Huawei CH225 V5 (Intel Xeon Platinum 8158)

CPU2017 License: 3175
Test Sponsor: Huawei
Hardware Availability: Jul-2017

test Date: Oct-2018
Software Availability: Mar-2018

Tested by: Huawei


test Date: Oct-2018
Hardware Availability: Jul-2017

Software Availability: Mar-2018

Hardware

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s 24</td>
<td>133</td>
<td>107</td>
</tr>
<tr>
<td>607.cactuBSSN_s 24</td>
<td>45.8</td>
<td>478</td>
</tr>
<tr>
<td>619.lbm_s 24</td>
<td>82.3</td>
<td>69.7</td>
</tr>
<tr>
<td>621.wrf_s 24</td>
<td>73.0</td>
<td>67.6</td>
</tr>
<tr>
<td>627.cam4_s 24</td>
<td>73.1</td>
<td>70.2</td>
</tr>
<tr>
<td>628.pop2_s 24</td>
<td>87.2</td>
<td></td>
</tr>
<tr>
<td>638.imagick_s 24</td>
<td>177</td>
<td></td>
</tr>
<tr>
<td>644.nab_s 24</td>
<td>84.9</td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s 24</td>
<td>114</td>
<td></td>
</tr>
<tr>
<td>654.roms_s 24</td>
<td>114</td>
<td></td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 106
SPECspeed2017_fp_peak = 107

Software

OS: Red Hat Enterprise Linux Server release 7.3 (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

Firmware: Version 0.80 Released Jun-2018
System State: Run level 3 (multi-user)

File System: xfs
Base Pointers: 64-bit
Peak Pointers: 64-bit

Other: jemalloc memory allocator V5.0.1
**Huawei CH225 V5 (Intel Xeon Platinum 8158)**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>24</td>
<td>124</td>
<td>474</td>
<td>124</td>
<td>478</td>
<td>124</td>
<td>478</td>
<td>24</td>
<td>124</td>
<td>477</td>
<td>123</td>
</tr>
<tr>
<td>607.cactubSSN_s</td>
<td>24</td>
<td><strong>125</strong></td>
<td><strong>133</strong></td>
<td>123</td>
<td>136</td>
<td>129</td>
<td>129</td>
<td>24</td>
<td><strong>125</strong></td>
<td><strong>133</strong></td>
<td>123</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>24</td>
<td><strong>114</strong></td>
<td><strong>45.8</strong></td>
<td>115</td>
<td>45.6</td>
<td>114</td>
<td>45.9</td>
<td>24</td>
<td><strong>114</strong></td>
<td><strong>45.8</strong></td>
<td>115</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>24</td>
<td>161</td>
<td>82.0</td>
<td><strong>161</strong></td>
<td><strong>82.3</strong></td>
<td>160</td>
<td>82.6</td>
<td>24</td>
<td><strong>147</strong></td>
<td><strong>89.7</strong></td>
<td>148</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>24</td>
<td>121</td>
<td>73.0</td>
<td>122</td>
<td>72.8</td>
<td><strong>121</strong></td>
<td><strong>73.0</strong></td>
<td>24</td>
<td><strong>121</strong></td>
<td><strong>73.1</strong></td>
<td>121</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>24</td>
<td>176</td>
<td>67.4</td>
<td>176</td>
<td>67.7</td>
<td><strong>176</strong></td>
<td><strong>67.6</strong></td>
<td>24</td>
<td>169</td>
<td>70.1</td>
<td>168</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>24</td>
<td>165</td>
<td>87.5</td>
<td>166</td>
<td>86.9</td>
<td><strong>165</strong></td>
<td><strong>87.2</strong></td>
<td>24</td>
<td>165</td>
<td>87.5</td>
<td>166</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>24</td>
<td>98.5</td>
<td>177</td>
<td><strong>98.6</strong></td>
<td><strong>177</strong></td>
<td>98.6</td>
<td>177</td>
<td>24</td>
<td>98.5</td>
<td>177</td>
<td><strong>98.6</strong></td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>24</td>
<td>107</td>
<td>85.0</td>
<td>107</td>
<td>84.9</td>
<td><strong>107</strong></td>
<td><strong>84.9</strong></td>
<td>24</td>
<td>107</td>
<td>85.0</td>
<td>107</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>24</td>
<td>139</td>
<td>113</td>
<td>138</td>
<td>114</td>
<td><strong>138</strong></td>
<td><strong>114</strong></td>
<td>24</td>
<td>138</td>
<td>114</td>
<td><strong>138</strong></td>
</tr>
</tbody>
</table>

