# SPEC® CFP2006 Result



## Dell Inc.

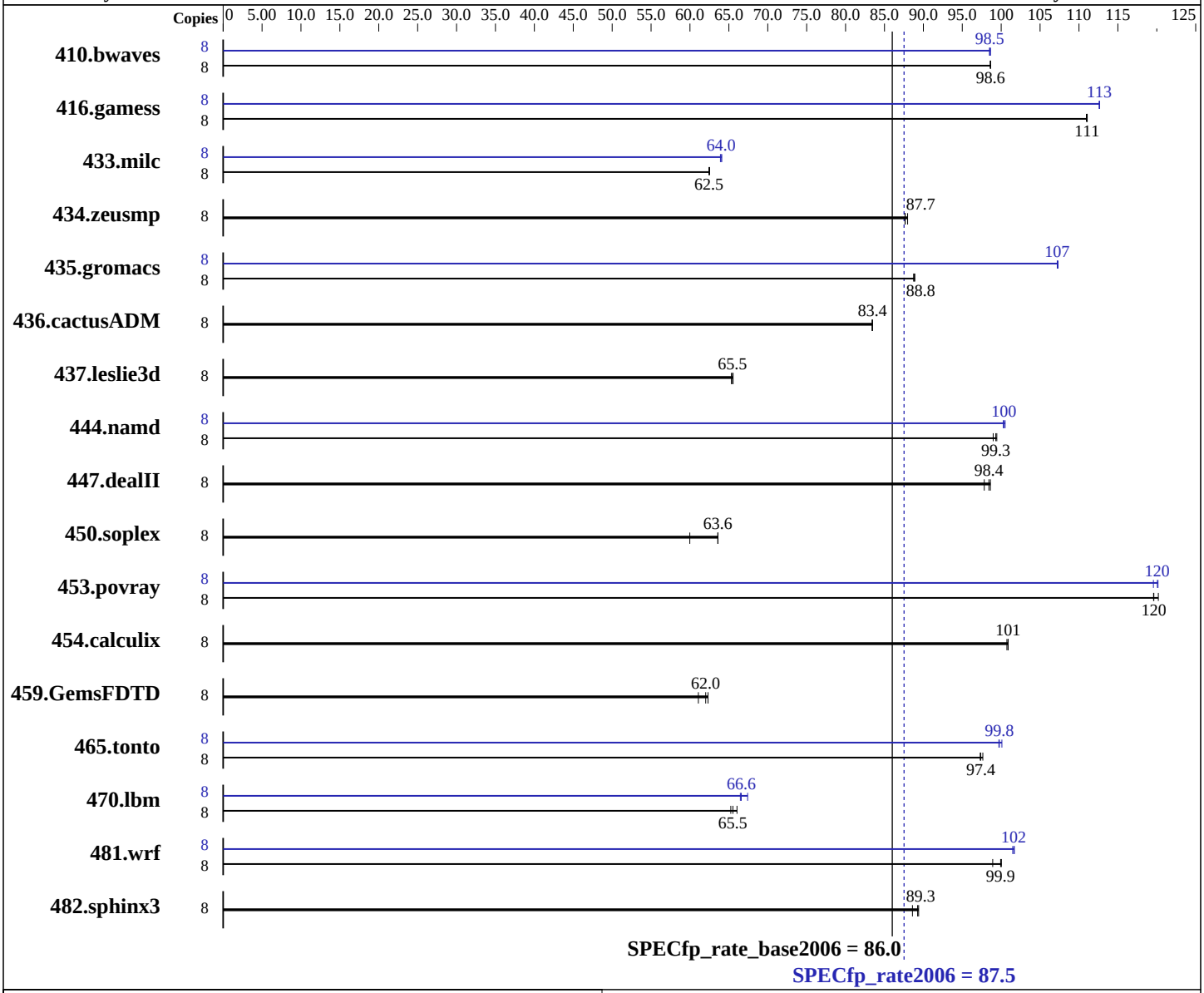
PowerEdge 6950 (AMD Opteron 8218, 2.60 GHz)

