

Cloud-Computing For Banking Investment And Services

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Abstract : “The more the things change the more they stay the same.” That can be true in some aspects of life, but not in the banking industry. At a global level, the scale of change in this industry since 2008 has been unprecedented. Control is now in the hands of the customer, rather than the bank. Satisfying customer demands has become more complex as they are looking for convenience and control over their banking services. . Technology has become a costly hurdle for financial institutions and developing customized solutions or investing in advanced banking platforms has either been unfeasible or they resulted to too many failures. Cloud computing is touted as a way to delivery software in the future, can help banking sector react to this new customer-driven environment within innovation business models, operations and IT. Using cloud computing, banks can create a flexible and agile banking environment that can quickly respond to new business needs. Though cloud banking can face few problems like security data confidentiality and quality of services, they can be sorted by building a good application model. It also elaborates the defects of current banking systems, and explores the innovative applications of cloud computing in banks.

I. INTRODUCTION

Cloud computing is a standardized model and a paradigm shift in computing for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. It has the capabilities and resources which can be delivered as a service to customers using internet technologies. Cloud economics are attractive and increasingly relevant to financial services organizations. It has the potential and ability to change the financial services landscape completely. By making efficient enterprise-level banking systems and high end technologies available in the cloud on a pay-per-use basis, now any customer can have access to modern core banking systems without the cost and other barriers usually associated with this technology. Banks that take advantage of cloud based technologies are better positioned to provide facilities for users to develop, deploy and manage their applications ‘on the cloud’ as well as respond to current economic uncertainties, interconnected global financial systems and growing customer demands.

II. DEVELOPMENT MODELS OF CLOUD COMPUTING

Cloud based services can be broadly classified in different ways, depending on their organizational structure and provisioning location. A cloud deployment model represents a specific type of cloud environment, primarily distinguished by its size, location of the cloud services hosted, security requirements, its desire to share cloud services and ability to manage some or all of the services. Four deployment models are usually distinguished by service providers, namely public, private, community and hybrid cloud service.

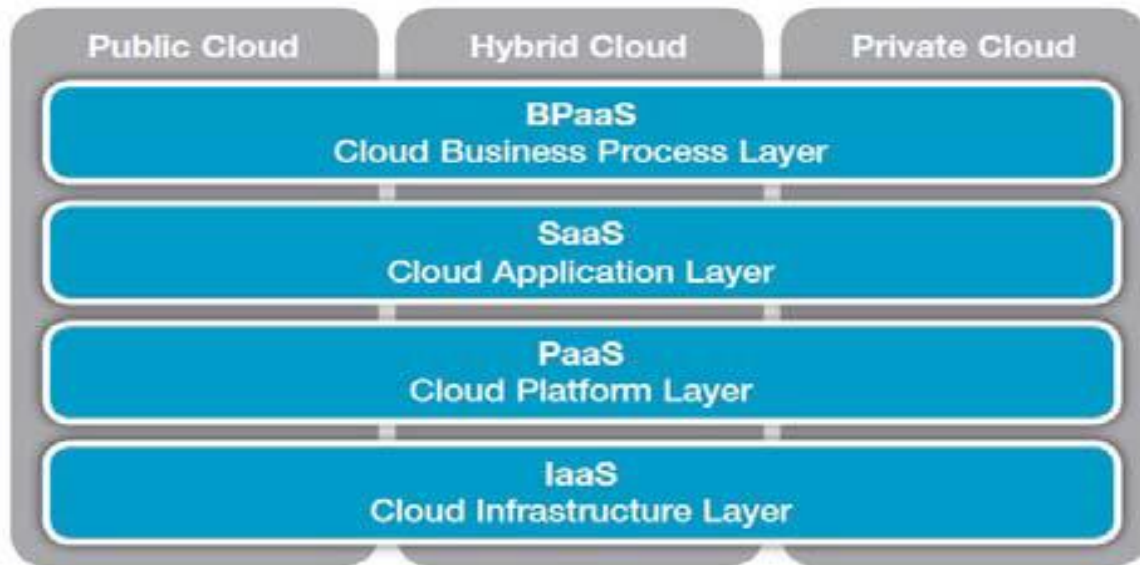
Public Cloud— A public cloud is available over the internet to everyone and is governed by an organization that trades cloud services. The cloud provider manages and owns everything from operations and facilities to computing resources. The most popular public clouds are Amazon EC2, Google App Engine and Microsoft Azure. Public clouds are widely used in the deployment, development and management of enterprise applications, at low costs. It allows the organizations to delivery highly scalable and reliable applications rapidly and at more affordable cost. Security is a significant concern in public clouds.

