



# SPEC® CFP2006 Result

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## NEC Corporation

### SPECfp®\_rate2006 = 88.8

### Express5800/R110d-1M (Intel Xeon E5-2403)

### SPECfp\_rate\_base2006 = 86.8

CPU2006 license: 9006

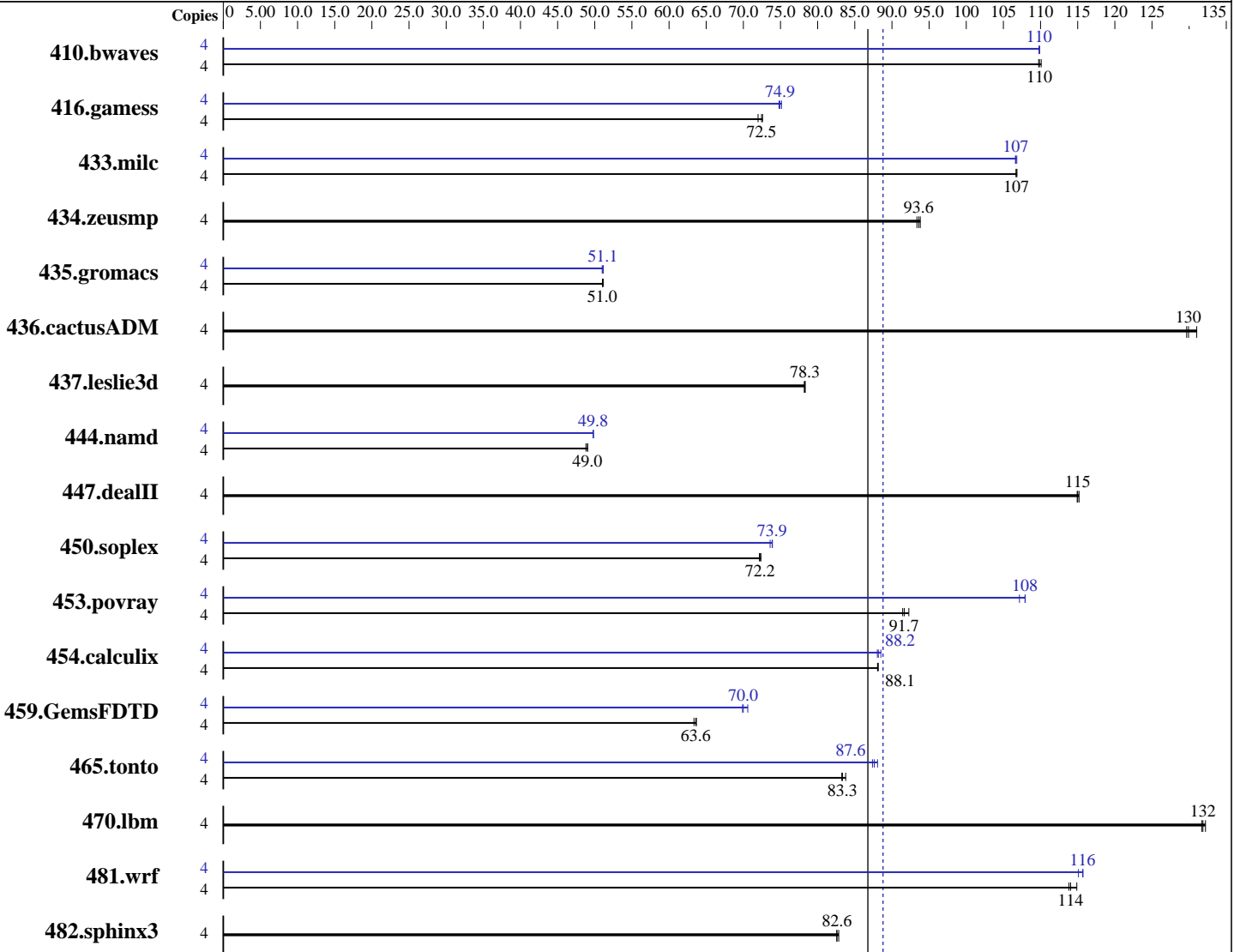
Test sponsor: NEC Corporation

Tested by: NEC Corporation

Test date: Jun-2012

Hardware Availability: May-2012

Software Availability: Dec-2011



SPECfp\_rate\_base2006 = 86.8

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#### 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 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    | 4      | 494        | 110         | <b>495</b>  | <b>110</b>  | 495        | 110         | 4      | <b>495</b> | <b>110</b>  | 495         | 110         | 495        | 110         |  |  |
| 416.gamess    | 4      | 1088       | 72.0        | <b>1081</b> | <b>72.5</b> | 1079       | 72.6        | 4      | 1042       | 75.1        | <b>1045</b> | <b>74.9</b> | 1047       | 74.8        |  |  |
| 433.milc      | 4      | <b>344</b> | <b>107</b>  | 344         | 107         | 344        | 107         | 4      | 344        | 107         | 344         | 107         | <b>344</b> | <b>107</b>  |  |  |
| 434.zeusmp    | 4      | 390        | 93.4        | 388         | 93.8        | <b>389</b> | <b>93.6</b> | 4      | 390        | 93.4        | 388         | 93.8        | <b>389</b> | <b>93.6</b> |  |  |
| 435.gromacs   | 4      | <b>560</b> | <b>51.0</b> | 560         | 51.0        | 558        | 51.2        | 4      | 560        | 51.0        | <b>559</b>  | <b>51.1</b> | 558        | 51.1        |  |  |
| 436.cactusADM | 4      | 369        | 130         | <b>368</b>  | <b>130</b>  | 365        | 131         | 4      | 369        | 130         | <b>368</b>  | <b>130</b>  | 365        | 131         |  |  |
| 437.leslie3d  | 4      | 480        | 78.3        | 481         | 78.2        | <b>480</b> | <b>78.3</b> | 4      | 480        | 78.3        | 481         | 78.2        | <b>480</b> | <b>78.3</b> |  |  |
| 444.namd      | 4      | <b>654</b> | <b>49.0</b> | 657         | 48.8        | 654        | 49.0        | 4      | 644        | 49.8        | <b>644</b>  | <b>49.8</b> | 644        | 49.8        |  |  |
