SPEC CPU®2017 Integer Rate Result

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GIGA-BYTE TECHNOLOGY CO., LTD.

(Test Sponsor: Giga Computing Technology Co., Ltd.)

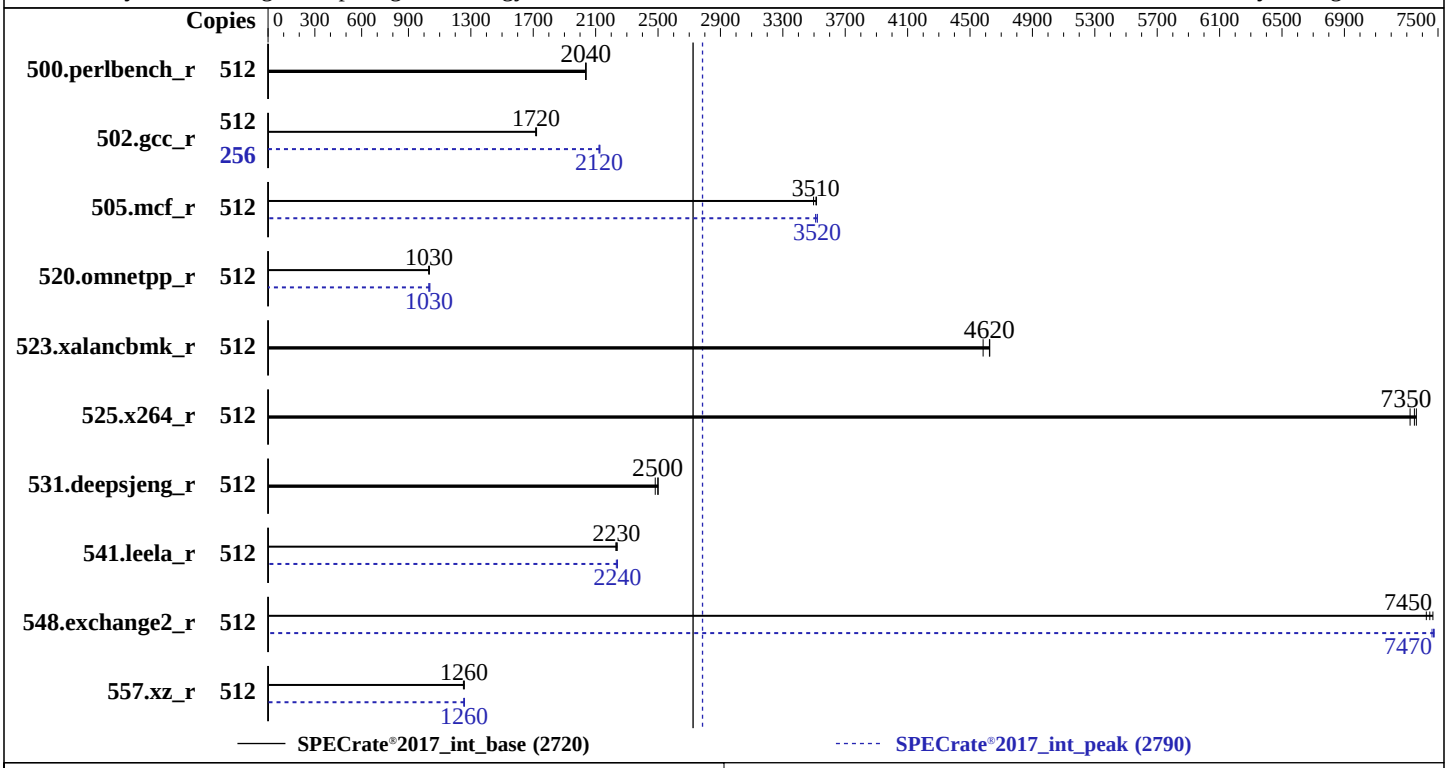
R183-Z93-LAJ1-000
(2.70 GHz, AMD EPYC 9755)

SPECrate®2017_int_base = 2720

SPECrate®2017_int_peak = 2790

CPU2017 License: 9082
Test Sponsor: Giga Computing Technology Co., Ltd.
Tested by: Giga Computing Technology Co., Ltd.

