BLOCKCHAIN WORKSHOP

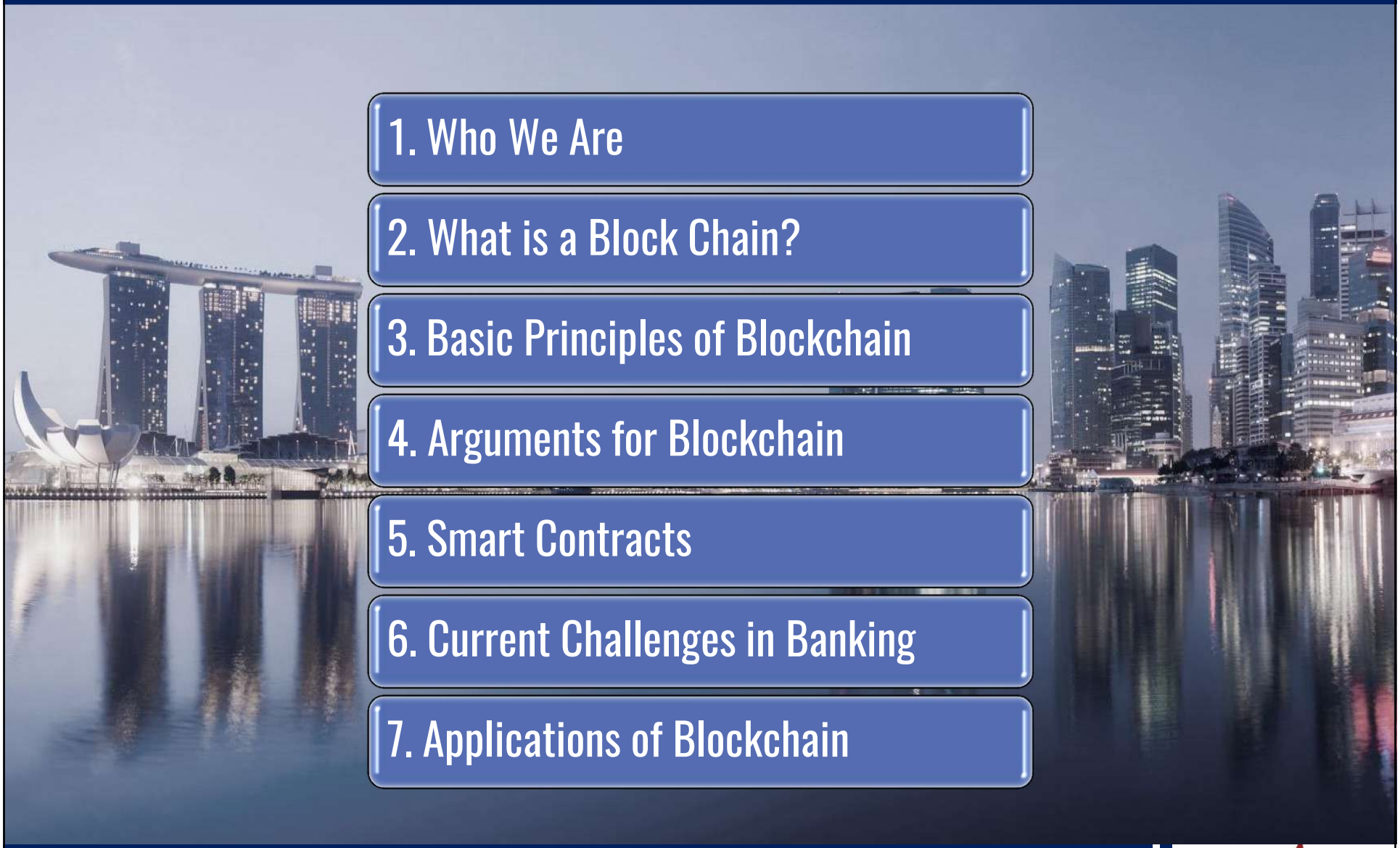
by Deriv Asia & DX Markets

Sam Ahmed

Deriv Asia
Collateral, Clearing & Post Execution Solutions

DXmarkets
beat the crowd.

Table of Contents



WHO WE ARE

PART ONE

About Us

Marcelo García Casil

CEO, DX Markets

Marcelo is a financial technology expert who has wide-ranging experience in designing and building large-scale enterprise-grade applications with a focus on investment banking and financial systems. With DX Markets, Marcelo is involved in developing technology solutions using blockchain in a number of areas within banking streams.

Sam Ahmed

Managing Director, Deriv Asia

Sam is a derivatives subject matter expert who has extensive experience working in banking across trading, risk management and middle office. With Deriv Asia, he is currently working with a number of banks in the region on strategic initiatives and implementing regulatory change and risk infrastructures across banks.

Our Vision

This is a joint partnership with Deriv Asia and DX Markets.

Deriv Asia, with its extensive experience in understanding banking infrastructures and workflows, is looking to identify areas within banking where blockchain could be introduced with the objective of lowering costs, increasing efficiency while introducing tools to allow greater regulatory oversight and audit trail.

DX Markets, having the cutting-edge blockchain technical know-how and design tools, will work to develop customized solutions in selected areas that have been identified within banking.

Together, DX Markets and Deriv Asia will participate in comprehensive implementation, testing, parallel-run, and final rollout of any of the solutions developed.

WHAT IS A BLOCK CHAIN?

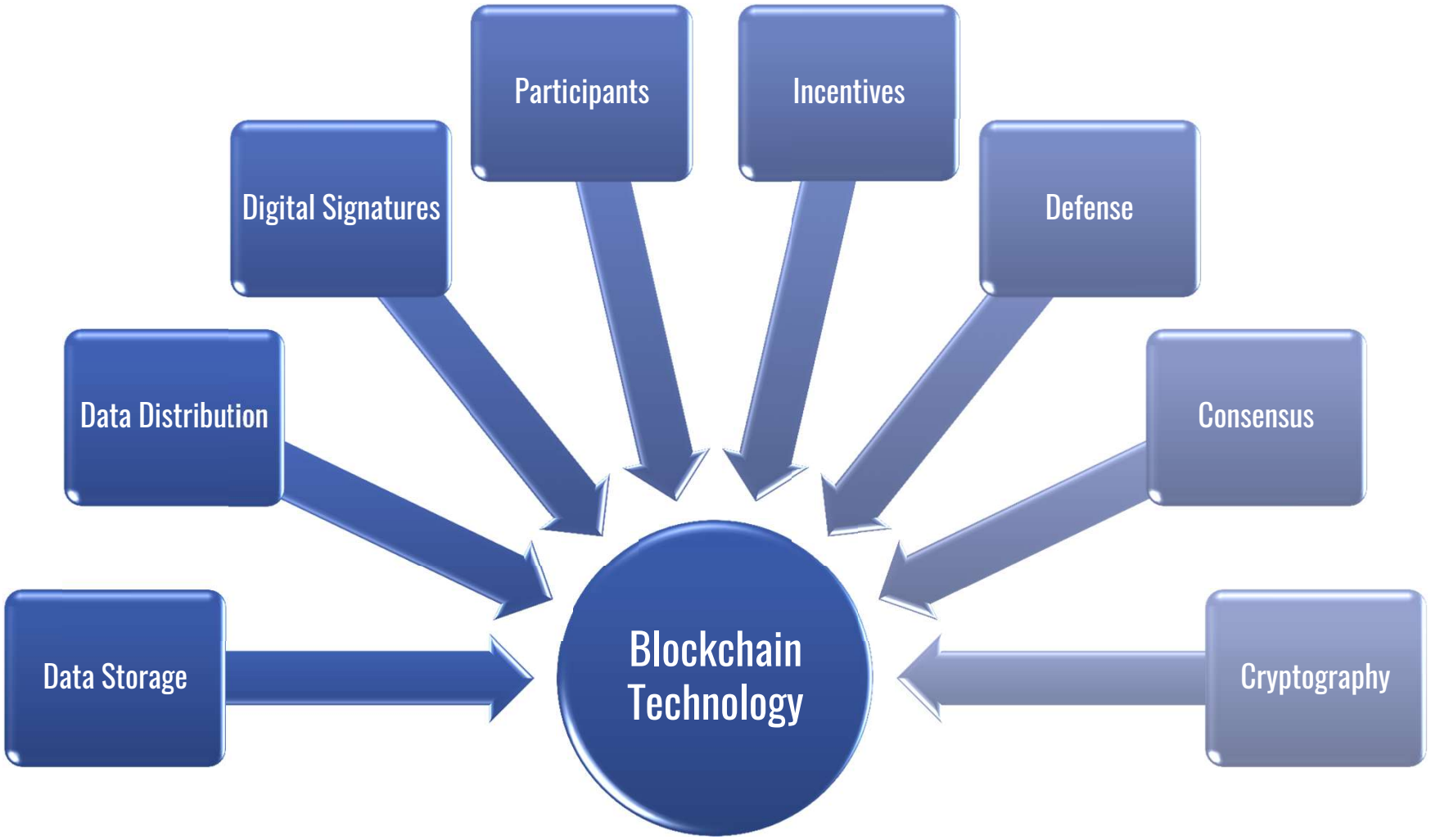
PART TWO

What is a block chain?

A block chain is a distributed ledger that maintains a list of financial transactions which is tamper-proof and updated in real time.

This record is protected with a highly resistant cryptography system which is on par with what is currently used in banks.

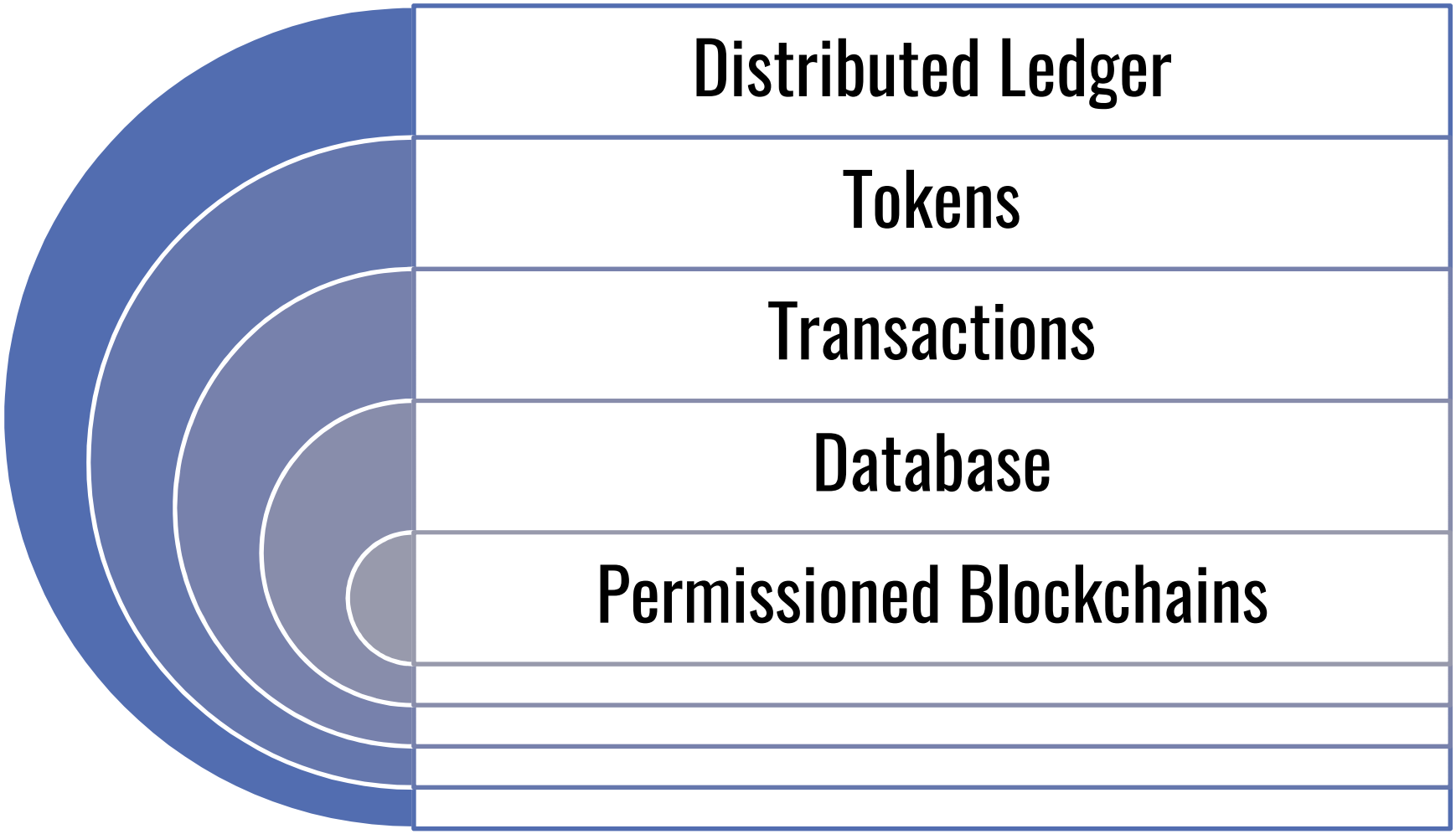
Blockchain Technology



Basic Principles of Blockchain

PART THREE

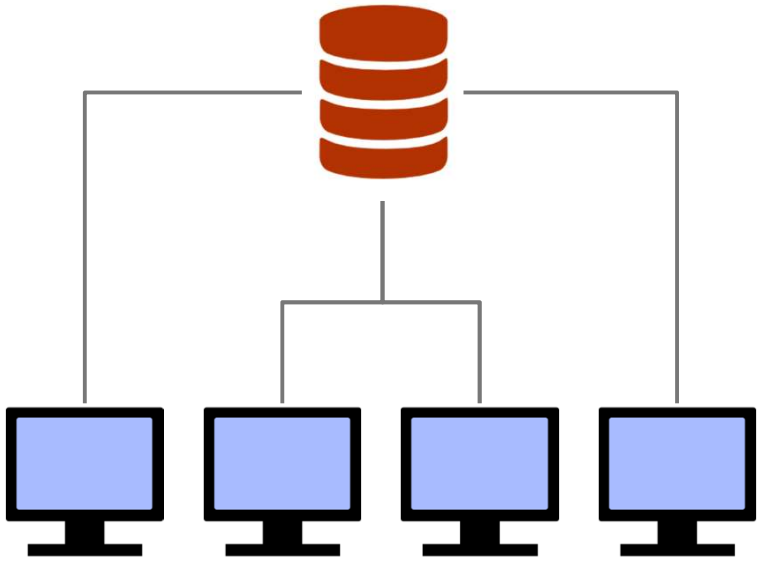
Basic Principles of Blockchain



Distributed Ledger

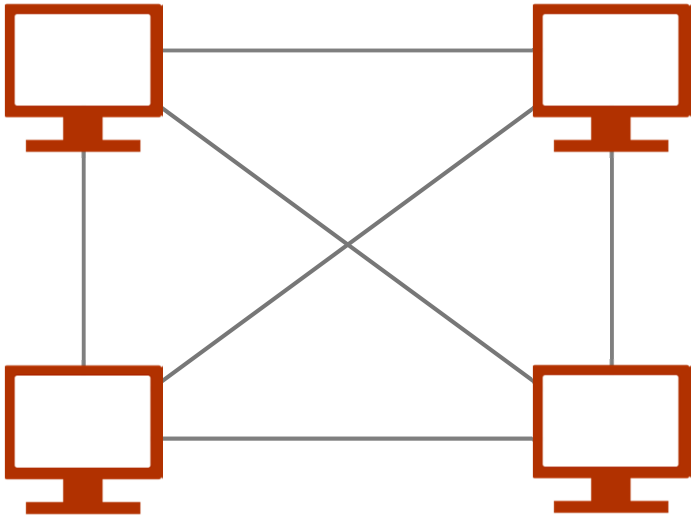
Centralized Distribution

Central Server



Clients

Decentralized Distribution



Distributed Nodes

Distributed Ledger

Private Distribution

Private blockchain network

All participants are known and trusted. (contractual obligations)

Public Distribution

Public blockchain networks

1. Anyone can write data to the ledger.

2. Anyone can read data on the ledger.

Blockchain Tokens

Mining Vs. Minting

Benefits & Challenges

Token-less Blockchains

Blockchain Tokens: Mining Vs. Minting

	MINING	MINTING
Validation Process	Nodes (members) validate transactions and bundle them in blocks which get added to the blockchain ledger. "Proof-of-work".	Members have to get special credentials to join, the mining process is no longer required.
Incentive	Act of mining is rewarded with an amount of blockchain tokens.	-
Security	Process of mining is deliberately computationally expensive to avoid malicious addition of invalid tx.	Members are contractually bound.
New Tokens	Reward for mining obtained by miners also result in new tokens being produced.	New tokens are issued by authorized members of the network, may require consensus.
Suitable for	Public blockchains – anyone can join	Private blockchains – members are known entities

Blockchain Tokens: Token-less Blockchains

Tokens exist in blockchains as a reward mechanism or to prevent transaction spam in public networks. If the network is private and the members are well-known and trusted then tokens are not needed to operate the blockchain.

