



# SPEC<sup>®</sup> CFP2006 Result

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## NEC Corporation

**SPECfp<sup>®</sup>2006 = 87.5**

Express5800/R120e-2M (Intel Xeon E5-2630 v2)

**SPECfp\_base2006 = 84.3**

CPU2006 license: 9006

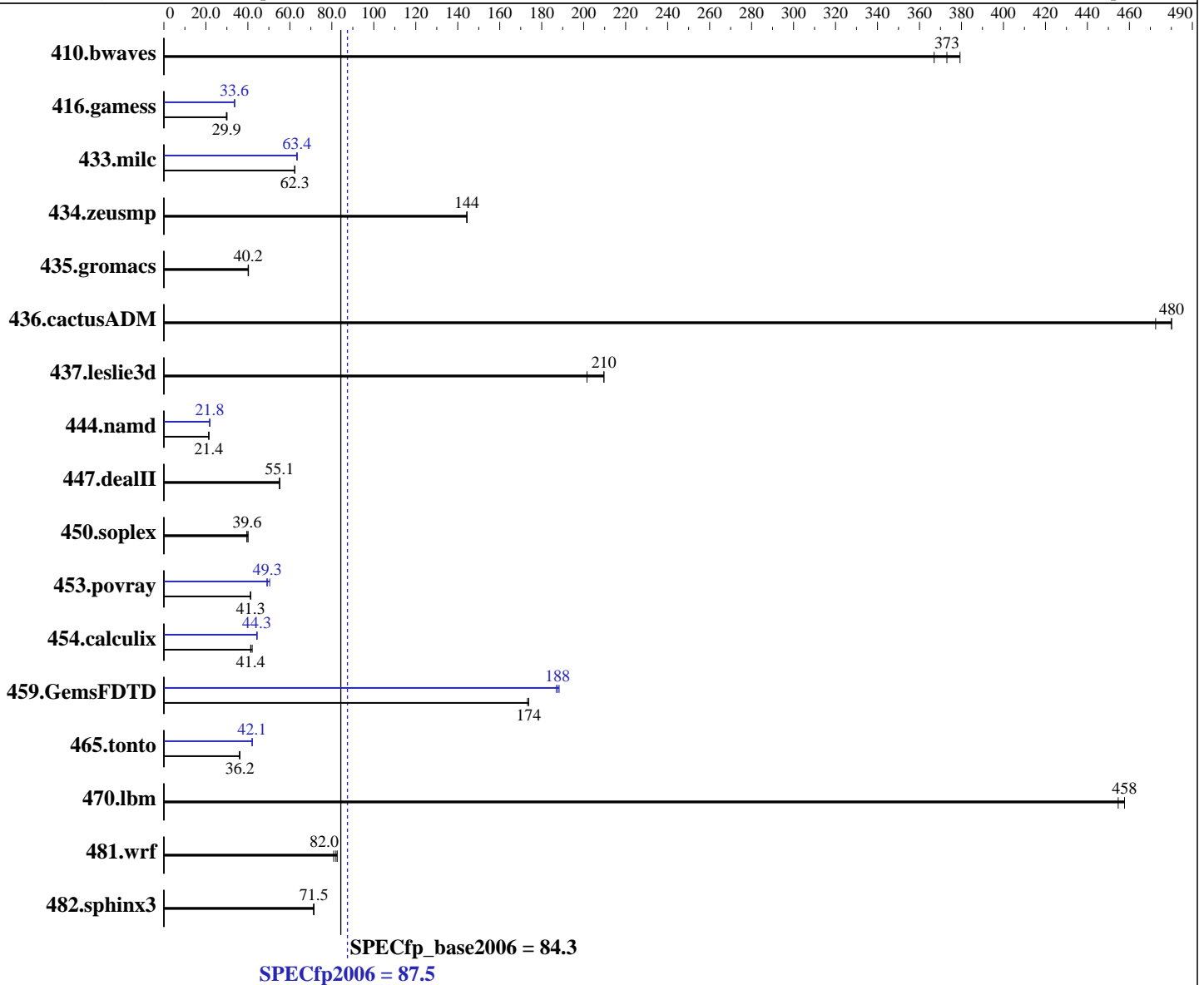
Test date: Nov-2013

Test sponsor: NEC Corporation

Hardware Availability: Sep-2013

Tested by: NEC Corporation

Software Availability: Sep-2013



### Hardware

CPU Name: Intel Xeon E5-2630 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.10 GHz  
 CPU MHz: 2600  
 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: Red Hat Enterprise Linux Server release 6.4 (Santiago)  
 Kernel 2.6.32-358.18.1.el6.x86\_64  
 Compiler: C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux;  
 Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: ext4

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L3 Cache: 15 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 256 GB (16 x 16 GB 2Rx4 PC3L-12800R-11, ECC)  
 Disk Subsystem: 1 x 300 GB SAS, 10000 RPM, RAID 0  
 Other Hardware: None

