



# SPEC<sup>®</sup> CFP2006 Result

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## NEC Corporation

SPECfp<sup>®</sup>2006 = **125**

Express5800/T120g (Intel Xeon E5-2697 v4)

SPECfp\_base2006 = **118**

CPU2006 license: 9006

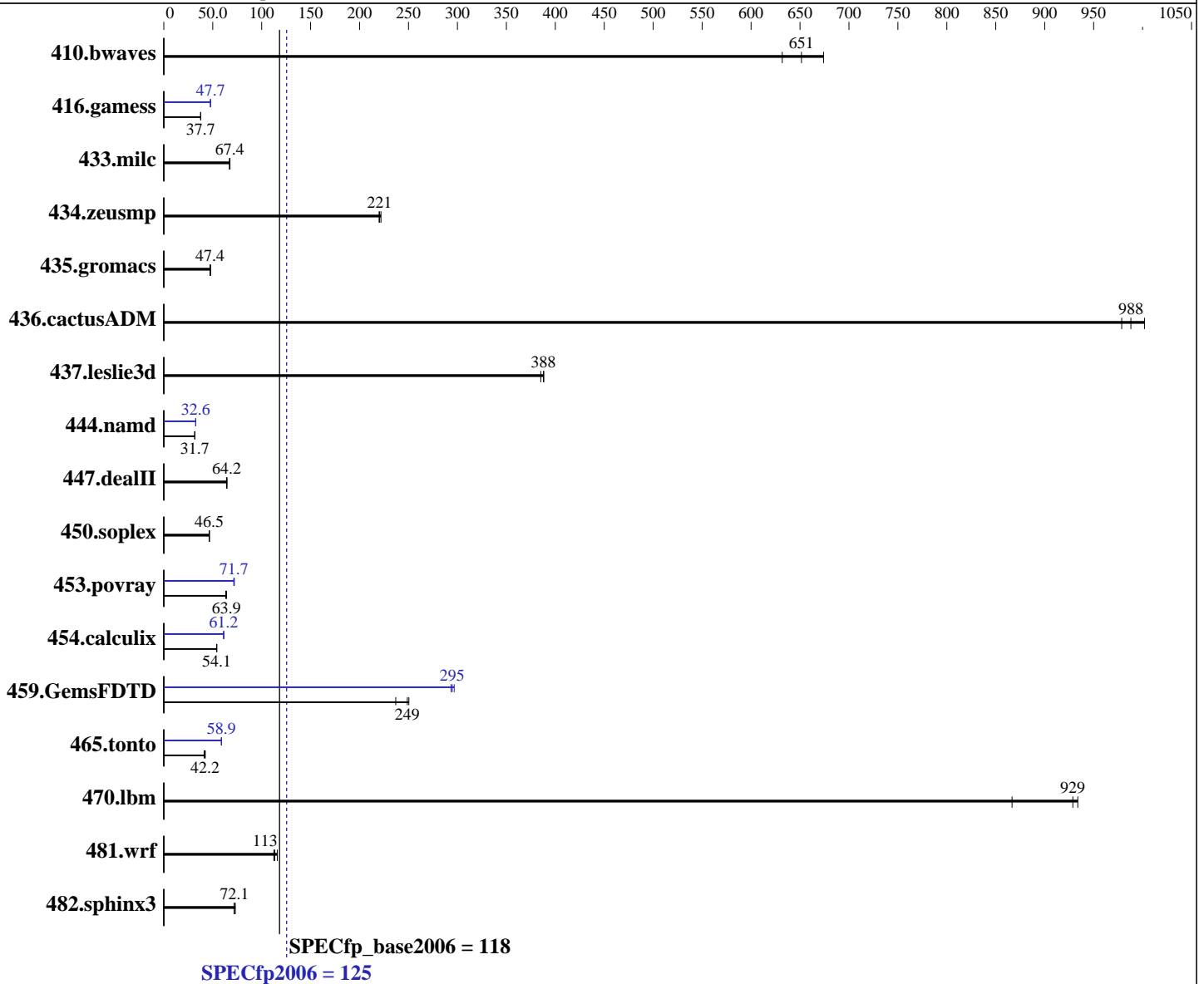
Test date: Mar-2016

Test sponsor: NEC Corporation

Hardware Availability: Apr-2016

Tested by: NEC Corporation

Software Availability: Jan-2016



### Hardware

CPU Name: Intel Xeon E5-2697 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz  
 CPU MHz: 2300  
 FPU: Integrated  
 CPU(s) enabled: 36 cores, 2 chips, 18 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 7.2 (Maipo)  
 Kernel 3.10.0-327.4.5.el7.x86\_64  
 Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;  
 Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: ext4

