



# SPEC<sup>®</sup> CFP2006 Result

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## Bull SAS

NovaScale R440 E2  
(Intel Xeon E5540, 2.53 GHz)

SPECfp<sup>®</sup>2006 = 33.8

SPECfp\_base2006 = 31.8

CPU2006 license: 20

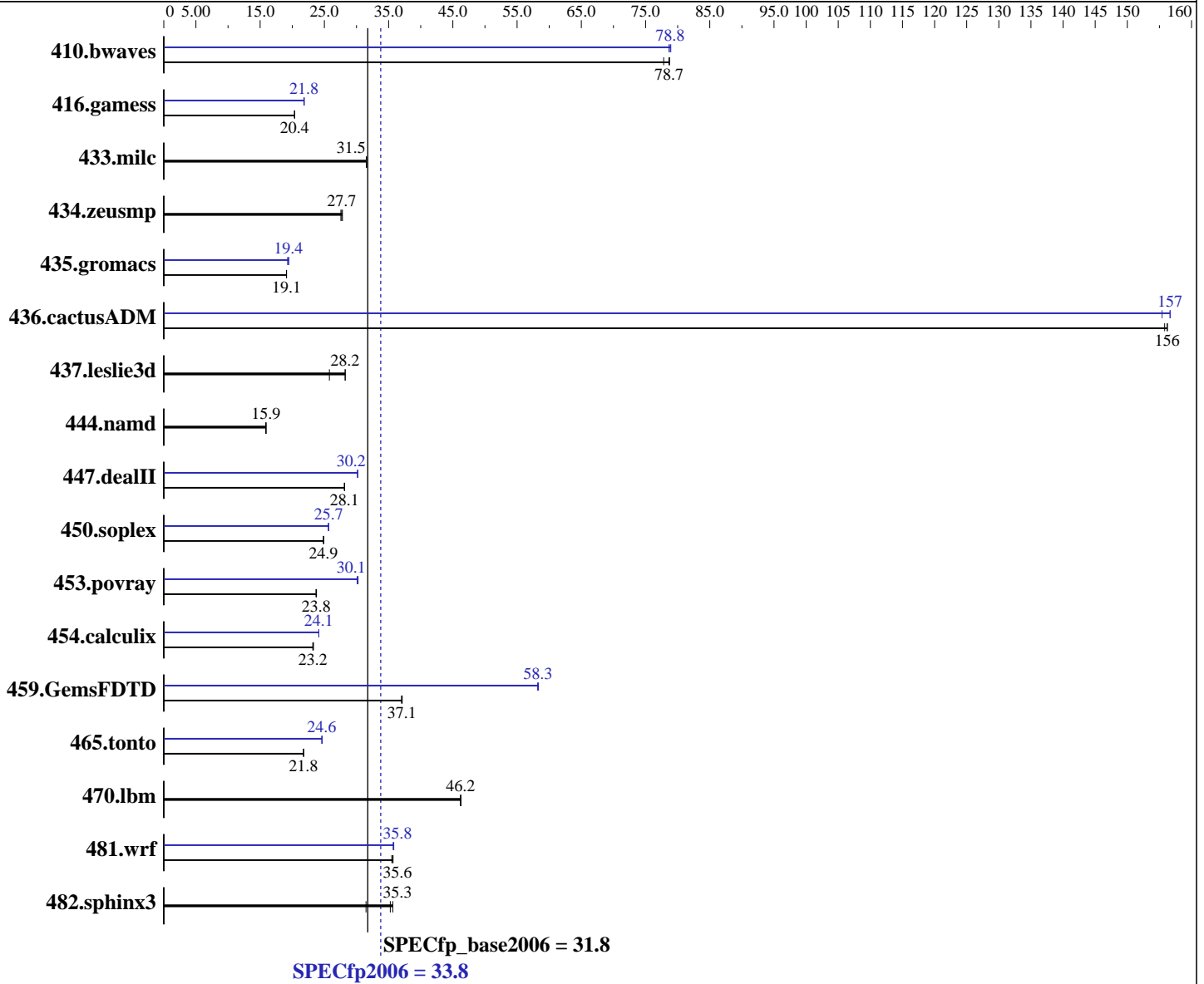
Test sponsor: Bull SAS

Tested by: NEC Corporation

Test date: Apr-2009

Hardware Availability: Apr-2009

Software Availability: Feb-2009



### Hardware

CPU Name: Intel Xeon E5540  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.80 GHz  
 CPU MHz: 2533  
 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\_cprof\_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	175	77.8	<b><u>173</u></b>	<b><u>78.7</u></b>	173	78.7	173	78.7	172	78.9	<b><u>172</u></b>	<b><u>78.8</u></b>
416.gamess	963	20.3	960	20.4	<b><u>961</u></b>	<b><u>20.4</u></b>	<b><u>897</u></b>	<b><u>21.8</u></b>	896	21.8	897	21.8
433.milc	291	31.6	291	31.5	<b><u>291</u></b>	<b><u>31.5</u></b>	291	31.6	291	31.5	<b><u>291</u></b>	<b><u>31.5</u></b>
434.zeusmp	330	27.6	<b><u>328</u></b>	<b><u>27.7</u></b>	327	27.8	330	27.6	<b><u>328</u></b>	<b><u>27.7</u></b>	327	27.8
435.gromacs	374	19.1	<b><u>374</u></b>	<b><u>19.1</u></b>	374	19.1	367	19.5	371	19.3	<b><u>368</u></b>	<b><u>19.4</u></b>
436.cactusADM	76.5	156	<b><u>76.5</u></b>	<b><u>156</u></b>	76.7	156	76.3	157	76.9	155	<b><u>76.3</u></b>	<b><u>157</u></b>
437.leslie3d	365	25.8	<b><u>333</u></b>	<b><u>28.2</u></b>	333	28.2	365	25.8	<b><u>333</u></b>	<b><u>28.2</u></b>	333	28.2
444.namd	504	15.9	<b><u>504</u></b>	<b><u>15.9</u></b>	504	15.9	504	15.9	<b><u>504</u></b>	<b><u>15.9</u></b>	504	15.9
447.dealII	406	28.1	<b><u>406</u></b>	<b><u>28.1</u></b>	407	28.1	<b><u>379</u></b>	<b><u>30.2</u></b>	379	30.2	379	30.2
