# SPEC® CPU2017 Integer Rate Result

**Fujitsu**

PRIMERGY CX2550 M4, Intel Xeon Silver 4108, 1.80GHz

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>65.3</th>
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<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>Not Run</td>
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</tbody>
</table>

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## Fujitsu

### Test Sponsor: Fujitsu

### Tested by: Fujitsu

### Hardware

- **CPU Name:** Intel Xeon Silver 4108
- **Max MHz.:** 3000
- **Nominal:** 1800
- **Enabled:** 16 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:** 11 MB I+D on chip per chip
- **Memory:** 192 GB (12 x 16 GB 2Rx4 PC4-2666V-R, running at 2400)
- **Storage:** 1 x SATA SSD, 960 GB
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 12 SP2 4.4.114-92.64-default
- **Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux;
  Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux
- **Parallel:** No
- **Firmware:** Fujitsu BIOS Version V1.0.0.0 R1.27.0 for D3853-A1x. Released Mar-2018
- **System State:** Run level 3 (multi-user)
- **File System:** xfs
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Other:** jemalloc memory allocator library V5.0.1

### Test Details

- **CPU2017 License:** 19
- **Test Date:** Apr-2018
- **Hardware Availability:** Dec-2017
- **Software Availability:** Mar-2018

### Benchmarks

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>SPECrate2017_int_base</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>32</td>
<td>48.7</td>
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<tr>
<td>502.gcc_r</td>
<td>32</td>
<td>59.3</td>
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<td>505.mcf_r</td>
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<td>520.omnetpp_r</td>
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<td>71.0</td>
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<tr>
<td>523.xalancbmk_r</td>
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<td>525.x264_r</td>
<td>32</td>
<td>54.3</td>
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<td>531.deepsjeng_r</td>
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<tr>
<td>541.leela_r</td>
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<td>118</td>
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<tr>
<td>548.exchange2_r</td>
<td>32</td>
<td>46.1</td>
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<tr>
<td>557.xz_r</td>
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**Software Availability:** Mar-2018

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SPECrate2017_int_peak = Not Run

Results Table

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<tr>
<td></td>
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</tr>
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</tr>
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<td>609</td>
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<td>913</td>
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<td>476</td>
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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"
Set Kernel Boot Parameter: nohz_full=1-31
Set CPU frequency governor to maximum performance with:
cpupower -c all frequency-set -g performance
Process tuning settings:
echo 0 > /proc/sys/kernel/ numa_balancing
echo 1000000 > /proc/sys/kernel/sched_min_granularity_ns
echo 15000000 > /proc/sys/kernel/sched_wakeup_granularity_ns
cpu idle state set with:
cpupower idle-set -d 1
cpupower idle-set -d 2

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017/lib/ia32:/home/Benchmark/speccpu2017/lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/Benchmark/speccpu2017/je5.0.1-32"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/Benchmark/speccpu2017/je5.0.1-64"
Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM

(Continued on next page)
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**SPECrate2017_int_base = 65.3**

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**General Notes (Continued)**

memory using Redhat Enterprise Linux 7.4
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>

jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets;
jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5;
jemalloc: sources available via jemalloc.net

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.
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:
- DCU Streamer Prefetcher = Disabled
- Intel Virtualization Technology = Disabled
- Power Technology = Custom
- HWPM Support = Disabled
- Uncore Frequency Scaling = Disabled
- Sub NUMA Clustering = Disabled
- Stale AtoS = Enabled
- LLC dead line alloc = Disabled
Sysinfo program /home/Benchmark/speccpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcco91c0f
running on CX2550M4 Tue Apr 17 17:06:56 2018

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 4108 CPU @ 1.80GHz
  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
```

(Continued on next page)
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Platform Notes (Continued)

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 4108 CPU @ 1.80GHz
Stepping: 4
CPU MHz: 1801.000
CPU max MHz: 1801.0000
CPU min MHz: 800.0000
BogoMIPS: 3591.55
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 pae mce 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 aperfmperf eagerfpu 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 3dnowprefetch ida arat epb invpcid_single pln pts dtherm intel_pt rsb_ctxtsw spec_ctrl retpoline kaiser tpr_shadow vnmi flexpriority ept vts_aes fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 512 ssmred ibs invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clfshuplt clwb avx512cd avx512bw avx512vl xsaveopt xsavesx xsavecn xgetbv1 cqm_1llc cqm_occmap_1llc

/proc/cpuinfo cache 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

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Platform Notes (Continued)

node 0 size: 96321 MB
node 0 free: 95997 MB
node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
node 1 size: 96645 MB
node 1 free: 96361 MB
node distances:
  node 0 1
  0: 10 21
  1: 21 10

From /proc/meminfo
  MemTotal: 197598076 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
  SUSE Linux Enterprise Server 12 SP2

From /etc/*release* /etc/*version*
  SuSE-release:
    SUSE Linux Enterprise Server 12 (x86_64)
    VERSION = 12
    PATCHLEVEL = 2
    # This file is deprecated and will be removed in a future service pack or release.
    # Please check /etc/os-release for details about this release.
  os-release:
    NAME="SLES"
    VERSION="12-SP2"
    VERSION_ID="12.2"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
  Linux CX2550M4 4.4.114-92.64-default #1 SMP Thu Feb 1 19:18:19 UTC 2018 (c6ce5db)
  x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Apr 17 17:03

SPEC is set to: /home/Benchmark/speccpu2017
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/sda4 xfs 852G 17G 836G 2% /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

(Continued on next page)
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Hardware Availability: Dec-2017
Software Availability: Mar-2018

Platform Notes (Continued)
frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
BIOS FUJITSU V1.0.0.0 R1.27.0 for D3853-A1x
03/15/2018
Memory:
12x Hynix HMA42GR7BJR4N-VK 16 GB 2 rank 2666, configured at 2400
4x Not Specified Not Specified

(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)
------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
==============================================================================
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
541.leela_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
==============================================================================
FC  548.exchange2_r(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort
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### Base Portability Flags

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<tr>
<td>500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64</td>
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### Base Optimization Flags

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<tbody>
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<td>C benchmarks: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc</td>
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<tr>
<td>C++ benchmarks: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc</td>
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### Base Other Flags

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<tbody>
<tr>
<td>C benchmarks: -m64 -std=c11</td>
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<tr>
<td>C++ benchmarks: -m64</td>
<td></td>
</tr>
<tr>
<td>Fortran benchmarks: -m64</td>
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The flags files that were used to format this result can be browsed at:

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

- [https://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.2-SKL-RevE.xml](https://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.2-SKL-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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