SPEC CPU®2017 Integer Speed Result

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New H3C Technologies Co., Ltd.

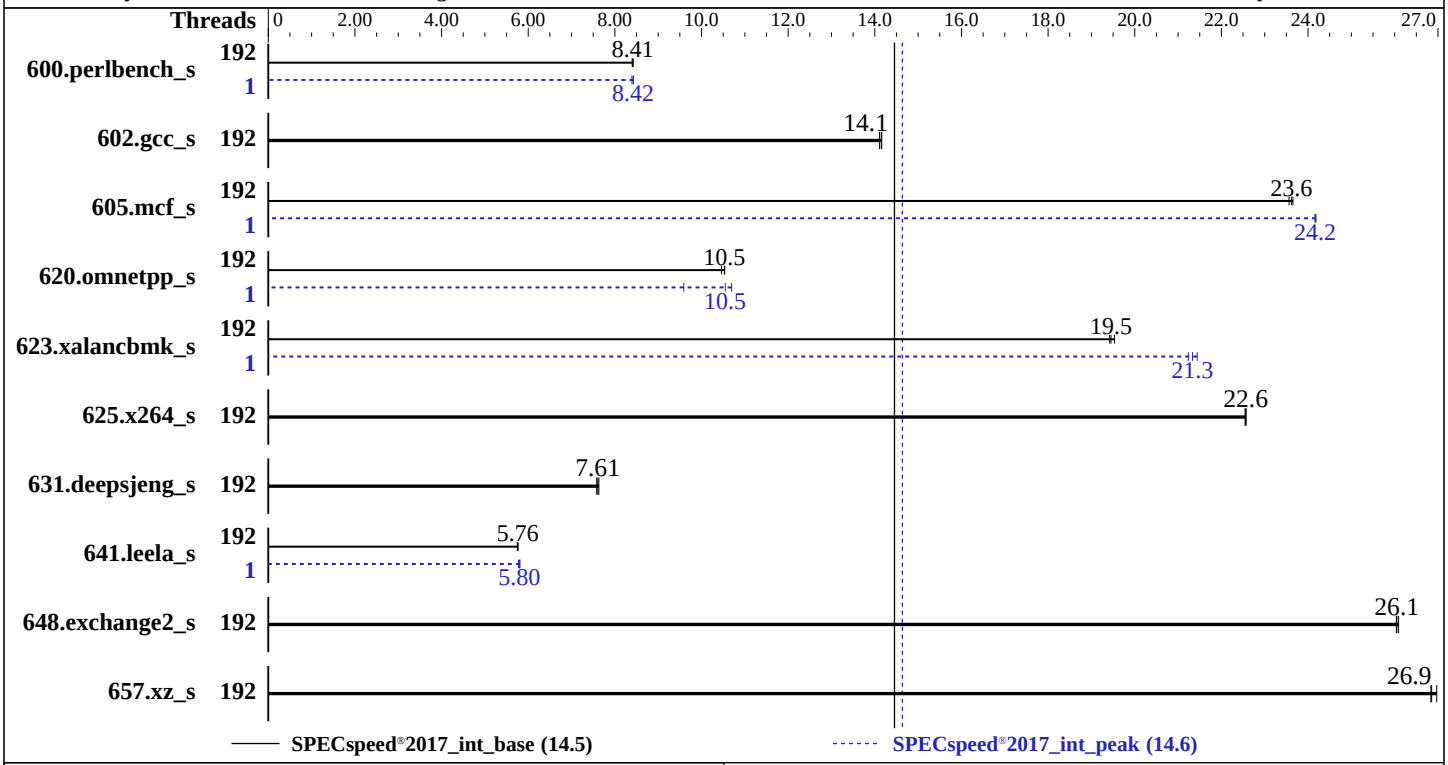
H3C UniServer R4950 G7
AMD EPYC 9654

SPECspeed®2017_int_base = 14.5

SPECspeed®2017_int_peak = 14.6

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.

