SPEC® CFP2006 Result
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IBM Corporation

$SPECfp^®2006 =$ 21.3

IBM System x3650 (Intel Xeon L5410)

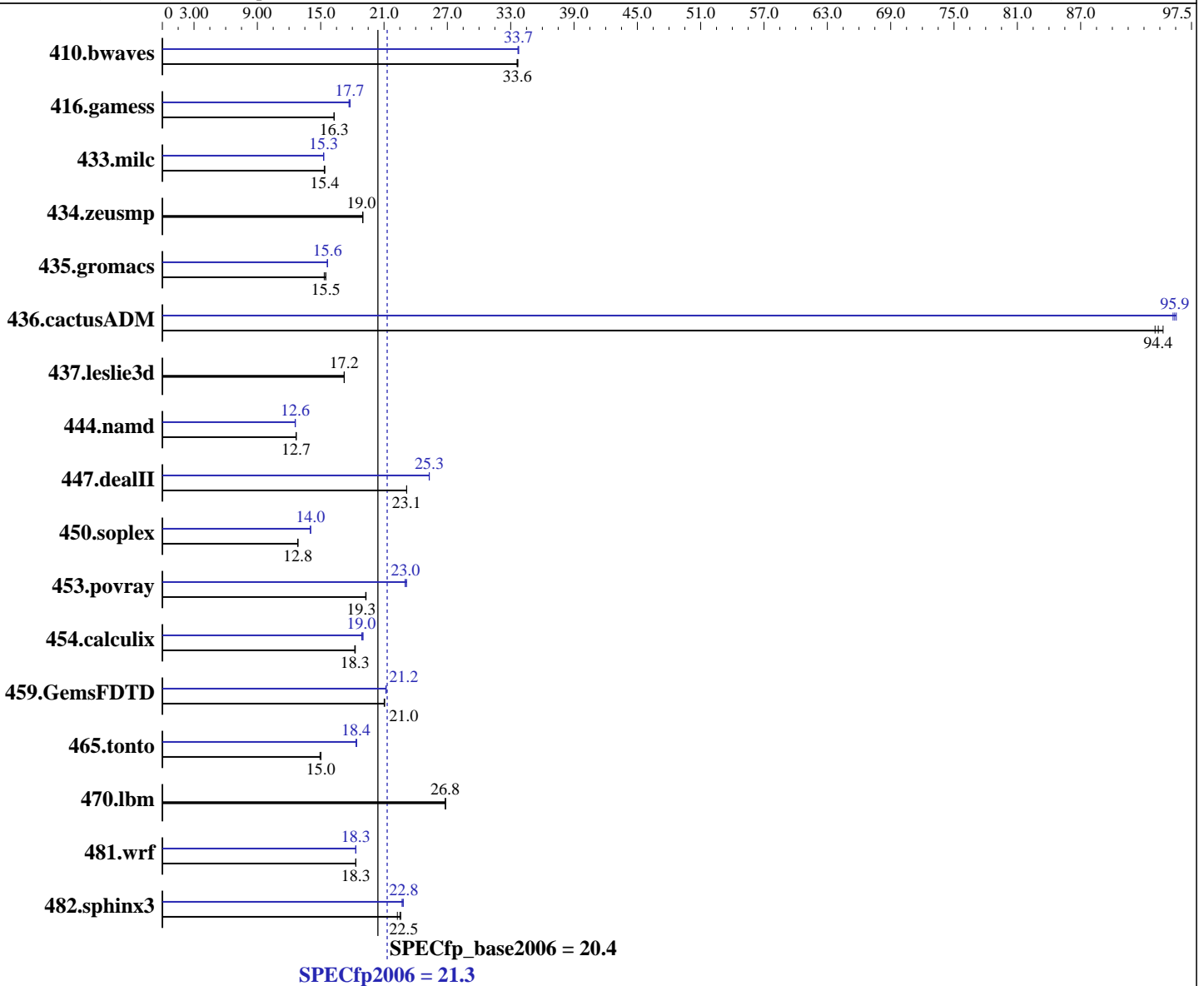$SPECfp\_base2006 =$ 20.4

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

Test date: Oct-2008
Hardware Availability: Nov-2008
Software Availability: Nov-2008

