



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

## Dell Inc.

SPECspeed®2017\_int\_base = 13.8

PowerEdge R6615 (AMD EPYC 9654P 96-Core Processor)

SPECspeed®2017\_int\_peak = 13.9

CPU2017 License: 6573

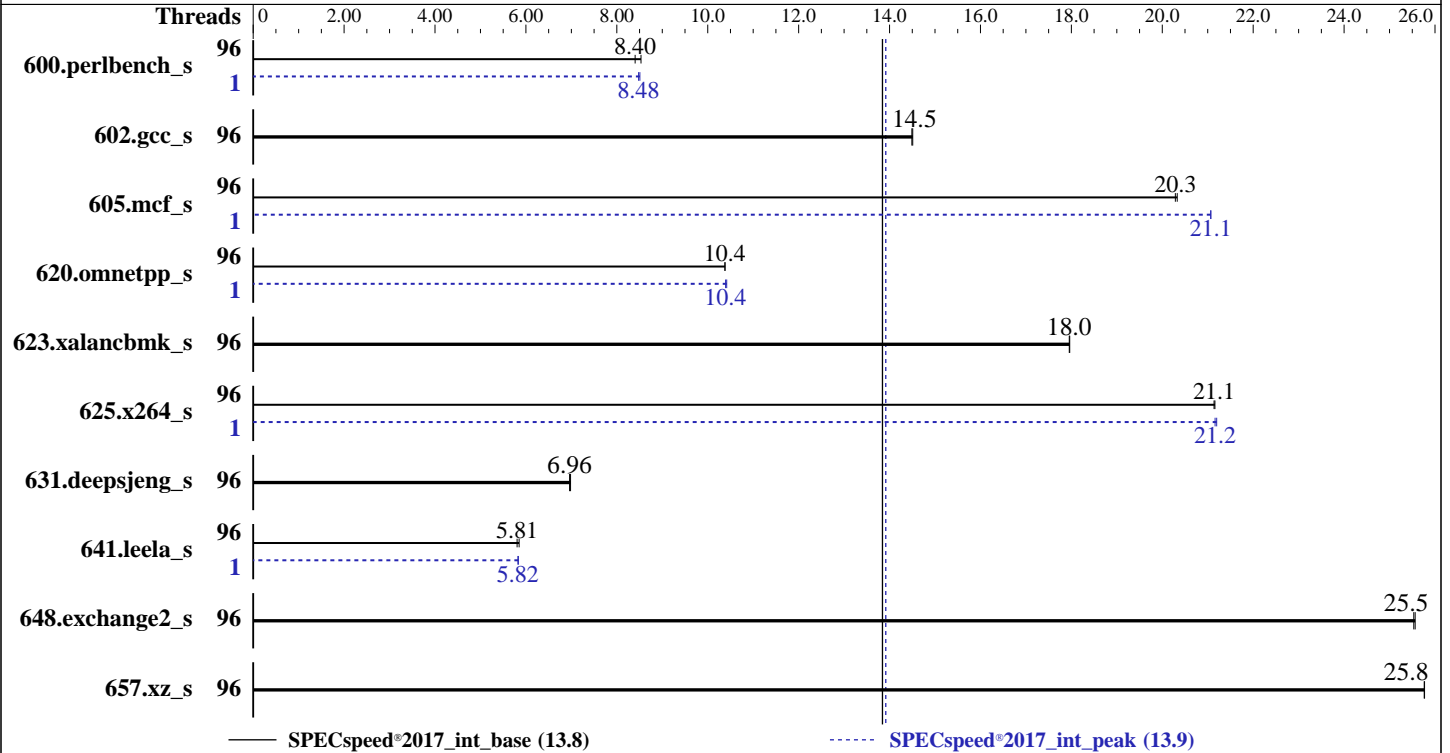
Test Date: Dec-2023

Test Sponsor: Dell Inc.

Hardware Availability: May-2023

Tested by: Dell Inc.

