



# SPEC<sup>®</sup> CFP2006 Result

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## IBM Corporation

SPECfp<sup>®</sup>2006 = 15.3

IBM BladeCenter LS42 (AMD Opteron 8347 HE)

SPECfp\_base2006 = 14.3

CPU2006 license: 11

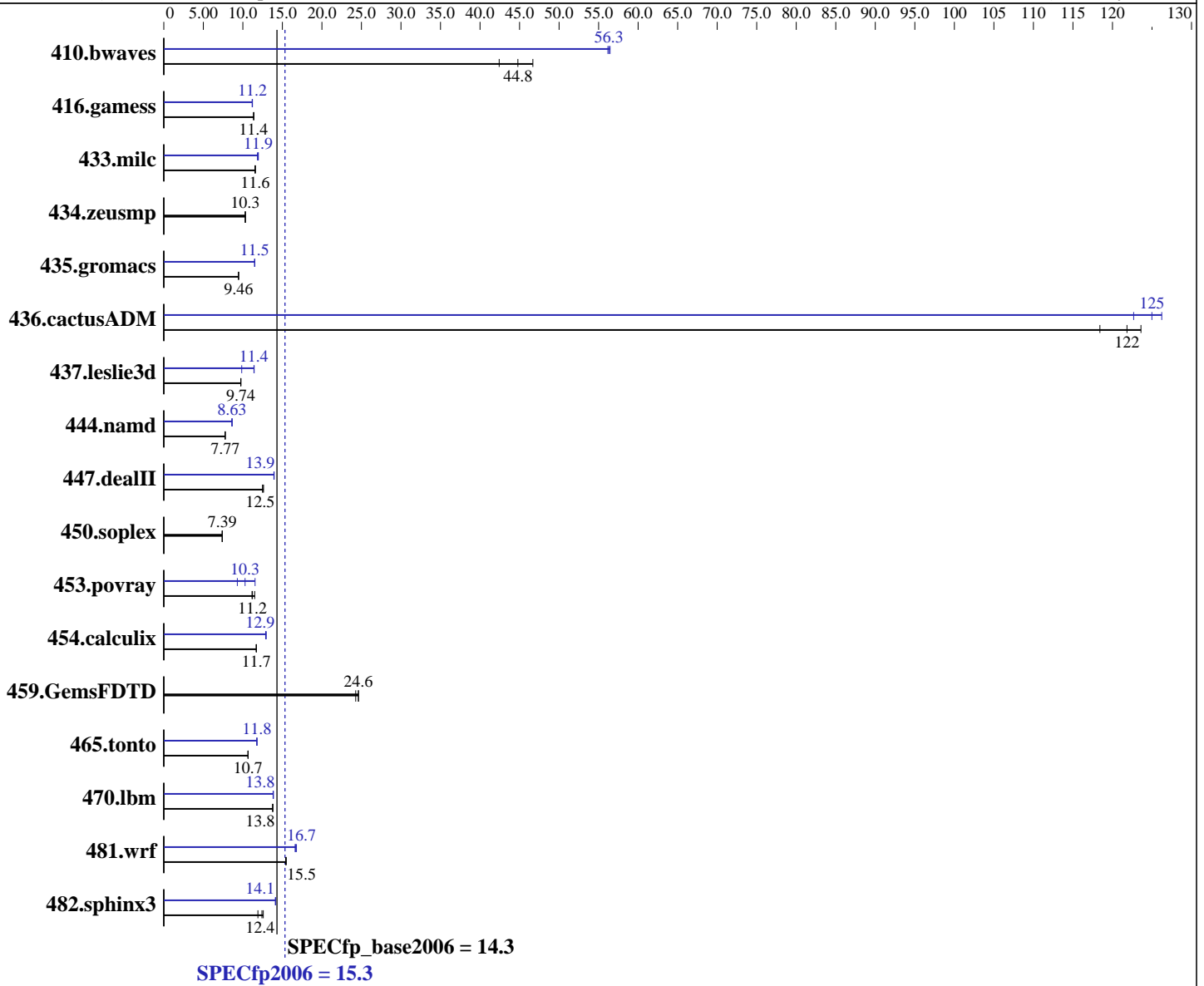
Test date: Aug-2008

Test sponsor: IBM Corporation

Hardware Availability: Sep-2008

Tested by: IBM Corporation

Software Availability: May-2008



### Hardware

CPU Name: AMD Opteron 8347 HE  
 CPU Characteristics:  
 CPU MHz: 1900  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 4 chips, 4 cores/chip  
 CPU(s) orderable: 1,2,3,4 chips  
 Primary Cache: 64 KB I + 64 KB D on chip per core  
 Secondary Cache: 512 KB I+D on chip per core

