SPEC® CFP2006 Result

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Dell Inc.

PowerEdge R610 (Intel Xeon X5570, 2.93 GHz)
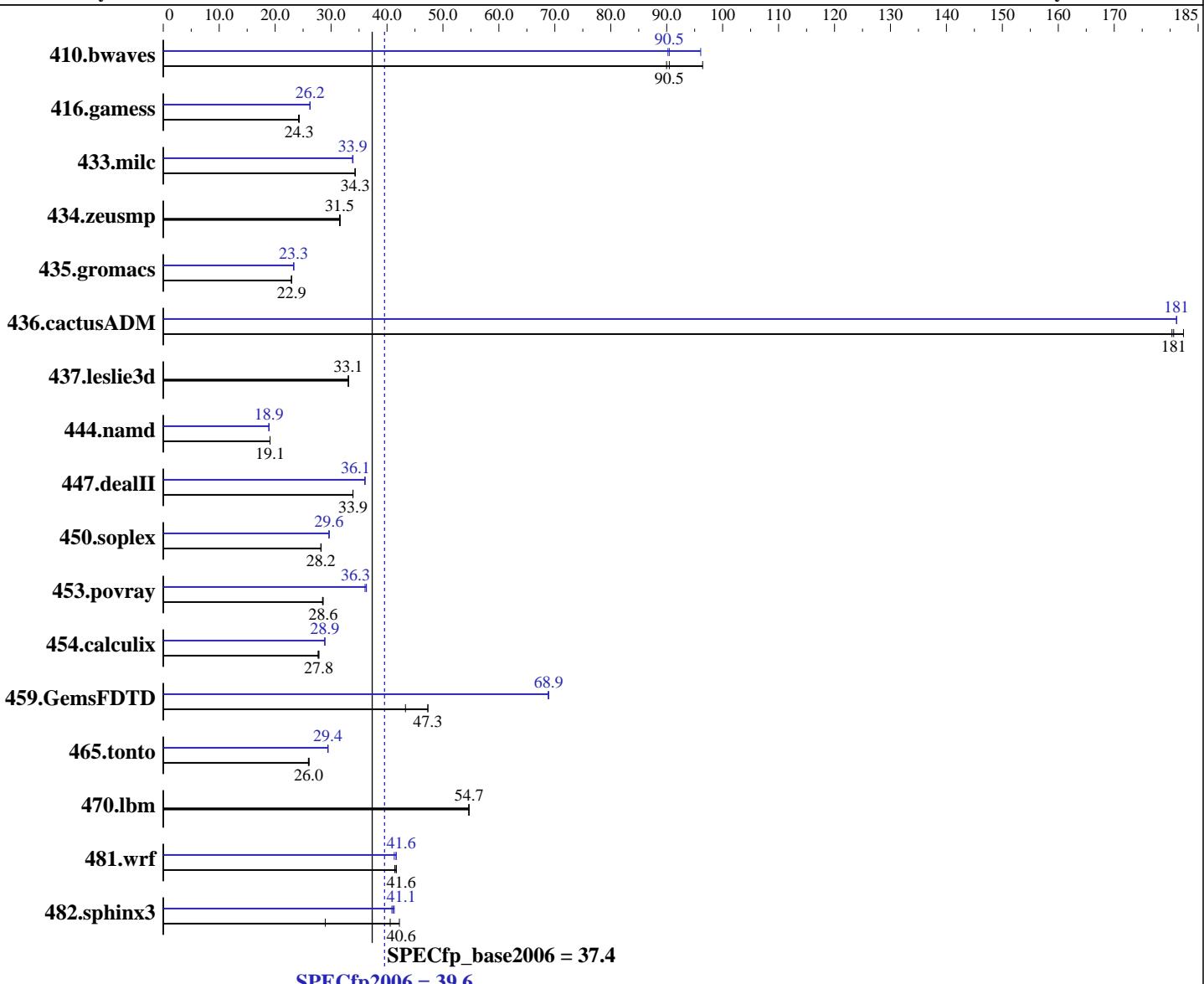
$SPECfp^{®}2006 =$ 39.6

$SPECfp\_base2006 =$ 37.4

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

Test date: Mar-2009
Hardware Availability: Mar-2009
Software Availability: Feb-2009

Benchmark	Result
410.bwaves	90.5 / 90.5
416.gamess	26.2 / 24.3
433.milc	33.9 / 34.3
434.zeusmp	31.5
435.gromacs	23.3 / 22.9
436.cactusADM	181 / 181
437.leslie3d	33.1
444.namd	18.9 / 19.1
447.dealII	36.1 / 33.9
450.soplex	29.6 / 28.2
453.povray	36.3 / 28.6
454.calculix	28.9 / 27.8
459.GemsFDTD	68.9 / 47.3
465.tonto	29.4 / 26.0
470.lbm	54.7
481.wrf	41.6 / 41.6
482.sphinx3	41.1 / 40.6

