SPEC CPU®2017 Integer Speed Result

ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.50 GHz, AMD EPYC 9224)

SPECspeed®2017_int_base = 13.2

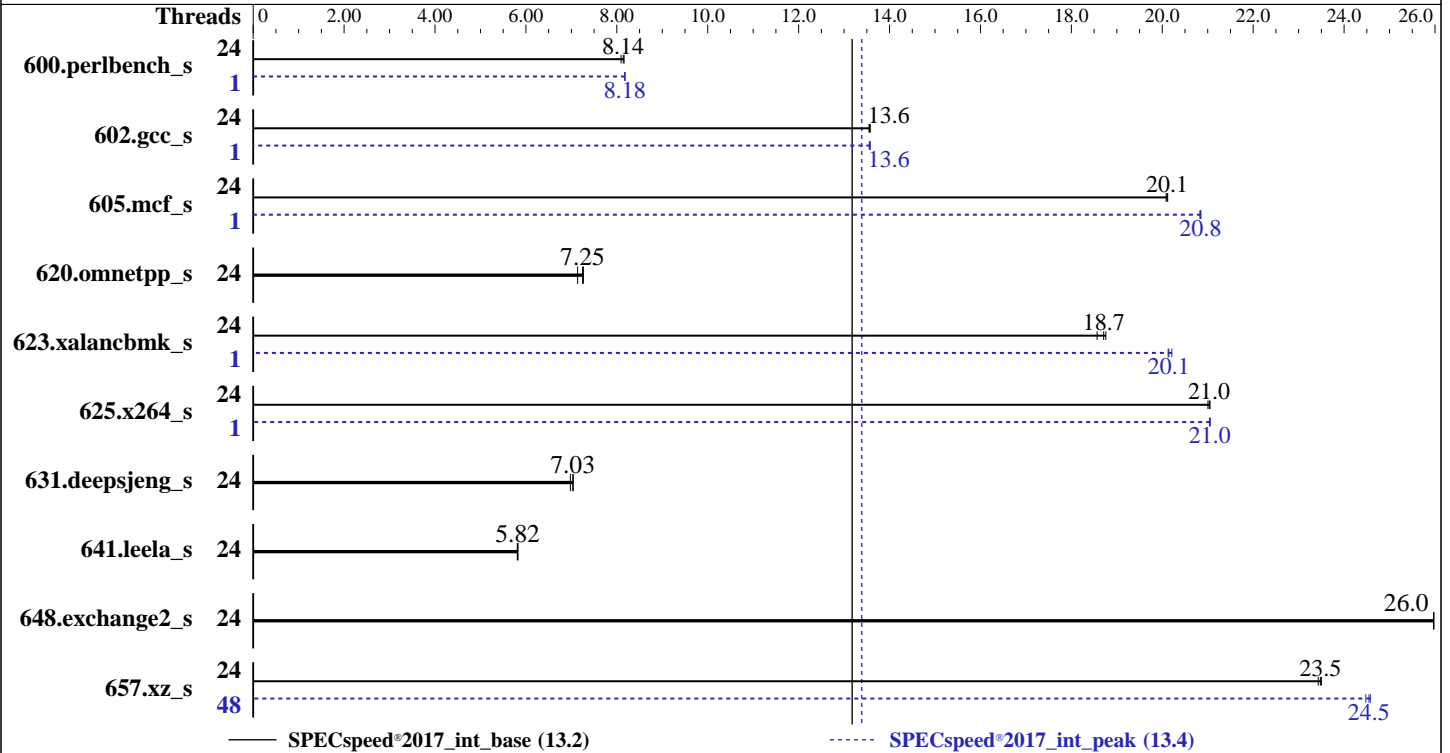SPECspeed®2017_int_peak = 13.4

CPU2017 License: 9016

Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Aug-2023

Hardware Availability: Nov-2022

Software Availability: Nov-2022

Threads	Result
600.perlbench_s 24	8.14
600.perlbench_s 1	8.18
602.gcc_s 24	13.6
602.gcc_s 1	13.6
605.mcf_s 24	20.1
605.mcf_s 1	20.8
620.omnetpp_s 24	7.25
623.xalancbmk_s 24	18.7
623.xalancbmk_s 1	20.1
625.x264_s 24	21.0
625.x264_s 1	21.0
631.deepsjeng_s 24	7.03
641.leela_s 24	5.82
648.exchange2_s 24	26.0
657.xz_s 24	23.5
657.xz_s 48	24.5

