Lenovo Global Technology
ThinkSystem SR950
(3.80 GHz, Intel Xeon Platinum 8256)

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

Threads

<table>
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<tr>
<th>Spec Number</th>
<th>Threads</th>
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<tr>
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<td>16</td>
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<tr>
<td>607.cactuBSSN_s</td>
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<td>619.lbm_s</td>
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<td>621.wrf_s</td>
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<tr>
<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>
<td>644.nab_s</td>
<td>16</td>
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</tr>
<tr>
<td>649.fotonik3d_s</td>
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</tr>
</tbody>
</table>

Software
OS: SUSE Linux Enterprise Server 15 (x86_64)
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

Hardware
CPU Name: Intel Xeon Platinum 8256
Max MHz.: 3900
Nominal: 3800
Enabled: 16 cores, 4 chips
Orderable: 2,3,4 chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 16.5 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
Lenovo Global Technology
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Results Table

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</tbody>
</table>

SPECspeed2017_fp_base = 94.3
SPECspeed2017_fp_peak = Not Run

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-2017-5715 (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.
## Lenovo Global Technology

**ThinkSystem SR950**  
(3.80 GHz, Intel Xeon Platinum 8256)

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<td>Hardware Availability: Apr-2019</td>
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<tr>
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<td>Software Availability: Nov-2018</td>
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**SPEC CPU2017 Floating Point Speed Result**

<table>
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---

**Platform Notes**

**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
- SNC 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 9 14:04:29 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) Platinum 8256 CPU @ 3.80GHz
  4 "physical id"s (chips)
  16 "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 : 4
  siblings : 4
physical 0: cores 1 5 9 13
physical 1: cores 1 2 5 13
physical 2: cores 2 5 9 13
physical 3: cores 4 8 9 13
```

```
From lscpu:
  Architecture: x86_64
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  CPU(s): 16
  On-line CPU(s) list: 0-15
  Thread(s) per core: 1
  Core(s) per socket: 4
  Socket(s): 4
  NUMA node(s): 4
  Vendor ID: GenuineIntel
  CPU family: 6
  Model: 85
  Model name: Intel(R) Xeon(R) Platinum 8256 CPU @ 3.80GHz
  Stepping: 6
  CPU MHz: 3800.000
  CPU max MHz: 3900.0000
```

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

#### Test System
- **Model:** ThinkSystem SR950
- **CPU:** (3.80 GHz, Intel Xeon Platinum 8256)

#### SPEC CPU2017 Floating Point Speed Result

<table>
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</table>

#### Platform Notes (Continued)

- **CPU min MHz:** 1200.0000
- **BogoMIPS:** 7600.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 16896K
- **NUMA node0 CPU(s):** 0-3
- **NUMA node1 CPU(s):** 4-7
- **NUMA node2 CPU(s):** 8-11
- **NUMA node3 CPU(s):** 12-15
- **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 xtr_quiz pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abtm 3nowprefetch cpuid_fault ebpx cat _l3 cdp _l3 invpcid_single ssbd mba ibpb stibp tpr _shadow vnumi f lexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 etsv invpcid rtm cqm mpx ret _a avx512f avx512dq rdseed adx safepoint clflushopt clwb intel _pt avx512cd avx512bw avx512vl xsaves opt xsaves vpga xgetbv1 xsaves cqm _llc cqm _occup _llc cqm _mbm _total cqm _mbm _local dtm thrm ida arat pin pts pku ospke avx512_vnni flush_lld arch _capabilities

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
- **node 0 size:** 193105 MB
- **node 0 free:** 189773 MB
- **node 1 cpus:** 4 5 6 7
- **node 1 size:** 193515 MB
- **node 1 free:** 193177 MB
- **node 2 cpus:** 8 9 10 11
- **node 2 size:** 193515 MB
- **node 2 free:** 193177 MB
- **node 3 cpus:** 12 13 14 15
- **node 3 size:** 193483 MB
- **node 3 free:** 192568 MB
- **node distances:**
  - **node 0:** 10 21 21 21
  - **node 1:** 21 10 21 21
  - **node 2:** 21 21 10 21
  - **node 3:** 21 21 21 10

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR950
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<td>Nov-2018</td>
</tr>
</tbody>
</table>

Platform Notes (Continued)

From /proc/meminfo

MemTotal:       792186792 kB
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 9 11:38

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)
Lenovo Global Technology  
ThinkSystem SR950  
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Compiler Version Notes

==============================================================================
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<td>Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,</td>
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Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

(Continued on next page)
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SPECspeed2017_fp_base = 94.3
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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

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
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
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

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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-A.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-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 2019-05-09 02:04:28-0400.
Originally published on 2019-06-11.