VisionFive 2 - RISC-V - JH7110

Linux ArchVF2 6.12.18-cwt-5.14.0-2 #1 SMP PREEMPT_DYNAMIC Tue Apr 8 17:15:39 +07 2025 riscv64 GNU/Linux

```
06.12.2025
sbc-bench v0.9.72

Installing needed tools: distro packages already installed. Done.
Checking cpufreq OPP. Done (results will be available in 10-16 minutes).
Executing tinymembench. Done.
Executing RAM latency tester. Done.
Executing OpenSSL benchmark. Done.
Executing 7-zip benchmark. Done.
Checking cpufreq OPP again. Done (12 minutes elapsed).

Results validation:

  * Advertised vs. measured max CPU clockspeed: -1.3% before, -1.3% after ->
https://tinyurl.com/32w9rr94
  * No swapping
  * Background activity (%system) OK
  * No throttling

Memory performance
memcpy: 865.7 MB/s
memset: 772.2 MB/s

7-zip total scores (3 consecutive runs): 4240,4242,4245, single-threaded: 1232

OpenSSL results:
type             16 bytes     64 bytes    256 bytes   1024 bytes   8192 bytes  16384 bytes
aes-128-cbc      28765.81k    38883.61k    42767.96k    43852.80k    44127.57k    44034.73k
aes-128-cbc      28915.51k    38936.47k    42785.54k    43860.65k    44133.03k    44045.65k
```

aes-192-cbc	26072.98k	33627.39k	36439.38k	37218.65k	37410.13k	37350.06k
aes-192-cbc	25876.20k	33591.68k	36442.11k	37213.18k	37415.59k	37360.98k
aes-256-cbc	23460.88k	29573.44k	31747.93k	32316.07k	32489.47k	32402.09k
aes-256-cbc	23408.30k	29574.68k	31744.85k	32339.97k	32489.47k	32434.86k

Full Result

sbc-bench v0.9.72 StarFive VisionFive 2 v1.3B (Sat, 06 Dec 2025 20:29:51 +0000)

Description: Arch Linux

/usr/sbin/gcc (GCC) 15.2.1 20250813

Uptime: 20:29:51 up 44 min, 1 user, load average: 1.06, 2.20, 1.70, 33.1°C, 319744133

Linux 6.12.18-cwt-5.14.0-2 (ArchVF2) 12/06/25 _riscv64_ (4 CPU)

avg-cpu: %user %nice %system %iowait %steal %idle
21.51 0.01 1.83 0.77 0.00 75.87

Device tps kB_read/s kB_wrtn/s kB_dscd/s kB_read kB_wrtn kB_dscd
mmcblk1 3.93 69.36 273.31 8.44 185584 731304 22592
zram0 0.03 0.54 0.00 0.00 1432 4 0

total used free shared buff/cache available
Mem: 3.8Gi 319Mi 3.5Gi 1.7Mi 105Mi 3.5Gi
Swap: 1.9Gi 0B 1.9Gi

Filename Type Size Used Priority
/dev/zram0 partition 1979388 0 100

WARNING: ZSWAP ON TOP OF ZRAM HAS BEEN CONFIGURED ON THIS SYSTEM!
THIS WILL SEVERELY HARM PERFORMANCE IN CASE SWAPPING OCCURS!

Zswap active using zstd/zsmalloc, max pool occupation: 20%, details:
pool_limit_hit:0
pool_total_size:0
reject_alloc_fail:0
reject_compress_fail:0
reject_compress_poor:0
reject_kmemcache_fail:0
reject_reclaim_fail:0
stored_pages:0
written_back_pages:0

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Checking cpufreq OPP (sifive,u74-mc):

Cpufreq OPP: 1500    Measured: 1481 (1481.241/1481.207/1481.190)     (-1.3%)
Cpufreq OPP: 1250    Measured:  730    (731.128/730.986/730.360)    (-41.6%)
Cpufreq OPP:  750    Measured:  730    (731.253/730.727/730.368)     (-2.7%)
Cpufreq OPP:  625    Measured:  481    (482.300/481.963/480.735)    (-23.0%)
Cpufreq OPP:  500    Measured:  481    (482.311/481.916/481.568)     (-3.8%)
Cpufreq OPP:  417    Measured:  356    (356.625/356.582/356.304)    (-14.6%)
Cpufreq OPP:  375    Measured:  356    (357.330/357.059/356.351)     (-5.1%)
Cpufreq OPP:  312    Measured:  281    (282.387/281.830/281.585)     (-9.9%)

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Hardware sensors:

sfctemp-isa-120e0000
temp1:        +31.0 C

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Executing benchmark on cpu0 (sifive,u74-mc):

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)            ==
```

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== 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                          :    884.4 MB/s (3, 2.3%)
 C copy backwards (32 byte blocks)         :    884.3 MB/s (2)
 C copy backwards (64 byte blocks)         :    885.6 MB/s (3, 0.1%)
 C copy                                    :    882.8 MB/s (2)
 C copy prefetched (32 bytes step)         :    883.3 MB/s (2)
 C copy prefetched (64 bytes step)         :    883.7 MB/s (3)
 C 2-pass copy                             :    855.7 MB/s (3)
 C 2-pass copy prefetched (32 bytes step)  :    853.3 MB/s (2)
 C 2-pass copy prefetched (64 bytes step)  :    853.6 MB/s (2)
 C scan 8                                  :    600.0 MB/s (3, 1.1%)
 C scan 16                                 :    987.6 MB/s (3, 3.2%)
 C scan 32                                 :    840.3 MB/s (3, 1.4%)
 C scan 64                                 :   1850.5 MB/s (3, 0.2%)
 C fill                                    :    771.4 MB/s (3, 0.3%)
 C fill (shuffle within 16 byte blocks)    :    777.2 MB/s (3, 0.4%)
 C fill (shuffle within 32 byte blocks)    :    770.8 MB/s (3, 0.3%)
 C fill (shuffle within 64 byte blocks)    :    774.0 MB/s (3, 0.4%)
 ---
 libc memcpy copy                          :    865.7 MB/s (3, 0.4%)
 libc memchr scan                          :   1358.9 MB/s (2)
 libc memset fill                          :    772.2 MB/s (2)

==========================================================================
==========================================================================
== 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. ==
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== 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 :    0.1 ns         /     0.0 ns
    32768 :    0.2 ns         /     0.1 ns
    65536 :    5.9 ns         /    10.7 ns
   131072 :    8.9 ns         /    16.0 ns
   262144 :   10.7 ns         /    18.6 ns
   524288 :   16.1 ns         /    29.5 ns
  1048576 :   19.1 ns         /    31.1 ns
  2097152 :   38.4 ns         /    62.5 ns
  4194304 :   86.7 ns         /   170.4 ns
  8388608 :  126.1 ns         /   248.2 ns
 16777216 :  146.8 ns         /   292.0 ns
 33554432 :  161.0 ns         /   319.5 ns
 67108864 :  171.1 ns         /   340.8 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 :    0.1 ns         /     0.0 ns
    32768 :    0.2 ns         /     0.1 ns
    65536 :    5.8 ns         /    10.7 ns
   131072 :    8.9 ns         /    16.0 ns
   262144 :   10.6 ns         /    18.6 ns
   524288 :   12.0 ns         /    19.9 ns
  1048576 :   14.0 ns         /    20.5 ns
  2097152 :   26.4 ns         /    26.8 ns
  4194304 :   80.8 ns         /   158.7 ns
  8388608 :  115.3 ns         /   226.1 ns
 16777216 :  130.9 ns         /   260.1 ns
 33554432 :  143.4 ns         /   284.7 ns
 67108864 :  149.4 ns         /   297.1 ns
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Executing ramlat on cpu0 (sifive,u74-mc), results in ns:

      size:  1x32  2x32  1x64  2x64 1xPTR 2xPTR 4xPTR 8xPTR
        4k: 2.832 2.908 2.735 2.793 2.026 2.027 2.789 5.658
        8k: 2.787 2.872 2.703 2.789 2.027 2.027 2.787 5.660
       16k: 2.793 2.884 2.712 2.790 2.030 2.032 2.790 5.666
       32k: 2.807 2.895 2.723 2.807 2.042 2.042 2.809 5.706
       64k: 13.76 24.48 13.58 24.41 13.54 24.41 48.85 97.74
      128k: 13.68 24.46 13.58 24.39 13.54 24.45 48.85 99.07
      256k: 13.67 24.45 13.60 24.37 13.54 24.42 48.84 97.82
      512k: 13.68 24.47 13.57 24.38 13.55 24.42 51.75 97.78
     1024k: 13.72 24.53 13.58 24.38 13.54 24.41 48.85 97.71
     2048k: 19.78 34.02 18.48 34.65 26.93 34.34 66.61 126.6
     4096k: 131.2 236.2 130.5 236.2 130.4 235.7 437.4 848.9
     8192k: 157.6 273.8 157.5 274.0 157.4 273.7 514.7 984.3
    16384k: 160.8 277.2 160.7 276.9 160.9 279.9 515.5 996.0
    32768k: 169.0 287.2 169.1 289.9 168.9 286.8 531.6 1014
    65536k: 169.7 287.3 169.1 287.4 169.1 286.7 531.6 1017
   131072k: 169.0 287.4 169.0 287.4 169.0 286.6 531.3 1014

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Executing benchmark twice on cluster 0 (sifive,u74-mc)

OpenSSL 3.6.0, built on 1 Oct 2025 (Library: OpenSSL 3.6.0 1 Oct 2025)
type             16 bytes     64 bytes    256 bytes   1024 bytes   8192 bytes  16384 bytes
aes-128-cbc      28765.81k    38883.61k    42767.96k    43852.80k    44127.57k    44034.73k
aes-128-cbc      28915.51k    38936.47k    42785.54k    43860.65k    44133.03k    44045.65k
aes-192-cbc      26072.98k    33627.39k    36439.38k    37218.65k    37410.13k    37350.06k
aes-192-cbc      25876.20k    33591.68k    36442.11k    37213.18k    37415.59k    37360.98k
aes-256-cbc      23460.88k    29573.44k    31747.93k    32316.07k    32489.47k    32402.09k
aes-256-cbc      23408.30k    29574.68k    31744.85k    32339.97k    32489.47k    32434.86k

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Executing benchmark single-threaded on cpu0 (sifive,u74-mc)

7-Zip (a) 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)
```

```
LE
CPU Freq: 64000000 64000000 64000000 64000000 128000000 256000000 512000000 -
2048000000

RAM size:    3866 MB,  # CPU hardware threads:   4
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:      973   98   966   947  |    17438   98   1514   1489
23:      942   98   980   961  |    17098   98   1505   1480
24:      925   98  1015   995  |    16766   98   1497   1472
25:      912   98  1063  1042  |    16493   98   1493   1468
---------------------------------  | ------------------------------
Avr:           98  1006   986  |          98  1502   1477
Tot:           98  1254  1232

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

7-Zip (a) 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: 64000000 - 64000000 - 128000000 - 512000000 1024000000 2048000000

RAM size:    3866 MB,  # CPU hardware threads:   4
RAM usage:    882 MB,  # Benchmark threads:      4

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

22:     2668  318   816  2596  |    67385  391  1471  5749
23:     2634  323   830  2684  |    66415  392  1464  5747
24:     2609  326   861  2806  |    64984  392  1456  5705
25:     2588  328   902  2955  |    63840  393  1447  5682
---------------------------------  | ------------------------------
Avr:          324   852  2760  |         392  1460  5721
Tot:          358  1156  4240
```

```
7-Zip (a) 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

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

RAM size:    3866 MB,  # CPU hardware threads:   4
RAM usage:    882 MB,  # Benchmark threads:      4

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

22:      2674   318    818   2602 |     67600   393   1469   5767
23:      2630   323    829   2680 |     66425   393   1463   5747
24:      2608   326    861   2805 |     64876   392   1454   5695
25:      2593   328    902   2961 |     63776   393   1445   5676
---------------------------------  | ------------------------------
Avr:           324    852   2762 |          393   1458   5722
Tot:           358   1155   4242

7-Zip (a) 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

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

RAM size:    3866 MB,  # CPU hardware threads:   4
RAM usage:    882 MB,  # Benchmark threads:      4

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

22:      2668   317    818   2596 |     67632   392   1470   5770
23:      2642   324    830   2692 |     66340   392   1463   5740
24:      2619   327    861   2816 |     65095   393   1455   5714
25:      2593   329    901   2961 |     63710   393   1444   5670
---------------------------------  | ------------------------------
Avr:           324    853   2766 |          393   1458   5724
Tot:           358   1155   4245

Compression: 2760,2762,2766
Decompression: 5721,5722,5724
Total: 4240,4242,4245
```

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

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
20:40:47: 1500MHz  4.29  79%   1%  76%   0%   0%   2%  36.3°C

Checking cpufreq OPP (sifive,u74-mc):

Cpufreq OPP: 1500    Measured: 1481 (1481.156/1481.070/1480.916)     (-1.3%)

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Hardware sensors:

sfctemp-isa-120e0000
temp1:        +35.2 C

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Thermal source: /sys/devices/virtual/thermal/thermal_zone0/ (cpu-thermal)

System health while running tinymembench:

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
20:30:34: 1500MHz  1.03  24%   1%  21%   0%   0%   0%  32.5°C
20:30:44: 1500MHz  1.03  25%   0%  24%   0%   0%   0%  33.7°C
20:30:55: 1500MHz  1.02  25%   0%  24%   0%   0%   0%  33.8°C
20:31:05: 1500MHz  1.02  25%   0%  24%   0%   0%   0%  34.0°C
20:31:15: 1500MHz  1.01  25%   0%  24%   0%   0%   0%  33.6°C
20:31:25: 1500MHz  1.01  25%   0%  24%   0%   0%   0%  33.4°C

