### SPEC® CFP2006 Result

**Dell Inc.**

PowerEdge 2970 (AMD Opteron 2347 HE, 1.9 GHz)

**SPECfp®_rate2006 = 77.8**

**SPECfp_rate_base2006 = 71.0**

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
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<tbody>
<tr>
<td>CPU Name: AMD Opteron 2347 HE</td>
<td>Operating System: SUSE Linux Enterprise Server 10 (x86_64) SP1, Kernel 2.6.16.46-0.12-smp</td>
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<tr>
<td>CPU Characteristics:</td>
<td>Compiler: PGI Server Complete Version 7.2, PathScale Compiler Suite Version 3.1</td>
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<tr>
<td>CPU MHz: 1900</td>
<td>Auto Parallel: No</td>
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<tr>
<td>FPU: Integrated</td>
<td>File System: ReiserFS</td>
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<tr>
<td>CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip</td>
<td>System State: Run level 3 (multi-user)</td>
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<tr>
<td>CPU(s) orderable: 1.2 chips</td>
<td>Base Pointers: 64-bit</td>
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<tr>
<td>Primary Cache: 64 KB I + 64 KB D on chip per core</td>
<td>Peak Pointers: 32/64-bit</td>
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<tr>
<td>Secondary Cache: 512 KB I+D on chip per core</td>
<td></td>
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</tbody>
</table>

**Dell Inc.**

**CPU2006 license: 55**

**Test sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**Test date:** Jun-2008

**Hardware Availability:** Apr-2008

**Software Availability:** Jun-2008

| Copy | 5.00 | 10.00 | 15.00 | 20.00 | 25.00 | 30.00 | 35.00 | 40.00 | 45.00 | 50.00 | 55.00 | 60.00 | 65.00 | 70.00 | 75.00 | 80.00 | 85.00 | 90.00 | 95.00 | 100.00 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| 410.bwaves | 8 | 70.7 | 70.7 | 8 | | | | | | | | | | | | | | | | | |
| 416.gamess | 8 | 58.8 | 58.8 | 8 | | | | | | | | | | | | | | | | | |
| 433.milc | 8 | 57.8 | 57.8 | 8 | | | | | | | | | | | | | | | | | |
| 434.zeusmp | 8 | 79.2 | 79.2 | 8 | | | | | | | | | | | | | | | | | |
| 435.gromacs | 8 | 89.2 | 89.2 | 8 | | | | | | | | | | | | | | | | | |
| 436.cactusADM | 8 | 83.9 | 83.9 | 8 | | | | | | | | | | | | | | | | | |
| 437.leslie3d | 8 | 82.3 | 82.3 | 8 | | | | | | | | | | | | | | | | | |
| 444.namd | 8 | 79.7 | 79.7 | 8 | | | | | | | | | | | | | | | | | |
| 447.dealII | 8 | 96.7 | 96.7 | 8 | | | | | | | | | | | | | | | | | |
| 450.soplex | 8 | 50.9 | 50.9 | 8 | | | | | | | | | | | | | | | | | |
| 453.povray | 8 | 51.3 | 51.3 | 8 | | | | | | | | | | | | | | | | | |
| 454.calculix | 8 | 113 | 113 | 8 | | | | | | | | | | | | | | | | | |
| 459.GemsFDTD | 8 | 94.9 | 94.9 | 8 | | | | | | | | | | | | | | | | | |
| 465.tonto | 8 | 96.4 | 96.4 | 8 | | | | | | | | | | | | | | | | | |
| 470.lbm | 8 | 82.5 | 82.5 | 8 | | | | | | | | | | | | | | | | | |
| 481.wrf | 8 | 85.1 | 85.1 | 8 | | | | | | | | | | | | | | | | | |
| 482.sphinx3 | 8 | 73.6 | 73.6 | 8 | | | | | | | | | | | | | | | | | |

**Continued on next page**

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**info@spec.org**

**http://www.spec.org/**

Page 1
Dell Inc.  
PowerEdge 2970 (AMD Opteron 2347 HE, 1.9 GHz)  

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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
mount -t hugetlbfs nodev /mnt/hugepages
'ulimit -l 2097152' was used to set environment locked pages in memory limit
Set vm/nr_hugepages=1200 in /etc/sysctl.conf

Base Compiler Invocation

C benchmarks:
pgcc

Continued on next page
Dell Inc.

PowerEdge 2970 (AMD Opteron 2347 HE, 1.9 GHz)

SPECfp_rate2006 = 77.8
SPECfp_rate_base2006 = 71.0

CPU2006 license: 55
Test sponsor: Dell Inc.
Test date: Jun-2008
Tested by: Dell Inc.
Hardware Availability: Apr-2008
Software Availability: Jun-2008

### Base Compiler Invocation (Continued)

C++ benchmarks:
- pgcpp

Fortran benchmarks:
- pgf95

Benchmarks using both Fortran and C:
- pgcc pgf95

### Base Portability Flags

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
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<tbody>
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<td>410.bwaves</td>
<td>-DSPEC_CPU_LP64</td>
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<tr>
<td>416.gameess</td>
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<td>433.milc</td>
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<td>434.zeusmp</td>
<td>-DSPEC_CPU_LP64</td>
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<tr>
<td>435.gromacs</td>
<td>-DSPEC_CPU_LP64 -Mnomain</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>-DSPEC_CPU_LP64 -Mnomain</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>-DSPEC_CPU_LP64</td>
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<td>444.namd</td>
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<td>-DSPEC_CPU_LP64</td>
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### 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
```
Dell Inc.

PowerEdge 2970 (AMD Opteron 2347 HE, 1.9 GHz)

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CPU2006 license: 55
Test sponsor: Dell Inc.
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Tested by: Dell Inc.
Software Availability: Jun-2008

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`
### Peak Portability Flags (Continued)

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### Peak Optimization Flags

**C benchmarks:**

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**C++ benchmarks:**

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<td>-tp barcelona-64 -Bstatic_pgi</td>
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<td>447.dealII</td>
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<td>450.soplex</td>
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**Fortran benchmarks:**

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<td>-Mpfo(pass 2) -fastsse -Mfprelaxed -Msmartalloc</td>
</tr>
<tr>
<td></td>
<td>-Mprefetch=distance:12 -Mprefetch=nta -tp barcelona-64</td>
</tr>
<tr>
<td></td>
<td>-Bstatic_pgi</td>
</tr>
</tbody>
</table>

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**SPEC CFP2006 Result**

**Dell Inc.**

PowerEdge 2970 (AMD Opteron 2347 HE, 1.9 GHz) | SPECfp_rate2006 = **77.8**
| SPECfp_rate_base2006 = **71.0**

| CPU2006 license: 55 | Test date: | Jun-2008 |
| Test sponsor: Dell Inc. | Hardware Availability: | Apr-2008 |
| Tested by: Dell Inc. | Software Availability: | Jun-2008 |

### Peak Optimization Flags (Continued)

- **416.games**: `–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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Dell Inc.

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CPU2006 license: 55
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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