

IBM开源技术微讲堂

Hyperledger Fabric v1.4 LTS



课程安排

03/14 区块链赋能产业价值和商业模式

03/21 Hyperledger 项目概览 社区介绍

03/28 Fabric 1.4 LTS概述

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04/25 应用开发指南

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Orderer解析

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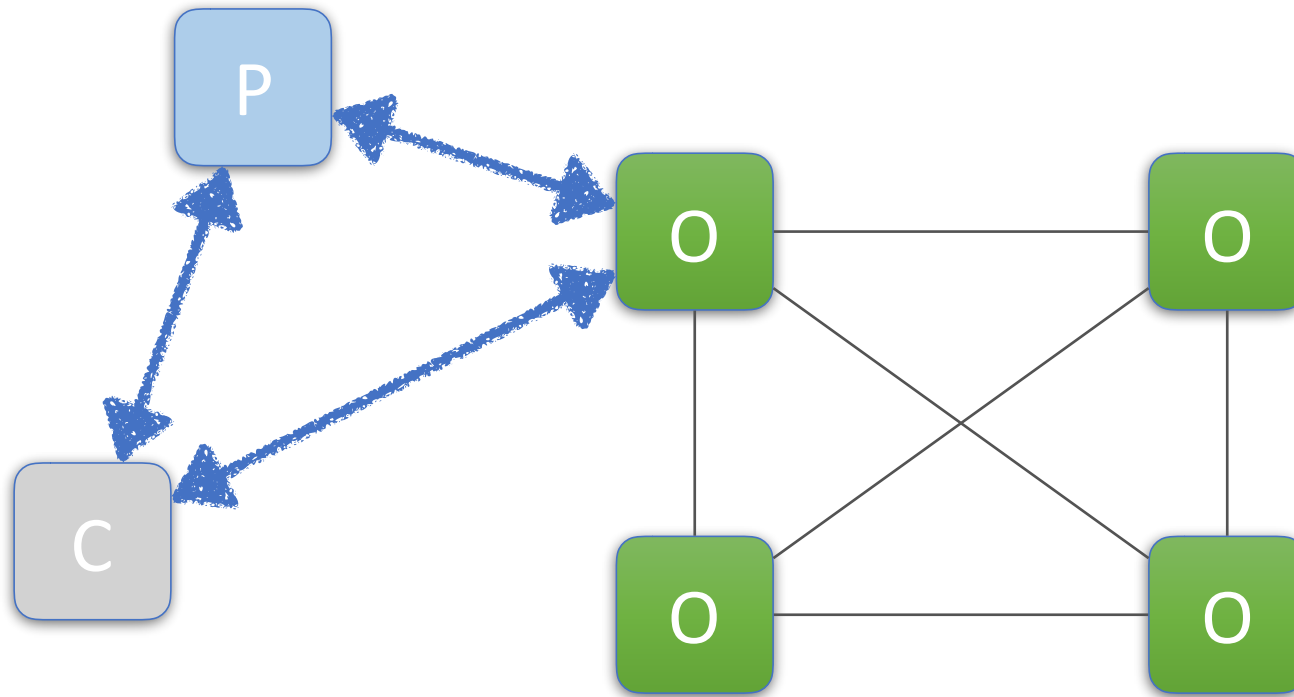


Outline

- Atomic Broadcast (Total Order)
- Channels
- Solo/Kafka/Raft
- Permission in Orderer



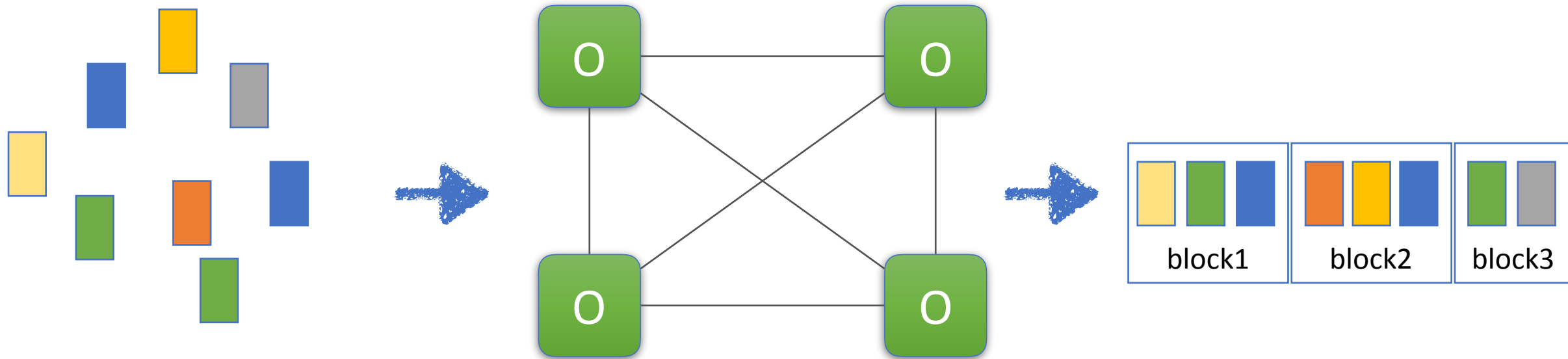
Atomic Broadcast (Total Order)



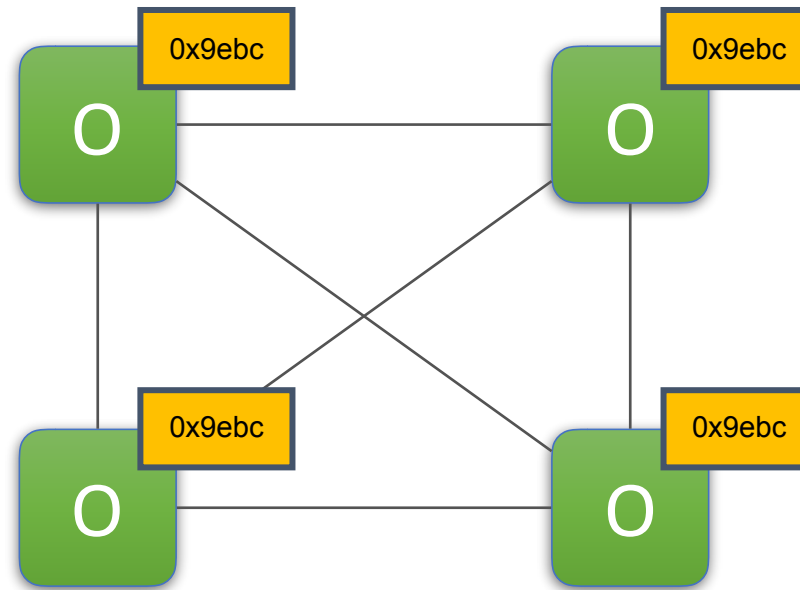
Execute-Order-Validate



Atomic Broadcast (Total Order)



