**Huawei**

**Huawei 2288H V5 (Intel Xeon Gold 6140)**

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>8.81</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
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</tr>
</tbody>
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**CPU2017 License:** 3175  
**Test Date:** Jan-2018  
**Hardware Availability:** Jul-2017  
**Test Sponsor:** Huawei  
**Software Availability:** Sep-2017  
**Tested by:** Huawei

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<th>Threads</th>
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<tr>
<td>625.x264_s</td>
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<td>10.2</td>
</tr>
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<td>631.deepsjeng_s</td>
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<td>4.31</td>
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<td>648.exchange2_s</td>
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<td>13.4</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>72</td>
<td>21.5</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Gold 6140  
- **Max MHz.:** 3700  
- **Nominal:** 2300  
- **Enabled:** 36 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:** 24.75 MB I+D on chip per core  
- **Other:** None  
- **Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)  
- **Storage:** 1 x 1200 GB SAS, 10000 RPM  
- **Other:** None

**Software**

- **OS:** SUSE Linux Enterprise Server 12 SP2 (x86_64)  
- **Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++  
- **Compiler for Linux:** Fortran: Version 18.0.0.128 of Intel Fortran  
- **Firmware:** Version 0.37 Released Nov-2017  
- **Parallel:** Yes  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 32/64-bit  
- **Other:** jemalloc: jemalloc memory allocator library V5.0.1
## SPEC CPU2017 Integer Speed Result

**Huawei**

Huawei 2288H V5 (Intel Xeon Gold 6140)

**CPU2017 License:** 3175  
**Test Sponsor:** Huawei  
**Tested by:** Huawei  
**Test Date:** Jan-2018  
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### Results Table

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<thead>
<tr>
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</table>

**SPECspeed2017_int_base =** 8.81  
**SPECspeed2017_int_peak =** 9.07

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,scatter"
- OMP_STACKSIZE = "192M"

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

jemalloc: configured and built at default for  
32bit (i686) and 64bit (x86_64) targets;  
jemalloc: built with the RedHat Enterprise 7.4,  
and the system compiler gcc 4.8.5;  
jemalloc: sources available from jemalloc.net or  

No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.  
No: 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.

(Continued on next page)
**Huawei**

**Huawei 2288H V5 (Intel Xeon Gold 6140)**

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<td>Huawei</td>
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<tr>
<td>Software Availability:</td>
<td>Sep-2017</td>
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</tbody>
</table>

**General Notes (Continued)**

No: 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.

This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.

The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, http://www.spec.org/osg/policy.html

This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.

**Platform Notes**

BIOS configuration:
- Power Efficiency Mode Set to Custom
- Hyper-Threading Set to Disable

Sysinfo program /spec2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on linux-jujq Sat Jan 13 07:38:10 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) Gold 6140 CPU @ 2.30GHz
- 2 "physical id"s (chips)
- 36 "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 : 18
- siblings : 18
- physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
- physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27

From lscpu:
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 36

(Continued on next page)
Huawei

Huawei 2288H V5 (Intel Xeon Gold 6140)

SPEC CPU2017 Integer Speed Result

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Huawei

Huawei 2288H V5 (Intel Xeon Gold 6140)

SPECspeed2017_int_base = 8.81
SPECspeed2017_int_peak = 9.07

CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Jan-2018
Tested by: Huawei
Hardware Availability: Jul-2017
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Platform Notes (Continued)

On-line CPU(s) list: 0-35
Thread(s) per core: 1
Core(s) per socket: 18
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6140 CPU @ 2.30GHz
Stepping: 4
CPU MHz: 1000.000
CPU max MHz: 2301.0000
CPU min MHz: 1000.0000
BogoMIPS: 4600.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
NUMA node0 CPU(s): 0-17
NUMA node1 CPU(s): 18-35
Flags: fpu vme de pse mre prae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpl 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
aperfmpref eagerfpu 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 3dnowprefetch ida arat epb pls dtherm intel_pt
tpr_shadow vni flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
ers invpcid rtm cqm mpx avx512f avx512d avx512dq rdseed adx smap clflushopt clwb avx512cd
avx512bw avx512vl xsaveopt xsaves xgetbv1 cqm_llc cqm_occup_llc

