



# SPEC<sup>®</sup> CFP2006 Result

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## NEC Corporation

**SPECfp<sup>®</sup>2006 = 106**

Express5800/R120f-2E (Intel Xeon E5-2650 v3)

**SPECfp\_base2006 = 102**

CPU2006 license: 9006

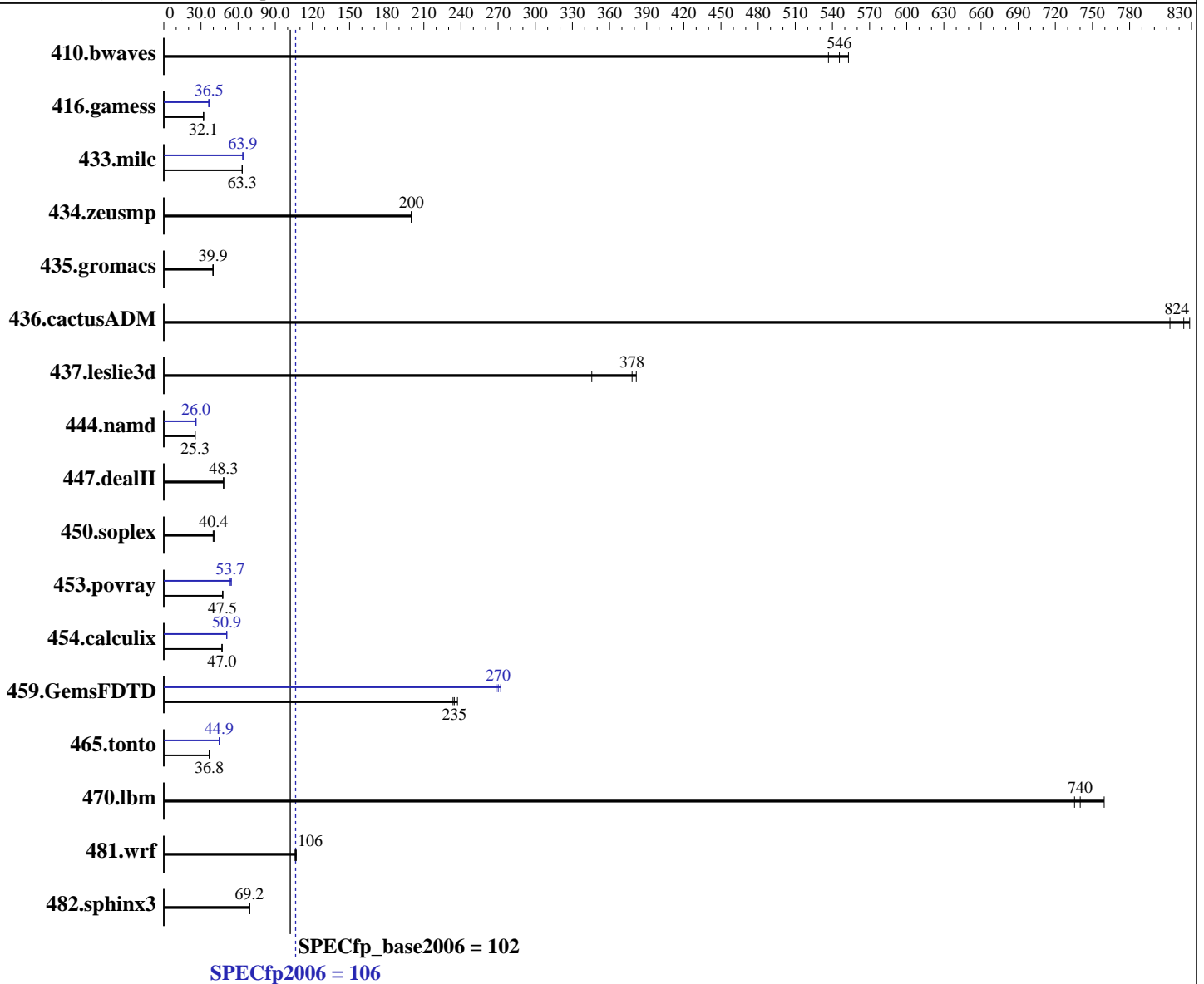
Test date: Jan-2015

Test sponsor: NEC Corporation

Hardware Availability: Jan-2015

Tested by: NEC Corporation

Software Availability: Jul-2014



### Hardware

CPU Name: Intel Xeon E5-2650 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz  
 CPU MHz: 2300  
 FPU: Integrated  
 CPU(s) enabled: 20 cores, 2 chips, 10 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: Red Hat Enterprise Linux Server release 6.5 (Santiago)  
 Kernel 2.6.32-431.20.3.el6.x86\_64  
 Compiler: C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux;  
 Fortran: Version 15.0.0.090 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: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)  
 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	25.3	537	<b><u>24.9</u></b>	<b><u>546</u></b>	24.6	553	25.3	537	<b><u>24.9</u></b>	<b><u>546</u></b>	24.6	553
416.gamess	<b><u>610</u></b>	<b><u>32.1</u></b>	609	32.1	610	32.1	<b><u>537</u></b>	<b><u>36.5</u></b>	539	36.3	537	36.5
433.milc	<b><u>145</u></b>	<b><u>63.3</u></b>	145	63.3	145	63.4	<b><u>144</u></b>	<b><u>63.9</u></b>	144	63.9	144	63.9
434.zeusmp	45.5	200	<b><u>45.5</u></b>	<b><u>200</u></b>	45.4	200	45.5	200	<b><u>45.5</u></b>	<b><u>200</u></b>	45.4	200
435.gromacs	181	39.5	179	39.9	<b><u>179</u></b>	<b><u>39.9</u></b>	181	39.5	179	39.9	<b><u>179</u></b>	<b><u>39.9</u></b>
436.cactusADM	14.7	813	14.4	829	<b><u>14.5</u></b>	<b><u>824</u></b>	14.7	813	14.4	829	<b><u>14.5</u></b>	<b><u>824</u></b>
437.leslie3d	27.2	346	24.6	382	<b><u>24.9</u></b>	<b><u>378</u></b>	27.2	346	24.6	382	<b><u>24.9</u></b>	<b><u>378</u></b>
444.namd	<b><u>317</u></b>	<b><u>25.3</u></b>	317	25.3	317	25.3	309	26.0	<b><u>309</u></b>	<b><u>26.0</u></b>	309	26.0
447.dealII	<b><u>237</u></b>	<b><u>48.3</u></b>	237	48.3	237	48.3	<b><u>237</u></b>	<b><u>48.3</u></b>	237	48.3	237	48.3
450.soplex	<b><u>206</u></b>	<b><u>40.4</u></b>	206	40.5	209	39.8	<b><u>206</u></b>	<b><u>40.4</u></b>	206	40.5	209	39.8
453.povray	112	47.7	<b><u>112</u></b>	<b><u>47.5</u></b>	112	47.5	97.5	54.6	99.0	53.7	<b><u>99.0</u></b>	<b><u>53.7</u></b>
454.calculix	175	47.1	<b><u>175</u></b>	<b><u>47.0</u></b>	176	46.9	162	50.8	<b><u>162</u></b>	<b><u>50.9</u></b>	162	50.9
