# SPEC® CPU2017 Integer Speed Result

## Lenovo Global Technology

ThinkSystem SD650  
(2.90 GHz, Intel Xeon Platinum 8268)

**SPECspeed2017_int_base** = 10.2  
**SPECspeed2017_int_peak** = Not Run

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</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>602.gcc_s</td>
<td>605.mcf_s</td>
<td>620.omnetpp_s</td>
<td>623.xalanbmk_s</td>
<td>625.x264_s</td>
<td>631.deepsjeng_s</td>
<td>641.leela_s</td>
<td>648.exchange2_s</td>
<td>657.xz_s</td>
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<td>6.80</td>
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<td>14.5</td>
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<td>14.1</td>
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</table>

### Hardware

- **CPU Name**: Intel Xeon Platinum 8268  
- **Max MHz.**: 3900  
- **Nominal**: 2900  
- **Enabled**: 48 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 for Linux**: 20181018  
- **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
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**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Test Date:** May-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Dec-2018

### Results Table

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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)
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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 9bcde8f29999c33d61f64985e45859ea9
running on linux-y34g Sat May 18 11:44:53 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 8268 CPU @ 2.90GHz
  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 : 24
  siblings : 48
  physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 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 25 26 27 28 29

From lscpu:
  Architecture: x86_64
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  CPU(s): 96
  On-line CPU(s) list: 0-95
  Thread(s) per core: 2
  Core(s) per socket: 24
  Socket(s): 2
  NUMA node(s): 2
  Vendor ID: GenuineIntel
  CPU family: 6
  Model: 85
  Model name: Intel(R) Xeon(R) Platinum 8268 CPU @ 2.90GHz
  Stepping: 6
  CPU MHz: 2900.000
  CPU max MHz: 3900.000

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

- **CPU min MHz:** 1200.0000  
- **BogoMIPS:** 5800.00  
- **Virtualization:** VT-x  
- **L1d cache:** 32K  
- **L1i cache:** 32K  
- **L2 cache:** 1024K  
- **L3 cache:** 36608K  
- **NUMA node0 CPU(s):** 0-23, 48-71  
- **NUMA node1 CPU(s):** 24-47, 72-95

**Flags:**

- fpu  
- vme  
- de  
- pse  
- mce  
- cmov  
- pat  
- pse36  
- clflush  
- dts  
- acpi  
- mpx  
- cmov  
- stp  
- m87  
- mp  
- m2  
- sub  
- ms  
- tss  
- pe  
- ka  
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- m2  
- sub  
- ms  
- tss  
- pe  
- ka  
- pge  
- mca  
- cmov  
- pat

/proc/cpuinfo cache data

- **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 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71  
- **node 0 size:** 193117 MB  
- **node 0 free:** 191323 MB  
- **node 1 cpus:** 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95  
- **node 1 size:** 193474 MB  
- **node 1 free:** 192524 MB  
- **node distances:**  

From /proc/meminfo

- **MemTotal:** 395870836 kB  
- **HugePages_Total:** 0  
- **Hugepagesize:** 2048 kB

From /etc/*release* /etc/*version*

SuSE-release:

(Continued on next page)
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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.

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 18 09:27

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1

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)

Compiler Version Notes

==============================================================================
| CC 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base) |
==============================================================================

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**Compiler Version Notes (Continued)**

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.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 19.0.1.144 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:
```plaintext
c -m64 -std=c11
```

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

Fortran benchmarks:
```plaintext
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 |

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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-transform=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-transform=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-transform=4
-nostandard-realloc-lhs

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

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

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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 2019-05-18 11:44:53-0400.
Originally published on 2019-06-11.