# Lenovo Global Technology

ThinkSystem SD650  
(2.70 GHz, Intel Xeon Platinum 8270)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base = 10.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak = Not Run</td>
</tr>
</tbody>
</table>

## Hardware

- **CPU Name**: Intel Xeon Platinum 8270  
  - Max MHz.: 4000  
  - Nominal: 2700  
  - Enabled: 52 cores, 2 chips, 2 threads/core  
  - Orderable: 1,2 chips  
  - Cache L1: 32 KB I + 32 KB D on chip per core  
  - L2: 1 MB I+D on chip per core  
  - L3: 35.75 MB I+D on chip per chip  
  - Other: None  
- **Memory**: 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)  
- **Storage**: 1 x 480 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 19.0.1.144 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 OTE135R 2.10 released Feb-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

## Test Details

- **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

The table below shows the SPECspeed2017_int_base results for various benchmarks:

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>10.2</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>12.8</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>9.17</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>12.7</td>
</tr>
<tr>
<td>623.xalanchmk_s</td>
<td>5.57</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>4.88</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>14.4</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>14.6</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>24.9</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>104</td>
</tr>
</tbody>
</table>

**Threads** (10.4)
Lenovo Global Technology
ThinkSystem SD650
(2.70 GHz, Intel Xeon Platinum 8270)

SPECSpeed2017_int_base = 10.4
SPECSpeed2017_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>104</td>
<td>256</td>
<td>6.95</td>
<td>255</td>
<td>6.96</td>
<td>254</td>
<td>6.98</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>104</td>
<td>384</td>
<td>10.4</td>
<td>391</td>
<td>10.2</td>
<td>392</td>
<td>10.2</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>104</td>
<td>369</td>
<td>12.8</td>
<td>371</td>
<td>12.7</td>
<td>368</td>
<td>12.8</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>104</td>
<td>178</td>
<td>9.17</td>
<td>178</td>
<td>9.17</td>
<td>176</td>
<td>9.26</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>104</td>
<td>111</td>
<td>12.7</td>
<td>111</td>
<td>12.7</td>
<td>111</td>
<td>12.8</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>104</td>
<td>121</td>
<td>14.6</td>
<td>121</td>
<td>14.6</td>
<td>121</td>
<td>14.5</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>104</td>
<td>257</td>
<td>5.57</td>
<td>258</td>
<td>5.56</td>
<td>257</td>
<td>5.57</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>104</td>
<td>349</td>
<td>4.88</td>
<td>349</td>
<td>4.88</td>
<td>350</td>
<td>4.88</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>104</td>
<td>204</td>
<td>14.4</td>
<td>203</td>
<td>14.4</td>
<td>203</td>
<td>14.4</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>104</td>
<td>248</td>
<td>24.9</td>
<td>249</td>
<td>24.9</td>
<td>248</td>
<td>24.9</td>
</tr>
</tbody>
</table>

SPECSpeed2017_int_base = 10.4
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-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.
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)
SPEC CPU2017 Integer Speed Result

Lenovo Global Technology
ThinkSystem SD650
(2.70 GHz, Intel Xeon Platinum 8270)

SPECspeed2017_int_base = 10.4
SPECspeed2017_int_peak = Not Run

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

General Notes (Continued)

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance
Choose Operating Mode set 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-ic19.0u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-y34g Mon May 13 10:11:12 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) Platinum 8270 CPU @ 2.70GHz
  2 "physical id"s (chips)
  104 "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 : 26
siblings : 52
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29

From lscpu:

Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 104
On-line CPU(s) list: 0-103
Thread(s) per core: 2
Core(s) per socket: 26
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8270 CPU @ 2.70GHz
Stepping: 6

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD650
(2.70 GHz, Intel Xeon Platinum 8270)

SPEC CPU2017 Integer Speed Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

SPECspeed2017_int_base = 10.4
SPECspeed2017_int_peak = Not Run

Lenovo Global Technology

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

SPECspeed2017_int_base = 10.4
SPECspeed2017_int_peak = Not Run

Platform Notes (Continued)

CPU MHz: 2700.000
CPU max MHz: 4000.0000
CPU min MHz: 1000.0000
BogoMIPS: 5400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
NUMA node0 CPU(s): 0-25,52-77
NUMA node1 CPU(s): 26-51,78-103
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 nopl xtopology nonstop_tsc cpuid
aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtpmr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abtm 3nowprefetch cpuid_fault epb cat_l3 cdp_l3
invpcid_single ssbd mba ibrs ibpb tpr_shadow vnmi flexpriority ept vpid
fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erness invpcid rtm cmqm mpx rdt_a avx512f
avx512dq rdseed adx clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaves avx51c xgetbv1 xsavec cmq_l1c cmq_occup_llc cmq_mmb_total cmq_mmb_local
dtherm ida arat pin pts pku ospke avx512_vnni flush_l1d arch_capabilities

/cache_info
cache size : 36608 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 22 23 24 25 26 27 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 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 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105
node 0 size: 193088 MB
node 0 free: 190883 MB
node 1 cpus: 26 27 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 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 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105
node 1 size: 193503 MB
node 1 free: 192912 MB
node distances:
ode 0: 10
0: 10
1: 21
10:

From /proc/meminfo
MemTotal: 395869328 KB
HugePages_Total: 0
Hugepagesize: 2048 KB

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD650
(2.70 GHz, Intel Xeon Platinum 8270)

SPECspeed2017_int_base = 10.4
SPECspeed2017_int_peak = Not Run

Platform Notes (Continued)

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_PW
run-level 3 May 13 07:56
SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1
  Filesystem   Type  Size  Used Avail Use% Mounted on
  /dev/sdb3    xfs  446G  48G  399G  11% /

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 -[OTE135R-2.10]- 02/25/2019
  Memory:
    4x NO DIMM NO DIMM
    12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)
Lenovo Global Technology
ThinkSystem SD650
(2.70 GHz, Intel Xeon Platinum 8270)

SPECSpeed2017_int_base = 10.4
SPECSpeed2017_int_peak = Not Run

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.xalanchmk_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

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

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

**Lenovo Global Technology**  
ThinkSystem SD650  
(2.70 GHz, Intel Xeon Platinum 8270)  

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>10.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_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:** May-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Dec-2018

### Base Portability Flags (Continued)

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  
-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_2019.1.144/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

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

---

SPEC is a registered trademark 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 CPU2017 v1.0.5 on 2019-05-13 10:11:11-0400.  
Originally published on 2019-05-29.