



# SPEC® CFP2006 Result

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## Hewlett-Packard Company

SPECfp®\_rate2006 = 24.5

## ProLiant BL465c (AMD Opteron 2220)

SPECfp\_rate\_base2006 = 23.1

CPU2006 license: 3

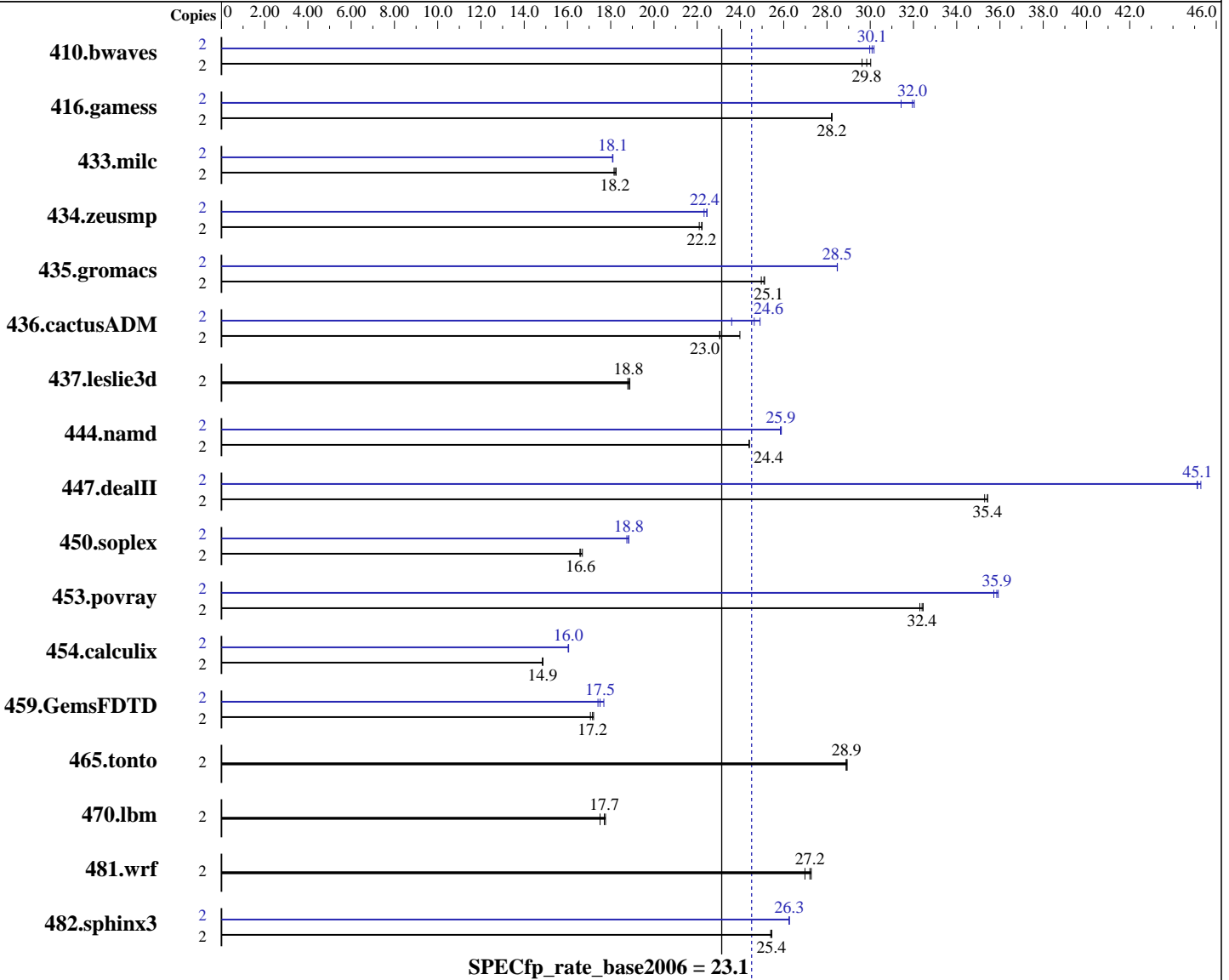
Test sponsor: Hewlett-Packard Company

Tested by: Hewlett-Packard Company

Test date: Jul-2007

Hardware Availability: Jan-2007

Software Availability: Apr-2007



### Hardware

CPU Name: AMD Opteron 2220  
 CPU Characteristics: 2.8 GHz, 1 MB L2 cache  
 CPU MHz: 2800  
 FPU: Integrated  
 CPU(s) enabled: 2 cores, 1 chip, 2 cores/chip  
 CPU(s) orderable: 1,2 chips  
 Primary Cache: 64 KB I + 64 KB D on chip per core  
 Secondary Cache: 1 MB I+D on chip per core

