### SPEC CPU®2017 Floating Point Speed Result

**Supermicro**  
A+ Server 2115GT-HNTF  
(H13SST-G , AMD EPYC 9454P)

| SPECspeed®2017_fp_base = 253 |
| SPECspeed®2017_fp_peak = 256 |

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro  
**Test Date:** Mar-2023  
**Hardware Availability:** Nov-2022  
**Software Availability:** Jan-2023

| Threads | 0 | 40.0 | 80.0 | 120 | 160 | 200 | 240 | 280 | 320 | 360 | 400 | 440 | 480 | 520 | 560 | 600 | 640 | 680 | 720 | 760 | 800 | 840 | 880 | 920 | 960 |
|---------|---|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 603.bwaves_s | 48 |       |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 607.cactuBSSN_s | 48 |       |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 619.lbm_s | 48 |       |       |     |     | 142 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 621.wrf_s | 48 |       |       |     |     | 142 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 627.cam4_s | 48 |       |       |     |     | 194 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 628.pop2_s | 48 |       |       |     |     | 168 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 638.imagick_s | 48 |       |       |     |     | 93.1 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 644.nab_s | 48 |       |       |     |     | 96.6 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 649.fotonik3d_s | 48 |       |       |     |     | 331 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 654.roms_s | 48 |       |       |     |     | 332 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

**Threads:** SPECspeed®2017_fp_base (253)  
**Threads:** SPECspeed®2017_fp_peak (256)

### Hardware

- **CPU Name:** AMD EPYC 9454P  
- **Max MHz:** 3800  
- **Nominal:** 2750  
- **Enabled:** 48 cores, 1 chip  
- **Orderable:** 1 chip  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **L2:** 1 MB I+D on chip per core  
- **L3:** 256 MB I+D on chip per chip, 32 MB shared / 6 cores  
- **Other:** None  
- **Memory:** 1152 GB (12 x 96 GB 2Rx4 PC5-4800B-R)  
- **Storage:** 1 x 1.92 TB SATA III SSD  
- **Other:** None

### Software

- **OS:** Ubuntu 22.04.1 LTS  
- **Kernel:** 5.15.0-58-generic  
- **Compiler:** C/C++/Fortran: Version 4.0.0 of AOCC  
- **Parallel:** Yes  
- **Firmware:** Version 1.1 released Jan-2023  
- **File System:** ext4  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 64-bit  
- **Other:** None  
- **Power Management:** BIOS and OS set to max performance at the cost of additional power usage.
Supermicro
A+ Server 2115GT-HNTF
(H13SST-G, AMD EPYC 9454P)

SPECspeed®2017_fp_base = 253
SPECspeed®2017_fp_peak = 256

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>603.bwaves_s</td>
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<td>75.2</td>
<td>784</td>
<td>75.6</td>
<td>781</td>
<td>75.6</td>
<td>780</td>
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<tr>
<td>607.cactuBSSN_s</td>
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<td>40.9</td>
<td>407</td>
<td>40.9</td>
<td>408</td>
<td>40.7</td>
<td>410</td>
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<td>36.9</td>
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<td>36.6</td>
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<td>37.0</td>
<td>141</td>
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<td>621.wrf_s</td>
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<td>68.4</td>
<td>193</td>
<td>68.3</td>
<td>194</td>
<td>68.1</td>
<td>194</td>
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<tr>
<td>627.cam4_s</td>
<td>48</td>
<td>53.0</td>
<td>167</td>
<td>52.9</td>
<td>168</td>
<td>52.8</td>
<td>168</td>
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<tr>
<td>628.pop2_s</td>
<td>48</td>
<td>127</td>
<td>93.1</td>
<td>128</td>
<td>93.0</td>
<td>127</td>
<td>93.3</td>
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<tr>
<td>638.imagick_s</td>
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<td>43.3</td>
<td>332</td>
<td>43.7</td>
<td>330</td>
<td>43.6</td>
<td>331</td>
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<tr>
<td>644.nab_s</td>
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<td>35.6</td>
<td>491</td>
<td>35.6</td>
<td>491</td>
<td>35.5</td>
<td>492</td>
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<td>649.fotonik3d_s</td>
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<td>62.5</td>
<td>146</td>
<td>61.5</td>
<td>148</td>
<td>62.2</td>
<td>147</td>
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<tr>
<td>654.roms_s</td>
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<td>48.3</td>
<td>326</td>
<td>48.2</td>
<td>327</td>
<td>48.3</td>
<td>326</td>
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</tbody>
</table>

