Lenovo Group Limited
Lenovo ThinkServer SD350
(2.60 GHz, Intel Xeon E5-2623 v4)

SPECfp®2006 = 98.4
SPECfp_base2006 = 95.1

Hardware
CPU Name: Intel Xeon E5-2623 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz
CPU MHz: 2600
FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip
CPU(s) orderable: 1.2 chips
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 256 KB I+D on chip per core

Software
Operating System: SUSE Linux Enterprise Server 12 SP1 (x86_64)
Kernel 3.12.49-11-default
Compiler: C++: Version 17.0.0.098 of Intel C/C++
Compiler for Linux;
Fortran: Version 17.0.0.098 of Intel Fortran
Compiler for Linux
Auto Parallel: Yes
File System: xfs
System State: Run level 3 (multi-user)
# Lenovo Group Limited

## Lenovo ThinkServer SD350
(2.60 GHz, Intel Xeon E5-2623 v4)

### SPEC CFP2006 Result

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>265</td>
<td>73.5</td>
</tr>
</tbody>
</table>

### Operating System Notes

- Stack size set to unlimited using "ulimit -s unlimited"
- Transparent Huge Pages disabled with:
  - echo never > /sys/kernel/mm/transparent_hugepage/enabled

### Platform Notes

- BIOS configuration:
  - Hyper-Threading set to Disabled
  - Sysinfo program /home/cpu2006-1.2-ic17.0/config/sysinfo.rev6993
- Revision 6993 of 2015-11-06 (b5e8d4d4eb51ed28d7f986696cbe290c1)
- running on Kent-SUT4 Sat Jan 16 00:53:08 2016

This section contains SUT (System Under Test) info as seen by

Continued on next page
Lenovo Group Limited
Lenovo ThinkServer SD350
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**SPECfp2006** = 98.4
**SPECfp_base2006** = 95.1

---

**Platform Notes (Continued)**

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 E5-2623 v4@ 2.60GHz
  - 2 "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 : 4
  - physical 0: cores 0 1 2 3
  - physical 1: cores 0 1 2 3
- cache size : 10240 KB

From /proc/meminfo
- MemTotal: 264573176 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
- SuSE-release:
  - SUSE Linux Enterprise Server 12 (x86_64)
  - VERSION = 12
  - PATCHLEVEL = 1
  # 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-SP1"
  - VERSION_ID="12.1"
  - PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
  - ID="sles"
  - ANSI_COLOR=0;32
  - CPE_NAME=cpe:/o:suse:sles:12:sp1

uname -a:
  (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 15 19:28

SPEC is set to: /home/cpu2006-1.2-ic17.0

Filesystem Type Size Used Avail Use% Mounted on
/dev/sdc5 xfs 703G 4.6G 698G 1% /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

Continued on next page
Lenovo Group Limited
Lenovo ThinkServer SD350
(2.60 GHz, Intel Xeon E5-2623 v4)

SPECfp2006 = 98.4
SPECfp_base2006 = 95.1

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

Platform Notes (Continued)

hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS American Megatrends Inc. 3.57 08/12/2016
Memory:
16x Samsung M393A2G40DB1-CRC 16 GB 2 rank 2400 MHz, configured at 2133 MHz

(End of data from sysinfo program)

General Notes

Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2006-1.2-ic17.0/libs/32:/home/cpu2006-1.2-ic17.0/libs/64:/home/cpu2006-1.2-ic17.0/sh10.2"
OMP_NUM_THREADS = "8"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.2

Base Compiler Invocation

C benchmarks:
icc -m64

C++ benchmarks:
iccpc -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
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: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main

Continued on next page
## Lenovo Group Limited

**Lenovo ThinkServer SD350**  
(2.60 GHz, Intel Xeon E5-2623 v4)

| SPECfp2006 = | 98.4 |
| SPECfp_base2006 = | 95.1 |

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<td>Hardware Availability: Sep-2016</td>
</tr>
<tr>
<td>Tested by: Lenovo Group Limited</td>
<td>Software Availability: Sep-2016</td>
</tr>
</tbody>
</table>

### Base Portability Flags (Continued)

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 -parallel -qopt-prefetch

C++ benchmarks:  
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

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

Benchmarks using both Fortran and C:  
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch

### Peak Compiler Invocation

C benchmarks:  
`icc -m64`

C++ benchmarks:  
`icpc -m64`

Fortran benchmarks:  
`ifort -m64`

Benchmarks using both Fortran and C:  
`icc -m64 ifort -m64`

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

C benchmarks:  
Continued on next page
## Lenovo Group Limited

**Lenovo ThinkServer SD350**  
(2.60 GHz, Intel Xeon E5-2623 v4)  

| SPECfp2006 = | 98.4 |
| SPECfp_base2006 = | 95.1 |

**CPU2006 license:** 9017  
**Test sponsor:** Lenovo Group Limited  
**Tested by:** Lenovo Group Limited  
**Test date:** Jan-2017  
**Hardware Availability:** Sep-2016  
**Software Availability:** Sep-2016

### Peak Optimization Flags (Continued)

<table>
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<th>Benchmark</th>
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<tr>
<td>433.milc</td>
<td>basepeak = yes</td>
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<tr>
<td>470.lbm</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>basepeak = yes</td>
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</table>

**C++ benchmarks:**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>444.namd</td>
<td>-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -fno-alias -auto-ilp32</td>
</tr>
<tr>
<td>447.dealII</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>450.soplex</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>453.povray</td>
<td>-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -unroll4 -ansi-alias</td>
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</table>

**Fortran benchmarks:**

<table>
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<tr>
<th>Benchmark</th>
<th>Flags</th>
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<tbody>
<tr>
<td>410.bwaves</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>416.gamess</td>
<td>-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -unroll2 -inline-level=0 -scalar-rep-</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -unroll2 -inline-level=0 -qopt-prefetch -parallel</td>
</tr>
<tr>
<td>465.tonto</td>
<td>-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -inline-calloc -qopt-malloc-options=3 -auto -unroll4</td>
</tr>
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**Benchmarks using both Fortran and C:**

<table>
<thead>
<tr>
<th>Benchmark</th>
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<tr>
<td>435.gromacs</td>
<td>basepeak = yes</td>
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<td>436.cactusADM</td>
<td>basepeak = yes</td>
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<tr>
<td>454.calculix</td>
<td>-xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32</td>
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Lenovo Group Limited

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**SPECfp2006 = 98.4**

**SPECfp_base2006 = 95.1**

Peak Optimization Flags (Continued)

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-ic17.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-BDW-revE.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-BDW-revE.xml

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