Huawei
Huawei CH242 V5 (Intel Xeon Gold 6152)

SPECspeed2017_fp_base = 166
SPECspeed2017_fp_peak = 167

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

Threads

603.bwaves_s 88
607.cactuBSSN_s 88
619.lbm_s 88
621.wrf_s 88
627.cam4_s 88
628.pop2_s 88
638.imagick_s 88
644.nab_s 88
649.fotonik3d_s 88
654.roms_s 88

SPECspeed2017_fp_base (166) --- SPECspeed2017_fp_peak (167)

Hardware
CPU Name: Intel Xeon Gold 6152
Max MHz.: 3700
Nominal: 2100
Enabled: 88 cores, 4 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: 30.25 MB I+D on chip per chip
Other: None
Memory: 1536 GB (48 x 32 GB 2Rx4 PC4-2666V-R)
Storage: 1 x 1200 GB SAS, 10000 RPM
Other: None

Software
OS: Red Hat Enterprise Linux Server release 7.3
(Maipo) 3.10.0-693.11.6.el7.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 0.84 Released Mar-2018
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: None
SPEC CPU2017 Floating Point Speed Result

Huawei
Huawei CH242 V5 (Intel Xeon Gold 6152)

SPECspeed2017_fp_base = 166
SPECspeed2017_fp_peak = 167

CPU2017 License: 3175
Test Sponsor: Huawei
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Results Table

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<td>179</td>
<td>73.9</td>
<td>178</td>
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<td>628.pop2_s</td>
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<td>71.9</td>
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<td>342</td>
<td>51.0</td>
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<td>649.fotonik3d_s</td>
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<td>73.8</td>
<td>213</td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 166
SPECspeed2017_fp_peak = 167

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 = "/spec/lib/ia32:/spec/lib/intel64:/spec/je5.0.1-32:/spec/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
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.

Platform Notes

BIOS configuration:
Power Efficiency Mode Set to Load Balance
Hyper-Threading Set to Disable

(Continued on next page)
Huawei

Huawei CH242 V5 (Intel Xeon Gold 6152)

**SPECspeed2017_fp_base** = 166

**SPECspeed2017_fp_peak** = 167

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<td>Huawei</td>
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<tr>
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<td>May-2018</td>
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<td>Jul-2017</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Jan-2018</td>
</tr>
</tbody>
</table>

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**Platform Notes (Continued)**

XPT Prefetch Set to Enabled

Sysinfo program /spec/bin/sysinfo

Rev: r5797 of 2017-06-14 96c45e456ad54c135fd618bcc091c0f
running on localhost.localdomain Thu May 24 10:28:57 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 6152 CPU @ 2.10GHz
  4 "physical id"s (chips)
    88 "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 : 22
siblings : 22
  physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
  physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
  physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
  physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
```

From lscpu:

```
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                88
On-line CPU(s) list:   0-87
Thread(s) per core:    1
Core(s) per socket:    22
Socket(s):             4
NUMA node(s):          4
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Gold 6152 CPU @ 2.10GHz
Stepping:              4
CPU MHz:               2101.000
BogoMIPS:              4207.06
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              1024K
L3 cache:              30976K
NUMA node0 CPU(s):     0-21
NUMA node1 CPU(s):     22-43
NUMA node2 CPU(s):     44-65
```

(Continued on next page)
Huawei CH242 V5 (Intel Xeon Gold 6152)

SPECspeed2017_fp_base = 166
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CPU2017 License: 3175
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Platform Notes (Continued)

NUMA node3 CPU(s): 66-87

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)
  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
  node 0 size: 391577 MB
  node 0 free: 382231 MB
  node 1 cpus: 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43
  node 1 size: 393216 MB
  node 1 free: 383888 MB
  node 2 cpus: 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
  node 2 size: 393216 MB
  node 2 free: 384253 MB
  node 3 cpus: 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87
  node 3 size: 393216 MB
  node 3 free: 384366 MB
  node distances:
    node 0 1 2 3
  0: 10 21 21 21
  1: 21 10 21 21
  2: 21 21 10 21
  3: 21 21 21 10

From /proc/meminfo
  MemTotal: 1583346560 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:

(Continued on next page)
Huawei
Huawei CH242 V5 (Intel Xeon Gold 6152)

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CPU2017 License: 3175
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Platform Notes (Continued)

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 May 24 05:30
SPEC is set to: /spec

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 400G 16G 385G 4% /

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. 0.84 03/26/2018
Memory:
48x Samsung M393A4K40BB2-CTD 32 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.
==============================================================================

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.

(Continued on next page)
Huawei
Huawei CH242 V5 (Intel Xeon Gold 6152)

SPECspeed2017_fp_base = 166
SPECspeed2017_fp_peak = 167

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

Compiler Version Notes (Continued)

FC  607.cactuBSSN_s(peak)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
iccc (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.
iccc (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.
iccc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
Huawei CH242 V5 (Intel Xeon Gold 6152)

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**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
```

(Continued on next page)
Huawei CH242 V5 (Intel Xeon Gold 6152)

SPECspeed2017_fp_base = 166
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CPU2017 License: 3175
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Tested by: Huawei

Test Date: May-2018
Hardware Availability: Jul-2017
Software Availability: Jan-2018

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -03 -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

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
Huawei CH242 V5 (Intel Xeon Gold 6152)

| SPECspeed2017_fp_base | 166 |
| SPECspeed2017_fp_peak  | 167 |

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

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`: `-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`

- `654.roms_s`: `basepeak = yes`

### 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`
Huawei

Huawei CH242 V5 (Intel Xeon Gold 6152)

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

**Test Date:** May-2018  
**Hardware Availability:** Jul-2017  
**Software Availability:** Jan-2018

### 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/Intel-ic18.0-official-linux64.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/Intel-ic18.0-official-linux64.xml)

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