



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

## Lenovo Global Technology

ThinkSystem SR850 V2  
(2.60 GHz, Intel Xeon Platinum 8376H)

SPECspeed®2017\_fp\_base = 245

SPECspeed®2017\_fp\_peak = Not Run

CPU2017 License: 9017

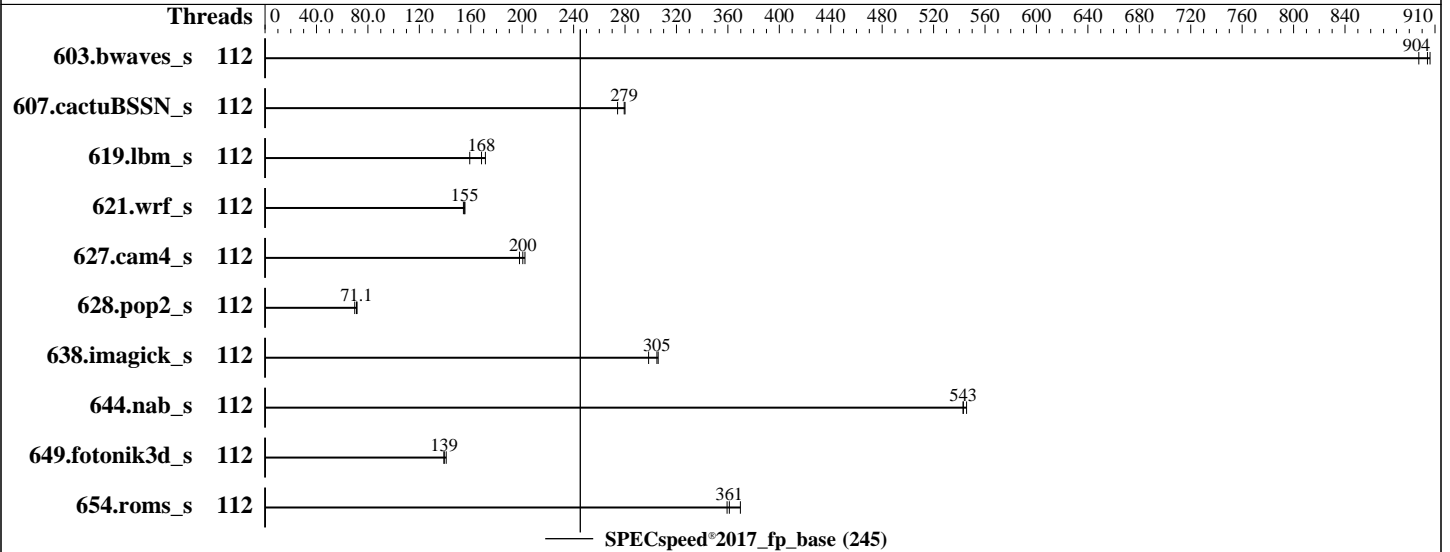
Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Dec-2020

Hardware Availability: Nov-2020

Software Availability: Aug-2020



### Hardware

CPU Name: Intel Xeon Platinum 8376H  
 Max MHz: 4300  
 Nominal: 2600  
 Enabled: 112 cores, 4 chips  
 Orderable: 2,4 chips  
 Cache L1: 32 KB I + 32 KB D on chip per core  
 L2: 1 MB I+D on chip per core  
 L3: 38.5 MB I+D on chip per chip  
 Other: None  
 Memory: 1536 GB (48 x 32 GB 2Rx8 PC4-3200AA-R)  
 Storage: 1 x 960 GB SATA SSD  
 Other: None

### Software

OS: Red Hat Enterprise Linux 8.2 (Ootpa)  
 Kernel 4.18.0-193.el8.x86\_64  
 Compiler: C/C++: Version 19.1.2.275 of Intel C/C++ Compiler for Linux;  
 Fortran: Version 19.1.2.275 of Intel Fortran Compiler for Linux  
 Parallel: Yes  
 Firmware: Lenovo BIOS Version M5E107I 1.01 released Nov-2020  
 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 set to prefer performance at the cost of additional power usage



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

## Lenovo Global Technology

ThinkSystem SR850 V2  
(2.60 GHz, Intel Xeon Platinum 8376H)

SPECspeed®2017\_fp\_base = 245

SPECspeed®2017\_fp\_peak = Not Run

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

**Test Date:** Dec-2020  
**Hardware Availability:** Nov-2020  
**Software Availability:** Aug-2020

## Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	112	<b>65.3</b>	<b>904</b>	65.7	897	65.1	906							
607.cactuBSSN_s	112	59.5	280	<b>59.7</b>	<b>279</b>	60.8	274							
619.lbm_s	112	<b>31.1</b>	<b>168</b>	30.6	171	32.9	159							
621.wrf_s	112	85.1	155	<b>85.2</b>	<b>155</b>	85.7	154							
627.cam4_s	112	44.8	198	43.8	202	<b>44.2</b>	<b>200</b>							
628.pop2_s	112	166	71.6	<b>167</b>	<b>71.1</b>	170	69.8							
638.imagick_s	112	47.2	306	48.4	298	<b>47.3</b>	<b>305</b>							
644.nab_s	112	<b>32.2</b>	<b>543</b>	32.0	546	32.2	543							
649.fotonik3d_s	112	65.5	139	<b>65.4</b>	<b>139</b>	64.7	141							
654.roms_s	112	42.6	370	43.8	359	<b>43.6</b>	<b>361</b>							

