# SPEC® CFP2006 Result

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## NEC Corporation

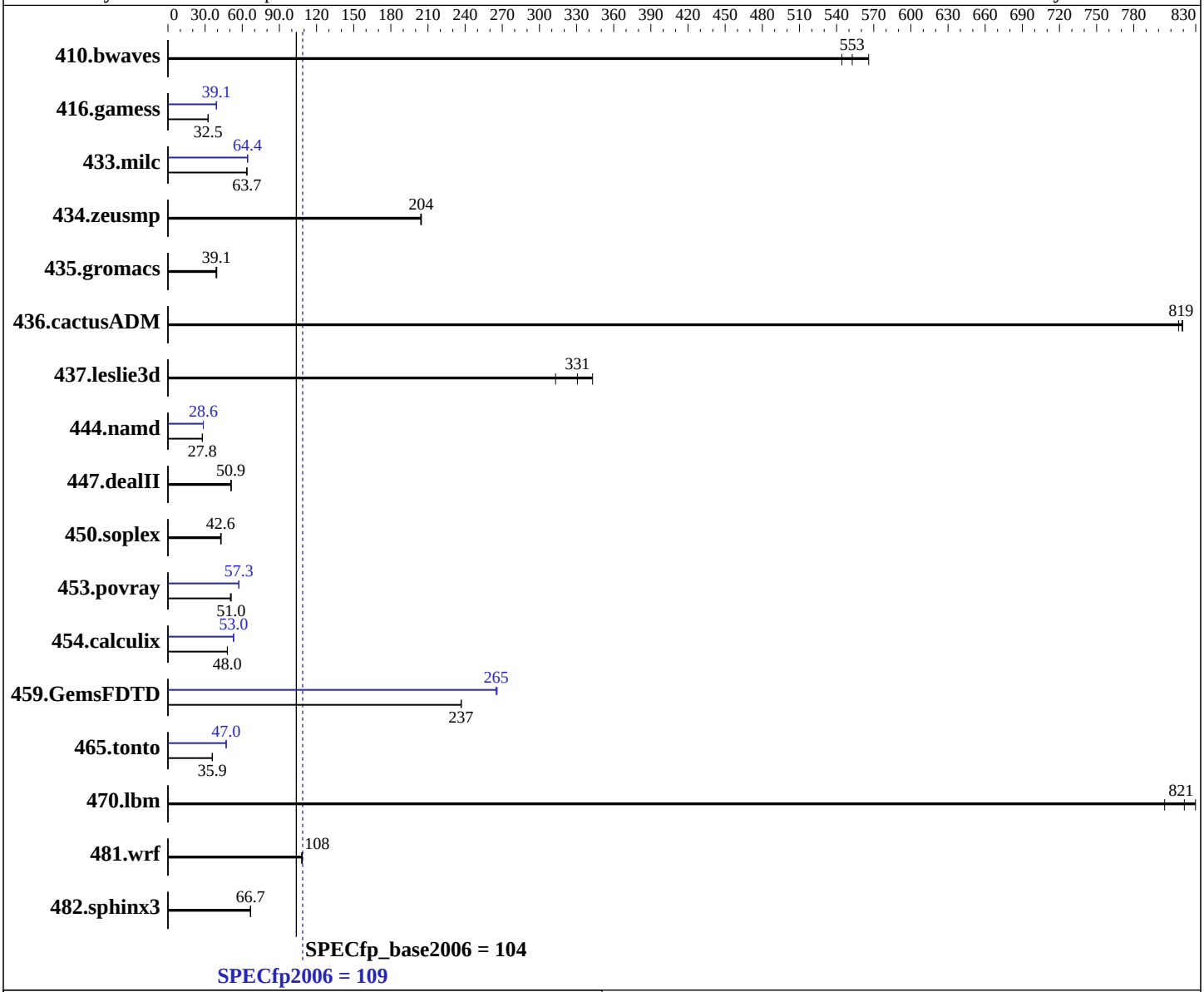
Express5800/R120f-1M (Intel Xeon E5-2695 v3)

