# SPEC CPU®2017 Integer Speed Result

## Fujitsu

**PRIMERGY RX2540 M6, Intel Xeon Platinum 8368Q, 2.60GHz**

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Fujitsu</td>
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<td>Tested by:</td>
<td>Fujitsu</td>
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<tr>
<td>Test Date:</td>
<td>Apr-2021</td>
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<td>Hardware Availability:</td>
<td>May-2021</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Aug-2020</td>
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</table>

### SPECspeed®2017_int_base = 12.5

### SPECspeed®2017_int_peak = Not Run

### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Value</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>152</td>
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<tr>
<td>602.gcc_s</td>
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<td>620.omnetpp_s</td>
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</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>152</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>152</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>152</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>152</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>152</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>152</td>
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### SPECspeed®2017_int_base (12.5)

### 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:** Yes

**Firmware:** Fujitsu BIOS Version V1.0.0.0 R1.4.0 for D3891-A1x. Released May-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:**
- jemalloc memory allocator V5.0.1
- BIOS set to prefer performance at the cost of additional power usage

### Hardware

**CPU Name:** Intel Xeon Platinum 8368Q

**Max MHz:** 3700

**Nominal:** 2600

**Enabled:** 76 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:** 57 MB I+D on chip per chip

**Other:** None

**Memory:** 1 TB (32 x 32 GB 2Rx4 PC4-3200AA-R)

**Storage:** 1 x SATA M.2 SSD, 480GB

**Other:** None
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### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
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<td>7.67</td>
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<td>7.68</td>
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<td>152</td>
<td>357</td>
<td>11.2</td>
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<tr>
<td>605.mcf_s</td>
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<td>19.6</td>
<td>240</td>
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<tr>
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<td>11.9</td>
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<td>12.1</td>
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<td>14.1</td>
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<tr>
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<td>152</td>
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<td>98.9</td>
<td>17.8</td>
<td>99.0</td>
<td>17.8</td>
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<td></td>
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<tr>
<td>631.deepsjeng_s</td>
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<tr>
<td>641.leela_s</td>
<td>152</td>
<td>138</td>
<td>21.4</td>
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<td>21.2</td>
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<td>152</td>
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<td>25.7</td>
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<td>240</td>
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<td></td>
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</table>

**SPECspeed®2017_int_base = 12.5**  
**SPECspeed®2017_int_peak = Not Run**

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

### Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"  
echo 1000 > /proc/sys/kernel/sched_migration_cost_ns

### Environment Variables Notes

Environment variables set by runcpu before the start of the run:  
KMP_AFFINITY = "granularity=fine,scatter"  
LD_LIBRARY_PATH = 
"/home/PVT/speccpu-1.1.5/lib/intel64:/home/PVT/speccpu-1.1.5/je5.0.1-64"  
MALLOCONF = "retain:true"  
OMP_STACKSIZE = "192M"

### 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  
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.

(Continued on next page)
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General Notes (Continued)
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

Platform Notes
BIOS configuration:
CPU C1E Support = Disabled
UPI Link Frequency Select = 10.4 GT/s

Sysinfo program /home/PVT/speccpu-1.1.5/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Tue Apr  6 05:50:10 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
model name : Intel(R) Xeon(R) Platinum 8368Q CPU @ 2.60GHz
2 "physical id"s (chips)
152 "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 : 38
siblings : 76
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 24
25 26 27 28 29 30 31 32 33 34 35 36 37
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 24
25 26 27 28 29 30 31 32 33 34 35 36 37

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 152
On–line CPU(s) list: 0-151
Thread(s) per core: 2
Core(s) per socket: 38
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Platinum 8368Q CPU @ 2.60GHz
Stepping: 6

(Continued on next page)
Platform Notes (Continued)

CPU MHz: 2153.957
CPU max MHz: 3700.0000
CPU min MHz: 800.0000
BogoMIPS: 5200.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 58368K
NUMA node0 CPU(s): 0-37,76-113
NUMA node1 CPU(s): 38-75,114-151
Flags: fpum vsme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov

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

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**Platform Notes (Continued)**

From `/proc/meminfo`

- MemTotal: 1056305008 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*`

- 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
- CVE-2018-3620 (L1 Terminal Fault): Not affected
- Microarchitectural Data Sampling: Not affected
- CVE-2017-5754 (Meltdown): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- CVE-2018-3639 (Speculative Store Bypass): Mitigation: usercopy/swaps barriers and __user pointer sanitization
- CVE-2017-5753 (Spectre variant 1): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
- CVE-2017-5715 (Spectre variant 2): No status reported
- CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
- CVE-2019-11135 (TSX Asynchronous Abort): Not affected

(Continued on next page)
Platform Notes (Continued)

run-level 3 Apr 6 00:03

SPEC is set to: /home/PVT/spec/cpu-1.1.5
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 330G 88G 243G 27% /home

From /sys/devices/virtual/dmi/id
Vendor: FUJITSU
Product: PRIMERGY RX2540 M6
Product Family: SERVER
Serial: EWAAxxxxxx

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:
32x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

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

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C       | 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base)
       | 625.x264_s(base) 657.xz_s(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.
------------------------------------------------------------------------------

C++     | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
       | 641.leela_s(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.

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**Compiler Version Notes (Continued)**

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**Fortran | 648.exchange2_s(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.
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**Base Compiler Invocation**

- **C benchmarks:**
  - `icc`

- **C++ benchmarks:**
  - `icpc`

- **Fortran benchmarks:**
  - `ifort`

**Base Portability Flags**

- `600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64`
- `602.gcc_s: -DSPEC_LP64`
- `605.mcf_s: -DSPEC_LP64`
- `620.omnetpp_s: -DSPEC_LP64`
- `623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX`
- `625.x264_s: -DSPEC_LP64`
- `631.deepsjeng_s: -DSPEC_LP64`
- `641.leela_s: -DSPEC_LP64`
- `648.exchange2_s: -DSPEC_LP64`
- `657.xz_s: -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`
  - `-gopt-mem-layout-trans=4 -fopenmp -DSPEC_OPENMP`

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Base Optimization Flags (Continued)

C benchmarks (continued):
-`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

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 -xCORE-AVX2`
-`-O3 -ipo -no-prec-div -qopt-mem-layout-trans=4`
-`-nostandard-realloc-lhs -align array32byte`
-`-mbranches-within-32B-boundaries`

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

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