SPEC® CFP2006 Result

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Fujitsu Siemens Computers

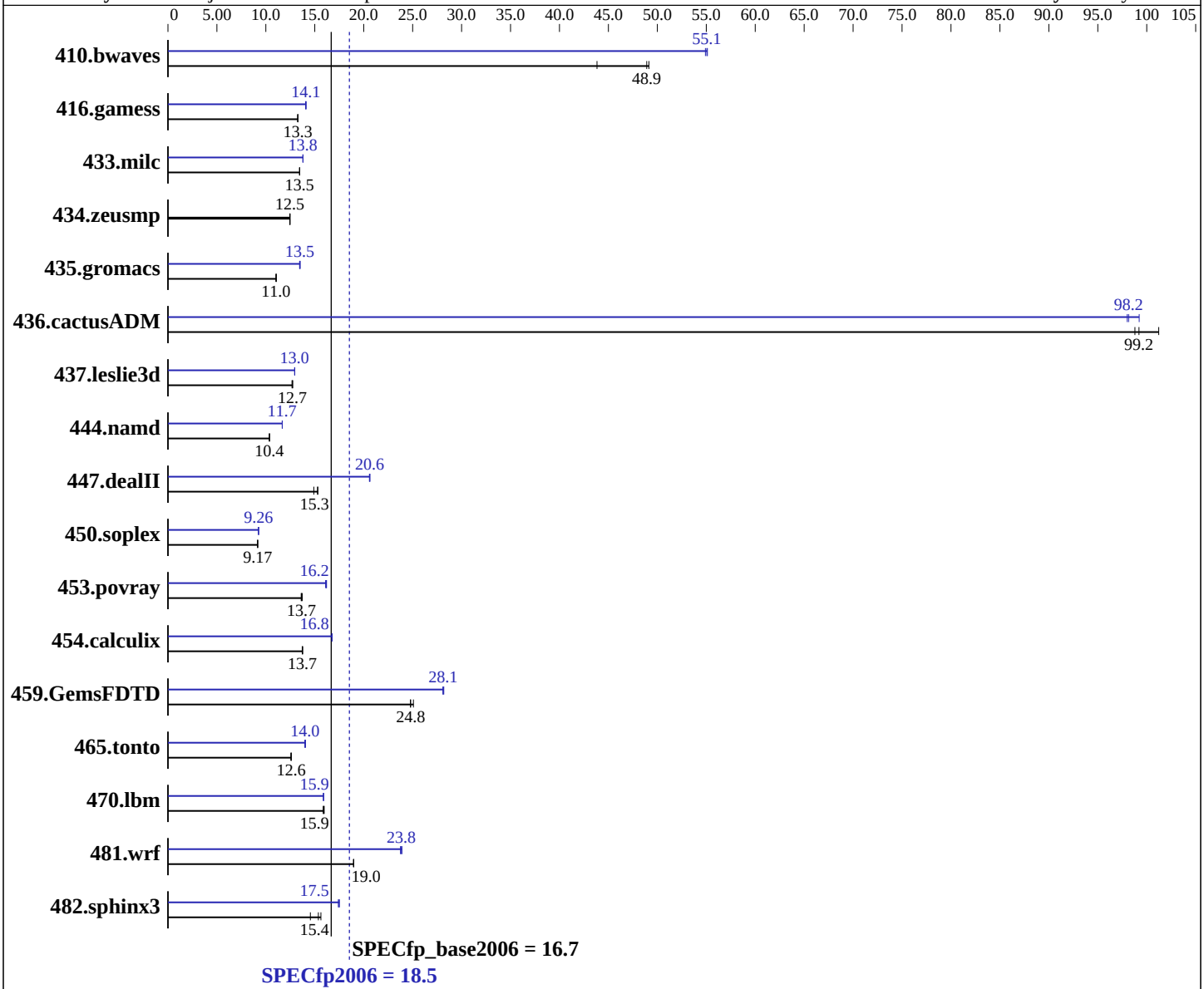
CELSIUS V840, AMD Opteron 2354 (2.2 GHz)

SPECfp®2006 = 18.5

SPECfp_base2006 = 16.7

CPU2006 license: 22
Test sponsor: Fujitsu Siemens Computers
Tested by: Fujitsu Siemens Computers

Test date: May-2008
Hardware Availability: May-2008
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:	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	277	49.1	310	43.8	**278**	**48.9**	**247**	**55.1**	247	55.1	247	54.9
416.gamess	1478	13.2	**1475**	**13.3**	1473	13.3	1388	14.1	**1388**	**14.1**	1393	14.1
433.milc	**682**	**13.5**	683	13.4	682	13.5	**665**	**13.8**	665	13.8	666	13.8
434.zeusmp	730	12.5	731	12.4	**730**	**12.5**	730	12.5	731	12.4	**730**	**12.5**
435.gromacs	647	11.0	**647**	**11.0**	644	11.1	531	13.4	**530**	**13.5**	528	13.5
436.cactusADM	118	101	121	98.8	**120**	**99.2**	122	98.0	**122**	**98.2**	120	99.2
437.leslie3d	**739**	**12.7**	738	12.7	742	12.7	726	12.9	725	13.0	**726**	**13.0**
444.namd	**773**	**10.4**	773	10.4	774	10.4	687	11.7	686	11.7	**687**	**11.7**
447.dealII	**749**	**15.3**	768	14.9	747	15.3	**555**	**20.6**	556	20.6	554	20.6
450.soplex	911	9.15	**910**	**9.17**	910	9.17	**901**	**9.26**	901	9.26	902	9.25
453.povray	391	13.6	388	13.7	**390**	**13.7**	330	16.1	328	16.2	**329**	**16.2**
454.calculix	599	13.8	**600**	**13.7**	601	13.7	492	16.8	**492**	**16.8**	492	16.8
459.GemsFDTD	**428**	**24.8**	423	25.1	428	24.8	378	28.1	**377**	**28.1**	376	28.2
465.tonto	**782**	**12.6**	784	12.6	780	12.6	**703**	**14.0**	700	14.1	703	14.0
470.lbm	**863**	**15.9**	861	16.0	866	15.9	864	15.9	865	15.9	**865**	**15.9**
481.wrf	589	19.0	588	19.0	**589**	**19.0**	470	23.8	467	23.9	**468**	**23.8**
482.sphinx3	1247	15.6	1340	14.6	**1268**	**15.4**	1113	17.5	1120	17.4	**1115**	**17.5**

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

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

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