SPEC® CFP2006 Result

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Dell Inc.

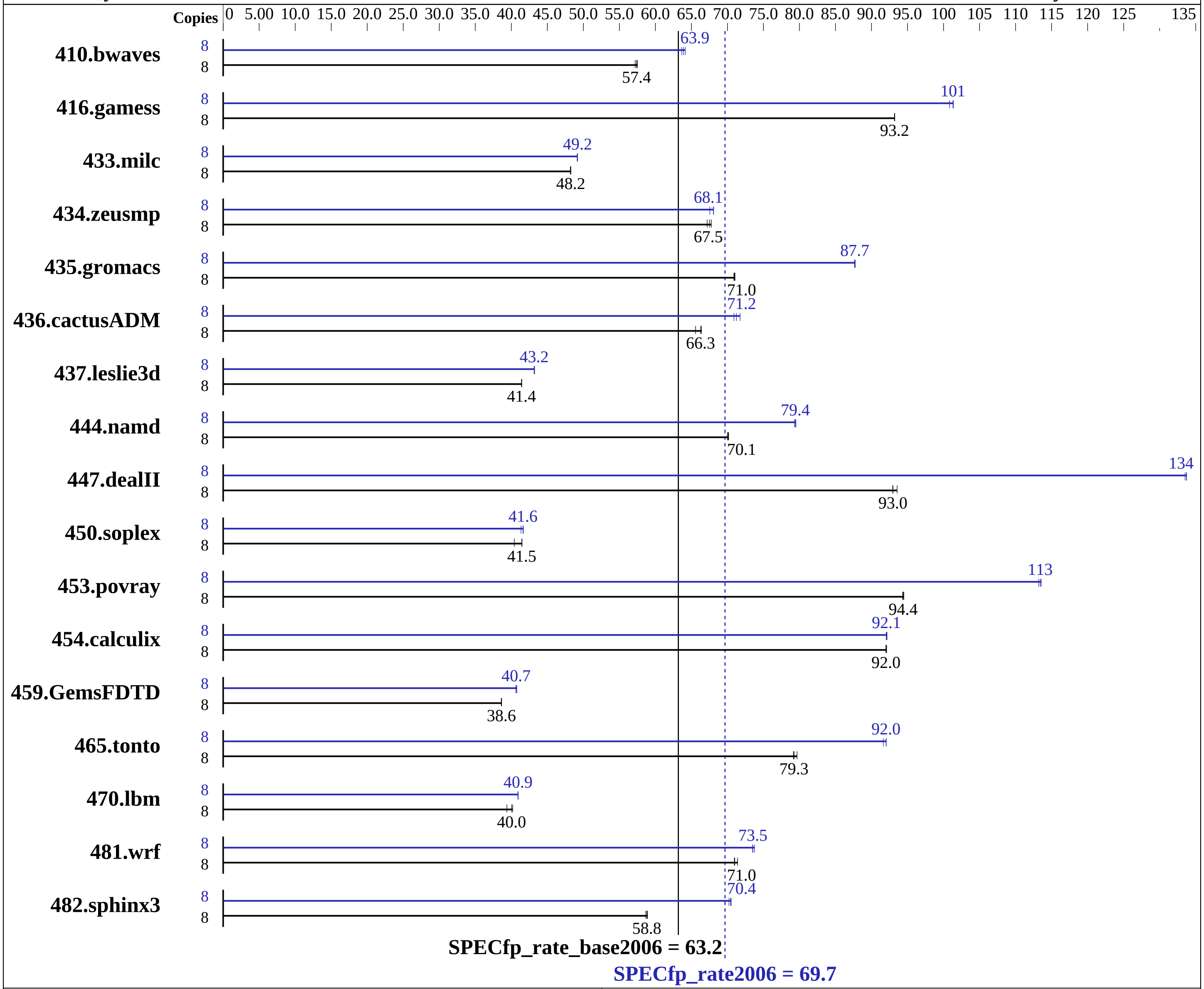
PowerEdge SC1435 (AMD Opteron 2347 HE, 1.9 GHz)

SPECfp®_rate2006 = 69.7

SPECfp_rate_base2006 = 63.2

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

Test date: Jun-2008
Hardware Availability: Jun-2008
Software Availability: Jun-2008



Hardware

CPU Name:	AMD Opteron 2347 HE
CPU Characteristics:	
CPU MHz:	1900
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 Version 3.1
Auto Parallel:	No
File System:	ReiserFS
System State:	Run level 3 (multi-user)
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 (8 x 2GB, DDR2-667 CL5)
Disk Subsystem: 1 x 73GB SAS, 10000 RPM
Other Hardware: None

Other Software: None

Results Table

	Base							Peak						
Benchmark	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	8	1901	57.2	1891	57.5	**1894**	**57.4**	8	1695	64.1	**1702**	**63.9**	1708	63.7
416.gamess	8	1681	93.2	1680	93.2	**1680**	**93.2**	8	1545	101	1554	101	**1546**	**101**
433.milc	8	1524	48.2	**1522**	**48.2**	1522	48.3	8	**1493**	**49.2**	1493	49.2	1495	49.1
434.zeusmp	8	1084	67.2	1074	67.8	**1078**	**67.5**	8	1078	67.6	**1070**	**68.1**	1069	68.1
435.gromacs	8	**805**	**71.0**	804	71.1	806	70.9	8	**651**	**87.7**	651	87.7	652	87.6
436.cactusADM	8	**1442**	**66.3**	1440	66.4	1458	65.6	8	1348	70.9	**1342**	**71.2**	1332	71.8
437.leslie3d	8	1814	41.5	**1815**	**41.4**	1816	41.4	8	1739	43.2	**1742**	**43.2**	1742	43.2
444.namd	8	917	70.0	914	70.2	**915**	**70.1**	8	**808**	**79.4**	809	79.3	807	79.5
447.dealII	8	985	92.9	978	93.6	**984**	**93.0**	8	**684**	**134**	684	134	685	134
450.soplex	8	1651	40.4	1608	41.5	**1609**	**41.5**	8	1614	41.3	**1603**	**41.6**	1601	41.7
453.povray	8	**451**	**94.4**	451	94.3	450	94.5	8	376	113	375	114	**375**	**113**
454.calculix	8	717	92.0	717	92.1	**717**	**92.0**	8	716	92.2	**717**	**92.1**	717	92.0
459.GemsFDTD	8	2199	38.6	**2197**	**38.6**	2196	38.7	8	2082	40.8	2088	40.6	**2087**	**40.7**
465.tonto	8	988	79.7	994	79.2	**993**	**79.3**	8	**855**	**92.0**	855	92.1	859	91.7
470.lbm	8	2791	39.4	2735	40.2	**2745**	**40.0**	8	2684	41.0	**2685**	**40.9**	2685	40.9
481.wrf	8	**1258**	**71.0**	1251	71.4	1259	71.0	8	1216	73.5	**1215**	**73.5**	1211	73.8
482.sphinx3	8	2657	58.7	2647	58.9	**2651**	**58.8**	8	2221	70.2	2211	70.5	**2214**	**70.4**

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

Operating System Notes

```
'numactl' was used to bind copies to the cores
Environment variable PGI_HUGE_PAGES set to 150
'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 2097152'  was used to set environment locked pages in memory limit
mount -t hugetlbfs nodev /mnt/hugepages
Set vm/nr_hugepages=1200 in /etc/sysctl.conf
```

Base Compiler Invocation

C benchmarks:
`pgcc`

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Base Compiler Invocation (Continued)

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:150
    -tp barcelona-64 -Bstatic_pgi

C++ benchmarks:
    -fast -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:150
    --zc_eh -tp barcelona-64 -Bstatic_pgi

Fortran benchmarks:
    -fast -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:150
    -tp barcelona-64 -Bstatic_pgi

