

CoreFirst® to monitor critical trading systems

A trading application case study

Abstract

This document describes a case study of a top global financial services organization that used CoreFirst to gain complete visibility into its trading platform from both the business and the IT perspective, understand the business impact software components have over trades in real time, speed up problem resolution and improve performance of a critical, web-based trading application built using proprietary technology and utilizing FIX and other financial application environment components. This case study highlights CoreFirst's capabilities as well as its differentiation from traditional monitoring tools.

The project

A proprietary trading application serves the banks clients and internal traders over the web, enabling them to perform all of the electronic trading services provided by the bank. The application supports approximately 30,000 clients and several hundred professional traders. Use of the system generates billions in revenue with estimated profits of several hundred thousand each day. The trading platform is used across several times zones: Asia Pacific, Americas, and Europe. It is characterized by low latency transactional activity and spiky volume. The application has been generally reliable and high quality and enjoys a good reputation. Due to the ongoing success, it is expected that the user community will experience growth rates of 50% annually for the foreseeable future. To maintain this reputation and provide a reliable service to all users, the application and environment are required to grow by similar proportions and measures need to be taken to ensure the planned growth in scale does not result in degradation of service.

The application

The application is built from a complex set of software components deployed over 30 physical servers and networks, FIX protocol applications for trading services are surrounded by other applications, users, and transactions that compete for finite resources. These application interactions cannot be an impediment to timely trading transfers. All trade transactions of the application traverse this complex infrastructure, as these are handled by different processing tiers.

Goals

To achieve tight business and IT linkage including:

- Visibility into all trade transactions including FIX and surrounding applications
- Real-time business impact view of the infrastructure's tier mapping to trade transactions
- Proactively prevent trade transaction performance issues and application outages

Methodology

The bank looked to a software solution that could monitor trade transaction performance across the entire application infrastructure – at the trade instance level. This solution would need to monitor individual trade transactions across FIX and surrounding processing tiers of the application architecture. Trade transaction monitoring would allow clear real-time and historical views into the complex operation of the application, and would allow the system to flex to meet high critical business transactions in cases of contention for system resources at peak demand.



The problem

- **Service availability & quality (application stability)**
the organization has a solid reputation for system reliability. A key driver for seeking investment is to protect this reputation as the system aggressively expands over the next few years to accommodate many more users and increased activity levels.
- **Slow business-critical trade transactions at peak times**
the application is increasingly experiencing performance issues during peak usage times, resulting in poor user experience. A slowdown of a critical trade transaction results in a significant loss of profit, particularly with large value trades. Handling large volumes of trades on behalf of important brokerage houses and making sure all trades are satisfied to a given time frame is becoming increasingly difficult as well.
- **Increased infrastructure complexity**
the increase in hardware is expected to be proportionate to the projected usage growth. This growth will result in higher hardware budgets, additional resources to manage the application and larger floor space to accommodate additional hardware boxes. Left unchecked, this increase in infrastructure, combined with a significantly higher user base, will make the environment more complex. It will also significantly increase the difficulty in tracing and eliminating performance issues that result in downtime, loss of revenue and user dissatisfaction.

To this organization, any loss in reputation, clients or profits – due to poor service delivery – was deemed unacceptable. A solution was needed to significantly reduce these risks.

The solution

CoreFirst from OpTier was chosen as the solution to the challenges and is currently used to map business services to IT infrastructure in production. It tracks and monitors all trade transactions – across FIX and surrounding applications, all the time – in order to create and maintain a complete profile of transaction activity in terms of time and resources. CoreFirst provides:

- Full visibility into trade transactions across FIX and surrounding applications
- Real-time business impact view of the infrastructure's tier mapping to trade transactions
- Ability to proactively prevent trade transaction performance issues and application outages

How CoreFirst helped:

- CoreFirst tracking enabled complete visibility into all trade transactions end-to-end in real time.
- Using CoreFirst, the bank can now understand the business and IT perspective of trade transaction latency and the exact business impact software components have over trading activity.
- CoreFirst allows the bank to respond to trade transaction latency issues in real time with pinpoint accuracy into each single transaction executed by internal or external users.
- CoreFirst tracking shortened the time for problem resolution, resulting in higher system uptime reduced trading losses and more effective use of IT development resources.



- CoreFirst Profiling improved accuracy of capacity planning by using real life transaction resource consumption data to simulate increased workloads.
- CoreFirst Alerting enabled IT to be alerted to possible high usage problems before they affected trading performance.

CoreFirst value delivered:

- Provide low overhead response time breakdown and resource consumption statistics at a resolution of a single business transaction. In the case of this application we used the information about CPU consumption per transaction – with minimal system overhead.
- Accurately track large numbers of transactions – in this case, some 2,000,000 trades per day – without resorting to less reliable performance monitoring methods such as sampling or using synthetic transactions.
- Monitor transaction flow with a tier breakdown view and the ability to adapt to topology changes with no need for application code changes.
- Display the time a single transaction spent in each of the tiers it passed through and to differentiate actual service time from the overall elapsed time on each tier.
- Display transaction resource consumption data from a tier perspective, and understand how resources are allocated to transactions.
- Identify and isolate latency caused both by the database tier as well as external FIX feeds to the trading system. In the past, when these situations occurred, it was impossible to isolate the cause and a "blame storm" usually ensued.
- Track the round-trip path taken by each transaction and accurately break down the trade times to sub-component latency times, despite the asynchronous nature of transaction flows

For further information, please visit www.optier.com or email us at info@optier.com.

About OpTier

OpTier® harnesses the power of real business transactions with its Business Transaction Management™ (BTM) software solutions. Based on unique Active Context Tracking™ (ACT) technology, our CoreFirst® product assures that business transactions flow smoothly within IT applications and infrastructure, without bottlenecks or outages, for improved end-user experience. CoreFirst delivers end-to-end visibility – of all business transactions, across all tiers, all the time – by discovering the links between IT components and business services, continuously and automatically. It also prioritizes IT transactions and management processes based on business needs and optimizes IT to reduce costs while meeting service level objectives.

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