SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R6615 (AMD EPYC 9734 112-Core Processor)

$SPECrate^®2017_fp_base = $ 679

$SPECrate^®2017_fp_peak = $ Not Run
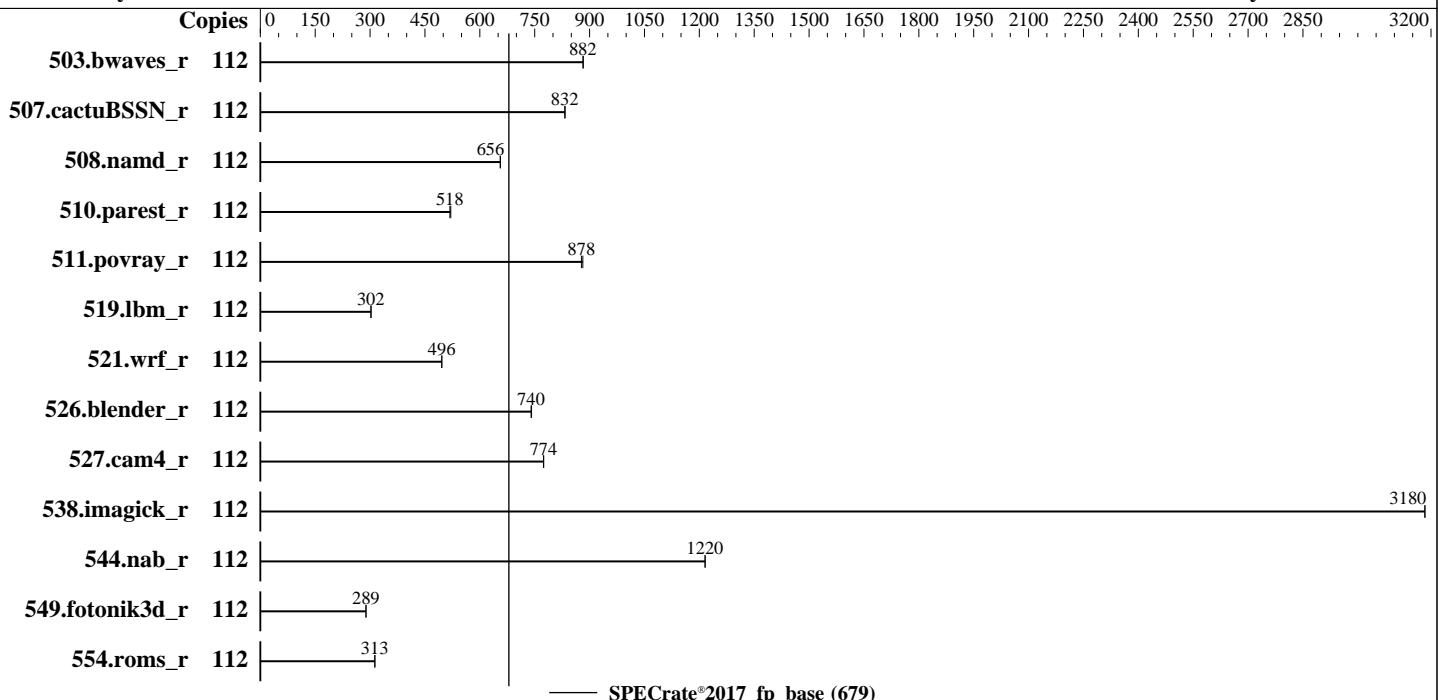
CPU2017 License: 6573
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

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

Benchmark	Copies	Result
503.bwaves_r	112	882
507.cactuBSSN_r	112	832
508.namd_r	112	656
510.parest_r	112	518
511.povray_r	112	878
519.lbm_r	112	302
521.wrf_r	112	496
526.blender_r	112	740
527.cam4_r	112	774
538.imagick_r	112	3180
544.nab_r	112	1220
549.fotonik3d_r	112	289
554.roms_r	112	313

SPECrate®2017_fp_base (679)

Hardware

CPU Name: AMD EPYC 9734
 Max MHz: 3000
 Nominal: 2200
Enabled: 112 cores, 1 chip
Orderable: 1 chip
Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 256 MB I+D on chip per chip, 16 MB shared / 7 cores
 Other: None
Memory: 768 GB (12 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 80 GB on tmpfs
Other: None

