Huawei
Huawei 1288H V5 (Intel Xeon Silver 4112)

SPECrate2017_int_base = 44.0
SPECrate2017_int_peak = 46.8

Hardware
CPU Name: Intel Xeon Silver 4112
Max MHz.: 3000
Nominal: 2600
Enabled: 8 cores, 2 chips, 2 threads/core
Orderable: 1.2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 8.25 MB I+D on chip per chip
Other: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)
Storage: 1 x 1200 GB SAS, 10000 RPM
Other: None

Software
OS: Red Hat Enterprise Linux Server release 7.4 (Maipo)
3.10.0-693.11.6.el7.x86_64
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
Huawei 1288H V5 (Intel Xeon Silver 4112)

Results Table

<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>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>16</td>
<td>773</td>
<td>32.9</td>
<td>766</td>
<td>32.5</td>
<td>784</td>
<td>32.5</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>16</td>
<td>581</td>
<td>39.0</td>
<td>583</td>
<td>38.9</td>
<td>583</td>
<td>38.9</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>16</td>
<td>463</td>
<td>55.8</td>
<td>456</td>
<td>56.7</td>
<td>465</td>
<td>55.6</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>16</td>
<td>745</td>
<td>28.4</td>
<td>750</td>
<td>28.0</td>
<td>751</td>
<td>28.0</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>16</td>
<td>358</td>
<td>47.2</td>
<td>359</td>
<td>47.1</td>
<td>355</td>
<td>47.5</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>16</td>
<td>329</td>
<td>85.2</td>
<td>329</td>
<td>85.1</td>
<td>329</td>
<td>85.1</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>16</td>
<td>438</td>
<td>38.0</td>
<td>483</td>
<td>37.9</td>
<td>483</td>
<td>37.9</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>16</td>
<td>769</td>
<td>34.5</td>
<td>769</td>
<td>34.5</td>
<td>769</td>
<td>34.4</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>16</td>
<td>512</td>
<td>81.8</td>
<td>516</td>
<td>81.2</td>
<td>516</td>
<td>81.2</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>16</td>
<td>337</td>
<td>32.2</td>
<td>540</td>
<td>32.0</td>
<td>534</td>
<td>32.3</td>
</tr>
</tbody>
</table>

SPECRate2017_int_base = 44.0
SPECRate2017_int_peak = 46.8

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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 (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

(Continued on next page)
Huawei

Huawei 1288H V5 (Intel Xeon Silver 4112)

<table>
<thead>
<tr>
<th>SPEC CPU2017 License: 3175</th>
<th>Test Date: Jul-2018</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: Jan-2018</td>
</tr>
</tbody>
</table>

**SPEC CPU2017 Integer Rate Result**

SPECrate2017_int_base = 44.0

SPECrate2017_int_peak = 46.8

**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 Sun Jul 8 11:17:48 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 4112 CPU @ 2.60GHz
2 "physical id"s (chips)
16 "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 : 4
siblings : 8
physical 0: cores 0 1 4 5
physical 1: cores 0 2 3 4

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 16
On-line CPU(s) list: 0-15
Thread(s) per core: 2
Core(s) per socket: 4
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4112 CPU @ 2.60GHz

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Huawei

Huawei 1288H V5 (Intel Xeon Silver 4112)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>44.0</td>
<td>46.8</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

Platform Notes (Continued)

Stepping: 4
CPU MHz: 2600.000
BogoMIPS: 5200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 8448K
NUMA node0 CPU(s): 0-3, 8-11
NUMA node1 CPU(s): 4-7, 12-15
Flags: fpu vme de pse tsc msr pae mce cmov pat pse36 clflush dtscache apic mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtsscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 fma

From numactl --hardware
	WARNING: a numactl 'node' might or might not correspond to a physical chip.
	node 0 cpus: 0 1 2 3 8 9 10 11

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)"

(Continued on next page)
### Huawei

**Huawei 1288H V5 (Intel Xeon Silver 4112)**

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>44.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>46.8</td>
</tr>
</tbody>
</table>

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

---

**Platform Notes (Continued)**

```ini
ID="rhel"
ID_LIKE="fedora"
VARIANT="Server"
VARIANT_ID="server"
VERSION_ID="7.4"
PRETTY_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 6 11:43**

**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.
```
# SPEC CPU2017 Integer Rate Result

**Huawei**

**Huawei 1288H V5 (Intel Xeon Silver 4112)**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_base</td>
<td>44.0</td>
</tr>
<tr>
<td>SPECrate2017_int_peak</td>
<td>46.8</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

---

## Compiler Version Notes (Continued)

```plaintext
==============================================================================
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.
```

```plaintext
==============================================================================
CXXC 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak)  
541.leela_r(peak)
==============================================================================
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```plaintext
==============================================================================
FC 548.exchange2_r(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

```
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
```

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

<table>
<thead>
<tr>
<th>Huawei 1288H V5 (Intel Xeon Silver 4112)</th>
<th>SPECrate2017_int_base = 44.0</th>
<th>SPECrate2017_int_peak = 46.8</th>
</tr>
</thead>
</table>

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

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

---

### Base Portability Flags (Continued)

- 531.deepsjeng_r: `-DSPEC_LP64`
- 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`

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

Huawei 1288H V5 (Intel Xeon Silver 4112)

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

**SPECrate2017_int_base = 44.0**  
**SPECrate2017_int_peak = 46.8**

### Peak Compiler Invocation (Continued)

**Fortran benchmarks:**

ifort

### 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`
- `505.mcf_r: -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`
- `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:

(Continued on next page)
**SPEC CPU2017 Integer Rate Result**

**Huawei**

Huawei 1288H V5 (Intel Xeon Silver 4112)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>44.0</td>
<td>46.8</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

---

**Peak Optimization Flags (Continued)***

520.omnetpp_r: 
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX2 -03 -no-prec-div -qopt-mem-layout-trans=3  
-L/usr/local/je5.0.1-64/lib -ljemalloc

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 -03 -no-prec-div -qopt-mem-layout-trans=3  
-L/usr/local/je5.0.1-32/lib -ljemalloc

531.deepsjeng_r: basepeak = yes

541.leela_r: Same as 520.omnetpp_r

**Fortran benchmarks:**

548.exchange2_r: basepeak = yes

---

**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
<table>
<thead>
<tr>
<th>Huawei 1288H V5 (Intel Xeon Silver 4112)</th>
<th>Huawei</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_base = 44.0</td>
<td>Huawei</td>
</tr>
<tr>
<td>SPECrate2017_int_peak = 46.8</td>
<td>Huawei</td>
</tr>
</tbody>
</table>

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

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 v1.0.2 on 2018-07-08 11:17:47-0400.
Originally published on 2018-08-07.