WHITE PAPER

CLOUD-ENABLED CORE BANKING

Why Now is the Right Time to Act

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Cloud-enabled Core Banking

The time is now for banks to capitalize on the many benefits that can be achieved by running core banking solutions in the cloud. This white paper explains why. Topics include: recent increased confidence in cloud strategies, the definition of cloud-based core banking, reasons/use cases for moving to cloud-native core banking and migrating to a cloud-enabled core; and a discussion of how banks can make the move to a cloud-based core.

This white paper is part of a series of FIS™ white paper publications regarding core banking modernization trends and topics.

Putting Your Core in the Cloud – Why Now?

Timing is everything when designing solutions for banks. While the quality of a solution greatly determines its strategic success, timing can be at least as important. Here we consider whether the time is right for a bank to migrate its core system to the cloud – and if so, why?

This year, Amazon Web Services (AWS) celebrates its 12th birthday, while Microsoft Azure turns eight. In this relatively short timeframe, these two companies have become the universal gold standard for cloud-based solutions. Major companies, including Netflix, Adobe, Apple, Samsung, BMW and Facebook, have all adopted cloud ina big way. However, even five years ago, the mere mention of a cloud-based core solution in the boardroom of a major bank would probably end a meeting early.

For many years, banks have used the cloud for non-critical systems, such as email, customer relationship management and application development. But they just weren't ready to discuss moving their core systems to the cloud. Instead, they relied on the trusted strategy of building out their bank IT on bank-owned hardware in bank-owned data centers. So what's changed?

Recent developments impacting three vital areas are the catalyst for banks rethinking cloud strategies:

Security

Data security was the most often-cited reason for banks not adopting ambitious cloud strategies. But recently, the level of security available in the cloud is at least as good as that within bank data centers. Cloud providers take data security very seriously, and security standards are among the highest available.

Regulation

In the past, regulators have shown concerns about banks using the cloud for customer data, due to perceived security risks. They also worried about the implications of the concentration of so much data residing with the big three cloud providers. However, regulators now acknowledge the benefits of cloud availability to banks, and they are starting to adapt their thinking. Moreover, cloud providers are engaging with the regulatory bodies to educate them about cloud technology and what it actually means. Regulators acknowledge that a modern infrastructure environment offers sustainable benefits to all parties. Banks can leverage the massive investments of Microsoft, Amazon and Google, so cloud can make banking more democratic and competitive.

Regulators also recognize that cloud technology can provide a very secure environment, which is better than most banks could achieve themselves. In return, banks are starting to get more guidance from regulators regarding the outsourcing of core offerings, and how they can leverage cloud providers to enable them to focus on banking rather than IT.

Regulators (especially in Europe) are also discovering that cloud banking is a powerful way of opening markets up to more competition. New entrants can utilize cloud environments to launch services into the market; cloud computing means that technology is no longer a barrier to entry.

Customers

In the age of the great customer experience, customers have high expectations – and the expectations keep increasing. Banks are under tremendous pressure to deliver innovative digital solutions to a consumer base that expects to transact instantly, anywhere, and at any time. These new dynamics are causing banks to rethink how best to build and deliver banking solutions.

Many banks are looking to the cloud for application development and deployment of new banking solutions. Cloud offers scope and scale to develop and deliver real-time services across any device without a significant investment in IT infrastructure. Cloud technology also offers a foundation on which to develop customer insights using big data and analytics, and simplifies the task of maintaining data transparency in multiple jurisdictions. In many banks, cloud computing has become top of the agenda.