Software

OS: Ubuntu 22.04.1 LTS
 5.15.0-46-generic
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: No
Firmware: Version 1.4.1 released Apr-2023
File System: tmpfs
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	Copies	Base Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Peak Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	112	**1274**	**882**	1272	883									
507.cactuBSSN_r	112	170	833	**170**	**832**									
508.namd_r	112	162	656	**162**	**656**									
510.parest_r	112	**565**	**518**	563	521									
511.povray_r	112	297	882	**298**	**878**									
519.lbm_r	112	390	303	**391**	**302**									
521.wrf_r	112	506	496	**506**	**496**									
526.blender_r	112	**230**	**740**	230	741									
527.cam4_r	112	**253**	**774**	253	775									
538.imagick_r	112	87.5	3180	**87.5**	**3180**									
544.nab_r	112	155	1220	**155**	**1220**									
549.fotonik3d_r	112	**1511**	**289**	1511	289									
554.roms_r	112	568	313	**569**	**313**									

SPECrate®2017_fp_base =   679

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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,
```

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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 =
     "/mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1/amd_rate_aocc400_znver4_A_lib/lib:/mnt/ramdisk/cpu2017-1
     .1.9-aocc400-znver4-A1/amd_rate_aocc400_znver4_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.


 Benchmark run from a 80 GB ramdisk created with the cmd: "mount -t tmpfs -o size=80G tmpfs /mnt/ramdisk"
```

Platform Notes

```
 BIOS settings:
             DRAM Refresh Delay : Performance
         DIMM Self Healing on
    Uncorrectable Memory Error : Disabled
             Logical Processor : Disabled
     Virtualization Technology : Disabled
          L1 Stride Prefetcher: : Disabled
          NUMA Nodes per Socket : 4
       L3 Cache as NUMA Domain : Enabled

                System Profile : Custom
           Memory Patrol Scrub : Disabled
          PCI ASPM L1 Link
               Power Management : Disabled
            Determinism Slider : Power Determinism

 Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on amd-sut Wed May 17 20:12:31 2023

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

 ------------------------------------------------------------
 Table of contents
 ------------------------------------------------------------
  1. uname -a
```

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Platform Notes (Continued)

```
    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 (249.11-0ubuntu3.4)
   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. tuned-adm active
   17. sysctl
   18. /sys/kernel/mm/transparent_hugepage
   19. /sys/kernel/mm/transparent_hugepage/khugepaged
   20. OS release
   21. Disk information
   22. /sys/devices/virtual/dmi/id
   23. dmidecode
   24. BIOS
   ------------------------------------------------------------


   ------------------------------------------------------------
   1. uname -a
     Linux amd-sut 5.15.0-46-generic #49-Ubuntu SMP Thu Aug 4 18:03:25 UTC 2022 x86_64 x86_64 x86_64 GNU/Linux


   ------------------------------------------------------------
   2. w
      20:12:31 up  2:01,  1 user,  load average: 81.58, 104.48, 107.87
     USER      TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
     root      tty1     -                18:36    1:33m  2.94s  0.50s /bin/bash ./amd_rate_aocc400_znver4_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              3093858
     nofiles              1024
     vmemory(kbytes)      unlimited
     locks                unlimited
     rtprio               0


   ------------------------------------------------------------
   5. sysinfo process ancestry
    /sbin/init
    /bin/login -p --
    -bash
    /bin/bash ./DELL_rate.sh
```

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Platform Notes (Continued)

```
 /bin/bash ./dell-run-main.sh rate
 /bin/bash ./dell-run-main.sh rate
 /bin/bash ./dell-run-speccpu.sh rate --define DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-LogProcD=1
   --define DL-BIOS-adddcD=1 --define DL-BIOS-VirtD=1 --define DL-VERS=v4.5 --output_format html,pdf,txt
 python3 ./run_amd_rate_aocc400_znver4_A1.py
 /bin/bash ./amd_rate_aocc400_znver4_A1.sh
 runcpu --config amd_rate_aocc400_znver4_A1.cfg --tune base --reportable --iterations 2 --define
   DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-LogProcD=1 --define DL-BIOS-adddcD=1 --define
   DL-BIOS-VirtD=1 --define DL-VERS=v4.5 --output_format html,pdf,txt fprate
 runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune base --reportable --iterations 2 --define
   DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-LogProcD=1 --define DL-BIOS-adddcD=1 --define
   DL-BIOS-VirtD=1 --define DL-VERS=v4.5 --output_format html,pdf,txt --nopower --runmode rate --tune base
   --size test:train:refrate fprate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.002/templogs/preenv.fprate.002.0.log --lognum 002.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1

 ------------------------------------------------------------
6. /proc/cpuinfo
    model name      : AMD EPYC 9734 112-Core Processor
    vendor_id       : AuthenticAMD
    cpu family      : 25
    model           : 160
    stepping        : 2
    microcode       : 0xaa00208
    bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
    TLB size        : 3584 4K pages
    cpu cores       : 112
    siblings        : 112
    1 physical ids (chips)
    112 processors (hardware threads)
    physical id 0: core ids
    0-6,16-22,32-38,48-54,64-70,80-86,96-102,112-118,128-134,144-150,160-166,176-182,192-198,208-214,224-230,
    240-246
    physical id 0: apicids
    0-6,16-22,32-38,48-54,64-70,80-86,96-102,112-118,128-134,144-150,160-166,176-182,192-198,208-214,224-230,
    240-246
  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):                 112
    On-line CPU(s) list:    0-111
    Vendor ID:              AuthenticAMD
    Model name:             AMD EPYC 9734 112-Core Processor
    CPU family:             25
    Model:                  160
    Thread(s) per core:     1
    Core(s) per socket:     112
    Socket(s):              1
    Stepping:               2
    Frequency boost:        enabled
    CPU max MHz:            3000.0000
```