Ledger entries and still benefit from all the properties of the blockchain, but without the need for a token.

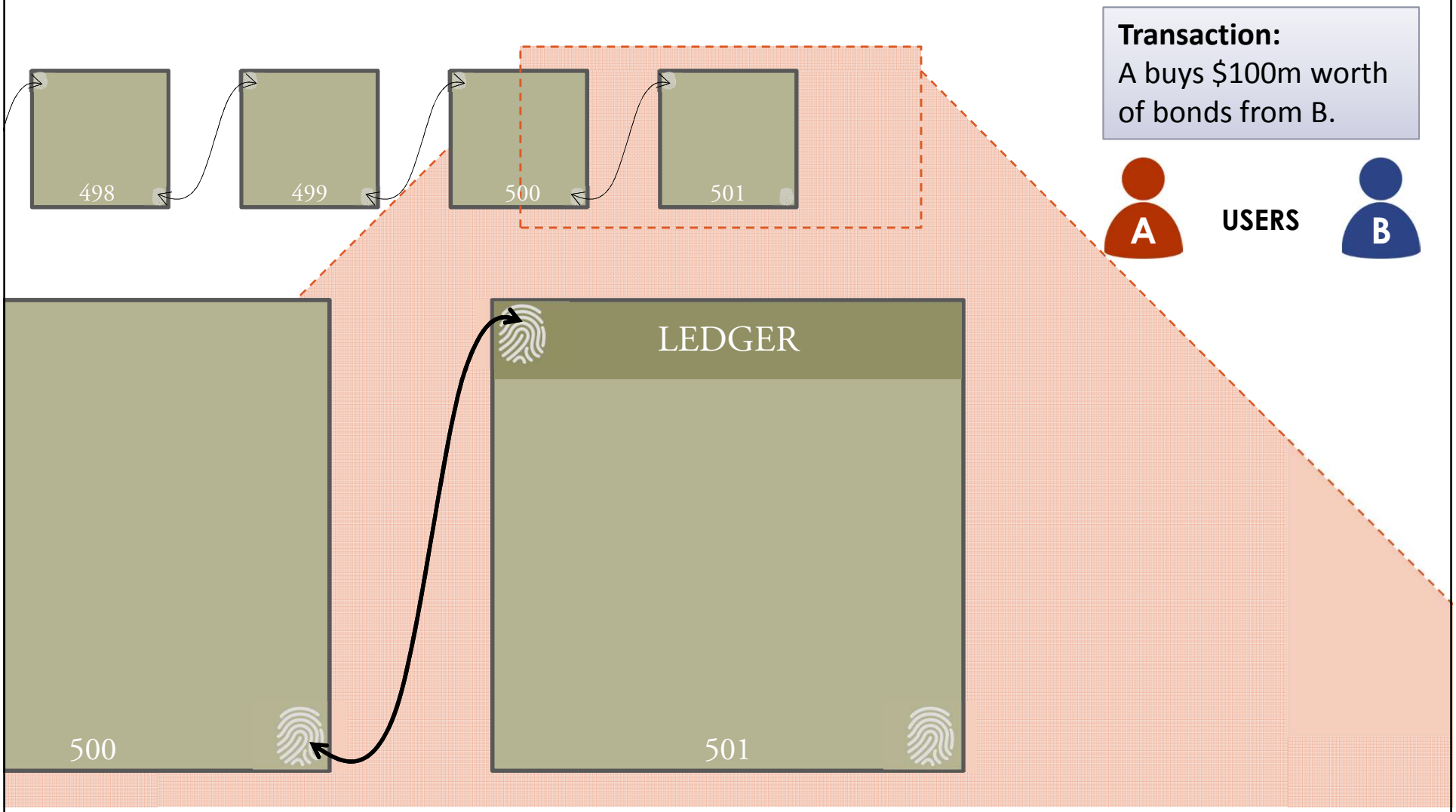
Blockchain Transactions

Going Digital:
Tokenization
of Assets

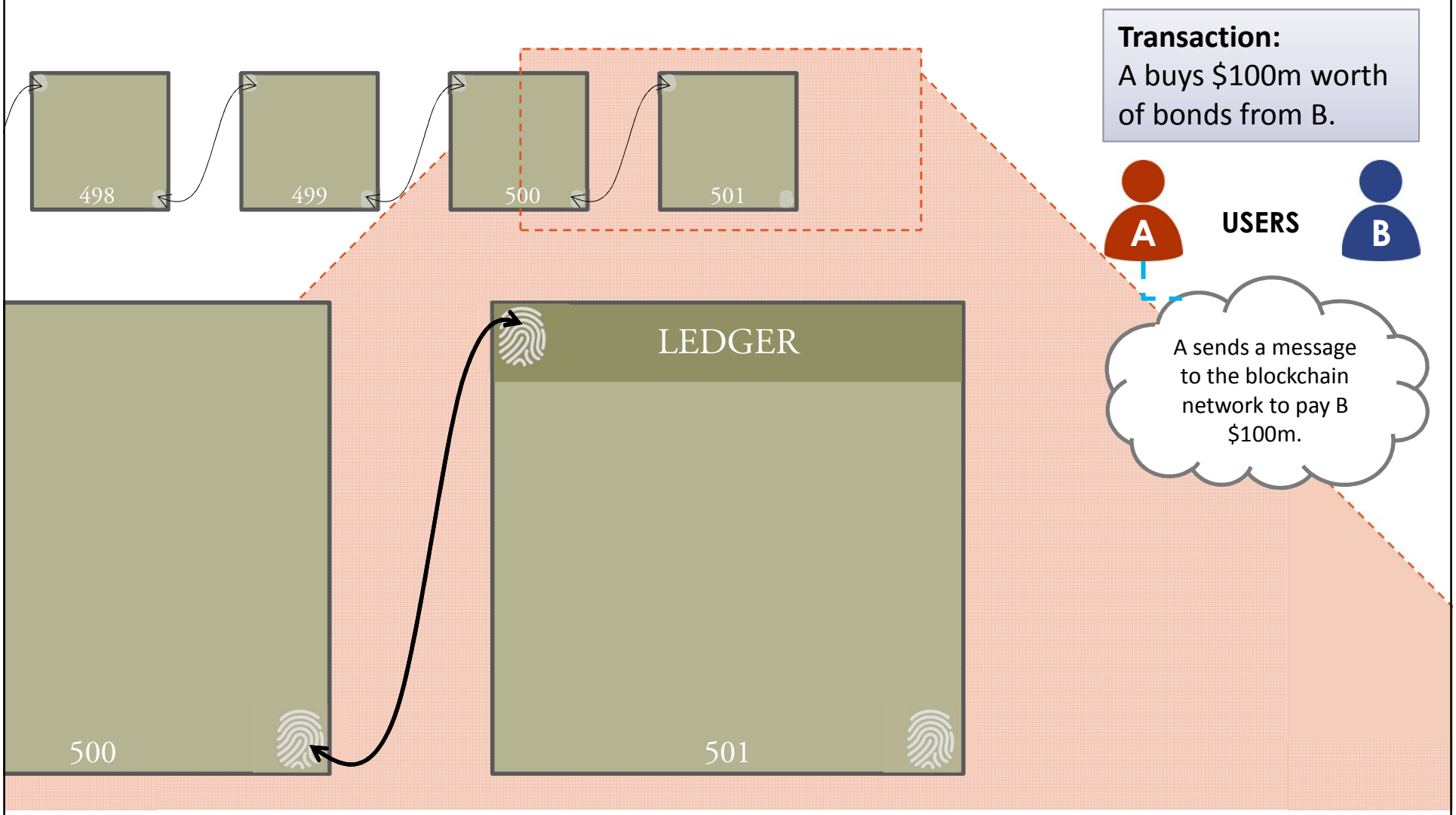
metadata
encryption

All products can be created as digital instruments in the blockchain.

