SPEC CPU®2017 Floating Point Speed Result

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Cisco Systems

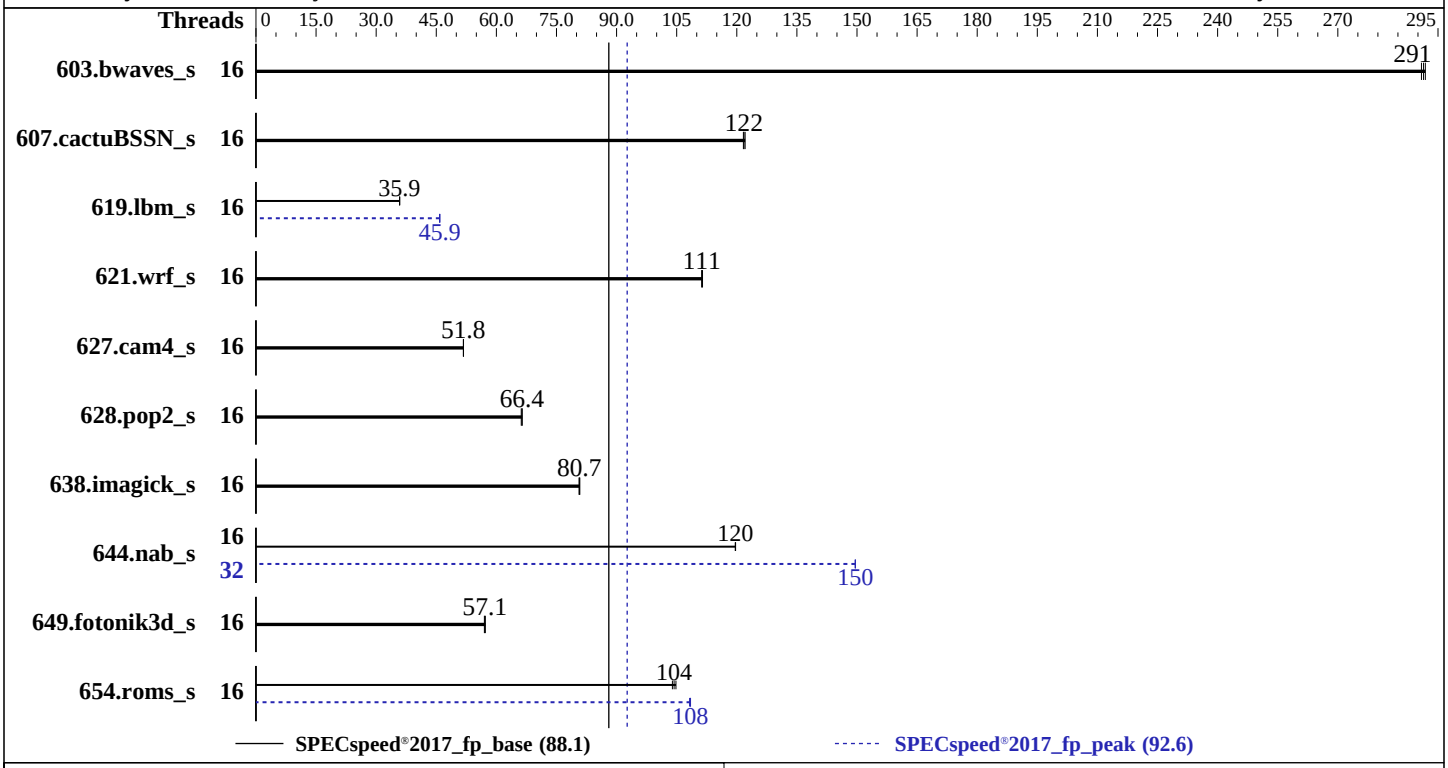
Cisco UCS C225 M6 (AMD EPYC 7302 16-Core)

SPECspeed®2017_fp_base = 88.1

SPECspeed®2017_fp_peak = 92.6

CPU2017 License: 9019
Test Sponsor: Cisco Systems
Tested by: Cisco Systems

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



Hardware

CPU Name:	AMD EPYC 7302
Max MHz:	3300
Nominal:	3000
Enabled:	16 cores, 1 chip, 2 threads/core
Orderable:	1 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, 16 MB shared / 2 cores
Other:	None
Memory:	1 TB (8 x 128 GB 4Rx4 PC4-3200V-L)
Storage:	1 x 960 GB M.2 SSD SATA
Other:	None

Software

OS:	SUSE Linux Enterprise Server 15 SP3 (x86_64) 5.3.18-57-default
Compiler:	C/C++/Fortran: Version 3.0.0 of AOCC
Parallel:	Yes
Firmware:	Version 4.2.1c released Aug-2021
File System:	xfs
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

