IBM Corporation

IBM System x iDataPlex dx360 M4 (Intel Xeon E5-2680)

**SPECfp®2006 = 89.9**

**SPECfp_base2006 = 85.7**

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

### Hardware

<table>
<thead>
<tr>
<th>CPU Name: Intel Xeon E5-2680</th>
<th>Operating System: Red Hat Enterprise Linux Server release 6.2 (Santiago)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz</td>
<td>2.6.32-220.el6.x86_64</td>
</tr>
<tr>
<td>CPU MHz: 2700</td>
<td>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</td>
</tr>
<tr>
<td>FPU: Integrated</td>
<td>Auto Parallel: Yes</td>
</tr>
<tr>
<td>CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip, 2 threads/core</td>
<td>File System: ext4</td>
</tr>
<tr>
<td>CPU(s) orderable: 1,2 chips</td>
<td></td>
</tr>
<tr>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
<td></td>
</tr>
<tr>
<td>Secondary Cache: 256 KB I+D on chip per core</td>
<td></td>
</tr>
</tbody>
</table>

### Software

| SPECfp_base2006 = 85.7 |

| SPECfp2006 = 89.9 |

<table>
<thead>
<tr>
<th>410.bwaves</th>
<th>416.gamess</th>
<th>433.milc</th>
<th>434.zeusmp</th>
<th>435.gromacs</th>
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<tr>
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<tr>
<td>436.cactusADM</td>
<td>437.leslie3d</td>
<td>444.namd</td>
<td>447.dealII</td>
<td>450.soplex</td>
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<td>252</td>
<td>24.2</td>
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<td>453.povray</td>
<td>454.calculix</td>
<td>459.GemsFDTD</td>
<td>465.tonto</td>
<td>470.lbm</td>
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<tr>
<td>481.wrf</td>
<td>482.sphinx3</td>
<td></td>
<td></td>
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<tr>
<td>75.4</td>
<td>72.5</td>
<td>71.5</td>
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SPEC CFP2006 Result

IBM Corporation
IBM System x iDataPlex dx360 M4 (Intel Xeon E5-2680)

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CPU2006 license: 11
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L3 Cache: 20 MB I+D on chip per chip
Other Cache: None
Memory: 128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC)
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
Other Software: None

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
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<td>39.5</td>
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<tr>
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<td>481.wrf</td>
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<td>75.4</td>
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<td>273</td>
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<td>273</td>
<td>71.5</td>
<td>270</td>
<td>72.2</td>
</tr>
</tbody>
</table>

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/Docs/sysinfo
$Rev: 6775 $ $Date:: 2011-08-16 #$ $Id: 8787f7622badcf24e01c368b1db4377c
running on tianden Wed Apr 11 17:29:12 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

Standard Performance Evaluation Corporation
info@spec.org
http://www.spec.org/
IBM Corporation
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Platform Notes (Continued)

From /proc/cpuinfo
model name : Genuine Intel(R) CPU @ 2.70GHz
2 "physical id"s (chips)
32 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
following excerpts from /proc/cpuinfo might not be reliable. Use with
cautions.)
cpu cores : 8
siblings : 16
physical 0: cores 0 1 2 3 4 5 6 7
physical 1: cores 0 1 2 3 4 5 6 7
cache size : 20480 KB

From /proc/meminfo
MemTotal: 132093704 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 tianden 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 Apr 11 17:13

SPEC is set to: /root/SPECcpu-v1.2
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/vg_tianden-lv_root
ext4 145G 74G 64G 54% /

(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-v1.2/1ibs/32:/root/SPECcpu-v1.2/1ibs/64"
OMP_NUM_THREADS = "16"

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
memory using RHEL5.5
Transparent Huge Pages enabled with:
IBM Corporation
IBM System x iDataPlex dx360 M4 (Intel Xeon E5-2680)

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General Notes (Continued)

echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled

Base Compiler Invocation

C benchmarks:
i cc  -m64

C++ benchmarks:
i cpc  -m64

Fortran benchmarks:
i fort  -m64

Benchmarks using both Fortran and C:
i cc  -m64 ifort  -m64

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
433.mlilc: -DSPEC_CPU_LP64
434.zesumsp: -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

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

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Base Optimization Flags (Continued)

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:
`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`

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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

Peak Optimization Flags (Continued)

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) -unroll2
           -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
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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Report generated on Thu Jul 24 05:04:06 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 9 May 2012.