Phoronix Test Suite

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svt av1 comparison

Intel Core i9-9900K testing with a ASUS PRIME Z390-A (0602 BIOS) and AMD Radeon RX 64 8GB on Ubuntu 18.10 via the Phoronix Test Suite.

Automated Executive Summary

Core i9 7980XE had the most wins, coming in first place for 50% of the tests.

Based on the geometric mean of all complete results, the fastest (Core i9 7980XE) was 1.912x the speed of the slowest (Core i7 7740X). Core i9 9900K was 0.827x the speed of Core i9 7980XE, Threadripper 2990WX was 0.992x the speed of Core i9 9900K, Core i9 7900X was 0.966x the speed of Threadripper 2990WX, EPYC 7351P was 0.746x the speed of Core i9 7900X, Ryzen 7 2700X was 0.993x the speed of EPYC 7351P, Core i7 7740X was 0.891x the speed of Ryzen 7 2700X.

Test Systems:

Core i9 7980XE

Processor: Intel Core i9-7980XE @ 4.20GHz (18 Cores / 36 Threads), Motherboard: ASUS PRIME X299-A (1602 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 16384MB, Disk: Samsung SSD 970 EVO 500GB, Graphics: NVIDIA NV120 12GB, Audio: Realtek ALC1220, Monitor: ASUS PB278, Network: Intel I219-V

OS: Ubuntu 18.10, Kernel: 4.18.0-15-generic (x86_64), Desktop: GNOME Shell 3.30.1, Display Server: X Server 1.20.1, Display Driver: modesetting 1.20.1, OpenGL: 4.3 Mesa 18.2.2, Compiler: GCC 8.2.0, File-System: ext4, Screen Resolution: 2560x1440

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
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline IBPB IBRS_FW STIBP + SSB disabled via prctl and seccomp + PTE Inversion; VMX: conditional cache flushes SMT vulnerable

Threadripper 2990WX

Processor: AMD Ryzen Threadripper 2990WX 32-Core @ 3.00GHz (32 Cores / 64 Threads), Motherboard: ASUS ROG ZENITH EXTREME (1601 BIOS), Chipset: AMD Family 17h, Memory: 32768MB, Disk: Samsung SSD 970 EVO Plus 500GB + Samsung SSD 970 EVO 500GB, Graphics: llvmpipe, Audio: Realtek ALC1220, Network: Intel I211 + Qualcomm Atheros QCA6174 802.11ac + Wilocity Wil6200 802.11ad

OS: Ubuntu 18.04, Kernel: 5.0.0-050000rc6-generic (x86_64) 20190210, Desktop: GNOME Shell 3.28.3, Display Server: X Server 1.19.6, Display Driver: modesetting 1.19.6, OpenGL: 3.3 Mesa 18.0.5 (LLVM 6.0 128 bits), Compiler: GCC 7.3.0, 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
Security Notes: __user pointer sanitization + Full AMD retpoline IBPB: conditional STIBP: disabled RSB filling + SSB disabled via prctl and seccomp

Ryzen 7 2700X

Processor: AMD Ryzen 7 2700X Eight-Core @ 3.70GHz (8 Cores / 16 Threads), Motherboard: ASUS ROG CROSSHAIR VII HERO (WI-FI) (1001 BIOS), Chipset: AMD Family 17h, Memory: 16384MB, Disk: Samsung SSD 970 EVO 250GB, Graphics: Sapphire AMD Radeon RX 470/480/570/570X/580/580X 4GB (1260/1750MHz), Audio: AMD Ellesmere, Monitor: ASUS PB278, Network: Intel I211 + Realtek RTL8822BE 802.11a/b/g/n/ac

OS: Ubuntu 18.10, Kernel: 4.18.0-10-generic (x86_64), Desktop: GNOME Shell 3.30.1, Display Server: X Server 1.20.1, Display Driver: modesetting 1.20.1, OpenGL: 4.5 Mesa 18.2.2 (LLVM 7.0.0), Compiler: GCC 8.2.0, File-System: ext4, Screen Resolution: 2560x1440

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
Security Notes: __user pointer sanitization + Full AMD retpoline IBPB + SSB disabled via prctl and seccomp

Core i7 7740X

Processor: Intel Core i7-7740K @ 4.50GHz (4 Cores / 8 Threads), Motherboard: Gigabyte X299 AORUS Gaming-CF (F2d BIOS), Chipset: Intel Kaby Lake, Memory: 8192MB, Disk: 120GB Force MP500, Graphics: MSI NVIDIA GP108

2GB, Audio: Realtek ALC1220, Network: Intel I219-V

OS: Ubuntu 18.04, Kernel: 4.20.0-999-generic (x86_64) 20181202, Desktop: GNOME Shell 3.28.1, Display Server: X Server 1.19.5, Display Driver: modesetting 1.19.5, Compiler: GCC 7.3.0, File-System: ext4

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-as=/usr/bin/x86_64-linux-gnu-as --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-ld=/usr/bin/x86_64-linux-gnu-ld --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling + SSB disabled via prctl and seccomp + PTE Inversion; VMX: conditional cache flushes SMT vulnerable

EPYC 7351P

Processor: AMD EPYC 7351P 16-Core @ 2.40GHz (16 Cores / 32 Threads), Motherboard: ASRockRack EPYCD8-2T (P1.20 BIOS), Chipset: AMD Family 17h, Memory: 32768MB, Disk: 800GB INTEL SSDPE2ME800G4, Graphics: NVIDIA GeForce GTX 750 Ti 2GB, Audio: NVIDIA Device 0fbc, Monitor: DELL P2415Q, Network: Mellanox MT26448 + 2 x Intel 10G X550T

OS: Ubuntu 18.10, Kernel: 4.18.0-15-generic (x86_64), Desktop: GNOME Shell 3.30.1, Display Server: X Server 1.20.1, Display Driver: modesetting 1.20.1, OpenGL: 4.3 Mesa 18.2.2, Compiler: GCC 8.2.0, 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
Security Notes: __user pointer sanitization + Full AMD retpoline IBPB + SSB disabled via prctl and seccomp

Core i9 7900X

Processor: Intel Core i7-7900X @ 4.50GHz (10 Cores / 20 Threads), Motherboard: ASRock X299 Extreme4 (P1.30 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 16384MB, Disk: 120GB Force MP500, Graphics: Zotac NVIDIA GeForce GT 610 1GB, Audio: Realtek ALC1220, Network: Intel I219-V

OS: Ubuntu 18.10, Kernel: 4.18.0-15-generic (x86_64), Desktop: GNOME Shell 3.30.1, Display Server: X Server 1.20.1, Display Driver: modesetting 1.20.1, Compiler: GCC 9.0.1 20190214, File-System: ext4

Compiler Notes: --disable-multilib --enable-checking=release --enable-languages=c,c++,fortran
Processor Notes: Scaling Governor: intel_pstate powersave
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline IBPB IBRS_FW STIBP + SSB disabled via prctl and seccomp + PTE Inversion; VMX: conditional cache flushes SMT vulnerable