/proc/cpuinfo cache data

cache size: 25344 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 16 17
node 0 size: 191497 MB
node 0 free: 190404 MB
node 1 cpus: 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
node 1 size: 193382 MB
node 1 free: 192261 MB
node distances:
node 0 1
 0: 10 21
 1: 21 10

(Continued on next page)
**SPEC CPU2017 Integer Speed Result**

**Huawei**

### Huawei 2288H V5 (Intel Xeon Gold 6140)

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**Test Date:** Jan-2018  
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**Software Availability:** Sep-2017

---

**Platform Notes (Continued)**

From `/proc/meminfo`:
- MemTotal: 394117236 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From `/etc/*release* /etc/*version*`:
- 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-jujq 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67)  
  x86_64 x86_64 x86_64 GNU/Linux

- run-level 3 Jan 13 02:30

**SPEC is set to:** `/spec2017`  
**Filesysten**  
<table>
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<tr>
<th>Type</th>
<th>Size</th>
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<td>500G</td>
<td>27G</td>
<td>474G</td>
<td>6%</td>
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</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. 0.37 11/13/2017
- Memory:
  - 24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666

(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, 
(Continued on next page)
Huawei
Huawei 2288H V5 (Intel Xeon Gold 6140)

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

Compiler Version Notes (Continued)

```
peak) 657.xz_s(base)

--------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
CC 600.perlbench_s(peak) 602.gcc_s(peak) 605.mcf_s(peak) 657.xz_s(peak)
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
  641.leela_s(base)
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
CXXC 620.omnetpp_s(peak) 623.xalancbmk_s(peak) 631.deepsjeng_s(peak)
  641.leela_s(peak)
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
FC 648.exchange2_s(base, peak)
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort
SPEC CPU2017 Integer Speed Result

Huawei

Huawei 2288H V5 (Intel Xeon Gold 6140)

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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-AVX2 -ipo -O3 -no-prec-div
- -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
- -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:

- -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
- -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:

- -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
- -qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
- -L/usr/local/je5.0.1-64/lib -ljemalloc

**Base Other Flags**

C benchmarks:

- -m64 -std=c11

C++ benchmarks:

- -m64

Fortran benchmarks:

- -m64
Huawei 2288H V5 (Intel Xeon Gold 6140)

**Peak Compiler Invocation**

C benchmarks:
- icc

C++ benchmarks:
- icpc

Fortran benchmarks:
- ifort

**Peak 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: -D_FILE_OFFSET_BITS=64 -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

(Continued on next page)
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**Software Availability:** Sep-2017

### Peak Optimization Flags (Continued)

657.xz_s: Same as 602.gcc_s

**C++ benchmarks:**

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32 -W1,-z,muldefs -prof-gen(pass1) -prof-use(pass 2) -ipo -xCORE-AVX2 -03 -no-prec-div -qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -L/usr/local/je5.0.1-32/lib -ljemalloc

631.deepsjeng_s: basepeak = yes

641.leela_s: basepeak = yes

**Fortran benchmarks:**

-W1,-z,muldefs -xCORE-AVX2 -ipo -03 -no-prec-div -qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte -L/usr/local/je5.0.1-64/lib -ljemalloc

### Peak Other Flags

**C benchmarks:**

-m64 -std=c11

**C++ benchmarks (except as noted below):**

-m64

623.xalancbmk_s: -m32

**Fortran benchmarks:**

-m64

---

The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html

http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.7.html

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml

http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.7.xml
Huawei

Huawei 2288H V5 (Intel Xeon Gold 6140)

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Software Availability: Sep-2017

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