ASUSTeK Computer Inc. | SPECspeed®2017_fp_base = 264
ASUS RS520A-E12-RS12U | SPECspeed®2017_fp_peak = 278
(2.75 GHz, AMD EPYC 9454P)

CPU2017 License: 9016 | Test Date: Mar-2023
Test Sponsor: ASUSTeK Computer Inc. | Hardware Availability: Dec-2022
Tested by: ASUSTeK Computer Inc. | Software Availability: Nov-2022

### Hardware

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>48</td>
<td>804</td>
<td>806</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>48</td>
<td>146</td>
<td>435</td>
</tr>
<tr>
<td>619.ibm_s</td>
<td>48</td>
<td>221</td>
<td>226</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>48</td>
<td>175</td>
<td>205</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>96</td>
<td>101</td>
<td>103</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>48</td>
<td>330</td>
<td>367</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>96</td>
<td>492</td>
<td>543</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>48</td>
<td>151</td>
<td>151</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>96</td>
<td>341</td>
<td>377</td>
</tr>
</tbody>
</table>

### Software

| OS:              | SUSE Linux Enterprise Server 15 SP4 (x86_64) | Kernel 5.14.21-150400.22-default |
| Compiler:        | C/C++/Fortran: Version 4.0.0 of AOCC         |
| Parallel:        | Yes                                           |
| Firmware:        | Version 0602 released Dec-2022                |
| File System:     | xfs                                           |
| System State:    | Run level 3 (multi-user)                      |
| Base Pointers:   | 64-bit                                        |
| Peak Pointers:   | 64-bit                                        |
| Power Management:| BIOS and OS set to prefer performance at the cost of additional power usage. |

CPU Name: AMD EPYC 9454P
Max MHz: 3800
Nominal: 2750
Enabled: 48 cores, 1 chip, 2 threads/core
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: 768 GB (12 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 1.6 TB PCIE NVME SSD
Other: None
ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.75 GHz, AMD EPYC 9454P)

SPECspeed®2017_fp_base = 264
SPECspeed®2017_fp_peak = 278

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

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>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>48</td>
<td>73.3</td>
<td>805</td>
<td>73.4</td>
<td>804</td>
<td>73.4</td>
<td>804</td>
<td>73.2</td>
<td>806</td>
<td>73.4</td>
<td>804</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>48</td>
<td>38.2</td>
<td>436</td>
<td>38.7</td>
<td>430</td>
<td>38.4</td>
<td>435</td>
<td>38.2</td>
<td>436</td>
<td>38.7</td>
<td>430</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>48</td>
<td>35.9</td>
<td>146</td>
<td>36.0</td>
<td>146</td>
<td>36.4</td>
<td>144</td>
<td>35.9</td>
<td>146</td>
<td>36.0</td>
<td>146</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>48</td>
<td>60.0</td>
<td>221</td>
<td>59.9</td>
<td>221</td>
<td>59.9</td>
<td>221</td>
<td>58.5</td>
<td>226</td>
<td>58.7</td>
<td>225</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>48</td>
<td>50.5</td>
<td>175</td>
<td>50.6</td>
<td>175</td>
<td>50.5</td>
<td>176</td>
<td>43.2</td>
<td>205</td>
<td>43.5</td>
<td>204</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>48</td>
<td>118</td>
<td>100</td>
<td>118</td>
<td>101</td>
<td>118</td>
<td>101</td>
<td>115</td>
<td>103</td>
<td>116</td>
<td>102</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>48</td>
<td>43.7</td>
<td>330</td>
<td>43.6</td>
<td>331</td>
<td>44.0</td>
<td>328</td>
<td>40.0</td>
<td>361</td>
<td>39.3</td>
<td>367</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>48</td>
<td>35.5</td>
<td>492</td>
<td>35.5</td>
<td>492</td>
<td>35.5</td>
<td>492</td>
<td>32.2</td>
<td>543</td>
<td>32.2</td>
<td>543</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>48</td>
<td>60.5</td>
<td>151</td>
<td>60.2</td>
<td>151</td>
<td>60.2</td>
<td>151</td>
<td>60.5</td>
<td>151</td>
<td>60.2</td>
<td>151</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>48</td>
<td>46.2</td>
<td>341</td>
<td>46.3</td>
<td>340</td>
<td>46.1</td>
<td>341</td>
<td>41.8</td>
<td>377</td>
<td>41.7</td>
<td>378</td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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.
'numactl' 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
OS set to performance mode via cpupower frequency-set -g performance
runcpu command invoked through numactl i.e.:
numacl --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, 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 never > /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 = "0-95"
LD_LIBRARY_PATH = "/cpu119/amd_speed_aocc400_genoa_B_lib/lib;" 
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "oversize_threshold:0,retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "96"

