# SPEC CPU®2017 Floating Point Rate Result

**Fujitsu**

PRIMERGY RX2540 M5, Intel Xeon Gold 6230, 2.10 GHz

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>211</th>
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</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak</td>
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**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu  
**Test Date:** Jun-2019  
**Hardware Availability:** May-2019  
**Software Availability:** Feb-2019

<table>
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<th>SPECrate®2017_fp_base (211)</th>
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<tr>
<td>503.bwaves_r     80</td>
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<tr>
<td>507.cactuBSSN_r  80</td>
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<tr>
<td>508.namd_r       80</td>
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<td>510.parest_r     80</td>
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<tr>
<td>511.povray_r     80</td>
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<tr>
<td>519.lbm_r        80</td>
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<tr>
<td>521.wrf_r        80</td>
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<td>527.cam4_r       80</td>
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<td>538.imagick_r    80</td>
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<tr>
<td>544.nab_r        80</td>
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<tr>
<td>549.fotonik3d_r  80</td>
</tr>
<tr>
<td>554.roms_r       80</td>
</tr>
</tbody>
</table>

## Hardware

**CPU Name:** Intel Xeon Gold 6230  
**Max MHz:** 3900  
**Nominal:** 2100  
**Enabled:** 40 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:** 27.5 MB I+D on chip per chip  
**Other:** None  
**Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)  
**Storage:** 1 x SATA M.2 SSD, 480 GB  
**Other:** None

## Software

**OS:** SUSE Linux Enterprise Server 15  
**Compiler:** C/C++; Version 19.0.0.117 of Intel C/C++ Compiler for Linux; Fortran: Version 19.0.0.117 of Intel Fortran Compiler for Linux  
**Parallel:** No  
**Firmware:** 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  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable  
**Other:** None  
**Power Management:** --
## Results Table

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<thead>
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**SPECrate®2017_fp_base = 211**

**SPECrate®2017_fp_peak = Not Run**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## 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"

Kernel Boot Parameter set with : nohz_full=1-79

Process tuning settings:

```bash
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:

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

runcpu command invoked through numactl i.e.:

(Continued on next page)
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CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

| Test Date: | Jun-2019 |
| Hardware Availability: | May-2019 |
| Software Availability: | Feb-2019 |

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/speccpu-1.0.5/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on RX2540M5-AD-537 Tue Jun 18 00:38:08 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 6230 CPU @ 2.10GHz
  2 "physical id"s (chips)
  80 "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 : 40
  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): 80
On-line CPU(s) list: 0-79
Thread(s) per core: 2
Core(s) per socket: 20
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 6230 CPU @ 2.10GHz
- **Stepping:** 6
- **CPU MHz:** 2100.000
- **CPU max MHz:** 3900.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 4200.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 28160K
- **NUMA node0 CPU(s):** 0-2,5,6,10-12,15,16,40-42,45,46,50-52,55,56
- **NUMA node1 CPU(s):** 3,4,7-9,13,14,17-19,43,44,47-49,53,54,57-59
- **NUMA node2 CPU(s):** 20-22,25,26,30-32,35,36,60-62,65,66,70-72,75,76
- **NUMA node3 CPU(s):** 23,24,27-29,33,34,37-39,63,64,67-69,73,74,77-79

**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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
- aperfmperf 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 3nowprefetch cpuid_fault epb cat_l3 cdp_l3
- invpcid_single ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority
- ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ets invpcid rtm cqm mpx rd_t_a
- avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
- xsaves opt xsave xgetbv1 xsaves cqm_llc cqm_occu_llc cqm_mbb_total cqm_mbb_local
- dtherm ida arat pfn pts hwp hwp_act_window hwp_epp hwp_pkg_req pku ospke avx512_vnni
- flush_l1d arch_capabilities

```
/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:** 4 nodes (0-3)
- **node 0 cpus:** 0 1 2 5 6 10 11 12 15 16 40 41 42 45 46 50 51 52 55 56
- **node 0 size:** 191858 MB
- **node 0 free:** 191423 MB
- **node 1 cpus:** 3 4 7 8 9 13 14 17 18 19 43 44 47 48 49 53 54 57 58 59
- **node 1 size:** 193532 MB
- **node 1 free:** 193227 MB
- **node 2 cpus:** 20 21 22 25 26 30 31 32 35 36 60 61 62 65 66 70 71 72 76 76
- **node 2 size:** 193532 MB
- **node 2 free:** 193246 MB
- **node 3 cpus:** 23 24 27 28 29 33 34 37 38 39 63 64 67 68 69 73 74 77 78 79
- **node 3 size:** 193319 MB
- **node 3 free:** 193077 MB
- **node distances:**

(Continued on next page)
**Fujitsu**

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</tr>
</tbody>
</table>

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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  
MemTotal: 790776168 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*  
**NAME**="SLES"  
**VERSION**="15"  
**VERSION_ID**="15"  
**PRETTY_NAME**="SUSE Linux Enterprise Server 15"  
**ID**="sles"  
**ID_LIKE**="suse"  
**ANSI_COLOR**="0;32"  
**CPE_NAME**="cpe:/o:suse:sles:15"

```
uname -a:  
Linux RX2540M5-AD-537 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 Jun 18 00:37

SPEC is set to: /home/Benchmark/speccpu-1.0.5  
Filesistem Type Size Used Avail Use% Mounted on  
/dev/sda5 xfs 405G 29G 377G 7% /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:  
1x Hynix HMA84GR7CJR4N-WM 32 GB 2 rank 2933, configured at 2934

(Continued on next page)
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Platform Notes (Continued)

23x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2934

(End of data from sysinfo program)

Compiler Version Notes

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<tr>
<th>C</th>
<th>519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)</th>
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Compiler Version Notes (Continued)

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Fortran, C | 521.wrf_r(base) 527.cam4_r(base)
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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

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Base Portability Flags (Continued)

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 -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:
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-CSL-RevE.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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