



# SPEC CPU®2017 Floating Point Speed Result

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## Dell Inc.

SPECspeed®2017\_fp\_base = 293

PowerEdge R6625 (AMD EPYC 9274F 24-Core Processor)

SPECspeed®2017\_fp\_peak = Not Run

CPU2017 License: 6573

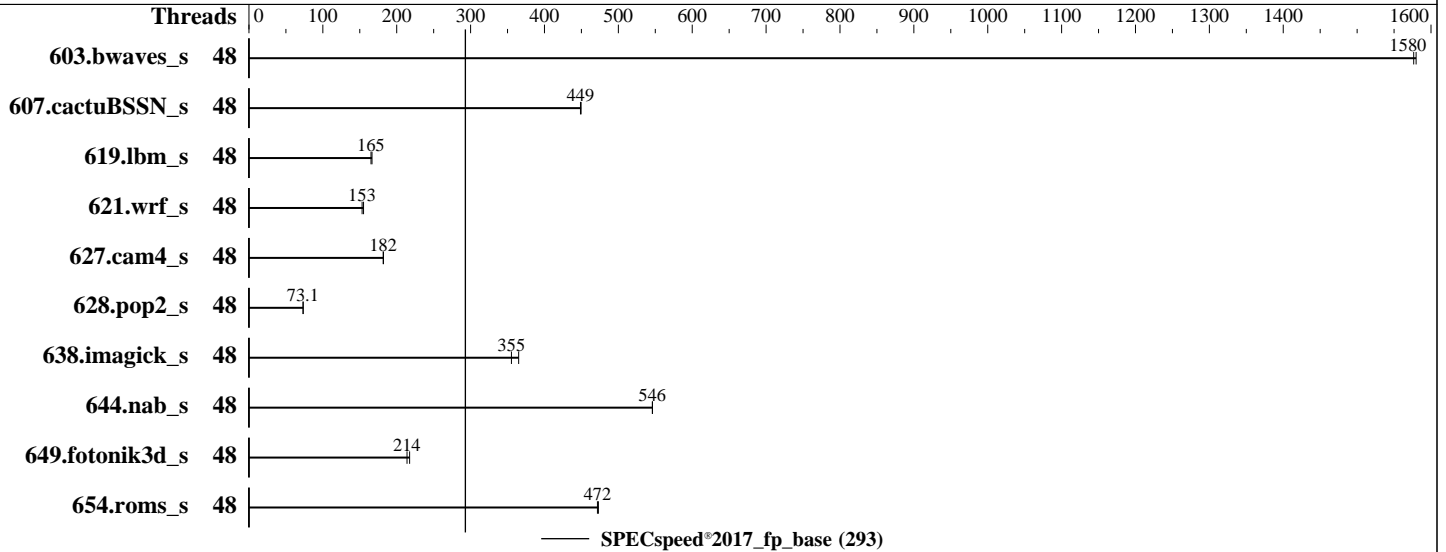
Test Date: Mar-2023

Test Sponsor: Dell Inc.

Hardware Availability: Mar-2023

Tested by: Dell Inc.

Software Availability: Nov-2022



### Hardware

CPU Name: AMD EPYC 9274F  
 Max MHz: 4300  
 Nominal: 4050  
 Enabled: 48 cores, 2 chips  
 Orderable: 1,2 chips  
 Cache L1: 32 KB I + 32 KB D on chip per core  
 L2: 1 MB I+D on chip per core  
 L3: 256 MB I+D on chip per chip, 32 MB shared / 3 cores  
 Other: None  
 Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-4800B-R)  
 Storage: 125 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 1.3.8 released Mar-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.



