# SPEC CPU®2017 Floating Point Speed Result

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## Dell Inc.

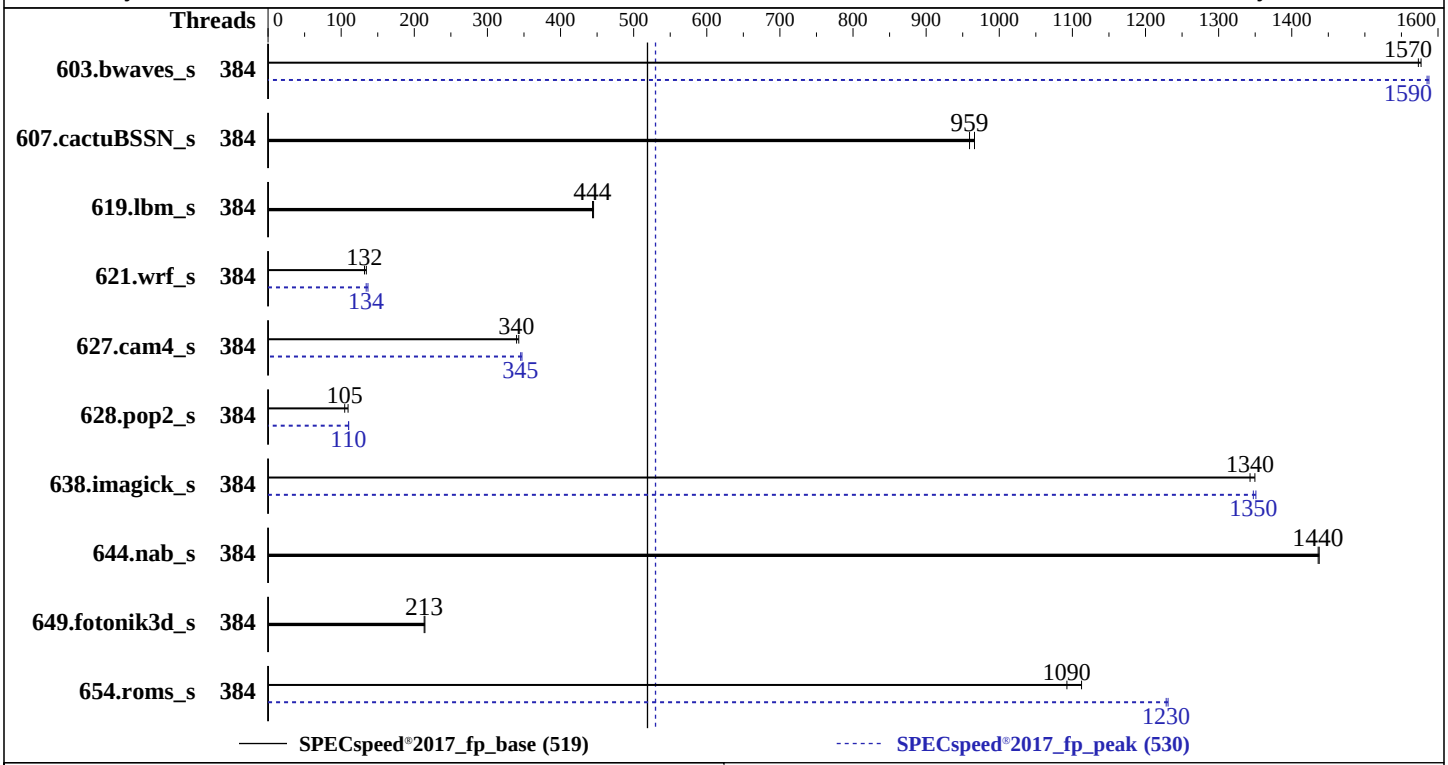
PowerEdge M7725 (AMD EPYC 9965 192-Core Processor)

SPECspeed®2017_fp_base = 519

SPECspeed®2017_fp_peak = 530

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

**Test Date:** Mar-2025
**Hardware Availability:** Mar-2025
**Software Availability:** Feb-2025




## Hardware

| | |
|---|---|
| CPU Name: | AMD EPYC 9965 |
| Max MHz: | 3700 |
| Nominal: | 2250 |
| Enabled: | 384 cores, 2 chips |
| Orderable: | 1,2 chips |
| Cache L1: | 32 KB I + 48 KB D on chip per core |
| L2: | 1 MB I+D on chip per core |
| L3: | 384 MB I+D on chip per chip, 32 MB shared / 16 cores |
| Other: | None |
| Memory: | 1536 GB (24 x 64 GB 2Rx4 PC5-6400B-R) |
| Storage: | 180 GB on tmpfs |
| Other: | CPU Cooling: DLC |