Atomic Broadcast (Total Order)

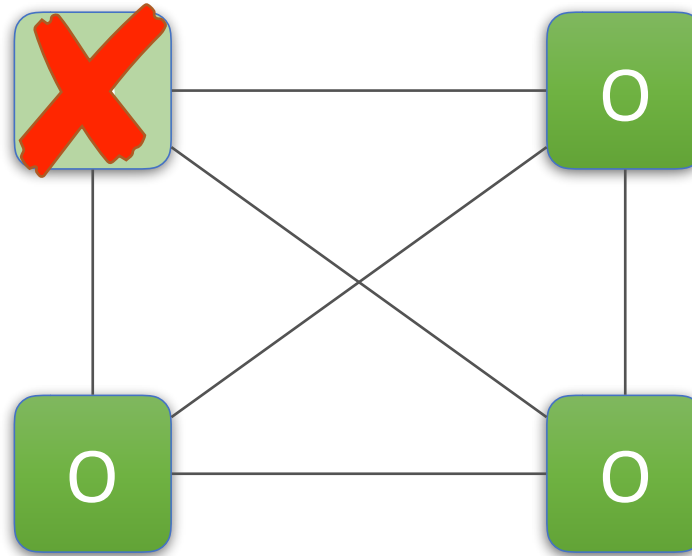


Produce identical blocks



Atomic Broadcast (Total Order)

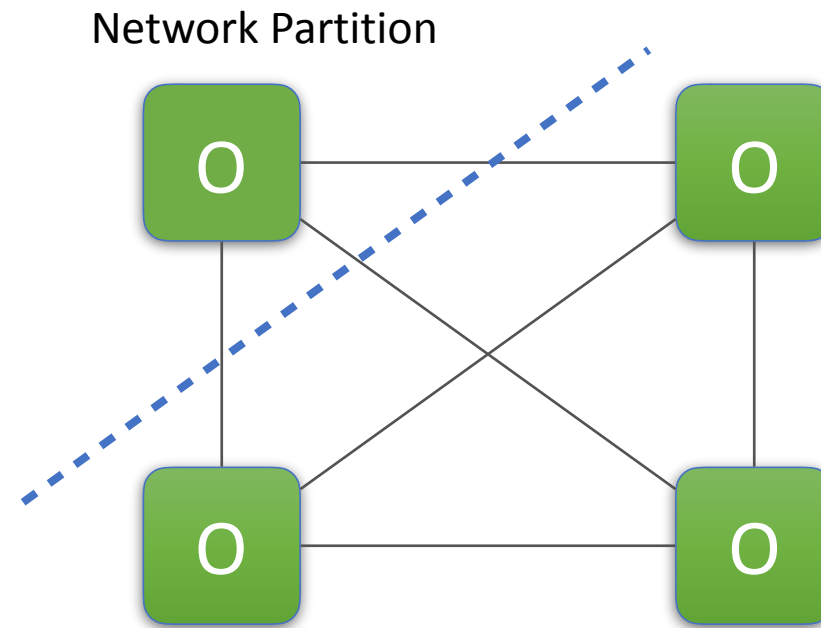
Fail-Recovery



Crash Fault Tolerance



Atomic Broadcast (Total Order)

