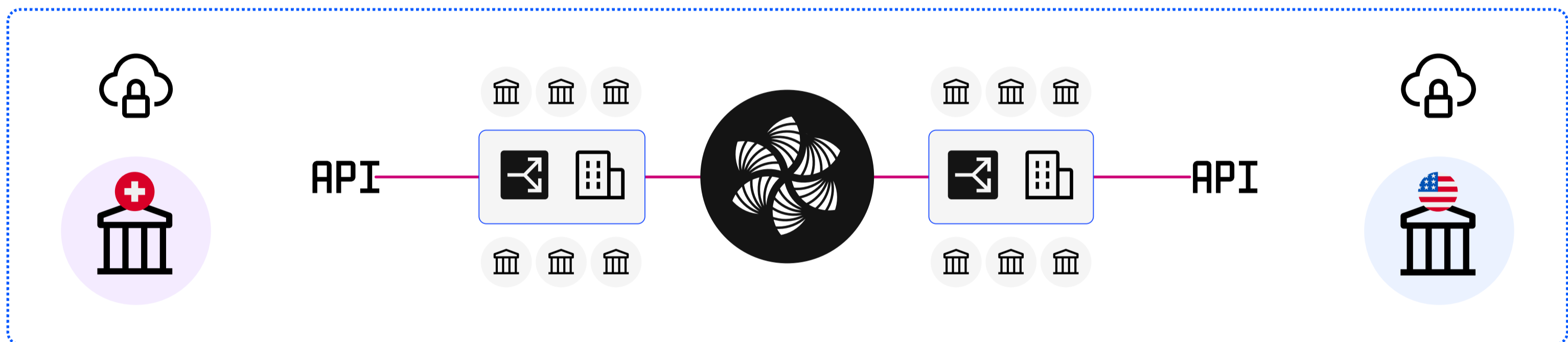# IsSettled
Worldwide Network

IsSettled Worldwide Network is a next-generation cross-border financial infrastructure for tokenization and movement of money, gold, and other assets for any amount in real-time, 24/7/365.

September 2023

Project Overview

IsSettled is designed to be an open and accessible system in the cloud, where participants interact through a simple, secure, and predictable API. Participants can use the system for asset tokenization, CBDC issuance, liquidity provision, FX transactions, remittances, payments, clearing, and settlement.

All financial transactions are carried out between the two parties to the transaction, regardless of where each financial institution is located, without intermediaries, quickly, safely, and efficiently. IsSettled offers two settlement mechanisms, RTGS (real-time gross settlement) and DNS (deferred net settlement), using reusable or one-time tokenized liquidity without the need to open correspondent nostro accounts.

Payments are processed using the ISO 20022 financial messaging standard on an STP (straight-through processing) basis. IsSettled checks each message and forwards it to the recipient. Fund transfers occur only when both parties have indicated their willingness to make a payment, minimizing the likelihood of errors. Because transactions occur directly between two entities, participants can process payments and KYC/AML checks more efficiently, quickly, and cost-effectively, with increased visibility, transparency, and a clear understanding of the origin of funds.

Accuracy in transaction execution eliminates the need to return failed payments, and any associated issues are immediately available to financial institutions, allowing changes to be made faster and more efficiently.

Parties need not rely on forecasted data; all information, such as payment processing fees, FX rates, client identity, KYC/AML status, transaction chain, and payment status, is available in real-time.

Multi-account

Participants no longer need to open traditional accounts and maintain liquidity in different currencies with multiple banks. IsSettled offers a multi-currency account to settle payments and FX trades in all currencies and assets available on IsSettled; for example, participants no longer need to open correspondent accounts with US banks to hold and settle US dollar payments on IsSettled. Because settlements on the network are real-time and predictable, treasurers can position and draw down liquidity reserves much more accurately. Participants can instantly buy or sell the liquidity needed to settle cross-border payments through the internal market maker market.
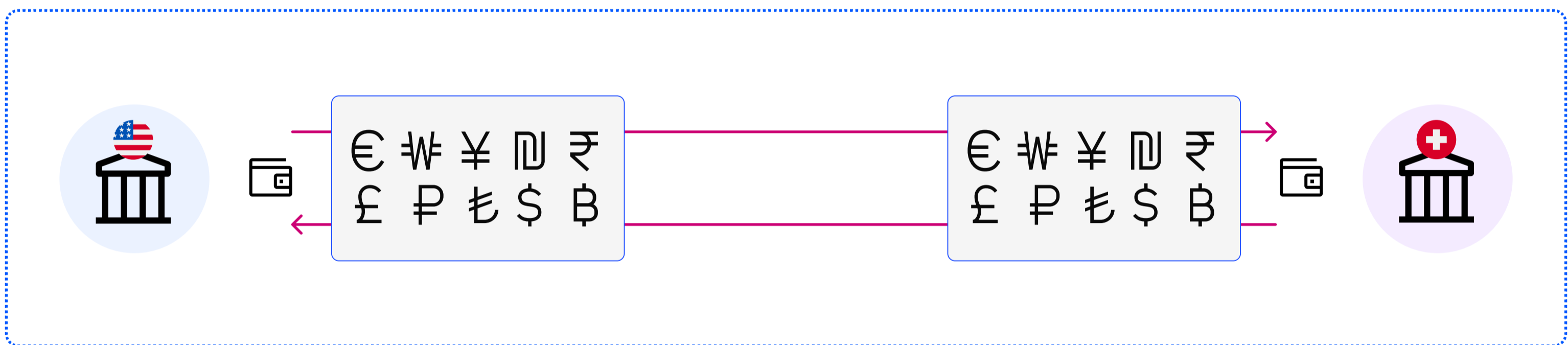

