Lenovo Global Technology
ThinkSystem SN550
(2.40 GHz, Intel Xeon Gold 5115)

CPU2006 license: 9017  
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Hardware
CPU Name: Intel Xeon Gold 5115
CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz
CPU MHz: 2400
FPU: Integrated
CPU(s) enabled: 20 cores, 2 chips, 10 cores/chip
CPU(s) orderable: 1.2 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)

SPECfp®2006 = 126
SPECfp_base2006 = 121
## Lenovo Global Technology

**ThinkSystem SN550**  
(2.40 GHz, Intel Xeon Gold 5115)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2006 license</td>
<td>9017</td>
</tr>
<tr>
<td>Test sponsor</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>Tested by</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>Test date</td>
<td>Jul-2017</td>
</tr>
<tr>
<td>Hardware Availability</td>
<td>Aug-2017</td>
</tr>
<tr>
<td>Software Availability</td>
<td>Nov-2016</td>
</tr>
<tr>
<td>L3 Cache</td>
<td>13.75 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>768 GB (24 x 32 GB 2Rx4 PC4-2666V-R, running at 2400 MHz)</td>
</tr>
<tr>
<td>Disk Subsystem</td>
<td>1 x 800 GB SATA SSD</td>
</tr>
<tr>
<td>Other Hardware</td>
<td>None</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other Software</td>
<td>None</td>
</tr>
</tbody>
</table>

### 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>18.8</td>
<td>724</td>
<td>18.8</td>
<td>724</td>
<td>18.7</td>
<td>727</td>
<td>18.8</td>
<td>724</td>
<td>18.8</td>
<td>724</td>
</tr>
<tr>
<td>416.gamess</td>
<td>472</td>
<td>41.5</td>
<td>473</td>
<td>41.4</td>
<td>472</td>
<td>41.5</td>
<td>437</td>
<td>44.8</td>
<td>437</td>
<td>44.8</td>
</tr>
<tr>
<td>433.milc</td>
<td>139</td>
<td>66.3</td>
<td>137</td>
<td>67.0</td>
<td>138</td>
<td>66.4</td>
<td>139</td>
<td>66.3</td>
<td>137</td>
<td>67.0</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>39.8</td>
<td>229</td>
<td>40.0</td>
<td>228</td>
<td>40.0</td>
<td>228</td>
<td>39.8</td>
<td>229</td>
<td>40.0</td>
<td>228</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>149</td>
<td>47.9</td>
<td>149</td>
<td>48.0</td>
<td>150</td>
<td>47.7</td>
<td>149</td>
<td>47.9</td>
<td>149</td>
<td>48.0</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>11.7</td>
<td>1020</td>
<td>11.4</td>
<td>1050</td>
<td>11.5</td>
<td>1040</td>
<td>11.7</td>
<td>1020</td>
<td>11.4</td>
<td>1050</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>21.1</td>
<td>446</td>
<td>21.0</td>
<td>447</td>
<td>21.6</td>
<td>435</td>
<td>21.1</td>
<td>446</td>
<td>21.0</td>
<td>447</td>
</tr>
<tr>
<td>444.namd</td>
<td>261</td>
<td>30.7</td>
<td>261</td>
<td>30.7</td>
<td>261</td>
<td>30.7</td>
<td>255</td>
<td>31.5</td>
<td>255</td>
<td>31.5</td>
</tr>
<tr>
<td>447.dealII</td>
<td>185</td>
<td>62.0</td>
<td>185</td>
<td>61.7</td>
<td>185</td>
<td>61.8</td>
<td>185</td>
<td>62.0</td>
<td>185</td>
<td>61.7</td>
</tr>
<tr>
<td>450.soplex</td>
<td>201</td>
<td>41.4</td>
<td>203</td>
<td>41.1</td>
<td>202</td>
<td>41.2</td>
<td>201</td>
<td>41.4</td>
<td>203</td>
<td>41.1</td>
</tr>
<tr>
<td>453.povray</td>
<td>87.9</td>
<td>60.5</td>
<td>87.8</td>
<td>60.6</td>
<td>87.8</td>
<td>60.6</td>
<td>77.0</td>
<td>69.1</td>
<td>77.4</td>
<td>68.7</td>
</tr>
<tr>
<td>454.calcix</td>
<td>13.3</td>
<td>62.1</td>
<td>133</td>
<td>62.2</td>
<td>133</td>
<td>62.0</td>
<td>125</td>
<td>66.0</td>
<td>125</td>
<td>65.8</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>42.0</td>
<td>252</td>
<td>41.7</td>
<td>254</td>
<td>41.3</td>
<td>257</td>
<td>35.6</td>
<td>298</td>
<td>35.6</td>
<td>298</td>
</tr>
<tr>
<td>465.tonto</td>
<td>226</td>
<td>43.5</td>
<td>229</td>
<td>42.9</td>
<td>228</td>
<td>43.2</td>
<td>170</td>
<td>57.9</td>
<td>170</td>
<td>57.8</td>
</tr>
<tr>
<td>470.lbm</td>
<td>12.7</td>
<td>1080</td>
<td>12.8</td>
<td>1070</td>
<td>12.8</td>
<td>1070</td>
<td>12.7</td>
<td>1080</td>
<td>12.8</td>
<td>1070</td>
</tr>
<tr>
<td>481.wrf</td>
<td>101</td>
<td>111</td>
<td>102</td>
<td>110</td>
<td>101</td>
<td>110</td>
<td>101</td>
<td>111</td>
<td>102</td>
<td>110</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>302</td>
<td>64.6</td>
<td>301</td>
<td>64.7</td>
<td>299</td>
<td>65.3</td>
<td>302</td>
<td>64.6</td>
<td>301</td>
<td>64.7</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  
  - DCU Streamer Prefetcher 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)  

