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# HoneyComb LX2K vs x86_64 CPUs in multithreaded workloads

ARM64 16-Core at 2GHz vs x86_64 8-16 Threaads 3-4.7GHz

**Automated Executive Summary**

*Core i7 8700K had the most wins, coming in first place for 53% of the tests.*

*Based on the geometric mean of all complete results, the fastest (Core i7 8700K) was 1.891x the speed of the slowest (Core i7 4770K). Ryzen 7 1800X was 0.989x the speed of Core i7 8700K, Ryzen 7 1700 was 0.874x the speed of Ryzen 7 1800X, Core i7 5960X was 0.987x the speed of Ryzen 7 1700, Core i7 7740X was 0.84x the speed of Core i7 5960X, HoneyComb LX2K was 0.819x the speed of Core i7 7740X, Xeon Silver 4108 was 0.982x the speed of HoneyComb LX2K, Ryzen 5 2400G was 0.944x the speed of Xeon Silver 4108, Core i7 4770K was 0.972x the speed of Ryzen 5 2400G.*

## Test Systems:

### Core i7 4770K

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

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

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

## Core i7 5960X

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

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

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

## Core i7 7740X

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

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

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

## Core i7 8700K

Processor: Intel Core i7-8700K @ 4.70GHz (6 Cores / 12 Threads), Motherboard: ASUS PRIME Z370-A (0606 BIOS),

Chipset: Intel Device 3ec2, Memory: 16384MB, Disk: 525GB SABRENT + 525GB Crucial_CT525MX3 + Samsung SSD 950 PRO 256GB, Graphics: MSI AMD Radeon RX 580 8192MB, Audio: Realtek ALC1220, Monitor: DELL P2415Q, Network: Intel Connection

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

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

## HoneyComb LX2K

Processor: ARMv8 Cortex-A72 @ 2.00GHz (16 Cores), Motherboard: SolidRun LX2160A COM type 7 module, Memory: 14336MB, Disk: 250GB Samsung SSD 860 + 8GB SL08G + 63GB DF4064

OS: Fedora 30, Kernel: 4.19.46-00003-g1107c2ef8370-dirty (aarch64), Compiler: GCC 9.1.1 20190503 + Clang 8.0.0, File-System: ext4

Compiler Notes: --build=aarch64-redhat-linux --disable-libunwind-exceptions --enable-__cxa_atexit --enable-bootstrap --enable-checking=release --enable-gnu-indirect-function --enable-gnu-unique-object --enable-initfini-array --enable-languages=c,c++,fortran,objc,obj-c++,ada,go,lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --mandir=/usr/share/man --with-gcc-major-version-only --with-isl --with-linker-hash-style=gnu
Processor Notes: Scaling Governor: qoriq_cpufreq performance
Java Notes: OpenJDK Runtime Environment (build 1.8.0_222-b10)
Python Notes: Python 2.7.16 + Python 3.7.4

## 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

## Xeon Silver 4108

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

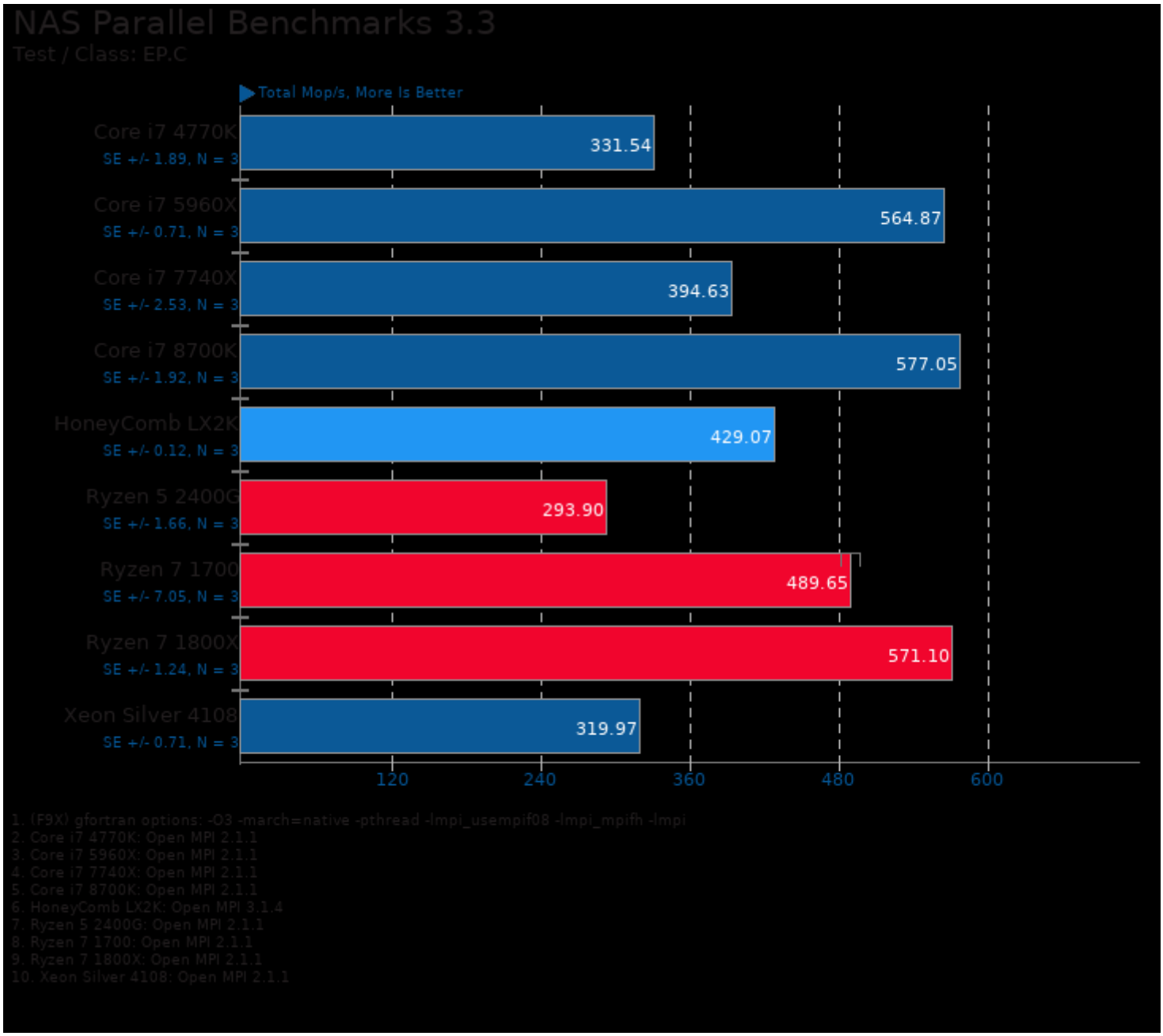
OS: Ubuntu 17.10, Kernel: 4.15.2-041502-generic (x86_64), Desktop: GNOME Shell 3.26.2, Display Driver: modesetting 1.19.5, Compiler: GCC 7.2.0, File-System: ext4, Screen Resolution: 1920x1080

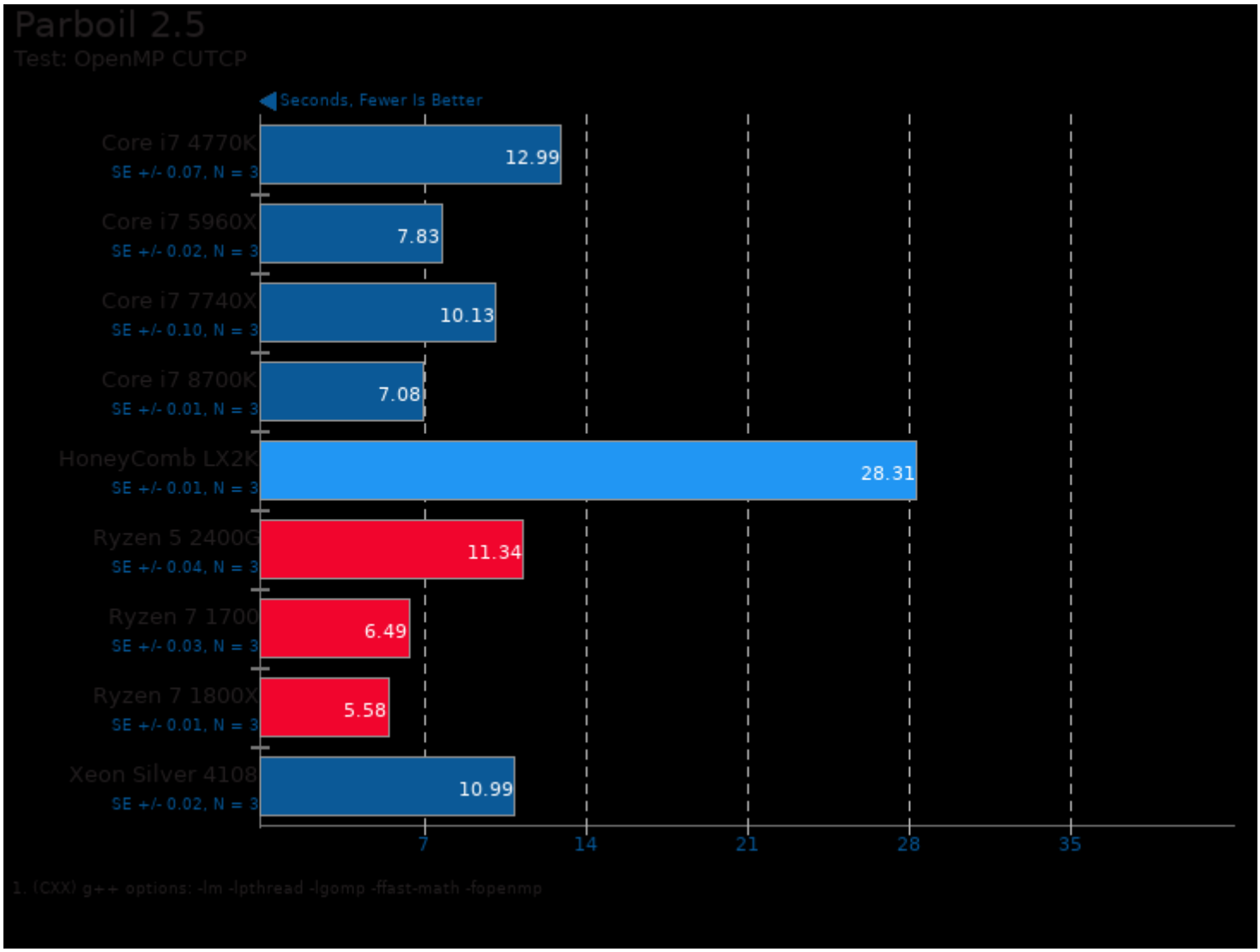
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes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

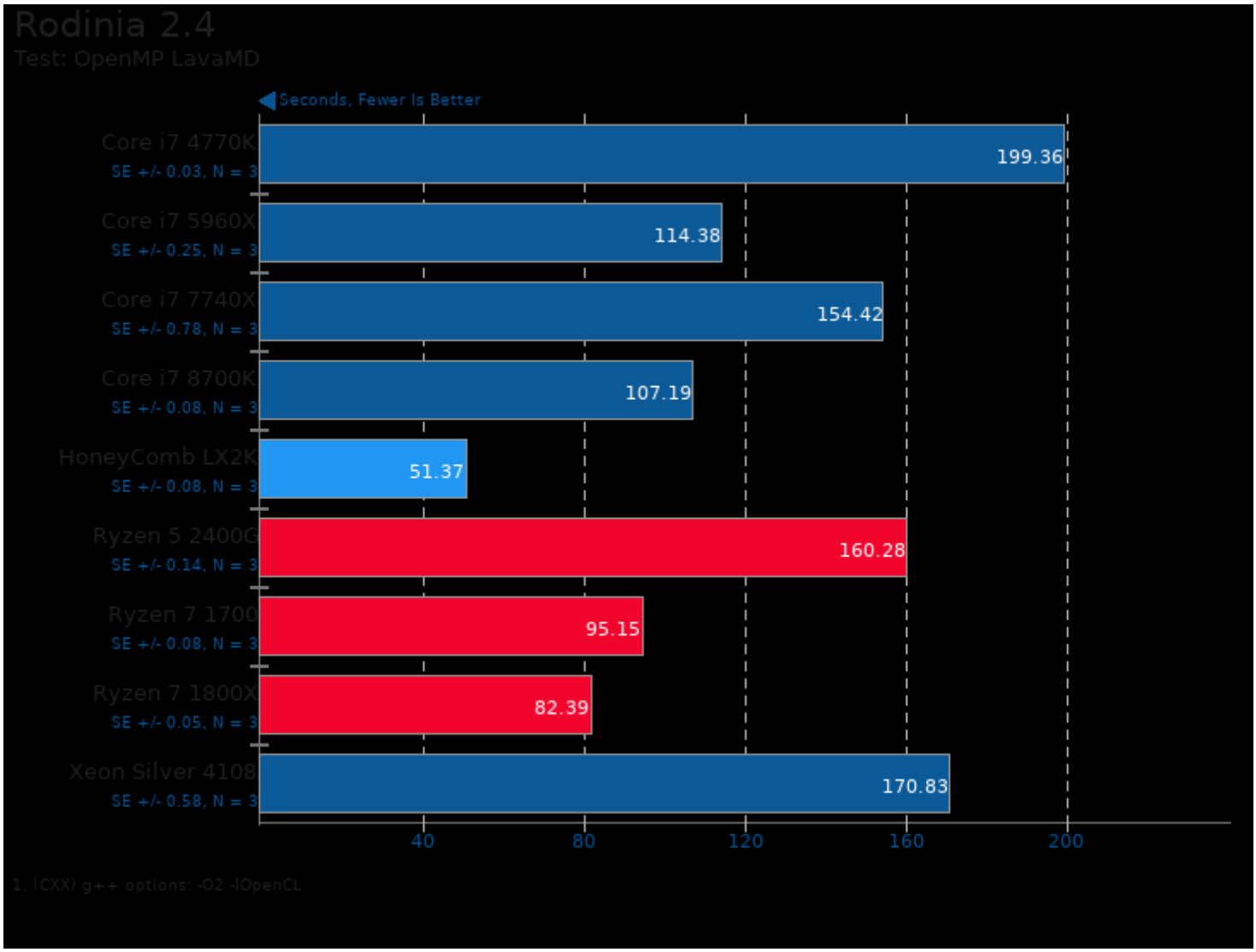
# HoneyComb LX2K vs x86_64 CPUs in multithreaded workloads

