### Lenovo Global Technology

**ThinkSystem SR570**  
(1.90 GHz, Intel Xeon Bronze 3204)

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU Name:</strong> Intel Xeon Bronze 3204</td>
<td><strong>OS:</strong> SUSE Linux Enterprise Server 12 SP4 (x86_64)</td>
</tr>
<tr>
<td><strong>Max MHz.:</strong> 1900</td>
<td><strong>Kernel:</strong> 4.12.14-94.41-default</td>
</tr>
<tr>
<td><strong>Nominal:</strong> 1900</td>
<td><strong>Compiler:</strong> C/C++: Version 19.0.1.144 of Intel C/C++</td>
</tr>
<tr>
<td><strong>Enabled:</strong> 12 cores, 2 chips</td>
<td><strong>Compiler Build 20181018 for Linux:</strong></td>
</tr>
<tr>
<td><strong>Orderable:</strong> 1.2 chips</td>
<td><strong>Fortran:</strong> Version 19.0.1.144 of Intel Fortran</td>
</tr>
<tr>
<td><strong>Cache L1:</strong> 32 KB I + 32 KB D on chip per core</td>
<td><strong>Compiler Build 20181018 for Linux:</strong></td>
</tr>
<tr>
<td><strong>L2:</strong> 1 MB I+D on chip per core</td>
<td><strong>Parallel:</strong> No</td>
</tr>
<tr>
<td><strong>L3:</strong> 8.25 MB I+D on chip per chip</td>
<td><strong>Firmware:</strong> Lenovo BIOS Version TEE135L 2.10 released Jan-2019</td>
</tr>
<tr>
<td><strong>Other:</strong> None</td>
<td><strong>File System:</strong> xfs</td>
</tr>
<tr>
<td><strong>Memory:</strong> 192 GB (12 x 16 GB 2Rx8 PC4-2933Y-R, running at 2133)</td>
<td><strong>System State:</strong> Run level 3 (multi-user)</td>
</tr>
<tr>
<td><strong>Storage:</strong> 1 x 960 GB SATA SSD</td>
<td><strong>Base Pointers:</strong> 64-bit</td>
</tr>
<tr>
<td><strong>Other:</strong> None</td>
<td><strong>Peak Pointers:</strong> Not Applicable</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Test Date:** Apr-2019  
**Hardware Availability:** Apr-2019  
**Tested by:** Lenovo Global Technology  
**Software Availability:** Dec-2018  
**Tested by:** Lenovo Global Technology  
**Software:** SUSE Linux Enterprise Server 12 SP4 (x86_64)  
**Compiler:** C/C++: Version 19.0.1.144 of Intel C/C++  
**Compiler Build 20181018 for Linux:**  
**Firmware:** Lenovo BIOS Version TEE135L 2.10 released Jan-2019  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable  
**Other:** None

<table>
<thead>
<tr>
<th>Copy</th>
<th>500.perlbench_r</th>
<th>502.gcc_r</th>
<th>505.mcf_r</th>
<th>520.omnetpp_r</th>
<th>523.xalancbmk_r</th>
<th>525.x264_r</th>
<th>531.deepsjeng_r</th>
<th>541.leela_r</th>
<th>548.exchange2_r</th>
<th>557.xz_r</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>32.1</td>
<td>37.8</td>
<td>49.6</td>
<td>30.4</td>
<td>49.7</td>
<td>70.0</td>
<td>32.2</td>
<td>26.9</td>
<td>73.7</td>
<td>23.6</td>
</tr>
</tbody>
</table>

**SPECrate2017_int_base = 39.6**

**SPECrate2017_int_peak = Not Run**
Lenovo Global Technology
ThinkSystem SR570
(1.90 GHz, Intel Xeon Bronze 3204)

SPECrates2017_int_base = 39.6
SPECrates2017_int_peak = Not Run

Results Table

| Benchmark       | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio 
|-----------------|--------|---------|-------|---------|-------|---------|-------
| 500.perlbench_r | 12     | 594     | 32.1  | 592     | 32.3  | 595     | 32.1  |
| 502.gcc_r       | 12     | 450     | 37.8  | 451     | 37.7  | 450     | 37.8  |
| 505.mcf_r       | 12     | 391     | 49.6  | 391     | 49.6  | 390     | 49.7  |
| 520.omnetpp_r   | 12     | 518     | 30.4  | 519     | 30.3  | 519     | 30.4  |
| 523.xalancbmk_r | 12     | 255     | 49.7  | 255     | 49.7  | 254     | 50.0  |
| 525.x264_r     | 12     | 300     | 70.0  | 300     | 70.0  | 300     | 70.0  |
| 531.deepsjeng_r| 12     | 428     | 32.1  | 428     | 32.2  | 427     | 32.2  |
| 541.leela_r     | 12     | 738     | 26.9  | 738     | 26.9  | 739     | 26.9  |
| 548.exchange2_r | 12     | 428     | 73.4  | 426     | 73.8  | 426     | 73.7  |
| 557.xz_r        | 12     | 549     | 23.6  | 550     | 23.6  | 549     | 23.6  |

