SPEC® CFP2006 Result

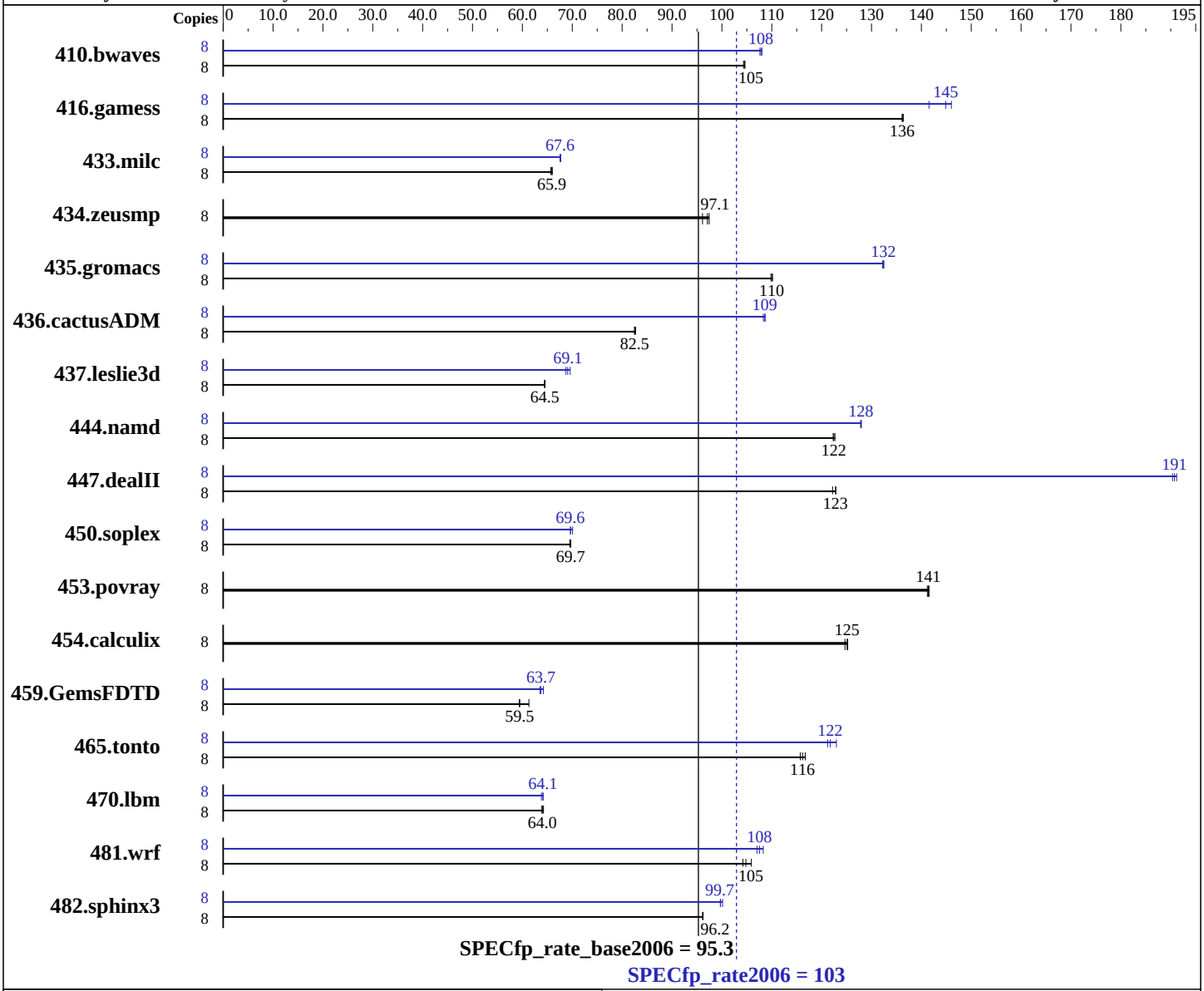
Sun Microsystems
Sun Fire X4440

SPECfp®_rate2006 = 103

SPECfp_rate_base2006 = 95.3

CPU2006 license: 6
Test sponsor: Sun Microsystems
Tested by: Sun Microsystems

Test date: Feb-2008
Hardware Availability: Apr-2008
Software Availability: Dec-2007



