



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

SPECspeed®2017\_int\_base = 16.2

SPECspeed®2017\_int\_peak = 16.3

PowerEdge R6615 (AMD EPYC 9174F 16-Core Processor)

CPU2017 License: 6573

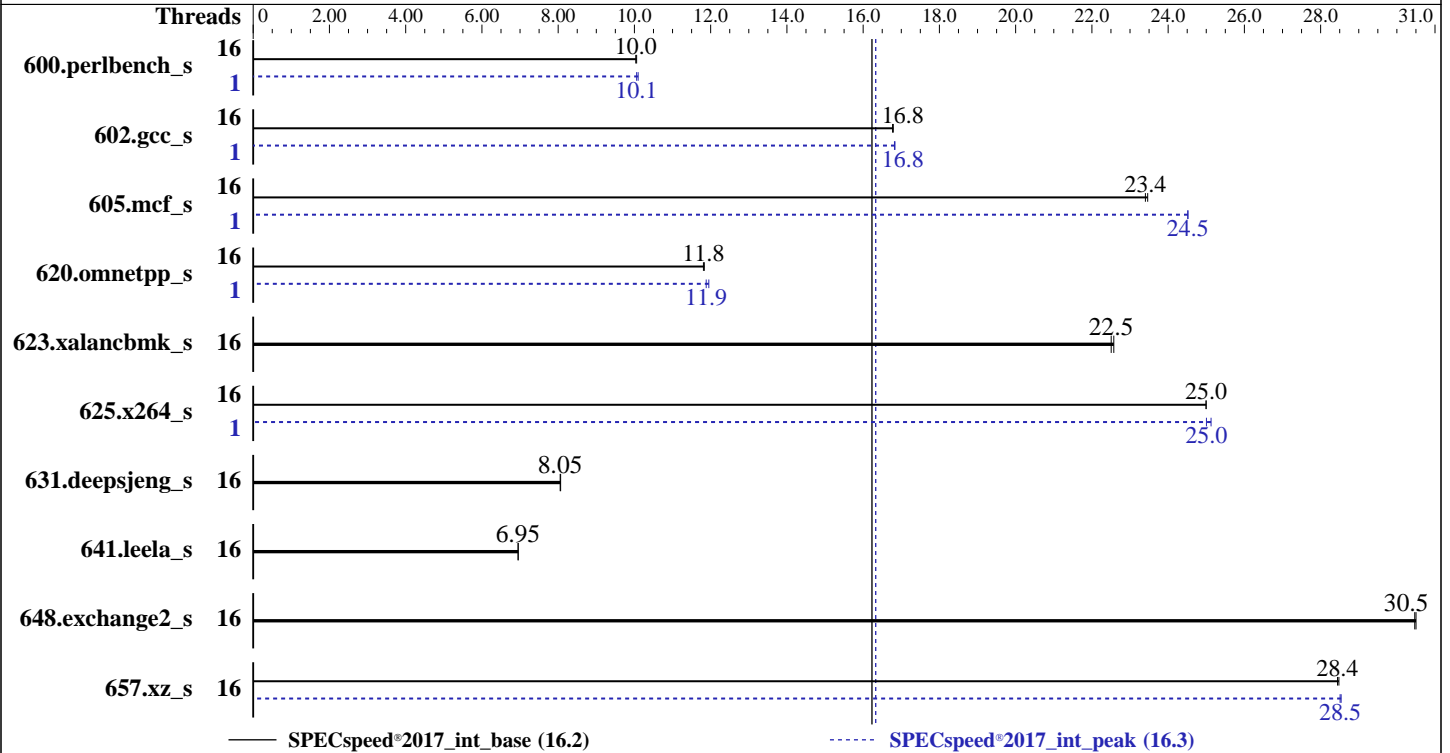
Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Nov-2023

Hardware Availability: May-2023

Software Availability: Oct-2023



### Hardware

CPU Name: AMD EPYC 9174F  
 Max MHz: 4400  
 Nominal: 4100  
 Enabled: 16 cores, 1 chip  
 Orderable: 1 chip  
 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 / 2 cores  
 Other: None  
 Memory: 384 GB (12 x 32 GB 2Rx8 PC5-4800B-R)  
 Storage: 40 GB on tmpfs  
 Other: None

