



# SPEC® CFP2006 Result

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## Hewlett-Packard Company

SPECfp®2006 = 24.9

ProLiant BL685c G6  
(2.9 GHz AMD Opteron 8389)

SPECfp\_base2006 = 22.6

CPU2006 license: 3

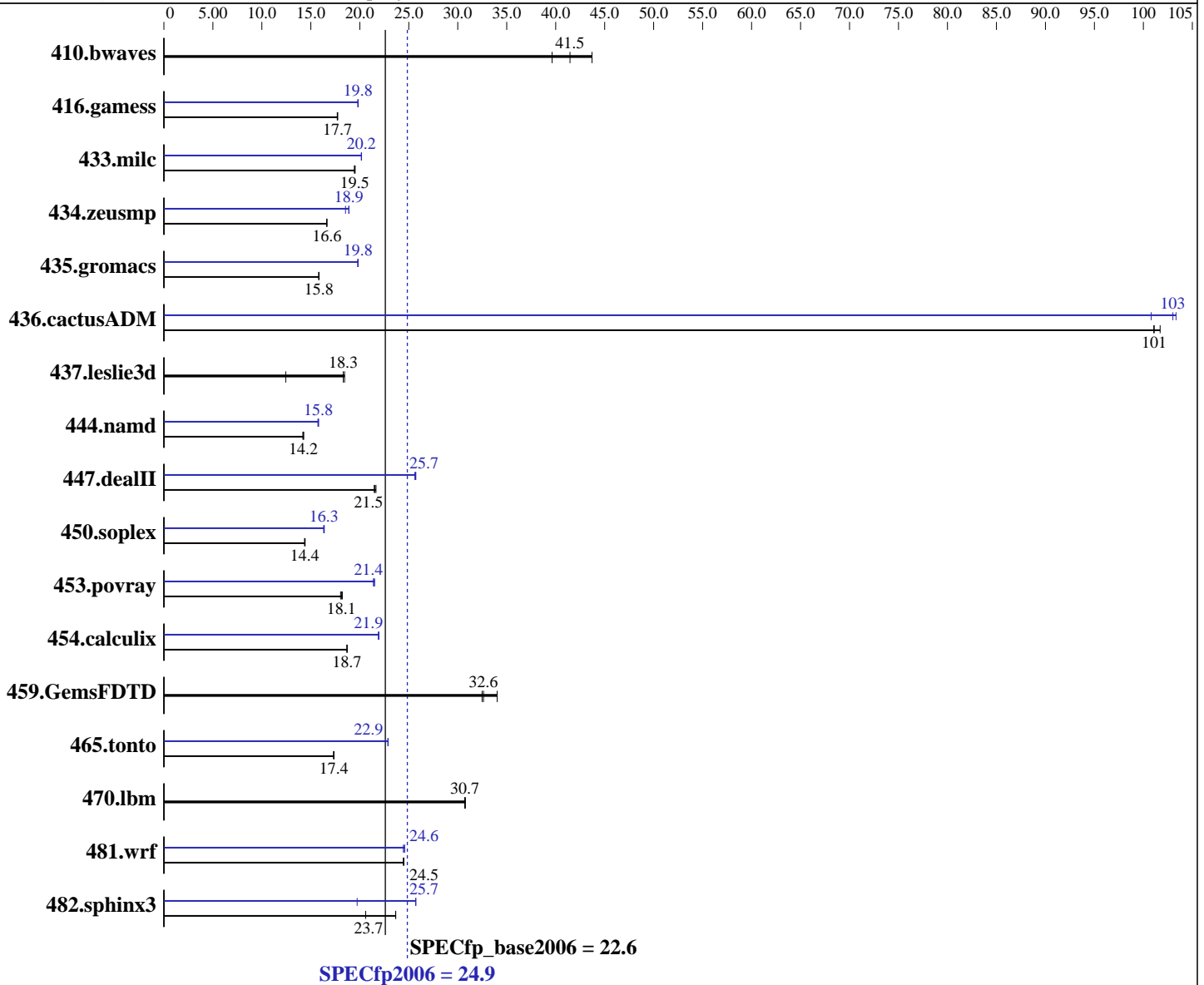
Test date: Mar-2009

Test sponsor: Hewlett-Packard Company

Hardware Availability: Apr-2009

Tested by: Hewlett-Packard Company

Software Availability: Mar-2009



### Hardware

CPU Name: AMD Opteron 8389  
 CPU Characteristics:  
 CPU MHz: 2900  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 2 chips, 4 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

