



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS C220 M5 (Intel Xeon Platinum 8280, 2.70GHz)

SPECspeed®2017\_fp\_base = 155

SPECspeed®2017\_fp\_peak = 154

CPU2017 License: 9019

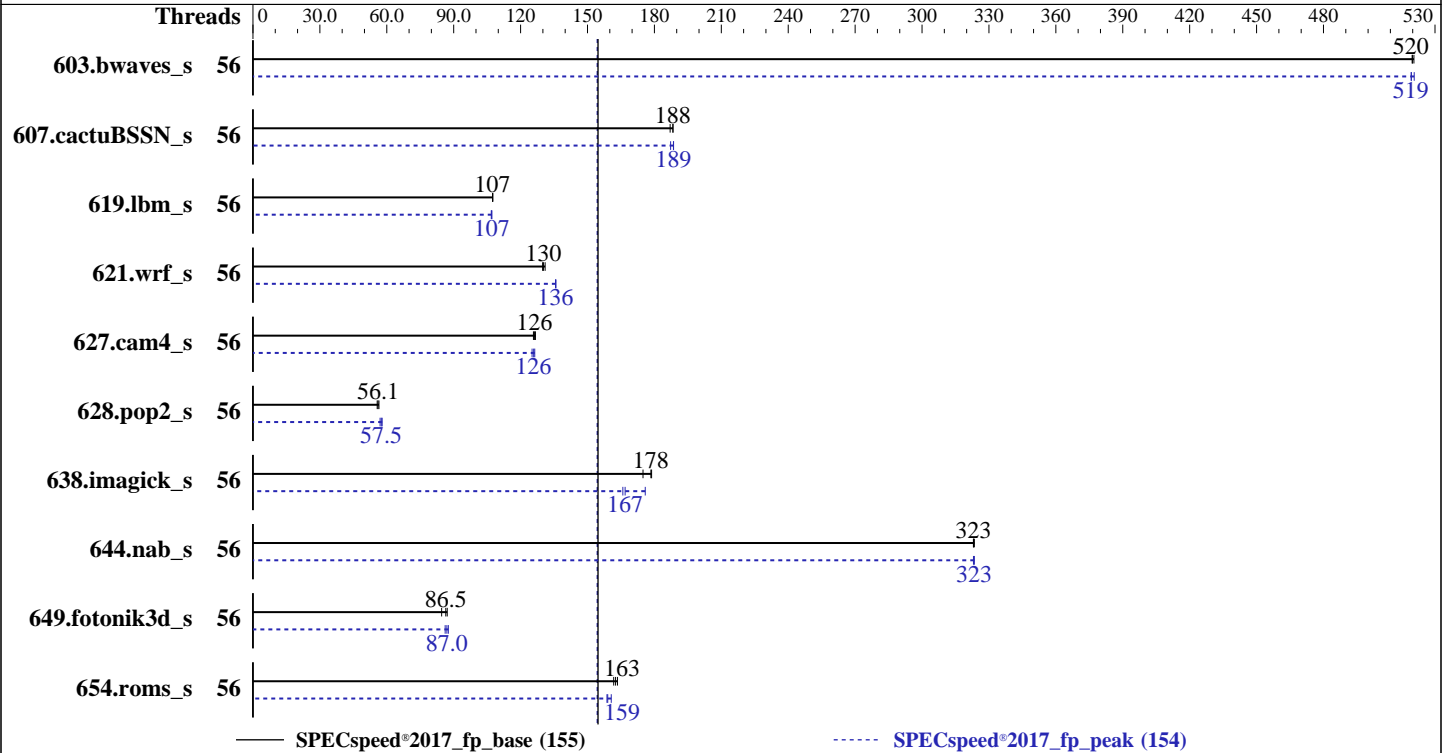
Test Sponsor: Cisco Systems

Tested by: Cisco Systems

Test Date: Nov-2019

Hardware Availability: Apr-2019

Software Availability: May-2019



### Hardware

CPU Name: Intel Xeon Platinum 8280  
 Max MHz: 4000  
 Nominal: 2700  
 Enabled: 56 cores, 2 chips  
 Orderable: 1,2 Chips  
 Cache L1: 32 KB I + 32 KB D on chip per core  
 L2: 1 MB I+D on chip per core  
 L3: 38.5 MB I+D on chip per chip  
 Other: None  
 Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933V-R)  
 Storage: 1 x 240 GB M.2 SATA SSD  
 Other: None

