## SPEC® CPU2017 Integer Speed Result

**Huawei**

**Huawei G560 V5 (Intel Xeon Gold 6140)**

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>7.86</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 3175  
**Test Sponsor:** Huawei  
**Test Date:** Apr-2019  
**Hardware Availability:** Jul-2017  
**Tested by:** Huawei  
**Software Availability:** Nov-2018

### 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 chip  
- **Order:** None  
- **Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R)  
- **Storage:** 1 x 1920 GB SATA SSD  
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux Server release 7.6 (x86_64)  
  (Maipo)  
- **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 1.09 Released Jan-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
## SPEC CPU2017 Integer Speed Result

**Huawei**

**Huawei G560 V5 (Intel Xeon Gold 6140)**

### SPECspeed2017_int_base = 7.86

### SPECspeed2017_int_peak = Not Run

**CPU2017 License:** 3175  
**Test Date:** Apr-2019  
**Hardware Availability:** Jul-2017  
**Test Sponsor:** Huawei  
**Software Availability:** Nov-2018  
**Tested by:** Huawei

### 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>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600:perlbench_s</td>
<td>36</td>
<td>337</td>
<td>5.27</td>
<td><strong>333</strong></td>
<td><strong>5.33</strong></td>
<td>333</td>
<td>5.33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>602:gcc_s</td>
<td>36</td>
<td>518</td>
<td><strong>7.68</strong></td>
<td>519</td>
<td>7.68</td>
<td>518</td>
<td>7.68</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>605:mcf_s</td>
<td>36</td>
<td>465</td>
<td>10.1</td>
<td><strong>466</strong></td>
<td><strong>10.1</strong></td>
<td>467</td>
<td>10.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>620:omnetpp_s</td>
<td>36</td>
<td>253</td>
<td><strong>6.45</strong></td>
<td>252</td>
<td>6.48</td>
<td>257</td>
<td>6.34</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>623:xalancbmk_s</td>
<td>36</td>
<td>144</td>
<td>9.81</td>
<td>145</td>
<td>9.75</td>
<td><strong>145</strong></td>
<td><strong>9.79</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>625:x264_s</td>
<td>36</td>
<td>172</td>
<td>10.2</td>
<td>172</td>
<td>10.3</td>
<td><strong>172</strong></td>
<td><strong>10.2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>631:deepsjeng_s</td>
<td>36</td>
<td><strong>329</strong></td>
<td><strong>4.36</strong></td>
<td>329</td>
<td>4.36</td>
<td>329</td>
<td>4.36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>641:leela_s</td>
<td>36</td>
<td>465</td>
<td>3.67</td>
<td><strong>464</strong></td>
<td><strong>3.68</strong></td>
<td>464</td>
<td>3.68</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>648:exchange2_s</td>
<td>36</td>
<td><strong>273</strong></td>
<td><strong>10.8</strong></td>
<td>273</td>
<td>10.8</td>
<td>272</td>
<td>10.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>657:xz_s</td>
<td>36</td>
<td>317</td>
<td>19.5</td>
<td>319</td>
<td>19.4</td>
<td><strong>317</strong></td>
<td><strong>19.5</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 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

# SPEC CPU2017 Integer Speed Result

## Huawei

### Huawei G560 V5 (Intel Xeon Gold 6140)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>7.86</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CPU2017 License</th>
<th>3175</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor</td>
<td>Huawei</td>
</tr>
<tr>
<td>Tested by</td>
<td>Huawei</td>
</tr>
<tr>
<td>Test Date</td>
<td>Apr-2019</td>
</tr>
<tr>
<td>Hardware Availability</td>
<td>Jul-2017</td>
</tr>
<tr>
<td>Software Availability</td>
<td>Nov-2018</td>
</tr>
</tbody>
</table>

## 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 localhost.localdomain Wed Apr 17 14:07:58 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) Gold 6140 CPU @ 2.30GHz
- physical id"s (chips)
- 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
- 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: 2301.000
- 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

(Continued on next page)
Huawei

Huawei G560 V5 (Intel Xeon Gold 6140)

