SPEC CPU®2017 Integer Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

ASUSTeK Computer Inc.

ASUS RS720A-E12-RS12
(2.25 GHz, AMD EPYC 9754)

$SPECrate^{®}2017\_int\_base = 1950$

$SPECrate^{®}2017\_int\_peak = 2140$
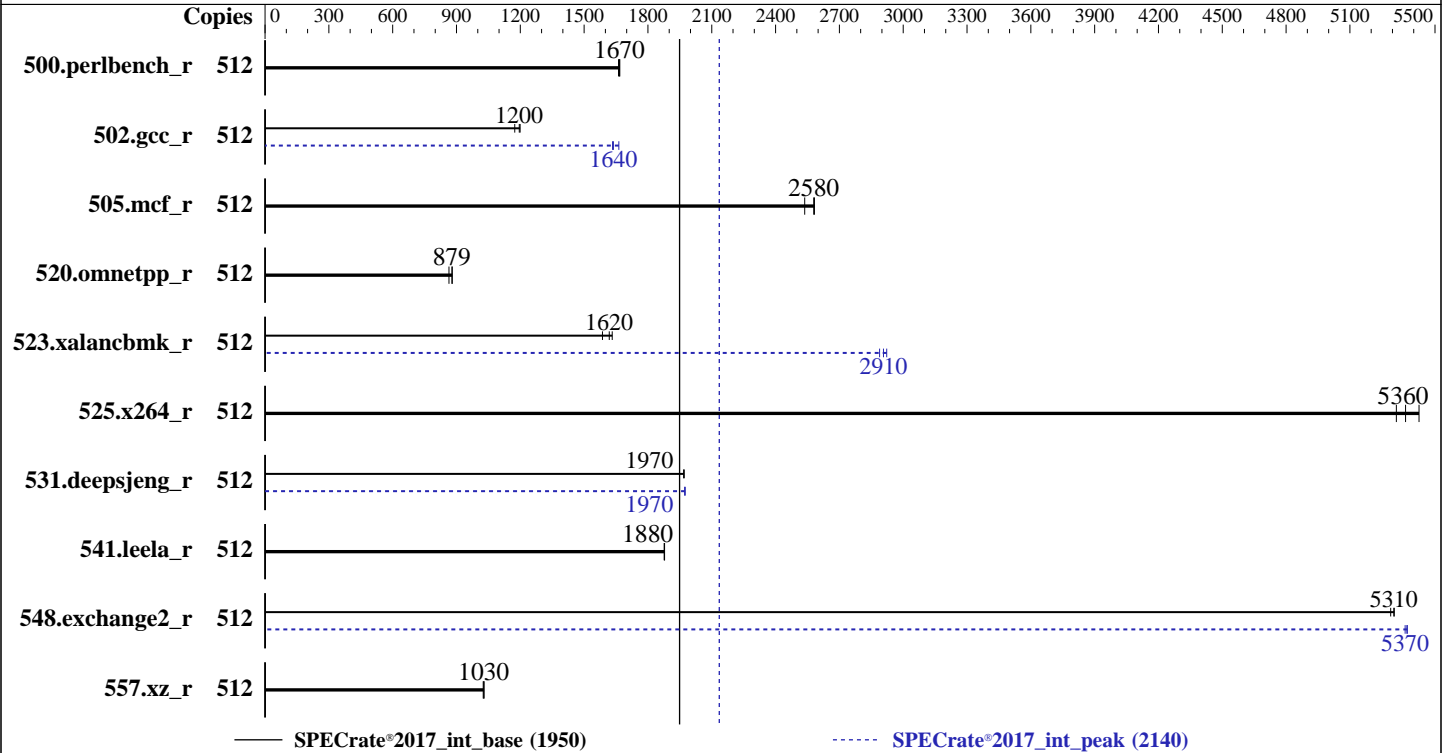
CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Test Date: May-2023
Hardware Availability: Jun-2023
Software Availability: Nov-2022

Copies		
500.perlbench_r	512	1670
502.gcc_r	512	1200 / 1640
505.mcf_r	512	2580
520.omnetpp_r	512	879
523.xalancbmk_r	512	1620 / 2910
525.x264_r	512	5360
531.deepsjeng_r	512	1970 / 1970
541.leela_r	512	1880
548.exchange2_r	512	5310 / 5370
557.xz_r	512	1030

SPECrate®2017_int_base (1950) —— SPECrate®2017_int_peak (2140) ------

Hardware

CPU Name: AMD EPYC 9754
 Max MHz: 3100
 Nominal: 2250
Enabled: 256 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
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,
 16 MB shared / 8 cores
 Other: None
Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 4.0 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: No
Firmware: Version 0902 released Apr-2023
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: None
Power Management: BIOS and OS set to prefer performance
 at the cost of additional power usage.

