### Lenovo Global Technology

**ThinkSystem SR630 V2**  
(2.10 GHz, Intel Xeon Gold 5318S)

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OS:</strong></td>
<td>Red Hat Enterprise Linux 8.3</td>
</tr>
<tr>
<td></td>
<td>(Ootpa)</td>
</tr>
<tr>
<td><strong>Kernel:</strong></td>
<td>4.18.0-240.el8.x86_64</td>
</tr>
<tr>
<td><strong>Compiler:</strong></td>
<td>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;</td>
</tr>
<tr>
<td><strong>Parallel:</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Firmware:</strong></td>
<td>Lenovo BIOS Version AFE111A 1.02 released May-2021</td>
</tr>
<tr>
<td><strong>File System:</strong></td>
<td>xfs</td>
</tr>
<tr>
<td><strong>System State:</strong></td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td><strong>Base Pointers:</strong></td>
<td>64-bit</td>
</tr>
<tr>
<td><strong>Peak Pointers:</strong></td>
<td>Not Applicable</td>
</tr>
<tr>
<td><strong>Other:</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Power Management:</strong></td>
<td>BIOS and OS set to prefer performance at the cost of additional power usage</td>
</tr>
</tbody>
</table>

#### SPEC CPU®2017 Integer Rate Result

**Lenovo Global Technology**  
**ThinkSystem SR630 V2**  
(2.10 GHz, Intel Xeon Gold 5318S)

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

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

**SPECrate®2017_int_base = 317**  
**SPECrate®2017_int_peak = Not Run**

### Hardware

- **CPU Name:** Intel Xeon Gold 5318S  
- **Max MHz:** 3400  
- **Nominal:** 2100  
- **Enabled:** 48 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:** 36 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 1 TB (32 x 32 GB 2Rx8 PC4-3200AA-R, running at 2933)  
- **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;  
- **Parallel:** No  
- **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:** None  
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>96</td>
<td>718</td>
<td>213</td>
<td>720</td>
<td>212</td>
<td>718</td>
<td>213</td>
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<tr>
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<td>519</td>
<td>262</td>
<td>520</td>
<td>262</td>
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<td>505.mcf_r</td>
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<td>286</td>
<td>543</td>
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<td>544</td>
<td>285</td>
<td>545</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
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<td>581</td>
<td>217</td>
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<td>217</td>
<td>580</td>
<td>217</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
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<td>255</td>
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<tr>
<td>525.x264_r</td>
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<td>531.deepsjeng_r</td>
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<td>548.exchange2_r</td>
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<td>401</td>
<td>628</td>
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<td>630</td>
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<td>557.xz_r</td>
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<td>579</td>
<td>179</td>
<td>580</td>
<td>179</td>
<td>579</td>
<td>179</td>
</tr>
</tbody>
</table>

SPECrater®2017_int_base = 317
SPECrater®2017_int_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"

## Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```
MALLOC_CONF = "retain:true"
```

## General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Red Hat Enterprise Linux 8.1
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
```

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR630 V2
(2.10 GHz, Intel Xeon Gold 5318S)

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

SPECraten®2017_int_base = 317
SPECraten®2017_int_peak = Not Run

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

General Notes (Continued)

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.
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.

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
MONITOR/MWAIT set to Enabled
CPU P-state Control set to Cooperative without Legacy
C-States set to Legacy
C1 Enhanced Mode set to Enabled
Intel Virtualization Technology set to Disabled
Adjacent Cache Prefetch set to Disabled
DCU Streamer Prefetcher set to Disabled
SNC set to Enabled
UPI Link Disable set to Disabled 1 Link

Sysinfo program /home/cpu2017-1.1.8-ic2021.1-revB/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaf64d
running on localhost.localdomain Wed Jun 23 05:06:47 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) Gold 5318S CPU @ 2.10GHz
  2 "physical id"s (chips)
  96 "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 : 24
siblings : 48
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
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

From lscpu from util-linux 2.32.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR630 V2
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**SPEC CPU®2017 Integer Rate Result**

**SPECratenew_int_base** = 317

**SPECratenew_int_peak** = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology
Test Date: Jun-2021
Hardware Availability: Jul-2021
Software Availability: Dec-2020

