Lenovo Global Technology
ThinkSystem SR570
(2.10 GHz, Intel Xeon Gold 5218R)

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

Test Date: Mar-2020
Hardware Availability: Mar-2020
Software Availability: Sep-2019

Software:
OS: SUSE Linux Enterprise Server 15 SP1 (x86_64)
Kernel 4.12.14-195-default
Compiler: C/C++: Version 19.0.5.281 of Intel
C/C++
Compiler for Linux;
Fortran: Version 19.0.5.281 of
Intel Fortran
Compiler for Linux
Parallel: Yes
Firmware: Lenovo BIOS Version TEE152L 2.51 released Feb-2020
tested as TEE151L 2.51 Jan-2020
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other:
Power Management: BIOS set to prefer performance at the cost of additional power usage

Hardware:
CPU Name: Intel Xeon Gold 5218R
Max MHz: 4000
Nominal: 2100
Enabled: 40 cores, 2 chips
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: 27.5 MB I+D on chip per chip
Other:
Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2933Y-R, running at 2666)
Storage: 1 x 960 GB SATA SSD
Other:

Threads

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<th>SPECspeed®2017_fp_base (124)</th>
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Threads:
603.bwaves_s  40
607.cactuBSSN_s  40
619.lbm_s  40
621.wrf_s  40
627.cam4_s  40
628.pop2_s  40
638.imagick_s  40
644.nab_s  40
649.fotonik3d_s  40
654.roms_s  40

SPECSpeed®2017_fp_base = 124
SPECSpeed®2017_fp_peak = Not Run
# Lenovo Global Technology

**ThinkSystem SR570**  
(2.10 GHz, Intel Xeon Gold 5218R)

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## Results Table

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<th>Seconds</th>
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<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
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**SPECspeed®2017_fp_base** = 124  
**SPECspeed®2017_fp_peak** = Not Run

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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### Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

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### Environment Variables Notes

Environment variables set by runcpu before the start of the run:  
KMP_AFFINITY = "granularity=fine,compact"  
LD_LIBRARY_PATH = "/home/cpu2017-1.1.0-ic19.0u5/lib/intel64"  
OMP_STACKSIZE = "192M"

---

### General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Redhat Enterprise Linux 8.0  
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.

(Continued on next page)
General Notes (Continued)

is mitigated in the system as tested and documented.

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
CPU P-state Control set to Automatic
MONITOR/MWAIT set to Enable
Hyper-Threading set to Disable
Adjacent Cache Prefetch set to Disable

Sysinfo program /home/cpu2017-1.1.0-ic19.0u5/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1be6e46a485a0011
running on linux-mazt Wed Mar 18 15:26:30 2020

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 5218R CPU @ 2.10GHz
  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 : 20
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 46 bits physical, 48 bits virtual
CPU(s): 40
On-line CPU(s) list: 0-39
Thread(s) per core: 1
Core(s) per socket: 20
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5218R CPU @ 2.10GHz
Stepping: 7
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SPECspeed®2017_fp_base = 124
SPECspeed®2017_fp_peak = Not Run

CPU MHz: 2100.00  
BogoMIPS: 4200.00  
Virtualization: VT-x  
L1d cache: 32K  
L1i cache: 32K  
L2 cache: 1024K  
L3 cache: 28160K  
NUMA node0 CPU(s): 0-19  
NUMA node1 CPU(s): 20-39  
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_tcb art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tcb 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_l3 invpcid_single intel_prrt ssbd mba ibrs ibpb ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase 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 xsaveas cqm_llc cqm_occurr_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts hwp_epp kpu ospke avx512_vnni md_clear flush_l1d arch_capabilities

/proc/cpuinfo cache data  
cache size : 28160 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 16 17 18 19  
node 0 size: 96086 MB  
node 0 free: 95769 MB  
node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39  
node 1 size: 96733 MB  
node 1 free: 96040 MB  
node distances:  
node 0 1  
0: 10 21  
1: 21 10  

From /proc/meminfo  
MemTotal: 197448400 kB  
HugePages_Total: 0  
Hugepagesize: 2048 KB

From /etc/*release* /etc/*version*  
os-release:  
NAME="SLES"

(Continued on next page)
SPEC CPU®2017 Floating Point Speed Result

Lenovo Global Technology
ThinkSystem SR570
(2.10 GHz, Intel Xeon Gold 5218R)

CPU2017 License: 9017
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SPECspeed®2017_fp_base = 124
SPECspeed®2017_fp_peak = Not Run

Test Date: Mar-2020
Hardware Availability: Mar-2020
Software Availability: Sep-2019

Platform Notes (Continued)

VERSION="15-SP1"
VERSION_ID="15.1"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp1"

uname -a:
    Linux linux-mazt 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

run-level 3 Mar 18 15:22

SPEC is set to: /home/cpu2017-1.1.0-ic19.0u5
    Filesystem Type Size Used Avail Use% Mounted on
    /dev/sda3      xfs  892G   55G  837G   7%  /

From /sys/devices/virtual/dmi/id
    BIOS:  Lenovo -[TEE151L-2.51]- 01/13/2020
    Vendor:  Lenovo
    Product: ThinkSystem SR570 -[7Y02RCZ000]-
    Product Family: ThinkSystem
    Serial:  1234567890

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.
    Memory:
        4x NO DIMM NO DIMM
        12x SK Hynix HMA82GR7CJR8N-WM 16 GB 2 rank 2933

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

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<th>SPECsweep®2017_fp_base =</th>
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**Compiler Version Notes**

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<td>619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)</td>
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</table>
|          | Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.5.281 Build 20190815  
|           | Copyright (C) 1985-2019 Intel Corporation. All rights reserved. |

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|           | Copyright (C) 1985-2019 Intel Corporation. All rights reserved. |

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**Base Compiler Invocation**

C benchmarks:  
**icc**

(Continued on next page)
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#### Base Compiler Invocation (Continued)

- **Fortran benchmarks:**  
  ifort

- **Benchmarks using both Fortran and C:**  
  ifort icc

- **Benchmarks using Fortran, C, and C++:**  
  icpc icc ifort

#### Base Portability Flags

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<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>-DSPEC_LP64 -DSPEC_CASE_FLAG</td>
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<td>628.pop2_s</td>
<td>-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian</td>
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<tr>
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<td>638.imagick_s</td>
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<td>-DSPEC_LP64</td>
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#### Base Optimization Flags

- **C benchmarks:**  
  -m64 -std=c11 -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
  -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

- **Fortran benchmarks:**  
  -m64 -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div  
  -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp  
  -nostandard-realloc-lhs

- **Benchmarks using both Fortran and C:**  
  -m64 -std=c11 -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
  -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP  
  -nostandard-realloc-lhs

- **Benchmarks using Fortran, C, and C++:**  
  -m64 -std=c11 -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
  -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP

(Continued on next page)
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Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
-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-F.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-F.xml

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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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