



# Hyperledger

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By Code Eater



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# Prerequisites

No Perquisites

# What is Hyperledger ?

- Private Permissioned Blockchain



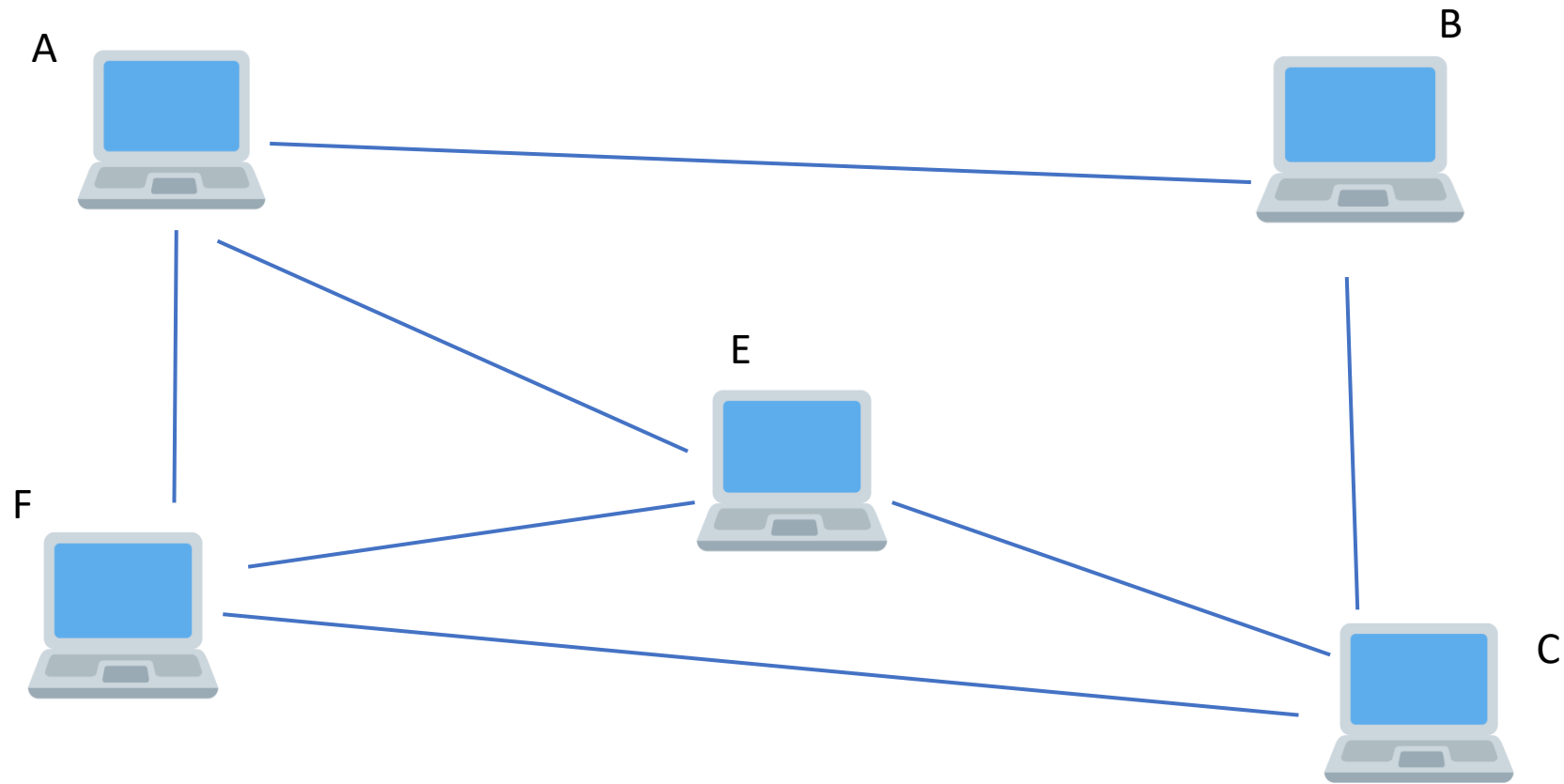
# Why Hyperledger (Enterprise Blockchain) ?