Test Date: Jul-2025
Hardware Availability: Oct-2024
Software Availability: Dec-2024



Hardware

CPU Name:	AMD EPYC 9654
Max MHz:	3700
Nominal:	2400
Enabled:	192 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:	384 MB I+D on chip per chip, 32 MB shared / 8 cores
Other:	None
Memory:	768 GB (24 x 32 GB 2Rx4 PC5-4800B-R)
Storage:	1 x 3.84TB SSD
Other:	CPU Cooling: Air

Software

OS:	Ubuntu 24.04.1 LTS kernel version 6.8.0-51-generic
Compiler:	C/C++/Fortran: Version 5.0.0 of AOCC
Parallel:	Yes
Firmware:	Version 6.30.39 released May-2025
File System:	ext4
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	64-bit
Other:	None
Power Management:	BIOS and OS set to 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	192	211	8.40	211	8.42	**211**	**8.41**	1	**211**	**8.42**	211	8.43	211	8.39
602.gcc_s	192	**281**	**14.1**	281	14.2	282	14.1	192	**281**	**14.1**	281	14.2	282	14.1
605.mcf_s	192	200	23.7	**200**	**23.6**	200	23.6	1	195	24.2	195	24.2	**195**	**24.2**
620.omnetpp_s	192	**155**	**10.5**	156	10.5	155	10.5	1	153	10.7	170	9.59	**155**	**10.5**
623.xalancbmk_s	192	**72.8**	**19.5**	72.5	19.5	73.0	19.4	1	66.1	21.4	**66.4**	**21.3**	66.7	21.2
625.x264_s	192	**78.2**	**22.6**	78.2	22.6	78.2	22.5	192	**78.2**	**22.6**	78.2	22.6	78.2	22.5
631.deepsjeng_s	192	188	7.63	189	7.58	**188**	**7.61**	192	188	7.63	189	7.58	**188**	**7.61**
641.leela_s	192	297	5.75	**296**	**5.76**	296	5.76	1	295	5.78	**294**	**5.80**	294	5.81
648.exchange2_s	192	113	26.1	**113**	**26.1**	113	26.0	192	113	26.1	**113**	**26.1**	113	26.0
657.xz_s	192	230	26.8	**230**	**26.9**	229	27.0	192	230	26.8	**230**	**26.9**	229	27.0

SPECspeed®2017_int_base = 14.5

SPECspeed®2017_int_peak = 14.6

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

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.
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-383"
LD_LIBRARY_PATH =
     "/home/cpu2017/amd_speed_aocc500_znver5_A_lib/lib:/home/cpu2017/amd_speed_aocc500_znver5_A_lib/lib32:/
     usr/local/mpc-131/lib:/usr/local/gmp-630/lib:/usr/local/mpfr-421/lib:/usr/local/isl-027/lib:/usr/local
     /gcc-1420/lib64:/usr/local/lib:/usr/lib:/usr/local/amd/aocc-compiler-5.0.0/lib:/usr/local/amd/aocc-com
     piler-5.0.0/lib32"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "384"

Environment variables set by runcpu during the 600.perlbench_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 605.mcf_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 620.omnetpp_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 623.xalancbmk_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 641.leela_s peak run:
GOMP_CPU_AFFINITY = "0"
```

General Notes

```
Binaries were compiled on a system with 2x AMD EPYC 9D64 CPU + 500GiB Memory using Ubuntu 22.04

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.
```

Platform Notes

```
BIOS settings:
SMT Control set to Enabled
SVM Mode set to Disabled
Power Profile Selection set to High Performance Mode
Determinism Slider set to Power
cTDP set to 400
PPT set to 400
NUMA nodes per socket set to NPS 4
ACPI SRAT L3 cache as NUMA domain set to Enabled

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on h3c Mon Jul 14 22:14:41 2025

