Lenovo Global Technology
ThinkSystem SN850
(2.60 GHz, Intel Xeon Gold 6126)

SPECfp®2006 = 151
SPECfp_base2006 = 144

Hardware
- CPU Name: Intel Xeon Gold 6126
- CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz
- CPU MHz: 2600
- FPU: Integrated
- CPU(s) enabled: 48 cores, 4 chips, 12 cores/chip
- CPU(s) orderable: 2,4 chips
- Primary Cache: 32 KB I + 32 KB D on chip per core
- Secondary Cache: 1 MB I+D on chip per core

Software
- Operating System: SUSE Linux Enterprise Server 12 SP2 (x86_64)
  Kernel 4.4.21-69-default
- Compiler: C/C++: Version 17.0.0.098 of Intel C/C++ Compiler for Linux;
  Fortran: Version 17.0.0.098 of Intel Fortran Compiler for Linux
- Auto Parallel: Yes
- File System: xfs
- System State: Run level 3 (multi-user)
## Lenovo Global Technology

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(2.60 GHz, Intel Xeon Gold 6126)

<table>
<thead>
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<td>Lenovo Global Technology</td>
</tr>
</tbody>
</table>

L3 Cache: 19.25 MB I+D on chip per chip
Other Cache: None
Memory: 1536 GB (48 x 32 GB 2Rx4 PC4-2666V-R)
Disk Subsystem: 1 x 960 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>
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<tbody>
<tr>
<td>416.gamess</td>
<td>405</td>
<td>48.3</td>
<td>405</td>
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<td>388</td>
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<td>390</td>
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<td>444.namd</td>
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<td>35.6</td>
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<td>447.dealII</td>
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<td>70.7</td>
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<td>453.povray</td>
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<td>69.8</td>
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<tr>
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<tr>
<td>459.GemsFDTD</td>
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<td>465.tonto</td>
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<td>481.wrf</td>
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<tr>
<td>482.sphinx3</td>
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<td>254</td>
<td>76.7</td>
<td>255</td>
<td>76.7</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:
- Choose Operating Mode set to Maximum Performance
- Hyper-Threading set to Disable
- Per Core P-state set to Disable
- DCA set to Disable
- Patrol Scrub set to Disable
- LLC dead line alloc set to Disable

Sysinfo program /home/cpu2006-1.2-ic17.0/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on SN850-01 Mon Sep 18 10:29:12 2017

Continued on next page
**SPEC CFP2006 Result**

**Lenovo Global Technology**

ThinkSystem SN850  
(2.60 GHz, Intel Xeon Gold 6126)  

SPECfp2006 = 151  
SPECfp_base2006 = 144  

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<td>Software Availability:</td>
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</tr>
</tbody>
</table>

**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) Gold 6126 CPU @ 2.60GHz
- 4 "physical id"s (chips)
- 48 "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: 12
  - Siblings: 12
  - Physical 0: cores 0 1 3 4 5 6 8 9 10 11 12 13
  - Physical 1: cores 0 1 2 4 5 6 8 9 10 11 13 14
  - Physical 2: cores 0 1 3 4 5 6 8 9 10 11 12 13
  - Physical 3: cores 0 1 2 4 5 6 8 9 10 11 13 14

Cache size: 19712 KB

From /proc/meminfo

- MemTotal: 1584968300 KB
- HugePages_Total: 0
- Hugepagesize: 2048 KB

From /etc/*release*/etc/*version*

- SuSE-release:
  - NAME="SLES"
  - VERSION="12-SP2"
  - VERSION_ID="12.2"
  - PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
  - ID="sles"
  - ANSI_COLOR="0;32"
  - CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:

  (9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Sep 18 10:28

SPEC is set to: /home/cpu2006-1.2-ic17.0

Additional information from dmidecode:  
Continued on next page
Lenovo Global Technology
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Platform Notes (Continued)

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.

BIOS Lenovo -[IVE109A-1.00] - 04/27/2017
Memory:
48x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666 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-ic17.0/lib32:/home/cpu2006-1.2-ic17.0/lib64:/home/cpu2006-1.2-ic17.0/sh10.2"
OMP_NUM_THREADS = "48"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.2
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

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# SPEC CFP2006 Result

**Lenovo Global Technology**  
**ThinkSystem SN850**  
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## Base Portability Flags (Continued)

- 437 Leslie3d: `-DSPEC_CPU_LP64`
- 444 namd: `-DSPEC_CPU_LP64`
- 447 dealII: `-DSPEC_CPU_LP64`
- 450 soplex: `-DSPEC_CPU_LP64`
- 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`  
- `-qopt-prefetch`

### C++ benchmarks:

- `-xCORE-AVX2`  
- `-ipo`  
- `-O3`  
- `-no-prec-div`  
- `-qopt-prefetch`

### Fortran benchmarks:

- `-xCORE-AVX2`  
- `-ipo`  
- `-O3`  
- `-no-prec-div`  
- `-parallel`  
- `-qopt-prefetch`

### Benchmarks using both Fortran and C:

- `-xCORE-AVX2`  
- `-ipo`  
- `-O3`  
- `-no-prec-div`  
- `-parallel`  
- `-qopt-prefetch`

## 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 Global Technology
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CPU2006 license: 9017
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Tested by: Lenovo Global Technology
Test date: Sep-2017
Hardware Availability: Aug-2017
Software Availability: Nov-2016

Peak Optimization Flags

C benchmarks:
433.milc: basepeak = yes
470.lbm: basepeak = yes
482.sphinx3: basepeak = yes

C++ benchmarks:
444.namd: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -fno-alias -auto-llp32
447.dealII: basepeak = yes
450.soplex: basepeak = yes
453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:
410.bwaves: basepeak = yes
416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll2 -inline-level=0 -scalar-rep-
434.zeusmp: basepeak = yes
437.leslie3d: basepeak = yes
459.GemsFDTD: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll2 -inline-level=0 -qopt-prefetch -parallel
465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -inline-calloc -qopt-malloc-options=3
-auto -unroll4

Benchmarks using both Fortran and C:
435.gromacs: basepeak = yes
436.cactusADM: basepeak = yes

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Peak Optimization Flags (Continued)
454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32
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-ic17.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-C.20171004.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-C.20171004.xml

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