



# SPEC<sup>®</sup> CFP2006 Result

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## NEC Corporation

**SPECfp<sup>®</sup>2006 = 56.6**

Express5800/GT110d-S (Intel Xeon E3-1220)

**SPECfp\_base2006 = 54.4**

CPU2006 license: 9006

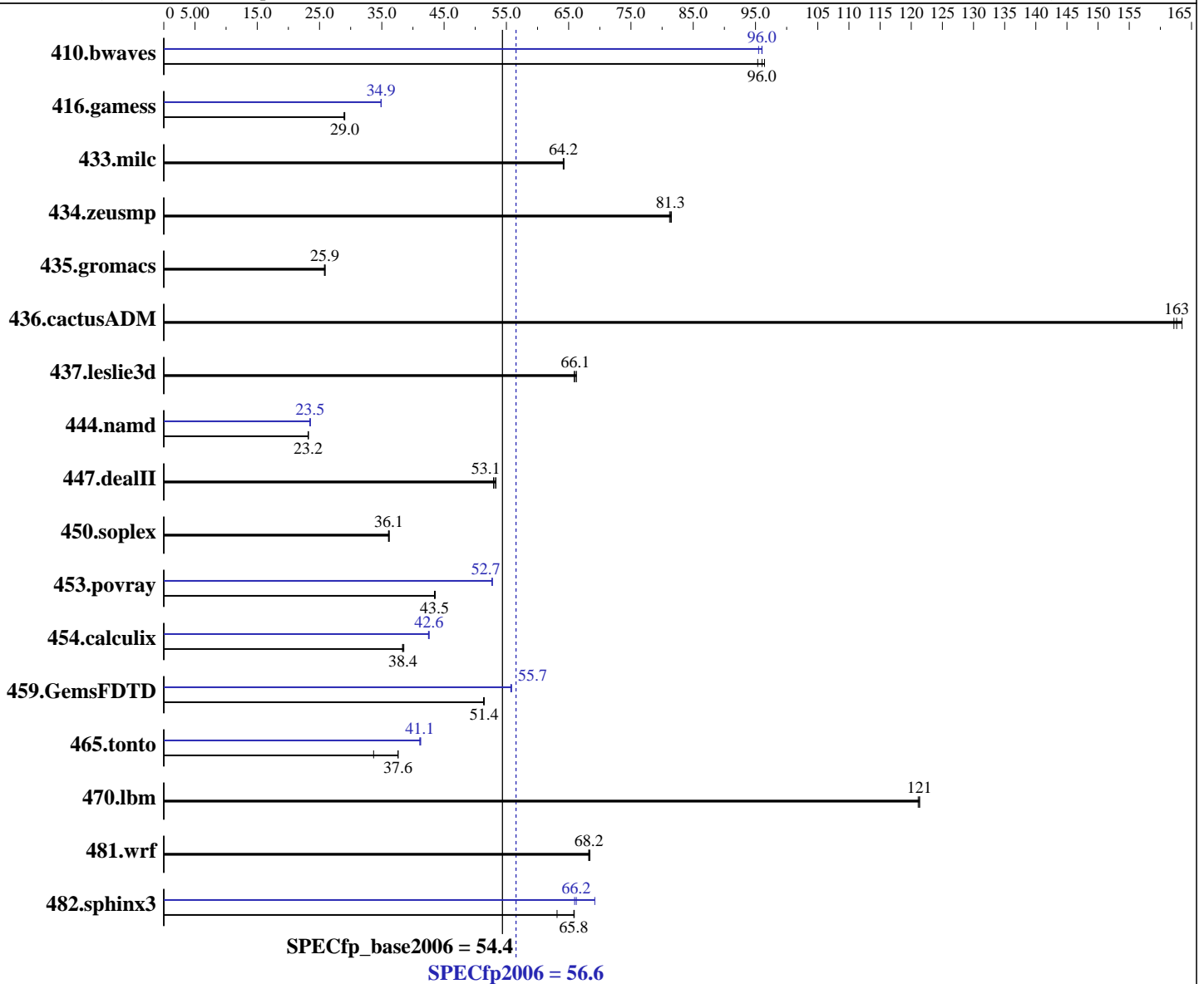
Test date: May-2011

Test sponsor: NEC Corporation

Hardware Availability: Jun-2011

Tested by: NEC Corporation

Software Availability: Mar-2011



### Hardware

CPU Name: Intel Xeon E3-1220  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz  
 CPU MHz: 3100  
 FPU: Integrated  
 CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip  
 CPU(s) orderable: 1 chip  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core

Continued on next page

### Software

Operating System: SUSE Linux Enterprise Server 11 SP1 (x86\_64), Kernel 2.6.32.12-0.7-default  
 Compiler: Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64, Version 12.0.3.174 Build 20110309  
 Auto Parallel: Yes  
 File System: ext3  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit

Continued on next page



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L3 Cache: 8 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 8 GB (2 x 4 GB 2Rx8 PC3-10600E-9, ECC)  
 Disk Subsystem: 1 x 160 GB SATA, 7200 RPM  
 Other Hardware: None

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	143	95.4	<b>142</b>	<b>96.0</b>	141	96.4	<b>142</b>	<b>96.0</b>	142	95.5	142	96.0
416.gamess	<b>674</b>	<b>29.0</b>	677	28.9	674	29.0	<b>561</b>	<b>34.9</b>	561	34.9	561	34.9
433.milc	143	64.2	143	64.1	<b>143</b>	<b>64.2</b>	143	64.2	143	64.1	<b>143</b>	<b>64.2</b>
434.zeusmp	<b>112</b>	<b>81.3</b>	112	81.2	112	81.5	<b>112</b>	<b>81.3</b>	112	81.2	112	81.5
435.gromacs	<b>276</b>	<b>25.9</b>	277	25.8	276	25.9	<b>276</b>	<b>25.9</b>	277	25.8	276	25.9
436.cactusADM	73.1	163	73.7	162	<b>73.5</b>	<b>163</b>	73.1	163	73.7	162	<b>73.5</b>	<b>163</b>
437.leslie3d	143	65.9	<b>142</b>	<b>66.1</b>	142	66.3	143	65.9	<b>142</b>	<b>66.1</b>	142	66.3
444.namd	<b>346</b>	<b>23.2</b>	346	23.2	346	23.2	342	23.5	341	23.5	<b>341</b>	<b>23.5</b>
447.dealII	<b>215</b>	<b>53.1</b>	215	53.3	216	52.9	<b>215</b>	<b>53.1</b>	215	53.3	216	52.9
450.soplex	231	36.1	<b>231</b>	<b>36.1</b>	230	36.2	231	36.1	<b>231</b>	<b>36.1</b>	230	36.2
453.povray	<b>122</b>	<b>43.5</b>	122	43.4	122	43.6	101	52.7	101	52.7	<b>101</b>	<b>52.7</b>
454.calculix	214	38.5	215	38.3	<b>215</b>	<b>38.4</b>	<b>194</b>	<b>42.6</b>	194	42.6	194	42.5
459.GemsFDTD	207	51.3	<b>206</b>	<b>51.4</b>	206	51.4	190	55.7	<b>190</b>	<b>55.7</b>	190	55.8
465.tonto	292	33.7	262	37.6	<b>262</b>	<b>37.6</b>	239	41.2	<b>239</b>	<b>41.1</b>	239	41.1
470.lbm	<b>113</b>	<b>121</b>	113	121	113	121	<b>113</b>	<b>121</b>	113	121	113	121
481.wrf	163	68.4	<b>164</b>	<b>68.2</b>	164	68.2	163	68.4	<b>164</b>	<b>68.2</b>	164	68.2
482.sphinx3	296	65.9	<b>296</b>	<b>65.8</b>	309	63.1	296	66.0	282	69.2	<b>294</b>	<b>66.2</b>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Operating System Notes

```
'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run
'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
echo 1800 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

## Platform Notes

Default BIOS settings were used.



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## General Notes

OMP\_NUM\_THREADS set to number of cores  
The Express5800/GT110d (Intel Xeon E3-1220) and the Express5800/GT110d-S (Intel Xeon E3-1220) models are electronically equivalent. The results have been measured on the Express5800/GT110d-S (Intel Xeon E3-1220) 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.lelie3d: -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

## Base Optimization Flags

C benchmarks:

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

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<b>CPU2006 license:</b> 9006	<b>Test date:</b> May-2011
<b>Test sponsor:</b> NEC Corporation	<b>Hardware Availability:</b> Jun-2011
<b>Tested by:</b> NEC Corporation	<b>Software Availability:</b> Mar-2011

## Base Optimization Flags (Continued)

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: `basepeak = yes`

470.lbm: `basepeak = yes`

482.sphinx3: `-xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias  
-parallel`

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`

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## Peak Optimization Flags (Continued)

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  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

### Fortran benchmarks:

410.bwaves: -xAVX -ipo -O3 -no-prec-div -opt-prefetch -parallel  
-static

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  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

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  
-B /usr/share/libhugetlbfs/ -Wl,-melf\_x86\_64 -Wl,-hugetlbfs-link=BDT

### 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-ic12.0-linux64-revB.html>

<http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revF.html>

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

<http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml>

<http://www.spec.org/cpu2006/flags/NEC-Intel-Linux-Settings-flags-revF.xml>



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