SPEC® CFP2006 Result

IBM Corporation

IBM System x3500 (Intel Xeon X5460)

$SPECfp^{®}2006 =$ 25.4
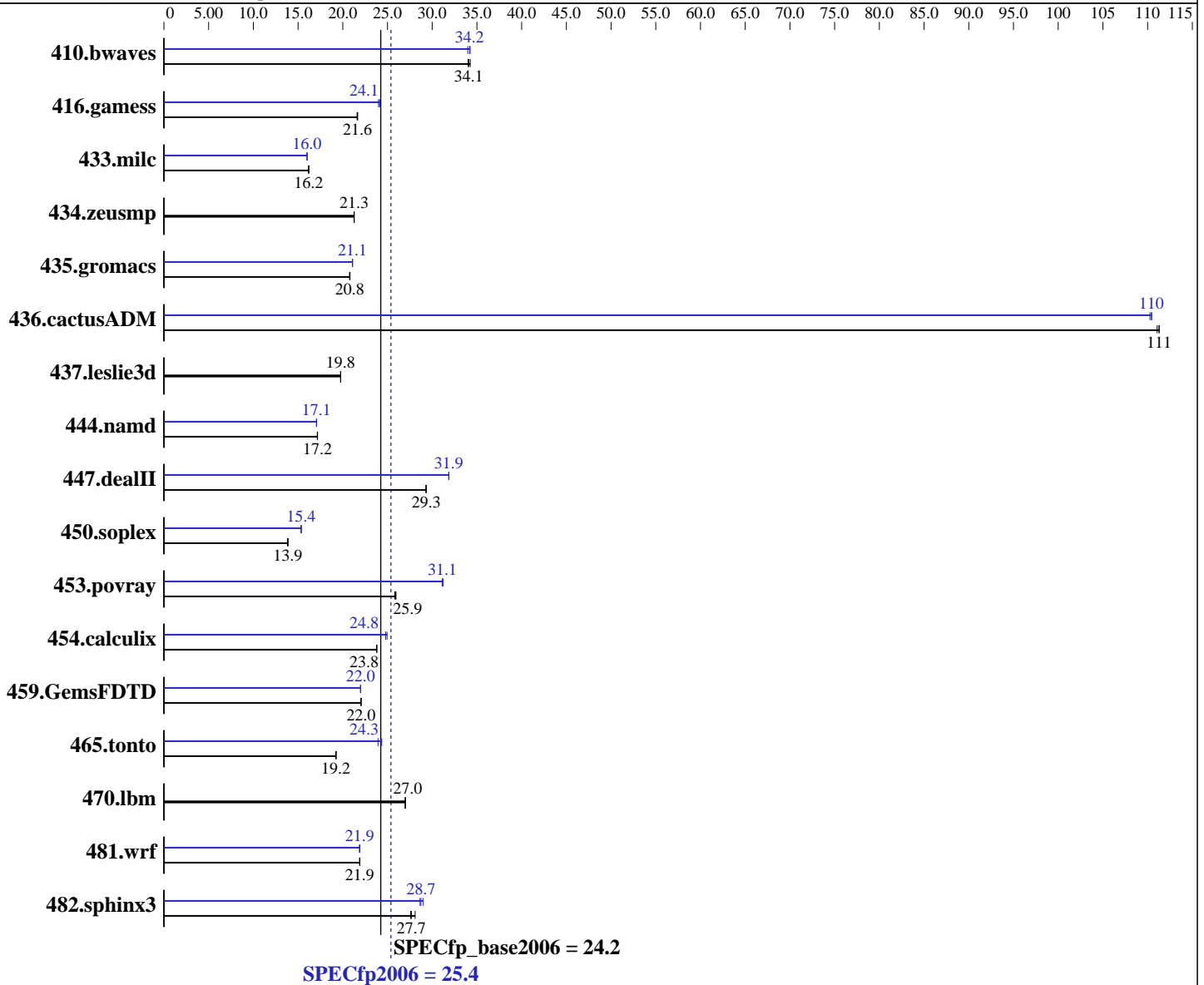
$SPECfp\_base2006 =$ 24.2

CPU2006 license: 11

Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Sep-2008

Hardware Availability: Nov-2008

Software Availability: Nov-2008

Benchmark	Value (blue / black)
410.bwaves	34.2 / 34.1
416.gamess	24.1 / 21.6
433.milc	16.0 / 16.2
434.zeusmp	21.3
435.gromacs	21.1 / 20.8
436.cactusADM	110 / 111
437.leslie3d	19.8
444.namd	17.1 / 17.2
447.dealII	31.9 / 29.3
450.soplex	15.4 / 13.9
453.povray	31.1 / 25.9
454.calculix	24.8 / 23.8
459.GemsFDTD	22.0 / 22.0
465.tonto	24.3 / 19.2
470.lbm	27.0
481.wrf	21.9 / 21.9
482.sphinx3	28.7 / 27.7

SPECfp_base2006 = 24.2

SPECfp2006 = 25.4

Hardware

CPU Name: Intel Xeon X5460

CPU Characteristics: 1333MHz system bus

CPU MHz: 3167

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 80 GB SATA, 7200 RPM
Other Hardware:	None

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

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	**399**	**34.1**	399	34.0	397	34.3	397	34.2	400	34.0	**398**	**34.2**
416.gamess	906	21.6	904	21.7	**905**	**21.6**	**812**	**24.1**	811	24.1	816	24.0
433.milc	567	16.2	**567**	**16.2**	567	16.2	573	16.0	**573**	**16.0**	574	16.0
434.zeusmp	428	21.3	**428**	**21.3**	428	21.3	428	21.3	**428**	**21.3**	428	21.3
435.gromacs	343	20.8	344	20.8	**344**	**20.8**	338	21.1	339	21.1	**339**	**21.1**
436.cactusADM	108	111	107	111	**107**	**111**	108	110	108	110	**108**	**110**
437.leslie3d	**476**	**19.8**	476	19.8	475	19.8	**476**	**19.8**	476	19.8	475	19.8
444.namd	468	17.2	**467**	**17.2**	467	17.2	470	17.1	470	17.1	**470**	**17.1**
447.dealII	390	29.3	391	29.3	**390**	**29.3**	359	31.9	359	31.8	**359**	**31.9**
450.soplex	601	13.9	603	13.8	**602**	**13.9**	**543**	**15.4**	543	15.4	544	15.3
453.povray	205	25.9	**205**	**25.9**	206	25.8	**171**	**31.1**	170	31.2	171	31.1
454.calculix	**347**	**23.8**	347	23.8	347	23.8	**333**	**24.8**	331	25.0	333	24.8
459.GemsFDTD	**481**	**22.0**	481	22.0	481	22.1	483	22.0	482	22.0	**482**	**22.0**
465.tonto	511	19.3	512	19.2	**512**	**19.2**	404	24.4	411	23.9	**405**	**24.3**
470.lbm	509	27.0	**509**	**27.0**	509	27.0	509	27.0	**509**	**27.0**	509	27.0
481.wrf	511	21.9	**510**	**21.9**	510	21.9	**510**	**21.9**	510	21.9	511	21.9
482.sphinx3	706	27.6	**704**	**27.7**	694	28.1	**678**	**28.7**	672	29.0	681	28.6

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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IBM System x3500 (Intel Xeon X5460)	SPECfp_base2006 =	24.2

CPU2006 license: 11
Test sponsor: IBM Corporation
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Test date: Sep-2008
Hardware Availability: Nov-2008
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-Linux64-Platform.20090713.03.html
http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090713.13.html

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

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