



SPEC® CFP2006 Result

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Dell Inc.

SPECfp®_rate2006 = 85.8

PowerEdge T605 (AMD Opteron 2354, 2.20 GHz)

SPECfp_rate_base2006 = 78.4

CPU2006 license: 55

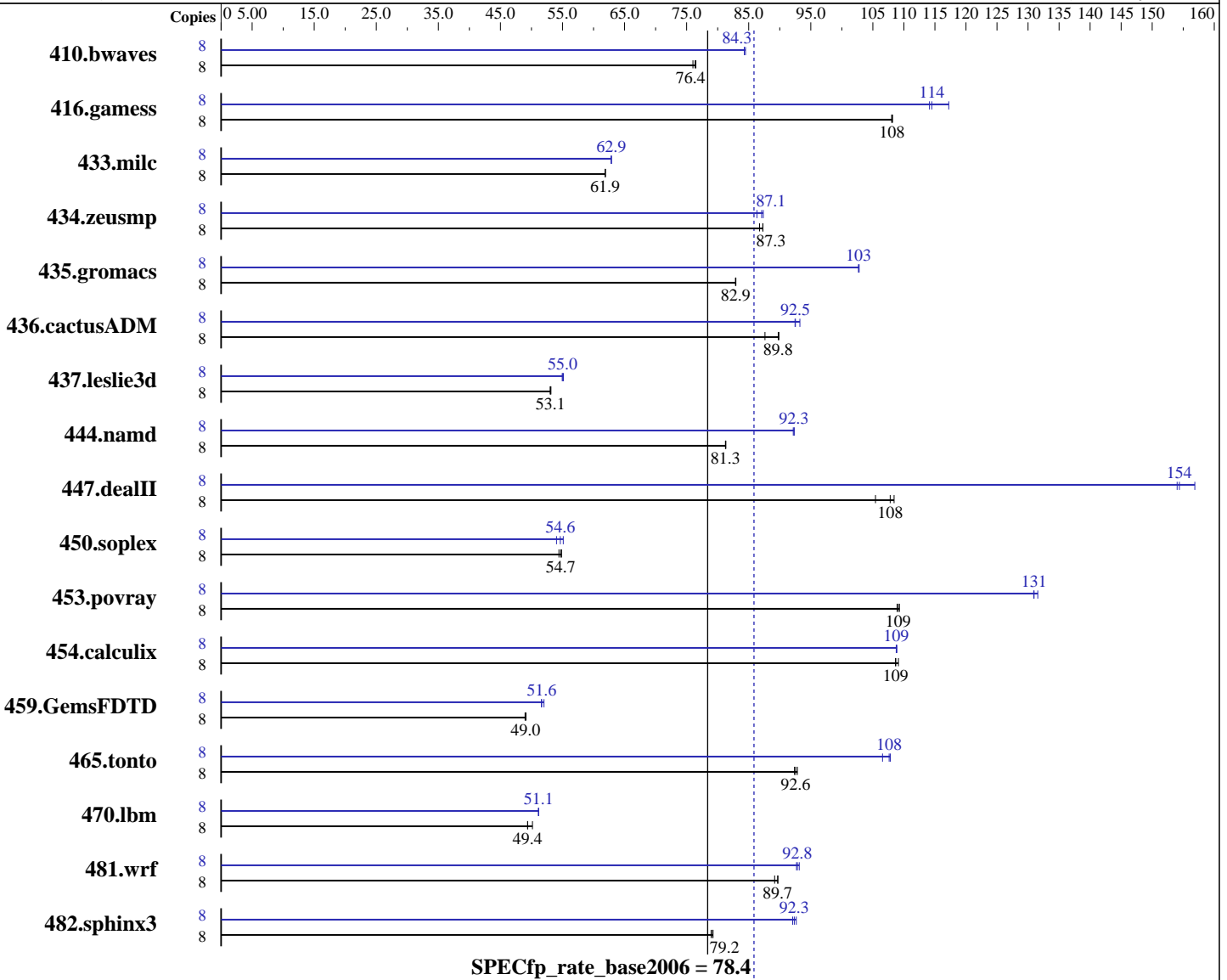
Test date: Mar-2008

Test sponsor: Dell Inc.

Hardware Availability: Apr-2008

Tested by: Dell Inc.

Software Availability: May-2008



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Hardware

CPU Name: AMD Opteron 2354
 CPU Characteristics: 2200
 CPU MHz: 2200
 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

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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	1430	76.0	<u>1424</u>	<u>76.4</u>	1421	76.5	8	1290	84.3	1287	84.5	<u>1290</u>	<u>84.3</u>
416.gamess	8	1448	108	<u>1449</u>	<u>108</u>	1450	108	8	<u>1368</u>	<u>114</u>	1336	117	1373	114
433.milc	8	1186	61.9	1187	61.9	<u>1187</u>	<u>61.9</u>	8	<u>1168</u>	<u>62.9</u>	1168	62.9	1168	62.9
434.zeusmp	8	<u>834</u>	<u>87.3</u>	834	87.3	839	86.7	8	843	86.3	833	87.3	<u>836</u>	<u>87.1</u>
435.gromacs	8	689	82.9	<u>689</u>	<u>82.9</u>	689	82.9	8	<u>556</u>	<u>103</u>	556	103	556	103
436.cactusADM	8	<u>1065</u>	<u>89.8</u>	1091	87.6	1064	89.9	8	1025	93.2	<u>1033</u>	<u>92.5</u>	1034	92.5
437.leslie3d	8	1415	53.1	1418	53.0	<u>1417</u>	<u>53.1</u>	8	1364	55.1	<u>1366</u>	<u>55.0</u>	1368	55.0
444.namd	8	<u>790</u>	<u>81.3</u>	789	81.3	790	81.3	8	<u>695</u>	<u>92.3</u>	696	92.2	695	92.3
447.dealII	8	844	108	868	105	<u>849</u>	<u>108</u>	8	594	154	583	157	<u>593</u>	<u>154</u>
450.soplex	8	1226	54.4	<u>1219</u>	<u>54.7</u>	1217	54.8	8	1235	54.0	<u>1221</u>	<u>54.6</u>	1210	55.1
453.povray	8	391	109	389	109	<u>390</u>	<u>109</u>	8	325	131	<u>325</u>	<u>131</u>	323	132
454.calculix	8	<u>607</u>	<u>109</u>	605	109	607	109	8	606	109	<u>607</u>	<u>109</u>	607	109
459.GemsFDTD	8	1733	49.0	<u>1731</u>	<u>49.0</u>	1728	49.1	8	1632	52.0	<u>1643</u>	<u>51.6</u>	1645	51.6
465.tonto	8	848	92.8	852	92.4	<u>851</u>	<u>92.6</u>	8	<u>731</u>	<u>108</u>	730	108	739	107
470.lbm	8	<u>2226</u>	<u>49.4</u>	2226	49.4	2191	50.2	8	<u>2149</u>	<u>51.1</u>	2149	51.1	2149	51.2
481.wrf	8	996	89.7	1002	89.2	<u>997</u>	<u>89.7</u>	8	964	92.7	<u>963</u>	<u>92.8</u>	959	93.1
482.sphinx3	8	1975	78.9	<u>1969</u>	<u>79.2</u>	1967	79.3	8	1693	92.1	<u>1689</u>	<u>92.3</u>	1683	92.7

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.dealII: -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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Tested with SPEC CPU2006 v1.0.
Report generated on Tue Jul 22 16:53:18 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 29 April 2008.