### Software

OS: Ubuntu 22.04.3 LTS  
 5.15.0-86-generic  
 Compiler: C/C++/Fortran: Version 4.0.0 of AOCC  
 Parallel: Yes  
 Firmware: Version 1.4.6 released Jul-2023  
 File System: tmpfs  
 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
600.perlbench_s	16	<b><u>177</u></b>	<b><u>10.0</u></b>	176	10.1			1	<b><u>176</u></b>	<b><u>10.1</u></b>	176	10.1		
602.gcc_s	16	<b><u>237</u></b>	<b><u>16.8</u></b>	237	16.8			1	<b><u>237</u></b>	<b><u>16.8</u></b>	237	16.8		
605.mcf_s	16	<b><u>202</u></b>	<b><u>23.4</u></b>	201	23.5			1	<b><u>193</u></b>	<b><u>24.5</u></b>	193	24.5		
620.omnetpp_s	16	138	11.8	<b><u>138</u></b>	<b><u>11.8</u></b>			1	136	12.0	<b><u>137</u></b>	<b><u>11.9</u></b>		
623.xalancbmk_s	16	62.8	22.6	<b><u>63.0</u></b>	<b><u>22.5</u></b>			16	62.8	22.6	<b><u>63.0</u></b>	<b><u>22.5</u></b>		
625.x264_s	16	70.6	25.0	<b><u>70.6</u></b>	<b><u>25.0</u></b>			1	<b><u>70.5</u></b>	<b><u>25.0</u></b>	70.2	25.1		
631.deepsjeng_s	16	<b><u>178</u></b>	<b><u>8.05</u></b>	178	8.06			16	<b><u>178</u></b>	<b><u>8.05</u></b>	178	8.06		
641.leela_s	16	<b><u>246</u></b>	<b><u>6.95</u></b>	245	6.95			16	<b><u>246</u></b>	<b><u>6.95</u></b>	245	6.95		
648.exchange2_s	16	<b><u>96.5</u></b>	<b><u>30.5</u></b>	96.4	30.5			16	<b><u>96.5</u></b>	<b><u>30.5</u></b>	96.4	30.5		
657.xz_s	16	<b><u>217</u></b>	<b><u>28.4</u></b>	217	28.5			16	217	28.5	<b><u>217</u></b>	<b><u>28.5</u></b>		

SPECspeed®2017\_int\_base = **16.2**

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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Compiler Notes

The AMD64 AOCC Compiler Suite is available at <http://developer.amd.com/amd-aocc/>

## Submit Notes

The config file option 'submit' was used.  
'numactl' was used to bind copies to the cores.  
See the configuration file for details.

## Operating System Notes

'ulimit -s unlimited' was used to set environment stack size limit  
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numactl i.e.:  
numactl --interleave=all runcpu <etc>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty\_ratio=8' run as root.  
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.  
To free node-local memory and avoid remote memory usage,  
'sysctl -w vm.zone\_reclaim\_mode=1' run as root.  
To clear filesystem caches, 'sync; sysctl -w vm.drop\_caches=3' run as root.  
To disable address space layout randomization (ASLR) to reduce run-to-run variability, 'sysctl -w kernel.randomize\_va\_space=0' run as root.

To enable Transparent Hugepages (THP) for all allocations,  
'echo always > /sys/kernel/mm/transparent\_hugepage/enabled' and  
'echo always > /sys/kernel/mm/transparent\_hugepage/defrag' run as root.



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## Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```
GOMP_CPU_AFFINITY = "0-15"
LD_LIBRARY_PATH = "/mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1.1/amd_speed_aocc400_znver4_A_lib/lib:"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "oversize_threshold:0,retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "16"
```

Environment variables set by runcpu during the 600.perlbench\_s peak run:

```
GOMP_CPU_AFFINITY = "15"
```

Environment variables set by runcpu during the 602.gcc\_s peak run:

```
GOMP_CPU_AFFINITY = "15"
```

Environment variables set by runcpu during the 605.mcf\_s peak run:

```
GOMP_CPU_AFFINITY = "15"
```

Environment variables set by runcpu during the 620.omnetpp\_s peak run:

```
GOMP_CPU_AFFINITY = "15"
```

Environment variables set by runcpu during the 625.x264\_s peak run:

```
GOMP_CPU_AFFINITY = "15"
```

Environment variables set by runcpu during the 657.xz\_s peak run:

```
GOMP_CPU_AFFINITY = "0-15"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "8"
```

## 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 40 GB ramdisk created with the cmd: "mount -t tmpfs -o size=40G tmpfs /mnt/ramdisk"

## Platform Notes

BIOS settings:

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

```
Logical Processor : Disabled
Virtualization Technology : Disabled
NUMA Nodes per Socket : 4
```

```
System Profile : Custom
C-States : Disabled
```

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## Platform Notes (Continued)

Memory Patrol Scrub : Disabled  
 PCI ASPM L1 Link  
 Power Management : Disabled  
 Determinism Slider : Power Determinism  
 Algorithm Performance  
 Boost Disable (ApbDis) : Enabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.9-aocc400-znver4-A1.1/bin/sysinfo  
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197  
 running on spa-dev-sut Wed Nov 22 15:51:41 2023

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 249 (249.11-0ubuntu3.10)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. tuned-adm active
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 spa-dev-sut 5.15.0-86-generic #96-Ubuntu SMP Wed Sep 20 08:23:49 UTC 2023 x86_64 x86_64 x86_64
GNU/Linux
```

```
2. w
15:51:41 up 0 min, 1 user, load average: 0.41, 0.13, 0.05
USER      TTY      FROM          LOGIN@      IDLE        JCPU        PCPU        WHAT
root      tty1      -             15:51      37.00s     1.25s     0.26s /bin/bash ./amd_speed_aocc400_znver4_A1.sh
```

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

```
4. ulimit -a
time(seconds)      unlimited
file(blocks)       unlimited
```

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## Platform Notes (Continued)

```

data(kbytes)          unlimited
stack(kbytes)         unlimited
coredump(blocks)     0
memory(kbytes)       unlimited
locked memory(kbytes) 2097152
process               1545650
nofiles               1024
vmemory(kbytes)      unlimited
locks                 unlimited
rtprio                0

```

### 5. sysinfo process ancestry

```

/sbin/init
/bin/login -p --
-bash
/bin/bash ./DELL_speed.sh
/bin/bash ./dell-run-main.sh speed
/bin/bash ./dell-run-main.sh speed
/bin/bash ./dell-run-speccpu.sh speed --define DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-VERS=v4.8.1
--output_format html,pdf,txt
python3 ./run_amd_speed_aocc400_znver4_A1.py
/bin/bash ./amd_speed_aocc400_znver4_A1.sh
runcpu --config amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 2 --define
DL-BIOS-NPS=4 --define DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-VERS=v4.8.1 --output_format
html,pdf,txt intspeak
runcpu --configfile amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 2 --define
DL-BIOS-NPS=4 --define DL-BIOSinc=Dell-BIOS_EPYC-4.inc --define DL-VERS=v4.8.1 --output_format
html,pdf,txt --nopower --runmode speed --tune base:peak --size test:train:refspeak intspeak --nopreenv
--note-preenv --logfile $SPEC/tmp/CPU2017.001/templogs/preenv.intspeak.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 9174F 16-Core Processor
vendor_id      : AuthenticAMD
cpu family     : 25
model          : 17
stepping       : 1
microcode      : 0xa10113e
bugs           : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass srs0
TLB size      : 3584 4K pages
cpu cores     : 16
siblings       : 16
1 physical ids (chips)
16 processors (hardware threads)
physical id 0: core ids 0-1,16-17,32-33,48-49,64-65,80-81,96-97,112-113
physical id 0: apicids 0-1,16-17,32-33,48-49,64-65,80-81,96-97,112-113

```

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

```

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### Platform Notes (Continued)

