



SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2025 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant Compute DL325 Gen12

(3.6 GHz, AMD EPYC 9015)

SPECspeed®2017_fp_base = 121

SPECspeed®2017_fp_peak = 126

CPU2017 License: 3

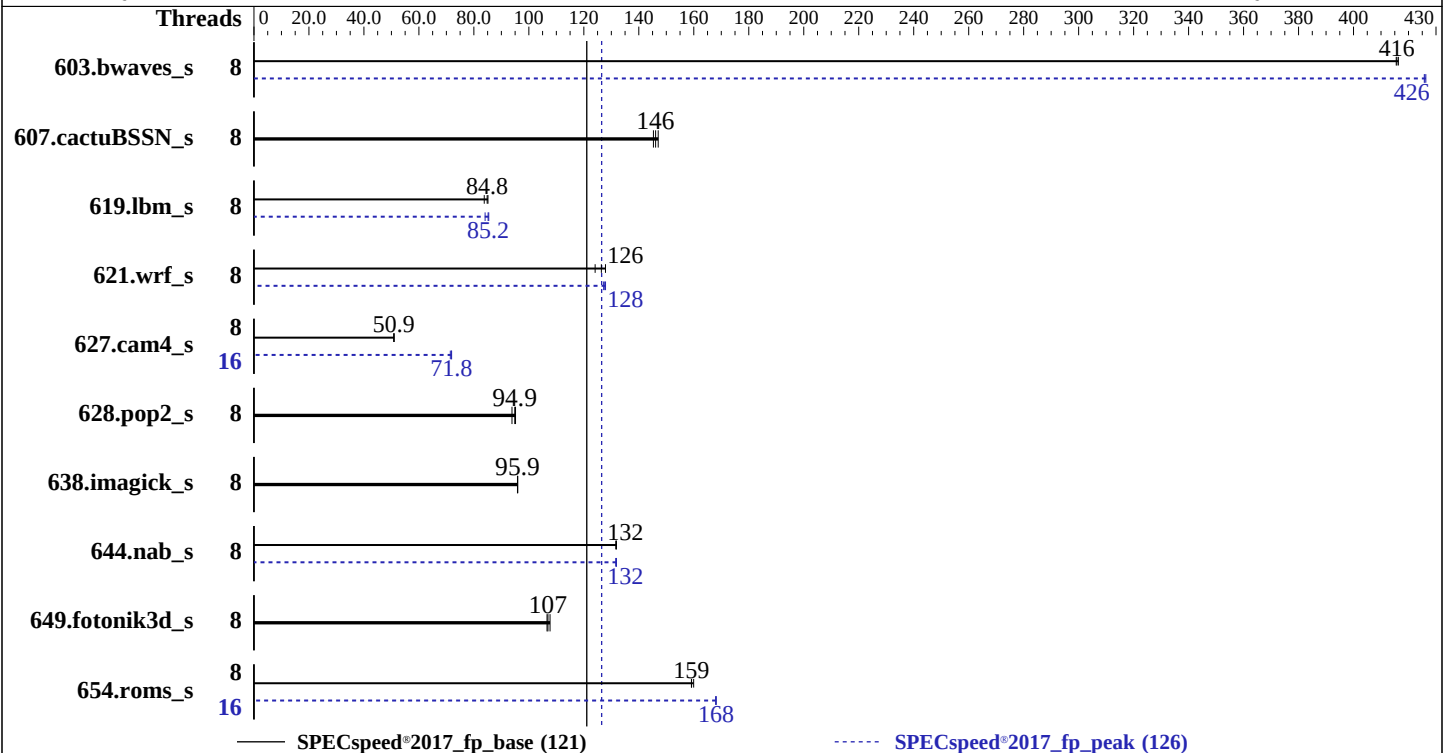
Test Sponsor: HPE

Tested by: HPE

Test Date: Sep-2025

Hardware Availability: Jul-2025

Software Availability: Oct-2024



Hardware

CPU Name: AMD EPYC 9015
Max MHz: 4100
Nominal: 3600
Enabled: 8 cores, 1 chip, 2 threads/core
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: 64 MB I+D on chip per chip, 32 MB shared / 4 cores
Other: None
Memory: 768 GB (12 x 64 GB 2Rx4 PC5-6400B-R, running at 5200)
Storage: 1 x 2 TB NVMe SSD
Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP6
kernel 6.4.0-150600.21-default
Compiler: C/C++/Fortran: Version 5.0.0 of AOCC
Parallel: Yes
Firmware: HPE BIOS Version v1.20 07/11/2025 released Jul-2025
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 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	8	142	416	142	416	<u>142</u>	<u>416</u>	8	139	426	138	426	<u>139</u>	<u>426</u>
607.cactuBSSN_s	8	113	147	<u>114</u>	<u>146</u>	115	145	8	113	147	<u>114</u>	<u>146</u>	115	145
619.lbm_s	8	<u>61.7</u>	<u>84.8</u>	61.5	85.1	62.5	83.8	8	<u>61.5</u>	<u>85.2</u>	61.3	85.4	62.3	84.1
621.wrf_s	8	<u>105</u>	<u>126</u>	107	124	103	128	8	104	127	103	128	<u>104</u>	<u>128</u>
627.cam4_s	8	174	51.0	174	50.9	<u>174</u>	<u>50.9</u>	16	123	71.9	124	71.4	<u>123</u>	<u>71.8</u>
628.pop2_s	8	<u>125</u>	<u>94.9</u>	125	95.2	126	93.9	8	<u>125</u>	<u>94.9</u>	125	95.2	126	93.9
638.imagick_s	8	150	95.9	150	96.0	<u>150</u>	<u>95.9</u>	8	150	95.9	150	96.0	<u>150</u>	<u>95.9</u>
644.nab_s	8	133	132	<u>133</u>	<u>132</u>	133	132	8	<u>133</u>	<u>132</u>	132	132	133	132
649.fotonik3d_s	8	85.5	107	<u>85.2</u>	<u>107</u>	84.6	108	8	85.5	107	<u>85.2</u>	<u>107</u>	84.6	108
654.roms_s	8	98.9	159	98.4	160	<u>98.9</u>	<u>159</u>	16	<u>93.7</u>	<u>168</u>	93.7	168	93.6	168

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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,
