## Lenovo Global Technology

**ThinkSystem SR150**  
(3.70 GHz, Intel Xeon E-2176G)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_int_base</th>
<th>SPECspeed2017_int_peak</th>
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<tr>
<td>600.perlbench_s</td>
<td>12</td>
<td>7.49</td>
<td>Not Run</td>
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<tr>
<td>602.gcc_s</td>
<td>12</td>
<td>12.3</td>
<td>12.3</td>
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<tr>
<td>605.mcf_s</td>
<td>12</td>
<td>6.95</td>
<td>4.4</td>
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<tr>
<td>620.omnetpp_s</td>
<td>12</td>
<td>15.2</td>
<td>15.2</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>625.x264_s</td>
<td>12</td>
<td></td>
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</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>12</td>
<td>6.77</td>
<td></td>
</tr>
<tr>
<td>641.leela_s</td>
<td>12</td>
<td>5.46</td>
<td></td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td>12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Hardware

**CPU Name:** Intel Xeon E-2176G  
**Max MHz.:** 4700  
**Nominal:** 3700  
**Enabled:** 6 cores, 1 chip, 2 threads/core  
**Orderable:** 1 chip  
**Cache L1:** 32 KB I + 32 KB D on chip per core  
**L2:** 256 KB I+D on chip per core  
**L3:** 12 MB I+D on chip per chip  
**Other:** None  
**Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)  
**Storage:** 1 x 960 GB SATA SSD  
**Other:** None

### Software

**OS:** SUSE Linux Enterprise Server 12 SP3 (x86_64)  
**Kernel:** 4.4.131-94.29-default  
**Compiler:** C/C++: Version 18.0.2.199 of Intel C/C++  
**Compiler for Linux:**  
**Fortran:** Version 18.0.2.199 of Intel Fortran  
**Compiler for Linux:**  
**Parallel:** Yes  
**Firmware:** Lenovo BIOS Version ISE105G 1.01 released Oct-2018  
**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

---

**Lenovo Global Technology**  
**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Test Date:** Nov-2018  
**Hardware Availability:** Jan-2019  
**Software Availability:** May-2018
# SPEC CPU2017 Integer Speed Result

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<td>Lenovo Global Technology</td>
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### SPECspeed2017_int_base = 10.4

### SPECspeed2017_int_peak = Not Run

### Test Date: Nov-2018

### Hardware Availability: Jan-2019

### Software Availability: May-2018

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
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<td>605.mcf_s</td>
<td>12</td>
<td>310</td>
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<td>15.2</td>
<td>308</td>
<td>15.3</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
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<td>623.xalancbmk_s</td>
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<td>12.2</td>
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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>6.77</td>
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<td>6.77</td>
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<td>641.leela_s</td>
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<td>313</td>
<td>5.44</td>
<td>312</td>
<td>5.46</td>
<td>312</td>
<td>5.46</td>
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<tr>
<td>648.exchange2_s</td>
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<td>17.0</td>
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<td>447</td>
<td>13.8</td>
<td>447</td>
<td>13.8</td>
<td>447</td>
<td>13.8</td>
</tr>
</tbody>
</table>

### 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-ic18.0u2/lib/ia32:/home/cpu2017-1.0.5-ic18.0u2/lib/intel64"
  - LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/cpu2017-1.0.5-ic18.0u2/je5.0.1-32:/home/cpu2017-1.0.5-ic18.0u2/je5.0.1-64"
  - OMP_STACKSIZE = "192M"

- Binaries compiled on a system with 1x Intel Core i7-6700K 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.
BiOS configuration:
Choose Operating Mode set to Maximum Performance
Execute Disable Bit set to Disable
DCA set to Enable
Sysinfo program /home/cpu2017-1.0.5-ic18.0u2/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-3wuo Fri Nov 9 16:37:19 2018

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) E-2176G CPU @ 3.70GHz
  1 "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 : 12
physical 0: 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: 2
Core(s) per socket: 6
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) E-2176G CPU @ 3.70GHz
Stepping: 10
CPU MHz: 4661.939
CPU max MHz: 4700.0000
CPU min MHz: 800.0000
BogoMIPS: 7391.96
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 12288K
NUMA node0 CPU(s): 0-11

(Continued on next page)
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SPECspeed2017_int_base = 10.4
SPECspeed2017_int_peak = Not Run

Platform Notes (Continued)

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 art 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 sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
  xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epbi invpcid_single pln pts
  dtherm hwp hwp_notify hwp_act_window hwp_epp intel_pt rsbctxsw spec_ctrl stibp ssbd
  retpoline kaiser tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle
  avx2 smep bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec
  xgetbv1

/proc/cpuinfo cache data
   cache size : 12288 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
   physical chip.
   available: 1 nodes (0)
   node 0 cpus:  0  1  2  3  4  5  6  7  8  9  10  11
   node 0 size:  64380 MB
   node 0 free:  62985 MB
   node distances:
     node 0
     0:  10

From /proc/meminfo
   MemTotal:  65925284 kB
   HugePages_Total: 0
   Hugepagesize:  2048 kB

From /etc/*release* /etc/*version*
   SuSE-release:
     SUSE Linux Enterprise Server 12 (x86_64)
     VERSION = 12
     PATCHLEVEL = 3
     # 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-SP3"
     VERSION_ID="12.3"
     PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
     ID="sles"
     ANSI_COLOR="0;32"
     CPE_NAME="cpe:/o:suse:sles:12:sp3"

   uname -a:
     Linux linux-3wuo 4.4.131-94.29-default #1 SMP Mon May 21 14:41:34 UTC 2018 (f49bc78)

(Continued on next page)
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Platform Notes (Continued)

x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

run-level 3 Nov 9 09:53

SPEC is set to: /home/cpu2017-1.0.5-ic18.0u2

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 btrfs 893G 16G 877G 2% /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 -[ISE105G-1.01]- 10/25/2018
Memory:
  4x Micron 18ASF2G72AZ-2G6D1 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)
   657.xz_s(base)
==============================================================================
icc (ICC) 18.0.2 20180210
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)
==============================================================================
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
FC  648.exchange2_s(base)
==============================================================================
ifort (IFORT) 18.0.2 20180210

(Continued on next page)
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Compiler Version Notes (Continued)

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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
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:
   -W1,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
   -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
   -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
   -W1,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
   -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
   -W1,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
   -qopt-mem-layout-trans=3 -nostandard-realloc-1hs

(Continued on next page)
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### Base Optimization Flags (Continued)

Fortran benchmarks (continued):

- `-L/usr/local/je5.0.1-64/lib -ljemalloc`

The flags files that were used to format this result can be browsed at:


You can also download the XML flags sources by saving the following links:


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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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