



SPEC® CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate2017_fp_base = 245

PowerEdge R7425 (AMD EPYC 7401, 2.00GHz)

SPECrate2017_fp_peak = 256

CPU2017 License: 55

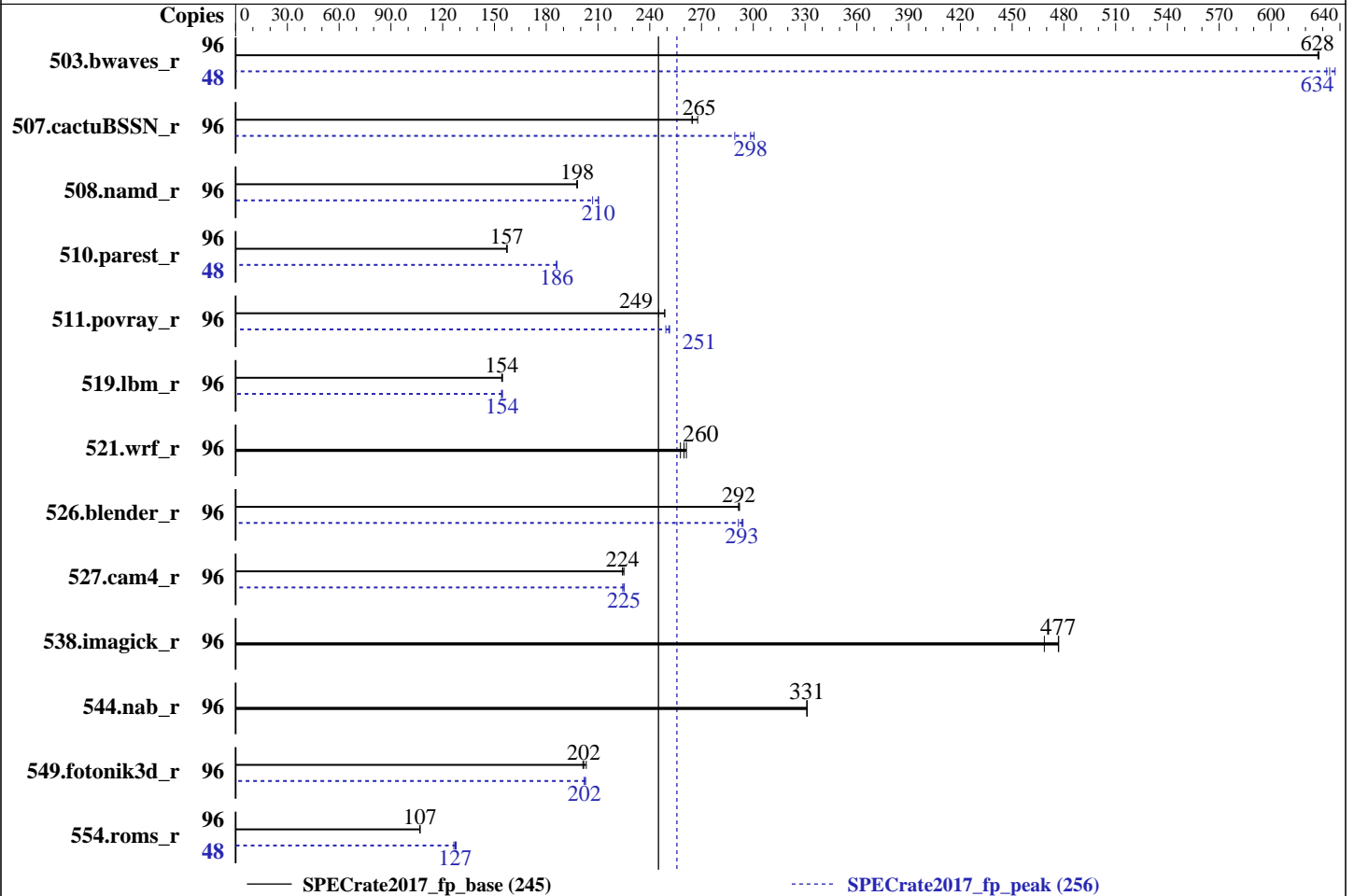
Test Date: Mar-2019

Test Sponsor: Dell Inc.

Hardware Availability: Jan-2019

Tested by: Dell Inc.

