Phoronix Test Suite

www.phoronix-test-suite.com

Raspberry Pi 4

ARMv7 Cortex-A72 testing on Raspbian 10 via the Phoronix Test Suite.

Automated Executive Summary

1.900 GHz had the most wins, coming in first place for 83% of the tests.

Based on the geometric mean of all complete results, the fastest (1.900 GHz) was 1.201x the speed of the slowest (Stock speed). 1.850 GHz was 0.983x the speed of 1.900 GHz, 1.750 GHz was 0.952x the speed of 1.850 GHz, Stock speed was 0.889x the speed of 1.750 GHz.

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

PHPBench (PHP Benchmark Suite) at 1.271x
LAME MP3 Encoding (WAV To MP3) at 1.264x
Rust Prime Benchmark (Prime Number Test To 200,000,000) at 1.263x
Smallpt (Global Illumination Renderer; 128 Samples) at 1.26x
PyBench (Total For Average Test Times) at 1.254x
Perl Benchmarks (Test: Pod2html) at 1.248x
NGINX Benchmark (Static Web Page Serving) at 1.234x
x264 (H.264 Video Encoding) at 1.233x
SciMark (Computational Test: Composite) at 1.217x

FLAC Audio Encoding (WAV To FLAC) at 1.215x.

Test Systems:

Stock speed

Processor: ARMv7 Cortex-A72 @ 1.50GHz (4 Cores), Motherboard: BCM2711 Raspberry Pi 4 Model B Rev 1.2, Memory: 4096MB, Disk: 32GB EB1QT

OS: Raspbian 10, Kernel: 5.10.11-v7l+ (armv7l), Compiler: GCC 8.3.0, File-System: ext4

Kernel Notes: snd_bcm2835.enable_compat_alsa=0 snd_bcm2835.enable_hdmi=1
Compiler Notes: --build=arm-linux-gnueabihf --disable-libitm --disable-libquadmath --disable-libquadmath-support --disable-sjlj-exceptions --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --program-prefix=arm-linux-gnueabihf- --target=arm-linux-gnueabihf --with-arch=armv6 --with-default-libstdcxx-abi=new --with-float=hard --with-fpu=vfp --with-gcc-major-version-only --with-target-system-zlib -v
Processor Notes: Scaling Governor: cpufreq-dt ondemand
Python Notes: Python 2.7.16 + Python 3.7.3

1.750 GHz

Processor: ARMv7 Cortex-A72 @ 1.80GHz (4 Cores), Motherboard: BCM2711 Raspberry Pi 4 Model B Rev 1.2, Memory: 4096MB, Disk: 32GB EB1QT

OS: Raspbian 10, Kernel: 5.10.11-v7l+ (armv7l), Compiler: GCC 8.3.0, File-System: ext4

Kernel Notes: snd_bcm2835.enable_compat_alsa=0 snd_bcm2835.enable_hdmi=1
Compiler Notes: --build=arm-linux-gnueabihf --disable-libitm --disable-libquadmath --disable-libquadmath-support --disable-sjlj-exceptions --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --program-prefix=arm-linux-gnueabihf- --target=arm-linux-gnueabihf --with-arch=armv6 --with-default-libstdcxx-abi=new --with-float=hard --with-fpu=vfp --with-gcc-major-version-only --with-target-system-zlib -v
Processor Notes: Scaling Governor: cpufreq-dt ondemand
Python Notes: Python 2.7.16 + Python 3.7.3

1.850 GHz

1.900 GHz

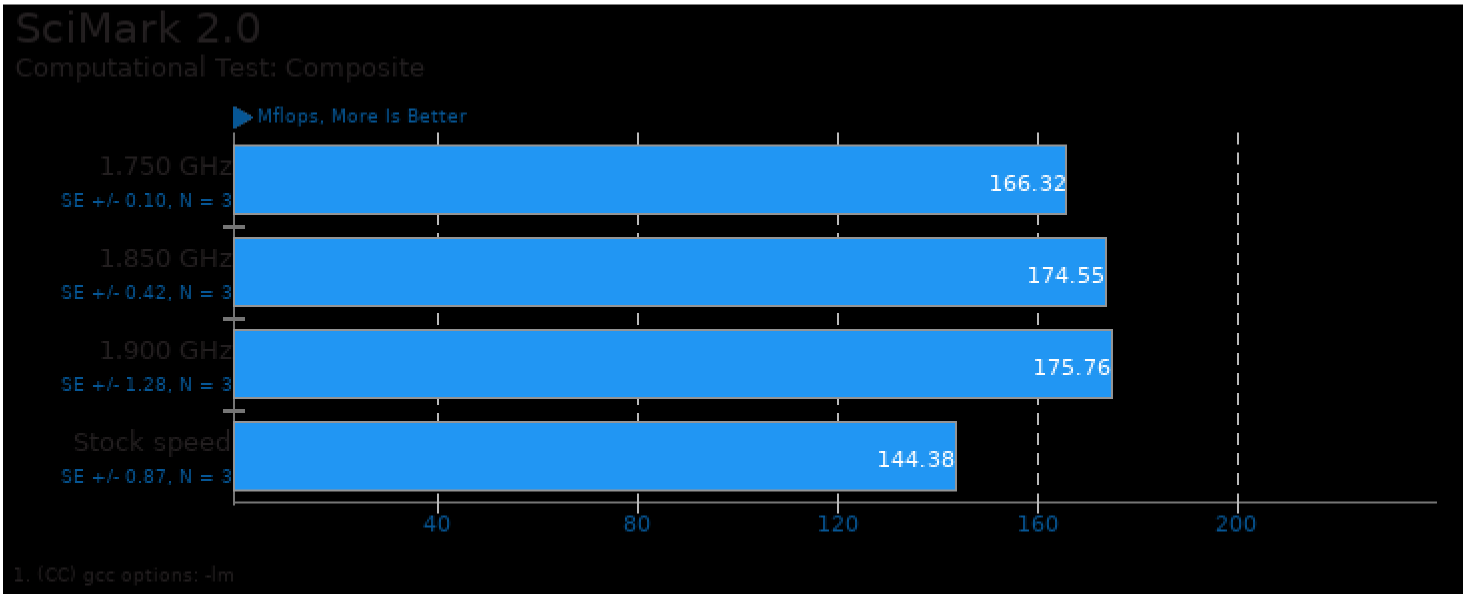
Processor: ARMv7 Cortex-A72 @ 1.90GHz (4 Cores), Motherboard: BCM2711 Raspberry Pi 4 Model B Rev 1.2, Memory: 4096MB, Disk: 32GB EB1QT

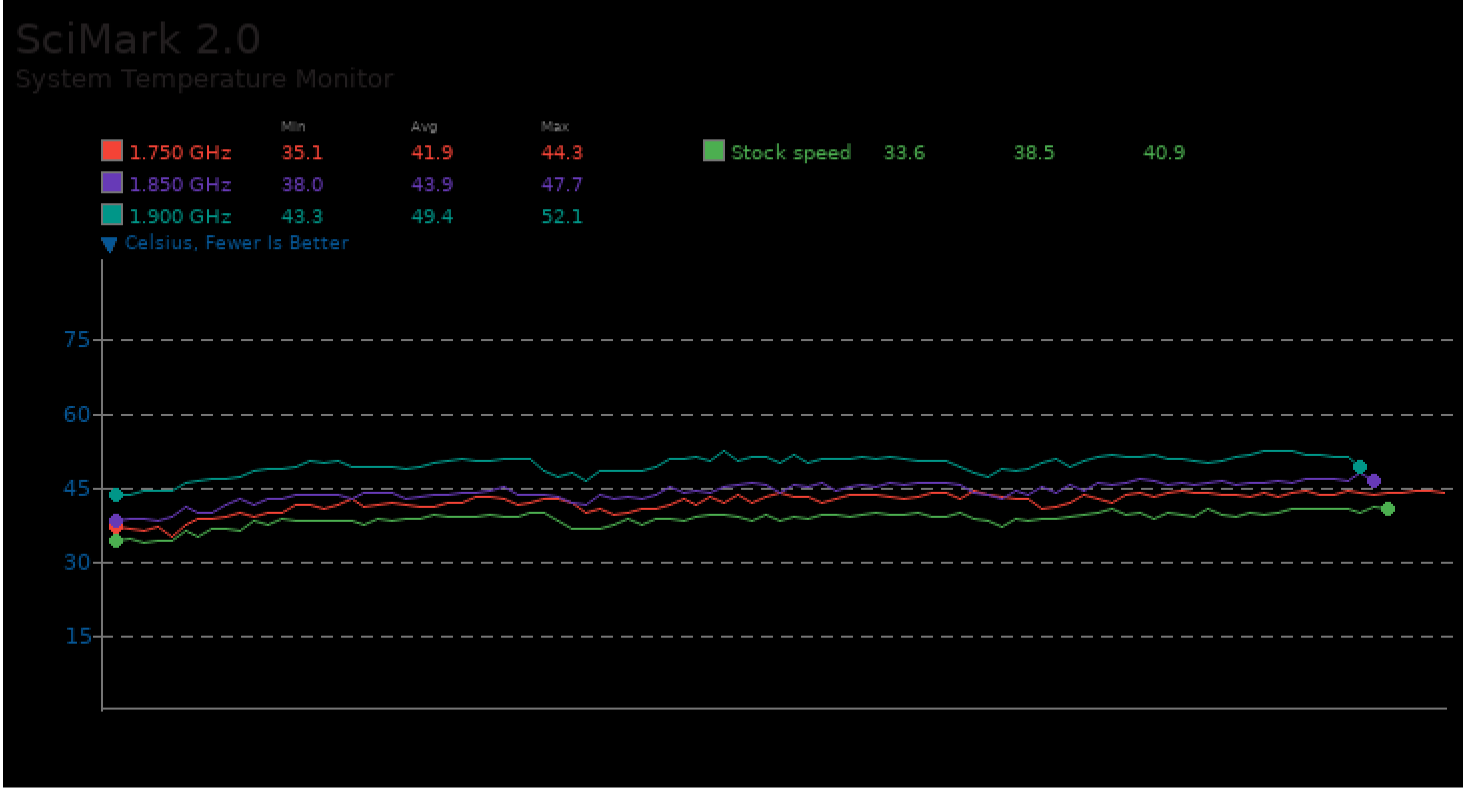
OS: Raspbian 10, Kernel: 5.10.11-v7l+ (armv7l), Compiler: GCC 8.3.0, File-System: ext4

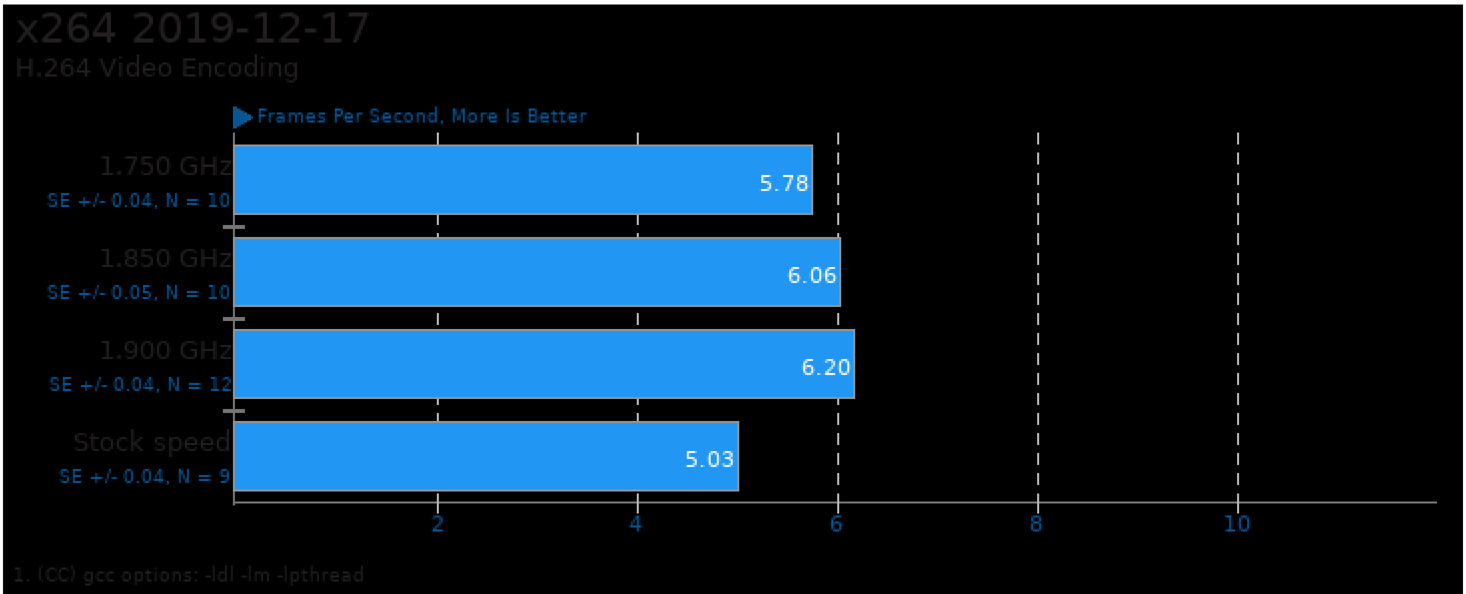
Kernel Notes: snd_bcm2835.enable_compat_alsa=0 snd_bcm2835.enable_hdmi=1
Compiler Notes: --build=arm-linux-gnueabihf --disable-libitm --disable-libquadmath --disable-libquadmath-support --disable-sjlj-exceptions --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --program-prefix=arm-linux-gnueabihf- --target=arm-linux-gnueabihf --with-arch=armv6 --with-default-libstdcxx-abi=new --with-float=hard --with-fpu=vfp --with-gcc-major-version-only --with-target-system-zlib -v
Processor Notes: Scaling Governor: cpufreq-dt ondemand
Python Notes: Python 2.7.16 + Python 3.7.3