Decentralization

Participants holding various assets in IsSettled accounts means that the real deposits are held in central and large commercial banks in different countries they trust. IsSettled is not a payment system, does not store physical assets, and does not bear obligations; it maintains a global ledger of all claims and obligations in a distributed ledger, connects participants in a decentralized way, and helps process payments, clearing, and settlements efficiently and accessible for everyone on one platform.
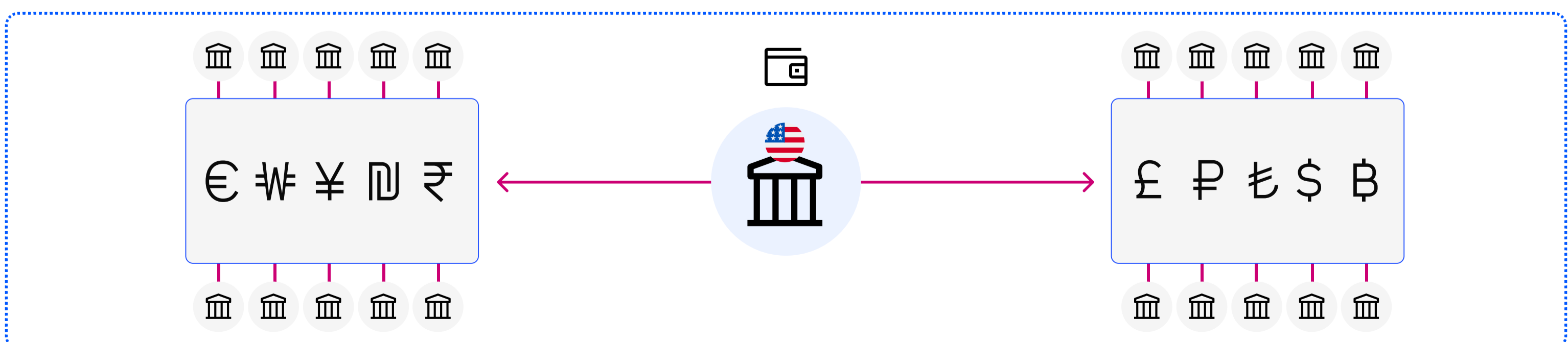
Effective Communication

Network participants can automatically establish business relationships with new partners, add/remove participants to allowed lists, open credit lines for assets, financial messaging, and quotations, and effectively sell/buy currency — all this in real-time, on one platform, without complex bureaucratic delays, using API calls.
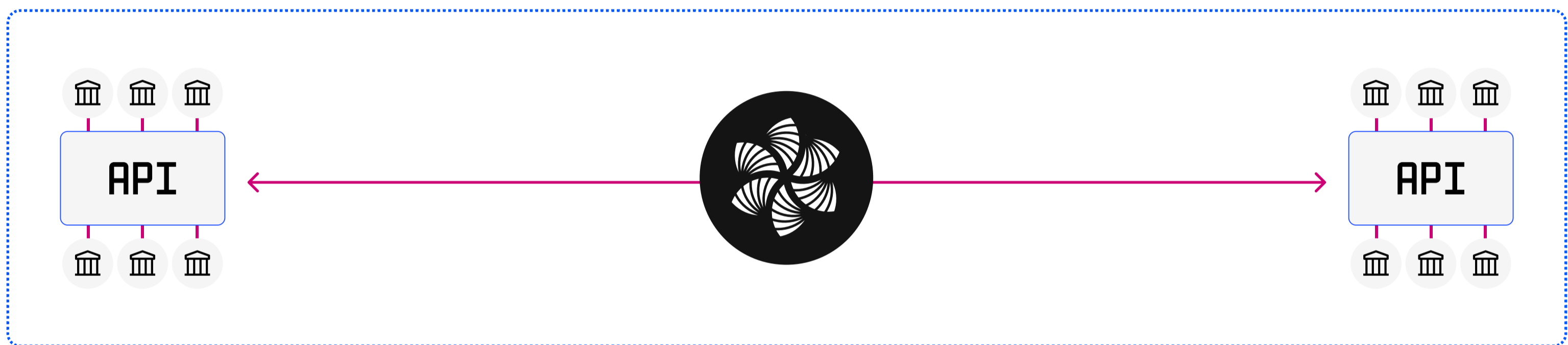
Tokenization and CBDC

