



SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Cisco Systems

Cisco UCS C225 M6 (AMD EPYC 7663 56-Core Processor)

SPECspeed®2017_fp_base = 246

SPECspeed®2017_fp_peak = 253

CPU2017 License: 9019

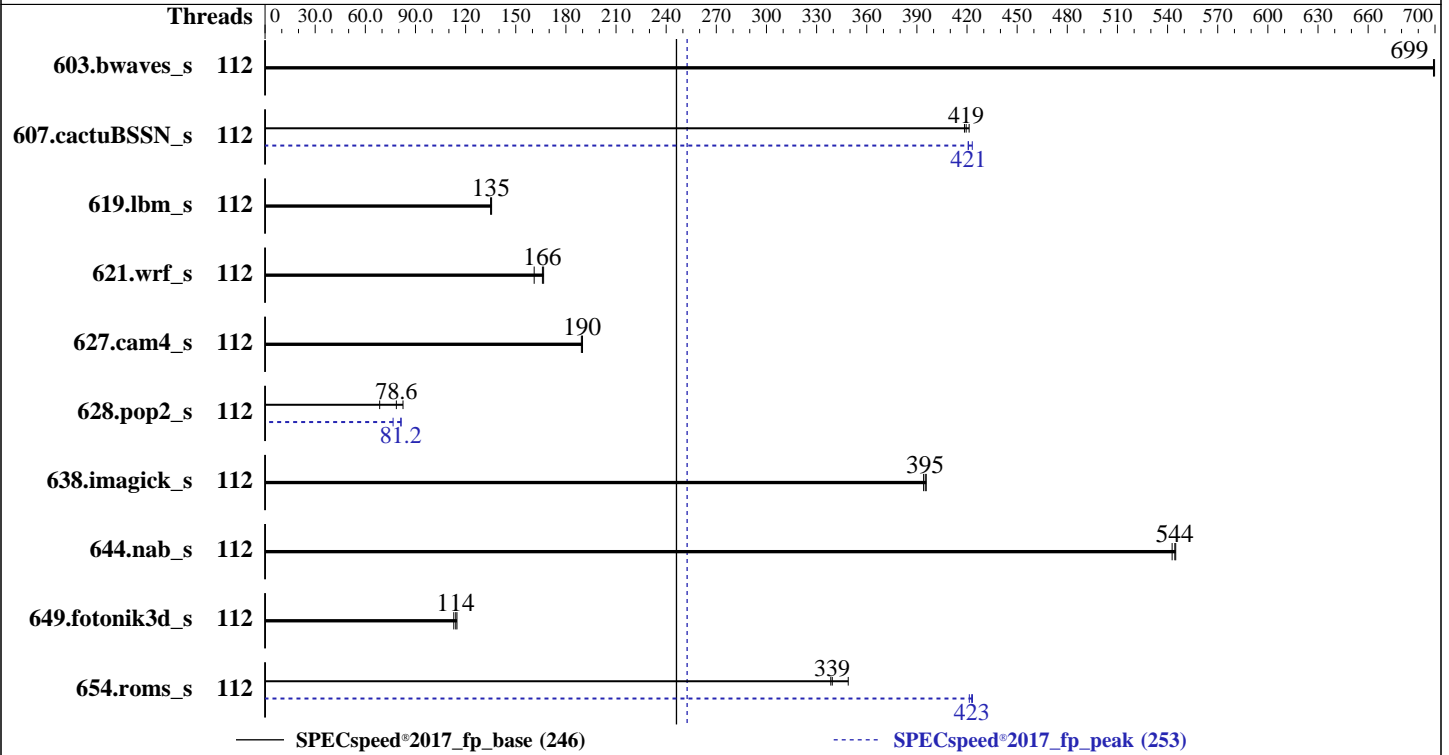
Test Sponsor: Cisco Systems

Tested by: Cisco Systems

Test Date: Sep-2021

Hardware Availability: Jun-2021

Software Availability: Jun-2021



Hardware

CPU Name: AMD EPYC 7663
 Max MHz: 3500
 Nominal: 2000
 Enabled: 112 cores, 2 chips
 Orderable: 1,2 chips
 Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 512 KB I+D on chip per core
 L3: 256 MB I+D on chip per chip,
 32 MB shared / 7 cores
 Other: None
 Memory: 2 TB (16 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)
 kernel version 5.3.18-57-default
 Compiler: C/C++/Fortran: Version 3.0.0 of AOCC
 Parallel: Yes
 Firmware: Version C225M6.4.2.1c released Sep-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



