



SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2025 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL325 Gen11

(2.10 GHz, AMD EPYC 9845)

SPECspeed®2017_fp_base = 383

SPECspeed®2017_fp_peak = 386

CPU2017 License: 3

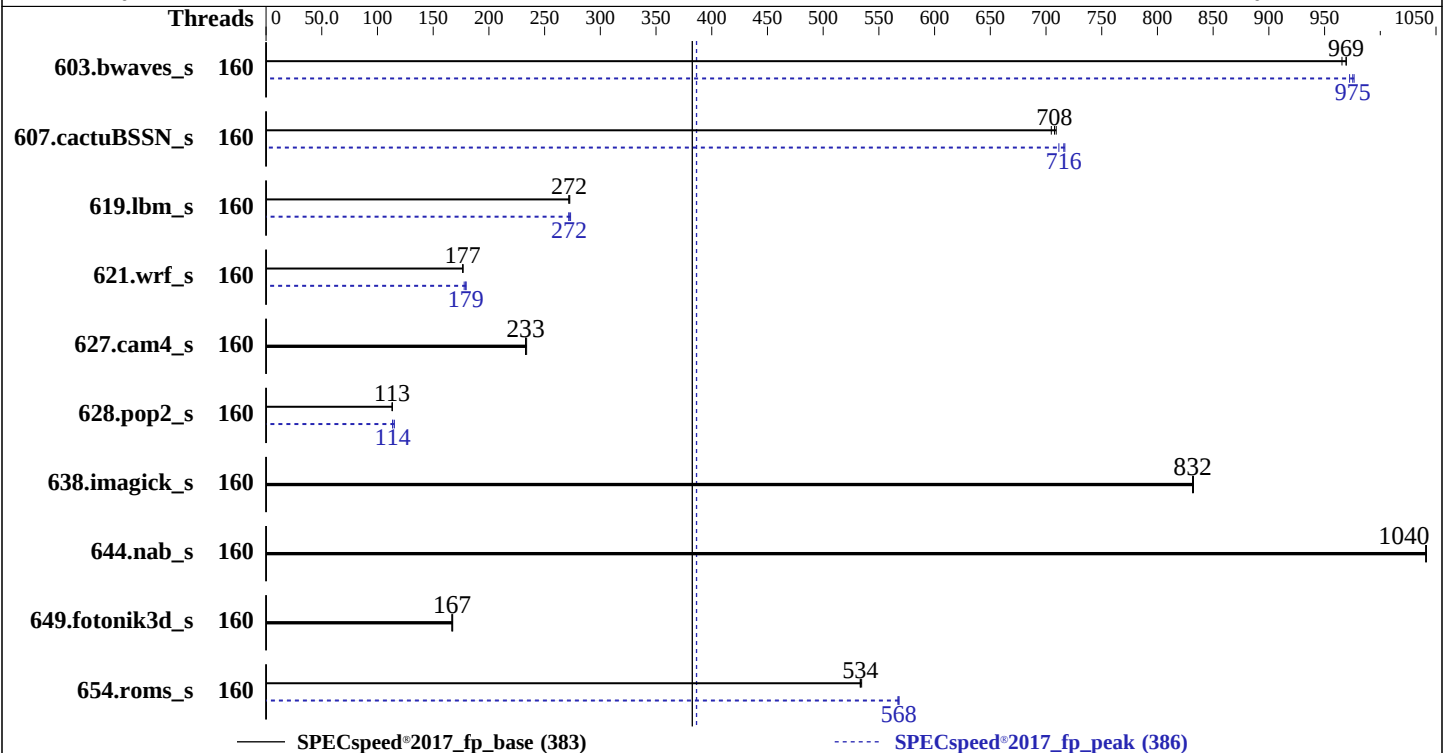
Test Sponsor: HPE

Tested by: HPE

Test Date: Jan-2025

Hardware Availability: Mar-2025

Software Availability: Oct-2024



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 SATA SSD
Other: CPU Cooling: CLC

