



# SPEC® CFP2006 Result

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## IBM Corporation

SPECfp®2006 = 14.5

## IBM System x3455 (AMD Opteron 2222 SE)

SPECfp\_base2006 = 13.6

CPU2006 license: 11

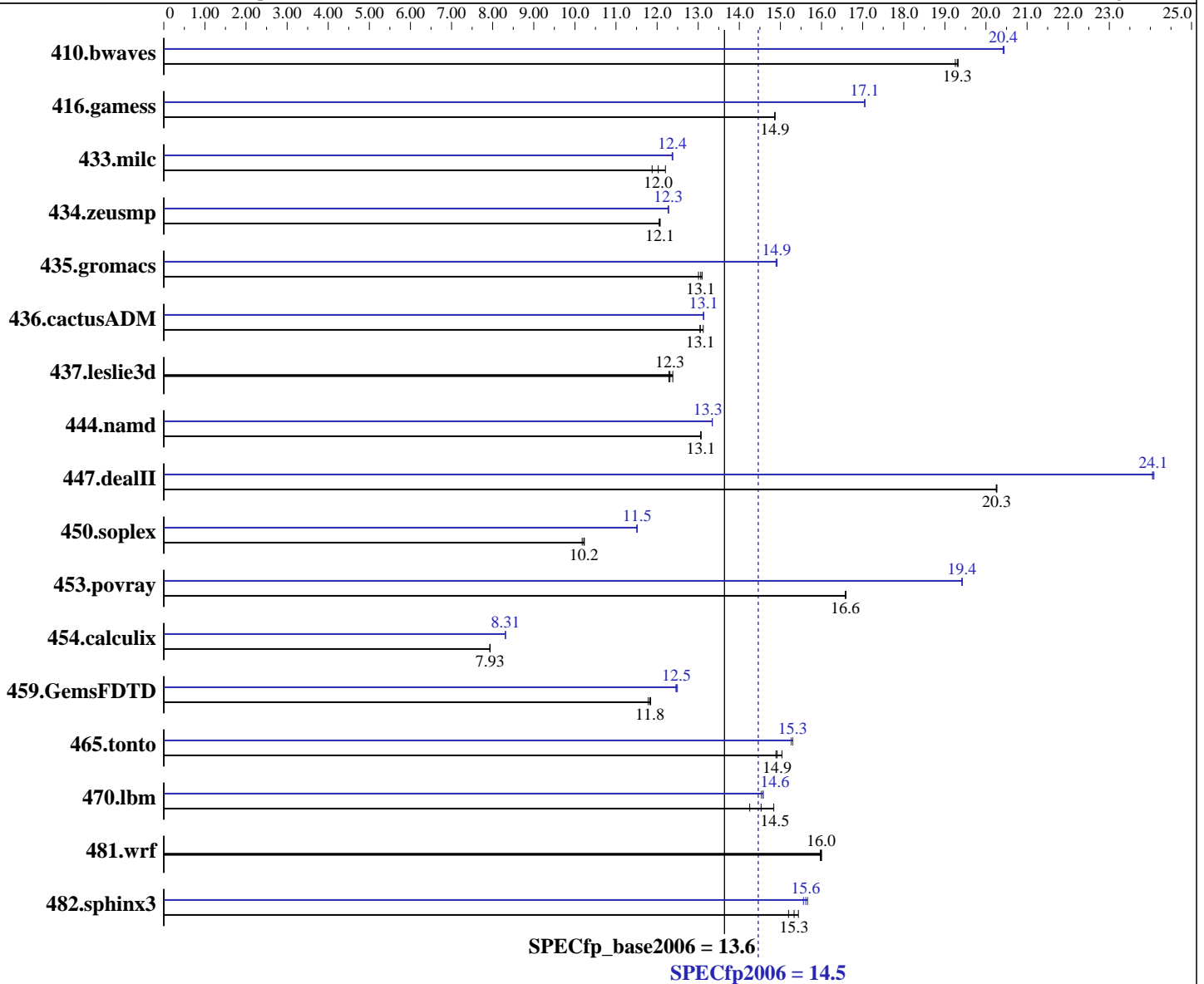
Test date: Feb-2007

Test sponsor: IBM Corporation

Hardware Availability: Apr-2007

Tested by: IBM Corporation

Software Availability: Aug-2006



**Hardware**

CPU Name: AMD Opteron 2222 SE  
 CPU Characteristics:  
 CPU MHz: 3000  
 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

**Software**

Operating System: SLES9 SP3 for AMD64/EM64T  
 Compiler: QLogic PathScale Compiler Suite 2.5  
 Auto Parallel: No  
 File System: ext3  
 System State: Multi-user, run level 3  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit  
 Other Software: None

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L3 Cache: None  
Other Cache: None  
Memory: 16 GB (8 x 2GB DDR2-5300 ECC)  
Disk Subsystem: 1 x 80 GB SATA, 7200 RPM  
Other Hardware: None

