

Risk and Challenges in Cloud Computing

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Abstract

Cloud computing has transformed the way organizations store, process, and access information by providing scalable, flexible, and cost-effective computing resources over the internet. Despite its numerous advantages, the rapid adoption of cloud-based services has introduced several risks and challenges related to security, privacy, reliability, and data management. This paper examines the major risks and challenges associated with cloud computing and discusses possible approaches for addressing them. Particular attention is given to data breaches, unauthorized access, insecure application programming interfaces, account hijacking, data loss, insider threats, and distributed denial-of-service attacks. The study also considers challenges related to data privacy, regulatory compliance, vendor dependency, service availability, interoperability, and limited control over underlying infrastructure. Multi-tenancy and the distribution of data across different geographical locations further increase the complexity of protecting sensitive information. The paper highlights the importance of effective identity and access management, encryption, secure authentication mechanisms, continuous monitoring, backup strategies, and comprehensive risk assessment in strengthening cloud security. Furthermore, organizations need to develop appropriate policies for data governance, compliance, incident response, and disaster recovery before migrating critical workloads to cloud environments. The study emphasizes that cloud security is a shared responsibility between cloud service providers and users, requiring continuous collaboration and risk management. Addressing these challenges through robust security frameworks, employee awareness, regular audits, and emerging technologies can improve the reliability, privacy, and resilience of cloud computing systems.

Keywords: Cloud Computing, Cloud Security, Data Privacy, Cybersecurity, Data Breach, Risk Management, Data Protection, Multi-Tenancy, Access Control, Cloud Infrastructure