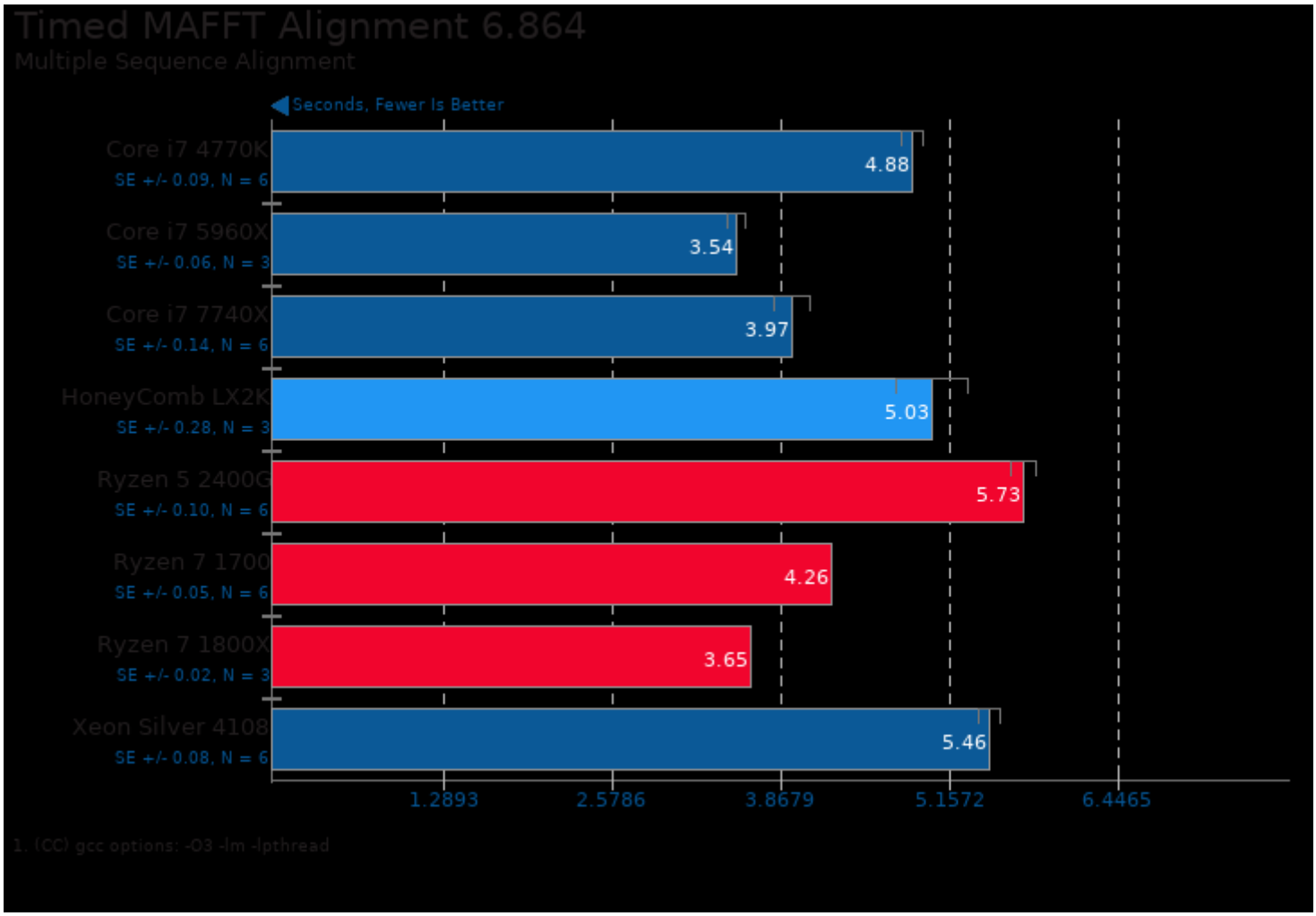
| | Core i7 4770K | Core i7 5960X | Core i7 7740X | Core i7 8700K | HoneyComb LX2K | Ryzen 5 2400G | Ryzen 7 1700 | Ryzen 7 1800X | Xeon Silver 4108 |
|---|---|---|---|---|---|---|---|---|---|
| **NAS Parallel Benchmarks - EP.C (Mop/s)** | 331.54 | 564.87 | 394.63 | **577.05** | 429.07 | **293.90** | 489.65 | 571.10 | 319.97 |
| **Normalized** | 57.45% | 97.89% | 68.39% | 100% | 74.36% | 50.93% | 84.85% | 98.97% | 55.45% |
| **Standard Deviation** | 1% | 0.2% | 1.1% | 0.6% | 0% | 1% | 2.5% | 0.4% | 0.4% |
| **Parboil - OpenMP CUTCP (sec)** | 12.99 | 7.83 | 10.13 | 7.08 | **28.31** | 11.34 | 6.49 | **5.58** | 10.99 |
| **Normalized** | 42.96% | 71.26% | 55.08% | 78.81% | 19.71% | 49.21% | 85.98% | 100% | 50.77% |
| **Standard Deviation** | 1% | 0.3% | 1.7% | 0.3% | 0% | 0.6% | 0.7% | 0.4% | 0.3% |
| **Rodinia - OpenMP LavaMD (sec)** | **199.36** | 114.38 | 154.42 | 107.19 | **51.37** | 160.28 | 95.15 | 82.39 | 170.83 |
| **Normalized** | 25.77% | 44.91% | 33.27% | 47.92% | 100% | 32.05% | 53.99% | 62.35% | 30.07% |
| **Standard Deviation** | 0% | 0.4% | 0.9% | 0.1% | 0.3% | 0.1% | 0.1% | 0.1% | 0.6% |
| **Timed MAFFT Alignment - M.S.A (sec)** | 4.88 | **3.54** | 3.97 | | 5.03 | **5.73** | 4.26 | 3.65 | 5.46 |
| **Normalized** | 72.54% | 100% | 89.17% | | 70.38% | 61.78% | 83.1% | 96.99% | 64.84% |
| **Standard Deviation** | 4.4% | 3.1% | 8.7% | | 9.6% | 4.3% | 3.1% | 0.9% | 3.8% |
| **John The Ripper - Blowfish (Real C/S)** | 6800 | 11710 | 8880 | **12758** | 7310 | **6022** | 10431 | 12445 | 8275 |
| **Normalized** | 53.3% | 91.79% | 69.6% | 100% | 57.3% | 47.2% | 81.76% | 97.55% | 64.86% |
| **Standard Deviation** | 3.2% | 0% | | | 4% | 3.9% | 0.8% | 0.1% | |
| **TTSIOD 3D Renderer - P.R.W.S.S.M (FPS)** | **204.31** | 325.51 | 277.43 | **391.67** | 248.32 | 211.60 | 274.64 | 312.22 | 210.84 |
| **Normalized** | 52.16% | 83.11% | 70.83% | 100% | 63.4% | 54.03% | 70.12% | 79.72% | 53.83% |
| **Standard Deviation** | 1.7% | 0.2% | 1.8% | 0.3% | 0.2% | 1.4% | 0.1% | 0.2% | 0.4% |
| **x264 - H.2.V.E (FPS)** | 37.64 | 58.01 | 49.95 | **72.96** | **30.92** | 34.75 | 60.90 | 71.46 | 32.75 |
| **Normalized** | 51.59% | 79.51% | 68.46% | 100% | 42.38% | 47.63% | 83.47% | 97.94% | 44.89% |
| **Standard Deviation** | 0.1% | 0.6% | 0.6% | 0.5% | 0.1% | 3.3% | 3.3% | 0.5% | 0.7% |
| **7-Zip Compression - C.S.T (MIPS)** | 21667 | 37236 | 28952 | **39039** | 23394 | **17729** | 30627 | 33022 | 27888 |
| **Normalized** | 55.5% | 95.38% | 74.16% | 100% | 59.92% | 45.41% | 78.45% | 84.59% | 71.44% |
| **Standard Deviation** | 1.3% | 1.4% | 2.9% | 1% | 0.5% | 3.3% | 0.6% | 1.5% | 1.5% |
| **Timed Linux Kernel Compilation - Time To Compile (sec)** | 150.12 | 89.15 | 106.97 | **79.10** | **313.10** | 153.49 | 95.17 | 85.22 | 127.47 |
| **Normalized** | 52.69% | 88.73% | 73.95% | 100% | 25.26% | 51.53% | 83.11% | 92.82% | 62.05% |
| **Standard Deviation** | 1% | 2.3% | 1% | 7% | 1.1% | 1.2% | 2.2% | 2% | 2.3% |
| **C-Ray - Total Time (sec)** | **24.51** | 13.97 | 18.69 | 12.78 | 12.98 | 19.48 | 11.23 | **9.70** | 19.69 |
| **Normalized** | 39.58% | 69.43% | 51.9% | 75.9% | 74.73% | 49.79% | 86.38% | 100% | 49.26% |
| **Standard Deviation** | 0.1% | 0.2% | 1.5% | 0.1% | 4.9% | 1.4% | 0% | 0.1% | 0.1% |
| **POV-Ray - Trace Time (sec)** | 131.09 | 70.27 | 87.94 | 60.96 | 101.88 | 107.39 | 64.40 | **56.21** | **195.83** |
| **Normalized** | 42.88% | 79.99% | 63.92% | 92.21% | 55.17% | 52.34% | 87.28% | 100% | 28.7% |
| **Standard Deviation** | 0.2% | 0.2% | 0.1% | 0.2% | 1.5% | 0.3% | 0% | 0.1% | 0.4% |
| **LAME MP3 Encoding - WAV To MP3 (sec)** | 32.54 | 36.18 | 27.50 | 26.07 | **21.52** | 35.19 | 36.59 | 33.50 | **39.90** |
| **Normalized** | 66.13% | 59.48% | 78.25% | 82.55% | 100% | 61.15% | 58.81% | 64.24% | 53.93% |
| **Standard Deviation** | 0.4% | 0.2% | 0.8% | 1.3% | 2.5% | 0.1% | 0% | 0.8% | 0.1% |

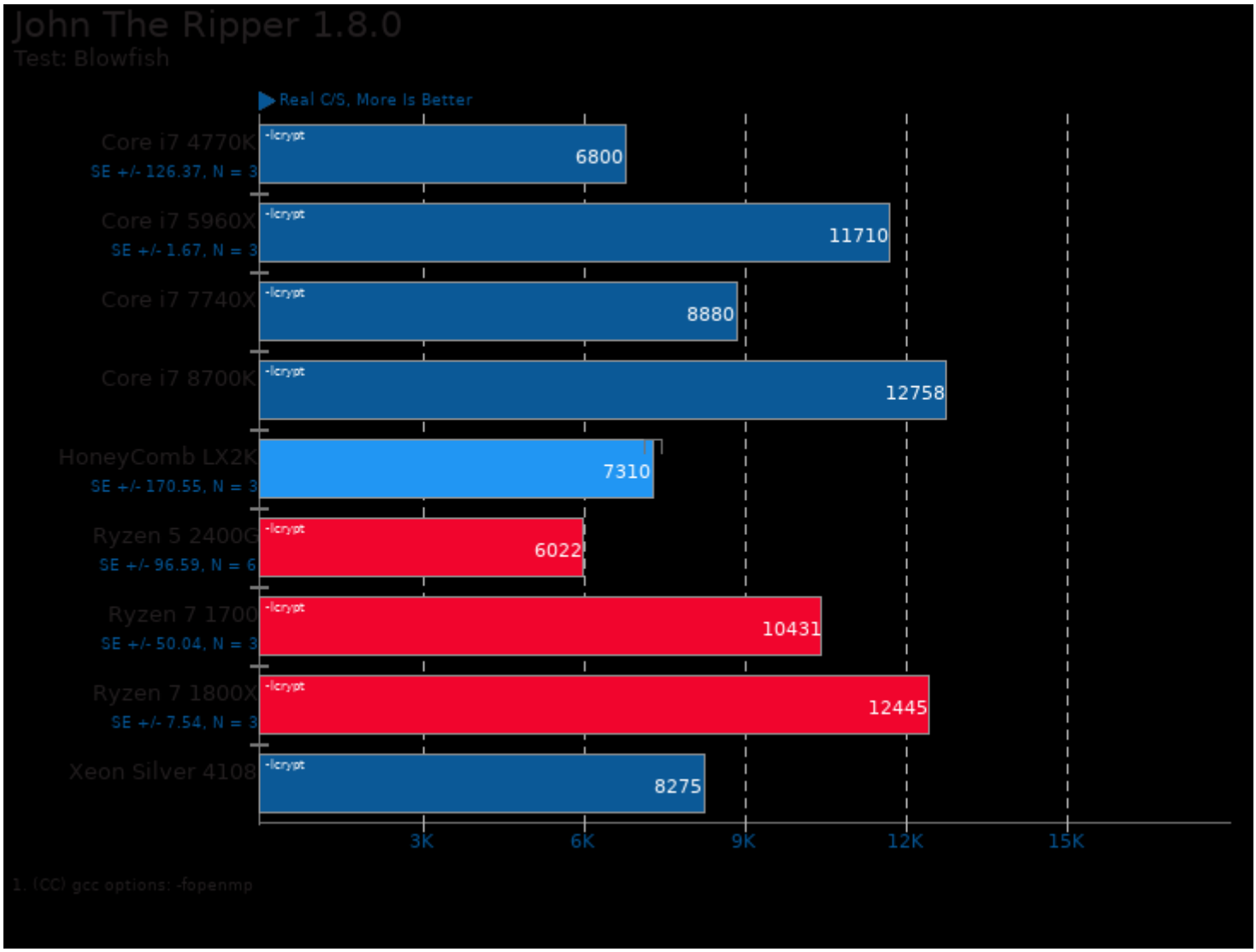
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **OpenSSL - R.4.b.P (Signs/sec)** | 689 | 1203 | 1313 | **1980** | **512** | 794 | 1380 | 1593 | 1285 |
| **Normalized** | 34.8% | 60.76% | 66.31% | 100% | 25.86% | 40.1% | 69.7% | 80.45% | 64.9% |
| **Standard Deviation** | 0.1% | 0% | 2.7% | 0.1% | 0% | 2.1% | 0.1% | 0.1% | 0.3% |

