### Lenovo Global Technology

**ThinkSystem SN550**  
(2.20 GHz, Intel Xeon Silver 4114)

---

**SPECrate2017_int_base** = 94.4  
**SPECrate2017_int_peak** = 101

---

#### Hardware

<table>
<thead>
<tr>
<th>Copies</th>
<th>perlbench_r</th>
<th>gcc_r</th>
<th>mcf_r</th>
<th>omnetpp_r</th>
<th>xalancbmk_r</th>
<th>x264_r</th>
<th>deepsjeng_r</th>
<th>leela_r</th>
<th>exchange2_r</th>
<th>xz_r</th>
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<td>74.0</td>
<td>75.6</td>
<td>69.9</td>
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</table>

> **SPECrate2017_int_base** (94.4)

---

#### Software

- **OS:** SUSE Linux Enterprise Server 12 SP2 (x86_64)
- **Compiler:** C/C++: Version 18.0.0.128 of Intel C/C++  
  Compiler for Linux:  
  Fortran: Version 18.0.0.128 of Intel Fortran
- **Firmware:** Lenovo BIOS Version IVE1111.1.01 released Aug-2017  
  File System: xfs
- **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
**Lenovo Global Technology**

ThinkSystem SN550  
(2.20 GHz, Intel Xeon Silver 4114)

**SPECrate2017_int_base** = 94.4  
**SPECrate2017_int_peak** = 101

**Results Table**

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<td>618</td>
<td>69.9</td>
</tr>
</tbody>
</table>

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/cpu2017.1.0.2.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>

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;

Lenovo Global Technology
ThinkSystem SN550
(2.20 GHz, Intel Xeon Silver 4114)

SPECrate2017_int_base = 94.4
SPECrate2017_int_peak = 101

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Test Date: Jan-2018
Tested by: Lenovo Global Technology
Software Availability: Sep-2017

General Notes (Continued)

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.

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
SNC set to Enable
Hardware Prefetcher set to Disable
MONITORMWAIT set to Enable
Execute Disable Bit set to Disable
Intel Virtualization Technology set to Disable
DCA set to Enable
Sysinfo program /home/cpu2017.1.0.2.ic18.0/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on SN550 Thu Jan 25 20:51:21 2018

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 4114 CPU @ 2.20GHz
  2 "physical id"s (chips)
  40 "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 : 10
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12

(Continued on next page)
Lenovo Global Technology
ThinkSystem SN550
(2.20 GHz, Intel Xeon Silver 4114)

SPEC CPU2017 Integer Rate Result
Copyright 2017-2018 Standard Performance Evaluation Corporation

SPECrate2017_int_base = 94.4
SPECrate2017_intPeak = 101

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

Test Date: Jan-2018
Hardware Availability: Aug-2017
Software Availability: Sep-2017

Platform Notes (Continued)

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 40
On-line CPU(s) list: 0-39
Thread(s) per core: 2
Core(s) per socket: 10
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz
Stepping: 4
CPU MHz: 2194.837
BogoMIPS: 4389.67
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 14080K
NUMA node0 CPU(s): 0-9,20-29
NUMA node1 CPU(s): 10-19,30-39
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
    aperfmperf eagerfpu 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 3dnowprefetch ida arat epb pni pclmulqdq dtes64
    tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
    erms invpcid rtm cqm mpx avx512f avx512d avx512q rdseed adx smap clflushopt clwb avx512bw
    avx512vl xsaveopt xsaves opt xgetbv1 cqm_llc cqm_occup_llc

/proc/cpuinfo cache data
    cache size: 14080 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 20 21 22 23 24 25 26 27 28 29
    node 0 size: 386637 MB
    node 0 free: 385418 MB
    node 1 cpus: 10 11 12 13 14 15 16 17 18 19 30 31 32 33 34 35 36 37 38 39
    node 1 size: 387040 MB
    node 1 free: 385998 MB

(Continued on next page)
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**ThinkSystem SN550**  
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<td>Software Availability: Sep-2017</td>
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<th>SPECrate2017_int_peak = 101</th>
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</thead>
</table>

**SPEC CPU2017 Integer Rate Result**  
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#### Platform Notes (Continued)

```
node distances:
node  0   1
 0:  10  21
 1:  21  10

From /proc/meminfo
MemTotal:       792245524 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 SN550 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 Jan 25 20:43

SPEC is set to: /home/cpu2017.1.0.2.ic18.0
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/sda4      xfs   687G  136G  552G  20%  /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 -[IVE111I-1.01]- 08/11/2017
  Memory:
    24x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666, configured at 2400
```

(End of data from sysinfo program)
Lenovo Global Technology
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**Hardware Availability:** Aug-2017  
**Software Availability:** Sep-2017

---

### Compiler Version Notes

```markdown
Base Compiler Invocation

C benchmarks:
- icc

C++ benchmarks:
- icpc
```

(Continued on next page)
Lenovo Global Technology
ThinkSystem SN550
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Base Compiler Invocation (Continued)

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.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:
-W1, -z, muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-W1, -z, muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-W1, -z, muldefs -xCORE-AVX2 -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

(Continued on next page)
## Lenovo Global Technology

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(2.20 GHz, Intel Xeon Silver 4114)

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### CPU2017 License: 9017

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### Test Date: Jan-2018

### Hardware Availability: Aug-2017

### Software Availability: Sep-2017

**Base Other Flags (Continued)**

- Fortran benchmarks:  
  - -m64

**Peak Compiler Invocation**

- C benchmarks:  
  - icc
- C++ benchmarks:  
  - icpc

- Fortran benchmarks:  
  - ifort

**Peak Portability Flags**

- Fortran benchmarks:
  - 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

**Peak Optimization Flags**

- C benchmarks:
  - 500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
  - -xCORE-AVX2 -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-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=3
    -L/usr/local/je5.0.1-32/lib -ljemalloc

(Continued on next page)
Lenovo Global Technology
ThinkSystem SN550
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Tested by: Lenovo Global Technology

Peak Optimization Flags (Continued)

505.mcf_r: -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib
-ljemalloc

525.x264_r: -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -fno-alias
-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-AVX2 -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-AVX2 -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-AVX2 -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

502gcc_r: -m32 -std=c11

C++ benchmarks (except as noted below):
-m64

523.xalancbmk_r: -m32

(Continued on next page)
Lenovo Global Technology
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SPECrate2017_int_base = 94.4
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<td>Software Availability:</td>
<td>Sep-2017</td>
<td>Lenovo Global Technology</td>
</tr>
</tbody>
</table>

**Peak Other Flags (Continued)**

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


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

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Tested with SPEC CPU2017 v1.0.2 on 2018-01-25 07:51:20-0500.
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