# SPEC® CFP2006 Result

## Lenovo Group Limited

Lenovo System x3250 M5
(Intel Xeon E3-1241 v3, 3.50 GHz)

$SPECfp^®\_rate2006 = $ 153

$SPECfp\_rate\_base2006 = $ 148

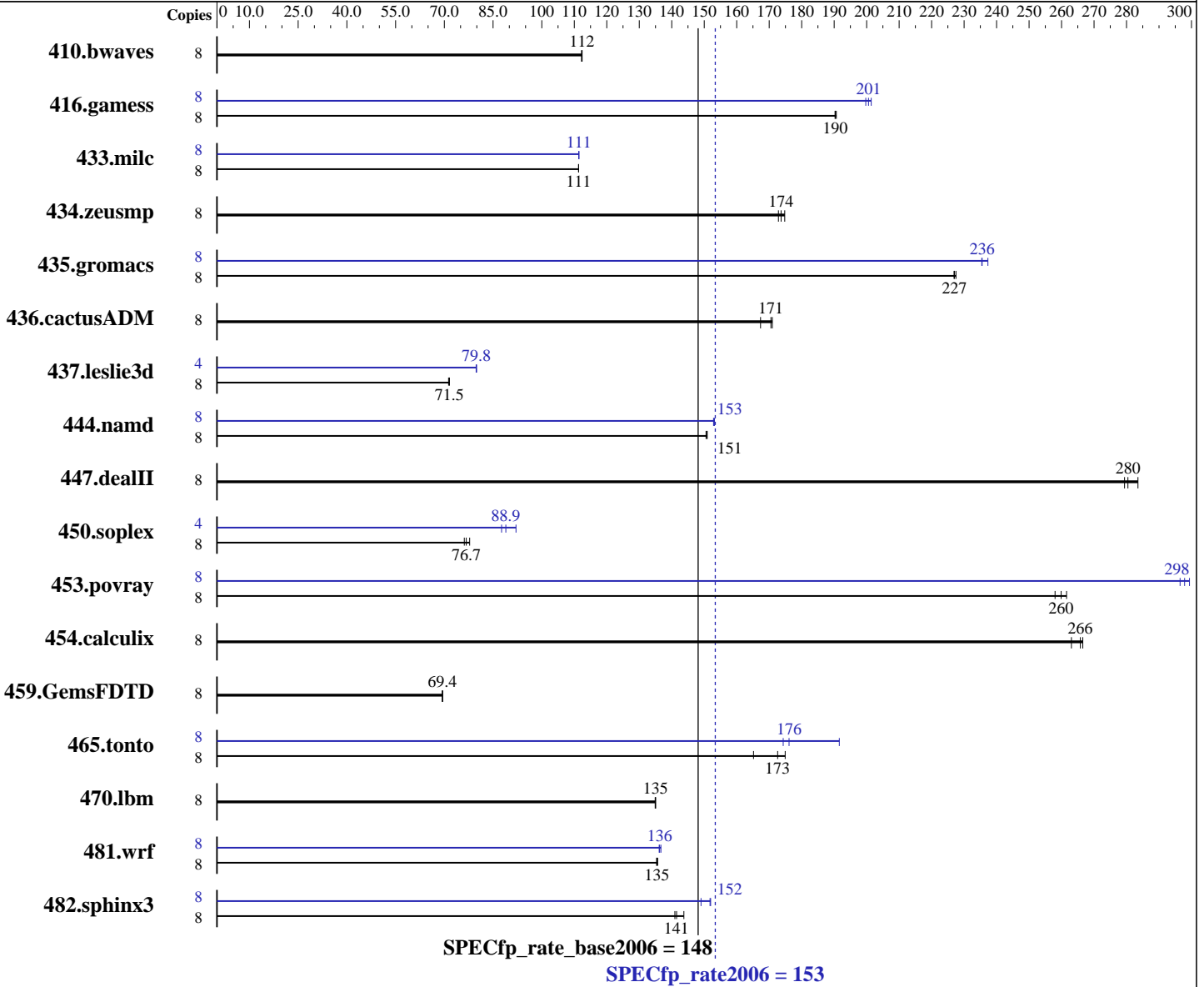| | Copies | |
|---|---|---|
| 410.bwaves | 8 | 112 |
| 416.gamess | 8 / 8 | 201 / 190 |
| 433.milc | 8 / 8 | 111 / 111 |
| 434.zeusmp | 8 | 174 |
| 435.gromacs | 8 / 8 | 236 / 227 |
| 436.cactusADM | 8 | 171 |
| 437.leslie3d | 4 / 8 | 79.8 / 71.5 |
| 444.namd | 8 / 8 | 153 / 151 |
| 447.dealII | 8 | 280 |
| 450.soplex | 4 / 8 | 88.9 / 76.7 |
| 453.povray | 8 / 8 | 298 / 260 |
| 454.calculix | 8 | 266 |
| 459.GemsFDTD | 8 | 69.4 |
| 465.tonto | 8 / 8 | 176 / 173 |
| 470.lbm | 8 | 135 |
| 481.wrf | 8 / 8 | 136 / 135 |
| 482.sphinx3 | 8 / 8 | 152 / 141 |

