



# SPEC<sup>®</sup> CFP2006 Result

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## Fujitsu Siemens Computers

### SPECfp<sup>®</sup>\_rate2006 = 89.1

### CELSIUS V840, AMD Opteron 2356 (2.3 GHz)

### SPECfp\_rate\_base2006 = 80.2

CPU2006 license: 22

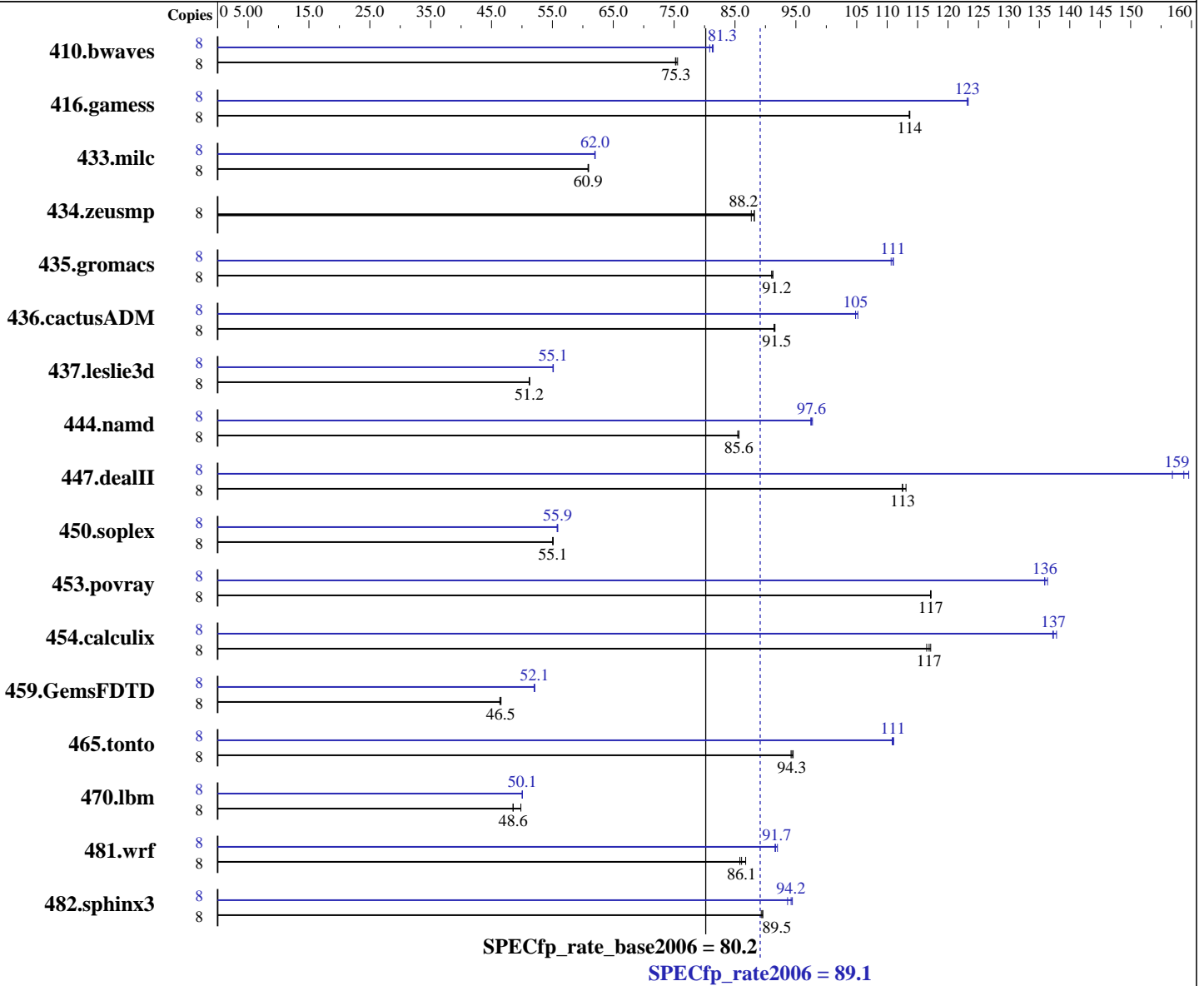
Test sponsor: Fujitsu Siemens Computers

Tested by: Fujitsu Siemens Computers

Test date: Apr-2008

Hardware Availability: May-2008

Software Availability: May-2008



#### Hardware

CPU Name: AMD Opteron 2356  
 CPU Characteristics:  
 CPU MHz: 2300  
 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 Server Complete Version 7.2, PathScale Compiler Suite, Release Pre-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	1445	75.2	1439	75.6	<b>1444</b>	<b>75.3</b>	8	<b>1338</b>	<b>81.3</b>	1335	81.4	1345	80.8
416.gamess	8	1377	114	1379	114	<b>1378</b>	<b>114</b>	8	<b>1272</b>	<b>123</b>	1270	123	1272	123
433.milc	8	1205	61.0	1207	60.9	<b>1207</b>	<b>60.9</b>	8	1184	62.0	<b>1184</b>	<b>62.0</b>	1185	62.0
434.zeusmp	8	826	88.2	<b>826</b>	<b>88.2</b>	830	87.7	8	826	88.2	<b>826</b>	<b>88.2</b>	830	87.7
435.gromacs	8	628	91.0	626	91.2	<b>626</b>	<b>91.2</b>	8	516	111	<b>515</b>	<b>111</b>	514	111
436.cactusADM	8	1044	91.6	1046	91.4	<b>1045</b>	<b>91.5</b>	8	909	105	912	105	<b>912</b>	<b>105</b>
437.leslie3d	8	1469	51.2	1467	51.3	<b>1469</b>	<b>51.2</b>	8	<b>1364</b>	<b>55.1</b>	1365	55.1	1363	55.2
