# SPEC CPU®2017 Floating Point Speed Result

## Lenovo Global Technology

**ThinkSystem SR550**  
(1.80 GHz, Intel Xeon Gold 6222V)

### SPECspeed®2017_fp_base = 114

### SPECspeed®2017_fp_peak = Not Run

| 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 |
| Firmware: | Lenovo BIOS Version TEE142E 2.30 released Aug-2019 tested as TEE141E 2.30 Jul-2019 |
| File System: | xfs |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |
| Peak Pointers: | Not Applicable |
| Other: | None |
| Power Management: | -- |

### Hardware

- **CPU Name:** Intel Xeon Gold 6222V  
- **Max MHz:** 3600  
- **Nominal:** 1800  
- **Enabled:** 40 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:** 27.5 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R, running at 2400)  
- **Storage:** 1 x 960 GB SATA SSD  
- **Other:** None

### Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_fp_base (114)</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>40</td>
<td>114</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>40</td>
<td>135</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>40</td>
<td>103</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>40</td>
<td>103</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>40</td>
<td>103</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>40</td>
<td>178</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>40</td>
<td>76.6</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>40</td>
<td>114</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>40</td>
<td>178</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>40</td>
<td>114</td>
</tr>
</tbody>
</table>

### Test Information

- **Test Date:** Aug-2019  
- **Test Sponsor:** Lenovo Global Technology  
- **Hardware Availability:** Jul-2019  
- **Software Availability:** Dec-2018  
- **CPU2017 License:** 9017  
- **Tested by:** Lenovo Global Technology  
- **Test Date:** Aug-2019  
- **Hardware Availability:** Jul-2019  
- **Software Availability:** Dec-2018
## SPEC CPU®2017 Floating Point Speed Result

**Lenovo Global Technology**

ThinkSystem SR550  
(1.80 GHz, Intel Xeon Gold 6222V)

---

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

<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>40</td>
<td>137</td>
<td>431</td>
<td>136</td>
<td>432</td>
<td>135</td>
<td>438</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>40</td>
<td>124</td>
<td>135</td>
<td>124</td>
<td>135</td>
<td>124</td>
<td>135</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>40</td>
<td>61.2</td>
<td>85.6</td>
<td>61.1</td>
<td>85.8</td>
<td>61.1</td>
<td>85.8</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>40</td>
<td>130</td>
<td>102</td>
<td>128</td>
<td>103</td>
<td>129</td>
<td>103</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>40</td>
<td>108</td>
<td>82.4</td>
<td>107</td>
<td>82.6</td>
<td>108</td>
<td>82.2</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>40</td>
<td>212</td>
<td>56.1</td>
<td>212</td>
<td>55.9</td>
<td>213</td>
<td>55.8</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>40</td>
<td>141</td>
<td>103</td>
<td>140</td>
<td>103</td>
<td>140</td>
<td>103</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>40</td>
<td><strong>98.3</strong></td>
<td><strong>178</strong></td>
<td>98.2</td>
<td>178</td>
<td>98.3</td>
<td>178</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>40</td>
<td>119</td>
<td>76.6</td>
<td>119</td>
<td>76.4</td>
<td><strong>119</strong></td>
<td><strong>76.6</strong></td>
</tr>
<tr>
<td>654.roms_s</td>
<td>40</td>
<td><strong>138</strong></td>
<td><strong>114</strong></td>
<td>138</td>
<td>114</td>
<td>138</td>
<td>114</td>
</tr>
</tbody>
</table>

---

**SPECspeed®2017_fp_base =** 114  
**SPECspeed®2017_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`

- 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.
- 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.
SPECCPU 2017 Floating Point Speed Result

Lenovo Global Technology
ThinkSystem SR550
(1.80 GHz, Intel Xeon Gold 6222V)

SPECSpeed 2017_fp_base = 114
SPECSpeed 2017_fp_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology
Test Date: Aug-2019
Hardware Availability: Jul-2019
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
Sysinfo program /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9

