## SPEC® CPU2017 Integer Rate Result

### Huawei

**Huawei XH628 V5 (Intel Xeon Gold 6130)**

<table>
<thead>
<tr>
<th><strong>SPECrate2017_int_base</strong></th>
<th>161</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SPECrate2017_int_peak</strong></td>
<td>170</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 3175  
**Test Sponsor:** Huawei  
**Tested by:** Huawei  
**Test Date:** Sep-2018  
**Hardware Availability:** Aug-2018  
**Software Availability:** Mar-2018

### Hardware

- **CPU Name:** Intel Xeon Gold 6130  
- **Max MHz.:** 3700  
- **Nominal:** 2100  
- **Enabled:** 32 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:** 22 MB I+D on chip per chip  
- **Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R)  
- **Storage:** 1 x 1800 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 18.0.2.199 of Intel C/C++  
  Compiler for Linux:  
  Fortran: Version 18.0.2.199 of Intel Fortran  
- **Firmware:** Version 0.86 Released Aug-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
## 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>
<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>64</td>
<td>832</td>
<td>123</td>
<td>815</td>
<td>125</td>
<td>811</td>
<td>126</td>
<td>64</td>
<td>670</td>
<td>152</td>
<td>674</td>
<td>151</td>
<td>675</td>
<td>151</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>64</td>
<td>648</td>
<td>140</td>
<td>651</td>
<td>139</td>
<td>653</td>
<td>139</td>
<td>64</td>
<td>548</td>
<td>165</td>
<td>548</td>
<td>165</td>
<td>549</td>
<td>165</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>64</td>
<td>526</td>
<td>197</td>
<td>531</td>
<td>195</td>
<td>533</td>
<td>194</td>
<td>64</td>
<td>526</td>
<td>197</td>
<td>531</td>
<td>195</td>
<td>533</td>
<td>194</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>64</td>
<td>792</td>
<td>106</td>
<td>790</td>
<td>106</td>
<td>788</td>
<td>107</td>
<td>64</td>
<td>792</td>
<td>106</td>
<td>790</td>
<td>106</td>
<td>788</td>
<td>107</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>64</td>
<td>422</td>
<td>160</td>
<td>418</td>
<td>162</td>
<td>421</td>
<td>160</td>
<td>64</td>
<td>348</td>
<td>194</td>
<td>345</td>
<td>196</td>
<td>345</td>
<td>196</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>64</td>
<td>359</td>
<td>312</td>
<td>358</td>
<td>313</td>
<td>360</td>
<td>311</td>
<td>64</td>
<td>359</td>
<td>312</td>
<td>358</td>
<td>313</td>
<td>360</td>
<td>311</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>64</td>
<td>521</td>
<td>141</td>
<td>529</td>
<td>139</td>
<td>524</td>
<td>140</td>
<td>64</td>
<td>521</td>
<td>141</td>
<td>529</td>
<td>139</td>
<td>524</td>
<td>140</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>64</td>
<td>797</td>
<td>133</td>
<td>801</td>
<td>132</td>
<td>798</td>
<td>133</td>
<td>64</td>
<td>787</td>
<td>135</td>
<td>793</td>
<td>134</td>
<td>778</td>
<td>136</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>64</td>
<td>538</td>
<td>311</td>
<td>538</td>
<td>312</td>
<td>538</td>
<td>311</td>
<td>64</td>
<td>538</td>
<td>311</td>
<td>538</td>
<td>312</td>
<td>538</td>
<td>311</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>64</td>
<td>576</td>
<td>120</td>
<td>620</td>
<td>111</td>
<td>619</td>
<td>112</td>
<td>64</td>
<td>576</td>
<td>120</td>
<td>620</td>
<td>111</td>
<td>619</td>
<td>112</td>
</tr>
</tbody>
</table>

### 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)
Huawei

Huawei XH628 V5 (Intel Xeon Gold 6130)