444.namd	8	751	85.4	<b>749</b>	<b>85.6</b>	749	85.7	8	658	97.4	<b>658</b>	<b>97.6</b>	656	97.7
447.dealII	8	809	113	814	112	<b>813</b>	<b>113</b>	8	574	160	583	157	<b>577</b>	<b>159</b>
450.soplex	8	1212	55.0	1210	55.1	<b>1211</b>	<b>55.1</b>	8	1194	55.9	1196	55.8	<b>1194</b>	<b>55.9</b>
453.povray	8	363	117	363	117	<b>363</b>	<b>117</b>	8	312	136	313	136	<b>313</b>	<b>136</b>
454.calculix	8	567	116	<b>565</b>	<b>117</b>	563	117	8	<b>481</b>	<b>137</b>	481	137	479	138
459.GemsFDTD	8	1823	46.6	<b>1825</b>	<b>46.5</b>	1831	46.4	8	1629	52.1	<b>1630</b>	<b>52.1</b>	1633	52.0
465.tonto	8	833	94.6	836	94.2	<b>834</b>	<b>94.3</b>	8	709	111	710	111	<b>709</b>	<b>111</b>
470.lbm	8	2206	49.8	2265	48.5	<b>2263</b>	<b>48.6</b>	8	2195	50.1	<b>2195</b>	<b>50.1</b>	2198	50.0
481.wrf	8	<b>1038</b>	<b>86.1</b>	1030	86.8	1041	85.8	8	972	92.0	<b>975</b>	<b>91.7</b>	976	91.6
482.sphinx3	8	1746	89.3	1741	89.6	<b>1741</b>	<b>89.5</b>	8	1665	93.6	<b>1655</b>	<b>94.2</b>	1651	94.4

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 -m3dnw

482.sphinx3: -Mpfi=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: -Mpfi(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: -Mpfi(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.20090714.html>

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

<http://www.spec.org/cpu2006/flags/fsc-mix-pgi-path.20090714.xml>

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