**CPU2017 Floating Point Rate Result**

Lenovo Global Technology  
ThinkSystem SR590  
(3.00 GHz, Intel Xeon Gold 5217)

<table>
<thead>
<tr>
<th>SPECrate2017_fp_base</th>
<th>116</th>
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</table>

**SPECrate2017_fp_peak** = Not Run

**CPU2017 License**: 9017  
**Test Date**: Apr-2019  
**Test Sponsor**: Lenovo Global Technology  
**Hardware Availability**: Apr-2019  
**Tested by**: Lenovo Global Technology  
**Software Availability**: Dec-2018

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<th>519.lbm_r</th>
<th>521.wrf_r</th>
<th>526.blender_r</th>
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**Copies** (116)

**Hardware**

- **CPU Name**: Intel Xeon Gold 5217  
- **Max MHz.**: 3700  
- **Nominal**: 3000  
- **Enabled**: 16 cores, 2 chips, 2 threads/core  
- **Orderable**: 1.2 chips  
- **Cache L1**: 32 KB I + 32 KB D on chip per core  
- **L2**: 1 MB I+D on chip per core  
- **L3**: 11 MB I+D on chip per chip  
- **Memory**: 192 GB (12 x 16 GB 2Rx8 PC4-2933Y-R, running at 2666)  
- **Storage**: 1 x 960 GB SATA SSD  
- **Other**: None

**Software**

- **OS**: SUSE Linux Enterprise Server 12 SP4 (x86_64)  
- **Kernel**: 4.12.14-94.41-default  
- **Compiler**: C/C++: Version 19.0.0.117 of Intel C/C++  
- **Compiler for Linux**:  
- **Compiler**: Fortran: Version 19.0.0.117 of Intel Fortran  
- **Compiler for Linux**:  
- **Parallel**: No  
- **Firmware**: Lenovo BIOS Version TEE135L 2.10 released Jan-2019  
- **File System**: btrfs  
- **System State**: Run level 3 (multi-user)  
- **Base Pointers**: 64-bit  
- **Peak Pointers**: Not Applicable  
- **Other**: None
Lenovo Global Technology
ThinkSystem SR590
(3.00 GHz, Intel Xeon Gold 5217)

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

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SPECrate2017_fp_base = 116
SPECrate2017_fp_peak = Not Run

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl 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"

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017-1.0.5-ic19/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
runcpu command invoked through numactl i.e.:
umactl --interleave=all runcpu <etc>
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

(Continued on next page)
SPEC CPU2017 Floating Point Rate Result

Lenovo Global Technology
ThinkSystem SR590
(3.00 GHz, Intel Xeon Gold 5217)

SPECrates2017_fp_base = 116
SPECrates2017_fp_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Dec-2018

General Notes (Continued)

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.
Yes: The test sponsor attests, as of date of publication, that CVE-2018-3640 (Spectre variant 3a) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2018-3639 (Spectre variant 4) is mitigated in the system as tested and documented.

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance
Choose Operating Mode set to Custom Mode
MONITOR/MWAIT set to Enable
Stale AtS set to Enable
LLC dead line alloc set to Disable
Sysinfo program /home/cpu2017-1.0.5-ic19/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9
running on SR590-sles12sp4 Mon Apr 22 02:52:52 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) Gold 5217 CPU @ 3.00GHz
  2 "physical id"s (chips)
  32 "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
  physical 1: 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): 32
On-line CPU(s) list: 0-31
Thread(s) per core: 2
Core(s) per socket: 8
Socket(s): 2
NUMA node(s): 2

(Continued on next page)
### Lenovo Global Technology

**ThinkSystem SR590**  
**(3.00 GHz, Intel Xeon Gold 5217)**

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**SPECrate2017_fp_base** = 116

