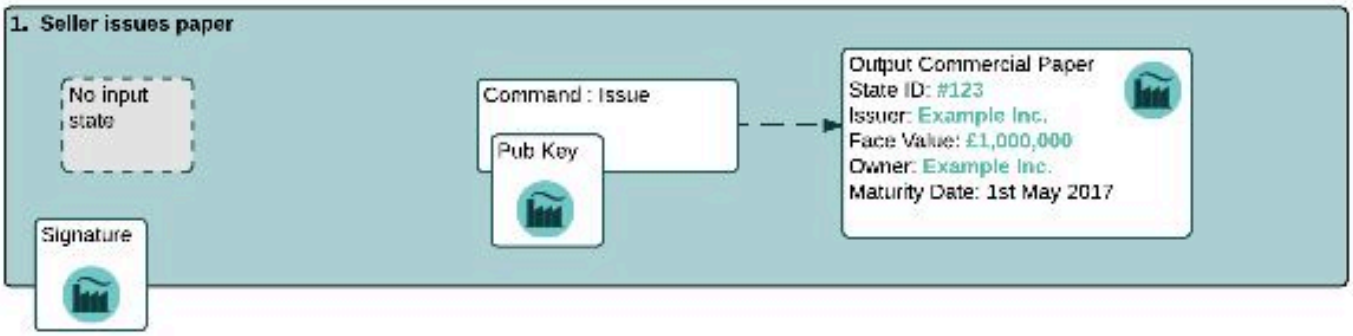
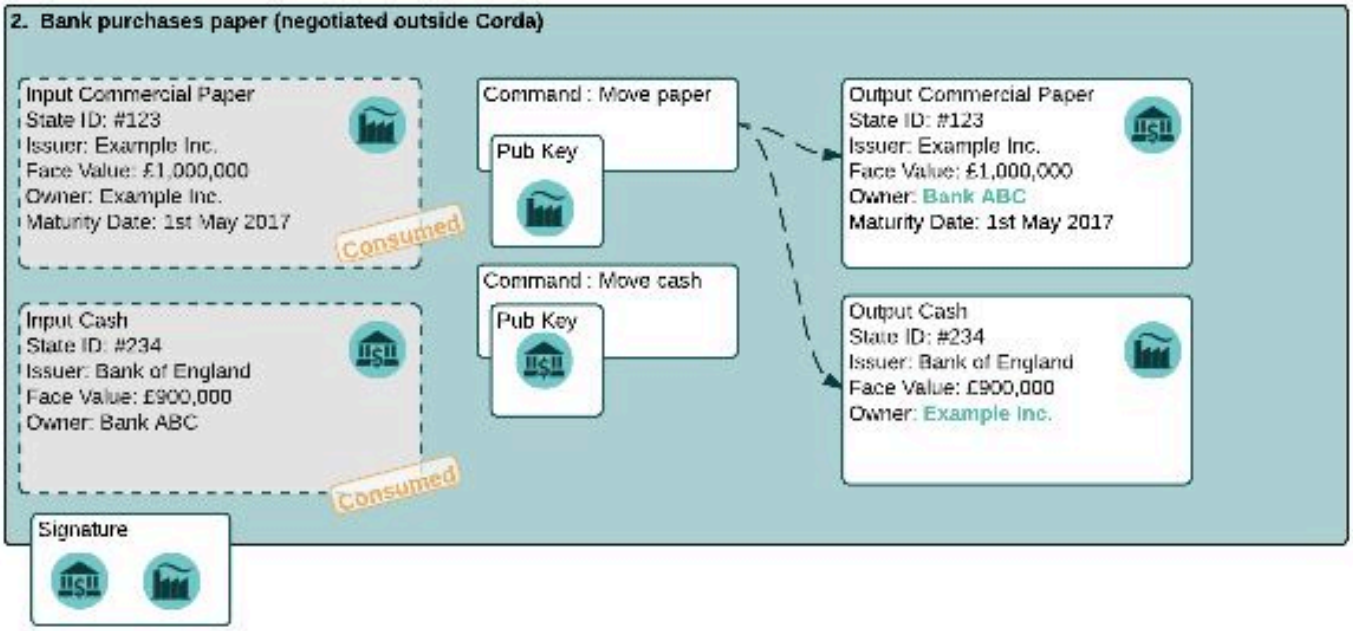
