



SPEC® CFP2006 Result

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IBM Corporation

SPECfp®2006 = 17.9

IBM System x3500 (Intel Xeon E5405)

SPECfp_base2006 = 15.2

CPU2006 license: 11

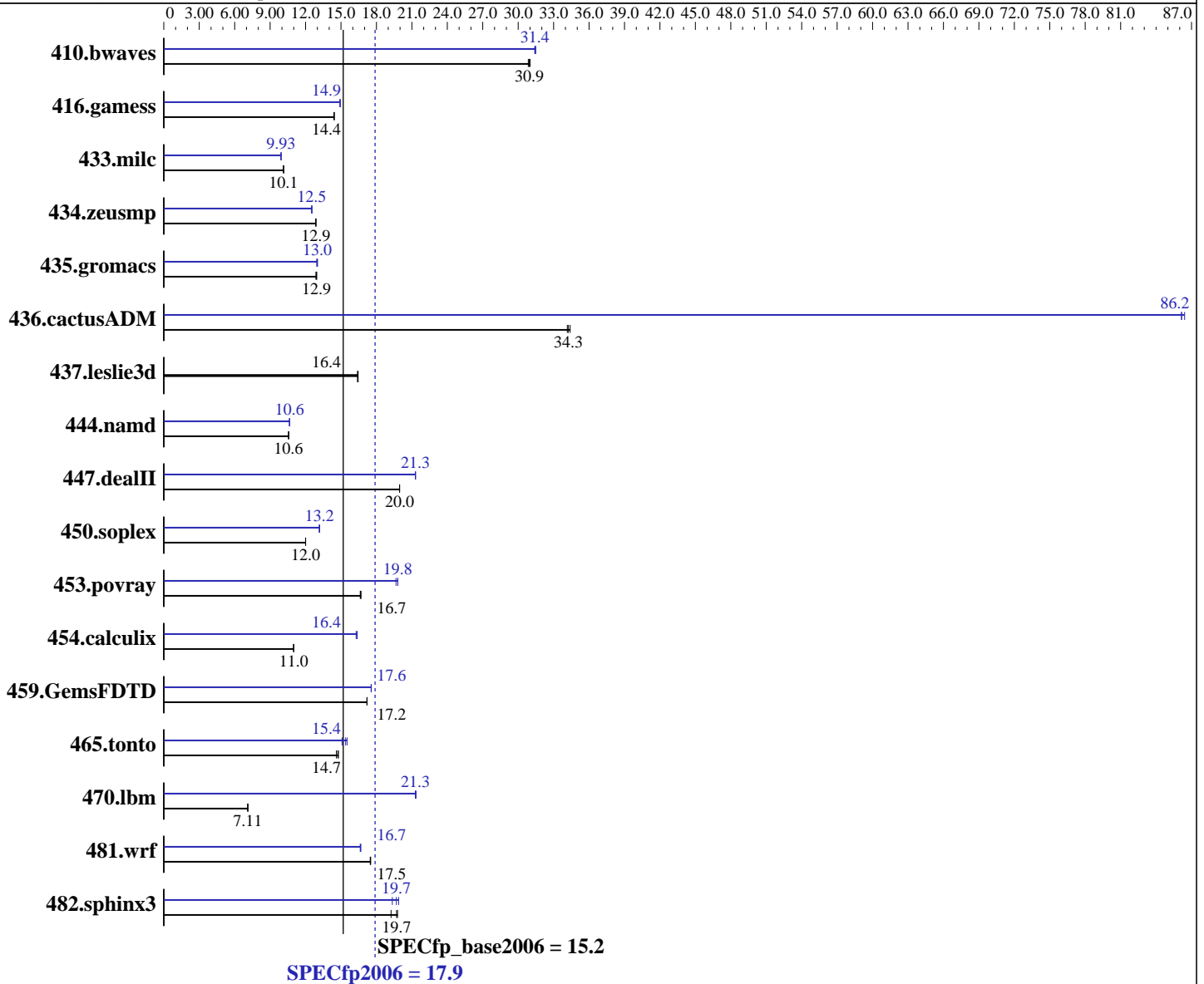
Test date: Mar-2008

Test sponsor: IBM Corporation

Hardware Availability: Jan-2008

Tested by: IBM Corporation

Software Availability: Nov-2007



Hardware

CPU Name: Intel Xeon E5405
 CPU Characteristics: 1333MHz system bus
 CPU MHz: 2000
 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 | | | | | |
|---------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|--------------------|-------------------|--------------------|-------------------|--------------------|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 438 | 31.0 | 440 | 30.9 | <u>439</u> | <u>30.9</u> | <u>433</u> | <u>31.4</u> | 433 | 31.4 | 432 | 31.5 |
| 416.gamess | 1357 | 14.4 | <u>1358</u> | <u>14.4</u> | 1359 | 14.4 | <u>1312</u> | <u>14.9</u> | 1312 | 14.9 | 1311 | 14.9 |
| 433.milc | 906 | 10.1 | <u>905</u> | <u>10.1</u> | 905 | 10.1 | 925 | 9.93 | <u>925</u> | <u>9.93</u> | 925 | 9.92 |
| 434.zeusmp | 707 | 12.9 | <u>707</u> | <u>12.9</u> | 707 | 12.9 | 726 | 12.5 | <u>726</u> | <u>12.5</u> | 726 | 12.5 |
| 435.gromacs | <u>552</u> | <u>12.9</u> | 552 | 12.9 | 555 | 12.9 | <u>549</u> | <u>13.0</u> | 549 | 13.0 | 552 | 12.9 |
| 436.cactusADM | 350 | 34.2 | 347 | 34.4 | <u>349</u> | <u>34.3</u> | 138 | 86.4 | 139 | 86.1 | <u>139</u> | <u>86.2</u> |
| 437.leslie3d | <u>572</u> | <u>16.4</u> | 571 | 16.5 | 573 | 16.4 | <u>572</u> | <u>16.4</u> | 571 | 16.5 | 573 | 16.4 |
