SPEC CPU®2017 Floating Point Speed Result

Dell Inc.

PowerEdge R6625 (AMD EPYC 9474F 48-Core Processor)

$SPECspeed^{®}2017\_fp\_base = 383$

$SPECspeed^{®}2017_fp_peak = $ Not Run

Threads		Result
603.bwaves_s	96	1510
607.cactuBSSN_s	96	603
619.lbm_s	96	254
621.wrf_s	96	205
627.cam4_s	96	265
628.pop2_s	96	83.6
638.imagick_s	96	597
644.nab_s	96	819
649.fotonik3d_s	96	212
654.roms_s	96	619

SPECspeed®2017_fp_base (383)

Hardware

CPU Name: AMD EPYC 9474F
 Max MHz: 4100
 Nominal: 3600
Enabled: 96 cores, 2 chips
Orderable: 1,2 chips
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 / 6 cores
 Other: None
Memory: 1536 GB (24 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.

Standard Performance Evaluation Corporation (info@spec.org)
https://www.spec.org/

SPEC CPU®2017 Floating Point Speed Result
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Dell Inc.

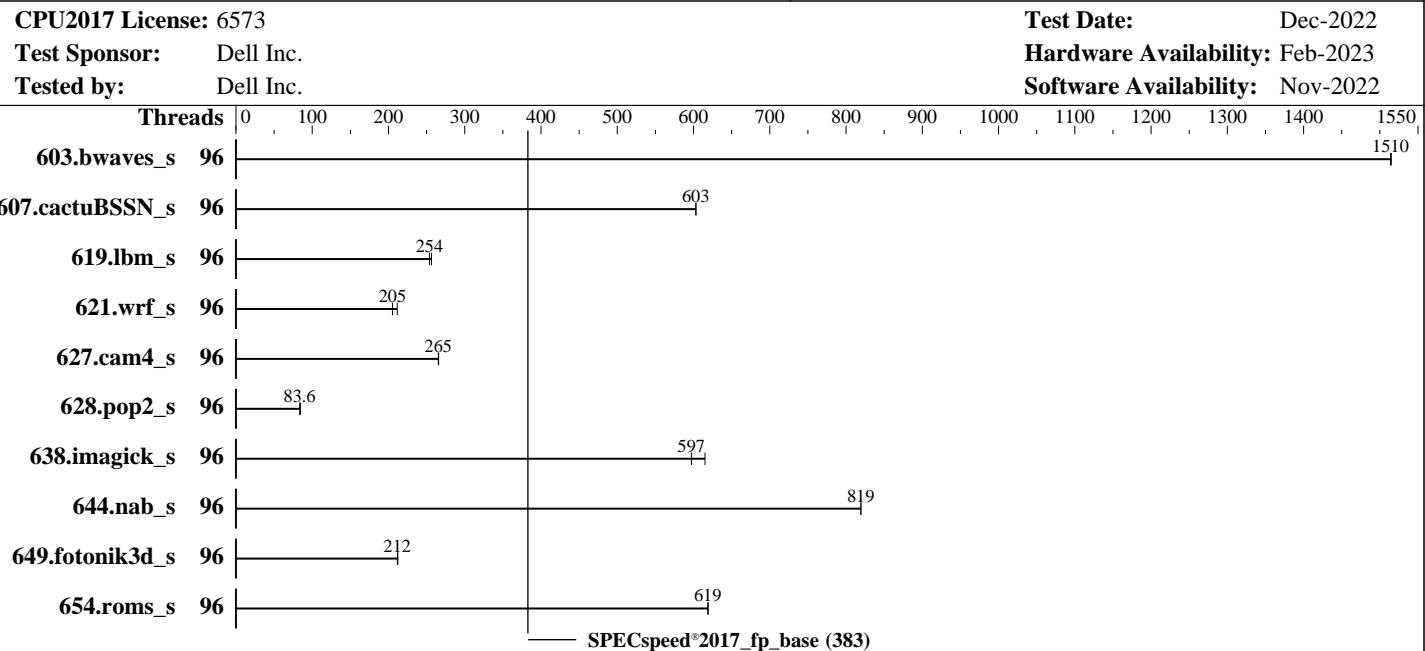PowerEdge R6625 (AMD EPYC 9474F 48-Core Processor)