SPECfp_rate_base2006 = 148

SPECfp_rate2006 = 153

## Hardware

CPU Name: Intel Xeon E3-1241 v3
CPU Characteristics: Intel Turbo Boost Technology up to 3.90 GHz
CPU MHz: 3500
FPU: Integrated
CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip, 2 threads/core
CPU(s) orderable: 1 chip
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: Red Hat Enterprise Linux Server release 6.5 (Santiago)
2.6.32-431.el6.x86_64
Compiler: C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux;
Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux
Auto Parallel: No
File System: ext4

*Continued on next page*

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| | |
|---|---|
| L3 Cache: | 8 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 16 GB (4 x 4 GB 2Rx8 PC3-12800U-13) |
| Disk Subsystem: | 1 x 1000 GB SATA, 7200 RPM |
| Other Hardware: | None |

| | |
|---|---|
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 32/64-bit |
| Peak Pointers: | 32/64-bit |
| Other Software: | None |

## Results Table

| Benchmark | Base Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Peak Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 410.bwaves | 8 | 969 | 112 | **968** | **112** | 967 | 112 | 8 | 969 | 112 | **968** | **112** | 967 | 112 |
| 416.gamess | 8 | 822 | 191 | **823** | **190** | 823 | 190 | 8 | 784 | 200 | **781** | **201** | 778 | 201 |
| 433.milc | 8 | 660 | 111 | 660 | 111 | **660** | **111** | 8 | **659** | **111** | 659 | 111 | 659 | 111 |
| 434.zeusmp | 8 | **419** | **174** | 421 | 173 | 417 | 175 | 8 | **419** | **174** | 421 | 173 | 417 | 175 |
| 435.gromacs | 8 | 251 | 227 | **252** | **227** | 252 | 227 | 8 | **242** | **236** | 243 | 235 | 241 | 237 |
| 436.cactusADM | 8 | **561** | **171** | 559 | 171 | 571 | 167 | 8 | **561** | **171** | 559 | 171 | 571 | 167 |
| 437.leslie3d | 8 | 1051 | 71.6 | 1055 | 71.3 | **1052** | **71.5** | 4 | **471** | **79.8** | 471 | 79.8 | 470 | 79.9 |
| 444.namd | 8 | 426 | 151 | **425** | **151** | 425 | 151 | 8 | 419 | 153 | 420 | 153 | **419** | **153** |
| 447.dealII | 8 | 323 | 284 | **326** | **280** | 328 | 279 | 8 | 323 | 284 | **326** | **280** | 328 | 279 |
| 450.soplex | 8 | **869** | **76.7** | 876 | 76.1 | 858 | 77.8 | 4 | 381 | 87.6 | **375** | **88.9** | 362 | 92.1 |
| 453.povray | 8 | **164** | **260** | 163 | 262 | 165 | 258 | 8 | 144 | 296 | **143** | **298** | 142 | 299 |
| 454.calculix | 8 | **248** | **266** | 248 | 267 | 251 | 263 | 8 | **248** | **266** | 248 | 267 | 251 | 263 |
| 459.GemsFDTD | 8 | 1222 | 69.5 | 1223 | 69.4 | **1223** | **69.4** | 8 | 1222 | 69.5 | 1223 | 69.4 | **1223** | **69.4** |
| 465.tonto | 8 | 477 | 165 | 450 | 175 | **456** | **173** | 8 | **447** | **176** | 452 | 174 | 411 | 192 |
| 470.lbm | 8 | **814** | **135** | 814 | 135 | 815 | 135 | 8 | **814** | **135** | 814 | 135 | 815 | 135 |
| 481.wrf | 8 | 659 | 136 | 660 | 135 | **660** | **135** | 8 | 654 | 137 | 656 | 136 | **656** | **136** |
| 482.sphinx3 | 8 | 1085 | 144 | **1102** | **141** | 1106 | 141 | 8 | 1026 | 152 | 1046 | 149 | **1027** | **152** |

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Submit Notes

    The taskset mechanism was used to bind copies to processors. The config file option 'submit'
    was used to generate taskset commands to bind each copy to a specific processor.
    For details, please see the config file.