Software Availability: Feb-2019



Hardware

CPU Name: AMD EPYC 7401
 Max MHz.: 3000
 Nominal: 2000
 Enabled: 48 cores, 2 chips, 2 threads/core
 Orderable: 1,2 chips
 Cache L1: 64 KB I + 32 KB D on chip per core
 L2: 512 KB I+D on chip per core
 L3: 64 MB I+D on chip per chip, 8 MB shared / 3 cores
 Other: None
 Memory: 1 TB (16 x 64 GB 4Rx4 PC4-2666V-L)
 Storage: 1 x 120 GB SATA SSD
 Other: None

Software

OS: Ubuntu 18.04.2 LTS
 kernel 4.15.0-45-generic
 4.15.0-45-generic
 Compiler: C/C++: Version 1.3.0 of AOCC
 Fortran: Version 4.8.2 of GCC
 Parallel: No
 Firmware: Version 1.7.6 released Jan-2019
 File System: ext4
 System State: Run level 5 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 Other: jemalloc: jemalloc memory allocator library
 V5.1.0



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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	96	1534	628	1535	627	1534	628	48	759	634	761	632	755	637
507.cactuBSSN_r	96	460	264	459	265	454	268	96	407	298	404	300	420	289
508.namd_r	96	460	198	461	198	461	198	96	434	210	434	210	441	207
510.parest_r	96	1597	157	1597	157	1597	157	48	675	186	675	186	675	186
511.povray_r	96	901	249	914	245	901	249	96	899	249	893	251	891	251
519.lbm_r	96	655	154	654	155	656	154	96	654	155	655	154	657	154
521.wrf_r	96	828	260	823	261	834	258	96	828	260	823	261	834	258
526.blender_r	96	502	291	501	292	501	292	96	498	293	497	294	502	291
527.cam4_r	96	746	225	748	224	749	224	96	746	225	749	224	746	225
538.imagick_r	96	501	477	509	469	501	477	96	501	477	509	469	501	477
544.nab_r	96	488	331	488	331	488	331	96	488	331	488	331	488	331
549.fotonik3d_r	96	1859	201	1841	203	1854	202	96	1851	202	1850	202	1845	203
554.roms_r	96	1428	107	1428	107	1428	107	48	599	127	597	128	603	126

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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/>

The AOCC Gold Linker plugin was installed and used for the link stage.

The AOCC Fortran Plugin version 1.3.0 was used to leverage AOCC optimizers with gfortran. It is available here:
<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
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>

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Operating System Notes (Continued)

Set dirty_ratio=8 to limit dirty cache to 8% of memory
Set swappiness=1 to swap only if necessary
Set zone_reclaim_mode=1 to free local node memory and avoid remote memory
sync then drop_caches=3 to reset caches before invoking runcpu

dirty_ratio, swappiness, zone_reclaim_mode and drop_caches were all set using privileged echo (e.g. echo 1 > /proc/sys/vm/swappiness).

Transparent huge pages were enabled for this run (OS default)

