

Intro to



HYPERLEDGER

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public vs private

permission-less vs permission-ed

Public Blockchain



Private Blockchain



Private Blockchain



A **permissioned** blockchain provides a way to secure the inter- actions among a group of entities that have a **common goal** but which **do not fully trust each other**, such as businesses that exchange funds, goods, or information.

Hyperledger family

Business blockchain technologies

A linux foundation project

Frameworks



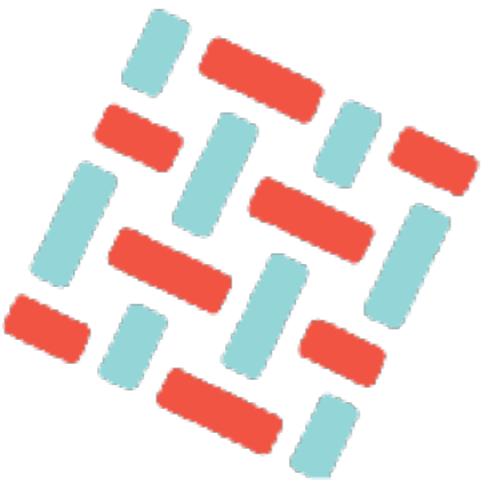
Hyperledger Burrow



Tools



Hyperledger Caliper

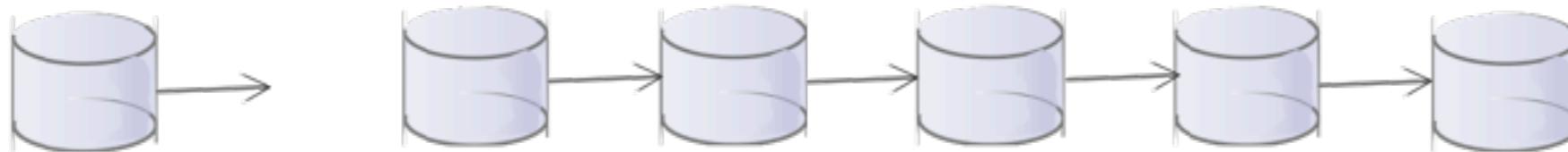
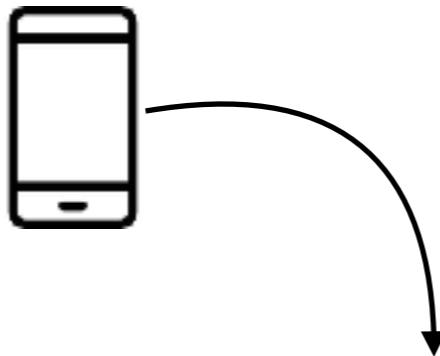


HYPERLEDGER FABRIC

Hyperledger Fabric is a permissioned blockchain platform, which means that all participants are, to an extent, identified and that it comes with a proper governance to resolve issues.

UseCase: Smart Card

SmartCard: One card to rule them all

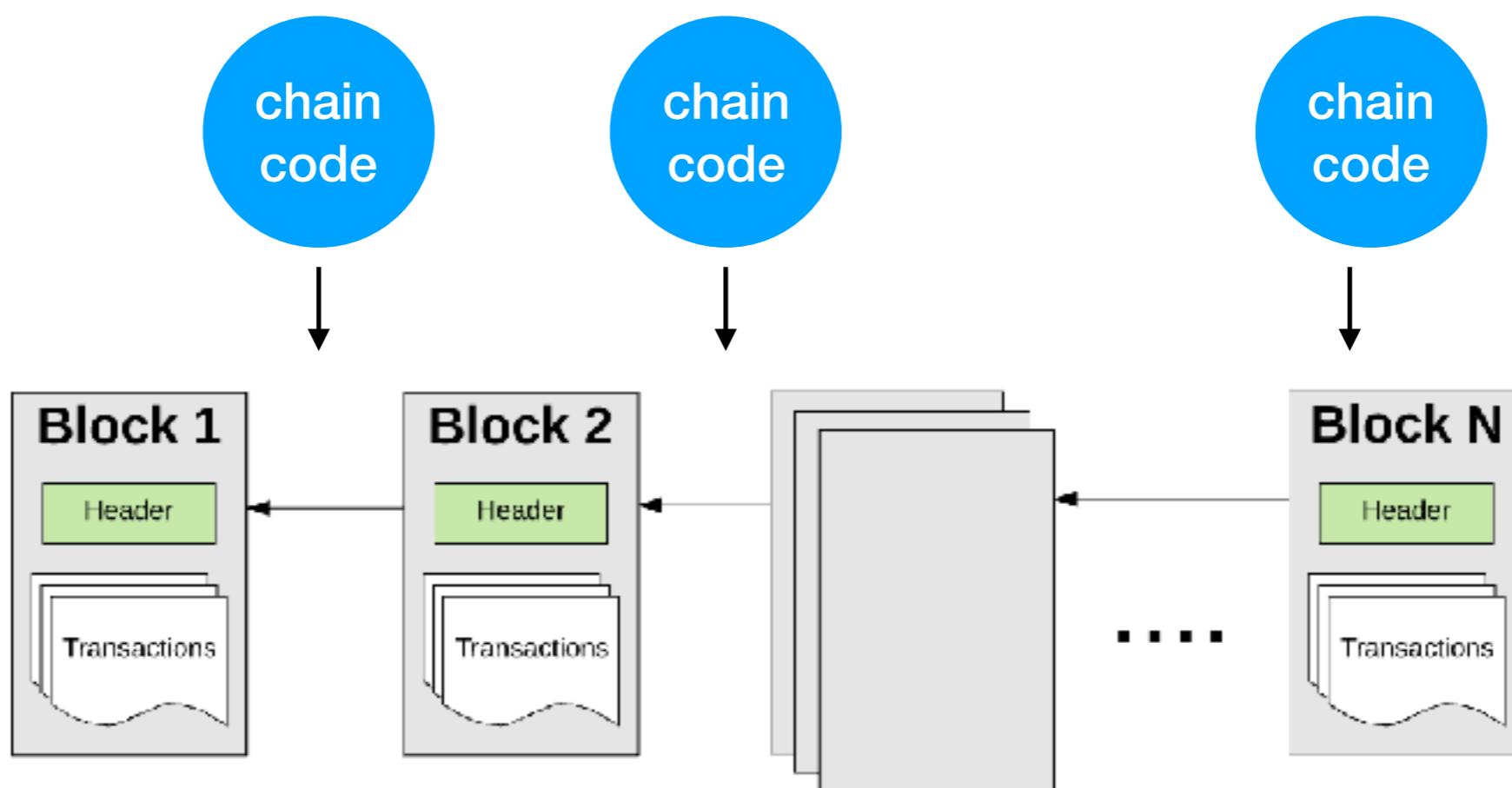


HyperLedger Fabric Model

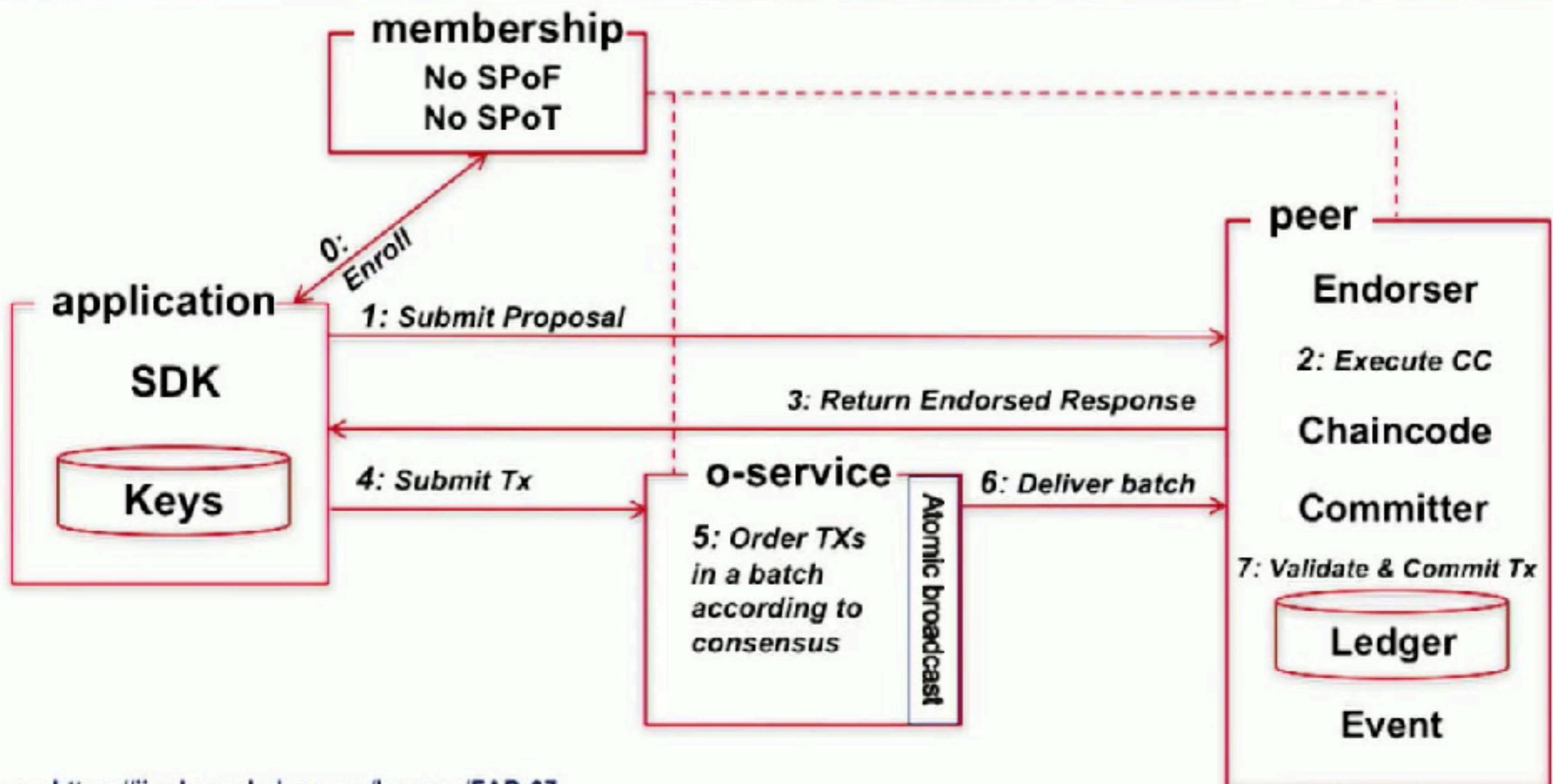
- **Assets** - Anything with monetary value
- **Chaincode** - Smart contracts (written in go, nodes, java)
- **Ledger** - blockchain (one ledger per channel)
- **Channels** - like a private network between subset of members
- **Security & membership services** - All participants have known identities
- **Consensus** - uses Byzantine fault tolerant consensus (pluggable)

