Huawei
Huawei CH121 V5 (Intel Xeon Silver 4114)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base = 94.0</th>
<th>SPECrate2017_int_peak = 101</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name: Intel Xeon Silver 4114</td>
<td>OS: Red Hat Enterprise Linux Server release 7.4 (Maipo)</td>
</tr>
<tr>
<td>Max MHz.: 3000</td>
<td>Compiler: C/C++: Version 18.0.0.128 of Intel C/C++</td>
</tr>
<tr>
<td>Nominal: 2200</td>
<td>Compiler for Linux: Fortran: Version 18.0.0.128 of Intel Fortran</td>
</tr>
<tr>
<td>Enabled: 20 cores, 2 chips, 2 threads/core</td>
<td>Compiler for Linux:</td>
</tr>
<tr>
<td>Orderable: 1,2 chips</td>
<td>Parallel: No</td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
<td>Firmware: Version 0.62 Released Mar-2018</td>
</tr>
<tr>
<td>L2: 1 MB I+D on chip per core</td>
<td>File System: xfs</td>
</tr>
<tr>
<td>L3: 13.75 MB I+D on chip per chip</td>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Other: None</td>
<td>Base Pointers: 64-bit</td>
</tr>
<tr>
<td>Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)</td>
<td>Peak Pointers: 32/64-bit</td>
</tr>
<tr>
<td>Storage: 1 x 1200 GB SAS, 10000 RPM</td>
<td>Other: jemalloc: jemalloc memory allocator library V5.0.1;</td>
</tr>
<tr>
<td>Other: None</td>
<td></td>
</tr>
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<table>
<thead>
<tr>
<th>Copies</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
</tr>
<tr>
<td>502.gcc_r</td>
</tr>
<tr>
<td>505.mcf_r</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
</tr>
<tr>
<td>525.x264_r</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
</tr>
<tr>
<td>541.leela_r</td>
</tr>
<tr>
<td>548.exchange2_r</td>
</tr>
<tr>
<td>557.xz_r</td>
</tr>
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</table>

SPECrate2017_int_base (94.0) SPECrate2017_int_peak (101)
## SPEC CPU2017 Integer Rate Result

**Huawei**

**Huawei CH121 V5 (Intel Xeon Silver 4114)**

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<tr>
<td>Tested by:</td>
<td>Huawei</td>
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<tr>
<td>Test Date:</td>
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<td>Hardware Availability:</td>
<td>Jul-2017</td>
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<td>Jan-2018</td>
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**SPECrate2017_int_base = 94.0**

**SPECrate2017_int_peak = 101**

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### Results Table

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<tr>
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<th>Ratio</th>
<th>Seconds</th>
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<th>Seconds</th>
<th>Ratio</th>
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<td>500.perlbench_r</td>
<td>40</td>
<td>890</td>
<td>71.6</td>
<td>889</td>
<td>71.6</td>
<td>880</td>
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<td>40</td>
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<td>88.2</td>
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<td>502.gcc_r</td>
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<td>80.2</td>
<td>693</td>
<td>81.7</td>
<td>684</td>
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<td>97.5</td>
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<td>97.0</td>
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<tr>
<td>505.mcf_r</td>
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<td>535</td>
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<td>536</td>
<td>120</td>
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<td>121</td>
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<td>120</td>
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<tr>
<td>520.omnetpp_r</td>
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<td>854</td>
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<td>848</td>
<td>61.9</td>
<td>843</td>
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<td>61.4</td>
<td>848</td>
<td>61.9</td>
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<td>454</td>
<td>93.0</td>
<td>447</td>
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<tr>
<td>525.x264_r</td>
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<td>531.deepsjeng_r</td>
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<td>82.2</td>
<td>557</td>
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<td>82.2</td>
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<td>82.3</td>
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<tr>
<td>541.leela_r</td>
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<tr>
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<td>40</td>
<td>602</td>
<td>174</td>
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<td>599</td>
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<td>601</td>
<td>174</td>
<td>601</td>
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<tr>
<td>557.xz_r</td>
<td>40</td>
<td>623</td>
<td>69.3</td>
<td>615</td>
<td>70.2</td>
<td>611</td>
<td>70.8</td>
<td>40</td>
<td>623</td>
<td>69.3</td>
<td>615</td>
<td>70.2</td>
</tr>
</tbody>
</table>

