## SPEC® CPU®2017 Integer Rate Result

**Fujitsu**

PRIMERGY CX2550 M5, Intel Xeon Platinum 8270, 2.70 GHz

<table>
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<th>Copies</th>
<th>SPECrate®2017_int_base</th>
<th>SPECrate®2017_int_peak</th>
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<td>520.omnetpp_r 104</td>
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<td></td>
</tr>
</tbody>
</table>

### CPU2017 License:
- 19

### Tested by:
- Fujitsu

### Test Sponsor:
- Fujitsu

### Hardware

- **CPU Name:** Intel Xeon Platinum 8270
- **Max MHz:** 4000
- **Nominal:** 2700
- **Enabled:** 52 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:** 35.75 MB I+D on chip per chip
- **Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)
- **Storage:** 1 x SATA M.2 SSD, 256 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
- **File System:** btrfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Other:** None
- **Power Management:** --

### Test Date:
- Apr-2019

### Hardware Availability:
- Apr-2019

### Software Availability:
- Feb-2019
Results Table

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<th>Benchmark</th>
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</tbody>
</table>

SPECrate®2017_int_base = 313
SPECrate®2017_int_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=1-103

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017-1.0.5_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.:
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)
## 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 = Enabled
  - Stale AtoS = Enable
  - LLC Prefetch = Enabled

- Sysinfo program /home/Benchmark/speccpu2017-1.0.5_INT/bin/sysinfo
  - Rev: r5974 of 2018-05-19 9bcd8f2999c3361f64985e45859ea9
  - running on linux-dftw Mon Apr 15 11:30:40 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

```plaintext
model name : Intel(R) Xeon(R) Platinum 8270 CPU @ 2.70GHz
2 "physical id"s (chips)
  104 "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 : 26
siblings : 52
  physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 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 22 24 25 26 27 28 29
```

### From lscpu:

```plaintext
Architecture:     x86_64
CPU op-mode(s):   32-bit, 64-bit
Byte Order:       Little Endian
CPU(s):           104
On-line CPU(s) list: 0-103
Thread(s) per core: 2
Core(s) per socket: 26
Socket(s):        2
```

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SPECrate®2017_int_base = 313
SPECrate®2017_int_peak = Not Run

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

When testing this system, SPEC recommends that you use the Linux
distribution in the latest branch of the Linux kernel. When testing
with compilers, we recommend that you use g++ 6.3.0 and glibc 2.23.

Platform Notes (Continued)

NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8270 CPU @ 2.70GHz
Stepping: 6
CPU MHz: 2700.000
CPU max MHz: 4000.0000
CPU min MHz: 1000.0000
BogoMIPS: 5400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
NUMA node0 CPU(s): 0-3,7-9,13-15,20-22,52-55,59-61,65-67,72-74
NUMA node1 CPU(s): 4-6,10-12,16-19,23-25,56-58,62-64,68-71,75-77
NUMA node2 CPU(s): 26-29,33-35,39-41,46-48,78-81,85-87,91-93,98-100
NUMA node3 CPU(s): 30-32,36-38,42-45,49-51,82-84,88-90,94-97,101-103
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 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 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single intel_pni ssbd mba ibrs ibpb ibrs增强了 tpr_shadow vmm flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cmq mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves xgetbv1 xsaveav cqm_llc cqm_occur_llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_reg pku ospke avx512_vnni flush_lld 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 9 13 14 15 20 21 22 52 53 54 55 59 60 61 65 66 67 72 73 74
  node 0 size: 95453 MB
  node 0 free: 95117 MB
  node 1 cpus: 4 5 6 10 11 12 16 17 18 19 23 24 25 56 57 58 62 63 64 68 69 70 71 75 76 77
  node 1 size: 96756 MB
  node 1 free: 96486 MB
  node 2 cpus: 26 27 28 29 33 34 35 39 40 41 46 47 48 78 79 80 81 85 86 87 91 92 93 98 99
  node 2 size: 96726 MB

(Continued on next page)
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**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu  
**Test Date:** Apr-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Feb-2019

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### Platform Notes (Continued)

- node 2 free: 96504 MB  
- node 3 cpus: 30 31 32 36 37 38 42 43 44 45 49 50 51 82 83 84 88 89 90 94 95 96 97 101 102 103  
- node 3 size: 96753 MB  
- node 3 free: 96533 MB  
- node distances:
  - node 0: 10 11 19 19  
  - node 1: 11 10 19 19  
  - node 2: 19 19 10 11  
  - node 3: 19 19 11 10

From `/proc/meminfo`

- MemTotal: 394946692 kB  
- 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-dftw 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 15 11:18

SPEC is set to: /home/Benchmark/speccpu2017-1.0.5_INT  
FS          TYPE      SIZE      USED Avail Use% Mounted on  
/dev/sda2   btrfs     238G     92G 147G 39% /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
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Platform Notes (Continued)

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 D3853-B1x 03/15/2019
Memory:
12x Micron 36ASF4G72PZ-2G9E2 32 GB 2 rank 2933
4x Not Specified Not Specified

(End of data from sysinfo program)

Compiler Version Notes

===============================================================================
| 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

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

Fortran benchmarks:

```
ifort -m64
```

## Base Portability Flags

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
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<tbody>
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</table>

## Base Optimization Flags

C benchmarks:

```
-W1, -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
-1qkmalloc
```

C++ benchmarks:

```
-W1, -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
-1qkmalloc
```

Fortran benchmarks:

```
-W1, -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
-1qkmalloc
```

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

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