

Strategic Smart Order Routing

Sequential and Aggressive Routing Strategies

CYCLE –Sequential Routing Strategy

CYCLE ensures orders are filled to the greatest extent possible, and at the best prices at all protected markets.

This strategy targets one protected market at a time and then sends the full remaining quantity on to the next market center. If the order can't be filled completely at the National Best Bid and Offer (NBBO), the CYCLE strategy will, in an iterative manner, route to other markets at the limit price of the original order.

The router first prioritizes the market centers by the price of the quote. For market centers at the same price level, the router uses several factors, including liquidity and speed of execution, to determine priority. It should also be noted the BATS Exchange smart order router accesses BATS Exchange's liquidity at each price level before routing to other market centers.



After tuning the performance of the BATS Exchange router, **the BATS Exchange CYCLE routing strategy has realized an *improved fill rate and faster execution* for members compared to the competition.**

Default routing at BATS Exchange runs exclusively through the BATS Exchange Smart Order Router using the CYCLE strategy after hitting dark pools using the DART strategy.

RECYCLE – Aggressive Routing Strategy

RECYCLE is designed to aggressively re-route and fill orders, where CYCLE leaves unfilled shares resting on the BATS Exchange book until they are matched with an incoming order to BATS Exchange.



By choosing RECYCLE, orders come off the BATS Exchange book and target a locking or crossing quote at another market center, matching or improving upon the limit price. This behavior occurs anytime BATS Exchange receives an updated quote from another market that locks OR crosses the order resting on the BATS Exchange book. Re-routing may continue until the order is completely filled.

See the reverse for examples of the behaviors for CYCLE and RECYCLE.

◆ Links

- [FIX Specification](#): FIX (Financial Information Exchange) protocol information.
- [Order Types](#): Order types and routing instructions for the BATS Exchange platform.
- [Fee Schedule](#): Pricing for accessing liquidity, liquidity rebates, routing and other pricing models.
- [Connectivity Manual](#): Details on making the connection to the BATS Exchange datacenters.

◆ Contacts

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◆ **Smart Order Router Behaviors**

Example of CYCLE Routing Strategy

The CYCLE routing strategy is detailed below using a buy order for 12,700 shares at \$125.00.

Example: Buy Order for 12,700 shares at \$125.00

Sell quotes as seen by the router

BATS	Market Center A	Market Center B	Market Center C
1,000 @ \$124.85	700 @ \$124.85	200 @ \$124.89	1200 @ \$124.88
1,000 @ \$124.89	100 @ \$124.92		

Route Attempts

Route Sequence	Quote Price	Market Center
---	\$124.85	BATS Exchange
1	\$124.85	Market Center A
2	\$124.88	Market Center C
---	\$124.89	BATS Exchange
3	\$124.89	Market Center B
4	\$124.92	Market Center A
5 – 7	\$125.00	Route attempt at limit price to A, B & C

Example of RECYCLE Routing Strategy

Using the CYCLE example above, assume 8,500 shares of the buy order at \$125.00 books at BATS Exchange after CYCLE. At this time, the offer on the consolidated quote would be greater than \$125.00. When the market presents an offer of \$125.00 or less, the order would be lifted from the BATS Exchange book and routed out.

NBO	Route Sequence	Order Progress	Market Center
\$125.01	1 (after CYCLE)	Resting Buy Order 8,500 @ \$125.00	at BATS Exchange
\$125.00	2	Order lifts and is routed out	to Market Center A
---	3	2,900 shares filled @ \$125.00	at Market Center A
\$125.01	4	Order returns to BATS (resting Buy Order 5,600 @ \$125.00)	to BATS Exchange
---	5	BATS receives an IOC sell order @ \$125.00 and 3,250 shares are matched on BATS @ \$125.00	at BATS Exchange
\$124.99	6	Order lifts and is routed out	to Market Center B
---	7	Remaining 2,350 shares filled @ \$124.99	Market Center B