Secure Asset Transfer Use Cases

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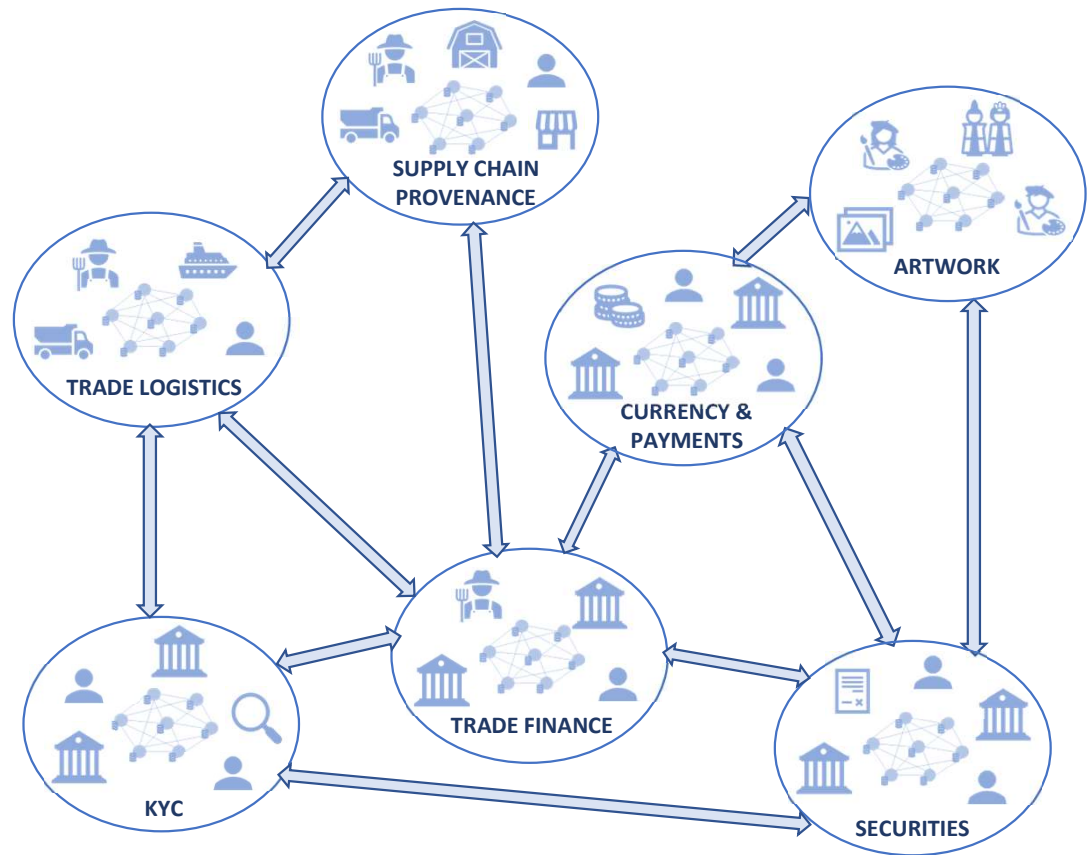
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Yokohama, Japan

