**CPU2017 Integer Rate Result**

**Fujitsu**
PRIMERGY RX2530 M4, Intel Xeon Silver 4112, 2.60GHz

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate2017_int_peak =</th>
<th>SPECrate2017_int_base =</th>
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</thead>
<tbody>
<tr>
<td>16</td>
<td>Not Run</td>
<td>43.9</td>
</tr>
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</table>

**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu  
**Test Date:** Mar-2018  
**Hardware Availability:** Jul-2017  
**Software Availability:** Feb-2018

<table>
<thead>
<tr>
<th>Test</th>
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<tbody>
<tr>
<td>perlbench_r</td>
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<td>31.7</td>
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<tr>
<td>gcc_r</td>
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<td>38.5</td>
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<tr>
<td>mcf_r</td>
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<tr>
<td>omnetpp_r</td>
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<td>xalancbmk_r</td>
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<td>x264_r</td>
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<td>deepsjeng_r</td>
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<td>leela_r</td>
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<td>exchange2_r</td>
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</tr>
<tr>
<td>xz_r</td>
<td>16</td>
<td>32.0</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Silver 4112  
- **Max MHz.:** 3000  
- **Nominal:** 2600  
- **Enabled:** 8 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:** 8.25 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 384 GB (24x16 GB 2Rx4 PC4-2666V-R, running at 2400)  
- **Storage:** 384 GB tmpfs  
- **Other:** 1 x SATA HDD, 1000 GB, 7200 RPM, used for swap

**Software**

- **OS:** SUSE Linux Enterprise Server 12 SP2  
- **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 V5.0.0.12 R1.17.0 for D3383-A1x. Released Feb-2018  
- **File System:** tmpfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **Other:** jemalloc memory allocator library V5.0.1
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SPECrate2017_int_base = 43.9
SPECrate2017_int_peak = Not Run

<table>
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<th>Benchmark</th>
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<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Copies</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>16</td>
<td>795</td>
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<td>588</td>
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<tr>
<td>505.mcf_r</td>
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<td>462</td>
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<td>56.0</td>
<td>458</td>
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<tr>
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<tr>
<td>525.x264_r</td>
<td>16</td>
<td>331</td>
<td>84.6</td>
<td>330</td>
<td>84.9</td>
<td>332</td>
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<tr>
<td>531.deepsjeng_r</td>
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<td>490</td>
<td>37.4</td>
<td>491</td>
<td>37.3</td>
<td>491</td>
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<tr>
<td>541.leela_r</td>
<td>16</td>
<td>756</td>
<td>35.0</td>
<td>763</td>
<td>34.7</td>
<td>765</td>
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<tr>
<td>548.exchange2_r</td>
<td>16</td>
<td>516</td>
<td>81.2</td>
<td>513</td>
<td>81.7</td>
<td>517</td>
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<tr>
<td>557.xz_r</td>
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<td>541</td>
<td>32.0</td>
<td>540</td>
<td>32.0</td>
<td>540</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"
Set Kernel Boot Parameter: nohz_full=1-15
Set CPU frequency governor to maximum performance with:
cpupower -c all frequency-set -g performance
Set tmpfs filesystem with:
mkdir /home/memory
mount -t tmpfs -o size=384g,rw tmpfs /home/memory
Process tuning settings:
  echo 0 > /proc/sys/kernel/numa_balancing
cpu idle state set with:
cpupower idle-set -d 1

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/memory/speccpu/je5.0.1-32:/home/memory/speccpu/je5.0.1-64"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.4

(Continued on next page)
**Fujitsu**

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<tr>
<td>SPECrate2017_int_peak</td>
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**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu

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<tr>
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<td>Jul-2017</td>
</tr>
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<td>Software Availability:</td>
<td>Feb-2018</td>
</tr>
</tbody>
</table>

### General Notes (Continued)

Transparent Huge Pages enabled by default  
Prior to runcpu invocation  
Filesytem 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;  
built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5;  