SPEC CPU2017 Integer Speed Result
Copyright 2017-2019 Standard Performance Evaluation Corporation

SPECspeed2017_int_base = 7.86
SPECspeed2017_int_peak = Not Run

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

Test Date: Apr-2019
Hardware Availability: Jul-2017
Software Availability: Nov-2018

Platform Notes (Continued)

NUMA node0 CPU(s): 0-17
NUMA node1 CPU(s): 18-35
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 rdtsdp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperfmpref perf erfu pni pclmulqdq dtes64 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 ebdt cat_l3 cdp_l3 intel_pni intel_pt ssbd
mbs ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1
hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap
clflushopt clwb avx512cd avx512bw avx512v1 xsaveopt xsaves xgetbv1 cqm_llc
rqm_occup_llc rqm_mbbq_local dtherm ida arat pln pts pkp ospke
spec_ctrl intel_stibp flush_l1d

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: 195187 MB
  node 0 free: 189769 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: 196608 MB
  node 1 free: 190572 MB
  node distances:
  node 0 1
  0: 10 21
  1: 21 10

From /proc/meminfo
MemTotal: 394621960 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
os-release:
  NAME="Red Hat Enterprise Linux Server"
  VERSION="7.6 (Maipo)"
  ID="rhel"
  ID_LIKE="fedora"
  VARIANT="Server"
  VARIANT_ID="server"
  VERSION_ID="7.6"
  PRETTY_NAME="Red Hat Enterprise Linux Server 7.6 (Maipo)"
  redhat-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)

(Continued on next page)
Huawei

Huawei G560 V5 (Intel Xeon Gold 6140)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>7.86</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

Test Date: Apr-2019
Hardware Availability: Jul-2017
Software Availability: Nov-2018

Platform Notes (Continued)

system-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)

uname -a:

Linux localhost.localdomain 3.10.0-957.el7.x86_64 #1 SMP Thu Oct 4 20:48:51 UTC 2018
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: Load fences, __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS (kernel)

run-level 3 Apr 17 10:09

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/sda4</td>
<td>xfs</td>
<td>300G</td>
<td>8.2G</td>
<td>292G</td>
<td>3%</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. 1.09 01/31/2019
Memory:

12x NO DIMM NO DIMM
12x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
<table>
<thead>
<tr>
<th>CC</th>
<th>perlbench_s(base)</th>
<th>gcc_s(base)</th>
<th>mcf_s(base)</th>
<th>x264_s(base)</th>
<th>xz_s(base)</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.</td>
<td></td>
<td>602.</td>
<td>605.</td>
<td>625.</td>
<td>657.</td>
</tr>
<tr>
<td>---------</td>
<td>-------------------</td>
<td>-------------</td>
<td>-------------</td>
<td>--------------</td>
<td>------------</td>
</tr>
</tbody>
</table>

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) 631.deepsjeng_s(base)
       641.leela_s(base)

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
SPEC CPU2017 Integer Speed Result

Huawei

Huawei G560 V5 (Intel Xeon Gold 6140)

| SPECspeed2017_int_base | 7.86 |
| SPECspeed2017_int_peak | Not Run |

CPU2017 License: 3175
Test Date: Apr-2019
Test Sponsor: Huawei
Tested by: Huawei

Hardware Availability: Jul-2017
Software Availability: Nov-2018

Compiler Version Notes (Continued)

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
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:
-W1, -z, muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

(Continued on next page)
Huawei G560 V5 (Intel Xeon Gold 6140)  

**SPEC CPU2017 Integer Speed Result**

**Huawei**

**SPECspeed2017_int_base = 7.86**

**SPECspeed2017_int_peak = Not Run**

<table>
<thead>
<tr>
<th>CPU2017 License: 3175</th>
<th>Test Date: Apr-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: Huawei</td>
<td>Hardware Availability: Jul-2017</td>
</tr>
<tr>
<td>Tested by: Huawei</td>
<td>Software Availability: Nov-2018</td>
</tr>
</tbody>
</table>

**Base Optimization Flags (Continued)**

C benchmarks (continued):
- `-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:

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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 14:07:58-0400.