### Lenovo Global Technology

**ThinkSystem SR570**  
(2.70 GHz, Intel Xeon Gold 6226)

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

#### Software

- **OS:** SUSE Linux Enterprise Server 12 SP4 (x86_64)  
  Kernel 4.12.14-94.41-default
- **Compiler:** C/C++: Version 19.0.4.227 of Intel C/C++  
  Compiler for Linux;  
  Fortran: Version 19.0.4.227 of Intel Fortran  
  Compiler for Linux
- **Parallel:** Yes
- **Firmware:** Lenovo BIOS Version TEE142E 2.30 released Aug-2019 tested as TEE141E 2.30 Jul-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
- **Power Management:** --

#### Hardware

- **CPU Name:** Intel Xeon Gold 6226  
  Max MHz: 3700  
  Nominal: 2700
- **Enabled:** 24 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: 19.25 MB I+D on chip per chip
- **Other:** None
- **Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2933Y-R)  
  Storage: 1 x 960 GB SATA SSD
- **Other:** None

#### SPEC CPU 2017 Integer Speed Result

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench_s</td>
<td>48</td>
<td>6.47</td>
<td>Not Run</td>
</tr>
<tr>
<td>gcc_s</td>
<td>48</td>
<td>9.30</td>
<td>12.0</td>
</tr>
<tr>
<td>mcf_s</td>
<td>48</td>
<td>6.45</td>
<td>11.8</td>
</tr>
<tr>
<td>omnetpp_s</td>
<td>48</td>
<td>5.22</td>
<td>13.5</td>
</tr>
<tr>
<td>xalancbmk_s</td>
<td>48</td>
<td>4.52</td>
<td>15.8</td>
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<tr>
<td>x264_s</td>
<td>48</td>
<td>5.22</td>
<td>22.1</td>
</tr>
<tr>
<td>deepsjeng_s</td>
<td>48</td>
<td>4.52</td>
<td>15.8</td>
</tr>
<tr>
<td>leela_s</td>
<td>48</td>
<td>6.45</td>
<td>22.1</td>
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<tr>
<td>exchange2_s</td>
<td>48</td>
<td>11.8</td>
<td></td>
</tr>
<tr>
<td>xz_s</td>
<td>48</td>
<td>12.0</td>
<td></td>
</tr>
</tbody>
</table>

---

**Figure:** SPEC CPU 2017 Integer Speed Result Table

**Figure:** SPEC CPU 2017 Integer Speed Result Graph

**Figure:** SPEC CPU 2017 Integer Speed Result Chart
## Lenovo Global Technology

### ThinkSystem SR570 (2.70 GHz, Intel Xeon Gold 6226)

---

**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
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---

### 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>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>48</td>
<td>275</td>
<td>6.45</td>
<td>273</td>
<td>6.50</td>
<td>275</td>
<td>6.47</td>
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<tr>
<td>602.gcc_s</td>
<td>48</td>
<td>427</td>
<td>9.33</td>
<td>428</td>
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<tr>
<td>605.mcf_s</td>
<td>48</td>
<td>392</td>
<td>12.0</td>
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<tr>
<td>620.omnetpp_s</td>
<td>48</td>
<td>248</td>
<td>6.58</td>
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<td>623.xalancbmk_s</td>
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<tr>
<td>625.x264_s</td>
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<td>5.22</td>
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<td>641.leela_s</td>
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<td>648.exchange2_s</td>
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<td>657.xz_s</td>
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<td>279</td>
<td>22.1</td>
<td>279</td>
<td>22.1</td>
<td>279</td>
<td>22.1</td>
</tr>
</tbody>
</table>

### SPECspeed®2017_int_base = 9.52  
### SPECspeed®2017_int_peak = Not Run

---

### 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:

```bash
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)
SPEC CPU®2017 Integer Speed Result

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SPECspeed®2017_int_peak = Not Run

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

General Notes (Continued)

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance
Choose Operating Mode set to Custom Mode
Memory Power Management set to Automatic
CPU P-state Control set to Cooperative
MONITOR/MWAIT set to Enable
Sysinfo program /home/cpu2017-1.0.5-ic19.0u4/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-d13d Thu Sep 19 17:27:13 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 6226 CPU @ 2.70GHz
  2 "physical id"s (chips)
  48 "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 : 12
siblings : 24
physical 0: cores 0 1 2 3 4 5 6 8 10 11 12 13
physical 1: cores 0 1 2 3 4 5 6 8 9 11 12 13

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 2
Core(s) per socket: 12
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6226 CPU @ 2.70GHz
Stepping: 7
CPU MHz: 2700.000
CPU max MHz: 3700.000

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

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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

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**Platform Notes (Continued)**

- CPU min MHz: 1200.0000
- BogoMIPS: 5400.00
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 19712K
- NUMA node0 CPU(s): 0-11,24-35
- NUMA node1 CPU(s): 12-23,36-47
- 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 noapic xtopology nonstop_tsc
- - 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 intel_pdp mba ibrs ibpb stibp tpr_shadow vnmi flexpriority ept
- - vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm
- - avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
- - xsaveopt xsavec xsaves cqm_llc cqm_occup_llc cqm_mbb_local dtherm ida arat pln pts hwp
- - hwp_act_window hwp_epp hwp_pkg_req pku ospke avx512_vnni flush_lld arch_capabilities

/proc/cpuinfo cache data
  cache size : 19712 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 8 9 10 11 24 25 26 27 28 29 30 31 32 33 34 35
  node 0 size: 96029 MB
  node 0 free: 95346 MB
  node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
  node 1 size: 96740 MB
  node 1 free: 96329 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10

From /proc/meminfo
  MemTotal: 197396696 KB
  HugePages_Total: 0
  Hugepagesize: 2048 KB

From /etc/*release*/etc/*version*/
  SuSE-release:  
    SUSE Linux Enterprise Server 12 (x86_64)

(Continued on next page)
Platform Notes (Continued)

    VERSION = 12
    PATCHLEVEL = 4
    # This file is deprecated and will be removed in a future service pack or release.
    # Please check /etc/os-release for details about this release.
    os-release:
        NAME="SLES"
        VERSION="12-SP4"
        VERSION_ID="12.4"
        PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"
        ID="sles"
        ANSI_COLOR="0;32"
        CPE_NAME="cpe:/o:suse:sles:12:sp4"

    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 19 17:25

    SPEC is set to: /home/cpu2017-1.0.5-ic19.0u4
        Filesystem     Type  Size  Used Avail Use% Mounted on
        /dev/sda3      xfs   892G   43G  850G   5% /

    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 -[TEE141E-2.30]- 07/02/2019
    Memory:
        4x NO DIMM NO DIMM
        12x SK Hynix HMA82GR7CJR8N-WM 16 GB 2 rank 2933

    (End of data from sysinfo program)
Lenovo Global Technology
ThinkSystem SR570
(2.70 GHz, Intel Xeon Gold 6226)

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

Compiler Version Notes (Continued)

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.

==============================================================================
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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 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 19.0.4.227 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

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SPECspeed®2017_int_base = 9.52
SPECspeed®2017_int_peak = Not Run

Base Portability Flags (Continued)

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 -qopenmp -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_2019.4.227/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-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

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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 2019-09-19 05:27:12-0400.