

## Enhancing Hyperledger Fabric: A Scalable Framework for Optimized Blockchain Performance

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**Abstract :** Hyperledger Fabric (HF), one of the private blockchain architectures, has gained popularity for enterprise use cases, namely supply chain management, finance, healthcare, etc., while focusing on the demand of users and functionalities like privacy, scalability, throughput, and modular architecture. However, enhancing performance is a crucial focus in the everchanging field of blockchain technology, particularly for private blockchains like HF. This paper focuses on the inherent difficulties related to scalability, throughput, and efficiency in handling large transactions. Our framework establishes a solid network architecture with two organizations, each having two types of peers (i.e., endorsing and anchor peers) and three raft orderers. It brings innovation to the chaincode, addresses functionalities like registration and transaction management via CouchDB, and integrates transaction management and block retrieval. Additionally, it includes a distributed consensus mechanism to gain maximum performance in a large architecture. Eventually, the findings assert an apparent enhancement in scalability, transaction speed, and system responsiveness, highlighting the effectiveness of our framework in optimizing the HF architecture.

**Keywords :** hyperledger fabric, private blockchain, scalability, transaction throughput, latency, consensus mechanism

**Conference Title :** ICBC 2024 : International Conference on Blockchain and Cryptocurrencies

**Conference Location :** Tunis, Tunisia

**Conference Dates :** October 24-25, 2024