# SPEC® CPU2017 Floating Point Speed Result

## Lenovo Global Technology

ThinkSystem SR550  
(2.50 GHz, Intel Xeon Gold 5215L)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>87.9</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Test Date:** Apr-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Dec-2018

### Hardware

- **CPU Name:** Intel Xeon Gold 5215L  
- **Max MHz.:** 3400  
- **Nominal:** 2500  
- **Enabled:** 20 cores, 2 chips  
- **Orderable:** 1.2 chips  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **Cache L2:** 1 MB I+D on chip per core  
- **Cache L3:** 13.75 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R, running at 2666)  
- **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 TEE135L 2.10 released Jan-2019  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **Other:** None

### Results

<table>
<thead>
<tr>
<th>Test</th>
<th>Threads</th>
<th>SPECspeed2017_fp_base</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>20</td>
<td>96.0</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>20</td>
<td>72.9</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>20</td>
<td>83.2</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>20</td>
<td>51.5</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>20</td>
<td>60.3</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>20</td>
<td>64.8</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>20</td>
<td>119</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>20</td>
<td>70.5</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>20</td>
<td>79.2</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>20</td>
<td>87.9</td>
</tr>
</tbody>
</table>

---

**NOTE:** All SPEC CPU tests are available under a royalty-free license. See the CPU2017 Benchmark Guide for more information.
Lenovo Global Technology
ThinkSystem SR550
(2.50 GHz, Intel Xeon Gold 5215L)

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

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>603.bwaves_s</td>
<td>20</td>
<td>166</td>
<td>356</td>
<td>167</td>
<td>354</td>
<td>167</td>
<td>353</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>20</td>
<td>173</td>
<td>96.1</td>
<td>174</td>
<td>96.0</td>
<td>174</td>
<td>96.0</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>20</td>
<td>71.9</td>
<td>72.9</td>
<td>71.9</td>
<td>72.8</td>
<td>71.8</td>
<td>72.9</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>20</td>
<td>157</td>
<td>84.4</td>
<td>159</td>
<td>83.1</td>
<td>159</td>
<td>83.2</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>20</td>
<td>172</td>
<td>51.5</td>
<td>173</td>
<td>51.2</td>
<td>172</td>
<td>51.5</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>20</td>
<td>197</td>
<td>60.3</td>
<td>197</td>
<td>60.4</td>
<td>198</td>
<td>60.0</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>20</td>
<td>222</td>
<td>65.0</td>
<td>223</td>
<td>64.8</td>
<td>223</td>
<td>64.8</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>20</td>
<td>147</td>
<td>119</td>
<td>147</td>
<td>119</td>
<td>147</td>
<td>119</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>20</td>
<td>129</td>
<td>70.5</td>
<td>130</td>
<td>70.1</td>
<td>129</td>
<td>70.5</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>20</td>
<td>199</td>
<td>79.0</td>
<td>199</td>
<td>79.2</td>
<td>199</td>
<td>79.2</td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 87.9
SPECspeed2017_fp_peak = Not Run

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,compact"
LD_LIBRARY_PATH = "/home/cpu2017-1.0.5-ic19.0u1/lib/intel64"
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
Yes: 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.
SPEC CPU2017 Floating Point Speed Result

Lenovo Global Technology
ThinkSystem SR550
(2.50 GHz, Intel Xeon Gold 5215L)

SPECspeed2017_fp_base = 87.9
SPECspeed2017_fp_peak = Not Run

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance
Choose Operating Mode set to Custom Mode
MONITOR/MWAIT set to Enable
Hyper-Threading set to Disable
Sysinfo program /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9
running on linux-dogi Thu Apr 18 16:15:23 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) Gold 5215L CPU @ 2.50GHz
  2 "physical id"s (chips)
  20 "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 : 10
siblings : 10
  physical 0: cores 0 1 2 3 4 8 9 10 11 12
  physical 1: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 20
On-line CPU(s) list: 0-19
Thread(s) per core: 1
Core(s) per socket: 10
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5215L CPU @ 2.50GHz
Stepping: 6
CPU MHz: 2500.000
CPU max MHz: 3400.0000
CPU min MHz: 1000.0000
BogoMIPS: 5000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR550
(2.50 GHz, Intel Xeon Gold 5215L)

<table>
<thead>
<tr>
<th>SPEC CPU2017 Floating Point Speed Result</th>
<th>Lenovo Global Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SPECspeed2017_fp_peak</strong> = Not Run</td>
<td></td>
</tr>
<tr>
<td><strong>SPECspeed2017_fp_base</strong> = 87.9</td>
<td></td>
</tr>
</tbody>
</table>

- **CPU2017 License**: 9017
- **Test Sponsor**: Lenovo Global Technology
- **Tested by**: Lenovo Global Technology
- **Test Date**: Apr-2019
- **Hardware Availability**: Apr-2019
- **Software Availability**: Dec-2018

**Platform Notes (Continued)**

<table>
<thead>
<tr>
<th>L3 cache:</th>
<th>14080K</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMA node0 CPU(s):</td>
<td>0-9</td>
</tr>
<tr>
<td>NUMA node1 CPU(s):</td>
<td>10-19</td>
</tr>
</tbody>
</table>

