



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## ASUSTeK Computer Inc.

ASUS RS720A-E12-RS12  
(2.20 GHz, AMD EPYC 9734)

SPECspeed®2017\_int\_base = 11.1

SPECspeed®2017\_int\_peak = 11.3

CPU2017 License: 9016

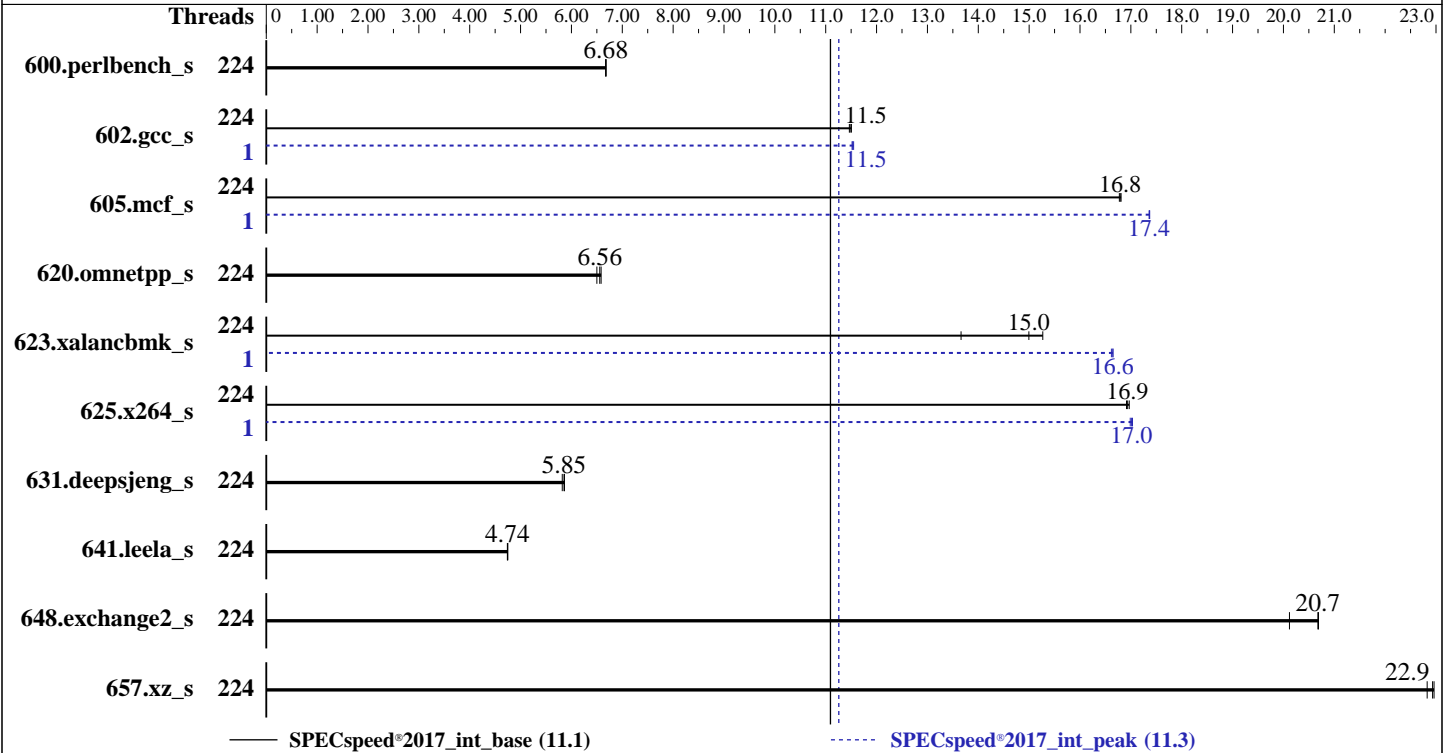
Test Sponsor: ASUSTeK Computer Inc.

Tested by: ASUSTeK Computer Inc.

Test Date: Nov-2023

Hardware Availability: Jun-2023

Software Availability: Nov-2022



### Hardware

CPU Name: AMD EPYC 9734  
 Max MHz: 3000  
 Nominal: 2200  
 Enabled: 224 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 / 7 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: Yes  
 Firmware: Version 1002 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.



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## Results Table

| Benchmark       | Base    |            |             |             |             |            | Peak        |         |            |             |            |             |             |             |
|-----------------|---------|------------|-------------|-------------|-------------|------------|-------------|---------|------------|-------------|------------|-------------|-------------|-------------|
|                 | Threads | Seconds    | Ratio       | Seconds     | Ratio       | Seconds    | Ratio       | Threads | Seconds    | Ratio       | Seconds    | Ratio       | Seconds     | Ratio       |
| 600.perlbench_s | 224     | 266        | 6.68        | 266         | 6.67        | <b>266</b> | <b>6.68</b> | 224     | 266        | 6.68        | 266        | 6.67        | <b>266</b>  | <b>6.68</b> |
| 602.gcc_s       | 224     | 346        | 11.5        | <b>347</b>  | <b>11.5</b> | 347        | 11.5        | 1       | <b>345</b> | <b>11.5</b> | 345        | 11.5        | 346         | 11.5        |
| 605.mcf_s       | 224     | 281        | 16.8        | <b>281</b>  | <b>16.8</b> | 281        | 16.8        | 1       | 272        | 17.4        | 272        | 17.4        | <b>272</b>  | <b>17.4</b> |
| 620.omnetpp_s   | 224     | <b>249</b> | <b>6.56</b> | 248         | 6.58        | 251        | 6.50        | 224     | <b>249</b> | <b>6.56</b> | 248        | 6.58        | 251         | 6.50        |
| 623.xalancbmk_s | 224     | 92.8       | 15.3        | <b>94.5</b> | <b>15.0</b> | 104        | 13.7        | 1       | 85.3       | 16.6        | 85.1       | 16.6        | <b>85.1</b> | <b>16.6</b> |
| 625.x264_s      | 224     | 104        | 16.9        | <b>104</b>  | <b>16.9</b> | 104        | 17.0        | 1       | 104        | 17.0        | <b>104</b> | <b>17.0</b> | 104         | 17.0        |
| 631.deepsjeng_s | 224     | <b>245</b> | <b>5.85</b> | 244         | 5.86        | 246        | 5.82        | 224     | <b>245</b> | <b>5.85</b> | 244        | 5.86        | 246         | 5.82        |
| 641.leela_s     | 224     | <b>360</b> | <b>4.74</b> | 359         | 4.75        | 360        | 4.74        | 224     | <b>360</b> | <b>4.74</b> | 359        | 4.75        | 360         | 4.74        |
| 648.exchange2_s | 224     | <b>142</b> | <b>20.7</b> | 142         | 20.7        | 146        | 20.1        | 224     | <b>142</b> | <b>20.7</b> | 142        | 20.7        | 146         | 20.1        |
| 657.xz_s        | 224     | 269        | 23.0        | <b>270</b>  | <b>22.9</b> | 271        | 22.8        | 224     | 269        | 23.0        | <b>270</b> | <b>22.9</b> | 271         | 22.8        |

SPECspeed®2017\_int\_base = **11.1**

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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) for all allocations,
'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:

```
GOMP_CPU_AFFINITY = "0-447"
LD_LIBRARY_PATH = "/aocczn4/amd_speed_aocc400_znver4_A_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 = "448"
```

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"
```

## 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 /aocczn4/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Thu Nov 16 02:56:45 2023
```

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

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## Platform Notes (Continued)

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- 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
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- 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
02:56:45 up 1 day, 18:00, 2 users, load average: 3.04, 6.49, 4.19
USER  TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
root  tty1    -                Tue09   12:36m 1.43s  0.14s /bin/bash ./amd_speed_aocc400_znver4_A1.sh
root  tty2    -                Tue13   12:37m 0.08s  0.08s -bash
```

