### Dell Inc.

**PowerEdge R7525 (AMD EPYC 7543 32-Core Processor)**

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS: Red Hat Enterprise Linux 8.3 (Ootpa)</td>
<td>CPU Name: AMD EPYC 7543</td>
</tr>
<tr>
<td>Compiler: C/C++/Fortran: Version 3.0.0 of AOCC</td>
<td>Max MHz: 3700</td>
</tr>
<tr>
<td>Parallel: Yes</td>
<td>Nominal: 2800</td>
</tr>
<tr>
<td>Firmware: Version 2.0.3 released Jan-2021</td>
<td>Enabled: 64 cores, 2 chips</td>
</tr>
<tr>
<td>File System: tmpfs</td>
<td>Orderable: 1.2 chips</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Base Pointers: 64-bit</td>
<td>L2: 512 KB I+D on chip per core</td>
</tr>
<tr>
<td>Peak Pointers: 64-bit</td>
<td>L3: 256 MB I+D on chip per core, 32 MB shared / 4 cores</td>
</tr>
<tr>
<td>Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.</td>
<td>Other: None</td>
</tr>
</tbody>
</table>

**Test Sponsor:** Dell Inc. **Test Date:** Mar-2021

**Hardware Availability:** Apr-2021 **Software Availability:** Mar-2021

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

**Software Availability:** Mar-2021

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed\textsuperscript{2017_fp_base} = 219</th>
<th>SPECspeed\textsuperscript{2017_fp_peak} = 225</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>64 threads</td>
<td>352</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>64 threads</td>
<td>333</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>64 threads</td>
<td>125</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>64 threads</td>
<td>130</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>64 threads</td>
<td>174</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>64 threads</td>
<td>176</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>64 threads</td>
<td>161</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>64 threads</td>
<td>65.0</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>64 threads</td>
<td>302</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>64 threads</td>
<td>263</td>
</tr>
</tbody>
</table>

**Additional Details:**
- **Speciation:** SPEC CPU 2017 Floating Point Speed Result
- **Copyright:** 2017-2021 Standard Performance Evaluation Corporation
Dell Inc. PowerEdge R7525 (AMD EPYC 7543 32-Core Processor)

SPECspeed®2017_fp_base = 219
SPECspeed®2017_fp_peak = 225

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base</th>
<th>Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Threads</td>
<td>Seconds</td>
</tr>
<tr>
<td>603.bwaves_s</td>
<td>64</td>
<td>78.0</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>64</td>
<td>47.3</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>64</td>
<td>41.7</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>64</td>
<td>76.1</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>64</td>
<td>55.1</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>64</td>
<td>183</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>64</td>
<td>47.7</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>64</td>
<td>40.3</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>64</td>
<td>75.4</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>64</td>
<td>59.9</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>

'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)
Dell Inc.

PowerEdge R7525 (AMD EPYC 7543 32-Core Processor)

| SPECspeed®2017_fp_base = 219 |
| SPECspeed®2017_fp_peak = 225 |

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

Test Date: Mar-2021  
Hardware Availability: Apr-2021  
Software Availability: Mar-2021

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 = "0-63"
LD_LIBRARY_PATH = 
"/mnt/ramdisk/cpu2017-1.1.5/amd_speed_aocc300_milan_B_lib/64;/mnt/ramdisk/cpu2017-1.1.5/amd_speed_aocc300_milan_B_lib/32:" 
MALLOC_CONF = "retain:true" 
OMP_DYNAMIC = "false" 
OMP_SCHEDULE = "static" 
OMP_STACKSIZE = "128M" 
OMP_THREAD_LIMIT = "64"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-63"

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.

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

Dell Inc.

PowerEdge R7525 (AMD EPYC 7543 32-Core Processor)

SPECspeed®2017_fp_base = 219
SPECspeed®2017_fp_peak = 225

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

Test Date: Mar-2021
Hardware Availability: Apr-2021
Software Availability: Mar-2021

General Notes (Continued)

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 225 GB ramdisk created with the cmd: "mount -t tmpfs -o size=225G tmpfs /mnt/ramdisk

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

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 /mnt/ramdisk/cpu2017-1.1.5/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Mon Mar 22 05:40:42 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 7543 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 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
  25 26 27 28 29 30 31
physical 1: 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

(Continued on next page)
Dell Inc.  
PowerEdge R7525 (AMD EPYC 7543 32-Core Processor)  

SPECspeed®2017_fp_base = 219
SPECspeed®2017_fp_peak = 225

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

Platform Notes (Continued)