SPECspeed®2017_int_base (13.2)

SPECspeed®2017_int_peak (13.4)

Hardware

CPU Name: AMD EPYC 9224

 Max MHz: 3700

 Nominal: 2500

Enabled: 24 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: 64 MB I+D on chip per chip,

 16 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

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 0901 released May-2023

File System: xfs

System State: Run level 3 (multi-user)

Base Pointers: 64-bit

Peak Pointers: 64-bit

Other: None

Power Management: BIOS and OS set to prefer performance
 at the cost of additional power usage.

https://www.spec.org/

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.50 GHz, AMD EPYC 9224)

$SPECspeed®2017\_int\_base = 13.2$

$SPECspeed®2017\_int\_peak = 13.4$

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	24	219	8.09	218	8.16	**218**	**8.14**	1	**217**	**8.18**	217	8.17	217	8.18
602.gcc_s	24	293	13.6	**294**	**13.6**	294	13.6	1	**294**	**13.6**	293	13.6	294	13.6
605.mcf_s	24	235	20.1	235	20.1	**235**	**20.1**	1	227	20.8	226	20.8	**227**	**20.8**
620.omnetpp_s	24	229	7.14	225	7.26	**225**	**7.25**	24	229	7.14	225	7.26	**225**	**7.25**
623.xalancbmk_s	24	**75.7**	**18.7**	76.3	18.6	75.5	18.8	1	70.1	20.2	**70.3**	**20.1**	70.4	20.1
625.x264_s	24	84.0	21.0	**83.9**	**21.0**	83.8	21.1	1	83.9	21.0	**83.8**	**21.0**	83.8	21.1
631.deepsjeng_s	24	205	6.98	204	7.04	**204**	**7.03**	24	205	6.98	204	7.04	**204**	**7.03**
641.leela_s	24	294	5.81	**293**	**5.82**	293	5.82	24	294	5.81	**293**	**5.82**	293	5.82
648.exchange2_s	24	**113**	**26.0**	113	26.0	113	26.0	24	**113**	**26.0**	113	26.0	113	26.0
657.xz_s	24	264	23.4	**263**	**23.5**	263	23.5	48	252	24.6	253	24.5	**252**	**24.5**
SPECspeed®2017_int_base =	**13.2**													
SPECspeed®2017_int_peak =	**13.4**													

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.:
numactl --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.

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.
```

Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.50 GHz, AMD EPYC 9224)

SPECspeed®2017_int_base = 13.2

SPECspeed®2017_int_peak = 13.4

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

Test Date: Aug-2023
Hardware Availability: Nov-2022
Software Availability: Nov-2022

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-47"
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 = "48"

Environment variables set by runcpu during the 600.perlbench_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 602.gcc_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 605.mcf_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 623.xalancbmk_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 625.x264_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 657.xz_s peak run:
GOMP_CPU_AFFINITY = "0-47"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "8"
```

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 = NPS4
Determinism Control = Manual
Determinism Enable = Power
Engine Boost = Aggressive
TDP Control = Manual
TDP = 240
PPT Control = Manual
PPT = 240
IOMMU = Disabled
BMC Configuration:
Fan mode = Full speed mode
```

(Continued on next page)

ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.50 GHz, AMD EPYC 9224)

SPECspeed®2017_int_base = 13.2

SPECspeed®2017_int_peak = 13.4

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

Test Date: Aug-2023
Hardware Availability: Nov-2022
Software Availability: Nov-2022

Platform Notes (Continued)

