SPEC® CFP2006 Result
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IBM Corporation

IBM System x3850 X5 (Intel Xeon E7-8867L)

$SPECfp^{®}2006 =$ 50.7

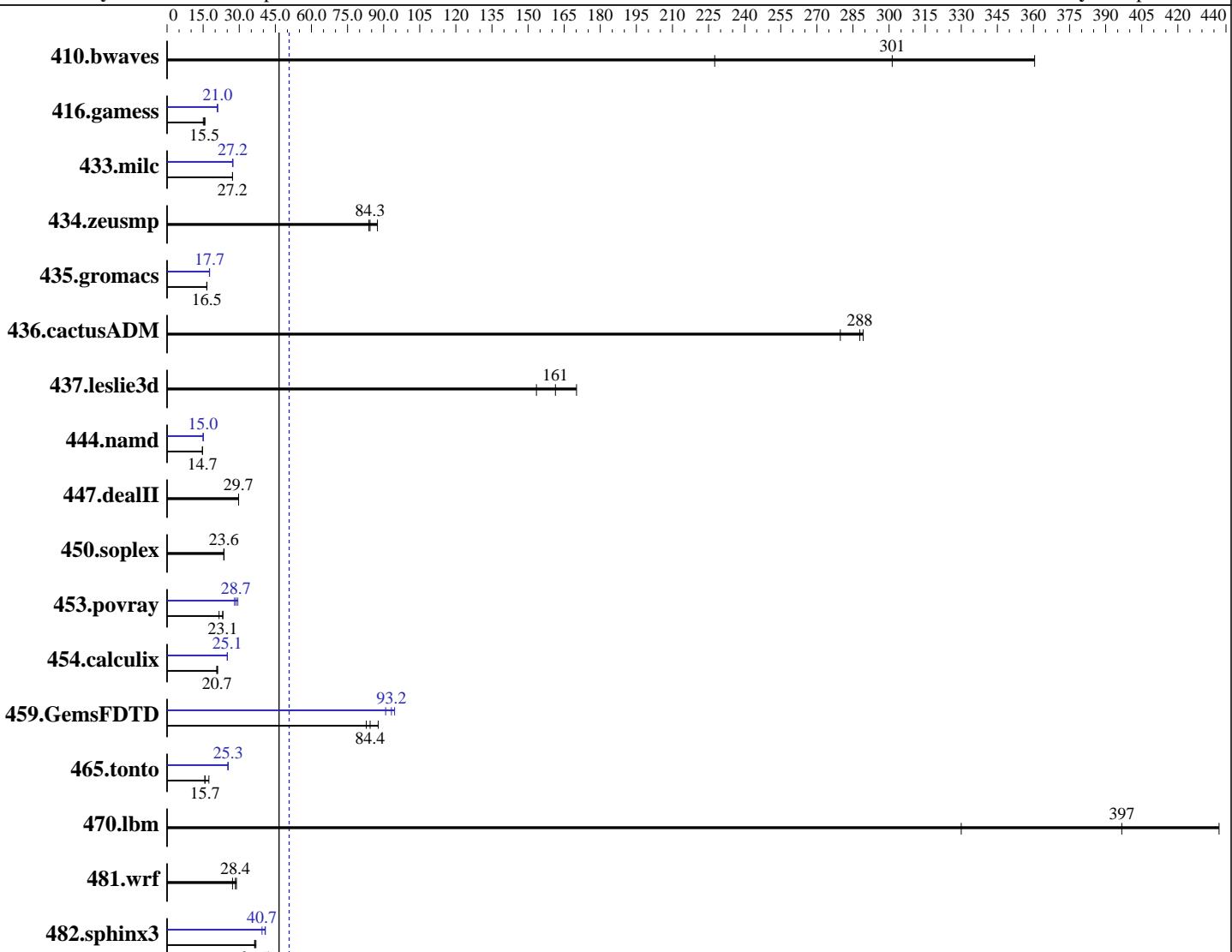$SPECfp\_base2006 =$ 46.5

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

Test date: May-2011
Hardware Availability: May-2011
Software Availability: Apr-2011

