



# SPEC® CFP2006 Result

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## Lenovo Global Technology

ThinkSystem SR530  
(2.60 GHz, Intel Xeon Gold 6126)

SPECfp®2006 = 146

SPECfp\_base2006 = 140

CPU2006 license: 9017

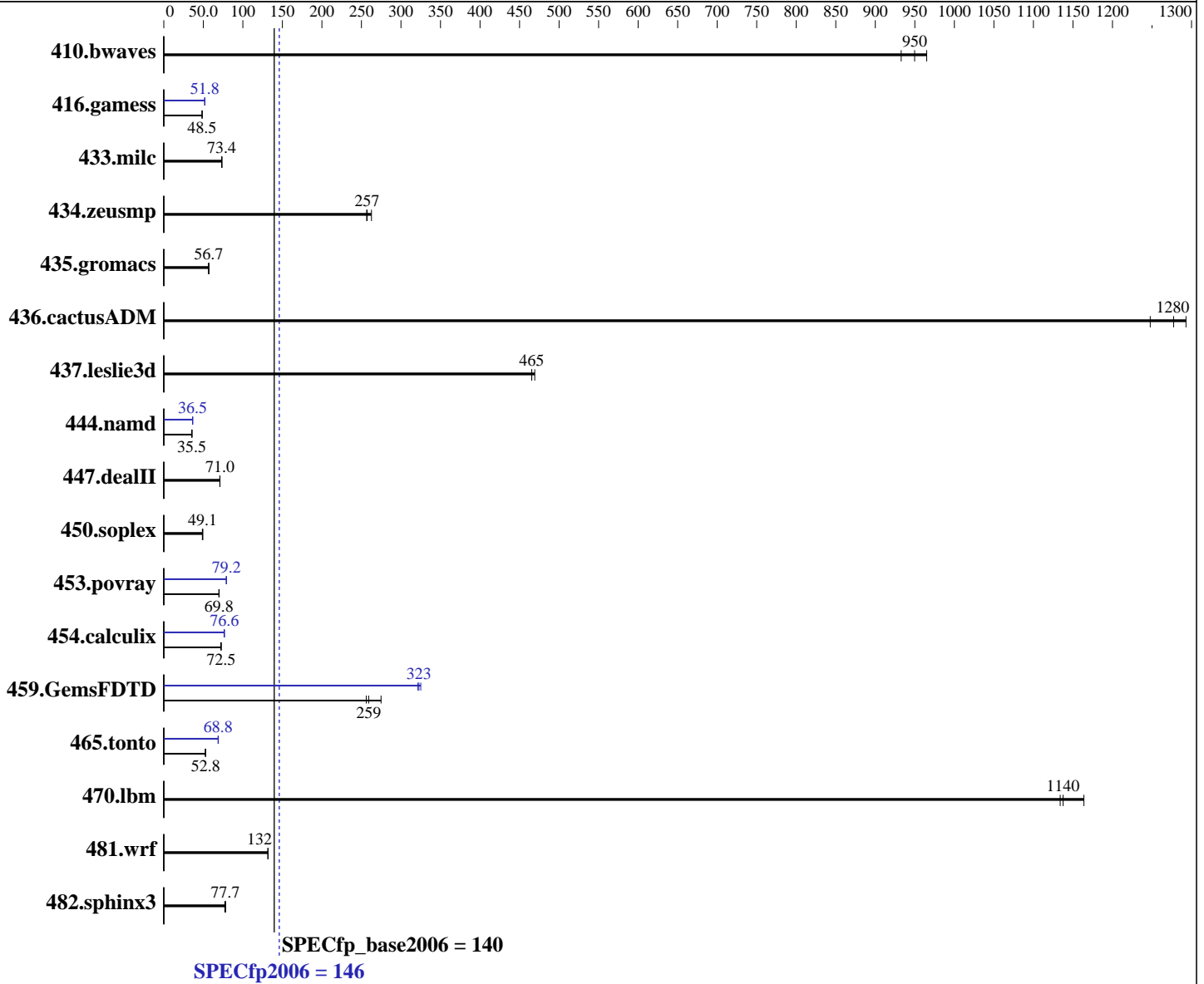
Test sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test date: Aug-2017