Why



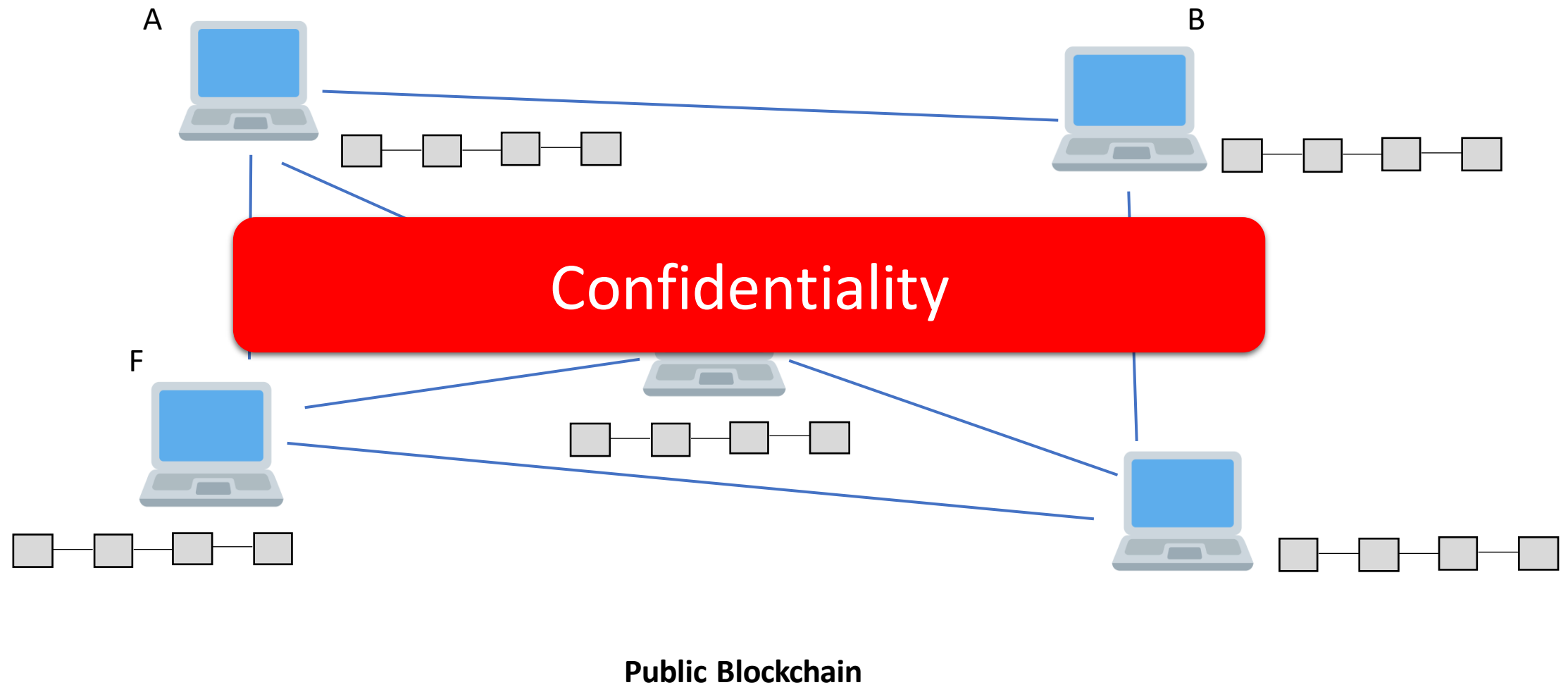
Issues with Public  
blockchain

# Issues with public blockchain

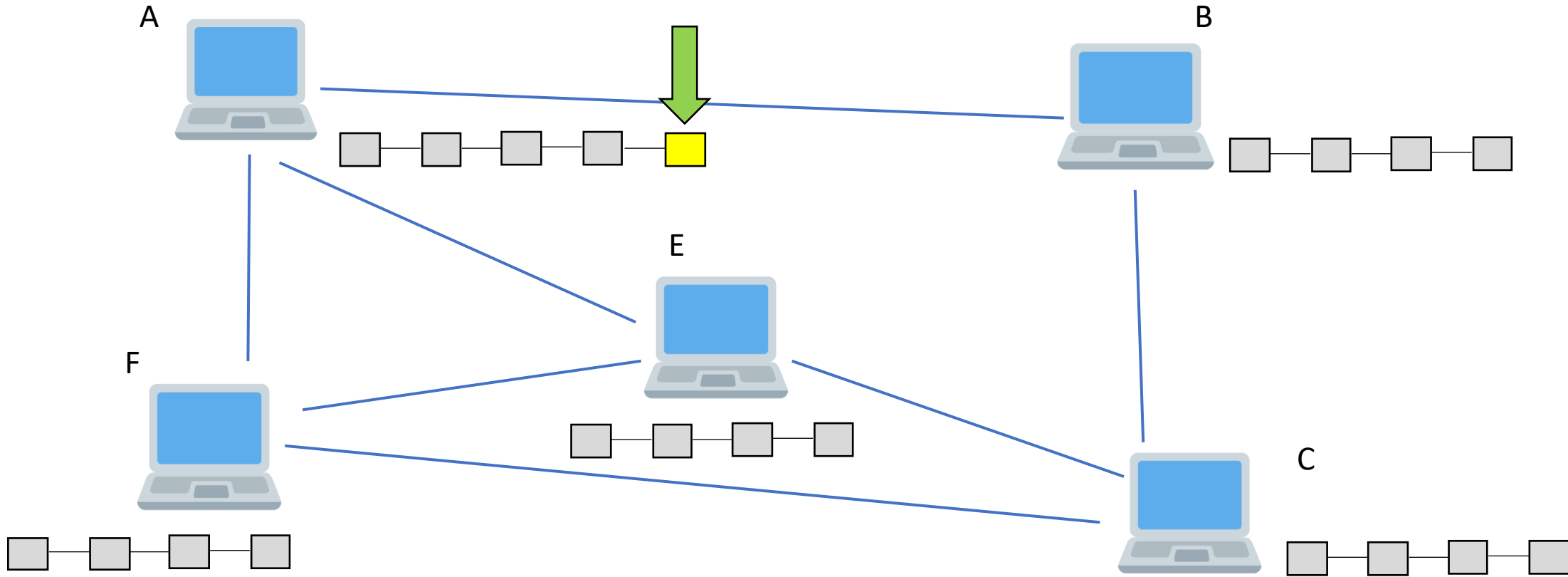


**Public Blockchain**

# Issues with public blockchain

