SPEC® CFP2006 Result

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Lenovo Group Limited

Lenovo ThinkServer RD120 (Intel Xeon X5470)

$SPECfp^{®}2006 =$ 26.1

$SPECfp\_base2006 =$ 25.1

CPU2006 license: 9017	**Test date:** May-2009
Test sponsor: Lenovo Group Limited	**Hardware Availability:** Apr-2009
Tested by: Lenovo Group Limited	**Software Availability:** Feb-2009

Results graph (SPECfp_base2006 = 25.1, SPECfp2006 = 26.1):

Benchmark	Peak	Base
410.bwaves	34.1	34.1
416.gamess	25.4	22.5
433.milc	16.3	16.4
434.zeusmp		21.8
435.gromacs	22.2	22.0
436.cactusADM	103	106
437.leslie3d		20.0
444.namd	18.0	18.1
447.dealII	33.2	30.8
450.soplex	15.8	14.3
453.povray	33.1	27.4
454.calculix	26.2	24.9
459.GemsFDTD	22.2	22.3
465.tonto	25.5	22.0
470.lbm		27.1
481.wrf	22.3	22.2
482.sphinx3	30.4	29.6

Hardware

CPU Name:	Intel Xeon X5470
CPU Characteristics:	1333MHz system bus
CPU MHz:	3333
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

Continued on next page

Software

Operating System:	SuSe Linux SLES10 SP2
Compiler:	Intel C++ and Fortran Compiler 11.0 for Linux Build 20090131 Package ID: l_cc_b_11.0.081, l_fc_b_11.0.081
Auto Parallel:	Yes
File System:	ReiserFS
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	32/64-bit

Continued on next page

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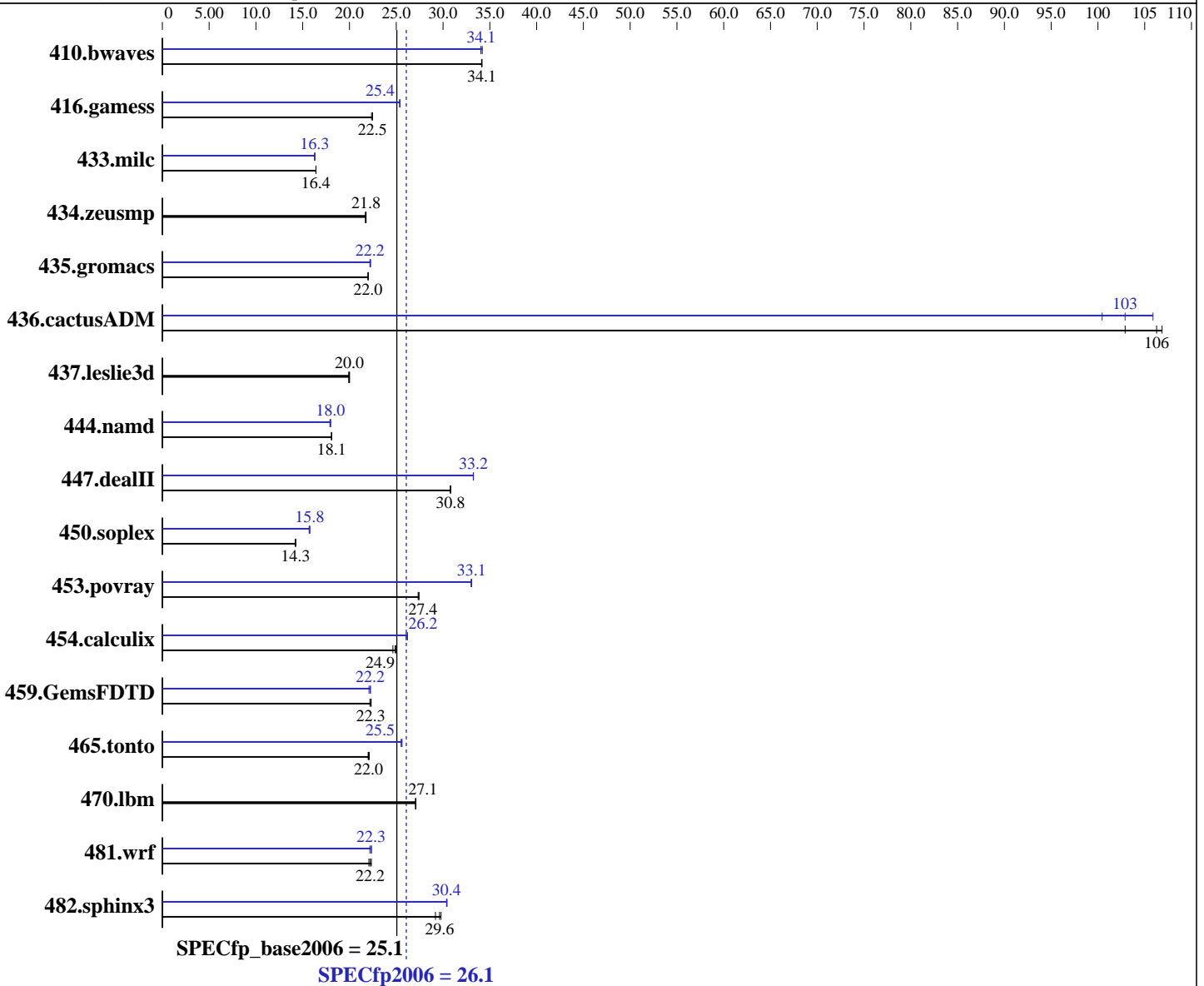| SPECfp2006 =	26.1
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L3 Cache:	None
Other Cache:	None
Memory:	16 GB (8 x 2GB 2Rx8 PC2 5300F)
Disk Subsystem:	1 x 146GB, SAS 15K RPM
Other Hardware:	None

