Huawei CH225 V5 (Intel Xeon Bronze 3104)

<table>
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<tr>
<th>SPECrate2017_fp_base = 49.6</th>
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<td>SPECrate2017_fp_peak = 51.3</td>
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CPU2017 License: 3175  
Test Sponsor: Huawei  
Tested by: Huawei  
Test Date: Sep-2018  
Hardware Availability: Jul-2017  
Software Availability: Mar-2018

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</tbody>
</table>

**Hardware**

CPU Name: Intel Xeon Bronze 3104  
Max MHz.: 1700  
Nominal: 1700  
Enabled: 12 cores, 2 chips  
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: 8.25 MB I+D on chip per chip  
Other: None  
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2666V-R, running at 2133)  
Storage: 1 x 1200 GB SAS, 10000 RPM  
Other: None

**Software**

OS: Red Hat Enterprise Linux Server release 7.4 (Maipo)  
Compiler: C/C++: Version 18.0.2.199 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.2.199 of Intel Fortran Compiler for Linux  
Parallel: No  
Firmware: Version 0.80 Released Jun-2018  
File System: xfs  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 64-bit  
Other: None
Huawei

Huawei CH225 V5 (Intel Xeon Bronze 3104)

Results Table

<table>
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<tr>
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<td>514</td>
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</tr>
</tbody>
</table>

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:

Binaries compiled on a system with 1x Intel Core i7-6700K CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.5
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Files system page cache synced and cleared with:
sync; echo 3 > /proc/sys/vm/drop_caches
runcpu command invokes through numactl i.e.:
numactl --interleave=all runcpu <etc>
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
SPEC CPU2017 Floating Point Rate Result

Huawei

Huawei CH225 V5 (Intel Xeon Bronze 3104)

SPECrate2017_fp_peak = 51.3

SPECrate2017_fp_base = 49.6

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

General Notes (Continued)

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
XPT Prefetch Set to Enabled
Sysinfo program /spec2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Mon Sep 17 01:33:30 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) Bronze 3104 CPU @ 1.70GHz
  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 3104 CPU @ 1.70GHz
Stepping: 4
CPU MHz: 1700.000
BogoMIPS: 3400.00

(Continued on next page)
Huawei CH225 V5 (Intel Xeon Bronze 3104)

<table>
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<th>CPU2017 License:</th>
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<td>Huawei</td>
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<td>Mar-2018</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

- **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 lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpub pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 fma cx16 xtpre pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch epb cat_l3 cdp_l3 invpcid_single intel_pt spec_ctrl ibpb_support tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsaves xgetbv1 cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm arat pln pts

```
/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: 391349 MB**
- **node 0 free: 375054 MB**
- **node 1 cpus: 6 7 8 9 10 11**
- **node 1 size: 393216 MB**
- **node 1 free: 376034 MB**
- **node distances:**
  - **node 0 1**
  - **0: 10 21**
  - **1: 21 10**

From `/proc/meminfo`
- **MemTotal:** 790510872 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"

(Continued on next page)
Huawei CH225 V5 (Intel Xeon Bronze 3104)

---

**Platform Notes (Continued)**

```plaintext
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
```

```text
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 Sep 16 16:16
```

**Files and System Information**

```
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda2      xfs   720G   91G  629G  13% /
```

---

**Compiler Version Notes**

```
CC  519.lbm_r(base) 538.imagick_r(base, peak) 544.nab_r(base, peak)
```

```text
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

```
CC  519.lbm_r(peak)
```

```text
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