Compiler Notes

The AMD64 AOCC Compiler Suite is available at
http://developer.amd.com/amd-aocc/

Submit Notes

The config file option 'submit' was used.
'nnumactl' was used to bind copies to the cores.
See the configuration file for details.

Operating System Notes

'ulimit -s unlimited' was used to set environment stack size limit
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numactl i.e.:
nnumactl --interleave=all runcpu <etc>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage,
'sysctl -w vm.zone_reclaim_mode=1' run as root.
To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run variability,
'sysctl -w kernel.randomize_va_space=0' run as root.

(Continued on next page)
Operating System Notes (Continued)

To enable Transparent Hugepages (THP) for all allocations, 'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and 'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.

To always enable THP for peak runs of:
603.bwaves_s, 607.cactuBSSN_s, 619.lbm_s, 627.cam4_s, 628.pop2_s, 638.imagick_s, 644.nab_s, 649.fotonik3d_s:
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled; echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.

To disable THP for peak runs of 621.wrf_s:
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled; echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.

To enable THP only on request for peak runs of 654.roms_s:
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled; echo madvise > /sys/kernel/mm/transparent_hugepage/defrag' run as root.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-47"
LD_LIBRARY_PATH = "/home/cpu2017/amd_speed_aocc400_genoa_B_lib/lib;"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "oversize_threshold:0,retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULER = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "48"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0-47"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0-47"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0-47"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-47"

Environment variables set by runcpu during the 638.imagick_s peak run:
GOMP_CPU_AFFINITY = "0-47"

Environment variables set by runcpu during the 644.nab_s peak run:
GOMP_CPU_AFFINITY = "0-47"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0 24 1 25 2 26 3 27 4 28 5 29 6 30 7 31 8 32 9 33 10 34"
**Environment Variables Notes (Continued)**

```
11 35 12 36 13 37 14 38 15 39 16 40 17 41 18 42 19 43 20 44 21 45 22 46
23 47
```

**General Notes**

Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

**Platform Notes**

BIOS Settings:
Determinism Control = Manual
Determinism Enable = Disable Performance Determinism
cTDP Control = Manual
cTDP = 300
Package Power Limit Control = Manual
Package Power Limit = 300
NUMA Nodes Per Socket = NPS4
SMT Control = Disabled
ACPI SRAT L3 cache As NUMA Domain = Enabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on h13sst-9454p Wed Mar 8 06:36:36 2023

SUT (System Under Test) info as seen by some common utilities.

---

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3. Username
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7. iscpu
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9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.6)
12. Failed units, from systemctl list-units --state=failed
13. Services, from systemctl list-unit-files
14. Linux kernel boot-time arguments, from /proc/cmdline
15. cpupower frequency-info
16. sysctl
17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/transparent
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS

-------------------------------------------------------------
1. uname -a
Linux h13sst-9454p 5.15.0-58-generic #64-Ubuntu SMP Thu Jan 5 11:43:13 UTC 2023 x86_64 x86_64 x86_64
GNU/Linux

-------------------------------------------------------------
2. w
06:36:36 up 4:22, 4 users, load average: 5.48, 5.23, 3.12
USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
lab      tty1     -                03:03    3:32m 35.67s  0.01s -bash
lab      tty2     -                03:04    3:32m  0.03s  0.01s -bash
lab      pts/0    -                03:04    3:22m  2.49s 35.64s sudo su -
lab      pts/1    -                03:04    3:10m  0.01s  0.01s sudo su -

