# SPEC® CFP2006 Result

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## Bull SAS

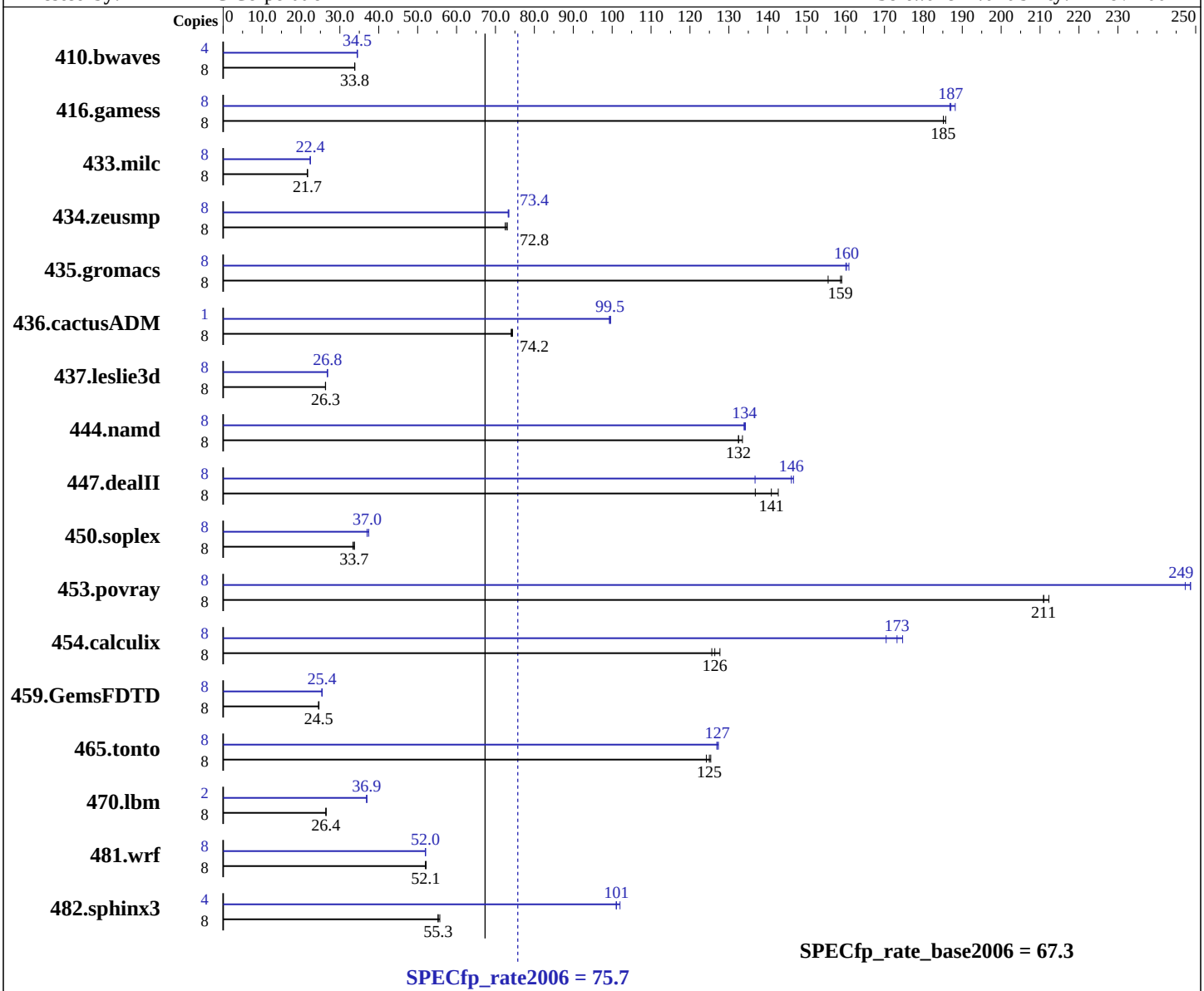
NovaScale R460 E1
(Intel Xeon X5460,3.16GHz)

**SPECfp®_rate2006 = 75.7**

**SPECfp_rate_base2006 = 67.3**

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

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




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon X5460 |
| CPU Characteristics: | 3.16 GHz, 2x6 MB L2 shared, 1333 MHz bus |
| CPU MHz: | 3160 |
| 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 (x86_64) SP1, Kernel 2.6.16.46-0.12-smp |
| Compiler: | Intel C++ and Fortran Compiler for Linux32 and Linux64 version 10.1 Build 20070913 Package ID: l_cc_p_10.1.008, l_fc_p_10.1.008 |
| Auto Parallel: | Yes |
| File System: | ext2 |

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L3 Cache: None
Other Cache: None
Memory: 12 GB (12x1 GB PC2-5300F, 2 rank, CL5-5-5, ECC)
Disk Subsystem: 1x73.2 GB SAS, 15000RPM
Other Hardware: None

System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: binutils-2.17.tar.gz, Version 2.17