Security and Regulatory Compliance Perceptions Associated with the Cloud

Perception	Reality
1. The cloud is insecure	"A multi-tenant cloud may actually be more secure because it makes it difficult to target a particular company or data set." **Senior executive, CTERA Networks Ltd.**
2. The cloud suffers from more breaches	"When the correct security policies for preventing attacks and detecting them are implemented, attacks are no more threatening to the cloud than any other piece of infrastructure." **President and Co-founder, Huddle™ (Ninian Solutions Ltd.)**
3. Data is secure when it is physically controlled	"The various high profile breaches...have served to highlight that the physical location of the data matters less than the access and associated controls". **General Manager of Navisite, LIC**
4. Cloud security tools and capabilities are not ready	" There are now tools and capabilities that allow IT to enable cloud securely in any number of enviornments specific to unique requirements' needs thanks to the ubiquitous nature of APIs." **CEO and founder of Netskope, Inc.**
5. Maintaing cloud security is far too difficult	"Believing in this myth leads to companies either compromising security in the name of business requirements or refraing from using the cloud for mission-critical applications." **CEO of Flux7, Inc.**

Sources: The great IT myth: is cloud really less secure than on-premise? Information Age, March 9, 2015.
20 of the Greatest Myths of Cloud Security, CIO.com, May 13, 2015.

What Is a Cloud-based Core Banking System?

Gartner defines a core banking system as "a back-end system that processes daily banking transactions and posts updates to accounts and other financial records. Core banking systems typically include deposit, loan and credit processing capabilities, with interfaces to general ledger systems and reporting tools." In simple terms, a bank's core refers to the mission-critical systems that facilitate virtually every transaction for a bank.

Cloud-based core banking means migrating the bank's core to a cloud provider, to exploit the provider's computing, tooling and operations power. In practice, the cloud offers virtually infinite computing capabilities and resources (servers, storage, networks, applications and services) that are delivered as a service to the bank.

Banks can leverage the power of the cloud by developing cloud-native applications. These are developed and deployed as a set of flexible microservices using Platform-as-a-Service (PaaS) tools — which can further reduce costs, boost performance and increase a bank's business velocity.

The cloud platform serves as the foundation for developing and running core applications, which are designed to be flexible and scalable. The bank has the ability to run the technologies they choose and scale as necessary – paying only for what they consume.

Why Move Toward Cloud-native Core Banking?

Beyond the obvious benefits of cost reduction, scalability, and speed of deployment, a cloud-native architecture offers greater agility – it enables a bank to do things that were previously impossible.

Many banks carry the burden of legacy systems and are working with third parties to meet customer needs and accelerate progress. Core banking in the cloud allows banks to move away from a model where all technology is in one place (the bank's data center) to one where APIs affect data movement instantaneously between multiple parties. Banks can mix and match "best of breed" solutions from their fintech partners and replace solutions when something better comes along, rather than being locked-in to a specific technology.

With this approach, banks can become innovators, build new products and scale the business. They can achieve a business agility that is impossible for a bank with a monolithic core. New services can be delivered quickly and cost-effectively, facilitating a better customer experience.

Use Cases for Migrating to a Cloud-Enabled Core

Become nimble

Typically, bank cores are monolithic and often mainframe-based applications that can hinder innovation. Seemingly simple updates can take a month, while a major enhancement can take upward of a year to introduce. In today's world, where the focus is on enhanced customer experiences and innovative products being brought to market fast, a core that can't support these requirements is an impediment to progress. An API-enabled cloud-based core can use microservices to develop and integrate new solutions quickly and efficiently.

Add agility to IT and operations

Although many banks view cloud computing as a way to save money and convert capital expenditure to operating expenditure, in practice it does much more. The cloud can also reduce waste in a bank's IT and operations. For most banks, running a data center operation is a major overhead and not a key value proposition. A cloud-enabled core frees a bank from this burden and offers a path to digitalize IT operations. Valuable resources can be redeployed from commodity work, such as running the core, to work that adds real customer value.

Faster solutions delivery via APIs

Banking has gone digital and more than 90 percent of customer interactions occur via a mobile app or website. Banks are jostling to deliver unique differentiating digital experiences that attract and retain new customers. They are often ranked by the quality, depth, and richness of their customer experience, which is powered by the core system. If that core is cloud-enabled via microservices and APIs then the bank is well-positioned to open new channels, using API-based services to connect with partners, regulators, and different parts of the bank itself.

