



# SPEC<sup>®</sup> CFP2006 Result

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## IBM Corporation

**SPECfp<sup>®</sup>2006 = 20.6**

## IBM System x3755 (AMD Opteron 8380)

**SPECfp\_base2006 = 19.6**

CPU2006 license: 11

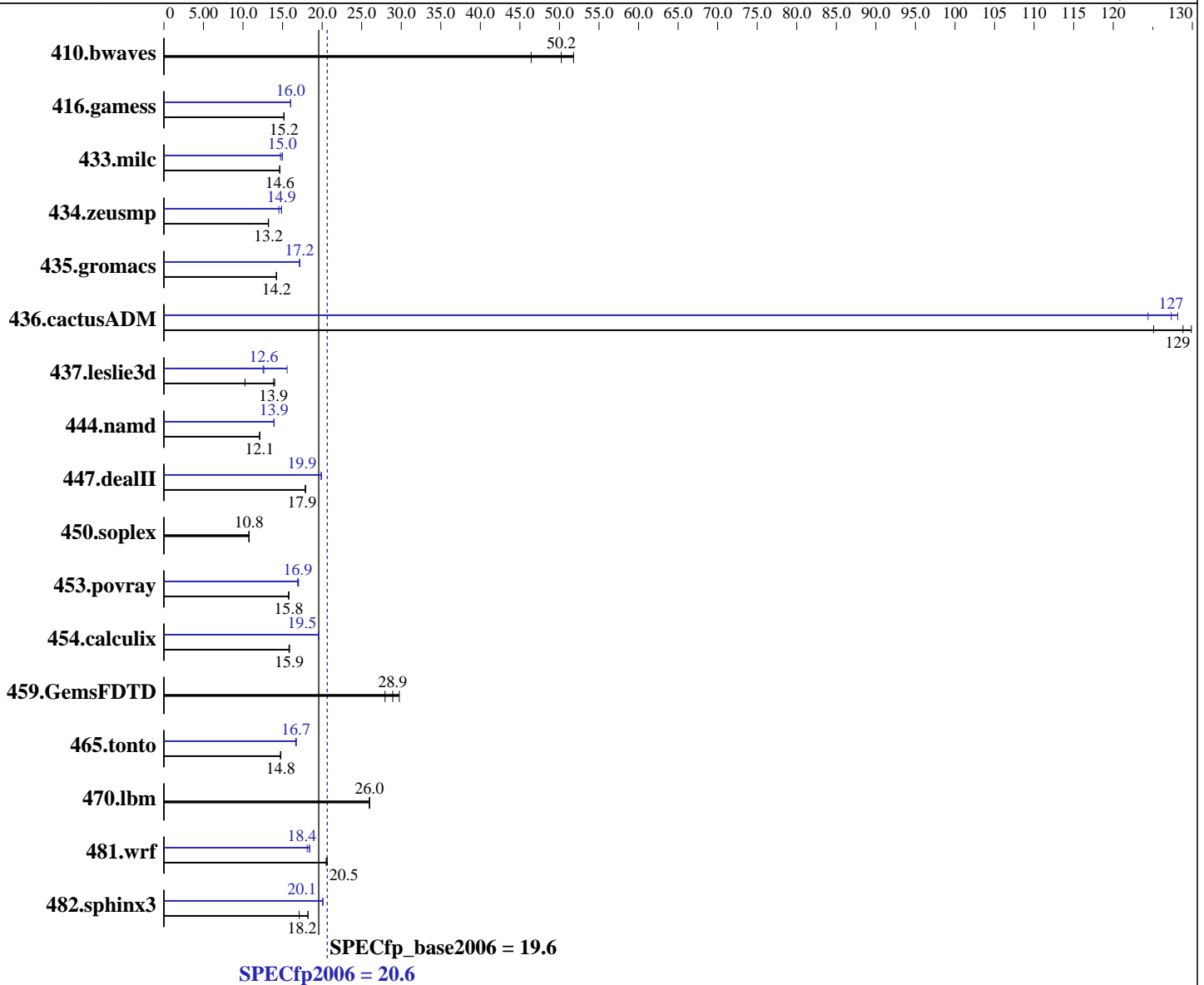
Test sponsor: IBM Corporation

Tested by: Advanced Micro Devices

Test date: Jan-2009

Hardware Availability: Mar-2009

Software Availability: May-2008



**SPECfp2006 = 20.6**

### Hardware

CPU Name: AMD Opteron 8380  
 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

