Lenovo Global Technology
ThinkSystem SR570
(2.50 GHz, Intel Xeon Gold 5215)

SPECrated2017_fp_base = 104
SPECrated2017_fp_peak = Not Run

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

Hardware
CPU Name: Intel Xeon Gold 5215
Max MHz.: 3400
Nominal: 2500
Enabled: 20 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: 13.75 MB I+D on chip per chip
Other: None
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 19.0.1.144 of Intel C/C++
Compiler Build 20181018 for Linux;
Fortran: Version 19.0.1.144 of Intel Fortran
Compiler Build 20181018 for Linux
Parallel: No
Firmware: Lenovo BIOS Version TEE135L 2.10 released Jan-2019
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None
SPEC CPU2017 Floating Point Rate Result

Lenovo Global Technology
ThinkSystem SR570
(2.50 GHz, Intel Xeon Gold 5215)

SPECrate2017_fp_base = 104
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Results Table

<table>
<thead>
<tr>
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<th>Ratio</th>
<th>Seconds</th>
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<td>503.bwaves_r</td>
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<td>45.4</td>
</tr>
</tbody>
</table>

SPECrate2017_fp_base = 104
SPECrate2017_fp_peak = Not Run

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

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-ic19.0u1/lib/intel64"
Binaries compiled on a system with 1x Intel Core i9-7900X 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.:
  numactl --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.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
Lenovo Global Technology

ThinkSystem SR570
(2.50 GHz, Intel Xeon Gold 5215)

SPECrated2017_fp_base = 104
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<td>Dec-2018</td>
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</tbody>
</table>

General Notes (Continued)

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
Sysinfo program /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-et90 Fri Apr 12 21:36:01 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 5215 CPU @ 2.50GHz
  2  "physical id"s (chips)
  40 "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 : 10
  siblings : 20
  physical 0: cores 0 1 2 3 4 8 9 10 11 12
  physical 1: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:
  Architecture: x86_64
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  CPU(s): 40
  On-line CPU(s) list: 0-39
  Thread(s) per core: 2
  Core(s) per socket: 10
  Socket(s): 2
  NUMA node(s): 2
  Vendor ID: GenuineIntel
  CPU family: 6
  Model: 85

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

**Lenovo Global Technology**

**ThinkSystem SR570**
(2.50 GHz, Intel Xeon Gold 5215)

---

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

---

**SPECraten2017_fp_base =** 104  
**SPECraten2017_fp_peak =** Not Run

---

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

---

**Platform Notes (Continued)**

Model name: Intel(R) Xeon(R) Gold 5215 CPU @ 2.50GHz  
Stepping: 6  
CPU MHz: 2500.000  
CPU max MHz: 3400.0000  
CPU min MHz: 1000.0000  
BogoMIPS: 5000.00  
Virtualization: VT-x  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 1024K  
L3 cache: 14080K  
NUMA node0 CPU(s): 0-9,20-29  
NUMA node1 CPU(s): 10-19,30-39  
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 aperfmperf pnipclmulqdq 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 xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3(invpcid_single ssbd mba ibrs ibpb tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsaves cqm_l1c cqm_occup_l1c cqm_mbm_total cqm_mbm_local dtherm ida arat pin pts pkup ospke avx512_vnni flush_l1d arch_capabilities

/proc/cpuinfo cache data  
cache size: 14080 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 8 9 20 21 22 23 24 25 26 27 28 29  
node 0 size: 96060 MB  
node 0 free: 95095 MB  
node 1 cpus: 10 11 12 13 14 15 16 17 18 19 30 31 32 33 34 35 36 37 38 39  
node 1 size: 96712 MB  
node 1 free: 95924 MB  
node distances:  
node 0 1  
0: 10 21  
1: 21 10

From /proc/meminfo  
MemTotal: 197398920 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR570
(2.50 GHz, Intel Xeon Gold 5215)

| SPECrate2017_fp_base = | 104 |
| SPECrate2017_fp_peak = | Not Run |

CPU2017 License: 9017
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Platform Notes (Continued)

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:
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 12 17:00

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1

<p>| | | | | | |</p>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Filesystem</td>
<td>Type</td>
<td>Size</td>
<td>Used</td>
<td>Avail</td>
<td>Use%</td>
</tr>
<tr>
<td>/dev/sda3</td>
<td>xfs</td>
<td>892G</td>
<td>35G</td>
<td>857G</td>
<td>4%</td>
</tr>
</tbody>
</table>

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 SR570

(2.50 GHz, Intel Xeon Gold 5215)

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### SPEC CPU2017 Floating Point Rate Result

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#### Compiler Version Notes

Almost done!

---

(Continued on next page)
## Compiler Version Notes (Continued)

---

CC  521.wrf_r(base) 527.cam4_r(base)

---

Intel (R) Fortran Intel (R) 64 Compiler for applications running on Intel (R) 64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
Intel (R) C Intel (R) 64 Compiler for applications running on Intel (R) 64, Version 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---

## Base Compiler Invocation

C benchmarks:
```bash
icc -m64 -std=c11
```

C++ benchmarks:
```bash
icpc -m64
```

Fortran benchmarks:
```bash
ifort -m64
```

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

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

Benchmarks using Fortran, C, and C++:
```bash
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 -funsigned-char

(Continued on next page)
**Lenovo Global Technology**  
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**CPU2017 License**: 9017  
**Test Sponsor**: Lenovo Global Technology  
**Tested by**: Lenovo Global Technology

**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-AVX512 -ipo -O3 -no-prec-div -gopt-prefetch  
- -ffinite-math-only -gopt-mem-layout-trans=4

**C++ benchmarks**:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -gopt-prefetch  
- -ffinite-math-only -gopt-mem-layout-trans=4

**Fortran benchmarks**:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -gopt-prefetch  
- -ffinite-math-only -gopt-mem-layout-trans=4 -auto  
- -nostandard-realloc-lhs -align array32byte

**Benchmarks using both Fortran and C**:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -gopt-prefetch  
- -ffinite-math-only -gopt-mem-layout-trans=4 -auto  
- -nostandard-realloc-lhs -align array32byte

**Benchmarks using both C and C++**:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -gopt-prefetch  
- -ffinite-math-only -gopt-mem-layout-trans=4

**Benchmarks using Fortran, C, and C++**:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -gopt-prefetch  
- -ffinite-math-only -gopt-mem-layout-trans=4 -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:

- http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-A.xml
## Lenovo Global Technology

**ThinkSystem SR570**  
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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 2019-04-12 09:36:00-0400.  