Transforming Financial Reporting: Phased Azure Cloud Migration for a Leading Bank

Client: NT | **Month:** May 2024

Business Problem: Northern Trust (NT) encountered significant challenges with their legacy financial software system used for financial transaction reporting. This system, hosted on Windows Server within Pivotal Cloud Foundry (PCF), was integral to daily operations but suffered from several critical issues:

1. **Operational Inefficiency:** The outdated infrastructure led to slow processing times and frequent downtimes, disrupting financial reporting and transaction management workflows essential for both internal operations and client servicing.
2. **High Maintenance Costs:** Maintaining and managing on-premises servers within PCF was increasingly unsustainable, diverting resources from strategic investments.
3. **Limited Scalability:** The existing infrastructure struggled to efficiently handle growing transaction volumes and user demands, limiting NT's ability to scale services during peak financial periods.
4. **Security Vulnerabilities:** Outdated security measures in the legacy system posed risks to data integrity and compliance with financial regulations, jeopardizing client trust and legal standing.

The financial software was essential for providing transaction reports to internal stakeholders and external clients, necessitating an urgent upgrade to a more robust, scalable, and secure platform.

Users Impact:

- **Internal Users:** Employees who relied on the system for generating, reviewing, and managing financial transaction reports were hampered by inefficiencies, compromising productivity and increasing operational risks.
- **External Users:** Clients using the system to access their transaction histories experienced delays and service interruptions, eroding trust and satisfaction with NT's financial services.

Approach:

Creospan helped devise a strategic plan to transition NT's financial software system to a more modern, efficient, and secure cloud-based environment using Microsoft Azure. The migration strategy was executed in phases to ensure minimal disruption, with the first phase focusing on identity management services and corresponding APIs.

1. **Initial Assessment:**
    a. **Understand Existing Workflows:** Creospan conducted a thorough evaluation of existing workflows, APIs, and their responses. This initial assessment was crucial for understanding the current state and identifying areas for improvement.
    b. **Baseline System Documentation:** By documenting the functionalities of the current systems, Creospan created a detailed baseline that served as a foundation for the migration process.
2. **API Migration:** The next step involved analyzing the current API responses and functionalities to ensure a smooth transition.
    a. **Refactor APIs:** Creospan refactored the new APIs to match the existing responses, ensuring compatibility with the new system.
    b. **Testing:** Extensive testing was conducted in both Development (Dev) and User Acceptance Testing (UAT) environments to validate the new APIs.
    c. **Cross-functional Coordination:** Coordination with cloud teams and other relevant stakeholders was essential to facilitate the seamless migration of APIs.
    d. **Sequential Migration:** The migration was carried out sequentially, with each service being migrated one at a time, followed by the systematic decommissioning of on-prem systems.
3. **Identity Management Service:**
    a. **Migration to Azure:** A significant part of the migration involved moving the identity management APIs to Azure Cloud to enhance authentication capabilities.
    b. **Microservices:** This migration ensured that all microservices utilized the new cloud-based identity management service, providing a robust and secure authentication framework for NT’s applications.
4. **Testing and Deployment:**
    a. **Thorough Testing:** Creospan performed rigorous testing in Dev and UAT environments to identify and resolve any issues. This thorough testing process ensured that the new system was reliable and free of critical errors.

b. **Issue Identification & Resolution:**Any issues identified during testing were promptly addressed to prevent them from affecting the production environment.
c. **Securing Stakeholder Approvals:** Finally, the updated APIs were deployed after obtaining the necessary approvals, ensuring a smooth transition to the new system.

Solution:

1. **Cloud Infrastructure Migration:** Transitioned from Windows servers within PCF to Microsoft Azure, enhancing scalability, security, and reliability. The migration to Azure provided a robust and flexible environment capable of supporting NT's growing transaction volumes and user demands.
2. **API Modernization and Integration:** Updated and optimized APIs using development frameworks such as React and SpringBoot, ensuring they seamlessly integrate with Azure cloud services. This modernization improved response times and reliability, especially during high-volume transaction periods.
3. **Identity Management Enhancement:** Migrated identity management services to Azure, significantly improving authentication processes and bolstering security. The enhanced identity management system ensured secure and reliable user authentication for both internal employees and external clients.
4. **Cost Reduction:** The migration to Azure eliminated the need for maintaining and managing on-premises servers, resulting in significant operational cost savings. This reduction in maintenance costs allowed NT to reallocate resources to more strategic initiatives.
5. **Enhanced Security Measures:** Implemented advanced security protocols and compliance measures in Azure, significantly reducing vulnerabilities to cyber threats and data breaches. The enhanced security posture ensured data protection and compliance with financial regulations.
6. **Performance and Reliability Improvement:** Optimized system performance by leveraging Azure's robust infrastructure, reducing downtime, and improving response times. The improvements in performance and reliability led to more consistent and dependable services for users.
7. **Monitoring and CI/CD Integration:** Enhanced monitoring capabilities using the ELK Stack (Elasticsearch, Logstash, Kibana) and streamlined continuous integration and deployment processes with GitHub and Azure Pipelines. These tools ensured proactive issue detection and efficient deployment workflows, minimizing disruptions.

Technology Stack:

- Legacy Systems: Windows Server within PCF
- Development Frameworks: React, SpringBoot
- CI/CD Tools: GitHub, Azure Pipelines
- Monitoring Tools: ELK Stack (Elasticsearch, Logstash, Kibana)
- Messaging Systems: Solace for MQs

Benefits: (Guestimates)

- 30% Reduction in Operational Costs: Lower maintenance and infrastructure costs following the cloud migration.
- 40% Improvement in System Reliability: Reduced downtimes and enhanced service availability.
- 25% Increase in User Satisfaction: Improved performance and reliability of financial transaction tools, leading to higher client satisfaction.
- Strengthened Security Posture: Enhanced data protection and compliance with financial regulations, securing client data and trust.

Challenges:

- **Documentation:** Dealing with outdated documentation posed significant challenges. The existing documentation was often incomplete or inaccurate, making it difficult to understand and migrate legacy systems accurately.
- **Risk Assessment:** Ensuring that new APIs did not negatively impact other microservices required thorough risk assessments. Any changes in the APIs needed to be carefully analyzed to prevent disruptions in the overall system functionality.
- **CI/CD Pipelines:** Overcoming issues with newly set up continuous integration and deployment (CI/CD) pipelines was critical. The extensive pipeline code required meticulous management to ensure smooth and efficient deployments.
- **Complex Data Migration:** Ensuring the accuracy and integrity of financial data during the migration was a significant challenge. The complexity of the data and the need for precise migration steps added layers of difficulty.
- **System Integration:** Seamlessly integrating new cloud services with existing applications and data stores required careful planning and execution to avoid operational disruptions.

Next Phase:

- **Ongoing API Migration:** The ongoing process of migrating APIs related to Identity Management Service will continue until June. This phase involves systematically updating and transferring all remaining APIs associated with identity management service to the Azure cloud environment.
- **Future Focus:** The next focus will be on transitioning other microservices and corresponding APIs to the cloud (transaction routing, financial planning, etc) . This will involve refactoring and optimizing these components to fully leverage the benefits of cloud infrastructure, ensuring enhanced performance, scalability, and reliability.

By adopting a phased approach and focusing initially on identity management and its corresponding APIs, Creospan ensured a smooth and secure transition for NT's financial software system. This strategic migration not only improved operational efficiency and security but also enhanced user satisfaction and positioned NT for future scalability and growth.