## Lenovo Global Technology

**ThinkSystem SR630**  
(1.80 GHz, Intel Xeon Silver 4108)

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
</table>
| **CPU Name:** Intel Xeon Silver 4108  
**Max MHz.:** 3000  
**Nominal:** 1800  
**Enabled:** 16 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:** 11 MB I+D on chip per chip  
**Other:** None  
**Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)  
**Storage:** 1 x 800 GB SAS SSD  
**Other:** None | **OS:** SUSE Linux Enterprise Server 12 SP2 (x86_64)  
**Kernel:** 4.4.21-69-default  
**Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++  
**Compiler for Linux:** Forttran: Version 18.0.0.128 of Intel Fortran  
**Compiler for Linux:**  
**Parallel:** No  
**Firmware:** Lenovo BIOS Version IVE113K 1.10 released Sep-2017  
**File System:** btrfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** 32/64-bit  
**Other:** jemalloc: jemalloc memory allocator library V5.0.1;  
jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets;  
jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5;  
jemalloc: sources available from jemalloc.net or releases |

### SPEC CPU2017 Integer Rate Result

**SPECratenet2017_int_base = 66.1**  
**SPECratenet2017_int_peak = 69.9**

**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Test Date:** Dec-2017  
**Hardware Availability:** Aug-2017  
**Software Availability:** Sep-2017  
**Tested by:** Lenovo Global Technology  
**Test Sponsor:** Lenovo Global Technology  
**Hardware Availability:** Aug-2017  
**Software Availability:** Sep-2017

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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
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Results Table

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SPECrate2017_int_base = 66.1
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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/cpu2017.1.0.2.ic18.0/lib/ia32:/home/cpu2017.1.0.2.ic18.0/lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/cpu2017.1.0.2.ic18.0/je5.0.1-32:/home/cpu2017.1.0.2.ic18.0/je5.0.1-64"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.4
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>
No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
No: 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.
No: 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.

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## Lenovo Global Technology

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### General Notes (Continued)

This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.

The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, http://www.spec.org/osg/policy.html

This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.

---

### Platform Notes

**BIOS configuration:**
- Choose Operating Mode set to Maximum Performance
- MONITORMwait set to Enable
- Execute Disable Bit set to Disable
- Trusted Execution Technology set to Enable
- Stale AtoS set to Enable
- LLC Deadline Alloc set to Disable
- Sysinfo program /home/cpu2017.1.0.2.ic18.0/bin/sysinfo
  Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
  running on Cable-SPECcpu2006-SUSE12SP2 Wed Dec 27 00:21:52 2017

**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) Silver 4108 CPU @ 1.80GHz
- 2 "physical id"s (chips)
- 32 "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 : 8
  - siblings : 16
  - physical 0: cores 0 1 2 3 4 5 6 7
  - physical 1: cores 0 1 2 3 4 5 6 7

From lscpu:

- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit

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(Continued on next page)
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Platform Notes (Continued)

Byte Order: Little Endian
CPU(s): 32
On-line CPU(s) list: 0-31
Thread(s) per core: 2
Core(s) per socket: 8
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4108 CPU @ 1.80GHz
Stepping: 4
CPU MHz: 1795.792
BogoMIPS: 3591.58
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 11264K
NUMA node0 CPU(s): 0-7,16-23
NUMA node1 CPU(s): 8-15,24-31
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpl mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtsscp
lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperfmpref perf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtpr pdcm pclid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb pln pts dtherm intel_pt
tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bml1 hle avx2 smep bmi2
ers invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd
avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_l1c cqm_occup_llc

/cache_size : 11264 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 16 17 18 19 20 21 22 23
node 0 size: 193110 MB
node 0 free: 192316 MB
node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
node 1 size: 193504 MB
node 1 free: 192790 MB
node distances:
node 0 1
 0: 10 21
 1: 21 10

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

***Lenovo Global Technology***

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(1.80 GHz, Intel Xeon Silver 4108)

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</table>

**Platform Notes (Continued)**

From `/proc/meminfo`

- MemTotal: 395893876 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

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

**SuSE-release:**

- SUSE Linux Enterprise Server 12 (x86_64)
- VERSION = 12
- PATCHLEVEL = 2

```
# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.
```

