### Dell Inc.

**PowerEdge R210 II (Intel Core i3-2100, 3.10 GHz)**

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<thead>
<tr>
<th>SPECint®2006</th>
<th>SPECint_base2006</th>
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<tr>
<td>36.6</td>
<td>35.0</td>
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</tbody>
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**CPU2006 license:** 55  
**Test date:** Mar-2011  
**Test sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Hardware Availability:** May-2011  
**Software Availability:** Apr-2011

<table>
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<tr>
<th>Benchmark</th>
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<tr>
<td>perlbench</td>
<td>26.1</td>
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<tr>
<td>bzip2</td>
<td>19.5</td>
<td>27.7</td>
</tr>
<tr>
<td>gcc</td>
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<tr>
<td>mcf</td>
<td>39.9</td>
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<tr>
<td>gobmk</td>
<td>23.7</td>
<td>46.6</td>
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<tr>
<td>hammer</td>
<td>24.8</td>
<td>46.9</td>
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<tr>
<td>sjeng</td>
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<tr>
<td>libquantum</td>
<td>49.3</td>
<td>43.6</td>
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<tr>
<td>h264ref</td>
<td>25.0</td>
<td>20.8</td>
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<tr>
<td>omnetpp</td>
<td>20.8</td>
<td>18.4</td>
</tr>
<tr>
<td>astar</td>
<td>22.0</td>
<td>33.4</td>
</tr>
<tr>
<td>xalancbmk</td>
<td>32.1</td>
<td></td>
</tr>
</tbody>
</table>

**SPECint_base2006 = 35.0**

**SPECint2006 = 36.6**

### Hardware

- **CPU Name:** Intel Core i3-2100  
- **CPU Characteristics:**  
  - CPU MHZ: 3100  
  - FPU: Integrated  
  - CPU(s) enabled: 2 cores, 1 chip, 2 cores/chip  
  - Primary Cache: 32 KB I + 32 KB D on chip per core  
  - Secondary Cache: 256 KB I+D on chip per core  
  - L3 Cache: 3 MB I+D on chip per chip  
  - Other Cache: None  
  - Memory: 8 GB (4 x 2 GB 2Rx4 PC3-10600R-9, ECC)  
  - Disk Subsystem: 1 x 146 GB 15000 RPM SAS  
  - Other Hardware: None

### Software

- **Operating System:** SUSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.12-0.7-default  
- **Compiler:** Intel C++ Intel 64 Compiler XE for applications running on Intel 64  
  - Version 12.0.1.116 Build 20101116  
- **Auto Parallel:** Yes  
- **File System:** ext3  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 32/64-bit  
- **Peak Pointers:** 32/64-bit  
- **Other Software:** SmartHeap 8.1 32-bit Library for Linux
## SPEC CINT2006 Result

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<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>400.perlbench</td>
<td>375</td>
<td>26.1</td>
<td>374</td>
<td>26.1</td>
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<td>324</td>
<td>30.1</td>
<td></td>
<td>324</td>
<td>30.1</td>
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<td>401.bzip2</td>
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<td>19.3</td>
<td>496</td>
<td>19.5</td>
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<td>474</td>
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<td>476</td>
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<tr>
<td>403.mcf</td>
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<td>27.0</td>
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<td>290</td>
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<tr>
<td>429.mcf</td>
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<td>452</td>
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<td></td>
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</tr>
<tr>
<td>456.hmmer</td>
<td>199</td>
<td>46.9</td>
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<td>46.9</td>
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<td>200</td>
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<td>46.6</td>
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<tr>
<td>458.sjeng</td>
<td>481</td>
<td>25.2</td>
<td>481</td>
<td>25.2</td>
<td></td>
<td>487</td>
<td>24.8</td>
<td></td>
<td>487</td>
<td>24.8</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>60.7</td>
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<td>60.7</td>
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<td>60.7</td>
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<tr>
<td>464.hmmer</td>
<td>507</td>
<td>43.1</td>
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<td>43.6</td>
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<td>449</td>
<td>49.3</td>
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<tr>
<td>471.omnetpp</td>
<td>301</td>
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<td>20.8</td>
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<td>250</td>
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<td>250</td>
<td>25.0</td>
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<tr>
<td>473.astar</td>
<td>319</td>
<td>22.0</td>
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<td>22.0</td>
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<td>382</td>
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<tr>
<td>483.xalancbmk</td>
<td>211</td>
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<td>32.9</td>
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<td>207</td>
<td>33.3</td>
<td></td>
<td>207</td>
<td>33.4</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 stack size to unlimited prior to run
- 'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
- echo 900> /proc/sys/vm/num_hugepages
- export HUGETLB_MORECORE=yes
- export LD_PRELOAD=/usr/lib64/libhugetlbfs.so

