

VisionFive 2 - RISC-V - JH7110

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-numio (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 written ==

== 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

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

size: 1x32 2x32 1x64 2x64 1xPTR 2xPTR 4xPTR 8xPTR
4k: 2.800 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

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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

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

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

Dict	Compressing				Decompressing			
	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

Dict	Compressing				Decompressing			
	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

Dict	Compressing				Decompressing			
	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

Dict	Compressing				Decompressing			
	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

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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
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)

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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

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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

#####

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

#####

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

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 written ==
== 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
```

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

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

#####

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

#####

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

Dict	Compressing				Decompressing			
	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

Dict	Compressing				Decompressing			
	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

FilenameTypeSizeUsedPriority
/dev/zram0          partition198553200100

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 written	==
== 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			

FilenameTypeSizeUsedPriority
/dev/zram0partition19855320100

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 | 830 | - |

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-numio (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 written ==

== 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, clocks speeds)

	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 | - |