System health while running ramlat:

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
20:31:27: 1500MHz  1.01  24%   1%  21%   0%   0%   0%  33.8°C
20:31:30: 1500MHz  1.01  25%   0%  24%   0%   0%   0%  33.5°C
20:31:33: 1500MHz  1.01  25%   0%  24%   0%   0%   0%  33.6°C
20:31:36: 1500MHz  1.01  25%   0%  24%   0%   0%   0%  33.6°C
20:31:40: 1500MHz  1.01  25%   0%  24%   0%   0%   0%  33.7°C
20:31:43: 1500MHz  1.01  25%   0%  24%   0%   0%   0%  33.7°C
20:31:46: 1500MHz  1.01  25%   0%  24%   0%   0%   0%  33.6°C
20:31:49: 1500MHz  1.01  25%   0%  24%   0%   0%   0%  33.5°C
```

20:31:52: 1500MHz 1.01 25% 0% 24% 0% 0% 0% 33.5°C
20:31:55: 1500MHz 1.01 25% 0% 24% 0% 0% 0% 33.5°C
20:31:58: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 33.5°C
20:32:01: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 33.5°C
20:32:04: 1500MHz 1.00 25% 1% 23% 0% 0% 0% 33.6°C

System health while running OpenSSL benchmark:

Time CPU load %cpu %sys %usr %nice %io %irq Temp
20:32:08: 1500MHz 1.00 24% 1% 21% 0% 0% 0% 33.9°C
20:32:24: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 33.9°C
20:32:40: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 33.9°C
20:32:56: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 34.0°C
20:33:12: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 34.1°C
20:33:28: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 34.1°C
20:33:44: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 34.1°C

System health while running 7-zip single core benchmark:

Time CPU load %cpu %sys %usr %nice %io %irq Temp
20:33:56: 1500MHz 1.00 24% 1% 21% 0% 0% 0% 34.3°C
20:34:06: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 34.0°C
20:34:16: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 33.9°C
20:34:26: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 33.9°C
20:34:36: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 33.9°C
20:34:46: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 33.9°C
20:34:56: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 33.9°C
20:35:07: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 33.9°C
20:35:17: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 34.0°C
20:35:27: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 33.9°C
20:35:37: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 33.9°C
20:35:47: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 33.9°C
20:35:57: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 33.9°C

System health while running 7-zip multi core benchmark:

Time CPU load %cpu %sys %usr %nice %io %irq Temp
20:35:59: 1500MHz 1.00 24% 1% 21% 0% 0% 0% 34.1°C
20:36:21: 1500MHz 1.78 84% 0% 82% 0% 0% 1% 36.1°C
20:36:41: 1500MHz 2.41 91% 0% 88% 0% 0% 1% 36.1°C
20:37:04: 1500MHz 2.89 90% 0% 87% 0% 0% 2% 36.5°C
20:37:24: 1500MHz 3.09 81% 1% 77% 0% 0% 2% 36.1°C
20:37:44: 1500MHz 3.41 92% 1% 89% 0% 0% 2% 36.4°C
20:38:05: 1500MHz 3.52 91% 0% 88% 0% 0% 1% 36.5°C
20:38:25: 1500MHz 3.65 91% 0% 88% 0% 0% 1% 36.5°C

```
20:38:46: 1500MHz  3.83  93%   0%  90%   0%   0%   2%  36.8°C
20:39:06: 1500MHz  3.71  80%   1%  76%   0%   0%   2%  36.2°C
20:39:26: 1500MHz  3.92  92%   1%  89%   0%   0%   2%  36.4°C
20:39:47: 1500MHz  3.89  91%   0%  89%   0%   0%   1%  36.5°C
20:40:07: 1500MHz  3.92  91%   0%  88%   0%   0%   1%  36.4°C
20:40:27: 1500MHz  4.01  93%   0%  90%   0%   0%   1%  36.8°C
20:40:47: 1500MHz  4.29  79%   1%  76%   0%   0%   2%  36.3°C

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Linux 6.12.18-cwt-5.14.0-2 (ArchVF2)    12/06/25        _riscv64_       (4 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           27.73    0.02    1.86    0.62    0.00   69.77

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
mmcblk1          3.20        58.55       218.72         6.74     196336     733460      22592
zram0            0.03         0.43         0.00         0.00       1432          4          0

               total        used        free      shared  buff/cache   available
Mem:           3.8Gi       326Mi       3.5Gi       1.8Mi       119Mi       3.5Gi
Swap:          1.9Gi          0B       1.9Gi

Filename                                Type            Size            Used            Priority
/dev/zram0                              partition       1979388         0               100

WARNING: ZSWAP ON TOP OF ZRAM HAS BEEN CONFIGURED ON THIS SYSTEM!
THIS WILL SEVERELY HARM PERFORMANCE IN CASE SWAPPING OCCURS!

Zswap active using zstd/zsmalloc, max pool occupation: 20%, details:
        pool_limit_hit:0
        pool_total_size:0
        reject_alloc_fail:0
        reject_compress_fail:0
        reject_compress_poor:0
        reject_kmemcache_fail:0
        reject_reclaim_fail:0
        stored_pages:0
        written_back_pages:0

CPU sysfs topology (clusters, cpufreq members, clockspeeds)
               cpufreq   min    max
 CPU    cluster  policy   speed  speed   core type
  0       0       0      312    1500   sifive,u74-mc
  1       0       0      312    1500   sifive,u74-mc
```

```
  2       0       0     312    1500   sifive,u74-mc
  3       0       0     312    1500   sifive,u74-mc

Architecture:                    riscv64
Byte Order:                      Little Endian
CPU(s):                          4
On-line CPU(s) list:               0-3
Vendor ID:                       0x489
Model name:                        sifive,u74-mc
CPU family:                      0x8000000000000007
Model:                           0x4210427
Thread(s) per core:                1
Core(s) per socket:                4
Socket(s):                       1
CPU(s) scaling MHz:                100%
CPU max MHz:                       1500.0000
CPU min MHz:                     312.5000
L1d cache:                       128 KiB (4 instances)
L1i cache:                       128 KiB (4 instances)
L2 cache:                        2 MiB (1 instance)
Vulnerability Gather data sampling:   Not affected
Vulnerability Itlb multihit:          Not affected
Vulnerability L1tf:                 Not affected
Vulnerability Mds:                  Not affected
Vulnerability Meltdown:               Not affected
Vulnerability Mmio stale data:        Not affected
Vulnerability Reg file data sampling: Not affected
Vulnerability Retbleed:               Not affected
Vulnerability Spec rstack overflow:   Not affected
Vulnerability Spec store bypass:      Not affected
Vulnerability Spectre v1:             Not affected
Vulnerability Spectre v2:             Not affected
Vulnerability Srbds:                Not affected
Vulnerability Tsx async abort:        Not affected

SoC guess: StarFive JH7110
DT compat: starfive,visionfive-2-v1.3b
           starfive,jh7110
 Compiler: /usr/sbin/gcc (GCC) 15.2.1 20250813 / riscv64-unknown-linux-gnu
 Userland: riscv64
   Kernel: 6.12.18-cwt-5.14.0-2/riscv64
           CONFIG_HZ=1000
           CONFIG_HZ_1000=y
           CONFIG_PREEMPTION=y
           CONFIG_PREEMPT=y
```

```
        CONFIG_PREEMPT_BUILD=y
        CONFIG_PREEMPT_COUNT=y
        CONFIG_PREEMPT_DYNAMIC=y
        CONFIG_PREEMPT_RCU=y

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

cpu0/index0: 32K, level: 1, type: Instruction
cpu0/index1: 32K, level: 1, type: Data
cpu0/index2: 2048K, level: 2, type: Unified
cpu1/index0: 32K, level: 1, type: Instruction
cpu1/index1: 32K, level: 1, type: Data
cpu1/index2: 2048K, level: 2, type: Unified
cpu2/index0: 32K, level: 1, type: Instruction
cpu2/index1: 32K, level: 1, type: Data
cpu2/index2: 2048K, level: 2, type: Unified
cpu3/index0: 32K, level: 1, type: Instruction
cpu3/index1: 32K, level: 1, type: Data
cpu3/index2: 2048K, level: 2, type: Unified

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

  cpusldo: 700 mV (0 mV max)
  vdd-cpu: 1040 mV (1540 mV max)

  opp-table-0:
     312 MHz    900.0 mV
     375 MHz    900.0 mV
     417 MHz    900.0 mV
     500 MHz    900.0 mV
     625 MHz    900.0 mV
     750 MHz    900.0 mV
    1250 MHz   1000.0 mV
    1500 MHz   1040.0 mV

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

Results validation:

 * Advertised vs. measured max CPU clockspeed: -1.3% before, -1.3% after ->
https://tinyurl.com/32w9rr94
 * No swapping
```

 * Background activity (%system) OK
 * No throttling

| StarFive VisionFive 2 v1.3B | 1500 MHz | 6.12 | Arch Linux riscv64 | 4240 | 1232 | 32420 | 870 | 770 | - | |

Linux starfive 6.6.20-cwt-5.12.0-3 #1 SMP PREEMPT_DYNAMIC Mon May 27 18:59:29 +07 2024 riscv64 GNU/Linux - ArchLinux

```
17.09.2024
sbc-bench v0.9.67

Installing needed tools: distro packages already installed. Done.
Checking cpufreq OPP. Done (results will be available in 10-16 minutes).
Executing tinymembench. Done.
Executing RAM latency tester. Done.
Executing OpenSSL benchmark. Done.
Executing 7-zip benchmark. Done.
Checking cpufreq OPP again. Done (12 minutes elapsed).

Results validation:

  * Measured clockspeed not lower than advertised max CPU clockspeed
  * No swapping
  * Background activity (%system) OK
  * No throttling

Memory performance
memcpy: 1057.5 MB/s
memset: 782.1 MB/s

7-zip total scores (3 consecutive runs): 4229,4227,4213, single-threaded: 1230

OpenSSL results:
type             16 bytes     64 bytes    256 bytes   1024 bytes   8192 bytes  16384 bytes
aes-128-cbc      30073.57k    39772.48k    43416.49k    44407.47k    44788.39k    44646.40k
aes-128-cbc      30072.71k    39772.99k    43426.30k    44392.45k    44758.36k    44646.40k
aes-192-cbc      26844.44k    34256.85k    36953.26k    37726.89k    37893.46k    37814.27k
aes-192-cbc      26823.18k    34249.92k    36945.32k    37710.51k    37920.77k    37819.73k
aes-256-cbc      24205.33k    30089.09k    32152.15k    32729.43k    32877.23k    32795.31k
```

```
aes-256-cbc      24233.20k    29937.62k    32064.17k    32664.92k    32869.03k    32789.85k
```

Full Result

sbc-bench v0.9.67 StarFive VisionFive 2 v1.3B (Mon, 16 Sep 2024 23:12:43 +0000)

Description: Arch Linux

/usr/sbin/gcc (GCC) 14.2.1 20240910

Uptime: 23:12:43 up 23 min, 2 users, load average: 0.08, 1.03, 1.28, 37.2°C, 333476070

Linux 6.6.20-cwt-5.12.0-3 (starfive) 09/16/24 _riscv64_ (4 CPU)

avg-cpu: %user   %nice %system %iowait %steal   %idle
        37.71   0.02   2.36   1.43   0.00   58.48

Device   tps   kB_read/s   kB_wrtn/s   kB_dscd/s   kB_read   kB_wrtn   kB_dscd
mmcblk1   4.52   120.13   412.08   5.46   170316   584232   7740
zram0   0.04   0.83   0.00   0.00   1180   4   0

               total   used   free   shared buff/cache   available
Mem: 3.8Gi   275Mi   3.5Gi   1.7Mi   93Mi   3.5Gi
Swap: 1.9Gi   0B   1.9Gi

Filename Type Size Used Priority
/dev/zram0   partition 1978364 0 100

WARNING: ZSWAP ON TOP OF ZRAM HAS BEEN CONFIGURED ON THIS SYSTEM!
THIS WILL SEVERELY HARM PERFORMANCE IN CASE SWAPPING OCCURS!

Zswap active using zstd/zsmalloc, max pool occupation: 20%, details:
duplicate_entry:0
pool_limit_hit:0
pool_total_size:0
reject_alloc_fail:0
reject_compress_poor:0
reject_kmemcache_fail:0
reject_reclaim_fail:0
same_filled_pages:0
stored_pages:0
written_back_pages:0

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

```
Checking cpufreq OPP (sifive,u74-mc):

Cpufreq OPP: 1500    Measured: 1486 (1486.657/1486.600/1486.278)
Cpufreq OPP: 1250    Measured:  736    (736.693/736.627/736.571)    (-41.1%)
Cpufreq OPP:  750    Measured:  736    (737.071/737.033/736.883)    (-1.9%)
Cpufreq OPP:  625    Measured:  487    (487.233/487.146/487.122)    (-22.1%)
Cpufreq OPP:  500    Measured:  487    (487.249/487.162/487.068)    (-2.6%)
Cpufreq OPP:  417    Measured:  362    (362.085/362.066/361.950)    (-13.2%)
Cpufreq OPP:  375    Measured:  362    (362.264/362.199/362.158)    (-3.5%)
Cpufreq OPP:  312    Measured:  287    (287.355/287.322/287.278)    (-8.0%)

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

Hardware sensors:

sfctemp-isa-0000
temp1:        +35.7 C

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

Executing benchmark on cpu0 (sifive,u74-mc):