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### Software

Operating System: Red Hat Enterprise Linux Server release 5.3, Kernel 2.6.18-128.el5  
 Compiler: PGI Server Complete Version 8.0  
 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

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L3 Cache: 6 MB I+D on chip per chip  
Other Cache: None  
Memory: 32 GB (8x4 GB, PC2-6400P CL5)  
Disk Subsystem: 1x72 GB 15 K SAS  
Other Hardware: None

Other Software: binutils 2.18  
32-bit and 64-bit libhugetlbfs libraries

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	311	43.7	343	39.6	<b><u>328</u></b>	<b><u>41.5</u></b>	311	43.7	343	39.6	<b><u>328</u></b>	<b><u>41.5</u></b>
416.gamess	1104	17.7	<b><u>1104</u></b>	<b><u>17.7</u></b>	1106	17.7	989	19.8	987	19.8	<b><u>988</u></b>	<b><u>19.8</u></b>
433.milc	472	19.4	<b><u>471</u></b>	<b><u>19.5</u></b>	470	19.5	456	20.1	<b><u>455</u></b>	<b><u>20.2</u></b>	455	20.2
434.zeusmp	<b><u>547</u></b>	<b><u>16.6</u></b>	547	16.6	548	16.6	482	18.9	<b><u>482</u></b>	<b><u>18.9</u></b>	491	18.5
435.gromacs	451	15.8	452	15.8	<b><u>451</u></b>	<b><u>15.8</u></b>	<b><u>360</u></b>	<b><u>19.8</u></b>	360	19.8	361	19.8
436.cactusADM	<b><u>118</u></b>	<b><u>101</u></b>	118	101	117	102	116	103	<b><u>116</u></b>	<b><u>103</u></b>	119	101
437.leslie3d	510	18.4	756	12.4	<b><u>513</u></b>	<b><u>18.3</u></b>	510	18.4	756	12.4	<b><u>513</u></b>	<b><u>18.3</u></b>
444.namd	565	14.2	562	14.3	<b><u>563</u></b>	<b><u>14.2</u></b>	<b><u>509</u></b>	<b><u>15.8</u></b>	510	15.7	508	15.8
447.dealII	<b><u>531</u></b>	<b><u>21.5</u></b>	533	21.5	528	21.7	445	25.7	<b><u>445</u></b>	<b><u>25.7</u></b>	447	25.6
450.soplex	580	14.4	<b><u>580</u></b>	<b><u>14.4</u></b>	578	14.4	509	16.4	511	16.3	<b><u>511</u></b>	<b><u>16.3</u></b>
453.povray	295	18.0	<b><u>294</u></b>	<b><u>18.1</u></b>	292	18.2	247	21.5	249	21.4	<b><u>248</u></b>	<b><u>21.4</u></b>
454.calculix	<b><u>441</u></b>	<b><u>18.7</u></b>	441	18.7	442	18.7	<b><u>376</u></b>	<b><u>21.9</u></b>	377	21.9	376	21.9
459.GemsFDTD	<b><u>325</u></b>	<b><u>32.6</u></b>	312	34.0	327	32.5	<b><u>325</u></b>	<b><u>32.6</u></b>	312	34.0	327	32.5
465.tonto	568	17.3	<b><u>567</u></b>	<b><u>17.4</u></b>	567	17.4	430	22.9	430	22.9	<b><u>430</u></b>	<b><u>22.9</u></b>
470.lbm	<b><u>447</u></b>	<b><u>30.7</u></b>	446	30.8	447	30.7	<b><u>447</u></b>	<b><u>30.7</u></b>	446	30.8	447	30.7
481.wrf	457	24.5	<b><u>456</u></b>	<b><u>24.5</u></b>	456	24.5	<b><u>455</u></b>	<b><u>24.6</u></b>	457	24.4	455	24.6
482.sphinx3	<b><u>824</u></b>	<b><u>23.7</u></b>	946	20.6	823	23.7	<b><u>758</u></b>	<b><u>25.7</u></b>	988	19.7	757	25.7

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  
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 7168.  
NCPUS set to number of cores

