SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R7625 (AMD EPYC 9754 128-Core Processor)

$SPECspeed^{®}2017\_fp\_base = 406$

$SPECspeed^{®}2017\_fp\_peak = 417$

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

Test Date: Dec-2023
Hardware Availability: Jun-2023
Software Availability: Sep-2023

Benchmark	Threads	base	peak
603.bwaves_s	256	1680	1680
607.cactuBSSN_s	256	655	662
619.lbm_s	256	266	275
621.wrf_s	256	152	183
627.cam4_s	256	240	240
628.pop2_s	256	85.9	88.8
638.imagick_s	256	855	
644.nab_s	256	1000	
649.fotonik3d_s	256	195	195
654.roms_s	256	794	

SPECspeed®2017_fp_base (406)   SPECspeed®2017_fp_peak (417)

Hardware

CPU Name: AMD EPYC 9754
 Max MHz: 3100
 Nominal: 2250
Enabled: 256 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, 16 MB shared / 8 cores
 Other: None
Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 130 GB on tmpfs
Other: None

Software

OS: Ubuntu 22.04.3 LTS
 5.15.0-84-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 5 (graphical 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.

SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R7625 (AMD EPYC 9754 128-Core Processor)

$SPECspeed^{®}2017\_fp\_base = 406$

$SPECspeed^{®}2017\_fp\_peak = 417$
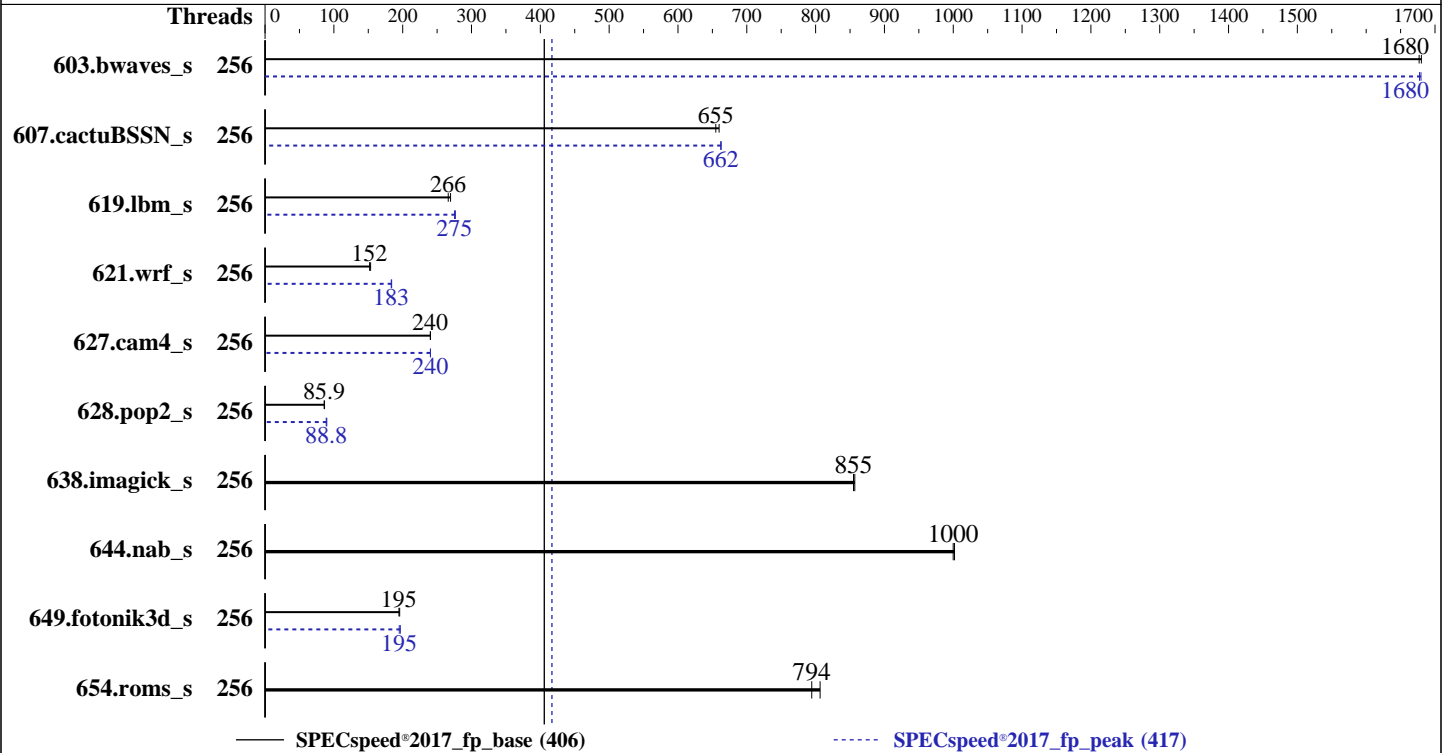
CPU2017 License: 6573   **Test Date:** Dec-2023
Test Sponsor: Dell Inc.   **Hardware Availability:** Jun-2023
Tested by: Dell Inc.   **Software Availability:** Sep-2023

