



# SPEC® CFP2006 Result

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## IBM Corporation

**SPECfp®2006 = 20.2**

IBM System x iDataPlex dx320 (Intel Xeon L5420)

**SPECfp\_base2006 = 17.2**

CPU2006 license: 11

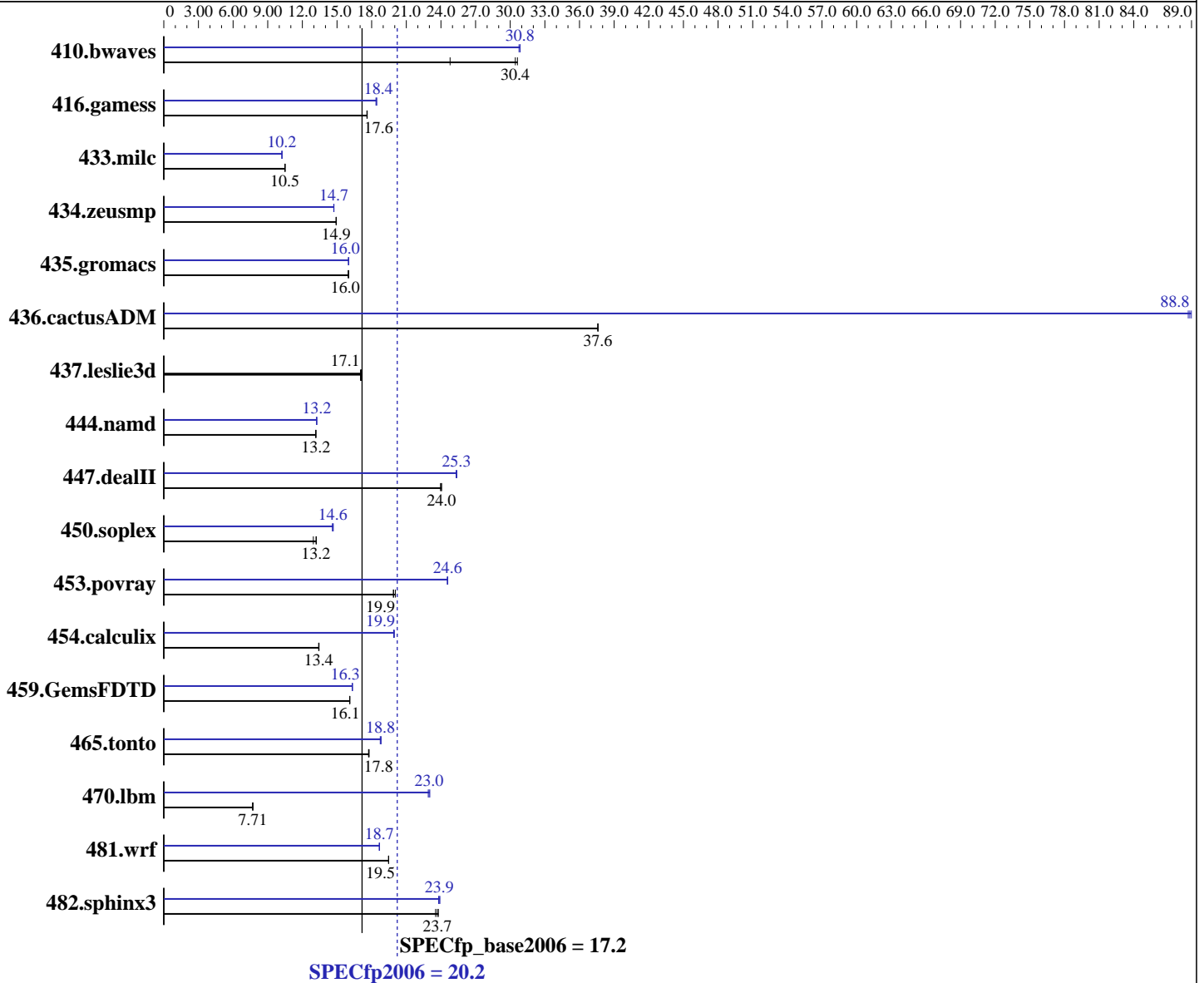
Test date: Sep-2008

Test sponsor: IBM Corporation

Hardware Availability: Nov-2008

Tested by: IBM Corporation

Software Availability: Jul-2008



### Hardware

CPU Name: Intel Xeon L5420  
 CPU Characteristics: 1333MHz system bus  
 CPU MHz: 2500  
 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: Red Hat Enterprise Linux AS release 4 (x86\_64)(Nahant Update 7), Kernel 2.6.9-78.ELsmp  
 Compiler: Intel C++ and Fortran Compiler 10.1 for Linux Build 20080312 Package ID: l\_cc\_p\_10.1.015, l\_fc\_p\_10.1.015  
 Auto Parallel: Yes  
 File System: ReiserFS  
 System State: Run level 3 (multi-user)