Chaincode

Hyperledger Fabric, smart contracts are referred to as chaincode. Smart contract chaincode is installed onto peer nodes and instantiated to one or more channels.

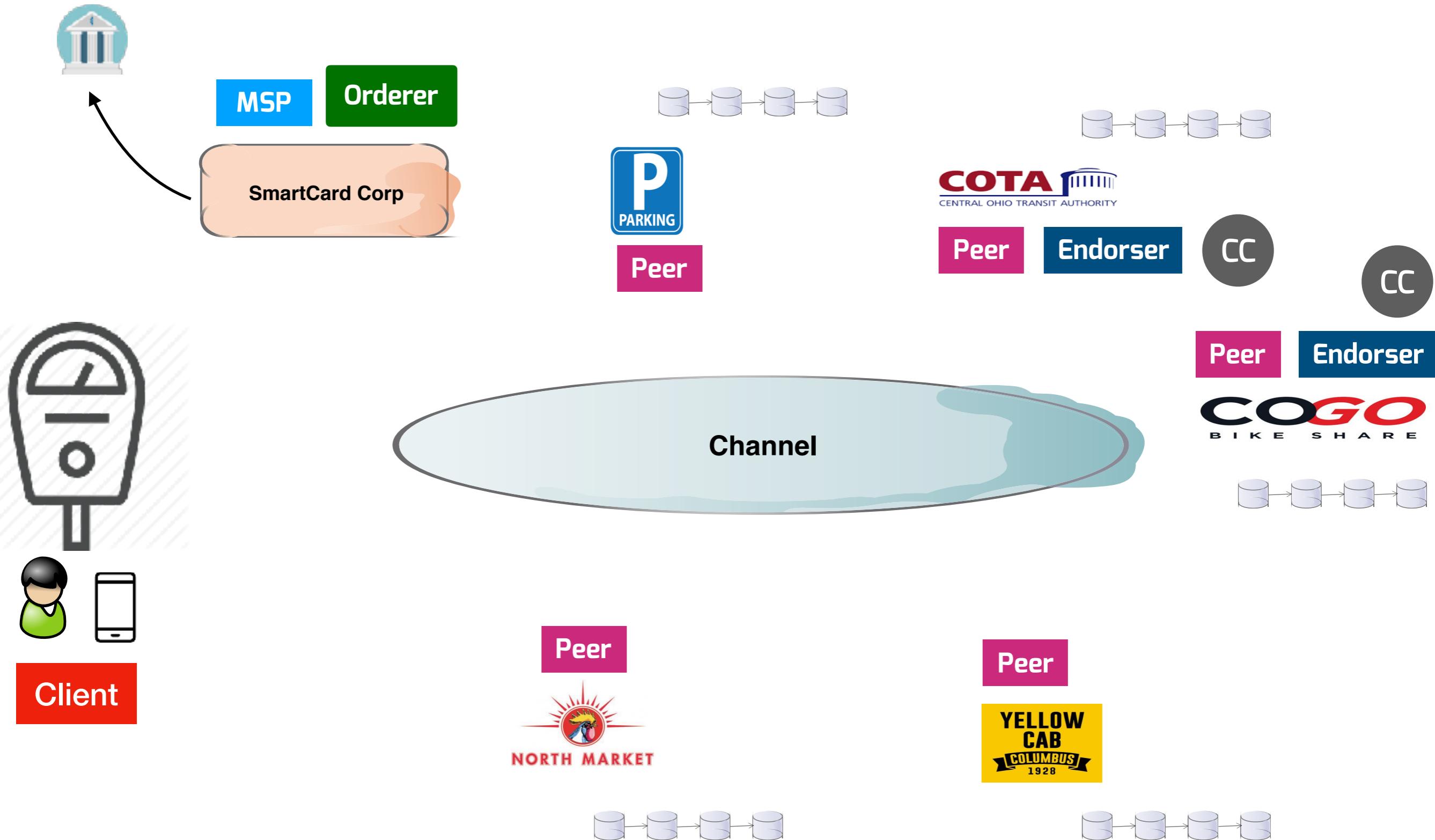


