



# SPEC<sup>®</sup> CFP2006 Result

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## NEC Corporation

**SPECfp<sup>®</sup>2006 = 115**

Express5800/R120f-2M (Intel Xeon E5-2697 v3)

**SPECfp\_base2006 = 110**

CPU2006 license: 9006

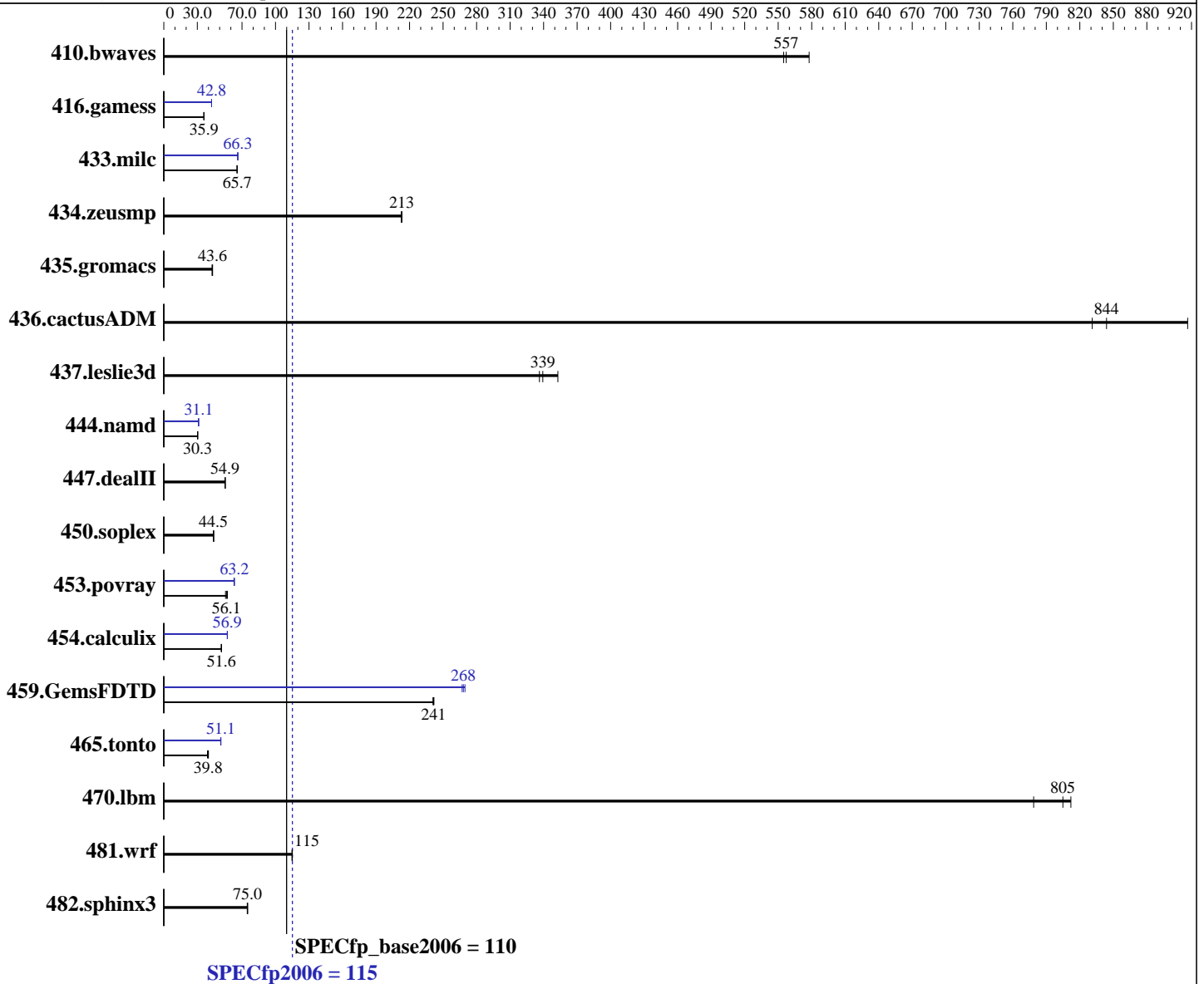
Test date: Nov-2014

Test sponsor: NEC Corporation

Hardware Availability: Feb-2015

Tested by: NEC Corporation

Software Availability: Jul-2014



### Hardware

CPU Name: Intel Xeon E5-2697 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz  
 CPU MHz: 2600  
 FPU: Integrated  
 CPU(s) enabled: 28 cores, 2 chips, 14 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 2.6.32-431.17.1.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: 35 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	23.5	578	<b><u>24.4</u></b>	<b><u>557</u></b>	24.5	555	23.5	578	<b><u>24.4</u></b>	<b><u>557</u></b>	24.5	555
416.gamess	544	36.0	<b><u>546</u></b>	<b><u>35.9</u></b>	546	35.9	457	42.8	458	42.8	<b><u>457</u></b>	<b><u>42.8</u></b>
433.milc	140	65.5	140	65.7	<b><u>140</u></b>	<b><u>65.7</u></b>	<b><u>139</u></b>	<b><u>66.3</u></b>	139	66.3	139	66.2
434.zeusmp	42.8	213	<b><u>42.7</u></b>	<b><u>213</u></b>	42.7	213	42.8	213	<b><u>42.7</u></b>	<b><u>213</u></b>	42.7	213
435.gromacs	<b><u>164</u></b>	<b><u>43.6</u></b>	164	43.6	165	43.2	<b><u>164</u></b>	<b><u>43.6</u></b>	164	43.6	165	43.2
436.cactusADM	13.0	917	14.4	831	<b><u>14.2</u></b>	<b><u>844</u></b>	13.0	917	14.4	831	<b><u>14.2</u></b>	<b><u>844</u></b>
437.leslie3d	28.0	336	<b><u>27.7</u></b>	<b><u>339</u></b>	26.6	353	28.0	336	<b><u>27.7</u></b>	<b><u>339</u></b>	26.6	353
444.namd	<b><u>265</u></b>	<b><u>30.3</u></b>	265	30.3	265	30.3	258	31.1	<b><u>258</u></b>	<b><u>31.1</u></b>	257	31.1
447.dealII	208	55.0	208	54.9	<b><u>208</u></b>	<b><u>54.9</u></b>	208	55.0	208	54.9	<b><u>208</u></b>	<b><u>54.9</u></b>
