**Lenovo Group Limited**

Lenovo System x3550 M5
(2.10 GHz, Intel Xeon E5-2695 v4)

**SPECfp®2006 = 117**

**SPECfp_base2006 = 110**

**Hardware**

- **CPU Name:** Intel Xeon E5-2695 v4
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.30 GHz
- **CPU MHz:** 2100
- **FPU:** Integrated
- **CPU(s) enabled:** 36 cores, 2 chips, 18 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/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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info@spec.org
http://www.spec.org/
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SPEC CFP2006 Result

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Test sponsor:
Lenovo Group Limited

CPU2006 license: 9017
Test date: May-2016

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Tested by:
Lenovo Group Limited

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

BIOS Configuration:

$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on DaAn-01 Fri May 27 19:40:09 2016

Results Table

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<td>433.milc</td>
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<td>106</td>
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<tr>
<td>482.sphinx3</td>
<td>307</td>
<td>63.5</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

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
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SPECfp2006 = 117
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CPU2006 license: 9017
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Test date: May-2016
Tested by: Lenovo Group Limited
Hardware Availability: Mar-2016
Software Availability: Dec-2015

Platform Notes (Continued)

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E5-2695 v4 @ 2.10GHz
2 "physical id"s (chips)
36 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
following excerpts from /proc/cpuinfo might not be reliable. Use with
cautions.)
cpu cores : 18
siblings : 18
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
cache size : 46080 KB

From /proc/meminfo
MemTotal: 263827712 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 27 00:35

SPEC is set to: /home/cpu2006-1.2-ic16.0
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 688G 28G 661G 5% /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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Platform Notes (Continued)

BIOS LENOVO -[TBE124K-2.10]- 05/10/2016
Memory:
16x Hynix HMA42GR7AFR4N-UH 16 GB 2 rank 2400 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 = "36"

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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**Hardware Availability:** Mar-2016
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### Base Portability Flags (Continued)

- 453.povray: \(-\text{DSPEC\_CPU\_LP64}\)
- 454.calculix: \(-\text{DSPEC\_CPU\_LP64}\) \(-\text{nofor\_main}\)
- 459.GemsFDTD: \(-\text{DSPEC\_CPU\_LP64}\)
- 465.tonto: \(-\text{DSPEC\_CPU\_LP64}\)
- 470.lbm: \(-\text{DSPEC\_CPU\_LP64}\)
- 481.wrf: \(-\text{DSPEC\_CPU\_LP64}\) \(-\text{DSPEC\_CPU\_CASE\_FLAG}\) \(-\text{DSPEC\_CPU\_LINUX}\)
- 482.sphinx3: \(-\text{DSPEC\_CPU\_LP64}\)

### Base Optimization Flags

**C benchmarks:**
- \(-\text{xCORE\_AVX2}\)
- \(-\text{ipo}\)
- \(-\text{O3}\)
- \(-\text{no-prec-div}\)
- \(-\text{parallel}\)
- \(-\text{opt-prefetch}\)
- \(-\text{ansi-alias}\)

**C++ benchmarks:**
- \(-\text{xCORE\_AVX2}\)
- \(-\text{ipo}\)
- \(-\text{O3}\)
- \(-\text{no-prec-div}\)
- \(-\text{opt-prefetch}\)
- \(-\text{ansi-alias}\)

**Fortran benchmarks:**
- \(-\text{xCORE\_AVX2}\)
- \(-\text{ipo}\)
- \(-\text{O3}\)
- \(-\text{no-prec-div}\)
- \(-\text{parallel}\)
- \(-\text{opt-prefetch}\)

**Benchmarks using both Fortran and C:**
- \(-\text{xCORE\_AVX2}\)
- \(-\text{ipo}\)
- \(-\text{O3}\)
- \(-\text{no-prec-div}\)
- \(-\text{parallel}\)
- \(-\text{opt-prefetch}\)
- \(-\text{ansi-alias}\)

### Peak Compiler Invocation

**C benchmarks:**
- \textit{icc} \(-\text{m64}\)

**C++ benchmarks:**
- \textit{icpc} \(-\text{m64}\)

**Fortran benchmarks:**
- \textit{ifort} \(-\text{m64}\)

**Benchmarks using both Fortran and C:**
- \textit{icc} \(-\text{m64}\) \textit{ifort} \(-\text{m64}\)

### Peak Portability Flags

Same as Base Portability Flags
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CPU2006 license: 9017
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Tested by: Lenovo Group Limited

Test date: May-2016
Hardware Availability: Mar-2016
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) -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
           -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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