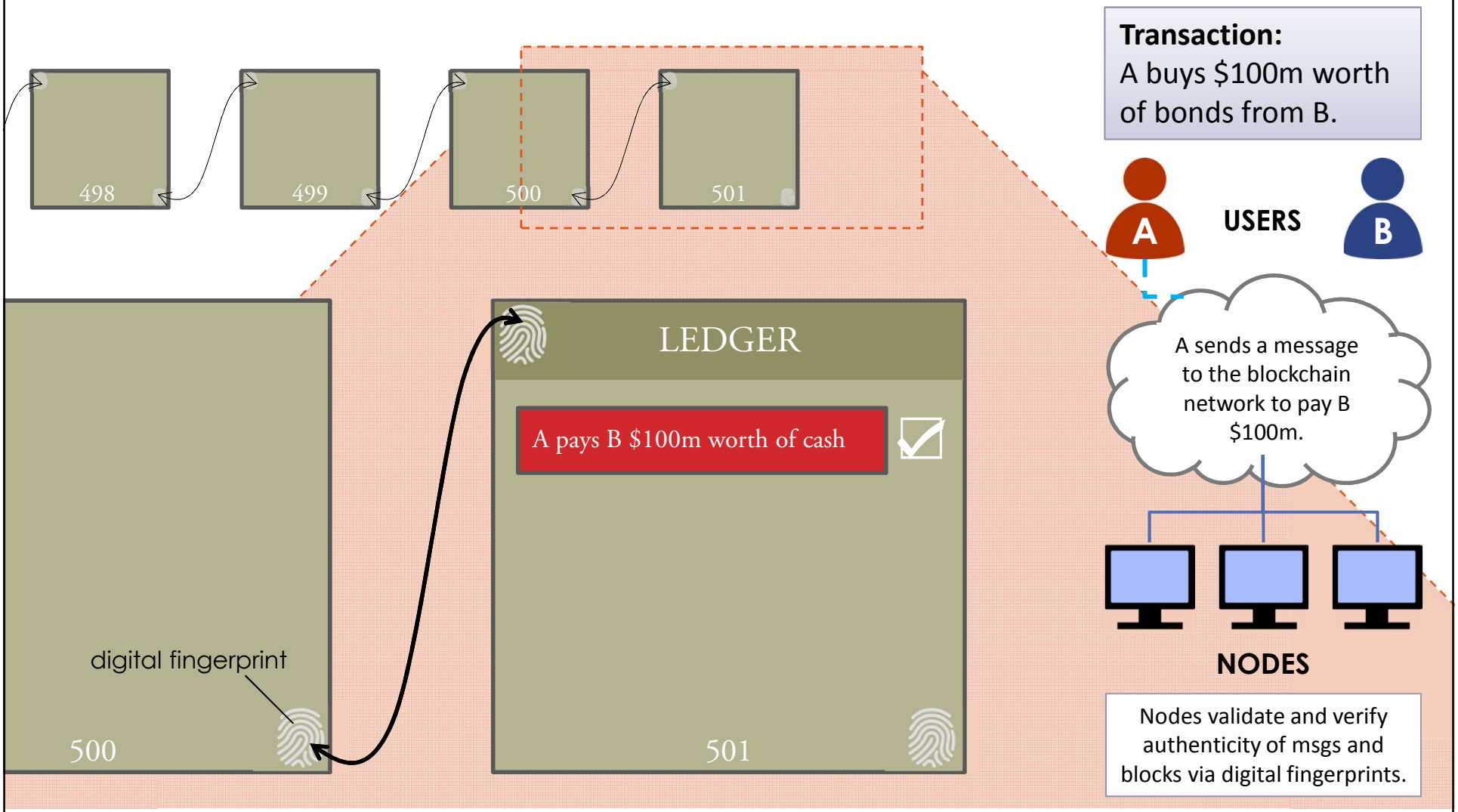
Blockchain Transactions



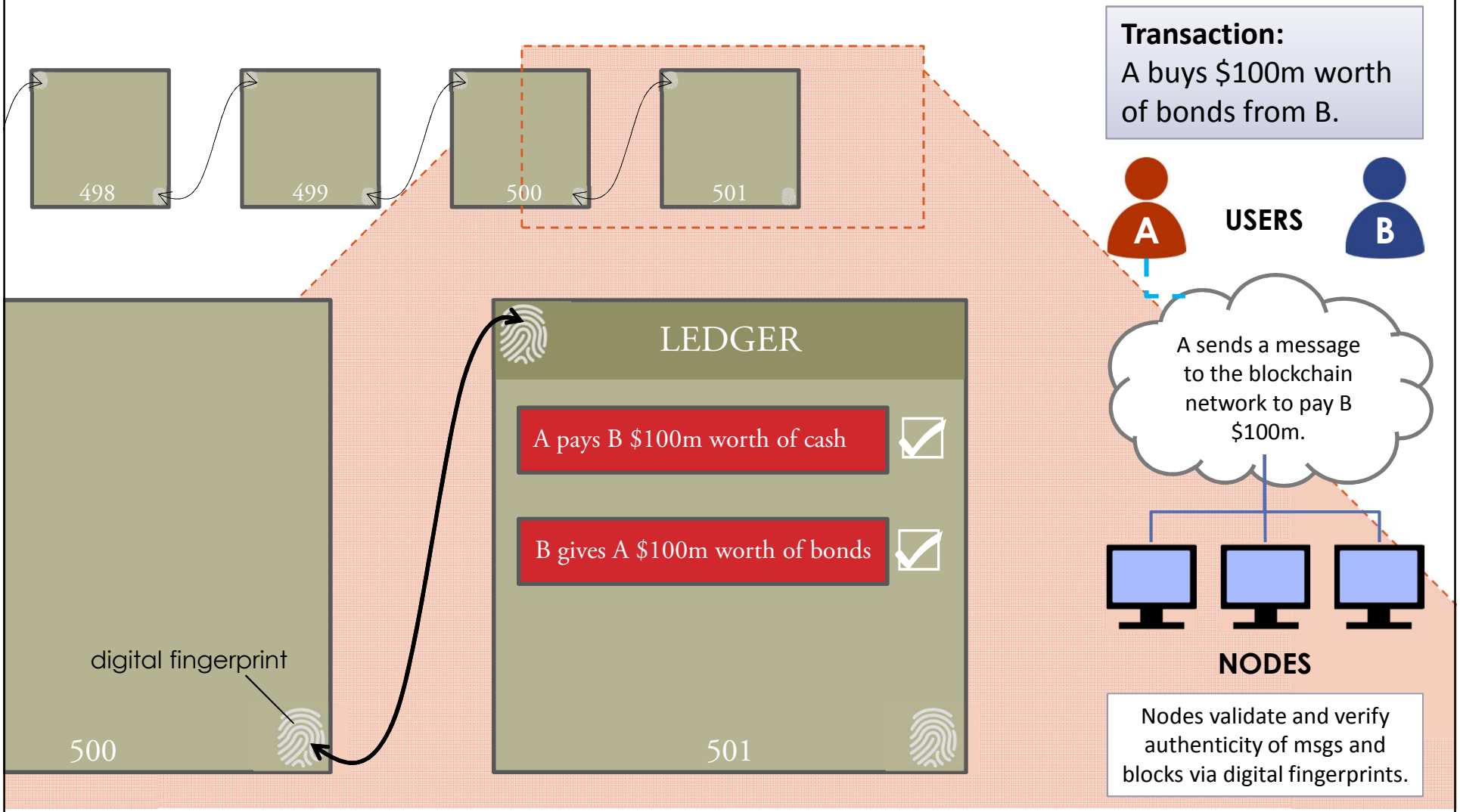
Blockchain Transactions



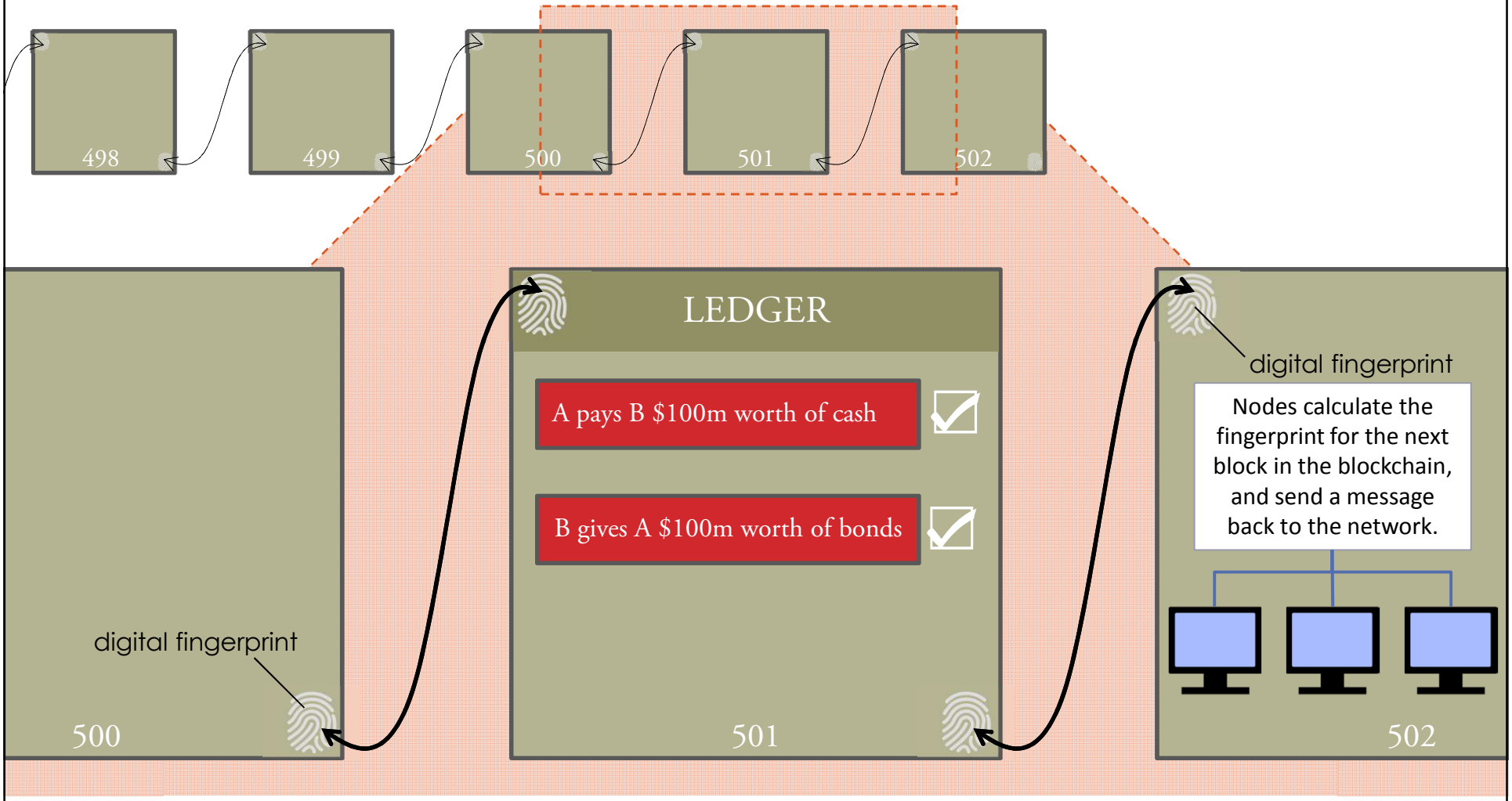
Blockchain Transactions



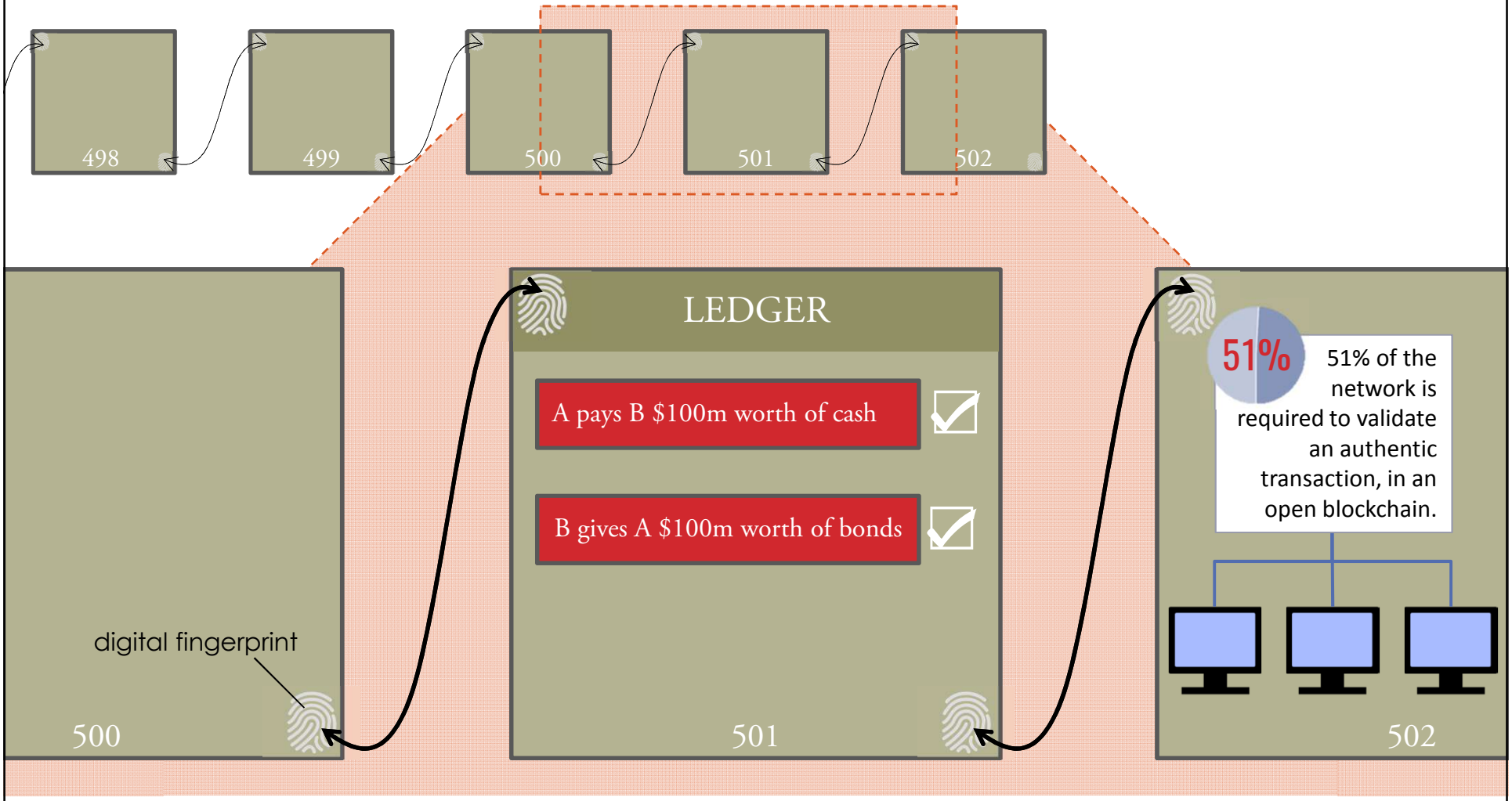
Blockchain Transactions



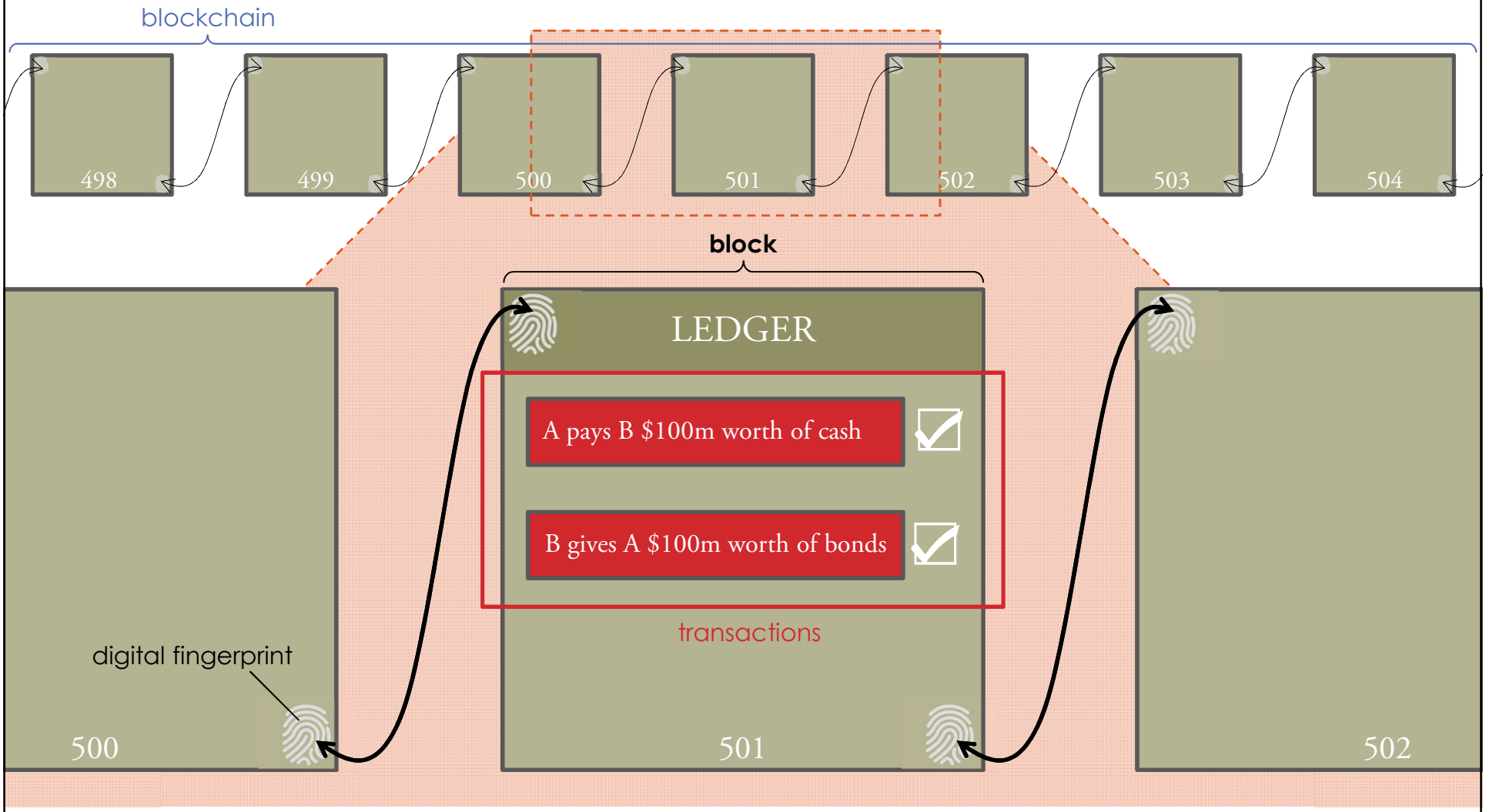
Blockchain Transactions



Blockchain Transactions



Blockchain Transactions



Blockchain Database

Data Immutability

- ✓ blocks of transactions
- ✓ unique thumbprint validation
- ✓ ensures content of block cannot be modified ("immutable")

Audit Trail

- ✓ permanent record
- ✓ blocks cannot be deleted/changed
- ✓ full audit trail
- ✓ can be made public or private

Storing Metadata

- ✓ free format field
- ✓ any data structure can be stored
- ✓ any form of information
- ✓ full details of transactions

Encryption

- ✓ increased security
- ✓ cryptographic guarantees
- ✓ minimize risk of exposure
- ✓ enables autonomous control

Permissioned Blockchains

Defines user roles for each party for a specific function.

Functions can include read, write, validate, issue and ETC.

Arguments for Blockchain

PART FOUR

Arguments for Blockchain

Instant Settlement

- ✓ Peer-to-Peer ("P2P") protocol
- ✓ Ledger updates automatically

Reduce Operational Risk

- ✓ increased accuracy of trade data
- ✓ reduce settlement risk
- ✓ minimal parties and movements
- ✓ golden source of trust of info

Real-Time Reporting

- ✓ eliminates potential reporting fines for late reporting or not complying with regulations
- ✓ reduce reputational risk

Real-Time Auditing

- ✓ transparent historical record
- ✓ effective customized monitoring by participants, supervisors and regulators (privacy layering)

Arguments for Blockchain

Reduce Costs

- ✓ reduce fess: brokerage, settlement, etc.
- ✓ reduce operational costs: supervision, IT structure, etc.
- ✓ reduce reporting costs

Tamper-Proof

- ✓ openly verifiable by community of network users
- ✓ mathematically impossible to delete data

Resilient

- ✓ distributed nodes highly resistant to attack
- ✓ authenticity of transactions can be computationally verified

Full In-Place Replacement

- ✓ improves on existing system
- ✓ due diligence, AML and KYC compliance requirements remain in-place

Reduce Costs

"Distributed ledger technology could reduce banks' infrastructure costs attributable to cross-border payments, securities trading and regulatory compliance by between $15-20 billion per annum by 2022."