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                          :   1113.5 MB/s (3, 3.7%)
 C copy backwards (32 byte blocks)         :   1101.1 MB/s (2)
 C copy backwards (64 byte blocks)         :   1103.3 MB/s (2)
 C copy                                    :   1087.4 MB/s (3, 0.4%)
 C copy prefetched (32 bytes step)         :   1065.1 MB/s (3, 0.2%)
 C copy prefetched (64 bytes step)         :   1068.2 MB/s (2)
 C 2-pass copy                             :    817.3 MB/s (3, 0.4%)
 C 2-pass copy prefetched (32 bytes step)  :    838.6 MB/s (3, 0.5%)
 C 2-pass copy prefetched (64 bytes step)  :    829.7 MB/s (3, 0.5%)
 C scan 8                                  :    587.5 MB/s (2)
 C scan 16                                 :    974.4 MB/s (3, 2.5%)
 C scan 32                                 :    832.9 MB/s (3, 1.0%)
 C scan 64                                 :   2095.9 MB/s (2)
 C fill                                    :    782.8 MB/s (3, 0.5%)
 C fill (shuffle within 16 byte blocks)    :    961.4 MB/s (3, 10.7%)
 C fill (shuffle within 32 byte blocks)    :    776.3 MB/s (2)
 C fill (shuffle within 64 byte blocks)    :    780.1 MB/s (3, 0.3%)
 ---
 libc memcpy copy                          :   1057.5 MB/s (2)
 libc memchr scan                          :   1367.3 MB/s (2)
 libc memset fill                          :    782.1 MB/s (3, 0.3%)

================================================================================
== 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 :    0.2 ns         /     0.1 ns
    65536 :    5.8 ns         /    10.7 ns
   131072 :    8.8 ns         /    16.0 ns
   262144 :   10.6 ns         /    18.6 ns
   524288 :   16.3 ns         /    29.4 ns
  1048576 :   19.1 ns         /    31.6 ns
  2097152 :   36.6 ns         /    58.6 ns
  4194304 :   86.7 ns         /   170.6 ns
  8388608 :  125.2 ns         /   246.8 ns
 16777216 :  146.5 ns         /   290.5 ns
 33554432 :  160.1 ns         /   318.2 ns
 67108864 :  170.6 ns         /   339.4 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 :    0.1 ns         /     0.0 ns
    32768 :    0.2 ns         /     0.1 ns
    65536 :    5.8 ns         /    10.7 ns
   131072 :    8.7 ns         /    15.9 ns
   262144 :   10.6 ns         /    18.6 ns
   524288 :   12.0 ns         /    19.8 ns
  1048576 :   14.1 ns         /    20.5 ns
  2097152 :   25.8 ns         /    26.5 ns
  4194304 :   80.1 ns         /   158.6 ns
  8388608 :  114.7 ns         /   225.1 ns
 16777216 :  130.4 ns         /   259.3 ns
 33554432 :  142.6 ns         /   283.7 ns
 67108864 :  148.8 ns         /   295.8 ns
```

##

Executing ramlat on cpu0 (sifive,u74-mc), results in ns:

```
      size:  1x32  2x32  1x64  2x64 1xPTR 2xPTR 4xPTR 8xPTR
        4k: 2.800 2.916 2.724 2.785 2.019 2.020 2.776 5.639
        8k: 2.777 2.861 2.693 2.777 2.020 2.020 2.777 5.639
       16k: 2.780 2.867 2.703 2.780 2.022 2.022 2.782 5.646
       32k: 2.797 2.881 2.711 2.796 2.034 2.034 2.796 5.676
       64k: 13.65 24.58 13.50 24.29 13.49 24.30 48.67 97.47
      128k: 13.58 24.46 13.49 24.29 13.50 24.29 48.66 98.68
      256k: 13.59 24.47 13.49 24.29 13.50 24.30 48.74 97.40
      512k: 13.59 24.48 13.50 24.29 13.49 24.30 51.56 97.47
     1024k: 13.63 24.48 13.51 24.29 13.50 24.29 48.69 97.35
     2048k: 18.78 33.58 17.85 37.19 26.43 34.24 65.48 125.3
     4096k: 130.4 235.6 130.1 235.2 130.3 235.2 435.9 846.0
     8192k: 156.9 272.9 156.7 273.1 156.8 272.8 511.8 983.3
    16384k: 160.1 276.1 160.1 275.8 160.0 278.8 513.3 992.1
    32768k: 168.4 286.1 168.3 289.1 168.3 285.5 529.4 1010
    65536k: 168.5 286.0 168.5 286.4 168.5 285.7 529.7 1013
   131072k: 168.4 286.3 168.4 286.3 169.2 285.5 529.7 1010
```

##

Executing benchmark twice on cluster 0 (sifive,u74-mc)

OpenSSL 3.3.2, built on 3 Sep 2024 (Library: OpenSSL 3.3.2 3 Sep 2024)

type	16 bytes	64 bytes	256 bytes	1024 bytes	8192 bytes	16384 bytes
aes-128-cbc	30073.57k	39772.48k	43416.49k	44407.47k	44788.39k	44646.40k
aes-128-cbc	30072.71k	39772.99k	43426.30k	44392.45k	44758.36k	44646.40k
aes-192-cbc	26844.44k	34256.85k	36953.26k	37726.89k	37893.46k	37814.27k
aes-192-cbc	26823.18k	34249.92k	36945.32k	37710.51k	37920.77k	37819.73k
aes-256-cbc	24205.33k	30089.09k	32152.15k	32729.43k	32877.23k	32795.31k
aes-256-cbc	24233.20k	29937.62k	32064.17k	32664.92k	32869.03k	32789.85k

##

Executing benchmark single-threaded on cpu0 (sifive,u74-mc)

7-Zip (a) 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

```
LE
CPU Freq: 64000000 32000000 64000000 - 128000000 256000000 512000000 - -

RAM size:    3864 MB,  # CPU hardware threads:   4
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:      998   98   987   972  |    17146   99  1482  1464
23:      962   98   996   980  |    16819   99  1474  1456
24:      943   98  1030  1014  |    16490   99  1467  1448
25:      931   98  1081  1064  |    16246   99  1465  1446
--------------------------------  | ------------------------------
Avr:           98  1023  1007  |          99  1472  1453
Tot:           99  1248  1230

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

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

7-Zip (a) 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: 64000000 64000000 - 64000000 128000000 256000000 256000000 1024000000
2048000000

RAM size:    3864 MB,  # CPU hardware threads:   4
RAM usage:    882 MB,  # Benchmark threads:      4

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

22:     2726  319   831  2652  |    66410  393  1441  5666
23:     2693  326   841  2744  |    65340  394  1435  5654
24:     2674  330   871  2876  |    63888  394  1425  5609
25:     2665  332   916  3044  |    62769  394  1417  5586
--------------------------------  | ------------------------------
Avr:          327   865  2829  |         394  1429  5629
Tot:          360  1147  4229
```

```
7-Zip (a) 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: 64000000 64000000 64000000 64000000 - - - - 2048000000

RAM size:    3864 MB,  # CPU hardware threads:   4
RAM usage:    882 MB,  # Benchmark threads:      4

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

22:      2749   321   833   2675  |    66472   394   1440   5671
23:      2675   325   839   2726  |    65120   394   1431   5635
24:      2675   330   871   2877  |    63919   394   1425   5611
25:      2660   333   912   3038  |    62701   394   1415   5580
---------------------------------  | ------------------------------
Avr:           327   864   2829  |          394   1428   5624
Tot:           361   1146   4227

7-Zip (a) 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: 64000000 - 64000000 64000000 128000000 - - - -

RAM size:    3864 MB,  # CPU hardware threads:   4
RAM usage:    882 MB,  # Benchmark threads:      4

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

22:      2727   319   831   2653  |    65748   390   1438   5609
23:      2668   324   839   2719  |    65169   394   1433   5639
24:      2668   328   874   2869  |    63795   393   1423   5600
25:      2650   332   913   3026  |    62780   394   1417   5587
---------------------------------  | ------------------------------
Avr:           326   864   2817  |          393   1428   5609
Tot:           359   1146   4213

Compression: 2829,2829,2817
Decompression: 5629,5624,5609
Total: 4229,4227,4213
```

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

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

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
23:23:36: 1500MHz  3.58  83%   1%  80%   0%   0%   1%  43.0°C

Checking cpufreq OPP (sifive,u74-mc):

Cpufreq OPP: 1500    Measured: 1486 (1486.711/1486.598/1486.503)

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

Hardware sensors:

sfctemp-isa-0000
temp1:        +41.9 C

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

Thermal source: /sys/devices/virtual/thermal/thermal_zone0/ (cpu-thermal)

System health while running tinymembench:

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
23:13:22: 1500MHz  0.69  41%   1%  37%   0%   1%   0%  37.5°C
23:13:32: 1500MHz  0.74  25%   0%  24%   0%   0%   0%  38.9°C
23:13:42: 1500MHz  0.78  25%   0%  24%   0%   0%   0%  39.1°C
23:13:53: 1500MHz  0.81  25%   0%  24%   0%   0%   0%  39.3°C
23:14:03: 1500MHz  0.84  25%   0%  24%   0%   0%   0%  39.4°C
23:14:13: 1500MHz  0.87  25%   0%  24%   0%   0%   0%  39.0°C

System health while running ramlat:

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
23:14:21: 1500MHz  0.88  40%   1%  36%   0%   1%   0%  39.3°C
23:14:24: 1500MHz  0.89  25%   0%  24%   0%   0%   0%  39.0°C
23:14:27: 1500MHz  0.90  25%   0%  24%   0%   0%   0%  39.1°C
23:14:30: 1500MHz  0.90  25%   0%  24%   0%   0%   0%  39.2°C
23:14:33: 1500MHz  0.91  25%   0%  24%   0%   0%   0%  39.3°C
23:14:36: 1500MHz  0.91  25%   0%  24%   0%   0%   0%  39.3°C
```

23:14:39: 1500MHz 0.91 25% 0% 24% 0% 0% 0% 39.2°C
23:14:42: 1500MHz 0.92 25% 0% 24% 0% 0% 0% 39.1°C
23:14:45: 1500MHz 0.92 25% 0% 24% 0% 0% 0% 39.0°C
23:14:48: 1500MHz 0.93 25% 0% 24% 0% 0% 0% 39.0°C
23:14:51: 1500MHz 0.93 25% 0% 24% 0% 0% 0% 39.2°C
23:14:54: 1500MHz 0.93 25% 0% 24% 0% 0% 0% 39.1°C
23:14:57: 1500MHz 0.94 25% 1% 23% 0% 0% 0% 39.2°C

System health while running OpenSSL benchmark:

Time CPU load %cpu %sys %usr %nice %io %irq Temp
23:15:01: 1500MHz 1.02 40% 1% 36% 0% 1% 0% 39.6°C
23:15:17: 1500MHz 1.02 25% 0% 24% 0% 0% 0% 39.6°C
23:15:33: 1500MHz 1.01 25% 0% 24% 0% 0% 0% 39.7°C
23:15:49: 1500MHz 1.01 25% 0% 24% 0% 0% 0% 39.8°C
23:16:05: 1500MHz 1.01 25% 0% 24% 0% 0% 0% 39.9°C
23:16:21: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 39.9°C
23:16:37: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 39.9°C

System health while running 7-zip single core benchmark:

Time CPU load %cpu %sys %usr %nice %io %irq Temp
23:16:49: 1500MHz 1.00 39% 1% 35% 0% 1% 0% 40.1°C
23:16:59: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 39.8°C
23:17:09: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 39.8°C
23:17:19: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 39.7°C
23:17:29: 1500MHz 1.00 25% 0% 24% 0% 0% 0% 39.8°C
23:17:39: 1500MHz 1.07 25% 0% 24% 0% 0% 0% 39.8°C
23:17:49: 1500MHz 1.06 25% 0% 24% 0% 0% 0% 39.8°C
23:18:00: 1500MHz 1.05 25% 0% 24% 0% 0% 0% 39.9°C
23:18:10: 1500MHz 1.04 25% 0% 24% 0% 0% 0% 39.9°C
23:18:20: 1500MHz 1.04 25% 0% 24% 0% 0% 0% 39.9°C
23:18:30: 1500MHz 1.03 25% 0% 24% 0% 0% 0% 39.8°C
23:18:40: 1500MHz 1.02 25% 0% 24% 0% 0% 0% 39.9°C

System health while running 7-zip multi core benchmark:

