## CPU2017 Integer Speed Result

**Lenovo Global Technology**

**ThinkSystem SR950**

(1.90 GHz, Intel Xeon Gold 6238T)

**SPECspeed2017_int_base** = 9.74

**SPECspeed2017_int_peak** = Not Run

### Hardware

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>May-2019</th>
</tr>
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<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
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<td>Tested by:</td>
<td>Lenovo Global Technology</td>
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<tr>
<td>CPU2017 License:</td>
<td>9017</td>
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<td>Hardware Availability:</td>
<td>Apr-2019</td>
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<td>Software Availability:</td>
<td>Nov-2018</td>
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**CPU Name:** Intel Xeon Gold 6238T

**Max MHz:** 3700

**Nominal:** 1900

**Enabled:** 88 cores, 4 chips

**Orderable:** 2,3,4 chips

**Cache L1:** 32 KB I + 32 KB D on chip per core

**Cache L2:** 1 MB I+D on chip per core

**Cache L3:** 30.25 MB I+D on chip per chip

**Other:** None

**Memory:** 768 GB (48 x 16 GB 2Rx8 PC4-2933Y-R)

**Storage:** 1 x 800 GB SATA SSD

**Other:** None

### Software

**OS:** SUSE Linux Enterprise Server 15 (x86_64)

**Kernel:** 4.12.14-25.13-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 PSE121I 1.50 released Mar-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
Lenovo Global Technology
ThinkSystem SR950
(1.90 GHz, Intel Xeon Gold 6238T)

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

SPECSpeed2017_int_base = 9.74
SPECSpeed2017_int_peak = Not Run

Results Table

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<tr>
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</table>

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

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)
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)
Lenovo Global Technology
ThinkSystem SR950
(1.90 GHz, Intel Xeon Gold 6238T)

SPECspeed2017_int_base = 9.74
SPECspeed2017_int_peak = Not Run

General Notes (Continued)

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance
Choose Operating Mode set to Custom Mode
CPU P-state Control set to Autonomous
Hyper-Threading set to Disable
Trusted Execution Technology set to Enable
DCU Streamer Prefetcher set to Disable
MONITOR/MWAIT set to Enable

Sysinfo program /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-jdx4 Thu May 30 16:49:19 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
  4 "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 : 22
  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
  physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
  physical 3: 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:    1
  Core(s) per socket:    22
  Socket(s):             4
  NUMA node(s):          4
  Vendor ID:             GenuineIntel
  CPU family:            6
  Model:                 85

(Continued on next page)
### Lenovo Global Technology

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**Platform Notes (Continued)**

```
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): 0-21  
NUMA node1 CPU(s): 22-43  
NUMA node2 CPU(s): 44-65  
NUMA node3 CPU(s): 66-87
```

**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 art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid  
aperfmonf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16  
xtpic pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave  
avx f16c rdrand lahf_lm abr_mibi l1ibi amsr mcmx smx est tm2 ssse3 sdbg fma cx16  
xtpic pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave  
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avx f16c rdrand lahf_lm abr_mibi l1ibi amsr mcmx smx est tm2 ssse3 sdbg fma cx16
```

```
/cache data

cache size : 30976 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 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
node 0 size: 193074 MB
node 0 free: 189661 MB
node 1 cpus: 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43
node 1 size: 193515 MB
node 1 free: 192967 MB
node 2 cpus: 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65
node 2 size: 193515 MB
node 2 free: 193243 MB
node 3 cpus: 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87
node 3 size: 193512 MB
node 3 free: 193091 MB
node distances:

node 0 1 2 3
 0: 10 21 21 21
 1: 21 10 21 21
```
Lenovo Global Technology
ThinkSystem SR950
(1.90 GHz, Intel Xeon Gold 6238T)

SPECspeed2017_int_base = 9.74
SPECspeed2017_int_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology
Test Date: May-2019
Hardware Availability: Apr-2019
Software Availability: Nov-2018

Platform Notes (Continued)

2:  21  21  10  21
3:  21  21  21  10

From /proc/meminfo
   MemTotal:       792184704 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 May 30 16:48

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1
   Filesystem  Type   Size  Used Avail Use% Mounted on
   /dev/sda2    xfs   744G   22G   723G   3% /

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 -[PSE121I-1.50]- 03/01/2019
   Memory:
      48x NO DIMM NO DIMM
      48x Samsung M393A2K43CB2-CVF 16 GB 2 rank 2933

(End of data from sysinfo program)
**Lenovo Global Technology**

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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
```

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## Base Optimization Flags

**C benchmarks:**
- `Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`  
- `qopt-mem-layout-trans=4 -gopenmp -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/Intel Compiler 19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64 -lqkmalloc`

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

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.

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