# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

PowerEdge R6615 (AMD EPYC 9534 64-Core Processor)

$SPECspeed®2017\_fp\_base = 286$

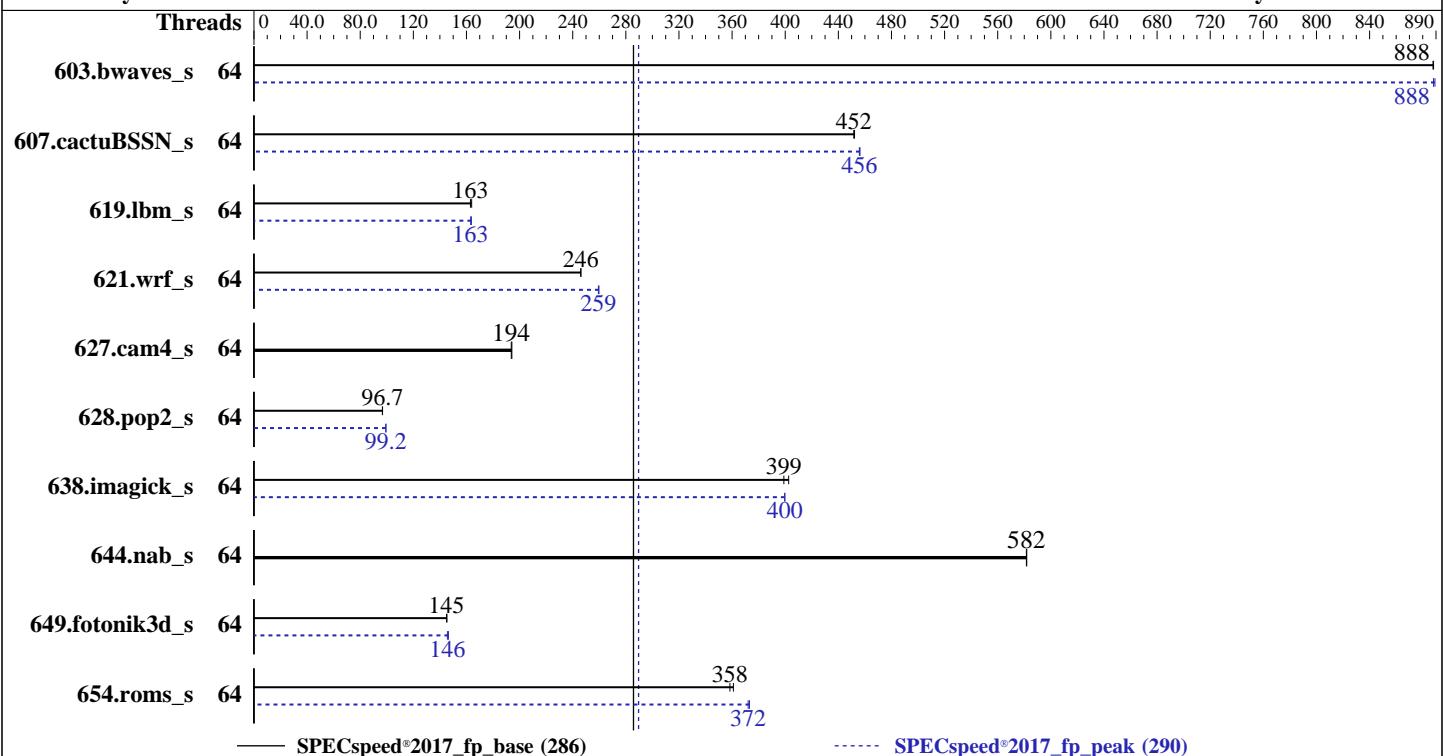$SPECspeed®2017\_fp\_peak = 290$

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

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



| Threads | | |
|---|---|---|
| 603.bwaves_s | 64 | 888 / 888 |
| 607.cactuBSSN_s | 64 | 452 / 456 |
| 619.lbm_s | 64 | 163 / 163 |
| 621.wrf_s | 64 | 246 / 259 |
| 627.cam4_s | 64 | 194 |
| 628.pop2_s | 64 | 96.7 / 99.2 |
| 638.imagick_s | 64 | 399 / 400 |
| 644.nab_s | 64 | 582 |
| 649.fotonik3d_s | 64 | 145 / 146 |
| 654.roms_s | 64 | 358 / 372 |