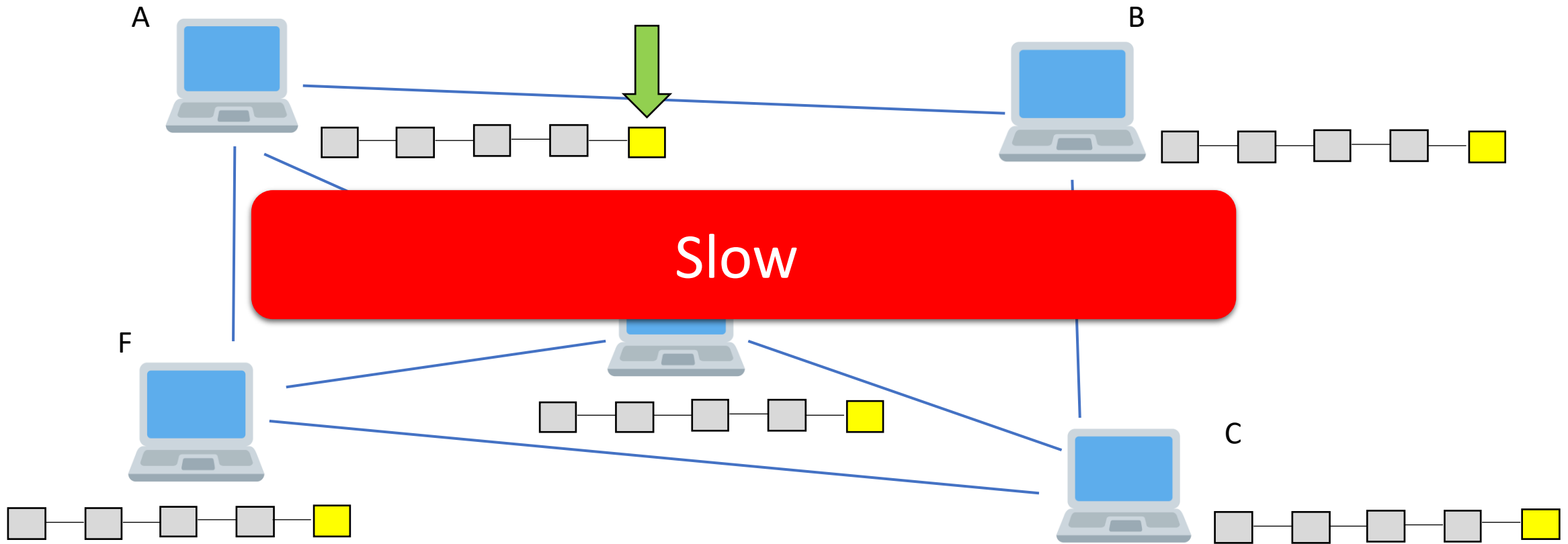


# Issues with public blockchain

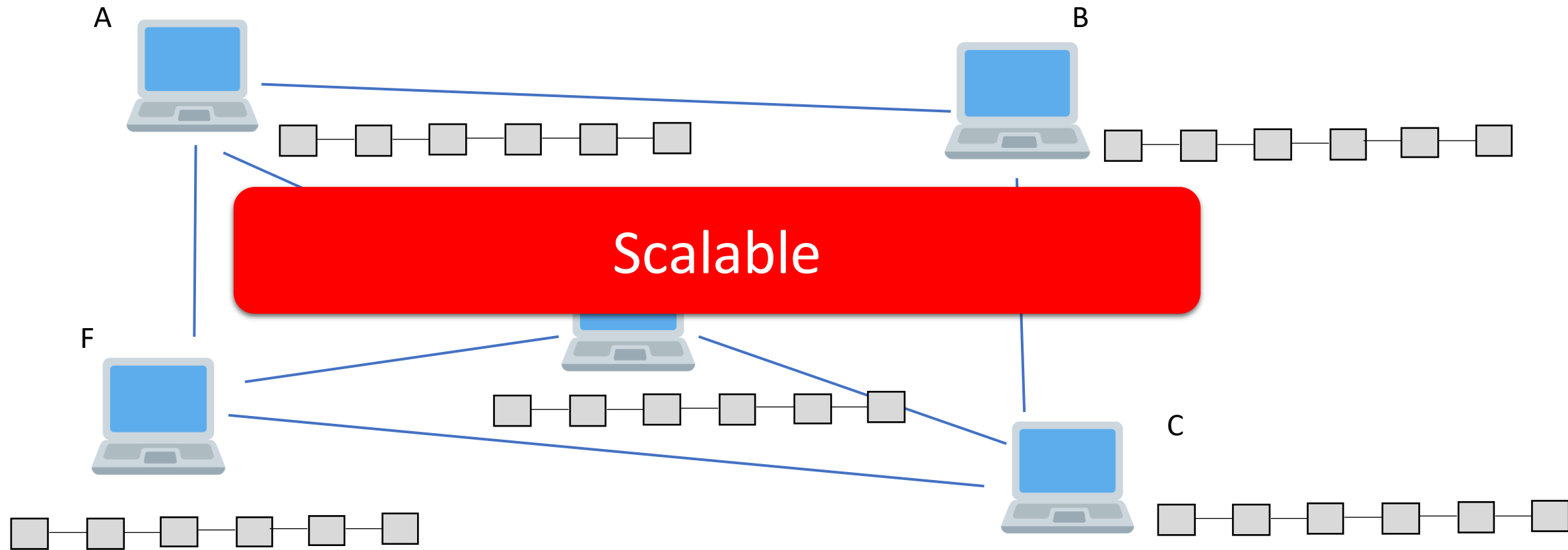


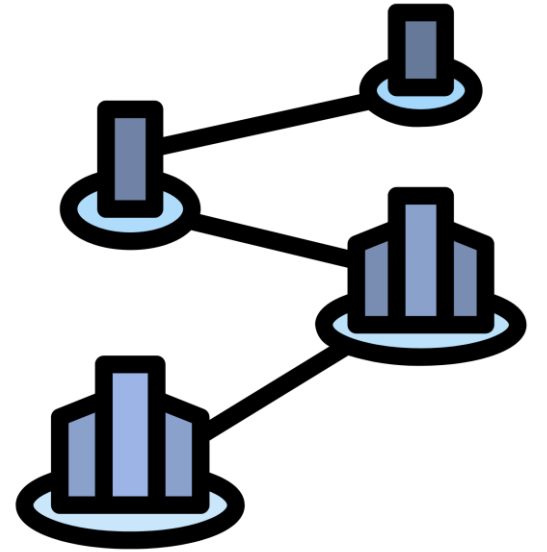
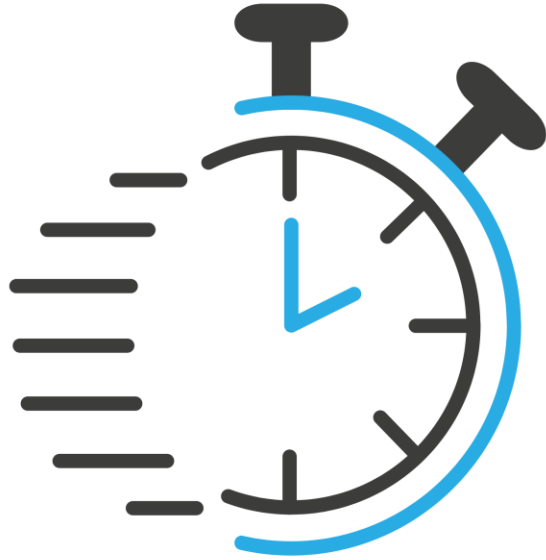