450.soplex	<b><u>335</u></b>	<b><u>24.9</u></b>	335	24.9	335	24.9	325	25.7	<b><u>325</u></b>	<b><u>25.7</u></b>	325	25.6
453.povray	225	23.7	224	23.8	<b><u>224</u></b>	<b><u>23.8</u></b>	177	30.1	<b><u>176</u></b>	<b><u>30.1</u></b>	176	30.2
454.calculix	355	23.2	354	23.3	<b><u>355</u></b>	<b><u>23.2</u></b>	342	24.1	342	24.1	<b><u>342</u></b>	<b><u>24.1</u></b>
459.GemsFDTD	287	37.0	<b><u>286</u></b>	<b><u>37.1</u></b>	286	37.1	182	58.2	182	58.3	<b><u>182</u></b>	<b><u>58.3</u></b>
465.tonto	452	21.8	452	21.8	<b><u>452</u></b>	<b><u>21.8</u></b>	399	24.7	400	24.6	<b><u>400</u></b>	<b><u>24.6</u></b>
470.lbm	297	46.3	297	46.2	<b><u>297</u></b>	<b><u>46.2</u></b>	297	46.3	297	46.2	<b><u>297</u></b>	<b><u>46.2</u></b>
481.wrf	315	35.5	<b><u>313</u></b>	<b><u>35.6</u></b>	313	35.7	313	35.7	<b><u>312</u></b>	<b><u>35.8</u></b>	312	35.8
482.sphinx3	619	31.5	<b><u>553</u></b>	<b><u>35.3</u></b>	547	35.7	619	31.5	<b><u>553</u></b>	<b><u>35.3</u></b>	547	35.7

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 E5540),  
the NEC Express5800/R120a-2(Intel Xeon E5540),  
the Bull NovaScale R440 E2 (Intel Xeon E5540, 2.53 GHz) and  
the Bull NovaScale R460 E2 (Intel Xeon E5540, 2.53 GHz) models are electronically equivalent.  
The results have been measured on a NEC Express5800/R120a-1(Intel Xeon E5540) 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: -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 other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC CPU2006 v1.1.

Report generated on Tue Jul 22 23:50:02 2014 by SPEC CPU2006 PS/PDF formatter v6932.

Originally published on 12 May 2009.