



# SPEC<sup>®</sup> CFP2006 Result

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## IBM Corporation

### SPECfp<sup>®</sup>\_rate2006 = 54.1

### IBM BladeCenter HS21 (Intel Xeon L5240)

### SPECfp\_rate\_base2006 = 48.5

CPU2006 license: 11

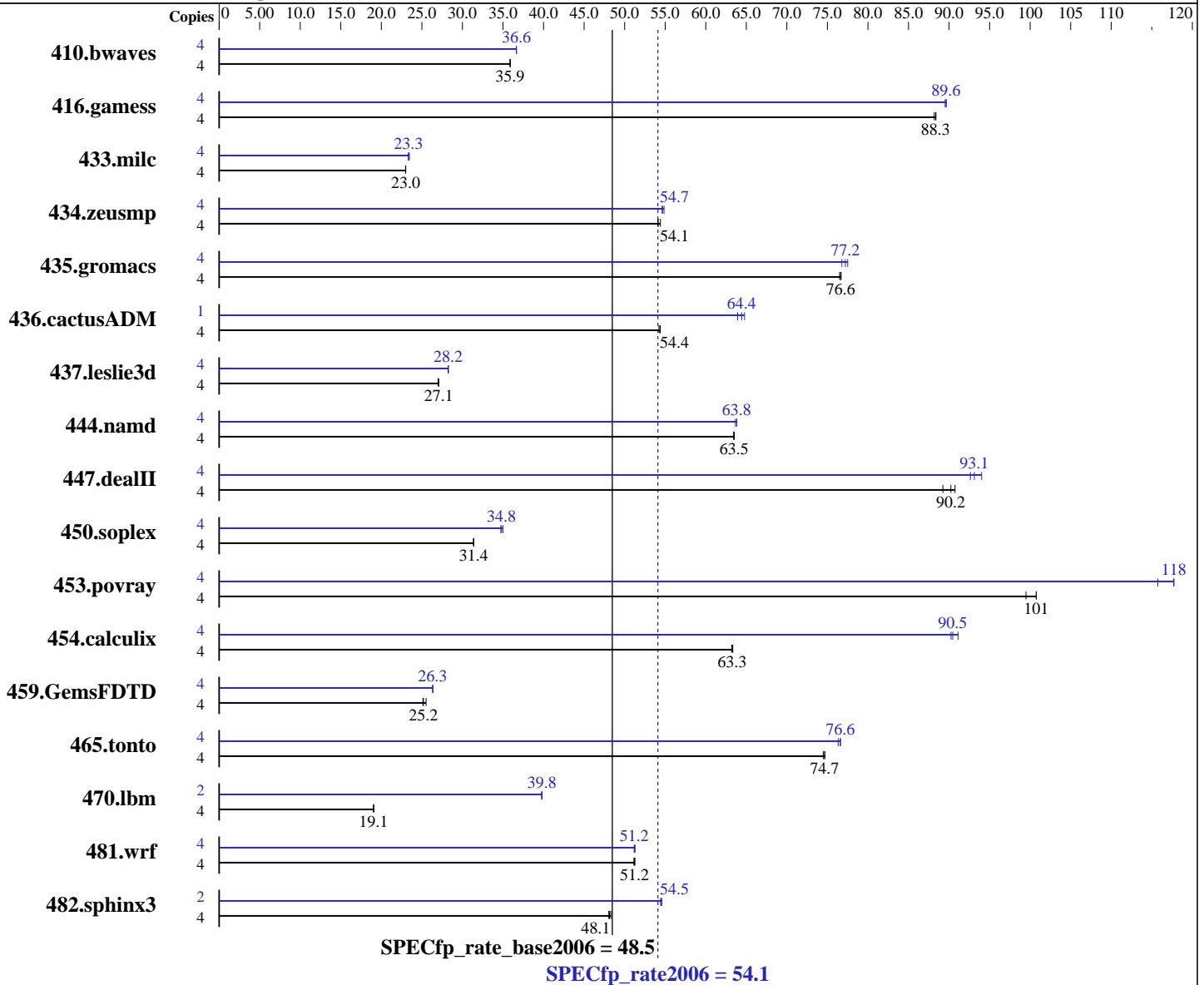
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Feb-2008

Hardware Availability: May-2008

Software Availability: Nov-2007



### Hardware

CPU Name: Intel Xeon L5240  
 CPU Characteristics: 1333MHz system bus  
 CPU MHz: 3000  
 FPU: Integrated  
 CPU(s) enabled: 4 cores, 2 chips, 2 cores/chip  
 CPU(s) orderable: 1,2 chips  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 6 MB I+D on chip per chip

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### Software

Operating System: SuSE Linux Enterprise Server 10 (x86\_64), Kernel 2.6.16.21-0.8-smp  
 Compiler: Intel C++ and Fortran Compiler 10.1 for Linux Build 20070913 Package ID: l\_cc\_p\_10.1.008, l\_fc\_p\_10.1.008  
 Auto Parallel: Yes  
 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: Binutils 2.17.50.0.15