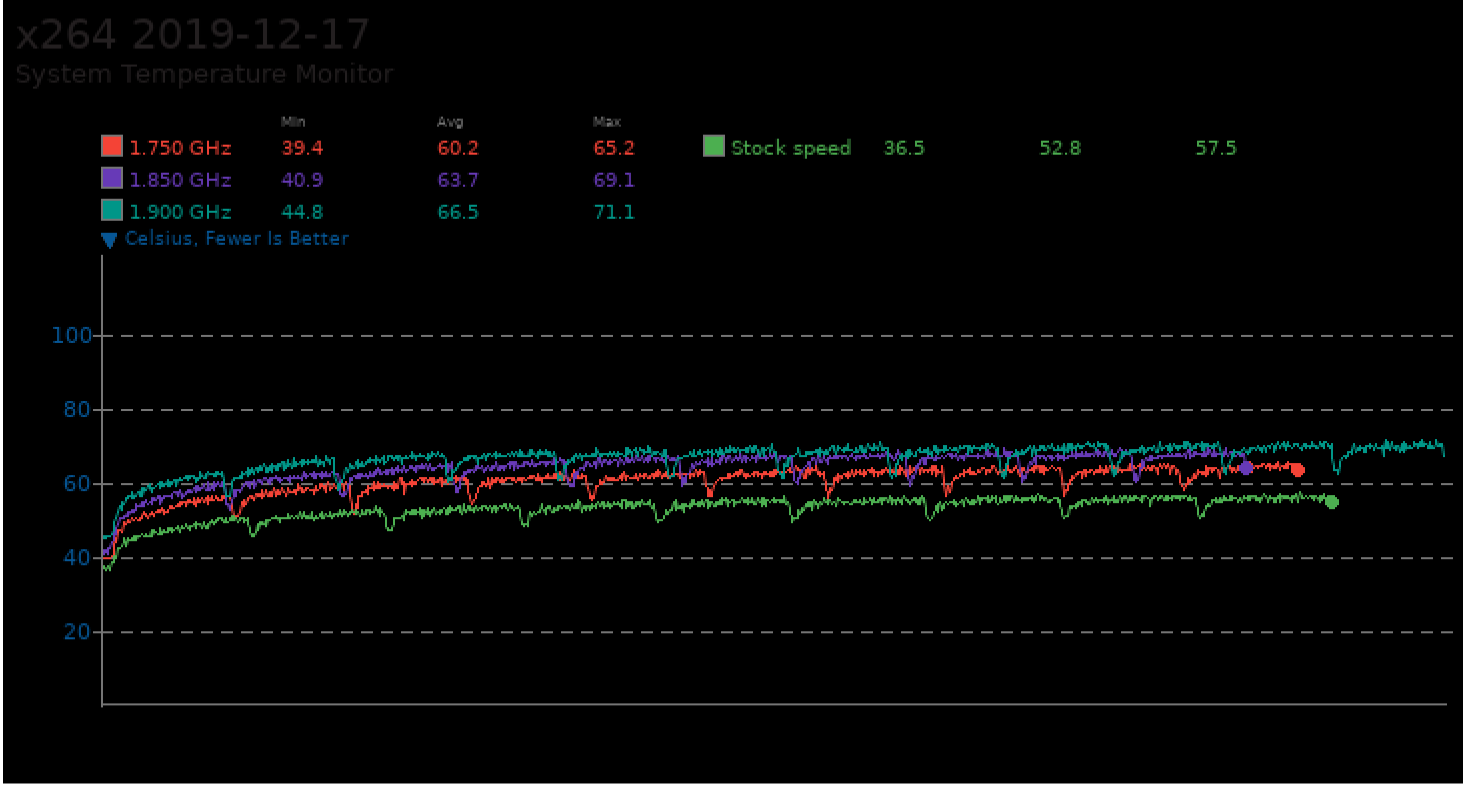
Raspberry Pi 4

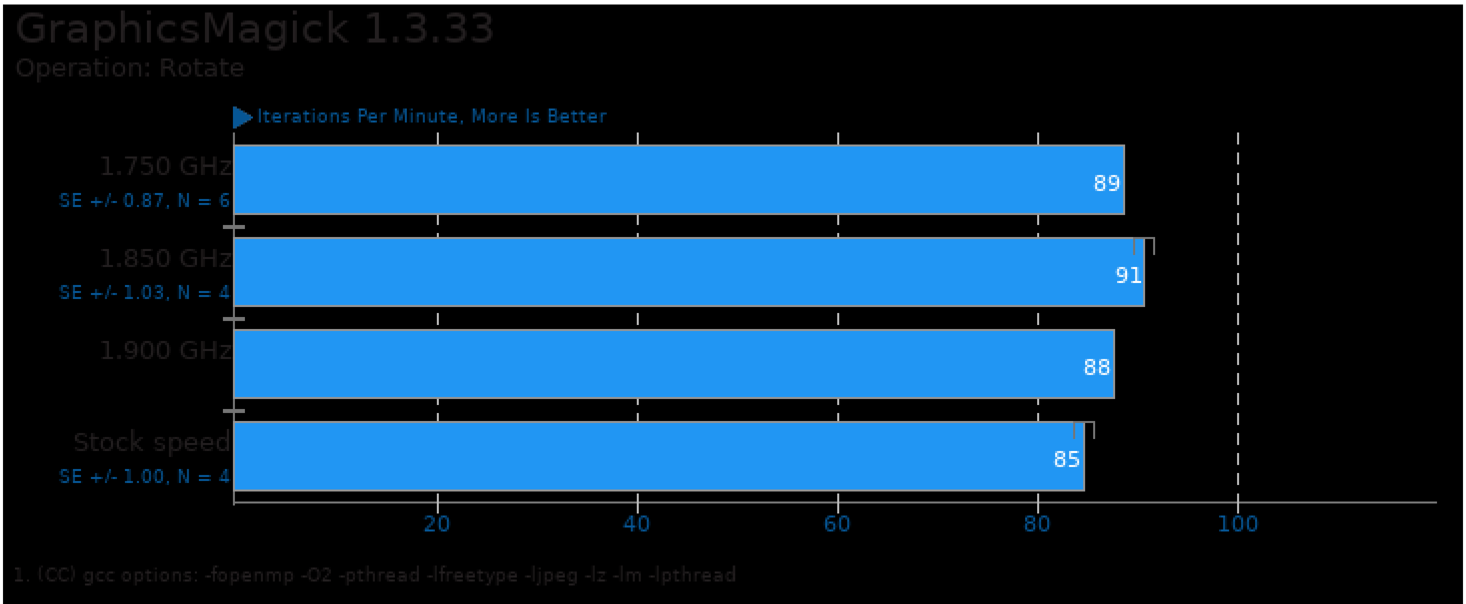
	Stock speed	1.750 GHz	1.850 GHz	1.900 GHz
SciMark - Composite (Mflops)	144.38	166.32	174.55	175.76
Normalized	82.15%	94.63%	99.31%	100%
Standard Deviation	1%	0.1%	0.4%	1.3%
x264 - H.2.V.E (FPS)	5.03	5.78	6.06	6.20
Normalized	81.13%	93.23%	97.74%	100%
Standard Deviation	2.4%	2.4%	2.5%	2.4%
GraphicsMagick - Rotate	85	89	91	88
Normalized	93.41%	97.8%	100%	96.7%
Standard Deviation	2.4%	2.4%	2.3%	
Rust Prime Benchmark - P.N.T.T.2.0.0 (sec)	1525	1307	1238	1207
Normalized	79.15%	92.39%	97.55%	100%
Standard Deviation	0%	0%	0%	0%
Smallpt - G.I.R.1.S (sec)	129.172	110.785	104.900	102.549
Normalized	79.39%	92.57%	97.76%	100%
Standard Deviation	0.1%	0.2%	0.1%	0%
Zstd Compression - 19 (MB/s)	2.67	2.51	2.57	2.58
Normalized	100%	94.01%	96.25%	96.63%
Standard Deviation	1.6%	1.7%	1.9%	2.4%
FLAC Audio Encoding - WAV To FLAC (sec)	109.182	101.052	90.609	89.896
Normalized	82.34%	88.96%	99.21%	100%
Standard Deviation	2.4%	2.4%	2.7%	4.6%
LAME MP3 Encoding - WAV To MP3 (sec)	41.601	35.863	33.926	32.915
Normalized	79.12%	91.78%	97.02%	100%
Standard Deviation	0.1%	0.6%	0.5%	0.3%
Perl Benchmarks - Pod2html (sec)	0.63496252	0.53866134	0.52816211	0.50870507
Normalized	80.12%	94.44%	96.32%	100%
Standard Deviation	0.7%	0.9%	2.2%	0.2%
PyBench - T.F.A.T.T (Milliseconds)	5265	4566	4317	4198
Normalized	79.73%	91.94%	97.24%	100%
Standard Deviation	0.7%	0.9%	0.3%	0.3%
NGINX Benchmark - S.W.P.S (Reqs/sec)	4000	4601	4792	4937
Normalized	81.02%	93.2%	97.07%	100%
Standard Deviation	0.1%	0.2%	0.3%	0.1%
PHPBench - P.B.S (Score)	102130	120807	127392	129841
Normalized	78.66%	93.04%	98.11%	100%
Standard Deviation	0.4%	0.3%	0.1%	0.3%

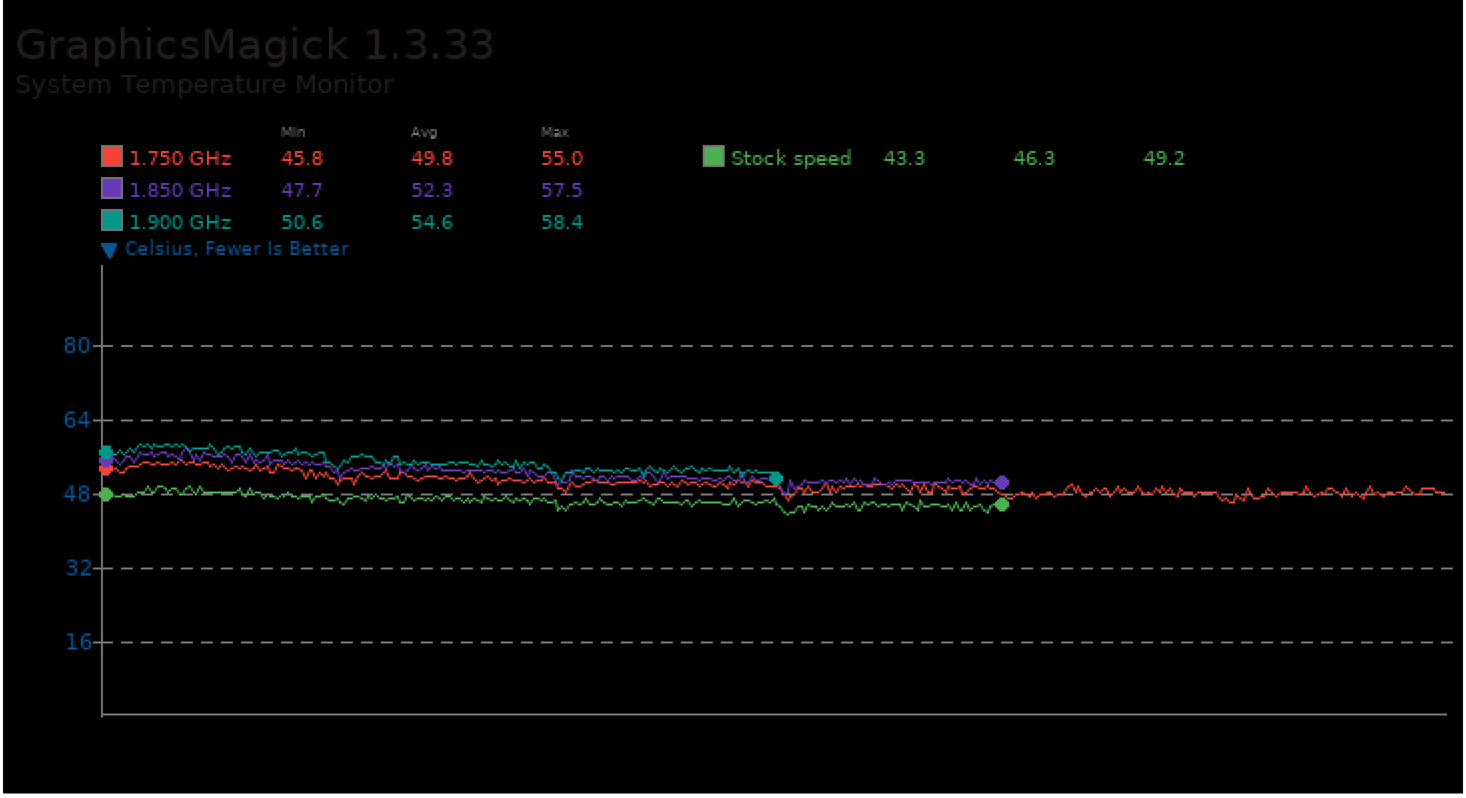

SciMark 2.0
Computational Test: Composite
Mflops, More Is Better
1.750 GHz
SE +/- 0.10, N = 3
166.32
1.850 GHz
SE +/- 0.42, N = 3
174.55
1.900 GHz
SE +/- 1.28, N = 3
175.76
Stock speed
SE +/- 0.87, N = 3
144.38
40
80
120
160
200
1. (CC) gcc options: -lm

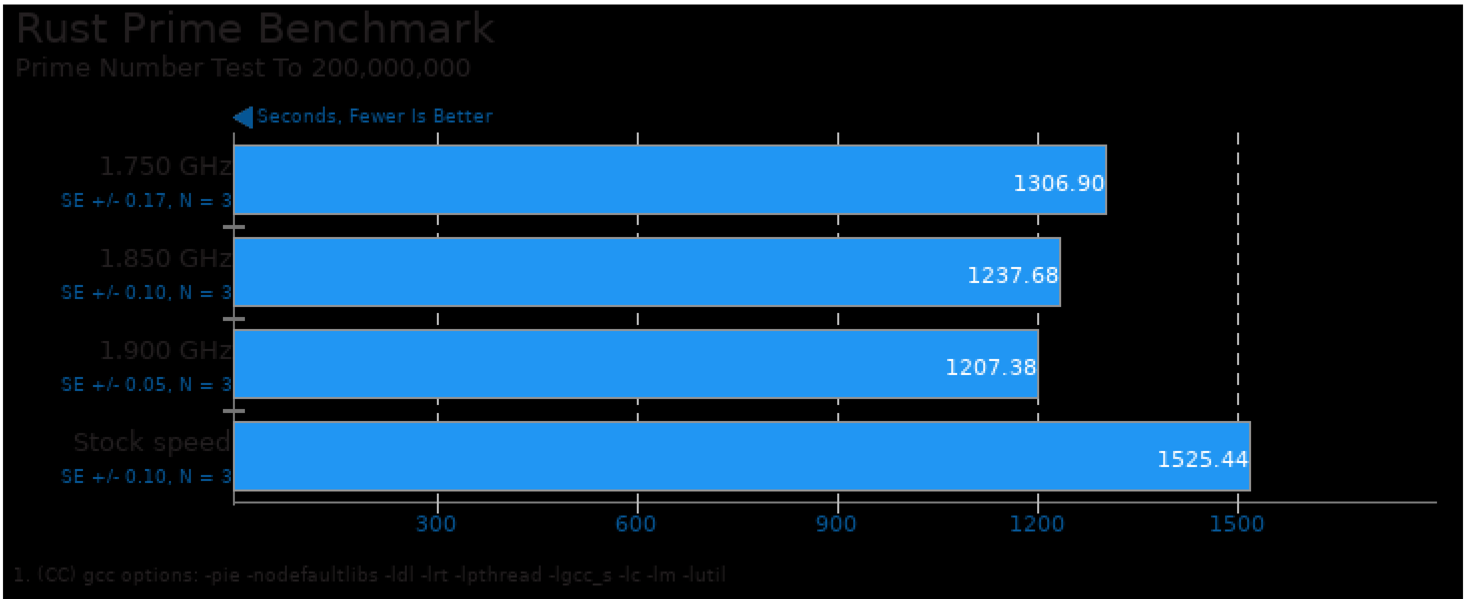

SciMark 2.0
System Temperature Monitor
Min
Avg
Max
1.750 GHz 35.1 41.9 44.3
1.850 GHz 38.0 43.9 47.7
1.900 GHz 43.3 49.4 52.1
Stock speed 33.6 38.5 40.9
Celsius, Fewer Is Better
75
60
45
30
15

