

A Survey of Security and Privacy Challenges in Cloud Computing and Desirable Solutions In Future

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Abstract

As organizations increasingly transition critical operations to the cloud, ensuring strong security measures becomes paramount. However, the evolving threat landscape poses significant challenges as cyber adversaries continually devise sophisticated tactics to exploit vulnerabilities in cloud infrastructure. This article gives an overview of cloud computing infrastructure, how cloud computing works, as well as how major companies around the world implement cloud computing transformation. The article also provides in-depth analysis of the current threats facing cloud security, from data breaches and insider threats to sophisticated attacks and vulnerabilities in the supply chain. By examining real-world case studies and industry reports, we identify key vulnerabilities that leave cloud environments at risk of exploitation. Furthermore, this article includes the security options offered by the major vendors, thereby exploring the emerging trends and technologies that are shaping the future of cloud security. Additionally, we discuss the role of automation, orchestration, and artificial intelligence in enhancing threat detection and response in the cloud. By fostering collaboration among industry stakeholders and leveraging innovative approaches, organizations can proactively mitigate risk and build resilient cloud architectures to the challenges of the future threat landscape.

Keywords. xxx, xxx, yyy, xxx, xxx, xxx, yyy

1 INTRODUCTION

In recent years, cloud computing has emerged as a dominant paradigm in the realm of IT infrastructure, driven by a confluence of market forces and technological advancements. The dynamic nature of modern business environments has propelled organizations towards adopting cloud-based solutions to meet their evolving computational needs. With an ever-expanding array of enterprise services and applications, companies are increasingly reliant on cloud infrastructures to support their operations.

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This article explores the multifaceted landscape of cloud security, divided into five chapters. In Security Issues and Threats: Delving into the various security concerns that plague cloud environments, this chapter examines real-world examples and their implications for cloud security. In Attack Patterns: Understanding the methods and patterns used by attackers is crucial for devising effective security measures. This chapter explores common attack vectors targeting cloud infrastructures, providing insights into malicious strategies. In Current Techniques to Counter: To mitigate the risks posed by security threats, organizations deploy a range of techniques and technologies. This chapter reviews the current state-of-the-art approaches for securing cloud environments. Fi-

nally, in Future Directions: Looking ahead, the landscape of cloud security is poised for continued evolution. This final chapter examines emerging trends and technologies that are shaping the future of cloud security

2 EXAMPLE L^AT_EX

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