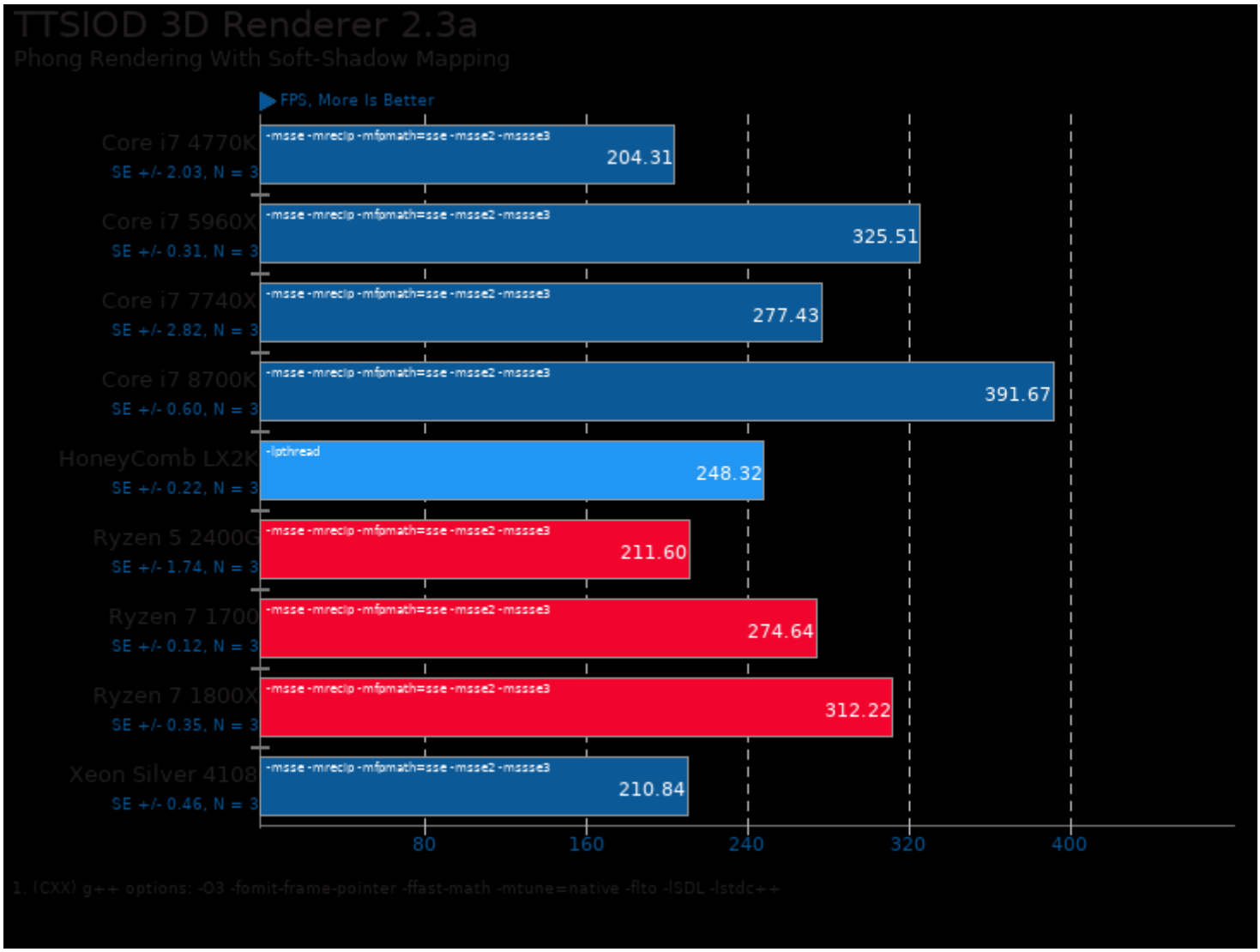

NAS Parallel Benchmarks 3.3
Test / Class: EP.C
Total Mop/s, More Is Better
Core i7 4770K
SE +/- 1.89, N = 3
331.54
Core i7 5960X
SE +/- 0.71, N = 3
564.87
Core i7 7740X
SE +/- 2.53, N = 3
394.63
Core i7 8700K
SE +/- 1.92, N = 3
577.05
HoneyComb LX2K
SE +/- 0.12, N = 3
429.07
Ryzen 5 2400G
SE +/- 1.66, N = 3
293.90
Ryzen 7 1700
SE +/- 7.05, N = 3
489.65
Ryzen 7 1800X
SE +/- 1.24, N = 3
571.10
Xeon Silver 4108
SE +/- 0.71, N = 3
319.97
120
240
360
480
600
1. (F9X) gfortran options: -O3 -march=native -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
2. Core i7 4770K: Open MPI 2.1.1
3. Core i7 5960X: Open MPI 2.1.1
4. Core i7 7740X: Open MPI 2.1.1
5. Core i7 8700K: Open MPI 2.1.1
6. HoneyComb LX2K: Open MPI 3.1.4
7. Ryzen 5 2400G: Open MPI 2.1.1
8. Ryzen 7 1700: Open MPI 2.1.1
9. Ryzen 7 1800X: Open MPI 2.1.1
10. Xeon Silver 4108: Open MPI 2.1.1

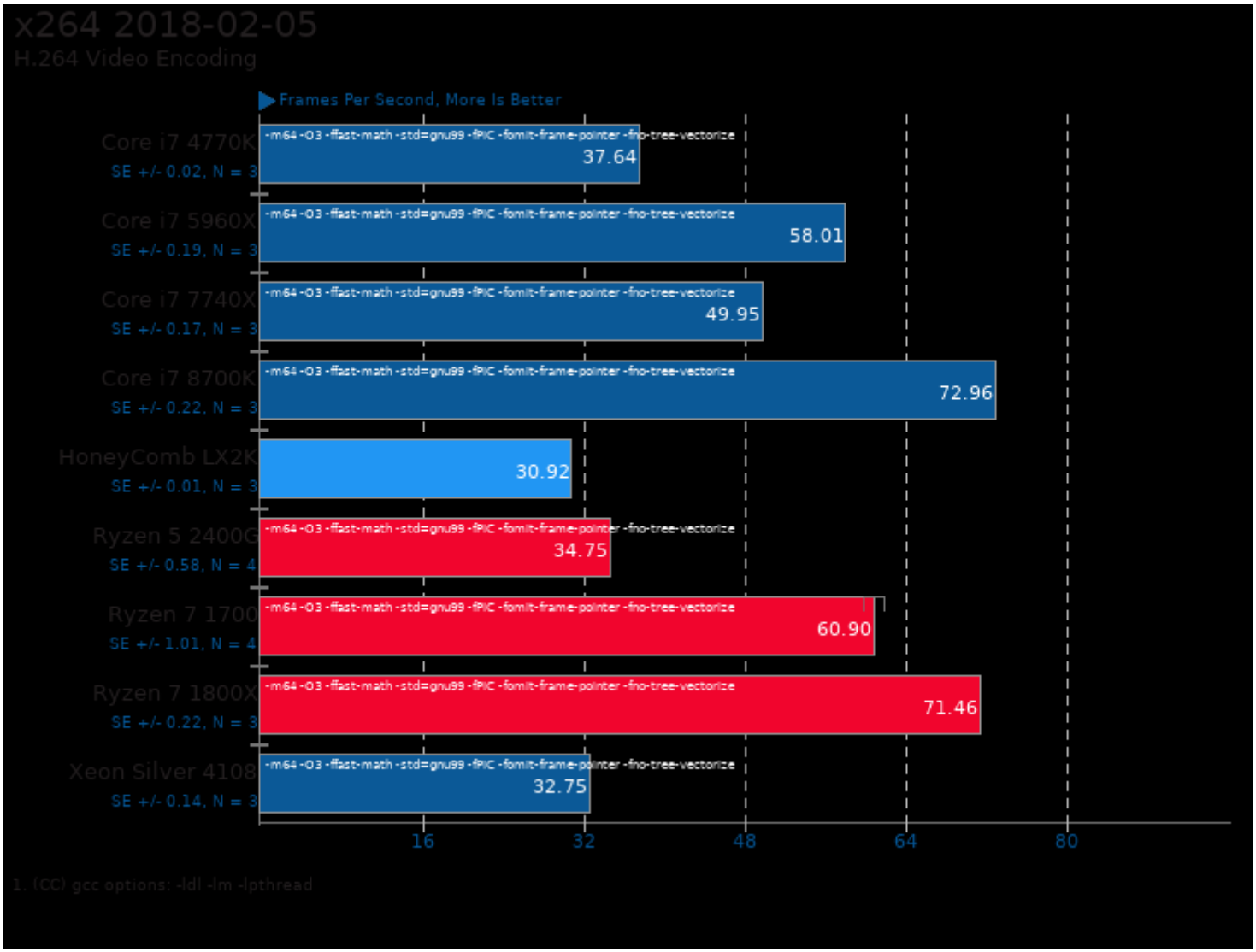

Parboil 2.5
Test: OpenMP CUTCP
Seconds, Fewer Is Better
Core i7 4770K
SE +/- 0.07, N = 3
12.99
Core i7 5960X
SE +/- 0.02, N = 3
7.83
Core i7 7740X
SE +/- 0.10, N = 3
10.13
Core i7 8700K
SE +/- 0.01, N = 3
7.08
HoneyComb LX2K
SE +/- 0.01, N = 3
28.31
Ryzen 5 2400G
SE +/- 0.04, N = 3
11.34
Ryzen 7 1700
SE +/- 0.03, N = 3
6.49
Ryzen 7 1800X
SE +/- 0.01, N = 3
5.58
Xeon Silver 4108
SE +/- 0.02, N = 3
10.99
7
14
21
28
35
1. (CXX) g++ options: -lm -lpthread -lgomp -ffast-math -fopenmp

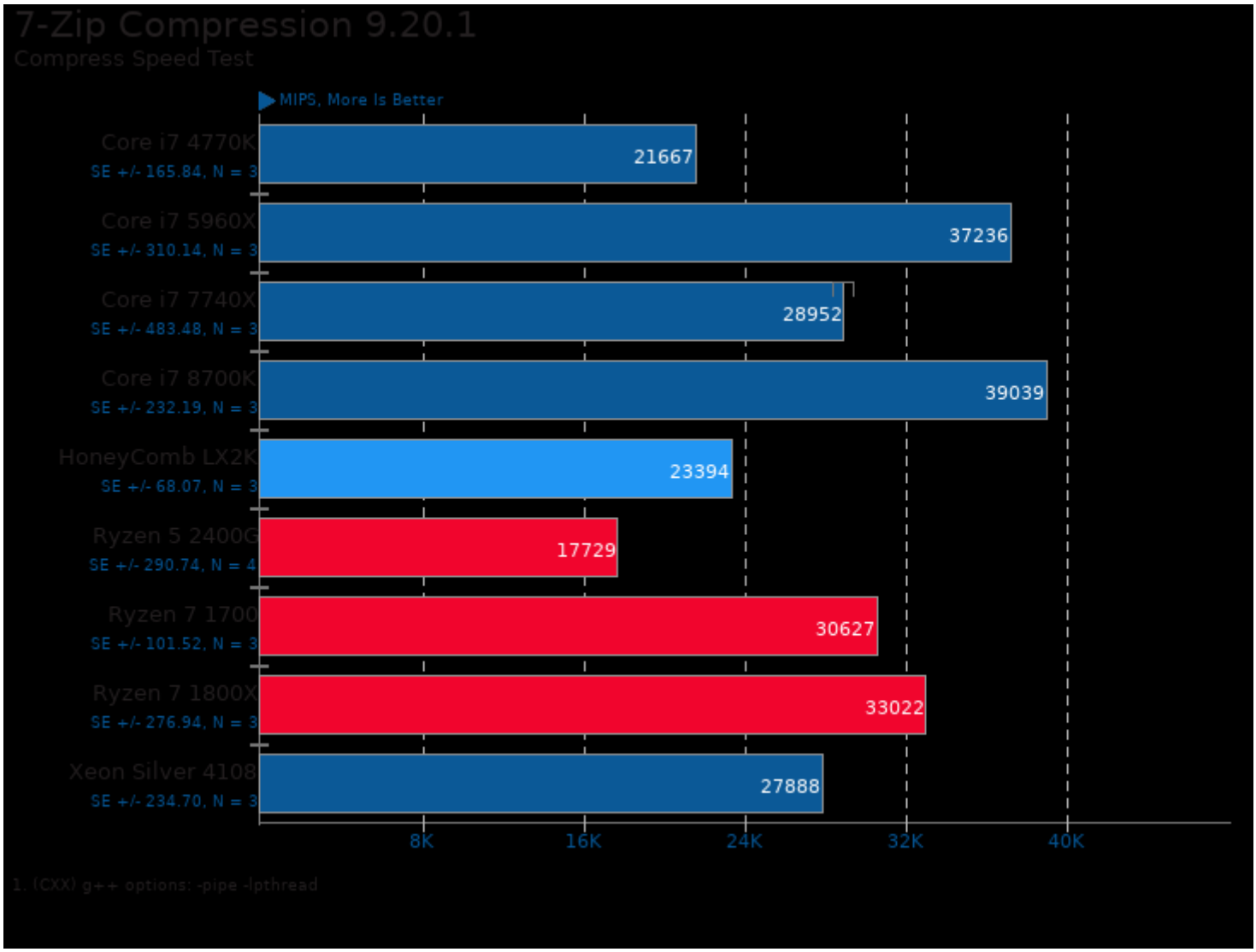

Rodinia 2.4
Test: OpenMP LavaMD
Seconds, Fewer Is Better
Core i7 4770K
SE +/- 0.03, N = 3
199.36
Core i7 5960X
SE +/- 0.25, N = 3
114.38
Core i7 7740X
SE +/- 0.78, N = 3
154.42
Core i7 8700K
SE +/- 0.08, N = 3
107.19
HoneyComb LX2K
SE +/- 0.08, N = 3
51.37
Ryzen 5 2400G
SE +/- 0.14, N = 3
160.28
Ryzen 7 1700
SE +/- 0.08, N = 3
95.15
Ryzen 7 1800X
SE +/- 0.05, N = 3
82.39
Xeon Silver 4108
SE +/- 0.58, N = 3
170.83
40
80
120
160
200
1. (CXX) g++ options: -O2 -lOpenCL

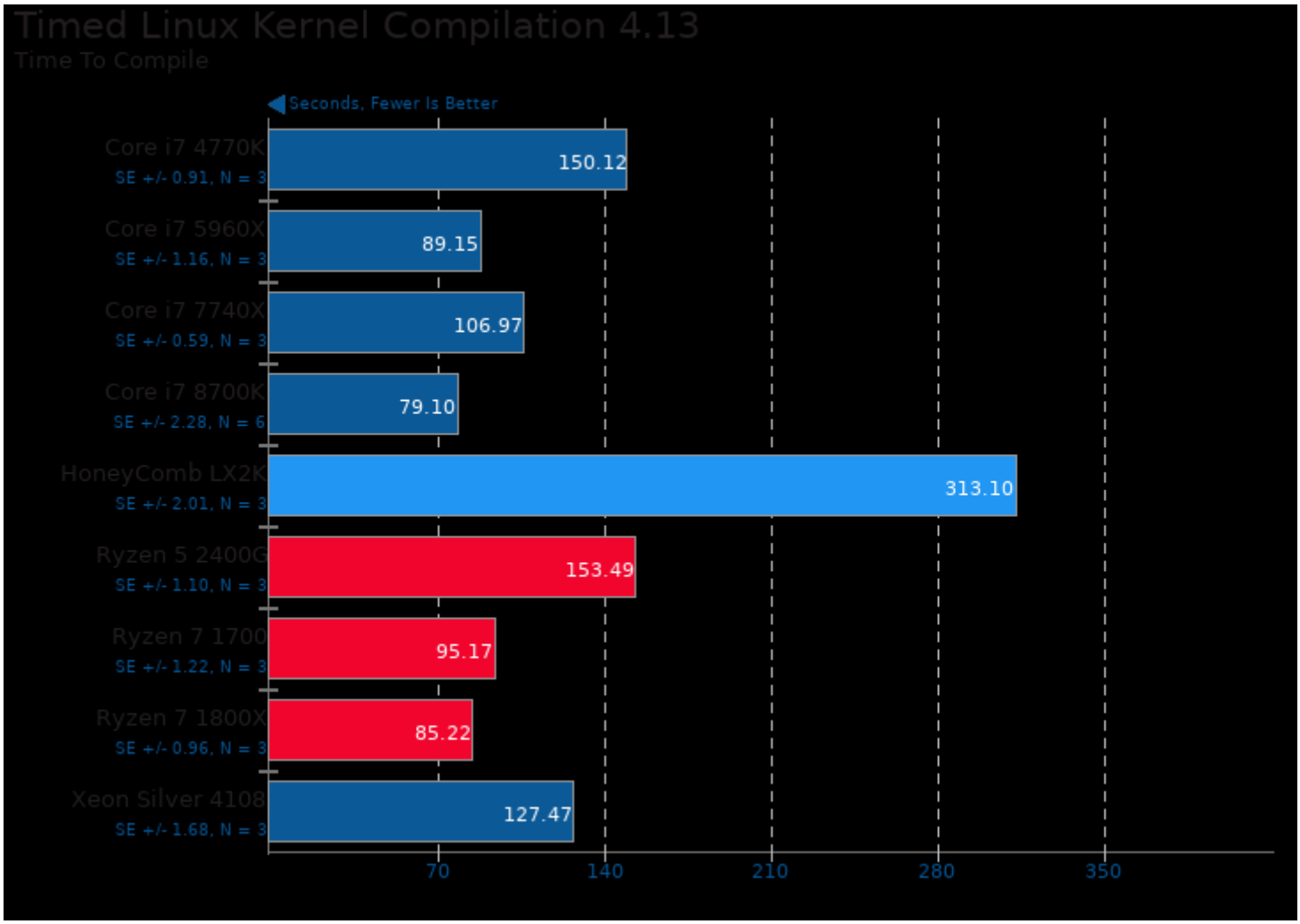

Timed MAFFT Alignment 6.864
Multiple Sequence Alignment
Seconds, Fewer Is Better
Core i7 4770K
SE +/- 0.09, N = 6
4.88
Core i7 5960X
SE +/- 0.06, N = 3
3.54
Core i7 7740X
SE +/- 0.14, N = 6
3.97
HoneyComb LX2K
SE +/- 0.28, N = 3
5.03
Ryzen 5 2400G
SE +/- 0.10, N = 6
5.73
Ryzen 7 1700
SE +/- 0.05, N = 6
4.26
Ryzen 7 1800X
SE +/- 0.02, N = 3
3.65
Xeon Silver 4108
SE +/- 0.08, N = 6
5.46
1.2893
2.5786
3.8679
5.1572
6.4465
1. (CC) gcc options: -O3 -lm -lpthread