Test Date: Sep-2024
Hardware Availability: Oct-2024
Software Availability: Aug-2024



Hardware

CPU Name:	AMD EPYC 9755
Max MHz:	4100
Nominal:	2700
Enabled:	256 cores, 2 chips, 2 threads/core
Orderable:	1,2 chips
Cache L1:	32 KB I + 48 KB D on chip per core
L2:	1 MB I+D on chip per core
L3:	512 MB I+D on chip per chip, 32 MB shared / 8 cores
Other:	None
Memory:	1536 GB (24 x 64 GB 2Rx4 PC5-6400B-R, running at 6000)
Storage:	1 x 3.84TB SSD
Other:	CPU Cooling: Air

Software

OS:	Ubuntu 22.04.03 LTS 5.15.0-119-generic
Compiler:	C/C++/Fortran: Version 5.0.0 of AOCC
Parallel:	No
Firmware:	Version R02_F19 released Sep-2024
File System:	ext4
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	400	2040	**400**	**2040**	400	2040	512	400	2040	**400**	**2040**	400	2040
502.gcc_r	512	**422**	**1720**	423	1720	421	1720	256	171	2120	170	2130	**171**	**2120**
505.mcf_r	512	**236**	**3510**	237	3500	235	3520	512	236	3510	**235**	**3520**	235	3520
520.omnetpp_r	512	**650**	**1030**	652	1030	650	1030	512	647	1040	652	1030	**650**	**1030**
523.xalancbmk_r	512	117	4630	**117**	**4620**	118	4580	512	117	4630	**117**	**4620**	118	4580
525.x264_r	512	122	7360	122	7320	**122**	**7350**	512	122	7360	122	7320	**122**	**7350**
531.deepsjeng_r	512	**235**	**2500**	236	2480	235	2500	512	**235**	**2500**	236	2480	235	2500
541.leela_r	512	**380**	**2230**	380	2230	379	2240	512	379	2240	380	2230	**379**	**2240**
548.exchange2_r	512	180	7470	**180**	**7450**	181	7430	512	180	7460	**180**	**7470**	179	7480
557.xz_r	512	**440**	**1260**	442	1250	440	1260	512	439	1260	441	1250	**440**	**1260**

SPECrate®2017_int_base = **2720**

SPECrate®2017_int_peak = **2790**

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) 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.
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/root/new_RC1298c/amd_rate_aocc500_znver5_A_lib/lib:/root/new_RC1298c/amd_rate_aocc500_znver5_A_lib/l
     ib32:"
MALLOC_CONF = "retain:true"
```

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 Settings:
Power Policy Quick Settings = Best Performance
TDP Control = Manual
TDP = 500
PPT Control = Manual
PPT = 500
SMT Mode = Enabled

 Sysinfo program /root/new_RC1298c/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on mz93-fs1 Mon Jan  1 18:58:50 2024

 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 (249.11-0ubuntu3.9)
 12. Failed units, from systemctl list-units --state=failed
 13. Services, from systemctl list-unit-files
 14. Linux kernel boot-time arguments, from /proc/cmdline
 15. cpupower frequency-info
 16. sysctl
 17. /sys/kernel/mm/transparent_hugepage
 18. /sys/kernel/mm/transparent_hugepage/khugepaged
 19. OS release
 20. Disk information
```

(Continued on next page)

Platform Notes (Continued)

```
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS
------------------------------------------------------------

------------------------------------------------------------
1. uname -a
  Linux mz93-fs1 5.15.0-119-generic #129-Ubuntu SMP Fri Aug 2 19:25:20 UTC 2024 x86_64 x86_64 x86_64
  GNU/Linux

------------------------------------------------------------
2. w
   18:58:50 up 15:29,  1 user,  load average: 0.07, 0.02, 0.00
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  root     tty1     -                03:31   16.00s  1.34s  0.33s /bin/bash ./amd_rate_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              6189875
  nofiles              1024
  vmemory(kbytes)      unlimited
  locks                unlimited
  rtprio               0

------------------------------------------------------------
5. sysinfo process ancestry
 /sbin/init
 /bin/login -f
 -bash
 python3 ./run_amd_rate_aocc500_znver5_A1.py
 /bin/bash ./amd_rate_aocc500_znver5_A1.sh
 runcpu --config amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 intrate
 runcpu --configfile amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 --nopower
   --runmode rate --tune base:peak --size test:train:refrate intrate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.004/templogs/preenv.intrate.004.0.log --lognum 004.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /root/new_RC1298c

------------------------------------------------------------
6. /proc/cpuinfo
    model name      : AMD EPYC 9755 128-Core Processor
    vendor_id       : AuthenticAMD
    cpu family      : 26
    model           : 2
    stepping        : 1
    microcode       : 0xb002116
    bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
    TLB size        : 192 4K pages
    cpu cores       : 128
```