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 v2.30 01/17/2025 released
Jan-2025
File System: xfs
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	160	<u>60.9</u>	<u>969</u>	61.1	966	60.9	970	160	<u>60.5</u>	<u>975</u>	60.7	972	60.4	976
607.cactuBSSN_s	160	23.7	705	23.5	709	<u>23.6</u>	<u>708</u>	160	23.4	712	23.3	717	<u>23.3</u>	<u>716</u>
619.lbm_s	160	<u>19.3</u>	<u>272</u>	19.3	272	19.2	273	160	19.3	272	19.2	273	<u>19.3</u>	<u>272</u>
621.wrf_s	160	74.8	177	75.0	176	<u>74.9</u>	<u>177</u>	160	73.7	180	74.4	178	<u>73.8</u>	<u>179</u>
627.cam4_s	160	38.1	233	<u>38.0</u>	<u>233</u>	37.9	234	160	38.1	233	<u>38.0</u>	<u>233</u>	37.9	234
628.pop2_s	160	105	113	<u>105</u>	<u>113</u>	105	113	160	105	114	<u>104</u>	<u>114</u>	103	115
638.imagick_s	160	17.3	832	17.3	832	<u>17.3</u>	<u>832</u>	160	17.3	832	17.3	832	<u>17.3</u>	<u>832</u>
644.nab_s	160	<u>16.8</u>	<u>1040</u>	16.8	1040	16.8	1040	160	<u>16.8</u>	<u>1040</u>	16.8	1040	16.8	1040
649.fotonik3d_s	160	54.4	168	54.7	167	<u>54.5</u>	<u>167</u>	160	54.4	168	54.7	167	<u>54.5</u>	<u>167</u>
654.roms_s	160	29.5	533	29.5	535	<u>29.5</u>	<u>534</u>	160	27.7	568	<u>27.7</u>	<u>568</u>	27.8	567

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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 = "0-159"

LD_LIBRARY_PATH =

"/home/cpu2017_new/amd_speed_aocc500_znver5_A_lib/lib:/home/cpu2017_new/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 = "160"

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

GOMP_CPU_AFFINITY = "0-159"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:

GOMP_CPU_AFFINITY = "0-159"

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

GOMP_CPU_AFFINITY = "0-159"

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

GOMP_CPU_AFFINITY = "0-159"

Environment variables set by runcpu during the 628.pop2_s peak run:

GOMP_CPU_AFFINITY = "0-159"

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

GOMP_CPU_AFFINITY = "0-159"

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.

Platform Notes

BIOS Configuration

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

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

ACPI CST C2 Latency set to 18 microseconds

Thermal Configuration set to Maximum Cooling

AMD SMT Option set to Disabled

Workload Profile set to Custom

Power Regulator set to OS Control Mode

The reference code/AGESA version used in this ROM is version Turin-PI 1.0.0.3

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Platform Notes (Continued)

Sysinfo program /home/cpu2017_new/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Fri Jan 24 14:26:54 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 254 (254.10+suse.84.ge8d77af424)
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. cpupower frequency-info
16. tuned-adm active
17. sysctl
18. /sys/kernel/mm/transparent_hugepage
19. /sys/kernel/mm/transparent_hugepage/khugepaged
20. OS release
21. Disk information
22. /sys/devices/virtual/dmi/id
23. dmidecode
24. BIOS

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

2. w
14:26:54 up 1 day, 3:23, 2 users, load average: 0.12, 0.57, 0.83
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
root pts/0 172.17.1.96 Thu11 21.00s 1.20s 0.28s /bin/bash ./amd_speed_aocc500_znver5_A1.sh

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) 3094453
max locked memory (kbytes, -l) 2097152
max memory size (kbytes, -m) unlimited
open files (-n) 1024

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Platform Notes (Continued)

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) 3094453
virtual memory (kbytes, -v) unlimited
file locks (-x) unlimited

