Lenovo Global Technology
ThinkSystem SR650
(2.60 GHz, Intel Xeon Gold 6142)

SPEC® CPU2017 Integer Speed Result

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

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<tr>
<td>8.77</td>
<td>9.03</td>
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</table>

CPU Name: Intel Xeon Gold 6142
Max MHz.: 3700
Nominal: 2600
Enabled: 32 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: 22 MB I+D on chip per chip
Other: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)
Storage: 1 x 800 GB SAS SSD
Other: None

OS: SUSE Linux Enterprise Server 12 SP2 (x86_64)
Compiler: C/C++: Version 18.0.0.128 of Intel C/C++
Fortran: Version 18.0.0.128 of Intel Fortran
Parallel: Yes
File System: btrfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc: jemalloc memory allocator library V5.0.1
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**Software Availability:** Sep-2017

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**Results Table**

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<td>9.28</td>
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<td>605.mcf_s</td>
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<td>620.omnetpp_s</td>
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<td>623.xalanchmk_s</td>
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<td>631.deepsjeng_s</td>
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<td>641.leela_s</td>
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<td>648.exchange2_s</td>
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</tbody>
</table>

**SPECspeed2017_int_base =** 8.77
**SPECspeed2017_int_peak =** 9.03

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:

```
LD_LIBRARY_PATH = "/home/cpu2017.1.0.2.ic18.0/lib/ia32:/home/cpu2017.1.0.2.ic18.0/lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/cpu2017.1.0.2.ic18.0/je5.0.1-32:/home/cpu2017.1.0.2.ic18.0/je5.0.1-64"
OMP_STACKSIZE = "192M"
```

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4

Transparent Huge Pages enabled by default

Prior to runcpu invocation

```
sync; echo 3> /proc/sys/vm/drop_caches
jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets;
jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5;
```

No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

No: 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.

No: 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.

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SPECspeed2017_int_peak = 9.03
SPECspeed2017_int_base = 8.77

Test Date: Oct-2017
Hardware Availability: Aug-2017
Software Availability: Sep-2017

General Notes (Continued)
This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.
The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, http://www.spec.org/osg/policy.html
This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.

Platform Notes
BIOS configuration:
Choose Operating Mode set to Maximum Performance
Hyper-Threading set to Disable
MONITORM/WAIT set to Enable
Adjacent Cache Prefetch set to Disable
XPT Prefetcher set to Enable
Stale AtoS set to Enable
DCA set to Enable
Sysinfo program /home/cpu2017.1.0.2.ic18.0/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on Cyborg-SPECcpu2017-SUSE12SP2 Sun Oct 29 17:23:42 2017

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 6142 CPU @ 2.60GHz
  2 "physical id"s (chips)
  32 "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 : 16
  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): 32

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Platform Notes (Continued)

On-line CPU(s) list: 0-31
Thread(s) per core: 1
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 6142 CPU @ 2.60GHz
Stepping: 4
CPU MHz: 2593.895
BogoMIPS: 5187.79
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K
NUMA node0 CPU(s): 0-15
NUMA node1 CPU(s): 16-31
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu 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 ida arat epb pln pts dtherm intel_pt tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erts invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc /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
node 0 size: 193099 MB
node 0 free: 192290 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
node 1 size: 193504 MB
node 1 free: 192724 MB
node distances:

From /proc/meminfo

(Continued on next page)
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SPECspeed2017_int_base = 8.77
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Platform Notes (Continued)

MemTotal: 395882808 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
oS-release:
  NAME="SLES"
  VERSION="12-SP2"
  VERSION_ID="12.2"
  PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
  Linux Cyborg-SPECcpu2017-SUSE12SP2 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Oct 29 17:22

SPEC is set to: /home/cpu2017.1.0.2.ic18.0

Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb2 btrfs 744G 202G 542G 28% /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 SBIOS" standard.

BIOS Lenovo -[IVE111I-1.01]- 08/11/2017
Memory:
  24x Samsung M393A2K43BB1-CTD 16 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC  600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base, peak) 657.xz_s(base)
==============================================================================
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================
CC  600.perlbench_s(peak) 602.gcc_s(peak) 605.mcf_s(peak) 657.xz_s(peak)

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**Compiler Version Notes (Continued)**

```plaintext
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```plaintext
CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base) 641.leela_s(base)
```

```plaintext
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```plaintext
CXXC 620.omnetpp_s(peak) 623.xalancbmk_s(peak) 631.deepsjeng_s(peak) 641.leela_s(peak)
```

```plaintext
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```plaintext
FC 648.exchange2_s(base, peak)
```

```plaintext
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

**Base Compiler Invocation**

C benchmarks:
- icc

C++ benchmarks:
- icpc

Fortran benchmarks:
- ifort

**Base Portability Flags**

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64

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**Test Date:**  Oct-2017  
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**Software Availability:** Sep-2017

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### Base Portability Flags (Continued)

605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
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=3 -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=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

**Fortran benchmarks:**
- Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
- L/usr/local/je5.0.1-64/lib -ljemalloc

---

### Base Other Flags

**C benchmarks:**
- m64 -std=c11

**C++ benchmarks:**
- m64

**Fortran benchmarks:**
- m64

---

### Peak Compiler Invocation

**C benchmarks:**
- icc

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## Peak Compiler Invocation (Continued)

### C++ benchmarks:
- icpc

### Fortran benchmarks:
- ifort

## Peak Portability Flags

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<th>Flag</th>
<th>C++ benchmarks</th>
<th>Fortran benchmarks</th>
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<td>648.exchange2_s</td>
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<tr>
<td>-DSPEC_LP64</td>
<td>657.xz_s</td>
<td>660.perlbench_s</td>
</tr>
</tbody>
</table>

## Peak Optimization Flags

### C benchmarks:
- 600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2  
-xCORE-AVX512 -qopt-mem-layout-trans=3 -ipo -O3  
-no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp  
-DSPEC_OPENMP -fno-strict-overflow  
-L/usr/local/je5.0.1-64/lib -ljemalloc

- 620.omnetpp_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2  
-xCORE-AVX512 -qopt-mem-layout-trans=3 -ipo -O3  
-no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp  
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

- 623.xalancbmk_s: -D_FILE_OFFSET_BITS=64 -DSPEC_LINUX  
-DSPEC_LP64

- 624.x264_s: -DSPEC_LP64

- 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

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Peak Optimization Flags (Continued)

625.x264_s: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

657.xz_s: Same as 602.gcc_s

C++ benchmarks:

602.omnetpp_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

623.xalancbmk_s: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-32/lib -ljemalloc

631.deepsjeng_s: Same as 620.omnetpp_s

641.leela_s: Same as 620.omnetpp_s

Fortran benchmarks:

-flags -m64 -std=c11

C++ benchmarks (except as noted below):

-flags -m64

623.xalancbmk_s: -m32

Fortran benchmarks:

-flags -m64

Peak Other Flags

C benchmarks:

-m64

C++ benchmarks (except as noted below):

-flags -m64

623.xalancbmk_s: -m32

Fortran benchmarks:

-flags -m64
## Lenovo Global Technology

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The flags files that were used to format this result can be browsed at:
- [http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html)

You can also download the XML flags sources by saving the following links:
- [http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.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 v1.0.2 on 2017-10-29 05:23:41-0400.  
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