## Lenovo Global Technology

**ThinkSystem SD530**  
*(2.70 GHz, Intel Xeon Gold 6258R)*

---

**SPECrate®2017_int_base = 360**  
**SPECrate®2017_int_peak = Not Run**

---

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS: SUSE Linux Enterprise Server 15 SP1 (x86_64) Kernel 4.12.14-195-default</td>
<td>CPU Name: Intel Xeon Gold 6258R</td>
</tr>
<tr>
<td>Compiler: C/C++: Version 19.1.1.217 of Intel</td>
<td>Max MHz: 4000</td>
</tr>
<tr>
<td>Compiler for Linux; Fortran: Version 19.1.1.217 of Intel Fortran</td>
<td>Nominal: 2700</td>
</tr>
<tr>
<td>Firmware: Lenovo BIOS Version TEE155L 2.61 released May-2020</td>
<td>Enabled: 56 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>File System: xfs</td>
<td>Orderable: 1,2 chips</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Base Pointers: 64-bit</td>
<td>L2: 1 MB I+D on chip per core</td>
</tr>
<tr>
<td>Peak Pointers: Not Applicable</td>
<td>L3: 38.5 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other: None</td>
<td>Other: None</td>
</tr>
<tr>
<td>Power Management: BIOS set to prefer performance at the cost of additional power usage</td>
<td></td>
</tr>
</tbody>
</table>

---

### Test Date: Jun-2020  
**Hardware Availability:** Mar-2020  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Software Availability:** Apr-2020

---

### Copies

<table>
<thead>
<tr>
<th>Program</th>
<th>Base</th>
<th>Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>112</td>
<td></td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>112</td>
<td>252</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>112</td>
<td>262</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>112</td>
<td>574</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>112</td>
<td>209</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>112</td>
<td></td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>112</td>
<td>463</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>112</td>
<td></td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>112</td>
<td>720</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>112</td>
<td></td>
</tr>
</tbody>
</table>

---

**Test Date:** Jun-2020  
**Hardware Availability:** Mar-2020  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Software Availability:** Apr-2020

---

### CPU2017 License: 9017  
**Test Date:** Jun-2020  
**Hardware Availability:** Mar-2020  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Software Availability:** Apr-2020

---

### Hardware

<table>
<thead>
<tr>
<th>Program</th>
<th>Base</th>
<th>Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>112</td>
<td></td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>112</td>
<td>252</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>112</td>
<td>262</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>112</td>
<td>574</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>112</td>
<td>209</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>112</td>
<td></td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>112</td>
<td>463</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>112</td>
<td></td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>112</td>
<td>720</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>112</td>
<td></td>
</tr>
</tbody>
</table>

---

**Test Date:** Jun-2020  
**Hardware Availability:** Mar-2020  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Software Availability:** Apr-2020

---

### Hardware

- **CPU Name:** Intel Xeon Gold 6258R  
  - **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  
  - **L2:** 1 MB I+D on chip per core  
  - **L3:** 38.5 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

---

**Test Date:** Jun-2020  
**Hardware Availability:** Mar-2020  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Software Availability:** Apr-2020

---

### Software

- **OS:** SUSE Linux Enterprise Server 15 SP1 (x86_64) Kernel 4.12.14-195-default  
  - **Compiler:** C/C++: Version 19.1.1.217 of Intel  
    - **Compiler for Linux:** Fortran: Version 19.1.1.217 of Intel Fortran  
    - **Compiler for Linux:**  
      - **Parallel:** No  
      - **Firmware:** Lenovo BIOS Version TEE155L 2.61 released May-2020  
      - **File System:** xfs  
      - **System State:** Run level 3 (multi-user)  
      - **Base Pointers:** 64-bit  
      - **Peak Pointers:** Not Applicable  
      - **Other:** None  
      - **Power Management:** BIOS set to prefer performance at the cost of additional power usage
### Lenovo Global Technology

ThinkSystem SD530  
(2.70 GHz, Intel Xeon Gold 6258R)

<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>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specrate®2017_int_base = 360</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specrate®2017_int_peak = Not Run</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

### Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler. The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux. The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux.

### 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"

### Environment Variables Notes

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

```
LD_LIBRARY_PATH = 
  "*/home/cpu2017-1.1.0-ic19.1.1/lib/intel64:/home/cpu2017-1.1.0-ic19.1.1/lib/ia32:/home/cpu2017-1.1.0-ic19.1.1/je5.0.1-32"

MALLOC_CONF = "retain:true"
```
Lenovo Global Technology
ThinkSystem SD530
(2.70 GHz, Intel Xeon Gold 6258R)

SPECrates®2017_int_base = 360
SPECrates®2017_int_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Test Date: Jun-2020
Tested by: Lenovo Global Technology
Hardware Availability: Mar-2020
Software Availability: Apr-2020

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 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.:
numactl --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.
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/cpu2017-1.1.0-ic19.1.1/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edf1e6e46a485a0011
running on linux-jq95 Fri Jun 5 01:04:28 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) Gold 6258R 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
(Continued on next page)
## Lenovo Global Technology