General Notes

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH = "/home/cpu2017-1.0.5/amd1812na_rate_revA_lib/64:/home/cpu2017-1.0.5/amd1812na_rate_revA_lib/32:"
```

Binaries were compiled on a system with 2 x AMD EPYC 7601 CPU + 512GB Memory using RHEL 7.6

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.

jemalloc: configured and built with GCC v4.8.5 in RHEL v7.2 under default conditions.
jemalloc: sources available from jemalloc.net or <https://github.com/jemalloc/jemalloc/releases>
jemalloc uses environment variable MALLOC_CONF with values narenas and lg_chunk:
narenas: sets the maximum number of arenas to use for automatic multiplexing of threads and arenas.
lg_chunk: set the virtual memory chunk size (log base 2). For example,
lg_chunk:21 sets the default chunk size to 2²¹ = 2MiB

Platform Notes

BIOS settings:

Determinism Slider set to Power Determinism

Sysinfo program /home/cpu2017-1.0.5/bin/sysinfo

Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9

running on r7425 Wed Mar 13 23:59:36 2019

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Platform Notes (Continued)

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 7401 24-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 : 24

siblings : 48

physical 0: cores 0 1 8 9 10 12 13 14 16 17 18 20 21 22 24 25 26 28 29 30

physical 1: cores 0 1 8 9 10 12 13 14 16 17 18 20 21 22 24 25 26 28 29 30

From lscpu:

Architecture: x86_64

CPU op-mode(s): 32-bit, 64-bit

Byte Order: Little Endian

CPU(s): 96

On-line CPU(s) list: 0-95

Thread(s) per core: 2

Core(s) per socket: 24

Socket(s): 2

NUMA node(s): 8

Vendor ID: AuthenticAMD

CPU family: 23

Model: 1

Model name: AMD EPYC 7401 24-Core Processor

Stepping: 2

CPU MHz: 2596.661

BogoMIPS: 3992.29

Virtualization: AMD-V

L1d cache: 32K

L1i cache: 64K

L2 cache: 512K

L3 cache: 8192K

NUMA node0 CPU(s): 0,8,16,24,32,40,48,56,64,72,80,88

NUMA node1 CPU(s): 2,10,18,26,34,42,50,58,66,74,82,90

NUMA node2 CPU(s): 4,12,20,28,36,44,52,60,68,76,84,92

NUMA node3 CPU(s): 6,14,22,30,38,46,54,62,70,78,86,94

NUMA node4 CPU(s): 1,9,17,25,33,41,49,57,65,73,81,89

NUMA node5 CPU(s): 3,11,19,27,35,43,51,59,67,75,83,91

NUMA node6 CPU(s): 5,13,21,29,37,45,53,61,69,77,85,93

NUMA node7 CPU(s): 7,15,23,31,39,47,55,63,71,79,87,95

Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov

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Platform Notes (Continued)

```

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 amd_dcm aperfmperf pni
pclmulqdq monitor ssse3 fma cxl6 sse4_1 sse4_2 movbe popcnt aes xsave avx f16c
rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch
osvw skinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb
hw_pstate sme ssbd ibpb vmcall fsgsbase bmi1 avx2 smep bmi2 rdseed adx smap
clflushopt sha_ni xsaveopt xsavec xgetbv1 xsaves clzero irperf xsaveerptr arat npt
lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter
pfthreshold avic v_vmsave_vmload vgif overflow_recov succor smca

```

```

/proc/cpuinfo cache data
cache size : 512 KB

```

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

```

available: 8 nodes (0-7)
node 0 cpus: 0 8 16 24 32 40 48 56 64 72 80 88
node 0 size: 128638 MB
node 0 free: 128413 MB
node 1 cpus: 2 10 18 26 34 42 50 58 66 74 82 90
node 1 size: 128999 MB
node 1 free: 128799 MB
node 2 cpus: 4 12 20 28 36 44 52 60 68 76 84 92
node 2 size: 129020 MB
node 2 free: 128835 MB
node 3 cpus: 6 14 22 30 38 46 54 62 70 78 86 94
node 3 size: 129020 MB
node 3 free: 128797 MB
node 4 cpus: 1 9 17 25 33 41 49 57 65 73 81 89
node 4 size: 129020 MB
node 4 free: 128794 MB
node 5 cpus: 3 11 19 27 35 43 51 59 67 75 83 91
node 5 size: 129020 MB
node 5 free: 128787 MB
node 6 cpus: 5 13 21 29 37 45 53 61 69 77 85 93
node 6 size: 129020 MB
node 6 free: 128778 MB
node 7 cpus: 7 15 23 31 39 47 55 63 71 79 87 95
node 7 size: 124986 MB
node 7 free: 124743 MB
node distances:
node  0  1  2  3  4  5  6  7
  0:  10 16 16 16 28 28 22 28
  1:  16 10 16 16 28 28 28 22
  2:  16 16 10 16 22 28 28 28
  3:  16 16 16 10 28 22 28 28
  4:  28 28 22 28 10 16 16 16

```

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Platform Notes (Continued)

```

5:  28  28  28  22  16  10  16  16
6:  22  28  28  28  16  16  10  16
7:  28  22  28  28  16  16  16  10

```

From /proc/meminfo

```

MemTotal:      1052392344 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

/usr/bin/lsb_release -d
Ubuntu 18.04.2 LTS

```

From /etc/*release* /etc/*version*