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Platform Notes (Continued)

```
  CPU min MHz:                    400.0000
  BogoMIPS:                       4401.11
  Flags:                          fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                                  clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm
                                  constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf rapl
                                  pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe
                                  popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy
                                  abm sse4a misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext
                                  perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3
                                  invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsgsbase bmi1
                                  avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap
                                  avx512ifma clflushopt clwb avx512cd sha_ni avx512bw avx512vl xsaveopt
                                  xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
                                  avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd amd_ppin 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 overflow_recov succor smca fsrm flush_l1d
  Virtualization:                 AMD-V
  L1d cache:                      3.5 MiB (112 instances)
  L1i cache:                      3.5 MiB (112 instances)
  L2 cache:                       112 MiB (112 instances)
  L3 cache:                       256 MiB (16 instances)
  NUMA node(s):                   16
  NUMA node0 CPU(s):              0-6
  NUMA node1 CPU(s):              7-13
  NUMA node2 CPU(s):              56-62
  NUMA node3 CPU(s):              63-69
  NUMA node4 CPU(s):              28-34
  NUMA node5 CPU(s):              35-41
  NUMA node6 CPU(s):              84-90
  NUMA node7 CPU(s):              91-97
  NUMA node8 CPU(s):              42-48
  NUMA node9 CPU(s):              49-55
  NUMA node10 CPU(s):             98-104
  NUMA node11 CPU(s):             105-111
  NUMA node12 CPU(s):             14-20
  NUMA node13 CPU(s):             21-27
  NUMA node14 CPU(s):             70-76
  NUMA node15 CPU(s):             77-83
  Vulnerability Itlb multihit:    Not affected
  Vulnerability L1tf:             Not affected
  Vulnerability Mds:              Not affected
  Vulnerability Meltdown:         Not affected
  Vulnerability Mmio stale data:  Not affected
  Vulnerability Retbleed:         Not affected
  Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
  Vulnerability Spectre v1:       Mitigation; usercopy/swapgs barriers and __user pointer sanitization
  Vulnerability Spectre v2:       Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP disabled, RSB
                                  filling
  Vulnerability Srbds:            Not affected
  Vulnerability Tsx async abort:  Not affected

 From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE         LEVEL  SETS PHY-LINE COHERENCY-SIZE
      L1d       32K     3.5M    8 Data          1      64     1            64
      L1i       32K     3.5M    8 Instruction   1      64     1            64
      L2         1M     112M    8 Unified       2    2048     1            64
      L3        16M     256M   16 Unified       3   16384     1            64
```