Benchmark	Result
410.bwaves	33.7 / 33.6
416.gamess	17.7 / 16.3
433.milc	15.3 / 15.4
434.zeusmp	19.0
435.gromacs	15.6 / 15.5
436.cactusADM	95.9 / 94.4
437.leslie3d	17.2
444.namd	12.6 / 12.7
447.dealII	25.3 / 23.1
450.soplex	14.0 / 12.8
453.povray	23.0 / 19.3
454.calculix	19.0 / 18.3
459.GemsFDTD	21.2 / 21.0
465.tonto	18.4 / 15.0
470.lbm	26.8
481.wrf	18.3 / 18.3
482.sphinx3	22.8 / 22.5

SPECfp_base2006 = 20.4
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Hardware

CPU Name: Intel Xeon L5410
CPU Characteristics: 1333MHz system bus
CPU MHz: 2333
FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip
CPU(s) orderable: 1,2 chips
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 12 MB I+D on chip per chip, 6 MB shared / 2 cores

Software

Operating System: SuSE Linux Enterprise Server 10 (x86_64) SP1, Kernel 2.6.16.46-0.12-smp
Compiler: Intel C++ and Fortran Compiler 11.0 for Linux Build 20080730 Package ID: l_cproc_b_11.0.042, l_fproc_b_11.0.042
Auto Parallel: Yes
File System: ReiserFS
System State: Run level 3 (multi-user)
Base Pointers: 64-bit

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L3 Cache:	None
Other Cache:	None
Memory:	16 GB (8 x 2 GB DDR2-5300F ECC)
Disk Subsystem:	1 x 36 GB SAS, 15000 RPM
Other Hardware:	None

Peak Pointers:	32/64-bit
Other Software:	Binutils 2.18.50.0.7.20080502

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	403	33.7	**404**	**33.6**	404	33.6	**403**	**33.7**	403	33.7	403	33.7
416.gamess	1202	16.3	**1203**	**16.3**	1204	16.3	1107	17.7	**1104**	**17.7**	1101	17.8
433.milc	599	15.3	**597**	**15.4**	597	15.4	601	15.3	**601**	**15.3**	601	15.3
434.zeusmp	479	19.0	479	19.0	**479**	**19.0**	479	19.0	479	19.0	**479**	**19.0**
435.gromacs	461	15.5	466	15.3	**461**	**15.5**	**457**	**15.6**	456	15.6	457	15.6
436.cactusADM	126	94.8	**127**	**94.4**	127	94.0	124	96.1	**125**	**95.9**	125	95.8
437.leslie3d	**546**	**17.2**	545	17.2	546	17.2	**546**	**17.2**	545	17.2	546	17.2
444.namd	632	12.7	**633**	**12.7**	633	12.7	638	12.6	**637**	**12.6**	636	12.6
447.dealII	494	23.1	494	23.1	**494**	**23.1**	453	25.3	**452**	**25.3**	452	25.3
450.soplex	649	12.8	**650**	**12.8**	650	12.8	594	14.0	594	14.0	**594**	**14.0**
453.povray	**276**	**19.3**	276	19.3	276	19.3	231	23.0	**231**	**23.0**	230	23.1
454.calculix	451	18.3	453	18.2	**452**	**18.3**	434	19.0	**434**	**19.0**	437	18.9
459.GemsFDTD	505	21.0	504	21.1	**504**	**21.0**	**501**	**21.2**	501	21.2	500	21.2
465.tonto	**655**	**15.0**	655	15.0	659	14.9	534	18.4	536	18.4	**536**	**18.4**
470.lbm	513	26.8	**513**	**26.8**	512	26.8	513	26.8	**513**	**26.8**	512	26.8
481.wrf	610	18.3	**609**	**18.3**	609	18.3	**610**	**18.3**	610	18.3	609	18.3
482.sphinx3	875	22.3	**866**	**22.5**	863	22.6	854	22.8	858	22.7	**855**	**22.8**

