

CLOUD COMPUTING AND SECURITY: THE SECURITY MECHANISM AND PILLARS OF ERPS ON CLOUD TECHNOLOGY

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Abstract

Cloud computing is one of the latest technologies that has been employed by many organizations. The technology presents the cheaper means of data management through a secure cloud system. The majority of organizations have opted for cloud computing technology since it is a reliable means of managing organizational information. However, many critics have complained about the security feature of the cloud systems since third-party companies handle them. Research shows that the sophisticated technology provided by cloud has shown some vulnerabilities hence not trustworthy. Research indicates that many organizations fail to report the cybercrimes associated with cloud system due to reputation damage and embarrassments associated. This paper will address the cloud computing security, taking the case study of ERP systems on the use of secure cloud systems.

Keywords: *Cloud computing, security, ERP, Server, data privacy, cryptographic, VMware*

Cloud computing is a technology that involves hosting applications, information, and other organization services on the servers and accessing the software via the internet connection. Under this technology, the organizations can pay for the services they require to a company hosting for them. To access the resource and computing power from cloud space, services must be paid for depending on the usage pattern (Al-Mashari & Zairi, 2000). The institutions are the rule of the game that is; they include primary constraints like laws, and practice, relaxed restrictions like conventions and behaviors are controlled. This research will seek to discuss the issues related to the application of ERP's security and privacy at the cloud systems. Secondly, it will consider if there are any security mechanisms and pillars that can be established to facilitate trustworthiness and confidentiality of data stored on the cloud servers.

Cloud computing is one of the latest technologies that are likely to drive many organizations to greater heights. The concept of cloud computing has been widely accepted by regular internet users. However, some severe organizations have a great concern over the security features of these systems.

Companies are moving to the implementation of cloud technologies to perform critical functions at least cost. At the same time, these companies are faced with a challenge on how to protect the data and all users' information stored on the cloud systems. Security, confidentiality, and privacy are the first concerns when it comes to cloud servers, as compared to the cost of operation (Al-Mashari & Zairi, 2000). For companies, lack of technologies and resources to manage third-party security in the cloud servers can result in low costs safety. Cloud computing users consequently are facing various security related risks.

The cloud systems have both technical and institutional challenges. The legal regimes relating to cloud safety management are developing slowly as compared

to the rate of technology expansion. The safety issues like privacy, information ownership, and privacy currently are not covered adequately in the current legal systems. Some researchers are arguing that the organization is supposed to be legally responsible for customer's data rather than the third-party company (Al-Mashari & Zairi, 2000). Another issue raised is the lack of respect on how some third-party companies handle client's information. Criticisms also are facing cloud providers because they do not investigate their clients, who are the organizations whether they have secure systems before processing their data.

Businesses and many other clients have expressed their concern on the issue of data security. They have become more cautious about the use of cloud services to store their highly valued and sensitive data. Due to weak security strategies implemented, cloud systems remain the riskiest approach to manage information (Al-Mashari & Zairi, 2000). According to the report done by the International Data Corporation in 2008, safety was the most significant obstacle to the embracing of cloud computing technology. Additionally, the organizations are worried about any hidden charges associated with the lawsuits and security breaches of data privacy.

General Analysis and Problem of Statement

Security issue with cloud computing technology is the new puzzle for many organizations today. The whole idea of implementing cloud services is to reduce the cost involved in managing all resources and software at the organization level. With the virtualized environment, the user can access information from any location and at any time of the day (Al-Mashari & Zairi, 2000). These services are known as Software as a Service (SaaS). Enterprise resource planning is a type of software that unites all the operations of the organization through a single interface. It changes all the organizational processes while managing all data effectively.

Probabilities of a fruitful execution of an ERP in an association are less. Likewise, it takes a generous measure of labor, cost, and exertion to convey and keep up the ERP. A whole ERP application being re-appropriated is a moderately new thought and has been under dialog much of the time for its points of interest and some inert disservices (ECONOMIST, 2009). In today's world with such monetary circumstances, it suits authoritative for an association to lessen its working expenses while expanding mostly productivity with a similar measure of assets and to satisfy client's requests (Al-Mashari & Zairi, 2000). This is the dwelling a cloud and anchored based ERP can indeed encourage a company, nevertheless some remarkably relevant inconveniences that must be defeated to make this a more feasible choice to a "best of breed" or an off-the-shelf ERP arrangement, complete.

The barriers to the implementation of cloud computing technology depends on the data of the organization. If the organization is handling substantial data sets, it will be useful to manage it through the cloud service. However, many other situation can call for the use of cloud technology. These factors can be the saving of operation costs, fault tolerance, on-demand service, data flexibility, and

compliance data formats, on-demand service and information reliance (ECONOMIST. (2009). There are four diverse types of cloud services that an organization can opt to use dependent on the company requirements. The four categories include public cloud, accessed by any subscriber, secondly is the private cloud, obtained by a specific controlled group, the third one is the community cloud, which is shared among the organizations members and the last one, is the hybrid cloud, which is any combination of the above types (Al-Mashari & Zairi, 2000).

Objectives of the Study

The general objectives and specific objectives are addressed in this study. The general aim is to illustrate and identify various cons and pros that will result in an organization that utilized cloud computing or a cloud-based ERP system and the possible security risks associated. The objectives of this study are: to investigate the current cloud systems framework; to analyze if the cloud systems are associated with any security vulnerability; and to evaluate any possible disadvantages of adopting cloud computing technologies in an organization.

Literature Review

ERP systems are the current software used in many businesses for storage of information and computing purposes. An ERP system manages and integrates all business processes into one entity to facilitate activities of the company through a simple software. Most organizations view the ERP-integrated system as a means of standardizing the organizational operations and provides seamless access to information in the business. ERPs stores and manages information at an appropriate format while stretching past business boundaries (ECONOMIST, 2009). Since this system touches all parts of the organization, it is a critical tool to facilitate organizational performance.

One key challenge with the adoption of ERP is the flexibility of the business to welcome the new integrations into data processing systems. The flexibility involved denotes to the degree to which the ERP software can be configured to meet the requirements of the business. In other words, some managers find the ERP system difficult to use when integrating projects (ECONOMIST, 2009). The online delivery has been a long-term dream for software salespersons and suppliers. There are several areas for future research about ERP systems and the cloud computing technologies. Instead of licensing software like the ERP system, it is cheap and convenient to adopt the system form the cloud service provider who created the software.

A cloud is a type of disseminated computer system with a gathering of interconnected virtual computers. These computers are unified through a single server to allocate resources upon request. Most of the applications developed on cloud systems are determined by the services demanded by the physical location provider. The benefits of cloud-based systems are that they offer flexibility, reliability, agility, and interoperability. Cloud computing presents easy scalability and flexibility of resources and dismantling of funds and clients require during

the peak workloads (ISACA, 2009). The use of cloud system offers a pay-per-use basis with a fixed cost and reduced risk.

Cloud-based ERP systems have a slighter time measure for configuring and deploying the software. The effects the agility of the system and the business and reduces the costs involved with time delays (ECONOMIST, 2009). This system allows the organization to benefit from a competitive edge. Through this system, organizational data is accessed globally from any location; this also facilitates virtual working.

Besides the aspect of data security, the adoption of cloud systems has some regulations and legal procedures. When moving submissions to the cloud, the organization can opt to trace the resources anywhere on the planet concerning the laws applicable (Kim, 2009). For instance, some cryptographic strategies may not be applied in some other countries due to restrictions present (ISACA, 2009). Cloud services have decreased the expense of substance stockpiling and conveyance. However, they can be hard to use for non-designers, as each administration is best used using remarkable web benefits, and have their very own one of kind idiosyncrasies (Kim, 2009). A client could likewise get frightful amazement on the off chance that they have not comprehended what they will be charged for (Kim, 2009). Merchant secure is another issue that an association may need to confront if they need to relocate towards another specialist organization.

Research Methodologies and Theoretical Frameworks

This research was focused on finding a solution to the problem of cloud-based ERP systems. Formulating a research topic is very significant in any study. To evaluate the pros and cons of ERP systems, which are cloud-based, and its security impact, the background of the topic was first assessed.

Qualitative research contributed to the investigation of how cloud-based systems are vulnerable to security issues. Qualitative approaches are based on the non-numerical data by providing means of behavior assessment in quantitative data (Bryman & Bell, 2003). It seeks to evaluate a concept and the meaning of a phenomenon. Personal methods depends on the conviction that the people are on-screen characters who play a functioning job in reacting to circumstances and the acknowledgment that the reaction depends on the specific importance (ECONOMIST, 2009). The comprehension of this importance is characterized and reclassified through cooperation, with affectability to situations and the connection between health, activity and the result (Bryman & Bell, 2003). Subjective examination considers better contrasts to be uncovered which will enable the analyst to explore his case thoroughly. As indicated by research, the attributes of this methodology as empowering the scientist to examine marvels in their standard settings, while endeavoring to decipher these wonders as far as the implications individuals convey to them.

