



SPEC[®] CFP2006 Result

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Dell Inc.

SPECfp[®]_rate2006 = 88.3

PowerEdge R805, AMD Opteron 2358 SE (2.40 GHz)

SPECfp_rate_base2006 = 80.7

CPU2006 license: 55

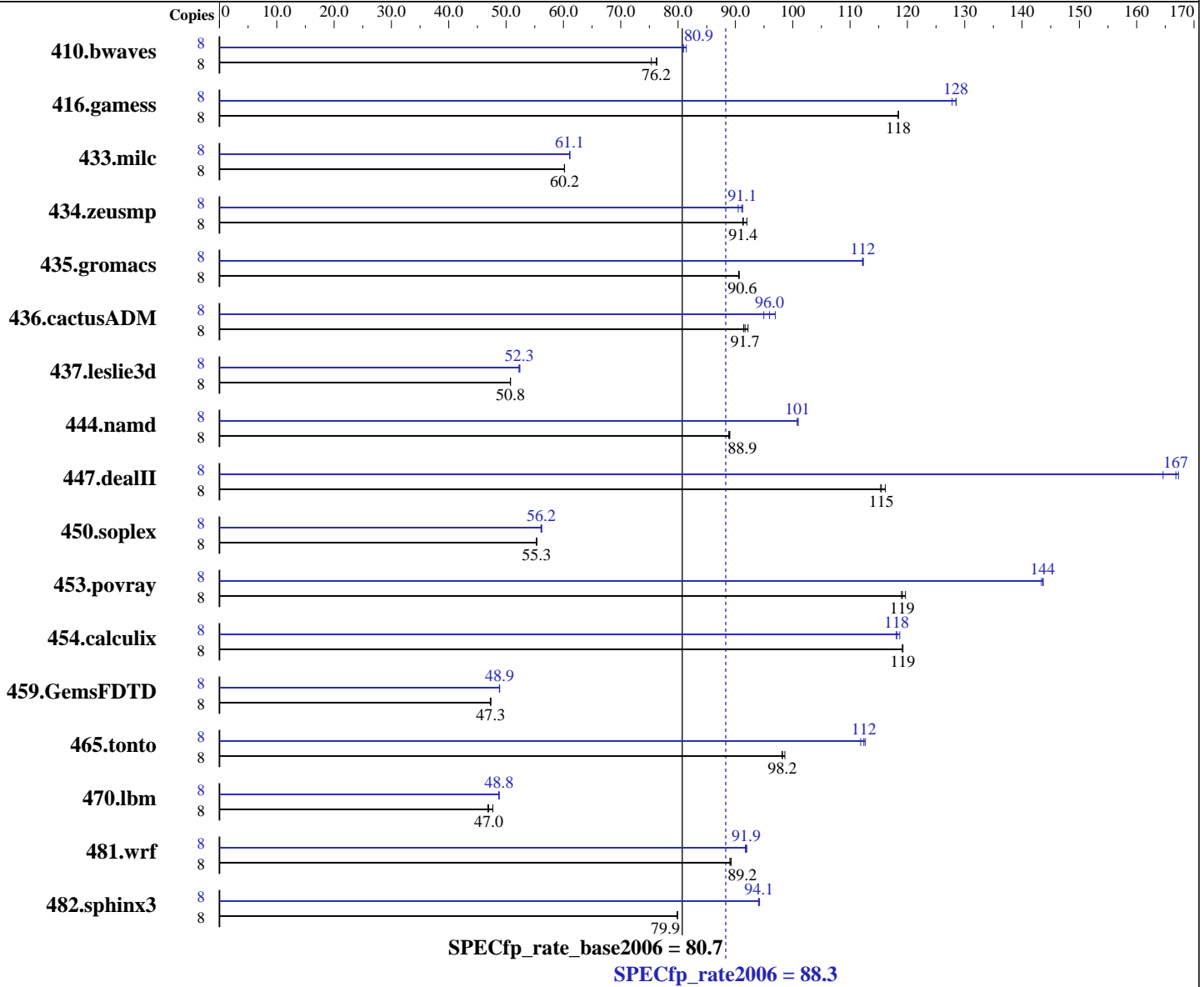
Test date: Apr-2008

Test sponsor: Dell Inc.

Hardware Availability: Jun-2008

Tested by: Dell Inc.