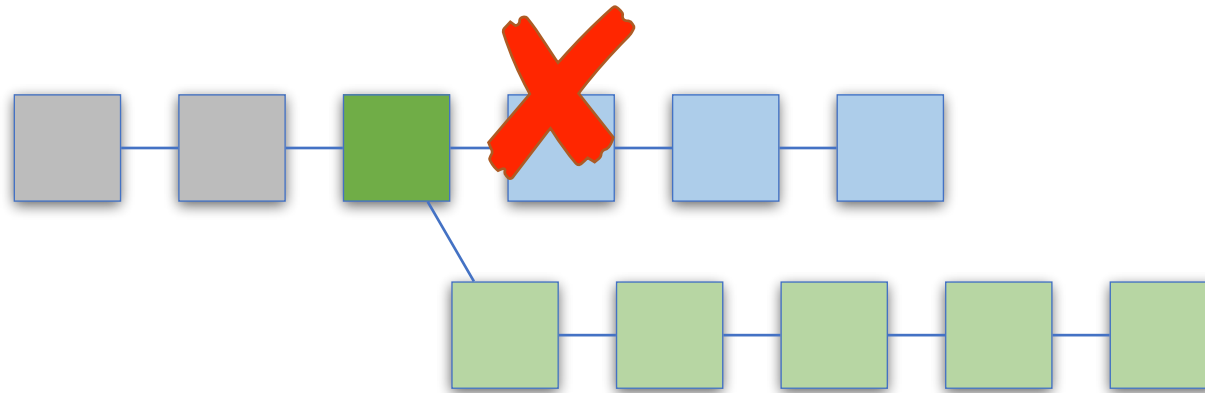


Crash Fault Tolerance



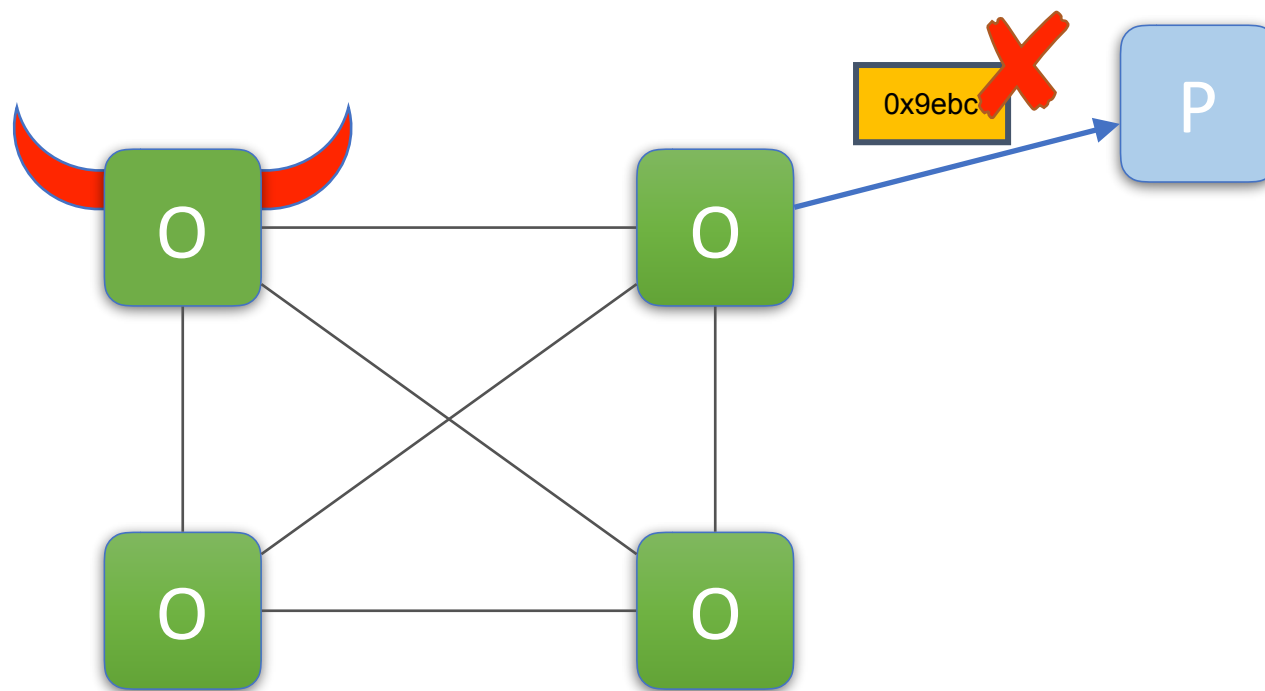
Atomic Broadcast (Total Order)

Strong Consistency (Finality, no temporary fork)



Byzantine Fault Tolerance

CFT Orderer != CFT Fabric



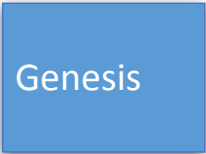
Block Cutting

- BatchSize
 - MaxMessageCount
 - AbsoluteMaxBytes
 - PreferredMaxBytes
- BatchTimeout
 - Timeout



Channels

System Channel



Channels

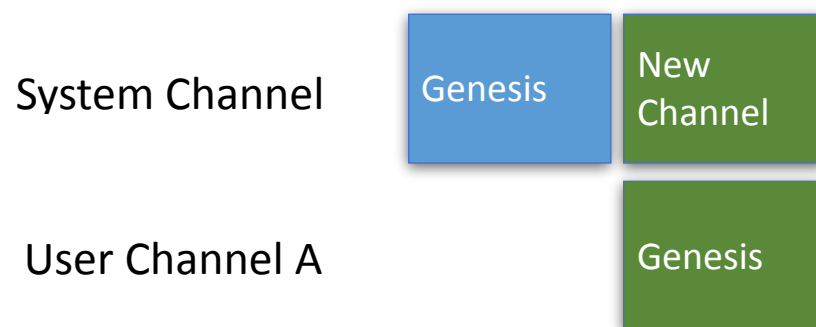
System Channel

Genesis

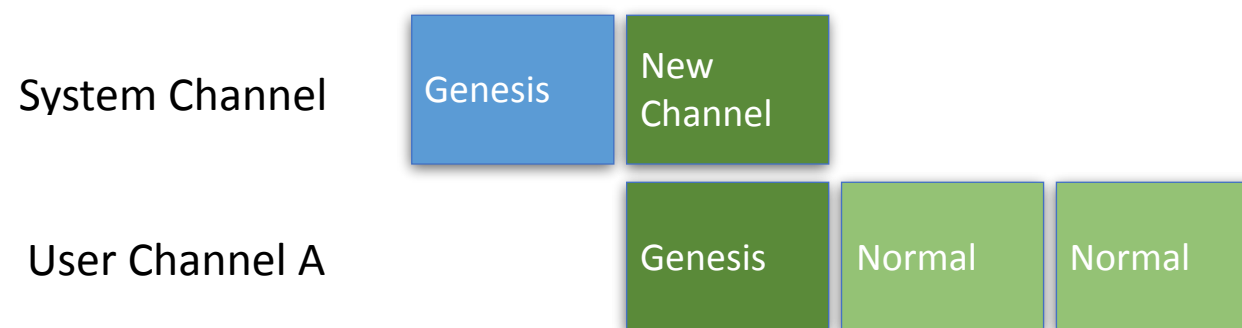
New
Channel



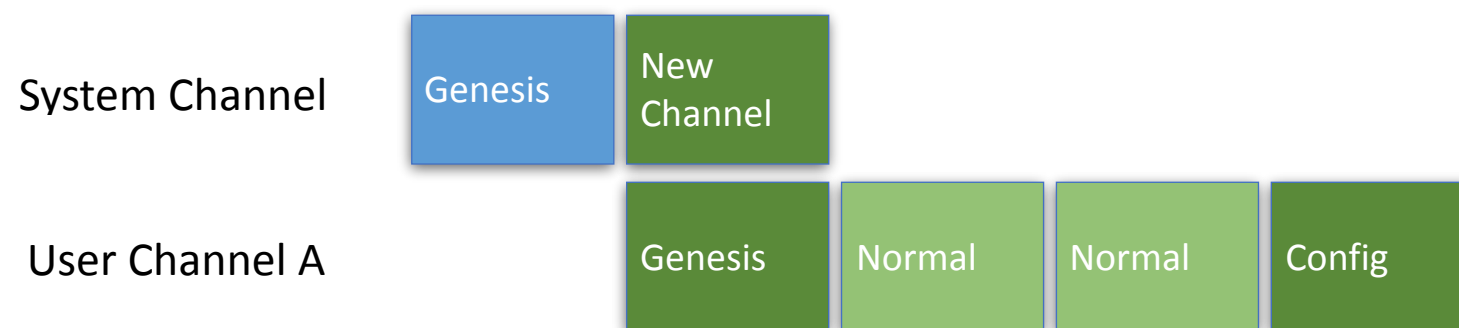
Channels



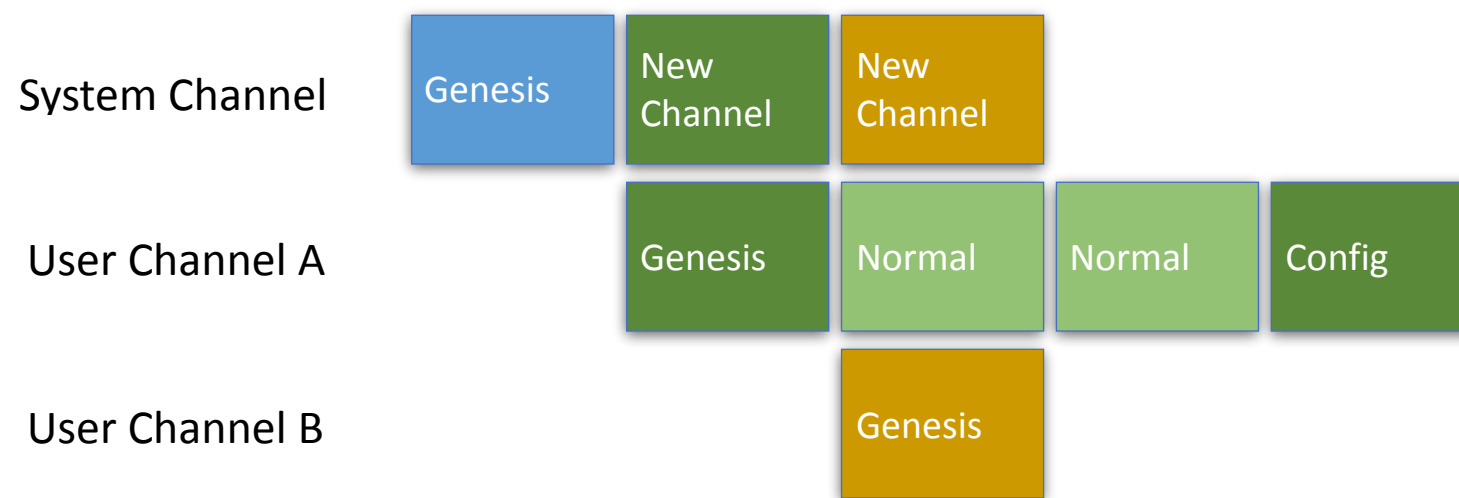
Channels



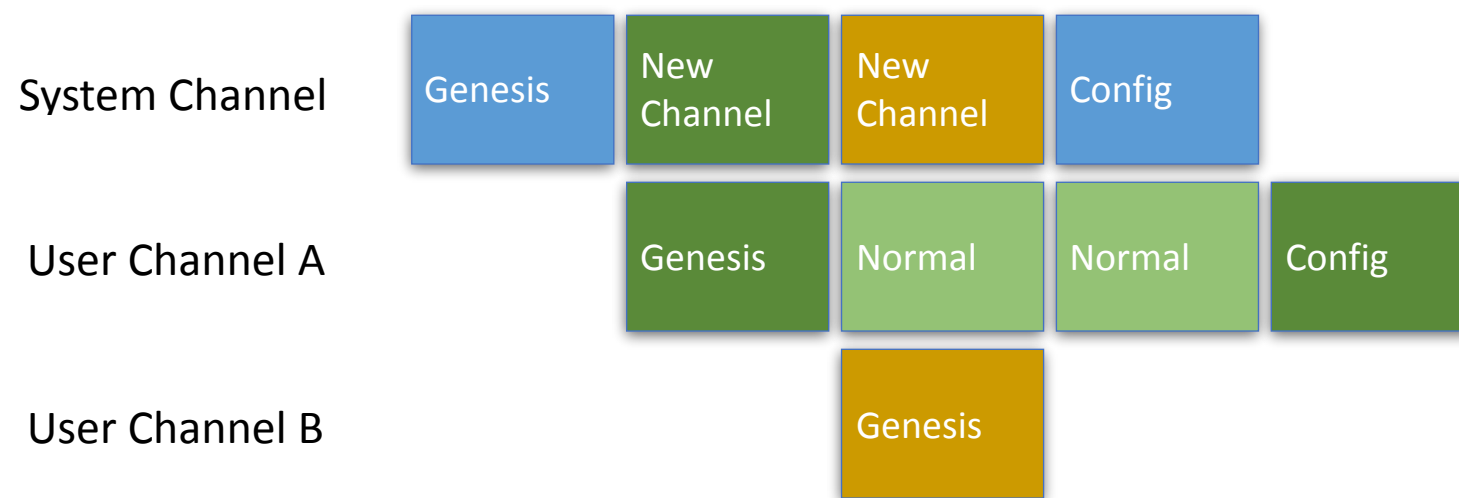
