



# SPEC® CFP2006 Result

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## IBM Corporation

**SPECfp®2006 = 11.7**

## IBM System x3755 (AMD Opteron 8216)

**SPECfp\_base2006 = 11.0**

CPU2006 license: 11

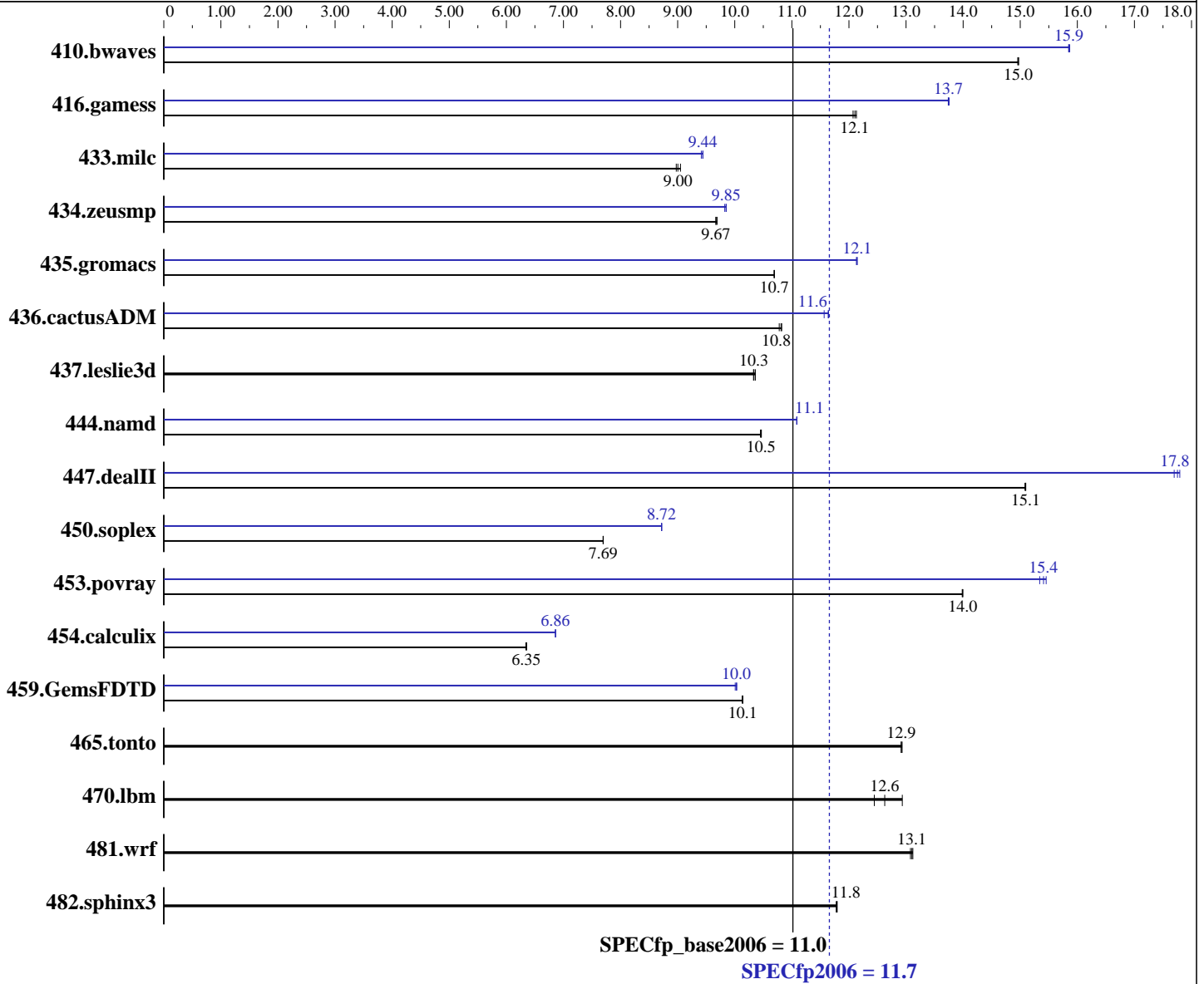
Test sponsor: IBM Corporation

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, 15000 RPM  
Other Hardware: None

Other Software: None

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	<b>908</b>	<b>15.0</b>	908	15.0	909	15.0	857	15.9	<b>857</b>	<b>15.9</b>	858	15.8
416.gamess	1622	12.1	1614	12.1	<b>1618</b>	<b>12.1</b>	<b>1425</b>	<b>13.7</b>	1423	13.8	1425	13.7
433.milc	1023	8.98	<b>1020</b>	<b>9.00</b>	1014	9.05	975	9.41	<b>972</b>	<b>9.44</b>	972	9.44
434.zeusmp	939	9.69	941	9.67	<b>941</b>	<b>9.67</b>	924	9.85	926	9.82	<b>924</b>	<b>9.85</b>
435.gromacs	668	10.7	668	10.7	<b>668</b>	<b>10.7</b>	589	12.1	588	12.1	<b>588</b>	<b>12.1</b>
436.cactusADM	<b>1105</b>	<b>10.8</b>	1104	10.8	1109	10.8	1026	11.6	<b>1027</b>	<b>11.6</b>	1033	11.6
437.leslie3d	907	10.4	<b>909</b>	<b>10.3</b>	910	10.3	907	10.4	<b>909</b>	<b>10.3</b>	910	10.3
444.namd	767	10.5	<b>767</b>	<b>10.5</b>	766	10.5	723	11.1	<b>723</b>	<b>11.1</b>	723	11.1
447.dealII	758	15.1	758	15.1	<b>758</b>	<b>15.1</b>	<b>644</b>	<b>17.8</b>	646	17.7	643	17.8
450.soplex	1084	7.69	<b>1084</b>	<b>7.69</b>	1083	7.70	957	8.72	956	8.72	<b>957</b>	<b>8.72</b>
453.povray	380	14.0	380	14.0	<b>380</b>	<b>14.0</b>	347	15.3	344	15.5	<b>345</b>	<b>15.4</b>
454.calculix	1301	6.34	1298	6.36	<b>1299</b>	<b>6.35</b>	1203	6.86	<b>1203</b>	<b>6.86</b>	1202	6.86
459.GemsFDTD	1047	10.1	1046	10.1	<b>1046</b>	<b>10.1</b>	<b>1058</b>	<b>10.0</b>	1060	10.0	1057	10.0
465.tonto	762	12.9	<b>762</b>	<b>12.9</b>	761	12.9	762	12.9	<b>762</b>	<b>12.9</b>	761	12.9
470.lbm	1062	12.9	<b>1088</b>	<b>12.6</b>	1104	12.4	1062	12.9	<b>1088</b>	<b>12.6</b>	1104	12.4
481.wrf	854	13.1	<b>853</b>	<b>13.1</b>	851	13.1	854	13.1	<b>853</b>	<b>13.1</b>	851	13.1
482.sphinx3	<b>1653</b>	<b>11.8</b>	1655	11.8	1653	11.8	<b>1653</b>	<b>11.8</b>	1655	11.8	1653	11.8

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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