**SPECspeed2017_fp_base = 106**

**SPECspeed2017_fp_peak = 107**

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.

Huawei

Huawei CH225 V5 (Intel Xeon Platinum 8158)

| SPECspeed2017_fp_base = 106 |
| SPECspeed2017_fp_peak = 107 |

| SPEC CPU2017 Floating Point Speed Result |

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

**Platform Notes**

BIOS configuration:
- Power Policy Set to Load Balance
- Hyper-Threading Set to Disable
- XPT Prefetch Set to Enabled
Syisnfo program /spec2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bccc091c0f
running on localhost.localdomain Thu Oct 11 10:20:06 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 8158 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 1 2 3 4 9 10 16 18 19 25 26
physical 1: cores 0 3 4 5 6 7 16 18 19 20 21 22
```

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) Platinum 8158 CPU @ 3.00GHz
Stepping: 4
CPU MHz: 3001.000
BogoMIPS: 6006.14
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
NUMA node0 CPU(s): 0-11
NUMA node1 CPU(s): 12-23
```

(Continued on next page)
## Platform Notes (Continued)

/proc/cpuinfo cache data  
  cache size : 25344 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 6 7 8 9 10 11  
  node 0 size: 194737 MB  
  node 0 free: 189362 MB  
  node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23  
  node 1 size: 196608 MB  
  node 1 free: 191588 MB  
  node distances:  
    node 0  1  
    0: 10 21  
    1: 21 10  

From /proc/meminfo  
  MemTotal:       394169160 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)  

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 Oct 11 05:14  

SPEC is set to: /spec2017  
  Filesystem Type Size Used Avail Use% Mounted on  
  /dev/sda4 xfs 400G 9.6G 391G 3% /  

(Continued on next page)
Huawei
Huawei CH225 V5 (Intel Xeon Platinum 8158)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>106</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>107</td>
</tr>
</tbody>
</table>

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

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

Platform Notes (Continued)

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. 0.80 06/27/2018
Memory:
24x Samsung M393A2K43BB1-CTD 16 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.
icpc (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  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)

(Continued on next page)
Huawei CH225 V5 (Intel Xeon Platinum 8158)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>106</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>107</td>
</tr>
</tbody>
</table>

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

---

Compiler Version Notes (Continued)

```plaintext
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:
```plaintext
icc -m64 -std=c11
```

Fortran benchmarks:
```plaintext
ifort -m64
```

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

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

Base Portability Flags

```plaintext
603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.1bm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
```

(Continued on next page)
### Base Portability Flags (Continued)

- 627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
- 628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
- 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 -qopenmp -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 -qopenmp
- `-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 -qopenmp -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 -qopenmp -DSPEC_OPENMP`
- `-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc`

### 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`
Huawei CH225 V5 (Intel Xeon Platinum 8158)

Huawei

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

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

SPECspeed2017_fp_base = 106
SPECspeed2017_fp_peak = 107

Peak Compiler Invocation (Continued)

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:

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

(Continued on next page)
Huawei CH225 V5 (Intel Xeon Platinum 8158)

SPECspeed2017_fp_peak = 107
SPECspeed2017_fp_base = 106

Peak Optimization Flags (Continued)

628.pop2_s: Same as 621.wrf_s

Benchmarks using Fortran, C, and C++:

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:

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

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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 2018-10-11 10:20:05-0400.
Originally published on 2018-10-30.