# SPEC® CPU2017 Integer Rate Result

## Fujitsu

**PRIMERGY RX2540 M5, Intel Xeon Silver 4215, 2.50 GHz**

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
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<tbody>
<tr>
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### CPU2017 License:
19

### Test Sponsor:
Fujitsu

### Tested by:
Fujitsu

### Test Date:
Apr-2019

### Hardware Availability:
May-2019

### Software Availability:
Feb-2019

### Copies

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>32</td>
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</table>

### Hardware

**CPU Name:** Intel Xeon Silver 4215

**Max MHz.:** 3500

**Nominal:** 2500

**Enabled:** 16 cores, 2 chips, 2 threads/core

**Orderable:** 1,2 chips

**Cache L1:** 32 KB I + 32 KB D on chip per core

**Cache L2:** 1 MB I+D on chip per core

**Cache L3:** 11 MB I+D on chip per chip

**Other:** None

**Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R, running at 2400)

**Storage:** 1 x SATA M.2 SSD, 240 GB

**Other:** None

### Software

**OS:** SUSE Linux Enterprise Server 15

**4.12.14-25.28-default**

**Compiler:** C/C++: Version 19.0.1.144 of Intel C/C++ Compiler Build 20181018 for Linux;

**Fortran:** Version 19.0.1.144 of Intel Fortran Compiler Build 20181018 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

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**SPECrate2017_int_base (95.6)**
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**CPU2017 License:** 19  
**Test Date:** Apr-2019  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu  
**Hardware Availability:** May-2019  
**Software Availability:** Feb-2019

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>Seconds Base</th>
<th>Seconds Ratio</th>
<th>Seconds Peak</th>
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<td></td>
<td></td>
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<td>63.3</td>
</tr>
</tbody>
</table>

**Results**

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=1-111

### General Notes

- Environment variables set by runcpu before the start of the run:  
  `LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017-1.0.5/lib/intel64"`
- Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM 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>`
  - 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.

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(Continued on next page)
Fujitsu
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General Notes (Continued)

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
DCU Ip Prefetcher = Disabled
DCU Streamer Prefetcher = Disabled
Stale AtoS = Enable
Fan Control = Full
Sub NUMA Clustering = Disabled
Sysinfo program /home/Benchmark/speccpu2017-1.0.5/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcd8f2999c33d61f64985e45859ea9
running on RX2540M5 Tue Apr 23 12:31:13 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) Silver 4215 CPU @ 2.50GHz
    2 "physical id"s (chips)
    32 "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 : 8
    siblings : 16
    physical 0: cores 0 1 2 3 4 5 6 7
    physical 1: cores 0 1 2 3 4 5 6 7

From lscpu:
    Architecture:       x86_64
    CPU op-mode(s):     32-bit, 64-bit
    Byte Order:         Little Endian
    CPU(s):             32
    On-line CPU(s) list: 0-31
    Thread(s) per core: 2
    Core(s) per socket: 8
    Socket(s):          2
    NUMA node(s):       2
    Vendor ID:          GenuineIntel
    CPU family:         6
    Model:              85
    Model name:         Intel(R) Xeon(R) Silver 4215 CPU @ 2.50GHz

(Continued on next page)
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Tested by: Fujitsu  
Test Date: Apr-2019  
Hardware Availability: May-2019  
Software Availability: Feb-2019  

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## Platform Notes (Continued)

Stepping: 6  
CPU MHz: 2500.000  
CPU max MHz: 3500.0000  
CPU min MHz: 1000.0000  
BogoMIPS: 5000.00  
Virtualization: VT-x  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 1024K  
L3 cache: 11264K  
NUMA node0 CPU(s): 0-7,16-23  
NUMA node1 CPU(s): 8-15,24-31  
Flags: fpu vme de pse tsc msr mcr pae mce 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 pccid dca sse4_1 sse4_2 x2apic movbe poprdt vpdebug vswpmsg vsuid perfctr_pdpconfig tsc_diff monitors aperf  

```
/platform/cpuid data

Cache size: 11264 KB
```

From numactl --hardware **WARNING:** a numactl 'node' might or might not correspond to a physical chip.  
```
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7 16 17 18 19 20 21 22 23
node 0 size: 385475 MB
node 0 free: 384986 MB
node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
node 1 size: 386857 MB
node 1 free: 386449 MB
node distances:
node 0 1
  0: 10 21
  1: 21 10
```

From /proc/meminfo  
```
MemTotal: 790868228 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

(Continued on next page)
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SPECrate2017_int_base = 95.6
SPECrate2017_int_peak = Not Run

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Platform Notes (Continued)

From /etc/*release* /etc/*version*
  os-release:
    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 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 23 10:41

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 SBIOS" 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 2400

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
  CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
      557.xz_r(base)
==============================================================================

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Fujitsu
PRIMERGY RX2540 M5, Intel Xeon Silver 4215, 2.50 GHz

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Compiler Version Notes (Continued)

Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
541.leela_r(base)

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC  548.exchange2_r(base)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.1.144 Build 20181018
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

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
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**Base Portability Flags (Continued)**

557.xz_r: -DSPEC_LP64

**Base Optimization Flags**

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

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-RevA.xml

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

Tested with SPEC CPU2017 v1.0.5 on 2019-04-22 23:31:12-0400.