



Other Use-Cases of Blockchain



Blockchain in IoT

Why IoT Need Blockchain?

IoT devices are powered by centralized servers, which won't be enough for long-term solutions.

Thus, if IoT devices want to reach their full potential, they must move away from the centralized servers and switch to the concept of decentralization.

Apart from that, IoT devices suffer from various shortcomings such as lack of compliance in the manufacturing stage, security holes in the device updates, vulnerability to DDoS attacks, etc.

Thus, for transforming their operations in terms of accountability and security, enterprises and organizations can send their IoT data to an immutable blockchain ledger for added accountability and security.

How Blockchain can Help IoT?

Brings Trust: As we know, with Blockchain, there is no centralized server in control of your data; thus, technology maintains a complete level of trust.

Cost-Efficient: Blockchain and IoT can manage everything on their own without any issues, reducing the additional cost associated with security.

Streamline Processes: Blockchain in IoT can streamline the entire process without involving any third-party intermediaries.

Additionally, Blockchain can help **alleviate the security and scalability concerns associated with IoT** in various ways such as:

- Tamper-proof
- Robust level of encryption
- Transparency
- Coordination among billions of connected devices

Applications of IoT and Blockchain

Blockchain in Agriculture

The combination of Blockchain and IoT has the ability to completely transform the food processing market, from farm to grocery store to home. By installing IoT sensors in the farming area and sending data directly to Blockchain can bring overall transformation in the food supply chain.

Tracking Components and Maintaining Compliance

The ability to track components that go into an aircraft or automobile is critical in terms of safety and regulatory compliance. IoT data stored in Blockchain enables all the involved parties to see component provenance throughout a product's life.

Healthcare

Maintaining privacy is crucial, especially in the healthcare sector, as there are possibilities of counterfeit medicines. Thus the transparency and traceable nature of Blockchain, along with the embedded IoT sensors, can help monitor and trace the shipment of drugs right from their origin to the supply chain destination.

Applications of IoT and Blockchain

Freight Transportation

Moving freight is a complicated procedure that involves multiple stakeholders with varying priorities. Temperatures, position, arrival times, and status of shipping containers can all be stored on an IoT-enabled blockchain as they travel. Immutable nature of blockchain transactions ensure that all parties can trust the data and act promptly and efficiently to move products.

Log Operational Maintenance Data

IoT devices monitor the status of critical machines' safety and maintenance. From engines to elevators, blockchain delivers a tamper-proof database of operating data and the maintenance that comes with it. Third-party repair partners can keep an eye on the blockchain for preventative maintenance and then log their work on it.

Conceptual Architecture of IoT Blockchain Platform



Conceptual architecture of the IoT Blockchain platform depicts the IoT Blockchain platform's hypothetical scenario, which includes IoT devices, user devices, data storage, local bridges, and servers connected via a peer-to-peer network of Blockchain.

IoT Server: The IoT server can be defined as a service provider that can communicate or interact with local bridges and the Blockchain network to offer several services to end-users.

Data Storage on Cloud: Environmental data obtained by sensors, physical device profiles, and device owner profiles can all be stored securely in the Blockchain network's data storage.

User Client: End users can read and publish data to the Blockchain network using a user client, which can be any terminal device like smartphones or laptops.

Communication Protocols: Developers can use a variety of communication protocols for IoT systems such as Bluetooth®, WiFi, 2G-3G-4G cellular, and others.

Conceptual Architecture of IoT Blockchain Platform



Communication Strategy: Two methods are presented for communicating with physical devices, either through local bridges or with the help of direct wireless communications.

IoT Devices: Sensors and actuators are two types of IoT devices: sensors collect environmental data like temperature and communicate it to servers for further processing, whilst actuators conduct actions (like turning on the light) in response to requests from end-users.

Current Blockchain IoT Players

- Chain of Things (CoT)
- IOTA
- Riddle&Code
- Modum.io