-------------------------------------------------------------
3. Username
  From environment variable $USER: root
  From the command 'logname':     lab

-------------------------------------------------------------
4. ulimit -a
  time(seconds)        unlimited
  file(blocks)         unlimited
  data(kbytes)         unlimited
  stack(kbytes)        unlimited
  coredump(blocks)     0
  memory(kbytes)       unlimited
  locked memory(kbytes) 2097152
  process              4642780
  nofiles              1024

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(H13SST-G, AMD EPYC 9454P)

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

SPECspeed®2017_fp_base = 253
SPECspeed®2017_fp_peak = 256

Test Date: Mar-2023
Hardware Availability: Nov-2022
Software Availability: Jan-2023

Platform Notes (Continued)

<table>
<thead>
<tr>
<th>vmemory(kbytes)</th>
<th>unlimited</th>
</tr>
</thead>
<tbody>
<tr>
<td>locks</td>
<td>unlimited</td>
</tr>
<tr>
<td>rtprio</td>
<td>0</td>
</tr>
</tbody>
</table>

5. sysinfo process ancestry
/sbin/init
/bin/login -p --
-bash
sudo su -
sudo su -
-su -
-bash
python3 ./run_amd_speed_aocc400_genoa_B1.py
/bin/bash ./amd_speed_aocc400_genoa_B1.sh
runcpu --config amd_speed_aocc400_genoa_B1.cfg --tune all --reportable --iterations 3 fpspeed
runcpu --configfile amd_speed_aocc400_genoa_B1.cfg --tune all --reportable --iterations 3 --nopower
--runmode speed --tune base:peak --size test:train:refspeed fpspeed --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.002/templogs/preenv.fpspeed.002.0.log --lognum 002.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017

6. /proc/cpuinfo

<table>
<thead>
<tr>
<th>model name</th>
<th>AMD EPYC 9454P 48-Core Processor</th>
</tr>
</thead>
<tbody>
<tr>
<td>vendor_id</td>
<td>AuthenticAMD</td>
</tr>
<tr>
<td>cpu family</td>
<td>25</td>
</tr>
<tr>
<td>model</td>
<td>17</td>
</tr>
<tr>
<td>stepping</td>
<td>1</td>
</tr>
<tr>
<td>microcode</td>
<td>0xa101111</td>
</tr>
<tr>
<td>bugs</td>
<td>sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass</td>
</tr>
<tr>
<td>TLB size</td>
<td>3584 4K pages</td>
</tr>
<tr>
<td>cpu cores</td>
<td>48</td>
</tr>
<tr>
<td>siblings</td>
<td>48</td>
</tr>
<tr>
<td>1 physical ids (chips)</td>
<td></td>
</tr>
<tr>
<td>48 processors (hardware threads)</td>
<td></td>
</tr>
<tr>
<td>physical id 0: core ids</td>
<td>0-5,16-21,32-37,48-53,64-69,80-85,96-101,112-117</td>
</tr>
<tr>
<td>physical id 0: apicids</td>
<td>0-5,16-21,32-37,48-53,64-69,80-85,96-101,112-117</td>
</tr>
</tbody>
</table>

Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for virtualized systems. Use the above data carefully.

7. lscpu

From lscpu from util-linux 2.37.2:

<table>
<thead>
<tr>
<th>Architecture:</th>
<th>x86_64</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU op-mode(s):</td>
<td>32-bit, 64-bit</td>
</tr>
</tbody>
</table>

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Platform Notes (Continued)

Address sizes: 52 bits physical, 57 bits virtual
Byte Order: Little Endian
CPU(s): 48
On-line CPU(s) list: 0-47
Vendor ID: AuthenticAMD
Model name: AMD EPYC 9454P 48-Core Processor
CPU family: 25
Model: 17
Thread(s) per core: 1
Core(s) per socket: 48
Socket(s): 1
Stepping: 1
Frequency boost: enabled
CPU max MHz: 3812.0000
CPU min MHz: 400.0000
BogoMIPS: 5500.06