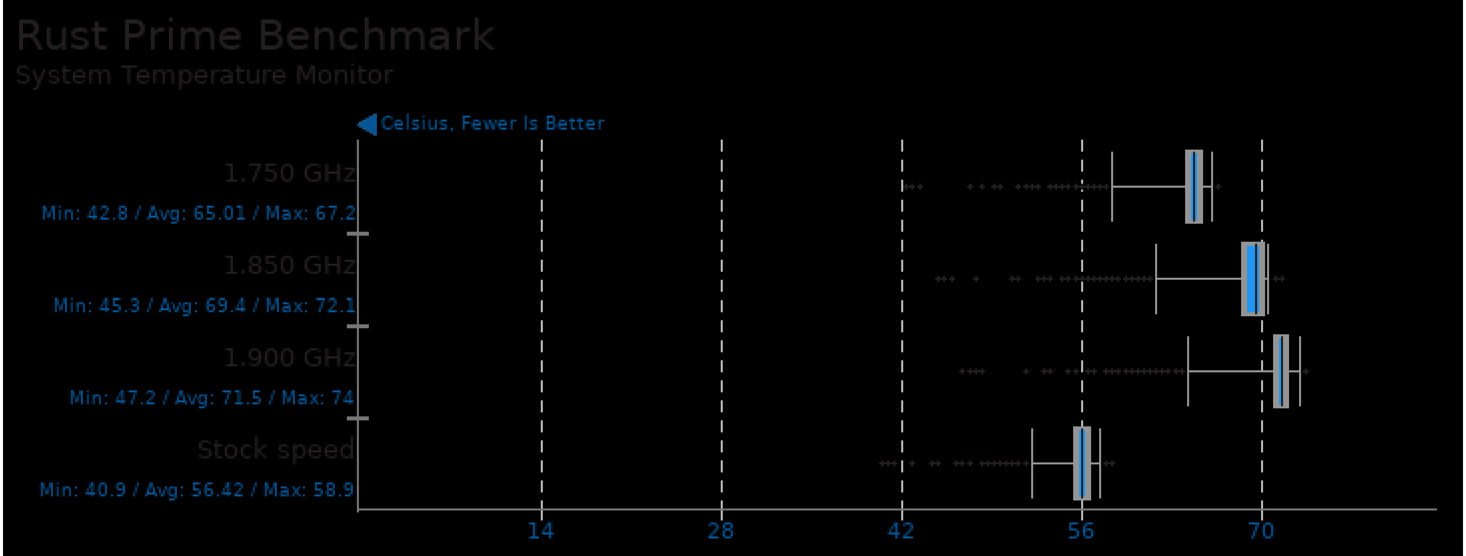

x264 2019-12-17
H.264 Video Encoding
Frames Per Second, More Is Better
1.750 GHz
SE +/- 0.04, N = 10
5.78
1.850 GHz
SE +/- 0.05, N = 10
6.06
1.900 GHz
SE +/- 0.04, N = 12
6.20
Stock speed
SE +/- 0.04, N = 9
5.03
2
4
6
8
10
1. (CC) gcc options: -ldl -lm -lpthread

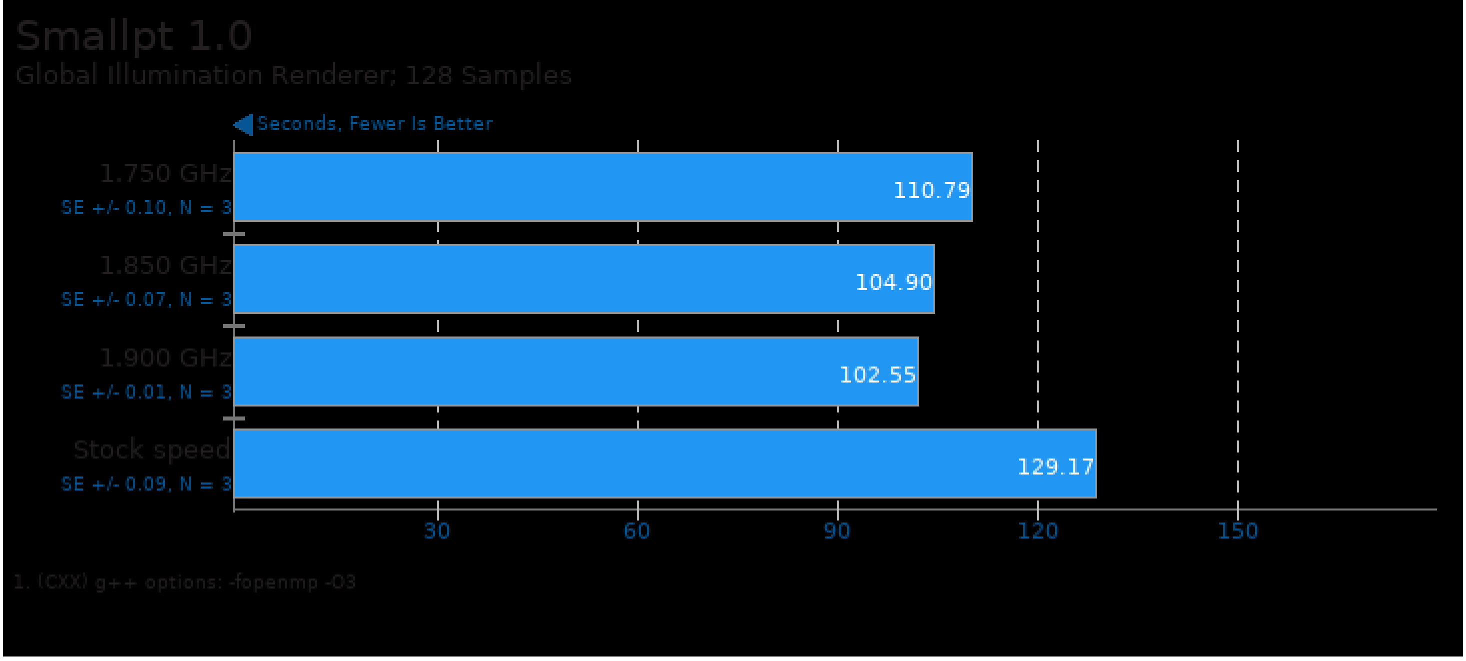

x264 2019-12-17
System Temperature Monitor
Min
Avg
Max
1.750 GHz 39.4 60.2 65.2
1.850 GHz 40.9 63.7 69.1
1.900 GHz 44.8 66.5 71.1
Stock speed 36.5 52.8 57.5
Celsius, Fewer Is Better
100
80
60
40
20

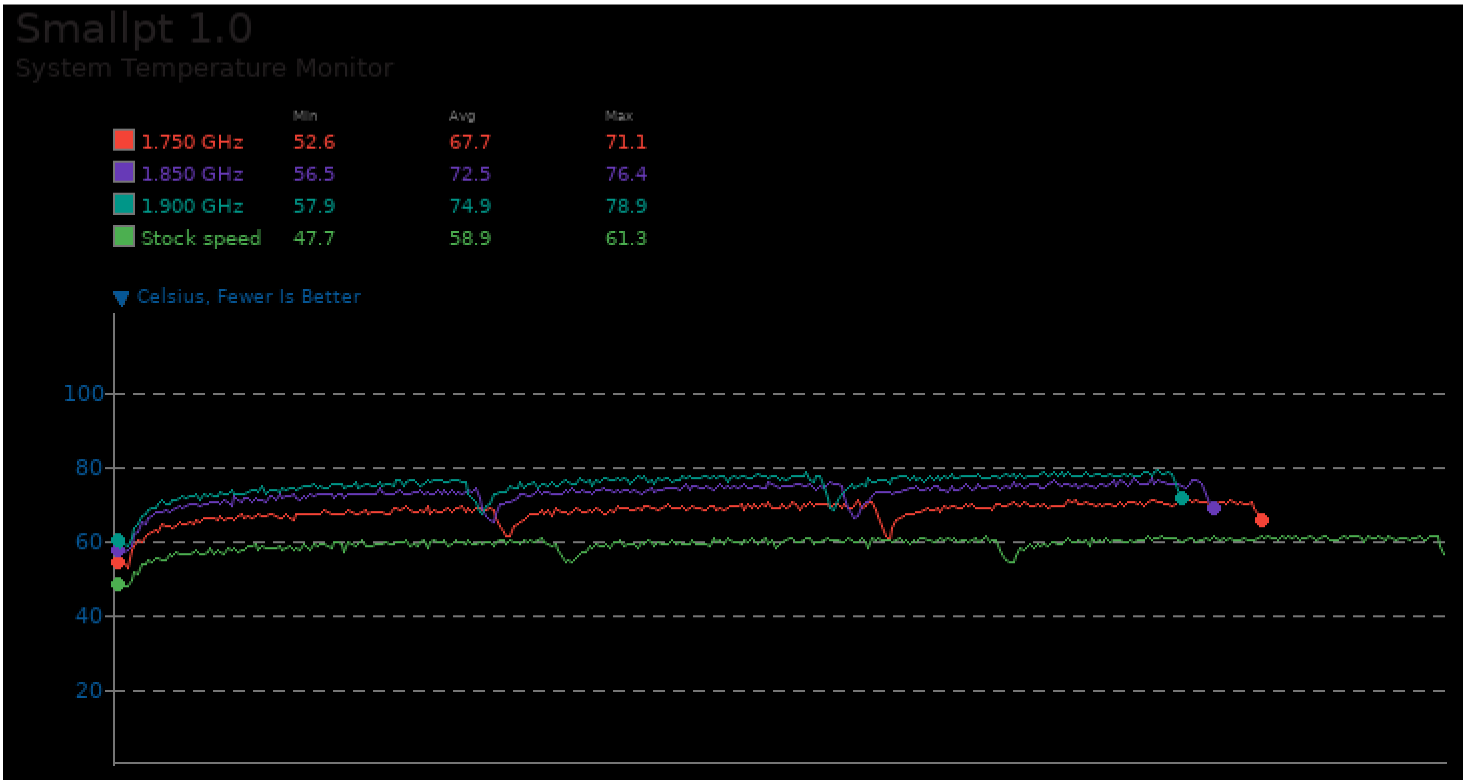

GraphicsMagick 1.3.33
Operation: Rotate
Iterations Per Minute, More Is Better
1.750 GHz
SE +/- 0.87, N = 6
89
1.850 GHz
SE +/- 1.03, N = 4
91
1.900 GHz
88
Stock speed
SE +/- 1.00, N = 4
85
20
40
60
80
100
1. (CC) gcc options: -fopenmp -O2 -pthread -lfreetype -ljpeg -lz -lm -lpthread

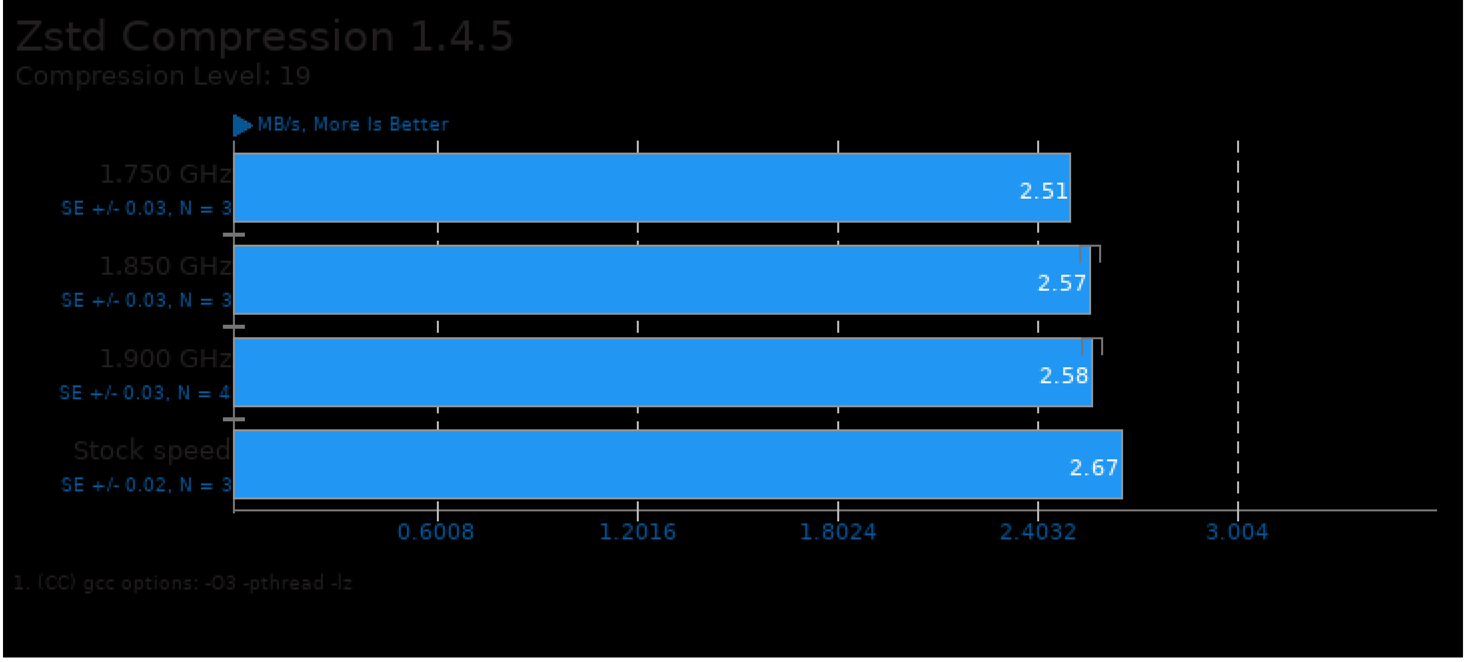

GraphicsMagick 1.3.33
System Temperature Monitor
Min Avg Max
1.750 GHz 45.8 49.8 55.0
1.850 GHz 47.7 52.3 57.5
1.900 GHz 50.6 54.6 58.4
Stock speed 43.3 46.3 49.2
Celsius, Fewer Is Better
80
64
48
32
16