Core i9 9900K

Processor: Intel Core i9-9900K @ 5.00GHz (8 Cores / 16 Threads), Motherboard: ASUS PRIME Z390-A (0602 BIOS), Chipset: Intel Cannon Lake PCH Shared SRAM, Memory: 16384MB, Disk: Samsung SSD 970 EVO 250GB + 2000GB SABRENT, Graphics: AMD Radeon RX 64 8GB (1630/945MHz), Audio: Realtek ALC1220, Monitor: Acer B286HK, Network: Intel I219-V

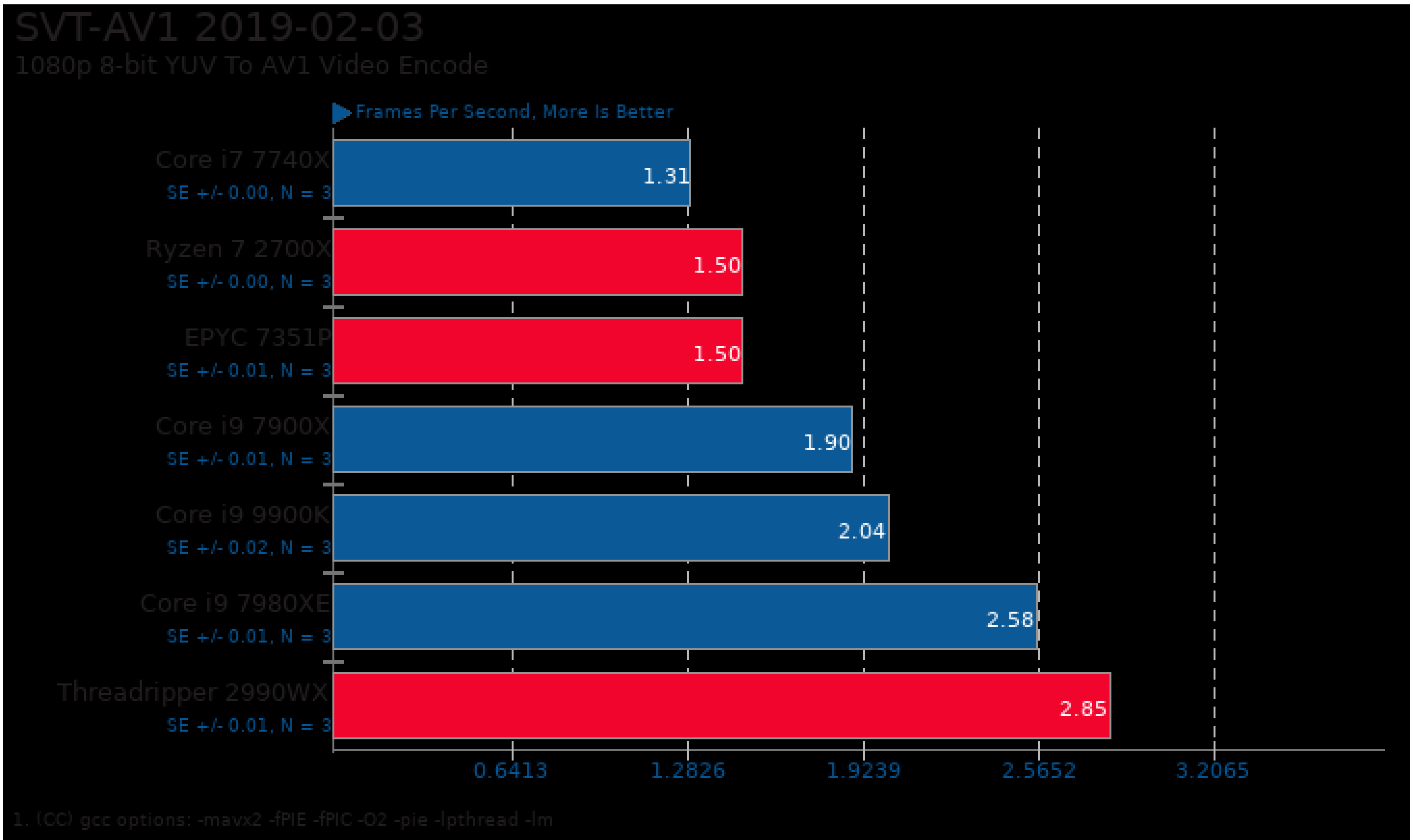
OS: Ubuntu 18.10, Kernel: 5.0.0-rc1-phx-amd-stg-next (x86_64) 20190214, Desktop: GNOME Shell 3.30.1, Display Server: X Server 1.20.1, Display Driver: modesetting 1.20.1, OpenGL: 4.5 Mesa 19.1.0-devel (git-7ed5ffa158) (LLVM 9.0.0), Vulkan: 1.1.90, Compiler: GCC 8.2.0, File-System: ext4, Screen Resolution: 3840x2160

