Leveraging blockchain and smart contracts for iot

Technology, Internet

With the advent of Bitcoin and the whitepaper named Bitcoin: A P2P Electronic Cash System by Satoshi Nakamoto, whose identity is yet to be verified, Blockchain has become incredibly famous. Aside from cryptocurrencies, Blockchain has multiple use cases such as government voting, healthcare, real estate, IoT etc.

A Blockchain network is a decentralised peer-to-peer network without any central authority that invigilates the transactions that occur between the various entities. It is a trustless network where the peers may not trust each other, but they still continue to transact. Therefore, applications which has been running on centralised database platforms with central governing authority, e. g. banks have the potential to be moved on a Blockchain platform without any hassles while providing the same functionalities as before.

Smart contracts is another feature available on most Blockchain platforms such as Ethereum. They are self-executing contracts as the name suggests which reside on the Blockchain and have unique addresses so that they can be called later on. The smart contracts are coded in such a manner that they execute when certain conditions are met, e. g. a customer can create a smart contract involving his car vendor such that the payment is only released when the vendor delivers the car. Hence, smart contracts automate a lot of the workflow which is manual and thus could be of great use in the IoT domain.

Internet of Things (IoT) can be defined as an interconnection of objects that are accessible through the internet. These set of objects could include

wearables, home appliances, vehicles and other items with embedded sensors and electronics which can communicate and interact with each other. Although IoT is one of the most common buzzwords which is used these days, there are specific roadblocks which present themselves when we try to adopt IoT. These challenges include the large data that is generated every minute by the IoT devices and also the fact that the devices have to be connected to the internet all the time for it to function correctly. There are also security concerns regarding who might view the data and whether it has been tampered with or altered or misused by any malicious entity.

To resolve the above concerns regarding IoT, we leverage Blockchain which is immutable and tamper-proof by nature. In a supply chain example for the healthcare industry, IoT devices could be used which would store their data in a blockchain network and thus be extremely beneficial to avoid losses of millions of dollars that happen due to drug tampering. In the further sections of this report, we analyse how blockchain and smart contracts work and check if it's viable to leverage blockchain for IoT while at the same time discuss the challenges we might face.