



# SPEC® CPU2017 Floating Point Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

## Dell Inc.

SPECrate2017\_fp\_base = 259

PowerEdge R7425 (AMD EPYC 7551, 2.00 GHz)

SPECrate2017\_fp\_peak = 268

CPU2017 License: 55

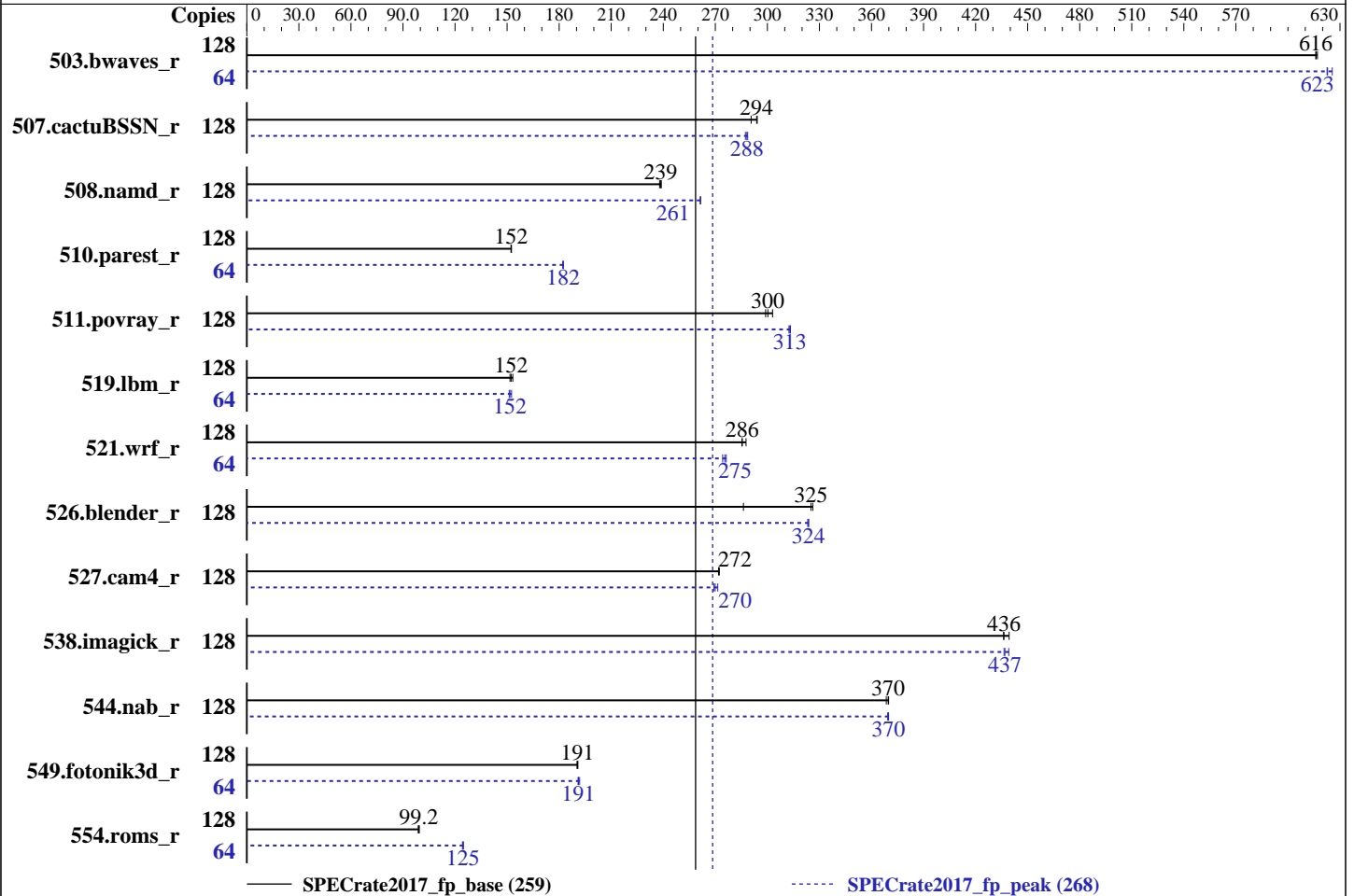
Test Date: Sep-2018

Test Sponsor: Dell Inc.