The deposit tokenization and CBDC issuance models allow efficient, cheap, instant cross-border payments and settlements. IsSettled provides a platform not only to create (digitize) any assets but also to manage them (e.g., to open credit lines or allow/deny ownership of an asset), allocate assets to participants' accounts (providing liquidity), and redeem them. In this context, redemption implies that participants can request to exchange tokenized assets for real assets in the traditional system. Available on IsSettled, these models enable seamless communication between digital and traditional systems.
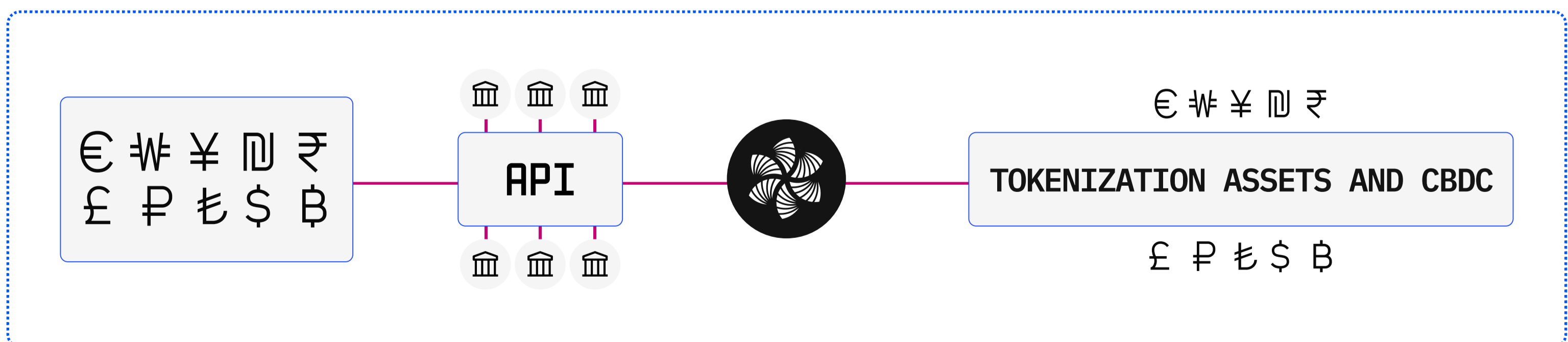
Any Assets

IsSettled offers a standardized mechanism for digitizing any asset class for the transparent and secure circulation of tokenized assets. Objects of tokenization can be debt obligations, cash and non-cash money (bank deposits), bonds, metals, crypto, commodities, and any other assets with value.
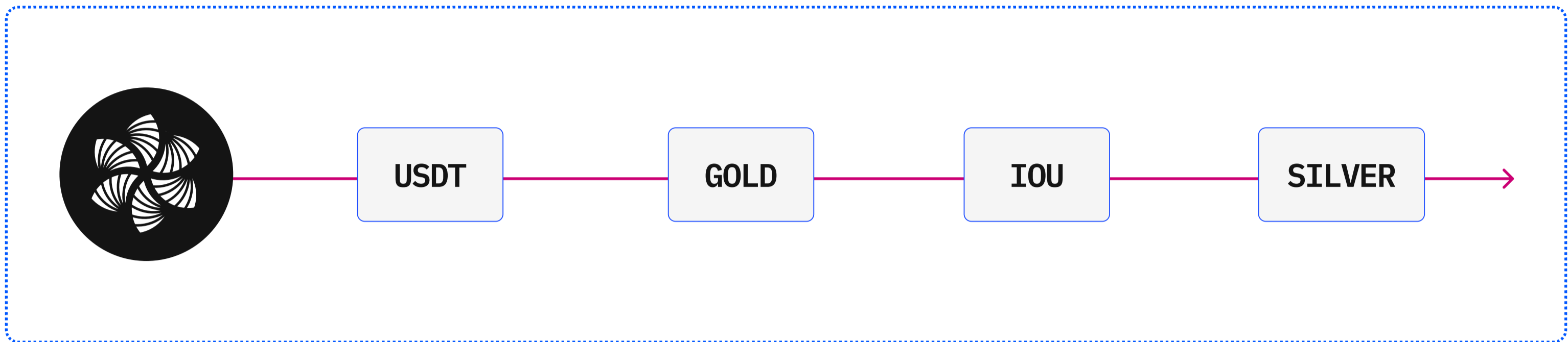
Emission Models