```
Sysinfo program /cpu119/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Tue Aug  8 09:13:19 2023

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

------------------------------------------------------------
Table of contents
------------------------------------------------------------
 1. uname -a
 2. w
 3. Username
 4. ulimit -a
 5. sysinfo process ancestry
 6. /proc/cpuinfo
 7. lscpu
 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
   09:13:20 up 1 min,  1 user,  load average: 0.82, 0.40, 0.15
   USER     TTY       FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1      -                09:13   14.00s  1.10s  0.05s /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) 3094616
  max locked memory       (kbytes, -l) 2097152
  max memory size         (kbytes, -m) unlimited
  open files                      (-n) 1024
```

(Continued on next page)

ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.50 GHz, AMD EPYC 9224)

SPECspeed®2017_int_base = 13.2

SPECspeed®2017_int_peak = 13.4

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

Test Date: Aug-2023
Hardware Availability: Nov-2022
Software Availability: Nov-2022

Platform Notes (Continued)

```
    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) 3094616
    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
   /bin/bash ./amd_speed_aocc400_genoa_B1.sh
   runcpu --config amd_speed_aocc400_genoa_B1.cfg --tune all --reportable --iterations 3 intspeed
   runcpu --configfile amd_speed_aocc400_genoa_B1.cfg --tune all --reportable --iterations 3 --nopower
     --runmode speed --tune base:peak --size test:train:refspeed intspeed --nopreenv --note-preenv --logfile
     $SPEC/tmp/CPU2017.594/templogs/preenv.intspeed.594.0.log --lognum 594.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
  $SPEC = /cpu119


  -----------------------------------------------------------
  6. /proc/cpuinfo
      model name        : AMD EPYC 9224 24-Core Processor
      vendor_id         : AuthenticAMD
      cpu family        : 25
      model             : 17
      stepping          : 1
      microcode         : 0xa101116
      bugs              : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
      TLB size          : 3584 4K pages
      cpu cores         : 24
      siblings          : 48
      1 physical ids (chips)
      48 processors (hardware threads)
      physical id 0: core ids 0-5,8-13,16-21,24-29
      physical id 0: apicids 0-11,16-27,32-43,48-59
   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:
    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):                  48
    On-line CPU(s) list:     0-47
    Vendor ID:               AuthenticAMD
    Model name:              AMD EPYC 9224 24-Core Processor
    CPU family:              25
    Model:                   17
    Thread(s) per core:      2
    Core(s) per socket:      24
    Socket(s):               1
```

(Continued on next page)

ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.50 GHz, AMD EPYC 9224)

SPECspeed®2017_int_base = 13.2

SPECspeed®2017_int_peak = 13.4

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

Test Date: Aug-2023
Hardware Availability: Nov-2022
Software Availability: Nov-2022

Platform Notes (Continued)

```
  Stepping:                      1
  Frequency boost:               enabled
  CPU max MHz:                   3706.0540
  CPU min MHz:                   1500.0000
  BogoMIPS:                      4992.46
  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 rapl
                                 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 sse4a misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext
                                 perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3
                                 invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall 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_occup_llc cqm_mbm_total cqm_mbm_local
                                 avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd amd_ppin arat npt lbrv
                                 svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
                                 pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi
                                 umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
                                 avx512_vpopcntdq la57 rdpid overflow_recov succor smca fsrm flush_l1d
  Virtualization:                AMD-V
  L1d cache:                     768 KiB (24 instances)
  L1i cache:                     768 KiB (24 instances)
  L2 cache:                      24 MiB (24 instances)
  L3 cache:                      64 MiB (4 instances)
  NUMA node(s):                  4
  NUMA node0 CPU(s):             0-5,24-29
  NUMA node1 CPU(s):             6-11,30-35
  NUMA node2 CPU(s):             12-17,36-41
  NUMA node3 CPU(s):             18-23,42-47
  Vulnerability Itlb multihit:   Not affected
  Vulnerability L1tf:            Not affected
  Vulnerability Mds:             Not affected
  Vulnerability Meltdown:        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 always-on, RSB
                                 filling
  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     768K   8 Data            1    64       1              64
      L1i      32K     768K   8 Instruction     1    64       1              64
      L2        1M      24M   8 Unified         2  2048       1              64
      L3       16M      64M  16 Unified         3 16384       1              64