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## Results Table

| Benchmark       | Base    |                    |                   |                    |                    |         | Peak  |         |         |       |         |       |         |       |
|-----------------|---------|--------------------|-------------------|--------------------|--------------------|---------|-------|---------|---------|-------|---------|-------|---------|-------|
|                 | Threads | Seconds            | Ratio             | Seconds            | Ratio              | Seconds | Ratio | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 603.bwaves_s    | 48      | 37.3               | 1580              | <b><u>37.4</u></b> | <b><u>1580</u></b> |         |       |         |         |       |         |       |         |       |
| 607.cactuBSSN_s | 48      | <b><u>37.1</u></b> | <b><u>449</u></b> | 37.1               | 450                |         |       |         |         |       |         |       |         |       |
| 619.lbm_s       | 48      | 31.4               | 167               | <b><u>31.7</u></b> | <b><u>165</u></b>  |         |       |         |         |       |         |       |         |       |
| 621.wrf_s       | 48      | 85.3               | 155               | <b><u>86.4</u></b> | <b><u>153</u></b>  |         |       |         |         |       |         |       |         |       |
| 627.cam4_s      | 48      | 48.7               | 182               | <b><u>48.8</u></b> | <b><u>182</u></b>  |         |       |         |         |       |         |       |         |       |
| 628.pop2_s      | 48      | 162                | 73.5              | <b><u>162</u></b>  | <b><u>73.1</u></b> |         |       |         |         |       |         |       |         |       |
| 638.imagick_s   | 48      | 39.5               | 365               | <b><u>40.6</u></b> | <b><u>355</u></b>  |         |       |         |         |       |         |       |         |       |
| 644.nab_s       | 48      | 32.0               | 546               | <b><u>32.0</u></b> | <b><u>546</u></b>  |         |       |         |         |       |         |       |         |       |
| 649.fotonik3d_s | 48      | 41.9               | 217               | <b><u>42.6</u></b> | <b><u>214</u></b>  |         |       |         |         |       |         |       |         |       |
| 654.roms_s      | 48      | 33.3               | 473               | <b><u>33.4</u></b> | <b><u>472</u></b>  |         |       |         |         |       |         |       |         |       |

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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,  
'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'  
run as root.

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## Operating System Notes (Continued)

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 = "0-47"  
LD\_LIBRARY\_PATH = "/mnt/ramdisk/cpu2017-1.1.9-aocc400-B1e/amd\_speed\_aocc400\_genoa\_B\_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 = "48"

## 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 125 GB ramdisk created with the cmd: "mount -t tmpfs -o size=125G 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  
L3 Cache as NUMA Domain : Enabled  
  
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-B1e/bin/sysinfo  
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197

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## Platform Notes (Continued)

running on genoa-sut Sun Mar 26 03:21:21 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
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- 9. /proc/meminfo
- 10. who -r
- 11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.4)
- 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 genoa-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
03:21:21 up 5 min, 1 user, load average: 0.16, 0.53, 0.34
USER      TTY      FROM          LOGIN@      IDLE        JCPU        PCPU        WHAT
root      tty1    -             27Nov61    25.00s     1.28s     0.29s /bin/bash ./amd_speed_aocc400_genoa_B1.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            6190502
nofiles            1024
vmemory(kbytes)    unlimited
locks              unlimited
rtprio            0
```

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## Platform Notes (Continued)

```

-----
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-specspeed.sh --output_format csv,html,pdf,txt -define
    Dell-BIOS-inc=Dell-BIOS_EPYC-4.inc --define Dell-BIOS-LogProcD=1
python3 ./run_amd_speed_aocc400_genoa_B1.py
/bin/bash ./amd_speed_aocc400_genoa_B1.sh
runcpu --config amd_speed_aocc400_genoa_B1.cfg --tune base --reportable --iterations 2 --output_format
    csv,html,pdf,txt -define Dell-BIOS-inc=Dell-BIOS_EPYC-4.inc --define Dell-BIOS-LogProcD=1 fpspeed
runcpu --configfile amd_speed_aocc400_genoa_B1.cfg --tune base --reportable --iterations 2 --output_format
    csv,html,pdf,txt --define Dell-BIOS-inc=Dell-BIOS_EPYC-4.inc --define Dell-BIOS-LogProcD=1 --nopower
--runmode speed --tune base --size test:train:refspeed fpspeed --nopreenv --note-preenv --logfile
    $SPEC/tmp/CPU2017.001/templogs/preenv.fpspeed.001.0.log --lognum 001.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /mnt/ramdisk/cpu2017-1.1.9-aocc400-B1e

```

```

-----
6. /proc/cpuinfo
model name      : AMD EPYC 9274F 24-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 25
model          : 17
stepping       : 1
microcode      : 0xa101116
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size       : 3584 4K pages
cpu cores      : 24
siblings       : 24
2 physical ids (chips)
48 processors (hardware threads)
physical id 0: core ids 0-2,16-18,32-34,48-50,64-66,80-82,96-98,112-114
physical id 1: core ids 0-2,16-18,32-34,48-50,64-66,80-82,96-98,112-114
physical id 0: apicids 0-2,16-18,32-34,48-50,64-66,80-82,96-98,112-114
physical id 1: apicids 128-130,144-146,160-162,176-178,192-194,208-210,224-226,240-242
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): 48
On-line CPU(s) list: 0-47
Vendor ID: AuthenticAMD
Model name: AMD EPYC 9274F 24-Core Processor
CPU family: 25
Model: 17
Thread(s) per core: 1
Core(s) per socket: 24
Socket(s): 2

```

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## Platform Notes (Continued)

