# Chapter 85
# Cloud Security in E–Commerce Applications

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## ABSTRACT

*In this chapter, the authors focus on the most fundamental barrier in the e-commerce application's adoption: security. The most significant or important aspect to explore in cloud computing is how to keep the data secure in the most efficient way with cutting-edge technologies. Cloud computing has taken its place by providing its convenient services like on-demand service, pay-per-use, rapid elasticity, resource pooling, and other lucrative facilities. In this chapter, the authors will firstly describe the introduction related to cloud computing, major characteristics, types, and a few security concerns and issues in cloud computing. Furthermore, they discuss the introduction of e-commerce applications, how it is interlinked with cloud computing, and what the possible threats are. Moreover, what the possible solutions could be are discussed, so that we can secure data on both user side as well as on the server side. The authors suggest some existing solutions at the end of the chapter.*

## INTRODUCTION

E-Commerce has become an essential part of the user's daily life activities. Detailed discussions on E-commerce applications are already available in previous chapters of this book. Just to show the importance of E-commerce applications once the CEO of the famous Company (Amazon.com™), Jeff Bezos said, "I should have 3 million stores on the Web if I have 3 million customers" (Schafer, Konstan, & Riedl, 2001). The understanding related to consumer trust is very much essential for the growth and develop-

ment of e-commerce but it involves the number of technical issues and challenges including security and privacy (Ahuja, 2000; Feldman, 2000). In the Information Technology domain, cloud computing has become one of the booming technology. Due to elasticity, availability, vast infrastructure and better support for software, cloud technology attracts the developers of e-commerce applications towards it. The main advantages of cloud computing include low-cost infrastructure (Software, Hardware and their license) and some big companies like Microsoft and Google also offer cloud services for free or on very less cost. Despite all benefits, the major concern for the cloud's implementation in the e-commerce domain is the security issue. Security in the cloud includes data security and confidentiality related to privacy(Saleh, 2012). In this chapter, our main focus area is the Security of E-commerce related to the cloud. Transporting sensitive and important data to the cloud data centers and then to maintain its security is the most important concern nowadays. The cloud service provider (CSP) must ensure and responsible to secure and protect data traffic that travels between the application to the cloud data centers. CSP's signs a Service Level Agreement (SLA) with the service user of cloud to certify and ensure the level of security, privacy, and also facilities the user wants.

For a detailed overview of the topic and discussion, this chapter is further divided into different small sub-sections. Section 1 includes details on Cloud Computing, (a) its characteristics, (b) major service providers of cloud, (c) Deployment Models of cloud (d) Service Models of cloud (e) Security Concerns and Issues in Cloud Computing. Section 2 discusses, the Introduction of E-commerce Application and further subdivides into 2 sections (a) E-Commerce application and its relation with cloud and (b) include the Security Concerns in E-Commerce applications. Section 3 is the last section of the chapter that is based on the Solutions of Cloud Security in an E-commerce application.

## CLOUD COMPUTING

Cloud computing model enables the network to access shared resources that can be provided on-demand and user can access it anywhere. This shared pool of resources is used by cloud service. Users can use this by signing an SLA with a CSP (Dikaiakos, Katsaros, Mehra, Pallis, & Vakali, 2009). Detailed characteristics and techniques are given below.

a.  **Cloud computing characteristics**
    Cloud have different characteristics related to their usage, In this section, we will summarize the most common characteristics defined by some famous researchers (Mell & Grance, 2011)
    i.   Scalability
         As we know that the world's most famous giants in cloud services are Google, Amazon, Yahoo, and others, Millions of servers are located all around the world by the CSP's. They can easily add or remove nodes and servers with little modification to cloud server and infrastructure due to the scalable property of cloud.
    ii.  Virtualization and Broad Network Access
         The client can access all the services by using any medium like mobiles, laptops, tablets, and workstations. Cloud has a built-in capacity to handle and virtualize all the physical resources used by the client

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