SPEC® CFP2006 Result
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Dell Inc.

PowerEdge 6950 (AMD Opteron 8214, 2.20 GHz)

$SPECfp^{®}\_rate2006 =$ 77.3

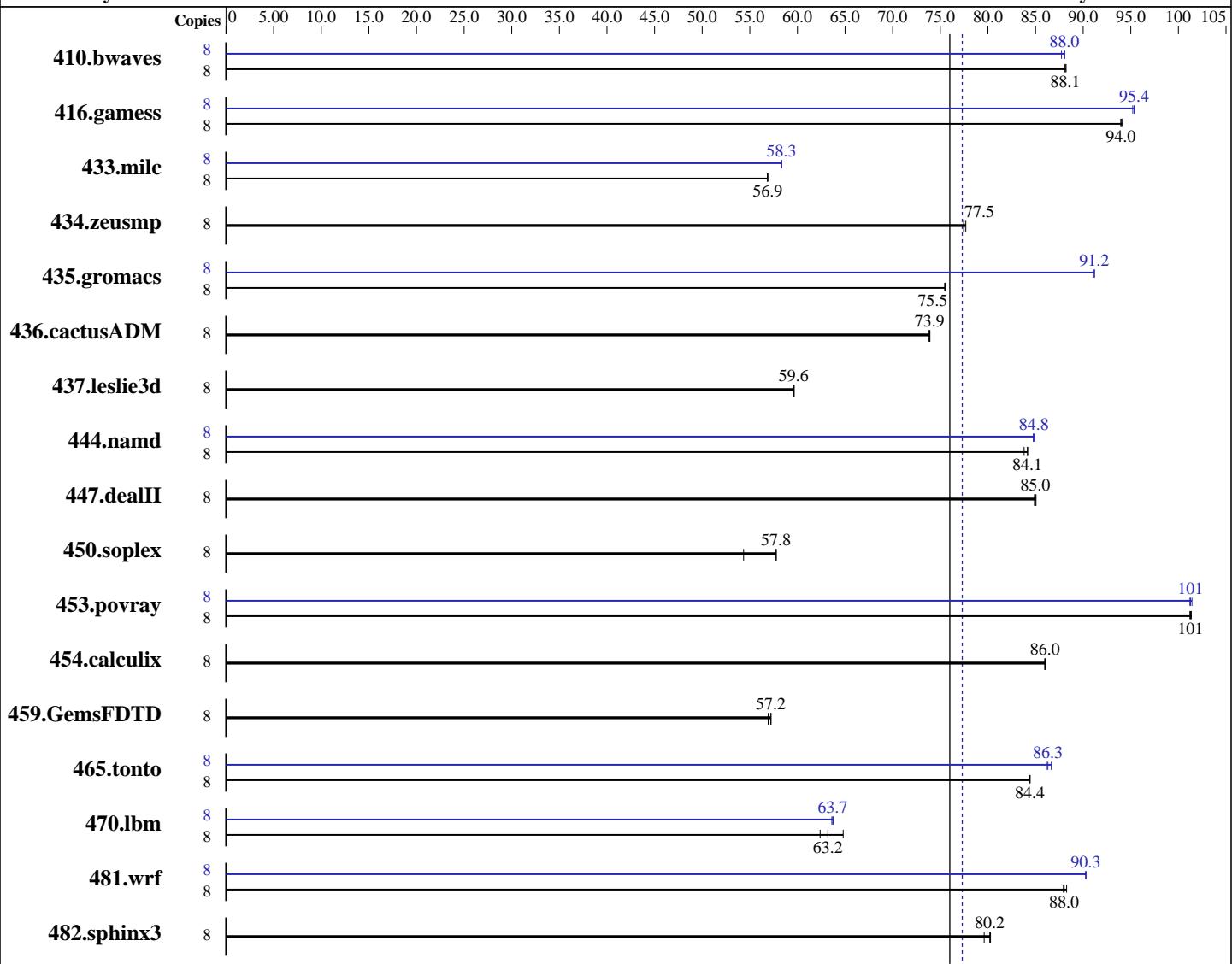$SPECfp\_rate\_base2006 =$ 76.0

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

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

Copies

410.bwaves	8 — 88.0 / 8 — 88.1
416.gamess	8 — 95.4 / 8 — 94.0
433.milc	8 — 58.3 / 8 — 56.9
434.zeusmp	8 — 77.5
435.gromacs	8 — 91.2 / 8 — 75.5
436.cactusADM	8 — 73.9
437.leslie3d	8 — 59.6
444.namd	8 — 84.8 / 8 — 84.1
447.dealII	8 — 85.0
450.soplex	8 — 57.8
453.povray	8 — 101 / 8 — 101
454.calculix	8 — 86.0
459.GemsFDTD	8 — 57.2
465.tonto	8 — 86.3 / 8 — 84.4
470.lbm	8 — 63.7 / 8 — 63.2
481.wrf	8 — 90.3 / 8 — 88.0
482.sphinx3	8 — 80.2

SPECfp_rate_base2006 = 76.0

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Hardware

CPU Name: AMD Opteron 8214
CPU Characteristics:
CPU MHz: 2200
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
Continued on next page

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
Continued on next page

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

Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	8	**1234**	**88.1**	1234	88.1	1233	88.2	8	**1235**	**88.0**	1239	87.7	1235	88.1
416.gamess	8	**1667**	**94.0**	1665	94.1	1667	94.0	8	**1643**	**95.4**	1645	95.2	1642	95.4
433.milc	8	1292	56.9	**1291**	**56.9**	1291	56.9	8	1259	58.3	**1259**	**58.3**	1259	58.4
434.zeusmp	8	940	77.4	937	77.7	**939**	**77.5**	8	940	77.4	937	77.7	**939**	**77.5**
435.gromacs	8	757	75.5	**757**	**75.5**	756	75.5	8	627	91.1	**627**	**91.2**	626	91.2
436.cactusADM	8	1295	73.8	**1294**	**73.9**	1293	73.9	8	1295	73.8	**1294**	**73.9**	1293	73.9
437.leslie3d	8	1260	59.7	**1262**	**59.6**	1262	59.6	8	1260	59.7	**1262**	**59.6**	1262	59.6
444.namd	8	766	83.8	762	84.2	**762**	**84.1**	8	**756**	**84.8**	757	84.8	755	84.9
447.dealII	8	1076	85.1	**1077**	**85.0**	1078	84.9	8	1076	85.1	**1077**	**85.0**	1078	84.9
450.soplex	8	1228	54.3	**1155**	**57.8**	1155	57.8	8	1228	54.3	**1155**	**57.8**	1155	57.8
453.povray	8	420	101	**420**	**101**	421	101	8	420	101	**420**	**101**	421	101
454.calculix	8	767	86.1	**767**	**86.0**	768	86.0	8	767	86.1	**767**	**86.0**	768	86.0
459.GemsFDTD	8	1491	56.9	1483	57.2	**1484**	**57.2**	8	1491	56.9	1483	57.2	**1484**	**57.2**
465.tonto	8	932	84.4	**933**	**84.4**	933	84.4	8	**912**	**86.3**	908	86.7	914	86.2
470.lbm	8	1696	64.8	1762	62.4	**1739**	**63.2**	8	1728	63.6	**1726**	**63.7**	1724	63.8
481.wrf	8	**1015**	**88.0**	1012	88.3	1016	87.9	8	990	90.3	990	90.3	**990**	**90.3**
482.sphinx3	8	1959	79.6	**1944**	**80.2**	1942	80.3	8	1959	79.6	**1944**	**80.2**	1942	80.3

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
```

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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: -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

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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

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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