SPEC® CPU2017 Floating Point Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Supermicro
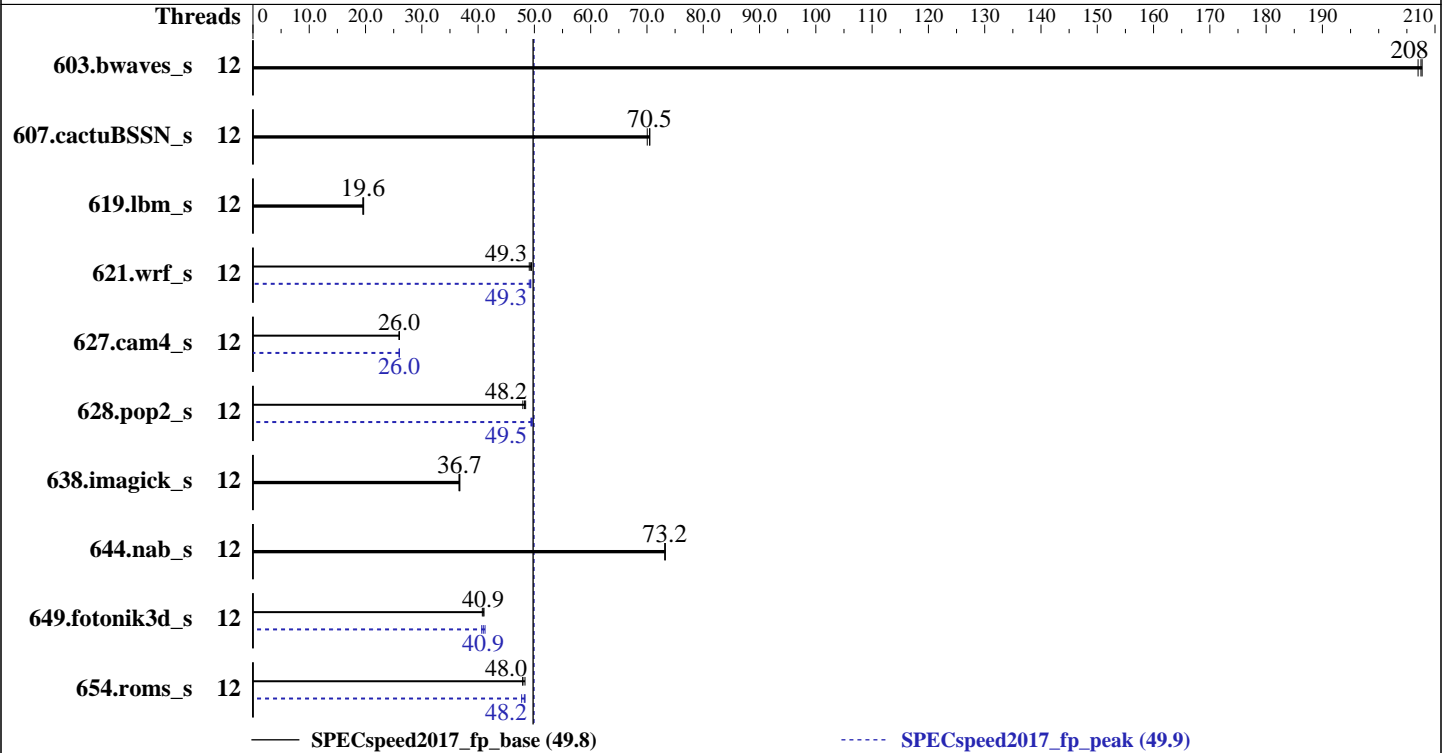
SuperServer 5019P-MT (X11SPi-TF , Intel Xeon Gold 5118)

$SPECspeed2017\_fp\_base = 49.8$

$SPECspeed2017\_fp\_peak = 49.9$

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Nov-2018

Hardware Availability: Jul-2017

Software Availability: Mar-2018

Threads

Benchmark	Threads	Value
603.bwaves_s	12	208
607.cactuBSSN_s	12	70.5
619.lbm_s	12	19.6
621.wrf_s	12	49.3 / 49.3
627.cam4_s	12	26.0 / 26.0
628.pop2_s	12	48.2 / 49.5
638.imagick_s	12	36.7
644.nab_s	12	73.2
649.fotonik3d_s	12	40.9 / 40.9
654.roms_s	12	48.0 / 48.2

—— **SPECspeed2017_fp_base (49.8)**   ----- **SPECspeed2017_fp_peak (49.9)**

Hardware

CPU Name: Intel Xeon Gold 5118
 Max MHz.: 3200
 Nominal: 2300
Enabled: 12 cores, 1 chip
Orderable: 1 chip
Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 16.5 MB I+D on chip per chip
 Other: None
Memory: 192 GB (6 x 32 GB 2Rx4 PC4-2666V-R, running at 2400)
Storage: 1 x 200 GB SATA III SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 12 SP3 (x86_64) Kernel 4.4.114-94.11-default
Compiler: C/C++: Version 18.0.2.199 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.2.199 of Intel Fortran Compiler for Linux
Parallel: Yes
Firmware: Supermicro BIOS version 2.1 released Jun-2018
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator library V5.0.1