Software Availability: Sep-2023



### Hardware

CPU Name: AMD EPYC 9654P  
 Max MHz: 3700  
 Nominal: 2400  
 Enabled: 96 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: 384 MB I+D on chip per chip, 32 MB shared / 8 cores  
 Other: None  
 Memory: 768 GB (12 x 64 GB 2Rx4 PC5-4800B-R)  
 Storage: 70 GB on tmpfs  
 Other: None

### Software

OS: Ubuntu 22.04.3 LTS  
 5.15.0-84-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 5 (graphical 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	96	<b><u>211</u></b>	<b><u>8.40</u></b>	208	8.53			1	209	8.51	<b><u>209</u></b>	<b><u>8.48</u></b>		
602.gcc_s	96	<b><u>275</u></b>	<b><u>14.5</u></b>	274	14.5			96	<b><u>275</u></b>	<b><u>14.5</u></b>	274	14.5		
605.mcf_s	96	232	20.3	<b><u>233</u></b>	<b><u>20.3</u></b>			1	<b><u>224</u></b>	<b><u>21.1</u></b>	224	21.1		
620.omnetpp_s	96	157	10.4	<b><u>157</u></b>	<b><u>10.4</u></b>			1	<b><u>157</u></b>	<b><u>10.4</u></b>	157	10.4		
623.xalancbmk_s	96	<b><u>78.9</u></b>	<b><u>18.0</u></b>	78.9	18.0			96	<b><u>78.9</u></b>	<b><u>18.0</u></b>	78.9	18.0		
625.x264_s	96	83.4	21.2	<b><u>83.4</u></b>	<b><u>21.1</u></b>			1	<b><u>83.4</u></b>	<b><u>21.2</u></b>	83.2	21.2		
631.deepsjeng_s	96	<b><u>206</u></b>	<b><u>6.96</u></b>	205	6.98			96	<b><u>206</u></b>	<b><u>6.96</u></b>	205	6.98		
641.leela_s	96	<b><u>294</u></b>	<b><u>5.81</u></b>	292	5.85			1	<b><u>293</u></b>	<b><u>5.82</u></b>	292	5.83		
648.exchange2_s	96	115	25.6	<b><u>115</u></b>	<b><u>25.5</u></b>			96	115	25.6	<b><u>115</u></b>	<b><u>25.5</u></b>		
657.xz_s	96	240	25.8	<b><u>240</u></b>	<b><u>25.8</u></b>			96	240	25.8	<b><u>240</u></b>	<b><u>25.8</u></b>		

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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 = "0-95"
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 = "96"
```

Environment variables set by runcpu during the 600.perlbench\_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 641.leela\_s peak run:

```
GOMP_CPU_AFFINITY = "15"
```

## 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 70 GB ramdisk created with the cmd: "mount -t tmpfs -o size=70G 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
Memory Patrol Scrub : Disabled
PCI ASPM L1 Link
Power Management : Disabled
Determinism Slider : Power Determinism
```

(Continued on next page)



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## Platform Notes (Continued)

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 amd-spa Wed Dec 6 17:24:48 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 amd-spa 5.15.0-84-generic #93-Ubuntu SMP Tue Sep 5 17:16:10 UTC 2023 x86\_64 x86\_64 x86\_64 GNU/Linux

2. w  
17:24:48 up 0 min, 1 user, load average: 0.31, 0.09, 0.03  
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT  
root tty1 - 17:24 40.00s 1.45s 0.31s /bin/bash ./amd\_speed\_aocc400\_znver4\_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

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### Platform Notes (Continued)

process	3093832
nofiles	1024
vmemory(kbytes)	unlimited
locks	unlimited
rtprio	0

```
-----
5. sysinfo process ancestry
/bin/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-BIOS-adddcD=1
--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-BIOS-adddcD=1 --define DL-VERS=v4.8.1
--output_format html,pdf,txt intspeed
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-BIOS-adddcD=1 --define DL-VERS=v4.8.1
--output_format html,pdf,txt --nopower --runmode speed --tune base:peak --size test:train:refspeed
intspeed --nopreenv --note-preenv --logfile $SPEC/tmp/CPU2017.001/templogs/preenv.intspeed.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 9654P 96-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
TLB size      : 3584 4K pages
cpu cores     : 96
siblings      : 96
1 physical ids (chips)
96 processors (hardware threads)
physical id 0: core ids 0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119,128-135,144-151,160-167,176-183
physical id 0: apicids 0-7,16-23,32-39,48-55,64-71,80-87,96-103,112-119,128-135,144-151,160-167,176-183
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):           96
On-line CPU(s) list: 0-95
Vendor ID:        AuthenticAMD
Model name:       AMD EPYC 9654P 96-Core Processor
-----
```