### Software

Operating System: SuSE Linux Enterprise Server 10 (x86\_64) SP1, Kernel 2.6.16.46-0.12-smp  
 Compiler: PGI Server Complete Version 7.2  
 Auto Parallel: Yes  
 File System: ReiserFS  
 System State: Run level 3 (Full multiuser with network)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit  
 Other Software: binutils 2.18.50

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L3 Cache: 2 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 64 GB (16 x 4 GB DDR2-6400 ECC)  
 Disk Subsystem: 1 x 73 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	<b>303</b>	<b>44.8</b>	291	46.7	320	42.4	241	56.5	<b>241</b>	<b>56.3</b>	242	56.2
416.gamess	1719	11.4	<b>1723</b>	<b>11.4</b>	1724	11.4	<b>1747</b>	<b>11.2</b>	1747	11.2	1752	11.2
433.milc	792	11.6	<b>794</b>	<b>11.6</b>	796	11.5	768	12.0	<b>768</b>	<b>11.9</b>	775	11.8
434.zeusmp	<b>882</b>	<b>10.3</b>	882	10.3	883	10.3	<b>882</b>	<b>10.3</b>	882	10.3	883	10.3
435.gromacs	<b>755</b>	<b>9.46</b>	755	9.45	755	9.46	620	11.5	<b>621</b>	<b>11.5</b>	622	11.5
436.cactusADM	<b>98.1</b>	<b>122</b>	96.7	124	101	118	97.4	123	94.7	126	<b>95.6</b>	<b>125</b>
437.leslie3d	963	9.76	965	9.74	<b>965</b>	<b>9.74</b>	954	9.86	<b>824</b>	<b>11.4</b>	822	11.4
444.namd	1032	7.77	<b>1033</b>	<b>7.77</b>	1034	7.76	<b>929</b>	<b>8.63</b>	932	8.61	927	8.65
447.dealII	907	12.6	915	12.5	<b>914</b>	<b>12.5</b>	<b>821</b>	<b>13.9</b>	822	13.9	820	14.0
450.soplex	<b>1128</b>	<b>7.39</b>	1125	7.41	1130	7.38	<b>1128</b>	<b>7.39</b>	1125	7.41	1130	7.38
453.povray	463	11.5	477	11.2	<b>474</b>	<b>11.2</b>	461	11.5	<b>517</b>	<b>10.3</b>	572	9.30
454.calculix	<b>704</b>	<b>11.7</b>	704	11.7	707	11.7	640	12.9	637	13.0	<b>639</b>	<b>12.9</b>
459.GemsFDTD	437	24.3	431	24.6	<b>431</b>	<b>24.6</b>	437	24.3	431	24.6	<b>431</b>	<b>24.6</b>
465.tonto	924	10.6	<b>923</b>	<b>10.7</b>	923	10.7	<b>836</b>	<b>11.8</b>	837	11.8	834	11.8
470.lbm	997	13.8	<b>997</b>	<b>13.8</b>	997	13.8	991	13.9	<b>993</b>	<b>13.8</b>	994	13.8
481.wrf	725	15.4	722	15.5	<b>722</b>	<b>15.5</b>	672	16.6	666	16.8	<b>671</b>	<b>16.7</b>
482.sphinx3	1549	12.6	<b>1570</b>	<b>12.4</b>	1637	11.9	1382	14.1	<b>1378</b>	<b>14.1</b>	1377	14.2

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Submit Notes

The config file option 'submit' was used.

