# SPEC® CPU2017 Integer Rate Result

## Hardware

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>151</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>161</td>
</tr>
</tbody>
</table>

### CPU2017 License

- Huawei
- Huawei
- Huawei
- Huawei

### Software

- OS:
  - Red Hat Enterprise Linux Server release 7.4 (Maipo)
- Compiler:
  - C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux:
  - Fortran: Version 18.0.0.128 of Intel Fortran
- Parallel:
  - No
- Firmware:
  - Version 0.62 Released Mar-2018
- File System:
  - xfs
- System State:
  - Run level 3 (multi-user)
- Base Pointers:
  - 64-bit
- Peak Pointers:
  - 32/64-bit
- Other:
  - jemalloc: jemalloc memory allocator library V5.0.1;

### Hardware

- CPU Name: Intel Xeon Gold 6136
- Max MHz.: 3700
- Nominal: 3000
- 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: 24.75 MB I+D on chip per chip
- Other: None
- Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)
- Storage: 1 x 1200 GB SAS, 10000 RPM
- Other: None

### Test Sponsor

- Huawei

### Test Date

- Jul-2018

### Hardware Availability

- Jan-2018

### Tested by

- Huawei

### Software Availability

- Jan-2018
Results Table

<table>
<thead>
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<th>Benchmark</th>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>48</td>
<td>680</td>
<td>112</td>
<td>692</td>
<td>110</td>
<td>705</td>
<td>108</td>
<td>48</td>
<td>550</td>
<td>139</td>
<td>556</td>
<td>138</td>
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<td>138</td>
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<td>502.gcc_r</td>
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<td>519</td>
<td>131</td>
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<td>155</td>
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<tr>
<td>505.mcf_r</td>
<td>48</td>
<td>407</td>
<td>191</td>
<td>406</td>
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<td>419</td>
<td>185</td>
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<td>191</td>
<td>406</td>
<td>191</td>
<td>419</td>
<td>185</td>
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<tr>
<td>520.omnetpp_r</td>
<td>48</td>
<td>681</td>
<td>92.5</td>
<td>692</td>
<td>91.1</td>
<td>684</td>
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<td>92.5</td>
<td>692</td>
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<td>684</td>
<td>92.0</td>
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<tr>
<td>523.xalancbmk_r</td>
<td>48</td>
<td>324</td>
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<td>531.deepsjeng_r</td>
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<td>426</td>
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<td>541.leela_r</td>
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<td>652</td>
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<tr>
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<td>48</td>
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<td>557.xz_r</td>
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<td>501</td>
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<td>111</td>
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<td>111</td>
<td>501</td>
<td>104</td>
</tr>
</tbody>
</table>

SPECrate2017_int_base = 151
SPECrate2017_int_peak = 161

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**

**Huawei 5288 V5 (Intel Xeon Gold 6136)**

| SPECrate2017_int_base | 151 |
| SPECrate2017_int_peak | 161 |

**CPU2017 License:** 3175  
**Test Sponsor:** Huawei  
**Test Date:** Jul-2018  
**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  
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 Jul 25 13:11:45 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 6136 CPU @ 3.00GHz
- 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 2 3 4 9 10 16 18 19 25 26
- physical 1: cores 0 1 2 3 4 9 10 16 18 19 25 26

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

(Continued on next page)
Huawei 5288 V5 (Intel Xeon Gold 6136)

**SPECrate2017_int_base** = 151

**SPECrate2017_int_peak** = 161

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

Platform Notes (Continued)

