# Raspberry Pi 4 - VMware ESXi - BCM2711

> Virtual Machine on VMware ESXi 7.0 Release 1.13, Dual-Core Virtual Machine. Host @2100 MHz

Linux raspberrypi4 6.3.0-1-arm64 #1 SMP Debian 6.3.7-1 (2023-06-12) aarch64 GNU/Linux

```
08.07.2023
sbc-bench v0.9.42

Installing needed tools: Done.
Checking cpufreq OPP. Done (results will be available in 9-14 minutes).
Executing tinymembench. Done.
Executing RAM latency tester. Done.
Executing OpenSSL benchmark. Done.
Executing 7-zip
benchmark...

             Done.
Checking cpufreq OPP again. Done (9 minutes elapsed).

Results validation:

  * No swapping
  * Throttling occured

Memory performance
memcpy: 2421.0 MB/s
memset: 3243.7 MB/s

7-zip total scores (3 consecutive runs): 3341,3410,3393, single-threaded: 1798

OpenSSL results:
type             16 bytes     64 bytes    256 bytes   1024 bytes   8192 bytes  16384 bytes
```

| | | | | | | |
|---|---|---|---|---|---|---|
| aes-128-cbc | 49447.93k | 53976.09k | 55393.79k | 55831.21k | 55986.86k | 55907.67k |
| aes-128-cbc | 49542.43k | 53921.32k | 55418.20k | 55851.69k | 55965.01k | 56027.82k |
| aes-192-cbc | 42226.14k | 45174.42k | 46304.00k | 46683.14k | 46631.59k | 46830.93k |
| aes-192-cbc | 41792.09k | 44896.04k | 46208.77k | 46623.74k | 46918.31k | 46749.01k |
| aes-256-cbc | 36586.13k | 38903.94k | 39674.79k | 40048.98k | 40012.46k | 40080.73k |
| aes-256-cbc | 36114.35k | 39022.19k | 39820.71k | 39884.12k | 40108.03k | 39927.81k |

## Full Result

```
sbc-bench v0.9.42 VMware Cortex-A72 VM (Sat, 08 Jul 2023 15:08:50 +0200)

Distributor ID:□Debian
Description:□Debian GNU/Linux trixie/sid
Codename:□trixie

Device Info:
□Manufacturer: VMware, Inc.
□Product Name: VMware20,1
□Version: 1
□SKU Number: 0000000000000001
□Family: VMware

BIOS/UEFI:
□Vendor: VMware, Inc.
□Version: VMW201.00V.21747440.BA64.2305102224
□Release Date: 05/10/2023

/usr/bin/gcc (Debian 12.3.0-4) 12.3.0

Uptime: 15:08:50 up 7 min,  2 users,  load average: 0.08, 0.04, 0.01,  °C,  182776534

Linux 6.3.0-1-arm64 (raspberrypi4) □07/08/23 □_aarch64_□(2 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           0.66    0.00    1.29    0.46    0.00   97.60

Device             tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn
kB_dscd
sda              15.09       656.11        27.82         0.00     294193
```

```
12476          0

               total        used        free      shared  buff/cache   available
Mem:           974Mi       189Mi       754Mi       572Ki        98Mi       784Mi
Swap:          951Mi          0B       951Mi

Filename□□□□Type□□Size□□Used□□Priority
/dev/sda3                                partition□974844□□0□□-2

################################################################################

Checking cpufreq OPP (Cortex-A72):

No cpufreq support available. Measured on cpu1: 1990 MHz (1990.790/1990.163/1989.586)

################################################################################

Executing benchmark on cpu0 (Cortex-A72):

tinymembench v0.4.9-nuumio (simple benchmark for memory throughput and latency)

CFLAGS:
bandwidth test min repeats (-b): 2
bandwidth test max repeats (-B): 3
bandwidth test mem realloc (-M): no      (-m for realloc)
      latency test repeats (-l): 3
        latency test count (-c): 1000000

================================================================================
== Memory bandwidth tests                                                     ==
==                                                                            ==
== Note 1: 1MB = 1000000 bytes                                                ==
== Note 2: Test result is the best of repeated runs. Number of repeats  ==
