



# SPEC<sup>®</sup> CFP2006 Result

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## Fujitsu Siemens Computers

### SPECfp<sup>®</sup>\_rate2006 = 76.8

### CELSIUS V840, AMD Opteron 2346 HE (1.8 GHz)

### SPECfp\_rate\_base2006 = 69.1

CPU2006 license: 22

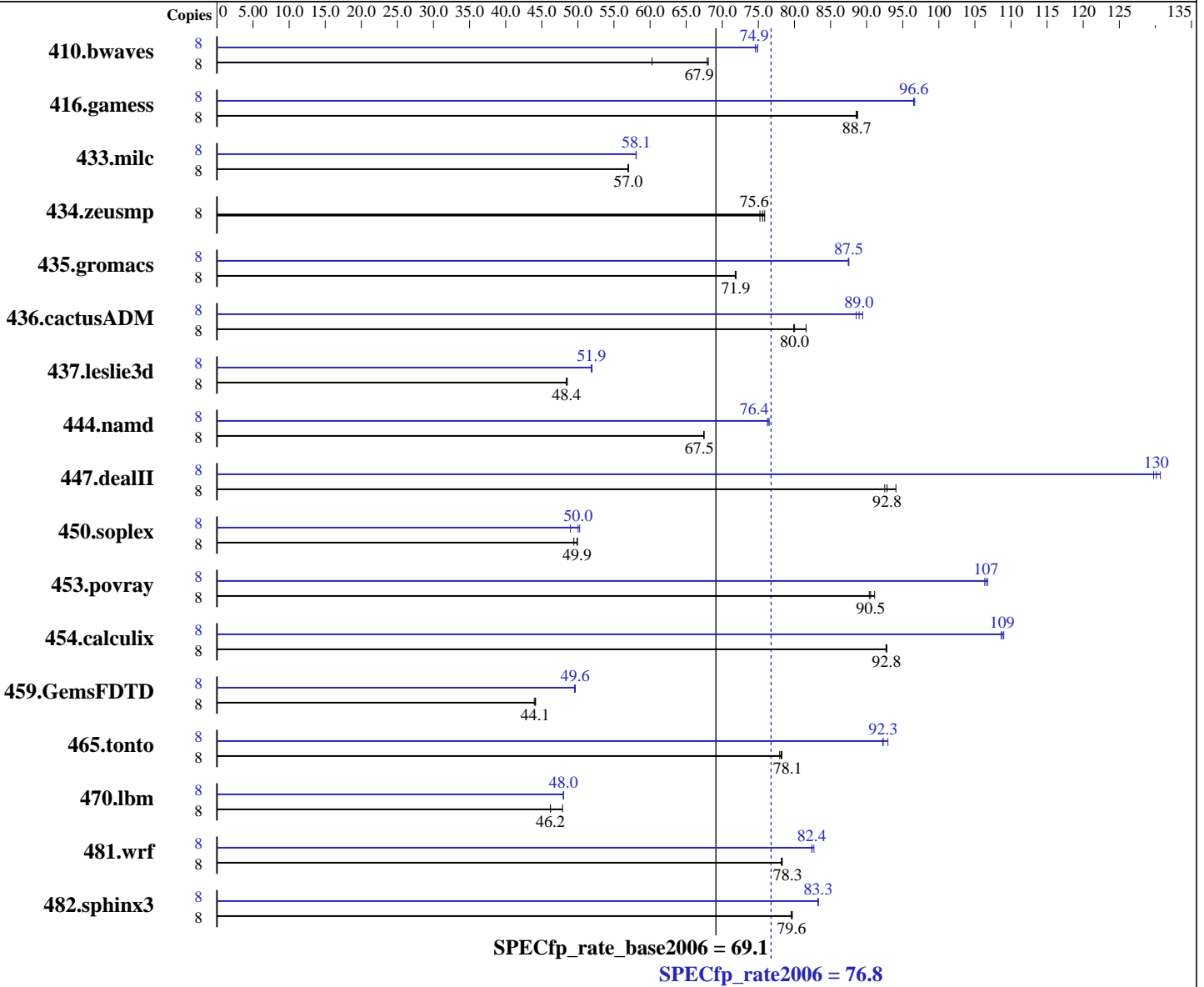
Test sponsor: Fujitsu Siemens Computers

Tested by: Fujitsu Siemens Computers

Test date: Jun-2008

Hardware Availability: May-2008

Software Availability: May-2008



#### Hardware

CPU Name: AMD Opteron 2346 HE  
 CPU Characteristics:  
 CPU MHz: 1800  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip  
 CPU(s) orderable: 1,2 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 Workstation Complete Version 7.2-1 PathScale Compiler Suite, Release 3.2 Beta  
 Auto Parallel: No  
 File System: ext3  
 System State: Multi-User SuSE Run Level 3  
 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: 16 GB (8x2GB PC2-5300P, CL5, dual rank ECC)  
 Disk Subsystem: 1 x 400 GB SATA II, 7200 rpm  
 Other Hardware: None

Other Software: binutils 2.18.50

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	8	1804	60.3	1597	68.1	<b>1601</b>	<b>67.9</b>	8	1458	74.6	1452	74.9	<b>1452</b>	<b>74.9</b>
416.gamess	8	1769	88.6	1765	88.7	<b>1767</b>	<b>88.7</b>	8	<b>1622</b>	<b>96.6</b>	1620	96.7	1623	96.5
433.milc	8	1290	56.9	1288	57.0	<b>1289</b>	<b>57.0</b>	8	<b>1265</b>	<b>58.1</b>	1264	58.1	1265	58.1
