



SPEC[®] CFP2006 Result

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Dell Inc.

SPECfp[®]_rate2006 = 137

PowerEdge R805 (AMD Opteron 2431, 2.40 GHz)

SPECfp_rate_base2006 = 123

CPU2006 license: 55

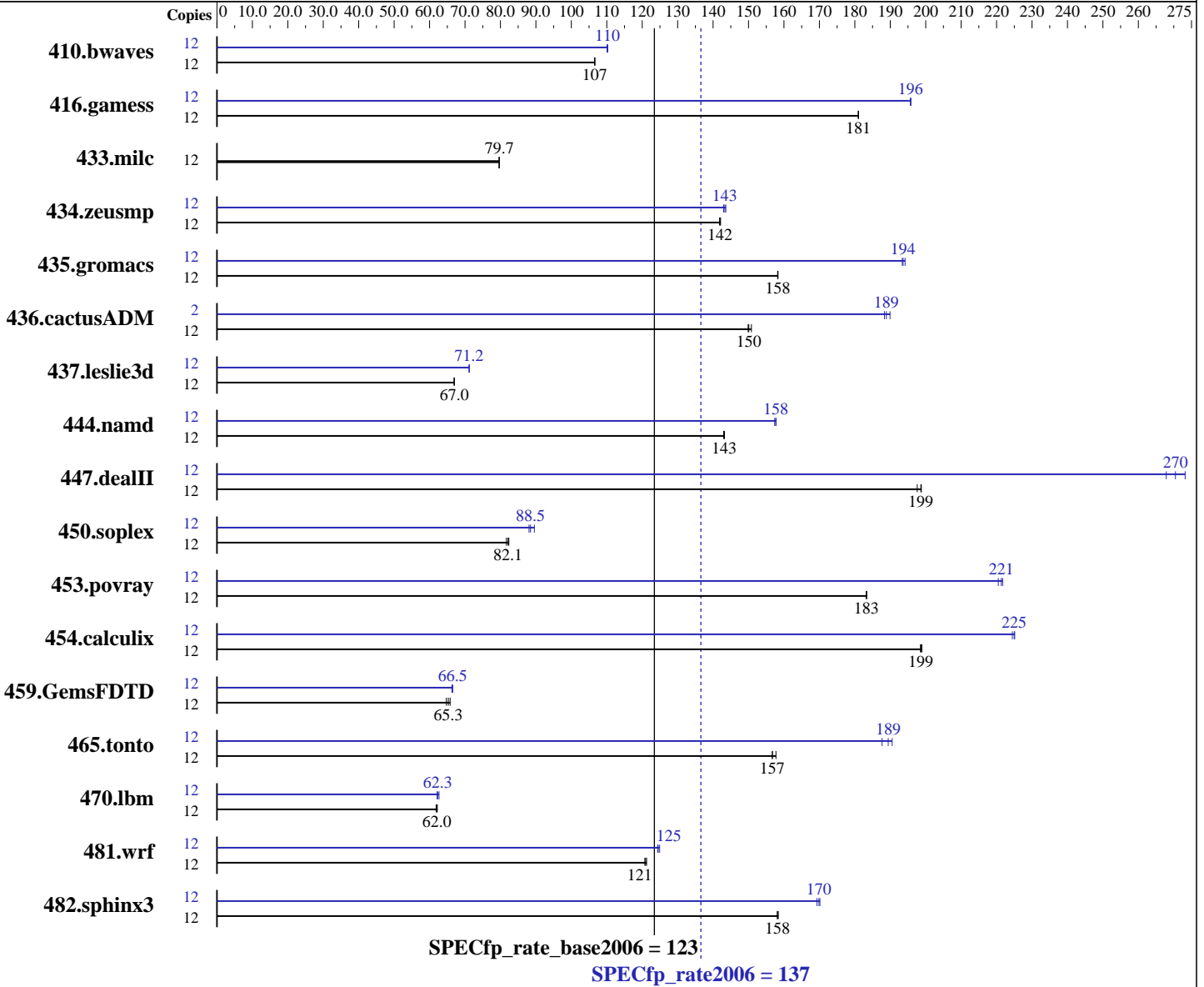
Test date: Jul-2009

Test sponsor: Dell Inc.

Hardware Availability: Jul-2009

Tested by: Dell Inc.

Software Availability: Apr-2009



Hardware

CPU Name: AMD Opteron 2431
 CPU Characteristics:
 CPU MHz: 2400
 FPU: Integrated
 CPU(s) enabled: 12 cores, 2 chips, 6 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

Continued on next page

Software

Operating System: Red Hat Enterprise Linux Server release 5.3, Kernel 2.6.18-128.el5
 Compiler: PGI Server Complete Version 8.0 x86 Open64 4.2.2 Compiler Suite (from AMD)
 Auto Parallel: Yes
 File System: ext3
 System State: Run level 3 (Full multiuser with network)
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit

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L3 Cache: 6 MB I+D on chip per chip
Other Cache: None
Memory: 32 GB (8 x 4 GB DDR2-800)
Disk Subsystem: 1 x 73 GB 15000 RPM SAS
Other Hardware: None

Other Software: binutils 2.18

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	12	1530	107	1529	107	1530	107	12	1479	110	1480	110	1481	110
416.gamess	12	1298	181	1298	181	1298	181	12	1200	196	1201	196	1200	196
433.milc	12	1383	79.7	1384	79.6	1383	79.7	12	1383	79.7	1384	79.6	1383	79.7
434.zeusmp	12	770	142	769	142	768	142	12	764	143	762	143	760	144
435.gromacs	12	541	158	542	158	541	158	12	441	194	443	194	443	193
436.cactusADM	12	957	150	955	150	951	151	2	126	190	127	188	127	189
437.leslie3d	12	1684	67.0	1685	67.0	1685	66.9	12	1585	71.2	1584	71.2	1585	71.2
444.namd	12	673	143	672	143	673	143	12	610	158	611	157	610	158
447.dealII	12	695	198	691	199	691	199	12	502	273	508	270	512	268
450.soplex	12	1218	82.1	1225	81.7	1215	82.4	12	1136	88.1	1131	88.5	1117	89.6
453.povray	12	348	183	348	183	348	183	12	288	221	290	220	288	222
454.calculix	12	499	199	498	199	498	199	12	441	224	440	225	440	225
459.GemsFDTD	12	1967	64.7	1950	65.3	1935	65.8	12	1914	66.5	1915	66.5	1921	66.3
465.tonto	12	749	158	754	157	753	157	12	623	189	620	191	629	188
470.lbm	12	2651	62.2	2666	61.8	2658	62.0	12	2631	62.7	2647	62.3	2654	62.1
481.wrf	12	1108	121	1110	121	1106	121	12	1076	125	1073	125	1078	124
482.sphinx3	12	1476	158	1479	158	1479	158	12	1377	170	1381	169	1375	170

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.

Operating System Notes

'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 2097152' was used to set environment locked pages in memory limit

Set vm/nr_hugepages=5400 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages



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General Notes

Environment variables set by runspec before the start of the run:

HUGETLB_LIMIT = "450"

LD_LIBRARY_PATH = "/root/cpu2006-1.1/amd0905is-libs/64:/root/cpu2006-1.1/amd0905is-libs/32"

NCPUS = "6"

PGI_HUGE_PAGES = "450"

The x86 Open64 Compiler Suite is only available from (and supported by) AMD at <http://developer.amd.com/cpu/open64>

Base Compiler Invocation

C benchmarks:

pgcc

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.deallI: -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



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Base Optimization Flags

C benchmarks:

-fastsse -Msmartalloc=huge -Mfprelaxed -Mipa=fast -Mipa=inline
-tp shanghai-64 -Bstatic_pgi

C++ benchmarks:

-fastsse -Msmartalloc=huge -Mfprelaxed --zc_eh -Mipa=fast
-Mipa=inline -tp shanghai-64 -Bstatic_pgi

Fortran benchmarks:

-fastsse -Msmartalloc=huge -Mfprelaxed -Mvect=short -Mipa=fast
-Mipa=inline -tp shanghai-64 -Bstatic_pgi

Benchmarks using both Fortran and C:

-fastsse -Msmartalloc=huge -Mfprelaxed -Mipa=fast -Mipa=inline
-tp shanghai-64 -Mvect=short -Bstatic_pgi

Base Other Flags

C benchmarks:

-Mipa=jobs:4

C++ benchmarks:

-Mipa=jobs:4

Fortran benchmarks:

-Mipa=jobs:4

Benchmarks using both Fortran and C:

-Mipa=jobs:4

Peak Compiler Invocation

C benchmarks:

pgcc

C++ benchmarks (except as noted below):

openCC

444.namd: pgcpp

Fortran benchmarks (except as noted below):

openf95

410.bwaves: pgf95

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Peak Compiler Invocation (Continued)

434.zeusmp: pgf95

437.leslie3d: pgf95

Benchmarks using both Fortran and C (except as noted below):

pgcc pgf95

435.gromacs: opencc openf95

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
 436.cactusADM: -DSPEC_CPU_LP64 -Mnomain
 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_CASE_FLAG -DSPEC_CPU_LINUX
 482.sphinx3: -DSPEC_CPU_LP64

