**SPEC® CPU2017 Integer Speed Result**

**Lenovo Global Technology**

ThinkSystem SR590  
(2.20 GHz, Intel Xeon Platinum 8253)

| SPECspeed2017_int_base = 7.91 |
| SPECspeed2017_int_peak = Not Run |

**CPU2017 License:** Lenovo Global Technology  
**Test Date:** Apr-2019  
**Hardware Availability:** Apr-2019

| Software Availability: Dec-2018 |

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_int_base (7.91)</th>
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</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>64</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>64</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>64</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>64</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>64</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>64</td>
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<tr>
<td>631.deepsjeng_s</td>
<td>64</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>64</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>64</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>64</td>
</tr>
</tbody>
</table>

**Hardware**

| CPU Name: Intel Xeon Platinum 8253 |
| Max MHz.: 3000 |
| Nominal: 2200 |
| 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: 192 GB (12 x 16 GB 2Rx8 PC4-2933Y-R) |
| Storage: 1 x 960 GB SATA SSD |
| Other: None |

| OS: SUSE Linux Enterprise Server 12 SP4 (x86_64) |
| Kernel 4.12.14-94.41-default |
| 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: Yes |
| Firmware: Lenovo BIOS Version TEE135L 2.10 released Jan-2019 |
| System State: Run level 3 (multi-user) |
| File System: btrfs |
| Base Pointers: 64-bit |
| Peak Pointers: Not Applicable |
| Other: jemalloc memory allocator V5.0.1 |
## SPEC CPU2017 Integer Speed Result

**Lenovo Global Technology**

ThinkSystem SR590  
(2.20 GHz, Intel Xeon Platinum 8253)

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

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>600:perlbench_s</td>
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<td>5.32</td>
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<tr>
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<tr>
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<tr>
<td>625:x264_s</td>
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<tr>
<td>631:deepsjeng_s</td>
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<td>641:leela_s</td>
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<tr>
<td>648:exchange2_s</td>
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<td>10.8</td>
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<td>10.8</td>
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<tr>
<td>657:xz_s</td>
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<td>19.3</td>
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<td>19.3</td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**SPECspeed2017_int_base =** 7.91  
**SPECspeed2017_int_peak =** Not Run

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### 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:
- KMP_AFFINITY = "granularity=fine,scatter"
- LD_LIBRARY_PATH = "/home/cpu2017-1.0.5-ic19.0u1/lib/intel64"
- LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/cpu2017-1.0.5-ic19.0u1/je5.0.1-64"
- OMP_STACKSIZE = "192M"

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
```

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) 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.

jemalloc, a general purpose malloc implementation built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

(Continued on next page)
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<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tr>
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<td>7.91</td>
</tr>
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<td>SPECspeed2017_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:** Apr-2019  
**Hardware Availability:** Apr-2019  
**Software Availability:** Dec-2018

## General Notes (Continued)


## Platform Notes

BIOS configuration:
- Choose Operating Mode set to Maximum Performance
- Choose Operating Mode set to Custom Mode
- Memory Power Management set to Automatic
- CPU P-state Control set to Cooperative
- 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-2uov Wed Apr 17 19:12:14 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](https://www.spec.org/cpu2017/Docs/config.html#sysinfo)

**From /proc/cpuinfo**

```plaintext
* model name: Intel(R) Xeon(R) Platinum 8253 CPU @ 2.20GHz
  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:**

```plaintext
* 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): 2
* Vendor ID: GenuineIntel
* CPU family: 6
* Model: 85
* Model name: Intel(R) Xeon(R) Platinum 8253 CPU @ 2.20GHz
* Stepping: 6
* CPU MHz: 2200.000
* CPU max MHz: 3000.000
```

(Continued on next page)
Lenovo Global Technology
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SPECspeed2017_int_base = 7.91
SPECspeed2017_int_peak = Not Run

Platform Notes (Continued)

CPU min MHz: 1000.0000
BogoMIPS: 4400.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K
NUMA node0 CPU(s): 0-15,32-47
NUMA node1 CPU(s): 16-31,48-63
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 art arch_perfmon pebs bts rep_good nopt xl8topology nonstop_tsc cpuid
aperfmon perf 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 lords init tsc_deadline_timer aesc
avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3
invcpcid_single ssbd mba ibrs ibpb stibp tpr_shadow v恩i flexpriority ept vpid
fsgsbase 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
xsaves xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
dtherm ida arat pte hwp hwp_act_window hwp_epp hwp_pkg_rel pku ospke avx512_vnni
flush_l1d 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 6 7 8 9 10 11 12 13 14 15 32 33 34 35 36 37 38 39 40 41 42 43
44 45 46 47
node 0 size: 96325 MB
node 0 free: 95534 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 48 49 50 51 52 53 54 55 56
57 58 59 60 61 62 63
node 1 size: 96738 MB
node 1 free: 95654 MB
node distances:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 197697744 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

(Continued on next page)
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</table>

**Platform Notes (Continued)**

SuSE-release:
- 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_PW

run-level 3 Apr 17 13:21

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1
- Filesystem Type Size Used Avail Use% Mounted on
  /dev/sdb3 btrfs 740G 35G 706G 5% /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 -[TEE135L-2.10]- 01/10/2019
- Memory:
  - 4x NO DIMM NO DIMM
  - 12x SK Hynix HMA82GR7CJR8N-WM 16 GB 2 rank 2933

(End of data from sysinfo program)
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Compiler Version Notes
==============================================================================
CC  600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base) 657.xz_s(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.
------------------------------------------------------------------------------

CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base) 641.leela_s(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  648.exchange2_s(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
600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64

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Base Portability Flags (Continued)

623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -gopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/Intel Compiler 19 compilers and libraries 2019.1.144/linux/compiler/lib/intel64
-lqkmalloc

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs

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

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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 2019-04-17 07:12:14-0400.