# Lenovo Global Technology

**ThinkSystem SN550**  
(3.80 GHz, Intel Xeon Platinum 8256)

<table>
<thead>
<tr>
<th>Software Availability:</th>
<th>May-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2017 License:</td>
<td>9017</td>
</tr>
<tr>
<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
</tr>
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<td>Tested by:</td>
<td>Lenovo Global Technology</td>
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<tr>
<td>Test Date:</td>
<td>Jun-2019</td>
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<tr>
<td>Hardware Availability:</td>
<td>Apr-2019</td>
</tr>
<tr>
<td>Specspeed2017_int_base</td>
<td>9.54</td>
</tr>
<tr>
<td>Specspeed2017_int_peak</td>
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</tr>
</tbody>
</table>

## CPU Name:
Intel Xeon Platinum 8256

## Max MHz.:
3900

## Nominal:
3800

## Orderable:
1,2 chips

## Enabled:
8 cores, 2 chips, 2 threads/core

## Cache L1:
32 KB I + 32 KB D on chip per core

## L1:
1 MB I+D on chip per core

## L3:
16.5 MB I+D on chip per chip

## Other:
None

## Memory:
768 GB (24 x 32 GB 2Rx4 PC4-2666V-R)

## Storage:
1 x 960 GB SATA SSD

## Other:
None

## OS:
SUSE Linux Enterprise Server 15 (x86_64)

## Kernel:
4.12.14-25.13-default

## Compiler:
C/C++: Version 19.0.4.227 of Intel C/C++

## Fortran:
Version 19.0.4.227 of Intel Fortran

## Parallel:
Yes

## Firmware:
Lenovo BIOS Version IVE135M 2.10 released Jan-2019

## File System:
xfs

## System State:
Run level 3 (multi-user)

## Base Pointers:
64-bit

## Peak Pointers:
Not Applicable

## Other:
jemalloc memory allocator V5.0.1

## Hardware Speeds:

<table>
<thead>
<tr>
<th>Test</th>
<th>Threads</th>
<th>SPECspeed2017_int_base</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perbench_s</td>
<td>16</td>
<td>9.25</td>
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<tr>
<td>602.gcc_s</td>
<td>16</td>
<td>12.4</td>
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<tr>
<td>605.mcf_s</td>
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<td>12.3</td>
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<td>620.omnetpp_s</td>
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<td>623.xalancbmk_s</td>
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<td>625.x264_s</td>
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<td>16.7</td>
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<td>631.deepsjeng_s</td>
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<td>648.exchange2_s</td>
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<tr>
<td>657.xz_s</td>
<td>16</td>
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</tbody>
</table>

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**Threads**

16

---

**Software**

**CPU Name:** Intel Xeon Platinum 8256

**Max MHz.:** 3900

**Nominal:** 3800

**Enabled:** 8 cores, 2 chips, 2 threads/core

**Orderable:** 1,2 chips

**Cache L1:** 32 KB I + 32 KB D on chip per core

**L1:** 1 MB I+D on chip per core

**L3:** 16.5 MB I+D on chip per chip

**Other:** None

**Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2666V-R)

**Storage:** 1 x 960 GB SATA SSD

**Other:** None

**OS:** SUSE Linux Enterprise Server 15 (x86_64)

**Kernel:** 4.12.14-25.13-default

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**Parallel:** Yes

**Firmware:** Lenovo BIOS Version IVE135M 2.10 released Jan-2019

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**System State:** Run level 3 (multi-user)

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**Peak Pointers:** Not Applicable

**Other:** jemalloc memory allocator V5.0.1
Lenovo Global Technology
ThinkSystem SN550
(3.80 GHz, Intel Xeon Platinum 8256)

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<td>343</td>
<td>18.0</td>
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</tbody>
</table>

SPECspeed2017_int_base = 9.54
SPECspeed2017_int_peak = Not Run

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

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:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = ""/home/cpu2017-1.0.5-ic19.0u4/lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/cpu2017-1.0.5-ic19.0u4/je5.0.1-64"
OMP_STACKSIZE = "192M"

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

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.
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.
jemalloc, a general purpose malloc implementation built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

(Continued on next page)
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SPECspeed2017_int_base = 9.54
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology
Test Date: Jun-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

General Notes (Continued)

