



# SPEC CPU®2026 Floating Point Rate Result

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## Hewlett Packard Enterprise

(Test Sponsor: HPE)

### ProLiant DL325 Gen11

(2.10 GHz, AMD EPYC 9845)

SPECrate®2026\_fp\_base = 456

SPECrate®2026\_fp\_peak = 456

CPU2026 License: 3

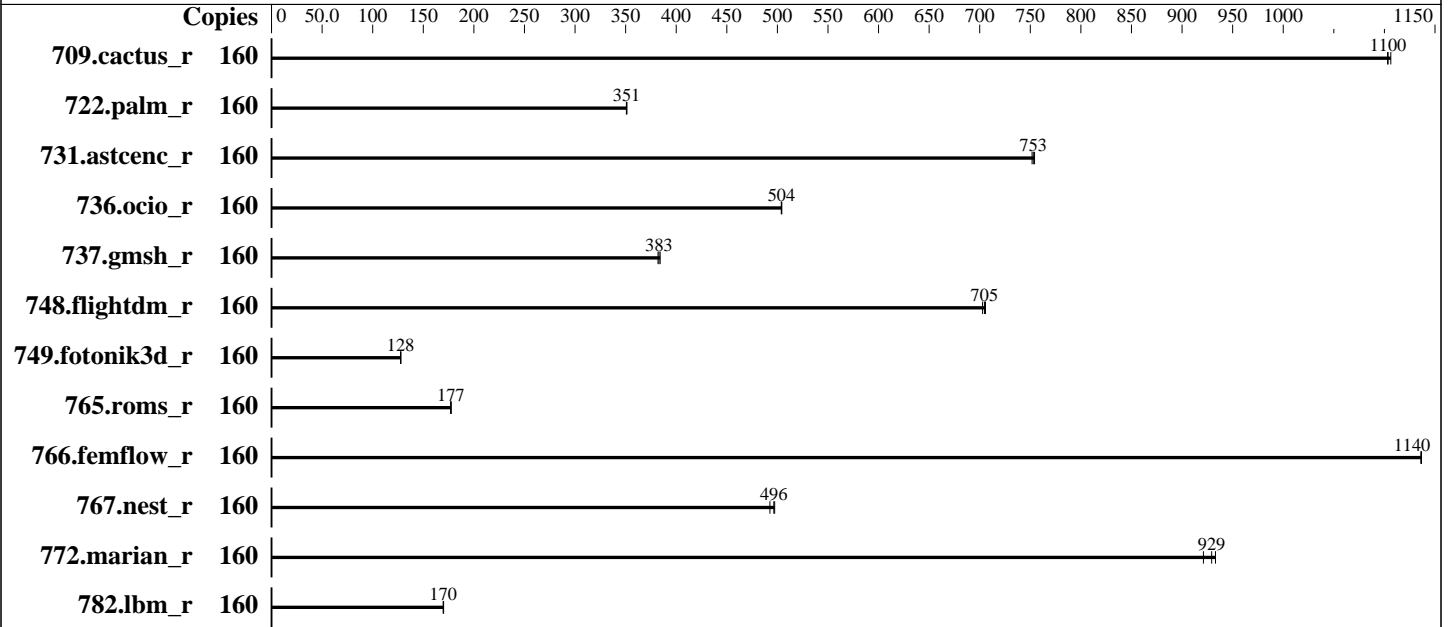
Test Sponsor: HPE

Tested by: HPE

Test Date: Jan-2026

Hardware Availability: Mar-2025

Software Availability: Jan-2026



### Hardware

CPU Name: AMD EPYC 9845  
 Max MHz: 3700  
 Nominal: 2100  
 Enabled: 160 cores, 1 chip  
 Orderable: 1 Chip  
 Cache L1: 32 KB I + 48 KB D on chip per core  
 L2: 1 MB I+D on chip per core  
 L3: 320 MB I+D on chip per chip,  
 32 MB shared / 16 cores  
 Other: None  
 Memory: 768 GB (12 x 64 GB 2Rx4 PC5-6400B-R)  
 Storage: 1 x 480 GB NVMe SSD  
 Cooling: CLC  
 Other: None

