SPEC CPU®2017 Floating Point Speed Result

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Dell Inc.

PowerEdge M7725 (AMD EPYC 9475F 48-Core Processor)

$SPECspeed^{®}2017\_fp\_base = 522$

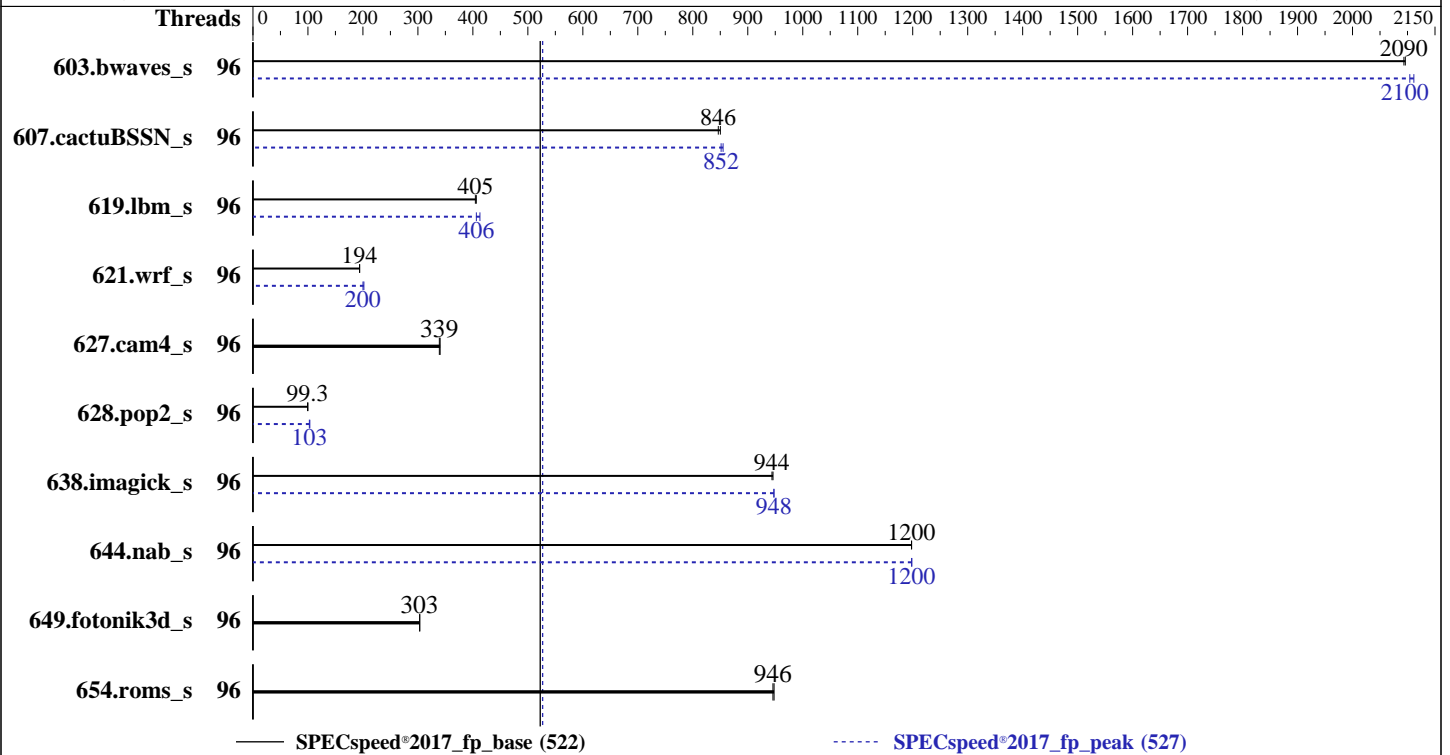$SPECspeed^{®}2017\_fp\_peak = 527$

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

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

Threads

Benchmark	Threads	base	peak
603.bwaves_s	96	2090	2100
607.cactuBSSN_s	96	846	852
619.lbm_s	96	405	406
621.wrf_s	96	194	200
627.cam4_s	96	339	
628.pop2_s	96	99.3	103
638.imagick_s	96	944	948
644.nab_s	96	1200	1200
649.fotonik3d_s	96	303	
654.roms_s	96	946	

SPECspeed®2017_fp_base (522)   SPECspeed®2017_fp_peak (527)

Hardware

CPU Name: AMD EPYC 9475F
 Max MHz: 4800
 Nominal: 3650
Enabled: 96 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: 256 MB I+D on chip per chip, 32 MB shared / 6 cores
 Other: None
Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-6400B-R)
Storage: 70 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.