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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	112	84.4	699	84.3	700	84.4	699	112	84.4	699	84.3	700	84.4	699
607.cactuBSSN_s	112	39.7	419	39.8	418	39.6	421	112	39.4	423	39.6	421	39.6	421
619.lbm_s	112	38.8	135	38.7	135	38.6	136	112	38.8	135	38.7	135	38.6	136
621.wrf_s	112	79.7	166	79.4	167	82.1	161	112	79.7	166	79.4	167	82.1	161
627.cam4_s	112	46.7	190	46.7	190	46.8	189	112	46.7	190	46.7	190	46.8	189
628.pop2_s	112	151	78.6	173	68.6	144	82.5	112	146	81.4	146	81.2	155	76.6
638.imagick_s	112	36.6	394	36.5	396	36.5	395	112	36.6	394	36.5	396	36.5	395
644.nab_s	112	32.2	543	32.1	544	32.1	545	112	32.2	543	32.1	544	32.1	545
649.fotonik3d_s	112	80.7	113	79.4	115	79.9	114	112	80.7	113	79.4	115	79.9	114
654.roms_s	112	46.4	339	45.1	349	46.5	338	112	37.2	423	37.4	421	37.2	423

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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.
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root for peak
```

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Operating System Notes (Continued)

integer runs and all FP runs to enable Transparent Hugepages (THP).
'cpupower frequency-set -g performance' run as root to set the scaling governor to performance.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-111"
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 = "16G"
OMP_THREAD_LIMIT = "112"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-111"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-111"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-111"

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>



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Platform Notes

BIOS Configuration

SMT Mode set to Disabled
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 Sat Sep 25 22:16:30 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 7663 56-Core Processor
 2 "physical id"s (chips)
112 "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 : 56
siblings : 56
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30 32 33 34 35 36 37 38 40 41 42 43 44 45 46 48 49 50 51 52 53 54 56 57 58 59
60 61 62
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30 32 33 34 35 36 37 38 40 41 42 43 44 45 46 48 49 50 51 52 53 54 56 57 58 59
60 61 62
```

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: 48 bits physical, 48 bits virtual
CPU(s): 112
On-line CPU(s) list: 0-111
Thread(s) per core: 1
Core(s) per socket: 56
Socket(s): 2
NUMA node(s): 16
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 7663 56-Core Processor
```

(Continued on next page)



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Platform Notes (Continued)

```

Stepping: 1
Frequency boost: enabled
CPU MHz: 1807.896
CPU max MHz: 2000.0000
CPU min MHz: 1500.0000
BogoMIPS: 3992.59
Virtualization: AMD-V
L1d cache: 3.5 MiB
L1i cache: 3.5 MiB
L2 cache: 56 MiB
L3 cache: 512 MiB
NUMA node0 CPU(s): 0-6
NUMA node1 CPU(s): 7-13
NUMA node2 CPU(s): 14-20
NUMA node3 CPU(s): 21-27
NUMA node4 CPU(s): 28-34
NUMA node5 CPU(s): 35-41
NUMA node6 CPU(s): 42-48
NUMA node7 CPU(s): 49-55
NUMA node8 CPU(s): 56-62
NUMA node9 CPU(s): 63-69
NUMA node10 CPU(s): 70-76
NUMA node11 CPU(s): 77-83
NUMA node12 CPU(s): 84-90
NUMA node13 CPU(s): 91-97
NUMA node14 CPU(s): 98-104
NUMA node15 CPU(s): 105-111
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 disabled, 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
aperfmpperf pni pclmulqdq monitor ssse3 fma cx16 pcid 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
bpxt 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 rdseed adx

```

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Platform Notes (Continued)

smap clflushopt clwb sha_ni xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local clzero irperf xsaveerptr wbnoinvd amd_ppin arat npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter pfthreshold v_vmsave_vmload vgif umip pku ospke vaes vpclmulqdq rdpid overflow_recov succor smca fsrm

From lscpu --cache:

NAME	ONE-SIZE	ALL-SIZE	WAYS	TYPE	LEVEL	SETS	PHY-LINE	COHERENCY-SIZE
L1d	32K	3.5M	8	Data	1	64	1	64
L1i	32K	3.5M	8	Instruction	1	64	1	64
L2	512K	56M	8	Unified	2	1024	1	64
L3	32M	512M	16	Unified	3	32768	1	64

/proc/cpuinfo cache data
cache size : 512 KB

From numactl --hardware

WARNING: a numactl 'node' might or might not correspond to a physical chip.