Flags:
- fpu
- vme
- de
- pse
- tsc
- msr
- pae
- mca
- cmov
- pat
- pse36
- clflush
- dts
- dtse64
- monitor
ds
- cpl
- vmx
- smx
- est
- tm2
- ssse3
- sdbg
- fma
- cx16
- xtrp
- pdcm
- pcid
- dca
- sse4_1
- sse4_2
- x2apic
- movbe
- popcnt
tsc
deadline_timer
aes
xsave
avxf16c
rdarand
lahf
lm
abm
3dnowprefetch
cpuid_fault
epb
cat_l3
cdp_l3
invpcid_single
ssbd
mba
ibrs
ibpb
stibp
tpr_shadow
vmni
flexpriority
ept
vpid
fsgsbase
tsc_adjust
bmi1
hle
avx2
smep
bmi2
erms
invpcid
rtm
cqm
mpx
rdt_a
avx512f
avx512dq
rdseed
adx
clflushopt
clw
intel
pt
avx512cd
avx512bw
avx512vl
xsaveopt
xsave
xcvtsk
xsavec
cqm
lcc
cqm
occup
lcc
cqm
mbm
local
dtherm
ida
arat
pin
tps
pku
ospke
avx512
vnni
flush
l1d
arch_capabilities

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a
different physical chip.

- available: 2 nodes (0-1)
- node 0 cpus: 0 1 2 3 4 5 6 7 8 9
- node 0 size: 193126 MB
- node 0 free: 192734 MB
- node 1 cpus: 10 11 12 13 14 15 16 17 18 19
- node 1 size: 193481 MB
- node 1 free: 192938 MB

From /proc/meminfo
- MemTotal: 395886764 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
- SUSE-release:
  - 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.

(Continued on next page)
<table>
<thead>
<tr>
<th>Platform Notes (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERSION_ID=&quot;12.4&quot;</td>
</tr>
<tr>
<td>PRETTY_NAME=&quot;SUSE Linux Enterprise Server 12 SP4&quot;</td>
</tr>
<tr>
<td>ID=&quot;sles&quot;</td>
</tr>
<tr>
<td>ANSI_COLOR=&quot;0;32&quot;</td>
</tr>
<tr>
<td>CPE_NAME=&quot;cpe:/o:suse:sles:12:sp4&quot;</td>
</tr>
</tbody>
</table>

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 Apr 18 16:12

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1
   Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3     xfs 892G 40G 852G  5%  /

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 -[TEE135L-2.10]- 01/10/2019
   Memory:
      12x SK Hynix HMA84GR7CJR4N-WM 32 GB 2 rank 2933, configured at 2666

(End of data from sysinfo program)

<table>
<thead>
<tr>
<th>Compiler Version Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC 619.ibm_s(base) 638.imagick_s(base) 644.nab_s(base)</td>
</tr>
</tbody>
</table>

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.

(Continued on next page)
## Lenovo Global Technology

### ThinkSystem SR550
(2.50 GHz, Intel Xeon Gold 5215L)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>87.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 9017  | **Test Date:** Apr-2019  
**Test Sponsor:** Lenovo Global Technology  | **Hardware Availability:** Apr-2019  
**Tested by:** Lenovo Global Technology  | **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.

==============================================================================  
FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_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.

==============================================================================  
CC  621.wrf_s(base) 627.cam4_s(base) 628.pop2_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.  
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.

---

### Base Compiler Invocation

C benchmarks:
```
icc -m64 -std=c11
```

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
ifort -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:
```
icpc -m64 icc -m64 -std=c11 ifort -m64
```
### Base Portability Flags

- `603.bwaves_s`: `-DSPEC_LP64`
- `607.cactuBSSN_s`: `-DSPEC_LP64`
- `619.lbm_s`: `-DSPEC_LP64`
- `621.wrf_s`: `-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian`
- `627.cam4_s`: `-DSPEC_LP64 -DSPEC_CASE_FLAG`
- `628.pop2_s`: `-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian -assume byterecl`
- `638.imagick_s`: `-DSPEC_LP64`
- `644.nab_s`: `-DSPEC_LP64`
- `649.fotonik3d_s`: `-DSPEC_LP64`
- `654.roms_s`: `-DSPEC_LP64`

### Base Optimization Flags

#### C benchmarks:

- `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=4 -openmp -DSPEC_OPENMP`

#### Fortran benchmarks:

- `-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=4 -openmp`
- `-nostandard-realloc-lhs`

#### Benchmarks using both Fortran and C:

- `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=4 -openmp -DSPEC_OPENMP`
- `-nostandard-realloc-lhs`

#### Benchmarks using Fortran, C, and C++:

- `-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=4 -openmp -DSPEC_OPENMP`
- `-nostandard-realloc-lhs`

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:

<table>
<thead>
<tr>
<th>Lenovo Global Technology</th>
<th>SPECspeed2017_fp_base = 87.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThinkSystem SR550</td>
<td>SPECspeed2017_fp_peak = Not Run</td>
</tr>
<tr>
<td>(2.50 GHz, Intel Xeon Gold 5215L)</td>
<td></td>
</tr>
</tbody>
</table>

- **CPU2017 License:** 9017
- **Test Sponsor:** Lenovo Global Technology
- **Tested by:** Lenovo Global Technology
- **Test Date:** Apr-2019
- **Hardware Availability:** Apr-2019
- **Software Availability:** Dec-2018
- **Tested with SPEC CPU2017 v1.0.5 on 2019-04-18 04:15:22-0400.**
- **Originally published on 2019-05-14.**

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.