SPEC CPU®2017 Floating Point Rate Result

Fujitsu
PRIMERGY TX1330 M4, Intel Xeon E-2286G, 4.00 GHz

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

Copies

<table>
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<th>Benchmark</th>
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<th>SPECrate®2017_fp_peak</th>
<th>SPECrate®2017_fp_base</th>
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SPECrater®2017_fp_peak = 40.0
SPECrater®2017_fp_base = 39.3

Hardware

CPU Name: Intel Xeon E-2286G
Max MHz: 4900
Nominal: 4000
Enabled: 6 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: 12 MB I+D on chip per chip
Other: None
Memory: 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)
Storage: 1 x SATA M.2 SSD, 480 GB
Other: None

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
Power Management: BIOS set to prefer performance at the cost of additional power usage
**Fujitsu**

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### Results Table

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</tbody>
</table>

**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:

(Continued on next page)
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SPECrate®2017_fp_peak = 40.0

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

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

General Notes (Continued)

sync; echo 3 > /proc/sys/vm/drop_caches
Yes: 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 295195f888a3d7ed16e646a485a001
running on SLES15-BMT Thu Jan 9 09:48:49 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-2286G CPU @ 4.00GHz
  1 "physical id"s (chips)
  6 "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 : 6
  siblings : 6
  physical 0: cores 0 1 2 3 4 5

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 6
On-line CPU(s) list: 0-5
Thread(s) per core: 1
Core(s) per socket: 6
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel

(Continued on next page)
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Platform Notes (Continued)

CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) E-2286G CPU @ 4.00GHz
Stepping: 10
CPU MHz: 4000.000
CPU max MHz: 4900.0000
CPU min MHz: 800.0000
BogoMIPS: 8016.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 12288K
NUMA node0 CPU(s): 0-5
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 pdelgb rdtscp
lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpref tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3
sdbg fma cx16 xtpr pdcm pclid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer
xsave avx fl64 rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb invpcid_single pti
ssbd ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi
hle avx2 smep bmi2 ets invpcid rtm mpx rdseed adx smap clflushopt intel_pt xsaveopt
xsavec xgetbv1 xsaves dtcrefresh ida arat pln pts hwp hwp_notify hwp_act_window hwp_epp
flush_l1d

/proc/cpuinfo cache data
  cache size: 12288 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
  node 0 size: 63927 MB
  node 0 free: 63447 MB
  node distances:
    node 0
    0: 10

From /proc/meminfo
  MemTotal: 65461368 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

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

(Continued on next page)
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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): Mitigation: PTE Inversion; VMX: vulnerable, SMT disabled
Microarchitectural Data Sampling: No status reported
CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2018-3639 (Speculative Store Bypass): Vulnerable
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation, IBPB: conditional, IBRS_FW, RSB filling

run-level 3 Jan 9 09:45

SPEC is set to: /home/Benchmark/speccpu2017-1.1.0
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda5 xfs 343G 66G 278G 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)
Fujitsu
PRIMERGY TX1330 M4, Intel Xeon E-2286G, 4.00 GHz

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***Compiler Version Notes***

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<tr>
<th>Language</th>
<th>Compiler</th>
<th>Benchmark(s) base, peak</th>
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<tbody>
<tr>
<td>C</td>
<td>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.</td>
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<tr>
<td>C++</td>
<td>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.</td>
<td></td>
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<tr>
<td>C++, C</td>
<td>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. 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. 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.</td>
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<tr>
<td>C++, C, Fortran</td>
<td>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. 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. 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.</td>
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Software Availability: May-2019

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)
## Base Portability Flags (Continued)

- 521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
- 526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
- 527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
- 538.imagick_r: -DSPEC_LP64
- 544.nab_r: -DSPEC_LP64
- 549.fotonik3d_r: -DSPEC_LP64
- 554.roms_r: -DSPEC_LP64

## 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)
Fujitsu
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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: basepeak = yes

Fortran benchmarks:
503.bwaves_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -auto

(Continued on next page)
**Fujitsu**

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<tr>
<td>SPECrate®2017_fp_peak = 40.0</td>
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| Test Sponsor: | Fujitsu |
| Tested by: | Fujitsu |

**Peak Optimization Flags (Continued)**

503.bwaves_r

- 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++:

- 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++:

- 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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