**SPEC® CFP2006 Result**

**Dell Inc.**

**PowerEdge 6950 (AMD Opteron 8218, 2.60 GHz)**

<table>
<thead>
<tr>
<th>SPECfp®_rate2006</th>
<th>87.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_rate_base2006</td>
<td>86.0</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 55  
**Test date:** Sep-2007  
**Hardware Availability:** Dec-2006  
**Test sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**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

### Software

- **Operating System:** 64-Bit SUSE LINUX Enterprise Server 10 SP1  
- **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  
- **Auto Parallel:** No  
- **File System:** ReiserFS  
- **System State:** Multi-user, run level 3

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Continued on next page
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**Software Availability:** Oct-2007

| Memory: 32 GB (16x2GB, DDR2-667 CL5 ECC Dual Rank) | **Base Pointers:** 32/64-bit |
| L3 Cache: None | **Peak Pointers:** 32/64-bit |
| Other Cache: None | **Other Software:** None |
| Disk Subsystem: 1 x 250 GB SATA 7200 RPM |
| Other Hardware: None |

**SPECfp_rate2006** = 87.5  
**SPECfp_rate_base2006** = 86.0

### Results Table

<table>
<thead>
<tr>
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<td>89.3</td>
</tr>
</tbody>
</table>

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

### General Notes

'unlimit -s unlimited' was used to set environment stack size  
'unlimit -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/sysct1.conf  
mount -t hugetlbfs nodev /mnt/hugepages  
Environment variable PGI_HUGE_PAGES set to 150

### Base Compiler Invocation

C benchmarks:  
pgcc

Continued on next page
### Dell Inc.

**PowerEdge 6950 (AMD Opteron 8218, 2.60 GHz)**

**SPECfp_rate2006 =** 87.5  
**SPECfp_rate_base2006 =** 86.0

---

**Base Compiler Invocation (Continued)**

- **C++ benchmarks:**  
  - pgcpp

- **Fortran benchmarks:**  
  - pgf95

- **Benchmarks using both Fortran and C:**  
  - pgcc pgf95

---

**Base Portability Flags**

```plaintext
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 -Mnomain
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:**  
  ```plaintext
  -fast -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:8
  -tp k8-64 -Bstatic_pgi
  ```

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

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

- **Benchmarks using both Fortran and C:**  
  ```plaintext
  -fast -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:8
  -tp k8-64 -Bstatic_pgi
  ```
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Base Other Flags  

C benchmarks:  
-\( \neg w \)  

C++ benchmarks:  
-\( \neg w \)  

Fortran benchmarks:  
-\( \neg w \)  

Benchmarks using both Fortran and C:  
-\( \neg w \)  

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: -Mprelaxed -msmartalloc=huge:8 -Mipa=fast -Mipa=inline(pass 2) -Mipa=noarg(pass 2) -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
### Peak Optimization Flags (Continued)

#### C++ benchmarks:

444.namd:  
- -Mmpi(pass 1)  
- -Mmpf(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  
- -Mfapprox=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
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Software Availability: Oct-2007  

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  

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