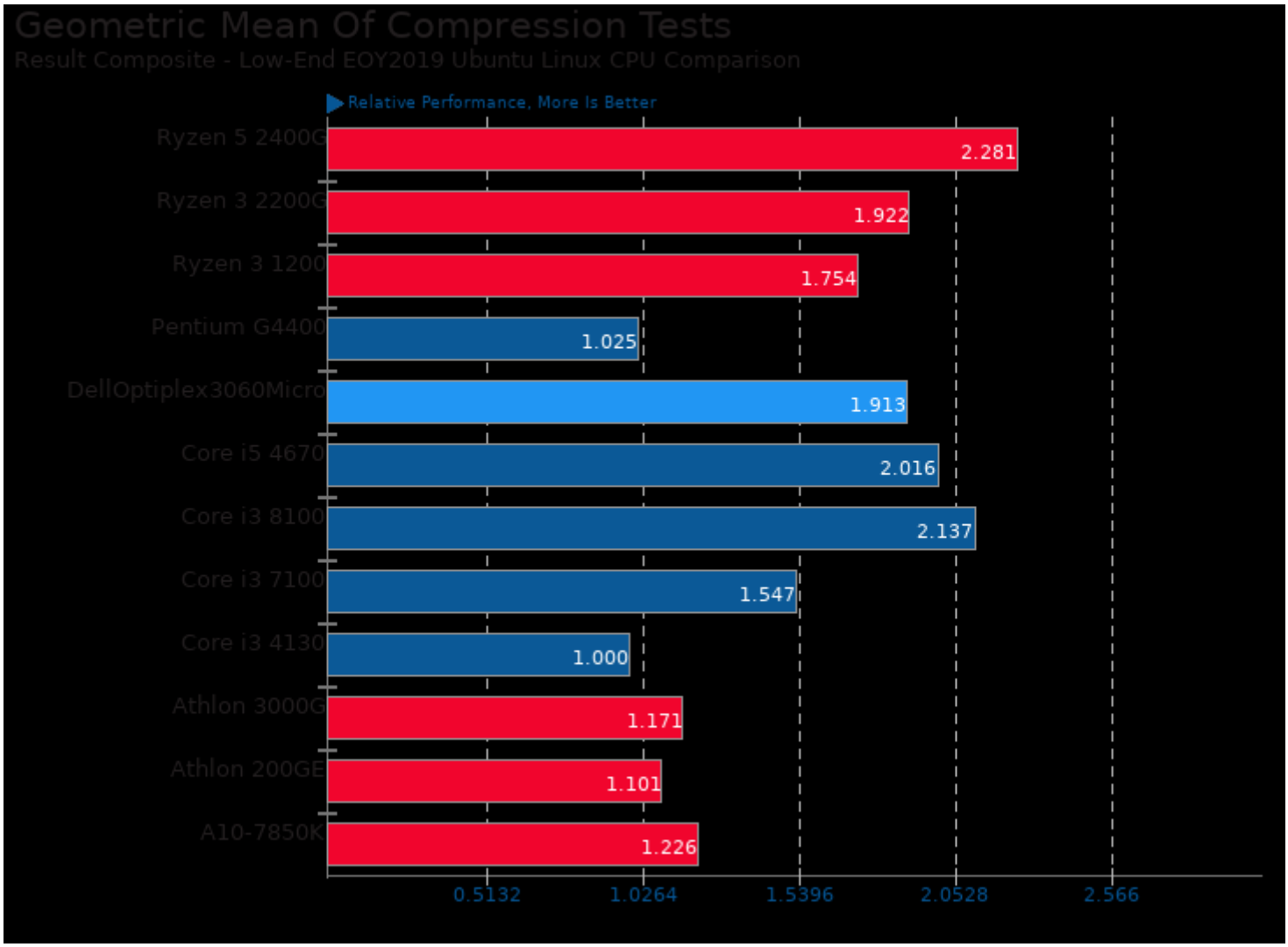
Geometric mean based upon tests: system/selenium



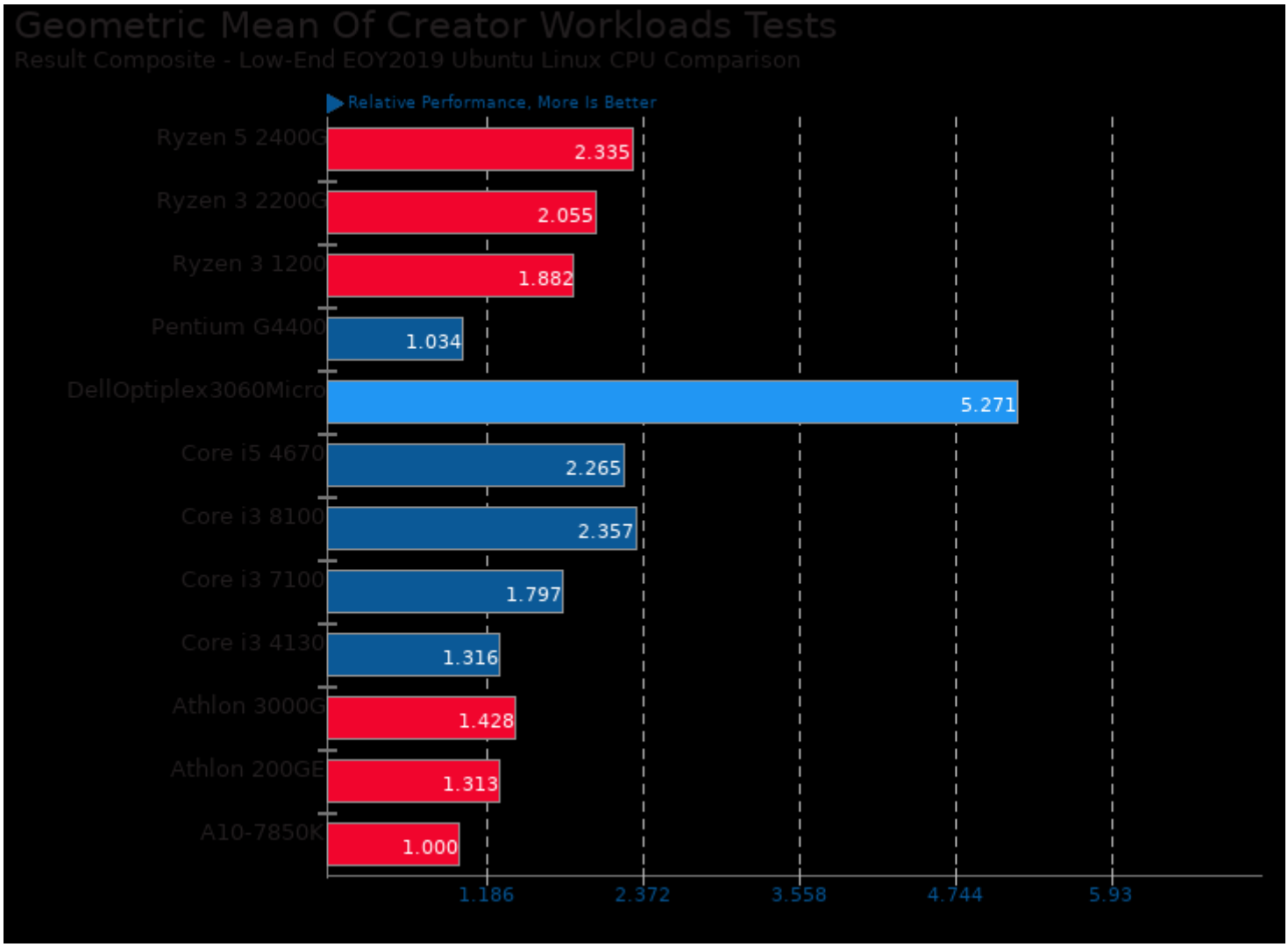
Geometric mean based upon tests: pts/build-linux-kernel and pts/build2



