# SPEC CPU®2017 Integer Speed Result

## Lenovo Global Technology

ThinkSystem SD650 V2  
(2.60 GHz, Intel Xeon Platinum 8358)

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

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>11.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_int_peak</td>
<td>Not Run</td>
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<table>
<thead>
<tr>
<th>Test Date:</th>
<th>May-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Feb-2021</td>
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### Results

<table>
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<tr>
<th>Threads</th>
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<th>4.00</th>
<th>6.00</th>
<th>8.00</th>
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<th>12.0</th>
<th>14.0</th>
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<tbody>
<tr>
<td>600.perlbench_s 128</td>
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<td>605.mcf_s 128</td>
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<td>620.omnetpp_s 128</td>
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<td>631.deepsjeng_s 128</td>
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<td>648.exchange2_s 128</td>
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<tr>
<td>657.xz_s 128</td>
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**SPECspeed®2017_int_base** (11.6)

### Hardware

- **CPU Name:** Intel Xeon Platinum 8358  
- **Max MHz:** 3400  
- **Nominal:** 2600  
- **Enabled:** 64 cores, 2 chips, 2 threads/core  
- **Orderable:** 2 chips  
- **Cache L1:** 32 KB I + 48 KB D on chip per core  
- **L2:** 1.25 MB I+D on chip per core  
- **L3:** 48 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)  
- **Storage:** 1 x 480 GB SATA SSD  
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux 8.3  
- **Kernel:** 4.18.0-240.el8.x86_64  
- **Compiler:**  
  - C/C++: Version 2021.1 of Intel oneAPI DPC++/C++  
  - Fortran: Version 2021.1 of Intel Fortran Compiler  
  - Classic Build 20201112 for Linux  
- **Parallel:** Yes  
- **Firmware:** Lenovo BIOS Version U8E109PT1 1.01, released Apr-2021  
- **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:** BIOS set to prefer performance at the cost of additional power usage
Lenovo Global Technology
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(2.60 GHz, Intel Xeon Platinum 8358)

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base</th>
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<th>Seconds</th>
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</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"

Environment Variables Notes
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = 
"/home/cpu2017-1.1.5-ic2021.1-revB/lib/intel64:/home/cpu2017-1.1.5-ic202
1.1-revB/je5.0.1-64"
MALLOCP_CONF = "retain:true"
OMP_STACKSIZE = "192M"

General Notes
Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Redhat Enterprise Linux 8.0
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.

(Continued on next page)
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SPECspeed®2017_int_base = 11.6
SPECspeed®2017_int_peak = Not Run

General Notes (Continued)
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
C-States set to Autonomous
CPU P-state Control set to Autonomous

Sysinfo program /home/cpu2017-1.1.5-ic2021.1-revB/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on ip10-245-59-38.labs.lenovo.com Fri May 7 11:01:44 2021

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 8358 CPU @ 2.60GHz
  2 "physical id"s (chips)
  128 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following
certs from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 32
siblings : 64
physical 0: cores 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
physical 1: cores 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

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 128
On-line CPU(s) list: 0-127
Thread(s) per core: 2
Core(s) per socket: 32
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Platinum 8358 CPU @ 2.60GHz

(Continued on next page)
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Test Date: May-2021
Tested by: Lenovo Global Technology
Software Availability: Feb-2021

CPU MHz: 1801.454
BogoMIPS: 5200.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 49152K
NUMA node0 CPU(s): 0-31,64-95
NUMA node1 CPU(s): 32-63,96-127

Platform Notes (Continued)

Stepping: 6
CPU MHz: 1801.454
BogoMIPS: 5200.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 49152K
NUMA node0 CPU(s): 0-31,64-95
NUMA node1 CPU(s): 32-63,96-127

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
 xtpr 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 invpcid_single
 intel_pni ssbd mba ibrs ibpb ibrs_enhanced tpr_shadow vnmi flexpriority ept
 vpid ept_ad fsgsgbase tsc_adjust bmi1 hle avx2 smep bmi2 ets rmvi invpcid cmqr rdt_a
 avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni
 avx512bw avx512vl xsaveopt xsavevc xSAVEC xsavePrefetch价 xsavePrefetch cqm llc
 avx512f cmqm_cmqr cmqm_mbb_total cmqm_local split_lock_detect wbinvd dtherm ida arat
 pin pts avx512vbmi umip pku
 ospke avx512_vbmi2 gfn i vaes vpclmulqdq avx512_vnni avx512_bitalg tme
 avx512_vpopcntdq la57 rdpid md_clear pconfig flush_lld arch_capabilities

/proc/cpuinfo cache data
 cache size : 49152 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
 node 0 size: 237934 MB
 node 0 free: 256030 MB
 node 1 cpus: 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
 node 1 size: 239865 MB
 node 1 free: 257485 MB
 node distances:
 node   0   1
 0: 10  20
 1: 20  10

From /proc/meminfo
MemTotal: 527992808 KB

(Continued on next page)
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SPECspeed®2017_int_base = 11.6
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Platform Notes (Continued)

HugePages_Total:       0
Hugepagesize:       2048 kB

/sbin/tuned-adm active
   Current active profile: throughput-performance

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux release 8.3 (Ootpa)

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux"
      VERSION="8.3 (Ootpa)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="8.3"
      PLATFORM_ID="platform:el8"
      PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
      ANSI_COLOR="0;31"
      redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
      system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
      system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

uname -a:
   Linux ip10-245-59-38.labs.lenovo.com 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020 x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit): Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swapgs barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 May 7 10:34
SPEC is set to: /home/cpu2017-1.1.5-ic2021.1-revB

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Software Availability: Feb-2021

**Platform Notes (Continued)**

```
Filesystem     Type  Size  Used  Avail  Use%  Mounted on
/dev/sda4      xfs  372G   21G  351G   6%  /home
```

From /sys/devices/virtual/dmi/id

Vendor: Lenovo
Product: ThinkSystem SD650 V2
Product Family: ThinkSystem
Serial: 1234567890

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.

Memory:
16x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

BIOS:
Vendor: Lenovo
Version: U8E109PT1-1.01
Date: 04/28/2021
Revision: 1.1
Firmware Revision: 1.40

(End of data from sysinfo program)

**Compiler Version Notes**

```
C       | 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base) 657.xz_s(base)
==============================================================================
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
```

```
C++      | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
       | 641.leela_s(base)
==============================================================================
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
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```

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Compiler Version Notes (Continued)
Fortran | 648.exchange2_s (base)
---------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Base Compiler Invocation
C benchmarks:
icx
C++ benchmarks:
icpx
Fortran benchmarks:
ifort

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:
-DSPEC_OPENMP -std=c11 -m64 -fiopenmp -Wl,-z,muldefs -xCORE-AVX2
-O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:
-DSPEC_OPENMP -m64 -Wl,-z,muldefs -xCORE-AVX2 -O3 -ffast-math -flto

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Base Optimization Flags (Continued)

C++ benchmarks (continued):
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin/
-1qkmalloc

Fortran benchmarks:
-m64 -xCORE-AVX2 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries

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-ICElake-D.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-ICElake-D.xml
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml

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

Tested with SPEC CPU®2017 v1.1.5 on 2021-05-06 23:01:43-0400.