Lenovo Group Limited

Lenovo ThinkServer TS450
(2.90 GHz, Intel Xeon E3-1260L v5)

SPECfp®_rate2006 = 183
SPECfp_rate_base2006 = 178

Hardware

| Test sponsor: Lenovo Group Limited |
| Tested by: Lenovo Group Limited |

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<td>416.gamess</td>
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<tr>
<td>482.sphinx3</td>
<td>8</td>
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</tbody>
</table>

Software

Operating System: SUSE Linux Enterprise Server 12 (x86_64)
Kernel 3.12.28-4-default
Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;
Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux
Auto Parallel: No
File System: xfs
System State: Run level 3 (multi-user)

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### Lenovo Group Limited

**Lenovo ThinkServer TS450**  
(2.90 GHz, Intel Xeon E3-1260L v5)

**CPU2006 license:** 9017  
**Test sponsor:** Lenovo Group Limited  
**Tested by:** Lenovo Group Limited

<table>
<thead>
<tr>
<th>L3 Cache:</th>
<th>8 MB I+D on chip per chip</th>
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<th>32/64-bit</th>
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<tr>
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<td>Peak Pointers:</td>
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<tr>
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<td>Disk Subsystem:</td>
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**Software Availability:** Aug-2015  
**Hardware Availability:** Oct-2015  
**Test date:** Jan-2016

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### Results Table

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</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### 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"  
Transparent Huge Pages enabled with:  
```bash  
echo always > /sys/kernel/mm/transparent_hugepage/enabled  
```

Filesystem page cache cleared with:  
```bash  
echo 1 > /proc/sys/vm/drop_caches  
```
**Lenovo Group Limited**  
Lenovo ThinkServer TS450  
(2.90 GHz, Intel Xeon E3-1260L v5)  

<table>
<thead>
<tr>
<th>SPECfp_rate2006</th>
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</thead>
<tbody>
<tr>
<td>SPECfp_rate_base2006</td>
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**CPU2006 license:** 9017  
**Test sponsor:** Lenovo Group Limited  
**Test date:** Jan-2016  
**Tested by:** Lenovo Group Limited  
**Hardware Availability:** Oct-2015  
**Software Availability:** Aug-2015

**Platform Notes**

BIOS Configuration:  
- EIST Support set to Enabled  
- Intel (R) Hyper-Threading set to Enabled  
- C1E Support set to Enabled  
- C State Support set to Enabled  
- Turbo Mode set to Enable

Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6914  
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1  
running on TS450-SLE12 Thu Jan 21 00:37:00 2016

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:  
http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo

```
model name : Intel(R) Xeon(R) CPU E3-1260L v5 @ 2.90GHz
  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
cache size : 8192 KB
```

From /proc/meminfo

```
MemTotal:       32932764 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

From /etc/*release* /etc/*version*  
SuSE-release:

```
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 0
# 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"
VERSION="12"
VERSION_ID="12"
PRETTY_NAME="SUSE Linux Enterprise Server 12"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:o:suse:sles:12"
```

uname -a:

```
Linux TS450-SLE12 3.12.28-4-default #1 SMP Thu Sep 25 17:02:34 UTC 2014
(9879bd4) x86_64 x86_64 x86_64 GNU/Linux
```
Lenovo Group Limited
Lenovo ThinkServer TS450
(2.90 GHz, Intel Xeon E3-1260L v5)

SPECfp_rate2006 = 183
SPECfp_rate_base2006 = 178

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

Platform Notes (Continued)

run-level 3 Jan 20 16:14

SPEC is set to: /home/cpu2006-1.2-ic16.0
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 600G 7.6G 593G 2% /home

Additional information from dmidecode:

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 FWKT32A 12/25/2015
Memory:
4x Samsung M378A1G43DB0-CPB 8 GB 2 rank 2133 MHz

(End of data from sysinfo program)

General Notes

Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "\n/home/cpu2006-1.2-ic16.0/libs/32:/home/cpu2006-1.2-ic16.0/libs/64:/home/cpu2006-1.2-ic16.0/sh"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/transparent_hugepage/enabled

Base Compiler Invocation

C benchmarks:

`icc -m64`

C++ benchmarks:

`icpc -m64`

Fortran benchmarks:

`ifort -m64`

Benchmarks using both Fortran and C:

`icc -m64 ifort -m64`

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64

Continued on next page
Lenovo Group Limited
Lenovo ThinkServer TS450
(2.90 GHz, Intel Xeon E3-1260L v5)

SPECfp_rate2006 = 183
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CPU2006 license: 9017
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Software Availability: Aug-2015

Base Portability Flags (Continued)

433.milc: -DSPEC_CPU_LP64
434.zesump: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64 -nofor_main
454.caculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3

Peak Compiler Invocation

C benchmarks:
icc -m64

C++ benchmarks (except as noted below):
icpc -m64

450.soplex: icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin

Fortran benchmarks:
ifort -m64

Continued on next page
Lenovo Group Limited

Lenovo ThinkServer TS450 (2.90 GHz, Intel Xeon E3-1260L v5)

SPECfp_rate2006 = 183
SPECfp_rate_base2006 = 178

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

Test date: Jan-2016
Hardware Availability: Oct-2015
Software Availability: Aug-2015

Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

icc  -m64 ifort  -m64

Peak Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.games: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -D_FILE_OFFSET_BITS=64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFD: -DSPEC_CPU_LP64
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes
470.lbm: basepeak = yes
482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
            -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
            -par-num-threads=1(pass 1) -opt-mem-layout-trans=3(pass 2)
            -prof-use(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes

450.soplex: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
            -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
            -par-num-threads=1(pass 1) -opt-mem-layout-trans=3(pass 2)
            -prof-use(pass 2) -opt-malloc-options=3

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Lenovo Group Limited
Lenovo ThinkServer TS450
(2.90 GHz, Intel Xeon E3-1260L v5)

SPEC CFP2006 Result

 SPECfp_rate2006 = 183
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CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Test date: Jan-2016
Tested by: Lenovo Group Limited
Hardware Availability: Oct-2015
Software Availability: Aug-2015

Peak Optimization Flags (Continued)

453.povray: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -opt-mem-layout-trans=3(pass 2)
-prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
-inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes
437.leslie3d: basepeak = yes
459.GemsFDTD: basepeak = yes

465.tonto: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll14 -auto
-inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -opt-mem-layout-trans=3(pass 2)
-prof-use(pass 2) -opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes
454.calculix: basepeak = yes
481.wrf: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml
## Lenovo Group Limited

### Lenovo ThinkServer TS450

(2.90 GHz, Intel Xeon E3-1260L v5)

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| Test date:       | Jan-2016           |
| Hardware Availability: | Oct-2015 |
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Tested with SPEC CPU2006 v1.2.