



# SPEC® CFP2006 Result

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## IBM Corporation

SPECfp®2006 = **23.7**

## IBM BladeCenter HS21 (Intel Xeon X5460)

SPECfp\_base2006 = **19.9**

CPU2006 license: 11

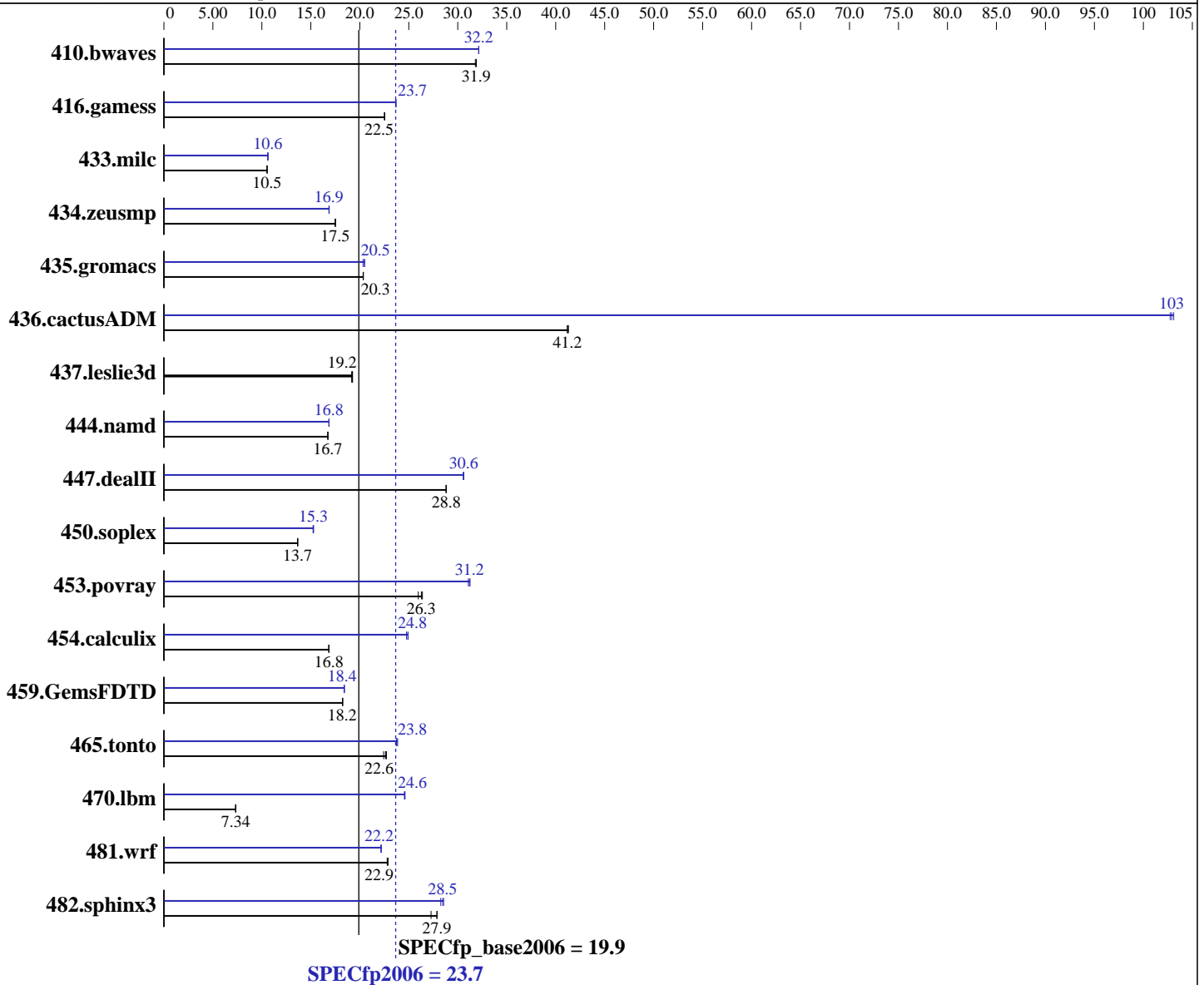
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Nov-2007

Hardware Availability: Jan-2008

Software Availability: Nov-2008



**Hardware**

CPU Name: Intel Xeon X5460  
 CPU Characteristics: 1333MHz system bus  
 CPU MHz: 3158  
 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: 12 MB I+D on chip per chip, 6 MB shared / 2 cores

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**Software**

Operating System: SLES10 (x86\_64), 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  
 Peak Pointers: 32/64-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: Memory and I/O Expansion Unit (P/N 42C1600)

