



Blockchain Technology


Hyperledger basics

Goals

- What is Blockchain
- Blockchain for business
- Hyperledger fabric model
- Capabilities of Hyperledger fabric
- Elements of Hyperledger fabric model



Hyperledger fabric

- ▶ It is a blockchain project within the Linux foundation
 - ▶ It is a private and permissioned blockchain platform
 - ▶ Members are known
 - ▶ They enroll through a MSP (membership service provider)
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Business network


➤ Describing a business network and its members

e.g. for a fruit export business

- Farmers
- Quality evaluators
- Shipping/ Transport company



Business network: Components

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- ▶ Members
 - ▶ Smart contracts
 - ▶ Transactions
 - ▶ Participants
 - ▶ Ledger



Members

Different parties who interact with the company in and during its business operations

e.g. farmers, shipping company, suppliers etc.



Smart contract

Business rules and business logic

Rules governing how the manufacturer deals with the different members.

e.g. Fruit can only belong to one participant at a time, an owner can sell a fruit only once etc.



Transaction

- ▶ They implement the underlying business processes and business rules
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Participant

- ▶ They use credentials obtained from the MSP to access the business network and invoke transactions.
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Ledger

Where the record of transactions that take place on assets is maintained.







Capabilities of Hyperledger fabric

- Modular design
 - Chain code
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Capabilities of Hyperledger fabric



- Modular design – allows for particular customization needs of some of its components e.g. One can plug-in their own algorithm instead of using inbuilt algorithms.



➤ Chain code functionality– allows application business developers to program business logic in the form of transactions. Chain code validates the inputs and relevant business rules for these transactions.

➤ Private channel – selected subset of the members of a business network; they see particular transactions.

➤ Chain code operates within a specific predefined channel

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- *Privacy and confidentiality: Channels* – Through them, confidentiality among member sets on the same business network can be achieved.
 - Private channels – restricted messaging paths that can be used to provide transaction privacy and confidentiality for specific subsets of network members.
 - All information (transactions, members and channel information) pertaining to a channel is visible only to the members of that particular channel.



Where the record of transactions that take place on assets is maintained.





Identity management: All network participants (user ID's) are managed and authenticated by the MSP.

- ▶ Access control lists can be used to provide additional layers of permissions by authorizing specific operations within the network.
- ▶ Participants in a network know each other's identity but don't know what the other is doing.

