## Lenovo Global Technology

**ThinkSystem SD530 (2.70 GHz, Intel Xeon Platinum 8280M)**

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>335</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon Platinum 8280M
- **Max MHz:** 4000
- **Nominal:** 2700
- **Enabled:** 56 cores, 2 chips, 2 threads/core
- **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:** 38.5 MB I+D on chip per chip
- **Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R)
- **Storage:** 1 x 800 GB SATA SSD
- **Power Management:** --

### Software

- **OS:** SUSE Linux Enterprise Server 15 (x86_64)
- **Kernel:** 4.12.14-25.13-default
- **Compiler:** C/C++: Version 19.0.4.227 of Intel C/C++ Compiler for Linux;
- **Compiler for Linux:**
- **Parallel:** No
- **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

### Basic Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base</th>
<th>Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>112</td>
<td>730</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>253</td>
<td>418</td>
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<tr>
<td>505.mcf_r</td>
<td>197</td>
<td>725</td>
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<tr>
<td>520.omnetpp_r</td>
<td>339</td>
<td>718</td>
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<tr>
<td>523.xalancbmk_r</td>
<td>293</td>
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</tr>
<tr>
<td>525.x264_r</td>
<td>281</td>
<td>718</td>
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<tr>
<td>531.deepsjeng_r</td>
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<td>718</td>
</tr>
<tr>
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<td>718</td>
</tr>
<tr>
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</tr>
<tr>
<td>557.xz_r</td>
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<td></td>
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### Test Details

- **CPU2017 License:** 9017
- **Test Sponsor:** Lenovo Global Technology
- **Test Date:** Sep-2019
- **Tested by:** Lenovo Global Technology
- **Hardware Availability:** Apr-2019
- **Software Availability:** May-2019
- **Hardware:** Lenovo Global Technology
- **Software:** Lenovo Global Technology
**SPEC CPU®2017 Integer Rate Result**

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**Lenovo Global Technology**

ThinkSystem SD530
(2.70 GHz, Intel Xeon Platinum 8280M)

---

**SPECrate®2017_int_base = 335**

**SPECrate®2017_int_peak = Not Run**

---

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds (Base)</th>
<th>Ratio</th>
<th>Seconds (Peak)</th>
<th>Ratio</th>
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<th>Ratio</th>
<th>Seconds (Peak)</th>
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<td>675</td>
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<tr>
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**SPECrate®2017_int_base = 335**

**SPECrate®2017_int_peak = Not Run**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

---

**Submit Notes**

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

---

**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:

LD_LIBRARY_PATH = "/home/cpu2017-1.0.5-ic19.0u4/lib/intel64"

Binaries compiled on a system with 1x Intel Core i9-799X 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
```

runcpu command invoked through numactl i.e.:

```
umactl --interleave=all runcpu <etc>
```

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)

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD530
(2.70 GHz, Intel Xeon Platinum 8280M)

SPECr®2017_int_base = 335
SPECr®2017_int_peak = Not Run

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

Test Date: Sep-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

General Notes (Continued)
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.

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
DCU Streamer Prefetcher set to Disable
MONITOR/MWAIT set to Enable
SNC set to Enable
Sysinfo program /home/cpu2017-1.0.5-ic19.0u4/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-qxkw Mon Sep 16 09:55:00 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 8280M CPU @ 2.70GHz
  2 "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 : 56
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

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: 2
Core(s) per socket: 28
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6

(Continued on next page)
### Lenovo Global Technology

**ThinkSystem SD530**  
*(2.70 GHz, Intel Xeon Platinum 8280M)*

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**SPEC CPU®2017 Integer Rate Result**  

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<td>May-2019</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

Model: 85  
Model name: Intel(R) Xeon(R) Platinum 8280M CPU @ 2.70GHz  
Stepping: 6  
CPU MHz: 2700.000  
CPU max MHz: 4000.0000  
CPU min MHz: 1000.0000  
BogoMIPS: 5400.00  
Virtualization: VT-x  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 1024K  
L3 cache: 39424K  
NUMA node0 CPU(s): 0-3,7-9,14-17,21-23,56-59,63-65,70-73,77-79  
NUMA node1 CPU(s): 4-6,10-13,18-20,24-27,60-62,66-69,74-76,80-83  
NUMA node2 CPU(s): 28-31,35-37,42-45,49-51,84-87,91-93,98-101,105-107  
NUMA node3 CPU(s): 32-34,38-41,46-48,52-55,58-60,64-65,70-73,77-79  
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 arch_perfmon pebs bts rep_good nopl xtopology 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 rdrnd lahf_lm abm 3nowprefetch cpuid_fault ebcat l3 cdp l3 invpcid_single intel_pplin ssbd mba ibrs ibpb tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 3msm mpx rdseed rdrand abts dca mtrr_nr dtlb_l1d 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.

<table>
<thead>
<tr>
<th>available: 4 nodes (0-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>node 0 cpus: 0 1 2 3 7 8 9 14 15 16 17 21 22 23 56 57 58 59 63 64 65 70 71 72 73 77 78 79</td>
</tr>
<tr>
<td>node 0 size: 96334 MB</td>
</tr>
<tr>
<td>node 0 free: 93057 MB</td>
</tr>
<tr>
<td>node 1 cpus: 4 5 6 10 11 12 13 18 19 20 24 25 26 27 60 61 62 66 67 68 69 74 75 76 80 81 82 83</td>
</tr>
<tr>
<td>node 1 size: 96752 MB</td>
</tr>
<tr>
<td>node 1 free: 96201 MB</td>
</tr>
<tr>
<td>node 2 cpus: 28 29 30 31 35 36 37 42 43 44 45 49 50 51 84 85 86 87 91 92 93 98 99 100 101 105 106 107</td>
</tr>
<tr>
<td>node 2 size: 96752 MB</td>
</tr>
<tr>
<td>node 2 free: 96502 MB</td>
</tr>
<tr>
<td>node 3 cpus: 32 33 34 38 39 40 41 46 47 48 52 53 54 55 88 89 90 94 95 96 97 102 103 104 105 106 107</td>
</tr>
</tbody>
</table>

(Continued on next page)
Platform Notes (Continued)

108 109 110 111
node 3 size: 96749 MB
node 3 free: 96412 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
MemTotal: 395867512 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  os-release:
    NAME="SLES"
    VERSION="15"
    VERSION_ID="15"
    PRETTY_NAME="SUSE Linux Enterprise Server 15"
    ID="sles"
    ID_LIKE="suse"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:15"

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 Sep 16 09:53

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u4
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/sdb3 xfs 737G 98G 640G 14% /

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.
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ThinkSystem SD530
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Sep-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

Platform Notes (Continued)

- BIOS Lenovo -[TEE141E-2.30]- 07/02/2019
- Memory:
  - 4x NO DIMM NO DIMM
  - 12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

C
- 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)
- 525.x264_r(base) 557.xz_r(base)

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

C++
- 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
- 541.leela_r(base)

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Fortran
- 548.exchange2_r(base)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
- icc -m64 -std=c11

C++ benchmarks:
- icpc -m64

Fortran benchmarks:
- ifort -m64
Lenovo Global Technology
ThinkSystem SD530
(2.70 GHz, Intel Xeon Platinum 8280M)

**SPECrate®2017_int_base** = 335
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**Base Portability Flags**

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

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**Base Optimization Flags**

**C** benchmarks:
- Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- qopt-mem-layout-trans=4
- /usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
- lqkmalloc

**C++** benchmarks:
- Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- qopt-mem-layout-trans=4
- /usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
- lqkmalloc

**Fortran** benchmarks:
- Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
- /usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
- lqkmalloc

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:

[http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-F.xml](http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-F.xml)
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**Test Date:** Sep-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** May-2019

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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