SPEC® CFP2006 Result

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Lenovo Group Limited

Lenovo ThinkServer RD210 (Intel Xeon X5570, 2.93 GHz)

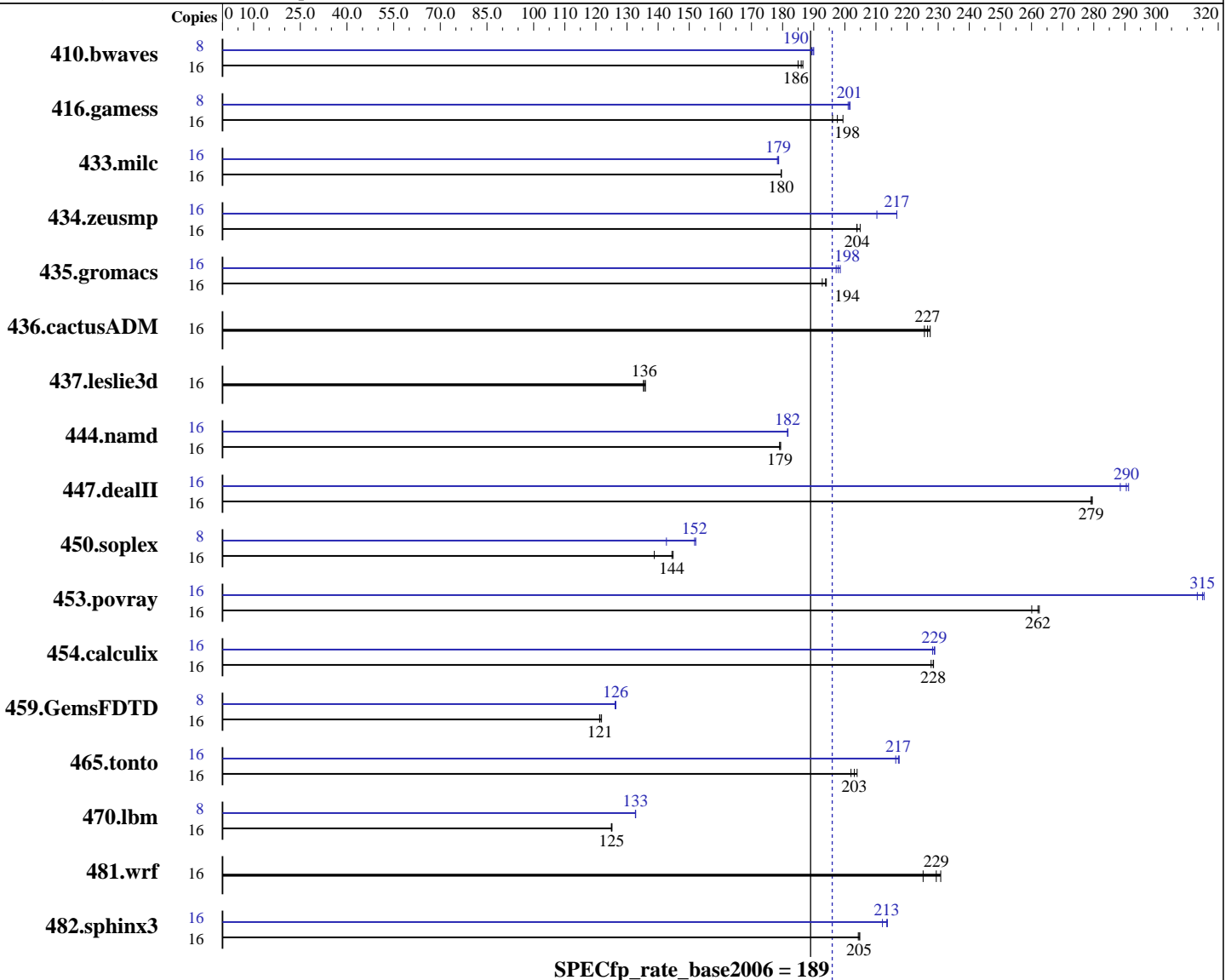$SPECfp^{®}\_rate2006 =$ 196

$SPECfp\_rate\_base2006 =$ 189

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

Copies scale: 0 10.0 25.0 40.0 55.0 70.0 85.0 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 320

- 410.bwaves: 8 copies — 190; 16 copies — 186
- 416.gamess: 8 copies — 201; 16 copies — 198
- 433.milc: 16 copies — 179; 16 copies — 180
- 434.zeusmp: 16 copies — 217; 16 copies — 204
- 435.gromacs: 16 copies — 198; 16 copies — 194
- 436.cactusADM: 16 copies — 227
- 437.leslie3d: 16 copies — 136
- 444.namd: 16 copies — 182; 16 copies — 179
- 447.dealII: 16 copies — 290; 16 copies — 279
- 450.soplex: 8 copies — 152; 16 copies — 144
- 453.povray: 16 copies — 315; 16 copies — 262
- 454.calculix: 16 copies — 229; 16 copies — 228
- 459.GemsFDTD: 8 copies — 126; 16 copies — 121
- 465.tonto: 16 copies — 217; 16 copies — 203
- 470.lbm: 8 copies — 133; 16 copies — 125
- 481.wrf: 16 copies — 229
- 482.sphinx3: 16 copies — 213; 16 copies — 205

SPECfp_rate_base2006 = 189

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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

Continued on next page

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 11.0 for Linux Build 20090131 Package ID: l_cproc_p_11.0.081, l_cprof_p_11.0.081
Auto Parallel:	No
File System:	ReiserFS
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit

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L3 Cache: 8 MB I+D on chip per chip	Peak Pointers: 32/64-bit
Other Cache: None	Other Software: Binutils 2.18.50.0.7.20080502
Memory: 24 GB (6 x 4 GB DDR3-1333 DR RDIMM)	
Disk Subsystem: 1 x 73 GB, SAS 15K RPM	
Other Hardware: None	

Results Table

Benchmark	Base Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
410.bwaves	16	1175	185	1166	187	**1169**	**186**	8	572	190	**573**	**190**	574	189
416.gamess	16	**1585**	**198**	1571	199	1598	196	8	**777**	**201**	779	201	777	202
433.milc	16	**818**	**180**	818	180	818	180	16	**822**	**179**	824	178	822	179
434.zeusmp	16	714	204	710	205	**714**	**204**	16	**672**	**217**	672	217	692	210
435.gromacs	16	589	194	**589**	**194**	593	193	16	575	199	579	197	**577**	**198**
436.cactusADM	16	848	226	**844**	**227**	841	227	16	848	226	**844**	**227**	841	227
437.leslie3d	16	1112	135	**1110**	**136**	1106	136	16	1112	135	**1110**	**136**	1106	136
444.namd	16	715	179	717	179	**716**	**179**	16	706	182	**706**	**182**	707	182
447.dealII	16	656	279	**656**	**279**	655	280	16	629	291	634	289	**630**	**290**
450.soplex	16	962	139	**924**	**144**	921	145	8	468	143	**440**	**152**	439	152
453.povray	16	327	260	**325**	**262**	324	263	16	**270**	**315**	272	313	270	315
454.calculix	16	**578**	**228**	578	229	580	228	16	**577**	**229**	578	228	577	229
459.GemsFDTD	16	**1399**	**121**	1394	122	1401	121	8	671	126	**672**	**126**	673	126
465.tonto	16	772	204	**775**	**203**	779	202	16	728	216	**725**	**217**	724	217
470.lbm	16	**1758**	**125**	1759	125	1757	125	8	828	133	828	133	**828**	**133**
481.wrf	16	774	231	**779**	**229**	794	225	16	774	231	**779**	**229**	794	225
482.sphinx3	16	**1524**	**205**	1526	204	1522	205	16	1470	212	**1461**	**213**	1459	214

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

Submit Notes

    The config file option 'submit' was used.
     numactl was used to bind copies to the cores

Operating System Notes

     'ulimit -s unlimited' was used to set the stacksize 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:
    -xSSE4.2 -ipo -O3 -no-prec-div -static

C++ benchmarks:
    -xSSE4.2 -ipo -O3 -no-prec-div -static

Fortran benchmarks:
    -xSSE4.2 -ipo -O3 -no-prec-div -static

Benchmarks using both Fortran and C:
    -xSSE4.2 -ipo -O3 -no-prec-div -static

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Peak Compiler Invocation

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

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

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Peak Optimization Flags (Continued)

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

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-

      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

      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: -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)

      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

      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: basepeak = yes

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Peak Optimization Flags (Continued)

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

481.wrf: `basepeak = yes`

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.

Tested with SPEC CPU2006 v1.1.
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