Lenovo Global Technology
ThinkSystem SD530
(2.20 GHz, Intel Xeon Gold 5120T)

SPECfp®2006 = 127
SPECfp_base2006 = 121

CPU2006 license: 9017
Test date: Aug-2017
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Hardware
CPU Name: Intel Xeon Gold 5120T
CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz
CPU MHz: 2200
FPU: Integrated
CPU(s) enabled: 28 cores, 2 chips, 14 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 17.0.3.191 of Intel C/C++ Compiler for Linux;
Fortran: Version 17.0.3.191 of Intel Fortran Compiler for Linux
Auto Parallel: Yes
File System: xfs
System State: Run level 3 (multi-user)
Lenovo Global Technology
(2.20 GHz, Intel Xeon Gold 5120T)

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L3 Cache: 19.25 MB I+D on chip per chip
Other Cache: None
Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R, running at 2400 MHz)
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

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>59.4</td>
<td>329</td>
<td>59.2</td>
<td>328</td>
<td>59.4</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:
Choose Operating Mode set to Maximum Performance
LLC dead line alloc set to Disable
Patrol Scrub set to Disable
DCU Streamer Prefetcher set to Disable
DCA set to Enable
Hyper-Threading set to Disable
Sysinfo program /home/cpu2006-1.2-ic17.0u3/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
Lenovo Global Technology
ThinkSystem SD530
(2.20 GHz, Intel Xeon Gold 5120T)

| SPECfp2006 = | 127 |
| SPECfp_base2006 = | 121 |

CPU2006 license: 9017
Test sponsor: Lenovo Global Technology
Test date: Aug-2017
Tested by: Lenovo Global Technology
Hardware Availability: Aug-2017
Software Availability: Apr-2017

**Platform Notes (Continued)**

running on stark-02-04 Thu Aug 3 06:18:27 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 5120T CPU @ 2.20GHz
- 2 "physical id"s (chips)
- 28 "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 : 14
  - siblings : 14
  - physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
  - physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
- cache size : 19712 KB

From /proc/meminfo
- MemTotal: 395893572 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 stark-02-04 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 Aug 3 06:16

SPEC is set to: /home/cpu2006-1.2-ic17.0u3
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 689G 94G 595G 14% /home

Additional information from dmidecode:

Continued on next page
SPEC CFP2006 Result

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 -[TEE113J-1.00]- 06/03/2017
Memory:
4x NO DIMM NO DIMM
12x 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-ic17.0u3/lib/ia32:/home/cpu2006-1.2-ic17.0u3/lib/intel64:/home/cpu2006-1.2-ic17.0u3/sh10.2"
OMP_NUM_THREADS = "28"

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
Filesystem page cache cleared with:
shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run

---

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

Continued on next page

Standard Performance Evaluation Corporation
info@spec.org
http://www.spec.org/
## Lenovo Global Technology

**ThinkSystem SD530**  
(2.20 GHz, Intel Xeon Gold 5120T)

### SPEC CFP2006 Result

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>SPECfp_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>121</td>
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**CPU2006 license:** 9017  
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**Test sponsor:** Lenovo Global Technology  
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### Base Portability Flags (Continued)

<table>
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</thead>
<tbody>
<tr>
<td>435.gromacs</td>
<td><code>-DSPEC_CPU_LP64 -nofor_main</code></td>
</tr>
<tr>
<td>436.cactusADM</td>
<td><code>-DSPEC_CPU_LP64 -nofor_main</code></td>
</tr>
<tr>
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<tr>
<td>444.namd</td>
<td><code>-DSPEC_CPU_LP64 -nofor_main</code></td>
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<td><code>-DSPEC_CPU_LP64</code></td>
</tr>
<tr>
<td>454.calculix</td>
<td><code>-DSPEC_CPU_LP64 -nofor_main</code></td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td><code>-DSPEC_CPU_LP64</code></td>
</tr>
<tr>
<td>465.tonto</td>
<td><code>-DSPEC_CPU_LP64</code></td>
</tr>
<tr>
<td>470.lbm</td>
<td><code>-DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX</code></td>
</tr>
<tr>
<td>481.wrf</td>
<td><code>-DSPEC_CPU_LP64</code></td>
</tr>
<tr>
<td>482.sphinx3</td>
<td><code>-DSPEC_CPU_LP64</code></td>
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</table>

### Base Optimization Flags

<table>
<thead>
<tr>
<th>Language</th>
<th>Optimization Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td><code>-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch</code></td>
</tr>
<tr>
<td>C++</td>
<td><code>-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch</code></td>
</tr>
<tr>
<td>Fortran</td>
<td><code>-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch</code></td>
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<tr>
<td>Benchmarks using both Fortran and C:</td>
<td><code>-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch</code></td>
</tr>
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</table>

### Peak Compiler Invocation

<table>
<thead>
<tr>
<th>Language</th>
<th>Compiler Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td><code>icc -m64</code></td>
</tr>
<tr>
<td>C++</td>
<td><code>icpc -m64</code></td>
</tr>
<tr>
<td>Fortran</td>
<td><code>ifort -m64</code></td>
</tr>
<tr>
<td>Benchmarks using both Fortran and C:</td>
<td><code>icc -m64 ifort -m64</code></td>
</tr>
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Peak Portability Flags

Same as Base Portability Flags

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
-auto -unroll4

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Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes
436.cactusADM: basepeak = yes
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-revF.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-revF.xml
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-C.20171004.xml

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