



# SPEC® CFP2006 Result

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## NEC Corporation

### SPECfp®\_rate2006 = 60.8

### Express5800/R110e-1E (Intel Pentium G640)

### SPECfp\_rate\_base2006 = 59.6

CPU2006 license: 9006

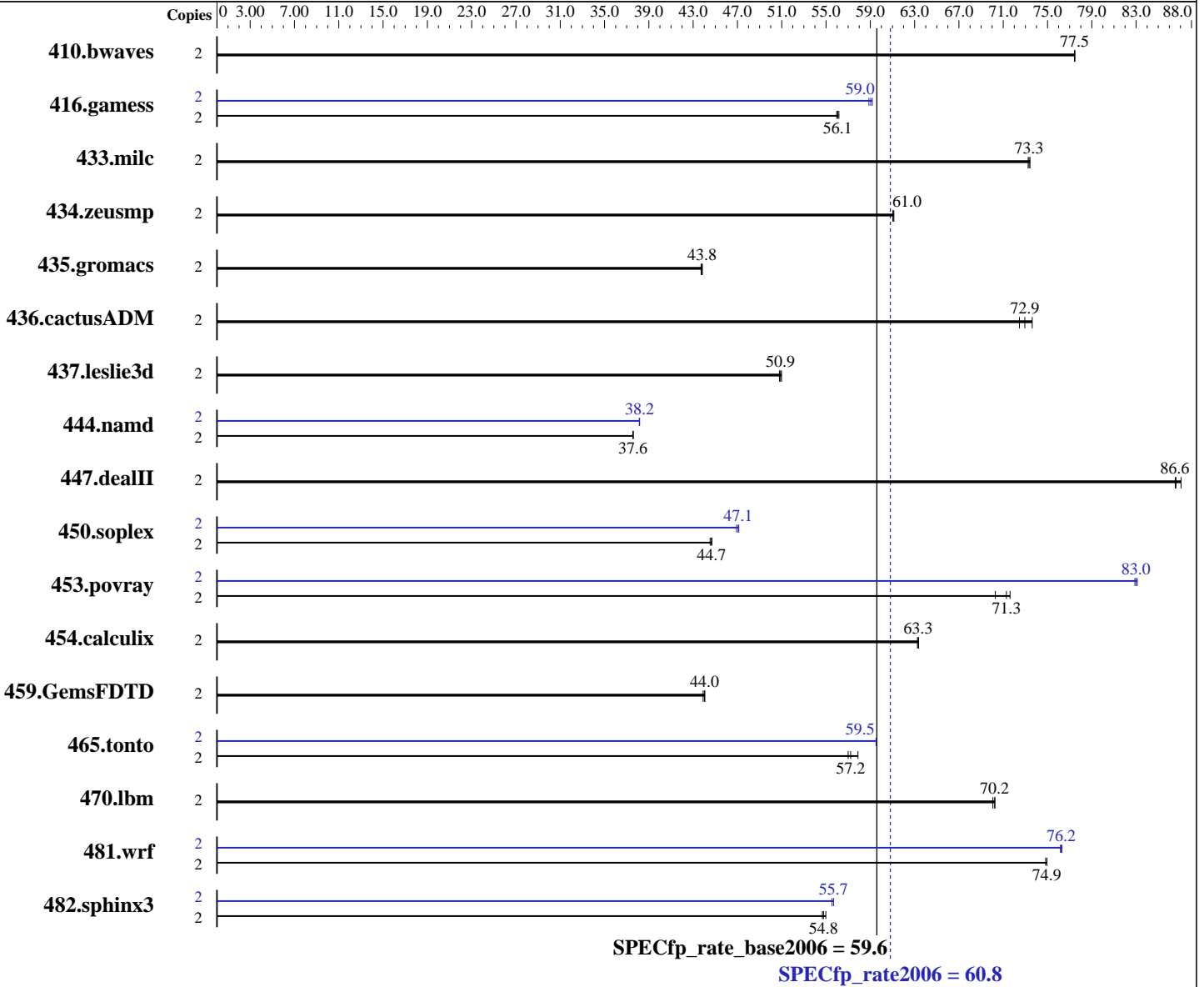
Test sponsor: NEC Corporation

Tested by: NEC Corporation

Test date: Jul-2012

Hardware Availability: Jul-2012

Software Availability: Feb-2012



#### Hardware

CPU Name: Intel Pentium G640  
 CPU Characteristics:  
 CPU MHz: 2800  
 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 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    | 2      | <b><u>351</u></b> | <b><u>77.5</u></b> | 351               | 77.4               | 351               | 77.5               | 2      | <b><u>351</u></b> | <b><u>77.5</u></b> | 351               | 77.4               | 351               | 77.5               |  |  |
| 416.gamess    | 2      | <b><u>699</u></b> | <b><u>56.1</u></b> | 700               | 56.0               | 697               | 56.2               | 2      | 662               | 59.2               | 665               | 58.9               | <b><u>663</u></b> | <b><u>59.0</u></b> |  |  |
| 433.milc      | 2      | 251               | 73.2               | 250               | 73.4               | <b><u>250</u></b> | <b><u>73.3</u></b> | 2      | 251               | 73.2               | 250               | 73.4               | <b><u>250</u></b> | <b><u>73.3</u></b> |  |  |
| 434.zeusmp    | 2      | 298               | 61.0               | 298               | 61.1               | <b><u>298</u></b> | <b><u>61.0</u></b> | 2      | 298               | 61.0               | 298               | 61.1               | <b><u>298</u></b> | <b><u>61.0</u></b> |  |  |
| 435.gromacs   | 2      | 326               | 43.8               | 327               | 43.7               | <b><u>326</u></b> | <b><u>43.8</u></b> | 2      | 326               | 43.8               | 327               | 43.7               | <b><u>326</u></b> | <b><u>43.8</u></b> |  |  |
| 436.cactusADM | 2      | <b><u>328</u></b> | <b><u>72.9</u></b> | 325               | 73.6               | 330               | 72.5               | 2      | <b><u>328</u></b> | <b><u>72.9</u></b> | 325               | 73.6               | 330               | 72.5               |  |  |
| 437.leslie3d  | 2      | 369               | 51.0               | 370               | 50.8               | <b><u>369</u></b> | <b><u>50.9</u></b> | 2      | 369               | 51.0               | 370               | 50.8               | <b><u>369</u></b> | <b><u>50.9</u></b> |  |  |
| 444.namd      | 2      | 427               | 37.6               | <b><u>427</u></b> | <b><u>37.6</u></b> | 427               | 37.6               | 2      | <b><u>420</u></b> | <b><u>38.2</u></b> | 421               | 38.1               | 420               | 38.2               |  |  |
| 447.dealII    | 2      | 264               | 86.5               | 263               | 87.1               | <b><u>264</u></b> | <b><u>86.6</u></b> | 2      | 264               | 86.5               | 263               | 87.1               | <b><u>264</u></b> | <b><u>86.6</u></b> |  |  |
| 450.soplex    | 2      | <b><u>374</u></b> | <b><u>44.7</u></b> | 373               | 44.7               | 375               | 44.5               | 2      | 354               | 47.1               | 356               | 46.9               | <b><u>354</u></b> | <b><u>47.1</u></b> |  |  |