Hardware Availability: Dec-2018

Tested by: Dell Inc.

Software Availability: Jul-2018



### Hardware

CPU Name: AMD EPYC 7551  
 Max MHz.: 3000  
 Nominal: 2000  
 Enabled: 64 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 / 4 cores  
 Other: None  
 Memory: 1 TB (16 x 64 GB 4DRx4 PC4-2667V-L)

Storage: 1 x 120 GB SATA SSD  
 Other: None

### Software

OS: SUSE Linux Enterprise Server 12 SP3  
 kernel 4.4.138-8

Compiler: C/C++: Version 1.0.0 of AOCC  
 Fortran: Version 4.8.2 of GCC

Parallel: No  
 Firmware: Version 1.6.2 released Sep-2018  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 Other: jemalloc memory allocator library V4.5.0



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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	128	<b><u>2083</u></b>	<b><u>616</u></b>	2083	616	2080	617	64	<b><u>1030</u></b>	<b><u>623</u></b>	1026	626	1031	623
507.cactuBSSN_r	128	<b><u>552</u></b>	<b><u>294</u></b>	558	291	551	294	128	<b><u>562</u></b>	<b><u>288</u></b>	564	287	561	289
508.namd_r	128	511	238	509	239	<b><u>510</u></b>	<b><u>239</u></b>	128	465	261	<b><u>465</u></b>	<b><u>261</u></b>	465	261
510.parest_r	128	2199	152	2195	153	<b><u>2198</u></b>	<b><u>152</u></b>	64	<b><u>918</u></b>	<b><u>182</u></b>	918	182	919	182
511.povray_r	128	1000	299	986	303	<b><u>995</u></b>	<b><u>300</u></b>	128	954	313	<b><u>955</u></b>	<b><u>313</u></b>	957	312
519.lbm_r	128	889	152	880	153	<b><u>886</u></b>	<b><u>152</u></b>	64	<b><u>445</u></b>	<b><u>152</u></b>	442	153	446	151
521.wrf_r	128	1005	285	997	288	<b><u>1004</u></b>	<b><u>286</u></b>	64	<b><u>520</u></b>	<b><u>275</u></b>	523	274	519	276
526.blender_r	128	681	286	<b><u>600</u></b>	<b><u>325</u></b>	598	326	128	<b><u>602</u></b>	<b><u>324</u></b>	602	324	603	323
527.cam4_r	128	824	272	<b><u>823</u></b>	<b><u>272</u></b>	822	272	128	<b><u>829</u></b>	<b><u>270</u></b>	832	269	825	271
538.imagick_r	128	730	436	725	439	<b><u>730</u></b>	<b><u>436</u></b>	128	<b><u>729</u></b>	<b><u>437</u></b>	730	436	725	439
544.nab_r	128	582	370	<b><u>583</u></b>	<b><u>370</u></b>	585	369	128	582	370	583	369	<b><u>583</u></b>	<b><u>370</u></b>
549.fotonik3d_r	128	<b><u>2617</u></b>	<b><u>191</u></b>	2622	190	2615	191	64	1306	191	1300	192	<b><u>1305</u></b>	<b><u>191</u></b>
554.roms_r	128	2059	98.8	<b><u>2051</u></b>	<b><u>99.2</u></b>	2047	99.4	64	815	125	818	124	<b><u>816</u></b>	<b><u>125</u></b>

