



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2025 Standard Performance Evaluation Corporation

Cisco Systems

Cisco UCS X215c M8 (AMD EPYC 9454
2.75 GHz Processor)

SPECrate®2017_fp_base = 1110

SPECrate®2017_fp_peak = 1110

CPU2017 License: 9019

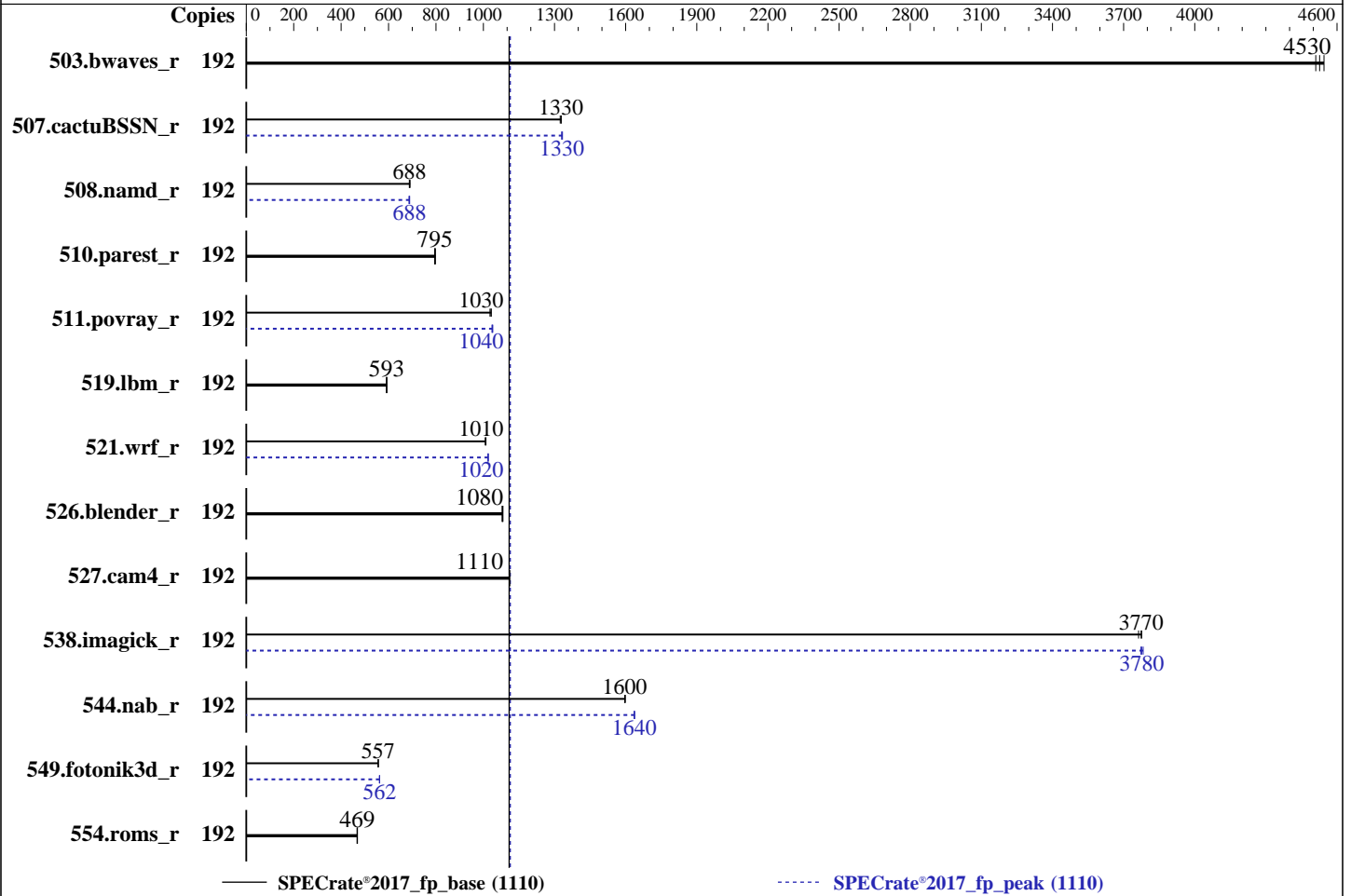
Test Sponsor: Cisco Systems

Tested by: Cisco Systems

Test Date: Jan-2025

Hardware Availability: Oct-2024

Software Availability: Sep-2024



Hardware

CPU Name: AMD EPYC 9454
 Max MHz: 3800
 Nominal: 2750
 Enabled: 96 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: 256 MB I+D on chip per chip, 32 MB shared / 6 cores
 Other: None
 Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-5600B-R, running at 4800)
 Storage: 1 x 960 GB NVMe SSD
 Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP6 kernel version 6.4.0-150600.21-default
 Compiler: C/C++/Fortran: Version 5.0.0 of AOCC
 Parallel: No
 Firmware: Version 4.3.5 released Aug-2024
 File System: btrfs
 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						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	192	424	4550	427	4510	425	4530	192	424	4550	427	4510	425	4530
507.cactuBSSN_r	192	183	1330	184	1320	183	1330	192	183	1330	183	1330	182	1330
508.namd_r	192	265	688	265	688	264	691	192	266	686	265	688	265	689
510.parest_r	192	630	798	632	795	631	795	192	630	798	632	795	631	795
511.povray_r	192	436	1030	434	1030	434	1030	192	433	1040	431	1040	432	1040
519.lbm_r	192	342	593	342	591	342	593	192	342	593	342	591	342	593
521.wrf_r	192	426	1010	425	1010	427	1010	192	422	1020	422	1020	421	1020
526.blender_r	192	271	1080	271	1080	270	1080	192	271	1080	271	1080	270	1080
527.cam4_r	192	302	1110	302	1110	303	1110	192	302	1110	302	1110	303	1110
538.imagick_r	192	127	3770	127	3760	126	3780	192	126	3780	127	3770	126	3780
544.nab_r	192	202	1600	202	1600	202	1600	192	198	1640	198	1640	197	1640
