

Case Study



After AppFabric, NCache stands as the leading caching solution for seamless migration with zero performance downtime.”

- Sr. DevOps Engineer

Investment Management Firm

NCache allows this organization to maintain high availability and accelerate their FinTech Application performance.

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Introduction

Country or Region:

North America

Industry:

Investment

Company Profile:

This global investment management firm offers a broad spectrum of financial solutions, including mutual funds, exchange-traded funds (ETFs), and asset management service. The organization is dedicated to providing tailored investment strategies for retail and institutional clients worldwide. They focus on innovation and responsible investing to help clients meet their financial goals in today's rapidly shifting market conditions.

In the ever-changing investment management sector, the firm faced notable challenges using AppFabric. Additionally, after Microsoft discontinued AppFabric, the firm recognized the urgent need for a more effective solution to enhance transaction speeds and reduce database reliance for their financial trading application. This concern was especially pressing given that the application in question serves as their backbone for processing data, executing trades, and managing client portfolios. However, the firm aimed to maintain a robust security infrastructure while ensuring a seamless migration. This led them to explore alternate distributed caching options - that would reduce database trips and optimize overall performance, resulting in a more efficient experience for their trading application.

Application Pain Points

Prior to implementing NCache, they used a Jenkins CI/CD pipeline. This pipeline utilized PowerShell and MSBuild scripts to fetch code from TFS. It then built solutions and generated MSIs for their Microsoft BizTalk applications, which were subsequently deployed with web services.

However, with AppFabric's discontinuation, they had to deal with frequent downtime and manual interventions during application deployments, which significantly impacted their ability to monitor and make trades. They also struggled to efficiently handle the growing volume of users and transactions. Increased traffic led to slow response times, and the database became overloaded with queries, causing delays.

These issues prompted them to look for more reliable high-performance alternatives that could seamlessly replace AppFabric while resolving the previous limitations in their CI/CD pipeline. Specifically, they sought a solution that would reduce downtime, automate deployments, improve

application availability, and manage increasing workloads, all while integrating smoothly with their existing Microsoft BizTalk applications and web services.

They explored both Redis and NCache, with multiple teams testing each product extensively. These teams concluded that NCache was the more suitable option given their applications are .NET-based, necessitating a native .NET caching solution. Moreover, the variety of features (e.g., Pub/Sub, SQL Search, etc.) that NCache provides convinced them that NCache was by far the stronger choice.

How NCache Fits into Their Solution?

NCache offers a seamless AppFabric migration through its AppFabric wrapper, enabling a smooth transition with negligible application changes. Its powerful features, including its Pub/Sub messaging model, Partition-Replica topology, and limitless performance, make it an ideal solution for the firm's trading application. It markedly reduces database trips and accelerates transaction processing. Additionally, NCache's perpetual licensing model and comprehensive 24/7 support, made it easy for the firm to adopt within their available timeframe.

Application Architectural Overview and Deployment with NCache

The application architecture comprises of the following components:

- **Front-end:** The front-end contains the trading application dashboards that monitor and track the trade activity.
- **Logic Layer:** The logic layer includes the messaging queue that facilitates the transfer of messages between the publisher and the subscribers. The processing logic includes transforming and storing messages in various formats before they are published to the dashboards.
- **Back-end:** The back-end uses an MSSQL database, and the application runs on .NET 4.5, utilizing both web services and Windows services.

Alachisoft Product:

NCache

Customer Needs Met:

- Performance
- Seamless Migration
- Reduced Database Trips
- Real-time communication with Pub/Sub
- High Availability

