Chapter 3
Cloud Security Using Ear Biometrics

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ABSTRACT

Cloud computing has created much enthusiasm in the IT world, institutions, business groups and different organizations and provided new techniques to cut down resource costs and increase its better utilization. It is a major challenge for cloud consumers and service providers equally. Establishing one's identity has become complicated in a vastly interconnected cloud computing network. The need of a consistent cloud security technique has increased in the wake of heightened concerns about security. The rapid development in cloud data storage, network computing services, accessing the cloud services from vendors has made cloud open to security threats. In this chapter, we have proposed an approach based on Ear Biometric for cloud security of individual consumers and vendors. This approaches started to get acceptance as a genuine method for determining an individual's identity. This chapter provides with the stepping stone for future researches to unveil how biometrics can change the cloud security scenario as we know it.

1. INTRODUCTION

Cloud computing security is an evolutionary offshoot of computer security, information security and security of internet based computation, whereby shared resources, different relevant software and information is provided to computers and other devices on demand. Cloud computing has rapidly become one of the most prominent concept in the IT world due to its innovative model of computing as based on their utility. It promises increased flexibility, scalability and reliability, while promising decreased operational and support costs. However, many potential cloud users are

reluctant to move to cloud computing on a large scale due to the unaddressed security issues present in cloud computing. In October 2009 paper representation "Effectively and Securely using the Cloud Computing Paradigm" by Peter Mell and Tim Grance of United States National Institute of Standards and Technologies (NIST) has given the definition of cloud computing: "Cloud computing is a model for enabling ubiquitous, convenient, on demand network access to shared pool of configurable computing resources(e.g., networks, servers, storage, applications, and services) and applications as services that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Mell, & Grance, 2009). Cloud security emphasizes on the main objective of the a broad set of policies for different issues, new trend of technologies and to control deployments to protected cloud database like shared resources, different essential software, information of different organizations (academics, Industries and different Vendors) and provide a complete level of security to infrastructure (may be very complex) of cloud computing.

1.1 Characteristics of Cloud Computing Model

In cloud computing, the shared pool of resources is incorporated through virtualization or job scheduling techniques. Virtualization is a process to create the set of logical resources whether it may be hardware platform, operating system, network resources and other shared resources usually implemented by the software based components acting like physical resources. In general software resources is known as hypervisor which imitates as a set of resources and gives permission to the operating system software (logical resources) running on a virtual machine separated from the underlying hardware resources. Following are essential characteristics of cloud computing model. The National Institute of Standards and

Technology (NIST)'s definition of cloud computing identifies "five essential characteristics".

1.1.1 On-Demand Self-Service

On demand self–service enables consumer to use the cloud computing as needed without human interaction between users and service providers. With the help of on demand self service characteristics, consumer can schedule the different cloud services such as computation and storages as their requirement. In addition to valuable and satisfactory to the consumer, the self service interear must be user friendly to access the different cloud resources and effective means to manage the service offerings. The main advantage of on-demand self-service provides better and eases and elimination of human interaction provides efficiencies to both the consumer and vendor of cloud service (Mell, & Grance, 2009).

1.1.2 Broad Network Access

For cloud computing to be successful alternative to the in house data centre it requires the high bandwidth communication internet communication links and capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, tablets, laptops, and workstations). One of the principal economics explanations for cloud computing is that lowered cost of high bandwidth network communication to the cloud provides access to a bigger pool of shared resources that sustain efficient level of utilization. In addition many organizations utilizes the three–tier based architecture to provide the communication between cloud and consumer's laptop, printer, communication devices like mobile phones and PDAs to wide area networks. Following are the elements in the three tier architecture of cloud computing.

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