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**Secure Framework with Access Control for Interoperable
Blockchain Networks using Blockchain Router**

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Abstract

Blockchain technology has gained more popularity in the past couple of years and the industry is adopting to use the technology not only in finance sector but in other domains as well. The technology has some advantages and disadvantages where academia is researching to address the technology gaps available. One of the major advantages of the technology are the immutability and the security. The disadvantages identified in the industry are the inefficient use of computing resources and scalability issues.

Blockchain scalability has gained attention of academia in the recent past with the increase in published papers. The blockchain networks are isolated networks which cannot communicate with other blockchain networks. The isolation of blockchains limits the scalability and research is conducted to overcome this barrier.

The previous research on interoperability has proposed different approaches by the academia and there are some industrial solutions that are available. Mostly the solutions are focused on cryptocurrencies. The current scalable blockchain solutions has an intermediary where all the transactions that are monitored from a centralized body which completely opposes the notion of the blockchain technology of transparency. The proposed solution addresses the above issues and build a fundamental interoperable blockchain network addressing the current issues available in blockchain interoperation. The architecture proposed is modular, use industry best practices and open-sourced. The prototype is developed on Ethereum blockchain and the smart contracts are developed using solidity. The communication architecture combines modules of off-chain oracles. The web applications that display user data is developed using ReactJS and Web3js.

Keywords: Blockchain, Scalability, Security, Ethereum, Solidity, Permissionless, web3js, ReactJS, off-chain oracle