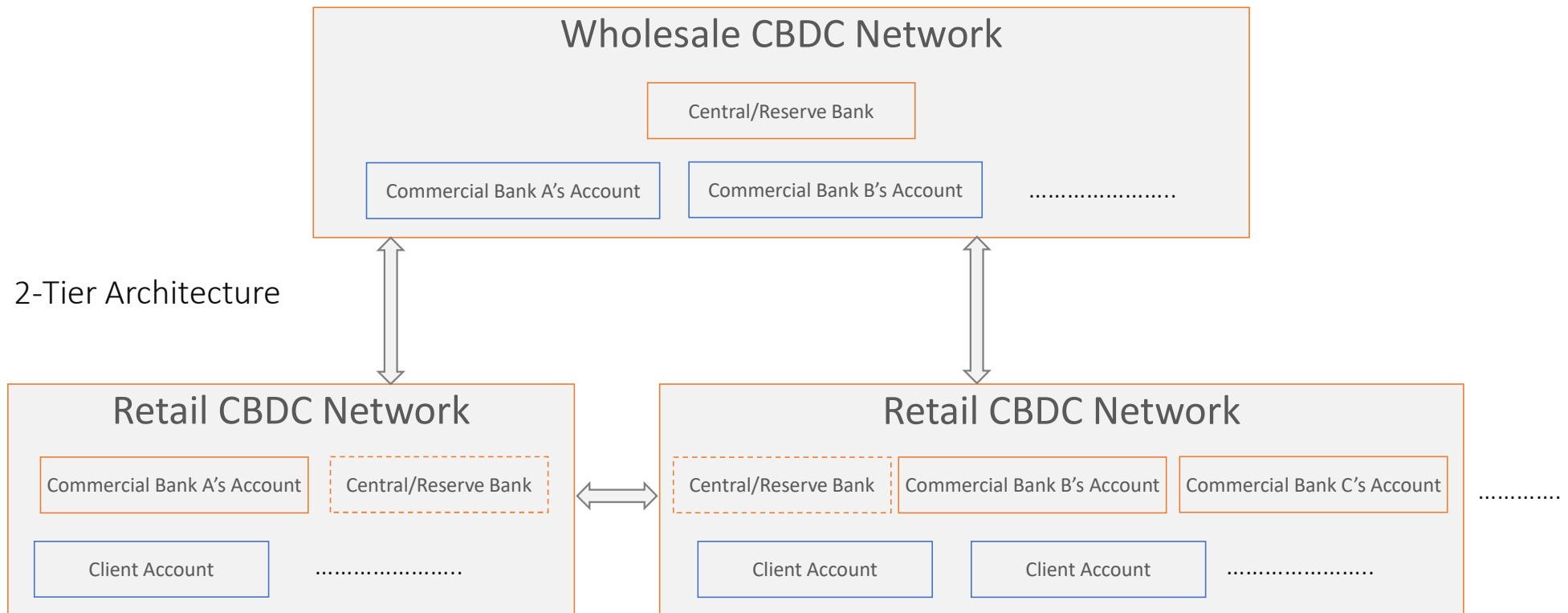March 31, 2023

Draft Link: https://datatracker.ietf.org/doc/draft-ramakrishna-sat-use-cases/

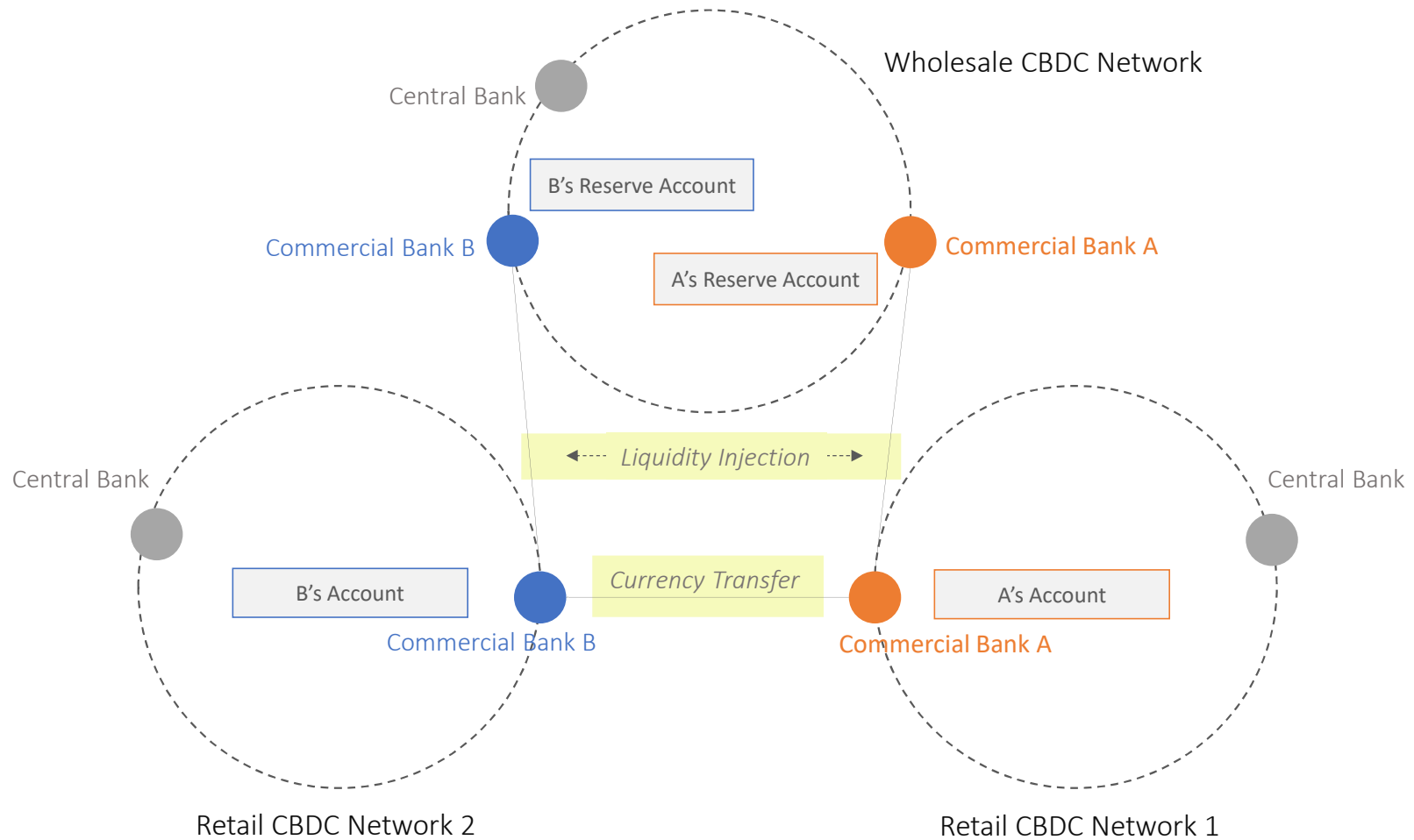# Fragmented Business Workflows and Siloed Assets

- Different parts of complex business workflows are governed by different systems and networks, often using distributed ledger technology (DLT)
  - Practical trend has been toward minimum viable ecosystems
  - Proliferation of diverse but disconnected networks
- Result: partitions of different kinds
  - Digital assets lying within ledgers (siloes)
  - Limited workflows managing a portion of the entire business lifecycle
  - User base: customers and service providers

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Central Bank Digital Currency (CBDC) Landscape

Wholesale CBDC Network

Central/Reserve Bank

Commercial Bank A's Account   Commercial Bank B's Account   …………………….

2-Tier Architecture

Retail CBDC Network

Commercial Bank A's Account   Central/Reserve Bank

Client Account   …………………….

Retail CBDC Network

Central/Reserve Bank   Commercial Bank B's Account   Commercial Bank C's Account   ………….

Client Account   Client Account   …………………….

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CBDC Transfer (Asset Transfer)