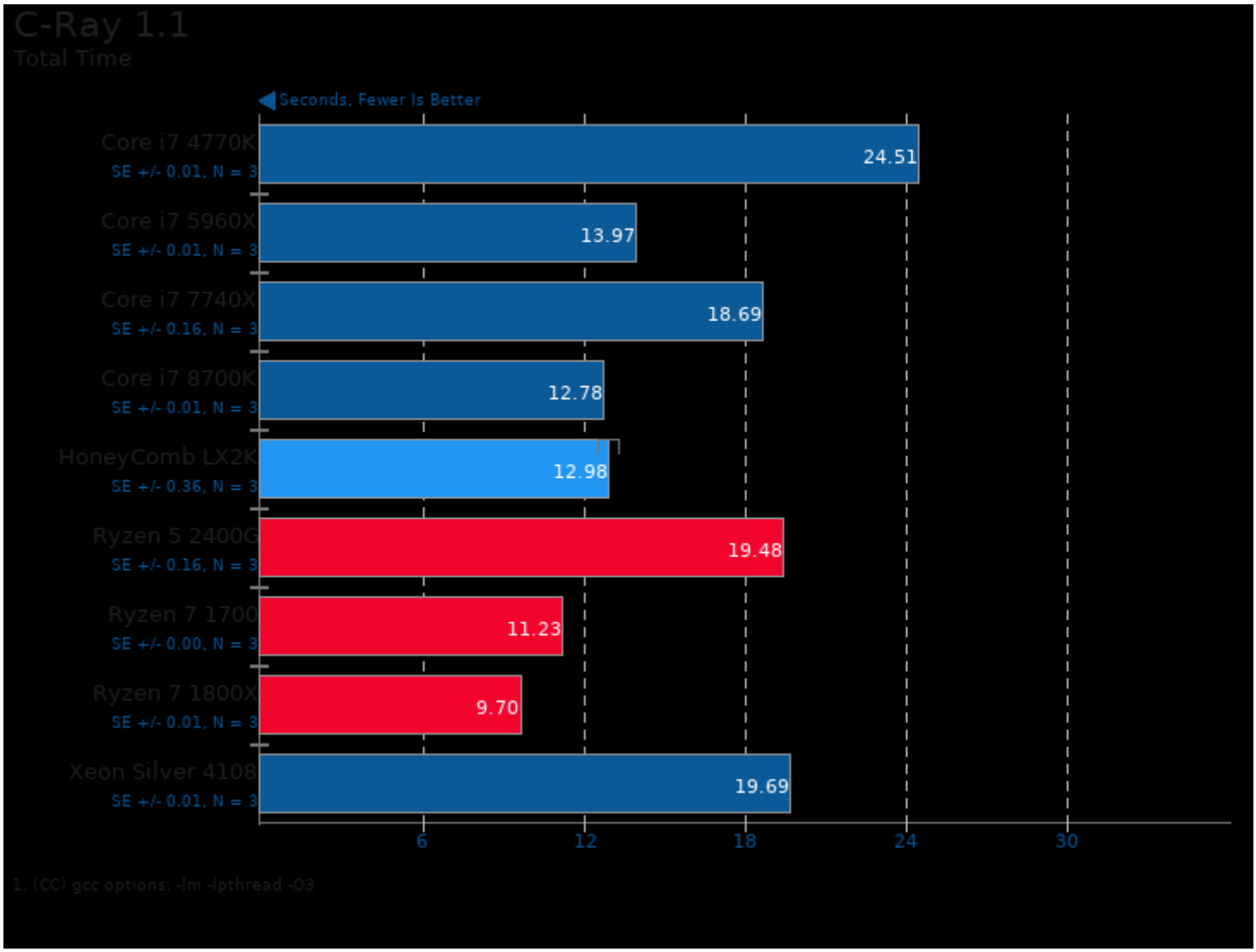

John The Ripper 1.8.0
Test: Blowfish
Real C/S, More Is Better
Core i7 4770K
SE +/- 126.37, N = 3
Core i7 5960X
SE +/- 1.67, N = 3
Core i7 7740X
Core i7 8700K
HoneyComb LX2K
SE +/- 170.55, N = 3
Ryzen 5 2400G
SE +/- 96.59, N = 6
Ryzen 7 1700
SE +/- 50.04, N = 3
Ryzen 7 1800X
SE +/- 7.54, N = 3
Xeon Silver 4108
-lcrypt
6800
11710
8880
12758
7310
6022
10431
12445
8275
3K
6K
9K
12K
15K
1. (CC) gcc options: -fopenmp

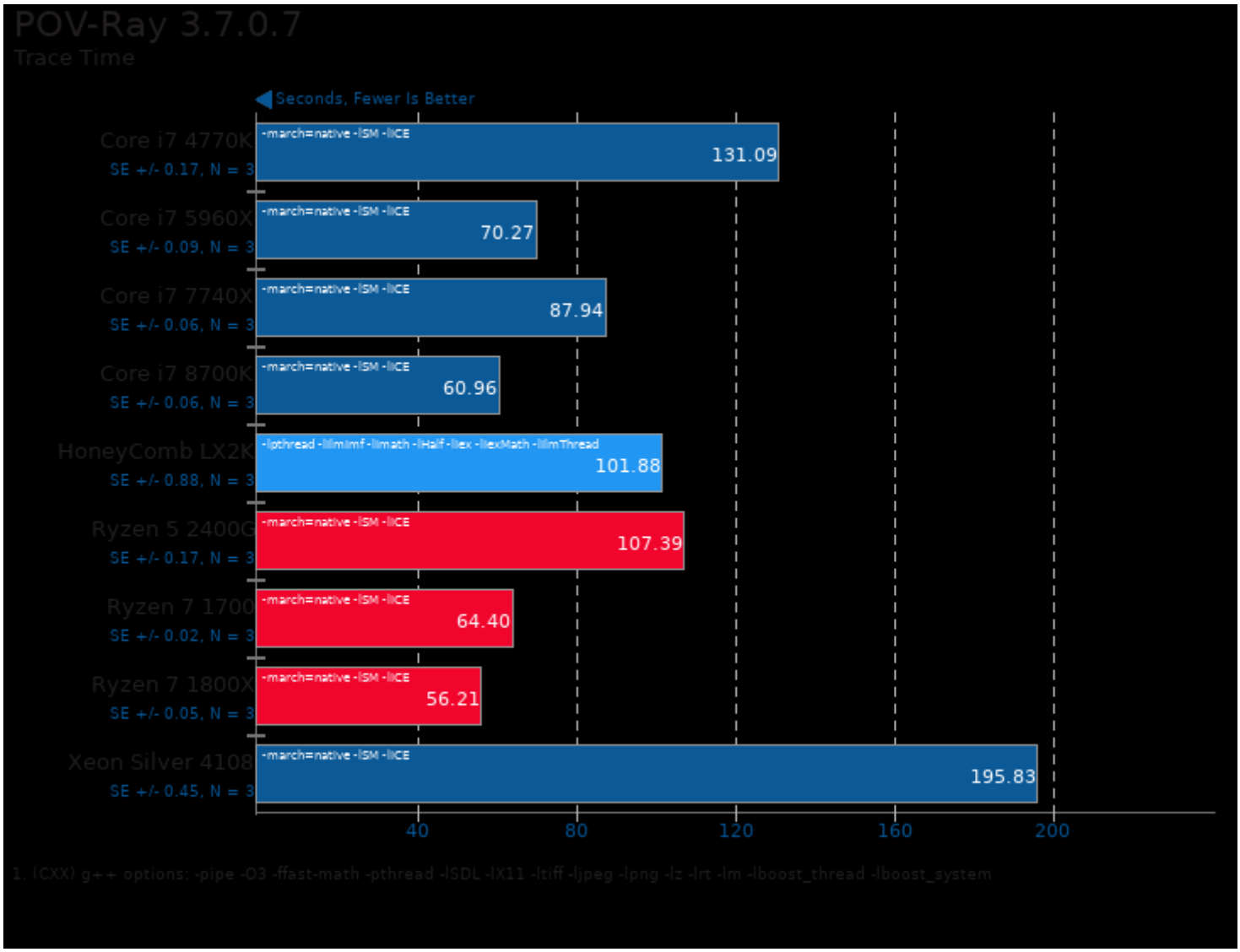

TTSIOD 3D Renderer 2.3a
Phong Rendering With Soft-Shadow Mapping
FPS, More Is Better
Core i7 4770K
SE +/- 2.03, N = 3
-msse -mrecip -mfpmath=sse -msse2 -mssse3
204.31
Core i7 5960X
SE +/- 0.31, N = 3
-msse -mrecip -mfpmath=sse -msse2 -mssse3
325.51
Core i7 7740X
SE +/- 2.82, N = 3
-msse -mrecip -mfpmath=sse -msse2 -mssse3
277.43
Core i7 8700K
SE +/- 0.60, N = 3
-msse -mrecip -mfpmath=sse -msse2 -mssse3
391.67
HoneyComb LX2K
SE +/- 0.22, N = 3
-lpthread
248.32
Ryzen 5 2400G
SE +/- 1.74, N = 3
-msse -mrecip -mfpmath=sse -msse2 -mssse3
211.60
Ryzen 7 1700
SE +/- 0.12, N = 3
-msse -mrecip -mfpmath=sse -msse2 -mssse3
274.64
Ryzen 7 1800X
SE +/- 0.35, N = 3
-msse -mrecip -mfpmath=sse -msse2 -mssse3
312.22
Xeon Silver 4108
SE +/- 0.46, N = 3
-msse -mrecip -mfpmath=sse -msse2 -mssse3
210.84
80
160
240
320
400
1. (CXX) g++ options: -O3 -fomit-frame-pointer -ffast-math -mtune=native -flto -lSDL -lstdc++

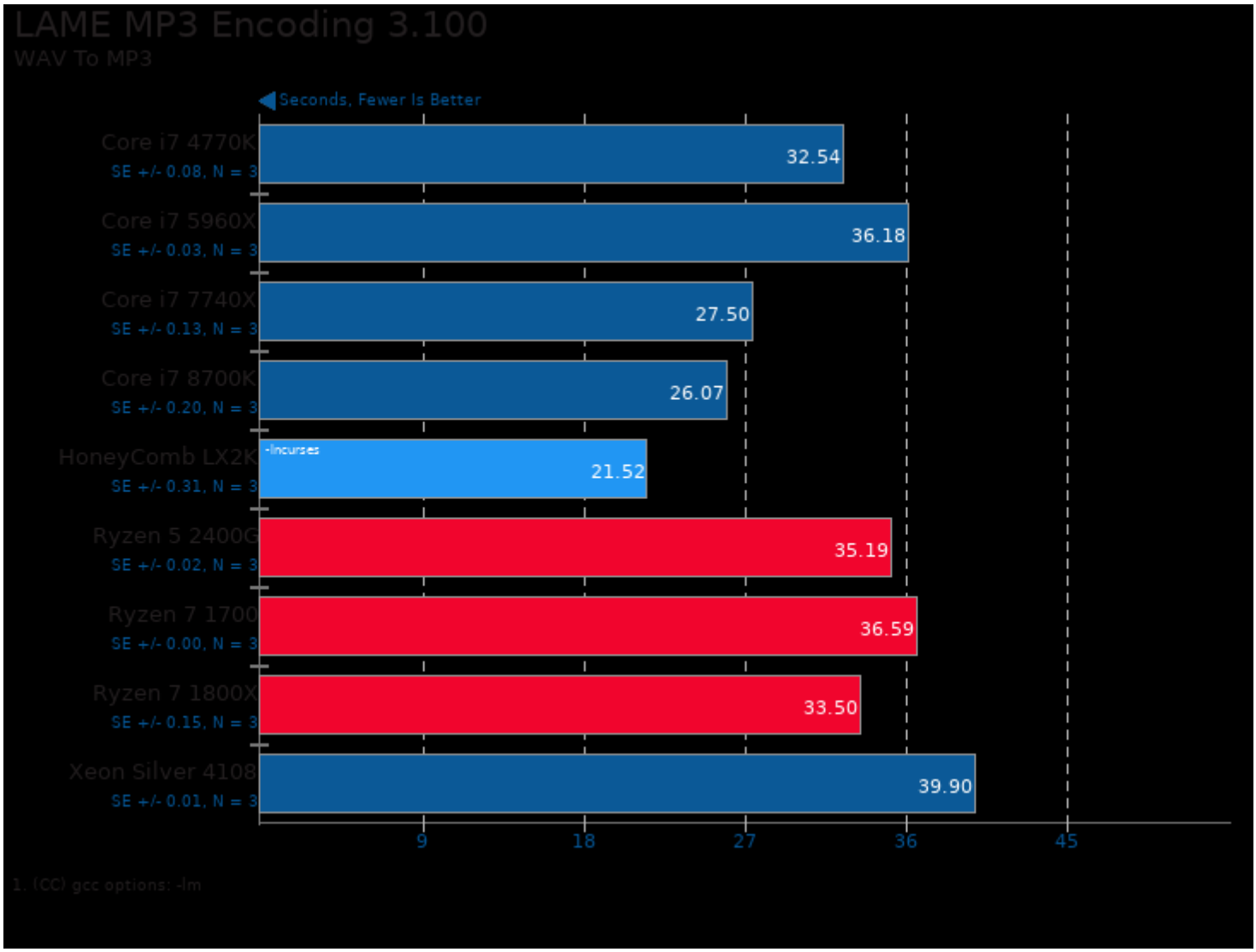

x264 2018-02-05
H.264 Video Encoding
Frames Per Second, More Is Better
Core i7 4770K
SE +/- 0.02, N = 3
37.64
Core i7 5960X
SE +/- 0.19, N = 3
58.01
Core i7 7740X
SE +/- 0.17, N = 3
49.95
Core i7 8700K
SE +/- 0.22, N = 3
72.96
HoneyComb LX2K
SE +/- 0.01, N = 3
30.92
Ryzen 5 2400G
SE +/- 0.58, N = 4
34.75
Ryzen 7 1700
SE +/- 1.01, N = 4
60.90
Ryzen 7 1800X
SE +/- 0.22, N = 3
71.46
Xeon Silver 4108
SE +/- 0.14, N = 3
32.75
-m64 -O3 -ffast-math -std=gnu99 -fPIC -fomit-frame-pointer -fno-tree-vectorize
16
32
48
64
80
1. (CC) gcc options: -ldl -lm -lpthread

