**Lenovo Global Technology**

**ThinkSystem SD530**
(2.10 GHz, Intel Xeon Gold 6152)

**SPECfp®2006 = 141**

**SPECfp_base2006 = 134**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>834</td>
</tr>
<tr>
<td>416.gamess</td>
<td>47.9</td>
</tr>
<tr>
<td>433.milc</td>
<td>74.7</td>
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<tr>
<td>434.zeusmp</td>
<td>251</td>
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<td>435.gromacs</td>
<td>46.4</td>
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<tr>
<td>436.cactusADM</td>
<td>1280</td>
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<tr>
<td>437.leslie3d</td>
<td>437</td>
</tr>
<tr>
<td>444.namd</td>
<td>35.5</td>
</tr>
<tr>
<td>447.dealII</td>
<td>71.6</td>
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<td>450.soplex</td>
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<td>453.povray</td>
<td>79.4</td>
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<td>454.calculix</td>
<td>66.3</td>
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<tr>
<td>459.GemsFD</td>
<td>296</td>
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<tr>
<td>465.tonto</td>
<td>45.1</td>
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<tr>
<td>470.lbm</td>
<td>437</td>
</tr>
<tr>
<td>481.wrf</td>
<td>127</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>64.0</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 9017

**Test sponsor:** Lenovo Global Technology

**Tested by:** Lenovo Global Technology

**CPU Name:** Intel Xeon Gold 6152

**CPU Characteristics:** Intel Turbo Boost Technology up to 3.70 GHz

**CPU MHz:** 2100

**FPU:** Integrated

**CPU(s) enabled:** 44 cores, 2 chips, 22 cores/chip

**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)

---

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Lenovo Global Technology
ThinkSystem SD530
(2.10 GHz, Intel Xeon Gold 6152)

CPU2006 license: 9017
Test sponsor: Lenovo Global Technology
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L3 Cache: 30.25 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
Base Pointers: 64-bit
Peak Pointers: 32/64-bit

Benchmark | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
410.bwaves | 15.5 | 877 | **16.3** | 834 | 16.7 | 812 | 15.5 | 877 | **16.3** | 834 | 16.7 | 812
416.gamess | 408 | 48.0 | **409** | 47.9 | 409 | 47.9 | **379** | 51.7 | 379 | 51.6 | 379 | 51.7
433.milc | 123 | 74.7 | 125 | 73.3 | **123** | 74.7 | 123 | 74.7 | 125 | 73.3 | 123 | 74.7
434.zeusmp | 35.9 | 253 | **36.2** | 251 | 36.6 | 248 | 35.9 | 253 | **36.2** | 251 | 36.6 | 248
435.gromacs | 154 | 46.2 | 153 | 46.6 | **154** | 46.4 | 154 | 46.2 | 153 | 46.6 | **154** | 46.4
437.leslie3d | 21.4 | 439 | **21.5** | 437 | 21.7 | 434 | 21.4 | 439 | **21.5** | 437 | 21.7 | 434
444.namd | **226** | 35.5 | 226 | 35.5 | 226 | 35.5 | 220 | 36.4 | **220** | 36.4 | 220 | 36.4
447.dealII | 161 | 71.3 | 159 | 71.8 | **160** | 71.6 | 161 | 71.3 | 159 | 71.8 | **160** | 71.6
450.soplex | 163 | 51.2 | 165 | 50.6 | **164** | 50.9 | 163 | 51.2 | 165 | 50.6 | **164** | 50.9
453.povray | 76.1 | 69.9 | 76.2 | 69.8 | **76.2** | 69.8 | **67.0** | 79.4 | 66.9 | 79.6 | 67.1 | 79.3
454.calculix | 124 | 66.5 | 124 | 66.3 | **124** | 66.3 | **108** | 76.5 | 108 | 76.4 | 108 | 76.5
459.GemsFDTD | 40.6 | 261 | **41.7** | 254 | 43.6 | 243 | 35.7 | 297 | 35.9 | 295 | **35.8** | 296
465.tonto | 216 | 45.5 | 221 | 44.5 | **218** | 45.1 | 148 | 66.3 | 149 | 66.1 | **149** | 66.2
470.lbm | 10.2 | 1350 | **10.3** | 1330 | 10.4 | 1320 | 10.2 | 1350 | **10.3** | 1330 | 10.4 | 1320
481.wrf | 88.2 | 127 | **88.0** | 127 | 86.1 | 130 | 88.2 | 127 | **88.0** | 127 | 86.1 | 130
482.sphinx3 | 303 | 64.3 | 306 | 63.7 | **304** | 64.0 | 303 | 64.3 | 306 | 63.7 | **304** | 64.0

Results Table

Stack size set to unlimited using "ulimit -s unlimited"

Operating System 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)
running on stark-02-01 Thu Jul 27 12:21:17 2017

Platform Notes

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Lenovo Global Technology
ThinkSystem SD530
(2.10 GHz, Intel Xeon Gold 6152)

SPECFp2006 = 141
SPECFp_base2006 = 134

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

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 6152 CPU @ 2.10GHz
2 "physical id"s (chips)
44 "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 : 22
siblings : 22
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27 28
cache size : 30976 KB

From /proc/meminfo
MemTotal: 395892780 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-02-01 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 27 12:15

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
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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

(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 = "44"

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

Continued on next page
Lenovo Global Technology
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Base Portability Flags (Continued)

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
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -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
Lenovo Global Technology
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Software Availability: Apr-2017

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-ilkp32
- 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

Continued on next page
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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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