# SPEC® CFP2006 Result

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## Bull SAS

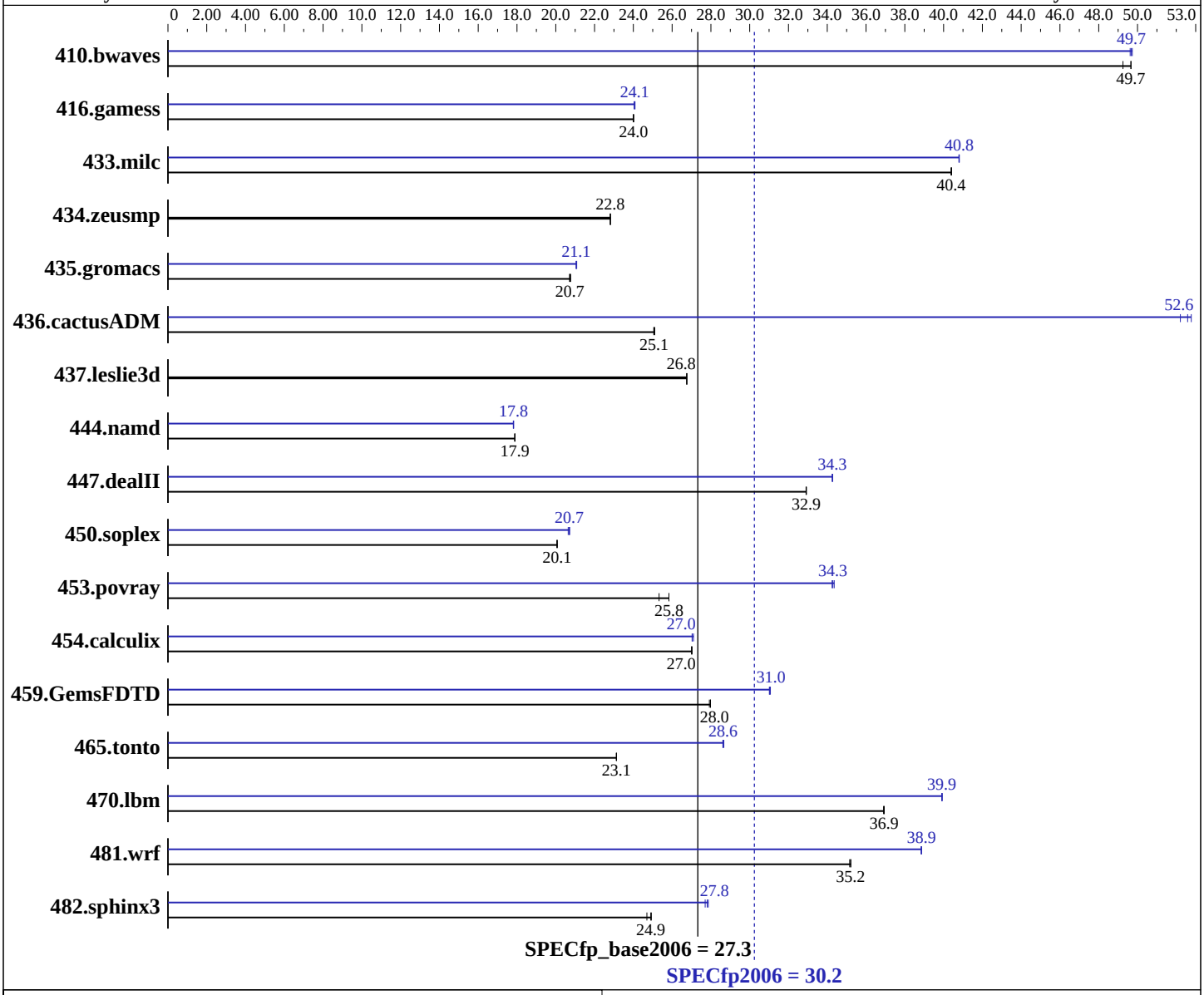
NovaScale R410 F2 (Intel Core i3-540, 3.06 GHz)

SPECfp®2006 = 30.2

SPECfp_base2006 = 27.3

**CPU2006 license:** 20
**Test sponsor:** Bull SAS
**Tested by:** Dell Inc.

**Test date:** Dec-2009
**Hardware Availability:** Jan-2010
**Software Availability:** Dec-2009




## Hardware

| | |
|---|---|
| CPU Name: | Intel Core i3-540 |
| CPU Characteristics: | |
| CPU MHz: | 3067 |
| FPU: | Integrated |
| CPU(s) enabled: | 2 cores, 1 chip, 2 cores/chip, 2 threads/core |
| 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: | Red Hat Enterprise Linux Server release 5.3, Kernel 2.6.18-128.el5 |
| Compiler: | Intel Fortran Compiler and Intel C++ Compiler Professional Edition 11.1 For Linux Build 20091012 Package ID: l_cproc_p_11.1.059, l_cprof_p_11.1.059 |
| Auto Parallel: | Yes |
| File System: | ReiserFS |
| System State: | Run level 3 (multi-user) |

