SPEC CPU®2017 Floating Point Rate Result

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Hewlett Packard Enterprise
(Test Sponsor: HPE)
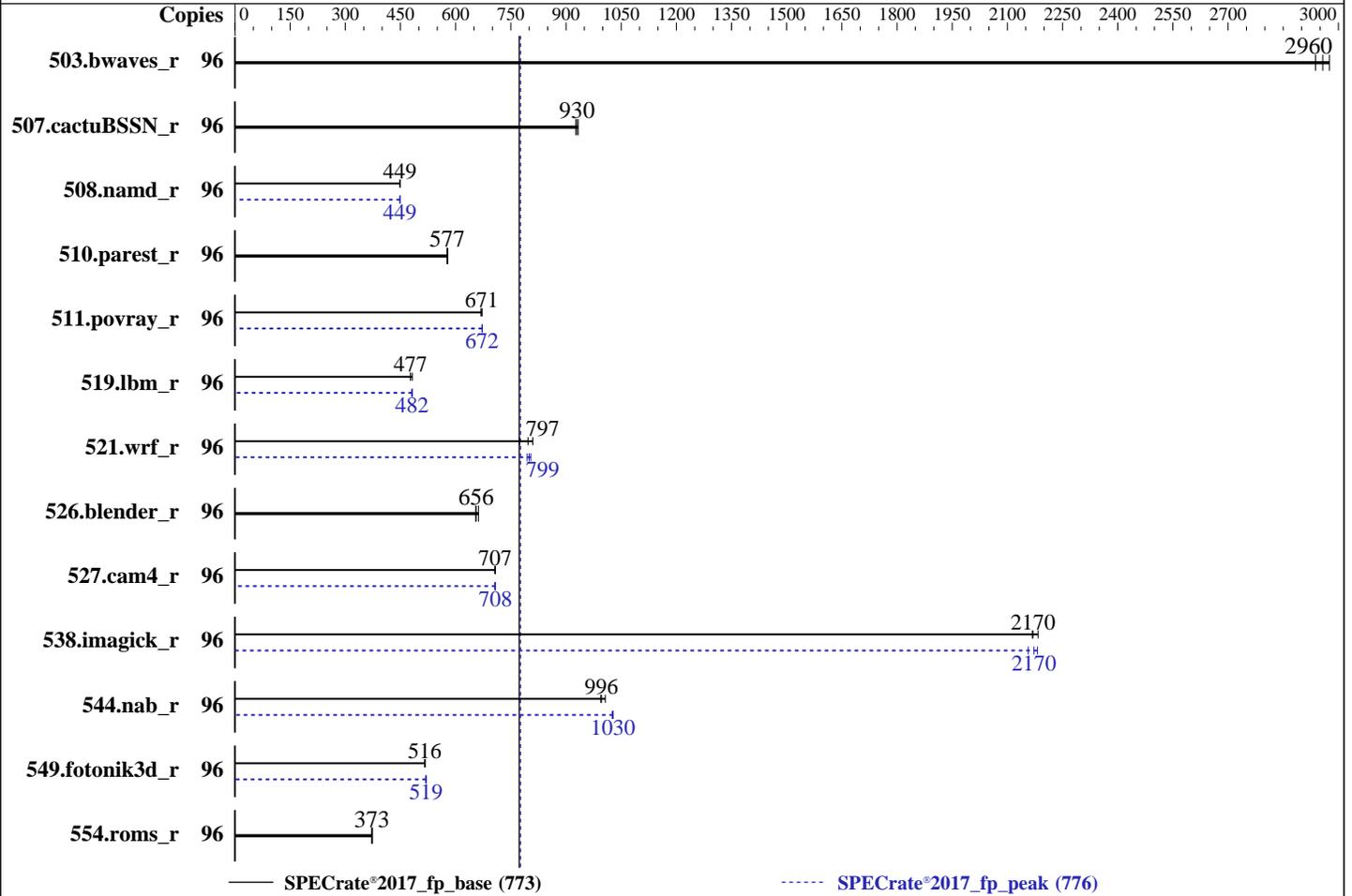
ProLiant DL385 Gen11
(2.90 GHz, AMD EPYC 9254)