Hardware

CPU Name:	AMD Opteron 8224
CPU Characteristics:	
CPU MHz:	3200
FPU:	Integrated
CPU(s) enabled:	8 cores, 4 chips, 2 cores/chip
CPU(s) orderable:	2,4 (order by number of chips)
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core

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Software

Operating System:	SuSE Linux Enterprise Server 10 SP1 64-bit kernel

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L3 Cache: None
Other Cache: None
Memory: 64 GB (16x4GB, DDR2-667 CL5 Reg Dual Rank)
Disk Subsystem: SAS, 72 GB,10 K RPM
Other Hardware: None

Compiler: The Portland Group (PGI)
PGI pgf90 7.1-0 Fortran Compiler
PGI pgcc 7.1-0 C Compiler
PGI pgCC 7.1-0 C++ Compiler
The PathScale Compiler v3.0
PathScale pathf95 3.0 Fortran Compiler
PathScale pathcc 3.0 C Compiler
PathScale pathCC 3.0 C++ Compiler
Auto Parallel: No
File System: ReiserFS
System State: Multi-user, run level 3
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	8	**1040**	**105**	1039	105	1042	104	8	1006	108	1010	108	**1008**	**108**
416.gamess	8	1150	136	**1150**	**136**	1149	136	8	**1081**	**145**	1107	142	1073	146
433.milc	8	1118	65.7	**1114**	**65.9**	1113	66.0	8	1087	67.6	**1087**	**67.6**	1085	67.7
434.zeusmp	8	757	96.1	747	97.5	**750**	**97.1**	8	757	96.1	747	97.5	**750**	**97.1**
435.gromacs	8	519	110	520	110	**519**	**110**	8	432	132	**432**	**132**	431	132
436.cactusADM	8	**1158**	**82.5**	1159	82.5	1156	82.7	8	880	109	883	108	**880**	**109**
437.leslie3d	8	**1166**	**64.5**	1167	64.4	1165	64.5	8	1081	69.6	1094	68.7	**1088**	**69.1**
444.namd	8	**524**	**122**	525	122	523	123	8	501	128	**502**	**128**	502	128
447.dealII	8	745	123	749	122	**745**	**123**	8	479	191	**480**	**191**	481	190
450.soplex	8	960	69.5	957	69.7	**958**	**69.7**	8	952	70.1	**958**	**69.6**	958	69.6
453.povray	8	301	142	301	141	**301**	**141**	8	301	142	301	141	**301**	**141**
454.calculix	8	**528**	**125**	527	125	529	125	8	**528**	**125**	527	125	529	125
459.GemsFDTD	8	**1427**	**59.5**	1384	61.3	1430	59.4	8	1322	64.2	1336	63.5	**1332**	**63.7**
465.tonto	8	**678**	**116**	675	117	680	116	8	640	123	**647**	**122**	649	121
470.lbm	8	1711	64.2	1720	63.9	**1717**	**64.0**	8	1722	63.8	**1714**	**64.1**	1713	64.2
481.wrf	8	857	104	**853**	**105**	844	106	8	825	108	**831**	**108**	835	107
482.sphinx3	8	1620	96.2	1622	96.1	**1621**	**96.2**	8	1557	100	**1563**	**99.7**	1564	99.7

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

Operating System Notes

```
'ulimit -s unlimited' used to set environment stack size
'ulimit -l 2457600' was used to set environment lock pages quantity
'numactl' was used to bind copies to the cores
Set vm/nr_hugepages=2400 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
```

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Operating System Notes (Continued)

Environment variable PGI_HUGE_PAGES set to 150

Platform Notes

Default BIOS settings were used.

