



# SPEC<sup>®</sup> CFP2006 Result

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## IBM Corporation

### SPECfp<sup>®</sup>\_rate2006 = 89.2

### IBM BladeCenter LS41 (AMD Opteron 8220)

### SPECfp\_rate\_base2006 = 84.0

CPU2006 license: 11

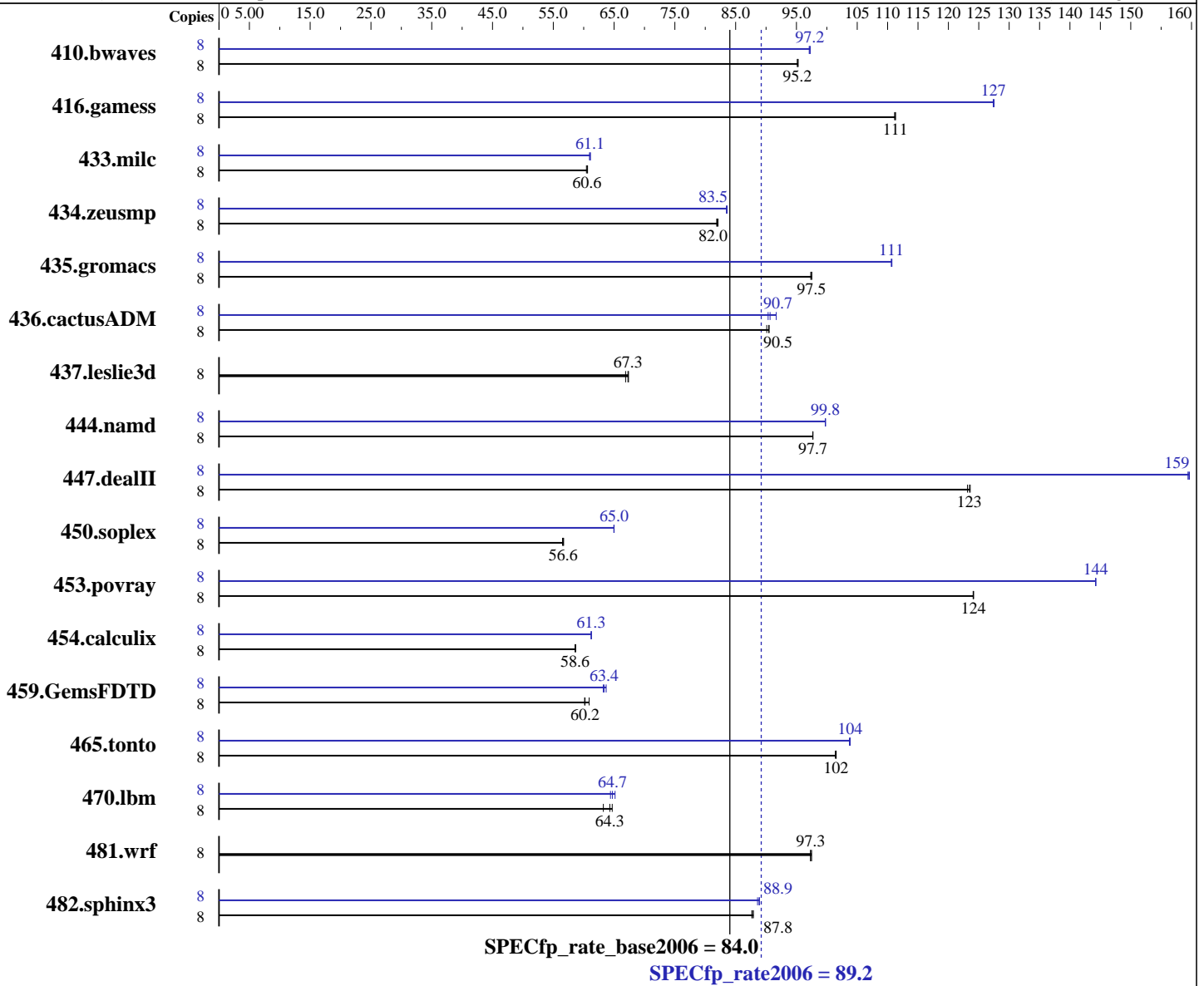
Test date: Feb-2007

Test sponsor: IBM Corporation

Hardware Availability: Apr-2007

Tested by: IBM Corporation

Software Availability: Aug-2006



#### Hardware

CPU Name: AMD Opteron 8220  
 CPU Characteristics:  
 CPU MHz: 2800  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 4 chips, 2 cores/chip  
 CPU(s) orderable: 1, 2, 4 chips  
 Primary Cache: 64 KB I + 64 KB D on chip per core  
 Secondary Cache: 1 MB I+D on chip per core

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#### 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: 32 GB (16 x 2GB DDR2-5300 ECC)  
Disk Subsystem: 1 x 73 GB SATA, 10000 RPM  
Other Hardware: None

### Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	8	1142	95.2	1141	95.3	<u>1142</u>	<u>95.2</u>	8	1120	97.1	1118	97.3	<u>1119</u>	<u>97.2</u>
416.gamess	8	1409	111	<u>1408</u>	<u>111</u>	1408	111	8	1230	127	1228	128	<u>1229</u>	<u>127</u>
433.milc	8	1215	60.5	1211	60.6	<u>1213</u>	<u>60.6</u>	8	1205	61.0	<u>1203</u>	<u>61.1</u>	1202	61.1
434.zeusmp	8	887	82.1	<u>888</u>	<u>82.0</u>	889	81.9	8	871	83.6	872	83.5	<u>871</u>	<u>83.5</u>
435.gromacs	8	587	97.4	<u>586</u>	<u>97.5</u>	586	97.5	8	516	111	<u>516</u>	<u>111</u>	516	111
436.cactusADM	8	1061	90.1	<u>1057</u>	<u>90.5</u>	1056	90.5	8	1058	90.3	<u>1054</u>	<u>90.7</u>	1043	91.7
