SPEC® CFP2006 Result

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Hewlett-Packard Company

ProLiant DL165 G5
(2.3 GHz AMD Opteron 2356)

$SPECfp®\_rate2006 =$ 45.0
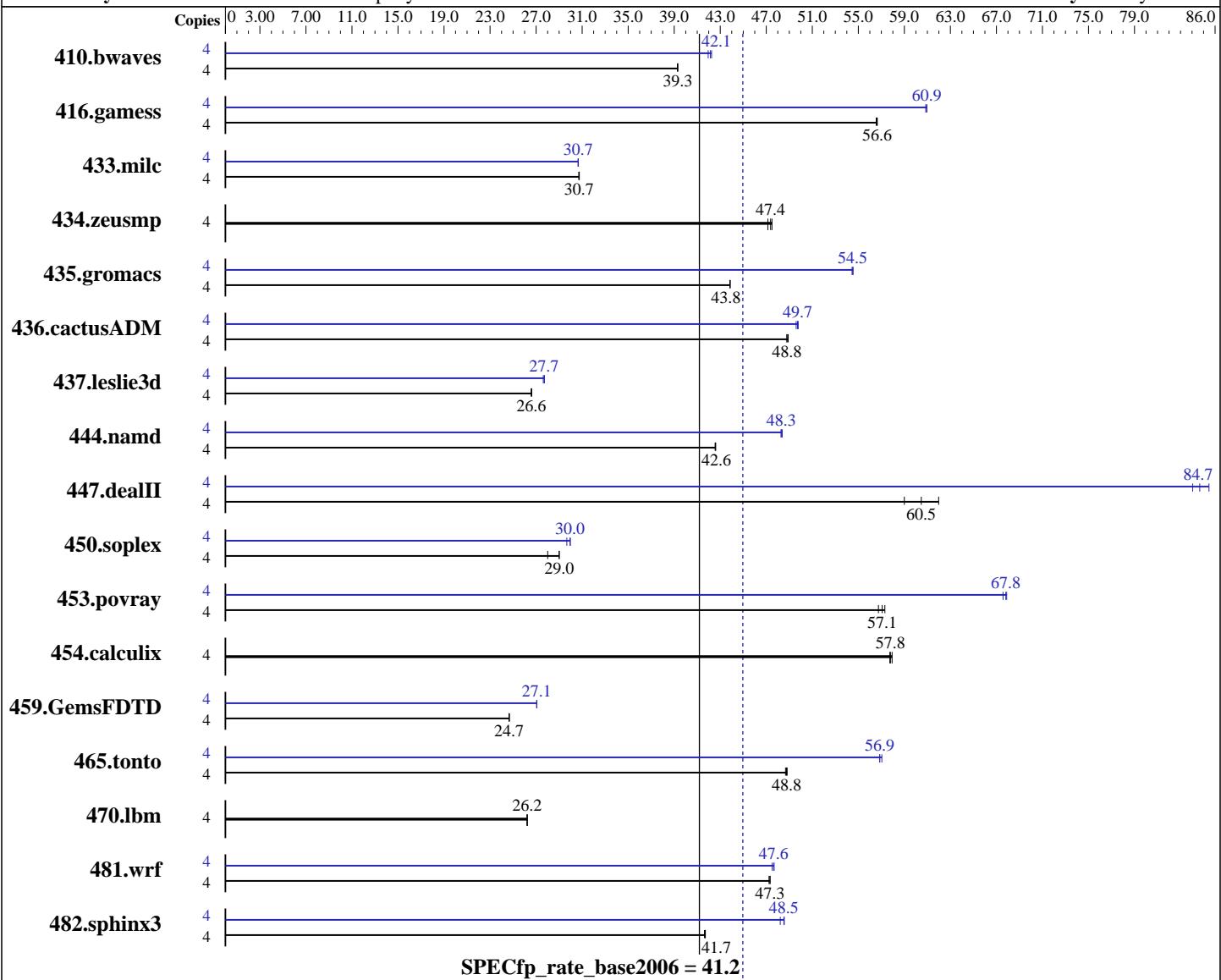
$SPECfp\_rate\_base2006 =$ 41.2

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

Test date: Mar-2008
Hardware Availability: Mar-2008
Software Availability: May-2008

