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Security Issue Analysis in Cloud Computing Environment

Vijay.G.R *, Dr.A.Rama Mohan Reddy**
*(PhD scholar Department of Computer Science & Engg, JNTUA, Anantapur, A.P, India)
** (Professor, Dept. of CSE, SVU College of Engineering, Tirupati, A.P, India)

ABSTRACT

The growth in field of cloud computing increases threat security aspects. Security has remained a constant issue for Internet and networking, when we are talking about security cloud really effects. Lack of security is the only a problem or difficulty that must be overcome in wide adoption of cloud computing. Cloud computing is surrounded by many security issues like securing data, and examining the utilization of cloud by the cloud computing vendors. Cloud computing has brought lots of security challenges for the consumers and service providers. Our work mainly provides the basic idea on Cloud Computing with the Security Issue mainly faced in both larger and smaller scale organizations where Cloud Computing is implemented and necessary steps which can solve these problems to certain extent.

This will enable researchers and security professionals to know about users and vendors concerns and critical analysis about the different research type proposed.

Keywords :Cloud Computing, Security Issues

I. INTRODUCTION

As more facets of work and personal life move online and the Internet becomes a platform for virtual human society, a new paradigm of large-scale distributed computing has emerged. Web-based companies, such as Google and Amazon, have built web infrastructure to deal with the internet-scale data storage and computation. If we consider such infrastructure as a "virtual computer", it demonstrates a possibility of new computing model, i.e., centralize the data and computation on the "super computer" with unprecedented storage and computing capability, which can be viewed as a simplest form of cloud computing . Cloud Computing is a new term for a long-held dream of computing as a utility , which has recently emerged as a commercial reality. Cloud computing is a model for enabling on-demand network access in order to share computing resources such as network bandwidth, storage, applications, etc that is able to be rapidly scalable with minimal service provider management .

The Cloud Computing model has three service delivery models and main three deployment models are: (1) Private cloud: a cloud platform is dedicated for specific organization, (2) Public cloud available to public users to register and use the available infrastructure, and (3) Hybrid cloud: a private cloud that can extend to use resources in public clouds. Public cloud most vulnerable deployment model because for public users to host their services who may be malicious users.

In providing a secure Cloud computing solution, a major decision is to decide on the type of cloud to be implemented. Currently there are three types of cloud deployment models offered, namely, a public, private and hybrid cloud.

Public Cloud: A public cloud is a model which allows users' access to the cloud via interfaces using mainstream web browsers. It's typically based on a pay-per-use model, similar to a prepaid electricity metering system which is flexible enough to cater for spikes in demand for cloud optimization.

Private Cloud: A private cloud is set up within an organization's internal enterprise datacenter. It is easier to align with security, compliance, and regulatory requirements, and provides more enterprise control over deployment and use.

Hybrid Cloud: A hybrid cloud is a private cloud linked to one or more external cloud services, centrally managed, provisioned as a single unit, and circumscribed by a secure network. It provides virtual IT solutions through a mix of both public and private clouds.

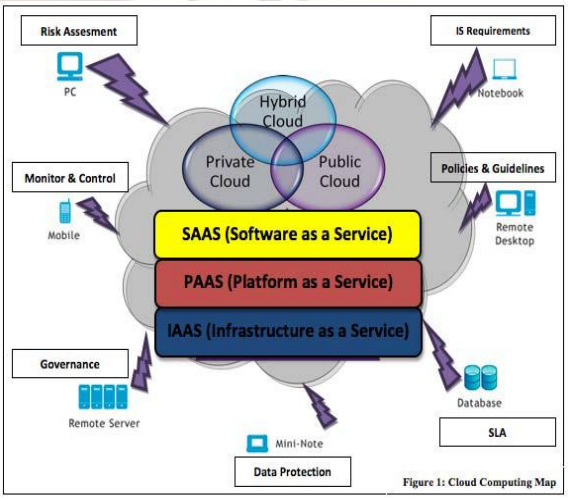

Fig 1: Cloud Computing Map

Hybrid Clouds provide more secure control of the data and applications and allows various parties to access information over the Internet. Figure1 explains about different cloud models and services also, there are 5 major technical characteristics of cloud computing: (i) large scale computing resources (ii) high scalability & elastic (iii) shared resource pool (virtualized and physical resource) (iv) dynamic resource scheduling and (v) general purpose. Specifically, cloud computing provides computing resources as on demand services that are hosted remotely, accessed over the Internet, and generally billed on a per-use basis.

II. LITERATURE REVIEW

A numerous researches have been presented in the literature for cloud computing and its security issues. A brief review of some recent researches is presented here. In the last few years, cloud computing has grown from being a promising business concept to one of the fast growing segments of the IT industry. But as more and more information on individuals and companies are placed in the cloud, concerns were beginning to grow about just how safe an environment it was. Despite of all the hype surrounding the cloud, enterprise customers were still reluctant to deploy their business in the cloud. Security was one of the major issues which reduces the growth of cloud computing and complications with data privacy and data protection continue to plague the market. The advent of an advanced model should not negotiate with the required functionalities and capabilities present in the current model. A new model targeting at improving features of an existing model must not risk or threaten other important features of the current model. The architecture of cloud poses such a threat to the security of the existing technologies when deployed in a cloud environment. Cloud service users need to be vigilant in understanding the risks of data breaches in that new environment. S. Subashini *et al.* [1] proposed a survey of the different security risks that pose a threat to the cloud.

Cloud computing has become one of the most significant information security issues in recent years. That was due to the dramatically emerging applications and required services of cloud computing. However, in order to safely utilize and enjoy the benefit of cloud computing through wired/wireless networking, sufficient assurance of information security such as confidentiality, authentication, non repudiation, and integrity was the most critical factor for adoption. In order to well understand the security of cloud computing, experimental platform based on kernel-based virtual machine has established. Besides, a dynamic intrusion detection system for strengthening the security application of cloud computing was implemented. In their mechanism, numbers of intrusion detectors were dispatched on the whole topology of the networking system through multi-layers and multi-stages deployment. Those information security issues related with the application and service of cloud computing would be experimented and discussed. The experiments included the equipment security of the client side termination, the threats of web site and webpage, the detection and diagnosis and surveillance of intrusion, the access and security of database in the cloud side, the detection of system leakage and the monitor of real-time repairing process, the management of server system, the management of mobile e-commerce processing, and the integrated analysis of associated security information and issues. Chang-Lung Tsai *et al.* [2] proposed a mechanism that was not only focused on find out some solutions, but also focused on develop some feasible information security techniques or products for the application and service of cloud computing.

Cloud computing technology was a new concept of providing dramatically scalable and virtualized resources, bandwidth, software and hardware on demand to consumers. Consumers could typically requests cloud services via a web browser or web service. Using cloud computing, consumers could safe cost of hardware deployment, software licenses and system maintenance. On the other hand, it also has a few security issues. Danish Jamil *et al.* [3] introduced four cloud security problems, which are XML Signature Element Wrapping, Browser Security, Cloud Malware Injection Attack and Flooding Attacks, and also gives the possible countermeasures.

Cloud computing moved away from personal computers and the individual enterprise application server to services provided by the cloud of computers. The emergence of cloud computing has made a tremendous impact on the Information Technology (IT) industry over the past few years. Currently IT industry needs Cloud computing services to provide best opportunities to real world. Cloud computing was in initial stages, with many issues still to be addressed. The objective of that was to explore the different issues of cloud computing and identify important research opportunities in this increasingly important area. V. Krishna Reddy *et al.* [4] presented different design challenges categorized under security challenges, Data Challenges, Performance challenges and other Design Challenges. The figure 2 explains the cloud computing architectures, which contains

(i) Five Different Characteristics - On demand self service, Broad network access, Resource pooling, Rapid Elasticity and Measure Service.

(ii) Three Delivery Models- IaaS, PaaS and SaaS.

(iii)Four Deployment Models- Public, Private, Community and Hybrid.

Krishna Chaitanya *et al.* [5] provided the basic idea on Cloud Computing. It also deals with the Security Issue mainly faced in the Industry where Cloud Computing is implemented and necessary steps which could solve these problems to certain extent.
The prominence of the place of cloud computing in future converged networks was incontestable.
That was due to the obvious advantages of the cloud as a medium of storage with ubiquity of access platforms and minimal hardware requirements on the user end. Secure delivery of data to and from the cloud is however a serious issue that needs to be addressed.

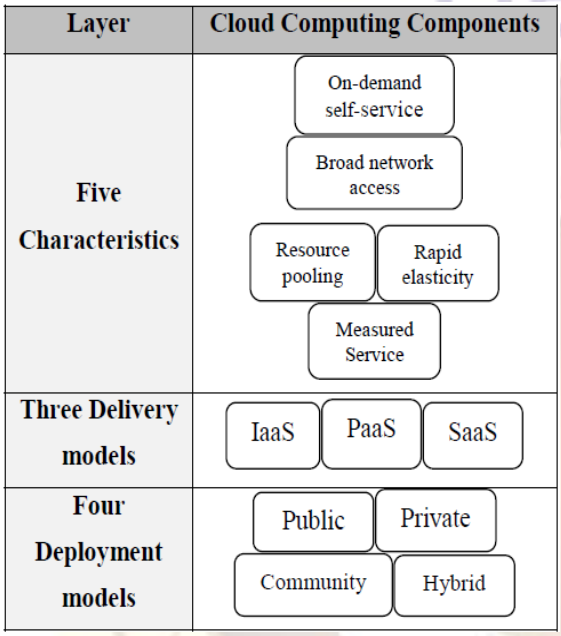

Fig 2: Cloud Environment Architecture

Aderemi A. Atayero *et al.* [6] presented the security issues affecting cloud computing and proposed the use of homomorphic encryption as a panacea for dealing with these serious security concerns vis-à-vis the access to cloud data.
Cloud computing was a set of IT services that were provided to a customer over a network on a leased basis and with the ability to scale up or down their service requirements. Usually cloud computing services were delivered by a third party provider who owns the infrastructure. It advantages to mention but a few include scalability, resilience, flexibility, efficiency and outsourcing non-core activities. Despite the potential gains achieved from the cloud computing, the organizations were slow in accepting it due to security issues and challenges associated with it Security was one of the major issues which hamper the growth of cloud. Kuyoro S. O et al. [7] introduced a detailed analysis of the cloud computing security issues and challenges focusing on the cloud computing types and the service delivery types.

III.CRITICAL EVALUATION

Ref	Context of Research	Problem Discussed	Research Type
1	Service delivery models survey in Cloud Computing	Different Security risks that pose a threat to the cloud.	Theoretical study
2.	Security in Enterprise Cloud	Security Techniques for applications in cloud	Theoretical study
3.	Web Security issues in cloud computing.	Cloud Security problems,	Theoretical study
4.	Research Issues in Cloud Computing	Security Challenge, Data Challenges Performance Challenges	Theoretical study
5.	Study of Security Issues in Cloud Computing	Security Issue mainly faced in the Industry.	Theoretical study
6.	The Potential of Homeomorphic Encryption in cloud	Security issues affecting and proposed homomorphism encryption.	Theoretical study
7.	Challenges and Security Issues in Cloud Computing	Focusing on the types of Cloud Computing and service service deliveries.	Theoretical study

IV. CONCLUSION

In this study different security issues research papers were studied briefly. In both larger and smaller scale organizations they are using cloud computing environment because of large advantage of cloud computing. The cloud computing has different security issues in threats in user view, one can say that lack of security is the only worth mentioning disadvantage of cloud computing. The bond between service providers and users is necessary for providing better cloud security.

In this paper we analyse the security issues, threats and challenges in wide acceptance of cloud computing, because there may be loss of data and privacy. Researchers Scholars and IT security professionals must press forward towards practical achievements in security and privacy to users. Our study identifies top security concerns of cloud computing, these concerns are security risks, techniques, problems, challenges and security issues of cloud computing and its services.

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