**Fujitsu**
PRIMERGY CX2560 M5, Intel Xeon Silver 4210, 2.20 GHz

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base = 107</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak = Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu  
**Test Date:** Jun-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Feb-2019

**Hardware**

| Copies | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 |
|--------|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 500.perlbench_r | 40 | | | | | | | | | | | | | | | | | | | | | | | |
| 502.gcc_r | 40 | | | | | | | | | | | | | | | | | | | | | | | |
| 505.mcf_r | 40 | | | | | | | | | | | | | | | | | | | | | | | |
| 520.omnetpp_r | 40 | | | | | | | | | | | | | | | | | | | | | | | |
| 523.xalancbmk_r | 40 | | | | | | | | | | | | | | | | | | | | | | | |
| 525.x264_r | 40 | | | | | | | | | | | | | | | | | | | | | | | |
| 531.deepsjeng_r | 40 | | | | | | | | | | | | | | | | | | | | | | | |
| 541.leela_r | 40 | | | | | | | | | | | | | | | | | | | | | | | |
| 548.exchange2_r | 40 | | | | | | | | | | | | | | | | | | | | | | | |
| 557.xz_r | 40 | | | | | | | | | | | | | | | | | | | | | | | |

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base (107)</th>
</tr>
</thead>
</table>

**Software**

| CPU Name: Intel Xeon Silver 4210 |
| Max MHz: 3200 |
| Nominal: 2200 |
| 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 |
| Other: None |
| Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R, running at 2400) |
| Storage: 1 x SATA M.2 SSD, 256 GB |
| Other: None |

| OS: SUSE Linux Enterprise Server 15 |
| 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 V1.0.0.0 R1.6.0 for D3854-B1x, released Jun-2019. Tested as V1.0.0.0 R1.3.3 for D3854-B1x Mar-2019 |
| File System: btrfs |
| System State: Run level 3 (multi-user) |
| Base Pointers: 64-bit |
| Peak Pointers: Not Applicable |
| Other: None |
| Power Management: -- |
SPEC CPU®2017 Integer Rate Result

Fujitsu

PRIMERGY CX2560 M5, Intel Xeon Silver 4210, 2.20 GHz

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

SPECrate®2017_int_base = 107
SPECrate®2017_int_peak = Not Run

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Copies</th>
<th>Seconds</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>40</td>
<td>40</td>
<td>770</td>
<td>779</td>
<td>81.8</td>
<td>775</td>
<td>82.2</td>
<td></td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>40</td>
<td>40</td>
<td>666</td>
<td>666</td>
<td>85.1</td>
<td>668</td>
<td>84.8</td>
<td></td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>40</td>
<td>40</td>
<td>461</td>
<td>462</td>
<td>140</td>
<td>461</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>40</td>
<td>40</td>
<td>706</td>
<td>707</td>
<td>74.3</td>
<td>710</td>
<td>73.9</td>
<td></td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>40</td>
<td>40</td>
<td>350</td>
<td>349</td>
<td>121</td>
<td>350</td>
<td>121</td>
<td></td>
</tr>
<tr>
<td>525.x264_r</td>
<td>40</td>
<td>40</td>
<td>336</td>
<td>337</td>
<td>209</td>
<td>337</td>
<td>208</td>
<td>208</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>40</td>
<td>40</td>
<td>503</td>
<td>503</td>
<td>91.1</td>
<td>503</td>
<td>91.0</td>
<td></td>
</tr>
<tr>
<td>541.leela_r</td>
<td>40</td>
<td>40</td>
<td>793</td>
<td>788</td>
<td>83.5</td>
<td>796</td>
<td>83.2</td>
<td></td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>40</td>
<td>40</td>
<td>544</td>
<td>544</td>
<td>193</td>
<td>546</td>
<td>192</td>
<td></td>
</tr>
<tr>
<td>557.xz_r</td>
<td>40</td>
<td>40</td>
<td>601</td>
<td>601</td>
<td>71.9</td>
<td>601</td>
<td>71.9</td>
<td></td>
</tr>
</tbody>
</table>

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=1-39

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017-1.0.5_rate_int/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.:
umactl --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)

(Continued on next page)
## SPEC CPU®2017 Integer Rate Result

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU2017 License:</strong></td>
<td>19</td>
</tr>
<tr>
<td><strong>Test Sponsor:</strong></td>
<td>Fujitsu</td>
</tr>
<tr>
<td><strong>Tested by:</strong></td>
<td>Fujitsu</td>
</tr>
<tr>
<td><strong>Fujitsu</strong></td>
<td>PRIMERGY CX2560 M5, Intel Xeon Silver 4210, 2.20 GHz</td>
</tr>
<tr>
<td><strong>SPECrate®2017_int_base =</strong></td>
<td>107</td>
</tr>
<tr>
<td><strong>SPECrate®2017_int_peak =</strong></td>
<td>Not Run</td>
</tr>
</tbody>
</table>

