Huawei

Huawei XH628 V5 (Intel Xeon Bronze 3104)

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<tr>
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CPU2017 License: 3175
Test Sponsor: Huawei
Tested by: Huawei

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<td>554.roms_r</td>
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</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:** 352 GB (11 x 32 GB 2Rx4 PC4-2666V-R, running at 2133)
- **Storage:** 1 x 1800 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 0.86 Released Aug-2018
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** None
SPEC CPU2017 Floating Point Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Huawei

Huawei XH628 V5 (Intel Xeon Bronze 3104)

SPECrate2017_fp_base = 47.6

SPECrate2017_fp_peak = 48.5

Results Table

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</tbody>
</table>

SPECrate2017_fp_base = 47.6

SPECrate2017_fp_peak = 48.5

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
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>
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
Huawei XH628 V5 (Intel Xeon Bronze 3104) SPECrate2017_fp_base = 47.6
SPECrate2017_fp_peak = 48.5

CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Aug-2018
Tested by: Huawei
Hardware Availability: Aug-2018
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
Sysinfo program /spec2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Fri Aug 17 02:13:49 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
    Virtualization: VT-x
Huawei XH628 V5 (Intel Xeon Bronze 3104)

SPECrate2017_fp_base = 47.6
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CPU2017 License: 3175
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Tested by: Huawei
Test Date: Aug-2018
Hardware Availability: Aug-2018
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Platform Notes (Continued)

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 sse mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc arch_perfmon pebs bts rep_good nopl nonstop_tsc
aperfmpref eagerfpu pni pclmulqdq dtes64 msr eez est tm2 ssse3 fma cx16 xtrnor
pcid pdcm pclid 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 vnmi flexpriority ept vpid fsgsbase tsc_adjust
bmi1 hle avx2 smep bmi2 orts invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx
snap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc
cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm arat pln pts

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: 195701 MB
   node 0 free: 190447 MB
   node 1 cpus: 6 7 8 9 10 11
   node 1 size: 163840 MB
   node 1 free: 159421 MB
   node distances:
     node   0   1
     0: 10 21
     1: 21 10

MemTotal: 362113528 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

(Continued on next page)
Huawei XH628 V5 (Intel Xeon Bronze 3104)

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Platform Notes (Continued)

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

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 Aug 16 16:55

SPEC is set to: /spec2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/nvme0n1p4 xfs 1.5T 8.3G 1.5T 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. 0.86 08/06/2018
Memory:
5x NO DIMM NO DIMM
11x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666, configured at 2133

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  519.lbm_r(base) 538.imagick_r(base, peak) 544.nab_r(base, peak)
------------------------------------------------------------------------------
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 XH628 V5 (Intel Xeon Bronze 3104)  

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**Compiler Version Notes (Continued)**

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

---

```plaintext
CXXC 508.namd_r(peak)
```

---

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

---

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

---

```plaintext
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.
```

---

```plaintext
CC 511.povray_r(peak)
```

---

```plaintext
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.
```

---

```plaintext
FC 507.cactuBSSN_r(base, peak)
```

---

```plaintext
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.
```

---

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

---

```plaintext
ifort (IFORT) 18.0.2 20180210  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```
Huawei
Huawei XH628 V5 (Intel Xeon Bronze 3104)

SPECrate2017_fp_base = 47.6
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Compiler Version Notes (Continued)

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

==============================================================================
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icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
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CC   521.wrf_r(peak) 527.cam4_r(peak)
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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
Huawei XH628 V5 (Intel Xeon Bronze 3104)

SPECrate2017_fp_base = 47.6
SPECrate2017_fp_peak = 48.5

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

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</tbody>
</table>

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

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
510.parest_r: basepeak = yes

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

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<tbody>
<tr>
<td>Huawei XH628 V5 (Intel Xeon Bronze 3104)</td>
<td></td>
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</table>

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

### Peak Optimization Flags (Continued)

**Fortran benchmarks:**

503.bwaves_r:basepeak = yes  
549.fotonik3d_r:basepeak = yes  
554.roms_r:  
```plaintext  
-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:**

521.wrf_r:  
```plaintext  
-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  
```

527.cam4_r:basepeak = yes

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

511.povray_r:  
```plaintext  
-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:basepeak = yes

**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:


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