SPEC CPU®2017 Floating Point Rate Result

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Quanta Cloud Technology
(Test Sponsor: Quanta Computer Inc.)

QuantaGrid S44NL-1U
AMD EPYC 9755

$SPECrate®2017\_fp\_base =$ **1060**

$SPECrate®2017_fp_peak = $ Not Run
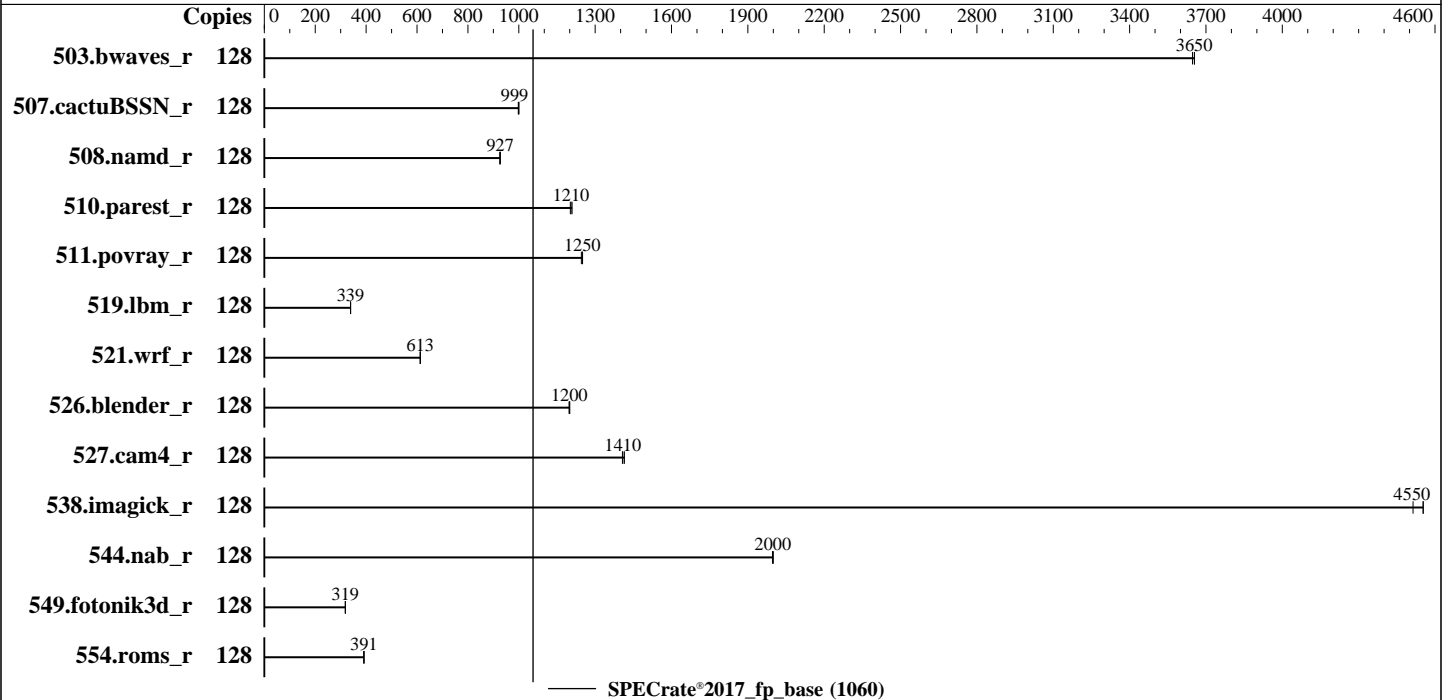
CPU2017 License: 9050

Test Sponsor: Quanta Computer Inc.

Tested by: Quanta Computer Inc.

Test Date: Sep-2024

Hardware Availability: Oct-2024

Software Availability: Sep-2024

Benchmark	Copies	Result
503.bwaves_r	128	3650
507.cactuBSSN_r	128	999
508.namd_r	128	927
510.parest_r	128	1210
511.povray_r	128	1250
519.lbm_r	128	339
521.wrf_r	128	613
526.blender_r	128	1200
527.cam4_r	128	1410
538.imagick_r	128	4550
544.nab_r	128	2000
549.fotonik3d_r	128	319
554.roms_r	128	391

SPECrate®2017_fp_base (1060)

Hardware

CPU Name: AMD EPYC 9755

Max MHz: 4100

Nominal: 2700

Enabled: 128 cores, 1 chip

Orderable: 1 chip

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: 768 GB (12 x 64 GB 2Rx4 PC5-6400B-R, running at 5200)

Storage: 1 x 3.84 TB NVMe SSD

Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP6 kernel 6.4.0-150600.21-default

