

Low-latency market data delivery
to seize competitive advantage



WebSphere Front Office for Financial Markets: Fast, scalable access to market data.





Data from SIAC, NASDAQ and NYSE indicates a 158% increase in combined equity and options 5-second peak message volume between 2007 and 2008.¹

It's clear today that market volatility is driving a demand for smarter data delivery within financial markets. As firms move toward recovery, the need for dynamic, flexible infrastructures that operate more efficiently — and more cost-effectively — has never been greater. Yet financial services firms, such as asset management and broker dealer firms, investment banks, and hedge fund managers face a daunting set of efficiency, productivity and responsiveness challenges. Spiraling levels of data traffic within an unpredictable marketplace have created an urgent need to adopt a best-in-class infrastructure that can:

- Make electronic trading decisions more rapidly than ever.*
- Perform increasingly large analytical computations.*
- Address extreme spikes in capacity needs.*
- Cut costs of ownership through infrastructure efficiencies.*
- Increase ROI through quality of service use cases leveraged across the global enterprise.*

Adding to these requirements are the pressures of increased global competition, a sharper focus on profitability and lower cost of ownership (TCO), and more stringent regulatory requirements — all of which are driving the need for high-speed, low-latency market data delivery. To achieve this, financial firms need a smarter way to deliver financial market data. IBM WebSphere® Front Office for Financial Markets delivers.



Today's IT organizations require a data delivery platform that can:

- *Handle voluminous message traffic with stringent latency requirements.*
- *Perform with sub-millisecond message speed.*
- *Scale to handle any fluctuation in message traffic.*
- *Support high availability through load balancing and lightning-fast failover.*
- *Accept feeds from virtually any provider with vendor-neutral connectivity.*
- *Address requirements for compliance and risk management.*

WebSphere Front Office for Financial Markets not only provides fast and scalable access to market data sources and trading venues, it is also a highly available, robust platform which offers:

- *A growing number of supported global exchange and data sources.*
- *Consolidated order book for combining feeds in a single view.*
- *Varying qualities of service through high-speed multicast and point-to-point messaging support.*
- *Single point of access control with advanced entitlement, administrative and monitoring capabilities and namespace resolution services.*
- *Normalized data access through field, symbol and data translation, including level 1 and level 2 data models.*
- *Support for regulatory compliance, increased scrutiny and transparency.*
- *Flexible pricing model with options to lower your TCO.*

Leveraging a low-latency platform for managing real-time market data directly from exchanges, brokers and vendors, and using technology integrated from IBM-acquired InfoDyne, WebSphere Front Office for Financial Markets offers extensive feed handler capabilities, a robust data platform, and a rich messaging and middleware portfolio. This enables IT professionals in financial firms to digest enormous amounts of data and use it to their firm's advantage.

By the end of 2009, it is estimated that combined one-minute peak message rates for equities and options will reach 2,772,000.²





Manage high-volume data with ease

The ongoing growth of financial market data has spurred widespread use of model-driven trading and algorithmic execution, real-time portfolio and risk management, and the adoption of new technologies such as hybrid computing and stream processing. Alongside this technological shift in data management, IT teams are tasked with maintaining, improving and monitoring performance levels and compliance — even as the complexity and volume of data analysis continue to soar.

WebSphere Front Office for Financial Markets gives IT professionals in financial firms the ability to manage large volumes of market data while enabling high-speed, reliable connectivity to low-latency algorithmic and electronic trading platforms at high throughput levels. Unlike other solutions available today, WebSphere Front Office for Financial Markets enables firms to leverage:

- ***Out-of-the-box access to dozens of direct exchange, order book and consolidated feed handlers and support for 70+ data feeds, to ease integration of feeds into applications.***

- ***Exceptional performance — sub-millisecond from source feed to application programming interface (API).***
- ***High availability and load balancing, with sub-second failover and feed partitioning capability.***
- ***Horizontal and vertical scalability.***
- ***Concurrent message distribution with no loss of speed.***
- ***Distributed cache server for distributed deployment environments.***
- ***Microsoft Excel connectivity.***
- ***Integrated Eclipse-based administrative desktop.***
- ***Easy-to-use APIs for data access.***
- ***A full range of global support from standard product to on-site.***

Speed data delivery with ultra low-latency, high-throughput messaging transport

As speed and throughput become more crucial, IT is increasingly pressured to deliver more messages per second to local and remote points. WebSphere Front Office for Financial Markets helps your IT teams make speed a priority.

