

## Chapter 8

# Internet of Things in Cyber Security Scope

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### ABSTRACT

*IoT represents a technologically bright future where heterogeneously connected devices will be connected to the internet and make intelligent collaborations with other objects to extend the borders of the world with physical entities and virtual components. Despite rapid evolution, this environment is still facing new challenges and security issues that need to be addressed. This chapter will give a comprehensive view of IoT technologies. It will discuss the IoT security scope in detail. Furthermore, a deep analysis of the most recent proposed mechanisms is classified. This study will be a guide for future studies, which direct to three primary leading technologies—machine learning (ML), blockchain, and artificial intelligence (AI)—as intelligent solutions and future directions for IoT security issues.*

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## **INTRODUCTION**

Internet of Thing (IoT) is an integration of a world-wide network of interconnected physical objects as sensors, actuators, machines, and smart devices which communicate based on standard protocols. This smart device impacts human daily life toward automation, intelligent, and smart transportation. Recently, the application of IoT such as health care, smart grid, smart home, online carted-items tracking, and environment monitoring are developing rapidly and such smart applications produce a huge amount of information which obtain vast computing facility, storage area, and communication data transfer capacity (Nižetić, Sandro, Petar Šolić, Diego López-de-Ipiña González-de, 2020). According to Cisco, in 2020, numerous of wearable devices, smart meters, wireless sensors, connected vehicles, and other smart devices will be 50 billion of them connected to the internet while by 2025 will be increased to 500 billion. Processing, sensing, heterogeneous access, services and applications, and additional components like privacy and security are the main mechanisms of IoT. Security is the most recent concern in this environment due to its extends the 'internet' via a traditional internet, sensor network mobile network and so on. Furthermore, everything will be connected to this internet. While the third is that these things will communicate with other. Therefore, the new privacy security issue will arise, and researcher must pay more care to these challenges related to authenticity, integrity and confidentiality of information in the IoT as well as there are many privacy and security concerns on different layer. As a solution to extend and improve the security and minimize the security weakness of IoT, many technologies have been used and blockchain is consider as one of the technologies used to mitigate the attacks as some researchers agreed that to strengthen security in IoT, four methods can be applied which are secure IoT communications using Blockchain technology, authenticate users, detect legal IoT and configure IoT. Blockchain has been a high demand technology since the initial advent of the bitcoin by Satoshi Nakamoto. At the first stages, this technology was used to prevent the duplicate ordain of transactions. Blockchain name is indicated to data structure, and it might cover network or system structure. It consists of a number of organized blocks where a transaction is stored each block and these blocks are directly attached to its previous block formatting a chain (Fakhri & Mutijarsa, 2018). Classification of access control management, protecting data in IoT and storing the public key and the private key in IoT objects are some of the main enchantments that blockchain provided to IoT security (Fakhri & Mutijarsa, 2018) (H. Yang et al., 2020). Additionally, Data records authorization, protecting data from being tampered in the data sharing stage, and managing access attributes are some of the powerful extends of blockchain technology in IoT (H. Yang et al., 2020).

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