



SPEC[®] CFP2006 Result

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Bull SAS

NovaScale R440 E2
(Intel Xeon E5520, 2.26 GHz)

SPECfp[®]2006 = 31.3

SPECfp_base2006 = 29.6

CPU2006 license: 20

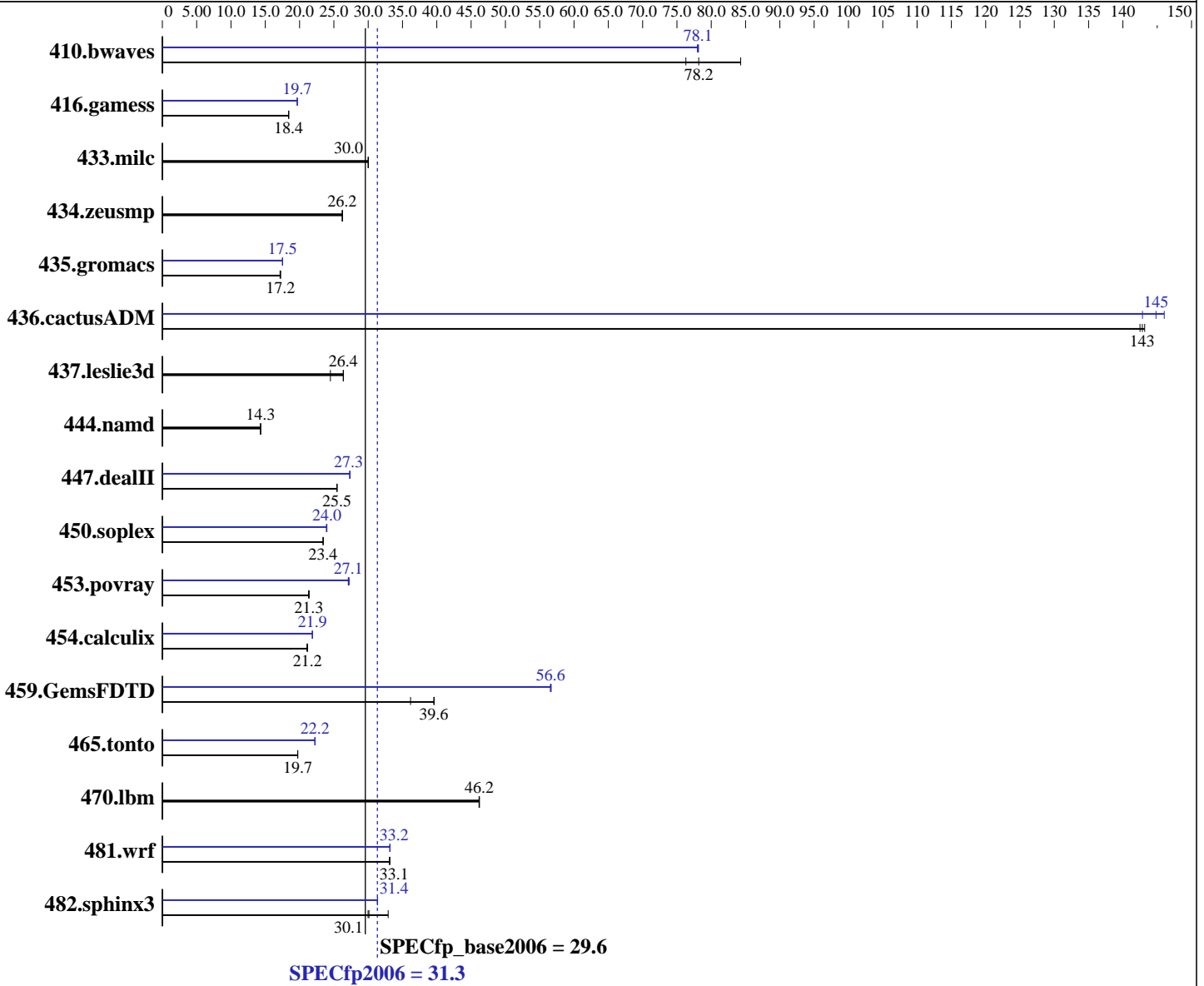
Test sponsor: Bull SAS

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-smpp
 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	<u>174</u>	<u>78.2</u>	<u>174</u>	<u>78.1</u>	174	78.1	174	78.0
416.gamess	1065	18.4	1063	18.4	<u>1064</u>	<u>18.4</u>	996	19.7	996	19.7	<u>996</u>	<u>19.7</u>
433.milc	306	30.0	306	30.0	<u>306</u>	<u>30.0</u>	306	30.0	306	30.0	<u>306</u>	<u>30.0</u>
434.zeusmp	347	26.2	<u>347</u>	<u>26.2</u>	347	26.3	347	26.2	<u>347</u>	<u>26.2</u>	347	26.3
435.gromacs	415	17.2	<u>415</u>	<u>17.2</u>	416	17.2	408	17.5	407	17.5	<u>408</u>	<u>17.5</u>
436.cactusADM	83.9	142	83.5	143	<u>83.7</u>	<u>143</u>	83.7	143	<u>82.5</u>	<u>145</u>	81.8	146
437.leslie3d	356	26.4	384	24.5	<u>357</u>	<u>26.4</u>	356	26.4	384	24.5	<u>357</u>	<u>26.4</u>
444.namd	<u>560</u>	<u>14.3</u>	560	14.3	560	14.3	<u>560</u>	<u>14.3</u>	560	14.3	560	14.3
447.dealII	449	25.5	<u>449</u>	<u>25.5</u>	450	25.4	<u>419</u>	<u>27.3</u>	419	27.3	418	27.3
450.soplex	356	23.4	356	23.4	<u>356</u>	<u>23.4</u>	349	23.9	<u>348</u>	<u>24.0</u>	348	24.0
453.povray	249	21.4	<u>249</u>	<u>21.3</u>	249	21.3	195	27.2	<u>196</u>	<u>27.1</u>	196	27.1
454.calculix	390	21.2	392	21.1	<u>390</u>	<u>21.2</u>	377	21.9	377	21.9	<u>377</u>	<u>21.9</u>
459.GemsFDTD	293	36.2	<u>268</u>	<u>39.6</u>	268	39.6	<u>187</u>	<u>56.6</u>	187	56.7	188	56.6
465.tonto	499	19.7	<u>499</u>	<u>19.7</u>	498	19.7	442	22.3	<u>443</u>	<u>22.2</u>	443	22.2
470.lbm	<u>298</u>	<u>46.2</u>	298	46.2	297	46.2	<u>298</u>	<u>46.2</u>	298	46.2	297	46.2
481.wrf	<u>337</u>	<u>33.1</u>	337	33.1	337	33.2	<u>337</u>	<u>33.2</u>	337	33.1	336	33.2
482.sphinx3	<u>647</u>	<u>30.1</u>	592	32.9	650	30.0	<u>622</u>	<u>31.3</u>	<u>621</u>	<u>31.4</u>	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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Tested with SPEC CPU2006 v1.1.
Report generated on Tue Jul 22 23:47:35 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 12 May 2009.