5. sysinfo process ancestry

```
/usr/lib/systemd/systemd --switched-root --system --deserialize=42
```

```
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
```

```
sshd: root [priv]
```

```
sshd: root@pts/0
```

```
-bash
```

```
python3 ./run_fpspeed.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/CPU2017.004/templogs/preenv.fpspeed.004.0.log --lognum 004.0 --from_runcpu 2
```

```
specperl $SPEC/bin/sysinfo
```

```
$SPEC = /home/cpu2017_new
```

6. /proc/cpuinfo

```
model name      : AMD EPYC 9845 160-Core Processor  
vendor_id      : AuthenticAMD  
cpu family     : 26  
model          : 17  
stepping       : 0  
microcode      : 0xb101028  
bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass  
TLB size       : 192 4K pages  
cpu cores      : 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
BIOS CPU family:	107
CPU family:	26

CPU @ 2.1GHz

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Platform Notes (Continued)

Model: 17
Thread(s) per core: 1
Core(s) per socket: 160
Socket(s): 1
Stepping: 0
Frequency boost: enabled
CPU(s) scaling MHz: 106%
CPU max MHz: 2100.0000
CPU min MHz: 1500.0000
BogoMIPS: 4193.78
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 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 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_lld debug_swap
AMD-V
7.5 MiB (160 instances)
L1d cache: 5 MiB (160 instances)
L1i cache: 160 MiB (160 instances)
L2 cache: 320 MiB (10 instances)
L3 cache: 10
NUMA node(s): 0-15
NUMA node0 CPU(s): 16-31
NUMA node1 CPU(s): 32-47
NUMA node2 CPU(s): 48-63
NUMA node3 CPU(s): 64-79
NUMA node4 CPU(s): 80-95
NUMA node5 CPU(s): 96-111
NUMA node6 CPU(s): 112-127
NUMA node7 CPU(s): 128-143
NUMA node8 CPU(s): 144-159
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/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced / Automatic IBRS; IBPB conditional; STIBP
disabled; RSB filling; PBRBS-eIBRS Not affected; BHI Not affected
Vulnerability Srbds: Not affected

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Platform Notes (Continued)

Vulnerability Tsx async abort: 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: 10 nodes (0-9)

node 0 cpus: 0-15

node 0 size: 77094 MB

node 0 free: 76703 MB

node 1 cpus: 16-31

node 1 size: 77409 MB

node 1 free: 77110 MB

node 2 cpus: 32-47

node 2 size: 77411 MB

node 2 free: 77157 MB

node 3 cpus: 48-63

node 3 size: 77409 MB

node 3 free: 77247 MB

node 4 cpus: 64-79

node 4 size: 77411 MB

node 4 free: 77252 MB

node 5 cpus: 80-95

node 5 size: 77373 MB

node 5 free: 77204 MB

node 6 cpus: 96-111

node 6 size: 77409 MB

node 6 free: 77256 MB

node 7 cpus: 112-127

node 7 size: 77411 MB

node 7 free: 77260 MB

node 8 cpus: 128-143

node 8 size: 77411 MB

node 8 free: 77248 MB

node 9 cpus: 144-159

node 9 size: 77300 MB

node 9 free: 77133 MB

node distances:

node	0	1	2	3	4	5	6	7	8	9
0:	10	11	11	11	11	11	11	11	11	11
1:	11	10	11	11	11	11	11	11	11	11
2:	11	11	10	11	11	11	11	11	11	11
3:	11	11	11	10	11	11	11	11	11	11
4:	11	11	11	11	10	11	11	11	11	11
5:	11	11	11	11	11	10	11	11	11	11
6:	11	11	11	11	11	11	10	11	11	11
7:	11	11	11	11	11	11	11	10	11	11
8:	11	11	11	11	11	11	11	11	10	11
9:	11	11	11	11	11	11	11	11	11	10

9. `/proc/meminfo`

MemTotal: 792210972 kB

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Platform Notes (Continued)

10. who -r
run-level 3 Jan 23 11:05

11. Systemd service manager version: systemd 254 (254.10+suse.84.ge8d77af424)
Default Target Status
multi-user degraded

12. Failed units, from systemctl list-units --state=failed
UNIT LOAD ACTIVE SUB DESCRIPTION
* NetworkManager-wait-online.service loaded failed failed Network Manager Wait Online

13. Services, from systemctl list-unit-files
STATE UNIT FILES
enabled ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online
YaST2-Firstboot YaST2-Second-Stage apparmor appstream-sync-cache auditd bluetooth cron
display-manager getty@ irqbalance issue-generator kbdsettings klog lvm2-monitor nscd
postfix purge-kernels rollback rsyslog smartd sshd systemd-pstore wpa_supplicant
enabled-runtime systemd-remount-fs
disabled accounts-daemon autofs autoyast-initscripts blk-availability bluetooth-mesh boot-sysctl
ca-certificates chrony-wait chronyd console-getty cups cups-browsed debug-shell
dmraid-activation dnsmasq ebttables exchange-bmc-os-info firewallld fsidd gpm grub2-once
haveged hwloc-dump-hwdata ipmi ipmievd issue-add-ssh-keys kexec-load lunmask man-db-create
multipathd nfs nfs-blkmap nmb openvpn@ ostree-remount rpcbind rpmconfigcheck rsyncd
rtkit-daemon serial-getty@ smartd-generate_opts smb snmpd snmptrapd speech-dispatcherd
systemd-boot-check-no-failures systemd-confext systemd-network-generator systemd-sysex
systemd-time-wait-sync systemd-timesyncd tuned udisks2 update-system-flatpaks upower
vncserver@ wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny wpa_supplicant@
indirect pcsd saned@ systemd-userdbd wickedd

14. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
root=UUID=2ecde7f3-1fd0-4b78-b405-d37301501b53
splash=silent
mitigations=auto
quiet
security=apparmor

15. cpupower frequency-info
analyzing CPU 26:
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

16. tuned-adm active
No current active profile.

17. sysctl
kernel.numa_balancing 1
kernel.randomize_va_space 0

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Platform Notes (Continued)