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  
Override OS Energy Performance = Enabled  
Energy Performance = Performance  
Package C State limit = C0  
LLC Dead Line Alloc = Disabled  
Stale AtoS = Enabled  
Sub NUMA Clustering = Disabled  
IMC Interleaving = 2-way  
Fan Control = Full  
Sysinfo program /home/memory/speccpu/bin/sysinfo  
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f  
running on RX2530M4 Fri Mar 23 03:00:36 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 4112 CPU @ 2.60GHz  
2 "physical id"s (chips)  
16 "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 : 4

(Continued on next page)
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Platform Notes (Continued)

siblings : 8
physical 0: cores 0 1 3 4
physical 1: cores 1 2 4 5

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 16
On-line CPU(s) list: 0-15
Thread(s) per core: 2
Core(s) per socket: 4
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4112 CPU @ 2.60GHz
Stepping: 4
CPU MHz: 2600.669
CPU max MHz: 3000.0000
CPU min MHz: 800.0000
BogoMIPS: 5187.81
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 8448K
NUMA node0 CPU(s): 0-3,8-11
NUMA node1 CPU(s): 4-7,12-15
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 art arch_perfmon pebs bts rep_good nopl apic ndx tsc
star tsc_diff Thermal ts sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts
dtherm hwp_act_window hwp_epp hwp_pkg_req intel_pt rsb_ctxsw spec_ctrl retpoline
kaiser tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep
bmi2 erms invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb
avx512cd avx512bw avx512vl xsaveopt xsavevc xgetbv1 cqm_llc cqm_occucll

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 2 nodes (0-1)

(Continued on next page)
Platform Notes (Continued)

node 0 cpus: 0 1 2 3 8 9 10 11
node 0 size: 191784 MB
node 0 free: 182315 MB
node 1 cpus: 4 5 6 7 12 13 14 15
node 1 size: 193388 MB
node 1 free: 193079 MB
node distances:
  node  0   1
  0:  10  21
  1:  21  10

From /proc/meminfo
  MemTotal:       394417256 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 RX2530M4 4.4.14-92.64-default #1 SMP Thu Feb 1 19:18:19 UTC 2018 (c6ce5db)
  x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 23 02:51

SPEC is set to: /home/memory/speccpu
  Filesystem     Type Size Used Avail Use% Mounted on
  tmpfs          tmpfs  384G  8.8G  376G   3% /home/memory

Additional information from dmidecode follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow
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 // American Megatrends Inc. V5.0.0.12 R1.17.0 for D3383-A1x 02/08/2018
Memory:
24x Hynix HMA42GR7BJR4N-VK 16 GB 2 rank 2666, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
<table>
<thead>
<tr>
<th>CC 500.perlibench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_r(base)</th>
</tr>
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<tbody>
<tr>
<td>icc (ICC) 18.0.0 20170811</td>
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<tr>
<td>Copyright (C) 1985-2017 Intel Corporation. All rights reserved.</td>
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<tr>
<td>------------------------------------------------------------------------------</td>
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<tr>
<td>CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)</td>
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<tr>
<td>------------------------------------------------------------------------------</td>
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<tr>
<td>icpc (ICC) 18.0.0 20170811</td>
</tr>
<tr>
<td>Copyright (C) 1985-2017 Intel Corporation. All rights reserved.</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
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<tr>
<td>FC 548.exchange2_r(base)</td>
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<tr>
<td>ifort (IFORT) 18.0.0 20170811</td>
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<tr>
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Base Compiler Invocation

C benchmarks:
iccc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort
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### 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=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

**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

**Fortran benchmarks:**  
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte  
-L/usr/local/je5.0.1-64/lib -ljemalloc

### Base Other Flags

**C benchmarks:**  
-m64 -std=c11

**C++ benchmarks:**  
-m64

**Fortran benchmarks:**  
-m64

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-V1.2-SKL-RevE.xml

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

Tested with SPEC CPU2017 v1.0.2 on 2018-03-22 14:00:35-0400.
Originally published on 2018-04-17.