## Lenovo Global Technology

Thinksystem SR250  
(3.30 GHz, Intel Xeon E-2136)

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

<table>
<thead>
<tr>
<th>Test Date: Dec-2018</th>
<th>Hardware Availability: Jan-2019</th>
<th>Software Availability: May-2018</th>
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</thead>
</table>

### CPU2017 Floating Point Speed Result

**SPECspeed2017_fp_base** = 29.3  
**SPECspeed2017_fp_peak** = Not Run

### Hardware

- **CPU Name:** Intel Xeon E-2136  
  - Max MHZ.: 4500  
  - Nominal: 3300  
  - 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 480 GB SATA SSD  
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux Server release 7.5 (Maipo)  
  - Kernel 3.10.0-862.3.2.el7.x86_64  
- **Compiler:**  
  - C/C++: Version 18.0.2.199 of Intel C/C++  
  - Fortran: Version 18.0.2.199 of Intel Fortran  
- **Parallel:** Yes  
- **Firmware:** Lenovo BIOS Version ISE105G 1.01 released Oct-2018  
- **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

### SPEC speed Results

### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>6</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>6</td>
<td>7.06</td>
<td>0.0</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>6</td>
<td>23.9</td>
<td>0.0</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>6</td>
<td>28.7</td>
<td>0.0</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>6</td>
<td>17.3</td>
<td>0.0</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>6</td>
<td>16.8</td>
<td>0.0</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>6</td>
<td>55.7</td>
<td>0.0</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>6</td>
<td>55.0</td>
<td>0.0</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>6</td>
<td>78.9</td>
<td>0.0</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>6</td>
<td>78.0</td>
<td>0.0</td>
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SPECspeed2017_fp_base =  29.3
SPECspeed2017_fp_peak =  Not Run

Results Table

| Benchmark    | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |^
|--------------|---------|---------|-------|---------|-------|---------|-------|^
| 603.bwaves_s | 6       | 748     | 78.9  | 748     | 78.9  | 748     | 78.9  |^
| 607.cactuBSSN_s | 6       | 302     | 55.2  | 304     | 54.9  | 303     | 55.0  |^
| 619.lbm_s    | 6       | 742     | 7.06  | 740     | 7.08  | 742     | 7.06  |^
| 621.wrf_s    | 6       | 339     | 39.1  | 346     | 38.3  | 338     | 39.1  |^
| 627.cam4_s   | 6       | 371     | 23.9  | 371     | 23.9  | 371     | 23.9  |^
| 628.pop2_s   | 6       | 341     | 34.8  | 341     | 34.8  | 342     | 34.7  |^
| 638.imagick_s| 6       | 503     | 28.7  | 504     | 28.7  | 502     | 28.7  |^
| 644.nab_s    | 6       | 314     | 55.7  | 314     | 55.6  | 314     | 55.7  |^
| 649.fotonik3d_s | 6       | 526     | 17.3  | 526     | 17.3  | 526     | 17.3  |^
| 654.roms_s   | 6       | 938     | 16.8  | 945     | 16.7  | 938     | 16.8  |^

SPECspeed2017_fp_base =  29.3
SPECspeed2017_fp_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,compact,1,0"
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
Fisystem 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.
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
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**Hardware Availability:** Jan-2019  
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**Software Availability:** May-2018

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**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

Sysinfo program /home/cpu2017-1.0.5-ic18.0u2/bin/sysinfo  
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9  
runtime localhost.localdomain Wed Dec 5 12:23:56 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-2136 CPU @ 3.30GHz  
- 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-2136 CPU @ 3.30GHz  
- Stepping: 10  
- CPU MHz: 4399.328  
- CPU max MHz: 4500.0000  
- CPU min MHz: 800.0000  
- BogoMIPS: 6624.00  
- Virtualization: VT-x  
- L1d cache: 32K  
- L1i cache: 32K  
- L2 cache: 256K  
- L3 cache: 12288K  
- NUMA node0 CPU(s): 0-11

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SPECspeed2017_fp_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 xptr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
  xsave avx f16c rdrand lahf_lm abm 3dnowprefetch epb intel_pt tpr_shadow vnmi
  flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2  ertms invpcid rtm
  mpx rdtscp adx smap clflushopt xsaveopt x salv xsavec xtpr xsetbv ibpb ibrs ibrs
  stibp dtherm ida
  arat pln pts hwp hwp_notify hwp_act_window hwp_epp spec_ctrl intel_stibp ssbd

/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: 65485 MB
  node 0 free: 62846 MB
  node distances:
    node 0
    0:  10

From /proc/meminfo
  MemTotal:  65924832 kB
  HugePages_Total:       0
  Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
o-release:
  NAME="Red Hat Enterprise Linux Server"
  VERSION="7.5 (Maipo)"
  ID="rhel"
  ID_LIKE="fedora"
  VARIANT="Server"
  VARIANT_ID="server"
  VERSION_ID="7.5"
  PRETTY_NAME="Red Hat Enterprise Linux Server 7.5 (Maipo)"
  redhat-release: Red Hat Enterprise Linux Server release 7.5 (Maipo)
  system-release: Red Hat Enterprise Linux Server release 7.5 (Maipo)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:7.5:ga:server

uname -a:
  Linux localhost.localdomain 3.10.0-862.3.2.el7.x86_64 #1 SMP Tue May 15 18:22:15 EDT
  2018 x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

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Platform Notes (Continued)

CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: Load fences
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS (kernel)

run-level 3 Dec 5 10:04

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

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  619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
==============================================================================
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================
FC  607.cactuBSSN_s(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  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
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Compiler Version Notes (Continued)

==============================================================================
CC 621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(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:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

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

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

Base Portability Flags

603.bwaves_s: -DSPEC_LP64 607.cactuBSSN_s: -DSPEC_LP64 619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64 649.fotonik3d_s: -DSPEC_LP64 654.roms_s: -DSPEC_LP64
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Base Optimization Flags

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:

Benchmarks using both Fortran and C:

Benchmarks using Fortran, C, and C++:

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:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-SKL-H.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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