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	16	202	292	**202**	**291**	203	291	16	202	292	**202**	**291**	203	291
607.cactuBSSN_s	16	137	122	**137**	**122**	137	122	16	137	122	**137**	**122**	137	122
619.lbm_s	16	146	35.9	**146**	**35.9**	146	35.8	16	**114**	**45.9**	114	45.8	114	45.9
621.wrf_s	16	**119**	**111**	119	111	119	111	16	**119**	**111**	119	111	119	111
627.cam4_s	16	171	51.8	171	51.8	**171**	**51.8**	16	171	51.8	171	51.8	**171**	**51.8**
628.pop2_s	16	**179**	**66.4**	179	66.4	179	66.2	16	**179**	**66.4**	179	66.4	179	66.2
638.imagick_s	16	**179**	**80.7**	178	80.8	179	80.6	16	**179**	**80.7**	178	80.8	179	80.6
644.nab_s	16	146	120	**146**	**120**	146	120	32	**117**	**150**	117	150	117	150
649.fotonik3d_s	16	159	57.2	160	57.0	**160**	**57.1**	16	159	57.2	160	57.0	**160**	**57.1**
654.roms_s	16	150	105	**151**	**104**	151	104	16	145	108	**145**	**108**	145	108

SPECspeed®2017_fp_base = 88.1

SPECspeed®2017_fp_peak = 92.6

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.

To enable Transparent Hugepages (THP) for all allocations,
```

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Operating System Notes (Continued)

'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /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 =
     "/home/cpu2017/amd_speed_aocc300_milan_B_lib/lib;/home/cpu2017/amd_speed
     _aocc300_milan_B_lib/lib32:"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "592M"
OMP_THREAD_LIMIT = "32"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0-15"

Environment variables set by runcpu during the 644.nab_s peak run:
GOMP_CPU_AFFINITY = "0 16 1 17 2 18 3 19 4 20 5 21 6 22 7 23 8 24 9 25 10 26
     11 27 12 28 13 29 14 30 15 31"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-15"
```

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
```

Platform Notes

```
SMT Mode set to Auto
NUMA nodes per socket set to NPS1
ACPI SRAT L3 Cache As NUMA Domain set to Enabled
DRAM Scrub Time set to Disabled
Determinism Slider set to Power
L1 Stream HW Prefetcher set to Enabled
APBDIS set to 1

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on localhost Sun Dec 12 21:28:39 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 7302 16-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 : 16
      siblings  : 32
      physical 0: cores 0 1 4 5 8 9 12 13 16 17 20 21 24 25 28 29

From lscpu from util-linux 2.36.2:
     Architecture:                    x86_64
     CPU op-mode(s):                  32-bit, 64-bit
     Byte Order:                      Little Endian
     Address sizes:                   43 bits physical, 48 bits virtual
     CPU(s):                          32
     On-line CPU(s) list:             0-31
     Thread(s) per core:              2
     Core(s) per socket:              16
     Socket(s):                       1
     NUMA node(s):                    8
     Vendor ID:                       AuthenticAMD
     CPU family:                      23
     Model:                           49
     Model name:                      AMD EPYC 7302 16-Core Processor
     Stepping:                        0
     Frequency boost:                 enabled
     CPU MHz:                         1709.671
     CPU max MHz:                     3000.0000
     CPU min MHz:                     1500.0000
     BogoMIPS:                        5988.90
```

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Platform Notes (Continued)

```
      Virtualization:                  AMD-V
      L1d cache:                       512 KiB
      L1i cache:                       512 KiB
      L2 cache:                        8 MiB
      L3 cache:                        128 MiB
      NUMA node0 CPU(s):               0,1,16,17
      NUMA node1 CPU(s):               2,3,18,19
      NUMA node2 CPU(s):               4,5,20,21
      NUMA node3 CPU(s):               6,7,22,23
      NUMA node4 CPU(s):               8,9,24,25
      NUMA node5 CPU(s):               10,11,26,27
      NUMA node6 CPU(s):               12,13,28,29
      NUMA node7 CPU(s):               14,15,30,31
      Vulnerability Itlb multihit:     Not affected
      Vulnerability L1tf:              Not affected
      Vulnerability Mds:               Not affected
      Vulnerability Meltdown:          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; Full AMD retpoline, IBPB conditional,
      IBRS_FW, STIBP conditional, RSB filling
      Vulnerability Srbds:             Not affected
      Vulnerability Tsx async abort:   Not affected
      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 pni pclmulqdq monitor ssse3 fma cx16 sse4_1 sse4_2 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 hw_pstate sme ssbd mba sev ibrs ibpb stibp
      vmmcall sev_es fsgsbase bmi1 avx2 smep bmi2 cqm rdt_a rdseed adx smap clflushopt
      clwb sha_ni xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
      cqm_mbm_local clzero irperf xsaveerptr wbnoinvd arat npt lbrv svm_lock nrip_save
      tsc_scale vmcb_clean flushbyasid decodeassists pausefilter pfthreshold avic
      v_vmsave_vmload vgif umip rdpid overflow_recov succor smca

