SPEC® CFP2006 Result

IBM Corporation

IBM System x iDataPlex dx360 M3 (Intel Xeon E5649)

$SPECfp^{®}2006 =$ 52.6

$SPECfp\_base2006 =$ 49.2

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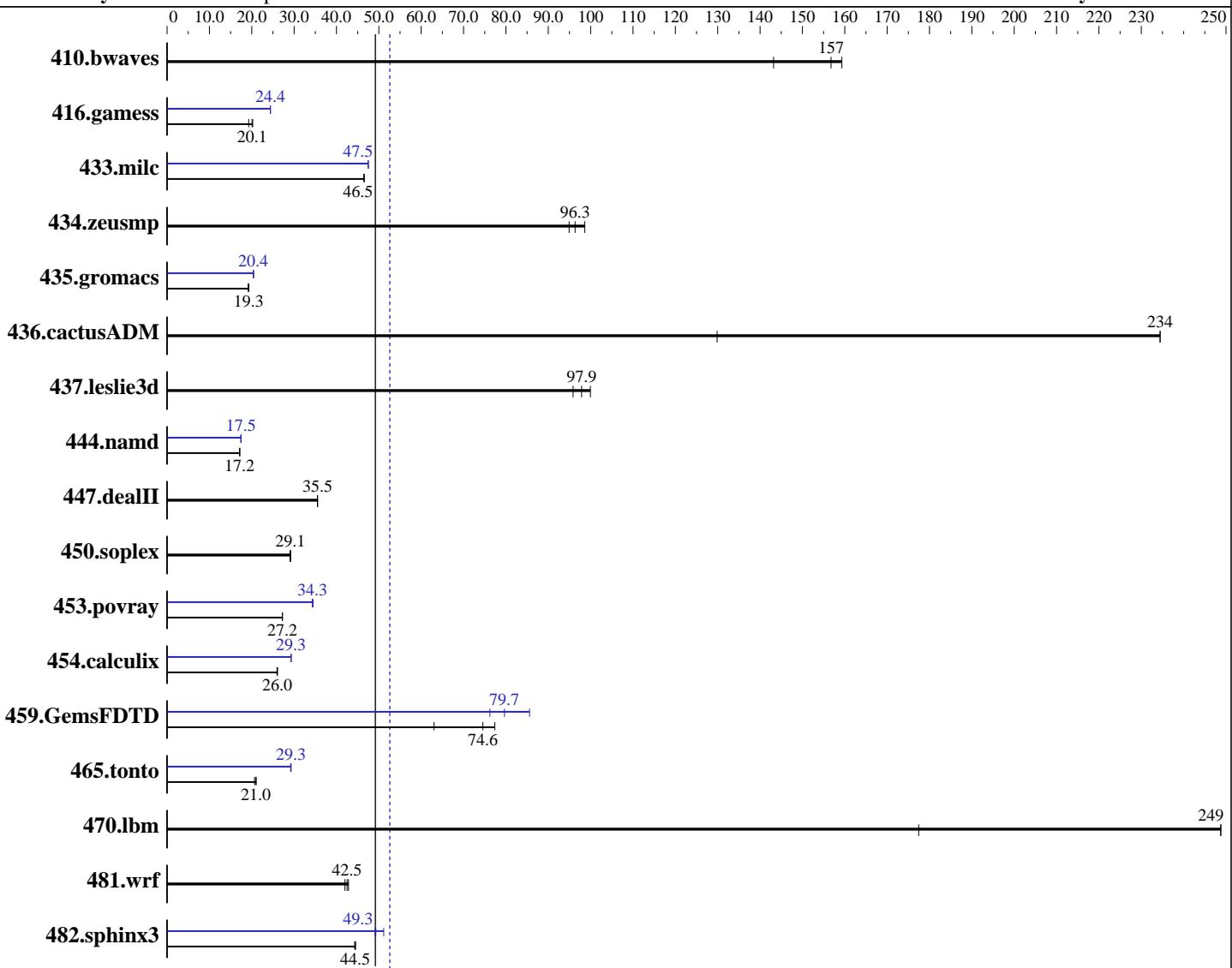**Test sponsor:** IBM Corporation
Tested by: IBM Corporation

Test date: Mar-2011
Hardware Availability: Feb-2011
Software Availability: Jan-2011

Results bar chart:

- 410.bwaves: 157
- 416.gamess: 24.4 / 20.1
- 433.milc: 47.5 / 46.5
- 434.zeusmp: 96.3
- 435.gromacs: 20.4 / 19.3
- 436.cactusADM: 234
- 437.leslie3d: 97.9
- 444.namd: 17.5 / 17.2
- 447.dealII: 35.5
- 450.soplex: 29.1
- 453.povray: 34.3 / 27.2
- 454.calculix: 29.3 / 26.0
- 459.GemsFDTD: 79.7 / 74.6
- 465.tonto: 29.3 / 21.0
- 470.lbm: 249
- 481.wrf: 42.5
- 482.sphinx3: 49.3 / 44.5

