



# SPEC® CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Dell Inc.

SPECrate2017\_fp\_base = 58.5

Dell PowerEdge R7415 (AMD EPYC 7261, 2.50GHz)

SPECrate2017\_fp\_peak = 59.2

CPU2017 License: 55

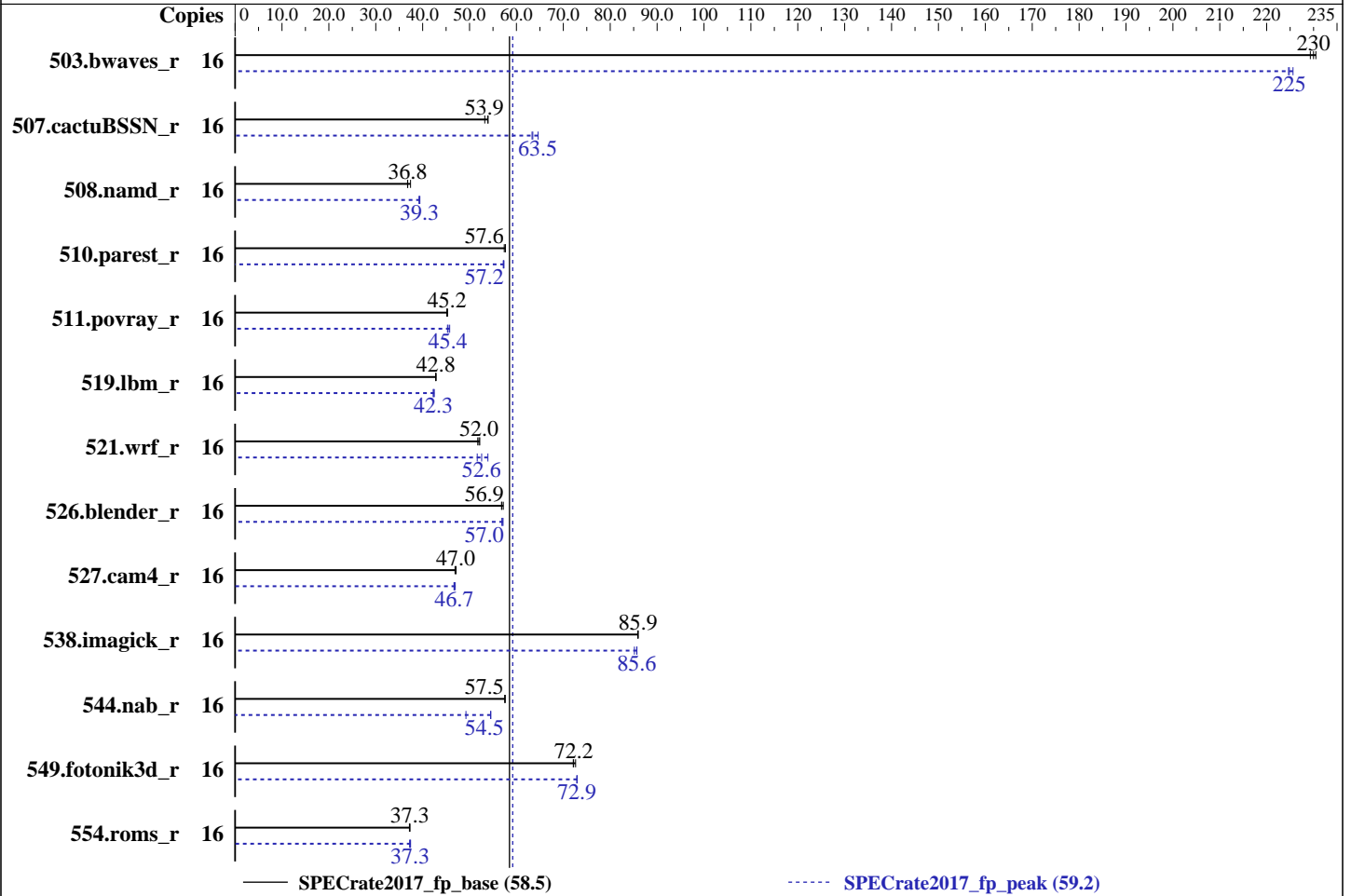
Test Date: Mar-2019

Test Sponsor: Dell Inc.

Hardware Availability: Apr-2019

Tested by: Dell Inc.

Software Availability: Feb-2019



### Hardware

CPU Name: AMD EPYC 7261  
 Max MHz.: 2900  
 Nominal: 2500  
 Enabled: 8 cores, 1 chip, 2 threads/core  
 Orderable: 1 chip  
 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  
 Other: None  
 Memory: 512 GB (8 x 64 GB 4Rx4 PC4-2667V-L)  
 Storage: 1 x 1.92 TB SATA SSD  
 Other: None

### Software

OS: Ubuntu 18.04.2 LTS  
 kernel 4.15-45-generic  
 Compiler: C/C++: Version 1.3.0 of AOCC  
 Fortran: Version 4.8.2 of GCC  
 Parallel: No  
 Firmware: Version 1.8.4 released Feb-2019  
 File System: ext4  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 Other: jemalloc memory allocator library V4.5.0



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate2017\_fp\_base = 58.5

Dell PowerEdge R7415 (AMD EPYC 7261, 2.50GHz)

SPECrate2017\_fp\_peak = 59.2

CPU2017 License: 55  
Test Sponsor: Dell Inc.  
Tested by: Dell Inc.

