



# SPEC® CFP2006 Result

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## NEC Corporation

SPECfp®2006 = **51.7**

### Express5800/R120b-1 (Intel Xeon E5645)

SPECfp\_base2006 = **48.4**

CPU2006 license: 9006

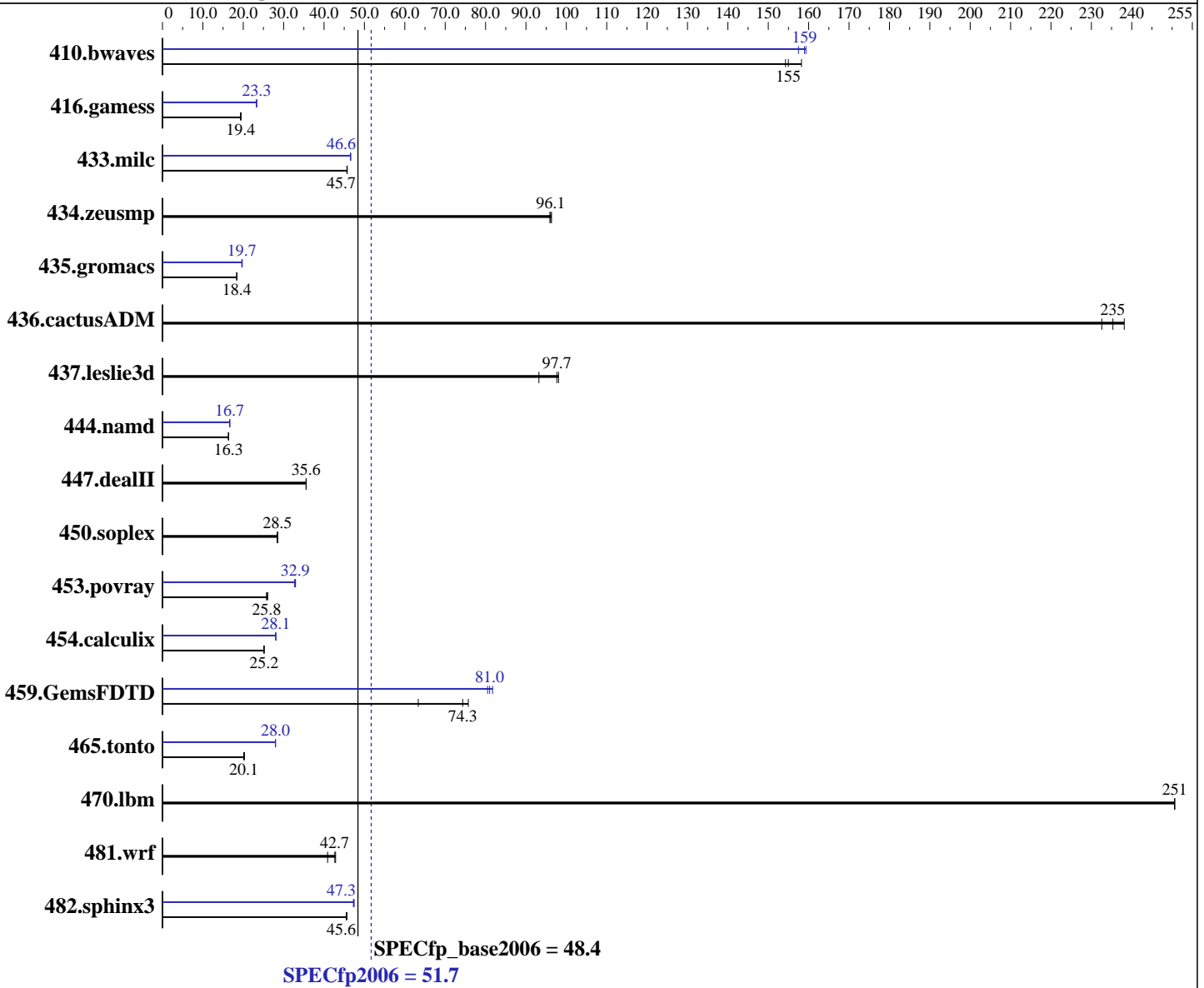
Test sponsor: NEC Corporation

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  
 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: Yes  
 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        |             |             |             |             |             |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|               | Seconds     | Ratio       | Seconds     | Ratio       | Seconds     | Ratio       | Seconds     | Ratio       | Seconds     | Ratio       | Seconds     | Ratio       |
| 410.bwaves    | 85.9        | 158         | <b>87.7</b> | <b>155</b>  | 88.1        | 154         | 85.3        | 159         | 86.3        | 157         | <b>85.5</b> | <b>159</b>  |
| 416.gamess    | 1013        | 19.3        | 1006        | 19.5        | <b>1010</b> | <b>19.4</b> | 841         | 23.3        | 840         | 23.3        | <b>840</b>  | <b>23.3</b> |
| 433.milc      | <b>201</b>  | <b>45.7</b> | 201         | 45.7        | 201         | 45.8        | 197         | 46.6        | 197         | 46.5        | <b>197</b>  | <b>46.6</b> |
| 434.zeusmp    | 94.5        | 96.3        | <b>94.7</b> | <b>96.1</b> | 94.9        | 95.9        | 94.5        | 96.3        | <b>94.7</b> | <b>96.1</b> | 94.9        | 95.9        |
| 435.gromacs   | <b>388</b>  | <b>18.4</b> | 388         | 18.4        | 388         | 18.4        | <b>363</b>  | <b>19.7</b> | 361         | 19.8        | 363         | 19.7        |
| 436.cactusADM | <b>50.8</b> | <b>235</b>  | 50.2        | 238         | 51.4        | 233         | <b>50.8</b> | <b>235</b>  | 50.2        | 238         | 51.4        | 233         |
| 437.leslie3d  | 95.8        | 98.1        | 101         | 93.2        | <b>96.2</b> | <b>97.7</b> | 95.8        | 98.1        | 101         | 93.2        | <b>96.2</b> | <b>97.7</b> |
| 444.namd      | <b>491</b>  | <b>16.3</b> | 491         | 16.3        | 490         | 16.4        | <b>481</b>  | <b>16.7</b> | 482         | 16.6        | 481         | 16.7        |
| 447.dealII    | <b>322</b>  | <b>35.6</b> | 321         | 35.6        | 322         | 35.6        | <b>322</b>  | <b>35.6</b> | 321         | 35.6        | 322         | 35.6        |
| 450.soplex    | 294         | 28.4        | <b>293</b>  | <b>28.5</b> | 292         | 28.5        | 294         | 28.4        | <b>293</b>  | <b>28.5</b> | 292         | 28.5        |
| 453.povray    | 206         | 25.8        | <b>206</b>  | <b>25.8</b> | 204         | 26.1        | 161         | 32.9        | <b>162</b>  | <b>32.9</b> | 163         | 32.7        |
| 454.calculix  | 327         | 25.2        | <b>328</b>  | <b>25.2</b> | 329         | 25.1        | <b>294</b>  | <b>28.1</b> | 294         | 28.1        | 294         | 28.1        |
| 459.GemsFDTD  | <b>143</b>  | <b>74.3</b> | 140         | 75.7        | 168         | 63.3        | 132         | 80.5        | 130         | 81.8        | <b>131</b>  | <b>81.0</b> |
| 465.tonto     | 485         | 20.3        | <b>488</b>  | <b>20.1</b> | 489         | 20.1        | 352         | 28.0        | <b>352</b>  | <b>28.0</b> | 352         | 28.0        |
| 470.lbm       | <b>54.8</b> | <b>251</b>  | 54.8        | 251         | 54.8        | 251         | <b>54.8</b> | <b>251</b>  | 54.8        | 251         | 54.8        | 251         |