- Fintech 2.0 Paper, Santander InnoVentures

Sources: World Bank remittance data; World Federation of Exchanges; Oxera; Financial Times; Oliver Wyman analysis

Privacy Layering

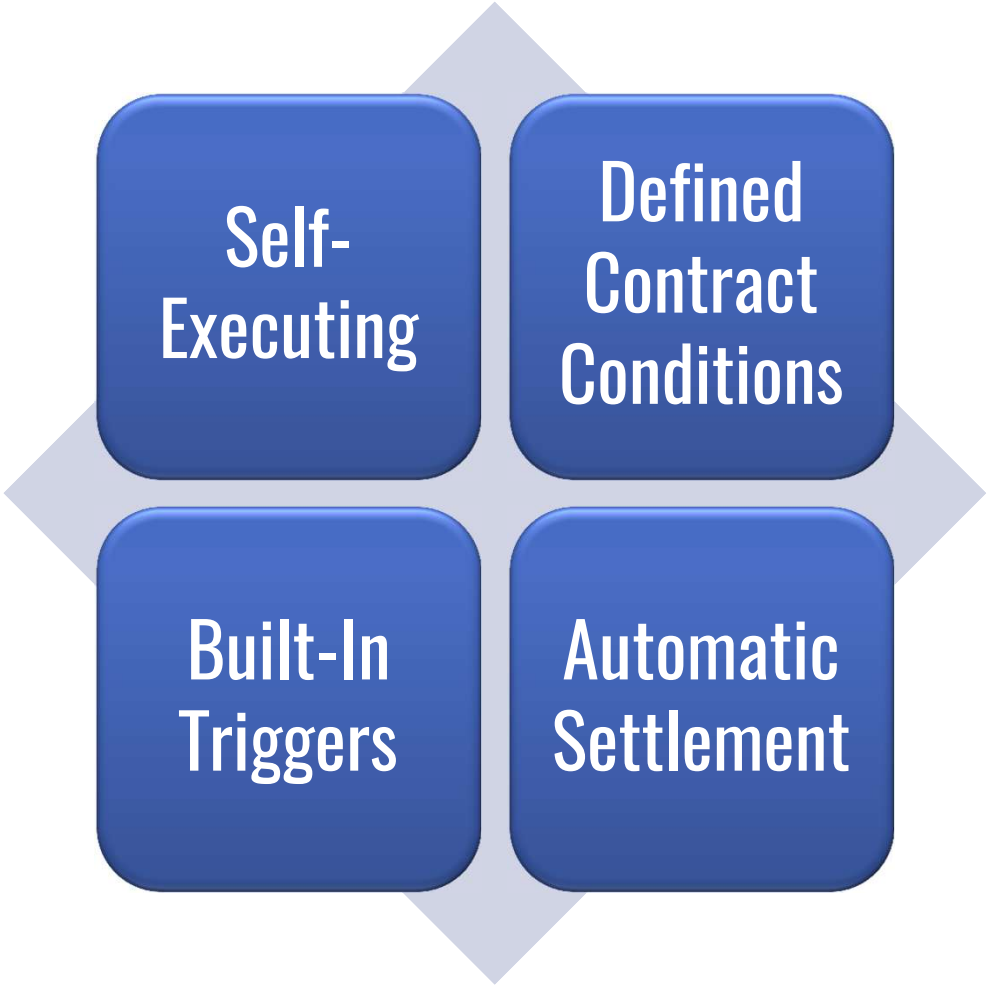
Smart Contracts

PART FIVE

What is a Smart Contract?

Smart contracts are a piece of business logic that sits within the blockchain, defining the terms and conditions of a transaction.

Features of a Smart Contract



Smart Contracts and the Derivatives World

Current Challenges in Banking

PART SIX

Current Challenges in Banking

Regulations

Disruptive Technology

Cost of Capital

Fragmented Markets

Post-financial crisis banking landscape is challenged by regulations and compliance.

Impact of Capital on Banking

LEVERAGE

The Leverage Ratio – as a non-risk-weighted measure – is having perverse effects by preventing banks from holding low-yielding, high-quality assets in preference for riskier assets which would produce a higher relative return of capital.

CAPITAL

Increased RWA for both market and credit risk will force banks to question their product offerings and client franchises in order to determine the optimal product mix and target client segment. It will force banks to abandon market share and focus on ROE.

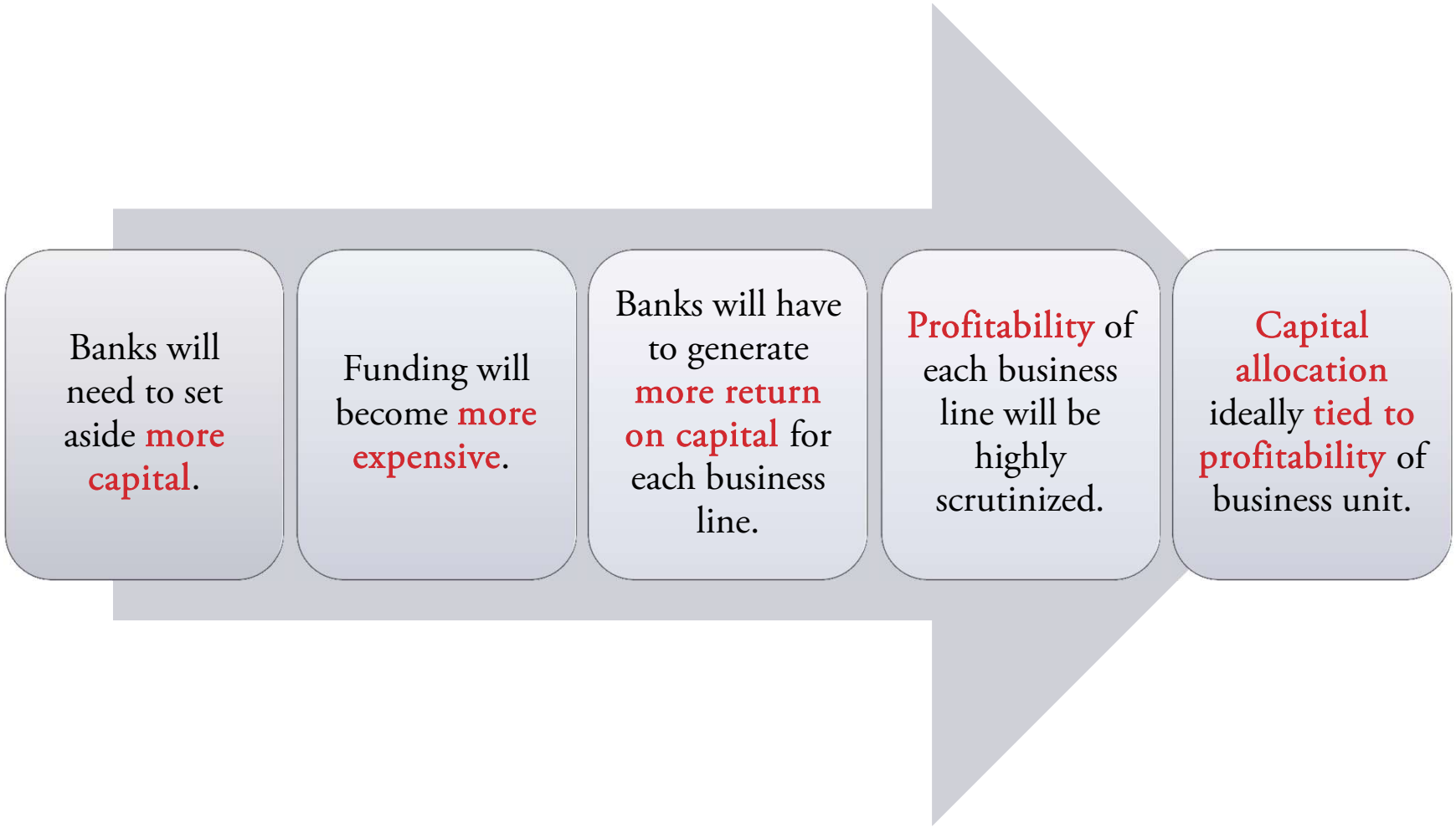
FUNDING

New liquidity rules are likely to push towards more deposits & reduced short-term wholesale funding reliance, along with increased acceptance of high quality liquid assets from counterparties as collateral, designed to reduce roll-over risk and duration of funding. NSFR will affect prime brokers who are facing less liquid hedge funds and rely on the bank for funding of assets that are not HQLA.

CVA

New capital charge for over-the-counter ("OTC") derivative exposures to address changes in market value associated with changes in the credit-worthiness of a counterparty.

Result of Capital and Funding on Banking



Impact of Regulations on Costs

Dodd-Frank | EMIR | Basel 3

High regulatory compliance costs makes it much more expensive today to trade the same portfolio of OTC derivatives than pre-2008.

- Legal Fees
- Infrastructure Builds
- Technology Upgrades
- Data Connectivity
- Reporting & Clearing Fees
- Default Fund Contributions
- Funding for Margins & Collateral

Current Challenges in Banking

Prime Services

Prime services will see a sharp reduction in ROE from 15% to about 8%. This type of business is not subject to RWA for market or credit, but will be severely affected by leverage ratio.

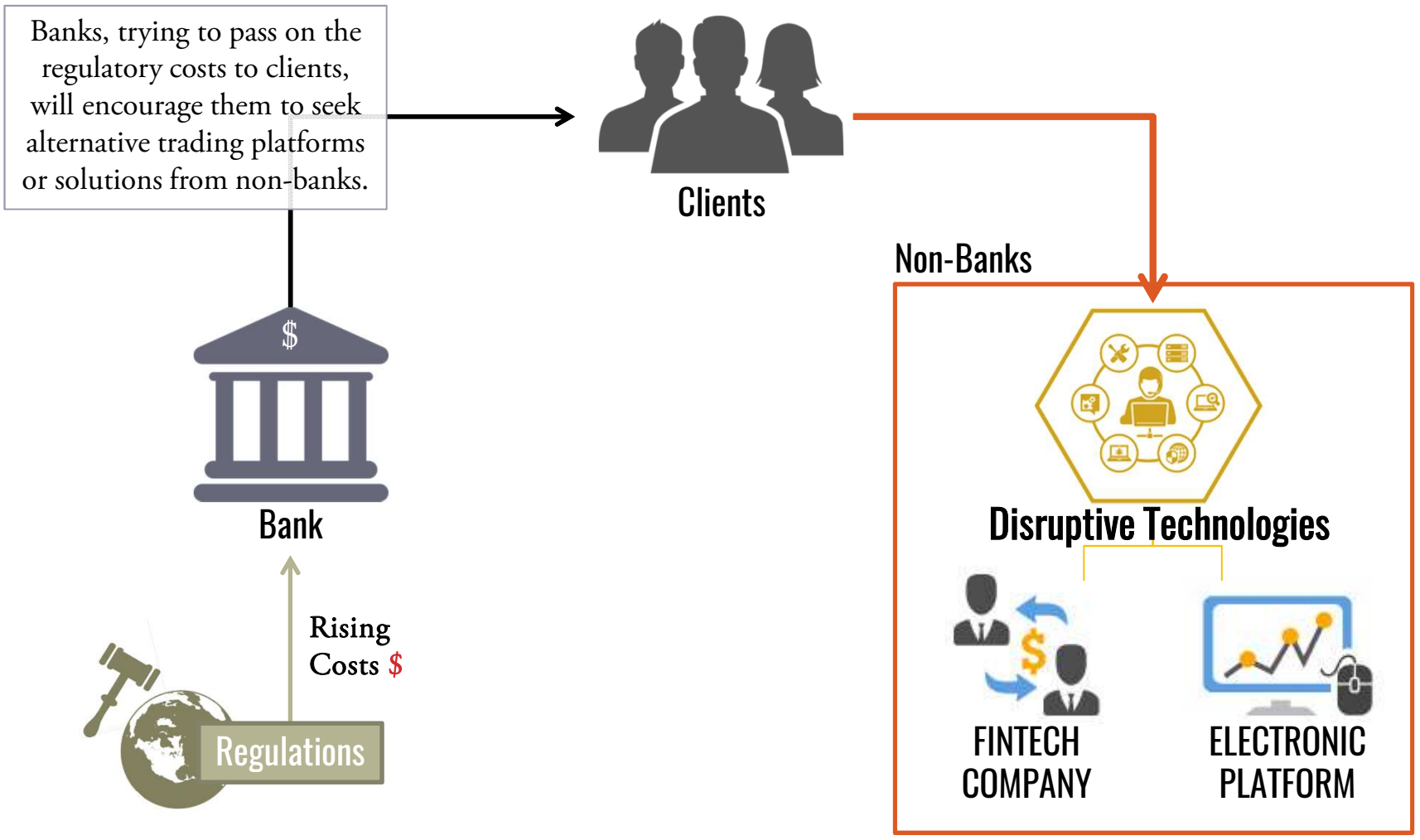
Proprietary Trading

Proprietary trading enjoyed an average pre-regulation ROE of 35% to 7% largely due to RWA for market risk and usage of company balance sheet. Volker rule will also discourage banks from conducting in-house proprietary trading.

ROE for some banks appears to be averaging around 6%-8% for banks after the financial crises which is lower than the long-term cost of capital (widely considered to be 10-12% by BIS study 2009).

This is a risk for the banking industry as a whole, particularly US &European banks.

Markets, Costs & Disruptive Technology



Implications of Disruptive Technology

Loss of Revenue

Most of the infrastructures and technology in the market will be owned by FinTech companies and not banks. Banks will lose revenue to utilities and vendors for any infrastructure, post-trade services and compliance monitoring (KYC, AML etc.)

Replacement

Cost effective trading platforms from non-banks will start to replace broker-dealer desks at banks for buyside, high net worth and retail clients.

Agency Model

Broker-Dealer desks at banks will try and reduce their capital costs to attempt to stay competitive on pricing. Thus, brokering will switch towards a pure agency model with little appetite to use balance sheet and warehouse risk.

Single Source

New multi asset electronic dealing platforms along with the ability to store financial and client data, calculate risk parameters and perform reporting, may offer clients a 'one stop' single source of trading and post trading needs.

Implications of Disruptive Technology

Loss of Revenue

Replacement

Agency Model

Single Source

Most of the infrastru technol will be c compan banks. F revenue vendors infrastru services monitor etc.)

