



# SPEC® CFP2006 Result

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## IBM Corporation

**SPECfp®2006 = 23.8**

### IBM BladeCenter LS42 (AMD Opteron 8384)

**SPECfp\_base2006 = 22.1**

CPU2006 license: 11

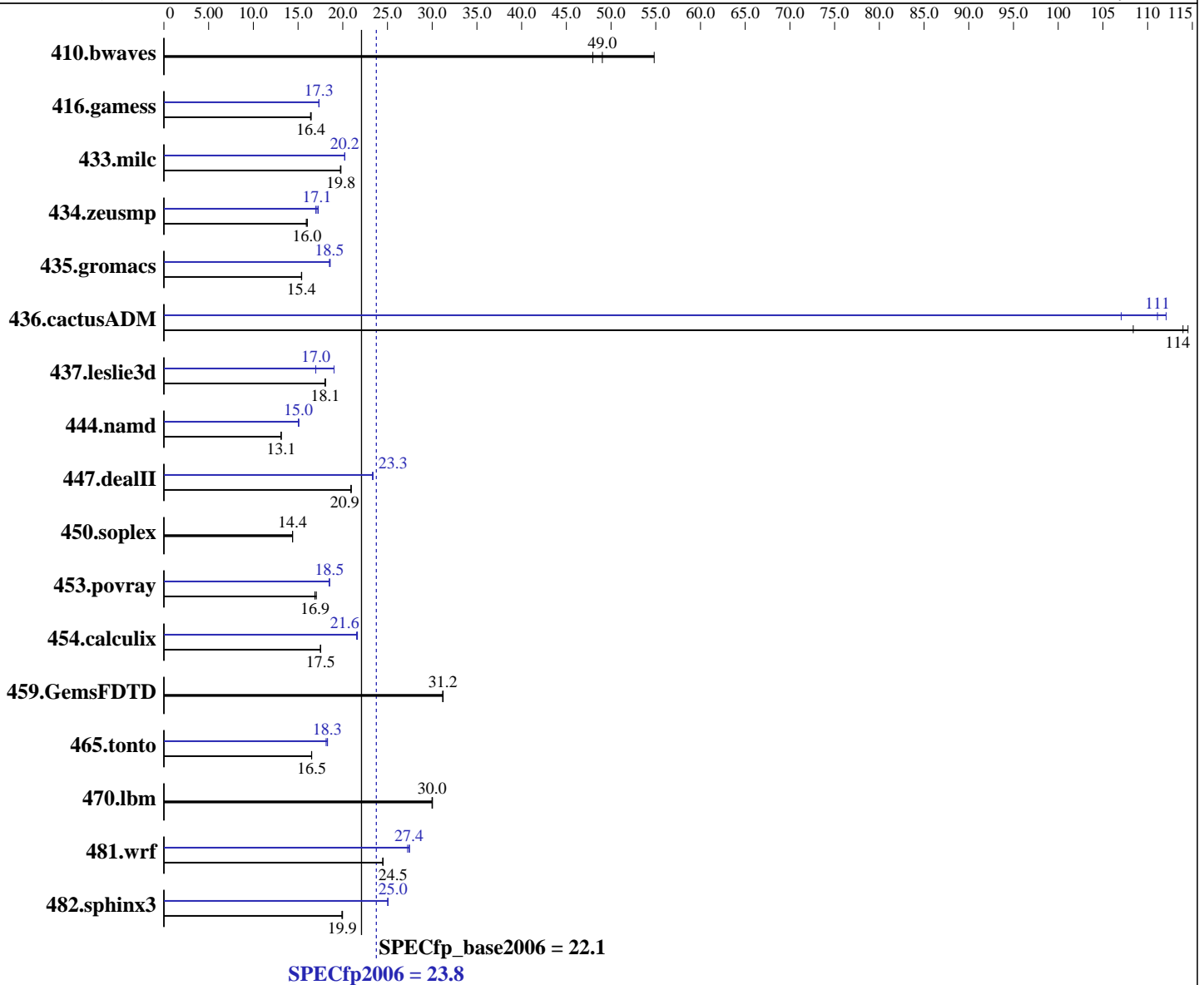
Test sponsor: IBM Corporation

Tested by: Advanced Micro Devices

Test date: Oct-2008

Hardware Availability: Nov-2008

Software Availability: May-2008



### Hardware

CPU Name: AMD Opteron 8384  
 CPU Characteristics:  
 CPU MHz: 2700  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 2 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) SP2, Kernel 2.6.16.60-0.21-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: 32/64-bit  
 Peak Pointers: 64-bit

