# SPEC® CFP2006 Result
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## NEC Corporation

$SPECfp^{®}2006 =$    73.6

Express5800/R120d-2M (Intel Xeon E5-2640)
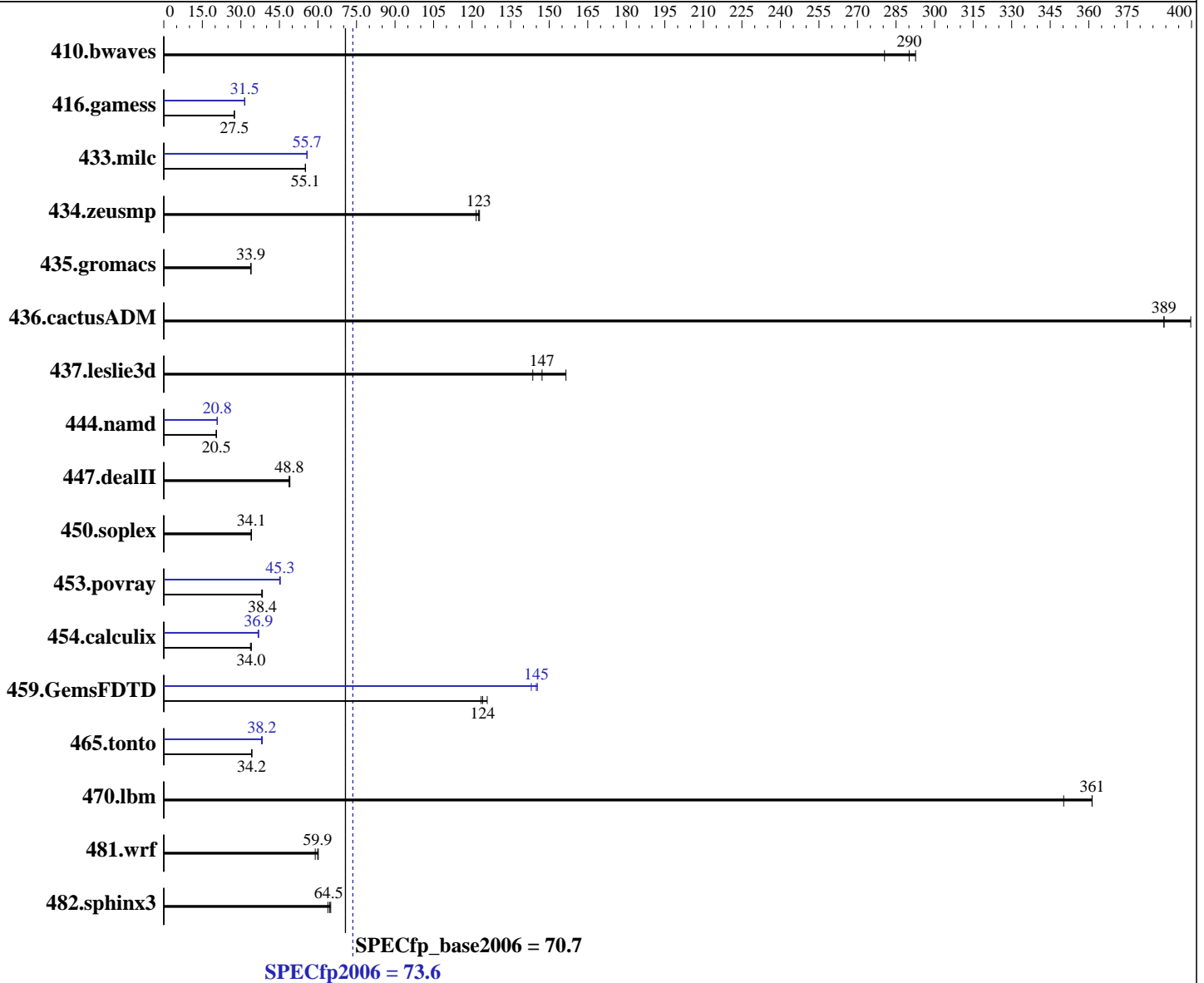
$SPECfp\_base2006 =$    70.7

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

**Test date:** May-2012
**Hardware Availability:** Apr-2012
**Software Availability:** Dec-2011



| Benchmark | Value |
|---|---|
| 410.bwaves | 290 |
| 416.gamess | 31.5 / 27.5 |
| 433.milc | 55.7 / 55.1 |
| 434.zeusmp | 123 |
| 435.gromacs | 33.9 |
| 436.cactusADM | 389 |
| 437.leslie3d | 147 |
| 444.namd | 20.8 / 20.5 |
| 447.dealII | 48.8 |
| 450.soplex | 34.1 |
| 453.povray | 45.3 / 38.4 |
| 454.calculix | 36.9 / 34.0 |
| 459.GemsFDTD | 145 / 124 |
| 465.tonto | 38.2 / 34.2 |
| 470.lbm | 361 |
| 481.wrf | 59.9 |
| 482.sphinx3 | 64.5 |

**SPECfp_base2006 = 70.7**
**SPECfp2006 = 73.6**

## Hardware

CPU Name: Intel Xeon E5-2640
CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz
CPU MHz: 2500
FPU: Integrated
CPU(s) enabled: 12 cores, 2 chips, 6 cores/chip, 2 threads/core
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
**Continued on next page**