## Results Table

| Benchmark     | Base   |             |             |             |             |             |             | Peak   |             |             |             |             |             |             |
|---------------|--------|-------------|-------------|-------------|-------------|-------------|-------------|--------|-------------|-------------|-------------|-------------|-------------|-------------|
|               | Copies | Seconds     | Ratio       | Seconds     | Ratio       | Seconds     | Ratio       | Copies | Seconds     | Ratio       | Seconds     | Ratio       | Seconds     | Ratio       |
| 410.bwaves    | 4      | 1515        | 35.9        | 1515        | 35.9        | <b>1515</b> | <b>35.9</b> | 4      | 1483        | 36.7        | 1484        | 36.6        | <b>1483</b> | <b>36.6</b> |
| 416.gamess    | 4      | 886         | 88.4        | <b>887</b>  | <b>88.3</b> | 888         | 88.2        | 4      | <b>874</b>  | <b>89.6</b> | 875         | 89.5        | 874         | 89.7        |
| 433.milc      | 4      | <b>1596</b> | <b>23.0</b> | 1596        | 23.0        | 1598        | 23.0        | 4      | <b>1573</b> | <b>23.3</b> | 1566        | 23.5        | 1575        | 23.3        |
| 434.zeusmp    | 4      | 673         | 54.1        | <b>672</b>  | <b>54.1</b> | 669         | 54.4        | 4      | 666         | 54.6        | 664         | 54.9        | <b>666</b>  | <b>54.7</b> |
| 435.gromacs   | 4      | <b>373</b>  | <b>76.6</b> | 372         | 76.7        | 373         | 76.5        | 4      | <b>370</b>  | <b>77.2</b> | 372         | 76.8        | 368         | 77.5        |
| 436.cactusADM | 4      | <b>879</b>  | <b>54.4</b> | 881         | 54.2        | 879         | 54.4        | 1      | 184         | 64.8        | <b>185</b>  | <b>64.4</b> | 187         | 63.9        |
| 437.leslie3d  | 4      | <b>1389</b> | <b>27.1</b> | 1388        | 27.1        | 1393        | 27.0        | 4      | 1331        | 28.2        | <b>1331</b> | <b>28.2</b> | 1330        | 28.3        |
| 444.namd      | 4      | <b>505</b>  | <b>63.5</b> | 506         | 63.4        | 505         | 63.5        | 4      | 503         | 63.8        | 504         | 63.7        | <b>503</b>  | <b>63.8</b> |
| 447.dealII    | 4      | 513         | 89.2        | 504         | 90.7        | <b>507</b>  | <b>90.2</b> | 4      | 487         | 94.0        | <b>491</b>  | <b>93.1</b> | 494         | 92.6        |
| 450.soplex    | 4      | 1064        | 31.4        | <b>1063</b> | <b>31.4</b> | 1062        | 31.4        | 4      | 960         | 34.7        | <b>958</b>  | <b>34.8</b> | 953         | 35.0        |
| 453.povray    | 4      | 211         | 101         | <b>211</b>  | <b>101</b>  | 214         | 99.5        | 4      | 184         | 116         | 181         | 118         | <b>181</b>  | <b>118</b>  |
| 454.calculix  | 4      | <b>522</b>  | <b>63.3</b> | 521         | 63.3        | 522         | 63.2        | 4      | 366         | 90.2        | <b>365</b>  | <b>90.5</b> | 362         | 91.1        |
| 459.GemsFDTD  | 4      | <b>1685</b> | <b>25.2</b> | 1663        | 25.5        | 1689        | 25.1        | 4      | <b>1611</b> | <b>26.3</b> | 1611        | 26.3        | 1611        | 26.3        |
| 465.tonto     | 4      | <b>527</b>  | <b>74.7</b> | 527         | 74.7        | 528         | 74.5        | 4      | 514         | 76.6        | 516         | 76.3        | <b>514</b>  | <b>76.6</b> |
| 470.lbm       | 4      | 2885        | 19.0        | <b>2885</b> | <b>19.1</b> | 2884        | 19.1        | 2      | 691         | 39.8        | <b>690</b>  | <b>39.8</b> | 690         | 39.8        |
| 481.wrf       | 4      | <b>872</b>  | <b>51.2</b> | 872         | 51.3        | 874         | 51.1        | 4      | <b>873</b>  | <b>51.2</b> | 873         | 51.2        | 871         | 51.3        |
| 482.sphinx3   | 4      | 1623        | 48.0        | <b>1620</b> | <b>48.1</b> | 1614        | 48.3        | 2      | <b>715</b>  | <b>54.5</b> | 716         | 54.4        | 714         | 54.6        |

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

## General Notes

All benchmarks compiled in 64-bit mode except 437.leslie3d, 450.soplex, 470.lbm and 482.sphinx3, at peak, are compiled in 32-bit mode  
Hardware Sector Prefetch Enabled and Adjacent Sector Prefetch Enabled  
OMP\_NUM\_THREADS set to number of cores  
KMP\_AFFINITY set to physical,0  
KMP\_STACKSIZE set to 64M  
taskset utility used to bind CPU(s) to processes

## Base Compiler Invocation

C benchmarks:  
icc

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CPU2006 license: 11

Test date: Feb-2008

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Hardware Availability: May-2008

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Software Availability: Nov-2007

## Base Compiler Invocation (Continued)

C++ benchmarks:  
icpc

Fortran benchmarks:  
ifort

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



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## Peak Compiler Invocation

C benchmarks (except as noted below):

```
/opt/intel/cc/10.1.008/bin/icc -L/opt/intel/cc/10.1.008/lib
-I/opt/intel/cc/10.1.008/include
```

433.milc: icc

C++ benchmarks (except as noted below):

icpc

```
450.soplex: /opt/intel/cc/10.1.008/bin/icpc -L/opt/intel/cc/10.1.008/lib
-I/opt/intel/cc/10.1.008/include
```

Fortran benchmarks (except as noted below):

ifort

```
437.leslie3d: /opt/intel/fc/10.1.008/bin/ifort -L/opt/intel/fc/10.1.008/lib
-I/opt/intel/fc/10.1.008/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.deall: -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.dealII: -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 -parallel -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-linux64-revC.20090713.html>



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

<http://www.spec.org/cpu2006/flags/Intel-ic10.1-fp-linux64-revC.20090713.xml>

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