## SPEC® CFP2006 Result

**Hewlett-Packard Company**

ProLiant DL165 G5  
(2.7 GHz AMD Opteron 2384)

### CPU2006 license: 3  
Test sponsor: Hewlett-Packard Company  
Tested by: Hewlett-Packard Company  
Test date: Jan-2009  
Hardware Availability: Nov-2008  
Software Availability: Jun-2008

<table>
<thead>
<tr>
<th>Software</th>
<th>SPECfp®_rate2006 = 59.3</th>
<th>SPECfp_rate_base2006 = 53.2</th>
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<tbody>
<tr>
<td>Hardware</td>
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<td></td>
</tr>
<tr>
<td>CPU Name:</td>
<td>AMD Opteron 2384</td>
<td></td>
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<tr>
<td>CPU Characteristics:</td>
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<tr>
<td>CPU MHz:</td>
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<tr>
<td>FPU:</td>
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<td>CPU(s) enabled:</td>
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<tr>
<td>CPU(s) orderable:</td>
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<td>Primary Cache:</td>
<td>64 KB I + 64 KB D on chip per core</td>
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<tr>
<td>Secondary Cache:</td>
<td>512 KB I+D on chip per core</td>
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</table>

### Software

- Compiler: PGI Server Complete Version 7.2
- PathScale Compiler Suite Version 3.2
- Auto Parallel: Yes
- File System: ext3
- System State: Run level 3 (multi-user)
- Base Pointers: 64-bit
- Peak Pointers: 32/64-bit

### Hardware

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<th>Program</th>
<th>Copies</th>
<th>SPECfp_rate2006 = 53.2</th>
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<td>410.bwaves</td>
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<td>416.gamess</td>
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<td>465.tonto</td>
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<td>470.lbm</td>
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<td>481.wrf</td>
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<td>482.sphinx3</td>
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### Notes

- Continued on next page
Hewlett-Packard Company

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SPEC CFP2006 Result

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SPECfp_rate_base2006 = 53.2

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company
Test date: Jan-2009
Hardware Availability: Nov-2008
Software Availability: Jun-2008
L3 Cache: 6 MB I+D on chip per chip
Other Cache: None
Memory: 16 GB (4x4 GB, PC2-6400P CL5)
Disk Subsystem: 1x72 GB 15K SAS
Other Hardware: None
Other Software: binutils 2.18
32-bit and 64-bit libhugetlbfs libraries

Results Table

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<tr>
<th>Benchmark</th>
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</table>

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

Environment stack size set to 'unlimited'
Max locked memory set to 2097152
The libhugetlbfs libraries were installed using the installation rpms that came with the distribution.
PGI_HUGE_PAGES set to 896.
Total number of huge pages available is 3584.
NCPUS set to number of cores.
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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_MORECORE = "yes"
NCPUS = "4"

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.gameg: -DSPEC_CPU_LP64
433.mlilc: -DSPEC_CPU_LP64
434.zoeusmp: -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
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Base Optimization Flags

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

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):
pathf95

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 p95
435.gromacs: pathcc pathf95
481.wrf: pathcc pathf95

Peak 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 -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 -Mnomain
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: -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge
-Mprefetch=t0 -Mloop32 -Mfprelaxed -Mipa=fast -Mipa=inline
-tp barcelona-64 -Bstatic_pgi

482.sphinx3: -Mpf=indirect(pass 1) -Mpf=indirect(pass 2)
-Mipa=fast(pass 2) -Mipa=inline(pass 2)
-Mvect=cachesize:6291456 -fastsse -Mfprelaxed -Msmartalloc
-tp barcelona-64 -Bstatic_pgi

C++ benchmarks:
Peak Optimization Flags (Continued)

444.namd: -Mpfii(pass 1) -Mmpo(pass 2) -Mipa=fast(pass 2)
- Mipa=inline(pass 2) -Mvect=cachesize:6291456 -fastsse
- Munroll=n:4 - Munroll=m:8 - Msmtarloct=huget - Mnodedpchk
- Mfprelaxed --zc_eh -tp barcelona-64 -Bstatic_pgi

447.dealII: -march=barcelona -Ofast -INLINE:aggressive=on -LNO:opt=0
- OPT:alias=disjoint -fno-exceptions -m32

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_Init=off -OPT:fold_unsigned_relops=on
- OPT:malloc_algc=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 -Msmtarloct
- Mpfii=nta - Mmpo=fast - Mipa=inline
- tp barcelona-64 - Bstatic_pgi

416.gamess: -march=barcelona -fb_create fbdata(pass 1)
- fb_opt fbdata(pass 2)
- L/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 -Mfprelaxed
- Mprefetch=distance:8 -Mprefetch=t0 -Msmtarloct=huget
- Msmtarloct=hugetbss -Mipa=fast - Mipa=inline
- tp barcelona-64 - Bstatic_pgi

437.leslie3d: -Mpfii=indirect(pass 1) -Mmpo=indirect(pass 2)
- Mipa=fast(pass 2) - Mipa=inline(pass 2)
- Mvect=cachesize:6291456 -fastsse -Mvect=fuse
- Msmtarloct=huget -Mprefetch=distance:8 -Mprefetch=t0
- Mfprelaxed -tp barcelona-64 - Bstatic_pgi

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_algc=1
- L/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_algc=1
- L/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT
- L/usr/lib64 -lhugetlbfs

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Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

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

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

454.calculix:  
- Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)  
- Mipa=fast(pass 2) -Mipa=inline(pass 2)  
- Mprefetch=t0 -Mpre -Mpreflaxed -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  
- L/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT  
- L/usr/lib64 -lhugetlbfs

Peak Other Flags

C benchmarks:
- Mipa=jobs:4(pass 2)

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

Fortran benchmarks (except as noted below):
- Mipa=jobs:4(pass 2)

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

Continued on next page
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Peak Other Flags (Continued)

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.html
http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.20090710.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/pgi72_linux_flags.xml
http://www.spec.org/cpu2006/flags/CPU2006_flags.20090710.xml
http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.20090710.xml

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For other inquiries, please contact webmaster@spec.org.

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