



SPEC[®] CFP2006 Result

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Dell Inc.

SPECfp[®]2006 = 23.7

PowerEdge R905 (AMD Opteron 8389, 2.90 GHz)

SPECfp_base2006 = 19.3

CPU2006 license: 55

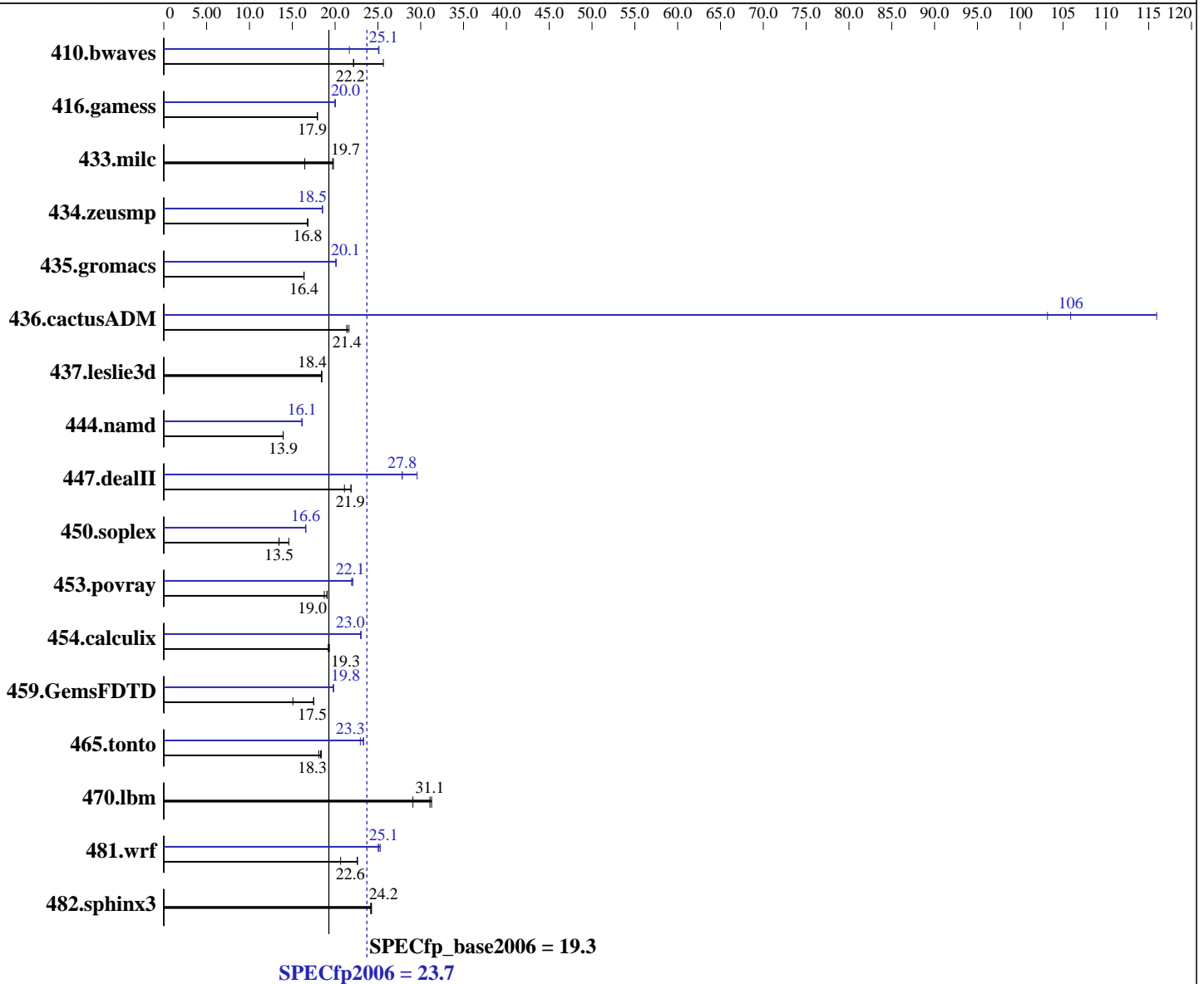
Test date: Feb-2009

Test sponsor: Dell Inc.