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	256	35.1	1680	**35.2**	**1680**			256	35.1	1680	**35.2**	**1680**		
607.cactuBSSN_s	256	25.3	660	**25.5**	**655**			256	**25.2**	**662**	25.1	663		
619.lbm_s	256	19.4	270	**19.7**	**266**			256	18.9	277	**19.0**	**275**		
621.wrf_s	256	**87.1**	**152**	86.2	153			256	71.9	184	**72.1**	**183**		
627.cam4_s	256	**36.9**	**240**	36.9	240			256	36.9	240	**36.9**	**240**		
628.pop2_s	256	137	86.4	**138**	**85.9**			256	132	89.7	**134**	**88.8**		
638.imagick_s	256	**16.9**	**855**	16.8	857			256	**16.9**	**855**	16.8	857		
644.nab_s	256	17.4	1000	**17.5**	**1000**			256	17.4	1000	**17.5**	**1000**		
649.fotonik3d_s	256	46.6	196	**46.9**	**195**			256	46.4	197	**46.8**	**195**		
654.roms_s	256	**19.8**	**794**	19.5	806			256	**19.8**	**794**	19.5	806		
SPECspeed®2017_fp_base =		**406**												
SPECspeed®2017_fp_peak =		**417**												

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.
```

(Continued on next page)

SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R7625 (AMD EPYC 9754 128-Core Processor)

$SPECspeed®2017\_fp\_base = 406$

$SPECspeed®2017\_fp\_peak = 417$

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

Test Date: Dec-2023
Hardware Availability: Jun-2023
Software Availability: Sep-2023

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 = "0-255"
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 = "256"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 627.cam4_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-255"

Environment variables set by runcpu during the 649.fotonik3d_s peak run:
GOMP_CPU_AFFINITY = "0-255"
PGHPF_ZMEM = "yes"
```

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 130 GB ramdisk created with the cmd: "mount -t tmpfs -o size=130G tmpfs /mnt/ramdisk"
```

Dell Inc.

PowerEdge R7625 (AMD EPYC 9754 128-Core Processor)

$SPECspeed®2017\_fp\_base = 406$

$SPECspeed®2017\_fp\_peak = 417$

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

Test Date: Dec-2023
Hardware Availability: Jun-2023
Software Availability: Sep-2023

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-spa Fri Dec  8 11:26:15 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 (249.11-0ubuntu3.10)
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 amd-spa 5.15.0-84-generic #93-Ubuntu SMP Tue Sep 5 17:16:10 UTC 2023 x86_64 x86_64 x86_64 GNU/Linux

-----------------------------------------------------------
2. w
   11:26:16 up  2:50,  1 user,  load average: 5.36, 6.16, 3.56
```

(Continued on next page)

Dell Inc.

