



# SPEC® CFP2006 Result

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## IBM Corporation

SPECfp®2006 = 14.3

## IBM System x3755 (AMD Opteron 8360 SE)

SPECfp\_base2006 = 12.3

CPU2006 license: 11

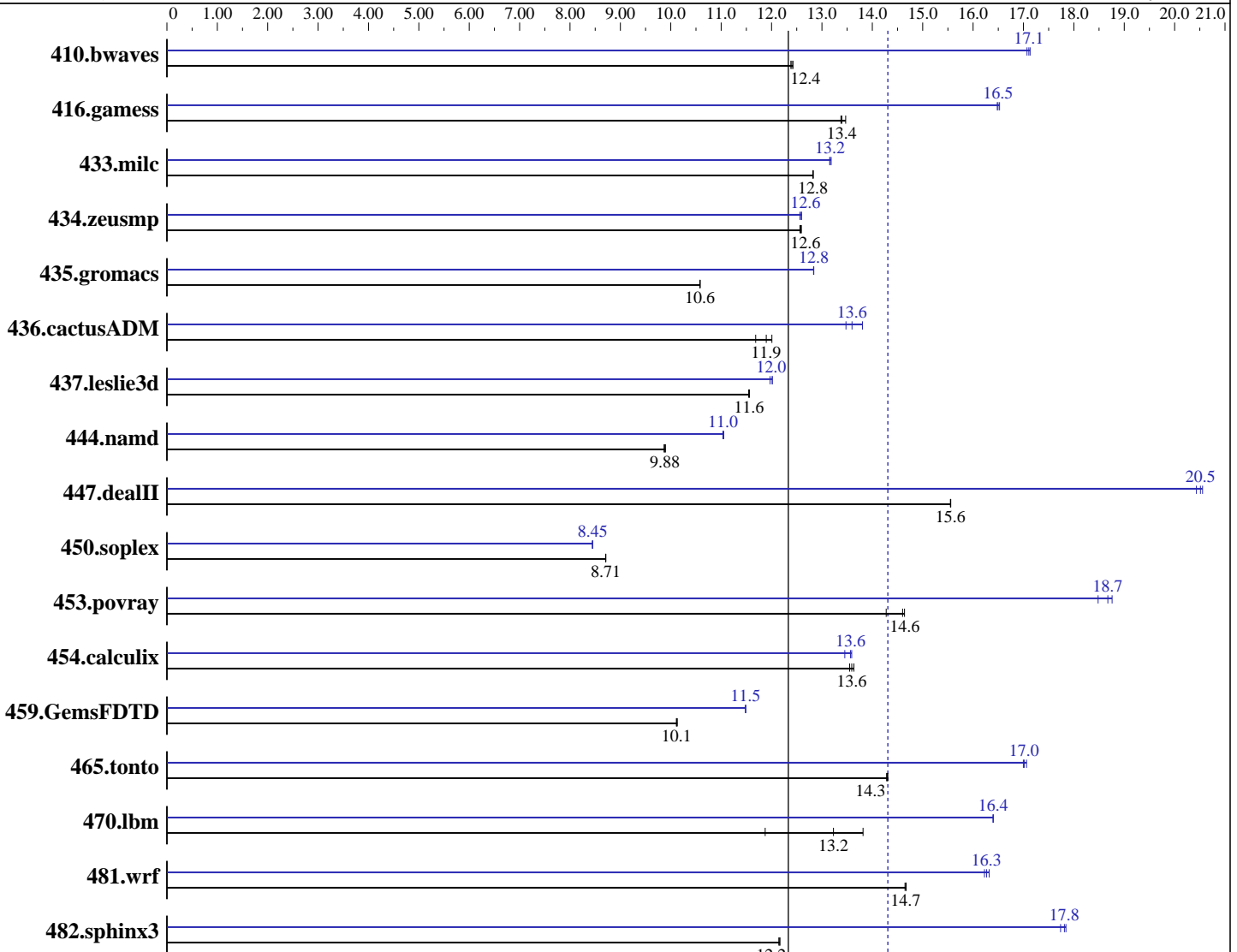
Test sponsor: IBM Corporation

Tested by: Advanced Micro Devices

Test date: Apr-2008

Hardware Availability: Jul-2008

Software Availability: May-2008



SPECfp\_base2006 = 12.3

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### Hardware

CPU Name: AMD Opteron 8360 SE  
 CPU Characteristics:  
 CPU MHz: 2500  
 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

