



SPEC® CFP2006 Result

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Dell Inc.

SPECfp®_rate2006 = 82.3

PowerEdge T605 (AMD Opteron 2350, 2.00 GHz)

SPECfp_rate_base2006 = 75.2

CPU2006 license: 55

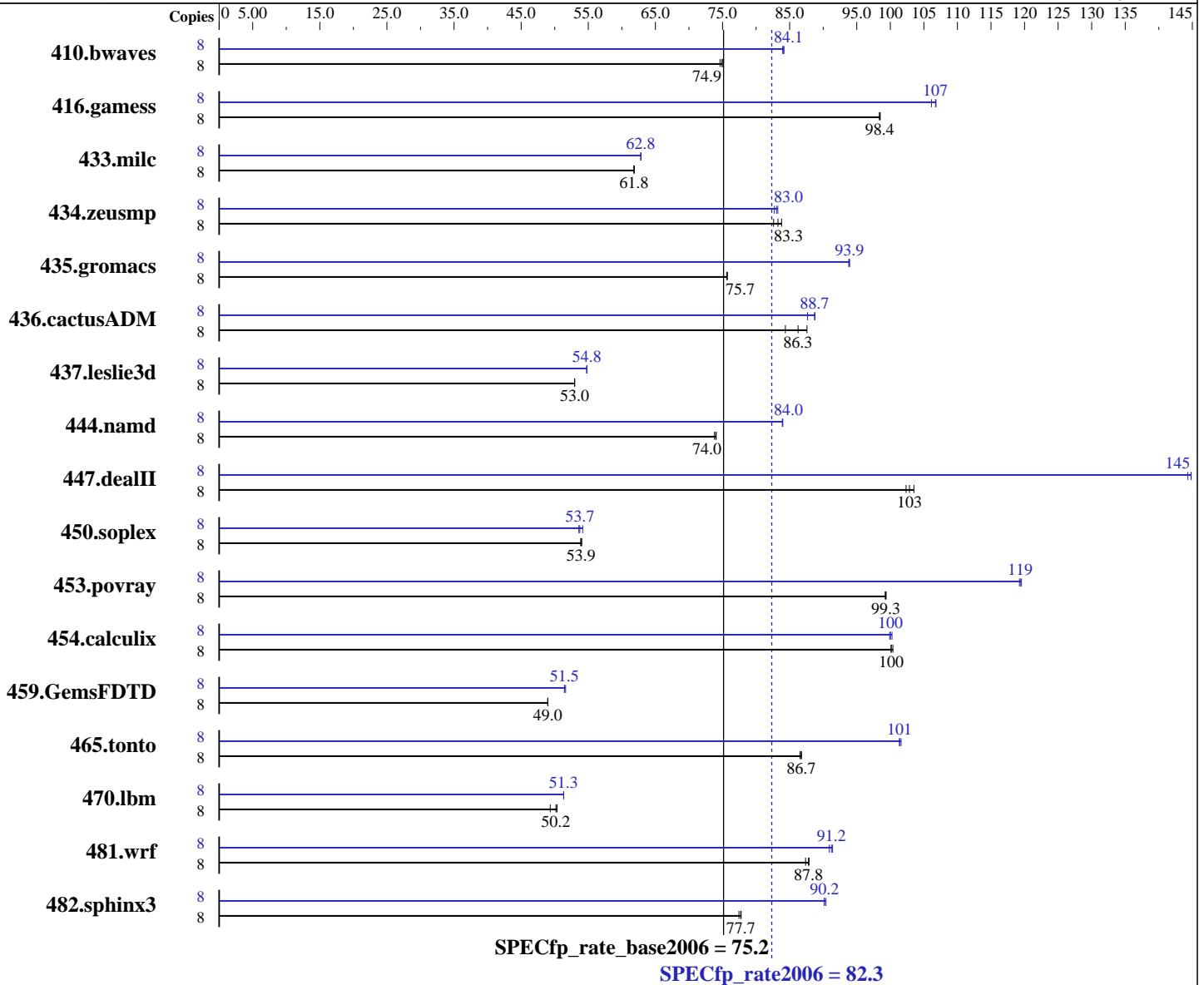
Test date: Mar-2008

Test sponsor: Dell Inc.

Hardware Availability: Apr-2008

Tested by: Dell Inc.

Software Availability: May-2008



Hardware

CPU Name: AMD Opteron 2350
 CPU Characteristics:
 CPU MHz: 2000
 FPU: Integrated
 CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip
 CPU(s) orderable: 1,2 chips
 Primary Cache: 64 KB I + 64 KB D on chip per core
 Secondary Cache: 512 KB I+D on chip per core

Software

Operating System: SuSE Linux Enterprise Server 10 (x86_64) SP1, Kernel 2.6.16.46-0.12-smp
 Compiler: PGI Server Complete Version 7.2 PathScale Compiler Suite Version 3.1
 Auto Parallel: No
 File System: ReiserFS
 System State: Run Level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit

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L3 Cache: 2 MB I+D on chip per chip
Other Cache: None
Memory: 16 GB (4 x 4 GB, DDR2-667, CL5, Reg, Dual Rank)
Disk Subsystem: 2 x 250 GB 7200 RPM SATA (RAID 0)
Other Hardware: None

