## SPEC CPU®2017 Integer Rate Result

**Fujitsu**

PRIMERGY TX1320 M4, Intel Xeon E-2288G, 3.70 GHz

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base =</th>
<th>59.6</th>
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<tbody>
<tr>
<td>SPECrate®2017_int_energy_base =</td>
<td>435</td>
</tr>
<tr>
<td>SPECrate®2017_int_peak =</td>
<td>Not Run</td>
</tr>
<tr>
<td>SPECrate®2017_int_energy_peak =</td>
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### Hardware

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate®2017_int_base (59.6)</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>16</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>16</td>
</tr>
<tr>
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<td>523.xalancbmk_r</td>
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<tr>
<td>525.x264_r</td>
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</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>16</td>
</tr>
<tr>
<td>541.leela_r</td>
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</tr>
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<td>548.exchange2_r</td>
<td>16</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>16</td>
</tr>
</tbody>
</table>

### Software

- **OS:** SUSE Linux Enterprise Server 15
- **Compiler:** C/C++: Version 19.0.4.227 of Intel C/C++ Compiler for Linux;
  Fortran: Version 19.0.4.227 of Intel Fortran Compiler for Linux
- **Parallel:** No
- **Firmware:** Fujitsu BIOS Version V5.0.0.13 R1.12.0 for D3673-A1x. Released Sep-2019
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Other:** None
- **Power Management:** Enabled

### Power

- **Max. Power (W):** 194.27
- **Idle Power (W):** 24.11
- **Min. Temperature (C):** 20.50
- **Elevation (m):** 11
- **Line Standard:** 200 V / 50 Hz / 1 phase / 2 wires

(Continued on next page)
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Fujitsu
PRIMERGY TX1320 M4, Intel Xeon E-2288G, 3.70 GHz

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

Provisioning: Line-powered

Power (Continued)

Power Settings
Management FW: Version 1.60h for D3673-A1x of Fujitsu BMC Firmware
Memory Mode: Normal

Power Analyzer:
Hardware Vendor: Hioki
Model: Hioki PW3336-1-Channel
Serial Number: 170134584
Input Connection: USB via USB-Serial CH340
Metrology Institute: NICT
Calibration By: HIOKI E.E. CORPORATION
Calibration Label: H06400087-1901T
Calibration Date: 1-Jan-2019
PTDaemon Version: 1.9.1 (a2d19f26; 2019-07-17)
Current Ranges Used: 1A
Voltage Range Used: 300V

Power-Relevant Hardware
Power Supply: 1 x 450 W (non-redundant)
Details: Standard power supply part of base unit S26361-K1639-V101
Backplane: 4 x 2.5inch HDD back plane
Other Storage: Embedded SATA Controller
Storage Model #s: S26361-F5706
NICs Installed: 2 x Intel I210 Springville @ 1 Gb
NICs Enabled (FW/OS): 2 / 2
NICs Connected/Speed: 2 @ 1 Gb
Other HW Model #: None

Temperature Meter
Temperature Meter: 10.26.120.153:8889
Hardware Vendor: Digi International Inc.
Model: DigiWATCHPORT_H
Serial Number: W 640 45112
Input Connection: USB
PTDaemon Version: 1.9.1 (a2d19f26; 2019-07-17)
Setup Description: 5 mm in front of SUT main air intake

Base Results Table

<table>
<thead>
<tr>
<th></th>
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SPECRate®2017_int_base = 59.6
SPECRate®2017_int_energy_base = 435

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.
Fujitsu
PRIMERGY TX1320 M4, Intel Xeon E-2288G, 3.70 GHz

Submit Notes
The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate taskset 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=1-15

Environment Variables Notes
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017-1.1.0/lib/intel64:/home/Benchmark/speccpu2017-1.1.0/lib/ia32:/home/Benchmark/speccpu2017-1.1.0/je5.0.1-32"

General Notes
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017-1.1.0/lib/intel64"
Binaries compiled on a system with 1x Intel Core i9–799X 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

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:
Adjacent Cache Line Prefetch = Disabled
C states = Disabled
Fan Control = Auto
Hardware Prefetcher = Disabled

(Continued on next page)
**Fujitsu**

PRIMERGY TX1320 M4, Intel Xeon E-2288G, 3.70 GHz

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</tr>
<tr>
<td>SPECrate®2017_int_energy_peak</td>
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</tr>
</tbody>
</table>

**Platform Notes (Continued)**

Intel Virtualization Technology = Disabled
Intel Speed Shift Technology = Disabled

Sysinfo program /home/Benchmark/spec.cpu2017-1.1.0/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
running on TX1320M4 Mon Oct 14 09:44:58 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) E-2288G CPU @ 3.70GHz
  1  "physical id"s (chips)
  16 "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
```

From lscpu:

