# SPEC® CPU2017 Integer Rate Result

**Lenovo Global Technology**

ThinkSystem SR630
(2.30 GHz, Intel Xeon Gold 5218N)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>Lenovo Global Technology</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>
<tr>
<td>Test Date:</td>
<td>May-2019</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Apr-2019</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Nov-2018</td>
</tr>
</tbody>
</table>

**SPECrate2017_int_base** = **178**

**SPECrate2017_int_peak** = **Not Run**

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>178</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate2017_int_base (178)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>15.0</td>
</tr>
<tr>
<td>15.0</td>
<td>30.0</td>
</tr>
<tr>
<td>30.0</td>
<td>45.0</td>
</tr>
<tr>
<td>45.0</td>
<td>60.0</td>
</tr>
<tr>
<td>60.0</td>
<td>75.0</td>
</tr>
<tr>
<td>75.0</td>
<td>90.0</td>
</tr>
<tr>
<td>90.0</td>
<td>105</td>
</tr>
<tr>
<td>105</td>
<td>120</td>
</tr>
<tr>
<td>120</td>
<td>135</td>
</tr>
<tr>
<td>135</td>
<td>150</td>
</tr>
<tr>
<td>150</td>
<td>165</td>
</tr>
<tr>
<td>165</td>
<td>180</td>
</tr>
<tr>
<td>180</td>
<td>195</td>
</tr>
<tr>
<td>195</td>
<td>210</td>
</tr>
<tr>
<td>210</td>
<td>225</td>
</tr>
<tr>
<td>225</td>
<td>240</td>
</tr>
<tr>
<td>240</td>
<td>255</td>
</tr>
<tr>
<td>255</td>
<td>270</td>
</tr>
<tr>
<td>270</td>
<td>285</td>
</tr>
<tr>
<td>285</td>
<td>300</td>
</tr>
<tr>
<td>300</td>
<td>315</td>
</tr>
<tr>
<td>315</td>
<td>330</td>
</tr>
<tr>
<td>330</td>
<td>345</td>
</tr>
<tr>
<td>345</td>
<td>360</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon Gold 5218N
- **Max MHz.:** 3700
- **Nominal:** 2300
- **Enabled:** 32 cores, 2 chips, 2 threads/core
- **Orderable:** 1.2 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **L2:** 1 MB I+D on chip per core
- **L3:** 22 MB I+D on chip per chip
- **Other:** None
- **Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R, running at 2666)
- **Storage:** 1 x 800 GB SATA SSD
- **Memory:** None

### Software

- **OS:** Red Hat Enterprise Linux Server release 7.6 (Maipo)
- **Kernel:** 3.10.0-957.el7.x86_64
- **Compiler:** C/C++: Version 19.0.1.144 of Intel C/C++ Compiler Build 20181018 for Linux;
  Fortran: Version 19.0.1.144 of Intel Fortran Compiler Build 20181018 for Linux
- **Parallel:** No
- **Firmware:** Lenovo BIOS Version IVE135P 2.10 released Feb-2019
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** Not Applicable
- **Other:** None
SPEC CPU2017 Integer Rate Result

Lenovo Global Technology
ThinkSystem SR630
(2.30 GHz, Intel Xeon Gold 5218N)

SPECrate2017_int_base = 178
SPECrate2017_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>
<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>64</td>
<td>748</td>
<td>136</td>
<td>742</td>
<td>137</td>
<td>744</td>
<td>137</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>64</td>
<td>606</td>
<td>150</td>
<td>603</td>
<td>150</td>
<td>602</td>
<td>150</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>64</td>
<td>432</td>
<td>240</td>
<td>429</td>
<td>241</td>
<td>430</td>
<td>241</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>64</td>
<td>700</td>
<td>120</td>
<td>695</td>
<td>121</td>
<td>700</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>64</td>
<td>328</td>
<td>206</td>
<td>327</td>
<td>206</td>
<td>328</td>
<td>206</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>525.x264_r</td>
<td>64</td>
<td>333</td>
<td>336</td>
<td>332</td>
<td>337</td>
<td>333</td>
<td>336</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>64</td>
<td>496</td>
<td>148</td>
<td>496</td>
<td>148</td>
<td>496</td>
<td>148</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>541.leela_r</td>
<td>64</td>
<td>747</td>
<td>142</td>
<td>746</td>
<td>142</td>
<td>754</td>
<td>141</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>64</td>
<td>535</td>
<td>314</td>
<td>533</td>
<td>314</td>
<td>532</td>
<td>315</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>557.xz_r</td>
<td>64</td>
<td>572</td>
<td>121</td>
<td>573</td>
<td>121</td>
<td>573</td>
<td>121</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SPECrate2017_int_base = 178
SPECrate2017_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"

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017-1.0.5-ic19.0u1/lib/intel64"

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.5
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
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)

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR630
(2.30 GHz, Intel Xeon Gold 5218N)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>178</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

Test Date: May-2019
Hardware Availability: Apr-2019
Software Availability: Nov-2018

General Notes (Continued)

is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2018-3640 (Spectre variant 3a) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2018-3639 (Spectre variant 4) is mitigated in the system as tested and documented.

