# SPEC® CFP2006 Result

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## NEC Corporation

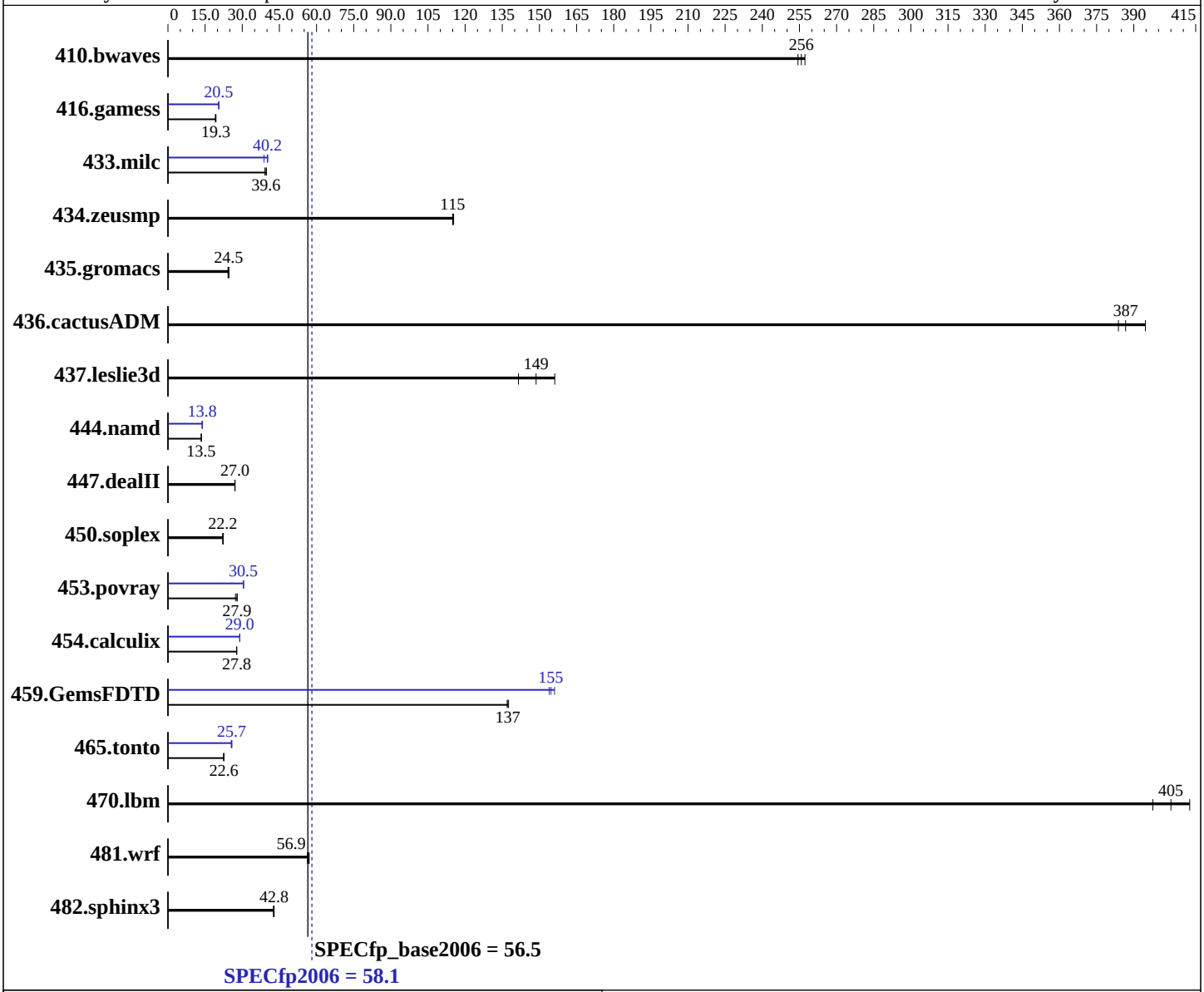
Express5800/R120f-2M (Intel Xeon E5-2603 v3)

