SPEC® CPU2017 Floating Point Speed Result

Huawei

Huawei 1288H V5 (Intel Xeon Gold 6138)

**SPECspeed2017_fp_base = 112**

**SPECspeed2017_fp_peak = 114**

---

**Threads**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>40</td>
<td>151</td>
<td>189</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>40</td>
<td>44.8</td>
<td>189</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>40</td>
<td>78.8</td>
<td>189</td>
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<tr>
<td>621.wrf_s</td>
<td>40</td>
<td>86.5</td>
<td>189</td>
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<tr>
<td>627.cam4_s</td>
<td>40</td>
<td>86.9</td>
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<tr>
<td>628.pop2_s</td>
<td>40</td>
<td>64.9</td>
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<tr>
<td>638.imagick_s</td>
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<tr>
<td>644.nab_s</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>40</td>
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</tr>
<tr>
<td>654.roms_s</td>
<td>40</td>
<td>120</td>
<td>189</td>
</tr>
</tbody>
</table>

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**Hardware**

- **CPU Name:** Intel Xeon Gold 6138
- **Max MHz.:** 3700
- **Nominal:** 2000
- **Enabled:** 40 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:** 27.5 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:** 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 Compiler for Linux
- **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 6138)

SPECspeed2017_fp_base = 112

SPECspeed2017_fp_peak = 114

### Results Table

<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>
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</table>

**SPECspeed2017_fp_base = 112**

**SPECspeed2017_fp_peak = 114**

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:

grep; echo 3> /proc/sys/vm/drop_caches

### 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 linux-jujq Thu Dec 14 15:56:12 2017

SUT (System Under Test) info as seen by some common utilities.

For more information on this section, see

(Continued on next page)
Huawei 1288H V5 (Intel Xeon Gold 6138)

**SPECspeed2017_fp_base** = 112

**SPECspeed2017_fp_peak** = 114

**CPU2017 License**: 3175

**Test Sponsor**: Huawei

**Test Date**: Dec-2017

**Hardware Availability**: Jul-2017

**Tested by**: Huawei

**Software Availability**: Sep-2017

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**Huawei**

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---

**Platform Notes (Continued)**

From /proc/cpuinfo

- model name: Intel(R) Xeon(R) Gold 6138 CPU @ 2.00GHz
- 2 "physical id"s (chips)
- 40 "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: 20
- siblings: 20
- physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
- physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

---

From lscpu:

- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 40
- On-line CPU(s) list: 0-39
- Thread(s) per core: 1
- Core(s) per socket: 20
- Socket(s): 2
- NUMA node(s): 2
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Gold 6138 CPU @ 2.00GHz
- Stepping: 4
- CPU MHz: 1100.000
- CPU max MHz: 2001.0000
- CPU min MHz: 1000.0000
- BogoMIPS: 3999.99
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 28160K
- NUMA node0 CPU(s): 0-19
- NUMA node1 CPU(s): 20-39
- 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 rdtsscp
- 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 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 plc pts dtherm intel_pt
- tpr_shadow vmm灵活优先级 ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
- erms invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd

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

Huawei
Huawei 1288H V5 (Intel Xeon Gold 6138)

<table>
<thead>
<tr>
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<th>CPU2017 License: 3175</th>
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</tr>
<tr>
<td>Tested by: Huawei</td>
<td>Software Availability: Sep-2017</td>
</tr>
</tbody>
</table>

Platform Notes (Continued)

avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc

/proc/cpuinfo cache data
  cache size : 28160 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 18 19
  node 0 size: 191497 MB
  node 0 free: 189967 MB
  node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
  node 1 size: 193382 MB
  node 1 free: 191405 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*
  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-jejq 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 Dec 13 22:59
  SPEC is set to: /spec2017

(Continued on next page)
Huawei

Huawei 1288H V5 (Intel Xeon Gold 6138)

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Platform Notes (Continued)

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
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<tbody>
<tr>
<td>/dev/sda2</td>
<td>xfs</td>
<td>500G</td>
<td>27G</td>
<td>474G</td>
<td>6%</td>
<td>/</td>
</tr>
</tbody>
</table>

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)
---
ncc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
---
CC 619.lbm_s(peak)
---
ncc (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.
---
FC 607.cactuBSSN_s(peak)
---
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

(Continued on next page)
Huawei 1288H V5 (Intel Xeon Gold 6138)

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

Test Date: Dec-2017
Hardware Availability: Jul-2017
Software Availability: Sep-2017

Huawei

Compiler Version Notes (Continued)

Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
ifort (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
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

(Continued on next page)
Huawei

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Base Compiler Invocation (Continued)

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.cactusBSSN_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
Huawei

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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

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 -openmp
- DSPEC_OPENMP

(Continued on next page)
Peak Optimization Flags (Continued)

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: basepeak = yes
649.fotonik3d_s: basepeak = yes

654.roms_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

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

Peak Other Flags

C benchmarks:
-m64 -std=c11

Fortran benchmarks:
-m64

(Continued on next page)
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Peak Other Flags (Continued)

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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Tested with SPEC CPU2017 v1.0.2 on 2017-12-14 02:56:11-0500.
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