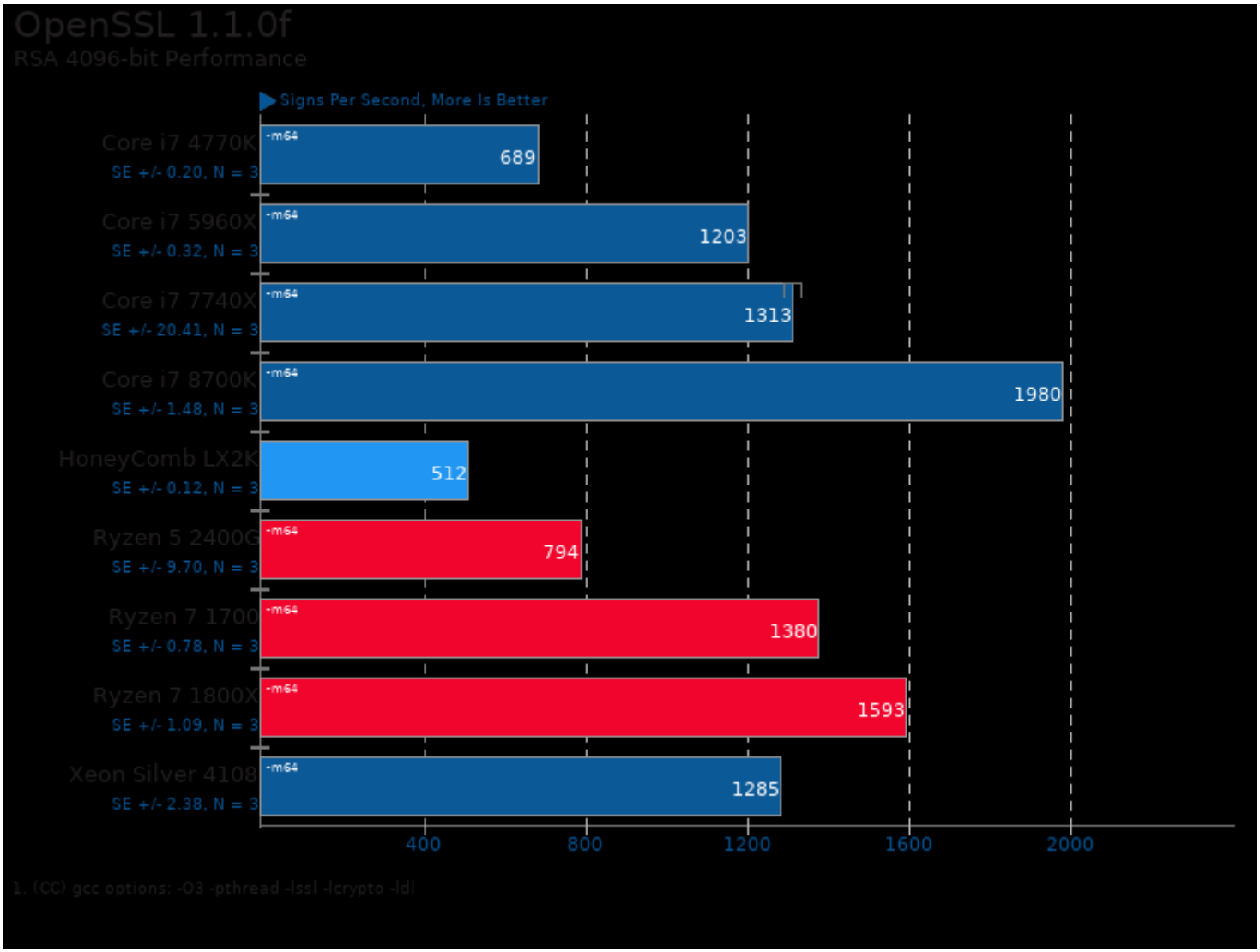

7-Zip Compression 9.20.1
Compress Speed Test
MIPS, More Is Better
Core i7 4770K
SE +/- 165.84, N = 3
21667
Core i7 5960X
SE +/- 310.14, N = 3
37236
Core i7 7740X
SE +/- 483.48, N = 3
28952
Core i7 8700K
SE +/- 232.19, N = 3
39039
HoneyComb LX2K
SE +/- 68.07, N = 3
23394
Ryzen 5 2400G
SE +/- 290.74, N = 4
17729
Ryzen 7 1700
SE +/- 101.52, N = 3
30627
Ryzen 7 1800X
SE +/- 276.94, N = 3
33022
Xeon Silver 4108
SE +/- 234.70, N = 3
27888
8K
16K
24K
32K
40K
1. (CXX) g++ options: -pipe -lpthread


Timed Linux Kernel Compilation 4.13
Time To Compile
Seconds, Fewer Is Better
Core i7 4770K
SE +/- 0.91, N = 3
150.12
Core i7 5960X
SE +/- 1.16, N = 3
89.15
Core i7 7740X
SE +/- 0.59, N = 3
106.97
Core i7 8700K
SE +/- 2.28, N = 6
79.10
HoneyComb LX2K
SE +/- 2.01, N = 3
313.10
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
Xeon Silver 4108
SE +/- 1.68, N = 3
127.47
70
140
210
280
350

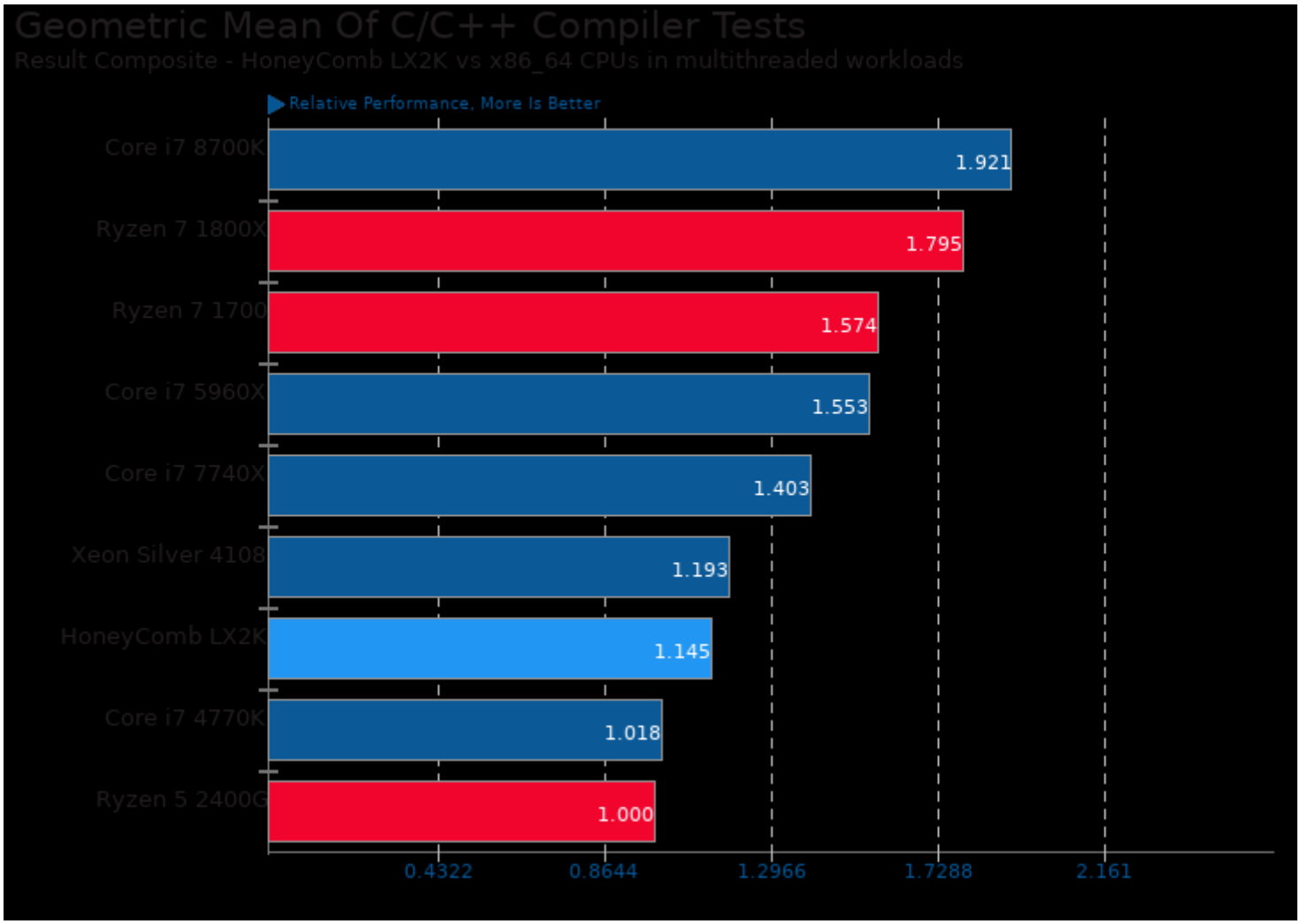

C-Ray 1.1
Total Time
Seconds, Fewer Is Better
Core i7 4770K
SE +/- 0.01, N = 3
24.51
Core i7 5960X
SE +/- 0.01, N = 3
13.97
Core i7 7740X
SE +/- 0.16, N = 3
18.69
Core i7 8700K
SE +/- 0.01, N = 3
12.78
HoneyComb LX2K
SE +/- 0.36, N = 3
12.98
Ryzen 5 2400G
SE +/- 0.16, N = 3
19.48
Ryzen 7 1700
SE +/- 0.00, N = 3
11.23
Ryzen 7 1800X
SE +/- 0.01, N = 3
9.70
Xeon Silver 4108
SE +/- 0.01, N = 3
19.69
6
12
18
24
30
1. (CC) gcc options: -lm -lpthread -O3


POV-Ray 3.7.0.7
Trace Time
Seconds, Fewer Is Better
Core i7 4770K
SE +/- 0.17, N = 3
-march=native -ISM -lICE
131.09
Core i7 5960X
SE +/- 0.09, N = 3
-march=native -ISM -lICE
70.27
Core i7 7740X
SE +/- 0.06, N = 3
-march=native -ISM -lICE
87.94
Core i7 8700K
SE +/- 0.06, N = 3
-march=native -ISM -lICE
60.96
HoneyComb LX2K
SE +/- 0.88, N = 3
-lpthread -lilmimf -limath -lHalf -lIex -lIexMath -lilmThread
101.88
Ryzen 5 2400G
SE +/- 0.17, N = 3
-march=native -ISM -lICE
107.39
Ryzen 7 1700
SE +/- 0.02, N = 3
-march=native -ISM -lICE
64.40
Ryzen 7 1800X
SE +/- 0.05, N = 3
-march=native -ISM -lICE
56.21
Xeon Silver 4108
SE +/- 0.45, N = 3
-march=native -ISM -lICE
195.83
40
80
120
160
200
1. (CXX) g++ options: -pipe -O3 -ffast-math -pthread -lSDL -lX11 -ltiff -ljpeg -lpng -lz -lrt -lm -lboost_thread -lboost_system

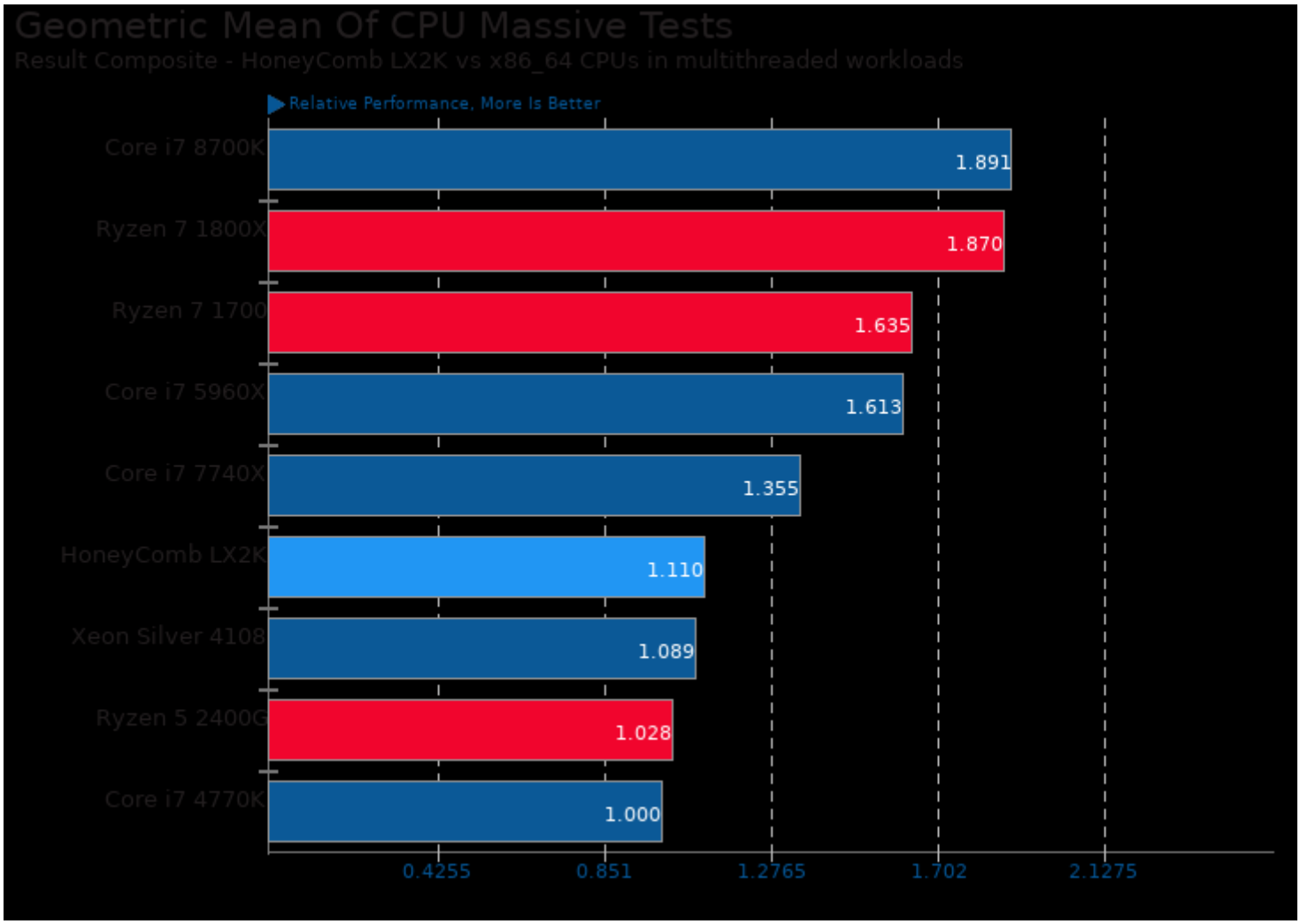

LAME MP3 Encoding 3.100
WAV To MP3
Seconds, Fewer Is Better
Core i7 4770K
SE +/- 0.08, N = 3
32.54
Core i7 5960X
SE +/- 0.03, N = 3
36.18
Core i7 7740X
SE +/- 0.13, N = 3
27.50
Core i7 8700K
SE +/- 0.20, N = 3
26.07
HoneyComb LX2K
SE +/- 0.31, N = 3
-lncurses
21.52
Ryzen 5 2400G
SE +/- 0.02, N = 3
35.19
Ryzen 7 1700
SE +/- 0.00, N = 3
36.59
Ryzen 7 1800X
SE +/- 0.15, N = 3
33.50
Xeon Silver 4108
SE +/- 0.01, N = 3
39.90
9
18
27
36
45
1. (CC) gcc options: -lm


