# SPEC® CFP2006 Result

## Lenovo Group Limited

Lenovo System x3650 M5
(2.60 GHz, Intel Xeon E5-2623 v4)

### SPECfp®2006 = 97.5

### SPECfp_base2006 = 93.5

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### Hardware

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

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### Software

- **Operating System:** SUSE Linux Enterprise Server 12 SP1 (x86_64) Kernel 3.12.49-11-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:** Yes
- **File System:** xfs
- **System State:** Run level 3 (multi-user)

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### Test Details

- **CPU2006 license:** 9017
- **Test sponsor:** Lenovo Group Limited
- **Tested by:** Lenovo Group Limited
- **Test date:** May-2016
- **Software Availability:** Dec-2015
- **Hardware Availability:** Mar-2016
- **Tested by:** Lenovo Group Limited

---

### SPEC Result

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>CPU</th>
<th>Memory</th>
<th>Time</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>42.0</td>
<td>40.0</td>
<td>365.1</td>
<td>159</td>
</tr>
<tr>
<td>416.game5</td>
<td>35.3</td>
<td>40.0</td>
<td>365.1</td>
<td>159</td>
</tr>
<tr>
<td>433.milc</td>
<td>71.0</td>
<td>40.0</td>
<td>365.1</td>
<td>159</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>50.3</td>
<td>40.0</td>
<td>365.1</td>
<td>159</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>40.0</td>
<td>40.0</td>
<td>365.1</td>
<td>159</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>35.3</td>
<td>40.0</td>
<td>365.1</td>
<td>159</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>29.1</td>
<td>40.0</td>
<td>365.1</td>
<td>159</td>
</tr>
<tr>
<td>444.namd</td>
<td>28.2</td>
<td>40.0</td>
<td>365.1</td>
<td>159</td>
</tr>
<tr>
<td>447.dealII</td>
<td>62.4</td>
<td>40.0</td>
<td>365.1</td>
<td>159</td>
</tr>
<tr>
<td>450.soplex</td>
<td>38.5</td>
<td>40.0</td>
<td>365.1</td>
<td>159</td>
</tr>
<tr>
<td>453.povray</td>
<td>64.1</td>
<td>40.0</td>
<td>365.1</td>
<td>159</td>
</tr>
<tr>
<td>454.calculix</td>
<td>57.1</td>
<td>40.0</td>
<td>365.1</td>
<td>159</td>
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<tr>
<td>459.GemsFDTD</td>
<td>53.8</td>
<td>40.0</td>
<td>365.1</td>
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<tr>
<td>465.tonto</td>
<td>53.3</td>
<td>40.0</td>
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</tr>
<tr>
<td>470.lbm</td>
<td>81.1</td>
<td>40.0</td>
<td>365.1</td>
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<tr>
<td>481.wrf</td>
<td>72.3</td>
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<tr>
<td>482.sphinx3</td>
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<td>40.0</td>
<td>365.1</td>
<td>159</td>
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</tbody>
</table>

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**SPECfp®2006 = 97.5**

**SPECfp_base2006 = 93.5**

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### Lenovo Group Limited

**SPEC CFP2006 Result**

**Lenovo System x3650 M5**

(2.60 GHz, Intel Xeon E5-2623 v4)

<table>
<thead>
<tr>
<th>CPU2006 license:</th>
<th>Test date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>9017</td>
<td>May-2016</td>
</tr>
</tbody>
</table>

**Lenovo Group Limited**

**Test sponsor:** Lenovo Group Limited

**Tested by:** Lenovo Group Limited

**L3 Cache:** 10 MB I+D on chip per chip

**Other Cache:** None

**Memory:** 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)

**Disk Subsystem:** 1 x 800 GB SATA SSD

**Other Hardware:** None

**Base Pointers:** 64-bit

**Peak Pointers:** 32/64-bit

**Other Software:** None

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### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>37.3</td>
<td>365</td>
<td>37.2</td>
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<td>37.0</td>
<td>367</td>
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<tr>
<td>416.gamess</td>
<td><strong>555</strong></td>
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<tr>
<td>433.milc</td>
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<td><strong>71.0</strong></td>
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<td>71.0</td>
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<td>434.zeusmp</td>
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<td>436.cactusADM</td>
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<td>489</td>
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<tr>
<td>447.dealII</td>
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<td>93.1</td>
<td>57.2</td>
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<td>465.tonto</td>
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<tr>
<td>470.lbm</td>
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<tr>
<td>481.wrf</td>
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<td>82.1</td>
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<td><strong>81.1</strong></td>
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<tr>
<td>482.sphinx3</td>
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<td>269</td>
<td>72.5</td>
<td><strong>270</strong></td>
<td><strong>72.3</strong></td>
</tr>
</tbody>
</table>

### Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

### Platform Notes

**BIOS Configuration:**

- Operating Mode set to Maximum Performance
- Hyper-Threading set to Disabled
- COD Preference set to Disable

Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6914

$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1 running on XinYi-12 Tue May 10 00:33:56 2016

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

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Lenovo Group Limited

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SPECfp2006 = 97.5
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CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Test date: May-2016
Tested by: Lenovo Group Limited
Hardware Availability: Mar-2016
Software Availability: Dec-2015

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: 263962248 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:
Linux XinYi-12 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 9 19:05

SPEC is set to: /home/cpu2006-1.2-ic16.0
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 668G 7.6G 681G 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 Continued on next page
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Platform Notes (Continued)

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

BIOS LENOVO -[TCE124I-2.10]- 04/27/2016
Memory:
16x Hynix HMA42GR7AFR4N-UH 16 GB 2 rank 2400 MHz, configured at 2133 MHz
8x NO DIMM Unknown

(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-ic16.0/libs/32:/home/cpu2006-1.2-ic16.0/libs/64:/home/cpu2006-1.2-ic16.0/sh"
OMP_NUM_THREADS = "8"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1
Transparent Huge Pages disabled with:
echo never > /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
433.milc:  -DSPEC_CPU_LP64
434.zeusmp:  -DSPEC_CPU_LP64  -nofor_main
436.cactusADM:  -DSPEC_CPU_LP64  -nofor_main
437.leslie3d:  -DSPEC_CPU_LP64
444.namd:  -DSPEC_CPU_LP64  -nofor_main
447.dealII:  -DSPEC_CPU_LP64

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Base Portability Flags (Continued)  
450.soplex: -DSPEC_CPU_LP64  
453.povray: -DSPEC_CPU_LP64  
454.calculix: -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 -parallel -opt-prefetch  
-ansi-alias  
C++ benchmarks:  
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias  
Fortran benchmarks:  
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch  
Benchmarks using both Fortran and C:  
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch  
-ansi-alias  

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  

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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) -prof-use(pass 2) -fno-alias
-auto-llp32

447.dealII: basepeak = yes
450.soplex: basepeak = yes

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) -unroll4
-ansi-alias

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

459.GemsFDTD: -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-

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) -inline-calloc
-opt-malloc-options=3 -auto -unroll4

Benchmarks using both Fortran and C:

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Peak Optimization Flags (Continued)

435.gromacs: basepeak = yes
436.cactusADM: basepeak = yes
454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias
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
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-BDW-revC.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
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Settings-V1.2-BDW-revC.xml

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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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