

Graduate School of Science and Technology Master's Thesis Abstract

Laboratory name (Supervisor)	Large-Scale Systems (Shoji Kasahara (Professor))		
Student ID	2011317	Submission date	2022 / 1 / 20
Name	WIRAATMAJA CHRISTOPHER		
Thesis title	Cost-Efficient Blockchain-Based Access Control for the Internet of Things		
Abstract			
<p>Blockchain-based access control (BBAC) has been highly promising to prevent unauthorized resource access in the Internet of Things (IoT). However, maintaining BBAC can be potentially expensive due to the storage cost of the blockchain. To address this issue, we propose a layered BBAC architecture by combining blockchain with blockchain oracle and tamper-proof decentralized storage (e.g., IOTA).</p> <p>The proposed architecture consists of three main layers: a blockchain layer, which provides distributed and trustworthy access control, a storage layer, which stores meta data (e.g., subject/object attributes and policies) used in the access control of the blockchain layer, and an oracle layer, which works as a bridge to help transfer data between the blockchain and decentralized storage.</p> <p>This architecture achieves robust, auditable, and cost-efficient access control by migrating the meta data from the blockchain to the decentralized storage while keeping the fascinating tamper-proof feature of the blockchain.</p> <p>We implement and evaluate this architecture in terms of time and monetary cost to demonstrate its feasibility and superiority over existing ones.</p>			