



# SPEC® CFP2006 Result

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## Lenovo Global Technology

ThinkSystem SD530  
(3.00 GHz, Intel Xeon Gold 6136)

SPECfp®2006 = 149

SPECfp\_base2006 = 145

CPU2006 license: 9017

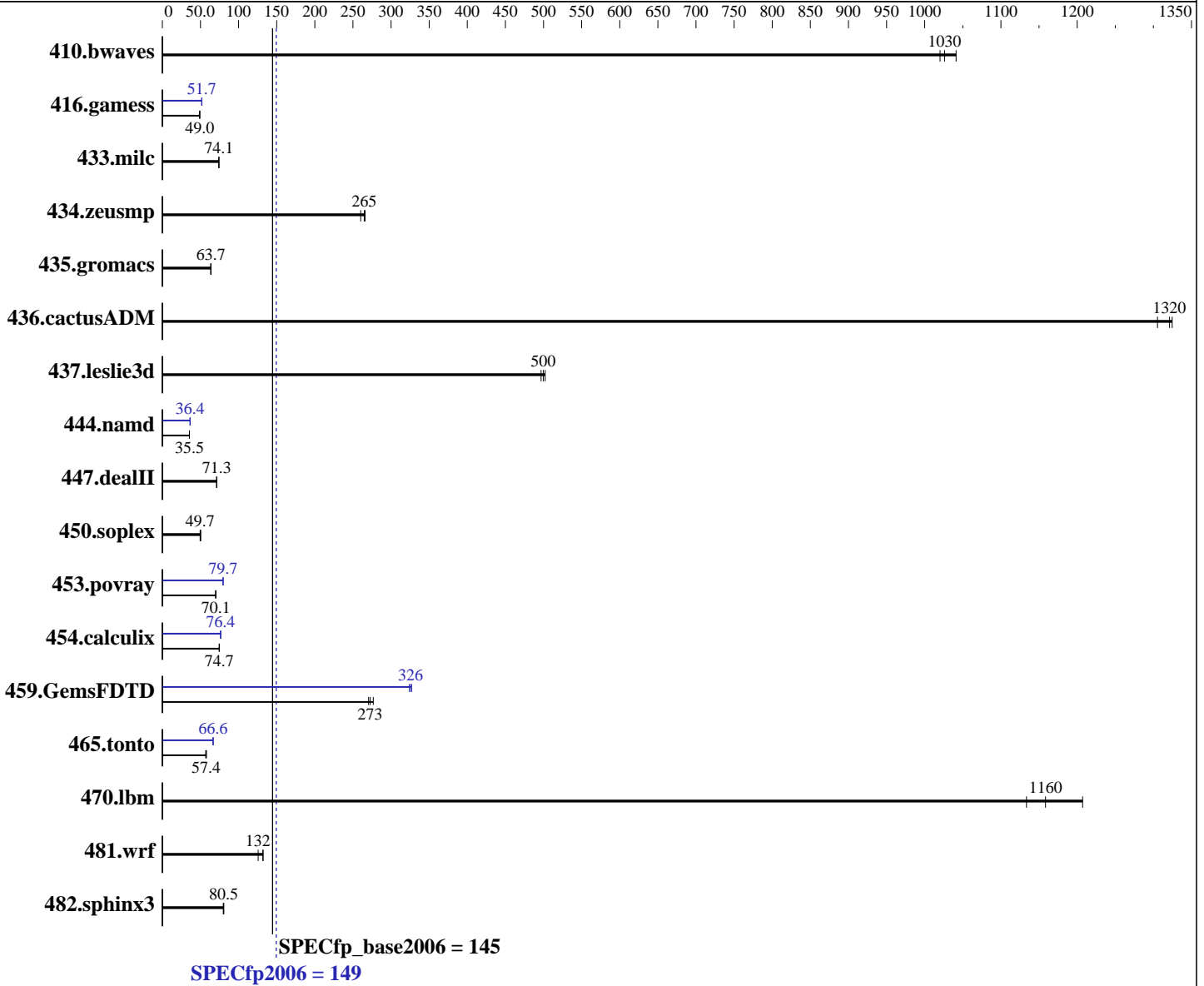
Test sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test date: Jul-2017

Hardware Availability: Aug-2017

Software Availability: Apr-2017



Hardware	
CPU Name:	Intel Xeon Gold 6136
CPU Characteristics:	Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz:	3000
FPU:	Integrated
CPU(s) enabled:	24 cores, 2 chips, 12 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

