



# SPEC<sup>®</sup> CFP2006 Result

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## Fujitsu Siemens Computers

### SPECfp<sup>®</sup>\_rate2006 = 86.7

### CELSIUS V840, AMD Opteron 2354 (2.2 GHz)

### SPECfp\_rate\_base2006 = 77.9

CPU2006 license: 22

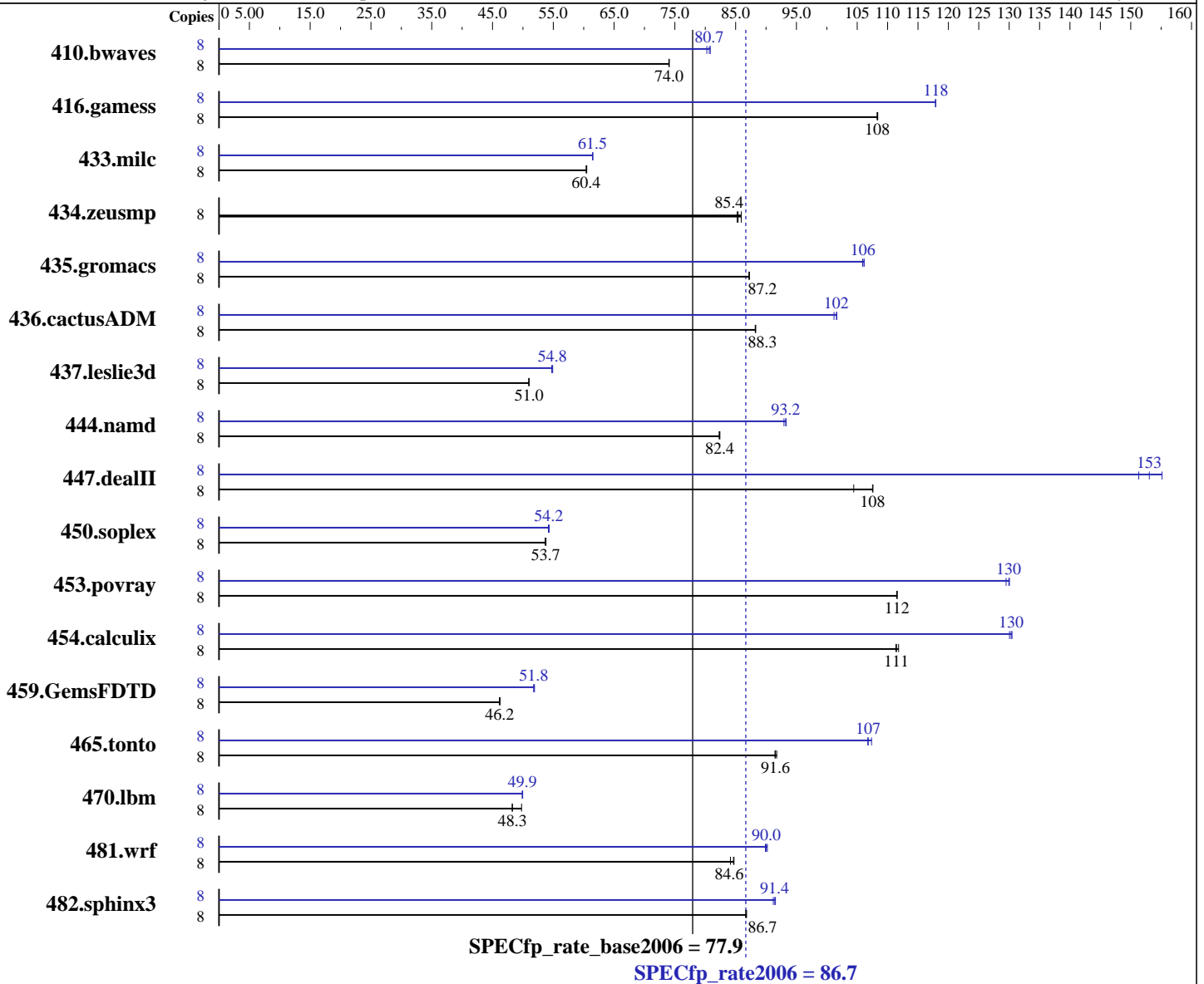
Test date: May-2008

Test sponsor: Fujitsu Siemens Computers

Hardware Availability: May-2008

Tested by: Fujitsu Siemens Computers

Software Availability: May-2008



#### Hardware

CPU Name: AMD Opteron 2354  
 CPU Characteristics:  
 CPU MHz: 2200  
 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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### Hardware (Continued)

