## Lenovo Global Technology

**ThinkSystem SR850P**  
(2.60 GHz, Intel Xeon Gold 6240)

### SPECspeed®2017_fp_base = 194

**SPECspeed®2017_fp_peak = Not Run**

---

### Hardware

**CPU Name:** Intel Xeon Gold 6240  
**Max MHz:** 3900  
**Nominal:** 2600  
**Enabled:** 72 cores, 4 chips  
**Orderable:** 4 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:** 24.75 MB I+D on chip per chip  
**Other:** None  
**Memory:** 1536 GB (48 x 32 GB 2Rx4 PC4-2933Y-R)  
**Storage:** 1 x 960 GB SATA SSD  
**Other:** None

---

### Software

**OS:** Red Hat Enterprise Linux 8.0  
(Ootpa)  
**Kernel:** 4.18.0-80.el8.x86_64  
**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 TEE156L 2.61 released May-2020  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable  
**Other:** None  
**Power Management:** BIOS set to prefer performance at the cost of additional power usage

---

### Test Details

**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Test Date:** Oct-2020  
**Hardware Availability:** Jun-2020  
**Tested by:** Lenovo Global Technology  
**Software Availability:** Sep-2019  
**Test Sponsor:** Lenovo Global Technology  
**Hardware Availability:** Jun-2020  
**Tested by:** Lenovo Global Technology  
**Software Availability:** Sep-2019

---

### Benchmark Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Result</th>
<th>Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>72</td>
<td>204</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>72</td>
<td>162</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>72</td>
<td>142</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>72</td>
<td>138</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>72</td>
<td>62.5</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>72</td>
<td>191</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>72</td>
<td>363</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>72</td>
<td>120</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>72</td>
<td>259</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>72</td>
<td></td>
</tr>
</tbody>
</table>

---

**SPECspeed®2017_fp_base (194)**
**SPEC CPU®2017 Floating Point Speed Result**

Copyright 2017-2020 Standard Performance Evaluation Corporation

**Lenovo Global Technology**

ThinkSystem SR850P

(2.60 GHz, Intel Xeon Gold 6240)

**SPECspeed®2017_fp_base = 194**

**SPECspeed®2017_fp_peak = Not Run**

**CPU2017 License:** 9017  
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**Software Availability:** Sep-2019

---

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>72</td>
<td>69.4</td>
<td>850</td>
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<td>852</td>
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<tr>
<td>607.cactuBSSN_s</td>
<td>72</td>
<td>81.8</td>
<td>204</td>
<td><strong>81.7</strong></td>
<td><strong>204</strong></td>
<td>81.3</td>
<td>205</td>
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<tr>
<td>619.lbm_s</td>
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<td>168</td>
<td>33.4</td>
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<tr>
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<td>92.9</td>
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<td><strong>93.1</strong></td>
<td><strong>142</strong></td>
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<td>142</td>
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<td>63.9</td>
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<td><strong>62.5</strong></td>
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</tbody>
</table>

**SPECspeed®2017_fp_base = 194**  
**SPECspeed®2017_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"

---

### 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-ic19.0u5-2/lib/intel64"
- OMP_STACKSIZE = "192M"

---

### General Notes

Binaries compiled on a system with 1x Intel Core i9-9900K 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.
Lenovo Global Technology
ThinkSystem SR850P
(2.60 GHz, Intel Xeon Gold 6240)

NAME: Lenovo Global Technology

SPECspeed®2017_fp_base = 194
SPECspeed®2017_fp_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Test Date: Oct-2020
Tested by: Lenovo Global Technology
Hardware Availability: Jun-2020
Software Availability: Sep-2019

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
MONITOR/MWAIT set to Enable
Hyper-Threading set to Disable

Sysinfo program /home/cpu2017-1.1.0-ic19.0u5-2/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f88a3d7edeb1e6e46a485a0011
running on localhost.localdomain Tue Oct 27 22:30:16 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 6240 CPU @ 2.60GHz
 4 "physical id"s (chips)
 72 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following
excerts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 18
siblings : 18
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
physical 2: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 3: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27

From lscpu:
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
Thread(s) per core: 1
Core(s) per socket: 18
Socket(s): 4
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6240 CPU @ 2.60GHz
Stepping: 7
CPU MHz: 1902.708
CPU max MHz: 3900.0000
CPU min MHz: 1000.0000
BogoMIPS: 5200.00
Virtualization: VT-x
L1d cache: 32K

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

### Lenovo Global Technology

**ThinkSystem SR850P**

(2.60 GHz, Intel Xeon Gold 6240)

