# SPEC CPU®2017 Integer Rate Result

## Fujitsu
PRIMERGY RX2540 M6, Intel Xeon Gold 5318S, 2.10GHz

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate®2017_int_base (311)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r 96</td>
<td>208</td>
</tr>
<tr>
<td>502.gcc_r 96</td>
<td>256</td>
</tr>
<tr>
<td>505.mcf_r 96</td>
<td>513</td>
</tr>
<tr>
<td>520.omnetpp_r 96</td>
<td>213</td>
</tr>
<tr>
<td>523.xalancbmk_r 96</td>
<td>393</td>
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<tr>
<td>525.x264_r 96</td>
<td>624</td>
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<tr>
<td>531.deepsjeng_r 96</td>
<td>211</td>
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<tr>
<td>541.leela_r 96</td>
<td>225</td>
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<tr>
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<td>648</td>
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<td>557.xz_r 96</td>
<td>176</td>
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### Hardware

- **CPU Name:** Intel Xeon Gold 5318S
- **Max MHz:** 3400
- **Nominal:** 2100
- **Enabled:** 48 cores, 2 chips, 2 threads/core
- **Orderable:** 1.2 chips
- **Cache L1:** 32 KB I + 48 KB D on chip per core
- **Cache L2:** 1.25 MB I+D on chip per core
- **Cache L3:** 36 MB I+D on chip per chip
- **Other:** None
- **Memory:** 1 TB (32 x 32 GB 2Rx4 PC4-3200AA-R, running at 2933)
- **Storage:** 1 x SATA M.2 SSD, 480GB
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux release 8.2 (Ootpa) 4.18.0-193.el8.x86_64
- **Compiler:** C/C++: Version 19.1.2.275 of Intel C/C++ Compiler for Linux;
  Fortran: Version 19.1.2.275 of Intel Fortran Compiler for Linux
- **Parallel:** No
- **Firmware:** Fujitsu BIOS Version V1.0.0.0 R1.6.0 for D3891-A1x. Released Jun-2021 tested as V1.0.0.0 R1.2.0 for D3891-A1x Apr-2021
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Other:** None
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage

---

### Test Details

- **CPU2017 License:** 19
- **Test Sponsor:** Fujitsu
- **Tested by:** Fujitsu
- **Test Date:** Jun-2021
- **Hardware Availability:** Aug-2021
- **Software Availability:** Aug-2020

---

### Result

- **SPECrate®2017_int_base =** 311
- **SPECrate®2017_int_peak =** Not Run
### SPEC CPU®2017 Integer Rate Result

**Fujitsu**  
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**SPECrate®2017_int_base = 311**  
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### Results Table

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**SPECrate®2017_int_base = 311**  
**SPECrate®2017_int_peak = Not Run**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

---

### Submit Notes

The config file option 'submit' was used.

---

### Operating System Notes

- Stack size set to unlimited using "ulimit -s unlimited"
- Kernel Boot Parameter set with : nohz_full=1-95

---

### Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```bash
LD_LIBRARY_PATH =
    
    
    "~/home/PVT/speccpu-1.1.8/lib/intel64:/home/PVT/speccpu-1.1.8/lib/ia32:/h
ome/PVT/speccpu-1.1.8/je5.0.1-32"
MALLOCONF = "retain:true"
```

---

### 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:
  ```bash
  sync; echo 3 > /proc/sys/vm/drop_caches
  ```
- runcpu command invoked through numactl i.e.:

(Continued on next page)
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**Test Sponsor:** Fujitsu

**Tested by:** Fujitsu

**Test Date:** Jun-2021

**Hardware Availability:** Aug-2021

**Software Availability:** Aug-2020

---

**General Notes (Continued)**

```bash
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:**
DCU Streamer Prefetcher = Disabled
CPU C1E Support = Disabled
Package C State Limit = C2
UPI Link Frequency Select = 10.4 GT/s
XPT Prefetch = Enabled
LLC Prefetch = Enabled
SNC = Enable SNC2
UPI Prefetch = Disabled
FAN Control = Full

Sysinfo program /home/PVT/speccpu-1.1.8/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acac64d
running on localhost.localdomain Wed Jun 9 12:32:10 2021

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
```plaintext
model name : Intel(R) Xeon(R) Gold 5318S CPU @ 2.10GHz
  2 "physical id"s (chips)
    96 "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 : 24
  siblings : 48
  physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
  physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
```

From lscpu from util-linux 2.32.1:
```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 96
On-line CPU(s) list: 0-95
```

