

RAAC: Robust and Auditable Access Control with Multiple Attribute Authorities for Public Cloud Storage

Objective:

Main objective of the system is to selectively encrypt data and use privacy classification methods under timing constraints.

Abstract:

Data access control is a challenging issue in public cloud storage systems. Cipher text-Policy Attribute-Based Encryption (CP-ABE) has been adopted as a promising technique to provide flexible, fine-grained and secure data access control for cloud storage with honest-but-curious cloud servers. However, in the existing CP-ABE schemes, the single attribute authority must execute the time-consuming user legitimacy verification and secret key distribution, and hence it results in a single-point performance bottleneck when a CP-ABE scheme is adopted in a large-scale cloud storage system. Users may be stuck in the waiting queue for a long period to obtain their secret keys, thereby resulting in low-efficiency of the system. Although multi authority access control schemes have been proposed, these schemes still cannot overcome the drawbacks of single-point bottleneck and low efficiency, due to the fact that each of the authorities still independently manages a disjoint attribute set. In this paper, we propose a novel heterogeneous framework to remove the

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problem of single-point performance bottleneck and provide a more efficient access control scheme with an auditing mechanism. Our framework employs multiple attribute authorities to share the load of user legitimacy verification. Meanwhile, in our scheme, a CA (Central Authority) is introduced to generate secret keys for legitimacy verified users.

Introduction:

Cloud storage is a promising and important service paradigm in cloud computing. Benefits of using cloud storage include greater accessibility, higher reliability, rapid deployment and stronger protection, to name just a few. Despite the mentioned benefits, this paradigm also brings forth new challenges on data access control, which is a critical issue to ensure data security. Since cloud storage is operated by cloud service providers, who are usually outside the trusted domain of data owners, the traditional access control methods in the Client/Server model are not suitable in cloud storage environment. The data access control in cloud storage environment has thus become a challenging issue. To address the issue of data access control in cloud storage, there have been quite a few schemes proposed, among which Ciphertext-Policy Attribute-Based Encryption (CP-ABE) is regarded as one of the most promising techniques. A salient feature of CP-ABE is that it grants data owners direct control power based on access policies, to provide flexible, fine grained and secure access control for cloud storage systems. In CP-ABE schemes, the access control is achieved by using cryptography, where an owner's data is encrypted with an access structure over attributes, and a user's secret key is labeled with his/her own attributes. Only if the attributes associated with the user's secret key satisfy the

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access structure, can the user decrypt the corresponding ciphertext to obtain the plaintext. So far, the CP-ABE based access control schemes for cloud storage have been developed into two complementary categories, namely, single-authority scenario , and multi authority scenario.

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