## Dell Inc.

### PowerEdge R6525 (AMD EPYC 7543P 32-Core Processor)

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

| Test Date: | May-2021 | Hardware Availability: | Jun-2021 |
| Software Availability: | Mar-2021 |

### SPECspeed®2017_fp_base = 155  
### SPECspeed®2017_fp_peak = 158

| SPECspeed®2017_fp_base | 155 | SPECspeed®2017_fp_peak | 158 |

### Hardware

<table>
<thead>
<tr>
<th>Threads</th>
<th>603.bwaves_s</th>
<th>607.cactuBSSN_s</th>
<th>619.lbm_s</th>
<th>621.wrf_s</th>
<th>627.cam4_s</th>
<th>628.pop2_s</th>
<th>638.imagick_s</th>
<th>644.nab_s</th>
<th>649.fotonik3d_s</th>
<th>654.roms_s</th>
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<tbody>
<tr>
<td></td>
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<td>SPECspeed®2017_fp_base</td>
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<td></td>
<td></td>
<td>158</td>
<td></td>
<td>158</td>
<td></td>
</tr>
</tbody>
</table>

### Software

| CPU Name: | AMD EPYC 7543P  
Max MHz: | 3700  
Nominal: | 2800  
Enabled: | 32 cores, 1 chip  
Orderable: | 1 chip  
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 / 4 cores  
Other: | None  
Memory: | 1 TB (8 x 128 GB 4Rx4 PC4-3200AA-L)  
Storage: | 128 GB on tmpfs  
Other: | None  
OS: | Red Hat Enterprise Linux 8.3 (Ootpa)  
Compiler: | Version 3.0.0 of AOCC  
Parallel: | Yes  
Firmware: | Version 2.2.5 released Apr-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.  

---

**603.bwaves_s**  
**607.cactuBSSN_s**  
**619.lbm_s**  
**621.wrf_s**  
**627.cam4_s**  
**628.pop2_s**  
**638.imagick_s**  
**644.nab_s**  
**649.fotonik3d_s**  
**654.roms_s**
Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tbody>
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<td>201</td>
<td>32</td>
<td>65.2</td>
<td>203</td>
<td>65.1</td>
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<td>627.cam4_s</td>
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<td>78.6</td>
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<tr>
<td>628.pop2_s</td>
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<tr>
<td>638.imagick_s</td>
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<td>80.0</td>
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<td>644.nab_s</td>
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<td>654.roms_s</td>
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<td>32</td>
<td>87.5</td>
<td>180</td>
<td>87.4</td>
</tr>
</tbody>
</table>

**Compiler Notes**


**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,
Dell Inc.
PowerEdge R6525 (AMD EPYC 7543P 32-Core Processor)

SPECspeed®2017_fp_base = 155
SPECspeed®2017_fp_peak = 158

Operating System Notes (Continued)

'écho 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 = "0-31"
LD_LIBRARY_PATH =
"/mnt/ramdisk/cpu2017-1.1.7-aocc300-B2/amd_speed_aocc300_milan_B_lib/lib
;/mnt/ramdisk/cpu2017-1.1.7-aocc300-B2/amd_speed_aocc300_milan_B_lib/lib
32:"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "32"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0 16 1 17 2 18 3 19 4 20 5 21 6 22 7 23 8 24 9 25 10 26
   11 27 12 28 13 29 14 30 15 31"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0-31"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-31"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 1TiB Memory using openSUSE 15.2

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.

jemalloc: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)
jemalloc 5.1.0 is available here:
Dell Inc. PowerEdge R6525 (AMD EPYC 7543P 32-Core Processor)

SPECspeed®2017_fp_base = 155
SPECspeed®2017_fp_peak = 158

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

General Notes (Continued)

https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2

Benchmark run from a 128 GB ramdisk created with the cmd: "mount -t tmpfs -o size=128G 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
- Algorithm Performance
- Boost Disable (ApbDis): Enabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.7-aocc300-B2/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on rhel-8-3-amd Wed May 19 14:15:07 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 7543P 32-Core Processor
  1 "physical id"s (chips)
  32 "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 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

From lscpu:
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 32

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

**Dell Inc.**

PowerEdge R6525 (AMD EPYC 7543P 32-Core Processor)  

| SPECspeed®2017_fp_base = 155 | SPECspeed®2017_fp_peak = 158 |

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

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**Platform Notes (Continued)**

