



# SPEC<sup>®</sup> CFP2006 Result

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## NEC Corporation

SPECfp<sup>®</sup>2006 = **125**

Express5800/R120g-1M (Intel Xeon E5-2699 v4)

SPECfp\_base2006 = **117**

CPU2006 license: 9006

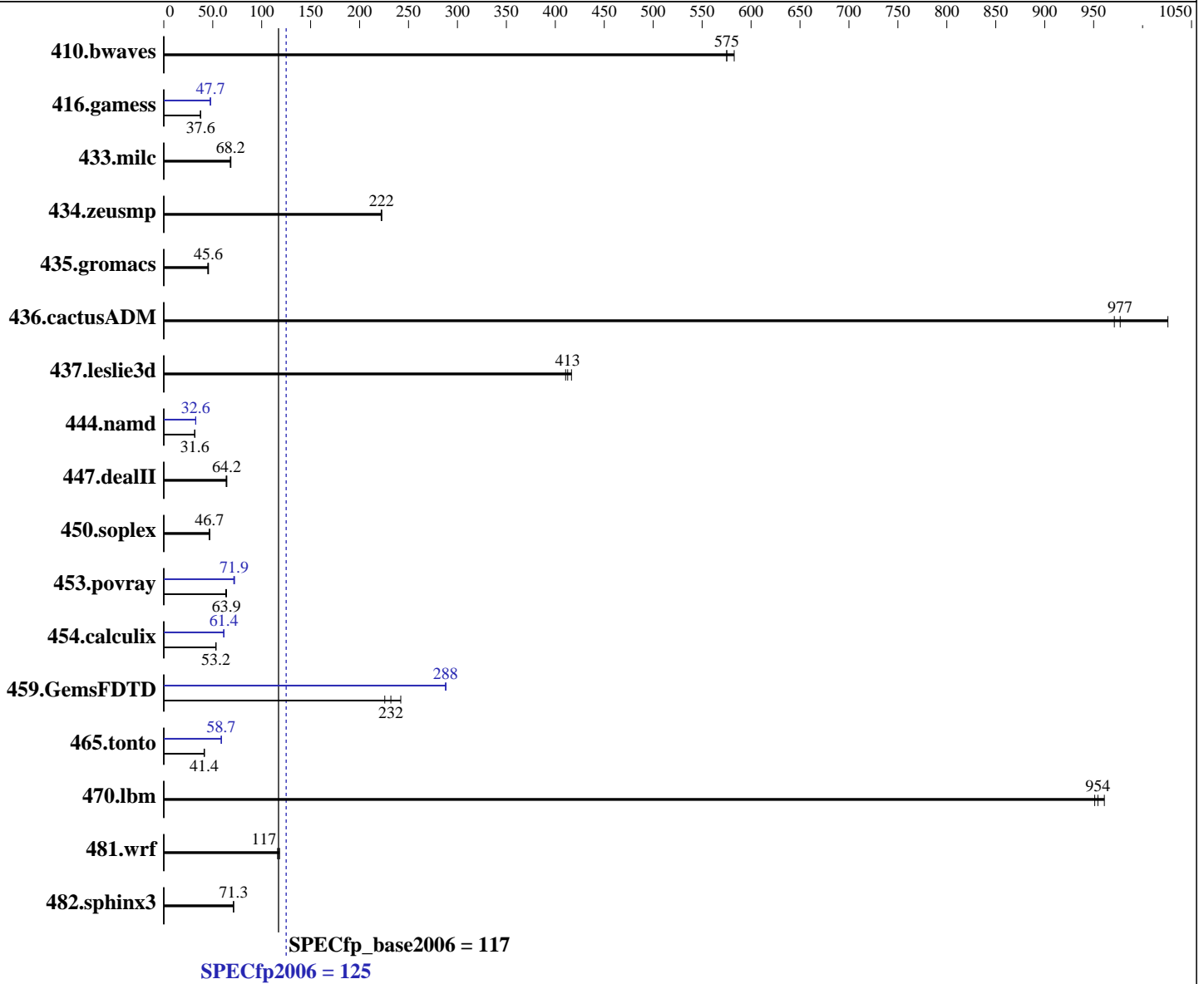
Test date: Apr-2016

Test sponsor: NEC Corporation

Hardware Availability: Apr-2016

Tested by: NEC Corporation

Software Availability: Jan-2016



### Hardware

CPU Name: Intel Xeon E5-2699 v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz  
 CPU MHz: 2200  
 FPU: Integrated  
 CPU(s) enabled: 44 cores, 2 chips, 22 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: 55 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	23.3	583	23.6	575	<b><u>23.6</u></b>	<b><u>575</u></b>	23.3	583	23.6	575	<b><u>23.6</u></b>	<b><u>575</u></b>
416.gamess	<b><u>521</u></b>	<b><u>37.6</u></b>	520	37.6	522	37.5	<b><u>410</u></b>	<b><u>47.7</u></b>	410	47.7	413	47.4
433.milc	134	68.6	<b><u>135</u></b>	<b><u>68.2</u></b>	135	68.0	134	68.6	<b><u>135</u></b>	<b><u>68.2</u></b>	135	68.0
434.zeusmp	41.0	222	<b><u>40.9</u></b>	<b><u>222</u></b>	40.9	223	41.0	222	<b><u>40.9</u></b>	<b><u>222</u></b>	40.9	223
435.gromacs	159	44.9	<b><u>157</u></b>	<b><u>45.6</u></b>	157	45.6	159	44.9	<b><u>157</u></b>	<b><u>45.6</u></b>	157	45.6
436.cactusADM	11.6	1030	<b><u>12.2</u></b>	<b><u>977</u></b>	12.3	971	11.6	1030	<b><u>12.2</u></b>	<b><u>977</u></b>	12.3	971
437.leslie3d	22.6	417	22.9	411	<b><u>22.8</u></b>	<b><u>413</u></b>	22.6	417	22.9	411	<b><u>22.8</u></b>	<b><u>413</u></b>