Flags: fpu vme de pse tsc msr pae mce cmov pat pse36
clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm
constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf rpl
pnipclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe
popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy
abmsse4asalisgnmsse 3nowprefetch osuw 1bslnit wdt tce topoext
perfctr_core perfctr_nb bprext perfctr_llc mwaltx cpb cat_l3 cdcp_l3
invpcid_single hw_pstate ssbd mba ibrs ibbp stibp vmmcall fagsbase bml1
avx2 smep bml2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap
avx512ifma clflushopt clwb avx512cd sha_ni avx512bw avx512vl xsaveopt
xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
avx512_bf16 clzero irperf xsaveerptr rdpru wbnoind amd_ppin cppc arat npt
lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassist
pausefilter pthreshold avic v_vmsave_vmload vgif v_specctrl avx512vbm
umip pku ospke avx512_vbmi2 gfnv vaes vpcmulqdq avx512_vnni avx512_vbtaig
avx512_vpopcntdq la57 rdpid overflow_recover succor smca fasm flash_l1d

Virtualization: AMD-V
L1d cache: 1.5 MiB (48 instances)
L1i cache: 1.5 MiB (48 instances)
L2 cache: 48 MiB (48 instances)
L3 cache: 256 MiB (8 instances)
NUMA node(s): 8
NUMA node0 CPU(s): 0-5
NUMA node1 CPU(s): 6-11
NUMA node2 CPU(s): 12-17
NUMA node3 CPU(s): 18-23
NUMA node4 CPU(s): 24-29
NUMA node5 CPU(s): 30-35
NUMA node6 CPU(s): 36-41
NUMA node7 CPU(s): 42-47
Vulnerability Itlb multihit: Not affected

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**SPECspeed®2017_fp_peak = 256**

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**Platform Notes (Continued)**

Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Mmio stale data: Not affected
Vulnerability Retbleed: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP disabled, RSB filling, PBRSB-eIBRS Not affected
Vulnerability Srbds: Not affected
Vulnerability Tsx async abort: Not affected

From lscpu --cache:

```
NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL  SETS PHY-LINE COHERENCY-SIZE
L1d  32K  1.5M  8 Data            1    64        1             64
L1i  32K  1.5M  8 Instruction     1    64        1             64
L2   1M   48M  8 Unified         2  2048        1             64
L3   32M  256M 16 Unified         3 32768        1             64
```

8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
available: 8 nodes (0-7)
node 0 cpus: 0-5
node 0 size: 144880 MB
node 0 free: 144315 MB
node 1 cpus: 6-11
node 1 size: 145108 MB
node 1 free: 144615 MB
node 2 cpus: 12-17
node 2 size: 145144 MB
node 2 free: 144352 MB
node 3 cpus: 18-23
node 3 size: 145144 MB
node 3 free: 144404 MB
node 4 cpus: 24-29
node 4 size: 145144 MB
node 4 free: 144790 MB
node 5 cpus: 30-35
node 5 size: 145095 MB
node 5 free: 144435 MB
node 6 cpus: 36-41
node 6 size: 145144 MB
node 6 free: 144458 MB
node 7 cpus: 42-47
node 7 size: 145144 MB
node 7 free: 144641 MB

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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Mar-2023
Hardware Availability: Nov-2022
Software Availability: Jan-2023

Platform Notes (Continued)

node distances:
node  0   1   2   3   4   5   6   7
0:  10  11  11  11  11  11  11  11
1:  11  10  11  11  11  11  11  11
2:  11  11  10  11  11  11  11  11
3:  11  11  11  10  11  11  11  11
4:  11  11  11  11  10  11  11  11
5:  11  11  11  11  11  10  11  11
6:  11  11  11  11  11  11  10  11
7:  11  11  11  11  11  11  11  10

---
9. /proc/meminfo
   MemTotal: 1188665368 kB

---
10. who -r
    run-level 3 Mar 8 02:16

---
11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.6)
    Default Target Status
    multi-user degraded