Hardware Availability: Aug-2017

Software Availability: Nov-2016



### Hardware

CPU Name: Intel Xeon Gold 6126  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz  
 CPU MHz: 2600  
 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

Continued on next page

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

Continued on next page



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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)  
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	14.1	965	<b>14.3</b>	<b>950</b>	14.6	933	14.1	965	<b>14.3</b>	<b>950</b>	14.6	933
416.gamess	404	48.4	404	48.5	<b>404</b>	<b>48.5</b>	378	51.9	<b>378</b>	<b>51.8</b>	378	51.8
433.milc	125	73.2	125	73.5	<b>125</b>	<b>73.4</b>	125	73.2	125	73.5	<b>125</b>	<b>73.4</b>
434.zeusmp	34.6	263	<b>35.4</b>	<b>257</b>	35.5	257	34.6	263	<b>35.4</b>	<b>257</b>	35.5	257
435.gromacs	126	56.7	125	57.1	<b>126</b>	<b>56.7</b>	126	56.7	125	57.1	<b>126</b>	<b>56.7</b>
436.cactusADM	<b>9.36</b>	<b>1280</b>	9.24	1290	9.58	1250	<b>9.36</b>	<b>1280</b>	9.24	1290	9.58	1250
437.leslie3d	20.2	465	20.0	469	<b>20.2</b>	<b>465</b>	20.2	465	20.0	469	<b>20.2</b>	<b>465</b>
444.namd	225	35.6	226	35.5	<b>226</b>	<b>35.5</b>	220	36.5	<b>220</b>	<b>36.5</b>	220	36.5
447.dealII	161	71.1	<b>161</b>	<b>71.0</b>	161	70.9	161	71.1	<b>161</b>	<b>71.0</b>	161	70.9
450.soplex	169	49.3	171	48.8	<b>170</b>	<b>49.1</b>	169	49.3	171	48.8	<b>170</b>	<b>49.1</b>
453.povray	<b>76.2</b>	<b>69.8</b>	76.0	70.0	76.3	69.7	<b>67.3</b>	<b>79.0</b>	<b>67.1</b>	<b>79.2</b>	67.1	79.3
454.calculix	114	72.7	<b>114</b>	<b>72.5</b>	114	72.1	108	76.6	<b>108</b>	<b>76.6</b>	108	76.3
459.GemsFDTD	<b>40.9</b>	<b>259</b>	38.6	275	41.4	256	<b>32.9</b>	<b>323</b>	32.6	325	33.0	321
465.tonto	186	52.9	188	52.5	<b>186</b>	<b>52.8</b>	143	69.0	143	68.7	<b>143</b>	<b>68.8</b>
470.lbm	11.8	1160	<b>12.1</b>	<b>1140</b>	12.1	1130	11.8	1160	<b>12.1</b>	<b>1140</b>	12.1	1130
481.wrf	84.9	132	<b>84.6</b>	<b>132</b>	84.6	132	84.9	132	<b>84.6</b>	<b>132</b>	84.6	132
482.sphinx3	252	77.2	249	78.2	<b>251</b>	<b>77.7</b>	252	77.2	249	78.2	<b>251</b>	<b>77.7</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:  
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 Thu Aug 3 07:26:39 2017

This section contains SUT (System Under Test) info as seen by  
Continued on next page



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### 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) Gold 6126 CPU @ 2.60GHz
  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 4 5 6 8 9 10 11 13 14
    physical 1: cores 0 1 2 4 5 6 8 9 10 11 13 14
  cache size : 19712 KB

```

```

From /proc/meminfo
MemTotal:      395883884 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 linux-ickx 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 07:24

```

SPEC is set to: /home/cpu2006-1.2-ic17.0
Filesystem      Type      Size  Used Avail Use% Mounted on
/dev/sda2        btrfs    744G  181G  561G   25% /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

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## 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 = "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

## 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

444.namd: -DSPEC\_CPU\_LP64

447.dealII: -DSPEC\_CPU\_LP64

450.soplex: -DSPEC\_CPU\_LP64

Continued on next page

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Page 4



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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



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## 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

### Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

Continued on next page



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## 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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