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Platform Notes (Continued)

```
     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 9755 128-Core Processor
   CPU family:                           26
   Model:                                2
   Thread(s) per core:                   2
   Core(s) per socket:                   128
   Socket(s):                            2
   Stepping:                             1
   Frequency boost:                      enabled
   CPU max MHz:                          4121.1909
   CPU min MHz:                          1500.0000
   BogoMIPS:                             5399.77
   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 ibrs_enhanced vmmcall fsgsbase tsc_adjust 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 avx_vnni 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 v_spec_ctrl avx512vbmi umip pku ospke
                                         avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
                                         avx512_vpopcntdq la57 rdpid bus_lock_detect movdiri movdir64b
                                         overflow_recov succor smca fsrm avx512_vp2intersect flush_l1d
   Virtualization:                       AMD-V
   L1d cache:                            12 MiB (256 instances)
   L1i cache:                            8 MiB (256 instances)
   L2 cache:                             256 MiB (256 instances)
   L3 cache:                             1 GiB (32 instances)
   NUMA node(s):                         32
   NUMA node0 CPU(s):                    0-7,256-263
   NUMA node1 CPU(s):                    8-15,264-271
   NUMA node2 CPU(s):                    16-23,272-279
```

(Continued on next page)

Platform Notes (Continued)

```
  NUMA node3 CPU(s):                    24-31,280-287
  NUMA node4 CPU(s):                    32-39,288-295
  NUMA node5 CPU(s):                    40-47,296-303
  NUMA node6 CPU(s):                    48-55,304-311
  NUMA node7 CPU(s):                    56-63,312-319
  NUMA node8 CPU(s):                    64-71,320-327
  NUMA node9 CPU(s):                    72-79,328-335
  NUMA node10 CPU(s):                   80-87,336-343
  NUMA node11 CPU(s):                   88-95,344-351
  NUMA node12 CPU(s):                   96-103,352-359
  NUMA node13 CPU(s):                   104-111,360-367
  NUMA node14 CPU(s):                   112-119,368-375
  NUMA node15 CPU(s):                   120-127,376-383
  NUMA node16 CPU(s):                   128-135,384-391
  NUMA node17 CPU(s):                   136-143,392-399
  NUMA node18 CPU(s):                   144-151,400-407
  NUMA node19 CPU(s):                   152-159,408-415
  NUMA node20 CPU(s):                   160-167,416-423
  NUMA node21 CPU(s):                   168-175,424-431
  NUMA node22 CPU(s):                   176-183,432-439
  NUMA node23 CPU(s):                   184-191,440-447
  NUMA node24 CPU(s):                   192-199,448-455
  NUMA node25 CPU(s):                   200-207,456-463
  NUMA node26 CPU(s):                   208-215,464-471
  NUMA node27 CPU(s):                   216-223,472-479
  NUMA node28 CPU(s):                   224-231,480-487
  NUMA node29 CPU(s):                   232-239,488-495
  NUMA node30 CPU(s):                   240-247,496-503
  NUMA node31 CPU(s):                   248-255,504-511
  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:   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; Enhanced / Automatic IBRS; IBPB conditional; STIBP
                                        always-on; RSB filling; PBRSB-eIBRS Not affected; BHI Not affected
  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       48K      12M   12 Data            1    64        1             64
     L1i       32K       8M    8 Instruction     1    64        1             64
     L2         1M     256M   16 Unified         2  1024        1             64
     L3        32M       1G   16 Unified         3 32768        1             64

------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 32 nodes (0-31)
  node 0 cpus: 0-7,256-263
  node 0 size: 47951 MB
  node 0 free: 47217 MB
  node 1 cpus: 8-15,264-271
```