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	512	489	1670	491	1660	**489**	**1670**	512	489	1670	491	1660	**489**	**1670**
502.gcc_r	512	**607**	**1200**	618	1170	605	1200	512	444	1630	**443**	**1640**	436	1660
505.mcf_r	512	326	2540	**321**	**2580**	320	2580	512	326	2540	**321**	**2580**	320	2580
520.omnetpp_r	512	777	865	763	880	**765**	**879**	512	777	865	763	880	**765**	**879**
523.xalancbmk_r	512	341	1590	**334**	**1620**	331	1630	512	185	2920	187	2890	**186**	**2910**
525.x264_r	512	**167**	**5360**	165	5420	169	5320	512	**167**	**5360**	165	5420	169	5320
531.deepsjeng_r	512	298	1970	298	1970	**298**	**1970**	512	297	1970	**297**	**1970**	297	1970
541.leela_r	512	451	1880	**452**	**1880**	452	1880	512	451	1880	**452**	**1880**	452	1880
548.exchange2_r	512	**253**	**5310**	253	5310	254	5290	512	**250**	**5370**	250	5370	250	5360
557.xz_r	512	537	1030	539	1030	**538**	**1030**	512	537	1030	539	1030	**538**	**1030**
SPECrate®2017_int_base =	**1950**													
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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) only on request for base runs,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To enable THP for all allocations for peak runs,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
```

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Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/aoccczn4/amd_rate_aocc400_znver4_A_lib/lib:/aoccczn4/amd_rate_aocc400_znver4_A_lib/lib32:"
MALLOC_CONF = "retain:true"

Environment variables set by runcpu during the 523.xalancbmk_r peak run:
MALLOC_CONF = "thp:never"
```

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 = 400
PPT Control = Manual
PPT = 400
BMC Configuration:
Fan mode = Full speed mode

 Sysinfo program /aoccczn4/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Sat May 20 00:35:09 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. Failed units, from systemctl list-units --state=failed
 13. Services, from systemctl list-unit-files
```

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Platform Notes (Continued)

```
 14. Linux kernel boot-time arguments, from /proc/cmdline
 15. cpupower frequency-info
 16. tuned-adm active
 17. sysctl
 18. /sys/kernel/mm/transparent_hugepage
 19. /sys/kernel/mm/transparent_hugepage/khugepaged
 20. OS release
 21. Disk information
 22. /sys/devices/virtual/dmi/id
 23. dmidecode
 24. 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
     00:35:09 up  7:10,  1 user,  load average: 107.89, 372.96, 457.14
    USER      TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
    root      tty1     -                17:28    7:06m  1.61s  0.26s /bin/bash ./amd_rate_aocc400_znver4_A1.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) 6190563
    max locked memory       (kbytes, -l) 2097152
    max memory size         (kbytes, -m) unlimited
    open files                      (-n) 1024
    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) 6190563
    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 ./rate.sh
    python3 ./run_amd_rate_aocc400_znver4_A1.py
    /bin/bash ./amd_rate_aocc400_znver4_A1.sh
    runcpu --config amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 intrate
    runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 --nopower
      --runmode rate --tune base:peak --size test:train:refrate intrate --nopreenv --note-preenv --logfile
      $SPEC/tmp/CPU2017.108/templogs/preenv.intrate.108.0.log --lognum 108.0 --from_runcpu 2
    specperl $SPEC/bin/sysinfo
```

(Continued on next page)

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Platform Notes (Continued)

