



# SPEC® CFP2006 Result

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## IBM Corporation

SPECfp®\_rate2006 = 44.2

IBM BladeCenter HS21 XM (Intel Xeon E5310)

SPECfp\_rate\_base2006 = 41.5

CPU2006 license: 11

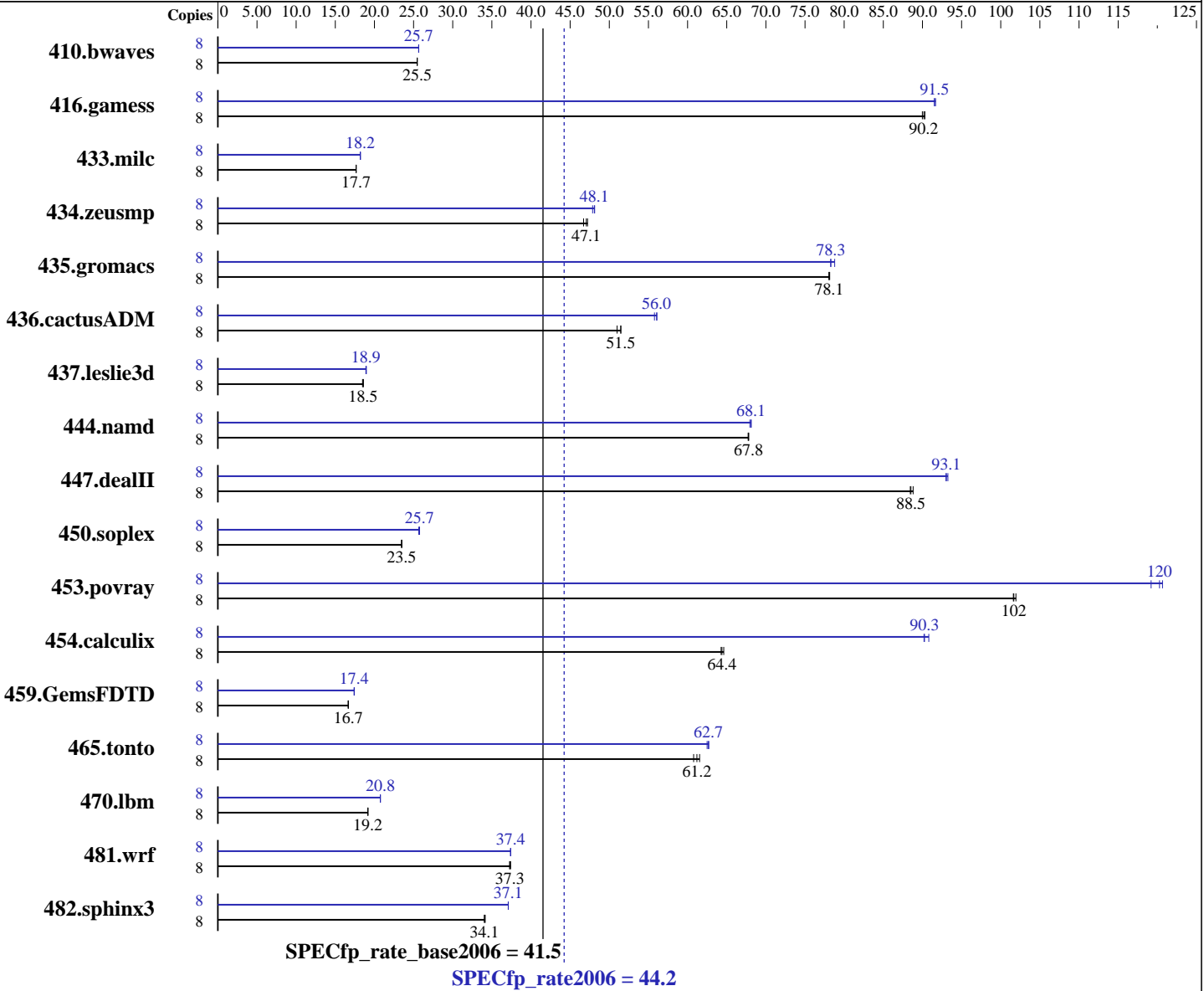
Test date: Aug-2007

Test sponsor: IBM Corporation

Hardware Availability: Feb-2007

Tested by: IBM Corporation

Software Availability: Nov-2007



### Hardware

CPU Name: Intel Xeon E5310  
 CPU Characteristics: 1066MHz system bus  
 CPU MHz: 1600  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip  
 CPU(s) orderable: 1,2 chips  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 8 MB I+D on chip per chip, 4 MB shared / 2 cores