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Platform Notes (Continued)

```
node 1 size: 48379 MB
node 1 free: 47743 MB
node 2 cpus: 16-23,272-279
node 2 size: 48379 MB
node 2 free: 47829 MB
node 3 cpus: 24-31,280-287
node 3 size: 48379 MB
node 3 free: 47858 MB
node 4 cpus: 32-39,288-295
node 4 size: 48379 MB
node 4 free: 47860 MB
node 5 cpus: 40-47,296-303
node 5 size: 48379 MB
node 5 free: 47877 MB
node 6 cpus: 48-55,304-311
node 6 size: 48379 MB
node 6 free: 47885 MB
node 7 cpus: 56-63,312-319
node 7 size: 48379 MB
node 7 free: 47884 MB
node 8 cpus: 64-71,320-327
node 8 size: 48379 MB
node 8 free: 47878 MB
node 9 cpus: 72-79,328-335
node 9 size: 48379 MB
node 9 free: 47881 MB
node 10 cpus: 80-87,336-343
node 10 size: 48379 MB
node 10 free: 47879 MB
node 11 cpus: 88-95,344-351
node 11 size: 48379 MB
node 11 free: 47879 MB
node 12 cpus: 96-103,352-359
node 12 size: 48379 MB
node 12 free: 47829 MB
node 13 cpus: 104-111,360-367
node 13 size: 48379 MB
node 13 free: 47885 MB
node 14 cpus: 112-119,368-375
node 14 size: 48379 MB
node 14 free: 47863 MB
node 15 cpus: 120-127,376-383
node 15 size: 48379 MB
node 15 free: 47882 MB
node 16 cpus: 128-135,384-391
node 16 size: 48379 MB
node 16 free: 47836 MB
node 17 cpus: 136-143,392-399
node 17 size: 48379 MB
node 17 free: 47884 MB
node 18 cpus: 144-151,400-407
node 18 size: 48379 MB
node 18 free: 47866 MB
node 19 cpus: 152-159,408-415
node 19 size: 48379 MB
node 19 free: 47886 MB
node 20 cpus: 160-167,416-423
node 20 size: 48377 MB
node 20 free: 47858 MB
node 21 cpus: 168-175,424-431
```

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Platform Notes (Continued)

```
node 21 size: 48381 MB
node 21 free: 47879 MB
node 22 cpus: 176-183,432-439
node 22 size: 48377 MB
node 22 free: 47859 MB
node 23 cpus: 184-191,440-447
node 23 size: 48381 MB
node 23 free: 47876 MB
node 24 cpus: 192-199,448-455
node 24 size: 48379 MB
node 24 free: 47833 MB
node 25 cpus: 200-207,456-463
node 25 size: 48379 MB
node 25 free: 47872 MB
node 26 cpus: 208-215,464-471
node 26 size: 48332 MB
node 26 free: 47801 MB
node 27 cpus: 216-223,472-479
node 27 size: 48379 MB
node 27 free: 47873 MB
node 28 cpus: 224-231,480-487
node 28 size: 48379 MB
node 28 free: 47875 MB
node 29 cpus: 232-239,488-495
node 29 size: 48379 MB
node 29 free: 47864 MB
node 30 cpus: 240-247,496-503
node 30 size: 48379 MB
node 30 free: 47872 MB
node 31 cpus: 248-255,504-511
node 31 size: 48281 MB
node 31 free: 47770 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  24
25  26  27  28  29  30  31
  0:  10  11  11  11  12  12  12  12  12  12  12  12  12  12  12  12  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  1:  11  10  11  11  12  12  12  12  12  12  12  12  12  12  12  12  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  2:  11  11  10  11  12  12  12  12  12  12  12  12  12  12  12  12  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  3:  11  11  11  10  12  12  12  12  12  12  12  12  12  12  12  12  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  4:  12  12  12  12  10  11  11  11  12  12  12  12  12  12  12  12  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  5:  12  12  12  12  11  10  11  11  12  12  12  12  12  12  12  12  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  6:  12  12  12  12  11  11  10  11  12  12  12  12  12  12  12  12  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  7:  12  12  12  12  11  11  11  10  12  12  12  12  12  12  12  12  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  8:  12  12  12  12  12  12  12  12  10  11  11  11  12  12  12  12  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
  9:  12  12  12  12  12  12  12  12  11  10  11  11  12  12  12  12  32  32  32  32  32  32  32  32  32
  32  32  32  32  32  32  32
 10:  12  12  12  12  12  12  12  12  11  11  10  11  12  12  12  12  32  32  32  32  32  32  32  32  32
 32  32  32  32  32  32  32
 11:  12  12  12  12  12  12  12  12  11  11  11  10  12  12  12  12  32  32  32  32  32  32  32  32  32
 32  32  32  32  32  32  32
 12:  12  12  12  12  12  12  12  12  12  12  12  12  10  11  11  11  32  32  32  32  32  32  32  32  32
```