$SPECrate^{®}2017\_fp\_base = 773$

$SPECrate^{®}2017\_fp\_peak = 776$

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Oct-2025

Hardware Availability: Oct-2024

Software Availability: Oct-2024

Benchmark	Copies	Base	Peak
503.bwaves_r	96	2960	
507.cactuBSSN_r	96	930	
508.namd_r	96	449	449
510.parest_r	96	577	
511.povray_r	96	671	672
519.lbm_r	96	477	482
521.wrf_r	96	797	799
526.blender_r	96	656	
527.cam4_r	96	707	708
538.imagick_r	96	2170	2170
544.nab_r	96	996	1030
549.fotonik3d_r	96	516	519
554.roms_r	96	373	

SPECrate®2017_fp_base (773)   SPECrate®2017_fp_peak (776)

Hardware

CPU Name: AMD EPYC 9254

Max MHz: 4150

Nominal: 2900

Enabled: 48 cores, 2 chips, 2 threads/core

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: 128 MB I+D on chip per chip, 32 MB shared / 6 cores

Other: None

Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-4800B-R)

Storage: 1 x 3.2 TB NVMe SSD

Other: CPU Cooling: Air

Software

OS: Ubuntu 22.04.4 LTS
Kernel 5.15.0-94-generic

Compiler: C/C++/Fortran: Version 5.0.0 of AOCC

Parallel: No

Firmware: HPE BIOS Version v2.30 01/17/2025 released Jan-2025

File System: ext4

System State: Run level 5 (multi-user, graphical)

Base Pointers: 64-bit

Peak Pointers: 64-bit

Other: None

Power Management: BIOS and OS set to prefer performance at the cost of additional power usage

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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Results Table

Benchmark	Base Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
503.bwaves_r	96	328	2940	**326**	**2960**	324	2980	96	328	2940	**326**	**2960**	324	2980
507.cactuBSSN_r	96	131	927	130	933	**131**	**930**	96	131	927	130	933	**131**	**930**
508.namd_r	96	**203**	**449**	203	449	203	449	96	203	449	**203**	**449**	203	449
510.parest_r	96	434	578	**435**	**577**	435	577	96	434	578	**435**	**577**	435	577
511.povray_r	96	**334**	**671**	334	672	335	669	96	334	672	333	672	**333**	**672**
519.lbm_r	96	210	482	**212**	**477**	212	477	96	210	481	210	482	**210**	**482**
521.wrf_r	96	**270**	**797**	266	810	278	774	96	267	804	**269**	**799**	271	794
526.blender_r	96	221	662	223	654	**223**	**656**	96	221	662	223	654	**223**	**656**
527.cam4_r	96	237	708	**237**	**707**	238	707	96	237	708	238	706	**237**	**708**
538.imagick_r	96	110	2170	**110**	**2170**	109	2180	96	111	2160	109	2180	**110**	**2170**
544.nab_r	96	162	995	160	1010	**162**	**996**	96	157	1030	158	1030	**157**	**1030**
549.fotonik3d_r	96	724	517	**725**	**516**	725	516	96	**720**	**519**	721	519	720	520
554.roms_r	96	**409**	**373**	408	374	410	372	96	**409**	**373**	408	374	410	372

SPECrate®2017_fp_base =	**773**
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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

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

Submit Notes

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

Operating System Notes

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

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

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

To enable Transparent Hugepages (THP) for all allocations,
```

(Continued on next page)

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Operating System Notes (Continued)

```
'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:
LD_LIBRARY_PATH =
     "/home/cpu2017/amd_rate_aocc500_znver5_A_lib/lib:/home/cpu2017/amd_rate_aocc500_znver5_A_lib/lib32:"
MALLOC_CONF = "retain:true"
```

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.
```

Platform Notes

```
BIOS Configurations : Parameters are selected in the order shown below
 Workload Profile set to General Throughput Compute
 Determinism Control set to Manual
   Performance Determinism set to Power Deterministic
 Last-Level Cache (LLC) as NUMA Node set to Enabled
 NUMA memory domains per socket set to Four memory domains per socket
 ACPI CST C2 Latency set to 18 microseconds
 Thermal Configuration set to Maximum Cooling
 Workload Profile set to Custom
  Power Regulator set to OS Control Mode


 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on admin1 Thu Oct 16 12:22:52 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
```

