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Raspberry Pi 3 vs. ODROID-C2 Benchmarks

Raspberry Pi 3 Model B vs. ODROID-C2 ARM Linux benchmarks. Tests by Michael Larabel for a future article on phoronix.

Automated Executive Summary

Odroid-H2 had the most wins, coming in first place for 83% of the tests.

Based on the geometric mean of all complete results, the fastest (Odroid-H2) was 5.109x the speed of the slowest (Raspberry Pi 3). ODROID-C2 was 0.42x the speed of Odroid-H2 and Raspberry Pi 3 was 0.466x the speed of ODROID-C2.

Test Systems:

ODROID-C2

Processor: AArch64 rev 4 @ 2.02GHz (4 Cores), Motherboard: ODROID-C2, Memory: 2048MB, Disk: 32GB SL32G

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OS: Ubuntu 16.04, Kernel: 3.14.29+ (aarch64), Compiler: GCC 5.3.1 20160216, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=aarch64-linux-gnu --disable-browser-plugin --disable-libquadmath --disable-werror --enable-checking=release --enable-clocale=gnu --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --target=aarch64-linux-gnu --with-arch-directory=aarch64 --with-default-libstdcxx-abi=new -v
Processor Notes: Scaling Governor: meson_cpufreq performance

Raspberry Pi 3

Processor: ARMv7 rev 4 @ 1.20GHz (4 Cores), Motherboard: BCM2709 Raspberry Pi 3 Model B Rev 1.2, Memory: 925MB, Disk: 16GB SD16G, Graphics: LLVMpipe

OS: Raspbian 8.0, Kernel: 4.1.18-v7+ (armv7l), Desktop: LXDE 0.7.2, Display Server: X Server 1.17.2, OpenGL: 3.0 Mesa 11.1.0 Gallium 0.4, Compiler: GCC 4.9.2, File-System: ext4, Screen Resolution: 1824x984

Compiler Notes: --build=arm-linux-gnueabihf --disable-browser-plugin --disable-libitm --disable-libquadmath --disable-sjlj-exceptions --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --target=arm-linux-gnueabihf --with-arch-directory=arm --with-arch=armv6 --with-float=hard --with-fpu=vfp -v
Processor Notes: Scaling Governor: BCM2835 Freq ondemand
Disk Mount Options Notes: data=ordered,noatime,rw

Odroid-H2

Processor: Intel Celeron J4105 @ 2.50GHz (4 Cores), Motherboard: HARDKERNEL ODROID-H2 v1.0 (5.13 BIOS), Chipset: Intel Device 31f0, Memory: 16384MB, Disk: 2 x 1000GB Western Digital WD10EZRX-00L + 16GB AGND3R, Graphics: inteldrmfb (750MHz), Audio: Realtek ALC662 rev1, Network: 2 x Realtek RTL8111/8168/8411