## Operating System Notes

'numactl' was used to bind copies to the cores.  
 Environment stack size set to 'unlimited'.  
 'ulimit -l 2097152' was used to set environment locked pages in memory quantity.  
 NCPUS set to number of cores.  
 PGI\_HUGE\_PAGES set to 896.  
 Set vm/nr\_hugepages=14336 in /etc/sysctl.conf  
 mount -t hugetlbfs none /mnt/hugepages  
 Processor Performance States Disabled in BIOS  
 Memory ChipKill Disabled in BIOS



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## Base Compiler Invocation

C benchmarks:

pgcc

C++ benchmarks:

pgcpp

Fortran benchmarks:

pgf95

Benchmarks using both Fortran and C:

pgcc pgf95

## 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 -Mnomain  
 436.cactusADM: -DSPEC\_CPU\_LP64 -Mnomain  
 437.leslie3d: -DSPEC\_CPU\_LP64  
 444.namd: -DSPEC\_CPU\_LP64  
 447.dealII: -DSPEC\_CPU\_LP64  
 450.soplex: -DSPEC\_CPU\_LP64  
 453.povray: -DSPEC\_CPU\_LP64  
 454.calculix: -DSPEC\_CPU\_LP64 -Mnomain  
 459.GemsFDTD: -DSPEC\_CPU\_LP64  
 465.tonto: -DSPEC\_CPU\_LP64  
 470.lbm: -DSPEC\_CPU\_LP64  
 481.wrf: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_CASE\_FLAG -DSPEC\_CPU\_LINUX  
 482.sphinx3: -DSPEC\_CPU\_LP64

## Base Optimization Flags

C benchmarks:

-fastsse -Msmartalloc=huge:896 -Mconcur -Mfprelaxed -Mipa=fast  
-Mipa=inline -tp barcelona-64 -Bstatic\_pgi

C++ benchmarks:

-fastsse -Msmartalloc=huge:896 -Mfprelaxed -Mconcur --zc\_eh  
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

Fortran benchmarks:

-fastsse -Mfprelaxed -Msmartalloc=huge:896 -Mconcur -Mipa=fast  
-Mipa=inline -tp barcelona-64 -Bstatic\_pgi

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## Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:

-fastsse -Msmartalloc=huge:896 -Mconcur -Mfprelaxed -Mipa=fast  
-Mipa=inline -tp barcelona-64 -Bstatic\_pgi

## Base Other Flags

C benchmarks:

-Mipa=jobs:8

C++ benchmarks:

-Mipa=jobs:8

Fortran benchmarks:

-Mipa=jobs:8

Benchmarks using both Fortran and C:

-Mipa=jobs:8

## Peak Compiler Invocation

C benchmarks:

pgcc

C++ benchmarks:

pgcpp

Fortran benchmarks:

pgf95

Benchmarks using both Fortran and C:

pgcc pgf95

## 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 -Mnomain  
436.cactusADM: -DSPEC\_CPU\_LP64 -Mnomain  
437.leslie3d: -DSPEC\_CPU\_LP64  
444.namd: -DSPEC\_CPU\_LP64  
450.soplex: -DSPEC\_CPU\_LP64

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## Peak Portability Flags (Continued)

453.povray: -DSPEC\_CPU\_LP64  
 454.calculix: -DSPEC\_CPU\_LP64 -Mnomain  
 459.GemsFDTD: -DSPEC\_CPU\_LP64  
 465.tonto: -DSPEC\_CPU\_LP64  
 470.lbm: -DSPEC\_CPU\_LP64  
 481.wrf: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_CASE\_FLAG -DSPEC\_CPU\_LINUX  
 482.sphinx3: -DSPEC\_CPU\_LP64

## Peak Optimization Flags

C benchmarks:

433.milc: -fastsse -Msmartalloc=huge:896 -Msafeptr -Mconcur  
 -Mfprelaxed -Mipa=inline -Mipa=arg -Mipa=const -Mipa=ptr  
 -Mipa=shape -tp barcelona-64 -Bstatic\_pgi

470.lbm: -fastsse -Msmartalloc=huge:896 -Mprefetch=t0 -Mloop32  
 -Mfprelaxed -Mipa=fast -Mipa=inline -tp barcelona-64  
 -Bstatic\_pgi

