## SPEC CPU®2017 Floating Point Rate Result

**Cisco Systems**

Cisco UCS C240 M5 (Intel Xeon Silver 4108 1.80 GHz)

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base = 85.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak = Not Run</td>
</tr>
</tbody>
</table>

### CPU2017 License:
9019

**Test Sponsor:** Cisco Systems

**Test Date:** Dec-2018

**Hardware Availability:** Aug-2017

**Tested by:** Cisco Systems

**Software Availability:** Oct-2018

### Hardware

| Copies | 0 | 15.0 | 30.0 | 45.0 | 60.0 | 75.0 | 90.0 | 105 | 120 | 135 | 150 | 165 | 180 | 195 | 210 | 225 | 240 | 255 | 270 | 285 | 300 | 315 |
|--------|---|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 503.bwaves_r | 32 |      |      |      |      |      |      | 59.7 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 507.cactuBSSN_r | 32 |      |      |      |      |      |      | 51.1 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 508.namd_r | 32 |      |      |      |      |      |      | 56.0 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 510.parest_r | 32 |      |      |      |      |      |      | 79.9 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 511.povray_r | 32 |      |      |      |      |      |      | 70.0 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 519.lbm_r | 32 |      |      |      |      |      |      | 103 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 521.wrf_r | 32 |      |      |      |      |      |      | 67.9 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 526.blender_r | 32 |      |      |      |      |      |      | 78.6 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 527.cam4_r | 32 |      |      |      |      |      |      | 155 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 538.imagick_r | 32 |      |      |      |      |      |      | 107 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 544.nab_r | 32 |      |      |      |      |      |      | 98.4 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 549.fotonik3d_r | 32 |      |      |      |      |      |      | 51.2 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 554.roms_r | 32 |      |      |      |      |      |      |      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

### Software

<table>
<thead>
<tr>
<th>OS:</th>
<th>SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.120-92.70-default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>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</td>
</tr>
<tr>
<td>Parallel:</td>
<td>No</td>
</tr>
<tr>
<td>Firmware:</td>
<td>Version 4.0.1 released Oct-2018</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
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<tr>
<td>Power Management:</td>
<td>--</td>
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## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tr>
<td>503.bwaves_r</td>
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<td>1029</td>
<td>312</td>
<td>1032</td>
<td>311</td>
<td>1031</td>
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<tr>
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<td>68.0</td>
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<td>67.9</td>
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<tr>
<td>527.cam4_r</td>
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<td>78.7</td>
<td>715</td>
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<td>712</td>
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<tr>
<td>538.imagick_r</td>
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<td>155</td>
<td>510</td>
<td>156</td>
<td>527</td>
<td>151</td>
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<tr>
<td>544.nab_r</td>
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<td>508</td>
<td>106</td>
<td>504</td>
<td>107</td>
<td>502</td>
<td>107</td>
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<tr>
<td>549.fotonik3d_r</td>
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<td>98.3</td>
<td>1265</td>
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<tr>
<td>554.roms_r</td>
<td>32</td>
<td>994</td>
<td>51.2</td>
<td>996</td>
<td>51.0</td>
<td>993</td>
<td>51.2</td>
</tr>
</tbody>
</table>

## Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

## 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:
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64"

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
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

(Continued on next page)
Cisco Systems
Cisco UCS C240 M5 (Intel Xeon Silver 4108 1.80 GHz)

| SPECrate®2017_fp_base = | 85.8 |
| SPECrate®2017_fp_peak = | Not Run |

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

Test Date: Dec-2018
Hardware Availability: Aug-2017
Software Availability: Oct-2018

General Notes (Continued)

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 Enabled
CPU performance set to Enterprise
Power Performance Tuning set to OS Controls
SNC set to Enabled
IMC Interleaving set to 1-way Interleave
Patrol Scrub set to Disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618b091c0f
running on linux-dkz7 Tue Dec 18 23:44:06 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) Silver 4108 CPU @ 1.80GHz
  2 "physical id"s (chips)
  32 "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 1 2 3 4 5 6 7
  physical 1: cores 0 1 2 3 4 5 6 7

