# SPEC CPU®2017 Integer Speed Result

## Lenovo Global Technology

**ThinkServer SR660 V2**  
(2.30 GHz, Intel Xeon Platinum 8380)

**SPECspeed®2017_int_base** = 11.7  
**SPECspeed®2017_int_peak** = Not Run

**CPU2017 License:** 9017  
**Test Date:** Dec-2021

**Test Sponsor:** Lenovo Global Technology  
**Hardware Availability:** Sep-2021

**Tested by:** Lenovo Global Technology  
**Software Availability:** Dec-2020

### Hardware

**CPU Name:** Intel Xeon Platinum 8380  
**Max MHz:** 3400  
**Nominal:** 2300

**Enabled:** 80 cores, 2 chips  
**Orderable:** 1.2 chips

**Cache L1:** 32 KB I + 48 KB D on chip per core  
**Cache L2:** 1.25 MB I+D on chip per core  
**Cache L3:** 60 MB I+D on chip per chip

**Other:** None  
**Memory:** 1 TB (32 x 32 GB 2Rx4 PC4-3200AA-R)  
**Storage:** 1 x 960 GB M.2 NVME 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:** Yes

**Firmware:** Lenovo BIOS Version XWE103C 1.61  
**File System:** xfs  
**System State:** Run level 3 (multi-user)  
**Base Pointers:** 64-bit  
**Peak Pointers:** Not Applicable

**Other:** jemalloc memory allocator V5.0.1

**Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage

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**Tested by:** Lenovo Global Technology  
**Hardware Availability:** Sep-2021

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**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**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPEC Speed®2017_int_base</th>
<th>SPEC Speed®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>80</td>
<td>6.94</td>
<td></td>
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<tr>
<td>602.gcc_s</td>
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<td>625.x264_s</td>
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<tr>
<td>631.deepsjeng_s</td>
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<tr>
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<tr>
<td>648.exchange2_s</td>
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<td>19.6</td>
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<tr>
<td>657.xz_s</td>
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
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<td>371</td>
<td>10.7</td>
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<tr>
<td>605.mcf_s</td>
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<td>625.x264_s</td>
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<td>16.8</td>
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<tr>
<td>648.exchange2_s</td>
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<td>19.6</td>
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<td></td>
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<tr>
<td>657.xz_s</td>
<td>80</td>
<td>256</td>
<td>24.2</td>
<td>254</td>
<td>24.3</td>
<td>256</td>
<td>24.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SPECspeed®2017_int_base = 11.7
SPECspeed®2017_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"
OS set to performance mode via cpupower frequency-set -g performance

Environment Variables Notes
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"

General Notes
Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Redhat Enterprise Linux 8.0
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.
jemalloc, a general purpose malloc implementation

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### Lenovo Global Technology

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<table>
<thead>
<tr>
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<th>Lenovo Global Technology</th>
</tr>
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<td>Test Sponsor</td>
<td>Lenovo Global Technology</td>
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<tr>
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**SPECspeed®2017_int_peak = Not Run**

**Test Date:** Dec-2021

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### General Notes (Continued)

built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5


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### Platform Notes

**BIOS configuration:**

Hyper-Threading set to Disable

**Sysinfo program** /home/cpu2017/bin/sysinfo

Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca64d4

running on localhost.localdomain Fri Dec 17 03:46:39 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 8380 CPU @ 2.30GHz
  2 "physical id"s (chips)
  80 "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 : 40
siblings : 40
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 32 33 34 35 36 37 38 39
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 32 33 34 35 36 37 38 39
```

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):              80
On-line CPU(s) list: 0-79
Thread(s) per core:  1
Core(s) per socket:  40
Socket(s):           2
NUMA node(s):        2
Vendor ID:           GenuineIntel
CPU family:          6
Model:               106
Model name:          Intel(R) Xeon(R) Platinum 8380 CPU @ 2.30GHz
Stepping:            6
CPU MHz:             3095.534
CPU max MHz:         3400.000
```

(Continued on next page)
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**Platform Notes (Continued)***

```
CPU min MHz: 800.0000  
BogoMIPS: 4600.00  
Virtualization: VT-x  
L1d cache: 48K  
L1i cache: 32K  
L2 cache: 1280K  
L3 cache: 61440K  
NUMA node0 CPU(s): 0-39  
NUMA node1 CPU(s): 40-79
```

```
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 pdpeslbgt rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid apermpref fpi pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pclmulqdq
```

```
From numactl --hardware  
WARNING: a numactl 'node' might or might not correspond to a physical chip.  
available: 2 nodes (0-1)  
nodem 0 cpus: 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 32 33 34 35 36 37 38 39  
nodem 0 size: 485120 MB  
nodem 0 free: 513829 MB  
nodem 1 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79  
nodem 1 size: 484836 MB  
nodem 1 free: 512266 MB  
nodem distances:  
node 0 1  
0: 10 20  
1: 20 10
```

```
From /proc/meminfo  
MemTotal: 1056158784 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB
```

(Continued on next page)
**Platform Notes (Continued)**

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

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance

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 localhost.localdomain 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:

<table>
<thead>
<tr>
<th>Vulnerability</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVE-2018-12207 (iTLB Multihit)</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2018-3620 (L1 Terminal Fault)</td>
<td>Not affected</td>
</tr>
<tr>
<td>Microarchitectural Data Sampling</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2017-5754 (Meltdown)</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2018-3639 (Speculative Store Bypass)</td>
<td>Mitigation: Speculative Store Bypass disabled via prctl and seccomp</td>
</tr>
<tr>
<td>CVE-2017-5753 (Spectre variant 1)</td>
<td>Mitigation: uservcopy/swaps barriers and __user pointer sanitization</td>
</tr>
<tr>
<td>CVE-2017-5715 (Spectre variant 2)</td>
<td>Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling</td>
</tr>
<tr>
<td>CVE-2020-0543 (Special Register Buffer Data Sampling)</td>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2019-11135 (TSX Asynchronous Abort)</td>
<td>Not affected</td>
</tr>
</tbody>
</table>

run-level 3 Jun 22 11:12

SPEC is set to: /home/cpu2017

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/mapper/rhel-home</td>
<td>xfs</td>
<td>819G</td>
<td>206G</td>
<td>614G</td>
<td>26%</td>
<td>/home</td>
</tr>
</tbody>
</table>

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</thead>
<tbody>
<tr>
<td>11.7</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

### Platform Notes (Continued)

From /sys/devices/virtual/dmi/id  
Vendor: Lenovo  
Product: ThinkServer SR660 V2  
Product Family: Lenovo ThinkServer  
Serial: 17D61CT01WWJ8000017

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:
32x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

BIOS:
- BIOS Vendor: LENOVO
- BIOS Version: XWE103C-1.61
- BIOS Date: 12/07/2021
- BIOS Revision: 5.22

(End of data from sysinfo program)

### Compiler Version Notes

```
C       | 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base)  
| 625.x264_s(base) 657.xz_s(base)  

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.1 Build 20201113  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
```

```
C++     | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)  
| 641.leela_s(base)  

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.1 Build 20201113  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
```

```
Fortran | 648.exchange2_s(base)  

Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
```

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Hardware Availability: Sep-2021
Software Availability: Dec-2020

Compiler Version Notes (Continued)

Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
  icx
C++ benchmarks:
icpx
Fortran benchmarks:
  ifort

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:
  -DSPEC_OPENMP -std=c11 -m64 -fiopenmp -Wl,-z,muldefs -xCORE-AVX2
  -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
  -qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
  -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:
  -DSPEC_OPENMP -m64 -Wl,-z,muldefs -xCORE-AVX2 -O3 -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/

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SPECSpeed\textsuperscript{2017\_int\_base} = 11.7
SPECSpeed\textsuperscript{2017\_int\_peak} = Not Run

Base Optimization Flags (Continued)

C++ benchmarks (continued):
-\texttt{-lqkmalloc}

Fortran benchmarks:
-\texttt{-m64 -xCORE-AVX2 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4}
-\texttt{-nostandard-realloc-lhs -align array32byte -auto}
-\texttt{-mbranches-within-32B-boundaries}

The flags files that were used to format this result can be browsed at
\begin{itemize}
\item \url{http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-ICE-I.html}
\item \url{http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.html}
\end{itemize}

You can also download the XML flags sources by saving the following links:
\begin{itemize}
\item \url{http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-ICE-I.xml}
\item \url{http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml}
\end{itemize}

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Tested with SPEC CPU\textsuperscript{2017 v1.1.8} on 2021-12-17 03:46:39-0500.