Private Cloud— A private cloud is accessible only to trusted users of an organization or group. All the information present in a private cloud can be managed either by the organization or the cloud provider. They allow usage of low-cost servers and hardware as well as improve average server utilization providing higher efficiency and cost reduction. The major limitation of a private cloud is that , the IT teams of an organization may have to invest in buying, building and managing the clouds independently.

Community Cloud— A community cloud is accessible to the members of a larger community comprised of different organizations or groups, and they are either managed internally or by a third-party. The costs are spread over fewer users than a public cloud and more than a private cloud. Only some of the cost savings potential of cloud computing are utilized

Hybrid Cloud— Hybrid cloud is a mixture of two or more clouds (private, community or public) that remain sole entities but are associated in order to administer services offering the benefits of multiple deployment model. It crosses isolation and provides boundaries so that it can't be classified into one single category of private, public, or community cloud service. Hybrid cloud can run in a private cloud and transform to a public cloud when the demand for computing capacity increases. A primary advantage of a hybrid cloud model is that an organization pays only for extra compute resources when they are needed. This feature overcome limitations like flexibility, scalability and criticality faced by public and private clouds .In hybrid cloud, we can structure our

applications as per the requirement of issues depending on their criticality of standards. Critical applications are mainly confined to the private cloud while allowing non-critical applications into the public cloud.



III. SERVICE MODELS OF CLOUD COMPUTING

Cloud service models offer financial organization the method to move from a capital-intensive way to a more malleable business model that minimize operational wage. The key to achieve maximum utilization of existing resources is in choosing the right cloud services model to meet business goals. There are four basic kinds of cloud service models. Each share similarities but have their own distinct differences as well.

Business Process-as-a-Service (BPaaS) - This service model is used for standard business processes such as billing, payroll, or human resources. BPaaS integrates all the other service models with process expertise. Few examples of BPaaS are ADP Employease an online business process service for human resources and AMEX Concur another online business process that connects travel suppliers and mobile solutions all around the world.

Software-as-a-Service (SaaS) - In this service model a cloud service provider manages the business software and related data, and end users access the software and data via their web browser. Types of software that can be delivered this way include accounting, customer relationship management, enterprise resource planning, invoicing, human resource management, content management, and service desk management. Organizations that use cloud based technologies release their applications on a hosting environment, which can be accessed through networks from various clients (e.g. web browser, PDA, etc.) by application users. These organizations do not have control over the Cloud infrastructure that often employs multi-tenancy system architecture. Examples of SaaS include SalesForce.com, Google Mail and Google Docs.

Platform-as-a-Service (PaaS) - A cloud service provider offers a complete platform for application, interface, and database development, storage, and testing. This feature help businesses to streamline the development, maintenance and support of custom applications, lowering IT costs and minimizing the need for hardware, software, and hosting environments. PaaS offers a development platform that hosts both completed and in-progress cloud applications. This requires PaaS, to support application hosting environment, to possess development infrastructure including programming environment, tools, configuration management, and so forth. Examples of PaaS are Microsoft Azure and Google App Engine.

Infrastructure-as-a-Service (IaaS) - This service model provided an alternative solution for businesses to buy resources as a fully outsourced service than purchasing servers, software, data center space or network equipment's. Cloud based organization's directly use IT infrastructures (processing, storage, networks, and other fundamental computing resources) provided in the IaaS cloud. Virtualization is vastly used in IaaS cloud in order to integrate/decompose physical resources in an ad-hoc manner to meet increasing or shrinking resource demand from cloud consumers. Examples of IaaS are NYSE Euro next CMCP.

ADVANTAGES OF CLOUD COMPUTING IN BANKING AND FINANCIAL SERVICES

A financial services firm that heavily relies on IT enabled services can benefit from cloud computing. Perceived cost savings, ease of scaling-in and scaling-out, faster time-to market for deploying systems, virtualization of enterprise wide data as a service, enterprise technology standardization, and the ability to access data and applications on the move are all critical consideration factors that can drive financial services firms to adopt cloud computing. **Customer Satisfaction** - The overarching and most disruptive impact of financial cloud computing will be, its impact on the relationship of banks and their service providers. Cloud computing will make these services more convenient, more accessible, easier to use, and more personalized to the individual's needs and their lifestyle. This is both a threat and an opportunity as it remains to be seen whether it is banks that lead this change or, increasingly, non-banking entrants. With the help rich resources of private cloud, commercial banks can equip customers with client devices **Investment In Cloud-Based Innovation**- Cloud computing can play a vital role in a bank's efforts to reinvent its business and operating models. A cloud computing platform automatically assembles, connects, configures and reconfigures virtualized technology resources to meet business goals. It eliminates constraints like the location of physical IT resources or what specific technologies are employed, which makes it possible to deploy business services rapidly and at a lower cost. Banking

innovation in emerging markets is being accelerated by faster economic growth and distinctive social needs. For banks, today's volatile business realities and expanding financial markets infers tremendous growth potential in near future.

ATM's in the Cloud - Banks are seeking to grow rapidly in emerging markets and reach unbanked customers, the time and cost of setting up distribution represent major hurdles. Opening a branch or installing a new ATM is expensive and can take several weeks. So third-parties could offer cloud based services that support rapid growth in a bank's distribution network and infrastructure.

IV. TECHNOLOGIES IN BANKING SECTOR

The Cloud computing technologies adoption continues to gain momentum across a wide range of banking services . Aside from all the positive spin around cloud computing technologies, a reliable, trusted, standard model of cloud computing that will enable faster rates and higher levels of adoption is still a long way off, with relatively limited progress being made in that regard in the past year . When a bank moves into cloud computing, there are two prime challenges that must be addressed

Security- The confidentiality and security of financial and personal data and mission-critical applications is paramount. Banks cannot afford the risk of a security breach. The confidentiality and security of commercial and personal data and mission-critical applications is preeminent [8]. With the special requirements of financial service industry, it becomes the major challenge to keep financial data secure, including data leakage, illegal use, loss and authentication. Since financial information is directly related to the economic benefits of many groups and individuals, the importance of information security is self-evident. Currently, the cloud industry lacks comprehensive guidance on security measures relating to personal and financial data. In addition, it is often difficult for potential customers to ascertain whether a cloud vendor meets the current IT security requirements set by regulators in their country (or countries) of operation. These security requirements may include specifications on data transmission, authentication, integrity, availability, location (including security of location), recoverability, consumer privacy and confidentiality. Ultimately, for cloud computing to gain full acceptance within the banking services sector, cloud services must be harmlessly integrated into existing security platforms and processes

Data Segregation and Privileged User Access: There dwell sensitive data that is processed outside the organization inherent risk of security of data because outsourced services bypass the physical and logical IT controls. As cloud is typically in a shared environment in that data can be shared. So there is the danger for data loss. Is encryption available at all phases, and were these encryption patterns designed and tested by experienced professionals.

Long-Term Viability and Recovery: It is very essential to recover the data when some problem occurs and creates failure. so the main question arises here is that can cloud provider restore data completely or not ,this issue can cause a stalemate in security. Ideally, cloud computing provider will never go broke or get acquired by a larger company with maybe new policies. But clients must be sure their data will remain available even after such as event.

V. CONCLUSION AND FUTURE ADVANCEMENTS

Cloud Computing is a promising paradigm for delivering computing utilities as services. Just as personal computers and servers shook up the world of mainframes and minicomputers or as smart phones and tablets revolutionized the mobile commerce industry, cloud computing is bringing similar far reaching changes to the licensing and provisioning of infrastructure and to methodologies for application development, deployment and delivery. Continued growth of cloud computing within the financial services industry will require vendors and firms to overcomes its challenges together.