SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

$SPECspeed^{®}2017\_fp\_base =$ 228

PowerEdge R6615 (AMD EPYC 9354 32-Core Processor)
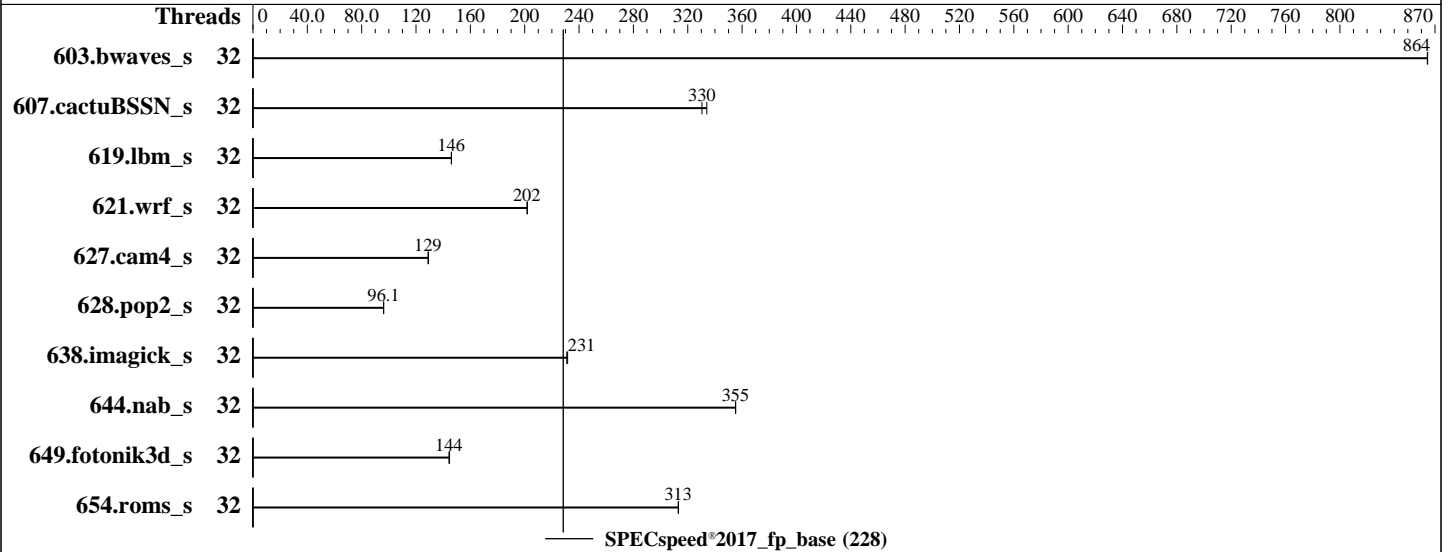
$SPECspeed^{®}2017\_fp\_peak =$ Not Run

CPU2017 License: 6573
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Jan-2023
Hardware Availability: Feb-2023
Software Availability: Nov-2022

Threads		Result
603.bwaves_s	32	864
607.cactuBSSN_s	32	330
619.lbm_s	32	146
621.wrf_s	32	202
627.cam4_s	32	129
628.pop2_s	32	96.1
638.imagick_s	32	231
644.nab_s	32	355
649.fotonik3d_s	32	144
654.roms_s	32	313

Scale: 0 40.0 80.0 120 160 200 240 280 320 360 400 440 480 520 560 600 640 680 720 760 800 870

SPECspeed®2017_fp_base (228)

Hardware

CPU Name: AMD EPYC 9354
 Max MHz: 3800
 Nominal: 3250
Enabled: 32 cores, 1 chip
Orderable: 1 chip
Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 256 MB I+D on chip per chip, 32 MB shared / 4 cores
 Other: None
Memory: 768 GB (12 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 125 GB on tmpfs
Other: None

Software

OS: Ubuntu 22.04.1 LTS
 5.15.0-46-generic
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: Yes
Firmware: Version 1.1.0 released Nov-2022
File System: tmpfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

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SPECspeed®2017_fp_peak = Not Run

