An e-Business Cloud Integration by an Effective Software Engineering Process Model and Cloud Computing Security Issues

Veera RaghavaRao Atukuri[1], Dr. R.Siva Rama Prasad[2]

[1]*Dept.of.Computer Science and Engineering*
Malineni Lakshmaiah Women's Engg. College
Guntur, AndhraPradesh, India
mrveera.atukuri@gmail.com

[2]*International Business Management*
Acharya Nagarjuna Univeristy
Nagarjuna Nagar, Guntur
AndhraPradesh , India
raminenisivaram@yahoo.co.in

Abstract – Main objective of this paper is to discuss how to utilize the Cloud Computing (CC) Technology and its applications for mapping (or) integration of small and large e-Business applications in to a single cloud. By doing this mapping of all categories of applications the e-Business activities will comes under a single roof, that which occupies a single space in a cloud i.e., the cloud will acts as a service in terms of a software or application (SaaS).This service will help for speed delivery and which drive down the management costs. By doing this mapping, all e-Business applications in to a cloud and it needs security from unauthorized users and that security has provided by cloud security models i.e., Security as a Service. Doing this it becomes more flexible and scalable to the users and which it will reduces the cost as well as less impact on systems.
This Paper provides the work related to the mapping and providing security to e-Business Cloud (e-Busi-Cloud).

Keywords – Cloud Computing, Saas, e-Business, Security as a Service, e-Busi-Cloud.

INTRODUCTION

Electronic business commonly referred to as "**e-business**", or an internet business, may be defined as the application of information and communication technologies (ICT) in support of all the activities of business. Commerce constitutes the exchange of products and services between businesses, groups and individuals and can be seen as one of the essential activities of any business. Electronic commerce focuses on the use of ICT to enable the external activities and relationships of the business with individuals, groups and other businesses. The term "e-business" was coined by IBM's marketing and Internet teams in 1996. Electronic business methods enable companies to link their internal and external data processing systems more efficiently and flexibly, to work more closely with suppliers and partners, and to better satisfy the needs and expectations of their customers.

Often, e-commerce involves the application of knowledge management systems. E-business involves business processes spanning the entire value chain: electronic purchasing and supply chain management, processing orders electronically, handling customer service, and cooperating with business partners. Special technical standards for e-business facilitate the exchange of data between companies. E-business software solutions allow the integration of intra and inter firm business processes. E-business can be conducted using the Web, the Internet, intranets, extranets, or some combination of these.

OBJECTIVE OF e-BUSINESS

The main objective of E-Business is:
The e-business services have been introduced to search for business partners and explore more opportunities. It is used to fetch potential customers, retain present customers and even locate old customers. Entrepreneurs build business relationships with the partners through the means of Internet. A marketer can invite the clients to enter into mergers and acquisitions or contracts to expand the business. A marketer should build an online presence in order to initiate and establish the online business. This is possible by building a website for the company. You should optimize the content in the site so that it becomes easily accessible to the search engines.

For this purpose, keyword rich content should be used. The presentation of the company website always reflects the image of the company. Therefore, the presentation of the website should not only be search engine friendly but also attractively presented. This is done to allure the customers and potential business partners towards your organization. The website should become accessible to the customers and the presentation should be visually emphatic. The wide use of Internet has given a boost to the growing trend of online shopping. A marketer can exhibit lucrative offers and his products and services on his website. Make the payment and purchasing procedure easy on the Internet. You can also provide contact details such as phone number or contact details of the call centre of the company.
These details are useful to serve the customers at the time when they encounter any difficulty of payment. The presentation of your products should appeal to the customers at a glance. For this purpose, you should study

your target customers thoroughly. E-business solutions establishes your online presence which enables you to boost the sales and revenue.
Other objectives like:

- Improve Service
- Save Time
- Reduce Processor Errors
- Reduce the cost of core service provision
- Improve morale

ARCHITECTURE of e-BUSINESS

To achieve true, real-time e-Commerce, next-generation e-Business systems must be built around a 3-tier application paradigm with a clear abstraction and true separation of user interface presentation, business logic, and content. Separation and abstraction of these layers is achieved through the use of business objects, particularly in the middle layer.

When separating presentation, application, and Data Logic three things must be considered:

- **User Interface** - The user interface must support a variety of interface mechanisms, including Web browsers for users, business managers, designers and desktop applications for developers.
- **Business Logic** - The middle tier must not only implement and execute business logic, it must also provide the framework of services that enable e-Business, including security services, transaction services, and caching, pooling, and other load balancing services to improve overall system performance.
- **Content** - The content layer includes corporate databases, document stores and other knowledge repositories.
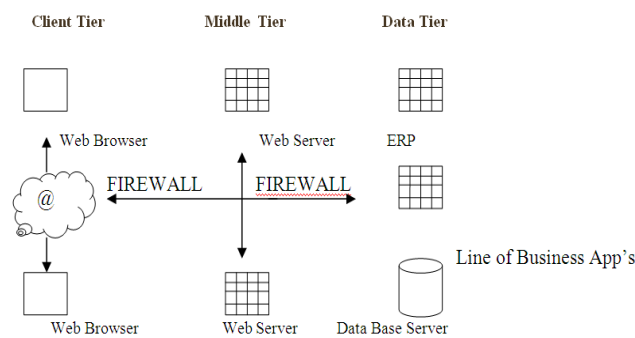-

Fig: 1   3- Tier Architecture of e-Business

This 3-tier architecture is inherently more scalable, more flexible, and more accurate than first-generation architectures, which simply bolt a Web browser interface onto existing client/server business applications. The separate presentation and business logic layers enable real-time communication. Execution of business logic can be divided between the client and the more powerful server platform to enhance performance. Business logic in the middle layer can be changed in one place to affect many applications, and data integrity is preserved because applications cannot access databases directly.

CLOUD COMPUTING TECHNOLOGY

Cloud computing encompasses a whole range of services and can be hosted in a variety of manners, depending on the nature of the service involved and the data/security needs of the contracting organization .Cloud computing is fast creating a revolution in the way information technology is used and procured by organizations and by individuals. According to the IEEE Computer Society Cloud Computing is:"*A paradigm in which information is permanently stored in servers on the Internet and cached temporarily on clients that include desktops, entertainment centers, table computers, notebooks, wall computers, handhelds, etc*."Cloud computing is the collection of scalable, virtualized resources, which is capable of hosting application and providing required services to the users and can charge as per the uses like utility. The basic model of cloud computing is shown in fig 1.

The main goal of cloud computing is to provide ICT services with shared infrastructure and the collection of many systems. In cloud computing every facility is provided in terms of service. It provides infrastructure as a service, software as a service, platform as a service, network as a service, and data storage as a service. The main philosophy of cloud computing is to provide every required things as a service. In order to be clearer, the services in the cloud can be thought in layer architecture where various resources are available in different layers.
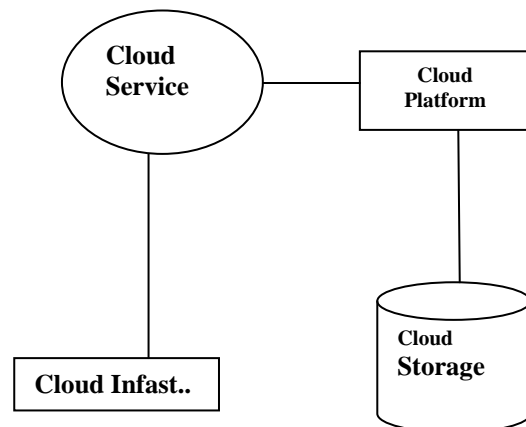
Fig: 2 Basic Model of Cloud Computing

For individuals, cloud computing means accessing web-based email, photo sharing and productivity software, much of it for free. For organizations, shifting to the cloud means having the ability to contract for computing services on-demand, rather than having to invest to host all the necessary hardware, software and support personnel necessary to provide a given level of services. And for governments, the value proposition of the cloud is especially appealing, given both changing demands for IT and challenging economic conditions. According to the concept of cloud computing, instead of purchasing hardware or software, a user purchases remote access to them via the Internet. There are three levels of cloud computing as shown in fig 2:

- Infrastructure as a Service – IaaS
- Platform as a Service – PaaS
- Software as a Service – SaaS
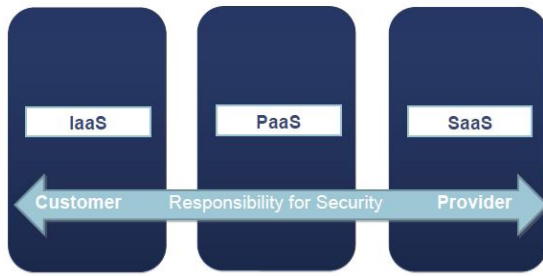
INFRASTRUCTURE AS A SERVICE (IaaS)

It consists in delivering computer infrastructure as a service. The infrastructure can include servers, storage space, network equipment and system software like operating systems and database systems. The infrastructure is provided in the form of virtual environment. The applications are accessible from various client devices through a thin client interface such as a web browser from the client's point of view it looks and operates exactly like standard infrastructure, while in fact it is one of many virtual environments hosted simultaneously on the same physical infrastructure resources.

PLATFORM AS A SERVICE (PaaS)

It consists in delivering application development environment. It supports the full life cycle of designing, implementing, testing, and deploying web applications and services. Developers, project managers, and testers are not required to download or install any development software on their local computers. The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages and tools supported by the provider.

SOFTWARE AS A SERVICE (SaaS)

It consists in delivering complete applications such as customer relationship management or enterprise resource planning over the Internet. A client purchases an access to these applications instead of purchasing licenses and exploiting them locally. The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications.

SIX STEP STRATEGY FOR COLLECTING DATA
❖ **PERUSE**

The Cloud Migration Strategy begins with learning about the basics of cloud computing. Cloud computing is the thrust area in computing technology, it will be important for technology transfer to occur the techies in and outside of government will need to go the extra mile to educate and inform the nontechie policymakers (agency executives, staffers, and lawmakers) as to the merits and value of cloud computing. It will be especially important to devote sufficient funding for research to establish how cloud computing is working - or not– in various areas and at all levels of government, so as to ground policy and practices in regard to governmental use of cloud computing.

❖ **ASSESSMENT**

In the second step the IT officers or Government officials should conduct an assessment of their present IT needs,

structure, and capacity utilization. In a cloud computing environment, and study the requirement of addition or reduction of the resources can be added—or subtracted—based on needs and demand
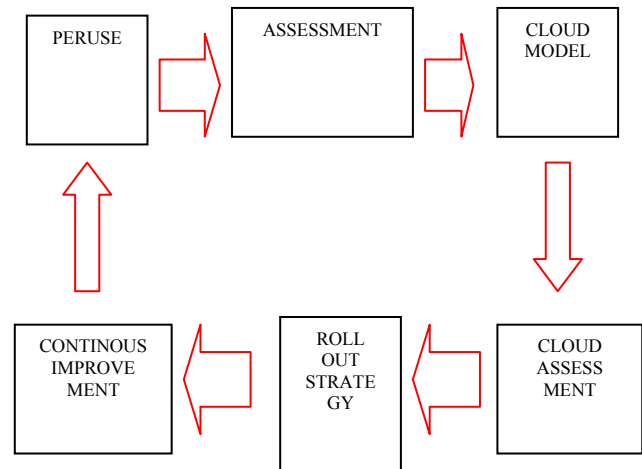
Fig: 4 Six Step Cloud Strategy

❖ **CLOUD MODEL**

In the Third step the IT professionals will develop the prototype for cloud computing based on the requirement for the particular project.

❖ **CLOUD ASSESSMENT**

After the internal assessment and external assessment of the prototype outreach stemming from the pilot effort, IT Professions should then conduct an overall IT cloud assessment to determine if their organization has data and applications that could readily move to a cloud environment, and which type of cloud public/private/hybrid cloud would be suitable or usable for these projects. As this assessment progresses, IT decision makers must focus on establishing decision rules as to which data and applications can – and cannot - be housed in any form of cloud environment. In doing so, they will discover a definite field of ―"cloud-eligible" and ―"cloud-ineligible" data and applications.