---
12. Failed units, from systemctl list-units --state=failed
    UNIT LOAD   ACTIVE SUB DESCRIPTION
    * systemd-networkd-wait-online.service loaded failed failed Wait for Network to be Configured

---
13. Services, from systemctl list-unit-files
    STATE UNIT FILES
    enabled ModemManager apparmor blk-availability cloud-config cloud-final cloud-init
cloud-init-local console-setup cron dmesg e2scrub_reap finalrd getty@
gpu-manager
grub-common grub-initrd-fallback irqbalance keyboard-setup lm-sensors lvm2-monitor
lxd-agent multipathd networkd-dispatcher open-iscsi open-vm-tools pollinate rsyslog
secureboot-db setvtrgb ssh systemd-networkd systemd-networkd-wait-online systemd-pstore
systemd-resolved systemd-timesyncd systemd-timesyncd thermald ua-reboot-cmds ubuntu-advantage udisks2 ufw
vgauth
    enabled-runtime netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
    disabled console-getty debug-shell iscsi idisks mdadm multipath-tools-boot rc rcS
    generated screen-cleanup sudo
    indirect upower
    masked cryptdisks cryptdisks-early hwclock lvm2 multipath-tools-boot rc rcS

(Continued on next page)
Supermicro
A+ Server 2115GT-HNTF
(H13SST-G, AMD EPYC 9454P)

SPECspeed®2017_fp_base = 253
SPECspeed®2017_fp_peak = 256

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Test Date: Mar-2023
Hardware Availability: Nov-2022
Software Availability: Jan-2023

Platform Notes (Continued)

14. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.15.0-58-generic
   root=UUID=d0cc852e-9857-40c1-b230-5999cbe027bc
   ro

15. cpupower frequency-info
   analyzing CPU 0:
   current policy: frequency should be within 400 MHz and 3.81 GHz.
   The governor "performance" may decide which speed to use
   within this range.

   boost state support:
   Supported: yes
   Active: yes
   Boost States: 0
   Total States: 3
   Pstate-P0: 2750MHz

16. sysctl
   kernel.numa_balancing               1
   kernel.randomize_va_space           0
   vm.compaction_proactiveness         20
   vm.dirty_background_bytes           0
   vm.dirty_background_ratio           10
   vm.dirty_bytes                      0
   vm.dirty_expire_centisecs           3000
   vm.dirty_ratio                      8
   vm.dirty_writeback_centisecs       500
   vm.dirtytime_expire_seconds        43200
   vm.extfrag_threshold               500
   vm.min_unmapped_ratio              1
   vm.nr_hugepages                    0
   vm.nr_hugepages_mempolicy          0
   vm.nr_overcommit_hugepages         0
   vm.swappiness                      1
   vm.watermark_boost_factor          15000
   vm.watermark_scale_factor          10
   vm.zone_reclaim_mode               1

17. /sys/kernel/mm/transparent_hugepage
   defrag [always] defer defer+madvise madvise never
   enabled [always] madvise never
   hpage_pmd_size 2097152

(Continued on next page)
Supermicro
A+ Server 2115GT-HNTF (H13SST-G, AMD EPYC 9454P)

SPEC CPU®2017 Floating Point Speed Result

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Platform Notes (Continued)

shmem_enabled always within_size advise [never] deny force

------------------------------------------------------------
18. /sys/kernel/mm/transparent_hugepage/khugepaged
   alloc_sleep_millisecs 60000
defrag 1
max_ptes_none 511
max_ptes_shared 256
max_ptes_swap 64
pages_to_scan 4096
scan_sleep_millisecs 10000

------------------------------------------------------------
19. OS release
   From /etc/*-release /etc/*-version
   os-release Ubuntu 22.04.1 LTS

------------------------------------------------------------
20. Disk information
   SPEC is set to: /home/cpu2017
   Filesystem Type Size  Used Avail Use% Mounted on
   /dev/sda2 ext4 1.8T 64G 1.6T 4% /

------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
   Vendor: Supermicro
   Product: Super Server
   Product Family: Family
   Serial: 0123456789

