## Lenovo Global Technology

### ThinkSystem SR630 V2 (2.20 GHz, Intel Xeon Gold 6338N)

**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

<table>
<thead>
<tr>
<th>SPECrate® 2017</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate® 2017_int_base =</td>
<td>411</td>
</tr>
<tr>
<td>SPECrate® 2017_int_peak =</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon Gold 6338N  
- **Max MHz:** 3500  
- **Nominal:** 2200  
- **Enabled:** 64 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:** 48 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

### 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:** No  
- **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:** None  
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage
SPEC CPU®2017 Integer Rate Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

Lenovo Global Technology
ThinkSystem SR630 V2
(2.20 GHz, Intel Xeon Gold 6338N)

SPECRate®2017_int_base = 411
SPECRate®2017_int_peak = Not Run

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>500.perlbench_r</td>
<td>128</td>
<td>710</td>
<td>287</td>
<td>708</td>
<td>288</td>
<td>709</td>
<td>287</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>128</td>
<td>579</td>
<td>313</td>
<td>577</td>
<td>314</td>
<td>576</td>
<td>315</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>128</td>
<td>313</td>
<td>660</td>
<td>314</td>
<td>659</td>
<td>313</td>
<td>661</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>128</td>
<td>667</td>
<td>252</td>
<td>665</td>
<td>252</td>
<td>664</td>
<td>253</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>128</td>
<td>264</td>
<td>512</td>
<td>264</td>
<td>512</td>
<td>264</td>
<td>511</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>128</td>
<td>262</td>
<td>856</td>
<td>262</td>
<td>856</td>
<td>262</td>
<td>855</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>128</td>
<td>456</td>
<td>322</td>
<td>456</td>
<td>322</td>
<td>456</td>
<td>322</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>128</td>
<td>668</td>
<td>317</td>
<td>668</td>
<td>317</td>
<td>669</td>
<td>317</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>128</td>
<td>387</td>
<td>867</td>
<td>386</td>
<td>868</td>
<td>386</td>
<td>868</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>128</td>
<td>586</td>
<td>236</td>
<td>589</td>
<td>235</td>
<td>587</td>
<td>236</td>
</tr>
</tbody>
</table>

SPECRate®2017_int_base = 411
SPECRate®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:
LD_LIBRARY_PATH =
"/home/cpu2017-1.1.5-ic2021.1-revB/lib/intel64:/home/cpu2017-1.1.5-ic2021.1-revB/lib/ia32:/home/cpu2017-1.1.5-ic2021.1-revB/jpe5.0.1-32"
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
(2.20 GHz, Intel Xeon Gold 6338N)

SPECrate®2017_int_base =  411
SPECrate®2017_int_peak = Not Run

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

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/cpu2017-1.1.5-ic2021.1-revB/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Fri May 14 00:35:25 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 6338N CPU @ 2.20GHz
  2 "physical id"s (chips)
  128 "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 : 32
  siblings : 64
  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
  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

From lscpu:
Architecture: x86_64

(Continued on next page)
**SPEC CPU®2017 Integer Rate Result**

**Lenovo Global Technology**

ThinkSystem SR630 V2
(2.20 GHz, Intel Xeon Gold 6338N)

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

**SPECrates**

- **SPECrates®2017_int_base = 411**
- **SPECrates®2017_int_peak = Not Run**

**Platform Notes (Continued)**

- **CPU op-mode(s):** 32-bit, 64-bit
- **Byte Order:** Little Endian
- **CPU(s):** 128
- **On-line CPU(s) list:** 0-127
- **Thread(s) per core:** 2
- **Core(s) per socket:** 32
- **Socket(s):** 2
- **NUMA node(s):** 4
- **Vendor ID:** GenuineIntel
- **CPU family:** 6
- **Model:** 106
- **Model name:** Intel(R) Xeon(R) Gold 6338N CPU @ 2.20GHz
- **Stepping:** 6
- **CPU MHz:** 822.323
- **CPU max MHz:** 3500.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 4400.00
- **Virtualization:** VT-x
- **L1d cache:** 48K
- **L1i cache:** 32K
- **L2 cache:** 1280K
- **L3 cache:** 49152K
- **NUMA node0 CPU(s):** 0-15, 64-79
- **NUMA node1 CPU(s):** 16-31, 80-95
- **NUMA node2 CPU(s):** 32-47, 96-111
- **NUMA node3 CPU(s):** 48-63, 112-127
- **Flags:** fpu vme de pse tsc msr pae mce 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 cpuid aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 fma cx16 xtrm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault epb cat_l3 invpcid_single intel_pni ssbd mba ibrs ibpb stibp ibrs_enhanced fs.gsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid cmqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaves cmqm cmq_occup_1lc cmq_mbm_total cmq_mbm_local split_lock_detect wbnoinvd dt_ether ida arat pln pts hwp hwp_act_window hwp_erp hwp_pkg_req avx512vmbi umip pku ospe avx512_vbmi2 gfeni vaes vcpulmolqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d arch_capabilities

/proc/cpuinfo cache data
- cache size: 49152 KB

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 3 4 5 6 7 8 9 10 11 12 13 14 15 64 65 66 67 68 69 70 71 72 73 74 75

(Continued on next page)
Platform Notes (Continued)

76 77 78 79
node 0 size: 251723 MB
node 0 free: 257269 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 80 81 82 83 84 85 86 87 88
89 90 91 92 93 94 95
node 1 size: 252361 MB
node 1 free: 257457 MB
node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 96 97 98 99 100 101 102
103 104 105 106 107 108 109 110 111
node 2 size: 252194 MB
node 2 free: 257741 MB
node 3 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 112 113 114 115 116 117
118 119 120 121 122 123 124 125 126 127
node 3 size: 252650 MB
node 3 free: 257556 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: 1056474368 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

(Continued on next page)
**Lenovo Global Technology**

ThinkSystem SR630 V2
(2.20 GHz, Intel Xeon Gold 6338N)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base =</th>
<th>411</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak =</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

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

---

**Platform Notes (Continued)**

```
uname -a:
    Linux localhost.localdomain 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020
    x64_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/swapgs barriers and __user pointer sanitization
- 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

```
runtime 3 May 14 00:33
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
```

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, configured at 2666
```

**BIOS:**

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

(Continued on next page)
Lenovo Global Technology  
ThinkSystem SR630 V2  
(2.20 GHz, Intel Xeon Gold 6338N)  

**SPEC CPU® 2017 Integer Rate Result**  
Copyright 2017-2021 Standard Performance Evaluation Corporation

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>411</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

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

**Platform Notes (Continued)**

(End of data from sysinfo program)

**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
**SPEC CPU®2017 Integer Rate Result**

**Lenovo Global Technology**

ThinkSystem SR630 V2
(2.20 GHz, Intel Xeon Gold 6338N)

| SPECrate®2017_int_base = | 411 |
| SPECrate®2017_int_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

---

**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  
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX  
525.x264_r: -DSPEC_LP64  
531.deepsjeng_r: -DSPEC_LP64  
541.keela_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


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)
## SPEC CPU®2017 Integer Rate Result

### Lenovo Global Technology

**ThinkSystem SR630 V2**  
(2.20 GHz, Intel Xeon Gold 6338N)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>411</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>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>

- **Test Date**: May-2021  
- **Hardware Availability**: Jul-2021  
- **Software Availability**: Feb-2021

---

SPEC CPU and SPECrate are registered trademarks 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 CPU®2017 v1.1.5 on 2021-05-13 12:35:24-0400.  
Report generated on 2021-06-08 20:03:16 by CPU2017 PDF formatter v6442.  
Originally published on 2021-06-08.