

**Dynamic-Hash-Table Based Public Auditing for Secure Cloud Storage**

**Abstract:**

Cloud storage is an increasingly popular application of cloud computing, which can provide on-demand outsourcing data services for both organizations and individuals. However, users may not fully trust the cloud service providers (CSPs) in that it is difficult to determine whether the CSPs meet their legal expectations for data security. Therefore, it is critical to develop efficient auditing techniques to strengthen data owners' trust and confidence in cloud storage. In this paper, we present a novel public auditing scheme for secure cloud storage based on dynamic hash table (DHT), which is a new two-dimensional data structure located at a third parity auditor (TPA) to record the data property information for dynamic auditing. Differing from the existing works, the proposed scheme migrates the authorized information from the CSP to the TPA, and thereby significantly reduces the computational cost and communication overhead. Meanwhile, exploiting the structural advantages of the DHT, our scheme can also achieve higher updating efficiency than the state-of-the-art schemes. In addition, we extend our scheme to support privacy preservation by combining the homomorphic authenticator based on the public key with the random masking generated by the TPA, and achieve batch auditing by employing the aggregate BLS signature technique. We formally prove the security of the proposed scheme, and evaluate the auditing performance by detailed experiments and comparisons with the existing ones. The results demonstrate that the proposed scheme can effectively achieve secure auditing for cloud storage, and outperforms the previous schemes in computation complexity, storage costs and communication overhead.