Huawei
Huawei XH628 V5 (Intel Xeon Gold 6142)

**SPECr2017_int_base** = 172
**SPECr2017_int_peak** = 183

---

**Hardware**

- **CPU Name:** Intel Xeon Gold 6142
- **Max MHz.:** 3700
- **Nominal:** 2600
- **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
- **Other:** None
- **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**

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**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>Seconds</th>
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<td>548.exchange2_r</td>
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<td>585</td>
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</tr>
</tbody>
</table>

**SPECrate2017_int_base = 172**

**SPECrate2017_int_peak = 183**

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
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SPECrate2017_int_base = 172
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CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei
Test Date: Aug-2018
Hardware Availability: Aug-2018
Software Availability: Mar-2018

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 Mon Aug 13 14:01:11 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 6142 CPU @ 2.60GHz
  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 6142 CPU @ 2.60GHz
Stepping:              4

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

**Huawei**

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### SPECrate2017_int_base = 172

### SPECrate2017_int_peak = 183

**Platform Notes (Continued)**

- CPU MHz: 2600.000
- BogoMIPS: 5200.00
- 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
- 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 ntopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3nowprefetch 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 erva invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts

/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: 96437 MB
- node 0 free: 93863 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: 95465 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: 96007 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: 95980 MB

node distances:

- node 0: 11 22 33 44 55 66 77 88
- node 1: 00 11 22 33 44 55 66 77
- node 2: 00 11 22 33 44 55 66 77
- node 3: 00 11 22 33 44 55 66 77

(Continued on next page)
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Platform Notes ( Continued )

From /proc/meminfo
MemTotal: 394174368 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 Aug 13 13:43

SPEC is set to: /spec2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 553G 8.0G 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

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**CPU2017 License:** 3175

**Test Sponsor:** Huawei

**Test Date:** Aug-2018

**Hardware Availability:** Aug-2018

**Tested by:** Huawei

**Software Availability:** Mar-2018

---

### Compiler Version Notes (Continued)

```plaintext
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 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 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 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
FC  548.exchange2_r(base)
IFORT 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
FC  548.exchange2_r(peak)
IFORT 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

### Base Compiler Invocation

**C benchmarks:**
```plaintext
icc -m64 -std=c11
```

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### 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=cl1**

(Continued on next page)
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Peak Compiler Invocation (Continued)

502.gcc_r: iicc -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

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Software Availability: Mar-2018

Peak Optimization Flags (Continued)

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 2018-08-13 10:01:10-0400.