



# SPEC<sup>®</sup> CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Lenovo Group Limited

SPECfp<sup>®</sup>2006 = 127

Lenovo System x3550 M5  
(2.20 GHz, Intel Xeon E5-2699R v4)

SPECfp\_base2006 = 120

CPU2006 license: 9017

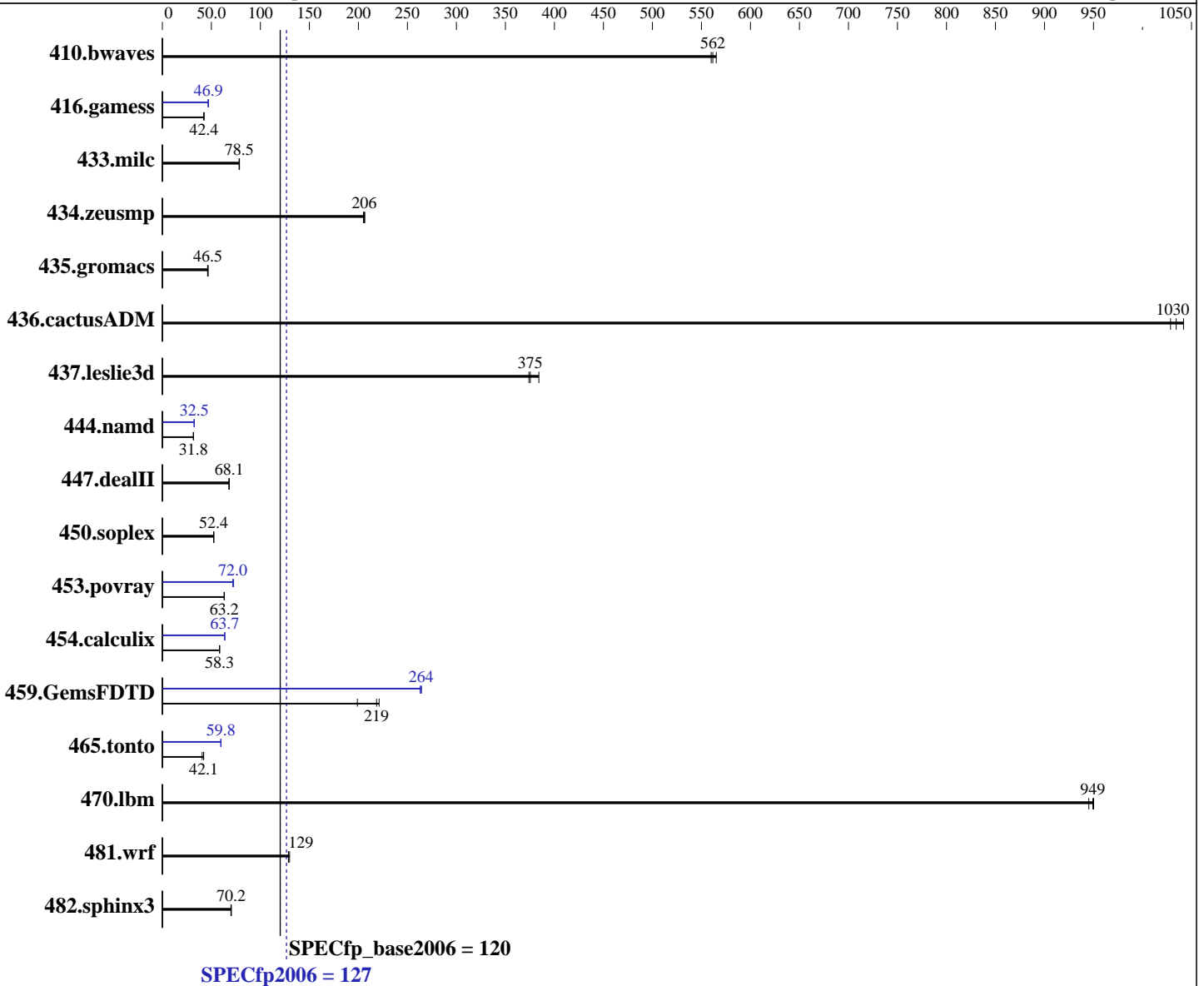
Test date: Nov-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Jan-2017

