Lenovo Global Technology
ThinkSystem SD530
(2.80 GHz, Intel Xeon Gold 6242)

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

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

SPECspeed2017_int_base = 9.90
SPECspeed2017_int_peak = Not Run

600.perlbench_s 602.gcc_s 605.mcf_s 620.omnetpp_s 623.xalancbmk_s 625.x264_s 631.deepsjeng_s 641.leela_s 648.exchange2_s 657.xz_s

Threads 0 1.00 3.00 5.00 7.00 9.00 11.0 13.0 15.0 17.0 19.0 21.0 24.0

64
6.75
64
9.72
64
12.4
64
7.32
64
14.3
64
23.5

--- SPECspeed2017_int_base (9.90) ---

Hardware
CPU Name: Intel Xeon Gold 6242
Max MHz.: 3900
Nominal: 2800
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 (12 x 32 GB 2Rx4 PC4-2933Y-R)
Storage: 1 x 800 GB SATA SSD
Other: None

Software
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 TEE135R 2.10 released Feb-2019
File System: btrfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: jemalloc memory allocator V5.0.1
SPEC CPU2017 Integer Speed Result

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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
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<th>Ratio</th>
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</table>

SPECspeed2017_int_base = 9.90

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

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.
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
spec

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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
Stale AtoS set to Disable
CPU P-State Control set to Cooperative
C-States set to Legacy
C1 Enhanced Mode set to Enable
Sysinfo program /home/cpu2017-1.0.5-ic19.0u1/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-25mq Fri May 24 15:34:04 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 6242 CPU @ 2.80GHz
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): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6242 CPU @ 2.80GHz
Stepping: 6
CPU MHz: 2800.000

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Platform Notes (Continued)

CPU max MHz: 3900.0000
CPU min MHz: 1200.0000
BogoMIPS: 5600.00
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 mca 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 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_13 invpcid_single ssbd mba ibrs ibpb tpr_shadow vndidi fpxprec ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erness invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed avx2 vppag clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaves xsaveopt xsaves xsavec xgetbv1 xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt

/proc/cpuinfo cache data

cache size : 22528 KB

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: 193121 MB
node 0 free: 192359 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: 193477 MB
node 1 free: 193078 MB
node distances:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo

MemTotal: 395878072 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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**Platform Notes (Continued)**

From `/etc/*release* /etc/*version*`  
SuSE-release:  
- USE 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:  
```
Linux linux-25mq 4.12.14-94.41-default #1 SMP Wed Oct 31 12:25:04 UTC 2018 (3090901) 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 May 24 15:32  

SPEC is set to: /home/cpu2017-1.0.5-ic19.0u1  
```
Filesystem Type Size Used Avail Use% Mounted on  
/dev/sdc2 btrfs 746G 41G 704G 6% /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 -[TEE135R-2.10]- 02/26/2019  
- Memory:  
  - 4x NO DIMM NO DIMM  
  - 12x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)
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---

### Compiler Version Notes

---

### Base Compiler Invocation

C benchmarks:
```plaintext
icc -m64 -std=c11
```

C++ benchmarks:
```plaintext
icpc -m64
```

Fortran benchmarks:
```plaintext
ifort -m64
```

---

### Base Portability Flags

```plaintext
600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
625.x264_s: -DSPEC_LP64
657.xz_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-AVX512 -ipo -O3 -no-prec-div
- -qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
- -L/usr/local/je5.0.1-64/lib -ljemalloc

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:
- -xCORE-AVX512 -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.

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