### Software

OS: Ubuntu 24.04.3 LTS  
 Kernel 6.8.0-90-generic  
 Compiler: C/C++/Fortran: Version 5.1.0 of AOCC  
 Compiler Category: Vendor  
 Firmware: HPE BIOS Version v2.90  
 released Jan-2026  
 File System: ext4  
 System State: Run level 5 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 Other: None  
 Power Management: BIOS and OS is set to prefer performance at the cost of additional power usage



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## Results Table

Benchmark	Base						Peak							
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
709.cactus_r	160	124	1100	<u>124</u>	<u>1100</u>	124	1110	160	124	1100	<u>124</u>	<u>1100</u>	124	1110
722.palm_r	160	<u>602</u>	<u>351</u>	601	351	602	351	160	<u>602</u>	<u>351</u>	601	351	602	351
731.ascenc_r	160	178	754	179	752	<u>178</u>	<u>753</u>	160	178	754	179	752	<u>178</u>	<u>753</u>
736.ocio_r	160	278	504	<u>278</u>	<u>504</u>	278	504	160	278	504	<u>278</u>	<u>504</u>	278	504
737.gmsh_r	160	191	384	<u>192</u>	<u>383</u>	192	382	160	191	384	<u>192</u>	<u>383</u>	192	382
748.flightdm_r	160	162	706	163	703	<u>163</u>	<u>705</u>	160	162	706	163	703	<u>163</u>	<u>705</u>
749.fotonik3d_r	160	1450	128	<u>1449</u>	<u>128</u>	1447	128	160	1450	128	<u>1449</u>	<u>128</u>	1447	128
765.roms_r	160	1424	177	<u>1420</u>	<u>177</u>	1420	177	160	1424	177	<u>1420</u>	<u>177</u>	1420	177
766.femflow_r	160	207	1140	206	1140	<u>207</u>	<u>1140</u>	160	207	1140	206	1140	<u>207</u>	<u>1140</u>
767.nest_r	160	258	493	255	497	<u>256</u>	<u>496</u>	160	258	493	255	497	<u>256</u>	<u>496</u>
772.marian_r	160	274	921	271	933	<u>272</u>	<u>929</u>	160	274	921	271	933	<u>272</u>	<u>929</u>
782.lbm_r	160	<u>540</u>	<u>170</u>	540	170	539	170	160	<u>540</u>	<u>170</u>	540	170	539	170

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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.

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## Operating System Notes (Continued)

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:  
LD\_LIBRARY\_PATH =  
"/home/cpu2026/amd\_rate\_aocc510\_znver5\_A\_lib/lib:/home/cpu2026/amd\_rate\_aocc510\_znver5\_A\_lib/lib32:"  
MALLOC\_CONF = "retain:true"

## General Notes

Binaries were compiled on a system with 2x AMD EPYC Venice256 CPU + 2TiB Memory using Ubuntu 24.04  
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.

## 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  
Memory Patrol Scrubbing set to Disabled  
ACPI CST C2 Latency set to 18 microseconds  
NUMA memory domains per socket set to Two memory domains per socket  
Thermal Configuration set to Maximum Cooling  
AMD SMT Option set to Disabled  
Workload Profile set to Custom  
Power Regulator set to OS Control Mode  
L2 HW Prefetcher set to Disabled

Sysinfo program /home/cpu2026/bin/sysinfo  
Rev: 069f95da7e7f5d81b2ce48a82150e54f  
running on admin1 Wed Jan 28 13:32:28 2026

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## Platform Notes (Continued)

SUT (System Under Test) info as seen by some common utilities.