**ThinkSystem SD530**  
(2.70 GHz, Intel Xeon Gold 6258R)

## SPEC CPU®2017 Integer Rate Result

<table>
<thead>
<tr>
<th>Copyright 2017-2020 Standard Performance Evaluation Corporation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lenovo Global Technology</strong></td>
</tr>
</tbody>
</table>
| **ThinkSystem SD530**  
(2.70 GHz, Intel Xeon Gold 6258R) |
| **SPECrate®2017_int_base** = 360 |
| **SPECrate®2017_int_peak** = Not Run |

### Platform Notes (Continued)

28 29 30

From lscpu:

- **Architecture:** x86_64
- **CPU op-mode(s):** 32-bit, 64-bit
- **Byte Order:** Little Endian
- **Address sizes:** 46 bits physical, 48 bits virtual
- **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
- **Model:** 85
- **Model name:** Intel(R) Xeon(R) Gold 6258R CPU @ 2.70GHz
- **Stepping:** 7
- **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):** 0-3,7-9,14-17,21-23,28-31,35-37,42-45,49-51,56-59,63-65,70-73,77-79
- **NUMA node1 CPU(s):** 4-6,10-13,18-20,24-27,32-34,38-41,46-48,52-55,60-62,66-69,74-76,80-83
- **NUMA node2 CPU(s):** 28-31,35-37,42-45,49-51,84-87,91-93,98-101,105-107
- **NUMA node3 CPU(s):** 32-34,38-41,46-48,52-55,58-60,65-67,70-72,84-86,102-104,108-111
- **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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssbe sse3 sdbg fma cx16 xtrunc pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault ebpx cat_l3 cdp_l3 invpcid_single intel_patin ssbd mba ibrs ibpb ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsaveas cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts pkup ospe axv512_vnni md_clear flush_lld arch_capabilities

```bash
test Date: Jun-2020
Hardware Availability: Mar-2020
Software Availability: Apr-2020
```
Platform Notes (Continued)

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 7 8 9 14 15 16 17 21 22 23 56 57 58 59 63 64 65 70 71 72 73 77 78 79
   node 0 size: 47958 MB
   node 0 free: 47318 MB
   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
   node 1 size: 48378 MB
   node 1 free: 48133 MB
   node 2 cpus:  28 29 30 31 35 36 37 42 43 44 45 49 50 51 84 85 86 94 95 96 97 102 103 104 108 109 110 111
   node 2 size: 48378 MB
   node 2 free: 48124 MB
   node 3 cpus: 32 33 34 38 39 40 41 46 47 48 52 53 54 55 58 88 89 90 94 95 96 97 102 103 104 108 109 110 111
   node 3 size: 48377 MB
   node 3 free: 48057 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:   197727576 kB
   HugePages_Total:   0
   Hugepagesize:   2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="SLES"
      VERSION="15-SP1"
      VERSION_ID="15.1"
      PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
      ID="sles"
      ID_LIKE="suse"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:15:sp1"

uname -a:
   Linux linux-jq95 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
   x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD530
(2.70 GHz, Intel Xeon Gold 6258R)

SPEC CPU®2017 Integer Rate Result

SPECrates2017_int_base = 360
SPECrates2017_int_peak = Not Run

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

Test Date: Jun-2020
Hardware Availability: Mar-2020
Software Availability: Apr-2020

Platform Notes (Continued)

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: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

run-level 3 Jun 5 01:03

SPEC is set to: /home/cpu2017-1.1.0-ic19.1.1
Filesystem Type Size Used Avail Use% Mounted on
/dev/md124p3 xfs 740G 67G 674G 9% /

From /sys/devices/virtual/dmi/id
BIOS: Lenovo -[TEE155L-2.61]- 05/20/2020
Vendor: Lenovo
Product: THINKSYSTEM SD530 -[7X2104Z000]-
Product Family: ThinkSystem
Serial: 1234567890

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:
4x NO DIMM NO DIMM
12x SK Hynix HMA82GR7CJR8N-WM 16 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 Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

==============================================================================
C++ | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
(Continued on next page)
Lenovo Global Technology
ThinkSystem SD530
(2.70 GHz, Intel Xeon Gold 6258R)

SPECrates®2017_int_base = 360
SPECrates®2017_int_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology
Test Date: Jun-2020
Hardware Availability: Mar-2020
Software Availability: Apr-2020

Compiler Version Notes (Continued)

<table>
<thead>
<tr>
<th>541.leela_r(base)</th>
</tr>
</thead>
</table>
| Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

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.xalancmk_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
Lenovo Global Technology
ThinkSystem SD530
(2.70 GHz, Intel Xeon Gold 6258R)

SPECrate®2017_int_base = 360
SPECrate®2017_int_peak = Not Run

Tested Date: Jun-2020
Hardware Availability: Mar-2020
Software Availability: Apr-2020

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

Base Optimization Flags

C benchmarks:
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-fuse-ld=gold -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

C++ benchmarks:
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse
-funroll-loops -fuse-ld=gold -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

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-H.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/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-H.xml

SPEC CPU and SPECrate 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.