



# SPEC<sup>®</sup> CFP2006 Result

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## NEC Corporation

SPECfp<sup>®</sup>2006 = **97.1**

Express5800/B120e-h (Intel Xeon E5-2650 v2)

SPECfp\_base2006 = **93.1**

CPU2006 license: 9006

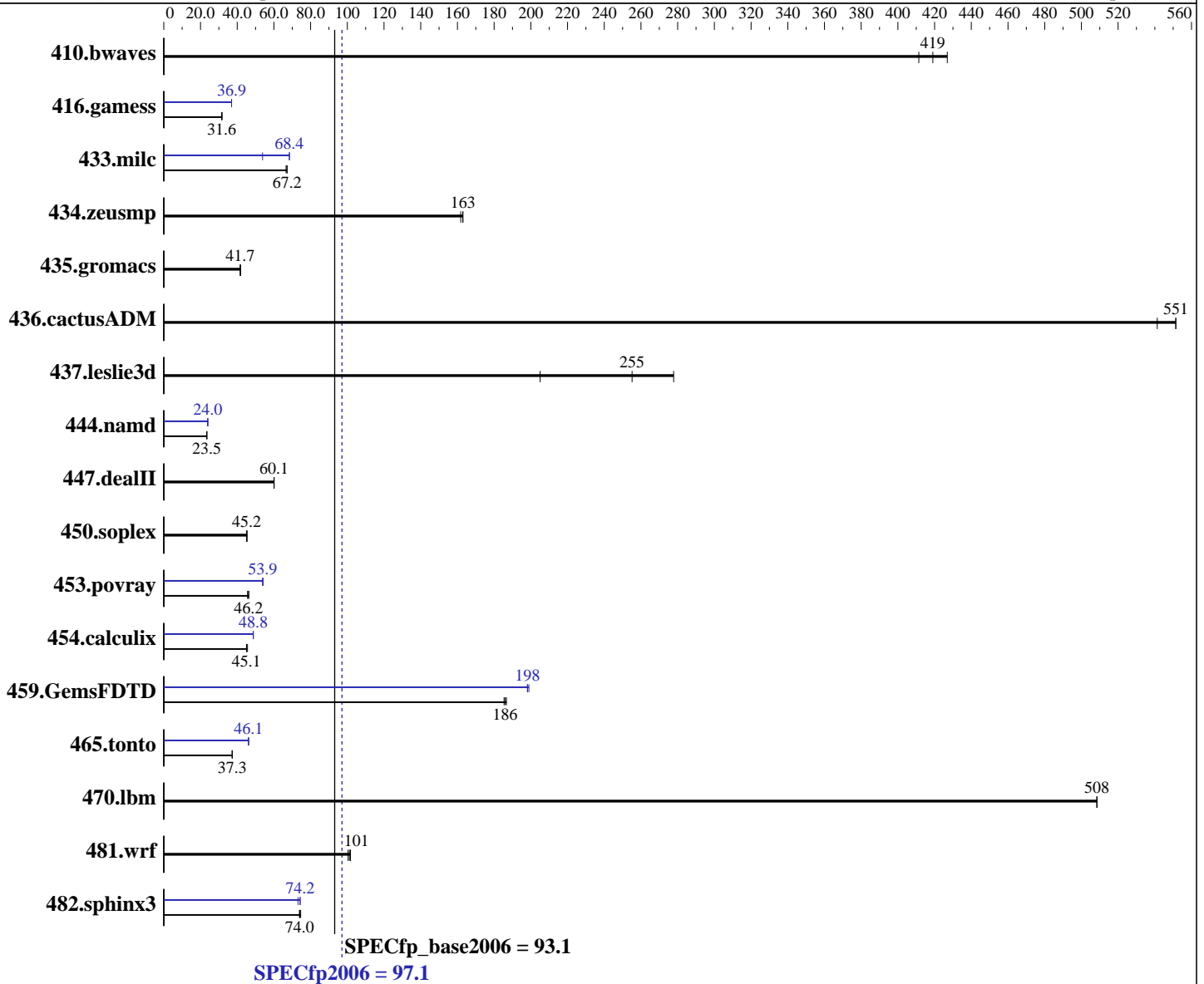
Test date: Dec-2013

Test sponsor: NEC Corporation

Hardware Availability: Sep-2013

Tested by: NEC Corporation

Software Availability: Sep-2013



### Hardware

CPU Name: Intel Xeon E5-2650 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz  
 CPU MHz: 2600  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 2 chips, 8 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: 20 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 400 GB SATA, SSD  
 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	<b><u>32.4</u></b>	<b><u>419</u></b>	33.0	411	31.8	427	<b><u>32.4</u></b>	<b><u>419</u></b>	33.0	411	31.8	427
416.gamess	<b><u>620</u></b>	<b><u>31.6</u></b>	617	31.8	621	31.5	<b><u>530</u></b>	<b><u>36.9</u></b>	530	36.9	530	36.9
433.milc	138	66.6	<b><u>137</u></b>	<b><u>67.2</u></b>	137	67.2	<b><u>134</u></b>	<b><u>68.4</u></b>	171	53.8	134	68.5
434.zeusmp	56.2	162	55.8	163	<b><u>55.8</u></b>	<b><u>163</u></b>	56.2	162	55.8	163	<b><u>55.8</u></b>	<b><u>163</u></b>
435.gromacs	172	41.6	171	41.8	<b><u>171</u></b>	<b><u>41.7</u></b>	172	41.6	171	41.8	<b><u>171</u></b>	<b><u>41.7</u></b>
436.cactusADM	22.1	541	21.7	551	<b><u>21.7</u></b>	<b><u>551</u></b>	22.1	541	21.7	551	<b><u>21.7</u></b>	<b><u>551</u></b>
437.leslie3d	45.8	205	33.8	278	<b><u>36.8</u></b>	<b><u>255</u></b>	45.8	205	33.8	278	<b><u>36.8</u></b>	<b><u>255</u></b>
444.namd	343	23.4	342	23.5	<b><u>342</u></b>	<b><u>23.5</u></b>	335	24.0	<b><u>335</u></b>	<b><u>24.0</u></b>	335	23.9
