SPEC® CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

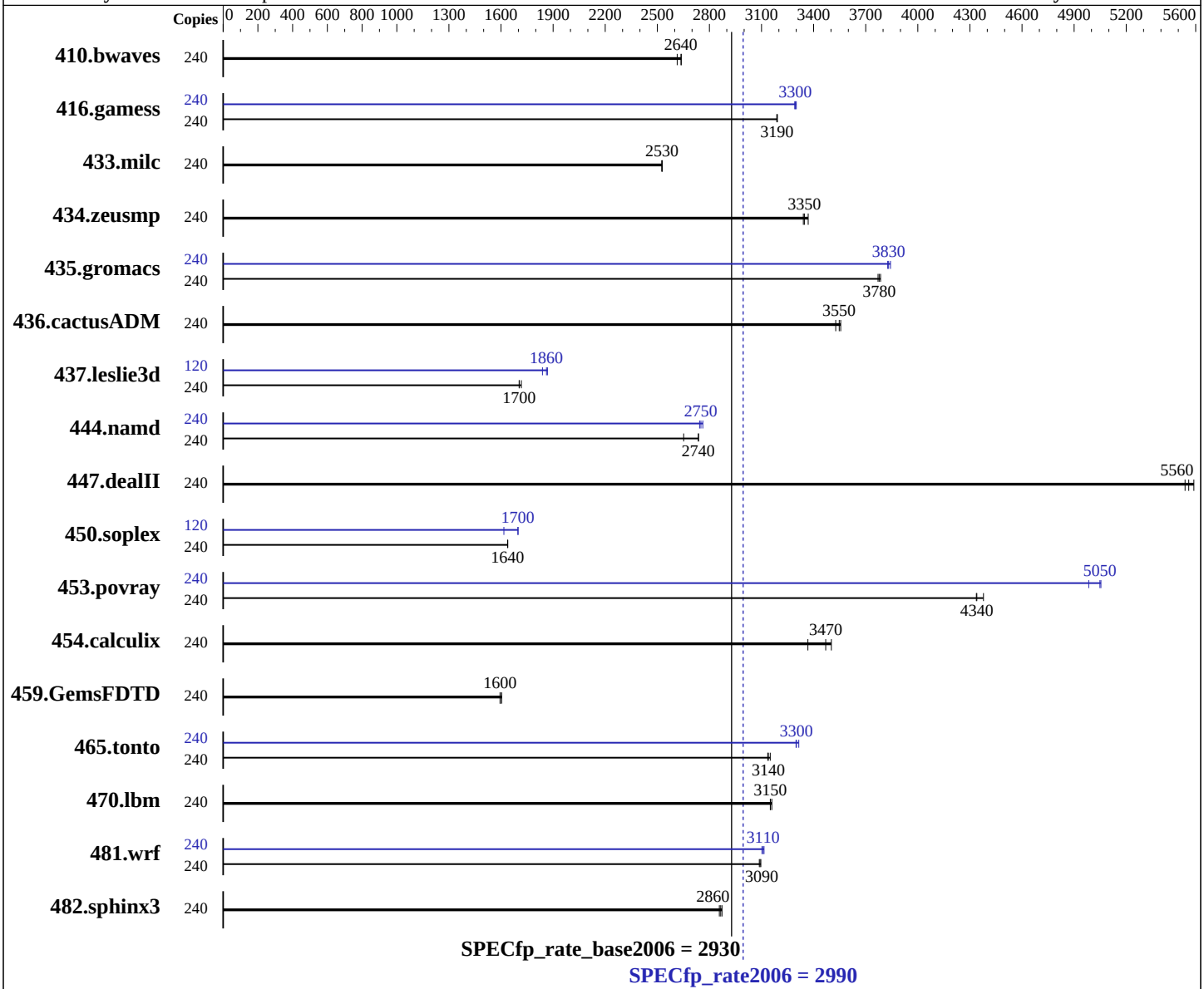
IBM System x3950 X6
(Intel Xeon E7-8870 v2, 2.30 GHz)

SPECfp®_rate2006 = 2990

SPECfp_rate_base2006 = 2930

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

Test date: May-2014
Hardware Availability: Jun-2014
Software Availability: Nov-2013



Hardware

CPU Name:	Intel Xeon E7-8870 v2
CPU Characteristics:	Intel Turbo Boost Technology up to 2.90 GHz
CPU MHz:	2300
FPU:	Integrated
CPU(s) enabled:	120 cores, 8 chips, 15 cores/chip, 2 threads/core
CPU(s) orderable:	4,6,8 chips
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core

Continued on next page

Software

Operating System:	Red Hat Enterprise Linux Server release 6.5 (Santiago) 2.6.32-431.el6.x86_64
Compiler:	C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux; Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux
Auto Parallel:	No
File System:	ext4

Continued on next page

SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

IBM System x3950 X6
(Intel Xeon E7-8870 v2, 2.30 GHz)

SPECfp_rate2006 = 2990

SPECfp_rate_base2006 = 2930

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

Test date: May-2014
Hardware Availability: Jun-2014
Software Availability: Nov-2013

L3 Cache: 30 MB I+D on chip per chip
Other Cache: None
Memory: 2 TB (128 x 16 GB 2Rx4 PC3L-12800R-11, ECC, running at 1333 MHz)
Disk Subsystem: 1 x 400 GB SATA, SSD
Other Hardware: None

