Dell Inc.

PowerEdge R7525 (AMD EPYC 7763 64-Core Processor)

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

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

SPECspeed\textsuperscript{2017}\_fp\_peak = 252
SPECspeed\textsuperscript{2017}\_fp\_base = 241

Hardware

\begin{itemize}
\item \textbf{CPU Name}: AMD EPYC 7763
\item \textbf{Max MHz}: 3500
\item \textbf{Nominal}: 2450
\item \textbf{Enabled}: 128 cores, 2 chips
\item \textbf{Orderable}: 1.2 chips
\item \textbf{Cache L1}: 32 KB I + 32 KB D on chip per core
\item \textbf{L2}: 512 KB I+D on chip per core
\item \textbf{L3}: 256 MB I+D on chip per core, 32 MB shared / 8 cores
\item \textbf{Other}: None
\item \textbf{Memory}: 2 TB (16 x 128 GB 4Rx4 PC4-3200AA-R)
\item \textbf{Storage}: 225 GB on tmpfs
\item \textbf{Other}: None
\end{itemize}

Software

\begin{itemize}
\item \textbf{OS}: Red Hat Enterprise Linux 8.3 (Ootpa)
\item \textbf{Compiler}: C/C++/Fortran: Version 3.0.0 of AOCC
\item \textbf{Parallel}: Yes
\item \textbf{Firmware}: Version 2.0.3 released Jan-2021
\item \textbf{File System}: tmpfs
\item \textbf{System State}: Run level 3 (multi-user)
\item \textbf{Base Pointers}: 64-bit
\item \textbf{Peak Pointers}: 64-bit
\item \textbf{Other}: jemalloc: jemalloc memory allocator library v5.1.0
\item \textbf{Power Management}: BIOS and OS set to prefer performance at the cost of additional power usage.
\end{itemize}
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
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<td>638.imagick_s</td>
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<td>649.fotonik3d_s</td>
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<td>654.roms_s</td>
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</tbody>
</table>

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### 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>
```

'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 = "0-127"
- `LD_LIBRARY_PATH = 
  
- `MALLOC_CONF = "retain:true"
- `OMP_DYNAMIC = "false"
- `OMP_SCHEDULE = "static"
- `OMP_STACKSIZE = "128M"
- `OMP_THREAD_LIMIT = "128"

Environment variables set by runcpu during the 603.bwaves_s peak run:
- `GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 628.pop2_s peak run:
- `GOMP_CPU_AFFINITY = "0-127"

Environment variables set by runcpu during the 654.roms_s peak run:
- `GOMP_CPU_AFFINITY = "0-127"

## 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.

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:

(Continued on next page)
General Notes (Continued)

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 Tue Mar 9 12:29:26 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 7763 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 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
53 54 55 56 57 58 59 60 61 62 63
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 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
53 54 55 56 57 58 59 60 61 62 63

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 128
On-line CPU(s) list: 0-127
Thread(s) per core: 1

(Continued on next page)
Dell Inc. PowerEdge R7525 (AMD EPYC 7763 64-Core Processor)

SPECspeed®2017_fp_base = 241
SPECspeed®2017_fp_peak = 252

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

Platform Notes (Continued)

Core(s) per socket:  64
Socket(s):  2
NUMA node(s):  16
Vendor ID:  AuthenticAMD
CPU family:  25
Model:  1
Model name:  AMD EPYC 7763 64-Core Processor
Stepping:  1
CPU MHz:  2005.434
BogoMIPS:  4890.79
Virtualization:  AMD-V
L1d cache:  32K
L1i cache:  32K
L2 cache:  512K
L3 cache:  32768K
NUMA node0 CPU(s):  0-7
NUMA node1 CPU(s):  8-15
NUMA node2 CPU(s):  16-23
NUMA node3 CPU(s):  24-31
NUMA node4 CPU(s):  32-39
NUMA node5 CPU(s):  40-47
NUMA node6 CPU(s):  48-55
NUMA node7 CPU(s):  56-63
NUMA node8 CPU(s):  64-71
NUMA node9 CPU(s):  72-79
NUMA node10 CPU(s):  80-87
NUMA node11 CPU(s):  88-95
NUMA node12 CPU(s):  96-103
NUMA node13 CPU(s):  104-111
NUMA node14 CPU(s):  112-119
NUMA node15 CPU(s):  120-127

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
rdseed rdrand lahf_lm cmp_legacy svm extapicid cr8_legacy abm sse4a misalignssse 3dnowprefetch
osvw ibs kini wt d tce topoext perfcrt_nr bpdext perfcrt_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 cqm rdt_a rseed adx smap clflushopt clwb
sha ni xsaveopt xsave xstate xgetbv1 xsaveas cqm_llc cqm_occup_llc cqm_mbb_total
cqm_mbm_local clzero irperf xsaveerprot wbnoinvd amd_pcpin arat npt lbiv svm_lock
nrip_save tsc_scale vmcb_clean flushbyasid decodeassist pfilter pfthreshold
v_vmsave_vmload vgif umip pku ospke vaes vpclmulqdq rdpid overflow_recov succor smca

/cache proc/cpuinfo cache data

(Continued on next page)
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<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
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Platform Notes (Continued)

From numactl --hardware

