



SPEC® CFP2006 Result

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IBM Corporation

SPECfp®_rate2006 = 69.6

IBM System x3400 (Intel Xeon E5420)

SPECfp_rate_base2006 = 62.0

CPU2006 license: 11

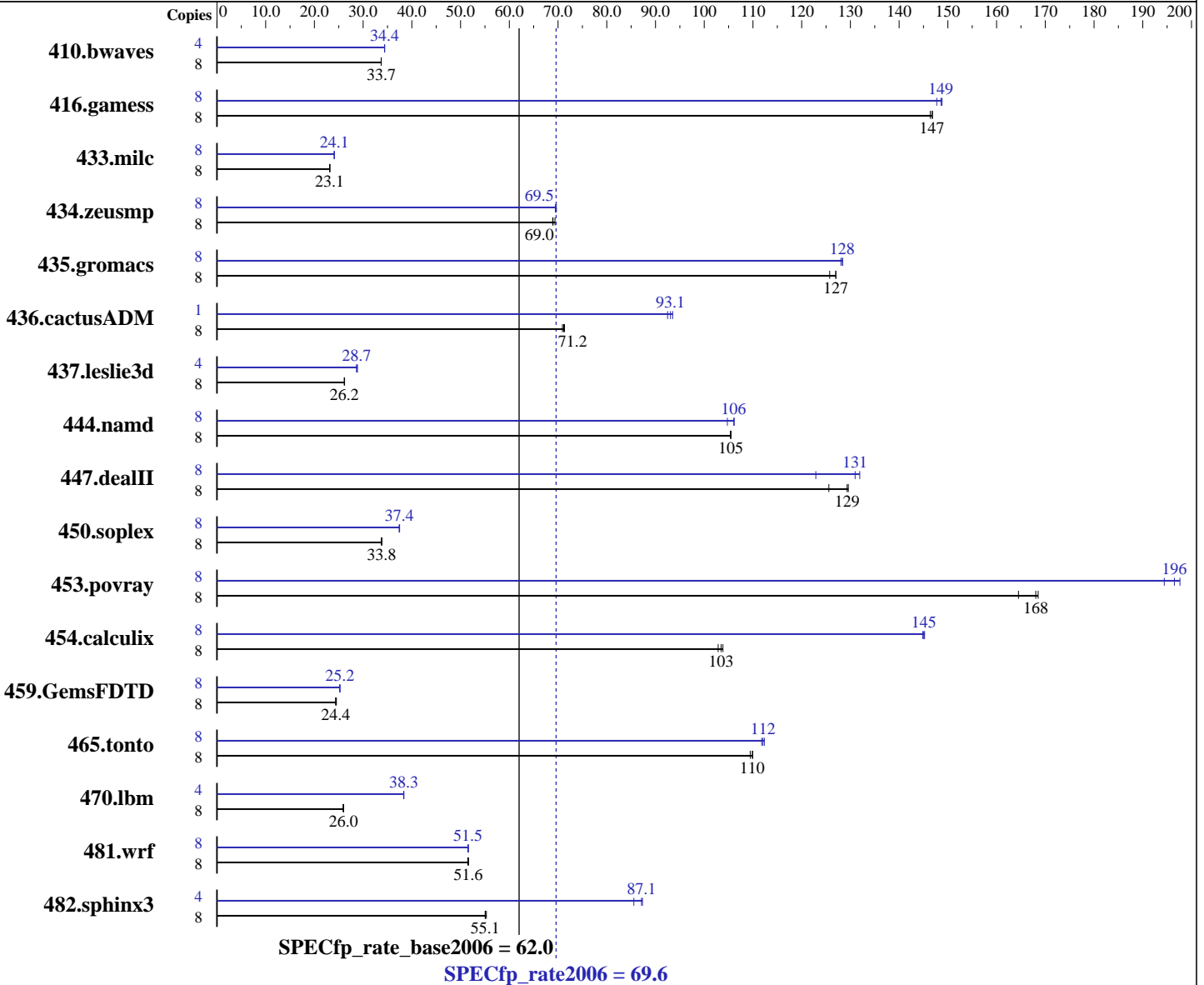
Test date: Mar-2008

Test sponsor: IBM Corporation

Hardware Availability: Jan-2008

Tested by: IBM Corporation

Software Availability: Nov-2007



Hardware

CPU Name: Intel Xeon E5420
 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: 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 80 GB SATA, 7200 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 | <u>3225</u> | <u>33.7</u> | 3224 | 33.7 | 3226 | 33.7 | 4 | 1580 | 34.4 | 1580 | 34.4 | <u>1580</u> | <u>34.4</u> |
| 416.gamess | 8 | 1070 | 146 | 1067 | 147 | <u>1067</u> | <u>147</u> | 8 | 1060 | 148 | <u>1054</u> | <u>149</u> | 1053 | 149 |
| 433.milc | 8 | 3165 | 23.2 | 3176 | 23.1 | <u>3175</u> | <u>23.1</u> | 8 | 3052 | 24.1 | <u>3049</u> | <u>24.1</u> | 3048 | 24.1 |
| 434.zeusmp | 8 | 1057 | 68.9 | <u>1055</u> | <u>69.0</u> | 1049 | 69.4 | 8 | <u>1048</u> | <u>69.5</u> | 1048 | 69.4 | 1045 | 69.7 |
| 435.gromacs | 8 | 454 | 126 | 450 | 127 | <u>450</u> | <u>127</u> | 8 | <u>445</u> | <u>128</u> | 445 | 128 | 446 | 128 |
| 436.cactusADM | 8 | 1340 | 71.3 | 1348 | 70.9 | <u>1344</u> | <u>71.2</u> | 1 | 129 | 92.5 | 128 | 93.5 | <u>128</u> | <u>93.1</u> |
| 437.leslie3d | 8 | 2871 | 26.2 | 2879 | 26.1 | <u>2873</u> | <u>26.2</u> | 4 | <u>1311</u> | <u>28.7</u> | 1304 | 28.8 | 1312 | 28.7 |
| 444.namd | 8 | 608 | 105 | <u>608</u> | <u>105</u> | 609 | 105 | 8 | 613 | 105 | <u>605</u> | <u>106</u> | 604 | 106 |