SPECfp_base2006 = 49.2
SPECfp2006 = 52.6

Hardware

CPU Name: Intel Xeon E5649
CPU Characteristics: Intel Turbo Boost Technology up to 2.93 GHz
CPU MHz: 2533
FPU: Integrated
CPU(s) enabled: 12 cores, 2 chips, 6 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

Continued on next page

Software

Operating System: SUSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.12-0.7-default
Compiler: Intel C++ and Fortran Intel 64 Compiler XE for applications running on Intel 64 Version 12.0 Update 3
Auto Parallel: Yes
File System: ext3
System State: Run level 3 (multi-user)
Base Pointers: 64-bit

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L3 Cache:	12 MB I+D on chip per chip	Peak Pointers:	32/64-bit
Other Cache:	None	Other Software:	None
Memory:	96 GB (12 x 8 GB 2Rx4 PC3-10600R-9, ECC)		
Disk Subsystem:	1 x 146 GB SAS, 15000 RPM		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	94.9	143	**86.7**	**157**	85.3	159	94.9	143	**86.7**	**157**	85.3	159
416.gamess	968	20.2	1016	19.3	**976**	**20.1**	**803**	**24.4**	803	24.4	802	24.4
433.milc	198	46.5	**197**	**46.5**	197	46.5	**193**	**47.5**	194	47.4	193	47.5
434.zeusmp	92.3	98.6	**94.5**	**96.3**	95.9	94.9	92.3	98.6	**94.5**	**96.3**	95.9	94.9
435.gromacs	370	19.3	373	19.1	**371**	**19.3**	**350**	**20.4**	349	20.4	351	20.4
436.cactusADM	**51.0**	**234**	51.0	234	92.0	130	**51.0**	**234**	51.0	234	92.0	130
437.leslie3d	98.1	95.9	**96.0**	**97.9**	94.1	99.9	98.1	95.9	**96.0**	**97.9**	94.1	99.9
444.namd	468	17.2	468	17.1	**468**	**17.2**	459	17.5	460	17.4	**460**	**17.5**
447.dealII	322	35.5	322	35.5	**322**	**35.5**	322	35.5	322	35.5	**322**	**35.5**
450.soplex	286	29.2	**286**	**29.1**	287	29.0	286	29.2	**286**	**29.1**	287	29.0
453.povray	195	27.2	**195**	**27.2**	195	27.2	**155**	**34.3**	155	34.3	154	34.5
454.calculix	318	26.0	**317**	**26.0**	316	26.1	282	29.3	282	29.3	**282**	**29.3**
459.GemsFDTD	**142**	**74.6**	137	77.4	168	63.0	**133**	**79.7**	139	76.2	124	85.6
465.tonto	477	20.6	**469**	**21.0**	468	21.0	**336**	**29.3**	336	29.3	337	29.2
470.lbm	55.2	249	**55.2**	**249**	77.4	177	55.2	249	**55.2**	**249**	77.4	177
481.wrf	**263**	**42.5**	261	42.8	266	42.0	**263**	**42.5**	261	42.8	266	42.0
482.sphinx3	440	44.3	**438**	**44.5**	438	44.5	397	49.1	381	51.2	**395**	**49.3**

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

Operating System Notes

```
'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run
'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
echo 900 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

Platform Notes

```
Turbo Mode enabled in BIOS
Turbo Boost set to Traditional in BIOS
Power C-State enabled in BIOS
Data Reuse disabled in BIOS
Demand Scrub disabled in BIOS
```

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General Notes

```
OMP_NUM_THREADS set to number of cores
Binaries compiled on RHEL5.5
```

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:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
-ansi-alias
```

C++ benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias
```

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Base Optimization Flags (Continued)

Fortran benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xSSE4.2 -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: -xSSE4.2(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: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -ansi-alias
             -parallel
```

C++ benchmarks:

```
   444.namd: -xSSE4.2(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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Peak Optimization Flags (Continued)

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xSSE4.2(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: -xSSE4.2(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
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

465.tonto: -xSSE4.2(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
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

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) -prof-use(pass 2) -static -auto-ilp32
-ansi-alias

436.cactusADM: basepeak = yes

454.calculix: -xSSE4.2 -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-ic12.0-linux64-revB.html
http://www.spec.org/cpu2006/flags/IBM-platform-linux64-revA.20110420.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml
http://www.spec.org/cpu2006/flags/IBM-platform-linux64-revA.20110420.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 v1.1.
Report generated on Wed Jul 23 19:45:10 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 20 April 2011.