

Charles River Trader

Multi-Asset Order and Execution Management

Charles River IMS combines an order management system (OMS) with multi-asset execution capabilities, creating a consolidated order and execution management system (OEMS). The OEMS enables traders to work more productively at generating alpha, managing trade risk and demonstrating best execution. Full trade lifecycle support, integrated compliance and workflow automation enables clients to manage the largest and most complex institutional portfolios on a single platform.

Potential Benefits:

- Manage list and portfolio execution strategies
- Monitor real-time market, order, and analytic data
- Quickly organize orders with spreadsheet-like filtering, grouping and sorting
- Monitor compliance throughout the trade lifecycle
- Easily add new brokers, strategies, and placement templates
- Capture trade and order data required for regulatory reporting

Multi-Asset Class Support



Fixed Income



Equities



Options



Foreign Exchange



OTC Derivatives



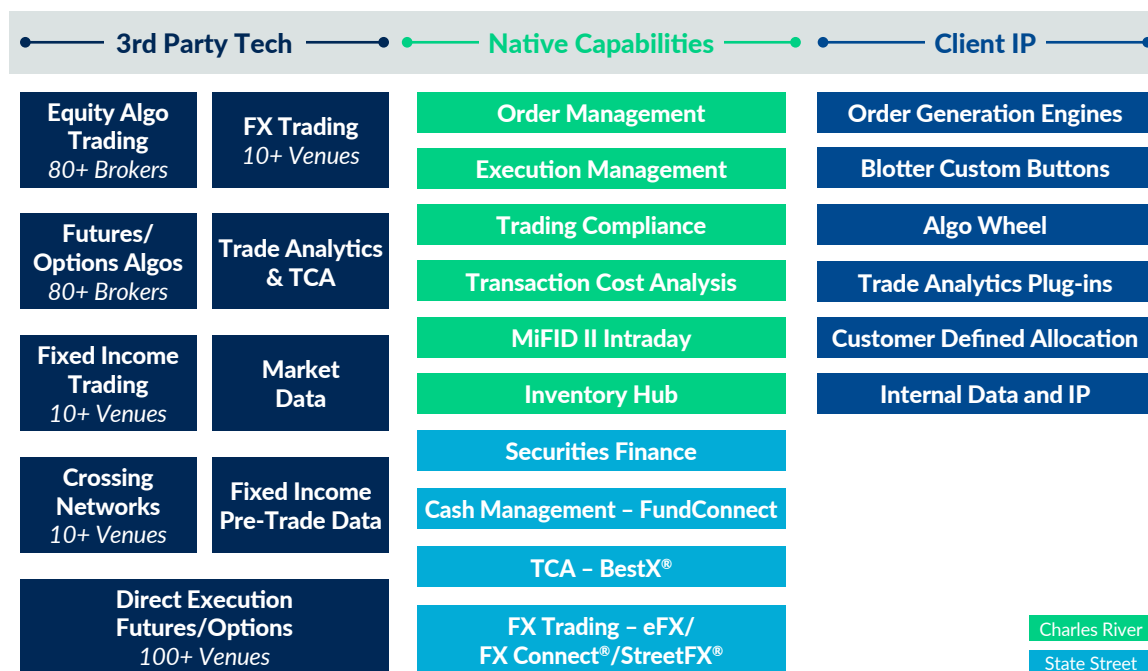
Exchange Traded
Derivatives



Commodities

Charles River Trading Ecosystem

Charles River's order and execution management ecosystem significantly extends native OEMS functionality, enabling firms to seamlessly access their preferred liquidity venues, transaction cost analysis (TCA) and application providers directly from Charles River IMS. Clients can also source internally produced algos, data and analytics to help meet the unique demands of their investment process and asset mix.



Full Trade Life Cycle Support

Charles River IMS provides a real-time dashboard for managing daily trading operations, workflows and execution. Dynamic trade blotter columns visually show real-time data changes – execution status, order status and gain/loss – via color and magnitude displays. Within the blotter, traders can import orders from spreadsheets or files.

Tight integration with Charles River Compliance allows traders to monitor compliance across the entire trade lifecycle. Users can reduce errors and risk by identifying potential issues before a trade is executed. Advanced FIX auto-routing evaluates order characteristics, real-time market data, and pre-trade TCA calculations, enabling intelligent order routing to preferred venues and brokers.

OEMS Capabilities:

- Direct Brokerage
- Trade Routing
- Auto FX
- Commission Rules
- Fee Defaults
- Reporting

Enhanced User Experience

Charles River IMS supports multi-monitor set-ups for custom desktop layouts and blotter profiles, based on individual needs and preferences. This allows a variety of custom views to be configured, such as single stock vs. portfolio trade, domestic vs. international, and groupings by asset type, with integrated and linked market data.

Traders can easily create and manage programs, and drag and drop to move orders between programs. Orders can be easily split, canceled, replaced, or cloned directly in the blotter. Third-party and internally developed applications can be easily integrated in the OEMS using Extensible Markup Language (XML), application programming interfaces (APIs), or Web services.

Global Connectivity

The Charles River Network enables fast and reliable direct access between buy-side clients and sell-side brokers. It supports global electronic trading via FIX, provides access to over 600 global liquidity venues and enables broker neutral, low-latency connectivity to all major trading destinations worldwide.

Traders can quickly send orders directly from the blotter to multi-broker trading venues, crossing networks, broker algorithms, program desks, alternative trading systems, dark pools, and smart routers. Connections are certified, tested and monitored by dedicated Charles River Network operations teams.

Charles River offers clients complete FIX software administration, connectivity management and support for each sell-side broker and trading destination. These services help eliminate the need for client FIX network administration and increase network reliability through continuous monitoring and ongoing testing and certification.