'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 = "0-15"

LD_LIBRARY_PATH =

"/home/cpu2017/amd_speed_aocc500_znver5_A_lib/lib:/home/cpu2017/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 = "16"

Environment variables set by runcpu during the 603.bwaves_s peak run:

GOMP_CPU_AFFINITY = "0-7"

Environment variables set by runcpu during the 619.lbm_s peak run:

GOMP_CPU_AFFINITY = "0-7"

Environment variables set by runcpu during the 621.wrf_s peak run:

GOMP_CPU_AFFINITY = "0-7"

Environment variables set by runcpu during the 627.cam4_s peak run:

GOMP_CPU_AFFINITY = "0-15"

Environment variables set by runcpu during the 644.nab_s peak run:

GOMP_CPU_AFFINITY = "0-7"

Environment variables set by runcpu during the 654.roms_s peak run:

GOMP_CPU_AFFINITY = "0-15"

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 Peak Frequency 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

Last-Level Cache (LLC) as NUMA Node set to Enabled

NUMA memory domains per socket set to Four memory domains per socket

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 localhost Thu Sep 18 15:18:09 2025

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Platform Notes (Continued)

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

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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 254 (254.10+suse.84.ge8d77af424)`
12. Services, from `systemctl list-unit-files`
13. Linux kernel boot-time arguments, from `/proc/cmdline`
14. `cpupower frequency-info`
15. `sysctl`
16. `/sys/kernel/mm/transparent_hugepage`
17. `/sys/kernel/mm/transparent_hugepage/khugepaged`
18. OS release
19. Disk information
20. `/sys/devices/virtual/dmi/id`
21. `dmidecode`
22. BIOS

```
1. uname -a
Linux localhost 6.4.0-150600.21-default #1 SMP PREEMPT_DYNAMIC Thu May 16 11:09:22 UTC 2024 (36c1e09/lp)
x86_64 x86_64 x86_64 GNU/Linux
```

```
2. w
15:18:09 up 3:19, 3 users, load average: 6.31, 5.79, 3.58
USER      TTY      FROM          LOGIN@   IDLE   JCPU   PCPU   WHAT
```

