# Lenovo Global Technology

## ThinkSystem SD530

(2.70 GHz, Intel Xeon Platinum 8270)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
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<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
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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  
**Test Sponsor:** Lenovo Global Technology  
**Hardware Availability:** Nov-2018

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<thead>
<tr>
<th>Threads</th>
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<tr>
<td>603.bwaves_s 52</td>
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</tr>
<tr>
<td>607.cactuBSSN_s 52</td>
<td></td>
</tr>
<tr>
<td>619.lbm_s 52</td>
<td></td>
</tr>
<tr>
<td>621.wrf_s 52</td>
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</tr>
<tr>
<td>627.cam4_s 52</td>
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<tr>
<td>628.pop2_s 52</td>
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</tr>
<tr>
<td>638.imagick_s 52</td>
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<tr>
<td>644.nab_s 52</td>
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</tr>
<tr>
<td>649.fotonik3d_s 52</td>
<td></td>
</tr>
<tr>
<td>654.roms_s 52</td>
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<table>
<thead>
<tr>
<th>Hardware</th>
</tr>
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<tbody>
<tr>
<td>CPU Name: Intel Xeon Platinum 8270</td>
</tr>
<tr>
<td>Max MHz.: 4000</td>
</tr>
<tr>
<td>Nominal: 2700</td>
</tr>
<tr>
<td>Enabled: 52 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>Orderable: 1.2 chips</td>
</tr>
<tr>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2: 1 MB I+D on chip per core</td>
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<tr>
<td>L3: 35.75 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other: None</td>
</tr>
<tr>
<td>Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)</td>
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<tr>
<td>Storage: 1 x 800 GB SATA SSD</td>
</tr>
<tr>
<td>Other: None</td>
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<table>
<thead>
<tr>
<th>Software</th>
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<tbody>
<tr>
<td>OS: Red Hat Enterprise Linux Server release 7.6 (Maipo)</td>
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<tr>
<td>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</td>
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<tr>
<td>Parallel: Yes</td>
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<tr>
<td>Firmware: Lenovo BIOS Version TEE135R 2.10 released Feb-2019</td>
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<tr>
<td>File System: btrfs</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers: 64-bit</td>
</tr>
<tr>
<td>Peak Pointers: Not Applicable</td>
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<tr>
<td>Other: None</td>
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</table>
Lenovo Global Technology
ThinkSystem SD530
(2.70 GHz, Intel Xeon Platinum 8270)

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
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<th>Seconds</th>
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<tbody>
<tr>
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<tr>
<td>607.cactuBSSN_s</td>
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<td>178</td>
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<td>619.lbm_s</td>
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<tr>
<td>627.cam4_s</td>
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<td>117</td>
<td>75.3</td>
<td>118</td>
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</tr>
<tr>
<td>628.pop2_s</td>
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<td>182</td>
<td>65.3</td>
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<td>638.imagick_s</td>
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<tr>
<td>644.nab_s</td>
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<td>649.fotonik3d_s</td>
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<td>87.1</td>
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<td>86.7</td>
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<td>85.8</td>
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<td>654.roms_s</td>
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<td>110</td>
<td>143</td>
<td>110</td>
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<td>110</td>
<td>143</td>
<td></td>
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</tr>
</tbody>
</table>

SPECspeed2017_fp_base = Not Run
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,1,0"
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.
Lenovo Global Technology
ThinkSystem SD530
(2.70 GHz, Intel Xeon Platinum 8270)

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

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance
Choose Operating Mode set to Custom Mode
C-States set to Legacy
C1 Enhanced Mode set to Enable
Adjacent Cache Prefetcher set to Disable

Sysinfo program /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on localhost.localdomain Tue Apr 2 19:22:14 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) Platinum 8270 CPU @ 2.70GHz
  2 "physical id"s (chips)
  104 "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 : 26
  siblings : 52
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25 26 27 28 29

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 104
On-line CPU(s) list: 0-103
Thread(s) per core: 2
Core(s) per socket: 26
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8270 CPU @ 2.70GHz
Stepping: 6
CPU MHz: 2700.000
BogoMIPS: 5400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K

(Continued on next page)
Lenovo Global Technology  
ThinkSystem SD530  
(2.70 GHz, Intel Xeon Platinum 8270)  

SPECspeed2017_fp_base = 151  
SPECspeed2017_fp_peak = Not Run

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

Software Availability: Nov-2018

Platform Notes (Continued)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>L2 cache:</td>
<td>1024K</td>
</tr>
<tr>
<td>L3 cache:</td>
<td>36608K</td>
</tr>
<tr>
<td>NUMA node0 CPU(s):</td>
<td>0-25,52-77</td>
</tr>
<tr>
<td>NUMA node1 CPU(s):</td>
<td>26-51,78-103</td>
</tr>
<tr>
<td>Flags:</td>
<td>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 oplm xtopology nonstop_tsc aperfmperf eagerfpu 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 epb cat_13 cdp_13 intel_pt ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bfinal hle avx2 smep bmi2  erts invpcid rtm cqm mpx rdtn_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts pak ospe avx512_vnni spec_ctrl intel_stibp flush_lld arch_capabilities</td>
</tr>
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</table>

/proc/cpuinfo cache data

cache size : 36608 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 20 21 22 23 24 25 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77

node 0 size: 196280 MB

node 0 free: 190908 MB

node 1 cpus: 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103

node 1 size: 196608 MB

node 1 free: 190777 MB

node distances:

node 0 1

0: 10 21

1: 21 10

From /proc/meminfo

MemTotal: 395878652 kB

HugePages_Total: 0

Hugepagesize: 2048 kB

From /etc/*release* /etc/*version* os-release:

NAME="Red Hat Enterprise Linux Server"

VERSION="7.6 (Maipo)"

ID="rhel"

ID_LIKE="fedora"

VARIANT="Server"

(Continued on next page)
Lenovo Global Technology

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Test Sponsor: Lenovo Global Technology
Test Date: Apr-2019
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Hardware Availability: Apr-2019
Software Availability: Nov-2018

Platform Notes (Continued)

```
VARIANT_ID="server"
VERSION_ID="7.6"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.6 (Maipo)"
redhat-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)

uname -a:
Linux localhost.localdomain 3.10.0-957.el7.x86_64 #1 SMP Thu Oct 4 20:48:51 UTC 2018
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: Load fences, __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS

run-level 3 Apr 2 17:34

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 btrfs 742G 34G 707G 5% /home

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 - [TEE135R-2.10] - 02/26/2019
Memory:
4x NO DIMM NO DIMM
12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

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)

(Continued on next page)
## Lenovo Global Technology

ThinkSystem SD530  
(2.70 GHz, Intel Xeon Platinum 8270)

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</table>

### 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.

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### 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
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SPECspeed2017_fp_base = 151
SPECspeed2017_fp_peak = Not Run

Test Date: Apr-2019
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Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.libm_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-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
## Lenovo Global Technology

**ThinkSystem SD530**  
*(2.70 GHz, Intel Xeon Platinum 8270)*

### SPEC CPU2017 Floating Point Speed Result

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
</tr>
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<tr>
<td>SPECspeed2017_fp_base</td>
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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 2019-04-02 07:22:13-0400.  
Report generated on 2019-04-30 17:45:00 by CPU2017 PDF formatter v6067.  