



SPEC CPU®2017 Integer Rate Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_int_base = 1710

PowerEdge R7625 (AMD EPYC 9734 112-Core Processor)

SPECrate®2017_int_peak = 1850

CPU2017 License: 6573

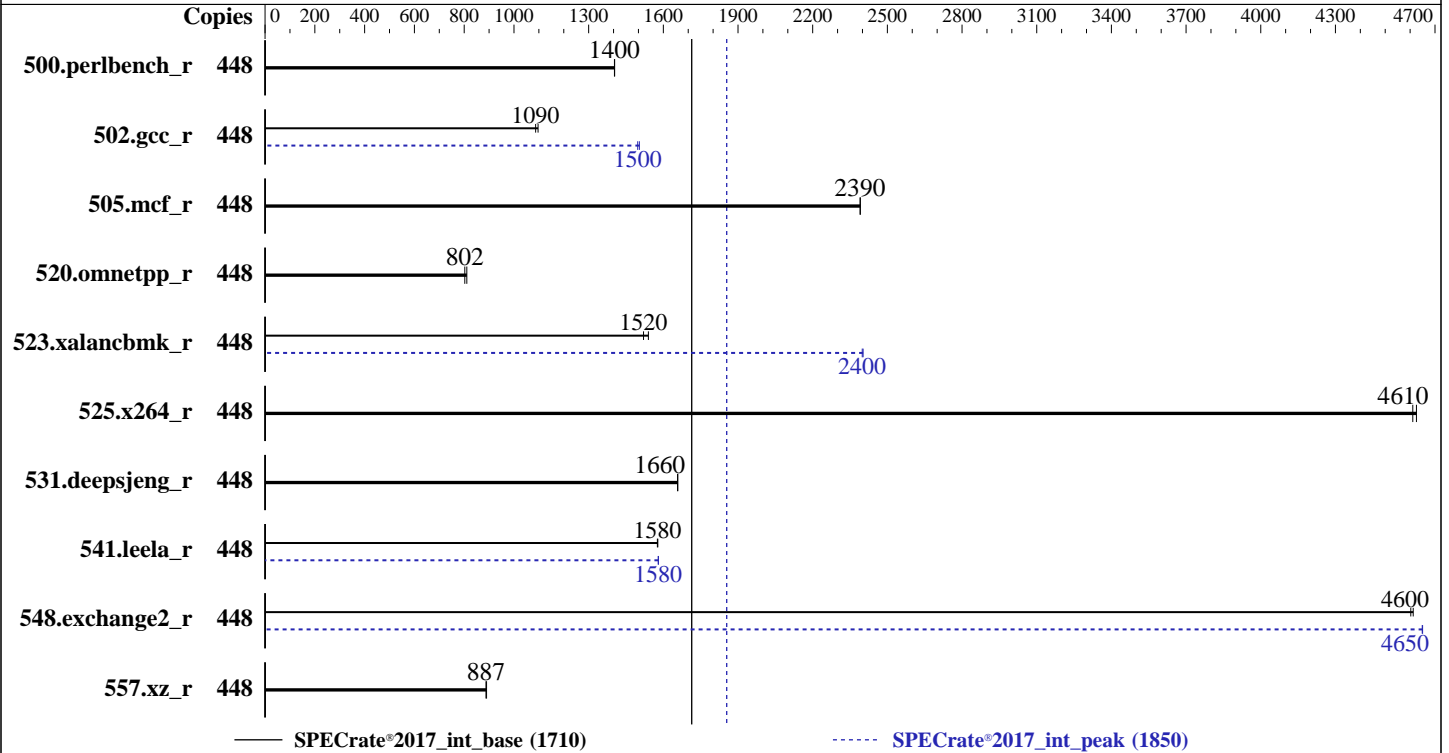
Test Date: Feb-2024

Test Sponsor: Dell Inc.

Hardware Availability: Nov-2022

Tested by: Dell Inc.

