# SPEC® CPU2017 Integer Speed Result

## Huawei

### Huawei 2288H V5 (Intel Xeon Platinum 8253)

**SPECspeed2017_int_base** = 7.91  
**SPECspeed2017_int_peak** = 8.10

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>3175</th>
<th>Test Date:</th>
<th>Mar-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Huawei</td>
<td>Hardware Availability:</td>
<td>Apr-2019</td>
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<tr>
<td>Tested by:</td>
<td>Huawei</td>
<td>Software Availability:</td>
<td>Dec-2018</td>
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<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_int_base (7.91)</th>
<th>SPECspeed2017_int_peak (8.10)</th>
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<tbody>
<tr>
<td>600.perlbench_s 32</td>
<td>6.25</td>
<td>8.07</td>
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<tr>
<td>602.gcc_s 32</td>
<td>8.37</td>
<td>10.4</td>
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<td>605.mcf_s 32</td>
<td>6.28</td>
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</tr>
<tr>
<td>620.omnetpp_s 32</td>
<td>6.49</td>
<td>9.81</td>
</tr>
<tr>
<td>623.xalancbmk_s 32</td>
<td>4.37</td>
<td>10.6</td>
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<tr>
<td>625.x264_s 32</td>
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<tr>
<td>631.deepsjeng_s 32</td>
<td>3.68</td>
<td>10.8</td>
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<td>641.leela_s 32</td>
<td>3.68</td>
<td>10.9</td>
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<tr>
<td>648.exchange2_s 32</td>
<td>18.9</td>
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</tr>
<tr>
<td>657.xz_s 32</td>
<td>10.9</td>
<td></td>
</tr>
</tbody>
</table>

## Hardware

**CPU Name:** Intel Xeon Platinum 8253  
**Max MHz.:** 3000  
**Nominal:** 2200  
**Enabled:** 32 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:** 22 MB I+D on chip per chip  
**Other:** None  
**Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)  
**Storage:** 1 x 1200 GB SAS, 10000 RPM  
**Other:** None

## Software

**OS:** SUSE Linux Enterprise Server 12 SP4 (x86_64)  
**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 6.36 Released Feb-2019  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** 64-bit  
**Other:** jemalloc memory allocator V5.0.1
Huawei 2288H V5 (Intel Xeon Platinum 8253)

CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei

SPECspeed2017_int_base = 7.91
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>657.xz_s</td>
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<td>327</td>
<td>18.9</td>
<td>32</td>
<td>326</td>
<td>19.0</td>
<td>325</td>
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</tbody>
</table>

SPECspeed2017_int_base = 7.91
SPECspeed2017_int_peak = 8.10

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
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 linux-71u2 Mon Mar 11 06:02:16 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 8253 CPU @ 2.20GHz
  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 : 16
siblings : 16
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

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:    1
Core(s) per socket:    16
Socket(s):             2
NUMA node(s):          2
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Platinum 8253 CPU @ 2.20GHz
Stepping:              6
CPU MHz:               2200.000
CPU max MHz:           3000.000
CPU min MHz:           1000.0000
BogoMIPS:              4400.00
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              1024K
L3 cache:              22528K

(Continued on next page)
SPEC CPU2017 Integer Speed Result

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Huawei

Huawei 2288H V5 (Intel Xeon Platinum 8253)

| SPECspeed2017_int_base | 7.91 |
| SPECspeed2017_int_peak | 8.10 |

CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei

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

Platform Notes (Continued)

NUMA node0 CPU(s): 0-15
NUMA node1 CPU(s): 16-31
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmrperf pni pclmulqdq dtes64 ms丽 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 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single ssbd
mba ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbse tsc_adjust bni
hle avx2 smep bmi2 ersed invpcid rtm cmpl mpx rdt_a avx512f avx512dq rbseed adx smap
ciflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsaves

cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts pku ospace
avx512_vnni flush_l1d arch_capabilities

/cache data cache size : 22528 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
node 0 size: 191933 MB
node 0 free: 190206 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
node 1 size: 193250 MB
node 1 free: 192096 MB
node distances:
nodel 0 1
0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 394428352 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:
NAME="SLES"
VERSION="12-SP4"
VERSION_ID="12.4"

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Huawei 2288H V5 (Intel Xeon Platinum 8253)  

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**SPECspeed2017_int_base** = 7.91  
**SPECspeed2017_int_peak** = 8.10

Platform Notes (Continued)

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 Mar 8 03:08

SPEC is set to: /spec2017

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda2</td>
<td>xfs</td>
<td>1.7T</td>
<td>7.7G</td>
<td>1.7T</td>
<td>1%</td>
<td>/</td>
</tr>
</tbody>
</table>

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. 6.36 02/15/2019
Memory:
12x Micron 36ASF4G72PZ-2G9E2 32 GB 2 rank 2933
12x NO DIMM NO DIMM

(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, peak) 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.

==============================================================================
CC  600.perlbench_s(peak) 602.gcc_s(peak) 605.mcf_s(peak) 657.xz_s(peak)
(Continued on next page)
# SPEC CPU2017 Integer Speed Result

## Huawei

### Huawei 2288H V5 (Intel Xeon Platinum 8253)

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### Compiler Version Notes (Continued)

```
-----------------------------------------------------------------------------
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.             
-----------------------------------------------------------------------------

CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base,  
  peak) 641.leela_s(base, peak)                                             
-----------------------------------------------------------------------------

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.             
-----------------------------------------------------------------------------

CXXC 620.omnetpp_s(peak)                                                   
-----------------------------------------------------------------------------

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, peak)                                              
-----------------------------------------------------------------------------

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
  ```
Huawei

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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
- 631.deepsjeng_s: -DSPEC_LP64
- 641.leela_s: -DSPEC_LP64
- 648.exchange2_s: -DSPEC_LP64
- 657.xz_s: -DSPEC_LP64

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
- -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

Peak Compiler Invocation

C benchmarks:
- icc -m64 -std=c11

C++ benchmarks:
- icpc -m64

Fortran benchmarks:
- ifort -m64
Huawei

Huawei 2288H V5 (Intel Xeon Platinum 8253)

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Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3 -no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -fno-strict-overflow -L/usr/local/je5.0.1-64/lib -ljemalloc

602.gcc_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512 -qopt-mem-layout-trans=4 -ipo -O3 -no-prec-div -DSPEC_SUPPRESS_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

605.mcf_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4 -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

625.x264_s: -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

657.xz_s: -Wl,-z,muldefs -xCORE-AVX512 -O3 -no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:

620.omnetpp_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4 -DSPEC_SUPPRESS_OPENMP -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64 -lgkmalloc

623.xalancbmk_s: basepeak = yes

631.deepsjeng_s: -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

(Continued on next page)
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Huawei

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CPU2017 License: 3175
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Peak Optimization Flags (Continued)

631.deepsjeng_s (continued):
-1qkmalloc

641.leela_s: Same as 631.deepsjeng_s

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 2019-03-11 06:02:15-0400.