## Platform Notes

BIOS configuration:  
Power Regulator set to Static High Performance Mode



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## General Notes

Environment variables set by runspec before the start of the run:  
HUGETLB\_MORECORE = "yes"  
NCPUS = "8"

## 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:

-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mconcur  
-Mfprelaxed -Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic\_pgi

Continued on next page



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## Base Optimization Flags (Continued)

C++ benchmarks:

`-Mvect=cachesize:6291456 -fastsse -Mconcur -Msmartalloc=huge  
-Mfprelaxed --zc_eh -Mipa=fast -Mipa=inline -tp barcelona-64  
-Bstatic_pgi`

Fortran benchmarks:

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

Benchmarks using both Fortran and C:

`-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mconcur  
-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):

`pgf95`

`416.gamess: pathf95`

`465.tonto: pathf95`

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## Peak Compiler Invocation (Continued)

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

pgcc pgf95

435.gromacs: 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  
 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  
 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 -Msafepttr -Mconcur -Mfprelaxed  
-Mipa=inline -Mipa=arg -Mipa=const -Mipa=ptr -Mipa=shape  
-tp barcelona-64

470.lbm: basepeak = yes

482.sphinx3: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)  
-Mipa=fast(pass 2) -Mipa=inline(pass 2)  
-Mvect=cachesize:6291456 -fastsse -Mfprelaxed -Msmartalloc  
-tp barcelona-64 -Bstatic\_pgi

C++ benchmarks:

444.namd: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)  
-Mipa=inline(pass 2) -Mvect=cachesize:6291456 -fastsse  
-Munroll=n:4 -Munroll=m:8 -Msmartalloc=huge -Mnodepchk  
-Mfprelaxed --zc\_eh -tp barcelona-64 -Bstatic\_pgi

Continued on next page



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## Peak Optimization Flags (Continued)

447.dealIII: -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\_Inf=off -OPT:fold\_unsigned\_relops=on  
-OPT:malloc\_alg=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: basepeak = yes

416.gamess: -march=barcelona -fb\_create fbdata(pass 1)  
-fb\_opt fbdata(pass 2)  
-Wl,-T/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 -Mconcur  
-Mprefetch=distance:8 -Mprefetch=t0 -Msmartalloc=huge  
-Msmartalloc=hugebss -Mipa=fast -Mipa=inline  
-tp barcelona-64 -Bstatic\_pgi

437.leslie3d: basepeak = yes

459.GemsFDTD: basepeak = yes

465.tonto: -march=barcelona -Ofast -OPT:alias=no\_f90\_pointer\_alias  
-LNO:blocking=off -CG:load\_exe=1 -IPA:plimit=525  
-OPT:malloc\_alg=1  
-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT  
-L/usr/lib64 -lhugetlbfs

### Benchmarks using both Fortran and C:

435.gromacs: -march=barcelona -Ofast -OPT:rsqrt=2 -OPT:malloc\_alg=1  
-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf\_x86\_64.xBDT  
-L/usr/lib64 -lhugetlbfs

436.cactusADM: -Mvect=cachesize:6291456 -fastsse -Mconcur  
-Msmartalloc=huge -Mfprelaxed -Mipa=fast -Mipa=inline  
-tp barcelona-64 -Bstatic\_pgi

454.calculix: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)  
-Mipa=fast(pass 2) -Mipa=inline(pass 2)  
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge  
-Mprefetch=t0 -Mpre -Mfprelaxed -tp barcelona-64

Continued on next page



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## Peak Optimization Flags (Continued)

454.calculix (continued):

-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  
-Wl,-T/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

416.gamess: 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

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/pgi80\\_linux\\_flags.20090710.00.html](http://www.spec.org/cpu2006/flags/pgi80_linux_flags.20090710.00.html)

[http://www.spec.org/cpu2006/flags/CPU2006\\_flags.20090710.html](http://www.spec.org/cpu2006/flags/CPU2006_flags.20090710.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/pgi80\\_linux\\_flags.20090710.00.xml](http://www.spec.org/cpu2006/flags/pgi80_linux_flags.20090710.00.xml)

[http://www.spec.org/cpu2006/flags/CPU2006\\_flags.20090710.xml](http://www.spec.org/cpu2006/flags/CPU2006_flags.20090710.xml)

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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