OpenSSL 1.1.0f
RSA 4096-bit Performance
Signs Per Second, More Is Better
Core i7 4770K
SE +/- 0.20, N = 3
-m64
689
Core i7 5960X
SE +/- 0.32, N = 3
-m64
1203
Core i7 7740X
SE +/- 20.41, N = 3
-m64
1313
Core i7 8700K
SE +/- 1.48, N = 3
-m64
1980
HoneyComb LX2K
SE +/- 0.12, N = 3
512
Ryzen 5 2400G
SE +/- 9.70, N = 3
-m64
794
Ryzen 7 1700
SE +/- 0.78, N = 3
-m64
1380
Ryzen 7 1800X
SE +/- 1.09, N = 3
-m64
1593
Xeon Silver 4108
SE +/- 2.38, N = 3
-m64
1285
400
800
1200
1600
2000
1. (CC) gcc options: -O3 -pthread -lssl -lcrypto -ldl

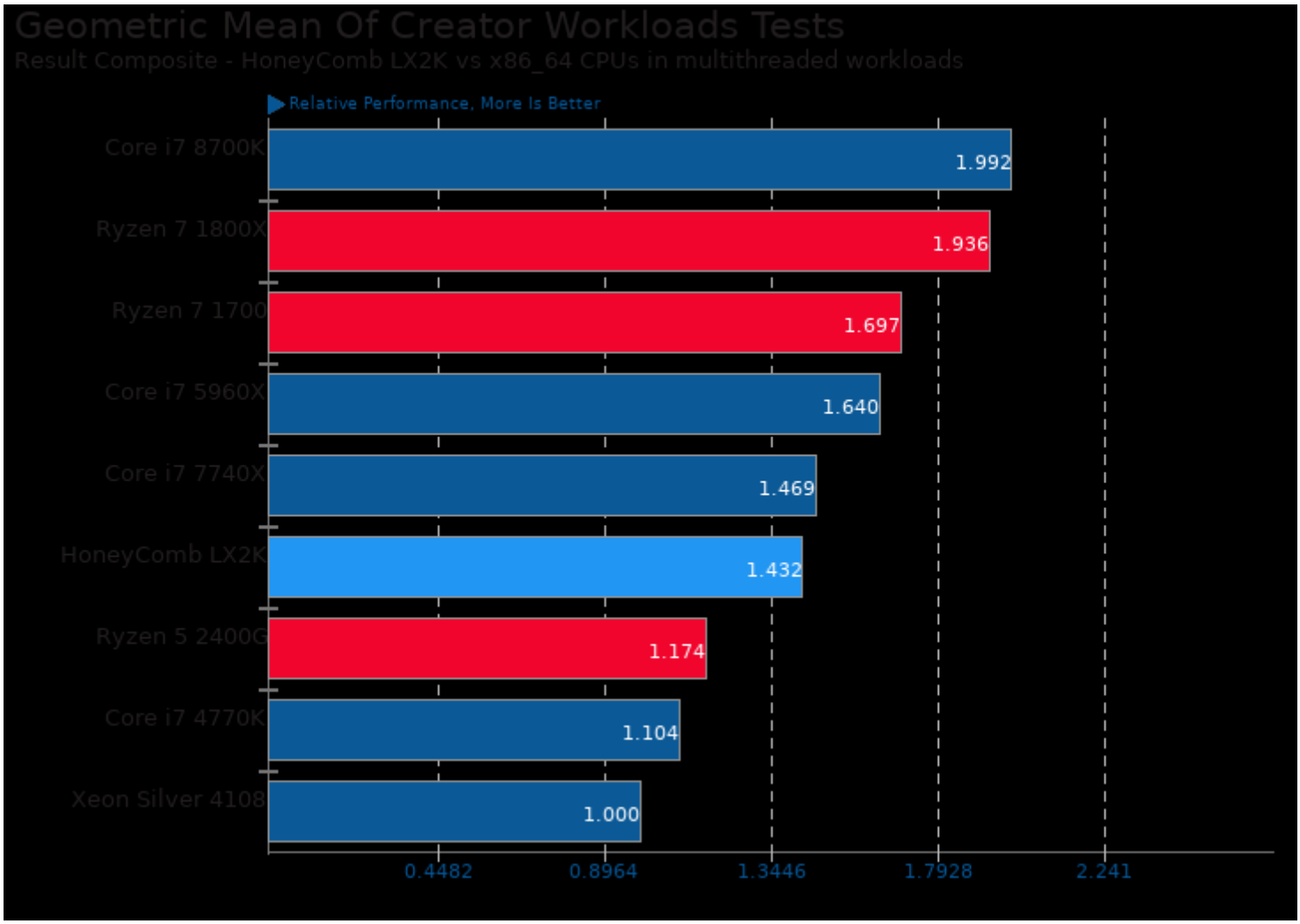
These geometric means are based upon test groupings / test suites for this result file.



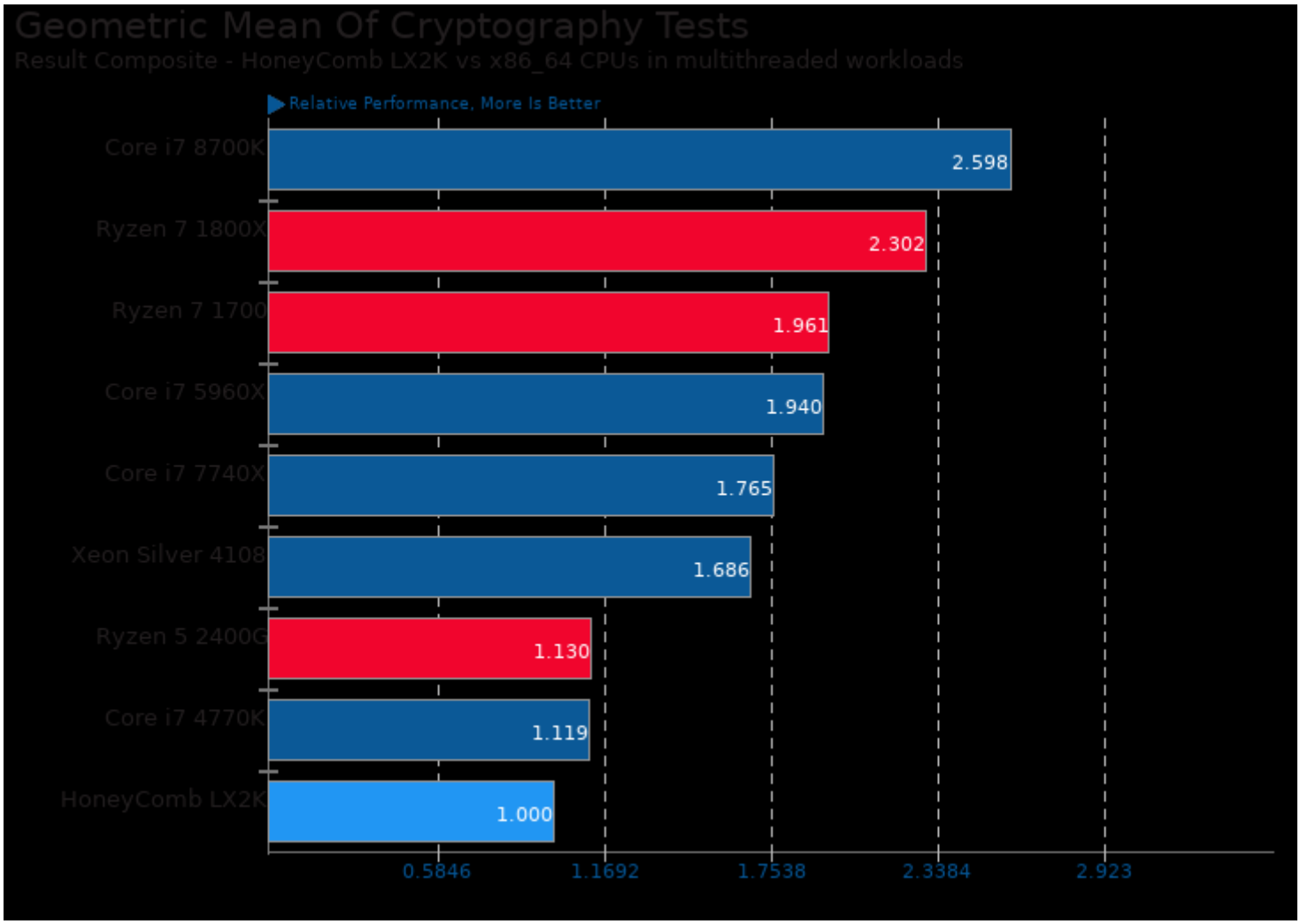

Geometric mean based upon tests: pts/mafft, pts/c-ray, pts/compress-7zip, pts/encode-mp3, pts/john-the-ripper, pts/x264 and pts/openssl



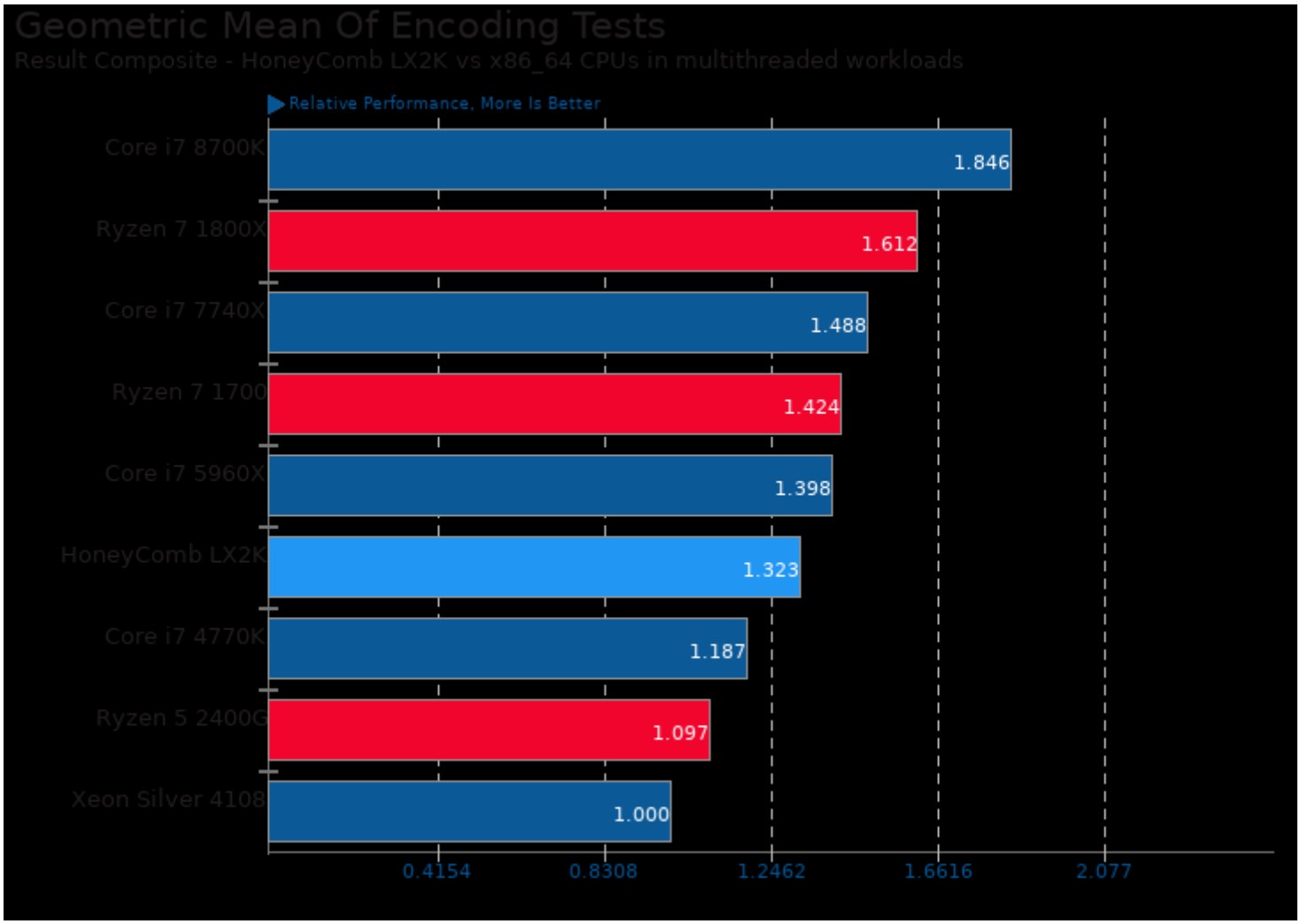

Geometric mean based upon tests: pts/build-linux-kernel, pts/c-ray, pts/compress-7zip, pts/x264, pts/encode-mp3, pts/john-the-ripper, pts/openssl, pts/mafft, pts/npb, pts/parboil, pts/povray, pts/rodinia and pts/ttsiod-renderer



