



# SPEC® CFP2006 Result

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## Bull SAS

NovaScale R440 E2  
(Intel Xeon X5570, 2.93 GHz)

SPECfp®\_rate2006 = 190

SPECfp\_rate\_base2006 = 183

CPU2006 license: 20

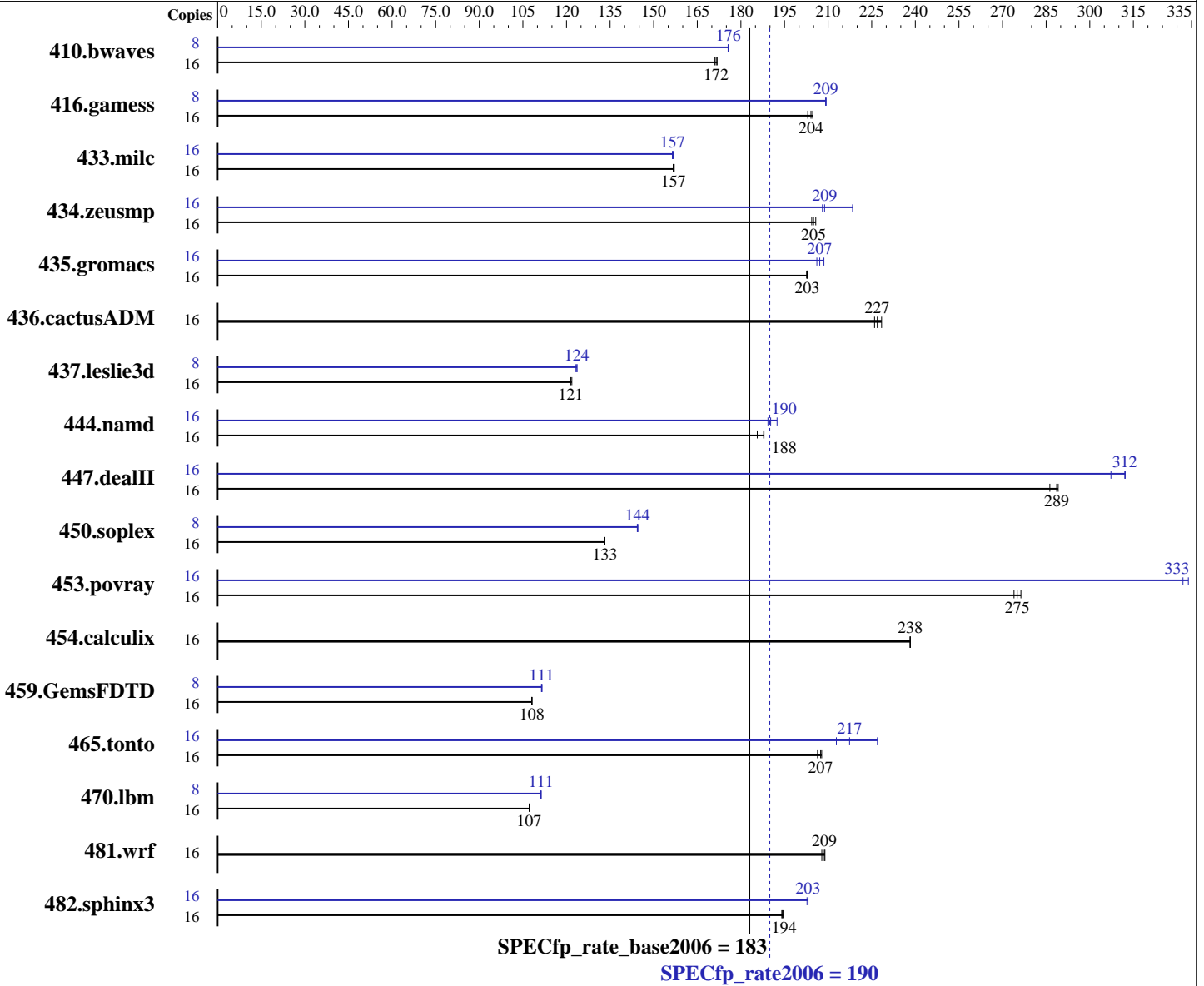
Test sponsor: Bull SAS

Tested by: NEC Corporation

Test date: Mar-2009

Hardware Availability: Apr-2009

Software Availability: Feb-2009



### Hardware

CPU Name: Intel Xeon 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 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: No  
 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						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	16	<b><u>1268</u></b>	<b><u>172</u></b>	1265	172	1271	171	8	619	176	619	176	<b><u>619</u></b>	<b><u>176</u></b>
416.gamess	16	1531	205	1543	203	<b><u>1535</u></b>	<b><u>204</u></b>	8	749	209	748	209	<b><u>749</u></b>	<b><u>209</u></b>
433.milc	16	935	157	<b><u>937</u></b>	<b><u>157</u></b>	937	157	16	<b><u>938</u></b>	<b><u>157</u></b>	937	157	939	156
434.zeusmp	16	708	206	712	204	<b><u>710</u></b>	<b><u>205</u></b>	16	667	218	700	208	<b><u>697</u></b>	<b><u>209</u></b>
435.gromacs	16	<b><u>563</u></b>	<b><u>203</u></b>	563	203	564	203	16	<b><u>552</u></b>	<b><u>207</u></b>	554	206	548	209
436.cactusADM	16	<b><u>843</u></b>	<b><u>227</u></b>	837	228	846	226	16	<b><u>843</u></b>	<b><u>227</u></b>	837	228	846	226
437.leslie3d	16	<b><u>1238</u></b>	<b><u>121</u></b>	1240	121	1234	122	8	<b><u>608</u></b>	<b><u>124</u></b>	611	123	608	124
444.namd	16	691	186	<b><u>683</u></b>	<b><u>188</u></b>	683	188	16	678	189	667	192	<b><u>675</u></b>	<b><u>190</u></b>
447.dealII	16	633	289	639	286	<b><u>634</u></b>	<b><u>289</u></b>	16	586	312	596	307	<b><u>587</u></b>	<b><u>312</u></b>
450.soplex	16	1002	133	1004	133	<b><u>1002</u></b>	<b><u>133</u></b>	8	462	145	462	144	<b><u>462</u></b>	<b><u>144</u></b>
453.povray	16	308	276	<b><u>309</u></b>	<b><u>275</u></b>	311	274	16	256	332	255	334	<b><u>255</u></b>	<b><u>333</u></b>
454.calculix	16	554	238	554	238	<b><u>554</u></b>	<b><u>238</u></b>	16	554	238	554	238	<b><u>554</u></b>	<b><u>238</u></b>
459.GemsFDTD	16	1570	108	<b><u>1570</u></b>	<b><u>108</u></b>	1571	108	8	<b><u>761</u></b>	<b><u>111</u></b>	762	111	761	112
465.tonto	16	<b><u>759</u></b>	<b><u>207</u></b>	758	208	763	206	16	694	227	<b><u>724</u></b>	<b><u>217</u></b>	740	213
470.lbm	16	<b><u>2051</u></b>	<b><u>107</u></b>	2051	107	2051	107	8	989	111	<b><u>988</u></b>	<b><u>111</u></b>	988	111
