# SPEC® CFP2006 Result

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## Fujitsu Siemens Computers

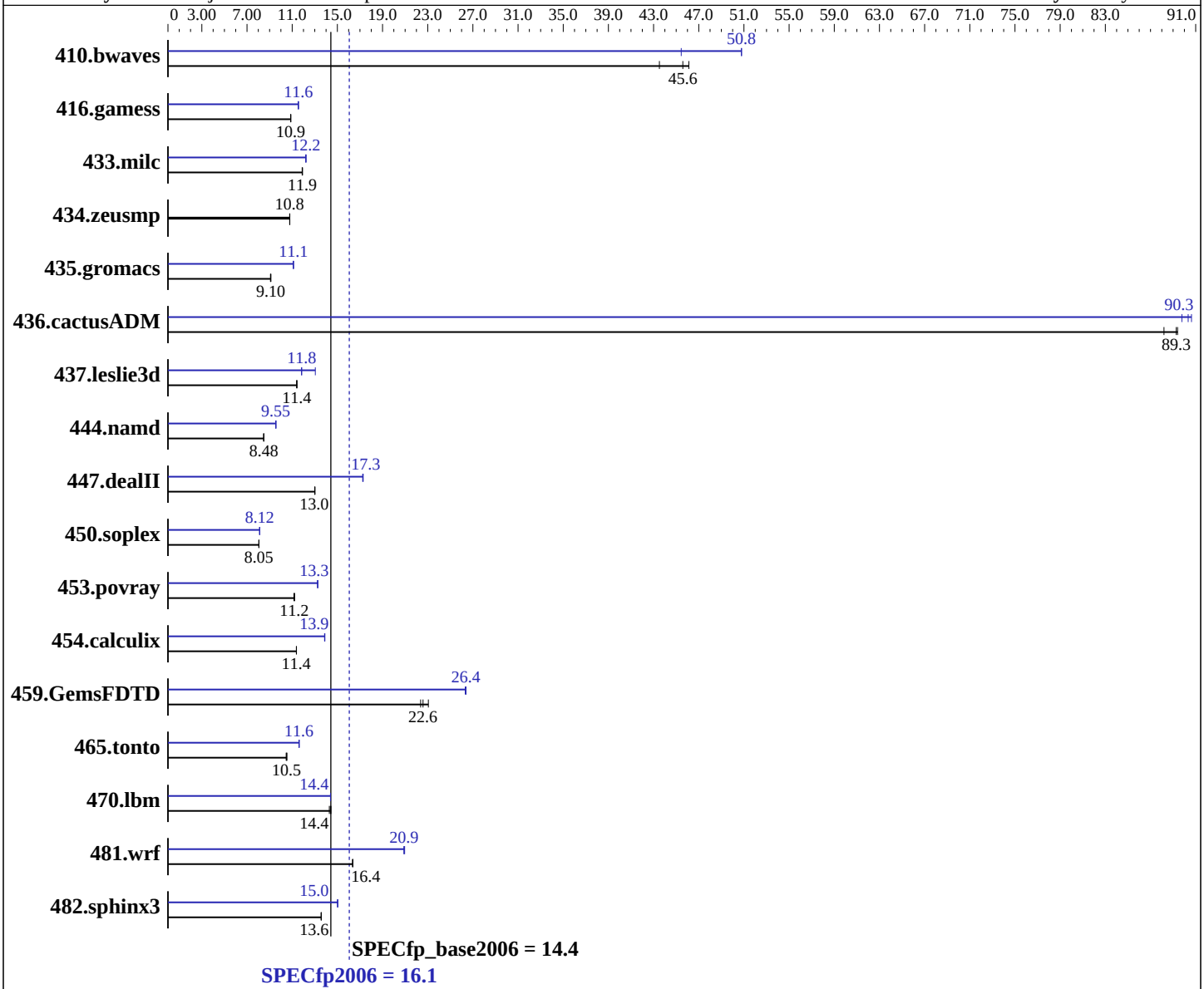
CELSIUS V840, AMD Opteron 2346 HE (1.8 GHz)