| 453.povray    | 2      | 149               | 71.6               | <b><u>149</u></b> | <b><u>71.3</u></b> | 151               | 70.3               | 2      | <b><u>128</u></b> | <b><u>83.0</u></b> | 128               | 82.9               | 128               | 83.1               |  |  |
| 454.calculix  | 2      | <b><u>261</u></b> | <b><u>63.3</u></b> | 261               | 63.3               | 260               | 63.4               | 2      | <b><u>261</u></b> | <b><u>63.3</u></b> | 261               | 63.3               | 260               | 63.4               |  |  |
| 459.GemsFDTD  | 2      | 482               | 44.1               | 483               | 43.9               | <b><u>482</u></b> | <b><u>44.0</u></b> | 2      | 482               | 44.1               | 483               | 43.9               | <b><u>482</u></b> | <b><u>44.0</u></b> |  |  |
| 465.tonto     | 2      | 345               | 57.0               | 340               | 57.9               | <b><u>344</u></b> | <b><u>57.2</u></b> | 2      | <b><u>331</u></b> | <b><u>59.5</u></b> | 331               | 59.5               | 331               | 59.5               |  |  |
| 470.lbm       | 2      | 392               | 70.1               | <b><u>391</u></b> | <b><u>70.2</u></b> | 391               | 70.3               | 2      | 392               | 70.1               | <b><u>391</u></b> | <b><u>70.2</u></b> | 391               | 70.3               |  |  |
| 481.wrf       | 2      | <b><u>298</u></b> | <b><u>74.9</u></b> | 298               | 74.9               | 299               | 74.8               | 2      | <b><u>293</u></b> | <b><u>76.2</u></b> | 293               | 76.2               | 293               | 76.3               |  |  |
| 482.sphinx3   | 2      | <b><u>712</u></b> | <b><u>54.8</u></b> | 709               | 55.0               | 713               | 54.7               | 2      | 700               | 55.7               | <b><u>700</u></b> | <b><u>55.7</u></b> | 702               | 55.5               |  |  |

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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Express5800/R110e-1E (Intel Pentium G640)

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CPU2006 license: 9006

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Hardware Availability: Jul-2012

Software Availability: Feb-2012

## 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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Test date: Jul-2012

Test sponsor: NEC Corporation

Hardware Availability: Jul-2012

Tested by: NEC Corporation

Software Availability: Feb-2012

## 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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CPU2006 license: 9006

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Test sponsor: NEC Corporation

Hardware Availability: Jul-2012

Tested by: NEC Corporation

Software Availability: Feb-2012

## 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: basepeak = yes  
 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: basepeak = yes  
 459.GemsFDTD: basepeak = yes

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**Test sponsor:** NEC Corporation

**Hardware Availability:** Jul-2012

**Tested by:** NEC Corporation

**Software Availability:** Feb-2012

## Peak Optimization Flags (Continued)

```
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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