## SPEC CPU2017 Floating Point Rate Result

### Huawei 5288 V5 (Intel Xeon Gold 5115)

<table>
<thead>
<tr>
<th>SPECrate2017_fp_base</th>
<th>111</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_fp_peak</td>
<td>114</td>
</tr>
</tbody>
</table>

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

### Hardware

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
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<td>507.cactuBSSN_r</td>
<td>40</td>
<td>79.5</td>
<td>134</td>
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<tr>
<td>508.namd_r</td>
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<tr>
<td>510.parest_r</td>
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<td>70.7</td>
<td>124</td>
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<tr>
<td>511.povray_r</td>
<td>40</td>
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<tr>
<td>519.lbm_r</td>
<td>40</td>
<td>79.2</td>
<td>122</td>
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<tr>
<td>526.blender_r</td>
<td>40</td>
<td>110</td>
<td>158</td>
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<td>527.cam4_r</td>
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<tr>
<td>538.imagick_r</td>
<td>40</td>
<td>106</td>
<td>140</td>
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<tr>
<td>544.nab_r</td>
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</tr>
<tr>
<td>549.fotonik3d_r</td>
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<tr>
<td>554.roms_r</td>
<td>40</td>
<td>60.5</td>
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</tr>
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</table>

**CPU Name:** Intel Xeon Gold 5115  
**Max MHz.:** 3200  
**Nominal:** 2400  
**Enabled:** 20 cores, 2 chips, 2 threads/core  
**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:** 13.75 MB I+D on chip per chip  
**Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)  
**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 18.0.0.128 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux |
| Firmware | Version 0.62 Released Mar-2018 |
| File System | xfs |
| System State | Run level 3 (multi-user) |
| Base Pointers | 64-bit |
| Peak Pointers | 64-bit |
| Other | None |

---

Page 1  
Standard Performance Evaluation Corporation (info@spec.org)  
https://www.spec.org/
### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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</tr>
</tbody>
</table>

**SPECrate2017_fp_base = 111**

**SPECrate2017_fp_peak = 114**

---

### Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

---

### 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:

```
```

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

File system page cache synced and cleared with:

```
sync; echo 3 > /proc/sys/vm/drop_caches
```

runcpu command invoked through numactl i.e.:

```
numactl --interleave=all runcpu <etc>
```

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

(Continued on next page)
Huawei

Huawei 5288 V5 (Intel Xeon Gold 5115)

SPEC CPU2017 Floating Point Rate Result
Copyright 2017-2018 Standard Performance Evaluation Corporation

CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Aug-2018
Hardware Availability: Jul-2017
CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Aug-2018
Hardware Availability: Jul-2017

SPECrate2017_fp_base = 111
SPECrate2017_fp_peak = 114

General Notes (Continued)
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 Policy Set to Performance
XPT Prefetch Set to Enabled
Sysinfo program /spec2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Fri Aug 10 18:46:45 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 5115 CPU @ 2.40GHz
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 : 10
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12

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: 2
Core(s) per socket: 10
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5115 CPU @ 2.40GHz
Stepping: 4
CPU MHz: 2400.000
BogoMIPS: 4800.00

(Continued on next page)
Huawei

Huawei 5288 V5 (Intel Xeon Gold 5115)

| SPECrate2017_fp_base | 111 |
| SPECrate2017_fp_peak | 114 |

CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Aug-2018
Tested by: Huawei

| Hardware Availability: Jul-2017 |
| Software Availability: Jan-2018 |

Platform Notes (Continued)

- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 14080K
- NUMA node0 CPU(s): 0-9, 20-29
- NUMA node1 CPU(s): 10-19, 30-39
- Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
- /proc/cpuinfo cache data
  - cache size: 14080 KB
- /proc/meminfo
  - MemTotal: 395141240 kB
  - HugePages_Total: 0
  - Hugepagesize: 2048 KB
- os-release:
  - NAME="Red Hat Enterprise Linux Server"
  - VERSION="7.4 (Maipo)"
  - ID=rhel
  - ID_LIKE="fedora"
  - VARIANT="Server"

(Continued on next page)
Huawei 5288 V5 (Intel Xeon Gold 5115)

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SPECrate2017_fp_base = 111
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Platform Notes (Continued)

VARIANT_ID="server"
VERSION_ID="7.4"
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 Aug 10 08:24

SPEC is set to: /spec2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 700G 35G 666G 5% /

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. 0.62 03/26/2018
Memory:
24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

CC 519.lbm_r(base) 538.imagick_r(base, peak) 544.nab_r(base)

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

--------------------------------------------------------------------------------
CC 519.lbm_r(peak) 544.nab_r(peak)

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

--------------------------------------------------------------------------------
CXXC 508.namd_r(base) 510.parest_r(base)

(Continued on next page)
Huawei

Huawei 5288 V5 (Intel Xeon Gold 5115)

SPECrate2017_fp_base = 111
SPECrate2017_fp_peak = 114

Compiler Version Notes (Continued)

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

CXXC 508.namd_r(peak) 510.parest_r(peak)

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

-----
CC 511.povray_r(base) 526.blender_r(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.