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 32
On-line CPU(s) list: 0-31
Thread(s) per core: 2
Core(s) per socket: 8
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85

(Continued on next page)
Cisco Systems
Cisco UCS C240 M5 (Intel Xeon Silver 4108 1.80 GHz)

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

Platform Notes (Continued)

Model name: Intel(R) Xeon(R) Silver 4108 CPU @ 1.80GHz
Stepping: 4
CPU MHz: 2714.910
CPU max MHz: 3000.0000
CPU min MHz: 800.0000
BogoMIPS: 3591.56
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 11264K
NUMA node0 CPU(s): 0-7,16-23
NUMA node1 CPU(s): 8-15,24-31
Flags: fpu vme de pse tsc msr pae mce cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology

From /proc/cpuinfo cache data
    cache size : 11264 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 16 17 18 19 20 21 22 23
    node 0 size: 385626 MB
    node 0 free: 385138 MB
    node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
    node 1 size: 387054 MB
    node 1 free: 386557 MB
    node distances:
      node    0   1
      0:  10  21
      1:  21  10

From /proc/meminfo
    MemTotal: 791225564 kB
    HugePages_Total: 0
    Hugepagesize: 2048 kB

From /etc/*release* /etc/*version* (Continued on next page)
Cisco Systems
Cisco UCS C240 M5 (Intel Xeon Silver 4108 1.80 GHz)  
SPECrater®2017_fp_base = 85.8  
SPECrater®2017_fp_peak = Not Run

CPU2017 License: 9019  
Test Sponsor: Cisco Systems  
Tested by: Cisco Systems  
Test Date: Dec-2018  
Hardware Availability: Aug-2017  
Software Availability: Oct-2018

Platform Notes (Continued)

SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 2
  # 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-SP2"
    VERSION_ID="12.2"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
  Linux linux-dkz7 4.4.120-92.70-default #1 SMP Wed Mar 14 15:59:43 UTC 2018 (52a83de)
  x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Dec 18 23:43

SPEC is set to: /home/cpu2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 500G 118G 383G 24% /

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. C240M5.4.0.1.139.1003182220 10/03/2018
  Memory:
    12x 0xCE00 M393A4K40BB2-CTD 32 GB 2 rank 2666, configured at 2400
    12x 0xCE00 M393A4K40CB2-CTD 32 GB 2 rank 2666, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
  C               | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
  icc (ICC) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================

(Continued on next page)
Cisco Systems
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| SPECrate®2017_fp_base = 85.8 |
|SPECrate®2017_fp_peak = Not Run |

C++             | 508.namd_r(base) 510.parest_r(base) |
-----------------|--------------------------------------|
icpc (ICC) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---

C++, C          | 511.povray_r(base) 526.blender_r(base) |
-----------------|--------------------------------------|
icpc (ICC) 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.
---

C++, C, Fortran | 507.cactuBSSN_r(base) |
-----------------|----------------------|
icpc (ICC) 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.
ifort (IFORT) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---

Fortran         | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base) |
-----------------|-----------------------------------------------------------|
ifort (IFORT) 19.0.1.144 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---

Fortran, C      | 521.wrf_r(base) 527.cam4_r(base) |
-----------------|----------------------------------|
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icc (ICC) 19.0.1.144 20181018
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---

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

(Continued on next page)
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Base Compiler Invocation (Continued)

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

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

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

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

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_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
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:
-xCORE-AVX512 -ipo -03 -no-prec-div -gopt-prefetch
-ffinite-math-only -gopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX512 -ipo -03 -no-prec-div -gopt-prefetch
-ffinite-math-only -gopt-mem-layout-trans=3

(Continued on next page)
Cisco Systems
Cisco UCS C240 M5 (Intel Xeon Silver 4108 1.80 GHz)

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Base Optimization Flags (Continued)

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

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

Benchmarks using both C and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -gopt-prefetch
-ffinite-math-only -gopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -gopt-prefetch
-ffinite-math-only -gopt-mem-layout-trans=3 -nostaandard-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

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