# Lenovo Global Technology

**ThinkSystem SR570**  
(2.30 GHz, Intel Xeon Gold 6230N)

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
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<tbody>
<tr>
<td>SPECspeed®2017_fp_peak</td>
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**CPU2017 License:** 9017  
**Test Date:** Sep-2019  
**Test Sponsor:** Lenovo Global Technology  
**Hardware Availability:** Jul-2019  
**Tested by:** Lenovo Global Technology  
**Software Availability:** May-2019

## Hardware

- **CPU Name:** Intel Xeon Gold 6230N  
- **Max MHz:** 3500  
- **Nominal:** 2300  
- **Enabled:** 40 cores, 2 chips  
- **Orderable:** 1,2 chips  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **Cache L2:** 1 MB I+D on chip per core  
- **Cache L3:** 27.5 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 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

## Performance

<table>
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<td>621.wrf_s</td>
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<td>627.cam4_s</td>
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<tr>
<td>628.pop2_s</td>
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<td>638.imagick_s</td>
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</tr>
<tr>
<td>644.nab_s</td>
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<td>649.fotonik3d_s</td>
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<tr>
<td>654.roms_s</td>
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SPECSpeed®2017_fp_base (122)
**Lenovo Global Technology**

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---

**SPECspeed®2017_fp_base = 122**

**SPECspeed®2017_fp_peak = Not Run**

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### Results Table

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**SPECspeed®2017_fp_base = 122**

**SPECspeed®2017_fp_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,compact"

LD_LIBRARY_PATH = "/home/cpu2017-1.0.5-ic19.0u4/lib/intel64"

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:

```
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.
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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

### Platform Notes

- **BIOS configuration:**
  - Choose Operating Mode set to Maximum Performance
  - Choose Operating Mode set to Custom Mode
  - CPU P-state Control set to Automatic
  - MONITOR/MWAIT set to Enable
  - Hyper-Threading set to Disable
  - Adjacent Cache Prefetch set to Disable
  - Sysinfo program /home/cpu2017-1.0.5-ic19.0u4/bin/sysinfo
  - Rev: r5974 of 2018-05-19
  - 9bcde8f2999c33d61f64985e45859ea9
  - running on linux-et90 Thu Sep 26 10:24:54 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 6230N CPU @ 2.30GHz
  - 2 "physical id"s (chips)
  - 40 "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: 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

  From lscpu:
  
  - Architecture: x86_64
  - CPU op-mode(s): 32-bit, 64-bit
  - Byte Order: Little Endian
  - CPU(s): 40
  - On-line CPU(s) list: 0-39
  - Thread(s) per core: 1
  - Core(s) per socket: 20
  - Socket(s): 2
  - NUMA node(s): 4
  - Vendor ID: GenuineIntel
  - CPU family: 6
  - Model: 85
  - Model name: Intel(R) Xeon(R) Gold 6230N CPU @ 2.30GHz
  - Stepping: 6
  - CPU MHz: 2300.000
  - BogoMIPS: 4600.00
  - Virtualization: VT-x
  - L1d cache: 32K
  - L1i cache: 32K
  - L2 cache: 1024K

(Continued on next page)
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Hardware Availability: Jul-2019
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**Platform Notes (Continued)**

L3 cache: 28160K
NUMA node0 CPU(s): 0-2, 5-6, 10-12, 15, 16
NUMA node1 CPU(s): 3, 4, 7-9, 13, 14, 17-19
NUMA node2 CPU(s): 20-22, 25, 26, 30-32, 35, 36
NUMA node3 CPU(s): 23, 24, 27-29, 33, 34, 37-39
Flags: fpu vme de pse 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 repl good nopl xtopology nonstop tsc cpu id
aperf mperf pci clflushopt dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtricular pcd pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avxf16c rdrand lahf_lm abm 3nowprefetch cpuid_fault cat_l3 cdp_l3
invpcid_single intel_ppin ssbd mba ibrs ibpb stibp tpr_shadow vmmi flexpriority ept
vpid fsgsbase tsc_adjust bni1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdta
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 pin pts hwp_epk pku ospxe avx512_vnni flush_lld arch_capabilities

From /proc/cpuinfo cache data
    cache size: 28160 KB

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 5 6 10 11 12 15 16
    node 0 size: 47686 MB
    node 0 free: 47455 MB
    node 1 cpus: 3 4 7 8 9 13 14 17 18 19
    node 1 size: 48342 MB
    node 1 free: 48149 MB
    node 2 cpus: 20 21 22 25 26 30 31 32 35 36
    node 2 size: 48371 MB
    node 2 free: 48033 MB
    node 3 cpus: 23 24 27 28 29 33 34 37 38 39
    node 3 size: 48369 MB
    node 3 free: 48027 MB
    node distances:
    node 0 1 2 3
    0: 10 11 21 21
    1: 11 10 21 21
    2: 21 21 10 11
    3: 21 21 11 10

From /proc/meminfo
    MemTotal: 197396848 kB
    HugePages_Total: 0
    Hugepagesize: 2048 kB

(Continued on next page)
**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 Sep 26 10:23

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u4  
Filesystem Type Size Used Avail Use% Mounted on  
/dev/sda3 xfs 892G 50G 842G 6% /

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

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<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
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<td>Jul-2019</td>
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### SPECspeed®2017_fp_base = 122

### SPECspeed®2017_fp_peak = Not Run

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### Compiler Version Notes

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|          | 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`  

(Continued on next page)
**Spec CPU®2017 Floating Point Speed Result**

**Lenovo Global Technology**

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**Base Compiler Invocation (Continued)**

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
ifort -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:
```
icpc -m64 icc -m64 -std=c11 ifort -m64
```

---

**Base Portability Flags**

<table>
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<tr>
<th>Benchmark</th>
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**Base Optimization Flags**

**C benchmarks:**
```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
```

**Fortran benchmarks:**
```
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs
```

**Benchmarks using both Fortran and C:**
```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs
```

**Benchmarks using Fortran, C, and C++:**
```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs
```

(Continued on next page)
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Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
-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 2019-09-25 22:24:54-0400.