❖ **ROLLOUT STRATEGY**

At this stage, it is time to begin rolling-out your cloud computing strategy - gaining buy-in from both organizational leadership and IT staffers, and communicating with both internal and external stakeholders as to the goals, progress, and costs/benefits of each cloud project. This is where the cloud goes from being a test effort to become more mainstream in the way the agency manages its data, its operations, and its people. It becomes part of ―"normal" organizational operations, just as other prior tech innovations (from telephony to fax to the Internet to e-mail and to social media) have become IT tools used in support of the agency's IT strategy, and more importantly, its overall strategy.

❖ **CONTINOUS IMPROVEMENT**

This is the last step and we call it "continuous improvement" tills we get the fully functional cloud computing based system with live data

PROPOSED MODEL FOR MAPPING E-BUSINESS APPLICATIONS IN TO A CLOUD

Today organizations face challenges of complex technologies and changing business environments. Analyzing the complexities of the IT environment we extend our enterprise application integration expertise to ensure that the technology is in line with your business objectives regardless the size and nature of organization. Whether your applications live solely in the cloud or work across physical, virtual, and cloud infrastructures, they need the same visibility, management, and control as the applications in your physical data centers. Otherwise, risk delays, errors, and inaccuracies—problems that can drive operating costs up and service levels down.

With this broad support, we'll be able to automate our business and IT processes wherever they reside. And with the visibility, management, and control we'll gain across all our IT operations—physical, virtual, and cloud—will be better able to hold down operating costs while ensuring high levels of service. For this automation and integration we can use an approach for deploying all the e-business applications and enterprise resource planning (ERP) in to one.

Cloud Deployment Models
➢   Public Cloud
➢   Community Cloud
➢   Hybrid Cloud
➢   Private Cloud
➢   Private Cloud Rental

PUBLIC CLOUD
Applications, storage, and other resources are made available to the general public by a service provider. Public cloud services may be free or offered on a pay-per-usage model. There are limited service providers like Microsoft, Google etc owns all Infrastructures at their Data Center and the access will be through Internet mode only. No direct connectivity proposed in Public Cloud Architecture.

COMMUNITY CLOUD
Community cloud shares infrastructure between several organizations from a specific community with common concerns (security, compliance, jurisdiction, etc.), whether managed internally or by a third-party and hosted internally or externally. The costs are spread over fewer users than a public cloud (but more than a private cloud), so only some of the cost savings potential of cloud computing are realized.

HYBRID CLOUD
Hybrid cloud is a composition of two or more clouds (private, community or public) that remain unique entities but are bound together, offering the benefits of multiple deployment models.

PRIVATE CLOUD
Private cloud is infrastructure operated solely for a single organization, whether managed internally or by a third-party and hosted internally or externally. They have attracted criticism because users "still have to buy, build, and manage them" and thus do not benefit from less hands-on management, essentially "the economic model that makes cloud computing such an intriguing concept".

PRIVATE CLOUD RENTAL
Private Cloud Rentals are a cost effective option to consider when security is a concern. Companies might consider the Hybrid Cloud model when replacing obsolete data center equipment. When moving critically important company private data off site to a Public Cloud is not an option, renting a modular data center can be considered. Using Virtual Machine concepts, the running applications can be moved from the existing data center to the leased equipment without any disruption to customers. The obsolete data center equipment can be removed and replaced with new hardware and then the applications can be moved from the leased equipment onto the new hardware. The leased equipment can then be returned. Optional, the equipment can be kept on site as a backup or powered down when it is not needed, then powered up and used when demand increases.

