Huawei

## SPEC® CPU2017 Integer Speed Result

<table>
<thead>
<tr>
<th>Test Sponsor</th>
<th>Hardware Availability</th>
<th>Software Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huawei</td>
<td>Jul-2017</td>
<td>Sep-2017</td>
</tr>
<tr>
<td>Huawei</td>
<td>Jan-2018</td>
<td></td>
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</table>

### CPU2017 License: 3175

### Tested by: Huawei

### Test Date: Jan-2018

### Hardware

- **CPU Name**: Intel Xeon Gold 6142
- **Max MHz.**: 3700
- **Nominal**: 2600
- **Enabled**: 32 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**: 22 MB I+D on chip per chip
- **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) 4.4.21-69-default
- **Compiler**: C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux
- **Parallel**: Yes
- **Firmware**: Version 0.37 Released Nov-2017
- **File System**: xfs
- **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

### SPECspeed2017_int_base = 8.75

### SPECspeed2017_int_peak = 9.02

### Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_int_base</th>
<th>SPECspeed2017_int_peak</th>
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<td>6.17</td>
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<td>64</td>
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<td>9.56</td>
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</tr>
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---

**Threads**

0 1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0 21.0 22.0 23.0
Huawei

Huawei 2288H V5 (Intel Xeon Gold 6142)

SPECspeed2017_int_base = 8.75
SPECspeed2017_int_peak = 9.02

CPU2017 License: 3175
Test Date: Jan-2018
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Results Table

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SPECspeed2017_int_base = 8.75
SPECspeed2017_int_peak = 9.02

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"
LD_LIBRARY_PATH = "/spec2017/lib/ia32;/spec2017/lib/intel64;/spec2017/je5.0.1-32;/spec2017/je5.0.1-64"
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)
### SPEC CPU2017 Integer Speed Result

**Huawei**

**Huawei 2288H V5 (Intel Xeon Gold 6142)**

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**CPU2017 License:** 3175  
**Test Date:** Jan-2018  
**Test Sponsor:** Huawei  
**Hardware Availability:** Jul-2017  
**Tested by:** Huawei  
**Software Availability:** Sep-2017

### 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](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 96c45e4568ad54c135fd618bccc091c0f
  running on linux-jujq Fri Jan 19 22:12:39 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](https://www.spec.org/cpu2017/Docs/config.html#sysinfo)

**From /proc/cpuinfo**
- model name: Intel(R) Xeon(R) Gold 6142 CPU @ 2.60GHz
- 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

(Continued on next page)
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SPECspeed2017_int_base = 8.75
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Platform Notes (Continued)

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) Gold 6142 CPU @ 2.60GHz
Stepping: 4
CPU MHz: 1000.000
CPU max MHz: 2601.0000
CPU min MHz: 1000.0000
BogoMIPS: 5200.02
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K
NUMA node0 CPU(s): 0-15
NUMA node1 CPU(s): 16-31
Flags: fpu vme de pse mce cx8 apic sep mtrr pae 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 aperfmpref perfmonitor 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 pnt ds dtherm intel_pt tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 3dnow invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512bw axv512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc

/proc/cpuinfo 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: 191497 MB
  node 0 free: 190405 MB
  node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
  node 1 size: 193382 MB
  node 1 free: 192348 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10

(Continued on next page)
Huawei

Huawei 2288H V5 (Intel Xeon Gold 6142)

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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 19 17:02

SPEC is set to: /spec2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 500G 27G 474G 6% /

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)
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### Compiler Version Notes (Continued)

- **peak** 657.xz_s(base)

---

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

---

```plaintext
CC 600.perlbench_s(peak) 602.gcc_s(peak) 605.mcf_s(peak) 657.xz_s(peak)
```

---

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

---

```plaintext
CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
641.leela_s(base)
```

---

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

---

```plaintext
CXXC 620.omnetpp_s(peak) 623.xalancbmk_s(peak) 631.deepsjeng_s(peak)
641.leela_s(peak)
```

---

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

---

```plaintext
FC 648.exchange2_s(base, peak)
```

---

```plaintext
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
Huawei 2288H V5 (Intel Xeon Gold 6142)  

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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
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### 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`

### Peak Optimization Flags

#### C benchmarks:

- `600.perlbench_s`: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2`
- `-xCORE-AVX2 -qopt-mem-layout-trans=3 -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-AVX2 -qopt-mem-layout-trans=3 -ipo -O3`
- `-no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp`
- `-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc`

- `605.mcf_s`: `basepeak = yes`

- `625.x264_s`: `-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`

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

<table>
<thead>
<tr>
<th>Huawei 2288H V5 (Intel Xeon Gold 6142)</th>
<th>Huawei</th>
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<tbody>
<tr>
<td><strong>SPECspeed2017_int_base</strong> = 8.75</td>
<td><strong>SPECspeed2017_int_peak</strong> = 9.02</td>
<td></td>
</tr>
</tbody>
</table>

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

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

### Peak Optimization Flags (Continued)

657.xz_s: Same as 602.gcc_s

C++ benchmarks:

```
620.omnetpp_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo 
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3 
-DSPEC_SUPPRESS_OPENMP -gopenmp -DSPEC_OPENMP 
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

623.xalancbmk_s: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32 
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo 
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3 
-DSPEC_SUPPRESS_OPENMP -gopenmp -DSPEC_OPENMP 
-L/usr/local/je5.0.1-32/lib -ljemalloc

631.deepsjeng_s: basepeak = yes

641.leela_s: basepeak = yes

### Peak Other Flags

C benchmarks:

```
-m64 -std=c11
```

C++ benchmarks (except as noted below):

```
-m64
```

623.xalancbmk_s: -m32

### 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
```

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

## Huawei

**Huawei 2288H V5 (Intel Xeon Gold 6142)**

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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/Intel-ic18.0-official-linux64.xml)
- [http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.7.xml](http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.7.xml)

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