

BANKING ON IaaS

Cost and efficiency advantages spur the financial services industry to adopt infrastructure as a service.

Executive Summary

The marketplace and technology are disrupting how financial services firms conduct business. To help meet new and challenging regulatory, compliance and customer service demands, a growing number of financial institutions are moving to cloud-based infrastructure as a service (IaaS) solutions.

IaaS applies the on-demand cloud delivery model to the essential IT resources that every firm needs: processing power, storage capacity, network bandwidth and security technologies. Combined, these tools enable IT managers to efficiently scale resources up or down depending on their prevailing requirements at any given time.

For a growing number of institutions, IaaS solutions are at the top of the list of potentially transformative technologies. The reason: IaaS can reduce costs, mitigate IT complexity and make organizations more efficient.

But to succeed with IaaS, a financial firm must focus on two key components. The first is an implementation strategy that can help it realize the potential benefits and avoid the pitfalls that can plague cloud projects. The second is access to cloud partners with expertise in this evolving area.

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Cloud Advantages

These days, it's not unlikely that every executive in a financial organization is looking for a way to cut costs – including IT costs. The cloud provides an opportunity to eliminate carrying the technology costs of infrastructure, platform and software.

"Now financial firms can have a service provider carry the costs," says Christopher Ford, chairman of the Global Sourcing Group at Morrison & Foerster, an advisory firm serving global financial-industry clients.

But the chance to reduce IT costs isn't the only potential benefit that's driving financial institutions to look closely at cloud in general and IaaS in particular. Capital markets firms are focusing more sharply on improving customer experience, supporting expansion strategies, improving operational effectiveness, addressing compliance and growing revenue. CIOs in forward-thinking firms are looking to IaaS for help.

The cloud model enables the on-demand delivery of essential IT resources, including processing power, storage capacity, network bandwidth and security technologies. This gives IT managers an efficient method for scaling resources up or down depending on the prevailing enterprise requirements. IaaS offerings are typically made available via the provider's service catalog, which enables authorized users to pick through a menu to provision new resources.

Business and Legal Risks

Use of cloud-based services is still a relatively new strategy. However, usage is expanding and evolving in rapid fashion.

One could consider the very risks associated with capital markets firms' use of cloud computing – privacy of financial institution and customer information, business continuity/disaster recovery issues, security of cloud-based data – not significantly different than those of traditional application or server-based IT systems. These issues have, for the most part, been successfully dealt with for years.

Still, compliance with regulatory requirements, for example, the Federal Gramm-Leach-Bliley Act and state laws applying to financial institutions, must be of concern, especially in the areas of:

- Financial privacy issues
- Customer data protection issues
- Business continuity and disaster recovery issues

Bottom line: Authoritative financial regulatory guidance on cloud computing activities for regulated financial firms is still somewhat sparse – but is developing. However, there is substantial regulatory guidance on financial firm third-party technology outsourcing activities. And in general, financial regulatory agencies have indicated that they will apply these to cloud computing activities.

Eight Core Benefits

Easy access to essential services is helping make IaaS one of today's most popular options in the fast-growing cloud market.

A new survey of senior-level executives across a variety of industries found that cloud adoption rates continue to rise, with 75 percent of respondents saying their organizations use some form of the cloud model, up from 67 percent a year earlier, according to North Bridge Venture Partners and GigaOM Research. The survey also found that the fastest growth area is IaaS, with usage rising from 35 percent of the organizations to 45 percent (and reflects a 29 percent increase over 2011).

The financial services industry is part of this push to the cloud. Almost 25 percent of financial industry executives said their organizations were aggressively pursuing cloud solutions, according to a survey earlier this year by NASDAQ OMX, a global securities exchange company.

The ability to utilize optimal technology and not compromise proprietary information is another reason financial firm IT decision-makers are considering cloud use. Bolstering this thinking is the fact that less business is being conducted face-to-face on the trading floor and more via email, text, chat and over the phone.

Driving demand for IaaS in financial services are eight core benefits:

1. Reduced costs: Rather than dedicating individual IT resources to a particular department or organization, the cloud model shares resources among different users. Known as multitenancy, this approach helps organizations optimize their resource investments in private clouds and reduce the cost of services in public clouds by spreading expenses among multiple customers.

2. Greater IT scalability and business agility: By dialing up resources via a service catalog, professionals in financial services can quickly gain new capacity without enduring an extended procurement process for requisitioning new resources and then waiting for IT shops to test and move technology into production. This can make new capacity available in days or hours rather than the weeks or months often typical with traditional provisioning models.

3. Integrated infrastructures: A lack of integration among systems run by various departments can create silos that promote redundancies and make information sharing difficult. IaaS breaks down these barriers by giving authorized employees access to the same pool of IT capacity and data.

4. More effective use of capital: Financial services firms pay for public IaaS resources using their operating-expense (OPEX) budgets, which avoids the capital expenses associated with on-premises hardware and software. Many financial industry CIOs may find that getting sign-off for incremental operating expense needs is easier than for large capital projects.

IaaS: Where to Start?

Adopting IaaS represents a strategic shift in IT operations for financial firms. Still, small steps can help assure that enterprises get the performance, reliability and security they need.

Start with a pilot project that supports a small application. General-purpose business apps, including email systems (typically email no longer contains credit card or other sensitive information), can be good candidates for reaping benefits while reducing fears or easing concerns that users may have about clouds.

Initially, financial firms should avoid using an IaaS infrastructure for mission-critical apps, including those that support client services, involve intellectual property or house data or services that are competitive differentiators.

Once the pilot IaaS platform is implemented, run benchmarks to determine how well it's meeting performance and cost goals, then make any necessary adjustments. Use the knowledge gained in the pilot to streamline additional IaaS implementations.

Subscription fees for cloud resources are also prenegotiated and predictable, which can make it easier to more accurately determine total cost of ownership (TCO).

5. Easier upgrades and patches: Routine maintenance, servicing and updates demand fewer internal resources when organizations centralize IT resources within a private cloud or after they offload the full responsibility to a cloud provider.

6. Big Data tamed: Unlimited, on-demand capacity available via IaaS means capital markets firms always have the platform they need to run complicated financial Big Data modeling and business analytics, conduct analyses and create simulations based on high volumes of structured and unstructured data. Similarly, IaaS gives firms a manageable way to steadily add storage capacity as data volumes grow, without the danger of underestimating requirements or overpaying for unused capacity.

7. High availability and disaster recovery: IaaS provides a reliable resource for automated backups and archiving, which can reduce both the cost and complexity of maintaining redundant data center capacity. If a widespread natural or manmade disaster strikes a data center, production tasks can automatically fail over to a cloud-based resource in a distant location. According to some industry estimates, the costs of commercial, cloud-based backup capacity can be a fraction of what an organization would spend to establish and maintain its own recovery site.

8. Opportunities for improved security: Cloud service providers have dedicated staffs assigned to maintain security at the highest levels, including adopting the latest technologies and best practices and working to assure systems receive immediate software patches and updates.

IaaS in a Private Cloud

With a private cloud model, IT resources can remain on premises and under the control of the internal technology staff. Private-cloud IaaS differs from traditional in-house data centers by extensively using virtualization to create pools of resources that are shared by various business departments and can be dynamically allocated per prevailing end-user needs.

An organization's IT budget will limit scalability, but a private cloud does provide direct control of security practices. And a strong private-cloud foundation can deliver immediate benefits to financial services firms, including better cost management and scalable IT resources.

Another option is a hybrid cloud infrastructure. CIOs can gain additional benefits by enabling workload sharing between their private clouds and outside cloud services.

This hybrid approach can:

- Support dynamic customer-facing websites
- Serve large and increasingly transactional data storage needs
- Provide ready access to high-performance computing capacity
- Handle demand spikes at the open and close of markets
- Offer platforms for testing new and complex trading algorithms
- Deliver resources to manage reference data
- Address the cost of maintaining low-latency trading

Firms can also use a hybrid cloud approach to handle demand spikes, serving proprietary and mission-critical apps within the private cloud to preserve customizations and apply heightened security policies, while maintaining a standing contract for third-party services should additional capacity become necessary.

Hybrid clouds give financial services organizations the flexibility to maintain in-house control over their most important assets while also providing a safety valve for fast access to outside services whenever additional computing power and storage capacities are needed.