549.fotonik3d_r	192	1344	557	1345	557	1345	556	192	1331	562	1331	562	1331	562
554.roms_r	192	651	469	651	469	653	467	192	651	469	651	469	653	467

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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,

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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 settings:

NUMA nodes per socket set to NPS4

Determinism Slider set to Power

DF C-States set to Disabled

```
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Mon Jan 13 11:54:37 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. Services, from `systemctl list-unit-files`
13. Linux kernel boot-time arguments, from `/proc/cmdline`
14. `cpupower frequency-info`

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Platform Notes (Continued)

- 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 (36cle09)
x86_64 x86_64 x86_64 GNU/Linux
-----
```

```
-----
2. w
11:54:37 up 4 days, 7:03, 3 users, load average: 0.34, 0.08, 0.03
USER      TTY      FROM            LOGIN@   IDLE   JCPU   PCPU WHAT
root      tty1     -                Thu04   44.00s 2.98s  0.29s /bin/bash ./amd_rate_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) 6191137
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) 6191137
virtual memory          (kbytes, -v) unlimited
file locks              (-x) unlimited
-----
```

```
-----
5. sysinfo process ancestry
/usr/lib/systemd/systemd --switched-root --system --deserialize=42
login -- root
-bash
python3 ./run_amd_rate_aocc500_znver5_A1.py -b fprate
/bin/bash ./amd_rate_aocc500_znver5_A1.sh
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/CPU2017.001/templogs/preenv.fprate.001.0.log --lognum 001.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017
-----
```

```
-----
6. /proc/cpuinfo
-----
```

