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ENABLING EFFICIENT USER REVOCATION IN IDENTITY-BASED CLOUD STORAGE AUDITING FOR SHARED BIG DATA

ABSTRACT

Cloud storage auditing schemes for shared data refer to checking the integrity of cloud data shared by a group of users. User revocation is commonly supported in such schemes, as users may be subject to group membership changes for various reasons. Previously, the computational overhead for user revocation in such schemes is linear with the total number of file blocks possessed by a revoked user. The overhead, however, may become a heavy burden because of the sheer amount of the shared cloud data. Thus, how to reduce the computational overhead caused by user revocations becomes a key research challenge for achieving practical cloud data auditing. In this project, we propose a novel storage auditing scheme that achieves highly efficient user revocation independent of the total number of file blocks possessed by the revoked user in the cloud. This is achieved by exploring a novel strategy for key generation and a new private key update technique. Using this strategy and the technique, we realize user revocation by just updating the no revoked group users' private keys rather than authenticators of the revoked user. The integrity auditing of the revoked user's data can still be correctly performed when the authenticators are not updated. Meanwhile, the proposed scheme is based on identity base cryptography, which eliminates the complicated certificate management in traditional Public Key Infrastructure (PKI) systems. The security and efficiency of the proposed scheme are validated via both analysis and experimental results.