# SPEC® CFP2006 Result

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## Dell Inc.

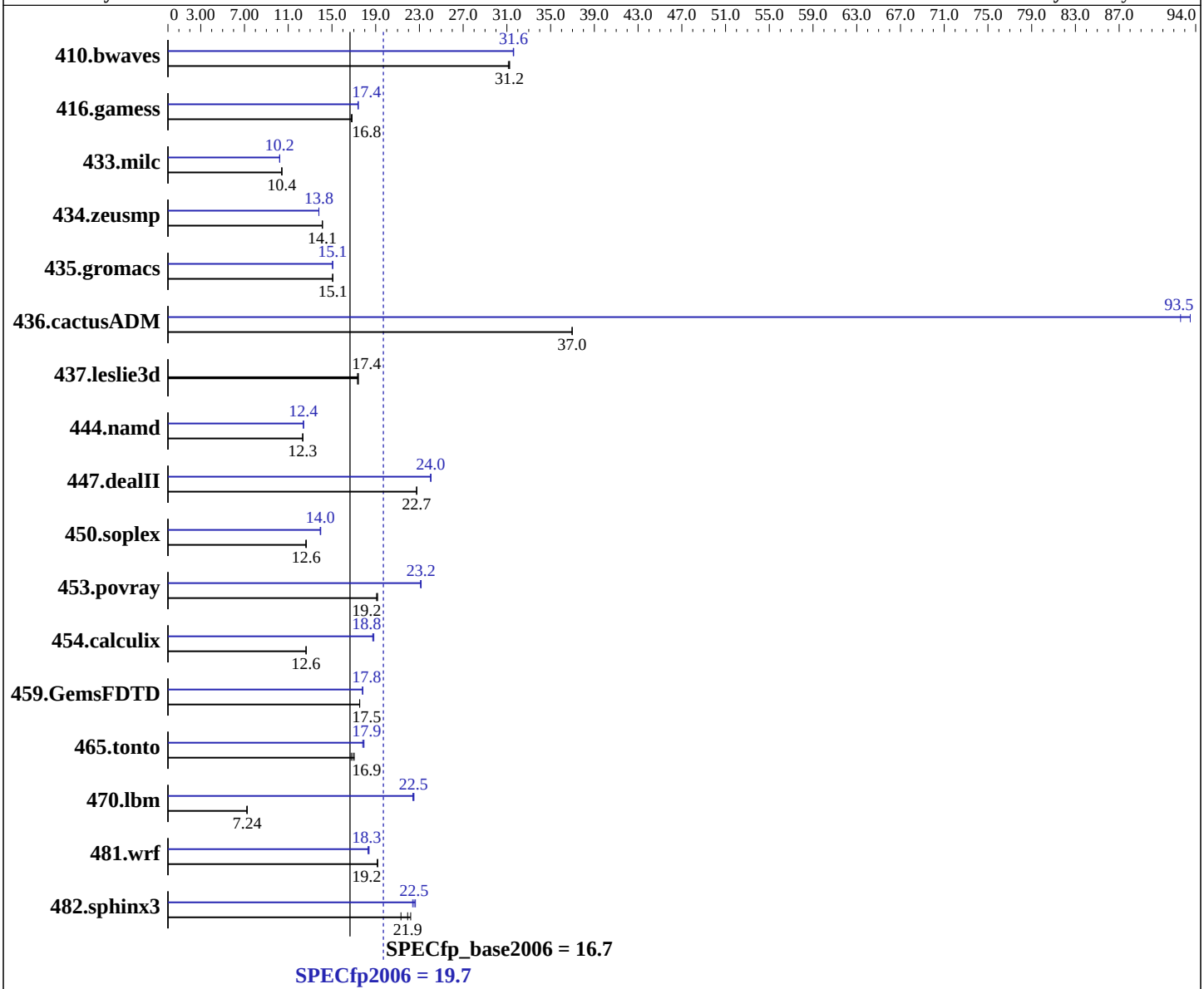
PowerEdge M600 (Intel Xeon E5410, 2.33 GHz)

SPECfp®2006 = 19.7

SPECfp_base2006 = 16.7

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

**Test date:** Aug-2008
**Hardware Availability:** Jan-2008
**Software Availability:** May-2008




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5410 |
| CPU Characteristics: | |
| CPU MHz: | 2333 |
| 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) SP2, Kernel 2.6.16-60.0.21-smp |
| Compiler: | Intel C++ and Fortran Compiler 10.1 for Linux Build 20080312 Package ID: l_cc_p_10.1.015, l_fc_p_10.1.015 |
| Auto Parallel: | Yes |
| File System: | ReiserFS |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |

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L3 Cache: None
Other Cache: None
Memory: 16 GB (8 x 2 GB 667 MHz ECC CL5 FB-DIMM)
Disk Subsystem: 1 x 80 GB 5400 RPM SATA
Other Hardware: None

Peak Pointers: 32/64-bit
Other Software: Binutils 2.18.50.0.7.20080502

## Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 435 | 31.2 | 437 | 31.1 | **435** | **31.2** | **430** | **31.6** | 430 | 31.6 | 430 | 31.6 |
| 416.gamess | **1164** | **16.8** | 1167 | 16.8 | 1163 | 16.8 | 1125 | 17.4 | **1125** | **17.4** | 1127 | 17.4 |
| 433.milc | 881 | 10.4 | 883 | 10.4 | **881** | **10.4** | 898 | 10.2 | 899 | 10.2 | **898** | **10.2** |
| 434.zeusmp | 644 | 14.1 | 644 | 14.1 | **644** | **14.1** | 659 | 13.8 | 659 | 13.8 | **659** | **13.8** |
| 435.gromacs | 474 | 15.1 | **474** | **15.1** | 474 | 15.1 | 474 | 15.1 | 474 | 15.1 | **474** | **15.1** |
| 436.cactusADM | **323** | **37.0** | 323 | 37.0 | 323 | 37.0 | **128** | **93.5** | 128 | 93.5 | 129 | 92.6 |
| 437.leslie3d | **540** | **17.4** | 540 | 17.4 | 542 | 17.3 | **540** | **17.4** | 540 | 17.4 | 542 | 17.3 |
| 444.namd | 651 | 12.3 | **651** | **12.3** | 650 | 12.3 | 647 | 12.4 | 648 | 12.4 | **647** | **12.4** |
| 447.dealII | 503 | 22.8 | 503 | 22.7 | **503** | **22.7** | 476 | 24.0 | 475 | 24.1 | **476** | **24.0** |
| 450.soplex | 659 | 12.7 | **660** | **12.6** | 662 | 12.6 | **598** | **14.0** | 599 | 13.9 | 597 | 14.0 |
| 453.povray | 278 | 19.2 | **278** | **19.2** | 279 | 19.1 | 230 | 23.1 | 230 | 23.2 | **230** | **23.2** |
| 454.calculix | 653 | 12.6 | **653** | **12.6** | 652 | 12.6 | 438 | 18.8 | 440 | 18.7 | **439** | **18.8** |
| 459.GemsFDTD | 605 | 17.5 | 605 | 17.5 | **605** | **17.5** | 596 | 17.8 | **596** | **17.8** | 596 | 17.8 |
| 465.tonto | 577 | 17.0 | 587 | 16.8 | **582** | **16.9** | 549 | 17.9 | **550** | **17.9** | 552 | 17.8 |
| 470.lbm | 1892 | 7.26 | **1897** | **7.24** | 1907 | 7.21 | **612** | **22.5** | 613 | 22.4 | 611 | 22.5 |
| 481.wrf | 582 | 19.2 | **582** | **19.2** | 583 | 19.1 | 610 | 18.3 | **609** | **18.3** | 607 | 18.4 |
| 482.sphinx3 | 915 | 21.3 | 878 | 22.2 | **889** | **21.9** | **866** | **22.5** | 861 | 22.6 | 871 | 22.4 |

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

## Operating System Notes

'ulimit -s unlimited' was used to set the stack size to unlimited prior to run

## 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
OMP_NUM_THREADS set to number of processors
KMP_AFFINITY set to "physical,0"
KMP_STACKSIZE set to 200M

## 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

## Peak Compiler Invocation

C benchmarks (except as noted below):
`/opt/intel/cc/10.1.015/bin/icc -L/opt/intel/cc/10.1.015/lib -I/opt/intel/cc/10.1.015/include`

433.milc: `icc`

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

450.soplex: `/opt/intel/cc/10.1.015/bin/icpc -L/opt/intel/cc/10.1.015/lib -I/opt/intel/cc/10.1.015/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`

Continued on next page

## 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.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 -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 files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic10.1-fp-linux64-revD.20090713.html
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20090713.07.html

You can also download the XML flags sources by saving the following links:

`http://www.spec.org/cpu2006/flags/Intel-ic10.1-fp-linux64-revD.20090713.xml`
`http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20090713.07.xml`


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