CPU2017 License: 6573
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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	32	68.2	865	**68.3**	**864**									
607.cactuBSSN_s	32	**50.4**	**330**	49.9	334									
619.lbm_s	32	**35.9**	**146**	35.8	146									
621.wrf_s	32	65.5	202	**65.6**	**202**									
627.cam4_s	32	**68.8**	**129**	68.6	129									
628.pop2_s	32	123	96.2	**124**	**96.1**									
638.imagick_s	32	62.3	232	**62.5**	**231**									
644.nab_s	32	49.2	355	**49.2**	**355**									
649.fotonik3d_s	32	**63.2**	**144**	63.0	145									
654.roms_s	32	**50.3**	**313**	50.3	313									
SPECspeed®2017_fp_base =		**228**												
SPECspeed®2017_fp_peak =		**Not Run**												

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>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage,
'sysctl -w vm.zone_reclaim_mode=1' run as root.
To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run
variability, 'sysctl -w kernel.randomize_va_space=0' run as root.
```

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CPU2017 License: 6573
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Test Date: Jan-2023
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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 always enable THP for peak runs of:
603.bwaves_s, 607.cactuBSSN_s, 619.lbm_s, 627.cam4_s, 628.pop2_s, 638.imagick_s, 644.nab_s, 649.fotonik3d_s:
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled; echo always > /sys/kernel/mm/transparent_hugepage/defrag'
run as root.
To disable THP for peak runs of 621.wrf_s:
'echo never > /sys/kernel/mm/transparent_hugepage/enabled; echo always > /sys/kernel/mm/transparent_hugepage/defrag'
run as root.
To enable THP only on request for peak runs of 654.roms_s:
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled; echo madvise > /sys/kernel/mm/transparent_hugepage/defrag'
run as root.
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-31"
LD_LIBRARY_PATH =
     "/mnt/ramdisk/cpu2017-1.1.8-aocc400-B1b/amd_speed_aocc400_genoa_B_lib/li
     b:"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "oversize_threshold:0,retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "32"
```

General Notes

```
Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

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 125 GB ramdisk created with the cmd: "mount -t tmpfs -o size=125G tmpfs /mnt/ramdisk"
```

Dell Inc.

PowerEdge R6615 (AMD EPYC 9354 32-Core Processor)

SPECspeed®2017_fp_base = 228

SPECspeed®2017_fp_peak = Not Run

CPU2017 License:	6573	**Test Date:**	Jan-2023
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Feb-2023
Tested by:	Dell Inc.	**Software Availability:**	Nov-2022

Platform Notes

```
BIOS settings:
            DRAM Refresh Delay : Performance
        DIMM Self Healing on
   Uncorrectable Memory Error : Disabled
            Logical Processor : Disabled
      Virtualization Technology : Disabled
      L3 Cache as NUMA Domain : Enabled

               System Profile : Custom
                     C-States : Disabled
           Memory Patrol Scrub : Disabled
          PCI ASPM L1 Link
             Power Management : Disabled
            Determinism Slider : Power Determinism
       Algorithm Performance
          Boost Disable (ApbDis) : Enabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.8-aocc400-B1b/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on amd-sut Sat Jan 14 23:11:10 2023

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 9354 32-Core Processor
      1  "physical id"s (chips)
      32 "processors"
   cores, siblings (Caution: counting these is hw and system dependent. The following
   excerpts from /proc/cpuinfo might not be reliable.  Use with caution.)
      cpu cores : 32
      siblings  : 32
      physical 0: cores 0 1 2 3 16 17 18 19 32 33 34 35 48 49 50 51 64 65 66 67 80 81 82
      83 96 97 98 99 112 113 114 115

From lscpu from util-linux 2.37.2:
      Architecture:                 x86_64
      CPU op-mode(s):               32-bit, 64-bit
      Address sizes:                52 bits physical, 57 bits virtual
      Byte Order:                   Little Endian
      CPU(s):                       32
      On-line CPU(s) list:          0-31
      Vendor ID:                    AuthenticAMD
      Model name:                   AMD EPYC 9354 32-Core Processor
      CPU family:                   25
```

(Continued on next page)

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PowerEdge R6615 (AMD EPYC 9354 32-Core Processor)

