

FireStox: Exploring NASDAQ Velocity and Forces

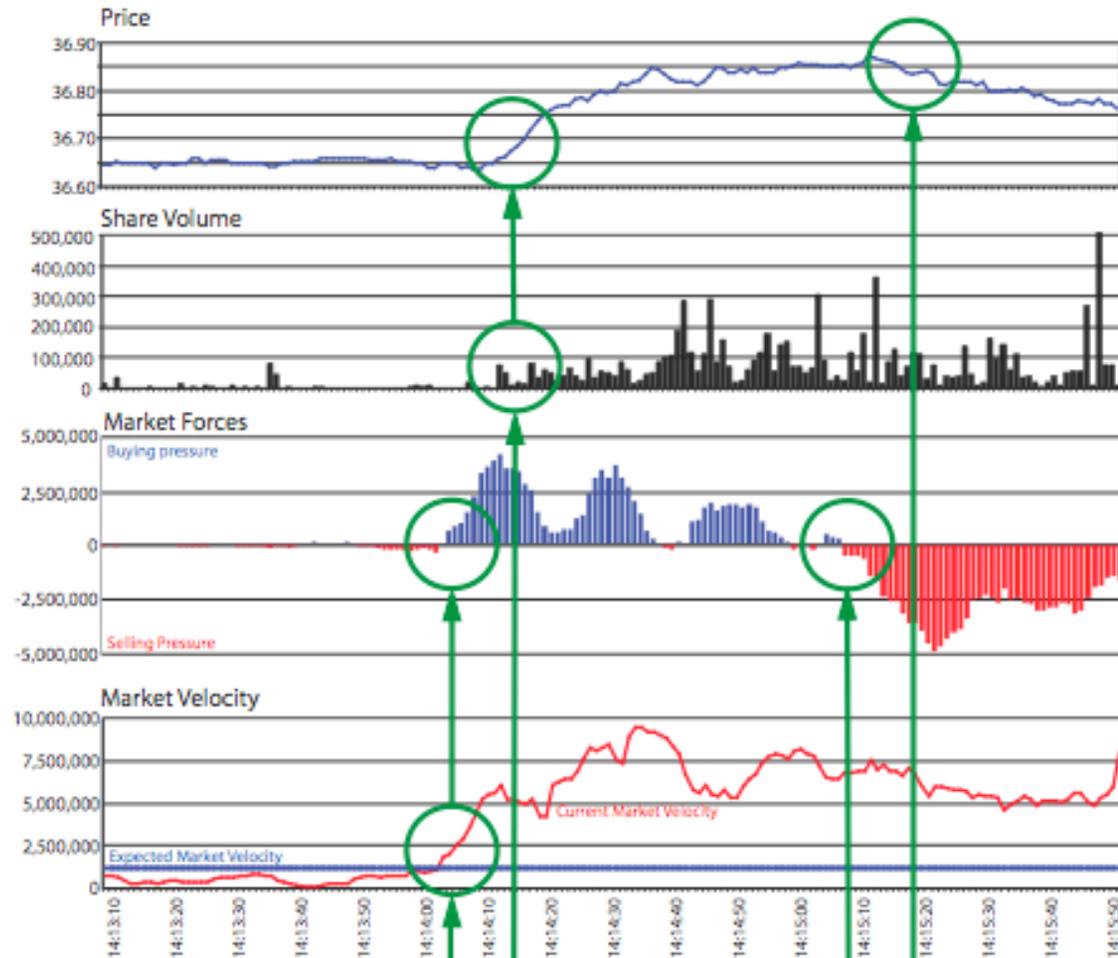
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Introduction: Stock Markets

- Two kinds of stock markets:
 - Stock markets with physical floors (e.g., NYSE)
 - Stock markets with completely electronic systems (e.g., NASDAQ)
- Traditionally, on physical floors, noise and physical presence gave vital information on activity, which is lacking in electronic markets
- NASDAQ's challenge: capture information found in physical floor interaction in data pulled from wholly automated trading
- NASDAQ's solution: Market Velocity and Forces