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### Software

Operating System: SLES 10 (x86\_64), 2.6.16.21-0.8-smp  
 Compiler: Intel C++ and Fortran Compiler for Linux version 10.1 Build 20070725  
 Auto Parallel: No  
 File System: ReiserFS  
 System State: Multi-user, run level 3  
 Base Pointers: 64-bit

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L3 Cache: None  
Other Cache: None  
Memory: 16 GB (8 x 2 GB DDR2-5300F ECC)  
Disk Subsystem: 1 x 36 GB SAS, 10000 RPM  
Other Hardware: None

Peak Pointers: 32/64-bit  
Other Software: None

## Results Table

| Benchmark     | Base   |                    |                    |                    |                    |                    |                    | Peak   |                    |                    |                    |                    |                    |                    |
|---------------|--------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|               | Copies | Seconds            | Ratio              | Seconds            | Ratio              | Seconds            | Ratio              | Copies | Seconds            | Ratio              | Seconds            | Ratio              | Seconds            | Ratio              |
| 410.bwaves    | 8      | 4271               | 25.5               | <b><u>4270</u></b> | <b><u>25.5</u></b> | 4269               | 25.5               | 8      | 4238               | 25.7               | <b><u>4238</u></b> | <b><u>25.7</u></b> | 4237               | 25.7               |
| 416.gamess    | 8      | 1741               | 90.0               | <b><u>1737</u></b> | <b><u>90.2</u></b> | 1734               | 90.3               | 8      | 1711               | 91.5               | <b><u>1711</u></b> | <b><u>91.5</u></b> | 1709               | 91.7               |
| 433.milc      | 8      | <b><u>4159</u></b> | <b><u>17.7</u></b> | 4159               | 17.7               | 4158               | 17.7               | 8      | <b><u>4035</u></b> | <b><u>18.2</u></b> | 4035               | 18.2               | 4035               | 18.2               |
| 434.zeusmp    | 8      | 1558               | 46.7               | 1542               | 47.2               | <b><u>1547</u></b> | <b><u>47.1</u></b> | 8      | 1513               | 48.1               | 1521               | 47.9               | <b><u>1514</u></b> | <b><u>48.1</u></b> |
| 435.gromacs   | 8      | 732                | 78.1               | 731                | 78.2               | <b><u>732</u></b>  | <b><u>78.1</u></b> | 8      | <b><u>729</u></b>  | <b><u>78.3</u></b> | 725                | 78.8               | 730                | 78.3               |
| 436.cactusADM | 8      | 1875               | 51.0               | <b><u>1858</u></b> | <b><u>51.5</u></b> | 1857               | 51.5               | 8      | 1714               | 55.8               | <b><u>1706</u></b> | <b><u>56.0</u></b> | 1705               | 56.1               |
| 437.leslie3d  | 8      | 4045               | 18.6               | <b><u>4054</u></b> | <b><u>18.5</u></b> | 4069               | 18.5               | 8      | <b><u>3975</u></b> | <b><u>18.9</u></b> | 3975               | 18.9               | 3964               | 19.0               |
| 444.namd      | 8      | <b><u>947</u></b>  | <b><u>67.8</u></b> | 946                | 67.8               | 947                | 67.7               | 8      | <b><u>942</u></b>  | <b><u>68.1</u></b> | 942                | 68.1               | 944                | 68.0               |
| 447.dealII    | 8      | 1031               | 88.8               | <b><u>1034</u></b> | <b><u>88.5</u></b> | 1035               | 88.4               | 8      | 981                | 93.2               | 984                | 93.0               | <b><u>983</u></b>  | <b><u>93.1</u></b> |
| 450.soplex    | 8      | 2841               | 23.5               | 2843               | 23.5               | <b><u>2842</u></b> | <b><u>23.5</u></b> | 8      | 2591               | 25.8               | 2600               | 25.7               | <b><u>2591</u></b> | <b><u>25.7</u></b> |
| 453.povray    | 8      | 418                | 102                | <b><u>419</u></b>  | <b><u>102</u></b>  | 419                | 102                | 8      | 353                | 121                | 357                | 119                | <b><u>354</u></b>  | <b><u>120</u></b>  |
| 454.calculix  | 8      | 1021               | 64.6               | <b><u>1025</u></b> | <b><u>64.4</u></b> | 1027               | 64.3               | 8      | 732                | 90.2               | <b><u>731</u></b>  | <b><u>90.3</u></b> | 727                | 90.8               |
| 459.GemsFDTD  | 8      | <b><u>5095</u></b> | <b><u>16.7</u></b> | 5096               | 16.7               | 5094               | 16.7               | 8      | 4875               | 17.4               | <b><u>4873</u></b> | <b><u>17.4</u></b> | 4871               | 17.4               |
| 465.tonto     | 8      | 1279               | 61.5               | 1295               | 60.8               | <b><u>1286</u></b> | <b><u>61.2</u></b> | 8      | <b><u>1256</u></b> | <b><u>62.7</u></b> | 1255               | 62.7               | 1260               | 62.5               |
| 470.lbm       | 8      | 5736               | 19.2               | <b><u>5736</u></b> | <b><u>19.2</u></b> | 5735               | 19.2               | 8      | 5296               | 20.8               | <b><u>5296</u></b> | <b><u>20.8</u></b> | 5295               | 20.8               |
| 481.wrf       | 8      | <b><u>2397</u></b> | <b><u>37.3</u></b> | 2389               | 37.4               | 2397               | 37.3               | 8      | 2388               | 37.4               | 2390               | 37.4               | <b><u>2390</u></b> | <b><u>37.4</u></b> |
| 482.sphinx3   | 8      | 4565               | 34.2               | <b><u>4577</u></b> | <b><u>34.1</u></b> | 4581               | 34.0               | 8      | 4202               | 37.1               | 4204               | 37.1               | <b><u>4203</u></b> | <b><u>37.1</u></b> |