Tested by: Lenovo Group Limited

Software Availability: Sep-2016



### Hardware

CPU Name: Intel Xeon E5-2699R v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz  
 CPU MHz: 2200  
 FPU: Integrated  
 CPU(s) enabled: 44 cores, 2 chips, 22 cores/chip  
 CPU(s) orderable: 1,2 chips  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core

Continued on next page

### Software

Operating System: SUSE Linux Enterprise Server 12 SP1 (x86\_64)  
 Kernel 3.12.49-11-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: xfs  
 System State: Run level 3 (multi-user)

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Lenovo Group Limited

SPECfp2006 = **127**

Lenovo System x3550 M5  
(2.20 GHz, Intel Xeon E5-2699R v4)

SPECfp\_base2006 = **120**

CPU2006 license: 9017

Test date: Nov-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Jan-2017

Tested by: Lenovo Group Limited

Software Availability: Sep-2016

L3 Cache: 55 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-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    | <u>24.2</u> | <u>562</u>  | 24.3        | 560         | 24.0        | 565         | <u>24.2</u> | <u>562</u>  | 24.3        | 560         | 24.0        | 565         |
| 416.gamess    | <u>462</u>  | <u>42.4</u> | 462         | 42.4        | 461         | 42.5        | 417         | 46.9        | 419         | 46.7        | <u>417</u>  | <u>46.9</u> |
| 433.milc      | 117         | 78.7        | <u>117</u>  | <u>78.5</u> | 117         | 78.3        | 117         | 78.7        | <u>117</u>  | <u>78.5</u> | 117         | 78.3        |
| 434.zeusmp    | 44.1        | 207         | 44.4        | 205         | <u>44.2</u> | <u>206</u>  | 44.1        | 207         | 44.4        | 205         | <u>44.2</u> | <u>206</u>  |
| 435.gromacs   | <u>153</u>  | <u>46.5</u> | 155         | 46.1        | 153         | 46.7        | <u>153</u>  | <u>46.5</u> | 155         | 46.1        | 153         | 46.7        |
| 436.cactusADM | 11.6        | 1030        | 11.5        | 1040        | <u>11.6</u> | <u>1030</u> | 11.6        | 1030        | 11.5        | 1040        | <u>11.6</u> | <u>1030</u> |
| 437.leslie3d  | 24.5        | 384         | <u>25.0</u> | <u>375</u>  | 25.1        | 374         | 24.5        | 384         | <u>25.0</u> | <u>375</u>  | 25.1        | 374         |
| 444.namd      | 252         | 31.8        | 254         | 31.6        | <u>252</u>  | <u>31.8</u> | <u>247</u>  | <u>32.5</u> | 247         | 32.5        | 247         | 32.5        |
| 447.dealII    | <u>168</u>  | <u>68.1</u> | 168         | 68.2        | 168         | 67.9        | <u>168</u>  | <u>68.1</u> | 168         | 68.2        | 168         | 67.9        |
| 450.soplex    | 159         | 52.4        | <u>159</u>  | <u>52.4</u> | 159         | 52.5        | 159         | 52.4        | <u>159</u>  | <u>52.4</u> | 159         | 52.5        |
| 453.povray    | <u>84.2</u> | <u>63.2</u> | 84.0        | 63.3        | 84.4        | 63.0        | 73.9        | 72.0        | 73.2        | 72.7        | <u>73.8</u> | <u>72.0</u> |
| 454.calculix  | 141         | 58.5        | 142         | 58.3        | <u>141</u>  | <u>58.3</u> | 130         | 63.7        | <u>130</u>  | <u>63.7</u> | 130         | 63.5        |
| 459.GemsFDTD  | 53.3        | 199         | <u>48.5</u> | <u>219</u>  | 48.0        | 221         | 40.1        | 264         | <u>40.2</u> | <u>264</u>  | 40.3        | 263         |
| 465.tonto     | 233         | 42.2        | 242         | 40.6        | <u>234</u>  | <u>42.1</u> | 165         | 59.8        | <u>165</u>  | <u>59.8</u> | 165         | 59.7        |
| 470.lbm       | 14.5        | 950         | 14.5        | 945         | <u>14.5</u> | <u>949</u>  | 14.5        | 950         | 14.5        | 945         | <u>14.5</u> | <u>949</u>  |
| 481.wrf       | <u>86.8</u> | <u>129</u>  | 86.1        | 130         | 86.8        | 129         | <u>86.8</u> | <u>129</u>  | 86.1        | 130         | 86.8        | 129         |
| 482.sphinx3   | 277         | 70.3        | <u>278</u>  | <u>70.2</u> | 279         | 70.0        | 277         | 70.3        | <u>278</u>  | <u>70.2</u> | 279         | 70.0        |