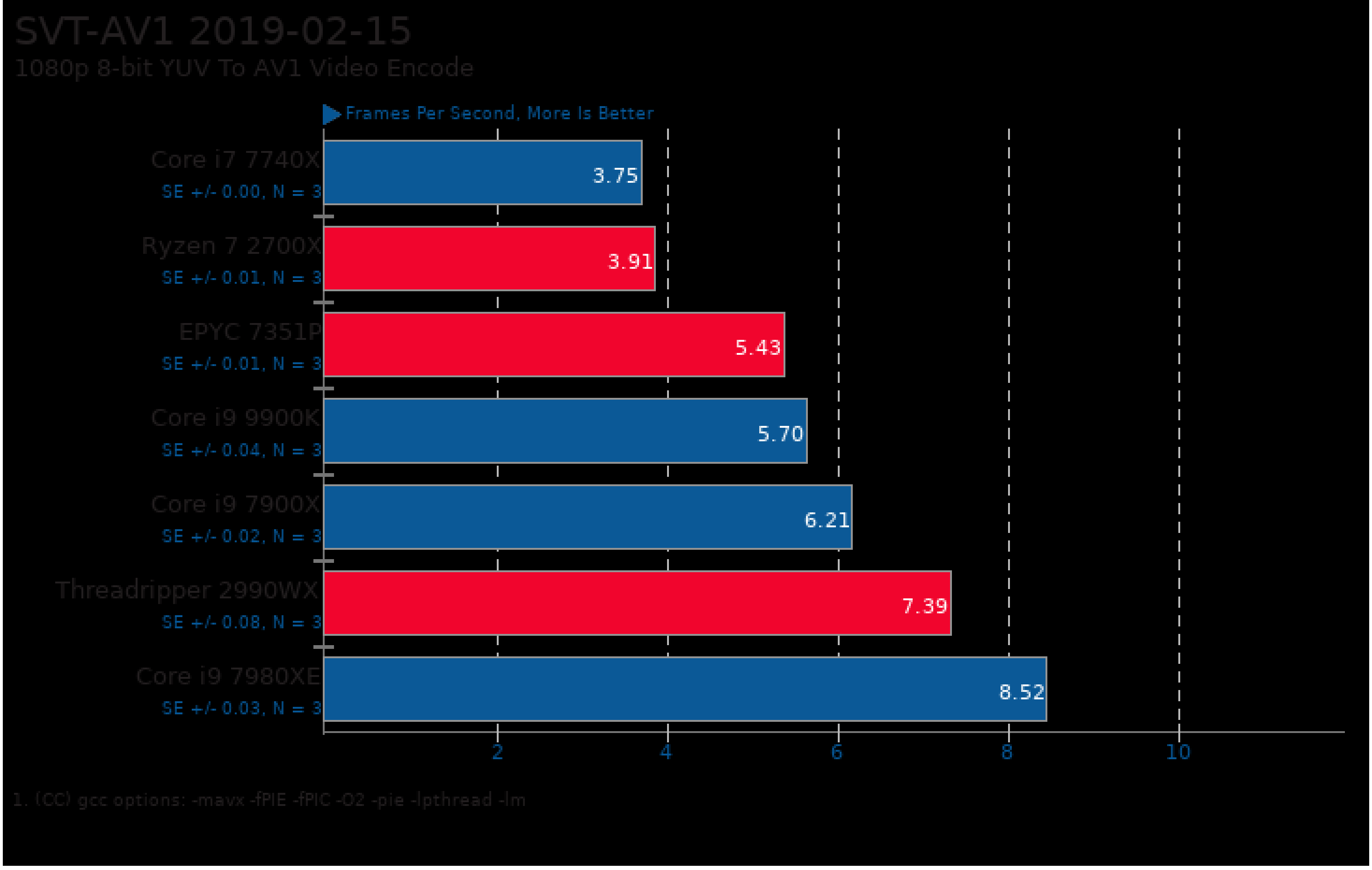
svt av1 comparison

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
Security Notes: __user pointer sanitization + Full generic retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling + SSB disabled via prctl and seccomp

	Core i9 7980XE	Threadripper 2990WX	Ryzen 7 2700X	Core i7 7740X	EPYC 7351P	Core i9 7900X	Core i9 9900K
SVT-AV1 - 1.8.b.Y.T.A.V.E (FPS)	2.58	**2.85**	1.50	**1.31**	1.50	1.90	2.04
Normalized	90.53%	100%	52.63%	45.96%	52.63%	66.67%	71.58%
Standard Deviation	0.4%	0.4%	0%	0.4%	0.7%	0.9%	1.5%
SVT-AV1 - 1.8.b.Y.T.A.V.E (FPS)	**8.52**	7.39	3.91	**3.75**	5.43	6.21	5.70
Normalized	100%	86.74%	45.89%	44.01%	63.73%	72.89%	66.9%
Standard Deviation	0.5%	1.8%	0.3%	0.2%	0.4%	0.6%	1.1%
SVT-HEVC - 1.8.b.Y.T.H.V.E (FPS)	**308**	169	151	**108**	160	208	207
Normalized	100%	54.87%	49.03%	35.06%	51.95%	67.53%	67.21%
Standard Deviation	2.1%	2.2%	0.9%	0.9%	1.5%	1.7%	0.4%
AOM AV1 - AV1 Video Encoding (FPS)	0.22	0.19	0.20	0.21	**0.14**	0.24	**0.29**
Normalized	75.86%	65.52%	68.97%	72.41%	48.28%	82.76%	100%
Standard Deviation	0%	0%	0%	0%	0%	0%	0%
dav1d - Summer Nature 4K (sec)	**26.57**		35.96		**39.54**		27.41
Normalized	100%		73.89%		67.2%		96.94%
Standard Deviation	0.4%		0.2%		1.8%		2.3%
dav1d - S.N.1 (sec)	13.74		12.58		**14.81**		**8.23**
Normalized	59.9%		65.42%		55.57%		100%
Standard Deviation	0.7%		0.2%		0.2%		1.6%