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L3 Cache: 45 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)  
 Disk Subsystem: 1 x 1 TB 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	20.2	674	21.5	632	<b><u>20.9</u></b>	<b><u>651</u></b>	20.2	674	21.5	632	<b><u>20.9</u></b>	<b><u>651</u></b>
416.gamess	<b><u>520</u></b>	<b><u>37.7</u></b>	519	37.7	520	37.7	<b><u>410</u></b>	<b><u>47.7</u></b>	411	47.7	410	47.8
433.milc	136	67.6	137	67.0	<b><u>136</u></b>	<b><u>67.4</u></b>	136	67.6	137	67.0	<b><u>136</u></b>	<b><u>67.4</u></b>
434.zeusmp	41.4	220	<b><u>41.3</u></b>	<b><u>221</u></b>	41.0	222	41.4	220	<b><u>41.3</u></b>	<b><u>221</u></b>	41.0	222
435.gromacs	151	47.3	<b><u>151</u></b>	<b><u>47.4</u></b>	149	47.8	151	47.3	<b><u>151</u></b>	<b><u>47.4</u></b>	149	47.8
436.cactusADM	12.2	979	11.9	1000	<b><u>12.1</u></b>	<b><u>988</u></b>	12.2	979	11.9	1000	<b><u>12.1</u></b>	<b><u>988</u></b>
437.leslie3d	24.2	388	24.4	385	<b><u>24.2</u></b>	<b><u>388</u></b>	24.2	388	24.4	385	<b><u>24.2</u></b>	<b><u>388</u></b>
444.namd	253	31.7	<b><u>253</u></b>	<b><u>31.7</u></b>	253	31.7	<b><u>246</u></b>	<b><u>32.6</u></b>	246	32.6	246	32.6
447.dealII	177	64.7	<b><u>178</u></b>	<b><u>64.2</u></b>	179	64.1	177	64.7	<b><u>178</u></b>	<b><u>64.2</u></b>	179	64.1
450.soplex	<b><u>179</u></b>	<b><u>46.5</u></b>	179	46.6	180	46.4	<b><u>179</u></b>	<b><u>46.5</u></b>	179	46.6	180	46.4
453.povray	83.2	64.0	84.1	63.3	<b><u>83.3</u></b>	<b><u>63.9</u></b>	73.8	72.1	74.4	71.5	<b><u>74.2</u></b>	<b><u>71.7</u></b>
454.calculix	152	54.2	<b><u>153</u></b>	<b><u>54.1</u></b>	153	54.0	135	61.2	<b><u>135</u></b>	<b><u>61.2</u></b>	135	61.2
459.GemsFDTD	<b><u>42.6</u></b>	<b><u>249</u></b>	42.4	250	44.8	237	36.1	294	<b><u>36.0</u></b>	<b><u>295</u></b>	35.8	297
465.tonto	239	41.2	233	42.3	<b><u>233</u></b>	<b><u>42.2</u></b>	167	58.8	<b><u>167</u></b>	<b><u>58.9</u></b>	167	58.9
470.lbm	15.9	867	14.7	934	<b><u>14.8</u></b>	<b><u>929</u></b>	15.9	867	14.7	934	<b><u>14.8</u></b>	<b><u>929</u></b>
481.wrf	99.4	112	<b><u>98.5</u></b>	<b><u>113</u></b>	96.3	116	99.4	112	<b><u>98.5</u></b>	<b><u>113</u></b>	96.3	116
482.sphinx3	267	73.1	271	71.8	<b><u>270</u></b>	<b><u>72.1</u></b>	267	73.1	271	71.8	<b><u>270</u></b>	<b><u>72.1</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  
 Snoop Mode: Home Snoop  
 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 = "36"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1

Transparent Huge Pages enabled with:

echo always > /sys/kernel/mm/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



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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: basepeak = yes

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:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -fno-alias  
-auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4  
-ansi-alias

### Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -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:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2  
-inline-level=0 -opt-prefetch -parallel

465.tonto: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -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



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The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.html>

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

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

<http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml>

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

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Tested with SPEC CPU2006 v1.2.  
Report generated on Thu Jun 30 13:12:53 2016 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 19 April 2016.