# SPEC® CFP2006 Result

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## IBM Corporation

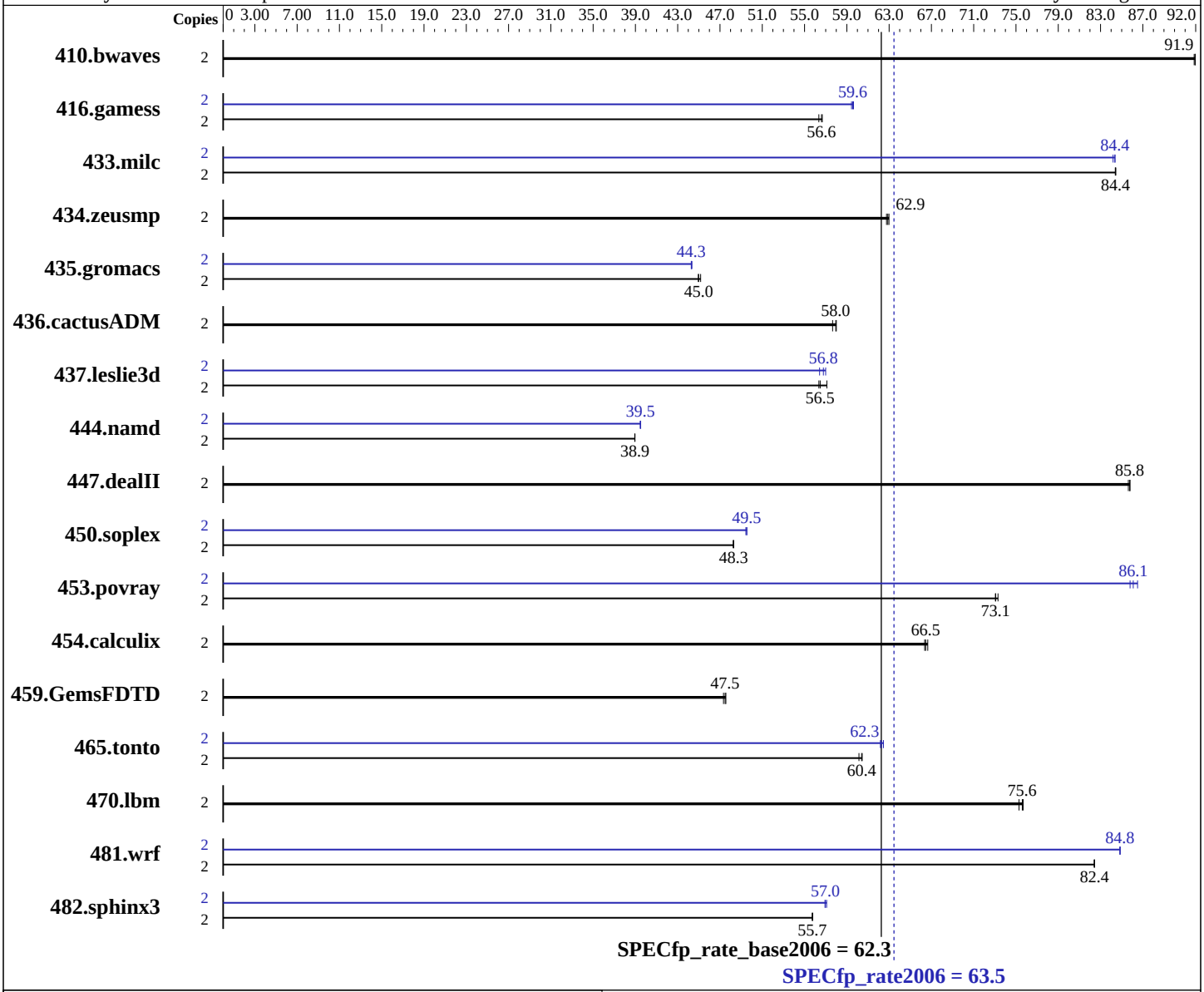
## IBM System x3100 M4 (Intel Pentium G850)

**SPECfp®_rate2006 = 63.5**

**SPECfp_rate_base2006 = 62.3**

**CPU2006 license:** 11
**Test sponsor:** IBM Corporation
**Tested by:** IBM Corporation

**Test date:** Nov-2011
**Hardware Availability:** Oct-2011
**Software Availability:** Aug-2011




### Hardware

| | |
|---|---|
| CPU Name: | Intel Pentium G850 |
| 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 6.1, Kernel 2.6.32-131.0.15.el6.x86_64 |
| Compiler: | C/C++/Fortran: Version 12.1.0.225 of Intel Compiler XE Build 20110803 |
| Auto Parallel: | No |
| File System: | ext4 |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 32/64-bit |

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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 PC3-10600E-9, ECC)
Disk Subsystem: 1 x 250 GB SATA, 7200 RPM
Other Hardware: None