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### 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 PathScale Compiler Suite Version 3.1  
 Auto Parallel: No  
 File System: ReiserFS  
 System State: Runlevel 3 (Full multiuser with network)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit

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L3 Cache: 2 MB I+D on chip per chip  
Other Cache: None  
Memory: 32 GB (16 x 2 GB, DDR2-667, CL5, Reg, Dual Rank)  
Disk Subsystem: 1 x 73.4 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	1097	12.4	<b><u>1096</u></b>	<b><u>12.4</u></b>	1094	12.4	796	17.1	793	17.1	<b><u>794</u></b>	<b><u>17.1</u></b>
416.gamess	1464	13.4	<b><u>1462</u></b>	<b><u>13.4</u></b>	1453	13.5	<b><u>1187</u></b>	<b><u>16.5</u></b>	1185	16.5	1188	16.5
433.milc	<b><u>716</u></b>	<b><u>12.8</u></b>	716	12.8	716	12.8	696	13.2	698	13.2	<b><u>697</u></b>	<b><u>13.2</u></b>
434.zeusmp	724	12.6	723	12.6	<b><u>723</u></b>	<b><u>12.6</u></b>	722	12.6	<b><u>723</u></b>	<b><u>12.6</u></b>	724	12.6
435.gromacs	675	10.6	<b><u>675</u></b>	<b><u>10.6</u></b>	675	10.6	556	12.8	556	12.8	<b><u>556</u></b>	<b><u>12.8</u></b>
436.cactusADM	<b><u>1005</u></b>	<b><u>11.9</u></b>	995	12.0	1023	11.7	887	13.5	866	13.8	<b><u>879</u></b>	<b><u>13.6</u></b>
437.leslie3d	813	11.6	814	11.5	<b><u>813</u></b>	<b><u>11.6</u></b>	782	12.0	785	12.0	<b><u>782</u></b>	<b><u>12.0</u></b>
444.namd	811	9.89	<b><u>812</u></b>	<b><u>9.88</u></b>	813	9.87	727	11.0	726	11.1	<b><u>726</u></b>	<b><u>11.0</u></b>
447.dealII	735	15.6	736	15.6	<b><u>736</u></b>	<b><u>15.6</u></b>	557	20.6	<b><u>558</u></b>	<b><u>20.5</u></b>	560	20.4
450.soplex	958	8.71	957	8.71	<b><u>958</u></b>	<b><u>8.71</u></b>	987	8.45	<b><u>987</u></b>	<b><u>8.45</u></b>	988	8.44
453.povray	<b><u>364</u></b>	<b><u>14.6</u></b>	363	14.6	373	14.3	<b><u>285</u></b>	<b><u>18.7</u></b>	288	18.5	284	18.8
454.calculix	609	13.6	<b><u>607</u></b>	<b><u>13.6</u></b>	605	13.6	613	13.5	607	13.6	<b><u>608</u></b>	<b><u>13.6</u></b>
459.GemsFDTD	<b><u>1049</u></b>	<b><u>10.1</u></b>	1049	10.1	1047	10.1	924	11.5	<b><u>924</u></b>	<b><u>11.5</u></b>	924	11.5
465.tonto	688	14.3	689	14.3	<b><u>688</u></b>	<b><u>14.3</u></b>	577	17.1	<b><u>578</u></b>	<b><u>17.0</u></b>	579	17.0
470.lbm	995	13.8	<b><u>1039</u></b>	<b><u>13.2</u></b>	1157	11.9	838	16.4	<b><u>838</u></b>	<b><u>16.4</u></b>	838	16.4
481.wrf	<b><u>762</u></b>	<b><u>14.7</u></b>	763	14.6	761	14.7	684	16.3	<b><u>687</u></b>	<b><u>16.3</u></b>	688	16.2
482.sphinx3	1602	12.2	1605	12.1	<b><u>1602</u></b>	<b><u>12.2</u></b>	<b><u>1094</u></b>	<b><u>17.8</u></b>	1099	17.7	1092	17.8

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

## Operating System Notes

```
'numactl' was used to bind copies to the cores
Environment variable PGI_HUGE_PAGES set to 150
'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 4915200' was used to set environment locked pages in memory quantity
Set vm/nr_hugepages=2400 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
```

## Base Compiler Invocation

C benchmarks:  
pgcc

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## Base Compiler Invocation (Continued)

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:
-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

C++ benchmarks:
-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 --zc_eh -tp barcelona-64 -Bstatic_pgi