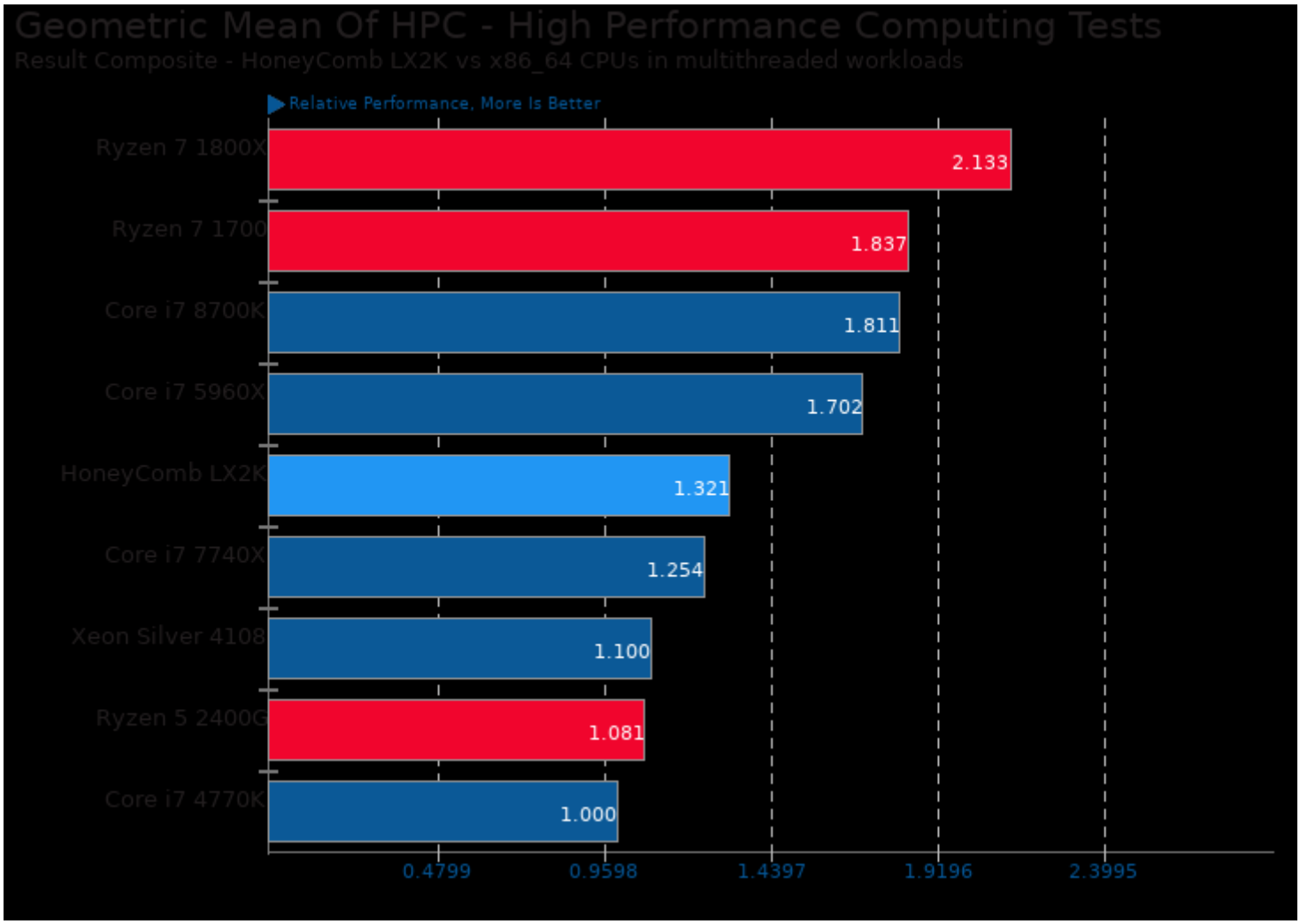

Geometric mean based upon tests: pts/c-ray, pts/povray, pts/ttsiod-renderer, pts/x264 and pts/encode-mp3