IsSettled provides various tokenized asset issuance models. The first model, the classic 1-to-1 value tokenization, is where a financial institution holds the equivalent of US dollars in bank reserve deposits and/or a cash vault and issues a proportional number of tokenized dollars that can be exchanged 1-to-1. The second model, collateral-based issuance, is when one or more institutions issue a digital asset pegged to the US dollar exchange rate and provide it with other assets, algorithmically regulating the issue. The third model, seigniorage-based emission, is when the country's central bank issues digital assets tied to the exchange rate and algorithmically increases or decreases the money supply based on general demand.

Standardization

IsSettled comprises a comprehensive cloud infrastructure that provides global, multi-currency, multi-organization, and multi-standard coverage. IsSettled can be thought of as a worldwide network. This common technical platform combines financial system participants from different jurisdictions to enable secure, traceable cross-border payments, clearing, and settlement using ISO 20022 and tokenized assets in real-time. The system is based on new technologies such as distributed ledger systems and industry standards, where each participant operates under agreed technical, legal, structural, and pricing policies and a complete understanding of operations.

Money Flow

Let's imagine that your bank serves customers in the US, and you have a customer who wants to send a payment to Hong Kong, but unfortunately, you don't have the Hong Kong dollars (HKD) to complete the transaction.

To do this, you need to retrieve participants in Hong Kong willing to complete the payment and figure out the fee to process the payment on your behalf. You can call the API endpoint and get a list of such participants.

Before you send the payment to the participant, you need to know how much it will cost. To do this, you need to request the participant to calculate the fee for sending the payment; when the participant calculates the charge amount, he will immediately return the information to you.

Note. You can make two requests. For example, the first request indicates the currency of interbank settlement in US dollars with payment to the beneficiary in Hong Kong dollars, and the second request the settlements and payment currency in Hong Kong dollars.

Suppose the participant answered that he accepts only Hong Kong dollars. Now, to make a payment, you need to exchange your existing tokenized USD with a participant who owns HKD, and to complete the exchange, you will need a list of participants willing to exchange USD.

To do this, you need to create a quotation request and send it to the IsSettled internal market maker market, after which you will receive offers from other network participants willing to exchange your US dollars for HKD. Now that you have received the quotations, it's time for a two-way settlement (PvP). You need to sign the exchange request with your secret key and send it to the IsSettled network, after which you will instantly receive a receipt of the completion of the transaction.

Now that you have the tokenized HKD, to complete the payment on behalf of your client to the recipient, you will need to provide the transaction details in pacs.008 and transmit them to the network after the beneficiary participant has processed the KYC/AML, it will return an issd.001 message about the identification results: if everything is successful, you will instantly receive pacs.002 that the payment was successfully delivered, and the amount of the interbank settlement in tokenized HKD will be debited from your multi-account and credited to the beneficiary participant. At this stage, a simultaneous payment to the recipient in the national currency and an interbank settlement in a tokenized asset will occur. It means the obligations between the wire parties are finally settled and terminated.

Once the payment and settlement are successful, the beneficiary participant has debited the funds from his bank account in favor of the payee; he is left with tokenized HKD, which he can accumulate, exchange for other currencies, or contact the tokenized asset custodian in his country for redemption.

Suppose a beneficiary participant has decided to redeem the national HKD and has approached a large bank that has tokenized HKD. He now needs to prepare a pacs.009 financial message stating the amount of the redemption in tokenized HKD and the bank details to credit the HKD local currency, and then sign the message with a key and send it to the network. IsSettled will check the balances and pacs.009 and forward the message to the custodian bank, which will calculate the redemption fee and send the pacs.002 message about the redemption results. At this stage, there will be a simultaneous exchange of tokenized HKD to the national currency HKD, which means — the obligations between the parties to the redemption are finally settled and terminated.

This scheme demonstrates key scenarios such as payment, clearing using ISO 20022 and final settlement between payment parties using tokenized assets, requesting and receiving quotes between the initiator and market makers, PvP settlement between transaction parties, redemption process with cashless funds transfer to the participant's bank account outside of IsSettled, between the tokenized asset holding bank and the custodian bank.

