### Huawei 1288H V5 (Intel Xeon Gold 6140)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base = 109</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak = 111</td>
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**CPU2017 License:** 3175  
**Test Date:** Jan-2018  
**Test Sponsor:** Huawei  
**Hardware Availability:** Jul-2017  
**Tested by:** Huawei  
**Software Availability:** Sep-2017

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
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<tr>
<td>603.bwaves_s</td>
<td>36</td>
<td>487</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>36</td>
<td>142</td>
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<tr>
<td>619.lbm_s</td>
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<td>43.1</td>
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<tr>
<td>621.wrf_s</td>
<td>36</td>
<td>83.7</td>
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<tr>
<td>627.came4_s</td>
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<td>90.6</td>
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<tr>
<td>628.pop2_s</td>
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<td>65.8</td>
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<tr>
<td>638.imagick_s</td>
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<td>67.2</td>
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<tr>
<td>644.nab_s</td>
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<td>105</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>36</td>
<td>190</td>
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</tr>
<tr>
<td>654.roms_s</td>
<td>36</td>
<td>109</td>
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</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Gold 6140  
- **Max MHz.:** 3700  
- **Nominal:** 2300  
- **Enabled:** 36 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:** 24.75 MB I+D on chip per core  
- **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:** SUSE Linux Enterprise Server 12 SP2 (x86_64)  
- **Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++  
- **Compiler for Linux:** Fortran: Version 18.0.0.128 of Intel Fortran  
- **Parallel:** Yes  
- **Firmware:** Version 0.37 Released Nov-2017  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 64-bit  
- **Other:** None
Huawei

Huawei 1288H V5 (Intel Xeon Gold 6140)

SPECspeed2017_fp_base = 109

SPECspeed2017_fp_peak = 111

Results Table

<table>
<thead>
<tr>
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<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>121</td>
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<td>117</td>
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<td>138</td>
<td>114</td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 109
SPECspeed2017_fp_peak = 111

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"
LD_LIBRARY_PATH = "/spec2017/lib/ia32;/spec2017/lib/intel64;/spec2017/je5.0.1-32;/spec2017/je5.0.1-64"
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)
Huawei 1288H V5 (Intel Xeon Gold 6140)

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CPU2017 License: 3175
Test Sponsor: Huawei
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 96c45e4568ad54c135fd618bccc091c0f
running on linux-jujq Sat Jan 13 17:45:16 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 6140 CPU @ 2.30GHz
2  "physical id"s (chips)
36 "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 : 18
siblings : 18
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 36
On-line CPU(s) list: 0-35
Thread(s) per core: 1
Core(s) per socket: 18
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6

(Continued on next page)
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Huawei 1288H V5 (Intel Xeon Gold 6140)

| SPECspeed2017_fp_base | 109 |
| SPECspeed2017_fp_peak | 111 |

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

Huawei 1288H V5 (Intel Xeon Gold 6140)

Platform Notes (Continued)

Model: 85
Model name: Intel(R) Xeon(R) Gold 6140 CPU @ 2.30GHz
Stepping: 4
CPU MHz: 1100.000
CPU max MHz: 2301.0000
CPU min MHz: 1000.0000
BogoMIPS: 4600.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
NUMA node0 CPU(s): 0-17
NUMA node1 CPU(s): 18-35
Flags: fpu vme de pse tsc msr pae mce cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb pni pkp ts dtherm intel_pt tpr_shadow vt x2apic sm mpx stos mca xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc /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 12 13 14 15 16 17
node 0 size: 191497 MB
node 0 free: 190401 MB
node 1 cpus: 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
node 1 size: 193382 MB
node 1 free: 192274 MB
node distances:
node 0 1
0:  10  21
1:  21  10

From /proc/meminfo
MemTotal: 394117236 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

(Continued on next page)
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Platform Notes (Continued)

SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 2
  # This file is deprecated and will be removed in a future service pack or release.
  # Please check /etc/os-release for details about this release.

os-release:
  NAME="SLES"
  VERSION="12-SP2"
  VERSION_ID="12.2"
  PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
  Linux linux-jujq 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67)
  x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 13 02:30

SPEC is set to: /spec2017

  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/sda2      xfs   500G   27G  474G   6% /

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. 0.37 11/13/2017
  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) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
  CC  619.lbm_s(peak)
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Huawei

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Compiler Version Notes (Continued)

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

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**Compiler Version Notes (Continued)**

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.  
icc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

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` 

Benchmarks using Fortran, C, 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`

### 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`
Peak Compiler Invocation (Continued)

Benmarks using both Fortran and C:
ifort icc

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

Peak Portability Flags

Same as Base Portability Flags

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: basepeak = yes
644.nab_s: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-DSPEC_OPENMP

Fortran benchmarks:
-qopt-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

Benmarks 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: basepeak = yes
628.pop2_s: Same as 621.wrf_s

(Continued on next page)
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Test Sponsor: Huawei
Tested by: Huawei

Specspeed2017_fp_peak = 111
Specspeed2017_fp_base = 109

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Peak Optimization Flags (Continued)

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

Peak 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

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/Huawei-Platform-Settings-SKL-V1.7.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/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.

Tested with SPEC CPU2017 v1.0.2 on 2018-01-13 04:45:15-0500.
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