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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	96	28.1	2100	**28.2**	**2090**			96	27.9	2110	**28.0**	**2100**		
607.cactuBSSN_s	96	**19.7**	**846**	19.6	850			96	**19.6**	**852**	19.5	855		
619.lbm_s	96	12.9	406	**12.9**	**405**			96	**12.9**	**406**	12.7	413		
621.wrf_s	96	**68.2**	**194**	68.1	194			96	65.5	202	**66.1**	**200**		
627.cam4_s	96	**26.1**	**339**	26.0	340			96	**26.1**	**339**	26.0	340		
628.pop2_s	96	119	100	**120**	**99.3**			96	115	103	**116**	**103**		
638.imagick_s	96	15.3	946	**15.3**	**944**			96	**15.2**	**948**	15.2	948		
644.nab_s	96	**14.6**	**1200**	14.6	1200			96	14.6	1200	**14.6**	**1200**		
649.fotonik3d_s	96	**30.1**	**303**	30.0	304			96	**30.1**	**303**	30.0	304		
654.roms_s	96	16.6	948	**16.6**	**946**			96	16.6	948	**16.6**	**946**		
SPECspeed®2017_fp_base =			**522**											
SPECspeed®2017_fp_peak =			**527**											

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.
```

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Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-95"
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 = "96"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0-95"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-95"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0-95"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0-95"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-95"

Environment variables set by runcpu during the 638.imagick_s peak run:
GOMP_CPU_AFFINITY = "0-95"

Environment variables set by runcpu during the 644.nab_s peak run:
GOMP_CPU_AFFINITY = "0-95"
```

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 70 GB ramdisk created with the cmd: "mount -t tmpfs -o size=70G tmpfs /mnt/ramdisk"
```

Platform Notes

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

                   System Profile : Custom
                         C-States : Disabled
               Memory Patrol Scrub : Disabled
```

(Continued on next page)

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Platform Notes (Continued)

```
        PCI ASPM L1 Link Power Management : Disabled
       Periodic Directory Rinse Tuning : Blended
                   Determinism Control : Manual
                    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 Mon Mar  3 22:55:56 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
     22:55:56 up 3 min,  2 users,  load average: 0.13, 0.04, 0.01
    USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU  WHAT
    root     tty1     -                22:53   41.00s  1.05s  0.31s /bin/bash ./amd_speed_aocc500_znver5_A1.sh
    root     tty2     -                22:55   44.00s  0.03s  ?     -bash

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

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Platform Notes (Continued)

```
        --------------------------------------------------------
        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                6189411
          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 9475F 48-Core Processor
            vendor_id        : AuthenticAMD
            cpu family       : 26
            model            : 2
            stepping         : 1
            microcode        : 0xb00211e
            bugs             : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
            TLB size         : 192 4K pages
            cpu cores        : 48
            siblings         : 48
            2 physical ids (chips)
            96 processors (hardware threads)
            physical id 0: core ids 0-5,16-21,32-37,48-53,64-69,80-85,96-101,112-117
            physical id 1: core ids 0-5,16-21,32-37,48-53,64-69,80-85,96-101,112-117
            physical id 0: apicids 0-5,16-21,32-37,48-53,64-69,80-85,96-101,112-117
            physical id 1: apicids 128-133,144-149,160-165,176-181,192-197,208-213,224-229,240-245
         Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
          virtualized systems.  Use the above data carefully.


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

(Continued on next page)

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Platform Notes (Continued)

```
From lscpu from util-linux 2.39.3:
  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):                             96
  On-line CPU(s) list:                0-95
  Vendor ID:                          AuthenticAMD
  BIOS Vendor ID:                     AMD
  Model name:                         AMD EPYC 9475F 48-Core Processor
  BIOS Model name:                    AMD EPYC 9475F 48-Core Processor          CPU @ 3.6GHz
  BIOS CPU family:                    107
  CPU family:                         26
  Model:                              2
  Thread(s) per core:                 1
  Core(s) per socket:                 48
  Socket(s):                          2
  Stepping:                           1
  Frequency boost:                    enabled
  CPU(s) scaling MHz:                 77%
  CPU max MHz:                        4819.1401
  CPU min MHz:                        1500.0000
  BogoMIPS:                           7289.40
  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:                          4.5 MiB (96 instances)
  L1i cache:                          3 MiB (96 instances)
  L2 cache:                           96 MiB (96 instances)
  L3 cache:                           512 MiB (16 instances)
  NUMA node(s):                       2
  NUMA node0 CPU(s):                  0-47
  NUMA node1 CPU(s):                  48-95
  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
```