------------------------------------------------------------
22. dmidecode
   Additional information from dmidecode 3.3 follows. WARNING: Use caution when you interpret this section.
   The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
   Memory:
   12x Micron Technology MTC40F204WS1RC48BBZ 96 GB 2 rank 4800

------------------------------------------------------------
23. BIOS
   (This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor: American Megatrends International, LLC.
   BIOS Version: 1.1
   BIOS Date: 01/17/2023
   BIOS Revision: 5.27
Supermicro
A+ Server 2115GT-HNTF
(H13SST-G , AMD EPYC 9454P)

SPECspeed®2017_fp_base = 253
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Test Sponsor: Supermicro
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Hardware Availability: Nov-2022
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Compiler Version Notes
==============================================================================
C | 619.lbm_s(base, peak) 638.imagick_s(base, peak)
  | 644.nab_s(base, peak)
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
==============================================================================
C++, C, Fortran | 607.cactuBSSN_s(base, peak)
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
==============================================================================
Fortran | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)
  | 654.roms_s(base, peak)
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
==============================================================================
Fortran, C | 621.wrf_s(base, peak) 627.cam4_s(base, peak)
  | 628.pop2_s(base, peak)
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
(Continued on next page)
Compiler Version Notes (Continued)

LLVM Mirror.Version.14.0.6
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

Base Compiler Invocation

C benchmarks:
clang

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

Benchmarks using Fortran, C, and C++:
clang++ clang flang

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
627.cam4_s: -DSPEC_CASE_FLAG -DSPEC_LP64
628.pop2_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64
**SPEC CPU®2017 Floating Point Speed Result**

**Supermicro**

A+ Server 2115GT-HNTF  
(H13SST-G, AMD EPYC 9454P)

**SPECspeed®2017_fp_base = 253**  
**SPECspeed®2017_fp_peak = 256**

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Test Date:** Mar-2023  
**Tested by:** Supermicro  
**Hardware Availability:** Nov-2022  
**Software Availability:** Jan-2023

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**Base Optimization Flags**

**C benchmarks:**
- `m64  -Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6`
- `Wl, -mllvm -Wl, -reduce-array-computations=3  -O3  -march=znver4`
- `fveclib=AMDLIBM  -ffast-math  -fopenmp  -flto  -fstruct-layout=7`
- `mllvm  -unroll-threshold=50  -mllvm -inline-threshold=1000`
- `fremap-arrays  -fstrip-mining  -mllvm -reduce-array-computations=3`
- `-DSPEC_OPENMP  -zopt -fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang`

**Fortran benchmarks:**
- `m64  -Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6`
- `Wl, -mllvm -Wl, -reduce-array-computations=3`
- `Wl, -mllvm -Wl, -enable-X86-prefetching -DSPEC_OPENMP -O3 -march=znver4`
- `fveclib=AMDLIBM  -ffast-math  -fopenmp  -flto  -Mrecursive  -funroll-loops`
- `mllvm -reduce-array-computations=3  -zopt -fopenmp=libomp -lomp`
- `lamdlibm -lamdalloc -lflang`

**Benchmarks using both Fortran and C:**
- `m64  -Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6`
- `Wl, -mllvm -Wl, -reduce-array-computations=3`
- `Wl, -mllvm -Wl, -enable-X86-prefetching -O3 -march=znver4`
- `fveclib=AMDLIBM  -ffast-math  -fopenmp  -flto  -fstruct-layout=7`
- `mllvm -unroll-threshold=50  -mllvm -inline-threshold=1000`
- `fremap-arrays  -fstrip-mining  -mllvm -reduce-array-computations=3`
- `-DSPEC_OPENMP -zopt -Mrecursive -funroll-loops`
- `mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang`

