



# SPEC® CFP2006 Result

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## NEC Corporation

SPECfp®2006 = **128**

Express5800/R120g-2M (Intel Xeon E5-2667 v4)

SPECfp\_base2006 = **123**

CPU2006 license: 9006

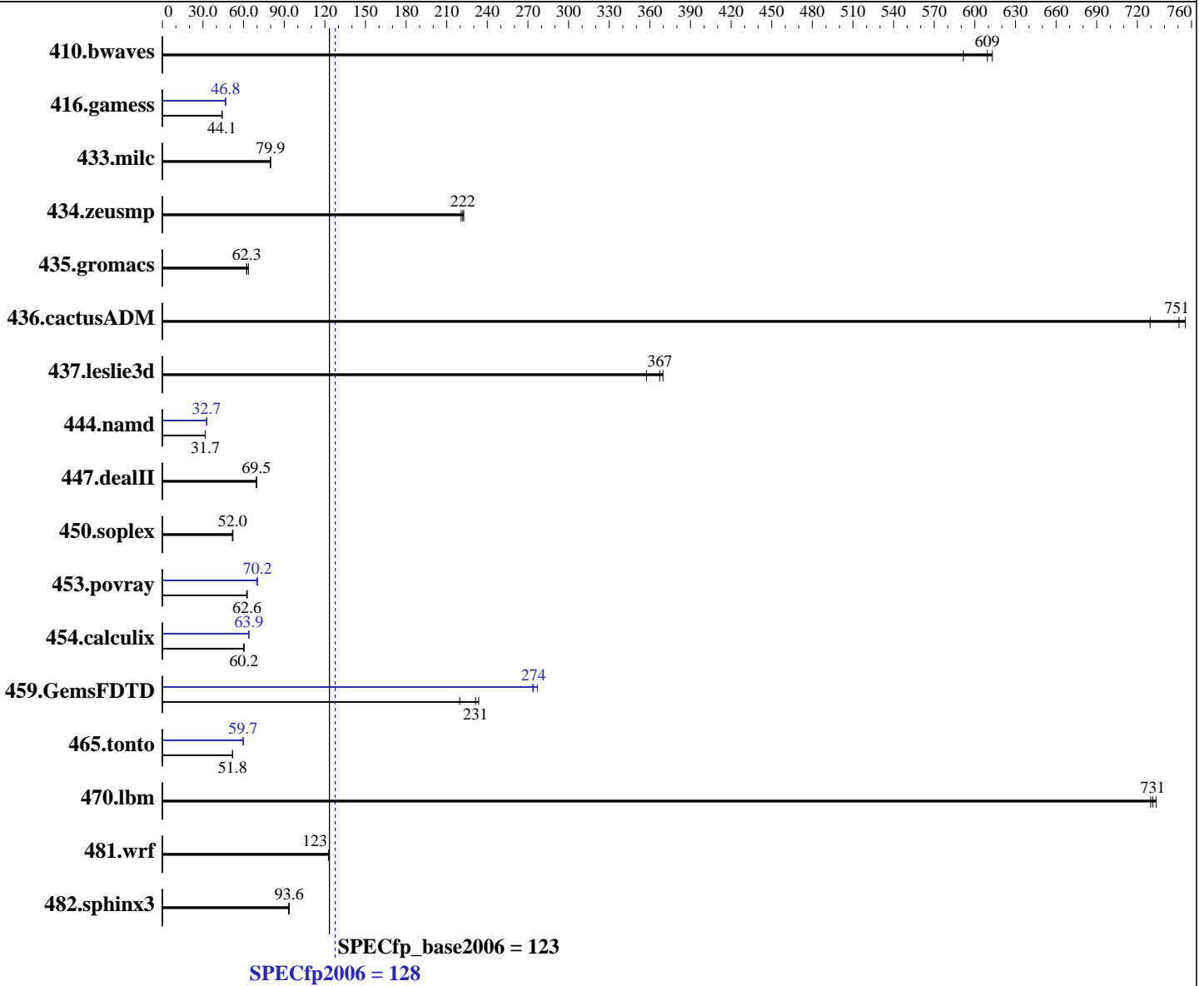
Test date: Apr-2016

Test sponsor: NEC Corporation

Hardware Availability: Apr-2016

Tested by: NEC Corporation

Software Availability: Jan-2016



**Hardware**

CPU Name: Intel Xeon E5-2667 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz  
 CPU MHz: 3200  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 2 chips, 8 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: 25 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    | <u>22.3</u> | <u>609</u>  | 23.0        | 592         | 22.2        | 613         | <u>22.3</u> | <u>609</u>  | 23.0        | 592         | 22.2        | 613         |
| 416.gamess    | 445         | 44.0        | <u>444</u>  | <u>44.1</u> | 443         | 44.2        | 421         | 46.5        | <u>419</u>  | <u>46.8</u> | 419         | 46.8        |
| 433.milc      | <u>115</u>  | <u>79.9</u> | 115         | 79.8        | 115         | 79.9        | <u>115</u>  | <u>79.9</u> | 115         | 79.8        | 115         | 79.9        |
| 434.zeusmp    | <u>41.0</u> | <u>222</u>  | 41.2        | 221         | 40.9        | 223         | <u>41.0</u> | <u>222</u>  | 41.2        | 221         | 40.9        | 223         |
| 435.gromacs   | 115         | 62.3        | <u>115</u>  | <u>62.3</u> | 112         | 63.6        | 115         | 62.3        | <u>115</u>  | <u>62.3</u> | 112         | 63.6        |
| 436.cactusADM | 16.4        | 729         | 15.8        | 755         | <u>15.9</u> | <u>751</u>  | 16.4        | 729         | 15.8        | 755         | <u>15.9</u> | <u>751</u>  |
| 437.leslie3d  | <u>25.6</u> | <u>367</u>  | 25.4        | 370         | 26.3        | 358         | <u>25.6</u> | <u>367</u>  | 25.4        | 370         | 26.3        | 358         |
| 444.namd      | 253         | 31.7        | <u>253</u>  | <u>31.7</u> | 253         | 31.7        | 245         | 32.7        | 245         | 32.7        | <u>245</u>  | <u>32.7</u> |
| 447.dealII    | <u>165</u>  | <u>69.5</u> | 165         | 69.5        | 164         | 69.6        | <u>165</u>  | <u>69.5</u> | 165         | 69.5        | 164         | 69.6        |
| 450.soplex    | 160         | 52.1        | <u>161</u>  | <u>52.0</u> | 161         | 51.7        | 160         | 52.1        | <u>161</u>  | <u>52.0</u> | 161         | 51.7        |
