IBM Corporation

IBM System x3650 M4 (Intel Xeon E5-2650)

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<th>SPECfp®2006</th>
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CPU2006 license: 11
Test sponsor: IBM Corporation
Test date: Mar-2012
Hardware Availability: Mar-2012
Tested by: IBM Corporation
Software Availability: Oct-2011

**SPECfp®2006 = 75.1**

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**SPECfp®2006 = 75.1**

**Hardware**

- CPU Name: Intel Xeon E5-2650
- CPU Characteristics: Intel Turbo Boost Technology up to 2.80 GHz
- CPU MHz: 2000
- 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

**Software**

- Operating System: Red Hat Enterprise Linux Server release 6.1 (Santiago) 2.6.32-131.0.15.el6.x86_64
- 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
IBM System x3650 M4 (Intel Xeon E5-2650)

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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 1 TB SAS, 7200 RPM
Other Hardware: None

System State: Run level 3 (add definition here)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

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<tr>
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</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 $ $Date:: 2011-10-11 #$ 6f2ebdfe5032aaa42e583f96b07f99d3
running on x3650M4 Sun Mar 25 00:52:33 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 x3650 M4 (Intel Xeon E5-2650)

SPECfp2006 = 75.1
SPECfp_base2006 = 70.9

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) Xeon(R) CPU E5-2650 0 @ 2.00GHz
    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
    caution.)
    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: 132113224 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 x3650M4 2.6.32-131.0.15.e16.x86_64 #1 SMP Tue May 10 15:42:40 EDT 2011
    x86_64 x86_64 x86_64 GNU/Linux

    run-level 3 Mar 23 11:26

    SPEC is set to: /root/SPECcpu-v1.2
    Filesystem Type Size Used Avail Use% Mounted on
    /dev/mapper/vg_x3650m4-lv_root ext4 790G 66G 685G 9% /

    Additional information from dmidecode:
    Memory:
    16x Samsung M393B1K70DH0-CK0 8 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 = "16"

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IBM System x3650 M4 (Intel Xeon E5-2650)  

**SPEC CFP2006 Result**

| SPECfp2006 = | 75.1 |
| SPECfp_base2006 = | 70.9 |

**CPU2006 license:** 11  
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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`
- 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 -03 -no-prec-div -static -parallel -opt-prefetch`
  - `-ansi-alias`

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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:

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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.games: -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
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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.
Originally published on 10 April 2012.