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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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L3 Cache: 24.75 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  
Other Software: None

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	13.1	1040	<b><u>13.2</u></b>	<b><u>1030</u></b>	13.3	1020	13.1	1040	<b><u>13.2</u></b>	<b><u>1030</u></b>	13.3	1020
416.gamess	<b><u>400</u></b>	<b><u>49.0</u></b>	400	49.0	400	49.0	379	51.7	<b><u>379</u></b>	<b><u>51.7</u></b>	378	51.8
433.milc	124	74.3	124	73.9	<b><u>124</u></b>	<b><u>74.1</u></b>	124	74.3	124	73.9	<b><u>124</u></b>	<b><u>74.1</u></b>
434.zeusmp	34.2	266	<b><u>34.4</u></b>	<b><u>265</u></b>	35.0	260	34.2	266	<b><u>34.4</u></b>	<b><u>265</u></b>	35.0	260
435.gromacs	113	63.5	<b><u>112</u></b>	<b><u>63.7</u></b>	112	63.8	113	63.5	<b><u>112</u></b>	<b><u>63.7</u></b>	112	63.8
436.cactusADM	9.15	1310	9.02	1320	<b><u>9.04</u></b>	<b><u>1320</u></b>	9.15	1310	9.02	1320	<b><u>9.04</u></b>	<b><u>1320</u></b>
437.leslie3d	18.9	497	<b><u>18.8</u></b>	<b><u>500</u></b>	18.7	502	18.9	497	<b><u>18.8</u></b>	<b><u>500</u></b>	18.7	502
444.namd	226	35.5	226	35.5	<b><u>226</u></b>	<b><u>35.5</u></b>	<b><u>220</u></b>	<b><u>36.4</u></b>	220	36.4	220	36.4
447.dealII	161	71.1	160	71.5	<b><u>160</u></b>	<b><u>71.3</u></b>	161	71.1	160	71.5	<b><u>160</u></b>	<b><u>71.3</u></b>
450.soplex	<b><u>168</u></b>	<b><u>49.7</u></b>	165	50.4	168	49.5	<b><u>168</u></b>	<b><u>49.7</u></b>	165	50.4	168	49.5
453.povray	76.1	69.9	75.9	70.1	<b><u>75.9</u></b>	<b><u>70.1</u></b>	66.9	79.5	66.7	79.7	<b><u>66.7</u></b>	<b><u>79.7</u></b>
454.calculix	<b><u>110</u></b>	<b><u>74.7</u></b>	110	74.8	111	74.6	<b><u>108</u></b>	<b><u>76.4</u></b>	108	76.5	108	76.4
459.GemsFDTD	<b><u>38.9</u></b>	<b><u>273</u></b>	38.3	277	39.2	271	32.5	327	<b><u>32.6</u></b>	<b><u>326</u></b>	32.7	324
465.tonto	<b><u>171</u></b>	<b><u>57.4</u></b>	173	56.9	170	57.8	148	66.6	<b><u>148</u></b>	<b><u>66.6</u></b>	148	66.6
470.lbm	11.4	1210	12.1	1130	<b><u>11.9</u></b>	<b><u>1160</u></b>	11.4	1210	12.1	1130	<b><u>11.9</u></b>	<b><u>1160</u></b>
481.wrf	88.9	126	84.5	132	<b><u>84.8</u></b>	<b><u>132</u></b>	88.9	126	84.5	132	<b><u>84.8</u></b>	<b><u>132</u></b>
482.sphinx3	244	79.9	242	80.5	<b><u>242</u></b>	<b><u>80.5</u></b>	244	79.9	242	80.5	<b><u>242</u></b>	<b><u>80.5</u></b>

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)

running on stark-02-02 Thu Jul 27 03:21:03 2017

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Tested by: Lenovo Global Technology

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 6136 CPU @ 3.00GHz
 2 "physical id"s (chips)
 24 "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 2 3 4 9 10 16 18 19 25 26
  physical 1   : cores 0 1 2 3 4 9 10 16 18 19 25 26
  cache size  : 25344 KB
```

From /proc/meminfo

```
MemTotal:      395892528 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-02-02 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 03:16

SPEC is set to: /home/cpu2006-1.2-ic17.0u3

```
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda4       xfs   689G   74G  616G  11% /home
```

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program  
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## Platform Notes (Continued)

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 = "24"

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

435.gromacs: -DSPEC\_CPU\_LP64 -nofor\_main

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## Base Portability Flags (Continued)

```

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
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



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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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