Time CPU load %cpu %sys %usr %nice %io %irq Temp
23:18:49: 1500MHz 1.02 38% 1% 35% 0% 1% 0% 40.1°C
23:19:13: 1500MHz 1.46 84% 0% 83% 0% 0% 1% 42.2°C
23:19:34: 1500MHz 2.32 90% 0% 88% 0% 0% 1% 42.3°C
23:19:56: 1500MHz 2.73 93% 0% 91% 0% 0% 1% 42.9°C
23:20:17: 1500MHz 2.86 81% 1% 77% 0% 0% 1% 42.5°C
23:20:38: 1500MHz 3.04 87% 0% 85% 0% 0% 1% 42.5°C
23:20:59: 1500MHz 3.25 91% 0% 89% 0% 0% 1% 42.9°C

```
23:21:21: 1500MHz  3.37  90%   0%  88%   0%   0%   1%  42.8°C
23:21:42: 1500MHz  3.65  89%   1%  86%   0%   0%   1%  42.9°C
23:22:03: 1500MHz  3.69  87%   1%  83%   0%   0%   1%  42.9°C
23:22:27: 1500MHz  3.78  90%   0%  88%   0%   0%   1%  43.0°C
23:22:51: 1500MHz  3.71  94%   0%  92%   0%   0%   1%  43.5°C
23:23:15: 1500MHz  3.89  90%   0%  87%   0%   0%   1%  43.4°C
23:23:36: 1500MHz  3.58  83%   1%  80%   0%   0%   1%  43.0°C

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

Linux 6.6.20-cwt-5.12.0-3 (starfive) 09/16/24 _riscv64_ (4 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
       42.54    0.02    2.15    0.97    0.00   54.33

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
mmcblk1          3.13       86.24       279.95         3.70     180616     586316       7740
zram0            0.03        0.56        0.00         0.00       1180          4          0

               total        used        free      shared  buff/cache   available
Mem:           3.8Gi       289Mi       3.5Gi       1.8Mi       110Mi       3.5Gi
Swap:          1.9Gi          0B       1.9Gi

Filename Type Size Used Priority
/dev/zram0                              partition 1978364 0 100

WARNING: ZSWAP ON TOP OF ZRAM HAS BEEN CONFIGURED ON THIS SYSTEM!
THIS WILL SEVERELY HARM PERFORMANCE IN CASE SWAPPING OCCURS!

Zswap active using zstd/zsmalloc, max pool occupation: 20%, details:
duplicate_entry:0
pool_limit_hit:0
pool_total_size:0
reject_alloc_fail:0
reject_compress_poor:0
reject_kmemcache_fail:0
reject_reclaim_fail:0
same_filled_pages:0
stored_pages:0
written_back_pages:0

CPU sysfs topology (clusters, cpufreq members, clockspeeds)
               cpufreq   min    max
 CPU    cluster  policy   speed  speed   core type
```

```
  0       0       0     312    1500   sifive,u74-mc
  1       0       0     312    1500   sifive,u74-mc
  2       0       0     312    1500   sifive,u74-mc
  3       0       0     312    1500   sifive,u74-mc

Architecture:        riscv64
Byte Order:          Little Endian
CPU(s):              4
On-line CPU(s) list: 0-3
Vendor ID:           0x489
Model name:            sifive,u74-mc
CPU family:          0x8000000000000007
Model:               0x4210427
Thread(s) per core:  1
Core(s) per socket:  4
Socket(s):           1
CPU(s) scaling MHz:  100%
CPU max MHz:          1500.0000
CPU min MHz:         312.5000
L1d cache:           128 KiB (4 instances)
L1i cache:           128 KiB (4 instances)
L2 cache:            2 MiB (1 instance)

SoC guess: StarFive JH7110
DT compat: starfive,visionfive-2-v1.3b
           starfive,jh7110
 Compiler: /usr/sbin/gcc (GCC) 14.2.1 20240910 / riscv64-unknown-linux-gnu
 Userland: riscv64
   Kernel: 6.6.20-cwt-5.12.0-3/riscv64
           CONFIG_HZ=1000
           CONFIG_HZ_1000=y
           CONFIG_PREEMPTION=y
           CONFIG_PREEMPT=y
           CONFIG_PREEMPT_BUILD=y
           CONFIG_PREEMPT_COUNT=y
           CONFIG_PREEMPT_DYNAMIC=y
           CONFIG_PREEMPT_RCU=y

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

cpu0/index0: 32K, level: 1, type: Instruction
cpu0/index1: 32K, level: 1, type: Data
cpu0/index2: 2048K, level: 2, type: Unified
cpu1/index0: 32K, level: 1, type: Instruction
```

```
cpu1/index1: 32K, level: 1, type: Data
cpu1/index2: 2048K, level: 2, type: Unified
cpu2/index0: 32K, level: 1, type: Instruction
cpu2/index1: 32K, level: 1, type: Data
cpu2/index2: 2048K, level: 2, type: Unified
cpu3/index0: 32K, level: 1, type: Instruction
cpu3/index1: 32K, level: 1, type: Data
cpu3/index2: 2048K, level: 2, type: Unified

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

  cpusldo: 700 mV (0 mV max)
  vdd-cpu: 1040 mV (1540 mV max)

  opp-table-0:
     312 MHz    800.0 mV
     375 MHz    800.0 mV
     417 MHz    800.0 mV
     500 MHz    800.0 mV
     625 MHz    800.0 mV
     750 MHz    800.0 mV
    1250 MHz   1000.0 mV
    1500 MHz   1040.0 mV

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

Results validation:

 * Measured clockspeed not lower than advertised max CPU clockspeed
 * No swapping
 * Background activity (%system) OK
 * No throttling

| StarFive VisionFive 2 v1.3B | 1500 MHz | 6.6 | Arch Linux riscv64 | 4220 | 1230 | 32790 | 1060
| 780 | - |
```

Linux starfive 5.15.2-cwt-5.10.3-1 #1 SMP PREEMPT Sat Dec 30 19:58:40 +07 2023 riscv64 GNU/Linux - ArchLinux

```
02.02.2024
sbc-bench v0.9.61


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 (12 minutes elapsed).

Results validation:

  * Measured clockspeed not lower than advertised max CPU clockspeed
  * No swapping
  * Background activity (%system) OK
  * No throttling

Memory performance
memcpy: 951.8 MB/s
memset: 906.0 MB/s

7-zip total scores (3 consecutive runs): 4035,4015,4050, single-threaded: 1163

OpenSSL results:
type             16 bytes     64 bytes    256 bytes   1024 bytes   8192 bytes  16384 bytes
aes-128-cbc      31138.30k    40285.72k    43436.57k    44537.17k    44769.28k    44646.40k
aes-128-cbc      31208.69k    40338.79k    43668.74k    44591.79k    44812.97k    44706.47k
aes-192-cbc      27599.42k    34544.43k    37111.04k    37771.95k    37928.96k    37857.96k
aes-192-cbc      27676.65k    34710.85k    37102.08k    37769.22k    37931.69k    37841.58k
aes-256-cbc      24910.03k    30398.89k    32253.18k    32748.20k    32882.69k    32800.77k
aes-256-cbc      24893.64k    30377.62k    32228.44k    32776.53k    32792.49k    32822.61k
```

Full Result

sbc-bench v0.9.61 StarFive VisionFive V2 (Fri, 02 Feb 2024 11:08:25 +0000)

/usr/sbin/gcc (GCC) 13.2.1 20230801

Uptime: 11:08:26 up 29 min, 1 user, load average: 0.16, 0.88, 1.33, 34.5°C, 294409116

Linux 5.15.2-cwt-5.10.3-1 (starfive) 02/02/24 _riscv64_ (4 CPU)

avg-cpu: %user   %nice %system %iowait %steal   %idle
      22.81   0.01   2.89   6.12   0.00   68.17

```
Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
mmcblk1          4.57        97.97       415.08       101.99     173208     733876     180314
zram0            0.18         0.74         0.00         0.00       1304          4          0

               total        used        free      shared  buff/cache   available
Mem:           3.8Gi       234Mi       3.6Gi       4.0Mi        84Mi       3.5Gi
Swap:          1.9Gi          0B       1.9Gi

Filename Type Size Used Priority
/dev/zram0                              partition 1975292 0 100

WARNING: ZSWAP ON TOP OF ZRAM HAS BEEN CONFIGURED ON THIS SYSTEM!
THIS WILL SEVERELY HARM PERFORMANCE IN CASE SWAPPING OCCURS!

Zswap active using lz4/zbud, max pool occupation: 20%, details:
duplicate_entry:0
pool_limit_hit:0
pool_total_size:0
reject_alloc_fail:0
reject_compress_poor:0
reject_kmemcache_fail:0
reject_reclaim_fail:0
same_filled_pages:0
stored_pages:0
written_back_pages:0

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

Checking cpufreq OPP (sifive,u74-mc):

Cpufreq OPP: 1500    Measured: 1485 (1485.977/1485.900/1485.862)
Cpufreq OPP:  750    Measured:  736    (736.089/736.080/735.939)     (-1.9%)
Cpufreq OPP:  500    Measured:  485    (486.159/485.682/485.342)     (-3.0%)
Cpufreq OPP:  375    Measured:  361    (361.135/361.117/360.919)     (-3.7%)

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

Hardware sensors:

120e0000.tmon-isa-0000
temp1:        +32.4 C
```

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

Executing benchmark on cpu0 (sifive,u74-mc):

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                     :    943.9 MB/s (3, 3.1%)
 C copy backwards (32 byte blocks)            :    943.8 MB/s (3)
 C copy backwards (64 byte blocks)            :    943.1 MB/s (2)
 C copy                               :    952.4 MB/s (2)
 C copy prefetched (32 bytes step)            :    951.8 MB/s (3, 0.9%)
 C copy prefetched (64 bytes step)            :    952.0 MB/s (3, 0.1%)
 C 2-pass copy                        :    770.7 MB/s (2)
 C 2-pass copy prefetched (32 bytes step)     :    777.7 MB/s (3, 0.2%)
 C 2-pass copy prefetched (64 bytes step)     :    773.9 MB/s (3)
 C scan 8                             :    627.3 MB/s (2)
 C scan 16                            :    546.4 MB/s (2)
 C scan 32                            :    836.3 MB/s (3, 1.3%)
 C scan 64                            :   1338.6 MB/s (3, 0.4%)
```

```
C fill                                  :    829.7 MB/s (2)
C fill (shuffle within 16 byte blocks)  :    830.9 MB/s (2)
C fill (shuffle within 32 byte blocks)  :    831.4 MB/s (2)
C fill (shuffle within 64 byte blocks)  :    830.4 MB/s (2)
---
libc memcpy copy                        :    951.8 MB/s (2)
libc memchr scan                        :   1506.2 MB/s (2)
libc memset fill                        :    906.0 MB/s (3, 4.8%)

==========================================================
==================
== 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 :    0.1 ns         /     0.0 ns
    32768 :    0.2 ns         /     0.1 ns
    65536 :    5.8 ns         /    10.6 ns
   131072 :    8.8 ns         /    15.9 ns
   262144 :   10.6 ns         /    18.5 ns
   524288 :   16.3 ns         /    28.5 ns
  1048576 :   19.2 ns         /    30.6 ns
  2097152 :   36.9 ns         /    58.2 ns
```

```
  4194304 :   86.5 ns         /   170.2 ns
  8388608 :  125.6 ns         /   246.9 ns
 16777216 :  146.7 ns         /   290.1 ns
 33554432 :  160.1 ns         /   318.0 ns
 67108864 :  170.2 ns         /   339.4 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 :    0.1 ns         /     0.0 ns
    32768 :    0.1 ns         /     0.2 ns
    65536 :    5.8 ns         /    10.6 ns
   131072 :    8.7 ns         /    15.9 ns
   262144 :   10.5 ns         /    18.4 ns
   524288 :   11.8 ns         /    19.7 ns
  1048576 :   13.8 ns         /    20.4 ns
  2097152 :   25.8 ns         /    26.1 ns
  4194304 :   80.1 ns         /   158.8 ns
  8388608 :  114.9 ns         /   225.3 ns
 16777216 :  130.5 ns         /   259.7 ns
 33554432 :  142.7 ns         /   283.8 ns
 67108864 :  149.1 ns         /   295.7 ns

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Executing ramlat on cpu0 (sifive,u74-mc), results in ns:

      size:  1x32  2x32  1x64  2x64 1xPTR 2xPTR 4xPTR 8xPTR
        4k: 2.829 2.918 2.743 2.780 2.020 2.022 2.781 5.644
        8k: 2.778 2.865 2.698 2.781 2.023 2.022 2.780 5.648
       16k: 2.783 2.879 2.699 2.784 2.027 2.025 2.782 5.647
       32k: 2.801 2.889 2.715 2.797 2.035 2.035 2.804 5.684
       64k: 13.70 24.46 13.55 24.34 13.50 24.29 48.67 97.46
      128k: 13.59 24.46 13.53 24.32 13.50 24.32 48.72 98.82
      256k: 13.61 24.50 13.52 24.31 13.51 24.32 48.72 97.56
      512k: 20.23 30.00 20.12 29.88 18.90 31.38 54.15 102.9
     1024k: 20.39 30.05 20.14 29.88 18.91 29.79 54.11 102.9
     2048k: 51.14 87.47 49.58 106.2 49.01 86.69 159.0 297.4
     4096k: 129.2 225.5 128.4 226.1 127.6 225.2 421.8 783.1
     8192k: 158.0 269.0 157.9 267.4 157.4 268.0 497.3 941.6
    16384k: 171.4 285.9 171.9 286.5 171.6 285.0 514.7 974.7
    32768k: 173.3 286.5 172.4 286.9 171.0 285.7 517.3 978.5
```

```
   65536k: 177.1 291.5 174.8 291.7 175.7 290.7 526.9 989.1
  131072k: 177.3 297.1 176.7 302.9 176.5 296.8 529.9 1005

############################################################
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Executing benchmark twice on cluster 0 (sifive,u74-mc)

OpenSSL 3.2.0, built on 23 Nov 2023 (Library: OpenSSL 3.2.0 23 Nov 2023)
type           16 bytes     64 bytes    256 bytes   1024 bytes   8192 bytes  16384 bytes
aes-128-cbc     31138.30k   40285.72k   43436.57k   44537.17k   44769.28k   44646.40k
aes-128-cbc     31208.69k   40338.79k   43668.74k   44591.79k   44812.97k   44706.47k
aes-192-cbc     27599.42k   34544.43k   37111.04k   37771.95k   37928.96k   37857.96k
aes-192-cbc     27676.65k   34710.85k   37102.08k   37769.22k   37931.69k   37841.58k
aes-256-cbc     24910.03k   30398.89k   32253.18k   32748.20k   32882.69k   32800.77k
aes-256-cbc     24893.64k   30377.62k   32228.44k   32776.53k   32792.49k   32822.61k

############################################################
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Executing benchmark single-threaded on cpu0 (sifive,u74-mc)

7-Zip (a) 17.05 : Copyright (c) 1999-2021 Igor Pavlov : 2017-08-28
p7zip Version 17.05 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: 64000000 64000000 - 64000000 128000000 - - - -

