



SPEC® CFP2006 Result

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Hewlett-Packard Company ProLiant BL685c

SPECfp®_rate2006 = 85.4

SPECfp_rate_base2006 = 80.5

CPU2006 license: 3

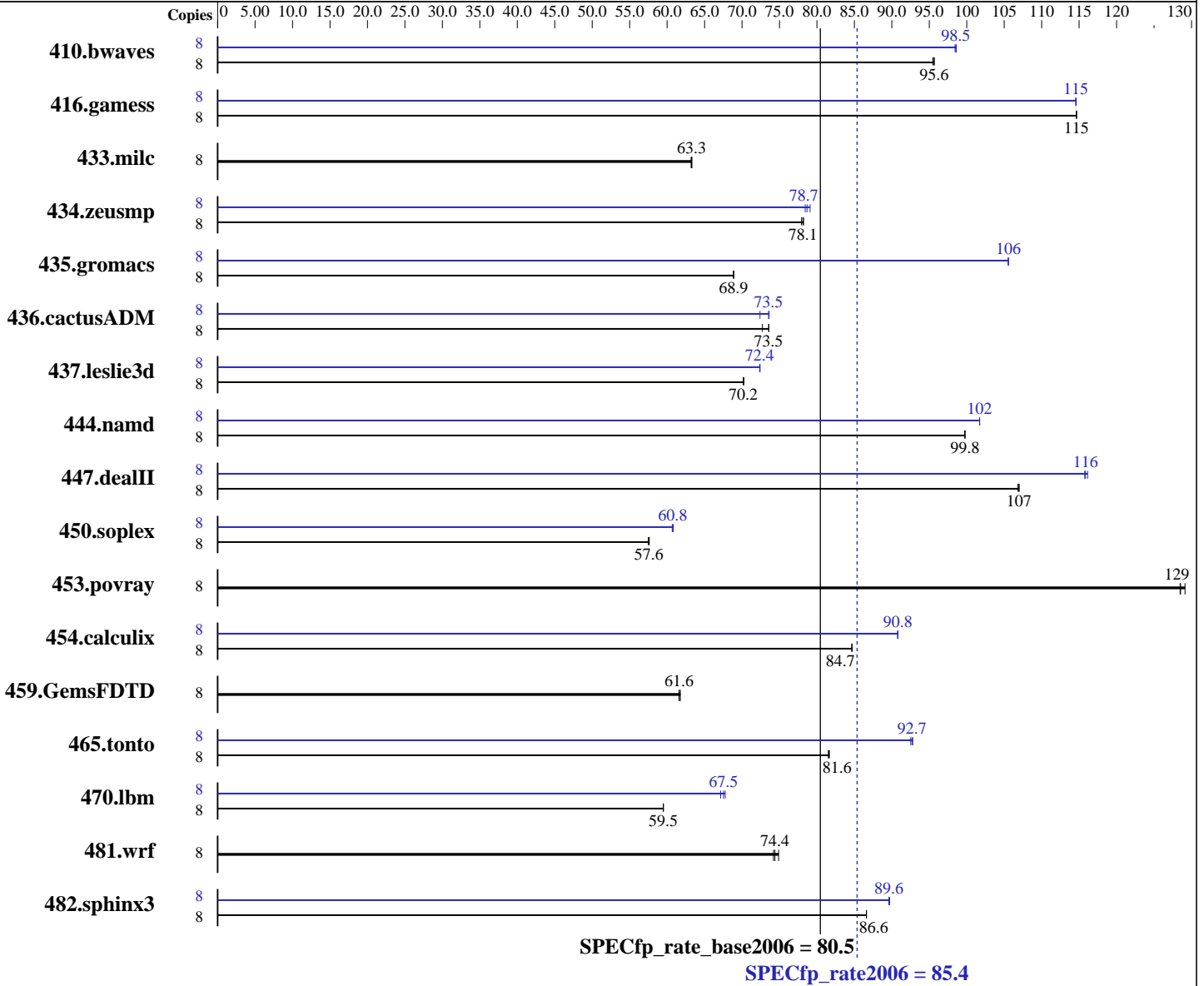
Test sponsor: Hewlett-Packard Company

Tested by: Hewlett-Packard Company

Test date: Feb-2007

Hardware Availability: Sep-2006

Software Availability: Jan-2007



Hardware

CPU Name: AMD Opteron 8220
 CPU Characteristics:
 CPU MHz: 2800
 FPU: Integrated
 CPU(s) enabled: 8 cores, 4 chips, 2 cores/chip
 CPU(s) orderable: 2,4 chips
 Primary Cache: 64 KB I + 64 KB D on chip per core
 Secondary Cache: 1 MB I+D on chip per core

