Fujitsu

PRIMERGY RX2530 M4, Intel Xeon Silver 4114, 2.20GHz

SPECrate2017_int_base = 94.7
SPECrate2017_int_peak = 101

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

Test Date: Mar-2018
Hardware Availability: Jul-2017
Software Availability: Feb-2018

Hardware

CPU Name: Intel Xeon Silver 4114
Max MHz.: 3000
Nominal: 2200
Enabled: 20 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: 13.75 MB I+D on chip per chip
Other: None
Memory: 384 GB (24 x 16 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
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 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: 32/64-bit
Other: jemalloc memory allocator library V5.0.1
SPEC CPU2017 Integer Rate Result

Fujitsu
PRIMERGY RX2530 M4, Intel Xeon Silver 4114, 2.20GHz

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>40</td>
<td>898</td>
<td>70.9</td>
<td>919</td>
<td>69.3</td>
<td>906</td>
<td>70.3</td>
<td>40</td>
<td>724</td>
<td>88.0</td>
<td>727</td>
<td>87.6</td>
<td>731</td>
<td>87.2</td>
<td></td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>40</td>
<td>685</td>
<td>82.7</td>
<td>684</td>
<td>82.8</td>
<td>687</td>
<td>82.4</td>
<td>40</td>
<td>586</td>
<td>96.7</td>
<td>586</td>
<td>96.6</td>
<td>588</td>
<td>96.4</td>
<td></td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>40</td>
<td>541</td>
<td>119</td>
<td>538</td>
<td>120</td>
<td>555</td>
<td>116</td>
<td>40</td>
<td>541</td>
<td>119</td>
<td>538</td>
<td>120</td>
<td>555</td>
<td>116</td>
<td></td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>40</td>
<td>839</td>
<td>62.6</td>
<td>849</td>
<td>61.8</td>
<td>844</td>
<td>62.2</td>
<td>40</td>
<td>839</td>
<td>62.6</td>
<td>849</td>
<td>61.8</td>
<td>844</td>
<td>62.2</td>
<td></td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>40</td>
<td>425</td>
<td>99.3</td>
<td>426</td>
<td>99.1</td>
<td>426</td>
<td>99.1</td>
<td>40</td>
<td>356</td>
<td>119</td>
<td>356</td>
<td>119</td>
<td>356</td>
<td>119</td>
<td></td>
</tr>
<tr>
<td>525.x264_r</td>
<td>40</td>
<td>388</td>
<td>181</td>
<td>386</td>
<td>181</td>
<td>382</td>
<td>183</td>
<td>40</td>
<td>373</td>
<td>188</td>
<td>372</td>
<td>188</td>
<td>371</td>
<td>189</td>
<td></td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>40</td>
<td>565</td>
<td>81.1</td>
<td>565</td>
<td>81.1</td>
<td>565</td>
<td>81.1</td>
<td>40</td>
<td>565</td>
<td>81.1</td>
<td>565</td>
<td>81.1</td>
<td>565</td>
<td>81.1</td>
<td></td>
</tr>
<tr>
<td>541.leela_r</td>
<td>40</td>
<td>889</td>
<td>74.5</td>
<td>889</td>
<td>74.5</td>
<td>884</td>
<td>75.0</td>
<td>40</td>
<td>871</td>
<td>76.0</td>
<td>877</td>
<td>75.5</td>
<td>878</td>
<td>75.4</td>
<td></td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>40</td>
<td>596</td>
<td>176</td>
<td>596</td>
<td>176</td>
<td>598</td>
<td>175</td>
<td>40</td>
<td>596</td>
<td>176</td>
<td>596</td>
<td>176</td>
<td>598</td>
<td>175</td>
<td></td>
</tr>
<tr>
<td>557.xz_r</td>
<td>40</td>
<td>615</td>
<td>70.3</td>
<td>615</td>
<td>70.3</td>
<td>614</td>
<td>70.3</td>
<td>40</td>
<td>615</td>
<td>70.3</td>
<td>615</td>
<td>70.3</td>
<td>614</td>
<td>70.3</td>
<td></td>
</tr>
</tbody>
</table>

SPECrate2017_int_base = 94.7
SPECrate2017_int_peak = 101
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=1-39
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 = "/home/memory/speccpu/lib/ia32:/home/memory/speccpu/lib/intel64"
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
Transparent Huge Pages enabled by default

(Continued on next page)
Fujitsu
PRIMERGY RX2530 M4, Intel Xeon Silver 4114, 2.20GHz

**SPECrate2017_int_base** = 94.7
**SPECrate2017_int_peak** = 101

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>19</th>
<th>Test Date:</th>
<th>Mar-2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Fujitsu</td>
<td>Hardware Availability:</td>
<td>Jul-2017</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Fujitsu</td>
<td>Software Availability:</td>
<td>Feb-2018</td>
</tr>
</tbody>
</table>