NASDAQ Market Velocity and Forces

QQQQ August 8, 2006

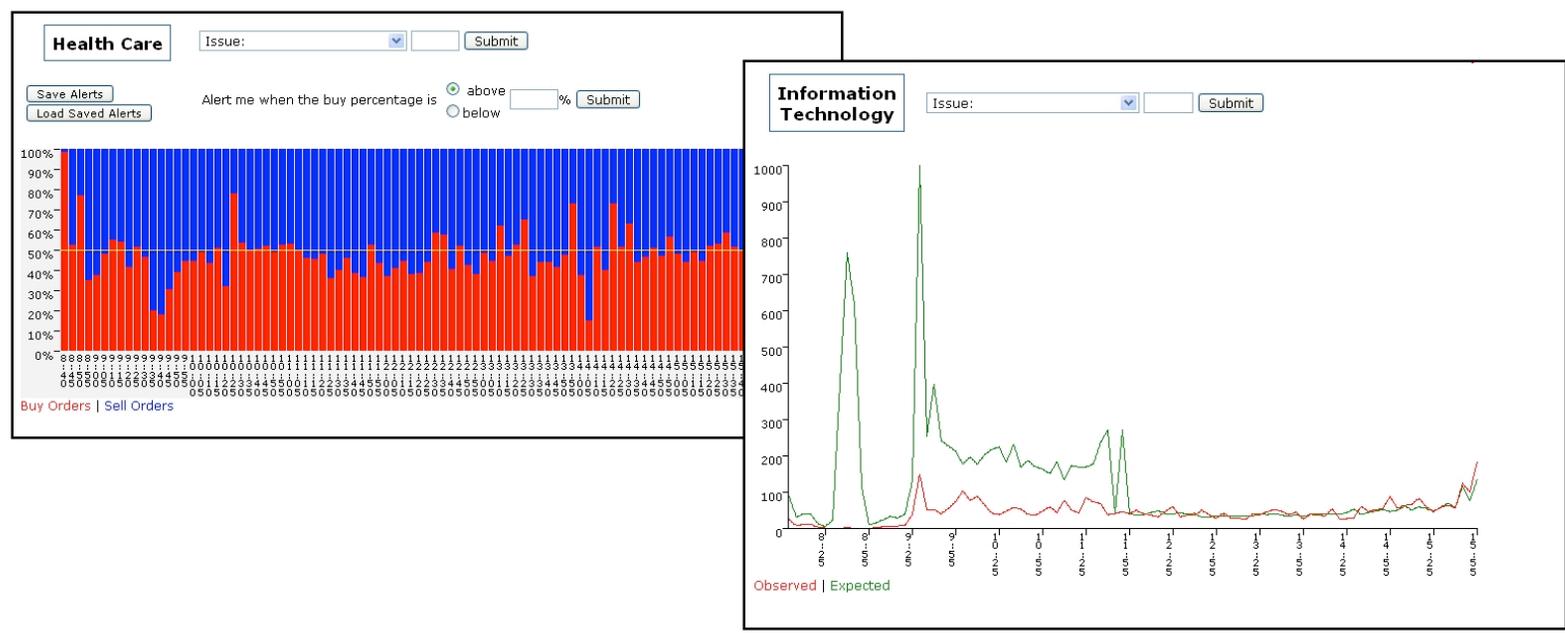


Market Velocity indicates surge in activity
Market Forces indicates direction

Market Forces indicates change in direction

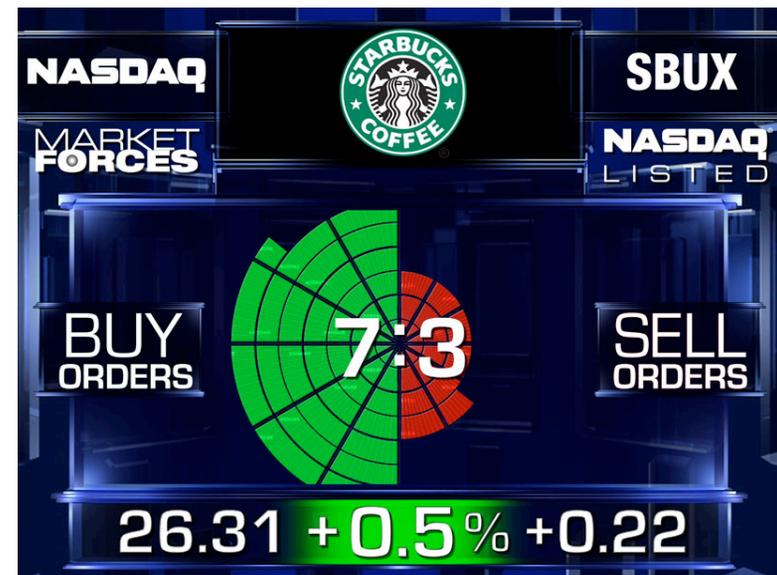
Visualizing Market Velocity and Forces

- Clients purchasing Velocity and Forces data get a data feed.
- NASDAQ's Experimental Market Information has graphing demos for Velocity and Forces
