



# SPEC® CFP2006 Result

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## IBM Corporation

### SPECfp®\_rate2006 = 63.3

## IBM System x3650 (Intel Xeon E5405)

### SPECfp\_rate\_base2006 = 56.8

CPU2006 license: 11

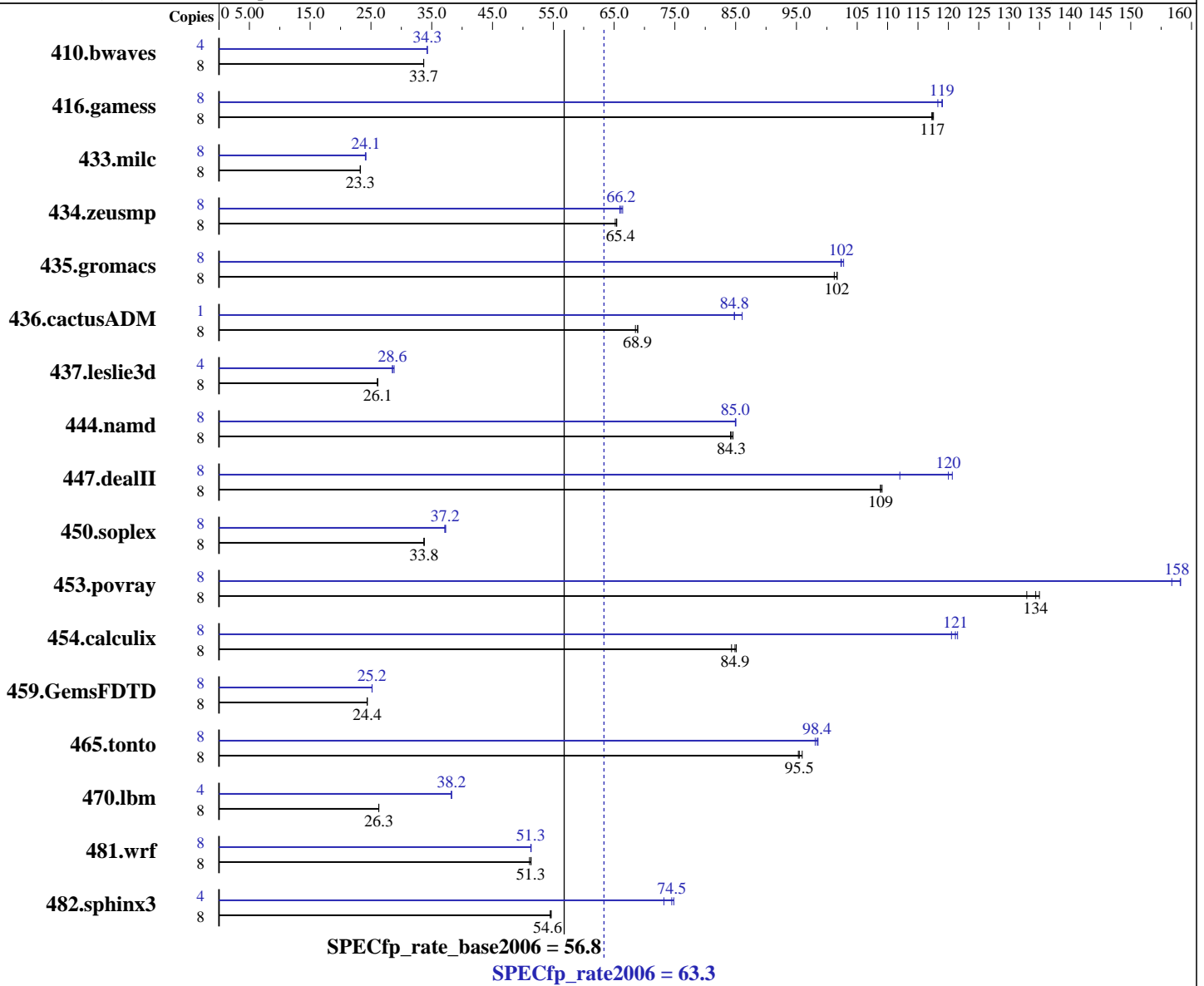
Test date: Nov-2007

Test sponsor: IBM Corporation

Hardware Availability: Jan-2008

Tested by: IBM Corporation

Software Availability: Nov-2007



### Hardware

CPU Name: Intel Xeon E5405  
 CPU Characteristics: 1333MHz system bus  
 CPU MHz: 1995  
 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-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, 15000 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	8	3227	33.7	<b><u>3229</u></b>	<b><u>33.7</u></b>	3229	33.7	4	<b><u>1587</u></b>	<b><u>34.3</u></b>	1587	34.3	1586	34.3
416.gamess	8	1333	118	1336	117	<b><u>1334</u></b>	<b><u>117</u></b>	8	1324	118	<b><u>1317</u></b>	<b><u>119</u></b>	1316	119
433.milc	8	3161	23.2	<b><u>3159</u></b>	<b><u>23.3</u></b>	3155	23.3	8	3039	24.2	<b><u>3042</u></b>	<b><u>24.1</u></b>	3050	24.1
434.zeusmp	8	1113	65.4	1117	65.2	<b><u>1113</u></b>	<b><u>65.4</u></b>	8	<b><u>1100</u></b>	<b><u>66.2</u></b>	1104	65.9	1096	66.4
435.gromacs	8	564	101	<b><u>562</u></b>	<b><u>102</u></b>	562	102	8	<b><u>558</u></b>	<b><u>102</u></b>	556	103	558	102
436.cactusADM	8	1388	68.9	<b><u>1388</u></b>	<b><u>68.9</u></b>	1395	68.5	1	141	84.8	<b><u>141</u></b>	<b><u>84.8</u></b>	139	86.1
437.leslie3d	8	<b><u>2881</u></b>	<b><u>26.1</u></b>	2886	26.1	2877	26.1	4	<b><u>1317</u></b>	<b><u>28.6</u></b>	1318	28.5	1305	28.8
444.namd	8	762	84.2	759	84.6	<b><u>761</u></b>	<b><u>84.3</u></b>	8	755	84.9	<b><u>755</u></b>	<b><u>85.0</u></b>	754	85.0
447.dealII	8	839	109	841	109	<b><u>841</u></b>	<b><u>109</u></b>	8	759	121	817	112	<b><u>763</u></b>	<b><u>120</u></b>