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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 1.0 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/amd1704-rate-libs-revD/64:/home/cpu2017-1.0.5/amd1704-rate-libs-revD/32:"  
MALLOC_CONF = "lg_chunk:28"
```

Binaries were compiled on a system with 2x AMD EPYC 7601 CPU + 512GB Memory using RHEL 7.4 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  $2^{21} = 2\text{MiB}$ .

## Platform Notes

BIOS settings:  
Memory Interleaving set to Channel Interleaving  
Virtualization Technology disabled  
System Profile set to Custom  
CPU Power Management set to Maximum Performance  
Memory Frequency set to Maximum Performance

(Continued on next page)



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## Platform Notes (Continued)

Turbo Boost enabled  
 C States set to Autonomous  
 Memory Patrol Scrub disabled  
 Memory Refresh Rate set to 1x  
 PCI ASPM L1 Link Power Management disabled  
 Determinism Slider set to Power Determinism  
 Sysinfo program /home/cpu2017-1.0.5/bin/sysinfo  
 Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9  
 running on linux-lz15 Wed Jan 1 00:47:00 2018

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 7551 32-Core Processor  
 2 "physical id"s (chips)  
 128 "processors"  
 cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)  
 cpu cores : 32  
 siblings : 64  
 physical 0: cores 0 1 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31  
 physical 1: cores 0 1 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

From lscpu:  
 Architecture: x86\_64  
 CPU op-mode(s): 32-bit, 64-bit  
 Byte Order: Little Endian  
 CPU(s): 128  
 On-line CPU(s) list: 0-127  
 Thread(s) per core: 2  
 Core(s) per socket: 32  
 Socket(s): 2  
 NUMA node(s): 8  
 Vendor ID: AuthenticAMD  
 CPU family: 23  
 Model: 1  
 Model name: AMD EPYC 7551 32-Core Processor  
 Stepping: 2  
 CPU MHz: 1996.152  
 BogoMIPS: 3992.30  
 Virtualization: AMD-V  
 L1d cache: 32K  
 L1i cache: 64K

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## Platform Notes (Continued)

```

L2 cache:          512K
L3 cache:          8192K
NUMA node0 CPU(s): 0,8,16,24,32,40,48,56,64,72,80,88,96,104,112,120
NUMA node1 CPU(s): 2,10,18,26,34,42,50,58,66,74,82,90,98,106,114,122
NUMA node2 CPU(s): 4,12,20,28,36,44,52,60,68,76,84,92,100,108,116,124
NUMA node3 CPU(s): 6,14,22,30,38,46,54,62,70,78,86,94,102,110,118,126
NUMA node4 CPU(s): 1,9,17,25,33,41,49,57,65,73,81,89,97,105,113,121
NUMA node5 CPU(s): 3,11,19,27,35,43,51,59,67,75,83,91,99,107,115,123
NUMA node6 CPU(s): 5,13,21,29,37,45,53,61,69,77,85,93,101,109,117,125
NUMA node7 CPU(s): 7,15,23,31,39,47,55,63,71,79,87,95,103,111,119,127
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 extd_apicid amd_dcm aperfmperf eagerfpu 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 skinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_l2 mwaitx arat cpb
hw_pstate ssbd ibpb retpoline retpoline_amd npt lbrv svm_lock nrip_save tsc_scale
vmcb_clean flushbyasid decodeassists pausefilter pfthreshold vmmcall avic fsgsbase
bmi1 avx2 smep bmi2 rdseed adx smap clflushopt sha_ni xsaveopt xsavec xgetbv1 clzero
irperf 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 96 104 112 120
node 0 size: 128622 MB
node 0 free: 128391 MB
node 1 cpus: 2 10 18 26 34 42 50 58 66 74 82 90 98 106 114 122
node 1 size: 129020 MB
node 1 free: 128857 MB
node 2 cpus: 4 12 20 28 36 44 52 60 68 76 84 92 100 108 116 124
node 2 size: 129020 MB
node 2 free: 128846 MB
node 3 cpus: 6 14 22 30 38 46 54 62 70 78 86 94 102 110 118 126
node 3 size: 129020 MB
node 3 free: 128847 MB
node 4 cpus: 1 9 17 25 33 41 49 57 65 73 81 89 97 105 113 121
node 4 size: 129020 MB
node 4 free: 128847 MB
node 5 cpus: 3 11 19 27 35 43 51 59 67 75 83 91 99 107 115 123
node 5 size: 129020 MB
node 5 free: 128860 MB
node 6 cpus: 5 13 21 29 37 45 53 61 69 77 85 93 101 109 117 125
node 6 size: 129020 MB

```

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## Platform Notes (Continued)

```

node 6 free: 128852 MB
node 7 cpus: 7 15 23 31 39 47 55 63 71 79 87 95 103 111 119 127
node 7 size: 129019 MB
node 7 free: 128849 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
  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:      1056530496 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

/usr/bin/lsb\_release -d

SUSE Linux Enterprise Server 12 SP3

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

SuSE-release:

```

SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 3

```

```

# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.