### Software

OS: SUSE Linux Enterprise Server 15 (x86\_64) 4.12.14-23-default  
 Compiler: C/C++: Version 19.0.4.227 of Intel C/C++ Compiler for Linux;  
 Fortran: Version 19.0.4.227 of Intel Fortran Compiler for Linux  
 Parallel: Yes  
 Firmware: Version 4.0.4g released Jul-2019  
 File System: btrfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 Other: None  
 Power Management: default



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS C220 M5 (Intel Xeon Platinum 8280, 2.70GHz)

SPECSpeed®2017\_fp\_base = 155

SPECSpeed®2017\_fp\_peak = 154

**CPU2017 License:** 9019  
**Test Sponsor:** Cisco Systems  
**Tested by:** Cisco Systems

**Test Date:** Nov-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** May-2019

## Results Table

Benchmark	Base						Peak							
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	56	114	520	<b>113</b>	<b>520</b>	113	521	56	<b>114</b>	<b>519</b>	114	519	113	521
607.cactuBSSN_s	56	<b>88.5</b>	<b>188</b>	89.1	187	88.5	188	56	89.0	187	<b>88.4</b>	<b>189</b>	88.4	189
619.lbm_s	56	48.8	107	48.7	108	<b>48.7</b>	<b>107</b>	56	49.0	107	<b>48.9</b>	<b>107</b>	48.9	107
621.wrf_s	56	101	131	102	130	<b>102</b>	<b>130</b>	56	<b>97.4</b>	<b>136</b>	97.5	136	97.4	136
627.cam4_s	56	70.0	127	<b>70.2</b>	<b>126</b>	70.5	126	56	70.8	125	70.1	126	<b>70.4</b>	<b>126</b>
628.pop2_s	56	<b>212</b>	<b>56.1</b>	213	55.7	210	56.5	56	208	57.0	<b>206</b>	<b>57.5</b>	205	57.9
638.imagick_s	56	80.7	179	<b>80.9</b>	<b>178</b>	82.5	175	56	87.0	166	<b>86.4</b>	<b>167</b>	82.0	176
644.nab_s	56	54.0	323	54.1	323	<b>54.1</b>	<b>323</b>	56	54.0	323	54.1	323	<b>54.0</b>	<b>323</b>
649.fotonik3d_s	56	105	87.1	108	84.6	<b>105</b>	<b>86.5</b>	56	104	87.6	106	86.2	<b>105</b>	<b>87.0</b>
654.roms_s	56	97.3	162	<b>96.8</b>	<b>163</b>	96.3	163	56	<b>99.0</b>	<b>159</b>	98.0	161	99.2	159

SPECSpeed®2017\_fp\_base = **155**

SPECSpeed®2017\_fp\_peak = **154**

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"

## Environment Variables Notes

Environment variables set by runcpu before the start of the run:  
KMP\_AFFINITY = "granularity=fine,compact"  
LD\_LIBRARY\_PATH = "/home/cpu2017/lib/intel64"  
OMP\_STACKSIZE = "192M"

## General Notes

Binaries compiled on a system with 1x Intel Core i9-7900X 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  
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.