Other Software: Binutils 2.17.50.0.15

## Results Table

| Benchmark     | Base        |             |            |             |            |             | Peak       |             |            |             |            |             |
|---------------|-------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|
|               | Seconds     | Ratio       | Seconds    | Ratio       | Seconds    | Ratio       | Seconds    | Ratio       | Seconds    | Ratio       | Seconds    | Ratio       |
| 410.bwaves    | <b>426</b>  | <b>31.9</b> | 427        | 31.8        | 426        | 31.9        | 423        | 32.1        | <b>423</b> | <b>32.2</b> | 423        | 32.2        |
| 416.gamess    | 868         | 22.6        | <b>869</b> | <b>22.5</b> | 870        | 22.5        | <b>827</b> | <b>23.7</b> | 826        | 23.7        | 827        | 23.7        |
| 433.milc      | 872         | 10.5        | <b>871</b> | <b>10.5</b> | 870        | 10.5        | 864        | 10.6        | 866        | 10.6        | <b>865</b> | <b>10.6</b> |
| 434.zeusmp    | 520         | 17.5        | <b>520</b> | <b>17.5</b> | 520        | 17.5        | <b>540</b> | <b>16.9</b> | 539        | 16.9        | 540        | 16.9        |
| 435.gromacs   | 351         | 20.3        | 351        | 20.4        | <b>351</b> | <b>20.3</b> | 348        | 20.5        | 351        | 20.3        | <b>349</b> | <b>20.5</b> |
| 436.cactusADM | 290         | 41.2        | <b>290</b> | <b>41.2</b> | 289        | 41.3        | 116        | 103         | 116        | 103         | <b>116</b> | <b>103</b>  |
| 437.leslie3d  | 488         | 19.3        | <b>488</b> | <b>19.2</b> | 490        | 19.2        | 488        | 19.3        | <b>488</b> | <b>19.2</b> | 490        | 19.2        |
| 444.namd      | <b>479</b>  | <b>16.7</b> | 479        | 16.8        | 479        | 16.7        | <b>476</b> | <b>16.8</b> | 476        | 16.9        | 476        | 16.8        |
| 447.dealII    | 397         | 28.8        | 397        | 28.8        | <b>397</b> | <b>28.8</b> | 374        | 30.6        | <b>374</b> | <b>30.6</b> | 374        | 30.6        |
| 450.soplex    | 611         | 13.6        | 610        | 13.7        | <b>611</b> | <b>13.7</b> | 546        | 15.3        | <b>547</b> | <b>15.3</b> | 548        | 15.2        |
| 453.povray    | <b>202</b>  | <b>26.3</b> | 205        | 26.0        | 202        | 26.4        | 171        | 31.1        | 170        | 31.3        | <b>171</b> | <b>31.2</b> |
| 454.calculix  | <b>490</b>  | <b>16.8</b> | 489        | 16.9        | 490        | 16.8        | 333        | 24.8        | <b>333</b> | <b>24.8</b> | 331        | 24.9        |
| 459.GemsFDTD  | <b>581</b>  | <b>18.2</b> | 582        | 18.2        | 581        | 18.3        | 576        | 18.4        | <b>576</b> | <b>18.4</b> | 576        | 18.4        |
| 465.tonto     | 433         | 22.7        | 438        | 22.4        | <b>435</b> | <b>22.6</b> | 412        | 23.9        | 414        | 23.8        | <b>414</b> | <b>23.8</b> |
| 470.lbm       | <b>1873</b> | <b>7.34</b> | 1882       | 7.30        | 1869       | 7.35        | 558        | 24.6        | 559        | 24.6        | <b>559</b> | <b>24.6</b> |
| 481.wrf       | 490         | 22.8        | <b>489</b> | <b>22.9</b> | 488        | 22.9        | 503        | 22.2        | 504        | 22.2        | <b>504</b> | <b>22.2</b> |
| 482.sphinx3   | 715         | 27.3        | <b>699</b> | <b>27.9</b> | 699        | 27.9        | 690        | 28.3        | <b>685</b> | <b>28.5</b> | 682        | 28.6        |

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 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 200M

## Base Compiler Invocation

C benchmarks:  
icc

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## 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 -parallel

C++ benchmarks:  
-fast -parallel

Fortran benchmarks:  
-fast -parallel

Benchmarks using both Fortran and C:  
-fast -parallel



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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:

ifort

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
437.leslie3d: -DSPEC_CPU_LP64
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-req- -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 -parallel

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: basepeak = yes

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

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 -parallel -prefetch -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.20090714.11.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic10.1-FP-intel64-linux-flags.20090714.11.xml>



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