```
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) 6190564
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) 6190564
virtual memory          (kbytes, -v) unlimited
```

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### Platform Notes (Continued)

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_znver4_A1.py
/bin/bash ./amd_speed_aocc400_znver4_A1.sh
runcpu --config amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 intspeak
runcpu --configfile amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 --nopower
--runmode speed --tune base:peak --size test:train:refspeak intspeak --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.296/templogs/preenv.intspeak.296.0.log --lognum 296.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /aocczn4

```

```

6. /proc/cpuinfo
model name      : AMD EPYC 9734 112-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 25
model          : 160
stepping       : 2
microcode      : 0xaa0020e
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size      : 3584 4K pages
cpu cores     : 112
siblings      : 224
2 physical ids (chips)
448 processors (hardware threads)
physical id 0: core ids
0-6,8-14,16-22,24-30,32-38,40-46,48-54,56-62,64-70,72-78,80-86,88-94,96-102,104-110,112-118,120-126
physical id 1: core ids
0-6,8-14,16-22,24-30,32-38,40-46,48-54,56-62,64-70,72-78,80-86,88-94,96-102,104-110,112-118,120-126
physical id 0: apicids
0-13,16-29,32-45,48-61,64-77,80-93,96-109,112-125,128-141,144-157,160-173,176-189,192-205,208-221,224-237,240-253
physical id 1: apicids
256-269,272-285,288-301,304-317,320-333,336-349,352-365,368-381,384-397,400-413,416-429,432-445,448-461,464-477,480-493,496-509
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):           448
On-line CPU(s) list: 0-447
Vendor ID:        AuthenticAMD
Model name:       AMD EPYC 9734 112-Core Processor
CPU family:       25
Model:            160
Thread(s) per core: 2
Core(s) per socket: 112

```

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### Platform Notes (Continued)

```

Socket(s):                2
Stepping:                 2
Frequency boost:          enabled
CPU max MHz:              2999.2180
CPU min MHz:              1500.0000
BogoMIPS:                 4399.99
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 pdpelgb 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_lld
Virtualization:           AMD-V
L1d cache:                7 MiB (224 instances)
L1i cache:                7 MiB (224 instances)
L2 cache:                 224 MiB (224 instances)
L3 cache:                 512 MiB (32 instances)
NUMA node(s):             8
NUMA node0 CPU(s):        0-27,224-251
NUMA node1 CPU(s):        28-55,252-279
NUMA node2 CPU(s):        56-83,280-307
NUMA node3 CPU(s):        84-111,308-335
NUMA node4 CPU(s):        112-139,336-363
NUMA node5 CPU(s):        140-167,364-391
NUMA node6 CPU(s):        168-195,392-419
NUMA node7 CPU(s):        196-223,420-447
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/swaps 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      | 7M       | 8    | Data        | 1     | 64    | 1        | 64             |
| L1i  | 32K      | 7M       | 8    | Instruction | 1     | 64    | 1        | 64             |
| L2   | 1M       | 224M     | 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: 0-27,224-251
node 0 size: 193268 MB

```

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### Platform Notes (Continued)

```

node 0 free: 192017 MB
node 1 cpus: 28-55,252-279
node 1 size: 193519 MB
node 1 free: 193093 MB
node 2 cpus: 56-83,280-307
node 2 size: 193519 MB
node 2 free: 193112 MB
node 3 cpus: 84-111,308-335
node 3 size: 193519 MB
node 3 free: 192660 MB
node 4 cpus: 112-139,336-363
node 4 size: 193519 MB
node 4 free: 193199 MB
node 5 cpus: 140-167,364-391
node 5 size: 193485 MB
node 5 free: 192839 MB
node 6 cpus: 168-195,392-419
node 6 size: 193519 MB
node 6 free: 193157 MB
node 7 cpus: 196-223,420-447
node 7 size: 193311 MB
node 7 free: 192932 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:      1584809180 kB

