# SPEC® CFP2006 Result

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## NEC Corporation

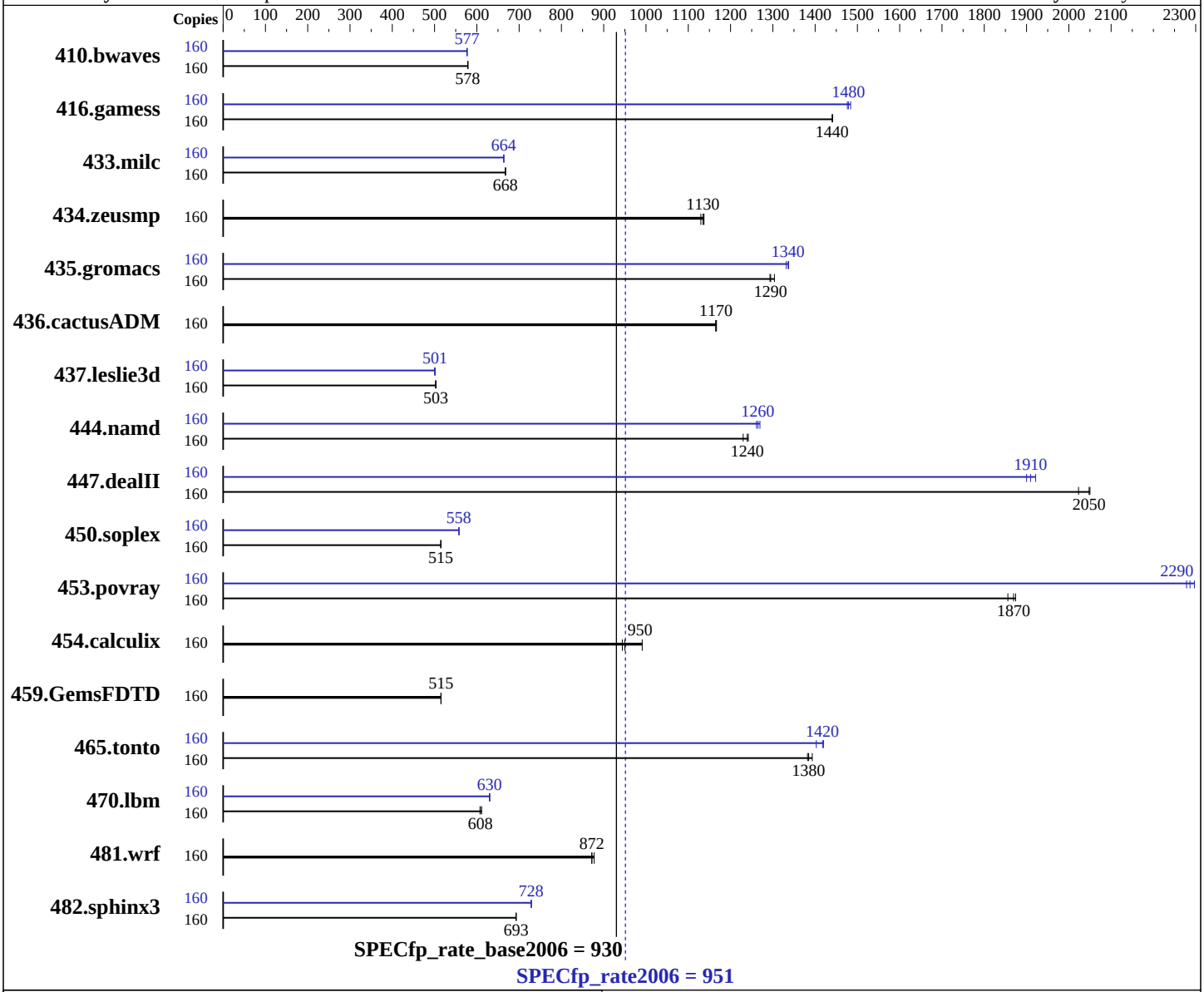
## Express5800/A1080a-E (Intel Xeon E7-8850)

**SPECfp®_rate2006 = 951**

**SPECfp_rate_base2006 = 930**

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

**Test date:** Nov-2011
**Hardware Availability:** Nov-2011
**Software Availability:** May-2011




### Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E7-8850 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 2.40 GHz |
| CPU MHz: | 2000 |
| FPU: | Integrated |
| CPU(s) enabled: | 80 cores, 8 chips, 10 cores/chip, 2 threads/core |
| CPU(s) orderable: | 8 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 6.1, Kernel 2.6.32-131.0.15.el6.x86_64 on an x86_64 |
| Compiler: | C/C++/Fortran: Version 12.0.4.191 of Intel Compiler XE Build 20110427 |
| Auto Parallel: | No |
| File System: | ext4 |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |
| Peak Pointers: | 32/64-bit |

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L3 Cache: 24 MB I+D on chip per chip
Other Cache: None
Memory: 1 TB (128 x 8 GB 2Rx4 PC3-8500R-7, ECC)
Disk Subsystem: 2x300 GB SAS, 10000 RPM, RAID 0
Other Hardware: None