## Results Table

| Benchmark     | Base       |             |             |             |            |             | Peak       |             |             |             |            |             |
|---------------|------------|-------------|-------------|-------------|------------|-------------|------------|-------------|-------------|-------------|------------|-------------|
|               | Seconds    | Ratio       | Seconds     | Ratio       | Seconds    | Ratio       | Seconds    | Ratio       | Seconds     | Ratio       | Seconds    | Ratio       |
| 410.bwaves    | <b>704</b> | <b>19.3</b> | 703         | 19.3        | 706        | 19.3        | 666        | 20.4        | 665         | 20.4        | <b>665</b> | <b>20.4</b> |
| 416.gamess    | 1318       | 14.9        | <b>1317</b> | <b>14.9</b> | 1317       | 14.9        | 1148       | 17.0        | <b>1148</b> | <b>17.1</b> | 1148       | 17.1        |
| 433.milc      | 773        | 11.9        | <b>763</b>  | <b>12.0</b> | 752        | 12.2        | 742        | 12.4        | 742         | 12.4        | <b>742</b> | <b>12.4</b> |
| 434.zeusmp    | 754        | 12.1        | <b>754</b>  | <b>12.1</b> | 755        | 12.0        | 742        | 12.3        | 741         | 12.3        | <b>742</b> | <b>12.3</b> |
| 435.gromacs   | <b>547</b> | <b>13.1</b> | 549         | 13.0        | 545        | 13.1        | 479        | 14.9        | <b>479</b>  | <b>14.9</b> | 479        | 14.9        |
| 436.cactusADM | 911        | 13.1        | 916         | 13.0        | <b>916</b> | <b>13.1</b> | <b>910</b> | <b>13.1</b> | 910         | 13.1        | 910        | 13.1        |
| 437.leslie3d  | 765        | 12.3        | 759         | 12.4        | <b>763</b> | <b>12.3</b> | 765        | 12.3        | 759         | 12.4        | <b>763</b> | <b>12.3</b> |
| 444.namd      | <b>614</b> | <b>13.1</b> | 614         | 13.1        | 614        | 13.1        | <b>601</b> | <b>13.3</b> | 601         | 13.3        | 601        | 13.3        |
| 447.dealII    | <b>565</b> | <b>20.3</b> | 565         | 20.2        | 565        | 20.3        | 476        | 24.0        | 475         | 24.1        | <b>475</b> | <b>24.1</b> |
| 450.soplex    | <b>816</b> | <b>10.2</b> | 815         | 10.2        | 819        | 10.2        | <b>724</b> | <b>11.5</b> | 725         | 11.5        | 724        | 11.5        |
| 453.povray    | <b>321</b> | <b>16.6</b> | 321         | 16.6        | 321        | 16.6        | 274        | 19.4        | 274         | 19.4        | <b>274</b> | <b>19.4</b> |
| 454.calculix  | 1039       | 7.94        | <b>1040</b> | <b>7.93</b> | 1040       | 7.93        | 993        | 8.31        | <b>993</b>  | <b>8.31</b> | 993        | 8.31        |
| 459.GemsFDTD  | 900        | 11.8        | <b>897</b>  | <b>11.8</b> | 896        | 11.8        | 852        | 12.5        | <b>851</b>  | <b>12.5</b> | 849        | 12.5        |
| 465.tonto     | 654        | 15.0        | <b>659</b>  | <b>14.9</b> | 661        | 14.9        | 643        | 15.3        | <b>643</b>  | <b>15.3</b> | 645        | 15.3        |
| 470.lbm       | 926        | 14.8        | 964         | 14.3        | <b>946</b> | <b>14.5</b> | 945        | 14.5        | 942         | 14.6        | <b>943</b> | <b>14.6</b> |
| 481.wrf       | <b>699</b> | <b>16.0</b> | 699         | 16.0        | 698        | 16.0        | <b>699</b> | <b>16.0</b> | 699         | 16.0        | 698        | 16.0        |
| 482.sphinx3   | 1263       | 15.4        | <b>1271</b> | <b>15.3</b> | 1282       | 15.2        | 1244       | 15.7        | <b>1248</b> | <b>15.6</b> | 1253       | 15.6        |

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

## Operating System Notes

taskset utility used to bind CPU(s) to processes

## Base Compiler Invocation

C benchmarks:  
pathcc

C++ benchmarks:  
pathCC

Fortran benchmarks:  
pathf95

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## Base Compiler Invocation (Continued)

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:  
-march=auto -Ofast

C++ benchmarks:  
-march=auto -Ofast

Fortran benchmarks:  
-march=auto -Ofast

Benchmarks using both Fortran and C:  
-march=auto -Ofast

## Base Other Flags

C benchmarks:  
-IPA:max\_jobs=2

C++ benchmarks:  
-IPA:max\_jobs=2

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## Base Other Flags (Continued)

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.lelie3d: -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

## Peak Optimization Flags

C benchmarks:

-march=auto -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -Ofast

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## Peak Optimization Flags (Continued)

C++ benchmarks:

444.namd: -march=auto -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2)  
-Ofast

447.dealII: -march=auto -Ofast -m32 -fno-exceptions

450.soplex: -march=auto -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 -fno-exceptions

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

Fortran benchmarks:

410.bwaves: -march=auto -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: -march=auto -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2)  
-O2 -OPT:Ofast -OPT:ro=3 -OPT:unroll\_size=256

434.zeusmp: -march=auto -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: -march=auto -Ofast -LNO:fission=2 -LNO:prefetch=0

465.tonto: -march=auto -Ofast -CG:local\_fwd\_sched=on -IPA:plimit=525

Benchmarks using both Fortran and C:

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

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

454.calculix: -march=auto -Ofast -CG:prefetch=off -LNO:simd=0  
-OPT:unroll\_times\_max=8 -WOPT:mem\_opnds=on

481.wrf: basepeak = yes



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## 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.20090714.29.html](http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.29.html)

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

[http://www.spec.org/cpu2006/flags/CPU2006\\_flags.20090714.29.xml](http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.29.xml)

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