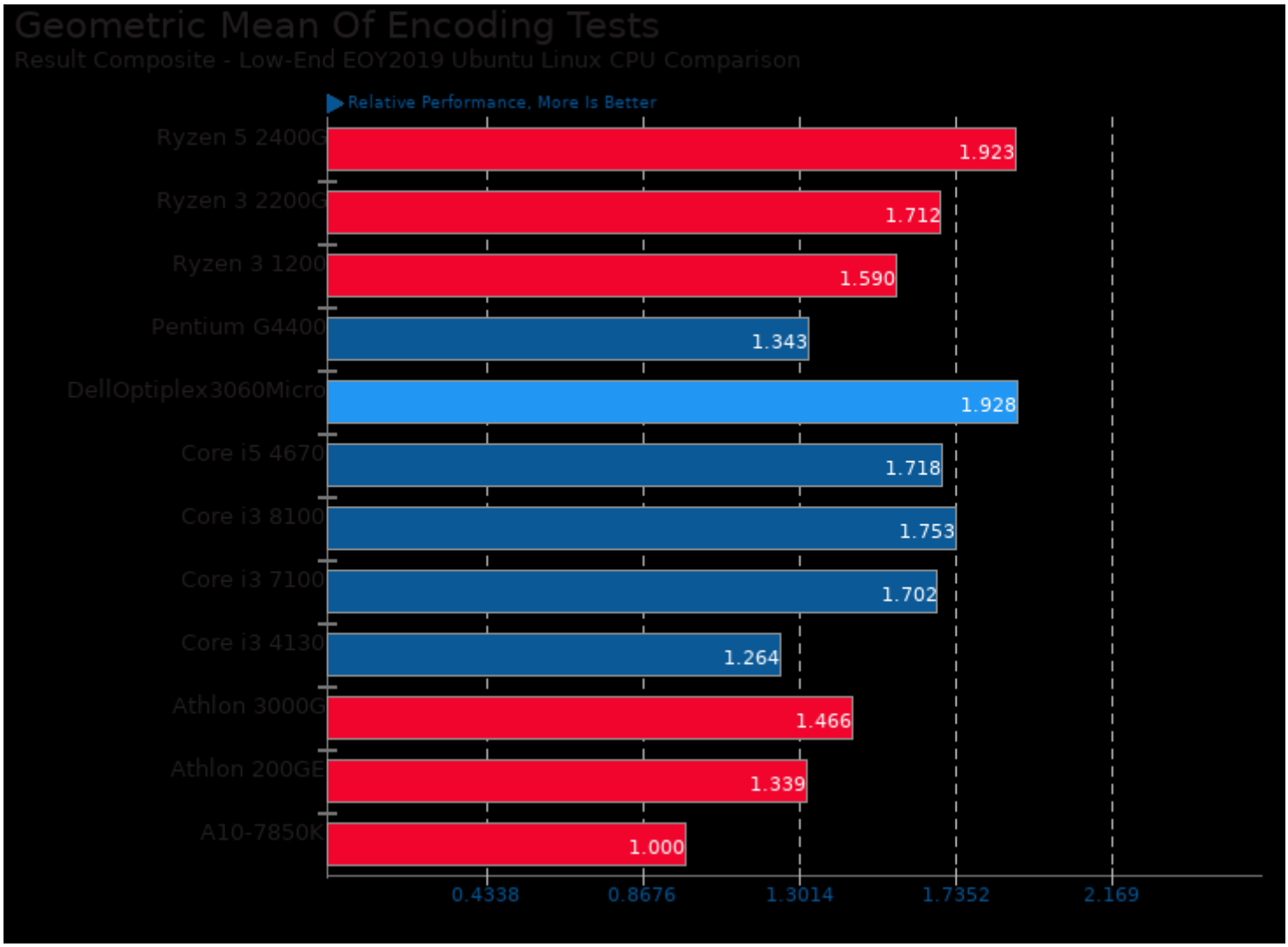
Geometric mean based upon tests: pts/graphics-magick, pts/himeno, pts/compress-7zip, pts/encode-mp3, pts/encode-flac, pts/sqlite-speedtest, pts/dav1d, pts/x264, pts/compress-zstd and pts/svt-vp9