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

```
4. ulimit -a
core file size          (blocks, -c) unlimited
data seg size           (kbytes, -d) unlimited
scheduling priority     (-e) 0
file size               (blocks, -f) unlimited
pending signals         (-i) 3094808
max locked memory       (kbytes, -l) 2097152
max memory size         (kbytes, -m) unlimited
open files              (-n) 1024
pipe size               (512 bytes, -p) 8
POSIX message queues    (bytes, -q) 819200
real-time priority      (-r) 0
stack size              (kbytes, -s) unlimited
cpu time                (seconds, -t) unlimited
max user processes      (-u) 3094808
```

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Platform Notes (Continued)

virtual memory (kbytes, -v) unlimited
file locks (-x) unlimited

```
-----
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize=42
SCREEN -S cpu
/bin/bash
python3 ./run_intspeed.py
/bin/bash ./amd_speed_aocc500_znver5_A1.sh
runcpu --config amd_speed_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 fpspeed
runcpu --configfile amd_speed_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 --nopower
--runmode speed --tune base:peak --size test:train:refspeed fpspeed --nopreenv --note-preenv --logfile
$SPEC/tmp/CPU2017.048/temlogs/preenv.fpspeed.048.0.log --lognum 048.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017
```

```
-----
6. /proc/cpuinfo
model name      : AMD EPYC 9015 8-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 26
model          : 2
stepping       : 1
microcode      : 0xb002151
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size       : 192 4K pages
cpu cores      : 8
siblings       : 16
1 physical ids (chips)
16 processors (hardware threads)
physical id 0: core ids 0-7
physical id 0: apicids 0-15
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):	16
On-line CPU(s) list:	0-15
Vendor ID:	AuthenticAMD
BIOS Vendor ID:	Advanced Micro Devices, Inc.
Model name:	AMD EPYC 9015 8-Core Processor
BIOS Model name:	AMD EPYC 9015 8-Core Processor
BIOS CPU family:	107
CPU family:	26
Model:	2
Thread(s) per core:	2
Core(s) per socket:	8
Socket(s):	1
Stepping:	1
Frequency boost:	enabled
CPU(s) scaling MHz:	102%
CPU max MHz:	3600.0000

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Platform Notes (Continued)

CPU min MHz: 1500.0000
BogoMIPS: 7189.36
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 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 bpxext 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 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 fsrm avx512_vp2intersect flush_l1d debug_swap
L1d cache: 384 KiB (8 instances)
L1i cache: 256 KiB (8 instances)
L2 cache: 8 MiB (8 instances)
L3 cache: 64 MiB (2 instances)
NUMA node(s): 2
NUMA node0 CPU(s): 0-3,8-11
NUMA node1 CPU(s): 4-7,12-15
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Mmio stale data: Not affected
Vulnerability Reg file data sampling: Not affected
Vulnerability Retbleed: Not affected
Vulnerability Spec rstack overflow: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced / Automatic IBRS; IBPB conditional; STIBP always-on; RSB filling; PBRSE-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	384K	12	Data	1	64	1	64
L1i	32K	256K	8	Instruction	1	64	1	64