SPECfp®_rate2006 = 87.5

SPECfp_rate_base2006 = 86.0

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

**Test date:** Sep-2007
**Hardware Availability:** Dec-2006
**Software Availability:** Oct-2007




## Hardware

| | |
|---|---|
| CPU Name: | AMD Opteron 8218 |
| CPU Characteristics: | |
| CPU MHz: | 2666 |
| FPU: | Integrated |
| CPU(s) enabled: | 8 cores, 4 chips, 2 cores/chip |
| CPU(s) orderable: | 2,4 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: | 64-Bit SUSE LINUX Enterprise Server 10 SP1 |
| Compiler: | The Portland Group (PGI)<br>PGI pgf90 7.1-0 Fortran Compiler<br>PGI pgcc 7.1-0 C Compiler<br>PGI pgCC 7.1-0 C++ Compiler |
| Auto Parallel: | No |
| File System: | ReiserFS |
| System State: | Multi-user, run level 3 |

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L3 Cache: None
Other Cache: None
Memory: 32 GB (16x2GB, DDR2-667 CL5 ECC Dual Rank)
Disk Subsystem: 1 x 250 GB SATA 7200 RPM
Other Hardware: None

Base Pointers: 32/64-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 | 1103 | 98.6 | 1102 | 98.7 | **1102** | **98.6** | 8 | 1104 | 98.5 | 1102 | 98.6 | **1103** | **98.5** |
| 416.gamess | 8 | 1410 | 111 | 1412 | 111 | **1411** | **111** | 8 | 1391 | 113 | 1390 | 113 | **1391** | **113** |
| 433.milc | 8 | 1176 | 62.5 | 1174 | 62.5 | **1176** | **62.5** | 8 | 1146 | 64.1 | 1149 | 63.9 | **1148** | **64.0** |
| 434.zeusmp | 8 | **830** | **87.7** | 831 | 87.6 | 828 | 88.0 | 8 | **830** | **87.7** | 831 | 87.6 | 828 | 88.0 |
| 435.gromacs | 8 | 644 | 88.7 | **643** | **88.8** | 643 | 88.9 | 8 | 532 | 107 | 533 | 107 | **533** | **107** |
| 436.cactusADM | 8 | 1146 | 83.5 | 1146 | 83.4 | **1146** | **83.4** | 8 | 1146 | 83.5 | 1146 | 83.4 | **1146** | **83.4** |
| 437.leslie3d | 8 | 1147 | 65.5 | **1149** | **65.5** | 1151 | 65.3 | 8 | 1147 | 65.5 | **1149** | **65.5** | 1151 | 65.3 |
| 444.namd | 8 | 648 | 99.0 | 645 | 99.4 | **646** | **99.3** | 8 | 640 | 100 | **639** | **100** | 638 | 101 |
| 447.dealII | 8 | 936 | 97.8 | **930** | **98.4** | 928 | 98.6 | 8 | 936 | 97.8 | **930** | **98.4** | 928 | 98.6 |
| 450.soplex | 8 | 1112 | 60.0 | **1049** | **63.6** | 1049 | 63.6 | 8 | 1112 | 60.0 | **1049** | **63.6** | 1049 | 63.6 |
| 453.povray | 8 | 356 | 120 | 354 | 120 | **356** | **120** | 8 | **354** | **120** | 354 | 120 | 356 | 120 |
| 454.calculix | 8 | 655 | 101 | **654** | **101** | 654 | 101 | 8 | 655 | 101 | **654** | **101** | 654 | 101 |
| 459.GemsFDTD | 8 | **1369** | **62.0** | 1390 | 61.1 | 1362 | 62.3 | 8 | **1369** | **62.0** | 1390 | 61.1 | 1362 | 62.3 |
| 465.tonto | 8 | 809 | 97.3 | **808** | **97.4** | 806 | 97.6 | 8 | 790 | 99.7 | **789** | **99.8** | 786 | 100 |
| 470.lbm | 8 | 1685 | 65.2 | **1678** | **65.5** | 1664 | 66.0 | 8 | **1651** | **66.6** | 1631 | 67.4 | 1654 | 66.5 |
| 481.wrf | 8 | **894** | **99.9** | 903 | 98.9 | 893 | 100 | 8 | **879** | **102** | 879 | 102 | 881 | 101 |
| 482.sphinx3 | 8 | 1760 | 88.6 | 1744 | 89.4 | **1747** | **89.3** | 8 | 1760 | 88.6 | 1744 | 89.4 | **1747** | **89.3** |

