



Blockchain approach to cyber security vulnerabilities

CSE-3501 Information Security Analysis and Audit

Semester: Fall-Semester 2022

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Motivation/Introduction

Increasing popularity of blockchain enabled systems has also brought about some concerns due to its transparent ledger system.

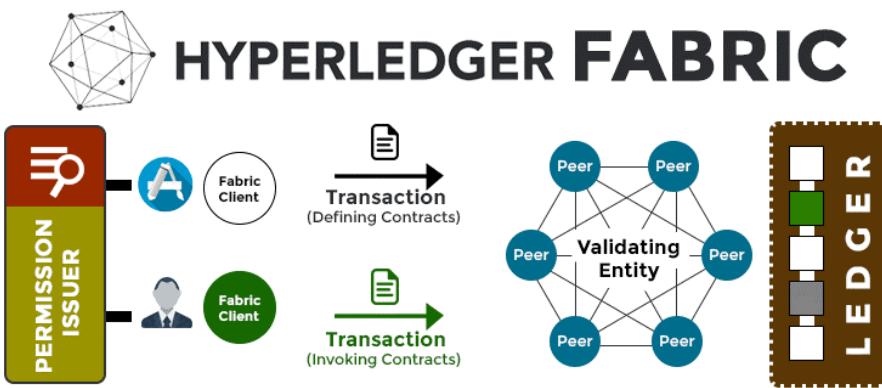
Because of this many competing companies are not able to use blockchain to secure their precious assets.

In order to solve this we present a solution using an open source blockchain namely HyperLedger Fabric.

Scope of the Project

We make use of HyperLedger fabric to develop a secure private blockchain network between two organizations. By this we are creating a separate channel for these organizations to perform secure transactions of assets between them.

Methodology



Due to competition, laws protecting and regulating the confidentiality of personal data, organizations dictate the need for confidentiality of certain data elements, which can be achieved by dividing data into block chains. Channels supported in Hyperledger Fabric allow data transfer only to those who must use it.

Fabric decentralized book and smart contract platform allow private channels to be used. If you have a large network of chains and you want to share data only with certain parties, you can create a private channel only with these participants.

Moreover, not every transaction can be visible to every network user. Hyperledger Fabric allows private transactions — something that cannot be done in Ethereum, which contributes to transparency.

Fabric allows you to use smart contracts called "Chaincode". Smart contracts developed at the highest level. Not every blockchain should be anonymous and open. It all depends on the purpose of its use. Hyperledger Fabric allows all network participants to have known identifiers. Decentralized block chains are exactly what financial companies need, and even more so the health care industry. For example, take the case of a mortgage company using blockchain. Information about the mortgage can not be publicly published. The information requires the parties to identify themselves on the network for authentication.

Implementation

Required dependencies:

curl
NodeJs and NPM
Go
Docker
Python 2.7

Commands to run in root terminal:

To clone the fabric and download docker images
curl -sSL http://bit.ly/2ysbOFE | bash -s
Creating shell script byfn.sh
Generating new network
.byfn.sh generate

Running the network
.byfn.sh up

Starting the Network

```
root@kali:/home/kali/jcomp/fabric-samples/first-network
File Actions Edit View Help
[root@kali ~]# ./byfn.sh up
Starting for channel 'mychannel' with CLI timeout of '10' seconds and CLI delay of '3' seconds
Continue? [Y/n] y
proceeding ...
LOCAL_VERSION=1.4.4
DOCKER_IMAGE_VERSION=1.4.4
Creating network "net_byfn" with the default driver
Creating volume "net_orderer.example.com" with default driver
Creating volume "net_peer0.org1.example.com" with default driver
Creating volume "net_peer1.org1.example.com" with default driver
Creating volume "net_peer0.org2.example.com" with default driver
Creating volume "net_peer1.org2.example.com" with default driver
Creating peer1.org1.example.com ... done
Creating orderer.example.com ... done
Creating peer1.org2.example.com ... done
Creating peer0.org1.example.com ... done
Creating peer0.org2.example.com ... done
Creating cli ... done
CONTAINER ID IMAGE STATUS PORTS NAMES
ab0af18c541a hyperledger/fabric-tools:latest "/bin/bash" 2 sec
nds ago Up Less than a second
cli
2bc96143a4dd hyperledger/fabric-peer:latest "peer node start" 8 sec
nds ago Up 2 seconds
tcp peer0.org1.example.com 0.0.0.0:7051->7051/tcp, :::7051->7051/
tcp peer0.org1.example.com 0.0.0.0:9051->9051/tcp, :::9051->9051/
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a007194ddcb6 hyperledger/fabric-peer:latest "peer node start" 8 sec
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