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</tr>
<tr>
<td>Software Availability:</td>
<td>Sep-2019</td>
</tr>
</tbody>
</table>

### Platform Notes (Continued)

- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 25344K
- **NUMA node0 CPU(s):** 0-17
- **NUMA node1 CPU(s):** 18-35
- **NUMA node2 CPU(s):** 36-53
- **NUMA node3 CPU(s):** 54-71
- **Flags:** fpu vme de pse tsc msr pae mca cmov pat sse3 c3 f80p dtlclflush dts mpx est mmx fsb cvtss2sd vs Cunningham exmx mca cx16 xtrr pdcm pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtrr pdcm pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
- **/proc/cpuinfo cache data**
  - cache size: 25344 KB

From **numactl --hardware**

WARNING: a numactl 'node' might or might not correspond to a physical chip.

<table>
<thead>
<tr>
<th>available</th>
<th>4 nodes</th>
<th>(0-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>node 0 cpus:</td>
<td>0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17</td>
<td></td>
</tr>
<tr>
<td>node 0 size:</td>
<td>386684 MB</td>
<td></td>
</tr>
<tr>
<td>node 0 free:</td>
<td>386189 MB</td>
<td></td>
</tr>
<tr>
<td>node 1 cpus:</td>
<td>18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35</td>
<td></td>
</tr>
<tr>
<td>node 1 size:</td>
<td>387068 MB</td>
<td></td>
</tr>
<tr>
<td>node 1 free:</td>
<td>386105 MB</td>
<td></td>
</tr>
<tr>
<td>node 2 cpus:</td>
<td>36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53</td>
<td></td>
</tr>
<tr>
<td>node 2 size:</td>
<td>387043 MB</td>
<td></td>
</tr>
<tr>
<td>node 2 free:</td>
<td>386044 MB</td>
<td></td>
</tr>
<tr>
<td>node 3 cpus:</td>
<td>54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71</td>
<td></td>
</tr>
<tr>
<td>node 3 size:</td>
<td>387067 MB</td>
<td></td>
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<tr>
<td>node 3 free:</td>
<td>386318 MB</td>
<td></td>
</tr>
<tr>
<td>node distances:</td>
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</tr>
<tr>
<td>node 0 1 2 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0: 10 21 21 21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1: 21 10 21 21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2: 21 21 10 21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3: 21 21 21 10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From **/proc/meminfo**

| MemTotal: | 1585012168 kB |

(Continued on next page)
Lenovo Global Technology
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SPECspeed®2017_fp_base = 194
SPECspeed®2017_fp_peak = Not Run

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

Platform Notes (Continued)

HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux"
      VERSION="8.0 (Ootpa)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="8.0"
      PLATFORM_ID="platform:el8"
      PRETTY_NAME="Red Hat Enterprise Linux 8.0 (Ootpa)"
      ANSI_COLOR="0;31"
   redhat-release: Red Hat Enterprise Linux release 8.0 (Ootpa)
   system-release: Red Hat Enterprise Linux release 8.0 (Ootpa)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:8.0:ga

   uname -a:
      Linux localhost.localdomain 4.18.0-80.el8.x86_64 #1 SMP Wed Mar 13 12:02:46 UTC 2019
      x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: No status reported
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 Oct 27 21:22

SPEC is set to: /home/cpu2017-1.1.0-ic19.0u5-2
   Filesystem Type Size Used Avail Use% Mounted on
   /dev/sda4 xfs 839G 47G 792G 6% /home

From /sys/devices/virtual/dmi/id
   BIOS: Lenovo -[TEE156L-2.61]- 05/20/2020
   Vendor: Lenovo
   Product: ThinkSystem SR850P -[7D2HCT01WW]-
   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
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SPECspeed®2017_fp_base = 194
SPECspeed®2017_fp_peak = Not Run

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.
Memory:
48x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

Compiler Version Notes

C               | 619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
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.

C++, C, Fortran | 607.cactuBSSN_s(base)
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.

Fortran, C      | 621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)
Intel(R) Fortran 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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Compiler Version Notes (Continued)

Version 19.0.5.281 Build 20190815
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

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

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:
-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

(Continued on next page)
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SPECspeed®2017_fp_base = 194
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Base Optimization Flags (Continued)

Fortran benchmarks (continued):
- nostandard-realloc-lhs

Benchmarks using both Fortran and C:
- m64 -std=cl1 -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=cl1 -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
- ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
- 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-I.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-I.xml