



SPEC® CFP2006 Result

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Hewlett-Packard Company

SPECfp®_rate2006 = 88.8

ProLiant DL165 G5
(2.3 GHz AMD Opteron 2356)

SPECfp_rate_base2006 = 81.3

CPU2006 license: 3

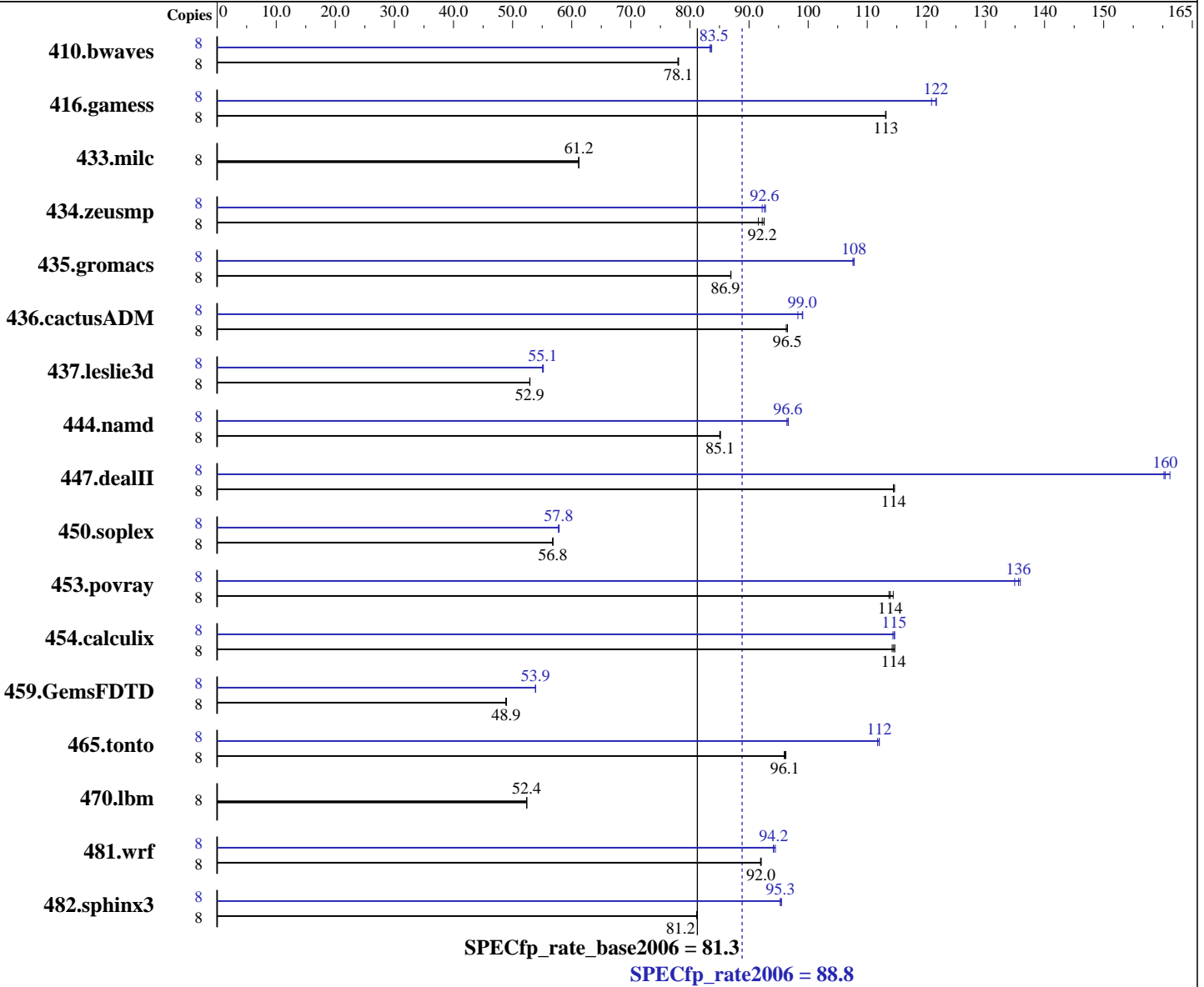
Test date: Mar-2008

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: 8 cores, 2 chips, 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: 32 GB (8x4 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	8	1395	78.0	1393	78.1	1393	78.1	8	1302	83.5	1299	83.7	1303	83.4
416.gamess	8	1384	113	1384	113	1385	113	8	1287	122	1288	122	1296	121
433.milc	8	1200	61.2	1200	61.2	1200	61.2	8	1200	61.2	1200	61.2	1200	61.2
434.zeusmp	8	789	92.2	787	92.5	795	91.6	8	785	92.8	786	92.6	789	92.2
435.gromacs	8	657	86.9	657	86.9	657	86.9	8	530	108	531	108	530	108
436.cactusADM	8	993	96.3	991	96.5	991	96.5	8	965	99.1	966	99.0	973	98.3
437.leslie3d	8	1421	52.9	1422	52.9	1420	52.9	8	1362	55.2	1365	55.1	1365	55.1
444.namd	8	754	85.1	753	85.2	754	85.0	8	664	96.7	666	96.4	664	96.6
447.dealII	8	800	114	799	114	798	115	8	571	160	571	160	568	161
450.soplex	8	1174	56.8	1175	56.8	1175	56.8	8	1155	57.8	1155	57.8	1153	57.9
453.povray	8	374	114	374	114	372	114	8	313	136	315	135	314	136
454.calculix	8	578	114	576	115	577	114	8	576	115	576	115	577	114
459.GemsFDTD	8	1737	48.9	1734	49.0	1736	48.9	8	1575	53.9	1575	53.9	1576	53.9
465.tonto	8	819	96.1	818	96.2	820	96.0	8	703	112	703	112	704	112
470.lbm	8	2098	52.4	2098	52.4	2099	52.4	8	2098	52.4	2098	52.4	2099	52.4
481.wrf	8	972	91.9	971	92.1	971	92.0	8	949	94.2	946	94.5	950	94.1
482.sphinx3	8	1921	81.2	1920	81.2	1921	81.2	8	1633	95.5	1636	95.3	1636	95.3

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 7168.
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: basepeak = yes
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.dealIII: -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: -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

```

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Peak Optimization Flags (Continued)

410.bwaves (continued):

-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 -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: -fastsse -Mfprelaxed -Msmartalloc=huge:150 -Mipa=jobs:4

-Mipa=fast -Mipa=inline -tp barcelona-64 -Bstatic_pgi

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:

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Peak Other Flags (Continued)

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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