



# SPEC<sup>®</sup> CFP2006 Result

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## IBM Corporation

### SPECfp<sup>®</sup>\_rate2006 = 46.6

### IBM System x3455 (AMD Opteron 2218)

### SPECfp\_rate\_base2006 = 44.3

CPU2006 license: 11

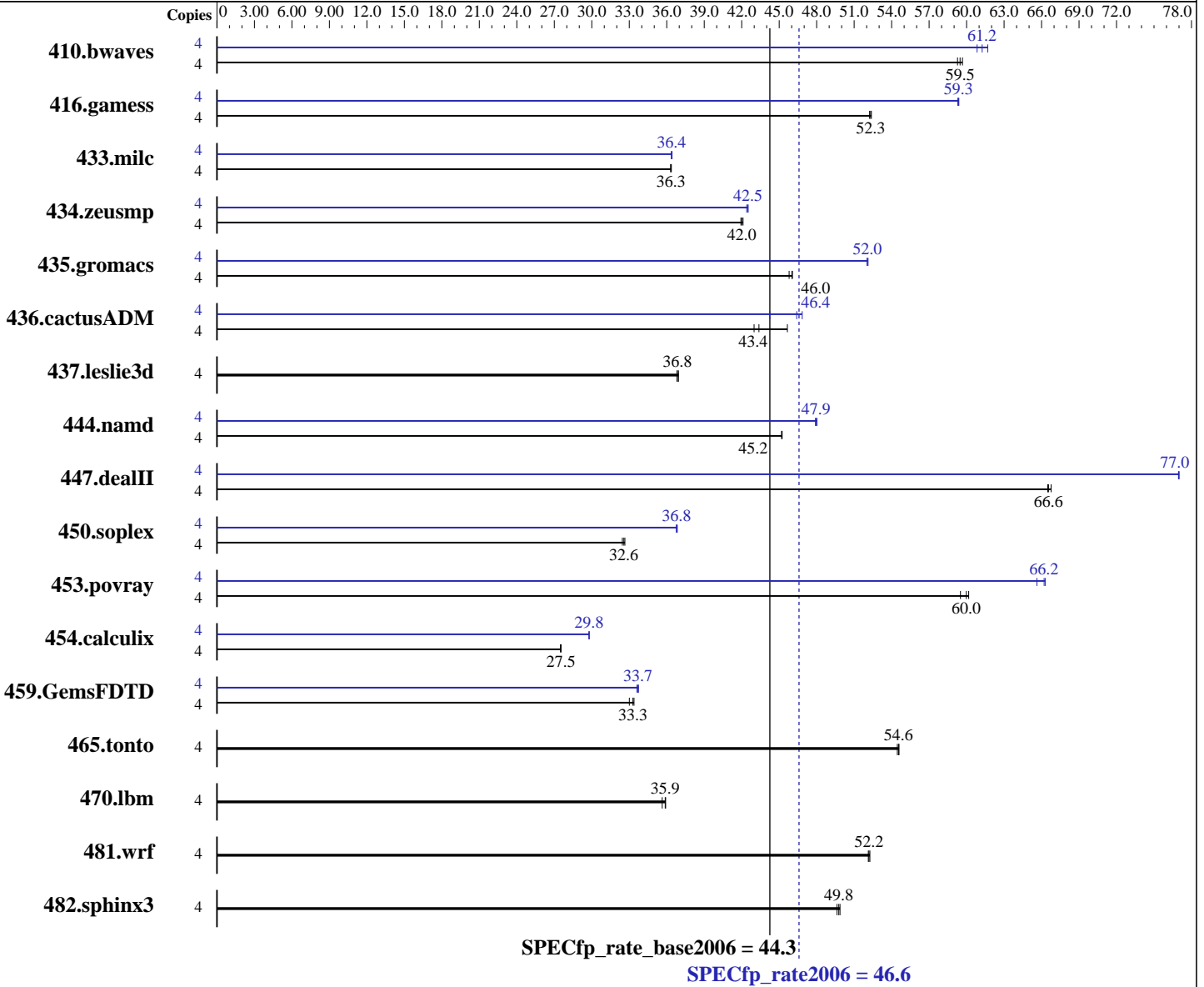
Test sponsor: IBM Corporation

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 160 GB Serial ATA, 7200 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	917	59.3	911	59.7	<b>914</b>	<b>59.5</b>	4	893	60.8	881	61.7	<b>888</b>	<b>61.2</b>
416.gamess	4	1499	52.2	<b>1497</b>	<b>52.3</b>	1495	52.4	4	1319	59.4	1321	59.3	<b>1320</b>	<b>59.3</b>
433.milc	4	1010	36.4	<b>1011</b>	<b>36.3</b>	1011	36.3	4	1008	36.4	<b>1009</b>	<b>36.4</b>	1010	36.4
434.zeusmp	4	864	42.1	868	41.9	<b>867</b>	<b>42.0</b>	4	859	42.4	856	42.5	<b>857</b>	<b>42.5</b>
435.gromacs	4	624	45.8	<b>621</b>	<b>46.0</b>	620	46.1	4	549	52.0	548	52.1	<b>549</b>	<b>52.0</b>
436.cactusADM	4	1112	43.0	1047	45.7	<b>1102</b>	<b>43.4</b>	4	<b>1030</b>	<b>46.4</b>	1020	46.8	1080	44.3
437.leslie3d	4	<b>1020</b>	<b>36.8</b>	1018	36.9	1021	36.8	4	<b>1020</b>	<b>36.8</b>	1018	36.9	1021	36.8
444.namd	4	<b>709</b>	<b>45.2</b>	709	45.2	710	45.2	4	670	47.9	668	48.0	<b>669</b>	<b>47.9</b>
447.dealII	4	<b>688</b>	<b>66.6</b>	688	66.5	685	66.8	4	<b>594</b>	<b>77.0</b>	595	77.0	594	77.0
450.soplex	4	<b>1024</b>	<b>32.6</b>	1022	32.7	1028	32.4	4	905	36.8	<b>907</b>	<b>36.8</b>	907	36.8
453.povray	4	354	60.2	<b>355</b>	<b>60.0</b>	358	59.5	4	<b>321</b>	<b>66.2</b>	324	65.6	321	66.3
454.calculix	4	<b>1199</b>	<b>27.5</b>	1200	27.5	1199	27.5	4	1108	29.8	<b>1108</b>	<b>29.8</b>	1108	29.8
459.GemsFDTD	4	<b>1275</b>	<b>33.3</b>	1271	33.4	1286	33.0	4	<b>1259</b>	<b>33.7</b>	1258	33.7	1262	33.6
465.tonto	4	723	54.5	<b>722</b>	<b>54.6</b>	721	54.6	4	723	54.5	<b>722</b>	<b>54.6</b>	721	54.6
470.lbm	4	1530	35.9	<b>1532</b>	<b>35.9</b>	1542	35.6	4	1530	35.9	<b>1532</b>	<b>35.9</b>	1542	35.6
481.wrf	4	<b>856</b>	<b>52.2</b>	857	52.1	855	52.3	4	<b>856</b>	<b>52.2</b>	857	52.1	855	52.3
482.sphinx3	4	1563	49.9	<b>1566</b>	<b>49.8</b>	1571	49.6	4	1563	49.9	<b>1566</b>	<b>49.8</b>	1571	49.6

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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Tested with SPEC CPU2006 v1.0.  
Report generated on Tue Sep 13 11:26:26 2016 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 21 August 2007.