



# SPEC<sup>®</sup> CFP2006 Result

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## NEC Corporation

SPECfp<sup>®</sup>2006 = **99.4**

Express5800/R120e-1M (Intel Xeon E5-2670 v2)

SPECfp\_base2006 = **95.0**

CPU2006 license: 9006

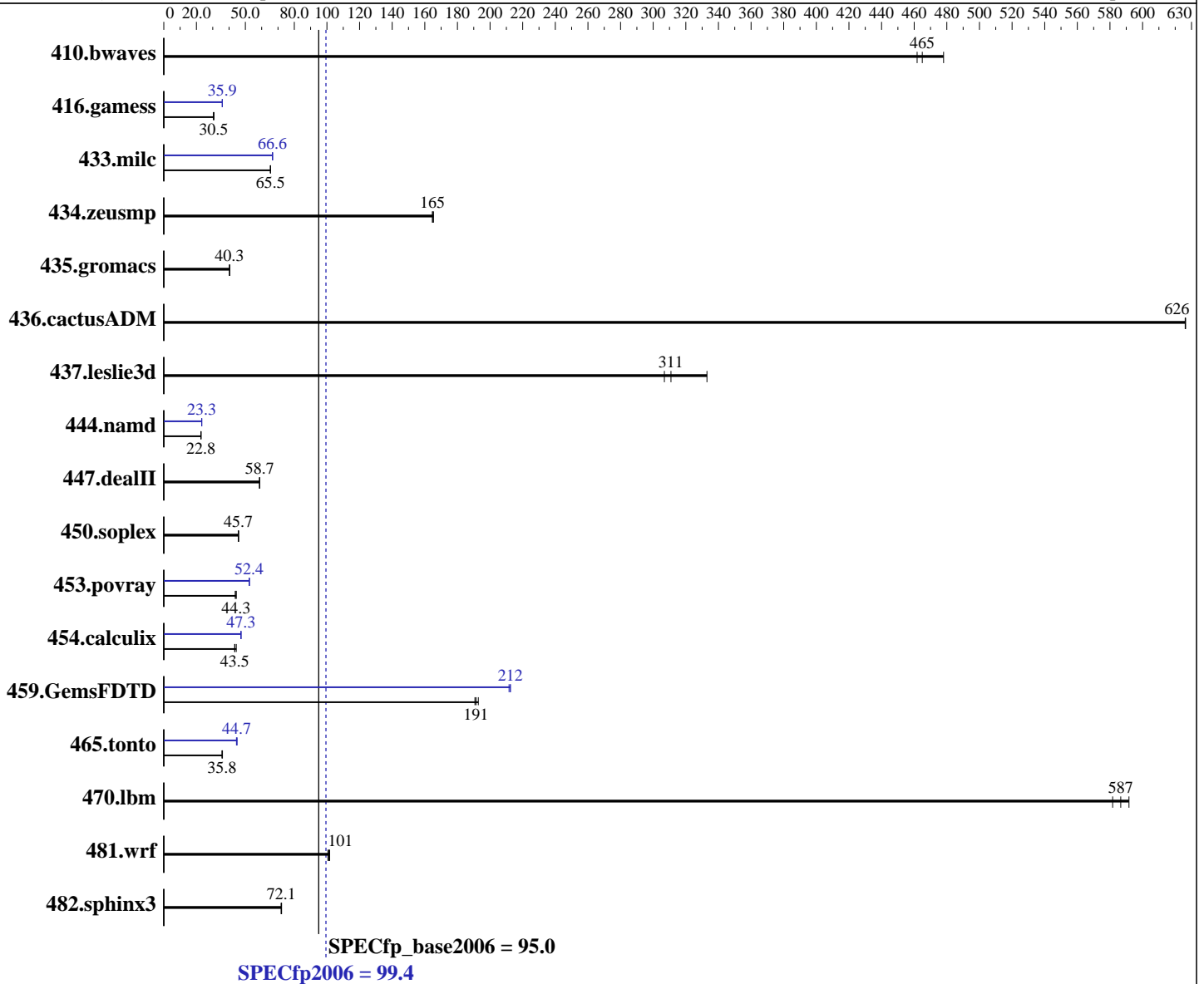
Test date: Oct-2013

Test sponsor: NEC Corporation

Hardware Availability: Sep-2013

Tested by: NEC Corporation

Software Availability: Sep-2013



**Hardware**

CPU Name: Intel Xeon E5-2670 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.30 GHz  
 CPU MHz: 2500  
 FPU: Integrated  
 CPU(s) enabled: 20 cores, 2 chips, 10 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: 25 MB I+D on chip per chip  
Other Cache: None  
Memory: 128 GB (8 x 16 GB 2Rx4 PC3-14900R-13, ECC)  
Disk Subsystem: 1 x 250 GB SATA, 7200 RPM  
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    | 28.4        | 478         | 29.4        | 462         | <u>29.2</u> | <u>465</u> | 28.4        | 478         | 29.4        | 462         | <u>29.2</u> | <u>465</u>  |
| 416.gamess    | 643         | 30.4        | <b>642</b>  | <b>30.5</b> | 636         | 30.8       | <u>546</u>  | <u>35.9</u> | 546         | 35.8        | 546         | 35.9        |
| 433.milc      | 141         | 65.3        | <b>140</b>  | <b>65.5</b> | 140         | 65.5       | 138         | 66.6        | 138         | 66.7        | <b>138</b>  | <b>66.6</b> |
| 434.zeusmp    | 55.2        | 165         | <u>55.2</u> | <u>165</u>  | 55.0        | 165        | 55.2        | 165         | <u>55.2</u> | <u>165</u>  | 55.0        | 165         |
| 435.gromacs   | <u>177</u>  | <u>40.3</u> | 177         | 40.4        | 177         | 40.3       | <u>177</u>  | <u>40.3</u> | 177         | 40.4        | 177         | 40.3        |
| 436.cactusADM | 19.1        | 626         | 19.1        | 626         | <u>19.1</u> | <u>626</u> | 19.1        | 626         | 19.1        | 626         | <u>19.1</u> | <u>626</u>  |
| 437.leslie3d  | 30.6        | 307         | <u>30.2</u> | <u>311</u>  | 28.2        | 333        | 30.6        | 307         | <u>30.2</u> | <u>311</u>  | 28.2        | 333         |