# Issues with public blockchain



# Issues with public blockchain



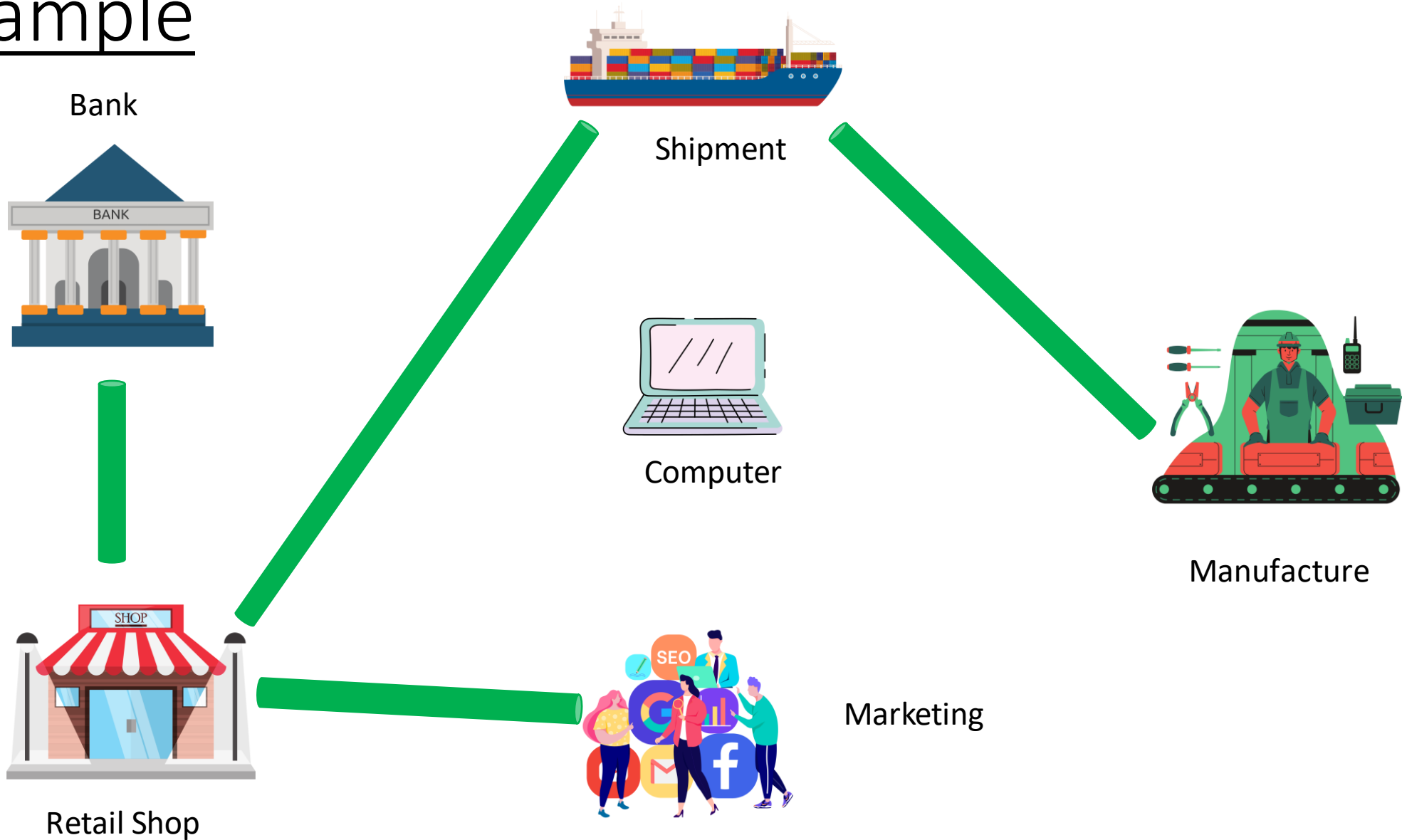


Why Hyperledger (Enterprise Blockchain) ?

# Public Blockchain vs Private Blockchain

Properties	Public Blockchain	Private Blockchain
Decentralize Ledger	✓	✓
Same Ledger	✓	✗
Immutable	✓	✓
Anonymous	✓	✗
All node verification	✓	✗
Smart Contract	✓	✓
Transparent	✓	✗

# Example



# Public Blockchain vs Private Blockchain

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Transparent	✓	✗

# Introduction to Hyperledger Fabric

- Hyperledger (or the Hyperledger project) is **an umbrella project of open source blockchains and related tools**, started in December 2015 by the **Linux Foundation**.

# Hyperledger Fabric

Modular

The diagram consists of three vertically stacked horizontal bars. Each bar has a colored rounded rectangle on the left and a white rectangle on the right. The top bar is orange, the middle is green, and the bottom is blue. The word 'Modular' is written in white inside the orange rounded rectangle. The word 'Scalable' is written in white inside the green rounded rectangle. The word 'Secure' is written in white inside the blue rounded rectangle. The white rectangles on the right are empty.

