**Lenovo Global Technology**

ThinkSystem SR850  
(2.20 GHz, Intel Xeon Platinum 8253)

---

**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Test Date:** May-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Dec-2018

---

**Threads**

<table>
<thead>
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<th>Value</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
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<tr>
<td>602.gcc_s</td>
<td>128</td>
</tr>
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<td>605.mcf_s</td>
<td>128</td>
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<tr>
<td>620.omnetpp_s</td>
<td>128</td>
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<tr>
<td>623.xalancbmk_s</td>
<td>128</td>
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<tr>
<td>625.x264_s</td>
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<td>631.deepsjeng_s</td>
<td>128</td>
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<td>641.leela_s</td>
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<tr>
<td>648.exchange2_s</td>
<td>128</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>128</td>
</tr>
</tbody>
</table>

---

**Hardware**

- **CPU Name:** Intel Xeon Platinum 8253  
- **Max MHz.:** 3000  
- **Nominal:** 2200  
- **Enabled:** 64 cores, 4 chips, 2 threads/core  
- **Orderable:** 2,4 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  
- **Memory:** 1536 GB (48 x 32 GB 2Rx4 PC4-2933Y-R)  
- **Storage:** 800 GB tmpfs  
- **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 TEE135T 2.10 released Mar-2019  
- **File System:** tmpfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **Other:** jemalloc memory allocator V5.0.1
Lenovo Global Technology
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
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SPECspeed2017_int_base = 7.90
SPECspeed2017_int_peak = Not Run

Results Table

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

SPECspeed2017_int_base = 7.90
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"
Tmpfs filesystem can be set with:
 mount -t tmpfs -o size=800g tmpfs /home
Process tuning setting:
echo 50000 > /proc/sys/kernel/sched_cfs_bandwidth_slice_us
echo 240000000 > /proc/sys/kernel/sched_latency_ns
echo 5000000 > /proc/sys/kernel/sched_migration_cost_ns
echo 100000000 > /proc/sys/kernel/sched_min_granularity_ns
echo 150000000 > /proc/sys/kernel/sched_wakeup_granularity_ns

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 = "/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.

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

**ThinkSystem SR850**  
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**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Test Date:** May-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Dec-2018

---

**General Notes (Continued)**

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.  


---

**Platform Notes**

- **BIOS configuration:**  
  - Choose Operating Mode set to Maximum Performance  
  - Choose Operating Mode set to Custom Mode  
  - C-states set to Legacy  
  - Trusted Execution Technology set to Enable  
  - Sysinfo program /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo  
  - Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9 running on linux-hxhl Thu May 16 10:37:42 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 8253 CPU @ 2.20GHz
  - 4 "physical id"s (chips)
  - 128 "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
    - physical 2: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
    - physical 3: 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): 128
  - On-line CPU(s) list: 0-127
  - Thread(s) per core: 2
  - Core(s) per socket: 16

(Continued on next page)
Lenovo Global Technology
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SPECspeed2017_int_base = 7.90
SPECspeed2017_int_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Hardware Availability: Apr-2019
Tested by: Lenovo Global Technology
Software Availability: Dec-2018
Test Date: May-2019

Platform Notes (Continued)

Socket(s): 4
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8253 CPU @ 2.20GHz
Stepping: 6
CPU MHz: 2200.000
CPU max MHz: 3000.0000
CPU min MHz: 1000.0000
BoGoMIPS: 4400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K
NUMA node0 CPU(s): 0-15,64-79
NUMA node1 CPU(s): 16-31,80-95
NUMA node2 CPU(s): 32-47,96-111
NUMA node3 CPU(s): 48-63,112-127
Flags: fpu vme de pse tsc msr pae mce 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 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 abmlat d3nowprefetch cpuid_fault epb cat_l3 cdp_l3

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 22 23 24 25 26 27 28 29 30 31 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95
node 0 size: 386663 MB
node 0 free: 386240 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95
node 1 size: 387026 MB
node 1 free: 373813 MB
node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 96 97 98 99 100 101 102

(Continued on next page)
SPEC CPU2017 Integer Speed Result

Lenovo Global Technology
ThinkSystem SR850
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SPECspeed2017_int_base =  7.90
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CPU2017 License:  9017
Test Sponsor:  Lenovo Global Technology
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Test Date:  May-2019
Hardware Availability:  Apr-2019
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Platform Notes (Continued)

103 104 105 106 107 108 109 110 111
node 2 size: 387055 MB
node 2 free: 386791 MB
node 3 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127
node 3 size: 387052 MB
node 3 free: 386788 MB
node distances:
node 0 1 2 3
 0: 10 21 21 31
 1: 21 10 31 21
 2: 21 31 10 21
 3: 31 21 21 10

From /proc/meminfo
MemTotal: 1584946072 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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_FW

run-level 3 May 16 10:29

(Continued on next page)
## Lenovo Global Technology

### Test Summary

**Lenovo Global Technology**  
ThinkSystem SR850  
(2.20 GHz, Intel Xeon Platinum 8253)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<td>Specspeed2017_int_base</td>
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</tbody>
</table>

### Platform Notes (Continued)

SPEC is set to: /home/cpu2017-1.0.5-icc19.0u1

```
Filesystem  Type  Size  Used  Avail  Use% Mounted on
tmpfs        tmpfs  800G  8.3G  792G   2%  /home
```

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 -[TEE135T-2.10]- 03/21/2019  
**Memory:**  
48x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

### Compiler Version Notes

```
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.
```

---

**Standard Performance Evaluation Corporation**  
(impact@spec.org)  
https://www.spec.org/
Lenovo Global Technology
ThinkSystem SR850
(2.20 GHz, Intel Xeon Platinum 8253)

**SPEC CPU2017 Integer Speed Result**

<table>
<thead>
<tr>
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<tbody>
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**SPECspeed2017_int_base = 7.90**

**SPECspeed2017_int_peak = Not Run**

**Test Date:** May-2019
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---

### Base Compiler Invocation

C benchmarks:
- `icc -m64 -std=c11`

C++ benchmarks:
- `icpc -m64`

Fortran benchmarks:
- `ifort -m64`

---

### Base Portability Flags

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench_s</td>
<td><code>--DSPEC_LP64 --DSPEC_LINUX_X64</code></td>
</tr>
<tr>
<td>gcc_s</td>
<td><code>--DSPEC_LP64</code></td>
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<tr>
<td>mcf_s</td>
<td><code>--DSPEC_LP64</code></td>
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</tr>
<tr>
<td>xz_s</td>
<td><code>--DSPEC_LP64</code></td>
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</tbody>
</table>

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### Base Optimization Flags

#### C benchmarks:
- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=4 -gopenmp -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`
## SPEC CPU2017 Integer Speed Result

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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:


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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 2019-05-15 22:37:41-0400.  
Originally published on 2019-06-11.