```

debian_version: buster/sid
os-release:
  NAME="Ubuntu"
  VERSION="18.04.2 LTS (Bionic Beaver)"
  ID=ubuntu
  ID_LIKE=debian
  PRETTY_NAME="Ubuntu 18.04.2 LTS"
  VERSION_ID="18.04"
  HOME_URL="https://www.ubuntu.com/"
  SUPPORT_URL="https://help.ubuntu.com/"

```

uname -a:

```

Linux r7425 4.15.0-45-generic #48-Ubuntu SMP Tue Jan 29 16:28:13 UTC 2019 x86_64
x86_64 x86_64 GNU/Linux

```

Kernel self-reported vulnerability status:

```

CVE-2017-5754 (Meltdown):      Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline, IBPB

```

run-level 5 Mar 13 13:44

SPEC is set to: /home/cpu2017-1.0.5

```

Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2       ext4  109G   19G   85G  19% /

```

Additional information from dmidecode follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS Dell Inc. 1.7.6 01/14/2019

Memory:

16x 80CE863280CE M386A8K40BM2-CTD 64 GB 4 rank 2666

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Platform Notes (Continued)

16x Not Specified Not Specified

(End of data from sysinfo program)

Compiler Version Notes

=====
CC 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)

AOCC.LLVM.1.3.0.B34.2018_10_22 clang version 7.0.0 (CLANG: Jenkins
AOCC_1_3_0_Release-Build#34) (based on LLVM AOCC.LLVM.1.3.0.B34.2018_10_22)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/aoccl.3.0/AOCC-1.3.0-Compiler/bin

=====
CXXC 508.namd_r(base, peak) 510.parest_r(base, peak)

AOCC.LLVM.1.3.0.B34.2018_10_22 clang version 7.0.0 (CLANG: Jenkins
AOCC_1_3_0_Release-Build#34) (based on LLVM AOCC.LLVM.1.3.0.B34.2018_10_22)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/aoccl.3.0/AOCC-1.3.0-Compiler/bin

=====
CC 511.povray_r(base, peak) 526.blender_r(base, peak)

AOCC.LLVM.1.3.0.B34.2018_10_22 clang version 7.0.0 (CLANG: Jenkins
AOCC_1_3_0_Release-Build#34) (based on LLVM AOCC.LLVM.1.3.0.B34.2018_10_22)
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AOCC_1_3_0_Release-Build#34) (based on LLVM AOCC.LLVM.1.3.0.B34.2018_10_22)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/aoccl.3.0/AOCC-1.3.0-Compiler/bin

=====
FC 507.cactuBSSN_r(base, peak)

AOCC.LLVM.1.3.0.B34.2018_10_22 clang version 7.0.0 (CLANG: Jenkins
AOCC_1_3_0_Release-Build#34) (based on LLVM AOCC.LLVM.1.3.0.B34.2018_10_22)

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 Target: x86_64-unknown-linux-gnu
 Thread model: posix
 InstalledDir: /root/work/compilers/aoccl.3.0/AOCC-1.3.0-Compiler/bin
 GNU Fortran (GCC) 4.8.2
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 You may redistribute copies of GNU Fortran
 under the terms of the GNU General Public License.
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=====

FC 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)

GNU Fortran (GCC) 4.8.2
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=====

CC 521.wrf_r(base, peak) 527.cam4_r(base, peak)

GNU Fortran (GCC) 4.8.2
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 You may redistribute copies of GNU Fortran
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 AOCC.LLVM.1.3.0.B34.2018_10_22 clang version 7.0.0 (CLANG: Jenkins
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Base Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

clang gfortran

Benchmarks using both Fortran and C:

clang gfortran

Benchmarks using both C and C++:

clang++ clang

Benchmarks using Fortran, C, and C++:

clang++ clang gfortran

Base Portability Flags

```
503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_CASE_FLAG -fconvert=big-endian -DSPEC_LP64
526.blender_r: -funsigned-char -D__BOOL_DEFINED -DSPEC_LP64
527.cam4_r: -DSPEC_CASE_FLAG -DSPEC_LP64
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64
```

Base Optimization Flags

C benchmarks:

```
-flto -Wl,-plugin-opt=-merge-constant
-Wl,-plugin-opt=-lsr-in-nested-loop
-Wl,-plugin-opt=-enable-vectorize-compares=false -O3 -ffast-math
-march=znver1 -mno-avx2 -fstruct-layout=3 -mllvm -unroll-threshold=50
-fremap-arrays -mllvm -inline-threshold=1000
```

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Base Optimization Flags (Continued)

C benchmarks (continued):

