



# SPEC<sup>®</sup> CFP2006 Result

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## Lenovo Global Technology

ThinkSystem SR950  
(2.60 GHz, Intel Xeon Gold 6142M)

SPECfp<sup>®</sup>2006 = **153**

SPECfp\_base2006 = **146**

CPU2006 license: 9017

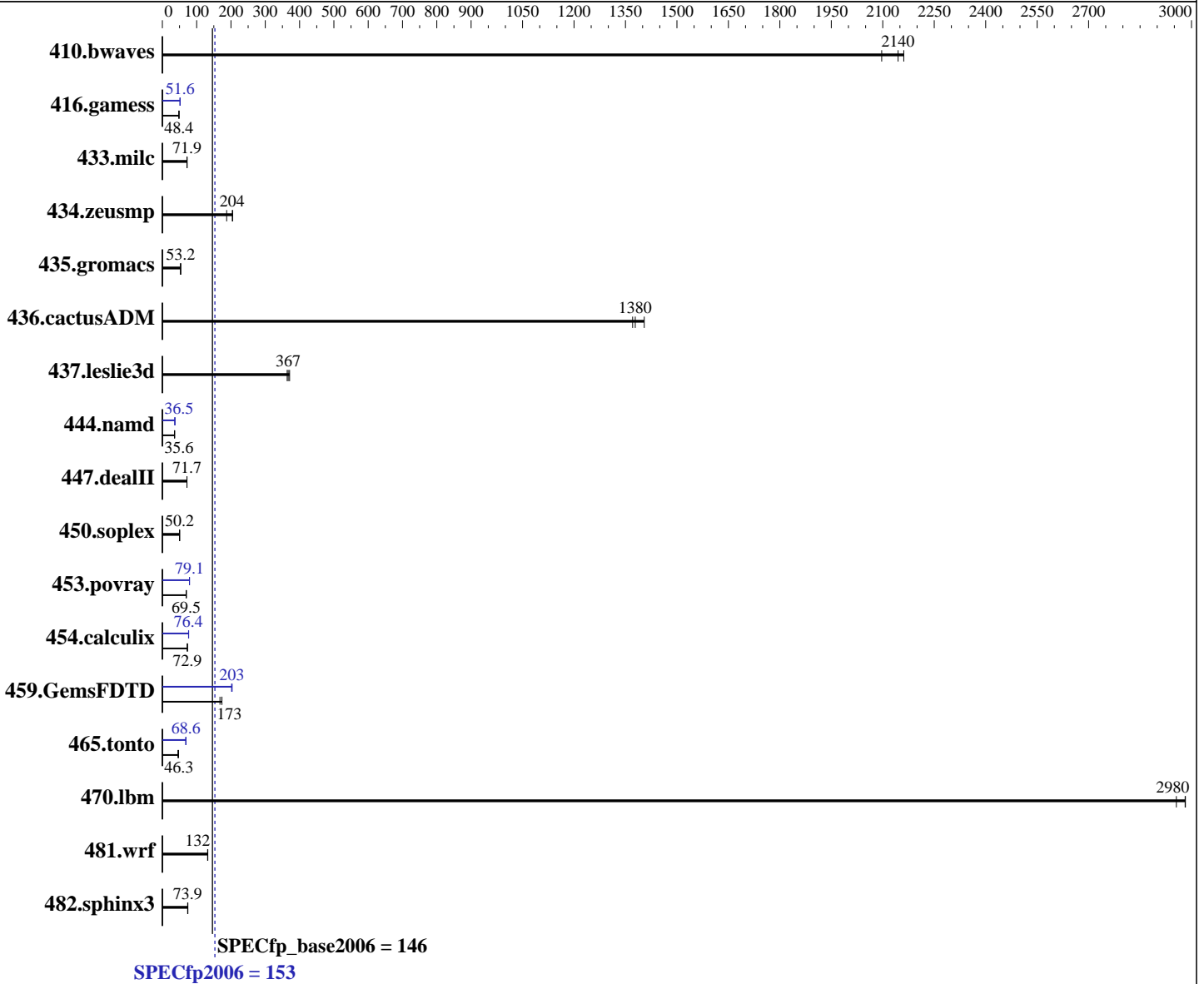
Test sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test date: Dec-2017

