BoF: Secure Asset Transfer

Use Cases

IETF 114

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Keppel Terminal
Photo by @chutternsnap from Unsplash
Fragmented Networks and Siloed Assets

- Promise of open networks: one network to rule them all
- But enterprise needs controllable privacy with decentralized trust
- Practical trend: minimum viable ecosystems
- Result: proliferation of diverse but disconnected networks

Vertical Fragmentation

Horizontal Fragmentation

We need interoperation to handle fragmentation

Examples
Trade Systems: Financing and Logistics

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

1. Request L/C
2. Propose L/C
3. Approve L/C
4. Upload Bill of Lading
5. Request Payment
Linking Trade Systems and Communicating Assets

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
Multi-System Supply Chains and Financing

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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
CBDC Transfer (Asset Transfer)
BACKUP
Modes of Interoperation: Generic Use Cases

- **Data Sharing**: The transfer of data from a source network to a consuming network. The data transfer can either be a result of a transaction in the source network, or an explicit request from a consuming network.

- **Asset Exchange**: The change of ownership of an asset in a source network and a corresponding change of ownership in another network. No actual value leaves the networks boundaries. Example: atomic cross-chain swap.

- **Asset Transfer**: The movement of an asset from the source network to a consuming network. As an asset cannot be double spent, transfer of an asset should result the termination/locking of its use in the source network, and its creation into the target network. Mechanisms that support such capabilities are one-way and two-way pegs.
Interoperation Modes: Building Blocks of Cross-Network Operations

Data Transfer/Sharing

Asset Exchange

Asset Transfer

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Interoperation Modes as Building Blocks

- **Claim**: any cross-network process interdependency can be realized as a combination of data transfers, asset transfers, and asset exchanges.

![Diagram](image.png)

- **Cross-Network Dependency**
  - **Bidirectional**:
    - Asset Transfer
    - Asset Exchange
  - **Unidirectional**:
    - Data Sharing
    - READ ➔ WRITE
    - WRITE ➔ WRITE
Delivery-vs-Payment: Bond for CBDC (Asset Exchange)

Financial Securities Network (FSN)

Central Bank

Securities (bond) xfer $T_{SA} \rightarrow_{SBx}$

B's Investors' Securities

A's Investors' Securities

Commercial Bank A

Commercial Bank B

Issuer

Central Bank

Central Bank Digital Currency Network (CBDCN)

Payments $T_{SB} \rightarrow_{SA}$

B's Account

A's Account

Commercial Bank B

Commercial Bank A

A's Investors' Securities

B's Investors' Securities

Issuer

Central Bank

Central Bank
Other Asset Transfer Use Cases

• Different networks with different clientele may exist for securities trading
  • Inevitably, investors will find the need to transfer bonds from one network to another, either to their own account (migration) or to another’s (sale)

• Other kinds of digital assets may also occasionally need to be moved across network boundaries
  • To fulfil a trade or a gift
  • Users may wish to migrate to other systems, to obtain better service or to comply with changing governmental regulations
  • Examples: artwork, property titles