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Platform Notes (Continued)

```

model name      : AMD EPYC 9454 48-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 25
model         : 17
stepping      : 1
microcode     : 0xa101148
bugs         : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass rsno
TLB size     : 3584 4K pages
cpu cores     : 48
siblings      : 96
2 physical ids (chips)
192 processors (hardware threads)
physical id 0 : core ids 0-5,8-13,16-21,24-29,32-37,40-45,48-53,56-61
physical id 1 : core ids 0-5,8-13,16-21,24-29,32-37,40-45,48-53,56-61
physical id 0 : apicids 0-11,16-27,32-43,48-59,64-75,80-91,96-107,112-123
physical id 1 : apicids 128-139,144-155,160-171,176-187,192-203,208-219,224-235,240-251

```

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):               192
On-line CPU(s) list: 0-191
Vendor ID:            AuthenticAMD
BIOS Vendor ID:      Advanced Micro Devices, Inc.
Model name:           AMD EPYC 9454 48-Core Processor
BIOS Model name:     AMD EPYC 9454 48-Core Processor
BIOS CPU family:     107
CPU family:          25
Model:               17
Thread(s) per core:  2
Core(s) per socket:  48
Socket(s):           2
Stepping:            1
Frequency boost:     enabled
CPU(s) scaling MHz:  73%
CPU max MHz:         3810.7910
CPU min MHz:         1500.0000
BogoMIPS:            5491.44
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 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 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

```

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Platform Notes (Continued)

v_vmsave_vmload vgif x2avic v_spec_ctrl vnmi avx512vbmi umip pku
ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnmi avx512_bitalg
avx512_vpoptndq la57 rdpid overflow_recov succor smca fsrm flush_l1d
debug_swap

Virtualization:

L1d cache: 3 MiB (96 instances)
L1i cache: 3 MiB (96 instances)
L2 cache: 96 MiB (96 instances)
L3 cache: 512 MiB (16 instances)

NUMA node(s): 8
NUMA node0 CPU(s): 0-11,96-107
NUMA node1 CPU(s): 12-23,108-119
NUMA node2 CPU(s): 24-35,120-131
NUMA node3 CPU(s): 36-47,132-143
NUMA node4 CPU(s): 48-59,144-155
NUMA node5 CPU(s): 60-71,156-167
NUMA node6 CPU(s): 72-83,168-179
NUMA node7 CPU(s): 84-95,180-191

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: Mitigation; Safe RET
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	32K	3M	8	Data	1	64	1	64
L1i	32K	3M	8	Instruction	1	64	1	64
L2	1M	96M	8	Unified	2	2048	1	64
L3	32M	512M	16	Unified	3	32768	1	64

8. numactl --hardware

NOTE: a numactl 'node' might or might not correspond to a physical chip.

available: 8 nodes (0-7)
node 0 cpus: 0-11,96-107
node 0 size: 193226 MB
node 0 free: 192116 MB
node 1 cpus: 12-23,108-119
node 1 size: 193529 MB
node 1 free: 192521 MB
node 2 cpus: 24-35,120-131
node 2 size: 193491 MB
node 2 free: 192558 MB
node 3 cpus: 36-47,132-143
node 3 size: 193529 MB
node 3 free: 192572 MB
node 4 cpus: 48-59,144-155
node 4 size: 193529 MB
node 4 free: 192491 MB

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Platform Notes (Continued)

```

node 5 cpus: 60-71,156-167
node 5 size: 193529 MB
node 5 free: 192561 MB
node 6 cpus: 72-83,168-179
node 6 size: 193529 MB
node 6 free: 192282 MB
node 7 cpus: 84-95,180-191
node 7 size: 193446 MB
node 7 free: 192412 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:      1584958976 kB

```