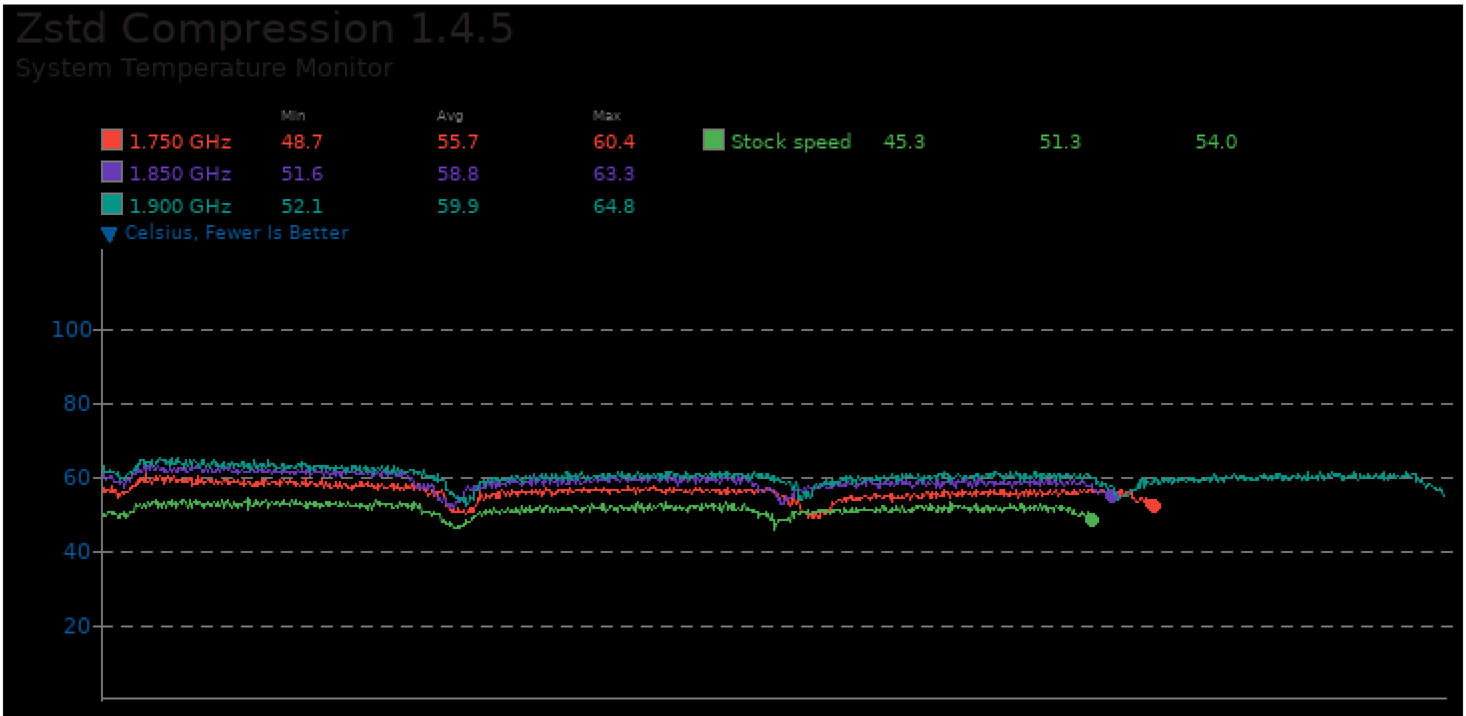

Rust Prime Benchmark
Prime Number Test To 200,000,000
Seconds, Fewer Is Better
1.750 GHz
SE +/- 0.17, N = 3
1306.90
1.850 GHz
SE +/- 0.10, N = 3
1237.68
1.900 GHz
SE +/- 0.05, N = 3
1207.38
Stock speed
SE +/- 0.10, N = 3
1525.44
300
600
900
1200
1500
1. (CC) gcc options: -pie -nodefaultlibs -ldl -lrt -lpthread -lgcc_s -lc -lm -lutil

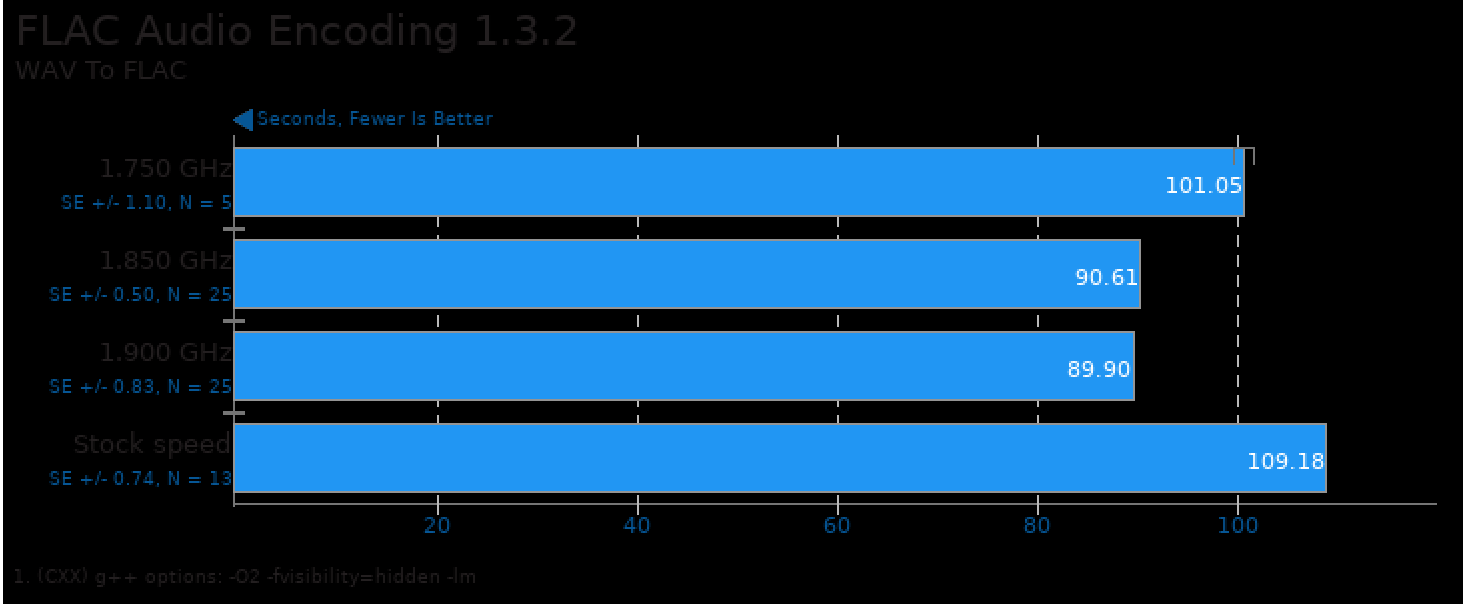

Rust Prime Benchmark
System Temperature Monitor
Celsius, Fewer Is Better
1.750 GHz
Min: 42.8 / Avg: 65.01 / Max: 67.2
1.850 GHz
Min: 45.3 / Avg: 69.4 / Max: 72.1
1.900 GHz
Min: 47.2 / Avg: 71.5 / Max: 74
Stock speed
Min: 40.9 / Avg: 56.42 / Max: 58.9
14
28
42
56
70

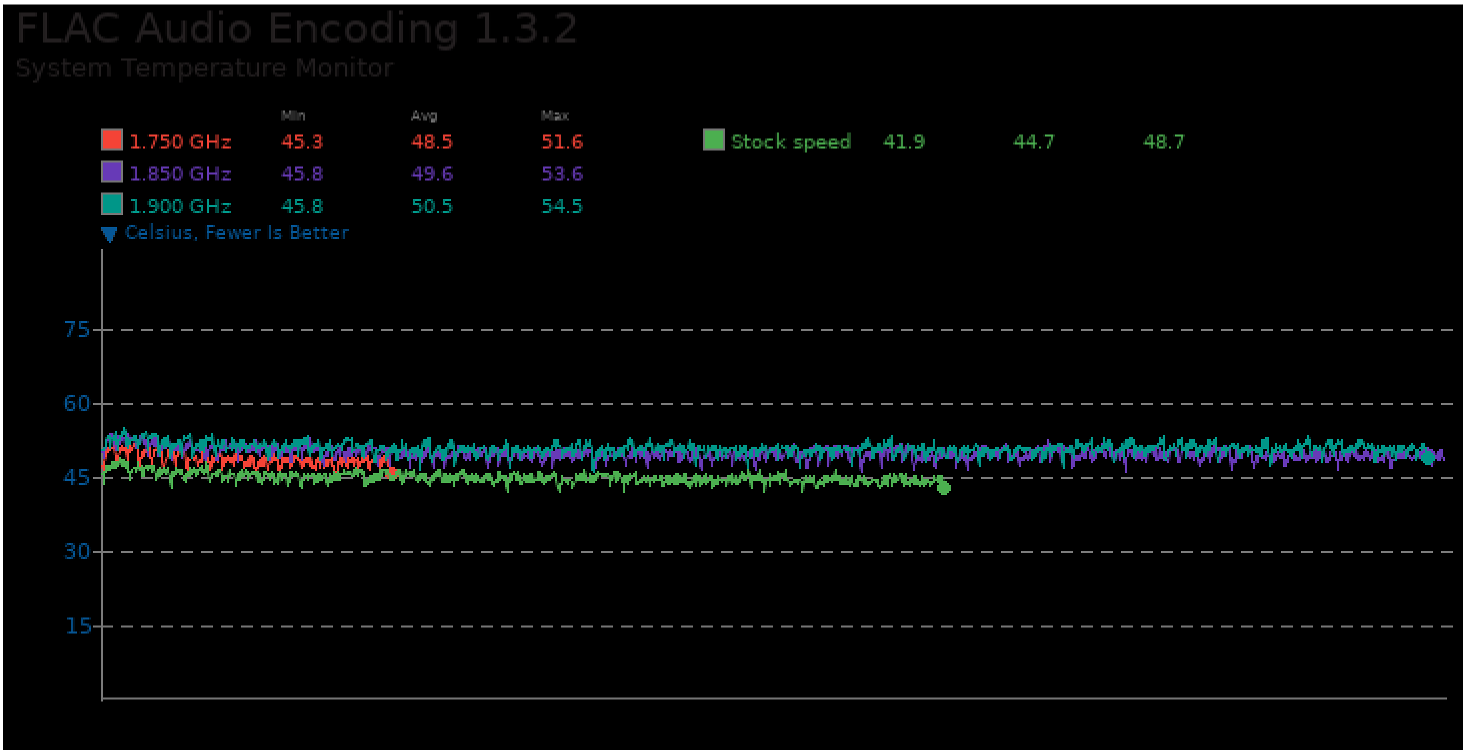

Smallpt 1.0
Global Illumination Renderer; 128 Samples
Seconds, Fewer Is Better
1.750 GHz
SE +/- 0.10, N = 3
110.79
1.850 GHz
SE +/- 0.07, N = 3
104.90
1.900 GHz
SE +/- 0.01, N = 3
102.55
Stock speed
SE +/- 0.09, N = 3
129.17
30
60
90
120
150
1. (CXX) g++ options: -fopenmp -O3

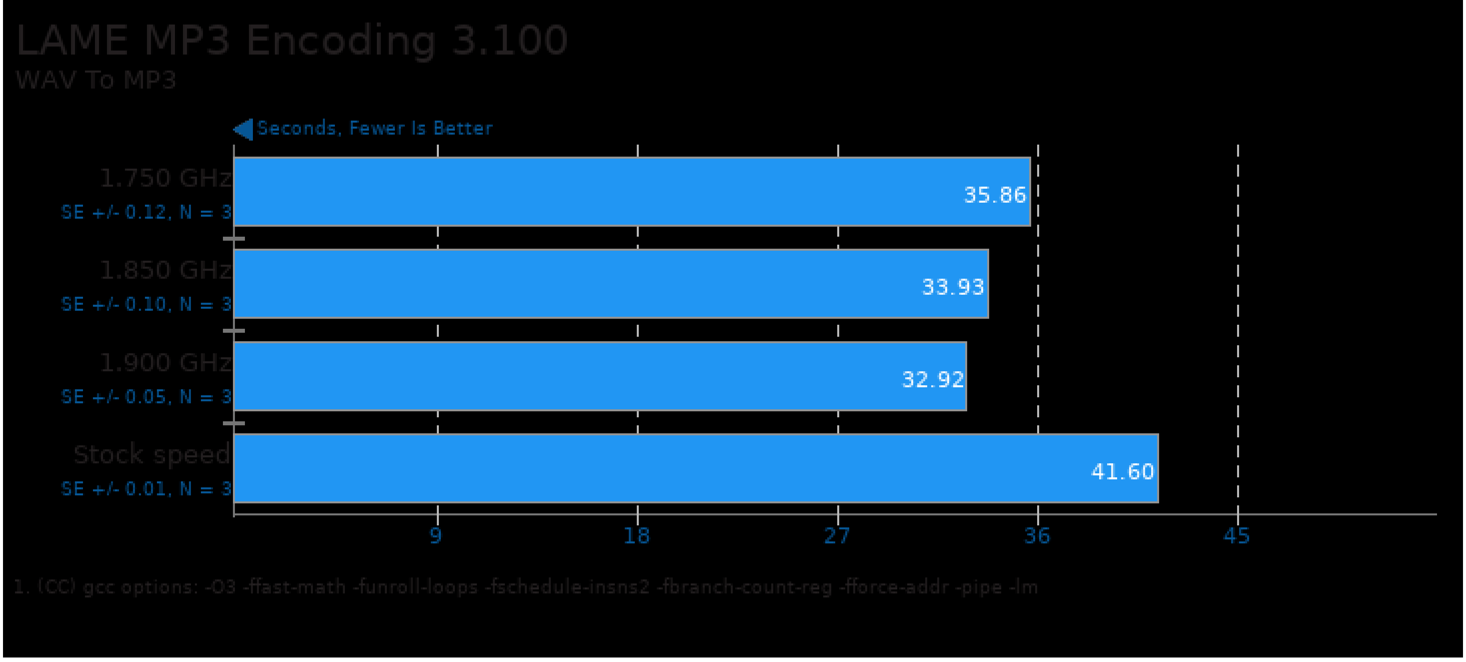

Smallpt 1.0
System Temperature Monitor
Min
Avg
Max
1.750 GHz 52.6 67.7 71.1
1.850 GHz 56.5 72.5 76.4
1.900 GHz 57.9 74.9 78.9
Stock speed 47.7 58.9 61.3
Celsius, Fewer Is Better
100
80
60
40
20