Other Software: Microquill SmartHeap V8.1
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	**398**	**34.1**	398	34.2	398	34.1	**399**	**34.1**	399	34.0	397	34.2
416.gamess	876	22.4	**872**	**22.5**	871	22.5	**771**	**25.4**	772	25.4	771	25.4
433.milc	559	16.4	559	16.4	**559**	**16.4**	564	16.3	563	16.3	**563**	**16.3**
434.zeusmp	**418**	**21.8**	419	21.7	418	21.8	**418**	**21.8**	419	21.7	418	21.8
435.gromacs	324	22.0	**325**	**22.0**	325	22.0	322	22.2	321	22.3	**322**	**22.2**
436.cactusADM	112	107	116	103	**112**	**106**	119	100	113	106	**116**	**103**
437.leslie3d	**470**	**20.0**	472	19.9	470	20.0	**470**	**20.0**	472	19.9	470	20.0
444.namd	443	18.1	**443**	**18.1**	444	18.1	**446**	**18.0**	446	18.0	448	17.9
447.dealII	372	30.8	371	30.8	**371**	**30.8**	**344**	**33.2**	344	33.2	344	33.3
450.soplex	**585**	**14.3**	585	14.3	587	14.2	**529**	**15.8**	532	15.7	529	15.8
453.povray	195	27.3	**194**	**27.4**	194	27.4	161	33.1	**161**	**33.1**	161	33.0
454.calculix	**332**	**24.9**	331	24.9	335	24.6	317	26.0	**315**	**26.2**	315	26.2
459.GemsFDTD	**476**	**22.3**	475	22.3	478	22.2	481	22.1	**477**	**22.2**	477	22.2
465.tonto	445	22.1	**447**	**22.0**	447	22.0	384	25.6	386	25.5	**385**	**25.5**
470.lbm	508	27.1	**507**	**27.1**	507	27.1	508	27.1	**507**	**27.1**	507	27.1
481.wrf	500	22.3	506	22.1	**503**	**22.2**	504	22.2	500	22.4	**501**	**22.3**
482.sphinx3	654	29.8	668	29.2	**658**	**29.6**	640	30.4	**641**	**30.4**	642	30.4

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
```

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:
```
-xSSE4.1 -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
```

Peak Compiler Invocation

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

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Peak Compiler Invocation (Continued)

```
482.sphinx3: /opt/intel/Compiler/11.0/081/bin/ia32/icc
             -L/opt/intel/Compiler/11.0/081/ipp/ia32/lib
             -I/opt/intel/Compiler/11.0/081/ipp/ia32/include
```

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

```
450.soplex: /opt/intel/Compiler/11.0/081/bin/ia32/icpc
            -L/opt/intel/Compiler/11.0/081/ipp/ia32/lib
            -I/opt/intel/Compiler/11.0/081/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
```

```
    470.lbm: basepeak = yes
```

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

Continued on next page

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Peak Optimization Flags (Continued)

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

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

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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.20090710.16.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.20090710.16.xml`

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

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