# SPEC® CFP2006 Result

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## Dell Inc.

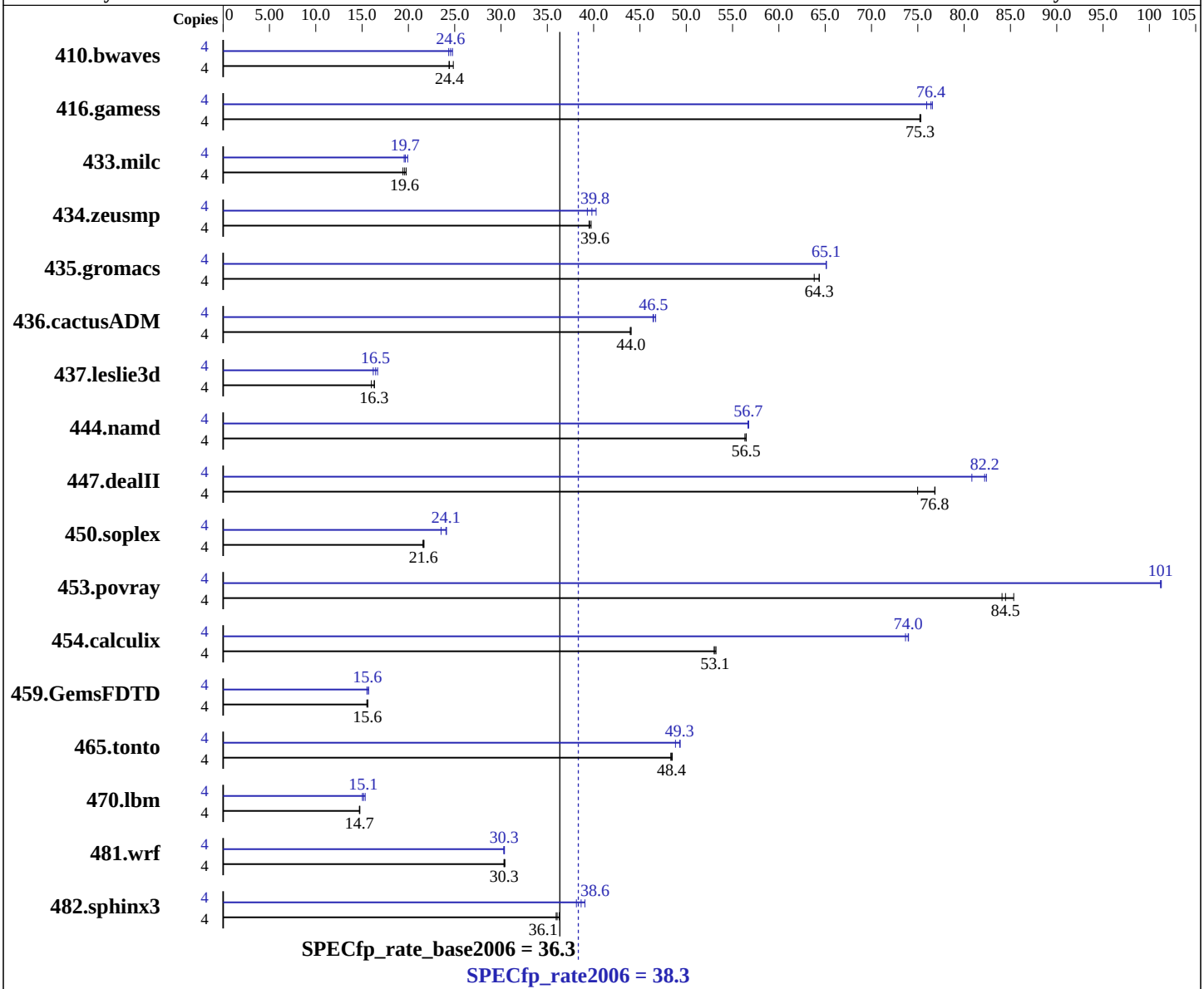
PowerEdge 860 (Intel Xeon X3230, 2.66 GHz)

SPECfp®_rate2006 = 38.3

SPECfp_rate_base2006 = 36.3

**CPU2006 license:** 55
**Test sponsor:** Dell Inc.
**Tested by:** Dell Inc.

**Test date:** Aug-2007
**Hardware Availability:** Jul-2007
**Software Availability:** Nov-2007




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon X3230 |
| CPU Characteristics: | 1066MHz system bus |
| CPU MHz: | 2660 |
| FPU: | Integrated |
| CPU(s) enabled: | 4 cores, 1 chip, 4 cores/chip |
| CPU(s) orderable: | 1 chip |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 8 MB I+D on chip per chip, 4 MB shared / 2 cores |

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## Software

| | |
|---|---|
| Operating System: | 64-Bit SUSE LINUX Enterprise Server 10 |
| Compiler: | Intel C++ and Fortran Compiler for Linux32 and Linux64 version 10.1 Build 20070725 |
| Auto Parallel: | No |
| File System: | ReiserFS |
| System State: | Multi-user, run level 3 |
| Base Pointers: | 32/64-bit |
| Peak Pointers: | 32/64-bit |

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L3 Cache: None
Other Cache: None
Memory: 8 GB (4x2 GB 667 Mhz DIMM)
Disk Subsystem: 1 x 73 GB SAS 10k RPM
Other Hardware: None

Other Software: SmartHeap library V8.1

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 4 | **2225** | **24.4** | 2188 | 24.8 | 2229 | 24.4 | 4 | 2232 | 24.4 | 2195 | 24.8 | **2213** | **24.6** |
| 416.gamess | 4 | 1040 | 75.3 | **1041** | **75.3** | 1041 | 75.2 | 4 | 1023 | 76.6 | **1025** | **76.4** | 1031 | 76.0 |
| 433.milc | 4 | 1891 | 19.4 | 1857 | 19.8 | **1874** | **19.6** | 4 | 1879 | 19.5 | 1843 | 19.9 | **1867** | **19.7** |
| 434.zeusmp | 4 | **920** | **39.6** | 916 | 39.7 | 921 | 39.5 | 4 | 926 | 39.3 | **914** | **39.8** | 904 | 40.3 |
| 435.gromacs | 4 | 448 | 63.8 | 444 | 64.4 | **444** | **64.3** | 4 | **439** | **65.1** | 439 | 65.1 | 439 | 65.1 |
| 436.cactusADM | 4 | 1088 | 43.9 | 1086 | 44.0 | **1086** | **44.0** | 4 | 1024 | 46.7 | **1029** | **46.5** | 1030 | 46.4 |
| 437.leslie3d | 4 | 2350 | 16.0 | **2306** | **16.3** | 2302 | 16.3 | 4 | 2320 | 16.2 | 2254 | 16.7 | **2284** | **16.5** |
| 444.namd | 4 | 569 | 56.3 | **568** | **56.5** | 568 | 56.5 | 4 | 566 | 56.7 | 565 | 56.7 | **566** | **56.7** |
| 447.dealII | 4 | 595 | 76.9 | **596** | **76.8** | 610 | 75.0 | 4 | 566 | 80.8 | **557** | **82.2** | 555 | 82.4 |
| 450.soplex | 4 | 1547 | 21.6 | 1538 | 21.7 | **1542** | **21.6** | 4 | 1418 | 23.5 | **1387** | **24.1** | 1383 | 24.1 |
| 453.povray | 4 | 253 | 84.1 | 249 | 85.4 | **252** | **84.5** | 4 | 210 | 101 | 210 | 101 | **210** | **101** |
| 454.calculix | 4 | 623 | 53.0 | 620 | 53.2 | **621** | **53.1** | 4 | **446** | **74.0** | 446 | 74.0 | 448 | 73.7 |
| 459.GemsFDTD | 4 | 2716 | 15.6 | **2721** | **15.6** | 2737 | 15.5 | 4 | 2700 | 15.7 | 2733 | 15.5 | **2725** | **15.6** |
| 465.tonto | 4 | 812 | 48.5 | 814 | 48.3 | **813** | **48.4** | 4 | 806 | 48.8 | 798 | 49.3 | **799** | **49.3** |
| 470.lbm | 4 | 3723 | 14.8 | **3732** | **14.7** | 3737 | 14.7 | 4 | 3584 | 15.3 | 3655 | 15.0 | **3628** | **15.1** |
| 481.wrf | 4 | **1472** | **30.3** | 1473 | 30.3 | 1469 | 30.4 | 4 | **1472** | **30.3** | 1471 | 30.4 | 1475 | 30.3 |
| 482.sphinx3 | 4 | 2169 | 36.0 | 2149 | 36.3 | **2162** | **36.1** | 4 | 2044 | 38.1 | 1996 | 39.1 | **2017** | **38.6** |

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Compiler Invocation Notes

```
OMP_NUM_THREADS set to number of cores
KMP_STACK_SIZE set to 64M
KMP_AFFINITY set to physical,0
```

## Operating System Notes

```
 'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run
'/usr/bin/taskset' used to bind processes to CPUs
```

## Platform Notes

```
BIOS Settings:
 Adjacent Cache Line Prefetch = Disabled (default Enabled)
 Hardware Prefetcher = Disabled (default Enabled)
```

## 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

Continued on next page

## Base Optimization Flags (Continued)

Fortran benchmarks:
`-fast`

Benchmarks using both Fortran and C:
`-fast`

## Peak Compiler Invocation

C benchmarks (except as noted below):
`/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/bin/icc`
`-L/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/lib`
`-I/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/include`

433.milc: `icc`

C++ benchmarks (except as noted below):
`icpc`

450.soplex: `/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/bin/icpc`
`-L/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/lib`
`-I/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/include`

Fortran benchmarks (except as noted below):
`ifort`

437.leslie3d: `/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/bin/ifort`
`-L/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/lib`
`-I/home/cmplr/usr3/alrahate/compilers/ic10.1mainline/20070725/Linux32/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.dealII: `-DSPEC_CPU_LP64`
453.povray: `-DSPEC_CPU_LP64`
454.calculix: `-DSPEC_CPU_LP64 -nofor_main`
459.GemsFDTD: `-DSPEC_CPU_LP64`

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## Peak Portability Flags (Continued)

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

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

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:

Continued on next page

## Peak Optimization Flags (Continued)

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 -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.20090714.13.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.20090714.13.xml`


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