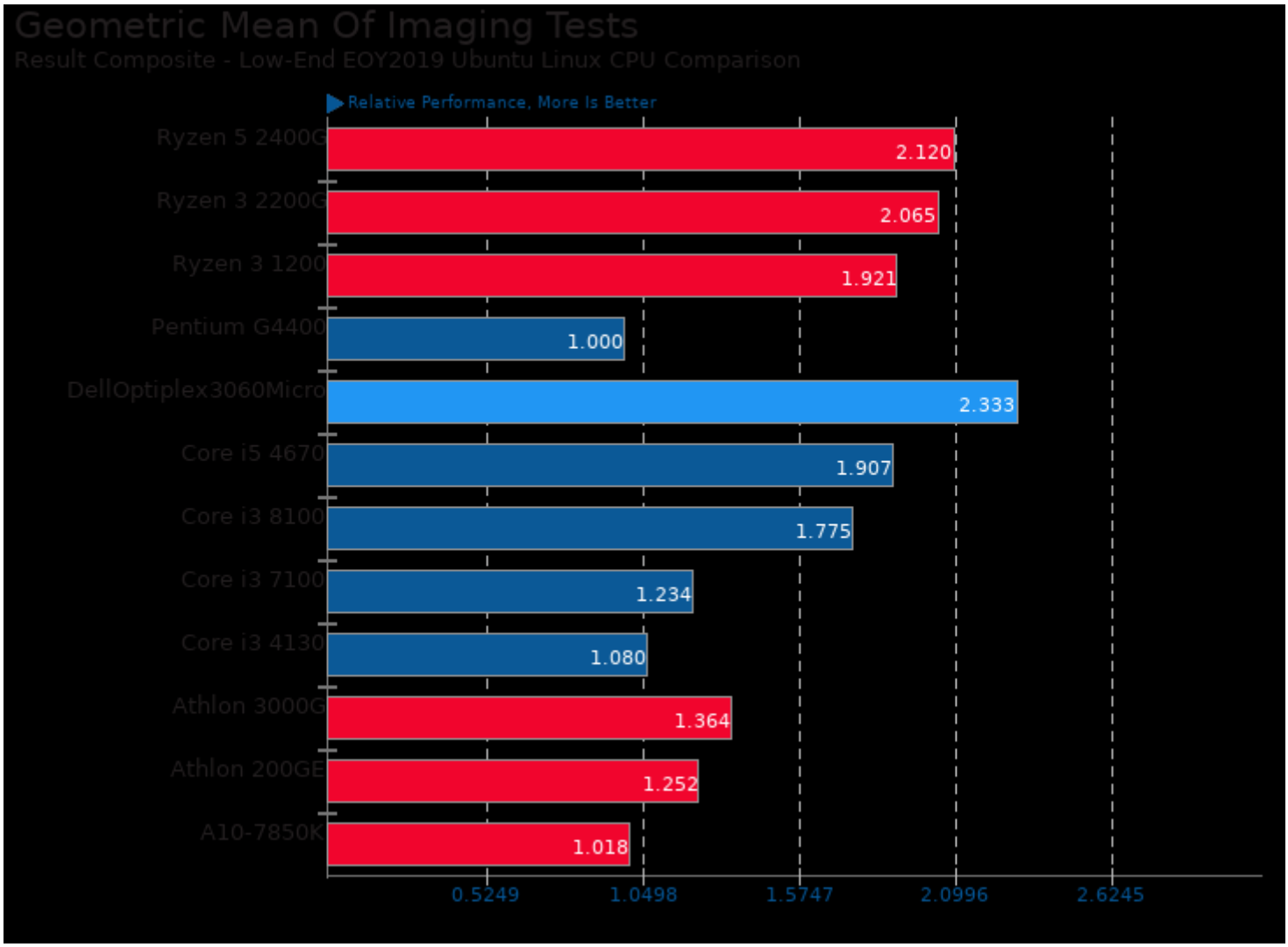
Geometric mean based upon tests: pts/compress-7zip and pts/compress-zstd



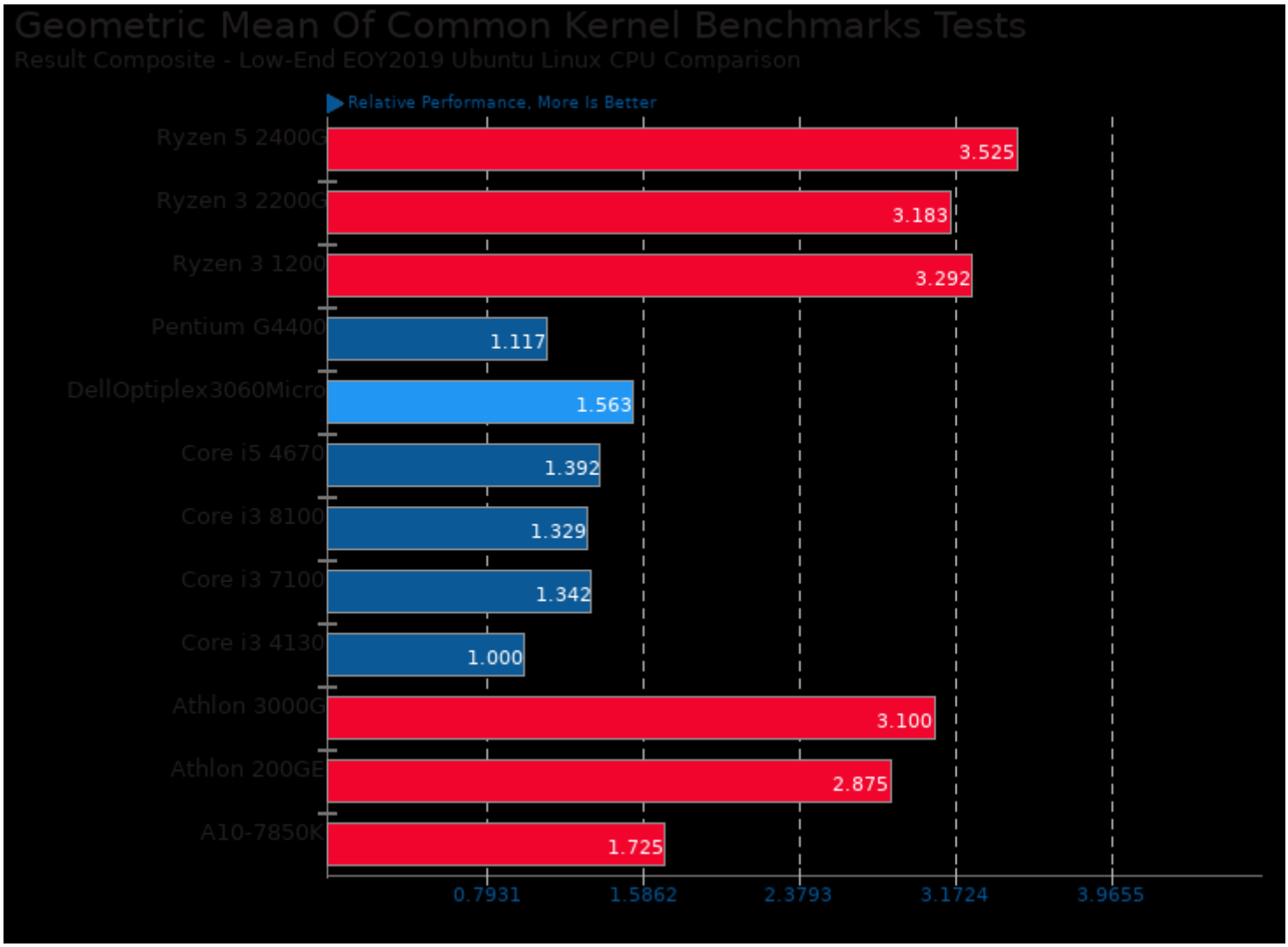
Geometric mean based upon tests: pts/ospray, pts/radiance, system/tesseract-ocr, pts/svt-vp9, pts/x264, pts/dav1d, pts/encode-mp3, pts/encode-flac, pts/graphics-magick, pts/tjbench, system/gimp, system/darktable, pts/embree, pts/oidn, pts/neatbench and pts/deepspeech