| 447.dealII    | 4      | <b>398</b> | <b>115</b>  | 397         | 115         | 398        | 115         | 4      | <b>398</b> | <b>115</b>  | 397         | 115         | 398        | 115         |  |  |
| 450.soplex    | 4      | <b>462</b> | <b>72.2</b> | 461         | 72.4        | 462        | 72.2        | 4      | 453        | 73.6        | 451         | 73.9        | <b>452</b> | <b>73.9</b> |  |  |
| 453.povray    | 4      | 233        | 91.4        | <b>232</b>  | <b>91.7</b> | 231        | 92.3        | 4      | <b>197</b> | <b>108</b>  | 199         | 107         | 197        | 108         |  |  |
| 454.calculix  | 4      | <b>374</b> | <b>88.1</b> | 374         | 88.1        | 375        | 88.1        | 4      | 375        | 88.0        | <b>374</b>  | <b>88.2</b> | 373        | 88.5        |  |  |
| 459.GemsFDTD  | 4      | 670        | 63.4        | <b>667</b>  | <b>63.6</b> | 666        | 63.7        | 4      | <b>606</b> | <b>70.0</b> | 607         | 69.9        | 601        | 70.6        |  |  |
| 465.tonto     | 4      | 473        | 83.3        | <b>472</b>  | <b>83.3</b> | 470        | 83.8        | 4      | 450        | 87.4        | 447         | 88.1        | <b>449</b> | <b>87.6</b> |  |  |
| 470.lbm       | 4      | 416        | 132         | 417         | 132         | <b>417</b> | <b>132</b>  | 4      | 416        | 132         | 417         | 132         | <b>417</b> | <b>132</b>  |  |  |
| 481.wrf       | 4      | 393        | 114         | <b>392</b>  | <b>114</b>  | 389        | 115         | 4      | <b>386</b> | <b>116</b>  | 388         | 115         | 386        | 116         |  |  |
| 482.sphinx3   | 4      | 941        | 82.8        | 944         | 82.6        | <b>944</b> | <b>82.6</b> | 4      | 941        | 82.8        | 944         | 82.6        | <b>944</b> | <b>82.6</b> |  |  |

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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Express5800/R110d-1M (Intel Xeon E5-2403)

SPECfp\_rate\_base2006 = 86.8

CPU2006 license: 9006

Test date: Jun-2012

Test sponsor: NEC Corporation

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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: basepeak = yes

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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