Channels



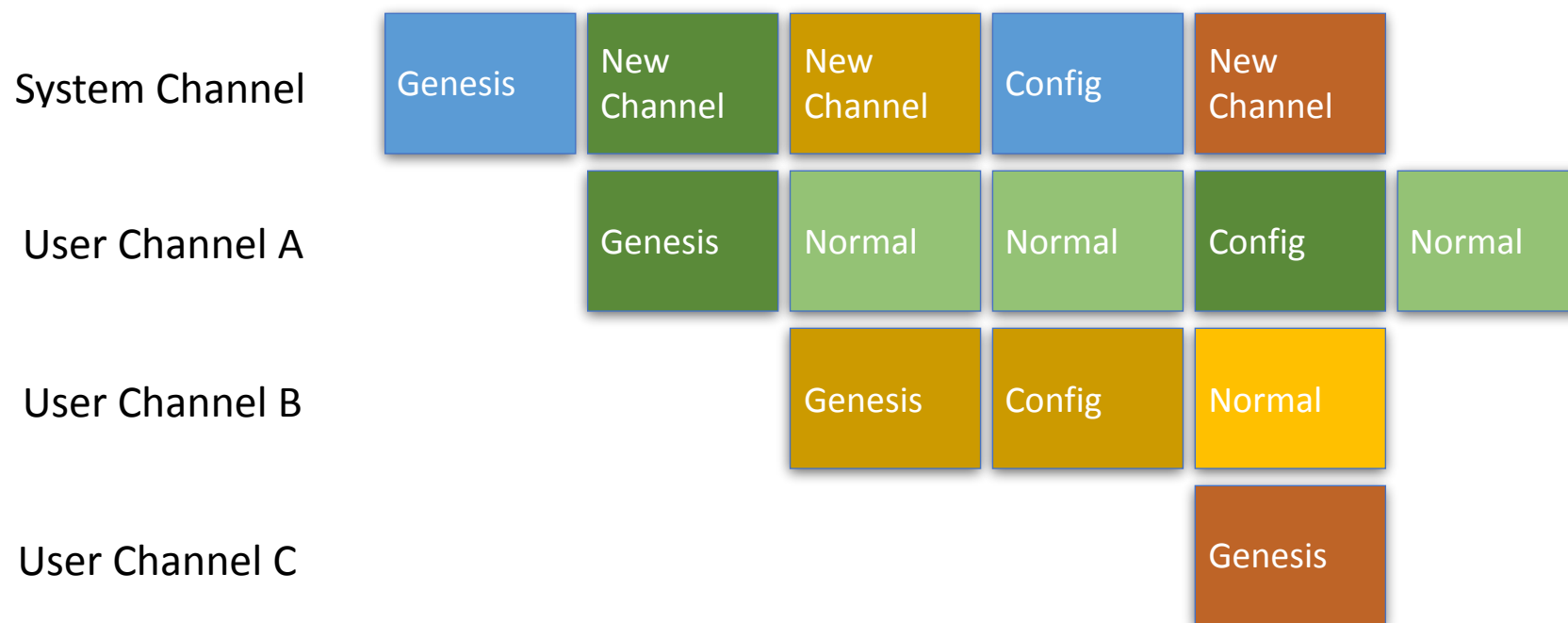
Channels



Channels



Channels



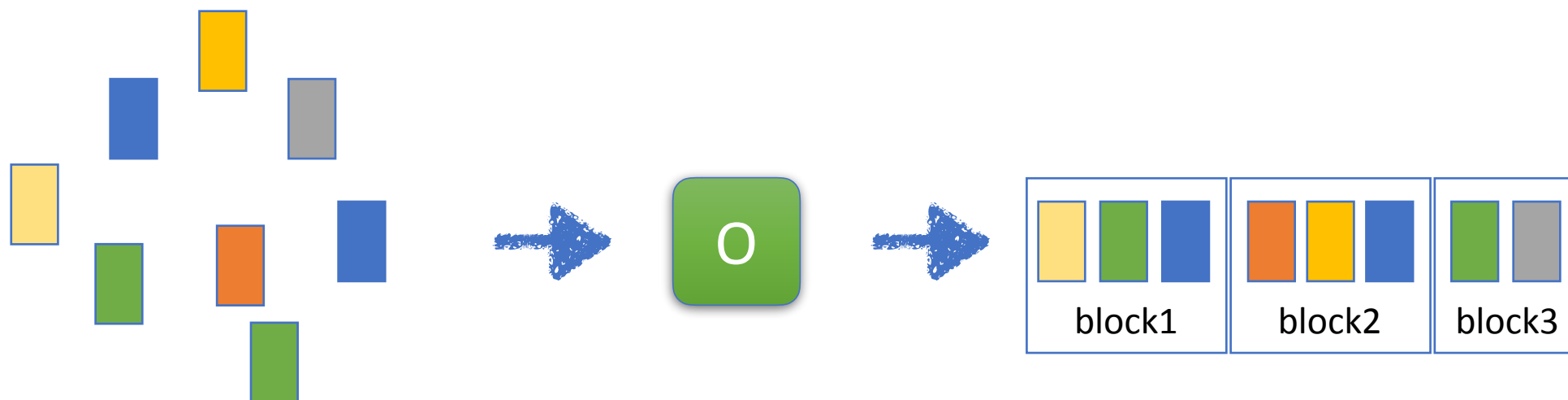
Consensus

- Solo
- Kafka
- Raft
- BFT

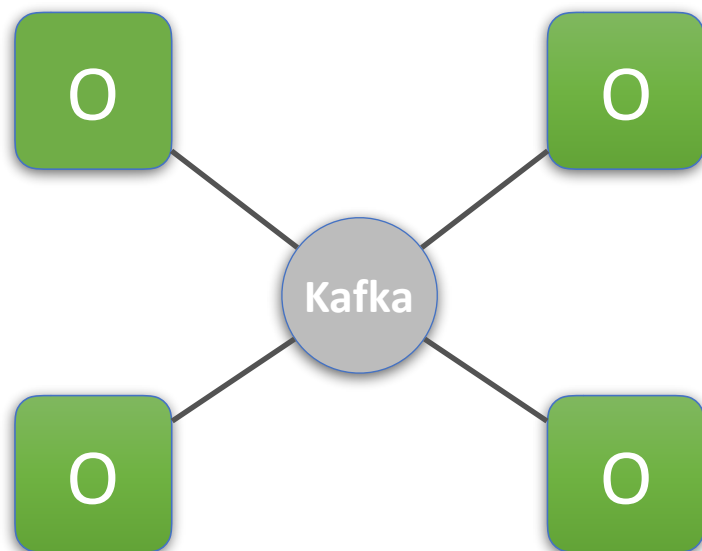


Solo

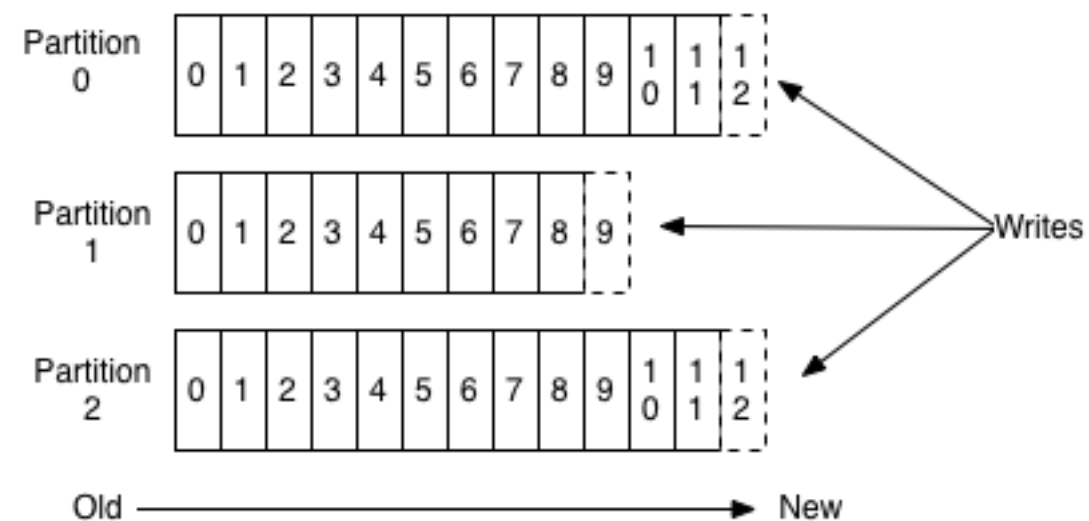
Dev ONLY!



