



# SPEC® CFP2006 Result

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## NEC Corporation

SPECfp®2006 = 76.1

Express5800/R120e-2M (Intel Xeon E5-2620 v2)

SPECfp\_base2006 = 73.3

CPU2006 license: 9006

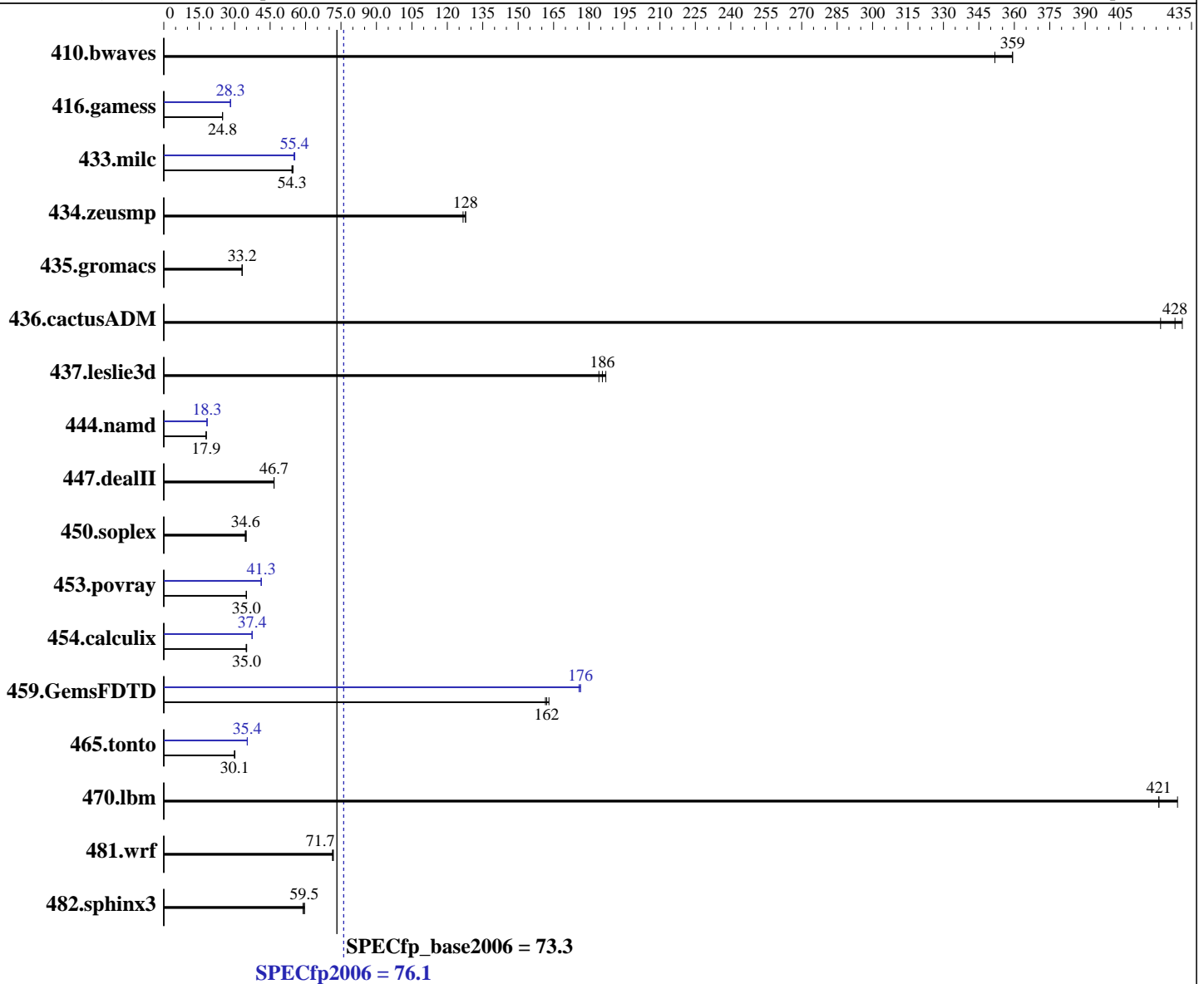
Test date: Nov-2013

Test sponsor: NEC Corporation

Hardware Availability: Sep-2013

Tested by: NEC Corporation

Software Availability: Sep-2013



**Hardware**

CPU Name: Intel Xeon E5-2620 v2  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.60 GHz  
 CPU MHz: 2100  
 FPU: Integrated  
 CPU(s) enabled: 12 cores, 2 chips, 6 cores/chip, 2 threads/core  
 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 6.4 (Santiago)  
 Kernel 2.6.32-358.18.1.el6.x86\_64  
 Compiler: C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux;  
 Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: ext4

