**Lenovo Global Technology**

**ThinkSystem SR850**

(2.50 GHz, Intel Xeon Gold 5215M)

**SPECspeed2017_int_base = 8.55**

**SPECspeed2017_int_peak = Not Run**

<table>
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<th>Threads</th>
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<tr>
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<td>605.mcf_s</td>
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<tr>
<td>620.omnetpp_s</td>
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</tr>
<tr>
<td>623.xalancbmk_s</td>
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<tr>
<td>625.x264_s</td>
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<td>631.deepsjeng_s</td>
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<tr>
<td>641.leela_s</td>
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</tr>
<tr>
<td>648.exchange2_s</td>
<td>80</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>80</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Gold 5215M
- **Max MHz.:** 3400
- **Nominal:** 2500
- **Enabled:** 40 cores, 4 chips, 2 threads/core
- **Orderable:** 2,4 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:** 13.75 MB I+D on chip per chip
- **Other:** None
- **Memory:** 1536 GB (48 x 32 GB 2Rx4 PC4-2666V-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
## SPEC CPU2017 Integer Speed Result

**Lenovo Global Technology**  
ThinkSystem SR850  
(2.50 GHz, Intel Xeon Gold 5215M)

** verbose**

<table>
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<th>Base Seconds</th>
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<td><strong>287</strong></td>
<td><strong>21.6</strong></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**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 2400000000 > /proc/sys/kernel/sched_latency_ns  
- echo 5000000 > /proc/sys/kernel/sched_migration_cost_ns  
- echo 1000000000 > /proc/sys/kernel/sched_min_granularity_ns  
- echo 1500000000 > /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 = "$LD_LIBRARY_PATH:/home/cpu2017-1.0.5-ic19.0u1/je5.0.1-64"  
- 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)
**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.

jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

---

**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 Tue May 7 11:47:08 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 5215M CPU @ 2.50GHz
4 "physical id"s (chips)
80 "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 : 10
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12
physical 2: cores 0 1 2 3 4 8 9 10 11 12
physical 3: cores 0 1 2 3 4 8 9 10 11 12
```

From lscpu:

```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 80
On-line CPU(s) list: 0-79
Thread(s) per core: 2
Core(s) per socket: 10
```

(Continued on next page)
SPEC CPU2017 Integer Speed Result
Copyright 2017-2019 Standard Performance Evaluation Corporation

Lenovo Global Technology
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(2.50 GHz, Intel Xeon Gold 5215M)

SPECspeed2017_int_base = 8.55
SPECspeed2017_int_peak = Not Run

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

Platform Notes (Continued)

Socket(s): 4
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5215M CPU @ 2.50GHz
Stepping: 6
CPU MHz: 2500.000
CPU max MHz: 3400.0000
CPU min MHz: 1000.0000
BogoMIPS: 5000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 14080K
NUMA node0 CPU(s): 0-9,40-49
NUMA node1 CPU(s): 10-19,50-59
NUMA node2 CPU(s): 20-29,60-69
NUMA node3 CPU(s): 30-39,70-79
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpl 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
aperfmpref pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrm pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avxf16c rdrand lahf_lm abtm 3nowprefetch cpuid_fault epb cat_l3 cdp_l3
invpcid_single ssbd mba ibrs ibpb stibp tpr_shadow vnumi flexpriority ept vpid
fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rd_MAP avx512f
avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaves opt xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local
dtherm ida arat pni pku ospke avx512_vnni flush_l1d 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 4 5 6 7 8 9 40 41 42 43 44 45 46 47 48 49
node 0 size: 386666 MB
node 0 free: 377068 MB
node 1 cpus: 10 11 12 13 14 15 16 17 18 19 50 51 52 53 54 55 56 57 58 59
node 1 size: 387057 MB
node 1 free: 383758 MB
node 2 cpus: 20 21 22 23 24 25 26 27 28 29 60 61 62 63 64 65 66 67 68 69
node 2 size: 387028 MB
node 2 free: 386126 MB

(Continued on next page)
SPEC CPU2017 Integer Speed Result

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| SPECspeed2017_int_base = | 8.55 |
| SPECspeed2017_int_peak = | Not Run |

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

Platform Notes (Continued)

node 3 cpus: 30 31 32 33 34 35 36 37 38 39 70 71 72 73 74 75 76 77 78 79
node 3 size: 387055 MB
node 3 free: 386836 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: 1584955332 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 7 11:29

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1

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

(Continued on next page)
Lenovo Global Technology  
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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

### Platform Notes (Continued)

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 SM BIOS" standard.

BIOS Lenovo -[TEE135T-2.10]- 03/21/2019  
Memory:  
48x 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)
```

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.

### Base Compiler Invocation

C benchmarks:  
icc -m64 -std=c11
Lenovo Global Technology
ThinkSystem SR850 (2.50 GHz, Intel Xeon Gold 5215M)

**SPEC CPU2017 Integer Speed Result**

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**SPECspeed2017_int_base = 8.55**

**SPECspeed2017_int_peak = Not Run**

**Base Compiler Invocation (Continued)**

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:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-1/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
-1/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

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
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**Test Date:** May-2019  
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You can also download the XML flags sources by saving the following links: