## SPEC® CPU2017 Integer Speed Result

### Huawei

**Huawei 5288 V5 (Intel Xeon Platinum 8276M)**

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base = 10.4</th>
</tr>
</thead>
</table>

**SPECspeed2017_int_peak = Not Run**

<table>
<thead>
<tr>
<th>CPU2017 License: 3175</th>
<th>Test Date: Apr-2019</th>
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<tbody>
<tr>
<td>Test Sponsor: Huawei</td>
<td>Hardware Availability: Apr-2019</td>
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<tr>
<td>Tested by: Huawei</td>
<td>Software Availability: Dec-2018</td>
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</table>

### Hardware

- **CPU Name:** Intel Xeon Platinum 8276M
- **Max MHz.:** 4000
- **Nominal:** 2200
- **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
- **Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R)
- **Storage:** 1 x 1200 GB SAS, 10000 RPM
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 12 SP4 (x86_64) 4.12.14-94.41-default
- **Compiler:** C/C++: Version 19.0.1.144 of Intel C/C++ Compiler Build 20181018 for Linux; Fortran: Version 19.0.1.144 of Intel Fortran Compiler Build 20181018 for Linux
- **Parallel:** Yes
- **Firmware:** Version 6.52 Released Mar-2019
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Other:** jemalloc memory allocator V5.0.1

---

### Threads

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base (10.4)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Thread</th>
<th>Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>56</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>56</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>56</td>
</tr>
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<td>56</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>56</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>56</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>56</td>
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</table>

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**Threads:**

<table>
<thead>
<tr>
<th>Start</th>
<th>End</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>10.4</td>
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<tr>
<td>1</td>
<td>2</td>
<td>12.9</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>9.11</td>
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<tr>
<td>3</td>
<td>4</td>
<td>12.7</td>
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<tr>
<td>4</td>
<td>5</td>
<td>14.8</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>5.54</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>4.90</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>14.4</td>
</tr>
<tr>
<td>8</td>
<td>9</td>
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</tr>
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SPECspeed2017_int_base = 10.4

SPECspeed2017_int_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>
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<tr>
<td>600.perlbench_s</td>
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<td>602.gcc_s</td>
<td>56</td>
<td>383</td>
<td>10.4</td>
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<td>10.4</td>
<td>393</td>
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<td>620.omnetpp_s</td>
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<td>171</td>
<td>9.55</td>
<td>179</td>
<td>9.11</td>
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<tr>
<td>623.xalancbmk_s</td>
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<td>12.6</td>
<td>110</td>
<td>12.8</td>
<td>112</td>
<td>12.7</td>
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<tr>
<td>625.x264_s</td>
<td>56</td>
<td>119</td>
<td>14.8</td>
<td>120</td>
<td>14.7</td>
<td>119</td>
<td>14.8</td>
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<td>631.deepsjeng_s</td>
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<td>259</td>
<td>5.54</td>
<td>257</td>
<td>5.59</td>
<td>259</td>
<td>5.54</td>
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<tr>
<td>641.leela_s</td>
<td>56</td>
<td>349</td>
<td>4.90</td>
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<td>203</td>
<td>14.5</td>
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</table>

SPECspeed2017_int_base = 10.4

SPECspeed2017_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:
KMP_AFFINITY = "granularity=fine,compact,1,0"
OMP_STACKSIZE = "192M"

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
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.
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
Huawei 5288 V5 (Intel Xeon Platinum 8276M)

**Platform Notes**

BIOS configuration:
- Power Policy Set to Load Balance
- Hyper-Threading Set to Disable
- XPT Prefetch Set to Enabled

Sysinfo program /spec2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on sles12sp4 Wed Apr 17 01:50:21 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 8276M CPU @ 2.20GHz
  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 8276M CPU @ 2.20GHz
Stepping:              7
CPU MHz:               2200.000
CPU max MHz:           4000.0000
CPU min MHz:           1000.0000
BogoMIPS:              4400.00
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
```

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Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Dec-2018

L2 cache: 1024K
L3 cache: 39424K
NUMA node0 CPU(s): 0-27
NUMA node1 CPU(s): 28-55
Flags: fpu vme de pse tsc mtrr pae 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 aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtrn pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abal3m abal3ms abal3msx movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abal3m abal3ms abal3msx

Platform Notes (Continued)

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: 191931 MB
node 0 free: 191207 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: 193249 MB
node 1 free: 190720 MB
node distances:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 394425772 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 4
# 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:
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Platform Notes (Continued)

NAME="SLES"
VERSION="12-SP4"
VERSION_ID="12.4"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp4"

uname -a:
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2017-5754 (Meltdown): Not affected
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 Apr 16 16:17
SPEC is set to: /spec2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 700G 14G 687G 2% /

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 INSYDE Corp. 6.52 03/16/2019
Memory:
24x Samsung M393A2K43CB2-CVF 16 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

--------------------------------------------------------------------------------
CC  600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base)
657.xz_s(base)
--------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

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Compiler Version Notes (Continued)

==============================================================================
CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
  641.leela_s(base)
==============================================================================
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================

==============================================================================
FC  648.exchange2_s(base)
==============================================================================
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
  64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Base Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
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Base Optimization Flags

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

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/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:
http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.9-revC.xml

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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 2019-04-17 01:50:20-0400.