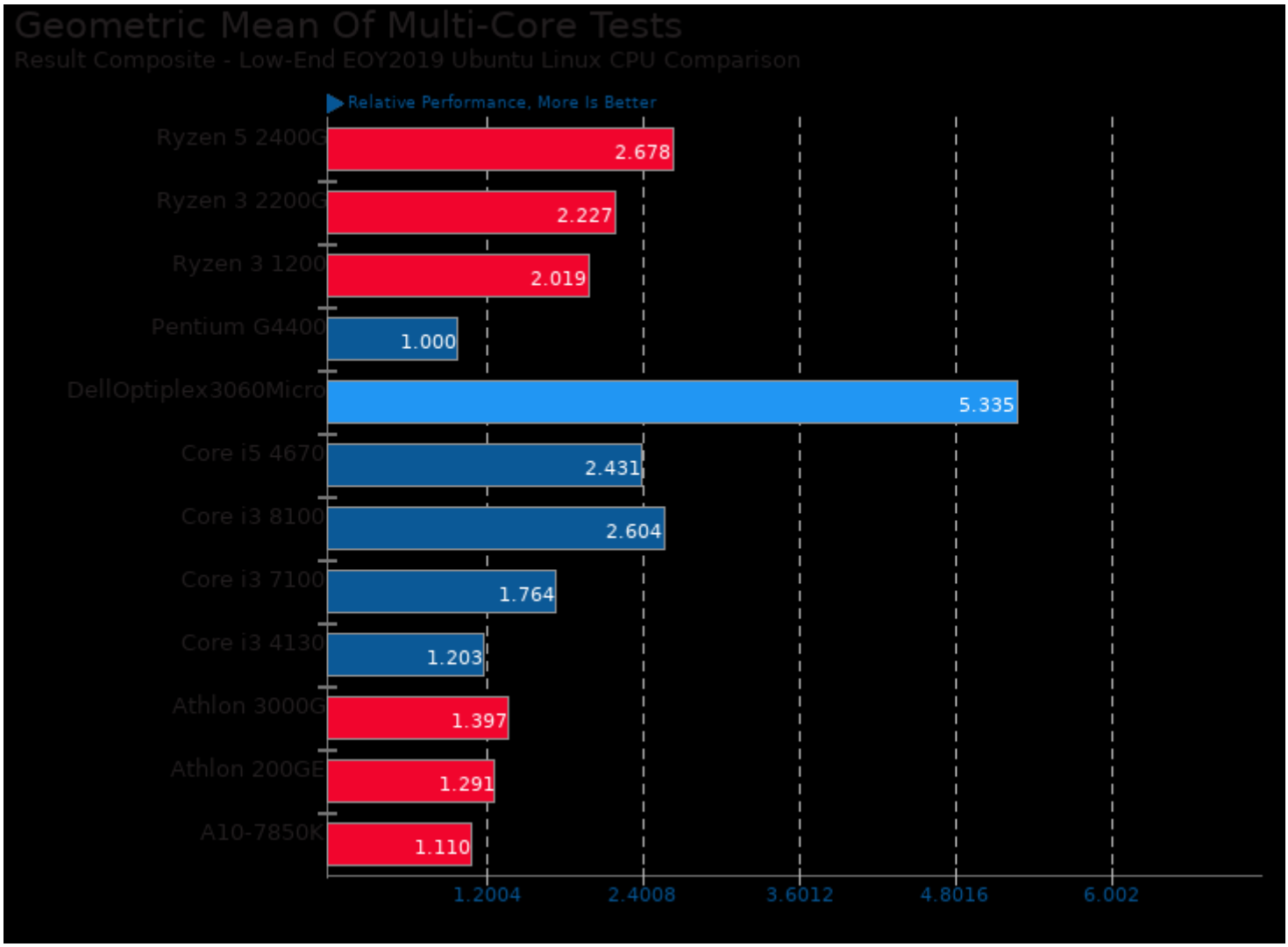
Geometric mean based upon tests: pts/encode-mp3, pts/encode-flac, pts/svt-vp9, pts/x264 and pts/dav1d



