Secure Asset Transfer Use Cases

V. Ramakrishna (IBM), Thomas Hardjono (MIT)

IETF 116: Secure Asset Transfer Working Group
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
Central Bank Digital Currency (CBDC) Landscape

2-Tier Architecture

Wholesale CBDC Network
- Central/Reserve Bank
- Commercial Bank A’s Account
- Commercial Bank B’s Account
- Commercial Bank C’s Account

Retail CBDC Network
- Commercial Bank A’s Account
- Client Account

Retail CBDC Network
- Central/Reserve Bank
- Commercial Bank B’s Account
- Commercial Bank C’s Account
- Client Account
CBDC Transfer (Asset Transfer)
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
Trade Networks: Financing and Logistics Workflows

1. Purchase Order (Off-Network)
2. Create Consignment
3. Upload B/L
4. Accept B/L
5. Dispatch consignment

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

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

1. Purchase Order (Off-Network)
2. Request L/C
3. Propose L/C
4. Approve L/C
5. Book Consignment
6. Obtain Letter of Credit (Inter-Network)
7. Create Consignment
8. Upload B/L
9. Accept B/L
10. Dispatch consignment
11. Obtain Bill of Lading (Inter-Network)
12. Request Payment

Trade Finance Network

Trade Logistics Network

TFN SATP Gateway

TLN SATP Gateway

Data (Ledger State) Sharing Views and View Addresses
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)