```shell
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: 128583 MB
node 0 free: 128493 MB
node 1 cpus: 8 9 10 11 12 13 14 15
node 1 size: 129021 MB
node 1 free: 128912 MB
node 2 cpus: 16 17 18 19 20 21 22 23
node 2 size: 129021 MB
node 2 free: 128887 MB
node 3 cpus: 24 25 26 27 28 29 30 31
node 3 size: 129021 MB
node 3 free: 128966 MB
node 4 cpus: 32 33 34 35 36 37 38 39
node 4 size: 129021 MB
node 4 free: 128973 MB
node 5 cpus: 40 41 42 43 44 45 46 47
node 5 size: 129021 MB
node 5 free: 128967 MB
node 6 cpus: 48 49 50 51 52 53 54 55
node 6 size: 129021 MB
node 6 free: 128931 MB
node 7 cpus: 56 57 58 59 60 61 62 63
node 7 size: 129021 MB
node 7 free: 128968 MB
node 8 cpus: 64 65 66 67 68 69 70 71
node 8 size: 129021 MB
node 8 free: 128934 MB
node 9 cpus: 72 73 74 75 76 77 78 79
node 9 size: 129019 MB
node 9 free: 123982 MB
node 10 cpus: 80 81 82 83 84 85 86 87
node 10 size: 129021 MB
node 10 free: 128757 MB
node 11 cpus: 88 89 90 91 92 93 94 95
node 11 size: 129021 MB
node 11 free: 128908 MB
node 12 cpus: 96 97 98 99 100 101 102 103
node 12 size: 129021 MB
node 12 free: 128908 MB
node 13 cpus: 104 105 106 107 108 109 110 111
node 13 size: 129019 MB
node 13 free: 128970 MB
node 14 cpus: 112 113 114 115 116 117 118 119
node 14 size: 129021 MB
```

(Continued on next page)
Dell Inc.

PowerEdge R7525 (AMD EPYC 7763 64-Core Processor)  

**SPECspeed®2017_fp_base = 241**  
**SPECspeed®2017_fp_peak = 252**

<table>
<thead>
<tr>
<th>CPU2017 License: 55</th>
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</tr>
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</table>

**SPEC CPU®2017 Floating Point Speed Result**  
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### Platform Notes (Continued)

```plaintext
node 14 free: 128862 MB
node 15 cpus: 120 121 122 123 124 125 126 127
node 15 size: 129017 MB
node 15 free: 128905 MB
node distances:

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</tbody>
</table>
```

From `/proc/meminfo`  
MemTotal: 2100999592 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 4.18.0-240.10.1.el8_3.x86_64 #1 SMP Wed Dec 16 03:30:52

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

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SPECspeed®2017_fp_base = 241
SPECspeed®2017_fp_peak = 252

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Platform Notes (Continued)

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 9 09:49 last=5

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

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

(End of data from sysinfo program)
Dell Inc.
PowerEdge R7525 (AMD EPYC 7763 64-Core Processor)

SPECspeed®2017_fp_base = 241
SPECspeed®2017_fp_peak = 252

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

---

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
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

(Continued on next page)
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.cactuBSSN_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
Dell Inc. PowerEdge R7525 (AMD EPYC 7763 64-Core Processor)

SPECspeed®2017_fp_base = 241
SPECspeed®2017_fp_peak = 252

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

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

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 -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 -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-lcm-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 -Mrecursive
- mllvm -fuse-tile-inner-loop -funroll-loops
- mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop
- mllvm -enable-lcm-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-lcm-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 -mllvm -inline-threshold=1000
- freemap-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 -Hz,1,0x1
- Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops
- mllvm -extra-vectorizer-passes -mllvm -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

(Continued on next page)
Dell Inc.

PowerEdge R7525 (AMD EPYC 7763 64-Core Processor)

SPECspeed®2017_fp_base = 241
SPECspeed®2017_fp_peak = 252

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

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
- `Wl,-mlirvm -Wl,-align-all-nofallthru-blocks=6`
- `Wl,-mlirvm -Wl,-reduce-array-computations=3 -O3 -march=znver3`
- `fvec=AMDLIBM -ffast-math -flto -fstruct-layout=5`
- `mlirvm -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-unswhitch -mlirvm -unroll-threshold=100`
- `finline-aggressive -mlirvm -loop-unswhitch-threshold=200000`
- `mlirvm -reroll-loops -mlirvm -aggressive-loop-unswhitch`
- `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`

Peak Compiler Invocation

C benchmarks:
- `clang`

Fortran benchmarks:
- `flang`

Benchmarks using both Fortran and C:
- `flang clang`

(Continued on next page)
Dell Inc.

PowerEdge R7525 (AMD EPYC 7763 64-Core Processor)

**SPECspeed®2017_fp_base = 241**

**SPECspeed®2017_fp_peak = 252**

**CPU2017 License:** 55

**Test Sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Test Date:** Mar-2021

**Hardware Availability:** Mar-2021

**Software Availability:** Mar-2021

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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**: -m64 -mno-adx -mno-sse4a -W1,-ml1vm -W1,-enable-x86-prefetching -W1,-ml1vm -W1,-enable-licm-vrp -W1,-ml1vm -W1,-function-specialize -W1,-ml1vm -W1,-align-all-nofallthru-blocks=6 -W1,-ml1vm -W1,-reduce-array-computations=3 -Ofast -march=znver3 -fveclib=AmdLibM -ffast-math -Mrecursive -ml1vm -reduce-array-computations=3 -ml1vm -global-vectorize-slp=true -ml1vm -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**: basepeak = yes
- **627.cam4_s**: basepeak = yes

(Continued on next page)
Dell Inc.  PowerEdge R7525 (AMD EPYC 7763 64-Core Processor)  SPECspeed®2017_fp_base = 241
SPECspeed®2017_fp_peak = 252

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

Peak Optimization Flags (Continued)

628.pop2_s: -m64 -mno-adx -mno-sse4a
-W1,-mlllvm -W1,-enable-X86-prefetching
-W1,-mlllvm -W1,-enable-licm-vrp
-W1,-mlllvm -W1,-function-specialize
-W1,-mlllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mlllvm -W1,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=5 -mlllvm -unroll-threshold=50
-fremap-arrays -flv-function-specialization
-mlllvm -inline-threshold=1000 -mlllvm -enable-gvn-hoist
-mlllvm -global-vectorize-slp=true
-mlllvm -function-specialize -mlllvm -enable-licm-vrp
-mlllvm -reduce-array-computations=3 -Mrecursive
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
-ljemalloc -lflang

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

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 R7525 (AMD EPYC 7763 64-Core Processor)

**SPECspeed®2017_fp_base = 241**  
**SPECspeed®2017_fp_peak = 252**

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<td>Tested by</td>
<td>Dell Inc.</td>
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| Test Date | Mar-2021 |
| Hardware Availability | Mar-2021 |
| Software Availability | Mar-2021 |

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Tested with SPEC CPU®2017 v1.1.5 on 2021-03-09 13:29:26-0500.  
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