==         is shown in brackets                                               ==
== Note 3: Results for 'copy' tests show how many bytes can be          ==
==         copied per second (adding together read and writen                 ==
==         bytes would have provided twice higher numbers)                    ==
== Note 4: 2-pass copy means that we are using a small temporary buffer ==
==         to first fetch data into it, and only then write it to the   ==
```

```
==         destination (source -> L1 cache, L1 cache -> destination)    ==
== Note 5: If sample standard deviation exceeds 0.1%, it is shown in    ==
==         brackets                                                     ==
==========================================================================

 C copy backwards                                     :   2146.2 MB/s (3, 7.9%)
 C copy backwards (32 byte blocks)                    :   2417.3 MB/s (3, 0.7%)
 C copy backwards (64 byte blocks)                    :   2429.6 MB/s (3, 0.8%)
 C copy                                               :   2430.3 MB/s (3, 0.3%)
 C copy prefetched (32 bytes step)                    :   2416.9 MB/s (3, 1.6%)
 C copy prefetched (64 bytes step)                    :   2420.6 MB/s (2)
 C 2-pass copy                                        :   1559.1 MB/s (3, 0.3%)
 C 2-pass copy prefetched (32 bytes step)             :   1733.8 MB/s (3, 2.7%)
 C 2-pass copy prefetched (64 bytes step)             :   1750.9 MB/s (3, 1.1%)
 C scan 8                                             :    976.3 MB/s (3, 0.3%)
 C scan 16                                            :   1936.6 MB/s (3, 0.7%)
 C scan 32                                            :   3675.3 MB/s (3, 1.1%)
 C scan 64                                            :   4006.4 MB/s (3, 0.6%)
 C fill                                               :   3276.2 MB/s (3, 0.6%)
 C fill (shuffle within 16 byte blocks)               :   3272.8 MB/s (2)
 C fill (shuffle within 32 byte blocks)               :   3267.8 MB/s (3, 0.8%)
 C fill (shuffle within 64 byte blocks)               :   3269.3 MB/s (3, 0.4%)
 ---
 libc memcpy copy                                     :   2421.0 MB/s (3, 0.4%)
 libc memchr scan                                     :   4017.9 MB/s (3, 1.2%)
 libc memset fill                                     :   3243.7 MB/s (3, 0.4%)
 ---
 NEON LDP/STP copy                                    :   2426.9 MB/s (3, 1.7%)
 NEON LDP/STP copy pldl2strm (32 bytes step)          :   2402.2 MB/s (3, 0.5%)
 NEON LDP/STP copy pldl2strm (64 bytes step)          :   2396.6 MB/s (3, 1.6%)
 NEON LDP/STP copy pldl1keep (32 bytes step)          :   2413.2 MB/s (3, 1.9%)
 NEON LDP/STP copy pldl1keep (64 bytes step)          :   1757.2 MB/s (3, 5.9%)
 NEON LD1/ST1 copy                                    :   2426.1 MB/s (3, 1.0%)
 NEON LDP load                                        :   4020.3 MB/s (2)
 NEON LDNP load                                       :   3973.5 MB/s (3, 21.6%)
 NEON STP fill                                        :   3220.0 MB/s (3, 8.5%)
 NEON STNP fill                                       :   3063.7 MB/s (3, 3.9%)
 ARM LDP/STP copy                                     :   2343.3 MB/s (3, 19.4%)
 ARM LDP load                                         :   4006.4 MB/s (3, 3.5%)
```

```
 ARM LDNP load                                      :   4002.0 MB/s (2)
 ARM STP fill                                       :   3274.8 MB/s (3, 0.2%)
 ARM STNP fill                                      :   3066.6 MB/s (3, 2.9%)

==========================================================================