```

-----
10. who -r
    run-level 3 Jan 9 04:51

```

```

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

```

```

-----
12. Services, from systemctl list-unit-files
STATE                               UNIT FILES
enabled                             YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron getty@ irqbalance iscsi
issue-generator kbdsettings klog lvm2-monitor nscd nvme-fc-boot-connections
nvme-fc-autoconnect postfix purge-kernels rollback rsyslog smartd sshd systemd-pstore
virtgemud wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny

enabled-runtime                     systemd-remount-fs
disabled                             autofsd autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
chronyd console-getty cups cups-browsed debug-shell dnsmasq ebttables exchange-bmc-os-info
firewalld fsidd gpm grub2-once haveged hwloc-dump-hwdata ipmi ipmievd iscsi-init iscsid
issue-add-ssh-keys kexec-load ksm kvm_stat libvirt-guests lunmask man-db-create multipathd
munge nfs nfs-blkmap nfs-server nfsserver rpcbind rpmconfigcheck rsyncd rtkit-daemon
salt-minion serial-getty@ slurmd smartd_generate_opts snmpd snmptrapd strongswan
strongswan-starter svnservice systemd-boot-check-no-failures systemd-confext
systemd-network-generator systemd-nspawn@ systemd-sysext systemd-time-wait-sync
systemd-timesyncd tcsd udisks2 virtinterfaced virtlockd virtlogd virtnetworkd virtnodevd
virtnwfilterd virtsecret virtstoraged ypbind

indirect                             pcsd systemd-userdbd tftpd wickedd

```

```

-----
13. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=/boot/vmlinuz-6.4.0-150600.21-default
root=UUID=a2d5841a-0efc-41c7-a352-ff6ddae8fa0b
splash=silent
mitigations=auto
quiet

```

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Platform Notes (Continued)

security=apparmor

```

-----
14. cpupower frequency-info
analyzing CPU 60:
  current policy: frequency should be within 1.50 GHz and 2.75 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          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
-----

```

```

-----
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
-----

```

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Platform Notes (Continued)

```
/dev/nvme0nlp3 btrfs 477G 15G 461G 4% /home
```

```
-----
20. /sys/devices/virtual/dmi/id
Vendor:      Cisco Systems Inc
Product:     UCSX-215C-M8
Serial:      FCH282172GT
-----
```

```
-----
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:
 17x 0xCE00 M321R8GA0PB0-CWMCH 64 GB 2 rank 5600, configured at 4800
  2x 0xCE00 M321R8GA0PB0-CWMJH 64 GB 2 rank 5600, configured at 4800
  5x 0xCE00 M321R8GA0PB0-CWMKJ 64 GB 2 rank 5600, configured at 4800
-----
```

```
-----
22. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor:      Cisco Systems, Inc.
BIOS Version:     X215M8.4.3.5.136.0801240859
BIOS Date:        08/01/2024
BIOS Revision:    5.27
-----
```

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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CPU2017 License: 9019

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Tested by: Cisco Systems

Test Date: Jan-2025

Hardware Availability: Oct-2024

Software Availability: Sep-2024

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)



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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

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Base Optimization Flags (Continued)

C++ benchmarks (continued):

```
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lamdalloc  
-lflang -ldl
```

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
```

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Base Optimization Flags (Continued)

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

```
-mllvm -reduce-array-computations=3 -zopt -mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000 -Mrecursive -funroll-loops
-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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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: basepeak = yes

```
538.imagick_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
-freemap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lamdalloc -ldl
```

```
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 -freemap-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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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
-freemap-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: basepeak = yes

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
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-freemap-arrays -mllvm -reduce-array-computations=3 -zopt
-mllvm -unroll-threshold=100
-mllvm -loop-unswitch-threshold=200000 -lamdlibm
-lamdalloc -ldl
```

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Peak Optimization Flags (Continued)

526.blender_r: basepeak = yes

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 -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3 -zopt
-mllvm -unroll-threshold=100 -mllvm -loop-unswitch-threshold=200000
-faggressive-loop-transform -fvector-transform -fscalar-transform
-Mrecursive -fepilog-vectorization-of-inductions -lamdlibm -lamdalloc
-ldl -lflang
```

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/aocc500-flags.html>

<http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-AMD-v3-revA.html>

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

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

<http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-AMD-v3-revA.xml>



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