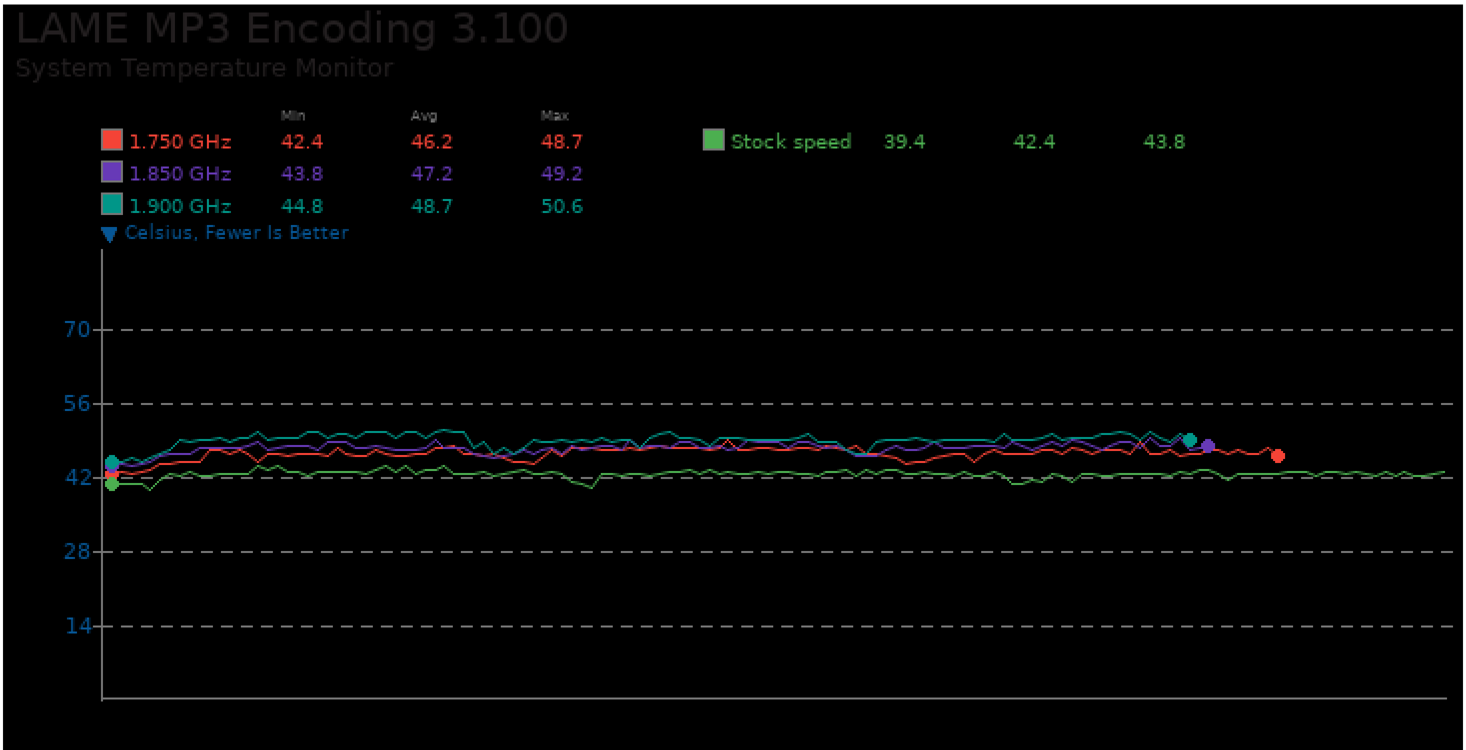

Zstd Compression 1.4.5
Compression Level: 19
MB/s, More Is Better
1.750 GHz
SE +/- 0.03, N = 3
2.51
1.850 GHz
SE +/- 0.03, N = 3
2.57
1.900 GHz
SE +/- 0.03, N = 4
2.58
Stock speed
SE +/- 0.02, N = 3
2.67
0.6008
1.2016
1.8024
2.4032
3.004
1. (CC) gcc options: -O3 -pthread -lz

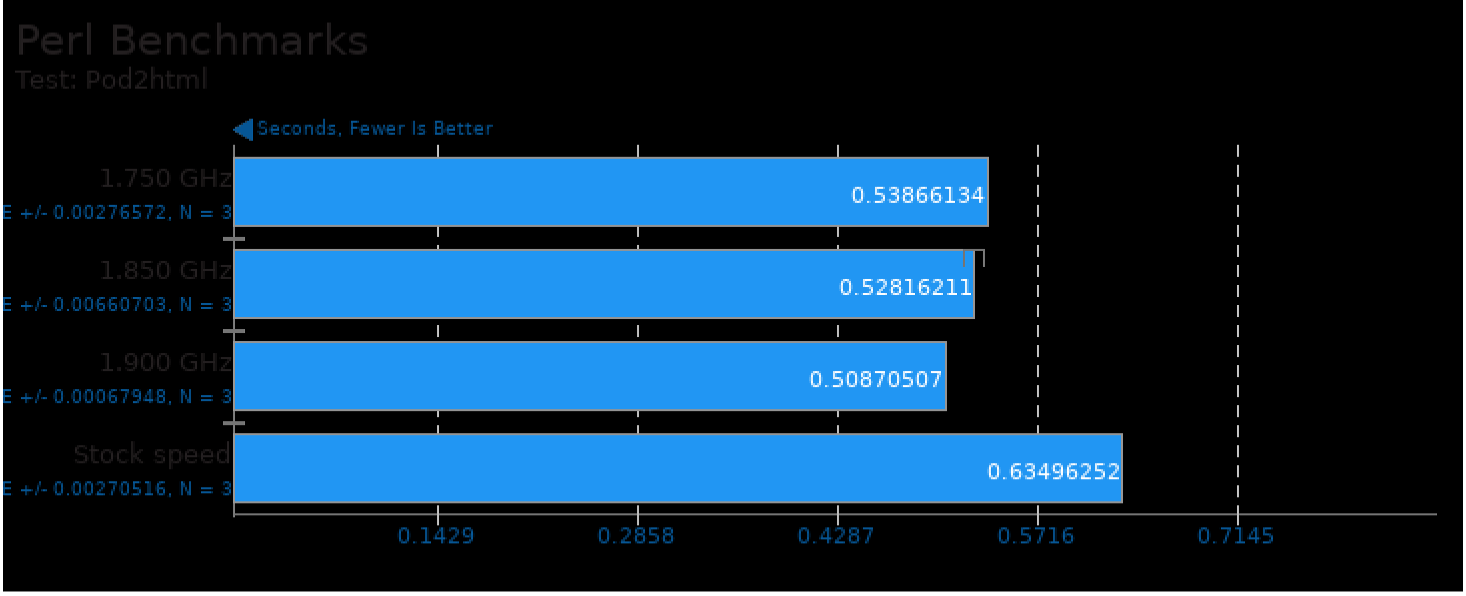

Zstd Compression 1.4.5
System Temperature Monitor
Min
Avg
Max
1.750 GHz 48.7 55.7 60.4
1.850 GHz 51.6 58.8 63.3
1.900 GHz 52.1 59.9 64.8
Stock speed 45.3 51.3 54.0
Celsius, Fewer Is Better
100
80
60
40
20


FLAC Audio Encoding 1.3.2
WAV To FLAC
Seconds, Fewer Is Better
1.750 GHz
SE +/- 1.10, N = 5
101.05
1.850 GHz
SE +/- 0.50, N = 25
90.61
1.900 GHz
SE +/- 0.83, N = 25
89.90
Stock speed
SE +/- 0.74, N = 13
109.18
20
40
60
80
100
1. (CXX) g++ options: -O2 -fvisibility=hidden -lm

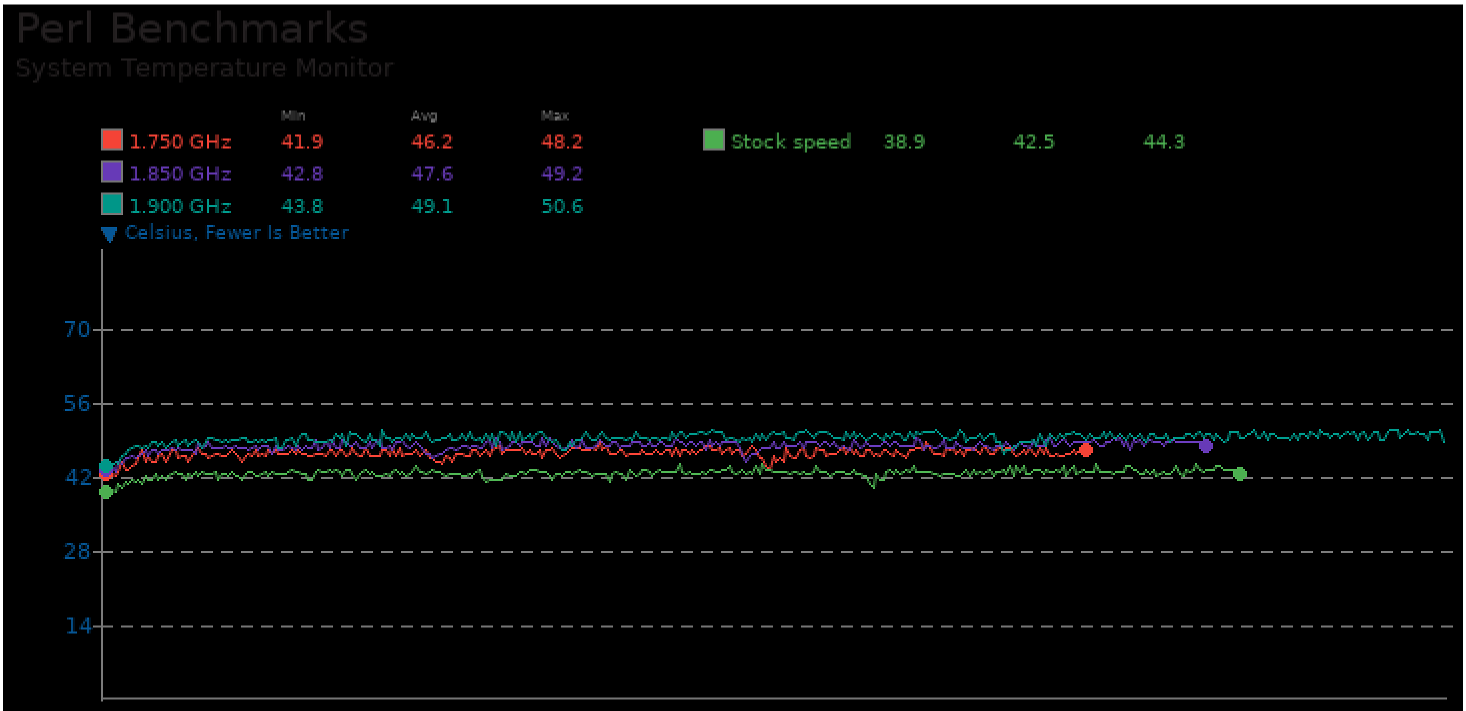

FLAC Audio Encoding 1.3.2
System Temperature Monitor
Min Avg Max
1.750 GHz 45.3 48.5 51.6
1.850 GHz 45.8 49.6 53.6
1.900 GHz 45.8 50.5 54.5
Stock speed 41.9 44.7 48.7
Celsius, Fewer Is Better
75
60
45
30
15

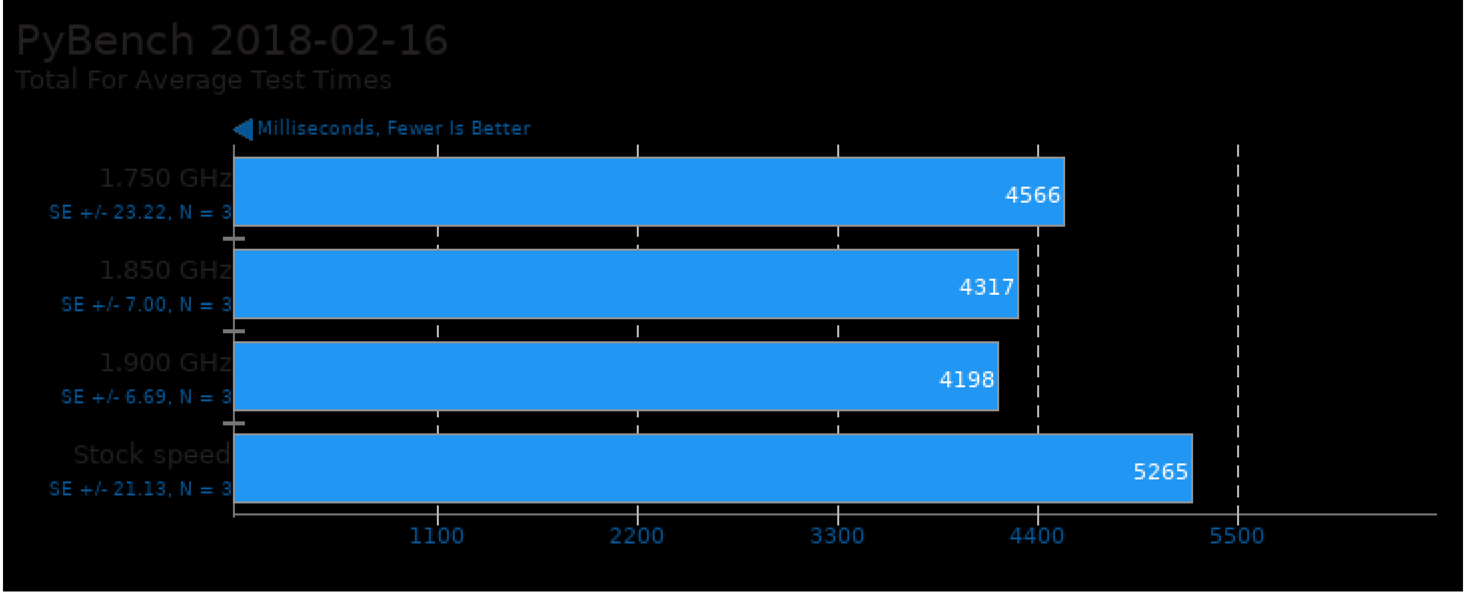

LAME MP3 Encoding 3.100
WAV To MP3
Seconds, Fewer Is Better
1.750 GHz
SE +/- 0.12, N = 3
35.86
1.850 GHz
SE +/- 0.10, N = 3
33.93
1.900 GHz
SE +/- 0.05, N = 3
32.92
Stock speed
SE +/- 0.01, N = 3
41.60
9
18
27
36
45
1. (CC) gcc options: -O3 -ffast-math -funroll-loops -fschedule-insns2 -fbranch-count-reg -fforce-addr -pipe -lm

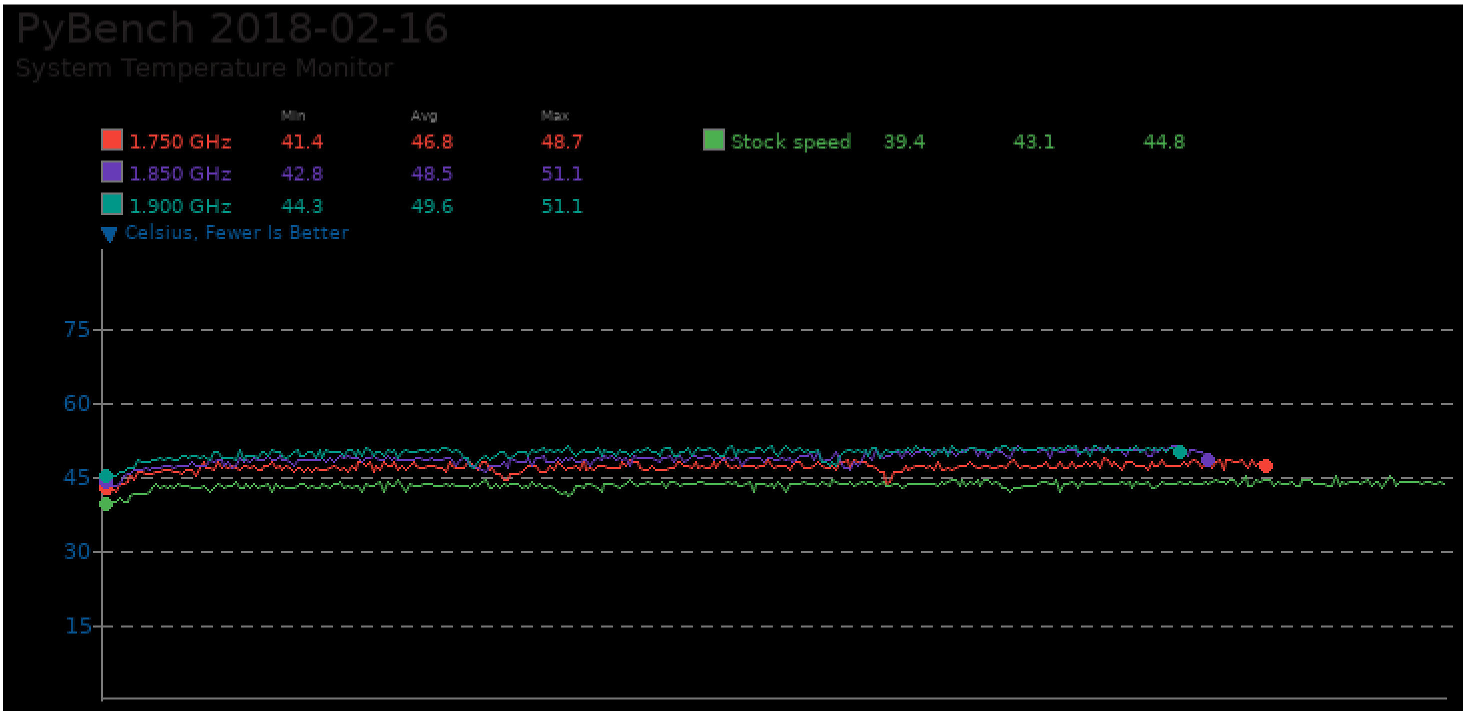

LAME MP3 Encoding 3.100
System Temperature Monitor
Min
Avg
Max
1.750 GHz 42.4 46.2 48.7
1.850 GHz 43.8 47.2 49.2
1.900 GHz 44.8 48.7 50.6
Stock speed 39.4 42.4 43.8
Celsius, Fewer Is Better
70
56
42
28
14