Byte Order: Little Endian
CPU(s): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 1
Core(s) per socket: 32
Socket(s): 2
NUMA node(s): 16
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 7543 32-Core Processor
Stepping: 1
CPU MHz: 1795.925
BogoMIPS: 5589.47
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
NUMA node8 CPU(s): 32-35
NUMA node9 CPU(s): 36-39
NUMA node10 CPU(s): 40-43
NUMA node11 CPU(s): 44-47
NUMA node12 CPU(s): 48-51
NUMA node13 CPU(s): 52-55
NUMA node14 CPU(s): 56-59
NUMA node15 CPU(s): 60-63

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 pni pclmulqdq
monitor ssse3 fma cx16 pdcm sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx f16c
rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch
osw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb
cat_l3 cdp_l3 invpcid_single hw_pstate sme ssbd mba sev ibrs ibpb stibp vmmcall
fsgsbase bmi1 avx2 smep bmi2 invpcid cmn rdt_a rdseed adx smap clflushopt clwb
sha_ni xsaveopt xsave xsetbv1 xsaveas cqm_llc cqm OCCUPYLLC cqm MBM TOTAL

cqm MBM_Local clzero irperf xsaveerptr wbnoinvd amd_ppin arpt lbrv svm_lock
nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pfthreshold
v_vmsave_vmload vgif umip pku ospke vaes vpclmulqdq rdpid overflow_recover succor smc
Dell Inc. PowerEdge R7525 (AMD EPYC 7543 32-Core Processor) SPECspeed®2017_fp_base = 219 SPECspeed®2017_fp_peak = 225

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

Test Date: Mar-2021
Hardware Availability: Apr-2021
Software Availability: Mar-2021

Platform Notes (Continued)

/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: 16 nodes (0-15)
  node 0 cpus: 0 1 2 3
  node 0 size: 128584 MB
  node 0 free: 128519 MB
  node 1 cpus: 4 5 6 7
  node 1 size: 129018 MB
  node 1 free: 128837 MB
  node 2 cpus: 8 9 10 11
  node 2 size: 129016 MB
  node 2 free: 128871 MB
  node 3 cpus: 12 13 14 15
  node 3 size: 129020 MB
  node 3 free: 128957 MB
  node 4 cpus: 16 17 18 19
  node 4 size: 129020 MB
  node 4 free: 128954 MB
  node 5 cpus: 20 21 22 23
  node 5 size: 129018 MB
  node 5 free: 128937 MB
  node 6 cpus: 24 25 26 27
  node 6 size: 129018 MB
  node 6 free: 128971 MB
  node 7 cpus: 28 29 30 31
  node 7 size: 116871 MB
  node 7 free: 116799 MB
  node 8 cpus: 32 33 34 35
  node 8 size: 129022 MB
  node 8 free: 128889 MB
  node 9 cpus: 36 37 38 39
  node 9 size: 129018 MB
  node 9 free: 128950 MB
  node 10 cpus: 40 41 42 43
  node 10 size: 129020 MB
  node 10 free: 124071 MB
  node 11 cpus: 44 45 46 47
  node 11 size: 129022 MB
  node 11 free: 128976 MB
  node 12 cpus: 48 49 50 51
  node 12 size: 129010 MB
  node 12 free: 128972 MB
  node 13 cpus: 52 53 54 55

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

Dell Inc.
PowerEdge R7525 (AMD EPYC 7543 32-Core Processor)

SPECspeed®2017_fp_base = 219
SPECspeed®2017_fp_peak = 225

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

Platform Notes (Continued)

node 13 size: 129018 MB
node 13 free: 128981 MB
node 14 cpus: 56 57 58 59
node 14 size: 129020 MB
node 14 free: 128873 MB
node 15 cpus: 60 61 62 63
node 15 size: 129016 MB
node 15 free: 128901 MB
node distances:

From /proc/meminfo
MemTotal: 2101013436 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)
### Platform Notes (Continued)

```plaintext
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

uname -a:  
    Linux localhost.localdomain 4.18.0-240.10.1.el8_3.x86_64 #1 SMP Wed Dec 16 03:30:52 EST 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):** 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/swapgs barriers and __user pointer sanitization
- **CVE-2017-5715 (Spectre variant 2):** Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: disabled, RSB filling
- **CVE-2020-0543 (Special Register Buffer Data Sampling):** Not affected
- **CVE-2019-11135 (TSX Asynchronous Abort):** Not affected

run-level 3 Mar 22 03:08 last=5

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.5
```

```
<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>225G</td>
<td>4.8G</td>
<td>221G</td>
<td>3%</td>
<td>/mnt/ramdisk</td>
</tr>
</tbody>
</table>

From /sys/devices/virtual/dmi/id

- **Vendor:** Dell Inc.
- **Product:** PowerEdge R7525
- **Product Family:** PowerEdge
- **Serial:** 48LN333

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
  16x Not Specified Not Specified

- **BIOS:**
  - **BIOS Vendor:** Dell Inc.
  - **BIOS Version:** 2.0.3
```

