### Dell Inc.

**PowerEdge R6625 (AMD EPYC 9334 32-Core Processor)**

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base = 14.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_int_peak = Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 6573  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Dec-2022  
**Hardware Availability:** Feb-2023  
**Software Availability:** Nov-2022

**Threads**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>64</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>64</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>64</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>64</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>64</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>64</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>64</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>64</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>64</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>64</td>
</tr>
</tbody>
</table>

**SPECspeed®2017_int_base (14.5)**

**Hardware**

- **CPU Name:** AMD EPYC 9334  
- **Max MHz:** 3900  
- **Nominal:** 2700  
- **Enabled:** 64 cores, 2 chips  
- **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:** 128 MB I+D on chip per chip, 32 MB shared / 8 cores  
- **Other:** None  
- **Memory:** 1536 GB (24 x 64 GB 2Rx4 PC5-4800B-R)  
- **Storage:** 125 GB on tmpfs  
- **Other:** None

**Software**

- **OS:** Ubuntu 22.04.1 LTS  
- **Compiler:** C/C++/Fortran: Version 4.0.0 of AOCC  
- **Parallel:** Yes  
- **Firmware:** Version 1.1.0 released Nov-2022  
- **File System:** tmpfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **Other:** None  
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage.
Dell Inc. PowerEdge R6625 (AMD EPYC 9334 32-Core Processor)

CPU2017 License: 6573
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

SPECspeed®2017_int_base = 14.5
SPECspeed®2017_int_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600:perlbench_s</td>
<td>64</td>
<td>201</td>
<td>8.82</td>
<td>201</td>
<td>8.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>602:gcc_s</td>
<td>64</td>
<td>265</td>
<td>15.0</td>
<td>264</td>
<td>15.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>605:mcfs_s</td>
<td>64</td>
<td>224</td>
<td>21.1</td>
<td>223</td>
<td>21.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>620:omnetpp_s</td>
<td>64</td>
<td>150</td>
<td>10.9</td>
<td>150</td>
<td>10.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>623:xalancbmk_s</td>
<td>64</td>
<td>75.1</td>
<td>18.9</td>
<td>75.2</td>
<td>18.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>625:x264_s</td>
<td>64</td>
<td>78.4</td>
<td>22.5</td>
<td>78.5</td>
<td>22.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>631:deepsjeng_s</td>
<td>64</td>
<td>195</td>
<td>7.33</td>
<td>196</td>
<td>7.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>641:leela_s</td>
<td>64</td>
<td>277</td>
<td>6.16</td>
<td>277</td>
<td>6.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>648:exchange2_s</td>
<td>64</td>
<td>111</td>
<td>26.6</td>
<td>110</td>
<td>26.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>657:xz_s</td>
<td>64</td>
<td>233</td>
<td>26.6</td>
<td>232</td>
<td>26.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

rncpu command invoked through numactl i.e.:
numactl --interleave=all rncpu <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.

(Continued on next page)
Operating System Notes (Continued)

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.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-63"
LD_LIBRARY_PATH = 
"/mnt/ramdisk/cpu2017-1.1.8-aocc400-B1b/amd_speed_aocc400_genoa_B_lib/lib":
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOCONF = "oversize_threshold:0,retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "64"

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 125 GB ramdisk created with the cmd: "mount -t tmpfs -o size=125G 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
  L3 Cache as NUMA Domain : Enabled

(Continued on next page)
SPEC CPU®2017 Integer Speed Result

Dell Inc.  SPECspeed®2017_int_base = 14.5
PowerEdge R6625 (AMD EPYC 9334 32-Core Processor)  SPECspeed®2017_int_peak = Not Run

CPU2017 License: 6573  Test Date:  Dec-2022
Test Sponsor: Dell Inc.  Hardware Availability: Feb-2023
Tested by: Dell Inc.  Software Availability: Nov-2022

Platform Notes (Continued)

System Profile : Custom
C-States : Disabled
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/cpu2017-1.1.8-aocc400-B1b/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca6c4d
running on amd-sut Sat Dec 10 18:43:19 2022