```

```

-----
10. who -r
run-level 3 Nov 14 08:58

```

```

-----
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 nvme-fc-boot-connections
postfix purge-kernels rollback rsyslog smartd sshd wicked wickedd-auto4 wickedd-dhcp4
wickedd-dhcp6 wickedd-nanny
enabled-runtime systemd-remount-fs
disabled autofsd autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
chronyd console-getty cups cups-browsed debug-shell ebttables exchange-bmc-os-info
firewalld gpm grub2-once haveged-switch-root hwloc-dump-hwdata ipmi ipmievd
issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap
nvme-autoconnect rdisc rpcbind rpmconfigcheck rsyncd serial-getty@ smartd_generate_opts
snmpd snmptrapd svnserv systemd-boot-check-no-failures systemd-network-generator

```

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### Platform Notes (Continued)

```
indirect          systemd-sysext systemd-time-wait-sync systemd-timesyncd tuned udisks2
wickedd
```

```
-----
13. 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
-----
```

```
-----
14. cpupower frequency-info
analyzing CPU 0:
  current policy: frequency should be within 1.50 GHz and 2.20 GHz.
                  The governor "performance" may decide which speed to use
                  within this range.

  boost state support:
    Supported: yes
    Active: yes
-----
```

```
-----
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
-----
```

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# SPEC CPU®2017 Integer Speed Result

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## ASUSTeK Computer Inc.

ASUS RS720A-E12-RS12  
(2.20 GHz, AMD EPYC 9734)

SPECspeed®2017\_int\_base = 11.1

SPECspeed®2017\_int\_peak = 11.3

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

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

### Platform Notes (Continued)

|                      |       |
|----------------------|-------|
| 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: /aocczn4  

| Filesystem     | Type | Size | Used | Avail | Use% | Mounted on |
|----------------|------|------|------|-------|------|------------|
| /dev/nvme0n1p4 | xf   | 2.0T | 201G | 1.9T  | 10%  | /          |

 -----

-----  
 21. /sys/devices/virtual/dmi/id  

|                 |                       |
|-----------------|-----------------------|
| Vendor:         | ASUSTeK COMPUTER INC. |
| Product:        | RS720A-E12-RS12       |
| 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 "DMTF SMBIOS" standard.  
 Memory:  
 24x Samsung M321R8GA0BB0-CQKDG 64 GB 2 rank 4800  
 -----

-----  
 23. BIOS  
 (This section combines info from /sys/devices and dmidecode.)  

|                |                          |
|----------------|--------------------------|
| BIOS Vendor:   | American Megatrends Inc. |
| BIOS Version:  | 1002                     |
| BIOS Date:     | 05/24/2023               |
| BIOS Revision: | 10.2                     |

 -----

### 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#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++ | 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#434 2022\_10\_28) (based on LLVM Mirror.Version.14.0.6)

(Continued on next page)



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### Compiler Version Notes (Continued)

Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

-----  
Fortran | 648.exchange2\_s(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  
-----

### Base Compiler Invocation

C benchmarks:

clang

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

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## Base Optimization Flags (Continued)

C benchmarks (continued):

```
-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 -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
```

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
```

(Continued on next page)



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**Software Availability:** Nov-2022

## Peak Compiler Invocation (Continued)

C++ benchmarks:

clang++

Fortran benchmarks:

flang

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

600.perlbench\_s: basepeak = yes

```
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: -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
```

625.x264\_s: Same as 605.mcf\_s

657.xz\_s: basepeak = yes

C++ benchmarks:

(Continued on next page)



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## Peak Optimization Flags (Continued)

620.omnetpp\_s: basepeak = yes

```
623.xalancbmk_s: -m64 -Wl,-mllvm -Wl,-reduce-array-computations=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

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-V1.6.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-V1.6.xml>

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