





# SPEC CFP2006 Result

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## IBM Corporation

SPECfp2006 = **22.3**

## IBM System x3755 (AMD Opteron 8384)

SPECfp\_base2006 = **20.7**

CPU2006 license: 11

Test sponsor: IBM Corporation

Tested by: Advanced Micro Devices

Test date: Nov-2008

Hardware Availability: Mar-2009

Software Availability: Jun-2008

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	275	49.4	<b><u>267</u></b>	<b><u>50.8</u></b>	252	54.0	275	49.4	<b><u>267</u></b>	<b><u>50.8</u></b>	252	54.0
416.gamess	1194	16.4	<b><u>1195</u></b>	<b><u>16.4</u></b>	1197	16.4	<b><u>1133</u></b>	<b><u>17.3</u></b>	1137	17.2	1131	17.3
433.milc	591	15.5	592	15.5	<b><u>592</u></b>	<b><u>15.5</u></b>	<b><u>581</u></b>	<b><u>15.8</u></b>	580	15.8	583	15.7
434.zeusmp	<b><u>643</u></b>	<b><u>14.1</u></b>	645	14.1	643	14.2	571	15.9	588	15.5	<b><u>581</u></b>	<b><u>15.7</u></b>
435.gromacs	466	15.3	<b><u>466</u></b>	<b><u>15.3</u></b>	465	15.3	386	18.5	385	18.5	<b><u>386</u></b>	<b><u>18.5</u></b>
436.cactusADM	89.6	133	95.4	125	<b><u>92.4</u></b>	<b><u>129</u></b>	87.2	137	91.5	131	<b><u>87.6</u></b>	<b><u>136</u></b>
437.leslie3d	<b><u>635</u></b>	<b><u>14.8</u></b>	636	14.8	633	14.9	720	13.1	578	16.3	<b><u>578</u></b>	<b><u>16.3</u></b>
444.namd	<b><u>613</u></b>	<b><u>13.1</u></b>	614	13.1	613	13.1	536	15.0	535	15.0	<b><u>535</u></b>	<b><u>15.0</u></b>
447.dealII	602	19.0	593	19.3	<b><u>594</u></b>	<b><u>19.2</u></b>	<b><u>534</u></b>	<b><u>21.4</u></b>	534	21.4	535	21.4
450.soplex	<b><u>724</u></b>	<b><u>11.5</u></b>	725	11.5	724	11.5	<b><u>724</u></b>	<b><u>11.5</u></b>	725	11.5	724	11.5
453.povray	313	17.0	<b><u>314</u></b>	<b><u>17.0</u></b>	315	16.9	290	18.3	<b><u>291</u></b>	<b><u>18.3</u></b>	291	18.3
454.calculix	<b><u>485</u></b>	<b><u>17.0</u></b>	482	17.1	485	17.0	<b><u>391</u></b>	<b><u>21.1</u></b>	392	21.1	391	21.1
459.GemsFDTD	336	31.6	361	29.4	<b><u>341</u></b>	<b><u>31.1</u></b>	336	31.6	361	29.4	<b><u>341</u></b>	<b><u>31.1</u></b>
465.tonto	620	15.9	<b><u>619</u></b>	<b><u>15.9</u></b>	616	16.0	543	18.1	<b><u>544</u></b>	<b><u>18.1</u></b>	544	18.1
470.lbm	<b><u>498</u></b>	<b><u>27.6</u></b>	498	27.6	498	27.6	<b><u>498</u></b>	<b><u>27.6</u></b>	498	27.6	498	27.6
481.wrf	511	21.9	515	21.7	<b><u>512</u></b>	<b><u>21.8</u></b>	574	19.5	<b><u>577</u></b>	<b><u>19.4</u></b>	581	19.2
482.sphinx3	1094	17.8	1144	17.0	<b><u>1140</u></b>	<b><u>17.1</u></b>	900	21.7	<b><u>901</u></b>	<b><u>21.6</u></b>	901	21.6

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:

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C++ benchmarks:

pgcpp

Fortran benchmarks:

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

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