```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 16
On-line CPU(s) list: 0-15
Thread(s) per core: 2
Core(s) per socket: 8
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) E-2288G CPU @ 3.70GHz
Stepping: 13
CPU MHz: 3700.000
CPU max MHz: 5000.0000
CPU min MHz: 800.0000
BogoMIPS: 7392.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 16384K
```

(Continued on next page)
Fujitsu

PRIMERGY TX1320 M4, Intel Xeon E-2288G, 3.70 GHz

SPEC CPU®2017 Integer Rate Result

SPECrates: 2017_int_base = 59.6
SPECrates: 2017_int_energy_base = 435
SPECrates: 2017_int_peak = Not Run
SPECrates: 2017_int_energy_peak = Not Run

CPU2017 License: 19
Test Date: Oct-2019
Test Sponsor: Fujitsu
Hardware Availability: Oct-2019
Tested by: Fujitsu
Software Availability: May-2019

Platform Notes (Continued)

NUMA node0 CPU(s): 0-15
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
aprfmpcrf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3
sdia fma cx16 xtpr pdcm pcdl sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer
aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb invpcid_single
ssbd ibrs ibpb stibp ibrs nærd tsc_deadline_timer aes xsaveopt xsaveopt xsaveopt xgetbv1 xfsaves dtherm ida arat pln pts hwp hwp_notify
hwp_act_window hwp_epp flush_lld arch_capabilities

/proc/cpuinfo cache data
  cache size: 16384 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
  physical chip.
  available: 1 nodes (0)
  node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
  node 0 size: 63885 MB
  node 0 free: 63384 MB
  node distances:
  node 0
  0: 10

From /proc/meminfo
  MemTotal: 65418524 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 TX1320M4 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

(Continued on next page)
**Fujitsu**

PRIMERGY TX1320 M4, Intel Xeon E-2288G, 3.70 GHz

<table>
<thead>
<tr>
<th>CPU2017 License</th>
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<tr>
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<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Fujitsu</td>
<td>Fujitsu</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

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 Oct 14 02:15

SPEC is set to: /home/Benchmark/speccpu2017-1.1.0

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sdb4</td>
<td>xfs</td>
<td>191G</td>
<td>79G</td>
<td>113G</td>
<td>42%</td>
<td>/home</td>
</tr>
</tbody>
</table>

From /sys/devices/virtual/dmi/id

- **BIOS:** FUJITSU // American Megatrends Inc. V5.0.0.13 R1.12.0 for D3673-A1x
- **Vendor:** FUJITSU
- **Product:** PRIMERGY TX1320 M4
- **Product Family:** SERVER
- **Serial:** YMJKXXXXXX

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:**
  - 4x SK Hynix HMA82GU7CJR8N-VK 16 GB 2 rank 2667

(End of data from sysinfo program)

**Power Settings Notes**

PTDaemon to measure power and temperature was run on a PRIMERGY RX2530 M5 as a controller with 2x Intel Xeon Platinum 8280 CPU and 768 GB of memory using Windows Server 2012 R2. Power management in the BIOS was default except for any settings mentioned in BIOS Configuration. No power management settings were set in the management firmware. The optional optical drive was not installed. The run was started and observed through the management firmware.
Fujitsu
PRIMERGY TX1320 M4, Intel Xeon E-2288G, 3.70 GHz

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

SPECrater®2017_int_base = 59.6
SPECrater®2017_int_energy_base = 435
SPECrater®2017_int_peak = Not Run
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Test Date: Oct-2019
Hardware Availability: Oct-2019
Software Availability: May-2019

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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64

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

| Fujitsu | SPECrate®2017_int_base = 59.6 |
| PRIMERGY TX1320 M4, Intel Xeon E-2288G, 3.70 GHz | SPECrate®2017_int_energy_base = 435 |
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**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu  
**Test Date:** Oct-2019  
**Hardware Availability:** Oct-2019  
**Software Availability:** May-2019

## Base Portability Flags (Continued)

- 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:
- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`  
- `-qopt-mem-layout-trans=4`  
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64`  
- `-lqkmalloc`

### C++ benchmarks:
- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`  
- `-qopt-mem-layout-trans=4`  
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64`  
- `-lqkmalloc`

### Fortran benchmarks:
- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`  
- `-qopt-mem-layout-trans=4`  
- `-nostandard-realloc-lhs -align array32byte`  
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/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:
Fujitsu

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CPU\textsuperscript{\textregistered}2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

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

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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\textsuperscript{\textregistered}2017 v1.1.0 on 2019-10-13 20:44:57-0400.
Report generated on 2019-11-01 10:43:30 by CPU\textsuperscript{\textregistered}2017 PDF formatter v6255.
Originally published on 2019-11-01.