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Platform Notes (Continued)

```
        -------------------------------------------------------------
        8. numactl --hardware
        NOTE: a numactl 'node' might or might not correspond to a physical chip.
          available: 16 nodes (0-15)
          node 0 cpus: 0-6
          node 0 size: 47928 MB
          node 0 free: 47453 MB
          node 1 cpus: 7-13
          node 1 size: 48382 MB
          node 1 free: 47924 MB
          node 2 cpus: 56-62
          node 2 size: 48346 MB
          node 2 free: 47889 MB
          node 3 cpus: 63-69
          node 3 size: 48380 MB
          node 3 free: 47932 MB
          node 4 cpus: 28-34
          node 4 size: 48382 MB
          node 4 free: 47956 MB
          node 5 cpus: 35-41
          node 5 size: 48382 MB
          node 5 free: 47968 MB
          node 6 cpus: 84-90
          node 6 size: 48382 MB
          node 6 free: 47972 MB
          node 7 cpus: 91-97
          node 7 size: 48380 MB
          node 7 free: 47961 MB
          node 8 cpus: 42-48
          node 8 size: 48382 MB
          node 8 free: 47923 MB
          node 9 cpus: 49-55
          node 9 size: 48382 MB
          node 9 free: 47956 MB
          node 10 cpus: 98-104
          node 10 size: 48382 MB
          node 10 free: 47960 MB
          node 11 cpus: 105-111
          node 11 size: 48380 MB
          node 11 free: 47948 MB
          node 12 cpus: 14-20
          node 12 size: 48382 MB
          node 12 free: 44397 MB
          node 13 cpus: 21-27
          node 13 size: 48382 MB
          node 13 free: 47965 MB
          node 14 cpus: 70-76
          node 14 size: 48382 MB
          node 14 free: 47955 MB
          node 15 cpus: 77-83
          node 15 size: 48338 MB
          node 15 free: 47908 MB
          node distances:
          node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
            0:  10  11  11  11  12  12  12  12  12  12  12  12  12  12  12  12
            1:  11  10  11  11  12  12  12  12  12  12  12  12  12  12  12  12
            2:  11  11  10  11  12  12  12  12  12  12  12  12  12  12  12  12
            3:  11  11  11  10  12  12  12  12  12  12  12  12  12  12  12  12
            4:  12  12  12  12  10  11  11  11  12  12  12  12  12  12  12  12
            5:  12  12  12  12  11  10  11  11  12  12  12  12  12  12  12  12
```

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Platform Notes (Continued)

```
   6:  12  12  12  12  11  11  10  11  12  12  12  12  12  12  12  12
   7:  12  12  12  12  11  11  11  10  12  12  12  12  12  12  12  12
   8:  12  12  12  12  12  12  12  12  10  11  11  11  12  12  12  12
   9:  12  12  12  12  12  12  12  12  11  10  11  11  12  12  12  12
  10:  12  12  12  12  12  12  12  12  11  11  10  11  12  12  12  12
  11:  12  12  12  12  12  12  12  12  11  11  11  10  12  12  12  12
  12:  12  12  12  12  12  12  12  12  12  12  12  12  10  11  11  11
  13:  12  12  12  12  12  12  12  12  12  12  12  12  11  10  11  11
  14:  12  12  12  12  12  12  12  12  12  12  12  12  11  11  10  11
  15:  12  12  12  12  12  12  12  12  12  12  12  12  11  11  11  10

  -------------------------------------------------------------
  9. /proc/meminfo
     MemTotal:       792141556 kB


  -------------------------------------------------------------
  10. who -r
    run-level 3 May 17 18:12


  -------------------------------------------------------------
  11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.4)
    Default Target  Status
    multi-user      degraded


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


  -------------------------------------------------------------
  13. Services, from systemctl list-unit-files
    STATE             UNIT FILES
    enabled           blk-availability console-setup cron dmesg e2scrub_reap finalrd getty@ gpu-manager
                      grub-common grub-initrd-fallback irqbalance keyboard-setup lm-sensors networkd-dispatcher
                      open-iscsi open-vm-tools pollinate rsyslog secureboot-db setvtrgb ssh systemd-networkd
                      systemd-pstore systemd-resolved systemd-timesyncd thermald tuned ua-reboot-cmds
                      ubuntu-advantage udisks2 vgauth wpa_supplicant
    enabled-runtime   netplan-ovs-cleanup systemd-fsck-root systemd-networkd-wait-online systemd-remount-fs
    disabled          ModemManager apparmor console-getty debug-shell iscsid lvm2-monitor lxd-agent multipathd
                      nftables rsync serial-getty@ systemd-boot-check-no-failures systemd-network-generator
                      systemd-sysext systemd-time-wait-sync ufw upower wpa_supplicant-nl80211@
                      wpa_supplicant-wired@ wpa_supplicant@
    generated         apport
    indirect          uuidd
    masked            NetworkManager NetworkManager-dispatcher NetworkManager-wait-online 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-5.15.0-46-generic
    root=UUID=593ab29a-c8fe-4d75-821a-b60d5c945311
    ro


  -------------------------------------------------------------
  15. cpupower frequency-info
    analyzing CPU 0:
      current policy: frequency should be within 400 MHz and 3.00 GHz.
                      The governor "performance" may decide which speed to use
                      within this range.
      boost state support:
```

