**Lenovo Global Technology**

ThinkSystem SR950
(1.90 GHz, Intel Xeon Gold 6238T)

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

---

### Hardware

- **CPU Name:** Intel Xeon Gold 6238T
- **Max MHz.:** 3700
- **Nominal:** 1900
- **Enabled:** 88 cores, 4 chips
- **Orderable:** 2,3,4 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:** 30.25 MB I+D on chip per chip
- **Other:** None
- **Memory:** 768 GB (48 x 16 GB 2Rx8 PC4-2933Y-R)
- **Storage:** 1 x 800 GB SATA SSD
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 15 (x86_64)
- **Kernel:** 4.12.14-25.13-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 PSE121I 1.50 released Mar-2019
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Other:** None

---

**SPEC® CPU2017 Floating Point Speed Result**

**Lenovo Global Technology**

ThinkSystem SR950
(1.90 GHz, Intel Xeon Gold 6238T)

---

**SPECspeed2017_fp_base = 182**  
**SPECspeed2017_fp_peak = Not Run**

---

**Threads**

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<tr>
<th>Benchmark</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
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<tr>
<td>607.cactuBSSN_s</td>
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<tr>
<td>619.lbm_s</td>
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<tr>
<td>621.wrf_s</td>
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<tr>
<td>627.cam4_s</td>
<td>88</td>
<td></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>
<td>654.roms_s</td>
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**SPECspeed2017_fp_base (182)**
### Lenovo Global Technology

ThinkSystem SR950  
(1.90 GHz, Intel Xeon Gold 6238T)

**CPU2017 License:** 9017  
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---

**Results Table**

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</tbody>
</table>

---

**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-ic19.0u1/lib/intel64"**  
**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
  ```

**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-2017-5751 (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.
## Lenovo Global Technology

**ThinkSystem SR950**  
(1.90 GHz, Intel Xeon Gold 6238T)

<table>
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<td>Lenovo Global Technology</td>
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<td>Test Date:</td>
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<td>Apr-2019</td>
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### Platform Notes

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---

**BIOS configuration:**
- Choose Operating Mode set to Maximum Performance
- Choose Operating Mode set to Custom Mode
- CPU P-state Control set to Autonomous
- Hyper-Threading set to Disable
- Trusted Execution Technology set to Enable
- DCU Streamer Prefetcher set to Disable
- MONITOR/MWAIT set to Enable

**Sysinfo program** /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo

**Rev:** r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9

running on linux-jdx4 Thu May 30 19:11:17 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](https://www.spec.org/cpu2017/Docs/config.html#sysinfo)

**From /proc/cpuinfo**

```
model name : Intel(R) Xeon(R) Gold 6238T CPU @ 1.90GHz
  4 "physical id"s (chips)
  88 "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 : 22
siblings : 22
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
```

**From lscpu:**

```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 88
On-line CPU(s) list: 0-87
Thread(s) per core: 1
Core(s) per socket: 22
Socket(s): 4
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6238T CPU @ 1.90GHz
Stepping: 6
CPU MHz: 1900.000
BogoMIPS: 3800.00
Virtualization: VT-x
```
Lenovo Global Technology
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SPECspeed2017_fp_base = 182
SPECspeed2017_fp_peak = Not Run

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**Platform Notes (Continued)**

L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 30976K
NUMA node0 CPU(s): 0-21
NUMA node1 CPU(s): 22-43
NUMA node2 CPU(s): 44-65
NUMA node3 CPU(s): 66-87

Flags: fpu vme de pse tsc msr pae mce cmov 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 nopl xtopology nonstop_tsc cpuid aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 l1sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault epb cat_l3 cmp_l3 invpcid_single ssbd mba ibrs ibpb stibp tpr_shadow vnmi fpxprio ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ermis invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsavec xmm_cqm xmm_occm_cqm xmm_mbb_total xmm_mbb_local dtherm ida arat pin pts hwp epp pkup ospke avx512_vnni flush_l1d arch_capabilities

/proc/cpuinfo cache data

cache size: 30976 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 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
node 0 size: 193074 MB
node 0 free: 189697 MB
node 1 cpus: 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43
node 1 size: 193515 MB
node 1 free: 192988 MB
node 2 cpus: 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
node 2 size: 193515 MB
node 2 free: 192628 MB
node 3 cpus: 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87
node 3 size: 193512 MB
node 3 free: 193136 MB

node distances:

node 0 1 2 3
0: 10 21 21 21
1: 10 21 21 21
2: 21 10 21 21
3: 21 21 21 10

From /proc/meminfo

MemTotal: 792184704 kB

(Continued on next page)
Lenovo Global Technology
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SPECspeed2017_fp_base = 182
SPECspeed2017_fp_peak = Not Run

Test Date: May-2019
Hardware Availability: Apr-2019
Software Availability: Nov-2018

Platform Notes (Continued)

HugePages_Total:       0
Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
  os-release:
    NAME="SLES"
    VERSION="15"
    VERSION_ID="15"
    PRETTY_NAME="SUSE Linux Enterprise Server 15"
    ID="sles"
    ID_LIKE="suse"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:15"

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 May 30 16:48

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/sda2      xfs   744G   22G  723G   3% /

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 -[PSE121I-1.50]- 03/01/2019
  Memory:
    48x NO DIMM NO DIMM
    48x Samsung M393A2K43CB2-CVF 16 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
  CC  619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)

(Continued on next page)
### Lenovo Global Technology

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---

### Compiler Version Notes (Continued)

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 607.cactuBSSN_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 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_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.

---

**CC 621.wrf_s(base) 627.cam4_s(base) 628.pop2_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:**

```bash
icc -m64 -std=c11
```

**Fortran benchmarks:**

```bash
ifort -m64
```

(Continued on next page)
Base Compiler Invocation (Continued)

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

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

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
## Lenovo Global Technology

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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:

- http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-A.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 CPU2017 v1.0.5 on 2019-05-30 07:11:16-0400.  
Originally published on 2019-07-09.