Architecture of Hyperledger Fabric v1

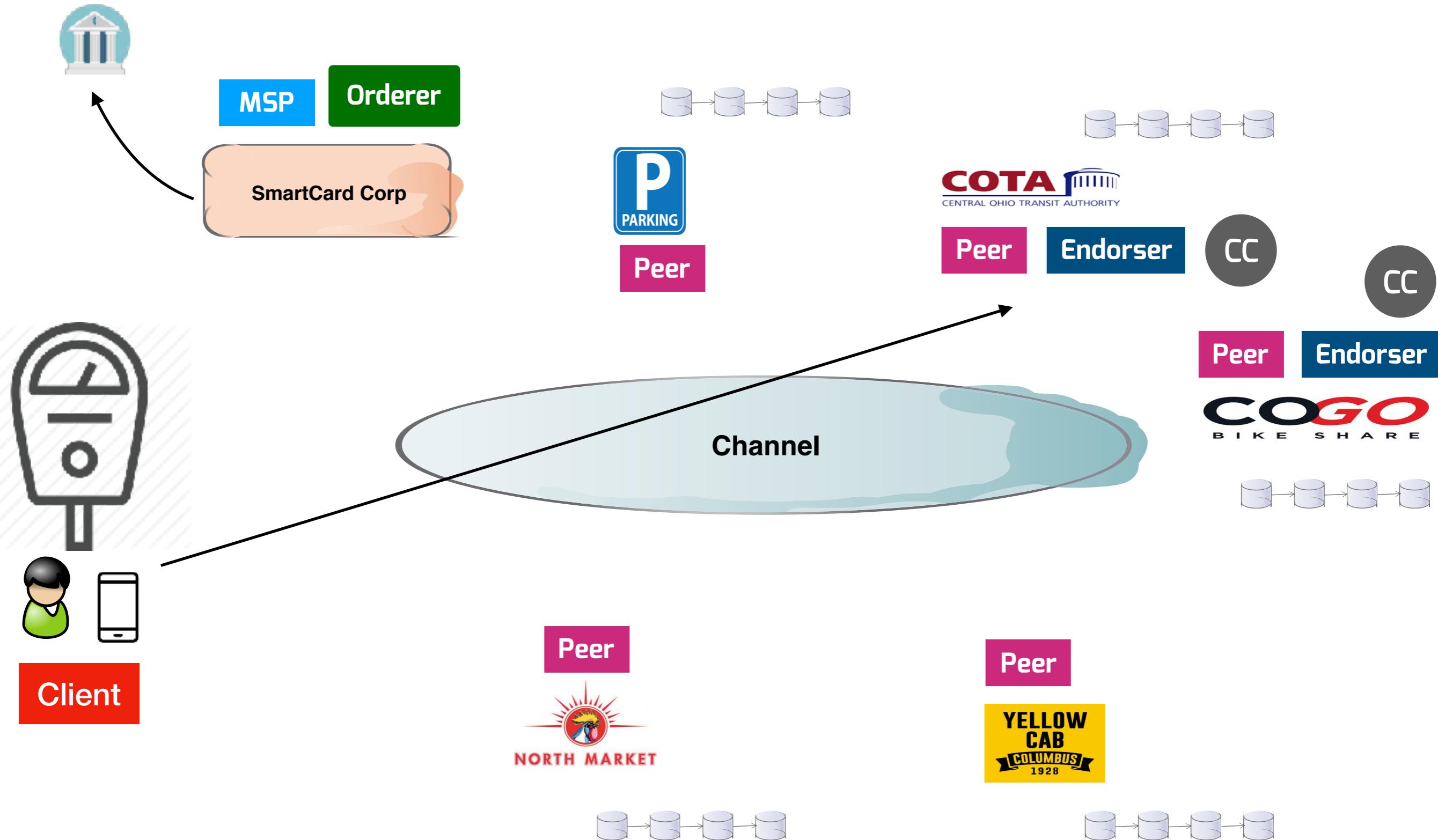


Source : <https://jira.hyperledger.org/browse/FAB-37>

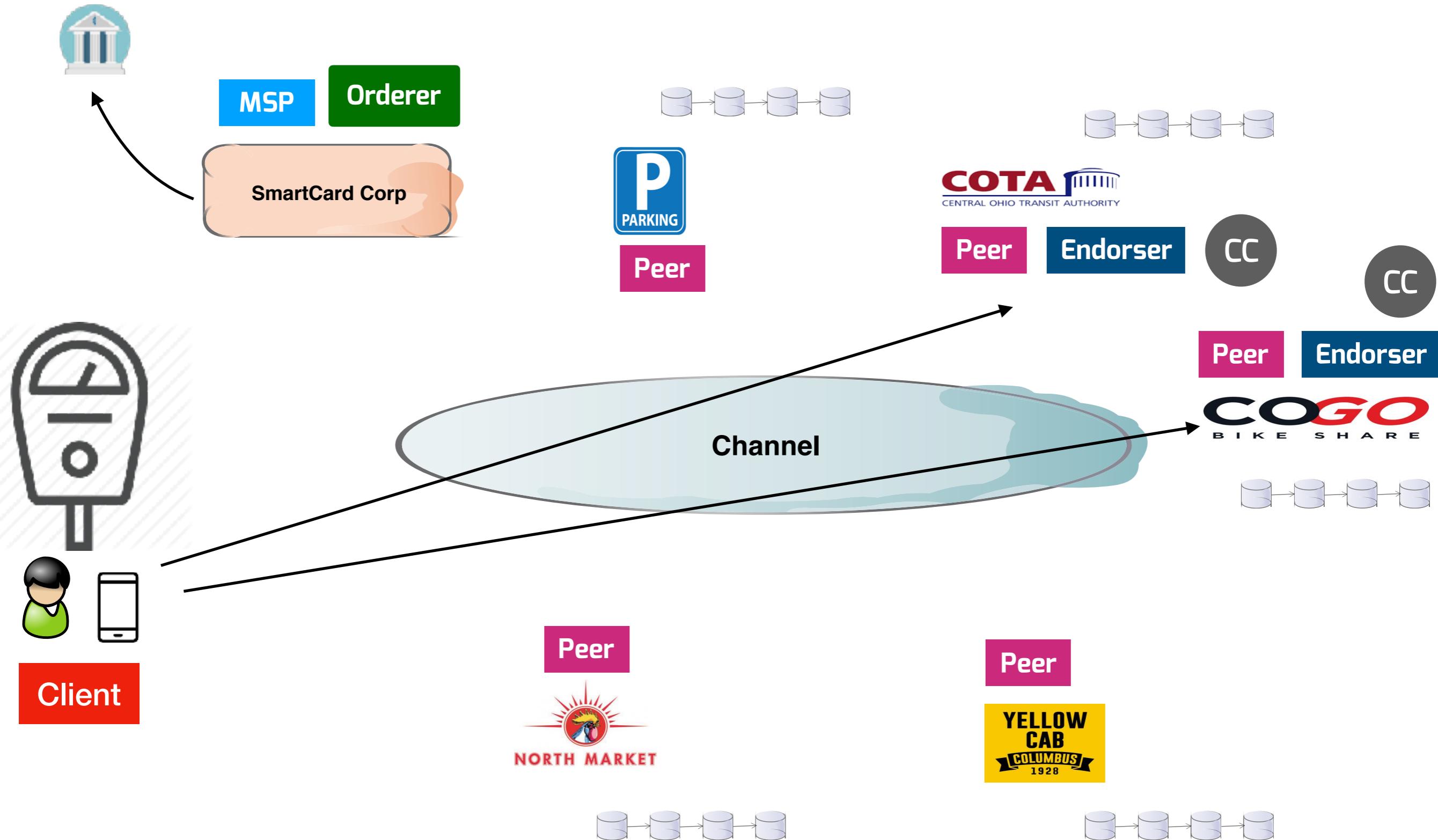
SmartCard Transaction Flow



