



# SPEC® CFP2006 Result

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## NEC Corporation

### SPECfp®\_rate2006 = 89.0

### Express5800/T110d (Intel Xeon E5-2403)

### SPECfp\_rate\_base2006 = 87.1

CPU2006 license: 9006

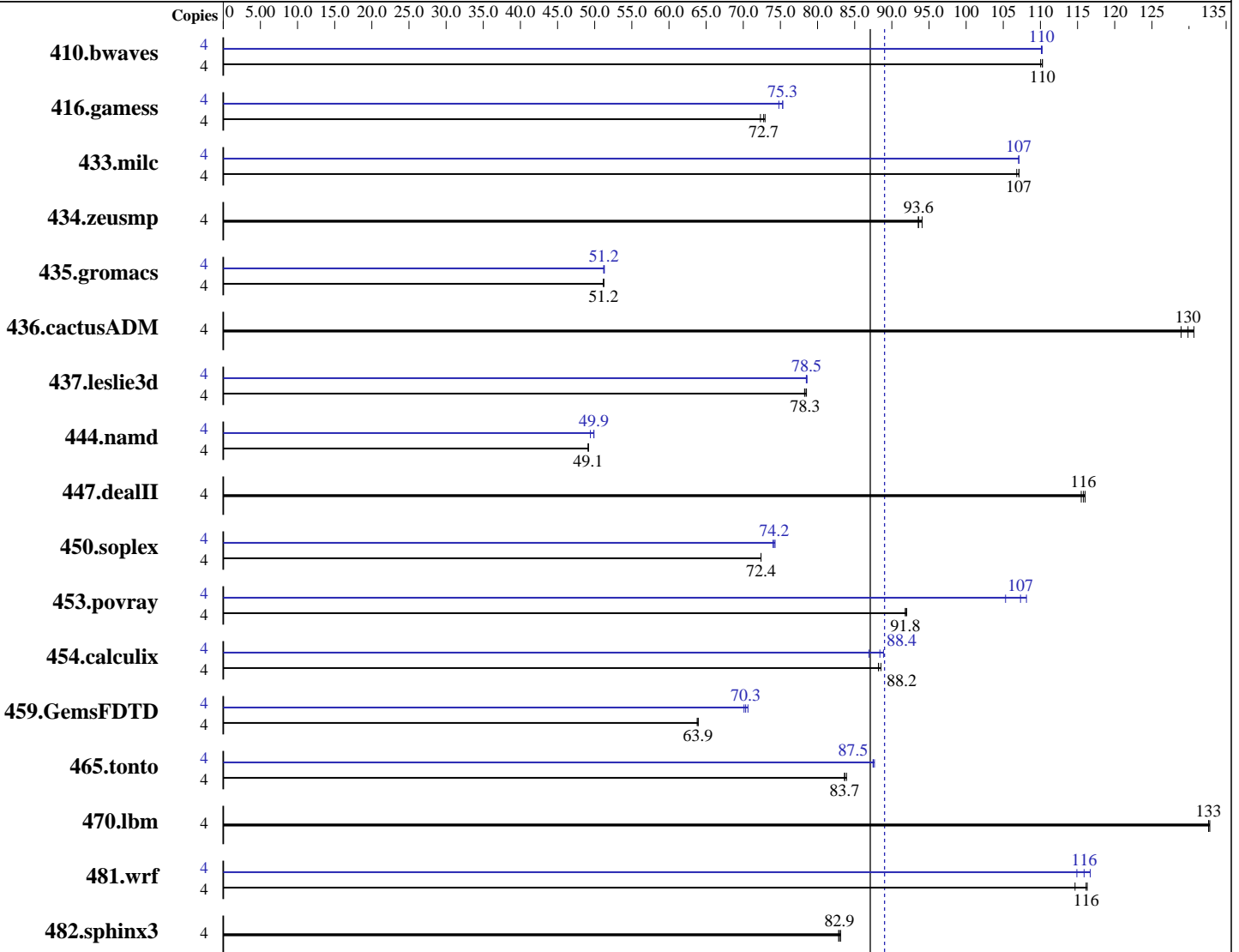
Test sponsor: NEC Corporation

Tested by: NEC Corporation

Test date: Jul-2012

Hardware Availability: May-2012

Software Availability: Dec-2011



SPECfp\_rate\_base2006 = 87.1

SPECfp\_rate2006 = 89.0

#### Hardware

CPU Name: Intel Xeon E5-2403  
 CPU Characteristics:  
 CPU MHz: 1800  
 FPU: Integrated  
 CPU(s) enabled: 4 cores, 1 chip, 4 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 12.1.2.273 of Intel C++ Studio XE for Linux;  
 Fortran: Version 12.1.2.273 of Intel Fortran Studio XE for Linux  
 Auto Parallel: No  
 File System: ext4