### 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:
- Adjacent Cache Line Prefetch = Disabled
- DCU Ip Prefetcher = Disabled
- DCU Streamer Prefetcher = Disabled
- Power Technology = Custom
- Energy Performance = Balanced Performance
- Uncore Frequency Scaling = Disabled
- Sub NUMA Clustering = Disabled
- Stale AtoS = Enable
- LLC Prefetch = Enabled
- Sysinfo program: `/home/Benchmark/speccpu2017-1.0.5_rate_int/bin/sysinfo`
- Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
- running on linux-3m0d Thu Jun  6 17:53:20 2019

### SUT (System Under Test) info as seen by some common utilities.

- From `/proc/cpuinfo`
  ```
  model name : Intel(R) Xeon(R) Silver 4210 CPU @ 2.20GHz
  2 "physical id"s (chips)
  40 "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 : 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
  ```

(Continued on next page)
## Fujitsu

**PRIMERGY CX2560 M5, Intel Xeon Silver 4210, 2.20 GHz**

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Fujitsu</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Fujitsu</td>
</tr>
</tbody>
</table>

**SPECrate®2017_int_base = 107**

**SPECrate®2017_int_peak = Not Run**

### Platform Notes (Continued)

- **CPU family:** 6
- **Model:** 85
- **Model name:** Intel(R) Xeon(R) Silver 4210 CPU @ 2.20GHz
- **Stepping:** 6
- **CPU MHz:** 2200.000
- **CPU max MHz:** 3200.0000
- **CPU min MHz:** 1000.0000
- **BogoMIPS:** 4400.00
- **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 pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdmels gb 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 xtrig pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abfm1 hle avx2 smep bmi2 ibrms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx51cd avx512bw avx512vl avx512v1 xsseopt xsaves xgetbv1 xsavec xcm_11c cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku ospke avx512_vnni flush_l1d arch_capabilities

/proc/cpuinfo cache data

```
cache size : 14080 KB
```

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

<table>
<thead>
<tr>
<th>available:</th>
<th>2 nodes (0-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>node 0 cpus:</td>
<td>0 1 2 3 4 5 6 7 8 9 20 21 22 23 24 25 26 27 28 29</td>
</tr>
<tr>
<td>node 0 size:</td>
<td>192191 MB</td>
</tr>
<tr>
<td>node 0 free:</td>
<td>191785 MB</td>
</tr>
<tr>
<td>node 1 cpus:</td>
<td>10 11 12 13 14 15 16 17 18 19 30 31 32 33 34 35 36 37 38 39</td>
</tr>
<tr>
<td>node 1 size:</td>
<td>193522 MB</td>
</tr>
<tr>
<td>node 1 free:</td>
<td>193192 MB</td>
</tr>
<tr>
<td>node distances:</td>
<td></td>
</tr>
<tr>
<td>node 0:</td>
<td>0 1</td>
</tr>
<tr>
<td>0:</td>
<td>10 18</td>
</tr>
<tr>
<td>1:</td>
<td>18 10</td>
</tr>
</tbody>
</table>

From `/proc/meminfo`

```
MemTotal: 394970696 kB
```
Fujitsu
PRIMERGY CX2560 M5, Intel Xeon Silver 4210, 2.20 GHz

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

SPECrate®2017_int_base = 107
SPECrate®2017_int_peak = Not Run

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

Platform Notes (Continued)

HugePages_Total: 0
Hugepagesize: 2048 kB

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 linux-3m0d 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 6 17:45

SPEC is set to: /home/Benchmark/speccpu2017-1.0.5_rate_int
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 btrfs 236G 150G 86G 64% /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 V1.0.0.0 R1.3.3 for D3854-B1x 03/15/2019
Memory:
6x Micron 36ASF4G72PZ-2G9E2 32 GB 2 rank 2933, configured at 2400
4x Not Specified Not Specified
6x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2400

(End of data from sysinfo program)
Fujitsu
PRIMERGY CX2560 M5, Intel Xeon Silver 4210, 2.20 GHz

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>Test Date:</th>
<th>Test Sponsor:</th>
<th>Hardware Availability:</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Jun-2019</td>
<td>Fujitsu</td>
<td>Apr-2019</td>
</tr>
<tr>
<td>Tested by:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fujitsu</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SPECrater®2017_int_base = 107
SPECrater®2017_int_peak = Not Run

Compiler Version Notes

```plaintext
==============================================================================
C       | 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,
Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C++     | 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.
------------------------------------------------------------------------------

==============================================================================
Fortran | 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

(Continued on next page)
SPEC CPU®2017 Integer Rate Result
Copyright 2017-2019 Standard Performance Evaluation Corporation

Fujitsu
PRIMERGY CX2560 M5, Intel Xeon Silver 4210, 2.20 GHz

SPECrate®2017_int_base = 107
SPECrate®2017_int_peak = Not Run

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu
Test Date: Jun-2019
Hardware Availability: Apr-2019
Software Availability: Feb-2019

Base Portability Flags (Continued)

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
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-RevE.xml

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU®2017 v1.0.5 on 2019-06-06 04:53:19-0400.