L2	1M	8M	16	Unified	2	1024	1	64
L3	32M	64M	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: 0-3,8-11

node 0 size: 386714 MB

node 0 free: 385439 MB

node 1 cpus: 4-7,12-15

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Platform Notes (Continued)

node 1 size: 387017 MB

node 1 free: 386187 MB

node distances:

node 0 1

0: 10 12

1: 12 10

9. /proc/meminfo

MemTotal: 792302112 kB

10. who -r

run-level 5 Sep 18 11:59

11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)

Default Target Status
graphical running

12. Services, from systemctl list-unit-files

STATE UNIT FILES

enabled ModemManager YaST2-Firstboot YaST2-Second-Stage apparmor appstream-sync-cache auditd
bluetooth cron display-manager getty@ irqbalance iscsi issue-generator kbdsettings klog
lvm2-monitor nsd nvme-fc-boot-connections nvme-autoconnect oracle postfix purge-kernels
rollback rsyslog sapconf smartd sshd systemctl-logger systemd-pstore virtqemu virtxend
wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny wpa_supplicant xencommons
enabled-runtime systemd-fsck-root systemd-remount-fs
disabled NetworkManager NetworkManager-dispatcher NetworkManager-wait-online accounts-daemon amavis
apache2 apache2@ autofs autostart-initscripts bgpd blk-availability bluetooth-mesh
boot-sysctl booth-arbitrator booth@ ca-certificates certmonger chrony-wait chronyd
clamav-milter clamd console-getty corosync corosync-notifd crm_mon ctdb cups cups-browsed
ddclient debug-shell dhcpd dhcpd6 dhcrelay dhcrelay6 dirsrv@ dlm dnsmasq drbd
drbd-lvchange@ drbd-wait-promotable@ ebttables exchange-bmc-os-info fetchmail firewalld
freshclam fsidd gpm grub2-once haveged hawk hwloc-dump-hwdata ipmi ipmievdev ipvsadm
iscsi-init iscsid isisd issue-add-ssh-keys kexec-load ksm kvm_stat ldirectord
libvirt-guests logd lunmask lvmlckd lvmlckd man-db-create mariadb mariadb@ multipathd
named nfs nfs-blkmap nfs-server nfs-server nmb openvpn@ ospf6d ospfd ostree-remount
pacemaker racoon racoon-setkey radvd rarpd@ ripd ripngd rpcbind rpmconfigcheck rsyncd
rtkit-daemon sanlock sbd sbd_remote serial-getty@ smartd_generate_opts smb snmpd snmptrapd
spamd spamd speech-dispatcher squid srp_daemon srp_daemon_port@ strongswan
strongswan-starter svnserv sysstat systemd-boot-check-no-failures systemd-confext
systemd-network-generator systemd-nspawn@ systemd-sysext systemd-time-wait-sync
systemd-timesyncd tcsh udisks2 update-system-flatpaks upower virtinterfaced virtlockd
virtlogd virtnetworkd virtnodevdev virtnwfilterd virtsecret virtstoraged vncserver@
vsftpd wdm winbind wpa_supplicant@ xen-dom0-modules xen-init-dom0
xen-qemu-dom0-disk-backend xen-watchdog xenconsole xendomains xenstored zebra
indirect pcsd saned@ systemd-userdbd tftp uidd wickedd

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

BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
root=UUID=97def8eb-7bcd-4ed3-b3a2-8816e352f9b0
splash=silent
mitigations=auto
quiet
security=apparmor
amd_pstate=active

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Platform Notes (Continued)

14. cpupower frequency-info

analyzing CPU 7:

current policy: frequency should be within 1.50 GHz and 3.60 GHz.

The governor "performance" may decide which speed to use within this range.

boost state support:

Supported: yes

Active: yes

15. sysctl