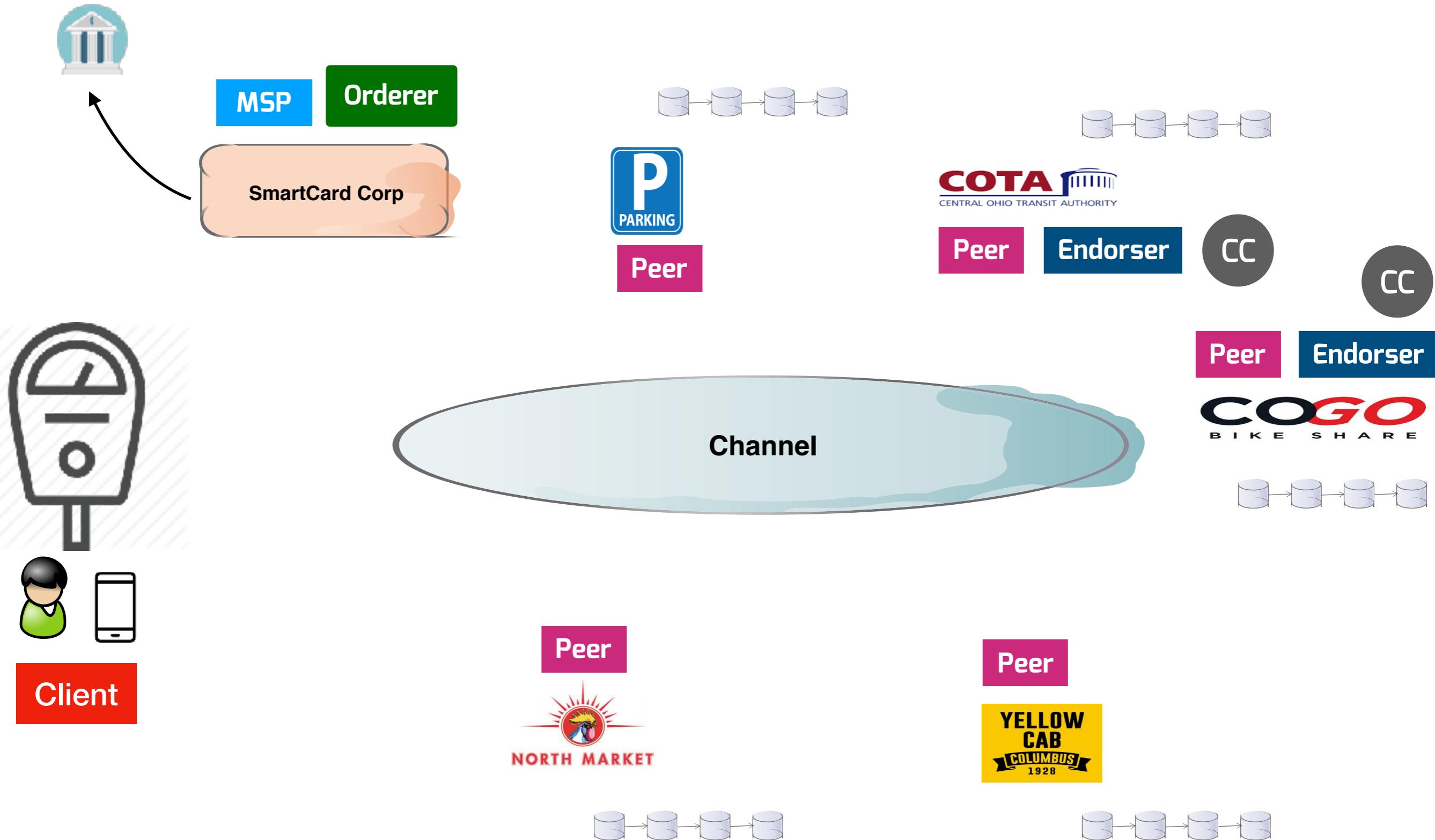
SmartCard Transaction Flow



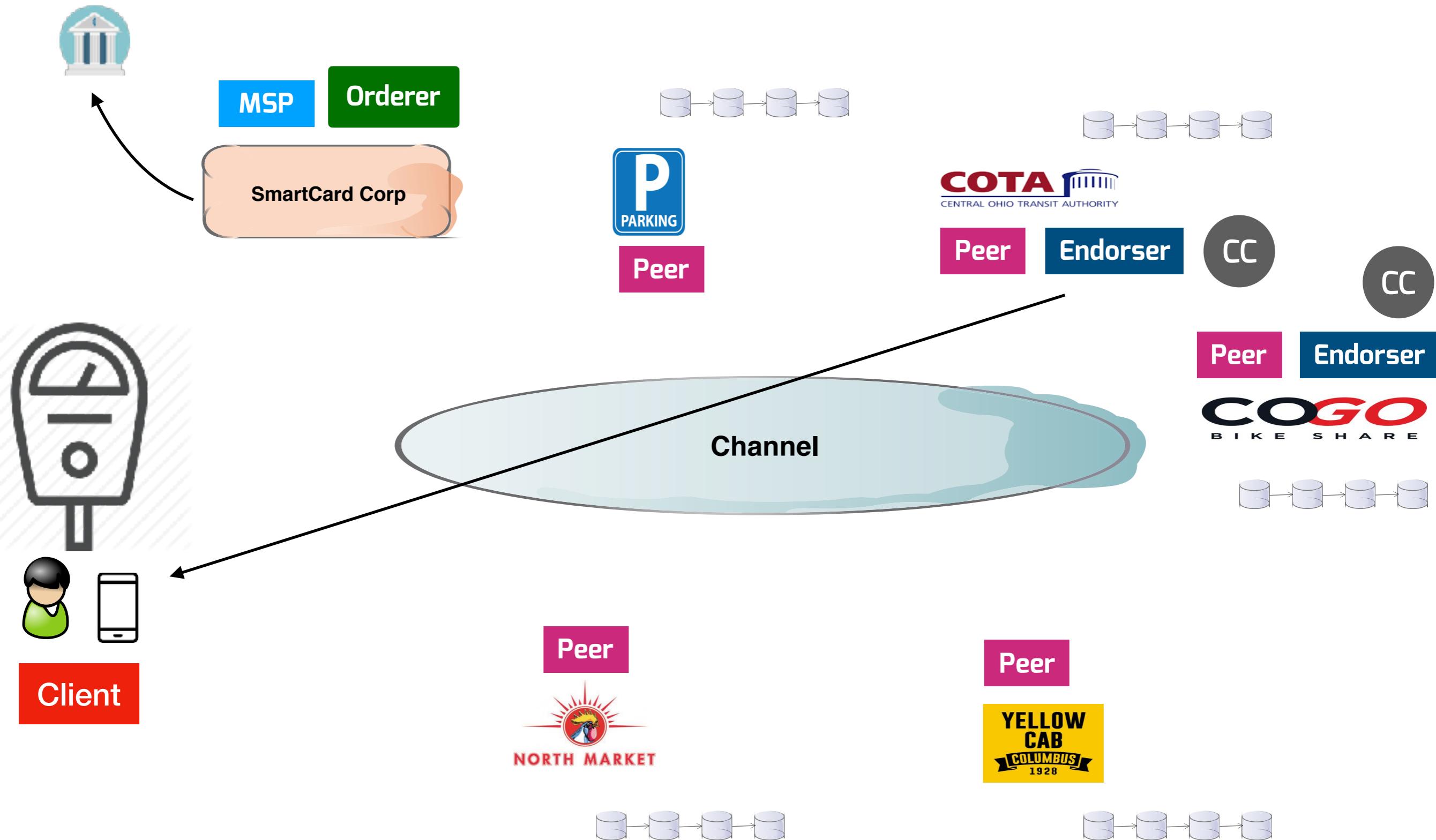
SmartCard Transaction Flow



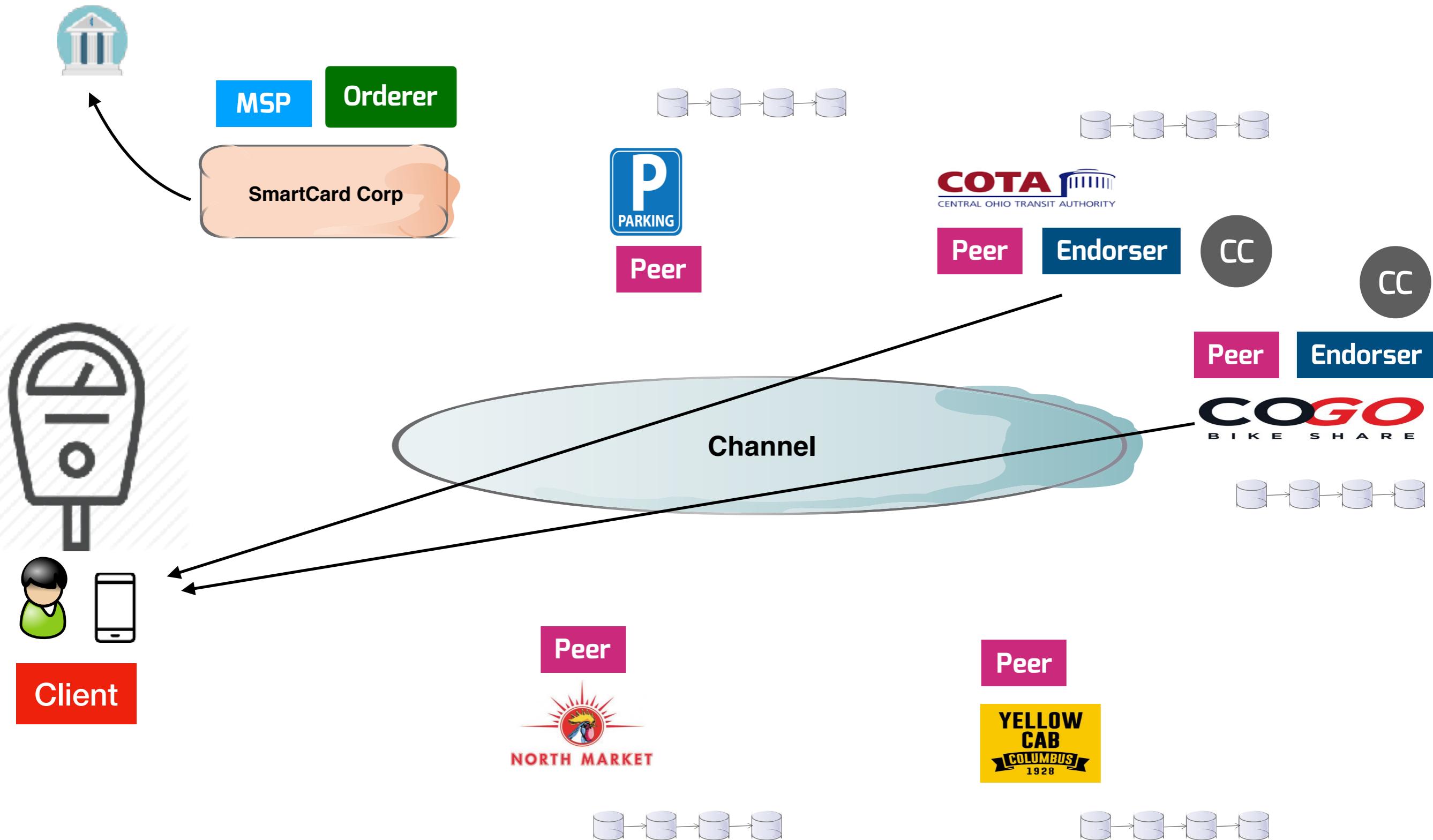
SmartCard Transaction Flow