Other Software: None

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 160 | 3754 | 579 | 3760 | 578 | **3759** | **578** | 160 | **3768** | **577** | 3767 | 577 | 3773 | 576 |
| 416.gamess | 160 | 2174 | 1440 | 2175 | 1440 | **2175** | **1440** | 160 | 2122 | 1480 | **2119** | **1480** | 2111 | 1480 |
| 433.milc | 160 | 2199 | 668 | 2202 | 667 | **2200** | **668** | 160 | **2213** | **664** | 2213 | 664 | 2212 | 664 |
| 434.zeusmp | 160 | 1280 | 1140 | 1289 | 1130 | **1283** | **1130** | 160 | 1280 | 1140 | 1289 | 1130 | **1283** | **1130** |
| 435.gromacs | 160 | 876 | 1300 | 883 | 1290 | **882** | **1290** | 160 | **855** | **1340** | 858 | 1330 | 854 | 1340 |
| 436.cactusADM | 160 | 1639 | 1170 | **1641** | **1170** | 1641 | 1160 | 160 | 1639 | 1170 | **1641** | **1170** | 1641 | 1160 |
| 437.leslie3d | 160 | 2987 | 503 | **2992** | **503** | 2993 | 503 | 160 | 3009 | 500 | **3001** | **501** | 3000 | 501 |
| 444.namd | 160 | **1035** | **1240** | 1033 | 1240 | 1043 | 1230 | 160 | **1014** | **1260** | 1011 | 1270 | 1017 | 1260 |
| 447.dealII | 160 | 905 | 2020 | 893 | 2050 | **894** | **2050** | 160 | **959** | **1910** | 953 | 1920 | 963 | 1900 |
| 450.soplex | 160 | 2589 | 515 | 2594 | 514 | **2592** | **515** | 160 | 2393 | 558 | 2391 | 558 | **2393** | **558** |
| 453.povray | 160 | **455** | **1870** | 454 | 1870 | 459 | 1860 | 160 | 371 | 2300 | 374 | 2280 | **372** | **2290** |
| 454.calculix | 160 | **1389** | **950** | 1332 | 991 | 1398 | 944 | 160 | **1389** | **950** | 1332 | 991 | 1398 | 944 |
| 459.GemsFDTD | 160 | **3295** | **515** | 3294 | 515 | 3295 | 515 | 160 | **3295** | **515** | 3294 | 515 | 3295 | 515 |
| 465.tonto | 160 | 1130 | 1390 | 1139 | 1380 | **1137** | **1380** | 160 | 1122 | 1400 | 1109 | 1420 | **1111** | **1420** |
| 470.lbm | 160 | **3613** | **608** | 3619 | 607 | 3595 | 611 | 160 | 3492 | 630 | **3488** | **630** | 3486 | 631 |
| 481.wrf | 160 | **2049** | **872** | 2037 | 878 | 2050 | 872 | 160 | **2049** | **872** | 2037 | 878 | 2050 | 872 |
| 482.sphinx3 | 160 | 4499 | 693 | 4504 | 692 | **4500** | **693** | 160 | 4282 | 728 | 4277 | 729 | **4281** | **728** |

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

## Submit Notes

```
The config file option 'submit' was used.
 numactl was used to bind copies to the cores
```

## Operating System Notes

```
'ulimit -s unlimited' was used to set the stack size to unlimited prior to run
echo 1 > /proc/sys/vm/zone_reclaim_mode
'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
echo 72000 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

## Platform Notes

```
ACPI type set to Type-3 in BIOS
Patrol Scrubbing set to disabled in Maintenance Console
```

## General Notes

```
Binaries were compiled on RHEL 5.6
```

# 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:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias
```

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## Base Optimization Flags (Continued)

C++ benchmarks:
`-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias`

Fortran benchmarks:
`-xSSE4.2 -ipo -O3 -no-prec-div -static`

Benchmarks using both Fortran and C:
`-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias`

## Peak Compiler Invocation

C benchmarks (except as noted below):
`icc -m64`

482.sphinx3: `icc -m32`

C++ benchmarks (except as noted below):
`icpc -m64`

450.soplex: `icpc -m32`

Fortran benchmarks:
`ifort -m64`

Benchmarks using both Fortran and C:
`icc -m64 ifort -m64`

## Peak 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`
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`

# Peak Optimization Flags

C benchmarks:

433.milc: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32

470.lbm: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3 -ansi-alias -opt-prefetch -static -auto-ilp32

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2

C++ benchmarks:

444.namd: -xSSE4.2(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: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32

450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3 -B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

453.povray: -xSSE4.2(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: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -static

416.gamess: -xSSE4.2(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: -xSSE4.2 -ipo -O3 -no-prec-div -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

459.GemsFDTD: basepeak = yes

465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -auto -inline-calloc -opt-malloc-options=3 -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

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# Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

435.gromacs: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2) `-no-prec-div`(pass 2) `-prof-use`(pass 2) `-opt-prefetch` `-static -auto-ilp32`

436.cactusADM: `basepeak = yes`

454.calculix: `basepeak = yes`

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.20110705.html
http://www.spec.org/cpu2006/flags/NEC-platform-linux64-revB.20120103.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.20110705.xml
http://www.spec.org/cpu2006/flags/NEC-platform-linux64-revB.20120103.xml


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