



# SPEC<sup>®</sup> CFP2006 Result

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## Bull SAS

SPECfp<sup>®</sup>2006 = 45.7

NovaScale R480 F2 (Intel Xeon E7-4820, 2.00 GHz)

SPECfp\_base2006 = 43.8

CPU2006 license: 20

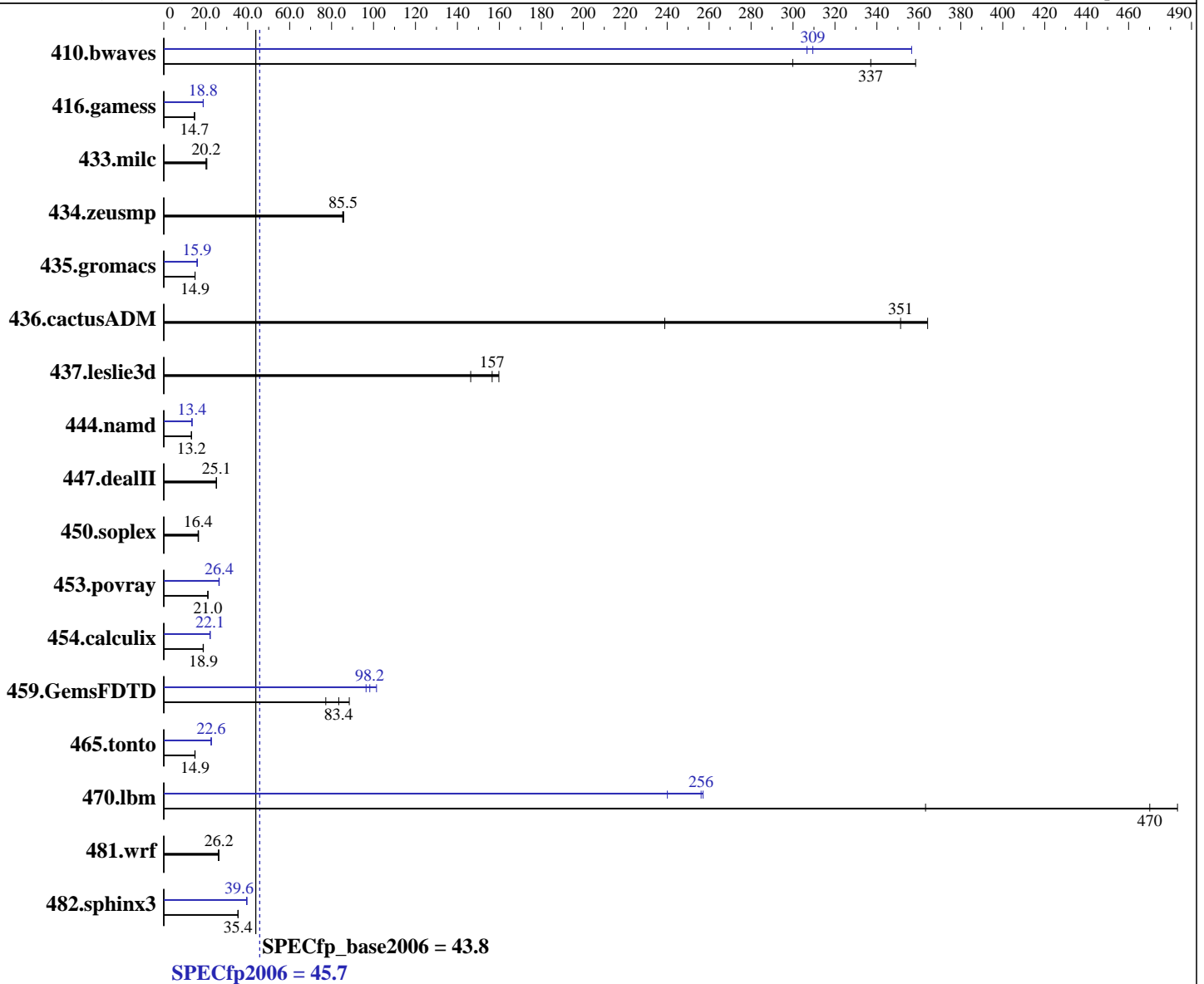
Test sponsor: Bull SAS

Tested by: Dell Inc.

