



SPEC® CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen10

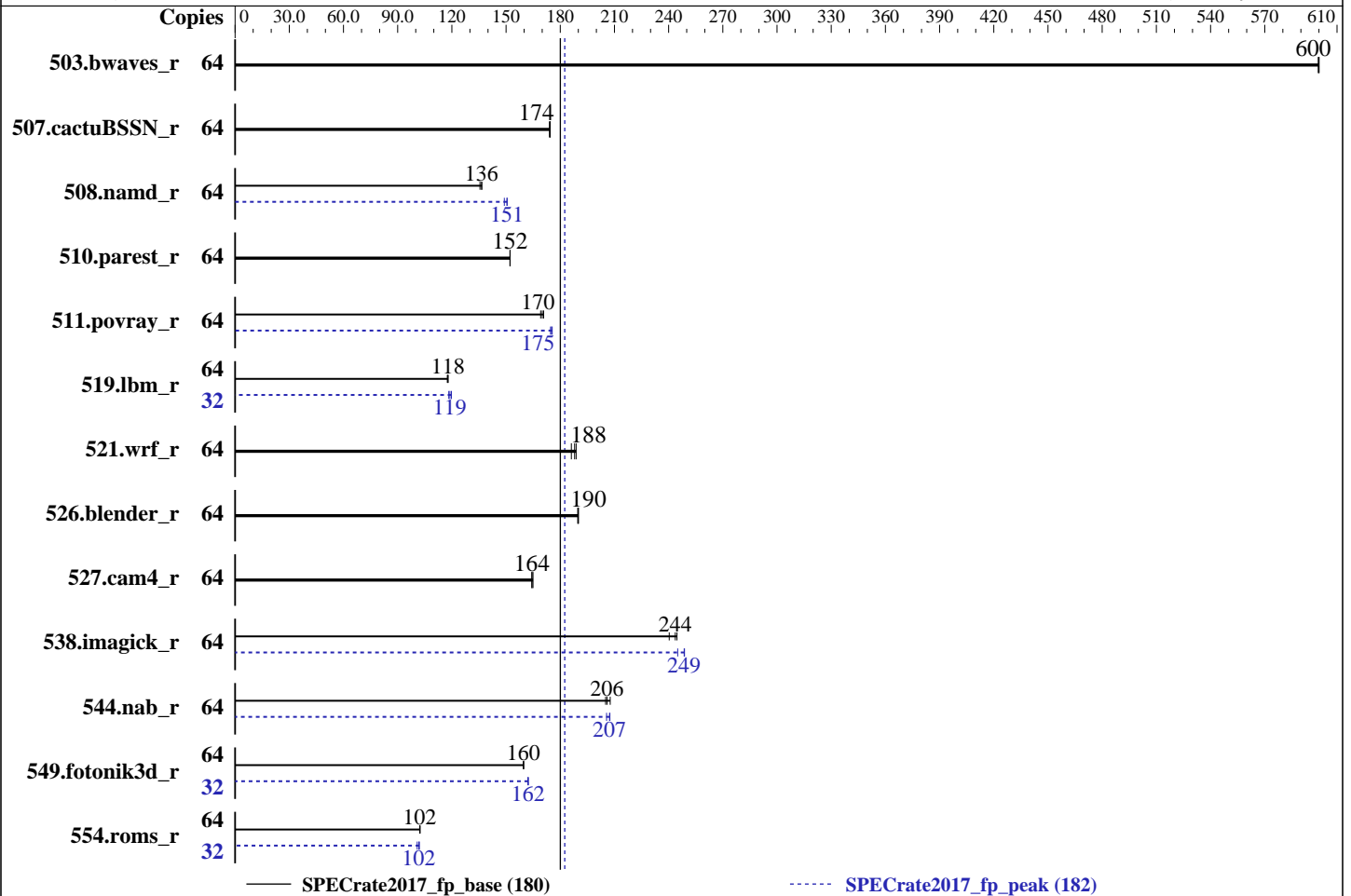
(2.40 GHz, AMD EPYC 7351)