    -----------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 4 nodes (0-3)
    node 0 cpus: 0-5,24-29
    node 0 size: 193238 MB
    node 0 free: 192282 MB
    node 1 cpus: 6-11,30-35
    node 1 size: 193519 MB
    node 1 free: 193226 MB
    node 2 cpus: 12-17,36-41
```

(Continued on next page)

ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.50 GHz, AMD EPYC 9224)

SPECspeed®2017_int_base = 13.2

SPECspeed®2017_int_peak = 13.4

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

Test Date: Aug-2023
Hardware Availability: Nov-2022
Software Availability: Nov-2022

Platform Notes (Continued)

```
   node 2 size: 193519 MB
   node 2 free: 193259 MB
   node 3 cpus: 18-23,42-47
   node 3 size: 193400 MB
   node 3 free: 192896 MB
   node distances:
   node   0   1   2   3
     0:  10  12  12  12
     1:  12  10  12  12
     2:  12  12  10  12
     3:  12  12  12  10


   ------------------------------------------------------------
 9. /proc/meminfo
   MemTotal:       792247060 kB


   ------------------------------------------------------------
 10. who -r
   run-level 3 Aug 8 09:12


   ------------------------------------------------------------
 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 lvm2-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
                   chronyd console-getty cups cups-browsed debug-shell ebtables exchange-bmc-os-info
                   firewalld gpm grub2-once haveged-switch-root ipmi ipmievd issue-add-ssh-keys kexec-load
                   lunmask man-db-create multipathd nfs nfs-blkmap nvmf-autoconnect rdisc rpcbind
                   rpmconfigcheck rsyncd serial-getty@ smartd_generate_opts snmpd snmptrapd svnserve
                   systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                   systemd-time-wait-sync systemd-timesyncd tuned udisks2
   indirect        wickedd

   ------------------------------------------------------------
 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


   ------------------------------------------------------------
 14. cpupower frequency-info
   analyzing CPU 0:
     current policy: frequency should be within 1.50 GHz and 2.50 GHz.
                     The governor "performance" may decide which speed to use
                     within this range.
     boost state support:
       Supported: yes
       Active: yes
```

(Continued on next page)

ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.50 GHz, AMD EPYC 9224)

SPECspeed®2017_int_base = 13.2

SPECspeed®2017_int_peak = 13.4

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

Test Date: Aug-2023
Hardware Availability: Nov-2022
Software Availability: Nov-2022

Platform Notes (Continued)

```
--------------------------------------------------------------
15. tuned-adm active
   It seems that tuned daemon is not running, preset profile is not activated.
   Preset profile: throughput-performance


--------------------------------------------------------------
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
   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  230G  271G  46% /


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

(Continued on next page)

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.50 GHz, AMD EPYC 9224)

SPECspeed®2017_int_base = 13.2

SPECspeed®2017_int_peak = 13.4

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

Test Date: Aug-2023
Hardware Availability: Nov-2022
Software Availability: Nov-2022

Platform Notes (Continued)

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



     ---------------------------------------------------------------
 23. BIOS
 (This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:        American Megatrends Inc.
   BIOS Version:       0901
   BIOS Date:          05/04/2023
   BIOS Revision:      9.1
```

Compiler Version Notes