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance
Choose Operating Mode set to Custom Mode
C-states set to Legacy
SNC set to Enable
Trusted Execution Technology set to Enable
Stale AtoS set to Enable
LLC dead line alloc set to Disable
Sysinfo program /home/cpu2017-1.0.5-ic19.0ul/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on localhost.localdomain Sat May 11 14:00:24 2019

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 5218N CPU @ 2.30GHz
  2 "physical id"s (chips)
  64 "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 : 16
siblings : 32
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 64
On-line CPU(s) list: 0-63
Thread(s) per core: 2
Core(s) per socket: 16
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel

(Continued on next page)
**SPEC CPU2017 Integer Rate Result**

Lenovo Global Technology

ThinkSystem SR630
(2.30 GHz, Intel Xeon Gold 5218N)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>178</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

### CPU2017 License:
9017

### Test Sponsor:
Lenovo Global Technology

### Tested by:
Lenovo Global Technology

### Test Date:
May-2019

### Hardware Availability:
Apr-2019

### Software Availability:
Nov-2018

---

**Platform Notes (Continued)**

```plaintext
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Gold 5218N CPU @ 2.30GHz
Stepping:              6
CPU MHz:               2300.000
BogoMIPS:              4600.00
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              1024K
L3 cache:              22528K
NUMA node0 CPU(s):     0-3,8-11,32-35,40-43
NUMA node1 CPU(s):     4-7,12-15,36-39,44-47
NUMA node2 CPU(s):     16-19,24-27,48-51,56-59
NUMA node3 CPU(s):     20-23,28-31,52-55,60-63
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 arch_perfmon pebs bts rep_good ntop xtopology nonstop_tsc aperffmaperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtrm pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch epb cat_13 cdp_13 intel_pt ssbd mbx ibrs ibpb stibp ibrs_enabled trp_shadow vnmi fmaxprec arch_capabilities

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 8 9 10 11 32 33 34 35 40 41 42 43
node 0 size: 97977 MB
node 0 free: 95205 MB
node 1 cpus: 4 5 6 7 12 13 14 15 36 37 38 39 44 45 46 47
node 1 size: 98304 MB
node 1 free: 95729 MB
node 2 cpus: 16 17 18 19 24 25 26 27 48 49 50 51 56 57 58 59
node 2 size: 98304 MB
node 2 free: 95368 MB
node 3 cpus: 20 21 22 23 28 29 30 31 52 53 54 55 60 61 62 63
node 3 size: 98304 MB
node 3 free: 95667 MB
node distances:
node 0 1 2 3

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR630
(2.30 GHz, Intel Xeon Gold 5218N)

SPECrate2017_int_base = 178
SPECrate2017_int_peak = Not Run

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

Platform Notes (Continued)

0: 10 11 21 21
1: 11 10 21 21
2: 21 21 10 11
3: 21 21 11 10

From /proc/meminfo
MemTotal: 395878596 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.6 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VARIANT="Server"
VARIANT_ID="server"
VERSION_ID="7.6"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.6 (Maipo)"
redhat-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)

uname -a:
Linux localhost.localdomain 3.10.0-957.el7.x86_64 #1 SMP Thu Oct 4 20:48:51 UTC 2018
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2017-5754 (Meltdown): Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: Load fences, __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS

run-level 3 May 10 19:13

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb2 xfs 689G 27G 663G 4% /home

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.
BIOS Lenovo -[IVE135P-2.10]- 02/13/2019
Memory:
24x Samsung M393A2K43CB2-CVF 16 GB 2 rank 2933, configured at 2666

(Continued on next page)
**SPEC CPU2017 Integer Rate Result**

Lenovo Global Technology
ThinkSystem SR630
(2.30 GHz, Intel Xeon Gold 5218N)

| SPECrate2017_int_base = | 178 |
| SPECrate2017_int_peak = | Not Run |

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

| Test Date: | May-2019 |
| Hardware Availability: | Apr-2019 |
| Software Availability: | Nov-2018 |

Platform Notes (Continued)

(End of data from sysinfo program)

---

**Compiler Version Notes**

---

**Base Compiler Invocation**

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64
Lenovo Global Technology
ThinkSystem SR630
(2.30 GHz, Intel Xeon Gold 5218N)

SPECrate2017_int_base = 178
SPECrate2017_int_peak = Not Run

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

Test Date: May-2019
Hardware Availability: Apr-2019
Software Availability: Nov-2018

---

**Base Portability Flags**

500.perlbench_r: -DPSEC_LP64 -DPSEC_LINUX_X64
502.gcc_r: -DPSEC_LP64
505.mcf_r: -DPSEC_LP64
520.omnetpp_r: -DPSEC_LP64
523.xalancbmk_r: -DPSEC_LP64 -DPSEC_LINUX
525.x264_r: -DPSEC_LP64
531.deepsjeng_r: -DPSEC_LP64
541.leela_r: -DPSEC_LP64
548.exchange2_r: -DPSEC_LP64
557.xz_r: -DPSEC_LP64

---

**Base Optimization Flags**

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

---

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-A.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-A.xml
## Lenovo Global Technology

ThinkSystem SR630
(2.30 GHz, Intel Xeon Gold 5218N)

<table>
<thead>
<tr>
<th>CPU2017 License: 9017</th>
<th>Test Date:</th>
<th>May-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: Lenovo Global Technology</td>
<td>Hardware Availability:</td>
<td>Apr-2019</td>
</tr>
<tr>
<td>Tested by: Lenovo Global Technology</td>
<td>Software Availability:</td>
<td>Nov-2018</td>
</tr>
</tbody>
</table>

### SPECrate2017_int_base

| 178 |

<table>
<thead>
<tr>
<th>SPECrate2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Run</td>
</tr>
</tbody>
</table>

CPU2017 License: 9017
Test Date: May-2019
Test Sponsor: Lenovo Global Technology
Hardware Availability: Apr-2019
Software Availability: Nov-2018

SPEC is a registered trademark 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 CPU2017 v1.0.5 on 2019-05-11 02:00:24-0400.
Originally published on 2019-05-29.