



SPEC CPU®2017 Integer Rate Result

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Dell Inc.

SPECrate®2017_int_base = 221

PowerEdge R6715 (AMD EPYC 9115 16-Core Processor)

SPECrate®2017_int_peak = 226

CPU2017 License: 6573

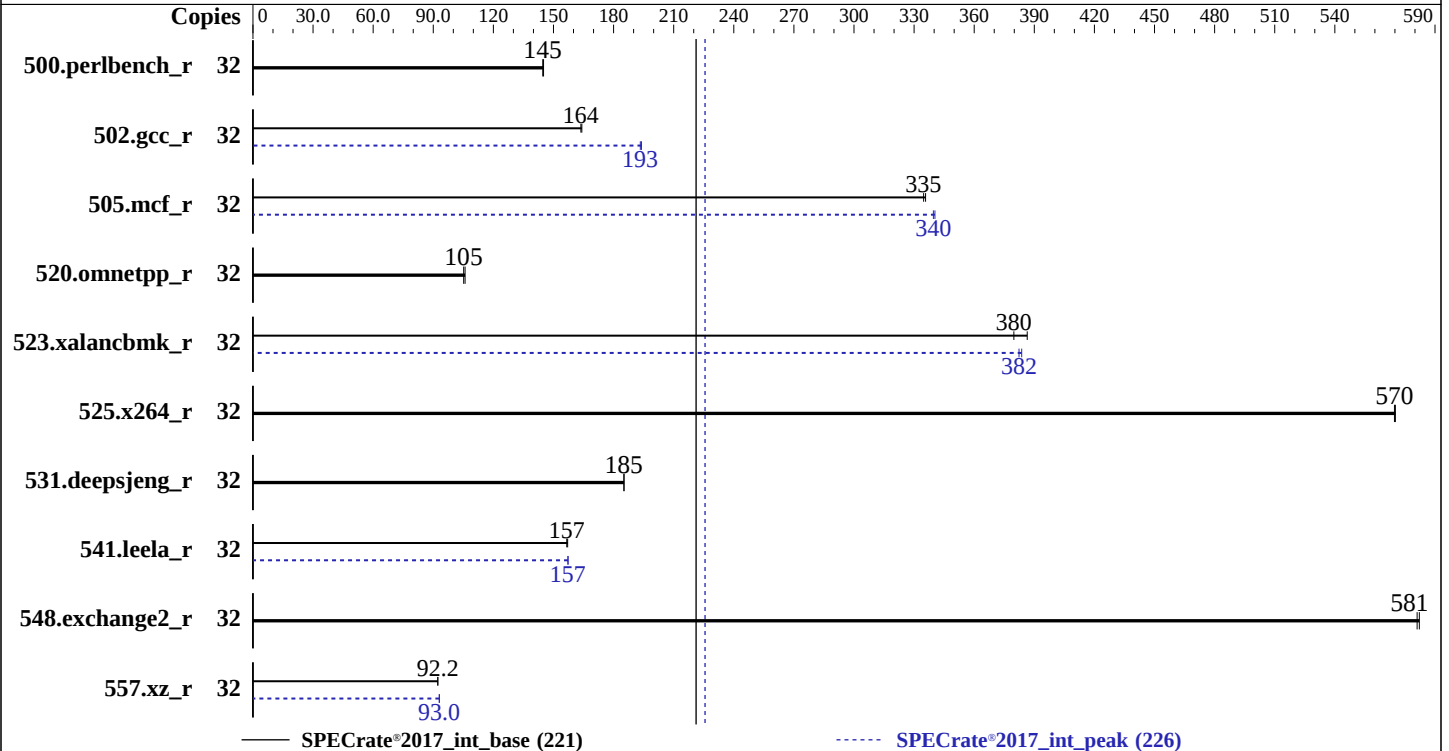
Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: May-2025