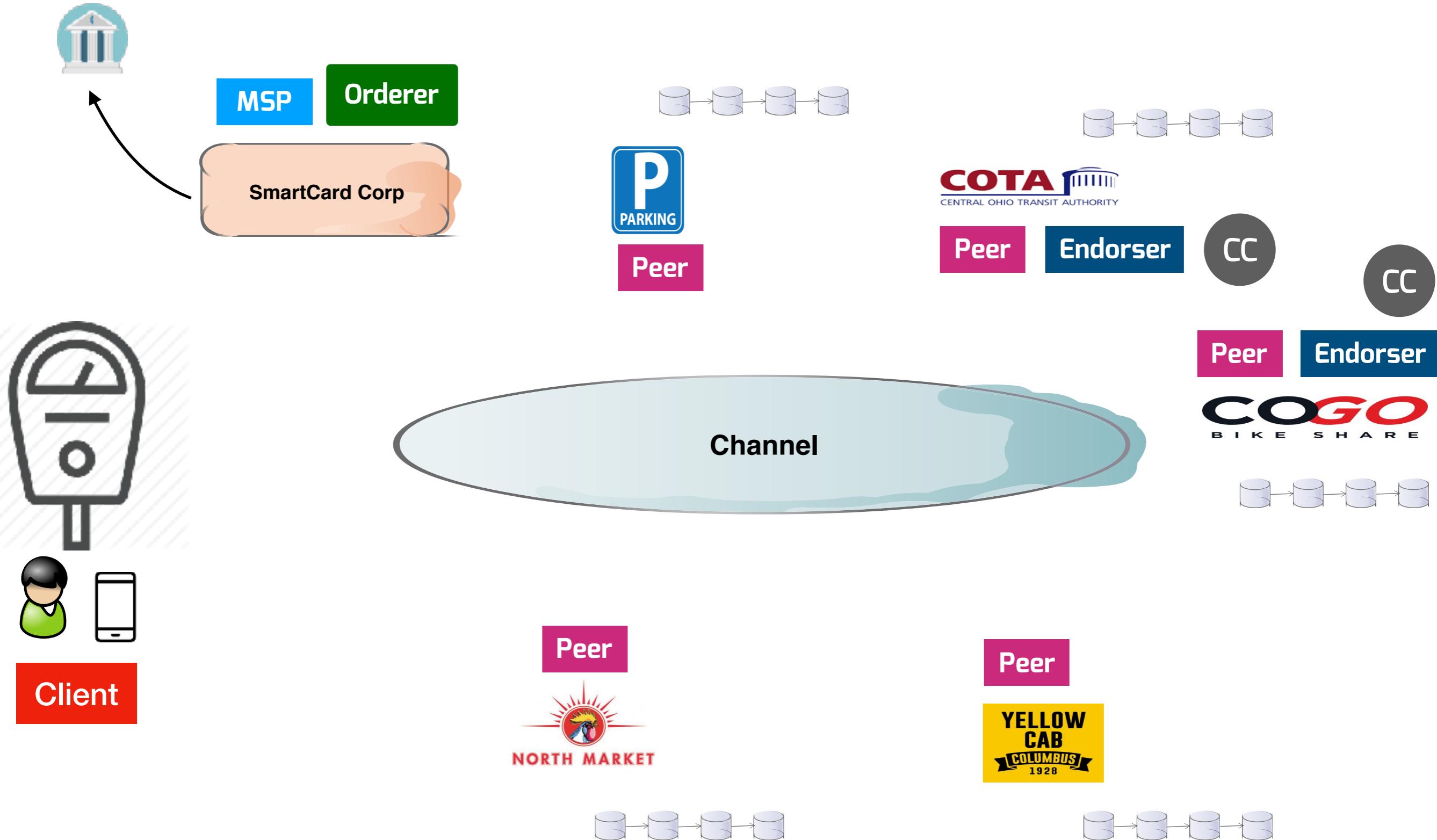
SmartCard Transaction Flow



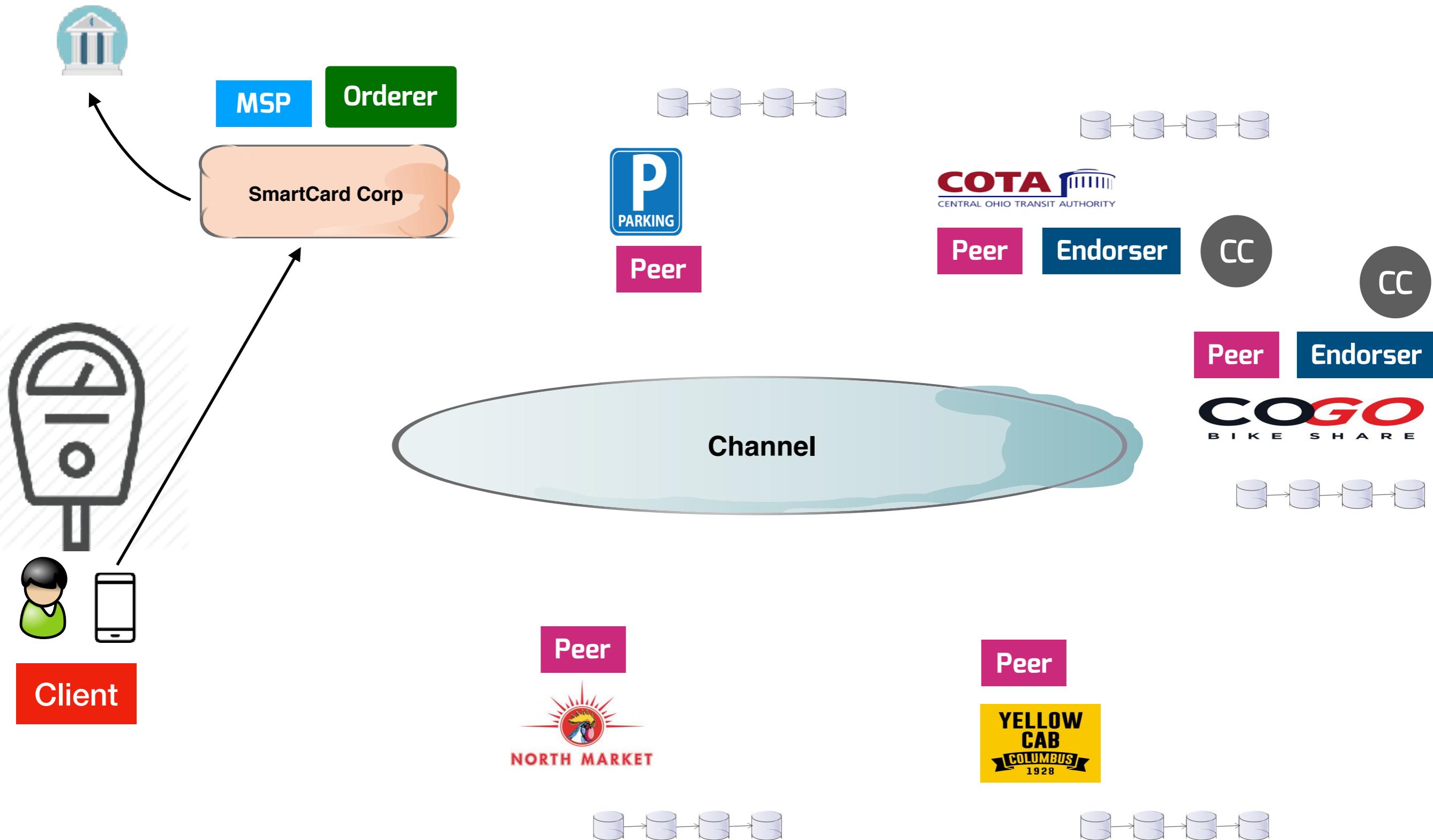
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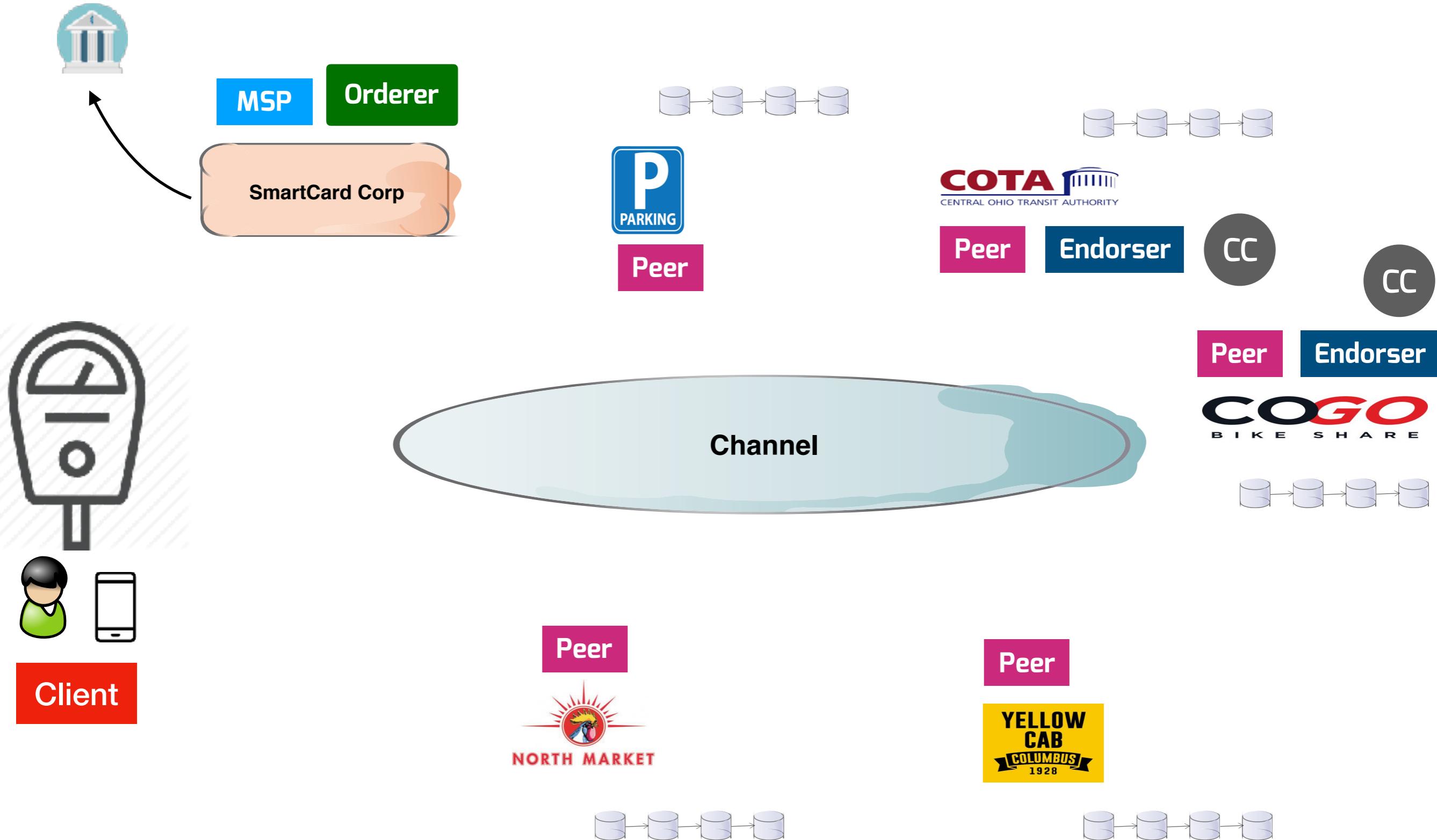
SmartCard Transaction Flow