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L3 Cache: 4 MB I+D on chip per chip
Other Cache: None
Memory: 8 GB (4 x 2 GB DDR3-1333 DR UDIMM)
Disk Subsystem: 1 x 160 GB 7200 RPM SATA
Other Hardware: None

Base Pointers: 64-bit
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 | 276 | 49.2 | **274** | **49.7** | 274 | 49.7 | 274 | 49.6 | **274** | **49.7** | 273 | 49.7 |
| 416.gamess | 815 | 24.0 | 816 | 24.0 | **815** | **24.0** | 813 | 24.1 | **814** | **24.1** | 814 | 24.0 |
| 433.milc | 227 | 40.4 | **227** | **40.4** | 227 | 40.4 | **225** | **40.8** | 225 | 40.8 | 225 | 40.8 |
| 434.zeusmp | 399 | 22.8 | **399** | **22.8** | 399 | 22.8 | 399 | 22.8 | **399** | **22.8** | 399 | 22.8 |
| 435.gromacs | **344** | **20.7** | 344 | 20.8 | 345 | 20.7 | 339 | 21.1 | **339** | **21.1** | 339 | 21.1 |
| 436.cactusADM | **477** | **25.1** | 476 | 25.1 | 477 | 25.1 | **227** | **52.6** | 226 | 52.8 | 229 | 52.2 |
| 437.leslie3d | 351 | 26.8 | **351** | **26.8** | 351 | 26.8 | 351 | 26.8 | **351** | **26.8** | 351 | 26.8 |
| 444.namd | 448 | 17.9 | 448 | 17.9 | **448** | **17.9** | 450 | 17.8 | 450 | 17.8 | **450** | **17.8** |
| 447.dealII | 348 | 32.9 | 347 | 32.9 | **348** | **32.9** | 334 | 34.3 | **334** | **34.3** | 334 | 34.3 |
| 450.soplex | 416 | 20.1 | 415 | 20.1 | **416** | **20.1** | 404 | 20.6 | **403** | **20.7** | 403 | 20.7 |
| 453.povray | 206 | 25.8 | **206** | **25.8** | 210 | 25.3 | 155 | 34.4 | **155** | **34.3** | 155 | 34.2 |
| 454.calculix | 305 | 27.0 | 306 | 27.0 | **305** | **27.0** | 304 | 27.1 | **305** | **27.0** | 305 | 27.0 |
| 459.GemsFDTD | 380 | 27.9 | **379** | **28.0** | 379 | 28.0 | 342 | 31.1 | **342** | **31.0** | 342 | 31.0 |
| 465.tonto | **425** | **23.1** | 426 | 23.1 | 425 | 23.1 | 343 | 28.7 | 344 | 28.6 | **344** | **28.6** |
| 470.lbm | 372 | 36.9 | 372 | 36.9 | **372** | **36.9** | 344 | 39.9 | **344** | **39.9** | 344 | 39.9 |
| 481.wrf | 318 | 35.2 | 317 | 35.2 | **317** | **35.2** | **287** | **38.9** | 287 | 38.9 | 288 | 38.8 |
| 482.sphinx3 | 789 | 24.7 | **783** | **24.9** | 782 | 24.9 | 699 | 27.9 | **701** | **27.8** | 704 | 27.7 |

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

## Submit Notes

```
The config file option 'submit' was used.
 numactl was used to bind copies to the cores
```

## 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)
```

## 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 R210 and the Bull NovaScale R410 F2 models are electronically equivalent.
This result was measured on a Dell PowerEdge R210.
```

## 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 -opt-prefetch
```

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## Base Optimization Flags (Continued)

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

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

Benchmarks using both Fortran and C:
`-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch`

## Peak Compiler Invocation

C benchmarks (except as noted below):
`icc -m64`

482.sphinx3: `icc -m32`

C++ benchmarks (except as noted below):
`icpc -m64`

450.soplex: `icpc -m32`

Fortran benchmarks:
`ifort -m64`

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

## 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`
470.lbm: `-DSPEC_CPU_LP64`
481.wrf: `-DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX`

# 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) -ansi-alias -parallel -auto-ilp32

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -static -unroll2

C++ benchmarks:

444.namd: -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) -fno-alias -auto-ilp32

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

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

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

Continued on next page

# Peak Optimization Flags (Continued)

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`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/Intel-ic11.1-fp-linux64-revA.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/Intel-ic11.1-fp-linux64-revA.xml`


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

Tested with SPEC CPU2006 v1.1.
Report generated on Wed Jul 23 06:36:08 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 16 February 2010.