# SPEC® CFP2006 Result

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## Bull SAS

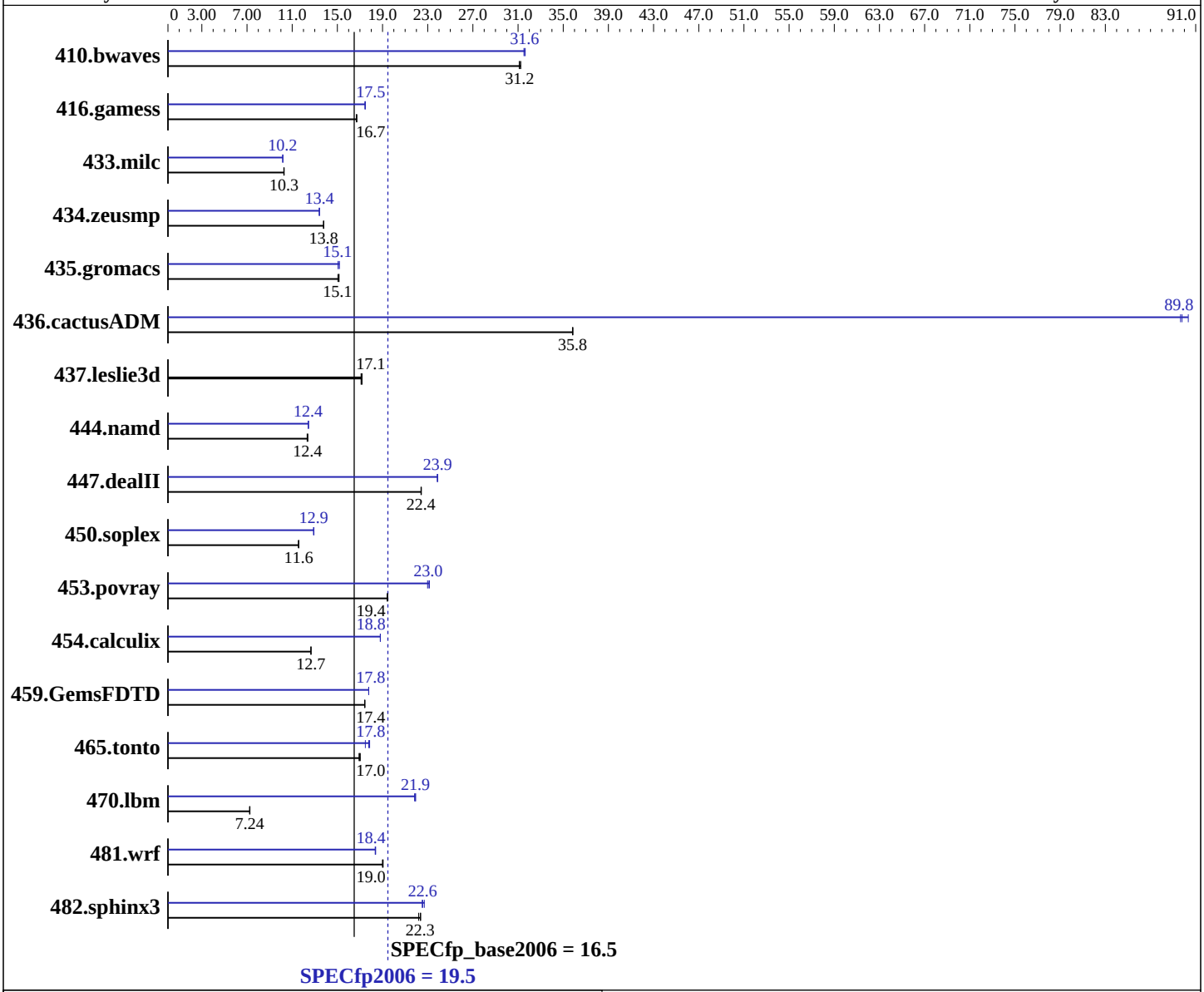
NovaScale R460 E1
(Intel Xeon E5410, 2.33 GHz)

SPECfp®2006 = 19.5

SPECfp_base2006 = 16.5

**CPU2006 license:** 20
**Test sponsor:** Bull SAS
**Tested by:** Bull SAS

**Test date:** Jun-2008
**Hardware Availability:** Jan-2008
**Software Availability:** Nov-2007




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5410 |
| CPU Characteristics: | 1333 MHz system bus |
| CPU MHz: | 2333 |
| 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: | 12 MB I+D on chip per chip, 6 MB shared / 2 cores |

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### Software

| | |
|---|---|
| Operating System: | SUSE LINUX Enterprise Server 10 SP1<br>Kernel 2.6.16.46-0.12-smp for x86_64 |
| Compiler: | Intel C++ and Fortran Compiler 10.1 for Linux<br>Build 20070913 Package ID: l_cc_p_10.1.008,<br>l_fc_p_10.1.008 |
| Auto Parallel: | Yes |
| File System: | ext2 |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |

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L3 Cache: None
Other Cache: None
Memory: 16 GB (8x2 GB) FB-DIMM PC2-5300F ECC CL5
Disk Subsystem: 1x73 GB SAS, 15000 RPM
Other Hardware: None