Hardware Availability: Mar-2025

Software Availability: Mar-2025



Hardware

CPU Name: AMD EPYC 9115
Max MHz: 4100
Nominal: 2600
Enabled: 16 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 / 8 cores
Other: None
Memory: 384 GB (12 x 32 GB 2Rx8 PC5-6400B-R, running at 5200)
Storage: 40 GB on tmpfs
Other: CPU Cooling: Air

Software

OS: Ubuntu 24.04.2 LTS
6.8.0-58-generic
Compiler: C/C++/Fortran: Version 5.0.0 of AOCC
Parallel: No
Firmware: Version 1.1.2 released Feb-2025
File System: tmpfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: None
Power Management: BIOS 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
500.perlbench_r	32	351	145	<u>352</u>	<u>145</u>			32	351	145	<u>352</u>	<u>145</u>		
502.gcc_r	32	<u>277</u>	<u>164</u>	276	164			32	<u>234</u>	<u>193</u>	234	194		
505.mcf_r	32	<u>154</u>	<u>335</u>	154	336			32	<u>152</u>	<u>340</u>	152	340		
520.omnetpp_r	32	<u>399</u>	<u>105</u>	397	106			32	<u>399</u>	<u>105</u>	397	106		
523.xalancbmk_r	32	<u>89.0</u>	<u>380</u>	87.4	386			32	<u>88.4</u>	<u>382</u>	88.1	384		
525.x264_r	32	<u>98.3</u>	<u>570</u>	98.3	570			32	<u>98.3</u>	<u>570</u>	98.3	570		
531.deepsjeng_r	32	<u>198</u>	<u>185</u>	198	185			32	<u>198</u>	<u>185</u>	198	185		
541.leela_r	32	337	157	<u>338</u>	<u>157</u>			32	337	157	<u>337</u>	<u>157</u>		
548.exchange2_r	32	144	582	<u>144</u>	<u>581</u>			32	144	582	<u>144</u>	<u>581</u>		
557.xz_r	32	<u>375</u>	<u>92.2</u>	374	92.3			32	371	93.1	<u>372</u>	<u>93.0</u>		

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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:

LD_LIBRARY_PATH =

"/mnt/ramdisk/cpu2017-1.1.9-aocc500-znerv5_A1.3/amd_rate_aocc500_znver5_A_lib/lib:/mnt/ramdisk/cpu2017-1.1.9-aocc500-znerv5_A1.3/amd_rate_aocc500_znver5_A_lib/lib32:"

MALLOC_CONF = "retain:true"

Environment variables set by runcpu during the 523.xalancbmk_r peak run:

MALLOC_CONF = "thp:always"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

Benchmark run from a 40 GB ramdisk created with the cmd: "mount -t tmpfs -o size=40G tmpfs /mnt/ramdisk"

Platform Notes

BIOS Settings:

Virtualization Technology : Disabled

NUMA Nodes Per Socket : 4

System Profile : Custom

C-States : Disabled

Memory Patrol Scrub : Disabled

PCI ASPM L1 Link Power Management : Disabled

Periodic Directory Rinse Tuning : Blended

Determinism Control : Manual

Determinism Slider : Power Determinism

Optimizer Mode : Enabled

Adaptive Allocation : Enabled

Dram Refresh Delay : Performance

DIMM Self Healing -

on Uncorrectable Memory Error : Disabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-aocc500-znerv5_A1.3/bin/sysinfo

Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197

running on 1234567-R6715 Sat May 10 11:15:30 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 255 (255.4-1ubuntu8.6)
12. Failed units, from systemctl list-units --state=failed
13. Services, from systemctl list-unit-files

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Platform Notes (Continued)

14. Linux kernel boot-time arguments, from /proc/cmdline
15. cpupower frequency-info
16. sysctl
17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/khugepaged
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS

1. uname -a
Linux 1234567-R6715 6.8.0-58-generic #60-Ubuntu SMP PREEMPT_DYNAMIC Fri Mar 14 18:29:48 UTC 2025 x86_64
x86_64 x86_64 GNU/Linux

2. w
11:15:30 up 6 min, 1 user, load average: 0.16, 0.04, 0.01
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
root tty1 - 11:10 40.00s 1.16s 0.31s /bin/bash ./amd_rate_aocc500_znver5_A1.sh

3. Username
From environment variable \$USER: root

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 1544731
nofiles 1024
vmemory(kbytes) unlimited
locks unlimited
rtprio 0

5. sysinfo process ancestry
/sbin/init
/bin/login -f --
-bash
/bin/bash ./DELL_rate.sh
/bin/bash /home/DellFiles/bin/dell-run-main.sh rate
/bin/bash /home/DellFiles/bin/dell-run-main.sh rate
/bin/bash /home/DellFiles/bin/AMD/dell-run-speccpu.sh rate --define DL-VERS=6.2 --output_format html, pdf, txt
python3 ./run_amd_rate_aocc500_znver5_A1.py
/bin/bash ./amd_rate_aocc500_znver5_A1.sh
runcpu --config amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 2 --define
DL-BIOS-L3NUMA=1 --define DL-BIOS-NPS=4 --define DL-VERS=6.2 --output_format html, pdf, txt intrate
runcpu --configfile amd_rate_aocc500_znver5_A1.cfg --tune all --reportable --iterations 2 --define
DL-BIOS-L3NUMA=1 --define DL-BIOS-NPS=4 --define DL-VERS=6.2 --output_format html, pdf, txt --nopower
--runtime rate --tune base:peak --size test:train:refrate intrate --nopreenv --note-preenv --logfile
\$SPEC/tmp/CPU2017.001/temlogs/preenv.intrate.001.0.log --lognum 001.0 --from_runcpu 2
specperl \$SPEC/bin/sysinfo

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Platform Notes (Continued)

\$SPEC = /mnt/ramdisk/cpu2017-1.1.9-aocc500-znerv5_A1.3

6. /proc/cpuinfo

```
model name      : AMD EPYC 9115 16-Core Processor
vendor_id       : AuthenticAMD
cpu family      : 26
model           : 2
stepping        : 1
microcode       : 0xb00211e
bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size        : 192 4K pages
cpu cores       : 16
siblings        : 32
1 physical ids (chips)
32 processors (hardware threads)
physical id 0: core ids 0-15
physical id 0: apicids 0-31
```

