



# SPEC<sup>®</sup> CFP2006 Result

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## Bull SAS

NovaScale R460 E2  
(Intel Xeon X5570, 2.93 GHz)

SPECfp<sup>®</sup>2006 = 39.2

SPECfp\_base2006 = 36.8

CPU2006 license: 20

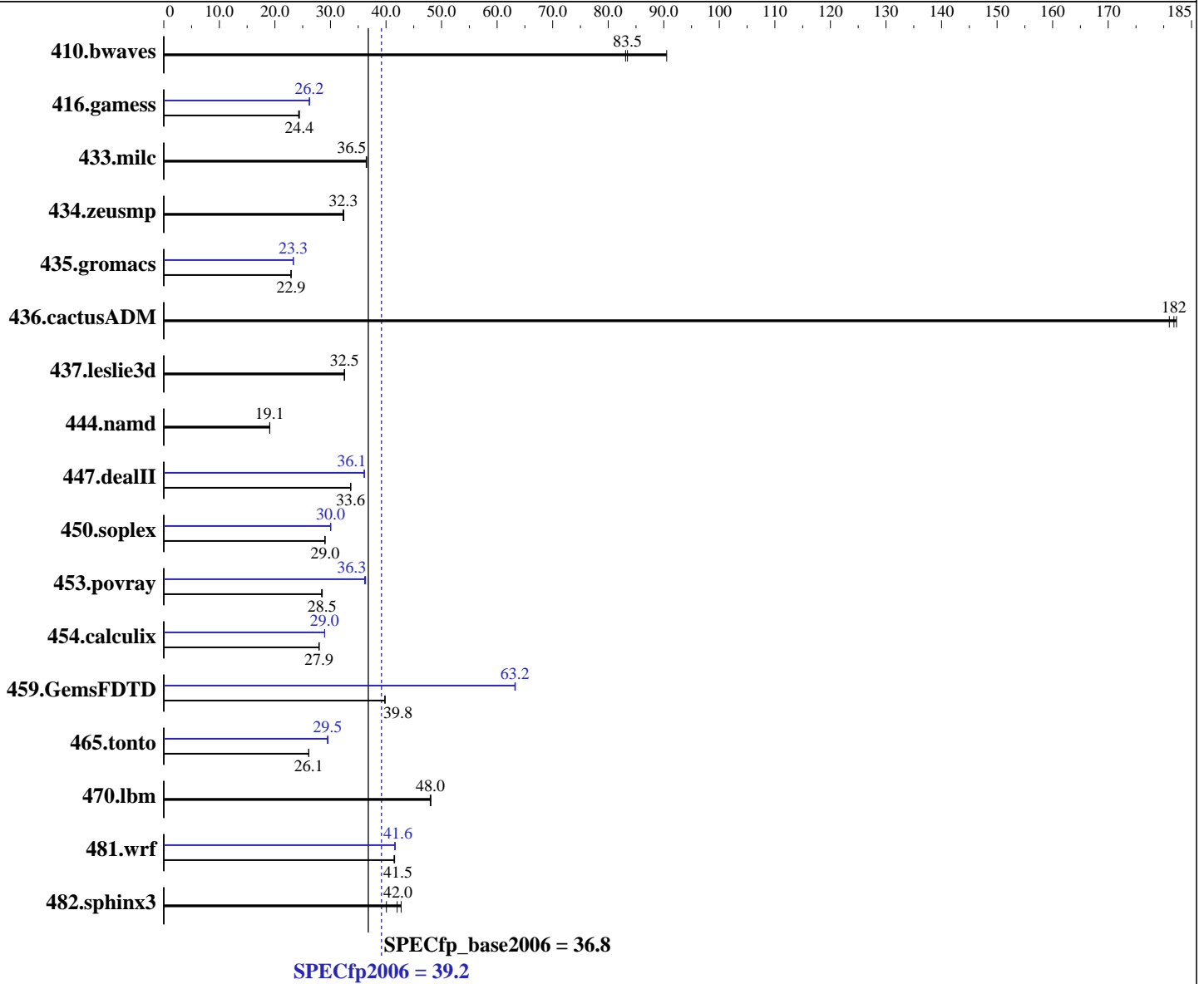
Test sponsor: Bull SAS

Tested by: NEC Corporation

Test date: Apr-2009

Hardware Availability: Apr-2009

Software Availability: Feb-2009



### Hardware

CPU Name: Intel Xeon X5570  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.33 GHz  
 CPU MHz: 2933  
 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-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)  
 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	150	90.5	<b><u>163</u></b>	<b><u>83.5</u></b>	163	83.1	150	90.5	<b><u>163</u></b>	<b><u>83.5</u></b>	163	83.1
416.gamess	803	24.4	<b><u>803</u></b>	<b><u>24.4</u></b>	807	24.3	748	26.2	746	26.2	<b><u>747</u></b>	<b><u>26.2</u></b>
433.milc	251	36.5	252	36.4	<b><u>252</u></b>	<b><u>36.5</u></b>	251	36.5	252	36.4	<b><u>252</u></b>	<b><u>36.5</u></b>
434.zeusmp	281	32.4	<b><u>282</u></b>	<b><u>32.3</u></b>	282	32.3	281	32.4	<b><u>282</u></b>	<b><u>32.3</u></b>	282	32.3
435.gromacs	311	22.9	<b><u>312</u></b>	<b><u>22.9</u></b>	312	22.9	<b><u>306</u></b>	<b><u>23.3</u></b>	307	23.3	306	23.3
436.cactusADM	<b><u>65.7</u></b>	<b><u>182</u></b>	66.0	181	65.6	182	<b><u>65.7</u></b>	<b><u>182</u></b>	66.0	181	65.6	182
437.leslie3d	289	32.6	289	32.5	<b><u>289</u></b>	<b><u>32.5</u></b>	289	32.6	289	32.5	<b><u>289</u></b>	<b><u>32.5</u></b>
444.namd	420	19.1	<b><u>420</u></b>	<b><u>19.1</u></b>	421	19.1	420	19.1	<b><u>420</u></b>	<b><u>19.1</u></b>	421	19.1
447.dealII	340	33.7	340	33.6	<b><u>340</u></b>	<b><u>33.6</u></b>	317	36.1	<b><u>317</u></b>	<b><u>36.1</u></b>	317	36.1