Compiler: C/C++/Fortran: Version 5.0.0 of AOCC

Parallel: No

Firmware: Version 3B02 released Sep-2024

File System: btrfs

System State: Run level 3 (multi-user)

Base Pointers: 64-bit

Peak Pointers: Not Applicable

Other: None

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

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	128	**351**	**3650**	351	3660	352	3650							
507.cactuBSSN_r	128	162	998	**162**	**999**	162	1000							
508.namd_r	128	**131**	**927**	131	927	131	925							
510.parest_r	128	277	1210	278	1200	**278**	**1210**							
511.povray_r	128	239	1250	240	1250	**239**	**1250**							
519.lbm_r	128	398	339	**398**	**339**	398	339							
521.wrf_r	128	467	614	**468**	**613**	468	612							
526.blender_r	128	162	1200	**163**	**1200**	163	1200							
527.cam4_r	128	158	1420	**159**	**1410**	159	1410							
538.imagick_r	128	70.5	4510	**69.9**	**4550**	69.9	4550							
544.nab_r	128	108	2000	**108**	**2000**	108	2000							
549.fotonik3d_r	128	**1566**	**319**	1566	319	1567	318							
554.roms_r	128	**520**	**391**	520	391	519	392							

$SPECrate®2017_fp_base = $ **1060**

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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

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,
```

(Continued on next page)

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Operating System Notes (Continued)

```
'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/cpu2017F/amd_rate_aocc500_znver5_A_lib/lib:/root/cpu2017F/amd_rate_aocc500_znver5_A_lib/lib32:"
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 Configuration
 ACPI CST C2 Latency set to 18
 NUMA nodes per socket set to NPS4
 Determinism Control is Manual
 Determinism Slider set to Power
 cTDP Control set to Manual
 cTDP set to 500
 PPT Control set to Manual
 PPT set to 500
 SMT Control set to Disable

 Sysinfo program /root/cpu2017F/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Tue Sep 17 02:29:23 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 254 (254.10+suse.84.ge8d77af424)
```

(Continued on next page)

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Platform Notes (Continued)

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


    ------------------------------------------------------------
    1. uname -a
      Linux localhost 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC 2024 (36c1e09/lp)
      x86_64 x86_64 x86_64 GNU/Linux


    ------------------------------------------------------------
    2. w
      02:29:23 up 0 min,  1 user,  load average: 0.13, 0.04, 0.01
      USER     TTY        FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
      root     tty1       -                02:28   45.00s  0.85s  0.05s /bin/bash ./amd_rate_aocc500_znver5_A1.sh


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


    ------------------------------------------------------------
    4. ulimit -a
      core file size          (blocks, -c) unlimited
      data seg size           (kbytes, -d) unlimited
      scheduling priority             (-e) 0
      file size               (blocks, -f) unlimited
      pending signals                 (-i) 3091890
      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) 3091890
      virtual memory          (kbytes, -v) unlimited
      file locks                      (-x) unlimited

    ------------------------------------------------------------
    5. sysinfo process ancestry
     /usr/lib/systemd/systemd --switched-root --system --deserialize=42
     login -- root
     -bash
     /bin/bash ./test.sh
     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 base --reportable --iterations 3 fprate
     runcpu --configfile amd_rate_aocc500_znver5_A1.cfg --tune base --reportable --iterations 3 --nopower
        --runmode rate --tune base --size test:train:refrate fprate --nopreenv --note-preenv --logfile
        $SPEC/tmp/CPU2017.001/templogs/preenv.fprate.001.0.log --lognum 001.0 --from_runcpu 2
```

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Platform Notes (Continued)

```
  specperl $SPEC/bin/sysinfo
 $SPEC = /root/cpu2017F


   ----------------------------------------------------------
 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
    siblings        : 128
    1 physical ids (chips)
    128 processors (hardware threads)
    physical id 0: core ids
    0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119,128-135,144-151,160-167,176-183,192-199,208-215,224-231,
    240-247
    physical id 0: apicids
    0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119,128-135,144-151,160-167,176-183,192-199,208-215,224-231,
    240-247
  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:               46 bits physical, 57 bits virtual
   Byte Order:                  Little Endian
   CPU(s):                      128
   On-line CPU(s) list:         0-127
   Vendor ID:                   AuthenticAMD
   BIOS Vendor ID:              Advanced Micro Devices, Inc.
   Model name:                  AMD EPYC 9755 128-Core Processor
   BIOS Model name:             AMD EPYC 9755 128-Core Processor            Unknown CPU @ 2.7GHz
   BIOS CPU family:             107
   CPU family:                  26
   Model:                       2
   Thread(s) per core:          1
   Core(s) per socket:          128
   Socket(s):                   1
   Stepping:                    1
   Frequency boost:             enabled
   CPU(s) scaling MHz:          67%
   CPU max MHz:                 4121.1909
   CPU min MHz:                 1500.0000
   BogoMIPS:                    5391.77
   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 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 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 hw_pstate ssbd mba perfmon_v2
```