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

## General Notes

taskset utility used to bind CPU(s) to processes

## Base Compiler Invocation

C benchmarks:  
icc

C++ benchmarks:  
icpc

Fortran benchmarks:  
ifort

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## Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

icc ifort

## 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 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
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 -nofor_main
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

C++ benchmarks:  
-fast

Fortran benchmarks:  
-fast

Benchmarks using both Fortran and C:  
-fast

## Peak Compiler Invocation

C benchmarks (except as noted below):

```

/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/bin/icc
-L/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/lib
-I/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/include

```

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## Peak Compiler Invocation (Continued)

433.milc: icc

C++ benchmarks (except as noted below):

icpc

450.soplex: /home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/bin/icpc  
-L/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/lib  
-I/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/include

Fortran benchmarks (except as noted below):

ifort

437.leslie3d: /home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/bin/ifort  
-L/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/lib  
-I/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/include

Benchmarks using both Fortran and C:

icc ifort

## 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 -nofor\_main  
436.cactusADM: -DSPEC\_CPU\_LP64 -nofor\_main  
444.namd: -DSPEC\_CPU\_LP64  
447.dealII: -DSPEC\_CPU\_LP64  
453.povray: -DSPEC\_CPU\_LP64  
454.calculix: -DSPEC\_CPU\_LP64 -nofor\_main  
459.GemsFDTD: -DSPEC\_CPU\_LP64  
465.tonto: -DSPEC\_CPU\_LP64  
481.wrf: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_CASE\_FLAG -DSPEC\_CPU\_LINUX

## Peak Optimization Flags

C benchmarks:

433.milc: -prof-gen(pass 1) -prof-use(pass 2) -fast -fno-alias  
-auto-ilp32

470.lbm: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2  
-scalar-rep- -prefetch -opt-malloc-options=3

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## Peak Optimization Flags (Continued)

482.sphinx3: -fast -unroll2

### C++ benchmarks:

444.namd: -prof-gen(pass 1) -prof-use(pass 2) -fast -fno-alias  
-auto-ilp32

447.dealIII: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2  
-ansi-alias -scalar-rep-

450.soplex: -prof-gen(pass 1) -prof-use(pass 2) -fast  
-opt-malloc-options=3

453.povray: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll4  
-ansi-alias

### Fortran benchmarks:

410.bwaves: -fast -prefetch

416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2 -Ob0  
-ansi-alias -scalar-rep-

434.zeusmp: -prof-gen(pass 1) -prof-use(pass 2) -fast

437.leslie3d: -prof-gen(pass 1) -prof-use(pass 2) -fast -prefetch  
-opt-malloc-options=3

459.GemsFDTD: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2 -Ob0  
-prefetch

465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll4 -auto

### Benchmarks using both Fortran and C:

435.gromacs: -prof-gen(pass 1) -prof-use(pass 2) -fast -prefetch  
-auto-ilp32

436.cactusADM: -prof-gen(pass 1) -prof-use(pass 2) -fast -unroll2  
-prefetch -auto-ilp32

454.calculix: -fast -unroll-aggressive -auto-ilp32

481.wrf: -fast -auto-ilp32

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

<http://www.spec.org/cpu2006/flags/Intel-ic10.1-FP-intel64-linux-flags.20090714.21.html>



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<http://www.spec.org/cpu2006/flags/Intel-ic10.1-FP-intel64-linux-flags.20090714.21.xml>

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

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