## Lenovo Global Technology

**ThinkSystem SR950**  
(2.50 GHz, Intel Xeon Platinum 8180)

### SPECspeed2017_int_base = 9.29

**SPECspeed2017_int_peak = Not Run**

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>Aug-2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Sep-2017</td>
</tr>
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<td>Software Availability:</td>
<td>May-2018</td>
</tr>
</tbody>
</table>

### Lenovo Global Technology

**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology

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### Threads

<table>
<thead>
<tr>
<th>Specmark</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>168</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>168</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>168</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>168</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>168</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>168</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>168</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>168</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>168</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>168</td>
</tr>
</tbody>
</table>

**SPECspeed2017_int_base (9.29)**

---

### Hardware

- **CPU Name:** Intel Xeon Platinum 8180  
- **Max MHz.:** 3800  
- **Enabled:** 168 cores, 6 chips  
- **Orderable:** 2,3,4,6,8 chips  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **L2:** 1 MB I+D on chip per core  
- **L3:** 38.5 MB I+D on chip per chip  
- **Memory:** 2304 GB (72 x 32 GB 2Rx4 PC4-2666V-R)  
- **Storage:** 1 x 800 GB SAS SSD  
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 12 SP2 (x86_64)  
- **Compiler:** C/C++: Version 18.0.2.199 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.2.199 of Intel Fortran Compiler for Linux  
- **Parallel:** Yes  
- **Firmware:** Lenovo BIOS Version PSE113P 1.30 released Jun-2018  
- **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
Lenovo Global Technology  
ThinkSystem SR950  
(2.50 GHz, Intel Xeon Platinum 8180)

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

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak Threads</th>
<th>Seconds</th>
<th>Ratio</th>
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<tr>
<td>600.perlbench_s</td>
<td>168</td>
<td>278</td>
<td>6.39</td>
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<td>6.41</td>
<td>276</td>
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<tr>
<td>602.gcc_s</td>
<td>168</td>
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<td>9.87</td>
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<td>9.80</td>
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<tr>
<td>605.mcf_s</td>
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<tr>
<td>620.omnetpp_s</td>
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<tr>
<td>625.x264_s</td>
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<td><strong>11.7</strong></td>
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<tr>
<td>631.deepsjeng_s</td>
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<tr>
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<td>216</td>
<td>13.6</td>
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<tr>
<td>657.xz_s</td>
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<td><strong>25.4</strong></td>
<td>244</td>
<td>25.4</td>
<td>242</td>
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<td></td>
<td></td>
</tr>
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**SPECspeed2017_int_base** = **9.29**  
**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-ic18.0u2/lib/ia32:/home/cpu2017-1.0.5-ic18.0u2/lib/intel64"  
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/cpu2017-1.0.5-ic18.0u2/je5.0.1-32:/home/cpu2017-1.0.5-ic18.0u2/je5.0.1-64"  
OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i7-6700K 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.  
jemalloc, a general purpose malloc implementation  
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5  
**Lenovo Global Technology**

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## SPEC CPU2017 Integer Speed Result

**SPECspeed2017_int_base** = 9.29  
**SPECspeed2017_int_peak** = Not Run

### Platform Notes

- BIOS configuration:  
  - Choose Operating Mode set to Max Performance  
  - Choose Operating Mode set to Custom Mode  
  - C-States set to Legacy  
  - Hyper-Threading set to Disable  
  - Intel Virtualization Technology set to Disable  
  - Uncore Frequency Scaling set to Disable  
  - UPI Prefetcher set to Disable  
  - Stale A to S set to Enable

- Sysinfo program /home/cpu2017-1.0.5-ic18.0u2/bin/sysinfo  
  Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9  
  running on linux-s8se Tue Aug 7 09:48:43 2018

- 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 8180 CPU @ 2.50GHz  
  - 6 "physical id"s (chips)  
  - 168 "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: 28  
    - siblings: 28  
    - physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30  
    - physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30  
    - physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30  
    - physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30  
    - physical 4: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30  
    - physical 5: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30

