## Lenovo Global Technology

ThinkSystem SR630
(1.90 GHz, Intel Xeon Gold 6238T)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>9017</th>
</tr>
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<td>Lenovo Global Technology</td>
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### SPECrate2017_int_base = 227

### SPECrate2017_int_peak = Not Run

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<td>40.0</td>
<td>176</td>
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<td>445</td>
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<tr>
<td>140</td>
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</table>

### Hardware

**CPU Name:** Intel Xeon Gold 6238T  
**Max MHz:** 3700  
**Nominal:** 1900  
**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 core  
**Other:** None  
**Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R)  
**Storage:** 1 x 800 GB SATA SSD  
**Other:** None

### Software

**OS:** Red Hat Enterprise Linux Server release 7.6 (Maipo)  
**Kernel:** 3.10.0-957.el7.x86_64  
**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  
**Compiler Build:** 20181018 for Linux  
**Parallel:** No  
**Firmware:** Lenovo BIOS Version IVE135P 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**

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<table>
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<th>Ratio</th>
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**SPECrate2017_int_base = 227**

**SPECrate2017_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-ic19.0u1/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.:

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

Yes: 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
C-states set to Legacy
SNC set to Enable
Trusted Execution Technology set to Enable
Stale AtoS set to Enable
LLC dead line alloc set to Disable
Sysinfo program /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on localhost.localdomain Tue Apr 16 22:43:09 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 6238T CPU @ 1.90GHz
  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

(Continued on next page)
Platform Notes (Continued)

- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Gold 6238T CPU @ 1.90GHz
- Stepping: 6
- CPU MHz: 1900.000
- BogoMIPS: 3800.00
- 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 cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtsscp
lm constant_tsc art arch_perfmon pebs bts rep_good nops tsc_new md SafeTMx
apedfmpref eagercpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtpf pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx fl64 rdrand lahf_lm abm 3dnop PREFETCH epb cat_1 cdp_13 intel_pt ssbd mba
ibrs ibpb stibp ibrs_enhanced tpr_shadow vmx flexpriority ept vpid facedbase
tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rdt_cqm mpx rdt_a avx512f avx512dq
rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsaveopt xgetbv
clqm_l1c clqm_occup_llc clqm_mbb_total clqm_mbb_local dtherm ida arat pln pts kpu ospke
avx512_vnni spec_ctrl intel_stibp flush_l1d arch_capabilities

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

From numactl --hardware warns: 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: 97976 MB
node 0 free: 95333 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: 98304 MB
node 1 free: 95680 MB
node 2 cpus: 22 23 24 28 29 30 32 33 34 35 39 40 66 67 68 72 73 74 77 78 79 83 84
node 2 size: 98304 MB
node 2 free: 95774 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: 98304 MB
node 3 free: 95737 MB
node distances:
node 0 1 2 3

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### SPECrate2017_int_peak = Not Run

**Platform Notes (Continued)**

<table>
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</tr>
<tr>
<td>21</td>
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<td>10</td>
</tr>
</tbody>
</table>

From /proc/meminfo

<table>
<thead>
<tr>
<th>MemTotal:</th>
<th>395877908 kB</th>
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</thead>
<tbody>
<tr>
<td>HugePages_Total:</td>
<td>0</td>
</tr>
<tr>
<td>Hugepagesize:</td>
<td>2048 kB</td>
</tr>
</tbody>
</table>

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

**os-release:**

- **NAME=** "Red Hat Enterprise Linux Server"
- **VERSION=** "7.6 (Maipo)"
- **ID=** "rhel"
- **ID_LIKE=** "fedora"
- **VARIANT=** "Server"
- **VARIANT_ID=** "server"
- **VERSION_ID=** "7.6"

**PRETTY_NAME=** "Red Hat Enterprise Linux Server 7.6 (Maipo)"

**redhat-release**: Red Hat Enterprise Linux Server release 7.6 (Maipo)

**system-release**: Red Hat Enterprise Linux Server release 7.6 (Maipo)

**system-release-cpe**: cpe:/o:redhat:enterprise_linux:7.6:ga:server

**uname -a:**

```
Linux localhost.localdomain 3.10.0-957.el7.x86_64 #1 SMP Thu Oct 4 20:48:51 UTC 2018
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: Load fences, __user pointer sanitization
- **CVE-2017-5715 (Spectre variant 2):** Mitigation: Enhanced IBRS

**run-level 3 Apr 16 17:37**

**SPEC is set to**: /home/cpu2017-1.0.5-ic19.0u1

**Filesystem** | **Type** | **Size** | **Used** | **Avail** | **Use%** | **Mounted on**
-----------------|--------|---------|---------|----------|---------|------------------
/dev/sdb2        | xfs    | 689G    | 31G     | 658G     | 5%      | /home

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 -[IVE135P-2.10]- 02/13/2019**

**Memory:**

- 24x Samsung M393A2K43CB2-CVF 16 GB 2 rank 2933

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

Test Date: Apr-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:
  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.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  
- -lqkmallocl

**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  
- -lqkmallocl

**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  
- -lqkmallocl

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:

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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 2019-04-16 10:43:08-0400.  