## Software

| | |
|---|---|
| OS: | Ubuntu 24.04.2 LTS 6.8.0-53-generic |
| Compiler: | C/C++/Fortran: Version 5.0.0 of AOCC |
| Parallel: | Yes |
| Firmware: | Version 1.0.0 released Jan-2025 |
| 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. |

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 603.bwaves_s | 384 | 37.4 | 1580 | **37.5** | **1570** | | | 384 | 37.2 | 1590 | **37.2** | **1590** | | |
| 607.cactuBSSN_s | 384 | 17.3 | 966 | **17.4** | **959** | | | 384 | 17.3 | 966 | **17.4** | **959** | | |
| 619.lbm_s | 384 | 11.8 | 445 | **11.8** | **444** | | | 384 | 11.8 | 445 | **11.8** | **444** | | |
| 621.wrf_s | 384 | **100** | **132** | 98.4 | 134 | | | 384 | 96.8 | 137 | **98.6** | **134** | | |
| 627.cam4_s | 384 | 25.8 | 343 | **26.1** | **340** | | | 384 | **25.7** | **345** | 25.5 | 347 | | |
| 628.pop2_s | 384 | **113** | **105** | 109 | 109 | | | 384 | **108** | **110** | 108 | 110 | | |
| 638.imagick_s | 384 | 10.7 | 1350 | **10.7** | **1340** | | | 384 | **10.7** | **1350** | 10.7 | 1350 | | |
| 644.nab_s | 384 | 12.2 | 1440 | **12.2** | **1440** | | | 384 | 12.2 | 1440 | **12.2** | **1440** | | |
| 649.fotonik3d_s | 384 | 42.5 | 215 | **42.7** | **213** | | | 384 | 42.5 | 215 | **42.7** | **213** | | |
| 654.roms_s | 384 | **14.4** | **1090** | 14.2 | 1110 | | | 384 | **12.8** | **1230** | 12.8 | 1230 | | |

**SPECspeed®2017_fp_base = 519**

**SPECspeed®2017_fp_peak = 530**

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.
```

## Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-383"
LD_LIBRARY_PATH =
     "/mnt/ramdisk/cpu2017-1.1.9-aocc500-znerv5_A1/amd_speed_aocc500_znver5_A_lib/lib:/mnt/ramdisk/cpu2017-
     1.1.9-aocc500-znerv5_A1/amd_speed_aocc500_znver5_A_lib/lib32:"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "384"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0-383"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0-383"

Environment variables set by runcpu during the 627.cam4_s peak run:
GOMP_CPU_AFFINITY = "0-383"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-383"

Environment variables set by runcpu during the 638.imagick_s peak run:
GOMP_CPU_AFFINITY = "0-383"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-383"
```

## General Notes

```
Binaries were compiled on a system with 2x AMD EPYC 9D64 CPU + 500GiB Memory using Ubuntu 22.04

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 180 GB ramdisk created with the cmd: "mount -t tmpfs -o size=180G tmpfs /mnt/ramdisk"
```

## Platform Notes

```
 BIOS Settings:
                    Logical Processor : Disabled
           Virtualization Technology : Disabled

                       System Profile : Custom
                             C-States : Disabled
                  Memory Patrol Scrub : Disabled
    PCI ASPM L1 Link Power Management : Disabled
      Periodic Directory Rinse Tuning : Blended
                  Determinism Control : Manual
```

**(Continued on next page)**

## Platform Notes (Continued)

```
                  Determinism Slider : Power Determinism
                      Optimizer Mode : Enabled
 Algorithm Performance Boost Disable : Enabled
                 Adaptive Allocation : Enabled
                  Dram Refresh Delay : Performance
                 DIMM Self Healing -
       on Uncorrectable Memory Error : Disabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-aocc500-znerv5_A1/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on M772501-M7725 Thu Mar  6 15:35:33 2025

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 255 (255.4-1ubuntu8.5)
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 M772501-M7725 6.8.0-53-generic #55-Ubuntu SMP PREEMPT_DYNAMIC Fri Jan 17 15:37:52 UTC 2025 x86_64
  x86_64 x86_64 GNU/Linux

------------------------------------------------------------
2. w
   15:35:33 up 5 min,  2 users,  load average: 0.04, 0.03, 0.00
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU  WHAT
  root     tty1     -                15:30   45.00s  1.35s  0.38s /bin/bash ./amd_speed_aocc500_znver5_A1.sh
  root     tty2     -                15:30    4:45   0.04s   ?    -bash

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

------------------------------------------------------------
4. ulimit -a
```