PUBLIC CLOUD MODEL FOR MAPPING OF E-BUSINESS APPLICATIONS

The Deployment of Pubic Cloud gives, the applications, storage and other resources are made available to the general public by a service provider. It offers both free and pay-per-usage through Internet mode only.
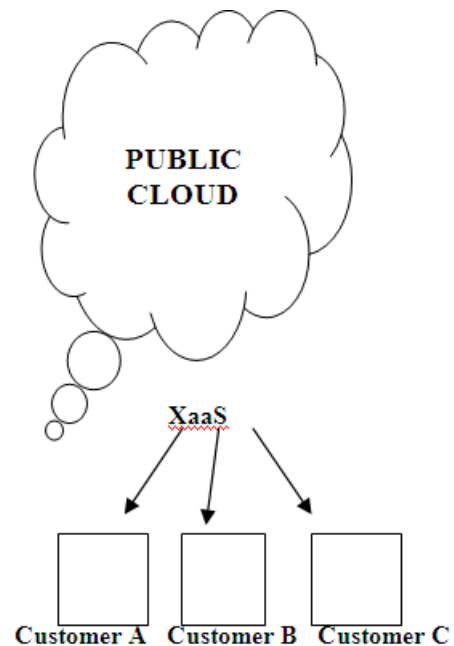
Fig: 3 Public Cloud Model

The above figure explains the cloud that maps all the applications of e-business and enterprise resource planning systems that which provides the services to the customers with flexible and cost effective methods. XaaS is a technology of providing Secure Cloud Computing simply and affordably. XaaS has leveraged cutting edge security and performance to provide complete Cloud based infrastructure platforms designed to meet the needs of the most demanding applications. The most demanding applications are showed in the following figure:

Fig: 4 Demanding Applications in Public Cloud (e-Busi-Cloud)

Once this mapping is to be done then the accessing of every e-Business application accessing will becomes more flexible and gets reduction of cost.

ADVANTAGES OF e-BUSI CLOUD MAPPING

By doing the data integration in to a cloud the following are the advantages:

➢ Flexibility
➢ Scalability
➢ Low total cost of ownership and accountability
➢ Deploying the speed of Business
➢ Minimizing the impact of system changes and new user requirements
➢ Reduces project risk.

SECURITY ISSUES IN CLOUD COMPUTING

Cloud security concerns can be grouped into any number of dimensions; these dimensions have been aggregated into three general areas: Security and Privacy, Compliance, and Legal Issues.
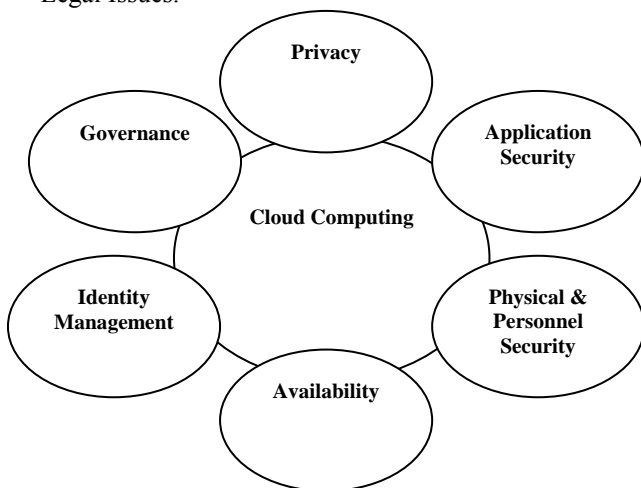
Identity Management

Every enterprise will have its own identity management system to control access to information and computing resources. Cloud providers either integrate the customer's identity management system into their own infrastructure, using SSO (Single Sign On / Off) technology, or provide an identity management solution of their own.

Physical and Personnel Security

Providers ensure that physical machines are adequately secure and that access to these machines as well as all relevant customer data is not only restricted but that access is documented.

Availability

Cloud providers assure customers that they will have regular and predictable access to their data and applications.

Application Security

Cloud providers ensure that applications available as a service via the cloud are secure by implementing testing and acceptance procedures for outsourced or packaged application code. It also requires application security measures be in place in the production environment.

Privacy

Finally, providers ensure that all critical data (credit card numbers, for example) are masked and that only authorized users have access to data in its entirety. Moreover, digital identities and credentials must be protected as should any data that the provider collects or produces about customer activity in the cloud.

CONCLUSION

Cloud Computing is an emerging technology in today's real world. Today every technical aspect will becomes more simple and flexible. To make this more usable to the users our approach will help them and provide a convenient environment for using the applications effectively as (Google providing the application software's in their respective sites like gmail, ect.,) and in minimum cost for the management. Security Issues also plays a vital role in every aspect of the every technology. So, providing security to the cloud is also an important thing in the computing because when integration of all applications at a side the functionality should be an effective note.

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