```

Byte Order:                Little Endian
CPU(s):                    16
On-line CPU(s) list:      0-15
Vendor ID:                 AuthenticAMD
Model name:               AMD EPYC 9174F 16-Core Processor
CPU family:               25
Model:                    17
Thread(s) per core:       1
Core(s) per socket:       16
Socket(s):                1
Stepping:                 1
BogoMIPS:                 8201.39
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 cpcp 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:                512 KiB (16 instances)
L1i cache:                512 KiB (16 instances)
L2 cache:                 16 MiB (16 instances)
L3 cache:                 256 MiB (8 instances)
NUMA node(s):             4
NUMA node0 CPU(s):       0-3
NUMA node1 CPU(s):       4-7
NUMA node2 CPU(s):       8-11
NUMA node3 CPU(s):       12-15
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf:       Not affected
Vulnerability Mds:        Not affected
Vulnerability Meltdown:   Not affected
Vulnerability Mmio stale data: Not affected
Vulnerability Retbleed:   Not affected
Vulnerability Spec rstack overflow: Mitigation; safe RET
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1:  Mitigation; usercopy/swaps barriers and __user pointer sanitization
Vulnerability Spectre v2:  Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP disabled, RSB
                          filling, PBRSE-eIBRS 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	512K	8	Data	1	64	1	64
L1i	32K	512K	8	Instruction	1	64	1	64
L2	1M	16M	8	Unified	2	2048	1	64
L3	32M	256M	16	Unified	3	32768	1	64

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## Platform Notes (Continued)

8. numactl --hardware

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

```

available: 4 nodes (0-3)
node 0 cpus: 0-3
node 0 size: 96311 MB
node 0 free: 95745 MB
node 1 cpus: 4-7
node 1 size: 96765 MB
node 1 free: 95819 MB
node 2 cpus: 8-11
node 2 size: 96765 MB
node 2 free: 94615 MB
node 3 cpus: 12-15
node 3 size: 96682 MB
node 3 free: 95256 MB
node distances:
node  0  1  2  3
  0:  10  12  12  12
  1:  12  10  12  12
  2:  12  12  10  12
  3:  12  12  12  10

```

9. /proc/meminfo

MemTotal: 395802440 kB

10. who -r

run-level 3 Nov 22 15:50

11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.10)

```

Default Target Status
multi-user      running

```

12. Services, from systemctl list-unit-files

```

STATE          UNIT FILES
enabled        ModemManager blk-availability console-setup cron dmesg e2scrub_reap finalrd getty@
                grub-common grub-initrd-fallback irqbalance keyboard-setup lm-sensors lvm2-monitor
                lxd-agent multipathd networkd-dispatcher networking open-vm-tools pollinate rsync rsyslog
                secureboot-db setvtrgb ssh systemd-networkd systemd-pstore systemd-timesyncd thermald
                tuned ua-reboot-cmds ubuntu-advantage udisks2 ufw vgauth
enabled-runtime netplan-ovs-cleanup systemd-fsck-root systemd-networkd-wait-online systemd-remount-fs
disabled       apparmor console-getty debug-shell ifupdown-wait-online iscsid nftables open-iscsi
                serial-getty@ systemd-boot-check-no-failures systemd-network-generator systemd-resolved
                systemd-sysexit systemd-time-wait-sync upower
generated     apport
indirect      uuid
masked        cryptdisks cryptdisks-early hwclock lvm2 multipath-tools-boot rc rcS screen-cleanup smartd
                smartmontools sudo x11-common

```

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

```

BOOT_IMAGE=/vmlinuz-5.15.0-86-generic
root=/dev/mapper/ubuntu--vg-ubuntu--lv
ro
net.ifnames=0

```

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### Platform Notes (Continued)

biosdevnames=0

```

-----
14. cpupower frequency-info
analyzing CPU 0:
  Unable to determine current policy
  boost state support:
    Supported: yes
    Active: yes
    Boost States: 0
    Total States: 3
    Pstate-P0: 4100MHz

```

```

-----
15. tuned-adm active
  Current active profile: latency-performance

```

```

-----
16. sysctl
kernel.numa_balancing          1
kernel.randomize_va_space      0
vm.compaction_proactiveness    20
vm.dirty_background_bytes      0
vm.dirty_background_ratio      3
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 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 22.04.3 LTS

```

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## Platform Notes (Continued)

### 20. 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	40G	3.4G	37G	9%	/mnt/ramdisk

### 21. /sys/devices/virtual/dmi/id

Vendor: Dell Inc.  
 Product: PowerEdge R6615  
 Product Family: PowerEdge  
 Serial: SL1R615

### 22. dmidecode

Additional information from dmidecode 3.3 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:  
12x 802C0000802C MTC20F2085S1RC48BA1 32 GB 2 rank 4800