## Software

Operating System: Red Hat Enterprise Linux Server release 6.2
Kernel 2.6.32-220.el6.x86_64
Compiler: C/C++: Version 12.1.2.273 of Intel C++ Studio XE for Linux;
Fortran: Version 12.1.2.273 of Intel Fortran Studio XE for Linux
Auto Parallel: Yes
File System: ext4
System State: Run level 3 (multi-user)
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| | |
|---|---|
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| | | | |
|---|---|---|---|
| L3 Cache: | 15 MB I+D on chip per chip | Base Pointers: | 64-bit |
| Other Cache: | None | Peak Pointers: | 32/64-bit |
| Memory: | 128 GB (16 x 8 GB 2Rx4 PC3L-12800R-11, ECC, running at 1333 MHz and CL9) | Other Software: | None |
| Disk Subsystem: | 1 x 250 GB SATA, 7200 RPM | | |
| Other Hardware: | None | | |

## Results Table

| Benchmark | Base | | | | | | Peak | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | **46.8** | **290** | 46.4 | 293 | 48.4 | 281 | **46.8** | **290** | 46.4 | 293 | 48.4 | 281 |
| 416.gamess | 716 | 27.4 | **713** | **27.5** | 712 | 27.5 | 622 | 31.5 | 623 | 31.4 | **622** | **31.5** |
| 433.milc | **166** | **55.1** | 166 | 55.1 | 167 | 55.1 | **165** | **55.7** | 165 | 55.8 | 165 | 55.7 |
| 434.zeusmp | 74.1 | 123 | 74.9 | 122 | **74.3** | **123** | 74.1 | 123 | 74.9 | 122 | **74.3** | **123** |
| 435.gromacs | 211 | 33.9 | **211** | **33.9** | 211 | 33.9 | 211 | 33.9 | **211** | **33.9** | 211 | 33.9 |
| 436.cactusADM | 30.7 | 389 | 29.9 | 400 | **30.7** | **389** | 30.7 | 389 | 29.9 | 400 | **30.7** | **389** |
| 437.leslie3d | 60.1 | 157 | 65.5 | 144 | **63.9** | **147** | 60.1 | 157 | 65.5 | 144 | **63.9** | **147** |
| 444.namd | **392** | **20.5** | 392 | 20.4 | 392 | 20.5 | 386 | 20.8 | 385 | 20.8 | **385** | **20.8** |
| 447.dealII | **234** | **48.8** | 234 | 48.8 | 233 | 49.1 | **234** | **48.8** | 234 | 48.8 | 233 | 49.1 |
| 450.soplex | 244 | 34.1 | **245** | **34.1** | 245 | 34.0 | 244 | 34.1 | **245** | **34.1** | 245 | 34.0 |
| 453.povray | 139 | 38.4 | **139** | **38.4** | 140 | 38.1 | 117 | 45.3 | 118 | 45.1 | **117** | **45.3** |
| 454.calculix | **243** | **34.0** | 242 | 34.1 | 245 | 33.7 | 225 | 36.7 | **224** | **36.9** | 224 | 36.9 |
| 459.GemsFDTD | 84.3 | 126 | **85.5** | **124** | 85.9 | 124 | 74.2 | 143 | 73.0 | 145 | **73.2** | **145** |
| 465.tonto | 288 | 34.2 | **287** | **34.2** | 287 | 34.3 | 257 | 38.3 | **257** | **38.2** | 259 | 38.0 |
| 470.lbm | 39.2 | 350 | **38.0** | **361** | 38.0 | 361 | 39.2 | 350 | **38.0** | **361** | 38.0 | 361 |
| 481.wrf | **187** | **59.9** | 190 | 58.9 | 186 | 60.1 | **187** | **59.9** | 190 | 58.9 | 186 | 60.1 |
| 482.sphinx3 | **302** | **64.5** | 300 | 65.0 | 305 | 63.9 | **302** | **64.5** | 300 | 65.0 | 305 | 63.9 |

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:
     Energy Performance: Performance

## General Notes

    Environment variables set by runspec before the start of the run:
    KMP_AFFINITY = "granularity=fine,scatter"
    LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64"

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$SPECfp\_base2006 =$    70.7

## General Notes (Continued)

```
OMP_NUM_THREADS = "12"

 The Express5800/R120d-1M and
 the Express5800/R120d-2M models are electronically equivalent.
 The results have been measured on the Express5800/R120d-2M model.

 Added glibc-static-2.12-1.47.el6.x86_64.rpm
 to enable static linking

 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
```

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## Base Optimization Flags

C benchmarks:
```
-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias
```

C++ benchmarks:
```
-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias
```

Fortran benchmarks:
```
-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xAVX -ipo -O3 -no-prec-div -static -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: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
              -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32
              -ansi-alias

    470.lbm: basepeak = yes

    482.sphinx3: basepeak = yes
```

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# Peak Optimization Flags (Continued)

C++ benchmarks:

    444.namd: -xAVX(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: -xAVX(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: -xAVX(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: basepeak = yes

    459.GemsFDTD: -xAVX(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: -xAVX(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: -xAVX -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-ic12.1-official-linux64.20111122.html
http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-R120d-RevA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.xml
http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-R120d-RevA.xml

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SPECfp2006 =          73.6

SPECfp_base2006 =          70.7

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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