Benchmark	Copies	Result
410.bwaves	4	42.1
410.bwaves	4	39.3
416.gamess	4	60.9
416.gamess	4	56.6
433.milc	4	30.7
433.milc	4	30.7
434.zeusmp	4	47.4
435.gromacs	4	54.5
435.gromacs	4	43.8
436.cactusADM	4	49.7
436.cactusADM	4	48.8
437.leslie3d	4	27.7
437.leslie3d	4	26.6
444.namd	4	48.3
444.namd	4	42.6
447.dealII	4	84.7
447.dealII	4	60.5
450.soplex	4	30.0
450.soplex	4	29.0
453.povray	4	67.8
453.povray	4	57.1
454.calculix	4	57.8
459.GemsFDTD	4	27.1
459.GemsFDTD	4	24.7
465.tonto	4	56.9
465.tonto	4	48.8
470.lbm	4	26.2
481.wrf	4	47.6
481.wrf	4	47.3
482.sphinx3	4	48.5
482.sphinx3	4	41.7

SPECfp_rate_base2006 = 41.2

SPECfp_rate2006 = 45.0

Hardware

CPU Name: AMD Opteron 2356
CPU Characteristics:
CPU MHz: 2300
FPU: Integrated
CPU(s) enabled: 4 cores, 1 chip, 4 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: SUSE Linux Enterprise Server 10 (x86_64) SP1, Kernel 2.6.16.46-0.12-smp
Compiler: PGI Server Complete Version 7.2 PathScale Compiler Suite, Release Pre-3.2 Beta
Auto Parallel: No
File System: ext2
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit

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L3 Cache:	2 MB I+D on chip per chip
Other Cache:	None
Memory:	16 GB (4x4 GB, PC2-5300P CL5)
Disk Subsystem:	1x146 GB 10 K SAS
Other Hardware:	None

Other Software: binutils-2.18.50

Results Table

Benchmark		Base							Peak					
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	4	**1383**	**39.3**	1384	39.3	1383	39.3	4	**1290**	**42.1**	1287	42.2	1296	42.0
416.gamess	4	1385	56.6	1383	56.6	**1383**	**56.6**	4	**1285**	**60.9**	1287	60.9	1285	61.0
433.milc	4	1196	30.7	1194	30.8	**1195**	**30.7**	4	**1198**	**30.7**	1197	30.7	1198	30.6
434.zeusmp	4	**768**	**47.4**	766	47.5	772	47.1	4	**768**	**47.4**	766	47.5	772	47.1
435.gromacs	4	**651**	**43.8**	651	43.9	651	43.8	4	**524**	**54.5**	524	54.5	524	54.5
436.cactusADM	4	977	48.9	**980**	**48.8**	980	48.8	4	960	49.8	**961**	**49.7**	964	49.6
437.leslie3d	4	1415	26.6	1413	26.6	**1414**	**26.6**	4	**1357**	**27.7**	1356	27.7	1361	27.6
444.namd	4	753	42.6	**753**	**42.6**	754	42.6	4	664	48.3	**664**	**48.3**	663	48.4
447.dealII	4	**757**	**60.5**	776	59.0	738	62.0	4	544	84.1	535	85.5	**540**	**84.7**
450.soplex	4	1191	28.0	1150	29.0	**1150**	**29.0**	4	1124	29.7	**1114**	**30.0**	1113	30.0
453.povray	4	**373**	**57.1**	375	56.7	371	57.3	4	315	67.6	**314**	**67.8**	313	67.9
454.calculix	4	**571**	**57.8**	572	57.7	570	57.9	4	**571**	**57.8**	572	57.7	570	57.9
459.GemsFDTD	4	1721	24.7	**1721**	**24.7**	1721	24.7	4	1568	27.1	**1569**	**27.1**	1569	27.1
465.tonto	4	809	48.7	**807**	**48.8**	806	48.8	4	**692**	**56.9**	690	57.0	692	56.9
470.lbm	4	2095	26.2	2096	26.2	**2096**	**26.2**	4	2095	26.2	2096	26.2	**2096**	**26.2**
481.wrf	4	944	47.3	946	47.2	**944**	**47.3**	4	**938**	**47.6**	940	47.5	937	47.7
482.sphinx3	4	1873	41.6	1869	41.7	**1870**	**41.7**	4	1617	48.2	**1606**	**48.5**	1605	48.6

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

Operating System Notes

```
Environment stack size set to 'unlimited'
Max locked memory set to 2097152
PGI_HUGE_PAGES set to 896.
Total number of huge pages available is 3584.
```

Base Compiler Invocation

C benchmarks:
```
pgcc
```

C++ benchmarks:
```
pgcpp
```

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Base Compiler Invocation (Continued)

