SPEC® CFP2006 Result
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Lenovo Group Limited

ThinkServer TD200x(Intel Xeon X5570, 2.93 GHz)

$SPECfp®2006 =$ 41.0

$SPECfp\_base2006 =$ 38.4
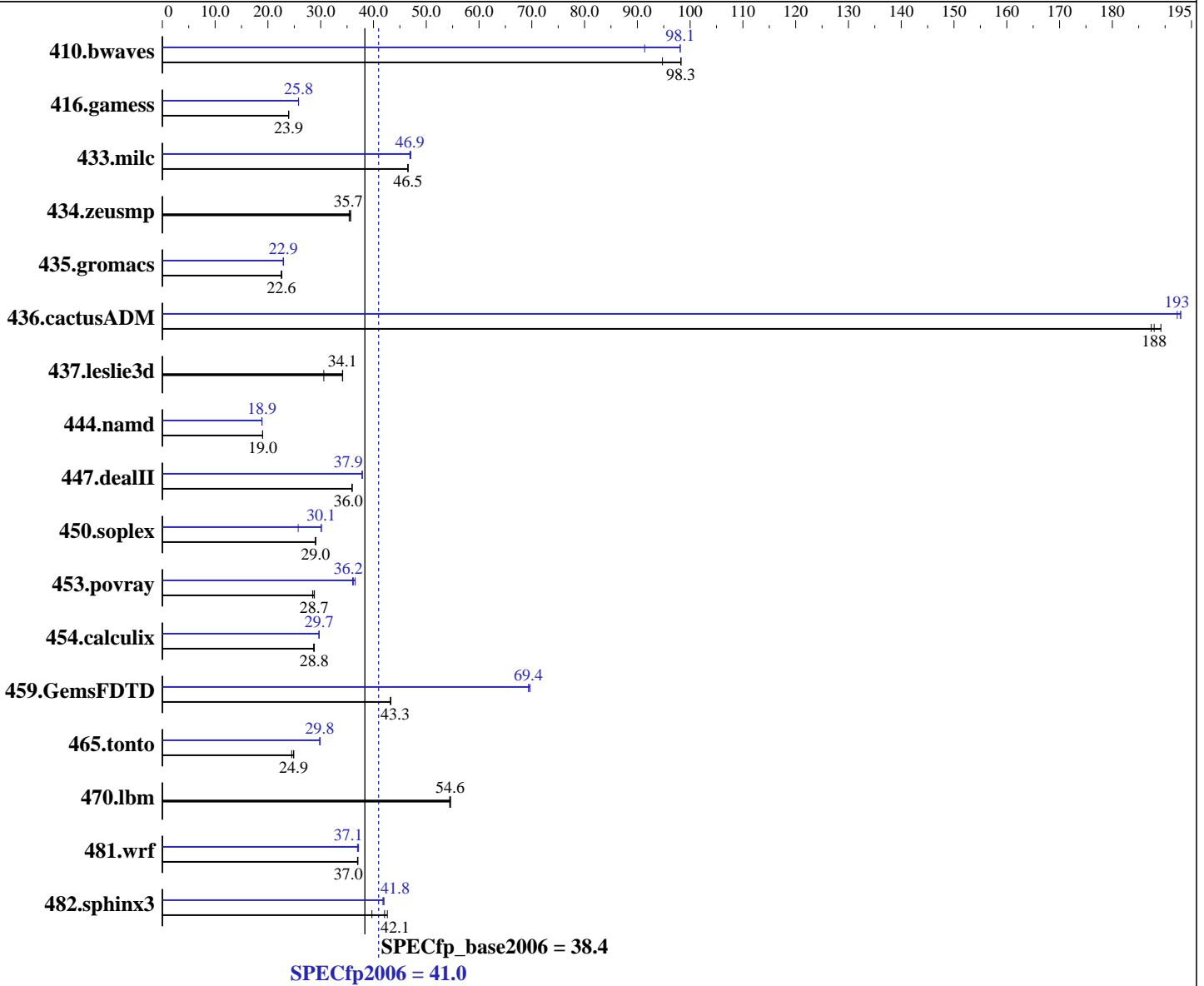
CPU2006 license: 9017
Test sponsor: Lenovo Group Limited
Tested by: Lenovo Group Limited

Test date: Sep-2009
Hardware Availability: Jul-2009
Software Availability: May-2009

