**Lenovo Global Technology**  
ThinkSystem SR630  
(1.90 GHz, Intel Xeon Gold 6238T)

<table>
<thead>
<tr>
<th>Test Sponsor:</th>
<th>Lenovo Global Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td><strong>CPU2017 License:</strong></td>
<td>9017</td>
</tr>
<tr>
<td><strong>Test Date:</strong></td>
<td>Apr-2019</td>
</tr>
<tr>
<td><strong>Hardware Availability:</strong></td>
<td>Apr-2019</td>
</tr>
</tbody>
</table>

**SPECrates**

- **SPECrates2017_fp_base**: 214
- **SPECrates2017_fp_peak**: Not Run

### Supported Benchmarks

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
</tr>
</thead>
<tbody>
<tr>
<td>bwaves_r</td>
<td>88</td>
</tr>
<tr>
<td>cactuBSSN_r</td>
<td>88</td>
</tr>
<tr>
<td>namd_r</td>
<td>88</td>
</tr>
<tr>
<td>parest_r</td>
<td>88</td>
</tr>
<tr>
<td>povray_r</td>
<td>88</td>
</tr>
<tr>
<td>lbm_r</td>
<td>88</td>
</tr>
<tr>
<td>wrf_r</td>
<td>88</td>
</tr>
<tr>
<td>blender_r</td>
<td>88</td>
</tr>
<tr>
<td>cam4_r</td>
<td>88</td>
</tr>
<tr>
<td>imagick_r</td>
<td>88</td>
</tr>
<tr>
<td>nab_r</td>
<td>88</td>
</tr>
<tr>
<td>fotokin3d_r</td>
<td>88</td>
</tr>
<tr>
<td>roms_r</td>
<td>88</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name**: Intel Xeon Gold 6238T  
- **Max MHz.**: 3700  
- **Nominal**: 1900  
- **Enabled**: 44 cores, 2 chips, 2 threads/core  
- **Orderable**: 1.2 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  
- **Memory**: 384 GB (24 x 16 GB 2Rx8 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 19.0.0.117 of Intel C/C++  
- **Compiler for Linux**: Compiler for Linux; Fortran: Version 19.0.0.117 of Intel Fortran  
- **Compiler for Linux**: Compiler for Linux  
- **Parallel**: No  
- **Firmware**: Lenovo BIOS Version IVE135P 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 SR630
(1.90 GHz, Intel Xeon Gold 6238T)

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>503.bwaves_r</td>
<td>88</td>
<td>1741</td>
<td>507</td>
<td>1738</td>
<td>508</td>
<td>1738</td>
<td>508</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>88</td>
<td>621</td>
<td>180</td>
<td>621</td>
<td>179</td>
<td>621</td>
<td>180</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>88</td>
<td>532</td>
<td>157</td>
<td>535</td>
<td>156</td>
<td>533</td>
<td>157</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>88</td>
<td>1938</td>
<td>119</td>
<td>1941</td>
<td>119</td>
<td>1937</td>
<td>119</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>88</td>
<td>848</td>
<td>242</td>
<td>852</td>
<td>241</td>
<td>850</td>
<td>242</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>88</td>
<td>781</td>
<td>119</td>
<td>781</td>
<td>119</td>
<td>782</td>
<td>119</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>88</td>
<td>897</td>
<td>220</td>
<td>903</td>
<td>218</td>
<td>892</td>
<td>221</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>88</td>
<td>560</td>
<td>239</td>
<td>562</td>
<td>239</td>
<td>562</td>
<td>238</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>88</td>
<td>628</td>
<td>245</td>
<td>627</td>
<td>245</td>
<td>629</td>
<td>245</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>88</td>
<td>423</td>
<td>518</td>
<td>428</td>
<td>511</td>
<td>425</td>
<td>514</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>88</td>
<td>397</td>
<td>373</td>
<td>397</td>
<td>373</td>
<td>398</td>
<td>373</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>88</td>
<td>2031</td>
<td>169</td>
<td>2030</td>
<td>169</td>
<td>2031</td>
<td>169</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>88</td>
<td>1463</td>
<td>95.6</td>
<td>1476</td>
<td>94.7</td>
<td>1472</td>
<td>95.0</td>
</tr>
</tbody>
</table>

SPECrate2017_fp_base = 214
SPECrate2017_fp_peak = Not Run

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/lib/intel64"
Binaries compiled on a system with 1x Intel Core i9-799X 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>
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

