



# SPEC<sup>®</sup> CFP2006 Result

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## Hewlett-Packard Company

SPECfp<sup>®</sup>2006 = 24.0

ProLiant DL585 G6  
(2.6 GHz AMD Opteron 8435)

SPECfp\_base2006 = 22.2

CPU2006 license: 3

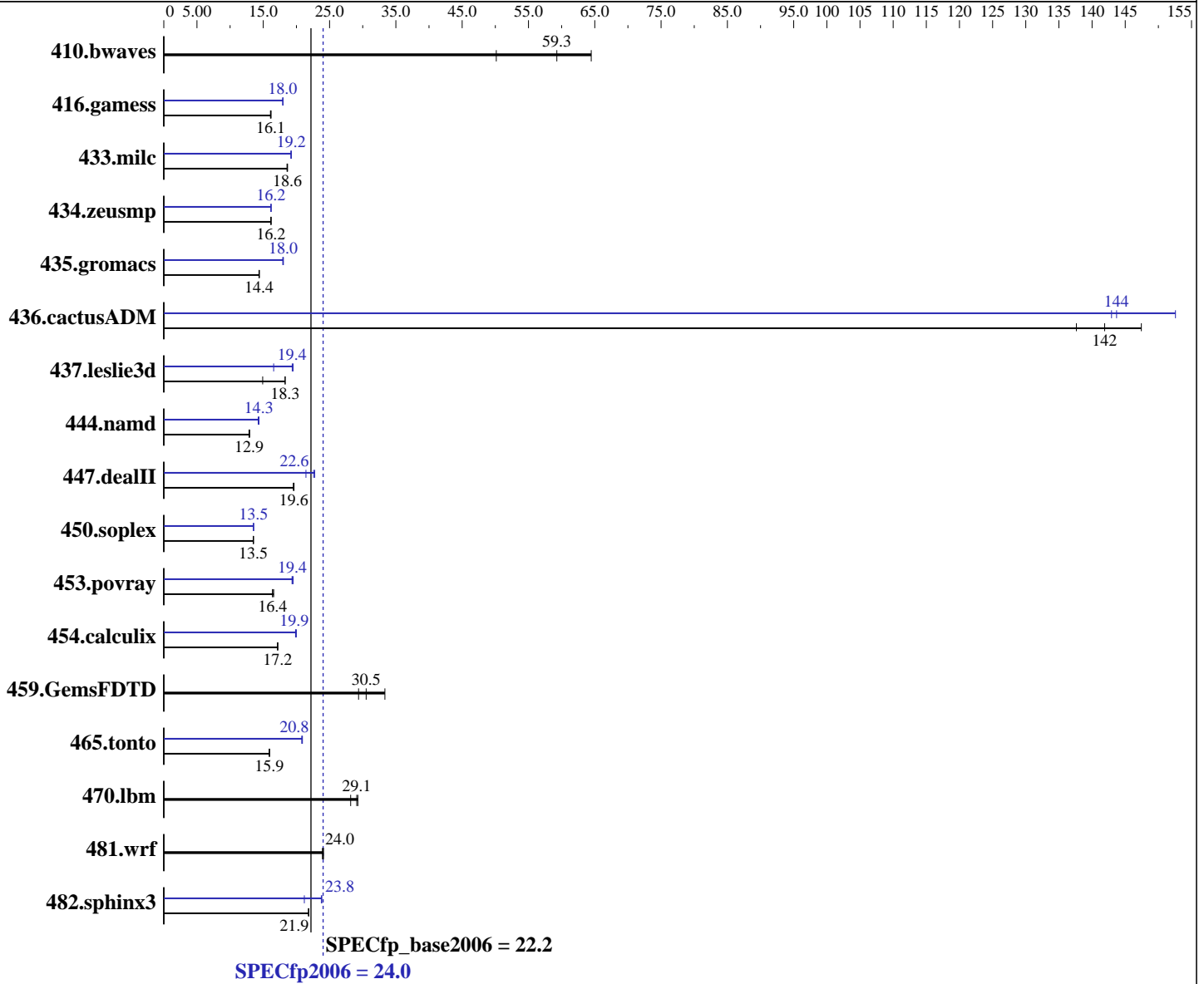
Test date: May-2009

Test sponsor: Hewlett-Packard Company

Hardware Availability: Jun-2009

Tested by: Hewlett-Packard Company

Software Availability: May-2008



**Hardware**

CPU Name: AMD Opteron 8435  
 CPU Characteristics:  
 CPU MHz: 2600  
 FPU: Integrated  
 CPU(s) enabled: 12 cores, 2 chips, 6 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

