Lenovo Global Technology

ThinkSystem ST250
(3.30 GHz, Intel Xeon E-2124)

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

Test Date: Nov-2018
Hardware Availability: Nov-2018
Software Availability: Aug-2018

SPECspeed2017_int_base = 9.09
SPECspeed2017_int_peak = Not Run

Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_int_base</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>4</td>
<td>6.72</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>4</td>
<td>11.1</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>4</td>
<td>14.0</td>
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<tr>
<td>620.omnetpp_s</td>
<td>4</td>
<td>6.16</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>4</td>
<td>10.9</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>4</td>
<td>13.2</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>4</td>
<td>6.22</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>4</td>
<td>4.99</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>4</td>
<td>15.6</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>4</td>
<td>8.66</td>
</tr>
</tbody>
</table>

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 960 GB SATA SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 15 (x86_64)
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 ISE105E 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
SPEC CPU2017 Integer 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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<td>625.x264_s</td>
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<td>15.6</td>
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<tr>
<td>657.xz_s</td>
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<td>715</td>
<td>8.65</td>
<td>714</td>
<td>8.66</td>
</tr>
</tbody>
</table>

SPECspeed2017_int_base = 9.09
SPECspeed2017_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"

General Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
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
## Lenovo Global Technology

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### CPU2017 License: 9017  
**Test Date:** Nov-2018

**Test Sponsor:** Lenovo Global Technology  
**Hardware Availability:** Nov-2018

**Tested by:** Lenovo Global Technology  
**Software Availability:** Aug-2018

### 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 9bcde8f2999c33d61f64985e45859ea9  
running on linux-nnmv Thu Nov 29 16:19:13 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:               3300.000
CPU max MHz:           4300.0000
CPU min MHz:           800.0000
BogoMIPS:              6624.00
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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Platform Notes (Continued)

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 pdpe1gb rdtsscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpref tsc_known_freq 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 3nowprefetch cpuid_fault epb invpcid_single
pti ssbd ibrs ibpb stibp tpr_shadow vnni fioxpriority ept vpd fsgsbase tsc_adjust
bmi1 hle avx2 smep bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt intel_pt
xsaveopt xsavec xgetbv1 xsaves dtherm ida arat pln pts hwp hwp_notify hwp_act_window
hwp_epp flush_l1d

From /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
    node 0 size: 64367 MB
    node 0 free: 50648 MB
    node distances:

    node   0
    0:  10

From /proc/meminfo

    MemTotal: 65912688 kB
    HugePages_Total: 0
    Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*

    os-release:
        NAME="SLES"
        VERSION="15"
        VERSION_ID="15"
        PRETTY_NAME="SUSE Linux Enterprise Server 15"
        ID="sles"
        ID_LIKE="suse"
        ANSI_COLOR="0;32"
        CPE_NAME="cpe:/o:suse:sles:15"

    uname -a:
        x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

    CVE-2017-5754 (Meltdown): Mitigation: PTI

(Continued on next page)
Cisco V11.2 CPU2017 Integer Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Cisco Global Technology

3.30 GHz, Intel Xeon E-2124

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

SPECspeed2017_int_base = 9.09
SPECspeed2017_int_peak = Not Run

---

Platform Notes (Continued)

CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation, IBPB, IBRS_FW

---

run-level 3 Nov 29 10:27

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

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 btrfs 895G 18G 876G 2% /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 -[I5E105E-1.01]- 10/11/2018
   Memory:
      4x Micron 18ASF2G72AZ-2G6D1 16 GB 2 rank 2666

(End of data from sysinfo program)

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Compiler Version Notes

==============================================================================
CC  600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base)
  657.xz_s(base)
==============================================================================

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

==============================================================================
CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
  641.leela_s(base)
==============================================================================

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

==============================================================================
FC 648.exchange2_s(base)
==============================================================================

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

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### Base Compiler Invocation

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

- **C++ benchmarks:**
  
  `icpc -m64`

- **Fortran benchmarks:**
  
  `ifort -m64`

### 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:**
  
  `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
  -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
  -L/usr/local/je5.0.1-64/lib -ljemalloc`

- **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`
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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:
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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