



# SPEC® CFP2006 Result

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## Bull SAS

NovaScale R440 E1  
(Intel Xeon X5460, 3.16GHz)

SPECfp®\_rate2006 = 42.6

SPECfp\_rate\_base2006 = 38.9

CPU2006 license: 20

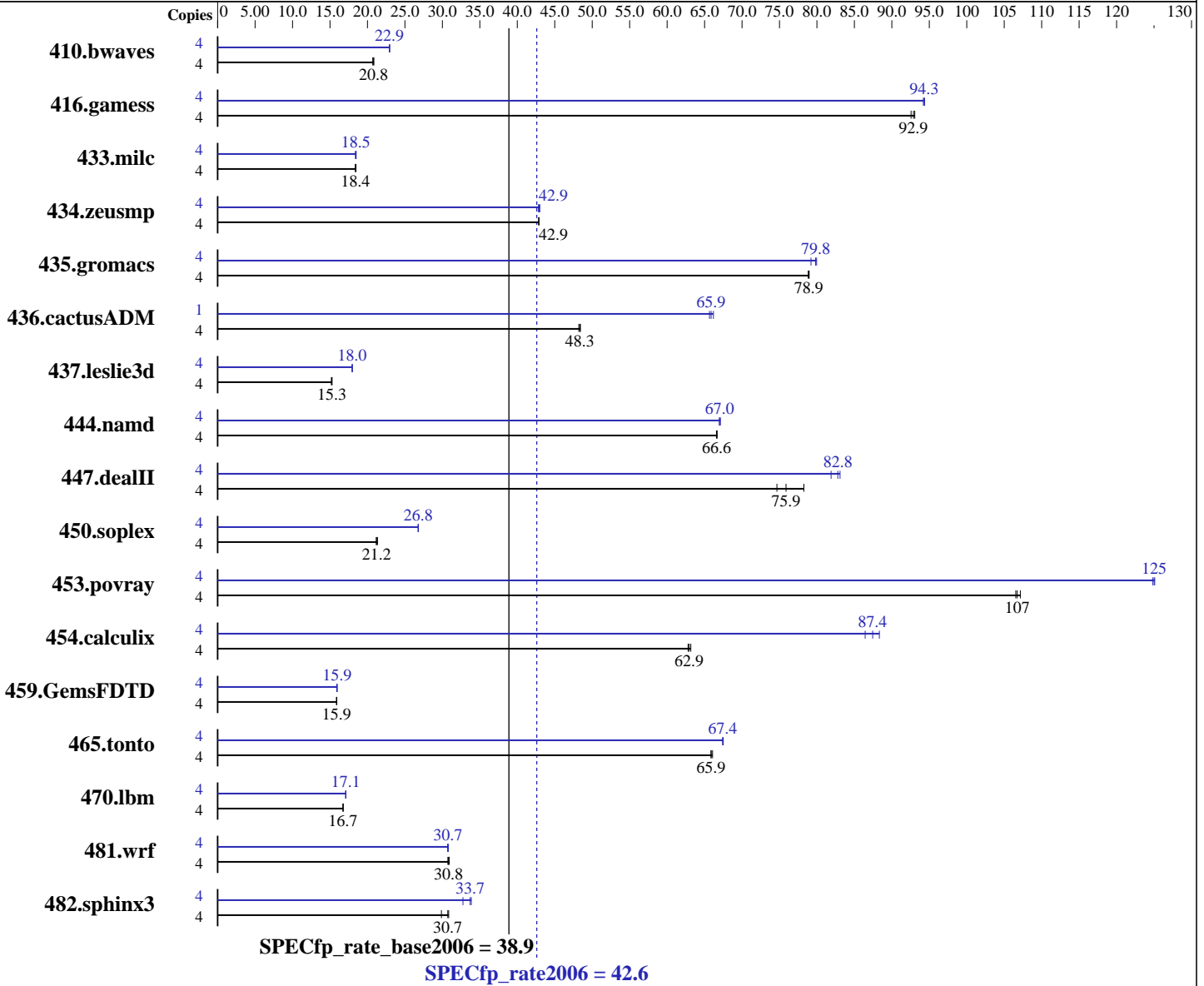
Test sponsor: Bull SAS

Tested by: Bull SAS

Test date: Mar-2008

Hardware Availability: Jan-2008

Software Availability: Nov-2007



### Hardware

CPU Name: Intel Xeon X5460  
 CPU Characteristics: 3.16 GHz, 12 MB L2, 1333 MHz system bus  
 CPU MHz: 3166  
 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 SP1, Kernel 2.6.16.46-0.12-smp for x86\_64  
 Compiler: Intel C++ and Fortran Compiler 10.1 for Linux Build 20070913 Package ID: l\_cc\_p\_10.1.008, l\_fc\_p\_10.1.008  
 Auto Parallel: Yes  
 File System: ReiserFS  
 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: 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						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	4	2625	20.7	<b>2610</b>	<b>20.8</b>	2608	20.8	4	<b>2369</b>	<b>22.9</b>	2366	23.0	2371	22.9
416.gamess	4	842	93.1	<b>843</b>	<b>92.9</b>	846	92.6	4	<b>830</b>	<b>94.3</b>	830	94.4	831	94.2
433.milc	4	<b>1996</b>	<b>18.4</b>	1998	18.4	1988	18.5	4	<b>1990</b>	<b>18.5</b>	1986	18.5	1997	18.4
434.zeusmp	4	849	42.9	849	42.9	<b>849</b>	<b>42.9</b>	4	<b>848</b>	<b>42.9</b>	850	42.8	846	43.0
435.gromacs	4	362	79.0	362	78.8	<b>362</b>	<b>78.9</b>	4	361	79.2	<b>358</b>	<b>79.8</b>	357	80.0
436.cactusADM	4	<b>989</b>	<b>48.3</b>	992	48.2	987	48.4	1	<b>181</b>	<b>65.9</b>	182	65.7	181	66.2
437.leslie3d	4	2462	15.3	<b>2465</b>	<b>15.3</b>	2477	15.2	4	2094	18.0	2092	18.0	<b>2092</b>	<b>18.0</b>
444.namd	4	481	66.7	<b>482</b>	<b>66.6</b>	482	66.6	4	479	67.0	478	67.1	<b>479</b>	<b>67.0</b>
447.dealII	4	585	78.3	<b>603</b>	<b>75.9</b>	613	74.7	4	551	83.1	<b>553</b>	<b>82.8</b>	559	81.9
450.soplex	4	<b>1573</b>	<b>21.2</b>	1563	21.3	1576	21.2	4	1245	26.8	1247	26.8	<b>1246</b>	<b>26.8</b>
453.povray	4	200	107	<b>199</b>	<b>107</b>	199	107	4	<b>170</b>	<b>125</b>	170	125	170	125
454.calculix	4	<b>524</b>	<b>62.9</b>	522	63.2	526	62.8	4	374	88.3	382	86.4	<b>377</b>	<b>87.4</b>
459.GemsFDTD	4	2668	15.9	<b>2671</b>	<b>15.9</b>	2675	15.9	4	<b>2661</b>	<b>15.9</b>	2671	15.9	2660	16.0
465.tonto	4	<b>598</b>	<b>65.9</b>	596	66.1	598	65.9	4	<b>584</b>	<b>67.4</b>	583	67.5	584	67.4
470.lbm	4	3283	16.7	3281	16.7	<b>3282</b>	<b>16.7</b>	4	3215	17.1	3213	17.1	<b>3213</b>	<b>17.1</b>
481.wrf	4	1445	30.9	1454	30.7	<b>1450</b>	<b>30.8</b>	4	1451	30.8	<b>1454</b>	<b>30.7</b>	1455	30.7
482.sphinx3	4	2528	30.8	<b>2538</b>	<b>30.7</b>	2610	29.9	4	2302	33.9	2381	32.7	<b>2313</b>	<b>33.7</b>

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)

## 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 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 NovaScale R460 E1 (Intel Xeon X5460, 3.16GHz) model.



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Test date: Mar-2008  
Hardware Availability: Jan-2008  
Software Availability: Nov-2007

## 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



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**CPU2006 license:** 20  
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## 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.deallI: -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.dealIII: -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

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.20090713.02.html>



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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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