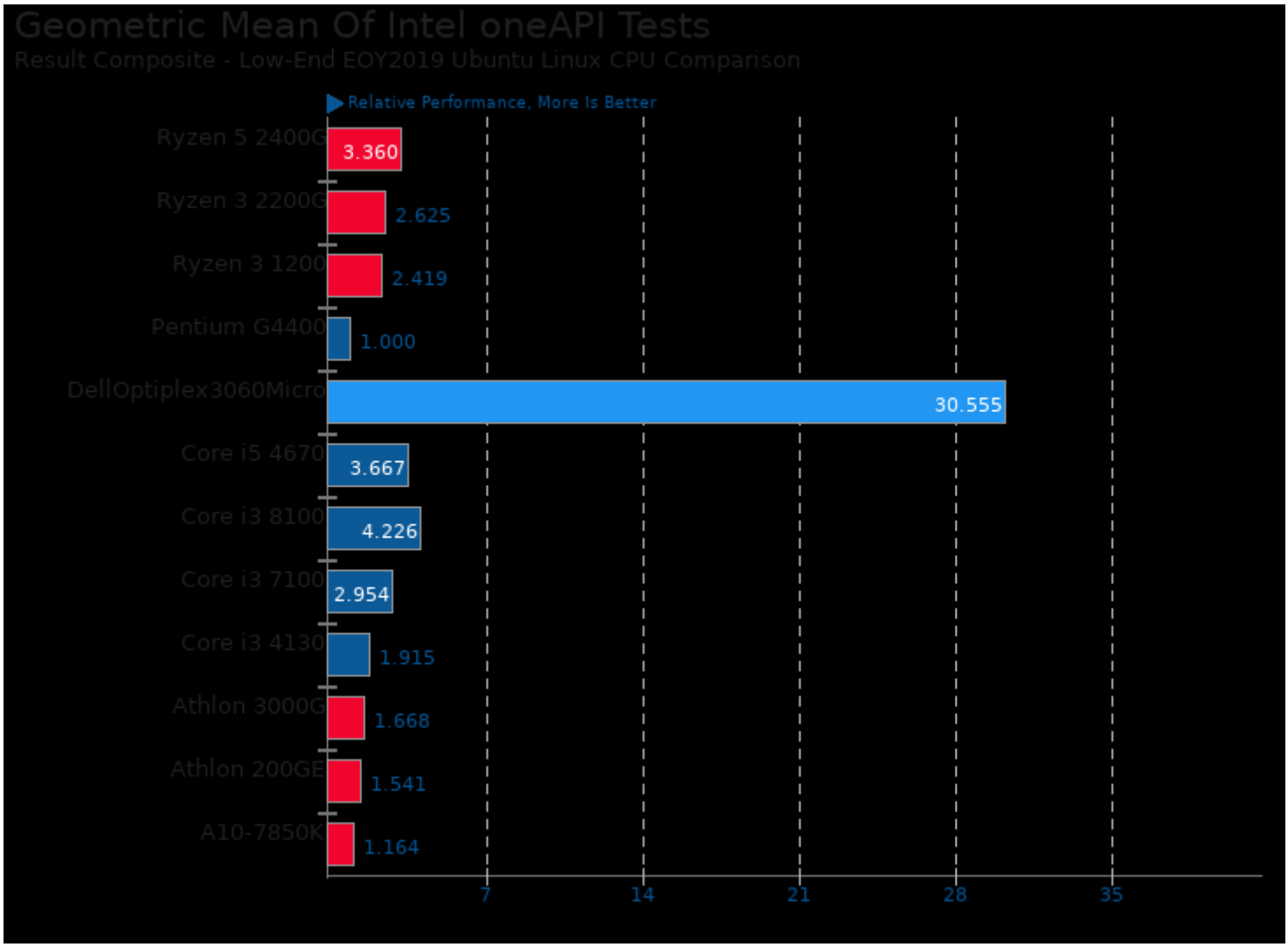
Geometric mean based upon tests: pts/graphics-magick, pts/tjbench, system/gimp and system/darktable



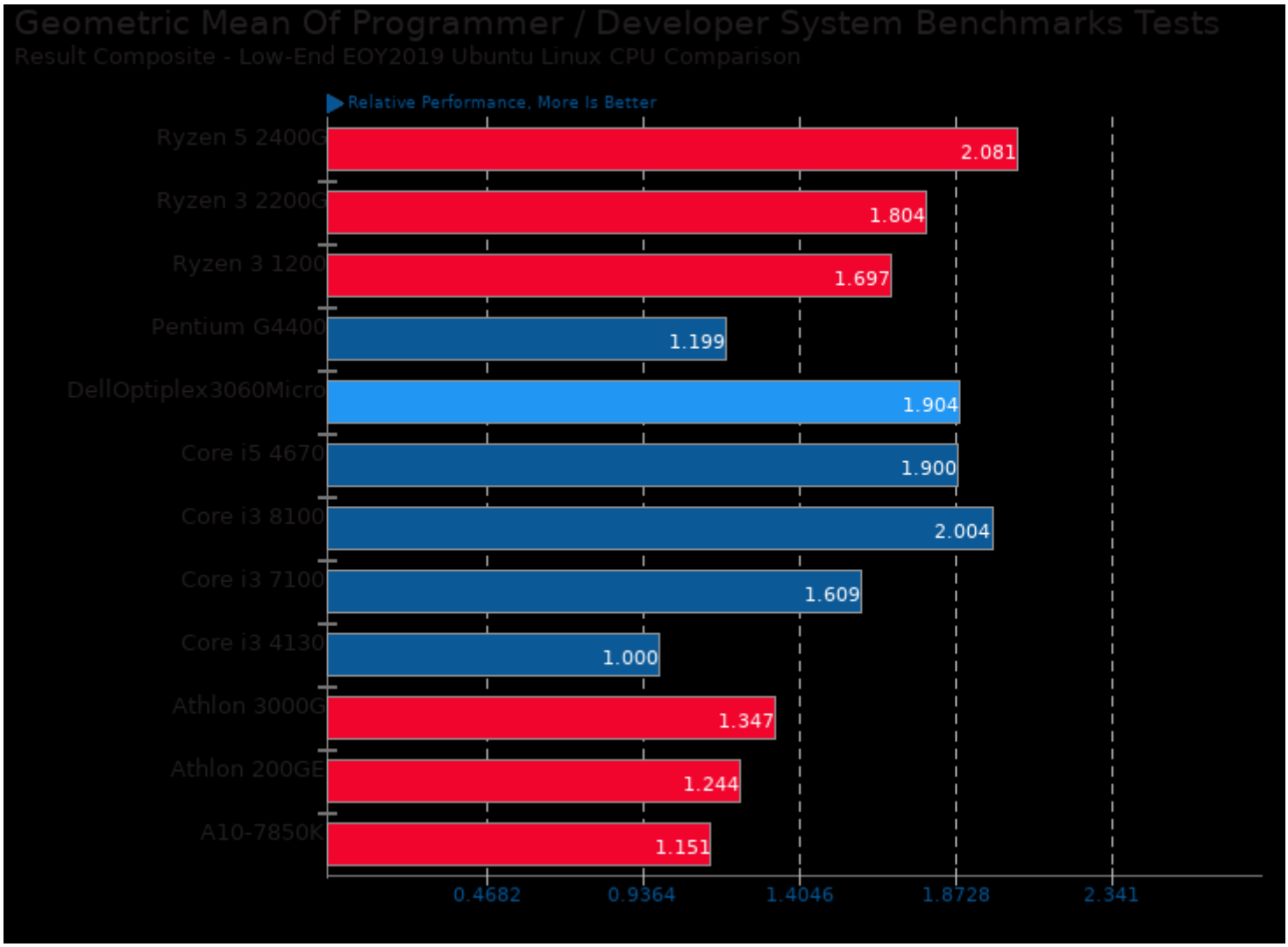
Geometric mean based upon tests: pts/sqlite-speedtest and pts/ctx-clock



