



# SPEC® CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

## IBM Corporation

SPECfp®2006 = 13.8

## IBM System x3455 (AMD Opteron 2220)

SPECfp\_base2006 = 13.1

CPU2006 license: 11

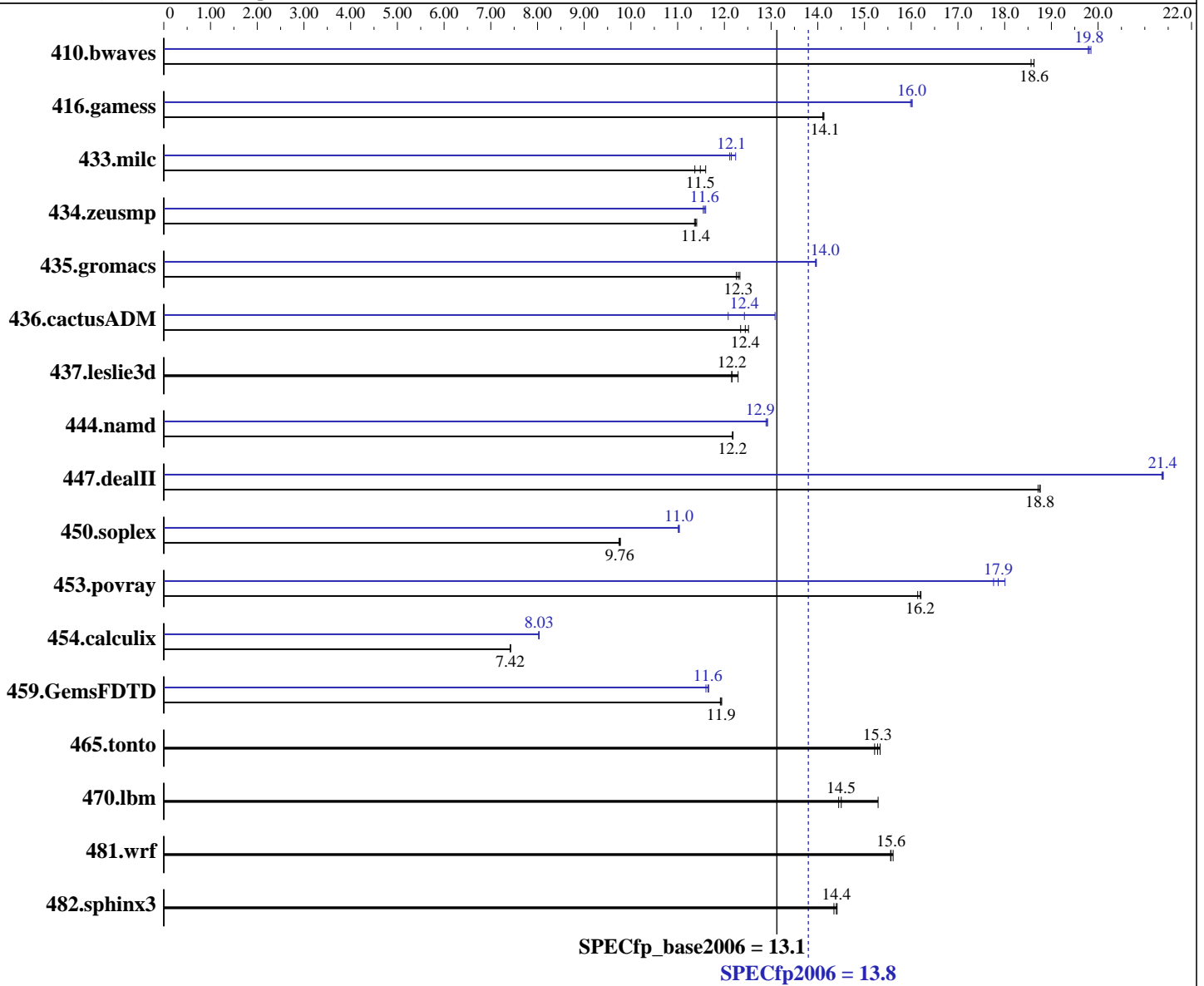
Test date: Jul-2007

Test sponsor: IBM Corporation

Hardware Availability: Apr-2007

Tested by: IBM Corporation

Software Availability: Mar-2007



### Hardware

CPU Name: AMD Opteron 2220  
 CPU Characteristics:  
 CPU MHz: 2800  
 FPU: Integrated  
 CPU(s) enabled: 4 cores, 2 chips, 2 cores/chip  
 CPU(s) orderable: 1, 2 chips  
 Primary Cache: 64 KB I + 64 KB D on chip per core  
 Secondary Cache: 1 MB I+D on chip per core