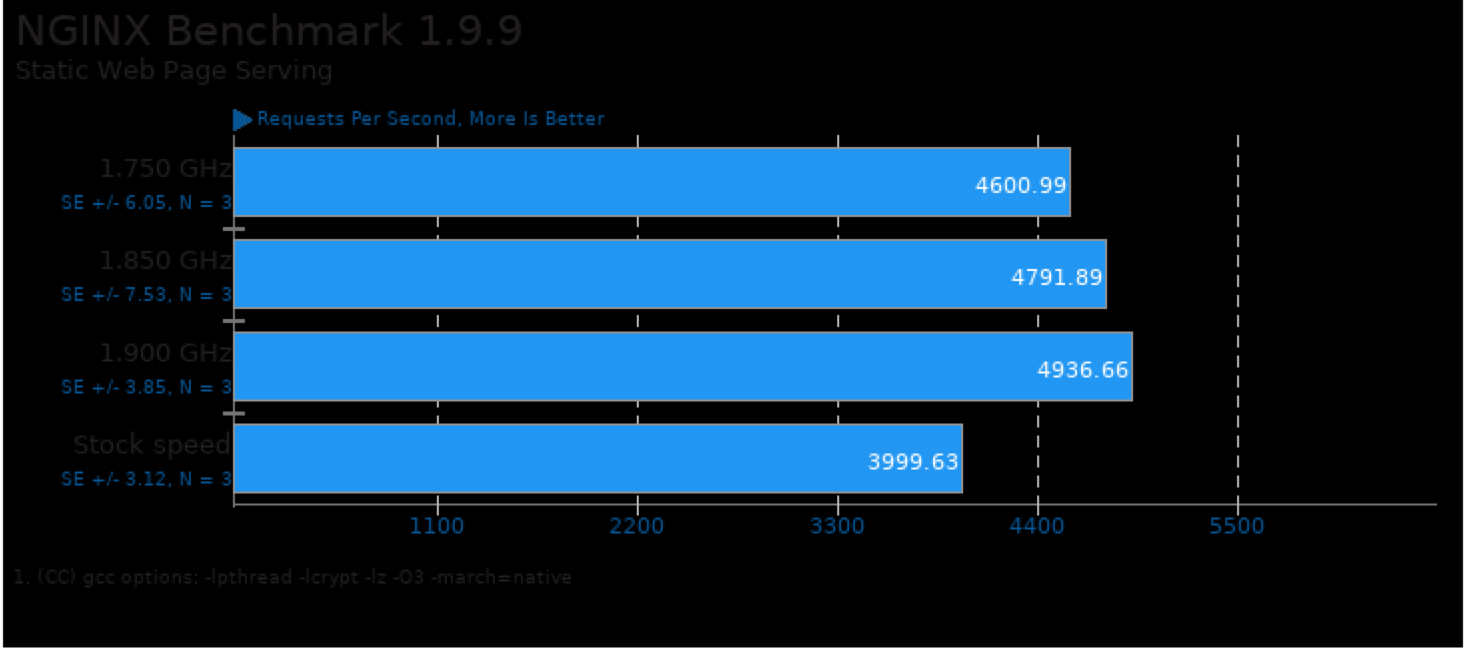

Perl Benchmarks
Test: Pod2html
Seconds, Fewer Is Better
1.750 GHz
SE +/- 0.00276572, N = 3
0.53866134
1.850 GHz
SE +/- 0.00660703, N = 3
0.52816211
1.900 GHz
SE +/- 0.00067948, N = 3
0.50870507
Stock speed
SE +/- 0.00270516, N = 3
0.63496252
0.1429
0.2858
0.4287
0.5716
0.7145

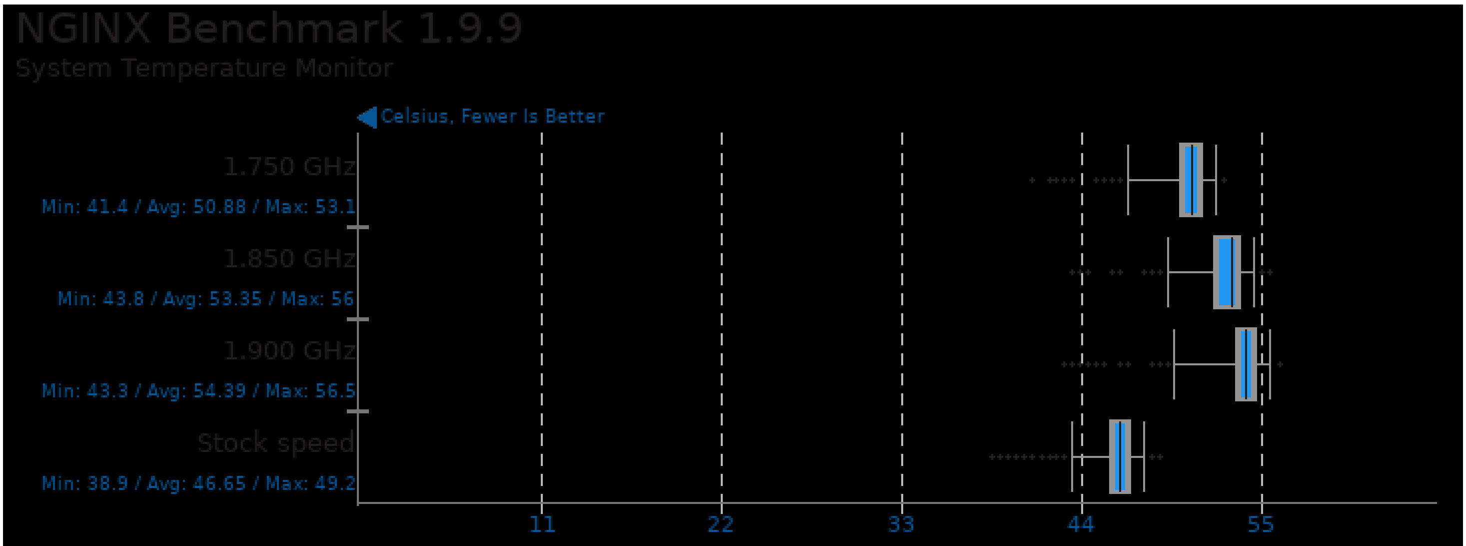
Raspberry Pi 4

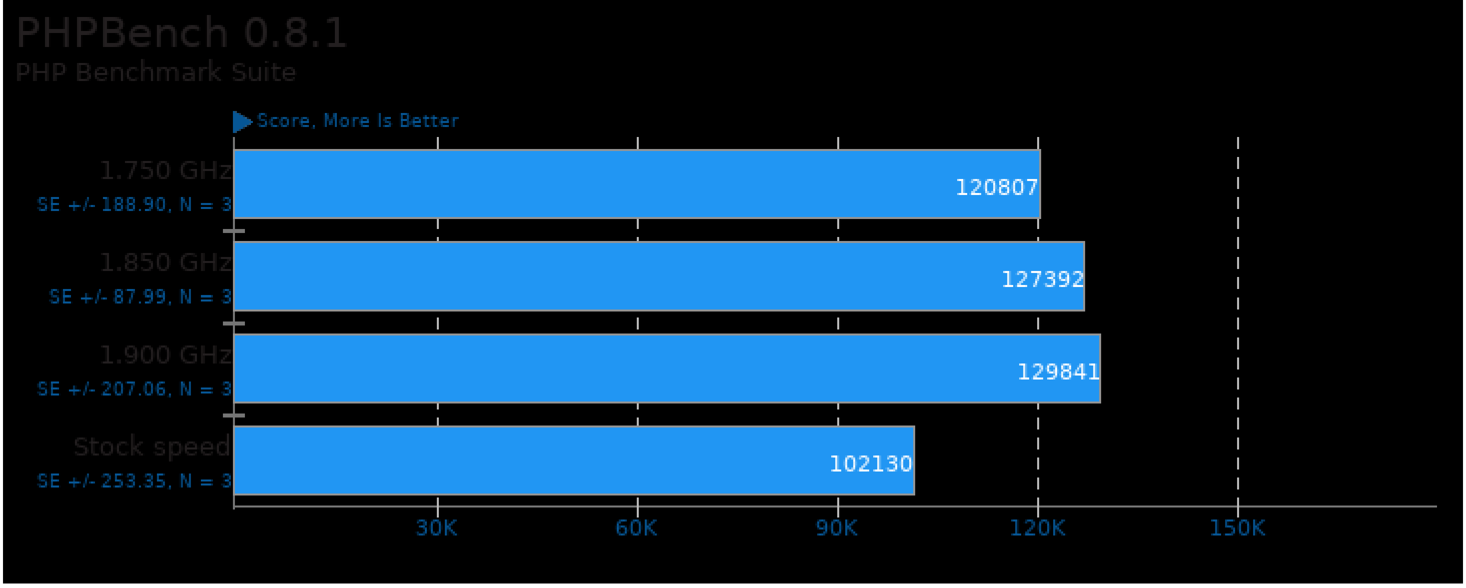


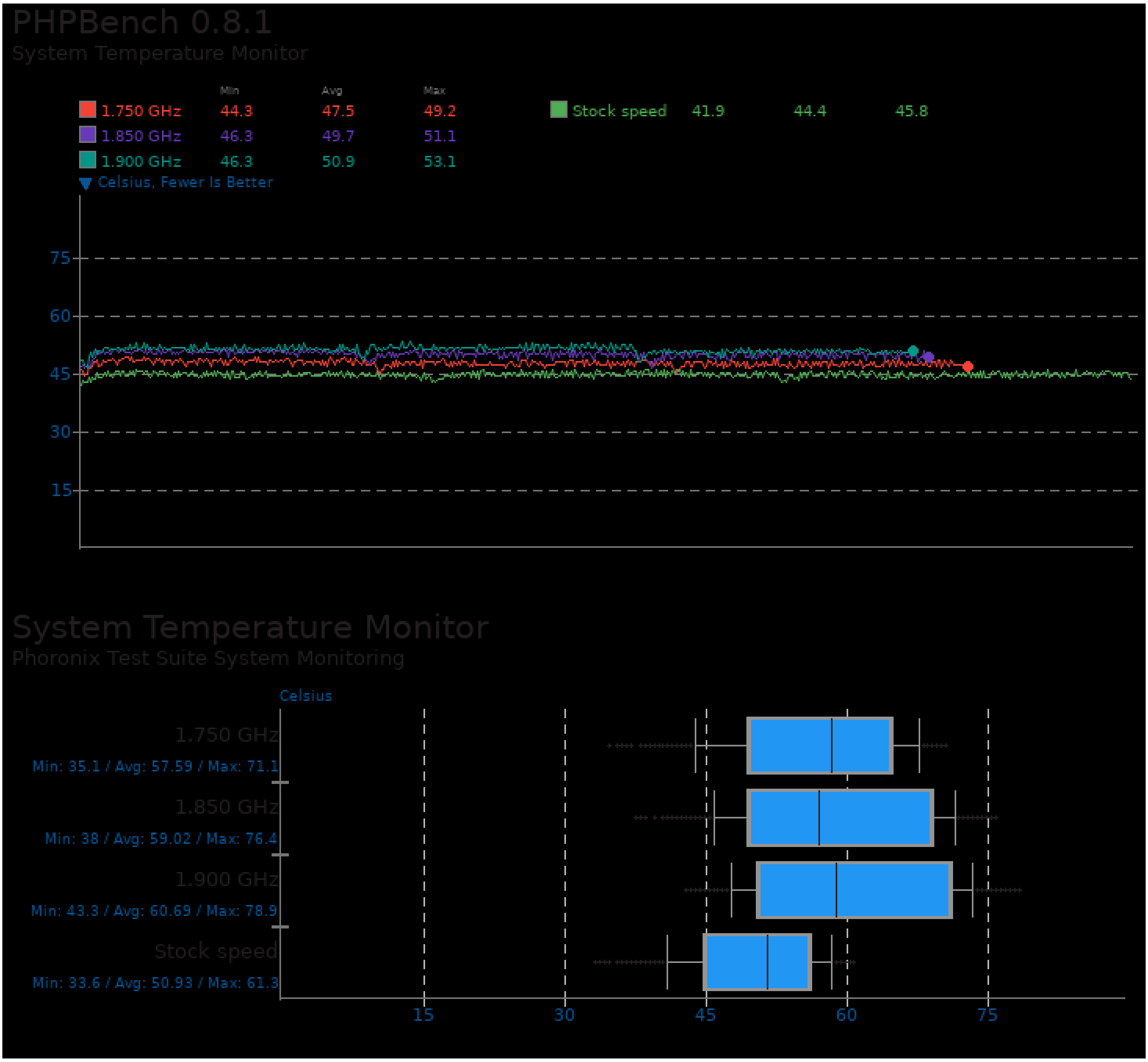



PyBench 2018-02-16
System Temperature Monitor
Min Avg Max
1.750 GHz 41.4 46.8 48.7
1.850 GHz 42.8 48.5 51.1
1.900 GHz 44.3 49.6 51.1
Stock speed 39.4 43.1 44.8
Celsius, Fewer Is Better
75
60
45
30
15

