



# SPEC® CFP2006 Result

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## IBM Corporation

**SPECfp®2006 = 13.6**

### IBM BladeCenter LS21 (AMD Opteron 2220)

**SPECfp\_base2006 = 12.8**

CPU2006 license: 11

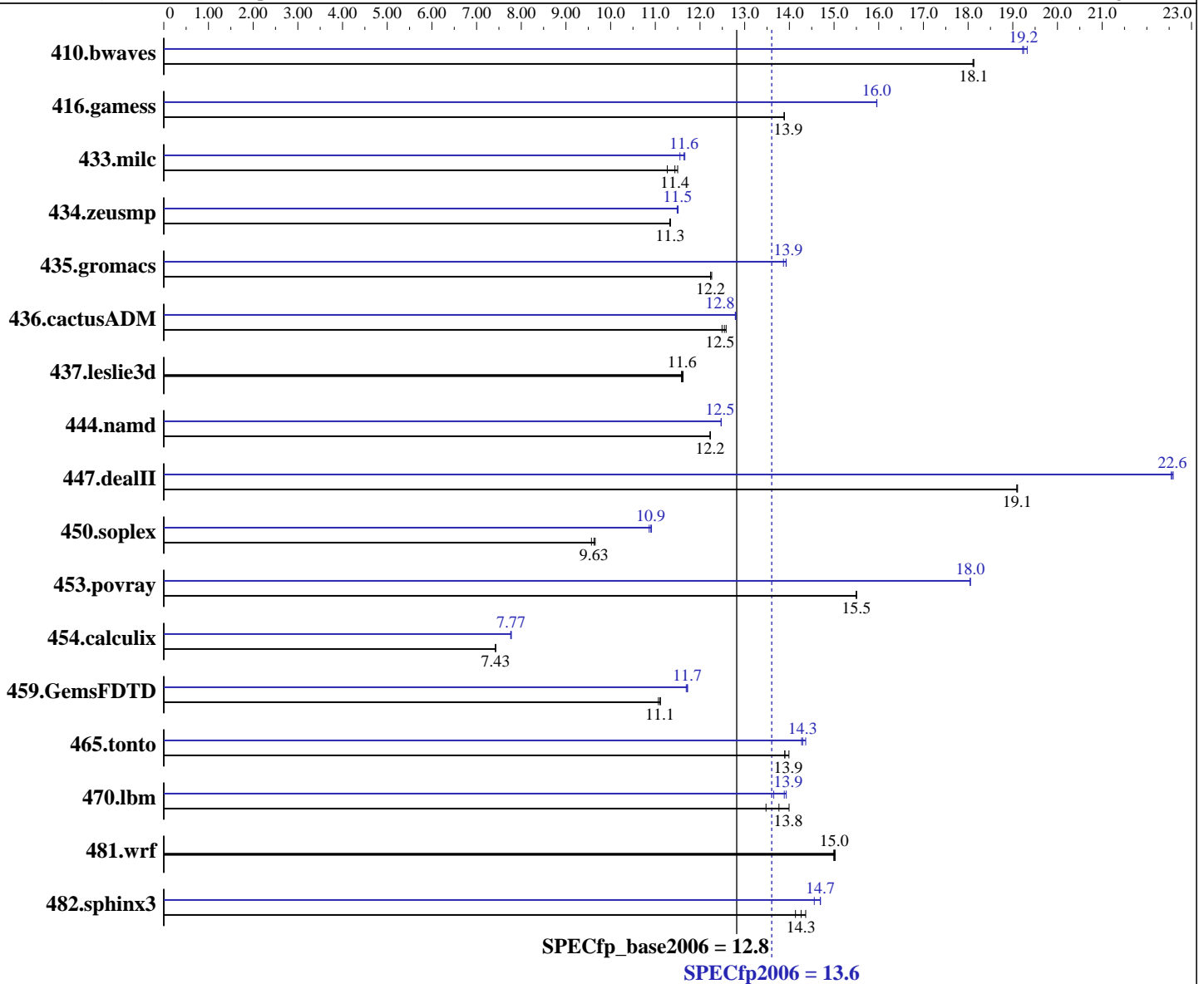
Test date: Feb-2007

Test sponsor: IBM Corporation

Hardware Availability: Feb-2007

Tested by: IBM Corporation

Software Availability: Aug-2006



**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: 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 74 GB SAS, 10000 RPM  
Other Hardware: None

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	750	18.1	750	18.1	<b>750</b>	<b>18.1</b>	707	19.2	703	19.3	<b>706</b>	<b>19.2</b>
416.gamess	1410	13.9	<b>1410</b>	<b>13.9</b>	1411	13.9	<b>1227</b>	<b>16.0</b>	1227	16.0	1227	16.0
433.milc	815	11.3	<b>803</b>	<b>11.4</b>	798	11.5	<b>789</b>	<b>11.6</b>	795	11.6	787	11.7
434.zeusmp	<b>803</b>	<b>11.3</b>	803	11.3	804	11.3	791	11.5	<b>791</b>	<b>11.5</b>	792	11.5
435.gromacs	<b>583</b>	<b>12.2</b>	582	12.3	584	12.2	515	13.9	<b>513</b>	<b>13.9</b>	513	13.9
436.cactusADM	957	12.5	950	12.6	<b>953</b>	<b>12.5</b>	<b>934</b>	<b>12.8</b>	934	12.8	933	12.8
437.leslie3d	809	11.6	811	11.6	<b>810</b>	<b>11.6</b>	809	11.6	811	11.6	<b>810</b>	<b>11.6</b>
444.namd	<b>656</b>	<b>12.2</b>	656	12.2	656	12.2	643	12.5	643	12.5	<b>643</b>	<b>12.5</b>
447.dealII	599	19.1	599	19.1	<b>599</b>	<b>19.1</b>	506	22.6	507	22.5	<b>507</b>	<b>22.6</b>
450.soplex	871	9.57	<b>866</b>	<b>9.63</b>	864	9.66	764	10.9	<b>765</b>	<b>10.9</b>	768	10.9
453.povray	343	15.5	343	15.5	<b>343</b>	<b>15.5</b>	295	18.0	295	18.0	<b>295</b>	<b>18.0</b>
454.calculix	1111	7.43	1112	7.42	<b>1111</b>	<b>7.43</b>	1061	7.78	<b>1062</b>	<b>7.77</b>	1063	7.76
459.GemsFDTD	959	11.1	<b>955</b>	<b>11.1</b>	955	11.1	907	11.7	<b>906</b>	<b>11.7</b>	905	11.7
465.tonto	703	14.0	708	13.9	<b>708</b>	<b>13.9</b>	685	14.4	689	14.3	<b>688</b>	<b>14.3</b>
470.lbm	982	14.0	1020	13.5	<b>998</b>	<b>13.8</b>	1007	13.7	986	13.9	<b>990</b>	<b>13.9</b>
481.wrf	743	15.0	<b>744</b>	<b>15.0</b>	745	15.0	743	15.0	<b>744</b>	<b>15.0</b>	745	15.0
482.sphinx3	1379	14.1	1357	14.4	<b>1367</b>	<b>14.3</b>	<b>1327</b>	<b>14.7</b>	1339	14.6	1326	14.7

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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