SPEC CPU2017 Floating Point Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Supermicro

SuperServer 5019P-MT (X11SPi-TF , Intel Xeon Gold 5118)

SPECspeed2017_fp_base = 49.8

SPECspeed2017_fp_peak = 49.9

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Nov-2018
Hardware Availability: Jul-2017
Software Availability: Mar-2018

Results Table

Benchmark	Base						Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	12	285	207	**284**	**208**	284	208	12	285	207	**284**	**208**	284	208
607.cactuBSSN_s	12	238	70.1	236	70.5	**237**	**70.5**	12	238	70.1	236	70.5	**237**	**70.5**
619.lbm_s	12	**268**	**19.6**	266	19.7	268	19.5	12	**268**	**19.6**	266	19.7	268	19.5
621.wrf_s	12	**268**	**49.3**	269	49.1	267	49.5	12	**268**	**49.3**	269	49.1	268	49.3
627.cam4_s	12	342	26.0	341	26.0	**341**	**26.0**	12	341	26.0	**341**	**26.0**	341	26.0
628.pop2_s	12	245	48.4	248	47.9	**246**	**48.2**	12	240	49.4	239	49.6	**240**	**49.5**
638.imagick_s	12	394	36.6	392	36.8	**393**	**36.7**	12	394	36.6	392	36.8	**393**	**36.7**
644.nab_s	12	238	73.3	**239**	**73.2**	239	73.2	12	238	73.3	**239**	**73.2**	239	73.2
649.fotonik3d_s	12	**223**	**40.9**	224	40.7	222	41.0	12	221	41.2	224	40.6	**223**	**40.9**
654.roms_s	12	**328**	**48.0**	326	48.3	329	47.9	12	330	47.7	326	48.3	**327**	**48.2**
SPECspeed2017_fp_base =		**49.8**											
SPECspeed2017_fp_peak =		**49.9**											

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

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

General Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"
OMP_STACKSIZE = "192M"

    Binaries compiled on a system with 1x Intel Core i7-6700K CPU + 32GB RAM
    memory using Redhat Enterprise Linux 7.5
    Transparent Huge Pages enabled by default
    Prior to runcpu invocation
    Filesystem page cache synced and cleared with:
    sync; echo 3>   /proc/sys/vm/drop_caches

    Yes: 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
    built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
    sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases

SPEC CPU2017 Floating Point Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Supermicro

SuperServer 5019P-MT (X11SPi-TF , Intel Xeon Gold 5118)

$SPECspeed2017\_fp\_base = 49.8$

$SPECspeed2017\_fp\_peak = 49.9$

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Nov-2018

Hardware Availability: Jul-2017

Software Availability: Mar-2018

Platform Notes

```
 BIOS Settings:
 Hyper-Threading [ALL] = Disable
 LLC dead line alloc = Disable
 Patrol Scrub = Disable
 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
 running on linux-cyyj Mon Nov 12 17:17:47 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 : Intel(R) Xeon(R) Gold 5118 CPU @ 2.30GHz
       1  "physical id"s (chips)
       12 "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 : 12
       siblings  : 12
       physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13

 From lscpu:
    Architecture:          x86_64
    CPU op-mode(s):        32-bit, 64-bit
    Byte Order:            Little Endian
    CPU(s):                12
    On-line CPU(s) list:   0-11
    Thread(s) per core:    1
    Core(s) per socket:    12
    Socket(s):             1
    NUMA node(s):          1
    Vendor ID:             GenuineIntel
    CPU family:            6
    Model:                 85
    Model name:            Intel(R) Xeon(R) Gold 5118 CPU @ 2.30GHz
    Stepping:              4
    CPU MHz:               1200.000
    CPU max MHz:           2301.0000
    CPU min MHz:           1000.0000
    BogoMIPS:              4599.99
    Virtualization:        VT-x
    L1d cache:             32K
    L1i cache:             32K
    L2 cache:              1024K
    L3 cache:              16896K
    NUMA node0 CPU(s):     0-11
```

(Continued on next page)

Supermicro

SuperServer 5019P-MT (X11SPi-TF , Intel Xeon Gold 5118)

$SPECspeed2017\_fp\_base = 49.8$

$SPECspeed2017\_fp\_peak = 49.9$

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Nov-2018

Hardware Availability: Jul-2017

Software Availability: Mar-2018

Platform Notes (Continued)

```
     Flags:                    fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
     pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
     lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
     aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
     fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
     xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts
     dtherm intel_pt rsb_ctxsw spec_ctrl retpoline kaiser tpr_shadow vnmi flexpriority
     ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx
     avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt
     xsavec xgetbv1 cqm_llc cqm_occup_llc pku ospke

 /proc/cpuinfo cache data
    cache size : 16896 KB

 From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
 physical chip.
    available: 1 nodes (0)
    node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11
    node 0 size: 192078 MB
    node 0 free: 184716 MB
    node distances:
    node   0
      0:  10

 From /proc/meminfo
    MemTotal:       196688852 kB
    HugePages_Total:        0
    Hugepagesize:       2048 kB

 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-cyyj 4.4.114-94.11-default #1 SMP Thu Feb 1 19:28:26 UTC 2018 (4309ff9)
```

