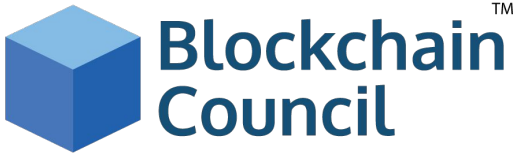


Certified Hyperledger Expert

Hyperledger Fabric Transaction Flow

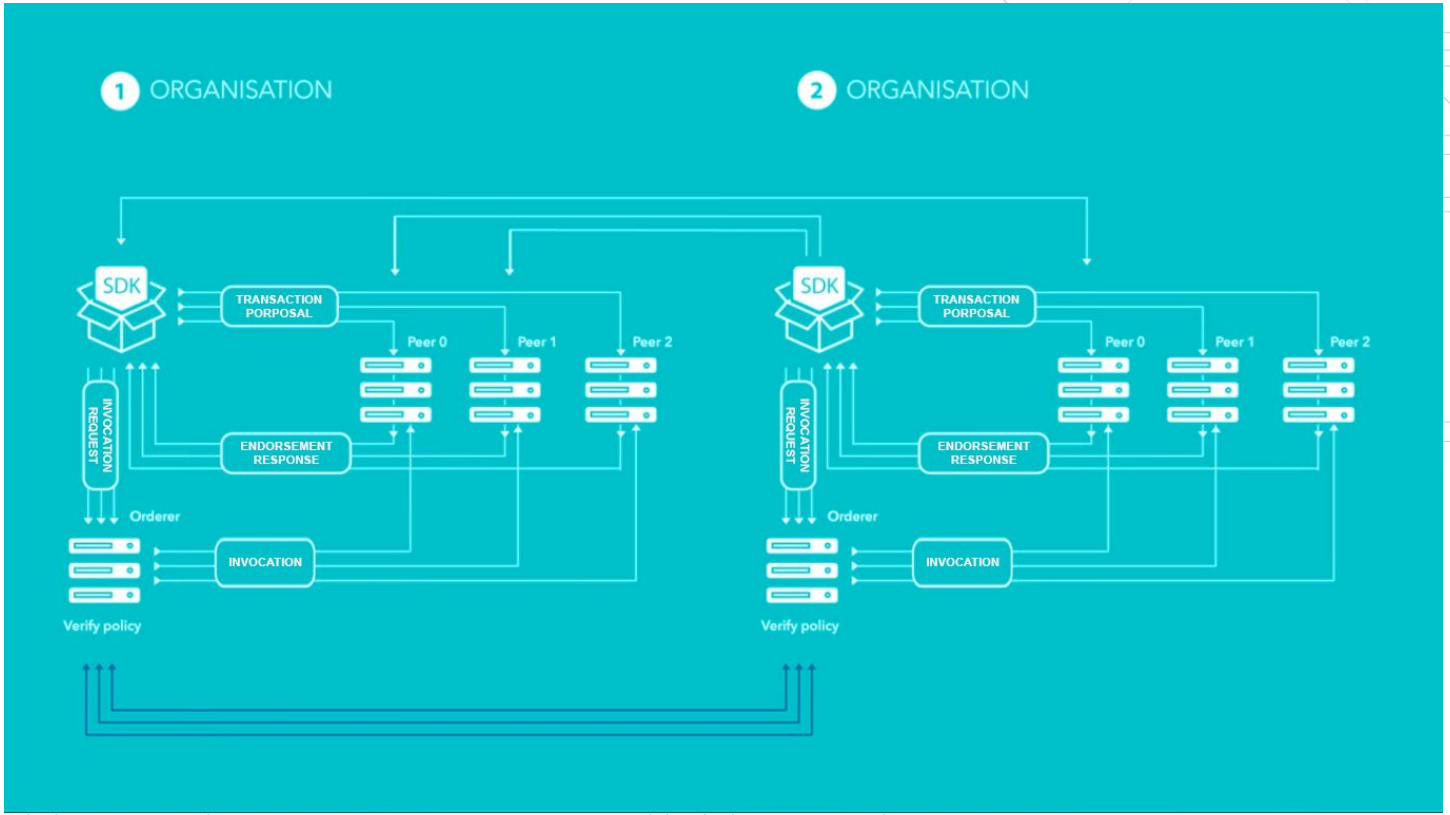
Transaction Flow Assumptions

- Channel is properly set up and running.
- The application user has registered and enrolled with the organization's certificate authority (CA) and received back necessary cryptographic material, which is used to authenticate to the network.
