Huawei

Huawei XH321 V5 (Intel Xeon Platinum 8256)

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

**Test Date**: Oct-2018  
**Hardware Availability**: Apr-2019  
**Software Availability**: Dec-2018

<table>
<thead>
<tr>
<th>Thread</th>
<th>SPECspeed2017_int_base =</th>
<th>SPECspeed2017_int_peak =</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s 8</td>
<td>9.00</td>
<td>Not Run</td>
</tr>
<tr>
<td>602.gcc_s 8</td>
<td>8.89</td>
<td>12.1</td>
</tr>
<tr>
<td>605.mcf_s 8</td>
<td>6.12</td>
<td>12.1</td>
</tr>
<tr>
<td>620.omnetpp_s 8</td>
<td>14.2</td>
<td></td>
</tr>
<tr>
<td>623.xalancbmk_s 8</td>
<td>5.44</td>
<td></td>
</tr>
<tr>
<td>625.x264_s 8</td>
<td>4.72</td>
<td></td>
</tr>
<tr>
<td>631.deepsjeng_s 8</td>
<td>13.8</td>
<td></td>
</tr>
<tr>
<td>641.leela_s 8</td>
<td>13.1</td>
<td></td>
</tr>
<tr>
<td>648.exchange2_s 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>657.xz_s 8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name**: Intel Xeon Platinum 8256  
- **Max MHz.**: 3900  
- **Nominal**: 3800  
- **Enabled**: 8 cores, 2 chips  
- **Orderable**: 1,2 chips  
- **Cache L1**: 32 KB I + 32 KB D on chip per core  
- **Cache L2**: 1 MB I+D on chip per core  
- **Cache L3**: 16.5 MB I+D on chip per chip  
- **Other**: None  
- **Memory**: 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)  
- **Storage**: 1 x 1800 GB SAS, 10000 RPM  
- **Other**: None

**Software**

- **OS**: SUSE Linux Enterprise Server 12 SP4 (x86_64)  
- **Compiler**: C/C++: Version 19.0.1.144 of Intel C/C++ Compiler Build 20181018 for Linux; Fortran: Version 19.0.1.144 of Intel Fortran Compiler Build 20181018 for Linux  
- **Parallel**: Yes  
- **Firmware**: Version 6.52 Released Mar-2019  
- **File System**: xfs  
- **System State**: Run level 3 (multi-user)  
- **Base Pointers**: 64-bit  
- **Peak Pointers**: Not Applicable  
- **Other**: jemalloc memory allocator V5.0.1
# SPEC CPU2017 Integer Speed Result

## Huawei

**Huawei XH321 V5 (Intel Xeon Platinum 8256)**

<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>
</tbody>
</table>

**SPECspeed2017_int_base = 9.00**

**SPECspeed2017_int_peak = Not Run**

---

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>8</td>
<td>267</td>
<td>6.64</td>
<td>267</td>
<td>6.64</td>
<td>267</td>
<td>6.65</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>8</td>
<td>448</td>
<td>8.89</td>
<td>444</td>
<td>8.97</td>
<td>457</td>
<td>8.72</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>8</td>
<td>384</td>
<td>12.3</td>
<td>397</td>
<td>11.9</td>
<td>389</td>
<td>12.1</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>8</td>
<td>267</td>
<td>6.12</td>
<td>267</td>
<td>6.10</td>
<td>265</td>
<td>6.16</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>8</td>
<td>118</td>
<td>12.0</td>
<td>117</td>
<td>12.1</td>
<td>115</td>
<td>12.4</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>8</td>
<td>129</td>
<td>13.7</td>
<td>124</td>
<td>14.2</td>
<td>124</td>
<td>14.2</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>8</td>
<td>267</td>
<td>5.37</td>
<td>263</td>
<td>5.44</td>
<td>263</td>
<td>5.44</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>8</td>
<td>361</td>
<td>4.72</td>
<td>358</td>
<td>4.77</td>
<td>363</td>
<td>4.71</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>8</td>
<td>214</td>
<td>13.8</td>
<td>208</td>
<td>14.1</td>
<td>214</td>
<td>13.8</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>8</td>
<td>468</td>
<td>13.2</td>
<td>471</td>
<td>13.1</td>
<td>490</td>
<td>12.6</td>
</tr>
</tbody>
</table>

---

### 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:

- KMP_AFFINITY = "granularity=fine,compact,1,0"
- OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i9-7900X 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:

```bash
sync; echo 3> /proc/sys/vm/drop_caches
```

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.