SPECfp®2006 = 109

SPECfp_base2006 = 104

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

**Test date:** Dec-2014
**Hardware Availability:** Feb-2015
**Software Availability:** Jul-2014




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5-2695 v3 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.30 GHz |
| CPU MHz: | 2300 |
| FPU: | Integrated |
| CPU(s) enabled: | 28 cores, 2 chips, 14 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 6.5 (Santiago)<br>Kernel 2.6.32-431.17.1.el6.x86_64 |
| Compiler: | C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux;<br>Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux |
| Auto Parallel: | Yes |
| File System: | ext4 |

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| | | | |
|---|---|---|---|
| L3 Cache: | 35 MB I+D on chip per chip | System State: | Run level 3 (multi-user) |
| Other Cache: | None | Base Pointers: | 64-bit |
| Memory: | 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R) | Peak Pointers: | 32/64-bit |
| Disk Subsystem: | 1 x 250 GB SATA, 7200 RPM | Other Software: | None |
| Other Hardware: | None | | |

## Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 25.0 | 544 | 24.0 | 566 | **24.6** | **553** | 25.0 | 544 | 24.0 | 566 | **24.6** | **553** |
| 416.gamess | 605 | 32.4 | 602 | 32.5 | **603** | **32.5** | 501 | 39.1 | 500 | 39.1 | **501** | **39.1** |
| 433.milc | **144** | **63.7** | 144 | 63.7 | 144 | 63.7 | 143 | 64.1 | **143** | **64.4** | 143 | 64.4 |
| 434.zeusmp | 44.4 | 205 | **44.5** | **204** | 44.6 | 204 | 44.4 | 205 | **44.5** | **204** | 44.6 | 204 |
| 435.gromacs | **183** | **39.1** | 181 | 39.5 | 184 | 38.9 | **183** | **39.1** | 181 | 39.5 | 184 | 38.9 |
| 436.cactusADM | 14.6 | 816 | 14.6 | 820 | **14.6** | **819** | 14.6 | 816 | 14.6 | 820 | **14.6** | **819** |
| 437.leslie3d | 27.4 | 343 | **28.4** | **331** | 30.0 | 313 | 27.4 | 343 | **28.4** | **331** | 30.0 | 313 |
| 444.namd | **289** | **27.8** | 288 | 27.8 | 289 | 27.8 | 281 | 28.6 | 281 | 28.5 | **281** | **28.6** |
| 447.dealII | **225** | **50.9** | 225 | 50.9 | 224 | 51.1 | **225** | **50.9** | 225 | 50.9 | 224 | 51.1 |
| 450.soplex | 194 | 43.0 | 196 | 42.6 | **196** | **42.6** | 194 | 43.0 | 196 | 42.6 | **196** | **42.6** |
| 453.povray | 104 | 51.0 | **104** | **51.0** | 106 | 50.4 | **92.9** | **57.3** | 93.0 | 57.2 | 92.6 | 57.4 |
| 454.calculix | 172 | 48.0 | **172** | **48.0** | 172 | 48.0 | 156 | 52.9 | 156 | 53.0 | **156** | **53.0** |
| 459.GemsFDTD | 44.8 | 237 | **44.8** | **237** | 44.8 | 237 | 40.0 | 265 | 39.9 | 266 | **40.0** | **265** |
| 465.tonto | 274 | 35.9 | 276 | 35.7 | **274** | **35.9** | **209** | **47.0** | 209 | 47.0 | 210 | 47.0 |
| 470.lbm | 17.1 | 805 | **16.7** | **821** | 16.6 | 830 | 17.1 | 805 | **16.7** | **821** | 16.6 | 830 |
| 481.wrf | 103 | 109 | 103 | 108 | **103** | **108** | 103 | 109 | 103 | 108 | **103** | **108** |
| 482.sphinx3 | **292** | **66.7** | 292 | 66.6 | 292 | 66.7 | **292** | **66.7** | 292 | 66.6 | 292 | 66.7 |

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
 Early Snoop: Disabled
 Hyper-Threading: Disabled
```

## 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 = "28"

 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/redhat_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

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## Base Optimization Flags (Continued)

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: `-xCORE-AVX2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2) `-no-prec-div`(pass 2) `-prof-use`(pass 2) `-auto-ilp32 -ansi-alias`

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(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xCORE-AVX2(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: -xCORE-AVX2(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-

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -xCORE-AVX2(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: -xCORE-AVX2(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: -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-ic15.0-official-linux64.html
http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-120f-RevB.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-120f-RevB.xml

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