- On-line CPU(s) list: 0-31
- Thread(s) per core: 1
- Core(s) per socket: 32
- Socket(s): 1
- NUMA node(s): 8
- Vendor ID: AuthenticAMD
- CPU family: 25
- Model: 1
- Model name: AMD EPYC 7543P 32-Core Processor
- Stepping: 1
- CPU MHz: 2561.655
- BogoMIPS: 5590.04
- Virtualization: AMD-V
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 512K
- L3 cache: 32768K
- NUMA node0 CPU(s): 0-3
- NUMA node1 CPU(s): 4-7
- NUMA node2 CPU(s): 8-11
- NUMA node3 CPU(s): 12-15
- NUMA node4 CPU(s): 16-19
- NUMA node5 CPU(s): 20-23
- NUMA node6 CPU(s): 24-27
- NUMA node7 CPU(s): 28-31

**Flags:**  
fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov  
pat pse36 clflush mmx mxmmxt fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtsclm  
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  
rdrand lahf_lm cmp_legacy svm extatic cr8_legacy abm sse4a misalignsse 3dnowprefetch  
osvw ibs kini wdt tce topoext perfctr_core perfctr_nb bpext perfctr_llc mwaitx cbp  
cat_l3 cdp_l3 invpcid_single hw_pstatr sme ssbd mba sev ibrs ipbp stibp vmcall  
fsqsbasha bml avx2 smep bmi2 invpcid cmp rdt_a rdseed adx smap clflushopt clwb  
sha ni xsaveopt xsaves xgetbvl xsaves cmp_llc cmp_occum_llc cmp_mbb_total  
 cmp_mbb_local clzero irperf xsaveerptr wbinvd amd_pbintr arat npt lbrv svm_lock  
nrip_save tscscale vmcb_clean flushbyasid decodeassist pfthreshold  
v_vmsave_vmload vgif unip pkp ospe vaes vpclmulqdq rrdi overflow_recoy succor smca

/proc/cpuinfo cache data  
cache size : 512 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  
node 0 size: 128418 MB  
node 0 free: 128226 MB

(Continued on next page)
Dell Inc. PowerEdge R6525 (AMD EPYC 7543P 32-Core Processor)

SPECspeed\textsuperscript{\textregistered}2017\_fp\_peak = 158

SPECspeed\textsuperscript{\textregistered}2017\_fp\_base = 155

CPU2017 License: 55
Test Sponsor: Dell Inc.
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Platform Notes (Continued)

node 1 cpus: 4 5 6 7
node 1 size: 129020 MB
node 1 free: 124719 MB
node 2 cpus: 8 9 10 11
node 2 size: 129020 MB
node 2 free: 128753 MB
node 3 cpus: 12 13 14 15
node 3 size: 129018 MB
node 3 free: 128908 MB
node 4 cpus: 16 17 18 19
node 4 size: 129016 MB
node 4 free: 128910 MB
node 5 cpus: 20 21 22 23
node 5 size: 129020 MB
node 5 free: 128846 MB
node 6 cpus: 24 25 26 27
node 6 size: 129018 MB
node 6 free: 128870 MB
node 7 cpus: 28 29 30 31
node 7 size: 116909 MB
node 7 free: 116808 MB

node distances:
node  0   1   2   3   4   5   6   7
 0: 10 11 11 11 11 11 11 11
 1: 11 10 11 11 11 11 11 11
 2: 11 11 10 11 11 11 11 11
 3: 11 11 11 10 11 11 11 11
 4: 11 11 11 11 10 11 11 11
 5: 11 11 11 11 11 10 11 11
 6: 11 11 11 11 11 11 10 11
 7: 11 11 11 11 11 11 11 10

From /proc/meminfo
MemTotal: 1043935032 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"

(Continued on next page)
Dell Inc.  
PowerEdge R6525 (AMD EPYC 7543P 32-Core Processor)  

<table>
<thead>
<tr>
<th>SPECspeed(^{\text{2017}}) (_{fp} \text{peak} = 158)</th>
<th>SPECspeed(^{\text{2017}}) (_{fp} \text{base} = 155)</th>
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<tr>
<td>CPU2017 License: 55</td>
<td>Test Date: May-2021</td>
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<td>Test Sponsor: Dell Inc.</td>
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<td>Software Availability: Mar-2021</td>
</tr>
</tbody>
</table>

