Huawei XH628 V5 (Intel Xeon Gold 6126)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench_r</td>
<td>48</td>
<td>124</td>
</tr>
<tr>
<td>gcc_r</td>
<td>48</td>
<td>116</td>
</tr>
<tr>
<td>mcf_r</td>
<td>48</td>
<td>137</td>
</tr>
<tr>
<td>omnetpp_r</td>
<td>48</td>
<td>85.8</td>
</tr>
<tr>
<td>xalancbmk_r</td>
<td>48</td>
<td>136</td>
</tr>
<tr>
<td>x264_r</td>
<td>48</td>
<td>169</td>
</tr>
<tr>
<td>deepsjeng_r</td>
<td>48</td>
<td>118</td>
</tr>
<tr>
<td>leela_r</td>
<td>48</td>
<td>112</td>
</tr>
<tr>
<td>exchange2_r</td>
<td>48</td>
<td>274</td>
</tr>
<tr>
<td>xz_r</td>
<td>48</td>
<td>98.6</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Gold 6126
- **Max MHz.:** 3700
- **Nominal:** 2600
- **Enabled:** 24 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:** 19.25 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 Compiler for Linux
- **Parallel:** No
- **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
**SPEC CPU2017 Integer Rate Result**

Huawei

Huawei XH628 V5 (Intel Xeon Gold 6126)

**SPECrate2017_int_base = 136**

**SPECrate2017_int_peak = 144**

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>3175</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Huawei</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Huawei</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Sep-2018</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Aug-2018</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Mar-2018</td>
</tr>
</tbody>
</table>

**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>48</td>
<td>746</td>
<td>102</td>
<td>745</td>
<td>103</td>
<td>746</td>
<td>102</td>
<td>48</td>
<td>612</td>
<td>125</td>
<td>619</td>
<td>123</td>
<td>617</td>
<td>124</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>48</td>
<td>586</td>
<td>116</td>
<td>588</td>
<td>116</td>
<td>590</td>
<td>115</td>
<td>48</td>
<td>496</td>
<td>137</td>
<td>495</td>
<td>137</td>
<td>496</td>
<td>137</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>48</td>
<td>458</td>
<td>169</td>
<td>458</td>
<td>169</td>
<td>475</td>
<td>163</td>
<td>48</td>
<td>458</td>
<td>169</td>
<td>458</td>
<td>169</td>
<td>475</td>
<td>163</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>48</td>
<td>733</td>
<td>85.9</td>
<td>734</td>
<td>85.7</td>
<td>734</td>
<td>85.8</td>
<td>48</td>
<td>733</td>
<td>85.9</td>
<td>734</td>
<td>85.7</td>
<td>734</td>
<td>85.8</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>48</td>
<td>373</td>
<td>136</td>
<td>373</td>
<td>136</td>
<td>374</td>
<td>136</td>
<td>48</td>
<td>309</td>
<td>164</td>
<td>307</td>
<td>165</td>
<td>308</td>
<td>165</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>48</td>
<td>307</td>
<td>274</td>
<td>307</td>
<td>274</td>
<td>307</td>
<td>274</td>
<td>48</td>
<td>307</td>
<td>274</td>
<td>307</td>
<td>274</td>
<td>307</td>
<td>274</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>48</td>
<td>463</td>
<td>119</td>
<td>465</td>
<td>118</td>
<td>469</td>
<td>117</td>
<td>48</td>
<td>463</td>
<td>119</td>
<td>465</td>
<td>118</td>
<td>469</td>
<td>117</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>48</td>
<td>712</td>
<td>112</td>
<td>714</td>
<td>111</td>
<td>711</td>
<td>112</td>
<td>48</td>
<td>686</td>
<td>116</td>
<td>711</td>
<td>112</td>
<td>700</td>
<td>114</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>48</td>
<td>490</td>
<td>257</td>
<td>490</td>
<td>257</td>
<td>491</td>
<td>256</td>
<td>48</td>
<td>490</td>
<td>257</td>
<td>490</td>
<td>257</td>
<td>491</td>
<td>256</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>48</td>
<td>524</td>
<td>98.9</td>
<td>526</td>
<td>98.6</td>
<td>552</td>
<td>93.9</td>
<td>48</td>
<td>524</td>
<td>98.9</td>
<td>526</td>
<td>98.6</td>
<td>552</td>
<td>93.9</td>
</tr>
</tbody>
</table>

- **SPECrate2017_int_base = 136**
- **SPECrate2017_int_peak = 144**

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) is mitigated in the system as tested and documented.

(Continued on next page)
Huawei

Huawei XH628 V5 (Intel Xeon Gold 6126)

**SPECrate2017_int_base = 136**

**SPECrate2017_int_peak = 144**

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

## General Notes (Continued)

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 Wed Sep 5 15:20:04 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 6126 CPU @ 2.60GHz
  2 "physical id"s (chips)
  48 "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 : 12
siblings : 24
physical 0: cores 0 1 3 5 6 8 9 10 11 12 13 14
physical 1: cores 0 1 3 4 5 6 8 9 10 11 12 13

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 2
Core(s) per socket: 12
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6126 CPU @ 2.60GHz
Stepping: 4
CPU MHz: 2600.000

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Huawei
Huawei XH628 V5 (Intel Xeon Gold 6126)

SPECrate2017_int_base = 136
SPECrate2017_int_peak = 144

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

Platform Notes (Continued)

BogoMIPS: 5200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 19712K
NUMA node0 CPU(s): 0-2, 5-7, 24-26, 29-31
NUMA node1 CPU(s): 3, 4, 8-11, 27, 28, 32-35
NUMA node2 CPU(s): 12-14, 18-20, 36-38, 42-44
NUMA node3 CPU(s): 15-17, 21-23, 39-41, 45-47
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 ds_cpl vmx smx est tm2 ssse3 fma cx16 xtpr
pdcm pcid dca sev sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx
f16c rdrand lahf_lm abm 3dnowprefetch epb cat_l3 cdp_l3 invpcid_single intel_pt
spec_ctrl ibpb_support tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust
bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx
smash clfshopt clwb avx512cd avx512bw avx512vl xsaveopt xsavevc xgetbv1 cqm_llc
cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pin pts

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

available: 4 nodes (0-3)
ode 0 cpus: 0 1 2 5 6 7 24 25 26 29 30 31
node 0 size: 96437 MB
node 0 free: 93785 MB
node 1 cpus: 3 4 8 9 10 11 27 28 32 33 34 35
node 1 size: 98304 MB
node 1 free: 95590 MB
node 2 cpus: 12 13 14 18 19 20 36 37 38 42 43 44
node 2 size: 98304 MB
node 2 free: 96039 MB
node 3 cpus: 15 16 17 21 22 23 39 40 41 45 46 47
node 3 size: 98304 MB
node 3 free: 96039 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

(Continued on next page)
Huawei

Huawei XH628 V5 (Intel Xeon Gold 6126)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>136</td>
<td>144</td>
</tr>
</tbody>
</table>

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

Platform Notes (Continued)

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="rhel"
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 5 15:15

SPEC is set to: /spec2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 1.7T 8.0G 1.7T 1% /

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)
==============================================================================
icc (ICC) 18.0.2 20180210

(Continued on next page)
Huawei

Huawei XH628 V5 (Intel Xeon Gold 6126)

SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

SPECrate2017_int_base = 136

SPECrate2017_int_peak = 144

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

Compiler Version Notes (Continued)

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.

Base Compiler Invocation

C benchmarks:
  icc -m64 -std=c11

(Continued on next page)
Huawei
Huawei XH628 V5 (Intel Xeon Gold 6126)

SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

SPECrate2017_int_base = 136
SPECrate2017_int_peak = 144

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:
-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

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Huawei

Huawei XH628 V5 (Intel Xeon Gold 6126)

SPECrate2017_int_base = 136
SPECrate2017_int_peak = 144

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.xalanchbk_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
557.xz_r: basepeak = yes

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Huawei
Huawei XH628 V5 (Intel Xeon Gold 6126)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>136</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>144</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Test Date</th>
<th>Sep-2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability</td>
<td>Aug-2018</td>
</tr>
<tr>
<td>Software Availability</td>
<td>Mar-2018</td>
</tr>
</tbody>
</table>

Peak Optimization Flags (Continued)

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

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.

Tested with SPEC CPU2017 v1.0.2 on 2018-09-05 11:20:03-0400.