450.soplex	288	29.0	<b><u>287</u></b>	<b><u>29.0</u></b>	287	29.0	277	30.1	<b><u>278</u></b>	<b><u>30.0</u></b>	278	30.0
453.povray	186	28.5	187	28.4	<b><u>187</u></b>	<b><u>28.5</u></b>	147	36.2	146	36.3	<b><u>147</u></b>	<b><u>36.3</u></b>
454.calculix	<b><u>295</u></b>	<b><u>27.9</u></b>	295	28.0	295	27.9	285	29.0	<b><u>285</u></b>	<b><u>29.0</u></b>	285	28.9
459.GemsFDTD	<b><u>267</u></b>	<b><u>39.8</u></b>	267	39.8	266	39.8	168	63.2	168	63.3	<b><u>168</u></b>	<b><u>63.2</u></b>
465.tonto	377	26.1	377	26.1	<b><u>377</u></b>	<b><u>26.1</u></b>	333	29.6	334	29.5	<b><u>334</u></b>	<b><u>29.5</u></b>
470.lbm	286	48.1	<b><u>286</u></b>	<b><u>48.0</u></b>	287	48.0	286	48.1	<b><u>286</u></b>	<b><u>48.0</u></b>	287	48.0
481.wrf	<b><u>269</u></b>	<b><u>41.5</u></b>	269	41.4	269	41.6	268	41.7	269	41.6	<b><u>268</u></b>	<b><u>41.6</u></b>
482.sphinx3	<b><u>464</u></b>	<b><u>42.0</u></b>	486	40.1	456	42.7	<b><u>464</u></b>	<b><u>42.0</u></b>	486	40.1	456	42.7

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 X5570),  
the NEC Express5800/R120a-2(Intel Xeon X5570),  
the Bull NovaScale R440 E2 (Intel Xeon X5570, 2.93 GHz) and  
the Bull NovaScale R460 E2 (Intel Xeon X5570, 2.93 GHz) models are electronically equivalent.  
The results have been measured on a NEC Express5800/R120a-1(Intel Xeon X5570) 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:

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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## Peak Optimization Flags

### C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

### 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: basepeak = yes

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

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