SPECrate2017_fp_base = 180

SPECrate2017_fp_peak = 182

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Jun-2018
Hardware Availability: May-2018
Software Availability: May-2018



Hardware

CPU Name: AMD EPYC 7351
Max MHz.: 2900
Nominal: 2400
Enabled: 32 cores, 2 chips, 2 threads/core
Orderable: 1, 2 chip(s)
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 / 2 cores
Other: None
Memory: 256 GB (16 x 16 GB 1Rx4 PC4-2666V-R)
Storage: 1 x 480 GB SATA SSD, RAID 0
Other: None

Software

OS: SUSE Linux Enterprise Server 12 (x86_64) SP3
Kernel 4.4.131-94.25-default
Compiler: C/C++: Version 1.0.0 of AOCC
Fortran: Version 4.8.2 of GCC
Parallel: No
Firmware: HPE BIOS Version A40 04/27/2018 released May-2018
File System: btrfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc: general purpose malloc implementation v4.5.0



SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen10

(2.40 GHz, AMD EPYC 7351)

SPECrate2017_fp_base = 180

SPECrate2017_fp_peak = 182

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Jun-2018
Hardware Availability: May-2018
Software Availability: May-2018

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	64	1070	600	1069	600	1070	600	64	1070	600	1069	600	1070	600
507.cactuBSSN_r	64	466	174	465	174	465	174	64	466	174	465	174	465	174
508.namd_r	64	445	137	446	136	449	136	64	408	149	404	151	404	151
510.parest_r	64	1100	152	1100	152	1100	152	64	1100	152	1100	152	1100	152
511.povray_r	64	883	169	875	171	879	170	64	853	175	851	176	856	175
519.lbm_r	64	573	118	572	118	574	117	32	285	118	282	120	284	119
521.wrf_r	64	770	186	759	189	763	188	64	770	186	759	189	763	188
526.blender_r	64	514	190	514	190	513	190	64	514	190	514	190	513	190
527.cam4_r	64	679	165	681	164	681	164	64	679	165	681	164	681	164
538.imagick_r	64	653	244	651	245	662	240	64	640	249	640	249	650	245
544.nab_r	64	519	208	523	206	525	205	64	519	207	524	206	520	207
549.fotonik3d_r	64	1561	160	1562	160	1563	160	32	769	162	769	162	768	162
554.roms_r	64	995	102	995	102	993	102	32	500	102	498	102	504	101

SPECrate2017_fp_base = 180

SPECrate2017_fp_peak = 182

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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>

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
Linux governor set to performance with cpupower "cpupower frequency-set -r -g performance"
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)

Huge pages were not configured for this run.



SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen10

(2.40 GHz, AMD EPYC 7351)

SPECrate2017_fp_base = 180

SPECrate2017_fp_peak = 182

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Jun-2018

Hardware Availability: May-2018

Software Availability: May-2018

General Notes

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

```
LD_LIBRARY_PATH = "/cpu2017/amd1704-rate-libs-revC/64;/cpu2017/amd1704-rate-libs-revC/32:"
MALLOCONF = "lg_chunk:28"
```

The AMD64 AOCC Compiler Suite is available at
<http://developer.amd.com/amd-aocc/>

Binaries were compiled on a system with 2x AMD EPYC 7601 CPU + 512GB Memory using RHEL 7.4

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/>

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, a general purpose malloc implementation, was obtained at
<https://github.com/jemalloc/jemalloc/releases/download/4.5.0/jemalloc-4.5.0.tar.bz2>
jemalloc was built with GCC v4.8.5 in RHEL v7.2 under default conditions.

jemalloc uses environment variable MALLOCONF 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 Configuration:

Thermal Configuration set to Maximum Cooling
Memory Patrol Scrubbing set to Disabled
Performance Determinism set to Power Deterministic
Processor Power and Utilization Monitoring set to Disabled
Workload Profile set to General Throughput Compute
Minimum Processor Idle Power Core C-State set to C6 State

Sysinfo program /cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-02cn Mon Jan 1 07:50:25 2001

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>

(Continued on next page)



SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen10

(2.40 GHz, AMD EPYC 7351)