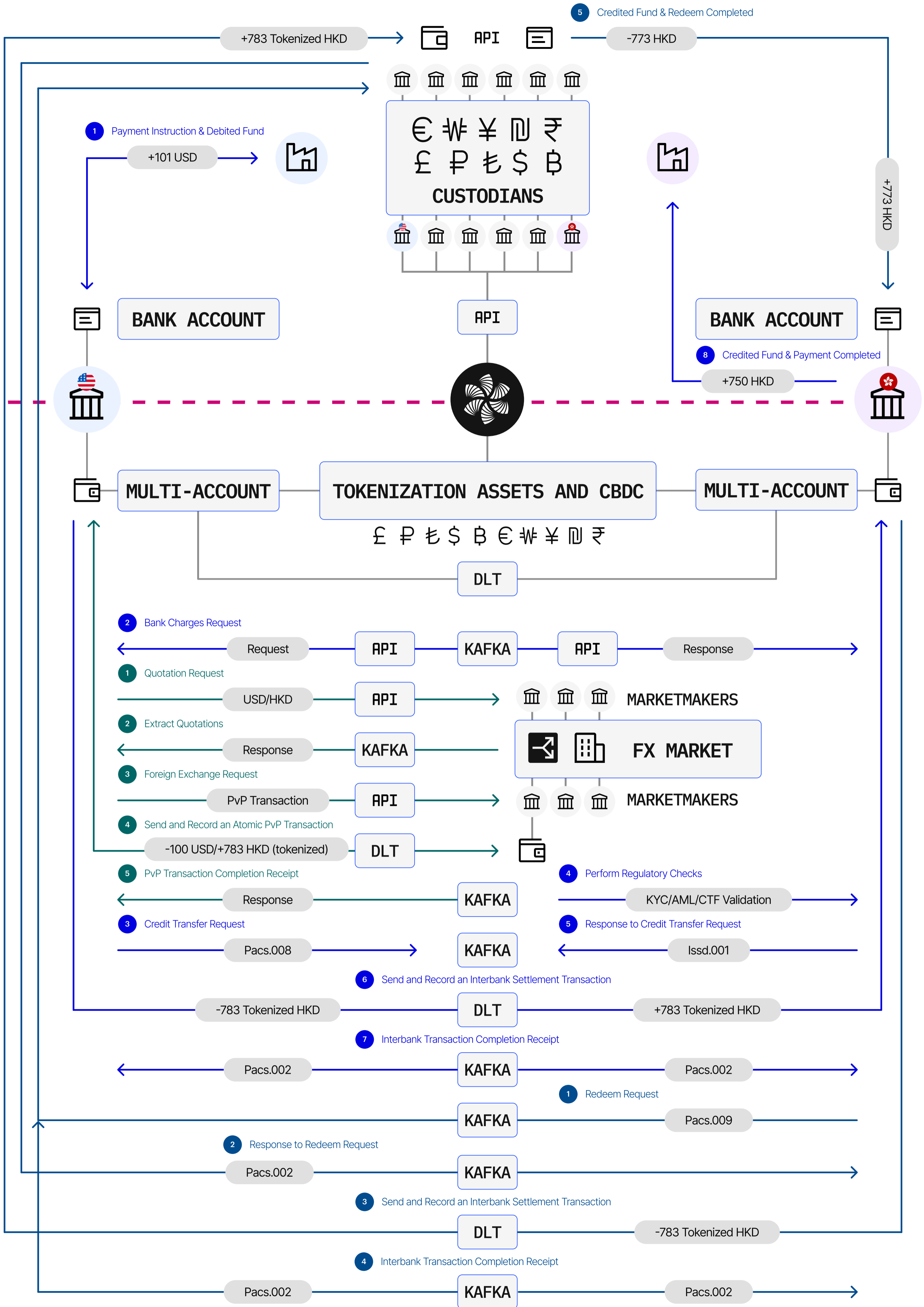Note. The described processes occur automatically using API calls and within a few seconds.

IsSettled Flow Scheme

The following slide visually shows the interaction between participants and the technical components of IsSettled.

■ Payment Flow

■ FX & PvP Flow

■ Redeem Flow

5 Credited Fund & Redeem Completed

+783 Tokenized HKD · API · -773 HKD

1 Payment Instruction & Debited Fund

+101 USD

CUSTODIANS

€ ₩ ¥ ₪ ₹
£ ₽ ₴ $ ฿

API

+773 HKD

BANK ACCOUNT · BANK ACCOUNT · +773 HKD

8 Credited Fund & Payment Completed

+750 HKD

MULTI-ACCOUNT · TOKENIZATION ASSETS AND CBDC · MULTI-ACCOUNT

£ ₽ ₴ $ ฿ € ₩ ¥ ₪ ₹

DLT

2 Bank Charges Request

Request · API · KAFKA · API · Response

1 Quotation Request

USD/HKD · API

MARKETMAKERS

2 Extract Quotations

Response · KAFKA

FX MARKET

3 Foreign Exchange Request

PvP Transaction · API

MARKETMAKERS

4 Send and Record an Atomic PvP Transaction

-100 USD/+783 HKD (tokenized) · DLT

5 PvP Transaction Completion Receipt

Response · KAFKA

4 Perform Regulatory Checks

KYC/AML/CTF Validation

3 Credit Transfer Request

Pacs.008 · KAFKA

5 Response to Credit Transfer Request

Issd.001

6 Send and Record an Interbank Settlement Transaction

-783 Tokenized HKD · DLT · +783 Tokenized HKD

7 Interbank Transaction Completion Receipt

Pacs.002 · KAFKA · Pacs.002

1 Redeem Request

KAFKA · Pacs.009

2 Response to Redeem Request

Pacs.002 · KAFKA

3 Send and Record an Interbank Settlement Transaction

DLT · -783 Tokenized HKD

4 Interbank Transaction Completion Receipt

Pacs.002 · KAFKA · Pacs.002

The Participants

IsSettled participants include commercial and central banks, non-bank financial institutions (NBFIs), money transfer operators (MTOs), fintech companies, industrial players, and corporations. Together, they form a community of financial service providers worldwide, united in a single digital environment.

Each IsSettled participant can take on one or more forms of participation, such as the business role of market maker, liquidity provider, or tokenized asset custodian, depending on business objectives.

IsSettled offers participants the opportunity to significantly reduce the cost of payment and settlement transactions and open access to new customers and business partners through new efficient business models for the lending and custody business.

Participation Forms

Participation as an Issuer/Custodian of Tokenized Deposits

Large banks can act as currency depositories and provide the service of issuing tokenized assets on deposits of network participants on demand, receiving income through commission fees for the issuance and/or redemption (deposit return) processes.

Benefits

By adopting this model, banks can increase their reserves from participant deposits while at the same time assuming repurchase obligations. This approach promotes growth in the depository business, embraces custodial services, and introduces innovative financial management practices, including cash management strategies.

Participation as a Liquidity Provider

By tokenizing money and other assets, large institutions can realize greater profits from providing liquidity with redemption and lending business models, serving more new customers.

Benefits

Participants can quickly and transparently allocate (fund/transfer) liquidity to market makers for further distribution into the market, ensuring liquidity is always present on the network for 24/7 transaction processing. This approach opens up lending opportunities and new markets, direct and indirect.

Participation as a Market Maker

Financial institutions participating as market makers can earn FX trades on the IsSettled internal interbank foreign exchange market, trading the tokenized liquidity needed to make payments and settlements.

Benefits

Participants receive 24/7 access to real-time quotations and automated FX transactions executed atomically and without intermediaries, with low exchange fees and the ability to cross-quotation assets available on IsSettled. The market maker is no longer tied to bilateral credit requirements and can freely dispose of various assets in the domestic market, using the IsSettled multi-account to store and atomically trade across multiple currencies — tokenized assets.

Advantages

Risk Management

Settlement Risk

Traditional systems often require multiple days for settlement, increasing the risk of default by one of the parties involved. By enabling real-time or near-real-time settlements, IsSettled reduces the exposure window and, thereby, the associated settlement risk.

Operational Risk

The multiple intermediaries and disparate systems in traditional cross-border payments increase the likelihood of operating errors. The IsSettled system uses a standardized protocol and direct point-to-point relationships without intermediaries, reducing mistakes and operational risk.

Counterparty Risk

With faster settlement times and the use of a distributed ledger, the exposure to the risk that a counterparty (e.g., another bank in the transaction chain) fails to deliver on its obligations is reduced.

Liquidity Risk

Traditional cross-border transactions often require banks to hold funds in foreign accounts (nostro/vostro accounts) to ensure liquidity. IsSettled's design could reduce the need for such accounts and associated costs, thus reducing the risks tied to tied-up capital in foreign currencies.

Exchange Rate Risk

Due to delays in traditional systems, fluctuations in currency exchange rates can affect the final amount received from cross-border transactions. Real-time PvP transactions minimize exposure to such volatility.

Transparency and Fraud Risk

Traditional systems may lack the transparency and traceability required to prevent fraudulent activities effectively. Blockchain's inherent transparency can provide better oversight, reducing opportunities for fraud.

