



# SPEC® CFP2006 Result

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## Bull SAS

NovaScale R460 E2  
(Intel Xeon E5520, 2.26 GHz)

SPECfp®2006 = 31.3

SPECfp\_base2006 = 29.6

CPU2006 license: 20

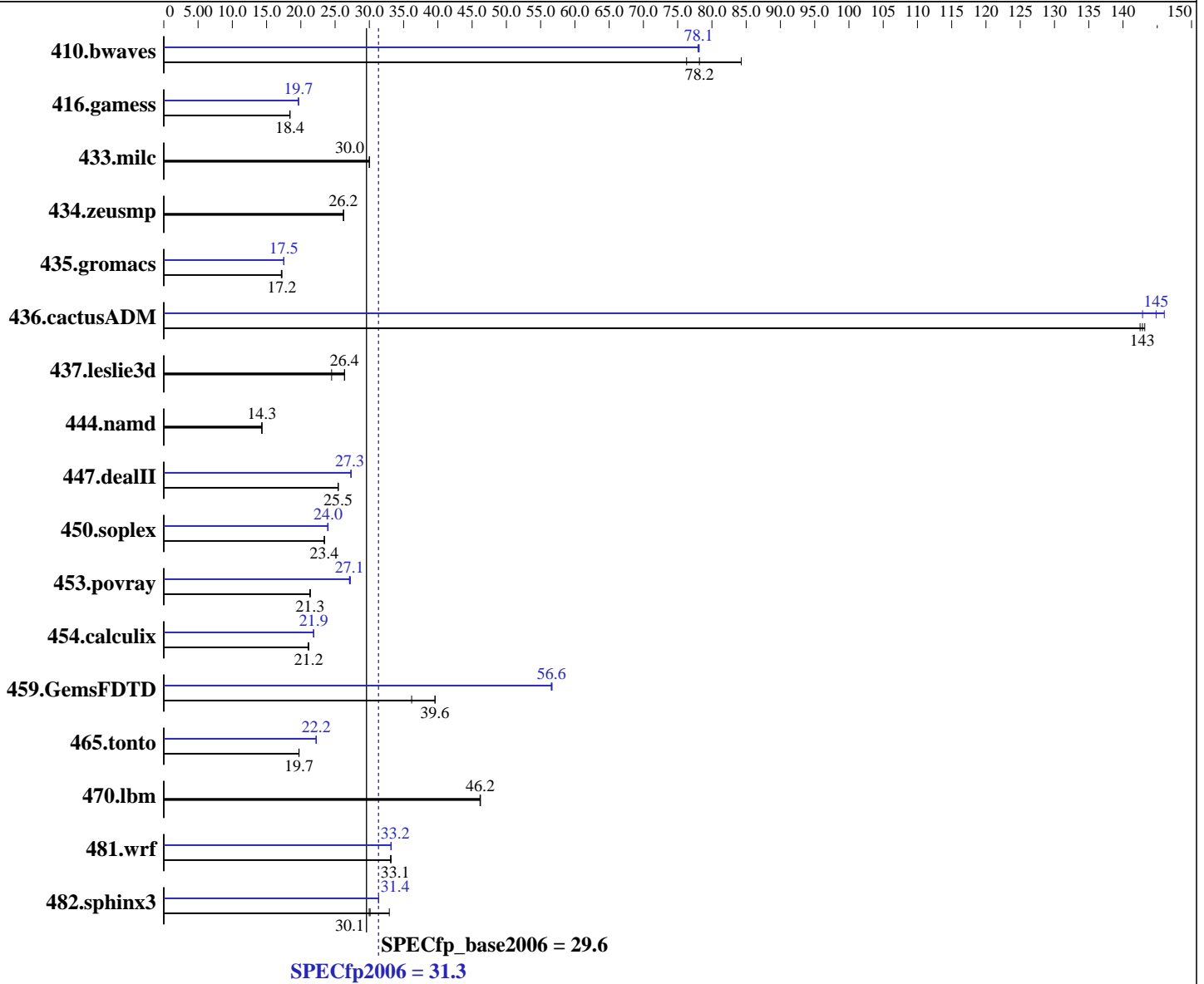
Test sponsor: Bull SAS

Tested by: NEC Corporation

Test date: Mar-2009

Hardware Availability: Apr-2009

Software Availability: Feb-2009



### Hardware

CPU Name: Intel Xeon E5520  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.53 GHz  
 CPU MHz: 2267  
 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

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### Software

Operating System: SUSE Linux Enterprise Server 10 (x86\_64) SP2, Kernel 2.6.16.60-0.34-smpt  
 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)  
 Base Pointers: 64-bit

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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