### Platform Notes (Continued)

```
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 rhel-8-3-amd 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

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/swapgs 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

run-level 3 Nov 26 12:35
SPEC is set to: /mnt/ramdisk/cpu2017-1.1.7-aocc300-B2
Filesystem Type Size Used Avail Use% Mounted on
tmpfs tmpfs 128G 4.0G 125G 4% /mnt/ramdisk

From /sys/devices/virtual/dmi/id
Vendor: Dell Inc.
Product: PowerEdge R6525
Product Family: PowerEdge
Serial: 1234567

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: 8x 802C8632802C 72ASS16G72LZ-3G2B3 128 GB 4 rank 3200
```
SPEC CPU®2017 Floating Point Speed Result

Dell Inc.
PowerEdge R6525 (AMD EPYC 7543P 32-Core Processor)

SPECspeed®2017_fp_base = 155
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Test Date: May-2021
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Hardware Availability: Jun-2021
Software Availability: Mar-2021

Platform Notes (Continued)

24x Not Specified Not Specified

BIOS:
  BIOS Vendor: Dell Inc.
  BIOS Version: 2.2.5
  BIOS Date: 04/08/2021
  BIOS Revision: 2.2

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C               | 619.lbm_s(base, peak) 638.imagick_s(base, peak)
                | 644.nab_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

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

PowerEdge R6525 (AMD EPYC 7543P 32-Core Processor)

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Compiler Version Notes (Continued)

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, 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
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.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64

(Continued on next page)
### Base Portability Flags (Continued)

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

### Base Optimization Flags

**C benchmarks:**

- `-m64` `-mno-adx` `-mno-sse4a` `-Wl,-mllvm -Wl,-region-vectorize`
- `-Wl,-mllvm -Wl,-function-specialize`
- `-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 -mllym -inline-threshold=1000`
- `-fremap-arrays -mllvm -function-specialize` `-flv-function-specialization`
- `-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true`
- `-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3 -z muldefs`
- `-DSPEC_OPENMP` `-fopenmp` `-fopenmp=libomp` `-lomp` `-lamdlibm` `-ljemalloc`
- `-lflang -lflangrti`

**Fortran benchmarks:**

- `-m64` `-mno-adx` `-mno-sse4a` `-Wl,-mllvm -Wl,-enable-X86-prefetching`
- `-Wl,-mllvm -Wl,-enable-licm-vrp -Wl,-mllvm -Wl,-region-vectorize`
- `-Wl,-mllvm -Wl,-function-specialize`
- `-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3 -Hz,1,0x1` `-O3`
- `-march=znver3` `-fveclib=AMDLIBM -ffast-math -frecursive`
- `-mllvm -fuse-tile-inner-loop -funroll-loops`
- `-mllvm -extra-vectorizer-passes -mllvm -lir-in-nested-loop`
- `-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3`
- `-mllvm -global-vectorize-slp=true -z muldefs -DSPEC_OPENMP` `-fopenmp`
- `-fopenmp=libomp` `-lomp` `-lamdlibm` `-ljemalloc` `-lflang -lflangrti`

**Benchmarks using both Fortran and C:**

- `-m64` `-mno-adx` `-mno-sse4a` `-Wl,-mllvm -Wl,-enable-X86-prefetching`
- `-Wl,-mllvm -Wl,-enable-licm-vrp -Wl,-mllvm -Wl,-region-vectorize`
- `-Wl,-mllvm -Wl,-function-specialize`
- `-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 -mllym -inline-threshold=1000`

(Continued on next page)
Dell Inc. 
PowerEdge R6525 (AMD EPYC 7543P 32-Core Processor) 

| SPECspeed®2017_fp_base = 155 |
| SPECspeed®2017_fp_peak = 158 |

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

Test Date: May-2021
Hardware Availability: Jun-2021
Software Availability: Mar-2021

**Base Optimization Flags (Continued)**

Benchmarks using both Fortran and C (continued):
- -fremap-arrays -mlirvm -function-specialize -flv-function-specialization
- -mlirvm -enable-gvn-hoist -mlirvm -global-vectorize-slp=true
- -mlirvm -enable-licm-vrp -mlirvm -reduce-array-computations=3 -Hz,1,0x1
- -Mrecursive -mlirvm -fuse-tile-inner-loop -funroll-loops
- -mlirvm -extra-vectorizer-passes -mlirvm -lsr-in-nested-loop -z muldefs
- -DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
- -lflang -lflangrti