== Framebuffer read tests.                                              ==
==                                                                      ==
== Many ARM devices use a part of the system memory as the framebuffer, ==
== typically mapped as uncached but with write-combining enabled.       ==
== Writes to such framebuffers are quite fast, but reads are much       ==
== slower and very sensitive to the alignment and the selection of      ==
== CPU instructions which are used for accessing memory.                ==
==                                                                      ==
== Many x86 systems allocate the framebuffer in the GPU memory,         ==
== accessible for the CPU via a relatively slow PCI-E bus. Moreover,    ==
== PCI-E is asymmetric and handles reads a lot worse than writes.       ==
==                                                                      ==
== If uncached framebuffer reads are reasonably fast (at least 100 MB/s ==
== or preferably >300 MB/s), then using the shadow framebuffer layer    ==
== is not necessary in Xorg DDX drivers, resulting in a nice overall    ==
== performance improvement. For example, the xf86-video-fbturbo DDX     ==
== uses this trick.                                                     ==
==========================================================================

 NEON LDP/STP copy (from framebuffer)               :   2541.3 MB/s (3, 15.9%)
 NEON LDP/STP 2-pass copy (from framebuffer)        :   1826.7 MB/s (3, 1.4%)
 NEON LD1/ST1 copy (from framebuffer)               :   2515.2 MB/s (3, 3.5%)
 NEON LD1/ST1 2-pass copy (from framebuffer)        :   1847.8 MB/s (3, 2.8%)
 ARM LDP/STP copy (from framebuffer)                :   2516.5 MB/s (3, 2.0%)
 ARM LDP/STP 2-pass copy (from framebuffer)         :   1838.1 MB/s (3, 1.1%)

==========================================================================
== Memory latency test                                                  ==
==                                                                      ==
== Average time is measured for random memory accesses in the buffers   ==
== of different sizes. The larger is the buffer, the more significant   ==
== are relative contributions of TLB, L1/L2 cache misses and SDRAM      ==
== accesses. For extremely large buffer sizes we are expecting to see   ==
== page table walk with several requests to SDRAM for almost every      ==
```

```
== memory access (though 64MiB is not nearly large enough to experience ==
== this effect to its fullest).                                          ==
==                                                                       ==
== Note 1: All the numbers are representing extra time, which needs to  ==
==         be added to L1 cache latency. The cycle timings for L1 cache ==
==         latency can be usually found in the processor documentation. ==
== Note 2: Dual random read means that we are simultaneously performing ==
==         two independent memory accesses at a time. In the case if    ==
==         the memory subsystem can't handle multiple outstanding       ==
==         requests, dual random read has the same timings as two       ==
==         single reads performed one after another.                    ==
===========================================================================

block size : single random read / dual random read, [MADV_NOHUGEPAGE]
      1024 :    0.0 ns          /     0.0 ns
      2048 :    0.0 ns          /     0.0 ns
      4096 :    0.0 ns          /     0.0 ns
      8192 :    0.0 ns          /     0.0 ns
     16384 :    0.0 ns          /     0.0 ns
     32768 :    0.1 ns          /     0.0 ns
     65536 :    4.4 ns          /     6.7 ns