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 6222V CPU @ 1.80GHz
  2 "physical id"s (chips)
  40 "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 : 20
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 40
On-line CPU(s) list: 0-39
Thread(s) per core: 1
Core(s) per socket: 20
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6222V CPU @ 1.80GHz
Stepping: 7
CPU MHz: 1800.000
CPU max MHz: 3600.0000
CPU min MHz: 800.0000
BogoMIPS: 3600.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR550
(1.80 GHz, Intel Xeon Gold 6222V)

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

**Platform Notes (Continued)**

L3 cache: 28160K
NUMA node0 CPU(s): 0-19
NUMA node1 CPU(s): 20-39
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dtsc acpi mxmm fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc art arch_perfmon pebs bts rep_good noapic xtopology nonstop_tsc cpuid
aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrd pdc mcd 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 cdp_l3
invpcid_single intel_p Sofia ssbd mba ibrs ibpib stibp tpr_shadow vnmf flexpriority ept
vpid fsgsbase tsc_adjust bhm1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a
avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsavec xsetbvl xsavec xcm_l1e xcm_occup_l1e xcm_mbb_total xcm_mbb_local
dtherm ida arat pin pts pku ospke avx512_vnni flush_lld arch_capabilities

/proc/cpuinfo cache data
    cache size: 28160 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
    node 0 size: 193122 MB
    node 0 free: 192311 MB
    node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
    node 1 size: 193480 MB
    node 1 free: 193211 MB
    node distances:
        node 0 1
        0: 10 21
        1: 21 10

From /proc/meminfo
    MemTotal: 395881428 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.
    # Please check /etc/os-release for details about this release.
    os-release:
        NAME="SLES"
        VERSION="12-SP4"

---

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR550
(1.80 GHz, Intel Xeon Gold 6222V)

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

SPECspeed®2017_fp_base = 114
SPECspeed®2017_fp_peak = Not Run

Test Date: Aug-2019
Hardware Availability: Jul-2019
Software Availability: Dec-2018

Platform Notes (Continued)

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 Aug 7 15:28

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1
    Filesystem Type Size Used Avail Use% Mounted on
    /dev/sda3 xfs 892G 41G 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 -[TEE141E-2.30]- 07/02/2019
    Memory:
        12x SK Hynix HMA84GR7CJR4N-WM 32 GB 2 rank 2933, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
  C               | 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.

==============================================================================
  C++, C, Fortran | 607.cactuBSSN_s(base)
==============================================================================

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR550
(1.80 GHz, Intel Xeon Gold 6222V)

SPECspeed®2017_fp_base = 114
SPECspeed®2017_fp_peak = Not Run

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

Test Date: Aug-2019
Hardware Availability: Jul-2019
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.

Fortran, C

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.

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
Lenovo Global Technology
ThinkSystem SR550
(1.80 GHz, Intel Xeon Gold 6222V)

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

SPECspeed®2017_fp_base = 114
SPECspeed®2017_fp_peak = Not Run

Test Date: Aug-2019
Hardware Availability: Jul-2019
Software Availability: Dec-2018

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
   -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-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-CLX-D.xml
<table>
<thead>
<tr>
<th>Lenovo Global Technology</th>
<th>SPECs\textsuperscript{2}017\textsubscript{FP} \textbf{base} = 114</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThinkSystem SR550</td>
<td>SPECs\textsuperscript{2}017\textsubscript{FP} \textbf{peak} = Not Run</td>
</tr>
<tr>
<td>(1.80 GHz, Intel Xeon Gold 6222V)</td>
<td></td>
</tr>
</tbody>
</table>

| CPU\textsuperscript{2}017 \textbf{License}: 9017 | Test Date: Aug-2019 |
| Test Sponsor: Lenovo Global Technology | Hardware Availability: Jul-2019 |
| Tested by: Lenovo Global Technology | Software Availability: Dec-2018 |

SPEC CPU and SPECs\textsuperscript{2}peed are registered trademarks 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.

Tested with SPEC CPU\textsuperscript{2}017 \textit{v1.0.5} on 2019-08-07 03:29:14-0400.
Report generated on 2019-09-03 14:50:47 by CPU\textsuperscript{2}017 PDF formatter v6255.
Originally published on 2019-09-03.