# SPEC CPU®2017 Integer Speed Result

**Lenovo Global Technology**  
ThinkSystem SR630 V2  
(2.80 GHz, Intel Xeon Silver 4309Y)

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>Jul-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Jul-2021</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Dec-2020</td>
</tr>
</tbody>
</table>

## 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;
- Parallel: Yes
- Firmware: Lenovo BIOS Version AFE111A 1.02 released May-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

## Hardware
- CPU Name: Intel Xeon Silver 4309Y
- Max MHz: 3600
- Nominal: 2800
- Enabled: 16 cores, 2 chips, 2 threads/core
- 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: 12 MB I+D on chip per chip
- Other: None
- Memory: 1 TB (32 x 32 GB 2Rx8 PC4-3200AA-R, running at 2666)
- Storage: 1 x 960 GB SATA SSD
- Other: None

## Test Results

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perbench_s</td>
<td>6.98</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>9.68</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>19.3</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>7.26</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>11.7</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>17.0</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>5.97</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>4.90</td>
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<tr>
<td>648.exchange2_s</td>
<td>20.8</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>19.1</td>
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</tbody>
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**SPECspeed®2017_int_base** = 11.0

**SPECspeed®2017_int_peak** = Not Run
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
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</tbody>
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**SPECspeed\textsuperscript{\textregistered}2017\_int\_base = 11.0**  
**SPECspeed\textsuperscript{\textregistered}2017\_int\_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,scatter"**
- **LD\_LIBRARY\_PATH ="/home/cpu2017-1.1.8-ic2021.1-revB/lib/intel64:/home/cpu2017-1.1.8-ic2021.1-revB/je5.0.1-64"**
- **MALLOC\_CONF = "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)*
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General Notes (Continued)
jemalloc, 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
C-States set to Legacy
C1 Enhanced Mode set to Enabled

Sysinfo program /home/cpu2017-1.1.8-ic2021.1-revB/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acfc64d
running on localhost.localdomain Thu Jul 1 20:23:36 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) Silver 4309Y CPU @ 2.80GHz
      2 "physical id"s (chips)
      32 "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 : 8
        siblings : 16
            physical 0: cores 0 1 2 3 4 5 6 7
            physical 1: cores 0 1 2 3 4 5 6 7

From lscpu from util-linux 2.32.1:
  Architecture:            x86_64
  CPU op-mode(s):          32-bit, 64-bit
  Byte Order:              Little Endian
  CPU(s):                  32
  On-line CPU(s) list:     0-31
  Thread(s) per core:      2
  Core(s) per socket:      8
  Socket(s):               2
  NUMA node(s):            2
  Vendor ID:               GenuineIntel
  CPU family:              6
  Model:                   106
  Model name:              Intel(R) Xeon(R) Silver 4309Y CPU @ 2.80GHz
  Stepping:                6
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SPECspeed®2017_int_base = 11.0
SPECspeed®2017_int_peak = Not Run

CPU2017 License: 9017
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Tested by: Lenovo Global Technology

Test Date: Jul-2021
Hardware Availability: Jul-2021
Software Availability: Dec-2020

Platform Notes (Continued)

CPU MHz: 1761.499
BogoMIPS: 5600.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 12288K
NUMA node0 CPU(s): 0-7,16-23
NUMA node1 CPU(s): 8-15,24-31

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 pdelgr dts
       cpuid

From /proc/cpuinfo cache data
   cache size : 12288 KB

   WARNING: a numacl '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 16 17 18 19 20 21 22 23
   node 0 size: 499806 MB
   node 0 free: 515059 MB
   node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
   node 1 size: 502727 MB
   node 1 free: 515353 MB

   node distances:
   node 0 1
   0: 10 20
   1: 20 10

From /proc/meminfo
   MemTotal: 1056495824 kB
   HugePages_Total: 0
   Hugepagesize: 2048 kB

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

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### Platform Notes (Continued)

From `/etc/*release* /etc/*version*`:

```bash
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)

```

```bash
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga
```

```bash
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

```bash
CVE-2017-5753 (Spectre variant 1):
Mitigation: usercopy/swapgs barriers and __user pointer sanitation
```

```bash
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

```bash
run-level 3 Jul 1 20:21
```

**SPEC is set to:** /home/cpu2017-1.1.8-ic2021.1-revB

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sdb4</td>
<td>xfs</td>
<td>819G</td>
<td>92G</td>
<td>727G</td>
<td>12%</td>
<td>/home</td>
</tr>
</tbody>
</table>

From `/sys/devices/virtual/dmi/id`:

- **Vendor:** Lenovo
- **Product:** ThinkSystem SR630 V2 MB
- **Product Family:** ThinkSystem
- **Serial:** 1234567890

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# SPEC CPU®2017 Integer Speed Result

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## Platform Notes (Continued)

Additional information from dmidecode 3.2 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, configured at 2666

BIOS:  
- BIOS Vendor: Lenovo  
- BIOS Version: AFE111A-1.02  
- BIOS Date: 05/07/2021  
- BIOS Revision: 1.2  
- Firmware Revision: 1.10

(End of data from sysinfo program)

## Compiler Version Notes

```
C       | 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base)  
       | 625.x264_s(base) 657.xz_s(base)  

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.1 Build 20201113  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
```

```
C++     | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)  
       | 641.leela_s(base)  

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.1 Build 20201113  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
```

```
Fortran | 648.exchange2_s(base)  

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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Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Base Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-DSPEC_OPENMP -std=c11 -m64 -fiopenmp -Wl,-z,muldefs -xCORE-AVX2
-O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:
-DSPEC_OPENMP -m64 -Wl,-z,muldefs -xCORE-AVX2 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin/
-1qkmalloc

Fortran benchmarks:
m64 -xCORE-AVX2 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries
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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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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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