**SPEC CPU®2017 Floating Point Rate Result**

**Fujitsu**

PRIMERGY TX1330 M4, Intel Xeon E-2278G, 3.40 GHz

<table>
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<th>Copies</th>
<th>SPECrate®2017_fp_base</th>
<th>SPECrate®2017_fp_peak</th>
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<tr>
<td>8</td>
<td>(43.4)</td>
<td>(44.3)</td>
</tr>
</tbody>
</table>

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**Hardware**

- **CPU Name:** Intel Xeon E-2278G
- **Max MHz:** 5000
- **Nominal:** 3400
- **Enabled:** 8 cores, 1 chip
- **Orderable:** 1 chip
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **L2:** 256 KB I+D on chip per core
- **L3:** 16 MB I+D on chip per chip
- **Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)
- **Storage:** 1 x SATA M.2 SSD, 480 GB
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage

---

**Software**

- **OS:** SUSE Linux Enterprise Server 15 4.12.14-25.28-default
- **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:** 64-bit
- **Other:** None

---

**Test Sponsor:** Fujitsu  
**Hardware Availability:** Oct-2019  
**Software Availability:** May-2019  
**Test Date:** Jan-2020
Fujitsu PRIMERGY TX1330 M4, Intel Xeon E-2278G, 3.40 GHz

SPECrate®2017_fp_base = 43.4
SPECrate®2017_fp_peak = 44.3

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<td>787</td>
<td>16.2</td>
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</tbody>
</table>

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

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"

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"

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 i9-7900X CPU + 32 GB 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:
**General Notes (Continued)**

```bash
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:
  - AES = Disabled
  - DCU Streamer Prefetcher = Disabled
  - Fan Control = Full
  - Hyper-Threading = Disabled
  - Package C-State limit = C0

- Sysinfo program `/home/Benchmark/speccpu2017-1.1.0/bin/sysinfo`
  - Rev: r6365 of 2019-08-21 295195f888a3d7ed1e6e46a485a0011
  - running on SLES15-BMT Mon Jan 13 09:52:14 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) E-2278G CPU @ 3.40GHz
  - physical id"s (chips)
  - 8 "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: 8
  - 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): 8
  - On-line CPU(s) list: 0-7
  - Thread(s) per core: 1
  - Core(s) per socket: 8
  - Socket(s): 1
  - NUMA node(s): 1
  - Vendor ID: GenuineIntel

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result
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Fujitsu
PRIMERGY TX1330 M4, Intel Xeon E-2278G, 3.40 GHz

SPEC®2017_fp_base = 43.4
SPEC®2017_fp_peak = 44.3

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<tr>
<th>CPU2017 License:</th>
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<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>Jan-2020</td>
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<td>Hardware Availability:</td>
<td>Oct-2019</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>May-2019</td>
</tr>
</tbody>
</table>

Platform Notes (Continued)

CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) E-2278G CPU @ 3.40GHz
Stepping: 13
CPU MHz: 3400.000
CPU max MHz: 5000.0000
CPU min MHz: 800.0000
BogoMIPS: 6816.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 16384K
NUMA node0 CPU(s): 0-7
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
apefmpperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3
sdmb fma cx16 xtpre pdcm pclid see4_1 see4_2 x2apic movbe popcnt tsc_deadline_timer
xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb invpcid_single ssbd
ibs ibpb stibp ibrs_enhanced tpr_shadow vmmi fpxrivity ept vpid fsgsbase
tsc_adjust bmi1 hle avx2 smep bmi2 ertc rdseed adx smap clflushopt
intel_pt xsaveopt xsavec xgetbv1 xsavec 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
  node 0 size: 63768 MB
  node 0 free: 63282 MB
  node distances:
    node 0
    0: 10

From /proc/meminfo
  MemTotal: 65298724 KB
  HugePages_Total: 0
  Hugepagesize: 2048 KB

From /etc/*release* /etc/*version*
o-release:
  NAME="SLES"
  VERSION="15"

(Continued on next page)
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PRIMERGY TX1330 M4, Intel Xeon E-2278G, 3.40 GHz

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

Test Date: Jan-2020
Hardware Availability: Oct-2019
Software Availability: May-2019

Platform Notes (Continued)

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 SLES15-BMT 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-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): Vulnerable
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 Jan 13 09:51

SPEC is set to: /home/Benchmark/speccpu2017-1.1.0
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda5 xfs 343G 66G 277G 20% /home

From /sys/devices/virtual/dmi/id
BIOS: FUJITSU // American Megatrends Inc. V5.0.0.13 R1.12.0 for D3673-A1x
09/06/2019
Vendor: FUJITSU
Product: PRIMERGY TX1330 M4
Product Family: SERVER
Serial: YMJLXXXXXX

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)
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CPU2017 License: 19
Test Sponsor: Fujitsu
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Test Date: Jan-2020
Hardware Availability: Oct-2019
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Compiler Version Notes

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<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
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Compiler Version Notes (Continued)

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

Fortran, C      | 521.wrf_r(base, peak) 527.cam4_r(base, peak)

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.

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.

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64

(Continued on next page)
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**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu

### Base Portability Flags (Continued)

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<td>526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char</td>
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<td>527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG</td>
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### Base Optimization Flags

**C benchmarks:**

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4

**C++ benchmarks:**

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4

**Fortran benchmarks:**

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs  
-align array32byte

**Benchmarks using both Fortran and C:**

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs  
-align array32byte

**Benchmarks using both C and C++:**

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4

**Benchmarks using Fortran, C, and C++:**

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs  
-align array32byte

### Peak Compiler Invocation

**C benchmarks:**

icc -m64 -std=c11

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

**Fujitsu**  
PRIMERGY TX1330 M4, Intel Xeon E-2278G, 3.40 GHz

| SPECrate®2017_fp_base = 43.4 | SPECrate®2017_fp_peak = 44.3 |

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

<table>
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<th>Jan-2020</th>
<th><strong>Hardware Availability:</strong> Oct-2019</th>
</tr>
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<tbody>
<tr>
<td>Software Availability:</td>
<td>May-2019</td>
<td></td>
</tr>
</tbody>
</table>

## Peak Compiler Invocation (Continued)

C++ benchmarks:  
icpc -m64

Fortran benchmarks:  
ifort -m64

Benchmarks using both Fortran and C:  
ifort -m64 icc -m64 -std=c11

Benchmarks using both C and C++:  
icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:  
icpc -m64 icc -m64 -std=c11 ifort -m64

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:  
519.lbm_r: basepeak = yes

538.imagick_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4

544.nab_r: basepeak = yes

C++ benchmarks:  
508.namd_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3  
-no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=4

510.parest_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4

Fortran benchmarks:

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

Fujitsu
PRIMERGY TX1330 M4, Intel Xeon E-2278G, 3.40 GHz

SPECrate®2017_fp_base = 43.4
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CPU2017 License: 19
Test Sponsor: Fujitsu
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Test Date: Jan-2020
Hardware Availability: Oct-2019
Software Availability: May-2019

Peak Optimization Flags (Continued)

503.bwaves_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs -align array32byte

549.fotonik3d_r: basepeak = yes

554.roms_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs -align array32byte

Benchmarks using both C and C++:
511.povray_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:
507.cactuBSSN_r: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0.2-CFL-RevD.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0.2-CFL-RevD.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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