# SPEC® CPU2017 Integer Rate Result

## Huawei

**Huawei XH321 V5 (Intel Xeon Gold 5120T)**

- **SPECrate2017_int_base** = 135
- **SPECrate2017_int_peak** = 143

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>56</td>
<td>103</td>
<td>128</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>56</td>
<td>120</td>
<td>141</td>
</tr>
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<td>56</td>
<td>88.4</td>
<td>169</td>
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</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>56</td>
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<tr>
<td>541.leela_r</td>
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<td>263</td>
</tr>
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<td></td>
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</tr>
<tr>
<td>557.xz_r</td>
<td>56</td>
<td>95.8</td>
<td>254</td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU Name</strong></td>
<td>Intel Xeon Gold 5120T</td>
</tr>
<tr>
<td><strong>Max MHz.</strong></td>
<td>3200</td>
</tr>
<tr>
<td><strong>Nominal</strong></td>
<td>2200</td>
</tr>
<tr>
<td><strong>Enabled</strong></td>
<td>28 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td><strong>Orderable</strong></td>
<td>1.2 chips</td>
</tr>
<tr>
<td><strong>Cache L1</strong></td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td><strong>L2</strong></td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td><strong>L3</strong></td>
<td>19.25 MB I+D on chip per chip</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>384 GB (12 x 32 GB 2Rx4 PC4-2666V-R, running at 2400)</td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>1 x 1200 GB SAS, 10000 RPM</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OS</strong></td>
<td>Red Hat Enterprise Linux Server release 7.3 (Maipo)</td>
</tr>
<tr>
<td></td>
<td>3.10.0-693.11.6.el7.x86_64</td>
</tr>
<tr>
<td><strong>Compiler</strong></td>
<td>C/C++: Version 18.0.0.128 of Intel C/C++</td>
</tr>
<tr>
<td></td>
<td>Compiler for Linux: Version 18.0.0.128 of Intel Fortran</td>
</tr>
<tr>
<td><strong>Parallel</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Firmware</strong></td>
<td>Version 0.59 Released Feb-2018</td>
</tr>
<tr>
<td><strong>File System</strong></td>
<td>xfs</td>
</tr>
<tr>
<td><strong>System State</strong></td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td><strong>Base Pointers</strong></td>
<td>64-bit</td>
</tr>
<tr>
<td><strong>Peak Pointers</strong></td>
<td>32/64-bit</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>jemalloc: jemalloc memory allocator library V5.0.1;</td>
</tr>
</tbody>
</table>
SPEC CPU2017 Integer Rate Result

Huawei

Huawei XH321 V5 (Intel Xeon Gold 5120T)

SPECrate2017_int_base = 135

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Results Table

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<tr>
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<th>Seconds</th>
<th>Ratio</th>
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<td>94.7</td>
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SPECrate2017_int_base = 135

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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:
LD_LIBRARY_PATH = "/spec/lib/ia32:/spec/lib/intel64:/spec/je5.0.1-32:/spec/je5.0.1-64"

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
Huawei XH321 V5 (Intel Xeon Gold 5120T)

SPECrate2017_int_base = 135
SPECrate2017_int_peak = 143

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

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
ADDDC Sparing Set to Disabled

Sysinfo program /spec/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bce91c0f
running on localhost.localdomain Tue Jun 19 19:14:17 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 5120T CPU @ 2.20GHz
    2 "physical id"s (chips)
    56 "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 : 14
  siblings : 28
  physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
  physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14

From lscpu:
  Architecture: x86_64
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  CPU(s): 56
  On-line CPU(s) list: 0-55
  Thread(s) per core: 2
  Core(s) per socket: 14
  Socket(s): 2
  NUMA node(s): 4
  Vendor ID: GenuineIntel
  CPU family: 6

(Continued on next page)
Platform Notes (Continued)

Model: 85
Model name: Intel(R) Xeon(R) Gold 5120T CPU @ 2.20GHz
Stepping: 4
CPU MHz: 2200.000
BogoMIPS: 4405.10
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 19712K
NUMA node0 CPU(s): 0-3,7-9,28-31,35-37
NUMA node1 CPU(s): 4-6,10-13,32-34,38-41
NUMA node2 CPU(s): 14-17,21-23,42-45,49-51
NUMA node3 CPU(s): 18-20,24-27,46-48,52-55

/proc/cpuinfo cache data
  cache size : 19712 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 7 8 9 28 29 30 31 35 36 37
  node 0 size: 96437 MB
  node 0 free: 93844 MB
  node 1 cpus: 4 5 6 10 11 12 13 32 33 34 38 39 40 41
  node 1 size: 98304 MB
  node 1 free: 96002 MB
  node 2 cpus: 14 15 16 17 21 22 23 42 43 44 45 49 50 51
  node 2 size: 98304 MB
  node 2 free: 96011 MB
  node 3 cpus: 18 19 20 24 25 26 27 46 47 48 52 53 54 55
  node 3 size: 98304 MB
  node 3 free: 95565 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
  MemTotal: 394174484 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  os-release:

(Continued on next page)
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SPEC CPU2017 Integer Rate Result

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Platform Notes (Continued)

NAME="Red Hat Enterprise Linux Server"
VERSION="7.3 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.3"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)

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 19 19:12

SPEC is set to: /spec
/dev/sda8    xfs    325G  114G  212G  36% /

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. 0.59 02/24/2018
Memory:
4x NO DIMM NO DIMM
12x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666, configured at 2400

(End of data from sysinfo program)

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)
==============================================================================

(Continued on next page)
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Huawei XH321 V5 (Intel Xeon Gold 5120T)

SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

spec

SPEC CPU2017 Integer Rate Result

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

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

(Continued on next page)
### Base Portability Flags (Continued)

- 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-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`

(Continued on next page)
Huawei
Huawei XH321 V5 (Intel Xeon Gold 5120T)

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Software Availability: Jan-2018

Peak Compiler Invocation (Continued)

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-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

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

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

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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Huawei

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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 2018-06-19 19:14:16-0400.


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