# SPEC CPU®2017 Integer Rate Result

## Fujitsu

PRIMERGY RX2540 M5, Intel Xeon Silver 4208, 2.10 GHz

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base = 91.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak = Not Run</td>
</tr>
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<table>
<thead>
<tr>
<th>CPU2017 License: 19</th>
<th>Test Date: Jul-2020</th>
</tr>
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<tbody>
<tr>
<td>Test Sponsor: Fujitsu</td>
<td>Hardware Availability: May-2019</td>
</tr>
<tr>
<td>Tested by: Fujitsu</td>
<td>Software Availability: Apr-2020</td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>CPU Name: Intel Xeon Silver 4208</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max MHz: 3200</td>
</tr>
<tr>
<td>Nominal: 2100</td>
</tr>
<tr>
<td>Enabled: 16 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>Orderable: 1.2 chips</td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2: 1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3: 11 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other: None</td>
</tr>
<tr>
<td>Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R, running at 2400)</td>
</tr>
<tr>
<td>Storage: 1 x SATA M.2 SSD, 480 GB</td>
</tr>
<tr>
<td>Other: None</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>OS: Red Hat Enterprise Linux release 8.0 (Ootpa) 4.18.0-80.el8.x86_64</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parallel: No</td>
</tr>
<tr>
<td>Firmware: Fujitsu BIOS Version V5.0.0.14 R1.18.0 for D3384-B1x released Feb-2020</td>
</tr>
<tr>
<td>File System: xfs</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers: 64-bit</td>
</tr>
<tr>
<td>Peak Pointers: Not Applicable</td>
</tr>
<tr>
<td>Other: none</td>
</tr>
<tr>
<td>Power Management: BIOS set to prefer performance at the cost of additional power usage</td>
</tr>
</tbody>
</table>

### SPEC CPU®2017 Integer Rate

<table>
<thead>
<tr>
<th>Test</th>
<th>Points</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>32</td>
</tr>
<tr>
<td>502.gcc_r</td>
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<tr>
<td>505.mcf_r</td>
<td>32</td>
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<tr>
<td>520.omnetpp_r</td>
<td>32</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>32</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>32</td>
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<tr>
<td>531.deepsjeng_r</td>
<td>32</td>
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<tr>
<td>541.leela_r</td>
<td>32</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>32</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>32</td>
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</tbody>
</table>

## Notes

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---

**Fujitsu**

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<tr>
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</tr>
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<tbody>
<tr>
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Results Table

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<tr>
<th>Benchmark</th>
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<td></td>
</tr>
</tbody>
</table>

SPECrate®2017_int_base = 91.7
SPECrate®2017_int_peak = Not Run

Compiler Notes
The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler.
The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux
The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

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=1-31

Environment Variables Notes
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = 
"/home/benchmark/speccpu/lib/intel64:/home/benchmark/speccpu/lib/ia32:/home/benchmark/speccpu/je5.0.1-32"
MALLOC_CONF = "retain:true"
Fujitsu
PRIMERGY RX2540 M5, Intel Xeon Silver 4208, 2.10 GHz

**SPEC CPU®2017 Integer Rate Result**

| SPECrate®2017_int_base = 91.7 |
| SPECrate®2017_int_peak = Not Run |

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

**General Notes**

Binaries compiled on a system with 1x Intel Core i9–7980XE CPU + 64GB RAM memory using Redhat Enterprise Linux 8.0
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.
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:
LLC Dead Line Alloc = Disabled
LLC prefetch = Enabled
Sub NUMA Clustering = Disabled
IMC Interleaving = 2-way
Patrol Scrub = Disabled
WR CRC feature Control = Disabled
Fan Control = Full

Sysinfo program /home/benchmark/speccpu/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed0b1e6e46a485a0011
running on localhost.localdomain Thu Aug 27 12:54:35 2020

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 4208 CPU @ 2.10GHz
              2 "physical id"s (chips)
              32 "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 : 8
    siblings : 16
    physical 0: cores 0 1 2 3 4 5 6 7
    physical 1: cores 0 1 2 3 4 5 6 7

From lscpu:

(Continued on next page)
SPEC CPU®2017 Integer Rate Result

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<td>Fujitsu</td>
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<tr>
<td>Test Date:</td>
<td>Jul-2020</td>
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<td>May-2019</td>
</tr>
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<td>Apr-2020</td>
</tr>
</tbody>
</table>