SPECspeed®2017_fp_base = 228

SPECspeed®2017_fp_peak = Not Run

CPU2017 License: 6573
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Jan-2023
Hardware Availability: Feb-2023
Software Availability: Nov-2022

Platform Notes (Continued)

```
Model:                      17
Thread(s) per core:         1
Core(s) per socket:         32
Socket(s):                  1
Stepping:                   1
Frequency boost:            enabled
CPU max MHz:                3800.0000
CPU min MHz:                400.0000
BogoMIPS:                   6501.64
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 rapl 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 osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb
bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs
ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 erms invpcid cqm rdt_a avx512f
avx512dq rdseed adx smap avx512ifma clflushopt clwb avx512cd sha_ni avx512bw
avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
cqm_mbm_local avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd amd_ppin cppc arat
npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
pausefilter pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi umip pku
ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg avx512_vpopcntdq
la57 rdpid overflow_recov succor smca fsrm flush_l1d
Virtualization:             AMD-V
L1d cache:                  1 MiB (32 instances)
L1i cache:                  1 MiB (32 instances)
L2 cache:                   32 MiB (32 instances)
L3 cache:                   256 MiB (8 instances)
NUMA node(s):               8
NUMA node0 CPU(s):          0-3
NUMA node1 CPU(s):          16-19
NUMA node2 CPU(s):          8-11
NUMA node3 CPU(s):          24-27
NUMA node4 CPU(s):          12-15
NUMA node5 CPU(s):          28-31
NUMA node6 CPU(s):          4-7
NUMA node7 CPU(s):          20-23
Vulnerability Itlb multihit:    Not affected
Vulnerability L1tf:             Not affected
Vulnerability Mds:              Not affected
Vulnerability Meltdown:         Not affected
Vulnerability Mmio stale data:  Not affected
Vulnerability Retbleed:         Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via
prctl and seccomp
Vulnerability Spectre v1:        Mitigation; usercopy/swapgs barriers and __user
```

(Continued on next page)

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Platform Notes (Continued)

```
      pointer sanitization
      Vulnerability Spectre v2:         Mitigation; Retpolines, IBPB conditional, IBRS_FW,
      STIBP disabled, RSB filling
      Vulnerability Srbds:              Not affected
      Vulnerability Tsx async abort:    Not affected

 From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE          LEVEL   SETS PHY-LINE COHERENCY-SIZE
      L1d       32K       1M   8 Data              1     64        1             64
      L1i       32K       1M   8 Instruction       1     64        1             64
      L2         1M      32M   8 Unified           2   2048        1             64
      L3        32M     256M  16 Unified           3  32768        1             64

 /proc/cpuinfo cache data
    cache size : 1024 KB


 From numactl --hardware
 WARNING: a numactl 'node' might or might not correspond to a physical chip.
   available: 8 nodes (0-7)
   node 0 cpus: 0 1 2 3
   node 0 size: 96312 MB
   node 0 free: 95043 MB
   node 1 cpus: 16 17 18 19
   node 1 size: 96766 MB
   node 1 free: 96124 MB
   node 2 cpus: 8 9 10 11
   node 2 size: 96766 MB
   node 2 free: 93911 MB
   node 3 cpus: 24 25 26 27
   node 3 size: 96731 MB
   node 3 free: 96406 MB
   node 4 cpus: 12 13 14 15
   node 4 size: 96766 MB
   node 4 free: 96453 MB
   node 5 cpus: 28 29 30 31
   node 5 size: 96726 MB
   node 5 free: 96387 MB
   node 6 cpus: 4 5 6 7
   node 6 size: 96766 MB
   node 6 free: 96141 MB
   node 7 cpus: 20 21 22 23
   node 7 size: 96766 MB
   node 7 free: 96501 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  11  11  11  11  11  11  11
     1:  11  10  11  11  11  11  11  11
```

(Continued on next page)

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SPECspeed®2017_fp_peak = Not Run