Scalable

Secure



# Hyperledger Fabric

Chain code

MSP

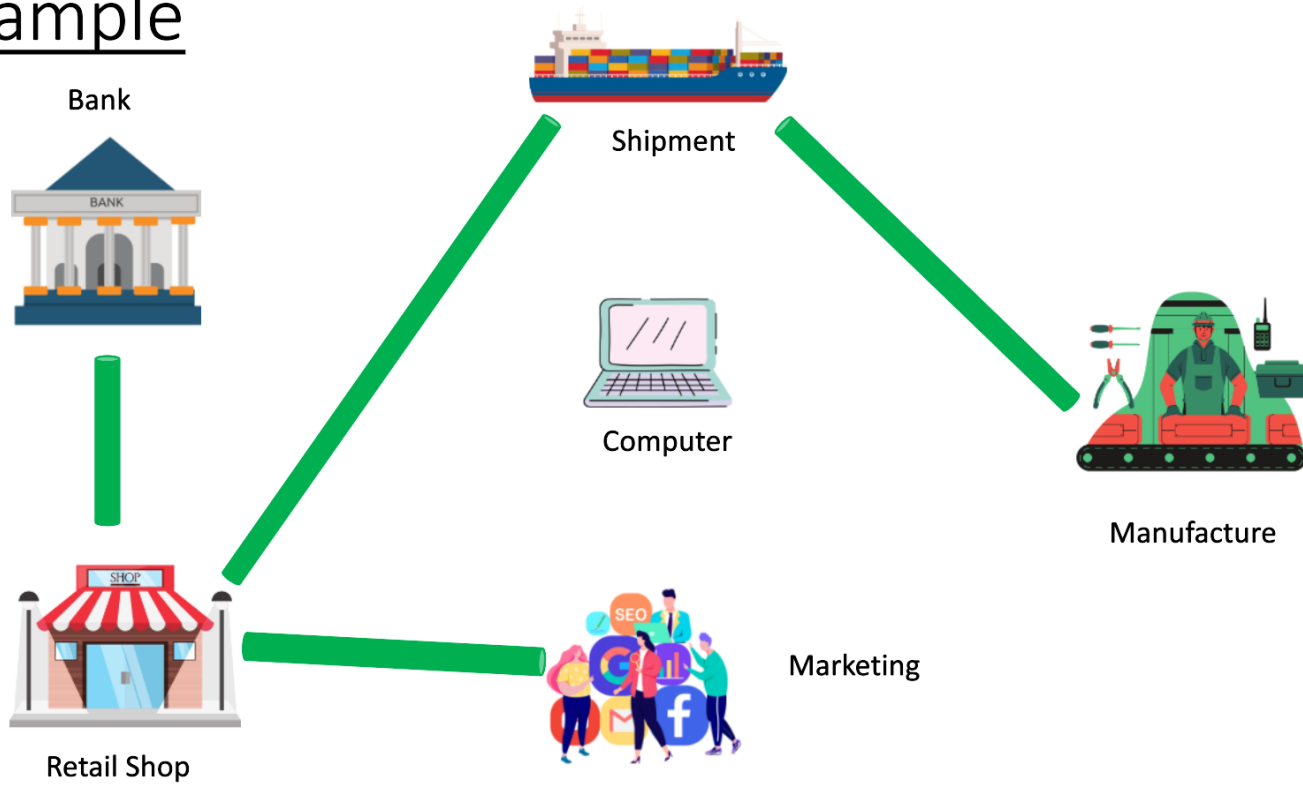
Channel

# Channel

- A channel is a **private communication pathway between two or more members of a Hyperledger.**

# Channel

## Example



# MSP (Member Service Provider)

- MSP is a **modular component that is used to manage identities on the blockchain network**. This provider is used to authenticate clients who want to join the blockchain network.

# Access Control List

- An access control list (ACL) is **a list of rules that specifies which users or systems are granted or denied access to a particular object or system resource.**
- Full access of transaction can be restricted with this.

# Different Types of Nodes

- **Committing Nodes** - Nodes that have all the copies of the ledger.
- **Endorsing Nodes** - Nodes that can execute chain code.
- **Ordering Nodes** - Nodes that maintain the sequence of transactions.

# Chaincode

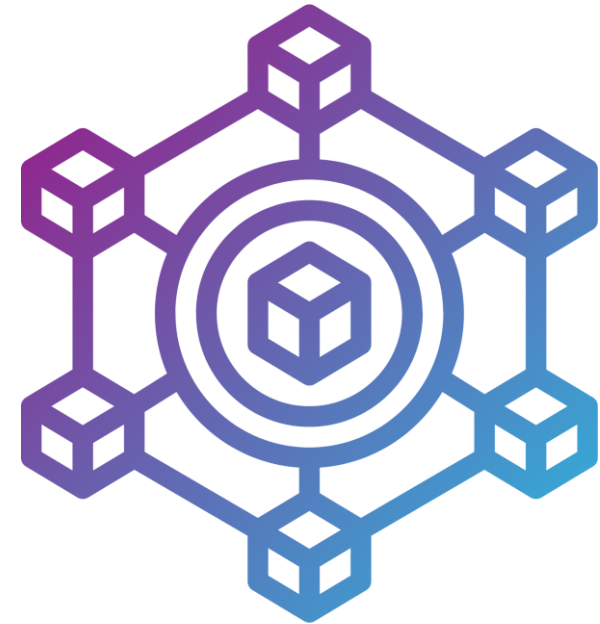
- Chaincode is a program, written in Go, node.js, or Java that implements a prescribed interface.