481.wrf	16	<b><u>856</u></b>	<b><u>209</u></b>	855	209	860	208	16	<b><u>856</u></b>	<b><u>209</u></b>	855	209	860	208
482.sphinx3	16	1603	194	<b><u>1606</u></b>	<b><u>194</u></b>	1607	194	16	<b><u>1536</u></b>	<b><u>203</u></b>	1535	203	1538	203

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Submit Notes

The config file option 'submit' was used.  
numactl was used to bind copies to the cores

## Operating System Notes

'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run

## 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

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## Base Optimization Flags (Continued)

C++ benchmarks:  
-xSSE4.2 -ipo -O3 -no-prec-div -static

Fortran benchmarks:  
-xSSE4.2 -ipo -O3 -no-prec-div -static

Benchmarks using both Fortran and C:  
-xSSE4.2 -ipo -O3 -no-prec-div -static

## 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 (except as noted below):  
ifort

437.leslie3d: ifort -m32

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  
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



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## Peak Optimization Flags

### C benchmarks:

433.milc: -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)  
-fno-alias

470.lbm: -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch  
-auto-ilp32

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -static -unroll2

### C++ benchmarks:

444.namd: -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)  
-fno-alias -auto-ilp32

447.dealII: -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-

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

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: -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)

437.leslie3d: -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 -opt-prefetch

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

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

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## Peak Optimization Flags (Continued)

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

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: basepeak = yes

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-revE.20090710.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-revE.20090710.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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