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

## General Notes

```
'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 2457600' was used to set environment locked pages in memory quantity
'numactl' was used to bind one copy per core, and memory to a local NUMA node
Set vm/nr_hugepages=1200 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
Environment variable PGI_HUGE_PAGES set to 150
```

## 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:8
-tp k8-64 -Bstatic_pgi

C++ benchmarks:
-fast -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:8
--zc_eh -tp k8-64 -Bstatic_pgi

Fortran benchmarks:
-fast -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:8
-tp k8-64 -Bstatic_pgi

Benchmarks using both Fortran and C:
-fast -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:8
-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:
`pgcc`

C++ benchmarks:
`pgcpp`

Fortran benchmarks:
`pgf95`

Benchmarks using both Fortran and C:
`pgcc pgf95`

## Peak Portability Flags

`Same as Base Portability Flags`

## 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:8 -tp k8-64 -Bstatic_pgi`

470.lbm: `-fast -Mfprelaxed -Msmartalloc=huge:8 -Mipa=fast -Mipa=noarg -tp k8-64 -Bstatic_pgi`

482.sphinx3: `basepeak = yes`

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## Peak Optimization Flags (Continued)

C++ benchmarks:

444.namd: `-Mpfi`(pass 1) `-Mpfo`(pass 2) `-Mipa=fast`(pass 2) `-Mipa=inline`(pass 2) `-fast -O4 -Mfprelaxed -Msmartalloc=huge:32 --zc_eh -tp k8-64 -Bstatic_pgi`

447.dealII: `basepeak = yes`

450.soplex: `basepeak = yes`

453.povray: `-fast -Mfprelaxed -Msmartalloc=huge:32 -Mipa=fast -Mipa=inline --zc_eh -tp k8-64 -Bstatic_pgi`

Fortran benchmarks:

410.bwaves: `-fast -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc -tp k8-64 -Bstatic_pgi`

416.gamess: `-fast -Mipa=fast -Mipa=inline -Mfprelaxed -Mvect=noaltcode -Msmartalloc=huge:64 -tp k8-64 -Bstatic_pgi`

434.zeusmp: `basepeak = yes`

437.leslie3d: `basepeak = yes`

459.GemsFDTD: `basepeak = yes`

465.tonto: `-fast -Mfprelaxed -Msmartalloc=huge:128 -Mipa=fast -Mipa=inline -Mvect=noaltcode -tp k8-64 -Bstatic_pgi`

Benchmarks using both Fortran and C:

435.gromacs: `-fast -O4 -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:16 -tp k8-64 -Mfpapprox=rsqrt -Bstatic_pgi`

436.cactusADM: `basepeak = yes`

454.calculix: `basepeak = yes`

481.wrf: `-fast -Mfprelaxed -Msmartalloc=huge:32 -Mvect=noaltcode -tp k8-64 -Bstatic_pgi`

## Peak Other Flags

C benchmarks:

`-w`

Continued on next page

## Peak Other Flags (Continued)

C++ benchmarks:
-w

Fortran benchmarks:
-w

Benchmarks using both Fortran and C:
-w

The flags file that was used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/pgi710_flags.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/pgi710_flags.xml



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

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