```

available: 16 nodes (0-15)
node 0 cpus: 0 1 2 3 4 5 6
node 0 size: 128836 MB
node 0 free: 128532 MB
node 1 cpus: 7 8 9 10 11 12 13
node 1 size: 129021 MB
node 1 free: 128918 MB
node 2 cpus: 14 15 16 17 18 19 20
node 2 size: 128988 MB
node 2 free: 128891 MB
node 3 cpus: 21 22 23 24 25 26 27
node 3 size: 129021 MB
node 3 free: 128936 MB
node 4 cpus: 28 29 30 31 32 33 34
node 4 size: 129021 MB
node 4 free: 128622 MB
node 5 cpus: 35 36 37 38 39 40 41
node 5 size: 129021 MB
node 5 free: 128838 MB
node 6 cpus: 42 43 44 45 46 47 48
node 6 size: 129021 MB
node 6 free: 128902 MB
node 7 cpus: 49 50 51 52 53 54 55
node 7 size: 116909 MB
node 7 free: 116821 MB
node 8 cpus: 56 57 58 59 60 61 62
node 8 size: 129021 MB
node 8 free: 128927 MB
node 9 cpus: 63 64 65 66 67 68 69

```

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Platform Notes (Continued)

```

node 9 size: 129021 MB
node 9 free: 128907 MB
node 10 cpus: 70 71 72 73 74 75 76
node 10 size: 129021 MB
node 10 free: 128927 MB
node 11 cpus: 77 78 79 80 81 82 83
node 11 size: 129021 MB
node 11 free: 128925 MB
node 12 cpus: 84 85 86 87 88 89 90
node 12 size: 129021 MB
node 12 free: 128928 MB
node 13 cpus: 91 92 93 94 95 96 97
node 13 size: 129021 MB
node 13 free: 128927 MB
node 14 cpus: 98 99 100 101 102 103 104
node 14 size: 129021 MB
node 14 free: 128916 MB
node 15 cpus: 105 106 107 108 109 110 111
node 15 size: 129016 MB
node 15 free: 128905 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
15: 32 32 32 32 32 32 32 32 11 11 11 11 11 11 11 10

```

From /proc/meminfo

MemTotal: 2101262076 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:
                                           disabled, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Sep 25 12:24

SPEC is set to: /home/cpu2017
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda3       xfs   557G  11G  546G   2% /

From /sys/devices/virtual/dmi/id
Vendor:         Cisco Systems Inc
Product:        UCSC-C225-M6S
Serial:         WZP252309U3

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

```

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Platform Notes (Continued)

frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

Memory:

16x 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: 5.22

(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
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Compiler Version Notes (Continued)

```

Fortran          | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)
                  | 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
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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

(Continued on next page)



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Base Portability Flags (Continued)

```

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 -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

```

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Cisco Systems

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SPECspeed®2017_fp_base = 246

SPECspeed®2017_fp_peak = 253

CPU2017 License: 9019

Test Sponsor: Cisco Systems

Tested by: Cisco Systems

Test Date: Sep-2021

Hardware Availability: Jun-2021

Software Availability: Jun-2021

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):

```
-fveclib=AMDLIBM -ffast-math -flt0 -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
-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 -flt0 -fstruct-layout=5
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-freemap-arrays -mllvm -function-specialize -flv-function-specialization
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3
-mllvm -enable-partial-unswitch -mllvm -unroll-threshold=100
-finline-aggressive -mllvm -loop-unswitch-threshold=200000
-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
-mllvm -extra-vectorizer-passes -mllvm -convert-pow-exp-to-int=false
-Hz,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
```



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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: 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
-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

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Peak Optimization Flags (Continued)

654.roms_s (continued):

-ljemalloc -lflang

Benchmarks using both Fortran and C:

621.wrf_s: basepeak = yes

627.cam4_s: basepeak = yes

628.pop2_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 -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 -Mrecursive
 -DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
 -ljemalloc -lflang

Benchmarks using Fortran, C, and C++:

-m64 -mno-adx -mno-sse4a -std=c++98
 -Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-enable-licm-vrp
 -Wl,-mllvm -Wl,-function-specialize
 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
 -Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast -march=znver3
 -fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
 -mllvm -unroll-threshold=50 -fremap-arrays -flv-function-specialization
 -mllvm -inline-threshold=1000 -mllvm -enable-gvn-hoist
 -mllvm -global-vectorize-slp=true -mllvm -function-specialize
 -mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3
 -finline-aggressive -mllvm -unroll-threshold=100 -mllvm -reroll-loops
 -mllvm -aggressive-loop-unswitch -Mrecursive -DSPEC_OPENMP -fopenmp
 -fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

Peak Other Flags

C benchmarks:

-Wno-unused-command-line-argument -Wno-return-type

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Peak Other Flags (Continued)

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

<http://www.spec.org/cpu2017/flags/aocc300-flags-B2.html>

<http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-AMD-v2-revD.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-revD.xml>

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