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Fujitsu Develops Blockchain Technology for Confidential Data Transfer

Elliot Maras on 20/10/2016

Blockchain technology provides information sharing with high transparency and reliability, without management by a specific trusted organization. Financial trading applications, however, have operational issues related to safely executing trades, such as key management. Document management applications bring issues in creating a system that limits which people are allowed to reference information recorded in the blockchain.

Fujitsu Laboratories of America, Inc. and Fujitsu Laboratories Ltd. have developed blockchain-based technologies to securely handle confidential data among multiple organizations.

Fujitsu: Two Technologies

Fujitsu Laboratories has developed two technologies: a transaction restriction technology based on pre-established policies that restrict trading, and a document encryption technology that allows only parties holding multiple distributed keys to access information recorded in the distributed ledger.

With transaction restriction technology, operations that prevent the misuse of keys become possible, allowing the safer use of the blockchain.

Encryption over blockchain.

With document encryption technology, it is possible to create a workflow in which documents are acknowledged by collective decision making or among specified organizations, or where they can be restored when keys are lost. The application of these security technologies will allow Fujitsu Laboratories to take blockchain's application beyond finance to more areas, such as document management, supply chain and logistics.

Blockchain technology offers high reliability and transparency by continually preserving transaction records by multiple computers that verify and record data, making it virtually impossible to alter.

Transparency Versus Privacy

In a blockchain, each user needs a digital key to execute exchanges or transactions. If the key is lost, it is impossible to transfer funds. If a key is stolen, the funds in an account can be stolen.

To enable transparency, it is sometimes necessary to publicize a transaction between organizations, while keeping transaction's details secret and shared only among the parties involved. The fact that blockchain records are shared with all users presents a challenge in how to protect the confidentiality of information.

Transaction Restriction

Fujitsu Laboratories has created a technology that restricts transactions based on pre-established policies, like restricting users to specific stores when executing transactions. The technology ties policies to keys used in activities such as capital transfers. It ensures that transactions violating policy

requirements are not added to the blockchain as a result of verification failures at computers participating in the blockchain. This makes it possible to minimize damage even if a key is stolen.

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Document Encryption

Because blockchain content is public, the technology is not suited to store documents which contain confidential information.

Fujitsu Laboratories has applied a proprietary sharing-based key management system that documents encryption. Different portions of a key are held by multiple users. Once a certain number of pieces are gathered, a key can be created.

This document encryption technology can control who sees the documents. The confidential portions of the contracts are not visible to ordinary users. The document can only be read when the parties involved, holding portions of the key, work together.

Fujitsu Laboratories has developed such a prototype system on the Hyperledger, an open source blockchain platform.

Fujitsu Laboratories is conducting trials for applying blockchain technology to finance and other areas as a cloud platform that can securely manage

confidential information and personal data among organizations. The company aims to commercialize this technology beginning in fiscal 2017.

Images from Shutterstock and Fujitsu.

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