Test Date: Mar-2019  
Hardware Availability: Apr-2019  
Software Availability: Feb-2019

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	16	700	229	696	230	<b>698</b>	<b>230</b>	16	711	226	<b>714</b>	<b>225</b>	714	225
507.cactuBSSN_r	16	375	53.9	380	53.2	<b>376</b>	<b>53.9</b>	16	320	63.3	<b>319</b>	<b>63.5</b>	314	64.6
508.namd_r	16	406	37.4	<b>413</b>	<b>36.8</b>	413	36.8	16	<b>387</b>	<b>39.3</b>	386	39.4	387	39.2
510.parest_r	16	726	57.6	<b>726</b>	<b>57.6</b>	729	57.4	16	732	57.2	<b>731</b>	<b>57.2</b>	730	57.3
511.povray_r	16	827	45.2	<b>826</b>	<b>45.2</b>	825	45.3	16	<b>822</b>	<b>45.4</b>	816	45.8	825	45.3
519.lbm_r	16	393	42.9	<b>394</b>	<b>42.8</b>	394	42.8	16	397	42.5	<b>399</b>	<b>42.3</b>	399	42.3
521.wrf_r	16	<b>689</b>	<b>52.0</b>	687	52.2	693	51.7	16	694	51.6	665	53.9	<b>682</b>	<b>52.6</b>
526.blender_r	16	426	57.2	<b>428</b>	<b>56.9</b>	429	56.8	16	428	56.9	426	57.1	<b>428</b>	<b>57.0</b>
527.cam4_r	16	594	47.1	<b>595</b>	<b>47.0</b>	597	46.9	16	596	47.0	599	46.7	<b>599</b>	<b>46.7</b>
538.imagick_r	16	<b>463</b>	<b>85.9</b>	463	85.9	463	85.9	16	467	85.2	<b>465</b>	<b>85.6</b>	464	85.7
544.nab_r	16	<b>468</b>	<b>57.5</b>	468	57.6	468	57.5	16	494	54.5	<b>494</b>	<b>54.5</b>	547	49.2
549.fotonik3d_r	16	859	72.6	865	72.1	<b>864</b>	<b>72.2</b>	16	855	72.9	<b>855</b>	<b>72.9</b>	855	72.9
554.roms_r	16	684	37.2	682	37.3	<b>682</b>	<b>37.3</b>	16	683	37.2	<b>681</b>	<b>37.3</b>	679	37.4

SPECrate2017\_fp\_base = 58.5

SPECrate2017\_fp\_peak = 59.2

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>

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate2017\_fp\_base = 58.5

Dell PowerEdge R7415 (AMD EPYC 7261, 2.50GHz)

SPECrate2017\_fp\_peak = 59.2

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

## 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 2<sup>21</sup> = 2MiB.

## Platform Notes

BIOS settings:

Virtualization Technology disabled

System Profile set to Custom

CPU Power Management set to Maximum Performance

Memory Frequency set to Maximum Performance

Turbo Boost enabled

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate2017\_fp\_base = 58.5

Dell PowerEdge R7415 (AMD EPYC 7261, 2.50GHz)

SPECrate2017\_fp\_peak = 59.2

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

## Platform Notes (Continued)

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 pe7415 Wed Mar 27 04:50:43 2019

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 7261 8-Core Processor

1 "physical id"s (chips)

16 "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 : 8

siblings : 16

physical 0: cores 0 8 12 16 20 24 28

From lscpu:

Architecture: x86\_64  
 CPU op-mode(s): 32-bit, 64-bit  
 Byte Order: Little Endian  
 CPU(s): 16  
 On-line CPU(s) list: 0-15  
 Thread(s) per core: 2  
 Core(s) per socket: 8  
 Socket(s): 1  
 NUMA node(s): 4  
 Vendor ID: AuthenticAMD  
 CPU family: 23  
 Model: 1  
 Model name: AMD EPYC 7261 8-Core Processor  
 Stepping: 2  
 CPU MHz: 2636.056  
 Bogomips: 4990.49  
 Virtualization: AMD-V  
 L1d cache: 32K  
 L1i cache: 64K  
 L2 cache: 512K  
 L3 cache: 8192K  
 NUMA node0 CPU(s): 0,4,8,12  
 NUMA node1 CPU(s): 1,5,9,13

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate2017\_fp\_base = 58.5

Dell PowerEdge R7415 (AMD EPYC 7261, 2.50GHz)