-----
CC 511.povray_r(peak) 526.blender_r(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.

-----
FC 507.cactusBSSN_r(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 507.cactusBSSN_r(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.

(Continued on next page)
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**Huawei**

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**Tested by:** Huawei  
**Software Availability:** Jan-2018

## Compiler Version Notes (Continued)

```plaintext
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
FC  503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base)
==============================================================================
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
FC  554.roms_r(peak)
==============================================================================
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
CC  521.wrf_r(base) 527.cam4_r(base)
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icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
CC  521.wrf_r(peak) 527.cam4_r(peak)
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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

- **C++ benchmarks:**
  - icpc

- **Fortran benchmarks:**
  - ifort

*(Continued on next page)*
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### Huawei

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### Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
```plaintext
ifort icc
```

Benchmarks using both C and C++:
```plaintext
icpc icc
```

Benchmarks using Fortran, C, and C++:
```plaintext
icpc icc ifort
```

### Base Portability Flags

- **503.bwaves.r:** -DSPEC_LP64  
- **507.cactusBSSN.r:** -DSPEC_LP64  
- **508.namd.r:** -DSPEC_LP64  
- **510.parest.r:** -DSPEC_LP64  
- **511.povray.r:** -DSPEC_LP64  
- **519.lbm.r:** -DSPEC_LP64  
- **521.wrf.r:** -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian  
- **526.blender.r:** -DSPEC_LP64 -DSPEC_LINUX -funsigned-char  
- **527.cam4_r:** -DSPEC_LP64 -DSPEC_CASE_FLAG  
- **538.imagick_r:** -DSPEC_LP64  
- **544.nab_r:** -DSPEC_LP64  
- **549.fotonik3d_r:** -DSPEC_LP64  
- **554.roms_r:** -DSPEC_LP64

### Base Optimization Flags

**C benchmarks:**
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3
```

**C++ benchmarks:**
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3
```

**Fortran benchmarks:**
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
```

(Continued on next page)
Huawei

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

Benchmarks using both Fortran and C:
-m64 -std=c11

Benchmarks using both C and C++:
-m64 -std=c11

Benchmarks using Fortran, C, and C++:
-m64 -std=c11

Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

(Continued on next page)
Huawei

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SPECrate2017_fp_peak = 114

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Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
  ifort icc

Benchmarks using both C and C++:
  icpc icc

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

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
  519.lbm_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
  -no-prec-div -qopt-prefetch -ffinite-math-only
  -qopt-mem-layout-trans=3

  538.imagick_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
  -ffinite-math-only -qopt-mem-layout-trans=3

  544.nab_r: Same as 519.lbm_r

C++ benchmarks:
  508.namd_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
  -no-prec-div -qopt-prefetch -ffinite-math-only
  -qopt-mem-layout-trans=3

  510.parest_r: basepeak = yes

Fortran benchmarks:
  503.bwaves_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
  -ffinite-math-only -qopt-mem-layout-trans=3
  -nostandard-realloc-lhs -align array32byte

(Continued on next page)
Huawei
Huawei 5288 V5 (Intel Xeon Gold 5115)

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<tr>
<th>SPECrate2017_fp_base</th>
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CPU2017 License: 3175
Test Sponsor: Huawei
Test Date: Aug-2018
Hardware Availability: Jul-2017
Tested by: Huawei
Software Availability: Jan-2018

Peak Optimization Flags (Continued)

549. fotonik3d_r: Same as 503. bwaves_r

554. roms_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs
-align array32byte

Benchmarks using both Fortran and C:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

Benchmarks using both C and C++:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
507. cactuBSSN_r: basepeak = yes

Peak Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

Benchmarks using both Fortran and C:
-m64 -std=c11

Benchmarks using both C and C++:
-m64 -std=c11

Benchmarks using Fortran, C, and C++:
-m64 -std=c11
### Huawei 5288 V5 (Intel Xeon Gold 5115)

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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

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-V1.9-revC.xml

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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