Cloud's Newness and Unique Vulnerabilities

The cloud's new uniqueness and newness in the organizations come with particular problems. With more popularity on this technology, new bugs,

security issues and vulnerability with virtual technologies are experienced. Cloud systems, however, are not familiar with many IT security companies. Lack of strategies to offer security at the cloud (ISACA, 2009). Experts are arguing that such vulnerabilities can provide a dangerous effect to the company implementing the technology (Boykin, 2001). The cloud can be challenging forensically in case there is the data breach. For instance, some public cloud systems can store information differently depending on the regulations regarding data privacy, data loss and privacy issues. Some companies may opt to encrypt data before storing it on the cloud.

	SaaS CONSUME	PaaS BUILD	IaaS HOST
Consumer	End User	Application Owner	Application Owner
Type of Service Provided	Completed Application	- RunTime Scenario - Cloud Storage - Integration, etc	- Cloud Storage - Virtual Server
Coverage at service level	- Application Uptime - Application Performance	- Environment Availability - Environment Performance - No Application Coverage	- Virtual Server Availability - Time to Provision - No platform or application coverage
Examples of Services Provided	- CRM - e-mails - Collaboratives - ERP	- Application Development - Decision Support - Web - Streaming	- Caching - Security - Legacy System Management

Cloud computing Layers according to Gartner, 2009.

Results of the Study

Cloud computing is the latest technology that has proved to be the best for many organizations. Some of the popular cloud service providers include Google, Amazon, Microsoft, IBM, and VMware in conjunction with other third-party companies (Boykin, 2001). The interpretation of the results from this research was based on third-party auditors, technology awareness, virtual network providers, cloud-based systems and access controls to the cloud information (Boykin, 2001). To secure the data stored on the cloud-based ERPs, the organization should look for means of encrypting information when retrieving it from the cloud systems. Secondly, there should be legal strategies governing third-party organizations that offer cloud services.

The model introduced in this paper likewise has suggestions for administration practice and open arrangement. Most cloud providers' administrations accompany no affirmation or guarantee of a given level of security and protection (Dubey & Wagle, 2007). Cloud suppliers need strategies and practices identified with protection and security. Nor is that their separate issue. Cloud suppliers have likewise exhibited a propensity to lessen their obligation by proposing contracts with the administration gave "as seems to be" with no guarantee (Boykin, 2001). View of inadequacy or resistance of cloud suppliers may consequently go about as a detour to organizations' cloud reception choices. In such manner, the above examination demonstrates that security and protection estimates intended to decrease apparent hazard and straight forwardness and clear correspondence procedures would make an upper hand for cloud suppliers (Boykin, 2001).

The novelty and uniqueness of the cloud frequently imply that customers would not comprehend what to request in speculation choices. A comprehension of model would likewise enable associations to take mechanical, conduct and perceptual/attitudinal measures (Al-Mashari & Zairi, 2000). The clients of the cloud are working on the supposition that cloud suppliers consider protection and security issues important. Nevertheless, against the background of the institutional settings, this likely could be an advantage however perhaps false suspicion.

Conclusion

Cloud computing is one of the modern technology that is useful in many organizations. Cloud computing works on the basis that it provides information in a quick and accessible means within the shortest time possible and from any geographical location. However, the issue of security and data privacy at the cloud-based ERP systems have posed a challenge to many organizations when it comes to adopting this technology. Distributed computing is a multi-occupant advantage partaking stage, which allows varied specialist governments to convey software design as administrations and convey equipment as administrations in a practical way. Anyway, alongside these points of interest, putting away a lot of information including fundamental data on the cloud propels profoundly gifted programmers, hence making a major imperative to business information proprietors (Boykin, 2001). Consequently, there is a requirement for the security columns and secretly instrument to be considered and actualized as one of the best arrangement of the urgent issues. Additionally, it should be recognizing Cloud Computing innovation with the goal that Legitimate and also ill-conceived associations and substances can be guaranteed to do not accessing information on the cloud through illicit, unprecedented, and semi lawful means (Boykin, 2001). The fears to implement cloud-based ERP systems can be eradicated with the implementation of an authentication pillar to provide secure online services.

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