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Platform Notes (Continued)

```
  10. who -r
  11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.12)
  12. Failed units, from systemctl list-units --state=failed
  13. Services, from systemctl list-unit-files
  14. Linux kernel boot-time arguments, from /proc/cmdline
  15. 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 admin1 5.15.0-94-generic #104-Ubuntu SMP Tue Jan 9 15:25:40 UTC 2024 x86_64 x86_64 x86_64 GNU/Linux


  ------------------------------------------------------------
  2. w
     12:22:52 up  2:48,  2 users,  load average: 0.05, 0.64, 18.84
     USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
     admin1   pts/0    172.17.1.97      09:39    2:42m  0.10s  0.04s sshd: admin1 [priv]
     admin1   pts/1    172.17.1.97      09:40    12.00s 1.02s  0.08s sudo -i


  ------------------------------------------------------------
  3. Username
    From environment variable $USER:   root
    From the command 'logname':        admin1


  ------------------------------------------------------------
  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               6190962
    nofiles               1024
    vmemory(kbytes)       unlimited
    locks                 unlimited
    rtprio                0


  ------------------------------------------------------------
  5. sysinfo process ancestry
   /lib/systemd/systemd --system --deserialize 22
   sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
   sshd: admin1 [priv]
   sshd: admin1@pts/0
   -bash
   sudo -i
   sudo -i
   -bash
   -bash
   python3 ./run_fprate.py
   /bin/bash ./amd_rate_aocc500_znver5_A1.sh
```

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Platform Notes (Continued)

```
 runcpu --config amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 fprate
 runcpu --configfile amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 --nopower
   --runmode rate --tune base:peak --size test:train:refrate fprate --nopreenv --note-preenv --logfile
  $SPEC/tmp/CPU2017.002/templogs/preenv.fprate.002.0.log --lognum 002.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017


--------------------------------------------------------------
6. /proc/cpuinfo
    model name      : AMD EPYC 9254 24-Core Processor
    vendor_id       : AuthenticAMD
    cpu family      : 25
    model           : 17
    stepping        : 1
    microcode       : 0xa101154
    bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass srso
    TLB size        : 3584 4K pages
    cpu cores       : 24
    siblings        : 48
    2 physical ids (chips)
    96 processors (hardware threads)
    physical id 0: core ids 0-5,8-13,16-21,24-29
    physical id 1: core ids 0-5,8-13,16-21,24-29
    physical id 0: apicids 0-11,16-27,32-43,48-59
    physical id 1: apicids 64-75,80-91,96-107,112-123
  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):                96
  On-line CPU(s) list:   0-95
  Vendor ID:             AuthenticAMD
  Model name:            AMD EPYC 9254 24-Core Processor
  CPU family:            25
  Model:                 17
  Thread(s) per core:    2
  Core(s) per socket:    24
  Socket(s):             2
  Stepping:              1
  Frequency boost:       enabled
  CPU max MHz:           2900.0000
  CPU min MHz:           1500.0000
  BogoMIPS:              5791.35
  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 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
```

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Platform Notes (Continued)

```
                         avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc
                         cqm_mbm_total cqm_mbm_local avx512_bf16 clzero irperf xsaveerptr rdpru
                         wbnoinvd amd_ppin cppc arat npt lbrv svm_lock nrip_save tsc_scale
                         vmcb_clean flushbyasid decodeassists pausefilter pfthreshold avic
                         v_vmsave_vmload vgif v_spec_ctrl avx512vbmi umip pku ospke avx512_vbmi2
                         gfni vaes vpclmulqdq avx512_vnni avx512_bitalg avx512_vpopcntdq la57
                         rdpid overflow_recov succor smca fsrm flush_l1d
    Virtualization:      AMD-V
    L1d cache:           1.5 MiB (48 instances)
    L1i cache:           1.5 MiB (48 instances)
    L2 cache:            48 MiB (48 instances)
    L3 cache:            256 MiB (8 instances)
    NUMA node(s):        8
    NUMA node0 CPU(s):   0-5,48-53
    NUMA node1 CPU(s):   6-11,54-59
    NUMA node2 CPU(s):   12-17,60-65
    NUMA node3 CPU(s):   18-23,66-71
    NUMA node4 CPU(s):   24-29,72-77
    NUMA node5 CPU(s):   30-35,78-83
    NUMA node6 CPU(s):   36-41,84-89
    NUMA node7 CPU(s):   42-47,90-95
    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 Retbleed:            Not affected
    Vulnerability Spec rstack overflow: Mitigation; safe RET
    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 always-on, 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     1.5M   8 Data              1    64        1             64
      L1i       32K     1.5M   8 Instruction       1    64        1             64
      L2         1M      48M   8 Unified           2  2048        1             64
      L3        32M     256M  16 Unified           3 32768        1             64


  ------------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 8 nodes (0-7)
    node 0 cpus: 0-5,48-53
    node 0 size: 193217 MB
    node 0 free: 192426 MB
    node 1 cpus: 6-11,54-59
    node 1 size: 193485 MB
    node 1 free: 192759 MB
    node 2 cpus: 12-17,60-65
    node 2 size: 193532 MB
    node 2 free: 192738 MB
    node 3 cpus: 18-23,66-71
    node 3 size: 193532 MB
    node 3 free: 192847 MB
    node 4 cpus: 24-29,72-77
```

