



# SPEC<sup>®</sup> CFP2006 Result

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Dell Inc.

SPECfp<sup>®</sup>2006 = 40.6

PowerEdge T710 (Intel Xeon E5607, 2.26 GHz)

SPECfp\_base2006 = 38.2

CPU2006 license: 55

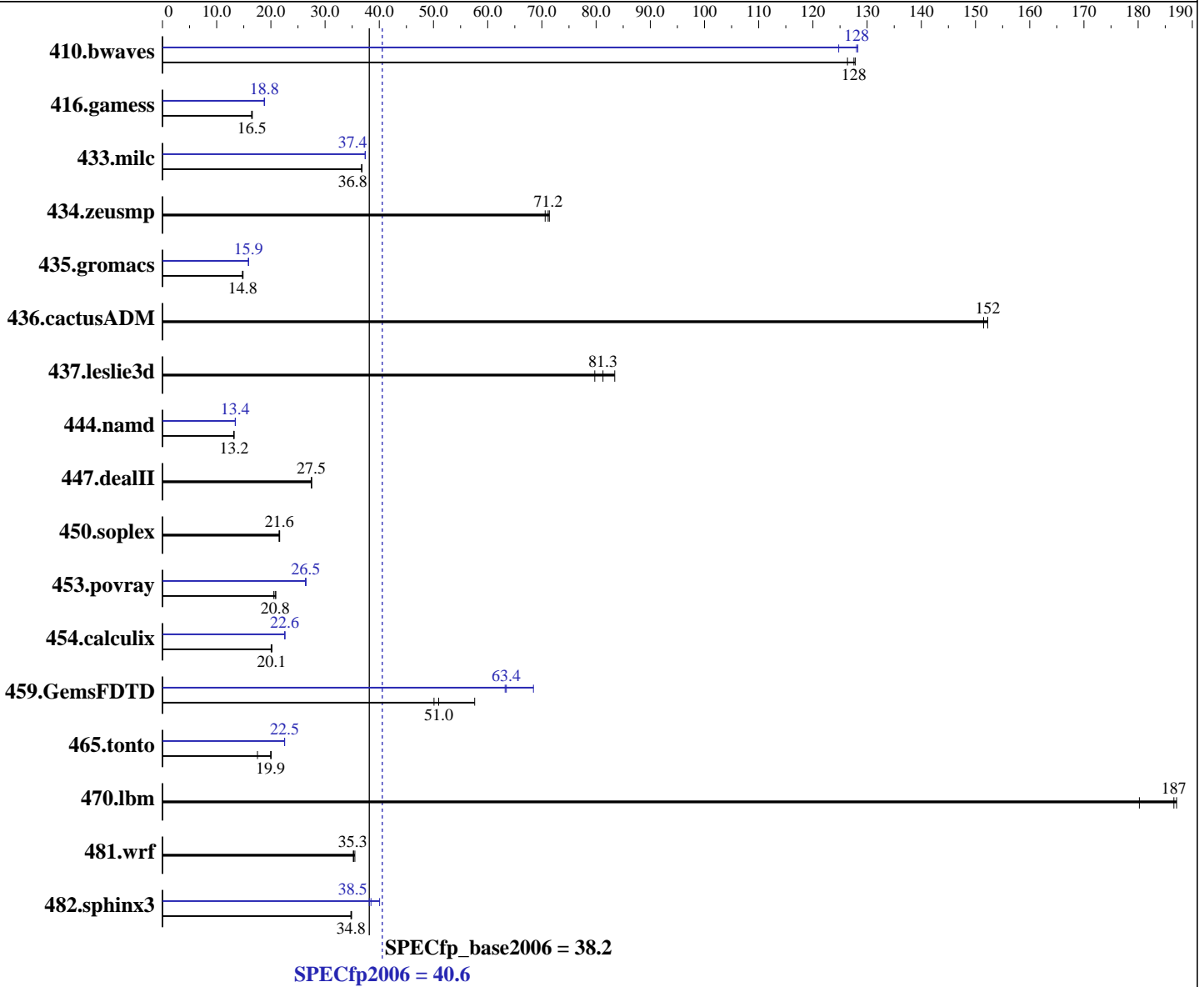
Test date: May-2011

Test sponsor: Dell Inc.

Hardware Availability: Feb-2011

Tested by: Dell Inc.

Software Availability: Apr-2011



## Hardware

CPU Name: Intel Xeon E5607  
 CPU Characteristics:  
 CPU MHz: 2267  
 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: 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: 8 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 48 GB (12 x 4 GB 2Rx4 PC3-10600R-9, ECC, running at 1066 MHz)  
 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    | 108         | 126         | <b>107</b>  | <b>128</b>  | 106         | 128         | <b>106</b>  | <b>128</b>  | 106         | 128         | 109         | 125         |
| 416.gamess    | <b>1187</b> | <b>16.5</b> | 1189        | 16.5        | 1181        | 16.6        | <b>1040</b> | <b>18.8</b> | 1044        | 18.8        | 1039        | 18.8        |
| 433.milc      | <b>250</b>  | <b>36.8</b> | 250         | 36.7        | 249         | 36.8        | <b>245</b>  | <b>37.4</b> | 246         | 37.4        | 245         | 37.4        |
| 434.zeusmp    | <b>128</b>  | <b>71.2</b> | 127         | 71.4        | 129         | 70.6        | <b>128</b>  | <b>71.2</b> | 127         | 71.4        | 129         | 70.6        |
| 435.gromacs   | 480         | 14.9        | <b>482</b>  | <b>14.8</b> | 484         | 14.8        | 450         | 15.9        | <b>450</b>  | <b>15.9</b> | 450         | 15.9        |
| 436.cactusADM | 78.9        | 151         | 78.5        | 152         | <b>78.5</b> | <b>152</b>  | 78.9        | 151         | 78.5        | 152         | <b>78.5</b> | <b>152</b>  |
| 437.leslie3d  | <b>116</b>  | <b>81.3</b> | 113         | 83.4        | 118         | 79.8        | <b>116</b>  | <b>81.3</b> | 113         | 83.4        | 118         | 79.8        |
| 444.namd      | 607         | 13.2        | <b>608</b>  | <b>13.2</b> | 610         | 13.2        | 597         | 13.4        | 597         | 13.4        | <b>597</b>  | <b>13.4</b> |
| 447.dealII    | 416         | 27.5        | <b>416</b>  | <b>27.5</b> | 416         | 27.5        | 416         | 27.5        | <b>416</b>  | <b>27.5</b> | 416         | 27.5        |
| 450.soplex    | <b>387</b>  | <b>21.6</b> | 386         | 21.6        | 388         | 21.5        | <b>387</b>  | <b>21.6</b> | 386         | 21.6        | 388         | 21.5        |
| 453.povray    | 254         | 20.9        | 259         | 20.5        | <b>256</b>  | <b>20.8</b> | 202         | 26.4        | <b>201</b>  | <b>26.5</b> | 201         | 26.5        |
| 454.calculix  | 411         | 20.1        | 409         | 20.2        | <b>410</b>  | <b>20.1</b> | 365         | 22.6        | 366         | 22.6        | <b>366</b>  | <b>22.6</b> |
| 459.GemsFDTD  | <b>208</b>  | <b>51.0</b> | 184         | 57.6        | 212         | 50.1        | <b>167</b>  | <b>63.4</b> | 168         | 63.2        | 155         | 68.4        |
| 465.tonto     | 490         | 20.1        | <b>493</b>  | <b>19.9</b> | 561         | 17.5        | 437         | 22.5        | 437         | 22.5        | <b>437</b>  | <b>22.5</b> |
| 470.lbm       | 76.2        | 180         | <b>73.6</b> | <b>187</b>  | 73.4        | 187         | 76.2        | 180         | <b>73.6</b> | <b>187</b>  | 73.4        | 187         |
| 481.wrf       | 315         | 35.5        | 317         | 35.2        | <b>317</b>  | <b>35.3</b> | 315         | 35.5        | 317         | 35.2        | <b>317</b>  | <b>35.3</b> |
| 482.sphinx3   | <b>560</b>  | <b>34.8</b> | 560         | 34.8        | 558         | 34.9        | 511         | 38.2        | <b>507</b>  | <b>38.5</b> | 486         | 40.1        |

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)



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## 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.deallI: -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:

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## 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



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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](mailto:webmaster@spec.org).

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