482.sphinx3: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)  
 -Mipa=inline(pass 2) -fastsse -Mfprelaxed -Msmartalloc  
 -tp barcelona-64 -Bstatic\_pgi

C++ benchmarks:

444.namd: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)  
 -Mipa=inline(pass 2) -fastsse -Munroll=n:4 -Munroll=m:8  
 -Msmartalloc=huge:896 -Mnodepchk -Mfprelaxed --zc\_eh  
 -tp barcelona-64 -Bstatic\_pgi

447.dealIII: -fastsse -alias=ansi -Msmartalloc=huge:896 -Mprefetch=t0  
 -Mno vect -Mfprelaxed --zc\_eh -Mipa=fast -Mipa=inline  
 -tp barcelona-32 -Bstatic\_pgi

450.soplex: basepeak = yes

453.povray: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)  
 -Mipa=fast(pass 2) -Mipa=inlinenopfo:3(pass 2)  
 -Mipa=staticfunc(pass 2) -fastsse -Msmartalloc=huge:896  
 -Mprefetch=t0 -Mfprelaxed -tp barcelona-64 -Bstatic\_pgi

Fortran benchmarks:

410.bwaves: -fastsse -Msmartalloc -Mprefetch=distance:12 -Mprefetch=nta  
 -Mconcur -Mloop32 -Mpre -Mfprelaxed -Mipa=fast  
 -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

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## Peak Optimization Flags (Continued)

416.gamess: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)  
-Mipa=inline(pass 2) -fastsse -Mvect=noaltcode  
-Mprefetch=t0 -Mfprelaxed -tp barcelona-64 -Bstatic\_pgi

434.zeusmp: basepeak = yes

437.leslie3d: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)  
-Mconcur=noaltcode(pass 2) -Mipa=fast(pass 2)  
-Mipa=inline(pass 2) -fastsse -Mvect=fuse  
-Msmartalloc=huge:896 -Mprefetch=distance:8 -Mprefetch=t0  
-Mfprelaxed -tp barcelona-64 -Bstatic\_pgi

459.GemsFDTD: basepeak = yes

465.tonto: -fastsse -O4 -Mvect=noaltcode -Msmartalloc=huge:896  
-Mprefetch=distance:8 -Mprefetch=t0 -Mfprelaxed -Mipa=fast  
-Mipa=inline -tp barcelona-64 -Bstatic\_pgi

Benchmarks using both Fortran and C:

435.gromacs: -fastsse -Msmartalloc=huge:896 -Mfprelaxed -Mconcur  
-Mfpapprox=rsqrt -Mipa=fast -Mipa=inline -tp barcelona-64  
-Bstatic\_pgi

436.cactusADM: -fastsse -Msmartalloc=huge:896 -Mfprelaxed -Mconcur -Mdse  
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

454.calculix: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)  
-Mipa=fast(pass 2) -Mipa=inline(pass 2) -fastsse  
-Msmartalloc=huge:896 -Mloop32 -Mprefetch=t0 -Mpre  
-Mfprelaxed -tp barcelona-64 -Bstatic\_pgi

481.wrf: -fastsse -Mvect=noaltcode -Msmartalloc  
-Mprefetch=distance:8 -Mconcur=noaltcode -Mfprelaxed  
-tp barcelona-64 -Bstatic\_pgi

## Peak Other Flags

C benchmarks:

-Mipa=jobs : 8(pass 2)

C++ benchmarks:

-Mipa=jobs : 8(pass 2)

Fortran benchmarks:

-Mipa=jobs : 8

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## Peak Other Flags (Continued)

Benchmarks using both Fortran and C (except as noted below):

-Mipa=jobs:8(pass 2)

481.wrf: No flags used

The flags file that was used to format this result can be browsed at

[http://www.spec.org/cpu2006/flags/pgi72\\_flags.html](http://www.spec.org/cpu2006/flags/pgi72_flags.html)

You can also download the XML flags source by saving the following link:

[http://www.spec.org/cpu2006/flags/pgi72\\_flags.xml](http://www.spec.org/cpu2006/flags/pgi72_flags.xml)

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

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