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L3 Cache: 10 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 24 GB (3 x 8 GB 2Rx4 PC3L-12800R-11, ECC, running at 1066 MHz and CL7)  
 Disk Subsystem: 1 x 250 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	4	493	110	<b>493</b>	<b>110</b>	494	110	4	493	110	<b>494</b>	<b>110</b>	494	110
416.gamess	4	1083	72.3	1074	72.9	<b>1077</b>	<b>72.7</b>	4	1040	75.3	1047	74.8	<b>1040</b>	<b>75.3</b>
433.milc	4	344	107	<b>343</b>	<b>107</b>	343	107	4	343	107	343	107	<b>343</b>	<b>107</b>
434.zeusmp	4	389	93.6	387	94.1	<b>389</b>	<b>93.6</b>	4	389	93.6	387	94.1	<b>389</b>	<b>93.6</b>
435.gromacs	4	558	51.2	558	51.2	<b>558</b>	<b>51.2</b>	4	557	51.3	<b>557</b>	<b>51.2</b>	558	51.2
436.cactusADM	4	<b>368</b>	<b>130</b>	371	129	366	131	4	<b>368</b>	<b>130</b>	371	129	366	131
437.leslie3d	4	479	78.5	<b>480</b>	<b>78.3</b>	481	78.3	4	478	78.6	479	78.5	<b>479</b>	<b>78.5</b>
444.namd	4	653	49.1	<b>653</b>	<b>49.1</b>	653	49.1	4	643	49.9	<b>643</b>	<b>49.9</b>	649	49.4
447.dealII	4	394	116	<b>395</b>	<b>116</b>	396	115	4	394	116	<b>395</b>	<b>116</b>	396	115
450.soplex	4	461	72.4	461	72.4	<b>461</b>	<b>72.4</b>	4	451	74.0	449	74.3	<b>450</b>	<b>74.2</b>
453.povray	4	231	92.0	232	91.8	<b>232</b>	<b>91.8</b>	4	202	105	<b>198</b>	<b>107</b>	197	108
454.calculix	4	<b>374</b>	<b>88.2</b>	373	88.5	374	88.2	4	371	88.9	<b>373</b>	<b>88.4</b>	380	86.9
459.GemsFDTD	4	664	63.9	<b>664</b>	<b>63.9</b>	665	63.8	4	605	70.1	601	70.6	<b>604</b>	<b>70.3</b>
465.tonto	4	469	83.9	471	83.6	<b>470</b>	<b>83.7</b>	4	450	87.5	<b>450</b>	<b>87.5</b>	449	87.7
470.lbm	4	414	133	414	133	<b>414</b>	<b>133</b>	4	414	133	414	133	<b>414</b>	<b>133</b>
481.wrf	4	390	115	384	116	<b>385</b>	<b>116</b>	4	<b>386</b>	<b>116</b>	389	115	383	117
482.sphinx3	4	<b>940</b>	<b>82.9</b>	938	83.1	941	82.8	4	<b>940</b>	<b>82.9</b>	938	83.1	941	82.8

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

BIOS Settings:  
Energy Performance: Performance



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**CPU2006 license:** 9006

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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:

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

C++ benchmarks:

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

Fortran benchmarks:

-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch

Benchmarks using both Fortran and C:

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

## Peak Compiler Invocation

C benchmarks:

icc -m64

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.dealII: -DSPEC\_CPU\_LP64  
453.povray: -DSPEC\_CPU\_LP64  
454.calculix: -DSPEC\_CPU\_LP64 -nofor\_main  
465.tonto: -DSPEC\_CPU\_LP64

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## Peak Portability Flags (Continued)

470.lbm: -DSPEC\_CPU\_LP64  
481.wrf: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_CASE\_FLAG -DSPEC\_CPU\_LINUX  
482.sphinx3: -DSPEC\_CPU\_LP64

## Peak Optimization Flags

### C benchmarks:

433.milc: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32  
-opt-mem-layout-trans=3

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

### C++ benchmarks:

444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -fno-alias  
-auto-ilp32

447.dealII: basepeak = yes

450.soplex: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias

### Fortran benchmarks:

410.bwaves: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -static

416.gamess: -xAVX(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: -xAVX -ipo -O3 -no-prec-div -static -opt-prefetch

459.GemsFDTD: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3

465.tonto: -xAVX(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

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## Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

435.gromacs: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -opt-prefetch  
-static -auto-ilp32 -opt-mem-layout-trans=3

436.cactusADM: basepeak = yes

454.calculix: -xAVX -ipo -O3 -no-prec-div -static -auto-ilp32  
-opt-mem-layout-trans=3

481.wrf: Same as 454.calculix

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

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