## SPEC CPU®2017 Integer Rate Result

**Fujitsu**

PRIMERGY RX2540 M5, Intel Xeon Gold 6230, 2.10 GHz

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>221</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

### CPU2017 License: 19

**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu  
**Test Date:** May-2019  
**Hardware Availability:** May-2019  
**Software Availability:** Feb-2019

### Copies

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>(221)</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
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<tr>
<td>502.gcc_r</td>
<td>80</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>80</td>
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<tr>
<td>520.omnetpp_r</td>
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<td>523.xalancbmk_r</td>
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<tr>
<td>525.x264_r</td>
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<tr>
<td>531.deepsjeng_r</td>
<td>80</td>
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<tr>
<td>541.leela_r</td>
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<tr>
<td>548.exchange2_r</td>
<td>80</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>80</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name**: Intel Xeon Gold 6230  
- **Max MHz**: 3900  
- **Nominal**: 2100  
- **Enabled**: 40 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**: 27.5 MB I+D on chip per chip  
- **Memory**: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)  
- **Storage**: 1 x SATA M.2 SSD, 480 GB  
- **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 V5.0.0.14 R1.8.0 for D3384-B1x, released Jun-2019. Tested as V5.0.0.14 R1.2.0 for D3384-B1x Feb-2019  
- **File System**: xfs  
- **System State**: Run level 3 (multi-user)  
- **Base Pointers**: 64-bit  
- **Peak Pointers**: Not Applicable  
- **Other**: None  
- **Power Management**: --

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**Page 1**  
Standard Performance Evaluation Corporation (info@spec.org)  
https://www.spec.org/
SPEC CPU®2017 Integer Rate Result

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Fujitsu
PRIMERGY RX2540 M5, Intel Xeon Gold 6230, 2.10 GHz

Copyright 2017-2019 Standard Performance Evaluation Corporation

SPECrate®2017_int_base = 221
SPECrate®2017_int_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
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<th>Ratio</th>
<th>Seconds</th>
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<td>149</td>
<td>578</td>
<td>149</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"
Kernel Boot Parameter set with : nohz_full=1-79

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>
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) is mitigated in the system as tested and documented.
(Continued on next page)
Fujitsu
PRIMERGY RX2540 M5, Intel Xeon Gold 6230, 2.10 GHz

SPECrate®2017_int_base = 221
SPECrate®2017_int_peak = Not Run

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

Test Date: May-2019
Hardware Availability: May-2019
Software Availability: Feb-2019

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:
Patrol Scrub = Disabled
WR CRC feature Control = Disabled
DCU Ip Prefetcher = Disabled
DCU Streamer Prefetcher = Disabled
Stale AtoS = Enable
Fan Control = Full
Sysinfo program /home/Benchmark/speccpu-1.0.5/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on RX2540M5-AD-537 Mon Jun 17 17:40:16 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
    model name : Intel(R) Xeon(R) Gold 6230 CPU @ 2.10GHz
       2 "physical id"s (chips)
       80 "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 : 20
siblings : 40
physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 80
On-line CPU(s) list: 0-79
Thread(s) per core: 2
Core(s) per socket: 20
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6230 CPU @ 2.10GHz
Stepping: 6

(Continued on next page)
### Fujitsu
PRIMERGY RX2540 M5, Intel Xeon Gold 6230, 2.10 GHz

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>Test Date:</th>
<th>Hardware Availability:</th>
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<tbody>
<tr>
<td>19</td>
<td>May-2019</td>
<td>May-2019</td>
</tr>
<tr>
<td>Test Sponsor:</td>
<td>Tested by:</td>
<td>Software Availability:</td>
</tr>
<tr>
<td>Fujitsu</td>
<td>Fujitsu</td>
<td>Feb-2019</td>
</tr>
</tbody>
</table>

**SPECrate®2017_int_base = 221**
**SPECrate®2017_int_peak = Not Run**

## Platform Notes (Continued)

- **CPU MHz:** 2100.000
- **CPU max MHz:** 3900.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 4200.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 28160K
- **NUMA node0 CPU(s):** 0-2, 5, 6, 10-12, 15, 16, 40-42, 45, 46, 50-52, 55, 56
- **NUMA node1 CPU(s):** 3, 4, 7, 13, 14, 17-19, 43, 44, 47-49, 53, 54, 57-59
- **NUMA node2 CPU(s):** 20-22, 25, 26, 30-32, 35, 36, 60-62, 65, 66, 70-72, 75, 76
- **NUMA node3 CPU(s):** 23, 24, 27-29, 33, 34, 37-39, 63, 64, 67-69, 73, 74, 77-79

**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 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 ablp 3nowprefetch cpuid_fault epb cat_l3 cd_p_l
- invpcid_single ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vni f lex
- priority ept vpid fsbgbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mp xdt a
- avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
- xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local
- dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku ospke avx512_vnni
- flush_l1d arch_capabilities

```
/proc/cpuinfo cache data
  cache size : 28160 KB
```

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

<table>
<thead>
<tr>
<th>available: 4 nodes (0-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>node 0 cpus: 0 1 2 5 6 10 11 12 15 16 40 41 42 45 46 50 51 52 55 56</td>
</tr>
<tr>
<td>node 0 size: 191858 MB</td>
</tr>
<tr>
<td>node 0 free: 191525 MB</td>
</tr>
<tr>
<td>node 1 cpus: 3 4 7 8 9 13 14 17 18 19 43 44 47 48 49 53 54 57 58 59</td>
</tr>
<tr>
<td>node 1 size: 193532 MB</td>
</tr>
<tr>
<td>node 1 free: 193205 MB</td>
</tr>
<tr>
<td>node 2 cpus: 20 21 22 25 26 30 31 32 35 36 60 61 62 65 66 70 71 72 75 76</td>
</tr>
<tr>
<td>node 2 size: 193532 MB</td>
</tr>
<tr>
<td>node 2 free: 193266 MB</td>
</tr>
<tr>
<td>node 3 cpus: 23 24 27 28 29 33 34 37 38 39 63 64 67 68 69 73 74 77 78 79</td>
</tr>
<tr>
<td>node 3 size: 193319 MB</td>
</tr>
<tr>
<td>node 3 free: 193055 MB</td>
</tr>
</tbody>
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Note: The remaining text is continued on the next page.
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Platform Notes (Continued)

1: 11 10 21 21
2: 21 21 10 11
3: 21 21 11 10

From /proc/meminfo
MemTotal: 790776172 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 RX2540M5-AD-537 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 Jun 17 15:53

SPEC is set to: /home/Benchmark/speccpu-1.0.5

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda5 xfs 405G 29G 377G 7% /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
frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
BIOS FUJITSU // American Megatrends Inc. V5.0.0.14 R1.2.0 for D3384-B1x
02/28/2019
Memory:
1x Hynix HMA84GR7CJR4N-WM 32 GB 2 rank 2933, configured at 2934
23x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2934

(Continued on next page)
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Platform Notes (Continued)

(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

Fortran benchmarks:
ifort -m64
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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.leea_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

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

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

Tested with SPEC CPU®2017 v1.0.5 on 2019-06-17 04:40:15-0400.  