### Lenovo Global Technology

**ThinkSystem SN550 (3.20 GHz, Intel Xeon Silver 4215R)**

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base = 10.2</th>
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<tbody>
<tr>
<td>SPECspeed®2017_int_peak = Not Run</td>
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</table>

**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Test Date:** Jun-2020  
**Hardware Availability:** Mar-2020  
**Software Availability:** Apr-2020

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
</table>
| OS: SUSE Linux Enterprise Server 15 SP1 (x86_64)  
Kernel 4.12.14-195-default  
Compiler: C/C++: Version 19.1.1.217 of Intel  
C/C++ Compiler for Linux;  
Fortran: Version 19.1.1.217 of Intel Fortran  
Compiler for Linux  
Parallel: Yes  
Firmware: Lenovo BIOS Version IVE155L 2.61 released May-2020  
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  
Power Management: BIOS set to prefer performance at the cost of additional power usage |
| CPU Name: Intel Xeon Silver 4215R  
Max MHz: 4000  
Nominal: 3200  
Enabled: 16 cores, 2 chips  
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  
Other: None  
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R, running at 2400)  
Storage: 1 x 960 GB SATA SSD  
Other: None |

**Threads**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base (10.2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>16</td>
<td>6.43</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>16</td>
<td>9.18</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>16</td>
<td>17.8</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>16</td>
<td>6.04</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>16</td>
<td>113.17</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>16</td>
<td>15.2</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>16</td>
<td>5.55</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>16</td>
<td>4.90</td>
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<tr>
<td>648.exchange2_s</td>
<td>16</td>
<td>16.9</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>16</td>
<td>19.5</td>
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Lenovo Global Technology
ThinkSystem SN550
(3.20 GHz, Intel Xeon Silver 4215R)

SPECSPEED®2017_int_base = 10.2
SPECSPEED®2017_int_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
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Results Table

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<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base Seconds</th>
<th>Ratio</th>
<th>Base Seconds</th>
<th>Ratio</th>
<th>Base Seconds</th>
<th>Ratio</th>
<th>Peak Seconds</th>
<th>Ratio</th>
<th>Peak Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
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<td>276</td>
<td>6.43</td>
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<td>6.43</td>
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<td>6.42</td>
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<tr>
<td>602.gcc_s</td>
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<td>9.18</td>
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<td>443</td>
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<td>605.mcf_s</td>
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<tr>
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<td>16</td>
<td>317</td>
<td>19.5</td>
<td>317</td>
<td>19.5</td>
<td>318</td>
<td>19.5</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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

Compiler Notes
The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler. The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux
The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

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:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/cpu2017-1.1.0-ic19.1.1/lib/intel64:/home/cpu2017-1.1.0-ic19.1.1/j e5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"

General Notes
Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Redhat Enterprise Linux 8.0
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
(Continued on next page)
Lenovo Global Technology
ThinkSystem SN550
(3.20 GHz, Intel Xeon Silver 4215R)

SPECspeed®2017_int_base = 10.2
SPECspeed®2017_int_peak = Not Run

General Notes (Continued)

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

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
MONITOR/MWAIT set to Enable
Hyper-Threading set to Disable
Trusted Execution Technology set to Enable
Workload Configuration set to I/O Sensitive
Patrol Scrub set to Disable

Sysinfo program /home/cpu2017-1.1.0-ic19.1.1/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbl6e6e46a485a0011
running on linux-anu7 Thu Jun 4 04:03:31 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) Silver 4215R CPU @ 3.20GHz
  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 : 8
siblings : 8
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

(Continued on next page)
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SPECspeed®2017_int_base = 10.2
SPECspeed®2017_int_peak = Not Run

Test Date: Jun-2020
Hardware Availability: Mar-2020
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Platform Notes (Continued)

CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 46 bits physical, 48 bits virtual
CPU(s): 16
On-line CPU(s) list: 0-15
Thread(s) per core: 1
Core(s) per socket: 8
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4215R CPU @ 3.20GHz
Stepping: 7
CPU MHz: 3200.000
CPU max MHz: 4000.0000
CPU min MHz: 1000.0000
BogoMIPS: 6400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 11264K
NUMA node0 CPU(s): 0-7
NUMA node1 CPU(s): 8-15
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 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
xtrm pud pmcd 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 cd p _l3
invpcid_single intel_pppin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmni
flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ibrm invpcid rtm
cmq mxr rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd
avx512bw avx512vl avx512vl xsavesopt xsaveopt xsaves xsaveopt xsaveopt xsaveopt
xsaveopt xexfbit xsaves cqm_llc cqm_occup llc cqm_mbb_total
cqm motherboard dtherm ida arat pln pts pkpu ospke avx512_vnni md_clear 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
dphysical chip.
 available: 2 nodes (0-1)
 node 0 cpus: 0 1 2 3 4 5 6 7
 node 0 size: 386661 MB
 node 0 free: 386051 MB

(Continued on next page)
SPEC CPU®2017 Integer Speed Result

Lenovo Global Technology
ThinkSystem SN550
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SPECspeed®2017_int_base = 10.2
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Platform Notes (Continued)

- node 1 cpus: 8 9 10 11 12 13 14 15
- node 1 size: 387069 MB
- node 1 free: 386690 MB
- node distances:
  - node 0 1
  - 0: 10 21
  - 1: 21 10

- From /proc/meminfo
  - MemTotal: 792300456 kB
  - HugePages_Total: 0
  - Hugepagesize: 2048 kB

- From /etc/*release* /etc/*version*
  - NAME="SLES"
  - VERSION="15-SP1"
  - VERSION_ID="15.1"
  - PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
  - ID="sles"
  - ID_LIKE="suse"
  - ANSI_COLOR="0;32"
  - CPE_NAME="cpe:/o:suse:sles:15:sp1"

- uname -a:
  - Linux linux-anu7 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
  - x86_64 x86_64 x86_64 GNU/Linux

- Kernel self-reported vulnerability status:
  - CVE-2018-3620 (L1 Terminal Fault): Not affected
  - Microarchitectural Data Sampling: Not affected
  - CVE-2017-5754 (Meltdown): Not affected
  - CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
  - CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
  - CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

- run-level 3 Jun 4 04:02

- SPEC is set to: /home/cpu2017-1.1.0-ic19.1.1
  - Filesystem Type Size Used Avail Use% Mounted on
  - /dev/sda3 xfs 893G 55G 838G 7% /

- From /sys/devices/virtual/dmi/id
  - BIOS: Lenovo -[IVE155L-2.61]- 05/20/2020

(Continued on next page)
Lenovo Global Technology
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SPECspeed®2017_int_base = 10.2
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Platform Notes (Continued)
Vendor: Lenovo
Product: ThinkSystem SN550 : ThinkSystem SN550 -[7X16CT00WW]-
Product Family: ThinkSystem
Serial: 1234567890

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:
24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933
(End of data from sysinfo program)

Compiler Version Notes

C
| 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base)
| 625.x264_s(base) 657.xz_s(base)

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

C++
| 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
| 641.leela_s(base)

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Fortran
| 648.exchange2_s(base)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Lenovo Global Technology

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Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

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

Base Optimization Flags

C benchmarks:
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ffast-math -ftlo -mfpmath=sse -funroll-loops
-fuse-ld=gold -qopt-mem-layout-trans=4 -fopenmp -DSPEC_OPENMP
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -ftlo -mfpmath=sse
-funroll-loops -fuse-ld=gold -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -xCORE-AVX512
-O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte

(Continued on next page)
# SPEC CPU®2017 Integer Speed Result

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ThinkSystem SN550  
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## Base Optimization Flags (Continued)

Fortran benchmarks (continued):

- mbranches-within-32B-boundaries

The flags files that were used to format this result can be browsed at:

- [Intel ic19.1u1 official Linux64 revA](http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.html)
- [Lenovo Platform SPECcpu2017 Flags V1.2 CLX H](http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-H.html)

You can also download the XML flags sources by saving the following links:

- [Intel ic19.1u1 official Linux64 revA](http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml)
- [Lenovo Platform SPECcpu2017 Flags V1.2 CLX H](http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-H.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 v1.1.0 on 2020-06-03 16:03:31-0400.


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