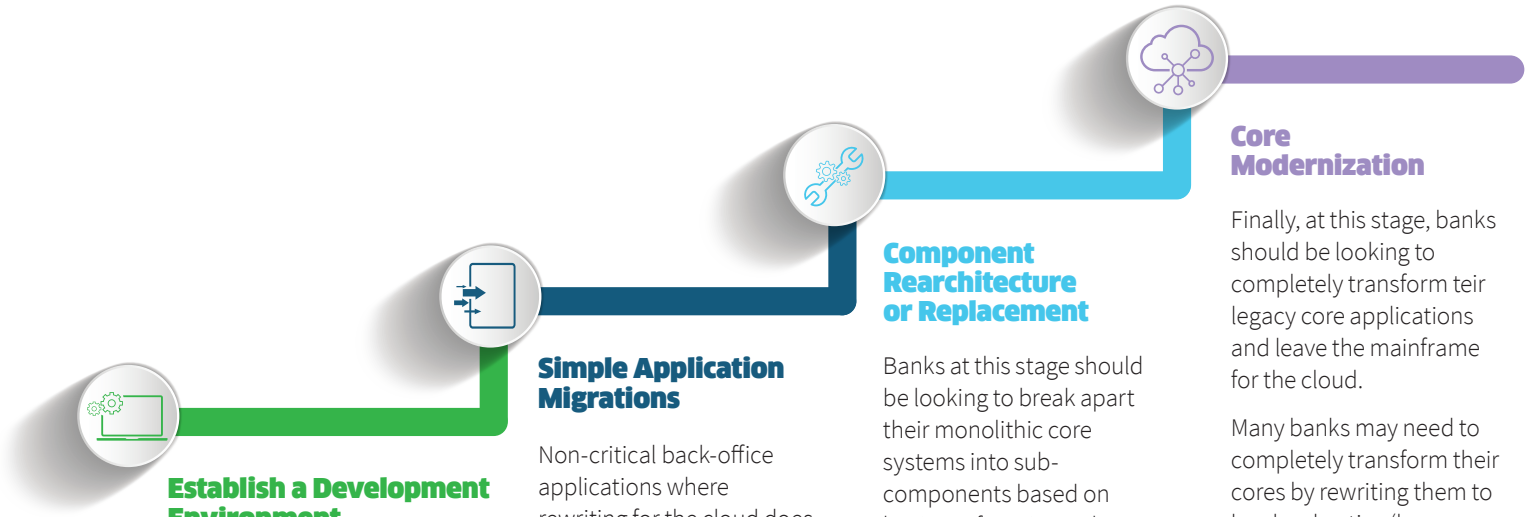
How to Move to a Cloud-based Core

With banks under pressure to transform and innovate quickly, delivering innovation on a legacy IT infrastructure is unsustainable. Implementing a cloud-native approach to core applications is the right approach, but making a start is never easy. So how should banks move to an agile, efficient cloud-native approach? It begins with a detailed migration plan, which should cover everything from strategy to roles and responsibilities, technology selection and business requirements analysis.

All banks must ask two fundamental questions:

- Which existing bank applications could be moved to the cloud to reduce costs and increase agility?
- Which applications could be replaced with something cloud-native or rearchitected for a cloud environment?
- Normally, when banks start moving systems into the cloud, they should avoid a wholesale migration. A gradual movement of core components, development and support strategies will ease the transition and build a firm foundation for a cloud-native applications suite. This can be done in four stages, as shown in the following image.

Transformation Steps for Core Banking Cloud Enablement



Establish a Development Environment

Banks can start by enabling application development, architecture and partner solutioning that is cloud native and uses microsrvices, containers such as Docker or Kubernetes, and platforms such as OpenShift or Pivotal.

The microservices approach provides features such as re-use, rapid updates, elasticity and scalabilty. These are beneficial for bank applications that are customer-facing, handle large volumes of users, and for which usage fluctuates and spikes at various times and often unpredictably (such as mobile banking, payments and trading applications).

Simple Application Migrations

Non-critical back-office applications where rewriting for the cloud does not make financial sense, and off-the-shelf applications, can be migrated to the cloud at this stage as these can generally be moved with almost no (or very little) code modifications. Typical examples include ERP, HR, email and collaboration applications/platforms.