447.dealII	<b><u>190</u></b>	<b><u>60.1</u></b>	191	60.0	190	60.1	<b><u>190</u></b>	<b><u>60.1</u></b>	191	60.0	190	60.1
450.soplex	184	45.4	185	45.1	<b><u>185</u></b>	<b><u>45.2</u></b>	184	45.4	185	45.1	<b><u>185</u></b>	<b><u>45.2</u></b>
453.povray	<b><u>115</u></b>	<b><u>46.2</u></b>	117	45.6	115	46.3	<b><u>98.6</u></b>	<b><u>53.9</u></b>	98.4	54.1	98.8	53.8
454.calculix	181	45.6	183	45.1	<b><u>183</u></b>	<b><u>45.1</u></b>	169	48.8	<b><u>169</u></b>	<b><u>48.8</u></b>	169	48.7
459.GemsFDTD	<b><u>57.0</u></b>	<b><u>186</u></b>	56.8	187	57.2	185	53.3	199	53.5	198	<b><u>53.5</u></b>	<b><u>198</u></b>
465.tonto	263	37.4	265	37.2	<b><u>264</u></b>	<b><u>37.3</u></b>	213	46.2	<b><u>213</u></b>	<b><u>46.1</u></b>	213	46.1
470.lbm	27.0	508	27.0	508	<b><u>27.0</u></b>	<b><u>508</u></b>	27.0	508	27.0	508	<b><u>27.0</u></b>	<b><u>508</u></b>
481.wrf	110	102	111	100	<b><u>110</u></b>	<b><u>101</u></b>	110	102	111	100	<b><u>110</u></b>	<b><u>101</u></b>
482.sphinx3	<b><u>263</u></b>	<b><u>74.0</u></b>	264	73.9	261	74.6	262	74.3	<b><u>263</u></b>	<b><u>74.2</u></b>	267	73.1

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 = "16"

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

## 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:

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

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## Base Optimization Flags (Continued)

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: -xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias  
-parallel

C++ benchmarks:

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## Peak Optimization Flags (Continued)

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-R120-RevB.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-R120-RevB.xml>



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