**Huawei CH225 V5 (Intel Xeon Platinum 8164)**

**SPECrate2017_int_base** = 235

**SPECrate2017_int_peak** = 250

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<thead>
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<th>Test Sponsor</th>
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<th>Software Availability</th>
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<td>Huawei</td>
<td>Jul-2017</td>
<td>Mar-2018</td>
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</tbody>
</table>

**CPU2017 License:** 3175

**Test Date:** Oct-2018

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<tr>
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<tr>
<td>500.perlbench_r</td>
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<td>520.omnetpp_r</td>
<td>104</td>
<td>154</td>
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<td>525.x264_r</td>
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<td>531.deepsjeng_r</td>
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<td>548.exchange2_r</td>
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<td>201</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>104</td>
<td>179</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Platinum 8164
- **Max MHz.:** 3700
- **Nominal:** 2000
- **Enabled:** 52 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:** 35.75 MB I+D on chip per chip
- **Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2666V-R)
- **Storage:** 1 x 1200 GB SAS, 10000 RPM
- **Other:** None

**Software**

- **OS:** Red Hat Enterprise Linux Server release 7.4 (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
SPEC CPU2017 Integer Rate Result
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Huawei

Huawei CH225 V5 (Intel Xeon Platinum 8164)

SPECrater2017_int_base = 235
SPECrater2017_int_peak = 250

CPU2017 License: 3175
Test Date: Oct-2018
Hardware Availability: Jul-2017

Test Sponsor: Huawei
Software Availability: Mar-2018

Tested by: Huawei

Results Table

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<th>Seconds</th>
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<td>478</td>
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<td>557.xz_r</td>
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<td>672</td>
<td>167</td>
<td>104</td>
<td>629</td>
</tr>
</tbody>
</table>

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 (Meltdrown) 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)
(Continued on next page)
**Huawei**

Huawei CH225 V5 (Intel Xeon Platinum 8164)

**SPEC CPU2017 Integer Rate Result**

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</table>

CPU2017 License: 3175
Test Date: Oct-2018
Test Sponsor: Huawei
Hardware Availability: Jul-2017
Tested by: Huawei
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**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 Tue Oct 9 16:11:16 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 8164 CPU @ 2.00GHz
2 "physical id"s (chips)
104 "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 : 26
siblings : 52
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28
29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 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): 104
On-line CPU(s) list: 0-103
Thread(s) per core: 2
Core(s) per socket: 26
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85

(Continued on next page)
Huawei

Huawei CH225 V5 (Intel Xeon Platinum 8164)

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

Platform Notes (Continued)

Model name: Intel(R) Xeon(R) Platinum 8164 CPU @ 2.00GHz
Stepping: 4
CPU MHz: 2000.000
BogoMIPS: 4000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
NUMA node0 CPU(s): 0-3,7-9,13-15,20-22,52-55,59-61,65-67,72-74
NUMA node1 CPU(s): 4-6,10-12,16-19,23-25,56-58,62-64,68-71,75-77
NUMA node2 CPU(s): 26-29,33-35,39-41,46-48,78-81,85-87,91-93,98-100
NUMA node3 CPU(s): 30-32,36-38,42-45,49-51,82-84,88-90,94-97,101-103
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
aarch64 nsticleap ept vpid fsgsbase tsc_adjust bm1 hle avx2 smep bmi2 erva
msipcd ira dcd avx512f avx512dq avx512cd avx512bw avx512vl xsaveopt xsavevc qem
p_mmb_cq_mbb_total qem_mbb_local dtherm ida arat pln pts

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 3 7 8 9 13 14 15 20 21 22 25 52 53 54 55 59 60 61 65 66 67 72 73 74
node 0 size: 194741 MB
node 0 free: 189982 MB
node 1 cpus: 4 5 6 10 11 12 16 17 18 19 23 24 25 56 57 58 62 63 64 68 69 70 71 75 76 77
node 1 size: 196608 MB
node 1 free: 192082 MB
node 2 cpus: 26 27 28 29 33 34 35 39 40 41 46 47 48 78 79 80 81 85 86 87 91 92 93 98 99
node 2 size: 196608 MB
node 2 free: 188604 MB
node 3 cpus: 30 31 32 36 37 38 42 43 44 45 49 50 51 82 83 84 88 89 90 94 95 96 97 101
node 3 size: 196608 MB
node 3 free: 192156 MB
node distances:
node 0 1 2 3
  0: 10 11 21 21

(Continued on next page)
Huawei

Huawei CH225 V5 (Intel Xeon Platinum 8164)

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Test Sponsor: Huawei
Hardware Availability: Jul-2017
Test Date: Oct-2018
Software Availability: Mar-2018

Platform Notes (Continued)

1: 11 10 21 21
2: 21 21 10 11
3: 21 21 11 10

From /proc/meminfo
MemTotal: 790510360 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
NAME="Red Hat Enterprise Linux Server"
VERSION="7.4 (Maipo)"
ID="rhel"
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 Oct 9 16:10

SPEC is set to: /spec2017

<table>
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<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
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</thead>
<tbody>
<tr>
<td>/dev/sda2</td>
<td>xfs</td>
<td>720G</td>
<td>33G</td>
<td>688G</td>
<td>5%</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 M393A4K40BB2-CTD 32 GB 2 rank 2666

(End of data from sysinfo program)
SPEC CPU2017 Integer Rate Result

Huawei

Huawei CH225 V5 (Intel Xeon Platinum 8164)

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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.
==============================================================================

==============================================================================
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.
SPEC CPU2017 Integer Rate Result

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Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

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:
-W1,-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:
-W1,-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:
-W1,-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
### SPEC CPU2017 Integer Rate Result

**Huawei**

**Huawei CH225 V5 (Intel Xeon Platinum 8164)**

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**Software Availability:** Mar-2018

#### Peak Compiler Invocation

C benchmarks (except as noted below):

```bash
c -m64 -std=c11
```

502.gcc_r:icc -m32 -std=c11 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin

C++ benchmarks (except as noted below):

```bash
icpc -m64
```

523.xalancbmk_r:icpc -m32 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin

Fortran benchmarks:

```bash
ifort -m64
```

#### Peak Portability Flags

500.perlbmk_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:

```bash
-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
```

502.gcc_r:-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

505.mcf_r:basepeak = yes

(Continued on next page)
Huawei CH225 V5 (Intel Xeon Platinum 8164)

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Peak Optimization Flags (Continued)

525.x264_r: basepeak = yes
557.xz_r: basepeak = yes

C++ benchmarks:
520.omnetpp_r: basepeak = yes
523.xalancbmk_r: -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
531.deepsjeng_r: basepeak = yes
541.leela_r: -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

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 2018-10-09 16:11:14-0400.
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