



# SPEC® CFP2006 Result

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## Dell Inc.

### SPECfp®\_rate2006 = 89.9

### PowerEdge M805 (AMD Opteron 2360 SE, 2.5 GHz)

### SPECfp\_rate\_base2006 = 81.9

CPU2006 license: 55

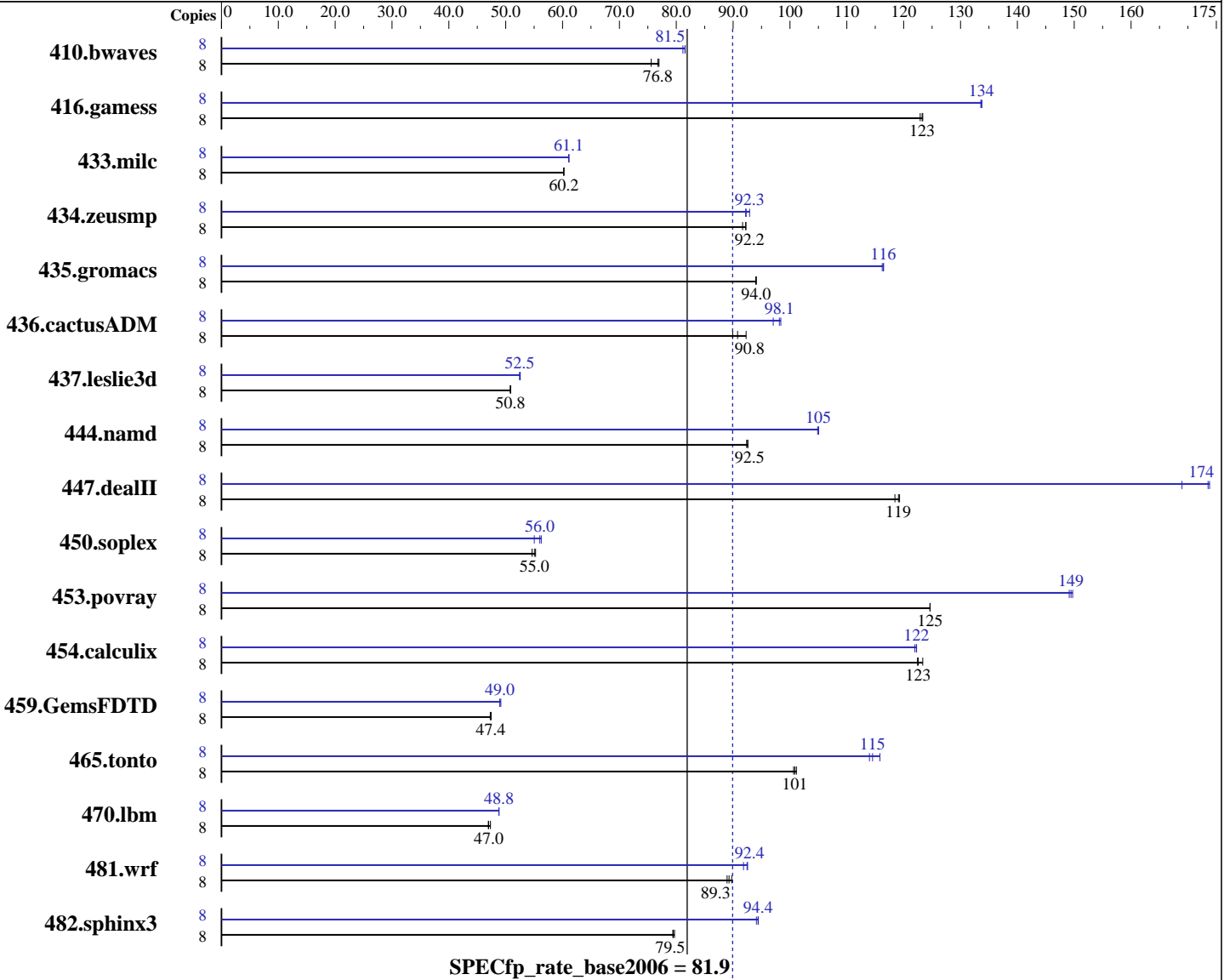
Test date: Jul-2008

Test sponsor: Dell Inc.

