## Huawei XH628 V5 (Intel Xeon Gold 6136)

<table>
<thead>
<tr>
<th>Specspeed2017_fp_base</th>
<th>105</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specspeed2017_fp_peak</td>
<td>106</td>
</tr>
</tbody>
</table>

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

### Hardware
- **CPU Name:** Intel Xeon Gold 6136  
- **Max MHz.:** 3700  
- **Nominal:** 3000  
- **Enabled:** 24 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:** 24.75 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R)  
- **Storage:** 1 x 1800 GB SAS, 10000 RPM  
- **Other:** None

### Software
- **OS:** Red Hat Enterprise Linux Server release 7.4 (Maipo)  
  3.10.0-693.11.6.el7.x86_64  
- **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:** Yes  
- **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:** jemalloc memory allocator V5.0.1

### Chart

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Score (Peak)</th>
<th>Score (Base)</th>
<th>Threads</th>
</tr>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>479</td>
<td>0</td>
<td>24</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>479</td>
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<td>24</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>45.5</td>
<td>82.2</td>
<td>24</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>88.2</td>
<td>72.5</td>
<td>24</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>66.7</td>
<td>72.6</td>
<td>24</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>69.0</td>
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<td>24</td>
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<tr>
<td>638.imagick_s</td>
<td>88.2</td>
<td>178</td>
<td>24</td>
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<tr>
<td>644.nab_s</td>
<td>112</td>
<td>84.0</td>
<td>24</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>112</td>
<td>88.2</td>
<td>24</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>112</td>
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<td>24</td>
</tr>
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Huawei

Huawei XH628 V5 (Intel Xeon Gold 6136)

 SPECspeed2017_fp_base = 105
 SPECspeed2017_fp_peak = 106

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<th>Seconds</th>
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<td>45.5</td>
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<td>45.5</td>
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<td>112</td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 105
SPECspeed2017_fp_peak = 106

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"
OMP_STACKSIZE = "192M"

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
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.
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
SPEC CPU2017 Floating Point Speed Result

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<tr>
<th>Huawei XH628 V5 (Intel Xeon Gold 6136)</th>
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<td>Tested by:</td>
<td>Huawei</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Sep-2018</td>
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<td>Aug-2018</td>
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<td>Software Availability:</td>
<td>Mar-2018</td>
</tr>
</tbody>
</table>

**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: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Wed Sep 5 18:19:48 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) Gold 6136 CPU @ 3.00GHz
- 2 "physical id"s (chips)
- 24 "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: 12
- siblings: 12
- physical 0: cores 0 3 4 5 6 7 16 18 19 20 21 22
- physical 1: cores 0 1 2 3 8 9 10 11 18 19 24 27

From lscpu:
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 24
- On-line CPU(s) list: 0-23
- Thread(s) per core: 1
- Core(s) per socket: 12
- Socket(s): 2
- NUMA node(s): 2
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Gold 6136 CPU @ 3.00GHz
- Stepping: 4
- CPU MHz: 3001.000
- CPU max MHz: 3001.0000
- CPU min MHz: 1200.0000
- BogoMIPS: 6000.00
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 25344K

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

**Huawei XH628 V5 (Intel Xeon Gold 6136)**

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**CPU2017 License:** 3175  
**Test Sponsor:** Huawei  
**Test Date:** Sep-2018  
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**Platform Notes (Continued)**

- **NUMA node0 CPU(s):** 0-11
- **NUMA node1 CPU(s):** 12-23
- **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 mce xapic 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 mce xapic mtrr pge mca cmov
- **/proc/cpuinfo cache data**
  - cache size : 25344 KB
- **/proc/meminfo**
  - MemTotal: 394174888 KB
  - HugePages_Total: 0
  - Hugepagesize: 2048 KB
- **/etc/*release* /etc/*version***
  - os-release:
    - NAME="Red Hat Enterprise Linux Server"
    - VERSION="7.4 (Maipo)"
    - ID="rhel"
    - ID_LIKE="fedora"
    - VARIANT="Server"
    - 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)

(Continued on next page)
Huawei

Huawei XH628 V5 (Intel Xeon Gold 6136)

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**Platform Notes (Continued)**

```plaintext
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 Sep 5 13:21

SPEC is set to: /spec2017
```

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:
  - 4x NO DIMM NO DIMM
  - 12x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666

(End of data from sysinfo program)

**Compiler Version Notes**

```
---
CC  619.lbm_s(base) 638.imagick_s(base, peak) 644.nab_s(base, peak)
---
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---

CC  619.lbm_s(peak)
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---

FC  607.cactuBSSN_s(base, peak)
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
iccc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---
(Continued on next page)```
Huawei
Huawei XH628 V5 (Intel Xeon Gold 6136)

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CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Sep-2018
Hardware Availability: Aug-2018
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Compiler Version Notes (Continued)

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

```
-------------------------------
FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base, peak)
-------------------------------
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
-------------------------------
```

```
-------------------------------
FC  603.bwaves_s(peak) 649.fotonik3d_s(peak)
-------------------------------
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
-------------------------------
```

```
-------------------------------
CC  621.wrf_s(base) 627.cam4_s(base, peak) 628.pop2_s(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  621.wrf_s(peak) 628.pop2_s(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

Fortran benchmarks:
ifort -m64

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

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

**Huawei**

**Huawei XH628 V5 (Intel Xeon Gold 6136)**

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### Base Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:
```
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:**
```
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -gopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

**Fortran benchmarks:**
```
-Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -gopenmp
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc
```

**Benchmarks using both Fortran and C:**
```
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -gopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc
```

**Benchmarks using Fortran, C, and C++:**
```
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -gopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc
```
Huawei

Huawei XH628 V5 (Intel Xeon Gold 6136)

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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:
619.lbm_s: basepeak = yes
638.imagick_s: basepeak = yes
644.nab_s: basepeak = yes

Fortran benchmarks:
603.bwaves_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -O2 -xCORE-AVX2 -qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3 -qopenmp -nostandard-realloc-lhs
649.fotonik3d_s: basepeak = yes
654.roms_s: -DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -nostandard-realloc-lhs

Benchmarks using both Fortran and C:

(Continued on next page)
## Huawei

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### Peak Optimization Flags (Continued)

- **621.wrf_s:** `-prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2 -qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs`
- **627.cam4_s:** `-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs`
- **628.pop2_s:** `Same as 621.wrf_s`
- **607.cactuBSSN_s:** `basepeak = yes`

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 v1.0.2 on 2018-09-05 14:19:47-0400.  