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### Platform Notes (Continued)

```

CPU family:                25
Model:                     17
Thread(s) per core:       1
Core(s) per socket:       96
Socket(s):                 1
Stepping:                 1
BogoMIPS:                 4801.41
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 sse3 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 bmlil 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 cppc arat npt lbrv svm_lock nrip_save tsc_scale
                          vmcb_clean flushbyasid decodeassists pausefilter pfthreshold avic
                          v_omsave_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:               3 MiB (96 instances)
L1i cache:               3 MiB (96 instances)
L2 cache:                96 MiB (96 instances)
L3 cache:                384 MiB (12 instances)
NUMA node(s):            4
NUMA node0 CPU(s):      0-23
NUMA node1 CPU(s):      24-47
NUMA node2 CPU(s):      48-71
NUMA node3 CPU(s):      72-95
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 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 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      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     384M    16 Unified       3   32768     1             64

```

```

-----
8. numactl --hardware
NOTE: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)
node 0 cpus: 0-23

```

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## Platform Notes (Continued)

```

node 0 size: 193074 MB
node 0 free: 192275 MB
node 1 cpus: 24-47
node 1 size: 193528 MB
node 1 free: 189418 MB
node 2 cpus: 48-71
node 2 size: 193528 MB
node 2 free: 192789 MB
node 3 cpus: 72-95
node 3 size: 193439 MB
node 3 free: 192757 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: 792137180 kB

```

```

10. who -r
run-level 5 Dec 6 17:24

```

```

11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.10)
Default Target Status
graphical running

```

```

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

```

```

13. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=/vmlinuz-5.15.0-84-generic
root=/dev/mapper/ubuntu--vg-ubuntu--lv
ro

```

```

14. cpupower frequency-info
analyzing CPU 0:
Unable to determine current policy
boost state support:
Supported: yes

```

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## Platform Notes (Continued)

Active: yes  
Boost States: 0  
Total States: 3  
Pstate-P0: 2400MHz

-----  
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  
-----

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 70G 3.4G 67G 5% /mnt/ramdisk  
-----

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## Platform Notes (Continued)

```

21. /sys/devices/virtual/dmi/id
Vendor:      Dell Inc.
Product:     PowerEdge R6615
Product Family: PowerEdge
Serial:      GLM4018

```

```

-----
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 MTC40F2046S1RC48BA1 64 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
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin

```



# SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Dell Inc.

SPECspeed®2017\_int\_base = 13.8

PowerEdge R6615 (AMD EPYC 9654P 96-Core Processor)

SPECspeed®2017\_int\_peak = 13.9

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Dec-2023

Hardware Availability: May-2023

Software Availability: Sep-2023

## 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
-freemap-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
-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

```

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## Base Optimization Flags (Continued)

C++ benchmarks (continued):

-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

## Peak Portability Flags

Same as Base Portability Flags



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SPECspeed®2017\_int\_peak = 13.9

CPU2017 License: 6573

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Dec-2023

Hardware Availability: May-2023

Software Availability: Sep-2023

## 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
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

602.gcc\_s: basepeak = yes

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

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

657.xz\_s: basepeak = yes

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

631.deepsjeng\_s: basepeak = yes

```
641.leela_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 -lflang
```

Fortran benchmarks:

648.exchange2\_s: basepeak = yes



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**CPU2017 License:** 6573

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**Tested by:** Dell Inc.

**Test Date:** Dec-2023

**Hardware Availability:** May-2023

**Software Availability:** Sep-2023

## 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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