# SPEC® CPU2017 Floating Point Speed Result

**Cisco Systems**

Cisco UCS C220 M5 (Intel Xeon Platinum 8160 2.10 GHz)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>133</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 9019

**Test Sponsor:** Cisco Systems

**Tested by:** Cisco Systems

**Test Date:** Jan-2019

**Hardware Availability:** Aug-2017

**Software Availability:** Nov-2018

## Hardware

**CPU Name:** Intel Xeon Platinum 8160

**Max MHz.:** 3700

**Nominal:** 2100

**Enabled:** 48 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:** 33 MB I+D on chip per chip

**Other:** None

**Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2666V-R)

**Storage:** 1 x 240 GB M.2 SATA SSD

**Other:** None

## Software

**OS:** SUSE Linux Enterprise Server 12 SP3 (x86_64) 4.4.120-94.17-default

**Compiler:** C/C++: Version 19.0.1.144 of Intel C/C++ Compiler for Linux;

**Fortran:** Version 19.0.1.144 of Intel Fortran Compiler for Linux

**Parallel:** Yes

**Firmware:** Version 4.0.1 released Oct-2018

**File System:** xfs

**System State:** Run level 3 (multi-user)

**Base Pointers:** 64-bit

**Peak Pointers:** Not Applicable

**Other:** None
Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Platinum 8160 2.10 GHz)

SPEC CPU2017 Floating Point Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

SPECspeed2017_fp_base = 133
SPECspeed2017_fp_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>48</td>
<td>123</td>
<td>481</td>
<td>123</td>
<td>481</td>
<td>123</td>
<td>479</td>
<td></td>
<td></td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>48</td>
<td>108</td>
<td>155</td>
<td>107</td>
<td>156</td>
<td>108</td>
<td>155</td>
<td></td>
<td></td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>48</td>
<td>54.9</td>
<td>95.4</td>
<td>54.9</td>
<td>95.4</td>
<td>54.8</td>
<td>95.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>48</td>
<td>113</td>
<td>117</td>
<td>113</td>
<td>117</td>
<td>112</td>
<td>118</td>
<td></td>
<td></td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>48</td>
<td>86.6</td>
<td>102</td>
<td>86.5</td>
<td>103</td>
<td>86.8</td>
<td>102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>48</td>
<td>205</td>
<td>57.8</td>
<td>209</td>
<td>56.9</td>
<td>208</td>
<td>57.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>48</td>
<td>122</td>
<td>119</td>
<td>122</td>
<td>118</td>
<td>122</td>
<td>119</td>
<td></td>
<td></td>
</tr>
<tr>
<td>644.nab_s</td>
<td>48</td>
<td>73.2</td>
<td>239</td>
<td>73.3</td>
<td>238</td>
<td>73.3</td>
<td>238</td>
<td></td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>48</td>
<td>111</td>
<td>81.9</td>
<td>112</td>
<td>81.7</td>
<td>111</td>
<td>82.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>654.roms_s</td>
<td>48</td>
<td>106</td>
<td>148</td>
<td>106</td>
<td>149</td>
<td>106</td>
<td>148</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 133
SPECspeed2017_fp_peak = Not Run

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 i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.4
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.

Platform Notes

BIOS Settings:
Intel HyperThreading Technology set to Disabled
CPU performance set to Enterprise

(Continued on next page)
Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Platinum 8160 2.10 GHz)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>133</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

CPU2017 License: 9019
Test Sponsor: Cisco Systems
Tested by: Cisco Systems
Test Date: Jan-2019
Hardware Availability: Aug-2017
Software Availability: Nov-2018

Platform Notes (Continued)

Power Performance Tuning set to OS Controls
SNC set to disabled
Patrol Scrub set to Disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-vaxe Wed Jan 16 03:39:49 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 8160 CPU @ 2.10GHz
 2 "physical id"s (chips)
48 "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 : 24
siblings : 24
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 1
Core(s) per socket: 24
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8160 CPU @ 2.10GHz
Stepping: 4
CPU MHz: 1486.372
CPU max MHz: 3700.0000
CPU min MHz: 1000.0000
BogoMIPS: 4190.16
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 33792K
NUMA node0 CPU(s): 0-23

(Continued on next page)
Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Platinum 8160 2.10 GHz)

SPEC CPU2017 Floating Point Speed Result

SPECspeed2017_fp_base = 133
SPECspeed2017_fp_peak = Not Run

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

Test Date: Jan-2019
Hardware Availability: Aug-2017
Software Availability: Nov-2018

Platform Notes (Continued)

NUMA node1 CPU(s): 24-47
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
aperfmonperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xpr pdc pcd cpa 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 hwte hw_act_window hwp_epp hwp_pkg_req intel_pt rdtscp spec_ctrl stibp
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
c1wb avx512cd avx512bw avx512vl xsaveopt xsavecw xgetbv1 cqm_11c cqm_occup_11c pku
ospke

/proc/cpuinfo cache data
cache size : 33792 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
  node 0 size: 385630 MB
  node 0 free: 383248 MB
  node 1 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
  node 1 size: 387059 MB
  node 1 free: 381433 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10

From /proc/meminfo
MemTotal: 791235424 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"

(Continued on next page)
Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Platinum 8160 2.10 GHz)

SPEC CPU2017 Floating Point Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

 SPECspeed2017_fp_base = 133
 SPECspeed2017_fp_peak = Not Run

CPU2017 License: 9019
Test Sponsor: Cisco Systems

Test Date: Jan-2019
Hardware Availability: Aug-2017

Tested by: Cisco Systems
Software Availability: Nov-2018

Platform Notes (Continued)

ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp3"

uname -a:
   Linux linux-vaxe 4.4.120-94.17-default #1 SMP Wed Mar 14 17:23:00 UTC 2018 (cf3a7bb)
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: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

run-level 3 Jan 15 22:43

SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdc1 xfs 224G 37G 187G 17% /

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 Cisco Systems, Inc. C220M5.4.0.1.139.1003182107 10/03/2018
Memory:
   11x 0xCE00 M393A4K40BB2-CTD 32 GB 2 rank 2666
   13x 0xCE00 M393A4K40CB2-CTD 32 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
==============================================================================
icc (ICC) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================

FC  607.cactuBSSN_s(base)
==============================================================================
icpc (ICC) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 19.0.1.144 20181018

(Continued on next page)
Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Platinum 8160 2.10 GHz)

SPEC CPU2017 Floating Point Speed Result

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>9019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Cisco Systems</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Cisco Systems</td>
</tr>
</tbody>
</table>

**SPECspeed2017_fp_base** = 133
**SPECspeed2017_fp_peak** = Not Run

**Compiler Version Notes (Continued)**

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
ifort (IFORT) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)

ifort (IFORT) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

CC  621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)

ifort (IFORT) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

---

**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

(Continued on next page)
Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Platinum 8160 2.10 GHz)

SPECspeed2017_fp_base = 133
SPECspeed2017_fp_peak = Not Run

CPU2017 License: 9019
Test Sponsor: Cisco Systems
Test Date: Jan-2019
Tested by: Cisco Systems
Hardware Availability: Aug-2017
Software Availability: Nov-2018

Base Portability Flags (Continued)

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=3 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte

Benchmarks using Fortran, C, and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte

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

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.0-official-linux64.xml
http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-V1.2-revH.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 2019-01-16 06:39:49-0500.
Originally published on 2019-02-19.