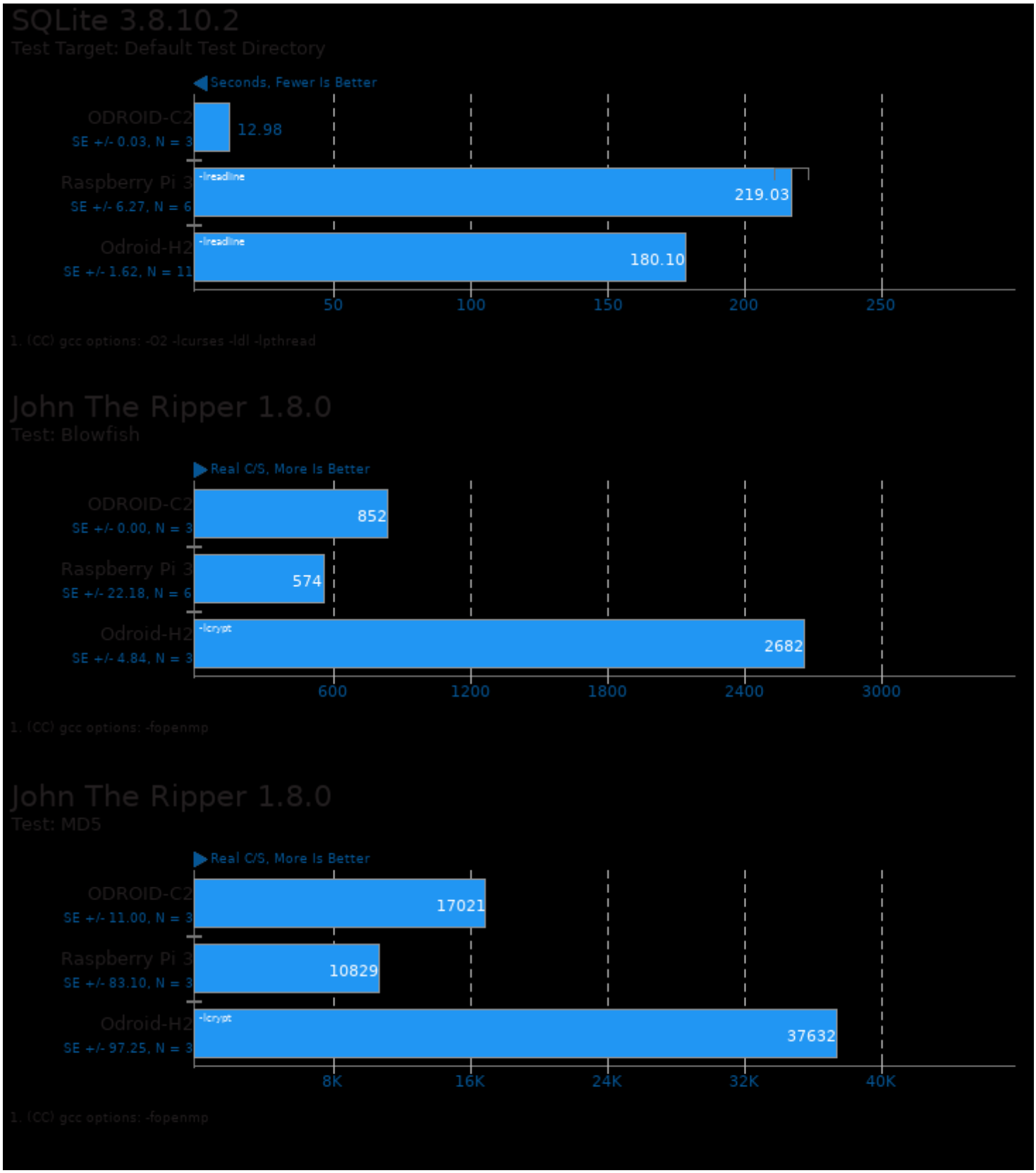
OS: Arch Linux, Kernel: 5.1.15-arch1-1-ARCH (x86_64), Compiler: GCC 9.1.0, File-System: btrfs, Screen Resolution: 1920x1080

Compiler Notes: --disable-libssp --disable-libstdcxx-pch --disable-libunwind-exceptions --disable-werror --enable-__cxa_atexit --enable-cet=auto --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-default-ssp --enable-gnu-indirect-function --enable-gnu-unique-object --enable-install-libiberty --enable-languages=c,c++,ada,fortran,go,lto,objc,obj-c++ --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --mandir=/usr/share/man --with-isl --with-linker-hash-style=gnu
Disk Notes: MQ-DEADLINE / nossd,relatime,rw,space_cache,subvol=/,subvolid=5 / Bcache writeback
Processor Notes: Scaling Governor: intel_pstate powersave
Security Notes: l1tf: Not affected + mds: Not affected + meltdown: Mitigation of PTI + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling

	ODROID-C2	Raspberry Pi 3	Odroid-H2
SQLite - D.T.D (sec)	**12.98**	**219.03**	180.10
Normalized	100%	5.93%	7.21%
Standard Deviation	0.4%	7%	3%
John The Ripper - Blowfish (Real C/S)	852	**574**	**2682**
Normalized	31.77%	21.4%	100%
Standard Deviation	0%	9.5%	0.3%
John The Ripper - MD5 (Real C/S)	17021	**10829**	**37632**
Normalized	45.23%	28.78%	100%
Standard Deviation	0.1%	1.3%	0.4%
C-Ray - Total Time (sec)	186.93	**251.91**	**51.84**
Normalized	27.73%	20.58%	100%

