## SPEC® CFP2006 Result

**Lenovo Group Limited**

Lenovo ThinkServer TS450 (3.60 GHz, Intel Xeon E3-1275 v5)

<table>
<thead>
<tr>
<th>SPECfp®2006 = 101</th>
<th>SPECfp_base2006 = 98.1</th>
</tr>
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</table>

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

**CPU Name:** Intel Xeon E3-1275 v5  
**CPU Characteristics:** Intel Turbo Boost Technology up to 4.00 GHz  
**CPU MHz:** 3600  
**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

### Software

- **Operating System:** SUSE Linux Enterprise Server 12 (x86_64)  
  Kernel 3.12.28-4-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)

### Hardware

- **410.bwaves**  
  57.0
- **416.gamess**  
  50.6
- **433.milc**  
  115
- **434.zeusmp**  
  210
- **435.gromacs**  
  68.7
- **436.cactusADM**  
  365
- **437.leslie3d**  
  108
- **444.namd**  
  39.2
- **447.dealII**  
  84.0
- **450.soplex**  
  57.8
- **453.povray**  
  84.5
- **454.calculix**  
  74.5
- **459.GemsFDTD**  
  84.4  
  83.2
- **465.tonto**  
  75.6
- **470.lbm**  
  67.4
- **481.wrf**  
  129
- **482.sphinx3**  
  104

**SPECfp_base2006 = 98.1**  
**SPECfp2006 = 101**
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L3 Cache: 8 MB I+D on chip per chip
Other Cache: None
Memory: 32 GB (4 x 8 GB 2Rx8 PC4-2133P-U)
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

Benchmark | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
410.bwaves | 96.9 | 140 | 96.9 | 140 | 96.3 | 141 | 96.9 | 140 | 96.9 | 140 | 96.3 | 141
416.gamess | 387 | 50.6 | 387 | 50.5 | 387 | 50.6 | 344 | 57.0 | 344 | 57.0 | 344 | 56.9
433.milc | 80.1 | 115 | 79.9 | 115 | 80.0 | 115 | 80.1 | 115 | 79.9 | 115 | 80.0 | 115
434.zeusmp | 43.5 | 209 | 43.4 | 210 | 43.4 | 210 | 43.5 | 209 | 43.4 | 210 | 43.4 | 210
435.gromacs | 104 | 68.8 | 104 | 68.7 | 104 | 68.8 | 104 | 68.8 | 104 | 68.7 | 104 | 68.5
436.cactusADM | 32.7 | 365 | 32.5 | 368 | 32.9 | 363 | 32.7 | 365 | 32.5 | 368 | 32.9 | 363
437.leslie3d | 87.1 | 108 | 86.7 | 108 | 86.9 | 108 | 87.1 | 108 | 86.7 | 108 | 86.9 | 108
444.namd | 208 | 38.5 | 208 | 38.5 | 208 | 38.5 | 205 | 39.2 | 205 | 39.2 | 205 | 39.2
447.dealII | 136 | 83.9 | 136 | 84.0 | 136 | 84.0 | 136 | 83.9 | 136 | 84.0 | 136 | 84.0
450.soplex | 145 | 57.3 | 144 | 57.8 | 144 | 57.8 | 145 | 57.3 | 144 | 57.8 | 144 | 57.8
453.povray | 71.5 | 74.4 | 71.3 | 74.6 | 71.4 | 74.5 | 62.6 | 85.0 | 63.0 | 84.4 | 62.9 | 84.5
454.calculix | 103 | 79.8 | 103 | 79.8 | 103 | 79.8 | 101 | 81.6 | 101 | 81.3 | 101 | 81.6
459.GemsFDTD | 127 | 83.2 | 128 | 83.1 | 127 | 83.2 | 126 | 84.3 | 126 | 84.5 | 126 | 84.4
465.tonto | 146 | 67.5 | 146 | 67.4 | 146 | 67.4 | 130 | 75.5 | 130 | 75.8 | 130 | 75.6
470.lbm | 73.4 | 187 | 73.4 | 187 | 73.4 | 187 | 73.4 | 187 | 73.4 | 187 | 73.4 | 187
481.wrf | 86.5 | 129 | 86.2 | 130 | 86.5 | 129 | 86.5 | 129 | 86.2 | 130 | 86.5 | 129
482.sphinx3 | 186 | 105 | 187 | 104 | 187 | 104 | 186 | 105 | 187 | 104 | 187 | 104

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 $ $Date:: 2014-06-25 #$ e3fb68667b5a285932ceab81e28219e1
running on TS450-SLE12 Fri Feb 19 22:26:12 2016
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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 E3-1275 v5 @ 3.60GHz
  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 TS450-SLE12 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 Feb 19 18:22

SPEC is set to: /home/cpu2006-1.2-ic16.0
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 600G 7.6G 593G 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
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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

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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
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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

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

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