# SPEC® CPU2017 Integer Speed Result

**Huawei**

**Huawei 5288 V5 (Intel Xeon Gold 5220)**

**SPECspeed2017_int_base** = 9.99

**SPECspeed2017_int_peak** = Not Run

---

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

---

### Threads

<table>
<thead>
<tr>
<th>Test</th>
<th>SPEC Name</th>
<th>SPECspeed2017_int_base</th>
<th>Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>perlbench</td>
<td></td>
<td>6.82</td>
</tr>
<tr>
<td>602</td>
<td>gcc</td>
<td></td>
<td>9.89</td>
</tr>
<tr>
<td>605</td>
<td>mcf</td>
<td></td>
<td>12.6</td>
</tr>
<tr>
<td>620</td>
<td>omnetpp</td>
<td></td>
<td>7.40</td>
</tr>
<tr>
<td>623</td>
<td>xalancbmk</td>
<td></td>
<td>12.5</td>
</tr>
<tr>
<td>625</td>
<td>x264</td>
<td></td>
<td>14.4</td>
</tr>
<tr>
<td>631</td>
<td>deepsjeng</td>
<td></td>
<td>5.49</td>
</tr>
<tr>
<td>641</td>
<td>leela</td>
<td></td>
<td>4.78</td>
</tr>
<tr>
<td>648</td>
<td>exchange2</td>
<td></td>
<td>14.1</td>
</tr>
<tr>
<td>657</td>
<td>xz</td>
<td></td>
<td>27.3</td>
</tr>
</tbody>
</table>

---

**Hardware**

- **CPU Name**: Intel Xeon Gold 5220  
- **Max MHz.**: 3900  
- **Nominal**: 2200  
- **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  
- **Other**: None  
- **Memory**: 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R, running at 2666)  
- **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 6.52 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
SPEC CPU2017 Integer Speed Result

Huawei

Huawei 5288 V5 (Intel Xeon Gold 5220)

SPECspeed2017_int_base = 9.99
SPECspeed2017_int_peak = Not Run

CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Apr-2019
Tested by: Huawei
Hardware Availability: Apr-2019
Software Availability: Dec-2018

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>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600.perlbench_s</td>
<td>36</td>
<td>263</td>
<td>6.76</td>
<td>260</td>
<td>6.82</td>
<td>260</td>
<td>6.84</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>36</td>
<td>409</td>
<td>9.73</td>
<td>396</td>
<td>10.1</td>
<td>403</td>
<td>9.89</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>36</td>
<td>373</td>
<td>12.6</td>
<td>369</td>
<td>12.8</td>
<td>373</td>
<td>12.6</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>36</td>
<td>208</td>
<td>7.85</td>
<td>212</td>
<td>7.70</td>
<td>209</td>
<td>7.80</td>
</tr>
<tr>
<td>623.xalanbmks_c</td>
<td>36</td>
<td>114</td>
<td>12.5</td>
<td>113</td>
<td>12.5</td>
<td>113</td>
<td>12.5</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>36</td>
<td>122</td>
<td>14.4</td>
<td>122</td>
<td>14.5</td>
<td>123</td>
<td>14.4</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>36</td>
<td>261</td>
<td>5.49</td>
<td>260</td>
<td>5.50</td>
<td>262</td>
<td>5.47</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>36</td>
<td>357</td>
<td>4.78</td>
<td>357</td>
<td>4.78</td>
<td>357</td>
<td>4.78</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>36</td>
<td>208</td>
<td>14.1</td>
<td>208</td>
<td>14.1</td>
<td>209</td>
<td>14.1</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>36</td>
<td>278</td>
<td>22.3</td>
<td>278</td>
<td>22.2</td>
<td>277</td>
<td>22.3</td>
</tr>
</tbody>
</table>

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"
LD_LIBRARY_PATH = "/spec/lib/ia32:/spec/lib/intel64:/spec/je5.0.1-32:/spec/je5.0.1-64"
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.
Huawei

Huawei 5288 V5 (Intel Xeon Gold 5220)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>9.99</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

CPU2017 License: 3175
Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Dec-2018

Platform Notes

BIOS configuration:
Power Policy Set to Load Balance
Hyper-Threading Set to Disable
XPT Prefetch Set to Enabled
Sysinfo program /spec/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on sles12sp4 Mon Apr 1 00:38:04 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 5220 CPU @ 2.20GHz
  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
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 5220 CPU @ 2.20GHz
Stepping: 6
CPU MHz: 2200.000
CPU max MHz: 3900.0000
CPU min MHz: 1000.0000
BogoMIPS: 4400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K

(Continued on next page)
Huawei 5288 V5 (Intel Xeon Gold 5220)

**SPECspeed2017_int_base = 9.99**

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>Test Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3175</td>
<td>Apr-2019</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Sponsor:</th>
<th>Hardware Availability:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huawei</td>
<td>Apr-2019</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tested by:</th>
<th>Software Availability:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huawei</td>
<td>Dec-2018</td>
</tr>
</tbody>
</table>

**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 rdtscp lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmpref perf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtrp 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 ibpb stibp tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mxp rdt_a avx512f avx512dq rdseed adx clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec xsavevc xsaveoptx xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts pku ospke avx512_vnni flush_l1d arch_capabilities

/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: 191904 MB
node 0 free: 186492 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: 193278 MB
node 1 free: 190035 MB
node distances:
node 0 1
0: 10 21
1: 21 10
```

From /proc/meminfo

```
MemTotal: 394427492 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"
```

(Continued on next page)
Huawei 5288 V5 (Intel Xeon Gold 5220)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>9.99</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

Huawei

CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei
Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Dec-2018

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 31 21:15

SPEC is set to: /spec
Filesystem Type  Size  Used Avail Use% Mounted on
/dev/sda3 xfs 849G 38G 812G 5% /

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, configured at 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)
   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.
==============================================================================

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

(Continued on next page)
Huawei

Huawei 5288 V5 (Intel Xeon Gold 5220)

SPEC CPU2017 Integer Speed Result

Huawei

Huawei 5288 V5 (Intel Xeon Gold 5220)

SPECspeed2017_int_base = 9.99
SPECspeed2017_int_peak = Not Run

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

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

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.

==============================================================================
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
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64
### SPEC CPU2017 Integer Speed Result

**Huawei**

**Huawei 5288 V5 (Intel Xeon Gold 5220)**

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>9.99</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**Huawei 5288 V5 (Intel Xeon Gold 5220)**

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

#### Base Optimization Flags

**C benchmarks:**

- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-ipo`  
- `-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`  
- `-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`  
- `-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 2019-04-01 00:38:04-0400.  