Lenovo Group Limited
Lenovo System x3550 M5
(3.50 GHz, Intel Xeon E5-2637 v4)

SPECfp®2006 = 114
SPECfp_base2006 = 110

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

Test date: Apr-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

Hardware
CPU Name: Intel Xeon E5-2637 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz: 3500
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 (x86_64)
Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux
Auto Parallel: Yes
File System: nfs
System State: Run level 3 (multi-user)
Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit

SPECfp_base2006 = 110
SPECfp2006 = 114
Lenovo Group Limited

SPEC CFP2006 Result

Lenovo System x3550 M5
(3.50 GHz, Intel Xeon E5-2637 v4)

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
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L3 Cache: 15 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 1 x 800 GB SATA SSD
Other Hardware: None
Other Software: None

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
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<td>214</td>
<td>90.9</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
- Intel Hyperthreading 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 linux-gj7w Wed Apr 20 19:29:30 2016

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 x3550 M5
(3.50 GHz, Intel Xeon E5-2637 v4)

SPECfp2006 = 114
SPECfp_base2006 = 110

CPU2006 license: 9017
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Test sponsor: Lenovo Group Limited
Test date: Apr-2016

Platform Notes (Continued)

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

From /proc/cpuinfo
model name: Intel(R) Xeon(R) CPU E5-2637 v4 @ 3.50GHz
  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 : 15360 KB

From /proc/meminfo
MemTotal: 263831276 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 linux-gj7w 3.12.28-4-default #1 SMP Thu Sep 25 17:02:34 UTC 2014
  (9879bd4) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Apr 20 14:43

SPEC is set to: /home/cpu2006-1.2-ic16.0
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 703G 11G 693G 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.
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Lenovo Group Limited

Lenovo System x3550 M5 (3.50 GHz, Intel Xeon E5-2637 v4)

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Tested by: Lenovo Group Limited

Test date: Apr-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

Platform Notes (Continued)

BIOS LENOVO -[TBE123H-2.10]- 03/25/2016
Memory:
8x NO DIMM Unknown
16x Samsung M393A2G40DB1-CRC 16 GB 2 rank 2400 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-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
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

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Lenovo Group Limited

Lenovo System x3550 M5
(3.50 GHz, Intel Xeon E5-2637 v4)

SPECfp2006 = 114
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Test date: Apr-2016
Hardware Availability: Mar-2016
Software Availability: Dec-2015

Base Portability Flags (Continued)

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
Lenovo Group Limited

Lenovo System x3550 M5
(3.50 GHz, Intel Xeon E5-2637 v4)

**SPECfp2006** = 114
**SPECfp_base2006** = 110

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

### 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) -03(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) -03(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) -03(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) -03(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) -03(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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Continued on next page
 SPEC CFP2006 Result

Lenovo Group Limited

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<tr>
<th>Lenovo System x3550 M5</th>
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<td>(3.50 GHz, Intel Xeon E5-2637 v4)</td>
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</table>

| CPU2006 license: 9017 | Test date: Apr-2016 |
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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-llp32 -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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