## SPEC® CPU2017 Floating Point Rate Result

**Lenovo Global Technology**  
Thinksystem SR250  
(3.80 GHz, Intel Xeon E-2174G)

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate2017_fp_base</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>31.5</td>
</tr>
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</table>

**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

### Hardware

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon E-2174G</td>
</tr>
<tr>
<td>Max MHz.</td>
<td>4700</td>
</tr>
<tr>
<td>Nominal</td>
<td>3800</td>
</tr>
<tr>
<td>Enabled</td>
<td>4 cores, 1 chip, 2 threads/core</td>
</tr>
<tr>
<td>Orderable</td>
<td>1 chip</td>
</tr>
<tr>
<td>Cache L1</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2</td>
<td>256 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3</td>
<td>8 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Memory</td>
<td>64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)</td>
</tr>
<tr>
<td>Storage</td>
<td>1 x 480 GB SATA SSD</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
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</table>

### Software

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
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<tbody>
<tr>
<td>OS</td>
<td>SUSE Linux Enterprise Server 12 SP3 (x86_64)</td>
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<tr>
<td>Compiler</td>
<td>C/C++: Version 18.0.2.199 of Intel C/C++</td>
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<tr>
<td>Firmware</td>
<td>Lenovo BIOS Version ISE105G 1.01 released Oct-2018</td>
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<tr>
<td>Parallel</td>
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<tr>
<td>File System</td>
<td>btrfs</td>
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<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>64-bit</td>
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<tr>
<td>Peak Pointers</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Other</td>
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</table>
**SPEC CPU2017 Floating Point Rate Result**

**Lenovo Global Technology**

Thinksystem SR250
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**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
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<td>503.bwaves_r</td>
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<tr>
<td>507.cactuBSSN_r</td>
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<td>508.namd_r</td>
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<td>317</td>
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<td>318</td>
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<td>510.parest_r</td>
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<td>36.7</td>
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<td>521.wrf_r</td>
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<td>22.6</td>
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<td>22.6</td>
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<tr>
<td>554.roms_r</td>
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<td>12.6</td>
<td>1009</td>
<td>12.6</td>
<td>1013</td>
<td>12.5</td>
</tr>
</tbody>
</table>

**Submit Notes**

The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate taskset 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"

**General Notes**

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

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"

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)

(Continued on next page)
Lenovo Global Technology
Thinksystem SR250
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SPECrates

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
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<tbody>
<tr>
<td>SPECrate2017_fp_base</td>
<td>31.5</td>
</tr>
<tr>
<td>SPECrate2017_fp_peak</td>
<td>Not Run</td>
</tr>
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</table>

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

General Notes (Continued)

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
Choose Operating Mode set to Custom Mode
CPU P-state Control set to Legacy
Execute Disable Bit set to Disable
Per Core P-state set to Disable
Adjacent Cache Prefetch set to Disable

Sysinfo program /home/cpu2017-1.0.5-ic18.0u2/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9
running on linux-ys4m Fri Nov 23 20:36:59 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-2174G CPU @ 3.80GHz
        1 "physical id"s (chips)
        8 "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 : 4
        siblings : 8
        physical 0: cores 0 1 2 3

From lscpu:
    Architecture: x86_64
    CPU op-mode(s): 32-bit, 64-bit
    Byte Order: Little Endian
    CPU(s): 8
    On-line CPU(s) list: 0-7
    Thread(s) per core: 2
    Core(s) per socket: 4
    Socket(s): 1
    NUMA node(s): 1
    Vendor ID: GenuineIntel
    CPU family: 6
    Model: 158
    Model name: Intel(R) Xeon(R) E-2174G CPU @ 3.80GHz
    Stepping: 10

(Continued on next page)
Lenovo Global Technology
Thinksystem SR250
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SPECrater2017_fp_base = 31.5
SPECrater2017_fp_peak = Not Run

Platform Notes (Continued)

CPU MHz:               4534.461
CPU max MHz:           4700.0000
CPU min MHz:           800.0000
BogoMIPS:              7583.94
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              256K
L3 cache:              8192K
NUMA node0 CPU(s):     0-7

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
                        aperfmpref 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 epb invpcid_single pln pts
dtherm hwp hwp_notify hwp_act_window hwp_epp intel_pt rsb_ctxsw spec_ctrl stibp ssbd
                        retpoline kaiser tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle
                        avx2 smep bmi2  9ms  9ms  9ms xsave 9ms 9ms 9ms 9ms 9ms

/proc/cpuinfo cache data
  cache size : 8192 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
  node 0 size: 64381 MB
  node 0 free: 63052 MB
  node distances:
  node 0
    0: 10

From /proc/meminfo
  MemTotal:       65926808 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:

(Continued on next page)
Lenovo Global Technology

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SPECrate2017_fp_base = 31.5
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Test Date: Nov-2018
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Platform Notes (Continued)

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-ys4m 4.4.131-94.29-default #1 SMP Mon May 21 14:41:34 UTC 2018 (f49bc78)
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 23 17:04

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

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 btrfs 446G 19G 427G 5% /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 SMIOS" 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 519.ibm_r(base) 538.imagick_r(base) 544.nab_r(base)
==============================================================================
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================
CXXC 508.namd_r(base) 510.parest_r(base)
==============================================================================

(Continued on next page)
## Lenovo Global Technology

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<table>
<thead>
<tr>
<th>SPECrate2017_fp_base</th>
<th>31.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_fp_peak</td>
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</tbody>
</table>

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### Compiler Version Notes (Continued)

```plaintext
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  

==============================================================================
CC  511.povray_r(base) 526.blender_r(base)
==============================================================================
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
FC  507.cactuBSSN_r(base)
==============================================================================
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
FC  503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
==============================================================================
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
CC  521.wrf_r(base) 527.cam4_r(base)
==============================================================================
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
```

### Base Compiler Invocation

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

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Base Compiler Invocation (Continued)

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -03 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

(Continued on next page)
<table>
<thead>
<tr>
<th>Lenovo Global Technology</th>
<th>SPECrate2017_fp_base = 31.5</th>
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<tr>
<td>TP crave SR250</td>
<td>SPECrate2017_fp_peak = Not Run</td>
</tr>
<tr>
<td>(3.80 GHz, Intel Xeon E-2174G)</td>
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<tr>
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</tr>
</tbody>
</table>

**Base Optimization Flags (Continued)**

Fortran benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
```

Benchmarks using both Fortran and C:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
```

Benchmarks using both C and C++:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3
```

Benchmarks using Fortran, C, and C++:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs
```

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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