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Software

Operating System: Solaris 10 6/06
 Compiler: Sun Studio 11 with Patches
 Auto Parallel: No
 File System: ufs
 System State: Default
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit
 Other Software: None



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L3 Cache: None
Other Cache: None
Memory: 64 GB (16x2 GB, PC2-5300P CL5)
Disk Subsystem: 72 GB 10K SAS
Other Hardware: None

Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---------------|--------|-------------|-------------|-------------|-------------|-------------|-------------|--------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 8 | 1139 | 95.5 | 1137 | 95.7 | 1137 | 95.6 | 8 | 1103 | 98.6 | 1103 | 98.5 | 1104 | 98.4 |
| 416.gamess | 8 | 1366 | 115 | 1366 | 115 | 1367 | 115 | 8 | 1367 | 115 | 1367 | 115 | 1367 | 115 |
| 433.milc | 8 | 1162 | 63.2 | 1160 | 63.3 | 1161 | 63.3 | 8 | 1162 | 63.2 | 1160 | 63.3 | 1161 | 63.3 |
| 434.zeusmp | 8 | 934 | 77.9 | 931 | 78.2 | 932 | 78.1 | 8 | 928 | 78.4 | 921 | 79.1 | 925 | 78.7 |
| 435.gromacs | 8 | 829 | 68.9 | 829 | 68.9 | 829 | 68.9 | 8 | 541 | 106 | 541 | 106 | 541 | 106 |
| 436.cactusADM | 8 | 1315 | 72.7 | 1300 | 73.5 | 1299 | 73.6 | 8 | 1320 | 72.4 | 1299 | 73.6 | 1300 | 73.5 |
| 437.leslie3d | 8 | 1072 | 70.2 | 1072 | 70.2 | 1070 | 70.3 | 8 | 1039 | 72.4 | 1039 | 72.4 | 1039 | 72.4 |
| 444.namd | 8 | 643 | 99.8 | 643 | 99.7 | 643 | 99.8 | 8 | 631 | 102 | 631 | 102 | 631 | 102 |
| 447.dealII | 8 | 857 | 107 | 856 | 107 | 855 | 107 | 8 | 788 | 116 | 790 | 116 | 791 | 116 |
| 450.soplex | 8 | 1159 | 57.6 | 1158 | 57.6 | 1161 | 57.5 | 8 | 1098 | 60.8 | 1099 | 60.7 | 1097 | 60.8 |
| 453.povray | 8 | 331 | 129 | 331 | 128 | 330 | 129 | 8 | 331 | 129 | 331 | 128 | 330 | 129 |
| 454.calculix | 8 | 780 | 84.7 | 779 | 84.7 | 779 | 84.7 | 8 | 727 | 90.8 | 727 | 90.8 | 727 | 90.8 |
| 459.GemsFDTD | 8 | 1377 | 61.6 | 1378 | 61.6 | 1374 | 61.8 | 8 | 1377 | 61.6 | 1378 | 61.6 | 1374 | 61.8 |
| 465.tonto | 8 | 966 | 81.5 | 965 | 81.6 | 964 | 81.7 | 8 | 851 | 92.5 | 849 | 92.7 | 848 | 92.8 |
| 470.lbm | 8 | 1848 | 59.5 | 1848 | 59.5 | 1847 | 59.5 | 8 | 1637 | 67.1 | 1628 | 67.5 | 1622 | 67.8 |
| 481.wrf | 8 | 1201 | 74.4 | 1193 | 74.9 | 1204 | 74.2 | 8 | 1201 | 74.4 | 1193 | 74.9 | 1204 | 74.2 |
| 482.sphinx3 | 8 | 1801 | 86.6 | 1800 | 86.6 | 1800 | 86.6 | 8 | 1740 | 89.6 | 1740 | 89.6 | 1738 | 89.7 |