Hardware Availability: May-2009

Tested by: Dell Inc.

Software Availability: Oct-2008



Hardware

CPU Name: AMD Opteron 8389
 CPU Characteristics:
 CPU MHz: 2900
 FPU: Integrated
 CPU(s) enabled: 16 cores, 4 chips, 4 cores/chip
 CPU(s) orderable: 4 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) SP2, Kernel 2.6.16.60-0.21-smp
 Compiler: PGI Server Complete Version 7.2 PathScale Compiler Suite Version 3.2
 Auto Parallel: Yes
 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: 6 MB I+D on chip per chip
Other Cache: None
Memory: 64 GB (16 x 4 GB DDR2-800)
Disk Subsystem: 1 x 73 GB 10000 RPM SAS
Other Hardware: None

Other Software: binutils 2.18
32-bit and 64-bit libhugetlbfs libraries

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	614	22.1	530	25.6	613	22.2	627	21.7	541	25.1	542	25.1
416.gamess	1092	17.9	1091	17.9	1093	17.9	980	20.0	979	20.0	977	20.0
433.milc	466	19.7	463	19.8	558	16.5	466	19.7	463	19.8	558	16.5
434.zeusmp	542	16.8	542	16.8	541	16.8	492	18.5	491	18.5	491	18.5
435.gromacs	436	16.4	436	16.4	436	16.4	355	20.1	355	20.1	355	20.1
436.cactusADM	559	21.4	559	21.4	553	21.6	103	116	113	106	116	103
437.leslie3d	510	18.4	511	18.4	510	18.4	510	18.4	511	18.4	510	18.4
444.namd	575	13.9	576	13.9	575	13.9	497	16.1	497	16.1	497	16.1
447.dealII	542	21.1	523	21.9	523	21.9	411	27.8	411	27.8	387	29.6
450.soplex	620	13.5	571	14.6	620	13.5	504	16.5	503	16.6	504	16.6
453.povray	279	19.1	279	19.0	284	18.7	243	21.9	241	22.1	241	22.1
454.calculix	428	19.3	430	19.2	427	19.3	359	23.0	358	23.0	358	23.0
459.GemsFDTD	704	15.1	606	17.5	607	17.5	536	19.8	535	19.8	536	19.8
465.tonto	537	18.3	535	18.4	544	18.1	422	23.3	429	22.9	423	23.3
470.lbm	439	31.3	442	31.1	472	29.1	439	31.3	442	31.1	472	29.1
481.wrf	495	22.6	541	20.6	494	22.6	445	25.1	446	25.0	442	25.3
482.sphinx3	807	24.2	804	24.3	804	24.2	807	24.2	804	24.3	804	24.2

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

Operating System Notes

The libhugetlbfs libraries were installed using the installation RPMs that came with the distribution.

'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=14336 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_MORECORE = "yes"

LD_LIBRARY_PATH = "/root/cpu2006-1.1/amd909gh-libs/64:/root/cpu2006-1.1/amd909gh-libs/32"

NCPUS = "8"

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.deall: -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:

-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi

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Base Optimization Flags (Continued)

C++ benchmarks:

-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed
--zc_eh -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi

Fortran benchmarks:

-Mvect=cachesize:6291456 -fastsse -Mfprelaxed -Msmartalloc=huge
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi

Benchmarks using both Fortran and C:

-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mfprelaxed
-Mipa=fast -Mipa=inline -tp barcelona-64 -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):

pathCC

444.namd: pgcpp

Fortran benchmarks (except as noted below):

pgf95

416.gamess: pathf95

459.GemsFDTD: pathf95

465.tonto: pathf95

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Peak Compiler Invocation (Continued)

