### Lenovo Global Technology

**ThinkSystem SR950**  
(3.60 GHz, Intel Xeon Gold 6244)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base =</th>
<th>11.0</th>
</tr>
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<tbody>
<tr>
<td>SPECspeed2017_int_peak =</td>
<td>Not Run</td>
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</tbody>
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- **CPU2017 License:** 9017  
- **Test Sponsor:** Lenovo Global Technology  
- **Tested by:** Lenovo Global Technology  
- **Test Date:** Mar-2019  
- **Hardware Availability:** Apr-2019  
- **Software Availability:** Nov-2018

#### Threads

<table>
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<tr>
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<tbody>
<tr>
<td>Threads</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>600.perlbench_s</td>
</tr>
<tr>
<td>602.gcc_s</td>
</tr>
<tr>
<td>605.mcf_s</td>
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<tr>
<td>620.omnetpp_s</td>
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<tr>
<td>623.xalancbmk_s</td>
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<tr>
<td>625.x264_s</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
</tr>
<tr>
<td>641.leela_s</td>
</tr>
<tr>
<td>648.exchange2_s</td>
</tr>
<tr>
<td>657.xz_s</td>
</tr>
</tbody>
</table>

#### Hardware

- **CPU Name:** Intel Xeon Gold 6244  
- **Max MHz.:** 4400  
- **Nominal:** 3600  
- **Enabled:** 24 cores, 3 chips  
- **Orderable:** 2,3,4 chips  
- **Cache L1:** 32 KB I+D on chip per core  
- **Cache L2:** 1 MB I+D on chip per core  
- **Cache L3:** 24.75 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 576 GB (36 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 PSE1211 1.50 released Mar-2019  
- **File System:** btrfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **Other:** jemalloc memory allocator V5.0.1
SPEC CPU2017 Integer Speed Result

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SPECspeed2017_int_peak = Not Run

Test Date: Mar-2019
Hardware Availability: Apr-2019
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Results Table

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SPECspeed2017_int_base = 11.0
SPECspeed2017_int_peak = Not Run

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-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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**SPECspeed2017_int_base = 11.0**

**SPECspeed2017_int_peak = Not Run**

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**General Notes (Continued)**


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**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 proton3 Tue Mar 26 16:45:03 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 6244 CPU @ 3.60GHz
  3 "physical id"s (chips)
  24 "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 : 8
  physical 0: cores 2 3 17 18 19 20 24 25
  physical 1: cores 2 4 9 20 24 25 26 27
  physical 3: cores 1 2 4 9 10 19 25 27
```

From lscpu:

```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 24
On-line CPU(s) list: 0-23
Thread(s) per core: 1
Core(s) per socket: 8
Socket(s): 3
NUMA node(s): 3
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6244 CPU @ 3.60GHz
```

(Continued on next page)
# SPEC CPU2017 Integer Speed Result

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**Platform Notes (Continued)**

- Stepping: 6
- CPU MHz: 3600.000
- BogoMIPS: 7200.00
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 25344K
- NUMA node0 CPU(s): 0-7
- NUMA node1 CPU(s): 8-15
- NUMA node2 CPU(s): 16-23
- Flags: 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 vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave f16c rdrand lahf_lm ablm abm 3nowprefetch cpuid perfmon perfctr intel_ped ivp cpuid_fault epb cat_13 cdp_13 invpcid_single ssbd mba ibpb stibp tpr_shadow vnmf flexpriority ept vpid fsbgsbase tsc_adjust bmi1 hle avx2 smep bmi2 3dnowPrefetch cpuid_fault epb cat_13 cdp_13
- /proc/cpuinfo cache data
  - cache size: 25344 KB

From `numactl --hardware` WARNING: a numactl 'node' might or might not correspond to a physical chip.
- available: 3 nodes (0-2)
- node 0 cpus: 0 1 2 3 4 5 6 7
- node 0 size: 192935 MB
- node 0 free: 192274 MB
- node 1 cpus: 8 9 10 11 12 13 14 15
- node 1 size: 193508 MB
- node 1 free: 192894 MB
- node 2 cpus: 16 17 18 19 20 21 22 23
- node 2 size: 193505 MB
- node 2 free: 192583 MB
- node distances:
  - node 0 1 2
  - 0: 10 21 20
  - 1: 21 10 20
  - 2: 20 20 10

From `/proc/meminfo`
- MemTotal: 593868860 kB
- HugePages_Total: 0

(Continued on next page)
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#### SPEC CPU2017 Integer Speed Result

**SPECspeed2017_int_base** = 11.0  
**SPECspeed2017_int_peak** = Not Run

#### Platform Notes (Continued)

- **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 Mar 25 22:21**

**SPEC is set to:** /home/cpu2017-1.0.5-ic19.0u1  
- Filesystem Type Size Used Avail Use% Mounted on
  - /dev/sda3 btrfs 742G 38G 704G 6% /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 -[PSE121I-1.50]- 03/01/2019
- Memory:
  - 60x NO DIMM NO DIMM
  - 36x Samsung M393A2K43CB2-CVF 16 GB 2 rank 2933

(End of data from sysinfo program)

### Compiler Version Notes

==============================================================================
| CC 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base) |
| 657.xz_s(base) |

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

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.

Compiler Version Notes (Continued)

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.

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
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64

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Base Portability Flags (Continued)

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

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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 2019-03-26 04:45:02-0400.
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