**SPEC® CPU2017 Floating Point Rate Result**

**Fujitsu**
PRIMERGY RX2540 M5, Intel Xeon Gold 5218, 2.30 GHz

### Copyright 2017-2019 Standard Performance Evaluation Corporation

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>Fujitsu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Fujitsu</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Fujitsu</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Apr-2019</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>May-2019</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Feb-2019</td>
</tr>
</tbody>
</table>

**SPECraten2017_fp_base = 181**

**SPECraten2017_fp_peak = Not Run**

### Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon Gold 5218</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max MHz.:</td>
<td>3900</td>
</tr>
<tr>
<td>Nominal:</td>
<td>2300</td>
</tr>
<tr>
<td>Enabled:</td>
<td>32 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>Orderable:</td>
<td>1.2 chips</td>
</tr>
<tr>
<td>Cache L1:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2:</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3:</td>
<td>22 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R, running at 2666)</td>
</tr>
<tr>
<td>Storage:</td>
<td>1 x SATA M.2 SSD, 240GB</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
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### Software

<table>
<thead>
<tr>
<th>OS:</th>
<th>SUSE Linux Enterprise Server 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 19.0.0.117 of Intel C/C++</td>
</tr>
<tr>
<td>Parallel:</td>
<td>No</td>
</tr>
<tr>
<td>Firmware:</td>
<td>Fujitsu BIOS Version V5.0.0.14 R1.8.0 for D3384-B1x. Released Jun-2019 tested as V5.0.0.14 R1.2.0 for D3384-B1x Feb-2019</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
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**SPECrate2017 fp_base =** 181  
**SPECrate2017 fp_peak =** Not Run

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>503.bwaves_r</td>
<td>64</td>
<td>1370</td>
<td>468</td>
<td>1371</td>
<td>468</td>
<td>1370</td>
<td>468</td>
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<tr>
<td>507.cactuBSSN_r</td>
<td>64</td>
<td>541</td>
<td>150</td>
<td>539</td>
<td>150</td>
<td>540</td>
<td>150</td>
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<tr>
<td>508.namd_r</td>
<td>64</td>
<td>459</td>
<td>132</td>
<td>461</td>
<td>132</td>
<td>460</td>
<td>132</td>
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<tr>
<td>510.parest_r</td>
<td>64</td>
<td>1558</td>
<td>107</td>
<td>1567</td>
<td>107</td>
<td>1569</td>
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<td>511.povray_r</td>
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<td><strong>209</strong></td>
<td>715</td>
<td>209</td>
<td>718</td>
<td>208</td>
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<tr>
<td>519.lbm_r</td>
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<td>106</td>
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<td>106</td>
<td>640</td>
<td>105</td>
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<tr>
<td>521.wrf_r</td>
<td>64</td>
<td>724</td>
<td>198</td>
<td>735</td>
<td>195</td>
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<td>197</td>
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<tr>
<td>526.blender_r</td>
<td>64</td>
<td>507</td>
<td>192</td>
<td>506</td>
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<td><strong>507</strong></td>
<td><strong>192</strong></td>
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<tr>
<td>527.cam4_r</td>
<td>64</td>
<td>598</td>
<td>187</td>
<td>600</td>
<td>186</td>
<td><strong>599</strong></td>
<td><strong>187</strong></td>
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<tr>
<td>538.imagick_r</td>
<td>64</td>
<td>416</td>
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<td>418</td>
<td>381</td>
<td><strong>416</strong></td>
<td><strong>382</strong></td>
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<tr>
<td>544.nab_r</td>
<td>64</td>
<td>369</td>
<td>292</td>
<td>373</td>
<td>289</td>
<td><strong>370</strong></td>
<td><strong>291</strong></td>
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<tr>
<td>549.fotonik3d_r</td>
<td>64</td>
<td>1670</td>
<td>149</td>
<td><strong>1672</strong></td>
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<td>1676</td>
<td>149</td>
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<tr>
<td>554.roms_r</td>
<td>64</td>
<td><strong>1186</strong></td>
<td><strong>85.8</strong></td>
<td>1185</td>
<td>85.8</td>
<td>1187</td>
<td>85.6</td>
</tr>
</tbody>
</table>

**Operating System Notes**

Stack size set to unlimited using "ulimit -s unlimited”  
Kernel Boot Parameter set with : nohz_full=1-63  
Process tuning settings:  
echo 10000000 > /proc/sys/kernel/sched_min_granularity_ns

**General Notes**

Environment variables set by runcpu before the start of the run:  
LD_LIBRARY_PATH = "*/home/Benchmark/speccpu2017-1.0.5/icc19-lib/intel64"  
Binaries compiled on a system with 2x Intel Xeon E5-2667 v2 CPU + 64GB RAM  
memory using SUSE Linux Enterprise Server 12 SP2  
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  
runcpu command invoked through numactl i.e.:
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SPECrates
SPECrates

Fujitsu

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

Test Date: Apr-2019
Hardware Availability: May-2019
Software Availability: Feb-2019

SPEC_CPU2017_fp_base = 181
SPEC_CPU2017_fp_peak = Not Run

General Notes (Continued)

numactl --interleave=all runcpu <etc>
NA: 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:
Patrol Scrub = Disabled
WR CRC feature Control = Disabled
Fan Control = Full
Sysinfo program /home/Benchmark/speccpu2017-1.0.5/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f999c33d61f64985e45859ea9
running on RX2540M5 Thu Apr 25 19:39:40 2019

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 5218 CPU @ 2.30GHz
  2 "physical id"s (chips)
  64 "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 : 32
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): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 2
Core(s) per socket: 16
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85

(Continued on next page)
## Platform Notes (Continued)

Model name: Intel(R) Xeon(R) Gold 5218 CPU @ 2.30GHz
Stepping: 6
CPU MHz: 2300.000
CPU max MHz: 3900.0000
CPU min MHz: 1000.0000
BogoMIPS: 4600.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K
NUMA node0 CPU(s): 0-3,8-11,32-35,40-43
NUMA node1 CPU(s): 4-7,12-15,36-39,44-47
NUMA node2 CPU(s): 16-19,24-27,48-51,56-59
NUMA node3 CPU(s): 20-23,28-31,52-55,60-63
Flags: fpu vme de pse tsc msr pae mce cmov pat pse36 clflush dts acpi sep mtrr pge mca cmov
pat pse36 clflush dts acpi sep mtrr pge mca cmov
pt pse36 clflush dts acpi sep mtrr pge mca cmov
pat pse36 clflush dts acpi sep mtrr pge mca cmov
pt

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.

```
/proc/cpuinfo cache data
cache size: 22528 KB
```

(Continued on next page)
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</table>

SPECRate2017_fp_base = 181

SPECRate2017_fp_peak = Not Run

### Platform Notes (Continued)

```
node  0  1  2  3
0:  10 11 21 21
1:  11 10 21 21
2:  21 21 10 11
3:  21 21 11 10
```

From /proc/meminfo

<table>
<thead>
<tr>
<th>MemTotal:</th>
<th>790861352 kB</th>
</tr>
</thead>
<tbody>
<tr>
<td>HugePages_Total:</td>
<td>0</td>
</tr>
<tr>
<td>Hugepagesize:</td>
<td>2048 kB</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>os-release:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME=&quot;SLES&quot;</td>
</tr>
<tr>
<td>VERSION=&quot;15&quot;</td>
</tr>
<tr>
<td>VERSION_ID=&quot;15&quot;</td>
</tr>
<tr>
<td>PRETTY_NAME=&quot;SUSE Linux Enterprise Server 15&quot;</td>
</tr>
<tr>
<td>ID=&quot;sles&quot;</td>
</tr>
<tr>
<td>ID_LIKE=&quot;suse&quot;</td>
</tr>
<tr>
<td>ANSI_COLOR=&quot;0;32&quot;</td>
</tr>
<tr>
<td>CPE_NAME=&quot;cpe:/o:suse:sles:15&quot;</td>
</tr>
</tbody>
</table>

```
uname -a:
Linux RX2540M5 4.12.14-25.28-default #1 SMP Wed Jan 16 20:00:47 UTC 2019 (dd6077c)
x86_64 x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

- CVE-2017-5754 (Meltdown): Not affected
- CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
- CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

run-level 3 Apr 25 19:36

```
SPEC is set to: /home/Benchmark/speccpu2017-1.0.5
Filesystem     Type Size Used Avail Use% Mounted on
/dev/sda5      xfs  191G  57G  135G  30% /home
```

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 FUJITSU // American Megatrends Inc. V5.0.0.14 R1.2.0 for D3384-B1x
  02/28/2019
- Memory:
  24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2666

(Continued on next page)
Platform Notes (Continued)

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  519.lbm_r(base)  538.imagick_r(base)  544.nab_r(base)
------------------------------------------------------------------------------
icc (ICC) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
CXXC 508.namd_r(base)  510.parest_r(base)
------------------------------------------------------------------------------
icpc (ICC) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
CC  511.povray_r(base)  526.blender_r(base)
------------------------------------------------------------------------------
icpc (ICC) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 19.0.0.117 20180804
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==============================================================================
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icc (ICC) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
ifort (IFORT) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
FC  503.bwaves_r(base)  549.fotonik3d_r(base)  554.roms_r(base)
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<tbody>
<tr>
<td>SPECrate2017_fp_peak</td>
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**Compiler Version Notes (Continued)**

```
CC  521.wrf_r(base) 527.cam4_r(base)
ifort (IFORT) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

**Base Compiler Invocation**

- **C benchmarks:**
  - `icc -m64 -std=c11`

- **C++ benchmarks:**
  - `icpc -m64`

- **Fortran benchmarks:**
  - `ifort -m64`

- **Benchmarks using both Fortran and C:**
  - `ifort -m64 icc -m64 -std=c11`

- **Benchmarks using both C and C++:**
  - `icpc -m64 icc -m64 -std=c11`

- **Benchmarks using Fortran, C, and C++:**
  - `icpc -m64 icc -m64 -std=c11 ifort -m64`

**Base Portability Flags**

- 503.bwaves_r: -DSPEC_LP64
- 507.cactuBSSN_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

(Continued on next page)
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</tbody>
</table>

**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu

**Base Portability Flags (Continued)**

- 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 -auto -nostandard-realloc-lhs

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

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 -auto -nostandard-realloc-lhs

The flags files that were used to format this result can be browsed at


You can also download the XML flags sources by saving the following links:


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Tested with SPEC CPU2017 v1.0.5 on 2019-04-25 06:39:40-0400.  
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