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

Operating System Notes

Processes were bound to cores using "submit" and "pbind".

```
ulimit -s unlimited (shell): increases stack
```

The following patches were applied to Sun Studio 11 compiler:

```
120759-09 : x86/x64
121016-05 : x86 C
121020-04 : x86 F90
121022-02 : x86 F90
121018-08 : x86 C++
```



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Platform Notes

Node Interleaving was disabled in BIOS

Base Compiler Invocation

C benchmarks:
cc

C++ benchmarks:
CC

Fortran benchmarks:
f90

Benchmarks using both Fortran and C:
cc f90

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
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_WORDS_LITTLEENDIAN
482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:
-fast -xipo=2 -xarch=amd64a

C++ benchmarks:
-fast -xipo=2 -xarch=amd64a -library=stlport4

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Base Optimization Flags (Continued)

Fortran benchmarks:

-fast -xipo=2 -xarch=amd64a

Benchmarks using both Fortran and C:

-fast(cc) -fast(f90) -xipo=2 -xarch=amd64a

Base Other Flags

C benchmarks:

-V

C++ benchmarks:

-verbose=version

Fortran benchmarks:

-V

Benchmarks using both Fortran and C:

-V

Peak Compiler Invocation

C benchmarks:

cc

C++ benchmarks:

CC

Fortran benchmarks:

f90

Benchmarks using both Fortran and C:

cc f90

Peak Portability Flags

433.milc: -DSPEC_CPU_LP64
436.cactusADM: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_WORDS_LITTLEENDIAN



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Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: -fast -xarch=amd64a -xpagesize=2m -W2, -Ainline:inc=200
-W2, -Ainline:cs=500 -xprefetch_level=3

482.sphinx3: -fast -xarch=amd64a -xrestrict -xipo=2 -xprefetch=auto
-xpagesize=2m -Wd, -iropt-prof -W2, -Ashort_ldst:ldld
-W2, -Ainline:rs=50 -M /usr/lib/ld/map.bssalign

C++ benchmarks:

444.namd: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xarch=amd64a
-xipo=2 -library=stlport4

447.deallI: -fast -xarch=amd64a -xipo=2 -xvector
-Qoption iropt -Abcopy -xalias_level -xrestrict
-xregs=frameptr -library=stlport4

450.soplex: -fast -xipo=2 -xarch=sse2a -library=stlport4

453.povray: basepeak = yes

Fortran benchmarks:

410.bwaves: -fast -xarch=amd64a -unroll=5 -stackvar -x04 -xipo=2
-xprefetch_level=3 -Qoption iropt -Rloop_dist

416.gamess: -fast -xarch=amd64a -xipo=2 -xprefetch_level=3

434.zeusmp: -fast -xarch=amd64a -xipo=2 -xregs=frameptr

437.leslie3d: -fast -xipo=2 -xarch=sse2a

459.GemsFDTD: basepeak = yes

465.tonto: -xprofile=collect:./feedback(pass 1)
-xprofile=use:./feedback(pass 2) -fast -xarch=amd64a
-xipo=2 -xvector=lib -xalias -xdepend -lbsdmalloc

Benchmarks using both Fortran and C:

435.gromacs: -fast(cc) -fast(f90) -xipo=2 -xarch=amd64a -Wu, -fsimple=3
-Qoption ube -fsimple=3

436.cactusADM: -fast(cc) -fast(f90) -xipo=2 -xarch=amd64a

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Peak Optimization Flags (Continued)

```
454.calculix: -fast(cc) -fast(f90) -xarch=amd64a -xpagesize=2m
-xprefetch=auto -xprefetch_level=3 -W2,-Ainline:inc=200
-W2,-Ainline:cs=500 -unroll=5 -stackvar -xO4 -xipo=2
-Qoption iropt -Rloop_dist
```

```
481.wrf: basepeak = yes
```

Peak Other Flags

C benchmarks:

```
-V
```

C++ benchmarks:

```
-verbose=version
```

Fortran benchmarks:

```
-V
```

Benchmarks using both Fortran and C:

```
-V
```

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

<http://www.spec.org/cpu2006/flags/HP-Solaris-Sun-Studio-Opteron.html>

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

<http://www.spec.org/cpu2006/flags/HP-Solaris-Sun-Studio-Opteron.xml>

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For other inquiries, please contact webmaster@spec.org.

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