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: -fastsse -Msmartalloc=huge -Mprefetch=t0 -Mloop32
-Mfprelaxed -Mipa=fast -Mipa=inline -tp shanghai-64
-Bstatic_pgi

482.sphinx3: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)
-Mipa=fast(pass 2) -Mipa=inline(pass 2) -fastsse
-Mfprelaxed -Msmartalloc -tp shanghai-64 -Bstatic_pgi

C++ benchmarks:

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

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Peak Optimization Flags (Continued)

447.dealll: -march=barcelona -Ofast -static -INLINE:aggressive=on
-LNO:opt=0 -Wf,-fno-exceptions -m32 -OPT:unroll_times_max=8
-OPT:unroll_size=256 -OPT:unroll_level=2 -HP:bdt=2m:heap=2m
-GRA:unspill=on -CG:cmp_peep=on -TENV:frame_pointer=off

450.soplex: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O3 -INLINE:aggressive=on
-OPT:IEEE_arith=3 -OPT:IEEE_NaN_Inf=off
-OPT:fold_unsigned_relops=on -OPT:malloc_alg=1
-CG:load_exe=0 -fno-exceptions -m32 -HP:bdt=2m

453.povray: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -INLINE:aggressive=on
-HP:bdt=2m:heap=2m

Fortran benchmarks:

410.bwaves: -fastsse -Msmartalloc -Mprefetch=nta -Mfprelaxed
-Mipa=fast -Mipa=inline -tp shanghai-64 -Bstatic_pgi

416.gamess: -march=barcelona -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O2 -OPT:Ofast -OPT:ro=3
-OPT:unroll_size=256 -HP:bdt=2m:heap=2m

434.zeusmp: -fastsse -Mfprelaxed -Mprefetch=distance:8 -Mprefetch=t0
-Msmartalloc=huge -Msmartalloc=hugebss -Mipa=fast
-Mipa=inline -tp shanghai-64 -Bstatic_pgi

437.leslie3d: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)
-Mipa=fast(pass 2) -Mipa=inline(pass 2) -fastsse
-Mvect=fuse -Msmartalloc=huge -Mprefetch=distance:8
-Mprefetch=t0 -Mfprelaxed -tp shanghai-64 -Bstatic_pgi

459.GemsFDTD: -march=barcelona -Ofast -LNO:fission=2 -LNO:simd=2
-LNO:prefetch_ahead=1 -CG:load_exe=0 -HP

465.tonto: -march=barcelona -Ofast -OPT:alias=no_f90_pointer_alias
-LNO:blocking=off -CG:load_exe=1 -IPA:plimit=525 -HP

Benchmarks using both Fortran and C:

435.gromacs: -march=barcelona -Ofast -OPT:rsqrt=2 -HP:bdt=2m:heap=2m

436.cactusADM: -fastsse -Mconcur -Msmartalloc=huge -Mfprelaxed -Mipa=fast
-Mipa=inline -tp shanghai-64 -Bstatic_pgi

454.calculix: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)
-Mipa=fast(pass 2) -Mipa=inline(pass 2) -fastsse
-Mvect=short -Msmartalloc=huge -Mprefetch=t0 -Mpre

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Peak Optimization Flags (Continued)

454.calculix (continued):

-Mfprelaxed -tp shanghai-64 -Bstatic_pgi

481.wrf: -fastsse -Mvect=noaltcode -Msmartalloc=huge

-Mprefetch=distance:8 -Mfprelaxed -tp shanghai-64

-Bstatic_pgi

Peak Other Flags

C benchmarks:

-Mipa=jobs:4(pass 2)

C++ benchmarks:

444.namd: -Mipa=jobs:4(pass 2)

Fortran benchmarks:

410.bwaves: -Mipa=jobs:4

434.zeusmp: -Mipa=jobs:4

437.leslie3d: -Mipa=jobs:4(pass 2)

Benchmarks using both Fortran and C:

436.cactusADM: -Mipa=jobs:4

454.calculix: -Mipa=jobs:4(pass 2)

The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2006/flags/pgi80_linux_flags.20090710.html

<http://www.spec.org/cpu2006/flags/x86-open64-4.2.2-flags.html>

<http://www.spec.org/cpu2006/flags/amd-platform.html>

You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2006/flags/pgi80_linux_flags.20090710.xml

<http://www.spec.org/cpu2006/flags/x86-open64-4.2.2-flags.xml>

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