| 481.wrf       | 261         | 42.9        | <b>262</b>  | <b>42.7</b> | 273         | 40.9        | 261         | 42.9        | <b>262</b>  | <b>42.7</b> | 273         | 40.9        |
| 482.sphinx3   | 427         | 45.7        | 428         | 45.5        | <b>428</b>  | <b>45.6</b> | 412         | 47.3        | 411         | 47.5        | <b>412</b>  | <b>47.3</b> |

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

## Operating System Notes

```
'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run
'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
echo 1800 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

## Platform Notes

BIOS Settings:  
 Hyper-Threading Technology: Disabled  
 Performance/Watt: Traditional  
 Server Class: Custom  
 Data Reuse Optimization: Disabled  
 Memory Voltage: Normal



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Express5800/R120b-1 (Intel Xeon E5645)

SPECfp\_base2006 = 48.4

CPU2006 license: 9006

Test date: May-2011

Test sponsor: NEC Corporation

Hardware Availability: Feb-2011

Tested by: NEC Corporation

Software Availability: Mar-2011

## General Notes

OMP\_NUM\_THREADS set to number of cores  
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.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

## Base Optimization Flags

C benchmarks:

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

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|   |                          |             |
|---|--------------------------|-------------|
| <b>NEC Corporation</b>                        | <b>SPECfp2006 =</b>      | <b>51.7</b> |
| <b>Express5800/R120b-1 (Intel Xeon E5645)</b> | <b>SPECfp_base2006 =</b> | <b>48.4</b> |

|                                      |  |
|--------------------------------------|--|
| <b>CPU2006 license:</b> 9006         | <b>Test date:</b> May-2011             |
| <b>Test sponsor:</b> NEC Corporation | <b>Hardware Availability:</b> Feb-2011 |
| <b>Tested by:</b> NEC Corporation    | <b>Software Availability:</b> Mar-2011 |

## Base Optimization Flags (Continued)

C++ benchmarks:  
 -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias

Fortran benchmarks:  
 -xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

Benchmarks using both Fortran and C:  
 -xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch  
 -ansi-alias

## Peak Compiler Invocation

C benchmarks:  
 icc -m64

C++ benchmarks:  
 icpc -m64

Fortran benchmarks:  
 ifort -m64

Benchmarks using both Fortran and C:  
 icc -m64 ifort -m64

## Peak Portability Flags

Same as Base Portability Flags

## 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  
 -ansi-alias

470.lbm: basepeak = yes

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

C++ benchmarks:

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## Peak Optimization Flags (Continued)

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: basepeak = yes

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

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: -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 -opt-prefetch -parallel  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

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) -inline-calloc  
-opt-malloc-options=3 -auto -unroll4  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

### 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) -static -auto-ilp32  
-ansi-alias

436.cactusADM: basepeak = yes

454.calculix: -xSSE4.2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

481.wrf: basepeak = yes



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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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