



# SPEC® CFP2006 Result

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## IBM Corporation

### SPECfp®\_rate2006 = 82.1

### IBM BladeCenter LS41 (AMD Opteron 8216)

### SPECfp\_rate\_base2006 = 77.6

CPU2006 license: 11

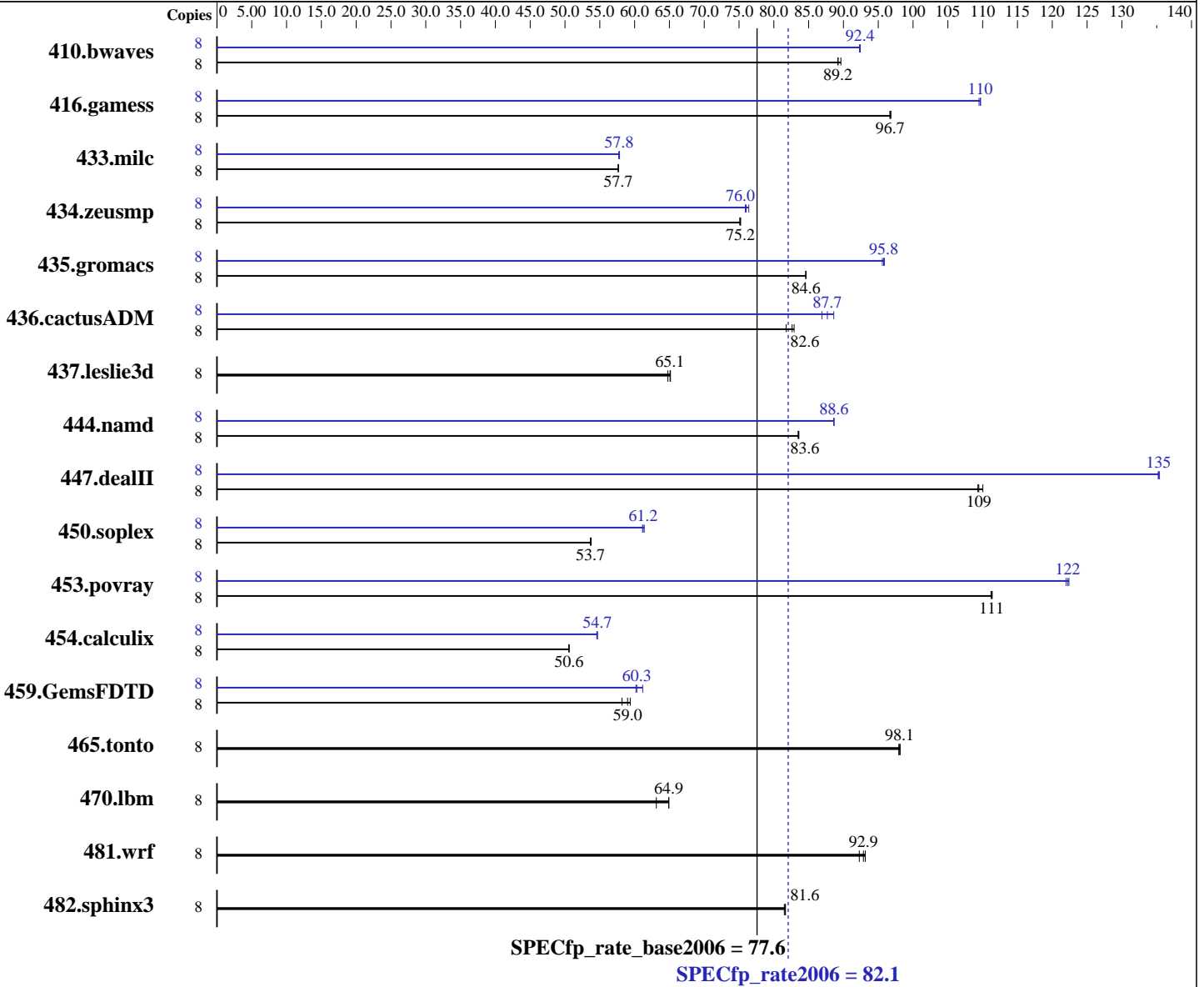
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Jul-2007

Hardware Availability: Oct-2006

Software Availability: Mar-2007



#### Hardware

CPU Name: AMD Opteron 8216  
 CPU Characteristics:  
 CPU MHz: 2400  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 4 chips, 2 cores/chip  
 CPU(s) orderable: 1, 2, 3, 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: 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

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L3 Cache: None  
Other Cache: None  
Memory: 32 GB (16 x 2GB DDR2-5300 ECC)  
Disk Subsystem: 1 x 36 GB SAS, 10000 RPM  
Other Hardware: None

Other Software: None

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	8	1219	89.2	<u>1218</u>	<u>89.2</u>	1213	89.6	8	1176	92.4	1178	92.3	<u>1177</u>	<u>92.4</u>
416.gamess	8	1620	96.7	1618	96.8	<u>1620</u>	<u>96.7</u>	8	1428	110	1431	109	<u>1428</u>	<u>110</u>
433.milc	8	1274	57.7	<u>1274</u>	<u>57.7</u>	1274	57.7	8	1270	57.8	<u>1271</u>	<u>57.8</u>	1272	57.7
434.zeusmp	8	<u>968</u>	<u>75.2</u>	969	75.1	968	75.2	8	<u>958</u>	<u>76.0</u>	953	76.4	959	75.9
435.gromacs	8	<u>675</u>	<u>84.6</u>	675	84.6	675	84.6	8	<u>596</u>	<u>95.8</u>	598	95.6	596	95.9
436.cactusADM	8	1153	82.9	1169	81.8	<u>1157</u>	<u>82.6</u>	8	1100	86.9	1079	88.6	<u>1090</u>	<u>87.7</u>
437.leslie3d	8	1154	65.2	1161	64.8	<u>1155</u>	<u>65.1</u>	8	1154	65.2	1161	64.8	<u>1155</u>	<u>65.1</u>
444.namd	8	767	83.6	<u>768</u>	<u>83.6</u>	769	83.5	8	724	88.6	724	88.6	<u>724</u>	<u>88.6</u>
447.dealII	8	837	109	832	110	<u>836</u>	<u>109</u>	8	<u>676</u>	<u>135</u>	677	135	676	135
450.soplex	8	1244	53.7	<u>1243</u>	<u>53.7</u>	1241	53.8	8	1087	61.4	<u>1090</u>	<u>61.2</u>	1091	61.1
453.povray	8	<u>382</u>	<u>111</u>	382	111	383	111	8	349	122	<u>348</u>	<u>122</u>	348	122
454.calculix	8	1305	50.6	<u>1305</u>	<u>50.6</u>	1305	50.6	8	<u>1208</u>	<u>54.7</u>	1207	54.7	1210	54.6
459.GemsFDTD	8	1430	59.4	<u>1439</u>	<u>59.0</u>	1459	58.2	8	1410	60.2	1388	61.2	<u>1407</u>	<u>60.3</u>
465.tonto	8	802	98.1	804	98.0	<u>803</u>	<u>98.1</u>	8	802	98.1	804	98.0	<u>803</u>	<u>98.1</u>
470.lbm	8	1741	63.1	1693	64.9	<u>1694</u>	<u>64.9</u>	8	1741	63.1	1693	64.9	<u>1694</u>	<u>64.9</u>
481.wrf	8	959	93.1	<u>962</u>	<u>92.9</u>	968	92.3	8	959	93.1	<u>962</u>	<u>92.9</u>	968	92.3
482.sphinx3	8	1913	81.5	<u>1910</u>	<u>81.6</u>	1909	81.7	8	1913	81.5	<u>1910</u>	<u>81.6</u>	1909	81.7

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

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## 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

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## 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



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## 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

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## 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)

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Tested with SPEC CPU2006 v1.0.

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