SPECspeed®2017_fp_base (286)      SPECspeed®2017_fp_peak (290)

## Hardware

CPU Name: AMD EPYC 9534
Max MHz: 3700
Nominal: 2450
Enabled: 64 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, 32 MB shared / 8 cores
Other: None
Memory: 768 GB (12 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 60 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: Yes
Firmware: Version 1.4.6 released Jul-2023
File System: tmpfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: None
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

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

# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

PowerEdge R6615 (AMD EPYC 9534 64-Core Processor)

$SPECspeed®2017\_fp\_base = 286$

$SPECspeed®2017\_fp\_peak = 290$

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

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

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 603.bwaves_s | 64 | 66.4 | 888 | **66.5** | **888** | | | 64 | **66.4** | **888** | 66.3 | 889 | | |
| 607.cactuBSSN_s | 64 | 36.9 | 452 | **36.9** | **452** | | | 64 | 36.5 | 456 | **36.6** | **456** | | |
| 619.lbm_s | 64 | **32.1** | **163** | 32.0 | 164 | | | 64 | **32.1** | **163** | 32.0 | 164 | | |
| 621.wrf_s | 64 | **53.8** | **246** | 53.7 | 246 | | | 64 | **51.0** | **259** | 50.9 | 260 | | |
| 627.cam4_s | 64 | 45.6 | 194 | **45.7** | **194** | | | 64 | 45.6 | 194 | **45.7** | **194** | | |
| 628.pop2_s | 64 | 123 | 96.8 | **123** | **96.7** | | | 64 | 119 | 99.4 | **120** | **99.2** | | |
| 638.imagick_s | 64 | 35.8 | 403 | **36.2** | **399** | | | 64 | **36.1** | **400** | 36.1 | 400 | | |
| 644.nab_s | 64 | **30.0** | **582** | 30.0 | 582 | | | 64 | **30.0** | **582** | 30.0 | 582 | | |
| 649.fotonik3d_s | 64 | **62.9** | **145** | 62.7 | 145 | | | 64 | **62.6** | **146** | 62.3 | 146 | | |
| 654.roms_s | 64 | 43.6 | 361 | **43.9** | **358** | | | 64 | **42.3** | **372** | 42.2 | 373 | | |
| **SPECspeed®2017_fp_base =** | **286** | | | | | | | | | | | | | |
| **SPECspeed®2017_fp_peak =** | **290** | | | | | | | | | | | | | |

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Compiler Notes

```
The AMD64 AOCC Compiler Suite is available at
http://developer.amd.com/amd-aocc/
```

## Submit Notes

```
The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.
```

## Operating System Notes

```
'ulimit -s unlimited' was used to set environment stack size limit
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage,
'sysctl -w vm.zone_reclaim_mode=1' run as root.
To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run
variability, 'sysctl -w kernel.randomize_va_space=0' run as root.

To enable Transparent Hugepages (THP) for all allocations,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
To always enable THP for peak runs of:
603.bwaves_s, 607.cactuBSSN_s, 619.lbm_s, 627.cam4_s, 628.pop2_s, 638.imagick_s, 644.nab_s, 649.fotonik3d_s:
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled; echo always > /sys/kernel/mm/transparent_hugepage/defrag'
```

**(Continued on next page)**

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

# Dell Inc.

PowerEdge R6615 (AMD EPYC 9534 64-Core Processor)