SPECspeed®2017\_fp\_base = 245

SPECspeed®2017\_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"

## Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```

KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH =
  "/home/cpu2017-1.1.0-ic19.lu2/lib/intel64:/home/cpu2017-1.1.0-ic19.lu2/j
  e5.0.1-64"
MALLOCONF = "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 disabled by default  
echo never > /sys/kernel/mm/transparent\_hugepage/enabled  
echo never > /sys/kernel/mm/transparent\_hugepage/defrag  
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.

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

## Lenovo Global Technology

SPECspeed®2017\_fp\_base = 245

ThinkSystem SR850 V2  
(2.60 GHz, Intel Xeon Platinum 8376H)

SPECspeed®2017\_fp\_peak = Not Run

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

**Test Date:** Dec-2020  
**Hardware Availability:** Nov-2020  
**Software Availability:** Aug-2020

### General Notes (Continued)

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.

jemalloc, a general purpose malloc implementation  
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5  
sources available from jemalloc.net or <https://github.com/jemalloc/jemalloc/releases>

### Platform Notes

BIOS configuration:  
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode  
MONITOR/MWAIT set to Enabled  
Hyper-Threading set to Disabled  
Adjacent Cache Prefetch set to Disabled

sysinfo program /home/cpu2017-1.1.0-ic19.lu2/bin/sysinfo  
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011  
running on localhost.localdomain Fri Dec 18 18:39:55 2020

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 8376H CPU @ 2.60GHz  
4 "physical id"s (chips)  
112 "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 : 28  
siblings : 28  
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30  
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30  
physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30  
physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30

From lscpu:  
Architecture: x86\_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
CPU(s): 112  
On-line CPU(s) list: 0-111  
Thread(s) per core: 1

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

## Lenovo Global Technology

SPECspeed®2017\_fp\_base = 245

ThinkSystem SR850 V2  
(2.60 GHz, Intel Xeon Platinum 8376H)

SPECspeed®2017\_fp\_peak = Not Run

CPU2017 License: 9017

Test Date: Dec-2020

Test Sponsor: Lenovo Global Technology

Hardware Availability: Nov-2020

Tested by: Lenovo Global Technology

Software Availability: Aug-2020

### Platform Notes (Continued)

```

Core(s) per socket: 28
Socket(s): 4
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8376H CPU @ 2.60GHz
Stepping: 11
CPU MHz: 2114.425
CPU max MHz: 4300.0000
CPU min MHz: 1000.0000
BogoMIPS: 5200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 39424K
NUMA node0 CPU(s): 0-27
NUMA node1 CPU(s): 28-55
NUMA node2 CPU(s): 56-83
NUMA node3 CPU(s): 84-111
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 nopl xtopology nonstop_tsc cpuid
aperfmpperf 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 epb cat_l3 cdp_l3
invpcid_single intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi
flexpriority ept vpid fsgsbase tsc_adjust bml 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 xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
cqm_mbm_local avx512_bf16 dtherm ida arat pln pts pku ospke avx512_vnni md_clear
flush_lld arch_capabilities

```

```

/proc/cpuinfo cache data
cache size : 39424 KB

```

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

```

available: 4 nodes (0-3)
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
node 0 size: 386654 MB
node 0 free: 386432 MB
node 1 cpus: 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
53 54 55
node 1 size: 387038 MB
node 1 free: 386817 MB

```

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

## Lenovo Global Technology

SPECspeed®2017\_fp\_base = 245

ThinkSystem SR850 V2  
(2.60 GHz, Intel Xeon Platinum 8376H)

SPECspeed®2017\_fp\_peak = Not Run

**CPU2017 License:** 9017

**Test Date:** Dec-2020

**Test Sponsor:** Lenovo Global Technology

**Hardware Availability:** Nov-2020

**Tested by:** Lenovo Global Technology

**Software Availability:** Aug-2020

### Platform Notes (Continued)

```

node 2 cpus: 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
81 82 83
node 2 size: 387065 MB
node 2 free: 386616 MB
node 3 cpus: 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105
106 107 108 109 110 111
node 3 size: 387065 MB
node 3 free: 386556 MB
node distances:
node  0  1  2  3
  0:  10  20  20  20
  1:  20  10  20  20
  2:  20  20  10  20
  3:  20  20  20  10

```

From /proc/meminfo

```

MemTotal:      1584971180 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

From /etc/\*release\* /etc/\*version\*

