**Lenovo Global Technology**

ThinkSystem SD650  
(2.20 GHz, Intel Xeon Platinum 8253)

**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  

---

**600.perlbench_s** 64  
Threads 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20  
602.gcc_s 64  
605.mcf_s 64  
620.omnetpp_s 64  
623.xalancbmk_s 64  
625.x264_s 64  
631.deepsjeng_s 64  
641.lm_eula_s 64  
648.exchange2_s 64  
657.xz_s 64  

---

**Hardware**

- **CPU Name:** Intel Xeon Platinum 8253  
- **Max MHz.:** 3000  
- **Nominal:** 2200  
- **Enabled:** 32 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:** 22 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 19.0.1.144 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

---

**SPECspeed2017_int_base =** 7.90  
**SPECspeed2017_int_peak =** Not Run
LENNOVO GLOBAL TECHNOLOGY
ThinkSystem SD650
(2.20 GHz, Intel Xeon Platinum 8253)

SPECspeed2017_int_base =  7.90
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>64</td>
<td>335</td>
<td>5.30</td>
<td>336</td>
<td>5.28</td>
<td>336</td>
<td>5.29</td>
</tr>
<tr>
<td>602:gcc_s</td>
<td>64</td>
<td>499</td>
<td>7.97</td>
<td>499</td>
<td>7.98</td>
<td>501</td>
<td>7.95</td>
</tr>
<tr>
<td>605:mcf_s</td>
<td>64</td>
<td>460</td>
<td>10.3</td>
<td>456</td>
<td>10.4</td>
<td>462</td>
<td>10.2</td>
</tr>
<tr>
<td>620:omnetpp_s</td>
<td>64</td>
<td>256</td>
<td>6.37</td>
<td>256</td>
<td>6.38</td>
<td>257</td>
<td>6.35</td>
</tr>
<tr>
<td>623:xalancbmk_s</td>
<td>64</td>
<td>144</td>
<td>9.83</td>
<td>144</td>
<td>9.81</td>
<td>146</td>
<td>9.73</td>
</tr>
<tr>
<td>625:x264_s</td>
<td>64</td>
<td>168</td>
<td>10.5</td>
<td>168</td>
<td>10.5</td>
<td>169</td>
<td>10.5</td>
</tr>
<tr>
<td>631:deepsjeng_s</td>
<td>64</td>
<td>329</td>
<td>4.35</td>
<td>330</td>
<td>4.35</td>
<td>330</td>
<td>4.34</td>
</tr>
<tr>
<td>641:leela_s</td>
<td>64</td>
<td>466</td>
<td>3.66</td>
<td>465</td>
<td>3.67</td>
<td>465</td>
<td>3.67</td>
</tr>
<tr>
<td>648:exchange2_s</td>
<td>64</td>
<td>271</td>
<td>10.8</td>
<td>273</td>
<td>10.8</td>
<td>274</td>
<td>10.7</td>
</tr>
<tr>
<td>657:xz_s</td>
<td>64</td>
<td>318</td>
<td>19.4</td>
<td>318</td>
<td>19.4</td>
<td>318</td>
<td>19.4</td>
</tr>
</tbody>
</table>

SPECspeed2017_int_base =  7.90
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)
### Lenovo Global Technology

**ThinkSystem SD650**  
(2.20 GHz, Intel Xeon Platinum 8253)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>7.90</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

**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-55rv Tue May 21 01:07:55 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 8253 CPU @ 2.20GHz
  2 "physical id"s (chips)
  64 "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 : 16
siblings : 32
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
```

From lscpu:

```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 2
Core(s) per socket: 16
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8253 CPU @ 2.20GHz
Stepping: 6
CPU MHz: 2200.000
CPU max MHz: 3000.0000
```

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD650
(2.20 GHz, Intel Xeon Platinum 8253)

SPECspeed2017_int_base = 7.90
SPECspeed2017_int_peak = Not Run

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

CPU min MHz: 1000.0000
BogoMIPS: 4400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K
NUMA node0 CPU(s): 0-15,32-47
NUMA node1 CPU(s): 16-31,48-63

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
aperfmpref pi pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrd 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
invcid_single ssbd mba ibrs ibrd tpr_shadow vnumi flexpriority ept vpid
fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ibrm invpcid rtm cqm mpx rd_a avx512f
avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsavec xsaveopt xsavec xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt

Platform Notes (Continued)

/proc/cpuinfo cache data
  cache size: 22528 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 32 33 34 35 36 37 38 39 40 41 42 43
                     44 45 46 47
  node 0 size: 193122 MB
  node 0 free: 192539 MB
  node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 48 49 50 51 52 53 54 55 56
                     57 58 59 60 61 62 63
  node 1 size: 193477 MB
  node 1 free: 192947 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10

From /proc/meminfo
  MemTotal: 395878560 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  SuSE-release:
Lenovo Global Technology
ThinkSystem SD650
(2.20 GHz, Intel Xeon Platinum 8253)

SPECspeed2017_int_base = 7.90
SPECspeed2017_int_peak = Not Run

Platform Notes (Continued)

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.

uname -a:
x86_64 x86_64 x86_64 GNU/Linux

Compiled with:
    CC  600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base)

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD650
(2.20 GHz, Intel Xeon Platinum 8253)

SPECspeed2017_int_base = 7.90
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

Compiler Version Notes (Continued)

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.

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.

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
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64

(Continued on next page)
SPEC CPU2017 Integer Speed Result

Lenovo Global Technology
ThinkSystem SD650
(2.20 GHz, Intel Xeon Platinum 8253)

SPECspeed2017_int_base = 7.90
SPECspeed2017_int_peak = Not Run

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>9017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>Test Date:</td>
<td>May-2019</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Apr-2019</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Dec-2018</td>
</tr>
</tbody>
</table>

Base Portability Flags (Continued)

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 2019-05-21 01:07:55-0400.
Originally published on 2019-06-11.