(Continued on next page)

## Platform Notes (Continued)

```
   time(seconds)        unlimited
   file(blocks)         unlimited
   data(kbytes)         unlimited
   stack(kbytes)        unlimited
   coredump(blocks)     0
   memory(kbytes)       unlimited
   locked memory(kbytes) 2097152
   process              6188649
   nofiles              1024
   vmemory(kbytes)      unlimited
   locks                unlimited
   rtprio               0

------------------------------------------------------------
5. sysinfo process ancestry
 /sbin/init
 /bin/login -p --
 -bash
 /bin/bash /home/DellFiles/bin/DELL_speed.sh
 /bin/bash /home/DellFiles/bin/dell-run-main.sh speed
 /bin/bash /home/DellFiles/bin/dell-run-main.sh speed
 /bin/bash /home/DellFiles/bin/AMD/dell-run-speccpu.sh speed --define DL-VERS=6.1a --output_format
   html,pdf,txt
 python3 ./run_amd_speed_aocc500_znver5_A1.py
 /bin/bash ./amd_speed_aocc500_znver5_A1.sh
 runcpu --config amd_speed_aocc500_znver5_A1.cfg --tune all --reportable --iterations 2 --define
   DL-BIOS-NPS=1 --define DL-VERS=6.1a --output_format html,pdf,txt fpspeed
 runcpu --configfile amd_speed_aocc500_znver5_A1.cfg --tune all --reportable --iterations 2 --define
   DL-BIOS-NPS=1 --define DL-VERS=6.1a --output_format html,pdf,txt --nopower --runmode speed --tune
   base:peak --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-aocc500-znerv5_A1

------------------------------------------------------------
6. /proc/cpuinfo
    model name      : AMD EPYC 9965 192-Core Processor
    vendor_id       : AuthenticAMD
    cpu family      : 26
    model           : 17
    stepping        : 0
    microcode       : 0xb101028
    bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
    TLB size        : 192 4K pages
    cpu cores       : 192
    siblings        : 192
    2 physical ids (chips)
    384 processors (hardware threads)
    physical id 0: core ids 0-191
    physical id 1: core ids 0-191
    physical id 0: apicids 0-191
    physical id 1: apicids 256-447
  Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
  virtualized systems.  Use the above data carefully.

------------------------------------------------------------
7. lscpu

From lscpu from util-linux 2.39.3:
  Architecture:                         x86_64
```

(Continued on next page)

## Platform Notes (Continued)

```
CPU op-mode(s):                  32-bit, 64-bit
Address sizes:                   52 bits physical, 57 bits virtual
Byte Order:                      Little Endian
CPU(s):                          384
On-line CPU(s) list:             0-383
Vendor ID:                       AuthenticAMD
BIOS Vendor ID:                  AMD
Model name:                      AMD EPYC 9965 192-Core Processor
BIOS Model name:                 AMD EPYC 9965 192-Core Processor                CPU @ 2.2GHz
BIOS CPU family:                 107
CPU family:                      26
Model:                           17
Thread(s) per core:              1
Core(s) per socket:              192
Socket(s):                       2
Stepping:                        0
Frequency boost:                 enabled
CPU(s) scaling MHz:              61%
CPU max MHz:                     3700.1951
CPU min MHz:                     1500.0000
BogoMIPS:                        4492.90
Flags:                           fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat
                                 pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb
                                 rdtscp lm constant_tsc rep_good amd_lbr_v2 nopl nonstop_tsc cpuid
                                 extd_apicid aperfmperf rapl pni pclmulqdq monitor ssse3 fma cx16 pcid
                                 sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx f16c rdrand lahf_lm
                                 cmp_legacy extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch
                                 osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext
                                 perfctr_llc mwaitx cpb cat_l3 cdp_l3 hw_pstate ssbd mba perfmon_v2
                                 ibrs ibpb stibp ibrs_enhanced vmmcall fsgsbase tsc_adjust bmi1 avx2
                                 smep bmi2 invpcid cqm rdt_a avx512f avx512dq rdseed adx smap
                                 avx512ifma clflushopt clwb avx512cd sha_ni avx512bw avx512vl xsaveopt
                                 xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
                                 cqm_mbm_local user_shstk avx_vnni avx512_bf16 clzero irperf
                                 xsaveerptr rdpru wbnoinvd amd_ppin cppc arat npt lbrv svm_lock
                                 nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter
                                 pfthreshold avic v_vmsave_vmload vgif x2avic v_spec_ctrl vnmi
                                 avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq
                                 avx512_vnni avx512_bitalg avx512_vpopcntdq la57 rdpid bus_lock_detect
                                 movdiri movdir64b overflow_recov succor smca avx512_vp2intersect
                                 flush_l1d debug_swap
L1d cache:                       18 MiB (384 instances)
L1i cache:                       12 MiB (384 instances)
L2 cache:                        384 MiB (384 instances)
L3 cache:                        768 MiB (24 instances)
NUMA node(s):                    2
NUMA node0 CPU(s):               0-191
NUMA node1 CPU(s):               192-383
Vulnerability Gather data sampling:   Not affected
Vulnerability Itlb multihit:          Not affected
Vulnerability L1tf:                   Not affected
Vulnerability Mds:                    Not affected
Vulnerability Meltdown:               Not affected
Vulnerability Mmio stale data:        Not affected
Vulnerability Reg file data sampling: Not affected
Vulnerability Retbleed:               Not affected
Vulnerability Spec rstack overflow:   Not affected
Vulnerability Spec store bypass:      Mitigation; Speculative Store Bypass disabled via prctl
Vulnerability Spectre v1:             Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2:             Mitigation; Enhanced / Automatic IBRS; IBPB conditional; STIBP
```

