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Title: Microservice Oriented Blockchain Architecture: Design and Issues

Abstract

Beyond the current cryptocurrency applications, a large-scale application use case of blockchain technology is expected to be in the enterprise application category, such as money remittance among banks, security ownership clearing, and digital asset management. However, from current centralized IT architecture to a decentralized architecture is challenging. This calls for the development of service oriented enterprise blockchain applications. The core is the design of microservice oriented architecture of blockchain enterprise applications to allow either the smooth transition or the coexistence of the centralized and decentralized applications.

With microservice architecture, a single application is developed as a suite of independently deployable, small, modular services, built around business capabilities and are independently deployable by a fully automated deployment mechanism. This suits blockchain based enterprise application where decentralized data management is preferred, in which each service can manages its own database and shared among blockchain nodes.

In this research study, it will be discussed how service or business oriented use case scenarios can be resolved with the blockchain lower level consensus protocols or smart contracts. A layered architecture similar to TCP/IP model is studied, and separate business or service layers will be created to form a blockchain application architecture. It could be such as a 3-layer architecture, which includes an business service layer, blockchain OS layer and blockchain core protocol layer. Design issues and challenges will be discussed as well.