**Software**

Operating System: Red Hat Enterprise Linux Server release 5.3, Advanced Platform, 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: 1x146 GB 10 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	271	50.1	211	64.5	<u>229</u>	<u>59.3</u>	271	50.1	211	64.5	<u>229</u>	<u>59.3</u>
416.gamess	<u>1213</u>	<u>16.1</u>	1217	16.1	1211	16.2	<u>1091</u>	<u>18.0</u>	1088	18.0	1092	17.9
433.milc	<u>493</u>	<u>18.6</u>	494	18.6	492	18.7	477	19.2	<u>478</u>	<u>19.2</u>	479	19.2
434.zeusmp	563	16.2	<u>563</u>	<u>16.2</u>	563	16.2	562	16.2	563	16.2	<u>563</u>	<u>16.2</u>
435.gromacs	496	14.4	<u>496</u>	<u>14.4</u>	497	14.4	398	17.9	<u>396</u>	<u>18.0</u>	396	18.0
436.cactusADM	81.1	147	86.8	138	<u>84.2</u>	<u>142</u>	83.6	143	78.3	153	<u>83.2</u>	<u>144</u>
437.leslie3d	630	14.9	<u>514</u>	<u>18.3</u>	513	18.3	<u>485</u>	<u>19.4</u>	567	16.6	482	19.5
444.namd	619	13.0	<u>623</u>	<u>12.9</u>	624	12.8	563	14.2	<u>559</u>	<u>14.3</u>	559	14.3
447.dealII	<u>583</u>	<u>19.6</u>	582	19.6	586	19.5	534	21.4	<u>506</u>	<u>22.6</u>	503	22.8
450.soplex	<u>617</u>	<u>13.5</u>	617	13.5	617	13.5	<u>616</u>	<u>13.5</u>	616	13.5	617	13.5
453.povray	324	16.4	<u>324</u>	<u>16.4</u>	321	16.6	273	19.5	275	19.3	<u>274</u>	<u>19.4</u>
454.calculix	480	17.2	<u>480</u>	<u>17.2</u>	481	17.2	415	19.9	<u>414</u>	<u>19.9</u>	413	20.0
459.GemsFDTD	318	33.3	<u>348</u>	<u>30.5</u>	361	29.4	318	33.3	<u>348</u>	<u>30.5</u>	361	29.4
465.tonto	617	16.0	<u>618</u>	<u>15.9</u>	618	15.9	472	20.8	<u>472</u>	<u>20.8</u>	471	20.9
470.lbm	<u>472</u>	<u>29.1</u>	488	28.2	469	29.3	<u>472</u>	<u>29.1</u>	488	28.2	469	29.3
481.wrf	<u>465</u>	<u>24.0</u>	464	24.1	467	23.9	<u>465</u>	<u>24.0</u>	464	24.1	467	23.9
482.sphinx3	894	21.8	<u>892</u>	<u>21.9</u>	891	21.9	920	21.2	818	23.8	<u>820</u>	<u>23.8</u>

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

## Operating System Notes

'ulimit -s unlimited' was used to set environment stack size  
'ulimit -l 2457600' was used to set environment locked pages in memory limit  
The libhugetlbfs libraries were installed using the installation rpms that came with the distribution.  
PGI\_HUGE\_PAGES set to 450.  
Total number of huge pages available is 5400.  
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 = "12"

## 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

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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:11

C++ benchmarks:

-Mipa=jobs:11

Fortran benchmarks:

-Mipa=jobs:11

Benchmarks using both Fortran and C:

-Mipa=jobs:11

## 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

## 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\_CASE\_FLAG -DSPEC\_CPU\_LINUX  
 482.sphinx3: -DSPEC\_CPU\_LP64

## Peak Optimization Flags

C benchmarks:

433.milc: -fastsse -Msmartalloc=huge -Msafeptr -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

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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: -Mphi=indirect(pass 1) -Mpfo=indirect(pass 2)  
-Mconcur=noaltcode(pass 2) -Mipa=fast(pass 2)  
-Mipa=inline(pass 2) -Mvect=cachesize:6291456 -fastsse  
-Mvect=fuse -Msmartalloc=huge -Mprefetch=distance:8  
-Mprefetch=t0 -Mfprelaxed -tp barcelona-64 -Bstatic\_pgi

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

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## Peak Optimization Flags (Continued)

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  
-Bstatic\_pgi

481.wrf: basepeak = yes

## Peak Other Flags

C benchmarks:

-Mipa=jobs:11(pass 2)

C++ benchmarks:

444.namd: -Mipa=jobs:11(pass 2)

Fortran benchmarks (except as noted below):

-Mipa=jobs:11

416.gamess: No flags used

465.tonto: No flags used

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

-Mipa=jobs:11

435.gromacs: 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.html](http://www.spec.org/cpu2006/flags/pgi80_linux_flags.html)

<http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.20090710.00.html>

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

You can also download the XML flags sources by saving the following links:

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

<http://www.spec.org/cpu2006/flags/amd-platform-amd909gh.20090710.00.xml>

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

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