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

General Notes

```
OMP_NUM_THREADS set to number of processors
KMP_AFFINITY set to "physical,0"
KMP_STACKSIZE set to 200M
Hardware Prefetch Enabled, Adjacent Sector Prefetch Enabled
'ulimit -s unlimited' was used to set the stack size to unlimited prior to run
```

Base Compiler Invocation

C benchmarks:
```
icc
```

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Base Compiler Invocation (Continued)

C++ benchmarks:
    icpc

Fortran benchmarks:
    ifort

Benchmarks using both Fortran and C:
    icc ifort

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:
    -xSSE4.1 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

C++ benchmarks:
    -xSSE4.1 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

Fortran benchmarks:
    -xSSE4.1 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

Benchmarks using both Fortran and C:
    -xSSE4.1 -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

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CPU2006 license: 11	**Test date:** Oct-2008
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Tested by: IBM Corporation	**Software Availability:** Nov-2008

Peak Compiler Invocation

C benchmarks (except as noted below):
```
icc
```

```
482.sphinx3: /opt/intel/Compiler/11.0/042/bin/ia32/icc
         -L/opt/intel/Compiler/11.0/042/ipp/ia32/lib
         -I/opt/intel/Compiler/11.0/042/ipp/ia32/include
```

C++ benchmarks (except as noted below):
```
icpc
```

```
450.soplex: /opt/intel/Compiler/11.0/042/bin/ia32/icpc
         -L/opt/intel/Compiler/11.0/042/ipp/ia32/lib
         -I/opt/intel/Compiler/11.0/042/ipp/ia32/include
```

Fortran benchmarks:
```
ifort
```

Benchmarks using both Fortran and C:
```
icc ifort
```

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
```

Peak Optimization Flags

C benchmarks:

```
   433.milc: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
         -no-prec-div -static -fno-alias
```

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Peak Optimization Flags (Continued)

          470.lbm: basepeak = yes

      482.sphinx3: -xSSE4.1 -ipo -O3 -no-prec-div -static -unroll2

C++ benchmarks:

        444.namd: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
                  -no-prec-div -static -fno-alias -auto-ilp32

        447.dealII: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
                  -no-prec-div -static -unroll2 -ansi-alias -scalar-rep-
                  -opt-prefetch

        450.soplex: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
                  -no-prec-div -static -opt-malloc-options=3

        453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
                  -no-prec-div -static -unroll4 -ansi-alias

Fortran benchmarks:

        410.bwaves: -xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch
                  -parallel

        416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
                  -no-prec-div -static -unroll2 -Ob0 -ansi-alias
                  -scalar-rep-

        434.zeusmp: basepeak = yes

        437.leslie3d: basepeak = yes

     459.GemsFDTD: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
                  -no-prec-div -static -unroll2 -Ob0 -opt-prefetch
                  -parallel

        465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
                  -no-prec-div -static -unroll4 -auto

Benchmarks using both Fortran and C:

     435.gromacs: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
                  -no-prec-div -static -opt-prefetch -auto-ilp32

   436.cactusADM: -prof-gen(pass 1) -prof-use(pass 2) -xSSE4.1 -ipo -O3
                  -no-prec-div -static -unroll2 -opt-prefetch -parallel
                  -auto-ilp32

      454.calculix: -xSSE4.1 -ipo -O3 -no-prec-div -static -auto-ilp32

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Peak Optimization Flags (Continued)

481.wrf: `-xSSE4.1 -ipo -O3 -no-prec-div -static -opt-prefetch -parallel -auto-ilp32`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090713.13.html
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20090713.03.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090713.13.xml
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20090713.03.xml

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