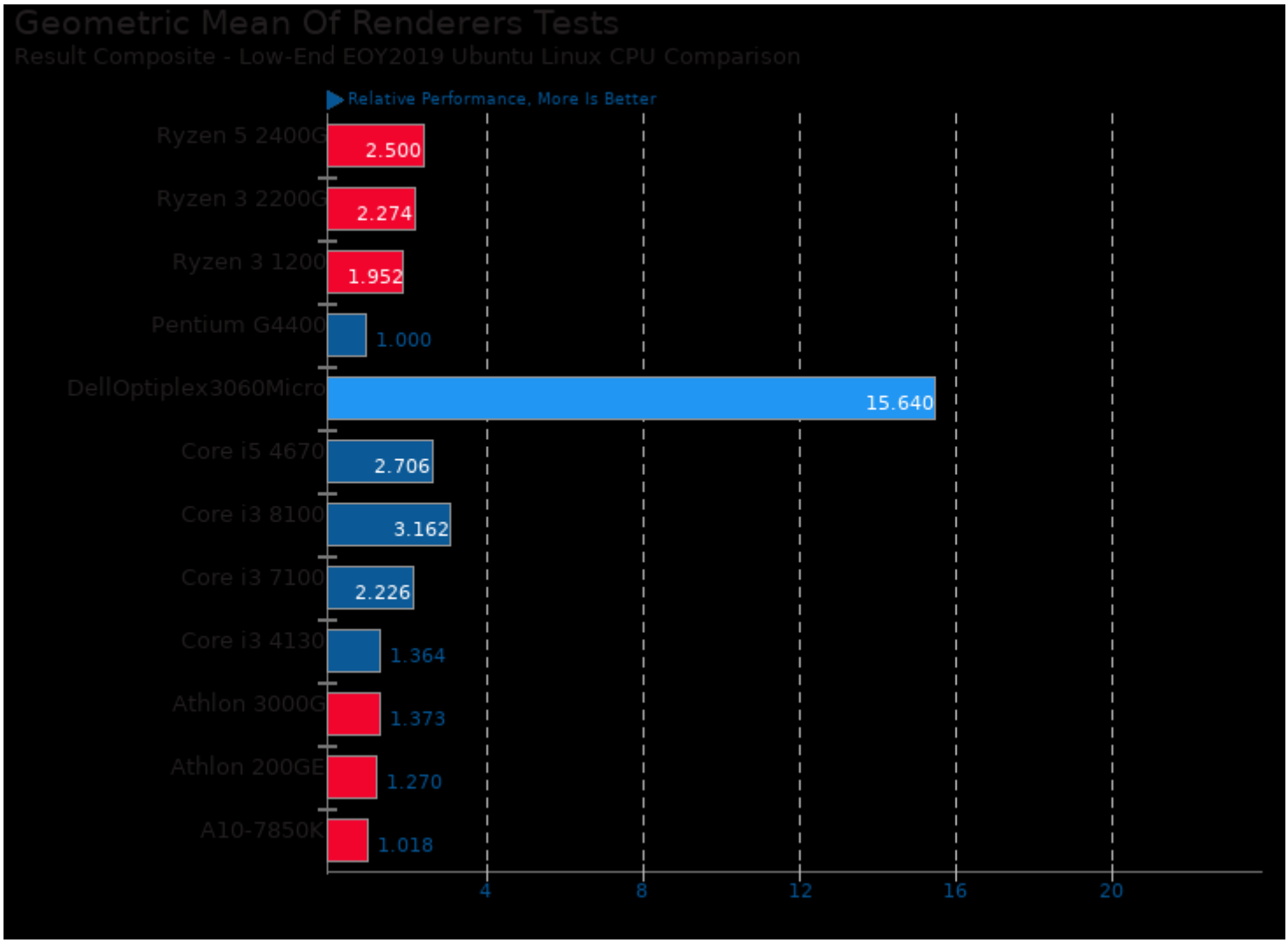
Geometric mean based upon tests: pts/ospray, pts/coremark, pts/svt-vp9, pts/x264, pts/dav1d, pts/graphics-magick, pts/compress-7zip, pts/compress-zstd, pts/build-linux-kernel, pts/build2, pts/radiance, pts/embree, pts/oidn and pts/neatbench