Continued on next page
Platform Notes (Continued)

running on SN550 Tue Jul 25 09:29:41 2017

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 5115 CPU @ 2.40GHz
  2 "physical id"s (chips)
  20 "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 : 10
  siblings : 10
  physical 0: cores 0 1 2 3 4 8 9 10 11 12
  physical 1: cores 0 1 2 3 4 8 9 10 11 12
  cache size : 14080 KB

From /proc/meminfo
MemTotal:       792245896 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:
  Linux SN550 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67)
  x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jul 25 09:28

SPEC is set to: /home/cpu2006-1.2-ic17.0
Filesystem    Type    Size    Used    Avail    Use%    Mounted on
/dev/sda4    xfs      687G    99G    588G    15%    /home
Additional information from dmidecode:

Continued on next page
Lenovo Global Technology
ThinkSystem SN550
(2.40 GHz, Intel Xeon Gold 5115)

SPECfp2006 = 126
SPECfp_base2006 = 121

CPU2006 license: 9017
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

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:
24x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666 MHz, configured at 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-ic17.0/libs/32:/home/cpu2006-1.2-ic17.0/libs/64:/home/cpu2006-1.2-ic17.0/sh10.2"
OMP_NUM_THREADS = "20"

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
443.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
Lenovo Global Technology
ThinkSystem SN550
(2.40 GHz, Intel Xeon Gold 5115)

SPECfp2006 = 126
SPECfp_base2006 = 121

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

Base Portability Flags (Continued)

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
ThinkSystem SN550
(2.40 GHz, Intel Xeon Gold 5115)

SPECfp2006 = 126
SPECfp_base2006 = 121

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

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-calloc -qopt-malloc-options=3
-parallel -unroll4

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

Continued on next page
# Lenovo Global Technology

**ThinkSystem SN550**  
*(2.40 GHz, Intel Xeon Gold 5115)*

<table>
<thead>
<tr>
<th>SPECfp2006</th>
<th>126</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>121</td>
</tr>
</tbody>
</table>

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

## 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/Intel-ic17.0-official-linux64.html)
- [http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-C.20171004.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/Intel-ic17.0-official-linux64.xml)
- [http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-C.20171004.xml](http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-C.20171004.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 3 October 2017.