Peak Pointers: 32/64-bit
Other Software: Binutils 2.17.50.0.15

## Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | **436** | **31.2** | 435 | 31.2 | 437 | 31.1 | 430 | 31.6 | 431 | 31.5 | **430** | **31.6** |
| 416.gamess | 1174 | 16.7 | **1173** | **16.7** | 1170 | 16.7 | 1122 | 17.4 | **1122** | **17.5** | 1120 | 17.5 |
| 433.milc | **893** | **10.3** | 893 | 10.3 | 895 | 10.3 | 902 | 10.2 | 903 | 10.2 | **903** | **10.2** |
| 434.zeusmp | **660** | **13.8** | 660 | 13.8 | 660 | 13.8 | **678** | **13.4** | 678 | 13.4 | 679 | 13.4 |
| 435.gromacs | 471 | 15.1 | **472** | **15.1** | 475 | 15.0 | **473** | **15.1** | 474 | 15.1 | 470 | 15.2 |
| 436.cactusADM | **333** | **35.8** | 334 | 35.8 | 333 | 35.9 | 133 | 89.7 | 132 | 90.3 | **133** | **89.8** |
| 437.leslie3d | **548** | **17.1** | 547 | 17.2 | 550 | 17.1 | **548** | **17.1** | 547 | 17.2 | 550 | 17.1 |
| 444.namd | 651 | 12.3 | **649** | **12.4** | 648 | 12.4 | **645** | **12.4** | 645 | 12.4 | 644 | 12.4 |
| 447.dealII | **510** | **22.4** | 510 | 22.4 | 511 | 22.4 | **479** | **23.9** | 480 | 23.8 | 479 | 23.9 |
| 450.soplex | **720** | **11.6** | 720 | 11.6 | 722 | 11.5 | 645 | 12.9 | **646** | **12.9** | 647 | 12.9 |
| 453.povray | **274** | **19.4** | 274 | 19.4 | 273 | 19.5 | 231 | 23.0 | 230 | 23.2 | **231** | **23.0** |
| 454.calculix | 651 | 12.7 | 652 | 12.7 | **651** | **12.7** | 439 | 18.8 | **439** | **18.8** | 439 | 18.8 |
| 459.GemsFDTD | 608 | 17.4 | 609 | 17.4 | **609** | **17.4** | 597 | 17.8 | **597** | **17.8** | 597 | 17.8 |
| 465.tonto | **580** | **17.0** | 578 | 17.0 | 582 | 16.9 | **553** | **17.8** | 551 | 17.9 | 563 | 17.5 |
| 470.lbm | 1892 | 7.26 | **1898** | **7.24** | 1901 | 7.23 | 627 | 21.9 | **627** | **21.9** | 629 | 21.8 |
| 481.wrf | 588 | 19.0 | 586 | 19.1 | **587** | **19.0** | 609 | 18.3 | 607 | 18.4 | **608** | **18.4** |
| 482.sphinx3 | 878 | 22.2 | 871 | 22.4 | **872** | **22.3** | 859 | 22.7 | 866 | 22.5 | **864** | **22.6** |

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
OMP_NUM_THREADS set to number of cores
KMP_AFFINITY set to physical,0
KMP_STACKSIZE set to 200M
```

## General Notes

```
All benchmarks compiled in 64-bit mode except 450.soplex,
470.lbm and 482.sphinx3, at peak, are compiled in 32-bit mode
The Bull NovaScale R440 E1 (Intel Xeon E5410, 2.33 GHz) and
the Bull NovaScale R460 E1 (Intel Xeon E5410, 2.33 GHz) models are electronically equivalent.
The results have been measured on a Bull NovaScale R460 E1 (Intel Xeon E5410, 2.33 GHz) model.
```

## Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
icc ifort

## 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:
-fast -parallel

C++ benchmarks:
-fast -parallel

Fortran benchmarks:
-fast -parallel

Benchmarks using both Fortran and C:
-fast -parallel

## Peak Compiler Invocation

C benchmarks (except as noted below):
`/opt/intel/cc/10.1.008/bin/icc -L/opt/intel/cc/10.1.008/lib -I/opt/intel/cc/10.1.008/include`

433.milc: `icc`

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

450.soplex: `/opt/intel/cc/10.1.008/bin/icpc -L/opt/intel/cc/10.1.008/lib -I/opt/intel/cc/10.1.008/include`

Fortran benchmarks:
`ifort`

Benchmarks using both Fortran and C:
`icc ifort`

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

## Peak Optimization Flags

C benchmarks:

433.milc: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-fast -fno-alias -auto-ilp32`

470.lbm: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-fast -unroll2 -scalar-rep- -prefetch -opt-malloc-options=3`

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# Peak Optimization Flags (Continued)

482.sphinx3: `-fast -unroll2`

C++ benchmarks:

444.namd: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-fast -fno-alias -auto-ilp32`

447.dealII: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-fast -unroll2 -ansi-alias -scalar-rep-`

450.soplex: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-fast -opt-malloc-options=3`

453.povray: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-fast -unroll4 -ansi-alias`

Fortran benchmarks:

410.bwaves: `-fast -prefetch -parallel`

416.gamess: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-fast -unroll2 -Ob0 -ansi-alias -scalar-rep-`

434.zeusmp: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-fast`

437.leslie3d: `basepeak = yes`

459.GemsFDTD: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-fast -unroll2 -Ob0 -prefetch -parallel`

465.tonto: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-fast -unroll4 -auto`

Benchmarks using both Fortran and C:

435.gromacs: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-fast -prefetch -auto-ilp32`

436.cactusADM: `-prof-gen`(pass 1) `-prof-use`(pass 2) `-fast -unroll2 -prefetch -parallel -auto-ilp32`

454.calculix: `-fast -unroll-aggressive -auto-ilp32`

481.wrf: `-fast -parallel -prefetch -auto-ilp32`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/EM64T_Intel101_fp_flags.20090713.00.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/EM64T_Intel101_fp_flags.20090713.00.xml`

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