Kafka



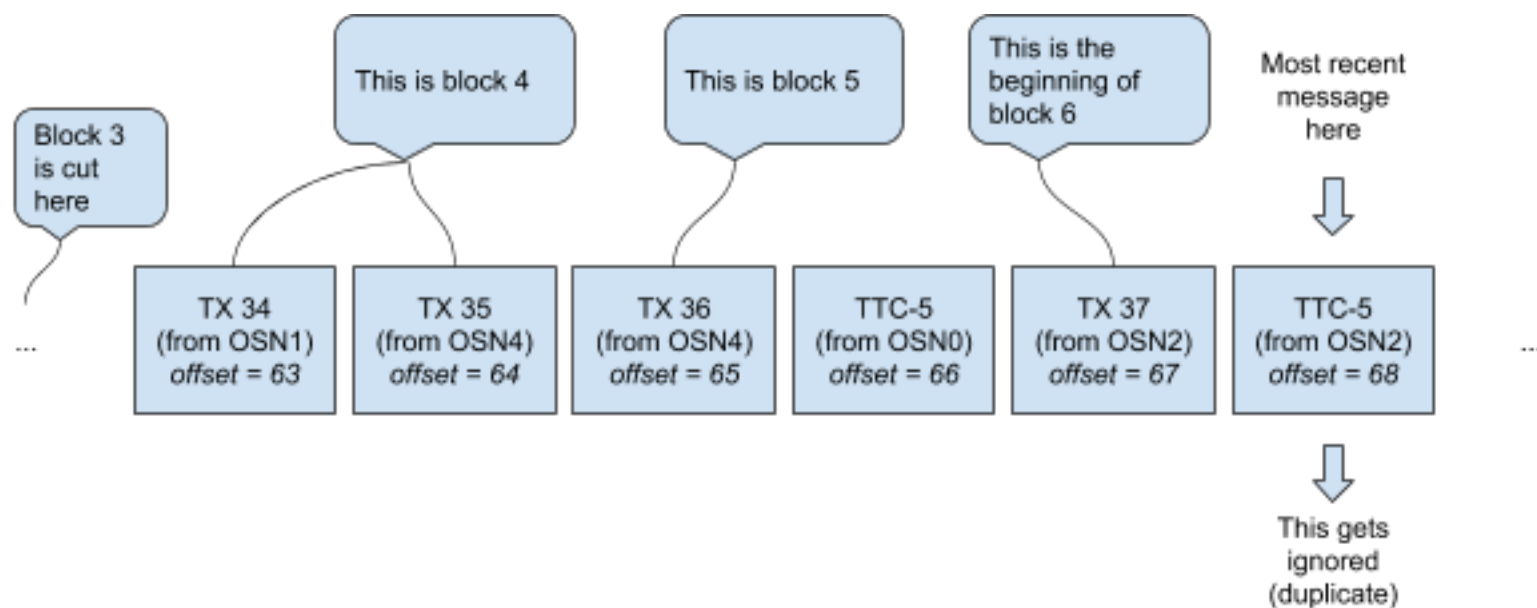
Anatomy of a Topic



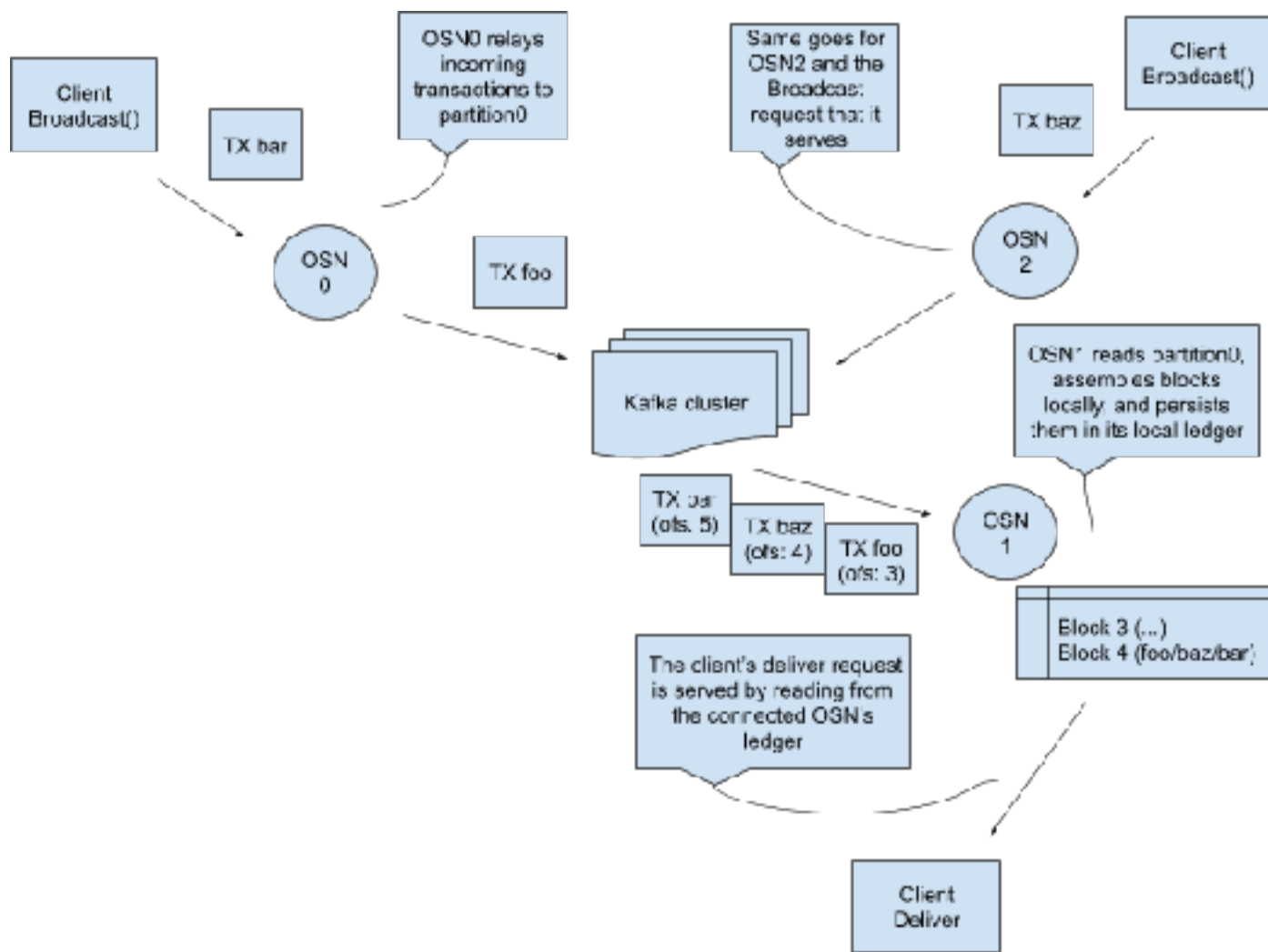
https://kafka.apache.org/documentation/#intro_topics