```
CXXC 508.namd_r(base) 510.parest_r(base, peak)
```

(Continued on next page)
### Huawei CH225 V5 (Intel Xeon Bronze 3104) Results

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<tr>
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</table>

#### Compiler Version Notes (Continued)

icpc (ICC) 18.0.2 20180210  
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.

---

CXXC 508.namd_r(peak)

---

icpc (ICC) 18.0.2 20180210  
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.

---

CC 511.povray_r(base) 526.blender_r(base, peak)

---

icpc (ICC) 18.0.2 20180210  
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.

icc (ICC) 18.0.2 20180210  
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.

---

CC 511.povray_r(peak)

---

icpc (ICC) 18.0.2 20180210  
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.

icc (ICC) 18.0.2 20180210  
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.

---

FC 507.cactuBSSN_r(base, peak)

---

icpc (ICC) 18.0.2 20180210  
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.

icc (ICC) 18.0.2 20180210  
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.

ifort (IFORT) 18.0.2 20180210  
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.

---

FC 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base)

---

ifort (IFORT) 18.0.2 20180210  
Copyright (C) 1985–2018 Intel Corporation. All rights reserved.

---

(Continued on next page)
SPEC CPU2017 Floating Point Rate Result

Huawei
Huawei CH225 V5 (Intel Xeon Bronze 3104)

SPECrate2017_fp_base = 49.6
SPECrate2017_fp_peak = 51.3

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

Compiler Version Notes (Continued)

FC  554.roms_r(peak)
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

CC  521.wrf_r(base) 527.cam4_r(base)
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

CC   521.wrf_r(peak) 527.cam4_r(peak)
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
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

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

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64
## SPEC CPU2017 Floating Point Rate Result

**Huawei**

Huawei CH225 V5 (Intel Xeon Bronze 3104)

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

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</table>

**Test Date:** Sep-2018  
**Hardware Availability:** Jul-2017  
**Software Availability:** Mar-2018

### Base Portability Flags

503.bwaves_r: -DSPEC_LP64  
507.cactuBSSN_r: -DSPEC_LP64  
508.namd_r: -DSPEC_LP64  
510.parest_r: -DSPEC_LP64  
511.povray_r: -DSPEC_LP64  
519.lbm_r: -DSPEC_LP64  
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian  
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char  
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG  
538.imagick_r: -DSPEC_LP64  
544.nab_r: -DSPEC_LP64  
549.fotonik3d_r: -DSPEC_LP64  
554.roms_r: -DSPEC_LP64

### Base Optimization Flags

**C benchmarks:**

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3

**C++ benchmarks:**

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3

**Fortran benchmarks:**

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

**Benchmarks using both Fortran and C:**

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

**Benchmarks using both C and C++:**

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3

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

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
Huawei

Huawei CH225 V5 (Intel Xeon Bronze 3104)

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

Test Date: Sep-2018
Hardware Availability: Jul-2017
Software Availability: Mar-2018

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

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

Benchmarks using both C and C++:
icpc -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:
519.lbm_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

538.imagick_r: basepeak = yes

544.nab_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

C++ benchmarks:
508.namd_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

(Continued on next page)
SPEC CPU2017 Floating Point Rate Result

Huawei

Huawei CH225 V5 (Intel Xeon Bronze 3104)

SPECrate2017_fp_base = 49.6
SPECrate2017_fp_peak = 51.3

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

Test Date: Sep-2018
Hardware Availability: Jul-2017
Software Availability: Mar-2018

Peak Optimization Flags (Continued)

510.parest_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

Fortran benchmarks:
503.bwaves_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -auto
-nostandard-realloc-lhs
549.fotonik3d_r: basepeak = yes
554.roms_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both Fortran and C:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both C and C++:
511.povray_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3
526.blender_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -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/Intel-ic18.0-official-linux64.2017-12-21.xml
http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.9-revC.xml
<table>
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<th>SPEC CPU2017 Floating Point Rate Result</th>
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<tr>
<td>Huawei CH225 V5 (Intel Xeon Bronze 3104)</td>
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| CPU2017 License: 3175                                                                                 |
| Test Sponsor: Huawei                                                                                  |
| Tested by: Huawei                                                                                    |
| Test Date: Sep-2018                                                                                   |
| Hardware Availability: Jul-2017                                                                       |
| Software Availability: Mar-2018                                                                       |

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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