# SPEC® CFP2006 Result

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## NEC Corporation

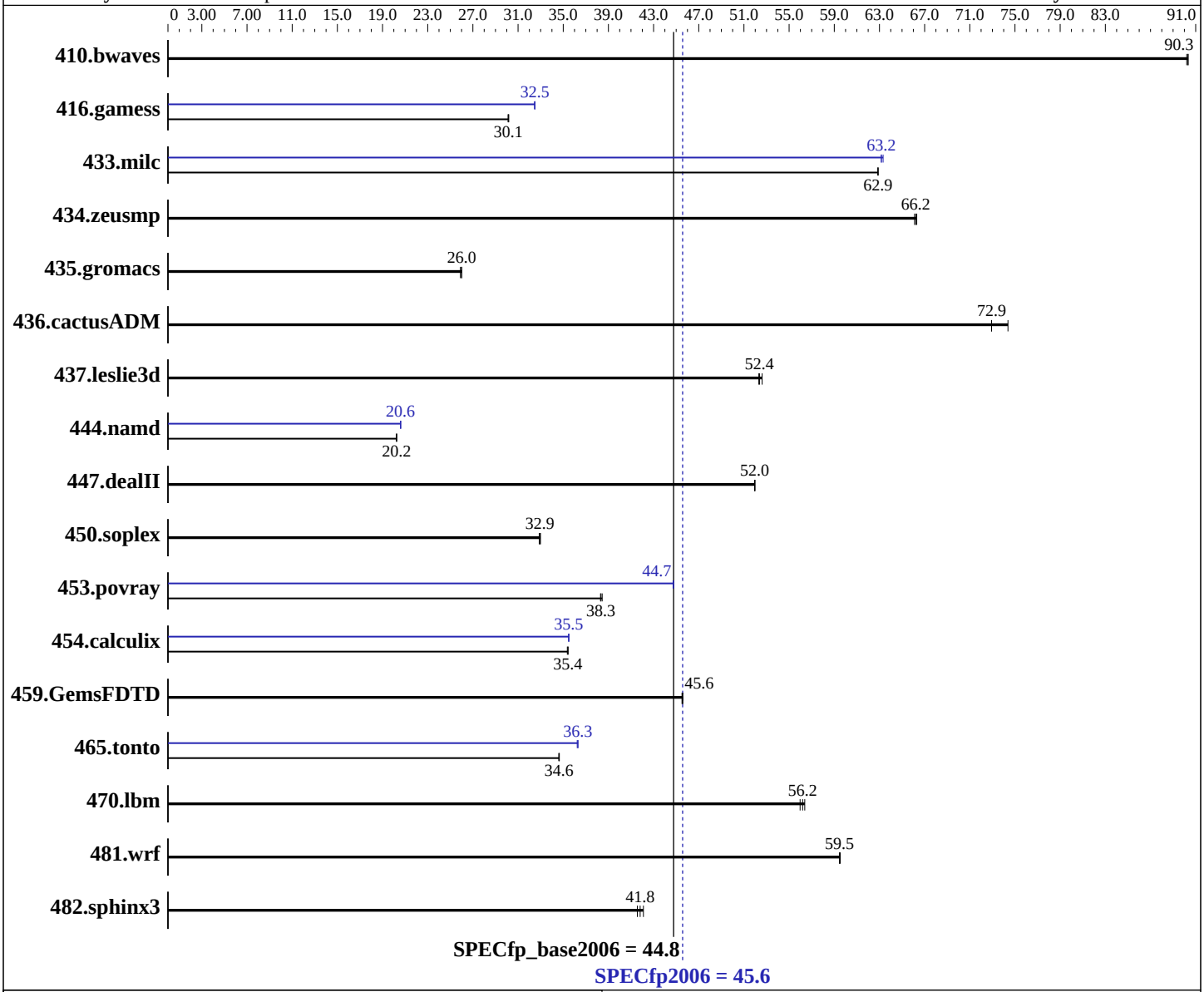
## Express5800/GT110e-S (Intel Pentium G2020)

SPECfp®2006 = 45.6

SPECfp_base2006 = 44.8

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

**Test date:** May-2013
**Hardware Availability:** Apr-2013
**Software Availability:** Feb-2012




### Hardware

| | |
|---|---|
| CPU Name: | Intel Pentium G2020 |
| CPU Characteristics: | |
| CPU MHz: | 2900 |
| FPU: | Integrated |
| CPU(s) enabled: | 2 cores, 1 chip, 2 cores/chip |
| CPU(s) orderable: | 1 chip |
| 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 6.2 (Santiago)<br>Kernel 2.6.32-220.el6.x86_64 |
| Compiler: | C/C++: Version 12.1.3.293 of Intel C++ Studio XE for Linux;<br>Fortran: Version 12.1.3.293 of Intel Fortran Studio XE for Linux |
| Auto Parallel: | Yes |
| File System: | ext4 |

