# SPEC® CFP2006 Result

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## NEC Corporation

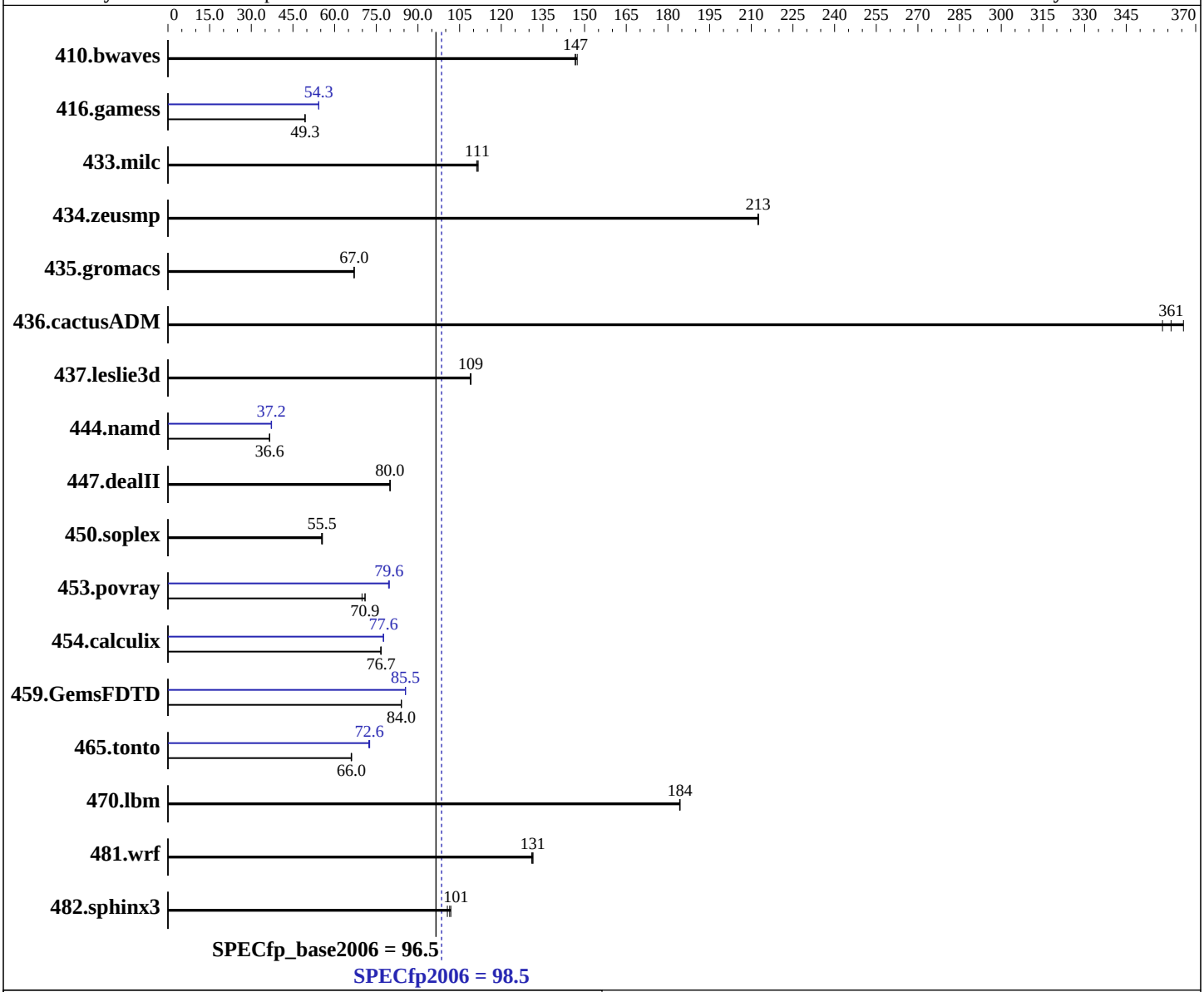
Express5800/R110h-1 (Intel Xeon E3-1230 v5)