```

Stepping: 1
Frequency boost: enabled
CPU max MHz: 4304.0000
CPU min MHz: 400.0000
BogoMIPS: 8102.37
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: 1.5 MiB (48 instances)
L1i cache: 1.5 MiB (48 instances)
L2 cache: 48 MiB (48 instances)
L3 cache: 512 MiB (16 instances)
NUMA node(s): 16
NUMA node0 CPU(s): 0-2
NUMA node1 CPU(s): 12-14
NUMA node2 CPU(s): 6-8
NUMA node3 CPU(s): 18-20
NUMA node4 CPU(s): 9-11
NUMA node5 CPU(s): 21-23
NUMA node6 CPU(s): 3-5
NUMA node7 CPU(s): 15-17
NUMA node8 CPU(s): 24-26
NUMA node9 CPU(s): 36-38
NUMA node10 CPU(s): 30-32
NUMA node11 CPU(s): 42-44
NUMA node12 CPU(s): 33-35
NUMA node13 CPU(s): 45-47
NUMA node14 CPU(s): 27-29
NUMA node15 CPU(s): 39-41
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      | 1.5M     | 8    | Data        | 1     | 64   | 1        | 64             |
| L1i  | 32K      | 1.5M     | 8    | Instruction | 1     | 64   | 1        | 64             |

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|    |     |      |            |   |       |   |    |
|----|-----|------|------------|---|-------|---|----|
| L2 | 1M  | 48M  | 8 Unified  | 2 | 2048  | 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: 16 nodes (0-15)

node 0 cpus: 0-2

node 0 size: 96313 MB

node 0 free: 94898 MB

node 1 cpus: 12-14

node 1 size: 96767 MB

node 1 free: 94709 MB

node 2 cpus: 6-8

node 2 size: 96767 MB

node 2 free: 96656 MB

node 3 cpus: 18-20

node 3 size: 96767 MB

node 3 free: 96170 MB

node 4 cpus: 9-11

node 4 size: 96767 MB

node 4 free: 96607 MB

node 5 cpus: 21-23

node 5 size: 96747 MB

node 5 free: 96381 MB

node 6 cpus: 3-5

node 6 size: 96731 MB

node 6 free: 96495 MB

node 7 cpus: 15-17

node 7 size: 96767 MB

node 7 free: 96432 MB

node 8 cpus: 24-26

node 8 size: 96767 MB

node 8 free: 96687 MB

node 9 cpus: 36-38

node 9 size: 96767 MB

node 9 free: 96671 MB

node 10 cpus: 30-32

node 10 size: 96767 MB

node 10 free: 96662 MB

node 11 cpus: 42-44

node 11 size: 96767 MB

node 11 free: 96656 MB

node 12 cpus: 33-35

node 12 size: 96767 MB

node 12 free: 96687 MB

node 13 cpus: 45-47

node 13 size: 96739 MB

node 13 free: 96615 MB

node 14 cpus: 27-29

node 14 size: 96767 MB

node 14 free: 96681 MB

node 15 cpus: 39-41

node 15 size: 96767 MB

node 15 free: 96672 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 | 11 | 11 | 11 | 11 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 1:   | 11 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| 2:   | 11 | 11 | 10 | 11 | 11 | 11 | 11 | 11 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |

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```

3: 11 11 11 10 11 11 11 11 32 32 32 32 32 32 32
4: 11 11 11 11 10 11 11 11 32 32 32 32 32 32 32
5: 11 11 11 11 11 10 11 11 32 32 32 32 32 32 32
6: 11 11 11 11 11 11 10 11 32 32 32 32 32 32 32
7: 11 11 11 11 11 11 11 10 32 32 32 32 32 32 32
8: 32 32 32 32 32 32 32 32 32 10 11 11 11 11 11
9: 32 32 32 32 32 32 32 32 32 11 10 11 11 11 11
10: 32 32 32 32 32 32 32 32 32 11 11 10 11 11 11
11: 32 32 32 32 32 32 32 32 32 11 11 11 10 11 11
12: 32 32 32 32 32 32 32 32 32 11 11 11 11 10 11
13: 32 32 32 32 32 32 32 32 32 11 11 11 11 10 11
14: 32 32 32 32 32 32 32 32 32 11 11 11 11 11 10
15: 32 32 32 32 32 32 32 32 32 11 11 11 11 11 10

```