Software Availability: May-2008



Hardware

CPU Name: AMD Opteron 2358 SE
 CPU Characteristics:
 CPU MHz: 2400
 FPU: Integrated
 CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip
 CPU(s) orderable: 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 (8x2GB, DDR2-667, CL5, Reg. Dual Rank)
Disk Subsystem: 1x73GB SAS, 10000 RPM
Other Hardware: None

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	1443	75.3	1425	76.3	<u>1427</u>	<u>76.2</u>	8	<u>1343</u>	<u>80.9</u>	1335	81.4	1344	80.9
416.gamess	8	1323	118	1323	118	<u>1323</u>	<u>118</u>	8	1219	129	1225	128	<u>1219</u>	<u>128</u>
433.milc	8	1221	60.2	1220	60.2	<u>1220</u>	<u>60.2</u>	8	1202	61.1	1202	61.1	<u>1202</u>	<u>61.1</u>
434.zeusmp	8	797	91.3	<u>797</u>	<u>91.4</u>	791	92.0	8	804	90.5	<u>799</u>	<u>91.1</u>	797	91.3
435.gromacs	8	630	90.6	<u>630</u>	<u>90.6</u>	630	90.7	8	509	112	509	112	<u>509</u>	<u>112</u>
436.cactusADM	8	<u>1043</u>	<u>91.7</u>	1037	92.2	1045	91.5	8	1007	95.0	<u>996</u>	<u>96.0</u>	986	97.0
437.leslie3d	8	<u>1481</u>	<u>50.8</u>	1481	50.8	1482	50.7	8	1439	52.3	1435	52.4	<u>1437</u>	<u>52.3</u>
444.namd	8	<u>721</u>	<u>88.9</u>	722	88.8	721	89.0	8	635	101	636	101	<u>636</u>	<u>101</u>
447.dealII	8	793	115	<u>793</u>	<u>115</u>	788	116	8	556	165	547	167	<u>549</u>	<u>167</u>
450.soplex	8	<u>1206</u>	<u>55.3</u>	1206	55.3	1205	55.4	8	1190	56.1	1187	56.2	<u>1188</u>	<u>56.2</u>
453.povray	8	358	119	356	120	<u>357</u>	<u>119</u>	8	<u>296</u>	<u>144</u>	296	144	297	143
454.calculix	8	<u>554</u>	<u>119</u>	554	119	554	119	8	559	118	<u>559</u>	<u>118</u>	556	119
459.GemsFDTD	8	<u>1794</u>	<u>47.3</u>	1793	47.3	1797	47.2	8	<u>1737</u>	<u>48.9</u>	1736	48.9	1738	48.8
465.tonto	8	798	98.6	802	98.1	<u>802</u>	<u>98.2</u>	8	<u>700</u>	<u>112</u>	704	112	699	113
470.lbm	8	2304	47.7	2348	46.8	<u>2340</u>	<u>47.0</u>	8	2253	48.8	<u>2254</u>	<u>48.8</u>	2256	48.7
481.wrf	8	1004	89.0	1001	89.3	<u>1002</u>	<u>89.2</u>	8	974	91.7	<u>972</u>	<u>91.9</u>	971	92.0
482.sphinx3	8	1953	79.9	<u>1952</u>	<u>79.9</u>	1951	79.9	8	1658	94.0	<u>1657</u>	<u>94.1</u>	1655	94.2

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 2457600' was used to set environment locked pages in memory quantity
Set vm/nr_hugepages=1200 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
```

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=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

C++ benchmarks:

-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 --zc_eh -tp barcelona-64 -Bstatic_pgi

Fortran benchmarks:

-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

Benchmarks using both Fortran and C:

-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi



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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

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=jobs:4 -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: -Mphi(pass 1) -Mipa=jobs:4(pass 2) -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.deallI: -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: -Mphi(pass 1) -Mipa=jobs:4(pass 2) -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=jobs:4
-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=jobs:4 -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=jobs:4
-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

C++ benchmarks:

444.namd: -w

Fortran benchmarks:

410.bwaves: -w

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Peak Other Flags (Continued)

434.zeusmp: -w

Benchmarks using both Fortran and C:

435.gromacs: -w

454.calculix: -w

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/amd123GH-flags.20090713.html>

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

<http://www.spec.org/cpu2006/flags/amd123GH-flags.20090713.xml>

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