**Lenovo Global Technology**

**ThinkSystem SN550**
(2.10 GHz, Intel Xeon Gold 5218T)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
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</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
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**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology

**Test Date:** Sep-2019  
**Hardware Availability:** Jul-2019  
**Software Availability:** May-2019

| SPECrate®2017_int_base | 175 |

| CPU Name: Intel Xeon Gold 5218T | OS: SUSE Linux Enterprise Server 15 (x86_64)  
Nominal: 2100 | Compiler: C/C++: Version 19.0.4.227 of Intel  
Enabled: 32 cores, 2 chips, 2 threads/core | C/C++ Compiler for Linux;  
Orderable: 1.2 chips | Fortran: Version 19.0.4.227 of Intel Fortran  
Cache L1: 32 KB I + 32 KB D on chip per core | Compiler for Linux;  
L2: 1 MB I+D on chip per core | Parallel: No  
L3: 22 MB I+D on chip per chip | Firmware: Lenovo BIOS Version IVE142E 2.30 released Aug-2019 tested as IVE141E 2.30 Jul-2019  
Other: None | File System: xfs  
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R, running at 2666) | System State: Run level 3 (multi-user)  
Storage: 1 x 960 GB SATA SSD | Base Pointers: 64-bit  
Other: None | Peak Pointers: Not Applicable  
Power Management: --

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<tr>
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<tr>
<td>502.gcc_r 64</td>
<td>147</td>
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<tr>
<td>505.mcf_r 64</td>
<td>230</td>
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<tr>
<td>520.omnetpp_r 64</td>
<td>118</td>
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<tr>
<td>523.xalancbmk_r 64</td>
<td>201</td>
</tr>
<tr>
<td>525.x264_r 64</td>
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<tr>
<td>531.deepsjeng_r 64</td>
<td>142</td>
</tr>
<tr>
<td>541.leela_r 64</td>
<td>136</td>
</tr>
<tr>
<td>548.exchange2_r 64</td>
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</tr>
<tr>
<td>557.xz_r 64</td>
<td>117</td>
</tr>
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</table>

**Software**  
**Firmware:** Lenovo BIOS Version IVE142E 2.30 released Aug-2019 tested as IVE141E 2.30 Jul-2019  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable  
**Other:** None  
**Power Management:** --
SPEC CPU®2017 Integer Rate Result
Copyright 2017-2019 Standard Performance Evaluation Corporation

Lenovo Global Technology
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(2.10 GHz, Intel Xeon Gold 5218T)

SPECraten®2017_int_base = 175
SPECraten®2017_int_peak = Not Run

Results Table

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<td>557.xz_r</td>
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<td>592</td>
<td>117</td>
<td>590</td>
<td>117</td>
<td>591</td>
<td>117</td>
</tr>
</tbody>
</table>

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-ic19.0u4/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.:
  numactl --interleave=all runcpu <etc>
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)
Lenovo Global Technology
ThinkSystem SN550
(2.10 GHz, Intel Xeon Gold 5218T)

SPECrate®2017_int_base = 175
SPECrate®2017_int_peak = Not Run

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

Test Date: Sep-2019
Hardware Availability: Jul-2019
Software Availability: May-2019

General Notes (Continued)

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
Trusted Execution Technology set to Enable
SNC set to Enable
Stale AtoS set to Enable
Sysinfo program /home/cpu2017-1.0.5-ic19.0u4/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9
running on linux-cq9p Sat Sep 28 02:16:43 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 5218T CPU @ 2.10GHz
  2 "physical id"s (chips)
  64 "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 : 16
siblings : 32
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 2
Core(s) per socket: 16
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5218T CPU @ 2.10GHz

(Continued on next page)
Lenovo Global Technology
ThinkSystem SN550
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CPU2017 License: 9017
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SPECraten2017_int_base = 175
SPECraten2017_int_peak = Not Run

Platform Notes (Continued)

7
2100.000
3800.0000
1000.0000
4200.00
VT-x
32K
32K
1024K
22528K
0-3,8-11,32-35,40-43
4-7,12-15,36-39,44-47
16-19,24-27,48-51,56-59
20-23,28-31,52-55,60-63

flag:
/proc/cpuinfo cache data
cache size : 22528 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)
  node 0 cpus: 0 1 2 3 8 9 10 11 32 33 34 35 40 41 42 43
  node 0 size: 193134 MB
  node 0 free: 186785 MB
  node 1 cpus: 4 5 6 7 12 13 14 15 36 37 38 39 44 45 46 47
  node 1 size: 193522 MB
  node 1 free: 193043 MB
  node 2 cpus: 16 17 18 19 24 25 26 27 48 49 50 51 56 57 58 59
  node 2 size: 193493 MB
  node 2 free: 192866 MB
  node 3 cpus: 20 21 22 23 28 29 30 31 52 53 54 55 60 61 62 63
  node 3 size: 193519 MB
  node 3 free: 192955 MB
  node distances:
    node 0 1 2 3
    0: 10 11 21 21

(Continued on next page)
## Lenovo Global Technology

**ThinkSystem SN550**  
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<table>
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</table>

### SPECrate®2017_int_base = 175
### SPECrate®2017_int_peak = Not Run

### Platform Notes (Continued)

```
1:  11 10 21 21  
2:  21 21 10 11  
3:  21 21 11 10  
```

From `/proc/meminfo`

- **MemTotal:** 792238724 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:
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 Sep 27 16:25**

**SPEC is set to:** `/home/cpu2017-1.0.5-ic19.0u4`

<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/sdb3</td>
<td>xfs</td>
<td>893G</td>
<td>61G</td>
<td>832G</td>
<td>7%</td>
<td>/</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 -[IVE141E-2.30]- 07/02/2019

**Memory:**

- 24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2666

(End of data from sysinfo program)
Lenovo Global Technology
ThinkSystem SN550
(2.10 GHz, Intel Xeon Gold 5218T)

SPECrates
2017_int_base = 175
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CPU2017 License: 9017
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Compiler Version Notes

==============================================================================
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<tbody>
<tr>
<td></td>
<td>Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416</td>
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<tr>
<td></td>
<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
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<th>C++</th>
<th>520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)</th>
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<th>548.exchange2_r(base)</th>
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</table>

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
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64

(Continued on next page)
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<td>Lenovo Global Technology</td>
<td>May-2019</td>
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</table>

### Base Portability Flags (Continued)

```
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-AVX512 -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-AVX512 -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-AVX512 -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

- [http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-F.html](http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-F.html)

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-F.xml](http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-F.xml)

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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®2017 v1.0.5 on 2019-09-27 14:16:42-0400.**


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