



# SPEC® CFP2006 Result

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## Hewlett-Packard Company

### SPECfp®\_rate2006 = 45.0

ProLiant DL185 G5  
(2.3 GHz AMD Opteron 2356)

### SPECfp\_rate\_base2006 = 41.1

CPU2006 license: 3

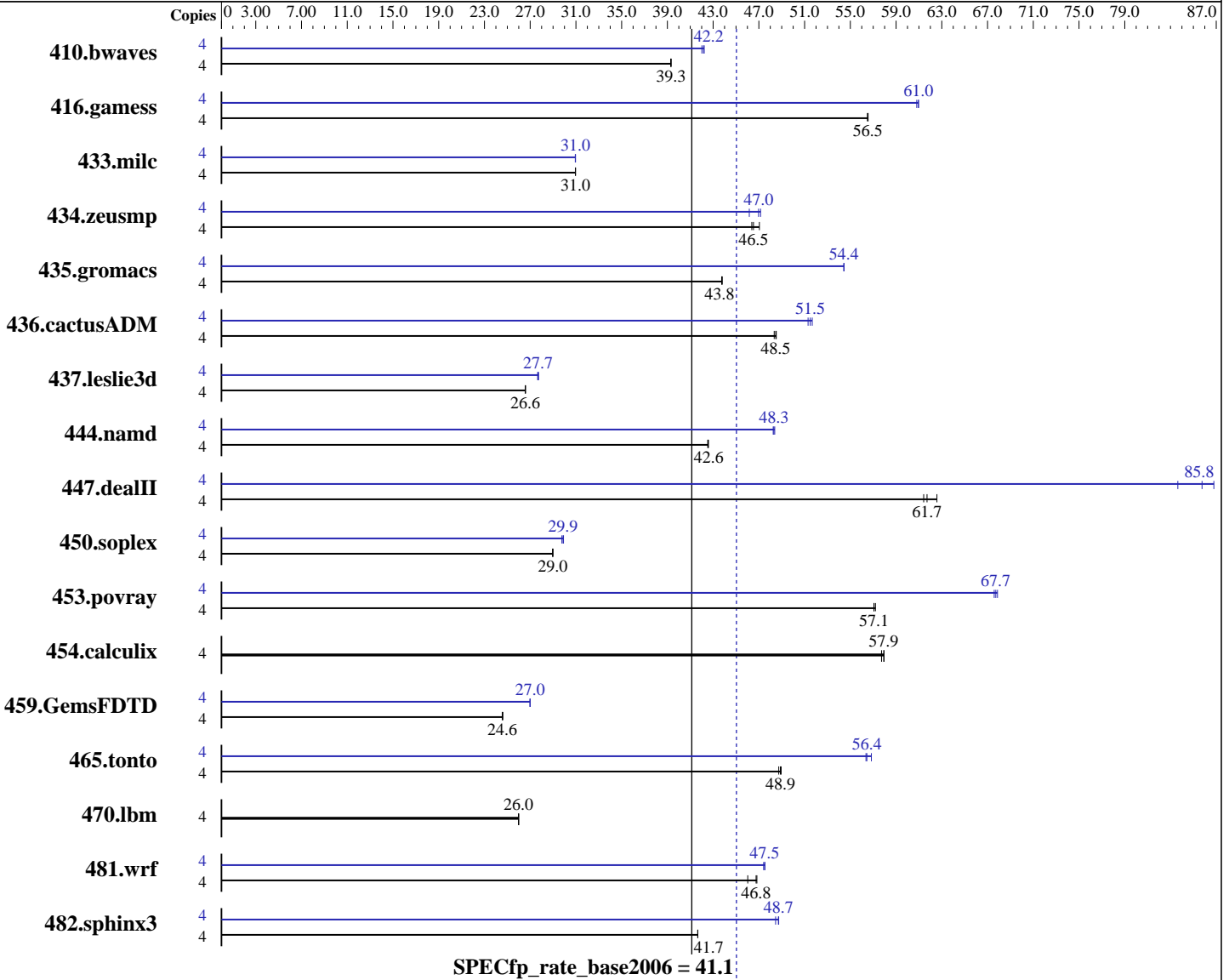
Test date: Mar-2008

Test sponsor: Hewlett-Packard Company

Hardware Availability: Mar-2008

Tested by: Hewlett-Packard Company

Software Availability: May-2008



### 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

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### 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	1384	39.3	1382	39.3	<u>1382</u>	<u>39.3</u>	4	1294	42.0	1288	42.2	<u>1289</u>	<u>42.2</u>
416.gamess	4	1385	56.6	<u>1386</u>	<u>56.5</u>	1386	56.5	4	<u>1285</u>	<u>61.0</u>	1288	60.8	1285	61.0
433.milc	4	1186	31.0	<u>1186</u>	<u>31.0</u>	1186	31.0	4	1186	31.0	<u>1186</u>	<u>31.0</u>	1187	30.9
434.zeusmp	4	<u>782</u>	<u>46.5</u>	785	46.4	774	47.0	4	772	47.1	789	46.2	<u>775</u>	<u>47.0</u>
435.gromacs	4	652	43.8	653	43.7	<u>652</u>	<u>43.8</u>	4	525	54.5	<u>525</u>	<u>54.4</u>	525	54.4
436.cactusADM	4	985	48.5	989	48.3	<u>986</u>	<u>48.5</u>	4	932	51.3	<u>928</u>	<u>51.5</u>	925	51.7
437.leslie3d	4	<u>1415</u>	<u>26.6</u>	1415	26.6	1415	26.6	4	1356	27.7	<u>1358</u>	<u>27.7</u>	1360	27.7
444.namd	4	754	42.5	<u>754</u>	<u>42.6</u>	753	42.6	4	663	48.4	<u>664</u>	<u>48.3</u>	665	48.3
447.dealII	4	745	61.4	731	62.6	<u>742</u>	<u>61.7</u>	4	547	83.6	<u>534</u>	<u>85.8</u>	527	86.8
450.soplex	4	1152	29.0	1151	29.0	<u>1151</u>	<u>29.0</u>	4	1115	29.9	<u>1117</u>	<u>29.9</u>	1120	29.8
453.povray	4	373	57.1	<u>373</u>	<u>57.1</u>	372	57.2	4	315	67.6	<u>314</u>	<u>67.7</u>	314	67.9
454.calculix	4	<u>570</u>	<u>57.9</u>	572	57.7	569	57.9	4	<u>570</u>	<u>57.9</u>	572	57.7	569	57.9
459.GemsFDTD	4	<u>1727</u>	<u>24.6</u>	1725	24.6	1728	24.6	4	1573	27.0	1572	27.0	<u>1572</u>	<u>27.0</u>
465.tonto	4	<u>805</u>	<u>48.9</u>	808	48.7	804	48.9	4	698	56.4	<u>697</u>	<u>56.4</u>	692	56.8