FIX Network Highlights



**Reliable,
redundant
point-to-point
connectivity**



**Seamless access
to brokers,
ECNs, ATs,
fixed income
and FX venues**



**Monitor IOIs,
fills, real-time
pricing, trade
and end-to-end
connectivity
status**



**Connect via
dedicated
telecommunications
infrastructure or
VPN**

One Platform for all Asset Classes



EQUITIES

- Manage orders based on country, level of liquidity and estimated cost impact
- View and evaluate orders before placement
- Execute/manage complex orders while automatically routing simpler orders
- Monitor intra-day implementation shortfall in real-time via gain/loss indicators and program slippage screens



FIXED INCOME

- Access streaming time and sales data from TRACE and MSRB, and inventory, quotes, and streaming executable prices
- Make more informed order routing decisions based on broad and deep execution analysis metrics
- Seamless connectivity to all major venues and dealers, and aggregates quote and inventory data on a centralized platform



FX

- Leverage currency pair-based internal crossing/netting
- Access pre-configured trading calendar
- Integrates with leading global FX execution venues including FXall, FX Connect® and 360T
- Cross-border trading with Auto FX facility
- Easily manage FX forward rolls
- Utilize FX algos for automated execution



DERIVATIVES

- Integrates with MarkitSERV, DTCC and Bloomberg VCON
- Drag-and-drop order submission to Tradeweb and Bloomberg SEFs
- Leverage embedded swap valuation and analytics



Execution Management Capabilities

- **Algorithmic Trading**
- **Real-Time Data**
- **Integrated Watch Lists**
- **Interactive Level I, Level II Display**
- **Price Snapping**
- **Integrated News**
- **Integrated Pre- and Post-Trade TCA**
- **Program Trading**
- **Real-Time Implementation Shortfall**
- **Trade Analytics**
- **Direct Market Access (DMA)**
- **Automated Order Routing**
- **Short Locate**

Cross-Asset Capabilities



REAL-TIME MARKET DATA

- Seamless interfaces with all major data providers
- Capture/snap real-time prices across order lifecycle
- Create or import watch lists for any set of securities
- Monitor interactive Level I and Level II (depth of market) data directly within the blotter
- View time and sales data for recent volume by venue and price level
- Create custom charts; access charts via navigations to third-party terminals or embedded components
- Receive news for securities/portfolios to identify market events/trends



PRE- AND POST-TRADE TRANSACTION COST ANALYSIS (TCA)

- Access data and value-added tools from over a dozen 3rd-party pre- and post-trade TCA providers
- Retrieve pre-trade TCA data for analysis and routing directly in the blotter
- Access third-party applications and web pages for context-sensitive drilldown and analysis
- Leverage web-based TCA screens for current orders
- Assess potential trade risk & impact in real-time



AUTOMATED ORDER ROUTING

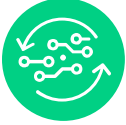
- Evaluate order characteristics, market conditions and/or pre-trade TCA information to help automate workflows
- Leverage a multi-broker DMA console to route/modify orders and view positions within the order book via a single click
- Manually work the order or directly route it to the market via a specific broker venue and/or broker algorithm
- Help ensure consistent order routing and automatically route low-alpha opportunities via FIX-based electronic trading



DIRECT MARKET ACCESS (DMA)

- Route orders directly to the market via DMA brokers
- View real-time time and sales data

Cross-Asset Capabilities



ALGORITHMIC TRADING

- Charles River Broker Packs allow users to access new liquidity destinations or deploy customized sell-side algorithms. A Broker Pack can be imported in one step – without any system upgrades or software changes – for quick trading using the latest strategies.



BROKER WHEEL

- The broker (or algo) wheel, is an automated selection process used in trade execution workflows. Each “spoke” of the wheel represents an execution destination. When an order is routed to the wheel, the system determines the ultimate destination, thereby eliminating trader bias towards specific brokers.



INTEGRATED POST-TRADE MATCHING AND SETTLEMENT

- Provides consistent view of the trade, from execution to settlement
- Allows fully automated post-trade processing with ability to route exceptions for review
- Helps ensure central or local matching via rules-based functionality



EXTENSIVE CONFIGURABILITY

- Configure preferred execution paths, automated smart routing logic and criteria
- Enable IOIs, dark pools and integration with block trading and crossing systems
- Integrate user-defined business logic directly into the blotter and final allocation process
- Automatically track directed brokerage, commissions and fees



STREAMLINED EXECUTION

- Access markets quickly and help eliminate keystrokes with drag-and-drop shortcuts and bump buttons
- Enable one-click execution via configurable broker bar
- Leverage auto-routing rules



PROGRAM TRADING

- Create, trade, monitor and update programs directly in the blotter
- Customize program reporting and monitoring of execution progress for quick adjustments
- Act on an entire program as easily as a single order
- Perform one-click execution via placement templates

Charles River Development, A State Street Company

Investment firms, asset owners, wealth managers, hedge funds and insurers in ~30 countries rely on Charles River's front and middle office investment management platform to manage more than ~US\$35 Trillion in assets. Together with State Street's middle and back office capabilities, Charles River's cloud-deployed software technology forms the foundation of State Street AlphaSM. The Charles River Investment Management Solution (Charles River IMS) is designed to automate and simplify the institutional investment process across asset classes, from portfolio management and risk analytics through trading and post-trade settlement, with integrated compliance and managed data throughout. Charles River's growing partner ecosystem enables clients to seamlessly access external data and analytics, applications and liquidity venues that support the demands of their product and asset class mix. Headquartered in Burlington, Massachusetts, we serve clients globally with more than 1,000 employees in 11 regional offices.

(Statistics as of Q3 2021)

Learn more at crd.com/trading

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