### Platform Notes

**BIOS Settings:**
- Power Management = Maximum Performance (Default = Active Power Controller)
- Logical Processor = Disabled (Default = Enabled)

### General Notes

- **OMP_NUM_THREADS** set to number of cores
- The Dell PowerEdge R210 II and the Bull NovaScale R410F2 models are electronically equivalent.
- The results have been measured on a Dell PowerEdge R210 II model
- Binaries were compiled on RHEL5.5

### Base Compiler Invocation

```bash
icc -m64
```

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SPECint_base2006 = 35.0

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Software Availability: Apr-2011

Base Compiler Invocation (Continued)

C++ benchmarks:
icpc -m64

Base Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
429.mcf: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
471.omnetpp: -DSPEC_CPU_LP64
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:
-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch -auto-p32
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

C++ benchmarks:
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -Wl,-z,muldefs
-L/smartheap -lsmartheap64
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Base Other Flags

C benchmarks:
403.gcc: -Dalloca=_alloca

Peak Compiler Invocation

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

400.perlbench: icc -m32

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Peak Compiler Invocation (Continued)

429.mcf: icc -m32
445.gobmk: icc -m32
464.h264ref: icc -m32
C++ benchmarks (except as noted below):
   icpc -m32
   473.astar: icpc -m64

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LINUX_IA32
401.bzip2: -DSPEC_CPU_LP64
403.gcc: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
   473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

400.perlbench: -xAVX (pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
   -no-prec-div(pass 2) -prof-use(pass 2) -opt-prefetch
   -ansi-alias
   -B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

401.bzip2: -xAVX (pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
   -no-prec-div -prof-use(pass 2) -auto-ilp32 -opt-prefetch
   -ansi-alias

403.gcc: -xAVX -ipo -O3 -no-prec-div -inline-calloc
   -opt-malloc-options=3 -auto-ilp32
   -B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

429.mcf: -xAVX (pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
   -no-prec-div(pass 2) -prof-use(pass 2) -auto-ilp32
   -ansi-alias
   -B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

445.gobmk: -xAVX(pass 2) -prof-gen(pass 1) -prof-use(pass 2)
   -auto-ilp32 -ansi-alias
   -B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

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Peak Optimization Flags (Continued)

456.hmmer: -xAVX -ipo -O3 -no-prec-div -unroll2 -auto-ilp32
-ansi-alias
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

458.sjeng: -xAVX(pasS 2) -prof-gen(pasS 1) -ipo(pasS 2) -O3(pasS 2)
-no-prec-div(pasS 2) -prof-use(pasS 2) -unroll1

462.libquantum: basepeak = yes

464.h264ref: -xAVX(pasS 2) -prof-gen(pasS 1) -ipo(pasS 2) -O3(pasS 2)
-no-prec-div(pasS 2) -prof-use(pasS 2) -unroll2
-ansi-alias
-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

C++ benchmarks:

471.omnetpp: -xAVX(pasS 2) -prof-gen(pasS 1) -ipo(pasS 2) -O3(pasS 2)
-no-prec-div(pasS 2) -prof-use(pasS 2)
-opt-ra-region-strategy=block -ansi-alias -Wl,-z,muldefs
-L/smartheap -lsmartheap
-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

473.astar: -xAVX(pasS 2) -prof-gen(pasS 1) -ipo(pasS 2) -O3(pasS 2)
-no-prec-div(pasS 2) -prof-use(pasS 2)
-opt-ra-region-strategy=routine -Wl,-z,muldefs
-L/smartheap -lsmartheap64

483.xalanbmk: -xAVX -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
-Wl,-z,muldefs -L/smartheap -lsmartheap
-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

Peak Other Flags

C benchmarks:

403.gcc: -Dalloca=_alloca

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.html
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110524.00.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110524.00.xml
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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.1.
Originally published on 7 June 2011.

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