Huawei

Huawei CH121 V5 (Intel Xeon Platinum 8156)

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

Hardware

CPU Name: Intel Xeon Platinum 8156
Max MHz.: 3700
Nominal: 3600
Enabled: 8 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: 16.5 MB I+D on chip per chip
Other: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)
Storage: 1 x 1200 GB SAS, 10000 RPM
Other: None

Software

OS: Red Hat Enterprise Linux Server release 7.3 (Maipo)
Compiler: C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux;
Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux
Parallel: Yes
Firmware: Version 0.31 Released Sep-2017
File System: ext4
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: None

SPECspeed2017_fp_base = 53.7
SPECspeed2017_fp_peak = 55.1

Threads

<table>
<thead>
<tr>
<th>Test</th>
<th>Thread Count</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
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</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>8</td>
<td>57.7</td>
<td>57.7</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>8</td>
<td>35.7</td>
<td>38.8</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>8</td>
<td>35.8</td>
<td>35.8</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>8</td>
<td>44.6</td>
<td>50.0</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>8</td>
<td>30.1</td>
<td>30.1</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>8</td>
<td>30.4</td>
<td>30.4</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>8</td>
<td>32.9</td>
<td>33.0</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>8</td>
<td>64.0</td>
<td>64.0</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>8</td>
<td>32.9</td>
<td>57.0</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>8</td>
<td>32.9</td>
<td>53.0</td>
</tr>
</tbody>
</table>

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SPEC SPEC® CPU2017 Floating Point Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation
Results Table

| Benchmark | Base | | | | Peak | |
|-----------|------|------|------|------|------|------|------|
|           | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 603.bwaves_s | 8 | 208 | 284 | 208 | 284 | 8 | 209 | 282 |
| 607.cactuBSSN_s | 8 | 290 | 57.6 | 289 | 57.7 | 289 | 57.8 | 8 | 283 | 58.8 |
| 619.ibm_s | 8 | 146 | 35.8 | 147 | 35.7 | 147 | 35.5 | 8 | 145 | 36.1 |
| 621.wrf_s | 8 | 290 | 45.6 | 300 | 44.2 | 297 | 44.6 | 8 | 283 | 58.8 |
| 627.cam4_s | 8 | 294 | 30.1 | 294 | 30.1 | 295 | 30.1 | 8 | 297 | 29.9 |
| 628.pop2_s | 8 | 263 | 45.1 | 266 | 44.7 | 267 | 44.5 | 8 | 253 | 46.9 |
| 638.imagick_s | 8 | 437 | 33.0 | 438 | 32.9 | 438 | 32.9 | 8 | 437 | 33.0 |
| 644.nab_s | 8 | 306 | 57.1 | 306 | 57.1 | 306 | 57.0 | 8 | 306 | 57.1 |
| 649.fotonik3d_s | 8 | 160 | 57.0 | 160 | 56.8 | 159 | 57.2 | 8 | 160 | 57.0 |
| 654.roms_s | 8 | 293 | 53.8 | 314 | 50.2 | 297 | 53.0 | 8 | 290 | 54.3 |

SPECspeed2017_fp_base = 53.7
SPECspeed2017_fp_peak = 55.1

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 i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4
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

No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
No: 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.
No: 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.

This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.

(Continued on next page)
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| Tested by: | Huawei |
| Test Date: | Jan-2018 |
| Hardware Availability: | Jul-2017 |
| Software Availability: | Sep-2017 |

**General Notes (Continued)**

The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, http://www.spec.org/osg/policy.html

This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.

**Platform Notes**

BIOS configuration:
Power Efficiency Mode Set to Custom
Hyper-Threading Set to Disable
Sysinfo program /spec2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Sun Jan 14 01:33:33 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) Platinum 8156 CPU @ 3.60GHz
  2 "physical id"s (chips)
  8 "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: 4
sibling: 4
physical 0: cores 0 3 10 13
physical 1: cores 5 8 10 11

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 8
On-line CPU(s) list: 0-7
Thread(s) per core: 1
Core(s) per socket: 4
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6

(Continued on next page)
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CPU2017 License: 3175  
Test Sponsor: Huawei  
Tested by: Huawei  
Test Date: Jan-2018  
Hardware Availability: Jul-2017  
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### Platform Notes (Continued)