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>
Yes: 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)
**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
MONITOR/MWAIT set to Enable
Sysinfo program /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-eth90 Mon Apr 22 22:02:39 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) Bronze 3204 CPU @ 1.90GHz
  2 "physical id"s (chips)
  12 "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 : 6
siblings : 6
physical 0: cores 0 1 2 3 4 5
physical 1: cores 0 1 2 3 4 5
```

From lscpu:

```
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                12
On-line CPU(s) list:   0-11
Thread(s) per core:    1
Core(s) per socket:    6
Socket(s):             2
NUMA node(s):          2
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Bronze 3204 CPU @ 1.90GHz
Stepping:              6
```

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

**Lenovo Global Technology**

**ThinkSystem SR570**  
(1.90 GHz, Intel Xeon Bronze 3204)

<table>
<thead>
<tr>
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<td>Lenovo Global Technology</td>
</tr>
<tr>
<td><strong>Tested by:</strong></td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td><strong>CPU MHz:</strong></td>
<td>1900.000</td>
</tr>
<tr>
<td><strong>CPU max MHz:</strong></td>
<td>1900.0000</td>
</tr>
<tr>
<td><strong>CPU min MHz:</strong></td>
<td>800.0000</td>
</tr>
<tr>
<td><strong>BogoMIPS:</strong></td>
<td>3800.00</td>
</tr>
<tr>
<td><strong>Virtualization:</strong></td>
<td>VT-x</td>
</tr>
<tr>
<td><strong>L1d cache:</strong></td>
<td>32K</td>
</tr>
<tr>
<td><strong>L1i cache:</strong></td>
<td>32K</td>
</tr>
<tr>
<td><strong>L2 cache:</strong></td>
<td>1024K</td>
</tr>
<tr>
<td><strong>L3 cache:</strong></td>
<td>8448K</td>
</tr>
<tr>
<td><strong>NUMA node0 CPU(s):</strong></td>
<td>0-5</td>
</tr>
<tr>
<td><strong>NUMA node1 CPU(s):</strong></td>
<td>6-11</td>
</tr>
</tbody>
</table>

**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 art 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
- xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
- avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3
- invpcid_single ssbd mba ibrs ibpb tpr_shadow vnmi flexpriority ept vpid
- fsgsbase ssbd mba ibrs ibpb tpr_shadow vnmi flexpriority ept vpid
- fsbgbase tsc_adjust bmi1 hle avx2 smep bmi2  erms invpcid rtm cqm mpx rdt_a avx512f
- avx512dq rdseed adx clflushopt clwb intel_pt avx512cd avx512bw avx512vl
- xsaveopt xsavec xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
- dtherm arat pln pts pku ospke avx512_vnni flush_lld arch_capabilities

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  
node 0 size: 96034 MB  
node 0 free: 95602 MB  
node 1 cpus: 6 7 8 9 10 11  
node 1 size: 96743 MB  
node 1 free: 96286 MB  
node distances:  
node 0 1  
0: 10 21  
1: 21 10  

From `/proc/meminfo`

```
MemTotal:      197404716 kB  
HugePages_Total:     0  
Hugepagesize:     2048 kB  
```

From `/etc/*release*`  
`SuSE-release:

(Continued on next page)
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SPECrate2017_int_base = 39.6
SPECrate2017_int_peak = Not Run

Platform Notes (Continued)

SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 4
# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.

os-release:
NAME="SLES"
VERSION="12-SP4"
VERSION_ID="12.4"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"
ID=sles
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp4"

uname -a:
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: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation, IBPB, IBRS_FW

run-level 3 Apr 22 21:50

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 892G 35G 857G 4% /

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 -[TEE135L-2.10]- 01/10/2019
Memory:
4x NO DIMM NO DIMM
12x SK Hynix HMA82GR7CJR8N-WM 16 GB 2 rank 2933, configured at 2133

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
==============================================================================

(Continued on next page)
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SPECrate2017_int_base = 39.6
SPECrate2017_int_peak = Not Run

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

Compiler Version Notes (Continued)

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

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
**Lenovo Global Technology**  
ThinkSystem SR570  
(1.90 GHz, Intel Xeon Bronze 3204)

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<tr>
<th><strong>CPU2017 License</strong></th>
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<tbody>
<tr>
<td><strong>Test Sponsor</strong></td>
<td>Lenovo Global Technology</td>
<td><strong>Hardware Availability</strong></td>
<td>Apr-2019</td>
</tr>
<tr>
<td><strong>Tested by</strong></td>
<td>Lenovo Global Technology</td>
<td><strong>Software Availability</strong></td>
<td>Dec-2018</td>
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</table>

**SPECrate2017_int_base** = 39.6  
**SPECrate2017_int_peak** = Not Run

---

### Base Portability Flags (Continued)

- 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**:

- -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


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.

Tested with SPEC CPU2017 v1.0.5 on 2019-04-22 10:02:38-0400.  