SPECspeed®2017_fp_base = 286

SPECspeed®2017_fp_peak = 290

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

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

## Operating System Notes (Continued)

```
run as root.
To disable THP for peak runs of 621.wrf_s:
'echo never > /sys/kernel/mm/transparent_hugepage/enabled; echo always > /sys/kernel/mm/transparent_hugepage/defrag'
run as root.
To enable THP only on request for peak runs of 654.roms_s:
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled; echo madvise > /sys/kernel/mm/transparent_hugepage/defrag'
run as root.
```

## Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-63"
LD_LIBRARY_PATH = "/mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1.1/amd_speed_aocc400_znver4_A_lib/lib:"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "oversize_threshold:0,retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "64"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 638.imagick_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 649.fotonik3d_s peak run:
GOMP_CPU_AFFINITY = "0-63"
PGHPF_ZMEM = "yes"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0 32 1 33 2 34 3 35 4 36 5 37 6 38 7 39 8 40 9 41 10 42 11 43 12 44 13 45 14 46 15 47
        16 48 17 49 18 50 19 51 20 52 21 53 22 54 23 55 24 56 25 57 26 58 27 59 28 60 29 61 30 62 31 63"
```

## 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.
```

**(Continued on next page)**

# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

PowerEdge R6615 (AMD EPYC 9534 64-Core Processor)

$SPECspeed®2017\_fp\_base = 286$

$SPECspeed®2017\_fp\_peak = 290$

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

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

## General Notes (Continued)

```
Benchmark run from a 60 GB ramdisk created with the cmd: "mount -t tmpfs -o size=60G 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
         NUMA Nodes per Socket : 1

                System Profile : Custom
                      C-States : Disabled
           Memory Patrol Scrub : Disabled
           PCI ASPM L1 Link
              Power Management : Disabled
           Determinism Slider : Power Determinism
     Algorithm Performance
        Boost Disable (ApbDis) : Enabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1.1/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on amd-sut Wed Nov 22 08:45:42 2023

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 (249.11-0ubuntu3.4)
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
---------------------------------------------------------
```

(Continued on next page)

## Dell Inc.

PowerEdge R6615 (AMD EPYC 9534 64-Core Processor)

$SPECspeed®2017\_fp\_base = 286$

$SPECspeed®2017\_fp\_peak = 290$

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

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

## Platform Notes (Continued)

```
   --------------------------------------------------------------
   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
      08:45:42 up  2:24,  1 user,  load average: 3.58, 5.17, 3.27
      USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
      root     tty1     -                06:24    2:20m  2.00s  0.40s /bin/bash ./amd_speed_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               3092406
     nofiles               1024
     vmemory(kbytes)       unlimited
     locks                 unlimited
     rtprio                0

   --------------------------------------------------------------
   5. sysinfo process ancestry
    /sbin/init
    /bin/login -p --
    -bash
    /bin/bash ./DELL_speed.sh
    /bin/bash ./dell-run-main.sh speed
    /bin/bash ./dell-run-main.sh speed
    /bin/bash ./dell-run-speccpu.sh speed --define DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-adddcD=1
      --define DL-VERS=v4.8.1 --output_format html,pdf,txt
    python3 ./run_amd_speed_aocc400_znver4_A1.py
    /bin/bash ./amd_speed_aocc400_znver4_A1.sh
    runcpu --config amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 2 --define
      DL-BIOS-NPS=1 --define DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-adddcD=1 --define DL-VERS=v4.8.1
      --output_format html,pdf,txt fpspeed
    runcpu --configfile amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 2 --define
      DL-BIOS-NPS=1 --define DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-adddcD=1 --define DL-VERS=v4.8.1
      --output_format html,pdf,txt --nopower --runmode speed --tune base:peak --size test:train:refspeed fpspeed
      --nopreenv --note-preenv --logfile $SPEC/tmp/CPU2017.002/templogs/preenv.fpspeed.002.0.log --lognum 002.0
      --from_runcpu 2
    specperl $SPEC/bin/sysinfo
    $SPEC = /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1.1

   --------------------------------------------------------------
   6. /proc/cpuinfo
       model name      : AMD EPYC 9534 64-Core Processor
       vendor_id       : AuthenticAMD
       cpu family      : 25
       model           : 17
       stepping        : 1
       microcode       : 0xa10113e
```

