# SPEC CPU®2017 Integer Speed Result

## Lenovo Global Technology

**ThinkSystem SR860**  
(2.60 GHz, Intel Xeon Gold 6240M)

### SPECspeed®2017_int_base = 10.2

**SPECspeed®2017_int_peak = Not Run**

| Software | OS: SUSE Linux Enterprise Server 12 SP4 (x86_64)  
Kernel 4.12.14-94.41-default  
Compiler: C/C++: Version 19.0.4.227 of Intel C/C++  
Compiler for Linux;  
Fortran: Version 19.0.4.227 of Intel Fortran  
Compiler for Linux  
Parallel: Yes  
Firmware: Lenovo BIOS Version TEE142E 2.30 released Aug-2019 tested as TEE141E 2.30 Jul-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  
Power Management: -- |
|---|
| Hardware | CPU Name: Intel Xeon Gold 6240M  
Max MHz: 3900  
Nominal: 2600  
Enabled: 72 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: 24.75 MB I+D on chip per chip  
Other: None  
Memory: 1556 GB (48 x 32 GB 2Rx4 PC4-2933Y-R)  
Storage: 800 GB tmpfs  
Other: None |

## Lenovo Global Technology

**Test Sponsor:** Lenovo Global Technology

**Test Date:** Aug-2019

**Hardware Availability:** Jul-2019

**Software Availability:** May-2019

### Threads

<table>
<thead>
<tr>
<th>Program</th>
<th>Baseline</th>
<th>Peak</th>
<th>Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>0.93</td>
<td>5.84</td>
<td>72</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>0.73</td>
<td>9.73</td>
<td>72</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>0.44</td>
<td>12.4</td>
<td>72</td>
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<tr>
<td>620.omnetpp_s</td>
<td>0.44</td>
<td>7.64</td>
<td>72</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>0.44</td>
<td>12.4</td>
<td>72</td>
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<tr>
<td>625.x264_s</td>
<td>0.44</td>
<td>14.1</td>
<td>72</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>0.44</td>
<td>5.38</td>
<td>72</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>0.44</td>
<td>4.78</td>
<td>72</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>0.44</td>
<td>16.7</td>
<td>72</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>0.44</td>
<td>24.8</td>
<td>72</td>
</tr>
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</table>

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### SPECspeed®2017_int_base (10.2)

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### Hardware

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### Software

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SPEC CPU®2017 Integer Speed Result

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Lenovo Global Technology
ThinkSystem SR860
(2.60 GHz, Intel Xeon Gold 6240M)

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
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<td>16.7</td>
<td>178</td>
<td>16.5</td>
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<tr>
<td>657.xz_s</td>
<td>72</td>
<td>250</td>
<td>24.8</td>
<td>250</td>
<td>24.8</td>
<td>250</td>
<td>24.8</td>
</tr>
</tbody>
</table>

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-ic19.0u4/lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/cpu2017-1.0.5-ic19.0u4/je5.0.1-64"
OMP_STACKSIZE = "192M"
Binaries compiled on a system with 1x Intel Core i9-799X 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.  

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
Symsinfo program /home/cpu2017-1.0.5-ic19.0u4/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9
running on linux-61sv Tue Aug 27 16:45:26 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 6240M CPU @ 2.60GHz
  4 "physical id"s (chips)
    72 "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: 18
siblings: 18
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 2: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 3: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 72
On-line CPU(s) list: 0-71
Thread(s) per core: 1
### Lenovo Global Technology

ThinkSystem SR860
(2.60 GHz, Intel Xeon Gold 6240M)

**Core(s) per socket:** 18  
**Socket(s):** 4  
**NUMA node(s):** 4  
**Vendor ID:** GenuineIntel  
**CPU family:** 6  
**Model:** 85  
**Model name:** Intel(R) Xeon(R) Gold 6240M CPU @ 2.60GHz

**Stepping:** 7  
**CPU MHz:** 2600.000  
**CPU max MHz:** 3900.0000  
**CPU min MHz:** 1000.0000

**BogoMIPS:** 5200.00  
**Virtualization:** VT-x  
**L1d cache:** 32K  
**L1i cache:** 32K  
**L2 cache:** 1024K  
**L3 cache:** 25344K

**NUMA node0 CPU(s):** 0-17  
**NUMA node1 CPU(s):** 18-35  
**NUMA node2 CPU(s):** 36-53  
**NUMA node3 CPU(s):** 54-71

**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 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 dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abrdi ase cpuid_fault epb cat_l3 cdp_l3 invpcid_single intel_ppcin ssbd mba ibrs ibpb stibp tpr_shadow vmmi flexpriority ept vpid fsgsb base tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cmp mxp rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaves opt xsaveopt xsavec xgetbv xsavec xsaveopt scqt lsq

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  
 node 0 size: 386665 MB  
 node 0 free: 374947 MB  
 node 1 cpus: 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35  
 node 1 size: 387029 MB  
 node 1 free: 385186 MB  
 node 2 cpus: 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53  
 node 2 size: 387058 MB
```

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### Lenovo Global Technology

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**SPECspeed®2017_int_base = 10.2**  
**SPECspeed®2017_int_peak = Not Run**

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#### Platform Notes (Continued)

- **node 2 free:** 386849 MB
- **node 3 cpus:** 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71
- **node 3 size:** 387055 MB
- **node 3 free:** 386847 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:` 1584955612 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
  - 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 Aug 27 16:41

- SPEC is set to: /home/cpu2017-1.0.5-ic19.0u4
  - Filesystem | Type | Size | Used | Avail | Use% | Mounted on
  
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<th>CPU2017 License: 9017</th>
<th>Test Date: Aug-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: Lenovo Global Technology</td>
<td>Hardware Availability: Jul-2019</td>
</tr>
<tr>
<td>Tested by: Lenovo Global Technology</td>
<td>Software Availability: May-2019</td>
</tr>
</tbody>
</table>

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 -[TEE141E-2.30]- 07/02/2019
Memory:
48x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

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C       | 600.perlbenc_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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
---

C++     | 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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 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 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
---

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

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SPEC CPU®2017 Integer Speed Result

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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 -gopenmp -DSPEC_OPENMP
-ipo -qopt-mem-layout-trans=4

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-ipo -qopt-mem-layout-trans=4

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-D.html
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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-D.xml](http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-D.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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