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Platform Notes (Continued)

```
        Supported: yes
        Active: yes
        Boost States: 0
        Total States: 3
        Pstate-P0:  2200MHz


    -------------------------------------------------------------
    16. tuned-adm active
      Current active profile: latency-performance


    -------------------------------------------------------------
    17. sysctl
      kernel.numa_balancing            1
      kernel.randomize_va_space        0
      vm.compaction_proactiveness      20
      vm.dirty_background_bytes        0
      vm.dirty_background_ratio        3
      vm.dirty_bytes                   0
      vm.dirty_expire_centisecs        3000
      vm.dirty_ratio                   8
      vm.dirty_writeback_centisecs     500
      vm.dirtytime_expire_seconds      43200
      vm.extfrag_threshold             500
      vm.min_unmapped_ratio            1
      vm.nr_hugepages                  0
      vm.nr_hugepages_mempolicy        0
      vm.nr_overcommit_hugepages       0
      vm.swappiness                    1
      vm.watermark_boost_factor        15000
      vm.watermark_scale_factor        10
      vm.zone_reclaim_mode             1


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


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


    -------------------------------------------------------------
    20. OS release
      From /etc/*-release /etc/*-version
      os-release Ubuntu 22.04.1 LTS


    -------------------------------------------------------------
    21. Disk information
    SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1
      Filesystem      Type   Size  Used Avail Use% Mounted on
      tmpfs           tmpfs  80G   3.5G   77G   5% /mnt/ramdisk
```

(Continued on next page)

Dell Inc.

SPECrate®2017_fp_base =   679

PowerEdge R6615 (AMD EPYC 9734 112-Core Processor)

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 6573		**Test Date:**	May-2023
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Jun-2023
Tested by:	Dell Inc.	**Software Availability:**	Nov-2022

Platform Notes (Continued)

```
     ------------------------------------------------------------
 22. /sys/devices/virtual/dmi/id
     Vendor:          Dell Inc.
     Product:         PowerEdge R6615
     Product Family: PowerEdge
     Serial:          GLM4030


     ------------------------------------------------------------
 23. 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:
     12x 80AD000080AD HMCG94MEBRA109N 64 GB 2 rank 4800



     ------------------------------------------------------------
 24. BIOS
 (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:         Dell Inc.
     BIOS Version:        1.4.1
     BIOS Date:           04/21/2023
     BIOS Revision:       1.4
```

Compiler Version Notes

```
==============================================================================
C               | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------


==============================================================================
C++             | 508.namd_r(base) 510.parest_r(base)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------


==============================================================================
C++, C          | 511.povray_r(base) 526.blender_r(base)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------


==============================================================================
```

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SPEC CPU®2017 Floating Point Rate Result

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Dell Inc.

PowerEdge R6615 (AMD EPYC 9734 112-Core Processor)

SPECrate®2017_fp_base =   679

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 6573
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

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

Compiler Version Notes (Continued)

```
C++, C, Fortran | 507.cactuBSSN_r(base)
-------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
-------------------------------------------------------------------------------


===============================================================================
Fortran        | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
-------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
-------------------------------------------------------------------------------


===============================================================================
Fortran, C     | 521.wrf_r(base) 527.cam4_r(base)
-------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
-------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
clang
```

C++ benchmarks:
```
clang++
```

Fortran benchmarks:
```
flang
```

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

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

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

Dell Inc.

PowerEdge R6615 (AMD EPYC 9734 112-Core Processor)

SPECrate®2017_fp_base =   679

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 6573	**Test Date:** May-2023
Test Sponsor: Dell Inc.	**Hardware Availability:** Jun-2023
Tested by: Dell Inc.	**Software Availability:** Nov-2022

Base Compiler Invocation (Continued)

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

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

C++ benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -mllvm -unroll-threshold=100
-finline-aggressive -mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc
-lflang
```

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Dell Inc.

PowerEdge R6615 (AMD EPYC 9734 112-Core Processor)

SPECrate®2017_fp_base =   679

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 6573	**Test Date:** May-2023
Test Sponsor: Dell Inc.	**Hardware Availability:** Jun-2023
Tested by: Dell Inc.	**Software Availability:** Nov-2022

Base Optimization Flags (Continued)

Fortran benchmarks:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -Kieee -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm -lamdalloc
-lflang
```

Benchmarks using both Fortran and C:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -Kieee -Mrecursive -funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -lflang
```

Benchmarks using both C and C++:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -lamdlibm -lamdalloc -lflang
```

Benchmarks using Fortran, C, and C++:
```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -Kieee -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc -lflang
```

SPEC CPU®2017 Floating Point Rate Result

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Dell Inc.

PowerEdge R6615 (AMD EPYC 9734 112-Core Processor)

SPECrate®2017_fp_base =   679

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 6573
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Base Other Flags

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

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/aocc400-flags.html
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.1.html
```

You can also download the XML flags sources by saving the following links:
```
http://www.spec.org/cpu2017/flags/aocc400-flags.xml
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.1.xml
```

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

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