 - Static, old data for demonstration purposes
 - Simple graphs that are given by sector only



Visualizing Market Velocity and Forces

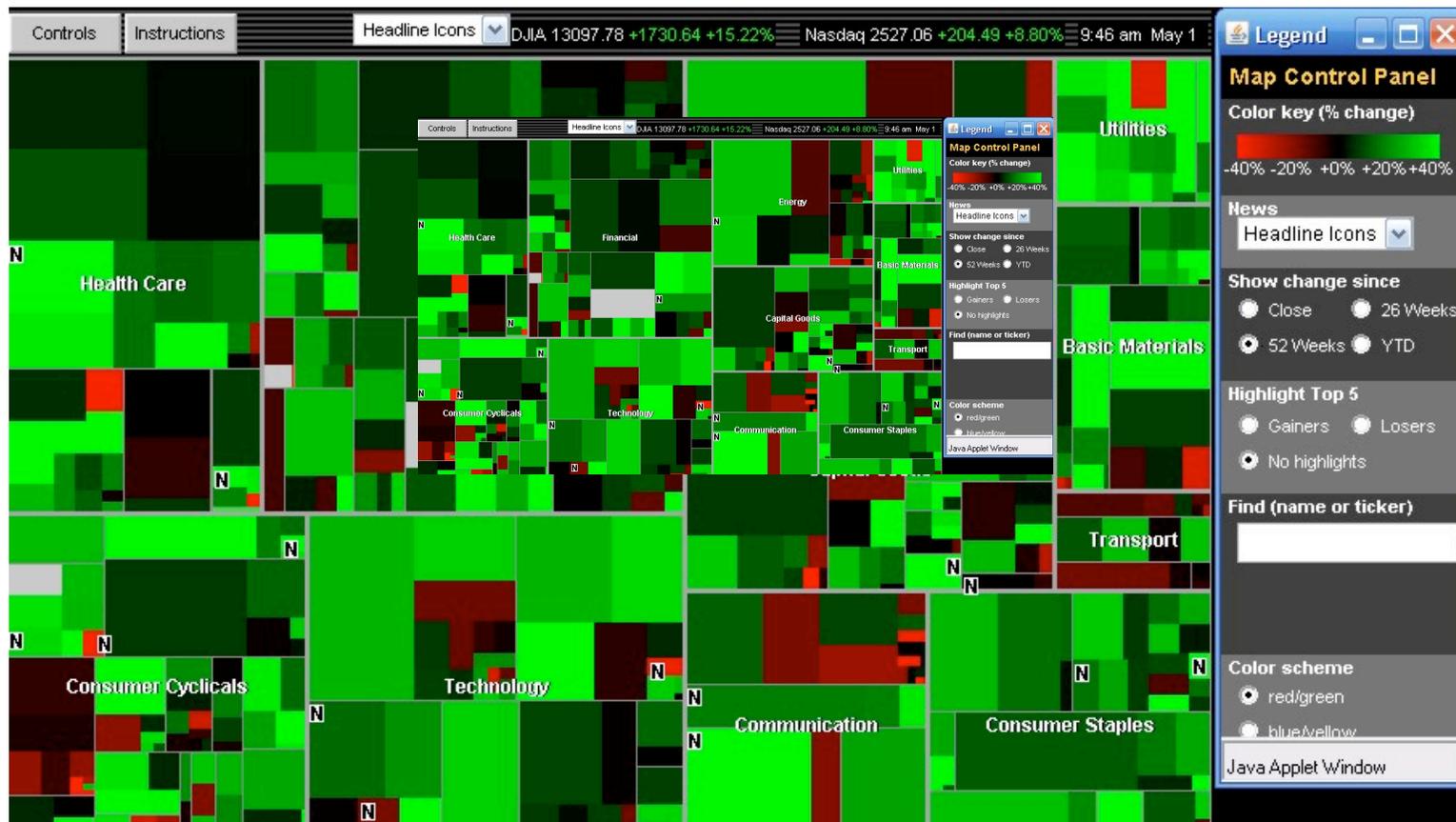
- NASDAQ's Marketsite provides visualizations of Velocity and Forces on a per-issue basis.
 - Visualizations are currently not available on the Web or in another easily accessible format
 - Visualizations do not provide overviews of Velocity and Forces trends throughout the whole market



Our Goals

- Provide a visualization that shows not only Velocity and Forces information for a single stock at a time, but many
 - We focused on the NASDAQ 100, an index of the largest, non-financial NASDAQ-listed companies
- Allow for exploration of trends and events related to changes in Velocity and Forces
 - Playback: ability to display Velocity and Forces and their changes over the course of the day
 - Provide information per issue including price and volume information for analysis
 - Provide sector-level information as well as issue-level information

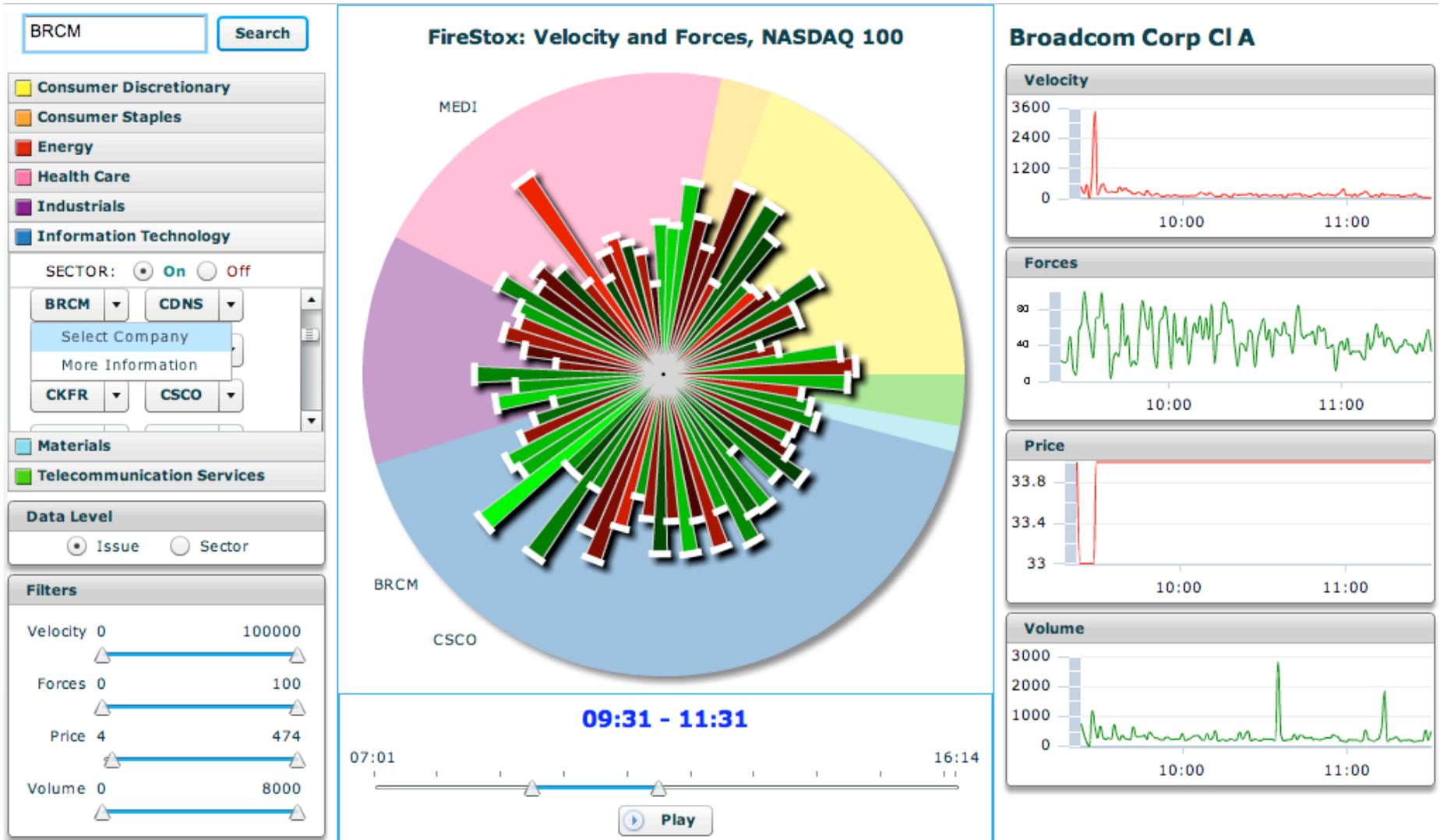
SmartMoney Map of the Market



Comparison to *Map of the Market*