PowerEdge R7625 (AMD EPYC 9754 128-Core Processor)

SPECspeed®2017_fp_base = 406

SPECspeed®2017_fp_peak = 417

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

Test Date: Dec-2023
Hardware Availability: Jun-2023
Software Availability: Sep-2023

Platform Notes (Continued)

```
   USER      TTY      FROM           LOGIN@   IDLE   JCPU   PCPU WHAT
   root      tty1     -              08:35    2:50m  2.24s  0.51s /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               6190180
     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 9754 128-Core Processor
       vendor_id       : AuthenticAMD
       cpu family      : 25
       model           : 160
       stepping        : 2
       microcode       : 0xaa00212
       bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
       TLB size        : 3584 4K pages
       cpu cores       : 128
       siblings        : 128
       2 physical ids (chips)
       256 processors (hardware threads)
       physical id 0: core ids
```

(Continued on next page)

SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R7625 (AMD EPYC 9754 128-Core Processor)

$SPECspeed®2017\_fp\_base = 406$

$SPECspeed®2017\_fp\_peak = 417$

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

Test Date: Dec-2023
Hardware Availability: Jun-2023
Software Availability: Sep-2023

Platform Notes (Continued)

```
     0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119,128-135,144-151,160-167,176-183,192-199,208-215,224-231,
     240-247
     physical id 1: core ids
     0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119,128-135,144-151,160-167,176-183,192-199,208-215,224-231,
     240-247
     physical id 0: apicids
     0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119,128-135,144-151,160-167,176-183,192-199,208-215,224-231,
     240-247
     physical id 1: apicids
     256-263,272-279,288-295,304-311,320-327,336-343,352-359,368-375,384-391,400-407,416-423,432-439,448-455,4
     64-471,480-487,496-503
   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):                          256
     On-line CPU(s) list:             0-255
     Vendor ID:                       AuthenticAMD
     Model name:                      AMD EPYC 9754 128-Core Processor
     CPU family:                      25
     Model:                           160
     Thread(s) per core:              1
     Core(s) per socket:              128
     Socket(s):                       2
     Stepping:                        2
     BogoMIPS:                        4500.87
     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:                       8 MiB (256 instances)
     L1i cache:                       8 MiB (256 instances)
     L2 cache:                        256 MiB (256 instances)
     L3 cache:                        512 MiB (32 instances)
     NUMA node(s):                    2
     NUMA node0 CPU(s):               0-127
     NUMA node1 CPU(s):               128-255
     Vulnerability Gather data sampling: Not affected
     Vulnerability Itlb multihit:        Not affected
```

(Continued on next page)

SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R7625 (AMD EPYC 9754 128-Core Processor)

SPECspeed®2017_fp_base = 406

SPECspeed®2017_fp_peak = 417

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

Test Date: Dec-2023
Hardware Availability: Jun-2023
Software Availability: Sep-2023

Platform Notes (Continued)

```
  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, PBRSB-eIBRS Not affected
  Vulnerability Srbds:              Not affected
  Vulnerability Tsx async abort:    Not affected


  From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL  SETS PHY-LINE COHERENCY-SIZE
      L1d       32K       8M    8 Data            1    64        1             64
      L1i       32K       8M    8 Instruction     1    64        1             64
      L2         1M     256M    8 Unified         2  2048        1             64
      L3        16M     512M   16 Unified         3 16384        1             64


  -------------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 2 nodes (0-1)
    node 0 cpus: 0-127
    node 0 size: 773634 MB
    node 0 free: 767918 MB
    node 1 cpus: 128-255
    node 1 size: 774023 MB
    node 1 free: 772619 MB
    node distances:
    node   0   1
      0:  10  32
      1:  32  10


  -------------------------------------------------------------
  9. /proc/meminfo
    MemTotal:       1584802252 kB


  -------------------------------------------------------------
  10. who -r
    run-level 5 Dec 8 08:35


  -------------------------------------------------------------
  11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.10)
    Default Target  Status
    graphical       running


  -------------------------------------------------------------
  12. Services, from systemctl list-unit-files
    STATE            UNIT FILES
    enabled          ModemManager apparmor blk-availability console-setup cron dmesg e2scrub_reap finalrd
                     getty@ gpu-manager grub-common grub-initrd-fallback irqbalance keyboard-setup lm-sensors
                     lvm2-monitor lxd-agent multipathd networkd-dispatcher 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 ufw vgauth
    enabled-runtime  netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
    disabled         console-getty debug-shell iscsid nftables open-iscsi rsync serial-getty@
                     systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                     systemd-time-wait-sync upower
    generated        apport
```

(Continued on next page)

Dell Inc.