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## Platform Notes (Continued)

```
                                    disabled; RSB filling; PBRSB-eIBRS Not affected; BHI Not affected
  Vulnerability Srbds:              Not affected
  Vulnerability Tsx async abort:    Not affected

From lscpu --cache:
     NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL  SETS PHY-LINE COHERENCY-SIZE
     L1d       48K      18M   12 Data            1    64        1             64
     L1i       32K      12M    8 Instruction     1    64        1             64
     L2         1M     384M   16 Unified         2  1024        1             64
     L3        32M     768M   16 Unified         3 32768        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: 0-191
  node 0 size: 773267 MB
  node 0 free: 770989 MB
  node 1 cpus: 192-383
  node 1 size: 773968 MB
  node 1 free: 767889 MB
  node distances:
  node   0   1
    0:  10  32
    1:  32  10

------------------------------------------------------------
9. /proc/meminfo
   MemTotal:       1584368992 kB

------------------------------------------------------------
10. who -r
  run-level 3 Mar 6 15:29

------------------------------------------------------------
11. Systemd service manager version: systemd 255 (255.4-1ubuntu8.5)
  Default Target  Status
  multi-user      running

------------------------------------------------------------
12. Services, from systemctl list-unit-files
  STATE            UNIT FILES
  enabled          ModemManager apparmor apport blk-availability cloud-config cloud-final cloud-init
                   cloud-init-local console-setup cron dmesg e2scrub_reap finalrd getty@ gpu-manager
                   grub-common grub-initrd-fallback keyboard-setup lm-sensors lvm2-monitor multipathd
                   networkd-dispatcher open-iscsi open-vm-tools pollinate rsyslog secureboot-db setvtrgb
                   sysstat systemd-networkd systemd-networkd-wait-online 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 rsync serial-getty@ ssh
                   systemd-boot-check-no-failures systemd-confext systemd-network-generator
                   systemd-networkd-wait-online@ systemd-pcrlock-file-system systemd-pcrlock-firmware-code
                   systemd-pcrlock-firmware-config systemd-pcrlock-machine-id systemd-pcrlock-make-policy
                   systemd-pcrlock-secureboot-authority systemd-pcrlock-secureboot-policy systemd-sysext
                   systemd-time-wait-sync upower
  indirect         systemd-sysupdate systemd-sysupdate-reboot uuidd
  masked           cryptdisks cryptdisks-early hwclock multipath-tools-boot screen-cleanup sudo x11-common

------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
```

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## Platform Notes (Continued)

```
  BOOT_IMAGE=/vmlinuz-6.8.0-53-generic
  root=/dev/mapper/ubuntu--vg-ubuntu--lv
  ro

------------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 159:
    current policy: frequency should be within 1.50 GHz and 2.25 GHz.
                    The governor "performance" may decide which speed to use
                    within this range.
    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
  max_ptes_swap              64
  pages_to_scan            4096
  scan_sleep_millisecs    10000
```