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
              482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
    -fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
    -Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

C++ benchmarks:
    -fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
    -Msmartalloc=huge:150 --zc_eh -tp barcelona-64 -Bstatic_pgi

Fortran benchmarks:
    -fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
    -Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

Benchmarks using both Fortran and C:
    -fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed
    -Msmartalloc=huge:150 -tp barcelona-64 -Bstatic_pgi

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Test date: Mar-2008

Hardware Availability: Mar-2008

Software Availability: May-2008

Base Other Flags

C benchmarks:
```
-w
```

C++ benchmarks:
```
-w
```

Fortran benchmarks:
```
-w
```

Benchmarks using both Fortran and C:
```
-w
```

Peak Compiler Invocation

C benchmarks (except as noted below):
```
pgcc
```

482.sphinx3: `pathcc`

C++ benchmarks (except as noted below):
```
pathCC
```

444.namd: `pgcpp`

Fortran benchmarks (except as noted below):
```
pathf95
```

410.bwaves: `pgf95`

434.zeusmp: `pgf95`

Benchmarks using both Fortran and C (except as noted below):
```
pgcc pgf95
```

436.cactusADM: `pathcc pathf95`

481.wrf: `pathcc pathf95`

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 -Mnomain`

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Peak Portability Flags (Continued)

```
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 -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: -fastsse -Msmartalloc=huge:150 -Msafeptr -Mfprelaxed
              -Mipa=jobs:4 -Mipa=inline -Mipa=arg -Mipa=const -Mipa=ptr
              -Mipa=shape -tp barcelona-64 -Bstatic_pgi

      470.lbm: basepeak = yes

   482.sphinx3: -march=barcelona -Ofast -LNO:vintr=2
              -CG:locs_shallow_depth=1
```

C++ benchmarks:

```
     444.namd: -Mpfi(pass 1) -Mipa=jobs:4(pass 2) -Mipa=fast(pass 2)
              -Mipa=inline(pass 2) -Mpfo(pass 2) -fast -Mfprelaxed
              -Msmartalloc=huge:150 --zc_eh -Mnodepchk -Munroll=n:4
              -Munroll=m:8 -tp barcelona-64 -Bstatic_pgi

    447.dealII: -march=barcelona -Ofast -static -INLINE:aggressive=on
              -OPT:malloc_alg=1 -m32 -fno-exceptions

    450.soplex: -march=barcelona -fb_create fbdata(pass 1)
              -fb_opt fbdata(pass 2) -m32 -O3 -TENV:frame_pointer=off
              -LNO:prefetch=1 -OPT:malloc_alg=1 -CG:load_exe=0

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

Fortran benchmarks:

```
    410.bwaves: -Mpfi(pass 1) -Mipa=jobs:4(pass 2) -Mipa=fast(pass 2)
              -Mipa=inline(pass 2) -Mpfo(pass 2) -fastsse -Mfprelaxed
              -Msmartalloc -Mprefetch=distance:12 -Mprefetch=nta
              -tp barcelona-64 -Bstatic_pgi
```

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Peak Optimization Flags (Continued)

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

434.zeusmp: `basepeak = yes`

437.leslie3d: `-march=barcelona -Ofast -m3dnow -OPT:unroll_size=256`
`-CG:load_exe=0`

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

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

Benchmarks using both Fortran and C:

435.gromacs: `-fast -Mfpapprox=rsqrt -Mipa=jobs:4 -Mipa=fast`
`-Mipa=inline -Mfprelaxed -Msmartalloc=huge:150`
`-tp barcelona-64 -Bstatic_pgi`

436.cactusADM: `-march=barcelona -fb_create fbdata(pass 1)`
`-fb_opt fbdata(pass 2) -Ofast -LNO:blocking=off`

454.calculix: `basepeak = yes`

481.wrf: `-march=barcelona -Ofast -LNO:blocking=off`
`-LNO:prefetch_ahead=10 -m3dnow -LANG:copyinout=off`
`-IPA:callee_limit=5000`

Peak Other Flags

C benchmarks (except as noted below):
`-w`

482.sphinx3: `No flags used`

C++ benchmarks:

444.namd: `-w`

Fortran benchmarks:

410.bwaves: `-w`

434.zeusmp: `-w`

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Peak Other Flags (Continued)

Benchmarks using both Fortran and C:

      435.gromacs: -w

      454.calculix: -w

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/hp-PGI72-PS32-flags.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/hp-PGI72-PS32-flags.xml`

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

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