Lenovo Group Limited
Lenovo NeXtScale nx360 M5
(3.40 GHz, Intel Xeon E5-2643 v4)

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

SPECfp®2006 = 123
SPECfp_base2006 = 119

0 30.0 60.0 90.0 120 150 180 210 240 270 300 330 360 390 420 450 480 510 540 570 600 630 660 690 720 750 780 810 840

410.bwaves
416.gamess
433.milc
434.zeusmp
435.gromacs
436.cactusADM
437.leslie3d
444.namd
447.dealII
450.soplex
453.povray
454.calculix
459.GemsFDTD
465.tonto
470.lbm
481.wrf
482.sphinx3

SPECfp_base2006 = 119
SPECfp2006 = 123

Hardware
CPU Name: Intel Xeon E5-2643 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz: 3400
FPU: Integrated
CPU(s) enabled: 12 cores, 2 chips, 6 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

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)

Software

Continued on next page

Standard Performance Evaluation Corporation
info@spec.org
http://www.spec.org/
Lenovo Group Limited

Lenovo NeXtScale nx360 M5
(3.40 GHz, Intel Xeon E5-2643 v4)

SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

SPECfp2006 = 123
SPECfp_base2006 = 119

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

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

L3 Cache: 20 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

Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

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>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>24.8</td>
<td>548</td>
<td>24.4</td>
<td>558</td>
<td>24.3</td>
<td>559</td>
<td>24.8</td>
<td>548</td>
<td>24.4</td>
<td>558</td>
</tr>
<tr>
<td>416.gamess</td>
<td>447</td>
<td>446</td>
<td>43.9</td>
<td>446</td>
<td>43.9</td>
<td>446</td>
<td>415</td>
<td>47.2</td>
<td>416</td>
<td>47.1</td>
</tr>
<tr>
<td>433.milc</td>
<td>117</td>
<td>78.6</td>
<td>118</td>
<td>77.6</td>
<td>117</td>
<td>78.7</td>
<td>117</td>
<td>78.6</td>
<td>117</td>
<td>78.7</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>43.4</td>
<td>210</td>
<td>43.4</td>
<td>210</td>
<td>43.2</td>
<td>211</td>
<td>43.4</td>
<td>210</td>
<td>43.2</td>
<td>211</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>113</td>
<td>63.4</td>
<td>112</td>
<td>63.5</td>
<td>112</td>
<td>63.6</td>
<td>113</td>
<td>63.4</td>
<td>112</td>
<td>63.5</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>16.4</td>
<td>728</td>
<td>16.2</td>
<td>736</td>
<td>16.3</td>
<td>732</td>
<td>16.4</td>
<td>728</td>
<td>16.2</td>
<td>736</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>33.2</td>
<td>283</td>
<td>32.3</td>
<td>291</td>
<td>32.2</td>
<td>292</td>
<td>32.2</td>
<td>283</td>
<td>32.3</td>
<td>291</td>
</tr>
<tr>
<td>444.namd</td>
<td>246</td>
<td>32.6</td>
<td>246</td>
<td>32.6</td>
<td>246</td>
<td>32.6</td>
<td>239</td>
<td>33.6</td>
<td>239</td>
<td>33.6</td>
</tr>
<tr>
<td>447.dealII</td>
<td>160</td>
<td>71.4</td>
<td>161</td>
<td>71.2</td>
<td>161</td>
<td>71.0</td>
<td>160</td>
<td>71.4</td>
<td>161</td>
<td>71.0</td>
</tr>
<tr>
<td>450.soplex</td>
<td>166</td>
<td>50.3</td>
<td>167</td>
<td>50.1</td>
<td>166</td>
<td>50.2</td>
<td>166</td>
<td>50.3</td>
<td>167</td>
<td>50.1</td>
</tr>
<tr>
<td>453.povray</td>
<td>82.8</td>
<td>64.3</td>
<td>82.9</td>
<td>64.2</td>
<td>83.4</td>
<td>63.8</td>
<td>73.2</td>
<td>72.7</td>
<td>73.8</td>
<td>72.1</td>
</tr>
<tr>
<td>454.calculix</td>
<td>131</td>
<td>63.1</td>
<td>131</td>
<td>63.1</td>
<td>131</td>
<td>63.0</td>
<td>126</td>
<td>65.5</td>
<td>126</td>
<td>65.5</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>49.0</td>
<td>216</td>
<td>48.6</td>
<td>218</td>
<td>48.6</td>
<td>218</td>
<td>42.2</td>
<td>251</td>
<td>41.9</td>
<td>253</td>
</tr>
<tr>
<td>465.tonto</td>
<td>184</td>
<td>53.5</td>
<td>184</td>
<td>53.4</td>
<td>184</td>
<td>53.5</td>
<td>161</td>
<td>61.0</td>
<td>161</td>
<td>61.0</td>
</tr>
<tr>
<td>470.lbm</td>
<td>18.8</td>
<td>729</td>
<td>19.0</td>
<td>725</td>
<td>18.8</td>
<td>732</td>
<td>18.8</td>
<td>729</td>
<td>19.0</td>
<td>725</td>
</tr>
<tr>
<td>481.wrf</td>
<td>111</td>
<td>100</td>
<td>111</td>
<td>101</td>
<td>111</td>
<td>101</td>
<td>111</td>
<td>100</td>
<td>111</td>
<td>101</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>211</td>
<td>92.2</td>
<td>212</td>
<td>91.8</td>
<td>212</td>
<td>91.7</td>
<td>211</td>
<td>92.2</td>
<td>212</td>
<td>91.8</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 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 wilykat-05 Thu May 19 00:43:52 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 NeXtScale nx360 M5
(3.40 GHz, Intel Xeon E5-2643 v4)

SPECfp2006 = 123
SPECfp_base2006 = 119

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Test date: May-2016
Hardware Availability: Mar-2016
Tested by: Lenovo Group Limited
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 E5-2643 v4 @ 3.40GHz
2 "physical id"s (chips)
12 "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 : 6
siblings : 6
physical 0: cores 0 1 2 3 6 7
physical 1: cores 0 1 2 3 6 7
cache size : 20480 KB

From /proc/meminfo
MemTotal: 263968112 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 18 19:42

SPEC is set to: /home/cpu2006-1.2-ic16.0
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 703G 7.9G 695G 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.

Continued on next page
Lenovo NeXtScale nx360 M5
(3.40 GHz, Intel Xeon E5-2643 v4)

SPECfp2006 = 123
SPECfp_base2006 = 119

Platform Notes (Continued)

BIOS LENOVO -[THE124GUS-2.10]- 04/28/2016
Memory:
  16x Hynix HMA42GR7AFR4N-UH 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 = "12"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB
memory using RedHat EL 7.1
Transparent Huge Pages enabled with:
echo always > /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 -nofor_main
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
Lenovo Group Limited

Lenovo NeXtScale nx360 M5
(3.40 GHz, Intel Xeon E5-2643 v4)

SPECfp2006 = 123
SPECfp_base2006 = 119

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

Base Portability Flags (Continued)

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
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-call
  -opt-malloc-options=3 -auto -unroll4

Benchmarks using both Fortran and C:

Continued on next page
Lenovo Group Limited

Lenovo NeXtScale nx360 M5
(3.40 GHz, Intel Xeon E5-2643 v4)

SPECfp2006 = 123
SPECfp_base2006 = 119

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

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

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU2006 v1.2.
Originally published on 28 June 2016.