Huawei

Huawei XH321 V5 (Intel Xeon Platinum 8256)

| SPECspeed2017_int_base = 9.00 |
| SPECspeed2017_int_peak = Not Run |

| CPU2017 License: | 3175 |
| Test Sponsor: | Huawei |
| Tested by: | Huawei |
| Test Date: | Oct-2018 |
| Hardware Availability: | Apr-2019 |
| Software Availability: | Dec-2018 |

Platform Notes

BIOS configuration:
Power Policy Set to Load Balance
Hyper-Threading Set to Disable
XPT Prefetch Set to Enabled
Sysinfo program /spec2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on spec2 Mon Oct 1 14:34:10 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) Platinum 8256 CPU @ 3.80GHz
   2 "physical id"s (chips)
   8 "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 : 4
   siblings : 4
   physical 0: cores 0 5 8 13
   physical 1: cores 5 8 9 12

From lscpu:
   Architecture: x86_64
   CPU op-mode(s): 32-bit, 64-bit
   Byte Order: Little Endian
   CPU(s): 8
   On-line CPU(s) list: 0-7
   Thread(s) per core: 1
   Core(s) per socket: 4
   Socket(s): 2
   NUMA node(s): 2
   Vendor ID: GenuineIntel
   CPU family: 6
   Model: 85
   Model name: Intel(R) Xeon(R) Platinum 8256 CPU @ 3.80GHz
   Stepping: 6
   CPU MHz: 3800.000
   CPU max MHz: 3900.0000
   CPU min MHz: 1200.0000
   BogoMIPS: 7600.00
   Virtualization: VT-x
   L1d cache: 32K
   L1i cache: 32K
   L2 cache: 1024K
   L3 cache: 16896K

(Continued on next page)
Huawei

Huawei XH321 V5 (Intel Xeon Platinum 8256)

SPEC CPU2017 Integer Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Huawei

Huawei XH321 V5 (Intel Xeon Platinum 8256)

SPECspeed2017_int_base = 9.00

SPECspeed2017_int_peak = Not Run

CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei
Test Date: Oct-2018
Hardware Availability: Apr-2019
Software Availability: Dec-2018

Platform Notes (Continued)

NUMA node0 CPU(s): 0-3
NUMA node1 CPU(s): 4-7
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpref pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm
pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c
rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_13 cd8 cdp_13 invpcid_single ssbd
mba ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1
hle avx2 smep bmi2 ets invpcid rtm cqm mpx rdt_a avx512f avx512dq rdsreset adx smack
clflushopt clwb intel_pt avx512c1 avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves
cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts pku ospke
avx512_vnni flush_l1d arch_capabilities

/proc/cpuinfo cache data
  cache size : 16896 KB

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
  node 0 size: 191935 MB
  node 0 free: 191436 MB
  node 1 cpus: 4 5 6 7
  node 1 size: 193252 MB
  node 1 free: 192814 MB
  node distances:
  node   0   1
  0: 10 21
  1: 21 10

From /proc/meminfo
  MemTotal: 394432864 KB
  HugePages_Total: 0
  Hugepagesize: 2048 KB

From /etc/*release* /etc/*version*
  SuSE-release:
    SUSE Linux Enterprise Server 12 (x86_64)
    VERSION = 12
    PATCHLEVEL = 4
    # This file is deprecated and will be removed in a future service pack or release.
    # Please check /etc/os-release for details about this release.
  os-release:
    NAME="SLES"
    VERSION="12-SP4"
    VERSION_ID="12.4"

(Continued on next page)
Huawei

Huawei XH321 V5 (Intel Xeon Platinum 8256)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>9.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

Platform Notes (Continued)

PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp4"

uname -a:
    Linux spec2 4.12.14-94.41-default #1 SMP Wed Oct 31 12:25:04 UTC 2018 (3090901) x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown):          Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation, IBPB, IBRS_FW

run-level 3 Oct 1 14:33

SPEC is set to: /spec2017

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda2      xfs   1.7T   11G  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. 6.52 03/16/2019
Memory:
4x NO DIMM NO DIMM
12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base)
    657.xz_s(base)
==============================================================================

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
    Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)

(Continued on next page)
<table>
<thead>
<tr>
<th>Huawei XH321 V5 (Intel Xeon Platinum 8256)</th>
<th>SPECspeed2017_int_base = 9.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2017 License: 3175</td>
<td>Test Date: Oct-2018</td>
</tr>
<tr>
<td>Test Sponsor: Huawei</td>
<td>Hardware Availability: Apr-2019</td>
</tr>
<tr>
<td>Tested by: Huawei</td>
<td>Software Availability: Dec-2018</td>
</tr>
</tbody>
</table>

**Compiler Version Notes (Continued)**

```
641.leela_s(base)
---------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---------------------------------------------------------------
```

```
FC 648.exchange2_s(base)
---------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---------------------------------------------------------------
```

**Base Compiler Invocation**

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

C++ benchmarks:
```
icpc -m64
```

Fortran benchmarks:
```
ifort -m64
```

**Base Portability Flags**

```
600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalanchmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64
```
Huawei XH321 V5 (Intel Xeon Platinum 8256)

SPECspeed2017_int_base = 9.00
SPECspeed2017_int_peak = Not Run

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

Test Date: Oct-2018
Hardware Availability: Apr-2019
Software Availability: Dec-2018

Base Optimization Flags

C benchmarks:
- Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- qopt-mem-layout=4 -qopenmp -DSPEC_OPENMP
- L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
- Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- qopt-mem-layout=4
- L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
- lqkmalloc

Fortran benchmarks:
- xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
- nostandard-realloc-lhs

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/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 v1.0.5 on 2018-10-01 14:34:09-0400.