

Research on protecting information data security when using cloud computing storage services

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Abstract: This study investigates the security of data information within cloud storage services, addressing critical vulnerabilities that arise from shared infrastructure, third-party management, and remote data access. As organizations increasingly migrate sensitive data to cloud platforms, risks such as unauthorized access, data breaches, and loss of data integrity become paramount. The research systematically analyzes existing security mechanisms, including encryption protocols, access control models, and identity management systems, evaluating their effectiveness in mitigating these threats. A mixed-method approach is employed, combining a comprehensive literature review with empirical analysis of current cloud security frameworks and case studies of real-world incidents. The findings reveal that while encryption and multi-factor authentication significantly enhance data protection, persistent challenges remain in key management, insider threats, and compliance with data sovereignty regulations. The study proposes a layered security architecture that integrates advanced encryption standards with dynamic access policies, offering a robust framework for safeguarding data confidentiality, integrity, and availability. This research contributes to the field by providing actionable recommendations for both cloud service providers and users to strengthen data security in cloud environments.

Keywords: data security, cloud storage, information protection, cloud computing