Introduction to Hyperledger Fabric

Introduction

Hyperledger Fabric is one of the major and oldest Blockchain projects within Hyperledger Umbrella. Similar to other Blockchain technologies, it has a ledger, uses smart contracts, and provides a system by which participants manage their transactions.

Key takeaways:

- Hyperledger is Private and Permissioned.
- The members of a Hyperledger Fabric network enroll through a trusted Membership Service Provider (MSP).
- Hyperledger Fabric offers a pluggable mechanism for multiple formats, consensus algorithms and MSP services.
- Hyperledger offers a functionality of creating channels, allowing a group of participants to create a separate ledger of transactions.

Hyperledger Functionalities

Hyperledger Fabric allows you to create a distributed ledger that delivers enterprise-ready network security, scalability, confidentiality and performance, in a modular Blockchain architecture. Hyperledger Fabric provides with the following network functionalities:

- Identity Management.
- Privacy and Confidentiality.
- Efficient processing.
- Chaincode functionality.
- Modular Design.

Identity Management

Hyperledger provides with a Membership Identity service known as Membership Service provider (MSP), that manages and authenticates all the participants on the network.

Moreover, access control lists can be used to provide additional permissions over the network. For example:

In case of Academic credentials over the Hyperledger, only the Universities/Educational institutions have the permissions to create new transaction over the network or trigger the chaincode over the network. On the other hand, the students only have the read permissions over the network.

Privacy and Confidentiality

Hyperledger Fabric enables business, and any user groups to have private and confidential transactions, to coexist on the same network.

Hyperledger allows the creation of private channels that provide transaction privacy and confidentiality for specific subsets of network members.

All the data over the Hyperledger network can be made accessible unless proper permissions are provided to the network participant.

Efficient Processing

Hyperledger Fabric provide concurrency and parallelism to the network, transaction execution by separating transaction ordering from transaction commitment.

This concurrent execution increases processing efficiency on each peer and accelerates delivery of transactions to the ordering service.

In addition to enabling parallel processing, the separation of transactions unburdens ordering nodes from the demands of transaction execution and ledger maintenance, while peer nodes are freed from updating the channel state.

Chaincode Functionality

Chaincode are applications which encode logic that is invoked by triggering transactions, done over the channel.

Chaincode used for a change of asset ownership ensures that all transactions that transfer ownership are under the same rules and requirements.

Hyperledger also have the system chaincode that defines operating parameters for the entire channel.

Modular Design

Hyperledger implements a modular architecture in the form of pluggable components.

You can use any specific algorithms for identity, ordering (consensus) and encryption, in any of the Hyperledger Fabric network.

The resultant network is an universal blockchain architecture that can be adopted, across different markets, regulatories and geographic boundaries.