



# SPEC® CFP2006 Result

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## NEC Corporation

SPECfp®\_rate2006 = 216

### Express5800/R120b-2 (Intel Xeon E5645)

SPECfp\_rate\_base2006 = 211

CPU2006 license: 9006

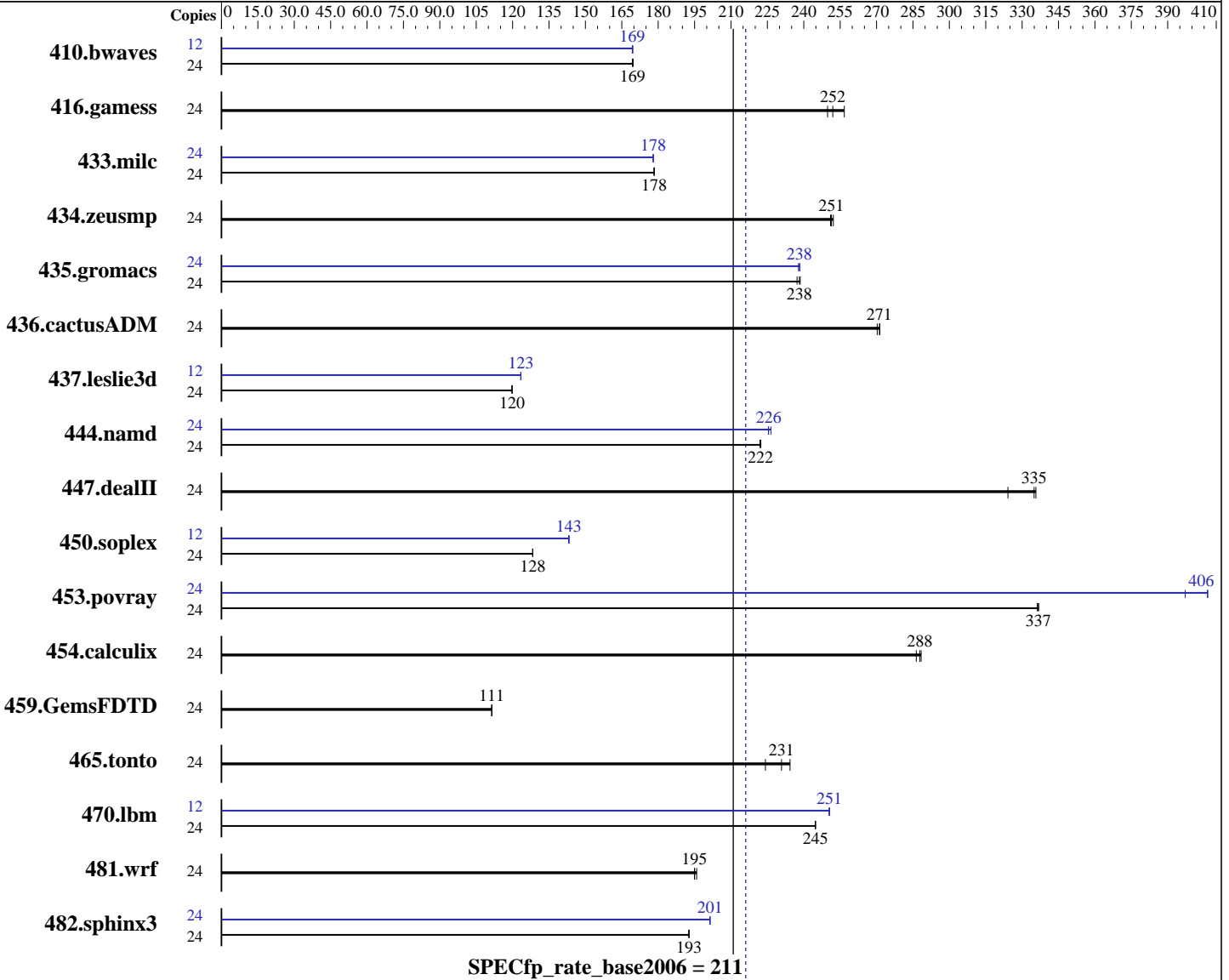
Test sponsor: NEC Corporation

Tested by: NEC Corporation

Test date: May-2011

Hardware Availability: Feb-2011

Software Availability: Mar-2011



#### Hardware

CPU Name: Intel Xeon E5645  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.80 GHz  
 CPU MHz: 2400  
 FPU: Integrated  
 CPU(s) enabled: 12 cores, 2 chips, 6 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 11 SP1 (x86\_64), Kernel 2.6.32.12-0.7-default  
 Compiler: Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64, Version 12.0.3.174 Build 20110309  
 Auto Parallel: No  
 File System: ext3  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit

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L3 Cache: 12 MB I+D on chip per chip  
Other Cache: None  
Memory: 96 GB (12 x 8 GB 2Rx4 PC3-10600R-9, ECC)  
Disk Subsystem: 1 x 500 GB SATA, 7200 RPM  
Other Hardware: None

