# SPEC® CFP2006 Result
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## Bull SAS

NovaScale R460 E2
(Intel Xeon X5550, 2.66 GHz)

$SPECfp^{®}2006 =$    36.7

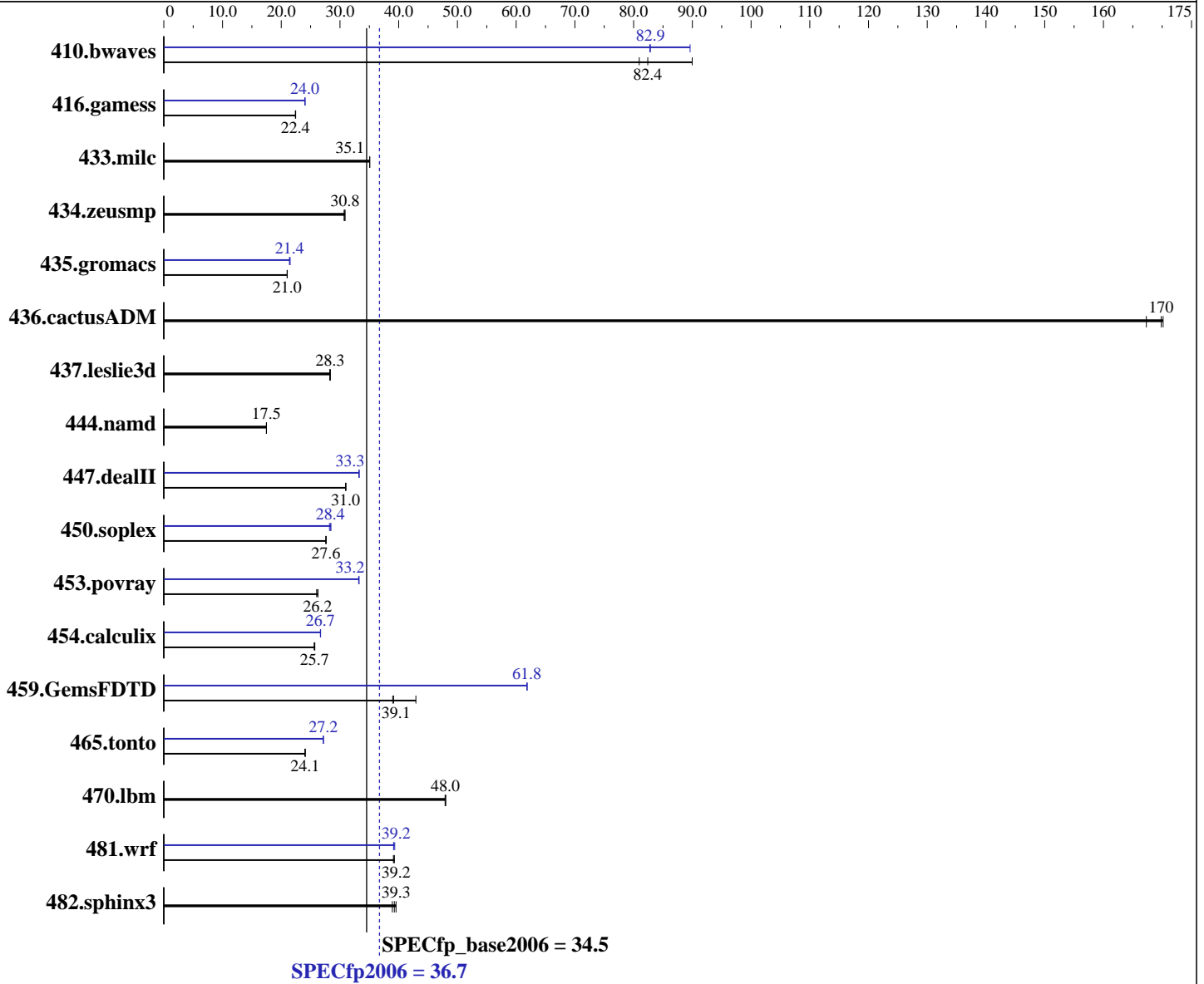$SPECfp\_base2006 =$    34.5

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

**Test date:** May-2009
**Hardware Availability:** Apr-2009
**Software Availability:** Feb-2009

| Benchmark | Result |
| --- | --- |
| 410.bwaves | 82.9 / 82.4 |
| 416.gamess | 24.0 / 22.4 |
| 433.milc | 35.1 |
| 434.zeusmp | 30.8 |
| 435.gromacs | 21.4 / 21.0 |
| 436.cactusADM | 170 |
| 437.leslie3d | 28.3 |
| 444.namd | 17.5 |
| 447.dealII | 33.3 / 31.0 |
| 450.soplex | 28.4 / 27.6 |
| 453.povray | 33.2 / 26.2 |
| 454.calculix | 26.7 / 25.7 |
| 459.GemsFDTD | 61.8 / 39.1 |
| 465.tonto | 27.2 / 24.1 |
| 470.lbm | 48.0 |
| 481.wrf | 39.2 / 39.2 |
| 482.sphinx3 | 39.3 |

