High-Performance Trading: Latency Management

Increasing Visibility Means More Control over Delivery of Trades and Market Data

What You Will Learn

Latency management is a critical component of a trading infrastructure. By providing micro-visibility into any change in latency across the trading cycle, the Cisco® Latency Management Solution enables the optimization of trade execution and market data delivery. The solution also helps reduce operational risk by providing real-time, actionable information, and reducing the amount of time needed to troubleshoot and resolve application performance problems. Latency monitoring is not just essential to operations; it is a trading decision tool.

Challenge

Automated trading has created a faster trading cycle in which milliseconds matter. Any delay in the execution of a trade can mean missed opportunities, which can mean loss of revenue, loss of reputation, and compliance problems.

New trading applications, such as the algorithms designed to take advantage of very short-lived pricing anomalies in the market, require low-latency access to market data, but also very predictable low-latency. Any variation in latency can create problems for the algorithm.

Smart order management systems, which route trades to the best execution venue, need low-latency connectivity to a wide range of networks (Alternative Trading Systems [ATS] or exchanges). These systems need real-time information about the response time of each venue to help ensure best execution, which is one of the main regulatory compliance requirements. Current tools are not granular enough to catch microbursts, which happen in the span of a millisecond. Lack of visibility leads to lack of control.

Latency Management

Financial applications are very demanding in terms of service-quality requirements. End-to-end latency needs to be in the single digits milliseconds range, with no packet loss and no jitter. The Cisco® Latency Management Solution provides the tools to detect and optimize the network to meet these demands. The solution is built around Cisco Bandwidth Quality Manager (BQM), a next-generation network performance management tool. Cisco BQM offers exceptional visibility into network events that affect application latency and packet loss.
The components of the Cisco Latency Management Solution are:

- Cisco Bandwidth Quality Manager (BQM) software
- Cisco® Application Delivery Engine (ADE) appliances

The main features of Cisco BQM are:

- **Granular measurement**: Cisco BQM measures traffic and network latency with microsecond granularity.
- **Detection**: Real-time detection of microbursts (congestion) occurs simultaneously on all interfaces.
- **Analysis**: Cisco BQM can analyze latency, jitter, and loss with per-packet resolution. Network events can trigger traffic captures, which can be used for forensic analysis to identify the cause of congestion.
- **Optimization**: Using the results of the analysis, Cisco BQM provides actionable information for tuning applications to meet quality targets.

Figure 1 shows the BQM dashboard.

**Business Benefits**

By implementing the Cisco Latency Management Solution, financial firms can reduce the amount of time needed to troubleshoot and fix problems related to application performance. Latency statistics can also be used to prove best execution, which is one of the main regulatory requirements in the
United States and Europe. Exchanges and other financial service providers can use the solution to prove they meet their service-level agreements (SLAs) with their clients.

Traditional network monitoring tools operate with minutes or seconds of granularity. Next-generation trading platforms, especially those supporting algorithmic trading, require latencies of less than 5 milliseconds and extremely low levels of packet loss. On a gigabit LAN, a 100-millisecond microburst can cause 10,000 transactions to be lost or excessively delayed. In these environments, latency must be measured at a much more granular level. Additionally, measurement of latency must break down the end-to-end transaction so that each step can be properly measured. Understanding where the bottleneck occurs is necessary to effectively tune any system. The Cisco Latency Management Solution offers these capabilities in an easy-to-use, easy to maintain, package.

Intelligent Networking

Latency is a complex phenomenon because it has many sources at different layers in the information stack: propagation delay, queuing delay, middleware delay, application delay, etc. The Cisco Latency Management Solution considers all these sources across the lines of business to optimize latency on a per-service basis, using the framework provided by Service-Oriented Networking Architecture (SONA).

Why Cisco?

The Cisco Latency Management Solution is unique in its capability to help both enterprises and managed service providers deliver network service quality resilience and compliance. It achieves this through micro visibility, service quality-aware forensics, and actionable analytics.

For More Information

To learn more about how the Cisco Latency Management Solution can benefit your organization, contact your account manager or visit http://www.cisco.com/go/financialmarkets.

You can also learn more by reading the design best practices for latency management white paper at http://www.cisco.com/web/strategy/financial/markets.html or visiting http://www.cisco.com/go/BQM to learn more about Cisco BQM.