450.soplex	187	44.7	<b><u>187</u></b>	<b><u>44.5</u></b>	187	44.5	187	44.7	<b><u>187</u></b>	<b><u>44.5</u></b>	187	44.5
453.povray	96.3	55.2	93.4	56.9	<b><u>94.8</u></b>	<b><u>56.1</u></b>	84.2	63.2	<b><u>84.2</u></b>	<b><u>63.2</u></b>	84.6	62.9
454.calculix	160	51.7	161	51.4	<b><u>160</u></b>	<b><u>51.6</u></b>	<b><u>145</u></b>	<b><u>56.9</u></b>	145	56.8	145	56.9
459.GemsFDTD	43.9	242	<b><u>43.9</u></b>	<b><u>241</u></b>	44.0	241	39.7	267	<b><u>39.6</u></b>	<b><u>268</u></b>	39.4	270
465.tonto	246	40.0	252	39.1	<b><u>247</u></b>	<b><u>39.8</u></b>	193	50.9	<b><u>193</u></b>	<b><u>51.1</u></b>	193	51.1
470.lbm	17.6	779	<b><u>17.1</u></b>	<b><u>805</u></b>	16.9	812	17.6	779	<b><u>17.1</u></b>	<b><u>805</u></b>	16.9	812
481.wrf	<b><u>97.1</u></b>	<b><u>115</u></b>	97.0	115	97.4	115	<b><u>97.1</u></b>	<b><u>115</u></b>	97.0	115	97.4	115
482.sphinx3	260	75.0	<b><u>260</u></b>	<b><u>75.0</u></b>	261	74.7	260	75.0	<b><u>260</u></b>	<b><u>75.0</u></b>	261	74.7

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 = "28"

The Express5800/R120f-1M (Intel Xeon E5-2697 v3) and the Express5800/R120f-2M (Intel Xeon E5-2697 v3) models are electronically equivalent. The results have been measured on the Express5800/R120f-2M (Intel Xeon E5-2697 v3) model.

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.deallI: -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:

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

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

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## Peak Optimization Flags (Continued)

C++ benchmarks:

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.dealIII: 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-ic14.0-official-linux64.20140128.html>

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



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

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