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

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Platform Notes (Continued)

```
------------------------------------------------------------
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------------------------------------------------------------
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 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 255 (255.4-1ubuntu8.4)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. sysctl
16. /sys/kernel/mm/transparent_hugepage
17. /sys/kernel/mm/transparent_hugepage/khugepaged
18. OS release
19. Disk information
20. /sys/devices/virtual/dmi/id
21. dmidecode
22. BIOS
------------------------------------------------------------

------------------------------------------------------------
1. uname -a
  Linux h3c 6.8.0-51-generic #52-Ubuntu SMP PREEMPT_DYNAMIC Thu Dec  5 13:09:44 UTC 2024 x86_64 x86_64 x86_64
  GNU/Linux

------------------------------------------------------------
2. w
   22:14:41 up 1 min,  1 user,  load average: 3.43, 2.12, 0.83
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU  WHAT
  root     tty1     -                22:14   18.00s  2.26s  0.52s /bin/bash ./amd_speed_aocc500_znver5_A1.sh

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

------------------------------------------------------------
4. ulimit -a
  time(seconds)        unlimited
  file(blocks)         unlimited
  data(kbytes)         unlimited
  stack(kbytes)        unlimited
  coredump(blocks)     0
  memory(kbytes)       unlimited
  locked memory(kbytes) 2097152
  process              3093601
  nofiles              1024
  vmemory(kbytes)      unlimited
  locks                unlimited
  rtprio               0

------------------------------------------------------------
5. sysinfo process ancestry
```

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Platform Notes (Continued)

```
 /sbin/init
 /bin/login -p --
 -bash
 python3 ./run_amd_speed_aocc500_znver5_A1.py
 /bin/bash ./amd_speed_aocc500_znver5_A1.sh
 runcpu --config amd_speed_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 intspeed
 runcpu --configfile amd_speed_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 --nopower
   --runmode speed --tune base:peak --size test:train:refspeed intspeed --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.004/templogs/preenv.intspeed.004.0.log --lognum 004.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017

------------------------------------------------------------
6. /proc/cpuinfo
    model name      : AMD EPYC 9654 96-Core Processor
    vendor_id       : AuthenticAMD
    cpu family      : 25
    model           : 17
    stepping        : 1
    microcode       : 0xa101154
    bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass srso
    TLB size        : 3584 4K pages
    cpu cores       : 96
    siblings        : 192
    2 physical ids (chips)
    384 processors (hardware threads)
    physical id 0: core ids 0-95
    physical id 1: core ids 0-95
    physical id 0: apicids 0-191
    physical id 1: apicids 256-447
  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 2.39.3:
  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):                               384
  On-line CPU(s) list:                  0-383
  Vendor ID:                            AuthenticAMD
  BIOS Vendor ID:                       Advanced Micro Devices, Inc.
  Model name:                           AMD EPYC 9654 96-Core Processor
  BIOS Model name:                      AMD EPYC 9654 96-Core Processor                 Unknown CPU @ 2.4GHz
  BIOS CPU family:                      107
  CPU family:                           25
  Model:                                17
  Thread(s) per core:                   2
  Core(s) per socket:                   96
  Socket(s):                            2
  Stepping:                             1
  Frequency boost:                      enabled
  CPU(s) scaling MHz:                   100%
  CPU max MHz:                          3709.0000
  CPU min MHz:                          400.0000
  BogoMIPS:                             4789.18
  Flags:                                fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat
```

(Continued on next page)