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    | 24     | 1923        | 170        | <u>1925</u> | <u>169</u> | 1925        | 169        | 12     | 963         | 169        | 962         | 170        | <u>963</u>  | <u>169</u> |
| 416.gamess    | 24     | 1831        | 257        | <u>1865</u> | <u>252</u> | 1881        | 250        | 24     | 1831        | 257        | <u>1865</u> | <u>252</u> | 1881        | 250        |
| 433.milc      | 24     | 1235        | 178        | <u>1235</u> | <u>178</u> | 1236        | 178        | 24     | 1238        | 178        | 1238        | 178        | <u>1238</u> | <u>178</u> |
| 434.zeusmp    | 24     | 866         | 252        | <u>869</u>  | <u>251</u> | 870         | 251        | 24     | 866         | 252        | <u>869</u>  | <u>251</u> | 870         | 251        |
| 435.gromacs   | 24     | 722         | 237        | <u>719</u>  | <u>238</u> | 718         | 239        | 24     | 721         | 238        | 719         | 238        | <u>719</u>  | <u>238</u> |
| 436.cactusADM | 24     | <u>1058</u> | <u>271</u> | 1061        | 270        | 1057        | 271        | 24     | <u>1058</u> | <u>271</u> | 1061        | 270        | 1057        | 271        |
| 437.leslie3d  | 24     | 1883        | 120        | <u>1883</u> | <u>120</u> | 1884        | 120        | 12     | 914         | 123        | <u>914</u>  | <u>123</u> | 915         | 123        |
| 444.namd      | 24     | <u>866</u>  | <u>222</u> | 866         | 222        | 867         | 222        | 24     | 854         | 225        | 850         | 226        | <u>853</u>  | <u>226</u> |
| 447.dealII    | 24     | 818         | 336        | 847         | 324        | <u>820</u>  | <u>335</u> | 24     | 818         | 336        | 847         | 324        | <u>820</u>  | <u>335</u> |
| 450.soplex    | 24     | 1560        | 128        | 1560        | 128        | <u>1560</u> | <u>128</u> | 12     | 699         | 143        | 699         | 143        | <u>699</u>  | <u>143</u> |
| 453.povray    | 24     | 379         | 337        | <u>379</u>  | <u>337</u> | 380         | 336        | 24     | <u>314</u>  | <u>406</u> | 321         | 397        | 314         | 407        |
| 454.calculix  | 24     | 687         | 288        | <u>688</u>  | <u>288</u> | 691         | 286        | 24     | 687         | 288        | <u>688</u>  | <u>288</u> | 691         | 286        |
| 459.GemsFDTD  | 24     | <u>2285</u> | <u>111</u> | 2285        | 111        | 2285        | 111        | 24     | <u>2285</u> | <u>111</u> | 2285        | 111        | 2285        | 111        |
| 465.tonto     | 24     | 1053        | 224        | 1008        | 234        | <u>1023</u> | <u>231</u> | 24     | 1053        | 224        | 1008        | 234        | <u>1023</u> | <u>231</u> |
| 470.lbm       | 24     | 1347        | 245        | 1348        | 245        | <u>1347</u> | <u>245</u> | 12     | <u>658</u>  | <u>251</u> | 658         | 250        | 658         | 251        |
| 481.wrf       | 24     | 1369        | 196        | <u>1375</u> | <u>195</u> | 1375        | 195        | 24     | 1369        | 196        | <u>1375</u> | <u>195</u> | 1375        | 195        |
| 482.sphinx3   | 24     | 2427        | 193        | <u>2427</u> | <u>193</u> | 2428        | 193        | 24     | <u>2323</u> | <u>201</u> | 2322        | 201        | 2324        | 201        |

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

## Submit Notes

The config file option 'submit' was used.  
numactl was used to bind copies to the cores

## Operating System Notes

'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run  
Huge pages were not configured for this run

## Platform Notes

BIOS Settings:  
Performance/Watt: Traditional  
Server Class: Custom

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CPU2006 license: 9006

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## Platform Notes (Continued)

Data Reuse Optimization: Disabled  
Memory Voltage: Normal

## General Notes

The Express5800/R120b-1 and the Express5800/R120b-2 models are electronically equivalent. The results have been measured on the Express5800/R120b-1 model.

## 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.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



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**Software Availability:** Mar-2011

## Base Optimization Flags

C benchmarks:

`-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias`

C++ benchmarks:

`-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias`

Fortran benchmarks:

`-xSSE4.2 -ipo -O3 -no-prec-div -static`

Benchmarks using both Fortran and C:

`-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias`

## 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.dealII: `-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`

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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

## 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) -prof-use(pass 2) -static -auto-ilp32

470.lbm: -xSSE4.2(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  
-ansi-alias -opt-prefetch -static -auto-ilp32

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2

C++ benchmarks:

444.namd: -xSSE4.2(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: -xSSE4.2(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  
-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

Fortran benchmarks:

410.bwaves: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -static

416.gamess: basepeak = yes

434.zeusmp: basepeak = yes

437.leslie3d: -xSSE4.2 -ipo -O3 -no-prec-div  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

459.GemsFDTD: basepeak = yes

465.tonto: basepeak = yes

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## Peak Optimization Flags (Continued)

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) -prof-use(pass 2) -opt-prefetch
             -static -auto-ilp32
```

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: basepeak = yes

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

<http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.html>

<http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revF.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml>

<http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revF.xml>

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

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