IBM Corporation

IBM System x3690 X5 + MAX5 (Intel Xeon X7560)

SPECfp®_rate2006 = 300
SPECfp_rate_base2006 = 287

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

Hardware

CPU Name: Intel Xeon X7560
CPU Characteristics: Intel Turbo Boost Technology up to 2.67 GHz
CPU MHz: 2267
FPU: Integrated
CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip, 2 threads/core
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

Operating System: SuSE Linux Enterprise Server 11 (x86_64), Kernel 2.6.27.19-5-default
Compiler: Intel C++ and Fortran Professional Compiler for IA32 and Intel 64, Version 11.1
Build 20091130 Package ID: l_cproc_p_11.1.064, l_cprof_p_11.1.064
Auto Parallel: No
File System: ext3
System State: Run level 3 (multi-user)
IBM Corporation
IBM System x3690 X5 + MAX5 (Intel Xeon X7560)

SPEC CFP2006 Result

IBM Corporation

SPEC fp_rate2006 = 300
SPEC fp_rate_base2006 = 287

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

Test date: Sep-2010
Hardware Availability: Aug-2010
Software Availability: Jan-2010

L3 Cache: 24 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (64 x 4 GB 4Rx8 PC3-8500R-7, ECC)
Disk Subsystem: 1 x 146 GB SAS, 15000 RPM
Other Hardware: None

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>32</td>
<td>1629</td>
<td>267</td>
<td>1629</td>
<td>267</td>
<td>1629</td>
<td>267</td>
<td>16</td>
<td>702</td>
<td>310</td>
<td>701</td>
<td>310</td>
<td>702</td>
<td>310</td>
<td></td>
<td></td>
</tr>
<tr>
<td>416.gamess</td>
<td>32</td>
<td>2087</td>
<td>300</td>
<td>2109</td>
<td>297</td>
<td>2090</td>
<td>300</td>
<td>32</td>
<td>2087</td>
<td>300</td>
<td>2109</td>
<td>297</td>
<td>2090</td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>433.milc</td>
<td>32</td>
<td>888</td>
<td>331</td>
<td>891</td>
<td>330</td>
<td>891</td>
<td>330</td>
<td>32</td>
<td>890</td>
<td>330</td>
<td>888</td>
<td>331</td>
<td>887</td>
<td>331</td>
<td></td>
<td></td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>32</td>
<td>1056</td>
<td>276</td>
<td>1057</td>
<td>275</td>
<td>1057</td>
<td>276</td>
<td>32</td>
<td>1056</td>
<td>276</td>
<td>1057</td>
<td>275</td>
<td>1057</td>
<td>276</td>
<td></td>
<td></td>
</tr>
<tr>
<td>435.gromacs</td>
<td>32</td>
<td>787</td>
<td>290</td>
<td>791</td>
<td>289</td>
<td>792</td>
<td>288</td>
<td>32</td>
<td>783</td>
<td>292</td>
<td>785</td>
<td>291</td>
<td>782</td>
<td>292</td>
<td></td>
<td></td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>32</td>
<td>1365</td>
<td>280</td>
<td>1366</td>
<td>280</td>
<td>1362</td>
<td>282</td>
<td>32</td>
<td>1365</td>
<td>280</td>
<td>1366</td>
<td>280</td>
<td>1362</td>
<td>281</td>
<td></td>
<td></td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>32</td>
<td>1559</td>
<td>193</td>
<td>1560</td>
<td>193</td>
<td>1570</td>
<td>192</td>
<td>16</td>
<td>747</td>
<td>201</td>
<td>747</td>
<td>201</td>
<td>745</td>
<td>202</td>
<td></td>
<td></td>
</tr>
<tr>
<td>444.namd</td>
<td>32</td>
<td>917</td>
<td>280</td>
<td>915</td>
<td>281</td>
<td>913</td>
<td>281</td>
<td>32</td>
<td>901</td>
<td>285</td>
<td>899</td>
<td>285</td>
<td>898</td>
<td>286</td>
<td></td>
<td></td>
</tr>
<tr>
<td>447.dealII</td>
<td>32</td>
<td>751</td>
<td>488</td>
<td>751</td>
<td>488</td>
<td>751</td>
<td>487</td>
<td>32</td>
<td>738</td>
<td>496</td>
<td>737</td>
<td>497</td>
<td>738</td>
<td>496</td>
<td></td>
<td></td>
</tr>
<tr>
<td>450.soplex</td>
<td>32</td>
<td>1207</td>
<td>221</td>
<td>1210</td>
<td>221</td>
<td>1209</td>
<td>221</td>
<td>32</td>
<td>1151</td>
<td>232</td>
<td>1150</td>
<td>232</td>
<td>1151</td>
<td>232</td>
<td></td>
<td></td>
</tr>
<tr>
<td>453.povray</td>
<td>32</td>
<td>418</td>
<td>407</td>
<td>419</td>
<td>406</td>
<td>420</td>
<td>405</td>
<td>32</td>
<td>349</td>
<td>488</td>
<td>349</td>
<td>488</td>
<td>348</td>
<td>489</td>
<td></td>
<td></td>
</tr>
<tr>
<td>454.calculix</td>
<td>32</td>
<td>746</td>
<td>354</td>
<td>746</td>
<td>354</td>
<td>743</td>
<td>355</td>
<td>32</td>
<td>746</td>
<td>354</td>
<td>746</td>
<td>354</td>
<td>743</td>
<td>355</td>
<td></td>
<td></td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>32</td>
<td>1785</td>
<td>190</td>
<td>1823</td>
<td>186</td>
<td>1868</td>
<td>182</td>
<td>32</td>
<td>1785</td>
<td>190</td>
<td>1823</td>
<td>186</td>
<td>1868</td>
<td>182</td>
<td></td>
<td></td>
</tr>
<tr>
<td>465.tonto</td>
<td>32</td>
<td>877</td>
<td>359</td>
<td>877</td>
<td>359</td>
<td>875</td>
<td>360</td>
<td>32</td>
<td>807</td>
<td>390</td>
<td>814</td>
<td>387</td>
<td>803</td>
<td>392</td>
<td></td>
<td></td>
</tr>
<tr>
<td>470.lbm</td>
<td>32</td>
<td>2539</td>
<td>173</td>
<td>2536</td>
<td>173</td>
<td>2537</td>
<td>173</td>
<td>16</td>
<td>1145</td>
<td>192</td>
<td>1145</td>
<td>192</td>
<td>1145</td>
<td>192</td>
<td></td>
<td></td>
</tr>
<tr>
<td>481.wrf</td>
<td>32</td>
<td>980</td>
<td>365</td>
<td>979</td>
<td>365</td>
<td>978</td>
<td>366</td>
<td>32</td>
<td>980</td>
<td>365</td>
<td>979</td>
<td>365</td>
<td>978</td>
<td>366</td>
<td></td>
<td></td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>32</td>
<td>2110</td>
<td>296</td>
<td>2107</td>
<td>296</td>
<td>2109</td>
<td>296</td>
<td>32</td>
<td>1948</td>
<td>320</td>
<td>1949</td>
<td>320</td>
<td>1950</td>
<td>320</td>
<td></td>
<td></td>
</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