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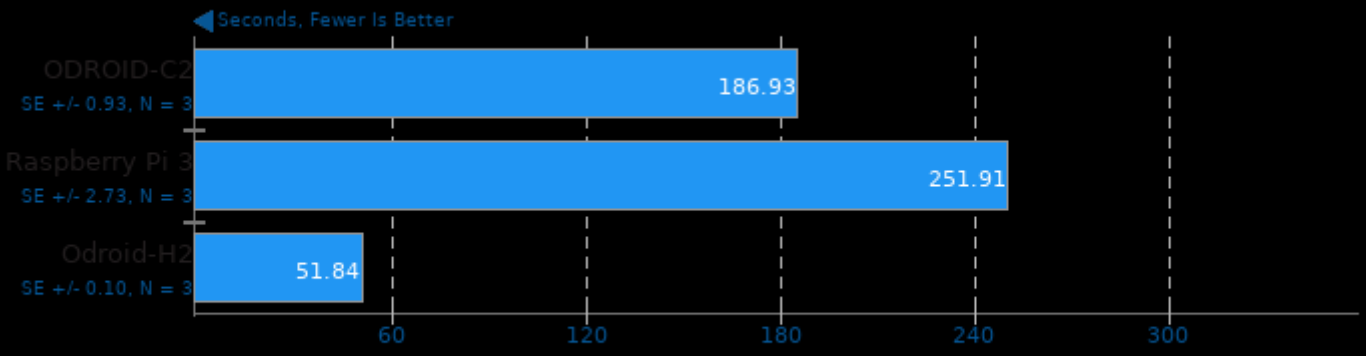
Standard Deviation	0.9%	1.9%	0.3%
FLAC Audio Encoding - WAV To FLAC (sec)	155.58	**228.29**	**13.73**
Normalized	8.83%	6.01%	100%
Standard Deviation	0.6%	0.3%	0%
FFmpeg - H.2.H.T.N.D (sec)	202.73	**253.17**	**22.70**
Normalized	11.2%	8.97%	100%
Standard Deviation	0.8%	0.4%	0.2%


SQLite 3.8.10.2
Test Target: Default Test Directory
Seconds, Fewer Is Better
ODROID-C2
SE +/- 0.03, N = 3
12.98
Raspberry Pi 3
SE +/- 6.27, N = 6
-lreadline
219.03
Odroid-H2
SE +/- 1.62, N = 11
-lreadline
180.10
50
100
150
200
250
1. (CC) gcc options: -O2 -lcurses -ldl -lpthread
John The Ripper 1.8.0
Test: Blowfish
Real C/S, More Is Better
ODROID-C2
SE +/- 0.00, N = 3
852
Raspberry Pi 3
SE +/- 22.18, N = 6
574
Odroid-H2
SE +/- 4.84, N = 3
-lcrypt
2682
600
1200
1800
2400
3000
1. (CC) gcc options: -fopenmp
John The Ripper 1.8.0
Test: MD5
Real C/S, More Is Better
ODROID-C2
SE +/- 11.00, N = 3
17021
Raspberry Pi 3
SE +/- 83.10, N = 3
10829
Odroid-H2
SE +/- 97.25, N = 3
-lcrypt
37632
8K
16K
24K
32K
40K
1. (CC) gcc options: -fopenmp

