



# SPEC® CFP2006 Result

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## Dell Inc.

SPECfp®2006 = 37.1

PowerEdge R610 (Intel Xeon E5620, 2.40 GHz)

SPECfp\_base2006 = 34.3

CPU2006 license: 55

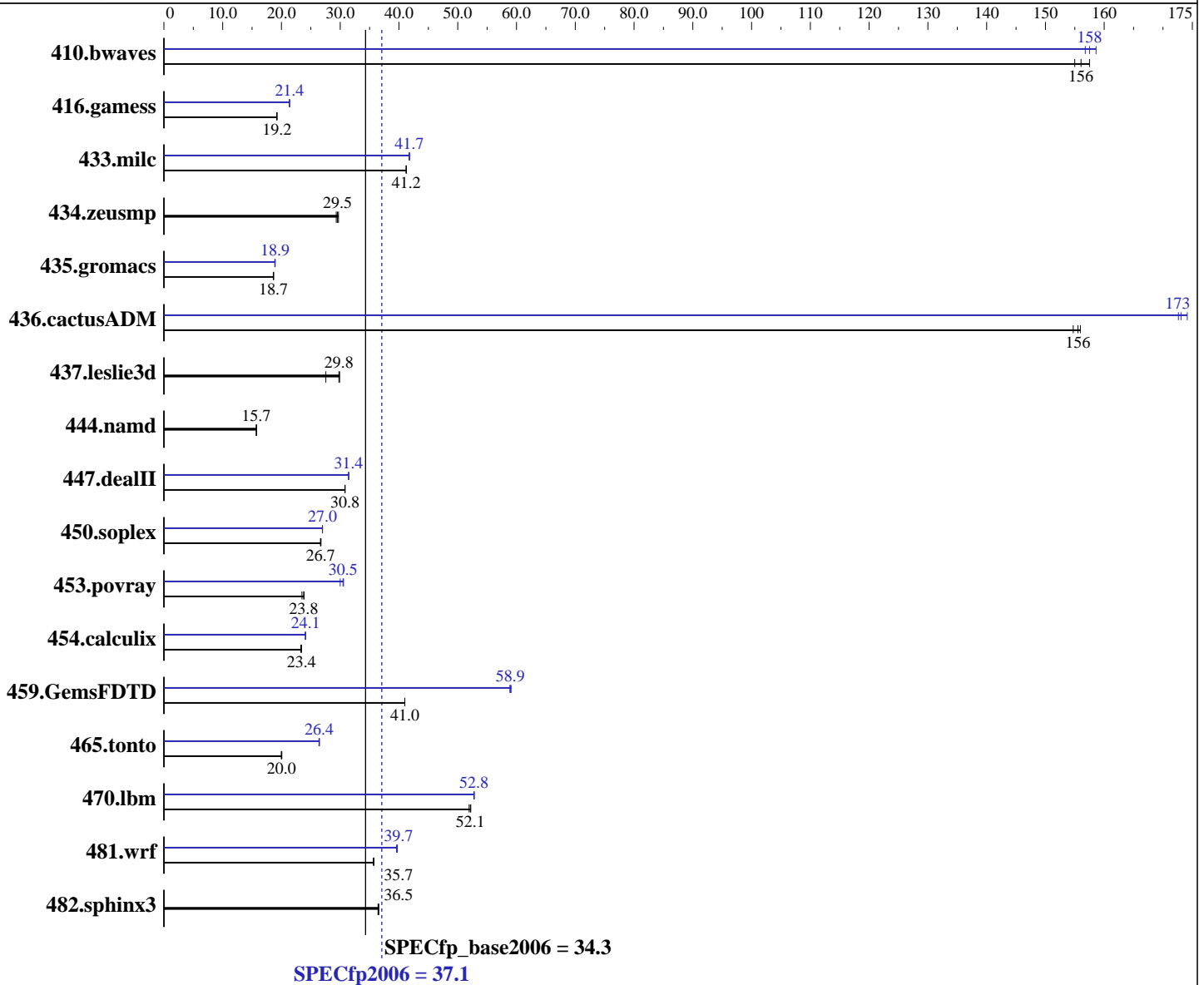
Test date: Apr-2010

Test sponsor: Dell Inc.

Hardware Availability: Mar-2010

Tested by: Dell Inc.

Software Availability: Dec-2009



### Hardware

CPU Name: Intel Xeon E5620  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.67 GHz  
 CPU MHz: 2400  
 FPU: Integrated  
 CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip, 2 threads/core  
 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

Continued on next page

### Software

Operating System: SUSE Linux Enterprise Server 11 (x86\_64), Kernel 2.6.27.19-5-smpp  
 Compiler: Intel C++ and Fortran Professional Compiler for IA32 and Intel 64, Version 11.1 Build 20091130 Package ID: l\_cproc\_p\_11.1.064, l\_cprof\_p\_11.1.064  
 Auto Parallel: Yes  
 File System: ext3  
 System State: Run level 3 (multi-user)

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L3 Cache: 12 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 48 GB (12 x 4 GB DDR3-1333 DR CL9, ECC, downclocked to 1066 MHz)  
 Disk Subsystem: 1 x 146 GB 15000 RPM SAS  
 Other Hardware: None