```

os-release:
NAME="Red Hat Enterprise Linux"
VERSION="8.2 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.2"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.2 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.2:ga

```

uname -a:

```

Linux localhost.localdomain 4.18.0-193.el8.x86_64 #1 SMP Fri Mar 27 14:35:58 UTC 2020
x86_64 x86_64 x86_64 GNU/Linux

```

Kernel self-reported vulnerability status:

```

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/swapgs barriers and __user

```

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

## Lenovo Global Technology

SPECspeed®2017\_fp\_base = 245

ThinkSystem SR850 V2  
(2.60 GHz, Intel Xeon Platinum 8376H)

SPECspeed®2017\_fp\_peak = Not Run

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

**Test Date:** Dec-2020  
**Hardware Availability:** Nov-2020  
**Software Availability:** Aug-2020

### Platform Notes (Continued)

CVE-2017-5715 (Spectre variant 2): pointer sanitization  
Mitigation: Enhanced IBRS, IBPB: conditional,  
RSB filling  
tsx\_async\_abort: Not affected

run-level 3 Dec 18 18:36

SPEC is set to: /home/cpu2017-1.1.0-ic19.lu2  
Filesystem Type Size Used Avail Use% Mounted on  
/dev/sda2 xfs 838G 52G 786G 7% /home

From /sys/devices/virtual/dmi/id  
BIOS: Lenovo M5E107I-1.01 11/02/2020  
Vendor: Lenovo  
Product: ThinkSystem SR850 V2  
Product Family: ThinkSystem  
Serial: none

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:  
48x Samsung M393A4G43AB3-CWE 32 GB 2 rank 3200

(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 19.1.2.275 Build 20200623  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
-----

=====  
C++, C, Fortran | 607.cactuBSSN\_s(base)  
-----

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.1.2.275 Build 20200623  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.1.2.275 Build 20200623  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

## Lenovo Global Technology

SPECspeed®2017\_fp\_base = 245

ThinkSystem SR850 V2  
(2.60 GHz, Intel Xeon Platinum 8376H)

SPECspeed®2017\_fp\_peak = Not Run

CPU2017 License: 9017

Test Date: Dec-2020

Test Sponsor: Lenovo Global Technology

Hardware Availability: Nov-2020

Tested by: Lenovo Global Technology

Software Availability: Aug-2020

### Compiler Version Notes (Continued)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.2.275 Build 20200623  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

=====  
Fortran | 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 19.1.2.275 Build 20200623  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

=====  
Fortran, C | 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 19.1.2.275 Build 20200623  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.  
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.2.275 Build 20200623  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

### Base Compiler Invocation

C benchmarks:

icc

Fortran benchmarks:

ifort

Benchmarks using both Fortran and C:

ifort icc

Benchmarks using Fortran, C, and C++:

icpc icc ifort

### Base Portability Flags

603.bwaves\_s: -DSPEC\_LP64  
607.cactuBSSN\_s: -DSPEC\_LP64  
619.lbm\_s: -DSPEC\_LP64

(Continued on next page)



# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

**Lenovo Global Technology**

SPECspeed®2017\_fp\_base = 245

ThinkSystem SR850 V2  
(2.60 GHz, Intel Xeon Platinum 8376H)

SPECspeed®2017\_fp\_peak = Not Run

CPU2017 License: 9017

Test Date: Dec-2020

Test Sponsor: Lenovo Global Technology

Hardware Availability: Nov-2020

Tested by: Lenovo Global Technology

Software Availability: Aug-2020

## Base Portability Flags (Continued)

```
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:

```
-m64 -std=c11 -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-mbranches-within-32B-boundaries
```

Fortran benchmarks:

```
-m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-nostandard-realloc-lhs -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Benchmarks using both Fortran and C:

```
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Benchmarks using Fortran, C, and C++:

```
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

The flags files that were used to format this result can be browsed at

[http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64\\_revA.html](http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.html)

<http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Cooperlake-A.html>

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

[http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64\\_revA.xml](http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml)

<http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Cooperlake-A.xml>





# SPEC CPU®2017 Floating Point Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

## Lenovo Global Technology

ThinkSystem SR850 V2  
(2.60 GHz, Intel Xeon Platinum 8376H)

SPECspeed®2017\_fp\_base = 245

SPECspeed®2017\_fp\_peak = Not Run

**CPU2017 License:** 9017

**Test Sponsor:** Lenovo Global Technology

**Tested by:** Lenovo Global Technology

**Test Date:** Dec-2020

**Hardware Availability:** Nov-2020

**Software Availability:** Aug-2020

SPEC CPU and SPECspeed 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](mailto:info@spec.org).

Tested with SPEC CPU®2017 v1.1.0 on 2020-12-18 05:39:54-0500.  
Report generated on 2021-01-19 16:57:39 by CPU2017 PDF formatter v6255.  
Originally published on 2021-01-19.