# SPEC® CPU2017 Floating Point Speed Result

## Huawei

Huawei 2288H V5 (Intel Xeon Bronze 3204)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>43.7</th>
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<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>44.0</td>
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**CPU2017 License:** 3175  
**Test Sponsor:** Huawei  
**Test Date:** Mar-2019  
**Hardware Availability:** Apr-2019  
**Tested by:** Huawei  
**Software Availability:** Dec-2018

### Hardware

<table>
<thead>
<tr>
<th>Threads</th>
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### Software

**CPU Name:** Intel Xeon Bronze 3204  
**Max MHz.:** 1900  
**Nominal:** 1900  
**Enabled:** 12 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:** 8.25 MB I+D on chip per chip  
**Other:** None  
**Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R, running at 2133)  
**Storage:** 1 x 1200 GB SAS, 10000 RPM  
**Other:** None

**OS:** SUSE Linux Enterprise Server 12 SP4 (x86_64)  
**Compiler:** C/C++: Version 19.0.1.144 of Intel C/C++  
**Parallel:** Yes  
**Firmware:** Version 6.36 Released Feb-2019  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** 64-bit  
**Other:** None
Huawei

Huawei 2288H V5 (Intel Xeon Bronze 3204)

SPECspeed2017_fp_base = 43.7
SPECspeed2017_fp_peak = 44.0

Results Table

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SPECspeed2017_fp_base = 43.7
SPECspeed2017_fp_peak = 44.0

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
XPT Prefetch Set to Enabled
Huawei
Huawei 2288H V5 (Intel Xeon Bronze 3204)

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Platform Notes (Continued)

Sysinfo program /spec2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9
running on sles12sp4 Mon Mar 25 14:36:59 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) Bronze 3204 CPU @ 1.90GHz
  2 "physical id"s (chips)
  12 "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 : 6
siblings : 6
physical 0: cores 0 1 2 3 4 5
physical 1: cores 0 1 2 3 4 5

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 12
On-line CPU(s) list: 0-11
Thread(s) per core: 1
Core(s) per socket: 6
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Bronze 3204 CPU @ 1.90GHz
Stepping: 6
CPU MHz: 1900.000
CPU max MHz: 1900.0000
CPU min MHz: 800.0000
BogoMIPS: 3800.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 8448K
NUMA node0 CPU(s): 0-5
NUMA node1 CPU(s): 6-11
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
## SPEC CPU2017 Floating Point Speed Result

### Huawei

#### Huawei 2288H V5 (Intel Xeon Bronze 3204)

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### Platform Notes (Continued)

```
/proc/cpuinfo cache data
  cache size : 8448 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
  node 0 size: 191906 MB
  node 0 free: 191194 MB
  node 1 cpus: 6 7 8 9 10 11
  node 1 size: 193281 MB
  node 1 free: 192087 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10

From /proc/meminfo
  MemTotal:       394433020 kB
  HugePages_Total:       0
  Hugepagesize:       2048 kB

From /etc/*release*/etc/*version*
  SuSE-release:
    SUSLE 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"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp4"
```

(Continued on next page)
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Platform Notes (Continued)

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 25 05:15

SPEC is set to: /spec2017
    Filesystem Type Size Used Avail Use% Mounted on
    /dev/sda3 xfs 700G 15G 686G 3% /

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. 6.36 02/15/2019
    Memory:
    24x Samsung M393A2K43CB2-CVF 16 GB 2 rank 2933, configured at 2133

(End of data from sysinfo program)

Compiler Version Notes

-----------------------------------------------------------------------------------
    CC 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)
-----------------------------------------------------------------------------------
    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, peak)
-----------------------------------------------------------------------------------
    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) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
    Version 19.0.1.144 Build 20181018

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Compiler Version Notes (Continued)

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base, peak)

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.

FC 603.bwaves_s(peak) 649.fotonik3d_s(peak)

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.

CC 621.wrf_s(base) 627.cam4_s(base, peak) 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.
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.

CC 621.wrf_s(peak) 628.pop2_s(peak)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
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Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
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### Base Compiler Invocation

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

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

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

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

### Base Portability Flags

- `603.bwaves_s`: -DSPEC_LP64
- `607.cactuBSSN_s`: -DSPEC_LP64
- `619.lbm_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:**
  ```bash
  -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
  -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
  ```

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

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Base Optimization Flags (Continued)

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

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11
Fortran benchmarks:
ifort -m64

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

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

Peak Portability Flags

Same as Base Portability Flags

Peak 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:
603.bwaves_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP
-DSPEC_OPENMP -O2 -xCORE-AVX512 -qopt-prefetch -ipo -O3
-ffinite-math-only -no-prec-div -qopt-mem-layout-trans=4
-qopenmp -nostandard-realloc-lhs
649.fotonik3d_s: Same as 603.bwaves_s
654.roms_s: basepeak = yes

(Continued on next page)
## Huawei

Huawei 2288H V5 (Intel Xeon Bronze 3204)

<table>
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<tr>
<th>SPECspeed2017_fp_base = 43.7</th>
<th>SPECspeed2017_fp_peak = 44.0</th>
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- **CPU2017 License**: 3175
- **Test Sponsor**: Huawei
- **Test Date**: Mar-2019
- **Hardware Availability**: Apr-2019
- **Tested by**: Huawei
- **Software Availability**: Dec-2018

### Peak Optimization Flags (Continued)

**Benchmarks using both Fortran and C:**

- 621.wrf_s: `basepeak = yes`

- 627.cam4_s: `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP -nostandard-realloc-1hs`

- 628.pop2_s: `-prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512 -qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=4 -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -nostandard-realloc-1hs`

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

- 607.cactuBSSN_s: `basepeak = yes`

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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:


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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 v1.0.5 on 2019-03-25 14:36:58-0400.