Environment variables set by runcpu during the 603.bwaves_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 627.cam4_s peak run:
GOMP_CPU_AFFINITY = "0-95"

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 = "0-95"

Environment variables set by runcpu during the 644.nab_s peak run:
GOMP_CPU_AFFINITY = "0-95"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-95"

(Continued on next page)
SPEC CPU®2017 Floating Point Speed Result

ASUSTeK Computer Inc.
ASUS RS520A-E12-RS12U
(2.75 GHz, AMD EPYC 9454P)

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

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

SPECspeed®2017_fp_base = 264
SPECspeed®2017_fp_peak = 278

Environment Variables Notes (Continued)

GOMP_CPU_AFFINITY = "0 48 1 49 2 50 3 51 4 52 5 53 6 54 7 55 8 56 9 57 10 58
11 59 12 60 13 61 14 62 15 63 16 64 17 65 18 66 19 67 20 68 21 69 22 70
23 71 24 72 25 73 26 74 27 75 28 76 29 77 30 78 31 79 32 80 33 81 34 82
35 83 36 84 37 85 38 86 39 87 40 88 41 89 42 90 43 91 44 92 45 93 46 94
47 95"

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 Configuration:
SR-IOV Support = Disabled
SVM Mode = Disabled
NUMA nodes per socket = NPS1
Determinism Control = Manual
Determinism Enable = Power
Engine Boost = Aggressive
TDP Control = Manual
TDP = 400
PPT Control = Manual
PPT = 400
IOMMU = Disabled
BMC Configuration:
Fan mode = Full speed mode

Sysinfo program /cpu19/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Wed Mar 8 21:01:55 2023

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

------------------------------------------------------------
1. uname -a

(Continued on next page)
ASUSTeK Computer Inc.
ASUS RS520A-E12-RS12U
(2.75 GHz, AMD EPYC 9454P)

SPECspeed®2017_fp_base = 264
SPECspeed®2017_fp_peak = 278

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Test Date: Mar-2023
Hardware Availability: Dec-2022
Tested by: ASUSTeK Computer Inc.
Software Availability: Nov-2022

Platform Notes (Continued)

2. w
3. Username
4. ulimit -a
5. sysinfo process ancestry
6. /proc/cpuinfo
7. iscpu
8. numactl --hardware
9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. tuned-adm active
16. sysctl
17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/khugepaged
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS

-------------------------------------------------------------------------------
1. uname -a
Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
x86_64 x86_64 x86_64 GNU/Linux

-------------------------------------------------------------------------------
2. w
 21:01:55 up  5:02,  1 user,  load average: 22.06, 49.75, 54.92
 USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
root     tty1     -                15:59    4:00m  1.21s  0.08s /bin/bash ./amd_speed_aocc400_genoa_B1.sh

-------------------------------------------------------------------------------
3. Username
   From environment variable $USER: root

-------------------------------------------------------------------------------
4. ulimit -a
   core file size          (blocks, -c) unlimited
   data seg size           (kbytes, -d) unlimited
   scheduling priority     (--e) 0
   file size               (blocks, -f) unlimited
   pending signals         (--i) 3093452
   max locked memory       (kbytes, -l) 2097152

(Continued on next page)
SPEC CPU®2017 Floating Point Speed Result

ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.75 GHz, AMD EPYC 9454P)

SPECspeed®2017_fp_base = 264
SPECspeed®2017_fp_peak = 278

Platform Notes (Continued)

max memory size (kbytes, -m) unlimited
open files (-n) 1024000
pipe size (512 bytes, -p) 8
POSIX message queues (bytes, -q) 819200
real-time priority (-r) 0
stack size (kbytes, -s) unlimited
cpu time (seconds, -t) unlimited
max user processes (-u) 3093452
virtual memory (kbytes, -v) unlimited
file locks (-x) unlimited

5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize 30
login -- root
--bash
/bin/bash ./speed.sh
python3 ./run_amd_speed_aocc400_genoa_B1.py
/runamd_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/CPUCPU2017.161/templogs/preenv.fpspeed.161.0.log` --lognum 161.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /cpu119

