Scalable Storage Scheme for Blockchain-Enabled IoT Equipped Food Supply Chains

Janitha Pranath Rupasena

(169230G)

Degree of Master of Science

Department of Electronic and Telecommunication Engineering

University of Moratuwa
Moratuwa, Sri Lanka

Abstract

Blockchain is an innovative technology which enabled new applications for solving numerous problems in distributed environments such as the internet of things (IoT) equipped food supply chains (FSCs). In FSCs, the large volume of IoT data such as audio, video, images, and sensor data will be transferred to ensure the traceability of the food to its source. When blockchain technology is used in an FSC, the storage requirements in the nodes will grow with time, since blockchain only allows information adding, without deleting the already stored information. Therefore, it is evident that offchain storage offers more flexibility than onchain storage in IoT equipped supply chains. This work proposes a scalable storage scheme using offchain storage, where the data from IoT devices in the supply chain will store offchain. To reduce the growth of offchain storage, we exploit the fact that some information regarding a particular food item may not be required after the expiration date. The scalability of the proposed scheme is validated through numerical and experimental results.

Keywords:
blockchain, internet of things, food supply chain, offchain storage.

Declaration

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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