

Data Security and Privacy– Preserving in Edge Computing: Cryptography and Trust Management Systems

Manoranjini J.

Swami Vivekananda Institute of Technology, India

Anbuchelian S.

Anna University, India

EXECUTIVE SUMMARY

The rapid massive growth of IoT and the explosive increase in the data used and created in the edge networks led to several complications in the cloud technology. Edge computing is an emerging technology which is ensuring itself as a promising technology. The authors mainly focus on the security and privacy issues and their solutions. There are a lot of important features which make edge computing the most promising technology. In this chapter, they emphasize the security and privacy issues. They also discuss various architectures that enable us to ensure safe technologies and also provide an analysis on various designs that enable strong security models. Next, they make a detailed study on different cryptographic techniques and trust management systems. This study helps us to identify the pros and cons that led us to promising implementations of edge computing in the current scenario. At the end of the chapter, the authors discuss on various open research areas which could be the thrust areas for the next era.

INTRODUCTION

Edge computing is the new era of computing. Over the period cloud computing has become the massive storage and the data warehousing was another notable factor of research with the cloud. However, the cloud has its disadvantages like effective bandwidth utilization, limited usage of resources. IoT has been a new working methodology that can perform massive growth in technical systems. However, there are several limitations in IoT as these devices incorporate only the cloud and the security issue in the cloud has always been the major limitation. To address these complexities edge computing came as a boon to the technical world.

The basic working of edge computing defines a device to process its data within itself or to the closest point near the device. This working principle has brought the data warehousing also to grow in a new way. So the data is processed somewhere between the device and the cloud repository. Generally, edge computing uses devices that act as an intermediate level for processing data. The cloud computing provisionally pictured few problems like the bandwidth maintenance and also not able to meet the data processing requirements. The problems faced while processing the data was mainly because of the size of data which was huge in size. Moreover this data processing consumed large amount of utilization capacity. So the cloud faced more challenges.

In edge computing the devices (Al-Fuqaha et al., 2015) are placed such that the data is either processed within the devices or at its close proximity. Sometimes we call it as data being processed at the corner or edge of the network. The edge computing network refers to the devices which are in close association with the devices. The devices which belong to the edge computing form a network with few ideal factors like the storage capacity speed or we can call it as computational speed which is required for fast data processing.

Edge computing architecture helps to reduce the computational processing in a large manner. Effective communication is also trusted as the network has its devices in close proximity. These flexibilities in the network contribute to the massive growth of this edge technology. In cloud technology the preserving of data was a challenge and secures data storage was always under a scrutiny. In particular the edge networks reduced these challenges in the cloud by offering efficient data storage. The cloud also had issues in access control which was another important privacy factor. However the upcoming edge computing offers stringent access control which maintain the privacy in a structured manner.

However, the edge computing had its own challenges. Since the data is processed in close proximities, every device has to be communicating and coordinating among them to ensure the flow of data processing without any security challenges. So the devices had to authenticate themselves. The authentication should be flexible so

13 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/data-security-and-privacy-preserving-in-edge-computing/271712

Related Content

Quantization of Continuous Data for Pattern Based Rule Extraction

Andrew Hamilton-Wright and Daniel W. Stashuk (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 1646-1652).

www.irma-international.org/chapter/quantization-continuous-data-pattern-based/11039

Web Usage Mining with Web Logs

Xiangji Huang (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 2096-2102).

www.irma-international.org/chapter/web-usage-mining-web-logs/11109

Evaluation of Decision Rules by Qualities for Decision-Making Systems

Ivan Bruha (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 795-801).

www.irma-international.org/chapter/evaluation-decision-rules-qualities-decision/10911

Knowledge Acquisition from Semantically Heterogeneous Data

Doina Caragea and Vasant Honavar (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 1110-1116).

www.irma-international.org/chapter/knowledge-acquisition-semantically-heterogeneous-data/10960

Bibliomining for Library Decision-Making

Scott Nicholson (2009). *Encyclopedia of Data Warehousing and Mining, Second Edition* (pp. 153-159).

www.irma-international.org/chapter/bibliomining-library-decision-making/10813