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Market Scanning System Design

Market Scanner Data Feeds

Any type of data feed can be used with the market scanner designs listed herein.

Most retail data feeds such as eSignal, Barchart and others impose restrictions on the number of symbols that the end user can subscribe to in real time.

This limitation can potentially be circumvented by simply subscribing to the maximum number of symbols allowed, obtaining the last price for each, unsubscribing from those symbols and then subscribing to another window of symbols. This process completes and starts over once all the symbols in the scanner watch-list have been processed.

A disadvantage to this work-around is that scanning does not occur in real time, but is delayed by the total time it takes to loop through all the symbols in the watch-list. Another major disadvantage is that this design restricts the application to scanning only; the data feed account cannot be used for scanning and real-time charting or quote screens if the symbols are constantly being subscribed/unsubscribed.

Certain retail data providers such as DTN, Interactive Data or Barchart, Inc. may offer snapshot files, which are simply XML or CSV files that may be downloaded by your application every few seconds. These files contain a list of all symbols and their most recent prices. The only disadvantage is that prices are several seconds old, therefore scanning does not occur in real-time. This solution may be the most cost-effective for retail applications when more than 500 or 1000 symbols are scanned.

The best data feed for market scanning is an unrestricted broadcast feed. Although cost prohibitive for most retail applications, such feeds may be ideal for professional or institutional trading purposes.

In any case, the scanners listed herein must be primed with a minimal amount of historical data for each symbol to be scanned. This document does not discuss the requirements or implications for maintaining a historical database on the client side or requesting historical data from a data vendor. Please contact a Modulus consultant for complete details.

1. Real Time, Symbol-by-Symbol Scanning (symbols are scanned individually)

This model is ideal if constant real-time data is available and if watching fewer than ~5,000 symbols.

Symbol _1	price update, scan	15MS*
Symbol _2		
Symbol _3		
Symbol _4	new bar, scan	15MS
Symbol _5		
…		
Symbol _n		

Total time: 30MS

Advantages:

- Each symbol may have a unique script or alert filter rule.
- Scanning occurs in real-time, when the price changes or a bar is appended.

Disadvantages:

- 30% slower because the script is parsed for each symbol and each scan.
- This model is technically not a true scanner but rather an alert system.
- Older computers may have performance issues with just a couple thousand symbols.

2. Batch Compare-Change Scanning (all symbols scanned in one pass)

This model is best for scanning more than ~5,000 symbols.

Symbol _1	price update, scan	12.5MS
Symbol _2		
Symbol _3		
Symbol _4	new bar, scan	12.5MS
Symbol _5		
…		
Symbol _n		

Total time: 25MS

Advantages:

- The script is parsed only once so scanning through several symbols occurs quickly.
- Scans only symbols that have changed since the last scan.
- Technically speaking, this is the *fastest* scanning design possible, although not real time.

Disadvantages:

- Not designed to run in real-time. Runs every second, 5 seconds, 10 seconds, etc.
- All symbols are scanned using the exact same script or filter rule.
- Uses an initial pass through data to identify symbols that have changed, adding CPU time.

3. Batch Snap-Shot Scanning (all symbols scanned in one pass)

This model is best when scanning on market opening or when historic data is unavailable for priming.

Symbol _1 scan 10MS
Symbol _2 scan 10MS
Symbol _3 scan 10MS
Symbol _4 scan 10MS
Symbol _5 scan 10MS
…
Symbol _n

Total time: 50MS

Advantages:

- Script is parsed once so scanning through all symbols is very fast.
- Can scan all symbols starting from the first bar after the market opens.

Disadvantages:

- Each symbol is scanned using the same script or filter rule, so there is less flexibility.
- Scans through all symbols regardless of price change.

** Scan times are for illustrative purposes only.*
*** Desktop scanning performance depends on hardware configuration.*