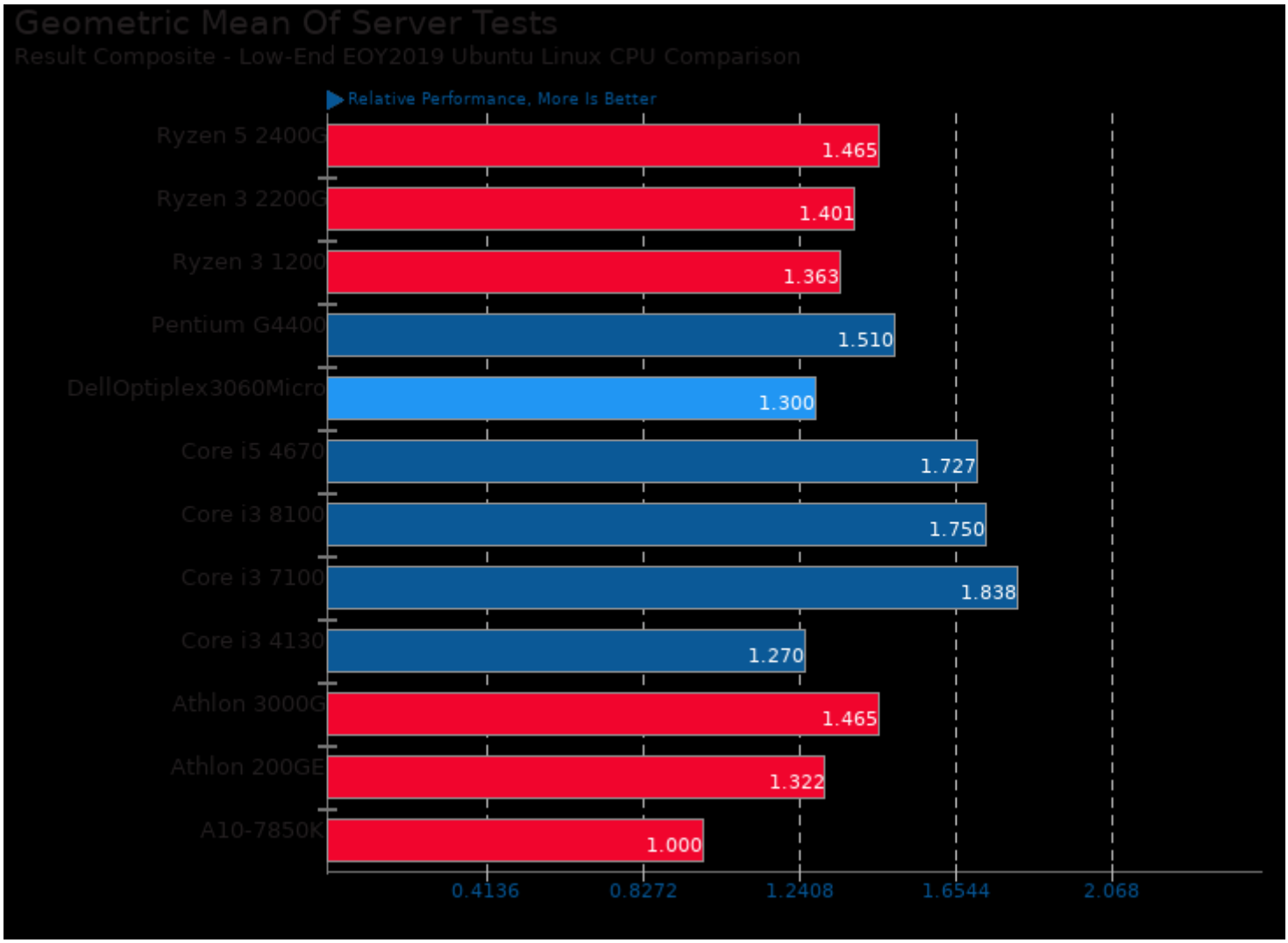
Geometric mean based upon tests: pts/embree, pts/oidn and pts/ospray



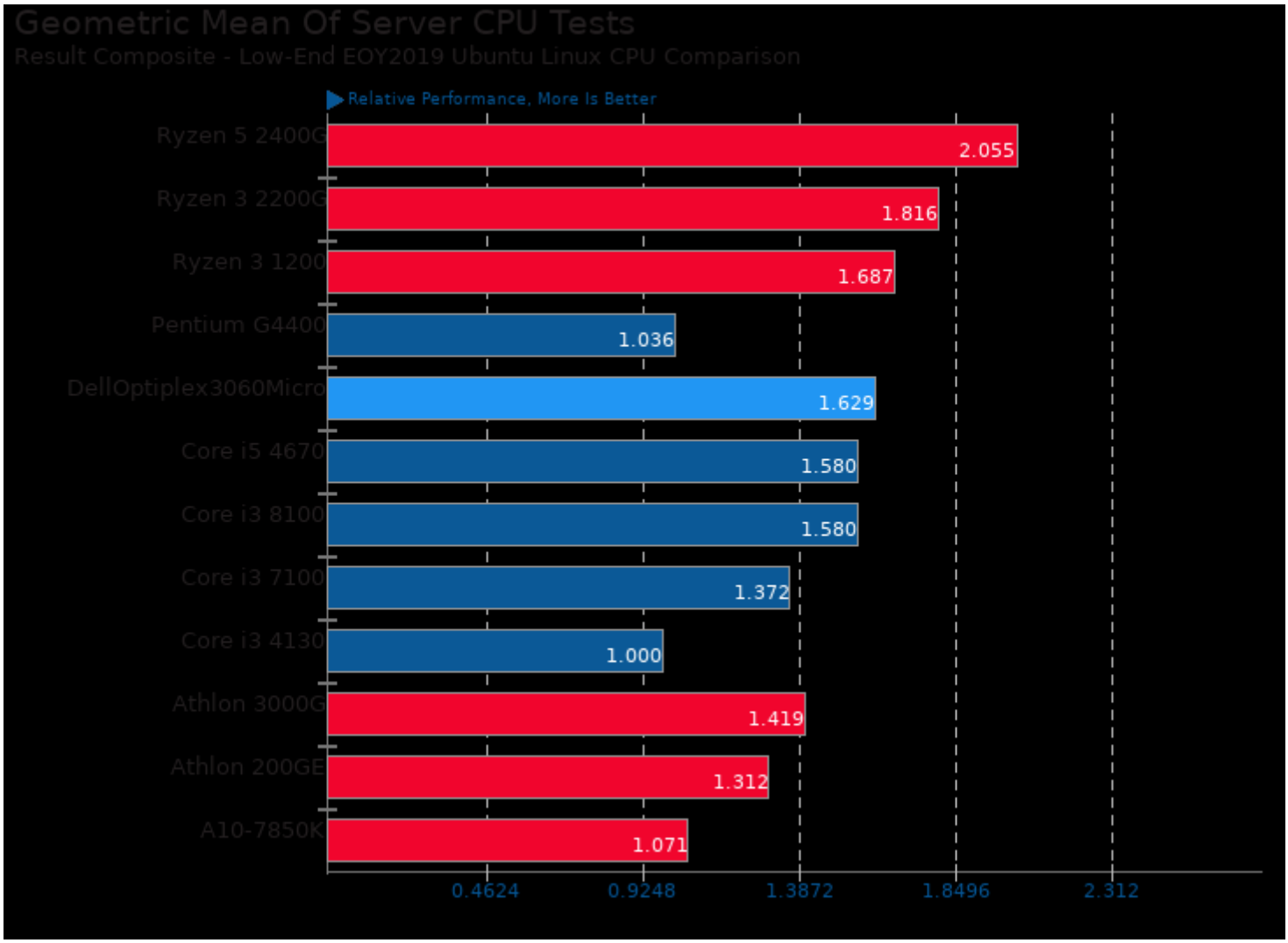
Geometric mean based upon tests: pts/sqlite-speedtest, pts/compress-zstd, pts/pybench, system/cryptsetup, pts/build-linux-kernel and pts/build2



