



SPEC[®] CFP2006 Result

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IBM Corporation

IBM System x3100 M4
(Intel Core i3-3240, 3.40 GHz)

SPECfp[®]_rate2006 = 86.8

SPECfp_rate_base2006 = 84.1

CPU2006 license: 11

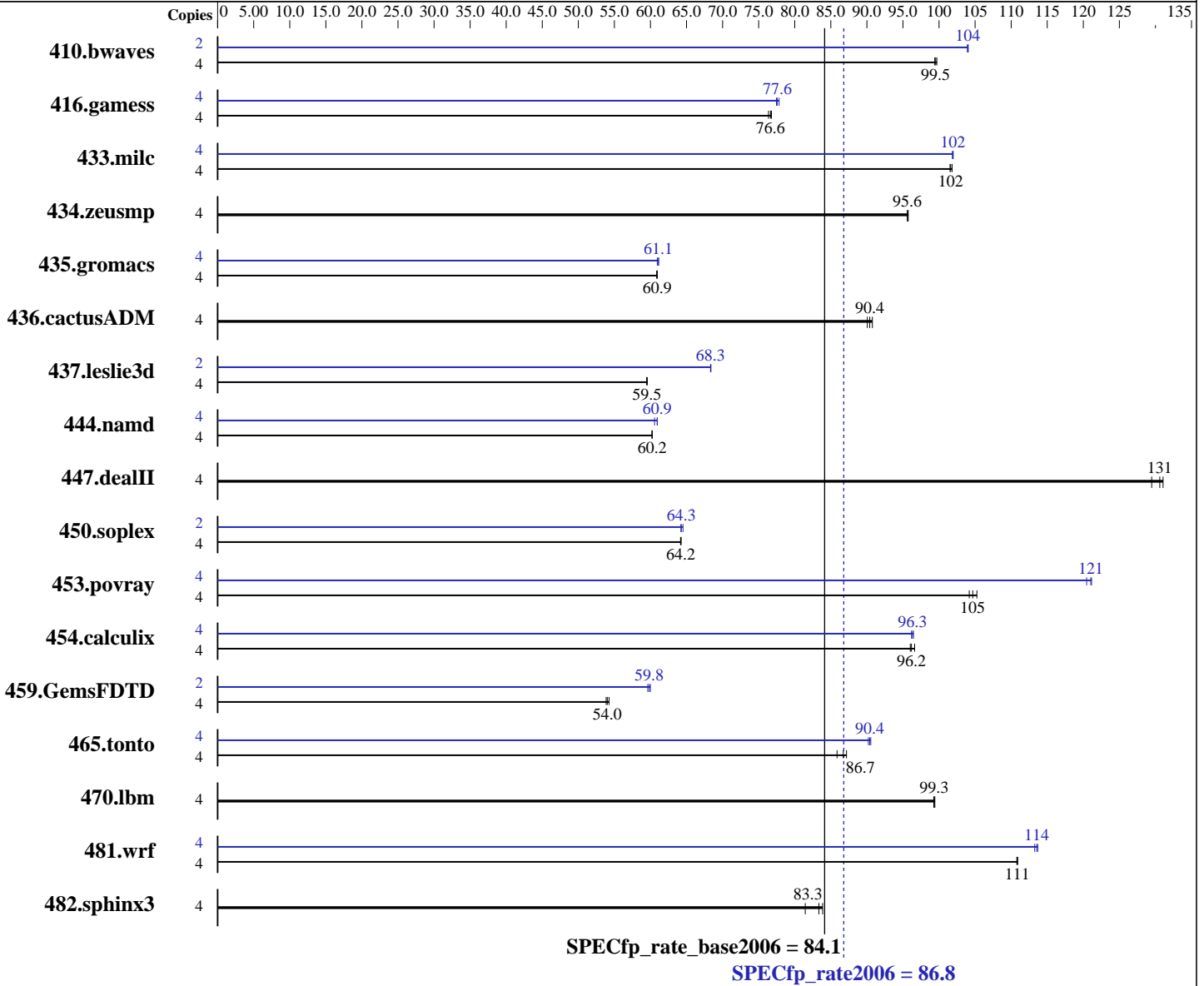
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Oct-2012

Hardware Availability: Sep-2012

Software Availability: Dec-2011



Hardware

CPU Name: Intel Core i3-3240
 CPU Characteristics:
 CPU MHz: 3400
 FPU: Integrated
 CPU(s) enabled: 2 cores, 1 chip, 2 cores/chip, 2 threads/core
 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)
 2.6.32-220.el6.x86_64
 Compiler: C/C++: Version 12.1.0.225 of Intel C++ Studio XE for Linux;
 Fortran: Version 12.1.0.225 of Intel Fortran Studio XE for Linux
 Auto Parallel: No
 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 PC3-12800E-11, ECC)
Disk Subsystem: 1 x 250 GB SATA, 7200 RPM
Other Hardware: None