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Platform Notes (Continued)

```
      2:  11  11  10  11  11  11  11  11
      3:  11  11  11  10  11  11  11  11
      4:  11  11  11  11  10  11  11  11
      5:  11  11  11  11  11  10  11  11
      6:  11  11  11  11  11  11  10  11
      7:  11  11  11  11  11  11  11  10

 From /proc/meminfo
    MemTotal:       792171868 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 /sbin/tuned-adm active
     Current active profile: latency-performance

 /sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
    performance

 /usr/bin/lsb_release -d
    Ubuntu 22.04.1 LTS

 From /etc/*release* /etc/*version*
    debian_version: bookworm/sid
    os-release:
       PRETTY_NAME="Ubuntu 22.04.1 LTS"
       NAME="Ubuntu"
       VERSION_ID="22.04"
       VERSION="22.04.1 LTS (Jammy Jellyfish)"
       VERSION_CODENAME=jammy
       ID=ubuntu
       ID_LIKE=debian
       HOME_URL="https://www.ubuntu.com/"

 uname -a:
    Linux amd-sut 5.15.0-46-generic #49-Ubuntu SMP Thu Aug 4 18:03:25 UTC 2022 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
 mmio_stale_data:                           Not affected
 retbleed:                                  Not affected
 CVE-2018-3639 (Speculative Store Bypass):  Mitigation: Speculative Store
                                            Bypass disabled via prctl and
```

(Continued on next page)

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Platform Notes (Continued)

```
                                            seccomp
CVE-2017-5753 (Spectre variant 1):          Mitigation: usercopy/swapgs
                                            barriers and __user pointer
                                            sanitization
CVE-2017-5715 (Spectre variant 2):          Mitigation: Retpolines, 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 Jan 14 22:00

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.8-aocc400-B1b
   Filesystem     Type    Size  Used Avail Use% Mounted on
   tmpfs          tmpfs   125G  3.4G  122G   3% /mnt/ramdisk

From /sys/devices/virtual/dmi/id
   Vendor:          Dell Inc.
   Product:         PowerEdge R6615
   Product Family:  PowerEdge
   Serial:          GLM4018

Additional information from dmidecode 3.3 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:
    12x 802C0000802C MTC40F2046S1RC48BA1 64 GB 2 rank 4800

BIOS:
   BIOS Vendor:        Dell Inc.
   BIOS Version:       1.1.0
   BIOS Date:          11/25/2022
   BIOS Revision:      1.1

(End of data from sysinfo program)
```

Compiler Version Notes

```
================================================================================
C                  | 619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
--------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
```

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Dell Inc.

PowerEdge R6615 (AMD EPYC 9354 32-Core Processor)

$SPECspeed®2017\_fp\_base =$ 228

$SPECspeed®2017\_fp\_peak = Not Run$

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Compiler Version Notes (Continued)

```
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------


==============================================================================
C++, C, Fortran | 607.cactuBSSN_s(base)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------


==============================================================================
Fortran          | 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------


==============================================================================
Fortran, C       | 621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------
```

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CPU2017 License: 6573
Test Sponsor: Dell Inc.
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Test Date: Jan-2023
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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
```

Base Optimization Flags

C benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

Fortran benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
```

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Dell Inc.

PowerEdge R6615 (AMD EPYC 9354 32-Core Processor)

SPECspeed®2017_fp_base =   228

SPECspeed®2017_fp_peak = Not Run

CPU2017 License: 6573
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Jan-2023
Hardware Availability: Feb-2023
Software Availability: Nov-2022

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-mllvm -reduce-array-computations=3 -zopt -fopenmp=libomp -lomp
-lamdlibm -lamdalloc -lflang
```

Benchmarks using both Fortran and C:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

Benchmarks using Fortran, C, and C++:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

Base Other Flags

C benchmarks:
```
-Wno-return-type -Wno-unused-command-line-argument
```

Fortran benchmarks:
```
-Wno-unused-command-line-argument
```

Benchmarks using both Fortran and C:
```
-Wno-return-type -Wno-unused-command-line-argument
```

Benchmarks using Fortran, C, and C++:
```
-Wno-return-type -Wno-unused-command-line-argument
```

SPEC CPU®2017 Floating Point Speed Result
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Dell Inc.

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CPU2017 License: 6573		**Test Date:**	Jan-2023
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The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2017/flags/aocc400-flags.html
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.0.html

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

http://www.spec.org/cpu2017/flags/aocc400-flags.xml
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-AMD-EPYC-v1.0.xml

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