# SPEC CPU®2017 Integer Rate Result

**Lenovo Global Technology**

**ThinkSystem SD530**

(2.10 GHz, Intel Xeon Gold 6238M)

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**SPECrade®2017_int_base = 244**

**SPECrade®2017_int_peak = Not Run**

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**Lenovo Global Technology**

**Test Sponsor:** Lenovo Global Technology

**Tested by:** Lenovo Global Technology

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**Copy**

<table>
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<th>Benchmark</th>
<th>Copies</th>
<th>SPECrate®2017_int_peak (244)</th>
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<td>557.xz_r</td>
<td>88</td>
<td>164</td>
</tr>
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**Hardware**

**CPU Name:** Intel Xeon Gold 6238M

**Max MHz:** 3700

**Nominal:** 2100

**Enabled:** 44 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:** 30.25 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

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**Software**

**OS:** SUSE Linux Enterprise Server 15 (x86_64)

**Kernel:** 4.1.12-14.13-default

**Compiler:** C/C++: Version 19.0.4.227 of Intel

**Compiler for Linux:**

**Fortran:** Version 19.0.4.227 of Intel Fortran

**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

**Power Management:** --
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SPECrate®2017_int_base = 244
SPECrate®2017_int_peak = Not Run

Results Table

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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
Files system 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)
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-ic19.0u4/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-xd43 Thu Sep  5 09:50:25 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 6238M CPU @ 2.10GHz
  2  "physical id"s (chips)
  88 "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 : 22
siblings : 44
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 88
On-line CPU(s) list: 0-87
Thread(s) per core: 2
Core(s) per socket: 22
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85

(Continued on next page)
**SPEC CPU®2017 Integer Rate Result**

Lenovo Global Technology  
ThinkSystem SD530  
(2.10 GHz, Intel Xeon Gold 6238M)

<table>
<thead>
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<th>CPU2017 License:</th>
<th>9017</th>
<th>Test Date:</th>
<th>Sep-2019</th>
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<tr>
<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
<td>Hardware Availability:</td>
<td>Jul-2019</td>
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<td>Tested by:</td>
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<td>Software Availability:</td>
<td>May-2019</td>
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</table>

### SPECrate®2017_int_base = 244  
SPECrate®2017_int_peak = Not Run

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**Platform Notes (Continued)**

Model name: Intel(R) Xeon(R) Gold 6238M CPU @ 2.10GHz  
Stepping: 7  
CPU MHz: 2100.000  
CPU max MHz: 3700.0000  
CPU min MHz: 1000.0000  
BogoMIPS: 4200.00  
Virtualization: VT-x  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 1024K  
L3 cache: 30976K  
NUMA node0 CPU(s): 0-2, 6-8, 11-13, 17, 18, 44-46, 50-52, 55-57, 61, 62  
NUMA node1 CPU(s): 3-5, 9, 10, 14-16, 19-21, 47-49, 53, 54, 58-60, 63-65  
NUMA node2 CPU(s): 22-24, 28-30, 33-35, 39, 40, 66-68, 72-74, 77-79, 83, 84  
NUMA node3 CPU(s): 25-27, 31, 32, 36-38, 41-43, 69-71, 75, 76, 80-82, 85-87  
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 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 rdrand lahf_lm abm idrdt lahf_lm admb abm abmcm cpufreq cpuid_fault epb cat_l3 dcp_l3 invpcid_single intel_ppln ssbd mba ibrs ibpb stibp tpr_shadow vmx flexpriority ept vpid fsgsbase tsc_adjust bini hle avx2 smep bmi2 erms invpcid rtm cmx mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsave vgxetbv xsavec xcmlllc xcm_occup_llc xcm_mbb_total xcm_mbb_local dtherm ida arat pni pts pku ospke avx512_vnni flush_l1d arch_capabilities   

/proc/cpuinfo cache data  
  cache size: 30976 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 6 7 8 11 12 13 17 18 44 45 46 50 51 52 55 56 57 61 62  
  node 0 size: 47980 MB  
  node 0 free: 44610 MB  
  node 1 cpus: 3 4 5 9 10 14 15 16 19 20 21 47 48 49 53 54 58 59 60 63 64 65  
  node 1 size: 48369 MB  
  node 1 free: 47905 MB  
  node 2 cpus: 22 23 24 28 29 30 33 34 35 39 40 66 67 68 72 73 74 77 78 79 83 84  
  node 2 size: 48369 MB  
  node 2 free: 48134 MB  
  node 3 cpus: 25 26 27 31 32 36 37 38 41 42 43 69 70 71 75 76 80 81 82 85 86 87  
  node 3 size: 48338 MB  
  node 3 free: 48121 MB  
  node distances:  
    node 0 1 2 3

(Continued on next page)
# SPEC CPU®2017 Integer Rate Result

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### Platform Notes (Continued)

<p>| | | |</p>
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<td>11 21 21</td>
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<td>10 21 21</td>
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<td>21</td>
<td>21 10 11</td>
</tr>
<tr>
<td>3:</td>
<td>21</td>
<td>21 11 10</td>
</tr>
</tbody>
</table>

From /proc/meminfo

MemTotal: 197691276 kB  
HugePages_Total: 0  
Hugepagedsize: 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 5 09:49

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u4  
Filesystem Type Size Used Avail Use% Mounted on  
/dev/md126p3 xfs 743G 60G 683G 9% /

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 -TEE141E-2.30- 07/02/2019  
Memory:  
4x NO DIMM NO DIMM  
12x SK Hynix HMA82GR7CJR8N-WM 16 GB 2 rank 2933

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SPEC CPU®2017 Integer Rate Result

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CPU2017 License: 9017
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Tested by: Lenovo Global Technology
Test Date: Sep-2019
Hardware Availability: Jul-2019
Software Availability: May-2019

Platform Notes (Continued)
(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
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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.keela_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_2019.4.227/linux/compiler/lib/intel64
-1qkmalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-1qkmalloc

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-1qkmalloc

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-D.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-D.xml
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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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