Lenovo Global Technology
ThinkSystem SD650 V2
(2.30 GHz, Intel Xeon Platinum 8352M)

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

CPU Name: Intel Xeon Platinum 8352M
Max MHz: 3500
Nominal: 2300
Enabled: 64 cores, 2 chips, 2 threads/core
Orderable: 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: 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)
Storage: 1 x 480 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;
Parallel: No
Firmware: Lenovo BIOS Version U8E111A 1.02 released May-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

SPECrate®2017_int_base = 421
SPECrate®2017_int_peak = Not Run

Hardware

<table>
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<tr>
<th>Software</th>
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<th>Seconds</th>
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<td>557.xz_r</td>
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<td>583</td>
<td>237</td>
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</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"

**Environment Variables Notes**

Environment variables set by runcpu before the start of the run:

```
LD_LIBRARY_PATH = 
MALLOCONF = "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)
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Test Date: Jun-2021
Hardware Availability: Jul-2021
Software Availability: Dec-2020

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
C-States set to Autonomous
DCU Streamer Prefetcher set to Disabled
Adjacent Cache Prefetch set to Disabled
UPI Link Disable set to Disabled 1 Link
CPU Frequency Limits set to Restrict maximum frequency
SNC set to Enabled

Sysinfo program /home/cpu2017-1.1.8-ic2021.1-revB/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on ip10-245-59-38.labs.lenovo.com Tue Jun 22 11:20:45 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) Platinum 8352M CPU @ 2.30GHz
  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 from util-linux 2.32.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 128
**Lenovo Global Technology**

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### Platform Notes (Continued)

- **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) Platinum 8352M CPU @ 2.30GHz
- **Stepping:** 6
- **CPU MHz:** 2799.930
- **BogoMIPS:** 4600.00
- **Virtualization:** VT-x

#### L1d cache:
- 48K

#### L1i cache:
- 32K

#### L2 cache:
- 1280K

#### L3 cache:
- 49152K

### Flags:

<table>
<thead>
<tr>
<th>fpu</th>
<th>vme</th>
<th>de</th>
<th>pse</th>
<th>mce</th>
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<th>mov</th>
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<td>mtrr</td>
<td>pge</td>
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<td>cmov</td>
</tr>
</tbody>
</table>

```
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
76 77 78 79
node 0 size: 124992 MB
node 0 free: 128225 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
```

(Continued on next page)
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Platform Notes (Continued)

node 1 size: 126426 MB
node 1 free: 123476 MB
node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111
node 2 size: 125404 MB
node 2 free: 128605 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: 125582 MB
node 3 free: 128580 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: 527992064 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/sbin/tuned-adm active
   Current active profile: throughput-performance

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux release 8.3 (Ootpa)

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

uname -a:
   Linux ip10-245-59-38.labs.lenovo.com 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020 x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

(Continued on next page)
## Lenovo Global Technology

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### Platform Notes (Continued)

- **CVE-2018-12207 (iTLB Multihit):** Not affected
- **CVE-2018-3620 (L1 Terminal Fault):** Not affected
- **Microarchitectural Data Sampling:** Not affected
- **CVE-2017-5754 (Meltdown):** Mitigation: Speculative Store Bypass disabled via `prctl` and `seccomp`
- **CVE-2018-3639 (Speculative Store Bypass):** Mitigation: `usercopy/swapgs barriers and __user pointer sanitization`
- **CVE-2017-5753 (Spectre variant 1):** Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
- **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

run-level 3 Jun 22 11:07

SPEC is set to: `/home/cpu2017-1.1.8-ic2021.1-revB`

```
Filesystem  Type      Size  Used  Avail Use% Mounted on
/dev/sda4   xfs        372G   59G  314G  16%  /home
```

From `/sys/devices/virtual/dmi/id`

- **Vendor:** Lenovo
- **Product:** ThinkSystem SD650 V2
- **Product Family:** ThinkSystem
- **Serial:** 1234567890

Additional information from `dmidecode` 3.2 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:**
  - 16x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

### BIOS

- **BIOS Vendor:** Lenovo
- **BIOS Version:** U8E111A-1.02
- **BIOS Date:** 05/07/2021
- **BIOS Revision:** 1.2
- **Firmware Revision:** 1.40

(End of data from `sysinfo` program)
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Compiler Version Notes

==============================================================================
<p>| 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                                               |</p>
<table>
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<tr>
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==============================================================================
<p>| C++                 | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)           |
|                    | 541.leela_r(base)                                                         |
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==============================================================================
<p>| 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                             |</p>
<table>
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<tr>
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</table>

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

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

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Base Portability Flags (Continued)

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
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -03 -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
-lqkmalloc

C++ benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -03 -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
-lqkmalloc

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -03 -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
-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-ICElake-E.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-ICElake-E.xml
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml
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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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Report generated on 2021-07-21 15:47:00 by CPU2017 PDF formatter v6442.  
Originally published on 2021-07-20.