---

**Platform Notes (Continued)**

```plaintext
CPU(s):              96
On-line CPU(s) list: 0-95
Thread(s) per core:  2
Core(s) per socket:  24
Socket(s):           2
NUMA node(s):        4
Vendor ID:           GenuineIntel
CPU family:          6
Model:               106
Model name:          Intel(R) Xeon(R) Gold 5318S CPU @ 2.10GHz
Stepping:            6
CPU MHz:             1429.558
CPU max MHz:         3400.0000
CPU min MHz:         800.0000
BogoMIPS:            4200.00
Virtualization:      VT-x
L1d cache:           48K
L1i cache:           32K
L2 cache:            1280K
L3 cache:            36864K
NUMA node0 CPU(s):   0-11,48-59
NUMA node1 CPU(s):   12-23,60-71
NUMA node2 CPU(s):   24-35,72-83
NUMA node3 CPU(s):   36-47,84-95
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrunc pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm ablp_lm 3dnowprefetch cpuid_fault ebcat_l3 invpcid_single
intel_pppin ssbd mba ibrs ibpb stibp ibrs_enhanced fsgsbase tsc_adjust bmi1 hle avx2
smep bmi2 erms invpd cmqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma
clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl xsaves cmqm_lic qm_occup_lic
cmqm_gbstr total cmqm_gbstr local split_lock_detect wbinvd dtherm ida arat pln pts hwp
hwp_act_window hwp_epp hwp_pkg_req avx512vbmi umip pku opske avx512_vbmi2 gfn_i vaes
vpcmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig
flush_l1d arch_capabilities
```

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Standard Performance Evaluation Corporation (info@spec.org) https://www.spec.org/
### Platform Notes (Continued)

```
node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23 60 61 62 63 64 65 66 67 68 69 70 71
node 1 size: 252468 MB
node 1 free: 257156 MB

node 2 cpus: 24 25 26 27 28 29 30 31 32 33 34 72 73 74 75 76 77 78 79 80 81 82 83
node 2 size: 252254 MB
node 2 free: 257551 MB

node 3 cpus: 36 37 38 39 40 41 42 43 44 45 46 47 84 85 86 87 88 89 90 91 92 93 94 95
node 3 size: 252756 MB
node 3 free: 257497 MB

node distances:
node   0   1   2   3
0:  10  11  20  20
1:  11  10  20  20
2:  20  20  10  11
3:  20  20  11  10
```

From `/proc/meminfo`
- MemTotal: 1056481304 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

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

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has 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:

(Continued on next page)
SPEC CPU®2017 Integer Rate Result
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Lenovo Global Technology
ThinkSystem SR630 V2
(2.10 GHz, Intel Xeon Gold 5318S)

SPECrate®2017_int_base = 317
SPECrate®2017_int_peak = Not Run

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>9017</th>
<th>Test Date:</th>
<th>Jun-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
<td>Hardware Availability:</td>
<td>Jul-2021</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
<td>Software Availability:</td>
<td>Dec-2020</td>
</tr>
</tbody>
</table>

Platform Notes (Continued)

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
Mitigation: usercopy/swapgs barriers and __user pointer sanitization
CVE-2017-5753 (Spectre variant 1):
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 Jun 23 00:53

SPEC is set to: /home/cpu2017-1.1.8-ic2021.1-revB
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb4 xfs 819G 92G 727G 12% /home

From /sys/devices/virtual/dmi/id
Vendor: Lenovo
Product: ThinkSystem SR630 V2 MB
Product Family: ThinkSystem
Serial: 1234567890

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 SBIOS" standard.
Memory:
32x Samsung M393A4G43AB3-CWE 32 GB 2 rank 3200, configured at 2933

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)
Lenovo Global Technology
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Compiler Version Notes

==============================================================================
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)
| 525.x264_r(base) 557.xz_r(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++     | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
| 541.leela_r(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 | 548.exchange2_r(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.

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64

(Continued on next page)
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Base Portability Flags (Continued)

523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -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

C++ benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -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:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-auto -mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-1qkmalloc

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-ICElake-E.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-ICElake-E.xml
http://www.spec.org/cpu2017/flags/Intel-iC2021-official-linux64_revA.xml
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(2.10 GHz, Intel Xeon Gold 5318S)

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**SPECrate®2017_int_base = 317**

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**CPU2017 License:** 9017

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**Test Date:** Jun-2021

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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®2017 v1.1.8 on 2021-06-22 17:06:46-0400.


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