Software Availability: Nov-2022



Hardware

CPU Name: AMD EPYC 9734
 Max MHz: 3000
 Nominal: 2200
 Enabled: 224 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, 16 MB shared / 7 cores
 Other: None
 Memory: 768 GB (24 x 32 GB 2Rx8 PC5-4800B-R)
 Storage: 210 GB on tmpfs
 Other: Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP4
 5.14.21-150400.22-default
 Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
 Parallel: No
 Firmware: Version 1.6.8 released Nov-2023
 File System: tmpfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 32/64-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
500.perlbench_r	448	508	1400	508	1400			448	508	1400	508	1400		
502.gcc_r	448	578	1100	584	1090			448	424	1500	422	1500		
505.mcf_r	448	303	2390	303	2390			448	303	2390	303	2390		
520.omnetpp_r	448	725	811	733	802			448	725	811	733	802		
523.xalancbmk_r	448	311	1520	307	1540			448	197	2400	197	2400		
525.x264_r	448	170	4610	170	4630			448	170	4610	170	4630		
531.deepsjeng_r	448	310	1660	310	1660			448	310	1660	310	1660		
541.leela_r	448	470	1580	471	1580			448	469	1580	470	1580		
548.exchange2_r	448	254	4610	255	4600			448	252	4650	252	4650		
557.xz_r	448	544	890	545	887			448	544	890	545	887		

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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) only on request for base runs,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To enable THP for all allocations for peak runs,
'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-aocc400-znver4-A1.1/amd_rate_aocc400_znver4_A_lib/lib:/mnt/ramdisk/cpu2017
-1.1.9-aocc400-znver4-A1.1/amd_rate_aocc400_znver4_A_lib/lib32:"
MALLOC_CONF = "retain:true"
```

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

```
MALLOC_CONF = "thp:never"
```

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.

Benchmark run from a 210 GB ramdisk created with the cmd: "mount -t tmpfs -o size=210G tmpfs /mnt/ramdisk"

Platform Notes

BIOS settings:

```
DRAM Refresh Delay : Performance
DIMM Self Healing on
Uncorrectable Memory Error : Disabled
```

```
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
Determinism Slider : Power Determinism
```

```
Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1.1/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Tue Feb 6 04:35:36 2024
```

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

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Platform Notes (Continued)

```

8. numactl --hardware
9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
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 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
x86_64 x86_64 x86_64 GNU/Linux

```

```

-----
2. w
 04:35:36 up 5 min,  1 user,  load average: 16.60, 66.26, 37.07
USER      TTY      FROM          LOGIN@   IDLE   JCPU   PCPU   WHAT
root      tty1    -              04:33   40.00s 2.18s  0.36s /bin/bash ./amd_rate_aocc400_znver4_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) 3093532
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) 3093532
virtual memory          (kbytes, -v) unlimited
file locks              (-x) unlimited

```

```

-----
5. sysinfo process ancestry
/usr/lib/systemd/systemd linux --switched-root --system --deserialize 30
login -- root
-bash
/bin/bash ./DELL_rate.sh
/bin/bash ./dell-run-main.sh rate

```

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Platform Notes (Continued)

```

/bin/bash ./dell-run-main.sh rate
/bin/bash ./dell-run-speccpu.sh rate --define DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-LogProc=1
--define DL-VERS=v4.8.5 --output_format html,pdf,txt
python3 ./run_amd_rate_aocc400_znver4_A1.py
/bin/bash ./amd_rate_aocc400_znver4_A1.sh
runcpu --config amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 2 --define DL-BIOS-NPS=4
--define DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-LogProc=1 --define DL-VERS=v4.8.5
--output_format html,pdf,txt intrate
runcpu --configfile amd_rate_aocc400_znver4_A1.cfg --tune all --reportable --iterations 2 --define
DL-BIOS-NPS=4 --define DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-BIOS-LogProc=1 --define DL-VERS=v4.8.5
--output_format html,pdf,txt --nopower --runmode 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
$SPEC = /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1.1

```

```

-----
6. /proc/cpuinfo
model name      : AMD EPYC 9734 112-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 25
model          : 160
stepping       : 2
microcode      : 0xaa00212
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
TLB size       : 3584 4K pages
cpu cores      : 112
siblings       : 224
2 physical ids (chips)
448 processors (hardware threads)
physical id 0: core ids
0-6,8-14,16-22,24-30,32-38,40-46,48-54,56-62,64-70,72-78,80-86,88-94,96-102,104-110,112-118,120-126
physical id 1: core ids
0-6,8-14,16-22,24-30,32-38,40-46,48-54,56-62,64-70,72-78,80-86,88-94,96-102,104-110,112-118,120-126
physical id 0: apicids
0-13,16-29,32-45,48-61,64-77,80-93,96-109,112-125,128-141,144-157,160-173,176-189,192-205,208-221,224-237
,240-253
physical id 1: apicids
256-269,272-285,288-301,304-317,320-333,336-349,352-365,368-381,384-397,400-413,416-429,432-445,448-461,4
64-477,480-493,496-509
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 2.37.2:
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): 448
On-line CPU(s) list: 0-447
Vendor ID: AuthenticAMD
Model name: AMD EPYC 9734 112-Core Processor
CPU family: 25
Model: 160
Thread(s) per core: 2
Core(s) per socket: 112
Socket(s): 2

```

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Platform Notes (Continued)