Test date: Mar-2011

Hardware Availability: Apr-2011

Software Availability: Apr-2011



### Hardware

CPU Name: Intel Xeon E7-4820  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.27 GHz  
 CPU MHz: 2000  
 FPU: Integrated  
 CPU(s) enabled: 32 cores, 4 chips, 8 cores/chip  
 CPU(s) orderable: 2,4 chips  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core

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### Software

Operating System: SUSE Linux Enterprise Server 11 SP1 (x86\_64), Kernel 2.6.32.12-0.7-default  
 Compiler: Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64 Version 12.0 Update 3  
 Auto Parallel: Yes  
 File System: ext3  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit

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L3 Cache: 18 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 512 GB (64 x 8 GB 4Rx8 PC3-8500R-7, ECC, running at 978 MHz)  
 Disk Subsystem: 1 x 500 GB 7200 RPM SAS 6Gb  
 Other Hardware: None

Peak Pointers: 32/64-bit  
 Other Software: None

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	37.9	358	<b>40.3</b>	<b>337</b>	45.3	300	<b>43.9</b>	<b>309</b>	44.3	307	38.1	357
416.gamess	1333	14.7	1349	14.5	<b>1334</b>	<b>14.7</b>	<b>1042</b>	<b>18.8</b>	1041	18.8	1042	18.8
433.milc	447	20.5	455	20.2	<b>454</b>	<b>20.2</b>	447	20.5	455	20.2	<b>454</b>	<b>20.2</b>
434.zeusmp	106	85.8	<b>106</b>	<b>85.5</b>	107	85.3	106	85.8	<b>106</b>	<b>85.5</b>	107	85.3
435.gromacs	<b>479</b>	<b>14.9</b>	479	14.9	481	14.9	446	16.0	<b>449</b>	<b>15.9</b>	449	15.9
436.cactusADM	32.8	364	<b>34.0</b>	<b>351</b>	50.0	239	32.8	364	<b>34.0</b>	<b>351</b>	50.0	239
437.leslie3d	58.8	160	64.2	146	<b>60.0</b>	<b>157</b>	58.8	160	64.2	146	<b>60.0</b>	<b>157</b>
444.namd	608	13.2	<b>608</b>	<b>13.2</b>	608	13.2	<b>597</b>	<b>13.4</b>	597	13.4	597	13.4
447.dealII	457	25.0	456	25.1	<b>456</b>	<b>25.1</b>	457	25.0	456	25.1	<b>456</b>	<b>25.1</b>
450.soplex	510	16.4	<b>508</b>	<b>16.4</b>	503	16.6	510	16.4	<b>508</b>	<b>16.4</b>	503	16.6
453.povray	253	21.0	<b>253</b>	<b>21.0</b>	253	21.0	<b>202</b>	<b>26.4</b>	201	26.4	203	26.3
454.calculix	437	18.9	<b>438</b>	<b>18.9</b>	440	18.7	373	22.1	374	22.1	<b>374</b>	<b>22.1</b>
459.GemsFDTD	137	77.2	120	88.4	<b>127</b>	<b>83.4</b>	110	96.4	105	101	<b>108</b>	<b>98.2</b>
465.tonto	659	14.9	<b>661</b>	<b>14.9</b>	665	14.8	436	22.6	434	22.7	<b>435</b>	<b>22.6</b>
470.lbm	<b>29.2</b>	<b>470</b>	28.4	483	37.8	363	53.4	257	57.2	240	<b>53.6</b>	<b>256</b>
481.wrf	<b>426</b>	<b>26.2</b>	430	26.0	426	26.2	<b>426</b>	<b>26.2</b>	430	26.0	426	26.2
482.sphinx3	552	35.3	549	35.5	<b>550</b>	<b>35.4</b>	<b>493</b>	<b>39.6</b>	493	39.5	492	39.6

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
'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
echo 900 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

## Platform Notes

BIOS Settings:  
 Power Management = Maximum Performance (Default = Active Power Controller)  
 Memory Interleaving = Enabled (Default = Disabled)



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## General Notes

The Dell PowerEdge R910 and the Bull NovaScale R480 F2 models are electronically equivalent. The results have been measured on a Dell PowerEdge R910 model. OMP\_NUM\_THREADS set to number of cores  
Binaries were compiled on RHEL5.5

## Base Compiler Invocation

C benchmarks:

icc -m64

C++ benchmarks:

icpc -m64

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

## 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.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

## Base Optimization Flags

C benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch  
-ansi-alias

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## Base Optimization Flags (Continued)

C++ benchmarks:

`-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias`

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  
-ansi-alias`

## Peak Compiler Invocation

C benchmarks:

`icc -m64`

C++ benchmarks:

`icpc -m64`

Fortran benchmarks:

`ifort -m64`

Benchmarks using both Fortran and C:

`icc -m64 ifort -m64`

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

`433.milc: basepeak = yes`

`470.lbm: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -parallel  
-ansi-alias -static -auto-ilp32`

`482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias  
-parallel`

C++ benchmarks:

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## Peak Optimization Flags (Continued)

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

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

### Fortran benchmarks:

410.bwaves: -xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -parallel  
-static

416.gamess: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -unroll2  
-inline-level=0 -scalar-rep- -static

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) -prof-use(pass 2) -unroll2  
-inline-level=0 -opt-prefetch -parallel  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -inline-calloc  
-opt-malloc-options=3 -auto -unroll4  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

### 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) -prof-use(pass 2) -static -auto-ilp32  
-ansi-alias

436.cactusADM: basepeak = yes

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

481.wrf: basepeak = yes



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

<http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.html>

<http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110308.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml>

<http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110308.xml>

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