## SPEC CPU®2017 Floating Point Speed Result

**Dell Inc.**

**PowerEdge C6525 (AMD EPYC 7643 48-Core Processor)**

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s 96</td>
<td>392</td>
<td>393</td>
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<tr>
<td>607.cactuBSSN_s 96</td>
<td>126</td>
<td>172</td>
</tr>
<tr>
<td>619.lbm_s 96</td>
<td>69.6</td>
<td>369</td>
</tr>
<tr>
<td>621.wrf_s 96</td>
<td>180</td>
<td>506</td>
</tr>
<tr>
<td>627.cam4_s 96</td>
<td>111</td>
<td>335</td>
</tr>
<tr>
<td>628.pop2_s 96</td>
<td>266</td>
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<tr>
<td>638.imagick_s 96</td>
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<tr>
<td>644.nab_s 96</td>
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<td></td>
</tr>
<tr>
<td>649.fotonik3d_s 96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>654.roms_s 96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### Hardware

- **CPU Name:** AMD EPYC 7643
- **Max MHz:** 3600
- **Nominal:** 2300
- **Enabled:** 96 cores, 2 chips
- **Orderable:** 1.2 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **L2:** 512 KB I+D on chip per core
- **L3:** 256 MB I+D on chip per chip, 32 MB shared / 6 cores
- **Other:** None
- **Memory:** 2 TB (16 x 128 GB 4Rx4 PC4-3200AA-L)
- **Storage:** 1002 GB on tmpfs
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux 8.3 (Ootpa) 4.18.0-240.el8.x86_64
- **Compiler:** C/C++/Fortran: Version 3.0.0 of AOCC
- **Parallel:** Yes
- **Firmware:** Version 2.2.2 released Mar-2021
- **File System:** tmpfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** jemalloc: jemalloc memory allocator library v5.1.0
- **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>
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<tbody>
<tr>
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</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>

'echo 8 > /proc/sys/vm/dirty_ratio' run as root to limit dirty cache to 8% of memory.
'echo 1 > /proc/sys/vm/swappiness' run as root to limit swap usage to minimum necessary.
'echo 1 > /proc/sys/vm/zone_reclaim_mode' run as root to free node-local memory and avoid remote memory usage.
'sync; echo 3 > /proc/sys/vm/drop_caches' run as root to reset filesystem caches.
'sysctl -w kernel.randomize_va_space=0' run as root to disable address space layout randomization (ASLR) to reduce run-to-run variability.

(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.
To enable THP only on request for peak runs of 628.pop2_s, and 638.imagick_s, 
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To disable THP for peak runs of 627.cam4_s, 644.nab_s, 649.fotonik3d_s, and 654.roms_s, 
'echo never > /sys/kernel/mm/transparent_hugepage/enabled' run as root.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-95"
LD_LIBRARY_PATH =
"/dev/shm/cpu2017-1.1.5/amd_speed_aocc300_milan_B_lib/64;/dev/shm/cpu201
7-1.1.5/amd_speed_aocc300_milan_B_lib/32;"
MALLOCC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "96"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-95"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-95"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 1TiB Memory using openSUSE 15.2
jemalloc: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)
jemalloc 5.1.0 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2

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)
SPEC CPU®2017 Floating Point Speed Result

Dell Inc.
PowerEdge C6525 (AMD EPYC 7643 48-Core Processor)

SPECspeed®2017_fp_base = 229
SPECspeed®2017_fp_peak = 234

CPU2017 License: 55
Test Sponsor: Dell Inc.
Test Date: Mar-2021
Hardware Availability: Mar-2021
Tested by: Dell Inc.
Software Availability: Mar-2021

General Notes (Continued)

is mitigated in the system as tested and documented.