444.namd	<b><u>253</u></b>	<b><u>31.6</u></b>	253	31.7	253	31.6	246	32.6	246	32.6	<b><u>246</u></b>	<b><u>32.6</u></b>
447.dealII	178	64.4	<b><u>178</u></b>	<b><u>64.2</u></b>	180	63.7	178	64.4	<b><u>178</u></b>	<b><u>64.2</u></b>	180	63.7
450.soplex	<b><u>179</u></b>	<b><u>46.7</u></b>	177	47.0	180	46.3	<b><u>179</u></b>	<b><u>46.7</u></b>	177	47.0	180	46.3
453.povray	84.0	63.3	<b><u>83.3</u></b>	<b><u>63.9</u></b>	83.0	64.1	74.4	71.5	<b><u>74.0</u></b>	<b><u>71.9</u></b>	73.6	72.3
454.calculix	154	53.4	155	53.2	<b><u>155</u></b>	<b><u>53.2</u></b>	<b><u>134</u></b>	<b><u>61.4</u></b>	135	61.1	134	61.5
459.GemsFDTD	43.8	242	<b><u>45.7</u></b>	<b><u>232</u></b>	47.0	226	<b><u>36.9</u></b>	<b><u>288</u></b>	36.8	288	36.9	288
465.tonto	<b><u>237</u></b>	<b><u>41.4</u></b>	237	41.5	239	41.1	168	58.7	167	58.9	<b><u>168</u></b>	<b><u>58.7</u></b>
470.lbm	14.4	951	<b><u>14.4</u></b>	<b><u>954</u></b>	14.3	961	14.4	951	<b><u>14.4</u></b>	<b><u>954</u></b>	14.3	961
481.wrf	<b><u>95.2</u></b>	<b><u>117</u></b>	96.1	116	94.4	118	<b><u>95.2</u></b>	<b><u>117</u></b>	96.1	116	94.4	118
482.sphinx3	<b><u>273</u></b>	<b><u>71.3</u></b>	274	71.1	273	71.3	<b><u>273</u></b>	<b><u>71.3</u></b>	274	71.1	273	71.3

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 = "44"

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 E5-2699 v4) and the Express5800/R120g-2M (Intel Xeon E5-2699 v4) models are electronically equivalent. The results have been measured on the Express5800/R120g-2M (Intel Xeon E5-2699 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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