# SPEC CPU®2017 Integer Speed Result

**Lenovo Global Technology**  
ThinkSystem SN550 V2  
(3.00 GHz, Intel Xeon Gold 5317)  

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## Lenovo Global Technology

### SPECspeed®2017_int_base = 11.5

### SPECspeed®2017_int_peak = Not Run

| Threads | 0 | 1.00 | 2.00 | 3.00 | 4.00 | 5.00 | 6.00 | 7.00 | 8.00 | 9.00 | 10.0 | 11.0 | 12.0 | 13.0 | 14.0 | 15.0 | 16.0 | 17.0 | 18.0 | 19.0 | 20.0 | 21.0 | 22.0 | 23.0 |
|---------|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 600.perlbench_s | 48 | 7.24 | | | | | | | | | | | | | | | | | | | | | | | |
| 602.gcc_s | 48 | | | | | | | | | | | | | | | | | | | | | | | |
| 605.mcf_s | 48 | | | 10.3 | | | | | | | | | | | | | | | | | | | | | |
| 620.omnetpp_s | 48 | | | | | | | | | | | | | | | | | | | | | | | |
| 623.xalancbmk_s | 48 | | | | 8.61 | | | | | | | | | | | | | | | | | | | | |
| 625.x264_s | 48 | | | | | | | | | | | | | | | | | | | | | | | |
| 631.deepsjeng_s | 48 | | | | | 5.97 | | | | | | | | | | | | | | | | | | | |
| 641.leela_s | 48 | | | | | | 4.90 | | | | | | | | | | | | | | | | | |
| 648.exchange2_s | 48 | | | | | | | | | | | | | | | | | | | | | | | |
| 657.xz_s | 48 | | | | | | | | | | | | | | | | | | | | | | | |

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### SPECspeed®2017_int_base (11.5)

## Hardware

- **CPU Name:** Intel Xeon Gold 5317  
- **Max MHz:** 3600  
- **Nominal:** 3000  
- **Enabled:** 24 cores, 2 chips, 2 threads/core  
- **Orderable:** 1.2 chips  
- **Cache L1:** 32 KB I + 48 KB D on chip per core  
- **L2:** 1.25 MB I+D on chip per core  
- **L3:** 18 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 512 GB (16 x 32 GB 2Rx8 PC4-3200AA-R, running at 2933)  
- **Storage:** 1 x 960 GB SATA SSD  
- **Other:** None

## Software

- **OS:** Red Hat Enterprise Linux 8.3 (Ootpa)  
- **Kernel:** 4.18.0-240.el8.x86_64  
- **Compiler:** C/C++, Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux; Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux  
- **Parallel:** Yes  
- **Firmware:** Lenovo BIOS Version U8E111A 1.02 released May-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
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

SPECspeed®2017_int_base = 11.5
SPECspeed®2017_int_peak = Not Run

Test Date: Jul-2021
Hardware Availability: Jul-2021
Software Availability: Dec-2020

Results Table

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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/cpu2017-1.1.8-ic2021.1-revB/lib/intel64:/home/cpu2017-1.1.8-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)
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Jul-2021
Hardware Availability: Jul-2021
Software Availability: Dec-2020

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
MONITOR/MWAIT set to Enabled
CPU P-state Control set to Cooperative with Legacy
C-States set to Legacy
UPI Link Disable set to Disabled 1 Link
UPI Prefetcher set to Disabled

Sysinfo program /home/cpu2017-1.1.8-ic2021.1-revB/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acfc64d
running on localhost.localdomain Fri Jul 9 14:38:07 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) Gold 5317 CPU @ 3.00GHz
  2 "physical id"s (chips)
  48 "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 : 12
siblings : 24
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11

From lscpu from util-linux 2.32.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 2
Core(s) per socket: 12
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106

(Continued on next page)
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**SPECspeed®2017_int_base = 11.5**
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#### Platform Notes (Continued)

- **Model name:** Intel(R) Xeon(R) Gold 5317 CPU @ 3.00GHz
- **Stepping:** 6
- **CPU MHz:** 1548.452
- **CPU max MHz:** 3600.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 6000.00
- **Virtualization:** VT-x
- **L1d cache:** 48K
- **L1i cache:** 32K
- **L2 cache:** 1280K
- **L3 cache:** 18432K
- **NUMA node0 CPU(s):** 0-11,24-35
- **NUMA node1 CPU(s):** 12-23,36-47
- **Flags:** fpu vme de pse tsc msr pae 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 3nowprefetch cpuid_fault epb cat_l3 invpcid_single intel_pni ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bm2 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 xsavec xsavevc xsavevs savevs cgmen occpa llc qcm multqa total qcm_mbb_local split_lock_detect wbnoinvd dtm/d fru pts hwp hwp_act_window hwp_epp hwp_pkg_req avx512vmbni umip pku ospke avx512_vmbni2 gfn vaes vpcmullqdfq avx512_vnni avx512_bitalg tme avx512_vvpopcntdq la57 rdpid md_clear pconfig flush_lld arch_capabilities

/proc/cpuinfo cache data

- cache size : 18432 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 24 25 26 27 28 29 30 31 32 33 34 35
- node 0 size: 249088 MB
- node 0 free: 256838 MB
- node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23 26 27 28 29 30 31 32 33 34 35
- node 1 size: 249088 MB
- node 1 free: 256838 MB
- node distances:
  - node 0 1
    - 0: 10 20
    - 1: 20 10

From /proc/meminfo

- MemTotal: 527878404 KB

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

```
HugePages_Total:       0
Hugepagesize:       2048 kB
/sbin/tuned-adm active
  Current active profile: throughput-performance
/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance
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 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 Jul 9 12:30
SPEC is set to: /home/cpu2017-1.1.8-ic2021.1-revB
```
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#### Test Details
- Test Date: Jul-2021
- Hardware Availability: Jul-2021
- Software Availability: Dec-2020

#### Platform Notes (Continued)

```plaintext
Filesystem       Type  Size  Used  Avail  Use%  Mounted on
/dev/sda4        xfs    818G  30G   789G  4%   /home
```

From `/sys/devices/virtual/dmi/id`

- **Vendor:** Lenovo
- **Product:** ThinkSystem SN550 V2
- **Product Family:** ThinkSystem
- **Serial:** 1234567890

Additional information from `dmidecode` 3.2 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 M393A4G43AB3-CWE 32 GB 2 rank 3200, configured at 2933

**BIOS:**
- **Vendor:** Lenovo
- **Version:** U8E111A-1.02
- **Date:** 05/07/2021
- **Revision:** 1.2
- **Firmware:** 1.40

(End of data from sysinfo program)

#### Compiler Version Notes

```plaintext
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.
```

```plaintext
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.
```
## 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/`  
- `-lqkmalloc`

**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:

You can also download the XML flags sources by saving the following links:

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

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Report generated on 2021-08-04 18:47:19 by CPU2017 PDF formatter v6442.  
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