SPECfp®2006 = 98.5

SPECfp_base2006 = 96.5

**CPU2006 license:** 9006
**Test sponsor:** NEC Corporation
**Tested by:** NEC Corporation

**Test date:** Dec-2015
**Hardware Availability:** Mar-2016
**Software Availability:** Nov-2015




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E3-1230 v5 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.80 GHz |
| CPU MHz: | 3400 |
| 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 |

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### Software

| | |
|---|---|
| Operating System: | Red Hat Enterprise Linux Server release 7.2 (Maipo)<br>Kernel 3.10.0-327.el7.x86_64 |
| Compiler: | C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;<br>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: | 8 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 16 GB (2 x 8 GB 2Rx8 PC4-2133P-E) |
| Disk Subsystem: | 1 x 500 GB 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 | **92.6** | **147** | 92.2 | 147 | 92.7 | 147 | **92.6** | **147** | 92.2 | 147 | 92.7 | 147 |
| 416.gamess | 397 | 49.3 | **397** | **49.3** | 396 | 49.4 | 361 | 54.3 | **361** | **54.3** | 361 | 54.3 |
| 433.milc | 82.6 | 111 | **82.4** | **111** | 82.2 | 112 | 82.6 | 111 | **82.4** | **111** | 82.2 | 112 |
| 434.zeusmp | **42.8** | **213** | 42.8 | 212 | 42.8 | 213 | **42.8** | **213** | 42.8 | 212 | 42.8 | 213 |
| 435.gromacs | **107** | **67.0** | 106 | 67.1 | 107 | 67.0 | **107** | **67.0** | 106 | 67.1 | 107 | 67.0 |
| 436.cactusADM | 32.7 | 366 | 33.4 | 358 | **33.1** | **361** | 32.7 | 366 | 33.4 | 358 | **33.1** | **361** |
| 437.leslie3d | 86.1 | 109 | **86.2** | **109** | 86.4 | 109 | 86.1 | 109 | **86.2** | **109** | 86.4 | 109 |
| 444.namd | 219 | 36.6 | 219 | 36.6 | **219** | **36.6** | 215 | 37.3 | 216 | 37.2 | **215** | **37.2** |
| 447.dealII | 143 | 80.0 | 143 | 79.9 | **143** | **80.0** | 143 | 80.0 | 143 | 79.9 | **143** | **80.0** |
| 450.soplex | 150 | 55.6 | **150** | **55.5** | 151 | 55.3 | 150 | 55.6 | **150** | **55.5** | 151 | 55.3 |
| 453.povray | **75.0** | **70.9** | 75.0 | 71.0 | 76.1 | 69.9 | 66.8 | 79.7 | **66.8** | **79.6** | 67.0 | 79.4 |
| 454.calculix | **108** | **76.7** | 108 | 76.6 | 108 | 76.7 | **106** | **77.6** | 106 | 77.7 | 106 | 77.5 |
| 459.GemsFDTD | 126 | 84.0 | **126** | **84.0** | 126 | 84.1 | 124 | 85.5 | 124 | 85.5 | **124** | **85.5** |
| 465.tonto | 149 | 66.1 | 149 | 66.0 | **149** | **66.0** | **136** | **72.6** | 135 | 72.6 | 136 | 72.3 |
| 470.lbm | **74.5** | **184** | 74.5 | 184 | 74.6 | 184 | **74.5** | **184** | 74.5 | 184 | 74.6 | 184 |
| 481.wrf | 85.0 | 131 | **85.0** | **131** | 85.3 | 131 | 85.0 | 131 | **85.0** | **131** | 85.3 | 131 |
| 482.sphinx3 | 194 | 101 | **192** | **101** | 191 | 102 | 194 | 101 | **192** | **101** | 191 | 102 |

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
 Hyper-Threading: Disabled
```

## 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"
OMP_NUM_THREADS = "4"

 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

## 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:

Continued on next page

# 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

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-V1.2-110h-RevA.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-V1.2-110h-RevA.xml


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For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Report generated on Tue Feb 9 17:20:56 2016 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 9 February 2016.