- **Model name:** Intel (R) Xeon(R) Gold 6136 CPU @ 3.00GHz
- **Stepping:** 4
- **CPU MHz:** 3000.000
- **BogoMIPS:** 6000.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 25344K
- **NUMA node0 CPU(s):** 0-2, 5, 7, 10, 24-26, 29, 31, 34
- **NUMA node1 CPU(s):** 3, 4, 6, 8, 9, 11, 27, 28, 30, 32, 33, 35
- **NUMA node2 CPU(s):** 12-14, 17, 19, 22, 36-38, 41, 43, 46
- **NUMA node3 CPU(s):** 15, 16, 18, 20, 21, 23, 39, 40, 42, 44, 45, 47
- **Flags:** fpu vme de pse tsc msr pae mce cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtscs64 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 abalrelf lgдв prefixed epid ibpb support tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erva invpcid rtm cqm mpx rtod_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsaves xsaveopt xgetbv1 cqm_llc cqm_occu_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pni

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

<table>
<thead>
<tr>
<th>Available</th>
<th>4 nodes (0-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>node 0 cpus:</td>
<td>0 1 2 5 7 10 24 25 26 29 31 34</td>
</tr>
<tr>
<td>node 0 size:</td>
<td>96437 MB</td>
</tr>
<tr>
<td>node 0 free:</td>
<td>93905 MB</td>
</tr>
<tr>
<td>node 1 cpus:</td>
<td>3 4 6 8 9 11 27 28 30 32 33 35</td>
</tr>
<tr>
<td>node 1 size:</td>
<td>98304 MB</td>
</tr>
<tr>
<td>node 1 free:</td>
<td>95539 MB</td>
</tr>
<tr>
<td>node 2 cpus:</td>
<td>12 13 14 17 19 22 36 37 38 41 43 46</td>
</tr>
<tr>
<td>node 2 size:</td>
<td>98304 MB</td>
</tr>
<tr>
<td>node 2 free:</td>
<td>96034 MB</td>
</tr>
<tr>
<td>node 3 cpus:</td>
<td>15 16 18 20 21 23 39 40 42 44 45 47</td>
</tr>
<tr>
<td>node 3 size:</td>
<td>98304 MB</td>
</tr>
<tr>
<td>node 3 free:</td>
<td>95999 MB</td>
</tr>
</tbody>
</table>

node distances:

<table>
<thead>
<tr>
<th>node 0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:</td>
<td>10 11 21 21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:</td>
<td>11 10 21 21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:</td>
<td>21 21 10 11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Huawei

Huawei 5288 V5 (Intel Xeon Gold 6136)

SPECrate2017_int_base = 151
SPECrate2017_int_peak = 161

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

Test Date: Jul-2018
Hardware Availability: Jul-2017
Software Availability: Jan-2018

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Platform Notes (Continued)

3: 21 21 11 10

From /proc/meminfo
MemTotal: 394174484 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 Jul 25 13:02

SPEC is set to: /spec2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-root xfs 1.8T 35G 1.7T 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. 0.62 03/26/2018
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) 502gcc_r(base) 505.mcf_r(base, peak)
525.x264_r(base, peak) 557.xz_r(base, peak)

(Continued on next page)
Huawei
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</tbody>
</table>

Compiler Version Notes (Continued)

```plaintext
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```plaintext
CC 500.perlbench_r(peak) 502.gcc_r(peak)
```

```plaintext
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```plaintext
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
      541.leela_r(base)
```

```plaintext
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```plaintext
CXXC 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak)
      541.leela_r(peak)
```

```plaintext
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```plaintext
FC 548.exchange2_r(base, peak)
```

```plaintext
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

---

Base Compiler Invocation

**C benchmarks:**
- icc

**C++ benchmarks:**
- icpc

**Fortran benchmarks:**
- ifort
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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 -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
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**Software Availability:** Jan-2018

### 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
  - 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

(Continued on next page)
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Peak Optimization Flags (Continued)

557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: basepeak = yes

523.xalancbnk_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -03 -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 -03 -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 -03 -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.xalancbnk_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
Huawei

Huawei 5288 V5 (Intel Xeon Gold 6136)

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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.

Tested with SPEC CPU2017 v1.0.2 on 2018-07-25 13:11:45-0400.
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