# SPEC® CPU2017 Integer Speed Result

**Lenovo Global Technology**

ThinkSystem SR550  
(2.30 GHz, Intel Xeon Gold 5218N)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base = 9.75</th>
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<tr>
<td>SPECspeed2017_int_peak = Not Run</td>
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**CPU2017 License:** 9017  
**Test Date:** Apr-2019

**Test Sponsor:** Lenovo Global Technology  
**Hardware Availability:** Apr-2019

**Tested by:** Lenovo Global Technology  
**Software Availability:** Dec-2018

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_int_base (9.75)</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s 64</td>
<td>6.74</td>
</tr>
<tr>
<td>602.gcc_s 64</td>
<td>9.81</td>
</tr>
<tr>
<td>605.mcf_s 64</td>
<td>12.6</td>
</tr>
<tr>
<td>620.omnetpp_s 64</td>
<td>11.6</td>
</tr>
<tr>
<td>623.xalancbmk_s 64</td>
<td>14.1</td>
</tr>
<tr>
<td>625.x264_s 64</td>
<td>21.0</td>
</tr>
<tr>
<td>631.deepsjeng_s 64</td>
<td>5.45</td>
</tr>
<tr>
<td>641.leea_s 64</td>
<td>4.77</td>
</tr>
<tr>
<td>648.exchange2_s 64</td>
<td></td>
</tr>
<tr>
<td>657.xz_s 64</td>
<td></td>
</tr>
</tbody>
</table>

## Hardware

- **CPU Name:** Intel Xeon Gold 5218N  
- **Max MHz.:** 3700  
- **Nominal:** 2300  
- **Enabled:** 32 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:** 22 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2933Y-R, running at 2666)  
- **Storage:** 1 x 960 GB SATA SSD  
- **Other:** None

## Software

- **OS:** SUSE Linux Enterprise Server 12 SP4 (x86_64)  
- **Kernel:** 4.12.14-94.41-default  
- **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:** Yes  
- **Firmware:** Lenovo BIOS Version TEE135L 2.10 released Jan-2019  
- **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
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SPECspeed2017_int_peak = Not Run

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>
<th>Ratio</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>64</td>
<td>266</td>
<td>6.67</td>
<td>263</td>
<td>6.74</td>
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<td>6.76</td>
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<tr>
<td>602.gcc_s</td>
<td>64</td>
<td>406</td>
<td>9.81</td>
<td>398</td>
<td>10.0</td>
<td>407</td>
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<tr>
<td>605.mcf_s</td>
<td>64</td>
<td>373</td>
<td>12.6</td>
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<td>12.6</td>
<td>377</td>
<td>12.5</td>
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<tr>
<td>620.omnetpp_s</td>
<td>64</td>
<td>216</td>
<td>7.56</td>
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<td>7.63</td>
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<td>7.62</td>
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<tr>
<td>623.xalancbmk_s</td>
<td>64</td>
<td>114</td>
<td>12.5</td>
<td>114</td>
<td>12.5</td>
<td>113</td>
<td>12.5</td>
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<tr>
<td>625.x264_s</td>
<td>64</td>
<td>152</td>
<td>11.6</td>
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<td>11.7</td>
<td>152</td>
<td>11.6</td>
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<tr>
<td>631.deepsjeng_s</td>
<td>64</td>
<td>262</td>
<td>5.46</td>
<td>263</td>
<td>5.45</td>
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<td>641.leela_s</td>
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<td>358</td>
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<td>4.77</td>
<td>358</td>
<td>4.77</td>
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<tr>
<td>648.exchange2_s</td>
<td>64</td>
<td>209</td>
<td>14.0</td>
<td>209</td>
<td>14.1</td>
<td>209</td>
<td>14.1</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>64</td>
<td>268</td>
<td>23.1</td>
<td>268</td>
<td>23.0</td>
<td>269</td>
<td>23.0</td>
</tr>
</tbody>
</table>

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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"

General Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/cpu2017-1.0.5-ic19.0u1/lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/cpu2017-1.0.5-ic19.0u1/je5.0.1-64"
OMP_STACKSIZE = "192M"

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

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

(Continued on next page)
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SPEC CPU2017 Integer Speed Result
Copyright 2017-2019 Standard Performance Evaluation Corporation

General Notes (Continued)


Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance
Choose Operating Mode set to Custom Mode
Memory Power Management set to Automatic
CPU P-state Control set to Cooperative
MONITOR/MWAIT 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 9bcd8f2999c33d61f649b85e45859ea9
running on linux-dogl Fri Apr 12 11:21:52 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 5218N CPU @ 2.30GHz
        2 "physical id"s (chips)
        64 "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 : 16
        siblings : 32
        physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
        physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu:
    Architecture: x86_64
    CPU op-mode(s): 32-bit, 64-bit
    Byte Order: Little Endian
    CPU(s): 64
    On-line CPU(s) list: 0-63
    Thread(s) per core: 2
    Core(s) per socket: 16
    Socket(s): 2
    NUMA node(s): 2
    Vendor ID: GenuineIntel
    CPU family: 6
    Model: 85
    Model name: Intel(R) Xeon(R) Gold 5218N CPU @ 2.30GHz
    Stepping: 6
    CPU MHz: 2300.000

(Continued on next page)
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### Platform Notes (Continued)

CPU max MHz: 3900.0000  
CPU min MHz: 1000.0000  
BogoMIPS: 4600.00  
Virtualization: VT-x  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 1024K  
L3 cache: 22528K  
NUMA node0 CPU(s): 0-15,32-47  
NUMA node1 CPU(s): 16-31,48-63  
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 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 xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_c3 l1d_tsc cplflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsave cold coredump cpqm cpqm_all cpqm_owner cpqm_guest cpqm_mem cpqm_local cpqm_total cpqm_guest memarch memfreq mem_capabilities

/proc/cpuinfo cache data  
cache size: 22528 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 12 13 14 15 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47  
node 0 size: 193122 MB  
node 0 free: 192256 MB  
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63  
node 1 size: 193477 MB  
node 1 free: 193174 MB  
node distances:  
node 0 1  
0: 10 21  
1: 21 10  
From /proc/meminfo  
MemTotal: 395878476 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB

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**Platform Notes (Continued)**

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

SuSE-release:

- SUSE Linux Enterprise Server 12 (x86_64)
- VERSION = 12
- PATCHLEVEL = 4

# 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-SP4"
- VERSION_ID="12.4"
- PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"
- ID="sles"
- ANSI_COLOR="0;32"
- CPE_NAME="cpe:/o:suse:sles:12:sp4"

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 Apr 12 11:19

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

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda3</td>
<td>xfs</td>
<td>892G</td>
<td>40G</td>
<td>852G</td>
<td>5%</td>
<td>/</td>
</tr>
</tbody>
</table>

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 -[TEE135L-2.10]- 01/10/2019

Memory:

- 12x SK Hynix HMA84GR7CJR4N-WM 32 GB 2 rank 2933, configured at 2666

(End of data from sysinfo program)
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Compiler Version Notes

==============================================================================
CC  600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base)
   657.xz_s(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 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
   641.leela_s(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  648.exchange2_s(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

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

(Continued on next page)
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**Base Portability Flags (Continued)**

- 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:
- -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
- -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=4
- -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
- -ljkmalloc

Fortran benchmarks:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
- -nostandard-realloc-lhs

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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 2019-04-11 23:21:52-0400.