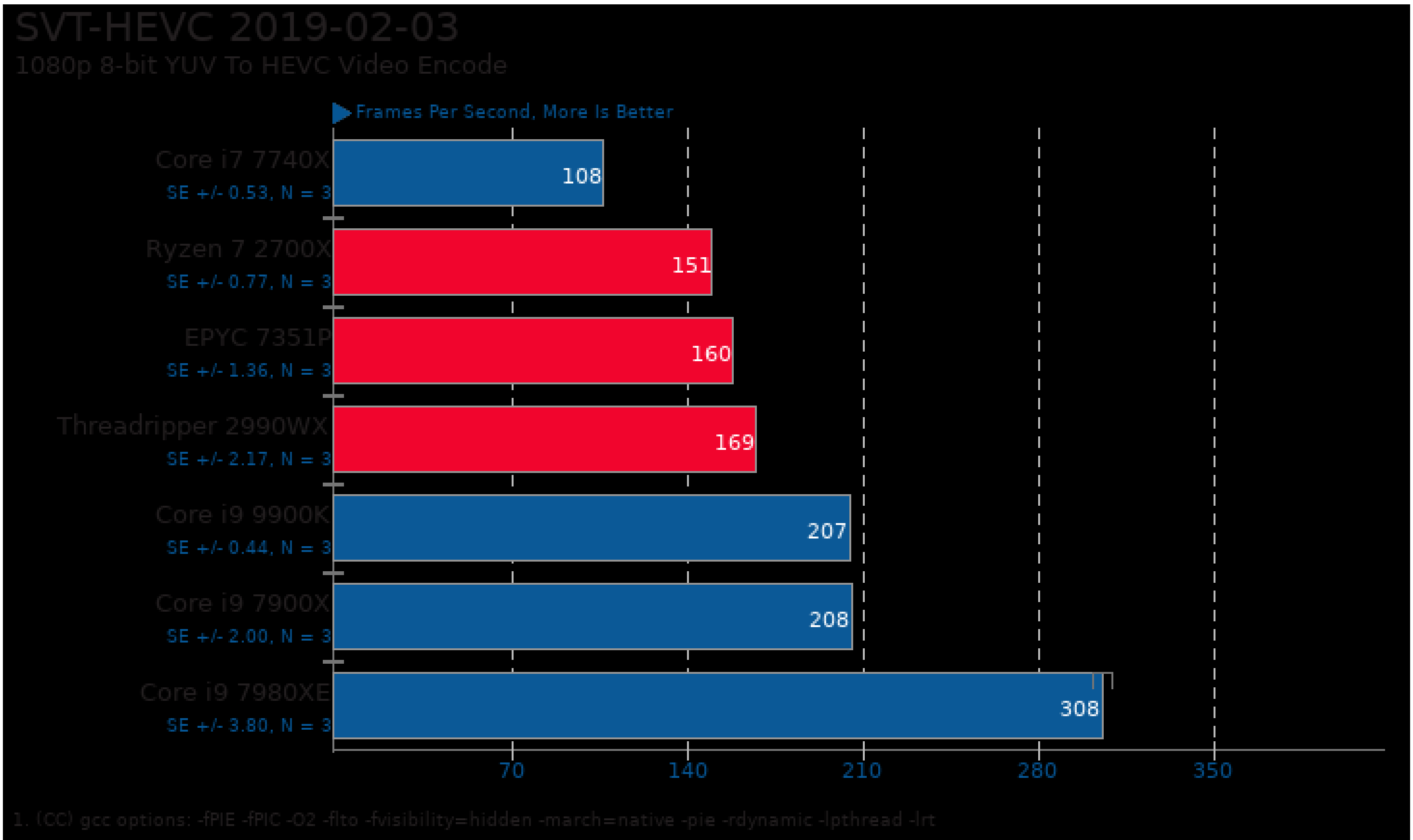
svt av1 comparison

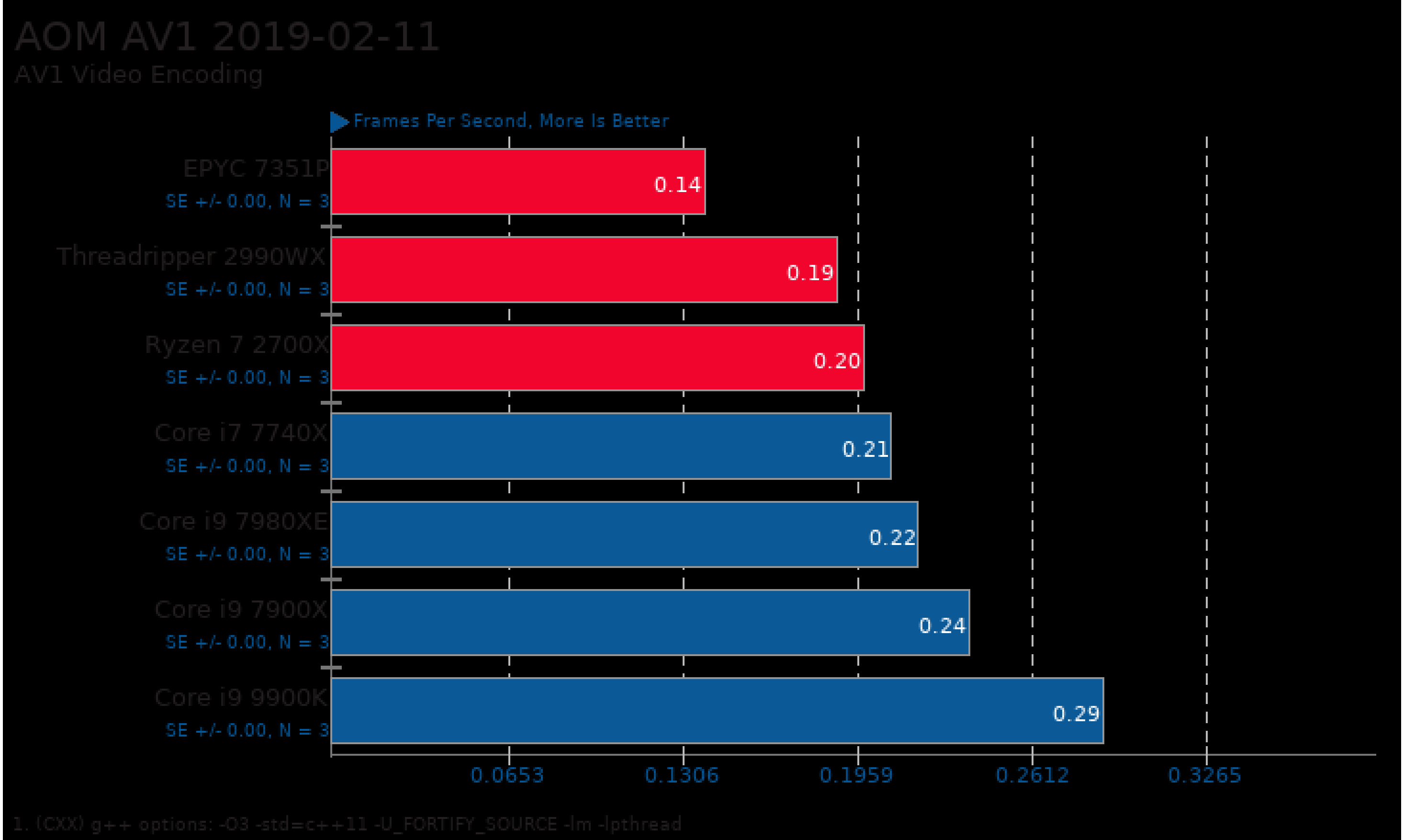




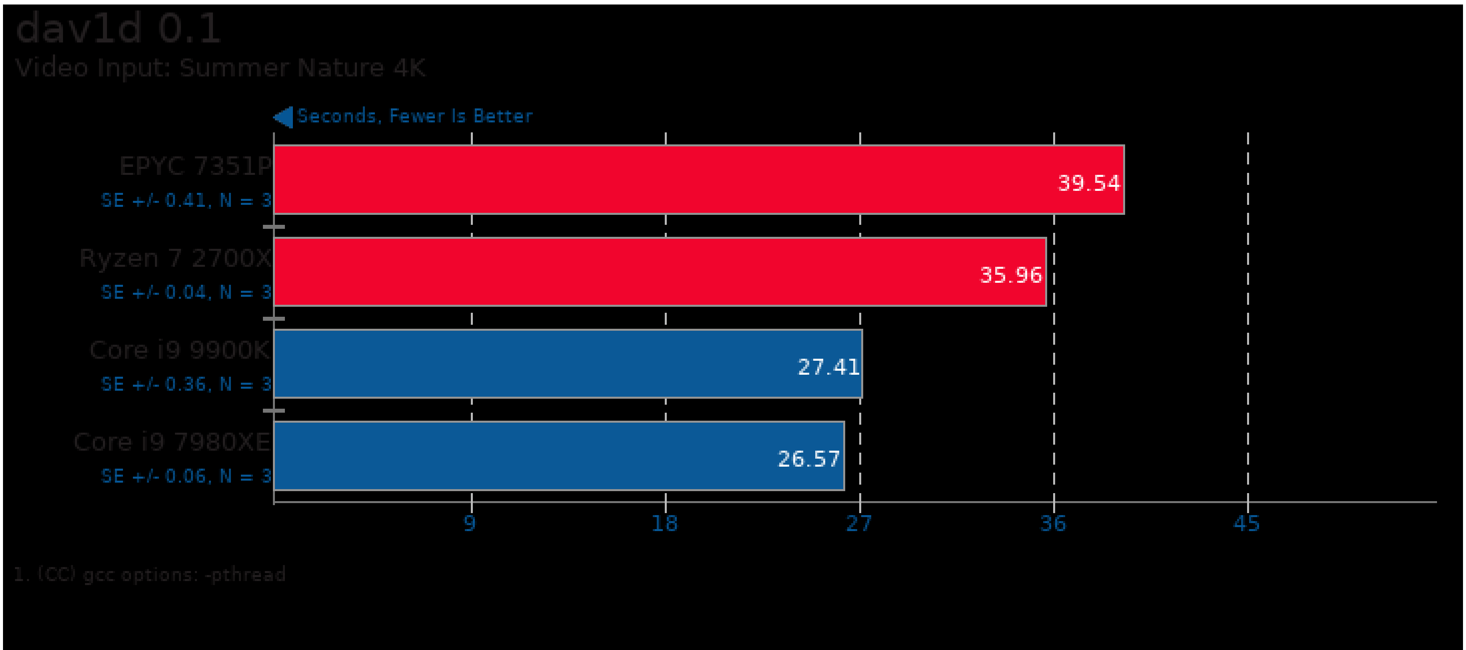
![pts Phoronix Test Suite]