Platform Notes (Continued)

```
                                pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb
                                rdtscp lm constant_tsc rep_good amd_lbr_v2 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 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 hw_pstate ssbd mba perfmon_v2
                                ibrs ibpb stibp ibrs_enhanced 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
                                user_shstk avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd
                                amd_ppin cppc arat npt lbrv svm_lock nrip_save tsc_scale vmcb_clean
                                flushbyasid decodeassists pausefilter pfthreshold avic
                                v_vmsave_vmload vgif x2avic v_spec_ctrl vnmi avx512vbmi umip pku
                                ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
                                avx512_vpopcntdq la57 rdpid overflow_recov succor smca fsrm flush_l1d
                                debug_swap
  L1d cache:                    6 MiB (192 instances)
  L1i cache:                    6 MiB (192 instances)
  L2 cache:                     192 MiB (192 instances)
  L3 cache:                     768 MiB (24 instances)
  NUMA node(s):                 24
  NUMA node0 CPU(s):            0-7,192-199
  NUMA node1 CPU(s):            8-15,200-207
  NUMA node2 CPU(s):            16-23,208-215
  NUMA node3 CPU(s):            24-31,216-223
  NUMA node4 CPU(s):            32-39,224-231
  NUMA node5 CPU(s):            40-47,232-239
  NUMA node6 CPU(s):            48-55,240-247
  NUMA node7 CPU(s):            56-63,248-255
  NUMA node8 CPU(s):            64-71,256-263
  NUMA node9 CPU(s):            72-79,264-271
  NUMA node10 CPU(s):           80-87,272-279
  NUMA node11 CPU(s):           88-95,280-287
  NUMA node12 CPU(s):           96-103,288-295
  NUMA node13 CPU(s):           104-111,296-303
  NUMA node14 CPU(s):           112-119,304-311
  NUMA node15 CPU(s):           120-127,312-319
  NUMA node16 CPU(s):           128-135,320-327
  NUMA node17 CPU(s):           136-143,328-335
  NUMA node18 CPU(s):           144-151,336-343
  NUMA node19 CPU(s):           152-159,344-351
  NUMA node20 CPU(s):           160-167,352-359
  NUMA node21 CPU(s):           168-175,360-367
  NUMA node22 CPU(s):           176-183,368-375
  NUMA node23 CPU(s):           184-191,376-383
  Vulnerability Gather data sampling:   Not affected
  Vulnerability Itlb multihit:          Not affected
  Vulnerability L1tf:                   Not affected
  Vulnerability Mds:                    Not affected
  Vulnerability Meltdown:               Not affected
  Vulnerability Mmio stale data:        Not affected
  Vulnerability Reg file data sampling: Not affected
  Vulnerability Retbleed:               Not affected
  Vulnerability Spec rstack overflow:   Mitigation; Safe RET
  Vulnerability Spec store bypass:      Mitigation; Speculative Store Bypass disabled via prctl
  Vulnerability Spectre v1:             Mitigation; usercopy/swapgs barriers and __user pointer sanitization
  Vulnerability Spectre v2:             Mitigation; Enhanced / Automatic IBRS; IBPB conditional; STIBP
                                always-on; RSB filling; PBRSB-eIBRS Not affected; BHI Not affected
```

(Continued on next page)

Platform Notes (Continued)

```
  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       6M    8 Data            1    64        1             64
     L1i       32K       6M    8 Instruction     1    64        1             64
     L2         1M     192M    8 Unified         2  2048        1             64
     L3        32M     768M   16 Unified         3 32768        1             64

------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 24 nodes (0-23)
  node 0 cpus: 0-7,192-199
  node 0 size: 31816 MB
  node 0 free: 31314 MB
  node 1 cpus: 8-15,200-207
  node 1 size: 32250 MB
  node 1 free: 31954 MB
  node 2 cpus: 16-23,208-215
  node 2 size: 32250 MB
  node 2 free: 32050 MB
  node 3 cpus: 24-31,216-223
  node 3 size: 32250 MB
  node 3 free: 32014 MB
  node 4 cpus: 32-39,224-231
  node 4 size: 32250 MB
  node 4 free: 32067 MB
  node 5 cpus: 40-47,232-239
  node 5 size: 32207 MB
  node 5 free: 32020 MB
  node 6 cpus: 48-55,240-247
  node 6 size: 32250 MB
  node 6 free: 31462 MB
  node 7 cpus: 56-63,248-255
  node 7 size: 32250 MB
  node 7 free: 31988 MB
  node 8 cpus: 64-71,256-263
  node 8 size: 32250 MB
  node 8 free: 32032 MB
  node 9 cpus: 72-79,264-271
  node 9 size: 32250 MB
  node 9 free: 32065 MB
  node 10 cpus: 80-87,272-279
  node 10 size: 32250 MB
  node 10 free: 32043 MB
  node 11 cpus: 88-95,280-287
  node 11 size: 32250 MB
  node 11 free: 32007 MB
  node 12 cpus: 96-103,288-295
  node 12 size: 32250 MB
  node 12 free: 31880 MB
  node 13 cpus: 104-111,296-303
  node 13 size: 32250 MB
  node 13 free: 31941 MB
  node 14 cpus: 112-119,304-311
  node 14 size: 32250 MB
  node 14 free: 31907 MB
  node 15 cpus: 120-127,312-319
```