Benchmarks using both Fortran and C:
    -fast -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:150
    -tp barcelona-64 -Bstatic_pgi

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Base Other Flags

C benchmarks:
`-w -Mipa=jobs:4`

C++ benchmarks:
`-w -Mipa=jobs:4`

Fortran benchmarks:
`-w -Mipa=jobs:4`

Benchmarks using both Fortran and C:
`-w -Mipa=jobs:4`

Peak Compiler Invocation

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

433.milc: `pgcc`

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

444.namd: `pgcpp`

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

410.bwaves: `pgf95`

434.zeusmp: `pgf95`

Benchmarks using both Fortran and C (except as noted below):
`pgcc pgf95`

436.cactusADM: `pathcc pathf95`

481.wrf: `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`

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Peak Portability Flags (Continued)

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_LINUX -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

Peak Optimization Flags

C benchmarks:

433.milc: -fastsse -Msmartalloc=huge:150 -Msafeptr -Mfprelaxed -Mipa=inline -Mipa=arg -Mipa=const -Mipa=ptr -Mipa=shape -tp barcelona-64 -Bstatic_pgi

470.lbm: -march=barcelona -Ofast -m3dnow

482.sphinx3: -march=barcelona -Ofast

C++ benchmarks:

444.namd: -Mpfi(pass 1) -Mipa=fast(pass 2) -Mipa=inline(pass 2) -Mpfo(pass 2) -fast -Mfprelaxed -Msmartalloc=huge:150 --zc_eh -Mnodepchk -Munroll=n:4 -Munroll=m:8 -tp barcelona-64 -Bstatic_pgi

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

450.soplex: -march=barcelona -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -m32 -O3 -TENV:frame_pointer=off -LNO:prefetch=1

453.povray: -march=barcelona -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast -CG:load_exe=0

Fortran benchmarks:

410.bwaves: -Mpfi(pass 1) -Mipa=fast(pass 2) -Mipa=inline(pass 2) -Mpfo(pass 2) -fastsse -Mfprelaxed -Msmartalloc -Mprefetch=distance:12 -Mprefetch=nta -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: -fastsse -Mfprelaxed -Msmartalloc=huge:150 -Mipa=fast
-Mipa=inline -tp barcelona-64 -Bstatic_pgi

437.leslie3d: -march=barcelona -Ofast -m3dnow -OPT:unroll_size=256
-CG:load_exe=0 -OPT:malloc_alg=1

459.GemsFDTD: -march=barcelona -Ofast -LNO:fission=2 -LNO:simd=2
-OPT:malloc_alg=1

465.tonto: -march=barcelona -Ofast -OPT:malloc_alg=1
-OPT:alias=no_f90_pointer_alias -LNO:blocking=off
-CG:load_exe=1 -IPA:plimit=525

Benchmarks using both Fortran and C:

435.gromacs: -fast -Mfpapprox=rsqrt -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

436.cactusADM: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -WOPT:aggstr=0

454.calculix: -fastsse -Mfprelaxed -Msmartalloc=huge:150 -Mipa=fast
-Mipa=inline -tp barcelona-64 -Bstatic_pgi

481.wrf: -march=barcelona -Ofast -LNO:blocking=off
-LNO:prefetch_ahead=10 -OPT:malloc_alg=1 -m3dnow
-LANG:copyinout=off -IPA:callee_limit=5000

Peak Other Flags

C benchmarks:

433.milc: -w -Mipa=jobs:4

C++ benchmarks:

444.namd: -w -Mipa=jobs:4(pass 2)

Fortran benchmarks:

410.bwaves: -w -Mipa=jobs:4(pass 2)

434.zeusmp: -w -Mipa=jobs:4

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Peak Other Flags (Continued)

Benchmarks using both Fortran and C:

435.gromacs: `-w -Mipa=jobs:4`

454.calculix: `-w -Mipa=jobs:4`

The flags file that was used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/amd421GH-flags.20090713.01.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/amd421GH-flags.20090713.01.xml

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