(Continued on next page)
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
LLC dead line alloc set to Disable
Patrol Scrub set to Disable
Sysinfo program /home/cpu2017-1.0.5-ic19/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on localhost.localdomain Tue Apr 16 00:36:00 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
    2 "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 : 44
  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

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

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR630
(1.90 GHz, Intel Xeon Gold 6238T)

SPECrate2017_fp_base = 214
SPECrate2017_fp_peak = Not Run

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

Platform Notes (Continued)

Thread(s) per core: 2
Core(s) per socket: 22
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
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): 0-2,6-8,11-13,17,18,44-46,50-52,55-57,61,62
NUMA node1 CPU(s): 3-5,9,10,14-16,19-21,47-49,53,54,58-60,63-65
NUMA node2 CPU(s): 22-24,28-30,33-35,39,40,66-68,72-74,77-79,83,84
NUMA node3 CPU(s): 25-27,31,32,36-38,41-43,69-71,75,76,80-82,85-87

Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca 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 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 pcache dtc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch epb cat_l3 cdp_l3 intel_pt ssbd mba ibrs ibpb stibp ibrs-enhanced tpr-shadow vnni flexpriority ept vpid fsgsbase tsc_adjust bml1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cmqm_llc cmqm_occup_llc cmqm_mbb_total cmqm_mbb_local dtlrm ida arat pln pts pku ospke avx512_vnni spec_ctrl intel_stibp flush_l1d arch_capabilities

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 6 7 8 11 12 13 17 18 44 45 46 50 51 52 55 56 57 61 62
node 0 size: 97976 MB
node 0 free: 95317 MB
node 1 cpus: 3 4 5 9 10 14 15 16 19 20 21 47 48 49 53 54 58 59 60 63 64 65
node 1 size: 98304 MB
node 1 free: 95723 MB
node 2 cpus: 22 23 24 28 29 30 33 34 35 39 40 66 67 68 72 73 74 77 78 79 83 84
node 2 size: 98304 MB
node 2 free: 95747 MB

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR630
(1.90 GHz, Intel Xeon Gold 6238T)

SPECrate2017_fp_base = 214
SPECrate2017_fp_peak = Not Run

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

Platform Notes (Continued)

node 3 cpus: 25 26 27 31 32 36 37 38 41 42 43 69 70 71 75 76 80 81 82 85 86 87
node 3 size: 98304 MB
node 3 free: 95774 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: 395877908 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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 15 20:59

SPEC is set to: /home/cpu2017-1.0.5-ic19
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb2 xfs 689G 31G 658G 5% /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)
## SPEC CPU2017 Floating Point Rate Result

### Lenovo Global Technology

**ThinkSystem SR630**  
**(1.90 GHz, Intel Xeon Gold 6238T)**

<table>
<thead>
<tr>
<th>Spec CPU2017 License:</th>
<th>9017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
</tr>
</tbody>
</table>

**SPECRate2017_fp_base = 214**  
**SPECRate2017_fp_peak = Not Run**

**Test Date:** Apr-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Oct-2018

### 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 -[IVE135P-2.10]- 02/13/2019**

Memory:

24x Samsung M393A2K43CB2-CVF 16 GB 2 rank 2933

(End of data from sysinfo program)

### Compiler Version Notes

```plaintext
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 19.0.0.117 Build 20180804
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 19.0.0.117 Build 20180804
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 19.0.0.117 Build 20180804
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 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

(Continued on next page)
## Lenovo Global Technology

ThinkSystem SR630  
(1.90 GHz, Intel Xeon Gold 6238T)

<table>
<thead>
<tr>
<th>SPECrate2017_fp_base</th>
<th>214</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

### Compiler Version Notes (Continued)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.0.117 Build 20180804  
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
```

Benchmarks using Fortran, C, and C++:
```
icpc -m64 icc -m64 -std=c11 ifort -m64
```
Lenovo Global Technology
ThinkSystem SR630
(1.90 GHz, Intel Xeon Gold 6238T)

SPECrate2017_fp_base = 214
SPECrate2017_fp_peak = Not Run

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

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

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=3

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -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=3 -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=3

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
-align array32byte
### Lenovo Global Technology

**ThinkSystem SR630**  
(1.90 GHz, Intel Xeon Gold 6238T)

<table>
<thead>
<tr>
<th>SPECrate2017_fp_base</th>
<th>214</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

**Test Date:** Apr-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Oct-2018

The flags files that were used to format this result can be browsed at:
- [Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-A.html](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:
- [Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-A.xml](http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-A.xml)

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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 2019-04-15 12:35:59-0400.  