Peak Pointers: 32/64-bit
Other Software: None

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 2 | **296** | **91.9** | 296 | 92.0 | 296 | 91.9 | 2 | **296** | **91.9** | 296 | 92.0 | 296 | 91.9 |
| 416.gamess | 2 | 691 | 56.7 | 695 | 56.4 | **692** | **56.6** | 2 | 659 | 59.4 | 657 | 59.6 | **658** | **59.6** |
| 433.milc | 2 | **218** | **84.4** | 218 | 84.4 | 217 | 84.4 | 2 | 218 | 84.2 | **218** | **84.4** | 218 | 84.4 |
| 434.zeusmp | 2 | **289** | **62.9** | 290 | 62.8 | 289 | 63.0 | 2 | **289** | **62.9** | 290 | 62.8 | 289 | 63.0 |
| 435.gromacs | 2 | 316 | 45.2 | **317** | **45.0** | 318 | 44.9 | 2 | **322** | **44.3** | 322 | 44.3 | 322 | 44.3 |
| 436.cactusADM | 2 | 415 | 57.7 | 412 | 58.0 | **412** | **58.0** | 2 | 415 | 57.7 | 412 | 58.0 | **412** | **58.0** |
| 437.leslie3d | 2 | 329 | 57.1 | **333** | **56.5** | 334 | 56.4 | 2 | 333 | 56.4 | **331** | **56.8** | 330 | 57.0 |
| 444.namd | 2 | **412** | **38.9** | 412 | 39.0 | 412 | 38.9 | 2 | 407 | 39.5 | **406** | **39.5** | 406 | 39.5 |
| 447.dealII | 2 | 267 | 85.8 | **267** | **85.8** | 267 | 85.6 | 2 | 267 | 85.8 | **267** | **85.8** | 267 | 85.6 |
| 450.soplex | 2 | **345** | **48.3** | 346 | 48.3 | 345 | 48.3 | 2 | 337 | 49.5 | **337** | **49.5** | 337 | 49.4 |
| 453.povray | 2 | 145 | 73.3 | **146** | **73.1** | 146 | 73.1 | 2 | 124 | 85.8 | 123 | 86.5 | **124** | **86.1** |
| 454.calculix | 2 | 248 | 66.7 | **248** | **66.5** | 249 | 66.4 | 2 | 248 | 66.7 | **248** | **66.5** | 249 | 66.4 |
| 459.GemsFDTD | 2 | **447** | **47.5** | 448 | 47.3 | 446 | 47.6 | 2 | **447** | **47.5** | 448 | 47.3 | 446 | 47.6 |
| 465.tonto | 2 | 327 | 60.1 | 326 | 60.5 | **326** | **60.4** | 2 | 315 | 62.5 | 317 | 62.2 | **316** | **62.3** |
| 470.lbm | 2 | 363 | 75.7 | **364** | **75.6** | 365 | 75.3 | 2 | 363 | 75.7 | **364** | **75.6** | 365 | 75.3 |
| 481.wrf | 2 | 271 | 82.4 | 271 | 82.4 | **271** | **82.4** | 2 | 263 | 84.9 | **263** | **84.8** | 263 | 84.8 |
| 482.sphinx3 | 2 | 699 | 55.7 | **699** | **55.7** | 699 | 55.8 | 2 | **684** | **57.0** | 685 | 56.9 | 683 | 57.1 |

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.
 taskset was used to bind copies to the cores
```

## Platform Notes

```
BIOS Settings:
C-State enabled in BIOS
```

## General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/root/SPECcpu12.1/smartheap:/root/SPECcpu12.1/ic12.1-libs/ia32/:/root/SPECcpu12.1/ic12.1-libs/intel64"
```

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## General Notes (Continued)

```
Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
memory using RHEL5.5 with binutils-2.17.50.0.6-14.el5
Stack size set to unlimited using "ulimit -s unlimited"
Transparent Huge Pages disabled with:
echo never  > /sys/kernel/mm/redhat_transparent_hugepage/enabled
Filesystem page cache cleared with:
echo 1>       /proc/sys/vm/drop_caches
runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>
```

## 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 -opt-prefetch -auto-p32 -ansi-alias -opt-mem-layout-trans=3`

C++ benchmarks:
`-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32 -ansi-alias -opt-mem-layout-trans=3`

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

Benchmarks using both Fortran and C:
`-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32 -ansi-alias -opt-mem-layout-trans=3`

## 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`

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## Peak Portability Flags (Continued)

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) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -static -auto-ilp32

470.lbm: basepeak = yes

482.sphinx3: -xSSE4.2 -ipo -O3 -no-prec-div -opt-mem-layout-trans=3 -unroll2

C++ benchmarks:

444.namd: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes

450.soplex: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -opt-malloc-options=3

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -opt-mem-layout-trans=3(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: -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch

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# Peak Optimization Flags (Continued)

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

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) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -opt-prefetch -static -auto-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: -xSSE4.2 -ipo -O3 -no-prec-div -static -auto-ilp32

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic12.1-linux64.html
http://www.spec.org/cpu2006/flags/IBM-platform-linux64-revB.20111206.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.1-linux64.xml
http://www.spec.org/cpu2006/flags/IBM-platform-linux64-revB.20111206.xml


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