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C-Ray 1.1

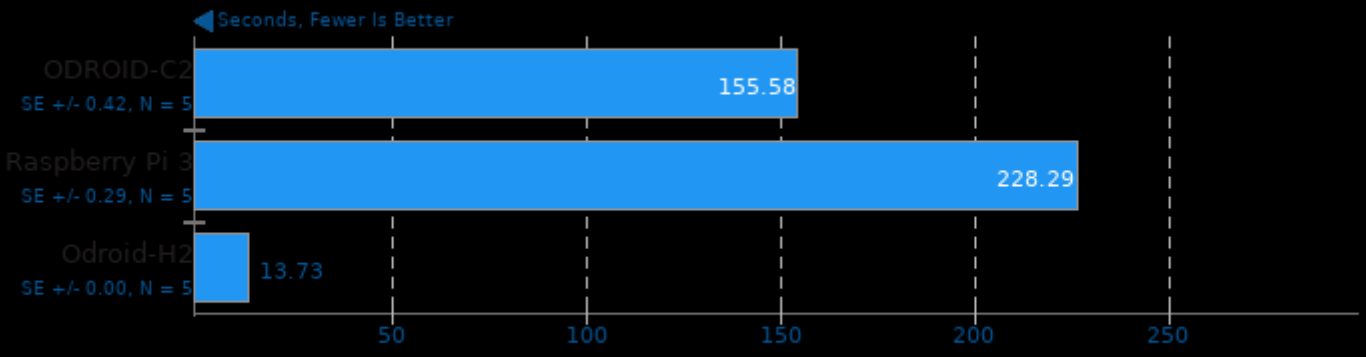
Total Time



1. (CC) gcc options: -lm -lpthread -O3

FLAC Audio Encoding 1.3.1

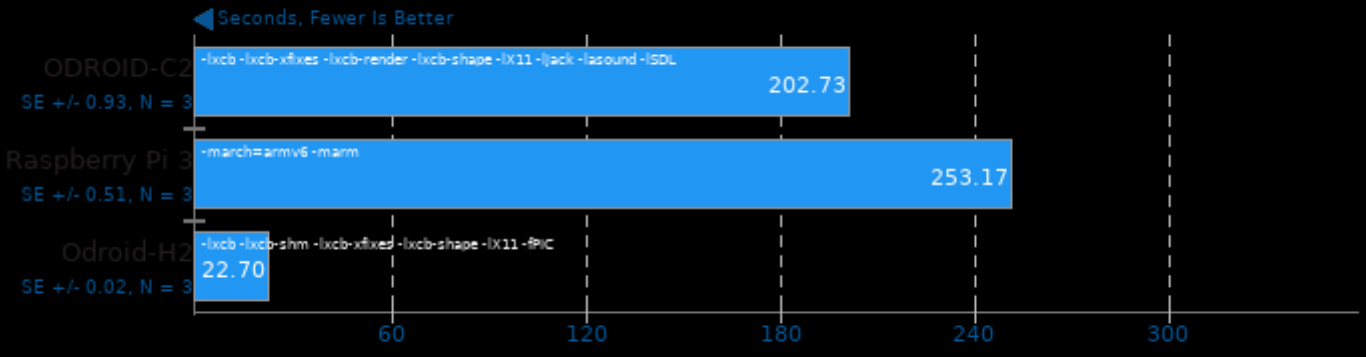
WAV To FLAC



1. (CXX) g++ options: -O2 -fvisibility=hidden -lm

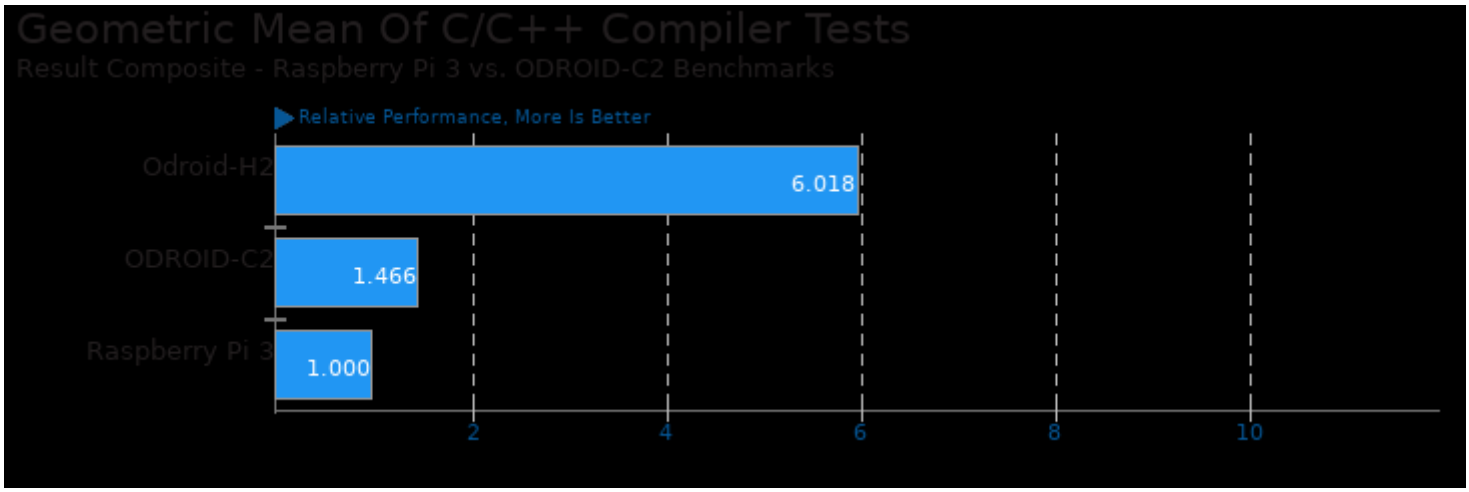
FFmpeg 2.8.1