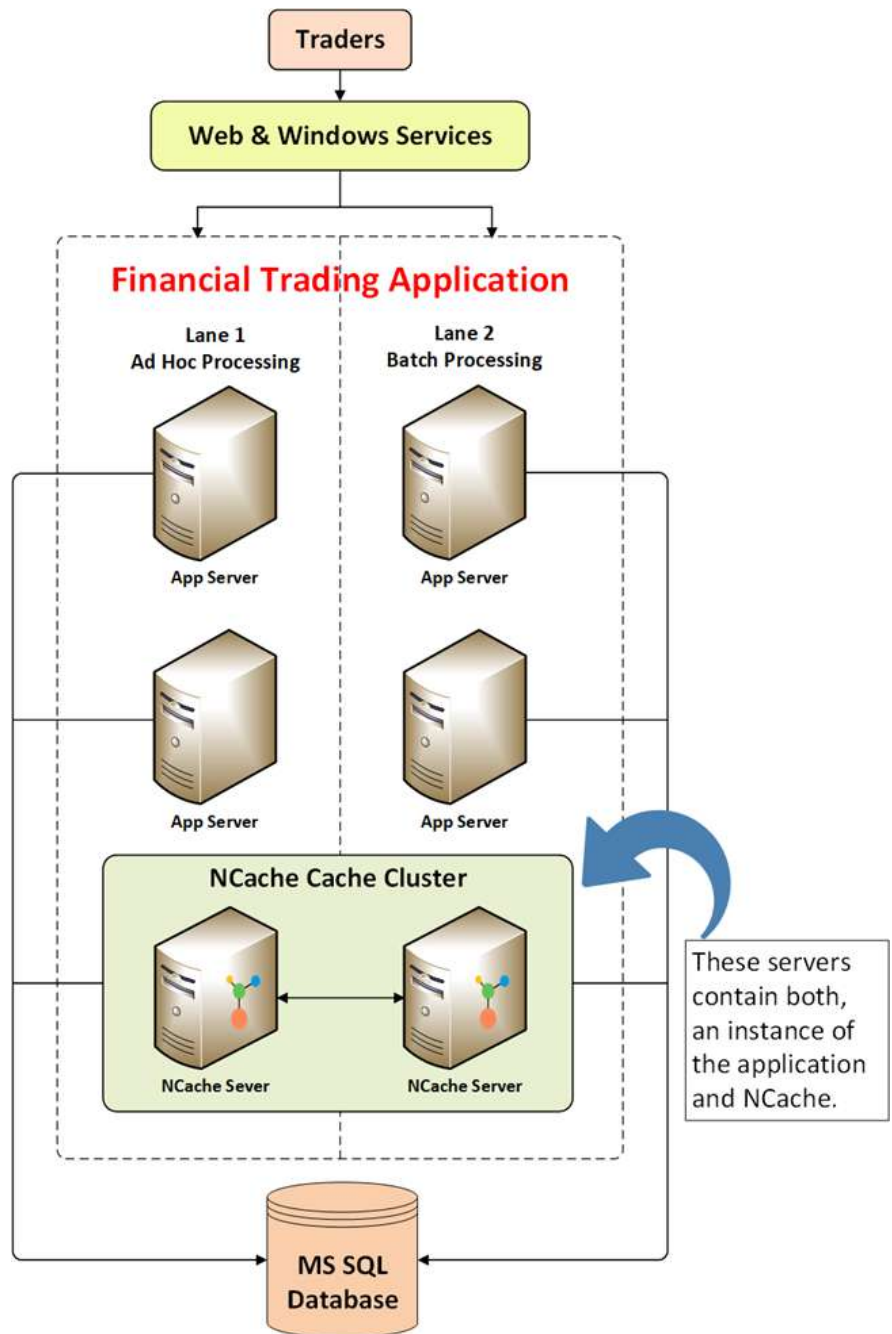


Figure - Architectural Diagram using NCache

The application is designed to efficiently manage up to 15,000 transactions per second, with peaks reaching up to 20,000. It is organized into two lanes: one for ad hoc files and another for batch processing. The batch processing lane can handle up to 450,000 transactions over a four-hour period. Given this transaction volume, NCache is essential to reducing response times, minimizing database trips, and improve overall performance. The application employs a Partition-Replica topology to optimize cluster performance and ensure high availability. Moreover, each lane consists of three web servers, these servers each host an application

instance whereas only one of them hosts NCache. Each server is equipped with 12 cores, 12 vCPUs, and 64GB of RAM.

The application operates on a Publish/Subscribe (Pub/Sub) model, where publishers, such as external applications like CRD, generate messages in formats like CSV, XML, or via messaging queues. These messages are received by Microsoft BizTalk software, where they are processed and validated before being stored. The processed messages are then sent to the trading application through a messaging queue for persistence. Subscribers register their interest in specific topics, such as trades, and can request relevant data after successful storage.

NCache Feature Usage

Effortless Migration from AppFabric to NCache

Migrating the trading application from AppFabric to NCache was easy and hassle-free, thanks to NCache's AppFabric wrapper. This wrapper allowed the application to maintain its existing structure without the need for any major code changes, significantly reducing the effort involved. Later on, when their caching needs evolved, they adopted NCache's direct APIs, which offered greater flexibility and control over advanced features. This effortless migration not only safeguarded the application from future issues but also improved its performance and reliability, ensuring the trading platform could handle high transaction volumes with ease.

Real-time Communication with Pub/Sub

NCache's Pub/Sub feature helps the trading application communicate in real time by allowing different parts of the system to send and receive messages quickly. It uses topics as communication channels, enabling publishers to share important updates, such as trades or market changes, with all interested subscribers at once. For example, when there's a significant change in the exchange rate of a currency, the system acts as the publisher and sends a message to a specific topic, such as "Currency Updates". All interested subscribers receive instant notifications about the new exchange rate. This ensures that everyone receives such critical information right away. As a result, the application allows traders to respond to developing situations instantaneously, which is crucial in the fast-paced world of finance.

About Alachisoft:

Alachisoft provides a popular high performance in-memory distributed cache called NCache. NCache is an Open Source middleware that runs in production environment and boosts performance and scalability of .NET web apps, SOA service apps, and general high traffic server apps. Since, 2005, NCache has proven essential to hundreds of customers worldwide, specially in US, UK, and Western Europe.

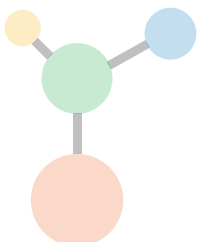
Visit our website at
www.alachisoft.com

You can download a free 30-Day fully working trial of NCache from here:
www.alachisoft.com/ncache

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Improved Performance with NCache

NCache, as an in-memory distributed cache, greatly enhances the trading application's performance by minimizing costly database queries. This caching mechanism significantly reduces latency, allowing for real-time access to critical information (e.g., currencies, current prices, etc.). By retrieving data from the cache instead of the database, NCache alleviates the load on the database, which is especially beneficial during peak trading hours. Consequently, the application encounters fewer bottlenecks and enjoys improved response times, ensuring traders can react to market changes in a timely manner, even under high transaction volumes.

Partition-Replica and High Availability

The Partition-Replica topology has been instrumental in enhancing the application's reliability and performance. By maintaining active replicas of each partition, this topology ensures that data remains accessible even in the event of a node failure. This redundancy allows for seamless failover, preventing downtime and ensuring that client applications can continue to operate without disruption.

Moving Forward with NCache

The investment management firm is excited to expand its use of NCache after experiencing notable improvements in performance and reliability. They plan to leverage the NCache Bridge feature, which will allow them to synchronize their cache across different data centers. Furthermore, they are actively exploring NCache Cloud for their upcoming cloud deployment. Therefore, the firm is poised to unlock the true potential of their trading operations and drive innovative solutions for their global clientele.