## SPEC® CFP2006 Result

### Dell Inc.

**PowerEdge R410 (Intel Xeon E5502, 1.86 GHz)**

| SPECfp®2006 | 21.8 |
| SPECfp_base2006 | 20.9 |

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

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

### Hardware

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon E5502</td>
</tr>
<tr>
<td>CPU Characteristics</td>
<td>1867</td>
</tr>
<tr>
<td>CPU(s) enabled</td>
<td>4 cores, 2 chips, 2 cores/chip</td>
</tr>
<tr>
<td>CPU Orderable</td>
<td>1,2 chips</td>
</tr>
<tr>
<td>Primary Cache</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache</td>
<td>256 KB I+D on chip per core</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>System</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>SUSE Linux Enterprise Server 10 (x86_64) SP2, Kernel 2.6.16.60-0.21-smp</td>
</tr>
<tr>
<td>Compiler</td>
<td>Intel C++ and Fortran Compiler Professional 11.0 for Linux</td>
</tr>
<tr>
<td>Auto Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>File System</td>
<td>ReiserFS</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
</tbody>
</table>
### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>240</td>
<td>56.6</td>
<td>223</td>
<td>60.8</td>
<td><strong>230</strong></td>
<td><strong>59.0</strong></td>
<td>224</td>
<td>60.6</td>
<td>230</td>
<td><strong>59.0</strong></td>
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<tr>
<td>416.gamess</td>
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<td>14.5</td>
<td>1352</td>
<td>14.5</td>
<td>1352</td>
<td>14.5</td>
<td>1276</td>
<td>15.3</td>
<td><strong>1277</strong></td>
<td><strong>15.3</strong></td>
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<tr>
<td>433.milc</td>
<td>385</td>
<td>23.8</td>
<td>386</td>
<td>23.8</td>
<td>387</td>
<td>23.7</td>
<td>389</td>
<td>23.6</td>
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<td><strong>23.6</strong></td>
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<tr>
<td>434.zeusmp</td>
<td>541</td>
<td>16.8</td>
<td><strong>543</strong></td>
<td><strong>16.8</strong></td>
<td>544</td>
<td>16.7</td>
<td>541</td>
<td>16.8</td>
<td><strong>543</strong></td>
<td><strong>16.8</strong></td>
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<tr>
<td>435.gromacs</td>
<td>536</td>
<td><strong>13.3</strong></td>
<td>536</td>
<td>13.3</td>
<td>536</td>
<td>13.3</td>
<td>526</td>
<td>13.6</td>
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<td><strong>13.6</strong></td>
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<tr>
<td>436.cactusADM</td>
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<td>381</td>
<td>31.4</td>
<td>384</td>
<td>31.1</td>
<td><strong>360</strong></td>
<td><strong>33.2</strong></td>
<td>362</td>
<td>33.0</td>
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<tr>
<td>437.leslie3d</td>
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<td>473</td>
<td>19.9</td>
<td>508</td>
<td>18.5</td>
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<td><strong>18.6</strong></td>
<td>473</td>
<td>19.9</td>
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<tr>
<td>444.namd</td>
<td>720</td>
<td>11.1</td>
<td><strong>721</strong></td>
<td><strong>11.1</strong></td>
<td>721</td>
<td>11.1</td>
<td>728</td>
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<td><strong>11.0</strong></td>
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<tr>
<td>447.dealII</td>
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<td>20.0</td>
<td>573</td>
<td>20.0</td>
<td><strong>573</strong></td>
<td><strong>20.0</strong></td>
<td>539</td>
<td>21.2</td>
<td>538</td>
<td>21.3</td>
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<td>450.soplex</td>
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<td>17.7</td>
<td>473</td>
<td>17.6</td>
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<td>466</td>
<td>17.9</td>
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<tr>
<td>453.povray</td>
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<td>16.7</td>
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<td>16.7</td>
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<tr>
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<td><strong>500</strong></td>
<td><strong>16.5</strong></td>
<td>487</td>
<td>17.0</td>
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<td>17.0</td>
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<tr>
<td>459.GemsFD1TD</td>
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<td>29.8</td>
<td>345</td>
<td>30.7</td>
<td><strong>346</strong></td>
<td><strong>30.7</strong></td>
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<td>35.6</td>
<td>299</td>
<td>35.5</td>
</tr>
<tr>
<td>465.tonto</td>
<td>645</td>
<td>15.3</td>
<td><strong>646</strong></td>
<td><strong>15.2</strong></td>
<td>646</td>
<td>15.2</td>
<td>574</td>
<td>17.1</td>
<td>575</td>
<td>17.1</td>
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<tr>
<td>470.lbm</td>
<td>335</td>
<td>41.1</td>
<td><strong>338</strong></td>
<td><strong>40.7</strong></td>
<td>338</td>
<td>40.7</td>
<td>335</td>
<td>41.1</td>
<td><strong>338</strong></td>
<td><strong>40.7</strong></td>
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<tr>
<td>481.wrf</td>
<td>461</td>
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<td><strong>460</strong></td>
<td><strong>24.3</strong></td>
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<td>24.3</td>
<td>461</td>
<td>24.2</td>
<td>459</td>
<td>24.3</td>
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<tr>
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<td>18.1</td>
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<td>21.4</td>
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<td>924</td>
<td>21.1</td>
<td><strong>931</strong></td>
<td><strong>20.9</strong></td>
</tr>
</tbody>
</table>

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

### Operating System Notes

'ulimit -s unlimited' was used to set the stacksize to unlimited prior to run

### General Notes

OMP_NUM_THREADS set to number of cores
KMP_AFFINITY set to granularity=fine,scatter
KMP_STACKSIZE set to 200M
Dell Inc.  
PowerEdge R410 (Intel Xeon E5502, 1.86 GHz)  

<table>
<thead>
<tr>
<th>SPECfp2006 = 21.8</th>
<th>SPECfp_base2006 = 20.9</th>
</tr>
</thead>
</table>

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

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

### Base Compiler Invocation

- C benchmarks: `icc`
- 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 -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`
SPEC CFP2006 Result

Dell Inc.
PowerEdge R410 (Intel Xeon E5502, 1.86 GHz)  

SPECfp2006 = 21.8  
SPECfp_base2006 = 20.9

CPU2006 license: 55  
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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
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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

Continued on next page
Peak Optimization Flags (Continued)

C++ benchmarks:

444.namd: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -03(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) -03(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) -03(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) -03(pass 2) -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: -xSSE4.2 -ipo -03 -no-prec-div -static -opt-prefetch -parallel

416.gamess: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2) -03(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) -03(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) -03(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) -03(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) -03(pass 2) -no-prec-div(pass 2) -static(pass 2) -prof-use(pass 2) -unroll2 -opt-prefetch -parallel -auto-ilp32

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SPECfp2006 = 21.8
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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

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.xml

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For other inquiries, please contact webmaster@spec.org.

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