## SPEC CPU®2017 Floating Point Speed Result

### Dell Inc.

PowerEdge R7525 (AMD EPYC 74F3 24-Core Processor)

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_fp_base = 198</th>
<th>SPECspeed®2017_fp_peak = 204</th>
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<th>SPECspeed®2017_fp_base</th>
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</table>

### Hardware

- **CPU Name:** AMD EPYC 74F3
- **Max MHz:** 4000
- **Nominal:** 3200
- **Enabled:** 48 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 / 3 cores
- **Other:** None
- **Memory:** 2 TB (16 x 128 GB 4Rx4 PC4-3200AA-L)
- **Storage:** 225 GB on tmpfs
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux 8.3 (Ootpa) 4.18.0-240.10.1.el8_3.x86_64
- **Compiler:** C/C++/Fortran: Version 3.0.0 of AOCC
- **Parallel:** Yes
- **Firmware:** Version 2.0.3 released Jan-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>
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<tr>
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<th>Threads</th>
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<th>Ratio</th>
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</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
'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>

Set dirty_ratio=8 to limit dirty cache to 8% of memory
Set swappiness=1 to swap only if necessary
Set zone_reclaim_mode=1 to free local node memory and avoid remote memory sync then drop_caches=3 to reset caches before invoking runcpu
ASLR is disabled to reduce run-to-run issues.

dirty_ratio, swappiness, zone_reclaim_mode, drop_caches and ASLR were all set using privileged echo (e.g. echo 1 > /proc/sys/vm/swappiness).

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

Dell Inc.
PowerEdge R7525 (AMD EPYC 74F3 24-Core Processor)  

| SPECspeed®2017_fp_base = 198 | SPECspeed®2017_fp_peak = 204 |

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

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

Operating System Notes (Continued)

Transparent huge pages set to 'always' for this run (OS default)  
For peak, transparent huge pages set to 'madvise' for 628, 638

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-47"
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;"
MALLOCS_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "48"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0-47"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-47"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0-47"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-47"

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

Benchmark run from a 225 GB ramdisk created with the cmd: "mount -t tmpfs -o size=225G tmpfs /mnt/ramdisk"
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PowerEdge R7525 (AMD EPYC 74F3 24-Core Processor)

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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/cpu2017-1.1.5/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Tue Mar 23 12:17:37 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 74F3 24-Core Processor
  2 "physical id"s (chips)
  48 "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 : 24
  siblings : 24
  physical 0: cores 0 1 2 4 5 6 8 9 10 12 13 14 16 17 18 20 21 22 24 25 26 28 29 30
  physical 1: cores 0 1 2 4 5 6 8 9 10 12 13 14 16 17 18 20 21 22 24 25 26 28 29 30

From lscpu:
  Architecture: x86_64
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  CPU(s): 48
  On-line CPU(s) list: 0-47
  Thread(s) per core: 1
  Core(s) per socket: 24
  Socket(s): 2
  NUMA node(s): 16
  Vendor ID: AuthenticAMD
  CPU family: 25
  Model: 1

(Continued on next page)
Dell Inc.
PowerEdge R7525 (AMD EPYC 74F3 24-Core Processor)

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Software Availability: Mar-2021

Platform Notes (Continued)

Model name: AMD EPYC 74F3 24-Core Processor
Stepping: 1
CPU MHz: 2929.065
BogoMIPS: 6387.84
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 32768K
NUMA node0 CPU(s): 0-2
NUMA node1 CPU(s): 3-5
NUMA node2 CPU(s): 6-8
NUMA node3 CPU(s): 9-11
NUMA node4 CPU(s): 12-14
NUMA node5 CPU(s): 15-17
NUMA node6 CPU(s): 18-20
NUMA node7 CPU(s): 21-23
NUMA node8 CPU(s): 24-26
NUMA node9 CPU(s): 27-29
NUMA node10 CPU(s): 30-32
NUMA node11 CPU(s): 33-35
NUMA node12 CPU(s): 36-38
NUMA node13 CPU(s): 39-41
NUMA node14 CPU(s): 42-44
NUMA node15 CPU(s): 45-47

Flags: fpu vme de pse tsc msr pae 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 npi pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw ibr sinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_llc mwaitx cbp cat_l3 cdp_l3 invpcid_single hw_pstate sme ssbd mba sev ibrs ibpb stibp vmmcall fsqsgbase bml1 avx2 smep bmi2 invpcid cqm rdt_ a rdseed adx smap clflushopt clwb sha ni xsaveopt xsavec xgetbv1 xsavees cqm_llc cqm_occu llc cqm_mbb total cqm_mbb_local clzero irperf xsaveeprtr wbnoinvd amd_ppin arat npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassistsf pausefilter pfthreshold v_vmsave_vmlload vgif umip pkpu ospke vaes vpclmulqdq rpdpd overflow_recover 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: 16 nodes (0-15)
    node 0 cpus: 0 1 2
    node 0 size: 128585 MB
    node 0 free: 128479 MB

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**Software Availability:** Mar-2021