- The chaincode is installed on the peers and instantiated on the channel.
- The chaincode contains logic defining a set of transaction instructions and the agreed upon price for an asset.
- An endorsement policy has also been set for this chaincode, stating that all the pears must endorse any transaction.

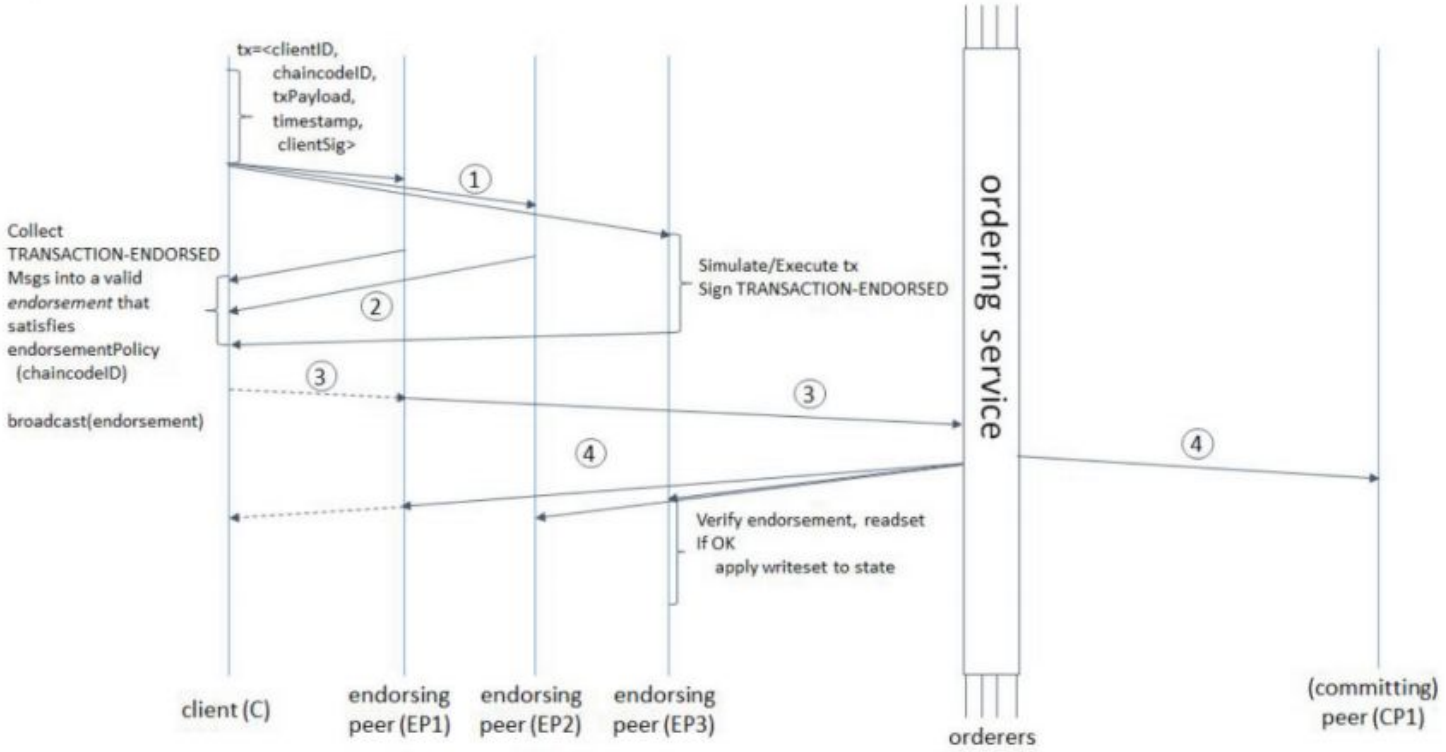
Transaction flow breakdown:

- Transaction proposal to the endorsing peers
- Endorsement response by the endorsing peers
- Invocation request to the ordering services
- Invocation response to the peers by validating and committing the transactions
- Ledger gets updated

Transaction Flow:

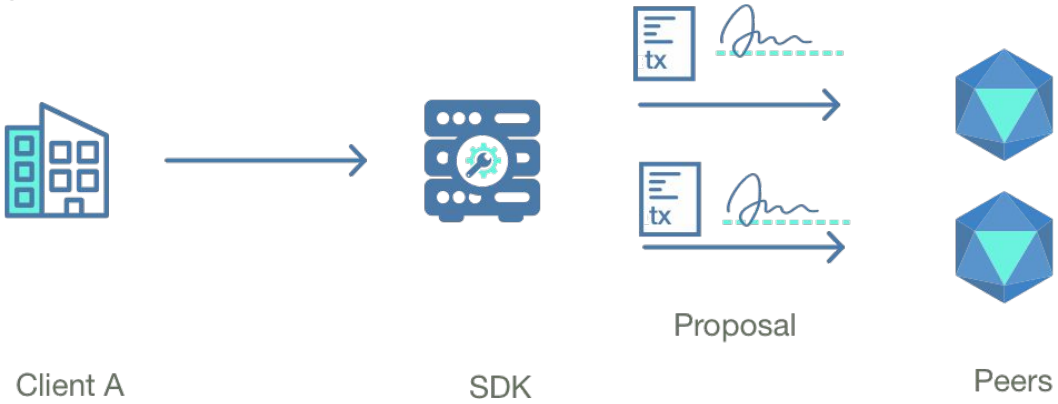


Transaction Flow:



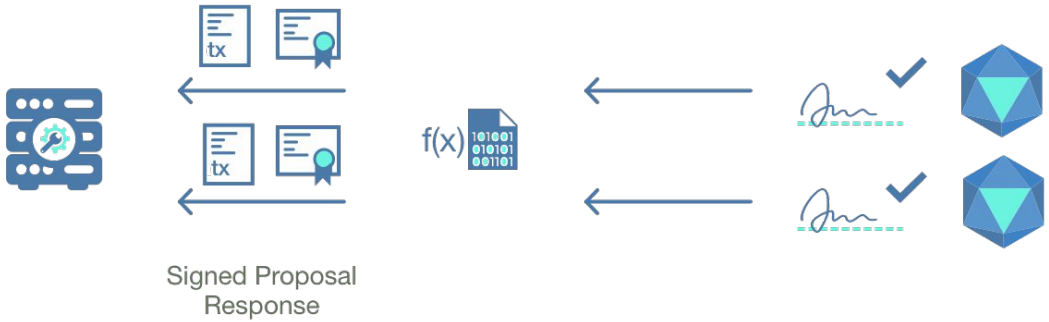
Transaction Proposal

- A client in an organisation uses some SDK or an application to initiate the transaction.
- Transaction proposal is prepared and is sent to endorsing peers.
- The proposal is a request to invoke a chaincode function so that data can be read and/or written to the peer ledger.



