# SPEC® CPU2017 Integer Rate Result

**Huawei**

Huawei 1288H V5 (Intel Xeon Silver 4108)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>65.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>69.6</td>
</tr>
</tbody>
</table>

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

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### Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon Silver 4108</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max MHz.:</td>
<td>3000</td>
</tr>
<tr>
<td>Nominal:</td>
<td>1800</td>
</tr>
<tr>
<td>Enabled:</td>
<td>16 cores, 2 chips, 2 threads/core</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>11 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, running at 2400)</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

| OS: | Red Hat Enterprise Linux Server release 7.4 (Maipo)  
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.10.0-693.11.6.el7.x86_64</td>
</tr>
</tbody>
</table>
| 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: | No |
| Firmware: | Version 0.62 Released Mar-2018 |
| 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; |
Huawei 1288H V5 (Intel Xeon Silver 4108)

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### SPEC CPU2017 Integer Rate Result

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>32</td>
<td>1037</td>
<td>49.1</td>
<td>1035</td>
<td>49.2</td>
<td>1059</td>
<td>48.1</td>
<td>32</td>
<td>837</td>
<td>60.9</td>
<td>845</td>
<td>60.3</td>
<td>847</td>
<td>60.1</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>32</td>
<td>748</td>
<td>60.5</td>
<td>750</td>
<td>60.4</td>
<td>758</td>
<td>59.8</td>
<td>32</td>
<td>654</td>
<td>69.3</td>
<td>657</td>
<td>69.0</td>
<td>656</td>
<td>69.1</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>32</td>
<td>634</td>
<td>81.6</td>
<td>624</td>
<td>82.8</td>
<td>648</td>
<td>79.8</td>
<td>32</td>
<td>634</td>
<td>81.6</td>
<td>624</td>
<td>82.8</td>
<td>648</td>
<td>79.8</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>32</td>
<td>901</td>
<td>46.6</td>
<td>904</td>
<td>46.4</td>
<td>903</td>
<td>46.5</td>
<td>32</td>
<td>901</td>
<td>46.6</td>
<td>904</td>
<td>46.4</td>
<td>903</td>
<td>46.5</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>32</td>
<td>485</td>
<td>69.7</td>
<td>488</td>
<td>69.3</td>
<td>486</td>
<td>69.6</td>
<td>32</td>
<td>411</td>
<td>82.3</td>
<td>408</td>
<td>82.8</td>
<td>409</td>
<td>82.6</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>32</td>
<td>473</td>
<td>119</td>
<td>472</td>
<td>119</td>
<td>474</td>
<td>118</td>
<td>32</td>
<td>446</td>
<td>126</td>
<td>457</td>
<td>123</td>
<td>457</td>
<td>123</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>32</td>
<td>657</td>
<td>55.8</td>
<td>657</td>
<td>55.8</td>
<td>657</td>
<td>55.8</td>
<td>32</td>
<td>657</td>
<td>55.8</td>
<td>657</td>
<td>55.8</td>
<td>657</td>
<td>55.8</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>32</td>
<td>1064</td>
<td>49.8</td>
<td>1068</td>
<td>49.6</td>
<td>1061</td>
<td>50.0</td>
<td>32</td>
<td>1048</td>
<td>50.6</td>
<td>1044</td>
<td>50.8</td>
<td>1040</td>
<td>51.0</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>32</td>
<td>714</td>
<td>117</td>
<td>714</td>
<td>118</td>
<td>714</td>
<td>117</td>
<td>32</td>
<td>714</td>
<td>117</td>
<td>715</td>
<td>117</td>
<td>714</td>
<td>117</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>32</td>
<td>695</td>
<td>49.7</td>
<td>748</td>
<td>46.2</td>
<td>695</td>
<td>49.7</td>
<td>32</td>
<td>695</td>
<td>49.7</td>
<td>748</td>
<td>46.2</td>
<td>695</td>
<td>49.7</td>
</tr>
</tbody>
</table>

**Submit Notes**

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

**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:

```
```

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
```
runcpu command invoked through numactl i.e.:
```
numactl --interleave=all runcpu <etc>
```
jemalloc: configured and built at default for 32bit (i648) and 64bit (x86_64) targets;
jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5;
**Huawei**

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<table>
<thead>
<tr>
<th>SPECrate2017_int_base = 65.7</th>
<th>SPECrate2017_int_peak = 69.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2017 License: 3175</td>
<td>Test Date: Jul-2018</td>
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<tr>
<td>Test Sponsor: Huawei</td>
<td>Hardware Availability: Jul-2017</td>
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<tr>
<td>Tested by: Huawei</td>
<td>Software Availability: Jan-2018</td>
</tr>
</tbody>
</table>

**General Notes (Continued)**

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.

**Platform Notes**

BIOS configuration:
Power Policy Set to Performance
XPT Prefetch Set to Enabled
Sysinfo program /spec2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Tue Jul 17 20:56:12 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) Silver 4108 CPU @ 1.80GHz
  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 : 8
  siblings : 16
  physical 0: cores 0 1 2 3 4 5 6 7
  physical 1: cores 0 1 2 3 4 5 6 7
```