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L3 Cache: 15 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 256 GB (16 x 16 GB 2Rx4 PC3L-12800R-11, ECC)  
 Disk Subsystem: 1 x 300 GB SAS, 10000 RPM, RAID 0  
 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>37.8</u></b>	<b><u>359</u></b>	38.6	352	37.8	359	<b><u>37.8</u></b>	<b><u>359</u></b>	38.6	352	37.8	359
416.gamess	<b><u>789</u></b>	<b><u>24.8</u></b>	789	24.8	786	24.9	695	28.2	692	28.3	<b><u>692</u></b>	<b><u>28.3</u></b>
433.milc	168	54.7	169	54.3	<b><u>169</u></b>	<b><u>54.3</u></b>	167	55.1	<b><u>166</u></b>	<b><u>55.4</u></b>	166	55.5
434.zeusmp	<b><u>71.2</u></b>	<b><u>128</u></b>	71.2	128	71.8	127	<b><u>71.2</u></b>	<b><u>128</u></b>	71.2	128	71.8	127
435.gromacs	215	33.2	216	33.1	<b><u>215</u></b>	<b><u>33.2</u></b>	215	33.2	216	33.1	<b><u>215</u></b>	<b><u>33.2</u></b>
436.cactusADM	28.3	422	<b><u>27.9</u></b>	<b><u>428</u></b>	27.7	431	28.3	422	<b><u>27.9</u></b>	<b><u>428</u></b>	27.7	431
437.leslie3d	51.0	184	50.2	187	<b><u>50.6</u></b>	<b><u>186</u></b>	51.0	184	50.2	187	<b><u>50.6</u></b>	<b><u>186</u></b>
444.namd	<b><u>447</u></b>	<b><u>17.9</u></b>	447	17.9	447	17.9	438	18.3	438	18.3	<b><u>438</u></b>	<b><u>18.3</u></b>
447.dealII	245	46.7	245	46.6	<b><u>245</u></b>	<b><u>46.7</u></b>	245	46.7	245	46.6	<b><u>245</u></b>	<b><u>46.7</u></b>
450.soplex	239	34.9	<b><u>241</u></b>	<b><u>34.6</u></b>	242	34.5	239	34.9	<b><u>241</u></b>	<b><u>34.6</u></b>	242	34.5
453.povray	152	34.9	152	35.0	<b><u>152</u></b>	<b><u>35.0</u></b>	<b><u>129</u></b>	<b><u>41.3</u></b>	129	41.3	129	41.2
454.calculix	235	35.1	<b><u>236</u></b>	<b><u>35.0</u></b>	237	34.8	221	37.3	220	37.5	<b><u>220</u></b>	<b><u>37.4</u></b>
459.GemsFDTD	65.1	163	<b><u>65.5</u></b>	<b><u>162</u></b>	65.7	162	60.2	176	60.4	176	<b><u>60.2</u></b>	<b><u>176</u></b>
465.tonto	327	30.1	<b><u>327</u></b>	<b><u>30.1</u></b>	330	29.9	279	35.3	278	35.4	<b><u>278</u></b>	<b><u>35.4</u></b>
470.lbm	<b><u>32.6</u></b>	<b><u>421</u></b>	32.6	421	32.0	429	<b><u>32.6</u></b>	<b><u>421</u></b>	32.6	421	32.0	429
481.wrf	156	71.4	<b><u>156</u></b>	<b><u>71.7</u></b>	156	71.7	156	71.4	<b><u>156</u></b>	<b><u>71.7</u></b>	156	71.7
482.sphinx3	<b><u>328</u></b>	<b><u>59.5</u></b>	327	59.5	331	58.9	<b><u>328</u></b>	<b><u>59.5</u></b>	327	59.5	331	58.9

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:  
 Energy Performance: Performance  
 Memory Voltage: 1.5 V

## General Notes

Environment variables set by runspec before the start of the run:  
 KMP\_AFFINITY = "granularity=fine,compact,1,0"  
 LD\_LIBRARY\_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"

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## General Notes (Continued)

OMP\_NUM\_THREADS = "12"

Added glibc-static-2.12-1.107.el6.x86\_64.rpm  
to enable static linking

Transparent Huge Pages enabled with:  
echo always > /sys/kernel/mm/redhat\_transparent\_hugepage/enabled  
The Express5800/R120e-1M and  
the Express5800/R120e-2M models are electronically equivalent.  
The results have been measured on the Express5800/R120e-2M model.

## 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:

```
-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch  
-ansi-alias
```

C++ benchmarks:

```
-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias
```

Fortran benchmarks:

```
-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:

```
-xAVX -ipo -O3 -no-prec-div -static -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: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32  
-ansi-alias
```

```
470.lbm: basepeak = yes
```

```
482.sphinx3: basepeak = yes
```

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## Peak Optimization Flags (Continued)

C++ benchmarks:

444.namd: -xAVX(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: -xAVX(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: -xAVX(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- -static

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xAVX(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: -xAVX(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: -xAVX -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-R120d-RevA.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml>

<http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-R120d-RevA.xml>

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

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