Platform Notes

Turbo Boost set to Traditional
# SPEC CFP2006 Result

**IBM Corporation**

IBM System x3690 X5 + MAX5 (Intel Xeon X7560)

<table>
<thead>
<tr>
<th>SPECfp_rate2006</th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_rate_base2006</td>
<td>287</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 11  
**Test date:** Sep-2010

**Test sponsor:** IBM Corporation  
**Hardware Availability:** Aug-2010

**Tested by:** IBM Corporation  
**Software Availability:** Jan-2010

---

## General Notes

'ulimit -s unlimited' was used to set the stack size to unlimited prior to run Binaries were compiled on SLES 10 with Binutils 2.18.50.0.7.20080502

---

## 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.tbm: `-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
```

**C++ benchmarks:**

```
-xSSE4.2  -ipo  -O3  -no-prec-div  -static
```

---

Continued on next page
IBM Corporation
IBM System x3690 X5 + MAX5 (Intel Xeon X7560)

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

CPU2006 license: 11
Test date: Sep-2010
Hardware Availability: Aug-2010
Test sponsor: IBM Corporation
Software Availability: Jan-2010

SPEC CFP2006 Result

SPECfp_rate2006 = 300
SPECfp_rate_base2006 = 287

Base Optimization Flags (Continued)

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

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

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.games: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
435.gromacs: -DSPEC_CPU_LP64
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64 -nofor_main
447.dealII: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64
454.caculusix: -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
IBM Corporation

IBM System x3690 X5 + MAX5 (Intel Xeon X7560)

SPEC CFP2006 Result

SPECfp_rate2006 = 300
SPECfp_rate_base2006 = 287

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

Test date: Sep-2010
Hardware Availability: Aug-2010
Software Availability: Jan-2010

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) -static(pass 2) -prof-use(pass 2)
          -fno-alias -opt-prefetch

470.lbm: -xsse4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
          -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
          -opt-malloc-options=3 -ansi-alias -auto-ilp32

482.sphinx3: -xsse4.2 -ipo -O3 -no-prec-div -static -unroll2

C++ benchmarks:

444.namd: -xsse4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
          -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
          -fno-alias -auto-ilp32

447.dealII: -xsse4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
            -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2)
            -unroll2 -ansi-alias -scalar-rep-

450.soplex: -xsse4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
            -no-prec-div(pass 2) -static(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) -static(pass 2) -prof-use(pass 2)
            -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: -xsse4.2 -ipo -O3 -no-prec-div -static -opt-prefetch

416.gamest: basepeak = yes

434.zeusmp: basepeak = yes

437.leslie3d: -xsse4.2 -ipo -O3 -no-prec-div -static

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) -static(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) -static(pass 2) -prof-use(pass 2)
              -opt-prefetch -auto-ilp32
<table>
<thead>
<tr>
<th></th>
<th>SPECfp_rate2006 = 300</th>
<th>SPECfp_rate_base2006 = 287</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU2006 license</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Test sponsor:</td>
<td>IBM Corporation</td>
<td></td>
</tr>
<tr>
<td>Tested by:</td>
<td>IBM Corporation</td>
<td></td>
</tr>
<tr>
<td>Test date:</td>
<td>Sep-2010</td>
<td></td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Aug-2010</td>
<td></td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Jan-2010</td>
<td></td>
</tr>
</tbody>
</table>

**Peak Optimization Flags (Continued)**

- 436.cactusADM: basepeak = yes
- 454.calculix: basepeak = yes
- 481.wrf: basepeak = yes

The flags file that was used to format this result can be browsed at

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/Intel-ic11.1-linux64-revE.20100929.00.xml