Huawei

Huawei CH225 V5 (Intel Xeon Platinum 8160)  

| SPECrate2017_int_base = 223 |
| SPECrate2017_int_peak = 237 |

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

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<th>SPECrate2017_int_base (223)</th>
<th>SPECrate2017_int_peak (237)</th>
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<td></td>
</tr>
<tr>
<td>557.xz_r</td>
<td>158</td>
<td></td>
</tr>
</tbody>
</table>

**Hardware**

CPU Name: Intel Xeon Platinum 8160  
Max MHz.: 3700  
Nominal: 2100  
Enabled: 48 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: 33 MB I+D on chip per chip  
Other: None  
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)  
Storage: 1 x 1200 GB SAS, 10000 RPM  
Other: None

**Software**

OS: Red Hat Enterprise Linux Server release 7.3 (Maipo)  
Compiler: C/C++: Version 18.0.2.199 of Intel C/C++  
Compiler for Linux: Fortran: Version 18.0.2.199 of Intel Fortran  
Compiler for Linux:  
Parallel: No  
Firmware: Version 0.80 Released Jun-2018  
File System: xfs  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 32/64-bit  
Other: jemalloc memory allocator V5.0.1
Huawei

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Results Table

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<td>595</td>
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<td>96</td>
<td>579</td>
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<td>879</td>
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<td>541.leela_r</td>
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<td>557.xz_r</td>
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<td>96</td>
<td>652</td>
</tr>
</tbody>
</table>

SPECrater2017_int_base = 223
SPECrater2017_int_peak = 237

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 i7-6700K 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
runcpu command invoked through numactl i.e.:
  numactl --interleave=all runcpu <etc>
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)
SPEC CPU2017 Integer Rate Result

Huawei

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CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Oct-2018
Tested by: Huawei

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Test Sponsor: Huawei
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Tested by: Huawei

General Notes (Continued)

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

Platform Notes

BIOS configuration:
Power Policy Set to Performance
SNC Set to Enabled
IMC Interleaving Set to 1-way Interleave
XPT Prefetch Set to Enabled
Sysinfo program /spec2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Fri Oct 12 13:42:33 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) Platinum 8160 CPU @ 2.10GHz
  2 "physical id"s (chips)
  96 "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 : 24
siblings : 48
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29

From lscpu:

Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 96
On-line CPU(s) list: 0-95
Thread(s) per core: 2
Core(s) per socket: 24
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8160 CPU @ 2.10GHz
Stepping: 4

(Continued on next page)
Huawei

Huawei CH225 V5 (Intel Xeon Platinum 8160)

<table>
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<th>CPU2017 License:</th>
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<tr>
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<td>Jul-2017</td>
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<td>Software Availability:</td>
<td>Mar-2018</td>
</tr>
</tbody>
</table>

**SPEC CPU2017 Integer Rate Result**

**SPECrate2017_int_base = 223**

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---

**Platform Notes (Continued)**

```
CPU MHz:               2100.000  
BogoMIPS:              4204.86  
Virtualization:        VT-x  
L1d cache:             32K  
L1i cache:             32K  
L2 cache:              1024K  
L3 cache:              33792K  
NUMA node0 CPU(s):     0-2, 6-8, 12-14, 18-20, 48-50, 54-56, 60-62, 66-68  
NUMA node1 CPU(s):     3-5, 9-11, 15-17, 21-23, 51-53, 57-59, 63-65, 69-71  
NUMA node2 CPU(s):     24-26, 30-32, 36-38, 42-44, 72-74, 78-80, 84-86, 90-92  
NUMA node3 CPU(s):     27-29, 33-35, 39-41, 45-47, 75-77, 81-83, 87-89, 93-95  
```

```
/platform/cpuintinfo cache data
    cache size : 33792 KB
```