6. /proc/cpuinfo
model name : AMD EPYC 9454P 48-Core Processor
vendor_id : AuthenticAMD
cpu family : 25
model : 17
stepping : 1
microcode : 0xa101111
bugs : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size : 3584 4K pages
cpu cores : 48
siblings : 96
1 physical ids (chips)
96 processors (hardware threads)
physical id 0: core ids 0-5,8-13,16-21,24-29,32-37,40-45,48-53,56-61
physical id 0: apicids 0-11,16-27,32-43,48-59,64-75,80-91,96-107,112-123
Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for virtualized systems. Use the above data carefully.

7. lscpu

(Continued on next page)
### SPEC CPU®2017 Floating Point Speed Result

**ASUSTeK Computer Inc.**

**ASUS RS520A-E12-RS12U**

(2.75 GHz, AMD EPYC 9454P)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>9016</th>
<th>Test Date:</th>
<th>Mar-2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>ASUSTeK Computer Inc.</td>
<td>Hardware Availability:</td>
<td>Dec-2022</td>
</tr>
<tr>
<td>Tested by:</td>
<td>ASUSTeK Computer Inc.</td>
<td>Software Availability:</td>
<td>Nov-2022</td>
</tr>
</tbody>
</table>

**SPECspeed®2017_fp_base = 264**

**SPECspeed®2017_fp_peak = 278**

---

**Platform Notes (Continued)**

- **From lscpu from util-linux 2.37.2:**
  - **Architecture:** x86_64
  - **CPU op-mode(s):** 32-bit, 64-bit
  - **Address sizes:** 52 bits physical, 57 bits virtual
  - **Byte Order:** Little Endian
  - **CPU(s):** 96
  - **On-line CPU(s) list:** 0-95
  - **Vendor ID:** AuthenticAMD
  - **Model name:** AMD EPYC 9454P 48-Core Processor
  - **CPU family:** 25
  - **Model:** 17
  - **Thread(s) per core:** 2
  - **Core(s) per socket:** 48
  - **Socket(s):** 1
  - **Stepping:** 1
  - **Frequency boost:** enabled
  - **CPU max MHz:** 3810.7910
  - **CPU min MHz:** 1500.0000
  - **BogoMIPS:** 5491.62
  - **Flags:**
    - fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca 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 ropl
    - pni pclmulqdq 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
    - abm ssse4 misalignsse 3nowprefetch osvw ibs skinit wdt tce topoext
    - perfctr_core perfctr_nb perfctr_l1c mwaitx cpb cat_l3 cdq_l3 invpcid_single
    - hw_pstate ssbd mba ibrs ibp sbp vmxcall fsgsbase bmi1
    - avx2 smep bmi2 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_occphys llc cqm_mbb_local
    - avx512_fp16 clzero irperf xsaveerpr rdtscp wbnoinvd amd_pprn arat npt lbrv
    - svm_lock nrip_safe tsc_scale vmcb_clean flushbyasid decodeassist
    - pausefilter pfthreshold avic v_vmsave_vmlinux vgif v_specctrl avx512vbmi
    - umip puck ospe avx512_vbmi2 gfnq vaes vpcm16dq avx512_vnni avx512_bitalg
    - avx512_vpopcntdq la57 rdpid overflow_recv succor smca fsm flush_lid

- **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):** 1
- **NUMA node0 CPU(s):** 0-95
- **Vulnerability Itlb multihit:** Not affected
- **Vulnerability L1ttf:** Not affected
- **Vulnerability Mds:** Not affected
- **Vulnerability Meltdown:** Not affected

(Continued on next page)
ASUSTeK Computer Inc.
ASUS RS520A-E12-RS12U
(2.75 GHz, AMD EPYC 9454P)

SPECspeed® 2017_fp_base = 264
SPECspeed® 2017_fp_peak = 278

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Platform Notes (Continued)

Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; userscopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP always-on, RSB filling
Vulnerability Srbds: Not affected
Vulnerability Tsx async abort: Not affected

From lscpu --cache:

<table>
<thead>
<tr>
<th>NAME</th>
<th>ONE-SIZE</th>
<th>ALL-SIZE</th>
<th>WAYS</th>
<th>TYPE</th>
<th>LEVEL</th>
<th>SETS</th>
<th>PHY-LINE</th>
<th>COHERENCY-SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1d</td>
<td>32K</td>
<td>1.5M</td>
<td>8</td>
<td>Data</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L1i</td>
<td>32K</td>
<td>1.5M</td>
<td>8</td>
<td>Instruction</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L2</td>
<td>1M</td>
<td>48M</td>
<td>8</td>
<td>Unified</td>
<td>2</td>
<td>2048</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L3</td>
<td>32M</td>
<td>256M</td>
<td>16</td>
<td>Unified</td>
<td>3</td>
<td>32768</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
available: 1 nodes (0)
node 0 cpus: 0-95
node 0 size: 773387 MB
node 0 free: 771702 MB
node distances:
node 0
0: 10

9. /proc/meminfo
MemTotal: 791949036 kB

10. who -r
run-level 3 Mar 8 15:59

11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
Default Target Status
multi-user running

12. Services, from systemctl list-unit-files
STATE UNIT FILES
enabled YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron display-manager getty@ haveged
irqbalance issue-generator kbdsettings klog logm2-monitor nscd nvmefc-boot-connections
postfix purge-kernels rollback rsyslog smartd sshd wicked wickedd-auto4 wickedd-dhcp4
wickedd-dhcp6 wickedd-nanny
enabled-runtime systemd-remount-fs
disabled autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait

(Continued on next page)
ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.75 GHz, AMD EPYC 9454P)

SPECspeed®2017_fp_base = 264
SPECspeed®2017_fp_peak = 278

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Test Date: Mar-2023
Hardware Availability: Dec-2022
Tested by: ASUSTeK Computer Inc.
Software Availability: Nov-2022

Platform Notes (Continued)

chronyd console-getty cups cups-browsed debug-shell ebtables exchange-bmc-os-info
firewalld gpm grub2-once haveged-switch-root ipmi ipmiwd issue-add-ssh-keys kexec-load
lunmask man-db-create multipathd nfs nfs-blkmap nvmf-autoconnect rdisc rpchbind
rpmconfigcheck rsyncd serial-getty@ smartd_generate_opts snmpd snmptrapd svnmigrate
tuned-adm active
It seems that tuned daemon is not running, preset profile is not activated.
Preset profile: latency-performance

13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
   root=UUID=9bcf0374-b29f-4a4c-932e-9c0e90fb0803
   splash=silent
   mitigations=auto
   quiet
cgroup_disable=memory,cpu,cpucacct,blkio,hugetlb,pids,cpuset,perf_event,freezer,devices,net_cls,net_prio
   indirect
   wickedd

14. cpupower frequency-info
   analyzing CPU 0:
   current policy: frequency should be within 1.50 GHz and 2.75 GHz.
   The governor "performance" may decide which speed to use within this range.
   boost state support:
   Supported: yes
   Active: yes

15. sysctl
   kernel.numa_balancing 0
   kernel.randomize_va_space 0
   vm.compartment_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.extrahuge_threshold 500
   vm.min_unmapped_ratio 1
   vm.nr_hugepages 0

(Continued on next page)
ASUSTeK Computer Inc.
ASUS RS520A-E12-RS12U
(2.75 GHz, AMD EPYC 9454P)

SPECspeed®2017_fp_base = 264
SPECspeed®2017_fp_peak = 278

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Test Date: Mar-2023
Hardware Availability: Dec-2022
Tested by: ASUSTeK Computer Inc.
Software Availability: Nov-2022