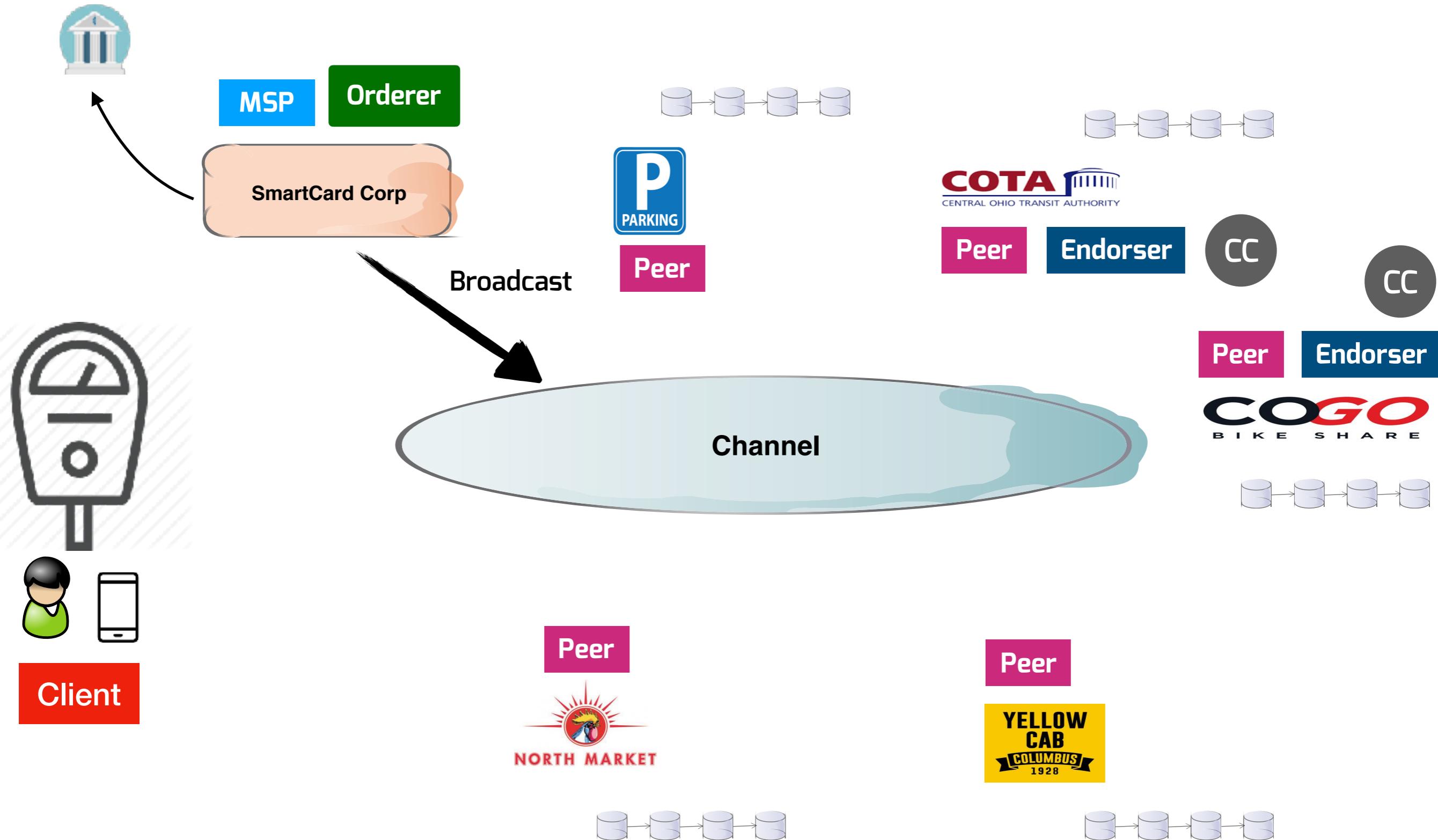
SmartCard Transaction Flow



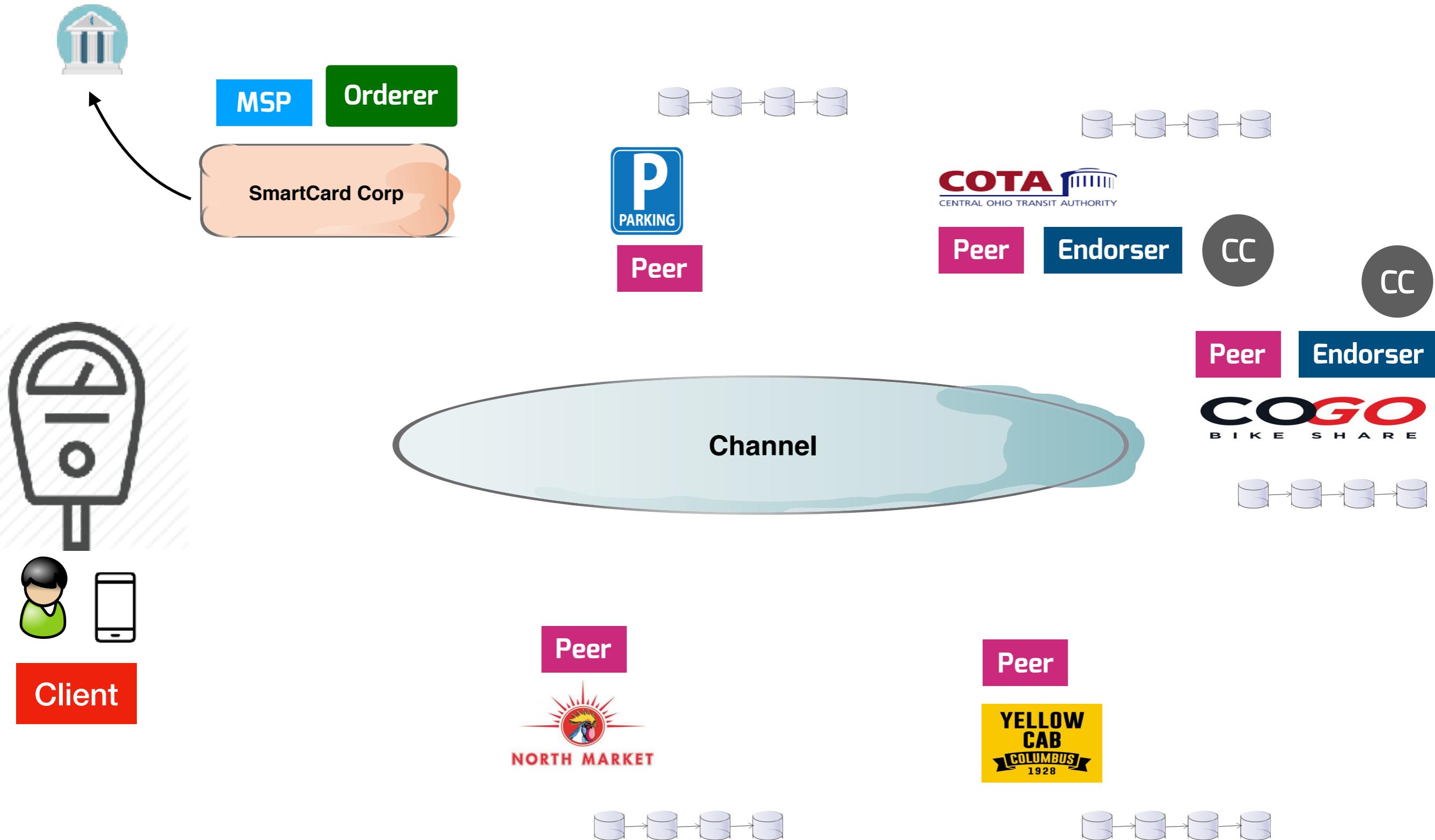
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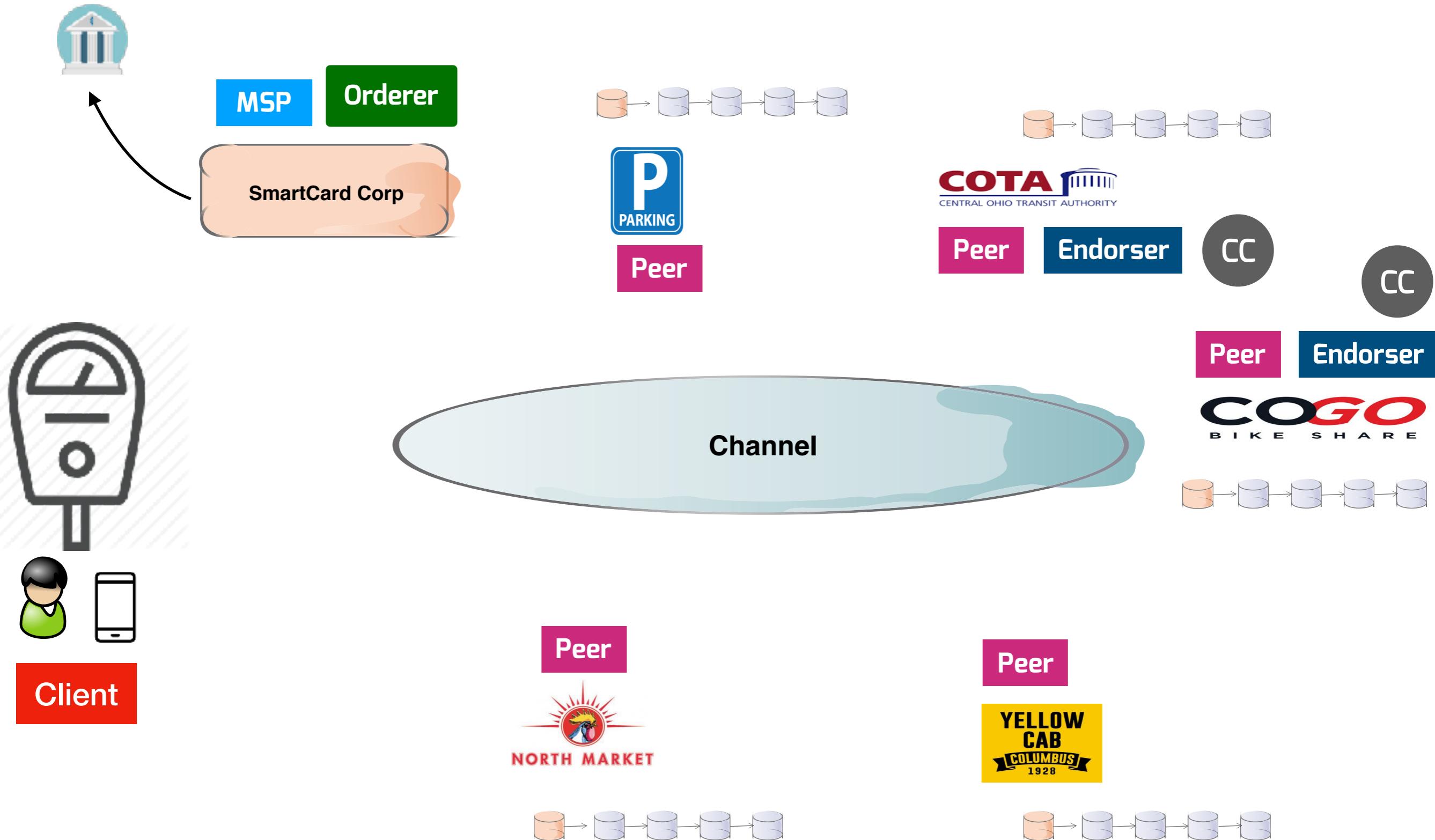
SmartCard Transaction Flow