# Hyperledger Transaction Flow

## 1) Client initiating a transaction



Read



MSP



Access Control  
List





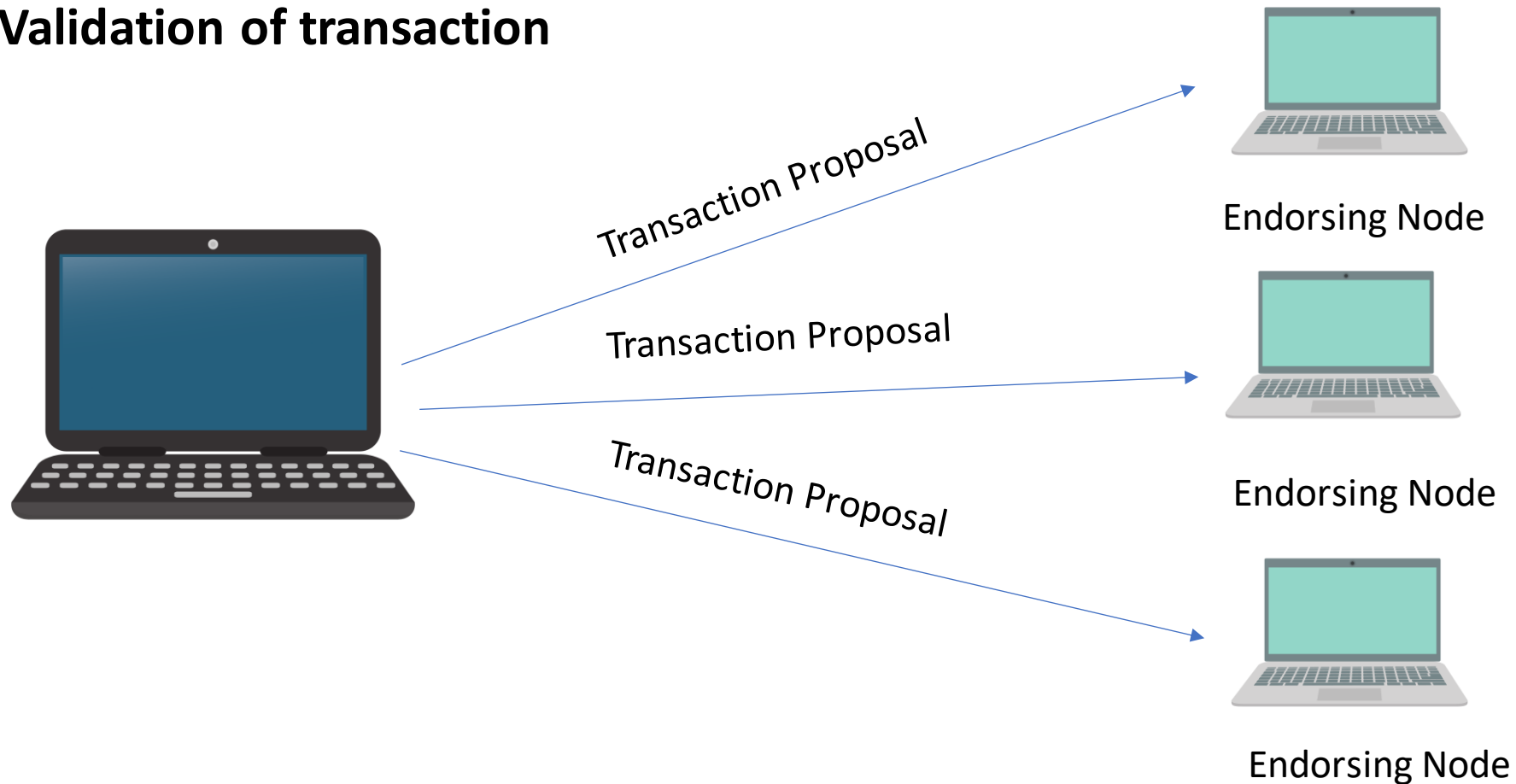
# Hyperledger Transaction Flow

## **2) Validation of transaction**



# Hyperledger Transaction Flow

## 2) Validation of transaction

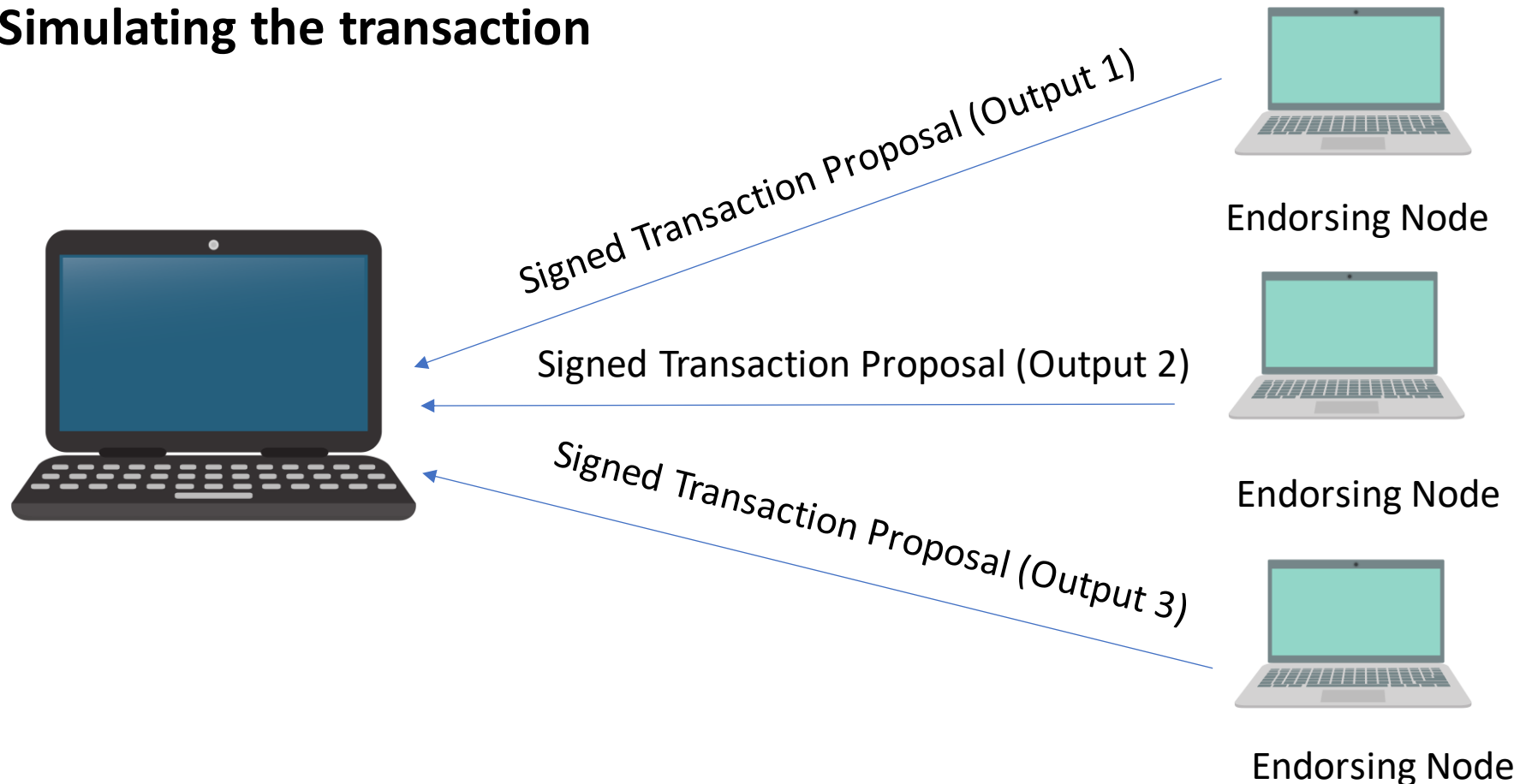


# Hyperledger Transaction Flow

## **3) Simulating the transaction**

# Hyperledger Transaction Flow

## 3) Simulating the transaction



# Hyperledger Transaction Flow

## 4) Verifying Proposal Response



51% consensus

Signed Transaction Proposal (Output 1)

Signed Transaction Proposal (Output 2)

Signed Transaction Proposal (Output 3)



Endorsing Node



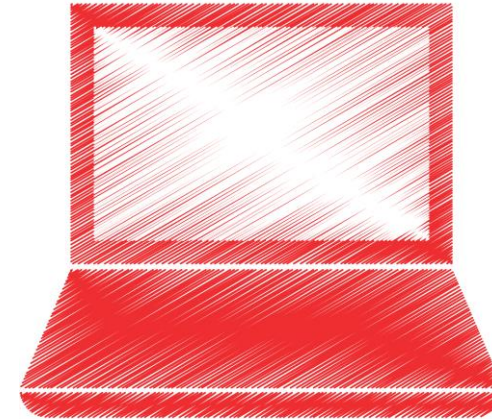
Endorsing Node



Endorsing Node

# Hyperledger Transaction Flow

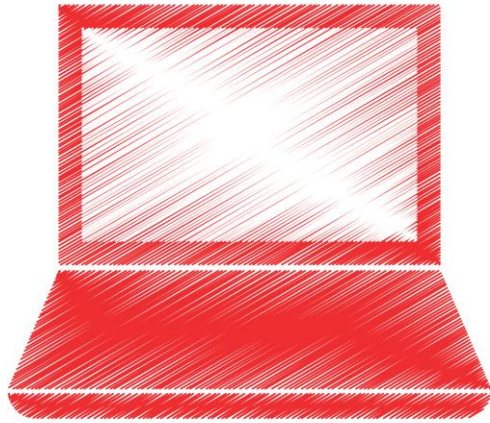
## 5) Broadcast transaction to the orderer



Orderer Node

# Hyperledger Transaction Flow

## 6) Order transaction and create block

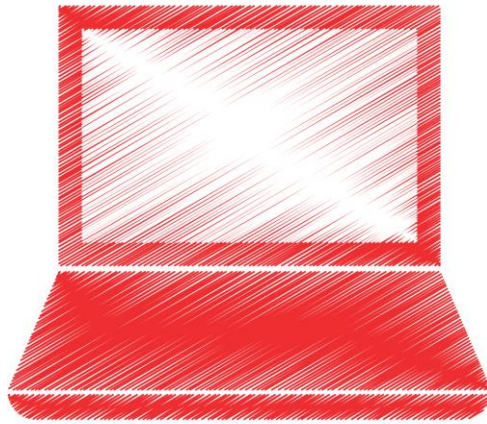


Orderer Node



# Hyperledger Transaction Flow

## 6) Order transaction and create block



Orderer Node



Committing Node



Committing Node



Endorsing Node



Endorsing Node

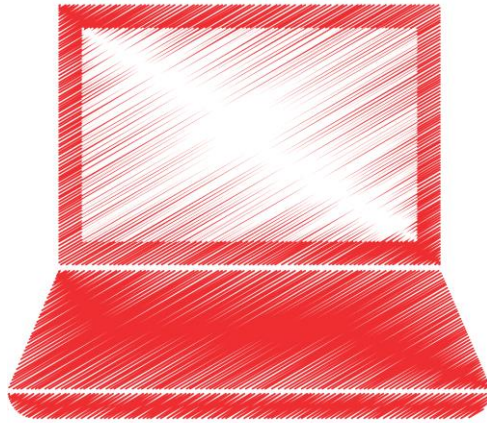


Endorsing Node



# Hyperledger Transaction Flow

## 7) Peers validate each transaction in the block



Orderer Node



Committing Node



Committing Node



Endorsing Node



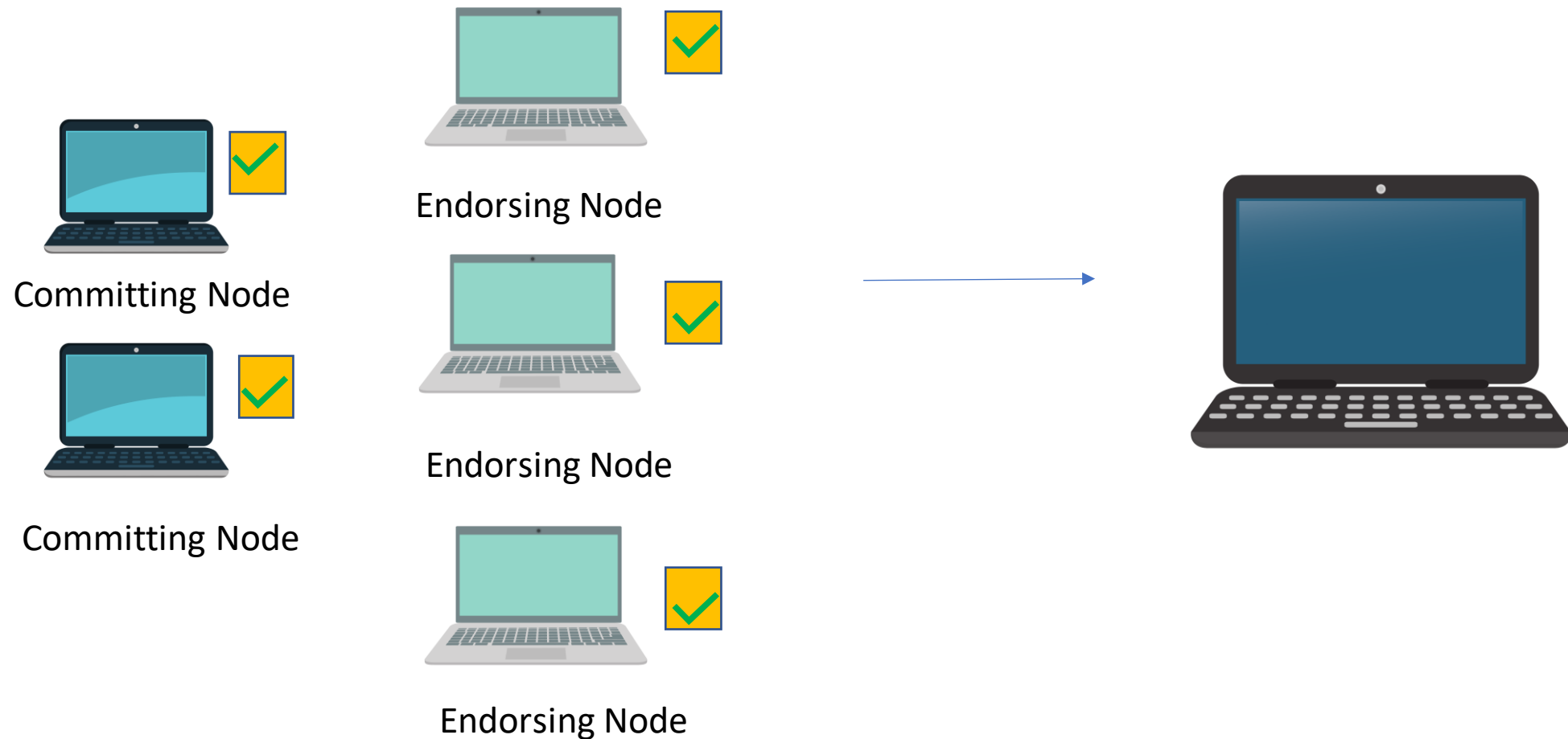
Endorsing Node



Endorsing Node

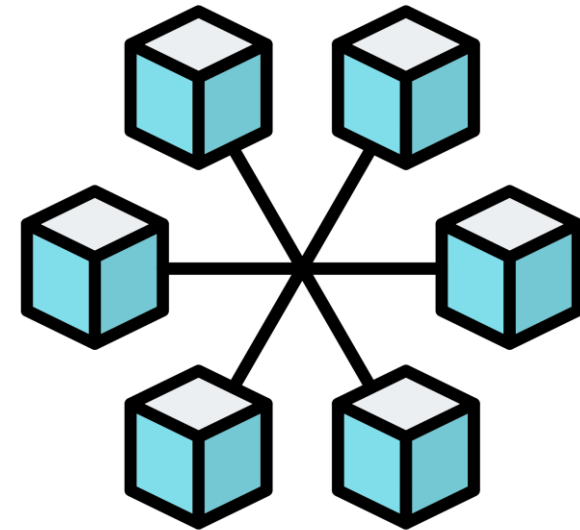
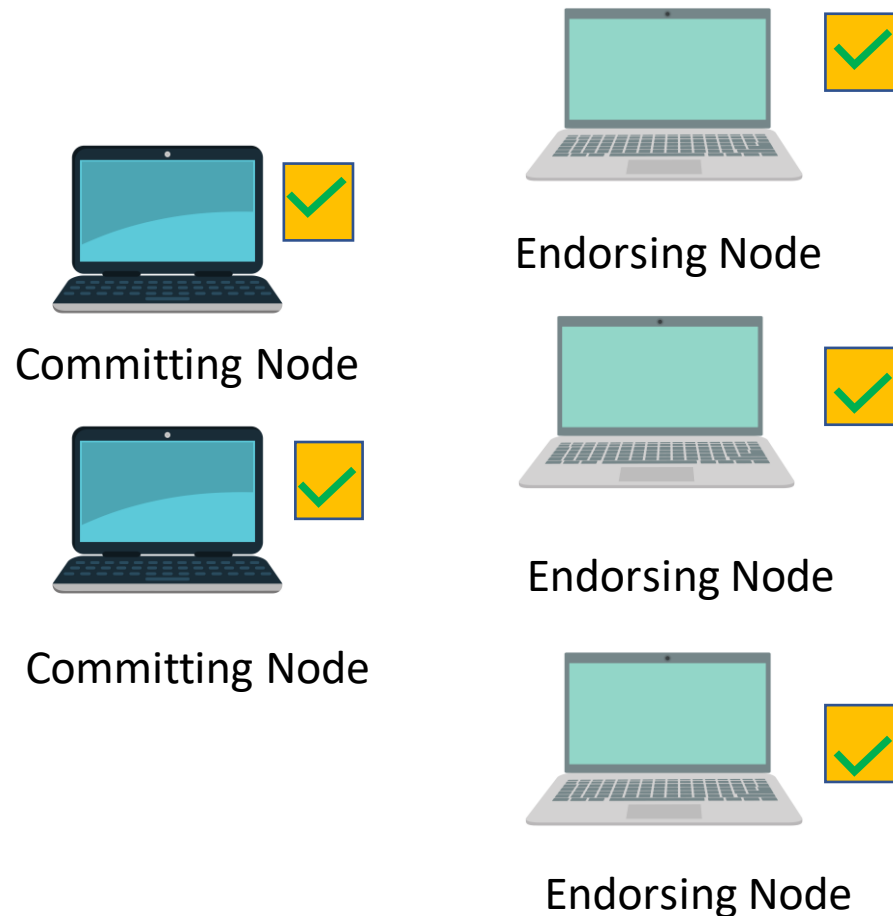
# Hyperledger Transaction Flow

## 7) Peers validate each transaction in the block



# Hyperledger Transaction Flow

## 8) Committing to their ledger



# Hyperledger Transaction Flow

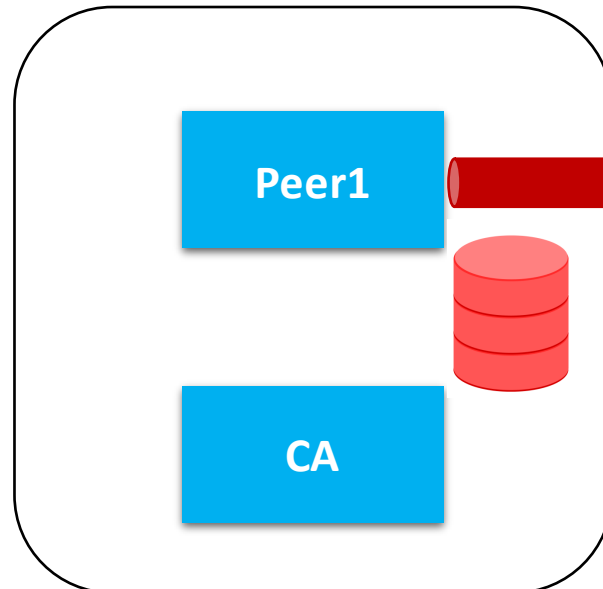
- 1) Client initiating a transaction
- 2) Validation of transaction
- 3) Simulating the transaction
- 4) Verifying Proposal Response
- 5) Broadcast transaction to the orderer
- 6) Order transaction and create block
- 7) Peers validate each transaction in the block
- 8) Committing to their ledger

# Hyperledger Test Network

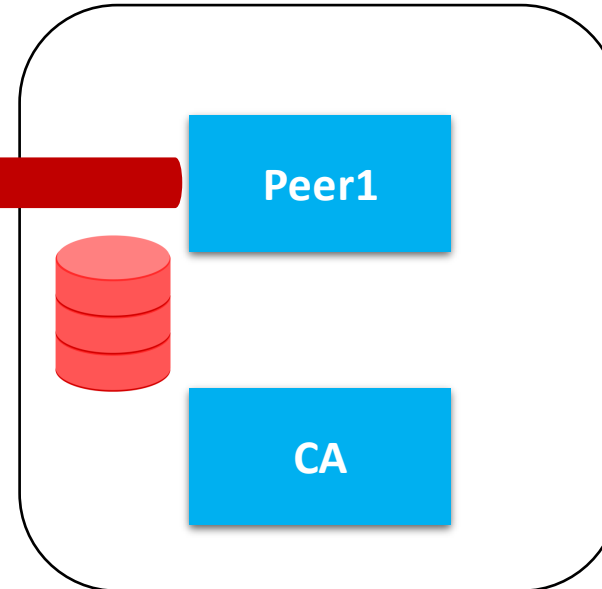
## Ordering Organization



## Organization 1



## Organization 2



# State Database

Comp Id -123  
Ownership - Kshitij

Comp Id -123  
Ownership - Karan

Comp Id -123  
Ownership - Kim

Comp Id -123  
Ownership - Raj

Comp Id -123  
Ownership - Rahul



Latest Transaction

Comp Id -123  
Ownership - Rahul



A low-angle, upward-looking shot of five graduates in black academic regalia. They are all smiling and looking towards the center. The graduates are of diverse backgrounds. The background is a dense canopy of green trees. The word "Congratulations" is written in white, underlined text across the center of the image.

Congratulations

# Thank You

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Instagram - @codeeeater21

Blockchain Developer Discord Community – Link in Description