Wholesale CBDC Network

Central Bank

B's Reserve Account

Commercial Bank B

A's Reserve Account

Commercial Bank A

Liquidity Injection

Central Bank

B's Account

Currency Transfer

A's Account

Commercial Bank B

Commercial Bank A

Central Bank

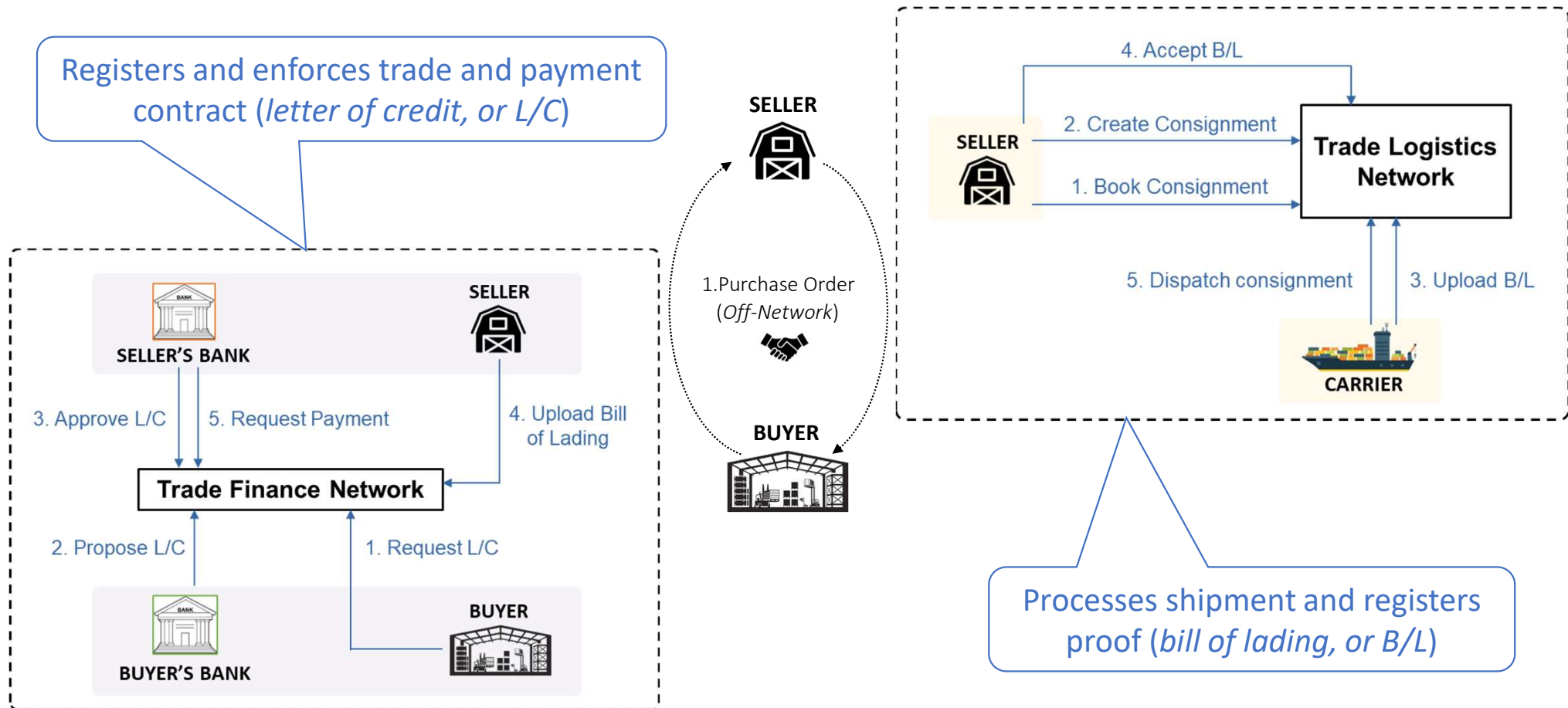Retail CBDC Network 2

Retail CBDC Network 1

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# Digital Artwork Transfer and Regulatory Compliance

- Artist communities seek to sell digital-only artwork in standard file formats in global marketplace

- Others may purchase and own full rights of usage upon payment

- Most popular mechanism: tokenization on distributed ledgers with ownership rights enforced through cryptography (digital signatures)

- Challenge: enable sale of artwork across national borders while following governmental regulations, especially with regard to taxation

  - Taxes must be deducted at the "point-of-sale" of transfer of ownership (compliance)

  - Proof of deduction and delivery of artwork must be available and non-repudiable (accountability)

- Solution: secure asset transfers of tokens (artwork or currency) via legally authorized gateways

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Trade Networks: Financing and Logistics Workflows