```
==============================================================================
C        | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak)
         | 657.xz_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++      | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak)
         | 641.leela_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 | 648.exchange2_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
```

(Continued on next page)

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.50 GHz, AMD EPYC 9224)

SPECspeed®2017_int_base = 13.2

SPECspeed®2017_int_peak = 13.4

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

Base Compiler Invocation (Continued)

C++ benchmarks:
`clang++`

Fortran benchmarks:
`flang`

Base Portability Flags

600.perlbench_s: `-DSPEC_LINUX_X64 -DSPEC_LP64`
602.gcc_s: `-DSPEC_LP64`
605.mcf_s: `-DSPEC_LP64`
620.omnetpp_s: `-DSPEC_LP64`
623.xalancbmk_s: `-DSPEC_LINUX -DSPEC_LP64`
625.x264_s: `-DSPEC_LP64`
631.deepsjeng_s: `-DSPEC_LP64`
641.leela_s: `-DSPEC_LP64`
648.exchange2_s: `-DSPEC_LP64`
657.xz_s: `-DSPEC_LP64`

Base Optimization Flags

C benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition -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 -lflang
-lamdalloc
```

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
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fvirtual-function-elimination -fvisibility=hidden -fopenmp=libomp
-lomp -lamdlibm -lflang -lamdalloc-ext
```

(Continued on next page)

SPEC CPU®2017 Integer Speed Result

ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.50 GHz, AMD EPYC 9224)

SPECspeed®2017_int_base = 13.2

SPECspeed®2017_int_peak = 13.4

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

Base Optimization Flags (Continued)

Fortran benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -O3 -march=znver4 -fveclib=AMDLIBM
-ffast-math -fopenmp -flto -mllvm -optimize-strided-mem-cost
-mllvm -unroll-aggressive -mllvm -unroll-threshold=150 -fopenmp=libomp
-lomp -lamdlibm -lflang -lamdalloc
```

Base Other Flags

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

C++ benchmarks:
```
-Wno-unused-command-line-argument
```

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

Peak Compiler Invocation

C benchmarks:
```
clang
```

C++ benchmarks:
```
clang++
```

Fortran benchmarks:
```
flang
```

Peak Portability Flags

```
Same as Base Portability Flags
```

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

ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.50 GHz, AMD EPYC 9224)

SPECspeed®2017_int_base = 13.2

SPECspeed®2017_int_peak = 13.4

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

Test Date: Aug-2023
Hardware Availability: Nov-2022
Software Availability: Nov-2022

Peak Optimization Flags

C benchmarks:

```
600.perlbench_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition -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
```

```
602.gcc_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition -z muldefs -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
```

```
605.mcf_s: Same as 600.perlbench_s
```

```
625.x264_s: Same as 600.perlbench_s
```

```
657.xz_s: Same as 600.perlbench_s
```

C++ benchmarks:

```
620.omnetpp_s: basepeak = yes
```

```
623.xalancbmk_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=aggressive -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -finline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden
-fopenmp=libomp -lomp -lamdlibm -lamdalloc-ext -lflang
```

```
631.deepsjeng_s: basepeak = yes
```

```
641.leela_s: basepeak = yes
```

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS RS520A-E12-RS12U
(2.50 GHz, AMD EPYC 9224)

SPECspeed®2017_int_base = 13.2

SPECspeed®2017_int_peak = 13.4

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

Peak Optimization Flags (Continued)

Fortran benchmarks:

648.exchange2_s: `basepeak = yes`

Peak Other Flags

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

C++ benchmarks:
`-Wno-unused-command-line-argument`

Fortran benchmarks:
`-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/ASUSTekPlatform-Settings-AMD-K14-V1.4.html
http://www.spec.org/cpu2017/flags/aocc400-flags-asusv01.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-AMD-K14-V1.4.xml
http://www.spec.org/cpu2017/flags/aocc400-flags-asusv01.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 2023-08-07 21:13:19-0400.
Report generated on 2023-08-30 09:43:32 by CPU2017 PDF formatter v6716.
Originally published on 2023-08-29.