Kafka



Kafka



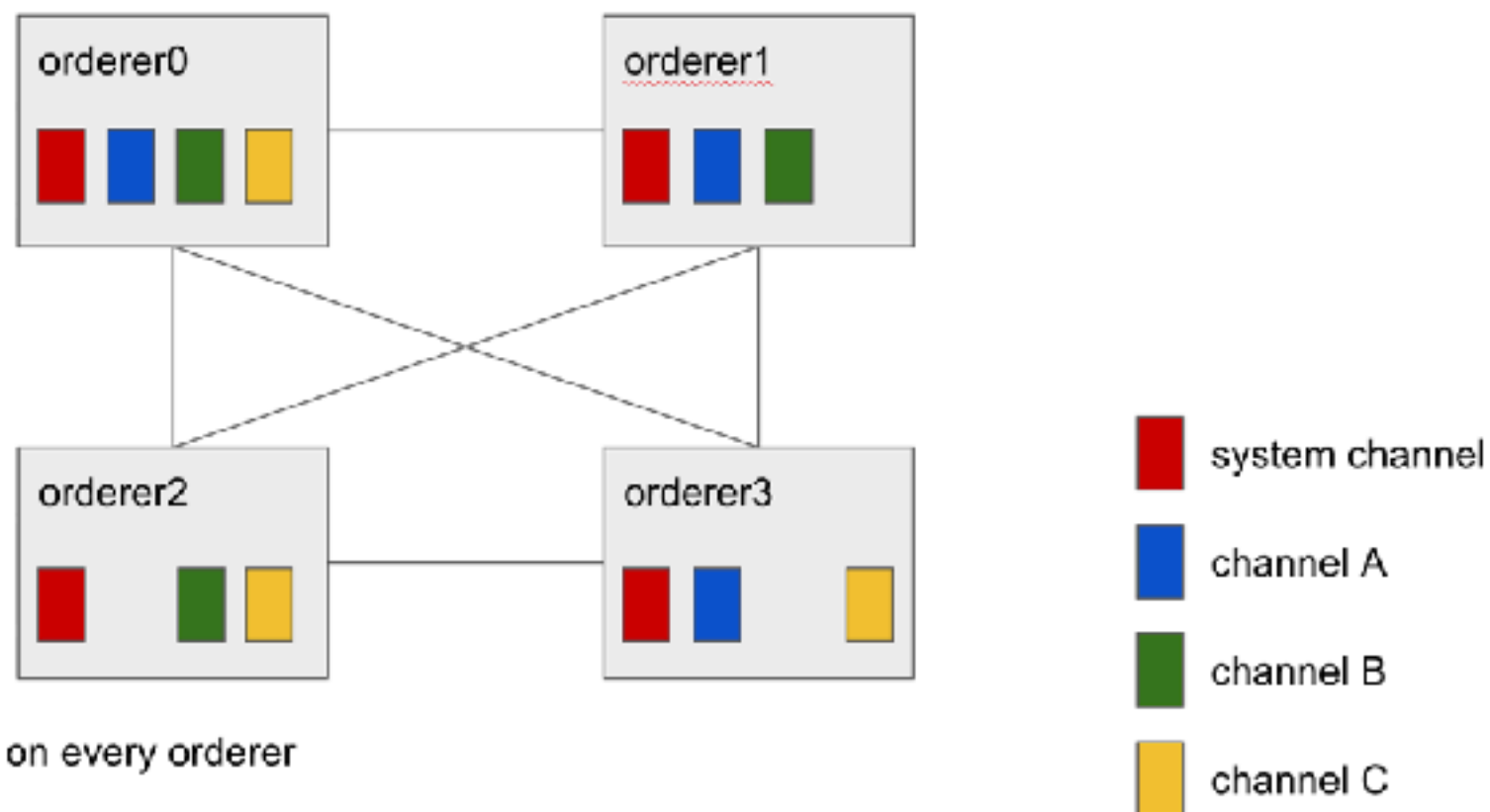
Raft

- Based on Etcd/raft library
- No Kafka/Zookeeper dependency (easier to operate)
- Necessary communication layer built for future use
- Each channel runs its own Raft instance
- A channel can run on a subset of orderers
- All orderers should belong to system channel
- Nodes are identified by TLS cert
- Support Migrating from Kafka to Raft



