# SPEC® CPU2017 Integer Speed Result

## Huawei

**Huawei 5288 V5 (Intel Xeon Gold 6130T)**

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>SPECspeed2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.88</td>
<td>9.20</td>
</tr>
</tbody>
</table>

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

### Hardware

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon Gold 6130T</td>
</tr>
<tr>
<td>Max MHz.</td>
<td>3700</td>
</tr>
<tr>
<td>Nominal</td>
<td>2100</td>
</tr>
<tr>
<td>Enabled</td>
<td>32 cores, 2 chips</td>
</tr>
<tr>
<td>Orderable</td>
<td>1,2 chips</td>
</tr>
<tr>
<td>Cache L1</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2</td>
<td>1 MB I-D on chip per core</td>
</tr>
<tr>
<td>L3</td>
<td>22 MB I-D on chip per chip</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)</td>
</tr>
<tr>
<td>Storage</td>
<td>1 x 1200 GB SAS, 10000 RPM</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>SUSE Linux Enterprise Server 12 SP2 (x86_64)</td>
</tr>
<tr>
<td>Compiler C++</td>
<td>Version 18.0.0.128 of Intel C/C++</td>
</tr>
<tr>
<td>Compiler Fortran</td>
<td>Version 18.0.0.128 of Intel Fortran</td>
</tr>
<tr>
<td>Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>Firmware</td>
<td>Version 0.62 Released Mar-2018</td>
</tr>
<tr>
<td>File System</td>
<td>xfs</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other</td>
<td>jemalloc: jemalloc memory allocator library V5.0.1;</td>
</tr>
</tbody>
</table>

### Benchmark Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads 32</th>
<th>SPECspeed2017_int_base</th>
<th>SPECspeed2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench_s</td>
<td>6.23</td>
<td>7.42</td>
<td>9.62</td>
</tr>
<tr>
<td>gcc_s</td>
<td>6.12</td>
<td>6.40</td>
<td>9.57</td>
</tr>
<tr>
<td>mcf_s</td>
<td>5.20</td>
<td></td>
<td>10.2</td>
</tr>
<tr>
<td>omnetpp_s</td>
<td>4.31</td>
<td></td>
<td>13.4</td>
</tr>
<tr>
<td>xalancbmk_s</td>
<td></td>
<td></td>
<td>15.4</td>
</tr>
<tr>
<td>x264_s</td>
<td></td>
<td></td>
<td>21.9</td>
</tr>
<tr>
<td>deepsjeng_s</td>
<td></td>
<td></td>
<td>22.4</td>
</tr>
<tr>
<td>leela_s</td>
<td></td>
<td></td>
<td>23.0</td>
</tr>
<tr>
<td>exchange2_s</td>
<td></td>
<td></td>
<td>24.4</td>
</tr>
<tr>
<td>xz_s</td>
<td></td>
<td></td>
<td>25.0</td>
</tr>
</tbody>
</table>

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Huawei
Huawei 5288 V5 (Intel Xeon Gold 6130T)

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

Test Date: Jul-2018
Hardware Availability: Jul-2017
Software Availability: Feb-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>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>602.gcc_s</td>
<td>32</td>
<td>414</td>
<td>9.62</td>
<td>413</td>
<td>9.64</td>
<td>414</td>
<td>9.61</td>
<td>32</td>
<td>403</td>
<td>9.88</td>
<td>399</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>32</td>
<td>410</td>
<td>11.5</td>
<td>411</td>
<td>11.5</td>
<td>414</td>
<td>11.4</td>
<td>32</td>
<td>409</td>
<td>11.5</td>
<td>410</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>32</td>
<td>260</td>
<td>6.26</td>
<td>267</td>
<td>6.12</td>
<td>280</td>
<td>5.82</td>
<td>32</td>
<td>254</td>
<td>6.42</td>
<td>255</td>
</tr>
<tr>
<td>623.xalanchmk_s</td>
<td>32</td>
<td>149</td>
<td>9.50</td>
<td>148</td>
<td>9.60</td>
<td>148</td>
<td>9.57</td>
<td>32</td>
<td>139</td>
<td>10.2</td>
<td>139</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>32</td>
<td>153</td>
<td>11.5</td>
<td>153</td>
<td>11.5</td>
<td>153</td>
<td>11.5</td>
<td>32</td>
<td>153</td>
<td>11.5</td>
<td>153</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>32</td>
<td>276</td>
<td>5.20</td>
<td>275</td>
<td>5.20</td>
<td>276</td>
<td>5.18</td>
<td>32</td>
<td>276</td>
<td>5.20</td>
<td>275</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>32</td>
<td>396</td>
<td>4.31</td>
<td>397</td>
<td>4.30</td>
<td>396</td>
<td>4.31</td>
<td>32</td>
<td>396</td>
<td>4.31</td>
<td>397</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>32</td>
<td>219</td>
<td>13.4</td>
<td>219</td>
<td>13.4</td>
<td>219</td>
<td>13.4</td>
<td>32</td>
<td>219</td>
<td>13.5</td>
<td>219</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>32</td>
<td>282</td>
<td>21.9</td>
<td>281</td>
<td>22.0</td>
<td>282</td>
<td>21.9</td>
<td>32</td>
<td>276</td>
<td>22.4</td>
<td>273</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,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;
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 6130T)

<table>
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<tr>
<th>SPECspeed2017_int_base</th>
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<td>8.88</td>
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CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei

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: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on linux-2gz1 Mon Jul 9 22:57:05 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 6130T CPU @ 2.10GHz
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) Gold 6130T CPU @ 2.10GHz
Stepping: 4
CPU MHz: 1100.000
CPU max MHz: 2101.0000
CPU min MHz: 1000.0000
BogoMIPS: 4200.03
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K

(Continued on next page)
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SPECspeed2017_int_base = 8.88

SPECspeed2017_int_peak = 9.20

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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 art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
                        aperfmperf 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 abml1 hle avx2 smep bmi2 ibrms invpcid rtm cqm mpx
                        avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt
                        xsaves xgetbv1 cqm_llc cqm_occup_llc

/cache data

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.

/proc/cpuinfo

From /proc/meminfo

From /etc/*release* /etc/*version*

SuSE-release:

NAME="SLES"
VERSION="12-SP2"
VERSION_ID="12.2"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"

(Continued on next page)
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Test Date: Jul-2018
Software Availability: Feb-2018
Hardware Availability: Jul-2017

Platform Notes (Continued)

ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
    Linux linux-2gz1 4.4.114-92.64-default #1 SMP Thu Feb 1 19:18:19 UTC 2018 (c6ce5db)
    x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jul 9 07:55

SPEC is set to: /spec2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 269G 30G 240G 11% /

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. 0.62 03/26/2018
    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, 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

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Compiler Version Notes (Continued)

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

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
Huawei

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<tr>
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**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

---

**Peak Compiler Invocation**

C benchmarks:
- icc

C++ benchmarks:
- icpc

Fortran benchmarks:
- ifort

---

**Peak Portability Flags**

600.perlbench_S: -DSPEC_LP64 -DSPEC_LINUX_X64

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Peak Portability Flags (Continued)

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: -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 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

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

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 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

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Peak Optimization Flags (Continued)

623.xalancbmk_s: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
-W1,-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 -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 -O3 -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

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-V1.9-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 v1.0.2 on 2018-07-09 22:57:05-0400.
Originally published on 2018-08-07.