**SPEC® CPU2017 Integer Rate Result**

Fujitsu

PRIMERGY CX2550 M4, Intel Xeon Silver 4112, 2.60GHz

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>19</th>
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<tr>
<td>Test Sponsor:</td>
<td>Fujitsu</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Fujitsu</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Apr-2018</td>
</tr>
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<td>Hardware Availability:</td>
<td>Dec-2017</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Mar-2018</td>
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| SPECrate2017_int_base = | 43.8 |
| SPECrate2017_int_peak = | Not Run |

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<th>Copies</th>
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</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
- **Cache L2:** 1 MB I+D on chip per core
- **Cache L3:** 8.25 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
- **File System:** xfs
- **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_peak = Not Run

Results Table

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</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
Process tuning settings:
echo 0 > /proc/sys/kernel/numa_balancing
echo 10000000 > /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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Test Date: Apr-2018  
Hardware Availability: Dec-2017  
Software Availability: Mar-2018

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 96c45e4568ad54c135fd618b0c091c0f  
running on CX2550M4 Wed Apr 18 15:16:39 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  
siblings : 8

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Platform Notes (Continued)

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

From lscpu:

Architecture:
CPU op-mode(s):
Byte Order:
CPU(s):
On-line CPU(s) list:
Thread(s) per core:
Core(s) per socket:
Socket(s):
NUMA node(s):
Vendor ID:
CPU family:
Model:
Model name:
Stepping:
CPU MHz:
CPU max MHz:
CPU min MHz:
BogoMIPS:
Virtualization:
L1d cache:
L1i cache:
L2 cache:
L3 cache:
NUMA node0 CPU(s):
NUMA node1 CPU(s):
Flags:

From numactl --hardware

WARNING: a numactl 'node' might or might not correspond to a physical chip.

(Continued on next page)
Platform Notes (Continued)

node 0 size: 95377 MB
node 0 free: 95072 MB
node 1 cpus: 4 5 6 7 12 13 14 15
node 1 size: 96645 MB
node 1 free: 96358 MB
node distances:
  node  0  1
  0: 10  21
  1: 21  10

From /proc/meminfo
MemTotal:      196631420 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 18 12:55

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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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

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

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort
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Fujitsu

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
### Fujitsu

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


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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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