```
Stepping: 2
BogoMIPS: 4400.94
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 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
        invpcid_single hw_pstate ssbd mba ibrs ibpb stibp 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
        avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd amd_ppin arat npt lbrv
        svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
        pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi
        umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
        avx512_vpopcntdq la57 rdpid overflow_recov succor smca fsrm flush_lld
Virtualization: AMD-V
L1d cache: 7 MiB (224 instances)
L1i cache: 7 MiB (224 instances)
L2 cache: 224 MiB (224 instances)
L3 cache: 512 MiB (32 instances)
NUMA node(s): 8
NUMA node0 CPU(s): 0-27,224-251
NUMA node1 CPU(s): 28-55,252-279
NUMA node2 CPU(s): 56-83,280-307
NUMA node3 CPU(s): 84-111,308-335
NUMA node4 CPU(s): 112-139,336-363
NUMA node5 CPU(s): 140-167,364-391
NUMA node6 CPU(s): 168-195,392-419
NUMA node7 CPU(s): 196-223,420-447
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP always-on, RSB
        filling
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	7M	8	Data	1	64	1	64
L1i	32K	7M	8	Instruction	1	64	1	64
L2	1M	224M	8	Unified	2	2048	1	64
L3	16M	512M	16	Unified	3	16384	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: 0-27,224-251
node 0 size: 96298 MB
node 0 free: 95282 MB
node 1 cpus: 28-55,252-279
node 1 size: 96751 MB
node 1 free: 96341 MB
```

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Platform Notes (Continued)

```

node 2 cpus: 56-83,280-307
node 2 size: 96751 MB
node 2 free: 92856 MB
node 3 cpus: 84-111,308-335
node 3 size: 96735 MB
node 3 free: 96386 MB
node 4 cpus: 112-139,336-363
node 4 size: 96751 MB
node 4 free: 96357 MB
node 5 cpus: 140-167,364-391
node 5 size: 96717 MB
node 5 free: 96327 MB
node 6 cpus: 168-195,392-419
node 6 size: 96751 MB
node 6 free: 96377 MB
node 7 cpus: 196-223,420-447
node 7 size: 96647 MB
node 7 free: 96257 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:      791969176 kB

```

```

10. who -r
    run-level 3 Feb 6 04:30

```

```

11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
    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      NetworkManager NetworkManager-dispatcher NetworkManager-wait-online YaST2-Firstboot
YaST2-Second-Stage apparmor auditd cron display-manager firewalld getty@ haveged
irqbalance issue-generator kbdsettings klog lvm2-monitor nscd purge-kernels rollback
rsyslog smartd sshd wpa_supplicant
enabled-runtime systemd-remount-fs
disabled    ModemManager accounts-daemon appstream-sync-cache autofs autoyast-initscripts
blk-availability bluetooth bluetooth-mesh boot-sysctl ca-certificates chrony-wait chronyd
console-getty cups cups-browsed debug-shell dnsmasq ebttables exchange-bmc-os-info gpm
grub2-once haveged-switch-root hwloc-dump-hwdata ipmi ipmievd iscsi iscsi-init iscsid
iscsiuio issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap

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Platform Notes (Continued)

```

nm-cloud-setup nmb ostree-remount postfix rdisc rpcbind rpmconfigcheck rsyncd rtkit-daemon
serial-getty@ smartd_generate_opts smb snmpd snmptrapd speech-dispatcherd
systemd-boot-check-no-failures systemd-network-generator systemd-sysext
systemd-time-wait-sync systemd-timesyncd tuned udisks2 upower wicked wickedd-auto4
wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny wpa_supplicant@
wickedd
indirect