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Platform Notes (Continued)

```
                      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 user_shstk 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 x2avic v_spec_ctrl vnmi
                      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 sev sev_es debug_swap
  Virtualization:                     AMD-V
  L1d cache:                          6 MiB (128 instances)
  L1i cache:                          4 MiB (128 instances)
  L2 cache:                           128 MiB (128 instances)
  L3 cache:                           512 MiB (16 instances)
  NUMA node(s):                       4
  NUMA node0 CPU(s):                  0-31
  NUMA node1 CPU(s):                  32-63
  NUMA node2 CPU(s):                  64-95
  NUMA node3 CPU(s):                  96-127
  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
  Vulnerability Spectre v1:           Mitigation; usercopy/swapgs barriers and __user pointer sanitization
  Vulnerability Spectre v2:           Mitigation; Enhanced / Automatic IBRS; IBPB conditional; STIBP
                                      disabled; 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       6M   12 Data            1     64        1             64
     L1i       32K       4M    8 Instruction     1     64        1             64
     L2         1M     128M   16 Unified         2   1024        1             64
     L3        32M     512M   16 Unified         3  32768        1             64


   ------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 4 nodes (0-3)
  node 0 cpus: 0-31
  node 0 size: 192924 MB
  node 0 free: 191253 MB
  node 1 cpus: 32-63
  node 1 size: 193527 MB
  node 1 free: 192971 MB
  node 2 cpus: 64-95
  node 2 size: 193488 MB
  node 2 free: 192959 MB
  node 3 cpus: 96-127
  node 3 size: 193057 MB
```

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Platform Notes (Continued)

```
   node 3 free: 186472 MB
   node distances:
   node   0   1   2   3
     0:  10  12  12  12
     1:  12  10  12  12
     2:  12  12  10  12
     3:  12  12  12  10


   ------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       791550672 kB


   ------------------------------------------------------------
10. who -r
   run-level 3 Sep 17 02:28


   ------------------------------------------------------------
11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)
   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@ irqbalance
                   issue-generator kbdsettings kdump kdump-early kdump-notify klog lvm2-monitor nscd
                   nvmefc-boot-connections nvmf-autoconnect postfix purge-kernels rollback rsyslog smartd
                   sshd systemd-pstore tuned wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
   enabled-runtime systemd-remount-fs
   disabled        autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                   chronyd console-getty cups cups-browsed debug-shell ebtables exchange-bmc-os-info
                   firewalld fsidd gpm grub2-once haveged hwloc-dump-hwdata ipmi ipmievd issue-add-ssh-keys
                   kexec-load lunmask man-db-create multipathd nfs nfs-blkmap rpcbind rpmconfigcheck rsyncd
                   serial-getty@ smartd_generate_opts snmpd snmptrapd systemd-boot-check-no-failures
                   systemd-confext systemd-network-generator systemd-sysext systemd-time-wait-sync
                   systemd-timesyncd udisks2 vncserver@
   indirect        systemd-userdbd wickedd


   ------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
   root=UUID=953cc22c-8cab-446e-9685-965f85d0088a
   cgroup_disable=memory,cpu,cpuacct,blkio,hugetlb,pids,cpuset,perf_event,freezer,devices,net_cls,net_prio
   mitigations=auto
   quiet
   security=apparmor
   crashkernel=372M,high
   crashkernel=72M,low


   ------------------------------------------------------------
14. cpupower frequency-info
   analyzing CPU 3:
     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

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

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Platform Notes (Continued)

```
15. tuned-adm active
  Current active profile: throughput-performance


  ------------------------------------------------------------
16. sysctl
  kernel.numa_balancing            1
  kernel.randomize_va_space        0
  vm.compaction_proactiveness      20
  vm.dirty_background_bytes        0
  vm.dirty_background_ratio        10
  vm.dirty_bytes                   0
  vm.dirty_expire_centisecs        3000
  vm.dirty_ratio                   8
  vm.dirty_writeback_centisecs     500
  vm.dirtytime_expire_seconds      43200
  vm.extfrag_threshold             500
  vm.min_unmapped_ratio            1
  vm.nr_hugepages                  0
  vm.nr_hugepages_mempolicy        0
  vm.nr_overcommit_hugepages       0
  vm.swappiness                    1
  vm.watermark_boost_factor        15000
  vm.watermark_scale_factor        10
  vm.zone_reclaim_mode             1


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


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


  ------------------------------------------------------------
19. OS release
  From /etc/*-release /etc/*-version
  os-release SUSE Linux Enterprise Server 15 SP6

  ------------------------------------------------------------
20. Disk information
SPEC is set to: /root/cpu2017F
  Filesystem     Type   Size  Used Avail Use% Mounted on
  /dev/nvme0n1p3 btrfs  2.5T  150G  2.4T   6% /root

  ------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:         Quanta Cloud Technology Inc.
    Product:        QuantaGrid S44NL-1U

  ------------------------------------------------------------
22. dmidecode
```

(Continued on next page)

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Platform Notes (Continued)

```
   Additional information from dmidecode 3.4 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:
     6x Samsung M321R8GA0PB2-CCPKC 64 GB 2 rank 6400, configured at 5200
     4x Samsung M321R8GA0PB2-CCPPC 64 GB 2 rank 6400, configured at 5200
     2x Samsung M321R8GA0PB2-CCPWC 64 GB 2 rank 6400, configured at 5200


   ------------------------------------------------------------
   23. BIOS
   (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:      American Megatrends International, LLC.
     BIOS Version:     3B02
     BIOS Date:        09/09/2024
     BIOS Revision:    5.35
     Firmware Revision: 5.2
```

Compiler Version Notes

```
==============================================================================================
C               | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
----------------------------------------------------------------------------------------------
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++             | 508.namd_r(base) 510.parest_r(base)
----------------------------------------------------------------------------------------------
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++, C          | 511.povray_r(base) 526.blender_r(base)
----------------------------------------------------------------------------------------------
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
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++, C, Fortran | 507.cactuBSSN_r(base)
----------------------------------------------------------------------------------------------
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
```

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SPEC CPU®2017 Floating Point Rate Result

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Quanta Cloud Technology
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QuantaGrid S44NL-1U
AMD EPYC 9755

SPECrate®2017_fp_base =   1060

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9050

Test Sponsor: Quanta Computer Inc.

Tested by: Quanta Computer Inc.

Test Date: Sep-2024

Hardware Availability: Oct-2024

Software Availability: Sep-2024

Compiler Version Notes (Continued)

```
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
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     | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
----------------------------------------------------------------------------------------------
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, C     | 521.wrf_r(base) 527.cam4_r(base)
----------------------------------------------------------------------------------------------
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
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
```

Benchmarks using both Fortran and C:
```
flang clang
```

Benchmarks using both C and C++:
```
clang++ clang
```

Benchmarks using Fortran, C, and C++:
```
clang++ clang flang
```

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

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Software Availability: Sep-2024

Base Portability Flags

503.bwaves_r: `-DSPEC_LP64`
507.cactuBSSN_r: `-DSPEC_LP64`
508.namd_r: `-DSPEC_LP64`
510.parest_r: `-DSPEC_LP64`
511.povray_r: `-DSPEC_LP64`
519.lbm_r: `-DSPEC_LP64`
521.wrf_r: `-DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64`
526.blender_r: `-funsigned-char -DSPEC_LP64`
527.cam4_r: `-DSPEC_CASE_FLAG -DSPEC_LP64`
538.imagick_r: `-DSPEC_LP64`
544.nab_r: `-DSPEC_LP64`
549.fotonik3d_r: `-DSPEC_LP64`
554.roms_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 -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 -lamdalloc
-lflang -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,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-extra-inliner
-O3 -march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-mllvm -unroll-threshold=100 -mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc
-lflang -ldl
```

Fortran benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-aggressive-gather=true
-Wl,-mllvm -Wl,-enable-masked-gather-sequence=false -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -flto -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm -lamdalloc
```

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Base Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-lflang -ldl
```

Benchmarks using both Fortran and C:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-aggressive-gather=true
-Wl,-mllvm -Wl,-enable-masked-gather-sequence=false -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 -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fepilog-vectorization-of-inductions
-lamdlibm -lamdalloc -lflang -ldl
```

Benchmarks using both C and C++:
```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-extra-inliner
-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 -mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000 -lamdlibm -lamdalloc -lflang
-ldl
```

Benchmarks using Fortran, C, and C++:
```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-extra-inliner
-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 -mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000 -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fepilog-vectorization-of-inductions
-lamdlibm -lamdalloc -lflang -ldl
```

Base Other Flags

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

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Quanta Cloud Technology
(Test Sponsor: Quanta Computer Inc.)

QuantaGrid S44NL-1U
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Software Availability: Sep-2024

Base Other Flags (Continued)

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

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

Benchmarks using both Fortran and C:
-Wno-unused-command-line-argument

Benchmarks using both C and C++:
-Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:
-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/Quanta-Computer-Inc-amd-speccpu-setting-v1_AMD_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/Quanta-Computer-Inc-amd-speccpu-setting-v1_AMD_Turin.xml

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

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