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L3 Cache: 6 MB I+D on chip per chip  
Other Cache: None  
Memory: 32 GB (8 x 4 GB DDR2-6400 ECC)  
Disk Subsystem: 1 x 73 GB SAS, 10000 RPM  
Other Hardware: None

Other Software: binutils 2.18.50  
32-bit and 64-bit libhugetlbfs libraries

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	283	48.0	248	54.8	<b>277</b>	<b>49.0</b>	283	48.0	248	54.8	<b>277</b>	<b>49.0</b>
416.gamess	<b>1191</b>	<b>16.4</b>	1189	16.5	1194	16.4	<b>1129</b>	<b>17.3</b>	1129	17.3	1130	17.3
433.milc	465	19.7	<b>464</b>	<b>19.8</b>	464	19.8	454	20.2	454	20.2	<b>454</b>	<b>20.2</b>
434.zeusmp	567	16.0	572	15.9	<b>569</b>	<b>16.0</b>	<b>532</b>	<b>17.1</b>	536	17.0	527	17.3
435.gromacs	464	15.4	463	15.4	<b>464</b>	<b>15.4</b>	385	18.5	384	18.6	<b>385</b>	<b>18.5</b>
436.cactusADM	104	115	110	108	<b>105</b>	<b>114</b>	<b>108</b>	<b>111</b>	107	112	112	107
437.leslie3d	522	18.0	521	18.1	<b>521</b>	<b>18.1</b>	554	17.0	<b>554</b>	<b>17.0</b>	494	19.0
444.namd	612	13.1	<b>612</b>	<b>13.1</b>	612	13.1	533	15.0	<b>533</b>	<b>15.0</b>	531	15.1
447.dealII	547	20.9	<b>547</b>	<b>20.9</b>	546	21.0	490	23.3	<b>490</b>	<b>23.3</b>	489	23.4
450.soplex	580	14.4	580	14.4	<b>580</b>	<b>14.4</b>	580	14.4	580	14.4	<b>580</b>	<b>14.4</b>
453.povray	315	16.9	<b>315</b>	<b>16.9</b>	312	17.1	<b>287</b>	<b>18.5</b>	287	18.5	288	18.5
454.calculix	471	17.5	<b>471</b>	<b>17.5</b>	471	17.5	<b>382</b>	<b>21.6</b>	383	21.5	381	21.6
459.GemsFDTD	340	31.2	<b>340</b>	<b>31.2</b>	340	31.2	340	31.2	<b>340</b>	<b>31.2</b>	340	31.2
465.tonto	596	16.5	595	16.5	<b>596</b>	<b>16.5</b>	<b>539</b>	<b>18.3</b>	543	18.1	538	18.3
470.lbm	458	30.0	<b>458</b>	<b>30.0</b>	457	30.0	458	30.0	<b>458</b>	<b>30.0</b>	457	30.0
481.wrf	<b>456</b>	<b>24.5</b>	457	24.5	456	24.5	410	27.2	407	27.5	<b>408</b>	<b>27.4</b>
482.sphinx3	<b>978</b>	<b>19.9</b>	979	19.9	975	20.0	<b>778</b>	<b>25.1</b>	<b>778</b>	<b>25.0</b>	779	25.0

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.  
'numactl' was used to bind copies to the cores.

## General Notes

The libhugetlbfs libraries were installed using the installation rpms that came with the distribution.

'ulimit -s unlimited' was used to set environment stack size  
'ulimit -l 2097152' was used to set environment locked pages in memory limit

Set vm/nr\_hugepages=7168 in /etc/sysctl.conf  
mount -t hugetlbfs nodev /mnt/hugepages

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## General Notes (Continued)

Environment variables set by runspec before the start of the run:

LD\_LIBRARY\_PATH = "/root/work/cpu2006v1.1/pgi72/linux\_lib64:/root/work/cpu2006v1.1/pgi72/linux\_lib32"

PGI\_HUGE\_PAGES = "7168"

NCPUS = "8"

The powersaved was disabled, set the CPU frequency to its maximum.

