IBM Corporation
IBM System x3500 M4 (Intel Xeon E5-2643)

| SPECfp®2006 | 82.4 |
| SPECfp_base2006 | 79.7 |

**CPU2006 license:** 11  
**Test date:** May-2012  
**Test sponsor:** IBM Corporation  
**Hardware Availability:** Mar-2012  
**Tested by:** IBM Corporation  
**Software Availability:** Oct-2011

### Hardware

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon E5-2643</td>
</tr>
<tr>
<td>CPU Characteristics:</td>
<td>Intel Turbo Boost Technology up to 3.50 GHz</td>
</tr>
<tr>
<td>CPU MHz:</td>
<td>3300</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>8 cores, 2 chips, 4 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1,2 chips</td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>256 KB I+D on chip per core</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System:</td>
<td>Red Hat Enterprise Linux Server release 6.1 (Santiago)</td>
</tr>
<tr>
<td>Compiler:</td>
<td>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</td>
</tr>
<tr>
<td>Auto Parallel:</td>
<td>Yes</td>
</tr>
<tr>
<td>File System:</td>
<td>ext4</td>
</tr>
</tbody>
</table>

---

Standard Performance Evaluation Corporation  
info@spec.org  
http://www.spec.org/
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>39.0</td>
<td>38.8</td>
<td>350</td>
<td>38.6</td>
<td>352</td>
</tr>
<tr>
<td>416.gamess</td>
<td>605</td>
<td>32.3</td>
<td>32.3</td>
<td>607</td>
<td>32.2</td>
</tr>
<tr>
<td>433.milc</td>
<td>147</td>
<td>62.6</td>
<td>36.1</td>
<td>149</td>
<td>61.4</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>73.4</td>
<td>124</td>
<td>73.6</td>
<td>74.2</td>
<td>123</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>192</td>
<td>37.2</td>
<td>192</td>
<td>192</td>
<td>37.2</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>30.7</td>
<td>31.1</td>
<td>385</td>
<td>32.1</td>
<td>373</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>48.8</td>
<td>49.0</td>
<td>192</td>
<td>57.6</td>
<td>163</td>
</tr>
<tr>
<td>444.namd</td>
<td>336</td>
<td>23.9</td>
<td>336</td>
<td>337</td>
<td>23.8</td>
</tr>
<tr>
<td>447.dealII</td>
<td>217</td>
<td>52.8</td>
<td>216</td>
<td>217</td>
<td>52.7</td>
</tr>
<tr>
<td>450.soplex</td>
<td>221</td>
<td>37.8</td>
<td>329</td>
<td>219</td>
<td>38.1</td>
</tr>
<tr>
<td>452.povray</td>
<td>119</td>
<td>44.7</td>
<td>119</td>
<td>120</td>
<td>44.5</td>
</tr>
<tr>
<td>454.calculix</td>
<td>213</td>
<td>38.6</td>
<td>213</td>
<td>215</td>
<td>38.4</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>78.0</td>
<td>136</td>
<td>78.0</td>
<td>136</td>
<td>78.6</td>
</tr>
<tr>
<td>465.tonto</td>
<td>70</td>
<td>36.5</td>
<td>40.8</td>
<td>242</td>
<td>40.7</td>
</tr>
<tr>
<td>470.lbm</td>
<td>41.8</td>
<td>329</td>
<td>42.6</td>
<td>322</td>
<td>41.8</td>
</tr>
<tr>
<td>481.wrf</td>
<td>141</td>
<td>79.3</td>
<td>142</td>
<td>143</td>
<td>78.2</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>258</td>
<td>75.5</td>
<td>264</td>
<td>266</td>
<td>73.3</td>
</tr>
</tbody>
</table>

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

### Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"
Zone reclaim mode enabled with:
echo 1 > /proc/sys/vm/zone_reclaim_mode

### Platform Notes

BIOS Settings:
Operating Mode set to Maximum Performance
Sysinfo program /root/SPECcpu-v1.2/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 $$ 6f2ebdf5032aaa42e583f96b07f99d3
running on x3500M4 Sat May  5 17:46:47 2012