Continued on next page

### Software

Operating System: SLES 10 (x86\_64), 2.6.16.21-0.8-smp  
 Compiler: QLogic PathScale  
 Compiler Suite, Release 3.0  
 Auto Parallel: No  
 File System: ext3  
 System State: Multi-user, run level 3  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

IBM Corporation

SPECfp2006 = 13.8

IBM System x3455 (AMD Opteron 2220)

SPECfp\_base2006 = 13.1

CPU2006 license: 11  
Test sponsor: IBM Corporation  
Tested by: IBM Corporation

Test date: Jul-2007  
Hardware Availability: Apr-2007  
Software Availability: Mar-2007

L3 Cache: None  
Other Cache: None  
Memory: 16 GB (8 x 2GB DDR2-5300 ECC)  
Disk Subsystem: 1 x 160 GB Serial ATA, 7200 RPM  
Other Hardware: None

Other Software: MicroQuill SmartHeap 8.1

## Results Table

| Benchmark     | Base        |             |             |             |            |             | Peak        |             |            |             |            |             |
|---------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|------------|-------------|------------|-------------|
|               | Seconds     | Ratio       | Seconds     | Ratio       | Seconds    | Ratio       | Seconds     | Ratio       | Seconds    | Ratio       | Seconds    | Ratio       |
| 410.bwaves    | 732         | 18.6        | <b>730</b>  | <b>18.6</b> | 730        | 18.6        | 687         | 19.8        | 685        | 19.8        | <b>686</b> | <b>19.8</b> |
| 416.gamess    | 1388        | 14.1        | <b>1387</b> | <b>14.1</b> | 1386       | 14.1        | <b>1223</b> | <b>16.0</b> | 1225       | 16.0        | 1222       | 16.0        |
| 433.milc      | 808         | 11.4        | <b>799</b>  | <b>11.5</b> | 791        | 11.6        | 758         | 12.1        | <b>756</b> | <b>12.1</b> | 750        | 12.2        |
| 434.zeusmp    | 798         | 11.4        | 801         | 11.4        | <b>799</b> | <b>11.4</b> | 784         | 11.6        | <b>786</b> | <b>11.6</b> | 788        | 11.5        |
| 435.gromacs   | 583         | 12.3        | <b>581</b>  | <b>12.3</b> | 579        | 12.3        | 512         | 14.0        | <b>511</b> | <b>14.0</b> | 511        | 14.0        |
| 436.cactusADM | 955         | 12.5        | <b>960</b>  | <b>12.4</b> | 968        | 12.3        | 913         | 13.1        | 989        | 12.1        | <b>961</b> | <b>12.4</b> |
| 437.leslie3d  | 765         | 12.3        | 773         | 12.2        | <b>773</b> | <b>12.2</b> | 765         | 12.3        | 773        | 12.2        | <b>773</b> | <b>12.2</b> |
| 444.namd      | <b>659</b>  | <b>12.2</b> | 658         | 12.2        | 659        | 12.2        | <b>621</b>  | <b>12.9</b> | 621        | 12.9        | 622        | 12.9        |
| 447.dealII    | <b>610</b>  | <b>18.8</b> | 610         | 18.8        | 611        | 18.7        | <b>535</b>  | <b>21.4</b> | 535        | 21.4        | 535        | 21.4        |
| 450.soplex    | 853         | 9.77        | 856         | 9.74        | <b>854</b> | <b>9.76</b> | 756         | 11.0        | 757        | 11.0        | <b>756</b> | <b>11.0</b> |
| 453.povray    | <b>329</b>  | <b>16.2</b> | 328         | 16.2        | 330        | 16.1        | <b>298</b>  | <b>17.9</b> | 295        | 18.0        | 300        | 17.8        |
| 454.calculix  | 1112        | 7.42        | <b>1112</b> | <b>7.42</b> | 1111       | 7.42        | <b>1027</b> | <b>8.03</b> | 1027       | 8.03        | 1028       | 8.03        |
| 459.GemsFDTD  | 888         | 11.9        | <b>889</b>  | <b>11.9</b> | 891        | 11.9        | 914         | 11.6        | <b>911</b> | <b>11.6</b> | 910        | 11.7        |
| 465.tonto     | 642         | 15.3        | <b>644</b>  | <b>15.3</b> | 647        | 15.2        | 642         | 15.3        | <b>644</b> | <b>15.3</b> | 647        | 15.2        |
| 470.lbm       | 899         | 15.3        | <b>947</b>  | <b>14.5</b> | 951        | 14.4        | 899         | 15.3        | <b>947</b> | <b>14.5</b> | 951        | 14.4        |
| 481.wrf       | 715         | 15.6        | <b>718</b>  | <b>15.6</b> | 718        | 15.6        | 715         | 15.6        | <b>718</b> | <b>15.6</b> | 718        | 15.6        |
| 482.sphinx3   | <b>1354</b> | <b>14.4</b> | 1352        | 14.4        | 1359       | 14.3        | <b>1354</b> | <b>14.4</b> | 1352       | 14.4        | 1359       | 14.3        |