## Operating System Notes

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

## Platform Notes

    BIOS setting:
    Operating Mode set to Maximum Performance
    Sysinfo program /home/SPEC_ic14/config/sysinfo.rev6818

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$SPECfp\_rate2006 = $ 153

$SPECfp\_rate\_base2006 = $ 148

**CPU2006 license:** 9017
**Test sponsor:** Lenovo Group Limited
**Tested by:** Lenovo Group Limited

**Test date:** Jan-2015
**Hardware Availability:** Jul-2014
**Software Availability:** Nov-2013

### Platform Notes (Continued)

```
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on localhost.localdomain Wed Jan  7 04:30:54 2015

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) CPU E3-1241 v3 @ 3.50GHz
      1 "physical id"s (chips)
      8 "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 : 4
      siblings  : 8
      physical 0: cores 0 1 2 3
   cache size : 8192 KB

From /proc/meminfo
   MemTotal:        16165980 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux Server release 6.5 (Santiago)

From /etc/*release* /etc/*version*
   redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
   system-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

uname -a:
   Linux localhost.localdomain 2.6.32-431.el6.x86_64 #1 SMP Sun Nov 10 22:19:54
   EST 2013 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 6 19:38

SPEC is set to: /home/SPEC_ic14
   Filesystem                    Type  Size  Used Avail Use% Mounted on
   /dev/mapper/VolGroup-lv_home ext4  860G   23G  793G   3% /home

Additional information from dmidecode:
  BIOS IBM -[JUE115CUS-1.06]- 11/11/2014
  Memory:
   4x Hynix/Hyundai HMT351U7EFR8A-PB 4 GB 1600 MHz 2 rank

(End of data from sysinfo program)
```

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|---|---|---|---|
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## General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/home/SPEC_ic14/libs/32:/home/SPEC_ic14/libs/64:/home/SPEC_ic14/sh"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RedHat EL 6.4
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/redhat_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
        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 -opt-prefetch -auto-p32
    -ansi-alias -opt-mem-layout-trans=3
Continued on next page

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**Test date:** Jan-2015
**Hardware Availability:** Jul-2014
**Software Availability:** Nov-2013

# Base Optimization Flags (Continued)

C++ benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

Fortran benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
```

Benchmarks using both Fortran and C:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

# Peak Compiler Invocation

C benchmarks (except as noted below):
```
icc    -m64
```

   482.sphinx3: `icc -m32`

C++ benchmarks (except as noted below):
```
icpc   -m64
```

    450.soplex: `icpc -m32`

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
icc    -m64 ifort -m64
```

# Peak 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
         453.povray: -DSPEC_CPU_LP64
       454.calculix: -DSPEC_CPU_LP64 -nofor_main
      459.GemsFDTD: -DSPEC_CPU_LP64

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**Test sponsor:** Lenovo Group Limited

**Tested by:** Lenovo Group Limited

**Test date:** Jan-2015

**Hardware Availability:** Jul-2014

**Software Availability:** Nov-2013

## Peak Portability Flags (Continued)

```
    465.tonto: -DSPEC_CPU_LP64
     470.lbm: -DSPEC_CPU_LP64
     481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
```

## Peak Optimization Flags

C benchmarks:

```
   433.milc: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
             -O3(pass 2) -no-prec-div(pass 2)
             -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
             -auto-ilp32

   470.lbm: basepeak = yes

 482.sphinx3: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-mem-layout-trans=3
             -unroll2
```

C++ benchmarks:

```
   444.namd: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
             -O3(pass 2) -no-prec-div(pass 2)
             -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -fno-alias
             -auto-ilp32

  447.dealII: basepeak = yes

  450.soplex: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
             -O3(pass 2) -no-prec-div(pass 2)
             -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
             -opt-malloc-options=3

  453.povray: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
             -O3(pass 2) -no-prec-div(pass 2)
             -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -unroll4
             -ansi-alias
```

Fortran benchmarks:

```
  410.bwaves: basepeak = yes

  416.gamess: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
             -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2
             -inline-level=0 -scalar-rep-

  434.zeusmp: basepeak = yes
```

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**Test date:** Jan-2015

**Hardware Availability:** Jul-2014

**Software Availability:** Nov-2013

# Peak Optimization Flags (Continued)

437.leslie3d: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDTD: basepeak = yes

465.tonto: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4
-auto -inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2)
-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
-opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-HSW-A.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/Lenovo-Platform-Flags-V1.2-HSW-A.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Report generated on Tue Jan 27 13:28:25 2015 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 27 January 2015.