**SPEC CPU®2017 Integer Speed Result**

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

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>10.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed®2017_int_base (10.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s 56</td>
<td>6.36</td>
</tr>
<tr>
<td>602.gcc_s 56</td>
<td>9.56</td>
</tr>
<tr>
<td>605.mcf_s 56</td>
<td>12.2</td>
</tr>
<tr>
<td>620.omnetpp_s 56</td>
<td>7.22</td>
</tr>
<tr>
<td>623.xalancbmk_s 56</td>
<td>12.5</td>
</tr>
<tr>
<td>625.x264_s 56</td>
<td>14.6</td>
</tr>
<tr>
<td>631.deepsjeng_s 56</td>
<td>5.18</td>
</tr>
<tr>
<td>641.leea_s 56</td>
<td>4.30</td>
</tr>
<tr>
<td>648.exchange2_s 56</td>
<td>17.1</td>
</tr>
<tr>
<td>657.xz_s 56</td>
<td>21.9</td>
</tr>
</tbody>
</table>

**Hardware**

**CPU Name:** Intel Xeon Platinum 8280M  
**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  
**Cache L2:** 1 MB I+D on chip per core  
**Cache 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:** Yes  
**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:** jemalloc memory allocator V5.0.1  
**Power Management:** --
Cisco Systems
Cisco UCS B200 M5 (Intel Xeon Platinum 8280M, 2.70GHz)

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

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>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>56</td>
<td>258</td>
<td>6.87</td>
<td>260</td>
<td>6.83</td>
<td>259</td>
<td>6.86</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>56</td>
<td>412</td>
<td>9.66</td>
<td>417</td>
<td>9.56</td>
<td>418</td>
<td>9.53</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>56</td>
<td>388</td>
<td>12.2</td>
<td>383</td>
<td>12.3</td>
<td>389</td>
<td>12.1</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>56</td>
<td>213</td>
<td>7.67</td>
<td>211</td>
<td>7.72</td>
<td>210</td>
<td>7.78</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>56</td>
<td>114</td>
<td>12.5</td>
<td>113</td>
<td>12.5</td>
<td>114</td>
<td>12.4</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>56</td>
<td>121</td>
<td>14.6</td>
<td>121</td>
<td>14.6</td>
<td>121</td>
<td>14.6</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>56</td>
<td>276</td>
<td>5.19</td>
<td>277</td>
<td>5.18</td>
<td>277</td>
<td>5.17</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>56</td>
<td>348</td>
<td>4.90</td>
<td>348</td>
<td>4.90</td>
<td>348</td>
<td>4.90</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>56</td>
<td>172</td>
<td>17.1</td>
<td>171</td>
<td>17.1</td>
<td>171</td>
<td>17.2</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>56</td>
<td>283</td>
<td>21.8</td>
<td>281</td>
<td>22.0</td>
<td>282</td>
<td>21.9</td>
</tr>
</tbody>
</table>

SPECspeed®2017_int_base = 10.1
SPECspeed®2017_int_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:
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 cleard with:
sync; echo 3>/proc/sys/vm/drop_caches
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
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 Integer Speed Result

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

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>10.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

CPU2017 License: 9019
Test Sponsor: Cisco Systems
Test Date: Aug-2019
Tested by: Cisco Systems
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
IMC Interleaving set to Auto
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on linux-pmqx Sat Aug 31 14:23:37 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)
  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 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

(Continued on next page)
Cisco Systems
Cisco UCS B200 M5 (Intel Xeon Platinum 8280M, 2.70GHz)

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

SPECspeed®2017_int_base = 10.1
SPECspeed®2017_int_peak = Not Run

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

Platform Notes (Continued)

| 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
aperfmrperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 sse3
sdbr dbog 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_puin mba tpr_shadow vmni flexpriority ept
vpid fsgsbase tsc_adjust bmlb hle avx2 smep bmi2 erms invpcid rtm cqm mpx rd_t_a
avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsave xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt

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

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: 385615 MB
node 0 free: 384646 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
node 1 size: 387014 MB
node 1 free: 382891 MB
node distances:
      node 0: 0 1
      node 1: 1 0

From /proc/meminfo
MemTotal: 791172588 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

(Continued on next page)
Cisco Systems
Cisco UCS B200 M5 (Intel Xeon Platinum 8280M, 2.70GHz)

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>10.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

CPU2017 License: 9019
Test Sponsor: Cisco Systems
Tested by: Cisco Systems
Test Date: Aug-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

Platform Notes (Continued)

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 31 12:00

SPEC is set to: /home/cpu2017

Filesystem     Type   Size  Used Avail Use% Mounted on
/dev/sdb4      btrfs  169G   18G  151G  11% /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)

Compiler Version Notes

==============================================================================
<table>
<thead>
<tr>
<th>C</th>
<th>600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>625.x264_s(base) 657.xz_s(base)</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------------------</td>
</tr>
<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>
</tr>
<tr>
<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>C++</td>
<td>620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)</td>
</tr>
<tr>
<td></td>
<td>641.leela_s(base)</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------------------</td>
</tr>
<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>
</tr>
<tr>
<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------------------</td>
</tr>
</tbody>
</table>

(Continued on next page)
Cisco Systems
Cisco UCS B200 M5 (Intel Xeon Platinum 8280M, 2.70GHz)

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>10.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

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

---

### Compiler Version Notes (Continued)

Fortran | 648.exchange2_s(base)

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.

---

### Base Compiler Invocation

**C benchmarks:**
```bash
cicc -m64 -std=c11
```

**C++ benchmarks:**
```bash
icpc -m64
```

**Fortran benchmarks:**
```bash
ifort -m64
```

---

### Base Portability Flags

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>-DSPEC_LP64 -DSPEC_LINUX_X64</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>-DSPEC_LP64 -DSPEC_LINUX</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>-DSPEC_LP64</td>
</tr>
</tbody>
</table>

---

### Base Optimization Flags

**C benchmarks:**
```bash
-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -gopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

**C++ benchmarks:**
```bash
-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
```

(Continued on next page)
Cisco Systems
Cisco UCS B200 M5 (Intel Xeon Platinum 8280M, 2.70GHz)

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>10.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

### Base Optimization Flags (Continued)

C++ benchmarks (continued):
- `-qopt-mem-layout-trans=4`
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64`
- `-lqkmalloc`

Fortran benchmarks:
- `xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4`
- `-nostandard-realloc-lhs`

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: