**SPEC CPU®2017 Integer Speed Result**

**Lenovo Global Technology**

**ThinkSystem SR550**

(2.10 GHz, Intel Xeon Gold 5218R)

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

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<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Specification</th>
<th>Threads</th>
<th>SPECspeed (11.4)</th>
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</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td></td>
<td>80</td>
<td>6.88</td>
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<tr>
<td>602.gcc_s</td>
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<td>605.mcf_s</td>
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<tr>
<td>620.omnetpp_s</td>
<td></td>
<td>80</td>
<td>13.9</td>
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<tr>
<td>623.xalancbmk_s</td>
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<td>625.x264_s</td>
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<tr>
<td>631.deepsjeng_s</td>
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<td>80</td>
<td>16.9</td>
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<tr>
<td>641.leea_s</td>
<td></td>
<td>80</td>
<td>4.90</td>
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<tr>
<td>648.exchange2_s</td>
<td></td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
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<td>80</td>
<td></td>
</tr>
</tbody>
</table>

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### Hardware

- **CPU Name:** Intel Xeon Gold 5218R  
- **Max MHz:** 4000  
- **Nominal:** 2100  
- **Enabled:** 40 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:** 27.5 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 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 19.1.1.217 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 TEE155L 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
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
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</tbody>
</table>

**SPECspeed®2017_int_base = 11.4**  
**SPECspeed®2017_int_peak = Not Run**

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** = 
    
## 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:
Lenovo Global Technology
ThinkSystem SR550
(2.10 GHz, Intel Xeon Gold 5218R)

SPECSpeed®2017_int_base = 11.4
SPECSpeed®2017_int_peak = Not Run

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

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.

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
LLC dead line alloc set to Disable

Sysinfo program /home/cpu2017-1.1.0-ic19.1.1/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1b6e46a485a0011
running on linux-h3af Fri Jun 12 18:01:05 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 5218R CPU @ 2.10GHz
   2 "physical id"s (chips)
   80 "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 : 20
   siblings : 40
   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

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): 80
On-line CPU(s) list: 0-79

(Continued on next page)
Lenovo Global Technology

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**Platform Notes (Continued)**

Thread(s) per core: 2
Core(s) per socket: 20
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5218R CPU @ 2.10GHz
Stepping: 7
CPU MHz: 2100.000
CPU max MHz: 4000.0000
CPU min MHz: 800.0000
BogoMIPS: 4200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 28160K
NUMA node0 CPU(s): 0-19, 40-59
NUMA node1 CPU(s): 20-39, 60-79
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 pdpte0 pldsc
lms constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmprefetch pn lchmulqdq dtes64 monitor ds CPL vmx smx est tm2 ssse3 sdbg fma cx16
xtrp pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
ax f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault epb cat_l13 cdp_l13
invpcid_single intel_pinn ssbd mba ibrs ibpb stibp ibrs enhanced tpr_shadow vnmi
flexpriority rsmtpid fsbgbase tsc_adjust bmi1 hle avx2 smep bmi2 erts invpcid rtm
cmmi mxp rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd
avx512bw avx512vl xsavemth xsaec xgetbvl xsave cqm llc cqm_occup llc cqm_mbb total
cqm_mbb local dtherm ida arat ptt hw act_window hwup epp hwp pkg_reg pku
ospke avx512_vmm md_clear flush_l1d arch_capabilities

From numactl --hardware

```
WARNING: a numactl 'node' might or might not correspond to a
physical chip.
```

```bash
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 40 41 42 43 44 45 46 47
48 49 50 51 52 53 54 55 56 57 58 59
node 0 size: 193147 MB
node 0 free: 192775 MB
node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 60 61 62 63 64
65 66 67 68 69 70 71 72 73 74 75 76 77 78 79
node 1 size: 193947 MB
node 1 free: 192608 MB
```
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SPECSpeed®2017_int_base = 11.4
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Node distances:

node 0 1
 0: 10 21
 1: 21 10

From /proc/meminfo
- MemTotal: 395924728 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-h3af 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 (Melttdown): 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 12 17:58

SPEC is set to: /home/cpu2017-1.1.0-ic19.1.1
- Filesystem Type Size Used Avail Use% Mounted on
  /dev/sda3 xfs 743G 43G 700G 6% /

From /sys/devices/virtual/dmi/id
- BIOS: Lenovo -[TEE155L-2.61]- 05/20/2020
- Vendor: Lenovo
- Product: ThinkSystem SR550 -[7X03RCZ000]-
- Product Family: ThinkSystem

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Platform Notes (Continued)

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:
12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)
This system support 6 DIMMs per processor, total 12 DIMMs.
12 DIMM slots installed with 32 GB DIMM for this run,
and running at 2666 due to CPU limitation.

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
ThinkSystem SR550
(2.10 GHz, Intel Xeon Gold 5218R)

## 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

| 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 |

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

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-I.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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