437.leslie3d	8	<u>1118</u>	<u>67.3</u>	1116	67.4	1124	66.9	8	<u>1118</u>	<u>67.3</u>	1116	67.4	1124	66.9
444.namd	8	657	97.7	657	97.7	<u>657</u>	<u>97.7</u>	8	643	99.8	643	99.8	<u>643</u>	<u>99.8</u>
447.dealII	8	743	123	<u>741</u>	<u>123</u>	741	124	8	<u>574</u>	<u>159</u>	573	160	574	159
450.soplex	8	1177	56.7	<u>1178</u>	<u>56.6</u>	1180	56.5	8	<u>1026</u>	<u>65.0</u>	1027	65.0	1026	65.0
453.povray	8	<u>343</u>	<u>124</u>	343	124	343	124	8	295	144	<u>295</u>	<u>144</u>	295	144
454.calculix	8	1125	58.7	1126	58.6	<u>1126</u>	<u>58.6</u>	8	<u>1077</u>	<u>61.3</u>	1078	61.2	1077	61.3
459.GemsFDTD	8	1394	60.9	1411	60.2	<u>1409</u>	<u>60.2</u>	8	1333	63.7	1343	63.2	<u>1339</u>	<u>63.4</u>
465.tonto	8	776	101	<u>775</u>	<u>102</u>	775	102	8	758	104	<u>758</u>	<u>104</u>	759	104
470.lbm	8	1738	63.2	<u>1710</u>	<u>64.3</u>	1699	64.7	8	1687	65.2	1707	64.4	<u>1698</u>	<u>64.7</u>
481.wrf	8	917	97.5	918	97.3	<u>918</u>	<u>97.3</u>	8	917	97.5	918	97.3	<u>918</u>	<u>97.3</u>
482.sphinx3	8	1779	87.7	1773	87.9	<u>1777</u>	<u>87.8</u>	8	1760	88.6	<u>1755</u>	<u>88.9</u>	1753	88.9

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.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

## 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.20090714.17.html](http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.17.html)

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

[http://www.spec.org/cpu2006/flags/CPU2006\\_flags.20090714.17.xml](http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.17.xml)

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