Base Pointers: 64-bit  
 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    | 87.7              | 155                | <b><u>87.1</u></b> | <b><u>156</u></b>  | 86.3               | 158                | 85.7               | 159                | <b><u>86.3</u></b> | <b><u>158</u></b>  | 86.7              | 157                |
| 416.gamess    | 1020              | 19.2               | <b><u>1018</u></b> | <b><u>19.2</u></b> | 1017               | 19.2               | 916                | 21.4               | 917                | 21.4               | <b><u>916</u></b> | <b><u>21.4</u></b> |
| 433.milc      | 223               | 41.2               | 223                | 41.3               | <b><u>223</u></b>  | <b><u>41.2</u></b> | <b><u>220</u></b>  | <b><u>41.7</u></b> | 220                | 41.8               | 220               | 41.7               |
| 434.zeusmp    | <b><u>308</u></b> | <b><u>29.5</u></b> | 306                | 29.7               | 310                | 29.3               | <b><u>308</u></b>  | <b><u>29.5</u></b> | 306                | 29.7               | 310               | 29.3               |
| 435.gromacs   | 383               | 18.7               | <b><u>383</u></b>  | <b><u>18.7</u></b> | 384                | 18.6               | 377                | 18.9               | <b><u>377</u></b>  | <b><u>18.9</u></b> | 378               | 18.9               |
| 436.cactusADM | 77.2              | 155                | 76.6               | 156                | <b><u>76.8</u></b> | <b><u>156</u></b>  | <b><u>69.0</u></b> | <b><u>173</u></b>  | 68.6               | 174                | 69.2              | 173                |
| 437.leslie3d  | 341               | 27.6               | <b><u>316</u></b>  | <b><u>29.8</u></b> | 314                | 29.9               | 341                | 27.6               | <b><u>316</u></b>  | <b><u>29.8</u></b> | 314               | 29.9               |
| 444.namd      | 510               | 15.7               | 510                | 15.7               | <b><u>510</u></b>  | <b><u>15.7</u></b> | 510                | 15.7               | 510                | 15.7               | <b><u>510</u></b> | <b><u>15.7</u></b> |
| 447.dealII    | <b><u>371</u></b> | <b><u>30.8</u></b> | 371                | 30.8               | 371                | 30.8               | 364                | 31.4               | <b><u>364</u></b>  | <b><u>31.4</u></b> | 364               | 31.4               |
| 450.soplex    | 313               | 26.6               | 312                | 26.7               | <b><u>313</u></b>  | <b><u>26.7</u></b> | 309                | 27.0               | 309                | 27.0               | <b><u>309</u></b> | <b><u>27.0</u></b> |
| 453.povray    | 223               | 23.8               | <b><u>224</u></b>  | <b><u>23.8</u></b> | 227                | 23.5               | <b><u>175</u></b>  | <b><u>30.5</u></b> | 177                | 30.0               | 174               | 30.6               |
| 454.calculix  | <b><u>353</u></b> | <b><u>23.4</u></b> | 354                | 23.3               | 352                | 23.4               | 343                | 24.1               | <b><u>342</u></b>  | <b><u>24.1</u></b> | 342               | 24.1               |
| 459.GemsFDTD  | 259               | 41.0               | <b><u>259</u></b>  | <b><u>41.0</u></b> | 259                | 41.0               | 180                | 59.1               | <b><u>180</u></b>  | <b><u>58.9</u></b> | 180               | 58.9               |
| 465.tonto     | 490               | 20.1               | <b><u>492</u></b>  | <b><u>20.0</u></b> | 492                | 20.0               | 373                | 26.4               | 372                | 26.4               | <b><u>372</u></b> | <b><u>26.4</u></b> |
| 470.lbm       | <b><u>264</u></b> | <b><u>52.1</u></b> | 263                | 52.2               | 265                | 51.9               | 260                | 52.8               | <b><u>260</u></b>  | <b><u>52.8</u></b> | 260               | 52.8               |
| 481.wrf       | 312               | 35.7               | <b><u>313</u></b>  | <b><u>35.7</u></b> | 313                | 35.6               | 281                | 39.7               | 282                | 39.6               | <b><u>281</u></b> | <b><u>39.7</u></b> |
| 482.sphinx3   | 533               | 36.6               | 535                | 36.4               | <b><u>534</u></b>  | <b><u>36.5</u></b> | 533                | 36.6               | 535                | 36.4               | <b><u>534</u></b> | <b><u>36.5</u></b> |

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

## 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  
KMP\_AFFINITY set to granularity=fine,scatter  
KMP\_STACKSIZE set to 200M  
The Dell PowerEdge R610 and  
the Bull NovaScale R440 F2 models are electronically equivalent.  
The results have been measured on a Dell PowerEdge R610 model.  
Binaries were compiled on SLES 10 with Binutils 2.18.50.0.7.20080502

## 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

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## Base Optimization Flags (Continued)

C++ benchmarks:

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

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`

## 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) -static(pass 2) -prof-use(pass 2)  
-ansi-alias`

470.lbm: `-xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-parallel -ansi-alias -auto-ilp32`

482.sphinx3: `basepeak = yes`

C++ benchmarks:

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## Peak Optimization Flags (Continued)

444.namd: basepeak = yes

447.dealII: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll2 -ansi-alias -scalar-rep- -auto-ilp32

450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-opt-malloc-options=3 -auto-ilp32

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll4 -ansi-alias

### Fortran benchmarks:

410.bwaves: -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch  
-parallel

416.gamess: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll2 -Ob0 -ansi-alias -scalar-rep-

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) -static(pass 2) -prof-use(pass 2)  
-unroll2 -Ob0 -opt-prefetch -parallel

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-inline-calloc -opt-malloc-options=3 -auto -unroll4

### 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) -static(pass 2) -prof-use(pass 2)  
-opt-prefetch -auto-ilp32

436.cactusADM: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)  
-unroll2 -opt-prefetch -parallel -auto-ilp32

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

481.wrf: Same as 454.calculix



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The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic11.1-linux64-revE.20100330.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/Intel-ic11.1-linux64-revE.20100330.xml>

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Tested with SPEC CPU2006 v1.1.  
Report generated on Wed Jul 23 07:07:40 2014 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 11 May 2010.