434.zeusmp	8	968	75.2	<b>963</b>	<b>75.6</b>	959	75.9	8	968	75.2	<b>963</b>	<b>75.6</b>	959	75.9
435.gromacs	8	796	71.8	794	71.9	<b>795</b>	<b>71.9</b>	8	653	87.4	<b>653</b>	<b>87.5</b>	653	87.5
436.cactusADM	8	1171	81.6	<b>1195</b>	<b>80.0</b>	1197	79.9	8	1069	89.5	<b>1075</b>	<b>89.0</b>	1079	88.6
437.leslie3d	8	1550	48.5	1554	48.4	<b>1552</b>	<b>48.4</b>	8	1450	51.9	<b>1449</b>	<b>51.9</b>	1447	52.0
444.namd	8	951	67.4	951	67.5	<b>951</b>	<b>67.5</b>	8	841	76.3	<b>840</b>	<b>76.4</b>	839	76.5
447.dealII	8	989	92.5	<b>986</b>	<b>92.8</b>	973	94.1	8	705	130	<b>703</b>	<b>130</b>	700	131
450.soplex	8	1350	49.4	1336	49.9	<b>1337</b>	<b>49.9</b>	8	1363	49.0	<b>1333</b>	<b>50.0</b>	1328	50.3
453.povray	8	471	90.4	467	91.1	<b>470</b>	<b>90.5</b>	8	399	107	400	106	<b>399</b>	<b>107</b>
454.calculix	8	<b>712</b>	<b>92.8</b>	712	92.7	711	92.8	8	608	109	<b>607</b>	<b>109</b>	606	109
459.GemsFDTD	8	1931	44.0	1923	44.1	<b>1925</b>	<b>44.1</b>	8	1714	49.5	1710	49.6	<b>1711</b>	<b>49.6</b>
465.tonto	8	1006	78.3	1010	78.0	<b>1007</b>	<b>78.1</b>	8	<b>853</b>	<b>92.3</b>	853	92.2	847	92.9
470.lbm	8	2296	47.9	<b>2379</b>	<b>46.2</b>	2380	46.2	8	2289	48.0	<b>2290</b>	<b>48.0</b>	2291	48.0
481.wrf	8	1141	78.3	<b>1142</b>	<b>78.3</b>	1143	78.2	8	1080	82.7	1084	82.4	<b>1084</b>	<b>82.4</b>
482.sphinx3	8	<b>1959</b>	<b>79.6</b>	1956	79.7	1960	79.6	8	1873	83.3	1872	83.3	<b>1872</b>	<b>83.3</b>

