## Lenovo Global Technology

**ThinkSystem SR530**  
(2.10 GHz, Intel Xeon Silver 4216)

### SPECspeed2017_int_base = 8.38

### SPECspeed2017_int_peak = Not Run

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</tbody>
</table>

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### Hardware

- **CPU Name:** Intel Xeon Silver 4216  
- **Max MHz.:** 3200  
- **Nominal:** 2100  
- **Enabled:** 32 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:** 22 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2933Y-R, running at 2400)  
- **Storage:** 1 x 960 GB SATA SSD  
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 12 SP4 (x86_64)  
- **Kernel:** 4.12.14-94.41-default  
- **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 TEE135L 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 SR530

(2.10 GHz, Intel Xeon Silver 4216)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
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<tr>
<td>SPECspeed2017_int_peak</td>
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| CPU2017 License: | 9017 |
| Test Sponsor: | Lenovo Global Technology |
| Tested by: | Lenovo Global Technology |
| Test Date: | Apr-2019 |
| Hardware Availability: | Apr-2019 |
| Software Availability: | Dec-2018 |

## Results Table

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</tbody>
</table>

| SPECspeed2017_int_base | 8.38 |
| 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 SR530
(2.10 GHz, Intel Xeon Silver 4216)

SPECspeed2017_int_base = 8.38
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

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

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
LLC dead line alloc set to Disable
Sysinfo program /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-yjm3 Sun Apr 21 16:58:09 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) Silver 4216 CPU @ 2.10GHz
  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
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
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4216 CPU @ 2.10GHz
Stepping: 6
CPU MHz: 2100.000

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

**Lenovo Global Technology**  
ThinkSystem SR530  
(2.10 GHz, Intel Xeon Silver 4216)

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</tr>
</tbody>
</table>

**Platform Notes (Continued)**

```plaintext
CPU max MHz: 3200.0000  
CPU min MHz: 800.0000  
BogoMIPS: 4200.00  
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 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 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 erts invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku ospke avx512_vnni flush_l1d arch_capabilities
```

```
/procd/cpuinfo cache data  
cache size: 22528 KB
```

From numactl --hardware  
WARNING: a numactl 'node' might or might not correspond to a physical chip.

<table>
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<th>2 nodes (0-1)</th>
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</thead>
<tbody>
<tr>
<td>node 0 cpus:</td>
<td>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</td>
</tr>
<tr>
<td>node 0 size:</td>
<td>96325 MB</td>
</tr>
<tr>
<td>node 0 free:</td>
<td>95477 MB</td>
</tr>
<tr>
<td>node 1 cpus:</td>
<td>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</td>
</tr>
<tr>
<td>node 1 size:</td>
<td>96738 MB</td>
</tr>
<tr>
<td>node 1 free:</td>
<td>96443 MB</td>
</tr>
</tbody>
</table>

```plaintext
From /proc/meminfo  
MemTotal: 197697680 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB
```

(Continued on next page)
Lenovo Global Technology
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SPECspeed2017_int_base = 8.38
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Platform Notes (Continued)

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

run-level 3 Apr 21 16:53

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1
Filesystem     Type Size Used Avail Use% Mounted on
/dev/sda3      xfs  892G   31G  861G   4% /

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 -[TEE135L-2.10]- 01/10/2019
Memory:
   12x SK Hynix HMA82GR7CJR8N-WM 16 GB 2 rank 2933, configured at 2400

(End of data from sysinfo program)
### Lenovo Global Technology

**ThinkSystem SR530**  
(2.10 GHz, Intel Xeon Silver 4216)

<table>
<thead>
<tr>
<th>CPU2017 License</th>
<th>Lenovo Global Technology</th>
<th>Test Date: Apr-2019</th>
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<td>Lenovo Global Technology</td>
<td>Hardware Availability: Apr-2019</td>
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**SPEC CPU2017 Integer Speed Result**

- **SPECspeed2017_int_base = 8.38**
- **SPECspeed2017_int_peak = Not Run**

#### 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.
------------------------------------------------------------------------------
==============================================================================
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.
------------------------------------------------------------------------------
==============================================================================
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:**  
  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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- **Hardware Availability:** Apr-2019  
- **Software Availability:** Dec-2018

## Base Portability Flags (Continued)

- 623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX  
- 625.x264_s: -DSPEC_LP64  
- 631.deepsjeng_s: -DSPEC_LP64  
- 641.leea_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_2019.1.144/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:


You can also download the XML flags sources by saving the following links:


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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 2019-04-21 04:58:08-0400.  