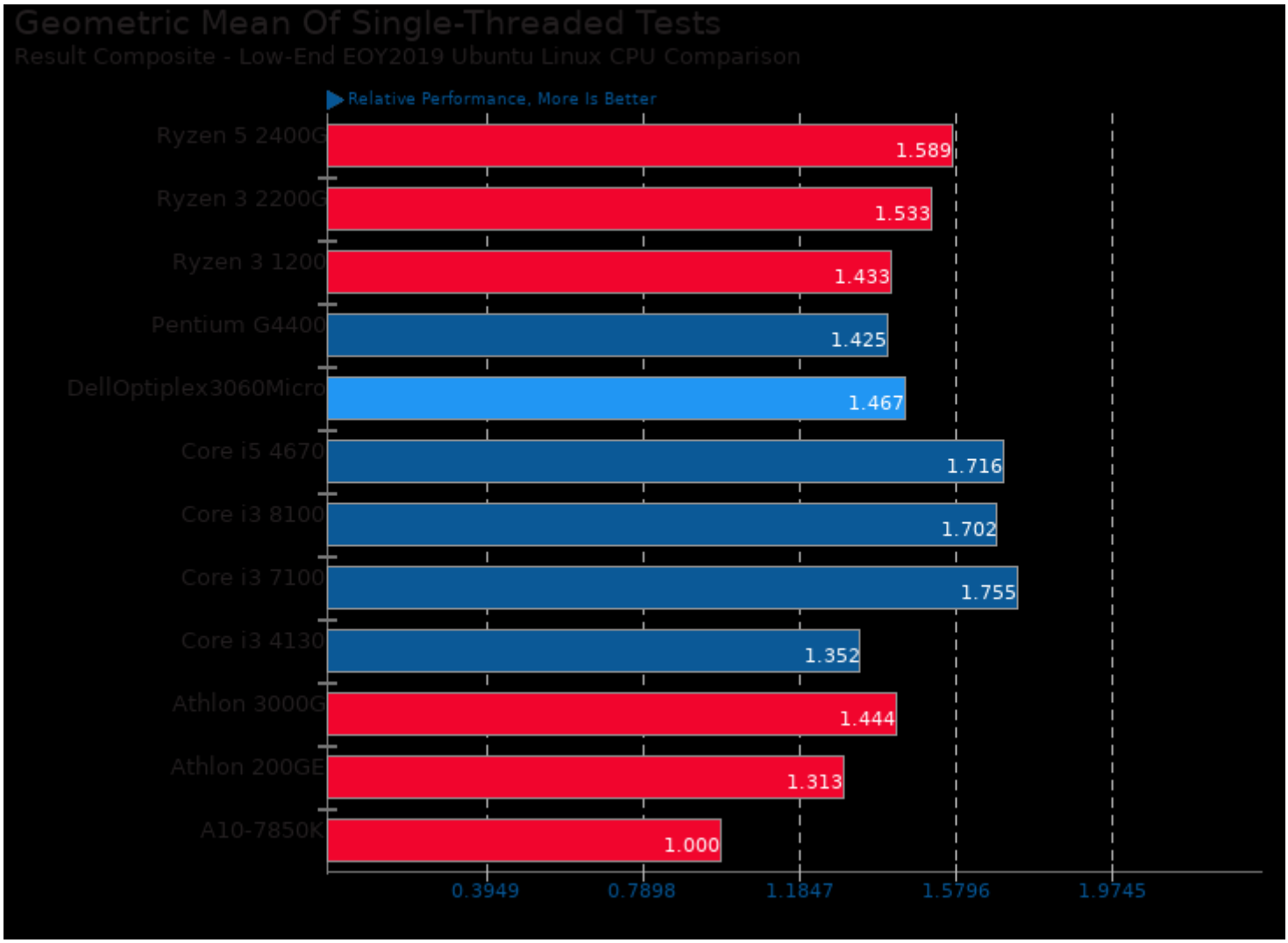
Geometric mean based upon tests: pts/ospray and pts/radiance



Geometric mean based upon tests: pts/phpbench, pts/perl-benchmark and pts/sqlite-speedtest



Geometric mean based upon tests: pts/svt-vp9, pts/x264, pts/dav1d, pts/himeno, pts/compress-7zip, pts/build-linux-kernel, pts/compress-zstd, pts/radiance, pts/tjbench, system/gimp, pts/ctx-clock, pts/pybench, pts/phpbench and system/tesseract-ocr



Geometric mean based upon tests: pts/java-scimark2, pts/deepspeech, pts/encode-flac, pts/encode-mp3, pts/perl-benchmark, pts/radiance, pts/rbenchmark, pts/sudokut, pts/tjbench, pts/pybench, pts/phpbench and system/tesseract-ocr

This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 29 March 2024 03:25.