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

## Operating System Notes

```

powersave -f is applied to set CPU to maximum frequency prior to run
stacksize is set to unlimited prior to run
ulimit -l 2457600
PGI_HUGE_PAGES set to 150
(Total number of huge pages available is 1200)

```

## General Notes

The command numactl has been used to bind processes to CPUs

For information about Fujitsu Siemens Computers please see:  
<http://www.fujitsu-siemens.com>



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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:150 -Mfprelaxed -Mipa=jobs:4 -Mipa=fast  
-Mipa=inline -tp barcelona-64 -Bstatic\_pgi

C++ benchmarks:

-fastsse -Msmartalloc=huge:150 -Mfprelaxed --zc\_eh -Mipa=jobs:4  
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

Fortran benchmarks:

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

## Peak Compiler Invocation

C benchmarks (except as noted below):

pgcc

470.lbm: pathcc

C++ benchmarks (except as noted below):

pathCC

444.namd: pgcpp

Fortran benchmarks (except as noted below):

pathf95

410.bwaves: pgf95

434.zeusmp: pgf95

437.leslie3d: pgf95

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

pgcc pgf95

436.cactusADM: 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  
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

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## Peak Portability Flags (Continued)

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: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 -CG:sse\_cse\_regs=0  
-CG:locs\_shallow\_depth=1 -m3dnow

482.sphinx3: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)  
-Mipa=jobs:4(pass 2) -Mipa=fast(pass 2) -Mipa=inline(pass 2)  
-fastsse -Mfprelaxed -Msmartalloc -tp barcelona-64  
-Bstatic\_pgi

C++ benchmarks:

444.namd: -Mphi(pass 1) -Mpfo(pass 2) -Mipa=jobs:4(pass 2)  
-Mipa=fast(pass 2) -Mipa=inline(pass 2) -fastsse  
-Munroll=n:4 -Munroll=m:8 -Msmartalloc=huge:150 -Mnodepch  
-Mfprelaxed --zc\_eh -tp barcelona-64 -Bstatic\_pgi

447.dealIII: -march=barcelona -Ofast -static -INLINE:aggressive=on  
-fno-exceptions -m32

450.soplex: -march=barcelona -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -O3 -TENV:frame\_pointer=off  
-LNO:prefetch=1 -OPT:malloc\_alg=1 -CG:load\_exe=0 -m32

453.povray: -march=barcelona -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -Ofast

Fortran benchmarks:

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

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

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## Peak Optimization Flags (Continued)

434.zeusmp: basepeak = yes

437.leslie3d: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)  
-Mipa=jobs:4(pass 2) -Mipa=fast(pass 2) -Mipa=inline(pass 2)  
-fastsse -Mvect=fuse -Msmartalloc=huge:150  
-Mprefetch=distance:8 -Mprefetch=t0 -Mfprelaxed  
-tp barcelona-64 -Bstatic\_pgi

459.GemsFDTD: -march=barcelona -Ofast -LNO:fission=2 -LNO:simd=2  
-LNO:prefetch\_ahead=1 -CG:load\_exe=0

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

Benchmarks using both Fortran and C:

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

436.cactusADM: -march=barcelona -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2) -Ofast -LNO:blocking=off

454.calculix: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)  
-Mipa=jobs:4(pass 2) -Mipa=fast(pass 2) -Mipa=inline(pass 2)  
-fastsse -Msmartalloc=huge:150 -Mprefetch=t0 -Mpre  
-Mfprelaxed -tp barcelona-64 -Bstatic\_pgi

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

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/fsc-mix-pgi-path.html>

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

<http://www.spec.org/cpu2006/flags/fsc-mix-pgi-path.xml>

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