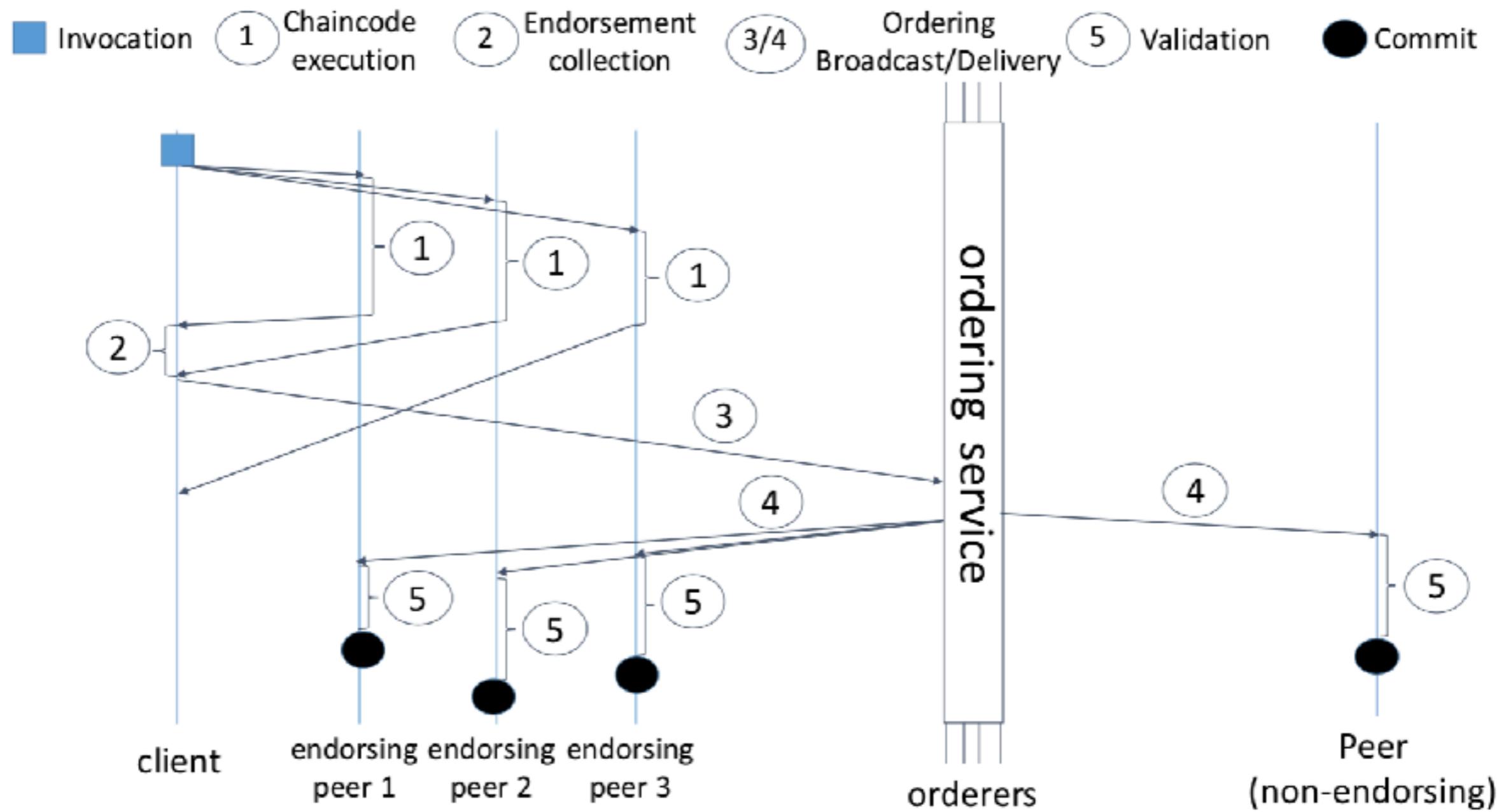
SmartCard Transaction Flow



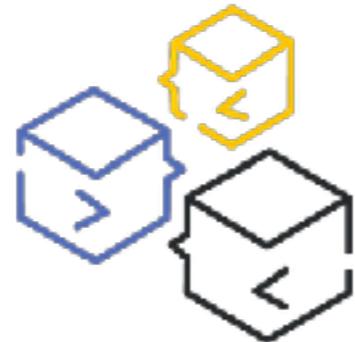
SmartCard Transaction Flow



Transaction Flow



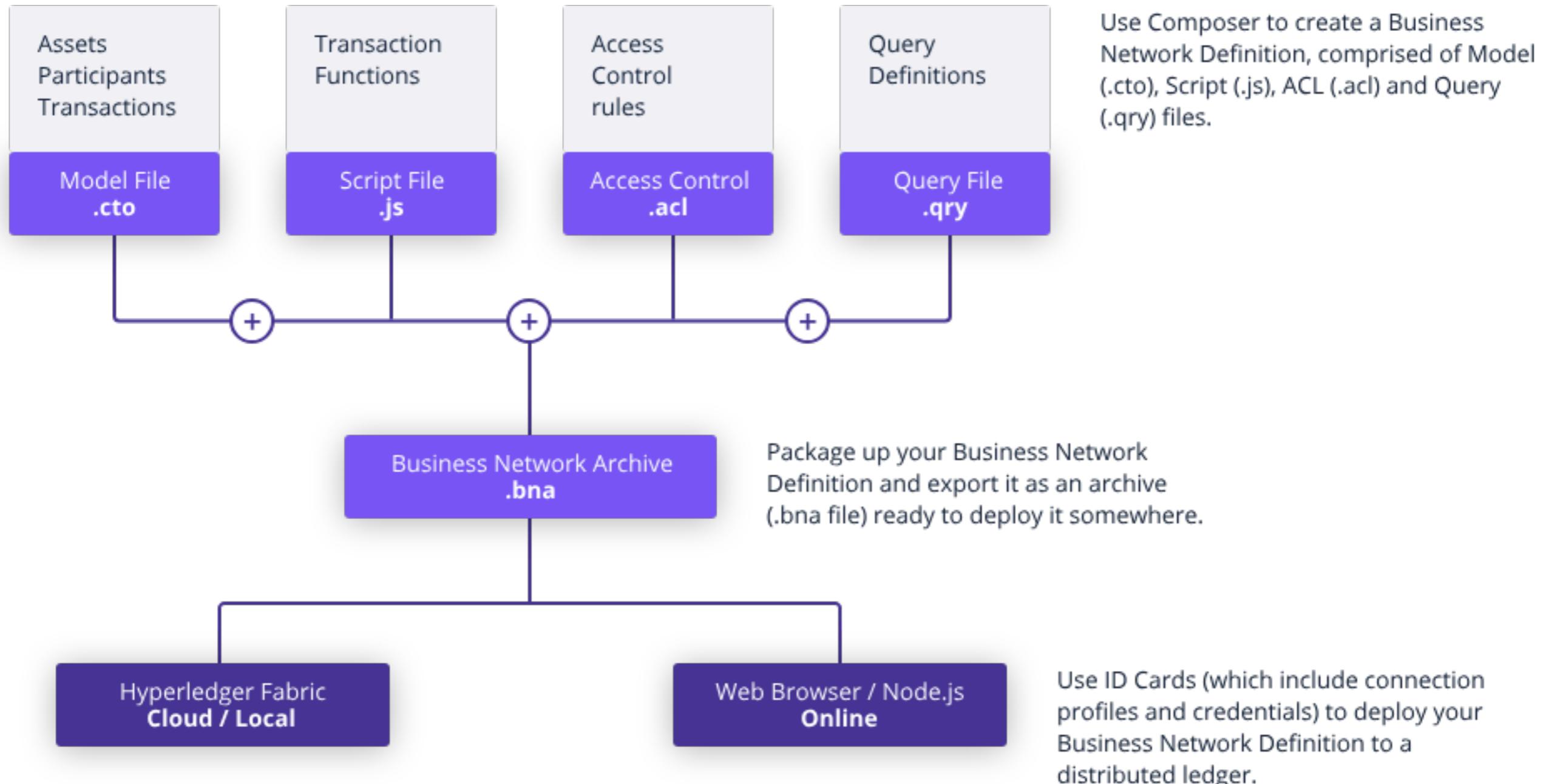
Modeling smart card



HYPERLEDGER **COMPOSER**

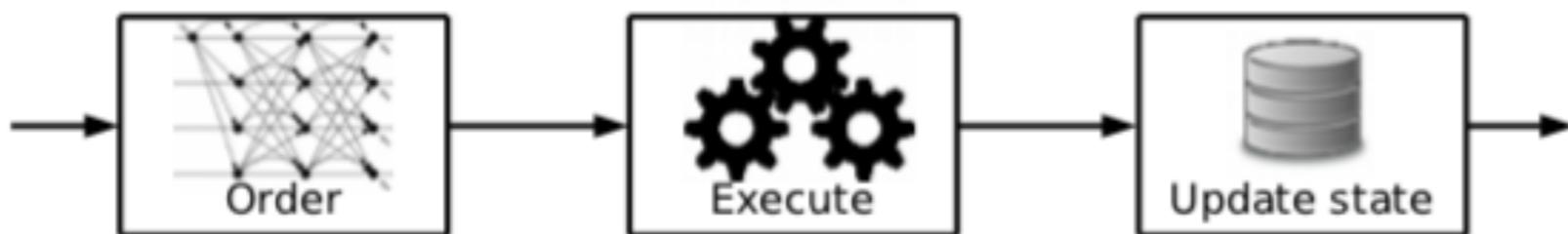
Hyperledger Composer is an extensive, open development toolset and framework to make developing blockchain applications easier

Composer Components



Demo

Difference between Ethereum and Hyperledger



- Consensus or atomic broadcast
- Deterministic (!) execution
- Persist state on all peers