Continued on next page

### Software

Operating System: SuSE Linux Enterprise Server 10 (x86\_64)  
 kernel 2.6.16.21-0.8-smp  
 Compiler: QLogic PathScale Compiler Suite,  
 Release 3.0  
 Auto Parallel: No  
 File System: ext2  
 System State: Multi-user, run level 3  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit

Continued on next page



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L3 Cache: None  
Other Cache: None  
Memory: 16 GB (4x4 GB, PC2-5300P CL5)  
Disk Subsystem: 2x72 GB 10 K SAS  
Other Hardware: None

Other Software: None

## Results Table

Benchmark	Base								Peak							
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
410.bwaves	2	905	30.0	<u>911</u>	<u>29.8</u>	918	29.6	2	901	30.2	<u>903</u>	<u>30.1</u>	907	30.0		
416.gamess	2	1387	28.2	<u>1388</u>	<u>28.2</u>	1388	28.2	2	<u>1226</u>	<u>32.0</u>	1222	32.0	1246	31.4		
433.milc	2	1011	18.2	<u>1009</u>	<u>18.2</u>	1006	18.3	2	<u>1015</u>	<u>18.1</u>	1015	18.1	1014	18.1		
434.zeusmp	2	819	22.2	<u>820</u>	<u>22.2</u>	824	22.1	2	<u>811</u>	<u>22.4</u>	816	22.3	811	22.5		
435.gromacs	2	572	25.0	<u>569</u>	<u>25.1</u>	569	25.1	2	501	28.5	501	28.5	<u>501</u>	<u>28.5</u>		
436.cactusADM	2	1037	23.0	997	24.0	<u>1037</u>	<u>23.0</u>	2	1013	23.6	<u>970</u>	<u>24.6</u>	960	24.9		
437.leslie3d	2	<u>999</u>	<u>18.8</u>	996	18.9	1000	18.8	2	<u>999</u>	<u>18.8</u>	996	18.9	1000	18.8		
444.namd	2	<u>657</u>	<u>24.4</u>	657	24.4	657	24.4	2	620	25.9	621	25.8	<u>620</u>	<u>25.9</u>		
447.dealII	2	648	35.3	646	35.4	<u>646</u>	<u>35.4</u>	2	507	45.1	505	45.3	<u>507</u>	<u>45.1</u>		
450.soplex	2	999	16.7	1006	16.6	<u>1004</u>	<u>16.6</u>	2	890	18.7	886	18.8	<u>886</u>	<u>18.8</u>		
453.povray	2	329	32.3	<u>328</u>	<u>32.4</u>	328	32.4	2	<u>297</u>	<u>35.9</u>	298	35.7	296	35.9		
454.calculix	2	<u>1111</u>	<u>14.9</u>	1110	14.9	1112	14.8	2	<u>1028</u>	<u>16.0</u>	1029	16.0	1028	16.1		
459.GemsFDTD	2	1233	17.2	<u>1237</u>	<u>17.2</u>	1244	17.1	2	1219	17.4	<u>1212</u>	<u>17.5</u>	1200	17.7		
465.tonto	2	<u>681</u>	<u>28.9</u>	680	28.9	681	28.9	2	<u>681</u>	<u>28.9</u>	680	28.9	681	28.9		
470.lbm	2	1570	17.5	1547	17.8	<u>1552</u>	<u>17.7</u>	2	1570	17.5	1547	17.8	<u>1552</u>	<u>17.7</u>		
481.wrf	2	<u>821</u>	<u>27.2</u>	819	27.3	828	27.0	2	<u>821</u>	<u>27.2</u>	819	27.3	828	27.0		
482.sphinx3	2	<u>1533</u>	<u>25.4</u>	1535	25.4	1532	25.5	2	1485	26.3	1485	26.3	<u>1485</u>	<u>26.3</u>		

