## Lenovo Global Technology

**ThinkSystem SR630 V2**  
(2.40 GHz, Intel Xeon Platinum 8368)

### SPEC CPU®2017 Floating Point Speed Result

**Copyright 2017-2021 Standard Performance Evaluation Corporation**

### Lenovo Global Technology

**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Test Date:** May-2021  
**Hardware Availability:** Jul-2021  
**Software Availability:** Feb-2021

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECspeed 2017_fp_base</th>
<th>SPECspeed 2017_fp_peak</th>
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<tr>
<td>603.bwaves_s</td>
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<td>607.cactuBSSN_s</td>
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<td>649.fotonik3d_s</td>
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</tr>
<tr>
<td>654.roms_s</td>
<td>76</td>
<td>263</td>
</tr>
</tbody>
</table>

### Hardware

**CPU Name:** Intel Xeon Platinum 8368  
**Max MHz:** 3400  
**Nominal:** 2400  
**Enabled:** 76 cores, 2 chips  
**Orderable:** 1.2 chips  
**Cache L1:** 32 KB I + 48 KB D on chip per core  
**L2:** 1.25 MB I+D on chip per core  
**L3:** 57 MB I+D on chip per chip  
**Other:** None  
**Memory:** 1 TB (32 x 32 GB 2Rx8 PC4-3200AA-R)  
**Storage:** 1 x 960 GB SATA SSD  
**Other:** None

### Software

**OS:** Red Hat Enterprise Linux 8.3  
(Ootpa)  
**Kernel:** 4.18.0-240.el8.x86_64  
**Compiler:** C/C++, Version 2021.1 of Intel oneAPI DPC++/C++  
**Compiler Build:** 20201113 for Linux; Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux; C/C++: Version 2021.1 of Intel C/C++ Compiler Classic Build 20201112 for Linux  
**Parallel:** Yes  
**Firmware:** Lenovo BIOS Version AFE109PT1 1.00 released Apr-2021  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable  
**Other:** jemalloc memory allocator V5.0.1  
**Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage
Lenovo Global Technology
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CPU2017 License: 9017
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Results Table

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</tr>
</tbody>
</table>

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/cpu2017-1.1.5-ic2021.1-revB/lib/intel64:/home/cpu2017-1.1.5-ic2021.1-revB/je5.0.1-64"
MALLOCONF = "retain:true"
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.

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

Lenovo Global Technology
ThinkSystem SR630 V2
(2.40 GHz, Intel Xeon Platinum 8368)

SPECSpeed®2017_fp_base = 232
SPECSpeed®2017_fp_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Test Date: May-2021
Tested by: Lenovo Global Technology
Hardware Availability: Jul-2021
Software Availability: Feb-2021

General Notes (Continued)

ejemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
MONITOR/MWAIT set to Enabled
Hyper-Threading set to Disabled
C-States set to Legacy
UPI Prefetcher set to Disabled
LLC Prefetch set to Enable

Sysinfo program /home/cpu2017-1.1.5-ic2021.1-revB/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afea89d4b38e2f1c
running on localhost.localdomain Sat May 15 22:34:41 2021

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 8368 CPU @ 2.40GHz
    2  "physical id"s (chips)
    76 "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 : 38
siblings : 38
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
25 26 27 28 29 30 31 32 33 34 35 36 37
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
25 26 27 28 29 30 31 32 33 34 35 36 37

From lscpu:
    Architecture: x86_64
    CPU op-mode(s): 32-bit, 64-bit
    Byte Order: Little Endian
    CPU(s): 76
    On-line CPU(s) list: 0-75
    Thread(s) per core: 1
    Core(s) per socket: 38
    Socket(s): 2
    NUMA node(s): 2
    Vendor ID: GenuineIntel

(Continued on next page)
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**SPECspeed®2017_fp_base** = 232

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**Platform Notes (Continued)**

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<th>Value</th>
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<tr>
<td>Model</td>
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</tr>
<tr>
<td>Model name</td>
<td>Intel(R) Xeon(R) Platinum 8368 CPU @ 2.40GHz</td>
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<tr>
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<td>NUMA node0 CPU(s)</td>
<td>0-37</td>
</tr>
<tr>
<td>NUMA node1 CPU(s)</td>
<td>38-75</td>
</tr>
</tbody>
</table>

---

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 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37
node 0 size: 486746 MB
node 0 free: 514037 MB
node 1 cpus: 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75
node 1 size: 488200 MB
node 1 free: 515007 MB
node distances:
    node   0   1
    0: 10 20
    1: 20 10
```

---

From `/proc/meminfo`

```
cache size : 58368 KB
```

---

(Continued on next page)
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Platform Notes (Continued)

MemTotal: 1056486292 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/sbin/tuned-adm active
   Current active profile: throughput-performance

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux"
      VERSION="8.3 (Ootpa)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="8.3"
      PLATFORM_ID="platform:el8"
      PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
      ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

uname -a:
   Linux localhost.localdomain 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020
   x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit): Not affected
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: usercopy/swaps barriers and __user pointer sanitation
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 May 15 21:18

SPEC is set to: /home/cpu2017-1.1.5-ic2021.1-revB

Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb4 xfs 818G 11G 807G 2% /home

(Continued on next page)
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Platform Notes (Continued)

From /sys/devices/virtual/dmi/id
Vendor: Lenovo
Product: ThinkSystem SR630 V2 MB
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:
32x Samsung M393A4G43AB3-CWE 32 GB 2 rank 3200

BIOS:
BIOS Vendor: Lenovo
BIOS Version: AFE109PT1-1.00
BIOS Date: 04/28/2021
BIOS Revision: 1.0
Firmware Revision: 1.10

(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 Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000 |
Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |
==============================================================================

==============================================================================
| C++, C, Fortran | 607.cactuBSSN_s(base) |
==============================================================================
| Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000 |
Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |
| Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000 |
Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |
| Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000 |
Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |
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### Compiler Version Notes (Continued)

```
==============================================================================
Fortran         | 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)  
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on  
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Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)  
64, Version 2021.1 Build 20201112_000000  
Copyright (C) 1985-2020 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.cacltBSSN_s: -DSPEC_LP64  
619.lbm: -DSPEC_LP64  
621.wrf: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian  
627.cam4: -DSPEC_LP64 -DSPEC_CASE_FLAG  
628.pop2: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian -assume byterecl  
```
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### Base Optimization Flags

**C benchmarks:**

```bash
-m64 -std=c11 -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP  
-mbranches-within-32B-boundaries
```

**Fortran benchmarks:**

```bash
-m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div  
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp  
-nostandard-realloc-lhs -mbranches-within-32B-boundaries  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

**Benchmarks using both Fortran and C:**

```bash
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div  
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp  
-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

**Benchmarks using Fortran, C, and C++:**

```bash
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div  
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp  
-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

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:

- [http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-ICElake-D.xml](http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-ICElake-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 CPU\textsuperscript{2017 v1.1.5} on 2021-05-15 10:34:40-0400.  
Report generated on 2021-06-08 20:03:48 by CPU2017 PDF formatter v6442.  
Originally published on 2021-06-08.