### Lenovo Global Technology

ThinkSystem SR650  
(1.90 GHz, Intel Xeon Bronze 3204)  

**SPECrate2017_int_base = 39.9**  
**SPECrate2017_int_peak = Not Run**

<table>
<thead>
<tr>
<th>Copies</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>32.7</td>
<td>38.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>26.9</td>
<td></td>
<td>23.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>50.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>70.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>73.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Hardware

- **CPU Name:** Intel Xeon Bronze 3204  
- **Max MHz.:** 1900  
- **Nominal:** 1900  
- **Enabled:** 12 cores, 2 chips  
- **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:** 8.25 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2933Y-R, running at 2133)  
- **Storage:** 1 x 800 GB SATA SSD  
- **Other:** 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 IVE135R 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
## Lenovo Global Technology

ThinkSystem SR650  
(1.90 GHz, Intel Xeon Bronze 3204)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds Base</th>
<th>Ratio Base</th>
<th>Seconds Peak</th>
<th>Ratio Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>12</td>
<td>584</td>
<td>32.7</td>
<td>585</td>
<td>32.6</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>12</td>
<td>440</td>
<td>38.7</td>
<td>439</td>
<td>38.7</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>12</td>
<td>384</td>
<td>50.5</td>
<td>385</td>
<td>50.4</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>12</td>
<td>526</td>
<td>29.9</td>
<td>529</td>
<td>29.8</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>12</td>
<td>251</td>
<td>50.5</td>
<td>252</td>
<td>50.4</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>12</td>
<td>298</td>
<td>70.5</td>
<td>298</td>
<td>70.5</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>12</td>
<td>424</td>
<td>32.4</td>
<td>424</td>
<td>32.4</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>12</td>
<td>739</td>
<td>26.9</td>
<td>739</td>
<td>26.9</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>12</td>
<td>428</td>
<td>73.4</td>
<td>430</td>
<td>73.1</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>12</td>
<td>543</td>
<td>23.9</td>
<td>543</td>
<td>23.9</td>
</tr>
</tbody>
</table>

**Results Table**

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)
**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
Trusted Execution Technology set to Enable
Stable AtoS set to Enable
LLC dead line alloc set to Disable
Sysinfo program /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on localhost.localdomain Sat May 11 23:37:57 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
## Lenovo Global Technology

ThinkSystem SR650  
(1.90 GHz, Intel Xeon Bronze 3204)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>39.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

### Platform Notes (Continued)

- Model: 85
- Model name: Intel(R) Xeon(R) Bronze 3204 CPU @ 1.90GHz
- Stepping: 6
- CPU MHz: 1900.000
- BogoMIPS: 3800.00
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 8448K
- NUMA node0 CPU(s): 0-5
- NUMA node1 CPU(s): 6-11
- Flags: pse36 clflush dtc acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtsscp lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx 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 cpb cat_13 cdp_13 intel_pt ssbd mba ibrs ibpb tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 3pmc invpcid rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb avx512fdx avx512fd avx512bw avx512vl xsaveopt xsavec xgetbv1 cmp_l1ic cmp_occcl l1c cmp_mbb_total cmp_mbb_local dtherm arat pln pku ospke avx512_vnni spec_ctrl intel_stibp flush_l1d arch_capabilities

From numactl --hardware  
```bash
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: 196281 MB
node 0 free: 191615 MB
node 0 cpus: 6 7 8 9 10 11
node 0 size: 196608 MB
node 0 free: 191921 MB
node distances:
node 0 1 0: 10 21
1: 21 10

From /proc/meminfo

```
MemTotal: 395880312 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

From /etc/*release*/etc/*version*

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

ThinkSystem SR650  
(1.90 GHz, Intel Xeon Bronze 3204)  

<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>

**SPEC CPU2017 Integer Rate Result**

<table>
<thead>
<tr>
<th>SPECrate2017_int_peak</th>
<th>Not Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_base</td>
<td>39.9</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

```
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 11 23:34
```

**SPEC is set to:** /home/cpu2017-1.0.5-ic19.0u1

```
  Filesystem     Type  Size  Used Avail Use% Mounted on  
  /dev/sdb2      xfs   689G   18G  671G   3% /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 -[IVE135R-2.10]- 02/27/2019**
- **Memory:**  
  24x Samsung M393A2K43CB2-CVF 16 GB 2 rank 2933, configured at 2133

**Compiler Version Notes**

```
Compiled with:
  CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_r(base)
```

**Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,**

(Continued on next page)
## Lenovo Global Technology

**ThinkSystem SR650**  
(1.90 GHz, Intel Xeon Bronze 3204)

<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>

| SPECrate2017_int_base = 39.9 | SPECrate2017_int_peak = Not Run |

**Compiler Version Notes (Continued)**

Version 19.0.1.144 Build 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

-------------------------------
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)
-------------------------------

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,  
Version 19.0.1.144 Build 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

-------------------------------
FC  548.exchange2_r(base)
-------------------------------

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)  
64, Version 19.0.1.144 Build 20181018  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

### 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  
531.deepsjeng_r: -DSPEC_LP64  
541.leela_r: -DSPEC_LP64  
548.exchange2_r: -DSPEC_LP64
```

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR650
(1.90 GHz, Intel Xeon Bronze 3204)

SPECrate2017_int_base = 39.9
SPECrate2017_int_peak = Not Run

Base Portability Flags (Continued)
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
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

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 11:37:56-0400.
Originally published on 2019-06-11.