### 23. BIOS

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

BIOS Vendor: Dell Inc.  
 BIOS Version: 1.4.6  
 BIOS Date: 07/06/2023  
 BIOS Revision: 1.4

## Compiler Version Notes

```
=====  
C          | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak)  
          | 657.xz_s(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++       | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak)  
          | 641.leela_s(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  
=====
```

```
=====  
Fortran   | 648.exchange2_s(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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# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECspeed®2017\_int\_base = 16.2

PowerEdge R6615 (AMD EPYC 9174F 16-Core Processor)

SPECspeed®2017\_int\_peak = 16.3

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Nov-2023

Hardware Availability: May-2023

Software Availability: Oct-2023

## Compiler Version Notes (Continued)

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

600.perlbench\_s: -DSPEC\_LINUX\_X64 -DSPEC\_LP64  
602.gcc\_s: -DSPEC\_LP64  
605.mcf\_s: -DSPEC\_LP64  
620.omnetpp\_s: -DSPEC\_LP64  
623.xalancbmk\_s: -DSPEC\_LINUX -DSPEC\_LP64  
625.x264\_s: -DSPEC\_LP64  
631.deepsjeng\_s: -DSPEC\_LP64  
641.leela\_s: -DSPEC\_LP64  
648.exchange2\_s: -DSPEC\_LP64  
657.xz\_s: -DSPEC\_LP64

## Base Optimization Flags

C benchmarks:

-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mllvm -Wl,-reduce-array-computations=3  
-Wl,-allow-multiple-definition -O3 -march=znver4 -fveclib=AMDLIBM  
-ffast-math -fopenmp -flto -fstruct-layout=7  
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000  
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3  
-DSPEC\_OPENMP -zopt -fopenmp=libomp -lomp -lamdlibm -lflang  
-lamdalloc

C++ benchmarks:

-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6

(Continued on next page)



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SPECspeed®2017\_int\_peak = 16.3

CPU2017 License: 6573

Test Sponsor: Dell Inc.

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Hardware Availability: May-2023

Software Availability: Oct-2023

## Base Optimization Flags (Continued)

C++ benchmarks (continued):

```
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fvirtual-function-elimination -fvisibility=hidden -fopenmp=libomp
-lomp -lamdlibm -lflang -lamdalloc-ext
```

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 -O3 -march=znver4 -fveclib=AMDLIBM
-ffast-math -fopenmp -flto -mllvm -optimize-strided-mem-cost
-mllvm -unroll-aggressive -mllvm -unroll-threshold=150 -fopenmp=libomp
-lomp -lamdlibm -lflang -lamdalloc
```

## Base Other Flags

C benchmarks:

```
-Wno-return-type -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
```

C++ benchmarks:

```
clang++
```

Fortran benchmarks:

```
flang
```



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECspeed®2017\_int\_base = 16.2

SPECspeed®2017\_int\_peak = 16.3

PowerEdge R6615 (AMD EPYC 9174F 16-Core Processor)

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Nov-2023

Hardware Availability: May-2023

Software Availability: Oct-2023

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

```
600.perlbench_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition -Ofast -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto
-fstruct-layout=9 -mllvm -unroll-threshold=50
-freemap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

```
602.gcc_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition -z muldefs -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-freemap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

605.mcf\_s: Same as 600.perlbench\_s

625.x264\_s: Same as 600.perlbench\_s

657.xz\_s: Same as 600.perlbench\_s

C++ benchmarks:

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

623.xalancbmk\_s: basepeak = yes

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# SPEC CPU®2017 Integer Speed Result

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SPECspeed®2017\_int\_peak = 16.3

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Nov-2023

Hardware Availability: May-2023

Software Availability: Oct-2023

## Peak Optimization Flags (Continued)

631.deepsjeng\_s: basepeak = yes

641.leela\_s: basepeak = yes

Fortran benchmarks:

648.exchange2\_s: basepeak = yes

## Peak Other Flags

C benchmarks:

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

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/aocc400-flags\\_A1.1.html](http://www.spec.org/cpu2017/flags/aocc400-flags_A1.1.html)

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.2.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/aocc400-flags_A1.1.xml)

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.2.xml>

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