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

pathcc pathf95

436.cactusADM: pgcc pgf95

454.calculix: pgcc pgf95

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_LINUX -fno-second-underscore
 482.sphinx3: -DSPEC_CPU_LP64

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
 -Mipa=inline(pass 2) -Mvect=cachesize:6291456 -fastsse
 -Munroll=n:4 -Munroll=m:8 -Msmartalloc=huge -Mnodepchk
 -Mfprelaxed --zc_eh -tp barcelona-64 -Bstatic_pgi

447.dealII: -march=barcelona -Ofast -static -INLINE:aggressive=on
 -fno-exceptions -m32

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Peak Optimization Flags (Continued)

450.soplex: -march=barcelona -fb_create fbdata(pass 1)
 -fb_opt fbdata(pass 2) -L/usr/lib -lhugetlbfs(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

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

Fortran benchmarks:

410.bwaves: -Mvect=cachesize:6291456 -fastsse -Msmartalloc
 -Mprefetch=nta -Mfprefaxed -Mipa=fast -Mipa=inline
 -tp barcelona-64 -Bstatic_pgi

416.gamess: -march=barcelona -fb_create fbdata(pass 1)
 -fb_opt fbdata(pass 2)
 -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT(pass 2)
 -L/usr/lib64 -lhugetlbfs(pass 2) -O2 -OPT:Ofast -OPT:ro=3
 -OPT:unroll_size=256

434.zeusmp: -Mvect=cachesize:6291456 -fastsse -Mfprefaxed
 -Mprefetch=distance:8 -Mprefetch=t0 -Msmartalloc=huge
 -Msmartalloc=hugebss -Mipa=fast -Mipa=inline
 -tp barcelona-64 -Bstatic_pgi

437.leslie3d: basepeak = yes

459.GemsFDTD: -march=barcelona -Ofast -LNO:fission=2 -LNO:simd=2
 -LNO:prefetch_ahead=1 -CG:load_exe=0 -CG:prefer_lru_reg=off
 -OPT:malloc_alg=1
 -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT
 -L/usr/lib64 -lhugetlbfs

465.tonto: -march=barcelona -Ofast -OPT:alias=no_f90_pointer_alias
 -LNO:blocking=off -CG:load_exe=1 -IPA:plimit=525
 -OPT:malloc_alg=1
 -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT
 -L/usr/lib64 -lhugetlbfs

Benchmarks using both Fortran and C:

435.gromacs: -march=barcelona -Ofast -OPT:rsqrt=2 -OPT:malloc_alg=1
 -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT
 -L/usr/lib64 -lhugetlbfs

436.cactusADM: -Mvect=cachesize:6291456 -fastsse -Mconcur
 -Msmartalloc=huge -Mfprefaxed -Mipa=fast -Mipa=inline
 -tp barcelona-64 -Bstatic_pgi

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Peak Optimization Flags (Continued)

454.calculix: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)
 -Mipa=fast(pass 2) -Mipa=inline(pass 2)
 -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge
 -Mprefetch=t0 -Mpre -Mfprelaxed -tp barcelona-64
 -Bstatic_pgi

481.wrf: -march=barcelona -Ofast -LNO:blocking=off
 -LNO:prefetch_ahead=10 -LANG:copyinout=off
 -IPA:callee_limit=5000 -GRA:prioritize_by_density=on
 -OPT:malloc_alg=1 -m3dnow
 -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT
 -L/usr/lib64 -lhugetlbfs

Peak Other Flags

C benchmarks:
-Mipa=jobs:4

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

Fortran benchmarks (except as noted below):
-Mipa=jobs:4

416.gamess: No flags used

459.GemsFDTD: No flags used

465.tonto: No flags used

Benchmarks using both Fortran and C (except as noted below):
-Mipa=jobs:4(pass 2)

435.gromacs: No flags used

481.wrf: No flags used

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

http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090710.html
<http://www.spec.org/cpu2006/flags/pathscale32-flags.html>
<http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.html>

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

http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090710.xml
<http://www.spec.org/cpu2006/flags/pathscale32-flags.xml>
<http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.xml>



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