| 447.dealII | 8 | <u>708</u> | <u>129</u> | 706 | 130 | 729 | 126 | 8 | <u>699</u> | <u>131</u> | 694 | 132 | 745 | 123 |
| 450.soplex | 8 | 1971 | 33.9 | 1975 | 33.8 | <u>1975</u> | <u>33.8</u> | 8 | 1783 | 37.4 | <u>1783</u> | <u>37.4</u> | 1780 | 37.5 |
| 453.povray | 8 | <u>253</u> | <u>168</u> | 259 | 164 | 253 | 169 | 8 | <u>217</u> | <u>196</u> | 215 | 198 | 219 | 194 |
| 454.calculix | 8 | 636 | 104 | <u>638</u> | <u>103</u> | 642 | 103 | 8 | 456 | 145 | <u>455</u> | <u>145</u> | 454 | 145 |
| 459.GemsFDTD | 8 | 3463 | 24.5 | <u>3479</u> | <u>24.4</u> | 3484 | 24.4 | 8 | <u>3365</u> | <u>25.2</u> | 3364 | 25.2 | 3367 | 25.2 |
| 465.tonto | 8 | 719 | 109 | <u>716</u> | <u>110</u> | 716 | 110 | 8 | 704 | 112 | <u>702</u> | <u>112</u> | 701 | 112 |
| 470.lbm | 8 | 4249 | 25.9 | <u>4228</u> | <u>26.0</u> | 4226 | 26.0 | 4 | 1435 | 38.3 | 1433 | 38.4 | <u>1433</u> | <u>38.3</u> |
| 481.wrf | 8 | 1736 | 51.5 | <u>1732</u> | <u>51.6</u> | 1731 | 51.6 | 8 | <u>1734</u> | <u>51.5</u> | 1735 | 51.5 | 1731 | 51.6 |
| 482.sphinx3 | 8 | 2820 | 55.3 | <u>2831</u> | <u>55.1</u> | 2833 | 55.0 | 4 | <u>895</u> | <u>87.1</u> | 911 | 85.6 | 893 | 87.3 |

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
taskset utility used to bind CPU(s) to processes
This result is measured on an IBM System x3500 Server. Note that the IBM System x3500 and IBM System x3400 are electrically equivalent.



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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.20090713.html>



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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.20090713.xml>

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