(Continued on next page)

# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

PowerEdge R6615 (AMD EPYC 9534 64-Core Processor)

SPECspeed®2017_fp_base = 286

SPECspeed®2017_fp_peak = 290

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

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

## Platform Notes (Continued)

```
      bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
      TLB size        : 3584 4K pages
      cpu cores       : 64
      siblings        : 64
      1 physical ids (chips)
      64 processors (hardware threads)
      physical id 0: core ids 0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119
      physical id 0: apicids 0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119
    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):                  64
      On-line CPU(s) list:     0-63
      Vendor ID:               AuthenticAMD
      Model name:              AMD EPYC 9534 64-Core Processor
      CPU family:              25
      Model:                   17
      Thread(s) per core:      1
      Core(s) per socket:      64
      Socket(s):               1
      Stepping:                1
      BogoMIPS:                4901.04
      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:               2 MiB (64 instances)
      L1i cache:               2 MiB (64 instances)
      L2 cache:                64 MiB (64 instances)
      L3 cache:                256 MiB (8 instances)
      NUMA node(s):            1
      NUMA node0 CPU(s):       0-63
      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
```

**(Continued on next page)**

## Dell Inc.

PowerEdge R6615 (AMD EPYC 9534 64-Core Processor)

SPECspeed®2017_fp_base = 286

SPECspeed®2017_fp_peak = 290

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

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

## Platform Notes (Continued)

```
  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       2M    8 Data            1    64        1             64
    L1i       32K       2M    8 Instruction     1    64        1             64
    L2         1M      64M    8 Unified         2  2048        1             64
    L3        32M     256M   16 Unified         3 32768        1             64

------------------------------------------------------------
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
  available: 1 nodes (0)
  node 0 cpus: 0-63
  node 0 size: 773212 MB
  node 0 free: 768002 MB
  node distances:
  node   0
    0:  10

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       791769844 kB

------------------------------------------------------------
10. who -r
   run-level 3 Nov 22 06:23

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

**(Continued on next page)**

## Dell Inc.

PowerEdge R6615 (AMD EPYC 9534 64-Core Processor)

SPECspeed®2017_fp_base = 286

SPECspeed®2017_fp_peak = 290

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

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

## Platform Notes (Continued)

```
----------------------------------------------------------
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:
     Unable to determine current policy
     boost state support:
       Supported: yes
       Active: yes
       Boost States: 0
       Total States: 3
       Pstate-P0:  2450MHz

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

----------------------------------------------------------
17. sysctl
   kernel.numa_balancing              0
   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
```

*(Continued on next page)*

## Dell Inc.

PowerEdge R6615 (AMD EPYC 9534 64-Core Processor)

SPECspeed®2017_fp_base = 286

SPECspeed®2017_fp_peak = 290

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

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

## Platform Notes (Continued)

```
     ----------------------------------------------------------
     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-A1.1
       Filesystem      Type   Size  Used Avail Use% Mounted on
       tmpfs           tmpfs   60G  3.4G   57G   6% /mnt/ramdisk

     ----------------------------------------------------------
     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:    1.4.6
         BIOS Date:       07/06/2023
         BIOS Revision:   1.4
```

## Compiler Version Notes

```
==============================================================================
C               | 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------

==============================================================================
C++, C, Fortran | 607.cactuBSSN_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
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)
```

**(Continued on next page)**

## Dell Inc.

PowerEdge R6615 (AMD EPYC 9534 64-Core Processor)

SPECspeed®2017_fp_base = 286

SPECspeed®2017_fp_peak = 290

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

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

## Compiler Version Notes (Continued)

```
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------

==============================================================================
Fortran        | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------