```
-flv-function-specialization -mllvm -enable-gvn-hoist  
-mllvm -function-specialize -z muldefs -lamdlibm -lpthread -ldl  
-ljemalloc
```

C++ benchmarks:

```
-std=c++98 -flto -Wl,-plugin-opt=-merge-constant  
-Wl,-plugin-opt=-lsr-in-nested-loop  
-Wl,-plugin-opt=-enable-vectorize-compares=false -O3 -march=znver1  
-mllvm -unroll-threshold=100 -finline-aggressive -fremap-arrays  
-mllvm -inline-threshold=1000 -mllvm -enable-vectorize-compares=false  
-z muldefs -lpthread -ldl -ljemalloc
```

Fortran benchmarks:

```
-flto -Wl,-plugin-opt=-merge-constant  
-Wl,-plugin-opt=-lsr-in-nested-loop  
-Wl,-plugin-opt=-enable-vectorize-compares=false -O3(gfortran)  
-O3(clang) -mavx -madx -funroll-loops -ffast-math -z muldefs  
-fplugin=dragonegg.so -fplugin-arg-dragonegg-llvm-option=-merge-constant  
-fplugin-arg-dragonegg-llvm-option=-enable-vectorize-compares:false  
-lpthread -ldl -ljemalloc -lgfortran -lamdlibm
```

Benchmarks using both Fortran and C:

```
-flto -Wl,-plugin-opt=-merge-constant  
-Wl,-plugin-opt=-lsr-in-nested-loop  
-Wl,-plugin-opt=-enable-vectorize-compares=false -O3(clang) -ffast-math  
-march=znver1 -mno-avx2 -fstruct-layout=3 -mllvm -unroll-threshold=50  
-fremap-arrays -mllvm -inline-threshold=1000  
-flv-function-specialization -mllvm -enable-gvn-hoist  
-mllvm -function-specialize -O3(gfortran) -mavx -madx -funroll-loops  
-z muldefs -fplugin=dragonegg.so  
-fplugin-arg-dragonegg-llvm-option=-merge-constant  
-fplugin-arg-dragonegg-llvm-option=-enable-vectorize-compares:false  
-lpthread -ldl -ljemalloc -lgfortran -lamdlibm
```

Benchmarks using both C and C++:

```
-std=c++98 -flto -Wl,-plugin-opt=-merge-constant  
-Wl,-plugin-opt=-lsr-in-nested-loop  
-Wl,-plugin-opt=-enable-vectorize-compares=false -O3 -ffast-math  
-march=znver1 -mno-avx2 -fstruct-layout=3 -mllvm -unroll-threshold=50  
-fremap-arrays -mllvm -inline-threshold=1000  
-flv-function-specialization -mllvm -enable-gvn-hoist  
-mllvm -function-specialize -mllvm -unroll-threshold=100  
-finline-aggressive -mllvm -enable-vectorize-compares=false -z muldefs  
-lpthread -ldl -ljemalloc
```

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Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

```

-std=c++98 -flto -Wl,-plugin-opt=-merge-constant
-Wl,-plugin-opt=-lsr-in-nested-loop
-Wl,-plugin-opt=-enable-vectorize-compares=false -O3(clang) -ffast-math
-march=znver1 -mno-avx2 -fstruct-layout=3 -mllvm -unroll-threshold=50
-freemap-arrays -mllvm -inline-threshold=1000
-flv-function-specialization -mllvm -enable-gvn-hoist
-mllvm -function-specialize -mllvm -unroll-threshold=100
-finline-aggressive -mllvm -enable-vectorize-compares=false
-O3(gfortran) -mavx -madox -funroll-loops -z muldefs
-fplugin=dragonegg.so -fplugin-arg-dragonegg-llvm-option=-merge-constant
-fplugin-arg-dragonegg-llvm-option=-enable-vectorize-compares:false
-lpthread -ldl -ljemalloc

```

Peak Compiler Invocation

C benchmarks:

clang

C++ benchmarks:

clang++

Fortran benchmarks:

clang gfortran

Benchmarks using both Fortran and C:

clang gfortran

Benchmarks using both C and C++:

clang++ clang

Benchmarks using Fortran, C, and C++:

clang++ clang gfortran

Peak Portability Flags

Same as Base Portability Flags



SPEC CPU2017 Floating Point Rate Result

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Dell Inc.

SPECrate2017_fp_base = 245

PowerEdge R7425 (AMD EPYC 7401, 2.00GHz)

SPECrate2017_fp_peak = 256

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2019

Hardware Availability: Jan-2019

Software Availability: Feb-2019

Peak Optimization Flags

C benchmarks:

```
519.lbm_r: -flto -Wl,-plugin-opt=-merge-constant
-Wl,-plugin-opt=-lsr-in-nested-loop -Ofast -march=znver1
-fstruct-layout=3 -mllvm -vectorize-memory-aggressively
-mno-avx2 -mllvm -unroll-threshold=100 -fremap-arrays
-mllvm -inline-threshold=1000 -lpthread -ldl -ljemalloc
```

538.imagick_r: basepeak = yes

544.nab_r: basepeak = yes

C++ benchmarks:

```
-std=c++98 -flto -Wl,-plugin-opt=-merge-constant
-Wl,-plugin-opt=-lsr-in-nested-loop -Ofast -march=znver1
-finline-aggressive -mllvm -unroll-threshold=100 -fremap-arrays
-mllvm -inline-threshold=1000 -lpthread -ldl -ljemalloc
```

Fortran benchmarks:

```
-flto -Wl,-plugin-opt=-merge-constant
-Wl,-plugin-opt=-lsr-in-nested-loop -O3(gfortran) -O3(clang) -mavx2
-madx -funroll-loops -ffast-math -fplugin=dragonegg.so
-fplugin-arg-dragonegg-llvm-option=-merge-constant
-fplugin-arg-dragonegg-llvm-option=-inline-threshold:1000 -lpthread
-ldl -ljemalloc -lgfortran -lamdlibm
```

Benchmarks using both Fortran and C:

521.wrf_r: basepeak = yes

```
527.cam4_r: -flto -Wl,-plugin-opt=-merge-constant
-Wl,-plugin-opt=-lsr-in-nested-loop -Ofast -march=znver1
-fstruct-layout=3 -mllvm -vectorize-memory-aggressively
-mno-avx2 -mllvm -unroll-threshold=100 -fremap-arrays
-mllvm -inline-threshold=1000 -O3(gfortran) -O3(clang)
-mavx2 -madx -funroll-loops -ffast-math
-fplugin=dragonegg.so
-fplugin-arg-dragonegg-llvm-option=-merge-constant
-fplugin-arg-dragonegg-llvm-option=-inline-threshold:1000
-lpthread -ldl -ljemalloc -lgfortran -lamdlibm
```

Benchmarks using both C and C++:

```
-std=c++98 -flto -Wl,-plugin-opt=-merge-constant
-Wl,-plugin-opt=-lsr-in-nested-loop -Ofast -march=znver1
-fstruct-layout=3 -mllvm -vectorize-memory-aggressively -mno-avx2
-mllvm -unroll-threshold=100 -fremap-arrays
```

(Continued on next page)



SPEC CPU2017 Floating Point Rate Result

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Peak Optimization Flags (Continued)

Benchmarks using both C and C++ (continued):

```
-mllvm -inline-threshold=1000 -finline-aggressive -lpthread -ldl
-ljemalloc
```

Benchmarks using Fortran, C, and C++:

```
-std=c++98 -flto -Wl,-plugin-opt=-merge-constant
-Wl,-plugin-opt=-lsr-in-nested-loop -Ofast -march=znver1
-fstruct-layout=3 -mllvm -vectorize-memory-aggressively -mno-avx2
-mllvm -unroll-threshold=100 -fremap-arrays
-mllvm -inline-threshold=1000 -finline-aggressive -O3 -mavx2 -madx
-funroll-loops -ffast-math -fplugin=dragonegg.so
-fplugin-arg-dragonegg-llvm-option=-merge-constant
-fplugin-arg-dragonegg-llvm-option=-inline-threshold:1000 -lpthread
-ldl -ljemalloc
```

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/gcc.2018-02-16.html>

<http://www.spec.org/cpu2017/flags/aocc130-flags-revA2.html>

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

<http://www.spec.org/cpu2017/flags/gcc.2018-02-16.xml>

<http://www.spec.org/cpu2017/flags/aocc130-flags-revA2.xml>

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