- Model: 85
- Model name: Intel(R) Xeon(R) Platinum 8156 CPU @ 3.60GHz
- Stepping: 4
- CPU MHz: 3601.000
- BogoMIPS: 7206.38
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 16896K
- NUMA node0 CPU(s): 0-3
- NUMA node1 CPU(s): 4-7

/proc/cpuinfo cache data

```
cache size : 16896 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
  node 0 size: 194709 MB
  node 0 free: 188865 MB
  node 1 cpus: 4 5 6 7
  node 1 size: 196608 MB
  node 1 free: 190957 MB

node distances:
  node   0   1
  0:  10  21
  1:  21  10
```

From /proc/meminfo

```
MemTotal:       394144876 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

From /etc/*release* /etc/*version*

```
os-release:
  NAME="Red Hat Enterprise Linux Server"
  VERSION="7.3 (Maipo)"
  ID="rhel"
  ID_LIKE="fedora"
  VERSION_ID="7.3"
  PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
  ANSI_COLOR="0;31"
  CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
```

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

**Huawei**

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

---

### Platform Notes (Continued)

```plaintext
uname -a:
Linux localhost.localdomain 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016
x86_64 x86_64 x86_64 GNU/Linux
```

**run-level 3 Jan 13 00:23**

**SPEC is set to:** /spec2017  
**Filesystem Type Size Used Avail Use% Mounted on**  
/dev/sda2 ext4 689G 25G 629G 4% /

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. 0.31 09/29/2017**  
**Memory:**  
- 24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666

---

### Compiler Version Notes

```plaintext
 ===========================================================================
 CC  619.lbm_s(base) 638.imagick_s(base, peak) 644.nab_s(base, peak)
 ===========================================================================
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
 ===========================================================================

 ===========================================================================
 CC  619.lbm_s(peak)
 ===========================================================================
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
 ===========================================================================

 ===========================================================================
 FC  607.cactuBSSN_s(base)
 ===========================================================================
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.0 20170811

(Continued on next page)```
## Huawei CH121 V5 (Intel Xeon Platinum 8156)

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<tbody>
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</tr>
</tbody>
</table>

### Compiler Version Notes (Continued)

```
FC  607.cactuBSSN_s(peak)
   icpc (ICC) 18.0.0 20170811
   Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
   ifort (IFORT) 18.0.0 20170811
   Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

FC  603.bwaves_s(peak) 649.fotonik3d_s(peak) 654.roms_s(peak)
   ifort (IFORT) 18.0.0 20170811
   Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

CC  621.wrf_s(base) 627.cam4_s(base, peak) 628.pop2_s(base)
   ifort (IFORT) 18.0.0 20170811
   Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

CC  621.wrf_s(peak) 628.pop2_s(peak)
   ifort (IFORT) 18.0.0 20170811
   Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```
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### Base Compiler Invocation

C benchmarks:
- icc

Fortran benchmarks:
- ifort

Benchmarks using both Fortran and C:
- ifort icc

Benchmarks using Fortran, C, and C++:
- icpc icc ifort

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

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp  
-nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP  
-nostandard-realloc-lhs -align array32byte

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

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Test Date: Jan-2018
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Base Optimization Flags (Continued)

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte

Base Other Flags

C benchmarks:
-m64 -std=c11

Fortran benchmarks:
-m64

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

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

Peak Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Peak Portability Flags

Same as Base Portability Flags
Huawei

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**SPEC CPU2017 Floating Point Speed Result**

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### Peak Optimization Flags

**C benchmarks:**

619.lbm_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

638.imagick_s: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-DSPEC_OPENMP

644.nab_s: Same as 638.imagick_s

**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 -align array32byte

649.fotonik3d_s: basepeak = yes

654.roms_s: Same as 603.bwaves_s

**Benchmarks using both Fortran and C:**

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 -align array32byte

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 -align array32byte

628.pop2_s: Same as 621.wrf_s

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

-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
-align array32byte
Huawei

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

**Fortran benchmarks:**
- `-m64`

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

**Benchmarks using Fortran, C, and C++:**
- `-m64 -std=c11`

---

**Peak Other Flags**

The flags files that were used to format this result can be browsed at:
- [http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html)

You can also download the XML flags sources by saving the following links:
- [http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml)
- [http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.7.xml](http://www.spec.org/cpu2017/flags/Huawei-Platform-Settings-SKL-V1.7.xml)

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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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