SPECspeed®2017_fp_base =	383
SPECspeed®2017_fp_peak =	Not Run

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

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

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	96	38.9	1510	**39.0**	**1510**									
607.cactuBSSN_s	96	27.6	603	**27.6**	**603**									
619.lbm_s	96	**20.6**	**254**	20.4	256									
621.wrf_s	96	62.5	212	**64.4**	**205**									
627.cam4_s	96	33.3	266	**33.4**	**265**									
628.pop2_s	96	141	84.4	**142**	**83.6**									
638.imagick_s	96	**24.2**	**597**	23.5	615									
644.nab_s	96	**21.3**	**819**	21.3	820									
649.fotonik3d_s	96	42.9	212	**43.1**	**212**									
654.roms_s	96	**25.4**	**619**	25.4	619									
SPECspeed®2017_fp_base =			383											
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.
```

(Continued on next page)

Dell Inc.

PowerEdge R6625 (AMD EPYC 9474F 48-Core Processor)

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CPU2017 License: 6573		**Test Date:** Dec-2022
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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 = "0-95"
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 = "96"

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"

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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 genoa-sut Fri Dec  9 18:44:02 2022

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 9474F 48-Core Processor
      2  "physical id"s (chips)
     96 "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 : 48
      siblings  : 48
      physical 0: cores 0 1 2 3 4 5 16 17 18 19 20 21 32 33 34 35 36 37 48 49 50 51 52 53
        64 65 66 67 68 69 80 81 82 83 84 85 96 97 98 99 100 101 112 113 114 115 116 117
      physical 1: cores 0 1 2 3 4 5 16 17 18 19 20 21 32 33 34 35 36 37 48 49 50 51 52 53
        64 65 66 67 68 69 80 81 82 83 84 85 96 97 98 99 100 101 112 113 114 115 116 117

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):                    96
      On-line CPU(s) list:       0-95
      Vendor ID:                 AuthenticAMD
```

(Continued on next page)

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Platform Notes (Continued)

```
Model name:                  AMD EPYC 9474F 48-Core Processor
CPU family:                  25
Model:                       17
Thread(s) per core:          1
Core(s) per socket:          48
Socket(s):                   2
Stepping:                    1
Frequency boost:             enabled
CPU max MHz:                 4114.0000
CPU min MHz:                 400.0000
BogoMIPS:                    7202.20
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:                   3 MiB (96 instances)
L1i cache:                   3 MiB (96 instances)
L2 cache:                    96 MiB (96 instances)
L3 cache:                    512 MiB (16 instances)
NUMA node(s):                16
NUMA node0 CPU(s):           0-5
NUMA node1 CPU(s):           24-29
NUMA node2 CPU(s):           12-17
NUMA node3 CPU(s):           36-41
NUMA node4 CPU(s):           18-23
NUMA node5 CPU(s):           42-47
NUMA node6 CPU(s):           6-11
NUMA node7 CPU(s):           30-35
NUMA node8 CPU(s):           48-53
NUMA node9 CPU(s):           72-77
NUMA node10 CPU(s):          60-65
NUMA node11 CPU(s):          84-89
NUMA node12 CPU(s):          66-71
NUMA node13 CPU(s):          90-95
NUMA node14 CPU(s):          54-59
```

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Platform Notes (Continued)

```
        NUMA node15 CPU(s):            78-83
        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
        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       3M    8 Data           1    64        1             64
        L1i       32K       3M    8 Instruction    1    64        1             64
        L2         1M      96M    8 Unified        2  2048        1             64
        L3        32M     512M   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: 16 nodes (0-15)
    node 0 cpus: 0 1 2 3 4 5
    node 0 size: 96312 MB
    node 0 free: 96009 MB
    node 1 cpus: 24 25 26 27 28 29
    node 1 size: 96766 MB
    node 1 free: 96493 MB
    node 2 cpus: 12 13 14 15 16 17
    node 2 size: 96766 MB
    node 2 free: 95873 MB
    node 3 cpus: 36 37 38 39 40 41
    node 3 size: 96766 MB
    node 3 free: 96059 MB
    node 4 cpus: 18 19 20 21 22 23
    node 4 size: 96730 MB
    node 4 free: 94538 MB
    node 5 cpus: 42 43 44 45 46 47
    node 5 size: 96746 MB
    node 5 free: 95265 MB
```

