## SPEC® CPU2017 Floating Point Speed Result

### Huawei

**Huawei CH225 V5 (Intel Xeon Platinum 8270)**

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

### SPECspeed2017_fp_base = 149

### SPECspeed2017_fp_peak = Not Run

### Threads

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_fp_base (149)</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>52</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>52</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>52</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>52</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>52</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>52</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>52</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>52</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>52</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>52</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon Platinum 8270
- **Max MHz.:** 4000
- **Nominal:** 2700
- **Enabled:** 52 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:** 35.75 MB I+D on chip per chip
- **Other:** None
- **Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R)
- **Storage:** 1 x 1200 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:** None
SPEC CPU2017 Floating Point Speed Result

Huawei
Huawei CH225 V5 (Intel Xeon Platinum 8270)

SPECspeed2017_fp_base = 149
SPECspeed2017_fp_peak = Not Run

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

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></td>
<td>Base</td>
<td></td>
<td></td>
<td>Peak</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>603.bwaves_s</td>
<td>52</td>
<td>109</td>
<td>542</td>
<td>108</td>
<td>544</td>
<td>108</td>
<td>545</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>52</td>
<td>90.6</td>
<td>184</td>
<td>91.3</td>
<td>182</td>
<td>91.1</td>
<td>183</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>52</td>
<td>49.2</td>
<td>106</td>
<td>49.4</td>
<td>106</td>
<td>49.3</td>
<td>106</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>52</td>
<td>102</td>
<td>130</td>
<td>102</td>
<td>129</td>
<td>102</td>
<td>130</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>52</td>
<td>74.1</td>
<td>120</td>
<td>73.7</td>
<td>120</td>
<td>74.0</td>
<td>120</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>52</td>
<td>203</td>
<td>58.6</td>
<td>202</td>
<td>58.8</td>
<td>206</td>
<td>57.7</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>52</td>
<td>105</td>
<td>137</td>
<td>99.3</td>
<td>145</td>
<td>105</td>
<td>137</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>52</td>
<td>57.4</td>
<td>304</td>
<td>57.6</td>
<td>304</td>
<td>57.5</td>
<td>304</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>52</td>
<td>103</td>
<td>88.8</td>
<td>102</td>
<td>89.0</td>
<td>103</td>
<td>88.8</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>52</td>
<td>102</td>
<td>154</td>
<td>102</td>
<td>154</td>
<td>103</td>
<td>153</td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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"
LD_LIBRARY_PATH = "/spec2017/lib/ia32:/spec2017/lib/intel64"
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:
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.

Platform Notes

BIOS configuration:
Power Policy Set to Load Balance
Hyper-Threading Set to Disable

(Continued on next page)
Huawei
Huawei CH225 V5 (Intel Xeon Platinum 8270)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>149</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

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

Platform Notes (Continued)

XPT Prefetch Set to Enabled
Sysinfo program /spec2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9
running on sles12sp4 Thu Mar 28 18:00:27 2019

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 8270 CPU @ 2.70GHz
  2 "physical id"s (chips)
  52 "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 : 26
siblings : 26
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 52
On-line CPU(s) list: 0-51
Thread(s) per core: 1
Core(s) per socket: 26
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8270 CPU @ 2.70GHz
Stepping: 6
CPU MHz: 2700.000
CPU max MHz: 4000.0000
CPU min MHz: 1000.0000
BogoMIPS: 5400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
NUMA node0 CPU(s): 0-25

(Continued on next page)
Huawei CH225 V5 (Intel Xeon Platinum 8270)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base =</th>
<th>149</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak =</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

Platform Notes (Continued)

NUMA node1 CPU(s):  26-51
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 nopl xtopology nonstop_tsc cpuid
        aperfmperf pni pclmulqdq dtes64 monitor 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_l3 cdp_c13
        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 rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512v1
        xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occuc_llc cqm_mbb_total cqm_mbb_local
        dtherm ida arat pinn pts pkp ospe avx512_vnni flush_l1d arch_capabilities

/process/cpuinfo cache data
  cache size: 36608 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 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
  node 0 size: 191902 MB
  node 0 free: 190618 MB
  node 1 cpus: 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51
  node 1 size: 193279 MB
  node 1 free: 191489 MB
  node distances:
  node  0: 10 21
  node  1: 21 10

From /proc/meminfo
  MemTotal: 394426528 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 CH225 V5 (Intel Xeon Platinum 8270)

SPEC speed2017_fp_base = 149
SPEC speed2017_fp_peak = Not Run

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

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

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:
x86_64 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 Mar 28 06:30

SPEC is set to: /spec2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 700G 13G 687G 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. 6.52 03/16/2019
Memory:
24x Samsung M393A2K43CB2-CVF 16 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  619.lbm_s(base) 638.imagick_s(base) 644.nab_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  607.cactuBSSN_s(base)
------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
## SPEC CPU2017 Floating Point Speed Result

### Huawei

**Huawei CH225 V5 (Intel Xeon Platinum 8270)**

<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_fp_base = 149**

**SPECSpeed2017_fp_peak = Not Run**

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

### Compiler Version Notes (Continued)

```plaintext
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
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.
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.
```

```plaintext
FC 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_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.
```

```plaintext
CC 621.wrf_s(base) 627.cam4_s(base) 628.pop2_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:**
```plaintext
icc -m64 -std=c11
```

**Fortran benchmarks:**
```plaintext
ifort -m64
```

**Benchmarks using both Fortran and C:**
```plaintext
ifort -m64 icc -m64 -std=c11
```

**Benchmarks using Fortran, C, and C++:**
```plaintext
icpc -m64 icc -m64 -std=c11 ifort -m64
```
**Huawei**

Huawei CH225 V5 (Intel Xeon Platinum 8270)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base = 149</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak = Not Run</td>
</tr>
</tbody>
</table>

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

---

### Base Portability Flags

- 603.bwaves_s: `-DSPEC_LP64`
- 607.cactusBSSN_s: `-DSPEC_LP64`
- 619.ibm_s: `-DSPEC_LP64`
- 621.wrf_s: `-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian`
- 627.cam4_s: `-DSPEC_LP64 -DSPEC_CASE_FLAG`
- 628.pop2_s: `-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian -assume byterecl`
- 638.imagick_s: `-DSPEC_LP64`
- 644.nab_s: `-DSPEC_LP64`
- 649.fotonik3d_s: `-DSPEC_LP64`
- 654.roms_s: `-DSPEC_LP64`

---

### Base Optimization Flags

**C benchmarks:**

- `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP`

**Fortran benchmarks:**

- `-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp`
- `-nostandard-realloc-lhs`

**Benchmarks using both Fortran and C:**

- `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP`
- `-nostandard-realloc-lhs`

**Benchmarks using Fortran, C, and C++:**

- `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP`
- `-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:

<table>
<thead>
<tr>
<th>Huawei CH225 V5 (Intel Xeon Platinum 8270)</th>
<th>Huawei CH225 V5 (Intel Xeon Platinum 8270)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak = Not Run</td>
<td>SPECspeed2017_fp_base = 149</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU2017 License: 3175</td>
<td>Test Date: Mar-2019</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>

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 2019-03-28 18:00:26-0400.