## SPEC CPU®2017 Floating Point Rate Result

**Cisco Systems**  
Cisco UCS B200 M5 (Intel Xeon Platinum 8280M, 2.70GHz)  

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>272</th>
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</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak</td>
<td>Not Run</td>
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**Test Sponsor:** Cisco Systems  
**Test Date:** Aug-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** May-2019

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

### Copies

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<table>
<thead>
<tr>
<th>503.bwaves_r</th>
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<td>507.cactuBSSN_r</td>
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<td>112</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>112</td>
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</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon Platinum 8280M  
- **Max MHz:** 4000  
- **Nominal:** 2700  
- **Enabled:** 56 cores, 2 chips, 2 threads/core  
- **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  
- **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:** No  
- **Firmware:** Version 4.0.4b released Apr-2019  
- **File System:** btrfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **Other:** None  
- **Power Management:** --
## Cisco Systems

Cisco UCS B200 M5 (Intel Xeon Platinum 8280M, 2.70GHz)

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### Results Table

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<td>2526</td>
<td>173</td>
</tr>
<tr>
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<td>112</td>
<td>1775</td>
<td>100</td>
</tr>
</tbody>
</table>

**SPECrate®2017_fp_base = 272**

**SPECrate®2017_fp_peak = Not Run**

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

## 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/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/je5.0.1-32"
```

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
```

runcpu command invoked through numactl i.e.:

```
umactl --interleave=all runcpu <etc>
```

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)

(Continued on next page)
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Cisco Systems

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

Test Date: Aug-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

General Notes (Continued)

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 Enabled
CPU performance set to Enterprise
Power Performance Tuning set to OS Controls
SNC set to Enabled
IMC Interleaving set to 1-way Interleave
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618b09c0f
running on linux-pmqx Fri Aug 30 18:19:45 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 8280M CPU @ 2.70GHz
    2 "physical id"s (chips)
    112 "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 : 56
  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): 112
  On-line CPU(s) list: 0-111
  Thread(s) per core: 2
  Core(s) per socket: 28
  Socket(s): 2
  NUMA node(s): 4
  Vendor ID: GenuineIntel

(Continued on next page)
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CPU2017 License: 9019
Test Sponsor: Cisco Systems
Test Date: Aug-2019
Hardware Availability: Apr-2019
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Platform Notes (Continued)

- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Platinum 8280M CPU @ 2.70GHz
- Stepping: 6
- CPU MHz: 2700.000
- CPU max MHz: 4000.0000
- CPU min MHz: 1000.0000
- BogoMIPS: 5400.00
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 39424K
- NUMA node0 CPU(s): 0-3, 7-9, 14-17, 21-23, 56-59, 63-73, 77, 79
- NUMA node1 CPU(s): 4-6, 10-13, 18-20, 24-27, 60-62, 66-69, 74-76, 80-83
- NUMA node2 CPU(s): 28-31, 35-37, 42-45, 49-51, 84-87, 91-93, 98-101, 105-107
- NUMA node3 CPU(s): 32-34, 38-41, 46-48, 52-55, 88-90, 94-97, 102-104, 108-111
- Flags: fpu vme de pse move mce 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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
- aperfmpref 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 3nowprefetch cpuid_fault
- epb cat_13 cdpl3 invpcid_single intel_pppin mba tpr_shadow vnumi flexpriority ept
- vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2  invpcid rtm cqm mpx rdt_a
- avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cw avx512cd avx512bw avx512vl
- xsaves opt xsave xgetbv xsave csxsave cqm_llc cqm_occllc cqm_mbm_total cqm_mbm_local
- ibpb ibrs ibrs dtherm ida arat plc pts hwp hwp_act_window hwp_epp hwp_pkg_req pku
- ospke avx512_vnni arch_capabilities ssbd

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

<table>
<thead>
<tr>
<th>node</th>
<th>cpus</th>
<th>size</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>0-3</td>
<td>192089 MB</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>184269 MB</td>
</tr>
<tr>
<td>1</td>
<td>0-11</td>
<td>193520 MB</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>187451 MB</td>
</tr>
<tr>
<td>2</td>
<td>0-31</td>
<td>193520 MB</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>193520 MB</td>
</tr>
</tbody>
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(Continued on next page)
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Platform Notes (Continued)

node 2 free: 187623 MB
node 3 cpus: 32 33 34 38 39 40 41 46 47 48 52 53 54 55 88 89 90 94 95 96 97 102 103 104
node 3 size: 193517 MB
node 3 free: 187673 MB
node distances:
node 0 1 2 3
0: 10 11 21 21
1: 11 10 21 21
2: 21 21 10 11
3: 21 21 11 10

From /proc/meminfo
MemTotal: 791161492 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
NAME="SLES"
VERSION="15"
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-pmqx 4.12.14-23-default #1 SMP Tue May 29 21:04:44 UTC 2018 (cd0437b)
x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Aug 30 13:43
SPEC is set to: /home/cpu2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb4 btrfs 169G 38G 131G 23% /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 Cisco Systems, Inc. B200M5.4.0.4b.0.0407191258 04/07/2019
Memory: 24x 0xCE00 M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2934

(End of data from sysinfo program)
Cisco Systems

Cisco UCS B200 M5 (Intel Xeon Platinum 8280M, 2.70GHz)

SPECraten2017_fp_base = 272
SPECraten2017_fp_peak = Not Run

Compiler Version Notes

==============================================================================
<table>
<thead>
<tr>
<th>C</th>
<th>519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)</th>
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<tbody>
<tr>
<td>Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,</td>
<td></td>
</tr>
<tr>
<td>Version 19.0.4.227 Build 20190416</td>
<td></td>
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Compiler Version Notes (Continued)

===============================================================================
Fortran, C | 521.wrf_r(base) 527.cam4_r(base)
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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.

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

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

(Continued on next page)
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Base Portability Flags (Continued)

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 -O3 -no-prec-div -gopt-prefetch
-ffinite-math-only -gopt-mem-layout-trans=4

C++ benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -gopt-prefetch
-ffinite-math-only -gopt-mem-layout-trans=4

Fortran benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -gopt-prefetch
-ffinite-math-only -gopt-mem-layout-trans=4 -auto
-nostandard-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=4 -auto
-nostandard-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=4

Benchmarks using Fortran, C, and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -gopt-prefetch
-ffinite-math-only -gopt-mem-layout-trans=4 -auto
-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:
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</table>

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