**Huawei**

Huawei CH121 V5 (Intel Xeon Platinum 8164)

<table>
<thead>
<tr>
<th>Thread</th>
<th>SPECspeed2017_int_base</th>
<th>SPECspeed2017_int_peak</th>
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<tr>
<td>600.perlbench_s 52</td>
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<tr>
<td>602.gcc_s 52</td>
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<td>623.xalancbmk_s 52</td>
<td>9.56</td>
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<td>625.x264_s 52</td>
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<td>641.leela_s 52</td>
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<tr>
<td>648.exchange2_s 52</td>
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<td></td>
</tr>
<tr>
<td>657.xz_s 52</td>
<td>23.8</td>
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</tr>
</tbody>
</table>

**Software**

- OS: SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.14-92.64-default
- 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: Yes
- 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;

**Hardware**

- CPU Name: Intel Xeon Platinum 8164
- Max MHz.: 3700
- Nominal: 2000
- Enabled: 52 cores, 2 chips
- 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
- Other: None
- Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)
- Storage: 1 x 1200 GB SAS, 10000 RPM
- Other: None
SPEC CPU2017 Integer Speed Result

Huawei
Huawei CH121 V5 (Intel Xeon Platinum 8164)

SPECspeed2017_int_base = 9.16
SPECspeed2017_int_peak = 9.44

Results Table

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<tr>
<th>Benchmark</th>
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<th>Seconds</th>
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<td>23.3</td>
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</tbody>
</table>

SPECspeed2017_int_base = 9.16
SPECspeed2017_int_peak = 9.44

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;
jemalloc: sources avilable from jemalloc.net or
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.
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Huawei CH121 V5 (Intel Xeon Platinum 8164)

SPECspeed2017_int_base = 9.16
SPECspeed2017_int_peak = 9.44

CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Nov-2016
Tested by: Huawei
Software Availability: Feb-2018

Platform Notes

BIOS configuration:
Power Efficiency Mode 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 Sun Nov  6 18:05:20 2016

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)
  52 "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: 26
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): 52
On-line CPU(s) list: 0-51
Thread(s) per core: 1
Core(s) per socket: 26
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8164 CPU @ 2.00GHz
Stepping: 4
CPU MHz: 1000.000
CPU max MHz: 2001.0000
CPU min MHz: 1000.0000
BogoMIPS: 4000.01
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K

(Continued on next page)
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Huawei CH121 V5 (Intel Xeon Platinum 8164)

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<td>Jul-2017</td>
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<tr>
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<td>Feb-2018</td>
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</tbody>
</table>

SPECspeed2017_int_base = 9.16
SPECspeed2017_int_peak = 9.44

Platform Notes (Continued)

- L2 cache: 1024K
- L3 cache: 36608K
- NUMA node0 CPU(s): 0-25
- NUMA node1 CPU(s): 26-51
- 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 abm 3dnowprefetch ida arat epb invpcid_single pln pts
- dtherm intel_pt rsb_ctxsw spec_ctrl retpoline kaiser tpr_shadow vmx flexpriority
- ept vpid fsgsbase tsc_adjust bml1 hle avx2 smep bmi2 3dnow invpcid rtm cqm mpx
- avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt
- xsavec xgetbv1 cqm_llc cqm_occup_llc

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

- available: 2 nodes (0-1)
- node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
- node 0 size: 191528 MB
- node 0 free: 185715 MB
- node 1 cpus: 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
- node 1 size: 193382 MB
- node 1 free: 191080 MB
- node distances:
  - node 0 1
  - 0: 10 21
  - 1: 21 10

From /proc/meminfo

- MemTotal: 394149468 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

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

- SuSE-release:
  - SUSE Linux Enterprise Server 12 (x86_64)
  - VERSION = 12
  - PATCHLEVEL = 2
  # This file is deprecated and will be removed in a future service pack or release.
  # Please check /etc/os-release for details about this release.
- os-release:
  - NAME="SLES"
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Huawei CH121 V5 (Intel Xeon Platinum 8164)

CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Nov-2016
CPU2017 License: 3175
Test Sponsor: Huawei
CPU2017 License: 3175
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Hardware Availability: Jul-2017
Test Date: Nov-2016
Hardware Availability: Jul-2017
Test Date: Nov-2016
Software Availability: Feb-2018
Software Availability: Feb-2018

Platform Notes (Continued)

VERSION="12-SP2"
VERSION_ID="12.2"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
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 Nov 6 03:19

SPEC is set to: /spec2017
Filesystem   Type  Size Used Avail Use% Mounted on
/dev/sda3     xfs  269G   29G  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)
(Continued on next page)
## Huawei CH121 V5 (Intel Xeon Platinum 8164)

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<td>Feb-2018</td>
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</table>

### Compiler Version Notes (Continued)

641.leela_s(base)

icpc (ICC) 18.0.0 20170811
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

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

**Huawei**

**Huawei CH121 V5 (Intel Xeon Platinum 8164)**

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| CPU2017 License: | 3175 |
| Test Sponsor:   | Huawei |
| Tested by:      | Huawei |
| Test Date:      | Nov-2016 |
| Hardware Availability: | Jul-2017 |
| Software Availability: | Feb-2018 |

**Base Portability Flags (Continued)**

- `657.xz_s: -DSPEC_LP64`

**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`
### Huawei

**Huawei CH121 V5 (Intel Xeon Platinum 8164)**

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**CPU2017 License:** 3175  
**Test Sponsor:** Huawei  
**Test Date:** Nov-2016  
**Tested by:** Huawei  
**Hardware Availability:** Jul-2017  
**Software Availability:** Feb-2018

### Peak Portability Flags

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<th>Benchmark</th>
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<td>-DSPEC_LP64 -DSPEC_LINUX_X64</td>
</tr>
<tr>
<td>gcc_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>mcf_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>omnippp_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>xalanckbmk_s</td>
<td>-D_FILE_OFFSET_BITS=64 -DSPEC_LINUX</td>
</tr>
<tr>
<td>x264_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>deepsjeng_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>leela_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>exchange2_s</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>xz_s</td>
<td>-DSPEC_LP64</td>
</tr>
</tbody>
</table>

### 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`  
- `-no-prec-div`  
- `-DSPEC_SUPPRESS_OPENMP`  
- `-qopenmp`  
- `-L/usr/local/je5.0.1-64`  
- `-ljemalloc`  

**602.gcc_s:**
- `-Wl,-z,muldefs`  
- `-prof-gen(pass 1)`  
- `-prof-use(pass 2)`  
- `-O2`  
- `-xCORE-AVX2`  
- `-qopt-mem-layout-trans=3`  
- `-ipo`  
- `-no-prec-div`  
- `-DSPEC_SUPPRESS_OPENMP`  
- `-qopenmp`  
- `-L/usr/local/je5.0.1-64`  
- `-ljemalloc`  

**605.mcf_s:**
- `basepeak = yes`

**625.x264_s:**
- `-Wl,-z,muldefs`  
- `-xCORE-AVX2`  
- `-qopt-mem-layout-trans=3`  
- `-ipo`  
- `-no-prec-div`  
- `-DSPEC_SUPPRESS_OPENMP`  
- `-qopenmp`  
- `-L/usr/local/je5.0.1-64`  
- `-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`  
- `-3`  
- `-no-prec-div`  
- `-qopt-mem-layout-trans=3`  
- `-DSPEC_SUPPRESS_OPENMP`  
- `-qopenmp`  
- `-DSPEC_OPENMP`  
- `-L/usr/local/je5.0.1-64`  
- `-ljemalloc`  

**623.xalanckbmk_s:**
- `-L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32`  
- `-Wl,-z,muldefs`  
- `-prof-gen(pass 1)`  
- `-prof-use(pass 2)`  
- `-ipo`  
- `-xCORE-AVX2`  
- `-3`  
- `-no-prec-div`  
- `-qopt-mem-layout-trans=3`  

(Continued on next page)
Peak Optimization Flags (Continued)

623.xalancbmk_s (continued):
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-32/lib -ljemalloc

631.deepsjeng_s: Same as 620.omnetpp_s

641.leela_s: basepeak = yes

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:
-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 2016-11-06 18:05:19-0500.