



# SPEC<sup>®</sup> CFP2006 Result

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## NEC Corporation

### SPECfp<sup>®</sup>\_rate2006 = 68.9

### Express5800/GT110e (Intel Pentium G2020)

### SPECfp\_rate\_base2006 = 67.2

CPU2006 license: 9006

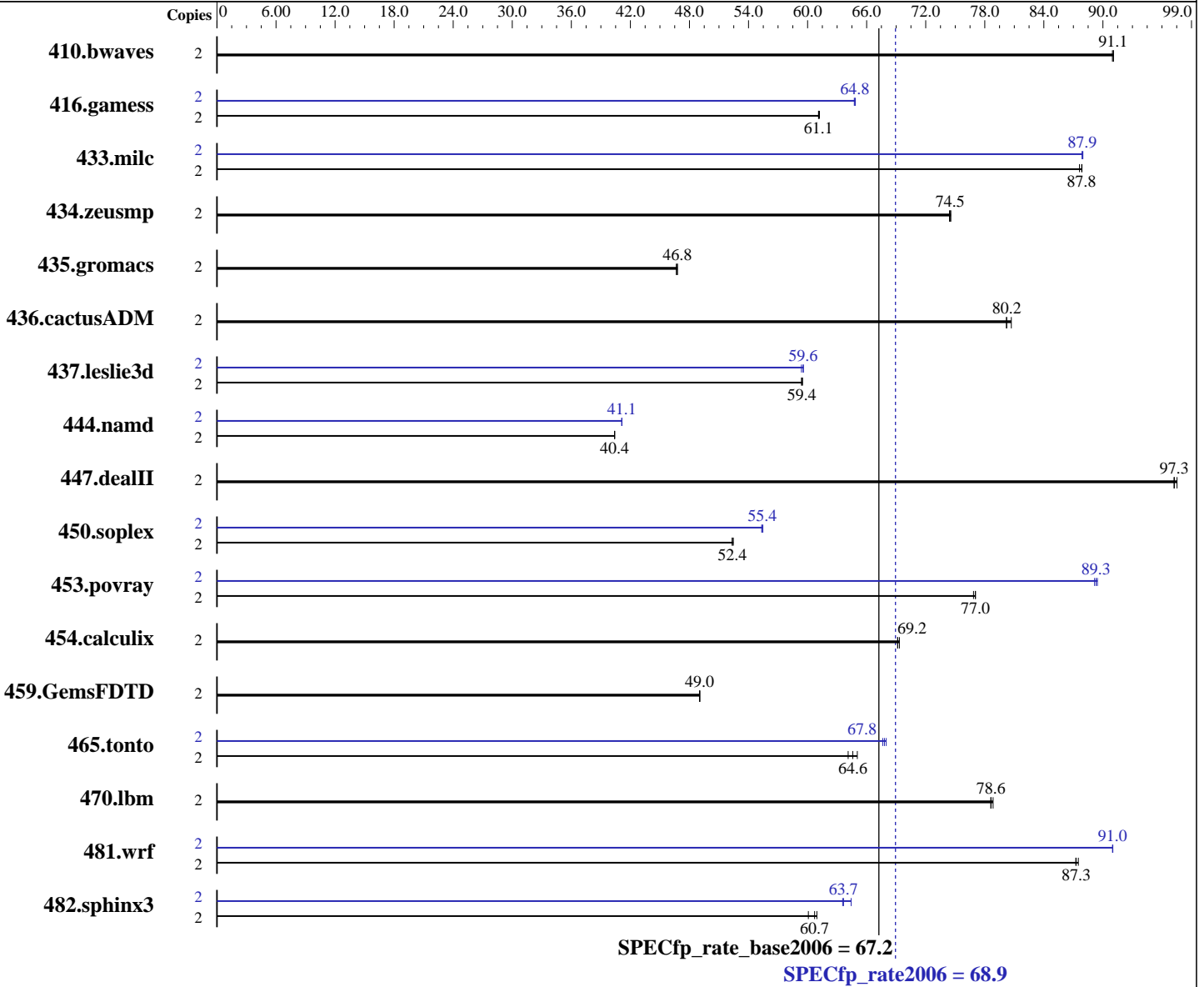
Test sponsor: NEC Corporation

Tested by: NEC Corporation

Test date: May-2013

Hardware Availability: Apr-2013

Software Availability: Feb-2012



#### Hardware

CPU Name: Intel Pentium G2020  
 CPU Characteristics:  
 CPU MHz: 2900  
 FPU: Integrated  
 CPU(s) enabled: 2 cores, 1 chip, 2 cores/chip  
 CPU(s) orderable: 1 chip  
 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: Red Hat Enterprise Linux Server release 6.2 (Santiago)  
 Kernel 2.6.32-220.el6.x86\_64  
 Compiler: C/C++: Version 12.1.3.293 of Intel C++ Studio XE for Linux;  
 Fortran: Version 12.1.3.293 of Intel Fortran Studio XE for Linux  
 Auto Parallel: No  
 File System: ext4

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L3 Cache: 3 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 16 GB (2 x 8 GB 2Rx8 PC3L-12800E-11, ECC, running at 1333 MHz and CL9)  
 Disk Subsystem: 1 x 500 GB SATA, 7200 RPM  
 Other Hardware: None

System State: Run level 3 (multi-user)  
 Base Pointers: 32/64-bit  
 Peak Pointers: 32/64-bit  
 Other Software: None

