# SPEC® CFP2006 Result

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## Dell Inc.

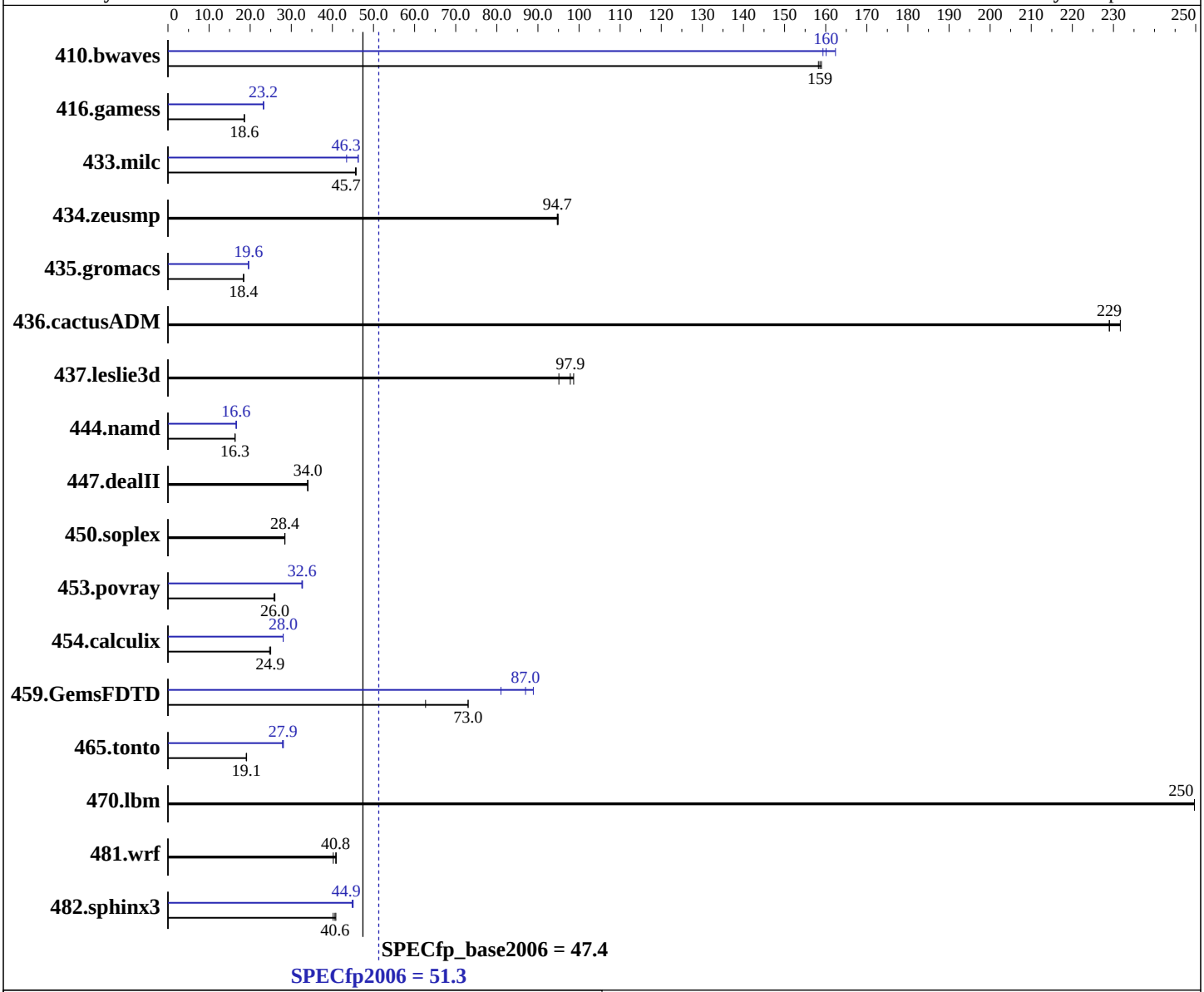
PowerEdge T710 (Intel Xeon L5640, 2.26 GHz)

SPECfp®2006 = 51.3

SPECfp_base2006 = 47.4

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

**Test date:** Jul-2011
**Hardware Availability:** Mar-2010
**Software Availability:** Apr-2011




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon L5640 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 2.80 GHz |
| CPU MHz: | 2267 |
| FPU: | Integrated |
| CPU(s) enabled: | 12 cores, 2 chips, 6 cores/chip |
| CPU(s) orderable: | 1,2 chips |
| 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 12.0 Update 3 |
| Auto Parallel: | Yes |
| File System: | ext3 |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |

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L3 Cache: 12 MB I+D on chip per chip
Other Cache: None
Memory: 48 GB (12 x 4 GB 2Rx4 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 | 85.9 | 158 | 85.5 | 159 | **85.7** | **159** | 85.3 | 159 | 83.7 | 162 | **84.9** | **160** |
| 416.gamess | 1056 | 18.5 | **1054** | **18.6** | 1052 | 18.6 | 843 | 23.2 | 841 | 23.3 | **843** | **23.2** |
| 433.milc | 201 | 45.8 | **201** | **45.7** | 201 | 45.6 | 211 | 43.5 | **198** | **46.3** | 198 | 46.3 |
| 434.zeusmp | **96.1** | **94.7** | 96.1 | 94.7 | 95.9 | 94.9 | **96.1** | **94.7** | 96.1 | 94.7 | 95.9 | 94.9 |
| 435.gromacs | 387 | 18.4 | 388 | 18.4 | **388** | **18.4** | 365 | 19.6 | **364** | **19.6** | 364 | 19.6 |
| 436.cactusADM | **52.2** | **229** | 51.6 | 232 | 52.2 | 229 | **52.2** | **229** | 51.6 | 232 | 52.2 | 229 |
| 437.leslie3d | **96.0** | **97.9** | 95.2 | 98.7 | 98.8 | 95.1 | **96.0** | **97.9** | 95.2 | 98.7 | 98.8 | 95.1 |
| 444.namd | 491 | 16.3 | **491** | **16.3** | 492 | 16.3 | 483 | 16.6 | 482 | 16.6 | **483** | **16.6** |
| 447.dealII | 336 | 34.1 | 337 | 34.0 | **336** | **34.0** | 336 | 34.1 | 337 | 34.0 | **336** | **34.0** |
| 450.soplex | 294 | 28.4 | **293** | **28.4** | 293 | 28.5 | 294 | 28.4 | **293** | **28.4** | 293 | 28.5 |
| 453.povray | 205 | 26.0 | 206 | 25.8 | **205** | **26.0** | 163 | 32.6 | 162 | 32.7 | **163** | **32.6** |
| 454.calculix | 330 | 25.0 | 334 | 24.7 | **331** | **24.9** | 294 | 28.0 | **294** | **28.0** | 294 | 28.0 |
| 459.GemsFDTD | **145** | **73.0** | 145 | 73.0 | 169 | 62.7 | 119 | 88.9 | **122** | **87.0** | 131 | 81.0 |
| 465.tonto | **515** | **19.1** | 517 | 19.0 | 514 | 19.1 | 353 | 27.9 | **352** | **27.9** | 350 | 28.1 |
| 470.lbm | 55.0 | 250 | **55.0** | **250** | 55.0 | 250 | 55.0 | 250 | **55.0** | **250** | 55.0 | 250 |
| 481.wrf | 278 | 40.2 | 273 | 41.0 | **274** | **40.8** | 278 | 40.2 | 273 | 41.0 | **274** | **40.8** |
| 482.sphinx3 | 477 | 40.8 | **480** | **40.6** | 485 | 40.2 | **434** | **44.9** | 433 | 45.1 | 435 | 44.8 |

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)
Data Reuse = Disabled (Default = Enabled)
Logical Processor = Disabled (Default = Enabled)
```

## General Notes

```
OMP_NUM_THREADS set to number of cores
Binaries were compiled on RHEL5.5
The Dell PowerEdge T710 and
the Bull NovaScale T860 F2 models are electronically equivalent.
The results have been measured on a Dell PowerEdge T710 model
```

## 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:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias
```

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## Base Optimization Flags (Continued)

C++ benchmarks:
`-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias`

Fortran benchmarks:
`-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch`

Benchmarks using both Fortran and C:
`-xSSE4.2 -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: `-xSSE4.2`(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: `basepeak = yes`

482.sphinx3: `-xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias -parallel`

C++ benchmarks:

Continued on next page

# Peak Optimization Flags (Continued)

444.namd: -xSSE4.2(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: -xSSE4.2(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: -xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -parallel -static

416.gamess: -xSSE4.2(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: -xSSE4.2(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: -xSSE4.2(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: -xSSE4.2(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

436.cactusADM: basepeak = yes

454.calculix: -xSSE4.2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

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 questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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