# SPEC CPU®2017 Floating Point Rate Result

**Fujitsu**

PRIMERGY RX2540 M5, Intel Xeon Gold 5220R, 2.20 GHz

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base =</th>
<th>227</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak =</td>
<td>Not Run</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>SPEC CPU®2017 License:</th>
<th>19</th>
</tr>
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<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>Mar-2020</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>May-2019</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>May-2019</td>
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## Copies

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<thead>
<tr>
<th>Test</th>
<th>Name</th>
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<tr>
<td>96</td>
<td>503.bwaves_r</td>
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<tr>
<td>96</td>
<td>507.cactuBSSN_r</td>
<td>183</td>
</tr>
<tr>
<td>96</td>
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<td>222</td>
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<tr>
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<td>511.povray_r</td>
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<td>519.lbm_r</td>
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<td>96</td>
<td>521.wrf_r</td>
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<td>526.blender_r</td>
<td>270</td>
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<td>96</td>
<td>527.cam4_r</td>
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<td>96</td>
<td>538.imagick_r</td>
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<td>96</td>
<td>544.nab_r</td>
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</tr>
<tr>
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### Hardware

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon Gold 5220R</td>
</tr>
<tr>
<td>Max MHz</td>
<td>4000</td>
</tr>
<tr>
<td>Nominal</td>
<td>2200</td>
</tr>
<tr>
<td>Enabled</td>
<td>48 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>35.75 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, 240 GB</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
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</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>OS</td>
<td>SUSE Linux Enterprise Server 15 4.12.14-25.28-default</td>
</tr>
<tr>
<td>Compiler</td>
<td>C/C++: Version 19.0.4.227 of Intel C/C++ Compiler Build 20190416 for Linux; Fortran: Version 19.0.4.227 of Intel Fortran Compiler Build 20190416 for Linux</td>
</tr>
<tr>
<td>Parallel</td>
<td>No</td>
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<tr>
<td>Firmware</td>
<td>Fujitsu BIOS Version V5.0.0.14 R1.18.0 for D3384-B1x released Apr-2020</td>
</tr>
<tr>
<td>File System</td>
<td>xfs</td>
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<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>64-bit</td>
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<tr>
<td>Peak Pointers</td>
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<td>Other</td>
<td>None</td>
</tr>
<tr>
<td>Power Management</td>
<td>BIOS set to prefer performance at the cost of additional power usage</td>
</tr>
</tbody>
</table>
RESULTS

Fujitsu
PRIMERGY RX2540 M5, Intel Xeon Gold 5220R, 2.20 GHz

SPEC CPU®2017 Floating Point Rate Result

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PRIMERGY RX2540 M5, Intel Xeon Gold 5220R, 2.20 GHz

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

Test Date: Mar-2020
Hardware Availability: May-2019
Software Availability: May-2019

Results Table

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</tbody>
</table>

SPECrate®2017_fp_base = 227
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=1-95
Process tuning settings:
echo 10000000 > /proc/sys/kernel/sched_min_granularity_ns

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017-1.1.0/lib/intel64"

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/Benchmark/cpu2017-1.1.0/lib/intel64"
Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM

(Continued on next page)
General Notes (Continued)

memory using Redhat Enterprise Linux 7.5
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.:
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/speccpu2017-1.1.0/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1e6e46a485a0011
running on RX2540M5_CLXR Thu Mar 12 18:20:44 2020

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 5220R CPU @ 2.20GHz
  2 "physical id"s (chips)
  96 "processors"
core(s), siblings (Caution: counting these is hw and system dependent. The following
  excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 24
siblings : 48
physical 0: cores 0 1 2 3 4 5 6 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 96
On-line CPU(s) list: 0-95

(Continued on next page)
Platform Notes (Continued)

Thread(s) per core: 2
Core(s) per socket: 24
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5220R CPU @ 2.20GHz
Stepping: 7
CPU MHz: 2200.000
CPU max MHz: 4000.0000
CPU min MHz: 1000.0000
BogoMIPS: 4400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
NUMA node0 CPU(s): 0-3,7,8,12-14,18-20,48-51,55,56,60-62,66-68
NUMA node1 CPU(s): 4-6,9-11,15-17,21-23,52-54,57-59,63-65,69-71
NUMA node2 CPU(s): 24-27,31-33,37-39,43,44,72-75,79-81,85-87,91,92
NUMA node3 CPU(s): 28-30,34-36,40-42,45-47,76-78,82-84,88-90,93-95
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 xtrac pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault ebт cat_13 cdп_13
invpcid_single intel_ppln ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmiflexpriori еpt vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves xsavecpum xsavec qm_llc qmem_occup_llc qmem_mb_total
qmem_mdb_local dtherm ida arat ptn pts hwp hwp_act_window hwp_epp hwp_pkg_req pku ospke avx512_vnni flush_l1d arch_capabilities

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 7 8 12 13 14 18 19 20 48 49 50 51 55 56 60 61 62 66 67 68
node 0 size: 191974 MB
node 0 free: 191577 MB
node 1 cpus: 4 5 6 9 10 11 15 16 17 21 22 23 52 53 54 57 58 59 63 64 65 69 70 71
node 1 size: 193502 MB
node 1 free: 193138 MB

(Continued on next page)
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Node 2 cpus: 24 25 26 27 31 32 33 37 38 39 43 44 47 72 73 74 75 79 80 81 85 86 87 91 92
Node 2 size: 193531 MB
Node 2 free: 193219 MB
Node 3 cpus: 28 29 30 34 35 36 40 41 42 45 46 47 76 77 78 82 83 84 88 90 93 94 95
Node 3 size: 193318 MB
Node 3 free: 193058 MB
Node distances:
0: 10 11 21 21
1: 11 10 21 21
2: 21 21 10 11
3: 21 21 11 10

From /proc/meminfo
MemTotal: 790862828 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_CLXR 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-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: No status reported
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
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 Mar 12 18:17
SPEC is set to: /home/Benchmark/speccpu2017-1.1.0

(Continued on next page)
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Platform Notes (Continued)

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda5 xfs 191G 113G 78G 60% /home

From /sys/devices/virtual/dmi/id
BIOS: FUJITSU // American Megatrends Inc. V5.0.0.14 R1.18.0 for D3384-B1x 02/10/2020
Vendor: FUJITSU
Product: PRIMERGY RX2540 M5
Product Family: SERVER
Serial: YMSQXXXXXX

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.
Memory:
24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2666

(End of data from sysinfo program)

Compiler Version Notes

-----------------------------------------------------------------------------------------------
| C               | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base) |
-----------------------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
-----------------------------------------------------------------------------------------------

-----------------------------------------------------------------------------------------------
| C++             | 508.namd_r(base) 510.parest_r(base) |
-----------------------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
-----------------------------------------------------------------------------------------------

-----------------------------------------------------------------------------------------------
| C++, C          | 511.povray_r(base) 526.blender_r(base) |
-----------------------------------------------------------------------------------------------
Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416

(Continued on next page)
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Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

(Continued on next page)
Base Compiler Invocation (Continued)

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
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=4

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

(Continued on next page)
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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=4 -auto -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=4

Benchmarks using Fortran, C, and C++:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

---

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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