Regulatory and Compliance Risk

As regulators worldwide increase scrutiny of cross-border transactions, adherence to evolving regulations becomes crucial. IsSettled's transparent and immutable ledger can aid compliance and reporting, potentially reducing regulatory risks.

Reputation Risk

Delays, unexpected fees, or errors in international payments can hurt a bank's reputation. By offering a faster, more transparent service, IsSettled can help institutions maintain and enhance their reputations.

Systemic Risk

The interdependence in the traditional banking system means that if one bank faces issues, it can ripple across the network. Decentralization and a distributed system, like IsSettled, can reduce such systemic risks.

Credit Risk

Immediate settlements and the potential to use tokenized assets as a settlement instrument can reduce the duration and amount of credit exposure between parties.

Economic Incentives

Immediate settlement helps reduce the time money is "in transit," thereby freeing up blocked capital. This predictability allows treasurers to forecast better and manage liquidity positions, knowing that the value sent or received will not fluctuate significantly during a transaction. This accuracy allows them to ensure that funds are available exactly when needed, optimizing the use of available capital. As a result, treasurers can maintain smaller reserves, freeing up capital that can be invested elsewhere or used more productively. Lower costs mean treasurers can transfer money more frequently if needed, giving them greater flexibility in liquidity positioning. With the immediate settlement feature, counterparty risk is minimized; this reduced risk can mean less need for collateral, further enhancing liquidity.

Streamlined Process

IsSettled simplifies the traditionally complex process of international transactions by removing multiple intermediaries. Fewer steps and intermediaries mean fewer fees and less room for errors, which can lead to additional costs.

Real-time Clearing and Settlement

Traditional systems separate clearing and settlement, leading to time lags and increased costs. IsSettled allows for simultaneous clearing and settlement, reducing time and associated costs.

Reduced Nostro/Vostro Accounts

IsSettled's approach can reduce the need for banks to hold foreign currency in nostro/vostro accounts, freeing up capital and reducing costs associated with maintaining these accounts.

Currency Exchange

Using tokenized assets in the internal market maker market for real-time PvP settlement can result in more competitive foreign exchange rates, potentially offering savings over traditional forex processes.

Transparent Fee Structure

Transparency and a complete real-time understanding of the fee structure will help banks and their clients avoid unexpected costs. Also, the absence of hidden fees or unexpected delays helps better liquidity planning.

Security

The solution was created based on proven, highly reliable, modern, and effective technologies per core industry standards and principles for systemically important payment systems, which are successfully implemented and used by leading companies worldwide.

In developing IsSettled, we considered the G20's goals of speed, transparency, and accessibility. In addition to industry standards in finance, the development of the IsSettled infrastructure solution was based on IBM's experience and borrowing of blockchain technologies, Hashicorp's modern security practices, and tokenization mechanisms in distributed ledgers.

IsSettled includes a participant user interface for system configuration, account and asset management, transaction viewing, uploading, and auditing, and a proprietary set of APIs for tokenization, payments, clearing, and settlement. Participants use two APIs depending on their business role in the network.

Each participant has the IsSettled global services deployed and configured in IBM's secure cloud, with which the participant's server systems interact via JSON RESTful APIs. OAuth 2.0 specification access tokens in JWT format are used to authenticate requests.

Strict IAM policies govern web office access and are further protected by two-factor authorization, ensuring that only authorized individuals with different privileges have access. API access tokens are created by member users with elevated privileges in the IsSettled web office interface.

The web portal also implements the business logic of request authorization based on the maker-checker principle, which ensures strict control over user requests. Each meaningful action is initiated by one person (maker) and approved by another (checker). A user cannot perform a change operation until a user with elevated access rights approves the request. This dual control mechanism minimizes errors, prevents unauthorized actions, and increases the integrity of transactions, making the system more reliable for financial institutions.

Transactions, quotations, and financial messages are signed with the participant's digital signature (Ed25519 scheme) in an isolated environment using a hardware security module. Settlement transactions require multiple signatures to be sent to the IsSettled network, ensuring that no single organization can unilaterally conduct the transaction.

Critical information is exchanged between participants through Kafka's gateway messaging service, which utilizes Kafka's distributed messaging broker to transmit financial messages, quotations, and transactions securely.

All payment data is transmitted directly between payment parties through a secure connection — neither IsSettled nor any third party has access to personal data. Financial institutions' server systems communicate with IsSettled through secure HTTPS connections and use OAuth 2.0 for authentication.