Cost effective trading

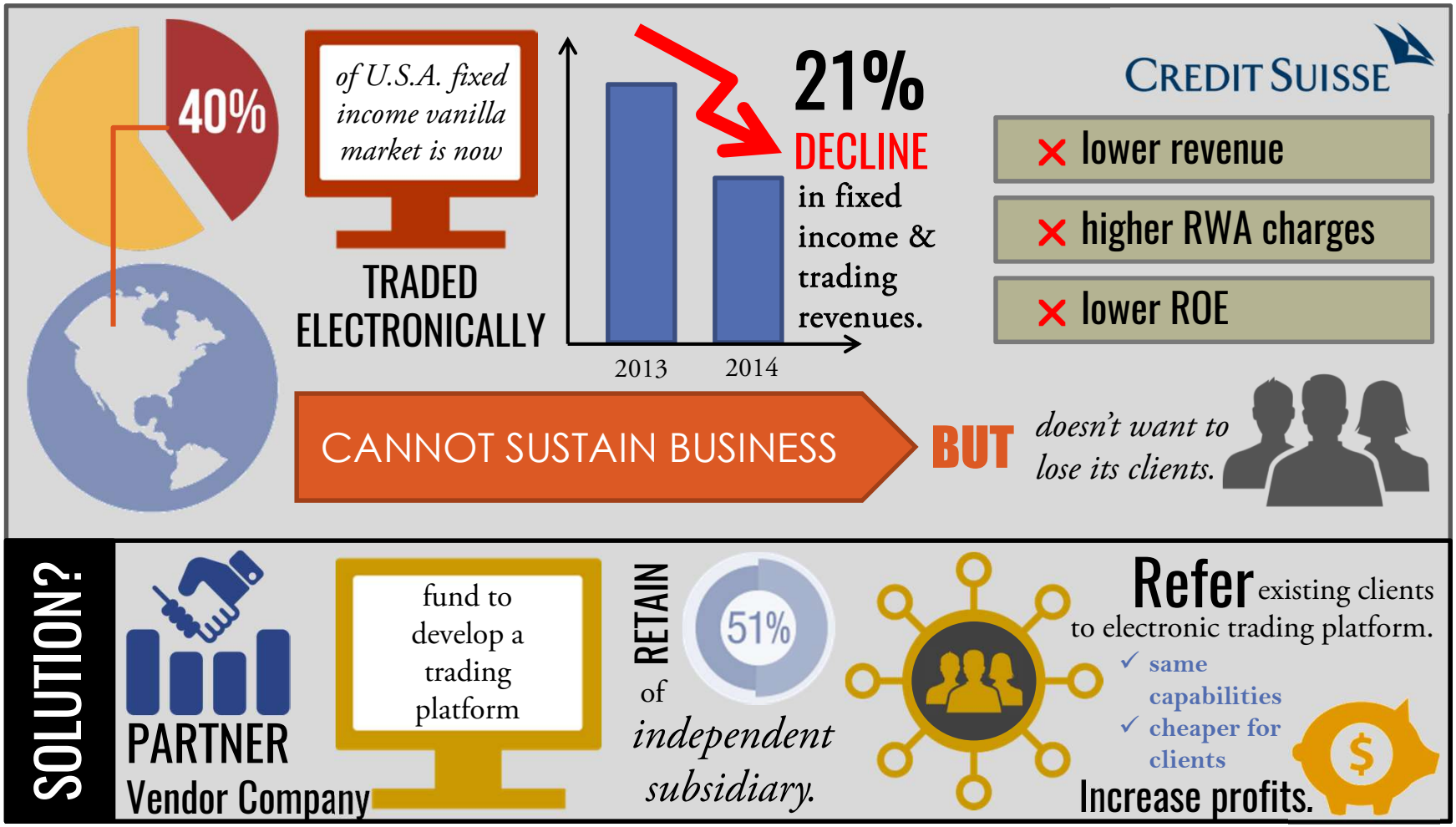
Broker-Dealer desks at

New multi asset

ith the ancial lculate d , may stop' ading needs.

Cost reduction opportunities and pressures to **stay competitive** against non banks with more sophisticated and lower cost technology may drive banks towards **new partnerships** in order to look for efficiencies from third-party services.

Case Study: Credit Suisse



Case Study: Credit Suisse

RESULTS

CREDIT SUISSE

Avoided Capital Charges

- Credit Suisse has moved its fixed income business off balance sheet, thereby avoiding RWA capital charges.

Retained Clients

- It has retained most of its clients.

Increased Profit.

- It has kept a significant share of the profits and reversed its downward revenue trend.