System State: Run level 3 (multi-user)
Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	240	1248	2610	**1237**	**2640**	1236	2640	240	1248	2610	**1237**	**2640**	1236	2640
416.gamess	240	1473	3190	1474	3190	**1473**	**3190**	240	**1426**	**3300**	1428	3290	1424	3300
433.milc	240	872	2530	**872**	**2530**	871	2530	240	872	2530	**872**	**2530**	871	2530
434.zeusmp	240	**653**	**3350**	648	3370	654	3340	240	**653**	**3350**	648	3370	654	3340
435.gromacs	240	**454**	**3780**	453	3790	454	3770	240	**447**	**3830**	446	3840	448	3830
436.cactusADM	240	807	3560	**808**	**3550**	813	3530	240	807	3560	**808**	**3550**	813	3530
437.leslie3d	240	**1323**	**1700**	1324	1700	1314	1720	120	604	1870	**606**	**1860**	614	1840
444.namd	240	**703**	**2740**	703	2740	726	2650	240	**700**	**2750**	697	2760	702	2740
447.dealII	240	496	5540	491	5590	**494**	**5560**	240	496	5540	491	5590	**494**	**5560**
450.soplex	240	1222	1640	1222	1640	**1222**	**1640**	120	619	1620	589	1700	**590**	**1700**
453.povray	240	**294**	**4340**	292	4380	294	4340	240	**253**	**5050**	256	4980	253	5050
454.calculix	240	**571**	**3470**	565	3500	588	3370	240	**571**	**3470**	565	3500	588	3370
459.GemsFDTD	240	1597	1590	1587	1600	**1596**	**1600**	240	1597	1590	1587	1600	**1596**	**1600**
465.tonto	240	750	3150	753	3140	**752**	**3140**	240	712	3310	716	3300	**715**	**3300**
470.lbm	240	**1046**	**3150**	1047	3150	1044	3160	240	**1046**	**3150**	1047	3150	1044	3160
481.wrf	240	**867**	**3090**	866	3100	868	3090	240	864	3100	**862**	**3110**	861	3110
482.sphinx3	240	1637	2860	**1633**	**2860**	1628	2870	240	1637	2860	**1633**	**2860**	1628	2870

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

Submit Notes

```
The numactl mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.
```

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
```

Platform Notes

```
Operating Mode set to Maximum Perfomance in BIOS
Memory Data Scrambling Disabled
Patrol Scrub Disabled
Sysinfo program /cpu2006.1.2_14_aug2013/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on x3950x6 Sat May 24 01:55:49 2014

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
  http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) CPU E7-8870 v2 @ 2.30GHz
      8 "physical id"s (chips)
      240 "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 : 15
      siblings  : 30
      physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 2: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 3: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 4: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 5: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 6: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 7: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
   cache size : 30720 KB

From /proc/meminfo
   MemTotal:       2117446648 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux Server release 6.5 (Santiago)

From /etc/*release* /etc/*version*
   redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
   system-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

uname -a:
   Linux x3950x6 2.6.32-431.el6.x86_64 #1 SMP Sun Nov 10 22:19:54 EST 2013
   x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 23 10:47

SPEC is set to: /cpu2006.1.2_14_aug2013
   Filesystem                Type  Size  Used Avail Use% Mounted on
   /dev/mapper/vg_x3950x6-lv_root ext4  357G  8.3G  331G   3% /
```

Continued on next page

Platform Notes (Continued)

```
 Additional information from dmidecode:
   BIOS IBM -[A8E107JUS-1.00]- 05/02/2014
   Memory:
    64x Hynix HMT42GR7AFR4A-PB 16 GB 1333 MHz 2 rank
    64x NO DIMM Unknown
    64x Samsung M393B2G70QH0-YK0 16 GB 1333 MHz 2 rank

 (End of data from sysinfo program)
Memory speed from dmidecode lists the downclocked speed of the run.
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/cpu2006.1.2_14_aug2013/libs/32:/cpu2006.1.2_14_aug2013/libs/64:/cpu2006.1.2_14_aug2013/sh"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RedHat EL 6.4
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
 Filesystem page cache cleared with:
 echo 1>       /proc/sys/vm/drop_caches
 runspec command invoked through numactl i.e.:
 numactl --interleave=all runspec <etc>
```

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

Continued on next page

Base Portability Flags (Continued)

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 -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

C++ benchmarks:
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

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

Benchmarks using both Fortran and C:
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

Peak Compiler Invocation

C benchmarks:
icc -m64

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 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
437.leslie3d: -DSPEC_CPU_LP64
444.namd: -DSPEC_CPU_LP64
447.dealII: -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

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
-prof-use(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes

450.soplex: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
-prof-use(pass 2) -opt-malloc-options=3

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
-prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

Continued on next page

Peak Optimization Flags (Continued)

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-

434.zeusmp: basepeak = yes

437.leslie3d: -xAVX -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDTD: basepeak = yes

465.tonto: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -auto -inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: -xAVX -ipo -O3 -no-prec-div -auto-ilp32

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-IVB-A.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-IVB-A.xml

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.
Report generated on Thu Jul 24 23:48:16 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 18 June 2014.