Dell Inc.

PowerEdge R7525 (AMD EPYC 7513 32-Core Processor)

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

SPECspeed²017_fp_base = 209
SPECspeed²017_fp_peak = 212

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

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

Threads

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>64</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>64</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>64</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>64</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>64</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>64</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>64</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>64</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>64</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>64</td>
</tr>
</tbody>
</table>

| SPECspeed²017_fp_base (209) | SPECspeed²017_fp_peak (212) |

Hardware

CPU Name: AMD EPYC 7513
Max MHz: 3650
Nominal: 2600
Enabled: 64 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: 128 MB I+D on chip per chip, 32 MB shared / 8 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.
Dell Inc.

PowerEdge R7525 (AMD EPYC 7513 32-Core Processor)

CPU 2017 License: 55
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>64</td>
<td>87.9</td>
<td>671</td>
<td>88.4</td>
<td>668</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>64</td>
<td>48.6</td>
<td>343</td>
<td>48.6</td>
<td>343</td>
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<tr>
<td>619.lbm_s</td>
<td>64</td>
<td>42.9</td>
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<td>621.wrf_s</td>
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<td>72.7</td>
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<tr>
<td>628.pop2_s</td>
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<td>66.4</td>
<td>179</td>
<td>66.4</td>
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<tr>
<td>638.imagick_s</td>
<td>64</td>
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<tr>
<td>644.nab_s</td>
<td>64</td>
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<td>415</td>
<td>42.2</td>
<td>414</td>
<td>42.2</td>
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</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>64</td>
<td>86.3</td>
<td>106</td>
<td>85.4</td>
<td>107</td>
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<tr>
<td>654.roms_s</td>
<td>64</td>
<td>66.8</td>
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<td>236</td>
<td>66.8</td>
<td>236</td>
<td></td>
<td></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.
Dell Inc.

PowerEdge R7525 (AMD EPYC 7513 32-Core Processor)

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

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_fp_base</td>
<td>209</td>
</tr>
<tr>
<td>SPECspeed®2017_fp_peak</td>
<td>212</td>
</tr>
</tbody>
</table>

**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)

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 607.cactuBSSN_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

jemalloc: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)  
jemalloc 5.1.0 is available here:  
https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.  
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.  
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

(Continued on next page)
General Notes (Continued)

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

Platform Notes

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

Sysinfo program /mnt/ramdisk/cpu2017-1.1.5/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2flc
running on localhost.localdomain Fri Mar 26 12:44:28 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 7513 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
- 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

(Continued on next page)
Dell Inc.  

PowerEdge R7525 (AMD EPYC 7513 32-Core Processor)  

**SPECspeed®2017_fp_base = 209**  
**SPECspeed®2017_fp_peak = 212**  

---

**Platform Notes (Continued)**

NUMA node(s): 8  
Vendor ID: AuthenticAMD  
CPU family: 25  
Model: 1  
Model name: AMD EPYC 7513 32-Core Processor  
Stepping: 1  
CPU MHz: 2115.042  
BogoMIPS: 5190.62  
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  

Flags: fpu vme de pse tsc msr pae mce 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 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 osfw ibs kinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_l1c mwaitx cbp cat_l3 cdpl_l3 invpcid_single hw_pstate sme ssbd mba sev ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 invpcid cqm rdt_a rdseed adx smap clflushopt clwb sha_ni xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local clzero irperf xsaveerptr wnbinvd amd_pprn arat npt lbrv svm_lock nrip_save tsc_salg vmcb_clean flushbyasid decodeassists pausefilter pfthreshold v_vmsave_vmload vgif umip pku ospke vaes vpcmldqrd pid overflow_recov 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 4 5 6 7  
node 0 size: 257562 MB  
node 0 free: 257456 MB  
node 1 cpus: 8 9 10 11 12 13 14 15  
node 1 size: 258035 MB  
node 1 free: 257961 MB  
node 2 cpus: 16 17 18 19 20 21 22 23

(Continued on next page)
Dell Inc.
PowerEdge R7525 (AMD EPYC 7513 32-Core Processor)

SPECspeed®2017_fp_base = 209
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CPU2017 License: 55
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Test Date: Mar-2021
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Software Availability: Mar-2021

Platform Notes (Continued)

node 2 size: 258031 MB
node 2 free: 257946 MB
node 3 cpus: 24 25 26 27 28 29 30 31
node 3 size: 245928 MB
node 3 free: 245808 MB
node 4 cpus: 32 33 34 35 36 37 38 39
node 4 size: 258041 MB
node 4 free: 252692 MB
node 5 cpus: 40 41 42 43 44 45 46 47
node 5 size: 258041 MB
node 5 free: 257866 MB
node 6 cpus: 48 49 50 51 52 53 54 55
node 6 size: 258043 MB
node 6 free: 259755 MB
node 7 cpus: 56 57 58 59 60 61 62 63
node 7 size: 258037 MB
node 7 free: 257835 MB
node distances:

From /proc/meminfo
MemTotal:       2101021556 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
/sbin/tuned-adm active
Current active profile: throughput-performance

From /etc/*release* /etc/*version*
ose-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)
Dell Inc. 
PowerEdge R7525 (AMD EPYC 7513 32-Core Processor) 

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SPECspeed®2017_fp_peak = 212

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Platform Notes (Continued)

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
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 sanitation
CVE-2017-5753 (Spectre variant 1): Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBF: disabled, RSB filling
CVE-2017-5715 (Spectre variant 2): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
run-level 3 Mar 26 05:09 last=5

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.5
Filesystem Type Size Used Avail Use% Mounted on
tmpfs tmpfs 225G 4.8G 221G 3% /mnt/ramdisk

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 SMI BIOS" standard.

Memory:
16x 802C8632802C 72ASS16G72LZ-3G2B3 128 GB 4 rank 3200
16x Not Specified Not Specified

BIOS:
BIOS Vendor: Dell Inc.

(Continued on next page)
## Dell Inc. PowerEdge R7525 (AMD EPYC 7513 32-Core Processor) SPEC CPU®2017 Floating Point Speed Result

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>209</td>
<td>212</td>
</tr>
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</table>

**CPU2017 License:** 55

**Test Sponsor:** Dell Inc.

**Test Date:** Mar-2021

**Hardware Availability:** Jun-2021

**Tested by:** Dell Inc.

**Software Availability:** Mar-2021

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### Platform Notes (Continued)

**BIOS Version:** 2.0.3  
**BIOS Date:** 01/15/2021  
**BIOS Revision:** 2.0

(End of data from sysinfo program)

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### Compiler Version Notes

**C**

| 619.lbm_s(base, peak) | 638.imagick_s(base, peak)  
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>644.nab_s(base, peak)</td>
<td></td>
</tr>
</tbody>
</table>

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)  
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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)  
<table>
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<td>654.roms_s(base, peak)</td>
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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

(Continued on next page)
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Compiler Version Notes (Continued)

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
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

(Continued on next page)
Dell Inc.

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SPECsone®2017 fp_base = 209
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Base Portability Flags (Continued)

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
-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 -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 -lfiertl

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
-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 -Hz,1,0x1
-Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops

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SPEC CPU®2017 Floating Point Speed Result
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Dell Inc.
PowerEdge R7525 (AMD EPYC 7513 32-Core Processor)

SPECspeed®2017_fp_base = 209
SPECspeed®2017_fp_peak = 212

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

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):
-mlllvm -extra-vectorizer-passes -mlllvm -lsr-in-nested-loop -z muldefs
-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,-mlllvm -Wl,-x86-use-vzeroupper=false
-Wl,-mlllvm -Wl,-region-vectorize -Wl,-mlllvm -Wl,-function-specialize
-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,-reduce-array-computations=3 -03 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlllvm -unroll-threshold=50 -mlllvm -inline-threshold=1000
-fremap-arrays -mlllvm -function-specialize -flv-function-specialization
-mlllvm -enable-gvn-hoist -mlllvm -global-vectorize-slp=true
-mlllvm -enable-licm-vrp -mlllvm -reduce-array-computations=3
-mlllvm -enable-partial-unswitch -mlllvm -unroll-threshold=100
-finline-aggressive -mlllvm -loop-unswitch-threshold=200000
-mlllvm -reroll-loops -mlllvm -aggressive-loop-unswitch
-mlllvm -extra-vectorizer-passes -mlllvm -convert-pow-exp-to-int=false
-Hz,1,0x1 -Mrecursive -mlllvm -fuse-tile-inner-loop -funroll-loops
-mlllvm -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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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: basepeak = yes
638.imagick_s: basepeak = yes
644.nab_s: basepeak = yes

Fortran benchmarks:
603.bwaves_s: basepeak = yes
649.fotonik3d_s: basepeak = yes
654.roms_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 -0fast
-march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mlllvm -reduce-array-computations=3
-mlllvm -global-vectorize-slp=true -mlllvm -enable-licm-vrp
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
-ljemalloc -lflang

(Continued on next page)
Dell Inc. PowerEdge R7525 (AMD EPYC 7513 32-Core Processor)

| SPECspeed®2017_fp_base = 209 |
| SPECspeed®2017_fp_peak = 212 |

CPU2017 License: 55
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Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

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 -llflag
```

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
## SPEC CPU®2017 Floating Point Speed Result

### Dell Inc.

**PowerEdge R7525 (AMD EPYC 7513 32-Core Processor)**

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<thead>
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<th>SPECspeed®2017_fp_base</th>
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</tbody>
</table>

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

You can also download the XML flags sources by saving the following links:


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