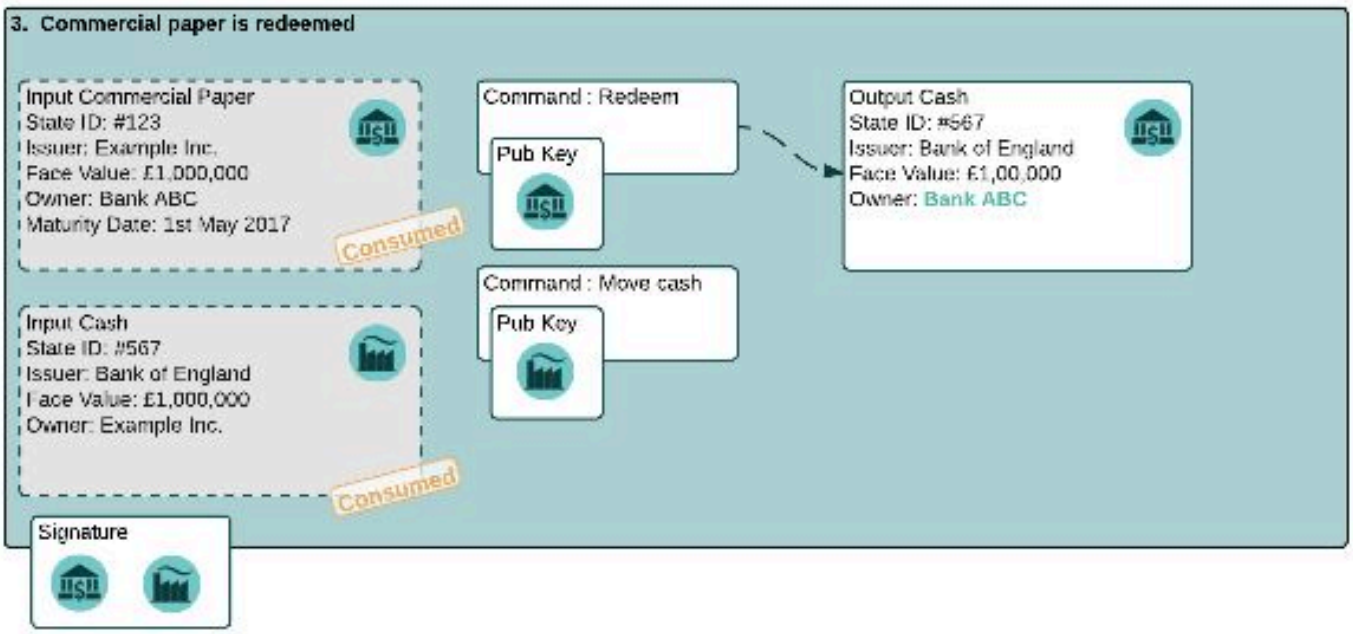
Introduction to R3 Corda

