



# SPEC® CFP2006 Result

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## IBM Corporation

SPECfp®2006 = 13.3

## IBM System x3655 (AMD Opteron 2218)

SPECfp\_base2006 = 12.7

CPU2006 license: 11

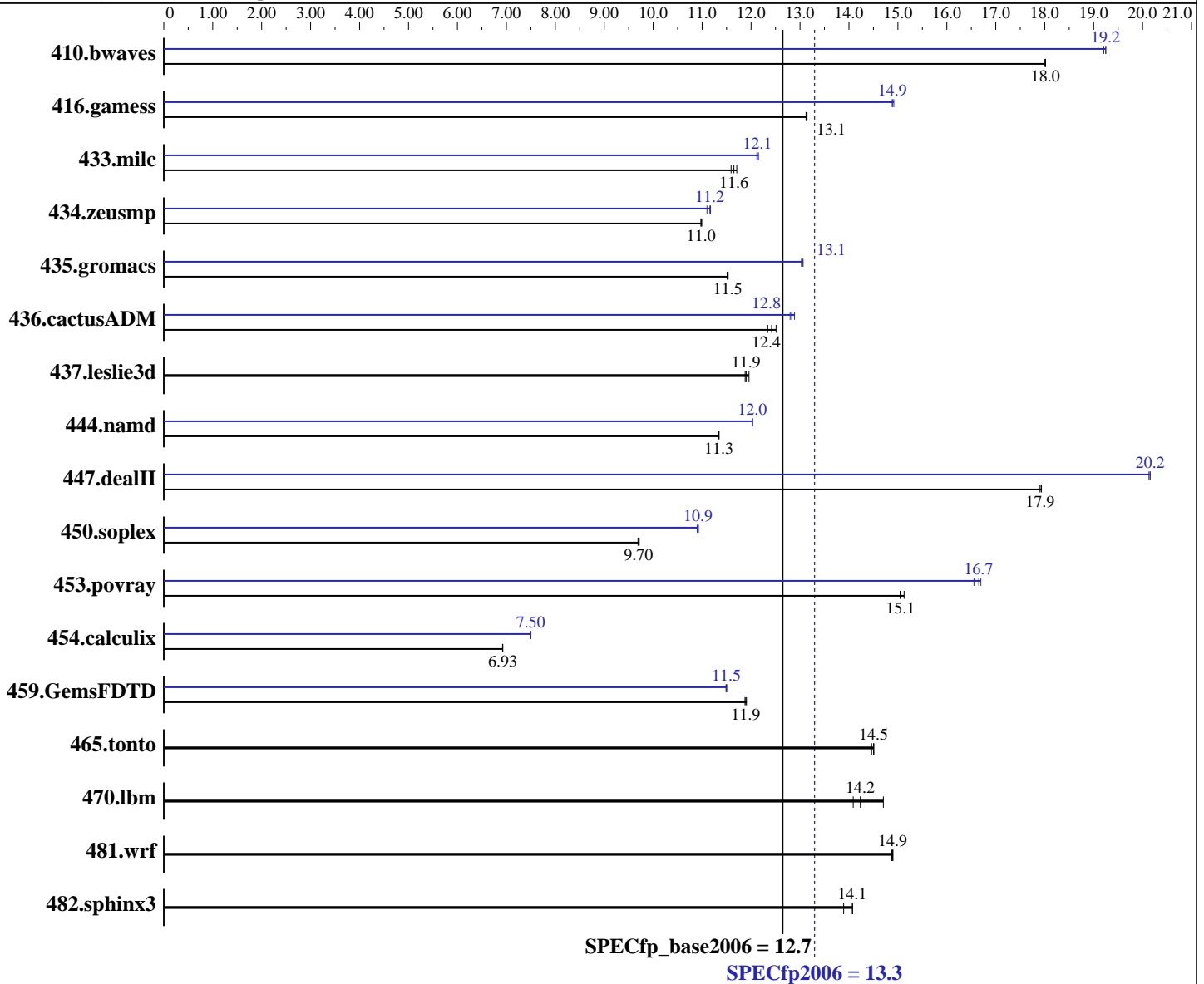
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Jul-2007

Hardware Availability: Oct-2006

Software Availability: Mar-2007



**Hardware**

CPU Name: AMD Opteron 2218  
 CPU Characteristics:  
 CPU MHz: 2600  
 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: MicroQuill SmartHeap 8.1

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	<b>754</b>	<b>18.0</b>	755	18.0	754	18.0	<b>706</b>	<b>19.2</b>	708	19.2	706	19.2
416.gamess	<b>1492</b>	<b>13.1</b>	1492	13.1	1490	13.1	<b>1315</b>	<b>14.9</b>	1317	14.9	1313	14.9
433.milc	<b>788</b>	<b>11.6</b>	792	11.6	784	11.7	<b>756</b>	<b>12.2</b>	<b>757</b>	<b>12.1</b>	758	12.1
434.zeusmp	829	11.0	<b>829</b>	<b>11.0</b>	828	11.0	<b>816</b>	<b>11.2</b>	815	11.2	820	11.1
435.gromacs	620	11.5	<b>619</b>	<b>11.5</b>	619	11.5	<b>547</b>	<b>13.1</b>	547	13.1	548	13.0
436.cactusADM	955	12.5	<b>962</b>	<b>12.4</b>	968	12.3	<b>931</b>	<b>12.8</b>	934	12.8	927	12.9
437.leslie3d	786	12.0	<b>790</b>	<b>11.9</b>	791	11.9	<b>786</b>	<b>12.0</b>	<b>790</b>	<b>11.9</b>	791	11.9
444.namd	707	11.3	<b>707</b>	<b>11.3</b>	708	11.3	<b>667</b>	<b>12.0</b>	667	12.0	667	12.0
447.dealII	638	17.9	639	17.9	<b>639</b>	<b>17.9</b>	568	20.1	568	20.2	<b>568</b>	<b>20.2</b>
450.soplex	861	9.69	<b>860</b>	<b>9.70</b>	858	9.71	<b>764</b>	<b>10.9</b>	764	10.9	765	10.9
453.povray	352	15.1	354	15.0	<b>353</b>	<b>15.1</b>	321	16.6	<b>319</b>	<b>16.7</b>	319	16.7
454.calculix	1191	6.93	1192	6.92	<b>1191</b>	<b>6.93</b>	<b>1100</b>	<b>7.50</b>	1100	7.50	1101	7.50
459.GemsFDTD	893	11.9	<b>892</b>	<b>11.9</b>	891	11.9	922	11.5	<b>923</b>	<b>11.5</b>	924	11.5
465.tonto	678	14.5	680	14.5	<b>679</b>	<b>14.5</b>	678	14.5	680	14.5	<b>679</b>	<b>14.5</b>
470.lbm	935	14.7	<b>965</b>	<b>14.2</b>	975	14.1	935	14.7	<b>965</b>	<b>14.2</b>	975	14.1
481.wrf	<b>750</b>	<b>14.9</b>	751	14.9	750	14.9	<b>750</b>	<b>14.9</b>	751	14.9	750	14.9
482.sphinx3	1403	13.9	<b>1385</b>	<b>14.1</b>	1385	14.1	1403	13.9	<b>1385</b>	<b>14.1</b>	1385	14.1

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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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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