## Lenovo Global Technology

### ThinkSystem SD530 (2.50 GHz, Intel Xeon Gold 6248)

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

### Performance Results

**SPECrate2017_int_base = 244**  
**SPECrate2017_int_peak = Not Run**

<table>
<thead>
<tr>
<th>Spec Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>80</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>80</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>80</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>80</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>80</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>80</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>80</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>80</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>80</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>80</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon Gold 6248  
- **Max MHz.:** 3900  
- **Nominal:** 2500  
- **Enabled:** 40 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:** 27.5 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2933Y-R)  
- **Storage:** 1 x 800 GB SATA SSD  
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 15 (x86_64)  
- **Kernel:** 4.12.14-25.13-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  
- **Fortran Build:** 20181018 for Linux  
- **Parallel:** No  
- **Firmware:** Lenovo BIOS Version TEE135R 2.10 released Feb-2019  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **Other:** None
# Lenovo Global Technology

ThinkSystem SD530  
(2.50 GHz, Intel Xeon Gold 6248)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>80</td>
<td>673</td>
<td>189</td>
<td>672</td>
<td>189</td>
<td>673</td>
<td>189</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>80</td>
<td>578</td>
<td>196</td>
<td>584</td>
<td>194</td>
<td>585</td>
<td>194</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>80</td>
<td>399</td>
<td>324</td>
<td>402</td>
<td>322</td>
<td>401</td>
<td>322</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>80</td>
<td>670</td>
<td>157</td>
<td>671</td>
<td>156</td>
<td>670</td>
<td>157</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>80</td>
<td>314</td>
<td>269</td>
<td>313</td>
<td>270</td>
<td>314</td>
<td>269</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>80</td>
<td>278</td>
<td>504</td>
<td>280</td>
<td>501</td>
<td>278</td>
<td>503</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>80</td>
<td>447</td>
<td>205</td>
<td>446</td>
<td>205</td>
<td>447</td>
<td>205</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>80</td>
<td>661</td>
<td>200</td>
<td>665</td>
<td>199</td>
<td>661</td>
<td>200</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>80</td>
<td>473</td>
<td>443</td>
<td>473</td>
<td>444</td>
<td>472</td>
<td>444</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>80</td>
<td>529</td>
<td>163</td>
<td>529</td>
<td>163</td>
<td>531</td>
<td>163</td>
</tr>
</tbody>
</table>

**SPECrate2017_int_base** = 244  
**SPECrate2017_int_peak** = Not Run

---

**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-ic19.0u1/lib/intel64"

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  
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) is mitigated in the system as tested and documented.

(Continued on next page)
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
Choose Operating Mode set 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-ic19.0u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-o8xc Wed Jun 12 11:39:09 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) Gold 6248 CPU @ 2.50GHz
  2  "physical id"s (chips)
  80 "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 : 40
  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): 80
  On-line CPU(s) list: 0-79
  Thread(s) per core: 2
  Core(s) per socket: 20
  Socket(s): 2
  NUMA node(s): 4
  Vendor ID: GenuineIntel
  CPU family: 6
  Model: 85

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD530
(2.50 GHz, Intel Xeon Gold 6248)

SPECrate2017_int_base = 244
SPECrate2017_int_peak = Not Run

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

Platform Notes (Continued)

Model name: Intel(R) Xeon(R) Gold 6248 CPU @ 2.50Ghz
Stepping: 6
CPU MHz: 2500.0000
CPU max MHz: 3900.0000
CPU min MHz: 1000.0000
BogoMIPS: 5000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 28160K
NUMA node0 CPU(s): 0-2, 5, 6, 10-12, 15, 16, 40-42, 45, 46, 50-52, 55, 56
NUMA node1 CPU(s): 3, 4, 7-9, 13, 14, 17-19, 43, 44, 47-49, 53-54, 57-59
NUMA node2 CPU(s): 20, 22, 25, 26, 30-32, 35, 36, 60-62, 65, 66, 70-72, 75, 76
NUMA node3 CPU(s): 23, 24, 27-29, 33, 34, 37, 38, 39, 63, 64, 67-69, 73, 74, 77-79
Flags: fpu vme de pse tsc msr pae mce cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art arch_perfmon 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 rdrand lahf_lm abm 3nowprefetch cpuid_fault ebpx cat_l3 cdp_l3 invpcid_single ssbd mba ibrs ibpb tpr_shadow vnmi flexpriority ept vpid fsgsbase ts_adjust bmi1 hle avx2 smep bmi2 ermi invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves xsaves xcmsg xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts pkp ospke avx512_vnni flush_l1d arch_capabilities

