# SPEC® CFP2006 Result

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## Dell Inc.

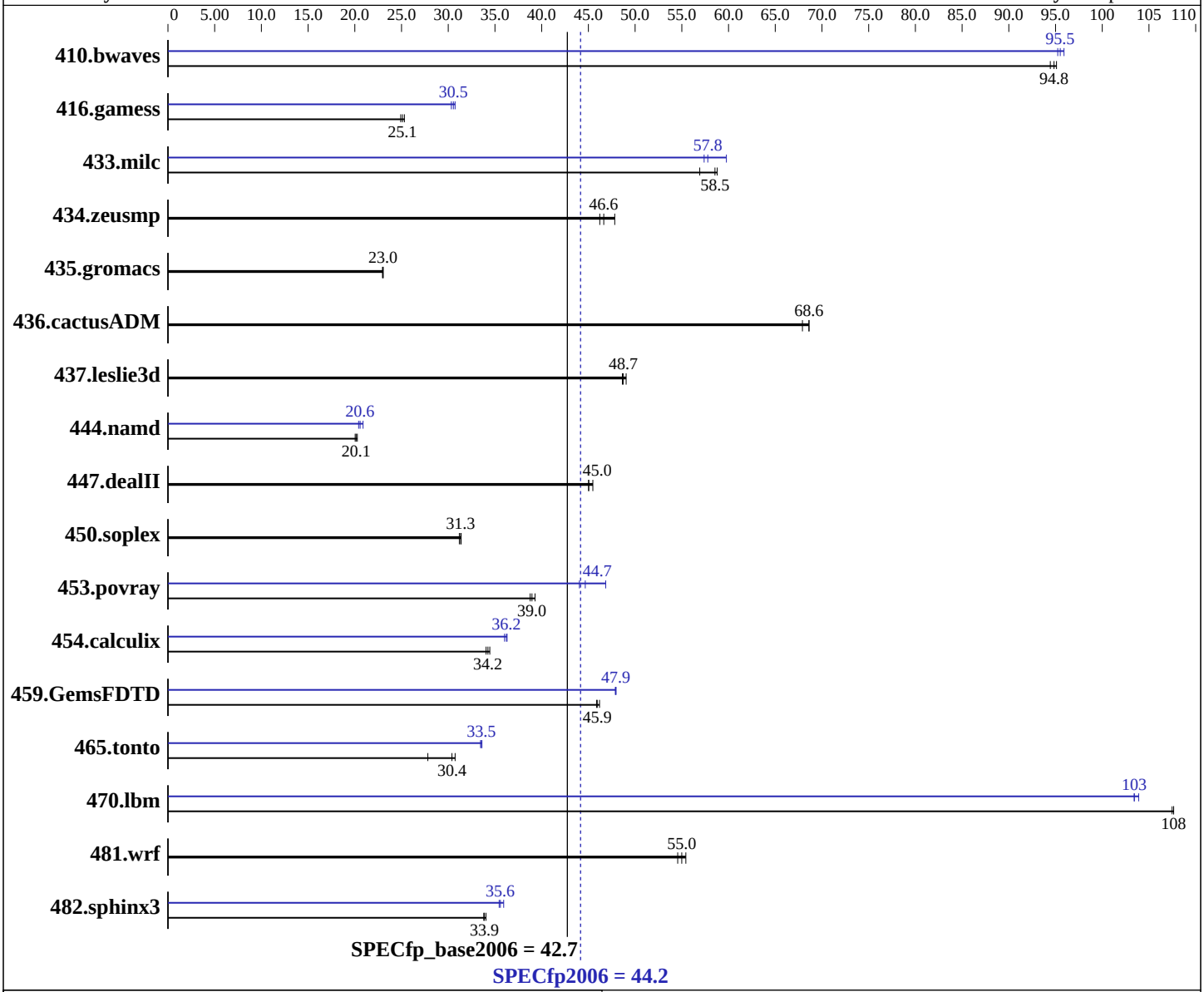
PowerEdge T110 II (Intel Core i3-2100, 3.10 GHz)

SPECfp®2006 = 44.2

SPECfp_base2006 = 42.7

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

**Test date:** Mar-2011
**Hardware Availability:** May-2011
**Software Availability:** Apr-2011




## Hardware

| | |
|---|---|
| CPU Name: | Intel Core i3-2100 |
| CPU Characteristics: | |
| CPU MHz: | 3100 |
| FPU: | Integrated |
| CPU(s) enabled: | 2 cores, 1 chip, 2 cores/chip |
| CPU(s) orderable: | 1 chip |
| Primary Cache: | 32 KB I + 32 KB D on chip per core |
| Secondary Cache: | 256 KB I+D on chip per core |

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## Software

| | |
|---|---|
| Operating System: | SUSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.12-0.7-default |
| Compiler: | Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64 Version 12 Alpha Build 20110105 |
| Auto Parallel: | Yes |
| File System: | ext3 |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |

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L3 Cache: 3 MB I+D on chip per chip
Other Cache: None
Memory: 8 GB (4 x 2 GB 2Rx8 PC3-10600R-9, ECC)
Disk Subsystem: 1 x 146 GB 15000 RPM SAS
Other Hardware: None