**SPECrate®2017_int_base** = 91.7

**SPECrate®2017_int_peak** = Not Run

**Platform Notes (Continued)**

- **Architecture:** x86_64
- **CPU op-mode(s):** 32-bit, 64-bit
- **Byte Order:** Little Endian
- **CPU(s):** 32
- **On-line CPU(s) list:** 0-31
- **Thread(s) per core:** 2
- **Core(s) per socket:** 8
- **Socket(s):** 2
- **NUMA node(s):** 2
- **Vendor ID:** GenuineIntel
- **CPU family:** 6
- **Model:** 85
- **Model name:** Intel(R) Xeon(R) Silver 4208 CPU @ 2.10GHz
- **Stepping:** 6
- **CPU MHz:** 1184.509
- **CPU max MHz:** 3200.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 4200.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 11264K
- **NUMA node0 CPU(s):** 0-7,16-23
- **NUMA node1 CPU(s):** 8-15,24-31
- **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
  - pe
  - syscall
  - nx
  - pdpe1gb
  - rdtscp
  - mce
  - cmov
  - stkeseg監
  - pae
  - mce
  - cmov
  - stkeseg監
  - pae
  - mce
  - cmov
  - stkeseg監
  - pae
  - mce
  - cmov
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  - pae
  - mce
  - cmov
  - stkeseg監
  - pae
  - mce
  - cmov
  - stkeseg監
  - pae
  - mce
  - cmov
  - stkeseg監
  - pae
  - mce

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 16 17 18 19 20 21 22 23
- **node 0 size:** 385559 MB
- **node 0 free:** 384901 MB

(Continued on next page)
SPEC CPU®2017 Integer Rate Result

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Platform Notes (Continued)

node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
node 1 size: 387067 MB
node 1 free: 386405 MB
node distances:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 791170516 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux"
VERSION="8.0 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.0"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.0 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.0 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.0 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.0:ga
uname -a:
Linux localhost.localdomain 4.18.0-80.el8.x86_64 #1 SMP Wed Mar 13 12:02:46 UTC 2019
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: No status reported
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
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 Aug 27 12:50

SPEC is set to: /home/benchmark/speccpu

Filesystem Type Size Used Avail Use% Mounted on
/dev_mapper/rhel-home xfs 168G 54G 115G 32% /home

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

From /sys/devices/virtual/dmi/id
- BIOS: FUJITSU // American Megatrends Inc. V5.0.0.14 R1.18.0 for D3384-B1x 02/10/2020
- Vendor: FUJITSU
- Product: PRIMERGY RX2540 M5
- Product Family: SERVER
- Serial: YMSQXXXXXX

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.

Memory:
- 12x Micron 36ASF4G72PZ-2G9E2 32 GB 2 rank 2933
- 12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)
This system support 12 DIMMs per processor, total 24 DIMMs.
24 DIMM slots installed with 32 GB DIMM for this run, and running at 2400 due to CPU limitation.

**Compiler Version Notes**

```
==============================================================================
<table>
<thead>
<tr>
<th>C</th>
<th>500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_r(base)</th>
</tr>
</thead>
</table>
==============================================================================
```

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

```
==============================================================================
<table>
<thead>
<tr>
<th>C++</th>
<th>520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)</th>
</tr>
</thead>
</table>
==============================================================================
```

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

```
==============================================================================
<table>
<thead>
<tr>
<th>Fortran</th>
<th>548.exchange2_r(base)</th>
</tr>
</thead>
</table>
==============================================================================
```

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)

(Continued on next page)
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Compiler Version Notes (Continued)

64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
_____________________________________________________

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:
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-fuse-ld=gold -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

C++ benchmarks:
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse

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**Base Optimization Flags (Continued)**

C++ benchmarks (continued):
-funroll-loops -fuse-ld=gold -qopt-mem-layout-trans=4  
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin  
-lqkmalloc

Fortran benchmarks:
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs  
-xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4  
-nostandard-realloc-lhs -align array32byte -auto  
-mbranches-within-32B-boundaries  
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin  
-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/Intel-ic19.1u1-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-CSL-RevF.xml

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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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