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Platform Notes (Continued)

```
  node 15 size: 32250 MB
  node 15 free: 32002 MB
  node 16 cpus: 128-135,320-327
  node 16 size: 32250 MB
  node 16 free: 32031 MB
  node 17 cpus: 136-143,328-335
  node 17 size: 32250 MB
  node 17 free: 32061 MB
  node 18 cpus: 144-151,336-343
  node 18 size: 32250 MB
  node 18 free: 32032 MB
  node 19 cpus: 152-159,344-351
  node 19 size: 32250 MB
  node 19 free: 32059 MB
  node 20 cpus: 160-167,352-359
  node 20 size: 32250 MB
  node 20 free: 32038 MB
  node 21 cpus: 168-175,360-367
  node 21 size: 32250 MB
  node 21 free: 32029 MB
  node 22 cpus: 176-183,368-375
  node 22 size: 32250 MB
  node 22 free: 32060 MB
  node 23 cpus: 184-191,376-383
  node 23 size: 32189 MB
  node 23 free: 31983 MB
  node distances:
  node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20  21  22  23
    0:  10  11  11  12  12  12  12  12  12  12  12  12  22  22  22  22  22  22  22  22  22  22  22  22
    1:  11  10  11  12  12  12  12  12  12  12  12  12  22  22  22  22  22  22  22  22  22  22  22  22
    2:  11  11  10  12  12  12  12  12  12  12  12  12  22  22  22  22  22  22  22  22  22  22  22  22
    3:  12  12  12  10  11  11  12  12  12  12  12  12  22  22  22  22  22  22  22  22  22  22  22  22
    4:  12  12  12  11  10  11  12  12  12  12  12  12  22  22  22  22  22  22  22  22  22  22  22  22
    5:  12  12  12  11  11  10  12  12  12  12  12  12  22  22  22  22  22  22  22  22  22  22  22  22
    6:  12  12  12  12  12  12  10  11  11  12  12  12  22  22  22  22  22  22  22  22  22  22  22  22
    7:  12  12  12  12  12  12  11  10  11  12  12  12  22  22  22  22  22  22  22  22  22  22  22  22
    8:  12  12  12  12  12  12  11  11  10  12  12  12  22  22  22  22  22  22  22  22  22  22  22  22
    9:  12  12  12  12  12  12  12  12  12  10  11  11  22  22  22  22  22  22  22  22  22  22  22  22
   10:  12  12  12  12  12  12  12  12  12  11  10  11  22  22  22  22  22  22  22  22  22  22  22  22
   11:  12  12  12  12  12  12  12  12  12  11  11  10  22  22  22  22  22  22  22  22  22  22  22  22
   12:  22  22  22  22  22  22  22  22  22  22  22  22  10  11  11  12  12  12  12  12  12  12  12  12
   13:  22  22  22  22  22  22  22  22  22  22  22  22  11  10  11  12  12  12  12  12  12  12  12  12
   14:  22  22  22  22  22  22  22  22  22  22  22  22  11  11  10  12  12  12  12  12  12  12  12  12
   15:  22  22  22  22  22  22  22  22  22  22  22  22  12  12  12  10  11  11  12  12  12  12  12  12
   16:  22  22  22  22  22  22  22  22  22  22  22  22  12  12  12  11  10  11  12  12  12  12  12  12
   17:  22  22  22  22  22  22  22  22  22  22  22  22  12  12  12  11  11  10  12  12  12  12  12  12
   18:  22  22  22  22  22  22  22  22  22  22  22  22  12  12  12  12  12  12  10  11  11  12  12  12
   19:  22  22  22  22  22  22  22  22  22  22  22  22  12  12  12  12  12  12  11  10  11  12  12  12
   20:  22  22  22  22  22  22  22  22  22  22  22  22  12  12  12  12  12  12  11  11  10  12  12  12
   21:  22  22  22  22  22  22  22  22  22  22  22  22  12  12  12  12  12  12  12  12  12  10  11  11
   22:  22  22  22  22  22  22  22  22  22  22  22  22  12  12  12  12  12  12  12  12  12  11  10  11
   23:  22  22  22  22  22  22  22  22  22  22  22  22  12  12  12  12  12  12  12  12  12  11  11  10

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       792034788 kB

------------------------------------------------------------
10. who -r
  run-level 3 Jul 14 22:13
```