Registers and enforces trade and payment contract (*letter of credit, or L/C*)

SELLER

1.Purchase Order (*Off-Network*)

BUYER

SELLER'S BANK

SELLER

3. Approve L/C   5. Request Payment   4. Upload Bill of Lading

Trade Finance Network

2. Propose L/C   1. Request L/C

BUYER'S BANK   BUYER

4. Accept B/L

SELLER   2. Create Consignment

1. Book Consignment

Trade Logistics Network

5. Dispatch consignment   3. Upload B/L

CARRIER

Processes shipment and registers proof (*bill of lading, or B/L*)

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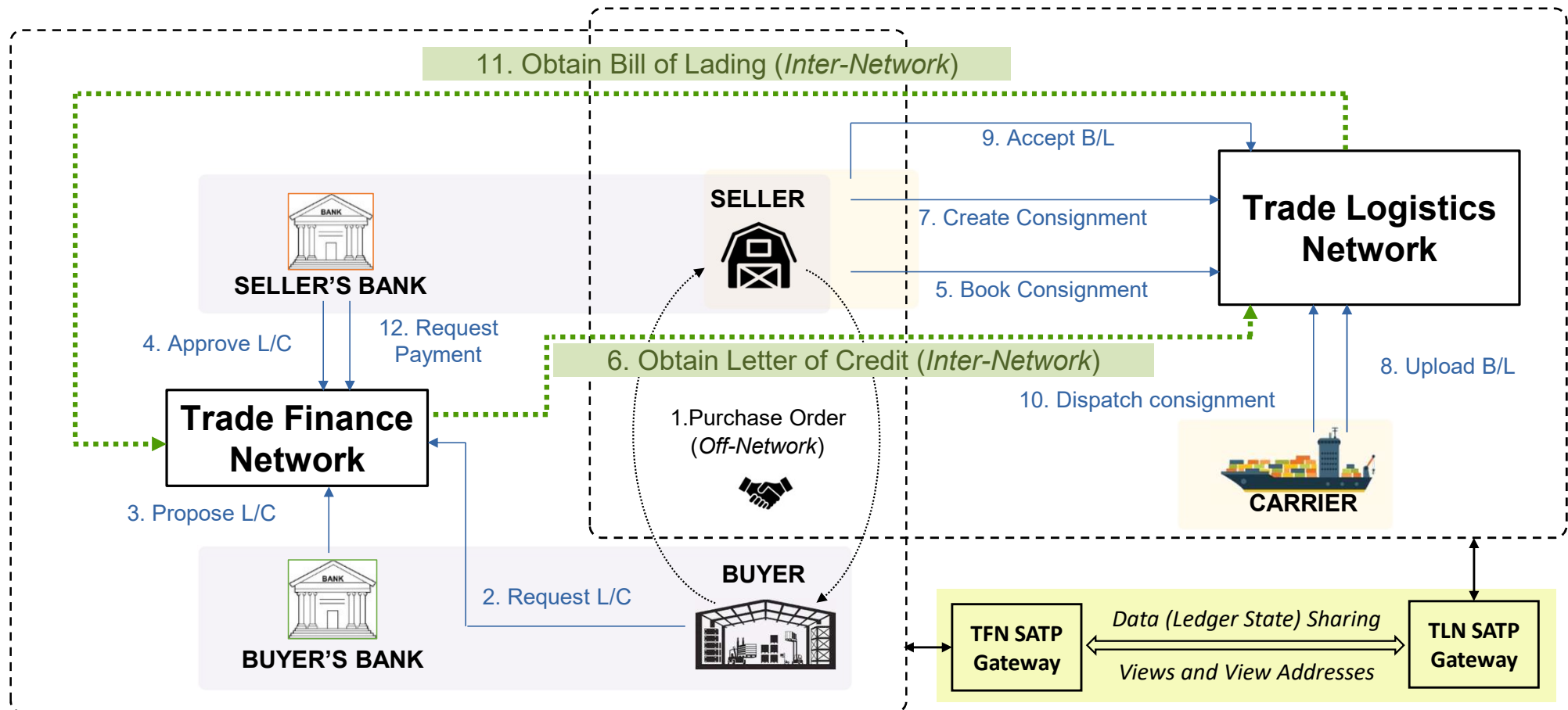
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Transfer of Assets across Trade Networks

