EUROPEAN CENTRAL BANK

EUROSYSTEM

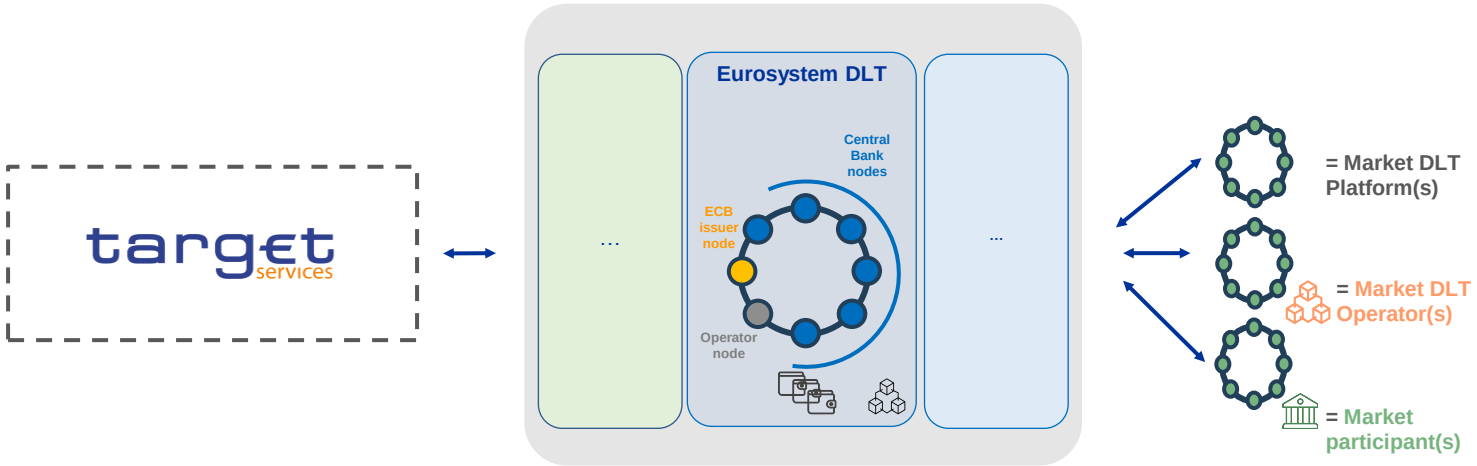
Workshop: Decentralised Programmability

Agenda item 2

3rd Pontes Market Contact Group meeting

26/02/2026

Overview



Decentralised programmability – definition

In the context of Pontes project deliverables:

- **decentralised programmability:** the possibility for the market to develop smart contracts, deployed by the National Central Banks on the Eurosystem DLT - provided that the smart contracts pass the governance and vetting procedures defined by the Eurosystem

Pontes MCG preliminary feedback on decentralised programmability

Q1: […] How interested is your institution in implementing decentralised programmability on the Eurosystem DLT by the go-live of the Pontes enhancements?

- Beneficial concept within a DLT framework, but timely delivery of Pontes Pilot should be prioritised over decentralised programmability
- Views expressed conditional to the model of Eurosystem DLT platform set up, i.e. only NCB nodes in Pontes Pilot;
- In terms of enhancements, market assigned lower priority but remain relevant within the longer-term developments

Q2: Which exact use cases would a decentralized programmability on the Eurosystem DLT support?

1. Cash-locking applications (locking of cash leg of DvP based on key provision, Signed Transfer Amount, Overnight)
2. Conditional and programmable payments
3. Microtransactions using CeBM
4. Interoperability of and coordination across DLT platforms
5. Automatic settlement in CeBM of nostro/vostro balances between banks
6. Escrow contracts
7. Automates coupon payments, corporate actions and redemptions

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Pontes Market Contact Group members' presentations

26/02/2026

Workshop – Decentralised Programmability

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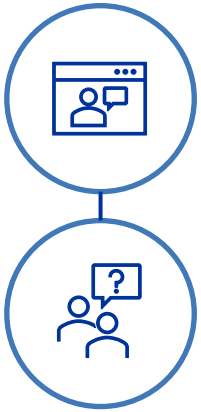
Pontes Market Contact Group members' presentations



20 minutes
Presentation of concrete use cases that may require decentralised programmability

10 minutes
Questions and answers

Decentralized Programmability

Potential Use Cases and Programmability Modules

DZ BANK – Christian Fries, Peter Kohl-Landgraf

Frankfurt, 26.02.2026

DZ BANK Gruppe

Rationale – Use of Smart Contracts for Digital Financial Instruments

- **Role of Smart Contracts**
  - A Smart Contract can deterministically orchestrate the interaction between involved parties
  - Their role as digital intermediaries and digital escrows enable “peer-to-peer” interaction
  - Smart Contracts create *new* financial instruments equipped with valuable features, e. g. **Prefunding-Mechanism**
  - Implementations of **“Smart Financial Contracts”:** Smart Derivative Contracts, Smart Bond Contracts*)

- **Value Proposition**
  - A Smart Contract may lock liquidity (prefunding) prior of execution ➔ Transaction **guaranteed to not fail**
  - Reduction of Settlement Risk: Enhancing settlement success and reducing costs associated with settlement failure
  - Operational Efficiency: The ***Standardization*** **through deterministic live cycles** can reduce execution risks

- **Pontes – Two Programmability Proposals**: In *addition* to the functionality provided via Pontes we propose two features:
  1. Cash-Locking for Delivery-versus-Payment
  2. Programmable Payment Instructions

*) https://www.dzbank.com/content/dzbank/en/home/we-are-dz-bank/press/news_archive/2025/smart-bond-contract--sbc----towards-a-functional-redesign-of-a-d.html

Use Case „Delivery-versus-Payment with Cash-Lock“

- Status Quo:
  - Pontes Pilot will provide a DvP-Mechanism which is based on HLC and requires Asset-Locking in combination with direct cash settlement and conditional key-decryption
  - Within the *Smart Bond Contract**) we developed a Module for *Decentralized* Delivery-versus-Payment**) - ERC-7573
  - This DvP-Standard allows both Cash *or* Asset-Locking and stores keys in a Smart Contract

- Proposed Programmability Extensions: “Cash-Lock based DvP”
  - Provide Cash-Locking based on HLC (and expose via EII)
  - Keys can be generated via EII also or be provided by some external Decryption Oracle (3rd Party)

- Benefits:
  - Lean-Interaction on Asset DLT: Cash-Locking prepares the transaction: “successful once the asset it transferred”.
    Advantage: No interaction of Buyer on the asset DLT required. Seller transfers assets and retrieves cash.
  - Ensure Asset Settlements: Once Buyer **reserved the cash, the buyer side of the transfer is guaranteed.**
    Advantage: Additional complexities introduced by failed cash-settlements on an Asset-Chain can be prevented

*) https://www.dzbank.com/content/dzbank/en/home/we-are-dz-bank/press/news_archive/2025/smart-bond-contract--sbc----towards-a-functional-redesign-of-a-d.html
**) https://innovationlab.dzbank.de/2024/01/30/lean-and-secure-decentralized-delivery-versus-payment-dvp-for-securities-settlement/

Use Case: „Programmable Payment Instruction“

- Status:
  - Pontes Pilot allows to create and submit **fixed payment instructions** via the EII based on a 4-eyes principle.
  - Recap: The Smart Derivative Contract (SDC) allows to mitigate Settlement Risk and Counterparty Credit Risk. It was featured in the 2024 ECB Trial. With respect to payments, SDC represents a recurring payment with **variable payment amounts** (settlements).

- Proposed Programmability Extensions: “From direct to programmable Settlements”
  - Making Payment Amounts a Parameter (set later by a valuation agent) creates Added Value for Financial Products
  - Receiving (signed) Payment Finality that can be verified by a Smart Contract on a separated Market-DLT

- Benefits:
  - Execution Efficiency: Initiation and Execution of a Payment Instructions can be decoupled and *remains bilateral*
  - Valuation Agent: A well-designed interaction with a 3rd-party provides the final details via signature (loose coupling)
  - Settlement Risk Reduction: A Programmable Payment Instruction can be **prefunded** with a certain maximum amount

Use Case: Programmable Payment Instruction (ctd)- Example SDC

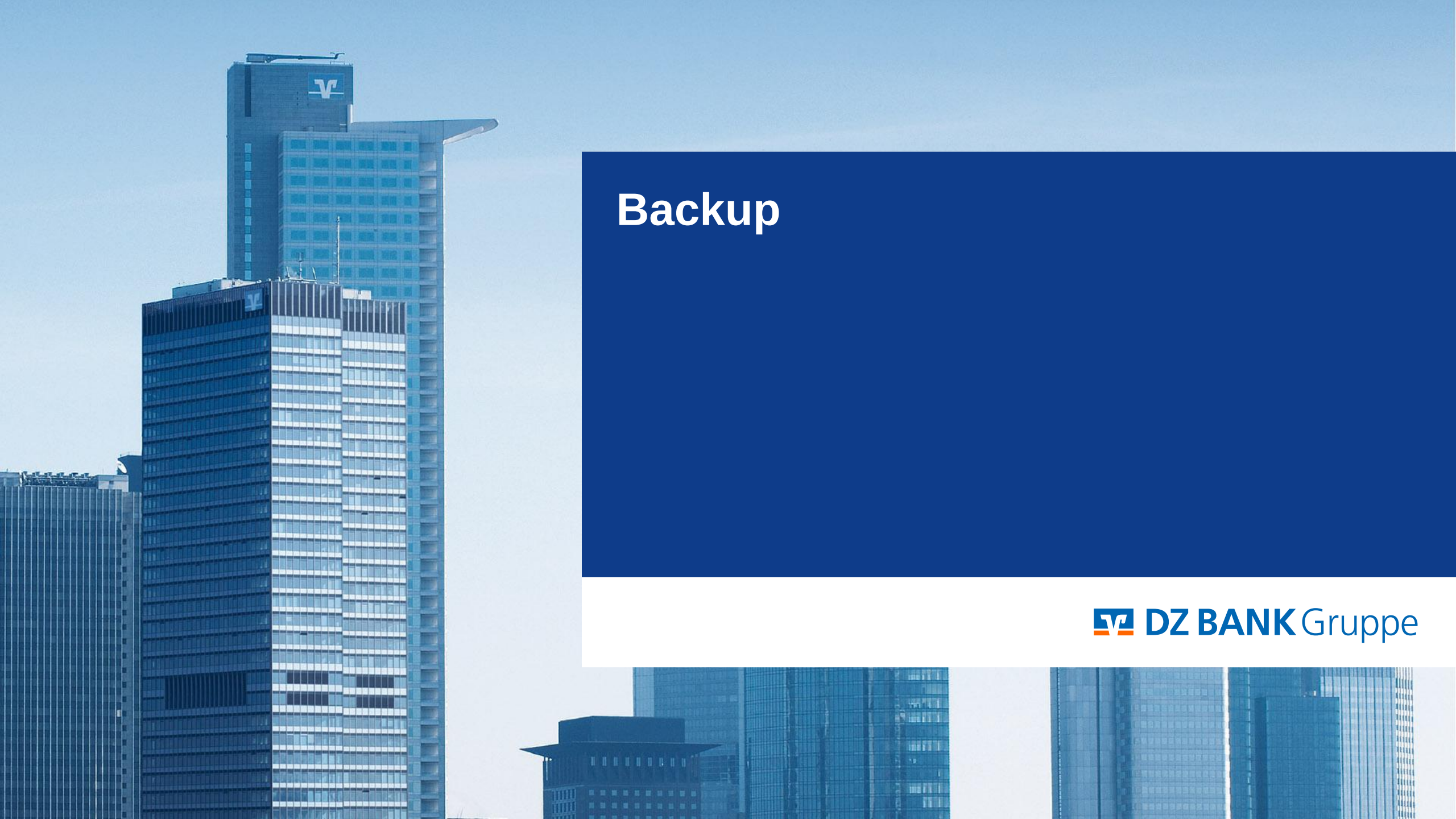
- The **Smart Derivative Contract** protocol (ERC-6123) is installed on some market DLT with a connection to the Pontes EII

- At the beginning of each Settlement Cycle:
  1. Both parties create and submit a "*Programmable Payment Instruction* (PPI)" via EII ("fully prepared").
     1. The PPI has an open payment amount, and a maximum transfer limit (M).
     2. The PPI has a public key that allows to verify a **Signed Amount** (to be submitted later).

- At each Settlement:
  1. The 3rd party valuation agent determines the amount and direction, signs* it, and stores this information on the SDC
  2. Either Party1 or Party2 will deliver this payment information to the standing instruction via EII to the respective PPI
  3. The PPI contract checks the validity of the signature and executes the payment
  4. The **Finality of the Settlement** will be signed by the NCB and be delivered to the Market-DLT / SDC

- Preferred (optional): To **secure Settlement Execution** both parties **prefund** the PPI with the amount of M (Cash-Locking)

* The two parties entitle a 3rd party valuation agent to sign a valuation.



Backup

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Pontes Functional Flow of Direct Settlement

Pilot phase - functional flows

Payment with direct settlement in T2

1 - 3 *Connection*
User authenticates via the agreed security protocols, establishing a trusted session

2 *Direct RTGS Payment Initiation*
Participant initialise the flow, specifying the Payer, Receiver, amount and currency, Payment Instruction ID

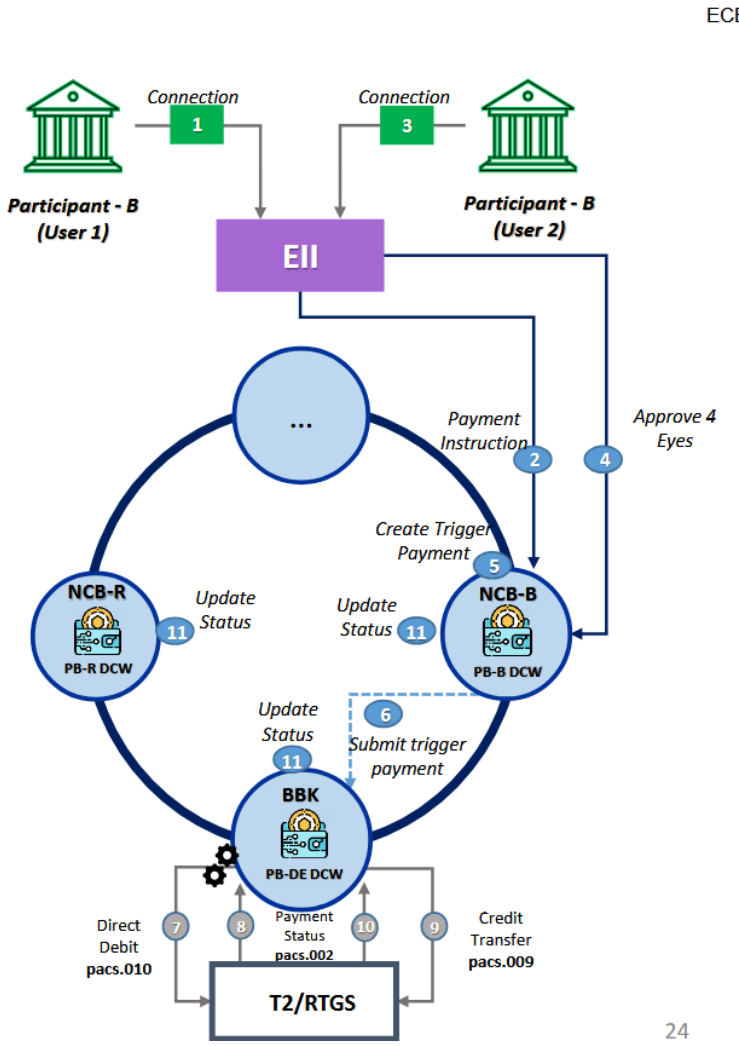
4 *4 Eyes Approval*
User 2 submits the approval

5 *Payment Instruction gets generated on the ledger*
NCB Manager node generate the trigger-payment instruction

6 *On-Chain Submission*
Payment Instruction gets approved and submitted on the ledger

7 → 10 *RTGS Settlement*
Trigger Backend turns the on-chain payment instruction into ISO 20022 pacs messages, debits the payers RTGS DCA, credits the RTGS DCA used as Technical Interim Account, transfers the funds to the receivers RTGS DCA and receives RTGS settlement confirmations

11 *Update Payment Status*
BBK node receives the RTGS settlement confirmation, records the success on-chain, and propagates the final payment status to involved participants



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Pontes - Delivery versus Payment via HLC

ECB-PUBLIC

Pilot phase - functional flows

DvP – Hash Link (initialisation)

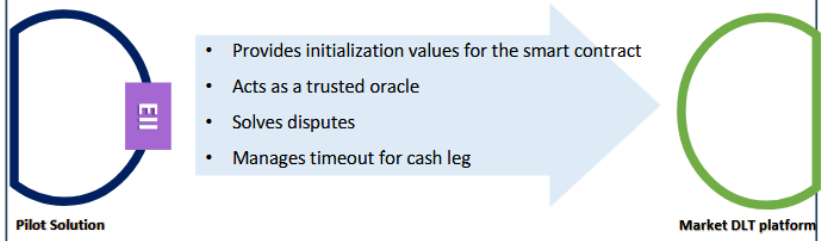
a **Create Hash Link Contract and lock the asset:**
Seller creates HLC on market DLT with DvP information

b **Lock the asset:**
Seller locks the asset in HLC

c **Buyer becomes aware of HLC creation:**
Buyer becomes aware of the transaction ID and the asset is locked on the market DLT platform

Hash Link Protocol

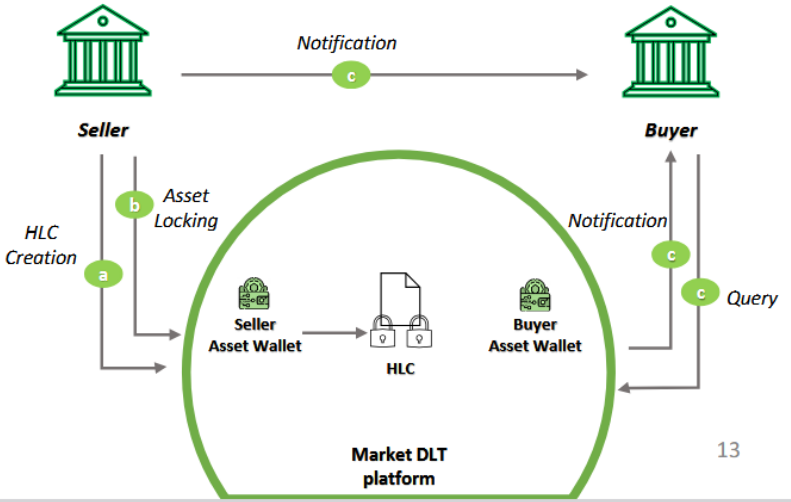
DvP transaction where the delivery of an asset from the Seller to the Buyer on the Market DLT happens conditionally to the execution of a payment from the Buyer to the Seller on the Pilot Solution



Hash Link Contract (HLC)

- Acts as Escrow locking the asset
- Asset transfer is conditioned to either a signature or the provisioning of a key (i.e. the pre-image of a hashed value).

Function	Mode	Actor	Needed information	Asset Transferred to
Execute	Cooperative	Seller	Signature	Buyer
	Forced	Buyer	Signature + Exec Key	Buyer
Cancel	Cooperative	Buyer	Signature	Seller
	Forced	Seller	Signature + Canc Key	Seller



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Smart Financial Contracts – Two current Product Solutions from DZ BANK

Smart Derivative Contract (SDC)

- The settlement of OTC derivatives is fraught with friction, costly and harbours risks: Counterparty Credit Risk
- The SDC defines a functional, deterministic life-cycle for an OTC derivative
- It represents a product innovation and can be operated on a DLT as a distributed protocol
- The commitment was proven by legally binding transactions and the ECB exploration phase

Smart Bond Contract (SBC)

- The ECB trials have shown that T+0 settlement is possible
- The SBC goes beyond this and functionalises the entire life cycle of a security
- The concept is based on international digital standards (ICMA) and guidelines (GFIF

SDC Experiment - envisaged trade date: 23.09.24, termination: 27.09.24

We plan to conduct the SDC-Experiment in week **KW39** (fallback would be to start in KW40). (We'd leave it open for now to have a second experiment scheduled at a later point in time, if that would be possible)

- Experiment Specification:
- Full automated Post-Trade Processing of an SDC (reference underlying: Interest Rate Swap) over 5 (up to 10) business days (ideally incl. weekend)
- Trade initialization planned for Monday: 23.09.24 @11:00 with settling a fixed upfront fee (first payment)
  Remark: After trade initialization has been triggered by the parties, *no manual interaction* will take place until trade termination!
- On each business day there will be *two* automated settlements (which includes automatic determination of the settlement value and submitting the payment)
  - first daily settlement at 12:00 (inside operating hours) – SDC will receive Status "Settled" almost instantaneously.
  - second daily settlement at 17:00 (outside operating hours) – SDC will receive Status "Settled" next BD (expected at 9:15 am).
- Trade-Termination on Friday 27th (or later) at 13:00 with both parties agreeing on a fixed termination fee (last payment).
- (Optional / to be clarified whether we can use live market data)
- Please let us know if you have any remarks and questions regarding our proposed setup and whether this approach is appropriate.

Design Elements of a SDC

Digital Trade Data
Format defines all trade and process terms, can be stored immutably on DLT

No Contract Risk ✓

Valuation Model
is part of the legal contract and determines calculation of the settlement amount

No Disputes ✓

Settled-2-Market
procedure is based on a prefunding mechanism and removes existing collateral processes

No Collateral Process ✓

Prefunding
is required and gets verified at the beginning of each settlement cycle. This guarantees settlement

No Counterparty Risk ✓

Termination Feature
is based on pre-agreed fees reduces uncertainties and shortens the close-out period

No Close-Out Risk ✓

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Summary

- What is the problem the Business Case would address and what opportunity does it create?
  - SDC removes Counterparty Credit Risk and frictions in OTC-Derivatives post-trade processing

- How would DLT overcome/fix the identified challenge(s)?
  - Why would (only) DLT address the challenge(s)?
    - DLT would enable full Disintermediation and Digitalisation of Post-Trade Processing
  - Where would DLT bring improvements where current infrastructures are unable to?
    - Complete Determinism: No Contract Risk, no Dispute, no Settlement Risk, no Default Risk
  - How would you address the challenge(s) without DLT?
    - SDC is a technology agnostic. Without DLT a central operator would be required.

- What are the learnings you envisage to obtain? What is the experience you wish to gain?
    - Central Bank Digital Currency (CBDC) leverages full potential of SDC concept

ERC-7573: Rationale for a DvP based on Encrypted Keys / Decryption Oracle

- To overcome frictions, Banca d'Italia *) introduced a key-based mechanic for DvP. An Oracle provides Keys for 'failure' and 'success' enabling seller or buyer to retrieve the asset depending on the payment state
- Need of Cash-Locking is removed, Time-Locking is removed.
- Drawbacks: Oracle to generate and hold secret keys therefore quite tightly coupled with each transaction

- General Idea of ERC-7573:
  - Use an Oracle-Service *only* to decrypt a certain key, without knowing what this key is for
  - Make use of asymmetric private-public key encryption: Parties can use the oracle's public key to *encrypt* secrets for their trading party, while only the oracle can *decrypt* with its private key
  - The Oracle does not need to hold 'state', and it does not need to know the transaction details
  - The service is loosely coupled to an 'on-chain' PaymentContract which emits the respective key upon state of the payment transaction – for that finality is required
  - Encrypted (+Hashed Keys) are persisted 'on chain', no off-chain storage is needed

*) Banca d'Italia 2022: "Integrating DLTs with market infrastructures: analysis and proof-of-concept for secure DvP between TIPS and DLT platforms"

CRÉDIT AGRICOLE
CORPORATE & INVESTMENT BANK

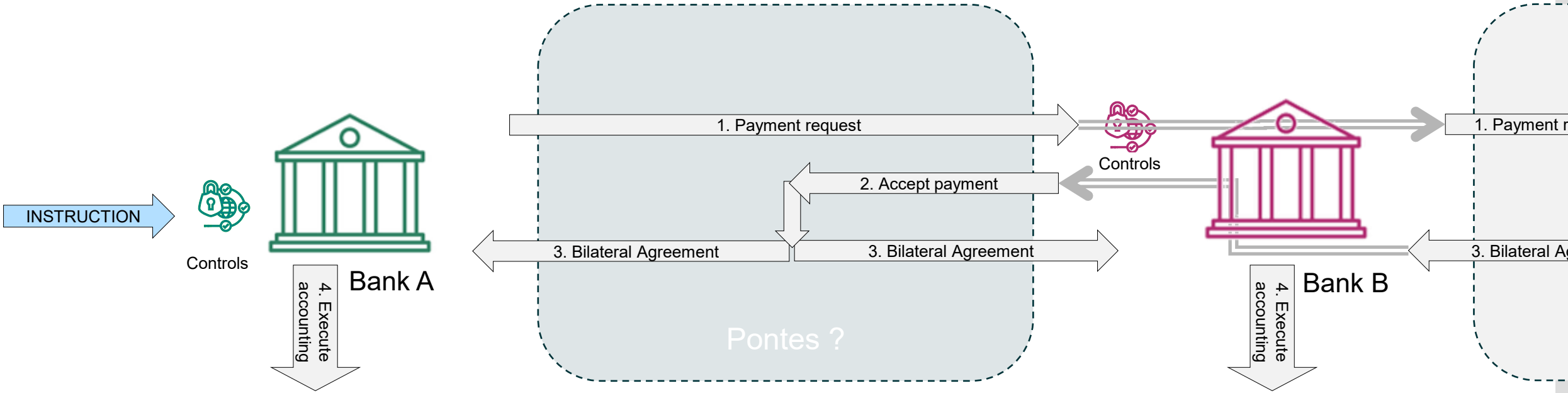
Connecting banks' systems for atomic 24/7 payment

Pontes Market Contact Group
26/02/2026

Search for 24/7 atomic interbank payment scheme
General principles and expected benefits

- End to end validation of the payment request before any balance is changed :
  - remove reversal need,
  - better client experience
- All banks perform their accounting based on an irrevocable commitment
  - client (and intermediaries) is not debited before acceptation
- Execution should be available 24/7 and fast (<10s ?)

- Bank B must be able to act as intermediary

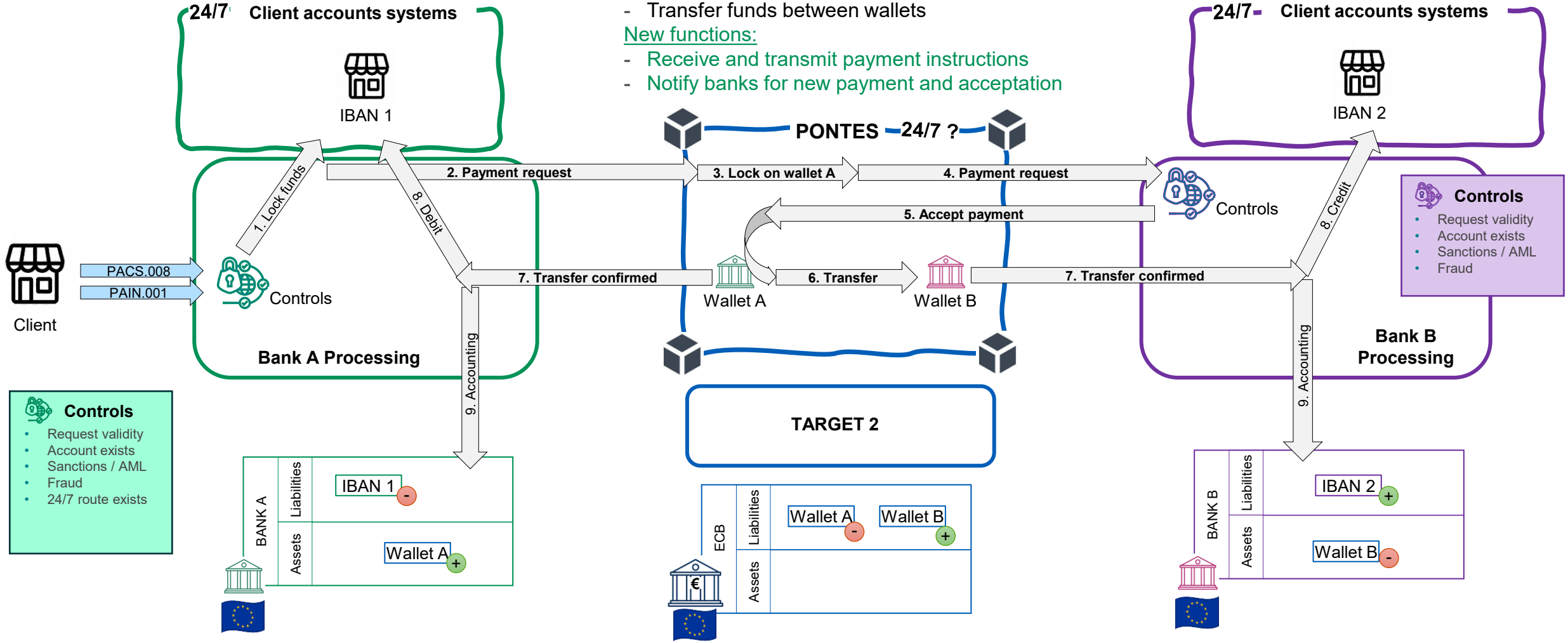


What programmability would be needed in Pontes

Pontes could assemble

Existing functions:
- Lock funds in wallet
- Transfer funds between wallets

New functions:
- Receive and transmit payment instructions
- Notify banks for new payment and acceptation



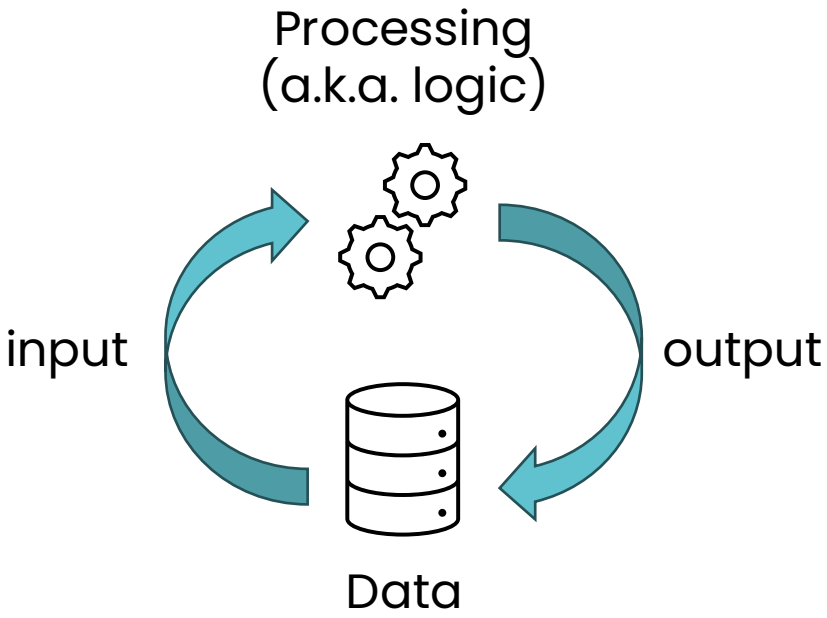
swiat

Pontes MCG #3

Programmability Workshop

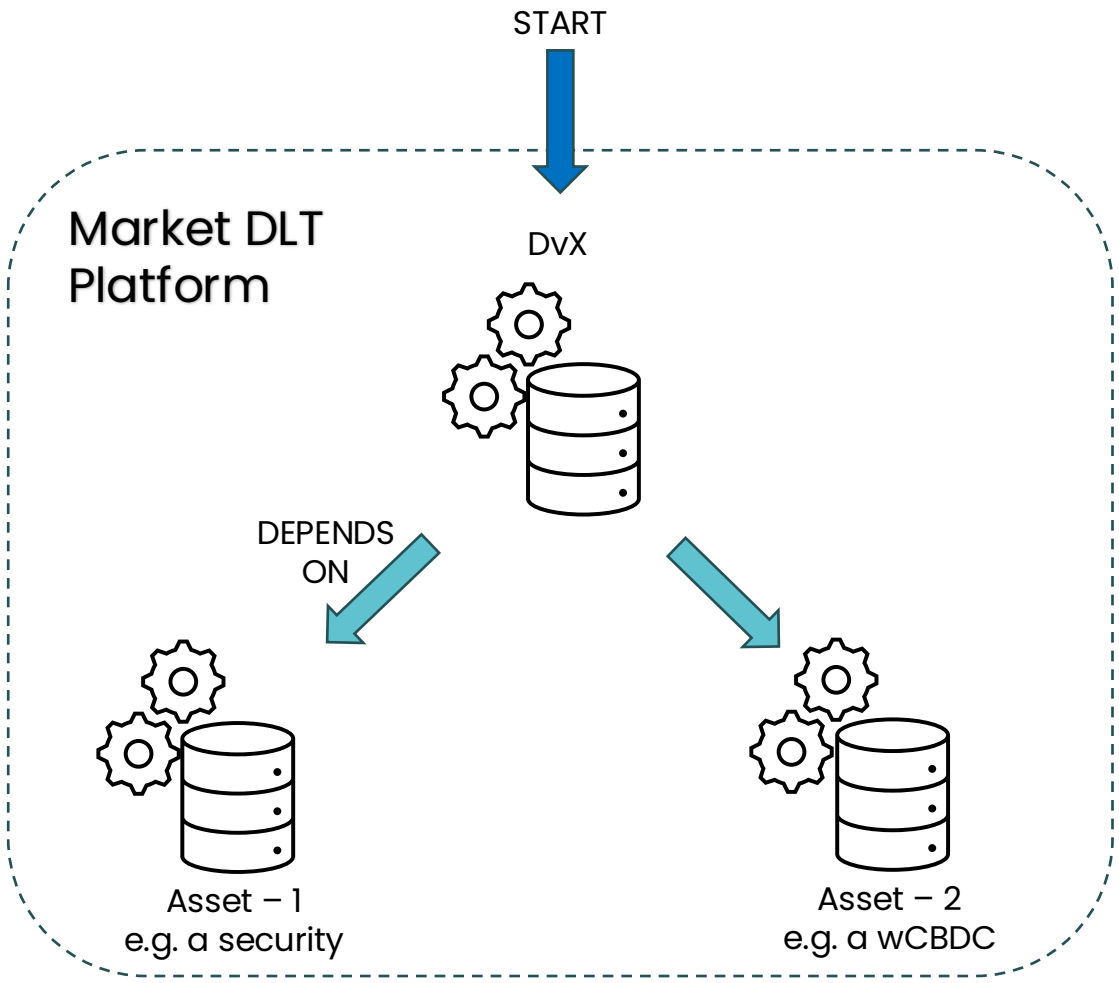
26.02.2026

Programmability



- Location?
- System Boundaries?
- Ownership?
- Trust?
- Changing requirements?
- ...

Intra-Ledger DvX



NOTE: Life becomes much easier when the assets reside on the same ledger.

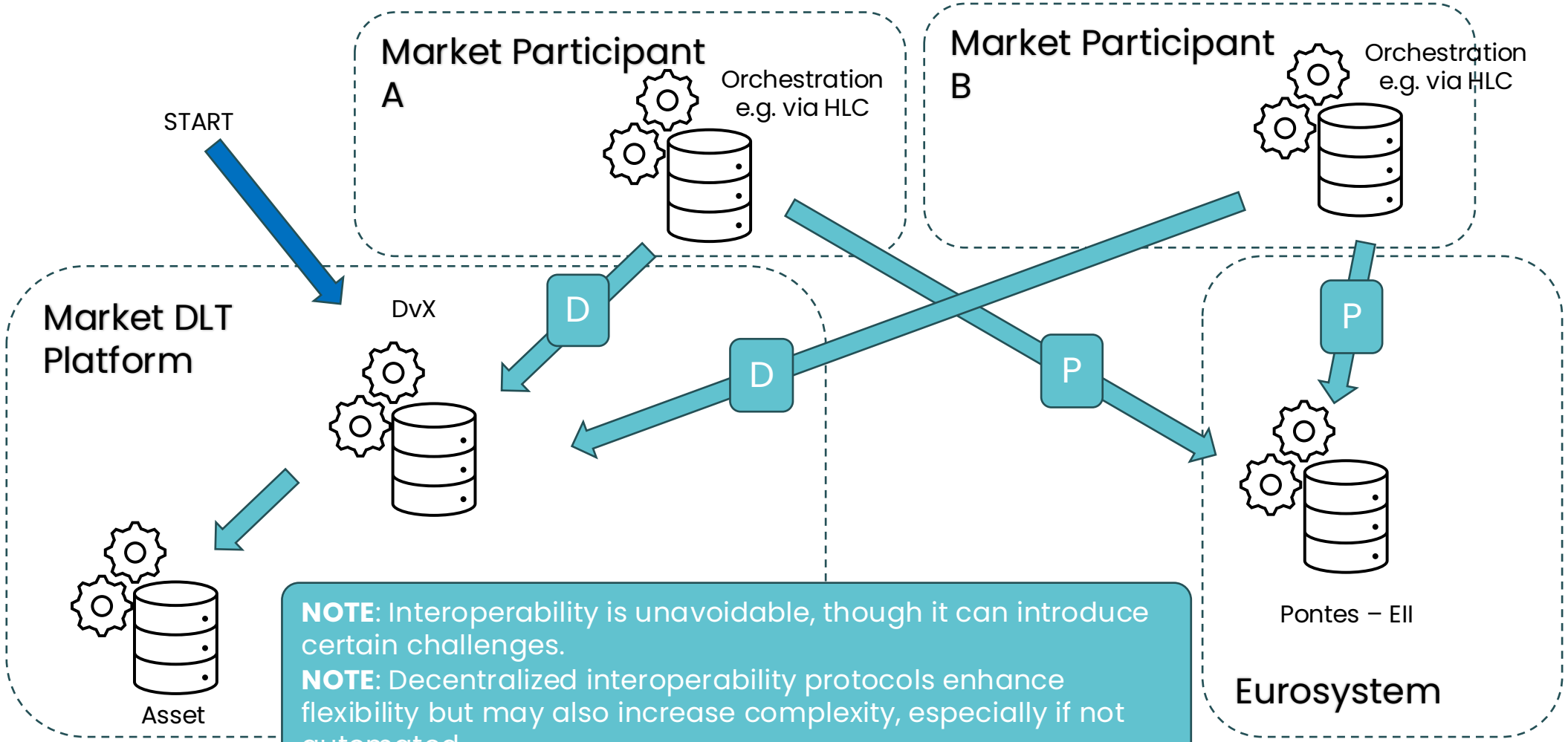
NOTE: This is precisely why stablecoins hold significant appeal.

NOTE: Introducing a wCBDC token on a Market DLT platform would be highly advantageous. Appia perhaps?

Cross-Ledger DvX
orchestrated by Market Participants

covered by the Pontes Pilot

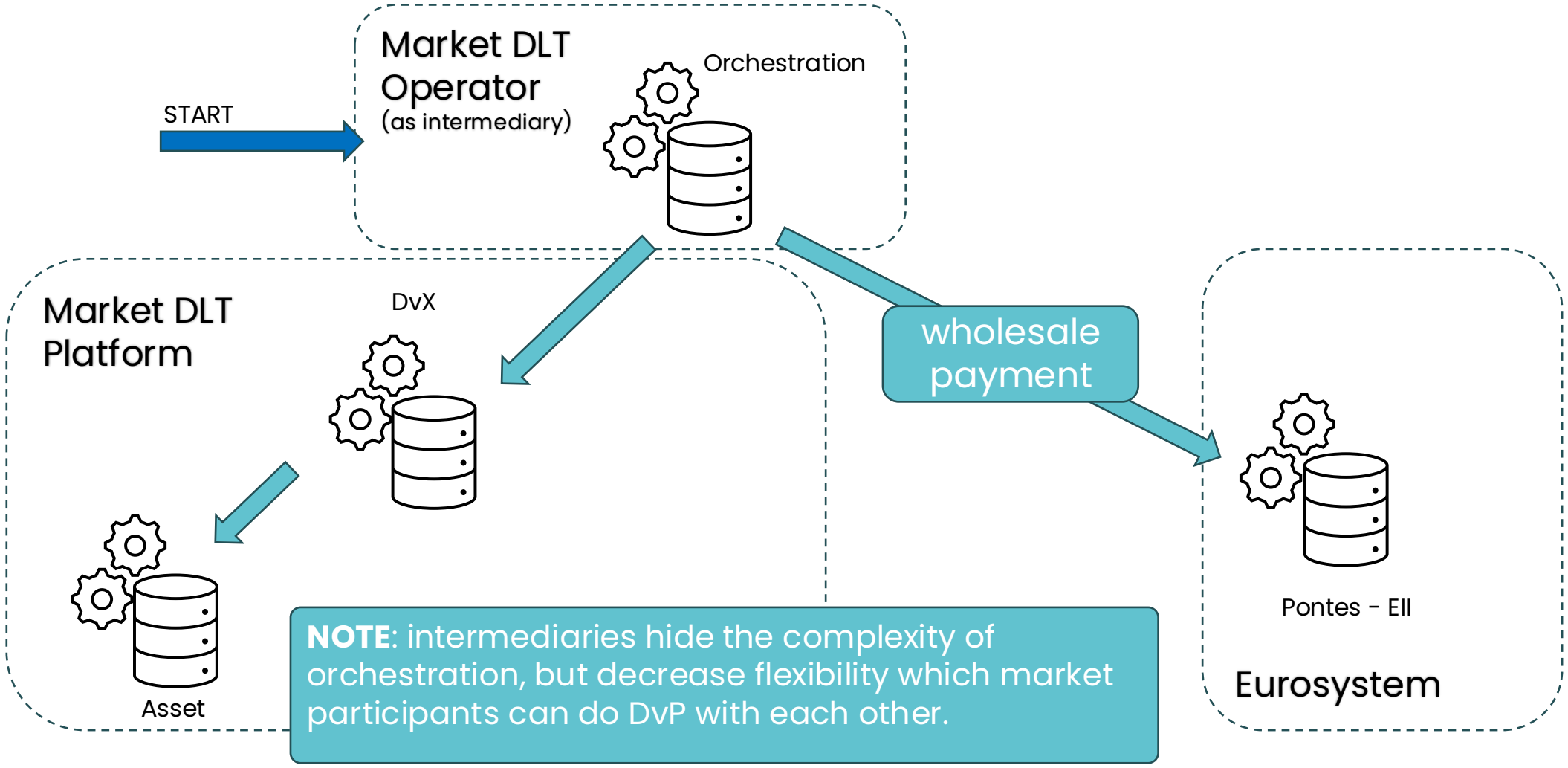
swiat



NOTE: Interoperability is unavoidable, though it can introduce certain challenges.
NOTE: Decentralized interoperability protocols enhance flexibility but may also increase complexity, especially if not automated.
NOTE: Programmability is primarily essential on the asset side, while payment requirements tend to remain relatively stable.

Cross-Ledger DvX
orchestrated by a Market DLT Operator

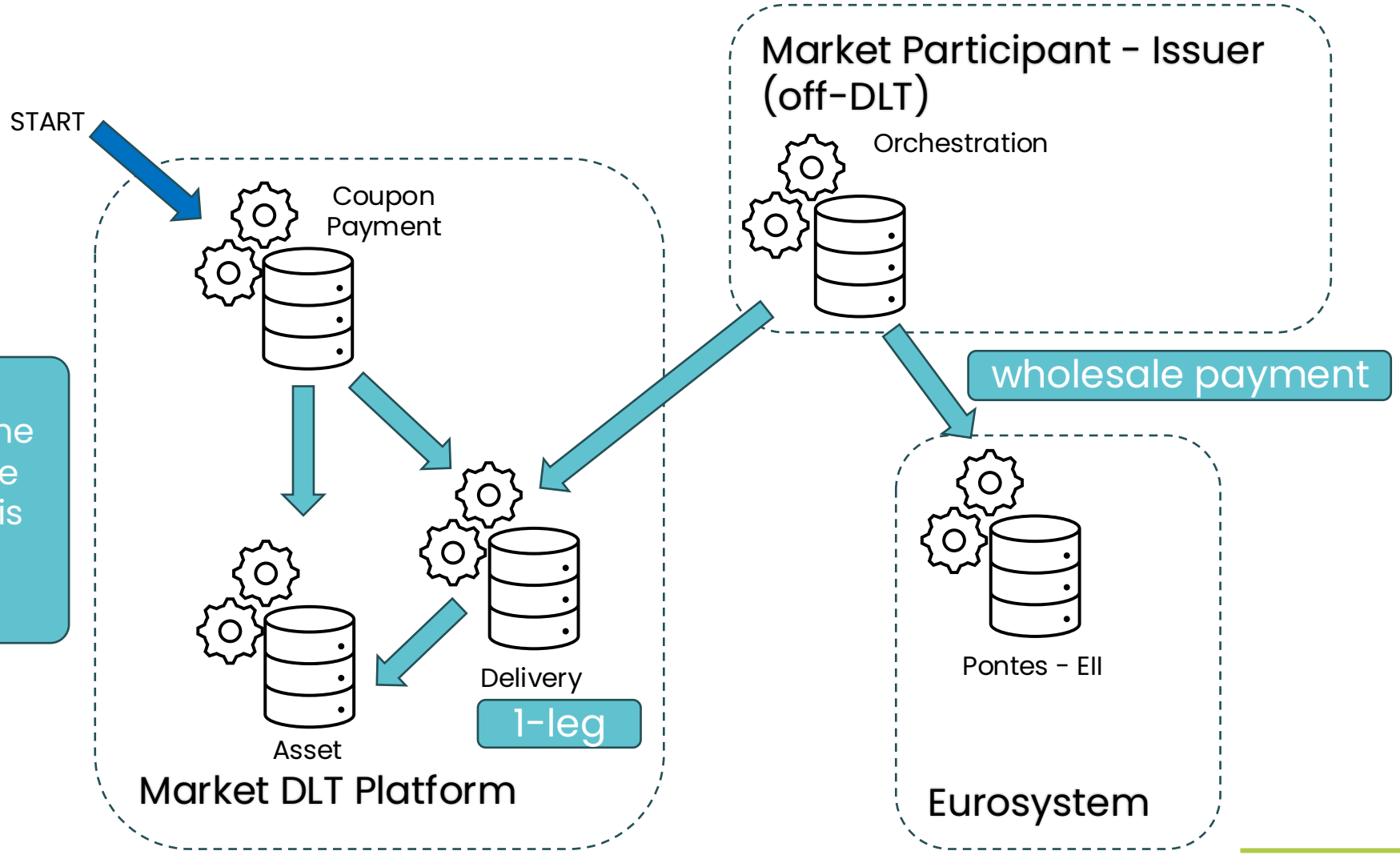
covered by the Pontes Pilot



Coupon Payment
on-DLT, with Pontes

covered by the Pontes Pilot

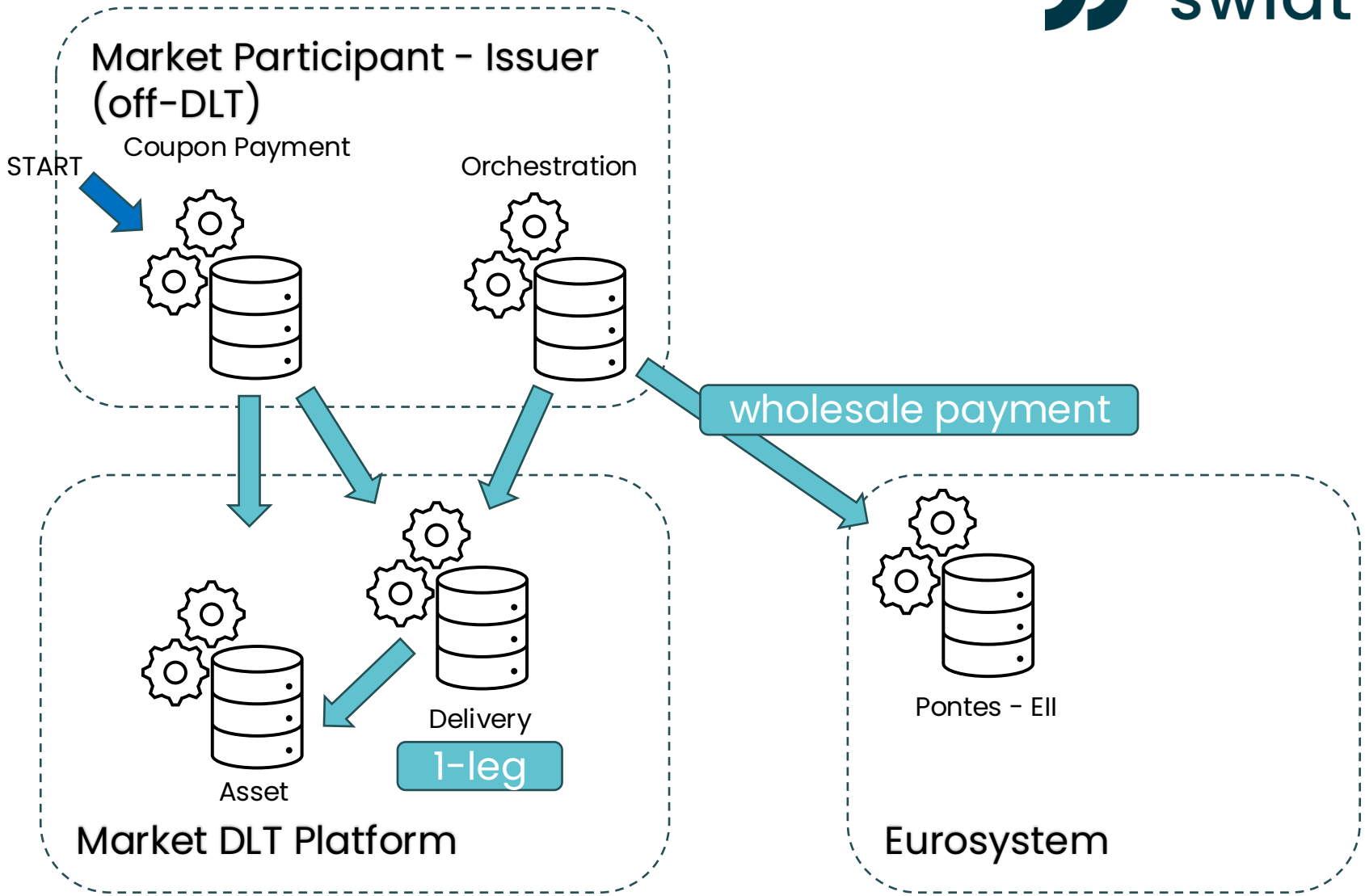
swiat



NOTE: While it may seem beneficial to place most of the logic and data directly on the DLT, in reality, this approach is rather problematic and is frequently unnecessary.

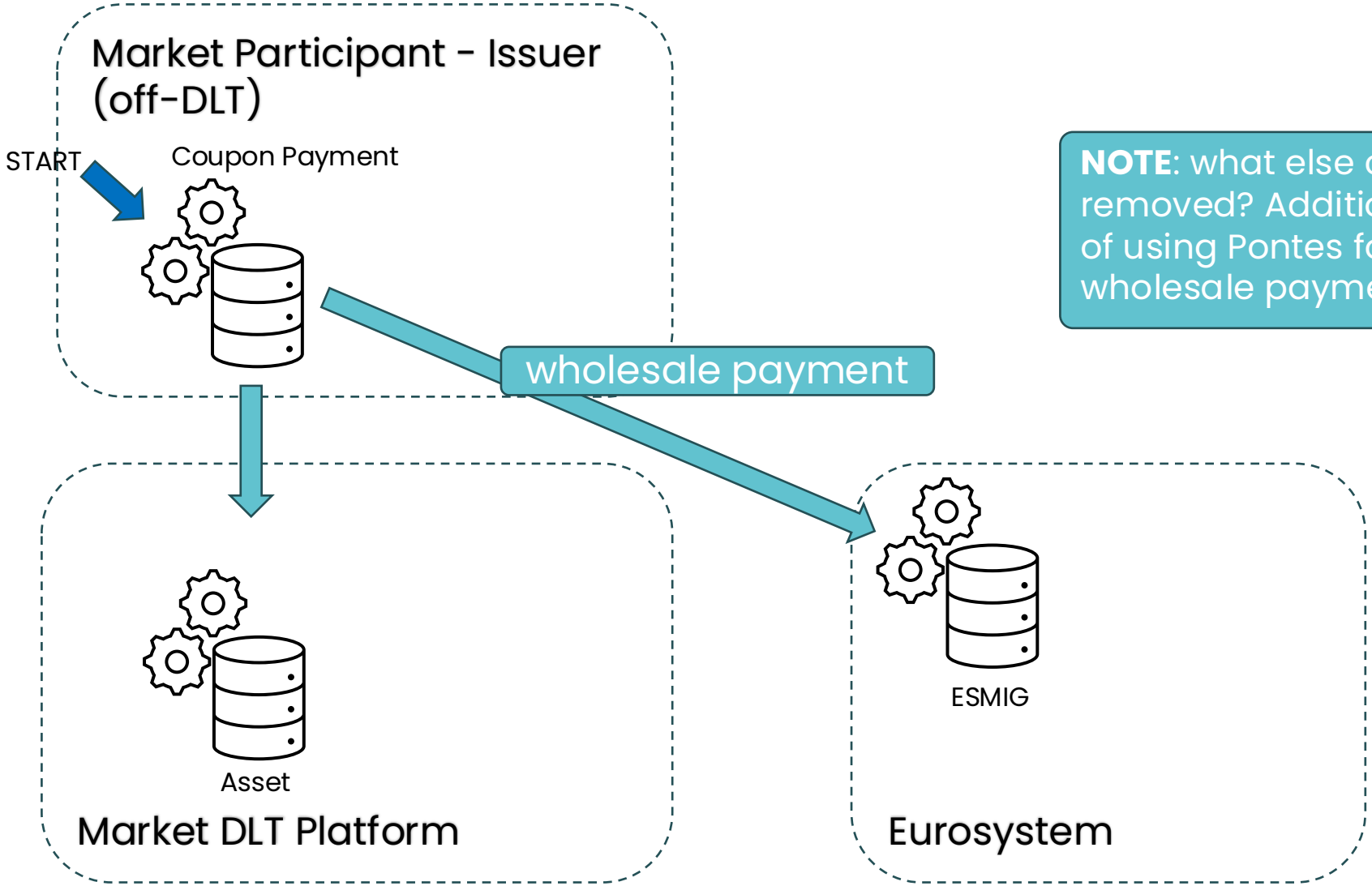
Coupon Payment
off-DLT, with Pontes

covered by the Pontes Pilot



NOTE: less is more? Moving logic and data off-DLT.

Coupon Payment
off-DLT, without Pontes



NOTE: what else can be removed? Additional benefits of using Pontes for one leg wholesale payments?

… more constellations to consider …

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Roadmap for Pontes initial launch and beyond

Agenda item 03

3rd Pontes Market Contact Group meeting

26/02/2026

George Kalogeropoulos

Deputy Head of Market Infrastructure Development Division, ECB

Eurosystem programme on tokenised wholesale CeBM

2024
Exploratory work

- ✓ Largest initiative of its kind
- ✓ Nearly €1.6 billion settled
- ✓ 64 market participants

2025
Programme launch

- ✓ Projects “Pontes” and “Appia” launched

2026
First milestones

- ✓ **Pontes initial launch**
- ✓ **Publication of Appia roadmap**

Eurosystem work programme: Pontes and Appia

Pontes to provide the bridge between DLT platforms and TARGET Services

Work programme will deliver on Eurosystem's continuing commitment to safe, efficient settlement in central bank money

Appia to shape future-ready, innovative, integrated financial ecosystem

ECB press release, July 2025

Single work programme: Appia shapes Pontes enhancements

Appia

Market developments

- Analysis and monitoring
- Stakeholder engagement

Technology & Standards

- Assessment of technological choices
- DLT standardisation

Central bank operations and services

- Test tokenised collateral
- Test transferability of CeBM
- Test shared network(s)

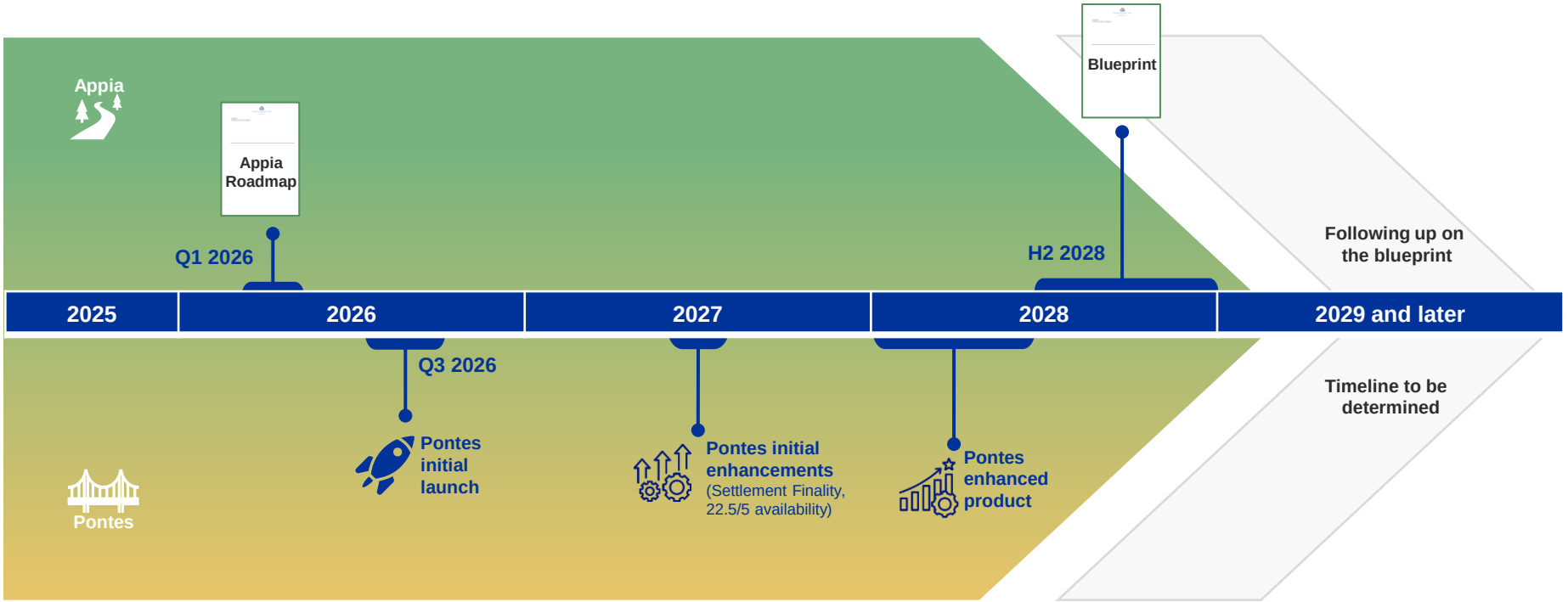
… Inform enhancements to prioritise in line with market needs

… Inform standards and technology to adopt

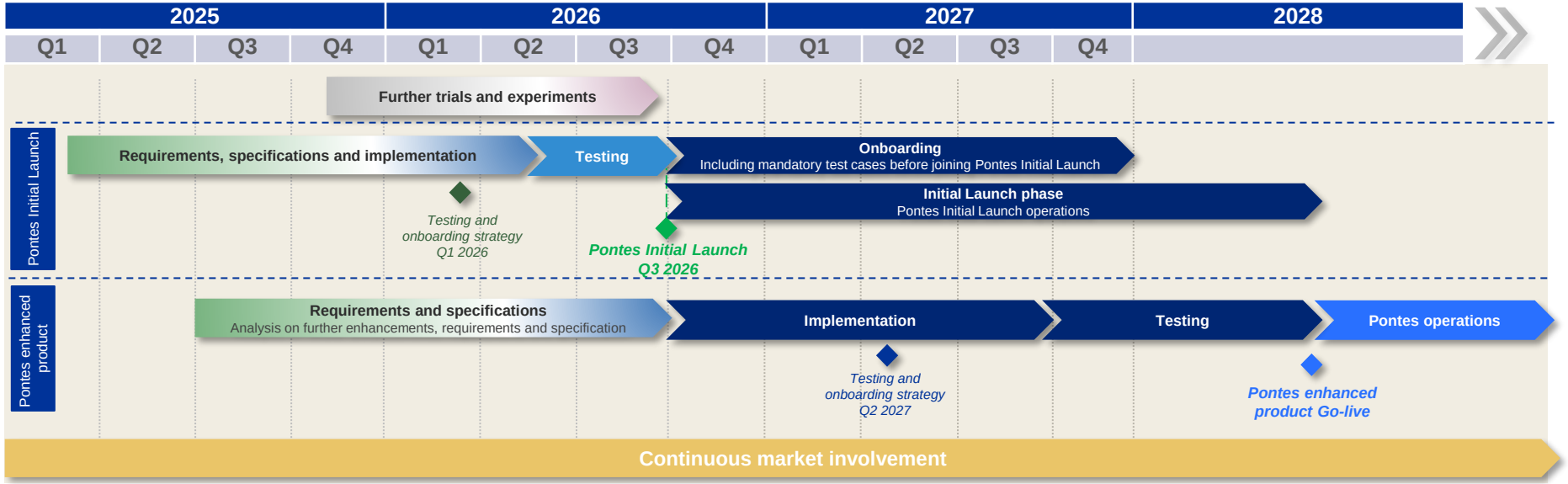
… Inform new functionalities, services and/or infrastructures to implement

Pontes

Appia and Pontes: a single work programme



Pontes: overall timeline



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EUROSYSTEM

Pilot phase – Service Description

Agenda item 4.1

3rd Pontes Market Contact Group meeting

26/02/2026

Service Description – table of contents

Chapter 2 – Actor, roles and user profiles

Actors
Covered also in the Business Description Document

Roles
Covered also in the Business Description Document

Relationship between actors
E.g. Description of the configuration needed to enable a Market DLT Operator to instruct on behalf of a Market Participant

User profiles
Market Participants and Market DLT Operators can have multiple users → different profiles (e.g. administrator, read, write, …) can be assigned to users

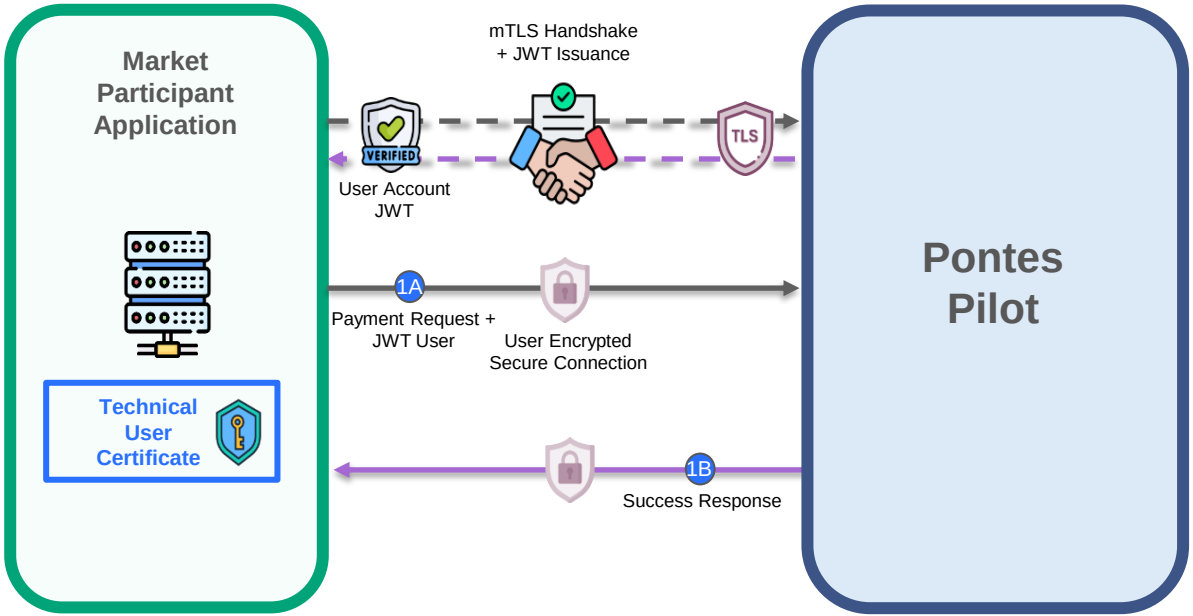
Chapter 3 – Business functionalities

1. **User-to-Application (U2A) and Application-to-Application (A2A) process description**
2. **Non-Repudiation of Origin (NRO)**
   Mechanisms providing evidence of the identity of the sender of a request and the integrity of that request.
3. **Local Reference Data Management**
   Reference data objects and related information
4. **Settlement-related functionalities**
   Parameters (mandatory and optional), responses (in case of success and error)
5. **Query and monitoring**
   Parameters (mandatory and optional), responses (in case of success and error)
6. **Application-to-Application (A2A) processing (1-step and 2-steps)**
   Focus on the next slides →

Chapter 3 – Business functionalities

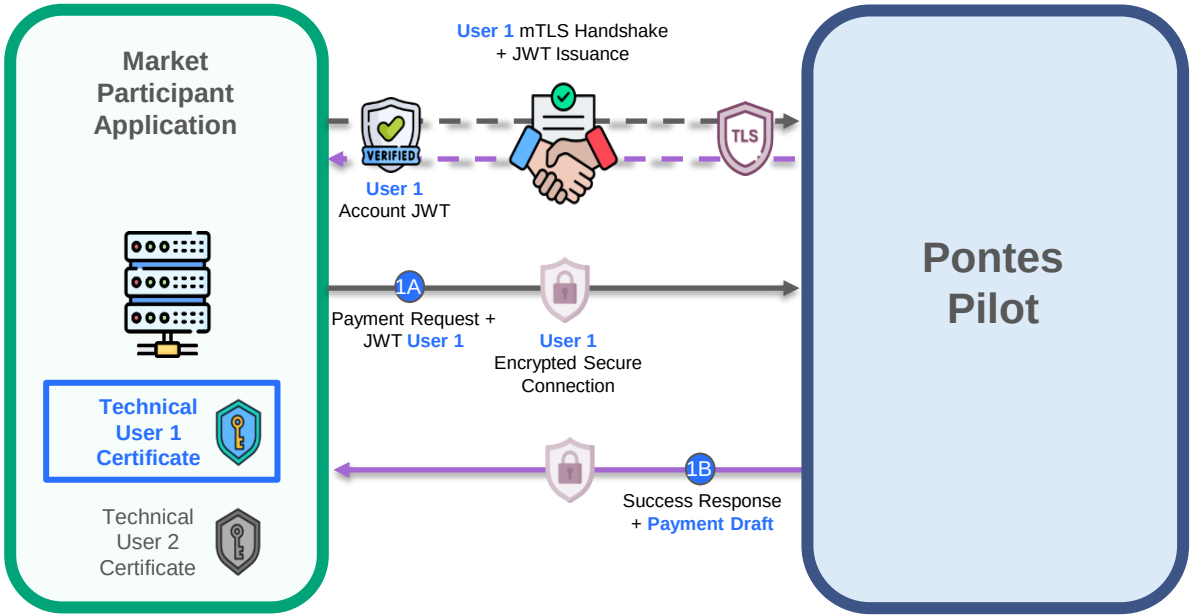
A2A processing (1-step)

JWT = JSON Web Token
mTLS = mutual Transport Layer Security



Chapter 3 – Business functionalities

A2A processing (2-steps*)

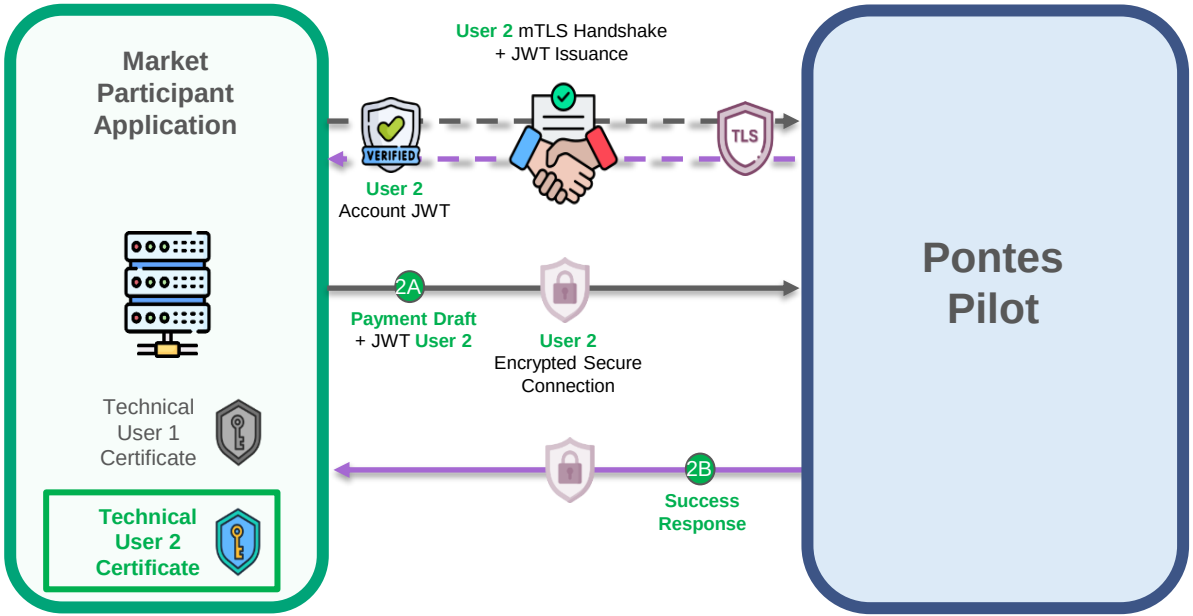


JWT = JSON Web Token
mTLS = mutual Transport Layer Security

* Some functionalities available in A2A require the market participants' application to confirm a successfully submitted request. The entire process is based on A2A interaction and does not require manual interventions.

Chapter 3 – Business functionalities

A2A processing (2-steps*)



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* Some functionalities available in A2A require the market participants' application to confirm a successfully submitted request. The entire process is based on A2A interaction and does not require manual interventions.

Chapter 4 – Operational business day

Elements of the Pontes Pilot **operational business day:**

- **Business day phases**
- **Timing**
- **Actors**
- **Operations available**

→ See high-level information in agenda item 4 of Pontes MCG meeting on 11 December 2025

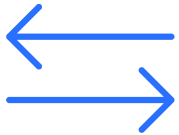
Chapter 5 – High level technical description

5.1 High-level architecture

- Extended Interoperability Interface
- Eurosystem DLT
- T2 Interface

5.2 Hosting and resilience

- Hosting of National Central Banks'
- Resilience of the solution



5.3 Interoperability Mechanism

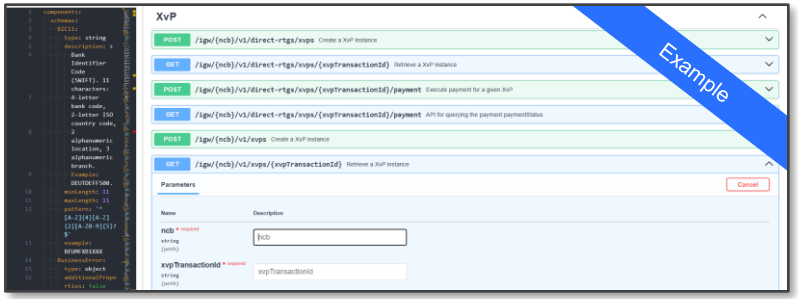
- Hash Link protocol details

Appendix 6.1 – API Documentation

The **OpenAPI Specification (OAS)** defines a standard, language-agnostic interface to HTTP Application Programming Interface (API) which allows both humans and applications to discover and understand the capabilities of the service.

OpenAPI Document is a human-readable file (in YAML) that describes the API of Pontes Pilot, including:

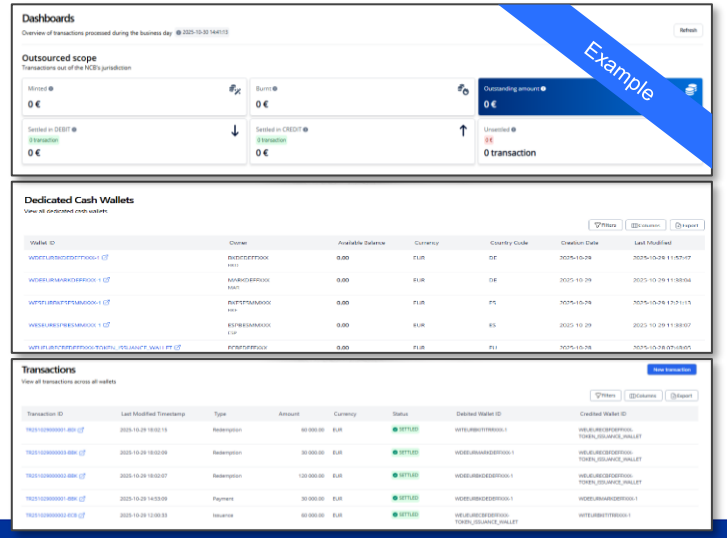
- **Endpoints:**
  The URL of the available APIs (e.g. /v1/xvps/…)
- **(HTTP) methods:**
  What action(s) the API makes available to the user (e.g. GET)
- **Parameters:**
  What information the API needs from the user (e.g. DvP ID)
- **Responses:**
  What the API will return to the user in case of success or error (e.g. the details of the DvP)
- …



Appendix 6.2 – Graphical User Interface

User Handbook that aims at facilitating the use of the **Graphical User Interface** of Pontes Pilot

- It describes the full range of functionalities available in **User-to-Application (U2A)** mode
- It provides information on all GUI screens and step-by-step instructions for typical workflows:
  - ❑ **Dashboards**
  - ❑ **Dedicated Cash Wallets**
  - ❑ **Transactions**
  - ❑ …



Demo in today's dedicated agenda item

Appendix 6.3 – Preparing for integration

Connectivity Guide to Pontes Pilot, including:

1. **Global connectivity overview**
2. **Authentication** principles and standards
3. **Application-to-Application (A2A) channel** specific configuration and requirements
4. **User-to-Application (U2A) channel** specific configuration and requirements
5. **Digital Certificates** (process for request, renewal, …)
6. **Connectivity checklist** (steps and actions)

Appendix 6.4 – Onboarding processes

Description of the **onboarding process** for

Market participants

Market DLT Operators

Including:

- Foreseen **interactions with their relevant National Central Banks**
- Forms with **details needed for the first configuration**
- …

Service Description

Status update

Service Description – status update

The Service Description:

- Elements of the Service Description have been presented to the Pontes MCG (e.g. Functional flows - agenda item 3.2 Pontes MCG meeting on 11 December 2025)
- The Service Description will be shared with the Pontes MCG in Q1 2026
- The document will be published on the ECB website on the page dedicated to Pontes

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Pilot – Volumetrics – market feedback

Agenda item 4.2

3rd Pontes Market Contact Group meeting

26/02/2026

Pontes Pilot – Volumetrics – status update

Pontes Pilot

- Business Description Document (BDD) for Pontes Pilot defines that the Eurosystem reserves the right to set limits on**:**
  - **maximum value of transactions settled** with the solution → **limits on value**
  - **number of transactions settled** with the solution → **limits on volume**

- 2nd Pontes MCG meeting (11-12-2025), a possible **approach for these limits** was presented:
  - Pontes MCG members shared their views via written procedure in January 2026 **(21 respondents)**

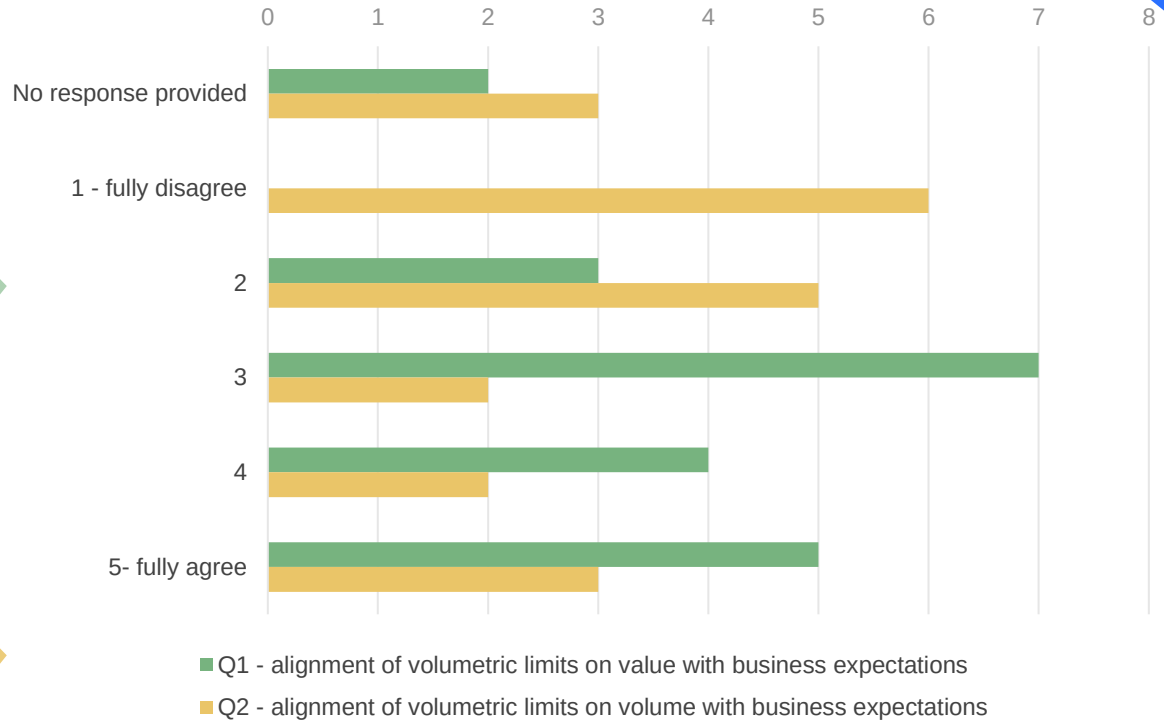
- **THE APPROACH HAS BEEN REVISED BY THE PONTES WG TAKING INTO ACCOUNT PONTES MCG FEEDBACK**

Overview of replies

Pontes Pilot

Q1:
In view of your potential connection to Pontes Pilot, to what extent are the proposed volumetric limits **on value** in line with your business expectations?

Q2:
In view of your potential connection to Pontes Pilot, to what extent are the proposed volumetric limits **on volume** in line with your business expectations?



Updated approach – limits on value

Pontes Pilot

Limit calculation:

Total value turnover of TARGET2 Securities (T2S) (in EUR billions)	248,940	
Value of securities issued in T2S-participating CSDs (in EUR billions)	30,850	**Considering the proposal for the updated DLT Pilot Regime Regulation**
Multiplier	8.06	
DLT PRR threshold on outstanding stock of assets issued* (in EUR billions)	6	**100**
Volumetric limit per market DLT operator for a year of operation (in EUR billions)	~50	**~800**
Volumetric limit per market DLT operator for quarterly operation (in EUR billions)	12.5	**200**

Based on market feedback:

- **Limit will be periodically reassessed** based on Pontes Pilot operational data
- Reporting frequency → **Quarterly**, market DLT operators to report to their National Central Banks
- **Soft limits** (limits should not be exceeded without NCB consultation) → the value limit will not be monitored by the Pilot solution while the compliance will be managed by the relevant NCB

* The proposal for the updated DLT Pilot Regime Regulation published by the European Commission on 4 Dec 2025 ('Market Integration (SIU) proposal package') contains an increase of the current overall limit for DLT infrastructures to record assets (DLT PRR Article 3) from 6 billion to **100 billion EUR**

Updated approach – limits on volume

Pontes Pilot

Limit calculation:

Number of daily transactions in T2S	~1M transactions / day
Assuming 2.5% of T2S transactions settled with Pontes Pilot	25K transactions / day

Based on market feedback:

- **Limit will be periodically reassessed** based on Pontes Pilot operational data
- **No technical enforcement mechanisms** (e.g. limiting traffic)
- Limits on volume are only used to **properly size the system capacity** (not to introduce technical limitations)

Annex

Limits on value

Pontes Pilot

General comment on limits on value:
The respondents considered the initial proposed approach on "value limit" as too restrictive

- **10 out of 21** suggest to **implement "soft limits"** (limits should not be exceeded without NCB consultation) and introduce escalation procedures and early-warning thresholds for stability
- **8 out of 21** notice that hard limits on value can discourage participation, especially for **large value systemic issuances**
- **4 out of 21** find the limits in line with their expectation, yet **underline the need for flexible adaptation**
- **1 out of 21** consider monthly limit net flexible enough → activities do not take place continuously throughout the year but there might be peak times, where the limit is easily reached

The overall sum is not 21 since the (free text) responses from Pontes MCG members covered multiple topics

Limits on volume

Pontes Pilot

General comment on limits on volume:
The majority mentions the need to increase flexibility in the limit application

- **11 out of 21** would prefer limits to be reassessed periodically or for “soft limits” to be implemented
- **9 out of 21** are **broadly aligned to the proposed limit**, yet all also highlight the need for increased flexibility once the adoption of Pontes Pilot will increase
- **2 out of 21** report that such limits would discourage adoption, especially among parties that have the expectation of fast scale adoption

The overall sum is not 21 since the (free text) responses from Pontes MCG members covered multiple topics

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Pontes Pilot - Update on Testing

Agenda item 6

3rd Pontes Market Contact Group meeting

26/02/2026

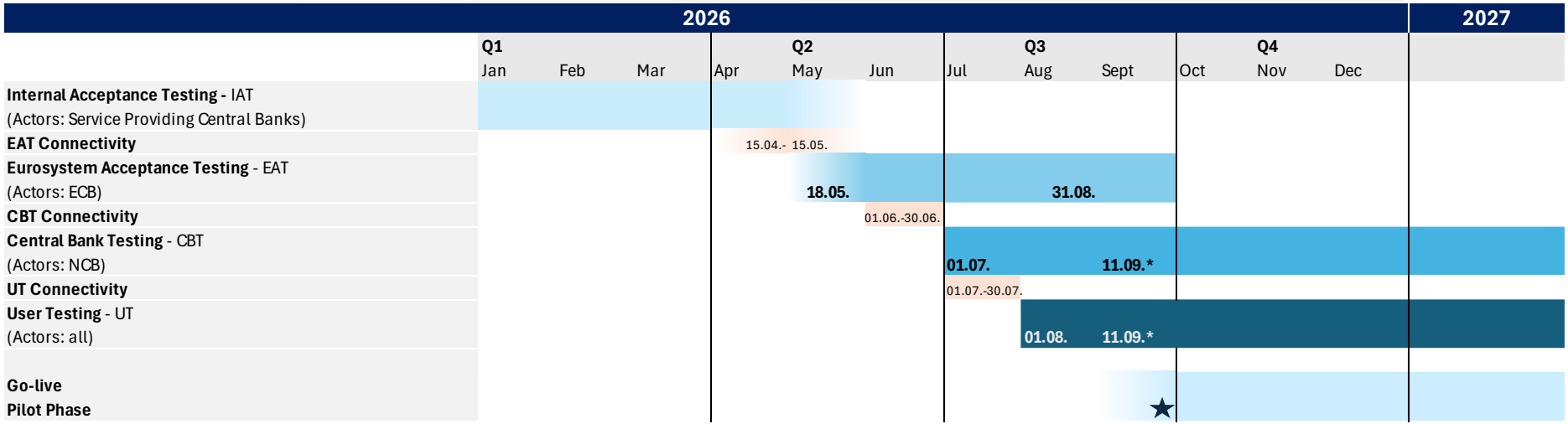
Agenda

1. Timeline, Testing Deliverables and Status
2. Information about Eurosystem Acceptance Testing (EAT) Preparation
3. Participation in Testing

Agenda

1. Timeline, Testing Deliverables and Status
2. Information about Eurosystem Acceptance Testing (EAT) Preparation
3. Participation in Testing

Testing Timeline



** 11.09.26 cut-off date refers to the mandatory testing to be conducted by CBs and market participants using the Pilot immediately as of Go-live*

Testing and Onboarding Strategy

- ✓ Reflects the structured approach the Eurosystem typically applies for new Services and gives an overview on the different stakeholders involved, the testing phases, entry criteria for the different testing phases and Pontes Pilot's go-live, testing approach, onboarding strategy and the framework for the Client Readiness monitoring.

- ✓ Publication foreseen on ECB website in 03/26

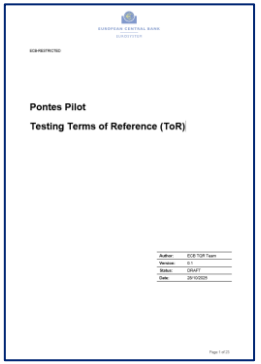
Onboarding-related deliverables

- ✓ ***Connectivity Guide and Reference data*** – see also Service Description agenda item, planned for publication late March / beginning of April

- ✓ ***Testing*** and ***certification***
  - ✓ Testing Terms of Reference (next slide)
  - ✓ EAT Test cases cf. Agenda Item 2

Testing Terms of Reference (ToR)

- ✓ Outlines principles for preparation, organisation and execution of all Pilot testing phases
- ✓ Covers the communication flow: Market Participants/Market DLT operators to address their requests to their National Central Bank's Service Desk (NSD) who contacts 4CB Service Desk in case of need (as per the TARGET Services process)
- ✓ Valid for all three testing stages, sharing a single test environment, connected to T2 UTEST environment to enable for the funding and defunding process:
  - ✓ Eurosystem Acceptance Testing (**EAT**) conducted by the ECB QAT Team
  - ✓ Central Bank Testing (**CBT**) conducted by the National Central Banks
  - ✓ User Testing (**UT**) conducted by Market Participants and Market DLT operators
- ✓ Includes operational testing aspects
- ✓ Drafting ongoing, a first version will be shared with the Pontes WG beginning of March


Pontes Pilot
Testing Terms of Reference (ToR)

Agenda

1. Timeline, Testing Deliverables and Status
2. Information about Eurosystem Acceptance Testing (EAT) Preparation
3. Participation in Testing

Status of EAT preparation

- ✓ EAT Testing strategy has been drafted and will be shared with Pontes WG in March
- ✓ Test cases for the EAT are:
  - ✓ Based on the Business Description Document (BDD) and Service Description (SD)
  - ✓ Covering various functional clusters that can be found in the annex of this presentation
  - ✓ Planned to be made available shortly before the start of EAT functional test phase starting on 18/05

- ✓ Connectivity:
  - ✓ Preparing T2 UTEST connection and reference data
  - ✓ Setting up tooling/network for API interaction with Pontes Pilot TEST endpoints (URLs tbc)

Agenda

1. Timeline, Testing Deliverables and Status
2. Information about Eurosystem Acceptance Testing (EAT) Preparation
3. Participation in Testing

Participating in Pontes Pilot Testing

… as a Market participant or Market DLT operator: contact your National Central Bank

…indicative number of participants in Pontes Pilot* :

#NCBs = 14 including 5 without participants

#Market participants = 31 including 5 Market DLT operators

#Market DLT Operators = 13

**Pontes Working Group (WG), i.e. Eurosystem NCBs, reporting in February 2026*

Mandatory certification test cases will be discussed and agreed in the Pontes WG in March 2026 and shared with the Pontes MCG thereafter; certification of participants will be performed by the relevant NCBs

Annex: List of functional clusters

Functional Cluster	Domain
Authentication	Interfaces and technical connectivity
Authorisation (Privileges and Roles enforcement)	Interfaces and technical connectivity
U2A connectivity	Interfaces and technical connectivity
A2A connectivity (API)	Interfaces and technical connectivity
RTGS Accounts	Reference Data
Participants	Reference Data
Users	Reference Data
Wallets (including mapping)	Reference Data
Calendar and settlement day schedule	Reference Data
Funding and Defunding	Settlement
Wallet to Wallet movement	Settlement
Payment (direct settlement in T2)	Settlement
Xvp processing (with HL)	Settlement
Payment free of Delivery (PFoD)	Settlement
Special Scenarios (blocked participant, closing days)	Settlement
Static Data Queries	Information Management
Dynamic Data Queries	Information Management

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Thank you

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Updates on Pontes legal framework, Eurosystem collateral policy and the DLT Pilot regime

26/02/2026 – Pontes MCG

Overview

1. Legal framework Pontes Pilot - Status and timeline
2. Eurosystem collateral policy on DLT-based assets
3. Proposed enhancements to the DLT Pilot Regime

1

Legal framework Pontes Pilot - Status and timeline

Legal framework Pontes Pilot

- The legal framework will include templates for the *Terms & Conditions* for the contractual relationship between (i) the **NCBs and the Market Participants** and (ii) **NCBs the Market DLT operators**
- The templates follow the same timeline as the legal framework
- Drafting is ongoing in ECB and the Pontes WG **until August 2026**
- Intended to be submitted to ECB decision-making bodies **mid-August, and approved by end September 2026**

  -Templates will be finalised very shortly before the launch of the Pilot

22/05 17/08

2

Eurosystem collateral policy on DLT-based assets

Key parameters of the Eurosystem collateral framework

- The main purpose of the collateral framework is to **protect the Eurosystem** from losses in case of counterparty default *(see Art 18 of ESCB Statute, "adequate collateral")*
- The Eurosystem takes collateral in all **21 jurisdictions** of the euro area based on a set of key principles (e.g. efficiency, safety, level playing field, etc.)
- Eligibility as Eurosystem collateral is strictly and solely based on **pre-determined rules** (implemented via legal acts), not on discretion
- For all eligible marketable assets there has to be an (eligible) operational way of **mobilisation**
- The framework has eligibility criteria on
    a. individual characteristics of the asset and its issuer
    b. the infrastructures used to issue the asset *and*
    c. the infrastructure used to hold / settle the asset (mobilisation channels)

Eurosystem announcement on 27 January

ECB press release 27 Jan 2026


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PRESS RELEASE

ECB paves way for acceptance of DLT-based assets as eligible Eurosystem collateral

27 January 2026

1st step

Accepting assets issued in DLT platforms provided by CSDs

- When mobilised as collateral, these assets need to be converted into positions in traditional securities accounts in eligible SSSs (i.e. settled in T2S)
- Operationalisation starts on 30 March 2026

2nd step

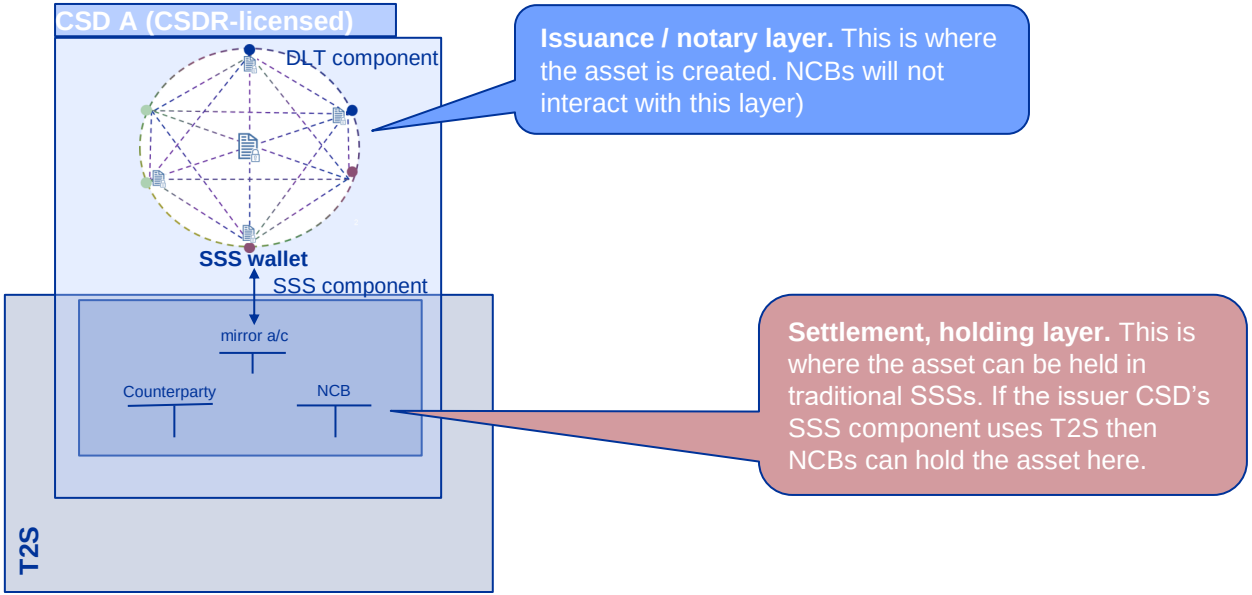
Exploring how to accept DLT-based assets other than Step 1

- I.e. not issued in CSDR licensed CSDs and / or not in 'de-tokenised' form in T2S
- Several operational, safety and regulatory considerations come into play

With these steps, the Eurosystem aims to provide a clear direction to industry players while aligning efforts and innovating within a common framework.

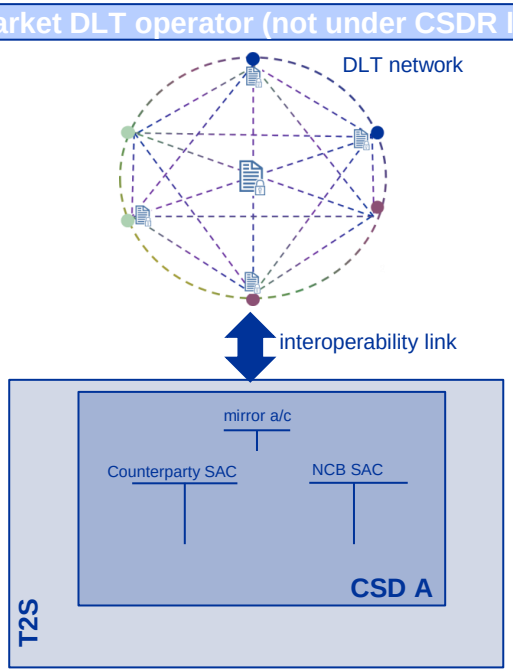
"ECB paves way for acceptance of DLT-based assets as eligible collateral" Press release on 27 January 2026: https://www.ecb.europa.eu/press/pr/date/2026/html/ecb.pr260127_1~a946167ce1.en.html

Step 1 – a closer look

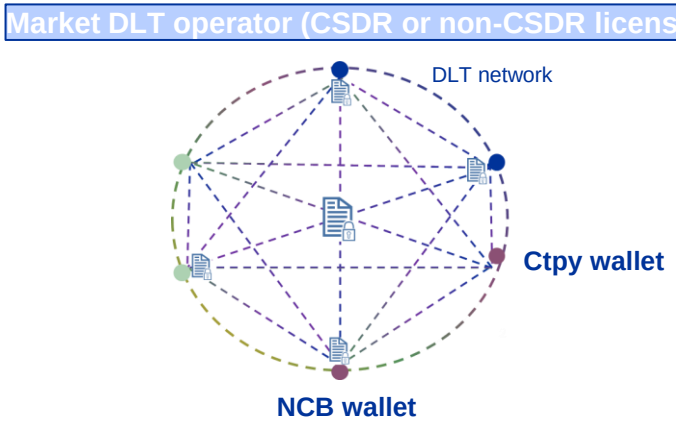


Step 2 – other potential set-ups ?, e.g.

Assets issued in DLT network operated by non-CSDR licensed operator and detokenised to T2S



Assets issued in DLT network operated by CSDR- or non-CSDR licensed operator and not detokenised to T2S



...

Relation with Pontes

- Eurosystem collateral operations have no direct / immediate relevance to the Pontes pilot at operational level
  - Pontes will be a cash (-token) settlement service
  - Eurosystem will not provide credit directly in Pontes
- However, both the Pontes pilot and the evolution of Eurosystem collateral policies are expected to facilitate the scaling up the market ecosystem – strong indirect link
- Eurosystem treats these initiatives as part of its work programme on tokenised wholesale central bank money settlement

Proposed enhancements to the DLT Pilot Regime

EC's Market integration package – DLTR enhancements

- **Expansion of DLTR:** increased activity limits and extended scope of instruments
- **Simplified regime:** lighter supervisory regime for small players (with lower activity thresholds)
- **Eligibility of new entities for DLTR licences:** credit institutions and crypto asset service providers (CASPs)
- **Requests for additional exemptions:** additional exemptions subject to supervisory discretion
- **Cash settlement:** clarifications on rules and safeguards pertaining to use of commercial bank money and e-money tokens
- **Licences for individual CSD services:** DLT account keeper / DLT notary
- **Settlement scheme:** DLT-based settlement between DLT account keepers without central (licensed) platform operator
- **Industry group for interoperable settlement between DLT market infrastructures:** requirement to participate in standardisation work on interoperability

DLTR enhancements – impact on Pontes

- The Market Integration Package is “only” a **proposal** yet
- If adopted, new DLTR may increase the attractiveness of the European regime vis-à-vis existing national regimes for DLT-based securities settlement
  - Increased DLTR thresholds may increase activity in Pontes
  - New / extended licences may increase number of entities using Pontes
- Positive scaling impact expected on market ecosystem
- Once adopted, Eurosystem will consider whether and how Pontes eligibility criteria needs to be amended