# SPEC® CFP2006 Result

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## NEC Corporation

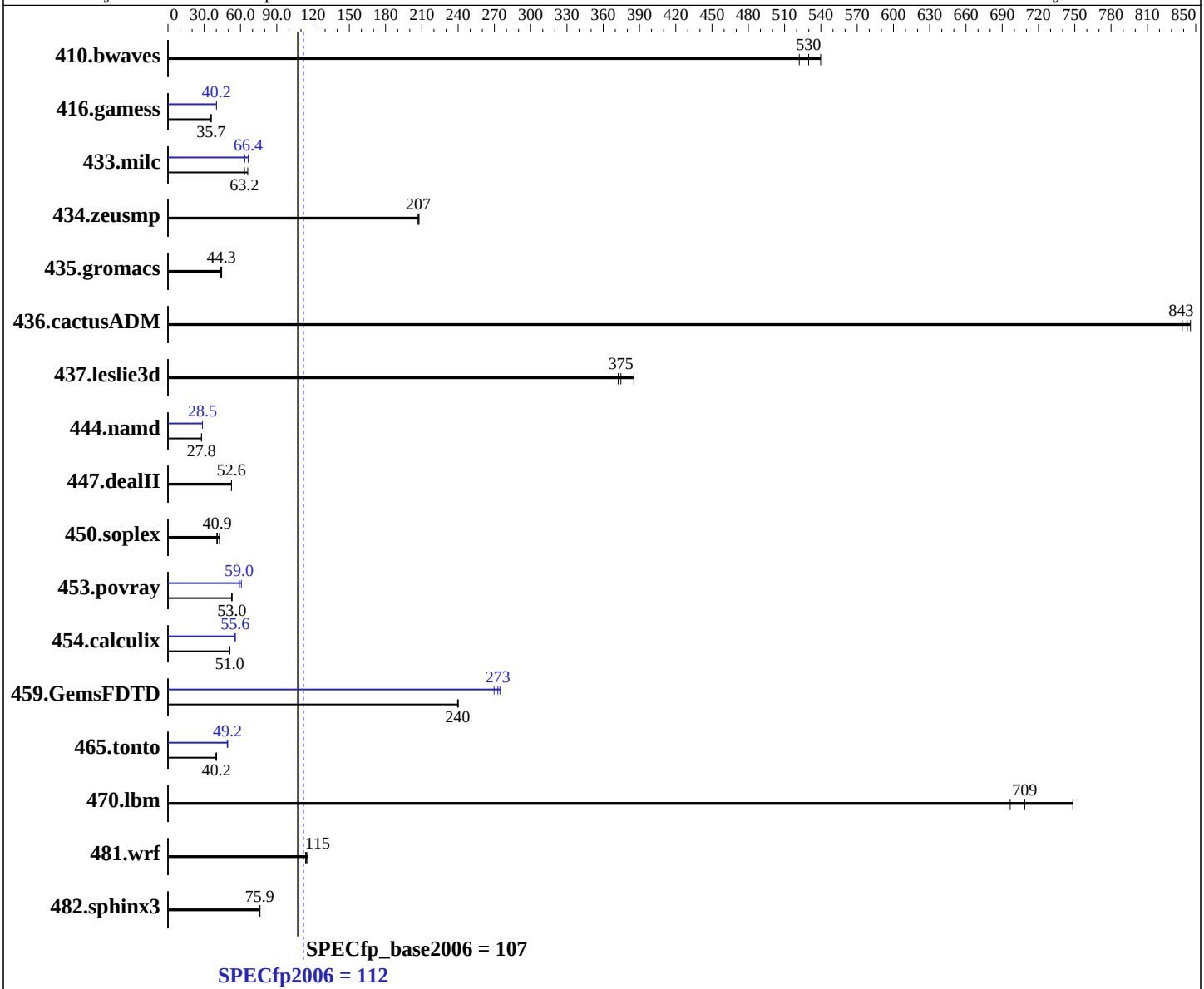
Express5800/R120f-2M (Intel Xeon E5-2660 v3)

SPECfp®2006 = 112

SPECfp_base2006 = 107

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

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




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5-2660 v3 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.30 GHz |
| CPU MHz: | 2600 |
| FPU: | Integrated |
| CPU(s) enabled: | 20 cores, 2 chips, 10 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: | 25 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 | 26.0 | 522 | **25.6** | **530** | 25.2 | 540 | 26.0 | 522 | **25.6** | **530** | 25.2 | 540 |
| 416.gamess | 550 | 35.6 | 548 | 35.7 | **549** | **35.7** | 488 | 40.1 | **488** | **40.2** | 487 | 40.2 |
| 433.milc | 146 | 62.9 | **145** | **63.2** | 139 | 66.0 | 144 | 63.5 | **138** | **66.4** | 138 | 66.6 |
| 434.zeusmp | 44.0 | 207 | **43.9** | **207** | 43.8 | 208 | 44.0 | 207 | **43.9** | **207** | 43.8 | 208 |
| 435.gromacs | 161 | 44.4 | **161** | **44.3** | 163 | 43.7 | 161 | 44.4 | **161** | **44.3** | 163 | 43.7 |
| 436.cactusADM | **14.2** | **843** | 14.1 | 846 | 14.2 | 839 | **14.2** | **843** | 14.1 | 846 | 14.2 | 839 |
| 437.leslie3d | **25.1** | **375** | 24.4 | 385 | 25.2 | 372 | **25.1** | **375** | 24.4 | 385 | 25.2 | 372 |
| 444.namd | **289** | **27.8** | 289 | 27.8 | 288 | 27.8 | 281 | 28.5 | **281** | **28.5** | 281 | 28.6 |
| 447.dealII | 218 | 52.6 | **218** | **52.6** | 218 | 52.6 | 218 | 52.6 | **218** | **52.6** | 218 | 52.6 |
| 450.soplex | **204** | **40.9** | 196 | 42.6 | 206 | 40.4 | **204** | **40.9** | 196 | 42.6 | 206 | 40.4 |
| 453.povray | **100** | **53.0** | 100 | 53.0 | 101 | 52.6 | 87.6 | 60.7 | 90.2 | 59.0 | **90.2** | **59.0** |
| 454.calculix | 161 | 51.1 | 162 | 51.0 | **162** | **51.0** | 149 | 55.4 | **148** | **55.6** | 148 | 55.6 |
| 459.GemsFDTD | 44.3 | 240 | 44.2 | 240 | **44.3** | **240** | **38.9** | **273** | 39.3 | 270 | 38.6 | 275 |
| 465.tonto | 248 | 39.7 | 245 | 40.2 | **245** | **40.2** | **200** | **49.2** | 201 | 49.0 | 199 | 49.5 |
| 470.lbm | 19.7 | 697 | 18.4 | 748 | **19.4** | **709** | 19.7 | 697 | 18.4 | 748 | **19.4** | **709** |
| 481.wrf | 98.1 | 114 | **97.5** | **115** | 96.7 | 115 | 98.1 | 114 | **97.5** | **115** | 96.7 | 115 |
| 482.sphinx3 | 257 | 75.8 | 256 | 76.2 | **257** | **75.9** | 257 | 75.8 | 256 | 76.2 | **257** | **75.9** |

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
 Demand 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 = "20"

 The Express5800/R120f-1M (Intel Xeon E5-2660 v3) and
 the Express5800/R120f-2M (Intel Xeon E5-2660 v3) models are electronically equivalent.
 The results have been measured on the Express5800/R120f-2M (Intel Xeon E5-2660 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-ic14.0-official-linux64.20140128.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-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-120f-RevB.xml


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