    131072 :    6.6 ns          /     8.9 ns
    262144 :    9.6 ns          /    11.9 ns
    524288 :   12.2 ns          /    14.2 ns
   1048576 :   32.1 ns          /    49.8 ns
   2097152 :   83.8 ns          /   120.9 ns
   4194304 :  113.3 ns          /   145.0 ns
   8388608 :  148.5 ns          /   185.8 ns
  16777216 :  165.1 ns          /   212.5 ns
  33554432 :  177.4 ns          /   229.7 ns
  67108864 :  222.1 ns          /   313.2 ns

block size : single random read / dual random read, [MADV_HUGEPAGE]
      1024 :    0.0 ns          /     0.0 ns
      2048 :    0.0 ns          /     0.0 ns
      4096 :    0.0 ns          /     0.0 ns
      8192 :    0.0 ns          /     0.0 ns
     16384 :    0.0 ns          /     0.0 ns
     32768 :    2.2 ns          /     3.7 ns
```

```
     65536 :    4.4 ns          /     6.7 ns
    131072 :    6.7 ns          /     8.9 ns
    262144 :    9.6 ns          /    11.9 ns
    524288 :   11.6 ns          /    14.2 ns
   1048576 :   30.6 ns          /    50.4 ns
   2097152 :   84.6 ns          /   120.8 ns
   4194304 :  111.7 ns          /   144.5 ns
   8388608 :  146.8 ns          /   185.3 ns
  16777216 :  164.5 ns          /   208.4 ns
  33554432 :  173.2 ns          /   221.4 ns
  67108864 :  179.4 ns          /   231.5 ns

################################################################################

Executing ramlat on cpu0 (Cortex-A72), results in ns:

       size:  1x32  2x32  1x64  2x64 1xPTR 2xPTR 4xPTR 8xPTR
         4k: 2.573 2.533 2.516 2.514 2.012 2.015 2.025 4.038
         8k: 2.515 2.513 2.516 2.514 2.013 2.014 2.051 4.295
        16k: 2.535 2.516 2.515 2.538 2.013 2.012 2.711 4.028
        32k: 2.520 2.524 2.525 2.519 2.015 2.017 2.995 4.038
        64k: 11.03 11.11 11.10 11.21 10.56 10.92 18.16 36.23
       128k: 11.09 11.11 11.10 11.14 10.59 11.68 18.37 36.45
       256k: 17.15 16.84 16.96 16.84 16.46 16.41 19.69 36.65
       512k: 15.66 15.34 15.93 15.39 18.55 15.70 19.50 36.91
      1024k: 96.15 74.11 93.91 70.15 82.78 70.09 80.89 104.9
      2048k: 125.7 127.5 129.7 124.4 126.5 118.3 132.6 199.8
      4096k: 135.8 134.8 135.8 138.6 136.7 135.8 142.7 183.3
      8192k: 185.0 187.0 184.0 185.4 185.5 179.4 186.0 203.9
     16384k: 183.2 185.5 185.2 185.9 186.1 185.1 192.9 214.3
     32768k: 184.8 187.0 184.8 187.1 187.2 189.6 197.9 221.0
     65536k: 185.8 188.8 186.6 188.6 189.5 192.3 199.8 224.8
    131072k: 187.2 264.9 192.4 196.3 189.5 207.5 207.1 228.6

################################################################################

Executing benchmark twice on cluster 0 (Cortex-A72)

OpenSSL 3.0.9, built on 30 May 2023 (Library: OpenSSL 3.0.9 30 May 2023)
```

```
type             16 bytes     64 bytes    256 bytes   1024 bytes   8192 bytes  16384 bytes
aes-128-cbc      49447.93k    53976.09k    55393.79k    55831.21k    55986.86k
55907.67k
aes-128-cbc      49542.43k    53921.32k    55418.20k    55851.69k    55965.01k
56027.82k
aes-192-cbc      42226.14k    45174.42k    46304.00k    46683.14k    46631.59k
46830.93k
aes-192-cbc      41792.09k    44896.04k    46208.77k    46623.74k    46918.31k
46749.01k
aes-256-cbc      36586.13k    38903.94k    39674.79k    40048.98k    40012.46k
40080.73k
aes-256-cbc      36114.35k    39022.19k    39820.71k    39884.12k    40108.03k
39927.81k

################################################################################

Executing benchmark single-threaded on cpu0 (Cortex-A72)

7-Zip (a) [64] 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,2 CPUs LE)

LE
CPU Freq: - - 64000000 - - - - - -

RAM size:     974 MB,  # CPU hardware threads:   2
RAM usage:    435 MB,  # Benchmark threads:      1

