## Fujitsu

PRIMERGY CX2550 M5, Intel Xeon Platinum 8280, 2.70GHz

### SPECrate2017 Integer Rate Result

<table>
<thead>
<tr>
<th>Test Sponsor:</th>
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<th>Hardware Availability:</th>
<th>Software Availability:</th>
</tr>
</thead>
</table>

### CPU2017 Integer Rate Result

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
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<tbody>
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<td>335</td>
<td>Not Run</td>
</tr>
<tr>
<td>30.0</td>
<td>273</td>
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<td>160</td>
<td>412</td>
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<td>220</td>
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<td>280</td>
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<tr>
<td>640</td>
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<tr>
<td>700</td>
<td>389</td>
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</table>

### Hardware

**CPU Name:** Intel Xeon Platinum 8280  
**Max MHz.:** 4000  
**Nominal:** 2700  
**Enabled:** 56 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:** 38.5 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, 240GB  
**Other:** None

### Software

**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 D3853-B1x. Released Jun-2019 tested as V1.0.0.0 R1.3.3 for D3853-B1x Mar-2019  
**File System:** btrfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable  
**Other:** None
Fujitsu
PRIMERGY CX2550 M5, Intel Xeon Platinum 8280, 2.70GHz

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

Results Table

<table>
<thead>
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<th>Seconds</th>
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<tr>
<td>500.perlbench_r</td>
<td>112</td>
<td>654</td>
<td>273</td>
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<td>410</td>
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<td>531.deepsjeng_r</td>
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<td>541.leela_r</td>
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<td>548.exchange2_r</td>
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<td>651</td>
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<td>651</td>
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<tr>
<td>557.xz_r</td>
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<td>529</td>
<td>229</td>
<td>530</td>
<td>228</td>
<td>529</td>
<td>229</td>
</tr>
</tbody>
</table>

SPECrate2017_int_base = 335
SPECrate2017_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=1-111

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.

(Continued on next page)
**Fujitsu**

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

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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:
- 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

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) Platinum 8280 CPU @ 2.70GHz
  - 2 "physical id"s (chips)
  - 112 "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 : 28
  - siblings : 56
- physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30
- physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30

From lscpu:

- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 112
- On-line CPU(s) list: 0-111
- Thread(s) per core: 2
- Core(s) per socket: 28
- Socket(s): 2
- NUMA node(s): 4

(Continued on next page)
### Fujitsu

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**CPU2017 Integer Rate Result**

| SPECrate2017_int_base = | 335 |
| SPECrate2017_int_peak = | Not Run |

**Platform Notes (Continued)**

```plaintext
Vendor ID:           GenuineIntel  
CPU family:          6  
Model:               85  
Model name:          Intel(R) Xeon(R) Platinum 8280 CPU @ 2.70GHz  
Stepping:            7  
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:            39424K  
NUMA node0 CPU(s):   0-3, 7-9, 14-17, 21-23, 56-59, 63-65, 70-73, 77-79  
NUMA node1 CPU(s):   4-6, 10-13, 18-20, 24-27, 60-62, 66-69, 74-76, 80-83  
NUMA node2 CPU(s):   28-31, 35-37, 42-45, 49-51, 84-87, 91-93, 98-101, 105-107  
NUMA node3 CPU(s):   32-34, 38-41, 46-48, 52-55, 88-90, 94-97, 102-104, 108-111  
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 rdtsscp 
                      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_pmmn ssbd mba ibrs ibpb ibrs增强了 tpr_shadow vmi 
                      flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpd cid rtm 
                      cmq mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd 
                      avx512bw avx512vli xsavesopt xsaveopt xsavec xgetbv1 xsaves cmq_llc cmq_occump llc cmq_mbm_total 
                      cmq_mbb_local dtherm ida arat pln 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.

```plaintext
available: 4 nodes (0-3)  
nodes 0 cpus: 0 1 2 3 7 8 9 14 15 16 17 21 22 23 56 57 58 59 63 64 65 70 71 72 73 77 78 79  
nodes 0 size: 95452 MB  
nodes 0 free: 95115 MB  
nodes 1 cpus: 4 5 6 10 11 12 13 18 19 20 24 25 26 27 60 61 62 66 67 68 69 74 75 76 80 81 82 83  
nodes 1 size: 96756 MB  
nodes 1 free: 96512 MB  
nodes 2 cpus: 28 29 30 31 35 36 37 42 43 44 45 49 50 51 84 85 86 87 91 92 93 98 99 100 101 105 106 107
```

(Continued on next page)
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SPECrate2017_int_base = 335
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Platform Notes (Continued)

node 2 size: 96726 MB
node 2 free: 96499 MB
node 3 cpus: 32 33 34 38 40 41 46 47 48 52 53 54 55 88 89 90 94 95 96 97 102 103 104 108 109 110 111
node 3 size: 96753 MB
node 3 free: 96521 MB
node distances:
node 0 1 2 3
5: 10 11 19 19
1: 11 10 19 19
2: 19 19 10 11
3: 19 19 11 10

From /proc/meminfo
MemTotal: 394945656 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 Mar 28 11:27

SPEC is set to: /home/Benchmark/speccpu2017-1.0.5_INT

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 btrfs 238G 64G 175G 27% /home

Additional information from dmidecode follows. WARNING: Use caution when you interpret

(Continued on next page)
Platform Notes (Continued)

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 D3853-B1x
Memory:
12x Micron 36ASF4G72PZ-2G9E2 32 GB 2 rank 2933
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)
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.
==============================================================================
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_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

(Continued on next page)
SPEC CPU2017 Integer Rate Result
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Base Compiler Invocation (Continued)

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
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
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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:


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Tested with SPEC CPU2017 v1.0.5 on 2019-03-27 22:47:16-0400.  
Originally published on 2019-04-16.