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Platform Notes (Continued)

```
  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
                                       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     4.5M   12 Data            1     64      1             64
      L1i      32K       3M    8 Instruction     1     64      1             64
      L2        1M      96M   16 Unified         2   1024      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: 2 nodes (0-1)
    node 0 cpus: 0-47
    node 0 size: 773384 MB
    node 0 free: 767055 MB
    node 1 cpus: 48-95
    node 1 size: 774041 MB
    node 1 free: 773140 MB
    node distances:
    node   0   1
      0:  10  32
      1:  32  10


  ------------------------------------------------------------
  9. /proc/meminfo
    MemTotal:       1584564136 kB


  ------------------------------------------------------------
  10. who -r
    run-level 3 Mar 3 22:52


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

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Platform Notes (Continued)

```
   --------------------------------------------------------------
   13. Linux kernel boot-time arguments, from /proc/cmdline
     BOOT_IMAGE=/vmlinuz-6.8.0-53-generic
     root=/dev/mapper/ubuntu--vg-ubuntu--lv
     ro


   --------------------------------------------------------------
   14. cpupower frequency-info
     analyzing CPU 67:
       current policy: frequency should be within 1.50 GHz and 3.65 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:  3650MHz


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

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Platform Notes (Continued)

```
   pages_to_scan            4096
   scan_sleep_millisecs    10000


  -------------------------------------------------------------
  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   70G   3.3G   67G   5% /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:
      7x 802C0000802C MTC40F2046S1RC64BD1 64 GB 2 rank 6400
      9x 80AD000080AD HMCG94AHBRA277N 64 GB 2 rank 6400
      2x 80AD000080AD HMCG94AHBRA480N 64 GB 2 rank 6400
      6x 80CE000080CE M321R8GA0PB2-CCPKC 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
```

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Dell Inc.

PowerEdge M7725 (AMD EPYC 9475F 48-Core Processor)

$SPECspeed^®2017\_fp\_base = 522$

$SPECspeed^®2017\_fp\_peak = 527$

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

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

Compiler Version Notes (Continued)

```
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
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
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
------------------------------------------------------------------------------


==============================================================================
Fortran      | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_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
------------------------------------------------------------------------------


==============================================================================
Fortran, C   | 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_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
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
------------------------------------------------------------------------------
```

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
```

SPEC CPU®2017 Floating Point Speed Result

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Dell Inc.

PowerEdge M7725 (AMD EPYC 9475F 48-Core Processor)

SPECspeed®2017_fp_base = 522

SPECspeed®2017_fp_peak = 527

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

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

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`

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
```

(Continued on next page)

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

Dell Inc.

PowerEdge M7725 (AMD EPYC 9475F 48-Core Processor)

$SPECspeed®2017\_fp\_base = 522$

$SPECspeed®2017\_fp\_peak = 527$

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

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

Base Optimization Flags (Continued)

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

SPEC CPU®2017 Floating Point Speed Result

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Dell Inc.

PowerEdge M7725 (AMD EPYC 9475F 48-Core Processor)

SPECspeed®2017_fp_base = 522

SPECspeed®2017_fp_peak = 527

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

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

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=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
```

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

```
644.nab_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 -mrecip=none
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

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: 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
```

Standard Performance Evaluation Corporation (info@spec.org)

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PowerEdge M7725 (AMD EPYC 9475F 48-Core Processor)

$SPECspeed^{®}2017\_fp\_base = 522$

$SPECspeed^{®}2017\_fp\_peak = 527$

CPU2017 License: 6573		**Test Date:**	Mar-2025
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Mar-2025
Tested by:	Dell Inc.	**Software Availability:**	Feb-2025

Peak Optimization Flags (Continued)

621.wrf_s (continued):
```
-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: basepeak = yes

628.pop2_s:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=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++:
```
-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 -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 -mllvm -unroll-threshold=100
-Mrecursive -fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

Peak Other Flags

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

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

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

Dell Inc.

$SPECspeed^®2017\_fp\_base = 522$

PowerEdge M7725 (AMD EPYC 9475F 48-Core Processor)

$SPECspeed^®2017\_fp\_peak = 527$

CPU2017 License: 6573		**Test Date:**	Mar-2025
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Mar-2025
Tested by:	Dell Inc.	**Software Availability:**	Feb-2025

Peak Other Flags (Continued)

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

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

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