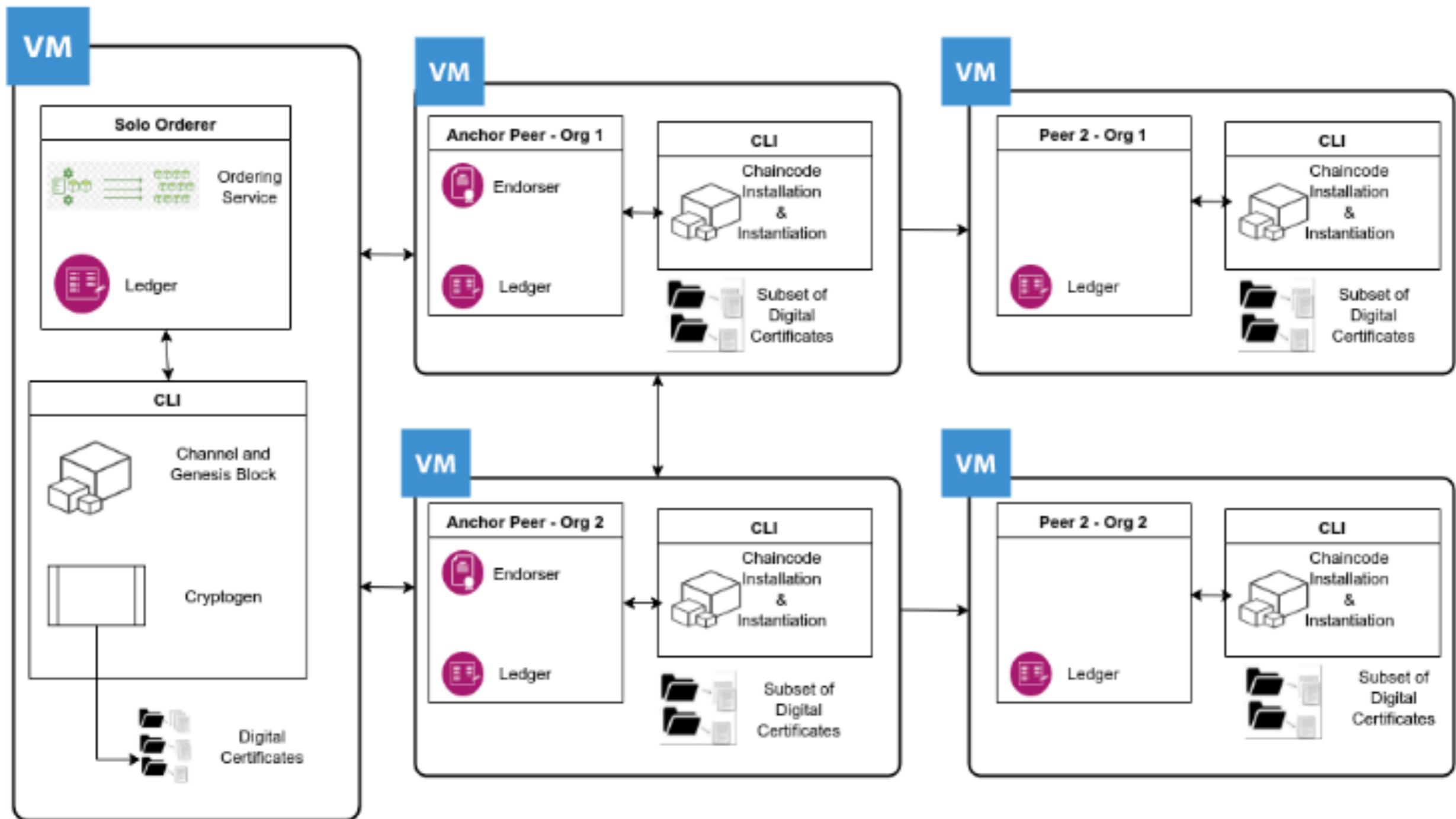
Vs.



- Simulate trans. and endorse
- Create rw-set
- Collect endorsements
- Order rw-sets
- Atomic broadcast (consensus)
- Stateless ordering service
- Validate endorsements & rw-sets
- Eliminate invalid and conflicting trans.
- Persist state on all peers

Thanks

Proposed Network setup in multiple VMs



Glossary

- Address
- Block
- Consensus
- Cryptocurrency
- Cryptographic Hash function
- Dapp
- Digital Signature
- Public Address
- Private key
- Wallet

Blockchain

Blockchain is cryptographically secure transactional singleton machine with shared-state.