### Table of contents

1. uname -srvm
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 (255.4-1ubuntu8.12)
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 -srvm
Linux 6.8.0-90-generic #91-Ubuntu SMP PREEMPT_DYNAMIC Tue Nov 18 14:14:30 UTC 2025 x86_64
```

```
2. w
13:32:28 up 2:46, 7 users, load average: 0.10, 0.03, 0.01
USER      TTY      FROM          LOGIN@      IDLE        JCPU      PCPU      WHAT
admin1    -        172.16.0.111  13:32      24:06      0.00s     ?        sshd: admin1 [priv]
admin1    -        172.16.0.111  13:32      24:06      0.00s     ?        sshd: admin1 [priv]
admin1    -        172.16.0.111  13:32      24:06      0.00s     ?        sshd: admin1 [priv]
admin1    -        172.16.0.111  13:32      24:06      0.00s     0.01s    sshd: admin1 [priv]
admin1    -        172.16.0.100  13:00      24:06      0.00s     0.02s    sshd: admin1 [priv]
admin1    -        172.16.0.100  12:58      24:06      0.00s     0.01s    sshd: admin1 [priv]
admin1    tty1    -             12:58      34:03      0.03s     ?        -bash
```

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## Platform Notes (Continued)

### 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                3094321
nofiles                1024
vmemory(kbytes)       unlimited
locks                  unlimited
rtprio                 0
```

### 5. sysinfo process ancestry

```
/sbin/init
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: admin1 [priv]
sshd: admin1@notty
/bin/bash $SPEC/run_fprate_sh.sh
sudo ./run_fprate.py
python3 ./run_fprate.py
/bin/bash ./amd_rate_aocc510_znver5_A1.sh
runcpu --config amd_rate_aocc510_znver5_A1.cfg --tune base --reportable --iterations 3 fprate
runcpu --configfile amd_rate_aocc510_znver5_A1.cfg --tune base --reportable --iterations 3 --nopower
--runmode rate --tune base --size test:train:refrate fprate --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2026.001/templogs/preenv.fprate.001.0.log --lognum 001.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2026
```

### 6. /proc/cpuinfo

```
model name      : AMD EPYC 9845 160-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 26
model          : 17
stepping       : 0
microcode      : 0xb101054
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size      : 192 4K pages
```

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## Platform Notes (Continued)

```
cpu cores      : 160
siblings      : 160
1 physical ids (chips)
160 processors (hardware threads)
physical id 0: core ids 0-159
physical id 0: apicids 0-159
```

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
CPU op-mode(s):              32-bit, 64-bit
Address sizes:                52 bits physical, 57 bits virtual
Byte Order:                  Little Endian
CPU(s):                       160
On-line CPU(s) list:         0-159
Vendor ID:                    AuthenticAMD
BIOS Vendor ID:              Advanced Micro Devices, Inc.
Model name:                   AMD EPYC 9845 160-Core Processor
BIOS Model name:              AMD EPYC 9845 160-Core Processor          CPU @ 2.1GHz
BIOS CPU family:              107
CPU family:                   26
Model:                        17
Thread(s) per core:          1
Core(s) per socket:          160
Socket(s):                    1
Stepping:                     0
Frequency boost:              enabled
CPU(s) scaling MHz:          105%
CPU max MHz:                  2100.0000
CPU min MHz:                  1500.0000
BogoMIPS:                     4193.80
```

```
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 svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch
osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpeext
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 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap
avx512ifma clflushopt clwb avx512cd sha_ni avx512bw avx512vl xsaveopt
xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
```

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## Platform Notes (Continued)

```
cqm_mbm_local user_shstk avx_vnni avx512_bf16 clzero irperf
xsaveerptr rdpru wbnoinvd amd_ppin cppc amd_ibpb_ret arat npt lbrv
svm_lock nrrip_save tsc_scale vmcb_clean flushbyasid decodeassists
pausefilter pfthreshold avic v_vmsave_vmload vgif x2avic v_spec_ctrl
vnni 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 fsrm avx512_vp2intersect
flush_llid debug_swap
```

```
Virtualization: AMD-V
L1d cache: 7.5 MiB (160 instances)
L1i cache: 5 MiB (160 instances)
L2 cache: 160 MiB (160 instances)
L3 cache: 320 MiB (10 instances)
NUMA node(s): 2
NUMA node0 CPU(s): 0-79
NUMA node1 CPU(s): 80-159
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/swaps barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced / Automatic IBRS; IBPB conditional; STIBP
disabled; RSB filling; PBRSE-eIBRS Not affected; BHI Not affected
Vulnerability Srbds: Not affected
Vulnerability Tsx async abort: Not affected
Vulnerability Vmscape: Not affected
```

From `lscpu --cache:`

NAME	ONE-SIZE	ALL-SIZE	WAYS	TYPE	LEVEL	SETS	PHY-LINE	COHERENCY-SIZE
L1d	48K	7.5M	12	Data	1	64	1	64
L1i	32K	5M	8	Instruction	1	64	1	64
L2	1M	160M	16	Unified	2	1024	1	64
L3	32M	320M	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: 0-79  
node 0 size: 386729 MB  
node 0 free: 385143 MB

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## Platform Notes (Continued)

```
node 1 cpus: 80-159
node 1 size: 386930 MB
node 1 free: 385713 MB
node distances:
node 0 1
  0: 10 12
  1: 12 10
```

9. /proc/meminfo  
MemTotal: 792228056 kB

10. who -r  
run-level 5 Jan 28 10:46

11. Systemd service manager version: systemd 255 (255.4-1ubuntu8.12)  
Default Target Status  
graphical running

12. Services, from systemctl list-unit-files

STATE	UNIT FILES
enabled	ModemManager apparmor appport 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 snapd sysstat systemd-networkd systemd-networkd-wait-online systemd-pstore systemd-resolved 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@ 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-sysex systemd-time-wait-sync systemd-timesyncd upower
indirect	systemd-sysupdate systemd-sysupdate-reboot uidd
masked	cryptdisks cryptdisks-early hwclock multipath-tools-boot screen-cleanup sudo x11-common

13. Linux kernel boot-time arguments, from /proc/cmdline  
BOOT\_IMAGE=/boot/vmlinuz-6.8.0-90-generic  
root=UUID=80ced99f-4de1-4843-9386-fd6dda74fdf5  
ro

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## Platform Notes (Continued)

-----  
14. cpupower frequency-info

analyzing CPU 102:

current policy: frequency should be within 1.50 GHz and 2.10 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: 2100MHz

-----  
15. tuned-adm active

Current active profile: balanced

-----  
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+madvice madvice never

enabled [always] madvice never

hpage\_pmd\_size 2097152

shmem\_enabled always within\_size advise [never] deny force

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(Continued on next page)



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## Platform Notes (Continued)

```
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 24.04.3 LTS
```

```
-----
20. Disk information
    SPEC is set to: /home/cpu2026
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda2       ext4  439G   34G  383G   9% /
```

```
-----
21. /sys/devices/virtual/dmi/id
    Vendor:          HPE
    Product:         ProLiant DL325 Gen11
    Product Family: ProLiant
    Serial:          DL325G11-010
```

```
-----
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:
    1x Micron MTC40F2046S1RC64BD2 MWFF 64 GB 2 rank 6400
    11x Micron MTC40F2046S1RC64BD2 QSFF 64 GB 2 rank 6400
```

