# SPEC® CPU2017 Floating Point Speed Result

## Lenovo Global Technology

ThinkSystem SR550  
(3.80 GHz, Intel Xeon Platinum 8256)

**SPECspeed2017_fp_base** = 58.2  
**SPECspeed2017_fp_peak** = Not Run

---

### Hardware

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon Platinum 8256</td>
</tr>
<tr>
<td>Max MHz.:</td>
<td>3900</td>
</tr>
<tr>
<td>Nominal:</td>
<td>3800</td>
</tr>
<tr>
<td>Enabled:</td>
<td>8 cores, 2 chips</td>
</tr>
<tr>
<td>Orderable:</td>
<td>1.2 chips</td>
</tr>
<tr>
<td>Cache L1:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2:</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3:</td>
<td>16.5 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)</td>
</tr>
<tr>
<td>Storage:</td>
<td>1 x 960 GB SATA SSD</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
</tbody>
</table>

---

### Software

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS:</td>
<td>SUSE Linux Enterprise Server 12 SP4 (x86_64)</td>
</tr>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 19.0.1.144 of Intel C/C++</td>
</tr>
<tr>
<td></td>
<td>Compiler Build 20181018 for Linux;</td>
</tr>
<tr>
<td></td>
<td>Fortran: Version 19.0.1.144 of Intel Fortran</td>
</tr>
<tr>
<td></td>
<td>Compiler Build 20181018 for Linux</td>
</tr>
<tr>
<td>Parallel:</td>
<td>Yes</td>
</tr>
<tr>
<td>Firmware:</td>
<td>Lenovo BIOS Version TEE135L 2.10 released Jan-2019</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
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### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_fp_base</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>8</td>
<td>57.0</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>8</td>
<td>47.1</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>8</td>
<td>61.0</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>8</td>
<td>29.0</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>8</td>
<td>46.7</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>8</td>
<td>35.3</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>8</td>
<td>62.9</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>8</td>
<td>57.6</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>8</td>
<td>55.2</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>8</td>
<td>286</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  
**Software Availability:** Dec-2018
SPEC CPU2017 Floating Point Speed Result

Lenovo Global Technology
ThinkSystem SR550
(3.80 GHz, Intel Xeon Platinum 8256)

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SPECspeed2017_fp_base = 58.2
SPECspeed2017_fp_peak = Not Run

Test Date: Apr-2019
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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>8</td>
<td>206</td>
<td>286</td>
<td>208</td>
<td>284</td>
<td>206</td>
<td>286</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>8</td>
<td>292</td>
<td>57.1</td>
<td>292</td>
<td>57.0</td>
<td>293</td>
<td>56.9</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>8</td>
<td>111</td>
<td>47.0</td>
<td>111</td>
<td>47.1</td>
<td>111</td>
<td>47.1</td>
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<tr>
<td>621.wrf_s</td>
<td>8</td>
<td>217</td>
<td>61.0</td>
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<td>60.9</td>
<td>216</td>
<td>61.2</td>
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<tr>
<td>627.cam4_s</td>
<td>8</td>
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<td>29.1</td>
<td>306</td>
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<td>307</td>
<td>28.9</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>8</td>
<td>254</td>
<td>46.7</td>
<td>254</td>
<td>46.8</td>
<td>254</td>
<td>46.7</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>8</td>
<td>409</td>
<td>35.3</td>
<td>407</td>
<td>35.4</td>
<td>409</td>
<td>35.3</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>8</td>
<td>278</td>
<td>62.9</td>
<td>278</td>
<td>62.9</td>
<td>278</td>
<td>62.9</td>
</tr>
<tr>
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<td>8</td>
<td>158</td>
<td>57.6</td>
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<td>58.0</td>
<td>159</td>
<td>57.5</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>8</td>
<td>281</td>
<td>55.9</td>
<td>286</td>
<td>55.0</td>
<td>285</td>
<td>55.2</td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 58.2
SPECspeed2017_fp_peak = Not Run

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,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**

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<tr>
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<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

---

**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
- SNC set to Enable
- Sysinfo program /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo
- Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
- running on linux-dogi Sun Apr 28 10:35:02 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](https://www.spec.org/cpu2017/Docs/config.html#sysinfo)

**From /proc/cpuinfo**

- model name: Intel(R) Xeon(R) Platinum 8256 CPU @ 3.80GHz
  - 2 "physical id"s (chips)
  - 8 "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 : 4
  - siblings : 4
  - physical 0: cores 4 8 9 13
  - physical 1: cores 2 5 9 13

**From lscpu:**

- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 8
- On-line CPU(s) list: 0-7
- Thread(s) per core: 1
- Core(s) per socket: 4
- Socket(s): 2
- NUMA node(s): 4
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Platinum 8256 CPU @ 3.80GHz
- Stepping: 6
- CPU MHz: 3800.000
- CPU max MHz: 3900.0000
- CPU min MHz: 1200.0000
- BogoMIPS: 7600.00
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K

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

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2 cache</td>
<td>1024K</td>
</tr>
<tr>
<td>L3 cache</td>
<td>16896K</td>
</tr>
<tr>
<td>NUMA node0 CPU(s)</td>
<td>0,2</td>
</tr>
<tr>
<td>NUMA node1 CPU(s)</td>
<td>1,3</td>
</tr>
<tr>
<td>NUMA node2 CPU(s)</td>
<td>4,6</td>
</tr>
<tr>
<td>NUMA node3 CPU(s)</td>
<td>5,7</td>
</tr>
</tbody>
</table>
| 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 nopt ltopology 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 eb 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 smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsavesopt xsavec xgetbv1 xsave xsaves cqm_llc cqm_occupa_llc cqm_mbb_total cqm_mbb_local dtstherm ida arat pln pts pku ospke avx512_vnni flush_lId arch_capabilities

/proc/cpuinfo cache data  
```plaintext
    cache size : 16896 KB
```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.  
```plaintext
 available: 4 nodes (0-3)
 node 0 cpus: 0 2
 node 0 size: 96370 MB
 node 0 free: 96184 MB
 node 1 cpus: 1 3
 node 1 size: 96757 MB
 node 1 free: 96525 MB
 node 2 cpus: 4 6
 node 2 size: 96757 MB
 node 2 free: 96545 MB
 node 3 cpus: 5 7
 node 3 size: 96725 MB
 node 3 free: 96494 MB
 node distances:
    node 0 1 2 3
     0:  10 11 21 21
     1:  11 10 21 21
     2:  21 21 10 11
     3:  21 21 11 10
```

From /proc/meminfo

```plaintext
    MemTotal: 3958886888 KB
    HugePages_Total: 0
    Hugepagesize: 2048 KB
```

(Continued on next page)
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SPECspeed2017_fp_base = 58.2
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CPU2017 License: 9017
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Platform Notes (Continued)

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.
   # 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 Apr 28 10:33

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

(End of data from sysinfo program)
Lenovo Global Technology
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SPEC CPU2017 Floating Point Speed Result
Copyright 2017-2019 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECpp2017_fp_base = 58.2
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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

Compiler Version Notes

==============================================================================
CC  619.lbm_s(base) 638.imagick_s(base) 644.nab_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  607.cactuBSSN_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.
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.
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FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
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Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
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-----------------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
  icc -m64 -std=c11

(Continued on next page)
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**Base Compiler Invocation (Continued)**

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 -qopenmp -DSPEC_OPENMP

**Fortran benchmarks:**
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-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 -qopenmp -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 -qopenmp -DSPEC_OPENMP

(Continued on next page)
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Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
-nostandard-realloc-lhs

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

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

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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 2019-04-27 22:35:02-0400.