**Benchmarks using Fortran, C, and C++:**
- `m64  -Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6`
- `Wl, -mllvm -Wl, -reduce-array-computations=3`
- `Wl, -mllvm -Wl, -x86-use-vzeroupper=false -O3 -march=znver4`
- `fveclib=AMDLIBM  -ffast-math  -fopenmp  -flto  -fstruct-layout=7`
- `mllvm -unroll-threshold=50  -mllvm -inline-threshold=1000`
- `fremap-arrays  -fstrip-mining  -mllvm -reduce-array-computations=3`
- `-DSPEC_OPENMP -zopt -mllvm -unroll-threshold=100 -finline-aggressive`
- `mllvm -loop-unschedule-threshold=2000000  -Mrecursive -funroll-loops`
- `mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang`
Supermicro
A+ Server 2115GT-HNTF
(H13SST-G , AMD EPYC 9454P)

SPECspeed®2017_fp_base = 253
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CPU2017 License: 001176
Test Date: Mar-2023
Test Sponsor: Supermicro
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Base Other Flags

C benchmarks:
-Wno-return-type -Wno-unused-command-line-argument

Fortran benchmarks:
-Wno-unused-command-line-argument

Benchmarks using both Fortran and C:
-Wno-return-type -Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:
-Wno-return-type -Wno-unused-command-line-argument

Peak Compiler Invocation

C benchmarks:
clang

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

Benchmarks using Fortran, C, and C++:
clang++ clang flang

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

619.lbm_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBC -ffast-math -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000

(Continued on next page)
Peak Optimization Flags (Continued)

619.lbm_s (continued):
-mlirv -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -ldl -zopt -lflang

638.imagick_s: Same as 619.lbm_s

644.nab_s: -m64 -Wl,-mlirv -Wl,-region-vectorize -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-fto -fstruct-layout=9 -mlirv -unroll-threshold=50
-freemap-arrays -fstrip-mining
-mlirv -inline-threshold=1000
-mlirv -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -ldl -zopt -lflang

Fortran benchmarks:

603.bwaves_s: -m64 -Wl,-mlirv -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlirv -Wl,-reduce-array-computations=3
-Wl,-mlirv -Wl,-enable-X86-prefetching -DSPEC_OPENMP
-Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math
-fopenmp -Mrecursive -mlirv -reduce-array-computations=3
-fvector-transform -fscalar-transform -fopenmp=libomp
-lomp -ldl -zopt -lflang

649.fotonik3d_s: basepeak = yes

654.roms_s: Same as 603.bwaves_s

Benchmarks using both Fortran and C:

621.wrf_s: -m64 -Wl,-mlirv -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlirv -Wl,-reduce-array-computations=3
-Wl,-mlirv -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-fto -fstruct-layout=9 -mlirv -unroll-threshold=50
-freemap-arrays -fstrip-mining
-mlirv -inline-threshold=1000
-mlirv -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-O3 -Mrecursive -funroll-loops -mlirv -lsr-in-nested-loop
-fopenmp=libomp -lomp -ldl -zopt -lflang

627.cam4_s: basepeak = yes

628.pop2_s: -m64 -Wl,-mlirv -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlirv -Wl,-reduce-array-computations=3
-Wl,-mlirv -Wl,-enable-X86-prefetching -Ofast
Supermicro
A+ Server 2115GT-HNTF
(H13SST-G, AMD EPYC 9454P)

SPECspeed®2017_fp_base = 253
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cpu2017 License: 001176
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Test Date: Mar-2023
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Peak Optimization Flags (Continued)

628.pop2_s (continued):
- -march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
- -flto -fstruct-layout=9 -mlllvm -unroll-threshold=50
- -fremap-arrays -fstrip-mining
- -mlllvm -inline-threshold=1000
- -mlllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
- -Mrecursive -fvector-transform -fscalar-transform
- -fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang

Benchmarks using Fortran, C, and C++:
607.cactuBSSN_s: basepeak = yes

Peak Other Flags

C benchmarks:
-Wno-return-type -Wno-unused-command-line-argument

Fortran benchmarks:
-Wno-unused-command-line-argument

Benchmarks using both Fortran and C:
-Wno-return-type -Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:
-Wno-return-type -Wno-unused-command-line-argument

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/aocc400-flags.html
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Genoa-revB.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/aocc400-flags.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Genoa-revB.xml

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