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L3 Cache: None  
Other Cache: None  
Memory: 16 GB(4 x 4 GB DDR2-5300P ECC)  
Disk Subsystem: 1 x 250 GB SATA, 7200 RPM  
Other Hardware: None

Base Pointers: 64-bit  
Peak Pointers: 32/64-bit  
Other Software: Binutils 2.18.50.0.7.20080502

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	548	24.8	444	30.6	<b>446</b>	<b>30.4</b>	442	30.8	440	30.9	<b>441</b>	<b>30.8</b>
416.gamess	<b>1112</b>	<b>17.6</b>	1113	17.6	1112	17.6	1062	18.4	1066	18.4	<b>1063</b>	<b>18.4</b>
433.milc	875	10.5	<b>874</b>	<b>10.5</b>	874	10.5	<b>897</b>	<b>10.2</b>	897	10.2	897	10.2
434.zeusmp	610	14.9	<b>610</b>	<b>14.9</b>	609	14.9	618	14.7	<b>618</b>	<b>14.7</b>	618	14.7
435.gromacs	446	16.0	<b>447</b>	<b>16.0</b>	447	16.0	446	16.0	<b>446</b>	<b>16.0</b>	447	16.0
436.cactusADM	318	37.6	318	37.6	<b>318</b>	<b>37.6</b>	<b>134</b>	<b>88.8</b>	135	88.7	134	89.0
437.leslie3d	<b>549</b>	<b>17.1</b>	549	17.1	552	17.0	<b>549</b>	<b>17.1</b>	549	17.1	552	17.0
444.namd	609	13.2	609	13.2	<b>609</b>	<b>13.2</b>	605	13.2	<b>606</b>	<b>13.2</b>	606	13.2
447.dealII	<b>476</b>	<b>24.0</b>	477	24.0	476	24.1	<b>451</b>	<b>25.3</b>	452	25.3	451	25.4
450.soplex	<b>633</b>	<b>13.2</b>	644	12.9	631	13.2	568	14.7	<b>570</b>	<b>14.6</b>	571	14.6
453.povray	<b>267</b>	<b>19.9</b>	265	20.1	268	19.9	216	24.6	217	24.5	<b>216</b>	<b>24.6</b>
454.calculix	<b>615</b>	<b>13.4</b>	614	13.4	615	13.4	413	20.0	414	19.9	<b>414</b>	<b>19.9</b>
459.GemsFDTD	659	16.1	<b>659</b>	<b>16.1</b>	659	16.1	650	16.3	650	16.3	<b>650</b>	<b>16.3</b>
465.tonto	553	17.8	<b>554</b>	<b>17.8</b>	555	17.7	523	18.8	<b>524</b>	<b>18.8</b>	525	18.7
470.lbm	<b>1782</b>	<b>7.71</b>	1788	7.69	1779	7.72	596	23.0	600	22.9	<b>598</b>	<b>23.0</b>
481.wrf	574	19.5	<b>574</b>	<b>19.5</b>	574	19.5	598	18.7	<b>598</b>	<b>18.7</b>	598	18.7
482.sphinx3	828	23.5	820	23.8	<b>823</b>	<b>23.7</b>	<b>817</b>	<b>23.9</b>	815	23.9	819	23.8

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 Prefetch Enabled and Adjacent Sector Prefetch Enabled  
OMP\_NUM\_THREADS set to number of processors  
KMP\_AFFINITY set to "physical,0"  
KMP\_STACKSIZE set to 200M  
'ulimit -s unlimited' was used to set the stack size to unlimited prior to run

## 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/10.1.015/bin/icc -L/opt/intel/cc/10.1.015/lib
-I/opt/intel/cc/10.1.015/include
```

433.milc: icc

C++ benchmarks (except as noted below):

icpc

```
450.soplex: /opt/intel/cc/10.1.015/bin/icpc -L/opt/intel/cc/10.1.015/lib
-I/opt/intel/cc/10.1.015/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.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 files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20090713.09.html>

<http://www.spec.org/cpu2006/flags/Intel-ic10.1-fp-linux64-revD.html>



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

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

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