

## Chapter 53

# Access Control Framework Using Multi- Factor Authentication in Cloud Computing

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### ABSTRACT

*The most challenging issues in cloud computing are access control and data security because users of the cloud outsource sensitive data and information to cloud provider servers, which are not within the same trusted domain as the data owner. Within cloud computing, various services and resources need protection from unauthorized use as a part of the security. Authentication is a key technology for information security. In recent years, a lot of research has been carried out throughout the world and several schemes have been proposed to improve authentication in the cloud. Remote authentication is the commonly used method to determine the identity of the remote client. In this article, the authors have proposed a systematic method for authenticating clients, namely by using a password, biometrics, and out-of-band-based access control mechanisms that are suitable for access control. The proposed system involves user ID/password, biometrics characteristics, and a mobile phone as a software token for one-time password generation.*

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## **1. INTRODUCTION**

The continuous improvement in computing infrastructure, in the last two decades, has produced a flood of data demanding improvement in large-scale data processing technologies. Cloud computing has emerged with major advantages in data storage technology and sharing of resources. We have to pay only for the resources and computer services that we use Patel et al. (2015). We are witnessing a continuous growth of computational technologies and consequent data generation during the past few decades. With the development of web technologies, users now generate and consume large amounts of data on the Internet. Cloud computing has provided a pattern change in the distribution of resources across the network, reducing the administrative costs associated with the IT infrastructure. With such progress, we find the necessity of new approaches to harness the potential of cloud in data storage and processing. Many issues and challenges exist in cloud computing. Some problems are safety, identity managing, source managing, cyber security, energy and energy managing, source obtainability and source heterogeneity. Among all these problems, security is important concern in the cyber world Reddy (2009).

## **2. CYBER SECURITY USING MULTIFACTOR AUTHENTICATION**

According to Department of Defense, Australian Government (2012) “Nowadays, cyber-crime has become vigorous over network’s growth businesses. Therefore, cyber security has become a vital requisite”. Cyber crooks have the skills to do the lot from burglary cerebral assets and pledging fraud by liberating worms and assuring acts of cyber terrorism. Cyber thieves have a dozen dangerous tools at their fingertips, and they ferret out weaknesses in website and software programs to snuffers that snatch passwords Chien et al. (2002).

According to security experts, almost 60% attacks go undetected. Most victim companies that have been suffered with such attacked will not report to the press, because of losing of the public trust and reputation Jain et al. (2013).

For cyber-security, the multifactor authentication approaches are being deployed. Such approaches include user id and password, token verification OTP and Biometrics characteristics in order to prove his/her identity and gain access to the system Singh et al. (2015).

## **3. RISKS ASSOCIATED TO CLOUD COMPUTING**

The hazard is the opportunity of an occasion and a negative impact on the success of attempts. Cloud technologies and solutions for non-cloud technologies agonize from the same type of risk, that is, security, integrity, availability and performance, Horwath et al. (2012). The level of organizational risk depends solutions are used in which way in the cloud. It is because of up and down in the probability and influence on events of the threat (inside and outside) linked through CSP which were contracted for services Babu et al. (2013). Few specific risks related with cloud computing are the following.

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