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"  
Transparent Huge Pages disabled with:  
echo never > /sys/kernel/mm/transparent\_hugepage/enabled

## Platform Notes

BIOS Configuration:  
Operating Mode set to Maximum Performance  
Hyper-Threading set to Disabled  
Sysinfo program /home/cpu2006-1.2-ic16.0/config/sysinfo.rev6993  
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)  
running on 123123 Wed Nov 23 14:49:15 2016

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



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Lenovo Group Limited

SPECfp2006 = 127

Lenovo System x3550 M5  
(2.20 GHz, Intel Xeon E5-2699R v4)

SPECfp\_base2006 = 120

CPU2006 license: 9017

Test date: Nov-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Jan-2017

Tested by: Lenovo Group Limited

Software Availability: Sep-2016

### 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) CPU E5-2699R v4 @ 2.20GHz
 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     : 56320 KB

```

From /proc/meminfo

```

MemTotal:      263826880 kB
HugePages_Total: 0
Hugepagesize:  2048 kB

```

From /etc/\*release\* /etc/\*version\*

```

SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 1
# 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-SP1"
VERSION_ID="12.1"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp1"

```

uname -a:

```

Linux 123123 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015 (8d714a0)
x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 Nov 23 10:07

SPEC is set to: /home/cpu2006-1.2-ic16.0

```

Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda4       xfs   689G   52G  638G   8% /home

```

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program  
Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

**Lenovo Group Limited**

**SPECfp2006 = 127**

Lenovo System x3550 M5  
(2.20 GHz, Intel Xeon E5-2699R v4)

**SPECfp\_base2006 = 120**

**CPU2006 license:** 9017

**Test date:** Nov-2016

**Test sponsor:** Lenovo Group Limited

**Hardware Availability:** Jan-2017

**Tested by:** Lenovo Group Limited

**Software Availability:** Sep-2016

## 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 -[TBE123H-2.10]- 03/25/2016

Memory:

16x Hynix HMA42GR7AFR4N-UH 16 GB 2 rank 2400 MHz

8x NO DIMM Unknown

(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-ic16.0/libs/32:/home/cpu2006-1.2-ic16.0/libs/64:/home/cpu2006-1.2-ic16.0/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

## 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

Continued on next page

Standard Performance Evaluation Corporation

info@spec.org

http://www.spec.org/

Page 4



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

**Lenovo Group Limited**

**SPECfp2006 = 127**

Lenovo System x3550 M5  
(2.20 GHz, Intel Xeon E5-2699R v4)

**SPECfp\_base2006 = 120**

**CPU2006 license:** 9017

**Test date:** Nov-2016

**Test sponsor:** Lenovo Group Limited

**Hardware Availability:** Jan-2017

**Tested by:** Lenovo Group Limited

**Software Availability:** Sep-2016

## Base Portability Flags (Continued)

```

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



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

## Lenovo Group Limited

SPECfp2006 = 127

Lenovo System x3550 M5  
(2.20 GHz, Intel Xeon E5-2699R v4)

SPECfp\_base2006 = 120

CPU2006 license: 9017

Test date: Nov-2016

Test sponsor: Lenovo Group Limited

Hardware Availability: Jan-2017

Tested by: Lenovo Group Limited

Software Availability: Sep-2016

## 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



# SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

**Lenovo Group Limited**

**SPECfp2006 = 127**

Lenovo System x3550 M5  
(2.20 GHz, Intel Xeon E5-2699R v4)

**SPECfp\_base2006 = 120**

**CPU2006 license:** 9017

**Test date:** Nov-2016

**Test sponsor:** Lenovo Group Limited

**Hardware Availability:** Jan-2017

**Tested by:** Lenovo Group Limited

**Software Availability:** Sep-2016

## 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-BDW-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-BDW-C.xml>

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC CPU2006 v1.2.

Report generated on Tue Feb 7 17:00:30 2017 by SPEC CPU2006 PS/PDF formatter v6932.

Originally published on 7 February 2017.