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
model name : AMD EPYC 9334 32-Core Processor
  2 "physical id"s (chips)
  64 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 32
siblings : 32
physical 0: cores 0 1 2 3 4 5 6 7 16 17 18 19 20 21 22 23 32 33 34 35 36 37 38 39
  48 49 50 51 52 53 54 55
physical 1: cores 0 1 2 3 4 5 6 7 16 17 18 19 20 21 22 23 32 33 34 35 36 37 38 39
  48 49 50 51 52 53 54 55

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): 64
On-line CPU(s) list: 0-63
Vendor ID: AuthenticAMD
Model name: AMD EPYC 9334 32-Core Processor
CPU family: 25
Model: 17
Thread(s) per core: 1
Core(s) per socket: 32
Socket(s): 2
Stepping: 1
Frequency boost: enabled

(Continued on next page)
## Platform Notes (Continued)

- **CPU max MHz:** 3911.0000
- **CPU min MHz:** 400.0000
- **BogoMIPS:** 5401.87
- **Flags:** fpu vme de pse tsc msr pae mce cx8 apic sep mtrr
- **Virtualization:** AMD-V
- **L1d cache:** 2 MiB (64 instances)
- **L1i cache:** 2 MiB (64 instances)
- **L2 cache:** 64 MiB (64 instances)
- **L3 cache:** 256 MiB (8 instances)
- **NUMA node(s):** 8
- **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 sanitation
- **Vulnerability Spectre v2:** Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBF disabled, RSB filling
- **Vulnerability Srbds:** Not affected
- **Vulnerability Tsx async abort:** Not affected

(Continued on next page)
### Platform Notes (Continued)

From `lscpu --cache`:

```
NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL SETS PHY-LINE COHERENCY-SIZE
L1d     32K     2M     8 Data            1    64        1             64
L1i     32K     2M     8 Instruction     1    64        1             64
L2       1M     64M     8 Unified         2  2048        1             64
L3       32M     256M   16 Unified        3 32768        1             64
```

/proc/cpuinfo cache data

```
cache size : 1024 KB
```

From `numactl --hardware`

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

```
available: 8 nodes (0-7)
   node 0 cpus: 0 1 2 3 4 5 6 7
   node 0 size: 193079 MB
   node 0 free: 192765 MB
   node 1 cpus: 16 17 18 19 20 21 22 23
   node 1 size: 193533 MB
   node 1 free: 193206 MB
   node 2 cpus: 24 25 26 27 28 29 30 31
   node 2 size: 193533 MB
   node 2 free: 198664 MB
   node 3 cpus: 8 9 10 11 12 13 14 15
   node 3 size: 193517 MB
   node 3 free: 193198 MB
   node 4 cpus: 32 33 34 35 36 37 38 39
   node 4 size: 193533 MB
   node 4 free: 193392 MB
   node 5 cpus: 48 49 50 51 52 53 54 55
   node 5 size: 193497 MB
   node 5 free: 193347 MB
   node 6 cpus: 56 57 58 59 60 61 62 63
   node 6 size: 193533 MB
   node 6 free: 193392 MB
   node 7 cpus: 40 41 42 43 44 45 46 47
   node 7 size: 193510 MB
   node 7 free: 193336 MB
   node distances:
   node   0   1   2   3   4   5   6   7
      0:  10  12  12  12  12  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  12  12  12  12
      5:  32  32  32  32  12  12  12  12
      6:  32  32  32  32  12  12  12  12
      7:  32  32  32  32  12  12  12  12
```

(Continued on next page)
Dell Inc. PowerEdge R6625 (AMD EPYC 9334 32-Core Processor)

SPECspeed®2017_int_base = 14.5

SPECspeed®2017_int_peak = Not Run

CPU2017 License: 6573
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Dec-2022
Hardware Availability: Feb-2023
Software Availability: Nov-2022

Platform Notes (Continued)

From /proc/meminfo
MemTotal: 1584884184 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/sbin/tuned-adm active
Current active profile: latency-performance

