Lenovo Group Limited
Lenovo ThinkServer TS150
(3.40 GHz, Intel Xeon E3-1230 v5)

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

CPU Name: Intel Xeon E3-1230 v5
CPU Characteristics: Intel Turbo Boost Technology up to 3.80 GHz
CPU MHz: 3400
FPU: Integrated
CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip
CPU(s) orderable: 1 chip
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 (x86_64)
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)

SPECfp®2006 = 98.0
SPECfp_base2006 = 95.9

Hardware
Software

Continued on next page
Continued on next page
Lenovo Group Limited

Lenovo ThinkServer TS150
(3.40 GHz, Intel Xeon E3-1230 v5)

CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited
CPU: 8 MB I+D on chip per chip
L3 Cache: 8 MB I+D on chip per chip
Memory: 32 GB (4 x 8 GB 2Rx8 PC4-2133P-U)
Disk Subsystem: 1 x 800 GB SATA SSD
Other Hardware: None
Other Cache: None
Other Software: None
Base Pointers: 64-bit
Peak Pointers: 32/64-bit

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>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>96.8</td>
<td>140</td>
<td>96.7</td>
<td>141</td>
<td>96.7</td>
<td>141</td>
<td>96.8</td>
<td>140</td>
<td>96.7</td>
<td>141</td>
<td>96.7</td>
<td>141</td>
</tr>
<tr>
<td>416.gamess</td>
<td>401</td>
<td>48.8</td>
<td>399</td>
<td>49.1</td>
<td>399</td>
<td>49.1</td>
<td>362</td>
<td>54.2</td>
<td>362</td>
<td>54.1</td>
<td>361</td>
<td>54.2</td>
</tr>
<tr>
<td>433.milc</td>
<td>81.9</td>
<td>112</td>
<td>81.6</td>
<td>113</td>
<td>81.6</td>
<td>113</td>
<td>81.9</td>
<td>112</td>
<td>81.6</td>
<td>113</td>
<td>81.6</td>
<td>113</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>43.8</td>
<td>208</td>
<td>43.8</td>
<td>208</td>
<td>43.8</td>
<td>208</td>
<td>43.8</td>
<td>208</td>
<td>43.8</td>
<td>208</td>
<td>43.8</td>
<td>208</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>107</td>
<td>66.7</td>
<td>107</td>
<td>66.7</td>
<td>107</td>
<td>66.6</td>
<td>107</td>
<td>66.7</td>
<td>107</td>
<td>66.7</td>
<td>107</td>
<td>66.6</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>33.1</td>
<td>361</td>
<td>33.1</td>
<td>361</td>
<td>32.8</td>
<td>365</td>
<td>33.1</td>
<td>361</td>
<td>33.1</td>
<td>361</td>
<td>32.8</td>
<td>365</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>87.1</td>
<td>108</td>
<td>87.1</td>
<td>108</td>
<td>87.1</td>
<td>108</td>
<td>87.1</td>
<td>108</td>
<td>87.1</td>
<td>108</td>
<td>87.1</td>
<td>108</td>
</tr>
<tr>
<td>444.namd</td>
<td>219</td>
<td>36.6</td>
<td>219</td>
<td>36.6</td>
<td>219</td>
<td>36.6</td>
<td>215</td>
<td>37.3</td>
<td>216</td>
<td>37.2</td>
<td>215</td>
<td>37.3</td>
</tr>
<tr>
<td>447.dealII</td>
<td>143</td>
<td>80.0</td>
<td>143</td>
<td>80.0</td>
<td>143</td>
<td>80.1</td>
<td>143</td>
<td>80.0</td>
<td>143</td>
<td>80.0</td>
<td>143</td>
<td>80.0</td>
</tr>
<tr>
<td>450.soplex</td>
<td>147</td>
<td>56.7</td>
<td>148</td>
<td>56.2</td>
<td>150</td>
<td>55.7</td>
<td>147</td>
<td>56.7</td>
<td>148</td>
<td>56.2</td>
<td>150</td>
<td>55.7</td>
</tr>
<tr>
<td>453.povray</td>
<td>75.3</td>
<td>70.6</td>
<td>74.8</td>
<td>71.1</td>
<td>75.5</td>
<td>70.5</td>
<td>66.2</td>
<td>80.3</td>
<td>66.2</td>
<td>80.4</td>
<td>66.2</td>
<td>80.3</td>
</tr>
<tr>
<td>454.calculix</td>
<td>108</td>
<td>76.6</td>
<td>108</td>
<td>76.6</td>
<td>108</td>
<td>76.6</td>
<td>107</td>
<td>77.4</td>
<td>107</td>
<td>77.3</td>
<td>107</td>
<td>77.4</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>128</td>
<td>83.0</td>
<td>128</td>
<td>82.9</td>
<td>128</td>
<td>82.9</td>
<td>126</td>
<td>84.2</td>
<td>126</td>
<td>84.1</td>
<td>126</td>
<td>84.1</td>
</tr>
<tr>
<td>465.tonto</td>
<td>151</td>
<td>65.3</td>
<td>151</td>
<td>65.3</td>
<td>150</td>
<td>65.4</td>
<td>137</td>
<td>72.0</td>
<td>137</td>
<td>71.9</td>
<td>137</td>
<td>71.9</td>
</tr>
<tr>
<td>470.lbm</td>
<td>73.3</td>
<td>188</td>
<td>73.2</td>
<td>188</td>
<td>73.3</td>
<td>188</td>
<td>73.3</td>
<td>188</td>
<td>73.2</td>
<td>188</td>
<td>73.3</td>
<td>188</td>
</tr>
<tr>
<td>481.wrf</td>
<td>87.4</td>
<td>128</td>
<td>87.4</td>
<td>128</td>
<td>87.5</td>
<td>128</td>
<td>87.4</td>
<td>128</td>
<td>87.4</td>
<td>128</td>
<td>87.5</td>
<td>128</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>192</td>
<td>101</td>
<td>193</td>
<td>101</td>
<td>194</td>
<td>100</td>
<td>192</td>
<td>101</td>
<td>193</td>
<td>101</td>
<td>194</td>
<td>100</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:
EIST Support set to Enabled
Intel (R) Hyper-Threading set to Disabled
C1E Support set to Enabled
C State Support set to Enabled
Turbo Mode set to Enable
Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1