Through integration with IBM WebSphere MQ Low Latency Messaging — a messaging transport engineered for the rigorous latency and throughput requirements typical of today's financial trading environments — WebSphere Front Office for Financial Markets provides high-speed, multicast messaging support for one-to-many communication. WebSphere MQ Low Latency Messaging is capable of delivering more than 45 million messages per second, and also provides native InfiniBand support, with latency measured as low as 5 microseconds for small message sizes.

WebSphere Front Office for Financial Markets also includes point-to-point (unicast) messaging capabilities to enable market data delivery to local or remote office clients. End-to-end latency has been demonstrated at less than 150 microseconds for a typical market data feed.³

Unchain your firm from data feed and vendor restrictions

To meet customer demand and competitive pressures, financial firms need connections to more venues and exchanges than ever

In tests in the IBM Haifa Research Lab, IBM WebSphere® MQ Low Latency Messaging processed about 2.5 million 45-byte messages per second on Ethernet, and more than 13 million on InfiniBand. It also performed with as low as 27us average latency for 45-byte messages on Ethernet and as low as 5us on InfiniBand — demonstrating ultra-low latency and outstanding performance.³

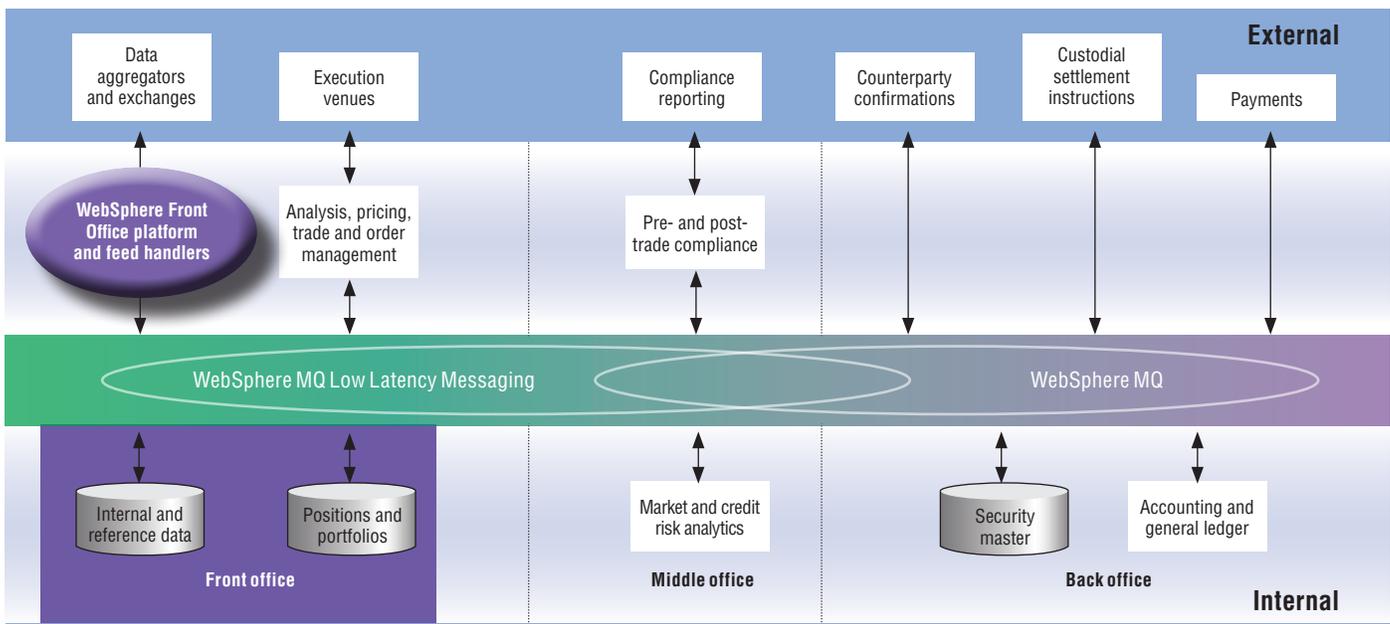


Figure 1: You can employ WebSphere MQ Low Latency Messaging at almost any point in the trading process.



before. The pressure is on to increase message traffic, speed the execution of trading strategies that take advantage of market fluctuations and lower the response time to faster-moving markets and electronic exchanges. WebSphere Front Office for Financial Markets offers data vendor independence, because the software is “content neutral” and can accept feeds from virtually any provider. Supported feeds include major U.S. and international data sources, and leading consolidated feeds such as Bloomberg B-Pipe on Demand (BPOD). An enhanced consolidated order book engine allows work to be distributed across multiple processes and systems for expanded horizontal scalability. This can provide powerful flexibility to help clients address the growing challenge of

merging multiple high-volume market depth feeds into a single consolidated view of the market.