- L/C and B/L represent workflow states but are also digital assets in their own rights
  - B/L can serve as title to shipment of goods, and can be traded as a security or used as collateral

- B/L can be transferred from TLN to TFN as property of the Seller's Bank pending payment

- L/C can be transferred from one TFN to another if the client (Buyer) needs to move to a different network for some reason
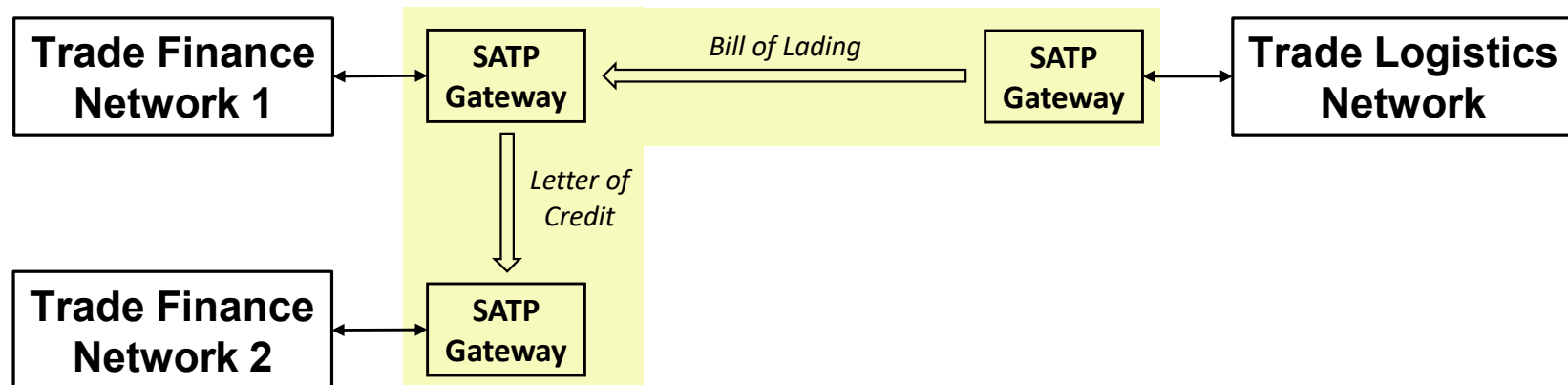
Use Cases for Data Sharing and Linking Workflows

Future SATP Extensions

Linking Trade Networks: Supply-Chain Integration

11. Obtain Bill of Lading (*Inter-Network*)

9. Accept B/L

SELLER

7. Create Consignment

Trade Logistics Network

5. Book Consignment

SELLER'S BANK

4. Approve L/C

12. Request Payment

6. Obtain Letter of Credit (*Inter-Network*)

8. Upload B/L

Trade Finance Network

1. Purchase Order (*Off-Network*)

10. Dispatch consignment

3. Propose L/C

CARRIER

BUYER

BUYER'S BANK

2. Request L/C

TFN SATP Gateway

Data (Ledger State) Sharing

TLN SATP Gateway

Views and View Addresses

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Questions

- Are the use cases compelling?

- Are the covered set of scenarios comprehensive? Are we missing anything major?
  - *Patterns*: transfer of assets (in SATP charter scope), sharing of ledger state snapshots and asset swaps (potential future additions)
  - *Applications*: international trade and supply chains, governmental regulations, financial markets (securities and currency)

- Is the tool (SATP) appropriate and adequate for the scenarios?
  - i.e., it solves the problem but does not try to bite off too much (by scoping the challenge to a gateway-to-gateway secure transfer of digital assets with defined ownerships)