**SPECrate2017_fp_peak** = Not Run

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**Platform Notes (Continued)**

```plaintext
Vendor ID:             GenuineIntel  
CPU family:            6  
Model:                 85  
Model name:            Intel(R) Xeon(R) Gold 5217 CPU @ 3.00GHz  
Stepping:              6  
CPU MHz:               3000.000  
CPU max MHz:           3700.0000  
CPU min MHz:           1200.0000  
BogoMIPS:              6000.00  
Virtualization:        VT-x  
L1d cache:             32K  
L1i cache:             32K  
L2 cache:              1024K  
L3 cache:              11264K  
NUMA node0 CPU(s):     0-7,16-23  
NUMA node1 CPU(s):     8-15,24-31  
Flags:                 fpu vme de pse tsc msr pae mca 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 movbe popcnt tsc_deadline_timer aes xsafe avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_single ssbd mba ibrs ibpb tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmip hle avx2 smep bmi2 erts invpcid rtm cqm mpx rdt_a avx512f avx512dq rsread axd smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 xsave vcmov l1c qm_mbb_total qm_mbb_local dtherm ida arat pln pts pku ospke avx512_vnni flush_l1d arch_capabilities
```

/proc/cpuinfo cache data

```
cache size : 11264 KB
```

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

```
available: 2 nodes (0-1)  
node 0 cpus: 0 1 2 3 4 5 6 7 16 17 18 19 20 21 22 23  
node 0 size: 96357 MB  
node 0 free: 95887 MB  
node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31  
node 1 size: 96712 MB  
node 1 free: 96231 MB  
node distances:  
  node 0 1  
    0: 10 21  
    1: 21 10
```

From /proc/meminfo

```
MemTotal: 197704292 KB
```

(Continued on next page)
### Lenovo Global Technology

ThinkSystem SR590  
(3.00 GHz, Intel Xeon Gold 5217)

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### SPEC CPU2017 Floating Point Rate Result

**SPECrate2017_fp_base = 116**

**SPECrate2017_fp_peak = Not Run**

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**Platform Notes (Continued)**

```
HugePages_Total:       0
Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*

SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 4
  # This file is deprecated and will be removed in a future service pack or release.
  # Please check /etc/os-release for details about this release.

os-release:
  NAME="SLES"
  VERSION="12-SP4"
  VERSION_ID="12.4"
  PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12:sp4"

uname -a:
  (3090901) x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation, IBPB, IBRS_FW

run-level 3 Apr 22 02:52

SPEC is set to: /home/cpu2017-1.0.5-ic19
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/sda3      btrfs  740G  35G  706G   5%  /home

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.
  BIOS Lenovo -[TEE135L-2.10]- 01/10/2019
  Memory:
    4x NO DIMM NO DIMM
    12x SK Hynix HMA82GR7CJR8N-WM 16 GB 2 rank 2933, configured at 2666

(End of data from sysinfo program)
```
Lenovo Global Technology
ThinkSystem SR590
(3.00 GHz, Intel Xeon Gold 5217)

SPECrates

SPECrate2017_fp_base = 116
SPECrate2017_fp_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Dec-2018

Compiler Version Notes

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<tr>
<th>CC</th>
<th>519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)</th>
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<td>Copyright (C) 1985-2018 Intel Corporation. All rights reserved.</td>
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**Lenovo Global Technology**

ThinkSystem SR590
(3.00 GHz, Intel Xeon Gold 5217)

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| CPU2017 License          | 9017        |
| Test Sponsor             | Lenovo Global Technology |
| Tested by                | Lenovo Global Technology |
| Test Date                | Apr-2019    |
| Hardware Availability    | Apr-2019    |
| Software Availability    | Dec-2018    |

**Compiler Version Notes (Continued)**

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 CC  521.wrf_r (base) 527.cam4_r (base)
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 Intel (R) Fortran Intel (R) 64 Compiler for applications running on Intel (R)
  64, Version 19.0.0.117 Build 20180804
 Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
 Intel (R) C Intel (R) 64 Compiler for applications running on Intel (R) 64,
  Version 19.0.0.117 Build 20180804
 Copyright (C) 1985-2018 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
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsinged-char

(Continued on next page)
## Lenovo Global Technology

ThinkSystem SR590  
(3.00 GHz, Intel Xeon Gold 5217)

### SPEC CPU2017 Floating Point Rate Result

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### Base Portability Flags (Continued)

- 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=3

#### C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3

#### Fortran benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -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=3 -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=3

- Benchmarks using Fortran, C, and C++:
  -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs -align array32byte

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:
## Lenovo Global Technology

**ThinkSystem SR590**  
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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU2017 v1.0.5 on 2019-04-21 14:52:52-0400.  