Block Chain Technology as the future for Internet of Things

For the partial fulfillment of the course

CS F211 - Data Structures & Algorithms

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Abstract:

The Internet of Things (IoT) is a machine to machine communication technology which holds much promise for creating a much more automated digitized future. IoT Devices send and receive large streams of data every minute which help in coordinating their functioning. Thus with greater increase in shared data and number of devices, the prospects of a security failure is also on the rise. Let's say our heart rate monitoring band sends regular updates to our doctor's terminal which can call an ambulance for help in case of an emergency. If someone was to break into this closed communication channel and compromise the data, it to lead to life endangering situations.

Currently, a number of encryption techniques are in place to protect IoT Device data when stored in the device and in transit. Various Legacy methods like NIST Suite b are currently used with IoT Devices for encryption security. These techniques provide decent security but the main thing holding attackers back is the computational complexity. Hence most attackers would move to an easier target instead. However as Joy's Law states - "*Computing Power Doubles every year*", there will come a time when even these "secure encryption techniques" can be broken by much more powerful machines. This is where Blockchain Technology comes in as a method to secure IoT devices.

Blockchain is a digital decentralized ledger system which can be used to keep a record of all legitimate transactions that have occurred so far in the network and is actively maintained by the combined effort of all nodes within the network. The most promising properties of the Blockchain Technology is that the records are public, it's completely decentralized and its secure. Also being decentralized, the current server client framework would also become obsolete as each device would simply be a node in the network and would be able to directly communicate with one another without the need to relay the information first to a centralized server. This also means that there is no central server which an attacker can take down to bring down the network.

This paper aims to explore how Blockchain Technology can be incorporated in Iot devices and what changes will bring to the current scenario in terms of independence, security and versatility of IoT technology.