



# SPEC<sup>®</sup> CFP2006 Result

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## Bull SAS

NovaScale R440 E2  
(Intel Xeon X5550, 2.66 GHz)

SPECfp<sup>®</sup>2006 = 36.7

SPECfp\_base2006 = 34.5

CPU2006 license: 20

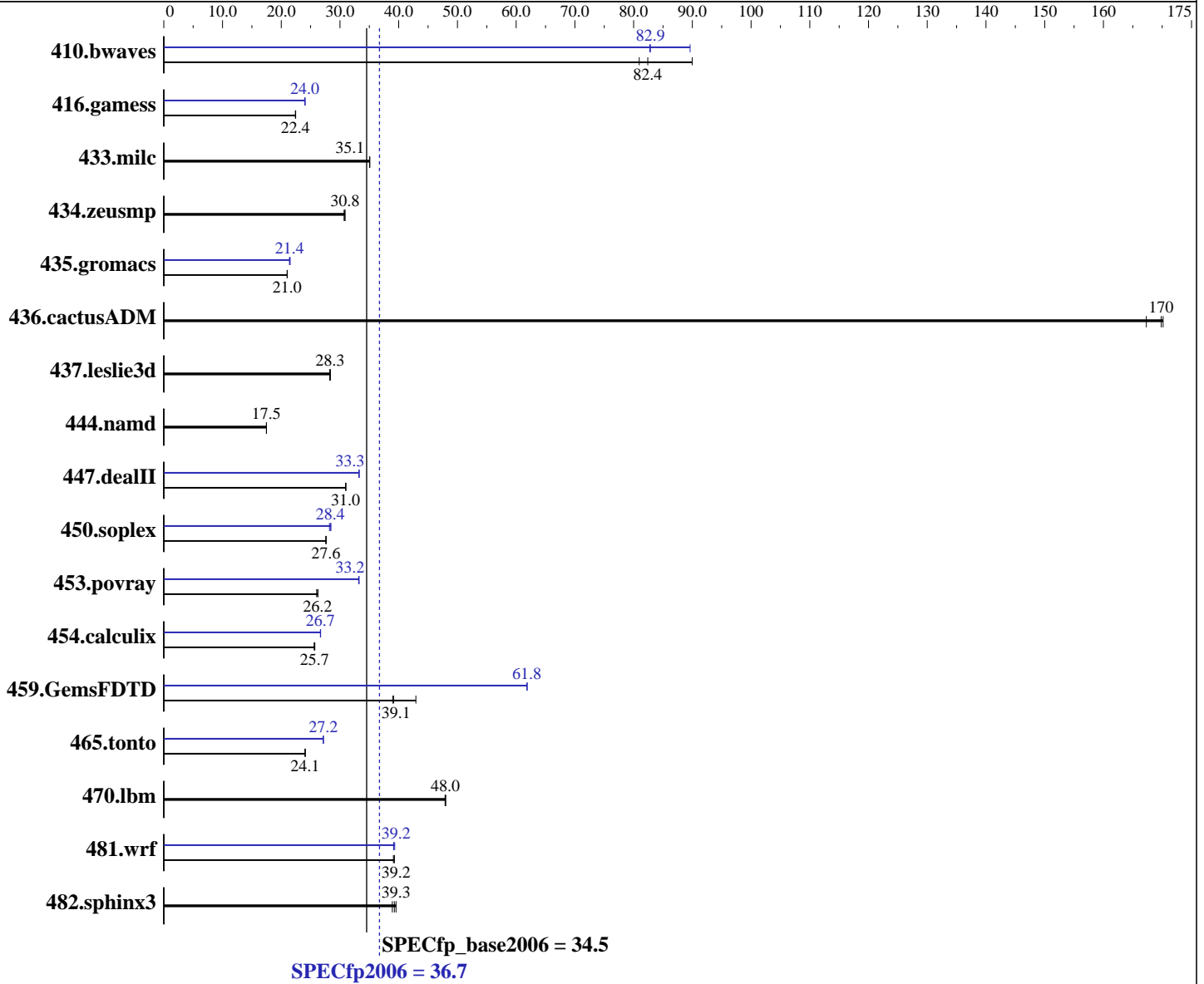
Test sponsor: Bull SAS

Tested by: NEC Corporation

Test date: May-2009

Hardware Availability: Apr-2009

Software Availability: Feb-2009



### Hardware

CPU Name: Intel Xeon X5550  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.06 GHz  
 CPU MHz: 2667  
 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 with patch Linux kernel 20090119, 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)