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

### Software (Continued)

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	1468	74.1	<b><u>1468</u></b>	<b><u>74.0</u></b>	1469	74.0	8	1345	80.8	<b><u>1348</u></b>	<b><u>80.7</u></b>	1355	80.3		
416.gamess	8	1445	108	<b><u>1446</u></b>	<b><u>108</u></b>	1446	108	8	<b><u>1328</u></b>	<b><u>118</u></b>	1328	118	1329	118		
433.milc	8	1214	60.5	1215	60.4	<b><u>1215</u></b>	<b><u>60.4</u></b>	8	1194	61.5	<b><u>1195</u></b>	<b><u>61.5</u></b>	1195	61.5		
434.zeusmp	8	<b><u>852</u></b>	<b><u>85.4</u></b>	854	85.3	847	85.9	8	<b><u>852</u></b>	<b><u>85.4</u></b>	854	85.3	847	85.9		
435.gromacs	8	655	87.2	<b><u>655</u></b>	<b><u>87.2</u></b>	655	87.3	8	539	106	538	106	<b><u>539</u></b>	<b><u>106</u></b>		
436.cactusADM	8	1083	88.3	1084	88.2	<b><u>1083</u></b>	<b><u>88.3</u></b>	8	<b><u>941</u></b>	<b><u>102</u></b>	945	101	941	102		
437.leslie3d	8	<b><u>1474</u></b>	<b><u>51.0</u></b>	1476	51.0	1474	51.0	8	1370	54.9	1373	54.8	<b><u>1372</u></b>	<b><u>54.8</u></b>		
444.namd	8	779	82.4	780	82.3	<b><u>779</u></b>	<b><u>82.4</u></b>	8	690	93.0	688	93.3	<b><u>688</u></b>	<b><u>93.2</u></b>		
447.dealII	8	851	108	<b><u>851</u></b>	<b><u>108</u></b>	876	104	8	<b><u>598</u></b>	<b><u>153</u></b>	590	155	605	151		
450.soplex	8	1240	53.8	<b><u>1242</u></b>	<b><u>53.7</u></b>	1243	53.7	8	<b><u>1230</u></b>	<b><u>54.2</u></b>	1228	54.3	1231	54.2		
453.povray	8	<b><u>381</u></b>	<b><u>112</u></b>	382	111	381	112	8	327	130	<b><u>328</u></b>	<b><u>130</u></b>	329	129		
454.calculix	8	590	112	<b><u>592</u></b>	<b><u>111</u></b>	593	111	8	<b><u>506</u></b>	<b><u>130</u></b>	506	130	507	130		
459.GemsFDTD	8	1836	46.2	<b><u>1838</u></b>	<b><u>46.2</u></b>	1839	46.2	8	1635	51.9	<b><u>1639</u></b>	<b><u>51.8</u></b>	1639	51.8		
465.tonto	8	861	91.5	<b><u>860</u></b>	<b><u>91.6</u></b>	858	91.8	8	<b><u>737</u></b>	<b><u>107</u></b>	738	107	733	107		
470.ibm	8	<b><u>2276</u></b>	<b><u>48.3</u></b>	2279	48.2	2208	49.8	8	2200	50.0	<b><u>2202</u></b>	<b><u>49.9</u></b>	2203	49.9		
481.wrf	8	1062	84.1	1055	84.7	<b><u>1056</u></b>	<b><u>84.6</u></b>	8	994	89.9	990	90.2	<b><u>992</u></b>	<b><u>90.0</u></b>		
482.sphinx3	8	<b><u>1799</u></b>	<b><u>86.7</u></b>	1799	86.7	1796	86.8	8	1710	91.2	<b><u>1705</u></b>	<b><u>91.4</u></b>	1703	91.5		

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

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## General Notes (Continued)

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

## 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  
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## Base Optimization Flags (Continued)

Fortran benchmarks:

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

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

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## Peak Portability Flags (Continued)

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  
 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 -m3dnw

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\_ah -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

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## Peak Optimization Flags (Continued)

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

434.zeusmp: basepeak = yes

437.leslie3d: -Mpfi=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: -Mpfi=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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