                       Compressing  |                 Decompressing
Dict     Speed Usage    R/U Rating  |      Speed Usage    R/U Rating
         KiB/s     %   MIPS   MIPS  |      KiB/s     %   MIPS   MIPS

22:       1560   100   1522   1518  |      24697   100   2112   2109
23:       1500   100   1531   1529  |      24158   100   2094   2091
24:       1414   100   1524   1520  |      23606   100   2076   2072
25:       1309   100   1497   1495  |      23030   100   2052   2050
----------------------------------  | ------------------------------
Avr:             100   1518   1516  |              100   2083   2081
Tot:             100   1801   1798
```

```
########################################################################

Executing benchmark 3 times multi-threaded on CPUs 0-1

7-Zip (a) [64] 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,2 CPUs LE)

LE
CPU Freq: - - - - - - - - -

RAM size:     974 MB,  # CPU hardware threads:   2
RAM usage:    441 MB,  # Benchmark threads:      2

                       Compressing  |                  Decompressing
Dict     Speed Usage    R/U Rating  |      Speed Usage    R/U Rating
         KiB/s     %   MIPS   MIPS  |      KiB/s     %   MIPS   MIPS

22:       2623   176   1452   2553  |      47959   198   2068   4095
23:       2613   186   1435   2662  |      46837   198   2050   4054
24:       2545   187   1466   2737  |      45543   198   2024   3998
25:       2346   185   1448   2679  |      44415   197   2005   3953
---------------------------------  | ------------------------------
Avr:             183   1450   2658  |              198   2037   4025
Tot:             190   1744   3341

7-Zip (a) [64] 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,2 CPUs LE)

LE
CPU Freq: - - - - - - - - -

RAM size:     974 MB,  # CPU hardware threads:   2
RAM usage:    441 MB,  # Benchmark threads:      2

                       Compressing  |                  Decompressing
Dict     Speed Usage    R/U Rating  |      Speed Usage    R/U Rating
         KiB/s     %   MIPS   MIPS  |      KiB/s     %   MIPS   MIPS

22:       2884   186   1508   2806  |      48366   199   2080   4130
```

```
23:       2680   188   1451   2731  |      47504   199   2064   4112
24:       2540   187   1460   2732  |      46113   199   2039   4048
25:       2379   184   1473   2716  |      45009   199   2017   4006
---------------------------------  | ----------------------------
Avr:             186   1473   2746  |             199   2050   4074
Tot:             193   1761   3410

7-Zip (a) [64] 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,2 CPUs LE)

LE
CPU Freq: - - - - - - - - -

RAM size:     974 MB,  # CPU hardware threads:   2
RAM usage:    441 MB,  # Benchmark threads:      2

                     Compressing  |                 Decompressing
Dict     Speed Usage    R/U Rating  |      Speed Usage    R/U Rating
         KiB/s     %   MIPS   MIPS  |      KiB/s     %   MIPS   MIPS

22:       2686   177   1480   2613  |      48604   199   2088   4150
23:       2642   188   1432   2693  |      47805   200   2073   4138
24:       2556   187   1473   2749  |      46454   199   2046   4078
25:       2363   185   1461   2699  |      45247   199   2024   4027
---------------------------------  | ----------------------------
Avr:             184   1461   2688  |             199   2058   4098
Tot:             192   1760   3393

Compression: 2658,2746,2688
Decompression: 4025,4074,4098
Total: 3341,3410,3393

##########################################################################

Testing maximum cpufreq again, still under full load. System health now:

Time      CPU n/a    load %cpu %sys %usr %nice %io %irq   Temp
15:17:20: n/a MHz    1.95  95%   2%  93%   0%   0%   0%      °C
```

```
Checking cpufreq OPP (Cortex-A72):

No cpufreq support available. Measured on cpu1: 1992 MHz (1992.379/1992.304/1992.204)

################################################################################

System health while running tinymembench:

Time      CPU n/a    load %cpu %sys %usr %nice %io %irq   Temp
15:08:56: n/a MHz    0.15   3%   1%   1%   0%   0%   0%      °C
15:09:06: n/a MHz    0.28  51%   0%  50%   0%   0%   0%      °C
15:09:16: n/a MHz    0.39  50%   0%  50%   0%   0%   0%      °C
15:09:26: n/a MHz    0.56  50%   0%  50%   0%   0%   0%      °C
15:09:37: n/a MHz    0.63  50%   0%  50%   0%   0%   0%      °C
15:09:47: n/a MHz    0.69  51%   0%  50%   0%   0%   0%      °C
15:09:57: n/a MHz    0.74  51%   0%  50%   0%   0%   0%      °C
15:10:07: n/a MHz    0.78  50%   0%  50%   0%   0%   0%      °C
15:10:17: n/a MHz    0.81  50%   0%  50%   0%   0%   0%      °C
15:10:27: n/a MHz    0.84  50%   0%  49%   0%   0%   0%      °C

System health while running ramlat:

Time      CPU n/a    load %cpu %sys %usr %nice %io %irq   Temp
15:10:37: n/a MHz    0.87  11%   1%  10%   0%   0%   0%      °C
15:10:40: n/a MHz    0.88  50%   0%  50%   0%   0%   0%      °C
15:10:43: n/a MHz    0.89  50%   0%  50%   0%   0%   0%      °C
15:10:46: n/a MHz    0.89  50%   0%  50%   0%   0%   0%      °C
15:10:49: n/a MHz    0.90  50%   0%  50%   0%   0%   0%      °C
15:10:52: n/a MHz    0.90  50%   0%  50%   0%   0%   0%      °C
15:10:55: n/a MHz    0.90  50%   0%  50%   0%   0%   0%      °C
15:10:58: n/a MHz    0.91  50%   0%  49%   0%   0%   0%      °C
15:11:01: n/a MHz    0.91  50%   0%  50%   0%   0%   0%      °C
15:11:04: n/a MHz    0.92  50%   0%  49%   0%   0%   0%      °C
15:11:07: n/a MHz    0.93  50%   1%  49%   0%   0%   0%      °C
15:11:11: n/a MHz    0.93  51%   1%  48%   0%   0%   0%      °C

System health while running OpenSSL benchmark:

Time      CPU n/a    load %cpu %sys %usr %nice %io %irq   Temp
```

```
15:11:12: n/a MHz    0.93  14%   1%  12%   0%   0%   0%      °C
15:11:28: n/a MHz    0.95  50%   0%  50%   0%   0%   0%      °C
15:11:44: n/a MHz    0.96  50%   0%  50%   0%   0%   0%      °C
15:12:00: n/a MHz    0.97  50%   0%  50%   0%   0%   0%      °C
15:12:16: n/a MHz    0.98  50%   0%  50%   0%   0%   0%      °C
15:12:32: n/a MHz    0.98  50%   0%  50%   0%   0%   0%      °C
15:12:48: n/a MHz    0.99  50%   0%  50%   0%   0%   0%      °C

System health while running 7-zip single core benchmark:

Time      CPU n/a    load %cpu %sys %usr %nice %io %irq   Temp
15:13:00: n/a MHz    0.99  19%   1%  18%   0%   0%   0%      °C
15:13:07: n/a MHz    0.99  50%   0%  49%   0%   0%   0%      °C
15:13:14: n/a MHz    0.99  50%   0%  50%   0%   0%   0%      °C
15:13:21: n/a MHz    0.99  50%   1%  49%   0%   0%   0%      °C
15:13:28: n/a MHz    1.00  50%   0%  49%   0%   0%   0%      °C
15:13:35: n/a MHz    1.00  50%   1%  49%   0%   0%   0%      °C
15:13:42: n/a MHz    1.00  50%   1%  49%   0%   0%   0%      °C
15:13:49: n/a MHz    1.00  50%   0%  49%   0%   0%   0%      °C
15:13:56: n/a MHz    1.00  50%   1%  48%   0%   0%   0%      °C
15:14:03: n/a MHz    1.00  50%   1%  49%   0%   0%   0%      °C
15:14:10: n/a MHz    1.00  50%   1%  49%   0%   0%   0%      °C
15:14:18: n/a MHz    1.00  50%   0%  49%   0%   0%   0%      °C

System health while running 7-zip multi core benchmark:

Time      CPU n/a    load %cpu %sys %usr %nice %io %irq   Temp
15:14:23: n/a MHz    1.16  23%   1%  21%   0%   0%   0%      °C
15:14:52: n/a MHz    1.63  96%   1%  94%   0%   0%   0%      °C