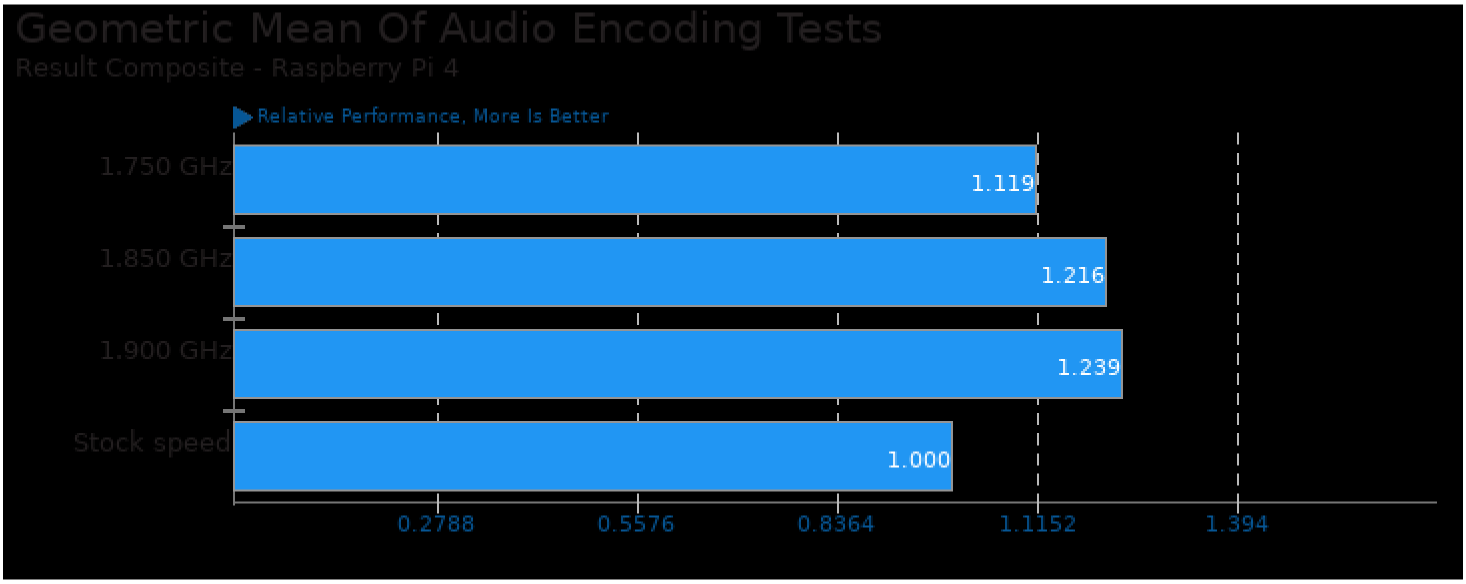

NGINX Benchmark 1.9.9
Static Web Page Serving
Requests Per Second, More Is Better
1.750 GHz
SE +/- 6.05, N = 3
4600.99
1.850 GHz
SE +/- 7.53, N = 3
4791.89
1.900 GHz
SE +/- 3.85, N = 3
4936.66
Stock speed
SE +/- 3.12, N = 3
3999.63
1100
2200
3300
4400
5500
1. (CC) gcc options: -lpthread -lcrypt -lz -O3 -march=native


NGINX Benchmark 1.9.9
System Temperature Monitor
Celsius, Fewer Is Better
1.750 GHz
Min: 41.4 / Avg: 50.88 / Max: 53.1
1.850 GHz
Min: 43.8 / Avg: 53.35 / Max: 56
1.900 GHz
Min: 43.3 / Avg: 54.39 / Max: 56.5
Stock speed
Min: 38.9 / Avg: 46.65 / Max: 49.2
11
22
33
44
55

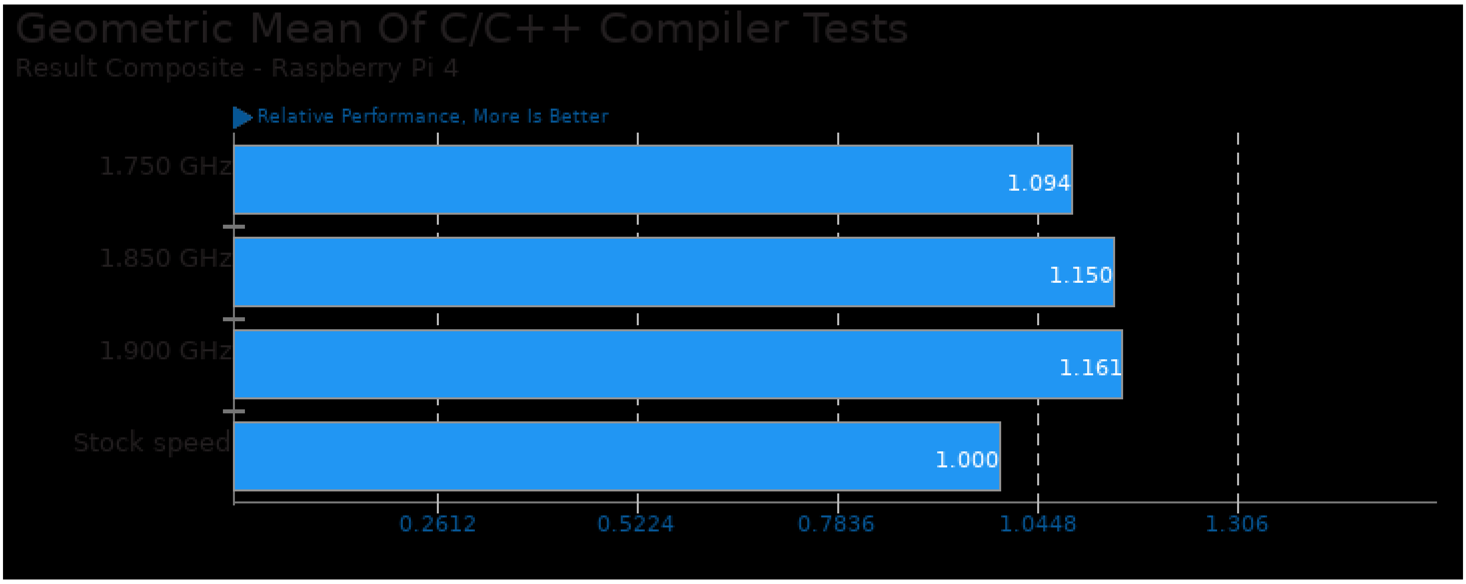

PHPBench 0.8.1
PHP Benchmark Suite
Score, More Is Better
1.750 GHz
SE +/- 188.90, N = 3
120807
1.850 GHz
SE +/- 87.99, N = 3
127392
1.900 GHz
SE +/- 207.06, N = 3
129841
Stock speed
SE +/- 253.35, N = 3
102130
30K
60K
90K
120K
150K


PHPBench 0.8.1
System Temperature Monitor
Min Avg Max
1.750 GHz 44.3 47.5 49.2
1.850 GHz 46.3 49.7 51.1
1.900 GHz 46.3 50.9 53.1
Stock speed 41.9 44.4 45.8
Celsius, Fewer Is Better
75
60
45
30
15
System Temperature Monitor
Phoronix Test Suite System Monitoring
Celsius
1.750 GHz
Min: 35.1 / Avg: 57.59 / Max: 71.1
1.850 GHz
Min: 38 / Avg: 59.02 / Max: 76.4
1.900 GHz
Min: 43.3 / Avg: 60.69 / Max: 78.9
Stock speed
Min: 33.6 / Avg: 50.93 / Max: 61.3
15
30
45
60
75

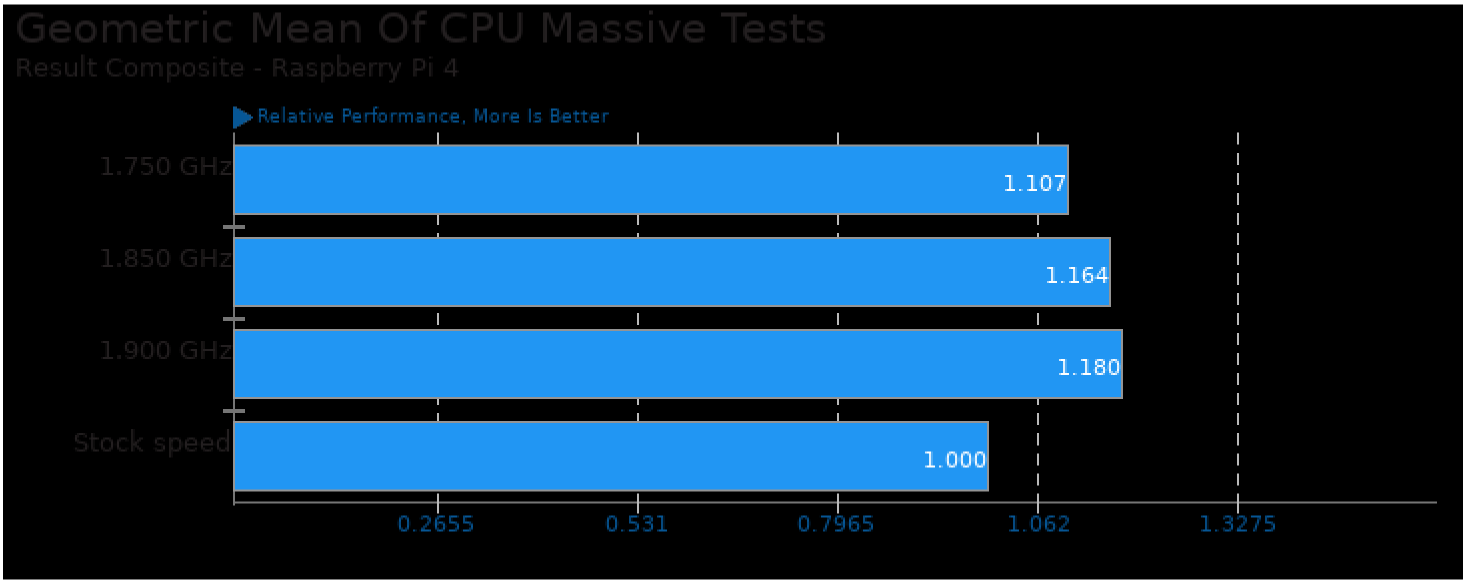
These geometric means are based upon test groupings / test suites for this result file.



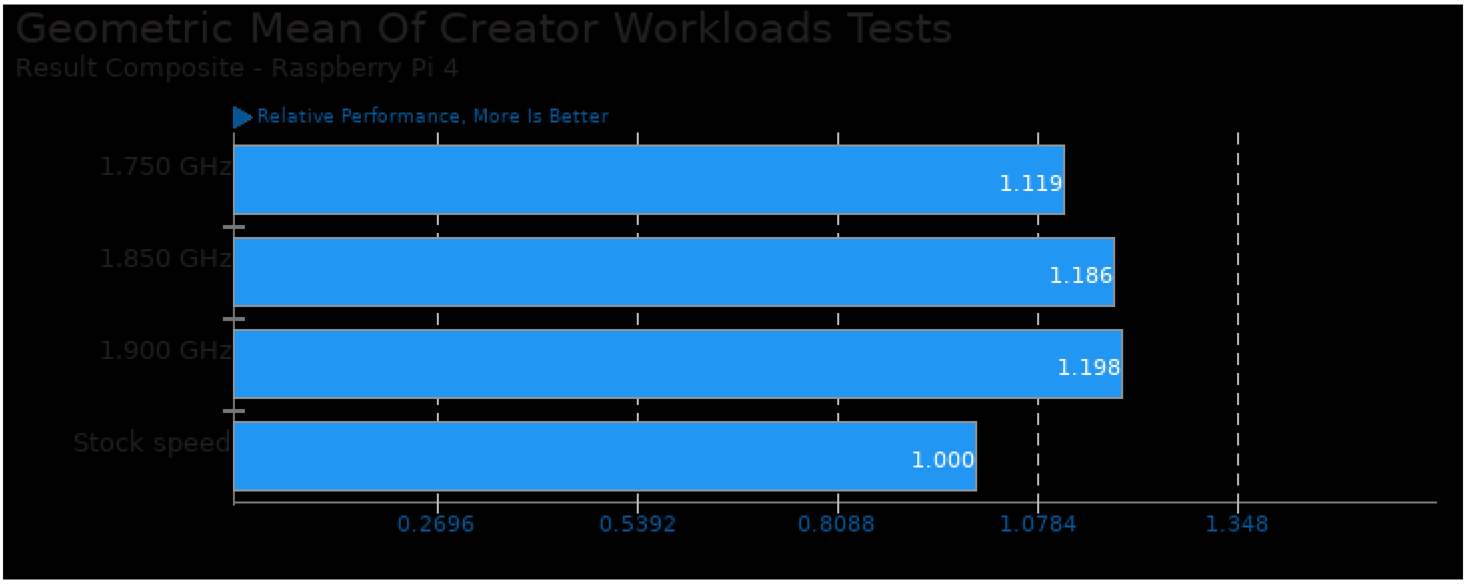
Geometric mean based upon tests: pts/encode-mp3 and pts/encode-flac



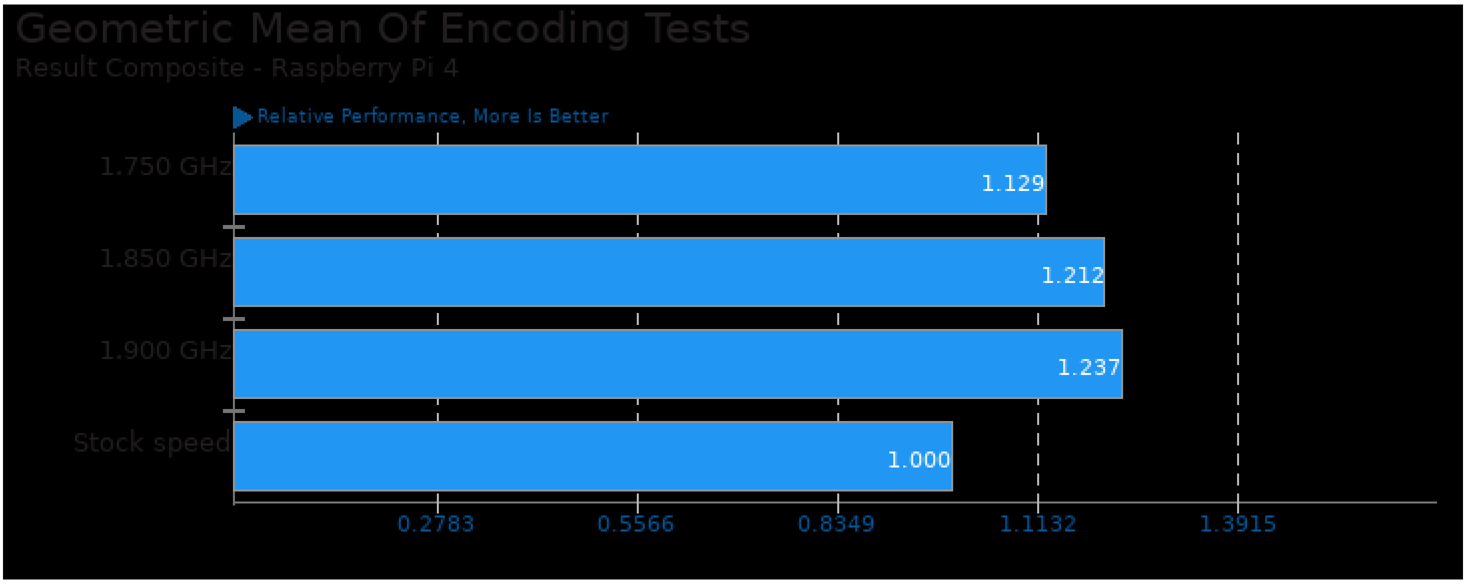
Geometric mean based upon tests: pts/scimark2, pts/graphics-magick, pts/encode-mp3, pts/encode-flac, pts/x264, pts/compress-zstd and pts/nginx



