GemFire Real-Time Events

BUSINESS BENEFITS WITH REAL-TIME EVENTS

- Implement event-driven business models and promote real-time decision support
- Identify fleeting but profitable business opportunities and capitalize on those opportunities
- Discern high-impact business events/vulnerabilities instantly and execute as appropriate
- Monitor events in real-time across multiple lines of business and from multiple sources and understand the correlations therein

INDUSTRY APPLICATIONS OF GEMFIRE REAL-TIME EVENTS

Financial Services

- Market Data Analytics For Program /Algorithmic Trading
- Risk Analytics
- Online Brokerage

Federal Government

- Battlefield Awareness
- Intelligence Operations

Telecom/OSS

- Fraud Detection
- Network Intrusion

Manufacturing/Logistics

- RFID Data Analysis

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Ensuring speed and agility in business activities directly depends on an organization's ability to sense and respond in real-time to business events, which are indicators of relevant state changes in an operating environment. In fiercely competitive markets like Financial Services, which are characterized by high volatility and reducing margins, sensing and reacting to events in that ecosystem often provides the ability to not only capitalize on opportunities that would have otherwise gone unnoticed, but also identify a company's vulnerabilities and execute accordingly. Several other industries like federal intelligence, telecom and manufacturing/logistics have similar applications for such event-driven business models.

GemFire Real-Time Events is a complex event processing and analysis solution that enables an enterprise to facilitate agile, event-driven business models. It helps companies:

- **Instantly identify** business events that are relevant to them based on real-time information that is constantly changing
- **Immediately analyze** these events to discern patterns and scenarios of interest, with the ability to correlate with other sources of information like historical data, customer data, reference data, etc.
- **Intelligently distribute** appropriate information to relevant clients and applications that have to react to these business events

Real-Time Events possesses the ability to rapidly analyze thousands of streaming events from different data sources and mine actionable data in real-time. It guarantees high-performance by identifying changes ("deltas") over a previous data snapshot and selectively propagating these changes to parties that are impacted by these events. Clients can register 'Continuous Queries (CQ)' of varying degrees of complexity based upon their interest through standard interfaces, such as SQL. A Continuous Query is a condition of interest that a client registers, which is constantly applied to real-time data to identify events significant to business operations. Thus, Real-Time Events can help companies orchestrate real-time decision-making in their business activities and remain competitive.

System Architecture

GemFire Real-Time Events architecture is depicted in Figure 1. It comprises of a server VM with an in-memory database and a number of client virtual machines working to configure, populate, and query application data tables in the server's database. Clients can run standard JDBC queries and they can also register Continuous Queries (as described earlier) with the server. These Continuous Queries can be configured with listeners to receive updates to the query result sets at regular intervals. The events supplied to the listeners include row delta information that is supplied to listener callbacks and is used to keep the ResultSet up-to-date. The client can also explicitly request a result set at any time for any Continuous Query that it has registered with the server. The server and client processes can be distributed over any number of machines.

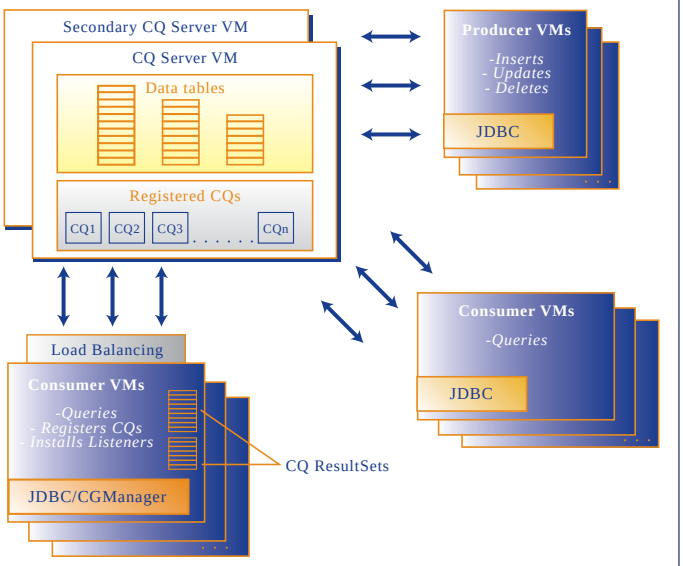

Figure 1: GemFire Real-Time Events System Architecture

Features and Functionality

Smarts for handling hundreds of Continuous Queries: GemFire Real-Time Events uses several algorithms and techniques for managing query predicates to quickly determine the queries that are affected by incoming events.

Data distribution and notification services: All events captured as deltas on the Real-Time Events server are translated in real-time into deltas on views registered by clients and pushed to the clients. Data can be distributed to hundreds of clients in real-time. Clients are notified of in-coming data through simple call-backs.

High availability: The Real-Time Events server can be configured to be highly available. GemFire accomplishes this by replicating data as it arrives at one or more servers. All meta-data that the server uses, such as information on active queries and schema information, is available to all servers. Clients are automatically routed to alternate servers if the server to which they are connected, fails.

SQL syntax and semantics: GemFire provides a very intuitive and easy to use interface for application developers. All events are captured using simple SQL Insert, Update and Delete statements. Applications express interest in data through views expressed using SQL select statements.

Load balancing: The client JDBC driver can be configured to load balance connections across several replicated servers. Load
balancing will result in the servers
performing and scaling better. Clients will have the choice of using sticky or
round-robin load balancing scheme.

Automatic fail-over: When configured with multiple replicated servers, the client JDBC driver will automatically detect unrecoverable errors in server connections and automatically delegate to alternate servers.

Management console: The console acts as a tool for administering, inspecting, monitoring and analyzing GemFire Real-Time Events server and client connections. GemFire will also expose all the management APIs using JMX for easy integration with Enterprise System Management (ESM) applications like Tivoli, HP Openview, etc.

System Requirements

Operating System	Minimum Platform Requirements	RAM	Swap Space	Disc Space
Solaris 8	Sun SPARC Ultra 1 with V9 instruction set	256 MB	256 MB	190 MB
Windows 2000	Intel® Pentium® II 200 MHz (or equivalent)	256 MB	256 MB of virtual memory	118 MB
Linux	Intel® Pentium® II 200 MHz (or equivalent)	256 MB	256 MB of virtual memory	163 MB

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