Lenovo Group Limited

Lenovo System x3850 X6
(2.20 GHz, Intel Xeon E7-8890 v4)

**SPECfp®2006 =** 127

**SPECfp_base2006 =** 118

<table>
<thead>
<tr>
<th>Test sponsor</th>
<th>Lenovo Group Limited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by</td>
<td>Lenovo Group Limited</td>
</tr>
<tr>
<td>Test date</td>
<td>May-2016</td>
</tr>
<tr>
<td>Hardware Availability</td>
<td>Jun-2016</td>
</tr>
<tr>
<td>Software Availability</td>
<td>Dec-2015</td>
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<table>
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<tr>
<th>Software Availability</th>
<th>Dec-2015</th>
</tr>
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<tbody>
<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
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<table>
<thead>
<tr>
<th>Hardware Availability</th>
<th>Dec-2015</th>
</tr>
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<tbody>
<tr>
<td>CPU(s) enabled</td>
<td>96 cores, 4 chips, 24 cores/hip</td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>2.4 chips</td>
</tr>
<tr>
<td>Primary Cache</td>
<td>32 KB L1 + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache</td>
<td>256 KB L1+D on chip per core</td>
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</table>

<table>
<thead>
<tr>
<th>Software Availability</th>
<th>Dec-2015</th>
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</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>SUSE Linux Enterprise Server 12 SP1 (x86_64)</td>
</tr>
<tr>
<td>Compiler</td>
<td>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</td>
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<tr>
<td>Auto Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>File System</td>
<td>xfs</td>
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</table>

**Hardware**

- CPU Name: Intel Xeon E7-8890 v4
- CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz
- CPU MHz: 2200
- FPU: Integrated
- CPU(s) enabled: 96 cores, 4 chips, 24 cores/hip
- CPU(s) orderable: 2.4 chips
- Primary Cache: 32 KB L1 + 32 KB D on chip per core
- Secondary Cache: 256 KB L1+D on chip per core

**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)
## Lenovo Group Limited

**Lenovo System x3850 X6**

(2.20 GHz, Intel Xeon E7-8890 v4)

---

**SPEC CFP2006 Result**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base Pointers:</th>
<th>Peak Pointers:</th>
<th>Other Software:</th>
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<tbody>
<tr>
<td>Lenovo Group Limited</td>
<td>64-bit</td>
<td>32/64-bit</td>
<td>None</td>
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<tr>
<td>Lenovo System x3850 X6</td>
<td>127</td>
<td>118</td>
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**CPU2006 license: 9017**

**Test sponsor:** Lenovo Group Limited

**Test date:** May-2016

**Hardware Availability:** Jun-2016

**Tested by:** Lenovo Group Limited

**Software Availability:** Dec-2015

---

### Results Table

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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
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<td>12.6</td>
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<td>12.5</td>
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<tr>
<td>416.gamess</td>
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<td>459.GemsFDTD</td>
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<tr>
<td>482.sphinx3</td>
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<td>323</td>
<td>60.3</td>
<td>319</td>
<td>61.0</td>
<td>333</td>
<td>58.6</td>
<td>323</td>
<td>60.3</td>
</tr>
</tbody>
</table>

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"*

---

### Platform Notes

**BIOS Configuration:**

Operating Mode set to Maximum Performance

Hyper-Threading set to Disable

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

$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1


This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:

Continued on next page
Lenovo Group Limited
Lenovo System x3850 X6
(2.20 GHz, Intel Xeon E7-8890 v4)

SPECfp2006 = 127
SPECfp_base2006 = 118

CPU2006 license: 9017
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Tested by: Lenovo Group Limited

Test date: May-2016
Hardware Availability: Jun-2016
Software Availability: Dec-2015

Platform Notes (Continued)

http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E7-8890 v4 @ 2.20GHz
  4 "physical id"s (chips)
  96 "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 : 24
siblings : 24
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
  27 28 29
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
  27 28 29
physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
  27 28 29
physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
  27 28 29
cache size : 61440 KB

From /proc/meminfo

MemTotal:       529159564 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 May 4 13:10

SPEC is set to: /home/cpu2006-1.2-ic16.0

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sdc4      xfs  701G  12G  690G  2% /home
Platform Notes (Continued)

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 IBM -[A9E131SDT-1.00]- 04/22/2016
Memory:
  64x NO DIMM Unknown
  32x Samsung M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at 1600 MHz

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 = "96"

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
Lenovo Group Limited
Lenovo System x3850 X6
(2.20 GHz, Intel Xeon E7-8890 v4)

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CPU2006 license: 9017
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Base Portability Flags (Continued)

435.gromacs: -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
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
Lenovo Group Limited
Lenovo System x3850 X6
(2.20 GHz, Intel Xeon E7-8890 v4)

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

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SPECFp_base2006 = 118

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Hardware Availability: Jun-2016
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Peak Portability Flags
Same as Base Portability Flags

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-ilp32
447.dealII: basepeak = yes
450.soplex: basepeak = yes
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) -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: -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 -opt-prefetch -parallel
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

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Lenovo Group Limited

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Peak Optimization Flags (Continued)

465.tonto (continued):
- opt=malloc-options=3 -auto -unroll4

Benchmarks using both Fortran and C:

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-Flags-V1.2-BDW-B.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-Flags-V1.2-BDW-B.xml

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For other inquiries, please contact webmaster@spec.org.

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