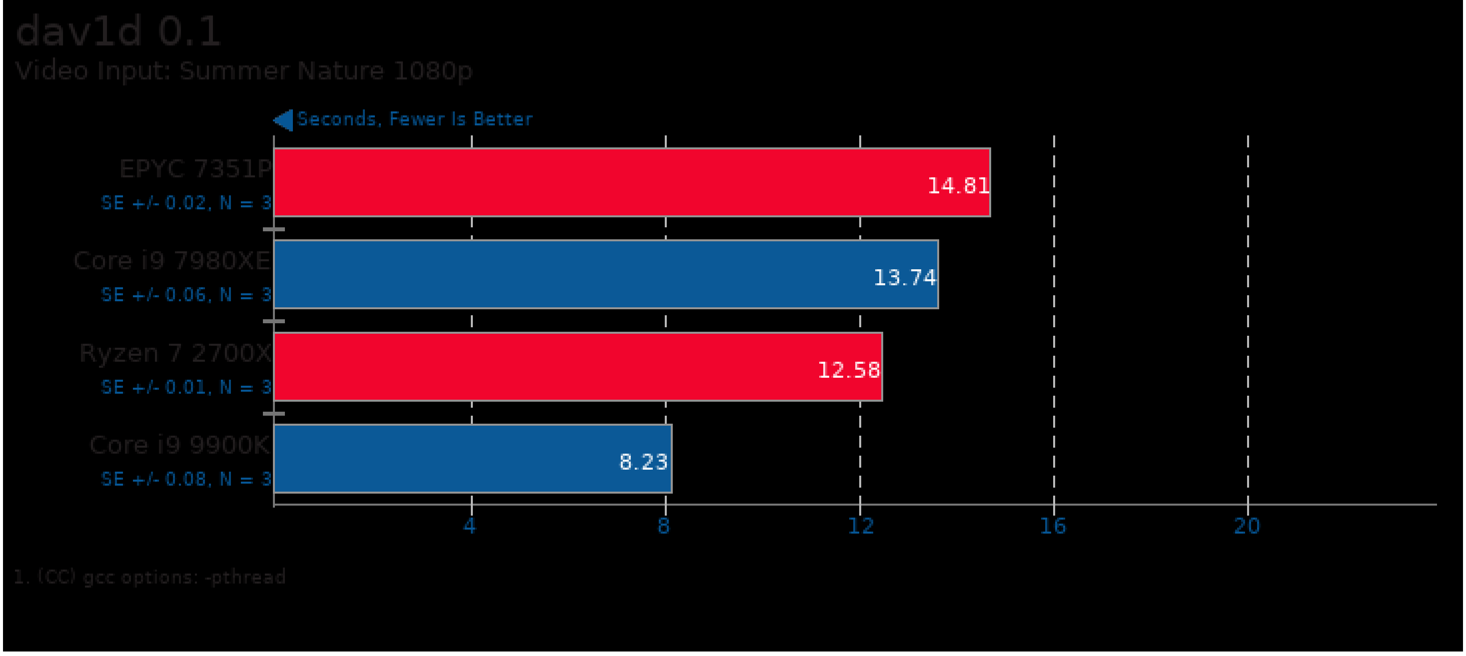
svt av1 comparison





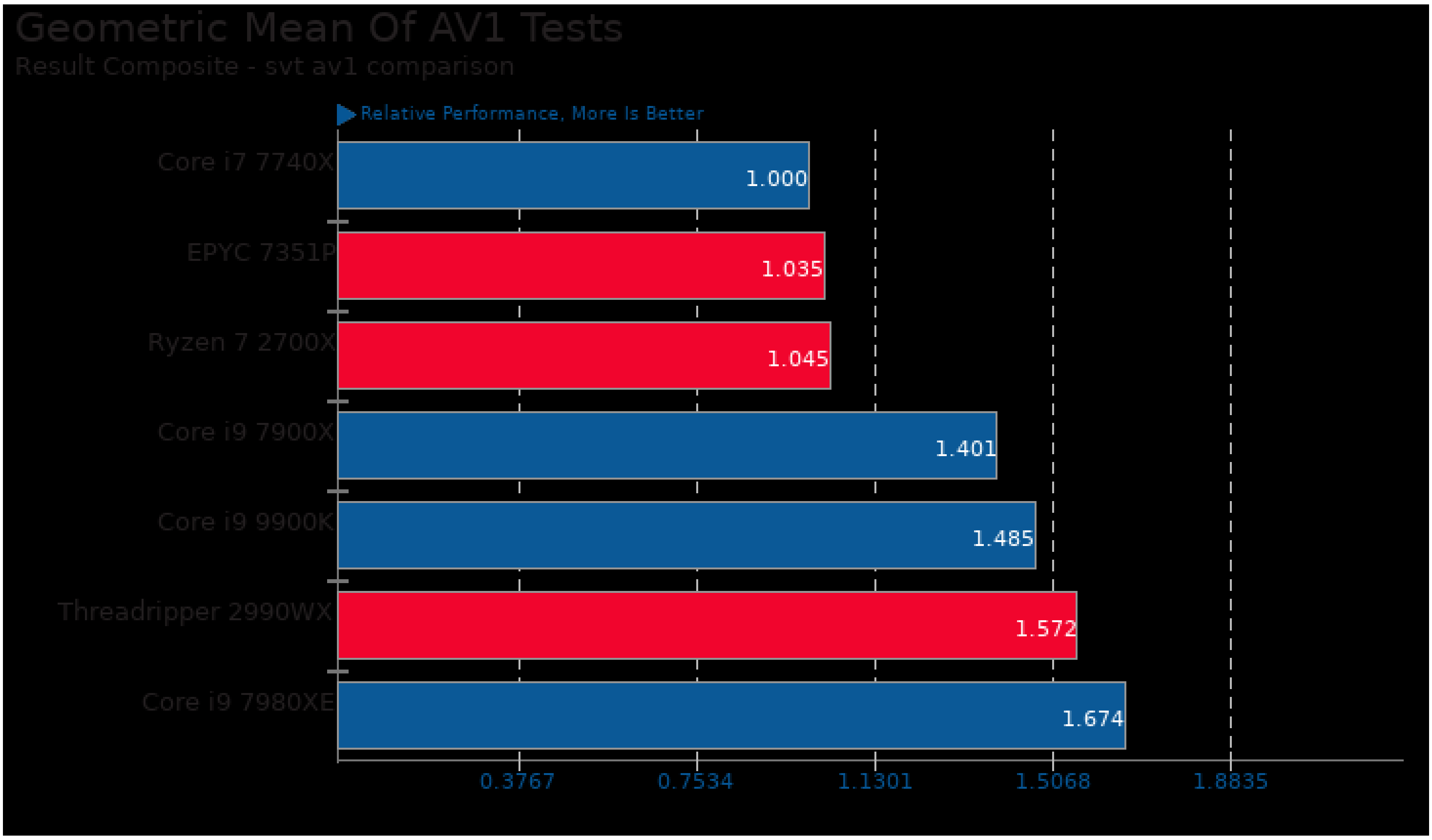
svt av1 comparison





svt av1 comparison

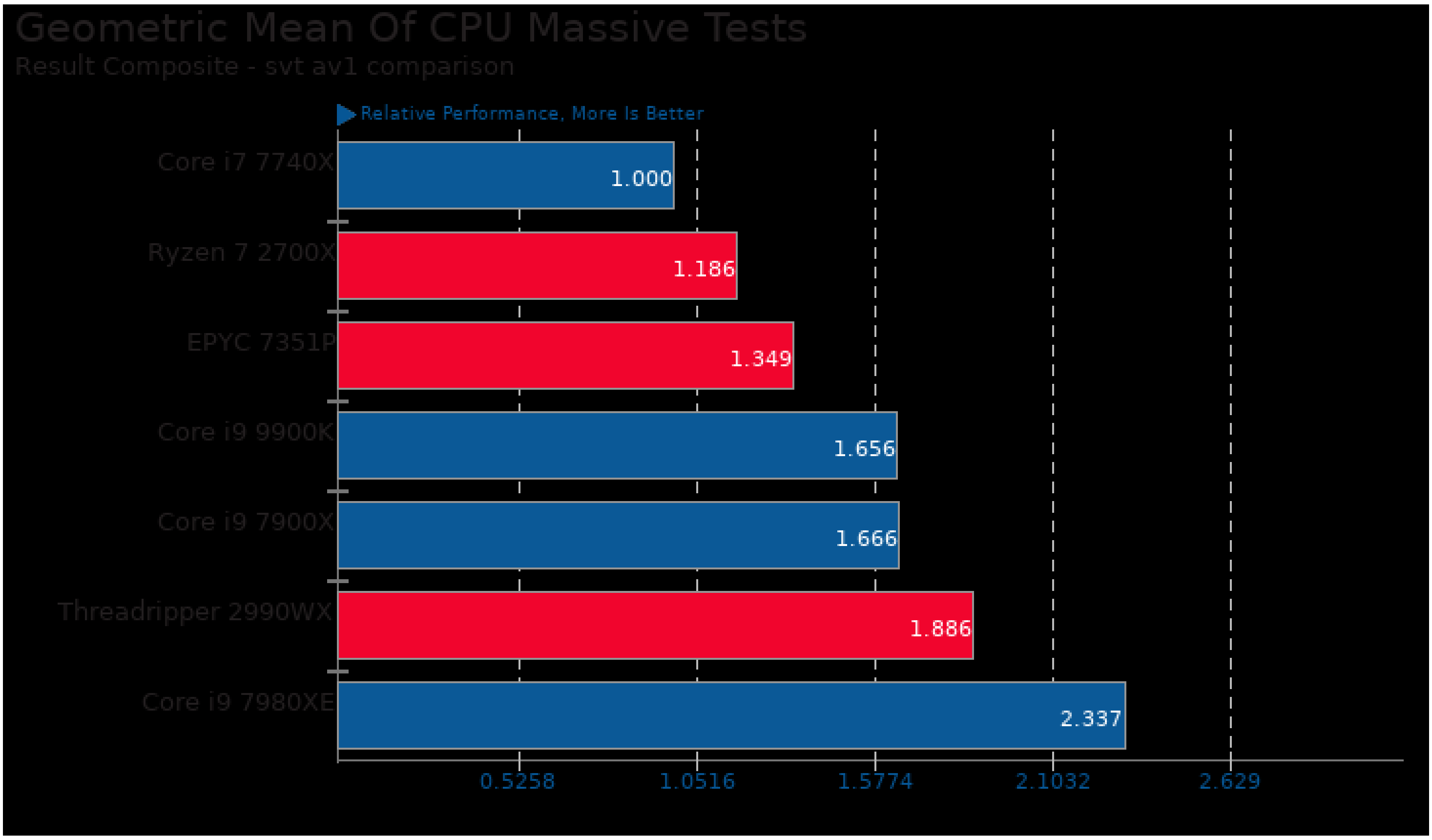