RAM size:    3858 MB,  # CPU hardware threads:   4
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:       888   98   877   864  |    17063   99  1476  1457
23:       856   98   886   872  |    16750   99  1469  1450
24:       828   98   906   891  |    16398   99  1458  1440
25:       798   98   926   911  |    15949   99  1439  1420
---------------------------------  | ------------------------------
Avr:           98   899   885  |          99  1460  1441
Tot:           99  1180  1163

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

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

7-Zip (a) 17.05 : Copyright (c) 1999-2021 Igor Pavlov : 2017-08-28
p7zip Version 17.05 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: - - - - 128000000 - - - -

RAM size: 3858 MB, # CPU hardware threads: 4
RAM usage: 882 MB, # Benchmark threads: 4

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

22:      2404   306   765   2339 | 66028   394   1431   5633
23:      2417   322   764   2463 | 64732   394   1422   5601
24:      2406   336   770   2588 | 63124   394   1408   5541
25: 2323 339 783 2652	61382 393 1389 5463
Avr: 326 770 2511	394 1413 5560
Tot: 360   1092   4035

7-Zip (a) 17.05 : Copyright (c) 1999-2021 Igor Pavlov : 2017-08-28
p7zip Version 17.05 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: - - - - 128000000 256000000 512000000 1024000000 2048000000

RAM size: 3858 MB, # CPU hardware threads: 4
RAM usage: 882 MB, # Benchmark threads: 4

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

22:      2106   265   773   2050 | 66140   393   1435   5643
23:      2420   323   763   2467 | 64935   394   1425   5619
24:      2424   338   772   2607 | 63245   394   1411   5552
25: 2370 345 785 2706	61518 393 1392 5475
Avr: 318 774 2457	394 1416 5572
Tot: 356   1095   4015

```
7-Zip (a) 17.05 : Copyright (c) 1999-2021 Igor Pavlov : 2017-08-28
p7zip Version 17.05 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: - - - 64000000 - - - 1024000000 -

RAM size:    3858 MB,  # CPU hardware threads:   4
RAM usage:    882 MB,  # Benchmark threads:      4

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

22:      2487   315    769   2420  |    66146   394   1433   5643
23:      2455   329    762   2502  |    64743   394   1422   5602
24:      2391   333    773   2571  |    62936   393   1406   5525
25:      2338   340    786   2670  |    61400   393   1390   5464
---------------------------------  | ------------------------------
Avr:           329    772   2541  |          394   1413   5559
Tot:           361   1092   4050

Compression: 2511,2457,2541
Decompression: 5560,5572,5559
Total: 4035,4015,4050

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

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

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
11:19:43: 1500MHz  3.89  94%   1%  91%   0%   0%   1%  38.8°C

Checking cpufreq OPP (sifive,u74-mc):

Cpufreq OPP: 1500    Measured: 1486 (1486.035/1485.997/1485.978)

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

Hardware sensors:

120e0000.tmon-isa-0000
temp1:        +37.1 C
```

##

Thermal source: /sys/devices/virtual/thermal/thermal_zone0/ (cpu-thermal)

System health while running tinymembench:

Time	CPU	load	%cpu	%sys	%usr	%nice	%io	%irq	Temp
11:08:46:	1500MHz	0.40	31%	2%	22%	0%	6%	0%	33.9°C
11:08:56:	1500MHz	0.50	25%	0%	24%	0%	0%	0%	35.2°C
11:09:06:	1500MHz	0.57	25%	0%	24%	0%	0%	0%	35.3°C
11:09:16:	1500MHz	0.64	25%	0%	24%	0%	0%	0%	35.5°C
11:09:26:	1500MHz	0.70	25%	0%	24%	0%	0%	0%	34.9°C

System health while running ramlat:

Time	CPU	load	%cpu	%sys	%usr	%nice	%io	%irq	Temp
11:09:36:	1500MHz	0.74	31%	2%	22%	0%	5%	0%	35.1°C
11:09:39:	1500MHz	0.76	25%	0%	24%	0%	0%	0%	34.9°C
11:09:42:	1500MHz	0.76	25%	0%	24%	0%	0%	0%	35.0°C
11:09:45:	1500MHz	0.78	25%	0%	24%	0%	0%	0%	35.0°C
11:09:48:	1500MHz	0.78	25%	0%	24%	0%	0%	0%	35.1°C
11:09:51:	1500MHz	0.88	25%	0%	24%	0%	0%	0%	35.0°C
11:09:54:	1500MHz	0.89	25%	0%	24%	0%	0%	0%	35.0°C
11:09:57:	1500MHz	0.89	25%	0%	24%	0%	0%	0%	34.9°C
11:10:00:	1500MHz	0.90	25%	0%	24%	0%	0%	0%	34.9°C
11:10:03:	1500MHz	0.91	25%	0%	24%	0%	0%	0%	34.9°C
11:10:07:	1500MHz	0.91	25%	0%	24%	0%	0%	0%	34.9°C
11:10:10:	1500MHz	0.91	25%	0%	24%	0%	0%	0%	34.9°C
11:10:13:	1500MHz	0.91	25%	1%	23%	0%	0%	0%	35.0°C
11:10:16:	1500MHz	0.92	25%	0%	24%	0%	0%	0%	34.9°C

System health while running OpenSSL benchmark:

Time	CPU	load	%cpu	%sys	%usr	%nice	%io	%irq	Temp
11:10:17:	1500MHz	0.92	31%	2%	22%	0%	5%	0%	35.2°C
11:10:33:	1500MHz	0.94	25%	0%	24%	0%	0%	0%	35.2°C
11:10:49:	1500MHz	0.96	25%	0%	24%	0%	0%	0%	35.4°C
11:11:05:	1500MHz	0.97	25%	0%	24%	0%	0%	0%	35.4°C
11:11:21:	1500MHz	0.97	25%	0%	24%	0%	0%	0%	35.4°C
11:11:37:	1500MHz	0.98	25%	0%	24%	0%	0%	0%	35.4°C
11:11:53:	1500MHz	0.99	25%	0%	24%	0%	0%	0%	35.5°C

System health while running 7-zip single core benchmark:

```
Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
11:12:05: 1500MHz  0.99  31%   2%  23%   0%   5%   0%  35.7°C
11:12:14: 1500MHz  0.99  25%   0%  24%   0%   0%   0%  35.3°C
11:12:23: 1500MHz  0.99  25%   0%  24%   0%   0%   0%  35.3°C
11:12:32: 1500MHz  0.99  25%   0%  24%   0%   0%   0%  35.3°C
11:12:41: 1500MHz  1.00  25%   0%  24%   0%   0%   0%  35.3°C
11:12:50: 1500MHz  1.00  25%   0%  24%   0%   0%   0%  35.3°C
11:12:59: 1500MHz  1.00  25%   0%  23%   0%   0%   0%  35.3°C
11:13:09: 1500MHz  1.00  25%   0%  24%   0%   0%   0%  35.3°C
11:13:18: 1500MHz  1.00  25%   0%  24%   0%   0%   0%  35.3°C
11:13:27: 1500MHz  1.00  25%   0%  24%   0%   0%   0%  35.4°C
11:13:36: 1500MHz  1.00  25%   0%  24%   0%   0%   0%  35.4°C
11:13:45: 1500MHz  1.00  25%   0%  24%   0%   0%   0%  35.3°C
11:13:54: 1500MHz  1.00  25%   0%  24%   0%   0%   0%  35.3°C
11:14:03: 1500MHz  1.00  25%   0%  24%   0%   0%   0%  35.3°C
11:14:12: 1500MHz  1.00  25%   0%  24%   0%   0%   0%  35.3°C
```

System health while running 7-zip multi core benchmark:

```
Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
11:14:16: 1500MHz  1.00  30%   2%  23%   0%   5%   0%  36.0°C
11:14:38: 1500MHz  1.73  90%   0%  88%   0%   0%   1%  37.8°C
11:14:57: 1500MHz  2.19  92%   0%  90%   0%   0%   1%  38.2°C
11:15:22: 1500MHz  2.72  88%   1%  85%   0%   0%   1%  38.2°C
11:15:41: 1500MHz  3.24  85%   1%  81%   0%   0%   1%  38.0°C
11:16:03: 1500MHz  3.52  93%   1%  90%   0%   0%   1%  38.5°C
11:16:28: 1500MHz  3.40  72%   0%  70%   0%   0%   1%  38.2°C
11:16:49: 1500MHz  3.59  94%   0%  92%   0%   0%   1%  38.6°C
11:17:14: 1500MHz  3.64  89%   1%  86%   0%   0%   1%  38.6°C
11:17:33: 1500MHz  3.81  85%   1%  81%   0%   0%   1%  38.2°C
11:17:54: 1500MHz  3.79  96%   1%  92%   0%   0%   1%  38.7°C
11:18:17: 1500MHz  3.92  87%   0%  85%   0%   0%   1%  38.8°C
11:18:37: 1500MHz  3.95  93%   0%  91%   0%   0%   1%  38.9°C
11:19:01: 1500MHz  3.85  88%   1%  85%   0%   0%   1%  38.7°C
11:19:21: 1500MHz  3.76  85%   1%  81%   0%   0%   1%  38.3°C
11:19:43: 1500MHz  3.89  94%   1%  91%   0%   0%   1%  38.8°C
```

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

```
Linux 5.15.2-cwt-5.10.3-1 (starfive) 02/02/24 _riscv64_ (4 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
          31.53    0.02    2.60    4.42    0.00   61.43
```

```
Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
mmcblk1          3.35        73.13       300.06       73.61     179152     735068     180314
zram0            0.13         0.53         0.00         0.00       1304          4          0

               total        used        free      shared  buff/cache   available
Mem:           3.8Gi       238Mi       3.6Gi       4.0Mi        91Mi       3.5Gi
Swap:          1.9Gi          0B       1.9Gi

Filename Type Size Used Priority
/dev/zram0                              partition 1975292 0 100

WARNING: ZSWAP ON TOP OF ZRAM HAS BEEN CONFIGURED ON THIS SYSTEM!
THIS WILL SEVERELY HARM PERFORMANCE IN CASE SWAPPING OCCURS!

Zswap active using lz4/zbud, max pool occupation: 20%, details:
duplicate_entry:0
pool_limit_hit:0
pool_total_size:0
reject_alloc_fail:0
reject_compress_poor:0
reject_kmemcache_fail:0
reject_reclaim_fail:0
same_filled_pages:0
stored_pages:0
written_back_pages:0

CPU sysfs topology (clusters, cpufreq members, clockspeeds)
               cpufreq   min    max
 CPU    cluster  policy   speed  speed   core type
  0       0       0      375    1500   sifive,u74-mc
  1       0       0      375    1500   sifive,u74-mc
  2       0       0      375    1500   sifive,u74-mc
  3       0       0      375    1500   sifive,u74-mc

Architecture:        riscv64
Byte Order:          Little Endian
CPU(s):              4
On-line CPU(s) list: 0-3

SoC guess: StarFive JH7110
DT compat: starfive,visionfive-v2
           starfive,jh7110
 Compiler: /usr/sbin/gcc (GCC) 13.2.1 20230801 / riscv64-unknown-linux-gnu
 Userland: riscv64
   Kernel: 5.15.2-cwt-5.10.3-1/riscv64
```

```
        CONFIG_HZ=1000
        CONFIG_HZ_1000=y
        CONFIG_PREEMPTION=y
        CONFIG_PREEMPT=y
        CONFIG_PREEMPT_COUNT=y
        CONFIG_PREEMPT_RCU=y

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

Kernel 5.15.2 is not latest 5.15.148 LTS that was released on 2024-01-25.

See https://endoflife.date/linux for details. It is somewhat likely that
a lot of exploitable vulnerabilities exist for this kernel as well as many
unfixed bugs.

But this version string doesn't matter since this is not an official LTS Linux
from kernel.org. This device runs a StarFive vendor/BSP kernel.

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

cpu0/index0: 32K, level: 1, type: Instruction
cpu0/index1: 32K, level: 1, type: Data
cpu0/index2: 2048K, level: 2, type: Unified
cpu1/index0: 32K, level: 1, type: Instruction
cpu1/index1: 32K, level: 1, type: Data
cpu1/index2: 2048K, level: 2, type: Unified
cpu2/index0: 32K, level: 1, type: Instruction
cpu2/index1: 32K, level: 1, type: Data
cpu2/index2: 2048K, level: 2, type: Unified
cpu3/index0: 32K, level: 1, type: Instruction
cpu3/index1: 32K, level: 1, type: Data
cpu3/index2: 2048K, level: 2, type: Unified

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

  cpu_vdd: 1040 mV (1540 mV max)

  opp-table-0:
     375 MHz    800.0 mV
     500 MHz    800.0 mV
     750 MHz    800.0 mV
    1500 MHz   1040.0 mV
```

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

Results validation:

 * Measured clockspeed not lower than advertised max CPU clockspeed
 * No swapping
 * Background activity (%system) OK
 * No throttling

| StarFive VisionFive V2 | 1500 MHz | 5.15 | Arch Linux riscv64 | 4030 | 1163 | 32810 | 950 | 910 | - |

Linux starfive 5.15.2-cwt-3.1.5-1 #1 SMP PREEMPT Sun Jul 2 23:54:37 +07 2023 riscv64 GNU/Linux - ArchLinux

```
09.07.2023
sbc-bench v0.9.42

Installing needed tools: pacman --noconfirm -Sq gcc make base-devel sysstat git dmidecode lshw
p7zip, tinymembench, ramlat, mhz. 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 (12 minutes elapsed).

Results validation:

  * Measured clockspeed not lower than advertised max CPU clockspeed
  * No swapping
  * Background activity (%system) OK
  * Zswap combined with ZRAM. Swapping performance severely harmed
  * No throttling

Memory performance
memcpy: 927.0 MB/s
memset: 831.7 MB/s

7-zip total scores (3 consecutive runs): 4128,4129,4138, single-threaded: 1178
```

OpenSSL results:

type	16 bytes	64 bytes	256 bytes	1024 bytes	8192 bytes	16384 bytes
aes-128-cbc	26713.37k	33158.38k	35514.54k	36161.88k	36345.17k	36252.33k
aes-128-cbc	26643.53k	33099.82k	35499.78k	36162.90k	36323.33k	36241.41k
aes-192-cbc	23883.17k	28842.69k	30630.14k	31116.63k	31222.44k	31162.37k
aes-192-cbc	23538.88k	28718.44k	30570.15k	31062.70k	31216.98k	31151.45k
aes-256-cbc	21542.26k	25437.31k	26880.26k	27282.43k	27372.20k	27306.67k
aes-256-cbc	21558.49k	25505.83k	26906.28k	27281.75k	27374.93k	27317.59k

Full Result

```
sbc-bench v0.9.42 StarFive VisionFive V2 (Sun, 09 Jul 2023 10:17:55 +0000)

/usr/sbin/gcc (GCC) 13.1.1 20230429

Uptime: 10:17:55 up 9 min,  1 user,  load average: 2.44, 1.13, 0.47,  51.3°C,  281418066

Linux 5.15.2-cwt-3.1.5-1 (ArchVF2) □07/09/23 □_riscv64_□(4 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           4.24    0.01    3.46    2.63    0.00   89.66

Device             tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
mmcblk1           9.27       316.89       892.13        63.62     188624     531029      37868
zram0             0.55         2.19         0.01         0.00       1304          4          0

               total        used        free      shared  buff/cache   available
Mem:           3.8Gi       247Mi       3.6Gi       4.7Mi        76Mi       3.5Gi
Swap:          1.9Gi          0B       1.9Gi

Filename□□□□Type□□Size□□Used□□Priority
/dev/zram0                                partition□1985532□□0□□100

WARNING: ZSWAP ON TOP OF ZRAM HAS BEEN CONFIGURED ON THIS SYSTEM!
THIS WILL SEVERELY HARM PERFORMANCE IN CASE SWAPPING OCCURS!

Zswap active using lz4/zbud, max pool occupation: 20%, details:
□duplicate_entry:0
□pool_limit_hit:0
□pool_total_size:0
□reject_alloc_fail:0
□reject_compress_poor:0
□reject_kmemcache_fail:0
□reject_reclaim_fail:0
□same_filled_pages:0
□stored_pages:0
□written_back_pages:0
```

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

Checking cpufreq OPP (sifive,u74-mc):

Cpufreq OPP: 1500    Measured: 1486 (1487.365/1485.885/1485.866)
Cpufreq OPP:  750    Measured:  735    (736.147/735.969/735.772)     (-2.0%)
Cpufreq OPP:  500    Measured:  485    (486.119/485.896/485.772)     (-3.0%)
Cpufreq OPP:  375    Measured:  361    (361.147/361.106/361.032)     (-3.7%)

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

Hardware sensors:

120e0000.tmon-isa-0000
temp1:        +52.0 C

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

Executing benchmark on cpu0 (sifive,u74-mc):

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                                     :    918.8 MB/s (3, 3.1%)
 C copy backwards (32 byte blocks)                    :    919.1 MB/s (2)
 C copy backwards (64 byte blocks)                    :    919.2 MB/s (2)
 C copy                                               :    927.0 MB/s (2)
 C copy prefetched (32 bytes step)                    :    927.2 MB/s (3, 0.3%)
 C copy prefetched (64 bytes step)                    :    927.0 MB/s (2)
```

```
 C 2-pass copy                                       :    761.2 MB/s (2)
 C 2-pass copy prefetched (32 bytes step)            :    767.6 MB/s (3, 0.2%)
 C 2-pass copy prefetched (64 bytes step)            :    763.6 MB/s (2)
 C scan 8                                            :    627.4 MB/s (2)
 C scan 16                                           :    546.4 MB/s (2)
 C scan 32                                           :    860.6 MB/s (3, 1.8%)
 C scan 64                                           :   1630.5 MB/s (3, 13.3%)
 C fill                                              :    831.9 MB/s (2)
 C fill (shuffle within 16 byte blocks)              :    833.3 MB/s (2)
 C fill (shuffle within 32 byte blocks)              :    831.1 MB/s (2)
 C fill (shuffle within 64 byte blocks)              :    832.1 MB/s (3)
 ---
 libc memcpy copy                                    :    927.0 MB/s (3)
 libc memchr scan                                    :   1195.6 MB/s (3, 0.2%)
 libc memset fill                                    :    831.7 MB/s (2)

==========================================================================
== 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 :    0.1 ns          /     0.0 ns
     32768 :    0.2 ns          /     0.1 ns
     65536 :    5.8 ns          /    10.6 ns
    131072 :    8.8 ns          /    15.9 ns
    262144 :   10.6 ns          /    18.4 ns
    524288 :   16.5 ns          /    29.3 ns
   1048576 :   19.2 ns          /    30.7 ns
   2097152 :   39.6 ns          /    64.2 ns
   4194304 :   86.5 ns          /   170.6 ns
   8388608 :  125.4 ns          /   247.0 ns
```

```
  16777216 :  146.3 ns          /   290.3 ns
  33554432 :  159.7 ns          /   317.6 ns
  67108864 :  169.8 ns          /   338.6 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 :    0.1 ns          /     0.0 ns
     32768 :    0.1 ns          /     0.1 ns
     65536 :    5.8 ns          /    10.6 ns
    131072 :    8.7 ns          /    15.9 ns
    262144 :   10.6 ns          /    18.4 ns
    524288 :   11.8 ns          /    19.7 ns
   1048576 :   13.8 ns          /    20.4 ns
   2097152 :   26.0 ns          /    26.9 ns
   4194304 :   80.0 ns          /   158.5 ns
   8388608 :  114.7 ns          /   225.5 ns
  16777216 :  130.6 ns          /   259.5 ns
  33554432 :  142.8 ns          /   283.4 ns
  67108864 :  148.9 ns          /   296.0 ns

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

Executing ramlat on cpu0 (sifive,u74-mc), results in ns:

       size:  1x32  2x32  1x64  2x64 1xPTR 2xPTR 4xPTR 8xPTR
         4k: 2.828 2.909 2.722 2.782 2.021 2.020 2.778 5.642
         8k: 2.780 2.864 2.694 2.779 2.021 2.025 2.780 5.648
        16k: 2.783 2.883 2.699 2.782 2.025 2.025 2.784 5.647
        32k: 2.798 2.882 2.716 2.801 2.035 2.035 2.799 5.686
        64k: 13.74 24.48 13.54 24.32 13.51 24.30 48.73 97.45
       128k: 13.60 24.50 13.55 24.30 13.51 24.29 49.55 97.48
       256k: 13.59 24.48 13.51 24.33 13.50 24.31 48.71 97.48
       512k: 19.54 30.00 20.14 29.86 18.90 32.54 54.12 102.9
      1024k: 20.05 30.44 20.35 30.25 19.12 30.06 54.92 104.1
      2048k: 51.90 86.55 60.80 87.50 50.10 85.98 157.8 297.2
      4096k: 126.5 221.6 126.3 221.4 125.5 221.4 418.4 770.4
      8192k: 158.8 272.7 158.5 270.8 157.9 273.7 495.8 945.2
     16384k: 164.5 279.3 164.6 277.3 164.4 276.6 507.9 971.8
     32768k: 174.8 289.6 176.5 290.7 174.3 288.9 518.1 983.3
     65536k: 174.9 291.3 174.8 291.7 174.6 290.3 527.7 985.2
    131072k: 177.7 296.7 179.8 296.2 176.6 295.9 529.4 1005

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

Executing benchmark twice on cluster 0 (sifive,u74-mc)

OpenSSL 3.1.1, built on 30 May 2023 (Library: OpenSSL 3.1.1 30 May 2023)
type             16 bytes     64 bytes    256 bytes   1024 bytes   8192 bytes  16384 bytes
aes-128-cbc      26713.37k    33158.38k    35514.54k    36161.88k    36345.17k    36252.33k
```

```
aes-128-cbc      26643.53k    33099.82k    35499.78k    36162.90k    36323.33k    36241.41k
aes-192-cbc      23883.17k    28842.69k    30630.14k    31116.63k    31222.44k    31162.37k
aes-192-cbc      23538.88k    28718.44k    30570.15k    31062.70k    31216.98k    31151.45k
aes-256-cbc      21542.26k    25437.31k    26880.26k    27282.43k    27372.20k    27306.67k
aes-256-cbc      21558.49k    25505.83k    26906.28k    27281.75k    27374.93k    27317.59k

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

Executing benchmark single-threaded on cpu0 (sifive,u74-mc)

7-Zip (a) 17.04 : Copyright (c) 1999-2021 Igor Pavlov : 2017-08-28
p7zip Version 17.04 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: 64000000 - 64000000 - - - - - 2048000000

RAM size:    3878 MB,  # CPU hardware threads:   4
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:        901    98    891    877  |      17294    99   1496   1477
23:        863    98    894    880  |      16980    99   1489   1470
24:        834    98    912    898  |      16634    99   1479   1460
25:        804    98    934    919  |      16199    99   1461   1442
----------------------------------  | ------------------------------
Avr:               98    908    893  |               99   1481   1462
Tot:               99   1194   1178

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

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

7-Zip (a) 17.04 : Copyright (c) 1999-2021 Igor Pavlov : 2017-08-28
p7zip Version 17.04 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: - - - - - - 512000000 - 2048000000

RAM size:    3878 MB,  # CPU hardware threads:   4
RAM usage:    882 MB,  # Benchmark threads:      4

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

22:       2574   318    789   2505  |      66761   393   1450   5696
23:       2528   330    781   2576  |      65581   394   1440   5674
24:       2507   342    789   2696  |      63868   393   1426   5607
25:       2390   340    802   2730  |      62202   393   1407   5536
```

```
---------------------------------  | ------------------------------
Avr:             332    790   2627  |              393   1431   5628
Tot:             363   1111   4128

7-Zip (a) 17.04 : Copyright (c) 1999-2021 Igor Pavlov : 2017-08-28
p7zip Version 17.04 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: 64000000 - - 64000000 128000000 256000000 - - -

RAM size:    3878 MB,  # CPU hardware threads:   4
RAM usage:    882 MB,  # Benchmark threads:      4

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

22:       2571   317    788   2502  |      66990   394   1451   5715
23:       2550   333    780   2599  |      65557   394   1440   5672
24:       2489   339    790   2677  |      63838   393   1426   5604
25:       2378   338    803   2716  |      62294   393   1410   5544
---------------------------------  | ------------------------------
Avr:             332    790   2623  |              393   1432   5634
Tot:             363   1111   4129

7-Zip (a) 17.04 : Copyright (c) 1999-2021 Igor Pavlov : 2017-08-28
p7zip Version 17.04 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: 64000000 64000000 - - - - - - 2048000000

RAM size:    3878 MB,  # CPU hardware threads:   4
RAM usage:    882 MB,  # Benchmark threads:      4

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

22:       2630   325    786   2558  |      67013   394   1452   5717
23:       2495   326    780   2543  |      65578   394   1440   5674
24:       2483   338    789   2670  |      63821   393   1426   5603
25:       2452   350    801   2800  |      62279   394   1408   5543
---------------------------------  | ------------------------------
Avr:             335    789   2643  |              394   1432   5634
Tot:             364   1110   4138

Compression: 2627,2623,2643
Decompression: 5628,5634,5634
Total: 4128,4129,4138

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

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

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
10:29:03: 1500MHz  4.05  96%   1%  92%   0%   0%   1%  68.5°C

Checking cpufreq OPP (sifive,u74-mc):

Cpufreq OPP: 1500    Measured: 1485 (1486.056/1485.905/1485.848)

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

Hardware sensors:

120e0000.tmon-isa-0000
temp1:        +66.5 C

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

Thermal source: /sys/devices/virtual/thermal/thermal_zone0/ (cpu-thermal)

System health while running tinymembench:

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
10:18:15: 1500MHz  2.12  10%   3%   4%   0%   2%   0%  53.5°C
10:18:25: 1500MHz  2.02  25%   0%  24%   0%   0%   0%  55.7°C
10:18:35: 1500MHz  1.87  25%   0%  24%   0%   0%   0%  56.2°C
10:18:45: 1500MHz  1.73  27%   0%  24%   0%   1%   0%  56.7°C
10:18:55: 1500MHz  1.64  25%   0%  24%   0%   0%   0%  56.2°C

System health while running ramlat:

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
10:19:05: 1500MHz  1.62  12%   2%   6%   0%   2%   0%  56.5°C
10:19:08: 1500MHz  1.62  25%   0%  24%   0%   0%   0%  56.4°C
10:19:12: 1500MHz  1.57  25%   0%  24%   0%   0%   0%  56.4°C
10:19:15: 1500MHz  1.57  25%   0%  24%   0%   0%   0%  56.6°C
10:19:18: 1500MHz  1.52  25%   0%  24%   0%   0%   0%  56.7°C
10:19:21: 1500MHz  1.48  25%   0%  24%   0%   0%   0%  56.8°C
10:19:24: 1500MHz  1.48  25%   0%  24%   0%   0%   0%  56.7°C
10:19:27: 1500MHz  1.44  25%   0%  24%   0%   0%   0%  56.6°C
10:19:30: 1500MHz  1.44  25%   0%  24%   0%   0%   0%  56.7°C
10:19:33: 1500MHz  1.41  25%   0%  24%   0%   0%   0%  56.7°C
10:19:36: 1500MHz  1.37  26%   0%  24%   0%   0%   0%  56.7°C
10:19:39: 1500MHz  1.37  26%   0%  24%   0%   1%   0%  56.8°C
10:19:42: 1500MHz  1.34  25%   1%  23%   0%   0%   0%  56.9°C
10:19:45: 1500MHz  1.34  25%   0%  24%   0%   0%   0%  56.9°C

