Lenovo Global Technology

ThinkSystem SR650
(2.60 GHz, Intel Xeon Gold 6240)

<table>
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<tbody>
<tr>
<td>SPECrate2017_fp_peak = Not Run</td>
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**Test Sponsor:** Lenovo Global Technology  
**Hardware Availability:** Apr-2019  
**Test Date:** May-2019  
**Software Availability:** Nov-2018

**CPU2017 License:** 9017  
**Tested by:** Lenovo Global Technology

### Hardware

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<td>namd_r</td>
<td>72</td>
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<td>538</td>
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<td>544</td>
<td>nab_r</td>
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<tr>
<td>554</td>
<td>roms_r</td>
<td>72</td>
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</table>

#### SPECrate2017_fp_base (215)

### Software

**OS:** Red Hat Enterprise Linux Server release 7.6 (Maipo)  
**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:** No  
**Firmware:** Lenovo BIOS Version IVE142E 2.30 released Aug-2019 tested as IVE135R 2.10 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
(2.60 GHz, Intel Xeon Gold 6240)

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

SPECrate2017_fp_base = 215
SPECrate2017_fp_peak = Not Run

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

Results Table

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<td>91.8</td>
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</tbody>
</table>

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

Submit Notes
The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.

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:
LD_LIBRARY_PATH = "/home/cpu2017-1.0.5-ic19.0u1/lib/intel64"
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
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
Lenovo Global Technology
ThinkSystem SR650
(2.60 GHz, Intel Xeon Gold 6240)

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</tbody>
</table>

**SPECrate2017_fp_base** = 215
**SPECrate2017_fp_peak** = Not Run

**General Notes (Continued)**

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.

**Platform Notes**

BIOS configuration:
Choose Operating Mode set to Maximum Performance
Choose Operating Mode set to Custom Mode
C-states set to Legacy
SNC set to Enable
DCU Streamer Prefetcher set to Disable
Trusted Execution Technology set to Enable
Stale AtoS set to Enable
Patrol Scrub set to Disable
Sysinfo program /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on localhost.localdomain Tue May 7 17:58:38 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

```plaintext
model name : Intel(R) Xeon(R) Gold 6240 CPU @ 2.60GHz
2 "physical id"s (chips)
72 "processors"
cores, siblings (Caution: counting these is hw and system dependent. Use with caution.)
cpu cores : 18
siblings : 36
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
```

From lscpu:

```plaintext
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 72
On-line CPU(s) list: 0-71
```

(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

SPECrate2017_fp_base = 215
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Test Date: May-2019
Hardware Availability: Apr-2019
Software Availability: Nov-2018

Platform Notes (Continued)

Thread(s) per core: 2
Core(s) per socket: 18
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6240 CPU @ 2.60GHz
Stepping: 6
CPU MHz: 2600.000
BogoMIPS: 5200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
NUMA node0 CPU(s): 0-2,5,6,9,10,14,15,36-38,41,42,45,46,50,51
NUMA node1 CPU(s): 3,4,7,8,11-13,16,17,39,40,43,44,47-49,52,53
NUMA node2 CPU(s): 18-20,23,24,27,28,32,33,54-56,59,60,63,64,68,69
NUMA node3 CPU(s): 21,22,25,26,29-31,34,35,57,58,61,62,65-67,70,71
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mpa mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtsscp
lm constant_tsc aarch64 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
erfmrperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xptr 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 cmpop xsaveopt xsavev1
xsaveopt xsavec xsaveprec mmclflush pebs noncomplain mmclflushopt intel_pstate
mvbft bullzip intel_pt ssbd mbx ibs ibbp stibp ibrs_enhanced tpr_shadow vmx
flexpriority etp vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl
avx2vpmi dca cqm_occup_llc cqm_mbb_total cqm_mbb_local dtherm ida arat pln pku ospke
avx512_vnni spec_ctrl intel_stibp flush_l1d arch_capabilities

From numactl --hardware WARNING: a numactl 'node' might or may not correspond to a
physical chip.

available: 4 nodes (0-3)
node 0 cpus: 0 1 2 5 6 9 10 14 15 36 37 38 41 42 45 46 50 51
node 0 size: 196220 MB
node 0 free: 191609 MB
node 1 cpus: 3 4 7 8 11 12 13 16 17 39 40 43 44 47 48 49 52 53
node 1 size: 196608 MB
node 1 free: 192129 MB
node 2 cpus: 18 19 20 23 24 27 28 32 33 54 55 56 59 60 63 64 68 69
node 2 size: 196608 MB
node 2 free: 191887 MB

(Continued on next page)
## Lenovo Global Technology

### ThinkSystem SR650
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**Platform Notes (Continued)**

```
node 3 cpus: 21 22 25 26 29 30 31 34 35 57 58 61 62 65 66 67 70 71
node 3 size: 196608 MB
node 3 free: 192116 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: 792178240 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*  
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)"

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 May 7 17:55

---

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 (Continued on next page)
## Lenovo Global Technology

**SPEC CPU2017 Floating Point Rate Result**

**ThinkSystem SR650**  
(2.60 GHz, Intel Xeon Gold 6240)

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### Platform Notes (Continued)

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  519.lbm_r(base) 538.imagick_r(base) 544.nab_r(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 508.namd_r(base) 510.parest_r(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.  
------------------------------------------------------------------------

------------------------------------------------------------------------  
CC  511.povray_r(base) 526.blender_r(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.  
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  507.cactuBSSN_r(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.  
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.1.144 Build 20181018  
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------------------------------------------------------------------------

(Continued on next page)
LENOVO GLOBAL TECHNOLOGY

ThinkSystem SR650
(2.60 GHz, Intel Xeon Gold 6240)

SPECRate2017_fp_base = 215
SPECRate2017_fp_peak = Not Run

Compiler Version Notes (Continued)

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.

------------------------------------------------------------------
FC  503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
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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

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

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64
### Lenovo Global Technology

**ThinkSystem SR650**  
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**SPECrate2017_fp_base** = 215

**SPECrate2017_fp_peak** = Not Run

---

### Base Portability Flags

- 503.bwaves_r: -DSPEC_LP64
- 507.cactuBSSN_r: -DSPEC_LP64
- 508.namd_r: -DSPEC_LP64
- 510.parest_r: -DSPEC_LP64
- 511.povray_r: -DSPEC_LP64
- 519.lbm_r: -DSPEC_LP64

- 521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
- 526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
- 527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
- 538.imagick_r: -DSPEC_LP64
- 544.nab_r: -DSPEC_LP64
- 549.fotonik3d_r: -DSPEC_LP64
- 554.roms_r: -DSPEC_LP64

---

### Base Optimization Flags

**C benchmarks:**
- xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-mem-layout-trans=4

**C++ benchmarks:**
- xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-mem-layout-trans=4

**Fortran benchmarks:**
- xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
- align array32byte

**Benchmarks using both Fortran and C:**
- xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
- align array32byte

**Benchmarks using both C and C++:**
- xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-mem-layout-trans=4

**Benchmarks using Fortran, C, and C++:**
- xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
- align array32byte
## Lenovo Global Technology

**ThinkSystem SR650**  
*(2.60 GHz, Intel Xeon Gold 6240)*

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**Test Date:** May-2019  
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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-D.html](http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-D.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-D.xml](http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-D.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 2019-05-07 05:58:37-0400.  
Originally published on 2019-08-07.