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Platform Notes (Continued)

```
------------------------------------------------------------
11. Systemd service manager version: systemd 255 (255.4-1ubuntu8.4)
  Default Target  Status
  multi-user      running

------------------------------------------------------------
12. Services, from systemctl list-unit-files
  STATE            UNIT FILES
  enabled          ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online apparmor
                   apport blk-availability cloud-config cloud-final cloud-init cloud-init-local console-setup
                   cron dmesg e2scrub_reap finalrd getty@ gpu-manager grub-common grub-initrd-fallback
                   keyboard-setup lm-sensors lvm2-monitor multipathd networkd-dispatcher open-iscsi
                   open-vm-tools pollinate rsyslog secureboot-db setvtrgb snapd sysstat systemd-networkd
                   systemd-networkd-wait-online systemd-pstore systemd-resolved systemd-timesyncd thermald
                   ua-reboot-cmds ubuntu-advantage udisks2 ufw unattended-upgrades vgauth wpa_supplicant
  enabled-runtime  netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
  disabled         console-getty debug-shell iscsid nftables rsync serial-getty@ ssh
                   systemd-boot-check-no-failures systemd-confext systemd-network-generator
                   systemd-networkd-wait-online@ systemd-pcrlock-file-system systemd-pcrlock-firmware-code
                   systemd-pcrlock-firmware-config systemd-pcrlock-machine-id systemd-pcrlock-make-policy
                   systemd-pcrlock-secureboot-authority systemd-pcrlock-secureboot-policy systemd-sysext
                   systemd-time-wait-sync upower wpa_supplicant-nl80211@ wpa_supplicant-wired@
                   wpa_supplicant@
  indirect         systemd-sysupdate systemd-sysupdate-reboot uuidd
  masked           cryptdisks cryptdisks-early hwclock multipath-tools-boot screen-cleanup sudo x11-common

------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/vmlinuz-6.8.0-51-generic
  root=UUID=5079c432-fd48-464d-92df-94ceb7591bc8
  ro
  iommu=pt
  amd_pstate=passive

------------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 51:
    current policy: frequency should be within 400 MHz and 3.71 GHz.
                    The governor "performance" may decide which speed to use
                    within this range.
    boost state support:
      Supported: yes
      Active: yes

------------------------------------------------------------
15. sysctl
  kernel.numa_balancing               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
```

(Continued on next page)