(Continued on next page)

Copyright 2017-2018 Standard Performance Evaluation Corporation

Supermicro

SuperServer 5019P-MT (X11SPi-TF , Intel Xeon Gold 5118)

$SPECspeed2017\_fp\_base =$ 49.8

$SPECspeed2017\_fp\_peak =$ 49.9

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Nov-2018
Hardware Availability: Jul-2017
Software Availability: Mar-2018

Platform Notes (Continued)

```
    x86_64 x86_64 x86_64 GNU/Linux

 Kernel self-reported vulnerability status:

 CVE-2017-5754 (Meltdown):         Mitigation: PTI
 CVE-2017-5753 (Spectre variant 1): Mitigation: Barriers
 CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

 run-level 3 Nov 12 10:56

 SPEC is set to: /home/cpu2017
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda3       xfs   145G   38G  108G  26% /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 American Megatrends Inc. 2.1 06/14/2018
   Memory:
    2x NO DIMM NO DIMM
    6x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666, configured at 2400

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
 CC  619.lbm_s(base) 638.imagick_s(base, peak) 644.nab_s(base, peak)
------------------------------------------------------------------------------
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
 CC   619.lbm_s(peak)
------------------------------------------------------------------------------
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
 FC  607.cactuBSSN_s(base, peak)
------------------------------------------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
```

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org) https://www.spec.org/

Supermicro

SuperServer 5019P-MT (X11SPi-TF , Intel Xeon Gold 5118)

$SPECspeed2017\_fp\_base = 49.8$

$SPECspeed2017\_fp\_peak = 49.9$

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Nov-2018

Hardware Availability: Jul-2017

Software Availability: Mar-2018

Compiler Version Notes (Continued)

```
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
 FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base, peak)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
FC  603.bwaves_s(peak) 649.fotonik3d_s(peak)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
 CC  621.wrf_s(base) 627.cam4_s(base, peak) 628.pop2_s(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
CC  621.wrf_s(peak) 628.pop2_s(peak)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:

```
icc -m64 -std=c11
```

Fortran benchmarks:

```
ifort -m64
```

(Continued on next page)

SPEC CPU2017 Floating Point Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Supermicro

SuperServer 5019P-MT (X11SPi-TF , Intel Xeon Gold 5118)

SPECspeed2017_fp_base = 49.8

SPECspeed2017_fp_peak = 49.9

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Nov-2018

Hardware Availability: Jul-2017

Software Availability: Mar-2018

Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
```
ifort -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:
```
icpc -m64 icc -m64 -std=c11 ifort -m64
```

Base Portability Flags

```
603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64
```

Base Optimization Flags

C benchmarks:
```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

Fortran benchmarks:
```
-Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc
```

Benchmarks using both Fortran and C:
```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc
```

Benchmarks using Fortran, C, and C++:
```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc
```

Supermicro

SuperServer 5019P-MT (X11SPi-TF , Intel Xeon Gold 5118)

$SPECspeed2017\_fp\_base = 49.8$

$SPECspeed2017\_fp\_peak = 49.9$

CPU2017 License: 001176

Test Sponsor: Supermicro

Tested by: Supermicro

Test Date: Nov-2018

Hardware Availability: Jul-2017

Software Availability: Mar-2018

Peak Compiler Invocation

C benchmarks:
```
icc -m64 -std=c11
```

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
ifort -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:
```
icpc -m64 icc -m64 -std=c11 ifort -m64
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

619.lbm_s: basepeak = yes

638.imagick_s: basepeak = yes

644.nab_s: basepeak = yes

Fortran benchmarks:

603.bwaves_s: basepeak = yes

649.fotonik3d_s: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-DSPEC_SUPPRESS_OPENMP` `-DSPEC_OPENMP -O2 -xCORE-AVX512 -qopt-prefetch -ipo -O3` `-ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3` `-qopenmp -nostandard-realloc-lhs`

654.roms_s: `-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div` `-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3` `-qopenmp -nostandard-realloc-lhs`

Benchmarks using both Fortran and C:

(Continued on next page)

Supermicro

SuperServer 5019P-MT (X11SPi-TF , Intel Xeon Gold 5118)

SPECspeed2017_fp_base = 49.8

SPECspeed2017_fp_peak = 49.9

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Nov-2018
Hardware Availability: Jul-2017
Software Availability: Mar-2018

Peak Optimization Flags (Continued)

621.wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512
-qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs

627.cam4_s: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs

628.pop2_s: Same as 621.wrf_s

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.html
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-SKL-revD.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-SKL-revD.xml

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 2018-11-12 04:17:46-0500.
Report generated on 2018-11-27 13:34:44 by CPU2017 PDF formatter v6067.
Originally published on 2018-11-27.