SPECfp®2006 = 58.1

SPECfp_base2006 = 56.5

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

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




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5-2603 v3 |
| CPU Characteristics: | |
| CPU MHz: | 1600 |
| FPU: | Integrated |
| CPU(s) enabled: | 12 cores, 2 chips, 6 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: 15 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)
Disk Subsystem: 1 x 250 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 | 53.4 | 254 | **53.1** | **256** | 52.8 | 257 | 53.4 | 254 | **53.1** | **256** | 52.8 | 257 |
| 416.gamess | 1024 | 19.1 | 1011 | 19.4 | **1012** | **19.3** | 952 | 20.6 | 955 | 20.5 | **955** | **20.5** |
| 433.milc | **232** | **39.6** | 231 | 39.8 | 234 | 39.2 | 237 | 38.8 | **229** | **40.2** | 228 | 40.3 |
| 434.zeusmp | **79.1** | **115** | 78.9 | 115 | 79.1 | 115 | **79.1** | **115** | 78.9 | 115 | 79.1 | 115 |
| 435.gromacs | **291** | **24.5** | 295 | 24.2 | 290 | 24.6 | **291** | **24.5** | 295 | 24.2 | 290 | 24.6 |
| 436.cactusADM | 31.1 | 384 | 30.3 | 395 | **30.9** | **387** | 31.1 | 384 | 30.3 | 395 | **30.9** | **387** |
| 437.leslie3d | **63.2** | **149** | 60.2 | 156 | 66.4 | 142 | **63.2** | **149** | 60.2 | 156 | 66.4 | 142 |
| 444.namd | **595** | **13.5** | 595 | 13.5 | 596 | 13.5 | 580 | 13.8 | 579 | 13.8 | **580** | **13.8** |
| 447.dealII | 423 | 27.0 | **423** | **27.0** | 422 | 27.1 | 423 | 27.0 | **423** | **27.0** | 422 | 27.1 |
| 450.soplex | 373 | 22.3 | 377 | 22.1 | **376** | **22.2** | 373 | 22.3 | 377 | 22.1 | **376** | **22.2** |
| 453.povray | 195 | 27.3 | **191** | **27.9** | 190 | 27.9 | 174 | 30.6 | 175 | 30.5 | **175** | **30.5** |
| 454.calculix | 298 | 27.7 | **297** | **27.8** | 297 | 27.8 | 285 | 29.0 | 284 | 29.0 | **285** | **29.0** |
| 459.GemsFDTD | **77.3** | **137** | 77.5 | 137 | 77.2 | 138 | 68.0 | 156 | **68.6** | **155** | 68.9 | 154 |
| 465.tonto | 435 | 22.6 | 438 | 22.5 | **436** | **22.6** | **383** | **25.7** | 385 | 25.5 | 381 | 25.8 |
| 470.lbm | **33.9** | **405** | 34.5 | 398 | 33.3 | 413 | **33.9** | **405** | 34.5 | 398 | 33.3 | 413 |
| 481.wrf | 198 | 56.3 | 196 | 57.0 | **196** | **56.9** | 198 | 56.3 | 196 | 57.0 | **196** | **56.9** |
| 482.sphinx3 | 458 | 42.6 | **455** | **42.8** | 455 | 42.9 | 458 | 42.6 | **455** | **42.8** | 455 | 42.9 |

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:
 Power Management Policy: Custom
 Energy Performance: Performance
 Patrol Scrub: Disabled
 Early Snoop: 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 = "12"

 The Express5800/R120f-1M (Intel Xeon E5-2603 v3) and
 the Express5800/R120f-2M (Intel Xeon E5-2603 v3) models are electronically equivalent.
 The results have been measured on the Express5800/R120f-2M (Intel Xeon E5-2603 v3) model.

 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`

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`

Continued on next page

# Peak Optimization Flags (Continued)

C++ benchmarks:

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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