| 453.povray    | 85.4        | 62.3        | <u>85.0</u> | <u>62.6</u> | 84.9        | 62.7        | <u>75.8</u> | <u>70.2</u> | 76.3        | 69.7        | 75.7        | 70.2        |
| 454.calculix  | 137         | 60.4        | 137         | 60.2        | <u>137</u>  | <u>60.2</u> | 129         | 63.9        | 129         | 63.8        | <u>129</u>  | <u>63.9</u> |
| 459.GemsFDTD  | 48.3        | 220         | <u>45.9</u> | <u>231</u>  | 45.4        | 234         | <u>38.7</u> | <u>274</u>  | 38.3        | 277         | 38.8        | 274         |
| 465.tonto     | <u>190</u>  | <u>51.8</u> | 190         | 51.8        | 189         | 52.0        | 165         | 59.6        | <u>165</u>  | <u>59.7</u> | 165         | 59.8        |
| 470.lbm       | 18.7        | 734         | 18.8        | 730         | <u>18.8</u> | <u>731</u>  | 18.7        | 734         | 18.8        | 730         | <u>18.8</u> | <u>731</u>  |
| 481.wrf       | 90.7        | 123         | <u>90.8</u> | <u>123</u>  | 91.0        | 123         | 90.7        | 123         | <u>90.8</u> | <u>123</u>  | 91.0        | 123         |
| 482.sphinx3   | 209         | 93.3        | <u>208</u>  | <u>93.6</u> | 208         | 93.7        | 209         | 93.3        | <u>208</u>  | <u>93.6</u> | 208         | 93.7        |

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  
 Snoop Mode: Home Snoop with Directory  
 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 = "16"

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

The Express5800/R120g-1M (Intel Xeon E5-2667 v4) and the Express5800/R120g-2M (Intel Xeon E5-2667 v4) models are electronically equivalent. The results have been measured on the Express5800/R120g-2M (Intel Xeon E5-2667 v4) model.

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.lelie3d: -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

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## Base Portability Flags (Continued)

482.sphinx3: -DSPEC\_CPU\_LP64

## 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

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## Peak Optimization Flags (Continued)

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

### C++ benchmarks:

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

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## Peak Optimization Flags (Continued)

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-ic16.0-official-linux64.html>

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

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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