



# SPEC® CPU2017 Floating Point Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

## Huawei

SPECspeed2017\_fp\_base = 112

## Huawei 2288H V5 (Intel Xeon Gold 6142)

SPECspeed2017\_fp\_peak = 114

CPU2017 License: 3175

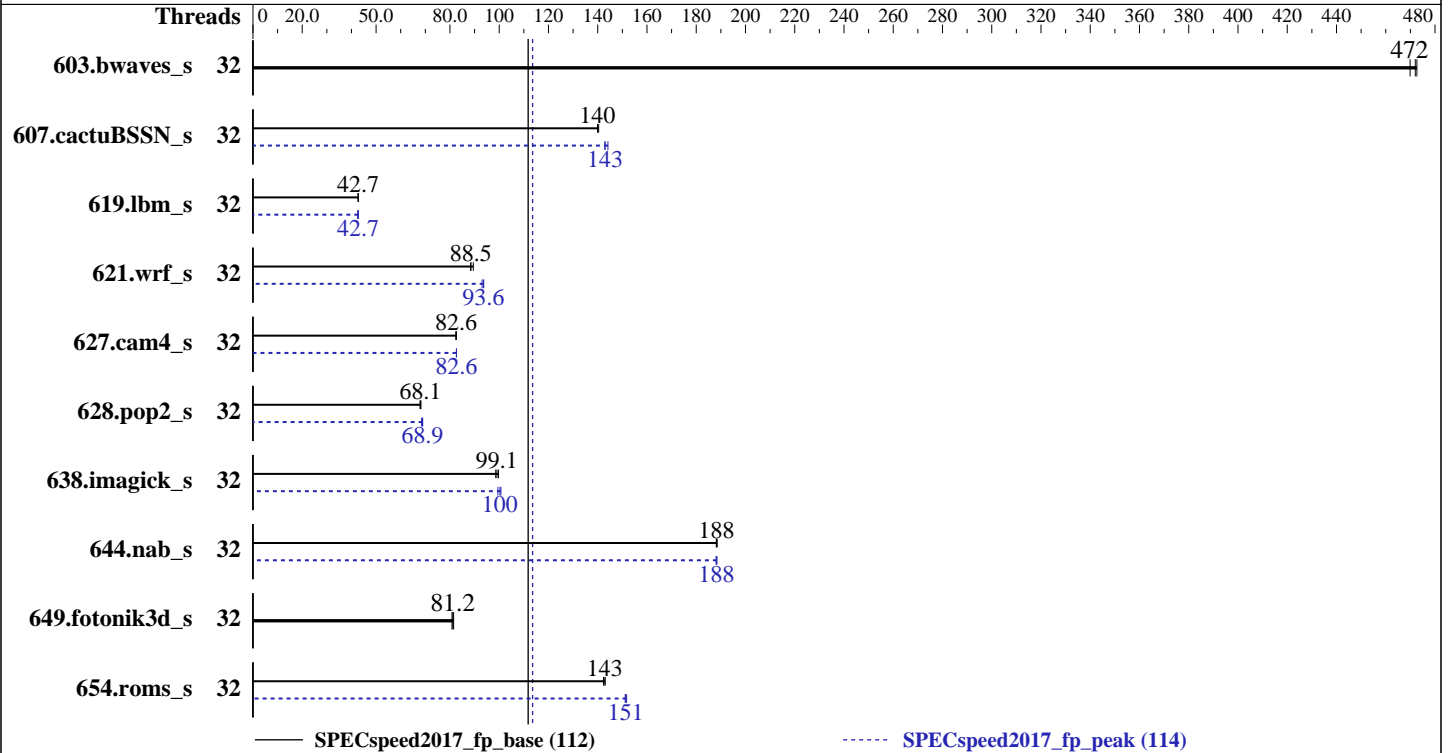
Test Sponsor: Huawei

Tested by: Huawei

Test Date: Jan-2018

Hardware Availability: Jul-2017

Software Availability: Sep-2017



### Hardware

CPU Name: Intel Xeon Gold 6142  
 Max MHz.: 3700  
 Nominal: 2600  
 Enabled: 32 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: 22 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) 4.4.21-69-default  
 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



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### Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	32	125	473	126	470	<u>125</u>	<u>472</u>	32	125	473	126	470	<u>125</u>	<u>472</u>
607.cactuBSSN_s	32	<u>119</u>	<u>140</u>	119	140	119	140	32	<u>117</u>	<u>143</u>	116	144	117	143
619.lbm_s	32	122	42.8	123	42.7	<u>123</u>	<u>42.7</u>	32	<u>123</u>	<u>42.7</u>	122	42.8	123	42.5
621.wrf_s	32	150	88.4	<u>149</u>	<u>88.5</u>	148	89.5	32	141	93.7	<u>141</u>	<u>93.6</u>	142	93.0
627.cam4_s	32	<u>107</u>	<u>82.6</u>	107	82.6	108	82.4	32	107	82.6	107	82.6	<u>107</u>	<u>82.6</u>
628.pop2_s	32	<u>174</u>	<u>68.1</u>	174	68.2	175	67.8	32	173	68.5	<u>172</u>	<u>68.9</u>	172	68.9
638.imagick_s	32	146	98.6	145	99.7	<u>146</u>	<u>99.1</u>	32	<u>144</u>	<u>100</u>	143	101	145	99.5
644.nab_s	32	92.7	189	<u>92.8</u>	<u>188</u>	92.9	188	32	92.9	188	92.7	188	<u>92.8</u>	<u>188</u>
649.fotonik3d_s	32	112	81.5	<u>112</u>	<u>81.2</u>	113	80.8	32	112	81.5	<u>112</u>	<u>81.2</u>	113	80.8
654.roms_s	32	110	143	111	142	<u>110</u>	<u>143</u>	32	104	151	<u>104</u>	<u>151</u>	104	152

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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)



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### 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 linux-jujy Sat Jan 20 10:33:58 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 6142 CPU @ 2.60GHz  
2 "physical id"s (chips)  
32 "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 : 16  
siblings : 16  
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15  
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu:  
Architecture: x86\_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
CPU(s): 32  
On-line CPU(s) list: 0-31  
Thread(s) per core: 1  
Core(s) per socket: 16  
Socket(s): 2  
NUMA node(s): 2  
Vendor ID: GenuineIntel  
CPU family: 6

(Continued on next page)



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## Platform Notes (Continued)

```

Model: 85
Model name: Intel(R) Xeon(R) Gold 6142 CPU @ 2.60GHz
Stepping: 4
CPU MHz: 1000.000
CPU max MHz: 2601.0000
CPU min MHz: 1000.0000
BogoMIPS: 5200.02
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K
NUMA node0 CPU(s): 0-15
NUMA node1 CPU(s): 16-31
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
aperfmpperf 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 pln pts dtherm intel_pt
tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
erms invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd
avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc

```

```

/proc/cpuinfo cache data
cache size : 22528 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
node 0 size: 191497 MB
node 0 free: 189932 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
node 1 size: 193382 MB
node 1 free: 191464 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*

```

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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 19 17:02
```

```

SPEC is set to: /spec2017
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2       xfs   500G   27G  473G   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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## Compiler Version Notes (Continued)

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

=====

FC 607.cactuBSSN\_s(peak)

-----  
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  
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



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## 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

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## Peak Compiler Invocation (Continued)

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 -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: 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
```

(Continued on next page)



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## Peak Optimization Flags (Continued)

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

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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