SPECfp_base2006 = 37.4

SPECfp2006 = 39.6

Hardware

CPU Name: Intel Xeon X5570
CPU Characteristics: Intel Turbo Boost Technology up to 3.33 GHz
CPU MHz: 2933
FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 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

Software

Operating System: SUSE Linux Enterprise Server 10 (x86_64) SP2, Kernel 2.6.16.60-0.21-smp
Compiler: Intel C++ and Fortran Compiler Professional 11.0 for Linux
Build 20090131 Package ID: l_cproc_p_11.0.080, l_cprof_p_11.0.080
Auto Parallel: Yes
File System: ReiserFS
System State: Run level 3 (multi-user)

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L3 Cache:	8 MB I+D on chip per chip
Other Cache:	None
Memory:	24 GB (6 x 4 GB DDR3-1333 DR RDIMM)
Disk Subsystem:	1 x 146 GB 10000 RPM SAS
Other Hardware:	None
Base Pointers:	64-bit
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	141	96.4	**150**	**90.5**	151	90.0	141	96.1	151	90.2	**150**	**90.5**
416.gamess	810	24.2	**806**	**24.3**	805	24.3	**746**	**26.2**	747	26.2	746	26.2
433.milc	**267**	**34.3**	268	34.2	267	34.3	**271**	**33.9**	271	33.8	271	33.9
434.zeusmp	289	31.5	**289**	**31.5**	288	31.6	289	31.5	**289**	**31.5**	288	31.6
435.gromacs	312	22.9	**311**	**22.9**	311	23.0	306	23.4	**306**	**23.3**	307	23.3
436.cactusADM	65.5	182	66.3	180	**66.2**	**181**	66.0	181	**66.0**	**181**	66.0	181
437.leslie3d	**284**	**33.1**	284	33.1	284	33.1	**284**	**33.1**	284	33.1	284	33.1
444.namd	**420**	**19.1**	420	19.1	420	19.1	424	18.9	**425**	**18.9**	425	18.9
447.dealII	337	33.9	**337**	**33.9**	338	33.9	317	36.1	317	36.0	**317**	**36.1**
450.soplex	296	28.2	**296**	**28.2**	295	28.2	**281**	**29.6**	281	29.6	281	29.7
453.povray	**186**	**28.6**	187	28.5	186	28.6	**147**	**36.3**	146	36.3	147	36.1
454.calculix	297	27.8	298	27.7	**297**	**27.8**	286	28.9	286	28.9	**286**	**28.9**
459.GemsFDTD	245	43.3	224	47.3	**224**	**47.3**	**154**	**68.9**	154	68.9	154	68.8
465.tonto	**379**	**26.0**	379	25.9	377	26.1	334	29.5	335	29.4	**334**	**29.4**
470.lbm	252	54.6	251	54.7	**251**	**54.7**	252	54.6	251	54.7	**251**	**54.7**
481.wrf	270	41.4	268	41.7	**268**	**41.6**	**268**	**41.6**	271	41.3	268	41.6
482.sphinx3	673	29.0	**480**	**40.6**	462	42.2	477	40.9	472	41.3	**474**	**41.1**

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 cores
KMP_AFFINITY set to granularity=fine,scatter
KMP_STACKSIZE set to 200M
```

Base Compiler Invocation

C benchmarks:
```
icc
```

C++ benchmarks:
```
icpc
```

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Base Compiler Invocation (Continued)

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

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

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
```

Peak Compiler Invocation

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

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Peak Compiler Invocation (Continued)

    482.sphinx3: `icc -m32`

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

    450.soplex: `icpc -m32`

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

          470.lbm: `basepeak = yes`

      482.sphinx3: `-xSSE4.2 -ipo -O3 -no-prec-div -static -unroll2`

C++ benchmarks:

Continued on next page

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Peak Optimization Flags (Continued)

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

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

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

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

Fortran benchmarks:

```
   410.bwaves: -xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch
               -parallel

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

   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) -static(pass 2) -prof-use(pass 2)
                -unroll2 -Ob0 -opt-prefetch -parallel

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

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) -static(pass 2) -prof-use(pass 2)
                -opt-prefetch -auto-ilp32

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

   454.calculix: -xSSE4.2 -ipo -O3 -no-prec-div -static -auto-ilp32
```

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Peak Optimization Flags (Continued)

481.wrf: `-xSSE4.2 -ipo -O3 -no-prec-div -static -opt-prefetch -parallel -auto-ilp32`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090710.04.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/Intel-ic11.0-fp-linux64-revA.20090710.04.xml`

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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