(Continued on next page)

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Platform Notes (Continued)

```
  node 4 size: 193532 MB
  node 4 free: 192894 MB
  node 5 cpus: 30-35,78-83
  node 5 size: 193532 MB
  node 5 free: 192909 MB
  node 6 cpus: 36-41,84-89
  node 6 size: 193532 MB
  node 6 free: 192887 MB
  node 7 cpus: 42-47,90-95
  node 7 size: 193486 MB
  node 7 free: 192838 MB
  node distances:
  node   0   1   2   3   4   5   6   7
    0:  10  12  12  12  32  32  32  32
    1:  12  10  12  12  32  32  32  32
    2:  12  12  10  12  32  32  32  32
    3:  12  12  12  10  32  32  32  32
    4:  32  32  32  32  10  12  12  12
    5:  32  32  32  32  12  10  12  12
    6:  32  32  32  32  12  12  10  12
    7:  32  32  32  32  12  12  12  10


  ------------------------------------------------------------
9. /proc/meminfo
  MemTotal:       1585002448 kB


  ------------------------------------------------------------
10. who -r
  run-level 5 Oct 16 09:36


  ------------------------------------------------------------
11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.12)
  Default Target  Status
  graphical       degraded


  ------------------------------------------------------------
12. Failed units, from systemctl list-units --state=failed
    UNIT                            LOAD   ACTIVE SUB    DESCRIPTION
  * systemd-networkd-wait-online.service loaded failed failed Wait for Network to be Configured


  ------------------------------------------------------------
13. Services, from systemctl list-unit-files
   STATE           UNIT FILES
   enabled         ModemManager apparmor 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 irqbalance keyboard-setup lvm2-monitor lxd-agent
                   multipathd networkd-dispatcher open-iscsi open-vm-tools pollinate rsyslog secureboot-db
                   setvtrgb snapd ssh systemd-networkd systemd-networkd-wait-online systemd-pstore
                   systemd-resolved systemd-timesyncd thermald tuned ua-reboot-cmds ubuntu-advantage udisks2
                   ufw unattended-upgrades vgauth
   enabled-runtime netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
   disabled        console-getty debug-shell iscsid nftables rsync serial-getty@
                   systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                   systemd-time-wait-sync upower
   generated       apport
   indirect        uuidd
   masked          cryptdisks cryptdisks-early hwclock lvm2 multipath-tools-boot rc rcS screen-cleanup sudo
                   x11-common


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

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Platform Notes (Continued)

```
 14. Linux kernel boot-time arguments, from /proc/cmdline
     BOOT_IMAGE=/boot/vmlinuz-5.15.0-94-generic
     root=UUID=6f291001-dc8b-466a-b460-b80d6d324346
     ro


  ----------------------------------------------------------------
 15. tuned-adm active
     Current active profile: throughput-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       10
     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

  ----------------------------------------------------------------
 19. OS release
     From /etc/*-release /etc/*-version
     os-release Ubuntu 22.04.4 LTS

  ----------------------------------------------------------------
 20. Disk information
 SPEC is set to: /home/cpu2017
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda2      ext4  2.9T   18G  2.8T   1% /

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

(Continued on next page)

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Platform Notes (Continued)

```
 21. /sys/devices/virtual/dmi/id
      Vendor:         HPE
      Product:        ProLiant DL385 Gen11
      Product Family: ProLiant
      Serial:         DL385G11-006


     -------------------------------------------------------------
 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:
      9x Hynix HMCG94AEBRA123N 64 GB 2 rank 4800
      15x Hynix HMCG94MEBRA121N 64 GB 2 rank 4800


     -------------------------------------------------------------
 23. BIOS
 (This section combines info from /sys/devices and dmidecode.)
      BIOS Vendor:       HPE
      BIOS Version:      2.30
      BIOS Date:         01/17/2025
      BIOS Revision:     2.30
      Firmware Revision: 1.66
```

