**Lenovo Global Technology**

**ThinkSystem SR650**

(3.80 GHz, Intel Xeon Platinum 8256)

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<table>
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<tr>
<th>SPECspeed2017_fp_base</th>
<th>58.4</th>
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**SPECspeed2017_fp_peak** = Not Run

**CPU2017 License:** 9017

**Test Sponsor:** Lenovo Global Technology

**Tested by:** Lenovo Global Technology

**Software Availability:** Nov-2018

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###_threads

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</table>

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### Hardware

**CPU Name:** Intel Xeon Platinum 8256

**Max MHz.:** 3900

**Nominal:** 3800

**Enabled:** 8 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:** 16.5 MB I+D on chip per chip

**Other:** None

**Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R)

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

**Other:** None

---

### Software

**OS:** Red Hat Enterprise Linux Server release 7.6 (Maipo)

**Kernel:** 3.10.0-957.el7.x86_64

**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 IVE135R 2.10 released Feb-2019

**File System:** xfs

**System State:** Run level 3 (multi-user)

**Base Pointers:** 64-bit

**Peak Pointers:** Not Applicable

**Other:** None
Lenovo Global Technology
ThinkSystem SR650
(3.80 GHz, Intel Xeon Platinum 8256)

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

SPECspeed2017_fp_base = 58.4
SPECspeed2017_fp_peak = Not Run

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Nov-2018

Results Table

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</table>

SPECspeed2017_fp_base = 58.4
SPECspeed2017_fp_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,compact"
LD_LIBRARY_PATH = "/home/cpu2017-1.0.5-ic19.0u1/lib/intel64"
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.
Lenovo Global Technology

ThinkSystem SR650
(3.80 GHz, Intel Xeon Platinum 8256)

| SPECspeed2017_fp_base = 58.4 |
| SPECspeed2017_fp_peak = Not Run |

CPUT2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance
Choose Operating Mode set to Custom Mode
C-states set to Legacy
Hyper-Threading set to Disable
Adjacent Cache Prefetch set to Disable
SNC set to Enable
Stale AtoS set to Enable
Sysinfo program /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c3d61f64985e45859ea9
running on localhost.localdomain Mon Apr 22 02:31:28 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) Platinum 8256 CPU @ 3.80GHz
  2 "physical id"s (chips)
  8 "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 : 4
siblings : 4
physical 0: cores 1 5 9 13
physical 1: cores 1 2 5 13

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s):
On-line CPU(s) list: 0-7
Thread(s) per core:
Core(s) per socket:
Socket(s):
NUMA node(s):
Vendor ID:
CPU family:
Model:
Model name:
Stepping:
CPU MHz:
BogoMIPS:
Virtualization:
L1d cache:
L1i cache:

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR650
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

SPECspeed2017_fp_base = 58.4
SPECspeed2017_fp_peak = Not Run

Platform Notes (Continued)

L2 cache: 1024K
L3 cache: 16896K
NUMA node0 CPU(s): 0,2
NUMA node1 CPU(s): 1,3
NUMA node2 CPU(s): 4,5
NUMA node3 CPU(s): 6,7
Flags: fpu vme de pse tsc mtrr pae mca 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
aperfmperf eagerfpu 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 epb cat_l3 cdp_l3 intel_pt ssbd mba
ibr ibpb stibp ibrs ibrs_enhanced tpr_shadow vmmi lexplicit ept vpid fsgsbase
tsc_adjust bm1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rd_ae avx512f avx512dq
dsead adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsaveopt xgetbv1
cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb-local dtherm ida arat pln pts pku ospke
avx512_vnni spec_ctrl intel_stibp flush_l1d arch_capabilities

/proc/cpuinfo cache data
  cache size : 16896 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 2
  node 0 size: 196221 MB
  node 0 free: 191776 MB
  node 1 cpus: 1 3
  node 1 size: 196608 MB
  node 1 free: 192139 MB
  node 2 cpus: 4 5
  node 2 size: 196608 MB
  node 2 free: 192181 MB
  node 3 cpus: 6 7
  node 3 size: 196608 MB
  node 3 free: 192208 MB
  node distances:
    node 0 1 2 3
    0: 10 11 21 21
    1: 11 10 21 21
    2: 21 21 10 11
    3: 21 21 11 10

From /proc/meminfo
  MemTotal: 792179284 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

(Continued on next page)
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Test Date: Apr-2019
Tested by: Lenovo Global Technology
Hardware Availability: Apr-2019
Software Availability: Nov-2018

Platform Notes (Continued)

From /etc/*release* /etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux Server"
    VERSION="7.6 (Maipo)"
    ID="rhel"
    ID_LIKE="fedora"
    VARIANT="Server"
    VARIANT_ID="server"
    VERSION_ID="7.6"
    PRETTY_NAME="Red Hat Enterprise Linux Server 7.6 (Maipo)"
  redhat-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)
  system-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)

uname -a:
Linux localhost.localdomain 3.10.0-957.el7.x86_64 #1 SMP Thu Oct 4 20:48:51 UTC 2018
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: Load fences, __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS

run-level 3 Apr 22 01:53

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/sdb2 xfs 689G 116G 573G 17% /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 -[IVE135R-2.10]- 02/27/2019
Memory: 24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
==============================================================================

(Continued on next page)
Lenovo Global Technology
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SPECspeed2017_fp_base = 58.4
SPECspeed2017_fp_peak = Not Run

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.

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.

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

Fortran benchmarks:
ifort -m64
SPEC CPU2017 Floating Point Speed Result

Lenovo Global Technology
ThinkSystem SR650
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SPECspeed2017_fp_base = 58.4
SPECspeed2017_fp_peak = Not Run

Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
   -assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

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

Fortran benchmarks:
-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:
-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++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs
# SPEC CPU2017 Floating Point Speed Result

**Lenovo Global Technology**  
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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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Tested with SPEC CPU2017 v1.0.5 on 2019-04-21 14:31:27-0400.  