459.GemsFDTD	44.7	237	45.4	234	<b><u>45.2</u></b>	<b><u>235</u></b>	<b><u>39.3</u></b>	<b><u>270</u></b>	39.5	268	39.0	272
465.tonto	<b><u>268</u></b>	<b><u>36.8</u></b>	267	36.8	269	36.6	220	44.8	<b><u>219</u></b>	<b><u>44.9</u></b>	219	44.9
470.lbm	18.7	736	<b><u>18.6</u></b>	<b><u>740</u></b>	18.1	759	18.7	736	<b><u>18.6</u></b>	<b><u>740</u></b>	18.1	759
481.wrf	104	107	105	106	<b><u>105</u></b>	<b><u>106</u></b>	104	107	105	106	<b><u>105</u></b>	<b><u>106</u></b>
482.sphinx3	281	69.4	282	69.1	<b><u>282</u></b>	<b><u>69.2</u></b>	281	69.4	282	69.1	<b><u>282</u></b>	<b><u>69.2</u></b>

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:  
 Power Management Policy: Custom  
 Energy Performance: Performance  
 Patrol Scrub: Disabled  
 Early Snoop: Disabled  
 Hyper-Threading: Disabled



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## General Notes

Environment variables set by runspec before the start of the run:

KMP\_AFFINITY = "granularity=fine,compact"

LD\_LIBRARY\_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"

OMP\_NUM\_THREADS = "20"

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.lelie3d: -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:

-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch  
-ansi-alias

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## Base Optimization Flags (Continued)

C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:

-xCORE-AVX2 -ipo -O3 -no-prec-div -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: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)  
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)  
-auto-ilp32 -ansi-alias

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

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## Peak Optimization Flags (Continued)

444.namd: -xCORE-AVX2(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: -xCORE-AVX2(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: -xCORE-AVX2(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-

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xCORE-AVX2(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: -xCORE-AVX2(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: -xCORE-AVX2 -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-ic15.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-120f-RevB.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-120f-RevB.xml>



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