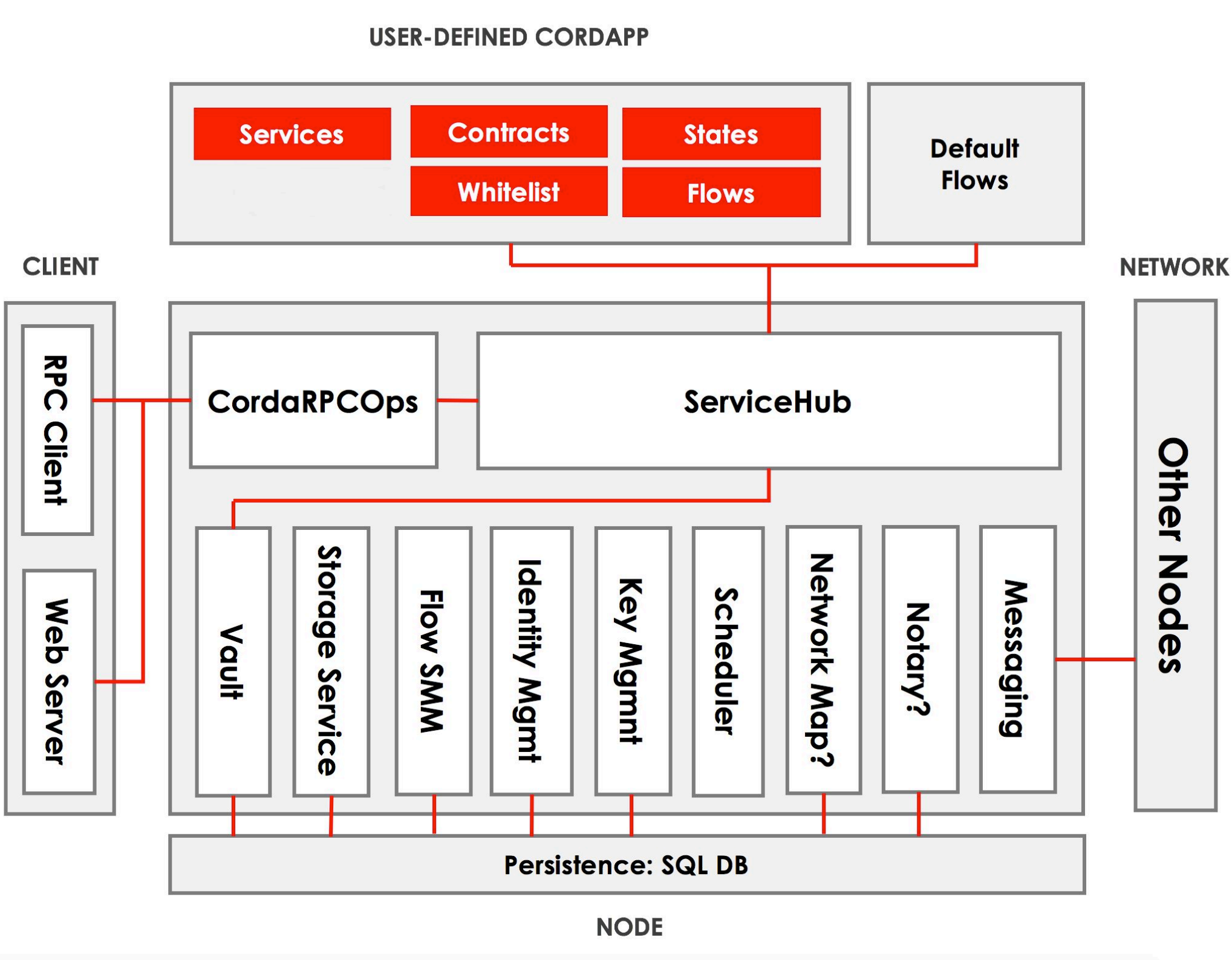
- Corda is distributed ledger software that processes and records data to promote a decentralized network environment.
- Corda is geared toward the financial sectors.
- Corda R3 architecture mainly supports smart contracts that resemble the definition of Braine, Bakshi, and Clack.
- The smart contract structure within Corda R3 architecture is an agreement where execution depends on the computer code but with human control and input.
- If anyone wants or needs, they can legally enforce these smart contracts anytime.
- If you face any unfairness in the smart contract feature of Corda private blockchain, you can take legal action.
- Application builders of R3 Corda include DTCC, Wells Fargo, MoneyGram, MasterCard, SIX Swiss Exchange and Nasdaq, along with major central banks and regulators across the globe
- R3 developed Corda, an open-source distributed ledger project designed to build an inter-operable network of distinct blockchain networks that are able to transact between each other privately.