These geometric means are based upon test groupings / test suites for this result file.



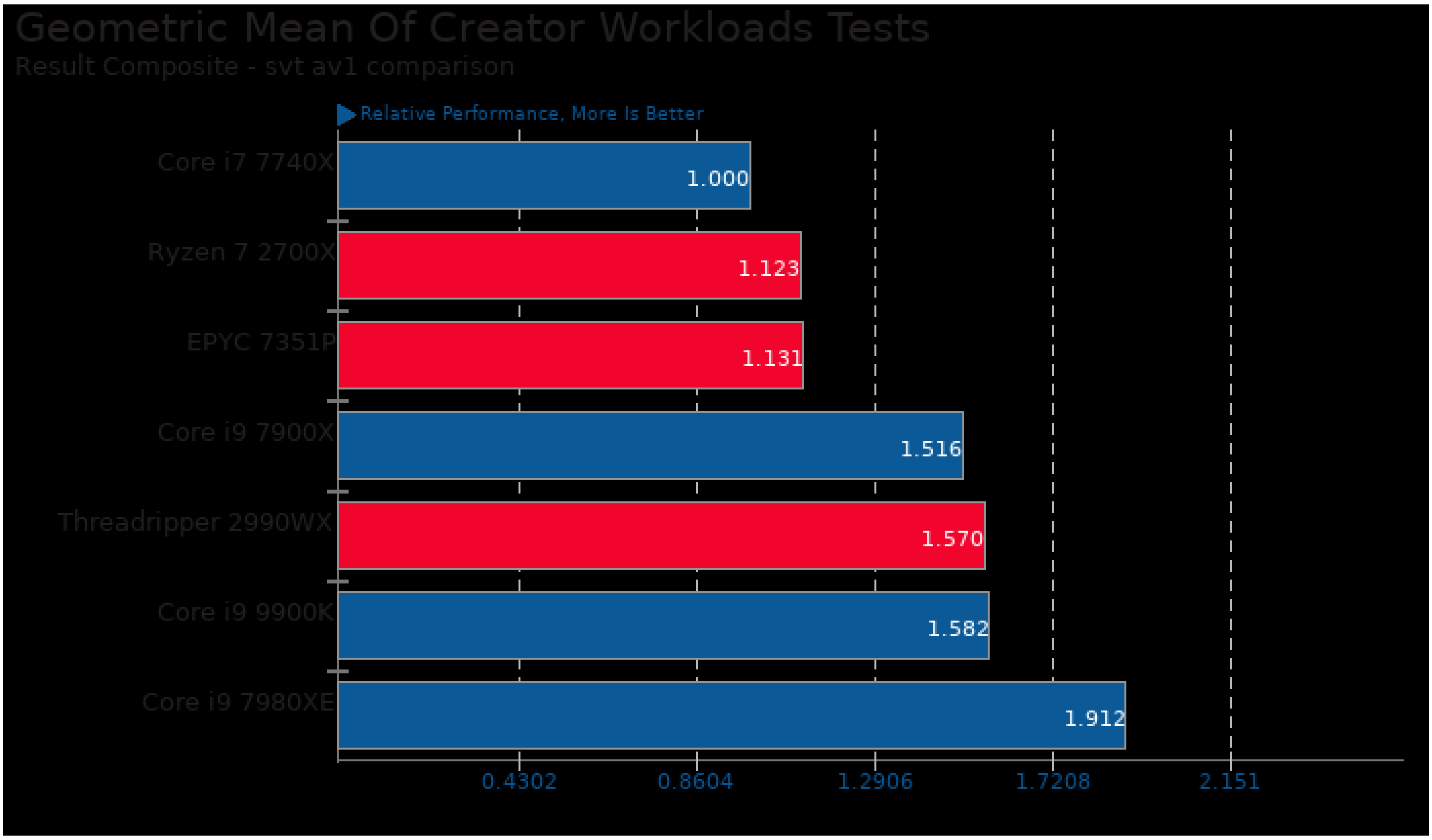
Geometric mean based upon tests: pts/dav1d, pts/aom-av1 and pts/svt-av1

