# SPEC® CPU2017 Integer Speed Result

**Lenovo Global Technology**

ThinkSystem SR860  
(2.50 GHz, Intel Xeon Gold 5215M)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>8.52</th>
</tr>
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<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>Not Run</td>
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</table>

**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>
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<tr>
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</tr>
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<tbody>
<tr>
<td>600.iperbench_s 40</td>
<td>5.81</td>
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<tr>
<td>602.gcc_s 40</td>
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<td>605.mcf_s 40</td>
<td>11.13</td>
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<td>620.omnetpp_s 40</td>
<td>5.53</td>
</tr>
<tr>
<td>625.xalancbmk_s 40</td>
<td>10.9</td>
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<tr>
<td>625.x264_s 40</td>
<td>11.8</td>
</tr>
<tr>
<td>631.deepsjeng_s 40</td>
<td>4.78</td>
</tr>
<tr>
<td>641 llela_s 40</td>
<td>4.16</td>
</tr>
<tr>
<td>648.exchange2_s 40</td>
<td>12.2</td>
</tr>
<tr>
<td>657.xz_s 40</td>
<td></td>
</tr>
</tbody>
</table>

## Hardware

- **CPU Name:** Intel Xeon Gold 5215M  
- **Max MHz.:** 3400  
- **Nominal:** 2500  
- **Enabled:** 40 cores, 4 chips  
- **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:** 13.75 MB I+D on chip per chip  
- **Memory:** 768 GB (48 x 16 GB 2Rx8 PC4-2666V-R)  
- **Storage:** 800 GB tmpfs  
- **Other:** None  
- **Orderable:** 2,4 chips  

## 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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### Results Table

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<tr>
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<th>Ratio</th>
<th>Peeks</th>
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**SPECspeed2017_int_base = 8.52**

**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 = "$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)
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Tested by: Lenovo Global Technology
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.

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
Hyper-Threading set to Disable
Adjacent Cache Prefetch set to Disable
MONITOR/MWAIT set to Enable
Sysinfo program /home/cpu2017-1.0.5-ic19.0ul/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-61sv Wed May 15 09:15:10 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)
40 "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 : 10
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): 40
On-line CPU(s) list: 0-39
Thread(s) per core: 1

(Continued on next page)
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SPECspeed2017_int_base = 8.52
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Platform Notes (Continued)

Core(s) per socket: 10
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
NUMA node1 CPU(s): 10-19
NUMA node2 CPU(s): 20-29
NUMA node3 CPU(s): 30-39

Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acp1 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 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 cpuid_fault epb cat_l3 cdp_l3 invpcid_single ssbd ibsd ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rdtcm rdt_a avx512f pti tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rdtcm rdt_a avx512f pti tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rdtcm rdt_a avx512f pti tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rdtcm rdt_a avx512f pti tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rdtcm rdt_a avx512f pti tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rdtcm rdt_a avx512f
proc/cpuinfo cache data
  cache size : 14080 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
node 0 size: 19315 MB
node 0 free: 192831 MB
node 1 cpus: 10 11 12 13 14 15 16 17 18 19
node 1 size: 193523 MB
node 1 free: 193230 MB
node 2 cpus: 20 21 22 23 24 25 26 27 28 29
node 2 size: 193523 MB

(Continued on next page)
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**Platform Notes (Continued)**

- node 2 free: 184474 MB
- node 3 cpus: 30 31 32 33 34 35 36 37 38 39
- node 3 size: 193492 MB
- node 3 free: 189311 MB
- node distances:
  - node 0: 10 21 21 31
  - node 1: 21 10 31 21
  - node 2: 21 31 10 21
  - node 3: 31 21 21 10

From /proc/meminfo
- MemTotal: 792242784 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 15 09:11

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1
Filesystem Type Size Used Avail Use% Mounted on

(Continued on next page)
## Lenovo Global Technology

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### Platform Notes (Continued)

```
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 M393A2K43BB1-CTD 16 GB 2 rank 2666

(End of data from sysinfo program)

### Compiler Version Notes

```
--- Compiler Invocation ---
```

**C**

```
600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_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.

---

**C++**

```
620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_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.

---

**Fortran**

```
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
```

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### Base Compiler Invocation (Continued)

**C++ benchmarks:**  
```plaintext```
icpc -m64
```

**Fortran benchmarks:**  
```plaintext```
ifort -m64
```

### Base Portability Flags

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<tr>
<th>Benchmark</th>
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<td>-DSPEC_LP64 -DSPEC_LINUX_X64</td>
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### Base Optimization Flags

**C benchmarks:**
```plaintext```
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP  
-L/usr/local/je5.0.1-64/lib -ljemalloc
```

**C++ benchmarks:**
```plaintext```
-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:**
```plaintext```
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4  
-nostandard-realloc-1hs
```

The flags files that were used to format this result can be browsed at:

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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.

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