```

os-release:

```

NAME="SLES"
VERSION="12-SP3"
VERSION_ID="12.3"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp3"

```

uname -a:

```

Linux linux-1z15 4.4.138-8.g8686768-default #1 SMP Mon Jun 25 17:25:25 UTC 2018
(8686768) 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

```

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## Platform Notes (Continued)

CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline + IBPB

run-level 3 Nov 25 18:10 last=5

SPEC is set to: /home/cpu2017-1.0.5

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda4	xfs	144G	3.9G	140G	3%	/home

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. 1.6.2 09/07/2018

Memory:

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

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.4.0.0.B35.2017\_04\_26 clang version 4.0.0 (CLANG:) (based on LLVM  
 AOCC.LLVM.4.0.0.B35.2017\_04\_26)  
 Target: x86\_64-unknown-linux-gnu  
 Thread model: posix  
 InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin  
 -----

=====  
CXXC 508.namd\_r(base, peak) 510.parest\_r(base, peak)

-----  
 AOCC.LLVM.4.0.0.B35.2017\_04\_26 clang version 4.0.0 (CLANG:) (based on LLVM  
 AOCC.LLVM.4.0.0.B35.2017\_04\_26)  
 Target: x86\_64-unknown-linux-gnu  
 Thread model: posix  
 InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin  
 -----

=====  
CC 511.povray\_r(base, peak) 526.blender\_r(base, peak)

-----  
 AOCC.LLVM.4.0.0.B35.2017\_04\_26 clang version 4.0.0 (CLANG:) (based on LLVM  
 AOCC.LLVM.4.0.0.B35.2017\_04\_26)

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## Compiler Version Notes (Continued)

```

Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin
AOCC.LLVM.4.0.0.B35.2017_04_26 clang version 4.0.0 (CLANG:) (based on LLVM
  AOCC.LLVM.4.0.0.B35.2017_04_26)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin

```

```

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

```

```

AOCC.LLVM.4.0.0.B35.2017_04_26 clang version 4.0.0 (CLANG:) (based on LLVM
  AOCC.LLVM.4.0.0.B35.2017_04_26)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin
AOCC.LLVM.4.0.0.B35.2017_04_26 clang version 4.0.0 (CLANG:) (based on LLVM
  AOCC.LLVM.4.0.0.B35.2017_04_26)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/AOCC-1.0-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.
For more information about these matters, see the file named COPYING

```

```

=====
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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You may redistribute copies of GNU Fortran
under the terms of the GNU General Public License.
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```

```

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

```

```

GNU Fortran (GCC) 4.8.2

```

(Continued on next page)





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## Compiler Version Notes (Continued)

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 GNU Fortran comes with NO WARRANTY, to the extent permitted by law.  
 You may redistribute copies of GNU Fortran  
 under the terms of the GNU General Public License.  
 For more information about these matters, see the file named COPYING  
 AOCC.LLVM.4.0.0.B35.2017\_04\_26 clang version 4.0.0 (CLANG:) (based on LLVM  
 AOCC.LLVM.4.0.0.B35.2017\_04\_26)  
 Target: x86\_64-unknown-linux-gnu  
 Thread model: posix  
 InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin

-----

## 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

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## Base Portability Flags (Continued)

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=-disable-vect-cmp  
-O3 -ffast-math -march=znver1 -fstruct-layout=2  
-mllvm -unroll-threshold=100 -fremap-arrays -mno-avx2  
-mllvm -inline-threshold=1000 -mllvm -disable-vect-cmp -z muldefs  
-ljemalloc
```

### C++ benchmarks:

```
-flto -Wl,-plugin-opt=-merge-constant  
-Wl,-plugin-opt=-lsr-in-nested-loop -Wl,-plugin-opt=-disable-vect-cmp  
-O3 -march=znver1 -mllvm -unroll-threshold=100 -finline-aggressive  
-fremap-arrays -mllvm -inline-threshold=1000 -mllvm -disable-vect-cmp  
-z muldefs -ljemalloc
```