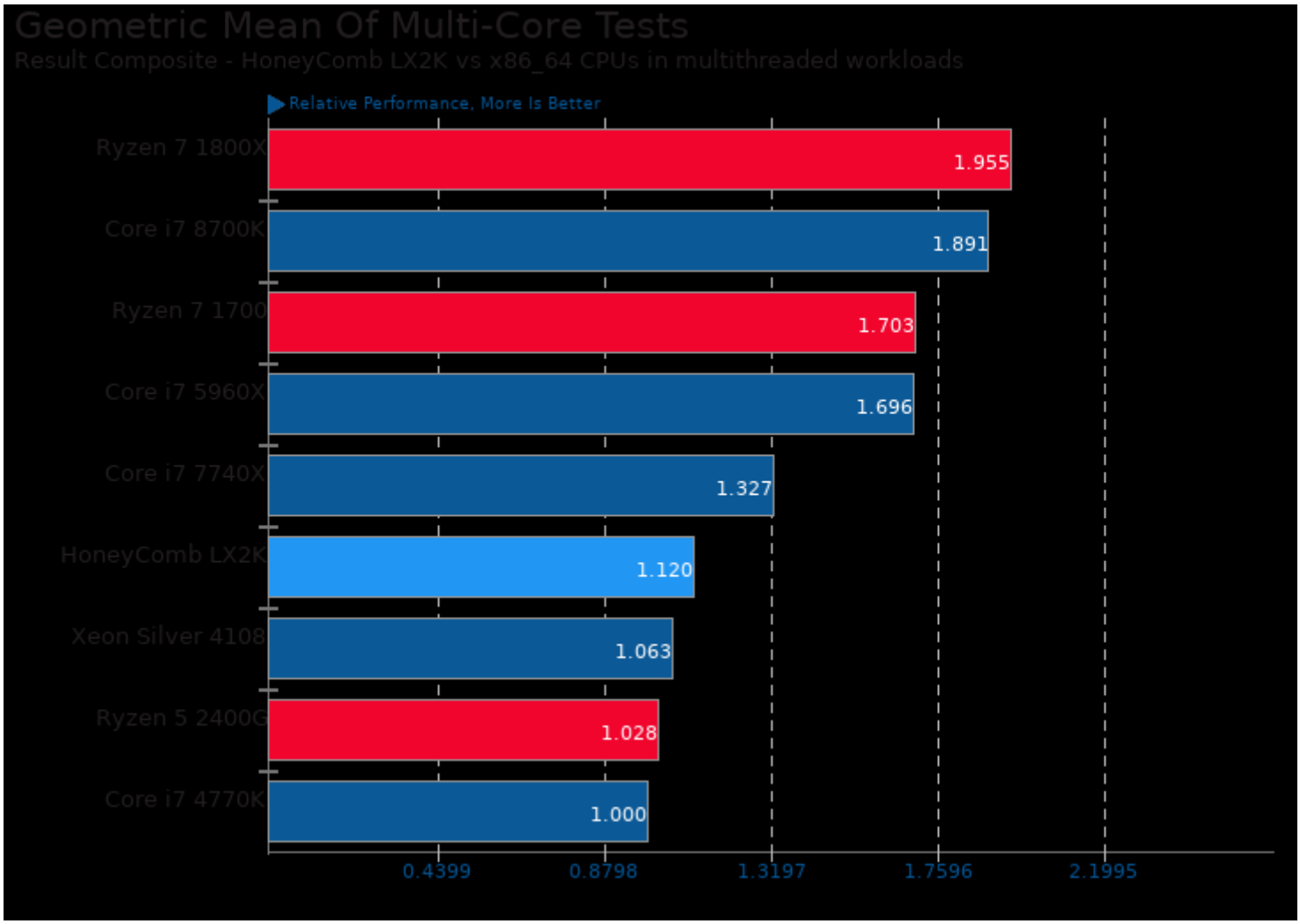

Geometric mean based upon tests: pts/openssl and pts/john-the-ripper



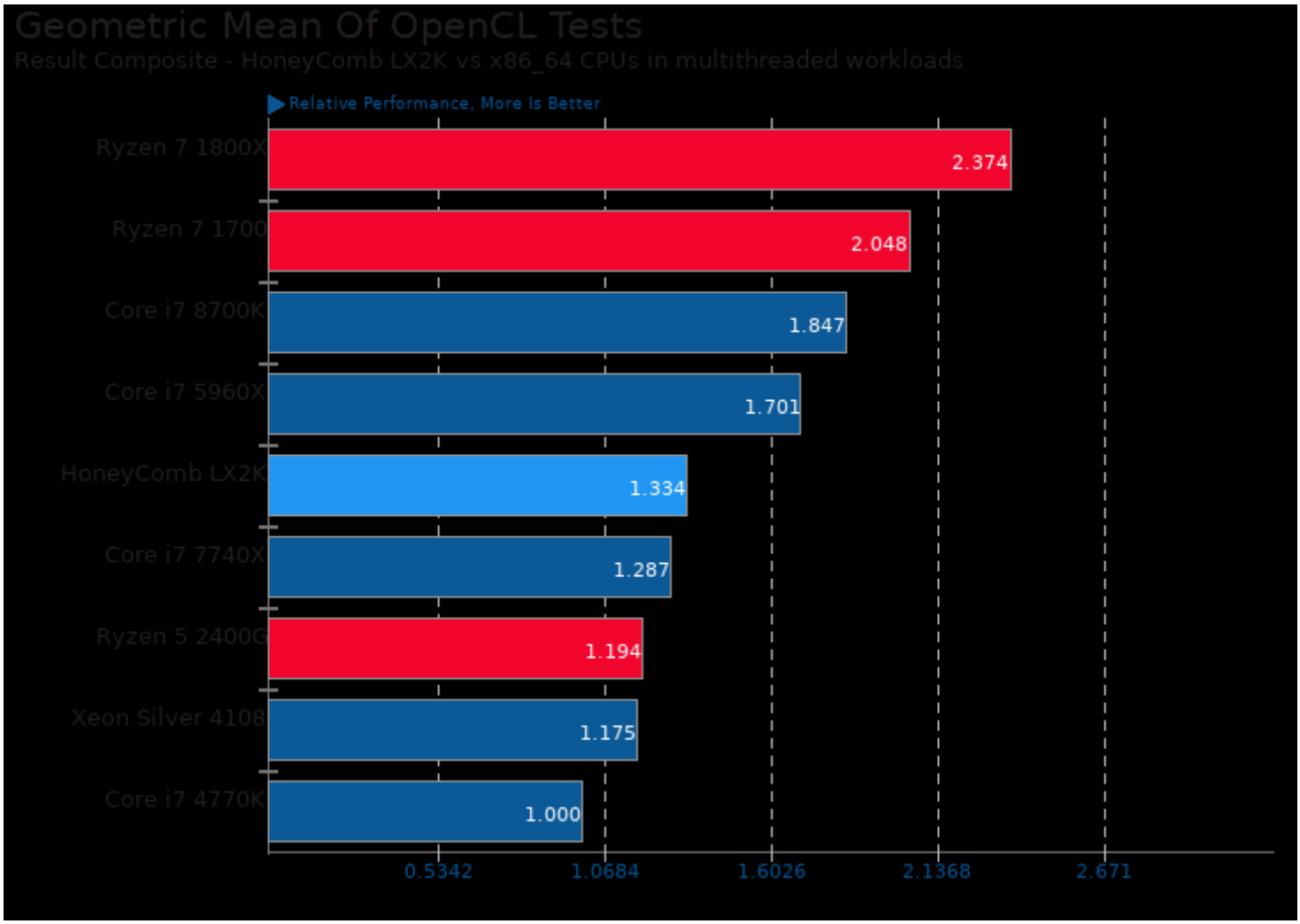

Geometric mean based upon tests: pts/encode-mp3 and pts/x264



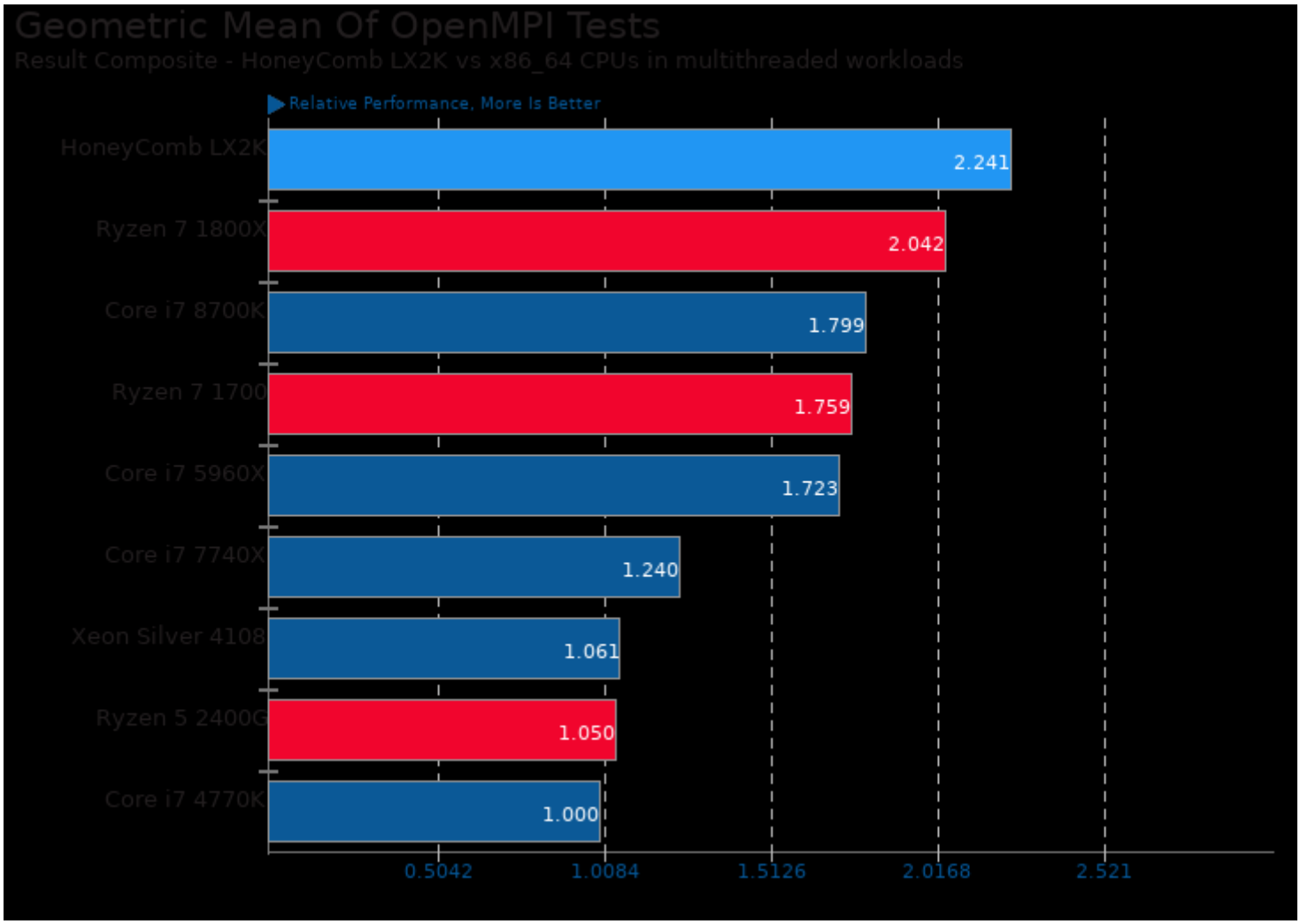

Geometric mean based upon tests: pts/npb, pts/rodinia, pts/parboil and pts/mafft



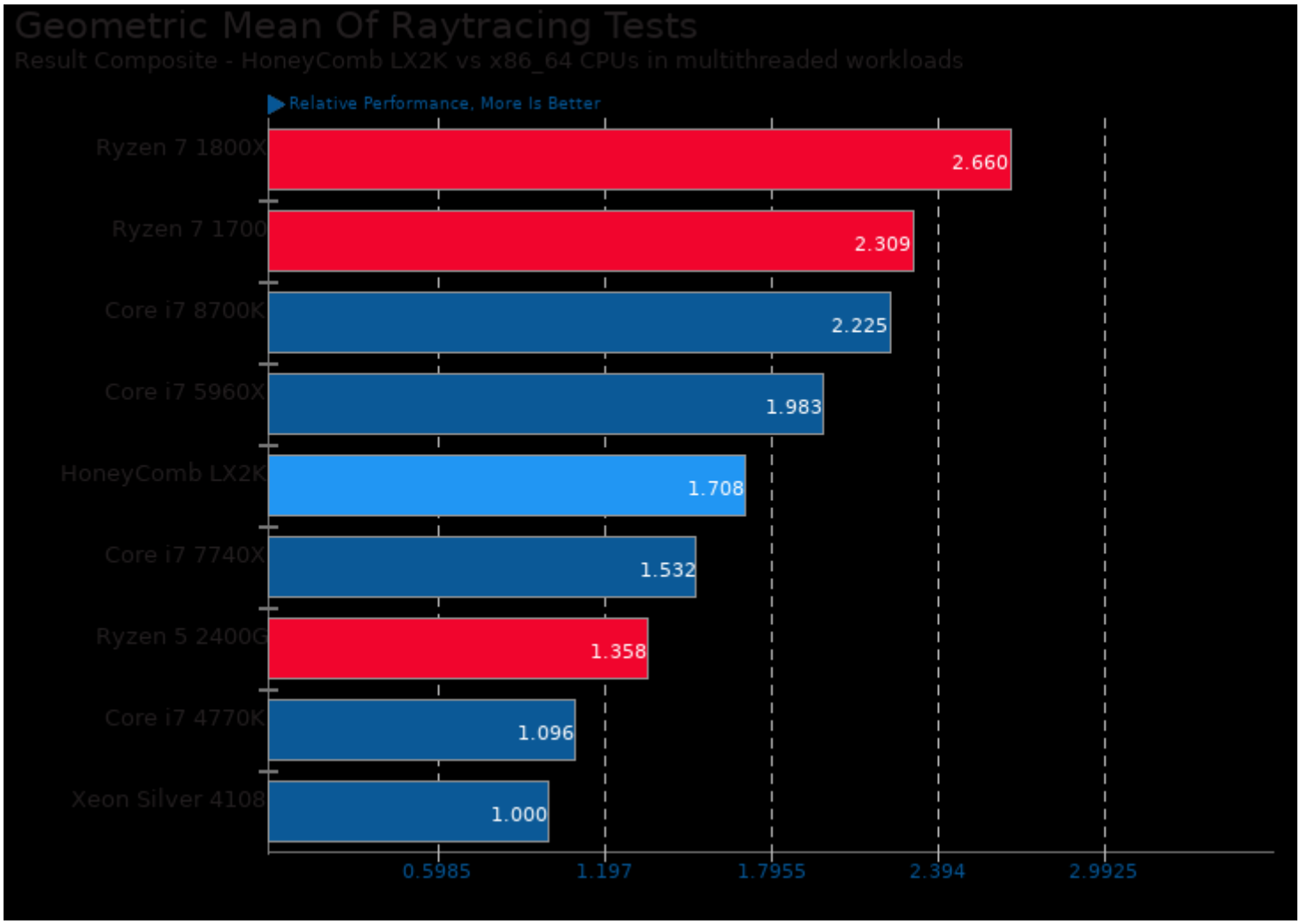

Geometric mean based upon tests: pts/c-ray, pts/povray, pts/x264, pts/rodinia, pts/parboil, pts/npb, pts/john-the-ripper, pts/compress-7zip, pts/build-linux-kernel and pts/ttsiod-renderer



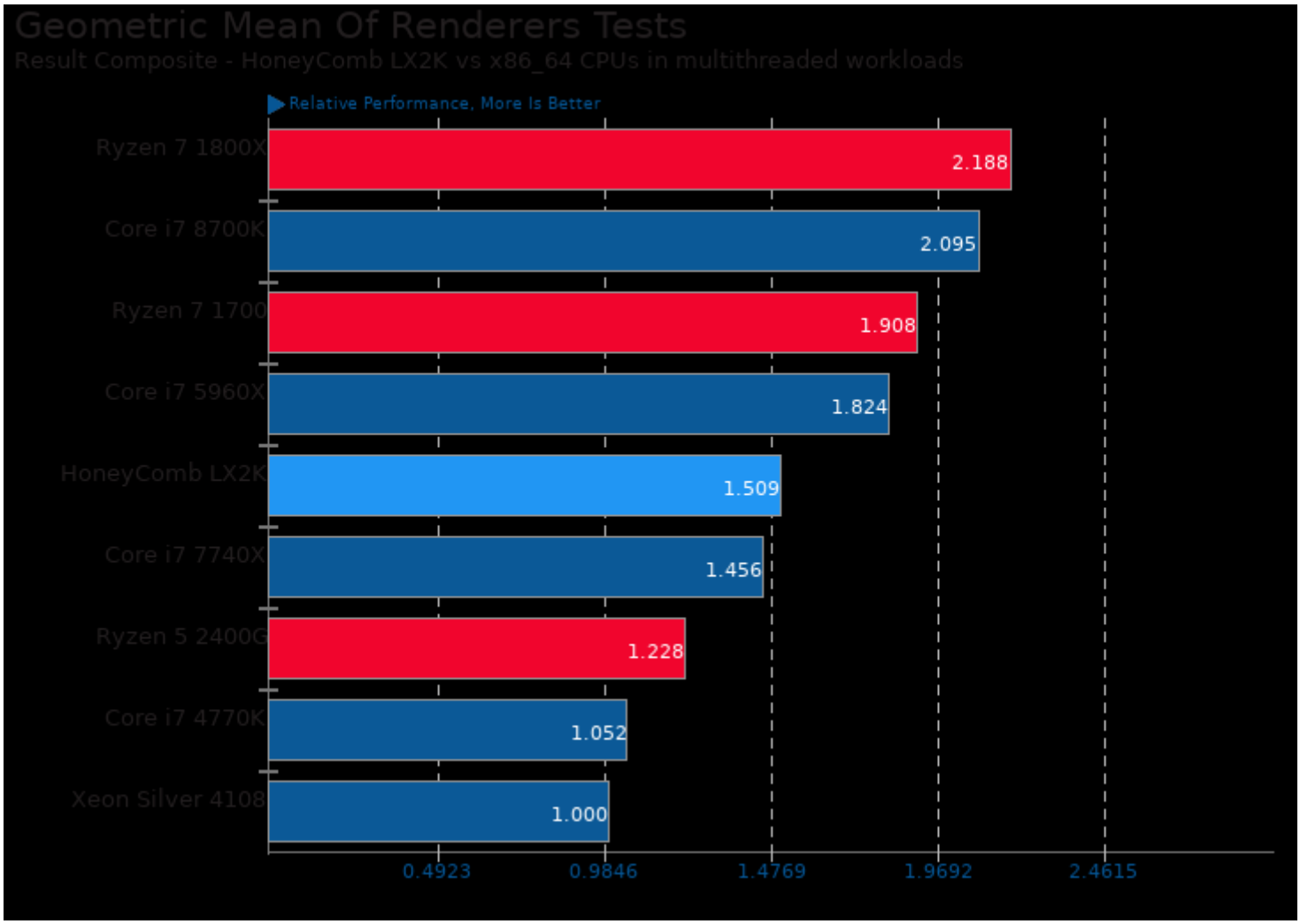

Geometric mean based upon tests: pts/rodinia and pts/parboil



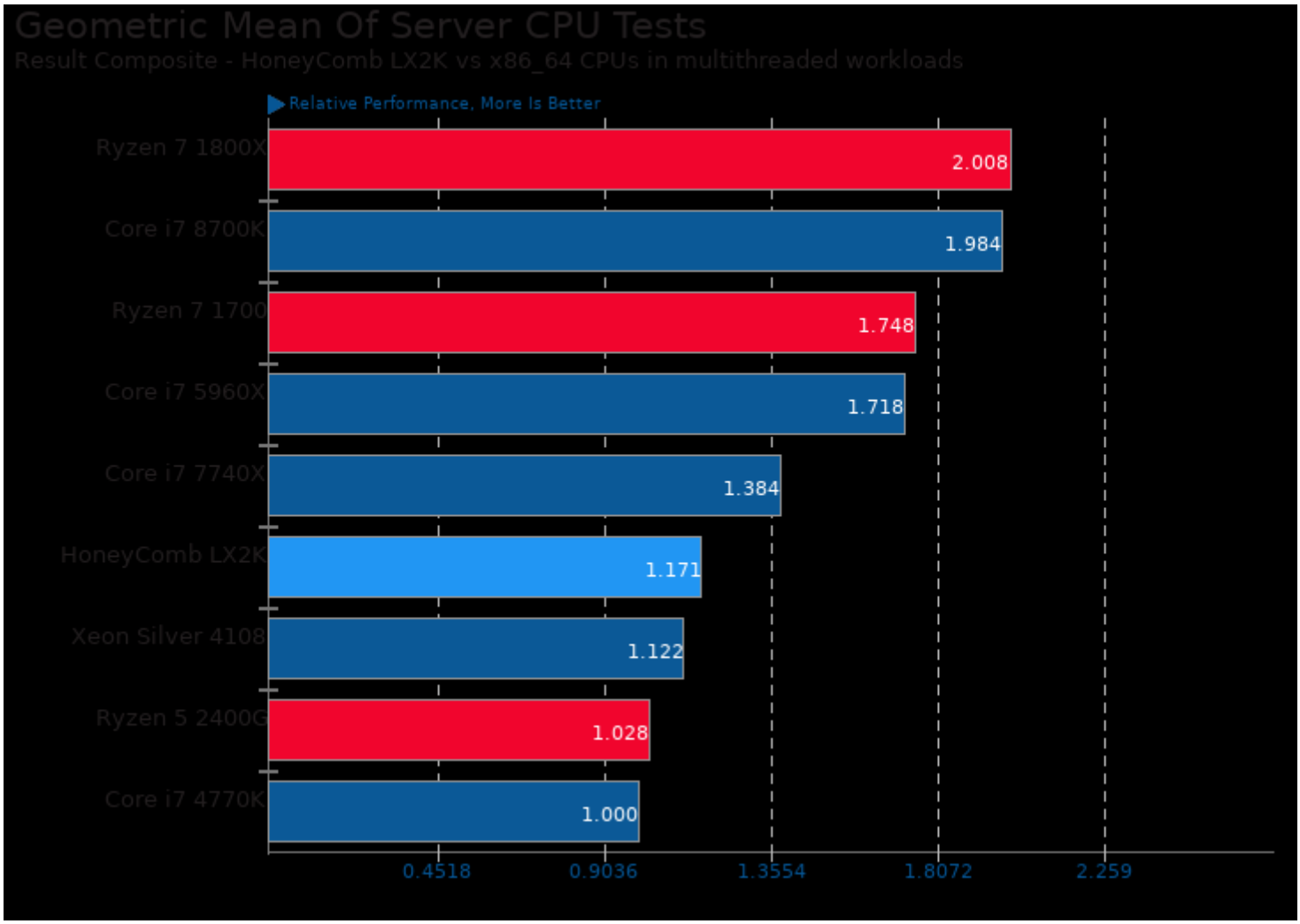

Geometric mean based upon tests: pts/npb and pts/rodinia



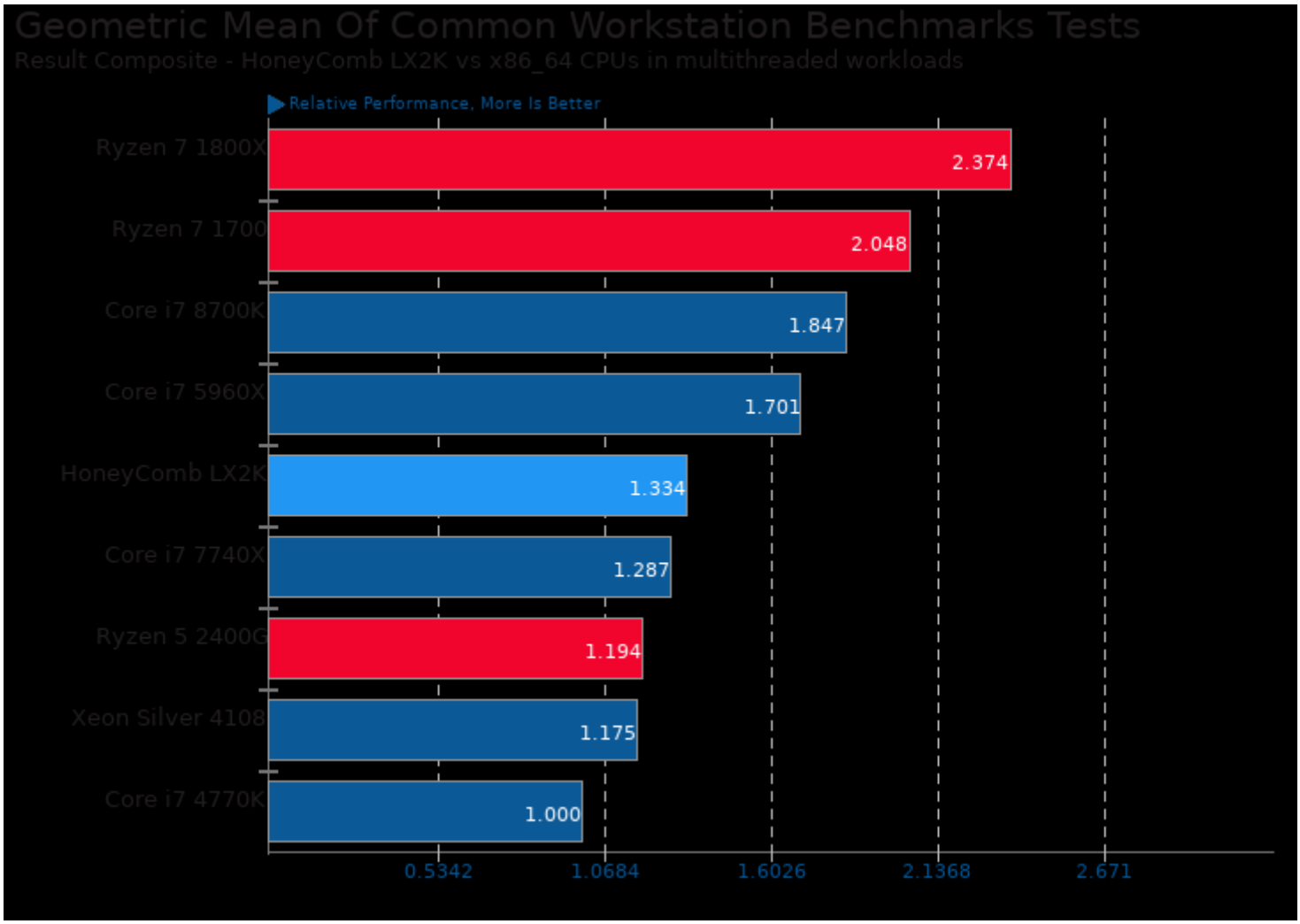

Geometric mean based upon tests: pts/c-ray and pts/povray




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




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




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

*This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 29 March 2024 02:30.*