**Lenovo Global Technology**

**Thinksystem SR250**
(3.70 GHz, Intel Xeon E-2176G)

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

**SPECrater2017_int_base =** 40.3  
**SPECrater2017_int_peak =** Not Run

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
</table>
| 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++  
Fortran: Version 18.0.2.199 of Intel Fortran  
Compiler for Linux  
Parallel: No  
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 | 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 480 GB SATA SSD  
Other: None |

<table>
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<tr>
<th>Copies</th>
<th>SPECrate2017_int_base (40.3)</th>
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<tr>
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<tr>
<td>502.gcc_r</td>
<td>12</td>
</tr>
<tr>
<td>505.mcf_r</td>
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</tr>
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<td>12</td>
</tr>
<tr>
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<td>12</td>
</tr>
<tr>
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<td>12</td>
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<tr>
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<td>12</td>
</tr>
<tr>
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<tr>
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</tr>
<tr>
<td>557.xz_r</td>
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</table>
# Lenovo Global Technology

## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base</th>
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<th>Base</th>
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<td>548.exchange2_r</td>
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<td>82.9</td>
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<td>12</td>
<td>462</td>
<td>28.1</td>
<td>495</td>
</tr>
</tbody>
</table>

**SPECrate2017_int_base = 40.3**

**SPECrate2017_int_peak = Not Run**

## 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) 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

(Continued on next page)
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SPECrate2017_int_base = 40.3  
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CPU2017 License: 9017  
Test Date: Nov-2018  
Test Sponsor: Lenovo Global Technology
Hardware Availability: Jan-2019  
Tested by: Lenovo Global Technology  
Software Availability: May-2018

General Notes (Continued)

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
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 Wed Nov 21 09:26:39 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: 4652.967

(Continued on next page)
**Lenovo Global Technology**

**Thinksystem SR250 (3.70 GHz, Intel Xeon E-2176G)**

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**Test Date:** Nov-2018  
**Hardware Availability:** Jan-2019

**Software Availability:** May-2018

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**Platform Notes (Continued)**

- **CPU max MHz:** 4700.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 7391.99
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 256K
- **L3 cache:** 12288K
- **NUMA node0 CPU(s):** 0-11

**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
- aperfmpref eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
- fma cx16 xtpmr pdcg pdeld 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 vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle
- avx2 smep bmi2 edom 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: 63889 MB

  node distances:

  node 0
  0: 10

- **From /proc/meminfo**

  MemTotal: 65925192 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"

(Continued on next page)
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Platform Notes (Continued)

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 21 09:25

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 SMBIOS" standard.

BIOS Lenovo -[ISE105G-1.01]- 10/25/2018
Memory:
4x Micron 18ASF2G72AZ-2G6D1 16 GB 2 rank 2666

Compiler Version Notes

--------------------------------------------------------------------------------
CC 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_r(base)
--------------------------------------------------------------------------------
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------

CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)

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

---
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---
FC 548.exchange2_r(base)
---
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
---

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

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

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

- **C++ benchmarks:**
  - `-Wl,-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:**
  - `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`
  - `-qopt-mem-layout-trans=3 -nostandard-realloc-lhs`
  - `-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: