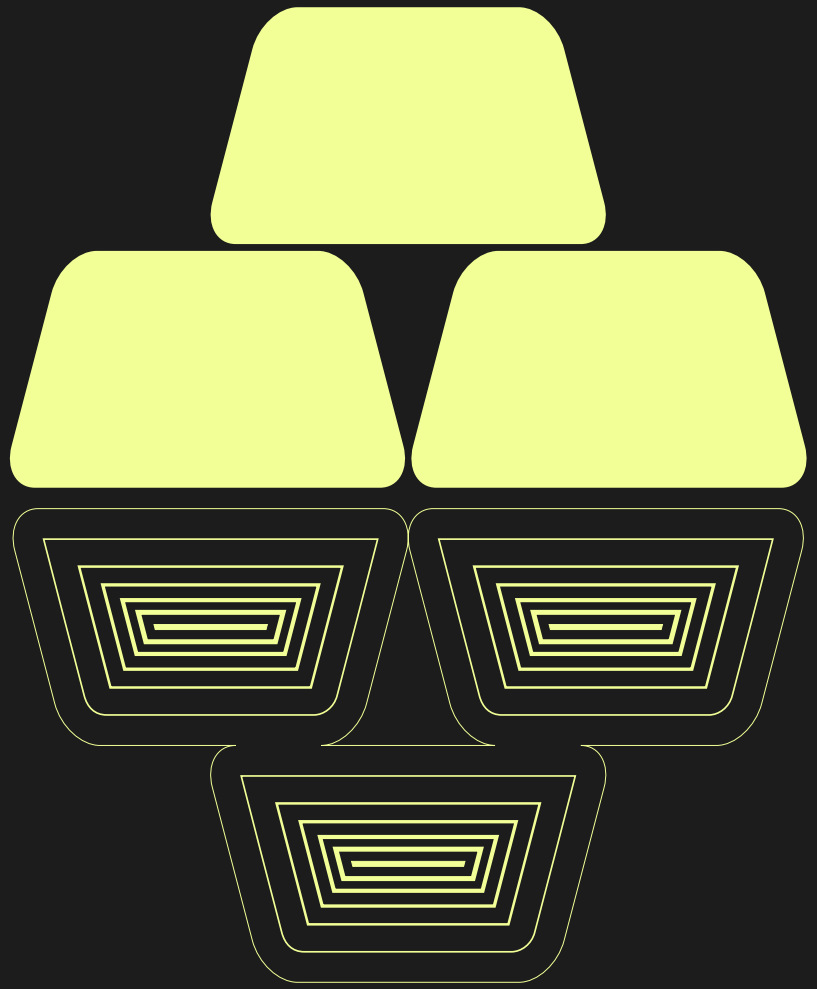
Canton

# Unlocking collateral mobility through tokenization: Gilts, Eurobonds and Gold

## Euroclear harnessing Canton Network for 24x7 mobility



THE EXPONENTIAL
POWER OF CONNECTION

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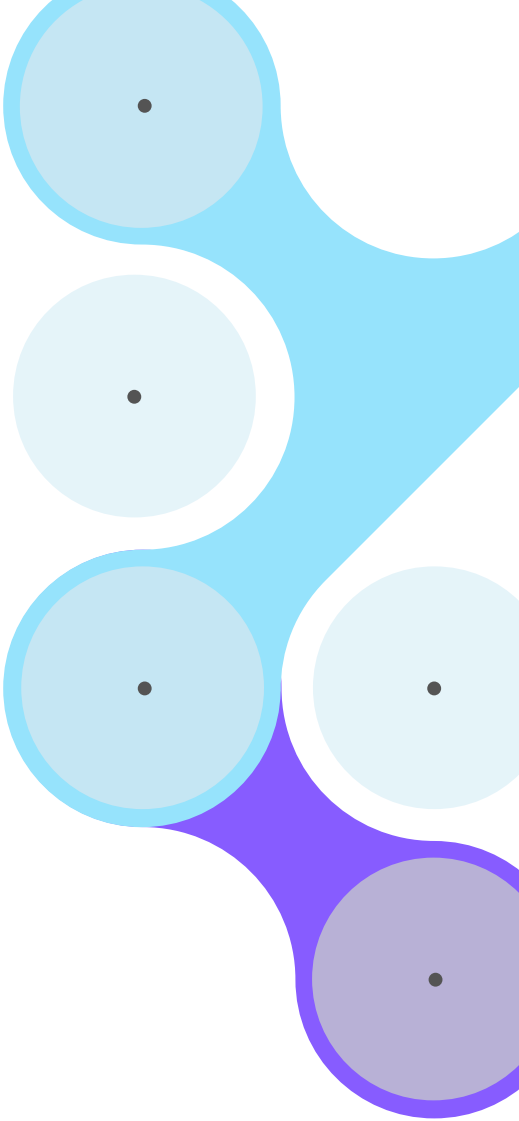
# Introduction

During June and July, Digital Asset joined forces with Euroclear, The World Gold Council and a broad industry group of investors, banks, CCPs, custodians/collateral agents and a CSD. Together, they completed a successful pilot that tokenized Gilts, Eurobonds and gold and used them as collateral across an interlinked series of margin, collateral and securities lending transactions.

The Gilts, Eurobonds and Gold Tokenization pilot involved 27 market participants, including Digital Asset, using 14 Canton nodes. Five types of cross-application transactions were connected using 11 distributed applications (six registry apps and five margin apps). In all, over 500 transactions were completed.

The pilot follows the successful Canton Network Pilot completed in December 2023, which set the stage for composable applications that can be used across a global economic network. After demonstrating an interoperable network of multiple parties and applications, several projects are underway to explore more targeted use cases in response to participants' requests. This includes the recently completed pilot that tokenized US Treasuries to improve collateral mobility.

To facilitate this exploration, Digital Asset made available a pilot platform that allows participants to use real world assets in complex transactions across multiple parties using the Canton Network.



## Introduction continued

The pilot proved the ability to create a digital twin of commonly used collateral as well as previously immobile real world assets (RWAs) and to use those tokenized assets as collateral in atomic, real-time transactions. The ability to mobilize and use these large pools of high quality assets more immediately and efficiently will unlock new revenue opportunities while reducing capital exposure and operating risk.

- SIFMA data shows a $230 trillion universe of marketable securities, yet the global collateral market is just $25.5 trillion.[1,2]
- Tokenization of real-world assets could save 35-65% across the settlement value chain, including $4.1B due to settlement failures.[3,4]

The pilot demonstrated that these assets could be used with immediate effect to meet intraday margin calls or be used in securities lending transactions, outside of normal settlement cycles, processing times and time zones. It further confirmed that the technology could create a more mobile operating model across different parties. Finally, and most importantly, it evidenced the ability of the ledger to be the legal record and validated the secured party's control over the digital twin and tokenized financial assets received as margin or collateral in the event of a counterparty default.

*1. 2023 Capital Markets Fact Book, SIFMA, July 2023*

*2. Finadium, Jan 30 2023*

*3. Acting US Comptroller of the Currency Michael Hsu, June 2023 speech*

*4. Bloomberg, How the New 'T+1' Rule Settles US Stocks in a Day, 2024-05-03*

## About Canton Network

**Canton is the first privacy-enabled open blockchain network, ensuring limitless connections that preserve privacy.** Enabled by unique smart contract technology, network participants can confidently exchange data and value to unlock the potential of synchronized financial markets.

The public-permissioned blockchain network includes a decentralized synchronization service – the Global Synchronizer – designed to respect privacy and institutional sovereignty.

In this pilot, independent Canton blockchains used this service to interoperate and execute atomic transactions, while ensuring participants remained in complete control of their permissions, exposures and interactions. This preserves the stability of trusted regulated processes while offering the transformative power to connect.

## About Euroclear

**Euroclear is the financial industry's trusted provider of post-trade services.** Guided by its purpose, Euroclear innovates to bring safety, efficiency and connections to financial markets for sustainable economic growth.

Euroclear provides domestic and cross-border settlement and related services for bonds, equities, derivatives and funds. As a proven, resilient capital market infrastructure, Euroclear is committed to delivering risk-mitigation, automation and efficiency at scale for its global client franchise.

The Euroclear group includes Euroclear Bank – which is rated AA by Fitch Ratings and Standard & Poor's – as well as Euroclear Belgium, Euroclear Finland, Euroclear France, Euroclear Nederland, Euroclear Sweden, Euroclear UK & International.

The Euroclear group settled the equivalent of EUR 1,072 trillion in securities transactions in 2023, representing 299 million domestic and cross-border transactions, and held EUR 37.7 trillion in assets for clients by end of 2023.

# The market rationale for tokenizing Gilts, Eurobonds and Gold

While the types of transactions requiring collateral, as well as the required amounts and quality of collateral, have increased dramatically in the past two decades, only a small portion of assets are being mobilized today. SIFMA data shows a $230 trillion universe of marketable securities, yet the global collateral market is just $25.5 trillion.[5,6]

Sovereign Gilts and Eurobonds offer a deep pool of high quality liquid assets. At mid-year 2023, the total market of Gilts in the UK amounted to nearly £2.4Tn, with over €12.97Tn of outstanding Eurobond issuance.[7,8] Eurobonds are among the largest fixed income segments globally, with issuances from more than 6,000 issuers located in 150 countries.[9] As desirable, accessible assets, Gilts and Eurobonds were a natural choice for this pilot.

In contrast, even though gold is seen as a high value, low risk, stable asset, it is rarely used as collateral. Although it can be easily converted to cash, the physical metal is difficult to move or store. While ISLA and many CCPs, among others, accept gold as eligible collateral in margin and other transactions, until now its lack of mobility has restricted its utility.

**“By digitizing gold we can overcome the perceived restrictions on moving and storing the physical metal, enabling this high-quality asset to be mobilized and used seamlessly within financial markets. To achieve this, the tokenization process must be able to specify a Standard Gold Unit (SGU)™ that represents and transfers the monetary value of, for example, 1 gram of pure gold.**
**An attributes record (purity, weight, location) can be created as a secondary token that will maintain details of the gold bars collateralized in the ecosystem meaning all physical gold of trusted integrity can be utilized as financial collateral, irrespective of its physical attributes and location.”**

**Mike Oswin, Global Head of Market Structure and Innovation at the World Gold Council**

WORLD GOLD COUNCIL

*5. 2023 Capital Markets Fact Book, SIFMA, July 2023*
*6. Finadium, Jan 30 2023*
*7. Statista, Market Value of Gilts in UK 2023, Nov 22 2023*
*8. Euroclear, Celebrating 60 years of the Eurobond, July 17 2023*
*9. Clearstream International Securities - Eurobonds (2022)*

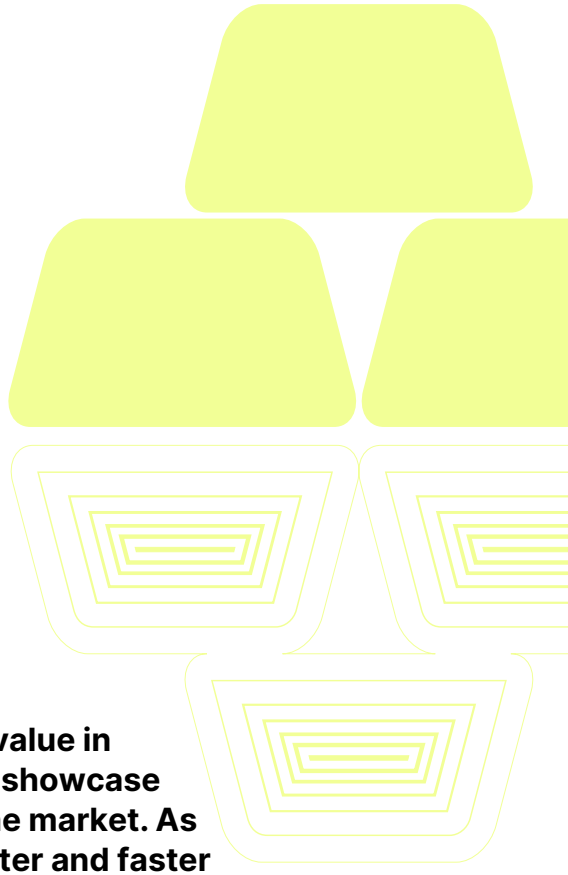
## About the pilot

The pilot explored tokenizing Gilts, Eurobonds and gold to enhance collateral mobility, improve liquidity and increase transactional efficiency. Along with other sovereign bonds like US Treasuries, Gilts and Eurobonds provide a deep pool of high quality liquid assets. This makes them a natural choice for this industry effort focused on proving tangible value from tokenization. Tokenizing gold can overcome the challenges inherent to the physical asset which, while widely accepted as collateral, is rarely used today.

In the pilot, the real world assets (RWAs) were tokenized by creating a digital twin as defined by the CFTC's GMAC Digital Asset Classification Approach and Taxonomy[10]. The digital twin is locked to the transaction and works through all phases of a collateral transaction, from margin call or lending to asset recall and closeout.

While one aspect of the pilot focused on the enhanced mobility that 24x7 immediate settlement enables, another key outcome was to demonstrate the perfected securities interest over collateral - and importantly, to prove the ability to seize control of the asset being used as collateral (both the digital twin and its corresponding RWA).

This is the underlying principle beneath the use of collateral in any transaction. Should the collateral provider default, the secured party (or collateral receiver) must have a clear and undisputed right to the asset, and to give direction for its custody and use. Therefore, the goal of this pilot was to go beyond day-to-day transaction flows to evidence the ability for the secured party to take control of an asset in the event of a default, and to prove that the smart contracts and underlying technology supports, or even improves on, the control in that scenario.



**"We recognize the immense value in industry experimentation to showcase the advantages of DLT for the market. As we strive to deliver even better and faster collateral mobilization for our clients, digital technologies like DLT will be key enablers for us to achieve this."**

**Olivier Grimonpont, Head of Product Management, Market Liquidity, Euroclear**

*10. A digital twin is defined as 'an electronic controllable record representing an asset that has been immobilized on another system of record, and reconciled with that original system of record to ensure ownership is reflected precisely'. A tokenized security is a digital twin token that represents an underlying security or financial instrument issued on a different platform (e.g., a traditional CSD or registrar), where such representation itself satisfies the definition of a security/financial instrument under local law. CFTC's GMAC Digital Asset Classification Approach and Taxonomy, Mar 6, 2024*

# Structure and participation

Using 11 distributed applications, a sequence of six different transactions were completed over a simulated three-day period.

- Gilts were tokenized for use in the initial repo trade, while the securities lending trade had prime brokers borrowing tokenized Eurobonds and collateralizing the trade with tokenized gold.
- Prime brokers borrowed Eurobonds and provided Gilt as collateral in another securities lending trade. The prime brokers then met variation margin calls using tokenized gold.
- After a prime broker default, counterparties took possession of both the tokenized asset and underlying real world asset.

**The six transactions were:**

1. Investor/Prime broker repo trade
2. Investor cleared repo required value (RQV) call
3. Prime broker cleared derivatives variation margin (VM) call
4. Investor/prime broker securities lending trade
5. Prime broker cleared derivatives variation margin (VM) call
6. Prime broker default

Three user groups – prime brokers, investors, and central counterparties – used Canton nodes to complete transactions across different applications on the Canton Network TestNet. The Global Synchronizer composed atomic transactions across sovereign blockchain applications to complete complex multiparty workflows.

Digital Asset provided the infrastructure, applications and connectivity needed for market participants to test interlinked business scenarios in a real world, production-like environment. The ability to leverage existing registry and margin applications from the Canton Network Pilot, with Daml smart contracts to codify business logic, expedited the pilot timeline.

**Including Digital Asset, 27 organizations participated in the pilot:**

| | |
|---|---|
| Investors | 4 |
| Prime Brokers | 3 |
| CSD and CCP | 1 |
| Custodians/ Collateral Agents | 4 |
| Repo and Securities Lending Agents | 3 |
| Observers | 11 |

## Collateralizing Gilts, Eurobonds and Gold on the Canton Network

Synchronized, connected sovereign blockchains were used to tokenize real world assets (RWAs), including physical assets, and deploy them as collateral across an interlinked series of margin, collateral and securities lending transactions. In the event of a default, secured parties can seize the tokens and underlying RWAs.

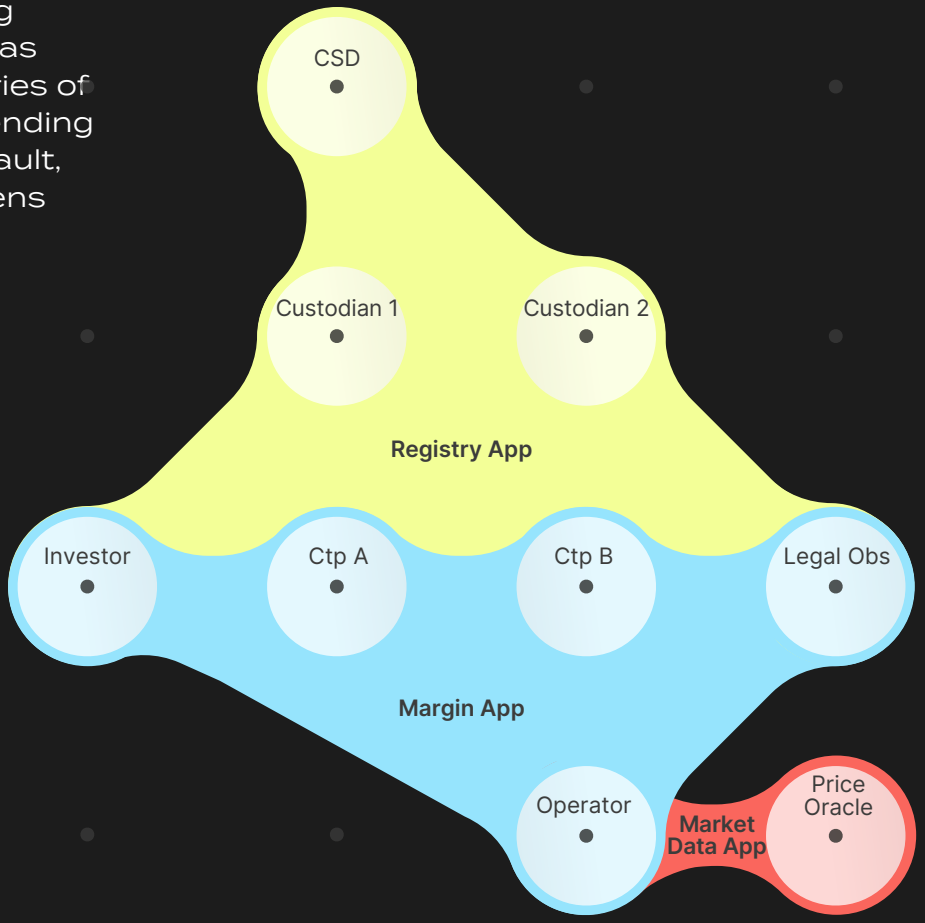
**Organizations** 27

**Registry apps** 6

**Margin apps** 5

**Participant nodes** 14

**Transactions** 500+




*Central Securities Depository (CSD)
Counterparty (CCy)

## Use cases

The six pilot use cases simulated real transaction flows to validate production viability.

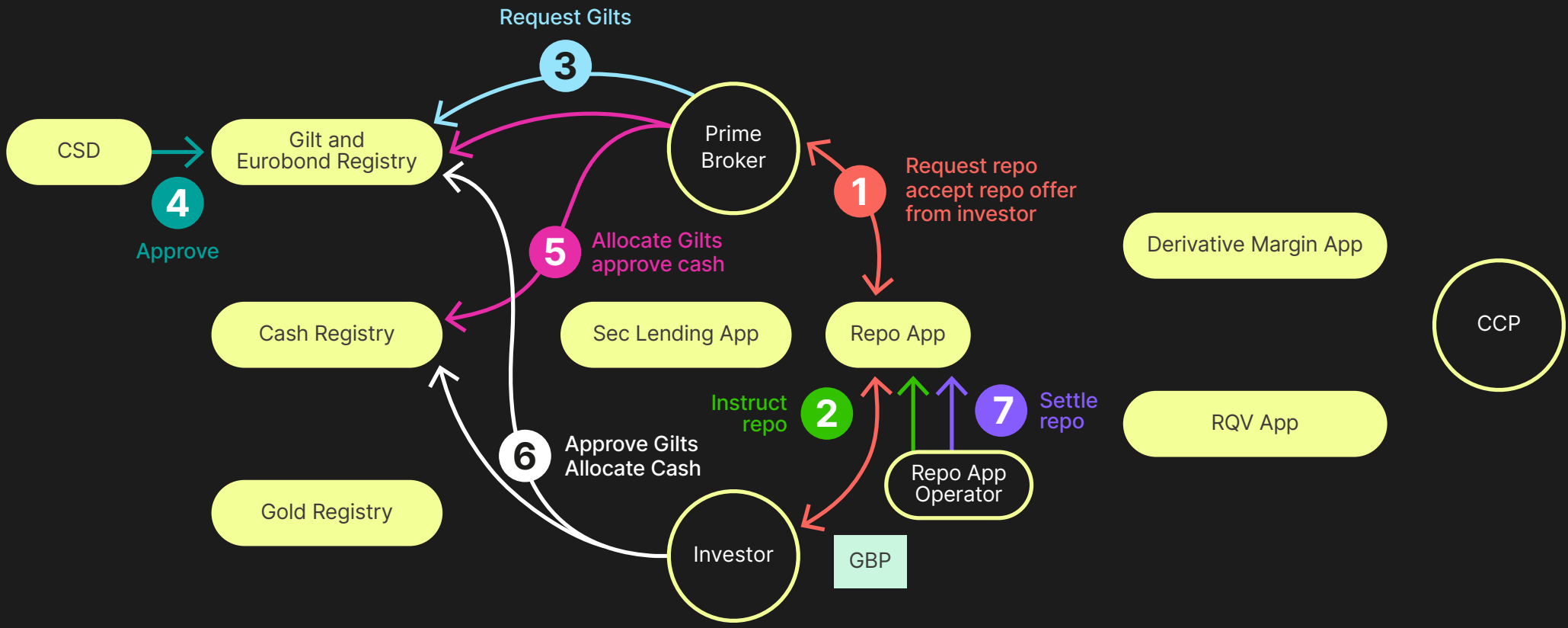
The first two days focused on interlinked repo, margining and securities lending transactions that traded, lent or used different RWAs – Gilts, Eurobonds and gold – as collateral.

These use cases demonstrated how tokenized collateral assets can be created, posted in real-time, and moved seamlessly and efficiently between different clearinghouses and prime brokerages to satisfy margin obligations and optimize capital allocation and efficiency. They also evidenced the ability to mobilize gold as collateral without needing to physically move the asset, creating a new pool of high quality assets.

In the event of a Prime Broker default, the secured party will want to seize the pledged assets by initiating a closeout. On Day 3, the defaulted Prime Broker is removed from the process, which takes place between the margin app operator, the secured party and the custodian in accordance with the default processes spelled out in the ISDA, GMRA, GMSLA and various other master agreements.

# Investor/Prime broker repo trade

Gilts were tokenized for use as collateral in the initial repo trade.

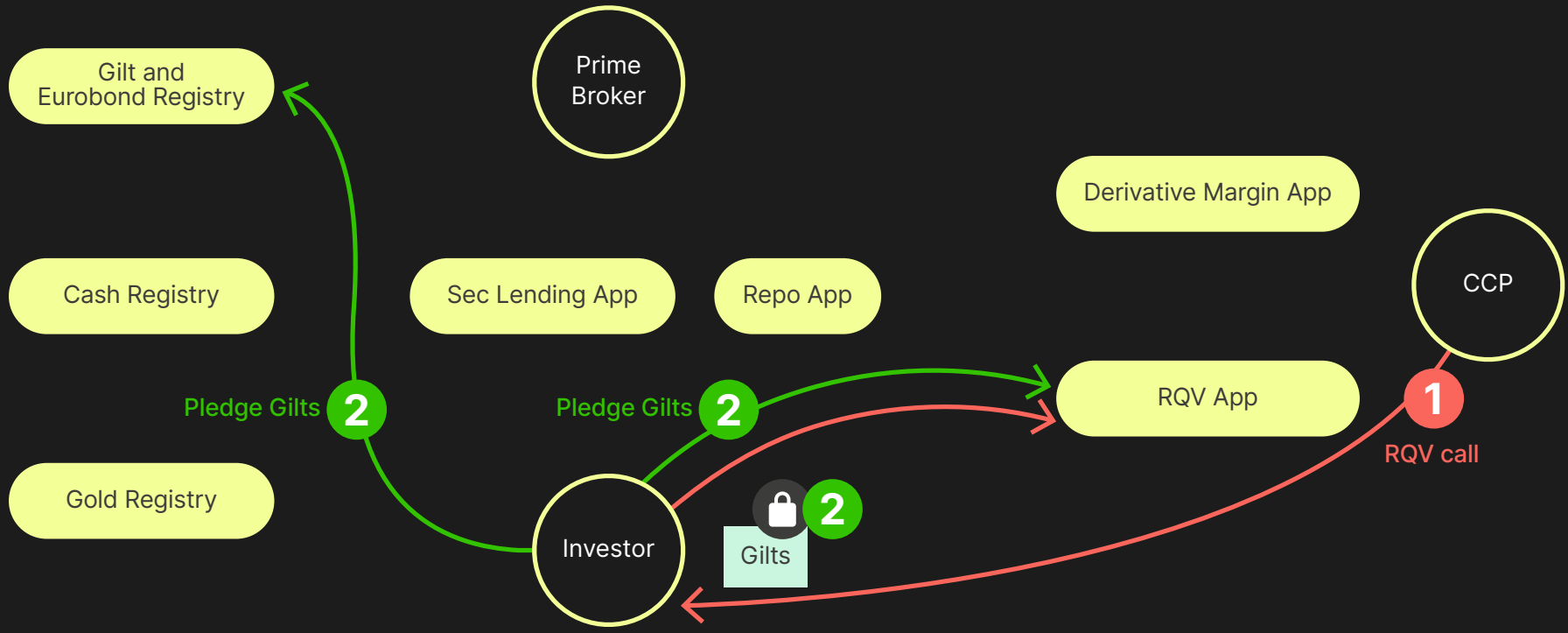



**Day 1, Step 1**

The Prime Broker enters into a repo to borrow GBP from the Investor and provide tokenized Gilts as collateral. After the digital twin is created (tokenizing the Gilts), the Gilts are locked to the repo contract. Settlement across different blockchains requires that transactions complete across three sovereign applications atomically (repo app, cash registry and Gilt & Eurobond registry). Using the Global Synchronizer and Canton Network, the Investor receives the tokenized Gilts and the Prime Broker receives the GBPs in a single composed transaction that preserves privacy.

# Investor cleared repo RQV call

Investor meets RQV call with tokenized gilts.

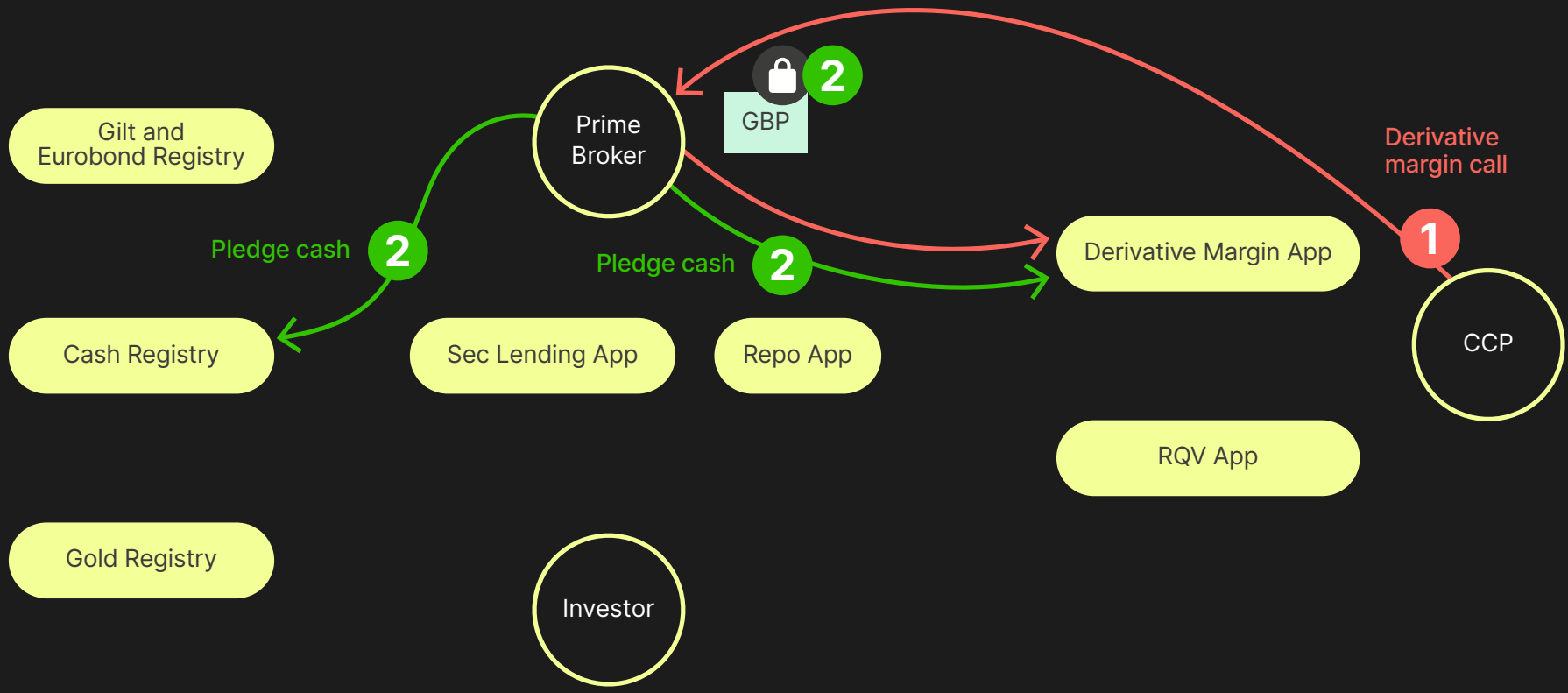



**Day 1, Step 2**

The Investor uses the Gilts just received as collateral in the repo transaction in order to meet an RQV call. Gilts are locked to the call in the Gilt & Eurobond registry.

# Prime broker cleared derivatives variation margin (VM) call

Prime broker uses cash to meet CCP variation margin call.




**Day 1, Step 3**

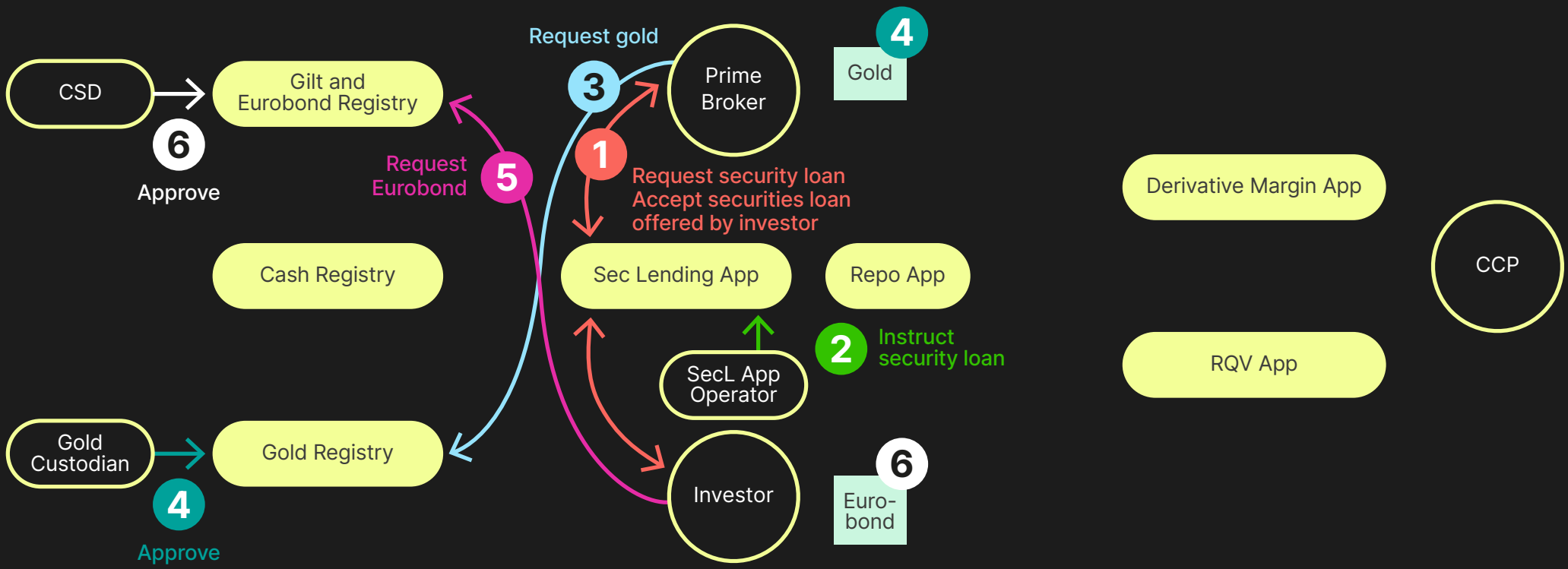
The Prime Broker meets a VM call by pledging cash (GBPs just received in the repo transaction). The cash is locked to the transaction in the cash registry.

**Day One Summary**

These flows show the benefits of improved collateral mobility. With atomic, cross-chain transactions, assets can settle intraday and immediately be allocated to other transactions.

# Investor/Prime broker securities lending trade

Prime broker provides gold as collateral in a Eurobond securities lending trade.



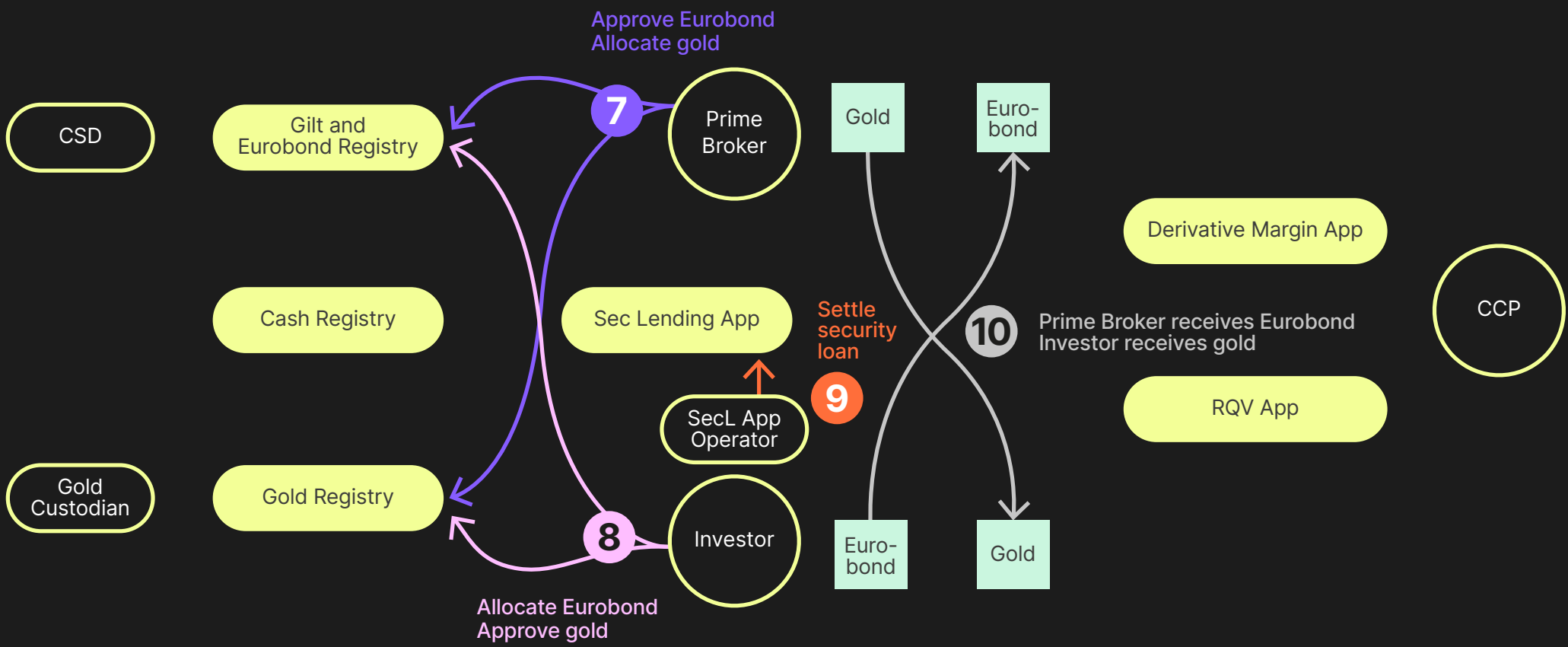

**Day 2, Step 4**

In this securities lending trade, the Prime Broker is requesting Eurobonds and providing gold as collateral. The gold token is created in two parts, a Standard Gold Unit (SGU)™ and a token representing the purity, weight and location of the gold (which influences the price). Once the gold is tokenized, atomic settlement between the Securities Lending app, Gilt & Eurobond registry, and Gold registry makes the Eurobonds and gold immediately available to the Prime Broker and Investor for use in other transactions.

**See next page for steps 7-10**

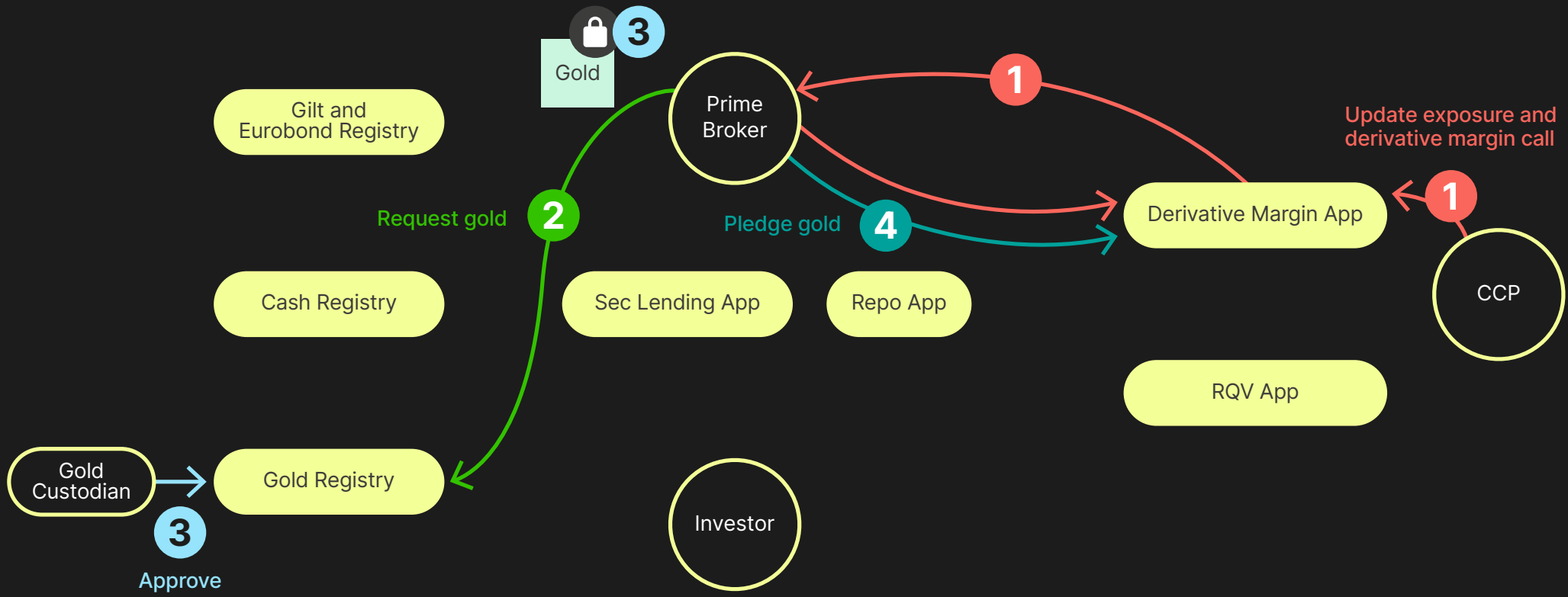
# Investor/Prime broker securities lending trade - continued

Prime broker provides gold as collateral in a Eurobond securities lending trade.



# Prime Broker cleared derivatives variation margin (VM) call

Prime broker uses tokenized gold to meet CCP variation margin call.




**Day 2, Step 5**

A CCP issues a VM call to the Prime Broker, who meets the call by pledging tokenized gold. The gold is locked to the transaction and the Gold registry is updated.

**Day Two Summary**

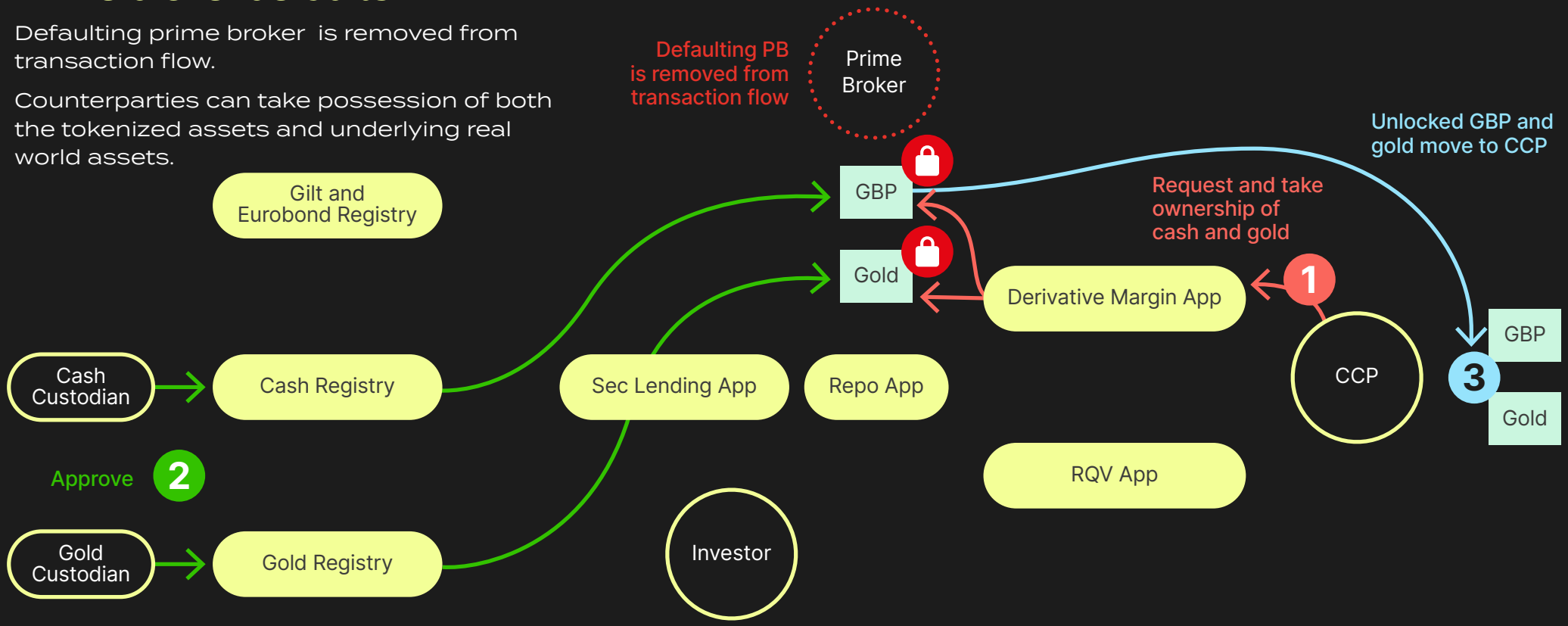
These flows show the ability to tokenize and mobile previously immobile assets, creating new pools of collateral and enabling their immediate use in transactions.

Efficient, intraday post-trade processing creates significant business value.

# Prime broker defaults

Defaulting prime broker is removed from transaction flow.

Counterparties can take possession of both the tokenized assets and underlying real world assets.




**Day 3, Step 6**

The Prime Broker has previously pledged GBPs and Gold in VM calls and securities lending transactions, and those assets are locked to the respective transactions. When the Prime Broker defaults, the CCP is able to request a closeout and take ownership of the assets from the Cash and Gold Custodians.

This simplified workflow demonstrates how tokenization can streamline the process of taking control over assets (both digital twin and RWA) that are locked to the transactions. The secured party has a perfected title, allowing them to seize and ultimately liquidate collateral assets in case of a default of a trading counterparty.

Once the closeout is approved, the secured party selects the collateral they want to seize. The custodian approves, and the ownership of the asset immediately changes from the Prime Broker to the CCP (secured party) in an atomic transaction. The CCP now has control over the asset and the custodian/agent will accept and act on their instructions.

This workflow commences once required offline procedures (i.e., documentation, signatures) have taken place. Throughout, the transfer of ownership over the asset is fully traceable and auditable on Canton Network and can stand up in a court of law. *See The importance of perfected securities interest, next page.*

Note: In the event a secured party is seizing assets from multiple custodians, the seizure of the assets happens atomically with the execution of the workflow.

Throughout the pilot, participants can only see the parts of the workflow and data to which they are entitled. Data is sharded and only distributed to the nodes that need it to complete a particular transaction step. This preserves the essential privacy requirements of participants across repo, securities lending and margin transactions.

# The importance of perfected securities interest

Perspectives from:

**Paul Landless**
**Partner, Co-Head of Fintech,**
**Clifford Chance**

**Boika Deleva**
**Global Financial Markets Counsel,**
**Clifford Chance**

**Manoj Ramia**
**General Counsel, Digital Asset**

Most blockchain pilots focus on the various steps of initiating or completing a transaction. For the tokenized Gilts, Eurobonds and Gold pilot, that lifecycle was extended to include default. The default scenario is crucial as the point of having collateral is not simply to offset the risk of a transaction. In the event of a default, the secured party must be able to take legal possession of that collateral. The pilot explored how this closeout process would change, if at all, when the underlying asset is tokenized.

The pilot introduces a new concept: the "digital twin". This nomenclature is adopted from the United States Commodity Futures Trading Commission's Global Markets Advisory Council for Digital Asset Markets Subcommittee (of which Digital Asset is a member). The subcommittee released its recommendation for an Approach for the Classification and Understanding of Digital Assets (the "CFTC Nomenclature").

The CFTC Nomenclature defines a digital twin as "an electronic controllable record representing an asset that has been immobilized on another system of record, and reconciled with that original system of record to ensure ownership is reflected precisely." This is in contrast to a "digital native," which is defined as "representing the primary record of value, that is not recorded on another system of record and does not require reconciliation with another system of record." The distinction, as implied by the labels, is between a digital version of something that exists somewhere else versus something that only exists in digital form. Accordingly, with the pilot, the tokenized Gilt or Eurobond is an electronic record representing something that exists (and is recorded) somewhere else.

The legal question thus becomes: how does the creation of a digital twin of the Gilt or Eurobond impact the underlying legal frameworks?

Here, the nomenclature can raise questions

**Clifford Chance observed the pilot to provide additional legal perspective on the use of a digital twin including whether, when using it as collateral, changes to agreements would be necessary.**

**"While there are many positions in the market, a prevailing one is that the DLT may be used to serve just as a record, or a ledger of rights, including ownership rights in the underlying security. Whether amendment to the master agreement will be required depends to a large extent on the provisions of such agreement. Some agreements may allow parties the flexibility to contractualize their securities delivery to be done by means of DLT or DLT platforms.**

**So while legal certainty is important, it can be done in platform rulebooks or other agreements between the parties without necessarily amending the master agreement."**

**Boika Deleva, Counsel, Clifford Chance**

CLIFFORD
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**“With certain approaches and platforms, a digital twin is not a separate asset and so the impact for master agreements, trading relationships, close-out processes, and valuation approaches are minimized, but it is always important to ensure the digital twin is catered for and reflected into existing product and platform documentation. As an operational and record-keeping tool rather than an asset, some of the legal and regulatory issues can be reduced while avoiding extensive surgery or a wholesale reset of established product and asset documentation.”**

**Paul Landless, Partner, Co-Head of Fintech, Clifford Chance**

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CHANCE

about the underlying legal framework. The notion of a digital twin implies the creation of something new, something that requires its own legal framework apart from the ‘original thing’ already subject to existing legal frameworks. However, the pilot demonstrated that, at bottom, when we speak of a digital twin, at least in the context of Canton, we are really speaking about a different, better set of books and records. From that perspective, the necessity of a new legal agreement or statutory regime may be unnecessary. Rather, existing agreements can still be used, perhaps simply with slight modification to account for the new books and records and to clarify that the digital twin and its original are both within the scope of the agreement.

Subsequent to the pilot’s completion ISLA, ICMA and Clifford Chance published the Digital Assets Annex, to accompany the Global Master Securities Lending Agreement (GMSLA), as was previously done for the Global Master Repurchase Agreement (GMRA). Read more here.

**“What makes this different is that the parties are agreeing on the technical and operations workflow, in addition to having agreed the legal control. When you‘re using Daml on Canton Network, an activity over a secured asset cannot happen unless both parties agree - and one such agreement is that one party, the Secured Party, can rightfully take control of the asset under pre-agreed conditions. This is perfected securities interest, now also provided in the app code and workflow, as well as in the legal contract.”**

**Kelly Mathieson, Chief Business Development Officer, Digital Asset**

# Pilot outcomes

With more than 500 executed transactions involving 6 complex workflows, executed by 16 market participants, the tokenized Eurobonds, Gilts and Gold pilot demonstrated the ability to successfully tokenize real world assets by creating a digital twin. This streamlined the ability to deploy existing liquidity pools (Eurobonds and Gilts) and unlocked access to a new high value asset (gold). The digital twins were used in collateral, margin and securities lending transactions, with both the digital twin and its RWA locked to those transactions.

The tokenized Eurobonds, Gilts and Gold could be posted in real time and moved seamlessly and efficiently to satisfy margin obligations, post as collateral, or be lent out for additional revenue. With atomic settlement, all parties benefit from enhanced collateral mobility, optimization and liquidity.

Turning to the worst case scenario of default, the pilot also evidenced the ability of secured parties to perfect title on and take control over the tokenized and underlying traditional asset, enabling the secured party to ultimately liquidate collateral assets in case of default of a trading counterparty. This is the necessary and final step in proving the utility of a digital twin and interoperable blockchains within real world scenarios.

The pilot further demonstrated tangible benefits to the market participants involved in the collateral, margin and securities lending transactions.

- **Collateral becomes more mobile and liquid.** It can be pledged and recalled more quickly with atomic transactions that remove settlement risk. Intraday collateralization becomes possible with 24/7 instant settlement.
- **Collateral pools expand** with the ability to tokenize previously immobile real world assets such as gold.
- **Operational efficiency improves substantially** with no market moves or potential for trade fails. A single golden source of data removes layers of time-consuming reconciliation throughout the transaction chain.
- **Data synchronization enhances visibility.** Participants get real time information on collateral pledged, received and moved.
- **Composable and truly atomic transactions** can take place across multiple sovereign instances of Canton blockchains, removing the reliance on messages and bridges and eliminating counterparty acceptance risk. Daml and Canton enable native interoperability.
- **Privacy is assured,** as the Canton protocol ensures participants see only the data and pieces of the transaction to which they are entitled.
- **Market transparency increases.** Transparency and auditability allow for the market-wide regulatory oversight necessary to further adoption of digital assets.
- **Secured parties have legal certainty of ownership.** With an immutable ledger and asset locked to the transaction, the secured party can be confident in their ability to seize collateral and change ownership in accordance with legal parameters in the event of a closeout.

## Next steps

Following the successful conclusion of the pilot, Digital Asset will work with interested participants to develop a production solution that leverages the infrastructure used in the pilot (Canton Network TestNet, the Global Synchronizer, and existing Canton applications (repo, margin, securities lending and asset registries).

## Contact us

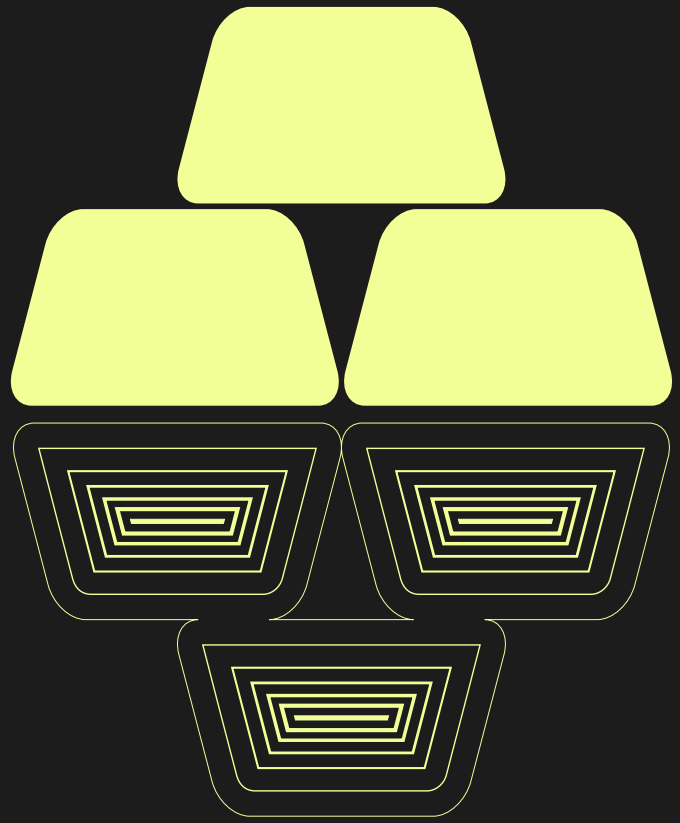
Learn more about the pilot, Canton applications or the Canton Network.


Kelly.Mathieson@digitalasset.com

Simon.Letort@digitalasset.com

Ian.Woodgate@digitalasset.com

Levente.Barczy@digitalasset.com


## Additional resources

- Canton white paper
- The Canton Network: A Regulatory Perspective
- Beyond Public Versus Private: Connectivity and Control Within Regulatory Guardrails with Canton
- Canton Global Synchronizer and Canton Coin Go Live
- Canton Pilot Report
- Canton website