Blockchain Based Banking System Using Hyperledger Fabric

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Abstract

The object of this report was to propose a blockchain-based banking transaction system on the basis of the Hyperledger Fabric framework , which is one of permissioned blockchain networks . Our propose work will help a lot in the banking sector . Blockchain is an essential technology with promising applications in banking industry now days.

1   Introduction

Blockchain is a peer -to peer distributed ledger that is secure and used to record transactions across many computer . The presence of a blockchain framework is expected to the way that offers a massive amount of security over the customary frameworks . Hyperledger fabric is a platform for distributed ledger solutions underpinned modular architecture delivering high degrees of confidentiality , resiliency , scalability . In hyperledger fabric smart contracts documents of the business processes automate with self executing terms between the parties written into lines of code in smart contract .Hyperledger fabric is ability to create channel allowing a group of partications to create a separate ledger of transactions . This codes in the smart contract and agreement stay in the distributed decentralized blockchain network . Proper environment setup is needed for the fabric test network . Fabric in order to determine whether its applications in practice is justified .

2   Background and Motivation

In this 21st century banking sector is about to be hit by some major changes.People are more concern about there privacy and specially about economic privacy.Recently Bangladesh Federal Reserve was stolen by using some network loophole and miscommunication between SWIFT and Federal Reserve of Bangladesh. on the other hand One of the main advantages of blockchain is the history of immutable transactions. Any purchases that have been made once cannot be removed. This will help to reduce much of the crimes committed against financial institutions.Blockchain uses the Smart Contracts principle. It includes a set of laws by which the parties involved in the contract and agree to deal with each other. It allows any kind of digital information to be stored and allows the party to access or modify data only in accordance with a set of predefined rules.

More and more banks are willing to implement there banking systems using blockchain technolgy.Not only because its faster and safer but also its usability. Our this project is a effort to mimic the real world.

3 Architechture

Our project's primary operator is a bank official who will interact with the front end of our system. only he will put input to our system. Frontend is hooked with api.We have used "Fetch" to take these input and call APIs. This project uses some API to connect the web-application and Hyperledger Fabric Test Network(HFTN). The CLI commands involving an HFTN are invoked as a background process. An administrator can directly use the features provided by this project that invokes those commands to create and manipulate an HFTN. Hyperledger Fabric Test Network (HFTN) provides these features: Network up and down, create channels in the network, deploy chaincode to the channel interact with applications for this project. Inside the test network module there is a function called ./network.sh . By using "./network.sh createChannel -ca -c mychannel -s couchdb" command a channel will be created inside hyperledger. When a channel is created then a chaincode can be deployed to the channel. To deploy a chaincode chaincode name, channel name, chaincode folder name and chaincode language should be submitted and then these information will pass through the API url and invoke the deployCC function.

4 Functionalities

The customer(potential and current) will have to provide a "key" to open account and make transactions.

4.1 Opening an account

To open an account in bank one person must provide his "key" which is direct linked to NID card, his name and a password(needed to be remembered) and other details.If this "key" don't match with out existing database of key he/she will not be able to open a bank account

4.2 Depositing money

Only the "key" and amount of money have to be specified in order to deposit money to the corresponding account

4.3 Withdrawing money

one of the major functionalities of bank account is that it allows users to withdraw money. To enjoy this function one must remember his password and and his key.

4.4 Sending money from one account to another account

In this feature withdrawing and depositing happens simultiniasly. Senders key, password and receiver's key along with specified amount is needed to send money from one account to another account within the bank

4.5

5   Limitations

There is no way to prevent some theif from stealing money if he knows the victims password and key.This is the most vulnarable point of our network.If is a way to generate an OTP for every transaction someone make this drawback will much likely to fade away.Another loophole of our system is that one person with another persons NID will also be able to generate an account which we cant prevent.In this case system operator has to check manually if the person is available himself or not by matching nid photo. It is not possible to prevent any kind of attack if the users mechine is somehow compromised.

6   Github Link

The full project will be available on: `https://github.com/rinkon005/Bank_ABC`

7   Conclution

Blockchain is a decentralized digital ledger which can't achieve hacker's objectives . For the security issue it is very important technology to adopt . There are lot of opportunities with blockchain technology with immeasurable values . This provides a unique way toestablish cryptography transactions by enabling simplifications of money in the world . Giants in the banking industry started to search new cases to expand services by using blockchain . In our project we tried to simulate the real case scenario of the banking system.Though there is much room for improvement we tried to make it as swift and secure as possible