---

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)
node 0 cpus: 0 1 2 6 7 8 12 13 14 18 19 20 48 49 50 54 55 56 60 61 62 66 67 68
node 0 size: 96433 MB
node 0 free: 93798 MB
node 1 cpus: 3 4 5 9 10 11 15 16 17 21 22 23 51 52 53 57 58 59 63 64 65 69 70 71
node 1 size: 98304 MB
node 1 free: 95959 MB
node 2 cpus: 24 25 26 30 31 32 36 37 38 42 43 44 72 73 74 78 79 80 84 85 86 90 91 92
node 2 size: 98304 MB
node 2 free: 95992 MB
node 3 cpus: 27 28 29 33 34 35 39 40 41 45 46 47 75 76 77 81 82 83 87 88 89 93 94 95
node 3 size: 98304 MB
node 3 free: 95443 MB
node distances:
node 0: 10 11 21 21
node 1: 11 10 21 21
node 2: 21 21 10 11
node 3: 21 21 11 10

From /proc/meminfo
MemTotal:       394168652 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.3 (Maipo)"
ID="rhel"

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

### Huawei

**Huawei CH225 V5 (Intel Xeon Platinum 8160)**

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**CPU2017 License:** 3175  
**Test Sponsor:** Huawei  
**Test Date:** Oct-2018  
**Hardware Availability:** Jul-2017  
**Tested by:** Huawei  
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### Platform Notes (Continued)

```plaintext
ID_LIKE="fedora"  
VERSION_ID="7.3"  
PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"  
ANSI_COLOR="0;31"  
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"  
redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)  
system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)  
```

```
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 Oct 12 13:41**

**SPEC is set to:** /spec2017  
**Filesystem**  
<table>
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<tr>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
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<tbody>
<tr>
<td>xfs</td>
<td>400G</td>
<td>16G</td>
<td>384G</td>
<td>4%</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. 0.80 06/27/2018
- Memory: 24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666

(End of data from sysinfo program)

### Compiler Version Notes

```
== CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_r(base) ==
== icc (ICC) 18.0.2 20180210 ==
== Copyright (C) 1985-2018 Intel Corporation. All rights reserved. ==
```

```
== CC  500.perlbench_r(peak) 502.gcc_r(peak) 505.mcf_r(peak) 525.x264_r(peak) 557.xz_r(peak) ==
== icc (ICC) 18.0.2 20180210 ==
== Copyright (C) 1985-2018 Intel Corporation. All rights reserved. ==
```

(Continued on next page)
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Compiler Version Notes (Continued)

---------------------------------------------------------------------
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
541.leela_r(base)
---------------------------------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---------------------------------------------------------------------

---------------------------------------------------------------------
CXXC 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak)
541.leela_r(peak)
---------------------------------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---------------------------------------------------------------------

---------------------------------------------------------------------
FC 548.exchange2_r(base)
---------------------------------------------------------------------
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---------------------------------------------------------------------

---------------------------------------------------------------------
FC 548.exchange2_r(peak)
---------------------------------------------------------------------
ifort (IFORT) 18.0.2 20180210
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
## SPEC CPU2017 Integer Rate Result

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</tr>
</tbody>
</table>

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

### Base Optimization Flags

**C benchmarks:**

- `-Wl,-z,muldefs -xCORE-AVX512 -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-AVX512 -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-AVX512 -ipo -O3 -no-prec-div
- qopt-mem-layout-trans=3 -nostandard-realloc-lhs
- -L/usr/local/je5.0.1-64/lib -ljemalloc`

### Peak Compiler Invocation

**C benchmarks (except as noted below):**

- `icc -m64 -std=c11`

**C++ benchmarks (except as noted below):**

- `icpc -m64`

**Fortran benchmarks:**

- `ifort -m64`
<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench</td>
<td>-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -fno-strict-overflow -L/usr/local/je5.0.1-64/lib -ljemalloc</td>
</tr>
<tr>
<td>gcc</td>
<td>-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-32/lib -ljemalloc</td>
</tr>
<tr>
<td>mcf</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>x264</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>xz</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>omnetpp</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>xalanbmk</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>xalancbmk</td>
<td>-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-32/lib -ljemalloc</td>
</tr>
<tr>
<td>deepsjeng</td>
<td>-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc</td>
</tr>
<tr>
<td>leela</td>
<td>Same as 531.deepsjeng</td>
</tr>
</tbody>
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Peak Optimization Flags (Continued)

Fortran benchmarks:

548.exchange2_r: basepeak = yes

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:

http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.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 2018-10-12 13:42:32-0400.
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