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

IBM System x3500 M4 (Intel Xeon E5-2643)

SPECf2006 = 82.4
SPECfp_base2006 = 79.7

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation
Test date: May-2012
Hardware Availability: Mar-2012
Software Availability: Oct-2011

Platform Notes (Continued)

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

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E5-2643 0 @ 3.30GHz
  2 "physical id"s (chips)
  16 "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 : 4
siblings : 8
physical 0: cores 0 1 2 3
physical 1: cores 0 1 2 3
cache size : 10240 KB

From /proc/meminfo
MemTotal: 66046724 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
Red Hat Enterprise Linux Server release 6.1 (Santiago)

From /etc/*release* /etc/*version*
redhat-release: Red Hat Enterprise Linux Server release 6.1 (Santiago)
system-release: Red Hat Enterprise Linux Server release 6.1 (Santiago)

uname -a:
  Linux x3500M4 2.6.32-131.0.15.el6.x86_64 #1 SMP Tue May 10 15:42:40 EDT 2011
  x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 4 16:08

SPEC is set to: /root/SPECcpu-v1.2
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/mapper/vg_x3500m4-lv_root ext4 210G 71G 128G 36% /

Additional information from dmidecode:
  Memory:
  16x Samsung M393B5273DH0-CK0 4 GB 1600 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,compact,1,0"
LD_LIBRARY_PATH = "/root/SPECcpu-v1.2/libs/32:/root/SPECcpu-v1.2/libs/64"
OMP_NUM_THREADS = "8"

Continued on next page
IBM Corporation
IBM System x3500 M4 (Intel Xeon E5-2643)

SPECfp2006 = 82.4
SPECfp_base2006 = 79.7

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation
Test date: May-2012
Hardware Availability: Mar-2012
Software Availability: Oct-2011

General Notes (Continued)

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB memory using RHEL5.5
Transparent Huge Pages enabled with:
etch 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
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:
-xAVX  -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias

Continued on next page
IBM Corporation
IBM System x3500 M4 (Intel Xeon E5-2643)

SPEC fp2006 = 82.4
SPEC fp_base2006 = 79.7

Base Optimization Flags (Continued)

C++ benchmarks:
- xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias

Fortran benchmarks:
- xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

Benchmarks using both Fortran and C:
- xAVX -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: -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
- ansi-alias

470.lbm: basepeak = yes

482.sphinx3: -xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias
-parallel

C++ benchmarks:

Continued on next page
**IBM Corporation**

**IBM System x3500 M4 (Intel Xeon E5-2643)**

**SPEC CFP2006 Result**

**CPU2006 license:** 11

**Test sponsor:** IBM Corporation

**Tested by:** IBM Corporation

<table>
<thead>
<tr>
<th>Test date</th>
<th>May-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability</td>
<td>Mar-2012</td>
</tr>
<tr>
<td>Software Availability</td>
<td>Oct-2011</td>
</tr>
</tbody>
</table>

**SPECfp2006 =** 82.4

**SPECfp_base2006 =** 79.7

**Peak Optimization Flags (Continued)**

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.dealII: `basepeak = yes`

450.soplex: `basepeak = yes`

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 -ipo -O3 -no-prec-div -opt-prefetch -parallel -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: `basepeak = yes`

459.GemsFDTD: `-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 -opt-prefetch -parallel`

465.tonto: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(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: `-xAVX -ipo -O3 -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-SNB-C.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-SNB-C.xml
## IBM Corporation

**IBM System x3500 M4 (Intel Xeon E5-2643)**

<table>
<thead>
<tr>
<th>SPECfp2006 =</th>
<th>82.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006 =</td>
<td>79.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CPU2006 license:</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor:</td>
<td>IBM Corporation</td>
</tr>
<tr>
<td>Tested by:</td>
<td>IBM Corporation</td>
</tr>
<tr>
<td>Test date:</td>
<td>May-2012</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Mar-2012</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Oct-2011</td>
</tr>
</tbody>
</table>

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Originally published on 22 May 2012.