Benchmark run from a 1002 GB ramdisk created with the cmd: "mount -t tmpfs -o size=1002G tmpfs /mnt/ramdisk"

Platform Notes

BIOS settings:
Logical processor : Disabled
L3 Cache as NUMA Domain : Enabled
Virtualization Technology : Disabled
DRAM Refresh Delay : Performance
System Profile : Custom
CPU Power Management : Maximum Performance
Memory Patrol Scrub : Disabled
PCI ASPM L1 Link
Power Management : Disabled

Sysinfo program /dev/shm/cpu2017-1.1.5/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Wed Mar 17 14:29:49 2021

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 7643 48-Core Processor
  2  "physical id"s (chips)
  96 "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 : 48
siblings : 48
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29 32 33 34 35 36 37 40 41 42 43 44 45 48 49 50 51 52 53 56 57 58 59 60 61
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29 32 33 34 35 36 37 40 41 42 43 44 45 48 49 50 51 52 53 56 57 58 59 60 61

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 96
On-line CPU(s) list: 0-95
Thread(s) per core: 1
Core(s) per socket: 48

(Continued on next page)
Platform Notes (Continued)

Socket(s):           2
NUMA node(s):        16
Vendor ID:           AuthenticAMD
CPU family:          25
Model:               1
Model name:          AMD EPYC 7643 48-Core Processor
Stepping:            1
CPU MHz:             1896.170
BogoMIPS:            4591.00
Virtualization:      AMD-V
L1d cache:           32K
L1i cache:           32K
L2 cache:            512K
L3 cache:            32768K
NUMA node0 CPU(s):   0-5
NUMA node1 CPU(s):   6-11
NUMA node2 CPU(s):   12-17
NUMA node3 CPU(s):   18-23
NUMA node4 CPU(s):   24-29
NUMA node5 CPU(s):   30-35
NUMA node6 CPU(s):   36-41
NUMA node7 CPU(s):   42-47
NUMA node8 CPU(s):   48-53
NUMA node9 CPU(s):   54-59
NUMA node10 CPU(s):  60-65
NUMA node11 CPU(s):  66-71
NUMA node12 CPU(s):  72-77
NUMA node13 CPU(s):  78-83
NUMA node14 CPU(s):  84-89
NUMA node15 CPU(s):  90-95
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 rdtsscp lm
constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf pni pclmulqdq
monitor ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx f16c
rdx rdxr 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 cd_p_l3 invpccide single hw_pstate sse mmsse mbs mba sev ibrs ibpb stibp vmmcall
fsgsbase bmi1 avx2 smep bmi2 invpcid cmq rdt_a rdseed adx smap clflushopt clwb
sha ni xsaveopt xsave xgetbv1 xsaves cmq_llc cmq_occip_llc cmq_mbb_total
cmq_mbb_local clzero irperf xsaveexit ptr wnoinvd amd_pini arat npt lbv svm_lock
nrip_save tsc_scale vmcb_clean flushbyasid decodeassist pfthreshold pff threshold
v_vmsave_vmload vgif umip pku ospke oas pe vcpumulqdp rdpid overlow_recov suctor smc

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a

(Continued on next page)
Dell Inc.

PowerEdge C6525 (AMD EPYC 7643 48-Core Processor)

SPECspeed®2017_fp_base = 229
SPECspeed®2017_fp_peak = 234

CPU2017 License: 55
Test Sponsor: Dell Inc.
Test Date: Mar-2021
Tested by: Dell Inc.
Hardware Availability: Mar-2021
Software Availability: Mar-2021

Platform Notes (Continued)

