

Chapter 4

Cloud Security Issues and Challenges

Srinivas Sethi
IGIT Sarang, India

Sai Sruti
IGIT Sarang, India

ABSTRACT

Cloud computing refers to the basic setup for an emerging model of service delivery, that has the advantage of decreasing the cost by sharing computing, infrastructure including storage resources. This can be combined with on-demand delivery mechanism relying on a pay-per-use model. Cloud computing offers an added level of risk because of essential services provided by it to a third party, which makes it difficult to maintain data privacy and security. Security in cloud computing is a critical aspect, which has various issues and challenges related to it. Cloud service providers/ brokers and the cloud service users should make aware of safety cloud. That is the cloud is safe enough from all kinds of the threats, so that the users do not face any problem like; loss of data or data theft. There is a possibility that, a malicious user can enter the cloud by imitating an authentic user, thus corrupt the entire cloud. It can affect many users who are sharing these types of clouds. This chapter mentions the list of parameters that disturb the security of the cloud. This also explores the cloud security issues and challenges faced by cloud service provider/brokers and cloud service users like; data, privacy, and infected application. Finally, it discusses the countermeasure for handling these issues and its challenges.

INTRODUCTION

Albeit there is no established definition for cloud computing, a definition that is adopted in a conventional manner which is provided by the National Institute of Standards and Technologies (NIST) of United States as:

Cloud computing is a model for enabling ubiquitous, 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. (Mell & Grance, 2009)

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Cloud computing is a prototype for conducive and on-demand networking platform to a shared group of configurable computing resources that can be expeditiously coupled and unconstrained with minimal management efforts. Cloud computing performs as a computational paradigm with distribution architecture. The main objectives of cloud computing concept are to provide quick, convenient, secure data storage and clear computing service, with all available computing resources treated as services and delivered over the Internet (Zhao et al., 2009; Zhang et al., 2010). The cloud augments fraternization, dexterity; extensibility, opportunity, competency to acclimate to fluctuations based on demand, accelerates the development works as per the users requirements, and provides the potential for cost reduction by optimized, effective and efficient computing in the cloud. The cloud computing concept is to make administer scalable with low-cost on-demand computing resources and it provides good quality of service levels. This type of computing is basically used to shares the distributed large scale resources which is cost effective and location independent. Resources available in the cloud can be used by the different client and designed and developed by the vendors such as Google, Amazon, IBM, Microsoft, Salesforce, Zoho, Rackspace, etc. It shares necessary software and various on-demand tools for different IT Industries to achieve enormous benefits of cloud computing. The most vital point for the customers/ client is that, the customers/ clients don't need to buy any resource from a third-party vendor. They can use the resource available in the cloud and pay for it as a service. Therefore, it helps a lot to the customers for saving the time and money. Clouds are not only for Multinational large companies but also being used by small and medium organisations (Lord CrusAd3r, n.d.). Although there are various advantages to adopting cloud computing concept, there are also some consequential obstacles to adopt this concept in the organisation.

Security is one of the most primary barriers to adopt this concept. Cloud computing is a relatively new computing prototype in the recent era. So, there is a major difficulties to include the security concept in various areas like; network, host, application, and data levels of cloud computing. These difficulties have consistently led information for executives to security concern and this is their number one concern with cloud computing implementation (KPMG, 2010). The architecture of the cloud computing consist of numerous cloud components, which are interacting with each other about the various data in different locations they are holding. This assists the users to get the desired data on a faster rate with reliability. The front end and the back end are two different parts focused on data when it comes to cloud. The front end is at user end at which required data is highly essential and users are mostly confined to secure data. Whereas, at the back end, the numerous data storage device, servers available in the Cloud (Lord CrusAd3r, n.d.). There are three kinds of cloud according to their characteristics and usage. They are named as private cloud, public cloud and hybrid cloud. The private cloud is owned by a single enterprise or organization and it provides greater control and better flexibility on the cloud. Whereas, public cloud is shared on a larger scale by the organization or companies for their use. Hybrid cloud is a mixing of private and public cloud which is exploited by most of the industries. The advantages of cloud computing technology may be very appealing but it also involvements several malfunctions. Cloud has different issues when it comes to security point of view, particularly on data theft, data loss and its privacy (Lord CrusAd3r, n.d.). However, in the cloud computing concept, it has a better impact as there are more numbers of people interact with the cloud. It influences many present technologies such as web browsers, web services, and virtualization.

In the cloud, data storage and virtualization are the most critical components and an attack to one of them can do the most harmful in the cloud. In the other part, attacks to one layer have more impact to the other layers. It can put more importance on threats, which is associated with data being stored and

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