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## Platform Notes (Continued)

```
------------------------------------------------------------
19. OS release
  From /etc/*-release /etc/*-version
  os-release Ubuntu 24.04.2 LTS

------------------------------------------------------------
20. Disk information
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-aocc500-znerv5_A1
  Filesystem     Type   Size  Used Avail Use% Mounted on
  tmpfs          tmpfs  180G  3.3G  177G   2% /mnt/ramdisk

------------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:         Dell Inc.
    Product:        PowerEdge M7725
    Product Family: PowerEdge
    Serial:         M772501

------------------------------------------------------------
22. dmidecode
  Additional information from dmidecode 3.5 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:
    13x 80AD000080AD HMCG94AHBRA277N 64 GB 2 rank 6400
    11x 80AD000080AD HMCG94AHBRA480N 64 GB 2 rank 6400


------------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:       Dell Inc.
   BIOS Version:      1.0.0
   BIOS Date:         01/23/2025
   BIOS Revision:     1.0
```

## Compiler Version Notes

```
==============================================================================================================
C              | 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)
--------------------------------------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
--------------------------------------------------------------------------------------------------------------

==============================================================================================================
C++, C, Fortran | 607.cactuBSSN_s(base, peak)
--------------------------------------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
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```

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## Compiler Version Notes (Continued)

```
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
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InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
------------------------------------------------------------------------------------------------------------

============================================================================================================
Fortran         | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak)
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Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
------------------------------------------------------------------------------------------------------------

============================================================================================================
Fortran, C      | 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(base, peak)
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Target: x86_64-unknown-linux-gnu
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Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
------------------------------------------------------------------------------------------------------------
```

## Base Compiler Invocation

C benchmarks:
`clang`

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`

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## Base Portability Flags (Continued)

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=znver5
-fveclib=AMDLIBM -ffast-math -fopenmp -DSPEC_OPENMP -flto
-fremap-arrays -fstrip-mining -fstruct-layout=7
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=50 -zopt -mrecip=none -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=znver5
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -funroll-loops
-mllvm -lsr-in-nested-loop -mllvm -reduce-array-computations=3
-Mrecursive -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=znver5
-fveclib=AMDLIBM -ffast-math -fopenmp -DSPEC_OPENMP -flto
-fremap-arrays -fstrip-mining -fstruct-layout=7
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=50 -zopt -funroll-loops
-mllvm -lsr-in-nested-loop -Mrecursive -mrecip=none -fopenmp=libomp
-lomp -lamdlibm -lamdalloc -lflang

Benchmarks using Fortran, C, and C++:
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -fopenmp -DSPEC_OPENMP -flto
-fremap-arrays -fstrip-mining -fstruct-layout=7

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## Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=50 -zopt
-mllvm -loop-unswitch-threshold=200000 -mllvm -unroll-threshold=100
-funroll-loops -mllvm -lsr-in-nested-loop -Mrecursive -mrecip=none
-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

## Peak Optimization Flags

C benchmarks:

619.lbm_s: `basepeak = yes`

638.imagick_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6 -Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast -march=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp -flto -DSPEC_OPENMP -fremap-arrays -fstrip-mining -fstruct-layout=9 -mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3 -mllvm -unroll-threshold=50 -zopt -fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang`

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=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp -fscalar-transform -fvector-transform -mllvm -reduce-array-computations=3 -Mrecursive -fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang`

649.fotonik3d_s: `basepeak = yes`

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=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp -flto -DSPEC_OPENMP -fremap-arrays -fstrip-mining -fstruct-layout=9 -mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3 -mllvm -unroll-threshold=50 -zopt -funroll-loops -mllvm -lsr-in-nested-loop -Mrecursive -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=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp`

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## Peak Optimization Flags (Continued)

627.cam4_s (continued):
-flto -DSPEC_OPENMP -fremap-arrays -fstrip-mining
-fstruct-layout=9 -mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=50 -zopt -Mrecursive
-mrecip=none -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=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -DSPEC_OPENMP -fremap-arrays -fstrip-mining
-fstruct-layout=9 -mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=50 -zopt -fscalar-transform
-fvector-transform -Mrecursive -fopenmp=libomp -lomp
-lamdlibm -lamdalloc -lflang

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

## 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/aocc500-flags.html
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.8.html

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2017/flags/aocc500-flags.xml
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.8.xml


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