SPECrate2017\_fp\_peak = 59.2

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

## Platform Notes (Continued)

```

NUMA node2 CPU(s): 2,6,10,14
NUMA node3 CPU(s): 3,7,11,15
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 amd_dcm 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 skinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb
hw_pstate sme ssbd ibpb vmmcall fsgsbase bmi1 avx2 smep bmi2 rdseed adx smap
clflushopt sha_ni xsaveopt xsavec xgetbv1 xsavec 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: 4 nodes (0-3)
node 0 cpus: 0 4 8 12
node 0 size: 128635 MB
node 0 free: 128460 MB
node 1 cpus: 1 5 9 13
node 1 size: 129017 MB
node 1 free: 128871 MB
node 2 cpus: 2 6 10 14
node 2 size: 129017 MB
node 2 free: 128864 MB
node 3 cpus: 3 7 11 15
node 3 size: 128994 MB
node 3 free: 128852 MB
node distances:
node 0 1 2 3
0: 10 16 16 16
1: 16 10 16 16
2: 16 16 10 16
3: 16 16 16 10

```

```

From /proc/meminfo
MemTotal: 528041808 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

```

```

/usr/bin/lsb_release -d
Ubuntu 18.04.2 LTS

```

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

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate2017\_fp\_base = 58.5

Dell PowerEdge R7415 (AMD EPYC 7261, 2.50GHz)

SPECrate2017\_fp\_peak = 59.2

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

## Platform Notes (Continued)

```

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 pe7415 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 3 Mar 26 20:10

```

SPEC is set to: /home/cpu2017-1.0.5
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2       ext4  1.8T   18G  1.7T   2% /

```

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. 1.8.4 02/22/2019
Memory:
8x 80CE863280CE M386A8K40BM2-CTD 64 GB 4 rank 2666
8x 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

```

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate2017\_fp\_base = 58.5

Dell PowerEdge R7415 (AMD EPYC 7261, 2.50GHz)

SPECrate2017\_fp\_peak = 59.2

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

## Compiler Version Notes (Continued)

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)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /root/work/compilers/aoccl.3.0/AOCC-1.3.0-Compiler/bin  
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

=====  
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)  
Target: x86\_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /root/work/compilers/aoccl.3.0/AOCC-1.3.0-Compiler/bin  
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  
GNU Fortran (GCC) 4.8.2  
Copyright (C) 2013 Free Software Foundation, Inc.  
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.

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

**Dell Inc.**

SPECrate2017\_fp\_base = 58.5

Dell PowerEdge R7415 (AMD EPYC 7261, 2.50GHz)

SPECrate2017\_fp\_peak = 59.2

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

## Compiler Version Notes (Continued)

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
Copyright (C) 2013 Free Software Foundation, Inc.
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
-----
```

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

```
GNU Fortran (GCC) 4.8.2
Copyright (C) 2013 Free Software Foundation, Inc.
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.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
-----
```

## Base Compiler Invocation

C benchmarks:  
clang

C++ benchmarks:  
clang++

Fortran benchmarks:  
clang gfortran

Benchmarks using both Fortran and C:  
clang gfortran

(Continued on next page)





# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate2017\_fp\_base = 58.5

Dell PowerEdge R7415 (AMD EPYC 7261, 2.50GHz)

SPECrate2017\_fp\_peak = 59.2

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

## Base Compiler Invocation (Continued)

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  
-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

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate2017\_fp\_base = 58.5

Dell PowerEdge R7415 (AMD EPYC 7261, 2.50GHz)

SPECrate2017\_fp\_peak = 59.2

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

## Base Optimization Flags (Continued)

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 -madox -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
-freemap-arrays -mllvm -inline-threshold=1000
-flv-function-specialization -mllvm -enable-gvn-hoist
-mllvm -function-specialize -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 -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
-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 -z muldefs
-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
-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
```



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate2017\_fp\_base = 58.5

Dell PowerEdge R7415 (AMD EPYC 7261, 2.50GHz)

SPECrate2017\_fp\_peak = 59.2

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

## 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

## 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 -lpthread -ldl -ljemalloc
```

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
```

(Continued on next page)



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate2017\_fp\_base = 58.5

Dell PowerEdge R7415 (AMD EPYC 7261, 2.50GHz)

SPECrate2017\_fp\_peak = 59.2

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2019

Hardware Availability: Apr-2019

Software Availability: Feb-2019

## Peak Optimization Flags (Continued)

Fortran benchmarks (continued):

```
-fplugin-arg-dragonegg-llvm-option=-inline-threshold:1000 -lpthread
-ldl -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(clang) -mavx
-ffast-math -O3(gfortran) -funroll-loops
-fplugin=dragonegg.so
-fplugin-arg-dragonegg-llvm-option=-merge-constant
-fplugin-arg-dragonegg-llvm-option=-inline-threshold:1000
-lpthread -ldl -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(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
-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
```



# SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate2017\_fp\_base = 58.5

Dell PowerEdge R7415 (AMD EPYC 7261, 2.50GHz)

SPECrate2017\_fp\_peak = 59.2

**CPU2017 License:** 55

**Test Sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Test Date:** Mar-2019

**Hardware Availability:** Apr-2019

**Software Availability:** Feb-2019

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>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge14G-revE2.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>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge14G-revE2.xml>

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

Tested with SPEC CPU2017 v1.0.5 on 2019-03-27 00:50:42-0400.

Report generated on 2019-04-16 17:18:29 by CPU2017 PDF formatter v6067.

Originally published on 2019-04-16.