450.soplex	8	1979	33.7	<b><u>1977</u></b>	<b><u>33.8</u></b>	1976	33.8	8	<b><u>1794</u></b>	<b><u>37.2</u></b>	1795	37.2	1789	37.3
453.povray	8	315	135	<b><u>317</u></b>	<b><u>134</u></b>	320	133	8	272	157	269	158	<b><u>269</u></b>	<b><u>158</u></b>
454.calculix	8	775	85.1	<b><u>777</u></b>	<b><u>84.9</u></b>	783	84.3	8	548	121	543	122	<b><u>545</u></b>	<b><u>121</u></b>
459.GemsFDTD	8	3476	24.4	<b><u>3483</u></b>	<b><u>24.4</u></b>	3484	24.4	8	3371	25.2	3369	25.2	<b><u>3370</u></b>	<b><u>25.2</u></b>
465.tonto	8	820	96.0	826	95.3	<b><u>825</u></b>	<b><u>95.5</u></b>	8	<b><u>800</u></b>	<b><u>98.4</u></b>	803	98.1	799	98.6
470.lbm	8	4182	26.3	<b><u>4181</u></b>	<b><u>26.3</u></b>	4180	26.3	4	1437	38.2	<b><u>1437</u></b>	<b><u>38.2</u></b>	1437	38.3
481.wrf	8	1749	51.1	<b><u>1741</u></b>	<b><u>51.3</u></b>	1740	51.3	8	<b><u>1742</u></b>	<b><u>51.3</u></b>	1742	51.3	1740	51.4
482.sphinx3	8	<b><u>2858</u></b>	<b><u>54.6</u></b>	2852	54.7	2861	54.5	4	1042	74.8	1065	73.2	<b><u>1047</u></b>	<b><u>74.5</u></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 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 Disabled  
OMP\_NUM\_THREADS set to number of cores  
KMP\_AFFINITY set to physical,0  
KMP\_STACKSIZE set to 64M  
Powersaved dameon was disabled in OS  
taskset utility used to bind CPU(s) to processes



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## Base Compiler Invocation

C benchmarks:

icc

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.deallI: -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

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-intel64-linux-flags.20090714.11.html>



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Tested with SPEC CPU2006 v1.0.  
Report generated on Tue Jul 22 15:01:58 2014 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 26 December 2007.