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

## General Notes

Node interleaving is disabled  
ulimit -s unlimited set

## Base Compiler Invocation

C benchmarks:  
pathcc

C++ benchmarks:  
pathCC

Continued on next page



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## Base Compiler Invocation (Continued)

Fortran benchmarks:  
pathf95

Benchmarks using both Fortran and C:  
pathcc pathf95

## 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  
436.cactusADM: -DSPEC\_CPU\_LP64 -fno-second-underscore  
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  
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

## Base Optimization Flags

C benchmarks:  
-Ofast

C++ benchmarks:  
-Ofast

Fortran benchmarks:  
-Ofast -OPT:malloc\_alg=1

Benchmarks using both Fortran and C:  
-Ofast -OPT:malloc\_alg=1

## Base Other Flags

C benchmarks:  
-IPA:max\_jobs=4

Continued on next page



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## Base Other Flags (Continued)

C++ benchmarks:

-IPA:max\_jobs=4

Fortran benchmarks:

-IPA:max\_jobs=4

Benchmarks using both Fortran and C:

-IPA:max\_jobs=4

## Peak Compiler Invocation

C benchmarks:

pathcc

C++ benchmarks:

pathCC

Fortran benchmarks:

pathf95

Benchmarks using both Fortran and C:

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  
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  
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



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## Peak Optimization Flags

### C benchmarks:

433.milc: -Ofast -CG:cflow=off -LNO:prefetch=1 -OPT:malloc\_alg=1

470.lbm: basepeak = yes

482.sphinx3: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -O3  
-OPT:Ofast -WOPT:aggstr=0 -m32

### C++ benchmarks:

444.namd: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -Ofast  
-fno-exceptions

447.deallI: -Ofast -static -INLINE:aggressive=on -OPT:malloc\_alg=1  
-m32 -fno-exceptions

450.soplex: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -m32 -O3  
-OPT:IEEE\_arith=3 -CG:load\_exe=0 -CG:movnti=1  
-LNO:minvariant=off -LNO:prefetch=1 -fno-exceptions

453.povray: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -Ofast  
-fno-fast-math

### Fortran benchmarks:

410.bwaves: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -O3  
-OPT:Ofast -OPT:IEEE\_arith=3 -LNO:blocking=off  
-LNO:ignore\_feedback=off

416.gamess: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -O2  
-OPT:Ofast -OPT:ro=3 -OPT:unroll\_size=256

434.zeusmp: -Ofast -CG:local\_fwd\_sched=on -LNO:blocking=off  
-LNO:interchange=off -LNO:fu=10 -LNO:full\_unroll\_outer=on

437.leslie3d: basepeak = yes

459.GemsFDTD: -Ofast -LNO:fission=2 -LNO:prefetch=0

465.tonto: basepeak = yes

### Benchmarks using both Fortran and C:

435.gromacs: -O3 -OPT:rsqrt=2 -OPT:ro=3

436.cactusADM: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -O3  
-LNO:prefetch=3 -LNO:prefetch\_ahead=5 -LNO:ou\_prod\_max=10  
-LNO:full\_unroll=5 -ipa

Continued on next page



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## Peak Optimization Flags (Continued)

454.calculix: -Ofast -LNO:simd=0 -WOPT:mem\_opnds=on

481.wrf: basepeak = yes

## Peak Other Flags

C benchmarks:

-IPA:max\_jobs=4

C++ benchmarks:

-IPA:max\_jobs=4

Fortran benchmarks:

-IPA:max\_jobs=4

Benchmarks using both Fortran and C:

-IPA:max\_jobs=4

The flags file that was used to format this result can be browsed at

[http://www.spec.org/cpu2006/flags/CPU2006\\_flags.20090714.15.html](http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.15.html)

You can also download the XML flags source by saving the following link:

[http://www.spec.org/cpu2006/flags/CPU2006\\_flags.20090714.15.xml](http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.15.xml)

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