Hardware Availability: Aug-2008

Tested by: Dell Inc.

Software Availability: May-2008



#### Hardware

CPU Name: AMD Opteron 2360 SE  
 CPU Characteristics:  
 CPU MHz: 2500  
 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) SP2, Kernel 2.6.16-60.0.21-smp  
 Compiler: PGI Server Complete Version 7.2 PathScale Compiler Suite Version 3.1  
 Auto Parallel: No  
 File System: ext3  
 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 36GB SAS 15000 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	1438	75.6	<b>1416</b>	<b>76.8</b>	1413	77.0	8	1333	81.6	<b>1334</b>	<b>81.5</b>	1339	81.2
416.gamess	8	<b>1271</b>	<b>123</b>	1270	123	1274	123	8	1171	134	1173	134	<b>1172</b>	<b>134</b>
433.milc	8	1220	60.2	<b>1219</b>	<b>60.2</b>	1219	60.2	8	1202	61.1	1202	61.1	<b>1202</b>	<b>61.1</b>
434.zeusmp	8	789	92.3	<b>789</b>	<b>92.2</b>	794	91.7	8	784	92.9	790	92.2	<b>789</b>	<b>92.3</b>
435.gromacs	8	608	94.0	607	94.1	<b>607</b>	<b>94.0</b>	8	491	116	490	116	<b>491</b>	<b>116</b>
436.cactusADM	8	1036	92.3	1063	89.9	<b>1053</b>	<b>90.8</b>	8	985	97.1	972	98.4	<b>974</b>	<b>98.1</b>
437.leslie3d	8	1480	50.8	<b>1480</b>	<b>50.8</b>	1479	50.9	8	1431	52.6	1434	52.4	<b>1433</b>	<b>52.5</b>
444.namd	8	<b>693</b>	<b>92.5</b>	695	92.4	693	92.6	8	<b>611</b>	<b>105</b>	612	105	611	105
447.dealII	8	773	118	767	119	<b>769</b>	<b>119</b>	8	542	169	527	174	<b>527</b>	<b>174</b>
450.soplex	8	1221	54.6	<b>1212</b>	<b>55.0</b>	1207	55.3	8	1213	55.0	<b>1191</b>	<b>56.0</b>	1186	56.3
453.povray	8	341	125	<b>341</b>	<b>125</b>	341	125	8	285	149	<b>285</b>	<b>149</b>	284	150
454.calculix	8	539	122	<b>539</b>	<b>123</b>	535	123	8	541	122	<b>540</b>	<b>122</b>	540	122
459.GemsFDTD	8	1790	47.4	<b>1792</b>	<b>47.4</b>	1795	47.3	8	1734	48.9	1727	49.1	<b>1733</b>	<b>49.0</b>
465.tonto	8	<b>780</b>	<b>101</b>	778	101	782	101	8	680	116	<b>687</b>	<b>115</b>	691	114
470.lbm	8	2342	46.9	<b>2339</b>	<b>47.0</b>	2323	47.3	8	2251	48.8	2252	48.8	<b>2252</b>	<b>48.8</b>
481.wrf	8	1005	88.9	996	89.8	<b>1001</b>	<b>89.3</b>	8	973	91.8	966	92.6	<b>967</b>	<b>92.4</b>
482.sphinx3	8	1956	79.7	<b>1961</b>	<b>79.5</b>	1964	79.4	8	<b>1652</b>	<b>94.4</b>	1657	94.1	1651	94.4

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 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=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: -Mphi(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.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=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/amd123GH-flags.20090713.01.html>

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

<http://www.spec.org/cpu2006/flags/amd123GH-flags.20090713.01.xml>

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Tested with SPEC CPU2006 v1.0.  
Report generated on Tue Sep 13 11:38:02 2016 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 19 August 2008.