**ABSTRACT**

With almost unlimited storage capacity and low maintenance cost, cloud storage becomes a convenient and efficient way for data sharing among cloud users. However, this introduces the challenges of access control and privacy protection when data sharing for multiple groups, as each group usually has its own encryption and access control mechanism to protect data confidentiality. In this paper, we propose a multiple-group data sharing scheme with privacy preservation in the cloud. This scheme constructs a flexible access control framework by using group signature, ciphertext-policy attribute-based encryption and broadcast encryption, which supports both intra-group and cross-group data sharing with anonymous access. Furthermore, our scheme supports efficient user revocation. The security and efficiency of the scheme are proved thorough analysis and experiments.