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:    2
Core(s) per socket:    8
Socket(s):             2
NUMA node(s):          2
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Silver 4108 CPU @ 1.80GHz
Stepping:              4
```

(Continued on next page)
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Huawei 1288H V5 (Intel Xeon Silver 4108)

SPECrate2017_int_base = 65.7
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CPU2017 License: 3175
Test Sponsor: Huawei
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CPU MHz: 1800.000
BogoMIPS: 3600.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 11264K
NUMA node0 CPU(s): 0-7, 16-23
NUMA node1 CPU(s): 8-15, 24-31

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
aperfmrperf eagerfp lrni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 fma cx16 xtpre
pcm dc dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx
fl64c rdrand lahf_lm abm 3dnowprefetch epb cat_l3 cdp_l3 invpcid_single intel_pt
spec_ctrl ibpb_support tpr_shadow vnumi flexpriority ept vpid fsgrbase tsc_adjust
bmi1 hle avx2 smep bmi2 erms invpcid rtm cgq mpx rdt_a avx512f avx512dq rdseed adx
smad clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cgq_llc
cgq_occupp llc cgq_mb_total cgq_mb_local dtherm ida arat p1n pts

/proc/cpuinfo cache data

Cache size : 11264 KB

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

available: 2 nodes (0-1)
nmde 0 cpus: 0 1 2 3 4 5 6 7 16 17 18 19 20 21 22 23
node 0 size: 195701 MB
node 0 free: 189382 MB
node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
node 1 size: 196608 MB
node 1 free: 190828 MB

node distances:
node 0 1 1
node 0: 10 21
node 1: 21 10

From /proc/meminfo

MemTotal: 395141240 KB
HugePages_Total: 0
Hugepagesize: 2048 KB

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

os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.4 (Maipo)"
ID="rhel"
Huawei

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Platform Notes (Continued)

ID_LIKE="fedora"
VARIANT="Server"
VARIANT_ID="server"
VERSION_ID="7.4"
PPRETTY_NAME="Red Hat Enterprise Linux Server 7.4 (Maipo)"
redhat-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.4:ga:server

uname -a:
Linux localhost.localdomain 3.10.0-693.11.6.el7.x86_64 #1 SMP Thu Dec 28 14:23:39 EST 2017 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jul 16 13:28

SPEC is set to: /spec2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 700G 35G 666G 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. 0.62 03/26/2018
Memory:
24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
525.x264_r(base, peak) 557.xz_r(base, peak)
==============================================================================
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
CC  500.perlbench_r(peak) 502.gcc_r(peak)
==============================================================================
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

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Huawei
Huawei 1288H V5 (Intel Xeon Silver 4108)

SPECrate2017_int_base = 65.7
SPECrate2017_int_peak = 69.6

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

Compiler Version Notes (Continued)

startswith
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
541.leela_r(base)

icpc (ICC) 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

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64

(Continued on next page)
Huawei 1288H V5 (Intel Xeon Silver 4108)

**SPEC CPU2017 Integer Rate Result**

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<thead>
<tr>
<th>Huawei</th>
<th>SPECrate2017_int_base = 65.7</th>
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<tbody>
<tr>
<td>Test Date:</td>
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<td>Jul-2017</td>
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<tr>
<td>Test Sponsor:</td>
<td>Huawei</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Jan-2018</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 3175

**Tested by:** Huawei

**Base Portability Flags (Continued)**

- 541.leela_r: -DSPEC_LP64
- 548.exchange2_r: -DSPEC_LP64
- 557.xz_r: -DSPEC_LP64

**Base Optimization Flags**

- **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

- **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
Huawei
Huawei 1288H V5 (Intel Xeon Silver 4108)

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CPU2017 License: 3175
Test Sponsor: Huawei
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Tested by: Huawei
Hardware Availability: Jul-2017
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Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -D_FILE_OFFSET_BITS=64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:
500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
-fno-strict-overflow -L/usr/local/je5.0.1-64/lib
-ljemalloc

502.gcc_r: -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
-L/usr/local/je5.0.1-32/lib -ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -fno-alias
-L/usr/local/je5.0.1-64/lib -ljemalloc

557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: basepeak = yes

523.xalancbmk_r: -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
-L/usr/local/je5.0.1-32/lib -ljemalloc

531.deepsjeng_r: basepeak = yes

(Continued on next page)
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| SPECrate2017_int_base | 65.7 |
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**Peak Optimization Flags (Continued)**

541.leela_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -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

**Peak Other Flags**

C benchmarks (except as noted below):
-m64 -std=c11

502.gcc_r: -m32 -std=c11

C++ benchmarks (except as noted below):
-m64

523.xalancbmk_r: -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 2018-07-17 20:56:11-0400.
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