



# SPEC® CFP2006 Result

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## IBM Corporation

**SPECfp®2006 = 20.6**

## IBM System x3650 (Intel Xeon E5420)

**SPECfp\_base2006 = 17.5**

CPU2006 license: 11

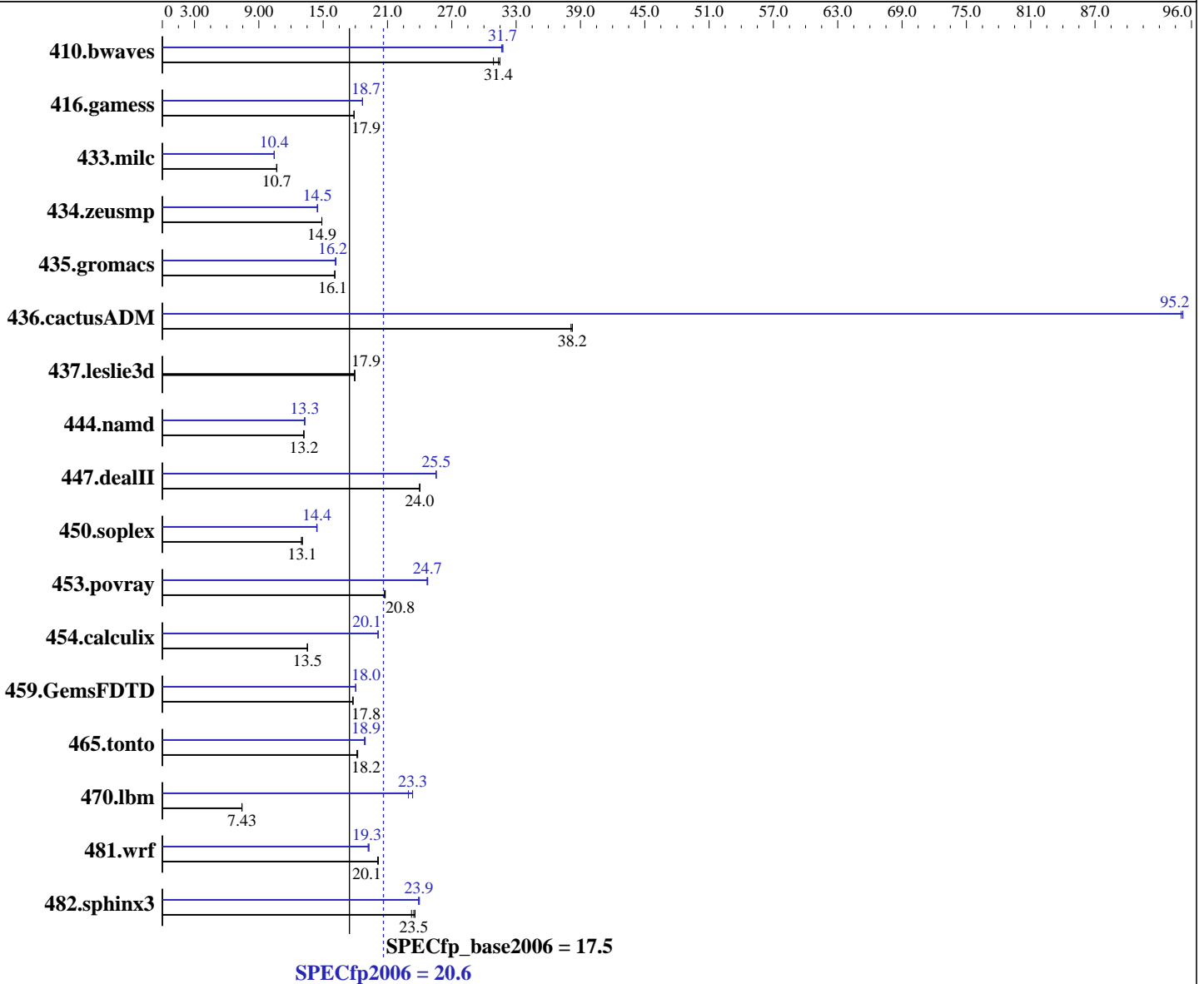
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Dec-2007

Hardware Availability: Jan-2008

Software Availability: Nov-2007



**Hardware**

CPU Name: Intel Xeon E5420  
 CPU Characteristics: 1333MHz system bus  
 CPU MHz: 2493  
 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: SuSE Linux Enterprise Server 10 (x86\_64), Kernel 2.6.16.21-0.8-smpt  
 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

Continued on next page



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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, 15000 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	440	30.9	432	31.5	<b>433</b>	<b>31.4</b>	429	31.6	<b>428</b>	<b>31.7</b>	428	31.8
416.gamess	1096	17.9	<b>1095</b>	<b>17.9</b>	1094	17.9	1049	18.7	1048	18.7	<b>1049</b>	<b>18.7</b>
433.milc	859	10.7	862	10.7	<b>860</b>	<b>10.7</b>	880	10.4	<b>880</b>	<b>10.4</b>	880	10.4
434.zeusmp	<b>612</b>	<b>14.9</b>	612	14.9	612	14.9	630	14.4	628	14.5	<b>628</b>	<b>14.5</b>
435.gromacs	<b>444</b>	<b>16.1</b>	443	16.1	444	16.1	443	16.1	<b>441</b>	<b>16.2</b>	441	16.2
436.cactusADM	313	38.1	312	38.3	<b>313</b>	<b>38.2</b>	126	95.0	126	95.2	<b>126</b>	<b>95.2</b>
437.leslie3d	<b>524</b>	<b>17.9</b>	523	18.0	525	17.9	<b>524</b>	<b>17.9</b>	523	18.0	525	17.9
444.namd	<b>607</b>	<b>13.2</b>	607	13.2	609	13.2	<b>604</b>	<b>13.3</b>	603	13.3	605	13.3
447.dealII	476	24.0	477	24.0	<b>477</b>	<b>24.0</b>	448	25.6	<b>448</b>	<b>25.5</b>	448	25.5
450.soplex	<b>639</b>	<b>13.1</b>	643	13.0	639	13.1	579	14.4	578	14.4	<b>578</b>	<b>14.4</b>
453.povray	257	20.7	256	20.8	<b>256</b>	<b>20.8</b>	<b>215</b>	<b>24.7</b>	215	24.7	215	24.8
454.calculix	609	13.5	610	13.5	<b>610</b>	<b>13.5</b>	410	20.1	<b>410</b>	<b>20.1</b>	410	20.1
459.GemsFDTD	597	17.8	597	17.8	<b>597</b>	<b>17.8</b>	588	18.0	<b>588</b>	<b>18.0</b>	588	18.0
465.tonto	540	18.2	<b>542</b>	<b>18.2</b>	542	18.2	520	18.9	<b>521</b>	<b>18.9</b>	522	18.8
470.lbm	1849	7.43	1852	7.42	<b>1850</b>	<b>7.43</b>	589	23.3	599	22.9	<b>589</b>	<b>23.3</b>
481.wrf	554	20.1	<b>555</b>	<b>20.1</b>	556	20.1	582	19.2	<b>580</b>	<b>19.3</b>	580	19.3
482.sphinx3	839	23.2	827	23.6	<b>831</b>	<b>23.5</b>	815	23.9	813	24.0	<b>815</b>	<b>23.9</b>

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  
Powersaved dameon was disabled in OS

## 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-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 -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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Tested with SPEC CPU2006 v1.0.  
Report generated on Tue Jul 22 16:20:49 2014 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 6 February 2008.