## IBM Corporation

**IBM System x3400 M3 (Intel Xeon E5607)**

| SPECfp_rate2006 | 138 |
| SPECfp_rate_base2006 | 131 |

### Hardware
- **CPU Name:** Intel Xeon E5607
- **CPU Characteristics:**
  - **CPU MHz:** 2267
  - **FPU:** Integrated
  - **CPU(s) enabled:** 8 cores, 2 chips, 4 cores/chip
  - **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

### Software
- **Operating System:** SUSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.12-0.7-default
- **Compiler:** Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64 Version 12.0.1.116 Build 20101116
- **Auto Parallel:** No
- **File System:** ext3
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit

### Test Information
- **CPU2006 license:** 11
- **Test sponsor:** IBM Corporation
- **Tested by:** IBM Corporation
- **Test date:** Apr-2011
- **Hardware Availability:** Feb-2011
- **Software Availability:** Jan-2011

### Benchmarks
- **410.bwaves**
- **416.gamess**
- **433.milc**
- **434.zeusmp**
- **435.gromacs**
- **436.cactusADM**
- **437.leslie3d**
- **444.namd**
- **447.dealII**
- **450.soplex**
- **453.povray**
- **454.calculix**
- **459.GemsFDTD**
- **465.tonto**
- **470.lbm**
- **481.wrf**
- **482.sphinx3**

### Performance Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECfp_rate2006</th>
<th>SPECfp_rate_base2006</th>
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</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>8</td>
<td>128</td>
<td>151</td>
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<tr>
<td>416.gamess</td>
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<td>138</td>
<td>146</td>
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<td>459.GemsFDTD</td>
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<td>465.tonto</td>
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<tr>
<td>481.wrf</td>
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</table>

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

<table>
<thead>
<tr>
<th>L3 Cache:</th>
<th>8 MB I+D on chip per chip</th>
<th>Peak Pointers:</th>
<th>32/64-bit</th>
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<tbody>
<tr>
<td>Other Cache:</td>
<td>None</td>
<td>Other Software:</td>
<td>None</td>
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<tr>
<td>Memory:</td>
<td>96 GB (12 x 8 GB 2Rx4 PC3-10600R-9, ECC, running at 1067 MHz)</td>
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<td></td>
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<tr>
<td>Disk Subsystem:</td>
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<td>Other Hardware:</td>
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**Results Table**

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<tr>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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</tr>
</tbody>
</table>

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.  
numactl was used to bind copies to the cores.

**Operating System Notes**

'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run  
'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages  
echo 7200 > /proc/sys/vm/nr_hugepages  
export HUGETLB_MORECORE=yes  
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
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IBM System x3400 M3 (Intel Xeon E5607)

**SPEC CFP2006 Result**

<table>
<thead>
<tr>
<th>SPECfp_rate2006</th>
<th>138</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_rate_base2006</td>
<td>131</td>
</tr>
</tbody>
</table>

CPU2006 license: 11
Test date: Apr-2011
Test sponsor: IBM Corporation
Hardware Availability: Feb-2011
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Software Availability: Jan-2011

**Platform Notes**

- Power C-State enabled in BIOS
- Data Reuse disabled in BIOS
- Demand Scrub disabled in BIOS

**General Notes**

- Binaries compiled on RHEL5.5

**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.zmmp: `-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`
IBM Corporation

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Base Optimization Flags

C benchmarks:
-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias

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

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

Benchmarks using both Fortran and C:
-xSSE4.2 -ipo -O3 -no-prec-div -static -ansi-alias

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
436.cactusADM: -DSPEC_CPU_LP64
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
459.GemsFDTD: -DSPEC_CPU_LP64
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

Peak Optimization Flags

C benchmarks:

433.milc: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -03(pass 2)
        -no-prec-div(pass 2) -prof-use(pass 2) -static -auto-ilp32
470.lbm: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -03(pass 2)
       -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3
        -ansi-alias -opt-prefetch -static -auto-ilp32

482.sphinx3: -xSSE4.2 -ipo -03 -no-prec-div -unroll12

C++ benchmarks:

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: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -03(pass 2)
        -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3
        -B/usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

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) -unroll14 -ansi-alias
        -B/usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Fortran benchmarks:

410.bwaves: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -03(pass 2)
        -no-prec-div(pass 2) -prof-use(pass 2) -static
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: -xSSE4.2 -ipo -03 -no-prec-div
        -B/usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

459.GemsFDTD: basepeak = yes

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Peak Optimization Flags (Continued)

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-callloc -opt-malloc-options=3
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes
436.cactusADM: basepeak = yes
454.calculix: basepeak = yes
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-ic12.0-linux64-revB.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml
http://www.spec.org/cpu2006/flags/IBM-platform-linux64-revA.20110420.xml

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For other inquiries, please contact webmaster@spec.org.

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