### Lenovo Global Technology

**ThinkSystem SD630 V2**

(3.00 GHz, Intel Xeon Gold 5317)

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<table>
<thead>
<tr>
<th>Test Sponsor</th>
<th>Lenovo Global Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>Test Date</td>
<td>Jun-2021</td>
</tr>
<tr>
<td>Hardware Availability</td>
<td>Jul-2021</td>
</tr>
<tr>
<td>Software Availability</td>
<td>Dec-2020</td>
</tr>
</tbody>
</table>

#### SPEC CPU 2017 Integer Speed Result

**SPECSpeed**

- **SPECspeed®2017_int_base** = 11.4
- **SPECspeed®2017_int_peak** = Not Run

---

#### Hardware

- **CPU Name:** Intel Xeon Gold 5317
- **Max MHz:** 3600
- **Nominal:** 3000
- **Enabled:** 24 cores, 2 chips, 2 threads/core
- **Orderable:** 2 chips
- **Cache L1:** 32 KBI + 48 KB D on chip per core
- **L2:** 1.25 MB I+D on chip per core
- **L3:** 18 MB I+D on chip per chip
- **Other:** None
- **Memory:** 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R, running at 2933)
- **Storage:** 1 x 480 GB SATA SSD
- **Other:** None

---

#### Software

- **OS:** Red Hat Enterprise Linux 8.3 (Ootpa)
- **Kernel:** 4.18.0-240.el8.x86_64
- **Compiler:** C/C++, Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux;
  Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux;
- **Parallel:** Yes
- **Firmware:** Lenovo BIOS Version U8E111A 1.02 released May-2021
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Other:** jemalloc memory allocator V5.0.1
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage

---

#### SPEC Speed Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base (11.4)</th>
</tr>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>48</td>
<td>7.20</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>48</td>
<td>10.2</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>48</td>
<td>19.2</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>48</td>
<td>8.31</td>
</tr>
<tr>
<td>623.xalanchmk_s</td>
<td>48</td>
<td>13.8</td>
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<tr>
<td>625.x264_s</td>
<td>48</td>
<td>5.96</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>48</td>
<td>4.90</td>
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<tr>
<td>641.leela_s</td>
<td>48</td>
<td>20.8</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>48</td>
<td>22.2</td>
</tr>
<tr>
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<td>48</td>
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### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tbody>
<tr>
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<td>246</td>
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<td>7.18</td>
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<tr>
<td>602.gcc_s</td>
<td>48</td>
<td>391</td>
<td>10.2</td>
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<td>10.1</td>
<td>387</td>
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<td>245</td>
<td>19.3</td>
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<td>8.29</td>
<td>195</td>
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<tr>
<td>623.xalancbmk_s</td>
<td>48</td>
<td>103</td>
<td>13.8</td>
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<td>13.7</td>
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<td>625.x264_s</td>
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<td>103</td>
<td>17.2</td>
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<tr>
<td>631.deepsjeng_s</td>
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<td>5.96</td>
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<td>348</td>
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<td>648.exchange2_s</td>
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<td>142</td>
<td>20.8</td>
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<td>20.8</td>
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<td>20.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td>48</td>
<td>278</td>
<td>22.2</td>
<td>276</td>
<td>22.4</td>
<td>278</td>
<td>22.2</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.

### 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:
- KMP_AFFINITY = "granularity=fine,scatter"
- LD_LIBRARY_PATH = 
  
  "/home/cpu2017-1.1.8-ic2021.1-revB/lib/intel64:/home/cpu2017-1.1.8-ic202
  1.1-revB/je5.0.1-64"
- MALLOC_CONF = "retain:true"
- OMP_STACKSIZE = "192M"