  From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL  SETS PHY-LINE COHERENCY-SIZE
      L1d       32K     512K    8 Data            1    64        1             64
      L1i       32K     512K    8 Instruction     1    64        1             64
      L2       512K       8M    8 Unified         2  1024        1             64
      L3        16M     128M   16 Unified         3 16384        1             64

  /proc/cpuinfo cache data
     cache size : 512 KB
```

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Platform Notes (Continued)

```
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 16 17
  node 0 size: 128839 MB
  node 0 free: 128592 MB
  node 1 cpus: 2 3 18 19
  node 1 size: 129022 MB
  node 1 free: 128895 MB
  node 2 cpus: 4 5 20 21
  node 2 size: 128988 MB
  node 2 free: 128838 MB
  node 3 cpus: 6 7 22 23
  node 3 size: 129022 MB
  node 3 free: 128912 MB
  node 4 cpus: 8 9 24 25
  node 4 size: 129022 MB
  node 4 free: 128801 MB
  node 5 cpus: 10 11 26 27
  node 5 size: 129022 MB
  node 5 free: 128919 MB
  node 6 cpus: 12 13 28 29
  node 6 size: 129022 MB
  node 6 free: 128868 MB
  node 7 cpus: 14 15 30 31
  node 7 size: 116912 MB
  node 7 free: 116748 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
    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:       1044330328 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

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


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Platform Notes (Continued)

```
From /etc/*release* /etc/*version*
   os-release:
      NAME="SLES"
      VERSION="15-SP3"
      VERSION_ID="15.3"
      PRETTY_NAME="SUSE Linux Enterprise Server 15 SP3"
      ID="sles"
      ID_LIKE="suse"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:15:sp3"

uname -a:
   Linux localhost 5.3.18-57-default #1 SMP Wed Apr 28 10:54:41 UTC 2021 (ba3c2e9) x86_64
   x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit):                          Not affected
CVE-2018-3620 (L1 Terminal Fault):                       Not affected
Microarchitectural Data Sampling:                        Not affected
CVE-2017-5754 (Meltdown):                                Not affected
CVE-2018-3639 (Speculative Store Bypass):                Mitigation: Speculative Store
                                                         Bypass disabled via prctl and
                                                         seccomp
CVE-2017-5753 (Spectre variant 1):                       Mitigation: usercopy/swapgs
                                                         barriers and __user pointer
                                                         sanitization
CVE-2017-5715 (Spectre variant 2):                       Mitigation: Full AMD retpoline,
                                                       IBPB: conditional, IBRS_FW, STIBP:
                                                         conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort):                 Not affected

run-level 3 Dec 12 10:20

SPEC is set to: /home/cpu2017
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda3      xfs   557G   12G  546G   2% /

From /sys/devices/virtual/dmi/id
    Vendor:         Cisco Systems Inc
    Product:        To

Additional information from dmidecode 3.2 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.
```

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Platform Notes (Continued)

```
   Memory:
     8x 0xCE00 M386AAG40AM3-CWE 128 GB 4 rank 3200

 BIOS:
    BIOS Vendor:       Cisco Systems Inc
    BIOS Version:      C225M6.4.2.1c.0.0806211349
    BIOS Date:         08/06/2021
    BIOS Revision:     5.14

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C               | 619.lbm_s(base, peak) 638.imagick_s(base, peak)
                | 644.nab_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
  LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
------------------------------------------------------------------------------

==============================================================================
C++, C, Fortran | 607.cactuBSSN_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
  LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
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         | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)
```

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Compiler Version Notes (Continued)

```
                | 654.roms_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
  LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
------------------------------------------------------------------------------

==============================================================================
Fortran, C      | 621.wrf_s(base, peak) 627.cam4_s(base, peak)
                | 628.pop2_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
  LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
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`

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Base Portability Flags (Continued)

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 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-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

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):
-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
-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
-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,1,0x1 -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

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

619.lbm_s: -m64 -mno-adx -mno-sse4a
-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 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

638.imagick_s: basepeak = yes

644.nab_s: -m64 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize -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

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Peak Optimization Flags (Continued)

644.nab_s (continued):
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

Fortran benchmarks:

603.bwaves_s: basepeak = yes

649.fotonik3d_s: basepeak = yes

654.roms_s: -m64 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-enable-X86-prefetching
-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 -Mrecursive
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true -mllvm -enable-licm-vrp
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
-ljemalloc -lflang

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++:

607.cactuBSSN_s: basepeak = yes

Peak Other Flags

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

Fortran benchmarks:
-Wno-unused-command-line-argument -Wno-return-type

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

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Peak Other Flags (Continued)

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
`http://www.spec.org/cpu2017/flags/aocc300-flags-B2.html`
`http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-AMD-v2-revC.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/aocc300-flags-B2.xml`
`http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-AMD-v2-revC.xml`

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

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