Dell Inc.  

PowerEdge R6625 (AMD EPYC 9554 64-Core Processor)  

SPECspeed2017_int_base = 14.0  
SPECspeed2017_int_peak = Not Run  

Hardware

CPU Name: AMD EPYC 9554  
Max MHz: 3750  
Nominal: 3100  
Enabled: 128 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: 256 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.
### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>128</td>
<td>209</td>
<td>8.51</td>
<td>211</td>
<td>8.41</td>
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<td>273</td>
<td>14.6</td>
<td>274</td>
<td>14.5</td>
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<tr>
<td>605.mcf_s</td>
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<td>20.5</td>
<td>231</td>
<td>20.4</td>
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<tr>
<td>620.omnetpp_s</td>
<td>128</td>
<td>156</td>
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<td>155</td>
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<tr>
<td>623.xalancbmk_s</td>
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<td>74.5</td>
<td>19.0</td>
<td>74.6</td>
<td>19.0</td>
<td></td>
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<tr>
<td>625.x264_s</td>
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<td>21.6</td>
<td>81.7</td>
<td>21.6</td>
<td></td>
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</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>128</td>
<td>202</td>
<td>7.10</td>
<td>202</td>
<td>7.08</td>
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<tr>
<td>641.leela_s</td>
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<td>5.92</td>
<td>288</td>
<td>5.93</td>
<td></td>
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<tr>
<td>648.exchange2_s</td>
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<td>25.0</td>
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<td>25.3</td>
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<td>657.xz_s</td>
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<td>26.6</td>
<td></td>
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<td></td>
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<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

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.

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

Dell Inc.

PowerEdge R6625 (AMD EPYC 9554 64-Core Processor)

SPECspeed®2017_int_base = 14.0
SPECspeed®2017_int_peak = Not Run

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

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 = "0-127"
LD_LIBRARY_PATH = 
"/mnt/ramdisk/cpu2017-1.1.8-aocc400-B1b/amd_speed_aocc400_genoa_B_lib/lib":
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOCS_CONF = "oversize-threshold:0,retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "128"

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)
## 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 982a61ec0915b55891ef0e16acaf64d  
running on genoa-sut Wed Dec 7 15:55:04 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 9554 64-Core Processor  
2 "physical id"s (chips)  
128 "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: 64  
siblings: 64  
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 64 65 66 67 68 69 70 71 80 81 82 83 84 85 86 87 96 97 98 99 100 101 102 103 112 113 114 115 116 117 118 119  
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 64 65 66 67 68 69 70 71 80 81 82 83 84 85 86 87 96 97 98 99 100 101 102 103 112 113 114 115 116 117 118 119

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): 128  
On-line CPU(s) list: 0-127  
Vendor ID: AuthenticAMD  
Model name: AMD EPYC 9554 64-Core Processor  
CPU family: 25  
Model: 17  
Thread(s) per core: 1  
Core(s) per socket: 64  
Socket(s): 2

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

**Dell Inc.**

**PowerEdge R6625 (AMD EPYC 9554 64-Core Processor)**

<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>

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base =</th>
<th>14.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_int_peak =</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

---

**Platform Notes (Continued)**

Stepping: 1

Frequency boost: enabled

CPU max MHz: 3764.0000
CPU min MHz: 400.0000

BogoMIPS: 6202.06

Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pg e 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 ibr nskinit wdt tce topoext perfctr_core perfctr_nb bext perfctr_l1c mwaitx cpb cat_l3 cdp_l3 invcpuid_single hw_pstate ssbd mba ibr ibpb stibp vmmcall fsqsb mba mi avx2 smp bmie rmdet cqm rdt_a avx512f avx512dq rsdadx smap avx512ifma clflushopt clwb avx512cd int ns mp cl flushbyasid decodeasists pausefilter pfthreshold avic v vmvload vgif v spec ctrl avx512vbmi umip pkpu ospke avx512_vbmi2 gfi vaes vpclmulqdq avx512_vnni avx512_bitalg avx512_vpopcntdq la57 rdpid overflow_reco1 succor smca fsrm flush_l1d

Virtualization: AMD-V

L1d cache: 4 MiB (128 instances)
L1i cache: 4 MiB (128 instances)
L2 cache: 128 MiB (128 instances)
L3 cache: 512 MiB (16 instances)

NUMA node (s):

<table>
<thead>
<tr>
<th>NUMA node0 CPU(s)</th>
<th>NUMA node1 CPU(s)</th>
<th>NUMA node2 CPU(s)</th>
<th>NUMA node3 CPU(s)</th>
<th>NUMA node4 CPU(s)</th>
<th>NUMA node5 CPU(s)</th>
<th>NUMA node6 CPU(s)</th>
<th>NUMA node7 CPU(s)</th>
<th>NUMA node8 CPU(s)</th>
<th>NUMA node9 CPU(s)</th>
<th>NUMA node10 CPU(s)</th>
<th>NUMA node11 CPU(s)</th>
<th>NUMA node12 CPU(s)</th>
<th>NUMA node13 CPU(s)</th>
<th>NUMA node14 CPU(s)</th>
<th>NUMA node15 CPU(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7</td>
<td>32-39</td>
<td>16-23</td>
<td>48-55</td>
<td>24-31</td>
<td>56-63</td>
<td>8-15</td>
<td>40-47</td>
<td>64-71</td>
<td>96-103</td>
<td>80-87</td>
<td>112-119</td>
<td>88-95</td>
<td>120-127</td>
<td>72-79</td>
<td>104-111</td>
</tr>
</tbody>
</table>

Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Mmio stale data: Not affected