15:15:21: n/a MHz    1.91  95%   2%  92%   0%   0%   0%      °C
15:15:51: n/a MHz    2.01  96%   1%  95%   0%   0%   0%      °C
15:16:21: n/a MHz    2.08  95%   2%  93%   0%   0%   0%      °C
15:16:50: n/a MHz    1.91  96%   1%  94%   0%   0%   0%      °C
15:17:20: n/a MHz    1.95  95%   2%  93%   0%   0%   0%      °C

################################################################################

Linux 6.3.0-1-arm64 (raspberrypi4) □07/08/23 □_aarch64_□(2 CPU)
```

```
avg-cpu:  %user   %nice %system %iowait  %steal   %idle
          35.36    0.02    1.27    0.22    0.00   63.12

Device             tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn
kB_dscd
sda               7.70       312.14        15.57         0.00     301621
15048          0

               total        used        free      shared  buff/cache   available
Mem:           974Mi       202Mi       734Mi       568Ki       106Mi       772Mi
Swap:          951Mi          0B       951Mi

Filename□□□□Type□□Size□□Used□□Priority
/dev/sda3                                partition□974844□□0□□-2

CPU sysfs topology (clusters, cpufreq members, clockspeeds)
                cpufreq   min    max
 CPU    cluster  policy   speed  speed   core type
  0       36        0       -      -     Cortex-A72 / r0p3
  1       36        0       -      -     Cortex-A72 / r0p3

Architecture:                    aarch64
CPU op-mode(s):                  32-bit, 64-bit
Byte Order:                      Little Endian
CPU(s):                          2
On-line CPU(s) list:             0,1
Vendor ID:                       ARM
BIOS Vendor ID:                  Arm
Model name:                      Cortex-A72
BIOS Model name:                 Arm Cortex-A72 r0p3  CPU @ 0.0GHz
BIOS CPU family:                 280
Model:                           3
Thread(s) per core:              1
Core(s) per socket:              2
Socket(s):                       1
Stepping:                        r0p3
BogoMIPS:                        108.00
Flags:                           fp asimd evtstrm crc32 cpuid
L1d cache:                       64 KiB (2 instances)
```

```
L1i cache:                       96 KiB (2 instances)
L2 cache:                        2 MiB (2 instances)
NUMA node(s):                    1
NUMA node0 CPU(s):               0,1
Vulnerability Itlb multihit:     Not affected
Vulnerability L1tf:              Not affected
Vulnerability Mds:               Not affected
Vulnerability Meltdown:          Not affected
Vulnerability Mmio stale data:   Not affected
Vulnerability Retbleed:          Not affected
Vulnerability Spec store bypass: Vulnerable
Vulnerability Spectre v1:        Mitigation; __user pointer sanitization
Vulnerability Spectre v2:        Vulnerable
Vulnerability Srbds:             Not affected
Vulnerability Tsx async abort:   Not affected

SoC guess: NXP LS1028A / guess flawed since running in vmware
 Compiler: /usr/bin/gcc (Debian 12.3.0-4) 12.3.0 / aarch64-linux-gnu
 Userland: arm64
   Kernel: 6.3.0-1-arm64/aarch64 (vmware)
           CONFIG_HZ=250
           CONFIG_HZ_250=y
           CONFIG_PREEMPT_NOTIFIERS=y
           CONFIG_PREEMPT_VOLUNTARY=y
           CONFIG_PREEMPT_VOLUNTARY_BUILD=y

################################################################################

Results validation:

  * No swapping
  * Throttling occured

Status of performance related policies found below /sys:

  * /sys/module/pcie_aspm/parameters/policy: [default] performance powersave
powersupersave

| VMware Cortex-A72 VM | ~2000 MHz | 6.3 | Debian GNU/Linux trixie/sid arm64 | 3380 | 1798
```

```
| 40000 | 2420 | 3240 | - |
```

Created 2023-07-08 12:57:33 UTC by XeroX
Updated 2023-07-08 13:39:17 UTC by XeroX