Huawei 2288H V5 (Intel Xeon Platinum 8180)

Huawei

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

Threaded SPEC CPU 2017 Floating Point Speed Result

<table>
<thead>
<tr>
<th>Software</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_base =</td>
<td>137</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

Hardware

CPU Name: Intel Xeon Platinum 8180  
Max MHz.: 3800  
Nominal: 2500  
Enabled: 56 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: 38.5 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 7.4 (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: Yes  
Firmware: Version 0.81 Released Jul-2018  
File System: xfs  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: Not Applicable  
Other: jemalloc memory allocator V5.0.1
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>56</td>
<td>119</td>
<td>495</td>
<td>120</td>
<td>492</td>
<td>119</td>
<td>495</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>56</td>
<td>82.2</td>
<td>203</td>
<td>80.3</td>
<td>208</td>
<td>79.5</td>
<td>210</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>56</td>
<td>112</td>
<td>47.0</td>
<td>111</td>
<td>47.4</td>
<td>111</td>
<td>47.4</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>56</td>
<td>145</td>
<td>91.3</td>
<td>143</td>
<td>92.3</td>
<td>145</td>
<td>91.2</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>56</td>
<td>75.1</td>
<td>118</td>
<td>75.2</td>
<td>118</td>
<td>75.1</td>
<td>118</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>56</td>
<td>184</td>
<td>64.7</td>
<td>184</td>
<td>64.6</td>
<td>188</td>
<td>63.1</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>56</td>
<td>90.1</td>
<td>160</td>
<td>95.4</td>
<td>151</td>
<td>95.8</td>
<td>151</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>56</td>
<td>53.9</td>
<td>324</td>
<td>54.0</td>
<td>324</td>
<td>53.9</td>
<td>324</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>56</td>
<td>102</td>
<td>89.0</td>
<td>102</td>
<td>89.5</td>
<td>102</td>
<td>89.6</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>56</td>
<td>102</td>
<td>154</td>
<td>103</td>
<td>153</td>
<td>102</td>
<td>154</td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 137
SPECspeed2017_fp_peak = Not Run

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
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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 96c45e4568ad54c135fd618b0c091c0f
running on localhost.localdomain Thu Jan 2 08:07:13 2020

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 8180 CPU @ 2.50GHz
- 2 "physical id"s (chips)
- 56 "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: 28
- siblings: 28
- physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30
- physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30

From lscpu:
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 56
- On-line CPU(s) list: 0-55
- Thread(s) per core: 1
- Core(s) per socket: 28
- Socket(s): 2
- NUMA node(s): 2
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Platinum 8180 CPU @ 2.50GHz
- Stepping: 4
- CPU MHz: 2501.000
- CPU max MHz: 2501.0000
- CPU min MHz: 1000.0000
- BogoMIPS: 5000.00
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K

(Continued on next page)
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Platform Notes (Continued)

```
L2 cache: 1024K
L3 cache: 39424K
NUMA node0 CPU(s): 0-27
NUMA node1 CPU(s): 28-55
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 xtopology nonstop_tsc
aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 fma
cx16 xtpr pdcm pcd 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 vmx flexpriority ept vpid fsgsbase
tsc_adjust bmi mlx cmov stck mtrr leave pti mdrr mce cc2 clflush clflushopt
```

```
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 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
  node 0 size: 194741 MB
  node 0 free: 189428 MB
  node 1 cpus: 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
          53 54 55
  node 1 size: 196608 MB
  node 1 free: 191994 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10
```

```
From /proc/meminfo

MemTotal: 394174888 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"
  VARIANT_ID="server"
  VERSION_ID="7.4"
```

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

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 Jan 2 08:05
```

SPEC is set to: /spec2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-root xfs 883G 14G 870G 2% /

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. 0.81 07/02/2018
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) 644.nab_s(base)
```

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

```
FC 607.cactuBSSN_s(base)
```

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Page 5
Huawei

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

CC  621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)
---------------------------------------------------------------
ifort (IFORT) 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.
---------------------------------------------------------------

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

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
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Base Optimization Flags

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

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

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