Platform Notes (Continued)

```
vm.nr_hugepages_mem_policy      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
   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 SUSE Linux Enterprise Server 15 SP4

20. Disk information
   SPEC is set to: /cpu119
   Filesystem Type  Size  Used  Avail Use% Mounted on
   /dev/nvme0n1p8 xfs  500G  102G  399G  21% /

21. /sys/devices/virtual/dmi/id
   Vendor: ASUSTeK COMPUTER INC.
   Product: RS520A-E12-RS12U
   Product Family: Server
   Serial: 123456789012

22. dmidecode
   Additional information from dmidecode 3.2 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

(Continued on next page)
SPEC CPU®2017 Floating Point Speed Result

ASUSTeK Computer Inc.
ASUS RS520A-E12-RS12U (2.75 GHz, AMD EPYC 9454P)

SPECspeed®2017_fp_base = 264
SPECspeed®2017_fp_peak = 278

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Test Date: Mar-2023
Tested by: ASUSTeK Computer Inc.
Hardware Availability: Dec-2022
Software Availability: Nov-2022

Platform Notes (Continued)

"DMTF SMBIOS" standard.
Memory:
12x Samsung M321R8GA0BB0-CQKVG 64 GB 2 rank 4800

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

(Continued on next page)
ASUSTeK Computer Inc.
ASUS RS520A-E12-RS12U
(2.75 GHz, AMD EPYC 9454P)

SPEC CPU®2017 Floating Point Speed Result
Copyright 2017-2023 Standard Performance Evaluation Corporation

SPECspeed®2017_fp_base = 264
SPECspeed®2017_fp_peak = 278

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Test Date: Mar-2023
Tested by: ASUSTeK Computer Inc.
Hardware Availability: Dec-2022
Software Availability: Nov-2022

Compiler Version Notes (Continued)

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

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
ASUSTeK Computer Inc.
ASUS RS520A-E12-RS12U
(2.75 GHz, AMD EPYC 9454P)

SPECspeed®2017_fp_base = 264
SPECspeed®2017_fp_peak = 278

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.
Test Date: Mar-2023
Hardware Availability: Dec-2022
Software Availability: Nov-2022

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

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 -lsr-in-nested-loop
-mllvm -reduce-array-computations=3 -zopt -fopenmp=libomp -lomp
-lamdllibm -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 -lamdllibm -lamdalloc
-lflang

Benchmarks using Fortran, C, and C++:
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6

(Continued on next page)
SPEC CPU®2017 Floating Point Speed Result
Copyright 2017-2023 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.
ASUS RS520A-E12-RS12U
(2.75 GHz, AMD EPYC 9454P)

SPECspeed®2017_fp_base = 264
SPECspeed®2017_fp_peak = 278

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.
Test Date: Mar-2023
Hardware Availability: Dec-2022
Software Availability: Nov-2022

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
-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
-freemap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fopenmp -lomp -lamlidlibm -lamdalloc
-llflang

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
SPEC CPU®2017 Floating Point Speed Result

ASUSTeK Computer Inc.
ASUS RS520A-E12-RS12U (2.75 GHz, AMD EPYC 9454P)

SPECspeed®2017_fp_base = 264
SPECspeed®2017_fp_peak = 278

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

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

Peak Portability Flags
Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

619.lbm_s: basepeak = yes

638.imagick_s: -m64 -Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6
-Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang

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

Fortran benchmarks:

603.bwaves_s: -m64 -Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6
-Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -frecursive -mllvm -reduce-array-computations=3
-fveclibtransform -fscalar-transform -fopenmp=libomp
-Ofast

649.fotonik3d_s: basepeak = yes

654.roms_s: Same as 603.bwaves_s

Benchmarks using both Fortran and C:

621.wrf_s: -m64 -Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6
-Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -frecursive -mllvm -reduce-array-computations=3
-fveclibtransform -fscalar-transform -fopenmp=libomp
-Ofast

(Continued on next page)
SPEC CPU®2017 Floating Point Speed Result

ASUSTeK Computer Inc.
ASUS RS520A-E12-RS12U
(2.75 GHz, AMD EPYC 9454P)

SPECspeed®2017_fp_base = 264
SPECspeed®2017_fp_peak = 278

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

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

Peak Optimization Flags (Continued)

621.wrf_s (continued):
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flt0 -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-O3 -Mrecursive -funroll-loops -mllvm -lsr-in-nested-loop
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang

627.cam4_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flt0 -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-Mrecursive -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang

628.pop2_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flt0 -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -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.cactusBSSN_s: basepeak = yes

Peak Other Flags

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

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

(Continued on next page)
ASUSTeK Computer Inc.
ASUS RS520A-E12-RS12U
(2.75 GHz, AMD EPYC 9454P)

SPECspeed®2017_fp_base = 264
SPECspeed®2017_fp_peak = 278

CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

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

Peak Other Flags (Continued)

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

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-AMD-K14-V1.0.xml
http://www.spec.org/cpu2017/flags/aocc400-flags.xml

SPEC CPU and SPECspeed are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2017 v1.1.9 on 2023-03-08 08:01:55-0500.
Report generated on 2023-03-29 00:38:30 by CPU2017 PDF formatter v6442.
Originally published on 2023-03-28.