Applications of Blockchain

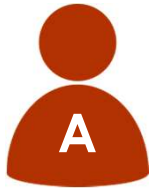
PART SEVEN

Trade Life Cycle

Current: Securities Trade Flow

A's Custodian

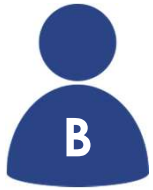
A's Nostro Bank



Counterparty A

B's Custodian

B's Nostro Bank

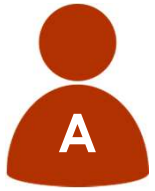


Counterparty B

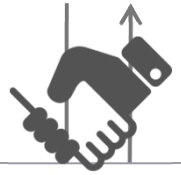
Current: Securities Trade Flow

A's Custodian

A's Nostro Bank



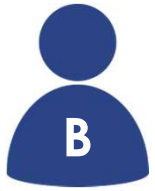
Counterparty A



1 **Execution & Confirmation**
A buys bonds from B @ $100m

B's Custodian

B's Nostro Bank



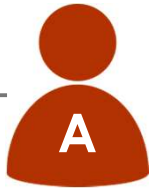
Counterparty B

Current: Securities Trade Flow

A's Custodian

A's Nostro Bank

2 A instructs its nostro bank to move $100m to Counterparty B's a/c.

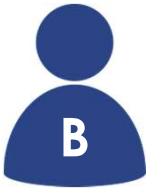


