Lenovo Global Technology
ThinkSystem SN550
(2.30 GHz, Intel Xeon Gold 6252N)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base =</th>
<th>274</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak =</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

**Hardware**

CPU Name: Intel Xeon Gold 6252N  
Max MHz: 3600  
Nominal: 2300  
Enabled: 48 cores, 2 chips, 2 threads/core  
Orderable: 1.2 chips

<table>
<thead>
<tr>
<th>Cache L1</th>
<th>32 KB I + 32 KB D on chip per core</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2:</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3:</td>
<td>35.75 MB I+D on chip per chip</td>
</tr>
</tbody>
</table>

Other: None  
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)  
Storage: 1 x 960 GB SATA SSD  
Other: None

**Software**

OS: SUSE Linux Enterprise Server 15 (x86_64)  
Compiler: C/C++: Version 19.0.4.227 of Intel  
C/C++ Compiler for Linux;

Fortran: Version 19.0.4.227 of Intel Fortran  
Compiler for Linux

Parallel: No  
Firmware: Lenovo BIOS Version IVE142E 2.30 released Aug-2019 tested as IVE141E 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: --
Lenovo Global Technology
ThinkSystem SN550
(2.30 GHz, Intel Xeon Gold 6252N)

SPECratre®2017_int_base = 274
SPECratre®2017_int_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>96</td>
<td>731</td>
<td>209</td>
<td>740</td>
<td>206</td>
<td>733</td>
<td>208</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>96</td>
<td>608</td>
<td>223</td>
<td>610</td>
<td>223</td>
<td>611</td>
<td>222</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>96</td>
<td>443</td>
<td>350</td>
<td>443</td>
<td>351</td>
<td>444</td>
<td>350</td>
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<tr>
<td>520.omnetpp_r</td>
<td>96</td>
<td>713</td>
<td>177</td>
<td>713</td>
<td>177</td>
<td>711</td>
<td>177</td>
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<tr>
<td>523.xalanbkmk_r</td>
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<td>345</td>
<td>294</td>
<td>343</td>
<td>296</td>
<td>346</td>
<td>293</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>96</td>
<td>300</td>
<td>560</td>
<td>302</td>
<td>557</td>
<td>302</td>
<td>556</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>96</td>
<td>483</td>
<td>228</td>
<td>482</td>
<td>228</td>
<td>483</td>
<td>228</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>96</td>
<td>732</td>
<td>217</td>
<td>737</td>
<td>216</td>
<td>724</td>
<td>220</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>96</td>
<td>450</td>
<td>559</td>
<td>451</td>
<td>558</td>
<td>451</td>
<td>557</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>96</td>
<td>567</td>
<td>183</td>
<td>568</td>
<td>183</td>
<td>566</td>
<td>183</td>
</tr>
</tbody>
</table>

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
Filesystme 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)
### Lenovo Global Technology

**ThinkSystem SN550**  
*(2.30 GHz, Intel Xeon Gold 6252N)*

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

**SPECrate®2017_int_base** = 274  
**SPECrate®2017_int_peak** = Not Run

---

### 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
Trusted Execution Technology set to Enable
SNC set to Enable
Stale AtoS set to Enable

**Sysinfo program**  
/home/cpu2017-1.0.5-ic19.0u4/bin/sysinfo

**Rev:** r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-cq9p Wed Sep 11 15:21:44 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 6252N CPU @ 2.30GHz
  2 "physical id"s (chips)
  96 "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 : 24
siblings : 48
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29
```

From lscpu:

```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 96
On-line CPU(s) list: 0-95
Thread(s) per core: 2
Core(s) per socket: 24
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6252N CPU @ 2.30GHz
```

(Continued on next page)
Platform Notes (Continued)

Stepping: 7
CPU MHz: 2300.000
CPU max MHz: 3600.0000
CPU min MHz: 1000.0000
BogoMIPS: 4600.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
NUMA node0 CPU(s): 0-3,7-9,13-15,19,20,48-51,55-57,61-63,67,68
NUMA node1 CPU(s): 4-6,10-12,16-18,21-23,52-54,58-60,64-66,69-71
NUMA node2 CPU(s): 24-27,31-33,37-39,43,44,72-75,79-81,85-87,91,92
NUMA node3 CPU(s): 28-30,34-36,40-42,45-47,76-78,82-84,88-90,93-95
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 pdcache rdtsc lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperlmpref pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx fl64 rdrand lahf_lm abm 3nowprefetch cpuid_fault epb cat ll cdp _l3 invpcid_single intel_pmcns ssbd mba ibrs ibp stibp tpr_shadow vnlmi flexpriority ept pld fsbsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occcll cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts pku ospke avx512_vnni flush_l1d arch_capabilities

/proc/cpuinfo cache data
  cache size : 36608 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 3 7 8 9 13 14 15 19 20 48 49 50 51 55 56 57 61 62 63 67 68
    node 0 size: 193132 MB
    node 0 free: 186971 MB
    node 1 cpus: 4 5 6 10 11 12 16 17 18 21 22 23 52 53 54 58 59 60 64 65 66 69 70 71
    node 1 size: 193492 MB
    node 1 free: 193191 MB
    node 2 cpus: 24 25 26 27 31 32 33 37 38 39 43 44 47 72 73 74 75 79 80 81 85 86 87 91 92
    node 2 size: 193521 MB
    node 2 free: 192949 MB
    node 3 cpus: 28 29 30 34 35 36 40 41 42 45 46 47 76 77 78 82 83 84 88 89 90 93 94 95
    node 3 size: 193518 MB
    node 3 free: 193177 MB

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

Lenovo Global Technology
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SPECRate®2017_int_base = 274
SPECRate®2017_int_peak = Not Run

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

Platform Notes (Continued)

1:  11  10  21  21
2:  21  21  10  11
3:  21  21  11  10

From /proc/meminfo
MemTotal:  792231664 kB
HugePages_Total:  0
Hugepagesize:  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 11 15:20

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u4
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb3 xfs 893G 61G 833G 7% /

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 -[IVE141E-2.30]- 07/02/2019
Memory:
24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)
Lenovo Global Technology
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Sep-2019
Hardware Availability: Jul-2019
Software Availability: May-2019

Compiler Version Notes
==============================================================================
|   | 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.
==============================================================================
|   | 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.
==============================================================================
|   | 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

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

(Continued on next page)
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SPECrate®2017_int_peak = Not Run

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Hardware Availability: Jul-2019
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Base Portability Flags (Continued)

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_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

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
-lqkmalloc

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_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

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