SPECrate2017_fp_base = 180

SPECrate2017_fp_peak = 182

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Jun-2018

Hardware Availability: May-2018

Software Availability: May-2018

Platform Notes (Continued)

From /proc/cpuinfo

model name : AMD EPYC 7351 16-Core Processor

2 "physical id"s (chips)

64 "processors"

cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)

cpu cores : 16

siblings : 32

physical 0: cores 0 1 4 5 8 9 12 13 16 17 20 21 24 25 28 29

physical 1: cores 0 1 4 5 8 9 12 13 16 17 20 21 24 25 28 29

From lscpu:

Architecture: x86_64

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

Byte Order: Little Endian

CPU(s): 64

On-line CPU(s) list: 0-63

Thread(s) per core: 2

Core(s) per socket: 16

Socket(s): 2

NUMA node(s): 8

Vendor ID: AuthenticAMD

CPU family: 23

Model: 1

Model name: AMD EPYC 7351 16-Core Processor

Stepping: 2

CPU MHz: 2400.000

CPU max MHz: 2400.0000

CPU min MHz: 1200.0000

BogoMIPS: 4791.02

Virtualization: AMD-V

L1d cache: 32K

L1i cache: 64K

L2 cache: 512K

L3 cache: 8192K

NUMA node0 CPU(s): 0-3,32-35

NUMA node1 CPU(s): 4-7,36-39

NUMA node2 CPU(s): 8-11,40-43

NUMA node3 CPU(s): 12-15,44-47

NUMA node4 CPU(s): 16-19,48-51

NUMA node5 CPU(s): 20-23,52-55

NUMA node6 CPU(s): 24-27,56-59

NUMA node7 CPU(s): 28-31,60-63

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

(Continued on next page)



SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen10

(2.40 GHz, AMD EPYC 7351)

SPECrate2017_fp_base = 180

SPECrate2017_fp_peak = 182

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Jun-2018

Hardware Availability: May-2018

Software Availability: May-2018

Platform Notes (Continued)

pclmulqdq monitor ssse3 fma cx16 sse4_1 sse4_2 movbe popcnt aes xsave avx fl6c
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
hw_pstate rds 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 ibpb 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 1 2 3 32 33 34 35
node 0 size: 32002 MB
node 0 free: 31830 MB
node 1 cpus: 4 5 6 7 36 37 38 39
node 1 size: 32254 MB
node 1 free: 32122 MB
node 2 cpus: 8 9 10 11 40 41 42 43
node 2 size: 32254 MB
node 2 free: 32124 MB
node 3 cpus: 12 13 14 15 44 45 46 47
node 3 size: 32254 MB
node 3 free: 32122 MB
node 4 cpus: 16 17 18 19 48 49 50 51
node 4 size: 32254 MB
node 4 free: 32123 MB
node 5 cpus: 20 21 22 23 52 53 54 55
node 5 size: 32254 MB
node 5 free: 32113 MB
node 6 cpus: 24 25 26 27 56 57 58 59
node 6 size: 32254 MB
node 6 free: 32107 MB
node 7 cpus: 28 29 30 31 60 61 62 63
node 7 size: 32121 MB
node 7 free: 31986 MB
node distances:
```

