### SPEC® CPU2017 Integer Rate Result

**Huawei**

Huawei CH121 V5 (Intel Xeon Platinum 8153)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>143</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>153</td>
</tr>
</tbody>
</table>

#### CPU2017 License: 3175

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>Jan-2018</th>
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<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Jul-2017</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Sep-2017</td>
</tr>
</tbody>
</table>

#### Test Sponsor: Huawei

#### Tested by: Huawei

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name: Intel Xeon Platinum 8153</td>
<td>OS: Red Hat Enterprise Linux Server release 7.3 (Maipo) 3.10.0-514.el7.x86_64</td>
</tr>
<tr>
<td>Max MHz.: 2800</td>
<td>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</td>
</tr>
<tr>
<td>Nominal: 2000</td>
<td>Parallel: No</td>
</tr>
<tr>
<td>Enabled: 32 cores, 2 chips, 2 threads/core</td>
<td>Firmware: Version 0.31 Released Sep-2017</td>
</tr>
<tr>
<td>Orderable: 1.2 chips</td>
<td>File System: ext4</td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>L2: 1 MB I+D on chip per core</td>
<td>Base Pointers: 64-bit</td>
</tr>
<tr>
<td>L3: 22 MB I+D on chip per chip</td>
<td>Peak Pointers: 32/64-bit</td>
</tr>
<tr>
<td>Other: None</td>
<td>Other: jemalloc: jemalloc memory allocator library V5.0.1</td>
</tr>
<tr>
<td>Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)</td>
<td></td>
</tr>
<tr>
<td>Storage: 1 x 1200 GB SAS, 10000 RPM</td>
<td></td>
</tr>
<tr>
<td>Other: None</td>
<td></td>
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</tbody>
</table>

#### Copies

<table>
<thead>
<tr>
<th>SPECrate2017_int_base (143)</th>
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<tbody>
<tr>
<td>500.perlbench_r 64</td>
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<tr>
<td>502.gcc_r 64</td>
<td>502.gcc_r 64</td>
</tr>
<tr>
<td>505.mcf_r 64</td>
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</tr>
<tr>
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</tr>
<tr>
<td>523.xalancbmk_r 64</td>
<td>523.xalancbmk_r 64</td>
</tr>
<tr>
<td>525.x264_r 64</td>
<td>525.x264_r 64</td>
</tr>
<tr>
<td>531.deepsjeng_r 64</td>
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<td>541.leela_r 64</td>
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<tr>
<td>557.xz_r 64</td>
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SPECrate2017_int_base = 143
SPECrate2017_int_peak = 153

Results Table

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<tr>
<th>Benchmark</th>
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<th>Ratio</th>
<th>Seconds</th>
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<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>64</td>
<td>970</td>
<td>105</td>
<td>952</td>
<td>107</td>
<td>967</td>
<td>105</td>
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<tr>
<td>502.gcc_r</td>
<td>64</td>
<td>670</td>
<td>135</td>
<td>687</td>
<td>132</td>
<td>722</td>
<td>126</td>
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<tr>
<td>505.mcf_r</td>
<td>64</td>
<td>579</td>
<td>179</td>
<td>579</td>
<td>179</td>
<td>575</td>
<td>180</td>
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<tr>
<td>520.omnetpp_r</td>
<td>64</td>
<td>803</td>
<td>105</td>
<td>823</td>
<td>102</td>
<td>817</td>
<td>103</td>
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<tr>
<td>523.xalancbmk_r</td>
<td>64</td>
<td>451</td>
<td>150</td>
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<td>525.x264_r</td>
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<td>425</td>
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<td>427</td>
<td>263</td>
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<td>531.deepsjeng_r</td>
<td>64</td>
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<td>121</td>
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<td>541.leela_r</td>
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<td>548.exchange2_r</td>
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<td>259</td>
<td>648</td>
<td>259</td>
<td>649</td>
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<tr>
<td>557.xz_r</td>
<td>64</td>
<td>650</td>
<td>106</td>
<td>635</td>
<td>109</td>
<td>749</td>
<td>92.3</td>
</tr>
</tbody>
</table>

SPECrate2017_int_base = 143
SPECrate2017_int_peak = 153

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
Filesysten 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;
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**Test Sponsor:** Huawei  
**Test Date:** Jan-2018  
**Tested by:** Huawei  
**Hardware Availability:** Jul-2017  
**Software Availability:** Sep-2017

---

### General Notes (Continued)


No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

No: 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.