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS C220 M5 (Intel Xeon Platinum 8280, 2.70GHz)

SPECspeed®2017\_fp\_base = 155

SPECspeed®2017\_fp\_peak = 154

**CPU2017 License:** 9019  
**Test Sponsor:** Cisco Systems  
**Tested by:** Cisco Systems

**Test Date:** Nov-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** May-2019

### Platform Notes

BIOS Settings:  
Intel HyperThreading Technology set to Disabled  
CPU performance set to Enterprise  
Power Performance Tuning set to OS Controls  
SNC set to Disabled  
Patrol Scrub set to Disabled

sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011  
running on linux-cud8 Fri Nov 1 15:04:27 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 : Intel(R) Xeon(R) Platinum 8280 CPU @ 2.70GHz  
2 "physical id"s (chips)  
56 "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 : 28  
siblings : 28  
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30  
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30

From lscpu:  
Architecture: x86\_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
CPU(s): 56  
On-line CPU(s) list: 0-55  
Thread(s) per core: 1  
Core(s) per socket: 28  
Socket(s): 2  
NUMA node(s): 2  
Vendor ID: GenuineIntel  
CPU family: 6  
Model: 85  
Model name: Intel(R) Xeon(R) Platinum 8280 CPU @ 2.70GHz  
Stepping: 7  
CPU MHz: 2700.000  
CPU max MHz: 4000.0000  
CPU min MHz: 1000.0000  
BogoMIPS: 5400.00

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS C220 M5 (Intel Xeon Platinum 8280, 2.70GHz)

SPECspeed®2017\_fp\_base = 155

SPECspeed®2017\_fp\_peak = 154

**CPU2017 License:** 9019  
**Test Sponsor:** Cisco Systems  
**Tested by:** Cisco Systems

**Test Date:** Nov-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** May-2019

### Platform Notes (Continued)

```

Virtualization:      VT-x
L1d cache:          32K
L1i cache:          32K
L2 cache:           1024K
L3 cache:           39424K
NUMA node0 CPU(s):  0-27
NUMA node1 CPU(s):  28-55
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 cpuid
aperfmpperf tsc_known_freq 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 cpuid_fault
epb cat_l3 cdp_l3 invpcid_single intel_ppin mba tpr_shadow vnmi flexpriority ept
vpid fsgsbase tsc_adjust bml hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a
avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
ibpb ibrs stibp dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku
ospke avx512_vnni arch_capabilities ssbd

```

```

/proc/cpuinfo cache data
cache size : 39424 KB

```

```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
node 0 size: 385603 MB
node 0 free: 378227 MB
node 1 cpus: 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
53 54 55
node 1 size: 387054 MB
node 1 free: 386032 MB
node distances:
node  0  1
 0:  10  21
 1:  21  10

```

```

From /proc/meminfo
MemTotal:      791202012 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

From /etc/*release* /etc/*version*
os-release:
NAME="SLES"
VERSION="15"

```

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS C220 M5 (Intel Xeon Platinum 8280, 2.70GHz)

SPECspeed®2017\_fp\_base = 155

SPECspeed®2017\_fp\_peak = 154

**CPU2017 License:** 9019  
**Test Sponsor:** Cisco Systems  
**Tested by:** Cisco Systems

**Test Date:** Nov-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** May-2019

### Platform Notes (Continued)

```
VERSION_ID="15"  
PRETTY_NAME="SUSE Linux Enterprise Server 15"  
ID="sles"  
ID_LIKE="suse"  
ANSI_COLOR="0;32"  
CPE_NAME="cpe:/o:suse:sles:15"
```

```
uname -a:  
Linux linux-cud8 4.12.14-23-default #1 SMP Tue May 29 21:04:44 UTC 2018 (cd0437b)  
x86_64 x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

```
CVE-2018-3620 (L1 Terminal Fault): No status reported  
Microarchitectural Data Sampling: No status reported  
CVE-2017-5754 (Meltdown): Not affected  
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled  
via prctl and seccomp  
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization  
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted  
Speculation, IBPB, IBRS_FW
```

```
run-level 3 Oct 31 12:12
```

```
SPEC is set to: /home/cpu2017  
Filesystem Type Size Used Avail Use% Mounted on  
/dev/sdb2 btrfs 224G 44G 180G 20% /home
```

```
From /sys/devices/virtual/dmi/id  
BIOS: Cisco Systems, Inc. C220M5.4.0.4g.0.0712190011 07/12/2019  
Vendor: Cisco Systems Inc  
Product: UCSC-C220-M5SX  
Serial: WZP22380CRE
```

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.