Deliver high availability

To support demands for high availability, WebSphere Front Office for Financial Markets offers the ability to create failover rules, as well as high availability detection and synchronization. Dynamic load balancing capabilities enable your IT teams to monitor availability by shifting workloads as needed. And a client connection capability, with simple APIs, enables your team to selectively route requests and responses and update traffic bi-directionally from market data sources to customer applications. The software also puts operational management features at your finger-

tips, with enhanced administrative and monitoring tools and Simple Network Management Protocol (SNMP) utilities.

Control data delivery costs by leveraging your existing infrastructure

It's clear that financial firms, faced with rising competition in a global marketplace, are tasked with reducing costs while simultaneously striving for profit growth. The challenge lies in meeting new technology needs while optimizing your existing infrastructure. WebSphere Front Office for Financial Markets enables your teams to leverage existing data sources and ease integration and migration of data with your existing applications — enabling you to reuse your infrastructure in new ways, all while controlling data delivery costs.





The distributed cache server supports distributed deployment environments. It acts as a bridge that allows data to flow to a remote site where it is cached. From there, the data can fan out to many clients at very high speed. Because snapshot requests can now be satisfied locally rather than having to go back to the central location, network traffic is dramatically reduced.

The WebSphere Front Office Microsoft Excel add-in allows users to integrate market data through WebSphere Front Office feed handlers into Excel spreadsheets. Data is updated in real time, and updates happen immediately when a spreadsheet is re-opened. Update volume can be reduced using

time-based conflation capabilities, and access to data is controlled through the WebSphere Front Office permissioning service. Snapshots and data contribution are also supported. Excel connectivity can help financial services firms fine-tune applications such as automated trading models and risk management systems.

Help address compliance mandates and risk management requirements

Regulations mandate that data reach firms as quickly as possible. Latency monitoring has become an imperative to meet today's stringent regulatory requirements. WebSphere Front Office for Financial Markets supports Regulation National Market System (RegNMS) in the United States for execution in equities markets, with features for latency monitoring. It also supports Markets in Financial

Instruments Directive (MiFID) in Europe, for execution within all markets.

Equally important is the need to maintain controls on data access. WebSphere Front Office for Financial Markets offers a manageable platform that supports features like entitlements, performance monitoring and single namespace. For example, advanced entitlement services give IT the ability to manage and authenticate users, control data access and generate usage reports. Built-in resolution services provide a single namespace, so applications do not need information on where services or data are sourced. The Front Office Administrative Desktop provides a single Eclipse-based rich-client desktop for WebSphere Front Office management capabilities. The new desktop offers a seamless transition between viewing and updating access controls, viewing usage statistics and monitoring and managing WebSphere Front Office deployments.





Choose unsurpassed reliability and availability in market data delivery: IBM

Unlike other market data delivery platforms available today, WebSphere Front Office for Financial Markets not only combines the best in high-performance, scalability and cost-effective access to market data sources and trading venues, it also offers exceptionally high availability and reliability — backed by the assurance of 24x7 service and support from IBM.

With a global presence, consultative support and a flexible pricing model to

help lower your total cost of ownership, IBM provides data delivery technology to support today's ever-changing market demands — and capture tomorrow's opportunities for growth.

For more information

To learn more about how WebSphere Front Office for Financial Markets can help your IT team deliver low-latency, highly available and cost-effective access to market data sources and trading venues, please contact your IBM representative, or visit ibm.com/financialmarkets/fasterdata

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¹ The Financial Information Forum with data from SIAC, NASDAQ and NYSE Arca, 2009.

² The New Risk Management: Fast Markets, Complex Challenge, Kevin McPartland, TABB Group, 2009.

³ The performance numbers listed for WebSphere MQ Low Latency Messaging and WebSphere Front Office for Financial Markets are based on measurements using standard IBM benchmarks in a controlled environment. The actual throughput that any application will experience may vary depending upon considerations such as message size, transmission rate, hardware platform and network configuration. Therefore, no assurance can be given that an individual application will achieve the throughput or latency stated here. Customers should conduct their own testing. For more detailed performance information, consult your IBM sales representative.