Compiler Version Notes

```
==================================================================================
C              | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(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++            | 508.namd_r(base, peak) 510.parest_r(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         | 511.povray_r(base, peak) 526.blender_r(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
----------------------------------------------------------------------------------
```

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SPEC CPU®2017 Floating Point Rate Result

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Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL385 Gen11
(2.90 GHz, AMD EPYC 9254)

SPECrate®2017_fp_base = 773

SPECrate®2017_fp_peak = 776

Compiler Version Notes (Continued)

```
=============================================================================================
C++, C, Fortran | 507.cactuBSSN_r(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
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         | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(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      | 521.wrf_r(base, peak) 527.cam4_r(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
```

C++ benchmarks:
```
clang++
```

Fortran benchmarks:
```
flang
```

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

(Continued on next page)

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL385 Gen11
(2.90 GHz, AMD EPYC 9254)

SPECrate®2017_fp_base = 773

SPECrate®2017_fp_peak = 776

CPU2017 License: 3		**Test Date:**	Oct-2025
Test Sponsor:	HPE	**Hardware Availability:**	Oct-2024
Tested by:	HPE	**Software Availability:**	Oct-2024

Base Compiler Invocation (Continued)

Benchmarks using both C and C++:
```
clang++ clang
```

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

Base Portability Flags

503.bwaves_r: `-DSPEC_LP64`
507.cactuBSSN_r: `-DSPEC_LP64`
508.namd_r: `-DSPEC_LP64`
510.parest_r: `-DSPEC_LP64`
511.povray_r: `-DSPEC_LP64`
519.lbm_r: `-DSPEC_LP64`
521.wrf_r: `-DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64`
526.blender_r: `-funsigned-char -DSPEC_LP64`
527.cam4_r: `-DSPEC_CASE_FLAG -DSPEC_LP64`
538.imagick_r: `-DSPEC_LP64`
544.nab_r: `-DSPEC_LP64`
549.fotonik3d_r: `-DSPEC_LP64`
554.roms_r: `-DSPEC_LP64`

Base Optimization Flags

C benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather -O3
-march=znver5 -fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc
-lflang -ldl
```

C++ benchmarks:
```
-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 -Wl,-mllvm -Wl,-extra-inliner
-O3 -march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-mllvm -unroll-threshold=100 -mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc
-lflang -ldl
```

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Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL385 Gen11
(2.90 GHz, AMD EPYC 9254)

SPECrate®2017_fp_base = 773

SPECrate®2017_fp_peak = 776

CPU2017 License: 3		**Test Date:**	Oct-2025
Test Sponsor:	HPE	**Hardware Availability:**	Oct-2024
Tested by:	HPE	**Software Availability:**	Oct-2024

Base Optimization Flags (Continued)

Fortran benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-aggressive-gather=true
-Wl,-mllvm -Wl,-enable-masked-gather-sequence=false -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -flto -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm -lamdalloc
-lflang -ldl
```

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
-Wl,-mllvm -Wl,-enable-aggressive-gather=true
-Wl,-mllvm -Wl,-enable-masked-gather-sequence=false -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fepilog-vectorization-of-inductions
-lamdlibm -lamdalloc -lflang -ldl
```

Benchmarks using both 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 -Wl,-mllvm -Wl,-extra-inliner
-O3 -march=znver5 -fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie
-flto -fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000 -lamdlibm -lamdalloc -lflang
-ldl
```