Role	Name
Seller of paper	Example Inc.
Buyer	Bank ABC

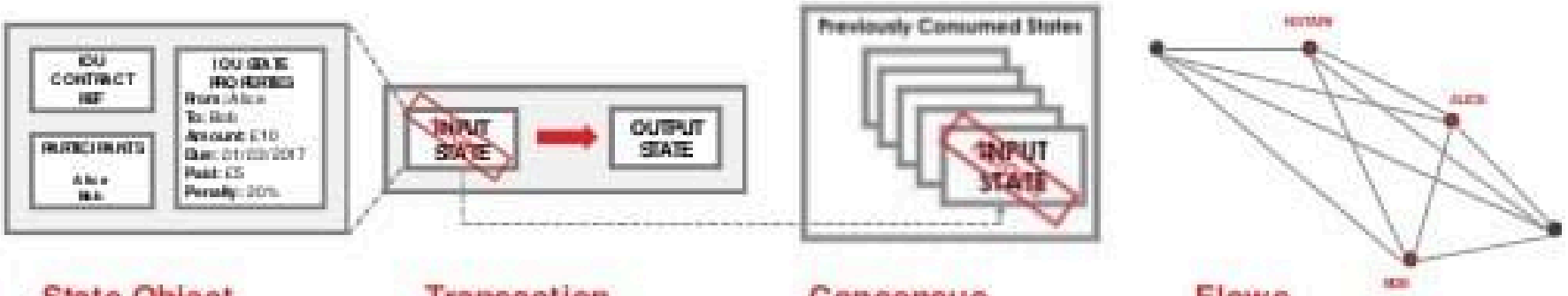







USER-DEFINED CORDAPP
Services
Contracts
States
Whitelist
Flows
Default Flows
CLIENT
NETWORK
RPC Client
Web Server
CordaRPCOps
ServiceHub
Vault
Storage Service
Flow SMM
Identity Mgmt
Key Mgmnt
Scheduler
Network Map?
Notary?
Messaging
Other Nodes
Persistence: SQL DB
NODE

Corda: Key Concepts



State Object

States are immutable objects that represent (shared) facts such as a financial agreement or contract at a specific point in time

Transaction

Transactions consume input states and create output states.

The newly created output states replace the input states which are marked as historic.

Consensus

Parties reach consensus on the evolution of a shared fact. This is done by testing the validity (by way of contract code) and uniqueness (by way of the notary) of the transaction.

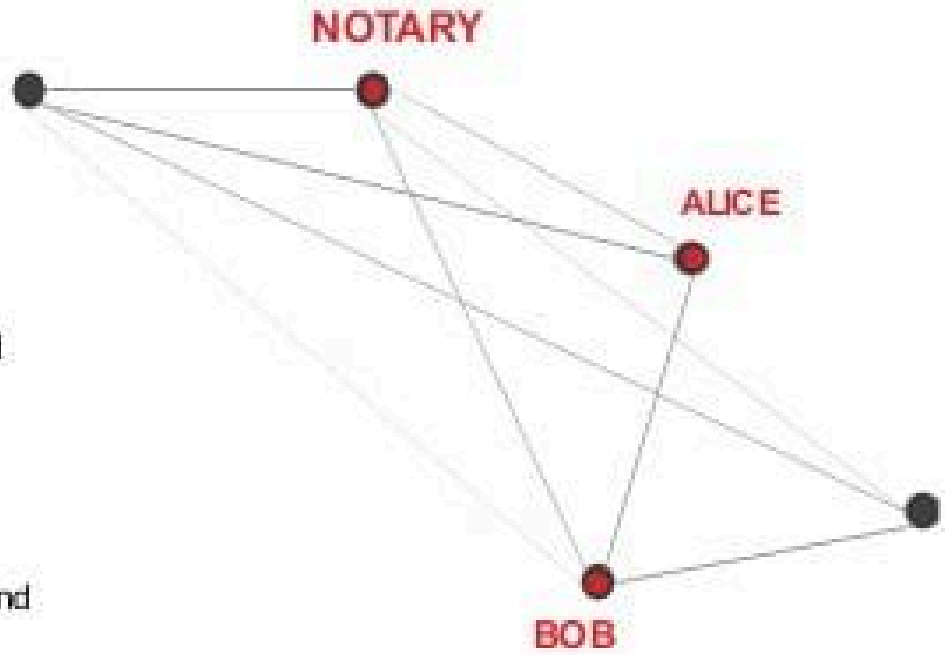
Flows

Flows are light-weight processes used to coordinate interactions required for peers to reach consensus about shared facts.

Corda: Key Concepts - Flows

Flows are light-weight processes used to coordinate interactions required for peers to reach consensus about shared facts.

- With Corda, peers communicate on a **point to point** basis
- Most distributed ledger platforms use message broadcasting and gossip networks to share data
- To communicate, peers must specify message recipients
- Recall that to commit a transaction, multiple peers are often required to sign and verify it
- To commit a transaction proposal, a workflow or "**flow**" of messaging, signing, verifying, among other things, is required
- Peers on a Corda network may have thousands of counter-parties and hundreds of thousands of concurrent flows



Notaries and consensus

- Pluggable consensus algorithms
- "Notaries" can be/should be distributed
- Notary implementations:
  - Onebox: for local testing/dev work
  - Raft: robust against node failure, not malice
  - Above x2 for non-validating modes
  - In future, BFT-SMaRT*

r3.