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Platform Notes (Continued)

```
    32  32  32  32  32  32  32
    13:  12  12  12  12  12  12  12  12  12  12  12  12  12  11  10  11  11  32  32  32  32  32  32  32  32  32
    32  32  32  32  32  32  32
    14:  12  12  12  12  12  12  12  12  12  12  12  12  12  11  11  10  11  32  32  32  32  32  32  32  32  32
    32  32  32  32  32  32  32
    15:  12  12  12  12  12  12  12  12  12  12  12  12  12  11  11  11  10  32  32  32  32  32  32  32  32  32
    32  32  32  32  32  32  32
    16:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  10  11  11  11  12  12  12  12  12
    12  12  12  12  12  12  12
    17:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  10  11  11  12  12  12  12  12
    12  12  12  12  12  12  12
    18:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  10  11  12  12  12  12  12
    12  12  12  12  12  12  12
    19:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  11  11  11  10  12  12  12  12  12
    12  12  12  12  12  12  12
    20:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  10  11  11  11  12
    12  12  12  12  12  12  12
    21:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  11  10  11  11  12
    12  12  12  12  12  12  12
    22:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  11  11  10  11  12
    12  12  12  12  12  12  12
    23:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  11  11  11  10  12
    12  12  12  12  12  12  12
    24:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  12  12  10
    11  11  11  12  12  12  12
    25:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  12  12  11
    10  11  11  12  12  12  12
    26:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  12  12  11
    11  10  11  12  12  12  12
    27:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  12  12  11
    11  11  10  12  12  12  12
    28:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  12  12  12
    12  12  12  10  11  11  11
    29:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  12  12  12
    12  12  12  11  10  11  11
    30:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  12  12  12
    12  12  12  11  11  10  11
    31:  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  12  12  12  12  12  12
    12  12  12  11  11  11  10

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       1584725108 kB

------------------------------------------------------------
10. who -r
  run-level 3 Jan 1 03:31

------------------------------------------------------------
11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.9)
  Default Target  Status
  multi-user      degraded

------------------------------------------------------------
12. Failed units, from systemctl list-units --state=failed
    UNIT                                  LOAD   ACTIVE SUB    DESCRIPTION
  * fwupd-refresh.service                 loaded failed failed Refresh fwupd metadata and update motd
  * systemd-networkd-wait-online.service loaded failed failed Wait for Network to be Configured

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

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Platform Notes (Continued)

```
13. Services, from systemctl list-unit-files
  STATE             UNIT FILES
  enabled           ModemManager apparmor 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 irqbalance keyboard-setup lvm2-monitor lxd-agent
                    multipathd networkd-dispatcher open-iscsi open-vm-tools pollinate rsyslog secureboot-db
                    setvtrgb snapd ssh systemd-networkd systemd-networkd-wait-online systemd-pstore
                    systemd-resolved systemd-timesyncd thermald ua-reboot-cmds ubuntu-advantage udisks2 ufw
                    unattended-upgrades vgauth
  enabled-runtime   netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
  disabled          console-getty debug-shell ipmievd iscsid nftables rsync serial-getty@
                    systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                    systemd-time-wait-sync upower
  generated         apport openipmi
  indirect          uuidd
  masked            cryptdisks cryptdisks-early hwclock lvm2 multipath-tools-boot rc rcS screen-cleanup sudo
                    x11-common

------------------------------------------------------------
14. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=/boot/vmlinuz-5.15.0-119-generic
  root=UUID=1380e2bd-2201-4a69-aee3-09a8eb63e291
  ro

------------------------------------------------------------
15. cpupower frequency-info
  analyzing CPU 0:
    current policy: frequency should be within 1.50 GHz and 2.70 GHz.
                    The governor "performance" may decide which speed to use
                    within this range.
    boost state support:
      Supported: yes
      Active: yes
      Boost States: 0
      Total States: 3
      Pstate-P0:  2800MHz

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

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

(Continued on next page)