470.lbm	4	<u>2115</u>	<u>26.0</u>	2116	26.0	2114	26.0	4	<u>2115</u>	<u>26.0</u>	2116	26.0	2114	26.0
481.wrf	4	971	46.0	954	46.8	<u>956</u>	<u>46.8</u>	4	940	47.5	942	47.4	<u>940</u>	<u>47.5</u>
482.sphinx3	4	1871	41.7	<u>1871</u>	<u>41.7</u>	1872	41.7	4	1609	48.5	1600	48.7	<u>1601</u>	<u>48.7</u>

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.  
NCPUS set to number of cores  
numactl used to bind processes to CPUs

## Platform Notes

BIOS configuration:  
Power Regulator set to Static High Performance Mode



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## 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  
 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

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## Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:

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

## 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
```



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## 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
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: -Mphi(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.deallI: -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:

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## Peak Optimization Flags (Continued)

410.bwaves: -Mphi(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

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: -fastsse -Mfprelaxed -Msmartalloc=huge:150 -Mipa=jobs:4  
-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

437.leslie3d: -march=barcelona -Ofast -m3dnw -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 -m3dnw -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

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## Peak Other Flags (Continued)

Fortran benchmarks:

410.bwaves: -w

434.zeusmp: -w

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](mailto:webmaster@spec.org).

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