## 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.deall: -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:

-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mconcur  
-Mfprelaxed -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

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## Base Optimization Flags (Continued)

C++ benchmarks:

```
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed  
-Mconcur --zc_eh -Mipa=fast -Mipa=inline -tp barcelona-64  
-Bstatic_pgi
```

Fortran benchmarks:

```
-Mvect=cachesize:6291456 -fastsse -Mfprelaxed -Msmartalloc=huge  
-Mconcur -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi
```

Benchmarks using both Fortran and C:

```
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -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
```



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## 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
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: -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge
-Msafeptr -Mconcur -Mfprelaxed -Mipa=inline -Mipa=arg
-Mipa=const -Mipa=ptr -Mipa=shape -tp barcelona-64
-Bstatic_pgi

470.lbm: basepeak = yes

482.sphinx3: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
-Mipa=inline(pass 2) -Mvect=cachesize:6291456 -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) -Mvect=cachesize:6291456 -fastsse
-Munroll=n:4 -Munroll=m:8 -Msmartalloc=huge -Mnodepchk
-Mfprelaxed --zc_eh -tp barcelona-64 -Bstatic_pgi

447.dealII: -Mvect=cachesize:6291456 -fastsse -alias=ansi
-Msmartalloc=huge -Mprefetch=t0 -Mnovect -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) -Mvect=cachesize:6291456 -fastsse

```

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## Peak Optimization Flags (Continued)

453.povray (continued):

-Msmartalloc=huge -Mprefetch=t0 -Mfprelaxed  
-tp barcelona-64 -Bstatic\_pgi

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)  
-Mipa=inline(pass 2) -Mvect=cachesize:6291456 -fastsse  
-Msmartalloc=huge -Mvect=noaltcode -Mprefetch=t0  
-Mfprelaxed -tp barcelona-64 -Bstatic\_pgi

434.zeusmp: -Mvect=cachesize:6291456 -fastsse -Mfprelaxed -Mconcur  
-Mprefetch=distance:8 -Mprefetch=t0 -Msmartalloc=huge  
-Msmartalloc=hugebss -Mipa=fast -Mipa=inline  
-tp barcelona-64 -Bstatic\_pgi

437.leslie3d: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)  
-Mconcur=noaltcode(pass 2) -Mipa=fast(pass 2)  
-Mipa=inline(pass 2) -Mvect=cachesize:6291456 -fastsse  
-Mvect=fuse -Msmartalloc=huge -Mprefetch=distance:8  
-Mprefetch=t0 -Mfprelaxed -tp barcelona-64 -Bstatic\_pgi

459.GemsFDTD: basepeak = yes

465.tonto: -Mvect=cachesize:6291456 -fastsse -O4 -Mvect=noaltcode  
-Msmartalloc=huge -Mprefetch=distance:8 -Mprefetch=t0  
-Mfprelaxed -Mipa=fast -Mipa=inline -tp barcelona-64  
-Bstatic\_pgi

Benchmarks using both Fortran and C:

435.gromacs: -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge  
-Mfprelaxed -Mconcur -Mfpapprox=rsqrt -Mipa=fast  
-Mipa=inline -tp barcelona-64 -Bstatic\_pgi

436.cactusADM: -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge  
-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)  
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge  
-Mloop32 -Mprefetch=t0 -Mpre -Mfprelaxed -tp barcelona-64  
-Bstatic\_pgi

481.wrf: -Mvect=cachesize:6291456 -fastsse -Mvect=noaltcode  
-Msmartalloc=huge -Mprefetch=distance:8 -Mconcur=noaltcode  
-Mfprelaxed -tp barcelona-64 -Bstatic\_pgi



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## Peak Other Flags

C benchmarks:

-Mipa=jobs:8(pass 2)

C++ benchmarks:

-Mipa=jobs:8(pass 2)

Fortran benchmarks:

-Mipa=jobs:8

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\\_linux\\_flags.20090713.01.html](http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090713.01.html)

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

[http://www.spec.org/cpu2006/flags/pgi72\\_linux\\_flags.20090713.01.xml](http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090713.01.xml)

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Tested with SPEC CPU2006 v1.1.

Report generated on Tue Jul 22 21:21:34 2014 by SPEC CPU2006 PS/PDF formatter v6932.

Originally published on 9 December 2008.