**SPECrate2017_int_base** = 161
**SPECrate2017_int_peak** = 170

CPU2017 License: 3175
Test Sponsor: Huawei
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 96c45e4568ad54c135fd618bccc091c0f
running on localhost.localdomain Sat Sep 1 12:09:22 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) Gold 6130 CPU @ 2.10GHz
  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
  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) Gold 6130 CPU @ 2.10GHz
Stepping: 4
Huawei

Huawei XH628 V5 (Intel Xeon Gold 6130)

**SPECrate2017_int_base** = 161

**SPECrate2017_int_peak** = 170

---

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

---

<table>
<thead>
<tr>
<th>Platform Notes (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU MHz:</td>
</tr>
<tr>
<td>BogoMIPS:</td>
</tr>
<tr>
<td>Virtualization:</td>
</tr>
<tr>
<td>L1d cache:</td>
</tr>
<tr>
<td>L1i cache:</td>
</tr>
<tr>
<td>L2 cache:</td>
</tr>
<tr>
<td>L3 cache:</td>
</tr>
<tr>
<td>NUMA node0 CPU(s):</td>
</tr>
<tr>
<td>NUMA node1 CPU(s):</td>
</tr>
<tr>
<td>NUMA node2 CPU(s):</td>
</tr>
<tr>
<td>NUMA node3 CPU(s):</td>
</tr>
<tr>
<td>Flags:</td>
</tr>
</tbody>
</table>

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 12 33 34 35 40 41 42 43  
node 0 size: 96437 MB  
node 0 free: 93769 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: 95982 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: 96021 MB  
node 3 cpus: 20 21 22 23 28 29 30 31 52 53 54 55 60 61 62 63  
node 3 size: 98304 MB  
node 3 free: 95528 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  

(Continued on next page)
Huawei

Huawei XH628 V5 (Intel Xeon Gold 6130)

SPECrate2017_int_base = 161
SPECrate2017_int_peak = 170

CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei
Test Date: Sep-2018
Hardware Availability: Aug-2018
Software Availability: Mar-2018

Platform Notes (Continued)

From /proc/meminfo
MemTotal: 394174376 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.4 (Maipo)"
ID="rheil"
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 Sep 1 12:03

SPEC is set to: /spec2017

Filesystem  Type  Size  Used Avail Use% Mounted on
/dev/sda4  xfs  553G  8.2G  545G  2% /

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. 0.86 08/06/2018
Memory:
4x NO DIMM NO DIMM
12x Samsung M393A4K40BB2-CTD 32 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)
==============================================================================

(Continued on next page)
Huawei

Huawei XH628 V5 (Intel Xeon Gold 6130)

SPECrate2017_int_base = 161
SPECrate2017_int_peak = 170

CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Sep-2018
Hardware Availability: Aug-2018
Tested by: Huawei
Software Availability: Mar-2018

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

(Continued on next page)
SPEC CPU2017 Integer Rate Result
Copyright 2017-2018 Standard Performance Evaluation Corporation

Huawei
Huawei XH628 V5 (Intel Xeon Gold 6130)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>161</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>170</td>
</tr>
</tbody>
</table>

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

Test Date: Sep-2018
Hardware Availability: Aug-2018
Software Availability: Mar-2018

Base Compiler Invocation (Continued)

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

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m64 -std=c11

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Huawei
Huawei XH628 V5 (Intel Xeon Gold 6130)

SPECrate2017_int_base = 161
SPECrate2017_int_peak = 170

CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei
Test Date: Sep-2018
Hardware Availability: Aug-2018
Software Availability: Mar-2018

Peak Compiler Invocation (Continued)

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):
icpc -m64

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

Fortran benchmarks:
ifort -m64

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

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
525.x264_r: basepeak = yes

(Continued on next page)
Huawei

Huawei XH628 V5 (Intel Xeon Gold 6130)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>161</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>170</td>
</tr>
</tbody>
</table>

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

Peak Optimization Flags (Continued)

557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: basepeak = yes

523.xalancbnk_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

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.