```

```

-----
14. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
root=UUID=ef117b4a-6c89-42a3-b0a0-2cc3fe661a68
linux
splash=silent
quiet
security=
mitigations=auto

```

```

-----
15. cpupower frequency-info
analyzing CPU 0:
Unable to determine current policy
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
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

```

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Platform Notes (Continued)

```
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 SP4

21. Disk information
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1.1
Filesystem Type Size Used Avail Use% Mounted on
tmpfs tmpfs 210G 3.4G 207G 2% /mnt/ramdisk

22. /sys/devices/virtual/dmi/id
Vendor: Dell Inc.
Product: PowerEdge R7625
Product Family: PowerEdge
Serial: 1234567

23. dmidecode
Additional information from dmidecode 3.2 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:
22x 802C0000802C MTC20F2085S1RC48BA1 32 GB 2 rank 4800
2x 80AD000080AD HMC888MEBRA174N 32 GB 2 rank 4800

24. BIOS
(This section combines info from /sys/devices and dmidecode.)
BIOS Vendor: Dell Inc.
BIOS Version: 1.6.8
BIOS Date: 11/24/2023
BIOS Revision: 1.6

Compiler Version Notes

=====
C | 502.gcc_r(peak)

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/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)

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SPEC CPU®2017 Integer Rate Result

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SPECrate®2017_int_base = 1710

PowerEdge R7625 (AMD EPYC 9734 112-Core Processor)

SPECrate®2017_int_peak = 1850

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Feb-2024

Hardware Availability: Nov-2022

Software Availability: Nov-2022

Compiler Version Notes (Continued)

```

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

```

```

C | 502.gcc_r(peak)

```

```

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/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 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

```

```

C++ | 523.xalancbmk_r(peak)

```

```

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

```

```

C++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base,
  | peak)

```

```

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

```

```

C++ | 523.xalancbmk_r(peak)

```

```

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

```

```

C++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base,
  | peak)

```

```

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu

```

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Test Date: Feb-2024

Hardware Availability: Nov-2022

Software Availability: Nov-2022

Compiler Version Notes (Continued)

Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

Fortran | 548.exchange2_r(base, peak)

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/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 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather
-z muldefs -O3 -march=znver4 -fveclib=AMDLIBM -ffast-math

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Base Optimization Flags (Continued)

C benchmarks (continued):

```
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang
-lamdalloc
```

C++ benchmarks:

```
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -z muldefs -O3
-march=znver4 -fveclib=AMDLIBM -ffast-math
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden -lamdlibm -lflang
-lamdalloc-ext
```

Fortran benchmarks:

```
-m64 -flto -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=znver4
-fveclib=AMDLIBM -ffast-math -fepilog-vectorization-of-inductions
-mllvm -optimize-strided-mem-cost -floop-transform
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm
-lflang -lamdalloc
```

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 -z muldefs -Ofast -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -fgnu89-inline
-landalloc
```

505.mcf_r: basepeak = yes

525.x264_r: basepeak = yes

557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: basepeak = yes

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Peak Optimization Flags (Continued)

```
523.xalancbmk_r: -m32 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=aggressive
-fno-loop-reroll -Ofast -march=znver4 -fveclib=AMDLIBM
-ffast-math -finline-aggressive
-mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt
-mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden
-lamdalloc-ext
```

531.deepsjeng_r: basepeak = yes

```
541.leela_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-finline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden
-lamdlbm -lflang -lamdalloc-ext
```

Fortran benchmarks:

```
-m64 -flto -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 -O3 -march=znver4 -fveclib=AMDLIBM
-ffast-math -fepilog-vectorization-of-inductions
-mllvm -optimize-strided-mem-cost -floop-transform
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlbm
-lflang -lamdalloc
```

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/aocc4/znver4/rate/amd_rate_aocc400_znver4_A_lib/lib32
```

C++ benchmarks (except as noted below):

-Wno-unused-command-line-argument

```
523.xalancbmk_r: -L/usr/lib32 -Wno-unused-command-line-argument
-L/home/work/cpu2017/v119/aocc4/znver4/rate/amd_rate_aocc400_znver4_A_lib/lib32
```

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Peak Other Flags (Continued)

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/aocc400-flags_A1.1.html

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.1.html>

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

http://www.spec.org/cpu2017/flags/aocc400-flags_A1.1.xml

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.1.xml>

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