- Size of companies in the treemap are proportional to market capitalization, which does not rapidly change
- Velocity and Forces both rapidly change and thus could make for a treemap that is constantly shuffling around
- So, we brainstormed something else...

Introducing FireStox

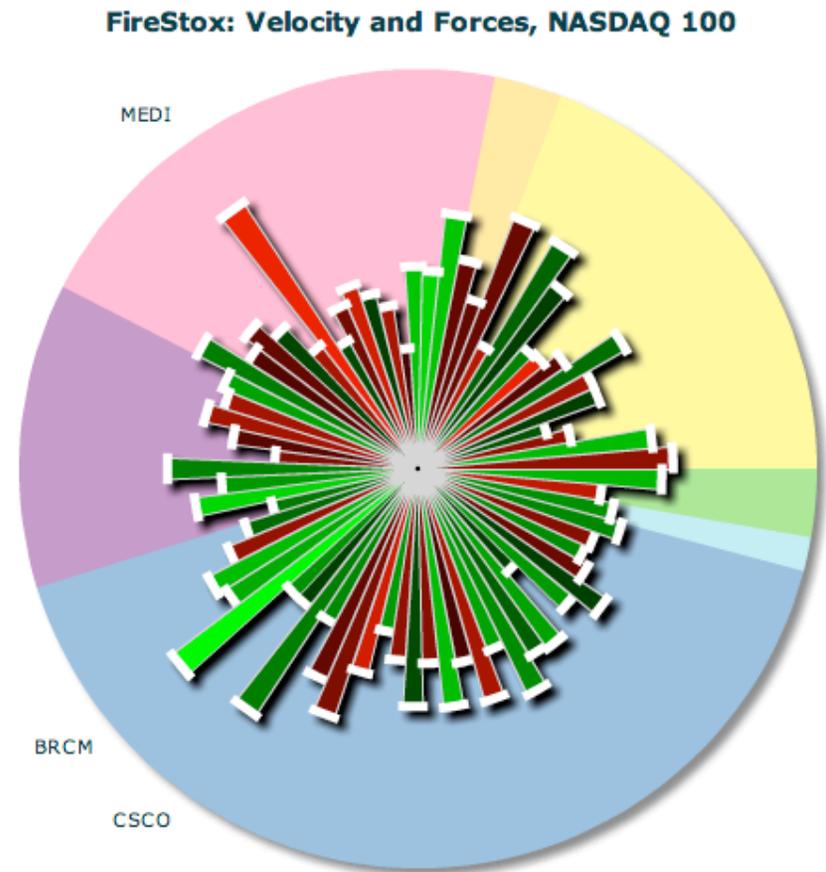


Features

- View Velocity and Forces at a glance for up to 100 companies
- Search, browse, and filter companies
- View aggregated V/F information for entire sectors at a time
- Select a window of time and replay market evolution minute-by-minute
- Correlate V/F with price and volume at a glance with stacked line graphs