Benchmark	Result
410.bwaves	301
416.gamess	21.0 / 15.5
433.milc	27.2 / 27.2
434.zeusmp	84.3
435.gromacs	17.7 / 16.5
436.cactusADM	288
437.leslie3d	161
444.namd	15.0 / 14.7
447.dealII	29.7
450.soplex	23.6
453.povray	28.7 / 23.1
454.calculix	25.1 / 20.7
459.GemsFDTD	93.2 / 84.4
465.tonto	25.3 / 15.7
470.lbm	397
481.wrf	28.4
482.sphinx3	40.7 / 36.5

SPECfp_base2006 = 46.5
SPECfp2006 = 50.7

Hardware

CPU Name: Intel Xeon E7-8867L
CPU Characteristics: Intel Turbo Boost Technology up to 2.53 GHz
CPU MHz: 2133
FPU: Integrated
CPU(s) enabled: 40 cores, 4 chips, 10 cores/chip, 2 threads/core
CPU(s) orderable: 1,2,3,4 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:	30 MB I+D on chip per chip
Other Cache:	None
Memory:	512 GB (64 x 8 GB 4Rx8 PC3-8500R-7, ECC)
Disk Subsystem:	2 x 147 GB 15k RPM SAS, RAID 0
Other Hardware:	None
Peak Pointers:	32/64-bit
Other Software:	None

Results Table

Benchmark	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
410.bwaves	37.7	360	**45.1**	**301**	59.7	228	37.7	360	**45.1**	**301**	59.7	228
416.gamess	1243	15.8	1300	15.1	**1261**	**15.5**	937	20.9	**933**	**21.0**	932	21.0
433.milc	337	27.2	337	27.2	**337**	**27.2**	337	27.2	**337**	**27.2**	335	27.4
434.zeusmp	104	87.4	108	83.9	**108**	**84.3**	104	87.4	108	83.9	**108**	**84.3**
435.gromacs	430	16.6	433	16.5	**432**	**16.5**	**404**	**17.7**	406	17.6	404	17.7
436.cactusADM	41.3	289	**41.5**	**288**	42.7	280	41.3	289	**41.5**	**288**	42.7	280
437.leslie3d	61.2	153	55.3	170	**58.3**	**161**	61.2	153	55.3	170	**58.3**	**161**
444.namd	547	14.7	**544**	**14.7**	544	14.8	**534**	**15.0**	534	15.0	534	15.0
447.dealII	**385**	**29.7**	385	29.7	385	29.7	**385**	**29.7**	385	29.7	385	29.7
450.soplex	**353**	**23.6**	354	23.6	352	23.7	**353**	**23.6**	354	23.6	352	23.7
453.povray	**230**	**23.1**	246	21.6	229	23.2	**186**	**28.7**	190	28.0	181	29.4
454.calculix	**398**	**20.7**	392	21.0	399	20.7	329	25.1	330	25.0	**329**	**25.1**
459.GemsFDTD	121	87.7	128	82.8	**126**	**84.4**	112	94.6	**114**	**93.2**	117	90.8
465.tonto	566	17.4	626	15.7	**625**	**15.7**	388	25.4	389	25.3	**388**	**25.3**
470.lbm	**34.6**	**397**	41.6	330	31.4	437	**34.6**	**397**	41.6	330	31.4	437
481.wrf	387	28.8	411	27.2	**393**	**28.4**	387	28.8	411	27.2	**393**	**28.4**
482.sphinx3	528	36.9	**534**	**36.5**	536	36.4	477	40.9	**479**	**40.7**	494	39.5

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
echo 1 > /proc/sys/vm/zone_reclaim_mode
'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

```
BIOS Settings:
Turbo Boost Power Optimization set to Traditional
```

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General Notes

```
OMP_NUM_THREADS set to number of cores
Binaries were 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.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.xml

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