SPECfp®2006 = 16.1

SPECfp_base2006 = 14.4

**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: | Yes |
| 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 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 295 | 46.1 | 312 | 43.5 | **298** | **45.6** | 268 | 50.8 | 299 | 45.4 | **268** | **50.8** |
| 416.gamess | 1800 | 10.9 | 1802 | 10.9 | **1802** | **10.9** | 1698 | 11.5 | 1694 | 11.6 | **1695** | **11.6** |
| 433.milc | 773 | 11.9 | 770 | 11.9 | **772** | **11.9** | **751** | **12.2** | 752 | 12.2 | 751 | 12.2 |
| 434.zeusmp | 844 | 10.8 | 843 | 10.8 | **844** | **10.8** | 844 | 10.8 | 843 | 10.8 | **844** | **10.8** |
| 435.gromacs | 787 | 9.08 | **784** | **9.10** | 784 | 9.11 | **643** | **11.1** | 644 | 11.1 | 642 | 11.1 |
| 436.cactusADM | 134 | 89.4 | 135 | 88.2 | **134** | **89.3** | 132 | 90.6 | **132** | **90.3** | 133 | 89.8 |
| 437.leslie3d | 823 | 11.4 | **824** | **11.4** | 825 | 11.4 | 795 | 11.8 | **794** | **11.8** | 720 | 13.0 |
| 444.namd | **945** | **8.48** | 944 | 8.49 | 947 | 8.47 | 840 | 9.55 | 839 | 9.56 | **840** | **9.55** |
| 447.dealII | 879 | 13.0 | **880** | **13.0** | 880 | 13.0 | 663 | 17.2 | 662 | 17.3 | **663** | **17.3** |
| 450.soplex | 1035 | 8.06 | 1036 | 8.05 | **1036** | **8.05** | 1026 | 8.13 | 1028 | 8.12 | **1027** | **8.12** |
| 453.povray | **475** | **11.2** | 474 | 11.2 | 477 | 11.2 | 401 | 13.3 | 402 | 13.2 | **401** | **13.3** |
| 454.calculix | 726 | 11.4 | **725** | **11.4** | 725 | 11.4 | 595 | 13.9 | 594 | 13.9 | **595** | **13.9** |
| 459.GemsFDTD | 474 | 22.4 | 460 | 23.1 | **470** | **22.6** | 403 | 26.3 | **402** | **26.4** | 402 | 26.4 |
| 465.tonto | **936** | **10.5** | 940 | 10.5 | 935 | 10.5 | 846 | 11.6 | 848 | 11.6 | **848** | **11.6** |
| 470.lbm | **955** | **14.4** | 952 | 14.4 | 962 | 14.3 | 954 | 14.4 | 955 | 14.4 | **955** | **14.4** |
| 481.wrf | 683 | 16.3 | **683** | **16.4** | 682 | 16.4 | 533 | 21.0 | 535 | 20.9 | **534** | **20.9** |
| 482.sphinx3 | 1436 | 13.6 | **1436** | **13.6** | 1437 | 13.6 | **1297** | **15.0** | 1296 | 15.0 | 1298 | 15.0 |

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

```
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:896 -Mconcur -Mfprelaxed -Mipa=jobs:4
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi

C++ benchmarks:
-fastsse -Msmartalloc=huge:896 -Mfprelaxed -Mconcur --zc_eh
-Mipa=jobs:4 -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi

Fortran benchmarks:
-fastsse -Mfprelaxed -Msmartalloc=huge:896 -Mconcur -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:896 -Mconcur -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):
`pgf95`

459.GemsFDTD: `pathf95`

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`
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=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 -apo

482.sphinx3: -Mpfi(pass 1) -Mpfo(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:896 -Mnodepchk
-Mfprelaxed --zc_eh -tp barcelona-64 -Bstatic_pgi

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

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 -apo

453.povray: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -apo

Fortran benchmarks:

410.bwaves: -fastsse -Msmartalloc -Mprefetch=distance:12 -Mprefetch=nta
-Mconcur -Mloop32 -Mpre -Mfprelaxed -Mipa=jobs:4
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi

416.gamess: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=jobs:4(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=jobs:4(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

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# Peak Optimization Flags (Continued)

459.GemsFDTD: `-march=barcelona -Ofast -LNO:fission=2 -LNO:simd=2 -LNO:prefetch_ahead=1 -CG:load_exe=0 -apo`

465.tonto: `-fastsse -O4 -Mvect=noaltcode -Msmartalloc=huge:896 -Mprefetch=distance:8 -Mprefetch=t0 -Mfprelaxed -Mipa=jobs:4 -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=jobs:4 -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi`

436.cactusADM: `-fastsse -Msmartalloc=huge:896 -Mfprelaxed -Mconcur -Mdse -Mipa=jobs:4 -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi`

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: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`

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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