```

9. /proc/meminfo
   MemTotal:      1584882404 kB

```

```

10. who -r
    run-level 3 Nov 27 20:32

```

```

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

```

```

12. Services, from systemctl list-unit-files
    STATE          UNIT FILES
    enabled        ModemManager blk-availability cloud-config cloud-final cloud-init cloud-init-local
                  console-setup cron dmesg e2scrub_reap finalrd getty@ grub-common grub-initrd-fallback
                  irqbalance keyboard-setup lm-sensors lvm2-monitor lxd-agent networkd-dispatcher open-iscsi
                  open-vm-tools pollinate rsync rsyslog secureboot-db setvtrgb ssh systemd-networkd
                  systemd-networkd-wait-online systemd-pstore systemd-resolved systemd-timesyncd thermald
                  tuned ua-reboot-cmds ubuntu-advantage udisks2 vgauth
    enabled-runtime netplan-ovs-cleanup rc-local systemd-remount-fs
    disabled       apparmor console-getty debug-shell iscsid multipathd nftables powertop serial-getty@
                  smartmontools sysstat systemd-boot-check-no-failures systemd-network-generator
                  systemd-sysext systemd-time-wait-sync ufw upower
    generated      apport
    indirect        uidd
    masked          accounts-daemon alsa-utils atd cryptdisks cryptdisks-early gpu-manager hwclock lvm2
                  multipath-tools-boot rc rcS screen-cleanup sudo x11-common

```

```

13. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/vmlinuz-5.15.0-46-generic
    root=/dev/mapper/ubuntu--vg-ubuntu--lv
    ro

```

```

14. cpupower frequency-info
    analyzing CPU 0:
      current policy: frequency should be within 400 MHz and 4.30 GHz.
                      The governor "performance" may decide which speed to use
                      within this range.
    boost state support:
      Supported: yes
      Active: yes

```

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# SPEC CPU®2017 Floating Point Speed Result

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Dell Inc.

SPECspeed®2017\_fp\_base = 293

PowerEdge R6625 (AMD EPYC 9274F 24-Core Processor)

SPECspeed®2017\_fp\_peak = Not Run

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

Test Date: Mar-2023  
Hardware Availability: Mar-2023  
Software Availability: Nov-2022

## Platform Notes (Continued)

Boost States: 0  
Total States: 3  
Pstate-P0: 4050MHz

-----  
15. tuned-adm active  
Current active profile: latency-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 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

-----  
17. /sys/kernel/mm/transparent\_hugepage  
defrag [always] defer+madvise madvise never  
enabled [always] madvise never  
hpage\_pmd\_size 2097152  
shmem\_enabled always within\_size advise [never] deny force

-----  
18. /sys/kernel/mm/transparent\_hugepage/khugepaged  
alloc\_sleep\_millisecs 60000  
defrag 1  
max\_ptes\_none 511  
max\_ptes\_shared 256  
max\_ptes\_swap 64  
pages\_to\_scan 4096  
scan\_sleep\_millisecs 10000

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

-----  
20. Disk information  
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-aocc400-B1e  
Filesystem Type Size Used Avail Use% Mounted on  
tmpfs tmpfs 125G 3.5G 122G 3% /mnt/ramdisk

-----  
21. /sys/devices/virtual/dmi/id

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## Platform Notes (Continued)

Vendor: Dell Inc.  
Product: PowerEdge R6625  
Product Family: PowerEdge  
Serial: BGP4016

### 22. dmidecode

Additional information from dmidecode 3.3 follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

#### Memory:

24x 802C0000802C MTC40F2046S1RC48BA1 64 GB 2 rank 4800

### 23. BIOS

(This section combines info from /sys/devices and dmidecode.)

BIOS Vendor: Dell Inc.  
BIOS Version: 1.3.8  
BIOS Date: 03/10/2023  
BIOS Revision: 1.3

## Compiler Version Notes

C | 619.lbm\_s(base) 638.imagick\_s(base) 644.nab\_s(base)

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)

Target: x86\_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

C++, C, Fortran | 607.cactuBSSN\_s(base)

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)

Target: x86\_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)

Target: x86\_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)

Target: x86\_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

Fortran | 603.bwaves\_s(base) 649.fotonik3d\_s(base) 654.roms\_s(base)

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)

Target: x86\_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

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Test Date: Mar-2023

Test Sponsor: Dell Inc.

Hardware Availability: Mar-2023

Tested by: Dell Inc.

Software Availability: Nov-2022

## Compiler Version Notes (Continued)

=====  
Fortran, C | 621.wrf\_s(base) 627.cam4\_s(base) 628.pop2\_s(base)  
=====

AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin  
AMD clang version 14.0.6 (CLANG: AOCC\_4.0.0-Build#389 2022\_10\_07) (based on LLVM Mirror.Version.14.0.6)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/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  
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



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Test Date: Mar-2023

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Software Availability: Nov-2022

## 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
-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
```



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**Test Date:** Mar-2023

**Hardware Availability:** Mar-2023

**Software Availability:** Nov-2022

## 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

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-v1.0.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-v1.0.xml>

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