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):            32
On-line CPU(s) list: 0-31
Vendor ID:         AuthenticAMD
BIOS Vendor ID:    AMD
Model name:        AMD EPYC 9115 16-Core Processor
BIOS Model name:   AMD EPYC 9115 16-Core Processor
BIOS CPU family:   107
CPU family:        26
Model:            2
Thread(s) per core: 2
Core(s) per socket: 16
Socket(s):         1
Stepping:          1
Frequency boost:    enabled
CPU(s) scaling MHz: 40%
CPU max MHz:       4115.8198
CPU min MHz:       1500.0000
BogoMIPS:          5193.06
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 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 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
```

CPU @ 2.6GHz

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Platform Notes (Continued)

xsaverptr rdpru wbnoinvd amd_ppin cppc amd_ibpb_ret arat npt lbrv
svm_lock nrp_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 avx512_vp2intersect
flush_l1d debug_swap
L1d cache: 768 KiB (16 instances)
L1i cache: 512 KiB (16 instances)
L2 cache: 16 MiB (16 instances)
L3 cache: 64 MiB (2 instances)
NUMA node(s): 2
NUMA node0 CPU(s): 0-7,16-23
NUMA node1 CPU(s): 8-15,24-31
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	768K	12	Data	1	64	1	64
L1i	32K	512K	8	Instruction	1	64	1	64
L2	1M	16M	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: 0-7,16-23
node 0 size: 192815 MB
node 0 free: 187040 MB
node 1 cpus: 8-15,24-31
node 1 size: 193441 MB
node 1 free: 192678 MB
node distances:
node 0 1
0: 10 12
1: 12 10

9. /proc/meminfo

MemTotal: 395527444 kB

10. who -r

run-level 3 May 10 11:10

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Platform Notes (Continued)

11. Systemd service manager version: systemd 255 (255.4-1ubuntu8.6)

Default Target Status
multi-user degraded

12. Failed units, from systemctl list-units --state=failed

UNIT	LOAD	ACTIVE	SUB	DESCRIPTION
* systemd-networkd-wait-online.service	loaded	failed	failed	Wait for Network to be Configured

Legend: LOAD -> Reflects whether the unit definition was properly loaded.
ACTIVE -> The high-level unit activation state, i.e. generalization of SUB.
SUB -> The low-level unit activation state, values depend on unit type.

1 loaded units listed.

13. 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 sysstat systemd-networkd systemd-networkd-wait-online systemd-pstore systemd-resolved systemd-timesyncd thermald ua-reboot-cmds ubuntu-advantage udisks2 ufw vgauth
enabled-runtime	netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
disabled	console-getty debug-shell ipmievd 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
generated	systemd-time-wait-sync upower openipmi
indirect	systemd-sysupdate systemd-sysupdate-reboot uuuid
masked	cryptdisks cryptdisks-early hwclock multipath-tools-boot screen-cleanup sudo x11-common

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

BOOT_IMAGE=/vmlinuz-6.8.0-58-generic
root=/dev/mapper/ubuntu--vg-ubuntu--lv
ro

15. cpupower frequency-info

analyzing CPU 29:
current policy: frequency should be within 1.50 GHz and 2.60 GHz.
The governor "schedutil" may decide which speed to use within this range.

boost state support:

Supported: yes
Active: yes
Boost States: 0
Total States: 3
Pstate-P0: 2600MHz

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

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Platform Notes (Continued)

```
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+madvise madvise never
enabled     [always] madvise never
hpage_pmd_size 2097152
shmem_enabled always within_size advise [never] deny force
```

```
-----
18. /sys/kernel/mm/transparent_hugepage/khugepaged
alloc_sleep_millisecs 60000
defrag                1
max_ptes_none         511
max_ptes_shared       256
max_ptes_swap         64
pages_to_scan         4096
scan_sleep_millisecs  10000
```

```
-----
19. OS release
From /etc/*-release /etc/*-version
os-release Ubuntu 24.04.2 LTS
```

```
-----
20. Disk information
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-aocc500-znerv5_A1.3
Filesystem      Type  Size  Used Avail Use% Mounted on
tmpfs            tmpfs  40G   3.3G   37G   9% /mnt/ramdisk
```

```
-----
21. /sys/devices/virtual/dmi/id
Vendor:      Dell Inc.
Product:     PowerEdge R6715
Product Family: PowerEdge
Serial:      1234567
```

```
-----
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:
  9x 802C0000802C MTC20F2085S1RC64BD1 32 GB 2 rank 6400, configured at 5200
  1x 802C0000802C MTC20F2085S1RC64BD2 32 GB 2 rank 6400, configured at 5200
  1x 802C0000802C MTC20F2085S1RC64BDY 32 GB 2 rank 6400, configured at 5200
```

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Platform Notes (Continued)

1x 80CE000080CE M321R4GA3EB2-CCPKC 32 GB 2 rank 6400, configured at 5200

23. BIOS

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

BIOS Vendor: Dell Inc.

BIOS Version: 1.1.2

BIOS Date: 02/20/2025

BIOS Revision: 1.1

Compiler Version Notes

C | 502.gcc_r(peak)

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

Target: i386-unknown-linux-gnu

Thread model: posix

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

C | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
| 557.xz_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 | 502.gcc_r(peak)

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

Target: i386-unknown-linux-gnu

Thread model: posix

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

C | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak)
| 557.xz_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++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak)
| 541.leela_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

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SPECrate®2017_int_base = 221

PowerEdge R6715 (AMD EPYC 9115 16-Core Processor)

SPECrate®2017_int_peak = 226

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: May-2025

Hardware Availability: Mar-2025

Software Availability: Mar-2025

Compiler Version Notes (Continued)

=====

Fortran | 548.exchange2_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

Base Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Base Portability Flags

500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -DSPEC_LP64
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_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
-Wl,-mllvm -Wl,-extra-inliner -z muldefs -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -fno-PIE -no-pie -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50

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Base Optimization Flags (Continued)

C benchmarks (continued):