```
node 0 1 2 3 4 5 6 7
0: 10 16 16 16 32 32 32 32
1: 16 10 16 16 32 32 32 32
2: 16 16 10 16 32 32 32 32
3: 16 16 16 10 32 32 32 32
4: 32 32 32 32 10 16 16 16
5: 32 32 32 32 16 10 16 16
6: 32 32 32 32 16 16 10 16
```

(Continued on next page)



SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen10

(2.40 GHz, AMD EPYC 7351)

SPECrate2017_fp_base = 180

SPECrate2017_fp_peak = 182

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Jun-2018

Hardware Availability: May-2018

Software Availability: May-2018

Platform Notes (Continued)

7: 32 32 32 32 16 16 16 10

From /proc/meminfo

MemTotal: 263832168 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-02cn 4.4.131-94.25-default #1 SMP Mon May 7 11:22:19 UTC 2018 (9700bac)

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 Dec 31 18:01

SPEC is set to: /cpu2017

Filesystem Type Size Used Avail Use% Mounted on

/dev/sda3 btrfs 445G 12G 433G 3% /

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 HPE A40 04/27/2018

(Continued on next page)



SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen10

(2.40 GHz, AMD EPYC 7351)

SPECrate2017_fp_base = 180

SPECrate2017_fp_peak = 182

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

Test Date: Jun-2018
Hardware Availability: May-2018
Software Availability: May-2018

Platform Notes (Continued)

Memory:

16x UNKNOWN NOT AVAILABLE

16x UNKNOWN NOT AVAILABLE 16 GB 1 rank 2666

(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)
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)

(Continued on next page)



SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen10

(2.40 GHz, AMD EPYC 7351)

SPECrate2017_fp_base = 180

SPECrate2017_fp_peak = 182

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Jun-2018

Hardware Availability: May-2018

Software Availability: May-2018

Compiler Version Notes (Continued)

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

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

=====
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.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



SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen10

(2.40 GHz, AMD EPYC 7351)

SPECrate2017_fp_base = 180

SPECrate2017_fp_peak = 182

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Jun-2018

Hardware Availability: May-2018

Software Availability: May-2018

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

(Continued on next page)



SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen10

(2.40 GHz, AMD EPYC 7351)

SPECrate2017_fp_base = 180

SPECrate2017_fp_peak = 182

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Jun-2018

Hardware Availability: May-2018

Software Availability: May-2018

Base Optimization Flags (Continued)

C++ benchmarks:

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

Fortran benchmarks:

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

Benchmarks using Fortran, C, and C++:

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

Peak Compiler Invocation

C benchmarks:

clang

(Continued on next page)



SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen10

(2.40 GHz, AMD EPYC 7351)

SPECrate2017_fp_base = 180

SPECrate2017_fp_peak = 182

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Jun-2018

Hardware Availability: May-2018

Software Availability: May-2018

Peak Compiler Invocation (Continued)

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  
-unroll-threshold=100 -fremap-arrays -inline-threshold=1000 -ljemalloc
```

C++ benchmarks:

```
508.namd_r: -flto -Wl,-plugin-opt= -merge-constant  
-Wl,-plugin-opt=-lsr-in-nested-loop -Ofast -march=znver1  
-finline-aggressive -mllvm -unroll-threshold=100  
-fremap-arrays -inline-threshold=1000 -ljemalloc
```

510.parest_r: basepeak = yes

Fortran benchmarks:

503.bwaves_r: basepeak = yes

```
549.fotonik3d_r: -flto -Wl,-plugin-opt= -merge-constant  
-Wl,-plugin-opt=-lsr-in-nested-loop -O3 -mavx2 -madx
```

(Continued on next page)



SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant DL385 Gen10

(2.40 GHz, AMD EPYC 7351)

SPECrate2017_fp_base = 180

SPECrate2017_fp_peak = 182

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Jun-2018

Hardware Availability: May-2018

Software Availability: May-2018

Peak Optimization Flags (Continued)

549.fotonik3d_r (continued):

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

554.roms_r: Same as 549.fotonik3d_r

Benchmarks using both Fortran and C:

521.wrf_r: basepeak = yes

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

```
511.povray_r: -flt0 -Wl,-plugin-opt= -merge-constant
-Wl,-plugin-opt=-lsr-in-nested-loop -Ofast -march=znver1
-fstruct-layout=3 -mllvm -vectorize-memory-aggressively
-mno-avx2 -unroll-threshold=100 -fremap-arrays
-inline-threshold=1000 -finline-aggressive -ljemalloc
```

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: basepeak = yes

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

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

<http://www.spec.org/cpu2017/flags/gcc.2017-11-20.html>

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-V1.2-EPYC-revD.html>

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

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

<http://www.spec.org/cpu2017/flags/gcc.2017-11-20.xml>

<http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-V1.2-EPYC-revD.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.

Tested with SPEC CPU2017 v1.0.5 on 2001-01-01 08:50:24-0500.

Report generated on 2019-02-21 17:19:08 by CPU2017 PDF formatter v6067.

Originally published on 2018-07-10.