H.264 HD To NTSC DV

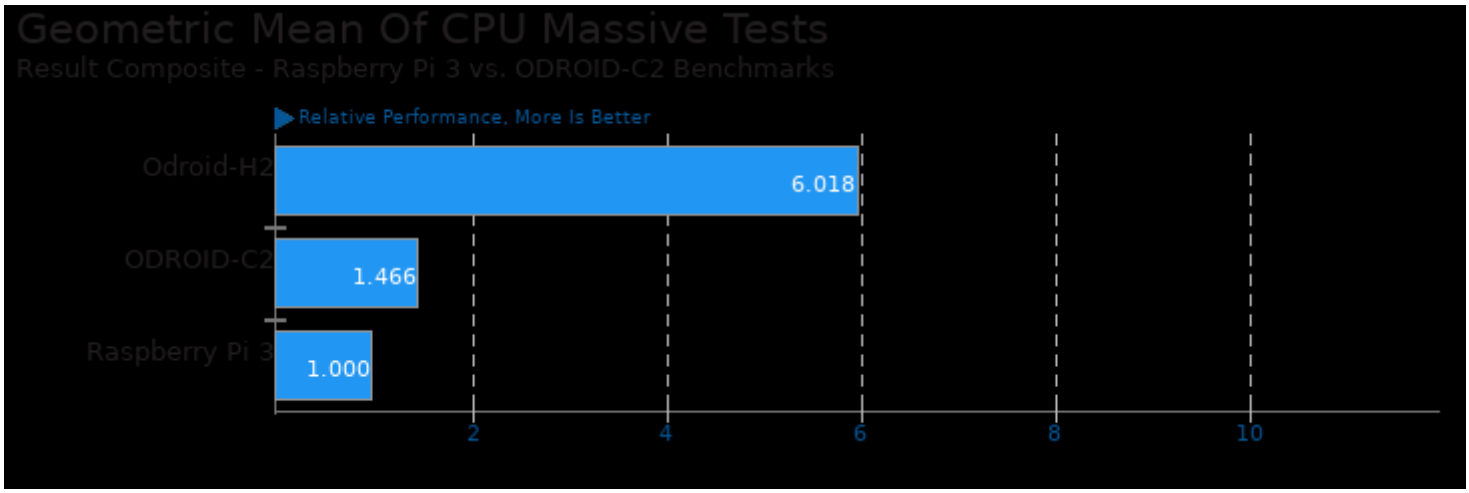


1. (CC) gcc options: -lavdevice -lavfilter -lavformat -lavcodec -lswresample -lswscale -lavutil -lm -llzma -lbz2 -pthread -std=c99 -fomit-frame-pointer -O3

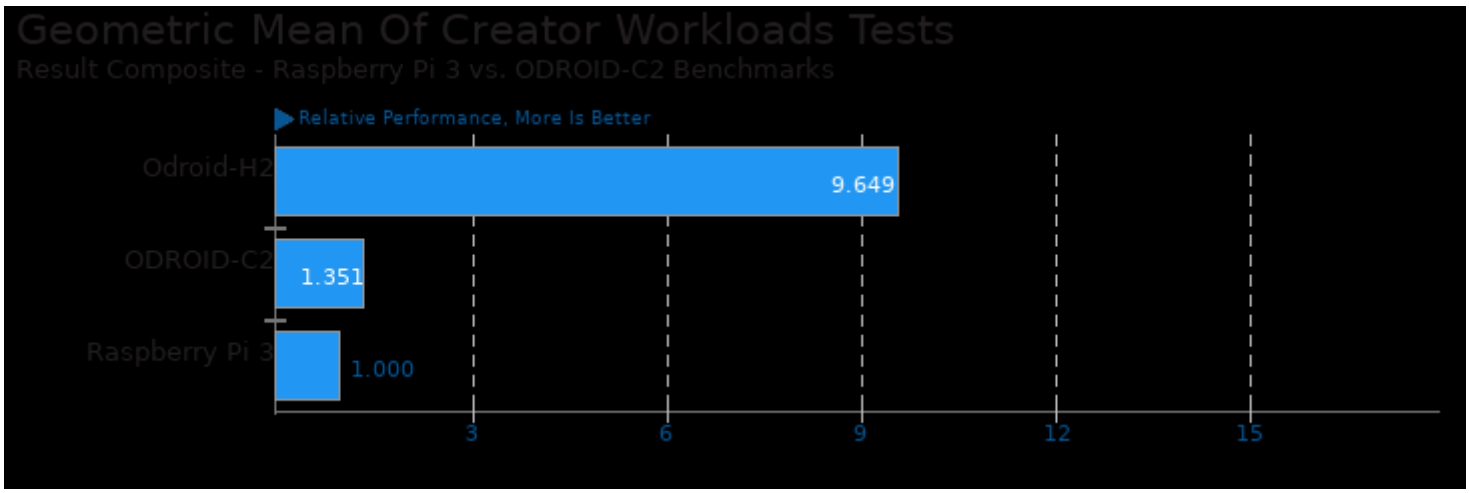
These geometric means are based upon test groupings / test suites for this result file.



