



# SPEC<sup>®</sup> CFP2006 Result

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## NEC Corporation

SPECfp<sup>®</sup>2006 = **126**

Express5800/T120g (Intel Xeon E5-2690 v4)

SPECfp\_base2006 = **119**

CPU2006 license: 9006

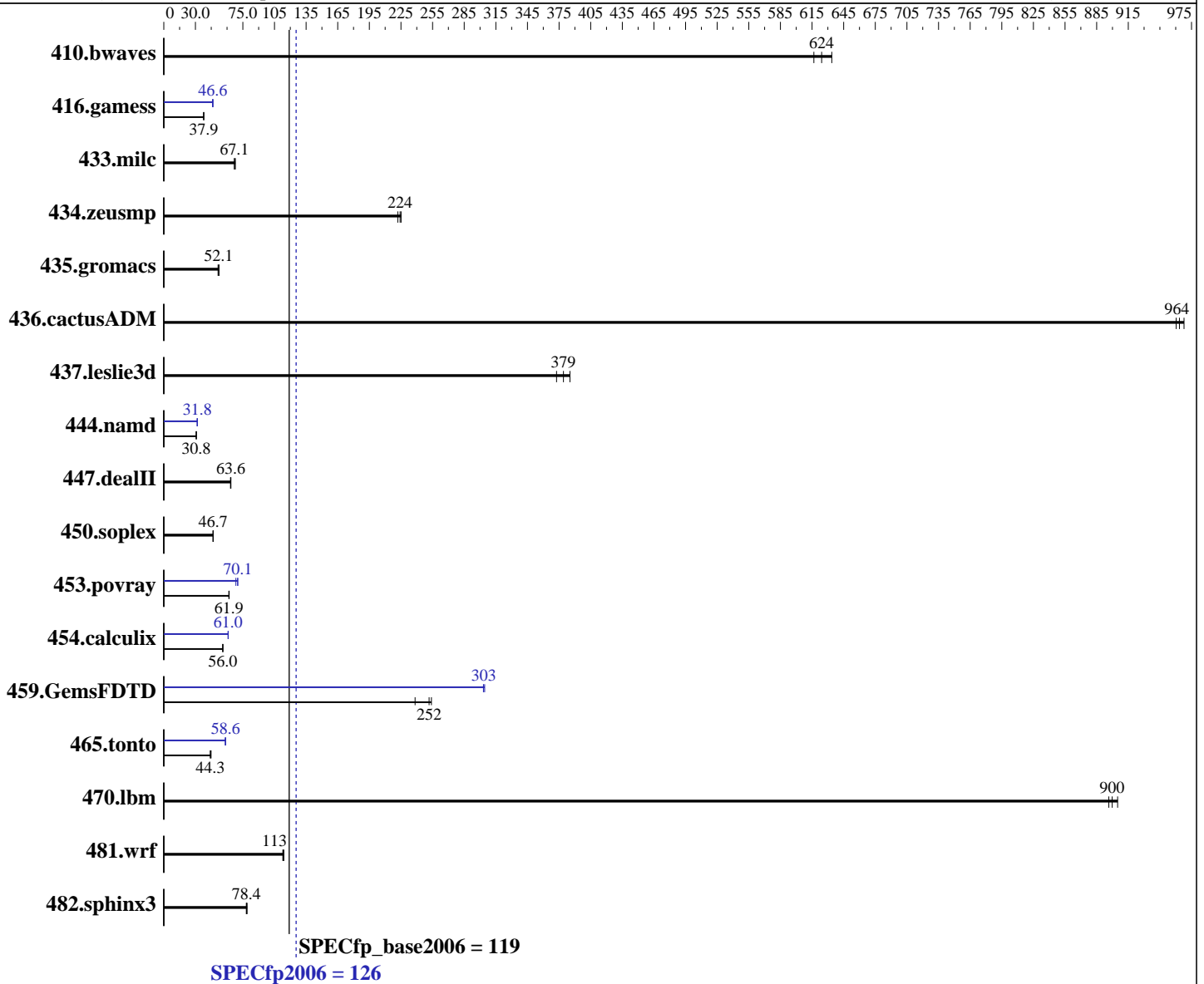
Test date: Mar-2016

Test sponsor: NEC Corporation

Hardware Availability: Apr-2016

Tested by: NEC Corporation

Software Availability: Jan-2016



**Hardware**

CPU Name: Intel Xeon E5-2690 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.50 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 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: 35 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	<b><u>21.8</u></b>	<b><u>624</u></b>	21.4	634	22.0	617	<b><u>21.8</u></b>	<b><u>624</u></b>	21.4	634	22.0	617
416.gamess	516	37.9	518	37.8	<b><u>517</u></b>	<b><u>37.9</u></b>	420	46.6	423	46.2	<b><u>420</u></b>	<b><u>46.6</u></b>
433.milc	<b><u>137</u></b>	<b><u>67.1</u></b>	137	67.0	135	67.9	<b><u>137</u></b>	<b><u>67.1</u></b>	137	67.0	135	67.9
434.zeusmp	<b><u>40.6</u></b>	<b><u>224</u></b>	40.4	225	41.0	222	<b><u>40.6</u></b>	<b><u>224</u></b>	40.4	225	41.0	222
435.gromacs	<b><u>137</u></b>	<b><u>52.1</u></b>	136	52.4	139	51.4	<b><u>137</u></b>	<b><u>52.1</u></b>	136	52.4	139	51.4
436.cactusADM	12.4	960	<b><u>12.4</u></b>	<b><u>964</u></b>	12.3	968	12.4	960	<b><u>12.4</u></b>	<b><u>964</u></b>	12.3	968