| 444.namd | <u>759</u> | <u>10.6</u> | 759 | 10.6 | 758 | 10.6 | 753 | 10.7 | <u>754</u> | <u>10.6</u> | 754 | 10.6 |
| 447.dealII | 573 | 20.0 | <u>573</u> | <u>20.0</u> | 573 | 20.0 | <u>537</u> | <u>21.3</u> | 537 | 21.3 | 537 | 21.3 |
| 450.soplex | 694 | 12.0 | 695 | 12.0 | <u>695</u> | <u>12.0</u> | 634 | 13.2 | 632 | 13.2 | <u>632</u> | <u>13.2</u> |
| 453.povray | 320 | 16.6 | 319 | 16.7 | <u>319</u> | <u>16.7</u> | <u>269</u> | <u>19.8</u> | 271 | 19.7 | 269 | 19.8 |
| 454.calculix | 751 | 11.0 | 750 | 11.0 | <u>750</u> | <u>11.0</u> | 504 | 16.4 | <u>504</u> | <u>16.4</u> | 507 | 16.3 |
| 459.GemsFDTD | 617 | 17.2 | 617 | 17.2 | <u>617</u> | <u>17.2</u> | 604 | 17.6 | <u>604</u> | <u>17.6</u> | 604 | 17.6 |
| 465.tonto | <u>668</u> | <u>14.7</u> | 666 | 14.8 | 674 | 14.6 | <u>639</u> | <u>15.4</u> | 634 | 15.5 | 652 | 15.1 |
| 470.lbm | <u>1932</u> | <u>7.11</u> | 1934 | 7.11 | 1930 | 7.12 | 644 | 21.4 | <u>645</u> | <u>21.3</u> | 645 | 21.3 |
| 481.wrf | <u>638</u> | <u>17.5</u> | 639 | 17.5 | 638 | 17.5 | <u>671</u> | <u>16.7</u> | 670 | 16.7 | 672 | 16.6 |
| 482.sphinx3 | 1013 | 19.2 | <u>989</u> | <u>19.7</u> | 985 | 19.8 | 1007 | 19.3 | 980 | 19.9 | <u>990</u> | <u>19.7</u> |

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
This result is measured on an IBM System x 3500 Server. Note that the IBM System x 3500 and IBM System x 3400 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 -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.20090713.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.20090713.xml>



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