



SPEC[®] CFP2006 Result

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IBM Corporation

SPECfp[®]2006 = 17.7

IBM BladeCenter LS42 (AMD Opteron 8356)

SPECfp_base2006 = 16.6

CPU2006 license: 11

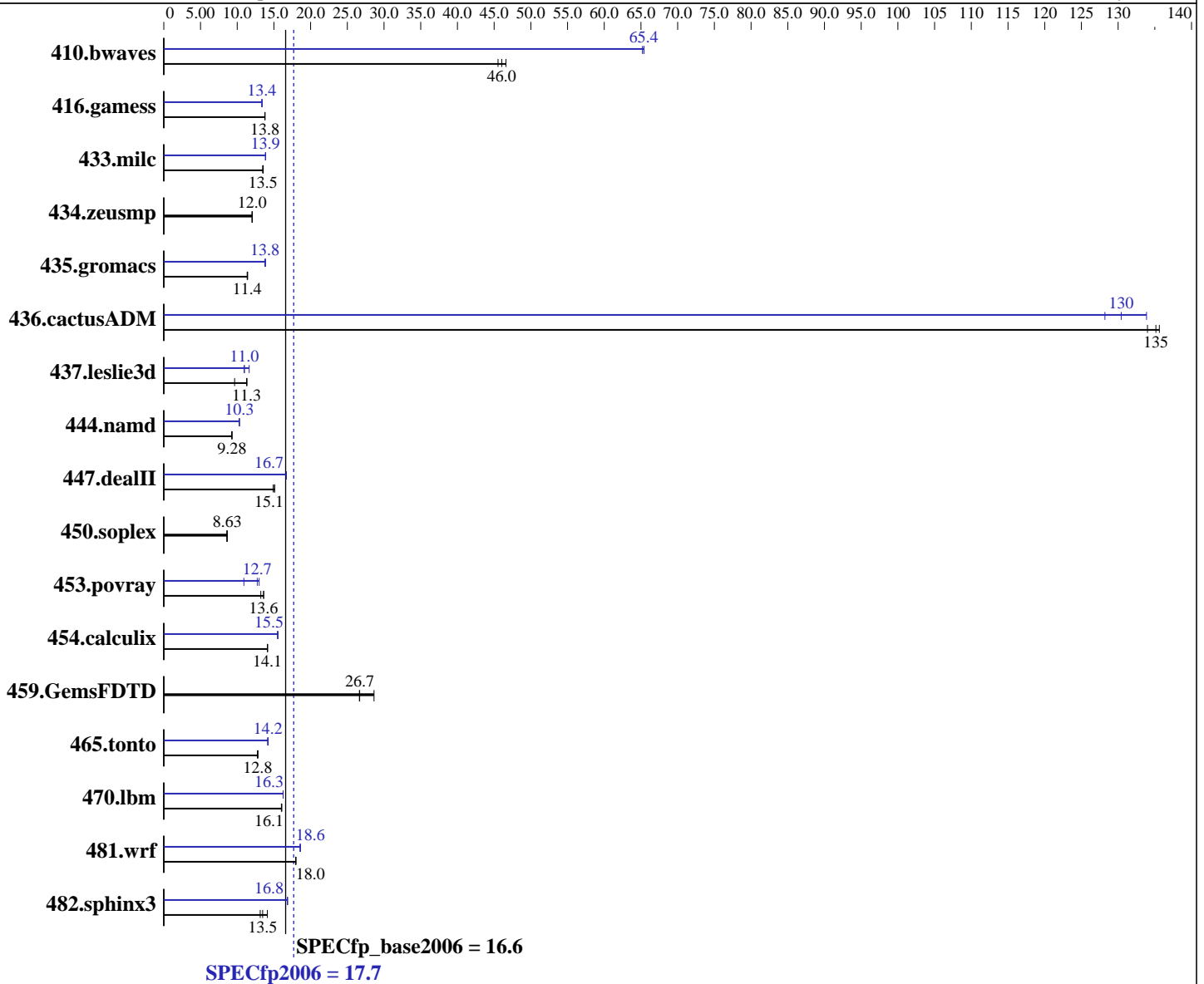
Test date: Aug-2008

Test sponsor: IBM Corporation

Hardware Availability: Sep-2008

Tested by: IBM Corporation

Software Availability: May-2008



Hardware

CPU Name: AMD Opteron 8356
 CPU Characteristics:
 CPU MHz: 2300
 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	292	46.6	298	45.5	<u>295</u>	<u>46.0</u>	<u>208</u>	<u>65.4</u>	208	65.2	208	65.4
416.gamess	1419	13.8	<u>1422</u>	<u>13.8</u>	1422	13.8	<u>1464</u>	<u>13.4</u>	1467	13.3	1461	13.4
433.milc	682	13.5	<u>678</u>	<u>13.5</u>	677	13.6	661	13.9	<u>662</u>	<u>13.9</u>	664	13.8
434.zeusmp	754	12.1	757	12.0	<u>756</u>	<u>12.0</u>	754	12.1	757	12.0	<u>756</u>	<u>12.0</u>
435.gromacs	625	11.4	<u>628</u>	<u>11.4</u>	628	11.4	<u>517</u>	<u>13.8</u>	515	13.9	518	13.8
436.cactusADM	88.1	136	89.2	134	<u>88.4</u>	<u>135</u>	89.3	134	93.2	128	<u>91.6</u>	<u>130</u>
437.leslie3d	<u>833</u>	<u>11.3</u>	829	11.3	974	9.65	<u>856</u>	<u>11.0</u>	858	11.0	808	11.6
444.namd	865	9.28	<u>865</u>	<u>9.28</u>	864	9.28	779	10.3	779	10.3	<u>779</u>	<u>10.3</u>
447.dealII	<u>758</u>	<u>15.1</u>	758	15.1	768	14.9	<u>685</u>	<u>16.7</u>	686	16.7	685	16.7
450.soplex	971	8.59	966	8.64	<u>966</u>	<u>8.63</u>	971	8.59	966	8.64	<u>966</u>	<u>8.63</u>
453.povray	<u>391</u>	<u>13.6</u>	391	13.6	403	13.2	410	13.0	488	10.9	<u>418</u>	<u>12.7</u>
454.calculix	585	14.1	<u>584</u>	<u>14.1</u>	584	14.1	533	15.5	<u>532</u>	<u>15.5</u>	530	15.6
459.GemsFDTD	398	26.6	<u>398</u>	<u>26.7</u>	370	28.6	398	26.6	<u>398</u>	<u>26.7</u>	370	28.6
465.tonto	<u>768</u>	<u>12.8</u>	768	12.8	772	12.7	696	14.1	692	14.2	<u>693</u>	<u>14.2</u>
470.lbm	<u>856</u>	<u>16.1</u>	858	16.0	855	16.1	845	16.3	<u>845</u>	<u>16.3</u>	845	16.3
481.wrf	622	18.0	620	18.0	<u>622</u>	<u>18.0</u>	602	18.6	600	18.6	<u>601</u>	<u>18.6</u>
482.sphinx3	<u>1447</u>	<u>13.5</u>	1484	13.1	1381	14.1	1158	16.8	<u>1157</u>	<u>16.8</u>	1156	16.9

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
 -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) -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

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

http://www.spec.org/cpu2006/flags/pgi72_flags.xml

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For other inquiries, please contact webmaster@spec.org.

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