



# SPEC® CFP2006 Result

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## IBM Corporation

SPECfp®2006 = 13.2

## IBM System x3755 (AMD Opteron 8220)

SPECfp\_base2006 = 12.4

CPU2006 license: 11

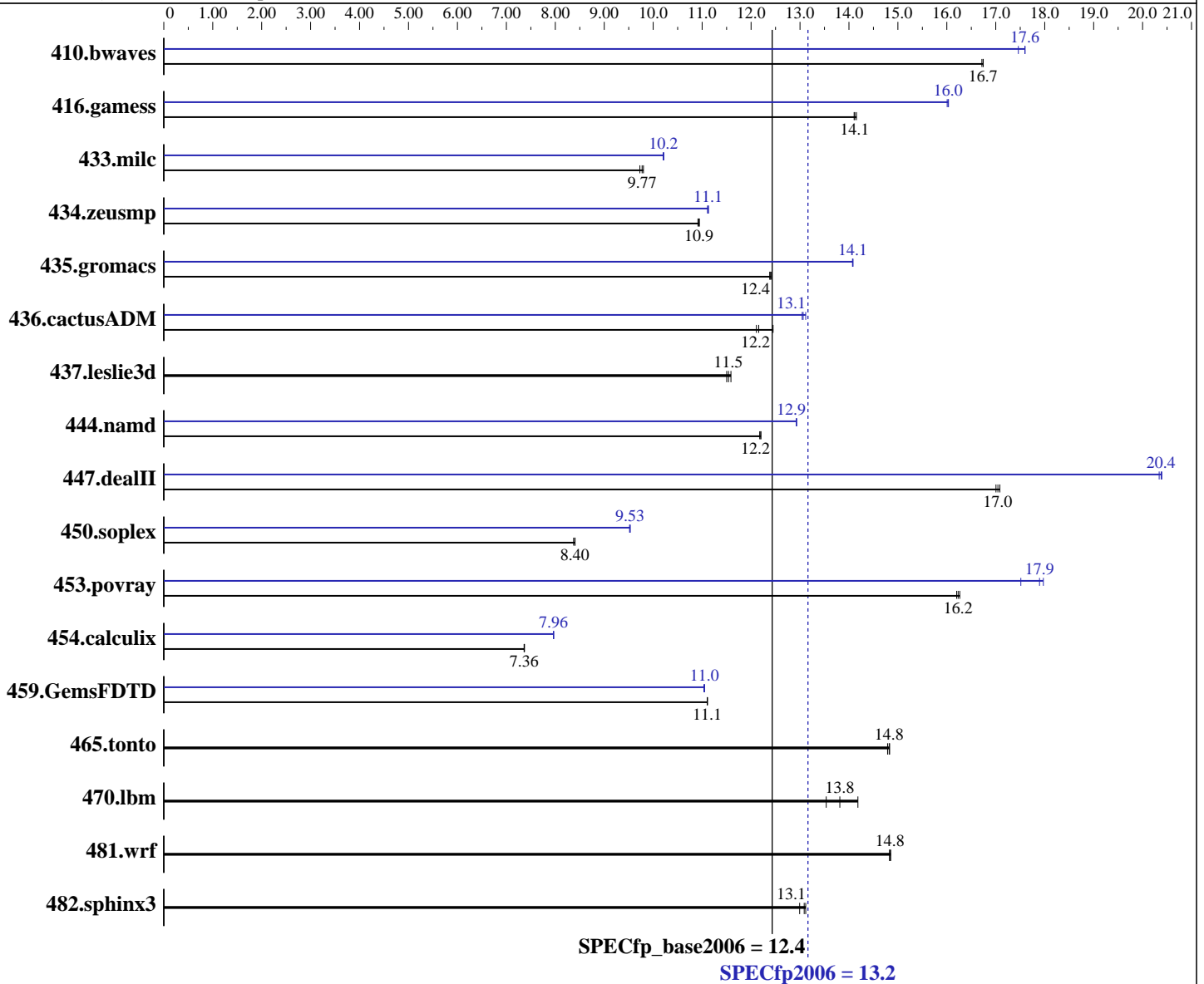
Test date: Jul-2007

Test sponsor: IBM Corporation

Hardware Availability: Apr-2007

Tested by: IBM Corporation

Software Availability: Mar-2007



**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, 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, 15000 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	812	16.7	<b>812</b>	<b>16.7</b>	813	16.7	778	17.5	772	17.6	<b>772</b>	<b>17.6</b>
416.gamess	1388	14.1	<b>1387</b>	<b>14.1</b>	1383	14.2	1223	16.0	1221	16.0	<b>1222</b>	<b>16.0</b>
433.milc	944	9.73	<b>939</b>	<b>9.77</b>	937	9.80	900	10.2	<b>899</b>	<b>10.2</b>	899	10.2
434.zeusmp	832	10.9	<b>832</b>	<b>10.9</b>	834	10.9	819	11.1	818	11.1	<b>818</b>	<b>11.1</b>
435.gromacs	<b>576</b>	<b>12.4</b>	577	12.4	575	12.4	507	14.1	<b>507</b>	<b>14.1</b>	507	14.1
436.cactusADM	987	12.1	<b>983</b>	<b>12.2</b>	960	12.5	916	13.0	911	13.1	<b>915</b>	<b>13.1</b>
437.leslie3d	811	11.6	817	11.5	<b>815</b>	<b>11.5</b>	811	11.6	817	11.5	<b>815</b>	<b>11.5</b>
444.namd	<b>658</b>	<b>12.2</b>	657	12.2	659	12.2	621	12.9	<b>620</b>	<b>12.9</b>	620	12.9
447.dealII	670	17.1	<b>671</b>	<b>17.0</b>	673	17.0	<b>561</b>	<b>20.4</b>	561	20.4	562	20.3
450.soplex	992	8.40	<b>993</b>	<b>8.40</b>	996	8.37	875	9.53	876	9.52	<b>875</b>	<b>9.53</b>
453.povray	327	16.3	<b>328</b>	<b>16.2</b>	328	16.2	296	18.0	<b>297</b>	<b>17.9</b>	304	17.5
454.calculix	1119	7.37	1120	7.36	<b>1120</b>	<b>7.36</b>	1036	7.96	1036	7.97	<b>1036</b>	<b>7.96</b>
459.GemsFDTD	955	11.1	<b>955</b>	<b>11.1</b>	955	11.1	961	11.0	<b>960</b>	<b>11.0</b>	960	11.1
465.tonto	<b>664</b>	<b>14.8</b>	663	14.8	665	14.8	<b>664</b>	<b>14.8</b>	663	14.8	665	14.8
470.lbm	969	14.2	<b>995</b>	<b>13.8</b>	1015	13.5	969	14.2	<b>995</b>	<b>13.8</b>	1015	13.5
481.wrf	752	14.9	<b>753</b>	<b>14.8</b>	753	14.8	752	14.9	<b>753</b>	<b>14.8</b>	753	14.8
482.sphinx3	1500	13.0	<b>1489</b>	<b>13.1</b>	1486	13.1	1500	13.0	<b>1489</b>	<b>13.1</b>	1486	13.1

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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