### Fortran benchmarks:

```
-flto -Wl,-plugin-opt=-merge-constant  
-Wl,-plugin-opt=-lsr-in-nested-loop -Wl,-plugin-opt=-disable-vect-cmp  
-O3 -mavx -madx -funroll-loops -ffast-math -z muldefs  
-fplugin=dragonegg.so -fplugin-arg-dragonegg-llvm-option=-merge-constant  
-fplugin-arg-dragonegg-llvm-option=-disable-vect-cmp -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=-disable-vect-cmp  
-O3 -ffast-math -march=znver1 -fstruct-layout=2  
-mllvm -unroll-threshold=100 -fremap-arrays -mno-avx2  
-mllvm -inline-threshold=1000 -mllvm -disable-vect-cmp -mavx -madx  
-funroll-loops -z muldefs -fplugin=dragonegg.so  
-fplugin-arg-dragonegg-llvm-option=-merge-constant  
-fplugin-arg-dragonegg-llvm-option=-disable-vect-cmp -ljemalloc  
-lgfortran -lamdlibm
```

### Benchmarks using both C and C++:

```
-flto -Wl,-plugin-opt=-merge-constant  
-Wl,-plugin-opt=-lsr-in-nested-loop -Wl,-plugin-opt=-disable-vect-cmp
```

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# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate2017\_fp\_base = 259

PowerEdge R7425 (AMD EPYC 7551, 2.00 GHz)

SPECrate2017\_fp\_peak = 268

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Sep-2018

Hardware Availability: Dec-2018

Software Availability: Jul-2018

## Base Optimization Flags (Continued)

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

```
-O3 -ffast-math -march=znver1 -fstruct-layout=2
-mllvm -unroll-threshold=100 -fremap-arrays -mno-avx2
-mllvm -inline-threshold=1000 -mllvm -disable-vect-cmp
-finline-aggressive -z muldefs -ljemalloc
```

Benchmarks using Fortran, C, and C++:

```
-flto -Wl,-plugin-opt=-merge-constant
-Wl,-plugin-opt=-lsr-in-nested-loop -Wl,-plugin-opt=-disable-vect-cmp
-O3 -ffast-math -march=znver1 -fstruct-layout=2
-mllvm -unroll-threshold=100 -fremap-arrays -mno-avx2
-mllvm -inline-threshold=1000 -mllvm -disable-vect-cmp
-finline-aggressive -mavx -madox -funroll-loops -z muldefs
-fplugin=dragonegg.so -fplugin-arg-dragonegg-llvm-option=-merge-constant
-fplugin-arg-dragonegg-llvm-option=-disable-vect-cmp -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



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## Peak Optimization Flags

### C benchmarks:

```
-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 -ljemalloc
```

### C++ benchmarks:

```
-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 -ljemalloc
```

### Fortran benchmarks:

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

### Benchmarks using both Fortran and C:

```
521.wrf_r: -flto -Wl,-plugin-opt=-merge-constant
-Wl,-plugin-opt=-lsr-in-nested-loop -O3 -mavx -ffast-math
-funroll-loops -fplugin=dragonegg.so
-fplugin-arg-dragonegg-llvm-option=-merge-constant
-fplugin-arg-dragonegg-llvm-option=-inline-threshold:1000
-ljemalloc -lgfortran -lamdlibm
```

```
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 -mavx2 -madox
-funroll-loops -ffast-math -fplugin=dragonegg.so
-fplugin-arg-dragonegg-llvm-option=-merge-constant
-fplugin-arg-dragonegg-llvm-option=-inline-threshold:1000
-ljemalloc -lgfortran -lamdlibm
```

### Benchmarks using both C and C++:

```
-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 -ljemalloc
```

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## Peak Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

```

-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 -ljemalloc

```

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

<http://www.spec.org/cpu2017/flags/aocc100-flags-revC-I.2018-11-13.html>

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

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

<http://www.spec.org/cpu2017/flags/aocc100-flags-revC-I.2018-11-13.xml>

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

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