### 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
```

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.
Lenovo Global Technology
ThinkSystem SD630 V2
(3.00 GHz, Intel Xeon Gold 5317)

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

SPECspeed®2017_int_base = 11.4
SPECspeed®2017_int_peak = Not Run

Test Date: Jun-2021
Hardware Availability: Jul-2021
Software Availability: Dec-2020

General Notes (Continued)

jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
C-States set to Autonomous
CPU P-state Control set to Autonomous

Sysinfo program /home/cpu2017-1.1.8-ic2021.1-revB/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaf64d
running on localhost.localdomain Thu Jun 24 10:25:22 2021

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 5317 CPU @ 3.00GHz
  2 "physical id"s (chips)
  48 "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 : 12
siblings : 24
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11

From lscpu from util-linux 2.32.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 2
Core(s) per socket: 12
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Gold 5317 CPU @ 3.00GHz
Stepping: 6
CPU MHz: 800.000

(Continued on next page)
**SPEC CPU®2017 Integer Speed Result**  
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**Lenovo Global Technology**  
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<tr>
<td>BogoMIPS: 6000.00</td>
</tr>
<tr>
<td>Virtualization: VT-x</td>
</tr>
<tr>
<td>L1d cache: 48K</td>
</tr>
<tr>
<td>L1i cache: 32K</td>
</tr>
<tr>
<td>L2 cache: 1280K</td>
</tr>
<tr>
<td>L3 cache: 18432K</td>
</tr>
<tr>
<td>NUMA node0 CPU(s): 0-11,24-35</td>
</tr>
<tr>
<td>NUMA node1 CPU(s): 12-23,36-47</td>
</tr>
<tr>
<td>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 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 xsvav ax f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault epb cat_l3 invpcid_single intel_pinn ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmni flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid cqm rdt_a_avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveropt xsaves xgetbv1 xsaves cqm_llc cqm_occucllc cqm_mbml_total cqm_mbb_local split_lock_detect bwoninvvd dtherm ida arat pln pts hwp_epp avx512v bmi umip pku ospke avx512_vbmi2 gfnl vaes vpcmuloqdq avx512_vmi_avx512_bitalg tme avx512_vpopcntdq 1a57 rdpid md_clear pconfig flush_l1d arch_capabilities</td>
</tr>
</tbody>
</table>

/proc/cpuinfo cache data  
cache size: 18432 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 24 25 26 27 28 29 30 31 32 33 34 35  
node 0 size: 248965 MB  
node 0 free: 254648 MB  
node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23 36 37 38 39 40 41 42 43 44 45 46 47  
node 1 size: 250230 MB  
node 1 free: 257381 MB  
node distances:  
node 0 1  
0: 10 20  
1: 20 10

From /proc/meminfo  
MemTotal: 528010716 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB

/sbin/tuned-adm active  
Current active profile: throughput-performance

(Continued on next page)
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CPU2017 License: 9017
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Platform Notes (Continued)

From /etc/*release* /etc/*version*

```
spec
```

From /etc/*release* /etc/*version*

```

oracle
```

From /etc/*release* /etc/*version*

```

From /sys/devices/virtual/dmi/id
Vendor: Lenovo
Product: ThinkSystem SD630 V2
Product Family: ThinkSystem
Serial: 1234567890

run-level 3 Jun 24 10:24

SPEC is set to: /home/cpu2017-1.1.8-ic2021.1-revB

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 372G 73G 300G 20% /home

(Continued on next page)
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Platform Notes (Continued)
Additional information from dmidecode 3.2 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:
16x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200, configured at 2933

BIOS:
BIOS Vendor: Lenovo
BIOS Version: U8E111A-1.02
BIOS Date: 05/07/2021
BIOS Revision: 1.2
Firmware Revision: 1.40

(End of data from sysinfo program)

Compiler Version Notes
==============================================================================
| C       | 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) |
|         | 625.x264_s(base) 657.xz_s(base) |

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

==============================================================================
| C++     | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base) |
|         | 641.leela_s(base) |

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

==============================================================================
| Fortran | 648.exchange2_s(base) |

Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
**SPEC CPU®2017 Integer Speed Result**

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### Base Compiler Invocation

- **C benchmarks:**
  - icx

- **C++ benchmarks:**
  - icpx

- **Fortran benchmarks:**
  - ifort

### Base Portability Flags

- **600.perlbench_s:** -DSPEC_LP64 -DSPEC_LINUX_X64
- **602.gcc_s:** -DSPEC_LP64
- **605.mcf_s:** -DSPEC_LP64
- **620.omnetpp_s:** -DSPEC_LP64
- **623.xalancbmk_s:** -DSPEC_LP64 -DSPEC_LINUX
- **625.x264_s:** -DSPEC_LP64
- **631.deepsjeng_s:** -DSPEC_LP64
- **641.leela_s:** -DSPEC_LP64
- **648.exchange2_s:** -DSPEC_LP64
- **657.xz_s:** -DSPEC_LP64

### Base Optimization Flags

- **C benchmarks:**
  - -DSPEC_OPENMP -std=c11 -m64 -fopenmp -Wl,-z,muldefs -xCORE-AVX2
  - -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
  - -qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
  - -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

- **C++ benchmarks:**
  - -DSPEC_OPENMP -m64 -Wl,-z,muldefs -xCORE-AVX2 -O3 -ffast-math -flto
  - -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
  - -mbranches-within-32B-boundaries
  - -L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin/
  - -lqkmalloc

- **Fortran benchmarks:**
  - -m64 -xCORE-AVX2 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
  - -nostandard-realloc-lhs -align array32byte -auto
  - -mbranches-within-32B-boundaries
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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-ICElake-E.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-ICElake-E.xml
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.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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