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance

/usr/bin/lsb_release -d
Ubuntu 22.04.1 LTS

From /etc/*release* /etc/*version*
debian_version: bookworm/sid
os-release:
  PRETTY_NAME="Ubuntu 22.04.1 LTS"
  NAME="Ubuntu"
  VERSION_ID="22.04"
  VERSION="22.04.1 LTS (Jammy Jellyfish)"
  VERSION_CODENAME=jammy
  ID=ubuntu
  ID_LIKE=debian
  HOME_URL="https://www.ubuntu.com/"

uname -a:
Linux amd-sut 5.15.0-46-generic #49-Ubuntu SMP Thu Aug 4 18:03:25 UTC 2022 x86_64
x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit): Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected
mmio_stale_data: Not affected
retbleed: Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swaps barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Retpolines, IBPB: conditional, IBRS_FW, STIBP:

(Continued on next page)
**SPEC CPU®2017 Integer Speed Result**

Dell Inc.  
PowerEdge R6625 (AMD EPYC 9334 32-Core Processor)  

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base =</th>
<th>14.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_int_peak =</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>6573</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

disabled, RSB filling

CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected  
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Dec 10 18:40

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.8-aocc400-B1b

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>tmpfs</td>
<td>tmpfs</td>
<td>125G</td>
<td>3.4G</td>
<td>122G</td>
<td>3%</td>
<td>/mnt/ramdisk</td>
</tr>
</tbody>
</table>

From /sys/devices/virtual/dmi/id

Vendor:         Dell Inc.  
Product:        PowerEdge R6625  
Product Family: PowerEdge  
Serial:         BGP4023

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:  
24x 80CE000080CE M321R8GA0BB0-CQKD G 64 GB 2 rank 4800

BIOS:

<table>
<thead>
<tr>
<th>BIOS Vendor:</th>
<th>Dell Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS Version:</td>
<td>1.1.0</td>
</tr>
<tr>
<td>BIOS Date:</td>
<td>11/25/2022</td>
</tr>
<tr>
<td>BIOS Revision:</td>
<td>1.1</td>
</tr>
</tbody>
</table>

(End of data from sysinfo program)

**Compiler Version Notes**

------------------------------------------------------------------
| C     | 600.perlbench_s(base) | 602.gcc_s(base) | 605.mcf_s(base) | 625.x264_s(base) | 657.xz_s(base) |
------------------------------------------------------------------
|       |                      |                |                |                  |               |

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)

<table>
<thead>
<tr>
<th>Target: x86_64-unknown-linux-gnu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thread model: posix</td>
</tr>
<tr>
<td>InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin</td>
</tr>
</tbody>
</table>

------------------------------------------------------------------
| C++    | 620.omnetpp_s(base) | 623.xalancbmk_s(base) | 631.deepsjeng_s(base) |
------------------------------------------------------------------
|        |                  |                    |                      |

(Continued on next page)
Compiler Version Notes (Continued)

| 641.leela_s(base) |
---|---
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/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
Dell Inc.

PowerEdge R6625 (AMD EPYC 9334 32-Core Processor)

**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 -lamdllibm -lfllang -lamdaloc`

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`
- `-lomp -lamdllibm -lfllang -lamdaloc-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 -lamdllibm -lfllang -lamdaloc`

**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`

The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2017/flags/aocc400-flags.html
Dell Inc. PowerEdge R6625 (AMD EPYC 9334 32-Core Processor)

<table>
<thead>
<tr>
<th>SPECsquad2017_int_base = 14.5</th>
<th>SPECsquad2017_int_peak = Not Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dell Inc.</td>
<td>Dell Inc.</td>
</tr>
</tbody>
</table>

CPU2017 License: 6573  
Test Sponsor: Dell Inc.  
Tested by: Dell Inc.  
Test Date: Dec-2022  
Hardware Availability: Feb-2023  
Software Availability: Nov-2022  

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

http://www.spec.org/cpu2017/flags/aocc400-flags.xml
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.0.xml

Originally published on 2023-02-01.
Report generated on 2023-02-01 18:19:06 by CPU2017 PDF formatter v6442.
Tested with SPEC CPU®2017 v1.1.8 on 2023-02-01 18:19:06 by CPU2017 PDF formatter v6442.
Originally published on 2023-02-01.