PowerEdge R7625 (AMD EPYC 9754 128-Core Processor)

$\text{SPECspeed}^{®}\text{2017\_fp\_base} = 406$

$\text{SPECspeed}^{®}\text{2017\_fp\_peak} = 417$

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

Test Date: Dec-2023
Hardware Availability: Jun-2023
Software Availability: Sep-2023

Platform Notes (Continued)

```
     indirect          uuidd
     masked            cryptdisks cryptdisks-early hwclock lvm2 multipath-tools-boot rc rcS screen-cleanup sudo
                       systemd-networkd-wait-online x11-common

     ----------------------------------------------------------------------
     13. Linux kernel boot-time arguments, from /proc/cmdline
       BOOT_IMAGE=/vmlinuz-5.15.0-84-generic
       root=/dev/mapper/ubuntu--vg-ubuntu--lv
       ro

     ----------------------------------------------------------------------
     14. 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:  2250MHz

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

(Continued on next page)

Dell Inc.

PowerEdge R7625 (AMD EPYC 9754 128-Core Processor)

SPECspeed®2017_fp_base = 406

SPECspeed®2017_fp_peak = 417

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

Test Date: Dec-2023
Hardware Availability: Jun-2023
Software Availability: Sep-2023

Platform Notes (Continued)

```
   max_ptes_swap            64
   pages_to_scan          4096
   scan_sleep_millisecs  10000


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


  ------------------------------------------------------------
  20. Disk information
  SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1.1
    Filesystem      Type   Size  Used Avail Use% Mounted on
    tmpfs          tmpfs  130G  3.4G  127G   3% /mnt/ramdisk


  ------------------------------------------------------------
  21. /sys/devices/virtual/dmi/id
      Vendor:         Dell Inc.
      Product:        PowerEdge R7625
      Product Family: PowerEdge
      Serial:         SLR7601


  ------------------------------------------------------------
  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:     1.4.6
    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)
```

(Continued on next page)

Dell Inc.

PowerEdge R7625 (AMD EPYC 9754 128-Core Processor)

$SPECspeed®2017\_fp\_base = 406$

$SPECspeed®2017\_fp\_peak = 417$

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

Test Date: Dec-2023
Hardware Availability: Jun-2023
Software Availability: Sep-2023

Compiler Version Notes (Continued)

```
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          | 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`

(Continued on next page)

Dell Inc.

PowerEdge R7625 (AMD EPYC 9754 128-Core Processor)

$SPECspeed^{®}2017\_fp\_base = 406$

$SPECspeed^{®}2017\_fp\_peak = 417$

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Dec-2023

Hardware Availability: Jun-2023

Software Availability: Sep-2023

Base Portability Flags (Continued)

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`

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`

(Continued on next page)

SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R7625 (AMD EPYC 9754 128-Core Processor)

SPECspeed®2017_fp_base = 406

SPECspeed®2017_fp_peak = 417

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

Test Date: Dec-2023
Hardware Availability: Jun-2023
Software Availability: Sep-2023

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
```
-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
```

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
```

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 R7625 (AMD EPYC 9754 128-Core Processor)

$SPECspeed^{®}2017\_fp\_base = 406$

$SPECspeed^{®}2017\_fp\_peak = 417$

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

Test Date: Dec-2023
Hardware Availability: Jun-2023
Software Availability: Sep-2023

Peak Portability Flags

Same as Base Portability Flags

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: basepeak = yes
```

```
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: basepeak = yes
```

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
```

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

Dell Inc.

PowerEdge R7625 (AMD EPYC 9754 128-Core Processor)

$SPECspeed^{®}2017\_fp\_base = 406$

$SPECspeed^{®}2017\_fp\_peak = 417$

CPU2017 License: 6573		**Test Date:**	Dec-2023
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Jun-2023
Tested by:	Dell Inc.	**Software Availability:**	Sep-2023

Peak Optimization Flags (Continued)

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

627.cam4_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 -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

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
```

SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R7625 (AMD EPYC 9754 128-Core Processor)

$SPECspeed^{®}2017\_fp\_base = 406$

$SPECspeed^{®}2017\_fp\_peak = 417$

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

Test Date: Dec-2023
Hardware Availability: Jun-2023
Software Availability: Sep-2023

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-v1.1.html`

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-v1.1.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 2023-12-08 06:26:15-0500.
Report generated on 2024-01-03 17:33:52 by CPU2017 PDF formatter v6716.
Originally published on 2024-01-02.