Data Alteration: A Better Approach to Securing Cloud Data with Encryption

Sara Rhazlane*,** , Amina El Ouazzani*, Nouria Harbi**, Nadia Kabachi**, Hassan Badir*

*LabTIC laboratory, ENSA Tanger, Abdelmalek Essaadi University, Tangier, Morroco
sara.rhazlane@eric.univ-lyon2.fr ; a.elouazzani2000@gmail.com
hbadir@uae.ac.ma
**ERIC Laboratory, University of Lyon, Lyon 2, France
nouria.harbi@univ-lyon2.fr ; nadia.kabachi@univ-lyon1.fr

Abstract. With the emergence of new technologies and the ubiquitous connectivity, large amounts of data are being generated everyday with the need to be stored properly and explored rapidly. In this context, the cloud computing services have been adopted to face these rising challenges. But in a cloud environment, data and the application are controlled by the service provider and the customer does not always have the possibility to increase the security level imposed. This leads users to apply encryption mechanisms before storing their data in the cloud. In this paper we propose a new approach that combines the strengths of both steganography and cryptography called Data Alteration. The technique aims to hide the data by modifying it completely as it remains readable, meaningful and therefore shows no suspicions to malicious cloud providers and pirates. The proposed appoach was implemented in Java and tested on realistic datasets in a multi agent systems based architecture.

1 Introduction

Every day quintillion bytes of data are generated and transferred due to the fast-growing number of users connected, and yet constantly increasing. With this rising amount of data, comes the need for storage solutions and affordable large capacity servers. One of the solutions is using a cloud computing environment. However, the challenge is how to analyze and interpret this data in a secure manner, more specifically securing the data itself. When storing data on cloud servers, two security concerns raises: First, the risk of a data misuse from an untrustworthy cloud provider and secondly, the attempt from the attackers and the hackers to collect sensitive information. Customers sometimes decide to entrust sensitive data as well as strategic ones to cloud service providers, that is why they usually have a policy of security and confidentiality encompassing all these data and the flexibility available to the client for securing its data can be limited by the nature of the proposed offer. Moreover, the data being accessed via Internet, hacking risks are more present than on local use.

In order to ensure the confidentiality and security of data stored in the cloud, several solutions have been proposed in the literature, Abdul Alsahib S.Aldeen et al. (2015). The most common solutions to address these concerns and benefit from the potential of cloud while