No: 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.

This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.

The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, http://www.spec.org/osg/policy.html

This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.

---

### 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 Thu Jan 18 00:34:36 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 8153 CPU @ 2.00GHz  
- 2 "physical id"s (chips)  
- 64 "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 : 16

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**Platform Notes (Continued)**

siblings : 32  
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15  
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15  

From lscpu:  
Architecture: x86_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
CPU(s): 64  
On-line CPU(s) list: 0-63  
Thread(s) per core: 2  
Core(s) per socket: 16  
Socket(s): 2  
NUMA node(s): 4  
Vendor ID: GenuineIntel  
CPU family: 6  
Model: 85  
Model name: Intel(R) Xeon(R) Platinum 8153 CPU @ 2.00GHz  
Stepping: 4  
CPU MHz: 2000.000  
BogoMIPS: 4004.61  
Virtualization: VT-x  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 1024K  
L3 cache: 22528K  
NUMA node0 CPU(s): 0-3,8-11,32-35,40-43  
NUMA node1 CPU(s): 4-7,12-15,36-39,44-47  
NUMA node2 CPU(s): 16-19,24-27,48-51,56-59  
NUMA node3 CPU(s): 20-23,28-31,52-55,60-63  

/proc/cpuinfo cache data  
cache size : 22528 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 3 8 9 10 11 32 33 34 35 40 41 42 43  
node 0 size: 96405 MB  
node 0 free: 93287 MB  
node 1 cpus: 4 5 6 7 12 13 14 15 36 37 38 39 44 45 46 47  
node 1 size: 98304 MB  
node 1 free: 95496 MB  
node 2 cpus: 16 17 18 19 24 25 26 27 48 49 50 51 56 57 58 59  
node 2 size: 98304 MB  
node 2 free: 95209 MB  
node 3 cpus: 20 21 22 23 28 29 30 31 52 53 54 55 60 61 62 63  

(Continued on next page)
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Platform Notes (Continued)

node 3 size: 98304 MB
node 3 free: 95608 MB
node distances:
node 0 1 2 3
  0:  10 11 21 21
  1:  11 10 21 21
  2:  21 21 10 11
  3:  21 21 11 10

From /proc/meminfo
  MemTotal:       394144364 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"
    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 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016
  x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 17 01:55

SPEC is set to: /spec2017
  Filesystem  Type  Size  Used Avail Use% Mounted on
  /dev/sda2  ext4  689G  26G  629G  4% /

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. 0.31 09/29/2017
  Memory:
    24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666

(End of data from sysinfo program)
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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.
------------------------------------------------------------------------------

==============================================================================
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.
------------------------------------------------------------------------------

==============================================================================
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.
------------------------------------------------------------------------------

==============================================================================
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:
iccc

C++ benchmarks:
icpc

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### Base Compiler Invocation (Continued)

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
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 -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

### Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

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### Base Other Flags (Continued)

- Fortran benchmarks:
  - `-m64`

### Peak Compiler Invocation

- **C benchmarks:**
  - `icc`
- **C++ benchmarks:**
  - `icpc`
- 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-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -fno-strict-overflow -L/usr/local/je5.0.1-64/lib -ljemalloc`

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### Peak Optimization Flags (Continued)

505.mcf_r: basepeak = yes

525.x264_r: -Wl,-z,muldefs -xCORE-AVX512 -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


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:


### 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
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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](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/Intel-ic18.0-official-linux64.xml)
- [http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.7.xml](http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.7.xml)

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