**SPECrate2017_int_base =** 94.0

**SPECrate2017_int_peak =** 101

---

### 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

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>
```

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 available from jemalloc.net or


(Continued on next page)
SPEC CPU2017 Integer Rate Result

Huawei

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SPECrate2017_int_peak = 101

CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Jun-2018
Tested by: Huawei
Hardware Availability: Jul-2017
Tested by: Huawei
Software Availability: Jan-2018

General Notes (Continued)

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.

Platform Notes

BIOS configuration:
Power Policy Set to Performance
XPT Prefetch Set to Enabled
Sysinfo program /spec2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Mon Jun 25 05:42:43 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) Silver 4114 CPU @ 2.20GHz
  2 "physical id"s (chips)
  40 "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 : 10
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 40
On-line CPU(s) list: 0-39
Thread(s) per core: 2
Core(s) per socket: 10
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz
Stepping: 4

(Continued on next page)
Huawei

Huawei CH121 V5 (Intel Xeon Silver 4114)

**SPECrate2017_int_base = 94.0**

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---

### Platform Notes (Continued)

- **CPU MHz:** 2200.000
- **BogoMIPS:** 4400.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 14080K
- **NUMA node0 CPU(s):** 0-9,20-29
- **NUMA node1 CPU(s):** 10-19,30-39
- **Flags:** fpu vme de pse ts mcr msr pae mce cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant ts arch_perfmon pebs bts rep_good ntopology nonstop tsc aperfmperf eagerfpu nni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 fma cx16 x2apic movbe popcnt set Linux ld tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch epb cat13 cdp13 invpcid_single intel_pht spec_ctrl ibp_shadow tpr_shadow vmm flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsaves xsetbv1 cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm ida arat pfn pml pts

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 20 21 22 23 24 25 26 27 28 29
- Node 0 size: 195701 MB
- Node 0 free: 190843 MB
- Node 1 cpus: 10 11 12 13 14 15 16 17 18 19 30 31 32 33 34 35 36 37 38 39
- Node 1 size: 196608 MB
- Node 1 free: 191642 MB

- Node distances:
  - node 0: 10
  - node 1: 21

From `/proc/meminfo`

- MemTotal: 395141240 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"

(Continued on next page)
### Huawei CH121 V5 (Intel Xeon Silver 4114)

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#### SPEC CPU2017 Integer Rate Result

**SPECrate2017_int_base = 94.0**

**SPECrate2017_int_peak = 101**

---

**Platform Notes (Continued)**

```plaintext
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
```

```plaintext
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 Jun 25 05:34
```

**SPEC is set to:** `/spec2017`

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda4</td>
<td>xfs</td>
<td>700G</td>
<td>35G</td>
<td>666G</td>
<td>5%</td>
<td>/</td>
</tr>
</tbody>
</table>

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, configured at 2400

---

**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.**

---

(Continued on next page)
Huawei

Huawei CH121 V5 (Intel Xeon Silver 4114)

**SPEC CPU2017 Integer Rate Result**

Copyright 2017-2018 Standard Performance Evaluation Corporation

**SPECrate2017_int_base** = 94.0

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**Compiler Version Notes (Continued)**

==============================================================================
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.
(Continued on next page)

**Base Compiler Invocation**

C benchmarks:
icc

C++ benchmarks:
icpc

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
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#### Base Portability Flags (Continued)

541.leela_r: -DSPEC_LP64  
548.exchange2_r: -DSPEC_LP64  
557.xz_r: -DSPEC_LP64

#### Base Optimization Flags

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

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
SPEC CPU2017 Integer Rate Result

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Huawei
Huawei CH121 V5 (Intel Xeon Silver 4114)

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CPU2017 License: 3175
Test Sponsor: Huawei
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Tested by: Huawei
Software Availability: Jan-2018

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-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
-fno-strict-overflow -L/usr/local/je5.0.1-64/lib
-ljemalloc

502.gcc_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -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: -Wl,-z,muldefs -xCORE-AVX2 -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

523.xalancbmk_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
-L/usr/local/je5.0.1-32/lib -ljemalloc

531.deepsjeng_r: basepeak = yes

(Continued on next page)
Huawei
Huawei CH121 V5 (Intel Xeon Silver 4114)

Peak Optimization Flags (Continued)

541.leela_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -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

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

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.

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