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 8 | 3212 | 33.8 | **3214** | **33.8** | 3216 | 33.8 | 4 | 1576 | 34.5 | 1577 | 34.5 | **1576** | **34.5** |
| 416.gamess | 8 | 846 | 185 | 843 | 186 | **846** | **185** | 8 | **837** | **187** | 838 | 187 | 832 | 188 |
| 433.milc | 8 | 3396 | 21.6 | **3387** | **21.7** | 3386 | 21.7 | 8 | **3278** | **22.4** | 3280 | 22.4 | 3276 | 22.4 |
| 434.zeusmp | 8 | **999** | **72.8** | 997 | 73.0 | 1004 | 72.5 | 8 | 991 | 73.4 | **992** | **73.4** | 994 | 73.3 |
| 435.gromacs | 8 | 367 | 156 | **360** | **159** | 359 | 159 | 8 | 357 | 160 | 355 | 161 | **356** | **160** |
| 436.cactusADM | 8 | 1285 | 74.4 | 1291 | 74.0 | **1288** | **74.2** | 1 | 120 | 99.3 | 120 | 99.6 | **120** | **99.5** |
| 437.leslie3d | 8 | **2856** | **26.3** | 2862 | 26.3 | 2856 | 26.3 | 8 | 2807 | 26.8 | 2804 | 26.8 | **2804** | **26.8** |
| 444.namd | 8 | 484 | 132 | **484** | **132** | 481 | 133 | 8 | 479 | 134 | **479** | **134** | 478 | 134 |
| 447.dealII | 8 | 669 | 137 | 641 | 143 | **649** | **141** | 8 | 624 | 147 | **627** | **146** | 669 | 137 |
| 450.soplex | 8 | 2001 | 33.4 | **1981** | **33.7** | 1977 | 33.7 | 8 | 1803 | 37.0 | **1801** | **37.0** | 1782 | 37.4 |
| 453.povray | 8 | 202 | 211 | 201 | 212 | **202** | **211** | 8 | 172 | 247 | **171** | **249** | 171 | 249 |
| 454.calculix | 8 | **522** | **126** | 525 | 126 | 517 | 128 | 8 | **381** | **173** | 387 | 170 | 378 | 175 |
| 459.GemsFDTD | 8 | 3445 | 24.6 | 3460 | 24.5 | **3459** | **24.5** | 8 | **3340** | **25.4** | 3347 | 25.4 | 3332 | 25.5 |
| 465.tonto | 8 | **630** | **125** | 634 | 124 | 628 | 125 | 8 | 620 | 127 | **620** | **127** | 618 | 127 |
| 470.lbm | 8 | 4161 | 26.4 | **4158** | **26.4** | 4155 | 26.5 | 2 | 745 | 36.9 | **745** | **36.9** | 744 | 36.9 |
| 481.wrf | 8 | 1719 | 52.0 | 1713 | 52.2 | **1715** | **52.1** | 8 | **1718** | **52.0** | 1719 | 52.0 | 1717 | 52.0 |
| 482.sphinx3 | 8 | 2799 | 55.7 | **2820** | **55.3** | 2823 | 55.2 | 4 | 772 | 101 | 764 | 102 | **771** | **101** |

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
'/usr/bin/taskset' used to bind processes to CPUs
OMP_NUM_THREADS set to number of cores (default).
```

## Platform Notes

```
Bios settings:
Intel SpeedStep Technology: Disabled
```

## General Notes

```
All benchmarks compiled in 64-bit mode except 437.leslie3d,
450.soplex, 470.lbm and 482.sphinx3, for peak, are
compiled in 32-bit mode
 The NEC Express5800/120Rh-1(Intel Xeon Prosessor X5460),
 the NEC Express5800/120Rj-2(Intel Xeon Prosessor X5460),
 the Bull NovaScale R440 E1 (Intel Xeon X5460,3.16GHz) and
 the Bull NovaScale R460 E1 (Intel Xeon X5460,3.16GHz) models are electronically equivalent.
 The results have been measured on a NEC Express5800/120Rj-2(Intel Xeon Prosessor X5460) 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`

C++ benchmarks:
`-fast`

Fortran benchmarks:
`-fast`

Benchmarks using both Fortran and C:
`-fast`

## 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 (except as noted below):
`ifort`

437.leslie3d: `/opt/intel/fc/10.1.008/bin/ifort -L/opt/intel/fc/10.1.008/lib -I/opt/intel/fc/10.1.008/include`

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`
444.namd: `-DSPEC_CPU_LP64`
447.dealII: `-DSPEC_CPU_LP64`

Continued on next page

## Peak Portability Flags (Continued)

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

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

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: -prof-gen(pass 1) -prof-use(pass 2) -fast -prefetch -opt-malloc-options=3

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

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# Peak Optimization Flags (Continued)

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 -auto-ilp32`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/NEC-Intel-ic10.1-FP-intel64-linux-flags.20090713.00.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/NEC-Intel-ic10.1-FP-intel64-linux-flags.20090713.00.xml`


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