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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

Base Pointers: 64-bit  
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	168	81.0	151	90.0	<b>165</b>	<b>82.4</b>	152	89.6	164	82.8	<b>164</b>	<b>82.9</b>
416.gamess	872	22.5	<b>873</b>	<b>22.4</b>	874	22.4	814	24.0	<b>814</b>	<b>24.0</b>	815	24.0
433.milc	<b>262</b>	<b>35.1</b>	262	35.1	262	35.1	<b>262</b>	<b>35.1</b>	262	35.1	262	35.1
434.zeusmp	295	30.8	296	30.7	<b>295</b>	<b>30.8</b>	295	30.8	296	30.7	<b>295</b>	<b>30.8</b>
435.gromacs	340	21.0	<b>340</b>	<b>21.0</b>	340	21.0	<b>333</b>	<b>21.4</b>	334	21.4	332	21.5
436.cactusADM	70.2	170	<b>70.4</b>	<b>170</b>	71.4	167	70.2	170	<b>70.4</b>	<b>170</b>	71.4	167
437.leslie3d	<b>332</b>	<b>28.3</b>	332	28.4	333	28.3	<b>332</b>	<b>28.3</b>	332	28.4	333	28.3
444.namd	459	17.5	459	17.5	<b>459</b>	<b>17.5</b>	459	17.5	459	17.5	<b>459</b>	<b>17.5</b>
447.dealII	369	31.0	369	31.0	<b>369</b>	<b>31.0</b>	344	33.3	<b>344</b>	<b>33.3</b>	344	33.2
450.soplex	302	27.6	302	27.6	<b>302</b>	<b>27.6</b>	293	28.5	<b>294</b>	<b>28.4</b>	296	28.2
453.povray	203	26.2	<b>203</b>	<b>26.2</b>	204	26.0	160	33.3	<b>160</b>	<b>33.2</b>	160	33.2
454.calculix	<b>321</b>	<b>25.7</b>	322	25.6	321	25.7	309	26.7	309	26.7	<b>309</b>	<b>26.7</b>
459.GemsFDTD	247	42.9	<b>271</b>	<b>39.1</b>	272	39.0	171	61.9	172	61.8	<b>172</b>	<b>61.8</b>
465.tonto	<b>409</b>	<b>24.1</b>	409	24.1	409	24.1	362	27.2	362	27.2	<b>362</b>	<b>27.2</b>
470.lbm	<b>286</b>	<b>48.0</b>	286	48.0	287	47.9	<b>286</b>	<b>48.0</b>	286	48.0	287	47.9
481.wrf	286	39.1	<b>285</b>	<b>39.2</b>	285	39.2	<b>285</b>	<b>39.2</b>	285	39.1	284	39.3
482.sphinx3	501	38.9	493	39.5	<b>496</b>	<b>39.3</b>	501	38.9	493	39.5	<b>496</b>	<b>39.3</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  
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 X5550),  
the NEC Express5800/R120a-2(Intel Xeon X5550),  
the Bull NovaScale R440 E2 (Intel Xeon X5550, 2.66 GHz) and  
the Bull NovaScale R460 E2 (Intel Xeon X5550, 2.66 GHz) models are electronically equivalent.  
The results have been measured on a NEC Express5800/R120a-1(Intel Xeon X5550) 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: -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: 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/NEC-Intel-Linux-Settings-flags-revE.html>  
<http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revG.html>

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

<http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revE.xml>  
<http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revG.xml>

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

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