# SPEC® CFP2006 Result

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## IBM Corporation

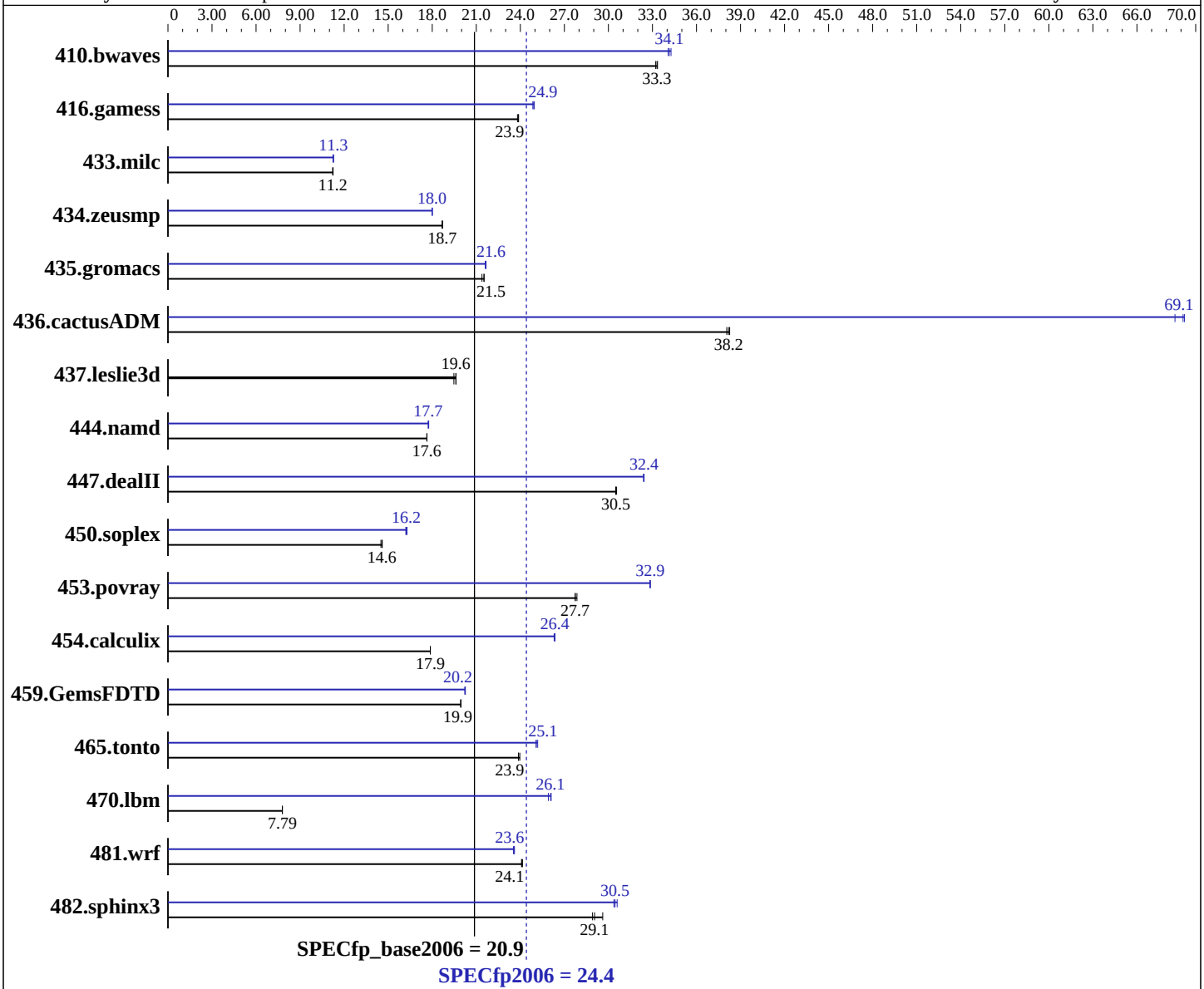
## IBM BladeCenter HS21 XM (Intel Xeon X5260)

SPECfp®2006 = 24.4

SPECfp_base2006 = 20.9

**CPU2006 license:** 11
**Test sponsor:** IBM Corporation
**Tested by:** IBM Corporation

**Test date:** Jan-2008
**Hardware Availability:** Feb-2008
**Software Availability:** Nov-2007




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon X5260 |
| CPU Characteristics: | 1333MHz system bus |
| CPU MHz: | 3325 |
| 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 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 408 | 33.3 | 409 | 33.2 | **408** | **33.3** | 397 | 34.3 | 399 | 34.1 | **398** | **34.1** |
| 416.gamess | **821** | **23.9** | 822 | 23.8 | 820 | 23.9 | **786** | **24.9** | 788 | 24.9 | 785 | 25.0 |
| 433.milc | 818 | 11.2 | 816 | 11.2 | **817** | **11.2** | **814** | **11.3** | 817 | 11.2 | 814 | 11.3 |
| 434.zeusmp | 487 | 18.7 | 487 | 18.7 | **487** | **18.7** | 505 | 18.0 | **506** | **18.0** | 506 | 18.0 |
| 435.gromacs | 334 | 21.4 | 332 | 21.5 | **332** | **21.5** | 330 | 21.7 | 330 | 21.6 | **330** | **21.6** |
| 436.cactusADM | 312 | 38.3 | 314 | 38.1 | **313** | **38.2** | 173 | 69.2 | **173** | **69.1** | 174 | 68.6 |
| 437.leslie3d | **479** | **19.6** | 479 | 19.6 | 483 | 19.5 | **479** | **19.6** | 479 | 19.6 | 483 | 19.5 |
| 444.namd | 455 | 17.6 | 455 | 17.6 | **455** | **17.6** | 452 | 17.7 | 452 | 17.8 | **452** | **17.7** |
| 447.dealII | 375 | 30.5 | **375** | **30.5** | 374 | 30.6 | **353** | **32.4** | 353 | 32.4 | 353 | 32.4 |
| 450.soplex | 575 | 14.5 | 571 | 14.6 | **572** | **14.6** | **514** | **16.2** | 512 | 16.3 | 515 | 16.2 |
| 453.povray | 192 | 27.7 | **192** | **27.7** | 191 | 27.9 | 162 | 32.9 | 162 | 32.8 | **162** | **32.9** |
| 454.calculix | 462 | 17.9 | **462** | **17.9** | 462 | 17.9 | 313 | 26.4 | **313** | **26.4** | 314 | 26.3 |
| 459.GemsFDTD | 532 | 19.9 | 532 | 19.9 | **532** | **19.9** | 525 | 20.2 | 524 | 20.3 | **524** | **20.2** |
| 465.tonto | 411 | 24.0 | **412** | **23.9** | 412 | 23.9 | 391 | 25.2 | 392 | 25.1 | **392** | **25.1** |
| 470.lbm | **1763** | **7.79** | 1764 | 7.79 | 1763 | 7.79 | 526 | 26.1 | **527** | **26.1** | 530 | 25.9 |
| 481.wrf | 463 | 24.1 | **463** | **24.1** | 464 | 24.1 | 475 | 23.5 | 473 | 23.6 | **474** | **23.6** |
| 482.sphinx3 | 658 | 29.6 | **671** | **29.1** | 674 | 28.9 | **640** | **30.5** | 642 | 30.4 | 637 | 30.6 |

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

## 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-rep- -prefetch -opt-malloc-options=3`

Continued on next page

# 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 -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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