## SPEC® CFP2006 Result

**IBM Corporation**  
IBM System x3100 M4  
(Intel Pentium G640, 2.80 GHz)

<table>
<thead>
<tr>
<th>Test sponsor: IBM Corporation</th>
<th>Tested by: IBM Corporation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2006 license: 11</td>
<td>Test date: Sep-2012</td>
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<tr>
<td>Test date: Sep-2012</td>
<td>Hardware Availability: May-2012</td>
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<tr>
<td>CPU(s) enabled: 2 cores, 1 chip, 2 cores/chip</td>
<td>Software Availability: Dec-2011</td>
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### SPECfp®2006 = 40.4  
SPECfp_base2006 = 39.7

<table>
<thead>
<tr>
<th>Benchmark</th>
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<tr>
<td>410.bwaves</td>
<td>29.5</td>
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<tr>
<td>416.gamess</td>
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<tr>
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<td>53.3</td>
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<tr>
<td>482.sphinx3</td>
<td>35.7</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Pentium G640  
- **CPU Characteristics:**  
  - **CPU MHz:** 2800  
  - **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

### Software

- **Operating System:** Red Hat Enterprise Linux Server release 6.2 (Santiago)  
- **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:** Yes  
- **File System:** ext4

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#### System Details
- **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, running at 1066 MHz)  
- **Disk Subsystem:** 1 x 250 GB SATA, 7200 RPM  
- **Other Hardware:** None  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 32/64-bit  
- **Software Availability:** Dec-2011

#### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
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</tbody>
</table>

#### 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**
- **Sysinfo program** /root/SPECCpu1.2/config/sysinfo.rev6800  
  $Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdf5032aaa42e583f96b07f99d3  
  running on localhost.localdomain Thu Sep 27 05:46:19 2012

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:

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**CPU2006 license:** 11  
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### Platform Notes (Continued)

http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo

- **model name**: Intel(R) Pentium(R) CPU G640 @ 2.80GHz
- **1 "physical id"s (chips)**
- **2 "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 : 2
  - 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)
```

```
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 Sep 25 15:56
```

```
SPEC is set to: /root/SPECcpu1.2
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/mapper/VolGroup-lv_root ext4 50G 31G 17G 66% /
```

Additional information from dmidecode:

- **Memory**: 2x Micron 18JSF1G72AZ-1G6D1 8 GB 1067 MHz 2 rank

(End of data from sysinfo program)

### General Notes

Environment variables set by runspec before the start of the run:

- **KMP_AFFINITY** = "granularity=fine,scatter"
- **LD_LIBRARY_PATH** = "/root/SPECcpu1.2/libs/32:/root/SPECcpu1.2/libs/64"
- **OMP_NUM_THREADS** = "2"

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General Notes (Continued)
---
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

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 -nofor_main
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: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias
- parallel

C++ benchmarks:

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Peak Optimization Flags (Continued)

444.namd: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -03(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: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -03(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) -03(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: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -03(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll2
-inline-level=0 -opt-prefetch -parallel
465.tonto: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -03(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 -03 -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/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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For other inquiries, please contact webmaster@spec.org.

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