A distributed ledger is used to store, record, and track settlement transactions, ensuring the authenticity and immutability of digital data. The distributed ledger is a global immutable ledger and is a single repository and processing center for mutual claims and obligations of participants. The digital database, through consensus, is updated every few seconds and contains the final records of each committed transaction in IsSettled.

Join Us

At the current stage of development, we, as network operators, are looking for partners to form a banking consortium to develop, publicize, and manage the global IsSettled network together.

We look forward to having you at IsSettled.

team@issettled.com

We Invite You to Collaborate on a Pilot Project and Be a Part of Our Burgeoning Consortium

→

Expert Opinion

"97% of institutional investors surveyed agree that tokenization will revolutionize asset management and benefit the industry. Institutions are also increasingly comfortable using digital money, but provided it comes from a trusted player." — © Oliver Wyman, JPMorgan Chase & Co. (2021): "Unlocking $120 Billion Value In Cross-Border Payments."

"The next generation for markets, the next generation for securities, will be tokenization of securities." — © BlackRock CEO Larry Fink.

"Tokenization will provide instantaneous settlement and reduced fees." — © BlackRock CEO Larry Fink.

"Growing interest in CBDCs, DTs, and SCs among banking and non-banking institutions indicates considerable the potential of this emerging asset class. Institutions should continue to pay close attention to potential interoperability solutions, which will help to unlock the full potential of this asset class in the future." — © Bank for International Settlements (2023): "Project Dynamo: CBDCs, stablecoins, and deposit tokens: wholesale adoption explorations and challenges."

"Many financial institutions are actively exploring the adoption of CBDCs, DTs, and SCs for both PvP and DvP scenarios." — © Bank for International Settlements (2023): "Project Dynamo: CBDCs, stablecoins, and deposit tokens: wholesale adoption explorations and challenges."

"An increasing number of institutions are exploring the adoption of CBDCs, DTs, and SCs across a wide range of wholesale use cases, including PvP and DvP." — © Bank for International Settlements (2023): "Project Dynamo: CBDCs, stablecoins, and deposit tokens: wholesale adoption explorations and challenges."

"The financial institutions we interviewed stressed the importance of digital money to settle digital assets efficiently." — © Bank for International Settlements (2023): "Project Dynamo: CBDCs, stablecoins, and deposit tokens: wholesale adoption explorations and challenges."

"A global marketplace for digital money could potentially overcome the foreign exchange problem." — © Mr. Tobias Adrian, Mr. Rodney Garratt, Mr. Dong He, and Mr. Tommaso Mancini Griffoli (2023): "Trust Bridges and Money Flows: A Digital Marketplace to Improve Cross-Border Payments"
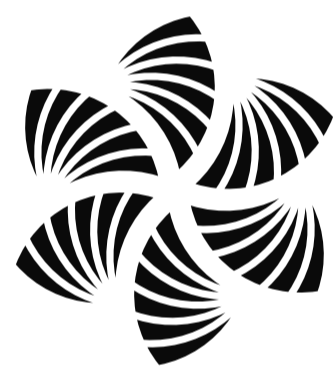
https://www.imf.org/en/Publications/fintech-notes/Issues/2023/03/03/Trust-Bridges-and-Money-Flows-A-Digital-Marketplace-to-Improve-Cross-Border-Payments-528038

"A shift toward digital money may reduce the need for bilateral trust relationships and foster more efficient and competitive market making." — © Mr. Tobias Adrian, Mr. Rodney Garratt, Mr. Dong He, and Mr. Tommaso Mancini Griffoli (2023): "Trust Bridges and Money Flows: A Digital Marketplace to Improve Cross-Border Payments"

https://www.imf.org/en/Publications/fintech-notes/Issues/2023/03/03/Trust-Bridges-and-Money-Flows-A-Digital-Marketplace-to-Improve-Cross-Border-Payments-528038

"At present, given where we are on in the UK on the imminent implementation of a vastly more capable RTGS system these options look to provide a faster route to settlement of tokenised transactions in central bank money and are working with industry on how to best exploit the possibilities of the RTGS system." — © Sir Jon Cunliffe (2023): "The shape of things to come: innovation in payments and money."

https://www.bankofengland.co.uk/speech/2023/april/jon-cunliffe-keynote-speech-at-the-innovate-finance-global-summit

"The increasingly important use of DLT requires a new form of money — tokenised commercial bank money — which will enable efficient, fully digital handling of payment transactions." — © GBIC (2021): Europe needs new money — an ecosystem of CBDC, tokenised commercial bank money and trigger solutions.

https://die-dk.de/media/files/20210625_DK_Ergebnisdokument_EN.pdf

CBDCs — central bank digital currencies.
DTs — deposit tokens.
SCs — stablecoins.

IsSettled

Worldwide Network