## Lenovo Global Technology

### ThinkSystem SD650

(2.10 GHz, Intel Xeon Gold 6238M)

---

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>9.83</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

- **CPU2017 License:** 9017
- **Test Sponsor:** Lenovo Global Technology
- **Tested by:** Lenovo Global Technology
- **Test Date:** Oct-2019
- **Hardware Availability:** Jul-2019
- **Software Availability:** May-2019

### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base (9.83)</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>88</td>
<td></td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>88</td>
<td>9.57</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>88</td>
<td>12.1</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>88</td>
<td>8.07</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>88</td>
<td>11.8</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>88</td>
<td>13.7</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>88</td>
<td>5.51</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>88</td>
<td>4.52</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>88</td>
<td>15.8</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>88</td>
<td>23.1</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon Gold 6238M
- **Max MHz:** 3700
- **Nominal:** 2100
- **Enabled:** 44 cores, 2 chips, 2 threads/core
- **Orderable:** 1,2 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:** 30.25 MB I+D on chip per chip
- **Other:** None
- **Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)
- **Storage:** 1 x 960 GB SATA SSD
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 12 SP4 (x86_64)
- **Kernel:** 4.12.14-94.41-default
- **Compiler:** C/C++: Version 19.0.4.227 of Intel C/C++
- **Compiler for Linux:** Intel Fortran
- **Compiler for Fortran:** Yes
- **Firmware:** Lenovo BIOS Version OTE142F 2.30 released Aug-2019 tested as OTE141F 2.30 Jul-2019
- **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
- **Power Management:** --
Lenovo Global Technology
ThinkSystem SD650
(2.10 GHz, Intel Xeon Gold 6238M)

SPECspeed®2017_int_base = 9.83
SPECspeed®2017_int_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>88</td>
<td>274</td>
<td>6.47</td>
<td>272</td>
<td>6.52</td>
<td>270</td>
<td>6.57</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>88</td>
<td>416</td>
<td>9.57</td>
<td>423</td>
<td>9.41</td>
<td>414</td>
<td>9.63</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>88</td>
<td>391</td>
<td>12.1</td>
<td>394</td>
<td>12.0</td>
<td>389</td>
<td>12.1</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>88</td>
<td>202</td>
<td>8.07</td>
<td>203</td>
<td>8.03</td>
<td>197</td>
<td>8.27</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>88</td>
<td>121</td>
<td>11.7</td>
<td>120</td>
<td>11.8</td>
<td>119</td>
<td>11.9</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>88</td>
<td>129</td>
<td>13.7</td>
<td>129</td>
<td>13.7</td>
<td>129</td>
<td>13.7</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>88</td>
<td>275</td>
<td>5.21</td>
<td>275</td>
<td>5.21</td>
<td>274</td>
<td>5.22</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>88</td>
<td>378</td>
<td>4.52</td>
<td>378</td>
<td>4.51</td>
<td>378</td>
<td>4.52</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>88</td>
<td>186</td>
<td>15.8</td>
<td>188</td>
<td>15.6</td>
<td>186</td>
<td>15.8</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>88</td>
<td>268</td>
<td>23.1</td>
<td>268</td>
<td>23.1</td>
<td>268</td>
<td>23.1</td>
</tr>
</tbody>
</table>

SPECspeed®2017_int_base = 9.83
SPECspeed®2017_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-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.
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

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD650
(2.10 GHz, Intel Xeon Gold 6238M)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>9017</th>
<th>Test Date:</th>
<th>Oct-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
<td>Hardware Availability:</td>
<td>Jul-2019</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
<td>Software Availability:</td>
<td>May-2019</td>
</tr>
</tbody>
</table>

### SPEC CPU®2017 Integer Speed Result

**SPECspeed®2017_int_base = 9.83**

**SPECspeed®2017_int_peak = Not Run**

General Notes (Continued)


Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
Memory Power Management set to Automatic
C-States set to Legacy
Adjacent Cache Prefetch set to Disable
Sysinfo program /home/cpu2017-1.0.5-ic19.0u4/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-55rv Sat Oct 5 04:45:19 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 6238M CPU @ 2.10GHz
  2 "physical id"s (chips)
  88 "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 : 22
siblings : 44
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 88
On-line CPU(s) list: 0-87
Thread(s) per core: 2
Core(s) per socket: 22
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6238M CPU @ 2.10GHz
Stepping: 7
CPU MHz: 2100.000
CPU max MHz: 3700.0000
CPU min MHz: 1000.0000

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD650
(2.10 GHz, Intel Xeon Gold 6238M)

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base =</th>
<th>9.83</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_int_peak =</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

BogoMIPS: 4200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 30976K
NUMA node0 CPU(s): 0-21,44-65
NUMA node1 CPU(s): 22-43,66-87
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge 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 ntopology nonstop_tsc cpuid
aperfmonitor pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3
invpcid_single intel_pme ssbd mba ibrs ibpb tpr_shadow vnmi flexpriority ept
vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdт_a
avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsaves xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local
dtherm ida arat pin pts pku ospke avx512_vnni flush_lld arch_capabilities

```
/proc/cpuinfo cache data
  cache size: 30976 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
  available: 2 nodes (0-1)
  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 44 45 46 47 48 49
  50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
  node 0 size: 193090 MB
  node 0 free: 192647 MB
  node 1 cpus: 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 66 67 68
  69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87
  node 1 size: 193504 MB
  node 1 free: 192605 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10

From /proc/meminfo
  MemTotal: 395872912 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  SuSE-release:
    SUSE Linux Enterprise Server 12 (x86_64)
```

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD650
(2.10 GHz, Intel Xeon Gold 6238M)

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

Platform Notes (Continued)

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 Oct 5 04:40

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u4

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 -[OTE141F-2.30]- 07/02/2019
Memory:
4x NO DIMM NO DIMM
12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

Compiler Version Notes

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD650
(2.10 GHz, Intel Xeon Gold 6238M)

SPECSpeed®2017_int_base = 9.83
SPECSpeed®2017_int_peak = Not Run

Compiler Version Notes (Continued)

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

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

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD650
(2.10 GHz, Intel Xeon Gold 6238M)

SPECspeed®2017_int_base =  9.83
SPECspeed®2017_int_peak = Not Run

Lenovo Global Technology

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Test Date: Oct-2019
Tested by: Lenovo Global Technology
Hardware Availability: Jul-2019
Software Availability: May-2019

Base Portability Flags (Continued)

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
-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_2019.4.227/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-F.html

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-F.xml

SPEC CPU and SPECspeed are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2017 v1.0.5 on 2019-10-05 04:45:18-0400.
Originally published on 2019-10-29.