```
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining  
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang  
-lamdalloc-ext -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,-do-block-reorder=advanced -z muldefs -O3 -march=znver5  
-fveclib=AMDLIBM -ffast-math -flto -mllvm -unroll-threshold=100  
-mllvm -loop-unswitch-threshold=200000  
-mllvm -reduce-array-computations=3 -zopt -fno-PIE -no-pie  
-fvirtual-function-elimination -fvisibility=hidden  
-mllvm -do-block-reorder=advanced -lamdlibm -lflang -lamdalloc-ext  
-ldl
```

Fortran benchmarks:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop  
-Wl,-mllvm -Wl,-enable-iv-split -z muldefs -O3 -march=znver5  
-fveclib=AMDLIBM -ffast-math -flto  
-fepilog-vectorization-of-inductions -mllvm -optimize-strided-mem-cost  
-floop-transform -mllvm -unroll-aggressive -mllvm -unroll-threshold=500  
-lamdlibm -lflang -lamdalloc -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
```

Peak Compiler Invocation

C benchmarks:

clang

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Peak Compiler Invocation (Continued)

C++ benchmarks:

clang++

Fortran benchmarks:

flang

Peak Portability Flags

```
500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -DSPEC_LP64
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64
```

Peak Optimization Flags

C benchmarks:

```
500.perlbench_r: basepeak = yes
```

```
502.gcc_r: -m32 -flto -Wl,-mllvm -Wl,-ldist-scalar-expand
-fenable-aggressive-gather -Wl,-mllvm -Wl,-extra-inliner
-z muldefs -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 -fgnu89-inline
-lamdalloc
```

```
505.mcf_r: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-extra-inliner -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
-lflang -lamdalloc-ext -ldl
```

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Peak Optimization Flags (Continued)

525.x264_r: basepeak = yes

```
557.xz_r: -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 -Wl,-mllvm -Wl,-extra-inliner
-Ofast -march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lflang -lamdalloc-ext -ldl
```

C++ benchmarks:

520.omnetpp_r: basepeak = yes

```
523.xalancbmk_r: -m64 -std=c++14
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=advanced -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden
-mllvm -do-block-reorder=advanced -lamdlibm -lflang
-lamdalloc-ext -ldl
```

531.deepsjeng_r: basepeak = yes

```
541.leela_r: -m64 -std=c++14
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=advanced -Ofast
-march=znver5 -fveclib=AMDLIBM -ffast-math -flto
-mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt -fno-PIE
-no-pie -fvirtual-function-elimination -fvisibility=hidden
-mllvm -do-block-reorder=advanced -lamdlibm -lflang
-lamdalloc-ext -ldl
```

Fortran benchmarks:

(Continued on next page)



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Peak Optimization Flags (Continued)

548.exchange2_r: basepeak = yes

Peak Other Flags

C benchmarks (except as noted below):

-Wno-unused-command-line-argument

502.gcc_r: -L/usr/lib32 -Wno-unused-command-line-argument

-L/home/work/cpu2017/v119/aocc5/1316/amd_rate_aocc500_znver5_A_lib/lib32

C++ benchmarks:

-Wno-unused-command-line-argument

Fortran benchmarks:

-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/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.8.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/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.8.xml>

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