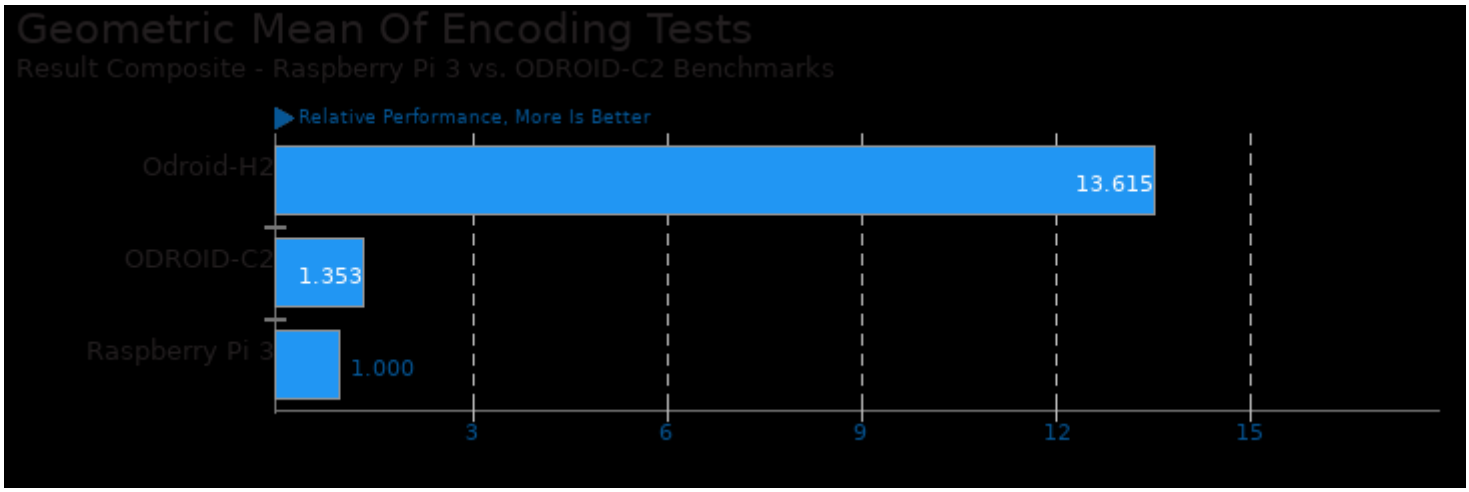
Geometric mean based upon tests: pts/c-ray, pts/encode-flac and pts/john-the-ripper