```
kernel.numa_balancing      0
kernel.randomize_va_space  0
vm.compaction_proactiveness 20
vm.dirty_background_bytes   314572800
vm.dirty_background_ratio   0
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
```

16. /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
```

17. /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
```

18. OS release

From /etc/*-release /etc/*-version

os-release SUSE Linux Enterprise Server 15 SP6

19. Disk information

SPEC is set to: /home/cpu2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/nvme0n1p3	ext4	1.8T	20G	1.7T	2%	/

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Platform Notes (Continued)

20. /sys/devices/virtual/dmi/id

Vendor: HPE
Product: HPE ProLiant Compute DL325 Gen12
Product Family: ProLiant
Serial: SANJACSCM

21. dmidecode

Additional information from dmidecode 3.4 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:

8x Hynix HMC94AHBRA480N 64 GB 2 rank 6400, configured at 5200
4x Micron MTC40F2046S1RC64BD2 QSFF 64 GB 2 rank 6400, configured at 5200

22. BIOS

(This section combines info from /sys/devices and dmidecode.)

BIOS Vendor: HPE
BIOS Version: 1.20
BIOS Date: 07/11/2025
BIOS Revision: 1.20
Firmware Revision: 1.16

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#1377 2024_09_24)

Target: x86_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc/aocc-compiler-5.0.0/bin

C++, C, Fortran | 607.cactuBSSN_s(base, peak)

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1377 2024_09_24)

Target: x86_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc/aocc-compiler-5.0.0/bin

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1377 2024_09_24)

Target: x86_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc/aocc-compiler-5.0.0/bin

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1377 2024_09_24)

Target: x86_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc/aocc-compiler-5.0.0/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#1377 2024_09_24)

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(Test Sponsor: HPE)

ProLiant Compute DL325 Gen12

(3.6 GHz, AMD EPYC 9015)

SPECspeed®2017_fp_base = 121

SPECspeed®2017_fp_peak = 126

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Sep-2025

Hardware Availability: Jul-2025

Software Availability: Oct-2024

Compiler Version Notes (Continued)

Target: x86_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc/aocc-compiler-5.0.0/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#1377 2024_09_24)

Target: x86_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc/aocc-compiler-5.0.0/bin

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1377 2024_09_24)

Target: x86_64-unknown-linux-gnu

Thread model: posix

InstalledDir: /opt/AMD/aocc/aocc-compiler-5.0.0/bin
=====

Base Compiler Invocation

C benchmarks:

clang

Fortran benchmarks:

flang

Benchmarks using both Fortran and C:

flang clang

Benchmarks using Fortran, C, and C++:

clang++ clang flang

Base Portability Flags

603.bwaves_s: -DSPEC_LP64

607.cactuBSSN_s: -DSPEC_LP64

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



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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
-freemap-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
-lamdlbm -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 -lamdlbm -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
-freemap-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 -lamdlbm -lamdalloc -lflang
```

Benchmarks using Fortran, C, and C++:

```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -fopenmp -DSPEC_OPENMP -flto
-freemap-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 -lamdlbm -lamdalloc -lflang
```



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Test Sponsor: HPE

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Test Date: Sep-2025

Hardware Availability: Jul-2025

Software Availability: Oct-2024

Base Other Flags

C benchmarks:

-Wno-return-type -Wno-unused-command-line-argument

Fortran benchmarks:

-Wno-unused-command-line-argument

Benchmarks using both Fortran and C:

-Wno-return-type -Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:

-Wno-return-type -Wno-unused-command-line-argument

Peak Compiler Invocation

C benchmarks:

clang

Fortran benchmarks:

flang

Benchmarks using both Fortran and C:

flang clang

Benchmarks using Fortran, C, and C++:

clang++ clang flang

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

619.lbm_s: -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

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Software Availability: Oct-2024

Peak Optimization Flags (Continued)

619.lbm_s (continued):

-mllvm -unroll-threshold=50 -zopt -fopenmp=libomp -lomp
-lamdlibm -lamdalloc -lflang

638.imagick_s: basepeak = yes

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: Same as 603.bwaves_s

Benchmarks using both Fortran and C:

621.wrf_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -DSPEC_OPENMP -fremap-arrays -fstrip-mining
-fstruct-layout=9 -mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=50 -zopt -funroll-loops
-mllvm -lsr-in-nested-loop -Mrecursive -fopenmp=libomp
-lomp -lamdlibm -lamdalloc -lflang

627.cam4_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp

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Software Availability: Oct-2024

Peak Optimization Flags (Continued)

627.cam4_s (continued):

-flto -DSPEC_OPENMP -fremap-arrays -fstrip-mining
-fstruct-layout=9 -mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=50 -zopt -Mrecursive
-mrecip=none -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang

628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

Peak Other Flags

C benchmarks:

-Wno-return-type -Wno-unused-command-line-argument

Fortran benchmarks:

-Wno-unused-command-line-argument

Benchmarks using both Fortran and C:

-Wno-return-type -Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:

-Wno-return-type -Wno-unused-command-line-argument

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

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-Turin-rev1.7.html>

<http://www.spec.org/cpu2017/flags/aocc500-flags.2024-10-10.html>

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

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-Turin-rev1.7.xml>

<http://www.spec.org/cpu2017/flags/aocc500-flags.2024-10-10.xml>

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Tested with SPEC CPU®2017 v1.1.9 on 2025-09-18 16:18:08-0400.

Report generated on 2025-11-05 12:06:17 by CPU2017 PDF formatter v6716.

Originally published on 2025-11-04.