Platform Notes

BIOS configuration:
Choose Operating Mode set to Custom Mode
Energy Efficient Turbo set to Disable
C-States set to Disable
Platform Controlled Type set to Efficiency-Favor Power
Page Policy set to Adaptive
Trusted Execution Technology set to Enable
Workload Configuration set to I/O Sensitive
Stale AtoS set to Enable
Sysinfo program /home/cpu2017-1.0.5-ic19.0u4/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcd08f2999c33d61f64985e45859ea9

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) Platinum 8256 CPU @ 3.80GHz
  2 "physical id"s (chips)
  16 "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 : 4
siblings : 8
physical 0: cores 1 5 9 13
physical 1: cores 1 2 5 13

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 16
On-line CPU(s) list: 0-15
Thread(s) per core: 2
Core(s) per socket: 4
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8256 CPU @ 3.80GHz

(Continued on next page)
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SPECspeed2017_int_base = 9.54
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CPU2017 License: 9017
CPU MHz: 3800.000
BogoMIPS: 7600.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 16896K
NUMA node0 CPU(s): 0-3,8-11
NUMA node1 CPU(s): 4-7,12-15
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
aperfmpref pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtpre pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abm 3dnowprefetch cpubi fault epb cat_l3 cdp_l3
invpcid_single ssbd mba ibrs ibpb tpr_shadow vnmf lexpriority ept vpid
fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ersed rseq cqm mpx rdt_a avx512f
avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occurs llc cqm_mbb_total cqm_mbb_local
dtherm ida arat pin pts hwp_epp pku ospke avx512_vnni flush_lld arch_capabilities

/proc/cpuinfo cache data
cache size : 16896 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 8 9 10 11
node 0 size: 386633 MB
node 0 free: 380121 MB
node 1 cpus: 4 5 6 7 12 13 14 15
node 1 size: 387047 MB
node 1 free: 385979 MB
node distances:
node 0 1
 0: 10 21
 1: 21 10

From /proc/meminfo
MemTotal: 792248584 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

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Test Date: Jun-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

Platform Notes (Continued)

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 Jun 6 17:40

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u4
  Filesystem   Type  Size  Used Avail Use% Mounted on
  /dev/sda3     xfs   893G   52G  842G   6% /

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 -[IVE135M-2.10]- 01/16/2019
Memory:
  24x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
  CC  600.perlbench_s(base)  602.gcc_s(base)  605.mcf_s(base)  625.x264_s(base)
     657.xz_s(base)
-------------------------------------------------------------------------------
  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.
==============================================================================

(Continued on next page)
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ThinkSystem SN550
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SPEC CPU2017 Integer Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

SPECspeed2017_int_base = 9.54
SPECspeed2017_int_peak = Not Run

CPU2017 License: 9017
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Compiler Version Notes (Continued)

==============================================================================
CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
641.leela_s(base)
==============================================================================
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.
==============================================================================
FC 648.exchange2_s(base)
==============================================================================
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.
==============================================================================

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Base Portability Flags

600.perlbench_s: -DSPEC_LP64  -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64  -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64
# SPEC CPU2017 Integer Speed Result

## Lenovo Global Technology

**ThinkSystem SN550**  
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<th>Lenovo Global Technology</th>
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## Base Optimization Flags

**C benchmarks:**
- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-ipo`  
- `-O3`  
- `-no-prec-div`  
- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-ipo`  
- `-O3`  
- `-no-prec-div`  
- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-ipo`  
- `-O3`  
- `-no-prec-div`  
- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-ipo`  
- `-O3`  
- `-no-prec-div`

**C++ benchmarks:**
- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-ipo`  
- `-O3`  
- `-no-prec-div`  
- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-ipo`  
- `-O3`  
- `-no-prec-div`  
- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-ipo`  
- `-O3`  
- `-no-prec-div`  
- `-Wl,-z,muldefs`  
- `-xCORE-AVX512`  
- `-ipo`  
- `-O3`  
- `-no-prec-div`

**Fortran benchmarks:**
- `-xCORE-AVX512`  
- `-ipo`  
- `-O3`  
- `-no-prec-div`  
- `-qopt-mem-layout-trans=4`  
- `-nostandard-realloc-lhs`

---

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:  

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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 2019-06-06 08:13:36-0400.  
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