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

## General Notes

taskset utility used to bind CPU(s) to processes  
DSPEC\_CPU\_TABLE\_WORKAROUND was used for portability when compiling 447.dealII  
due to compilation being performed on SLES 9 SP3

## Base Compiler Invocation

C benchmarks:  
pathcc

C++ benchmarks:  
pathCC

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

IBM Corporation

SPECfp2006 = 13.8

IBM System x3455 (AMD Opteron 2220)

SPECfp\_base2006 = 13.1

CPU2006 license: 11

Test date: Jul-2007

Test sponsor: IBM Corporation

Hardware Availability: Apr-2007

Tested by: IBM Corporation

Software Availability: Mar-2007

## Base Compiler Invocation (Continued)

Fortran benchmarks:  
pathf95

Benchmarks using both Fortran and C:  
pathcc pathf95

## 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  
 436.cactusADM: -DSPEC\_CPU\_LP64 -fno-second-underscore  
 437.leslie3d: -DSPEC\_CPU\_LP64  
 444.namd: -DSPEC\_CPU\_LP64  
 447.dealII: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_TABLE\_WORKAROUND  
 450.soplex: -DSPEC\_CPU\_LP64  
 453.povray: -DSPEC\_CPU\_LP64  
 454.calculix: -DSPEC\_CPU\_LP64  
 459.GemsFDTD: -DSPEC\_CPU\_LP64  
 465.tonto: -DSPEC\_CPU\_LP64  
 470.lbm: -DSPEC\_CPU\_LP64  
 481.wrf: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX -fno-second-underscore  
 482.sphinx3: -DSPEC\_CPU\_LP64

## Base Optimization Flags

C benchmarks:  
-Ofast

C++ benchmarks:  
-Ofast

Fortran benchmarks:  
-Ofast -OPT:malloc\_alg=1

Benchmarks using both Fortran and C:  
-Ofast -OPT:malloc\_alg=1

## Base Other Flags

C benchmarks:  
-IPA:max\_jobs=2

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

IBM Corporation

SPECfp2006 = 13.8

IBM System x3455 (AMD Opteron 2220)

SPECfp\_base2006 = 13.1

CPU2006 license: 11

Test date: Jul-2007

Test sponsor: IBM Corporation

Hardware Availability: Apr-2007

Tested by: IBM Corporation

Software Availability: Mar-2007

## Base Other Flags (Continued)

C++ benchmarks:

-IPA:max\_jobs=2

Fortran benchmarks:

-IPA:max\_jobs=2

Benchmarks using both Fortran and C:

-IPA:max\_jobs=2

## Peak Compiler Invocation

C benchmarks:

pathcc

C++ benchmarks:

pathCC

Fortran benchmarks:

pathf95

Benchmarks using both Fortran and C:

pathcc pathf95

## 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  
 436.cactusADM: -DSPEC\_CPU\_LP64 -fno-second-underscore  
 437.leslie3d: -DSPEC\_CPU\_LP64  
 444.namd: -DSPEC\_CPU\_LP64  
 447.dealII: -DSPEC\_CPU\_TABLE\_WORKAROUND  
 453.povray: -DSPEC\_CPU\_LP64  
 454.calculix: -DSPEC\_CPU\_LP64  
 459.GemsFDTD: -DSPEC\_CPU\_LP64  
 465.tonto: -DSPEC\_CPU\_LP64  
 470.lbm: -DSPEC\_CPU\_LP64  
 481.wrf: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX -fno-second-underscore  
 482.sphinx3: -DSPEC\_CPU\_LP64



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

IBM Corporation

SPECfp2006 = 13.8

IBM System x3455 (AMD Opteron 2220)

SPECfp\_base2006 = 13.1

CPU2006 license: 11

Test date: Jul-2007

Test sponsor: IBM Corporation

Hardware Availability: Apr-2007

Tested by: IBM Corporation

Software Availability: Mar-2007

## Peak Optimization Flags

### C benchmarks:

433.milc: -Ofast -CG:cflow=off -LNO:prefetch=1 -OPT:malloc\_alg=1

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

### C++ benchmarks:

444.namd: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -Ofast  
-fno-exceptions

447.dealIII: -Ofast -INLINE:aggressive=on -LNO:opt=0 -OPT:alias=disjoint  
-m32 -fno-exceptions

450.soplex: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -m32 -O3  
-OPT:IEEE\_arith=3 -CG:load\_exe=0 -CG:movnti=1  
-LNO:minvariant=off -LNO:prefetch=1 -fno-exceptions

453.povray: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -Ofast  
-fno-fast-math

### Fortran benchmarks:

410.bwaves: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -O3  
-OPT:Ofast -OPT:IEEE\_arith=3 -LNO:blocking=off  
-LNO:ignore\_feedback=off

416.gamess: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -O2  
-OPT:Ofast -OPT:ro=3 -OPT:unroll\_size=256

434.zeusmp: -Ofast -CG:local\_fwd\_sched=on -LNO:blocking=off  
-LNO:interchange=off -LNO:fu=10 -LNO:full\_unroll\_outer=on

437.leslie3d: basepeak = yes

459.GemsFDTD: -Ofast -LNO:fission=2 -LNO:prefetch=0

465.tonto: basepeak = yes

### Benchmarks using both Fortran and C:

435.gromacs: -O3 -OPT:rsqrt=2 -OPT:ro=3

436.cactusADM: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -O3  
-LNO:prefetch=3 -LNO:prefetch\_ahead=5 -LNO:ou\_prod\_max=10  
-LNO:full\_unroll=5 -ipa

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2016 Standard Performance Evaluation Corporation

IBM Corporation

SPECfp2006 = 13.8

IBM System x3455 (AMD Opteron 2220)

SPECfp\_base2006 = 13.1

CPU2006 license: 11

Test date: Jul-2007

Test sponsor: IBM Corporation

Hardware Availability: Apr-2007

Tested by: IBM Corporation

Software Availability: Mar-2007

## Peak Optimization Flags (Continued)

454.calculix: -Ofast -LNO:simd=0 -WOPT:mem\_opnds=on

481.wrf: basepeak = yes

## Peak Other Flags

C benchmarks:

-IPA:max\_jobs=2

C++ benchmarks:

-IPA:max\_jobs=2

Fortran benchmarks:

-IPA:max\_jobs=2

Benchmarks using both Fortran and C:

-IPA:max\_jobs=2

The flags file that was used to format this result can be browsed at

[http://www.spec.org/cpu2006/flags/CPU2006\\_flags.20090714.13.html](http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.13.html)

You can also download the XML flags source by saving the following link:

[http://www.spec.org/cpu2006/flags/CPU2006\\_flags.20090714.13.xml](http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.13.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 v1.0.

Report generated on Tue Sep 13 11:23:10 2016 by SPEC CPU2006 PS/PDF formatter v6932.

Originally published on 8 August 2007.