System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 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    | 35.8        | 379         | <b>36.4</b> | <b>373</b>  | 37.0        | 367         | 35.8        | 379         | <b>36.4</b> | <b>373</b>  | 37.0        | 367         |
| 416.gamess    | 650         | 30.1        | <b>656</b>  | <b>29.9</b> | 657         | 29.8        | 580         | 33.8        | <b>583</b>  | <b>33.6</b> | 583         | 33.6        |
| 433.milc      | 147         | 62.4        | 147         | 62.3        | <b>147</b>  | <b>62.3</b> | 144         | 63.6        | 145         | 63.3        | <b>145</b>  | <b>63.4</b> |
| 434.zeusmp    | 63.0        | 144         | 63.0        | 144         | <b>63.0</b> | <b>144</b>  | 63.0        | 144         | 63.0        | 144         | <b>63.0</b> | <b>144</b>  |
| 435.gromacs   | <b>178</b>  | <b>40.2</b> | 177         | 40.3        | 178         | 40.1        | <b>178</b>  | <b>40.2</b> | 177         | 40.3        | 178         | 40.1        |
| 436.cactusADM | 25.3        | 473         | 24.9        | 480         | <b>24.9</b> | <b>480</b>  | 25.3        | 473         | 24.9        | 480         | <b>24.9</b> | <b>480</b>  |
| 437.leslie3d  | 44.8        | 210         | 46.6        | 202         | <b>44.8</b> | <b>210</b>  | 44.8        | 210         | 46.6        | 202         | <b>44.8</b> | <b>210</b>  |
| 444.namd      | 375         | 21.4        | 375         | 21.4        | <b>375</b>  | <b>21.4</b> | <b>367</b>  | <b>21.8</b> | 368         | 21.8        | 367         | 21.8        |
| 447.dealII    | 208         | 55.1        | <b>208</b>  | <b>55.1</b> | 208         | 55.1        | 208         | 55.1        | <b>208</b>  | <b>55.1</b> | 208         | 55.1        |
| 450.soplex    | 208         | 40.1        | 211         | 39.6        | <b>211</b>  | <b>39.6</b> | 208         | 40.1        | 211         | 39.6        | <b>211</b>  | <b>39.6</b> |
| 453.povray    | 129         | 41.2        | <b>129</b>  | <b>41.3</b> | 128         | 41.4        | 106         | 50.4        | 108         | 49.1        | <b>108</b>  | <b>49.3</b> |
| 454.calculix  | 196         | 42.1        | <b>199</b>  | <b>41.4</b> | 199         | 41.4        | 186         | 44.4        | <b>186</b>  | <b>44.3</b> | 186         | 44.3        |
| 459.GemsFDTD  | 61.0        | 174         | <b>61.0</b> | <b>174</b>  | 61.2        | 173         | 56.3        | 188         | <b>56.5</b> | <b>188</b>  | 56.7        | 187         |
| 465.tonto     | 273         | 36.0        | 272         | 36.2        | <b>272</b>  | <b>36.2</b> | 234         | 42.1        | 234         | 42.1        | <b>234</b>  | <b>42.1</b> |
| 470.lbm       | <b>30.0</b> | <b>458</b>  | 30.0        | 458         | 30.2        | 455         | <b>30.0</b> | <b>458</b>  | 30.0        | 458         | 30.2        | 455         |
| 481.wrf       | 135         | 82.6        | 138         | 80.9        | <b>136</b>  | <b>82.0</b> | 135         | 82.6        | 138         | 80.9        | <b>136</b>  | <b>82.0</b> |
| 482.sphinx3   | <b>273</b>  | <b>71.5</b> | 273         | 71.3        | 272         | 71.5        | <b>273</b>  | <b>71.5</b> | 273         | 71.3        | 272         | 71.5        |

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

## Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

## Platform Notes

BIOS Settings:  
 Energy Performance: Performance  
 Memory Voltage: 1.5 V

## General Notes

Environment variables set by runspec before the start of the run:  
 KMP\_AFFINITY = "granularity=fine,compact,1,0"  
 LD\_LIBRARY\_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"

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## General Notes (Continued)

OMP\_NUM\_THREADS = "12"

Added glibc-static-2.12-1.107.el6.x86\_64.rpm  
to enable static linking

Transparent Huge Pages enabled with:  
echo always > /sys/kernel/mm/redhat\_transparent\_hugepage/enabled  
The Express5800/R120e-1M and  
the Express5800/R120e-2M models are electronically equivalent.  
The results have been measured on the Express5800/R120e-2M 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



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## Base Optimization Flags

C benchmarks:

-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch  
-ansi-alias

C++ benchmarks:

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

Fortran benchmarks:

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

Benchmarks using both Fortran and C:

-xAVX -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: -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  
-ansi-alias

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

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## Peak Optimization Flags (Continued)

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.dealIII: basepeak = yes

450.soplex: basepeak = yes

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: basepeak = yes

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) -unroll2  
-inline-level=0 -opt-prefetch -parallel

465.tonto: -xAVX(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

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

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

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-ic14.0-official-linux64.20140128.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-ic14.0-official-linux64.20140128.xml>

<http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-R120d-RevA.xml>



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