svt av1 comparison

Geometric mean based upon tests: pts/dav1d, pts/aom-av1 and pts/svt-av1

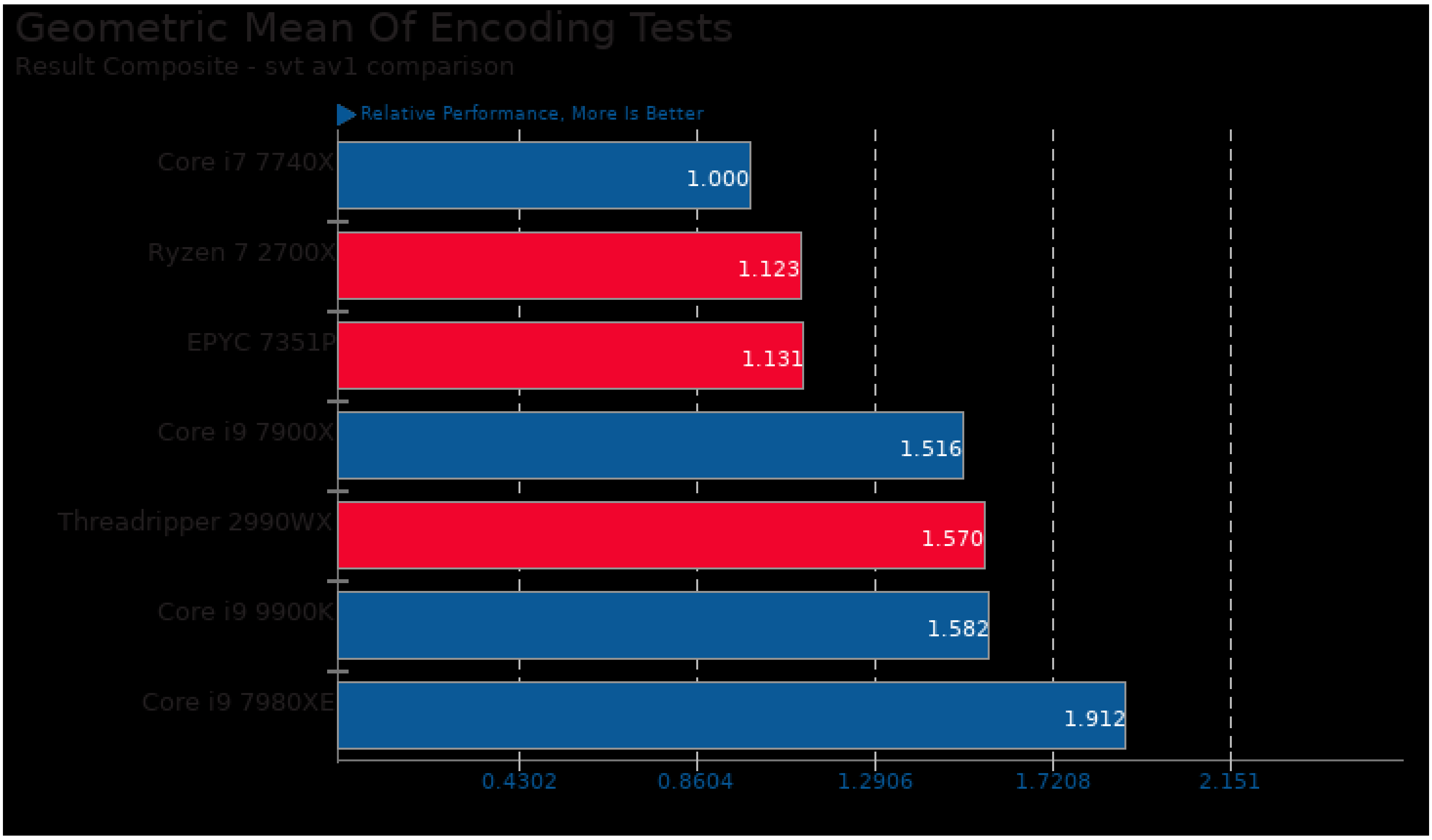


Geometric mean based upon tests: pts/dav1d, pts/svt-av1 and pts/svt-hevc



svt av1 comparison

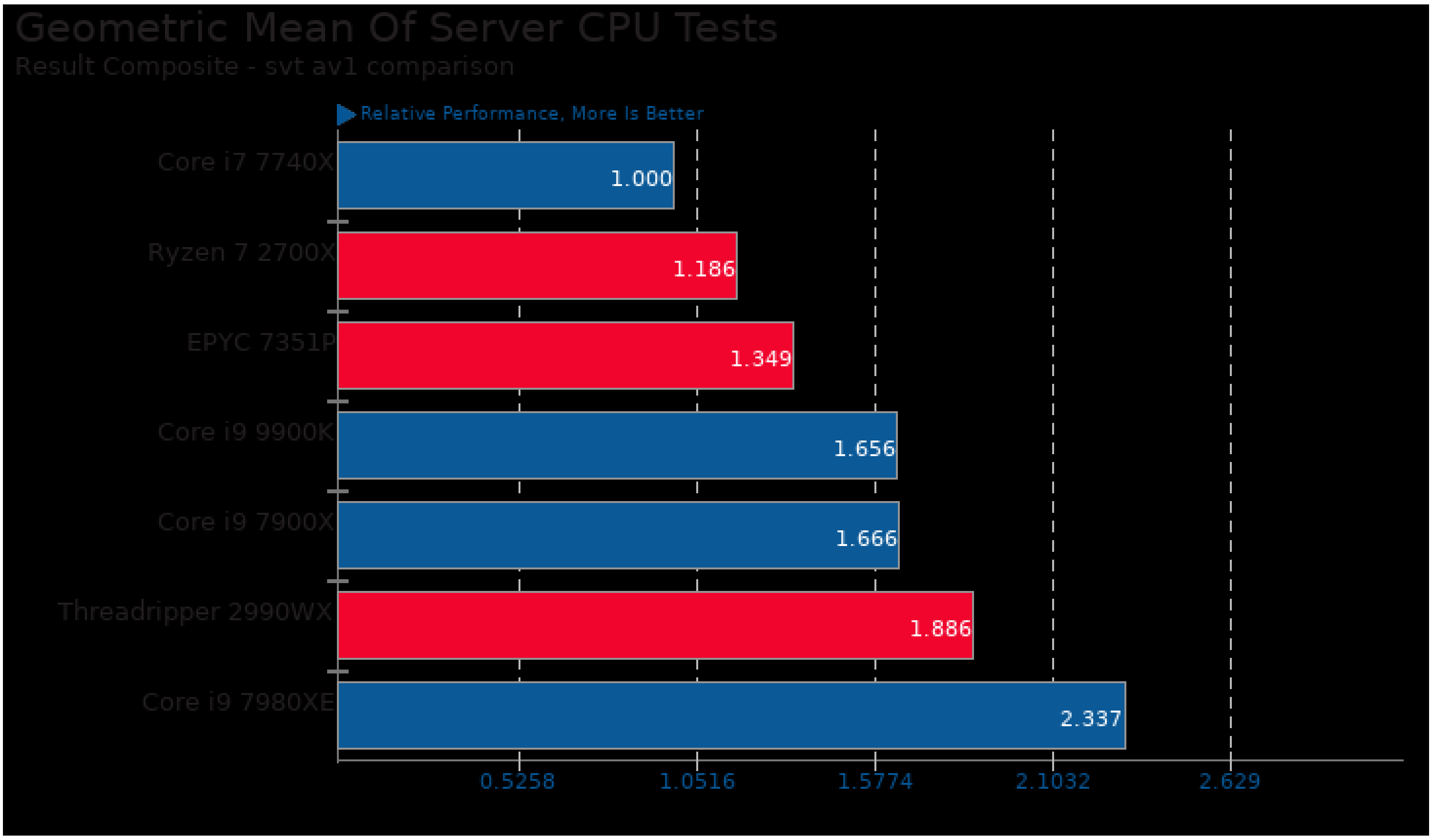
Geometric mean based upon tests: pts/svt-hevc, pts/dav1d, pts/aom-av1 and pts/svt-av1



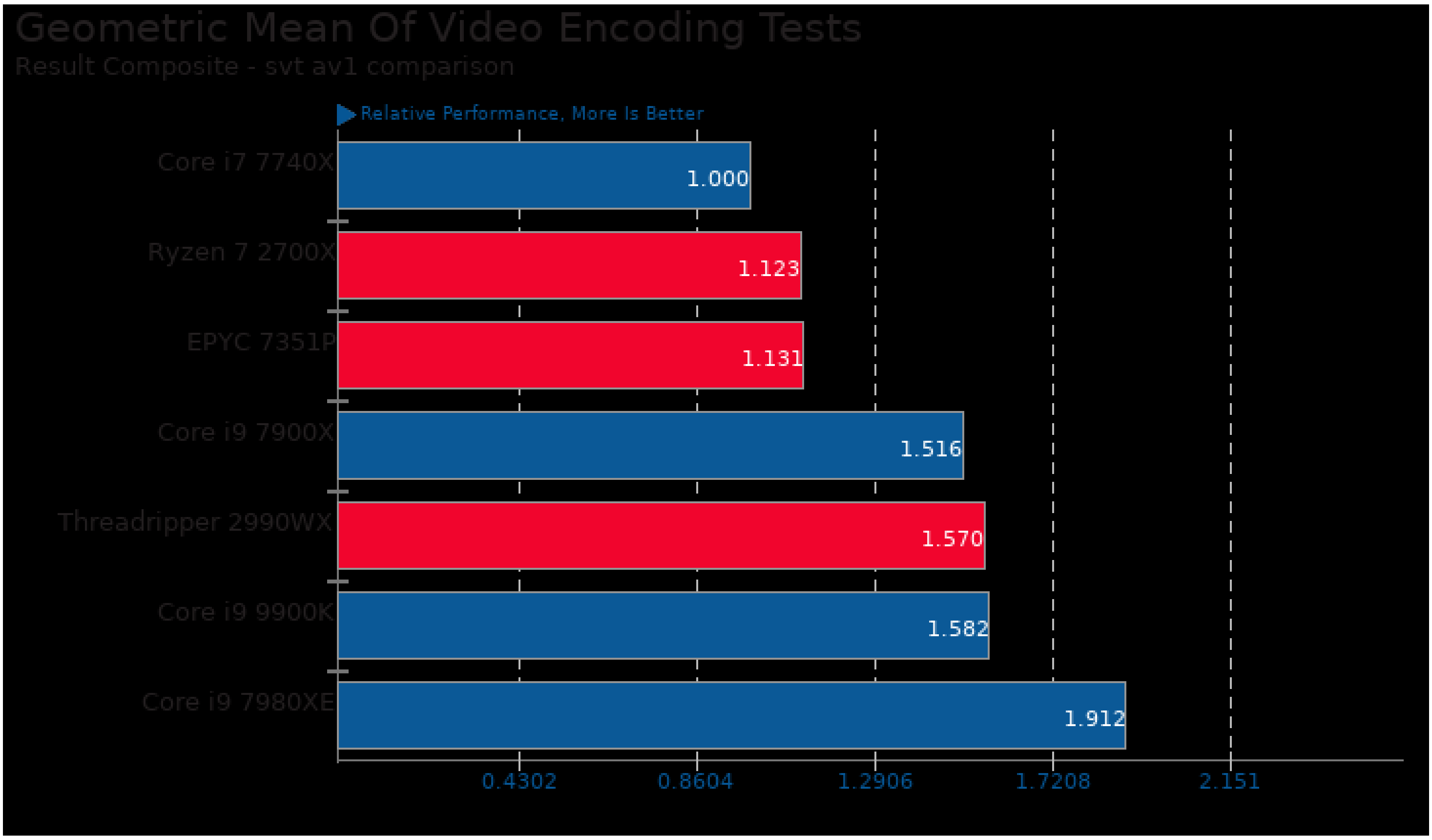
Geometric mean based upon tests: pts/svt-hevc, pts/dav1d, pts/aom-av1 and pts/svt-av1

svt av1 comparison

Geometric mean based upon tests: pts/svt-hevc, pts/dav1d, pts/aom-av1 and pts/svt-av1



Geometric mean based upon tests: pts/svt-av1, pts/svt-hevc and pts/dav1d



Geometric mean based upon tests: pts/svt-hevc, pts/dav1d, pts/aom-av1 and pts/svt-av1

This file was automatically generated via the Phoronix Test Suite benchmarking software on Wednesday, 22 March 2023 16:40.