**SPEC® CPU2017 Integer Speed Result**

**Lenovo Global Technology**

ThinkSystem ST550  
(3.00 GHz, Intel Xeon Gold 5217)

<table>
<thead>
<tr>
<th>CPU2017 License: 9017</th>
<th>Test Date: Apr-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: Lenovo Global Technology</td>
<td>Hardware Availability: Apr-2019</td>
</tr>
<tr>
<td>Tested by: Lenovo Global Technology</td>
<td>Software Availability: Nov-2018</td>
</tr>
</tbody>
</table>

### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_int_base = 8.99</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perbench_s</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>625.x264_s</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>641.leela_s</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td>32</td>
<td></td>
</tr>
</tbody>
</table>

### 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  
  - Other: None  
  - Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R, running at 2666)  
  - Storage: 1 x 480 GB SATA SSD  
  - Other: None

### Software

- **OS:** SUSE Linux Enterprise Server 15 (x86_64)  
- **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:** Yes  
- **Firmware:** Lenovo BIOS Version O0E135M 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
SPEC CPU2017 Integer Speed Result

Lenovo Global Technology
ThinkSystem ST550
(3.00 GHz, Intel Xeon Gold 5217)

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

SPECSpeed2017_int_base = 8.99
SPECSpeed2017_int_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>32</td>
<td>289</td>
<td>6.15</td>
<td>288</td>
<td>6.16</td>
<td>288</td>
<td>6.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>32</td>
<td>456</td>
<td>8.73</td>
<td>456</td>
<td>8.73</td>
<td>446</td>
<td>8.92</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>32</td>
<td>398</td>
<td>11.9</td>
<td>393</td>
<td>12.0</td>
<td>394</td>
<td>12.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>32</td>
<td>298</td>
<td>5.47</td>
<td>295</td>
<td>5.54</td>
<td>299</td>
<td>5.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>32</td>
<td>120</td>
<td>11.8</td>
<td>120</td>
<td>11.8</td>
<td>121</td>
<td>11.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>625.x264_s</td>
<td>32</td>
<td>136</td>
<td>12.9</td>
<td>136</td>
<td>13.0</td>
<td>136</td>
<td>13.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>32</td>
<td>277</td>
<td>5.17</td>
<td>276</td>
<td>5.18</td>
<td>277</td>
<td>5.17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>641.leela_s</td>
<td>32</td>
<td>377</td>
<td>4.52</td>
<td>378</td>
<td>4.51</td>
<td>378</td>
<td>4.52</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>32</td>
<td>220</td>
<td>13.3</td>
<td>221</td>
<td>13.3</td>
<td>220</td>
<td>13.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td>32</td>
<td>300</td>
<td>20.6</td>
<td>301</td>
<td>20.5</td>
<td>301</td>
<td>20.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SPECSpeed2017_int_base = 8.99
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-ic19.0u1/lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/cpu2017-1.0.5-ic19.0u1/je5.0.1-64"
OMP_STACKSIZE = "192M"

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

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) 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)
Lenovo Global Technology
ThinkSystem ST550
(3.00 GHz, Intel Xeon Gold 5217)

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

SPECspeed2017_int_base = 8.99
SPECspeed2017_int_peak = Not Run

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

General Notes (Continued)

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance
Choose Operating Mode set to Custom Mode
Stale AtoS set to Enable
LLC dead line alloc set to Disable
Patrol Scrub set to Disable
C-States set to legacy
Sysinfo program /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-pork Mon Apr 29 17:23:08 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
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

(Continued on next page)
Lenovo Global Technology  
ThinkSystem ST550  
(3.00 GHz, Intel Xeon Gold 5217)

**SPECspeed2017_int_base = 8.99**

**SPECspeed2017_int_peak = Not Run**

---

**Platform Notes (Continued)**

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 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 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 xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3 invpcid_SINGLE ssbd mba ibrs ibpb stibp tpr_shadow vnmi 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 xsavec xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtc_perfd arch_capabilities

/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: 193096 MB
node 0 free: 189715 MB
node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
node 1 size: 193509 MB
node 1 free: 192729 MB

node distances:

node 0 1
 0: 10 21
 1: 21 10

From /proc/meminfo

MemTotal: 395884572 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

os-release:
NAME="SLES"

(Continued on next page)
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 Apr 29 17:20
```

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

```
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sdc3      xfs   445G   43G  403G  10% /
```

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 -[O0E135M-2.10]- 01/16/2019
Memory:
  12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 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 19.0.1.144 Build 20181018
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

(Continued on next page)
**SPEC CPU2017 Integer Speed Result**

_Standard Performance Evaluation Corporation_  
[info@spec.org](mailto:info@spec.org)  
[https://www.spec.org/](https://www.spec.org/)

### Lenovo Global Technology

**ThinkSystem ST550**  
(3.00 GHz, Intel Xeon Gold 5217)

<table>
<thead>
<tr>
<th>CPU2017 License</th>
<th>Lenovo Global Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test Sponsor:</strong></td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td><strong>Tested by:</strong></td>
<td>Lenovo Global Technology</td>
</tr>
</tbody>
</table>

---

**Compiler Version Notes (Continued)**

```plaintext
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 19.0.1.144 Build 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

---

```plaintext
FC 648.exchange2_s(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.

---

**Base Compiler Invocation**

- **C benchmarks:**
  ```plaintext
  icc -m64 -std=c11
  ```

- **C++ benchmarks:**
  ```plaintext
  icpc -m64
  ```

- **Fortran benchmarks:**
  ```plaintext
  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
Lenovo Global Technology
ThinkSystem ST550
(3.00 GHz, Intel Xeon Gold 5217)

SPECspeed2017_int_base = 8.99
SPECspeed2017_int_peak = Not Run

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

Base Optimization Flags

C benchmarks:
-WI,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-WI,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

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

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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 2019-04-29 05:23:07-0400.