GEMFIRE™
THE ENTERPRISE DATA FABRIC

GemFire Enterprise Data Fabric (EDF) Drives a Low-Latency Foreign Exchange (F/X) Pricing Workflow

Customer: A top-tier global financial services firm with assets of $1.2 trillion and operations in more than 50 countries.

THE PAIN:

- Trading losses in the firm's F/X brokerage division (based in UK) due to data latencies in the calculation and distribution of F/X quotes to a multi-tiered customer base.
- High degree of competition leading to customer retention problems and arbitrage by other market players.
- Poor customer service due to 'stale' price information being published to a client.
- Inability to scale their platform to support an increase in the number of external gateways publishing price data.
- Lack of fail-over and high availability to guarantee continuous system uptime.

GEMFIRE SOLUTION:

Figure 1 highlights the F/X trading solution architecture that utilizes GemFire EDF. Market quotes (F/X pairs and executions) and client reference data are stored in the GemFire caching fabric for pricing engines to immediately access this data and compute prices for the different client tiers. This fabric also extends to the client distribution gateways, where smaller relevant subsets of price information are held in local cache instances.

As and when new quotes are received, the high-speed distribution and transport layer of GemFire updates these gateway cache instances instantaneously. Thus even under a heavy torrent of quote updates, data consistency is maintained across the pricing engines and the client gateways with no compromise on latency. Further, internal clients like traders and service desks can also access price information via the GemFire fabric as illustrated in Figure 1. The data held in GemFire is synchronously replicated in-memory to backup cache instances and asynchronously persisted to disk for automatic fail-over and high availability (HA). In the event of a node failure, the backup node acts as a standby guaranteeing 100% uptime. Upon restart, the failed application can retrieve its start by reloading its cache from the backup node.

Key Solution Metrics

- GemFire offered distribution latencies that were well below the customer's expectation of 50 ms (GemFire's average latency was 5 ms).
- This solution provided linear scalability even in use-cases that had 40 or more client distribution gateways.
- The GemFire solution demonstrated exceptional operational stability and rapid failure recovery mechanisms.

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- Competition, which included distributed caching vendors and messaging vendors, were comprehensively outperformed in performance and scalability tests. The closest competitor was 30% behind GemFire when it came to performance.

Relevant GemFire Features

- Flexible cache topologies and policies.
- High-speed data distribution and transport layer.
- Scalable cache membership management.
- Robust HA mechanisms.

BENEFITS AND BUSINESS IMPACT:

- Less than 5ms latency in distributing quotes to clients - **More accurate information >> More trades >> Greater revenues.**
- Significant performance improvements in pricing calculation due to faster data access from the GemFire fabric.
- Increased scalability to handle a five-fold expansion in the number of client-gateways handled.
- Improved customer service and customer retention in all client tiers.
- Smooth transition to distributed hardware architecture (from an SMP environment) - thanks to the underlying distributed data fabric.

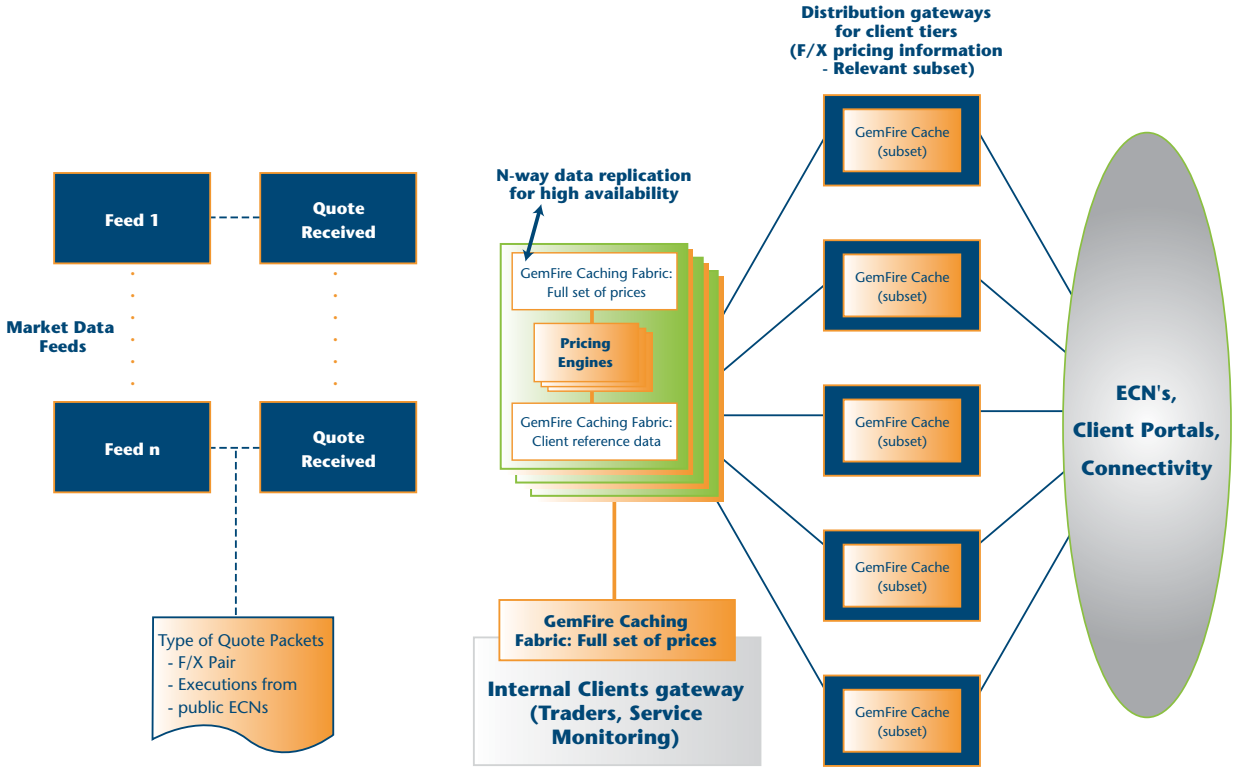

Figure 1: GemFire EDF in a F/X Pricing Workflow

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