Platform Notes (Continued)

```
  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

------------------------------------------------------------
16. /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

------------------------------------------------------------
17. /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

------------------------------------------------------------
18. OS release
  From /etc/*-release /etc/*-version
  os-release Ubuntu 24.04.1 LTS

------------------------------------------------------------
19. Disk information
SPEC is set to: /home/cpu2017
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/sda4      ext4  3.4T   19G  3.2T   1% /

------------------------------------------------------------
20. /sys/devices/virtual/dmi/id
    Vendor:          N/A
    Product:         N/A
    Product Family: Rack
    Serial:          N/A

------------------------------------------------------------
21. dmidecode
  Additional information from dmidecode 3.5 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:
    20x SK Hynix HMCG88AEBRA107N 32 GB 2 rank 4800
    4x SK Hynix HMCG88AEBRA115N 32 GB 2 rank 4800


------------------------------------------------------------
22. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       American Megatrends International, LLC.
   BIOS Version:      6.30.39
   BIOS Date:         05/22/2025
   BIOS Revision:     5.27
```

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 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
--------------------------------------------------------------------------------------------------------------

==============================================================================================================
Fortran | 648.exchange2_s(base, peak)
--------------------------------------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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

(Continued on next page)

Base Portability Flags (Continued)

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 -Wl,-mllvm -Wl,-extra-inliner -O3
-march=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp -DSPEC_OPENMP
-flto -fremap-arrays -fstrip-mining -fstruct-layout=7
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=50 -zopt -fopenmp=libomp -lomp -lamdlibm
-lflang -lamdalloc

C++ benchmarks:
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -fopenmp -DSPEC_OPENMP -flto
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -mllvm -unroll-threshold=100 -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,-enable-iv-split -Wl,-mllvm -Wl,-inline-recursion=4
-Wl,-mllvm -Wl,-lsr-in-nested-loop -O3 -march=znver5 -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

(Continued on next page)

Base Other Flags (Continued)

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

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
-Wl,-mllvm -Wl,-extra-inliner -Ofast -march=znver5
-fveclib=AMDLIBM -ffast-math -fopenmp -flto
-DSPEC_OPENMP -fremap-arrays -fstrip-mining
-fstruct-layout=9 -mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=50 -zopt -fopenmp=libomp -lomp
-lamdlibm -lamdalloc -lflang

602.gcc_s: basepeak = yes

605.mcf_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-extra-inliner -Ofast -march=znver5
-fveclib=AMDLIBM -ffast-math -fopenmp -flto
-DSPEC_OPENMP -fremap-arrays -fstrip-mining

(Continued on next page)

Peak Optimization Flags (Continued)

605.mcf_s (continued):
-fstruct-layout=9 -mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=50 -zopt -fopenmp=libomp -lomp
-lamdlibm -lamdalloc -lflang

625.x264_s: basepeak = yes

657.xz_s: basepeak = yes

C++ benchmarks:

620.omnetpp_s: -m64 -std=c++14
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -DSPEC_OPENMP -mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=100 -zopt
-fvirtual-function-elimination -fvisibility=hidden
-fopenmp=libomp -lomp -lamdlibm -lamdalloc-ext -lflang

623.xalancbmk_s: -m64 -std=c++14
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=advanced -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -DSPEC_OPENMP -mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=100 -zopt
-fvirtual-function-elimination -fvisibility=hidden
-mllvm -do-block-reorder=advanced -fopenmp=libomp -lomp
-lamdlibm -lamdalloc-ext -lflang

631.deepsjeng_s: basepeak = yes

641.leela_s: -m64 -std=c++14
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -DSPEC_OPENMP -mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=100 -zopt
-fvirtual-function-elimination -fvisibility=hidden
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang

Fortran benchmarks:

(Continued on next page)

Peak Optimization Flags (Continued)

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/aocc500-flags.2024-10-10.html`
`http://www.spec.org/cpu2017/flags/New_H3C-Platform-AMD-Settings-V2.0-Turin.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/aocc500-flags.2024-10-10.xml`
`http://www.spec.org/cpu2017/flags/New_H3C-Platform-AMD-Settings-V2.0-Turin.xml`

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