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 -Wl,-mllvm -Wl,-extra-inliner
-O3 -march=znver5 -fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie
-flto -fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000 -Mrecursive -funroll-loops
```

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Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL385 Gen11
(2.90 GHz, AMD EPYC 9254)

SPECrate®2017_fp_base = 773

SPECrate®2017_fp_peak = 776

CPU2017 License: 3		**Test Date:**	Oct-2025
Test Sponsor:	HPE	**Hardware Availability:**	Oct-2024
Tested by:	HPE	**Software Availability:**	Oct-2024

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
```
-mllvm -lsr-in-nested-loop -fepilog-vectorization-of-inductions
-lamdlibm -lamdalloc -lflang -ldl
```

Base Other Flags

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

C++ benchmarks:
```
-Wno-unused-command-line-argument
```

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

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

Benchmarks using both C and C++:
```
-Wno-unused-command-line-argument
```

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

Peak Compiler Invocation

C benchmarks:
```
clang
```

C++ benchmarks:
```
clang++
```

Fortran benchmarks:
```
flang
```

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

Benchmarks using both C and C++:
```
clang++ clang
```

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Hewlett Packard Enterprise

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ProLiant DL385 Gen11
(2.90 GHz, AMD EPYC 9254)

SPECrate®2017_fp_base = 773

SPECrate®2017_fp_peak = 776

CPU2017 License: 3	**Test Date:**	Oct-2025
Test Sponsor: HPE	**Hardware Availability:**	Oct-2024
Tested by: HPE	**Software Availability:**	Oct-2024

Peak Compiler Invocation (Continued)

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

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

519.lbm_r: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast`
`-march=znver5 -fveclib=AMDLIBM -ffast-math -flto`
`-fstruct-layout=7 -mllvm -unroll-threshold=50`
`-fremap-arrays -fstrip-mining`
`-mllvm -inline-threshold=1000`
`-mllvm -reduce-array-computations=3 -zopt -lamdlibm`
`-lamdalloc -ldl`

538.imagick_r: `Same as 519.lbm_r`

544.nab_r: `-m64 -flto -Wl,-mllvm -Wl,-ldist-scalar-expand`
`-fenable-aggressive-gather -Ofast -march=znver5`
`-fveclib=AMDLIBM -ffast-math -fstruct-layout=7`
`-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining`
`-mllvm -inline-threshold=1000`
`-mllvm -reduce-array-computations=3 -zopt -lamdlibm`
`-lamdalloc -ldl`

C++ benchmarks:

508.namd_r: `-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 -flto`
`-mllvm -unroll-threshold=100`
`-mllvm -reduce-array-computations=3 -zopt -lamdlibm`
`-lamdalloc -ldl`

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Hewlett Packard Enterprise
(Test Sponsor: HPE)

SPECrate®2017_fp_base = 773

ProLiant DL385 Gen11
(2.90 GHz, AMD EPYC 9254)

SPECrate®2017_fp_peak = 776

CPU2017 License: 3	**Test Date:** Oct-2025
Test Sponsor: HPE	**Hardware Availability:** Oct-2024
Tested by: HPE	**Software Availability:** Oct-2024

Peak Optimization Flags (Continued)

510.parest_r: basepeak = yes

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-Mrecursive -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -fvector-transform
-fscalar-transform -lamdlibm -lamdalloc -ldl -lflang

554.roms_r: basepeak = yes

Benchmarks using both Fortran and C:

521.wrf_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-ldl -lflang

527.cam4_r: -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 -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays
-mllvm -reduce-array-computations=3 -zopt -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
-fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-ldl -lflang

Benchmarks using both C and C++:

511.povray_r: -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
-Wl,-mllvm -Wl,-extra-inliner -Ofast -march=znver5

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ProLiant DL385 Gen11
(2.90 GHz, AMD EPYC 9254)

SPECrate®2017_fp_base = 773

SPECrate®2017_fp_peak = 776

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Oct-2025
Hardware Availability: Oct-2024
Software Availability: Oct-2024

Peak Optimization Flags (Continued)

511.povray_r (continued):
```
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -mllvm -reduce-array-computations=3 -zopt
-mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000 -lamdlibm
-lamdalloc -ldl
```

526.blender_r: `basepeak = yes`

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: `basepeak = yes`

Peak Other Flags

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

C++ benchmarks:
```
-Wno-unused-command-line-argument
```

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

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

Benchmarks using both C and C++:
```
-Wno-unused-command-line-argument
```

Benchmarks using Fortran, C, and C++:
```
-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/HPE-Platform-Flags-AMD-Genoa-rev2.2.html
http://www.spec.org/cpu2017/flags/aocc500-flags.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-Genoa-rev2.2.xml
http://www.spec.org/cpu2017/flags/aocc500-flags.xml

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

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(2.90 GHz, AMD EPYC 9254)

SPECrate®2017_fp_base = 773

SPECrate®2017_fp_peak = 776

CPU2017 License:	3	**Test Date:**	Oct-2025
Test Sponsor:	HPE	**Hardware Availability:**	Oct-2024
Tested by:	HPE	**Software Availability:**	Oct-2024

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

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