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

node 0 cpus: 0 1 2 5 6 10 11 12 15 16 40 41 42 45 46 50 51 52 55 56
node 0 size: 47972 MB
node 0 free: 44304 MB
node 1 cpus: 3 4 7 8 9 13 14 17 18 19 43 44 47 48 49 53 54 57 58 59
node 1 size: 48340 MB
node 1 free: 48040 MB
node 2 cpus: 20 21 22 25 26 30 31 32 35 36 60 61 62 65 66 70 71 72 75 76
node 2 size: 48369 MB
node 2 free: 48136 MB
node 3 cpus: 23 24 27 28 29 33 34 37 38 39 63 64 67 68 69 73 74 77 78 79
node 3 size: 48367 MB
node 3 free: 48139 MB
node distances:
node 0 1 2 3

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD530 (2.50 GHz, Intel Xeon Gold 6248)

SPECrate2017_int_base = 244
SPECrate2017_int_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Software Availability: Nov-2018
Tested by: Lenovo Global Technology
Hardware Availability: Apr-2019
Test Date: Jun-2019

Platform Notes (Continued)

0:  10  11  21  21
1:  11  10  21  21
2:  21  21  10  11
3:  21  21  11  10

From /proc/meminfo
MemTotal: 197683520 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 Jun 12 11:37

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/sdb3      xfs    744G   42G  702G   6% /

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 M393A2K43CB2-CVF 16 GB 2 rank 2933

(Continued on next page)
# SPEC CPU2017 Integer Rate Result

**Lenovo Global Technology**

ThinkSystem SD530  
(2.50 GHz, Intel Xeon Gold 6248)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>244</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

**Test Date:** Jun-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Nov-2018

## Platform Notes (Continued)

(End of data from sysinfo program)

## Compiler Version Notes

```
CC  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 19.0.1.144 Build 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

```
CXXC 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 19.0.1.144 Build 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

```
FC  548.exchange2_r(base)

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:**

```bash
icc -m64 -std=c11
```

**C++ benchmarks:**

```bash
icpc -m64
```

**Fortran benchmarks:**

```bash
ifort -m64
```
# Lenovo Global Technology

**ThinkSystem SD530**  
(2.50 GHz, Intel Xeon Gold 6248)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>244</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

## 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`

## Base Optimization Flags

### C benchmarks:

- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=4`
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64`
- `-lqkmalloc`

### C++ benchmarks:

- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=4`
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/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`
- `-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/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:

<table>
<thead>
<tr>
<th>Lenovo Global Technology</th>
<th>CPU2017 License: 9017</th>
</tr>
</thead>
<tbody>
<tr>
<td>ThinkSystem SD530</td>
<td>Test Date: Jun-2019</td>
</tr>
<tr>
<td>(2.50 GHz, Intel Xeon Gold 6248)</td>
<td>Hardware Availability: Apr-2019</td>
</tr>
<tr>
<td></td>
<td>Tested by: Lenovo Global Technology</td>
</tr>
<tr>
<td></td>
<td>Software Availability: Nov-2018</td>
</tr>
<tr>
<td></td>
<td>SPECrate2017_int_base = 244</td>
</tr>
<tr>
<td></td>
<td>SPECrate2017_int_peak = Not Run</td>
</tr>
</tbody>
</table>

SPEC is a registered trademark 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 CPU2017 v1.0.5 on 2019-06-11 23:39:09-0400.
Originally published on 2019-07-09.