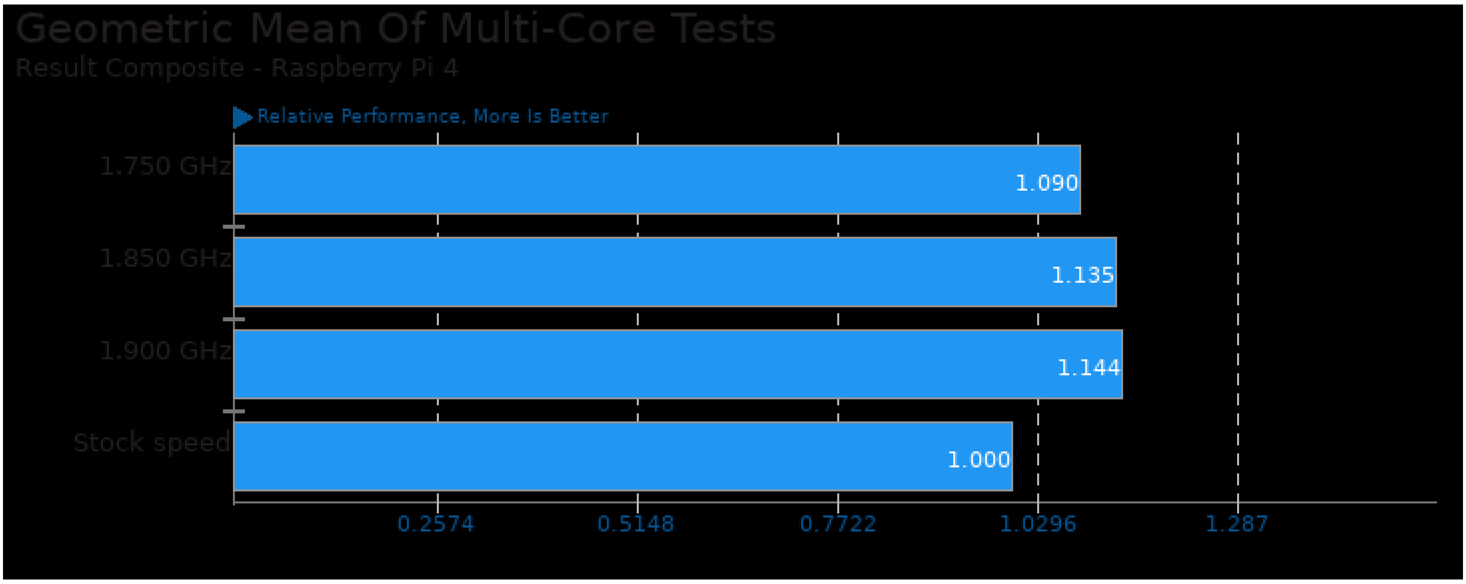
Geometric mean based upon tests: pts/compress-zstd, pts/x264, pts/encode-flac, pts/encode-mp3, pts/graphics-magick, pts/nginx, pts/phpbench and pts/rust-prime



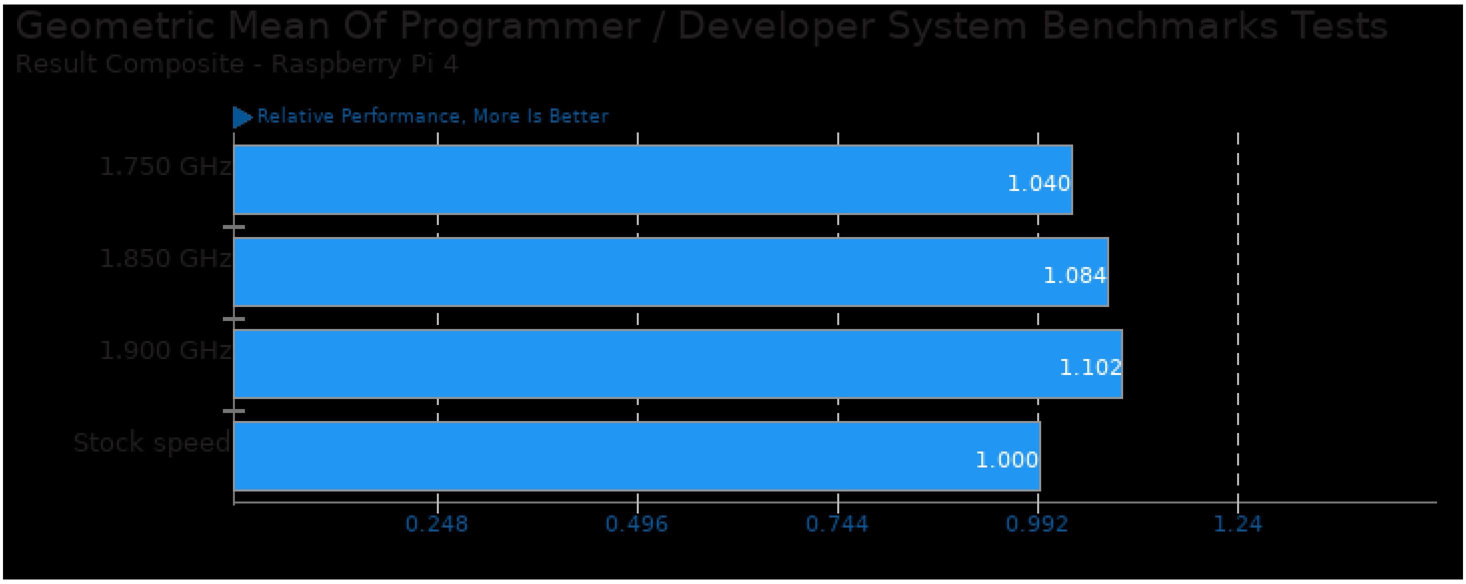
Geometric mean based upon tests: pts/smallpt, pts/x264, pts/encode-mp3, pts/encode-flac and pts/graphics-magick



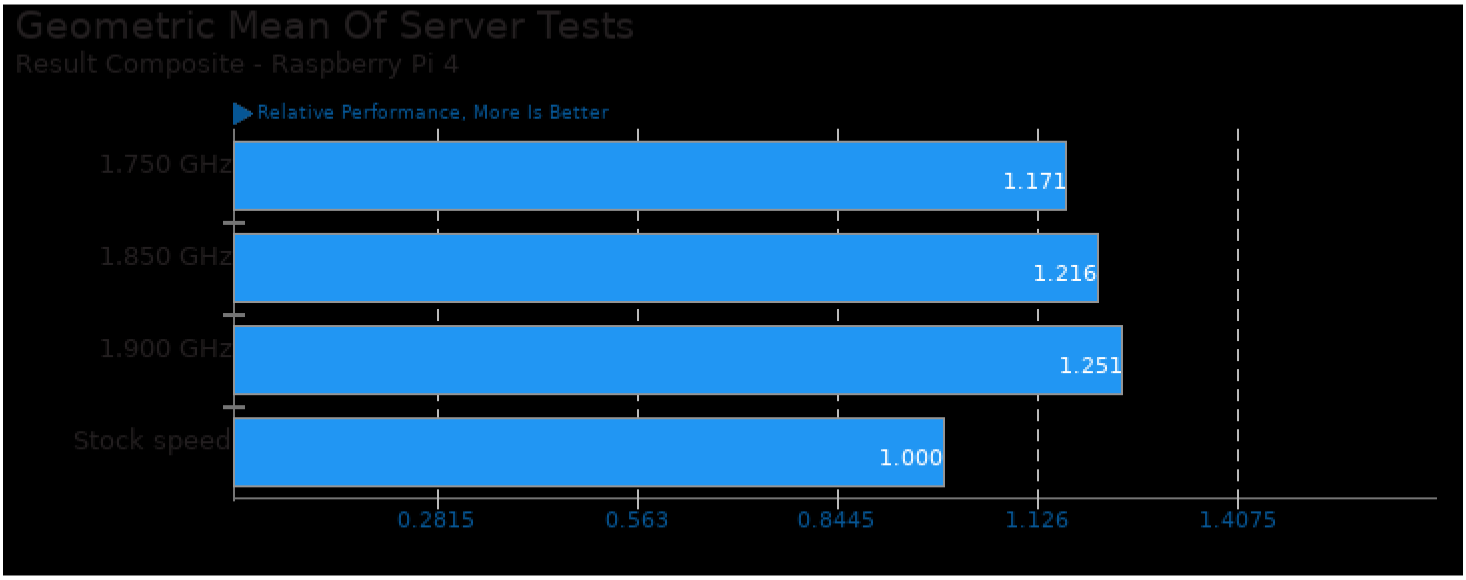
Geometric mean based upon tests: pts/encode-mp3, pts/encode-flac and pts/x264



Geometric mean based upon tests: pts/x264, pts/smallpt, pts/graphics-magick, pts/compress-zstd and pts/rust-prime

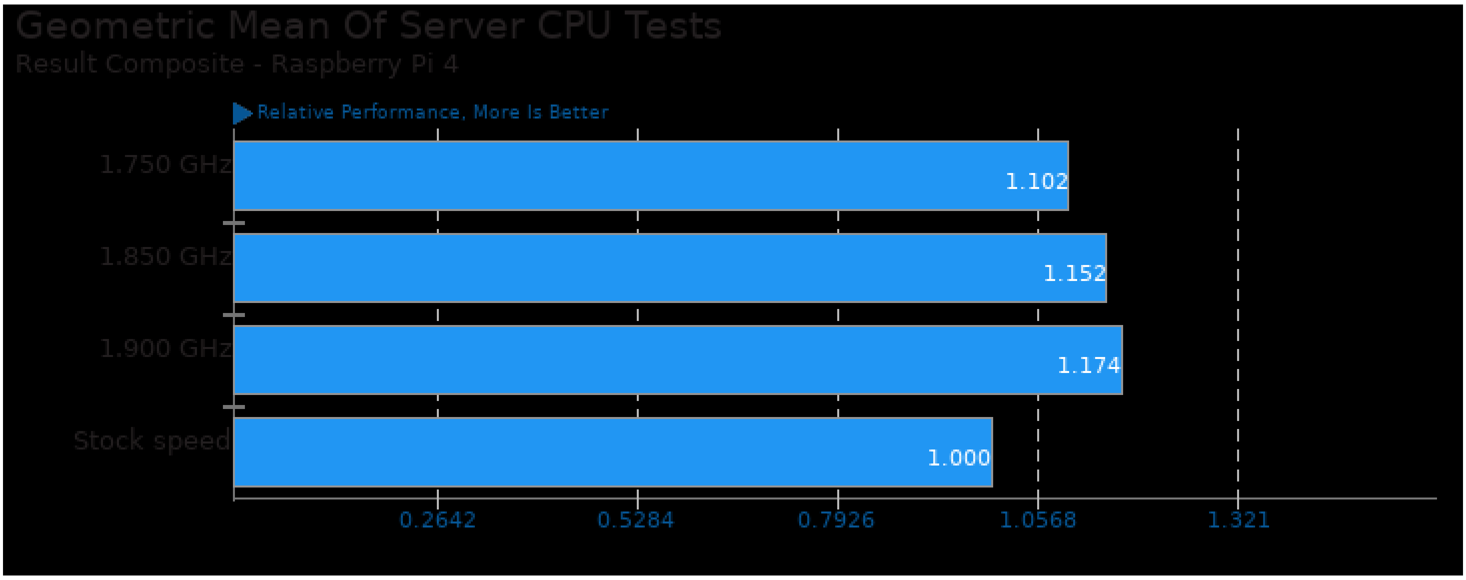


Geometric mean based upon tests: pts/compress-zstd and pts/pybench

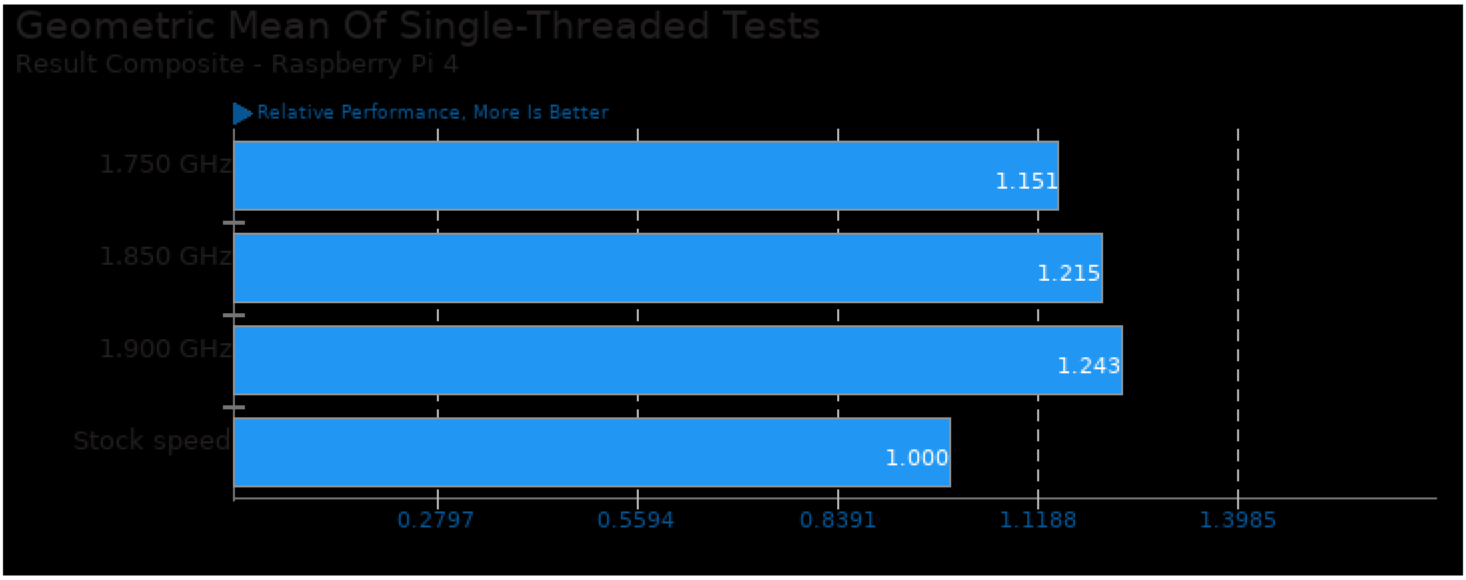


Geometric mean based upon tests: pts/nginx, pts/phpbench and pts/perl-benchmark

Raspberry Pi 4



Geometric mean based upon tests: pts/x264, pts/compress-zstd, pts/pybench and pts/phpbench



Geometric mean based upon tests: pts/scimark2, pts/encode-flac, pts/encode-mp3, pts/perl-benchmark, pts/pybench, pts/phpbench and pts/nginx

This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 29 March 2024 01:28.