Platform Notes (Continued)

```
17. /sys/kernel/mm/transparent_hugepage
  defrag          [always] defer defer+madvise madvise never
  enabled         [always] madvise never
  hpage_pmd_size  2097152
  shmem_enabled   always within_size advise [never] deny force

------------------------------------------------------------
18. /sys/kernel/mm/transparent_hugepage/khugepaged
  alloc_sleep_millisecs   60000
  defrag                      1
  max_ptes_none             511
  max_ptes_shared           256
  max_ptes_swap              64
  pages_to_scan            4096
  scan_sleep_millisecs    10000

------------------------------------------------------------
19. OS release
  From /etc/*-release /etc/*-version
  os-release Ubuntu 22.04.3 LTS

------------------------------------------------------------
20. Disk information
SPEC is set to: /root/new_RC1298c
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/nvme0n1p2 ext4  3.5T  396G  2.9T  12% /

------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:         Giga Computing
    Product:        R183-Z93-LAJ1-000
    Product Family: Server
    Serial:         0123456789012345678 9AB

------------------------------------------------------------
22. dmidecode
  Additional information from dmidecode 3.3 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 M321R8GA0EB2-CCPWC 64 GB 2 rank 6400, configured at 6000


------------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       GIGABYTE
   BIOS Version:      R02_F19
   BIOS Date:         09/18/2024
   BIOS Revision:     5.35
```

Compiler Version Notes

```
==============================================================================================================
C       | 502.gcc_r(peak)
--------------------------------------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: i386-unknown-linux-gnu
```

(Continued on next page)

Compiler Version Notes (Continued)

```
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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 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       | 502.gcc_r(peak)
------------------------------------------------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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 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++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak)
        | 541.leela_r(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 | 548.exchange2_r(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

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Base Compiler Invocation (Continued)

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 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather
-Wl,-mllvm -Wl,-extra-inliner -z muldefs -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang
-lamdalloc-ext -ldl

C++ benchmarks:
-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 -z muldefs -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -flto -mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -fno-PIE -no-pie
-fvirtual-function-elimination -fvisibility=hidden
-mllvm -do-block-reorder=advanced -lamdlibm -lflang -lamdalloc-ext
-ldl

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Base Optimization Flags (Continued)

Fortran benchmarks:
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -z muldefs -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -flto
-fepilog-vectorization-of-inductions -mllvm -optimize-strided-mem-cost
-floop-transform -mllvm -unroll-aggressive -mllvm -unroll-threshold=500
-lamdlibm -lflang -lamdalloc -ldl

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
505.mcf_r: -DSPEC_LP64

(Continued on next page)

Peak Portability Flags (Continued)

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 -Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather -Wl,-mllvm -Wl,-extra-inliner -z muldefs -Ofast -march=znver5 -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: `-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 -flto -fstruct-layout=7 -mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining -mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang -lamdalloc-ext -ldl`

525.x264_r: `basepeak = yes`

557.xz_r: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6 -Wl,-mllvm -Wl,-reduce-array-computations=3 -Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather -Wl,-mllvm -Wl,-extra-inliner -Ofast -march=znver5 -fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=7 -mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining -mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang -lamdalloc-ext -ldl`

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Peak Optimization Flags (Continued)

C++ benchmarks:

520.omnetpp_r: `-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 -flto -mllvm -unroll-threshold=100 -mllvm -reduce-array-computations=3 -zopt -fno-PIE -no-pie -fvirtual-function-elimination -fvisibility=hidden -mllvm -do-block-reorder=advanced -lamdlibm -lamdalloc-ext -ldl`

523.xalancbmk_r: `basepeak = yes`

531.deepsjeng_r: `basepeak = yes`

541.leela_r: `-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 -flto -mllvm -unroll-threshold=100 -mllvm -reduce-array-computations=3 -zopt -fno-PIE -no-pie -fvirtual-function-elimination -fvisibility=hidden -mllvm -do-block-reorder=advanced -lamdlibm -lflang -lamdalloc-ext -ldl`

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=znver5 -fveclib=AMDLIBM
-ffast-math -flto -fepilog-vectorization-of-inductions
-mllvm -optimize-strided-mem-cost -floop-transform
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm
-lflang -lamdalloc -ldl
```

Peak Other Flags

C benchmarks (except as noted below):

```
-Wno-unused-command-line-argument
```

(Continued on next page)

Peak Other Flags (Continued)

502.gcc_r: `-L/usr/lib32 -Wno-unused-command-line-argument -L/home/work/cpu2017/v119/aocc5/1316/amd_rate_aocc500_znver5_A_lib/lib32`

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.2024-10-10.00.html`
`http://www.spec.org/cpu2017/flags/GIGA-BYTE-Platform-SPECcpu2017-Flags-V1.0-Turin.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/aocc500-flags.2024-10-10.00.xml`
`http://www.spec.org/cpu2017/flags/GIGA-BYTE-Platform-SPECcpu2017-Flags-V1.0-Turin.xml`

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