Chapter 56
Blockchain Technology for IoT: An Information Security Perspective

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ABSTRACT

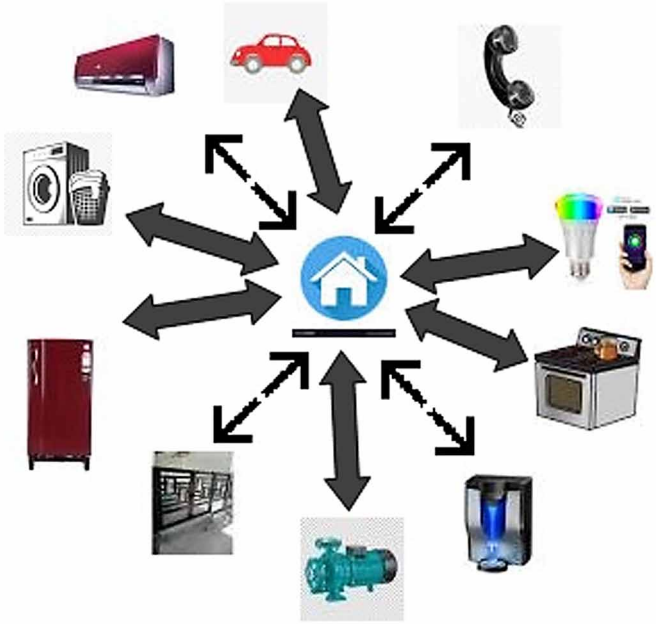
In the internet era, data is considered to be the primary asset, and the host or applications in a network are vulnerable to various attacks. Traditional network architectures have centralized authority to provide authentication, authorization, and access control services. In this case, there is a possibility of data mishandling activities from the valuable information available in the given network application. To avoid this type of mishandling, a new technology came into existence known as blockchain. Implementing blockchain technology in the internet of things (IoT) will ensure data integrity, stability, and durability. The authors present a detailed investigation of various IoT applications with blockchain implementation. Blockchain-based mechanisms will improve the security aspects in the traditional network applications related to IoT like insurance policies claiming, personal identification, and electronic health records.

DOI: 10.4018/978-1-6684-7132-6.ch056

1. INTRODUCTION

The world recognizes Internet of Things (IoT) in the year 1999 by the British technology pioneer Kevin Ashton. It is the interconnected device, which is capable of gathering different types of data from various locations and communicate among themselves. It communicates and transfers data among the things in peer to peer (P2P) manner. While enriching P2P communication, the workload among the things in the network will share with its neighbours. Involved devices may have differences in size, memory capacity, and processing capabilities. The main objectives of Internet-of-Things are 1) To gather valuable information from deployed location 2) Transform that information to centralized place without data loss 3) Above mentioned process is done without human intervention. IoT devices can be any devices that are capable of collecting and transforming data. For example, Smartwatches, Smartphones, Medical equipment, Environmental monitoring devices, Agricultural equipment, and many more. Communication among IoT devices is transmitted through a connected network topology.

Figure 1. IoT device example for Home automation



IoT is not a new technology; it is a combination of various traditional technologies like Wireless Sensor Network (WSN), Cloud computing, Big data analytics, Radio-Frequency Identification (RFID), Location-based services, and Automation. Internet of Things mainly deals with constraint devices. So it is unable to fulfil all the requirements like Storage capacity, Execution speed, Captured data Transferring capabilities, and Energy. In this case, Cloud computing will play a major part in IoT devices to provide a huge amount of memory for storage.

Every year millions of devices are connected through IoT across the globe. When thinking about millions of devices connected over the internet, People has to think about various issues with respect to