System State: Run level 3 (multi-user)
Base Pointers: 32/64-bit
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 | 4 | 547 | 99.4 | 546 | 99.5 | 545 | 99.7 | 2 | 261 | 104 | 261 | 104 | 262 | 104 |
| 416.gamess | 4 | 1022 | 76.6 | 1026 | 76.4 | 1020 | 76.8 | 4 | 1010 | 77.6 | 1006 | 77.8 | 1011 | 77.5 |
| 433.milc | 4 | 361 | 102 | 361 | 102 | 362 | 102 | 4 | 361 | 102 | 360 | 102 | 360 | 102 |
| 434.zeusmp | 4 | 380 | 95.7 | 381 | 95.6 | 381 | 95.6 | 4 | 380 | 95.7 | 381 | 95.6 | 381 | 95.6 |
| 435.gromacs | 4 | 469 | 60.9 | 469 | 60.9 | 469 | 60.9 | 4 | 469 | 60.9 | 467 | 61.1 | 467 | 61.1 |
| 436.cactusADM | 4 | 531 | 90.1 | 529 | 90.4 | 527 | 90.8 | 4 | 531 | 90.1 | 529 | 90.4 | 527 | 90.8 |
| 437.leslie3d | 4 | 632 | 59.5 | 631 | 59.5 | 632 | 59.5 | 2 | 275 | 68.4 | 275 | 68.3 | 275 | 68.3 |
| 444.namd | 4 | 533 | 60.2 | 533 | 60.2 | 533 | 60.2 | 4 | 530 | 60.6 | 526 | 60.9 | 526 | 60.9 |
| 447.dealII | 4 | 353 | 129 | 350 | 131 | 349 | 131 | 4 | 353 | 129 | 350 | 131 | 349 | 131 |
| 450.soplex | 4 | 519 | 64.3 | 520 | 64.2 | 520 | 64.2 | 2 | 259 | 64.5 | 260 | 64.3 | 260 | 64.2 |
| 453.povray | 4 | 202 | 105 | 203 | 105 | 204 | 104 | 4 | 176 | 121 | 176 | 121 | 177 | 120 |
| 454.calculix | 4 | 344 | 96.0 | 343 | 96.2 | 342 | 96.6 | 4 | 343 | 96.2 | 343 | 96.3 | 342 | 96.5 |
| 459.GemsFDTD | 4 | 788 | 53.9 | 786 | 54.0 | 782 | 54.3 | 2 | 356 | 59.6 | 354 | 60.0 | 355 | 59.8 |
| 465.tonto | 4 | 454 | 86.7 | 451 | 87.2 | 458 | 85.9 | 4 | 436 | 90.2 | 435 | 90.4 | 435 | 90.5 |
| 470.lbm | 4 | 554 | 99.3 | 553 | 99.3 | 553 | 99.4 | 4 | 554 | 99.3 | 553 | 99.3 | 553 | 99.4 |
| 481.wrf | 4 | 403 | 111 | 403 | 111 | 403 | 111 | 4 | 394 | 114 | 394 | 113 | 393 | 114 |
| 482.sphinx3 | 4 | 930 | 83.9 | 957 | 81.5 | 935 | 83.3 | 4 | 930 | 83.9 | 957 | 81.5 | 935 | 83.3 |

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

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Platform Notes

BIOS Settings:
Turbo Mode enabled in BIOS
C-State enabled in BIOS

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Platform Notes (Continued)

Sysinfo program /root/SPECcpul.2/config/sysinfo.rev6800
\$Rev: 6800 \$ \$Date:: 2011-10-11 # \$ 6f2ebdff5032aaa42e583f96b07f99d3
running on localhost.localdomain Sat Oct 20 01:44:50 2012

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:
<http://www.spec.org/cpu2006/Docs/config.html#sysinfo>

```
From /proc/cpuinfo
  model name : Intel(R) Core(TM) i3-3240 CPU @ 3.40GHz
    1 "physical id"s (chips)
    4 "processors"
  cores, siblings (Caution: counting these is hw and system dependent. The
  following excerpts from /proc/cpuinfo might not be reliable. Use with
  caution.)
    cpu cores : 2
    siblings  : 4
    physical 0: cores 0 1
  cache size : 3072 KB
```

```
From /proc/meminfo
  MemTotal:      16322724 kB
  HugePages_Total:      0
  Hugepagesize:    2048 kB
```

```
/usr/bin/lsb_release -d
  Red Hat Enterprise Linux Server release 6.2 (Santiago)
```

```
From /etc/*release* /etc/*version*
  redhat-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
  system-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server
```

```
uname -a:
  Linux localhost.localdomain 2.6.32-220.el6.x86_64 #1 SMP Wed Nov 9 08:03:13
  EST 2011 x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Oct 19 15:43
```

```
SPEC is set to: /root/SPECcpul.2
  Filesystem      Type      Size  Used Avail Use% Mounted on
  /dev/mapper/VolGroup-lv_root
    ext4          50G    30G   18G   64% /
```

```
Additional information from dmidecode:
  Memory:
    2x Micron 18JSF1G72AZ-1G6D1 8 GB 1600 MHz 2 rank
```

(End of data from sysinfo program)



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General Notes

Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/root/SPECcpul.2/libs/32:/root/SPECcpul.2/libs/64"

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB memory using RHEL5.5
Transparent Huge Pages enabled with:
echo always > /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.deallI: -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 -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3`

C++ benchmarks:

`-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3`

Fortran benchmarks:

`-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch`

Benchmarks using both Fortran and C:

`-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3`

Peak Compiler Invocation

C benchmarks:

`icc -m64`

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`
465.tonto: `-DSPEC_CPU_LP64`

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Peak Portability Flags (Continued)

470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
482.sphinx3: -DSPEC_CPU_LP64

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
-opt-mem-layout-trans=3

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

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.dealIII: basepeak = yes

450.soplex: -xAVX(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

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: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -static

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: -xAVX -ipo -O3 -no-prec-div -static -opt-prefetch

459.GemsFDTD: -xAVX(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

465.tonto: -xAVX(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

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Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

435.gromacs: -xAVX(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 -opt-mem-layout-trans=3

436.cactusADM: basepeak = yes

454.calculix: -xAVX -ipo -O3 -no-prec-div -static -auto-ilp32
-opt-mem-layout-trans=3

481.wrf: Same as 454.calculix

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/IBM-Platform-Flags-V1.2-IVB-A.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/IBM-Platform-Flags-V1.2-IVB-A.xml>

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