```
-----
23. BIOS
    (This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:    HPE
    BIOS Version:   2.90
    BIOS Date:      01/09/2026
    BIOS Revision:  2.90
    Firmware Revision: 1.65
```



# SPEC CPU®2026 Floating Point Rate Result

Copyright 2026 Standard Performance Evaluation Corporation

**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

ProLiant DL325 Gen11

(2.10 GHz, AMD EPYC 9845)

SPECrate®2026\_fp\_base = 456

SPECrate®2026\_fp\_peak = 456

**CPU2026 License:** 3

**Test Sponsor:** HPE

**Tested by:** HPE

**Test Date:** Jan-2026

**Hardware Availability:** Mar-2025

**Software Availability:** Jan-2026

## Compiler Version Notes

=====  
C | 782.lbm\_r(base)  
-----

AMD clang version 17.0.6 (CLANG: AOCC\_5.1.0-Build#1994 2025\_12\_23)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-5.1.0/bin  
-----

=====  
C++ | 731.astcenc\_r(base) 736.ocio\_r(base) 748.flightdm\_r(base)  
766.femflow\_r(base) 767.nest\_r(base) 772.marian\_r(base)

AMD clang version 17.0.6 (CLANG: AOCC\_5.1.0-Build#1994 2025\_12\_23)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-5.1.0/bin  
-----

=====  
C++, C | 709.cactus\_r(base) 737.gmsh\_r(base)  
-----

AMD clang version 17.0.6 (CLANG: AOCC\_5.1.0-Build#1994 2025\_12\_23)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-5.1.0/bin  
-----

=====  
Fortran | 722.palm\_r(base) 749.fotonik3d\_r(base) 765.roms\_r(base)  
-----

AMD clang version 17.0.6 (CLANG: AOCC\_5.1.0-Build#1994 2025\_12\_23)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc/aocc-compiler-5.1.0/bin  
-----

## Base Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

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## Base Compiler Invocation (Continued)

Fortran benchmarks:

flang

Benchmarks using both C and C++:

clang++ clang

## Base Portability Flags

709.cactus\_r: -DSPEC\_LP64

722.palm\_r: -DSPEC\_LP64

731.ascenc\_r: -DSPEC\_LP64

736.ocio\_r: -fno-finite-math-only -DSPEC\_LP64

737.gmsh\_r: -fno-fast-math -DSPEC\_LP64

748.flightdm\_r: -fno-reciprocal-math -DSPEC\_LP64

749.fotonik3d\_r: -DSPEC\_LP64

765.roms\_r: -DSPEC\_LP64

766.femflow\_r: -DSPEC\_LP64

767.nest\_r: -fno-finite-math-only -DSPEC\_LP64

772.marian\_r: -DSPEC\_LP64

782.lbm\_r: -DSPEC\_LP64

## Base Optimization Flags

C benchmarks:

-m64 -std=c18 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6

-Wl,-mllvm -Wl,-reduce-array-computations=3

-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather

-ffast-math -O3 -march=znver5 -fveclib=AMDLIBM -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

C++ benchmarks:

-m64 -std=c++17 -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

-ffast-math -O3 -march=znver5 -fveclib=AMDLIBM -flto

-mllvm -unroll-threshold=100 -mllvm -loop-unswitch-threshold=200000

-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc

-lflang

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**Hardware Availability:** Mar-2025  
**Software Availability:** Jan-2026

## Base Optimization Flags (Continued)

Fortran benchmarks:

```
-m64 -Mstandard -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 -ffast-math -O3
-march=znver5 -fveclib=AMDLIBM -flto -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -mllvm -reduce-array-computations=3
-fepilog-vectorization-of-inductions -zopt -lamdlibm -lamdalloc
-lflang
```

Benchmarks using both C and C++:

```
-m64 -std=c++17 -std=c18 -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
-ffast-math -O3 -march=znver5 -fveclib=AMDLIBM -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
```

## Peak Optimization Flags

C benchmarks:

782.lbm\_r: basepeak = yes

C++ benchmarks:

731.astcenc\_r: basepeak = yes

736.ocio\_r: basepeak = yes

748.flightdm\_r: basepeak = yes

766.femflow\_r: basepeak = yes

767.nest\_r: basepeak = yes

772.marian\_r: basepeak = yes

Fortran benchmarks:

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**Tested by:** HPE

**Test Date:** Jan-2026

**Hardware Availability:** Mar-2025

**Software Availability:** Jan-2026

## Peak Optimization Flags (Continued)

722.palm\_r: basepeak = yes

749.fotonik3d\_r: basepeak = yes

765.roms\_r: basepeak = yes

Benchmarks using both C and C++:

709.cactus\_r: basepeak = yes

737.gmsh\_r: basepeak = yes

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2026/results/flags/HPE-Platform-Flags-AMD-Turin-rev1.11.html>

<http://www.spec.org/cpu2026/results/flags/aocc-flags.2026-05-04.html>

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

<http://www.spec.org/cpu2026/results/flags/HPE-Platform-Flags-AMD-Turin-rev1.11.xml>

<http://www.spec.org/cpu2026/results/flags/aocc-flags.2026-05-04.xml>

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For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

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