```
Memory:  
24x 0xCE00 M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2934
```

(End of data from sysinfo program)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS C220 M5 (Intel Xeon Platinum 8280, 2.70GHz)

SPECspeed®2017\_fp\_base = 155

SPECspeed®2017\_fp\_peak = 154

**CPU2017 License:** 9019

**Test Sponsor:** Cisco Systems

**Tested by:** Cisco Systems

**Test Date:** Nov-2019

**Hardware Availability:** Apr-2019

**Software Availability:** May-2019

### Compiler Version Notes

```

=====
C                | 619.lbm_s(base, peak) 638.imagick_s(base, peak)
                  | 644.nab_s(base, peak)
=====

```

```

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
=====

```

```

=====
C++, C, Fortran | 607.cactuBSSN_s(base, peak)
=====

```

```

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
=====

```

```

=====
Fortran          | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak)
                  | 654.roms_s(base, peak)
=====

```

```

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
=====

```

```

=====
Fortran, C       | 621.wrf_s(base, peak) 627.cam4_s(base, peak)
                  | 628.pop2_s(base, peak)
=====

```

```

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
=====

```



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

**Cisco Systems**

Cisco UCS C220 M5 (Intel Xeon Platinum 8280, 2.70GHz)

SPECspeed®2017\_fp\_base = 155

SPECspeed®2017\_fp\_peak = 154

**CPU2017 License:** 9019  
**Test Sponsor:** Cisco Systems  
**Tested by:** Cisco Systems

**Test Date:** Nov-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** May-2019

## Base 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
```

## 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:

```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
```

Fortran benchmarks:

```
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp  
-nostandard-realloc-lhs
```

Benchmarks using both Fortran and C:

```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP  
-nostandard-realloc-lhs
```

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS C220 M5 (Intel Xeon Platinum 8280, 2.70GHz)

SPECspeed®2017\_fp\_base = 155

SPECspeed®2017\_fp\_peak = 154

CPU2017 License: 9019

Test Sponsor: Cisco Systems

Tested by: Cisco Systems

Test Date: Nov-2019

Hardware Availability: Apr-2019

Software Availability: May-2019

## Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:

```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs
```

## 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:

```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
```

Fortran benchmarks:

```
603.bwaves_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=4
-qopenmp -nostandard-realloc-lhs
```

649.fotonik3d\_s: Same as 603.bwaves\_s

```
654.roms_s: -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
```

(Continued on next page)





# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS C220 M5 (Intel Xeon Platinum 8280, 2.70GHz)

SPECspeed®2017\_fp\_base = 155

SPECspeed®2017\_fp\_peak = 154

**CPU2017 License:** 9019

**Test Sponsor:** Cisco Systems

**Tested by:** Cisco Systems

**Test Date:** Nov-2019

**Hardware Availability:** Apr-2019

**Software Availability:** May-2019

## Peak Optimization Flags (Continued)

654.roms\_s (continued):

`-qopenmp -nostandard-realloc-lhs`

Benchmarks using both Fortran and C:

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=4 -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=4 -qopenmp  
-DSPEC_OPENMP -nostandard-realloc-lhs`

628.pop2\_s: Same as 621.wrf\_s

Benchmarks using Fortran, C, and C++:

`-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP  
-nostandard-realloc-lhs`

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

<http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.html>

<http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-V1.2-revJ.html>

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

<http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.xml>

<http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-V1.2-revJ.xml>

SPEC CPU and SPECspeed are registered trademarks 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 CPU®2017 v1.1.0 on 2019-11-01 18:04:27-0400.

Report generated on 2019-12-17 17:45:51 by CPU2017 PDF formatter v6255.

Originally published on 2019-12-17.