- From lscpu:
  - Architecture: x86_64  
  - CPU op-mode(s): 32-bit, 64-bit  
  - Byte Order: Little Endian  
  - CPU(s): 168  
  - On-line CPU(s) list: 0-167  
  - Thread(s) per core: 1  
  - Core(s) per socket: 28  
  - Socket(s): 6

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

**Lenovo Global Technology**

**ThinkSystem SR950**

(2.50 GHz, Intel Xeon Platinum 8180)

**SPECspeed2017_int_base =** 9.29

**SPECspeed2017_int_peak =** Not Run

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**Platform Notes (Continued)**

| NUMA node(s):          | 6 |
| Vendor ID:             | GenuineIntel |
| CPU family:            | 6 |
| Model:                 | 85 |
| Model name:            | Intel(R) Xeon(R) Platinum 8180 CPU @ 2.50GHz |
| Stepping:              | 4 |
| CPU MHz:               | 2494.135 |
| BogoMIPS:              | 4988.27 |
| Virtualization:        | VT-x |
| L1d cache:             | 32K |
| L1i cache:             | 32K |
| L2 cache:              | 1024K |
| L3 cache:              | 39424K |
| NUMA node0 CPU(s):     | 0–27 |
| NUMA node1 CPU(s):     | 28–55 |
| NUMA node2 CPU(s):     | 56–83 |
| NUMA node3 CPU(s):     | 84–111 |
| NUMA node4 CPU(s):     | 112–139 |
| NUMA node5 CPU(s):     | 140–167 |

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 art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu nni 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 ida arat epb invpcid_single pln pts dtherm intel_pt rsb_ctxsw spec_ctrl stibp ssbd retpoline kaiser tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erts invpcd rtm cqm mpx avx512f avx512dq rdseed adx smap ciflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc

/proc/cpuinfo cache data

```
cache size : 39424 KB
```

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

```
available: 6 nodes (0-5)
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
node 0 size: 386505 MB
node 0 free: 385911 MB
node 1 cpus: 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55
node 1 size: 387049 MB
node 1 free: 386704 MB
node 2 cpus:  56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83
node 2 size: 387049 MB
node 2 free: 386759 MB
```

(Continued on next page)
SPEC CPU2017 Integer Speed Result

Lenovo Global Technology

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Platform Notes (Continued)

node 3 cpus: 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111
node 3 size: 387049 MB
node 3 free: 386790 MB
node 4 cpus: 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139
node 4 size: 387049 MB
node 4 free: 386752 MB
node 5 cpus: 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167
node 5 size: 387045 MB
node 5 free: 386596 MB
node distances:
node 0 1 2 3 4 5
0: 10 21 31 21 21 20
1: 21 10 21 31 31 20
2: 31 21 10 21 31 20
3: 21 31 21 10 31 20
4: 21 31 31 31 10 20
5: 20 20 20 20 20 10

From /proc/meminfo
MemTotal: 2377472720 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 2
  # 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-SP2"
    VERSION_ID="12.2"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
  Linux linux-s8se 4.4.121-92.80-default #1 SMP Mon May 21 14:40:10 UTC 2018 (2afdd00)
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

(Continued on next page)
Lenovo Global Technology
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Platform Notes (Continued)

CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

run-level 3 Aug 7 09:47

SPEC is set to: /home/cpu2017-1.0.5-ic18.0u2
Filesyst  Type Size Used Avail Use% Mounted on
/dev/sdb3 xfs 743G 166G 578G 23% /

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 -[PSE113P-1.30]- 06/14/2018
Memory:
24x NO DIMM NO DIMM
72x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base)
657.xz_s(base)
==============================================================================

icc (ICC) 18.0.2 20180210
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)
==============================================================================

icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
FC 648.exchange2_s(base)
==============================================================================

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
Lenovo Global Technology
ThinkSystem SR950
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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
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs
-L/usr/local/je5.0.1-64/lib -ljemalloc
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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/Intel-ic18.0-official-linux64.2017-12-21.xml
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-SKL-H.xml

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Tested with SPEC CPU2017 v1.0.5 on 2018-08-06 21:48:42-0400.
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