Peak Pointers: 32/64-bit
Other Software: None

## Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 143 | 95.1 | 144 | 94.4 | **143** | **94.8** | 143 | 95.2 | 142 | 95.9 | **142** | **95.5** |
| 416.gamess | **780** | **25.1** | 786 | 24.9 | 774 | 25.3 | **641** | **30.5** | 637 | 30.7 | 646 | 30.3 |
| 433.milc | 161 | 56.9 | **157** | **58.5** | 156 | 58.8 | **159** | **57.8** | 160 | 57.4 | 154 | 59.8 |
| 434.zeusmp | **195** | **46.6** | 190 | 47.8 | 197 | 46.2 | **195** | **46.6** | 190 | 47.8 | 197 | 46.2 |
| 435.gromacs | **310** | **23.0** | 311 | 23.0 | 310 | 23.0 | **310** | **23.0** | 311 | 23.0 | 310 | 23.0 |
| 436.cactusADM | 176 | 67.9 | **174** | **68.6** | 174 | 68.6 | 176 | 67.9 | **174** | **68.6** | 174 | 68.6 |
| 437.leslie3d | 193 | 48.6 | 192 | 49.0 | **193** | **48.7** | 193 | 48.6 | 192 | 49.0 | **193** | **48.7** |
| 444.namd | 400 | 20.0 | **398** | **20.1** | 396 | 20.3 | 393 | 20.4 | **390** | **20.6** | 384 | 20.9 |
| 447.dealII | **254** | **45.0** | 254 | 45.0 | 252 | 45.5 | **254** | **45.0** | 254 | 45.0 | 252 | 45.5 |
| 450.soplex | 266 | 31.4 | **266** | **31.3** | 267 | 31.2 | 266 | 31.4 | **266** | **31.3** | 267 | 31.2 |
| 453.povray | **137** | **39.0** | 135 | 39.3 | 137 | 38.8 | 114 | 46.9 | **119** | **44.7** | 121 | 44.0 |
| 454.calculix | 242 | 34.0 | **241** | **34.2** | 239 | 34.4 | 227 | 36.3 | **228** | **36.2** | 229 | 36.0 |
| 459.GemsFDTD | 231 | 45.9 | **231** | **45.9** | 230 | 46.2 | 221 | 48.0 | **221** | **47.9** | 222 | 47.9 |
| 465.tonto | **324** | **30.4** | 320 | 30.7 | 354 | 27.8 | **293** | **33.5** | 293 | 33.6 | 294 | 33.5 |
| 470.lbm | 128 | 107 | **128** | **108** | 128 | 108 | 132 | 104 | **133** | **103** | 133 | 103 |
| 481.wrf | **203** | **55.0** | 205 | 54.6 | 202 | 55.4 | **203** | **55.0** | 205 | 54.6 | 202 | 55.4 |
| 482.sphinx3 | 577 | 33.8 | **575** | **33.9** | 573 | 34.0 | 550 | 35.4 | 542 | 35.9 | **548** | **35.6** |

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 stacksize to unlimited prior to run
'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
echo 900> /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

## Platform Notes

```
BIOS Settings:
Power Management = Maximum Performance (Default = Active Power Controller)
Logical Processor = Disabled (Default = Enabled)
```

## General Notes

```
OMP_NUM_THREADS set to number of cores
The Dell PowerEdge T110 II and
the Bull NovaScale T810B F2 models are electronically equivalent.
The results have been measured on a Dell PowerEdge T110 II model
Binaries were compiled on RHEL5.5
```

## Base Compiler Invocation

C benchmarks:
```
icc   -m64
```

C++ benchmarks:
```
icpc  -m64
```

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
icc   -m64 ifort -m64
```

## 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:
```
-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias
```

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## Base Optimization Flags (Continued)

C++ benchmarks:
`-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias`

Fortran benchmarks:
`-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch`

Benchmarks using both Fortran and C:
`-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch -ansi-alias`

## Peak Compiler Invocation

C benchmarks:
`icc -m64`

C++ benchmarks:
`icpc -m64`

Fortran benchmarks:
`ifort -m64`

Benchmarks using both Fortran and C:
`icc -m64 ifort -m64`

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

433.milc: `-xAVX`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2) `-no-prec-div`(pass 2) `-prof-use`(pass 2) `-static -auto-ilp32 -ansi-alias`

470.lbm: `-xAVX`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2) `-no-prec-div`(pass 2) `-prof-use`(pass 2) `-parallel -ansi-alias -static -auto-ilp32`

482.sphinx3: `-xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias -parallel`

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## Peak Optimization Flags (Continued)

C++ benchmarks:

444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Fortran benchmarks:

410.bwaves: -xAVX -ipo -O3 -no-prec-div -opt-prefetch -parallel -static

416.gamess: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2 -inline-level=0 -scalar-rep- -static

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2 -inline-level=0 -opt-prefetch -parallel -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

465.tonto: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -inline-calloc -opt-malloc-options=3 -auto -unroll4 -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xAVX -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

481.wrf: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.html
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110524.00.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110524.00.xml


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For other inquiries, please contact webmaster@spec.org.

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