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:
-fast -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:448
-tp k8-64 -Bstatic_pgi

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Base Optimization Flags (Continued)

C++ benchmarks:
`-fast -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:448 --zc_eh -tp k8-64 -Bstatic_pgi`

Fortran benchmarks:
`-fast -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:448 -tp k8-64 -Bstatic_pgi`

Benchmarks using both Fortran and C:
`-fast -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:448 -tp k8-64 -Bstatic_pgi`

Base Other Flags

C benchmarks:
`-w`

C++ benchmarks:
`-w`

Fortran benchmarks:
`-w`

Benchmarks using both Fortran and C:
`-w`

Peak Compiler Invocation

C benchmarks (except as noted below):
`pathcc`

433.milc: `pgcc`

C++ benchmarks (except as noted below):
`pathCC`

444.namd: `pgcpp`

453.povray: `pgcpp`

Fortran benchmarks (except as noted below):
`pathf95`

434.zeusmp: `pgf95`

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Peak Compiler Invocation (Continued)

465.tonto: 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
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

433.milc: -Mpfi(pass 1) -Mipa=fast(pass 2) -Mipa=inline(pass 2)
-Mipa=noarg(pass 2) -Mpfo(pass 2) -fast -O4 -Mdse
-Mfprelaxed -Msmartalloc=huge:448 -tp k8-64 -Bstatic_pgi

470.lbm: -Ofast

482.sphinx3: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -O3
-OPT:Ofast -WOPT:aggstr=0 -m32

C++ benchmarks:

444.namd: -fast -O4 -Mfprelaxed -Msmartalloc=huge:448 --zc_eh
-tp k8-64 -Mnodepchk -Mprefetch -Msafe_lastval
-Msafeptr=static -Mstride0 -Munroll=n:4 -Mvect=noidiom
-Mvect=prefetch -Bstatic_pgi

447.dealII: -Ofast -INLINE:aggressive=on -OPT:malloc_alg=1 -m32
-fno-exceptions

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Peak Optimization Flags (Continued)

450.soplex: `-fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -m32 -O3 -OPT:IEEE_arith=3 -CG:load_exe=0 -CG:movnti=1 -LNO:minvariant=off -LNO:prefetch=1 -fno-exceptions`

453.povray: `basepeak = yes`

Fortran benchmarks:

410.bwaves: `-fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -O3 -OPT:Ofast -OPT:IEEE_arith=3 -LNO:blocking=off -LNO:ignore_feedback=off`

416.gamess: `-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: `-Ofast -OPT:malloc_alg=1`

459.GemsFDTD: `-Ofast -LNO:fission=2 -LNO:prefetch=0`

465.tonto: `-fast -O4 -Mfprelaxed -Msmartalloc=huge:448 -Mipa=fast -Mipa=inline -Mvect=noaltcode -tp k8-64 -Bstatic_pgi`

Benchmarks using both Fortran and C:

435.gromacs: `-fast -Mfpapprox=rsqrt -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:448 -tp k8-64 -Bstatic_pgi`

436.cactusADM: `-fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -O3 -LNO:prefetch=3 -LNO:prefetch_ahead=5 -LNO:ou_prod_max=10 -LNO:full_unroll=5 -ipa`

454.calculix: `basepeak = yes`

481.wrf: `-fast -Mfprelaxed -Msmartalloc=huge:448 -Mvect=noaltcode -tp k8-64 -Bstatic_pgi`

Peak Other Flags

C benchmarks:

433.milc: `-w`

C++ benchmarks (except as noted below):
`-w`

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Peak Other Flags (Continued)

447.dealII: `-static`

450.soplex: `No flags used`

Fortran benchmarks:

434.zeusmp: `-w`

465.tonto: `-w`

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

436.cactusADM: `No flags used`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/amd814GH-flags.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/amd814GH-flags.xml`

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.0.
Report generated on Tue Jul 22 17:36:21 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 11 June 2008.