Hardware Availability: Sep-2017

Software Availability: Apr-2017



| Hardware             |   |
|----------------------|---|
| CPU Name:            | Intel Xeon Gold 6142M                       |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.70 GHz |
| CPU MHz:             | 2600  |
| FPU:                 | Integrated                                  |
| CPU(s) enabled:      | 64 cores, 4 chips, 16 cores/chip            |
| CPU(s) orderable:    | 2,4 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)<br>Kernel 4.4.21-69-default  |
| Compiler:         | C/C++: Version 17.0.3.191 of Intel C/C++<br>Compiler for Linux;<br>Fortran: Version 17.0.3.191 of Intel Fortran<br>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: 22 MB I+D on chip per chip  
Other Cache: None  
Memory: 1536 GB (48 x 32 GB 2Rx4 PC4-2666V-R)  
Disk Subsystem: 1 x 800 GB SAS 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    | 6.48               | 2100               | 6.29               | 2160               | <b><u>6.34</u></b> | <b><u>2140</u></b> | 6.48              | 2100               | 6.29               | 2160               | <b><u>6.34</u></b> | <b><u>2140</u></b> |
| 416.gamess    | 405                | 48.3               | 404                | 48.4               | <b><u>404</u></b>  | <b><u>48.4</u></b> | <b><u>379</u></b> | <b><u>51.6</u></b> | 379                | 51.6               | 380                | 51.5               |
| 433.milc      | <b><u>128</u></b>  | <b><u>71.9</u></b> | 128                | 71.6               | 127                | 72.1               | <b><u>128</u></b> | <b><u>71.9</u></b> | 128                | 71.6               | 127                | 72.1               |
| 434.zeusmp    | 44.4               | 205                | <b><u>44.6</u></b> | <b><u>204</u></b>  | 48.6               | 187                | 44.4              | 205                | <b><u>44.6</u></b> | <b><u>204</u></b>  | 48.6               | 187                |
| 435.gromacs   | 134                | 53.2               | <b><u>134</u></b>  | <b><u>53.2</u></b> | 134                | 53.2               | 134               | 53.2               | <b><u>134</u></b>  | <b><u>53.2</u></b> | 134                | 53.2               |
| 436.cactusADM | 8.51               | 1400               | <b><u>8.67</u></b> | <b><u>1380</u></b> | 8.72               | 1370               | 8.51              | 1400               | <b><u>8.67</u></b> | <b><u>1380</u></b> | 8.72               | 1370               |
| 437.leslie3d  | 25.8               | 364                | 25.3               | 371                | <b><u>25.6</u></b> | <b><u>367</u></b>  | 25.8              | 364                | 25.3               | 371                | <b><u>25.6</u></b> | <b><u>367</u></b>  |
| 444.namd      | <b><u>225</u></b>  | <b><u>35.6</u></b> | 225                | 35.6               | 225                | 35.6               | 220               | 36.5               | <b><u>220</u></b>  | <b><u>36.5</u></b> | 220                | 36.5               |
| 447.dealII    | <b><u>160</u></b>  | <b><u>71.7</u></b> | 160                | 71.7               | 160                | 71.6               | <b><u>160</u></b> | <b><u>71.7</u></b> | 160                | 71.7               | 160                | 71.6               |
| 450.soplex    | <b><u>166</u></b>  | <b><u>50.2</u></b> | 166                | 50.1               | 166                | 50.4               | <b><u>166</u></b> | <b><u>50.2</u></b> | 166                | 50.1               | 166                | 50.4               |
| 453.povray    | 76.1               | 69.9               | 76.6               | 69.4               | <b><u>76.5</u></b> | <b><u>69.5</u></b> | 67.3              | 79.1               | 67.3               | 79.0               | <b><u>67.3</u></b> | <b><u>79.1</u></b> |
| 454.calculix  | 113                | 73.0               | <b><u>113</u></b>  | <b><u>72.9</u></b> | 113                | 72.7               | 108               | 76.3               | <b><u>108</u></b>  | <b><u>76.4</u></b> | 107                | 76.8               |
| 459.GemsFDTD  | <b><u>61.2</u></b> | <b><u>173</u></b>  | 63.2               | 168                | 61.1               | 174                | 52.6              | 202                | 52.2               | 203                | <b><u>52.3</u></b> | <b><u>203</u></b>  |
| 465.tonto     | <b><u>213</u></b>  | <b><u>46.3</u></b> | 215                | 45.7               | 208                | 47.3               | 144               | 68.5               | <b><u>143</u></b>  | <b><u>68.6</u></b> | 143                | 68.6               |
| 470.lbm       | 4.65               | 2960               | 4.61               | 2980               | <b><u>4.61</u></b> | <b><u>2980</u></b> | 4.65              | 2960               | 4.61               | 2980               | <b><u>4.61</u></b> | <b><u>2980</u></b> |
| 481.wrf       | 84.3               | 133                | <b><u>84.6</u></b> | <b><u>132</u></b>  | 84.6               | 132                | 84.3              | 133                | <b><u>84.6</u></b> | <b><u>132</u></b>  | 84.6               | 132                |
| 482.sphinx3   | <b><u>264</u></b>  | <b><u>73.9</u></b> | 262                | 74.4               | 264                | 73.8               | <b><u>264</u></b> | <b><u>73.9</u></b> | 262                | 74.4               | 264                | 73.8               |

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  
LLC dead line alloc set to Disable  
Sysinfo program /home/cpu2006-1.2-ic17.0u3/config/sysinfo.rev6993  
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)  
running on Proton4S-SUSE12SP2 Thu Dec 7 02:12:29 2017

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:

Continued on next page



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Software Availability: Apr-2017

### Platform Notes (Continued)

<http://www.spec.org/cpu2006/Docs/config.html#sysinfo>

From /proc/cpuinfo

model name : Intel(R) Xeon(R) Gold 6142M CPU @ 2.60GHz

4 "physical id"s (chips)

64 "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 : 16

siblings : 16

physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

physical 2: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

physical 3: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

cache size : 22528 KB

From /proc/meminfo

MemTotal: 1584766852 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 Proton4S-SUSE12SP2 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 Dec 7 01:22

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

| Filesystem | Type  | Size | Used | Avail | Use% | Mounted on |
|------------|-------|------|------|-------|------|------------|
| /dev/sda3  | btrfs | 743G | 182G | 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

Continued on next page



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## Platform Notes (Continued)

determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS Lenovo -[PSE105X-1.00]- 08/17/2017

Memory:

48x NO DIMM NO DIMM

48x 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 = "64"

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

436.cactusADM: -DSPEC\_CPU\_LP64 -nofor\_main

Continued on next page

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Page 4



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## Base Portability Flags (Continued)

```

437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.deall: -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



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Software Availability: Apr-2017

## 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-revF.html>

<http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-SKL-E.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-E.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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