Securing IoT Data Using Block Chain

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ABSTRACT

Internet of Things (IoT) is now in its initial stage but very soon, it is going to influence almost every day-to-day items we use. The more it will be included in our lifestyle, more will be the threat of it being misused. There is an urgent need to make IoT devices secure from getting cracked. Very soon IoT is going to expand the area for the cyber-attacks on homes and businesses by transforming objects that were used to be offline into online systems. Existing security technologies are just not enough to deal with this problem. Blockchain has emerged as the possible solution for creating more secure IoT systems in the time to come. In this paper, first an overview of the blockchain technology and its implementation has been explained; then we have discussed the infrastructure of IoT which is based on Blockchain network and at last a model has been provided for the security of internet of things using blockchain.

Keywords: Internet of Things (IoT), Blockchain system, Security.

1. INTRODUCTION

Internet-Of-Things (IoT) refers to a loosely coupled, a system of multiple heterogeneous and homogeneous devices having the power of sensing, processing, and network capabilities . Internets of Things have been discussed aptly with semantic touch in the IoT vision .The current scenario for making a safe and secure car is to lock your car automatically or manually. We become sure of its safety and security . Our future generation cars would be having all sensors based devices and at the same time connected in to the system . The cars with these devices make our car smart but are they safe? This is the pertinent question which compels us to write a more safe architecture for making our cars based on IoT devices safe and secure and connected to the Internet every time.

2. PROPOSED SYSTEM

The purpose of this research paper is to provide guidance for the use of blockchain technology, through cases to make a more secure and trustable IoT model IoT has numerous applications, for example: in making smart homes, Smart City, Improving Health, Autonomous Vehicles, etc. Some IoT devices are currently available in the market like Wearables, Smart Thermostat Systems, Air Conditioners, and refrigerators that use Wi-Fi for remote monitoring. Apart from all these benefits, IoT has some serious issues, which should be sorted out before it gets implemented, like the technologies on which the foundations of IoT have been established have several bugs, so if hackers get access to the system through these bugs, then they can compromise the privacy of the customer or even can cause harm to them. Thus, before implementing IoT, the security of these systems should be strengthened and made free from any bugs. Keeping the IoT device secure is one of the most difficult tasks to accomplish. In making these devices cheap, small and easy to use many security policies are compromised which increases the risk of security breach.

2.1 Modules

Network of Nodes

All the nodes connected through the internet maintain all of the transactions made on a blockchain network collaboratively. The authenticity of the transaction is checked by the protocol, which eliminates the involvement of a trusted third party for validation purpose . When a transaction is done, its records are added to the ledger of past transaction, this process is known as 'mining'. The proof of work has to be verified by the other nodes present on the network.

Distributed database system

The database, which is composed of blocks of information, is copied to every node of the system. Each block contains the following data in itself: A list of transactions; a timestamp; Information, which links it to the previous chain of the blocks.

Shared ledger

The ledger is updated every time a transaction is made. It is publicly available and is incorruptible which introduces transparency to the system.

Cryptography

It binds the data with the very strong crypto mechanism, which is not easy to track or tampered by unauthorized users.

2.2 Algorithm

Block chain Technique

A blockchain, originally block chain, is a growing list of records, called blocks, which are linked using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data. By design, a blockchain is resistant to modification of the data.

The emergence and popularity of blockchain techniques will significantly change the way of digital system operation and management. Blockchain is essentially a digital public ledger that securely records and automatically verifies high volume transactions digitally. By allowing digital information to be distributed, blockchain technology created the backbone of a new type of internet. Originally devised for the digital currency, Bitcoin, the tech community is now finding other potential uses for the technology. The application of blockchain will exhibit a variety of complicated problems and new requirements, which brings more open issues and challenges for research communities.

3. CONCLUSION

In this article, we have provide guidance for the use of blockchain technology, through cases to make a more secure and trustable IoT model. Because of the high-end hardware requirements for the internet of things, we concluded that internet of things is not going to be a full member of a blockchain network. But internet of things is definitely going to be benefited from the functionalities introduced by the blockchain technology through the APIs offered by the nodes of the network or by any specialized intermediaries. Through these functionalities internet of things could be made highly secure. We have discussed the new and emerging blockchain technology cybersecurity point. Blockchain technology mostly using and concentrating the finance area research work, as we know Bitcoin is a cryptocurrency which is based on blockchain technology. But in our article we try to introduce blockchain technology for internet of things to make secure data transmission between the

internet connected devices. For this we have provide oview of blockchain technology, security issues on IoT environment and also discuss and propose blockchain is as a solution of IoT Security.