physical chip.
    available: 16 nodes (0-15)
    node 0 cpus: 0 1 2 3 4 5
    node 0 size: 128584 MB
    node 0 free: 128472 MB
    node 1 cpus: 6 7 8 9 10 11
    node 1 size: 129018 MB
    node 1 free: 128727 MB
    node 2 cpus: 12 13 14 15 16 17
    node 2 size: 129020 MB
    node 2 free: 128820 MB
    node 3 cpus: 18 19 20 21 22 23
    node 3 size: 129016 MB
    node 3 free: 125727 MB
    node 4 cpus: 24 25 26 27 28 29
    node 4 size: 129018 MB
    node 4 free: 126312 MB
    node 5 cpus: 30 31 32 33 34 35
    node 5 size: 129020 MB
    node 5 free: 128899 MB
    node 6 cpus: 36 37 38 39 40 41
    node 6 size: 129016 MB
    node 6 free: 128948 MB
    node 7 cpus: 42 43 44 45 46 47
    node 7 size: 116906 MB
    node 7 free: 116847 MB
    node 8 cpus: 48 49 50 51 52 53
    node 8 size: 129018 MB
    node 8 free: 128956 MB
    node 9 cpus: 54 55 56 57 58 59
    node 9 size: 129020 MB
    node 9 free: 128968 MB
    node 10 cpus: 60 61 62 63 64 65
    node 10 size: 129020 MB
    node 10 free: 128972 MB
    node 11 cpus: 66 67 68 69 70 71
    node 11 size: 129020 MB
    node 11 free: 128972 MB
    node 12 cpus: 72 73 74 75 76 77
    node 12 size: 129018 MB
    node 12 free: 128974 MB
    node 13 cpus: 78 79 80 81 82 83
    node 13 size: 129020 MB
    node 13 free: 128970 MB
    node 14 cpus: 84 85 86 87 88 89
    node 14 size: 129018 MB
    node 14 free: 128971 MB

(Continued on next page)
Dell Inc.

PowerEdge C6525 (AMD EPYC 7643 48-Core Processor)

SPEC CPU®2017 Floating Point Speed Result

---

**CPU2017 License:** 55  
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---

**SPECspeed®2017_fp_base = 229**  
**SPECspeed®2017_fp_peak = 234**

---

**Platform Notes (Continued)**

```
node 15 cpus: 90 91 92 93 94 95
node 15 size: 128974 MB
node 15 free: 128925 MB
node distances:

node 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
0: 10 11 11 11 11 11 11 11 32 32 32 32 32 32 32 32
```

From /proc/meminfo

- MemTotal: 2101007120 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

/sbin/tuned-adm active

- Current active profile: throughput-performance

From /etc/*release* /etc/*version*

- os-release:
  - NAME="Red Hat Enterprise Linux"
  - VERSION="8.3 (Ootpa)"
  - ID="rhel"
  - ID_LIKE="fedora"
  - VERSION_ID="8.3"
  - PLATFORM_ID="platform:el8"
  - PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
  - ANSI_COLOR="0;31"

- redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
- system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
- system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

uname -a:

```
Linux localhost.localdomain 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020
x86_64 x86_64 x86_64 GNU/Linux
```

(Continued on next page)
### Dell Inc.

PowerEdge C6525 (AMD EPYC 7643 48-Core Processor)

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<td>Mar-2021</td>
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<td>Hardware Availability:</td>
<td>Mar-2021</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Mar-2021</td>
</tr>
</tbody>
</table>

#### Platform Notes (Continued)

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

---

The system is running:

```
run-level 3 Dec 2 06:00
```

**Filesystem**

```
<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>1002G</td>
<td>5.7G</td>
<td>997G</td>
<td>1%</td>
<td>/dev/shm</td>
</tr>
</tbody>
</table>
```

**From /sys/devices/virtual/dmi/id**

- **Vendor:** Dell Inc.
- **Product:** PowerEdge C6525
- **Product Family:** PowerEdge

**Additional information from dmidecode 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:**
  - 16x 802C8632802C 72ASS16G72LZ-3G2B3 128 GB 4 rank 3200

**BIOS:**

- **BIOS Vendor:** Dell Inc.
- **BIOS Version:** 2.2.2
- **BIOS Date:** 03/02/2021
- **BIOS Revision:** 2.2

(End of data from sysinfo program)
Dell Inc.  