```
   $SPEC = /aocczn4


   ----------------------------------------------------------
   6. /proc/cpuinfo
       model name      : AMD EPYC 9754 128-Core Processor
       vendor_id       : AuthenticAMD
       cpu family      : 25
       model           : 160
       stepping        : 2
       microcode       : 0xaa00205
       bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
       TLB size        : 3584 4K pages
       cpu cores       : 128
       siblings        : 256
       2 physical ids (chips)
       512 processors (hardware threads)
       physical id 0: core ids 0-127
       physical id 1: core ids 0-127
       physical id 0: apicids 0-255
       physical id 1: apicids 256-511
     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):                   512
     On-line CPU(s) list:      0-511
     Vendor ID:                AuthenticAMD
     Model name:               AMD EPYC 9754 128-Core Processor
     CPU family:               25
     Model:                    160
     Thread(s) per core:       2
     Core(s) per socket:       128
     Socket(s):                2
     Stepping:                 2
     Frequency boost:          enabled
     CPU max MHz:              3100.3411
     CPU min MHz:              1500.0000
     BogoMIPS:                 4544.68
     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
```

(Continued on next page)

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Platform Notes (Continued)

```
                                   avx512_vpopcntdq la57 rdpid overflow_recov succor smca fsrm flush_l1d
     Virtualization:               AMD-V
     L1d cache:                    8 MiB (256 instances)
     L1i cache:                    8 MiB (256 instances)
     L2 cache:                     256 MiB (256 instances)
     L3 cache:                     512 MiB (32 instances)
     NUMA node(s):                 8
     NUMA node0 CPU(s):            0-31,256-287
     NUMA node1 CPU(s):            32-63,288-319
     NUMA node2 CPU(s):            64-95,320-351
     NUMA node3 CPU(s):            96-127,352-383
     NUMA node4 CPU(s):            128-159,384-415
     NUMA node5 CPU(s):            160-191,416-447
     NUMA node6 CPU(s):            192-223,448-479
     NUMA node7 CPU(s):            224-255,480-511
     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       8M    8 Data            1    64        1             64
      L1i       32K       8M    8 Instruction     1    64        1             64
      L2         1M     256M    8 Unified         2  2048        1             64
      L3        16M     512M   16 Unified         3 16384        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: 0-31,256-287
    node 0 size: 193267 MB
    node 0 free: 191045 MB
    node 1 cpus: 32-63,288-319
    node 1 size: 193519 MB
    node 1 free: 191720 MB
    node 2 cpus: 64-95,320-351
    node 2 size: 193519 MB
    node 2 free: 191748 MB
    node 3 cpus: 96-127,352-383
    node 3 size: 193519 MB
    node 3 free: 191725 MB
    node 4 cpus: 128-159,384-415
    node 4 size: 193519 MB
    node 4 free: 191762 MB
    node 5 cpus: 160-191,416-447
    node 5 size: 193519 MB
    node 5 free: 191794 MB
    node 6 cpus: 192-223,448-479
    node 6 size: 193519 MB
    node 6 free: 191247 MB
    node 7 cpus: 224-255,480-511
    node 7 size: 193277 MB
```

(Continued on next page)

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Platform Notes (Continued)

```
  node 7 free: 191515 MB
  node distances:
  node   0   1   2   3   4   5   6   7
    0:  10  12  12  12  32  32  32  32
    1:  12  10  12  12  32  32  32  32
    2:  12  12  10  12  32  32  32  32
    3:  12  12  12  10  32  32  32  32
    4:  32  32  32  32  10  12  12  12
    5:  32  32  32  32  12  10  12  12
    6:  32  32  32  32  12  12  10  12
    7:  32  32  32  32  12  12  12  10


  ------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       1584808884 kB


  ------------------------------------------------------------
10. who -r
   run-level 3 May 19 17:27


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


  ------------------------------------------------------------
12. Failed units, from systemctl list-units --state=failed
     UNIT                         LOAD   ACTIVE SUB    DESCRIPTION
   * systemd-udev-settle.service loaded failed failed Wait for udev To Complete Device Initialization


  ------------------------------------------------------------
13. 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


  ------------------------------------------------------------
14. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
   root=UUID=bd4eeb48-8f2c-47c9-ae06-b7241b1d0eb7
   splash=silent
   mitigations=auto
   quiet
   security=apparmor


  ------------------------------------------------------------
15. cpupower frequency-info
   analyzing CPU 0:
     current policy: frequency should be within 1.50 GHz and 2.25 GHz.
```

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Platform Notes (Continued)

```
                        The governor "performance" may decide which speed to use
                        within this range.
     boost state support:
       Supported: yes
       Active: yes