Velocity and Forces Radar

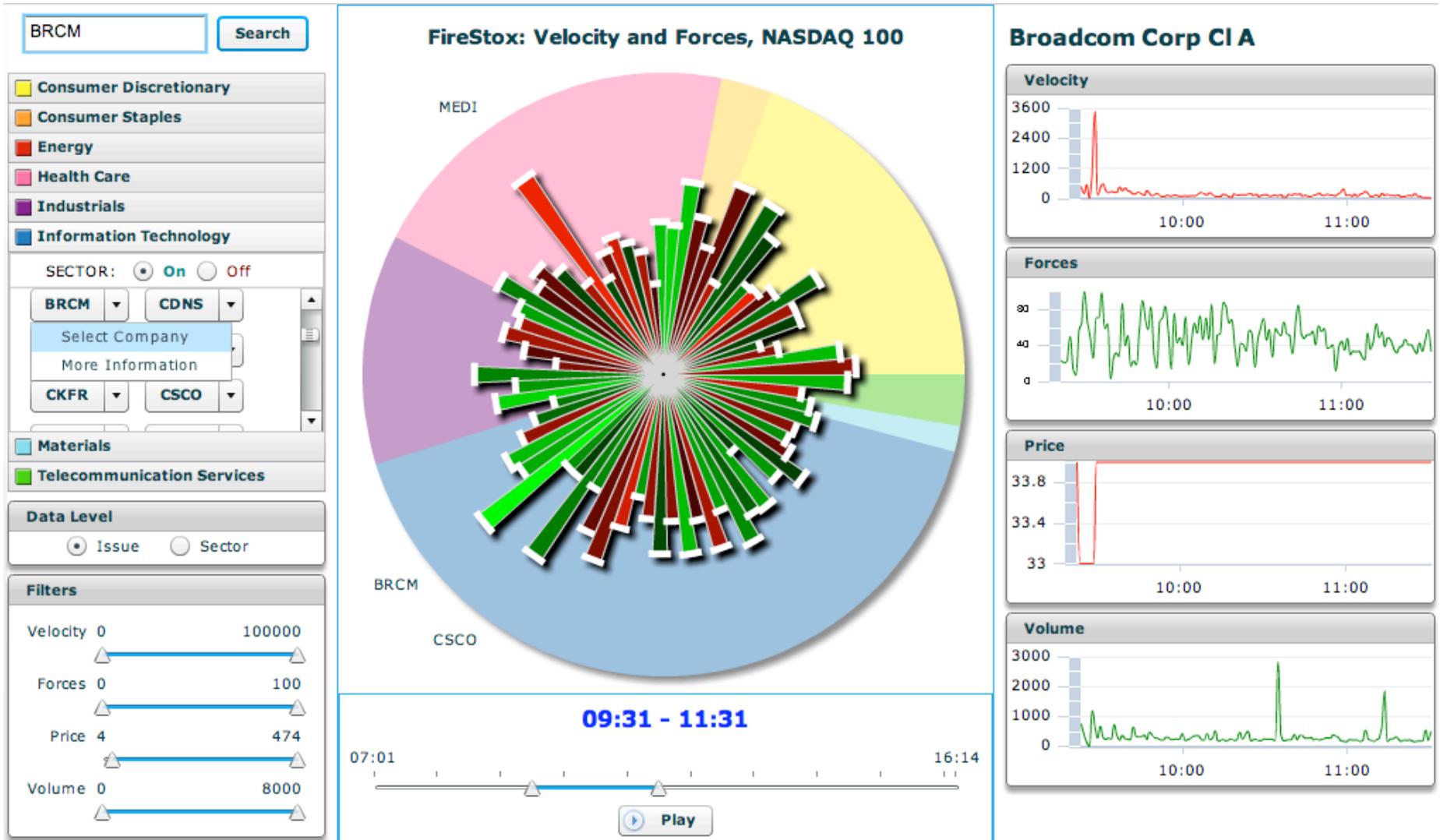
- Each wedge represents a company
- Velocity is proportional to wedge length
- Forces is indicated by color of a wedge
 - brighter red = greater selling pressure
 - brighter green = greater buying pressure
- Companies are sorted alphabetically within their sector



Data Sources

- We received data feeds from NASDAQ for February 7th, 2007
- Each entry is a **buy** or a **sell** order, and contains calculations of current Velocity and Forces values for a given stock
- There are **millions** of orders in the day
- Thus, we decided to aggregate V/F/price/volume data by the minute

Demonstration



Acknowledgments

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Questions?