## Lenovo Global Technology

ThinkSystem SR530
(3.60 GHz, Intel Xeon Platinum 8156)

### Software Availability
Aug-2017

### Hardware

<table>
<thead>
<tr>
<th>CPU Name</th>
<th>Intel Xeon Platinum 8156</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics</td>
<td>Intel Turbo Boost Technology up to 3.70 GHz</td>
</tr>
<tr>
<td>CPU MHz</td>
<td>3600</td>
</tr>
<tr>
<td>FPU</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled</td>
<td>8 cores, 2 chips, 4 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>1.2 chips</td>
</tr>
<tr>
<td>Primary Cache</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache</td>
<td>1 MB I+D on chip per core</td>
</tr>
</tbody>
</table>

### 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
btrfs

### System State
Run level 3 (multi-user)

---

### SPECfp®2006 = 125

### SPECfp_base2006 = 122

---

### CPU2006 license:
9017

### Test sponsor:
Lenovo Global Technology

### Tested by:
Lenovo Global Technology

### Test date:
Jul-2017

### Hardware Availability:
Aug-2017

### Software Availability:
Nov-2016

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<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Score</th>
</tr>
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<tbody>
<tr>
<td>410.bwaves</td>
<td>51.8</td>
</tr>
<tr>
<td>416.gamess</td>
<td>49.3</td>
</tr>
<tr>
<td>433.milc</td>
<td>72.9</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>214</td>
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<tr>
<td>436.cactusADM</td>
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<tr>
<td>437.leslie3d</td>
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</tr>
<tr>
<td>444.namd</td>
<td>36.5</td>
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<tr>
<td>447.dealII</td>
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<tr>
<td>450.soplex</td>
<td>47.2</td>
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<td>453.povray</td>
<td>79.1</td>
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<td>454.calculix</td>
<td>76.3</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>77.0</td>
</tr>
<tr>
<td>465.tonto</td>
<td>68.7</td>
</tr>
<tr>
<td>470.lbm</td>
<td>59.9</td>
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<tr>
<td>481.wrf</td>
<td>99.4</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>89.6</td>
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</table>

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**Continued on next page**
## Lenovo Global Technology

### SPECsp2006 Result

<table>
<thead>
<tr>
<th>Lenovo Global Technology</th>
<th>SPECfp2006 =</th>
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<tbody>
<tr>
<td>ThinkSystem SR530 (3.60 GHz, Intel Xeon Platinum 8156)</td>
<td>SPECfp_base2006 =</td>
<td>122</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 9017

**Test sponsor:** Lenovo Global Technology

**Tested by:** Lenovo Global Technology

- **L3 Cache:** 16.5 MB I+D on chip per chip
- **Other Cache:** None
- **Memory:** 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R)
- **Disk Subsystem:** 1 x 800 GB SATA SSD
- **Other Hardware:** None

<table>
<thead>
<tr>
<th>Base Pointers:</th>
<th>64-bit</th>
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<tr>
<td>Peak Pointers:</td>
<td>32/64-bit</td>
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<tr>
<td>Other Software:</td>
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**Test date:** Jul-2017

**Hardware Availability:** Aug-2017

**Software Availability:** Nov-2016

### Results Table

<table>
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<tr>
<th>Benchmark</th>
<th>Seconds Base</th>
<th>Ratio</th>
<th>Seconds Base</th>
<th>Ratio</th>
<th>Seconds Base</th>
<th>Ratio</th>
<th>Seconds Peak</th>
<th>Ratio</th>
<th>Seconds Peak</th>
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<td><strong>217</strong></td>
<td><strong>89.6</strong></td>
<td>218</td>
<td>89.4</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
- Uncore Frequency Scaling 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 linux-ickx Tue Jul 18 01:29:54 2017

This section contains SUT (System Under Test) info as seen by

Continued on next page
Platform Notes (Continued)

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) Platinum 8156 CPU @ 3.60GHz
  2 "physical id"s (chips)
  8 "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 3 10 13
  physical 1: cores 1 5 9 13
  cache size : 16896 KB

From /proc/meminfo
MemTotal: 395883116 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 2
  # 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-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 Jul 18 01:08

SPEC is set to: /home/cpu2006-1.2-ic17.0
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 btrfs 744G 118G 625G 16% /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 Global Technology
ThinkSystem SR530
(3.60 GHz, Intel Xeon Platinum 8156)

**SPECfp2006 = 125**
**SPECfp_base2006 = 122**

<table>
<thead>
<tr>
<th>CPU2006 license: 9017</th>
<th>Test date: Jul-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor: Lenovo Global Technology</td>
<td>Hardware Availability: Aug-2017</td>
</tr>
<tr>
<td>Tested by: Lenovo Global Technology</td>
<td>Software Availability: Nov-2016</td>
</tr>
</tbody>
</table>

Platform Notes (Continued)

- hardware, firmware, and the "DMTF SMBIOS" standard.
- BIOS Lenovo -[TEE105Z-1.00]- 04/27/2017
- Memory: 12x Hynix HMA84GR7AFR4N-VK 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/libs/32:/home/cpu2006-1.2-ic17.0/libs/64:/home/cpu2006-1.2-ic17.0/sh10.2"
- OMP_NUM_THREADS = "8"

- 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
- 437.leslie3d: -DSPEC_CPU_LP64 -nofor_main
- 444.namd: -DSPEC_CPU_LP64
- 447.dealII: -DSPEC_CPU_LP64
- 450.soplex: -DSPEC_CPU_LP64

Continued on next page
# SPEC CFP2006 Result

**Lenovo Global Technology**  
ThinkSystem SR530  
(3.60 GHz, Intel Xeon Platinum 8156)  

| SPECfp2006 = | 125 |
| SPECfp_base2006 = | 122 |

*CPU2006 license: 9017*  
*Test sponsor: Lenovo Global Technology*  
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*CPU2006 license: 9017*  
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| Test date: | Jul-2017 |
| Hardware Availability: | Aug-2017 |
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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 -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
ThinkSystem SR530
(3.60 GHz, Intel Xeon Platinum 8156)

SPECfp2006 = 125
SPECfp_base2006 = 122

CPU2006 license: 9017
Test sponsor: Lenovo Global Technology
Test date: Jul-2017
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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-Ilp32

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-callloc -qopt-malloc-options=3
-auto -unroll4

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes
436.cactusADM: basepeak = yes
Lenovo Global Technology
ThinkSystem SR530
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CPU2006 license: 9017
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Test date: Jul-2017
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Software Availability: Nov-2016

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.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.xml

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

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