Component Rearchitecture or Replacement

Banks at this stage should be looking to break apart their monolithic core systems into sub-components based on business functionn; these sub-components can be rearchitected or replaced via a partner application with cloud-native microsevices-based soutions that are easy to consume and integrate with.

Typical target business functions that are good candidates for decoupling from the core are customer, catlog, pricing, and analtical functions as they offer greater scalability and flexibility for banks. This approach enables these functions to be scaled and offered to the enterprise.

Core Modernization

Finally, at this stage, banks should be looking to completely transform teir legacy core applications and leave the mainframe for the cloud.

Many banks may need to completely transform their cores by rewriting them to be cloud native (because most legacy cores are still mainframe-based and monolithic).

From an industry perspective, approximately 19% of banks in the US and Europe have moved some of their applications to the cloud, however 52% of banks say they are starting the journey.

We expect to see significant core modernization activity over the next several years, as banks move toward a simplified and secure modern core processing engine that operates in the cloud.

Position for Success with Cloud-Enabled Core Banking

With a cloud-enabled core, a bank is in the position to drive innovation and shape the future of technology. In recent years fintechs or "neo bank" competitors have dominated this space. Many of these new arrivals have built differentiating customer experiences that have lured customers away from traditional banks.

With cloud-enabled core banking, banks can offer unique and exciting product offerings to existing and new customers by leveraging the benefits of the cloud in three key areas:

Cloud Native

Cloud is becoming the "new normal" in many industries. By moving its core to the cloud and adopting a cloud-native architecture, a bank can reduce time to market, and become more nimble and competitive. Over time, a cloud-native architecture will offer a lower total cost of ownership than a traditional in-house, mainframe core.

Platform banking

With a cloud-enabled core, a bank can leverage the cloud's "API first" approach to integration. This enables the addition of new features and functions to the existing core, and the development of a bespoke banking ecosystem. Over time, a bank can become a platform on which to add best-of-breed in-house or third-party fintech solutions that augment the core platform. A platform approach to core banking empowers a bank to become more responsive to change and to seize new market opportunities.

Open banking

The global financial services market is moving toward open banking, with initiatives in Europe, Asia Pacific and Australia. Most recently, Brazil and Japan have announced open banking regulations. Although the North American banking markets do not have any open banking regulations, several regulators have issued principles and guidance pertaining to open banking. Some US banks, including Citi and Capital One, have published APIs that allow for access of their data.

The cloud will play an integral role in the future of open banking as banks, regulators and governments prioritize cloud computing in financial institutions. In January 2018, the European Commission encouraged innovation through open banking and cloud computing.

It is this move toward openness that will provide new opportunities to make use of bank solutions, data and information in real time. This will open up financial services to new competitors and create new opportunities for banks that capitalize on the opportunity.

Putting Your Core in the Cloud – The Time Is Right

The business case for a cloud-enabled core is clear. Now is the time for banks to start thinking about and planning for going cloud native. Cloud has created extraordinary opportunities for banks to transform how they conceptualize, develop, manage and sell their products and services. When used to its fullest advantage, the cloud has the potential to redefine what it means to be a financial services company.

Banks that migrate to the cloud today will enjoy sustainable benefits tomorrow through increased security, on-demand elasticity, scale and reduced total cost of ownership. The cloud heralds a new epoch in computing and how banks deploy and consume computing services.

By acting now, banks can protect and expand their market share via the cloud. In the age of heightened consumer expectations around digital, increasing regulatory pressure, and the fintech and neo banks threat, the time is right to act.

FIS – Leading the Way with Next Generation Cloud-Enabled Core Banking

FIS is a global leader in core banking platforms and we have worked with cloud technologies since their inception. The FIS next generation core banking technology is cloud agnostic, so it can be used with the FIS private cloud, Microsoft Azure or AWS without needing to change the deployment process. We deliver an API-first, component-based, cloud-native core banking platform that enables banks to integrate and modify their core and supports any bank type, from digital to direct. Our platform can be deployed in a range of environments: FIS cloud, bank data center, public, private or hybrid cloud.

Glossary of Terms

API	Application program interface
AWS	Amazon Web Services
IT	Information technology
PaaS	Platform as a service

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