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


    ----------------------------------------------------------
    17. 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


    ----------------------------------------------------------
    18. /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


    ----------------------------------------------------------
    19. /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


    ----------------------------------------------------------
    20. OS release
      From /etc/*-release /etc/*-version
      os-release SUSE Linux Enterprise Server 15 SP4


    ----------------------------------------------------------
    21. Disk information
    SPEC is set to: /aocczn4
      Filesystem      Type  Size  Used Avail Use% Mounted on
      /dev/nvme0n1p4 xfs   2.0T   64G  2.0T   4% /
```

(Continued on next page)

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Platform Notes (Continued)

```
    ---------------------------------------------------------------
 22. /sys/devices/virtual/dmi/id
     Vendor:         ASUSTeK COMPUTER INC.
     Product:        RS720A-E12-RS12
     Product Family: Server
     Serial:         123456789012


    ---------------------------------------------------------------
 23. 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:
     24x Samsung M321R8GA0BB0-CQKDG 64 GB 2 rank 4800


    ---------------------------------------------------------------
 24. BIOS
 (This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:        American Megatrends Inc.
   BIOS Version:       0902
   BIOS Date:          04/12/2023
   BIOS Revision:      9.2
```

Compiler Version Notes

```
==================================================================================================
C        | 502.gcc_r(peak)
--------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------------------------


==================================================================================================
C        | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
         | 557.xz_r(base, peak)
--------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------------------------


==================================================================================================
C        | 502.gcc_r(peak)
--------------------------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------------------------


==================================================================================================
C        | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
         | 557.xz_r(base, peak)
```

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ASUSTeK Computer Inc.

ASUS RS720A-E12-RS12
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_int_base = 1950

SPECrate®2017_int_peak = 2140

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

Test Date: May-2023
Hardware Availability: Jun-2023
Software Availability: Nov-2022

Compiler Version Notes (Continued)

```
--------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------


================================================================================
C++     | 523.xalancbmk_r(peak)
--------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------


================================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base,
        | peak)
--------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------


================================================================================
C++     | 523.xalancbmk_r(peak)
--------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------


================================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base,
        | peak)
--------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------


================================================================================
Fortran | 548.exchange2_r(base, peak)
--------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
--------------------------------------------------------------------------------
```

SPEC CPU®2017 Integer Rate Result
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ASUSTeK Computer Inc.

ASUS RS720A-E12-RS12
(2.25 GHz, AMD EPYC 9754)

SPECrate®2017_int_base = 1950

SPECrate®2017_int_peak = 2140

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

Test Date: May-2023
Hardware Availability: Jun-2023
Software Availability: Nov-2022

Base Compiler Invocation

C benchmarks:
`clang`

C++ benchmarks:
`clang++`

Fortran benchmarks:
`flang`

Base Portability Flags

500.perlbench_r: `-DSPEC_LINUX_X64 -DSPEC_LP64`
502.gcc_r: `-DSPEC_LP64`
505.mcf_r: `-DSPEC_LP64`
520.omnetpp_r: `-DSPEC_LP64`
523.xalancbmk_r: `-DSPEC_LINUX -DSPEC_LP64`
525.x264_r: `-DSPEC_LP64`
531.deepsjeng_r: `-DSPEC_LP64`
541.leela_r: `-DSPEC_LP64`
548.exchange2_r: `-DSPEC_LP64`
557.xz_r: `-DSPEC_LP64`

Base Optimization Flags

C benchmarks:
`-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather`
`-z muldefs -O3 -march=znver4 -fveclib=AMDLIBM -ffast-math`
`-fstruct-layout=7 -mllvm -unroll-threshold=50`
`-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining`
`-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang`
`-lamdalloc`

C++ benchmarks:
`-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3 -z muldefs -O3`
`-march=znver4 -fveclib=AMDLIBM -ffast-math`
`-mllvm -unroll-threshold=100 -finline-aggressive`
`-mllvm -loop-unswitch-threshold=200000`
`-mllvm -reduce-array-computations=3 -zopt`
`-fvirtual-function-elimination -fvisibility=hidden -lamdlibm -lflang`

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

ASUSTeK Computer Inc.

ASUS RS720A-E12-RS12
(2.25 GHz, AMD EPYC 9754)

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Test Date: May-2023
Hardware Availability: Jun-2023
Software Availability: Nov-2022

Base Optimization Flags (Continued)

C++ benchmarks (continued):
```
-lamdalloc-ext
```

Fortran benchmarks:
```
-m64 -flto -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 -z muldefs -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fepilog-vectorization-of-inductions
-mllvm -optimize-strided-mem-cost -floop-transform
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm
-lflang -lamdalloc
```

Base Other Flags

C benchmarks:
```
-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