PowerEdge C6525 (AMD EPYC 7643 48-Core Processor)  

**SPECspeed®2017_fp_base** = 229  
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---

**Compiler Version Notes**

---

### C

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**AMD clang version 12.0.0** (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

---

### C++, C, Fortran

| 607.cactuBSSN_s(base, peak) |

---

**AMD clang version 12.0.0** (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

---

### Fortran

| 603.bwaves_s(base, peak) |
| 649.fotonik3d_s(base, peak) |
| 654.roms_s(base, peak) |

---

**AMD clang version 12.0.0** (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
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---

### Fortran, C

| 621.wrf_s(base, peak) |
| 627.cam4_s(base, peak) |
| 628.pop2_s(base, peak) |

---

**AMD clang version 12.0.0** (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
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Compiler Version Notes (Continued)

LLVM Mirror.Version.12.0.0
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

Base Compiler Invocation

C benchmarks:
clang

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

Benchmarks using Fortran, C, and C++:
clang++ clang flang

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactusBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
627.cam4_s: -DSPEC_CASE_FLAG -DSPEC_LP64
628.pop2_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64
SPEC CPU®2017 Floating Point Speed Result

Dell Inc.

PowerEdge C6525 (AMD EPYC 7643 48-Core Processor)

SPECspeed®2017_fp_base = 229
SPECspeed®2017_fp_peak = 234

CPU2017 License: 55
Test Sponsor: Dell Inc.
Test Date: Mar-2021

Tested by: Dell Inc.
Hardware Availability: Mar-2021
Software Availability: Mar-2021

Base Optimization Flags

C benchmarks:
-m64 -mno-adx -mno-sse4a -Wl,-mlllvm -Wl,-region-vectorize
-Wl,-mlllvm -Wl,-function-specialize
-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlllvm -unroll-threshold=50 -mlllvm -inline-threshold=1000
-freemap-arrays -mlllvm -function-specialize -flv-function-specialization
-mlllvm -enable-gvn-hoist -mlllvm -global-vectorize-slp=true
-mlllvm -enable-licm-vrp -mlllvm -reduce-array-computations=3 -z muldefs
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-1flang -1flangrti

Fortran benchmarks:
-m64 -mno-adx -mno-sse4a -Wl,-mlllvm -Wl,-enable-X86-prefetching
-Wl,-mlllvm -Wl,-function-specialize
-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,-reduce-array-computations=3 -Hz,1,0x1 -O3
-march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mlllvm -fuse-tile-inner-loop -funroll-loops
-mlllvm -extra-vectorizer-passes -mlllvm -lsr-in-nested-loop
-mlllvm -enable-licm-vrp -mlllvm -reduce-array-computations=3
-mlllvm -global-vectorize-slp=true -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -1flang -1flangrti

Benchmarks using both Fortran and C:
-m64 -mno-adx -mno-sse4a -Wl,-mlllvm -Wl,-enable-X86-prefetching
-Wl,-mlllvm -Wl,-function-specialize
-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlllvm -unroll-threshold=50 -mlllvm -inline-threshold=1000
-freemap-arrays -mlllvm -function-specialize -flv-function-specialization
-mlllvm -enable-gvn-hoist -mlllvm -global-vectorize-slp=true
-mlllvm -enable-licm-vrp -mlllvm -reduce-array-computations=3 -Hz,1,0x1
-Mrecursive -mlllvm -fuse-tile-inner-loop -funroll-loops
-mlllvm -extra-vectorizer-passes -mlllvm -lsr-in-nested-loop -z muldefs
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-1flang -1flangrti

Benchmarks using Fortran, C, and C++:
-m64 -mno-adx -mno-sse4a -std=c++98
-Wl,-mlllvm -Wl,-x86-use-vzeroupper=false
-Wl,-mlllvm -Wl,-region-vectorize -Wl,-mlllvm -Wl,-function-specialize

(Continued on next page)
Dell Inc. PowerEdge C6525 (AMD EPYC 7643 48-Core Processor)  

