# SPEC CPU®2017 Integer Speed Result

**Lenovo Global Technology**

**ThinkSystem ST650 V2**

(2.60 GHz, Intel Xeon Platinum 8358)

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>11.7</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
May-2021

## Hardware Availability
Jul-2021

## Software Availability
Feb-2021

### Threads

<table>
<thead>
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<th>Benchmark</th>
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<td>620.omnetpp_s</td>
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<td>623.xalancbmk_s</td>
<td>128</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>128</td>
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<tr>
<td>631.deepsjeng_s</td>
<td>128</td>
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<tr>
<td>641.leela_s</td>
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</tr>
<tr>
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### SPECspeed®2017_int_base (11.7)

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## Hardware

### CPU Name
Intel Xeon Platinum 8358

### Max MHz
3400

### Nominal
2600

### Enabled
64 cores, 2 chips, 2 threads/core

### Orderable
1.2 chips

### Cache L1
32 KB I + 48 KB D on chip per core

### Cache L2
1.25 MB I+D on chip per core

### Cache L3
48 MB I+D on chip per chip

### Other
None

### Memory
1 TB (32 x 32 GB 2Rx8 PC4-3200AA-R)

### Storage
1 x 960 GB SATA SSD

### Other
None

## Software

### OS
Red Hat Enterprise Linux 8.3 (Ootpa)

### Compiler
C/C++, Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux;

### Fortran
Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux;

### C/C++:
Version 2021.1 of Intel C/C++ 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 and OS set to prefer performance at the cost of additional power usage
# Lenovo Global Technology

**ThinkSystem ST650 V2**  
(2.60 GHz, Intel Xeon Platinum 8358)

---

### Results Table

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<th>Ratio</th>
<th>Seconds</th>
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<th>Ratio</th>
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<tr>
<td>600.perlbench_s</td>
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<td>253</td>
<td>7.02</td>
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</tbody>
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### 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"
- MALLOC_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)
Lenovo Global Technology
ThinkSystem ST650 V2
(2.60 GHz, Intel Xeon Platinum 8358)

SPECspeed®2017_int_base = 11.7
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 Legacy

Sysinfo program /home/cpu2017-1.1.5-ic2021.1-revB/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Thu May 13 17:34:20 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
excerpts 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
Stepping: 6

(Continued on next page)
Platform Notes (Continued)

```
CPU MHz: 2580.600
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 cmov cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdelgb rdtscp
lm constant_tsc art arch_perfmon pebs bts rep good nopl xtopology nonstop_tsc cpuid
aperfmr perf pni pclmulqdq dtls64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtp pr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abrm spec 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single
intel_pni ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmx flexpriority ept
vpid ept_ad fsxgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid cqm rdt_a
avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni
avx512bw avx512vl xsaveopt xsave xegetbvl xsaves cmov clflush opt xsaveopt xsaveopt
avxv512_vpopcntdq avx512_vbmi gfn vaes vpcm1mulqdx avx512_vnni avx512_bitalg tme
avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d arch_capabilities
```

/proc/cpuinfo cache data

```
cache size: 49152 KB
```

From numact1 --hardware WARNING: a numact1 '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 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: 477440 MB
node 0 free: 514949 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 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112
113 114 115 116 117 118 119 120 121 122 123 124 125 126 127
node 1 size: 479663 MB
node 1 free: 515135 MB
node distances:
node   0   1
0: 10 20
1: 20 10
```

From /proc/meminfo

```
MemTotal: 1056474892 KB
HugePages_Total: 0
```

(Continued on next page)
Platform Notes (Continued)

Hugepagesize: 2048 kB
/sbin/tuned-adm active
  Current active profile: balanced

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 localhost.localdomain 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/swaps barriers and __user pointer sanitation
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 13 17:32

SPEC is set to: /home/cpu2017-1.1.5-ic2021.1-revB
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/sda4 xfs 818G 89G 729G 11% /home

From /sys/devices/virtual/dmi/id

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Software Availability: Feb-2021

Platform Notes (Continued)
Vendor: Lenovo
Product: ThinkSystem ST650V2
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:
32x Samsung M393A4G43AB3-CWE 32 GB 2 rank 3200

BIOS:
BIOS Vendor: Lenovo
BIOS Version: U8E109PT1-1.01
BIOS Date: 04/28/2021
BIOS Revision: 1.1
Firmware Revision: 1.20

(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,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================
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
(Continued on next page)
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Compiler Version Notes (Continued)
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:

C++ benchmarks:

(Continued on next page)
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**Software Availability:** Feb-2021

### Base Optimization Flags (Continued)

Fortran benchmarks:

- `-m64`
- `-xCORE-AVX512`
- `-O3`
- `-ipo`
- `-no-prec-div`
- `-gopt-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:


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/Lenovo-Platform-SPECcpu2017-Flags-V1.2-ICElake-D.xml)