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	1457	74.6	<u>1451</u>	<u>74.9</u>	1450	75.0	8	1292	84.1	<u>1293</u>	<u>84.1</u>	1295	84.0
416.gamess	8	1592	98.4	<u>1591</u>	<u>98.4</u>	1590	98.5	8	1476	106	1467	107	<u>1468</u>	<u>107</u>
433.milc	8	<u>1188</u>	<u>61.8</u>	1188	61.8	1188	61.8	8	<u>1169</u>	<u>62.8</u>	1168	62.9	1169	62.8
434.zeusmp	8	881	82.6	<u>874</u>	<u>83.3</u>	869	83.8	8	880	82.7	<u>877</u>	<u>83.0</u>	875	83.2
435.gromacs	8	755	75.7	755	75.6	<u>755</u>	<u>75.7</u>	8	609	93.8	608	93.9	<u>608</u>	<u>93.9</u>
436.cactusADM	8	<u>1108</u>	<u>86.3</u>	1092	87.6	1133	84.4	8	<u>1078</u>	<u>88.7</u>	1077	88.8	1091	87.7
437.leslie3d	8	<u>1420</u>	<u>53.0</u>	1420	52.9	1419	53.0	8	1372	54.8	1373	54.8	<u>1373</u>	<u>54.8</u>
444.namd	8	869	73.8	866	74.1	<u>867</u>	<u>74.0</u>	8	765	83.9	<u>764</u>	<u>84.0</u>	764	84.0
447.dealII	8	884	104	894	102	<u>890</u>	<u>103</u>	8	<u>632</u>	<u>145</u>	632	145	634	144
450.soplex	8	1235	54.0	1238	53.9	<u>1237</u>	<u>53.9</u>	8	1245	53.6	<u>1242</u>	<u>53.7</u>	1232	54.2
453.povray	8	429	99.2	<u>428</u>	<u>99.3</u>	428	99.4	8	356	120	<u>357</u>	<u>119</u>	357	119
454.calculix	8	<u>659</u>	<u>100</u>	659	100	657	100	8	<u>660</u>	<u>100</u>	661	99.9	658	100
459.GemsFDTD	8	1733	49.0	<u>1733</u>	<u>49.0</u>	1734	49.0	8	1650	51.4	<u>1649</u>	<u>51.5</u>	1644	51.6
465.tonto	8	<u>908</u>	<u>86.7</u>	910	86.5	907	86.8	8	777	101	775	102	<u>776</u>	<u>101</u>
470.lbm	8	2183	50.3	2228	49.3	<u>2191</u>	<u>50.2</u>	8	2141	51.3	2141	51.3	<u>2141</u>	<u>51.3</u>
481.wrf	8	1023	87.4	1017	87.9	<u>1018</u>	<u>87.8</u>	8	<u>980</u>	<u>91.2</u>	978	91.4	983	90.9
482.sphinx3	8	<u>2006</u>	<u>77.7</u>	2013	77.4	2005	77.8	8	1725	90.4	1729	90.2	<u>1729</u>	<u>90.2</u>

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
'ulimit -l 2457600' was used to set environment locked pages in memory quantity
Set /proc/sys/vm/nr_hugepages=1200
mount -t hugetlbfs nodev /mnt/hugepages
```

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=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

C++ benchmarks:

-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 --zc_eh -tp barcelona-64 -Bstatic_pgi

Fortran benchmarks:

-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

Benchmarks using both Fortran and C:

-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
-Msmartalloc=huge:150 -tp barcelona-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 (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

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Peak Portability Flags (Continued)

```

436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -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_LINUX -fno-second-underscore
482.sphinx3: -DSPEC_CPU_LP64

```

Peak Optimization Flags

C benchmarks:

```

433.milc: -fastsse -Msmartalloc=huge:150 -Msafeptr -Mfprelaxed
-Mipa=jobs:4 -Mipa=inline -Mipa=arg -Mipa=const -Mipa=ptr
-Mipa=shape -tp barcelona-64 -Bstatic_pgi

470.lbm: -march=barcelona -Ofast -m3dnow

482.sphinx3: -march=barcelona -Ofast

```

C++ benchmarks:

```

444.namd: -Mphi(pass 1) -Mipa=jobs:4(pass 2) -Mipa=fast(pass 2)
-Mipa=inline(pass 2) -Mpfo(pass 2) -fast -Mfprelaxed
-Msmartalloc=huge:150 --zc_eh -Mnodepchk -Munroll=n:4
-Munroll=m:8 -tp barcelona-64 -Bstatic_pgi

447.deallI: -march=barcelona -Ofast -static -INLINE:aggressive=on
-OPT:malloc_alg=1 -m32 -fno-exceptions

450.soplex: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -m32 -O3 -TENV:frame_pointer=off
-LNO:prefetch=1

453.povray: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -CG:load_exe=0

```

Fortran benchmarks:

```

410.bwaves: -Mphi(pass 1) -Mipa=jobs:4(pass 2) -Mipa=fast(pass 2)
-Mipa=inline(pass 2) -Mpfo(pass 2) -fastsse -Mfprelaxed
-Msmartalloc -Mprefetch=distance:12 -Mprefetch=nta
-tp barcelona-64 -Bstatic_pgi

```

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Peak Optimization Flags (Continued)

416.gamess: -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=jobs:4
-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=jobs:4 -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=jobs:4
-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

C++ benchmarks:

444.namd: -w

Fortran benchmarks:

410.bwaves: -w

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Peak Other Flags (Continued)

434.zeusmp: -w

Benchmarks using both Fortran and C:

435.gromacs: -w

454.calculix: -w

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/amd123GH-flags.20090714.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/amd123GH-flags.20090714.xml>

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