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L3 Cache: 3 MB I+D on chip per chip
Other Cache: None
Memory: 16 GB (2 x 8 GB 2Rx8 PC3L-12800E-11, ECC, running at 1333 MHz and CL9)
Disk Subsystem: 1 x 500 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 | 150 | 90.3 | 151 | 90.2 | **150** | **90.3** | 150 | 90.3 | 151 | 90.2 | **150** | **90.3** |
| 416.gamess | 650 | 30.1 | **650** | **30.1** | 649 | 30.2 | 602 | 32.5 | **603** | **32.5** | 603 | 32.5 |
| 433.milc | 146 | 62.9 | 146 | 62.9 | **146** | **62.9** | 145 | 63.2 | 145 | 63.3 | **145** | **63.2** |
| 434.zeusmp | 137 | 66.3 | **137** | **66.2** | 138 | 66.1 | 137 | 66.3 | **137** | **66.2** | 138 | 66.1 |
| 435.gromacs | 276 | 25.9 | **275** | **26.0** | 275 | 26.0 | 276 | 25.9 | **275** | **26.0** | 275 | 26.0 |
| 436.cactusADM | 161 | 74.4 | **164** | **72.9** | 164 | 72.9 | 161 | 74.4 | **164** | **72.9** | 164 | 72.9 |
| 437.leslie3d | 180 | 52.3 | 179 | 52.6 | **179** | **52.4** | 180 | 52.3 | 179 | 52.6 | **179** | **52.4** |
| 444.namd | 396 | 20.2 | **396** | **20.2** | 396 | 20.2 | 389 | 20.6 | **389** | **20.6** | 389 | 20.6 |
| 447.dealII | **220** | **52.0** | 220 | 51.9 | 220 | 52.0 | **220** | **52.0** | 220 | 51.9 | 220 | 52.0 |
| 450.soplex | 253 | 33.0 | 254 | 32.9 | **253** | **32.9** | 253 | 33.0 | 254 | 32.9 | **253** | **32.9** |
| 453.povray | 138 | 38.4 | **139** | **38.3** | 139 | 38.3 | 119 | 44.8 | **119** | **44.7** | 119 | 44.7 |
| 454.calculix | **233** | **35.4** | 233 | 35.4 | 233 | 35.4 | 233 | 35.5 | 232 | 35.5 | **232** | **35.5** |
| 459.GemsFDTD | **233** | **45.6** | 233 | 45.5 | 233 | 45.6 | **233** | **45.6** | 233 | 45.5 | 233 | 45.6 |
| 465.tonto | 284 | 34.6 | 284 | 34.7 | **284** | **34.6** | 271 | 36.3 | **271** | **36.3** | 272 | 36.2 |
| 470.lbm | **244** | **56.2** | 245 | 56.0 | 244 | 56.4 | **244** | **56.2** | 245 | 56.0 | 244 | 56.4 |
| 481.wrf | **188** | **59.5** | 188 | 59.5 | 188 | 59.5 | **188** | **59.5** | 188 | 59.5 | 188 | 59.5 |
| 482.sphinx3 | 463 | 42.1 | 469 | 41.6 | **466** | **41.8** | 463 | 42.1 | 469 | 41.6 | **466** | **41.8** |

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

```
Default BIOS settings were used.
```

## 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"
OMP_NUM_THREADS = "2"
```

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## General Notes (Continued)

```
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
```

## Base Optimization Flags

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

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## Base Optimization Flags (Continued)

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

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

Benchmarks using both Fortran and C:
`-xSSE4.2 -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: `-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 -ansi-alias`

470.lbm: `basepeak = yes`

482.sphinx3: `basepeak = yes`

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`

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# Peak Optimization Flags (Continued)

447.dealII: basepeak = yes

450.soplex: basepeak = yes

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

Fortran benchmarks:

410.bwaves: basepeak = yes

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: basepeak = yes

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) -inline-calloc -opt-malloc-options=3 -auto -unroll4

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xSSE4.2 -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-linux64.20120425.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-linux64.20120425.xml
http://www.spec.org/cpu2006/flags/NEC-Platform-Settings-V1.2-R120d-RevA.xml

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