

Using ReplayService to Reduce Latency in EMS Messaging Systems

With program trading on electronic markets becoming the norm at financial institutions of all sizes, latency becomes the key issue. To increase the speed at which orders reach the trading floor, firms are moving to strip latency from both the price discovery and order placement message flows.

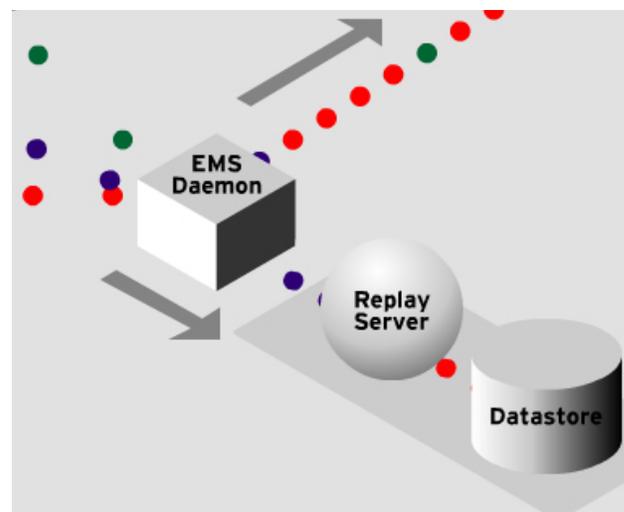
To accomplish this, all message paths are being overhauled to eliminate all possible traces of latency, forcing tradeoffs to be made between recoverability and latency reduction. A large contributor to latency is the storage of orders to disk at each message hop along their path to market. The elimination of these persistent writes within the message pipeline would significantly reduce latency, but introduces a risk of data loss in the case of an unexpected failure. To remove this latency penalty without compromising reliability and recoverability, firms are turning to CodeStreet's ReplayService.

ReplayService works at the messaging layer, operating as a passive recorder of messages flowing on the network. This allows orders to move along the critical path without being stored at each stage. The actual message storage occurs within ReplayService, outside of the critical path. When there is a network or system failure that prevents an order being routed to market, ReplayService's sophisticated message recovery features are used to retrieve previously sent messages and inject them back onto the messaging bus without having to do any synchronization at the receiving application. ReplayService will then seamlessly transition the client application to real time without loss of any order.

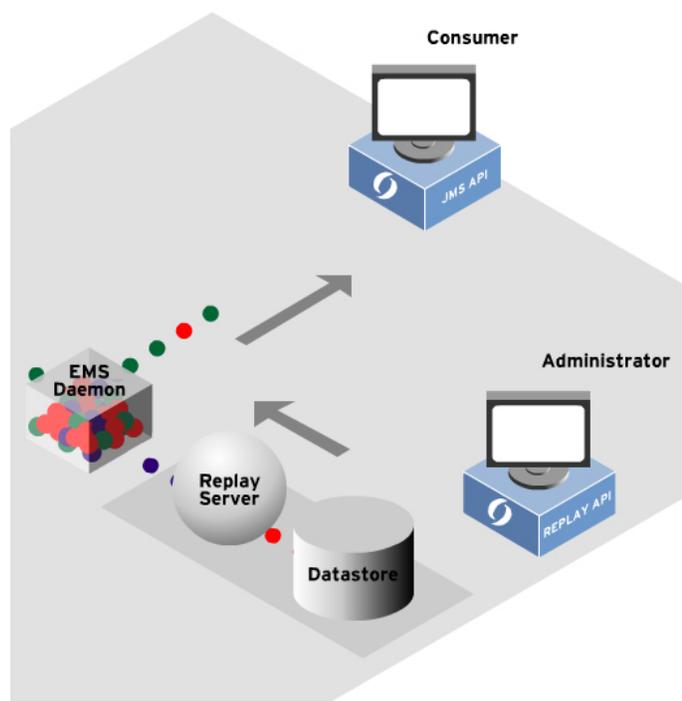
ReplayService allows trading institutions to build very low latency trading systems without fear of losing data and information. The software's lightweight, robust features and low cost make it an extremely attractive option for system architects.

Where Does Latency Come From?

Latency for a single message passing through an EMS daemon is typically very low regardless of whether it is a persistent message with durable subscribers or a non-persistent message. However, in typical high message rate environments, there are hundreds or possibly thousands of messages per second passing through the daemon. When using persistent messaging, with messages being stored to disk before being forwarded, the daemon will start to buffer the messages at very low rates – typically around 200Msgs/sec or less with 5 subscribers. This buffering of messages dramatically increases the latency of a given message through the daemon. If EMS is run with non-persistent messaging, the rate at which messages start to buffer is almost an order of magnitude higher. Thus, it is highly desirable to eliminate the disk write associated with persistent messaging.



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ReplayService Helps Reduce Latency in Your System

In a low latency routing environment, ReplayService is used as a passive recorder of all messages. Unlike persistence within the EMS daemon itself, ReplayService persists messages outside the critical path and thus does not add any latency into the critical path. It records messages by subscribing from a shared topic or bridged queue. In this mode, EMS passes non-persistent messages and ReplayService acts as a shadow persistence mechanism on behalf of the EMS daemon, freeing the EMS daemon from having to persist messages for purposes of recoverability. Should an EMS daemon fail during operation, ReplayService can inject the lost messages back into the ongoing messaging stream using its Rewindable Destination capability, thereby preserving the recoverability of the message stream under failure conditions.

Audit and Repair Capabilities

ReplayService provides an audit trail of all messages flowing through the system and the ability to replay these messages as desired. In addition, ReplayService allows messages to be repaired and re-sent when corruption or errors within messages themselves require this.

Whether your system requires low latency capability or not, ReplayService for EMS is an indispensable tool for all

EMS administrators and development groups. ReplayService for EMS provides sophisticated testing, audit and recovery features that are applicable in all EMS environments.

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