Dell Inc.

PowerEdge 2970 (AMD Opteron 2222 SE, 3.00 GHz)

| SPECfp_rate2006 | 50.7 |
| SPECfp_rate_base2006 | 49.7 |

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.
Test date: Sep-2007
Hardware Availability: Apr-2007
Software Availability: Oct-2007

**Hardware**
- CPU Name: AMD Opteron 2222 SE
- CPU Characteristics:
  - CPU MHz: 3000
  - FPU: Integrated
  - CPU(s) enabled: 4 cores, 2 chips, 2 cores/chip
  - CPU(s) orderable: 1,2 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
- Compiler:
  - 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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L3 Cache: None
Other Cache: None
Memory: 16 GB (8x2GB, DDR2-667 CL5 ECC Dual Rank)
Disk Subsystem: 1 x 73 GB SAS 10k RPM
Other Hardware: None

Base Pointers: 64-bit
Peak Pointers: 64-bit
Other Software: None

Results Table

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<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>53.8</td>
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<td></td>
</tr>
</tbody>
</table>

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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SPEC CFP2006 Result

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Base Compiler Invocation (Continued)

C++ benchmarks:
pgc++

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.leshe3d: -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:
-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
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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:
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: -Mfpi(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)  
- 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:  
- Mipa=fast  
- Mipa=inline  
- Mfprelaxed  
- Msmartalloc  
- tp k8-64  
- Bstatic_pgi

416.gamess:  
- 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

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**Peak Other Flags**

**C benchmarks:**

-w

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## SPEC CPU2006 Result

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### 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](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](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.

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