Counterparty A

1 **Execution & Confirmation**
A buys bonds from B @ $100m

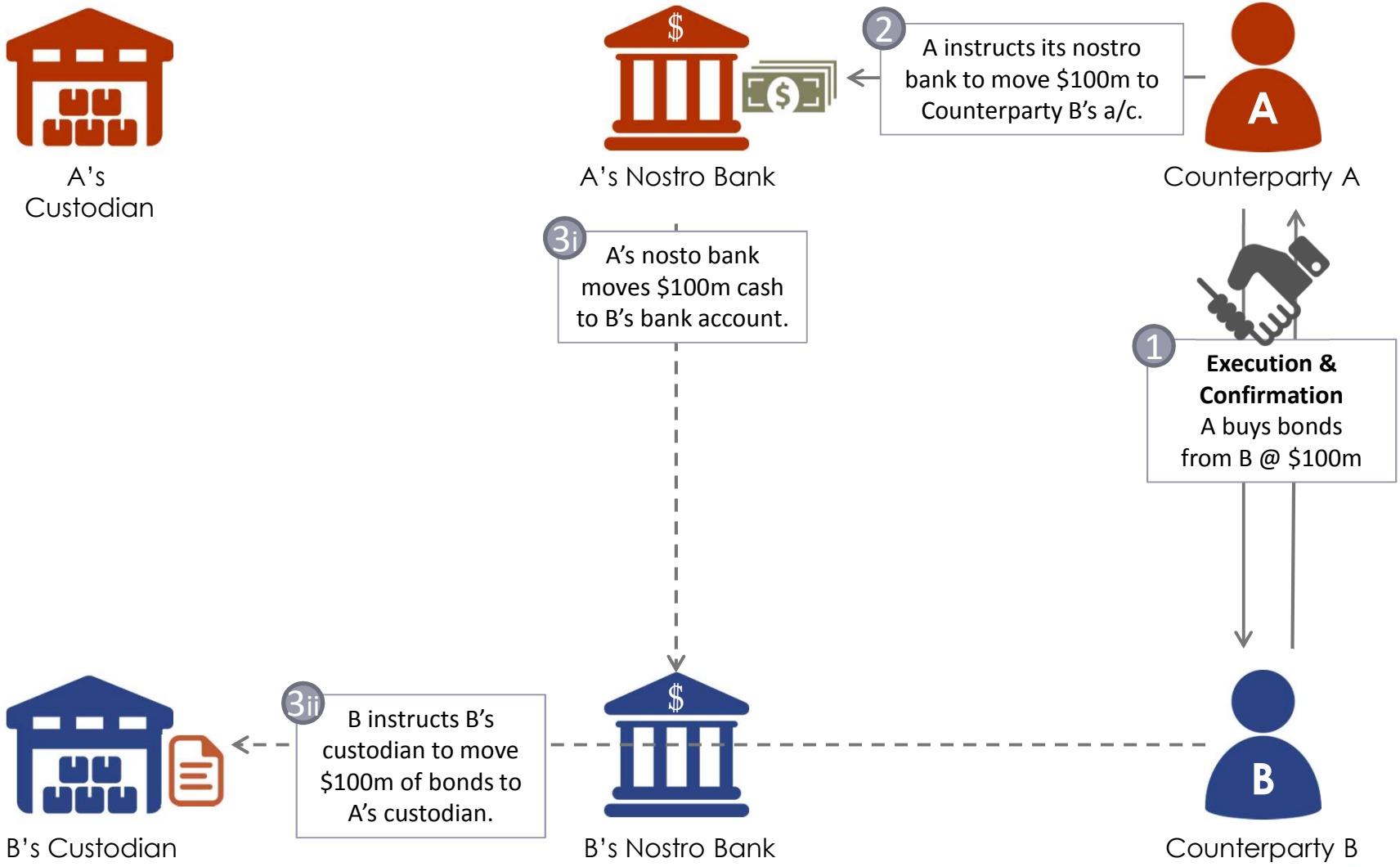
B's Custodian

B's Nostro Bank

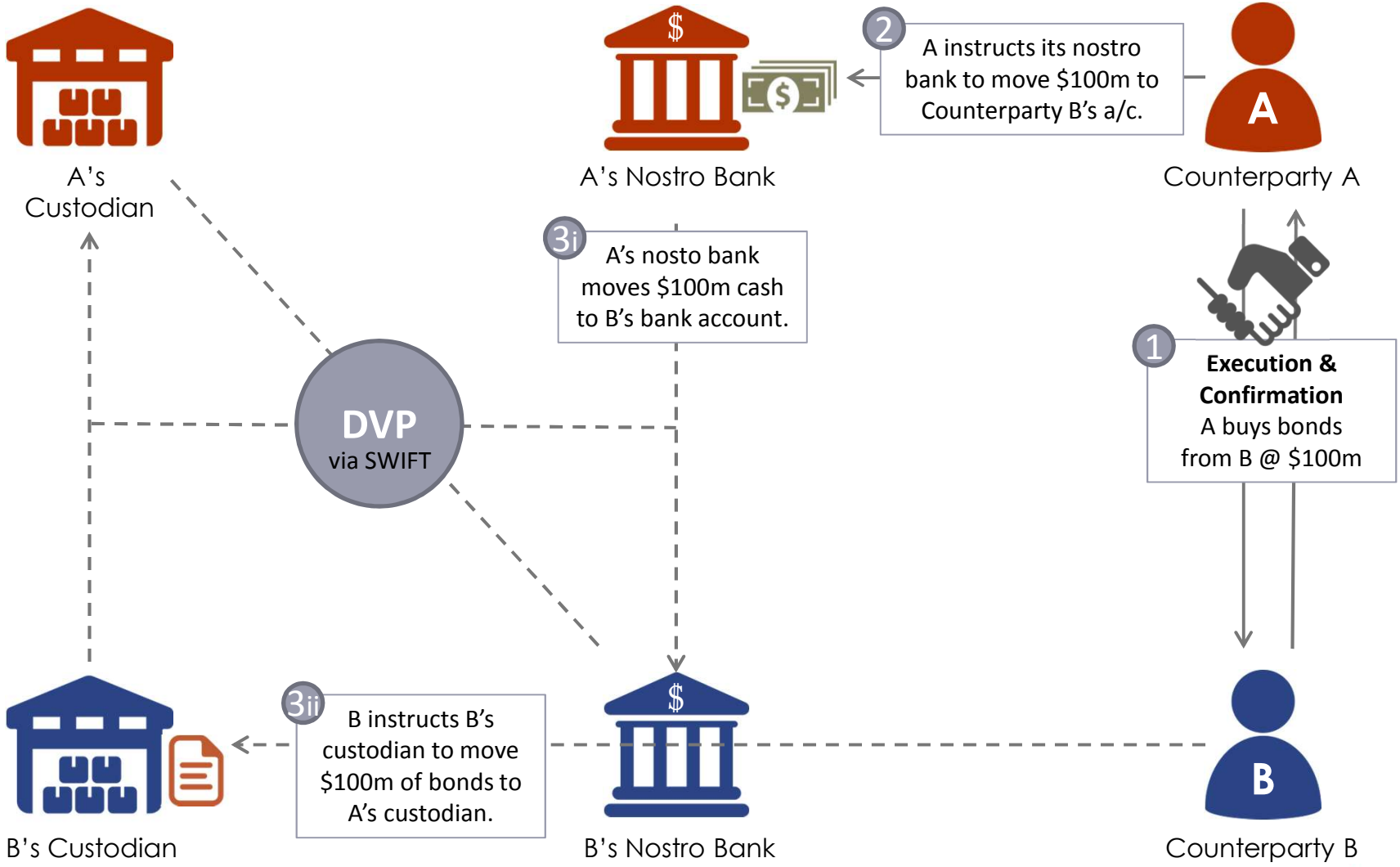


Counterparty B

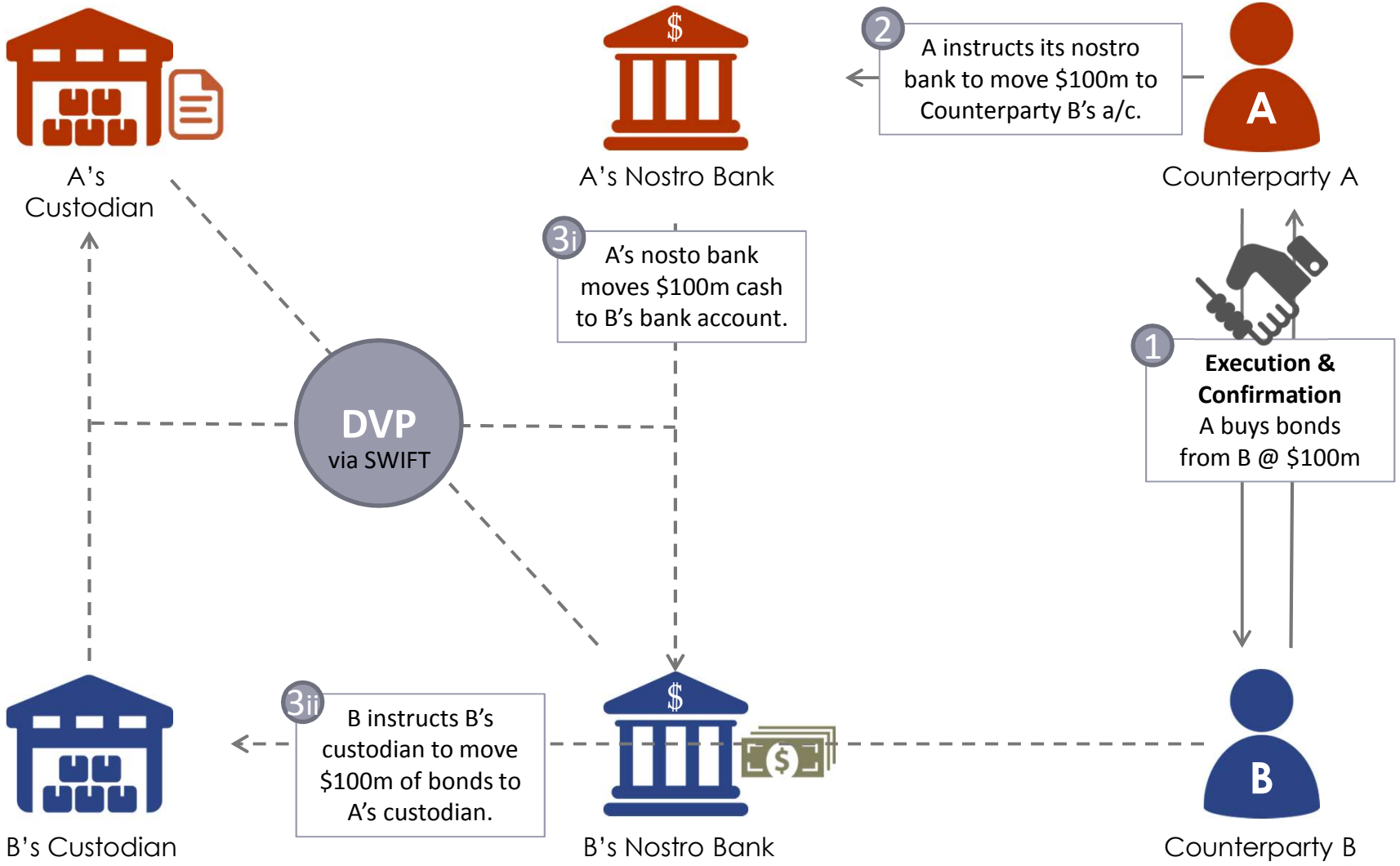
Current: Securities Trade Flow



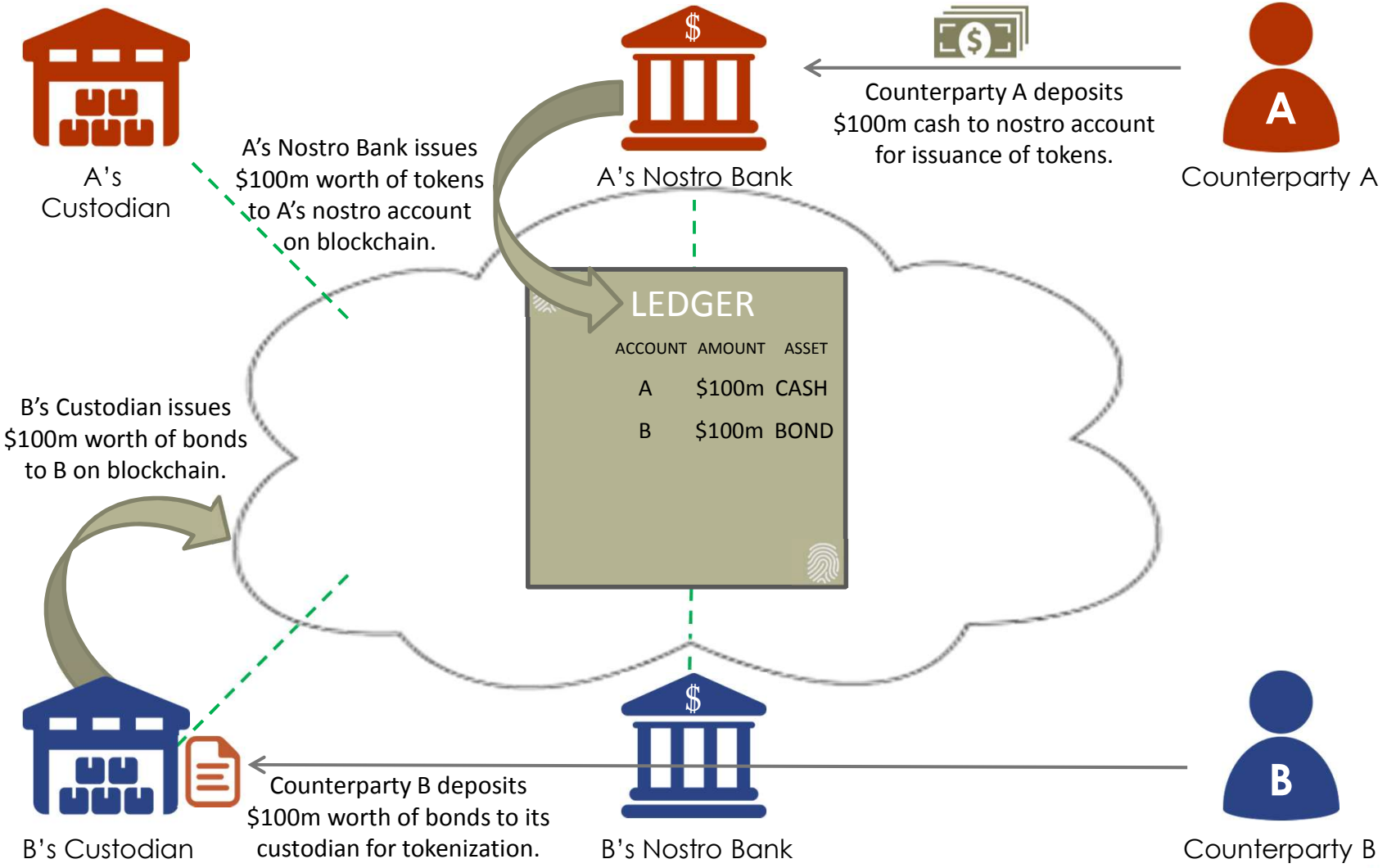
Current: Securities Trade Flow



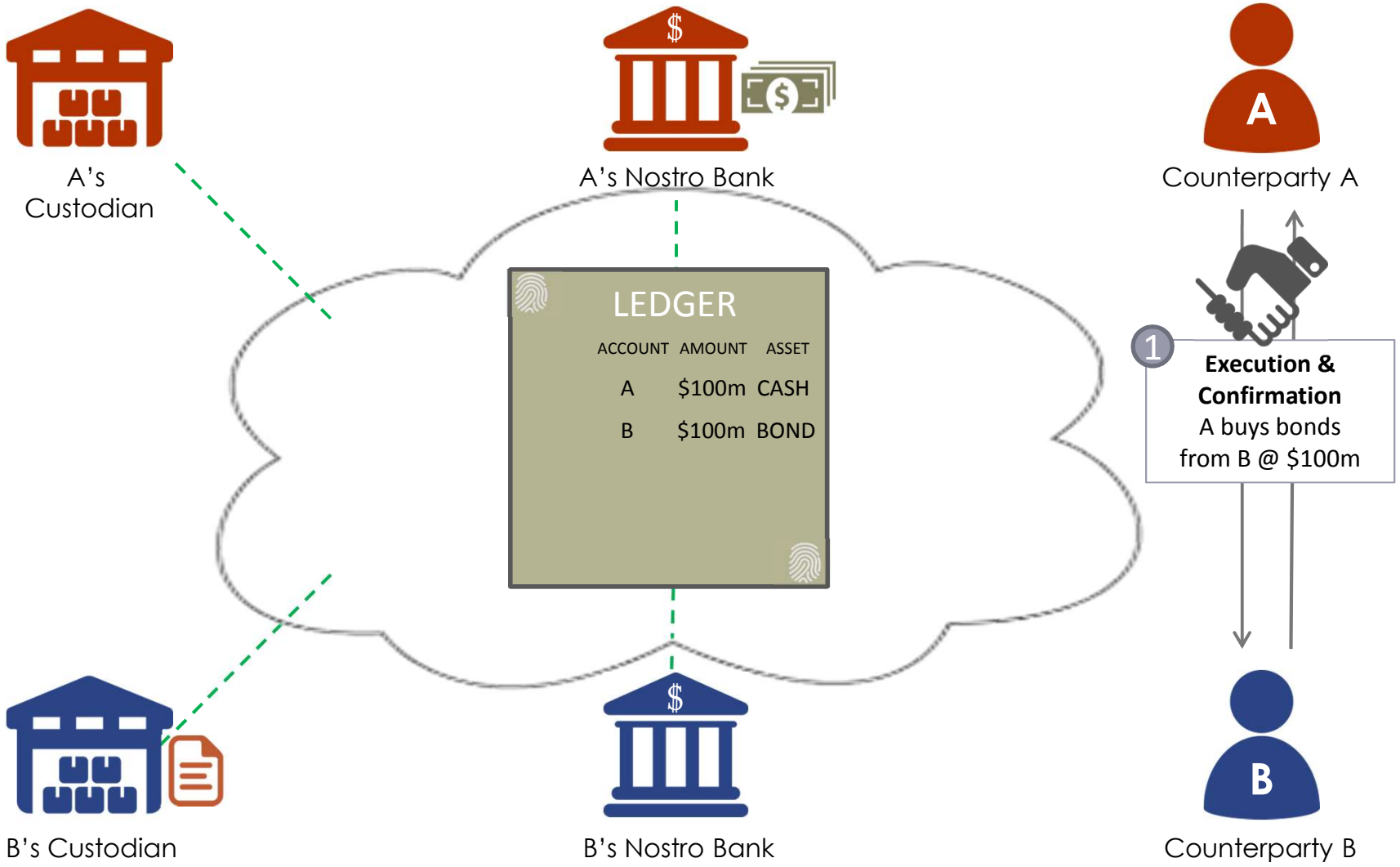
Current: Securities Trade Flow



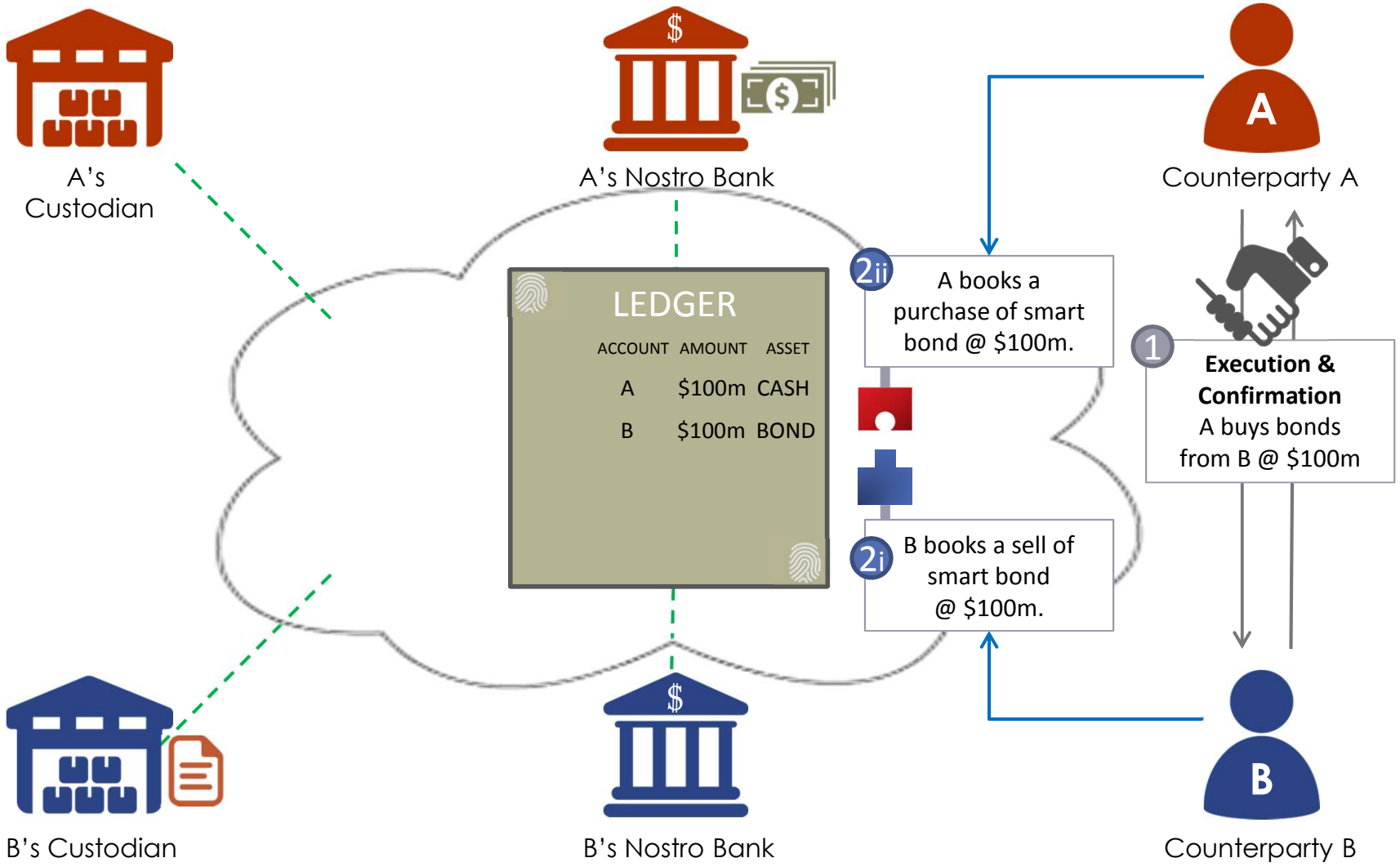
Blockchain: Issuing Cash and Securities



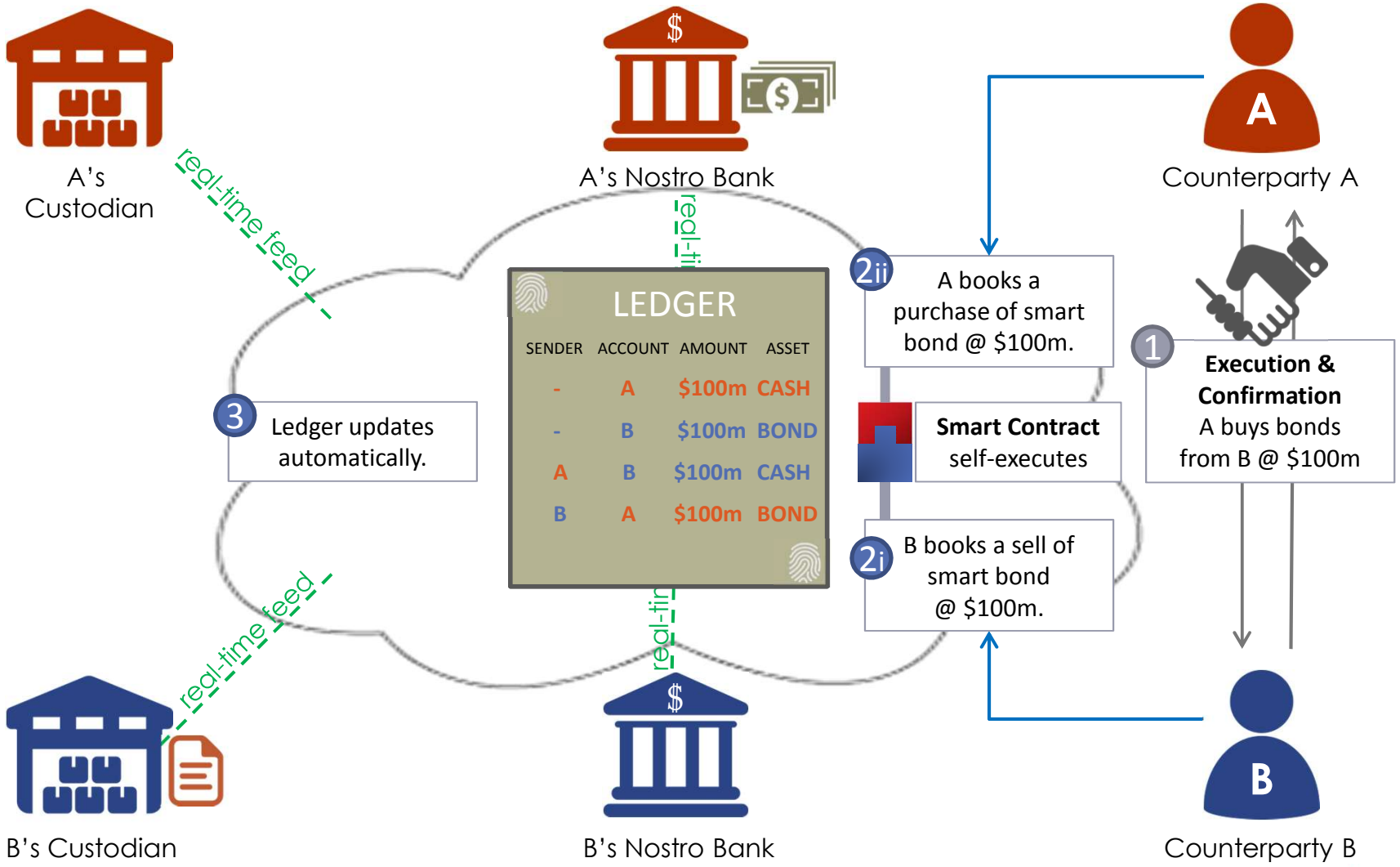
Blockchain: Securities Trade Flow



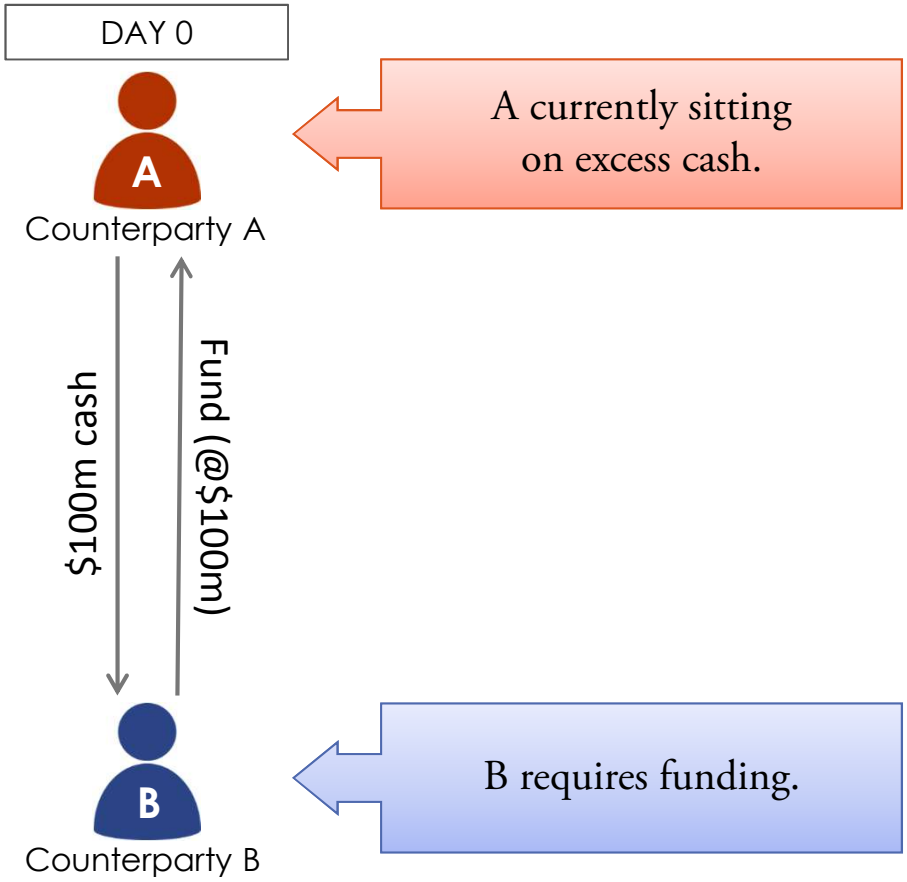
Blockchain: Securities Trade Flow



Blockchain: Securities Trade Flow

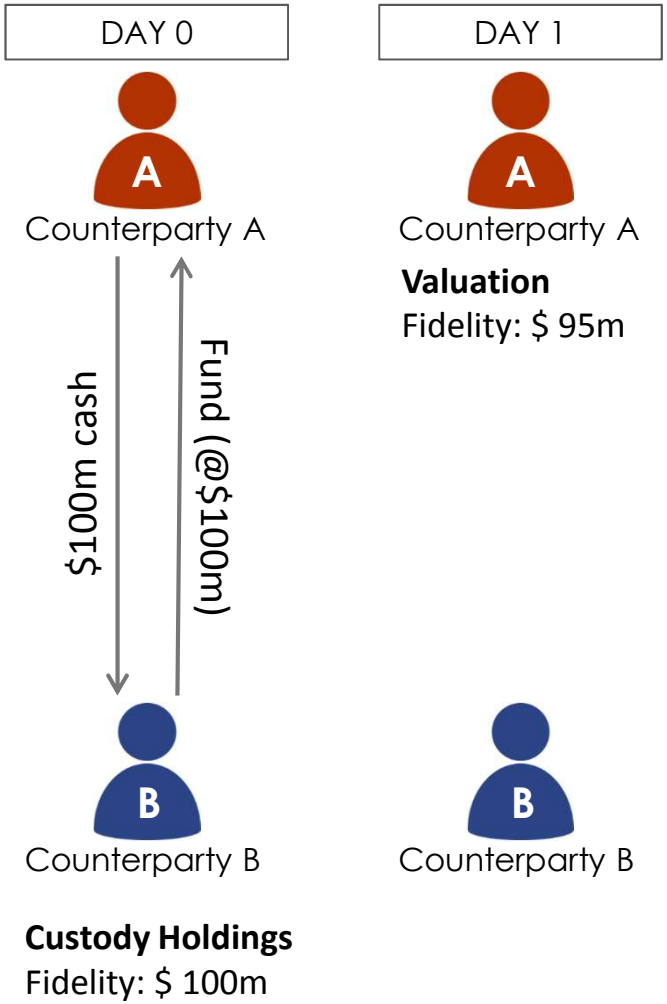


Current: Repo Trade Flow

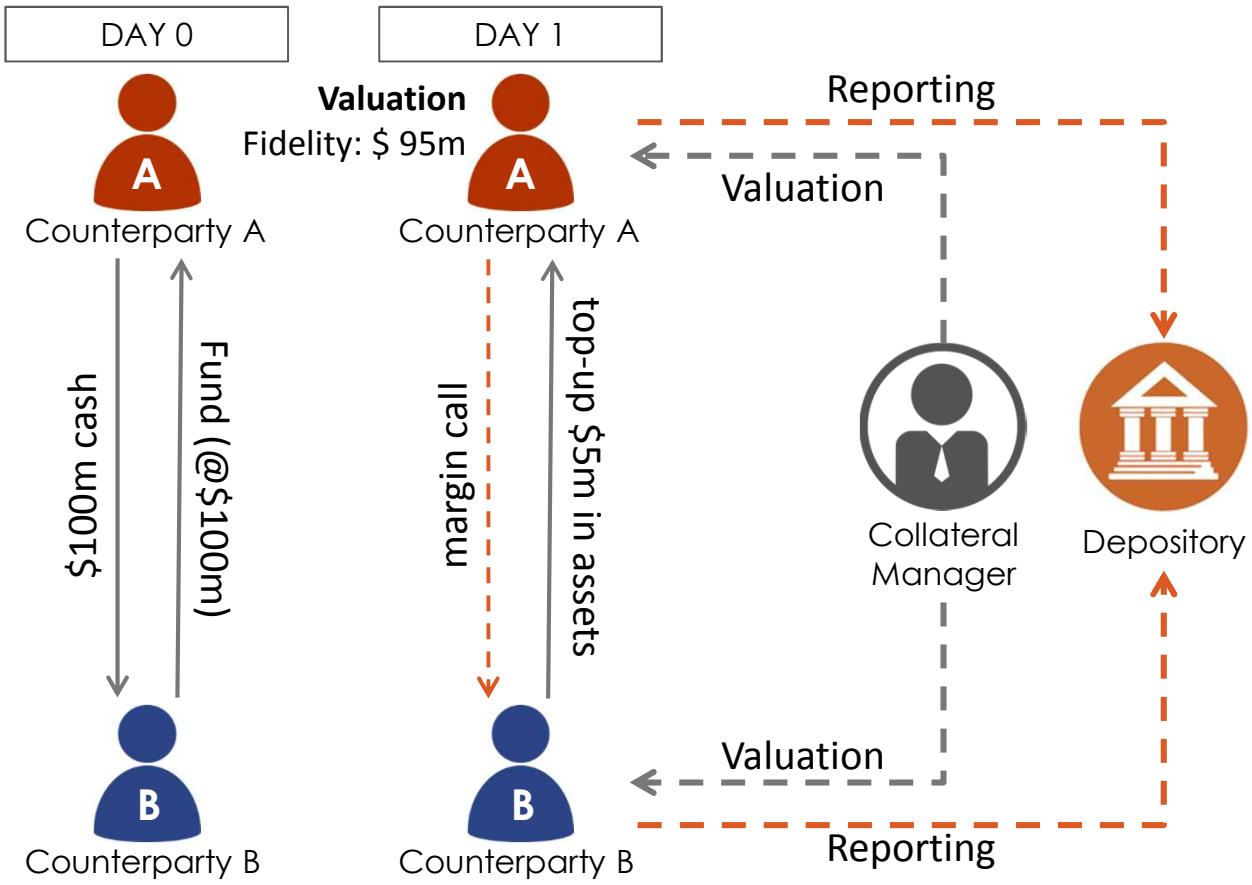