```
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
```

```
-----
18. /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
```

```
-----
19. /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
```

```
-----
20. OS release
From /etc/*-release /etc/*-version
os-release SUSE Linux Enterprise Server 15 SP6
```

```
-----
21. Disk information
SPEC is set to: /home/cpu2017_new
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sdc4       xfs   436G  144G  292G  34% /home
```

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

```
-----
23. 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:
```

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CPU2017 License: 3

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Platform Notes (Continued)

6x Micron MTC40F2046S1RC64BD2 MWFF 64 GB 2 rank 6400

6x Micron MTC40F2046S1RC64BD2 QSFF 64 GB 2 rank 6400

24. 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: 1.63

Compiler Version Notes

=====
C | 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)
=====

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)

Target: x86_64-unknown-linux-gnu

Thread model: posix

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

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

AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)

Target: x86_64-unknown-linux-gnu

Thread model: posix

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

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

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Software Availability: Oct-2024

Compiler Version Notes (Continued)

Thread model: posix

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

Base Compiler Invocation

C benchmarks:

clang

Fortran benchmarks:

flang

Benchmarks using both Fortran and C:

flang clang

Benchmarks using Fortran, C, and C++:

clang++ clang flang

Base Portability Flags

603.bwaves_s: -DSPEC_LP64

607.cactuBSSN_s: -DSPEC_LP64

619.lbm_s: -DSPEC_LP64

621.wrf_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64

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

(Continued on next page)



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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 -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
-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 -lamdlibm -lamdalloc -lflang
```

Benchmarks using Fortran, C, and C++:

```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver5
-fvecLib=AMDLIBM -ffast-math -fopenmp -DSPEC_OPENMP -fltO
-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=2000000 -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
```

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Base Other Flags (Continued)

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

638.imagick_s: basepeak = yes

644.nab_s: basepeak = yes

Fortran benchmarks:

(Continued on next page)



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Software Availability: Oct-2024

Peak Optimization Flags (Continued)

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: 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

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Peak Optimization Flags (Continued)

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

-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

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.2024-10-10.html>

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-Turin-rev1.5.html>

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

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

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-Turin-rev1.5.xml>

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