## Lenovo Global Technology

ThinkSystem SR950  
(1.80 GHz, Intel Xeon Gold 6222V)  

<table>
<thead>
<tr>
<th>Software</th>
<th>Lenovo Global Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2017 License:</td>
<td>9017</td>
</tr>
<tr>
<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>SPECspeed\textsuperscript{\textregistered}2017\textunderscore int_base =</td>
<td>9.37</td>
</tr>
<tr>
<td>SPECspeed\textsuperscript{\textregistered}2017\textunderscore int_peak =</td>
<td>Not Run</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Aug-2019</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Jul-2019</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Nov-2018</td>
</tr>
</tbody>
</table>

### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>threads</th>
<th>SPECspeed\textsuperscript{\textregistered}2017\textunderscore int_base (9.37)</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>80</td>
<td>6.26</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>80</td>
<td>9.26</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>80</td>
<td>11.8</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>80</td>
<td>7.78</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>80</td>
<td>11.5</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>80</td>
<td>12.7</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>80</td>
<td>5.05</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>80</td>
<td>4.41</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>80</td>
<td>13.0</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>80</td>
<td>23.1</td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon Gold 6222V</td>
</tr>
<tr>
<td>Max MHz:</td>
<td>3600</td>
</tr>
<tr>
<td>Nominal:</td>
<td>1800</td>
</tr>
<tr>
<td>Enabled:</td>
<td>80 cores, 4 chips</td>
</tr>
<tr>
<td>Orderable:</td>
<td>2,3,4 chips</td>
</tr>
<tr>
<td>Cache L1:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2:</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3:</td>
<td>27.5 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>1536 GB (48 x 32 GB 2Rx4 PC4-2933Y-R, running at 2400)</td>
</tr>
<tr>
<td>Storage:</td>
<td>1 x 800 GB SATA SSD</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
</tbody>
</table>

### 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 PSE122R 1.53 released Aug-2019 tested as PSE121R 1.53 Jul-2019 |
| File System: | btrfs |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |
| Peak Pointers: | Not Applicable |
| Power Management: | jemalloc memory allocator V5.0.1 |
SPEC CPU®2017 Integer Speed Result

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Lenovo Global Technology

ThinkSystem SR950
(1.80 GHz, Intel Xeon Gold 6222V)

SPECspeed®2017_int_base = 9.37
SPECspeed®2017_int_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>80</td>
<td>283</td>
<td>6.27</td>
<td>286</td>
<td>6.21</td>
<td>284</td>
<td>6.26</td>
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<tr>
<td>602.gcc_s</td>
<td>80</td>
<td>438</td>
<td>9.09</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>605.mcf_s</td>
<td>80</td>
<td>399</td>
<td>11.8</td>
<td>402</td>
<td>11.7</td>
<td>401</td>
<td>11.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>80</td>
<td>216</td>
<td>7.56</td>
<td>207</td>
<td>7.87</td>
<td>210</td>
<td>7.78</td>
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<tr>
<td>623.xalancbmk_s</td>
<td>80</td>
<td>123</td>
<td>11.5</td>
<td>123</td>
<td>11.6</td>
<td>123</td>
<td>11.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>625.x264_s</td>
<td>80</td>
<td>138</td>
<td>12.8</td>
<td>138</td>
<td>12.7</td>
<td>139</td>
<td>12.7</td>
<td></td>
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<td>80</td>
<td>284</td>
<td>5.05</td>
<td>284</td>
<td>5.05</td>
<td>283</td>
<td>5.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>641.leela_s</td>
<td>80</td>
<td>387</td>
<td>4.41</td>
<td>387</td>
<td>4.41</td>
<td>387</td>
<td>4.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>80</td>
<td>227</td>
<td>13.0</td>
<td>227</td>
<td>13.0</td>
<td>226</td>
<td>13.0</td>
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<td></td>
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<tr>
<td>657.xz_s</td>
<td>80</td>
<td>267</td>
<td>23.1</td>
<td>267</td>
<td>23.2</td>
<td>272</td>
<td>22.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>CPU2017 License</th>
<th>Test Date</th>
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<th>Hardware Availability</th>
<th>Software Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>9017</td>
<td>Aug-2019</td>
<td>Lenovo Global Technology</td>
<td>Jul-2019</td>
<td>Nov-2018</td>
</tr>
</tbody>
</table>

**General Notes (Continued)**


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### Platform Notes

BIOS configuration:
- Choose Operating Mode set to Maximum Performance
- Choose Operating Mode set to Custom Mode
- CPU P-state Control set to Autonomous
- Hyper-Threading set to Disable
- Trusted Execution Technology set to Enable
- DCU Streamer Prefetcher set to Disable
- MONITOR/MWAIT set to Enable

Sysinfo program /home/cpu2017-1.0.5-ic19.0ul/bin/sysinfo  
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9  
running on linux-i7o2 Tue Aug 6 23:02:29 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 6222V CPU @ 1.80GHz
- 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 : 20
  - siblings : 20
  - physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
  - physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
  - physical 2: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
  - physical 3: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

From lscpu:
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 80
- On-line CPU(s) list: 0-79
- Thread(s) per core: 1
- Core(s) per socket: 20
- Socket(s): 4
- NUMA node(s): 4
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85

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

**Lenovo Global Technology**

**ThinkSystem SR950**

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---

**SPECspeed®2017_int_base = 9.37**

**SPECspeed®2017_int_peak = Not Run**

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<td>Lenovo Global Technology</td>
</tr>
</tbody>
</table>

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**Platform Notes (Continued)**

- Model name: Intel(R) Xeon(R) Gold 6222V CPU @ 1.80GHz
- Stepping: 7
- CPU MHz: 1800.000
- BogoMIPS: 3600.00
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 28160K
- NUMA node0 CPU(s): 0-19
- NUMA node1 CPU(s): 20-39
- NUMA node2 CPU(s): 40-59
- NUMA node3 CPU(s): 60-79

Flags:

- fpu vme de pse tsc msr pae mce cmov 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 abtm fmsr a20_m[m] mmca
- Flags:

```
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 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
node 0 size: 386639 MB
node 0 free: 382955 MB
node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
node 1 size: 387022 MB
node 1 free: 386789 MB
node 2 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59
node 2 size: 387051 MB
node 2 free: 386784 MB
node 3 cpus: 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79
node 3 size: 387048 MB
node 3 free: 386570 MB
data distances:
node 0 1 2 3
0: 10 21 21 21
1: 21 10 21 21
```

(Continued on next page)
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SPECSpeed®2017_int_base = 9.37
SPECSpeed®2017_int_peak = Not Run

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

Platform Notes (Continued)

2:  21  21 10  21
3:  21  21  21 10

From /proc/meminfo
MemTotal:       1584907636 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:
   Linux linux-i7o2 4.12.14-25.13-default #1 SMP Tue Aug 14 15:07:35 UTC 2018 (947aa51)
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 Aug 6 22:55

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1
   Filesystem Type Size Used Avail Use% Mounted on
   /dev/sda2  btrfs 742G 35G 707G  5% /home

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 SM BIOS" standard.
   BIOS Lenovo -[PSE121R-1.53]- 07/03/2019
   Memory:
      48x NO DIMM NO DIMM
      48x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933, configured at 2400

(End of data from sysinfo program)
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

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 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.

==============================================================================
| C++     | 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.

==============================================================================
| Fortran | 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:
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

(Continued on next page)
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Software Availability: Nov-2018

Base Portability Flags (Continued)

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

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/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-D.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-D.xml

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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