Custody Holdings
Fidelity: $ 100m

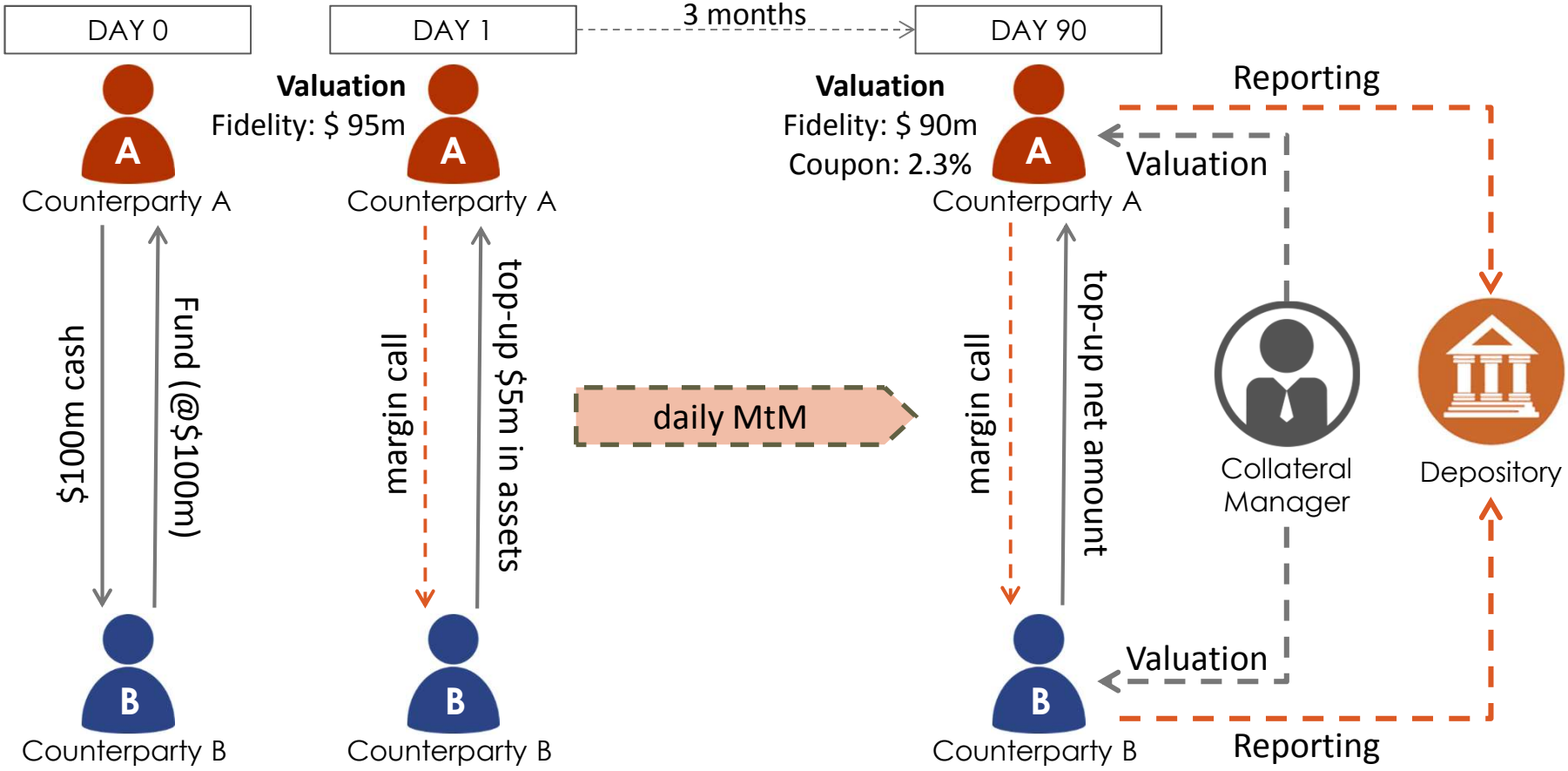
Current: Repo Trade Flow



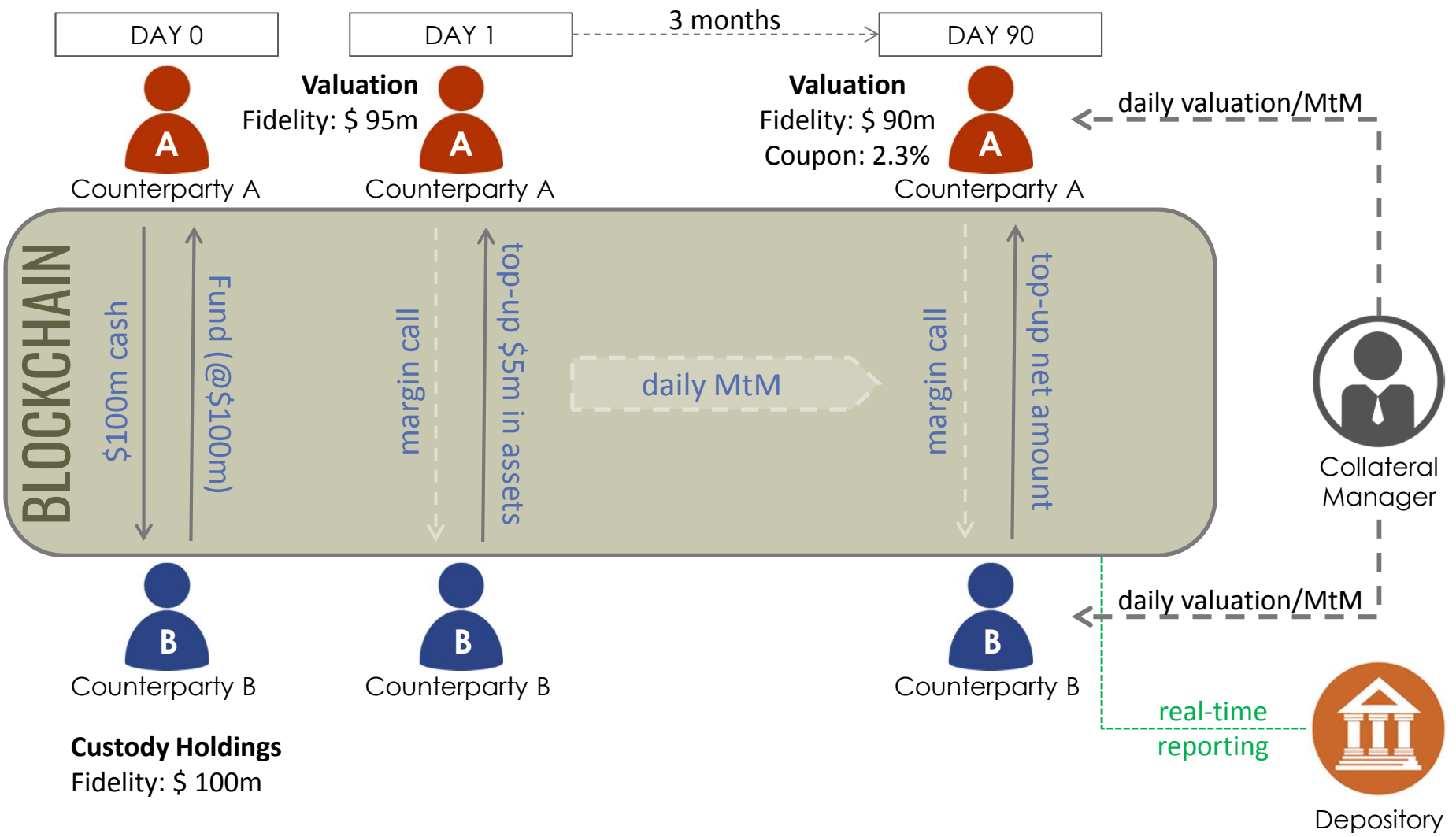
Current: Repo Trade Flow



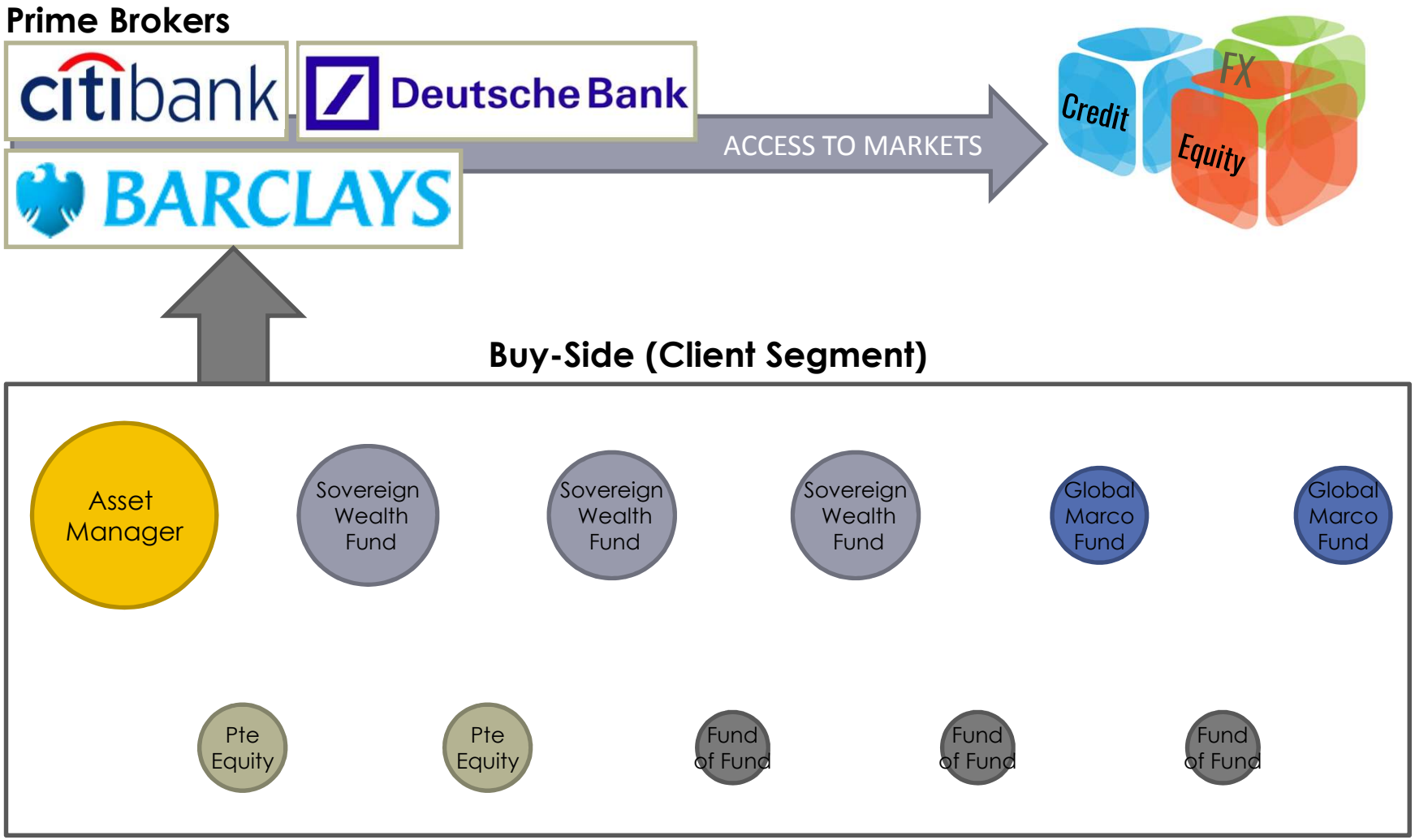
Current: Repo Trade Flow



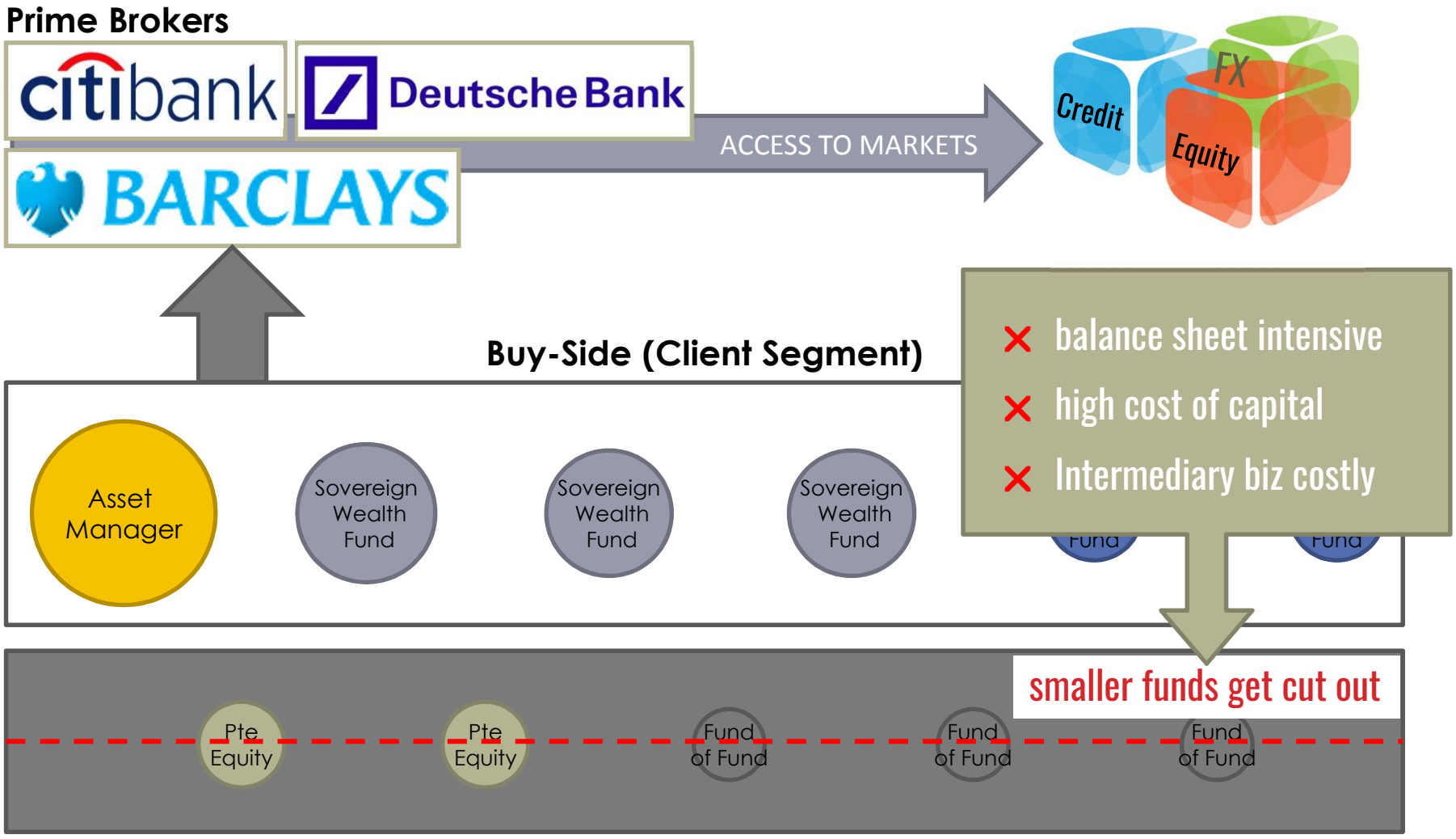
Blockchain: Repo Trade Flow



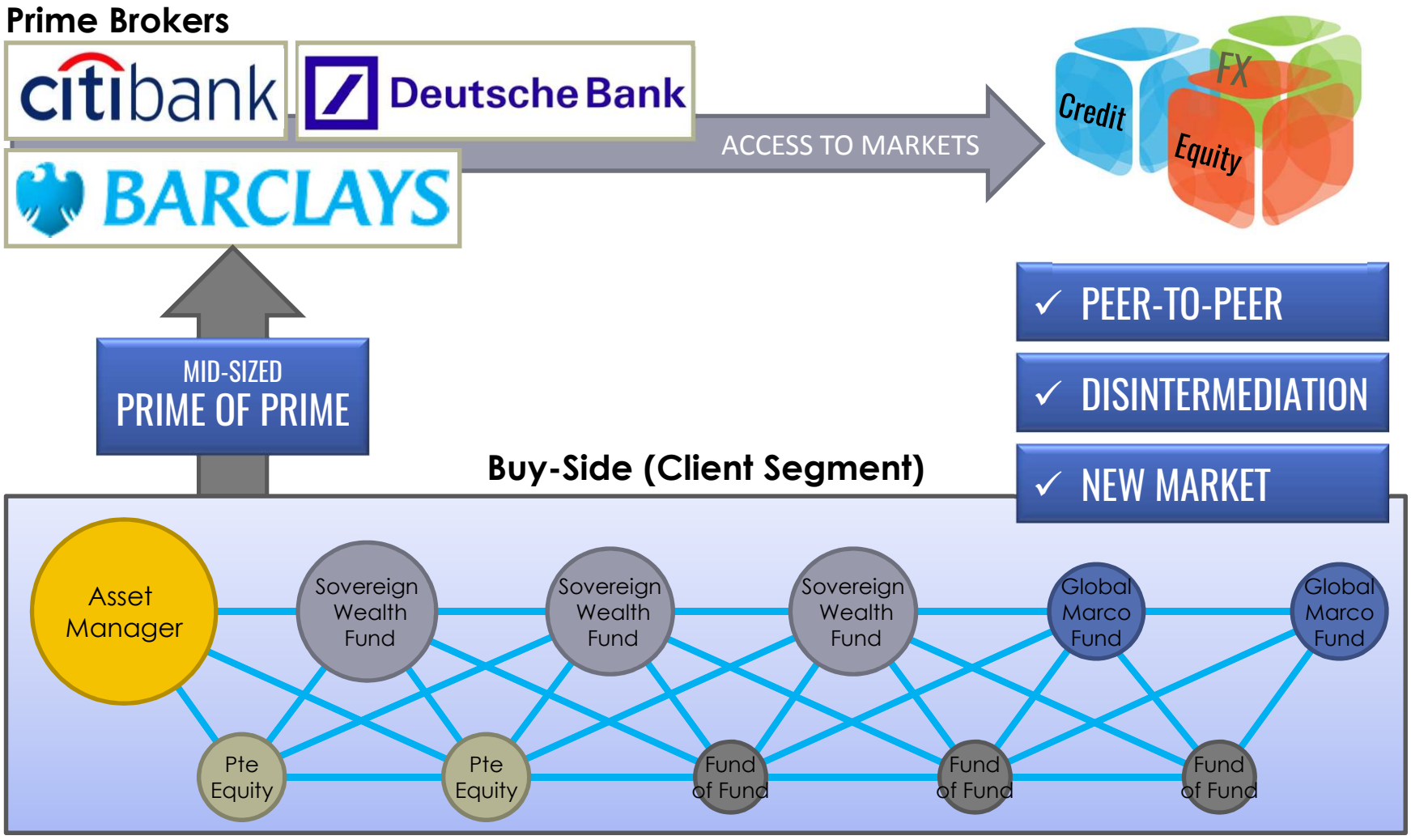
Current: Prime Brokerage Model



Current: Prime Brokerage Model



Blockchain: Prime Brokerage Model



Conclusion

Blockchain: The Evolution of Banking.

Accessibility

Security

Regulatory Compliant

Cost-Saving

THANK YOU

QUESTIONS WELCOME

Marcelo García Casil
www.dxmarkets.com
marcelo.garciacasil@dxmarkets.com

Sam Ahmed
www.derivasia.com.sg
sam.ahmed@derivasia.com.sg

DXmarkets
beat the crowd.

DerivAsia
Collateral, Clearing & Post Execution Solutions