Continued on next page
Lenovo Group Limited

Lenovo ThinkServer TS150
(3.40 GHz, Intel Xeon E3-1230 v5)

SPECfp2006 = 98.0
SPECfp_base2006 = 95.9

CPU2006 license: 9017
Test date: Jan-2016
Test sponsor: Lenovo Group Limited
Hardware Availability: Oct-2015
Tested by: Lenovo Group Limited
Software Availability: Aug-2015

Platform Notes (Continued)

This section contains SUT (System Under Test) info as seen by 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 E3-1230 v5 @ 3.40GHz
1 "physical id"s (chips)
4 "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
  cache size : 8192 KB

From /proc/meminfo

MemTotal:       32933324 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 TS150 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 Jan 6 09:02

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

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 693G 27G 667G 4% /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
Lenovo Group Limited
Lenovo ThinkServer TS150
(3.40 GHz, Intel Xeon E3-1230 v5)

SPECfp2006 = 98.0
SPECfp_base2006 = 95.9

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

Platform Notes (Continued)

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

BIOS LENOVO FWKT32A 12/25/2015
Memory:
4x Samsung M378A1G43DB0-CPB 8 GB 2 rank 2133 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,1,0"
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 = "4"

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
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
## SPEC CFP2006 Result

**Lenovo Group Limited**

Lenovo ThinkServer TS150  
(3.40 GHz, Intel Xeon E3-1230 v5)

<table>
<thead>
<tr>
<th>SPECfp2006</th>
<th>98.0</th>
<th>Test date: Jan-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>95.9</td>
<td>Hardware Availability: Oct-2015</td>
</tr>
</tbody>
</table>

**CPU2006**  
license: 9017

**Test sponsor:** Lenovo Group Limited

**Tested by:** Lenovo Group Limited

---

### 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 ThinkServer TS150
(3.40 GHz, Intel Xeon E3-1230 v5)

SPECfp2006 = 98.0
SPECfp_base2006 = 95.9

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

Test date: Jan-2016
Hardware Availability: Oct-2015
Software Availability: Aug-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)
-xipo(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)
-xipo(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)
-xipo(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)
-xipo(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)
-xipo(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:

Continued on next page
Lenovo Group Limited
Lenovo ThinkServer TS150
(3.40 GHz, Intel Xeon E3-1230 v5)

SPECfp2006 = 98.0
SPECfp_base2006 = 95.9

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

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