## Results Table

Benchmark	Base								Peak							
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
410.bwaves	2	<b>298</b>	<b>91.1</b>	299	91.0	298	91.1	2	<b>298</b>	<b>91.1</b>	299	91.0	298	91.1		
416.gamess	2	641	61.1	640	61.2	<b>641</b>	<b>61.1</b>	2	<b>604</b>	<b>64.8</b>	605	64.7	604	64.9		
433.milc	2	210	87.6	209	87.9	<b>209</b>	<b>87.8</b>	2	209	88.0	209	87.9	<b>209</b>	<b>87.9</b>		
434.zeusmp	2	244	74.6	<b>244</b>	<b>74.5</b>	245	74.4	2	244	74.6	<b>244</b>	<b>74.5</b>	245	74.4		
435.gromacs	2	306	46.7	305	46.8	<b>305</b>	<b>46.8</b>	2	306	46.7	305	46.8	<b>305</b>	<b>46.8</b>		
436.cactusADM	2	298	80.2	296	80.7	<b>298</b>	<b>80.2</b>	2	298	80.2	296	80.7	<b>298</b>	<b>80.2</b>		
437.leslie3d	2	317	59.4	<b>316</b>	<b>59.4</b>	316	59.5	2	<b>316</b>	<b>59.6</b>	316	59.6	317	59.4		
444.namd	2	<b>397</b>	<b>40.4</b>	397	40.4	397	40.4	2	390	41.1	<b>390</b>	<b>41.1</b>	390	41.1		
447.dealII	2	235	97.5	235	97.2	<b>235</b>	<b>97.3</b>	2	235	97.5	235	97.2	<b>235</b>	<b>97.3</b>		
450.soplex	2	318	52.5	319	52.3	<b>319</b>	<b>52.4</b>	2	301	55.5	<b>301</b>	<b>55.4</b>	301	55.3		
453.povray	2	<b>138</b>	<b>77.0</b>	138	77.1	138	76.9	2	<b>119</b>	<b>89.3</b>	119	89.4	119	89.1		
454.calculix	2	238	69.3	<b>239</b>	<b>69.2</b>	239	69.2	2	238	69.3	<b>239</b>	<b>69.2</b>	239	69.2		
459.GemsFDTD	2	433	49.1	433	49.0	<b>433</b>	<b>49.0</b>	2	433	49.1	433	49.0	<b>433</b>	<b>49.0</b>		
465.tonto	2	<b>305</b>	<b>64.6</b>	307	64.1	303	65.1	2	289	68.0	291	67.6	<b>290</b>	<b>67.8</b>		
470.lbm	2	350	78.6	<b>349</b>	<b>78.6</b>	349	78.8	2	350	78.6	<b>349</b>	<b>78.6</b>	349	78.8		
481.wrf	2	<b>256</b>	<b>87.3</b>	255	87.5	256	87.2	2	245	91.0	246	91.0	<b>246</b>	<b>91.0</b>		
482.sphinx3	2	640	60.9	<b>642</b>	<b>60.7</b>	649	60.1	2	605	64.4	<b>612</b>	<b>63.7</b>	613	63.6		

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

## Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

## Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

## Platform Notes

Default BIOS settings were used.



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## General Notes

Environment variables set by runspec before the start of the run:  
LD\_LIBRARY\_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64"

Added glibc-static-2.12-1.47.el6.x86\_64.rpm  
to enable static linking

Transparent Huge Pages enabled with:  
echo always > /sys/kernel/mm/redhat\_transparent\_hugepage/enabled  
Filesystem page cache cleared with:  
echo 1> /proc/sys/vm/drop\_caches  
runspec command invoked through numactl i.e.:  
numactl --interleave=all runspec <etc>

## Base Compiler Invocation

C benchmarks:

icc -m64

C++ benchmarks:

icpc -m64

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

## 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.dealII: -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



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## Base Optimization Flags

C benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32  
-ansi-alias -opt-mem-layout-trans=3

C++ benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32  
-ansi-alias -opt-mem-layout-trans=3

Fortran benchmarks:

-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch

Benchmarks using both Fortran and C:

-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32  
-ansi-alias -opt-mem-layout-trans=3

## Peak Compiler Invocation

C benchmarks (except as noted below):

icc -m64

482.sphinx3: icc -m32

C++ benchmarks (except as noted below):

icpc -m64

450.soplex: icpc -m32

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

## 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

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## Peak Portability Flags (Continued)

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

## 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) -opt-mem-layout-trans=3(pass 2)  
 -prof-use(pass 2) -static -auto-ilp32

470.lbm: basepeak = yes

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -opt-mem-layout-trans=3  
 -unroll2

### C++ benchmarks:

444.namd: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
 -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)  
 -prof-use(pass 2) -fno-alias -auto-ilp32

447.dealIII: basepeak = yes

450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
 -no-prec-div(pass 2) -opt-mem-layout-trans=3(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) -opt-mem-layout-trans=3(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) -prof-use(pass 2) -unroll2  
 -inline-level=0 -scalar-rep- -static

434.zeusmp: basepeak = yes

437.leslie3d: -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch

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## Peak Optimization Flags (Continued)

459.GemsFDTD: basepeak = yes

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -auto  
-inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: -xSSE4.2 -ipo -O3 -no-prec-div -static -auto-ilp32

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20120425.html>

<http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-R120d-RevA.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20120425.xml>

<http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-R120d-RevA.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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