Fortran benchmarks:
-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

Benchmarks using both Fortran and C:
-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

```



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## Base Other Flags

C benchmarks:

-w

C++ benchmarks:

-w

Fortran benchmarks:

-w

Benchmarks using both Fortran and C:

-w

## Peak Compiler Invocation

C benchmarks (except as noted below):

pathcc

433.milc: pgcc

C++ benchmarks (except as noted below):

pathCC

444.namd: pgcpp

Fortran benchmarks (except as noted below):

pathf95

410.bwaves: pgf95

434.zeusmp: pgf95

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

pgcc pgf95

436.cactusADM: pathcc pathf95

481.wrf: 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 -Mnomain

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## Peak Portability Flags (Continued)

```

436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -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_LINUX -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

```

## Peak Optimization Flags

C benchmarks:

```

433.milc: -fastsse -Msmartalloc=huge:150 -Msafeptr -Mfprelaxed
-Mipa=jobs:4 -Mipa=inline -Mipa=arg -Mipa=const -Mipa=ptr
-Mipa=shape -tp barcelona-64 -Bstatic_pgi

```

```

470.lbm: -march=barcelona -Ofast -m3dnow

```

```

482.sphinx3: -march=barcelona -Ofast

```

C++ benchmarks:

```

444.namd: -Mphi(pass 1) -Mipa=jobs:4(pass 2) -Mipa=fast(pass 2)
-Mipa=inline(pass 2) -Mpfo(pass 2) -fast -Mfprelaxed
-Msmartalloc=huge:150 --zc_eh -Mnodepchk -Munroll=n:4
-Munroll=m:8 -tp barcelona-64 -Bstatic_pgi

```

```

447.deallI: -march=barcelona -Ofast -static -INLINE:aggressive=on
-OPT:malloc_alg=1 -m32 -fno-exceptions

```

```

450.soplex: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -m32 -O3 -TENV:frame_pointer=off
-LNO:prefetch=1

```

```

453.povray: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -CG:load_exe=0

```

Fortran benchmarks:

```

410.bwaves: -Mphi(pass 1) -Mipa=jobs:4(pass 2) -Mipa=fast(pass 2)
-Mipa=inline(pass 2) -Mpfo(pass 2) -fastsse -Mfprelaxed
-Msmartalloc -Mprefetch=distance:12 -Mprefetch=nta
-tp barcelona-64 -Bstatic_pgi

```

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## Peak Optimization Flags (Continued)

416.gamess: -march=barcelona -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -O2 -OPT:Ofast -OPT:ro=3  
-OPT:unroll\_size=256

434.zeusmp: -fastsse -Mfprelaxed -Msmartalloc=huge:150 -Mipa=jobs:4  
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

437.leslie3d: -march=barcelona -Ofast -m3dnow -OPT:unroll\_size=256  
-CG:load\_exe=0 -OPT:malloc\_alg=1

459.GemsFDTD: -march=barcelona -Ofast -LNO:fission=2 -LNO:simd=2  
-OPT:malloc\_alg=1

465.tonto: -march=barcelona -Ofast -OPT:malloc\_alg=1  
-OPT:alias=no\_f90\_pointer\_alias -LNO:blocking=off  
-CG:load\_exe=1 -IPA:plimit=525

Benchmarks using both Fortran and C:

435.gromacs: -fast -Mfpapprox=rsqrt -Mipa=jobs:4 -Mipa=fast  
-Mipa=inline -Mfprelaxed -Msmartalloc=huge:150  
-tp barcelona-64 -Bstatic\_pgi

436.cactusADM: -march=barcelona -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -Ofast -WOPT:aggstr=0

454.calculix: -fastsse -Mfprelaxed -Msmartalloc=huge:150 -Mipa=jobs:4  
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

481.wrf: -march=barcelona -Ofast -LNO:blocking=off  
-LNO:prefetch\_ahead=10 -OPT:malloc\_alg=1 -m3dnow  
-LANG:copyinout=off -IPA:callee\_limit=5000

## Peak Other Flags

C benchmarks:

433.milc: -w

C++ benchmarks:

444.namd: -w

Fortran benchmarks:

410.bwaves: -w

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## Peak Other Flags (Continued)

434.zeusmp: -w

Benchmarks using both Fortran and C:

435.gromacs: -w

454.calculix: -w

The flags file that was used to format this result can be browsed at  
<http://www.spec.org/cpu2006/flags/amd123GH-flags.20090714.03.html>

You can also download the XML flags source by saving the following link:  
<http://www.spec.org/cpu2006/flags/amd123GH-flags.20090714.03.xml>

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

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