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Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
- -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6  
- -Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3  
- -fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5  
- -mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000  
- -fremap-arrays -mllvm -function-specialize -flv-function-specialization  
- -mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true  
- -mllvm -enable-lcm-vrp -mllvm -reduce-array-computations=3  
- -mllvm -enable-partial-unswitch -mllvm -unroll-threshold=100  
- -finline-aggressive -mllvm -loop-unswitch-threshold=200000  
- -mllvm -rerroll-loops -mllvm -aggressive-loop-unswitch  
- -mllvm -extra-vectorizer-passes -mllvm -convert-pow-exp-to-int=false  
- -Hz,1,0x1 -Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops  
- -mllvm -lsr-in-nested-loop -z muldefs -DSPEC_OPENMP -fopenmp  
- -fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang -lflangrti

Base Other Flags

C benchmarks:
- -Wno-unused-command-line-argument -Wno-return-type

Fortran benchmarks:
- -Wno-unused-command-line-argument -Wno-return-type

Benchmarks using both Fortran and C:
- -Wno-unused-command-line-argument -Wno-return-type

Benchmarks using Fortran, C, and C++:
- -Wno-unused-command-line-argument -Wno-return-type

Peak Compiler Invocation

C benchmarks:
clang

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

(Continued on next page)
Dell Inc.  
PowerEdge C6525 (AMD EPYC 7643 48-Core Processor)  

**SPECspeed®2017_fp_base = 229**  
**SPECspeed®2017_fp_peak = 234**

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### Peak Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:

```
clang++ clang flang
```

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

**C benchmarks:**

- `619.lbm_s: basepeak = yes`
- `638.imagick_s: basepeak = yes`
- `644.nab_s: basepeak = yes`

**Fortran benchmarks:**

- `603.bwaves_s: basepeak = yes`
- `649.fotonik3d_s: basepeak = yes`

Benchmarks using both Fortran and C:

- `621.wrf_s: basepeak = yes`
- `627.cam4_s: basepeak = yes`

(Continued on next page)
Dell Inc.  
PowerEdge C6525 (AMD EPYC 7643 48-Core Processor)  

SPECspeed®2017_fp_base = 229  
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Peak Optimization Flags (Continued)

628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:
- -m64 -mno-adx -mno-sse4a -std=c++98
- -Wl,-mlibvm -Wl,-x86-use-vzeroupper=false -Wl,-mlibvm -Wl,-enable-licm-vrp
- -Wl,-mlibvm -Wl,-function-specialize
- -Wl,-mlibvm -Wl,-align-all-nofallthru-blocks=6
- -Wl,-mlibvm -Wl,-reduce-array-computations=3 -Ofast -march=znver3
- -fvecclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
- -mlibvm -unroll-threshold=50 -fremap-arrays -flv-function-specialization
- -mlibvm -inline-threshold=1000 -mlibvm -enable-gvn-hoist
- -mlibvm -global-vectorize-slp=true -mlibvm -function-specialize
- -mlibvm -enable-licm-vrp -mlibvm -reduce-array-computations=3
- -finline-aggressive -mlibvm -unroll-threshold=100 -mlibvm -reroll-loops
- -mlibvm -aggressive-loop-unswitch -Mrecursive -DSPEC_OPENMP -fopenmp
- -fopenmp=libomp -lomp -landlibm -ljemalloc -lflang

Peak Other Flags

C benchmarks:
- -Wno-unused-command-line-argument -Wno-return-type

Fortran benchmarks:
- -Wno-unused-command-line-argument -Wno-return-type

Benchmarks using both Fortran and C:
- -Wno-unused-command-line-argument -Wno-return-type

Benchmarks using Fortran, C, and C++:
- -Wno-unused-command-line-argument -Wno-return-type

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

You can also download the XML flags sources by saving the following links:
## SPEC CPU®2017 Floating Point Speed Result

### Dell Inc.

**PowerEdge C6525 (AMD EPYC 7643 48-Core Processor)**

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