**os-release:**

- NAME="SLES"
- VERSION="12-SP2"
- VERSION_ID="12.2"
- PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
- ID="sles"
- ANSI_COLOR="0;32"
- CPE_NAME="cpe:/o:suse:sles:12:sp2"

**uname -a:**

```
Linux Cable-SPECcpu2006-SUSE12SP2 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67) x86_64 x86_64 x86_64 GNU/Linux
```

**run-level 3 Dec 27 00:12**

**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 -[IVE113K-1.10]- 09/06/2017**

**Memory:**

- 24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666, configured at 2400

**(End of data from sysinfo program)**

**Compiler Version Notes**

```
CC 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
```

**(Continued on next page)**
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## Compiler Version Notes (Continued)

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<thead>
<tr>
<th>Compiler</th>
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<th>Notes</th>
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</table>
| icc (ICC) | 18.0.0 20170811 | 525.x264_r(base, peak) 557.xz_r(base, peak)  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |
| icc (ICC) | 18.0.0 20170811 | 500.perlbench_r(peak) 502.gcc_r(peak)  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |
| icc (ICC) | 18.0.0 20170811 | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |
| icc (ICC) | 18.0.0 20170811 | 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak) 541.leela_r(peak)  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |
| ifort (IFORT) | 18.0.0 20170811 | 548.exchange2_r(base, peak)  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |

## Base Compiler Invocation

**C benchmarks:**
- icc

**C++ benchmarks:**
- icpc

**Fortran benchmarks:**
- ifort
**SPEC CPU2017 Integer Rate Result**

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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=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

**Base Other Flags**

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64
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**Peak Compiler Invocation**

C benchmarks:
- icc

C++ benchmarks:
- icpc

Fortran benchmarks:
- ifort

---

**Peak Portability Flags**

- 500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
- 502.gcc_r: -D_FILE_OFFSET_BITS=64
- 505.mcf_r: -DSPEC_LP64
- 520.omnetpp_r: -DSPEC_LP64
- 523.xalancbmk_r: -D_FILE_OFFSET_BITS=64 -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

(Continued on next page)

---

**Peak Optimization Flags**

C benchmarks:

- 500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
  -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
  -fno-strict-overflow -L/usr/local/je5.0.1-64/lib
  -ljemalloc

- 502.gcc_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
  -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
  -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
  -L/usr/local/je5.0.1-32/lib -ljemalloc

- 505.mcf_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -03 -no-prec-div
  -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib
  -ljemalloc

- 525.x264_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -03 -no-prec-div
  -qopt-mem-layout-trans=3 -fno-alias

(Continued on next page)
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### SPECrate2017_int_base = 66.1

### SPECrate2017_int_peak = 69.9

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### Peak Optimization Flags (Continued)

525.x264_r (continued):

- `L/usr/local/je5.0.1-64/lib -ljemalloc`

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

520.omnetpp_r: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo`
- `-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3`
- `-L/usr/local/je5.0.1-64/lib -ljemalloc`

523.xalancbmk_r: `-L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32`
- `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo`
- `-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3`
- `-L/usr/local/je5.0.1-32/lib -ljemalloc`

531.deepsjeng_r: Same as 520.omnetpp_r

541.leela_r: Same as 520.omnetpp_r

Fortran benchmarks:

- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`
- `-L/usr/local/je5.0.1-64/lib -ljemalloc`

---

### Peak Other Flags

C benchmarks (except as noted below):

- `-m64 -std=c11`

502.gcc_r: `-m32 -std=c11`

C++ benchmarks (except as noted below):

- `-m64`

523.xalancbmk_r: `-m32`

Fortran benchmarks:

- `-m64`

---

The flags files that were used to format this result can be browsed at

- [http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html)
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<tr>
<th>Lenovo Global Technology</th>
<th>SPECrate2017_int_base = 66.1</th>
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<tr>
<td>ThinkSystem SR630</td>
<td>SPECrate2017_int_peak = 69.9</td>
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<tr>
<td>(1.80 GHz, Intel Xeon Silver 4108)</td>
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<th>CPU2017 License: 9017</th>
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<td>Tested by: Lenovo Global Technology</td>
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You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml

http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-SKL-A.xml