Raft

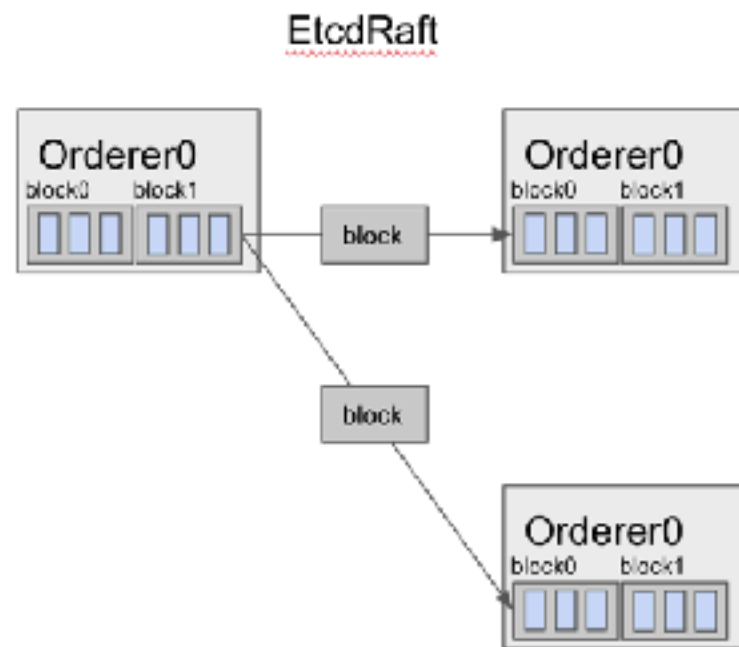
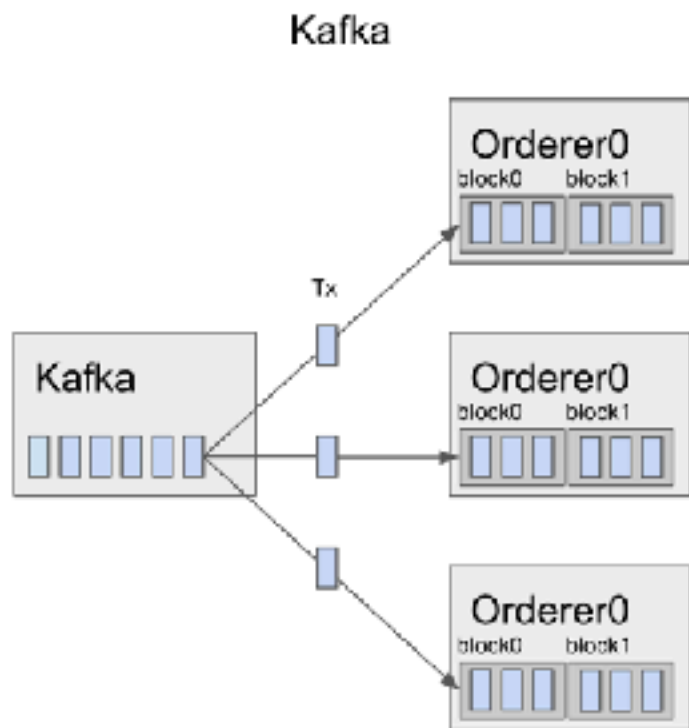
Each channel has its own raft cluster



* system channel runs on every orderer

Raft

Consent on blocks, instead of envelopes

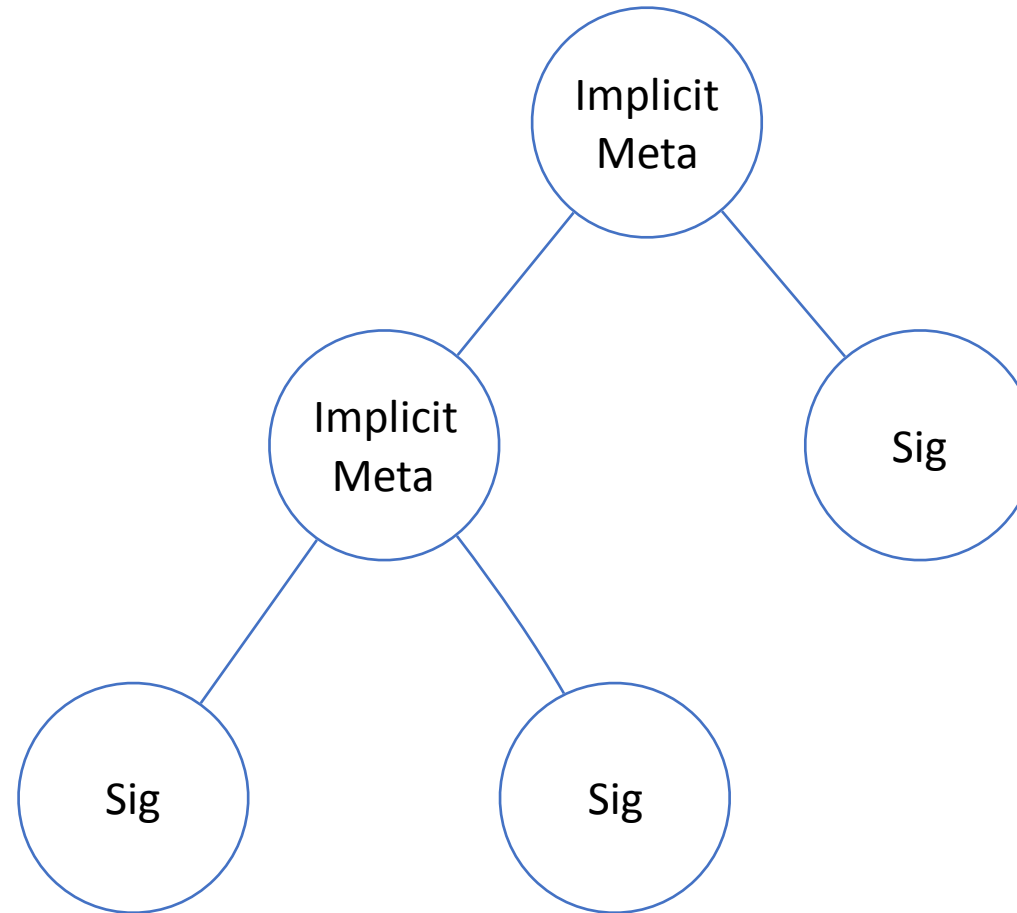


Only leader produces **blocks**.
Followers forward **transactions** to leader



Permission in Orderer

- ImplicitMeta Policy
 - ANY, ALL, MAJORITY
- Signature Policy
 - NOutOf (AND, OR)



未完待续...



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