437.leslie3d	25.2	373	<b><u>24.8</u></b>	<b><u>379</u></b>	24.4	385	25.2	373	<b><u>24.8</u></b>	<b><u>379</u></b>	24.4	385
444.namd	260	30.8	260	30.8	<b><u>260</u></b>	<b><u>30.8</u></b>	253	31.7	253	31.8	<b><u>253</u></b>	<b><u>31.8</u></b>
447.dealII	181	63.3	180	63.6	<b><u>180</u></b>	<b><u>63.6</u></b>	181	63.3	180	63.6	<b><u>180</u></b>	<b><u>63.6</u></b>
450.soplex	179	46.7	178	46.9	<b><u>178</u></b>	<b><u>46.7</u></b>	179	46.7	178	46.9	<b><u>178</u></b>	<b><u>46.7</u></b>
453.povray	85.8	62.0	<b><u>86.0</u></b>	<b><u>61.9</u></b>	86.2	61.7	75.8	70.2	77.8	68.4	<b><u>75.9</u></b>	<b><u>70.1</u></b>
454.calculix	<b><u>147</u></b>	<b><u>56.0</u></b>	147	56.0	147	55.9	<b><u>135</u></b>	<b><u>61.0</u></b>	135	61.1	135	61.0
459.GemsFDTD	44.5	238	41.8	254	<b><u>42.2</u></b>	<b><u>252</u></b>	34.9	304	<b><u>35.0</u></b>	<b><u>303</u></b>	35.0	303
465.tonto	<b><u>222</u></b>	<b><u>44.3</u></b>	219	44.8	223	44.1	168	58.6	169	58.3	<b><u>168</u></b>	<b><u>58.6</u></b>
470.lbm	<b><u>15.3</u></b>	<b><u>900</u></b>	15.2	905	15.3	897	<b><u>15.3</u></b>	<b><u>900</u></b>	15.2	905	15.3	897
481.wrf	98.9	113	<b><u>98.5</u></b>	<b><u>113</u></b>	98.1	114	98.9	113	<b><u>98.5</u></b>	<b><u>113</u></b>	98.1	114
482.sphinx3	249	78.3	247	79.0	<b><u>249</u></b>	<b><u>78.4</u></b>	249	78.3	247	79.0	<b><u>249</u></b>	<b><u>78.4</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 = "28"

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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