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**Platform Notes (Continued)**

```plaintext
node 1 cpus: 3 4 5
done 1 size: 129016 MB
done 1 free: 128903 MB
node 2 cpus: 6 7 8
done 2 size: 129016 MB
done 2 free: 128903 MB
node 3 cpus: 9 10 11
done 3 size: 129020 MB
done 3 free: 127446 MB
node 4 cpus: 12 13 14
done 4 size: 128979 MB
done 4 free: 128811 MB
node 5 cpus: 15 16 17
done 5 size: 129020 MB
done 5 free: 128944 MB
node 6 cpus: 18 19 20
done 6 size: 129022 MB
done 6 free: 128979 MB
node 7 cpus: 21 22 23
done 7 size: 116908 MB
done 7 free: 114960 MB
node 8 cpus: 24 25 26
done 8 size: 129020 MB
done 8 free: 128968 MB
node 9 cpus: 27 28 29
done 9 size: 129022 MB
done 9 free: 128922 MB
node 10 cpus: 30 31 32
done 10 size: 129020 MB
done 10 free: 128977 MB
node 11 cpus: 33 34 35
done 11 size: 129018 MB
done 11 free: 128987 MB
node 12 cpus: 36 37 38
done 12 size: 129018 MB
done 12 free: 128974 MB
node 13 cpus: 39 40 41
done 13 size: 129018 MB
done 13 free: 128988 MB
node 14 cpus: 42 43 44
done 14 size: 129018 MB
done 14 free: 128964 MB
node 15 cpus: 45 46 47
done 15 size: 129012 MB
done 15 free: 128980 MB
node distances:
node 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
```

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

0:  10  11  11  11  11  11  11  32  32  32  32  32  32  32  32  32  32  32  32  32  32

From /proc/meminfo
MemTotal: 2101016900 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 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

(Continued on next page)
Dell Inc. PowerEdge R7525 (AMD EPYC 74F3 24-Core Processor) Dell Inc.

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</tr>
<tr>
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</tr>
</tbody>
</table>

Platform Notes (Continued)

**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 23 04:52 last=5

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

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<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
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<tr>
<td>tmpfs</td>
<td>tmpfs</td>
<td>225G</td>
<td>4.8G</td>
<td>221G</td>
<td>3%</td>
<td>/mnt/ramdisk</td>
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</table>

From /sys/devices/virtual/dmi/id

<table>
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<th>Vendor: Dell Inc.</th>
</tr>
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<tbody>
<tr>
<td>Product: PowerEdge R7525</td>
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<tr>
<td>Product Family: PowerEdge</td>
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<tr>
<td>Serial: 48LN333</td>
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</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>BIOS Vendor: Dell Inc.</th>
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<tr>
<td>BIOS Version: 2.0.3</td>
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<tr>
<td>BIOS Date: 01/15/2021</td>
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<td>BIOS Revision: 2.0</td>
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(End of data from sysinfo program)

Compiler Version Notes

```
C       619.lbm_s(base, peak) 638.imagick_s(base, peak)
```

(Continued on next page)
Dell Inc.

PowerEdge R7525 (AMD EPYC 74F3 24-Core Processor)

**SPECspeed®2017_fp_base = 198**
**SPECspeed®2017_fp_peak = 204**

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**Compiler Version Notes (Continued)**

<table>
<thead>
<tr>
<th>644.nab_s(base, peak)</th>
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</thead>
<tbody>
<tr>
<td>AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)</td>
</tr>
<tr>
<td>Target: x86_64-unknown-linux-gnu</td>
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<tr>
<td>Thread model: posix</td>
</tr>
<tr>
<td>InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin</td>
</tr>
</tbody>
</table>

---

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 |
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 |

---

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 |

---

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

---

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

Dell Inc. PowerEdge R7525 (AMD EPYC 74F3 24-Core Processor)

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<tr>
<td>SPECspeed®2017_fp_peak = 204</td>
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</table>

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

Compiler Version Notes (Continued)

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.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
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -mno-adx -mno-sse4a -Wl,-mlllvm -Wl,-region-vectorize
-Wl,-mlllvm -Wl,-function-specialize

(Continued on next page)
Base Optimization Flags (Continued)

C benchmarks (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-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 -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`
- `-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-licm-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`
- `-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3`

(Continued on next page)
Dell Inc.

PowerEdge R7525 (AMD EPYC 74F3 24-Core Processor)

SPECspeed®2017_fp_base = 198
SPECspeed®2017_fp_peak = 204

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

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
- 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-licm-vrp -mllvm -reduce-array-computations=3
- mllvm -enable-partial-unswitch -mllvm -unroll-threshold=100
- finline-aggressive -mllvm -loop-unswitch-threshold=200000
- mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
- mllvm -extra-vectorizer-passes -mllvm -convert-pow-exp-to-int=false
- Hz,j,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
Benchmarks using Fortran, C, and C++:
clang++ clang flang
SPEC CPU®2017 Floating Point Speed Result

Dell Inc.
PowerEdge R7525 (AMD EPYC 74F3 24-Core Processor)

SPECspeed®2017_fp_base = 198
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

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

Peak Portability Flags
Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

619.ibm_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
-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:

(Continued on next page)
Peak Optimization Flags (Continued)

621.wrf_s: basepeak = yes

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-licm-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 -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
- 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

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:
Dell Inc.

PowerEdge R7525 (AMD EPYC 74F3 24-Core Processor)

SPECspeed\textsuperscript{\textregistered}2017\_fp\_base = 198
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<td>Mar-2021</td>
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