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	178	76.3	161	84.3	<b><u>174</u></b>	<b><u>78.2</u></b>	<b><u>174</u></b>	<b><u>78.1</u></b>	174	78.1	174	78.0
416.gamess	1065	18.4	1063	18.4	<b><u>1064</u></b>	<b><u>18.4</u></b>	996	19.7	996	19.7	<b><u>996</u></b>	<b><u>19.7</u></b>
433.milc	306	30.0	306	30.0	<b><u>306</u></b>	<b><u>30.0</u></b>	306	30.0	306	30.0	<b><u>306</u></b>	<b><u>30.0</u></b>
434.zeusmp	347	26.2	<b><u>347</u></b>	<b><u>26.2</u></b>	347	26.3	347	26.2	<b><u>347</u></b>	<b><u>26.2</u></b>	347	26.3
435.gromacs	415	17.2	<b><u>415</u></b>	<b><u>17.2</u></b>	416	17.2	408	17.5	407	17.5	<b><u>408</u></b>	<b><u>17.5</u></b>
436.cactusADM	83.9	142	83.5	143	<b><u>83.7</u></b>	<b><u>143</u></b>	83.7	143	<b><u>82.5</u></b>	<b><u>145</u></b>	81.8	146
437.leslie3d	356	26.4	384	24.5	<b><u>357</u></b>	<b><u>26.4</u></b>	356	26.4	384	24.5	<b><u>357</u></b>	<b><u>26.4</u></b>
444.namd	<b><u>560</u></b>	<b><u>14.3</u></b>	560	14.3	560	14.3	<b><u>560</u></b>	<b><u>14.3</u></b>	560	14.3	560	14.3
447.dealII	449	25.5	<b><u>449</u></b>	<b><u>25.5</u></b>	450	25.4	<b><u>419</u></b>	<b><u>27.3</u></b>	419	27.3	418	27.3
450.soplex	356	23.4	356	23.4	<b><u>356</u></b>	<b><u>23.4</u></b>	349	23.9	<b><u>348</u></b>	<b><u>24.0</u></b>	348	24.0
453.povray	249	21.4	<b><u>249</u></b>	<b><u>21.3</u></b>	249	21.3	195	27.2	<b><u>196</u></b>	<b><u>27.1</u></b>	196	27.1
454.calculix	390	21.2	392	21.1	<b><u>390</u></b>	<b><u>21.2</u></b>	377	21.9	377	21.9	<b><u>377</u></b>	<b><u>21.9</u></b>
459.GemsFDTD	293	36.2	<b><u>268</u></b>	<b><u>39.6</u></b>	268	39.6	<b><u>187</u></b>	<b><u>56.6</u></b>	187	56.7	188	56.6
465.tonto	499	19.7	<b><u>499</u></b>	<b><u>19.7</u></b>	498	19.7	442	22.3	<b><u>443</u></b>	<b><u>22.2</u></b>	443	22.2
470.lbm	<b><u>298</u></b>	<b><u>46.2</u></b>	298	46.2	297	46.2	<b><u>298</u></b>	<b><u>46.2</u></b>	298	46.2	297	46.2
481.wrf	<b><u>337</u></b>	<b><u>33.1</u></b>	337	33.1	337	33.2	<b><u>337</u></b>	<b><u>33.2</u></b>	337	33.1	336	33.2
482.sphinx3	<b><u>647</u></b>	<b><u>30.1</u></b>	592	32.9	650	30.0	<b><u>622</u></b>	<b><u>31.3</u></b>	<b><u>621</u></b>	<b><u>31.4</u></b>	621	31.4

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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## General Notes

The NEC Express5800/R120a-1(Intel Xeon E5520),  
the NEC Express5800/R120a-2(Intel Xeon E5520),  
the Bull NovaScale R440 E2 (Intel Xeon E5520, 2.26 GHz) and  
the Bull NovaScale R460 E2 (Intel Xeon E5520, 2.26 GHz) models are electronically equivalent.  
The results have been measured on a NEC Express5800/R120a-1(Intel Xeon E5520) 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.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

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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 (except as noted below):

icc

482.sphinx3: icc -m32

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.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  
470.lbm: -DSPEC\_CPU\_LP64  
481.wrf: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_CASE\_FLAG -DSPEC\_CPU\_LINUX



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## Peak Optimization Flags

### C benchmarks:

433.milc: basepeak = yes  
470.lbm: basepeak = yes  
482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -static -unroll2

### C++ benchmarks:

444.namd: basepeak = yes  
447.dealIII: -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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## Peak Optimization Flags (Continued)

436.cactusADM: -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 -opt-prefetch -parallel -auto-ilp32

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/Intel-ic11.0-fp-linux64-revG.html>

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

<http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revD.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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