(Continued on next page)
Dell Inc.  
PowerEdge R7525 (AMD EPYC 7543 32-Core Processor)  

SPEC speed™2017_fp_base = 219  
SPEC speed™2017_fp_peak = 225

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

Platform Notes (Continued)

BIOS Date: 01/15/2021  
BIOS Revision: 2.0

(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  
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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)  
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Compiler Version Notes (Continued)

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
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Target: x86_64-unknown-linux-gnu
Thread model: posix
Installed Dir: /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.ibm_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

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

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SPECspeed®2017_fp_peak = 225

Base Portability Flags (Continued)

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
-fvectl=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-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 -fvectl=AMDLIBM -ffast-math -Mrecursive
-mllvm -fuse-tile-inner-loop -funroll-loops
-mllvm -extra-vectorizer-passes -mllvm -lsr-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
-fvectl=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
-mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops
-mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop -z muldefs

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Dell Inc.  
PowerEdge R7525 (AMD EPYC 7543 32-Core Processor)

SPECspeed®2017_fp_base = 219
SPECspeed®2017_fp_peak = 225

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

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-llang -llangrti

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-nofallback-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -fno-fast-math -fstruct-layout=5
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -mlir -function-specialize -flv-function-specialization
-mlir -enable-gvn-hoist -mlir -global-vectorize-slp=true
-mlir -enable-licm-vrp -mlir -reduce-array-computations=3
-mlir -enable-partial-unswitch -mlir -unroll-threshold=100
-finline-aggressive -mlir -loop-unswitch-threshold=200000
-mlir -reroll-loops -mlir -aggressive-loop-unswitch
-mlir -extra-vectorizer-passes -mlir -convert-pow-exp-to-int=false
-Hz,1,0x1 -Mrecursive -mlir -fuse-tile-inner-loop -funroll-loops
-mlir -lsr-in-nested-loop -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -llang -llangrti

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
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PowerEdge R7525 (AMD EPYC 7543 32-Core Processor)

SPECspeed®2017_fp_base = 219
SPECspeed®2017_fp_peak = 225

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Peak Compiler Invocation (Continued)

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 -flto
-fstruct-layout=5 -mllvm -unroll-threshold=50
-fremap-arrays -flv-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: -m64 -mno-adx -mno-sse4a
-W1,-mllvm -W1,-enable-X86-prefetching
-W1,-mllvm -W1,-enable-licm-vrp
-W1,-mllvm -W1,-function-specialize
-W1,-mllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mllvm -W1,-reduce-array-computations=3 -Ofast

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PowerEdge R7525 (AMD EPYC 7543 32-Core Processor)

SPEC CPU®2017 Floating Point Speed Result

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SPECspeed®2017_fp_base = 219
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Peak Optimization Flags (Continued)

603.bwaves_s (continued):
-march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true -mllvm -enable-licm-vrp
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
-ljemalloc -lflang

649.fotonik3d_s: basepeak = yes

654.roms_s: Same as 603.bwaves_s

Benchmarks using both Fortran and C:

621.wrf_s: -m64 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-lcm-vrp
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=5 -mllvm -unroll-threshold=50
-freemap-arrays -flv-function-specialization
-mllvm -inline-threshold=1000 -mllvm -enable-gvn-hoist
-mllvm -global-vectorize-slp=true
-mllvm -function-specialize -mllvm -enable-lcm-vrp
-mllvm -reduce-array-computations=3 -Hz,1,0x1 -O3
-Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops
-mllvm -extra-vectorizer-passes -mllvm -lsr-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++:

-m64 -mno-adx -mno-sse4a -std=c++98
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-enable-lcm-vrp
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mllvm -unroll-threshold=50 -freemap-arrays -flv-function-specialization
-mllvm -inline-threshold=1000 -mllvm -enable-gvn-hoist
-mllvm -global-vectorize-slp=true -mllvm -function-specialize
-mllvm -enable-lcm-vrp -mllvm -reduce-array-computations=3

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**Dell Inc.**

PowerEdge R7525 (AMD EPYC 7543 32-Core Processor)  

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**SPEC CPU®2017 Floating Point Speed Result**

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**SPECspeed®2017_fp_peak = 225**

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**Peak Optimization Flags (Continued)**

Benchmarks using Fortran, C, and C++ (continued):
- `-finline-aggressive`  
- `-mllvm -unroll-threshold=100 -mllvm -reroll-loops`  
- `-mllvm -aggressive-loop-unswitch`  
- `-Mrecursive`  
- `-DSPEC_OPENMP`  
- `-fopenmp`  
- `-fopenmp=libomp`  
- `-lomp`  
- `-lamdlibm`  
- `-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`

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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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