


Chapter 10

Blockchain Technology Integration in IoT and Applications

Bhanu Chander

 <https://orcid.org/0000-0003-0057-7662>
Pondicherry University, India

ABSTRACT

The Internet of Things (IoT) pictures an entire connected world, where things or devices are proficient to exchange a few measured data words and interrelate with additional things. This turns for a feasible digital demonstration of the existent world. Nonetheless, nearly all IoT things are simple to mistreat or compromise. Moreover, IoT devices are restricted in computation, power, and storage, so they are more vulnerable to bugs and attacks than endpoint devices like smartphones, tablets, and computers. Blockchain has remarkable interest from academics and industry because of its salient features including reduced dependencies on third parties, cryptographic security, immutability, decentralized nature, distributed nature, and anonymity. In the current scenario, blockchain with its features provides an anonymous framework for IoT. This chapter produces comprehensive knowledge of IoTs, Blockchain knowledge, security issues, Blockchain integration with IoT (BIoT), consensus, mining, message validation mechanisms, challenges, a solution, and future directions.

DOI: 10.4018/978-1-7998-0373-7.ch010

INTRODUCTION

The standard of Internet of Things (IoT) positioned solid way for a world where several days by day things interrelated and cooperate with the intrinsic atmosphere in order to gather knowledge for routine secure tasks. IoT is expanding its appliances at fast face some reports already predicated that IoT connectable devices (smartphones, laptops, tablets, etc.) will grow to 30 billion by 2020-22 moreover machine to machine connectivity also grow from 800 million to 3 billion, all of them allied with wide-ranging applications similar to healthcare management, transportation, smart society, justification, and automated robots. In support of trustworthy with broad network intensification, it is compulsory to fabricate appropriate IoT protocols, architectures those can provide IoT services. At present IoT hang on centralized server-client prototype through Internet, but present prototype may not work in future because of rapidly growing devices usages, to overcome this fresh paradigm/prototype to be planned. Such as exposure entails, stuck between supplementary things, vigor against attacks, faultless authentication, data privacy and security, straightforward deployment and self-maintenance. These above-mentioned features obtain as a result of Blockchain (BC) the skill back-of-the Bitcoin crypto-currency scheme, studied to fascinating as well as critical for ensuring security and privacy for diverse applications in many domains-including the internet of things (Tiago et al., 2018; Mahadi et al., 2018; Ana Reyna et al., 2018).

Abstractly blockchain technology is a distributed database that holds proceedings of transactions which were collective among participated entities; every transaction is well-established by agreement of greater part of a group member, creating forged transactions unable to pass shared conformation. If one time a blockchain shaped and when established, it cannot be altered or modified. Blockchain technologies proficient to track, synchronize complete transactions and accumulate records/data from an outsized quantity of devices which make possible construction of applications that are entailing no central based cloud.

The hurried development of blockchain technology and blockchain involved appliances have begun to revolutionize the digital world's finances as well as financial services. At present, the appliances of blockchain raise from a financial transaction or insurance claim to issues in share trades and corporate bonds. In presumption, any-person any-place can utilize blockchain technology to broadcast information/data steadfastly. Blockchain technology is kind of distributed ledger knowledge that efficiently removes the central data point rather than most commonly used supply chains data structures. Here, distributed ledger knowledge/technology is the heart of

31 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/blockchain-technology-integration-in-iiot-and-applications/239164

Related Content

Machine Learning Based Localization

Duc A. Tran, XuanLong Nguyenand Thinh Nguyen (2009). *Localization Algorithms and Strategies for Wireless Sensor Networks: Monitoring and Surveillance Techniques for Target Tracking* (pp. 302-320).

www.irma-international.org/chapter/machine-learning-based-localization/25589

QoS: Requirements, Design Features, and Challenges on Wireless Sensor Networks

Ricardo H, González, Antonio A.F. Loureiroand Raquel A.F. Mini (2010). *Handbook of Research on Developments and Trends in Wireless Sensor Networks: From Principle to Practice* (pp. 56-78).

www.irma-international.org/chapter/qos-requirements-design-features-challenges/41111

Blockchain Hyperledger Sawtooth Enabled Digital Forensics Chain of Custody (CoC) A Short Report

(2022). *The International Journal of Imaging and Sensing Technologies and Applications* (pp. 0-0).

www.irma-international.org/article//306655

A Review on Conservation of Energy in Wireless Sensor Networks

Oluwadara J. Odeyinka, Opeyemi A. Ajibola, Michael C. Ndinechi, Onyebuchi C. Nosiriand Nnaemeka Chiemezie Onuekwusi (2020). *International Journal of Smart Sensor Technologies and Applications* (pp. 1-16).

www.irma-international.org/article/a-review-on-conservation-of-energy-in-wireless-sensor-networks/281600

A Description of How AI and Blockchain Technology Are Used in Business

Ramiz Salamaand Fadi Al-Turjman (2024). *AIoT and Smart Sensing Technologies for Smart Devices* (pp. 1-15).

www.irma-international.org/chapter/a-description-of-how-ai-and-blockchain-technology-are-used-in-business/338651