### 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: 32/64-bit  
 Peak Pointers: 64-bit  
 Other Software: binutils 2.18.50

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L3 Cache: 6 MB I+D on chip per chip  
Other Cache: None  
Memory: 64 GB (16 x 4 GB, DDR2-667 CL5 Reg Dual Rank)  
Disk Subsystem: 1 x 73.4 GB SAS, 15000 RPM  
Other Hardware: None

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	<u>271</u>	<u>50.2</u>	262	51.8	293	46.4	<u>271</u>	<u>50.2</u>	262	51.8	293	46.4
416.gamess	1291	15.2	1288	15.2	<u>1290</u>	<u>15.2</u>	1223	16.0	1222	16.0	<u>1222</u>	<u>16.0</u>
433.milc	626	14.7	627	14.6	<u>627</u>	<u>14.6</u>	623	14.7	614	15.0	<u>614</u>	<u>15.0</u>
434.zeusmp	690	13.2	688	13.2	<u>689</u>	<u>13.2</u>	626	14.5	<u>612</u>	<u>14.9</u>	612	14.9
435.gromacs	501	14.2	<u>502</u>	<u>14.2</u>	502	14.2	<u>416</u>	<u>17.2</u>	416	17.2	416	17.1
436.cactusADM	<u>92.8</u>	<u>129</u>	95.5	125	92.0	130	96.1	124	93.2	128	<u>93.9</u>	<u>127</u>
437.leslie3d	671	14.0	917	10.3	<u>678</u>	<u>13.9</u>	750	12.5	<u>745</u>	<u>12.6</u>	604	15.6
444.namd	663	12.1	663	12.1	<u>663</u>	<u>12.1</u>	<u>576</u>	<u>13.9</u>	576	13.9	576	13.9
447.dealII	638	17.9	641	17.9	<u>639</u>	<u>17.9</u>	575	19.9	575	19.9	<u>575</u>	<u>19.9</u>
450.soplex	777	10.7	773	10.8	<u>775</u>	<u>10.8</u>	777	10.7	773	10.8	<u>775</u>	<u>10.8</u>
453.povray	337	15.8	<u>337</u>	<u>15.8</u>	337	15.8	312	17.0	315	16.9	<u>314</u>	<u>16.9</u>
454.calculix	520	15.9	522	15.8	<u>520</u>	<u>15.9</u>	423	19.5	422	19.5	<u>422</u>	<u>19.5</u>
459.GemsFDTD	380	27.9	357	29.8	<u>367</u>	<u>28.9</u>	380	27.9	357	29.8	<u>367</u>	<u>28.9</u>
465.tonto	<u>666</u>	<u>14.8</u>	668	14.7	666	14.8	587	16.8	<u>590</u>	<u>16.7</u>	591	16.7
470.lbm	<u>529</u>	<u>26.0</u>	529	26.0	528	26.0	<u>529</u>	<u>26.0</u>	529	26.0	528	26.0
481.wrf	<u>544</u>	<u>20.5</u>	541	20.6	544	20.5	606	18.4	<u>607</u>	<u>18.4</u>	617	18.1
482.sphinx3	1140	17.1	<u>1071</u>	<u>18.2</u>	1069	18.2	971	20.1	<u>971</u>	<u>20.1</u>	970	20.1

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.

## Operating System Notes

Environment stack size set to 'unlimited'.  
The powersaved was disabled, set the CPU frequency to its maximum.  
Total number of huge pages available is 14336.  
'ulimit -l 2097152' was used to set environment locked pages in memory quantity.  
Set vm/nr\_hugepages=14336 in /etc/sysctl.conf  
mount -t hugetlbfs nodev /mnt/hugepages



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## General Notes

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"

NCPUS = "16"

## 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:

-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.html](http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090713.html)

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

[http://www.spec.org/cpu2006/flags/pgi72\\_linux\\_flags.20090713.xml](http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090713.xml)

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