Hewlett-Packard Company

ProLiant DL585 G6
(2.6 GHz AMD Opteron 8435)

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

SPECfp®_rate2006 = 141
SPECfp_rate_base2006 = 128

SPECfp_rate_base2006 = 128

Hardware

CPU Name: AMD Opteron 8435
CPU Characteristics:
CPU MHz: 2600
FPU: Integrated
CPU(s) enabled: 12 cores, 2 chips, 6 cores/chip
CPU(s) orderable: 2,4 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: Red Hat Enterprise Linux Server release 5.3,
Advanced Platform, Kernel 2.6.18-128.el5
Compiler: PGI Server Complete Version 8.0
x86 Open64 4.2.2 Compiler Suite
Auto Parallel: Yes
File System: ext3
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit

Continued on next page
## Results Table

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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 2457600' was used to set environment locked pages in memory limit  
The libhugetlbfs libraries were installed using the installation rpms that came with the distribution.

Set vm/nr_hugepages=5400 in /etc/sysctl.conf  
mount -t hugetlbfs nodev /mnt/hugepages
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SPECfp_rate_base2006 = 128

Platform Notes
BIOS configuration:
Power Regulator set to Static High Performance Mode

General Notes
Environment variables set by runspec before the start of the run:
HUGETLB_LIMIT = "450"
LD_LIBRARY_PATH = "/cpu2006/amd0905is-libs/64:/cpu2006/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.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

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Test date: May-2009
Hardware Availability: Jun-2009
Software Availability: Apr-2009

Base Portability Flags (Continued)
482.sphinx3: -DSPEC_CPU_LP64

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:11

C++ benchmarks:
- Mipa=jobs:11

Fortran benchmarks:
- Mipa=jobs:11

Benchmarks using both Fortran and C:
- Mipa=jobs:11

Peak Compiler Invocation

C benchmarks:
pgcc

C++ benchmarks (except as noted below):
openCC

  444.namd: pgcpp
Peak Compiler Invocation (Continued)

Fortran benchmarks (except as noted below):
openf95

410.bwaves: pgf95
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
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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: -Mmpi=indirect(pass 1) -Mmpo=indirect(pass 2) -Mipa=fast(pass 2) -Mipa=inline(pass 2) -fastsse -Mfprelaxed -Msmartalloc -tp shanghai-64 -Bstatic_pgi

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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) -fastsse -Munroll=n:4 -Munroll=m:8
- Msmaartalloc=huge -Mnodepchk -Mfprelaxed --zc_eh
- tp shanghai-64 -Bstatic_pgi

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

450.soplex: -march=barcelona -fb_create fbdatala(pass 1)
- fb_opt fbdatala(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-actions -m32 -HP:bd=2m

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

Fortran benchmarks:

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

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

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

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

459.GemsFDTD: -march=barcelona -Ofast -LNO:fusion=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:bd=2m:heap=2m

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SPEC CFP2006 Result

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Peak Optimization Flags (Continued)

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

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

C++ benchmarks:

444.namd: -Mipa=jobs:11(pass 2)

Fortran benchmarks:

410.bwaves: -Mipa=jobs:11
434.zeusmp: -Mipa=jobs:11
437.leslie3d: -Mipa=jobs:11(pass 2)

Benchmarks using both Fortran and C:

436.cactusADM: -Mipa=jobs:11
454.calculix: -Mipa=jobs:11(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.html
http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.20090710.00.html
http://www.spec.org/cpu2006/flags/x86-open64-4.2.2-flags.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/pgi80_linux_flags.xml
http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.20090710.00.xml
http://www.spec.org/cpu2006/flags/x86-open64-4.2.2-flags.xml
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For questions about this result, please contact the tester.  
For other inquiries, please contact webmaster@spec.org.

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