Hewlett-Packard Company

ProLiant DL585 G7
(2.3 GHz AMD Opteron 6176)

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

Hewlett-Packard Company

SPEC® CFP2006 Result

SPECfp®_rate2006 = 320
SPECfp_rate_base2006 = 294

Hardware

CPU Name: AMD Opteron 6176
CPU Characteristics: Integrated
CPU MHz: 2300
FPU: Integrated
CPU(s) enabled: 24 cores, 2 chips, 12 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: SUSE Linux Enterprise Server 11 (x86_64) SP1, Kernel 2.6.32.12-0.7-default
Compiler: x86 Open64 4.2.4 Compiler Suite (from AMD)
Auto Parallel: Yes
File System: ext3
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

Test date: Apr-2011
Hardware Availability: Feb-2011
Software Availability: Aug-2010

Continued on next page
## Results Table

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</table>

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

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### 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=10800` in `/etc/sysctl.conf`

Mount `-t hugetlbfs nodev /mnt/hugepages`
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Platform Notes

BIOS Configuration:
- HP Power Profile set to Maximum Performance
- Thermal Configuration set to Increased Cooling

General Notes

Environment variables set by runspec before the start of the run:
- HUGETLB_LIMIT = "450"
- LD_LIBRARY_PATH = "/cpu2006/amd1002mc-rate-libs-revC/64:/cpu2006/amd1002mc-rate-libs-revC/32"
- OMP_NUM_THREADS = "6"

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:
- opencc

C++ benchmarks:
- openCC

Fortran benchmarks:
- openf95

Benchmarks using both Fortran and C:
- opencc openf95

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64 416.games: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64 434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64 436.cactusADM: -DSPEC_CPU_LP64 -fno-second-underscore
437.lesle3d: -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
459.GemsFDTD: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX -DSPEC_CPU_CASE_FLAG
465.tonto: -DSPEC_CPU_LP64 -fno-second-underscore
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX -DSPEC_CPU_CASE_FLAG
- fno-second-underscore

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

Base Optimization Flags

C benchmarks:
-march=barcelona -msl -Ofast -OPT:malloc_alg=1 -HP:bdt=2m

C++ benchmarks:
-march=barcelona -msl -Ofast -static -INLINE:aggressive=on
-OPT:malloc_alg=1 -HP:bdt=2m

Fortran benchmarks:
-march=barcelona -msl -Ofast -HP

Benchmarks using both Fortran and C:
-march=barcelona -msl -Ofast -OPT:malloc_alg=1 -HP:bdt=2m -HP

Peak Compiler Invocation

C benchmarks:
opencc

C++ benchmarks:
openCC

Fortran benchmarks:
openf95

Benchmarks using both Fortran and C:
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 -fno-second-underscore
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64

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Hewlett-Packard Company

Peak Portability Flags (Continued)

459.465.470.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX -DSPEC_CPU_CASE_FLAG 
-fno-second-underscore
481.482.sphinx3: -DSPEC_CPU_LP64

Peak Optimization Flags

C benchmarks:

433.milc: -march=barcelona -msl -Ofast -CG:movnti=1 
-CG:local_sched_alg=1 -CG:locs_shallow_depth=1 
-HP:bdt=2m:heap=2m -LNO:prefetch=3

470.lbm: basepeak = yes

482.sphinx3: -march=barcelona -msl -fb_create fbdata(pass 1) 
-fb_opt fbdata(pass 2) -Ofast -OPT:malloc alg=2 
-CG:sse_cse_regs=0 -CG:locs_shallow_depth=1 -CG:cmp_peep=on 
-CG:local_sched_alg=1 -INLINE:aggressive=on

C++ benchmarks:

444.namd: -march=barcelona -msl -fb_create fbdata(pass 1) 
-fb_opt fbdata(pass 2) -Ofast -LNO:ignore_feedback=off 
-CG:local_sched alg=2 -CG:load_exe=0 -CG:compute to=on 
-OPT:unroll_size=256 -fno-exceptions -HP:bdt=2m:heap=2m

447.dealII: -march=barcelona -msl -Ofast -static -INLINE:aggressive=on 
-LNO:opt=0 -fno-emit-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 -msl -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 -msl -fb_create fbdata(pass 1) 
-fb_opt fbdata(pass 2) -Ofast -INLINE:aggressive=on

Fortran benchmarks:

410.bwaves: -march=barcelona -msl -O3 -OPT:Ofast -OPT:treeheight=on 
-LNO:blocking=off -LNO:prefetch_ahead=5 
-LNO:ignore_feedback=off -WOPT:aggstr=0 -HP:bdt=2m:heap=2m

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Peak Optimization Flags (Continued)

410.bwaves (continued):
-CPG: cmp_peep=on

416.gamess:
-march=barcelona -ms -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -O3 -LNO:fu=6 -LNO: blocking=0
-LNO: prefetch=0 -OPT: Ofast -OPT: ro=3 -OPT: unroll_size=256
-HP: bdt=2m: heap=2m

434.zeusmp:
-march=barcelona -ms -Ofast -LNO: blocking=off
-LNO: interchange=off -OPT: treeheight=on -OPT: unroll_size=256
-CPG: cmp_peep=on -GRA: prioritize_by_density=on -HP

437.leslie3d:
-march=barcelona -ms -Ofast -HP: bdt=2m: heap=2m

459.GemsFDTD:
-march=barcelona -ms -Ofast -LNO: fission=2
-LNO: prefetch_ahead=1 -CPG: load_exe=0 -CPG: local_sched_alg=1
-HP

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

Benchmarks using both Fortran and C:

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

436.cactusADM:
-march=barcelona -ms -fb_create fbdata(pass 1)
-fb_opt fbdata(pass 2) -Ofast -apo -LNO: prefetch_ahead=1
-HP: bdt=2m: heap=2m -LNO: heap_allocation_threshold=100

454.calculix:
-march=barcelona -ms -Ofast -CPG: load_exe=0
-CPG: ptr_load_use=0 -CPG: local_sched_alg=2 -CPG: compute_to=on
-LNO: prefetch_ahead=30 -WOPT: unroll=2
-GRPP: optimize_boundary=on -HP: bdt=2m: heap=2m

481.wrf:
-march=barcelona -ms -Ofast -LNO: blocking=off
-LNO: prefetch_ahead=10 -LANG: copyinout=off
-IPA: callee_limit=5000 -GRA: prioritize_by_density=on -m3dnow
-HP

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

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/hp-amd-linux-flags.20100330.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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