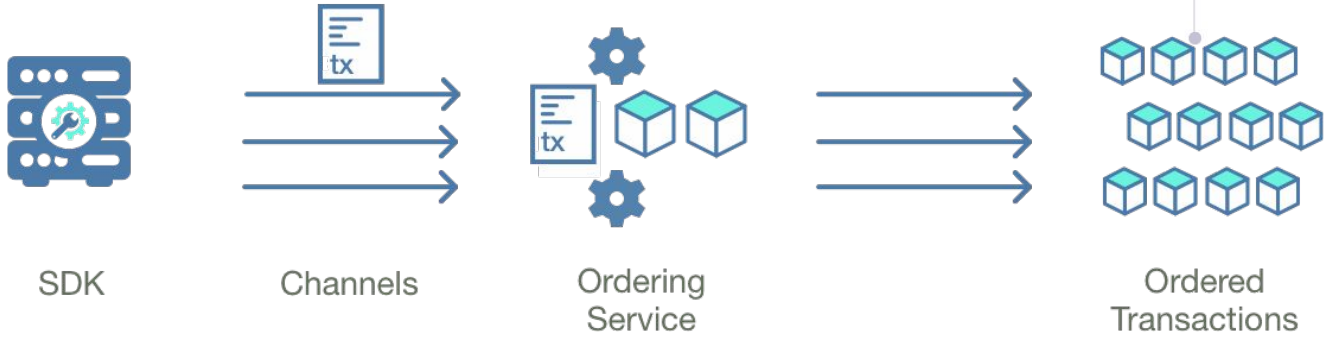
Endorsement Response

- Endorsing peers check for the validity of the format of the transaction proposal, for the duplicity of the transaction proposal, the signature check using Membership Service Provider and authorization of the requesting client.
- Endorsing peers take transaction proposal inputs as arguments and pass to chaincode function.
- Chaincode gets executed against the current state database to produce response value, read set, and write set.
- These sets along with the endorsing peer's signature is passed back as a "proposal response" to the SDK



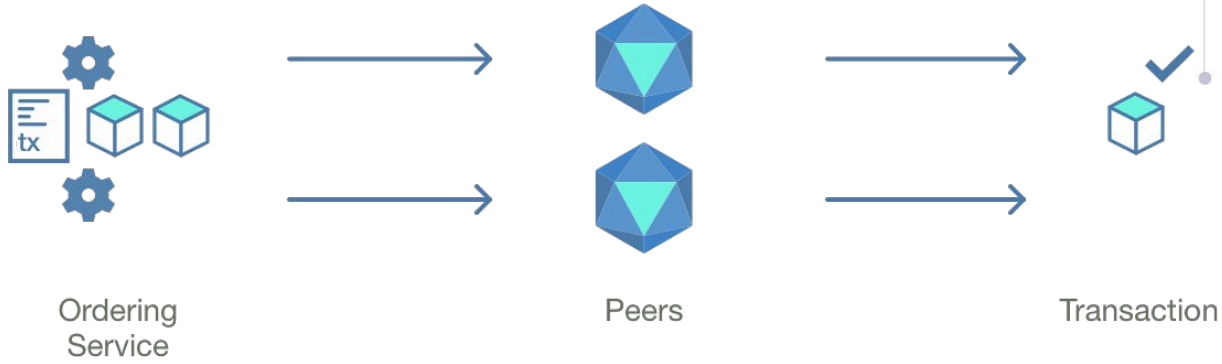
Role of Ordering Services:

- Application verifies endorsing peer signatures and compares the endorsement response to determine if the proposal responses are the same.
- The application “broadcasts” the transaction proposal and response within a “transaction message” to the Ordering Service.
- The transaction contains the read/write sets, the endorsing peers signatures and the Channel ID.
- The Ordering Service simply receives transactions from all channels in the network, orders them chronologically by channel, and creates blocks of transactions per channel.



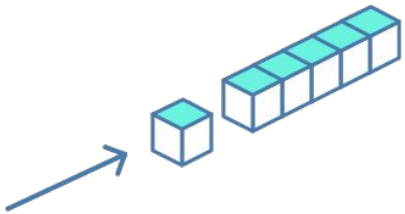
Invocation Response

- The blocks of transactions in the form of invocation response are “delivered” to all peers on the channel.
- The transactions within the block are validated to ensure endorsement policy is fulfilled.
- It is also checked if there have been any changes to ledger state for read set variables because it was generated by the transaction execution.
- Then the transactions in the block are tagged as valid or invalid.



Ledger Updation

- All the peer appends the block to the channel's chain
- Write sets are committed to current state database for all valid transactions
- An event is emitted to the application that invocation response has been immutably appended to the chain, as well as notification of whether the transaction was validated or invalidated.



Appending
Transaction

THANK YOU!

Any questions?

You can mail us at

hello@blockchain-council.org