Lenovo Global Technology

ThinkSystem SR150
(3.30 GHz, Intel Xeon E-2124)

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

Specspeed2017_fp_base = 23.8
Specspeed2017_fp_peak = Not Run

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

Hardware
CPU Name: Intel Xeon E-2124
Max MHz.: 4300
Nominal: 3300
Enabled: 4 cores, 1 chip
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: 8 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

Threads
603.bwaves_s 4
607.cactuBSSN_s 4
619.lbm_s 4
621.wrf_s 4
627.cam4_s 4
628.pop2_s 4
638.imagick_s 4
644.nab_s 4
649.fotonik3d_s 4
654.roms_s 4

SPECspeed2017_fp_base (23.8)
**SPEC CPU2017 Floating Point Speed Result**

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### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
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<tr>
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<td>7.21</td>
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<tr>
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<td>515</td>
<td>17.2</td>
<td>515</td>
<td>17.2</td>
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<tr>
<td>628.pop2_s</td>
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<td>419</td>
<td>28.4</td>
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<td>28.5</td>
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<tr>
<td>638.imagick_s</td>
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<td>18.5</td>
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<td>18.5</td>
<td>779</td>
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<tr>
<td>644.nab_s</td>
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<td>35.2</td>
</tr>
<tr>
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<td>654.roms_s</td>
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<td>1029</td>
<td>15.3</td>
<td>1030</td>
<td>15.3</td>
</tr>
</tbody>
</table>

**SPECspeed2017_fp_base = 23.8**  
**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"**
- **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.  
jemalloc, a general purpose malloc implementation built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5  
## Platform Notes

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 9bcde8f2999c33d6f64985e45859ea9
- running on linux-tsn1 Thu Dec 6 20:47:34 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-2124 CPU @ 3.30GHz
  - 1 "physical id"s (chips)
  - 4 "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: 4
  - 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): 4
- On-line CPU(s) list: 0-3
- Thread(s) per core: 1
- 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-2124 CPU @ 3.30GHz
- Stepping: 10
- CPU MHz: 4166.227
- CPU max MHz: 4300.000
- CPU min MHz: 800.000
- BogoMIPS: 6623.95
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 256K
- L3 cache: 8192K
- NUMA node0 CPU(s): 0-3

(Continued on next page)
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| Tested by: | Lenovo Global Technology | Software Availability: | May-2018 |

### SPECspeed2017_fp_base = 23.8

**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 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
  xsave avx f16c rdrand lahf_lm abmler ndtscpm tsc_adjust bmi1 hwp hwũ_notifie hwũ_act_window
  hwp_epp intel_p t rsb_ctxsw spec_ctrl stibp sbd
```

From `/proc/cpuinfo` cache data  
```
cache size: 8192 KB
```

From `/proc/meminfo`  
```
MemTotal:       65927492 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

From `/etc/*release` /`/etc/*version`  
```
NAME="SLES"
VERSION="12-SP3"
ID="sles"
```

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

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**SPECspeed2017_fp_base** = 23.8

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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 Dec 6 17:08

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

Filesystem | Type | Size | Used | Avail | Use% | Mounted on
---|------|------|------|-------|------|----------------
/dev/md126p2 | btrfs | 446G | 18G | 428G | 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 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)
іcc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

FC 607.cactuBSSN_s(base)
іcpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
іcc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
іfort (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)

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

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

#### Benchmarks using both Fortran and C:
- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP`
- `-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc`

#### Benchmarks using Fortran, C, and C++:
- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP`
- `-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc`

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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: