



# SPEC® CFP2006 Result

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## IBM Corporation

### SPECfp®\_rate2006 = 48.0

### IBM BladeCenter LS21 (AMD Opteron 2220)

### SPECfp\_rate\_base2006 = 45.7

CPU2006 license: 11

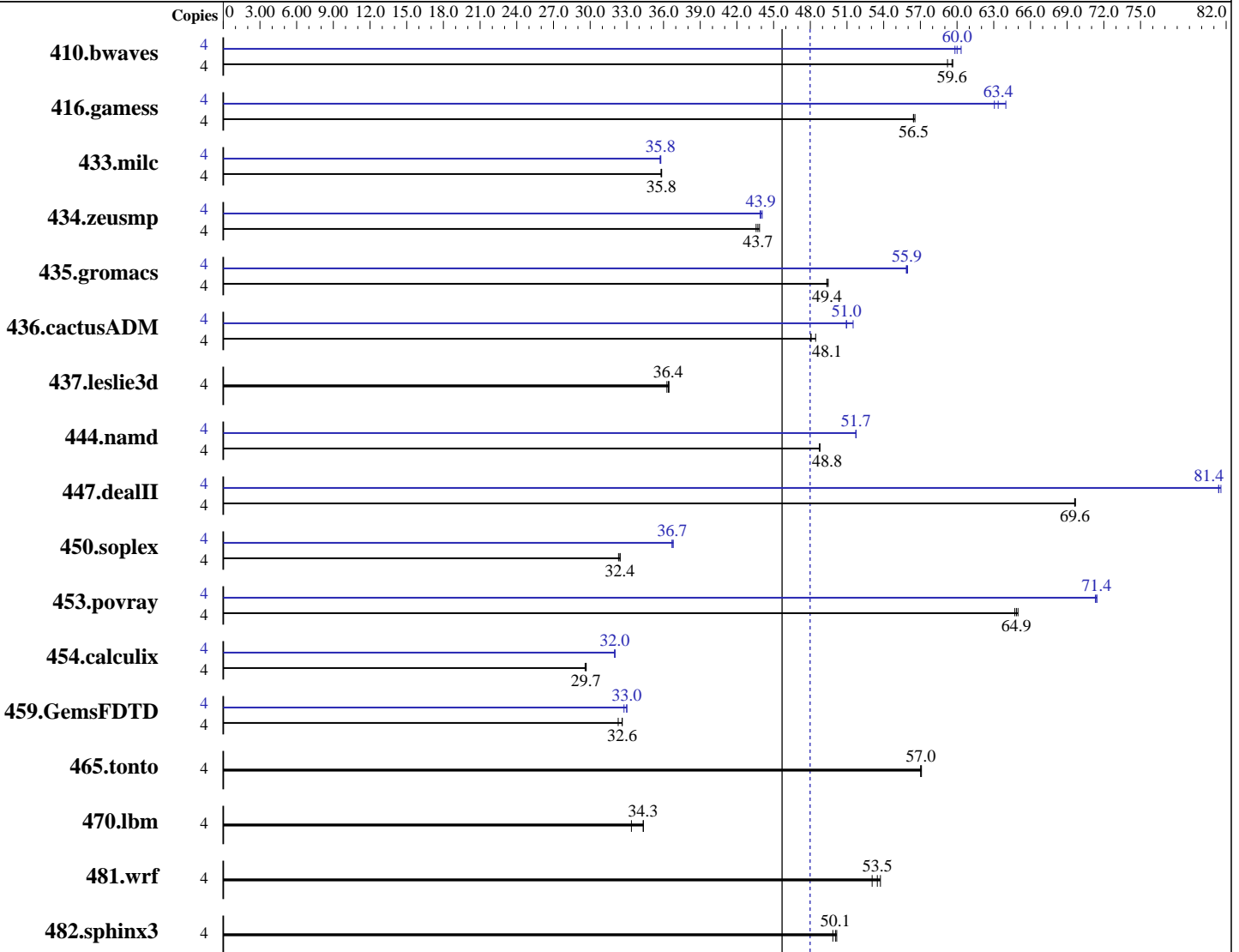
Test date: Mar-2007

Test sponsor: IBM Corporation

Hardware Availability: Feb-2007

Tested by: IBM Corporation

Software Availability: Mar-2007



SPECfp\_rate\_base2006 = 45.7

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#### 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

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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: 16 GB (8 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	4	911	59.7	<u>912</u>	<u>59.6</u>	918	59.2	4	<u>906</u>	<u>60.0</u>	901	60.3	909	59.8
416.gamess	4	1388	56.4	<u>1387</u>	<u>56.5</u>	1385	56.6	4	<u>1236</u>	<u>63.4</u>	1224	64.0	1242	63.1
433.milc	4	<u>1025</u>	<u>35.8</u>	1026	35.8	1024	35.8	4	1028	35.7	1026	35.8	<u>1027</u>	<u>35.8</u>
434.zeusmp	4	830	43.8	835	43.6	<u>833</u>	<u>43.7</u>	4	826	44.1	<u>828</u>	<u>43.9</u>	829	43.9
435.gromacs	4	579	49.4	<u>578</u>	<u>49.4</u>	577	49.5	4	511	55.9	<u>511</u>	<u>55.9</u>	510	56.0
436.cactusADM	4	<u>995</u>	<u>48.1</u>	987	48.4	995	48.0	4	938	50.9	928	51.5	<u>938</u>	<u>51.0</u>
437.leslie3d	4	<u>1033</u>	<u>36.4</u>	1036	36.3	1032	36.4	4	<u>1033</u>	<u>36.4</u>	1036	36.3	1032	36.4
444.namd	4	658	48.8	<u>658</u>	<u>48.8</u>	658	48.8	4	620	51.7	<u>620</u>	<u>51.7</u>	620	51.7
447.dealII	4	657	69.7	<u>657</u>	<u>69.6</u>	657	69.6	4	561	81.6	<u>562</u>	<u>81.4</u>	562	81.4
450.soplex	4	1032	32.3	<u>1028</u>	<u>32.4</u>	1028	32.4	4	907	36.8	909	36.7	<u>909</u>	<u>36.7</u>
453.povray	4	329	64.7	<u>328</u>	<u>64.9</u>	327	65.0	4	<u>298</u>	<u>71.4</u>	298	71.4	298	71.3
454.calculix	4	1112	29.7	<u>1113</u>	<u>29.7</u>	1115	29.6	4	1030	32.0	1031	32.0	<u>1031</u>	<u>32.0</u>
459.GemsFDTD	4	1314	32.3	<u>1301</u>	<u>32.6</u>	1301	32.6	4	1295	32.8	1286	33.0	<u>1287</u>	<u>33.0</u>
465.tonto	4	690	57.0	689	57.1	<u>690</u>	<u>57.0</u>	4	690	57.0	689	57.1	<u>690</u>	<u>57.0</u>
470.lbm	4	1647	33.4	<u>1601</u>	<u>34.3</u>	1600	34.4	4	1647	33.4	<u>1601</u>	<u>34.3</u>	1600	34.4
481.wrf	4	<u>835</u>	<u>53.5</u>	831	53.7	842	53.1	4	<u>835</u>	<u>53.5</u>	831	53.7	842	53.1
482.sphinx3	4	<u>1557</u>	<u>50.1</u>	1564	49.8	1554	50.2	4	<u>1557</u>	<u>50.1</u>	1564	49.8	1554	50.2

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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