System health while running OpenSSL benchmark:

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
10:19:46: 1500MHz  1.32  12%   2%   7%   0%   2%   0%  57.3°C
10:20:02: 1500MHz  1.25  25%   0%  24%   0%   0%   0%  57.5°C
```

```
10:20:18: 1500MHz  1.35  25%   0%  24%   0%   0%   0%  57.8°C
10:20:34: 1500MHz  1.27  25%   0%  24%   0%   0%   0%  58.1°C
10:20:50: 1500MHz  1.19  25%   0%  24%   0%   0%   0%  58.2°C
10:21:07: 1500MHz  1.15  25%   0%  24%   0%   0%   0%  58.5°C
10:21:23: 1500MHz  1.12  25%   0%  24%   0%   0%   0%  58.6°C

System health while running 7-zip single core benchmark:

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
10:21:34: 1500MHz  1.10  14%   2%   9%   0%   2%   0%  58.9°C
10:21:44: 1500MHz  1.08  25%   0%  24%   0%   0%   0%  58.7°C
10:21:53: 1500MHz  1.07  25%   0%  24%   0%   0%   0%  58.8°C
10:22:02: 1500MHz  1.06  25%   0%  24%   0%   0%   0%  58.9°C
10:22:11: 1500MHz  1.05  25%   0%  24%   0%   0%   0%  58.9°C
10:22:20: 1500MHz  1.05  25%   0%  24%   0%   0%   0%  59.1°C
10:22:29: 1500MHz  1.04  25%   0%  24%   0%   0%   0%  59.1°C
10:22:38: 1500MHz  1.03  25%   0%  24%   0%   0%   0%  59.2°C
10:22:47: 1500MHz  1.03  25%   0%  24%   0%   0%   0%  59.2°C
10:22:56: 1500MHz  1.02  25%   0%  24%   0%   0%   0%  59.3°C
10:23:05: 1500MHz  1.02  26%   0%  24%   0%   0%   0%  59.5°C
10:23:14: 1500MHz  1.02  25%   0%  24%   0%   0%   0%  59.5°C
10:23:23: 1500MHz  1.01  25%   0%  24%   0%   0%   0%  59.6°C
10:23:32: 1500MHz  1.01  25%   0%  24%   0%   0%   0%  59.6°C
10:23:41: 1500MHz  1.01  27%   0%  24%   0%   1%   0%  59.7°C

System health while running 7-zip multi core benchmark:

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
10:23:45: 1500MHz  1.01  16%   2%  11%   0%   1%   0%  59.9°C
10:24:08: 1500MHz  1.73  86%   0%  84%   0%   0%   1%  62.9°C
10:24:27: 1500MHz  2.57  93%   0%  91%   0%   0%   1%  63.9°C
10:24:52: 1500MHz  2.91  90%   1%  87%   0%   0%   1%  64.6°C
10:25:12: 1500MHz  3.50  86%   2%  82%   0%   0%   1%  64.7°C
10:25:31: 1500MHz  3.57  93%   1%  90%   0%   0%   1%  65.7°C
10:25:54: 1500MHz  3.76  89%   0%  87%   0%   0%   1%  66.0°C
10:26:13: 1500MHz  3.63  93%   0%  90%   0%   0%   1%  66.1°C
10:26:37: 1500MHz  3.73  90%   1%  87%   0%   0%   1%  66.7°C
10:26:57: 1500MHz  3.81  85%   2%  82%   0%   0%   1%  66.5°C
10:27:17: 1500MHz  3.87  93%   1%  90%   0%   0%   1%  67.3°C
10:27:40: 1500MHz  3.71  86%   0%  84%   0%   0%   1%  67.6°C
10:27:59: 1500MHz  3.66  93%   0%  91%   0%   0%   1%  67.9°C
10:28:24: 1500MHz  3.82  89%   1%  86%   0%   0%   1%  68.0°C
10:28:44: 1500MHz  3.89  87%   2%  83%   0%   0%   1%  67.9°C
10:29:03: 1500MHz  4.05  96%   1%  92%   0%   0%   1%  68.5°C

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

Linux 5.15.2-cwt-3.1.5-1 (ArchVF2) □07/09/23 □_riscv64_□(4 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
          30.72    0.02    2.63    1.33    0.00   65.30
```

```
Device             tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
mmcblk1           4.59       153.83       426.97        29.93     194992     541205      37944
zram0             0.26         1.03         0.00         0.00       1304          4          0

               total        used        free      shared  buff/cache   available
Mem:           3.8Gi       239Mi       3.6Gi       4.7Mi        89Mi       3.6Gi
Swap:          1.9Gi          0B       1.9Gi

Filename□□□□Type□□Size□□Used□□Priority
/dev/zram0                                partition□1985532□□0□□100

WARNING: ZSWAP ON TOP OF ZRAM HAS BEEN CONFIGURED ON THIS SYSTEM!
THIS WILL SEVERELY HARM PERFORMANCE IN CASE SWAPPING OCCURS!

Zswap active using lz4/zbud, max pool occupation: 20%, details:
□duplicate_entry:0
□pool_limit_hit:0
□pool_total_size:0
□reject_alloc_fail:0
□reject_compress_poor:0
□reject_kmemcache_fail:0
□reject_reclaim_fail:0
□same_filled_pages:0
□stored_pages:0
□written_back_pages:0

CPU sysfs topology (clusters, cpufreq members, clockspeeds)
                cpufreq   min    max
 CPU    cluster  policy   speed  speed   core type
  0        0        0      375    1500   sifive,u74-mc
  1        0        0      375    1500   sifive,u74-mc
  2        0        0      375    1500   sifive,u74-mc
  3        0        0      375    1500   sifive,u74-mc

Architecture:        riscv64
Byte Order:          Little Endian
CPU(s):              4
On-line CPU(s) list: 0-3

SoC guess: StarFive JH7110
DT compat: starfive,visionfive-v2
           starfive,jh7110
 Compiler: /usr/sbin/gcc (GCC) 13.1.1 20230429 / riscv64-unknown-linux-gnu
 Userland: riscv64
   Kernel: 5.15.2-cwt-3.1.5-1/riscv64
           CONFIG_HZ=1000
           CONFIG_HZ_1000=y
           CONFIG_PREEMPTION=y
           CONFIG_PREEMPT=y
           CONFIG_PREEMPT_COUNT=y
           CONFIG_PREEMPT_RCU=y
```

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

Kernel 5.15.2 is not latest 5.15.120 LTS that was released on 2023-07-05.

See https://endoflife.date/linux for details. It is somewhat likely that
a lot of exploitable vulnerabilities exist for this kernel as well as many
unfixed bugs.

But this version string doesn't matter since this is not an official LTS Linux
from kernel.org. This device runs a StarFive vendor/BSP kernel.

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

cpu0/index0: 32K, level: 1, type: Instruction
cpu0/index1: 32K, level: 1, type: Data
cpu0/index2: 2048K, level: 2, type: Unified
cpu1/index0: 32K, level: 1, type: Instruction
cpu1/index1: 32K, level: 1, type: Data
cpu1/index2: 2048K, level: 2, type: Unified
cpu2/index0: 32K, level: 1, type: Instruction
cpu2/index1: 32K, level: 1, type: Data
cpu2/index2: 2048K, level: 2, type: Unified
cpu3/index0: 32K, level: 1, type: Instruction
cpu3/index1: 32K, level: 1, type: Data
cpu3/index2: 2048K, level: 2, type: Unified

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

   cpu_vdd: 1040 mV (1540 mV max)

   opp-table-0:
       375 MHz    800.0 mV
       500 MHz    800.0 mV
       750 MHz    800.0 mV
      1500 MHz   1040.0 mV

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

Results validation:

  * Measured clockspeed not lower than advertised max CPU clockspeed
  * No swapping
  * Background activity (%system) OK
  * Zswap combined with ZRAM. Swapping performance severely harmed
  * No throttling

| StarFive VisionFive V2 | 1500 MHz | 5.15 | Arch Linux riscv64 | 4130 | 1178 | 27310 | 930 |
```

Linux starfive 5.15.0-starfive #1 SMP Sun Jun 11 07:48:39 UTC 2023 riscv64 GNU/Linux - Debian

```
08.07.2023
sbc-bench v0.9.42

Installing needed tools: Done.
Checking cpufreq OPP. Done (results will be available in 10-16 minutes).
Executing tinymembench. Done.
Executing RAM latency tester. Done.
Executing OpenSSL benchmark. Done.
Executing 7-zip benchmark. Done.
Checking cpufreq OPP again. Done (12 minutes elapsed).

Results validation:

  * Measured clockspeed not lower than advertised max CPU clockspeed
  * Background activity (%system) OK
  * No throttling

Memory performance
memcpy: 951.9 MB/s
memset: 897.0 MB/s

7-zip total scores (3 consecutive runs): 4043,4196,4194, single-threaded: 1194

OpenSSL results:
type             16 bytes     64 bytes    256 bytes   1024 bytes   8192 bytes  16384 bytes
aes-128-cbc      24254.94k    29816.04k    31697.75k    32206.51k    32347.48k    32314.71k
aes-128-cbc      22069.55k    29024.41k    31473.58k    32077.14k    32306.52k    32314.71k
aes-192-cbc      21428.23k    26155.80k    27729.24k    28092.42k    28254.21k    28246.02k
aes-192-cbc      21349.81k    26126.76k    27704.75k    28090.03k    28256.94k    28240.55k
aes-256-cbc      20020.66k    23400.26k    24707.93k    24986.97k    25100.29k    25094.83k
aes-256-cbc      19955.96k    23521.81k    24706.39k    25014.61k    25100.29k    24995.13k
```

Full results

```
sbc-bench v0.9.42 StarFive VisionFive V2 (Sat, 08 Jul 2023 13:26:34 +0000)

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

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

Uptime: 13:26:35 up 4 min,  2 users,  load average: 0.17, 0.36, 0.18,  51.0°C,  348672736

Linux 5.15.0-starfive (starfive) □07/08/23 □_riscv64_□(4 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           3.47    0.00    2.83    3.16    0.00   90.53

Device             tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn
kB_dscd
mmcblk1          35.67      1319.56       107.46         0.00     338349
27553          0

               total        used        free      shared  buff/cache   available
Mem:           3.8Gi       127Mi       3.7Gi       3.0Mi        64Mi       3.7Gi
Swap:             0B          0B          0B

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

Checking cpufreq OPP (sifive,u74-mc):

Cpufreq OPP: 1500    Measured: 1498 (1498.934/1498.915/1498.877)
Cpufreq OPP:  750    Measured:  748    (748.969/748.825/748.806)
Cpufreq OPP:  500    Measured:  498    (498.938/498.786/498.722)
Cpufreq OPP:  375    Measured:  373    (373.815/373.777/373.529)

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

Hardware sensors:

120e0000.tmon-isa-0000
temp1:        +50.8 C

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

Executing benchmark on cpu0 (sifive,u74-mc):
```

```
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                                     :    946.2 MB/s (3, 3.6%)
 C copy backwards (32 byte blocks)                    :    946.2 MB/s (2)
 C copy backwards (64 byte blocks)                    :    945.7 MB/s (2)
 C copy                                               :    954.5 MB/s (2)
 C copy prefetched (32 bytes step)                    :    953.4 MB/s (3, 0.6%)
 C copy prefetched (64 bytes step)                    :    954.0 MB/s (2)
 C 2-pass copy                                        :    758.4 MB/s (2)
 C 2-pass copy prefetched (32 bytes step)             :    764.6 MB/s (3, 0.2%)
 C 2-pass copy prefetched (64 bytes step)             :    761.9 MB/s (2)
 C scan 8                                             :    586.2 MB/s (3, 0.6%)
 C scan 16                                            :    555.1 MB/s (2)
 C scan 32                                            :   1029.0 MB/s (2)
 C scan 64                                            :   1276.8 MB/s (2)
 C fill                                               :    837.3 MB/s (2)
```

```
 C fill (shuffle within 16 byte blocks)           :    837.2 MB/s (2)
 C fill (shuffle within 32 byte blocks)           :    837.3 MB/s (2)
 C fill (shuffle within 64 byte blocks)           :    837.7 MB/s (2)
 ---
 libc memcpy copy                                 :    951.9 MB/s (2)
 libc memchr scan                                 :   1219.1 MB/s (2)
 libc memset fill                                 :    897.0 MB/s (3, 3.8%)

==========================================================================
== 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
      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 :    5.5 ns          /    10.5 ns
    131072 :    8.3 ns          /    15.8 ns
    262144 :   10.0 ns          /    18.6 ns
```

```
   524288 :   16.0 ns          /    28.6 ns
  1048576 :   19.5 ns          /    30.6 ns
  2097152 :   35.7 ns          /    53.6 ns
  4194304 :   84.8 ns          /   165.1 ns
  8388608 :  123.1 ns          /   241.7 ns
 16777216 :  144.1 ns          /   285.3 ns
 33554432 :  157.3 ns          /   312.6 ns
 67108864 :  167.6 ns          /   334.5 ns

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

Executing ramlat on cpu0 (sifive,u74-mc), results in ns:

       size:  1x32  2x32  1x64  2x64 1xPTR 2xPTR 4xPTR 8xPTR
         4k: 2.778 2.847 2.674 2.756 2.003 2.002 2.753 5.588
         8k: 2.753 2.837 2.669 2.753 2.002 2.002 2.753 5.588
        16k: 2.757 2.837 2.670 2.754 2.002 2.003 2.753 5.593
        32k: 2.762 2.838 2.671 2.754 2.003 2.004 2.762 5.593
        64k: 13.48 24.12 13.35 24.10 13.35 24.03 48.15 96.37
       128k: 13.47 24.11 13.35 24.11 13.45 24.03 48.14 96.50
       256k: 13.44 24.14 13.35 24.11 13.35 24.03 48.15 96.60
       512k: 20.12 30.90 20.04 29.58 18.69 29.37 53.48 101.9
      1024k: 20.17 29.65 19.99 29.59 18.72 29.39 53.54 112.8
      2048k: 53.46 90.24 52.58 89.95 50.72 90.25 166.9 312.1
      4096k: 126.6 220.9 127.0 230.7 125.5 221.2 404.0 768.0
      8192k: 156.3 266.5 156.6 270.4 156.1 265.3 486.6 930.2
     16384k: 167.6 278.6 167.4 278.3 166.7 276.9 503.8 956.0
     32768k: 172.4 286.2 171.3 284.7 171.4 283.4 511.0 968.1
     65536k: 171.1 285.1 171.1 286.5 171.0 287.4 512.0 968.1
    131072k: 173.6 293.0 172.7 288.4 172.7 287.5 517.9 981.4

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

Executing benchmark twice on cluster 0 (sifive,u74-mc)

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      24254.94k    29816.04k    31697.75k    32206.51k    32347.48k
32314.71k
```

```
aes-128-cbc      22069.55k    29024.41k    31473.58k    32077.14k    32306.52k
32314.71k
aes-192-cbc      21428.23k    26155.80k    27729.24k    28092.42k    28254.21k
28246.02k
aes-192-cbc      21349.81k    26126.76k    27704.75k    28090.03k    28256.94k
28240.55k
aes-256-cbc      20020.66k    23400.26k    24707.93k    24986.97k    25100.29k
25094.83k
aes-256-cbc      19955.96k    23521.81k    24706.39k    25014.61k    25100.29k
24995.13k

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

Executing benchmark single-threaded on cpu0 (sifive,u74-mc)

7-Zip (a) 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: 32000000 64000000 - - - - 512000000 1024000000 -

RAM size:    3891 MB,  # CPU hardware threads:   4
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:        917   100    892    892  |      17497   100   1494   1494
23:        875   100    892    892  |      17175   100   1487   1487
24:        848   100    912    912  |      16820   100   1477   1477
25:        820   100    936    936  |      16412   100   1461   1461
---------------------------------  | ----------------------------
Avr:             100    908    908  |              100   1480   1480
Tot:             100   1194   1194

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

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