Benchmark	Result (blue)	Result (base)
410.bwaves	98.1	98.3
416.gamess	25.8	23.9
433.milc	46.9	46.5
434.zeusmp		35.7
435.gromacs	22.9	22.6
436.cactusADM	193	188
437.leslie3d		34.1
444.namd	18.9	19.0
447.dealII	37.9	36.0
450.soplex	30.1	29.0
453.povray	36.2	28.7
454.calculix	29.7	28.8
459.GemsFDTD	69.4	43.3
465.tonto	29.8	24.9
470.lbm		54.6
481.wrf	37.1	37.0
482.sphinx3	41.8	42.1

SPECfp_base2006 = 38.4
SPECfp2006 = 41.0

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 chip
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 Professional Compiler for IA32 and Intel 64, Version 11.1
  Build 20090511   Package ID: l_cproc_p_11.1.040, l_cprof_p_11.1.040
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	Base Pointers:	64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	24 GB (6 x 4 GB DDR3-1333 DR RDIMM)	Other Software:	Microquill SmartHeap V8.1
Disk Subsystem:	1 x 73 GB 15000 RPM SAS		Binutils 2.18.50.0.7.20080502
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	143	94.8	**138**	**98.3**	138	98.3	149	91.4	**139**	**98.1**	138	98.1
416.gamess	818	23.9	818	23.9	**818**	**23.9**	**759**	**25.8**	759	25.8	759	25.8
433.milc	197	46.5	**197**	**46.5**	197	46.6	195	47.1	196	46.9	**196**	**46.9**
434.zeusmp	257	35.4	255	35.7	**255**	**35.7**	257	35.4	255	35.7	**255**	**35.7**
435.gromacs	315	22.6	**316**	**22.6**	317	22.5	312	22.9	311	22.9	**312**	**22.9**
436.cactusADM	63.2	189	63.8	187	**63.6**	**188**	62.1	192	61.9	193	**61.9**	**193**
437.leslie3d	307	30.6	275	34.2	**275**	**34.1**	307	30.6	275	34.2	**275**	**34.1**
444.namd	**422**	**19.0**	423	19.0	422	19.0	425	18.9	**425**	**18.9**	425	18.9
447.dealII	318	35.9	318	36.0	**318**	**36.0**	302	37.9	302	37.9	**302**	**37.9**
450.soplex	**287**	**29.0**	288	29.0	287	29.1	277	30.1	**277**	**30.1**	324	25.7
453.povray	**185**	**28.7**	187	28.5	185	28.8	146	36.5	148	36.0	**147**	**36.2**
454.calculix	288	28.7	**287**	**28.8**	286	28.8	278	29.7	**278**	**29.7**	278	29.7
459.GemsFDTD	246	43.2	**245**	**43.3**	245	43.3	152	69.7	**153**	**69.4**	153	69.4
465.tonto	402	24.5	395	24.9	**395**	**24.9**	329	29.9	330	29.8	**330**	**29.8**
470.lbm	**252**	**54.6**	252	54.6	252	54.4	**252**	**54.6**	252	54.6	252	54.4
481.wrf	302	37.0	301	37.0	**302**	**37.0**	302	37.0	**301**	**37.1**	300	37.2
482.sphinx3	491	39.7	457	42.6	**463**	**42.1**	466	41.8	464	42.0	**466**	**41.8**

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

    Submitted_by: Mengistu Taye <taye@lenovo.com>
    Submitted: Tue Nov 10 14:05:00 EST 2009
    Submission: cpu2006-20090925-08734.sub
```

Base Compiler Invocation

C benchmarks:
```
     icc   -m64
```

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Base Compiler Invocation (Continued)

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
```

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
```

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Peak Compiler Invocation

C benchmarks (except as noted below):
```
icc    -m64
```

```
482.sphinx3: icc -m32
```

C++ benchmarks (except as noted below):
```
icpc   -m64
```

```
450.soplex: icpc -m32
```

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
icc    -m64 ifort -m64
```

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
```

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Peak Optimization Flags (Continued)

C++ benchmarks:

```
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
```

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Peak Optimization Flags (Continued)

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

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-ic11.1-fp-linux64-revF.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/Intel-ic11.1-fp-linux64-revF.xml

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

Tested with SPEC CPU2006 v1.1.
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