(Continued on next page)
Dell Inc. PowerEdge R6625 (AMD EPYC 9554 64-Core Processor)

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

SPECspeed®2017_int_peak = Not Run
SPECspeed®2017_int_base = 14.0

Platform Notes (Continued)

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
Vulnerability Srbd: 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       4M    8 Data            1    64        1             64
L1i   32K       4M    8 Instruction     1    64        1             64
L2    1M     128M    8 Unified         2  2048        1             64
L3    32M     512M   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: 16 nodes (0-15)
node 0 cpus: 0 1 2 3 4 5 6 7
node 0 size: 96312 MB
node 0 free: 95896 MB
node 1 cpus: 32 33 34 35 36 37 38 39
node 1 size: 96764 MB
node 1 free: 92947 MB
node 2 cpus: 16 17 18 19 20 21 22 23
node 2 size: 96765 MB
node 2 free: 96556 MB
node 3 cpus: 48 49 50 51 52 53 54 55
node 3 size: 96764 MB
node 3 free: 96546 MB
node 4 cpus: 24 25 26 27 28 29 30 31
node 4 size: 96765 MB
node 4 free: 96531 MB
node 5 cpus: 56 57 58 59 60 61 62 63
node 5 size: 96764 MB
node 5 free: 96521 MB
node 6 cpus: 8 9 10 11 12 13 14 15
node 6 size: 96765 MB
node 6 free: 96572 MB
node 7 cpus: 40 41 42 43 44 45 46 47
node 7 size: 96748 MB
node 7 free: 96553 MB
```

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

<table>
<thead>
<tr>
<th>Node</th>
<th>CPU</th>
<th>Size</th>
<th>Free</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>64, 65, 66, 67, 68, 69, 70, 71</td>
<td>96,765 MB</td>
<td>96,613 MB</td>
</tr>
<tr>
<td>9</td>
<td>96, 97, 98, 99, 100, 101, 102, 103</td>
<td>96,729 MB</td>
<td>96,577 MB</td>
</tr>
<tr>
<td>10</td>
<td>80, 81, 82, 83, 84, 85, 86, 87</td>
<td>96,765 MB</td>
<td>96,621 MB</td>
</tr>
<tr>
<td>12</td>
<td>88, 89, 90, 91, 92, 93, 94, 95</td>
<td>96,765 MB</td>
<td>96,611 MB</td>
</tr>
<tr>
<td>13</td>
<td>120, 121, 122, 123, 124, 125, 126, 127</td>
<td>96,764 MB</td>
<td>96,615 MB</td>
</tr>
<tr>
<td>14</td>
<td>72, 73, 74, 75, 76, 77, 78, 79</td>
<td>96,765 MB</td>
<td>96,612 MB</td>
</tr>
<tr>
<td>15</td>
<td>104, 105, 106, 107, 108, 109, 110, 111</td>
<td>96,739 MB</td>
<td>96,591 MB</td>
</tr>
</tbody>
</table>

From /proc/meminfo

- MemTotal: 1584860820 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

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

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Test Sponsor: Dell Inc.
Tested by: Dell Inc.

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

Platform Notes (Continued)

/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 genoa-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:
    Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2018-3639 (Speculative Store Bypass):
    Mitigation: usercopy/swapgs barriers and __user pointer sanitization
CVE-2017-5753 (Spectre variant 1):
    Mitigation: Retpolines, IBPB: conditional, IBRS_FW, STIBP: disabled, RSB filling
CVE-2017-5715 (Spectre variant 2):
CVE-2020-0543 (Special Register Buffer Data Sampling):
    Not affected
CVE-2019-11135 (TSX Asynchronous Abort):
    Not affected

run-level 3 Dec 7 15:53

(Continued on next page)
Dell Inc. PowerEdge R6625 (AMD EPYC 9554 64-Core Processor)

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CPU2017 License: 6573
Test Sponsor: Dell Inc.
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Software Availability: Nov-2022

Platform Notes (Continued)

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.8-aocc400-B1b
Filesystem     Type   Size  Used Avail Use% Mounted on
tmpfs          tmpfs  125G  3.4G  122G   3% /mnt/ramdisk

From /sys/devices/virtual/dmi/id
Vendor:         Dell Inc.
Product:        PowerEdge R6625
Product Family: PowerEdge
Serial:         BGP4016

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 802C0000802C MTC40F2046S1RC48BA1 64 GB 2 rank 4800

BIOS:
  BIOS Vendor:      Dell Inc.
  BIOS Version:     1.1.0
  BIOS Date:        11/25/2022
  BIOS Revision:    1.1

(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)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

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

(Continued on next page)
Dell Inc.

PowerEdge R6625 (AMD EPYC 9554 64-Core Processor)

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

---

**Compiler Version Notes (Continued)**

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.xalancmk_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
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Dell Inc.
PowerEdge R6625 (AMD EPYC 9554 64-Core Processor)

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**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
- -Wl, -mllvm -Wl, -reduce-array-computations=3 -O3 -march=znver4
- -fveclib=AMDLIBM -ffast-math -fopenmp -flto
- -mllvm -unroll-threshold=100 -finline-aggressive
- -mllvm -loop-unswhitch-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-lv-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

---

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

http://www.spec.org/cpu2017/flags/aocc400-flags.html

### SPEC CPU®2017 Integer Speed Result

**Dell Inc.**

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


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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

 Tested with SPEC CPU®2017 v1.1.8 on 2022-12-07 10:55:04-0500.
 Report generated on 2023-02-01 18:19:05 by CPU2017 PDF formatter v6442.
 Originally published on 2023-02-01.