| 444.namd      | 352         | 22.8        | <u>352</u>  | <u>22.8</u> | 352         | 22.8       | 345         | 23.2        | 345         | 23.3        | <u>345</u>  | <u>23.3</u> |
| 447.dealII    | 195         | 58.7        | <u>195</u>  | <u>58.7</u> | 195         | 58.7       | 195         | 58.7        | <u>195</u>  | <u>58.7</u> | 195         | 58.7        |
| 450.soplex    | 182         | 45.9        | <u>182</u>  | <u>45.7</u> | 183         | 45.7       | 182         | 45.9        | <u>182</u>  | <u>45.7</u> | 183         | 45.7        |
| 453.povray    | <u>120</u>  | <u>44.3</u> | 120         | 44.4        | 122         | 43.8       | 101         | 52.5        | <u>102</u>  | <u>52.4</u> | 102         | 52.3        |
| 454.calculix  | <u>189</u>  | <u>43.5</u> | 186         | 44.4        | 190         | 43.4       | 174         | 47.3        | 174         | 47.3        | <u>174</u>  | <u>47.3</u> |
| 459.GemsFDTD  | 55.6        | 191         | 55.0        | 193         | <u>55.4</u> | <u>191</u> | 50.1        | 212         | 49.9        | 212         | <u>49.9</u> | <u>212</u>  |
| 465.tonto     | 274         | 36.0        | <u>275</u>  | <u>35.8</u> | 276         | 35.7       | 221         | 44.5        | <u>220</u>  | <u>44.7</u> | 219         | 44.9        |
| 470.lbm       | <u>23.4</u> | <u>587</u>  | 23.6        | 582         | 23.2        | 592        | <u>23.4</u> | <u>587</u>  | 23.6        | 582         | 23.2        | 592         |
| 481.wrf       | <u>110</u>  | <u>101</u>  | 110         | 102         | 111         | 101        | <u>110</u>  | <u>101</u>  | 110         | 102         | 111         | 101         |
| 482.sphinx3   | <u>270</u>  | <u>72.1</u> | 270         | 72.2        | 271         | 71.9       | <u>270</u>  | <u>72.1</u> | 270         | 72.2        | 271         | 71.9        |

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

## 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"  
OMP\_NUM\_THREADS = "20"

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CPU2006 license: 9006

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## General Notes (Continued)

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-1M 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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