Benchmarks using Fortran, C, and C++:
- -m64 -mno-adx -mno-sse4a -std=c++98
- -Wl,-mllvm -Wl,-x86-use-vzeroupper=false
- -Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize
- -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
- -Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -March=znver3
- -fveccli=AMDLIBM -ffast-math -fllto -fstruct-layout=5
- -mllvm -unroll-threshold=50 -mlirvm -inline-threshold=1000
- -fremap-arrays -mlirvm -function-specialize -flv-function-specialization
- -mlirvm -enable-gvn-hoist -mlirvm -global-vectorize-slp=true
- -mlirvm -enable-licm-vrp -mlirvm -reduce-array-computations=3
- -mlirvm -enable-partial-unswitch -mlirvm -unroll-threshold=100
- -findline-aggressive -mlirvm -loop-unswitch-threshold=200000
- -mlirvm -reroll-loops -mlirvm -aggressive-loop-unswitch
- -mlirvm -extra-vectorizer-passes -mlirvm -convert-pow-exp-to-int=false
- -Hz,1,0x1 -Mrecursive -mlirvm -fuse-tile-inner-loop -funroll-loops
- -mlirvm -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
Dell Inc.

PowerEdge R6525 (AMD EPYC 7543P 32-Core Processor)

SPECspeed®2017_fp_base = 155
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Peak 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

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

619.lbm_s: -m64 -mno-adx -mno-sse4a
-W1,-mllvm -W1,-function-specialize
-W1,-mllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mllvm -W1,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -fito
-fstruct-layout=5 -mllvm -unroll-threshold=50
-freemap-arrays -fly-function-specialization
-mllvm -inline-threshold=1000 -mllvm -enable-gvn-hoist
-mllvm -global-vectorize-slp=true
-mllvm -function-specialize -mllvm -enable-licm-vrp
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

638.imagick_s: basepeak = yes

644.nab_s: basepeak = yes

Fortran benchmarks:

603.bwaves_s: basepeak = yes

(Continued on next page)
Dell Inc.  
PowerEdge R6525 (AMD EPYC 7543P 32-Core Processor)  
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Peak Optimization Flags (Continued)

649.fotonik3d_s: basepeak = yes

654.roms_s: -m64 -mno-adx -mno-sse4a  
-W1,-mllv -W1,-enable-X86-prefetching  
-W1,-mllv -W1,-enable-licm-vrp  
-W1,-mllv -W1,-function-specialize  
-W1,-mllv -W1,-align-all-nofallthru-blocks=6  
-W1,-mllv -W1,-reduce-array-computations=3 -Ofast  
-march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive  
-mllv -reduce-array-computations=3  
-mllv -global-vectorize-slp=true -mllv -enable-licm-vrp  
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm  
-ljemalloc -lflang

Benchmarks using both Fortran and C:

621.wrf_s: -m64 -mno-adx -mno-sse4a  
-W1,-mllv -W1,-enable-X86-prefetching  
-W1,-mllv -W1,-enable-licm-vrp  
-W1,-mllv -W1,-function-specialize  
-W1,-mllv -W1,-align-all-nofallthru-blocks=6  
-W1,-mllv -W1,-reduce-array-computations=3 -Ofast  
-march=znver3 -fveclib=AMDLIBM -ffast-math -flto  
-fstruct-layout=5 -mllv -unroll-threshold=50  
-fremap-arrays -flv-function-specialization  
-mllv -inline-threshold=1000 -mllv -enable-gvn-hoist  
-mllv -global-vectorize-slp=true  
-mllv -function-specialize -mllv -enable-licm-vrp  
-mllv -reduce-array-computations=3 -Hz,1,0x1 -O3  
-Mrecursive -mllv -fuse-tile-inner-loop -funroll-loops  
-mllv -extra-vectorizer-passes -mllv -lslr-in-nested-loop  
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm  
-ljemalloc -lflang

627.cam4_s: basepeak = yes

628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes
### Dell Inc.

**PowerEdge R630 (AMD EPYC 7543P 32-Core Processor)**

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<th>SPECspeed®2017_fp_base</th>
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**CPU2017 License:** 55  
**Test Date:** May-2021  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Hardware Availability:** Jun-2021  
**Software Availability:** Mar-2021

#### 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:


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