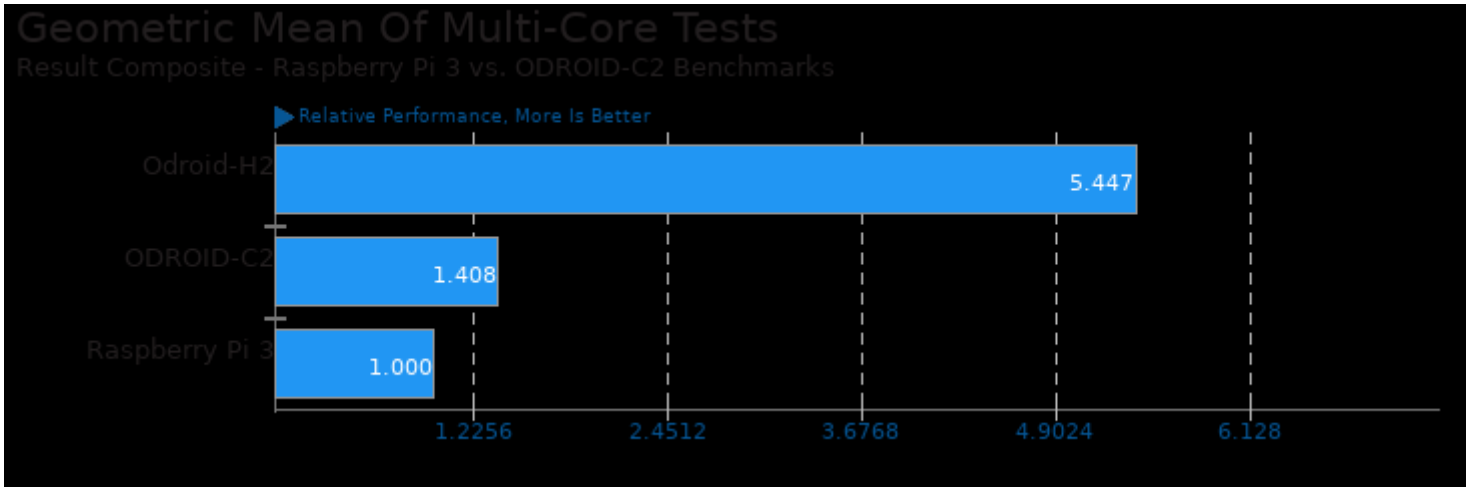
Geometric mean based upon tests: pts/c-ray, pts/encode-flac and pts/john-the-ripper



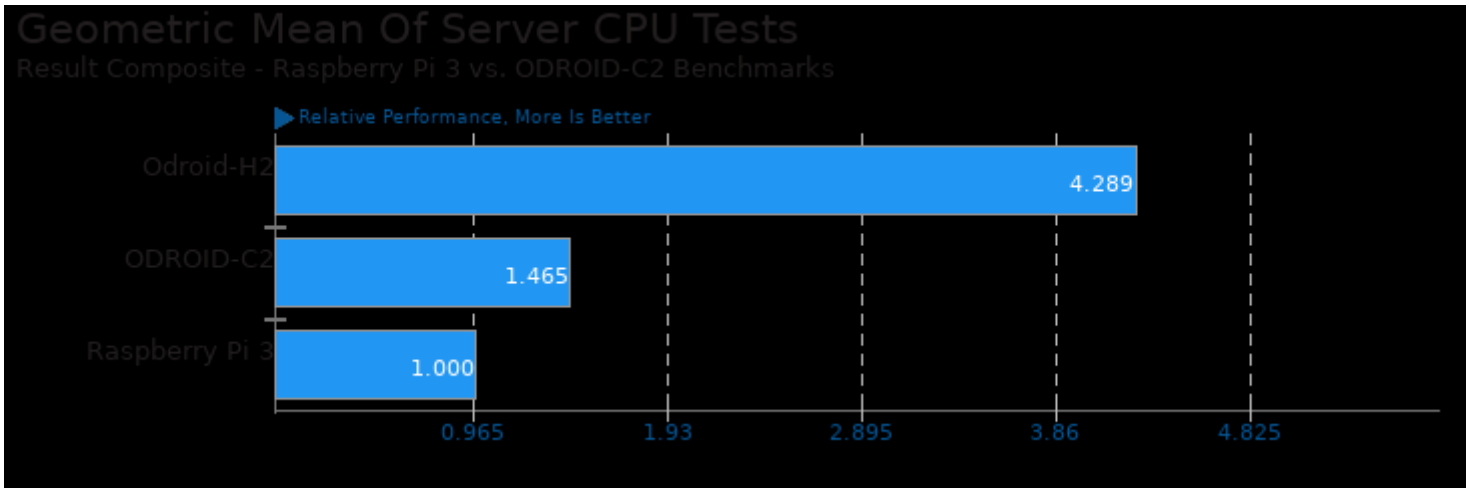
Geometric mean based upon tests: pts/c-ray, pts/ffmpeg and pts/encode-flac



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



Geometric mean based upon tests: pts/c-ray, pts/ffmpeg and pts/john-the-ripper



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

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