



# SPEC® CFP2006 Result

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## Bull SAS

NovaScale R460 E1  
(Intel Xeon X5470, 3.33 GHz)

SPECfp®\_rate2006 = 44.4

SPECfp\_rate\_base2006 = 41.8

CPU2006 license: 20

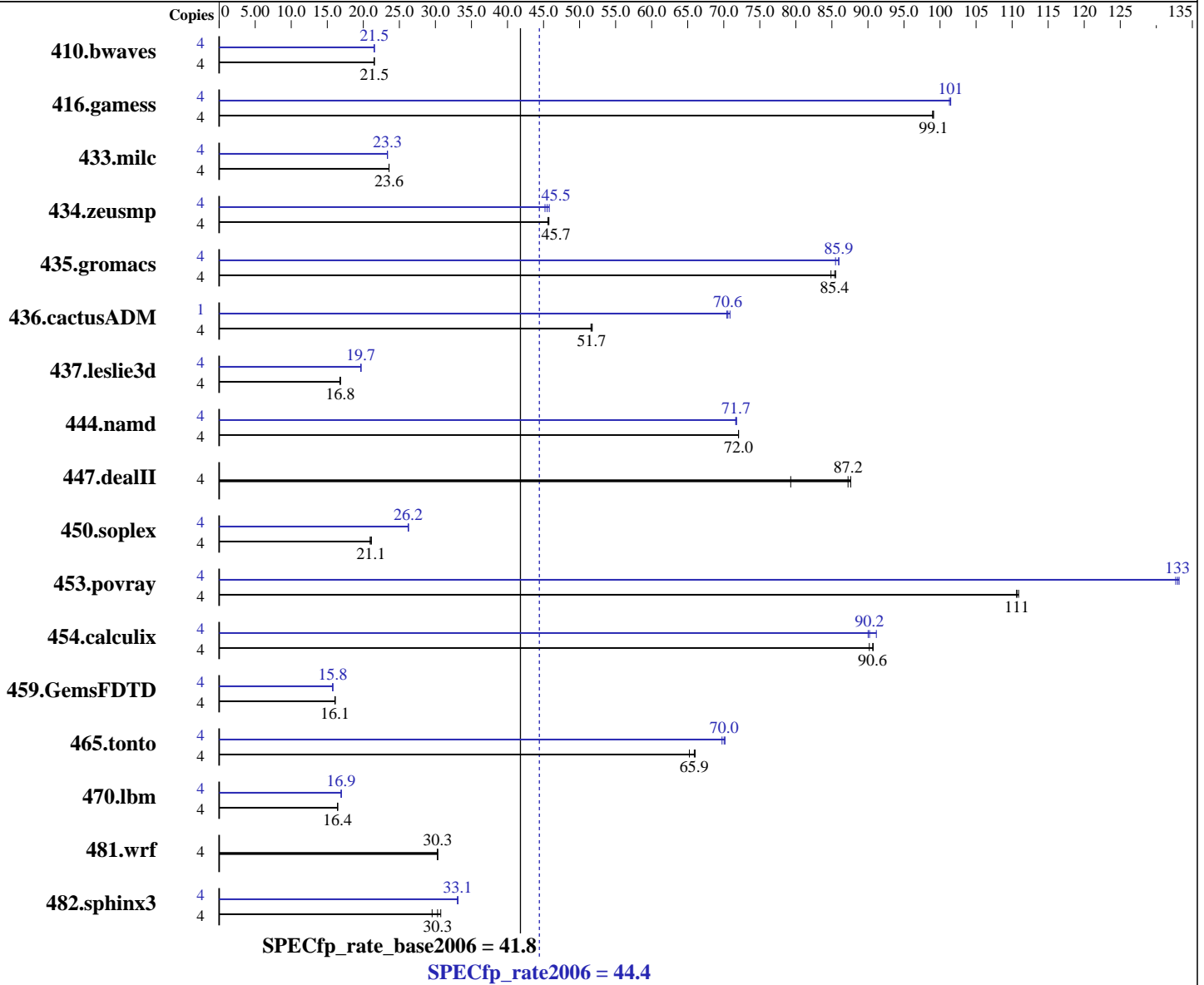
Test sponsor: Bull SAS

Tested by: NEC Corporation

Test date: Nov-2008

Hardware Availability: Oct-2008

Software Availability: Nov-2008



### Hardware

CPU Name: Intel Xeon X5470  
 CPU Characteristics: 3.33 GHz, 2x6 MB L2 shared, 1333 MHz system bus  
 CPU MHz: 3333  
 FPU: Integrated  
 CPU(s) enabled: 4 cores, 1 chip, 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) SP2, Kernel 2.6.16.60-0.21-smpp  
 Compiler: Intel C++ and Fortran Compiler 11.0 for Linux Build 20080730 Package ID: l\_cproc\_b\_11.0.044, l\_cprof\_b\_11.0.044  
 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 PC2-5300F, 2 rank, CL5-5-5, ECC)  
Disk Subsystem: 1x146.5 GB SAS, 15000RPM  
Other Hardware: None

Peak Pointers: 32/64-bit  
Other Software: Binutils 2.18.50.0.7.20080502

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	4	2529	21.5	<b><u>2526</u></b>	<b><u>21.5</u></b>	2525	21.5	4	2525	21.5	2526	21.5	<b><u>2526</u></b>	<b><u>21.5</u></b>
416.gamess	4	790	99.1	791	99.0	<b><u>790</u></b>	<b><u>99.1</u></b>	4	772	101	773	101	<b><u>772</u></b>	<b><u>101</u></b>
433.milc	4	1559	23.6	1558	23.6	<b><u>1558</u></b>	<b><u>23.6</u></b>	4	1573	23.3	<b><u>1573</u></b>	<b><u>23.3</u></b>	1573	23.3
434.zeusmp	4	798	45.6	796	45.8	<b><u>797</u></b>	<b><u>45.7</u></b>	4	<b><u>800</u></b>	<b><u>45.5</u></b>	805	45.2	795	45.8
435.gromacs	4	334	85.5	337	84.9	<b><u>334</u></b>	<b><u>85.4</u></b>	4	<b><u>332</u></b>	<b><u>85.9</u></b>	332	86.0	334	85.5
436.cactusADM	4	927	51.6	924	51.8	<b><u>925</u></b>	<b><u>51.7</u></b>	1	169	70.9	<b><u>169</u></b>	<b><u>70.6</u></b>	170	70.4
437.leslie3d	4	2235	16.8	<b><u>2235</u></b>	<b><u>16.8</u></b>	2245	16.7	4	1913	19.7	1910	19.7	<b><u>1912</u></b>	<b><u>19.7</u></b>
444.namd	4	<b><u>445</u></b>	<b><u>72.0</u></b>	445	72.1	445	72.0	4	<b><u>447</u></b>	<b><u>71.7</u></b>	448	71.7	447	71.8
447.dealII	4	<b><u>525</u></b>	<b><u>87.2</u></b>	522	87.6	577	79.3	4	<b><u>525</u></b>	<b><u>87.2</u></b>	522	87.6	577	79.3
450.soplex	4	1579	21.1	1593	20.9	<b><u>1584</u></b>	<b><u>21.1</u></b>	4	1270	26.3	1272	26.2	<b><u>1271</u></b>	<b><u>26.2</u></b>
453.povray	4	192	111	<b><u>192</u></b>	<b><u>111</u></b>	192	111	4	160	133	160	133	<b><u>160</u></b>	<b><u>133</u></b>
454.calculix	4	<b><u>364</u></b>	<b><u>90.6</u></b>	364	90.7	366	90.2	4	362	91.2	<b><u>366</u></b>	<b><u>90.2</u></b>	367	90.0
459.GemsFDTD	4	2635	16.1	<b><u>2638</u></b>	<b><u>16.1</u></b>	2643	16.1	4	2690	15.8	2696	15.7	<b><u>2694</u></b>	<b><u>15.8</u></b>
465.tonto	4	603	65.2	596	66.0	<b><u>597</u></b>	<b><u>65.9</u></b>	4	561	70.2	564	69.8	<b><u>562</u></b>	<b><u>70.0</u></b>
470.lbm	4	3344	16.4	3345	16.4	<b><u>3345</u></b>	<b><u>16.4</u></b>	4	3246	16.9	<b><u>3245</u></b>	<b><u>16.9</u></b>	3245	16.9
481.wrf	4	1473	30.3	1476	30.3	<b><u>1474</u></b>	<b><u>30.3</u></b>	4	1473	30.3	1476	30.3	<b><u>1474</u></b>	<b><u>30.3</u></b>
482.sphinx3	4	2536	30.7	<b><u>2573</u></b>	<b><u>30.3</u></b>	2639	29.5	4	<b><u>2357</u></b>	<b><u>33.1</u></b>	2353	33.1	2357	33.1

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.  
taskset was used to bind processes to cores except  
for 436.cactusADM peak

## 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 64M



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CPU2006 license: 20  
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Test date: Nov-2008  
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### Platform Notes

Bios settings:  
Hardware Prefetcher: Disabled  
Adjacent Cache Line Prefetch: Disabled

### General Notes

The NEC Express5800/120Rh-1(Intel Xeon X5470),  
the NEC Express5800/120Rj-2(Intel Xeon X5470),  
the Bull NovaScale R440 E1(Intel Xeon X5470, 3.33 GHz) and  
the Bull NovaScale R460 E1(Intel Xeon X5470, 3.33 GHz) models are electronically equivalent.  
The results have been measured on a NEC Express5800/120Rj-2(Intel Xeon X5470) 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.lelie3d: -DSPEC\_CPU\_LP64  
444.namd: -DSPEC\_CPU\_LP64  
447.deallI: -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



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## Base Optimization Flags

C benchmarks:  
-xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch

C++ benchmarks:  
-xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch

Fortran benchmarks:  
-xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch

Benchmarks using both Fortran and C:  
-xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch

## Peak Compiler Invocation

C benchmarks (except as noted below):  
icc

482.sphinx3: /opt/intel/Compiler/11.0/044/bin/ia32/icc  
-L/opt/intel/Compiler/11.0/044/ipp/ia32/lib  
-I/opt/intel/Compiler/11.0/044/ipp/ia32/include

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

450.soplex: /opt/intel/Compiler/11.0/044/bin/ia32/icpc  
-L/opt/intel/Compiler/11.0/044/ipp/ia32/lib  
-I/opt/intel/Compiler/11.0/044/ipp/ia32/include

Fortran benchmarks (except as noted below):  
ifort

437.leslie3d: /opt/intel/Compiler/11.0/044/bin/ia32/ifort  
-L/opt/intel/Compiler/11.0/044/ipp/ia32/lib  
-I/opt/intel/Compiler/11.0/044/ipp/ia32/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

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## Peak Portability Flags (Continued)

```
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
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: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
-no-prec-div -static -fno-alias

470.lbm: -xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch
-auto-ilp32

482.sphinx3: -xSSE4.1 -ipo -O3 -no-prec-div -static -unroll2
```

### C++ benchmarks:

```
444.namd: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
-no-prec-div -static -fno-alias -auto-ilp32

447.dealII: basepeak = yes

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

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

### Fortran benchmarks:

```
410.bwaves: -xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch

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

434.zeusmp: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
-no-prec-div -static

437.leslie3d: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
-no-prec-div -static -opt-malloc-options=3 -opt-prefetch
```

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## Peak Optimization Flags (Continued)

459.GemsFDTD: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3  
-no-prec-div -static -unroll2 -Ob0 -opt-prefetch

465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3  
-no-prec-div -static -unroll4 -auto

Benchmarks using both Fortran and C:

435.gromacs: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3  
-no-prec-div -static -opt-prefetch -auto-ilp32

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

454.calculix: -xSSE4.1 -ipo -O3 -no-prec-div -static -auto-ilp32

481.wrf: basepeak = yes

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revD.html>

<http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revB.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revD.xml>

<http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revB.xml>

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For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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