**Lenovo Global Technology**  
ThinkSystem SR570  
(2.90 GHz, Intel Xeon Gold 6226R)

| Test Sponsor: Lenovo Global Technology | Test Date: Mar-2020 |
| CPU2017 License: 9017 | Hardware Availability: Mar-2020 |
| Tested by: Lenovo Global Technology | Software Availability: Jun-2019 |

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<th>SPECspeed®2017_int_peak</th>
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<td>657.xz_s</td>
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</table>

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### Hardware

- **CPU Name:** Intel Xeon Gold 6226R  
- **Max MHz:** 3900  
- **Nominal:** 2900  
- **Enabled:** 32 cores, 2 chips, 2 threads/core  
- **Orderable:** 1,2 chips  
- **Cache L1:** 32 KB I+D on chip per core  
- **Cache L2:** 1 MB I+D on chip per core  
- **Cache L3:** 22 MB I+D on chip per chip  
- **Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2933Y-R)  
- **Storage:** 1 x 960 GB SATA SSD  
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 15 SP1 (x86_64)  
- **Kernel:** 4.12.14-195-default  
- **Compiler:** C/C++: Version 19.0.4.227 of Intel C/C++  
- **Compiler for Linux:** Intel Fortran  
- **Parallel:** Yes  
- **Firmware:** Lenovo BIOS Version TEE152L 2.51 released Feb-2020 (tested as TEE151L 2.51 Jan-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
Lenovo Global Technology
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SPECspeed®2017_int_base = 9.75
SPECspeed®2017_int_peak = Not Run

Results Table

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<td>268</td>
<td>23.1</td>
<td>268</td>
<td>23.1</td>
</tr>
</tbody>
</table>

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-ic19.0u4/lib/intel64:/home/cpu2017-1.1.0-ic19.0u4/j
e5.0.1-64"
OMP_STACKSIZE = "192M"

General Notes
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)
**General Notes (Continued)**

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
Memory Power Management set to Automatic
CPU P-state Control set to Cooperative
MONITOR/MWAIT set to Enable

Sysinfo program /home/cpu2017-1.1.0-ic19.0u4/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed61e6e46a485a0011
running on linux-mazt Sun Mar 22 23:30:09 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) Gold 6226R CPU @ 2.90GHz
- 2 "physical id"s (chips)
- 64 "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: 16
  - siblings: 32
  - physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
  - physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

**From lscpu:**
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- Address sizes: 46 bits physical, 48 bits virtual
- CPU(s): 64
- On-line CPU(s) list: 0–63
- Thread(s) per core: 2
- Core(s) per socket: 16
- Socket(s): 2
- NUMA node(s): 2
- Vendor ID: GenuineIntel

(Continued on next page)
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Platform Notes (Continued)

CPU family: 6  
Model: 85  
Model name: Intel(R) Xeon(R) Gold 6226R CPU @ 2.90GHz  
Stepping: 7  
CPU MHz: 2900.000  
CPU max MHz: 3900.0000  
CPU min MHz: 1200.0000  
BogoMIPS: 5800.00  
Virtualization: VT-x  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 1024K  
L3 cache: 22528K  
NUMA node0 CPU(s): 0-15,32-47  
NUMA node1 CPU(s): 16-31,48-63  
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  
aperfmprefetch pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sse4 sse4_1  
x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abtm  
abtm_msr 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3  
invpcl_single intel_pinn ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmmi  
flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcl rtm  
cqm_mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd  
avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsavec 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 md_clear flush_l1d arch_capabilities

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 12 13 14 15 32 33 34 35 36 37 38 39 40 41 42 43  
44 45 46 47  
node 0 size: 96085 MB  
node 0 free: 95733 MB  
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 48 49 50 51 52 53 54 55  
56 57 58 59 60 61 62 63  
node 1 size: 96731 MB  
node 1 free: 95910 MB  
node distances:  
node 0 1  
0: 10 21  
1: 21 10

(Continued on next page)
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SPECSpeed®2017_int_base = 9.75
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Platform Notes (Continued)

From /proc/meminfo
MemTotal: 197444924 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release*/etc/*version*
os-release:
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-mazt 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 Mar 22 23:27

SPEC is set to: /home/cpu2017-1.1.0-ic19.0u4
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 892G 59G 834G 7% /

From /sys/devices/virtual/dmi/id
BIOS: Lenovo -[TEE151L-2.51]- 01/13/2020
Vendor: Lenovo
Product: ThinkSystem SR570 -[7Y02RCZ000]-
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

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

**Lenovo Global Technology**

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**Test Date:** Mar-2020  
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---

### Platform Notes (Continued)

frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.  
Memory:  
4x NO DIMM NO DIMM  
12x SK Hynix HMA82GR7CJR8N-WM 16 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

Intel(R) C 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) C++ 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) Fortran 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.

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### Base Compiler Invocation

C benchmarks:  
icc -m64 -std=c11

C++ benchmarks:  
icpc -m64

Fortran benchmarks:  
ifort -m64
## Lenovo Global Technology

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### Test Date: Mar-2020  
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### Base Portability Flags

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<td>gcc</td>
<td>-DSPEC_LP64</td>
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<td>mcf</td>
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<td>-DSPEC_LP64</td>
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<tr>
<td>xalancbmk</td>
<td>-DSPEC_LP64 -DSPEC_LINUX</td>
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<td>x264</td>
<td>-DSPEC_LP64</td>
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<td>-DSPEC_LP64</td>
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<td>exchange2</td>
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<tr>
<td>xz</td>
<td>-DSPEC_LP64</td>
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### 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-G.html](http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-G.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-G.xml](http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-G.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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