==============================================================================
Fortran, C     | 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
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
```

Fortran benchmarks:
```
flang
```

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

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

## Base Portability Flags

603.bwaves_s: `-DSPEC_LP64`
607.cactuBSSN_s: `-DSPEC_LP64`
619.lbm_s: `-DSPEC_LP64`
621.wrf_s: `-DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64`
627.cam4_s: `-DSPEC_CASE_FLAG -DSPEC_LP64`

**(Continued on next page)**

## Dell Inc.

PowerEdge R6615 (AMD EPYC 9534 64-Core Processor)

SPECspeed®2017_fp_base = 286

SPECspeed®2017_fp_peak = 290

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

# Base Portability Flags (Continued)

628.pop2_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

# Base Optimization Flags

C benchmarks:
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang

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

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 -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang

Benchmarks using Fortran, C, and C++:
-m64 -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 -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3

**(Continued on next page)**

## Dell Inc.

PowerEdge R6615 (AMD EPYC 9534 64-Core Processor)

$SPECspeed^{®}2017\_fp\_base = 286$

$SPECspeed^{®}2017\_fp\_peak = 290$

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

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

# Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
```
-DSPEC_OPENMP -zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

# Base Other Flags

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

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

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

Benchmarks using Fortran, C, and C++:
```
-Wno-return-type -Wno-unused-command-line-argument
```

# Peak Compiler Invocation

C benchmarks:
```
clang
```

Fortran benchmarks:
```
flang
```

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

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

# Peak Portability Flags

```
Same as Base Portability Flags
```

## Dell Inc.

SPECspeed®2017_fp_base = 286

PowerEdge R6615 (AMD EPYC 9534 64-Core Processor)

SPECspeed®2017_fp_peak = 290

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

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

# Peak Optimization Flags

C benchmarks:

```
619.lbm_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

```
638.imagick_s: Same as 619.lbm_s
```

```
644.nab_s: basepeak = yes
```

Fortran benchmarks:

```
603.bwaves_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP
-Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math
-fopenmp -Mrecursive -mllvm -reduce-array-computations=3
-fvector-transform -fscalar-transform -fopenmp=libomp
-lomp -lamdlibm -lamdalloc -lflang
```

```
649.fotonik3d_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP
-Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math
-fopenmp -flto -Mrecursive
-mllvm -reduce-array-computations=3 -zopt -fopenmp=libomp
-lomp -lamdlibm -lamdalloc -lflang
```

```
654.roms_s: Same as 603.bwaves_s
```

Benchmarks using both Fortran and C:

```
621.wrf_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-O3 -Mrecursive -funroll-loops -mllvm -lsr-in-nested-loop
```

**(Continued on next page)**

## Dell Inc.

PowerEdge R6615 (AMD EPYC 9534 64-Core Processor)

$SPECspeed®2017\_fp\_base = 286$

$SPECspeed®2017\_fp\_peak = 290$

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

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

# Peak Optimization Flags (Continued)

621.wrf_s (continued):
```
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

627.cam4_s: basepeak = yes

628.pop2_s: ```-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-Mrecursive -fvector-transform -fscalar-transform
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

Benchmarks using Fortran, C, and C++:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=9
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -finline-aggressive -mllvm -unroll-threshold=100
-Mrecursive -fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

# Peak Other Flags

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

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

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

Benchmarks using Fortran, C, and C++:
```
-Wno-return-type -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_A1.1.html
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.2.html

# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

PowerEdge R6615 (AMD EPYC 9534 64-Core Processor)

$SPECspeed®2017\_fp\_base = 286$

$SPECspeed®2017\_fp\_peak = 290$

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

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

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/aocc400-flags_A1.1.xml
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.2.xml

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

Tested with SPEC CPU®2017 v1.1.9 on 2023-11-22 03:45:42-0500.
Report generated on 2024-02-29 17:33:56 by CPU2017 PDF formatter v6716.
Originally published on 2024-02-29.