(Continued on next page)

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Platform Notes (Continued)

```
node 6 cpus: 6 7 8 9 10 11
node 6 size: 96766 MB
node 6 free: 96453 MB
node 7 cpus: 30 31 32 33 34 35
node 7 size: 96766 MB
node 7 free: 95819 MB
node 8 cpus: 48 49 50 51 52 53
node 8 size: 96766 MB
node 8 free: 96567 MB
node 9 cpus: 72 73 74 75 76 77
node 9 size: 96766 MB
node 9 free: 96611 MB
node 10 cpus: 60 61 62 63 64 65
node 10 size: 96766 MB
node 10 free: 96594 MB
node 11 cpus: 84 85 86 87 88 89
node 11 size: 96766 MB
node 11 free: 96619 MB
node 12 cpus: 66 67 68 69 70 71
node 12 size: 96766 MB
node 12 free: 96574 MB
node 13 cpus: 90 91 92 93 94 95
node 13 size: 96736 MB
node 13 free: 96554 MB
node 14 cpus: 54 55 56 57 58 59
node 14 size: 96766 MB
node 14 free: 96581 MB
node 15 cpus: 78 79 80 81 82 83
node 15 size: 96766 MB
node 15 free: 96573 MB
node distances:
node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
  0:  10  11  11  11  11  11  11  11  32  32  32  32  32  32  32  32
  1:  11  10  11  11  11  11  11  11  32  32  32  32  32  32  32  32
  2:  11  11  10  11  11  11  11  11  32  32  32  32  32  32  32  32
  3:  11  11  11  10  11  11  11  11  32  32  32  32  32  32  32  32
  4:  11  11  11  11  10  11  11  11  32  32  32  32  32  32  32  32
  5:  11  11  11  11  11  10  11  11  32  32  32  32  32  32  32  32
  6:  11  11  11  11  11  11  10  11  32  32  32  32  32  32  32  32
  7:  11  11  11  11  11  11  11  10  32  32  32  32  32  32  32  32
  8:  32  32  32  32  32  32  32  32  10  11  11  11  11  11  11  11
  9:  32  32  32  32  32  32  32  32  11  10  11  11  11  11  11  11
 10:  32  32  32  32  32  32  32  32  11  11  10  11  11  11  11  11
 11:  32  32  32  32  32  32  32  32  11  11  11  10  11  11  11  11
 12:  32  32  32  32  32  32  32  32  11  11  11  11  10  11  11  11
 13:  32  32  32  32  32  32  32  32  11  11  11  11  11  10  11  11
 14:  32  32  32  32  32  32  32  32  11  11  11  11  11  11  10  11
```

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Platform Notes (Continued)

```
     15: 32 32 32 32 32 32 32 32 11 11 11 11 11 11 11 10


 From /proc/meminfo
    MemTotal:        1584868556 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 genoa-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
                                              seccomp
 CVE-2017-5753 (Spectre variant 1):           Mitigation: usercopy/swapgs
                                              barriers and __user pointer
                                              sanitization
 CVE-2017-5715 (Spectre variant 2):           Mitigation: Retpolines, IBPB:
```

(Continued on next page)

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Platform Notes (Continued)

```
                                        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 Dec 9 17:36

 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 R6625
    Product Family: PowerEdge
    Serial:         BGP4016

 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:
     24x 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
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
--------------------------------------------------------------------------------


================================================================================
C++, C, Fortran | 607.cactuBSSN_s(base)
```

(Continued on next page)

Dell Inc.

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Compiler Version Notes (Continued)

```
--------------------------------------------------------------------------
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
--------------------------------------------------------------------------
```

SPEC CPU®2017 Floating Point Speed Result

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Dell Inc.

PowerEdge R6625 (AMD EPYC 9474F 48-Core Processor)

SPECspeed®2017_fp_base =   383

SPECspeed®2017_fp_peak = Not Run

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

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

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`

(Continued on next page)

Dell Inc.

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$SPECspeed®2017\_fp\_base =$ 383

$SPECspeed®2017\_fp\_peak =$ Not Run

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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
```

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SPECspeed®2017_fp_base = 383

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

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

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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