```
7-Zip (a) 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: 64000000 64000000 - - 128000000 256000000 512000000 1024000000 2048000000

RAM size:    3891 MB,  # CPU hardware threads:   4
RAM usage:    882 MB,  # Benchmark threads:      4

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

22:       1753   214    799   1706  |      67832   398   1452   5787
23:       2599   339    782   2649  |      66677   400   1444   5769
24:       2572   351    789   2766  |      64957   399   1429   5702
25:       2028   284    816   2317  |      63431   399   1414   5645
--------------------------------  | ------------------------------
Avr:             297    796   2359  |              399   1435   5726
Tot:             348   1116   4043

7-Zip (a) 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: - - - - - 256000000 - - -

RAM size:    3891 MB,  # CPU hardware threads:   4
RAM usage:    882 MB,  # Benchmark threads:      4

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

22:       2651   331    779   2579  |      68173   400   1455   5816
23:       2584   337    782   2633  |      66586   399   1442   5761
24:       2563   348    792   2756  |      65197   400   1432   5723
25:       2319   327    811   2648  |      63439   399   1414   5646
```

```
---------------------------------  | ------------------------------
Avr:             336    791   2654  |              400   1436   5737
Tot:             368   1113   4196

7-Zip (a) 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=C,Utf16=off,HugeFiles=on,64 bits,4 CPUs LE)

LE
CPU Freq: - - - - - 256000000 - 1024000000 -

RAM size:    3891 MB,  # CPU hardware threads:   4
RAM usage:    882 MB,  # Benchmark threads:      4

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

22:       2453   303    788   2387  |      68047   399   1454   5806
23:       2612   340    783   2662  |      66455   399   1441   5750
24:       2527   344    791   2718  |      64923   399   1428   5699
25:       2526   360    802   2884  |      63395   399   1413   5642
---------------------------------  | ------------------------------
Avr:             337    791   2663  |              399   1434   5724
Tot:             368   1113   4194

Compression: 2359,2654,2663
Decompression: 5726,5737,5724
Total: 4043,4196,4194

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

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

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
13:37:36: 1500MHz  4.14  97%   1%  96%   0%   0%   0%  66.5°C

Checking cpufreq OPP (sifive,u74-mc):

Cpufreq OPP: 1500    Measured: 1498 (1498.896/1498.800/1498.762)
```

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

Hardware sensors:

120e0000.tmon-isa-0000
temp1:        +64.5 C

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

Thermal source: /sys/devices/virtual/thermal/thermal_zone0/ (cpu-thermal)

System health while running tinymembench:

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
13:26:54: 1500MHz  0.35  10%   2%   4%   0%   2%   0%  52.2°C
13:27:04: 1500MHz  0.45  25%   0%  25%   0%   0%   0%  54.8°C
13:27:14: 1500MHz  0.61  25%   0%  25%   0%   0%   0%  55.5°C
13:27:24: 1500MHz  0.70  25%   0%  25%   0%   0%   0%  56.1°C

System health while running ramlat:

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
13:27:35: 1500MHz  0.74  12%   2%   7%   0%   2%   0%  55.9°C
13:27:38: 1500MHz  0.74  25%   0%  25%   0%   0%   0%  55.8°C
13:27:41: 1500MHz  0.76  25%   0%  24%   0%   0%   0%  55.9°C
13:27:44: 1500MHz  0.76  25%   0%  25%   0%   0%   0%  56.0°C
13:27:47: 1500MHz  0.78  25%   0%  25%   0%   0%   0%  56.1°C
13:27:50: 1500MHz  0.80  25%   0%  25%   0%   0%   0%  56.2°C
13:27:53: 1500MHz  0.80  25%   0%  24%   0%   0%   0%  56.1°C
13:27:56: 1500MHz  0.82  25%   0%  24%   0%   0%   0%  56.0°C
13:27:59: 1500MHz  0.83  25%   0%  24%   0%   0%   0%  56.0°C
13:28:02: 1500MHz  0.83  25%   0%  24%   0%   0%   0%  56.0°C
13:28:05: 1500MHz  0.85  25%   0%  25%   0%   0%   0%  56.0°C
13:28:08: 1500MHz  0.85  25%   0%  24%   0%   0%   0%  56.1°C
13:28:11: 1500MHz  0.86  25%   1%  24%   0%   0%   0%  56.2°C
13:28:14: 1500MHz  0.87  25%   0%  25%   0%   0%   0%  56.2°C

System health while running OpenSSL benchmark:
```

```
Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
13:28:15: 1500MHz  0.87  14%   2%   9%   0%   2%   0%  56.6°C
13:28:32: 1500MHz  0.90  25%   0%  25%   0%   0%   0%  57.0°C
13:28:48: 1500MHz  0.92  25%   0%  25%   0%   0%   0%  57.1°C
13:29:04: 1500MHz  0.94  25%   0%  25%   0%   0%   0%  57.5°C
13:29:20: 1500MHz  0.96  25%   0%  25%   0%   0%   0%  57.5°C
13:29:36: 1500MHz  0.97  25%   0%  25%   0%   0%   0%  57.8°C
13:29:52: 1500MHz  0.98  25%   0%  25%   0%   0%   0%  57.9°C

System health while running 7-zip single core benchmark:

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
13:30:04: 1500MHz  0.98  16%   1%  13%   0%   1%   0%  58.2°C
13:30:15: 1500MHz  0.98  25%   0%  24%   0%   0%   0%  58.0°C
13:30:26: 1500MHz  0.99  25%   0%  24%   0%   0%   0%  58.1°C
13:30:37: 1500MHz  1.07  25%   0%  24%   0%   0%   0%  58.2°C
13:30:48: 1500MHz  1.06  25%   0%  24%   0%   0%   0%  58.3°C
13:30:59: 1500MHz  1.05  25%   0%  24%   0%   0%   0%  58.4°C
13:31:10: 1500MHz  1.04  25%   0%  24%   0%   0%   0%  58.5°C
13:31:21: 1500MHz  1.11  25%   0%  24%   0%   0%   0%  58.6°C
13:31:32: 1500MHz  1.09  25%   0%  24%   0%   0%   0%  58.7°C
13:31:44: 1500MHz  1.08  25%   0%  24%   0%   0%   0%  58.8°C
13:31:55: 1500MHz  1.06  25%   0%  24%   0%   0%   0%  58.8°C
13:32:06: 1500MHz  1.05  25%   0%  24%   0%   0%   0%  58.8°C

System health while running 7-zip multi core benchmark:

Time        CPU    load %cpu %sys %usr %nice %io %irq   Temp
13:32:12: 1500MHz  1.04  18%   1%  15%   0%   1%   0%  59.0°C
13:32:37: 1500MHz  1.83  63%   0%  63%   0%   0%   0%  61.7°C
13:33:00: 1500MHz  2.27  93%   0%  93%   0%   0%   0%  62.5°C
13:33:24: 1500MHz  2.63  93%   1%  91%   0%   0%   0%  63.8°C
13:33:46: 1500MHz  2.99  80%   1%  78%   0%   0%   0%  63.1°C
13:34:08: 1500MHz  3.21  72%   0%  71%   0%   0%   0%  63.7°C
13:34:31: 1500MHz  3.56  90%   0%  90%   0%   0%   0%  64.6°C
13:34:53: 1500MHz  3.69  90%   1%  89%   0%   0%   0%  64.8°C
13:35:15: 1500MHz  3.77  90%   1%  89%   0%   0%   0%  65.0°C
13:35:37: 1500MHz  3.84  88%   1%  87%   0%   0%   0%  64.9°C
```

```
13:36:00: 1500MHz  3.83  79%   0%  78%   0%   0%   0%  64.9°C
13:36:25: 1500MHz  3.78  90%   0%  90%   0%   0%   0%  65.5°C
13:36:50: 1500MHz  3.77  91%   1%  90%   0%   0%   0%  65.7°C
13:37:13: 1500MHz  3.83  88%   1%  87%   0%   0%   0%  65.8°C
13:37:36: 1500MHz  4.14  97%   1%  96%   0%   0%   0%  66.5°C

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

Linux 5.15.0-starfive (starfive) □07/08/23 □_riscv64_□(4 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
          40.28    0.01    1.29    0.93    0.00   57.48

Device             tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn
kB_dscd
mmcblk1          10.33       373.11        31.72         0.00     344205
29265          0

               total        used        free      shared  buff/cache   available
Mem:           3.8Gi       126Mi       3.6Gi       3.0Mi        71Mi       3.7Gi
Swap:             0B          0B          0B

CPU sysfs topology (clusters, cpufreq members, clockspeeds)
                 cpufreq   min    max
 CPU    cluster  policy   speed  speed   core type
  0        0        0      375    1500   sifive,u74-mc
  1        0        0      375    1500   sifive,u74-mc
  2        0        0      375    1500   sifive,u74-mc
  3        0        0      375    1500   sifive,u74-mc

Architecture:        riscv64
Byte Order:          Little Endian
CPU(s):              4
On-line CPU(s) list: 0-3

SoC guess: StarFive JH7110
DT compat: starfive,visionfive-v2
           starfive,jh7110
 Compiler: /usr/bin/gcc (Debian 12.3.0-4) 12.3.0 / riscv64-linux-gnu
```

```
 Userland: riscv64
   Kernel: 5.15.0-starfive/riscv64
           CONFIG_HZ=100
           CONFIG_HZ_100=y
           CONFIG_PREEMPT_COUNT=y
           CONFIG_PREEMPT_NONE=y

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

Kernel 5.15.0 is not latest 5.15.120 LTS that was released on 2023-07-05.

See https://endoflife.date/linux for details. It is somewhat likely that
a lot of exploitable vulnerabilities exist for this kernel as well as many
unfixed bugs.

But this version string doesn't matter since this is not an official LTS Linux
from kernel.org. This device runs a StarFive vendor/BSP kernel.

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

cpu0/index0: 32K, level: 1, type: Instruction
cpu0/index1: 32K, level: 1, type: Data
cpu0/index2: 2048K, level: 2, type: Unified
cpu1/index0: 32K, level: 1, type: Instruction
cpu1/index1: 32K, level: 1, type: Data
cpu1/index2: 2048K, level: 2, type: Unified
cpu2/index0: 32K, level: 1, type: Instruction
cpu2/index1: 32K, level: 1, type: Data
cpu2/index2: 2048K, level: 2, type: Unified
cpu3/index0: 32K, level: 1, type: Instruction
cpu3/index1: 32K, level: 1, type: Data
cpu3/index2: 2048K, level: 2, type: Unified

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

   cpu_vdd: 1040 mV (1540 mV max)

   opp-table-0:
       375 MHz    800.0 mV
```

```
       500 MHz    800.0 mV
       750 MHz    800.0 mV
      1500 MHz   1040.0 mV

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

Results validation:

  * Measured clockspeed not lower than advertised max CPU clockspeed
  * Background activity (%system) OK
  * No throttling

| StarFive VisionFive V2 | 1500 MHz | 5.15 | Debian GNU/Linux trixie/sid riscv64 | 4140 |
1194 | 25040 | 950 | 900 | - |
```

Created 2023-07-07 12:14:10 UTC by XeroX
Updated 2025-12-06 20:52:14 UTC by XeroX