



SPEC® CFP2006 Result

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IBM Corporation

SPECfp®2006 = 13.7

IBM System x3655 (AMD Opteron 2220)

SPECfp_base2006 = 12.9

CPU2006 license: 11

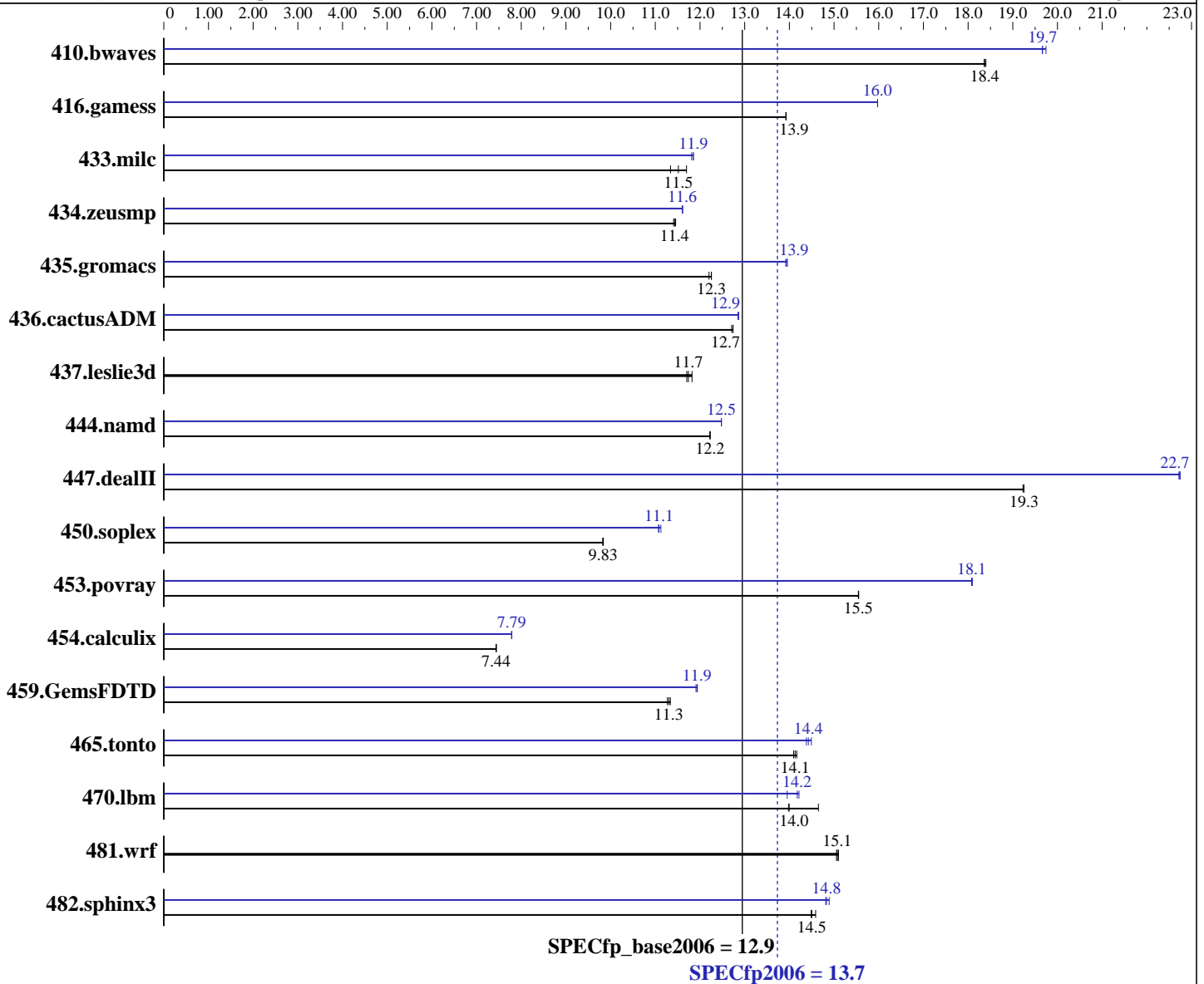
Test date: Feb-2007

Test sponsor: IBM Corporation

Hardware Availability: Apr-2007

Tested by: IBM Corporation

Software Availability: Aug-2006



Hardware

CPU Name: AMD Opteron 2220
 CPU Characteristics:
 CPU MHz: 2800
 FPU: Integrated
 CPU(s) enabled: 4 cores, 2 chips, 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: SLES9 SP3 for AMD64/EM64T
 Compiler: QLogic PathScale Compiler Suite 2.5
 Auto Parallel: No
 File System: ext3
 System State: Multi-user, run level 3
 Base Pointers: 64-bit
 Peak Pointers: 32/64-bit
 Other Software: None



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L3 Cache: None
Other Cache: None
Memory: 16 GB (8 x 2GB DDR2-5300 ECC)
Disk Subsystem: 1 x 74 GB SAS, 15000 RPM
Other Hardware: None

Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|-------------|-------------|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 740 | 18.4 | 739 | 18.4 | 740 | 18.4 | 691 | 19.7 | 688 | 19.7 | 691 | 19.7 |
| 416.gamess | 1406 | 13.9 | 1406 | 13.9 | 1406 | 13.9 | 1226 | 16.0 | 1226 | 16.0 | 1226 | 16.0 |
| 433.milc | 810 | 11.3 | 797 | 11.5 | 785 | 11.7 | 777 | 11.8 | 775 | 11.9 | 775 | 11.9 |
| 434.zeusmp | 794 | 11.5 | 796 | 11.4 | 798 | 11.4 | 784 | 11.6 | 784 | 11.6 | 784 | 11.6 |
| 435.gromacs | 583 | 12.3 | 585 | 12.2 | 583 | 12.3 | 512 | 13.9 | 513 | 13.9 | 512 | 14.0 |
| 436.cactusADM | 938 | 12.7 | 938 | 12.7 | 940 | 12.7 | 929 | 12.9 | 929 | 12.9 | 930 | 12.9 |
| 437.leslie3d | 795 | 11.8 | 801 | 11.7 | 803 | 11.7 | 795 | 11.8 | 801 | 11.7 | 803 | 11.7 |
| 444.namd | 656 | 12.2 | 656 | 12.2 | 656 | 12.2 | 643 | 12.5 | 643 | 12.5 | 643 | 12.5 |
| 447.dealII | 594 | 19.3 | 594 | 19.3 | 595 | 19.2 | 504 | 22.7 | 503 | 22.7 | 503 | 22.7 |
| 450.soplex | 848 | 9.84 | 849 | 9.83 | 849 | 9.82 | 750 | 11.1 | 753 | 11.1 | 753 | 11.1 |
| 453.povray | 342 | 15.6 | 342 | 15.5 | 342 | 15.5 | 294 | 18.1 | 294 | 18.1 | 294 | 18.1 |
| 454.calculix | 1108 | 7.44 | 1110 | 7.43 | 1110 | 7.44 | 1059 | 7.79 | 1059 | 7.79 | 1060 | 7.78 |
| 459.GemsFDTD | 941 | 11.3 | 939 | 11.3 | 936 | 11.3 | 891 | 11.9 | 889 | 11.9 | 889 | 11.9 |
| 465.tonto | 695 | 14.2 | 696 | 14.1 | 698 | 14.1 | 679 | 14.5 | 682 | 14.4 | 684 | 14.4 |
| 470.lbm | 938 | 14.7 | 983 | 14.0 | 982 | 14.0 | 985 | 14.0 | 967 | 14.2 | 969 | 14.2 |
| 481.wrf | 742 | 15.1 | 741 | 15.1 | 740 | 15.1 | 742 | 15.1 | 741 | 15.1 | 740 | 15.1 |
| 482.sphinx3 | 1336 | 14.6 | 1344 | 14.5 | 1345 | 14.5 | 1309 | 14.9 | 1316 | 14.8 | 1314 | 14.8 |

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

Operating System Notes

taskset utility used to bind CPU(s) to processes

Base Compiler Invocation

C benchmarks:
pathcc

C++ benchmarks:
pathCC

Fortran benchmarks:
pathf95

Continued on next page



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Base Compiler Invocation (Continued)

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 -DSPEC_CPU_TABLE_WORKAROUND
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:
-march=auto -Ofast

C++ benchmarks:
-march=auto -Ofast

Fortran benchmarks:
-march=auto -Ofast

Benchmarks using both Fortran and C:
-march=auto -Ofast

Base Other Flags

C benchmarks:
-IPA:max_jobs=2

C++ benchmarks:
-IPA:max_jobs=2

Continued on next page



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Base Other Flags (Continued)

Fortran benchmarks:

-IPA:max_jobs=2

Benchmarks using both Fortran and C:

-IPA:max_jobs=2

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
 447.dealII: -DSPEC_CPU_TABLE_WORKAROUND
 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

Peak Optimization Flags

C benchmarks:

-march=auto -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast

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Peak Optimization Flags (Continued)

C++ benchmarks:

444.namd: -march=auto -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2)
-Ofast

447.dealII: -march=auto -Ofast -m32 -fno-exceptions

450.soplex: -march=auto -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 -fno-exceptions

453.povray: -march=auto -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2)
-Ofast -fno-fast-math

Fortran benchmarks:

410.bwaves: -march=auto -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: -march=auto -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2)
-O2 -OPT:Ofast -OPT:ro=3 -OPT:unroll_size=256

434.zeusmp: -march=auto -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: -march=auto -Ofast -LNO:fission=2 -LNO:prefetch=0

465.tonto: -march=auto -Ofast -CG:local_fwd_sched=on -IPA:plimit=525

Benchmarks using both Fortran and C:

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

436.cactusADM: -march=auto -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2)
-O3 -LNO:prefetch_ahead=5 -LNO:ou_prod_max=10
-LNO:full_unroll=5 -ipa

454.calculix: -march=auto -Ofast -CG:prefetch=off -LNO:simd=0
-OPT:unroll_times_max=8 -WOPT:mem_opnds=on

481.wrf: basepeak = yes



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Peak Other Flags

C benchmarks:
-IPA:max_jobs=2

C++ benchmarks:
-IPA:max_jobs=2

Fortran benchmarks:
-IPA:max_jobs=2

Benchmarks using both Fortran and C:
-IPA:max_jobs=2

The flags file that was used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.17.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/CPU2006_flags.20090714.17.xml

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