Cloud Services Taxonomy

- **Infrastructure as a Service:** IaaS provides on-demand computing, storage and networking resources. It also is highly flexible and scalable so an organization's infrastructure resources can grow to meet changing needs.
- **Platform as a Service:** PaaS consists of resources for the underlying IT infrastructure and development tools for building and deploying cloud applications.
- **Software as a Service:** SaaS solutions deliver full versions of business applications on demand and typically through a web browser. SaaS eliminates the need for costly infrastructure expenses related to hosting apps on premises.

Community clouds offer yet another approach. A firm could use one to provide IaaS to select customers with common requirements or who have common security and accountability needs.

"Some cloud infrastructures are dedicated to enabling high-speed trading and algorithmic trading in the capital markets," says Alexander Tabb, partner and COO at the Tabb Group, a research and consulting firm that focuses exclusively on capital markets. "These sector-specific or community clouds are off the Internet so the only way to get to them is through an extranet."

Two Critical Concerns

There's a lot for financial institutions to like about IaaS, but questions and challenges remain. One of the most significant concerns voiced by financial users is security: Is it safe for the firm to be doing any computing in the cloud?

Keep in mind; attitudes are changing – and fast. The GigaOM survey ranks security as the top inhibitor, but the report's authors note that less than half (46 percent) continue to see security as the biggest roadblock, down from 55 percent a year earlier.

The Federal Financial Institutions Examination Council, whose members include representatives from the U.S. Federal Reserve System and the Federal Deposit Insurance Corp., advise financial institutions to consider continuous monitoring to ensure cloud providers employ effective security. This includes proper access controls for critical information, identity management systems and data encryption.

In addition to security, financial institutions moving to the cloud also must consider the impact on data center management. GigaOM found that a large percentage of IT executives consider IT management challenges an important area to focus on, with 46 percent believing that the growing reliance on clouds makes IT management more complex.

One way to relieve complexity is to adopt open, extensible and standards-based cloud solutions. CIOs can stay abreast of cloud standards developments by tracking the activities of key industry groups that are working in this area, including the Distributed Management Task Force, the Open Data Center Alliance and the TM Forum's Enterprise Cloud Leadership Council.

They also can install cloud-savvy tools to maintain quality of service (QoS) by automatically orchestrating workloads to

balance processing across cloud resources. These programs can run off preset thresholds or respond to current data trends to assign additional memory to a virtual machine that's running low or tap the processing power of an underutilized server.

Just as importantly, orchestration will automatically shut down resources if they're no longer needed. "This assures you're not paying for excess resources that you don't need," Tabb says.

IaaS Migration in 5 Steps

Financial organizations that choose IaaS need an implementation strategy that can help them realize the benefits. Here are five critical steps:

- 1. Standardize on a select number of hardware and software platforms.** Highly compatible hardware makes it easier for IT managers to create resource pools for dynamically provisioning resources. Further streamlining is possible by replacing traditional servers with blade units, installing storage area networks (SANs) and moving to 10-Gigabit Ethernet.
- 2. Further virtualization efforts.** Expanding the use of virtual machines in a number of areas (email, back office applications, etc.) allows financial services firms to significantly shrink the amount of physical hardware they require, while simultaneously maximizing utilization rates for remaining equipment and reducing power demands. Virtualization also provides the foundation for dynamically provisioning workloads, storage volumes, memory capacities and other resources.
- 3. Install tools for creating service catalogs and metering resource usage.** Catalogs identify the IT resources available from the cloud, display associated costs and provide users a way to quickly procure the right resources in the right volumes to meet their needs. Metering applications track the ongoing costs of these services based on usage volumes, which gives individuals, the IT department and the firm's financial department a clear view of IT expenses.
- 4. Dedicate internal staff to the cloud.** As clouds become essential IT resources, financial services firms will need internal expertise to implement private clouds and successfully manage outside cloud providers to assure performance, cost, security and compliance needs are being met.
- 5. Find the right partners.** Cloud providers should have a proven track record in this evolving market and offer connections to a large ecosystem of IaaS technology and solutions experts to develop both the best solutions needed now as well as those that will be needed in the future.

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