**SPECfp_base2006 = 34.5**

**SPECfp2006 = 36.7**

## Hardware

| | |
| --- | --- |
| CPU Name: | Intel Xeon X5550 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.06 GHz |
| CPU MHz: | 2667 |
| 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 10 (x86_64) SP2 with patch Linux kernel 20090119, Kernel 2.6.16.60-0.34-smp |
| Compiler: | Intel C++ and Fortran Compiler 11.0 for Linux Build 20090131 Package ID: l_cproc_p_11.0.081, l_cprof_p_11.0.081 |
| Auto Parallel: | Yes |
| File System: | ReiserFS |
| System State: | Run level 3 (multi-user) |

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| | |
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| | |
|---|---|
| L3 Cache: | 8 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 48 GB (12 X 4 GB PC3-8500R, 2 rank, CL7, ECC) |
| Disk Subsystem: | 1x146.5 GB SAS, 15000 RPM |
| 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 | 168 | 81.0 | 151 | 90.0 | **165** | **82.4** | 152 | 89.6 | 164 | 82.8 | **164** | **82.9** |
| 416.gamess | 872 | 22.5 | **873** | **22.4** | 874 | 22.4 | 814 | 24.0 | **814** | **24.0** | 815 | 24.0 |
| 433.milc | **262** | **35.1** | 262 | 35.1 | 262 | 35.1 | **262** | **35.1** | 262 | 35.1 | 262 | 35.1 |
| 434.zeusmp | 295 | 30.8 | 296 | 30.7 | **295** | **30.8** | 295 | 30.8 | 296 | 30.7 | **295** | **30.8** |
| 435.gromacs | 340 | 21.0 | **340** | **21.0** | 340 | 21.0 | **333** | **21.4** | 334 | 21.4 | 332 | 21.5 |
| 436.cactusADM | 70.2 | 170 | **70.4** | **170** | 71.4 | 167 | 70.2 | 170 | **70.4** | **170** | 71.4 | 167 |
| 437.leslie3d | **332** | **28.3** | 332 | 28.4 | 333 | 28.3 | **332** | **28.3** | 332 | 28.4 | 333 | 28.3 |
| 444.namd | 459 | 17.5 | 459 | 17.5 | **459** | **17.5** | 459 | 17.5 | 459 | 17.5 | **459** | **17.5** |
| 447.dealII | 369 | 31.0 | 369 | 31.0 | **369** | **31.0** | 344 | 33.3 | **344** | **33.3** | 344 | 33.2 |
| 450.soplex | 302 | 27.6 | 302 | 27.6 | **302** | **27.6** | 293 | 28.5 | **294** | **28.4** | 296 | 28.2 |
| 453.povray | 203 | 26.2 | **203** | **26.2** | 204 | 26.0 | 160 | 33.3 | **160** | **33.2** | 160 | 33.2 |
| 454.calculix | **321** | **25.7** | 322 | 25.6 | 321 | 25.7 | 309 | 26.7 | 309 | 26.7 | **309** | **26.7** |
| 459.GemsFDTD | 247 | 42.9 | **271** | **39.1** | 272 | 39.0 | 171 | 61.9 | 172 | 61.8 | **172** | **61.8** |
| 465.tonto | **409** | **24.1** | 409 | 24.1 | 409 | 24.1 | 362 | 27.2 | 362 | 27.2 | **362** | **27.2** |
| 470.lbm | **286** | **48.0** | 286 | 48.0 | 287 | 47.9 | **286** | **48.0** | 286 | 48.0 | 287 | 47.9 |
| 481.wrf | 286 | 39.1 | **285** | **39.2** | 285 | 39.2 | **285** | **39.2** | 285 | 39.1 | 284 | 39.3 |
| 482.sphinx3 | 501 | 38.9 | 493 | 39.5 | **496** | **39.3** | 501 | 38.9 | 493 | 39.5 | **496** | **39.3** |

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 granularity=fine,scatter
KMP_STACKSIZE set to 200M
```

## Platform Notes

```
BIOS setting:
NUMA configuration : Enabled
```

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$SPECfp2006 =$    36.7

$SPECfp\_base2006 =$    34.5

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

**Test date:** May-2009
**Hardware Availability:** Apr-2009
**Software Availability:** Feb-2009

## General Notes

The NEC Express5800/R120a-1(Intel Xeon X5550),
the NEC Express5800/R120a-2(Intel Xeon X5550),
the Bull NovaScale R440 E2 (Intel Xeon X5550, 2.66 GHz) and
the Bull NovaScale R460 E2 (Intel Xeon X5550, 2.66 GHz) models are electronically equivalent.
The results have been measured on a NEC Express5800/R120a-1(Intel Xeon X5550) 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:
    `-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch`

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## Bull SAS

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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
```

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

```
    450.soplex: icpc -m32
```

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
     470.lbm: -DSPEC_CPU_LP64
      481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
   482.sphinx3: -DSPEC_CPU_LP64
```

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$SPECfp2006 =$ 36.7

$SPECfp\_base2006 =$ 34.5

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## Peak Optimization Flags

C benchmarks:

      433.milc: `basepeak = yes`

      470.lbm: `basepeak = yes`

    482.sphinx3: `basepeak = yes`

C++ benchmarks:

    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- -opt-prefetch`

    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`
        `-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)`
        `-unroll4 -auto`

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`

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| | |
|---|---|
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| | |
|---|---|
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# Peak Optimization Flags (Continued)

436.cactusADM: basepeak = yes

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

481.wrf: -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch
-parallel -auto-ilp32

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revE.html
http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revG.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revE.xml
http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revG.xml

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