500.perlbench_r: `-DSPEC_LINUX_X64 -DSPEC_LP64`
502.gcc_r: `-D_FILE_OFFSET_BITS=64`

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ASUSTeK Computer Inc.

ASUS RS720A-E12-RS12
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SPECrate®2017_int_base = 1950

SPECrate®2017_int_peak = 2140

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

Peak Portability Flags (Continued)

505.mcf_r: `-DSPEC_LP64`
520.omnetpp_r: `-DSPEC_LP64`
523.xalancbmk_r: `-DSPEC_LINUX -DSPEC_LP64`
525.x264_r: `-DSPEC_LP64`
531.deepsjeng_r: `-DSPEC_LP64`
541.leela_r: `-DSPEC_LP64`
548.exchange2_r: `-DSPEC_LP64`
557.xz_r: `-DSPEC_LP64`

Peak Optimization Flags

C benchmarks:

500.perlbench_r: `basepeak = yes`

502.gcc_r: `-m32 -flto -z muldefs -Ofast -march=znver4`
`-fveclib=AMDLIBM -ffast-math -fstruct-layout=7`
`-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining`
`-mllvm -inline-threshold=1000`
`-mllvm -reduce-array-computations=3 -zopt -fgnu89-inline`
`-lamdalloc`

505.mcf_r: `basepeak = yes`

525.x264_r: `basepeak = yes`

557.xz_r: `basepeak = yes`

C++ benchmarks:

520.omnetpp_r: `basepeak = yes`

523.xalancbmk_r: `-m32 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-do-block-reorder=aggressive`
`-fno-loop-reroll -Ofast -march=znver4 -fveclib=AMDLIBM`
`-ffast-math -finline-aggressive`
`-mllvm -unroll-threshold=100`
`-mllvm -reduce-array-computations=3 -zopt`
`-mllvm -do-block-reorder=aggressive`
`-fvirtual-function-elimination -fvisibility=hidden`
`-lamdalloc-ext`

ASUSTeK Computer Inc.

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Peak Optimization Flags (Continued)

531.deepsjeng_r: `-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3`
`-march=znver4 -fveclib=AMDLIBM -ffast-math`
`-mllvm -unroll-threshold=100 -finline-aggressive`
`-mllvm -loop-unswitch-threshold=200000`
`-mllvm -reduce-array-computations=3 -zopt`
`-fvirtual-function-elimination -fvisibility=hidden`
`-lamdlibm -lamdalloc-ext`

541.leela_r: `basepeak = yes`

Fortran benchmarks:
`-m64 -flto -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 -fepilog-vectorization-of-inductions`
`-mllvm -optimize-strided-mem-cost -floop-transform`
`-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm`
`-lflang -lamdalloc`

Peak Other Flags

C benchmarks (except as noted below):
`-Wno-unused-command-line-argument`

502.gcc_r: `-L/usr/lib32 -Wno-unused-command-line-argument`
`-L/home/work/cpu2017/v119/aocc4/znver4/rate/amd_rate_aocc400_znver4_A_lib/lib32`

C++ benchmarks (except as noted below):
`-Wno-unused-command-line-argument`

523.xalancbmk_r: `-L/usr/lib32 -Wno-unused-command-line-argument`
`-L/home/work/cpu2017/v119/aocc4/znver4/rate/amd_rate_aocc400_znver4_A_lib/lib32`

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-V1.3.html
http://www.spec.org/cpu2017/flags/aocc400-flags.html

SPEC CPU®2017 Integer Rate Result

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(2.25 GHz, AMD EPYC 9754)

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CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
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Test Date: May-2023
Hardware Availability: Jun-2023
Software Availability: Nov-2022

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/ASUSTekPlatform-Settings-AMD-K14-V1.3.xml
http://www.spec.org/cpu2017/flags/aocc400-flags.xml

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

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