(Continued on next page)
### Fujitsu

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</table>

#### Platform Notes (Continued)

- **Thread(s) per core:** 2
- **Core(s) per socket:** 24
- **Socket(s):** 2
- **NUMA node(s):** 4
- **Vendor ID:** GenuineIntel
- **CPU family:** 6
- **Model:** 106
- **Model name:** Intel(R) Xeon(R) Gold 5318S CPU @ 2.10GHz
- **Stepping:** 6
- **CPU MHz:** 1269.316
- **CPU max MHz:** 3400.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 4200.00
- **Virtualization:** VT-x
- **L1d cache:** 48K
- **L1i cache:** 32K
- **L2 cache:** 1280K
- **L3 cache:** 36864K
- **NUMA node0 CPU(s):** 0-11, 48-59
- **NUMA node1 CPU(s):** 12-23, 60-71
- **NUMA node2 CPU(s):** 24-35, 72-83
- **NUMA node3 CPU(s):** 36-47, 84-95
- **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 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 movtc popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 invpccd_single ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsxenvpt xsxavcl xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local wbnoinv dtm dtherm ida arat pln pts hwp hwp_act_window hwp epp hwp_pkg_req avx512f vmi umip pku ospke avx512_vbmi gfn avs vpcmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_lld arch_capabilities

From numactl --hardware

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

<table>
<thead>
<tr>
<th>Available:</th>
<th>4 nodes (0-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node 0 cpus:</td>
<td>0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 60 61 62 63 64 65 66 67 68 69 70 71</td>
</tr>
<tr>
<td>Node 0 size:</td>
<td>257435 MB</td>
</tr>
<tr>
<td>Node 0 free:</td>
<td>257102 MB</td>
</tr>
<tr>
<td>Node 1 cpus:</td>
<td>12 13 14 15 16 17 18 19 20 21 22 23 60 61 62 63 64 65 66 67 68 69 70 71</td>
</tr>
</tbody>
</table>

(Continued on next page)
Platform Notes (Continued)

node 1 size: 258042 MB
node 1 free: 257642 MB
node 2 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 72 73 74 75 76 77 78 79 80 81 82 83
node 2 size: 258042 MB
node 2 free: 257380 MB
node 3 cpus: 36 37 38 39 40 41 42 43 44 45 46 47 84 85 86 87 88 89 90 91 92 93 94 95
node 3 size: 258040 MB
node 3 free: 257648 MB
node distances:
node 0 1 2 3
0: 10 11 20 20
1: 11 10 20 20
2: 20 20 10 11
3: 20 20 11 10

From /proc/meminfo
MemTotal: 1056318272 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/sbin/tuned-adm active
   Current active profile: throughput-performance
/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux"
      VERSION="8.2 (Ootpa)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="8.2"
      PLATFORM_ID="platform:el8"
      PRETTY_NAME="Red Hat Enterprise Linux 8.2 (Ootpa)"
      ANSI_COLOR="0;31"
   redhat-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
   system-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:8.2:ga

uname -a:
Linux localhost.localdomain 4.18.0-193.el8.x86_64 #1 SMP Fri Mar 27 14:35:58 UTC 2020
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2018-12207 (iTLB Multihit): Not affected

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Platform Notes (Continued)

CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling:
CVE-2017-5754 (Meltdown):
CVE-2018-3639 (Speculative Store Bypass):

CVE-2017-5753 (Spectre variant 1):
Mitigation: Speculative Store Bypass disabled via prctl and seccomp

CVE-2017-5715 (Spectre variant 2):
Mitigation: usercopy/swapgs barriers and __user pointer sanitization

CVE-2020-0543 (Special Register Buffer Data Sampling): No status reported
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Jun 9 12:23
SPEC is set to: /home/PVT/speccpu-1.1.8

Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb5 xfs 328G 78G 251G 24% /home

Additional information from dmidecode 3.2 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:
32x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200, configured at 2933

BIOS:
BIOS Vendor: FUJITSU
BIOS Version: V1.0.0.0 R1.2.0 for D3891-A1x
BIOS Date: 04/01/2021
BIOS Revision: 1.2
Firmware Revision: 3.20

Compiler Version Notes

C | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)

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Compiler Version Notes (Continued)

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Intel(R) C Compiler for applications running on Intel(R) 64, Version 19.1.2.275 Build 20200604
Copyright (C) 1985-2020 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++ Compiler for applications running on Intel(R) 64, Version 19.1.2.275 Build 20200604
Copyright (C) 1985-2020 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 19.1.2.275 Build 20200623
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

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#### Base Portability Flags (Continued)

- 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-AVX2 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops`
- `-qopt-mem-layout-trans=4`
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.3.275/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

**C++ benchmarks:**

- `-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries`
- `-Wl,-z,muldefs -xCORE-AVX2 -O3 -ffast-math -flto -mfpmath=sse`
- `-funroll-loops -qopt-mem-layout-trans=4`
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.3.275/linux/compiler/lib/intel64_lin`
- `-lqkmalloc`

**Fortran benchmarks:**

- `-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs`
- `-xCORE-AVX2 -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_2020.3.275/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:

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