### General Notes (Continued)

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;
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 Sat Mar 24 02:33:50 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 4114 CPU @ 2.20GHz
  2 "physical id"s (chips)
  40 "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 : 10
  siblings : 20

(Continued on next page)
### Platform Notes (Continued)

```
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12
```

From `lscpu`:
- **Architecture:** x86_64
- **CPU op-mode(s):** 32-bit, 64-bit
- **Byte Order:** Little Endian
- **CPU(s):** 40
- **On-line CPU(s) list:** 0-39
- **Thread(s) per core:** 2
- **Core(s) per socket:** 10
- **Socket(s):** 2
- **NUMA node(s):** 2
- **Vendor ID:** GenuineIntel
- **CPU family:** 6
- **Model:** 85
- **Model name:** Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz
- **Stepping:** 4
- **CPU MHz:** 2733.604
- **CPU max MHz:** 3000.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 4389.70
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 14080K
- **NUMA node0 CPU(s):** 0-9,20-29
- **NUMA node1 CPU(s):** 10-19,30-39
- **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 rdtscp
  lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
  aperfmperf eagerfpu nni 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 abml3 3dnowprefetch ida arat epb invpcid_single pln pts
  dtherm hwlp_act_window hwlp_epp hwlp_pkg_req intel_pt rsb_ctxsw spec_ctrl retpoline
  kaiser tpr_shadow vnumi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep
  bmi2 erms invpcid rtm cqm mxp avx512f avx512dq rdseed adx smap clflushopt clwb
  avx512cd avx512bw avx512vl xsxvopt xsxvec xgetbv1 cqm_llc cqm_occup_llc

/proc/cpuinfo cache data
  cache size : 14080 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 8 9 20 21 22 23 24 25 26 27 28 29
Platform Notes (Continued)

node 0 size: 191784 MB
node 0 free: 182328 MB
node 1 cpus: 10 11 12 13 14 15 16 17 18 19 30 31 32 33 34 35 36 37 38 39
node 1 size: 193388 MB
node 1 free: 193004 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 4.4.114-92.64-default #1 SMP Thu Feb 1 19:18:19 UTC 2018 (c6ce5db)
x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 24 02:03

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
hardware to be accurately determined", but the intent may not be met, as there are
Platform Notes (Continued)

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

==============================================================================
CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)  
525.x264_r(base, peak) 557.xz_r(base, peak)  
------------------------------------------------------------------------------
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.  
------------------------------------------------------------------------------

==============================================================================
CXXC 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak)  
541.leela_r(peak)  
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
------------------------------------------------------------------------------

==============================================================================
FC  548.exchange2_r(base, peak)  
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  

(Continued on next page)
Fujitsu
PRIMERGY RX2530 M4, Intel Xeon Silver 4114, 2.20GHz

SPECrate2017_int_base = 94.7
SPECrate2017_int_peak = 101

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

Test Date: Mar-2018
Hardware Availability: Jul-2017
Software Availability: Feb-2018

Compiler Version Notes (Continued)

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

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:
-W1,-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:
-W1,-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:
-W1,-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
SPEC CPU2017 Integer Rate Result

Fujitsu
PRIMERGY RX2530 M4, Intel Xeon Silver 4114, 2.20GHz

SPECrate2017_int_base = 94.7
SPECrate2017_int_peak = 101

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

Test Date: Mar-2018
Hardware Availability: Jul-2017
Software Availability: Feb-2018

Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -D_FILE_OFFSET_BITS=64 -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

Peak Optimization Flags

C benchmarks:
500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
-fno-strict-overflow -L/usr/local/je5.0.1-64/lib

(Continued on next page)
**SPEC CPU2017 Integer Rate Result**

**Fujitsu**

PRIMERGY RX2530 M4, Intel Xeon Silver 4114, 2.20GHz

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>94.7</td>
<td>101</td>
</tr>
</tbody>
</table>

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

---

### Peak Optimization Flags (Continued)

500.perlbench_r (continued):
- -ljemalloc

502.gcc_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32  
- -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
- -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3  
- -L/usr/local/je5.0.1-32/lib -ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
- -qopt-mem-layout-trans=3 -fno-alias  
- -L/usr/local/je5.0.1-64/lib -ljemalloc

557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: basepeak = yes

523.xalancbmk_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32  
- -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
- -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3  
- -L/usr/local/je5.0.1-32/lib -ljemalloc

531.deepsjeng_r: basepeak = yes

541.leela_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
- -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3  
- -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:

548.exchange2_r: basepeak = yes

---

### Peak Other Flags

C benchmarks (except as noted below):
- -m64 -std=c11

502.gcc_r: -m32 -std=c11

C++ benchmarks (except as noted below):
- -m64

(Continued on next page)
### Peak Other Flags (Continued)

523.xalancbmk_r: \texttt{-m32}

Fortran benchmarks:
\texttt{-m64}

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: