SERVICE DESCRIPTION

OF THE

BDF FULL DLT INTEROPERABILITY SOLUTION

FOR THE

EUROSYTEM EXPLORATORY WORK

SERVICE DESCRIPTION V1.6
01.06.2024

BANQUE DE FRANCE
EUROSYSTÈME

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1. Introduction

1.1. European Pilot Regime and Eurosystem exploratory work

The European Pilot Regime is a specific regulation framework which started in March 2023, for 3 years and renewable. It is focused on trading and settlement of tokenized or native DLT financial instruments (under some conditions). Among the 3 licences proposed (DLT MTF, SS, TSS[1]), two (DLT SS or DLT TSS) involve a cash asset which can be either a CoBM or CeBM when available.

The Eurosystem seeks to ensure that developments in central bank money (CeBM) keep pace with and contribute to digital innovation in wholesale payments. The Eurosystem has conducted:

- market outreach activities: to better assess the market's needs, demands and development regarding new technologies for settling wholesale financial transactions in CeBM
- analysis of various technical solutions for settling in CeBM using new technologies.

The Eurosystem exploratory work has been established to gain practical insights into different solutions together with the market. Although targeting candidates licensed under the Pilot Regime, these exploratory work may also encompass candidates subject to other eligibility criteria[2].

1.2. BdF Full DLT Solution

In this context and based on its wCBDC experiments program, Banque de France aims at providing a DLT platform, namely "DL3S" (Distributed Ledger for Securities Settlement System) that is a private and permissioned DLT (based on Hyperledger Fabric) and for which BdF is both provider and operator.

Banque de France is one of the Solution Provider Central Banks in the exploratory works and provides "Exploratory Cash Tokens" (ECT) on the DL3S platform for eligible participants.

The Banque de France has identified among the 3 models (Interoperability, Distribution, and Integration) experimented in its wCBDC program:

- The Interoperability model as the easiest model to implement rapidly
- The Distribution and Integration models to be studied in parallel.

The Interoperability focused models are TIPS Hash Link provided by BdI, Trigger Bridge provided by BBk and Full DLT Interoperability provided by BdF for the Eurosystem exploratory work.

1.3. ECT definition and qualification

The Exploratory cash tokens (ECT) issued on the Cash DLT platform by Banque de France or by any national Central bank of the Eurosystem shall not be considered as legally defined tokenised CeBM within the meaning of Pilot DLT Regime or any other regulations.
For the purpose of the BdF Full DLT Interoperability solution, the ECT represent the contractual undertaking of Banque de France (or any National Central Bank of the Eurosystem) to transfer CeBM in TARGET to any relevant TARGET participant, owner of ECT, in accordance with the rules applicable to the Eurosystem exploratory work. The purpose of the ECT is to simulate the entire behaviour of a wCeBM cash token as it could be implemented in a Full DLT solution Interoperability, with the aim to assess such solution under exploratory work conditions.

[1] That stands for DLT Market Trading Facility, DLT Securities Services and DLT Trading and Securities Services

[2] See Eurosystem eligibility for the exploratory work

1.4. Service Description - purpose

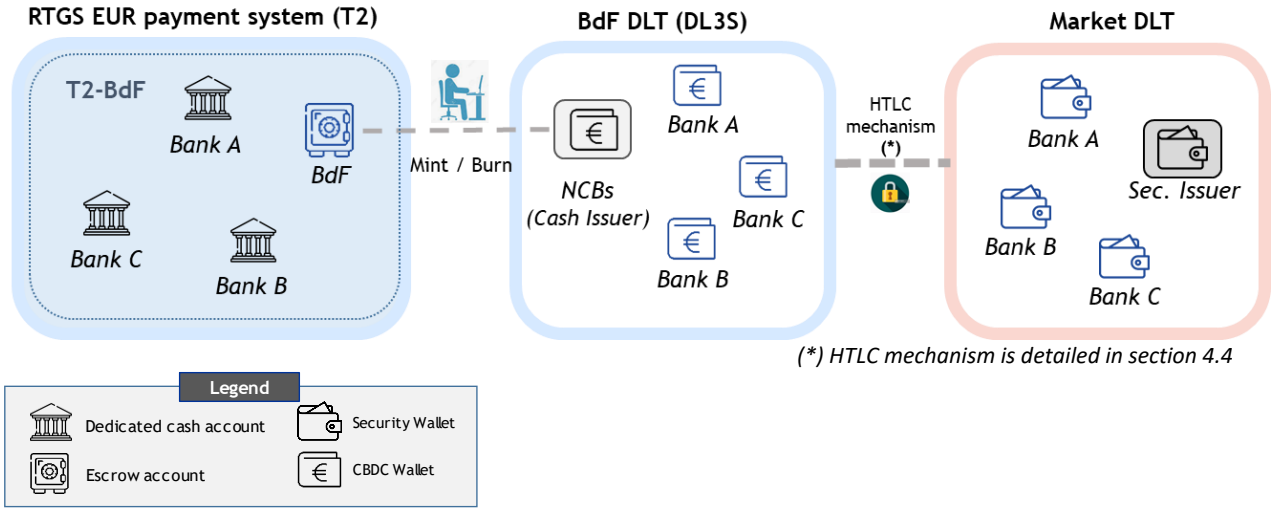
This document provides a detailed overview on the Cash DLT key features in terms of organisation and services. It covers the overall Cash DLT platform set up and key interactions with RTGS TARGET systems. As such it provides (more specifically under its onboarding procedures in annexes) the specification and steps to perform in order to join the exploratory work with the Full DLT Interoperability solution.
This document is dedicated to an audience composed by Cash DLT participants and Market DLT operators eligible to the exploratory work. Per the agreed process, local NCBs lead the eligibility assessment for market participants and Market DLT Operator of their jurisdiction.

1.5. Interoperability model – high level view

1.5.1. The overall operating model supported by Banque de France

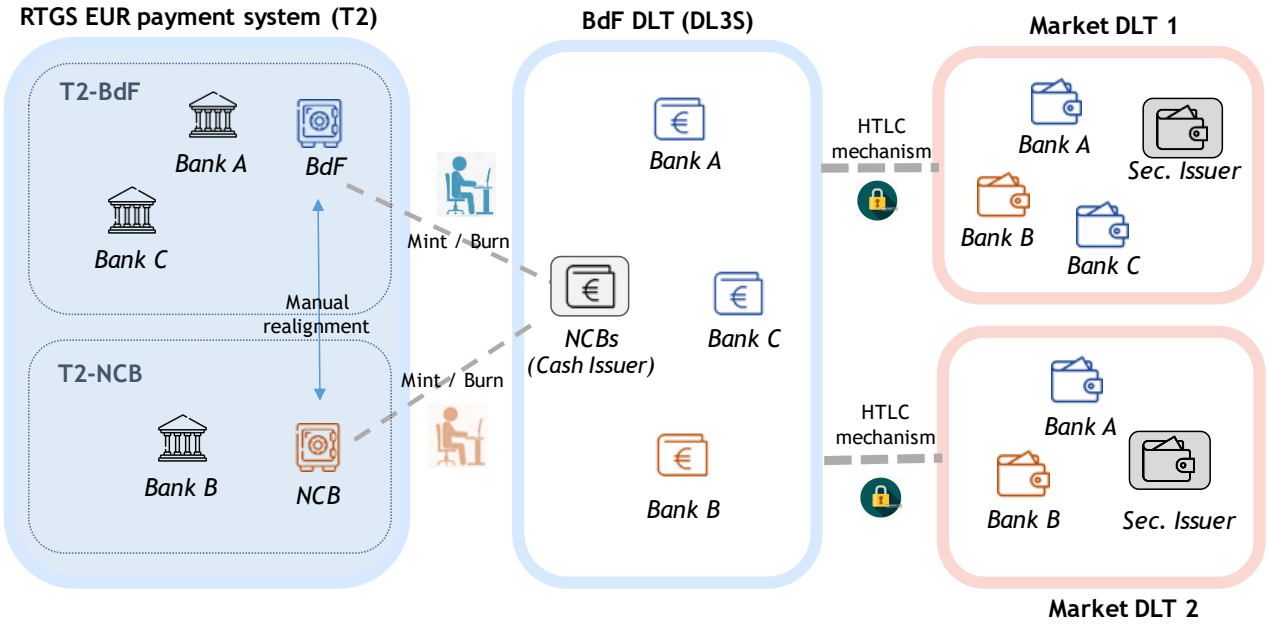
Banque de France will operate the Cash DLT ("DL3S") interconnected with Market DLT(s) from which tokenised financial instruments transactions will trigger payments in ECT. This DLT infrastructure is defined as the Interoperability Model where the Market(s) and Cash DLTs are operated independently from each other; i.e. by Banque de France as DL3S operator on one hand and the Market DLT operator on the other.

1.5.2. **Interoperability model** *(with one Market DLT)*



(*) HTLC mechanism is detailed in section 4.4

1.5.3. **Interoperability model** *(with two Market DLTs and two NCBs)*



In these examples, commercial banks A, B and C are participants to the Cash DLT platform ("Payment bank on DLT") and Market DLT platforms ("Security Custodians"). It is up to commercial banks to decide which Cash and / or Market DLT platforms they want to on-board. For example, a commercial bank can become participant of a Market DLT and outsource cash settlement to a third party, i.e. another commercial bank being participant of the Cash DLT platform.

2. Cash DLT participants

All Cash DLT participants use the Cash DLT network operated by Banque de France (see details in section 4). Cash DLT participants are either National Central Banks (NCB), Payment bank on DLTs (PBD) and (optional) clients of the Payment bank on DLT (i.e. Clients[3]).
The below section aims at detailing conditions for accessing the Cash DLT platform as well as roles, responsibility and the overall functions available in the Cash DLT platform.

2.1. National Central Banks (NCB)

NCB participating to Cash DLT are Eurosystem central banks. They play several potential roles according to their mandate. Consequently their roles are taking different forms which are described here under.

The NCBs participating to the Cash DLT platform are in charge of:

- Managing Payment banks on DLT placed under their own jurisdiction,
- Holding under an escrow account in the RTGS. Payment bank on DLT from the NCB jurisdiction transfer the amount in Euro based upon which ECT will be issued and distributed to them;

3 Clients could be any kind of financial institutions i.e. (none RTGS) commercial banks, asset owners, asset managers, private banks, corporates, etc.

- Minting, distributing and burning the ECT[4];
- Creating, monitoring, amending and closing Dedicated Cash Wallets of the Cash DLT participants under their jurisdiction;
- Supervising the overall Cash DLT activity which means having access to the overall Dedicated Cash Wallets and Dedicated Cash sub-wallets[5] balances and transactions of the Cash DLT participants under their jurisdiction;
- Ensuring the regulation is applied and market best practices are used in accordance with the Market DLT operator.
- Granting and removing access to the Cash DLT platform to Payment bank on DLTs: each NCB is in charge of authorising the Payment bank on DLT on the Cash DLT (equivalent to white listing, i.e. granting process for authorizing a Cash DLT participant). Operationally it is reflected as the creating, amending or deleting Dedicated Cash Wallets granted to the Payment bank on DLTs.
- Providing and holding the Payment bank on DLTs access means to the Cash DLT.
- Have the same right and capacity to interact with the Cash DLT as any other Payment bank on DLT (holding ECT and performing transactions);
- Consult Payment bank on DLT Dedicated Cash Wallets' balances and transactions history (issuance, redemption, transfers) under its jurisdiction (thanks to National ECT Supervisor[6]).
- Are in charge of the Hash Timed Locked Contracts (HTLC) for its managed exploratory cash token Dedicated Cash Wallets (i.e. Payment bank on DLT's wallets) for movement's intra Cash DLT and with Market DLTs.

The Banque de France is the Cash DLT operator

- Banque de France is the technical provider and operates the Cash DLT platform ("DL3S Operator");
- BdF manages the overall network configuration with the set up or removal of Cash DLT participants (roles...); i.e. granting, via the creation of the nodes and wallets, to NCBs and Payment bank on DLTs access to the Cash DLT;
- It monitors, in coordination with the Market DLT operator, the interoperability mechanism(s) between the Cash and Market DLTs, ensuring trustless ECT payment executions.

2.2. Payment bank on DLT

The Payment bank on DLT is governed by the National Centrals Bank of its own jurisdictions. Once authorised by the latter, Cash DLT access is granted via the attribution of a node (optional - see details in section 4) and Dedicated Cash Wallet(s) on the Cash DLT platform.
The Payment bank on DLT is a Cash DLT participant being regulated financial institutions only (i.e. credit institutions and investment firms as far T2-BF is concerned) and direct RTGS participant.

For being declared formally as Cash DLT participant, it is required to agree with the overall Cash DLT membership framework. It is formalised by a legal convention signed by the Payment bank on DLT representatives and the NCB of its own jurisdiction. The enclosed Service Description and the

[4] BdF and other involved NCBs address to one shared wallet ("Transit" wallet) their request to mint, distribute and burn exploratory cash tokens on the Cash DLT platform upon request from the Cash DLT participants.

[5] Dedicated Cash sub-wallets: Dedicated Cash Wallets owned by the Payment Bank on DLT and dedicated to the usage of its clients.

[6] "National ECT Supervisor" is a status provided to NCB allowing supervision of all ECT transactions involving Cash DLT participant of its own jurisdiction only.

Operational Forms are part of the overall process to set up the Cash DLT network and to deploy the access rights to the Payment bank on DLT.

Payment bank on DLT and Securities Custodian are managed in a consistent but independent manner from each other within the Cash and Market DLT platforms. When an event is triggered such as security delivery from a seller to a buyer, both "Security Custodian" and "Payment bank on DLT" can differ respectively from each other in both DLTs. Each Payment bank on DLT has to designate one or several Security Custodian(s) on the Market DLT. As key role, the Payment bank on DLT manages the overall cash operations for itself and third parties. Payment executions are triggered by market events taking place on the Market DLT connected to the Cash DLT. They are performed under the Payment bank on DLT's responsibility.

The role of the Payment bank on DLT encompasses two types of actions: static data management and payment executions its clients:

Static data management consists in:

- Creating, monitoring, amending and closing Dedicated Cash Wallets used by its clients. The Dedicated Cash Wallet being a technical object where ECT balances are managed, payments operations are instructed and instructions history is accessible to the Payment bank on DLT;
- Holding the clients' private keys and more broadly ensuring the clients have the "read only" access, via their Dedicated Cash sub-wallets, to their cash balances and payment instructions history on the Cash DLT platform.

Payment executions consist in:

- Managing its ECT positions using a unique Dedicated Cash Wallet for all Market DLTs (or one per Market DLT up to their choice[7])
- Receiving ECT on its Dedicated Cash Wallet (following a cash transfer in fiat from its RTGS account to the NCB escrow account in TARGET);
- Executing ECT transfers between its Dedicated Cash Wallet and its clients' Dedicated Cash sub-wallets or between its own Dedicated Cash Wallets;
- Executing ECT transfer triggered by an operation executed on the Market DLT for its Clients' Dedicated Cash Wallets. Overall market DLT operation types triggering ECT payment are defined into the operating and business model defined jointly between the DL3S Operator and the Market DLT operator.
- Holding ECT on its own Dedicated Cash Wallet or its clients' Dedicated Cash sub-wallets;
- Requesting ECT burning (that triggers a cash transfer in fiat from the NCB escrow account to its RTGS account in TARGET).

The Payment bank on DLT is a **Dedicated Cash Wallet Owner and** (if it has Clients) **Dedicated Cash Wallet Custodian** as it is entitled to create, amend and delete its clients' wallets.

Payment bank on DLT is in charge of the **Hash Timed Locked Contracts (HTLC)** for its managed exploratory Dedicated Cash Wallets (i.e. Clients' wallets) for movement's intra Cash DLT and with Market DLTs.

Should a specific support be needed, the Payment bank on DLT is entitled to request it to the DL3S Operator and the Market DLT operator.

[7] In this case, whitelisting is not detailed per wallet but only at the Payment bank on DLT level. It is the responsibility of the Security Custodian of the market DLT to configure the right Dedicated Cash wallet.

Please read the Onboarding procedures in annex for further details regarding the steps and specifications needed to onboard a Payment Bank DLT.

2.3. Payment bank on DLT's clients

The Payment bank on DLT is solely in charge of maintaining relationships with its clients according to the contractual framework agreed between both parties. The Payment bank on DLT remains the final holder of the ECT credited in each client's Dedicated Cash sub-Wallet. This is the responsibility of the Payment bank on DLT to conduct the overall Know Your Customer and Anti Money Laundering processes.

The Payment bank on DLT client is granted a specific "read only" access to the Cash DLT. **The client is a Dedicated Cash Wallet User** which cannot interact directly with the Cash DLT. Any action related to payment execution is performed by the Payment bank on DLT. It can open a dedicated "wallet" for segregation purpose, called "Dedicated Cash sub-wallet", which remains under the name of and is operated on its behalf by the Payment bank on DLT.

The client "read-only" access encompasses cash balances and overall movements on the used Dedicated Cash sub-wallet corresponding to market executions such as DvPs, redemption… any market event triggered by the Market DLT. The client ECT balance represents the purchasing power allocated by the Payment bank on DLT, it is reflected in the Dedicated Cash "sub-wallet".

The Payment bank on DLT Dedicated Cash sub-Wallets are **overall connected to the Payment bank on DLT,** itself connected to the RTGS account belonging to the Payment bank on DLT. The Payment bank on DLT remains the executing Party of any Market DLT operation triggering payments for its clients. The NCB remains the executing Party of any Market DLT operation triggering payments for the Payment bank on DLT

The client's access rights (logins and cryptographic accesses) **are provided by the Payment bank on DLT**.

With the Dedicated Cash sub-Wallet feature, Banque de France aims at offering the capacity to Payment bank on DLT to segregate the cash positions and operations at Client level. This service remains optional, the Payment bank on DLT can represent its Clients, i.e. client purchasing power in a net or gross basis in a single or multiple Dedicated Cash sub-wallets.

Please read the onboarding procedures in annex for further details regarding the steps and specifications needed to onboard a client of a Payment Bank DLT

2.4. Cash DLT profile typology

Cash DLT participant's capacity to interact with the Cash DLT platform is constructed according to the ECT wallet features detailed here under. Cash DLT roles are aligned with the services allowed for each type of Dedicated Cash Wallet.

- ***ECT Issuer*** granted to NCBs, it allows the ECT issuance (minting), distribution and redemption (burning). The setup is done by Banque de France acting in its capacity as the DL3S Operator.
- ***Dedicated Cash Wallet Manager***: granted to NCBs, it allows to create Dedicated Cash Wallets for Payment banks on DLT and for itself. It instruct ECT transfer and redemption and to view balance and transactions' history for its owned and managed Dedicated Cash Wallets (NCB's Payment bank on DLT wallets of its own jurisdiction). The setup is done by Banque de France acting in its capacity as the DL3S platform operator.

- ***Dedicated Cash Wallet Owner***: granted to Payment bank on DLTs (and NCBs[8]), it allows to own Dedicated Cash Wallets, instruct ECT transfer, redemption and view balance and transactions' history for these Dedicated Cash Wallets. The setup is done by Banque de France acting in its capacity as the DL3S DLT platform operator to define rights to each of Payment bank on DLT.
- ***Dedicated Cash Wallet Custodian***: granted to Payment bank on DLTs, it allows to create Dedicated Cash Wallets for their clients' exclusive usage. It also allows to instruct ECT transfer, redemption and view balance and transactions' history on these wallets. The setup is done by Banque de France acting in its capacity as the DL3S DLT platform operator to define rights to each of Payment bank on DLT.
- ***Dedicated Cash Wallet User***: granted to Payment bank on DLTs' clients, it allows to have a read only access on the Dedicated Cash Wallets created by its Payment bank on DLT (i.e. no instruction right) and view Dedicated Cash Wallet balance and transactions' history. The setup is done by the Payment bank on DLTs[9].

Business typology	**ECT Issuer**	**Dedicated Cash Wallet owner**	**Dedicated Cash Wallet manager**	**Dedicated Cash Wallet custodian**	**Dedicated Cash Wallet user**	**National ECT supervisor** [10]
NCBs	**X**	**X**	**X**			**X**
Payment bank on DLTs		**X**		**X**		
Clients of Payment bank on DLTs					**X**	
Other entities *(being RTGS participant)*		**X**				

Any other roles such as security issuer, security supervisor, market DLT platform operator or security custodian are not covered in this Cash DLT Service Description (but rather by the Market DLT).

[8] Case where a NCB holds ECT and perform transactions for itself.

[9] NCBs only have a read-only access to sub-wallets thanks to its Supervisor NCB status.

[10] Each NCB is "National ECT Supervisor" and supervises its own jurisdiction only.

3. Liquidity management: how ECT is operated

In the context of the BdF full DLT Interoperability solution, the payments' finality remains in RTGS. To do so, activities done on the Cash DLT are prefunded by commercial banks through a BdF RTGS escrow account (or the NCB ones of their jurisdiction). Participating NCBs will coordinate to handle accurate end-of-day alignments between NCB escrow accounts.

3.1. Key principles

To obtain exploratory cash tokens on chain, Payment bank on DLTs transfer funds from their RTGS account in TARGET to the NCB escrow account of their jurisdiction. Funds held in the NCB escrow account belong to the NCB**.** They become the property of the NCB operating the escrow account. In return, the NCB shall provide ECTs to the participant and, when such ECTs are burnt, shall return funds from the escrow account to the account designated by the participant submitting the ECTs.

Each NCB has to:

- Be the entry point for commercial banks at national level
- On-board and check TARGET account's reference of commercial banks under its jurisdiction
- Open an individual escrow account
- Check funding and process to defunding movements
- Take in charge the mint and burn process on the Cash DLT platform (via an access to DL3S). This last action can be made by BdF, on behalf of the NCB if requested.

Each Payment bank on DLT has to:

- Get in contact with its national central bank
- On-board and confirm TARGET account's reference with the NCB of its jurisdiction
- Fund its NCB escrow account
- Process funding and check defunding movements operated by its NCB

3.2. Operating process

The overall process is conducted as per the below:

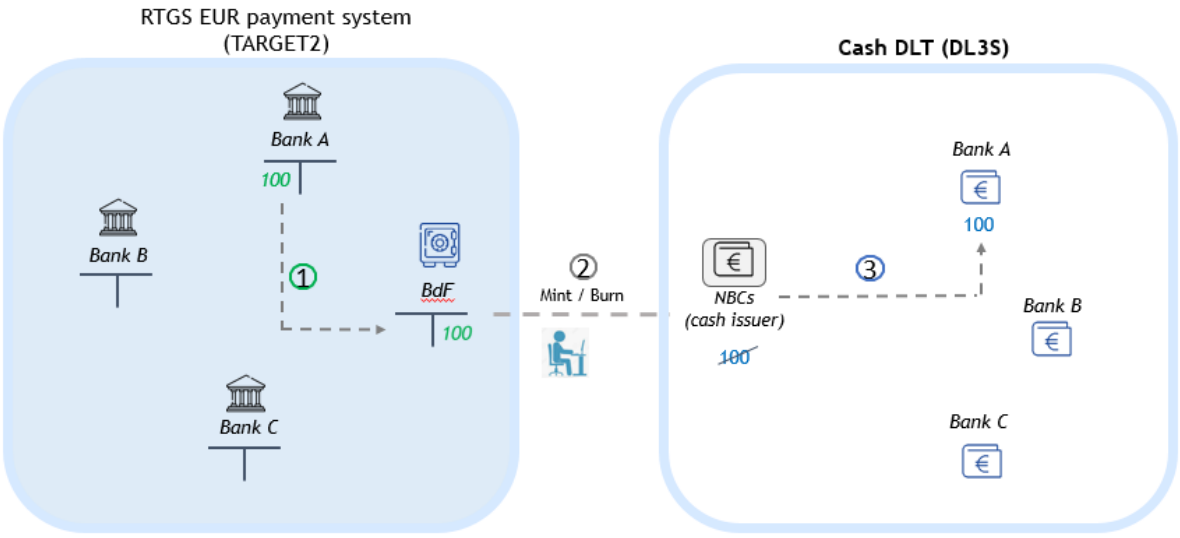
- At the start of the day, Payment banks on DLT manage their ECT liquidity needs in connection with the funds transfers executed in TARGET using their own TARGET RTGS accounts for crediting and receiving funds to and from the NCB escrow account of their own jurisdiction;
- NCBs issue and distribute the same ECT amount received in their Escrow Account to the Payment bank on DLT Dedicated Cash Wallet;

- At the end of the day, the ECT redemption is executed automatically; once finalised, the same burnt ECT amount will be transferred from the NCB escrow account belonging its jurisdiction to the Payment bank on DLT's TARGET RTGS account;
- If several NCBs intervene, each NCB uses its own TARGET escrow account corresponding to the Payment bank on DLT's TARGET RTGS account jurisdiction. Alignments may take place between NCB escrow accounts.

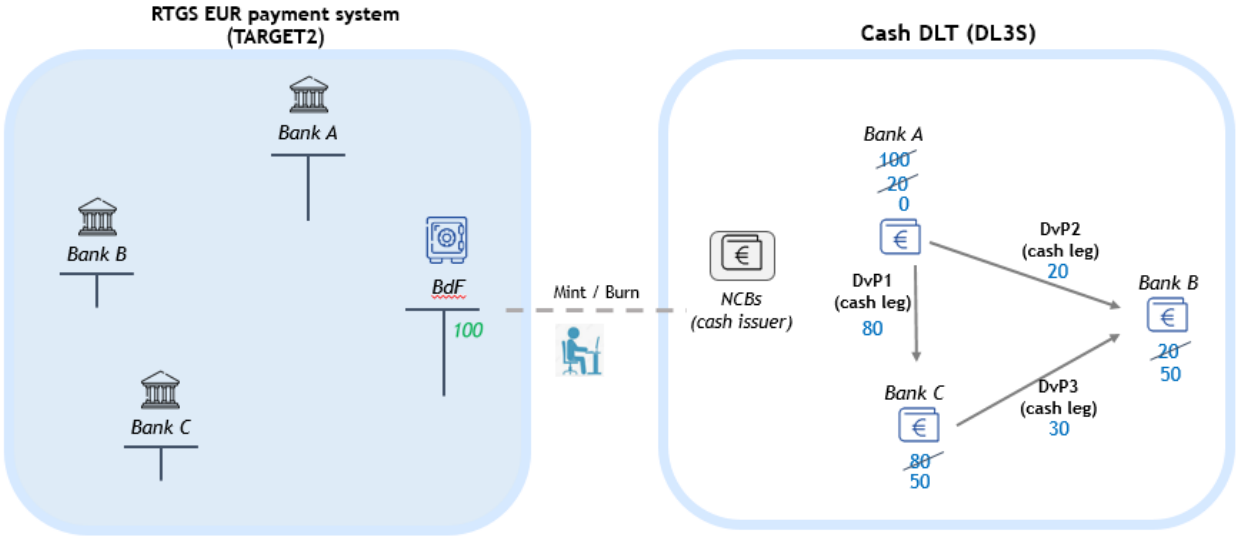
Daily operating hours are detailed in section 3.4.

FUNDING AND DEFUNDING PROCESS IN NET FOR DVP ON DLTS
EXAMPLE WITH FRENCH COMMERCIAL BANKS FOR ILLUSTRATION

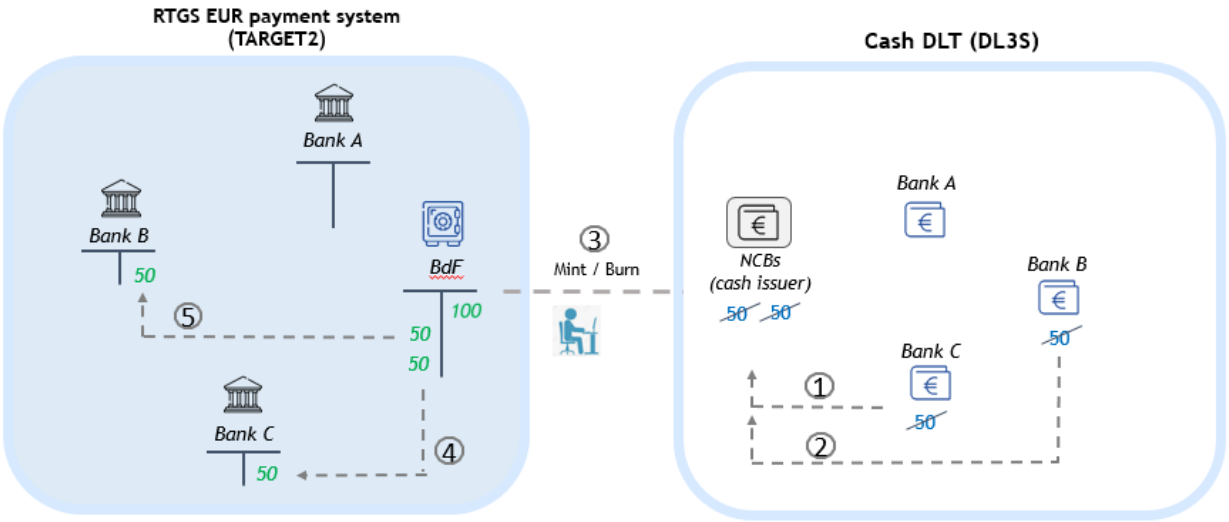
STEP 1: MINT OF CASH TOKEN BY BDF



STEP 2: CASH LEG SETTLEMENT OF DVP TRANSACTIONS



STEP 3: BURN CASH TOKENS BY BDF AND PROCESS TO NET PAYMENT IN RTGS



In these examples, commercial banks A, B and C are participants of both the RTGS EUR payment system and the Cash DLT platform ("Payment bank on DLT").

3.3. Finality

As exploratory cash token is not central bank money and the Cash DLT is not a system within the meaning of the Finality Directive, the irrevocability of cash payments is defined and realised in central bank money (CeBM) within TARGET.

Final settlement of the cash leg of a DvP transaction is taking place in TARGET and so,

- BdF reflects the burn of exploratory cash tokens done on the Cash DLT platform by the participant using TARGET-BF, in the production RTGS system.
- Other NCBs process the same way with their own RTGS escrow account.

It is to be noted that similarly the securities leg is settled on a Market DLT that is most often not a Securities Settlement System – except for Market DLT being licensed as a CSD. Therefore the final settlement of the cash leg is similarly pending until it is duly registered in the relevant SSS.

For the sake of the exploratory work what is key is:

- The atomicity of the settlement being performed under the HTLC process (see infra)
- And the guarantee under the legal framework that the cash is provided by the NCBs through the escrow accounts and the security is delivered by the Market DLT through the HTLC process and associated contingency procedure and legal enforcement[11].

[11] See also §3.6 Default management

3.4. Standard DLT Daily Session Hours

Cash DLT will follow the TARGET calendar, the daily session hours (in CET) are to accommodate TARGET operations which have to take place before TARGET cut off.

Until 9:00 am:	Payment bank on DLTs fund NCBs escrow accounts according to their internal treasury processes Interoperability between Cash DLT and Market DLT is closed
9:00 – 9:59 am:	NCBs get reports detailing TARGET transfers credited on NCBs escrow accounts in D-Day (one TARGET report per NCB). Cash DLT is open - available for NCBs and Payment bank on DLTs Exploratory Cash Tokens' minting is performed and completed Interoperability between Cash DLT and Market DLT is closed
10:00 am – 2:00 pm:	Cash DLT session is up and running – Market DLT is up and running Market DLT processes transactions which trigger ECT payments **Interoperability between Cash DLT and Market DLT is opened**
2:00 pm – 3:30 pm:	Cash DLT post session – Cash DLT is available for NCBs and Payment bank on DLTs Exploratory Cash Tokens' burning is performed and completed (via cash Sweep) NCBs process alignment between escrow accounts NCB transfers engaged vis-à-vis Payment bank on DLTs' TARGET accounts Interoperability between Cash DLT and Market DLT is closed
3:30 pm:	Cash DLT cut off – Cash DLT closing and change of business day

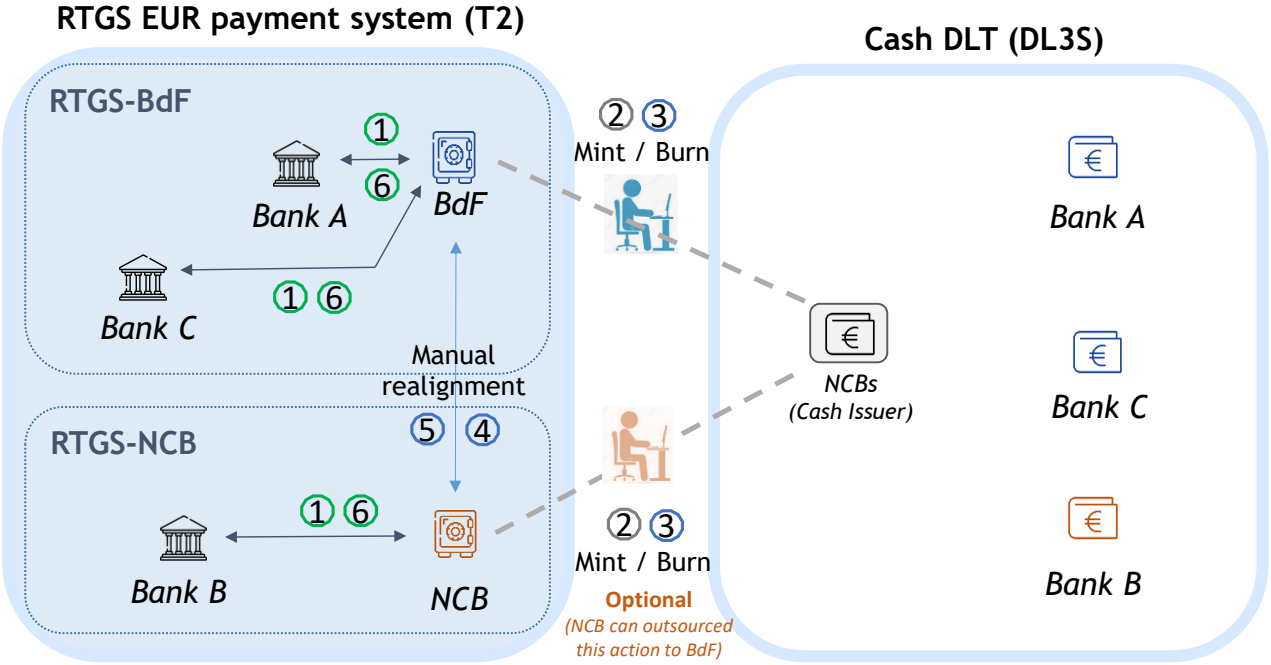
Exceptional requests for early (gross) defunding could be processed during this window assuming:

- That the Payment bank on DLT issuing such request notified its NCB and the BdF operational team at least 48 hours in advance,
- That the ECT redemption request that the participants wish to see reflected on a gross basis in the RTGS occurs no later than 11:00, for defunding to then take place by 12:00.
- BdF and the local NCB of the Payment bank on DLT issuing such a request reserve the right to reject this request in case of capacity constraints limitations and may ask the payment bank on DLT to schedule its trial operation at another point in time or to rely on the regular EoD procedure.

3.5. Illustration

Payment bank on DLTs are TARGET participants and should use the NCB of their jurisdiction as an operational entry point. Each NCB will be in charge of defining with the Payment bank on DLT, the TARGET account structure and overall process for ECT liquidity management. Each NCB will be in charge of monitoring ECT issuance, distribution and redemption in alignment with TARGET transfers.

3.5.1. ECT issuance and redemption high level view (with multiple NCBs)



In these examples, commercial banks A, B and C are participants of both the RTGS EUR payment system and the Cash DLT platform ("Payment bank on DLT").

Step by step description:

According to the daily session hours detailed in the previous section:

- Commercial banks transfer funds to the NCB escrow account of their jurisdiction;
- NCBs mint the corresponding amount of exploratory cash tokens on the commercial banks' Dedicated Cash Wallets;
- According to the account structure and Clients Dedicated Cash Wallet' set up, the ECT amounts are transferred to 1 or n Clients Dedicated Cash Wallets;

The overall ECT distribution is completed, including on clients Dedicated Cash Wallets, amounts are reflected in Clients' and Payment bank on DLTs' balances. The ECT distribution is taking place according to the Client's instructions provided ahead of the daily transactions.

At the end of the daily session:

- NCBs burn all exploratory cash tokens on all commercial banks' Dedicated Cash Wallets including Clients' Dedicated Cash Wallets.
- The NCBs process end-of-day calculation on the daily activity observed on the Cash DLT
- When necessary, NCBs align funds across the NCB escrow accounts
- Each NCB transfers back to the commercial banks RTGS account.

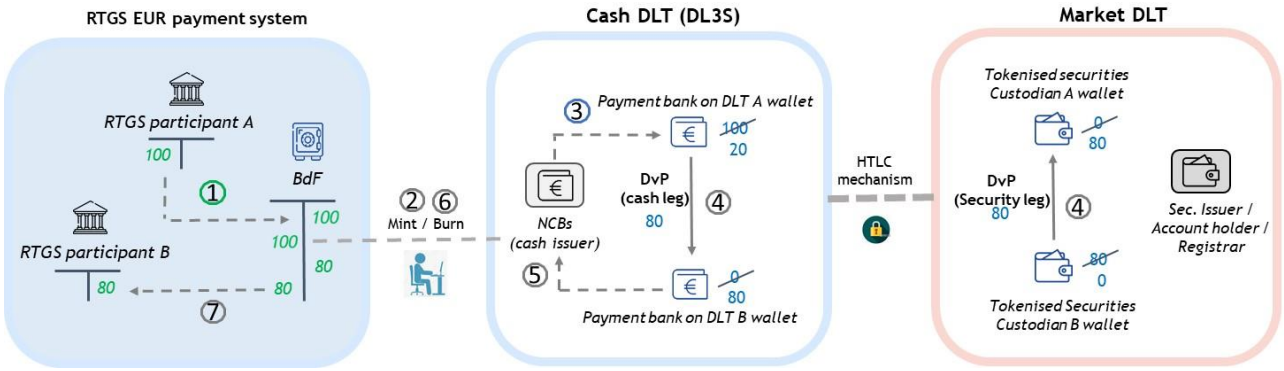
3.5.2. Security Delivery versus ECT Payment (DvP) use case

The below aims at providing an illustration of how transactions such as a DvP could be handled between a seller and a buyer of tokenised securities on a cross-chain execution made via a trustless mechanism set up between both the Cash and the Market DLT. The ECT distribution to Clients is optional.

- **Step 1 – Collateralisation**: As TARGET participant, the buyer of tokenised securities transfers fiat euro funds from its TARGET account to the NCB escrow account.
- **Step 2 – Minting process**: As exploratory cash token issuer, NCB mints exploratory cash tokens for an equivalent amount of the euro received in the NCB escrow account and distribute them to the buyer's Dedicated Cash Wallet opened on the cash DLT platform.
- **Step 3 – DvP**: Upon the settlement of atomic transactions[12], the exploratory cash token is debited from the buyer's Dedicated Cash Wallet and credited to the seller's cash wallet. Then (based on the HTLC mechanism), the tokenised securities are transferred from the seller's security wallet to the buyer's securities wallet on the Market DLT platform.
- **Step 4 – Burning process**: Following the seller's request, the exploratory cash tokens are redeemed by the NCB, which instructs the burning of the exploratory cash tokens[13], and transfers an equal euro amount from its escrow account to the seller's TARGET account. DvP shall be considered as final after the amount's transfer executed in TARGET-RTGS as far as the cash leg is concerned.

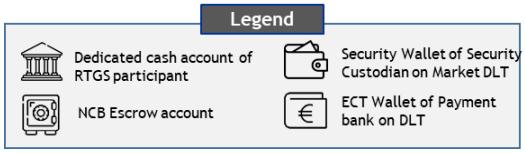
In this example:

- The **buyer** and **the seller of the tokenised securities** are **Payment bank on DLTs** on the cash DLT platform and **TARGET participants**. The buyer and the seller are acting for their own account (no client involved).
- **The NCB** is the **exploratory cash token issuer** on the Cash DLT platform and coordinates the **collateralisation** (funding / defunding mechanism) in TARGET-RTGS vis-à-vis TARGET participants of its jurisdiction.
- Other actors that are not mentioned in this example, are also involved in upstream and downstream of this DvP example such as **tokenised security issuer** and **tokenised security registrar**.



12 Atomic settlement: instant exchange of two assets, such that the transfer of one occurs only upon transfer of the other one (all or nothing settlement). This implies settling transactions on a gross, transaction by transaction basis and by means of a DvP, PvP or DvD procedure. BIS Annual Economic Report, June 2022, Part III, glossary.

13 Following Clients' request, the exploratory cash tokens hold on the Clients' Dedicated Cash Wallet are redeemed by its Payment bank on DLT as Dedicated Cash Wallet Custodian.



3.6. Default management

At the time of a default, a participant that has no or not anymore ECT would be subject to the standard TARGET rules without any particular adaptation being necessary[14].

Hence, the only situation to consider is the failure of a participant to the Cash DLT after the issuance and before the redemption of ECTs (i.e. where the participant still has ECTs).

Let's assume a simple situation where the seller transfers securities on a Market DLT in exchange for ECT of the buyer on the Cash DLT, with both participants participating in the same NCB.

If the default occurs before the transaction is completed;

- The **non-defaulted participant** is informed of the default of its potential counterparty and is not exposed to any risk because there is no transaction:
  - If it is the seller, it simply loses an opportunity to sell its security tokens but still owns them on the Market DLT;
  - If it is the buyer, it still has its ECT.

- The **defaulting participant** has its TARGET account and DL3S Wallet suspended or closed in accordance with the Guideline. The transaction therefore does not take place:
  - if it is the seller, it does not yet have ECT since the transaction does not take place, therefore the standard TARGET rules apply;
  - if it is the buyer, it may be in possession of ECT at the moment of its default (to be answered thereinafter).

It can be concluded that the only situation requiring careful consideration before the transaction deals with a defaulting participant that is a securities buyer still having ECTs at the time of its default.

If the default occurs after the transaction is completed;

- The **non-defaulted participant** is not at risk since:
  - if it is the buyer, it owns the security tokens and no longer has ECT. The default of the counterparty after the transaction takes place has no effect on the buyer;
  - if it is the seller, it already owns the ECTs, there is not risk of no completion of the transaction.

- The **defaulting participant** has already realised the transaction:
  - If it is the buyer, it does not have any more ECT;
  - If it is the seller, it may be in possession of ECT at the moment of its default (to be answered thereinafter).

[14] The risk of default of a TARGET participant is covered by the Guideline. The NCB may or must immediately terminate without prior notice or suspend the participation of a participant especially in insolvency proceedings or default (Article 25, Part 1, Annex I). In such a case, the NCB shall inform without undue delay the participant concerned, the other NCBs and the participants in all TARGET component systems of such suspension or termination. Participants shall bear any losses arising from the submission of a cash transfer order to participants whose participation has been suspended or terminated if such cash transfer order was entered into TARGET after receipt of the message. The NCB shall have a pledge over the participant's existing and future credit balances on its TARGET accounts, whereby collateralizing any current and future claims arising out of the legal relationship between the parties (Article 27, Part 1, Annex I).

It can be concluded that the only situation requiring careful consideration after the transaction deals with a defaulting participant that is a securities seller still having ECTs at the time of its default.

For the NCB involved, the risk is zero since both the buyer and the seller can only have ECTs if an equivalent amount is transferred in the NCBs' escrow account in a mechanism close to prefunding. In the event of a participant's default, all funds' redemption liabilities are therefore guaranteed by the funds that are owned by the NCB.

To sum up, the risk is only for a defaulting participant that would have ECTs in the Cash DLT at the time of its default. All the other actors in the experimentation involved are not exposed to any risk.

The identified risk is contractually framed so that a defaulting participant that would have ECTs in the Cash DLT at the time of its default is guaranteed that the NCB will transfer funds corresponding to its own ECTs to it.

The contracts for the experiment shall provide for the following:

- the escrow account is intended to receive funds corresponding to the total volume of ECTs issued by the NCB on the Cash DLT;
- the NCB expressly acknowledges that the amounts credited to the escrow account are exclusively used to collateralise the NCB's undertaking to return the equivalent in cash of the ECTs held by the participants;
- in the event of a participant's default, if it holds ECTs after its TARGET account has been closed, the NCB shall undertake to transfer by any means the cash equivalent of all ECTs held to the participant in default.

3.7. Entry point during experiments and trials

Where an eligible market participant or eligible market DLT platform operator encounters any issue while using the BdF Full DLT Interoperability during trials or experiments, it will:

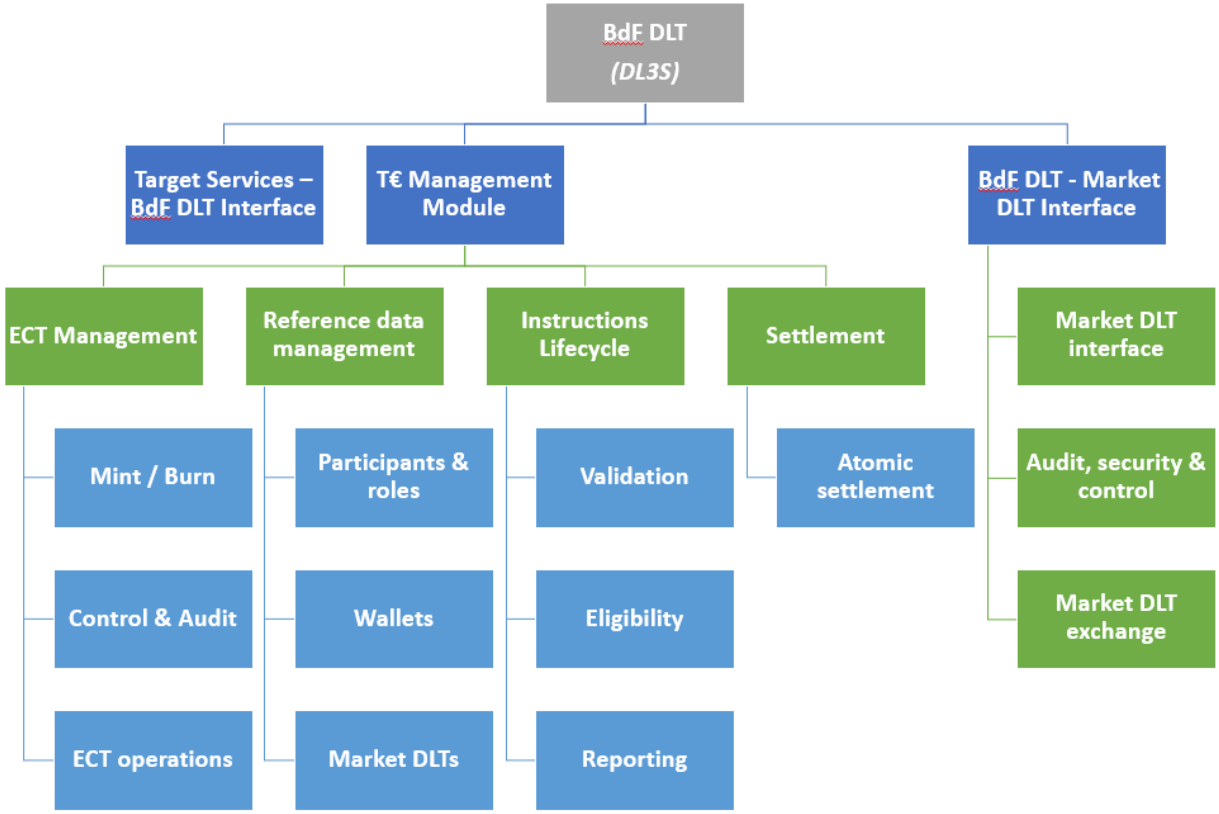
1. Contact its local NCB describing the issue.
2. The local NCB will either
    i. identify that the issue is not specific to exploratory work and independently affects TARGET Services (e.g. unavailability of RTGS GUI), in which case the regular procedures at L2-L3 shall apply or
    ii. identify that the issue is specific to the BdF Full DLT Interoperability and notify BdF which shall endeavour to fix it in a timely manner.
3. Where BdF cannot address the issue in time (e.g. by the next trial or experiment day), it will communicate to market participants that it cannot provide its solution for that trial or experiment day.
4. BdF may extraordinarily terminate the experiments and trials without advance notice in the event of an emergency, which cannot be resolved with reasonable efforts, if continuing could involve
    i. unacceptable risks to TARGET Services and/or any of the TARGET component systems and/or the new solutions/Solution Provider Central Banks, or
    ii. serious reputational risk for the Eurosystem, the Solution Provider Central Bank or TARGET services.

In the event of an extraordinary termination of the experiments and trials, eligible market participants and eligible market DLT platform operators may only be informed after such termination has occurred.

4. High level functional description of the Cash DLT solution

The Cash DLT, so called "***Distributed Ledger for Securities Settlement System***" (DL3S), is a DLT architecture provided and operated by Banque de France. It is a private and permissioned DLT built under HyperLedger Fabric protocol. It is designed for allowing interoperability with other Market DLTs built with different technologies. It gives Cash DLT participants the possibility to handle theirs cash positions and payment executions whatever Market DLT business model.

4.1. Cash DLT functions services



The Cash DLT core functions are defined for monitoring liquidity between Cash DLT participants and ensure orderly settlement executions within the below framework:

- **ECT management:**
  - ECT Issuance, distribution and destruction;
  - ECT Auditability and visibility for supervision;
  - ECT access control according to participant type;
  - ECT Transfer and payment executions.
- **Reference Data management:**
  - DLT Participant's set up
  - DLT Participant's information storage at wallet level;
  - Market DLT data flow access (if any - name, type, address, etc.).

- **Instructions lifecycle monitoring:**
  - Validate necessary information prior ECT payment thanks to the inter DLT data flow;
  - Report instructions status to both counterparties and to the NCB supervisors
- **Settlement**
  - Ensure cross DLT platforms' settlement thanks to atomic transactions (via the HTLC mechanism)
- **Market DLT Interfaces:**
  - Provide means to ensure interoperability with Market DLTs and ensure Cross DLT platforms' atomic settlement execution

4.2. Interaction with Target Services

During the exploratory work with the Full DLT Interoperability solution, no automatic process is proposed between the Cash DLT platform and the TARGET Services (TARGET and CLM). The operation procedures detailing TARGET cash transfers triggering ECT distribution between Payment bank on DLT and the NCB of its jurisdiction are specified in Appendix.

4.3. Market DLTs overview and interoperability

The below aims at providing interconnections features with the Market DLT. It remains a high level view, as detailed modus operandi will be specified in an ad hoc document redacted with Market DLT representatives.

We assume that Market DLT key features are:

- Private and permissioned or permissionless[15] DLT infrastructure which interacts with DL3S for transaction settlement and data information sharing (e.g. eligible digital assets or participants);
- Market DLTs operating model consists in securities' listing and registry, transactions triggering payments and overall security position management. It will be detailed for each Market DLT and will be subject to a dedicated document added in the Service Description appendix.

The interoperability is operated thanks to a trustless mechanism as detailed here under:

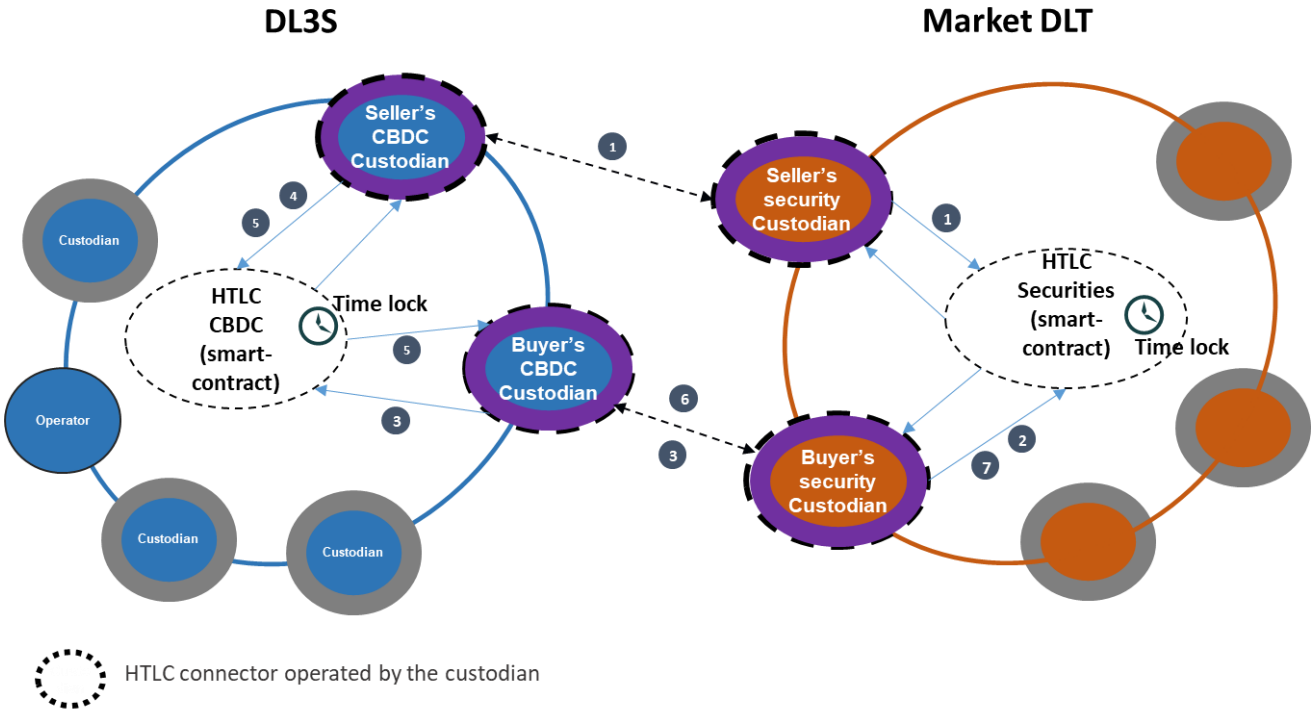
- Mechanism types which are time-bound conditional payments, cross networks, that do not require a trusted third party. They allow spending funds after presenting an original secret (secret phrase) before a pre-set timeout;
- Focus on the DVP operation type :
  - DvP instruction is initiated by the Market DLT based on trade information that are legally binding
  - The securities and Cash are settled on an "*all or nothing*" basis, ECT payment is triggered prior or at the same time of the Security delivery;
  - Should the settlement of any resource fail the whole transaction remains unexecuted; i.e. no Security delivery can take place without ECT payment, and no ECT payment can take place without Security delivery executed;

- The conditions to fulfil for executing ECT payments are :
  - Participants mapping in both networks, a Cash DLT correspondent should be defined for each Market DLT participants and be granted with technical means to get data from each network in a consistent manner. Consequently it is assumed that Securities and Payment bank on DLTs trust each other;

[15] See the eligibility criteria details for Market DLT based on permissionless blockchain

- A consistent definition should be done regarding the hashing and encoding functions between both Cash and Market DLTs.
- Cash DLT trusts the Market DLT who's responsible for the DLT market operation validation and execution;

4.4. Illustration: DvP execution based on HTLC trustless mechanism



The key steps undertaken for executing cross chain DvP are described below:

1. The Seller's Securities DLT Custodian locks the securities for a pre-defined Time lock "Ts" and sends the lock information to the Seller's Payment bank on DLT with secret 's';
2. The Buyer's Securities DLT Custodian audits the lock of securities
3. The Buyer's Securities DLT Custodian informs the Buyer's Payment bank on DLT who locks ECT for a pre-defined Time lock "Tc" (assuming Tc < Ts).
4. The Seller's Payment bank on DLT audits the lock of ECT
5. The seller's Payment bank on DLT claims the ECT using secret 's' before end of the Time lock "Tc" which reveals secret to the Buyer's Payment bank on DLT
6. The Buyer's Payment bank on DLT sends the secret"s" to the buyer's Securities DLT Custodian to claim the securities
7. The buyer's Securities DLT Custodian claims securities with secret "s" before end of "Ts"

See detailed flows description available in a separate document (so called "Interaction between Cash and Market DLTs for DvP settlement") provided on demand.

Exception management or which scenarios can lead to DvP non execution:

Assuming that seller and buyer have the right wallet set up on both Cash DLT and on the Market DLT, these are some cases where the settlement of the DvP transaction can fail:

- Seller does not have enough securities on its Securities DLT wallet on the Market DLT;
- Buyer does not have enough ECT on its ECT Dedicated Cash Wallet on the Cash DLT network;
- Seller has enough securities but does not lock them on the Market DLT;
- Buyer has enough ECT but does not lock them on the DL3S DLT.
- Seller does not claim buyer's ECT before expiration of period "T".

For each of the above cases, the trustless mechanism automatically rolls back to the initial situation and **none of the legs** of the DvP transaction are settled.

For the following failure case, a **contingency scenario** with manual operations could be triggered

- Seller claims ECT but Buyer does not claim securities

After an agreed timeout, Market DLT's operator instructs a FoP to send securities to the buyer and thus finalize the DvP transaction.

5. High level technical description of the Cash DLT solution

5.1. Architecture and hosting

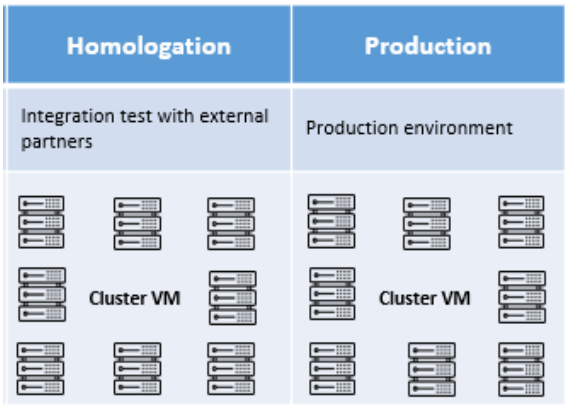
The Cash DLT solution hosting is provided on TWISTERX environment (IaaS offer).

Hosting dedicated to experiments:

- IaaS based on the OUTSCALE cloud
- Datacenters based in France
- Not connected to BdF IS

Hosting scenarios for Homologation & Production:

- BdF hosting (i.e. BDF hosts all participants nodes)



5.2. Technical interactions with Market DLTs

Exposure of a REST API for message exchanges.

- HTTPS communication protocol
- DLT able to implement smart-contract to handle HTLC logic :
  - Asset locking/escrow
  - Asset release on secret disclosure or after the time limit.

6. GLOSSARY:

- **Atomic settlement**: instant exchange of two assets, such that the transfer of one occurs only upon transfer of the other one (all or nothing settlement). This implies settling transactions on a gross, transaction by transaction basis and by means of a DvP, PvP or DvD procedure. BIS Annual Economic Report, June 2022, Part III, glossary.
- **CoBM**: Commercial Bank Money
- **CeBM**: Central Bank Money
- **Dedicated Cash Wallet**: Dedicated Cash Wallets owned by the Payment Bank on DLT and are either dedicated to its usage or dedicated to the usage of their clients
- **DLT**: Distributed Ledger Technology
- **DL3S**: Distributed Ledger for Securities Settlement System – Banque de France proprietary DLT platform
- **ECT**: Exploratory Cash Token
- **NCB**: National Central Bank(s)
- **MTF DLT**: Multilateral Trading Facility DLT
- **SSS DLT**: Securities Settlement System DLT
- **TSS DLT**: Trading and and Securities Settlement DLT
- **Minting**: process of issuing tokens
- **Burning**: process of redeeming tokens
- **White Listing**: process of agreeing the participation of given financial institutions on a DLT
- **Private key**: a cryptographic component which unlocks the right for its owner to control and use the associated crypto assets
- **Public key**: a cryptographic component comparable to an address, publicly visible to all users on the network where crypto assets can be transferred or deposited for the benefit of a private key owner

7. APPENDIX

7.1. Cash DLT (DL3S) User Hand Book

Version v1.7.5
Date 31.05.2024

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1 Introduction

1.1 Introduction to DL3S

The Banque de France provides services for payment and securities settlement based on Distributed Ledger Technology (DLT), through operating a system called Distributed Ledger Securities Settlement System (DL3S).

DL3S is a full DLT solution designed to allow (i) issuance of tokenised Central Bank (CB) money (*Exploratory Cash Tokens*), that can be transferred using DLT and (ii) its distribution to financial actors registered as participants to DL3S.

DL3S provides a wide range of functionalities meant to be used for various sorts of DLT-based use cases, including liquidity transfers, securities settlement (DvP) for tokenized assets, cross-border payments and cross-currency payments (including cross-border DvP and PvP), while preserving the anchor role of central bank (CB) money.

1.2 Overview of the UHB

1.2.1 General considerations

General

The DL3S User Handbook, hereinafter called UHB, aims at facilitating the use of the User Interface of DL3S (UI). It is intended for any DL3S participant regardless of the focus of its activities and describes the full range of functionalities available in user-to-application (U2A) mode. The UHB provides detailed reference information on all DL3S UI screens and step-by-step instructions for typical use cases.

Target Audience

There is only one handbook addressing all DL3S actors: national central banks (NCBs), Commercial banks (acting as payment banks/settlement banks), clients, securities issuers, etc. By referring to the table of contents, each reader can easily identify the relevant parts for its activities.

Related Documentation

The UHB is part of the functional documentation for DL3S. Among these, the service description provides a further detailed description of the business concepts behind DL3S as well as of the various use cases and functionalities that can be provided by DL3S.

The service description is available on the Banque de France's website and the UHB is made available to every financial actor that intend to become a DL3S participant.

Updates

Updated versions of the UHB will be provided on an ad-hoc basis following evolutions of the DL3S User Interface.

1.2.2 UHB Methodology

Several symbols and methodological elements are used throughout the DL3S UHB to ease orientation and to help you find relevant information in the most efficient way.

Page Layout

Every page in the UHB parts has a similar page layout. You can find four different elements:

- the header, which shows the chapter and sub-chapter title.
- the margin column on the left side of each page, which indicates the subject of each paragraph in order to ease the navigation within the document.
- the text column, which contains the main information, tables and screenshots
- the footer, which shows the name and the release of the document as well as the page number.

Links

Links are illustrated throughout the UHB with a little triangle followed by a page number within squared brackets. These links help you to jump to related sections by clicking on them or turning to the relevant page.

Type Set

Action Steps

Business use cases are divided into single action steps. These action steps are numbered sequentially. Intermediate results are described where appropriate and marked with an indented arrow. Each business scenario ends with a final result, indicated by an arrow.

Example:

1. Action step 1

2. Action step 2

   ➢ Intermediate result

3. Action step 3

   ➢ Result

Screenshots

Screenshots are used to illustrate the corresponding text. Note that there might be minor deviations between the screenshot and your screen appearance, according to your access rights or a specific selection you have made.

Wherever relevant, specific parts of a screenshot are highlighted with a red box. If there is more than one box, position numbers point out the relation to the corresponding description.

1.2.3 UHB Structure

The UHB is structured in five parts which are complemented by annexes.

Part 1	Part 1 introduces the User Handbook, by presenting shortly the product DL3S and by outlining the functioning and content of the UHB in order to smooth its handling by future DL3S participants.
Part 2	Part 2 indicates the various requirements associated with user administration in DL3S, such as registration or set-up. It also outlines the main characteristics of the User Interface, in order for an user to get used to its structure and organization.
Part 3	Part 3 presents the general organization of DL3S, aiming at indicate where can be find each kind of information that may be relevant for DL3S participants.
Part 4	Part 4 provides DL3S participants with series of screenshots in order to detail how to proceed with all relevant use cases in DL3S.
Part 5	Part 5 is specific to the DL3S Operator role in DL3S and provides the users in charge of the DL3S Operator role with series of screenshots in order to detail how to proceed with specific Operation functionalities.
Annexes	Annexes are composed of a list of all the figures presented throughout the UHB and with a glossary based on DL3S specific vocabulary as well as relevant vocabulary issued from market infrastructures and DLT backgrounds.

2 Overview of the User Interface

2.1 User Administration

To be in capacity to participate in DL3S and once the legal aspects completed, a participant needs to be provided a participation type and roles.

2.1.1 Types of participation description

There are 3 types of participation for the different entities in DL3S:

Blockchain participant	**Description** A blockchain participant hosts a node of the network. It hosts the entire DL3S stack, from the HyperLedger Fabrics (HLF) node to the various backend services and the user interface.
Direct participant	**Description** A direct participant doesn't host a node of the network. It is connected through the node of a blockchain participant. Direct participants can interact with the network e.g. send requests, access accounts balances, etc.
Indirect participant	**Description** Indirect participants cannot access the network in any way. Blockchain participants need to provide them access to the network via their own DL3S stack by creating specific users account.

During the exploratory phase, Banque de France hosts the nodes and each participants receives credentials to connect either from Banque de France or from its payment bank for clients.

Matrix of roles/type of participation:

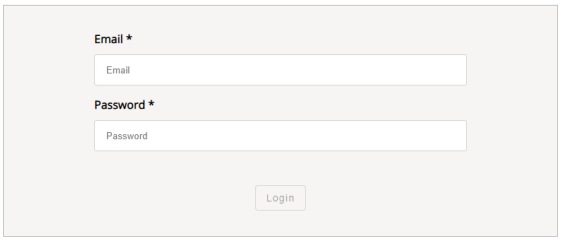
Roles	**Possible participation type**
Dedicated Cash Wallet owner	Blockchain participant or Direct participant or Indirect participant
Dedicated Cash Wallet manager (reserved to Central Banks)	Blockchain participant mandatory
Dedicated Cash Wallet Custodian	Blockchain participant mandatory
National CBDC Supervisor (reserved to Central Banks)	Blockchain participant or Direct participant
Dedicated Cash Wallet user	Indirect participant mandatory
CBDC Supervisor	Blockchain participant or Direct participant
CBDC Issuer (reserved to Central Banks)	Blockchain participant or Direct participant
DL3S Operator	Blockchain participant

2.2 Set-up and Login/Logout Procedures

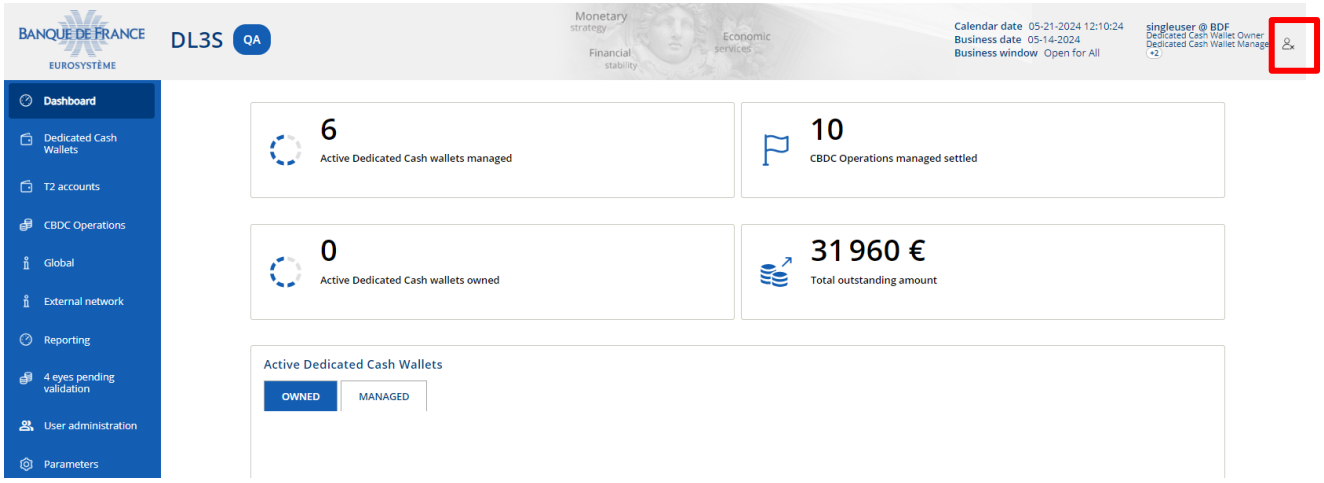
The DL3S Operator provides access rights to the new DL3S user.
Each new user receives:

- A login
- A password

Here is a screenshot of the connexion page with the Banque de France logo and the DL3S logo.

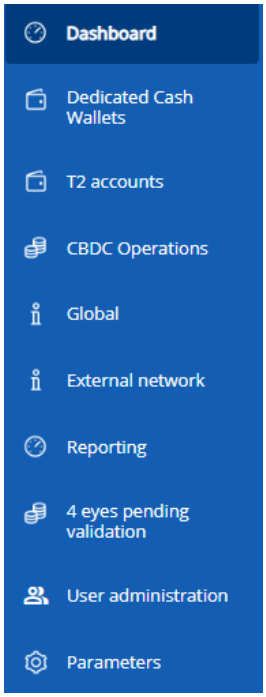


Once the email and the password are filled in, one needs to click on login.
To disconnect, one should click on the disconnection button on the top right corner



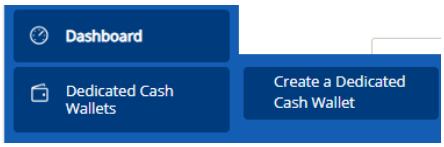
2.2.1 Menu Structure

On the left hand side, there is the main DL3S menu. Here is a glimpse of each tab composing this main menu and they will be further detailed along the user handbook:

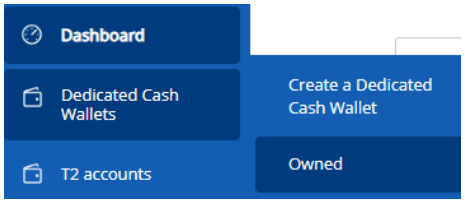


- *Dashboard tab*:
  - gives some structured information about total amount values such as the total amount of CBDC outstanding or the number of dedicated cash wallets owned or managed by the participant

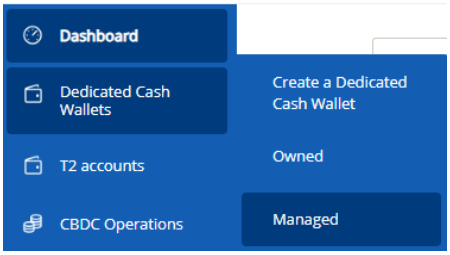
- *Dedicated Cash Wallets tab*:
  - Enables the creation of dedicated cash wallets if the participant has the role of ***Dedicated Cash Wallet Manager*** or the role of ***Dedicated Cash Wallet Custodian***



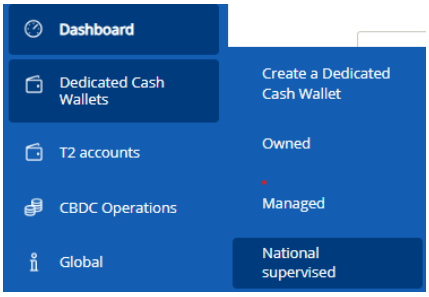
  - enables to see the details of the dedicated cash wallets owned by the participant if the participant has the role of ***Dedicated Cash Wallet Owner***



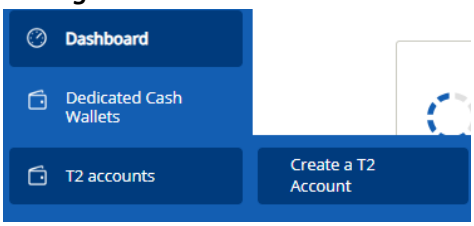
  - enables to see the details of the dedicated cash wallets managed by the participant if the participant has the role of ***Dedicated Cash Wallet Manager*** or the role of ***Dedicated Cash Wallet Custodian***



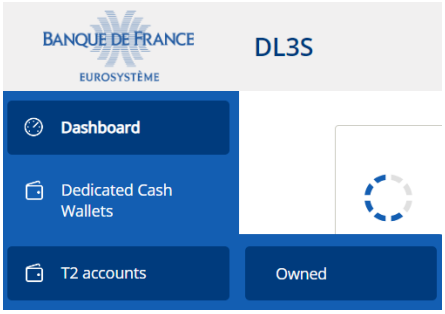
- enables to see the details of the Dedicated Cash Wallets supervised by the participant if the participant has the role of ***National CBDC Supervisor,*** the role of ***DL3S Operator*** or the role of ***CBDC Supervisor***



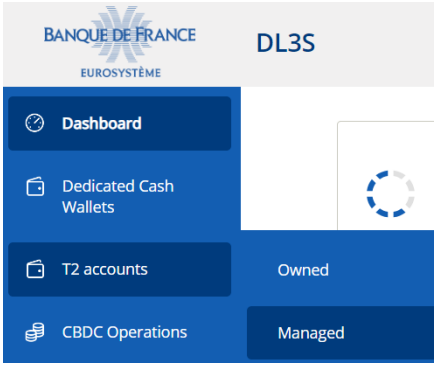
- *T2 Accounts tab:*
  - Enables the creation of dedicated cash wallets if the participant has the role of ***Dedicated Cash Wallet Manager***



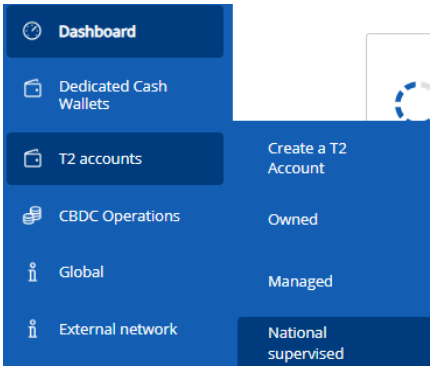
  - Enables to see the details of the T2 accounts references linked to the Dedicated Cash Wallets owned by the participant if the participant has the role of ***Dedicated Cash Wallet Owner***



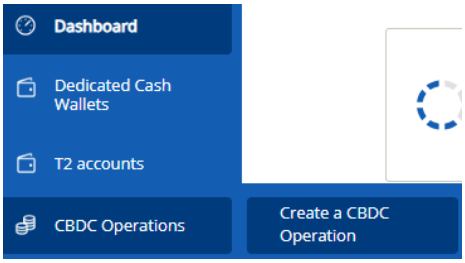
  - Enables to see the details of the T2 accounts references managed by the participant and links of the T2 account when they exist, if the participant has the role of ***Dedicated Cash Wallet Manager***



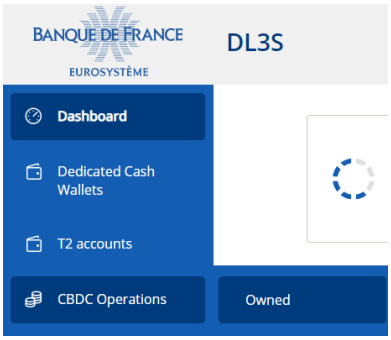
- Enables to see the details of the T2 accounts references supervised by the participant and links of the T2 account when they exist if the participant has the role of ***National CBDC Supervisor,*** the role of ***DL3S Operator*** or the role of ***CBDC Supervisor***



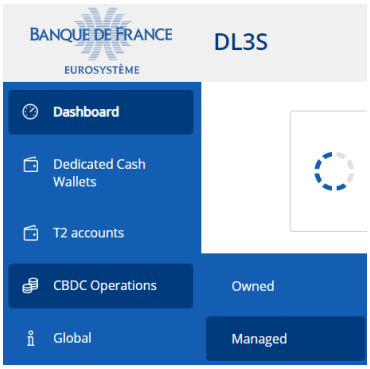
- *CBDC Operations tab:*
  - NB: CBDC Operations refers to CBDC Issuance, CBDC Transfer and CBDC Redemption. However, CBDC issuances are only displayed in the *CBDC issued* subtab while CBDC transfers and CBDC redemptions are in the *owned* and *managed* subtab
  - Enables the creation of CBDC Operations if the participant has the role of ***Dedicated Cash Wallet Manager, Dedicated Cash Wallet Custodian*** or ***Dedicated Cash Wallet Owner***



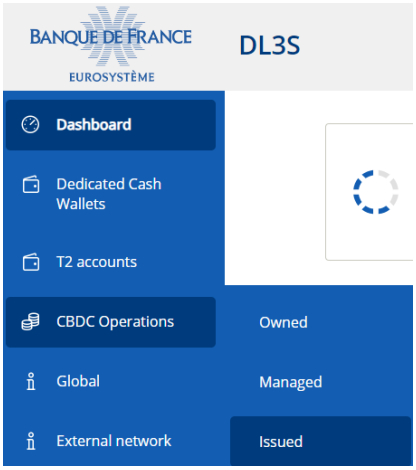
  - *Owned subtab* enables to see the details of CBDC transfers and CBDC redemptions a ***Dedicated Cash Wallet Owner*** is involved in



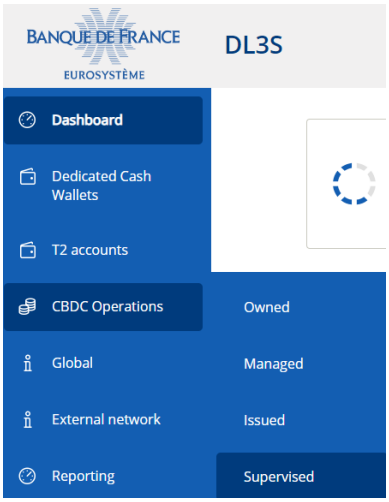
- *Managed subtab* enables to see the details of the CBDC transfers and CBDC redemptions executed by the participant with the ***Dedicated Cash Wallet Manager*** role or the ***Dedicated Cash Wallet Custodian*** role on the behalf of its clients



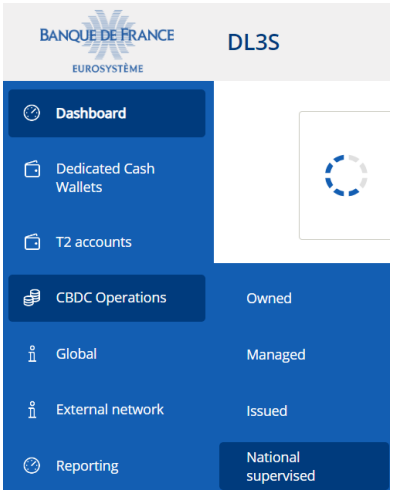
- *Issued subtab* enables to see CBDC issuances executed by the participant with the ***CBDC Issuer*** role



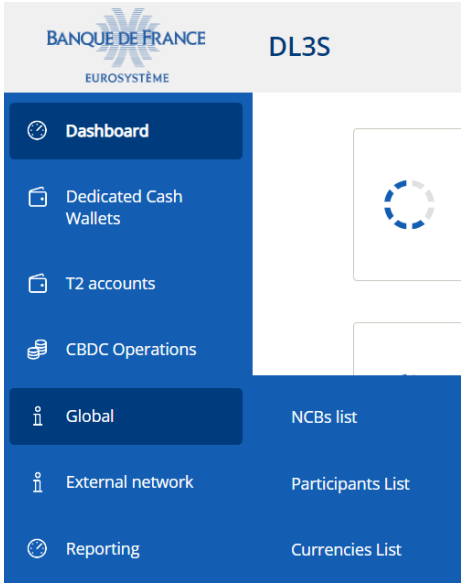
- *Supervised subtab* enables to see CBDC transfers and CBDC redemptions supervised by the participant with the ***CBDC Supervisor*** role.



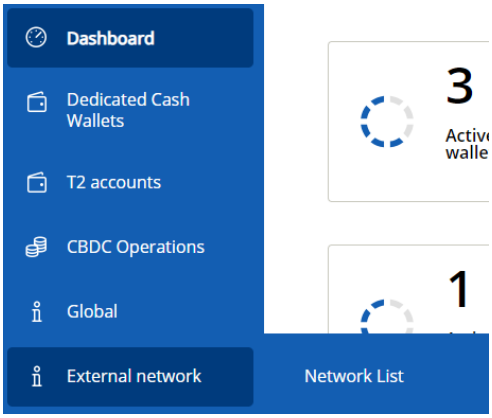
- *National supervised subtab* enables to see CBDC transfers and CBDC redemptions supervised in his jurisdiction by the participant with the ***National CBDC Supervisor*** role.



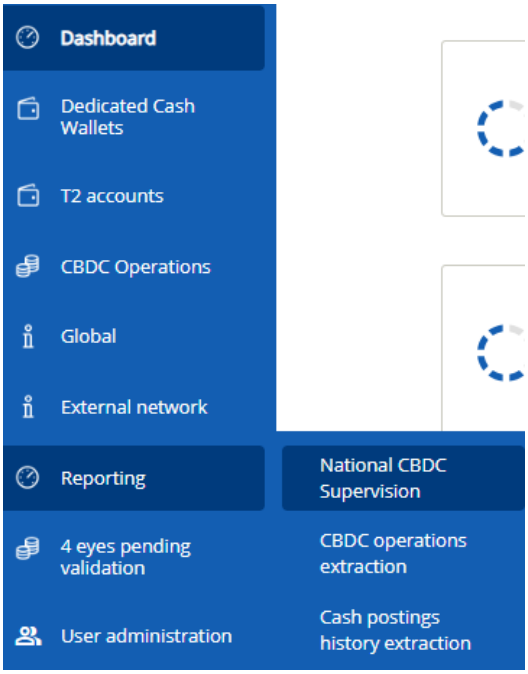
- *Global tab:*
  - Is accessible to every type of ***roles*** in DL3S but some specificities remain inside the sub-tabs according to the ***roles***. Please refer to the dedicated sections of this user hand book to dig into the specificities.
  - Enables to visualize some lists about NCBs, Participants, Clients and Currencies registered in DL3S.



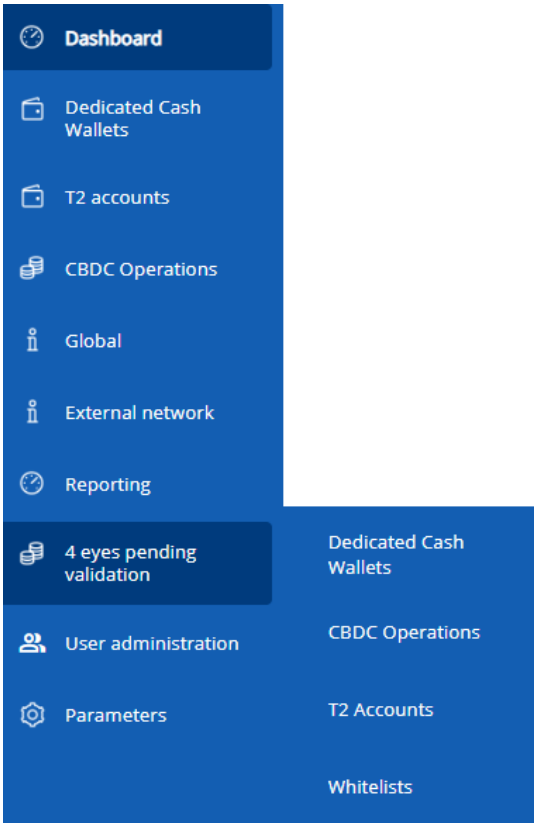
- *External Network tab:*
  - Is accessible to every type of ***roles*** in DL3S but some specificities remain inside the sub-tabs according to the ***roles***. Please refer to the dedicated sections of this user hand book to dig into the specificities.
  - Enables to visualize the external DLT platforms authorised to dialogue with DL3S.
  - Enables to visualize whitelisted participants and links to an external DLT platform



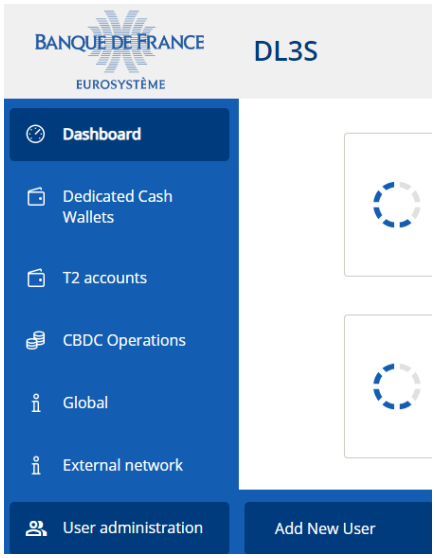
- *Reporting tab:*
  - Is accessible only to the roles ***CBDC Supervisor, National CBDC Supervisor*** and the ***DL3S Operator.***
  - Enables to visualize CBDC outstanding details in one jurisdiction for the ***National CBDC Supervisors.***
  - Enable extraction of CBDC operations and cash postings history for the ***DL3S Operator***, the ***National CBDC Supervisors*** and the ***CBDC Supervisors.***



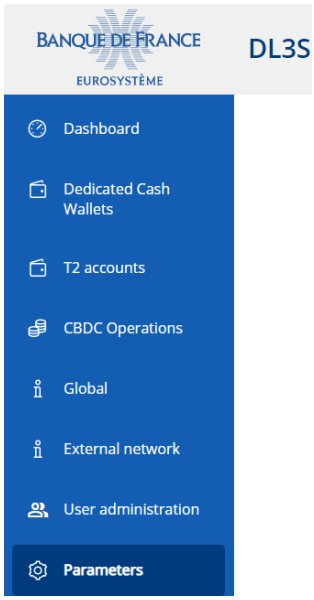
- *4 eyes pending validation* tab:
  - Is accessible to every participant concerned by the 4-eyes process e.g. ***Dedicated Cash Wallet Owner***, ***Dedicated Cash Wallet Manager*** and ***Dedicated Cash Wallet Custodian***
  - According to action you able to perform on DL3S, this tab will contain the following subtab *Dedicated Cash Wallets, CBDC Operations, T2 Accounts & Whitelists*
  - *Dedicated Cash Wallets subtab* will allow the approval or the reviewal of newly created dedicated cash wallets
  - *CBDC Operations subtab* will allow the approval or the reviewal of newly created CBDC Operations
  - *T2 accounts subtab* will allow the approval or the reviewal of newly referenced T2 accounts and newly links to T2 account.
  - *Whitelists subtab* will allow the approval or the reviewal of newly whitelisted participants to a network



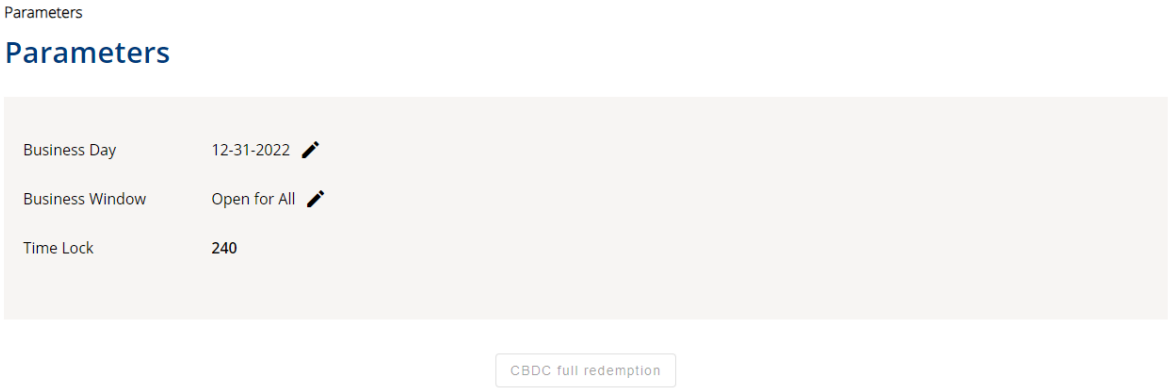
- *User administration tab*:
  - Is accessible only to the roles ***DL3S Operator***, ***Dedicated Cash Wallet Manager*** and ***Dedicated Cash Wallet Custodian***
  - Enables to create credentials for a client allowing the client to access to DL3S



- *Parameters tab*:
  - Business day (visible to every role, editable for ***DL3S Operator*** only – details under section 5)
  - Business window (visible to every role, editable for ***DL3S Operator*** only – access rules are described under section 3.6)
  - Time lock (visible to every role)



- CBDC full redemption (accessible only to the ***DL3S Operator*** – details in section 5.1.1)



2.2.2 Top Band Structure

From left to right:

- Banque de France Eurosysteme Logo
- DL3S logo
- The environment
- Calendar date that corresponds to the current day date
- Business date that corresponds to the date used for operations
- Business window given the current day time (details available under section 3.6)
- User @ participant short name
- The participant's ***roles***
- Disconnection button

2.2.3 Screen Types

Screens in read-only:

- *Dashboard tab*
- *Dedicated Cash Wallet - Supervised tab*

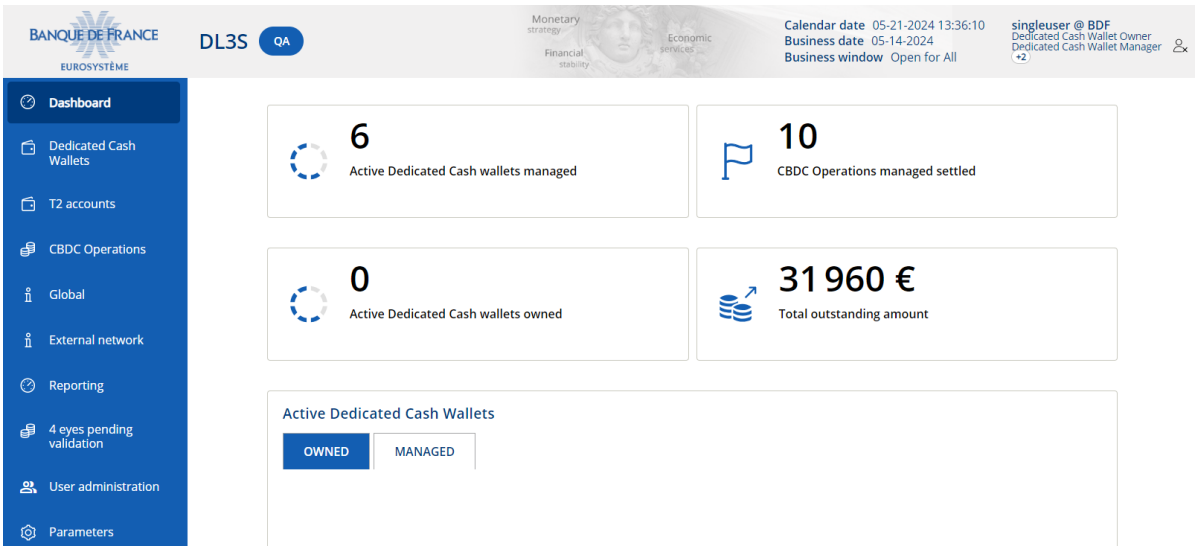
- *Dedicated Cash Wallet – National Supervised tab*
- *Dedicated Cash Wallets - owned tab* if the participant has only a ***Dedicated Cash Wallet Owner*** role
- *T2 Account – National Supervised tab*
- *Global – NCB list*
- *Global – Participants list except for the participants with the **Dedicated Cash Wallet Custodian** role who can add an Entity and the **DL3S Operator** who can also add an Entity*
- *Global – Currencies list*
- *External Network List except for the **DL3S Operator** who can add a new External Network and whitelists participants*
- *Reporting – National CBDC Supervision if the participant has the **National CBDC Supervisor** role*
- *Parameters except for the **DL3S Operator***

Screens with actions:

- *Dedicated Cash Wallets – Managed*
- *T2 Account – Owned tab*
- *T2 Account - Managed tab*
- *CBDC Operations – Owned tab*
- *CBDC Operations – Managed tab*
- *CBDC Operations – Issued tab*
- *CBDC Operations – 4 eyes process only for **Issuer** role*
- *Global – Participants List only for **Dedicated Cash Wallet Custodian** and **DL3S Operator*** who can add Entities
- *External Network for the **DL3S Operator***
- *External Network List for the **DL3S Operator***
- *Reporting – Data Extraction*
- *User administration for the **DL3S Operator*** and ***Dedicated Cash Wallet Custodian***
- *Parameters only for the **DL3S Operator***

3 Structured Information Part

3.1 Dashboard Screen



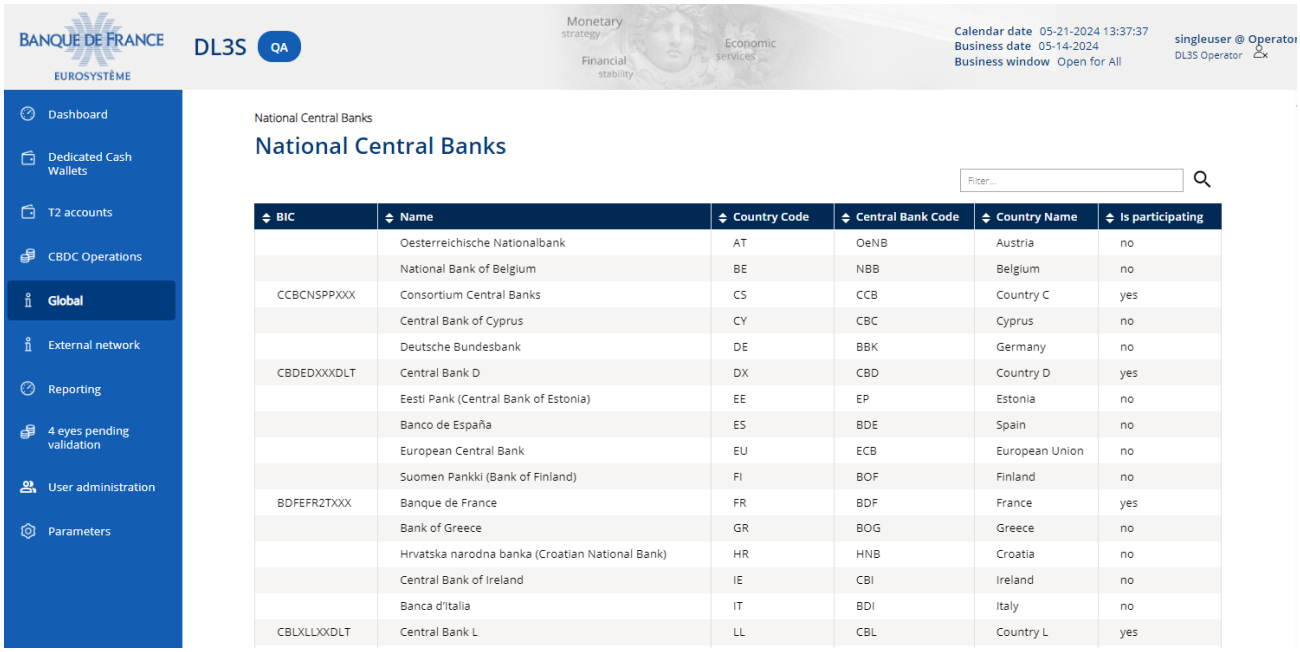
- *Active Dedicated Cash Wallet managed* corresponds to the number of active Dedicated Cash Wallets managed by the participant in the case of a participant having the ***Dedicated Cash Wallet Manager*** role and/or the ***Dedicated Cash Wallet Custodian*** role
- *Active Dedicated Cash Wallets owned* corresponds to the number of active Dedicated Cash Wallets owned by the participant. This is visible for every participant with ***Dedicated Cash Wallet Owner*** role
- *CBDC operations managed settled* corresponds to the number of CBDC operation that have the status "settled" and involving a participant managed by the entity. This is visible for every participant with ***Dedicated Cash Wallet Custodian, Dedicated Cash Wallet Manager*** or ***CBDC Supervisor*** role.
- *Total outstanding amount* corresponds to the total CBDC amount in circulation under the jurisdiction of the participant. This is visible for every participant with ***National CBDC Supervisor*** and/or ***CBDC Supervisor***.

3.2 Global tab

3.2.1 NCB List tab

This tab is accessible by clicking on *Global tab* then *NCB list sub-tab*. *NCB list sub-tab* is a list of NCBs registered in DL3S.

- *BIC* column is the participant ID in DL3S
- *Name* column corresponds to the NCB's name
- *Country Code* column corresponds to the code to identify the NCB jurisdiction country
- *Central Bank Code* column corresponds to the universal Central Bank Code identifier
- *Country Name* column corresponds to the name of the country of the NCB
- *Is Participating* column gives the information whether or not the NCB is participating to DL3S platform. A yes in that column means either a level 2 or 3 of NCB participation (see annexe)



BIC	Name	Country Code	Central Bank Code	Country Name	Is participating
	Oesterreichische Nationalbank	AT	OeNB	Austria	no
	National Bank of Belgium	BE	NBB	Belgium	no
CCBCNSPPXXX	Consortium Central Banks	CS	CCB	Country C	yes
	Central Bank of Cyprus	CY	CBC	Cyprus	no
	Deutsche Bundesbank	DE	BBK	Germany	no
CBDEDXXXDLT	Central Bank D	DX	CBD	Country D	yes
	Eesti Pank (Central Bank of Estonia)	EE	EP	Estonia	no
	Banco de España	ES	BDE	Spain	no
	European Central Bank	EU	ECB	European Union	no
	Suomen Pankki (Bank of Finland)	FI	BOF	Finland	no
BDFEFR2TXXX	Banque de France	FR	BDF	France	yes
	Bank of Greece	GR	BOG	Greece	no
	Hrvatska narodna banka (Croatian National Bank)	HR	HNB	Croatia	no
	Central Bank of Ireland	IE	CBI	Ireland	no
	Banca d'Italia	IT	BDI	Italy	no
CBLXLLXXDLT	Central Bank L	LL	CBL	Country L	yes

3.2.2 Participants List tab

3.2.2.1 Description

The *Participants List tab* is a list all the participants to DL3S, not only the NCBs.

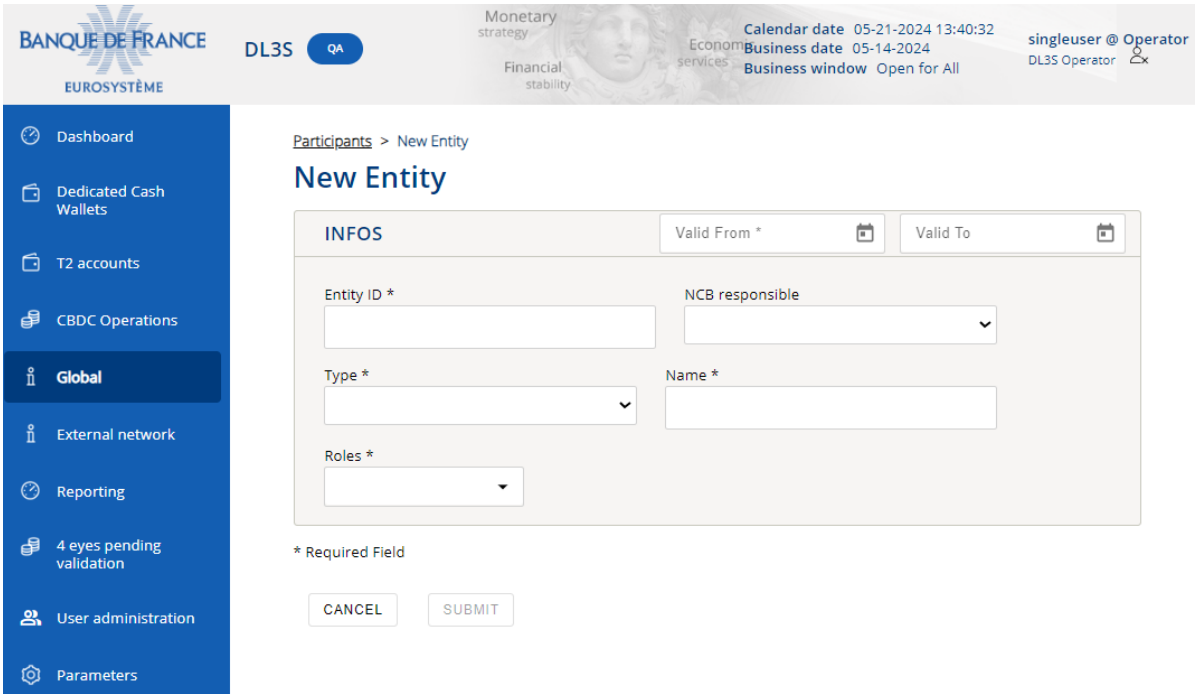
Entity ID	Type	Short Name	Country Code	Roles	Valid From	Valid To	Blocking Status
BDFEFR2TXXX	BIC	BDF	FR	Dedicated Cash Wallet Owner Dedicated Cash Wallet Manager CBDC Issuer National CBDC Supervisor	01-01-2022		
CBDEDXXXDLT	BIC	CBD	DX	National CBDC Supervisor	01-01-2022		
CBLXLLXXDLT	BIC	CBL	LL	Dedicated Cash Wallet Owner Dedicated Cash Wallet Manager CBDC Issuer National CBDC Supervisor	01-01-2022		
CCBCNSPPXXX	BIC	NCBISSUER	CS	Dedicated Cash Wallet Owner Dedicated Cash Wallet Manager CBDC Issuer CBDC Supervisor	01-01-2022		

In that list one can find NCBs, payment banks, custodians or institution.

- *Entity ID* corresponds to the LEI (Legal Entity Identifier) number or the BIC (Bank Identifier Code) number
- *Type* mentions whether the Entity ID is an LEI or a BIC
- *Short Name* is the short name of the participant in DL3S
- *Country Code* is the jurisdiction code of the participant in DL3S
- *Roles* corresponds to the participant's role in DL3S
- *The Add Entity* button is used to add new entity to DL3S. It is only accessible to a participant with *DL3S Operator* role.

By clicking on the inactive button on the top right, one can find the list of all participants that are no longer active or no yet active.

3.2.2.2 Adding a new entity

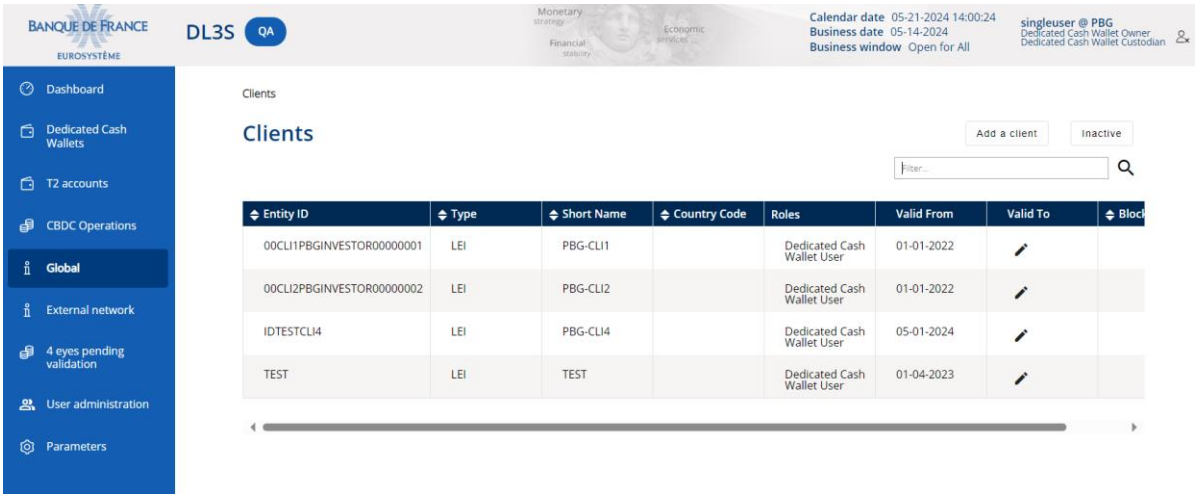


Only ***DL3S Operator*** can add a new participant by filling in:

- Its *Entity ID* either an LEI or a BIC
- Its NCB responsible
- *Type* is either LEI or BIC
- *Name* is the participant name in DL3S.
- *Roles* is the participant role in DL3S. It can be a ***CBDC Issuer, DCW Owner, DCW Manager, DCW Custodian, CBDC Supervisor, National CBDC Supervisor***.
- *Valid From,* the beginning of the participant validity date
- *Valid to*, the end of the participant validity date (not mandatory)

3.2.3 Client List tab

3.2.3.1 Description

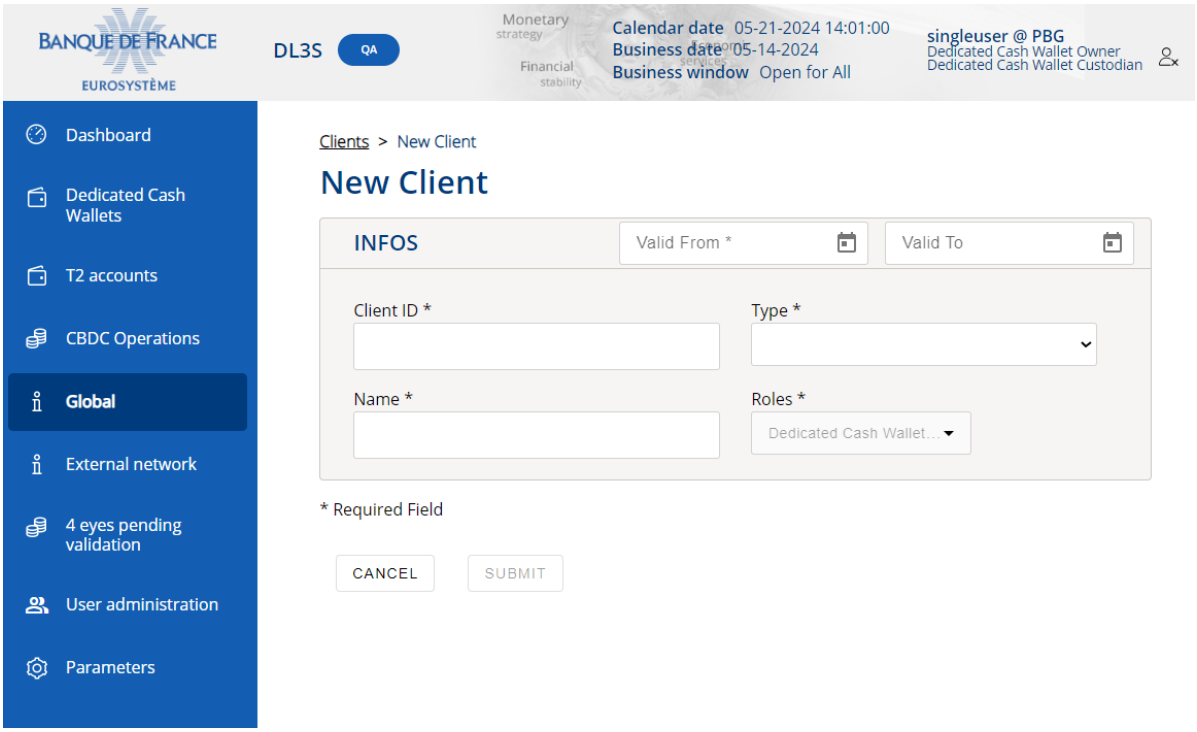


The *Clients List tab* is only accessible to ***DL3S Operator*** and ***Dedicated Cash Wallet Custodian***. For a ***Dedicated Cash Wallet Custodian***, it gives access to the list of its clients. For ***DL3S Operator,*** it gives access to the list of all the clients registered.

In that list one can find:

- *Entity ID* corresponds to the LEI (Legal Entity Identifier) number or the BIC (Bank Identifier Code) number
- *Type* mentions whether the Entity ID is an LEI or a BIC
- *Short Name* is the short name of the participant in DL3S
- *Country Code* is the jurisdiction code of the participant in DL3S
- *Roles* corresponds to the participant's role in DL3S
- *Currency corresponds to the currency of the CBDC transferred*
- *The Add Client* button is used to add new client to DL3S. It is only accessible to a participant with ***DL3S Operator*** role or ***Dedicated Cash Wallet Custodian*** role.

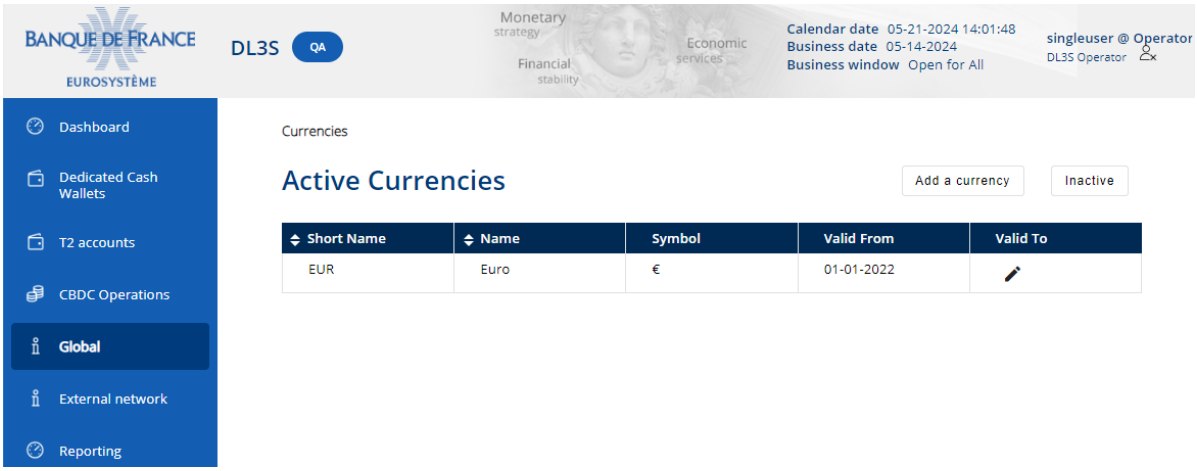
3.2.3.2 Adding a new client



Only ***Dedicated Cash Wallet Custodian*** can add a new client by filling in:

- Its *Entity ID* either an LEI or a BIC
- *Type* is either LEI or BIC
- *Name* is the participant name in DL3S.
- *Roles* is the participant role in DL3S. It can only be a ***Dedicated Cash Wallet User*** .
- *Valid From,* the beginning of the client validity date
- *Valid to*, the end of the client validity date (not mandatory)

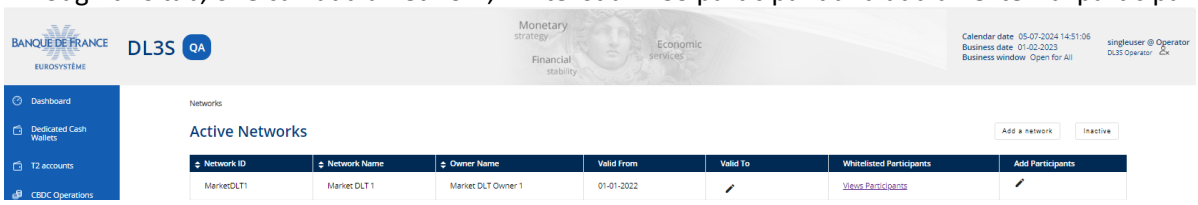
3.2.4 Currencies List



The currencies list tab gives the list of currencies used in DL3S.
Only the ***DL3S Operator*** has the *Add a currency* button.

3.3 External Network

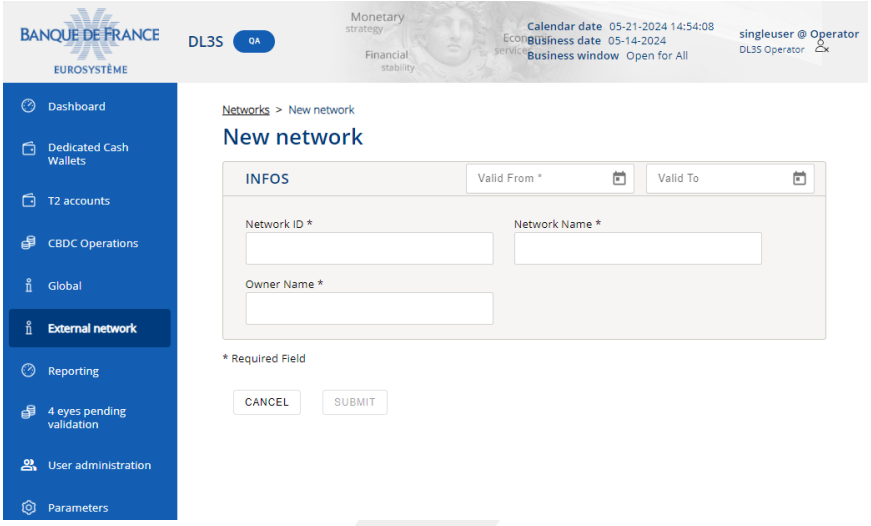
Through this tab, one can add a network, whitelist a DL3S participant and add an external participant.



- The *Network List tab* gives the list of external networks registered in DL3S with their characteristics (ID, Name, Owner Name, Validity dates, whitlisted participants according to the visibility rules)
- The *Add a network* button on top right corner enables to register a new external network to DL3S.
- Only the ***DL3S Operator*** role have this button and can add a new external network

3.3.1 Adding a new external network

Only the ***DL3S Operator*** can add a new external network by clicking on the button add a network.

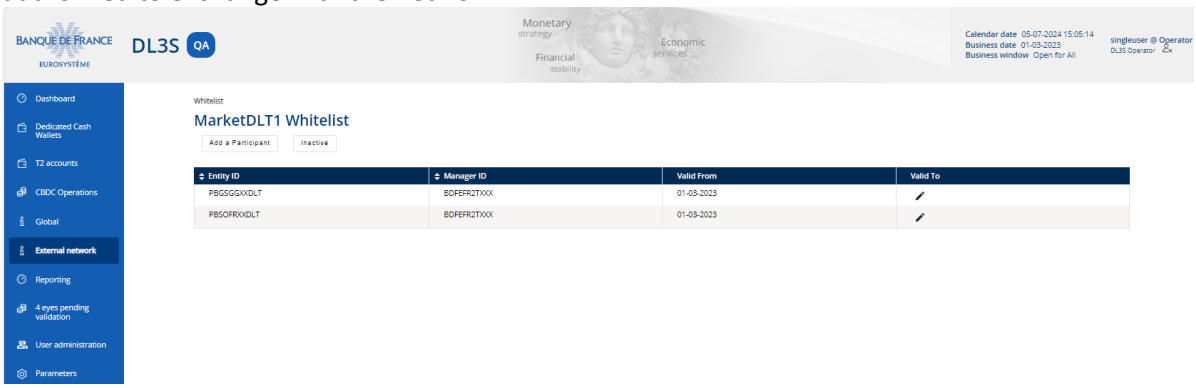


The ***DL3S Operator*** has to fill in the:

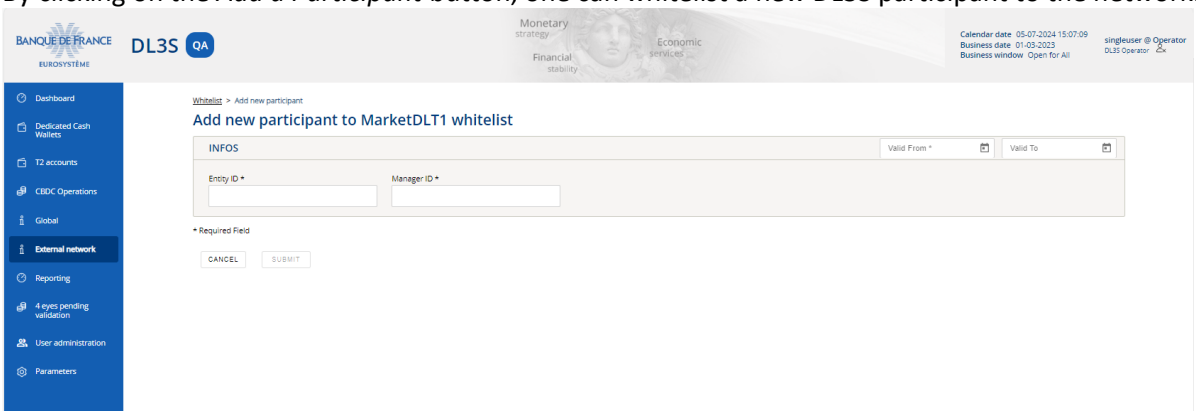
- *Network ID*, ID of the new external network in DL3S
- *Network Name*, the name of the new external network in DL3S
- *Owner Name*, the name of the owner of the market DLT (or network). It does not have to be an already-registered to DL3S participant
- *Valid From,* the beginning of the network validity date
- *Valid to*, the end of the network validity date (not mandatory)

3.3.2 Whitelisting a DL3S participant

Only the ***DL3S Operator*** and ***DCW Manager*** can whitelist a DL3S participant on a network.
By clicking on the *views participants* link, one can access to the list of DL3S participant whitelisted and authorized to exchange with the network.

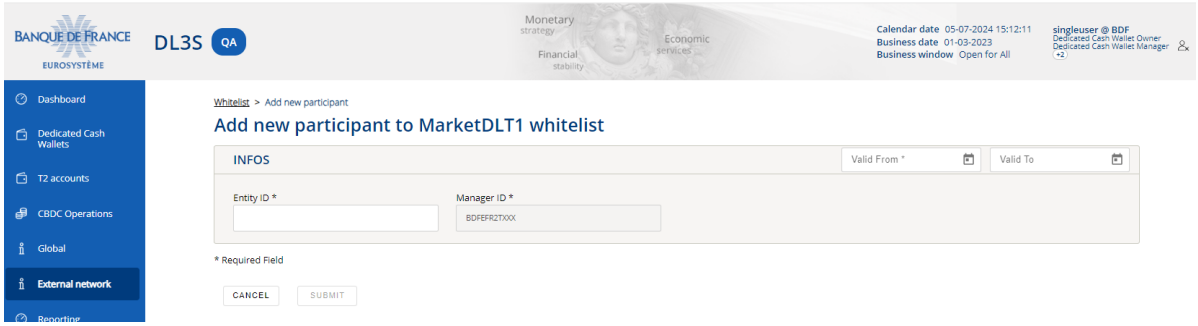


By clicking on the *Add a Participant* button, one can whitelist a new DL3S participant to the network.



One has to fill in:

- *Entity ID* column is the participant ID in DL3S
- *Manager ID* column is manager ID of the entity ID in DL3S. It is to be noted that manager ID is automatically filled with the BIC of the manager whitelisting if the whitelisting is done by a ***DCW manager***
- *Valid From,* the beginning of the whitelist validity date
- *Valid to*, the end of the whitelist validity date (not mandatory)



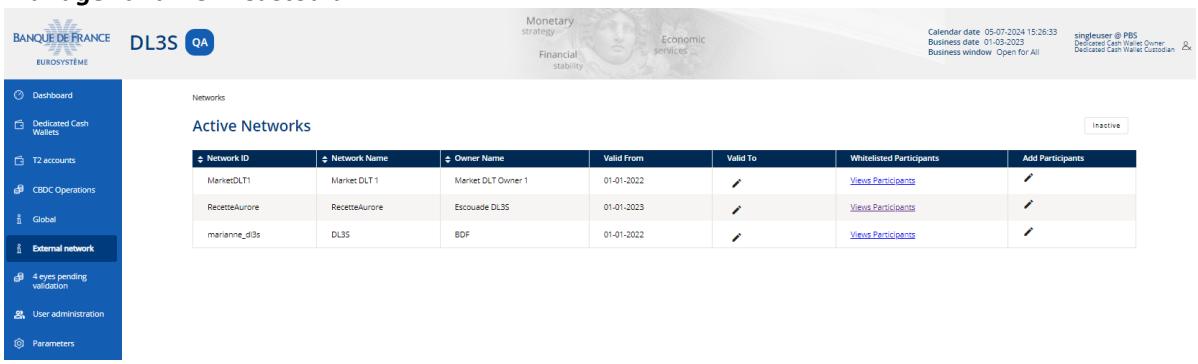
It is to be noted that for a ***DCW manager***, the whitelisting will follow the 4-eyes process on the contrary of ***DL3S Operator***.

A newly whitelisted participant will appears in the inactive view at first. It will appear in the active view at the valid from date entered when whitelisting the participant.

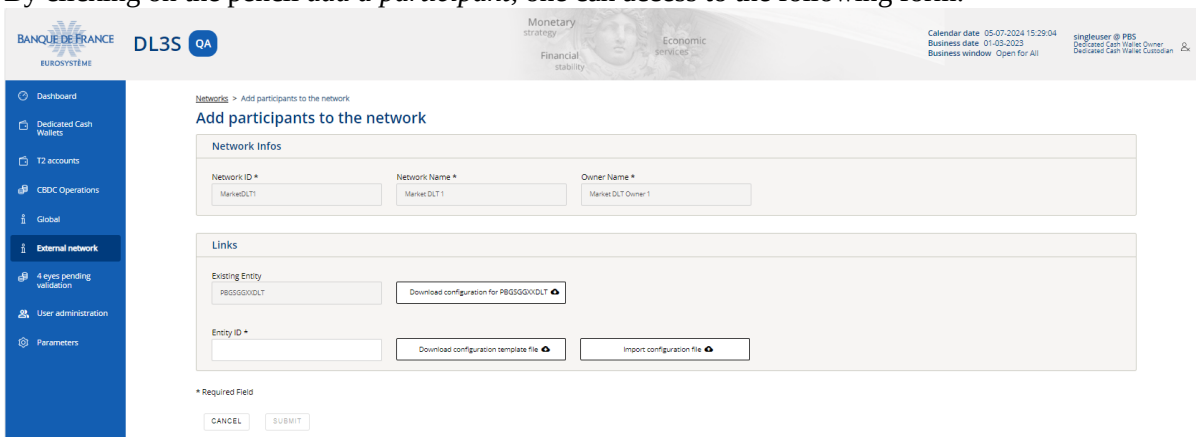
Once a participant is whiteslited, the whitelisting can be ended by entering a valid to date to the envisaged date.

3.3.3 Adding an external participant

To be able to fully interact with an external network, one has to register a participant of this external network on DL3S. It will enable the participant to send messages to the external participant on the network. This capability to add an external participant to a network is available for ***DL3S Operator, DCW Manager*** and ***DCW Custodian***.



By clicking on the pencil *add a participant*, one can access to the following form:



To add an external entity, it is needed to:

- Fill in the entity ID of the external participant on the Market DLT
- To download the template of the configuration that needs to be imported
- To import a file of configuration containing, authentication details to connect to Market DLT

This procedure will allow the market DLT to receive message from DL3S. To fully onboard an external participant on an external market DLT, he must also be able to send message to DL3S. In order so, it is needed to create a user for an external participant to fully onboard it (see 3.5.2.2).

3.4 Reporting

3.4.1 National CBDC Supervision

This tab is used for CBDC supervision and is available only for ***National CBDC Supervisors*** role.

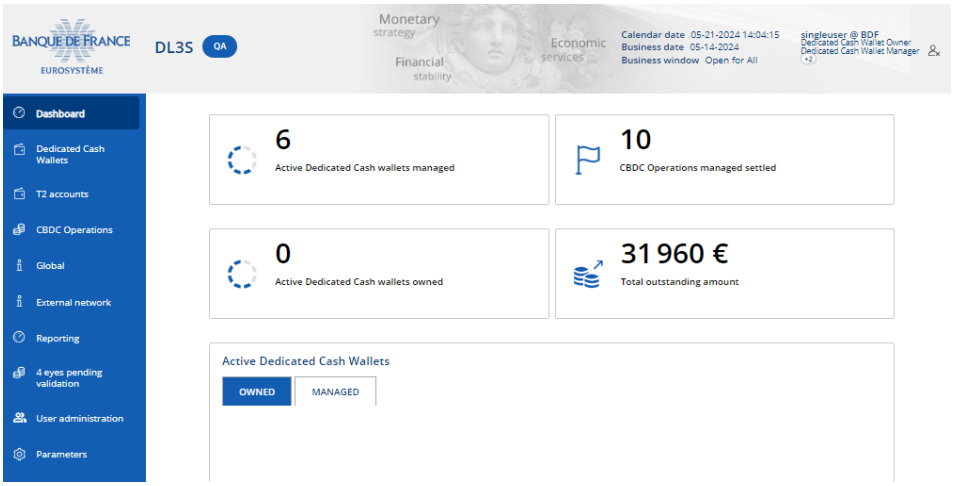
CBDC supervision
Summary

Currency
Euro

Participant	Total owned	Total clients	Total owned + clients
PBSOFRXXDLT *(05-21-2024 14:03:03)*	21 360	70	21 430
PBGSGGXXDLT *(05-21-2024 14:03:03)*	10 520	10	10 530
Total	31 880	80	31 960

On this tab, a ***National CBDC Supervisor*** can control three types of total values:

- *Participant* column corresponds to the DL3S participants supervised by the actual ***National CBDC Supervisor***
- *Total Owned* column corresponds the total CBDC amount owned by the DL3S participants under the NCB jurisdiction
- *Total Clients* is the total CBDC amount owned by clients of the DL3S participant under the NCB jurisdiction
- *Total Owned + Clients* is the total CBDC amount owned by the DL3S participants and its clients. It must be equal to total amount outstanding of the ***National CBDC Supervisor*** dashboard.



3.4.2 CBDC Operations extractions and Cash postings history extraction

This tab is only accessible to ***National CBDC Supervisor*** or ***DL3S Operator.***
Extractions are described in section 4.7.

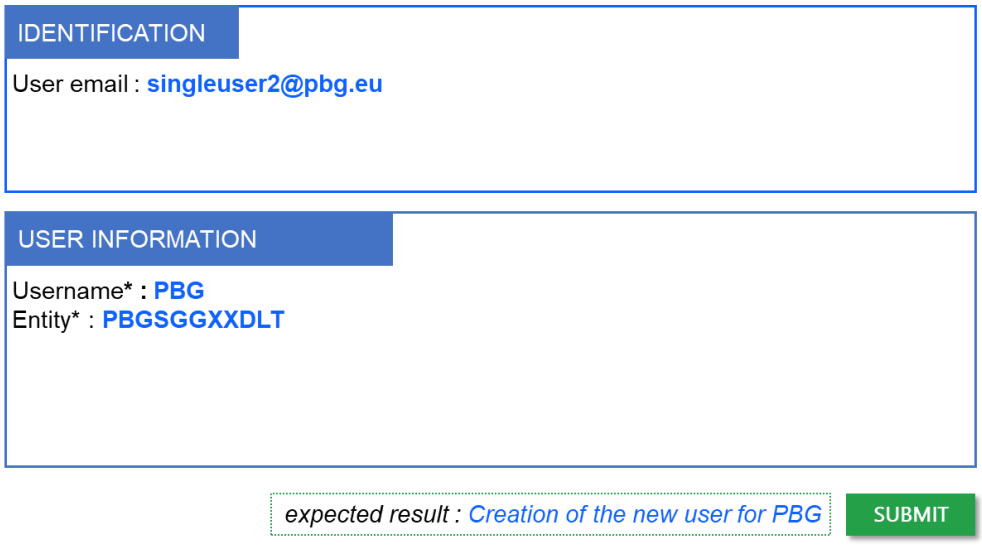
3.5 User administration

The **user administration** tab accessible in the left-hand sidebar of the DL3S UI, is available for every ***Dedicated Cash Wallet Custodian, Dedicated Cash Wallet Manager*** and for ***DL3S Operator***. It enables the creation of credentials for any new participant. ***Dedicated Cash Wallet Custodian*** can add a new user for their new clients only. ***DL3S Operator*** can add a new user for any participant of DL3S platform.

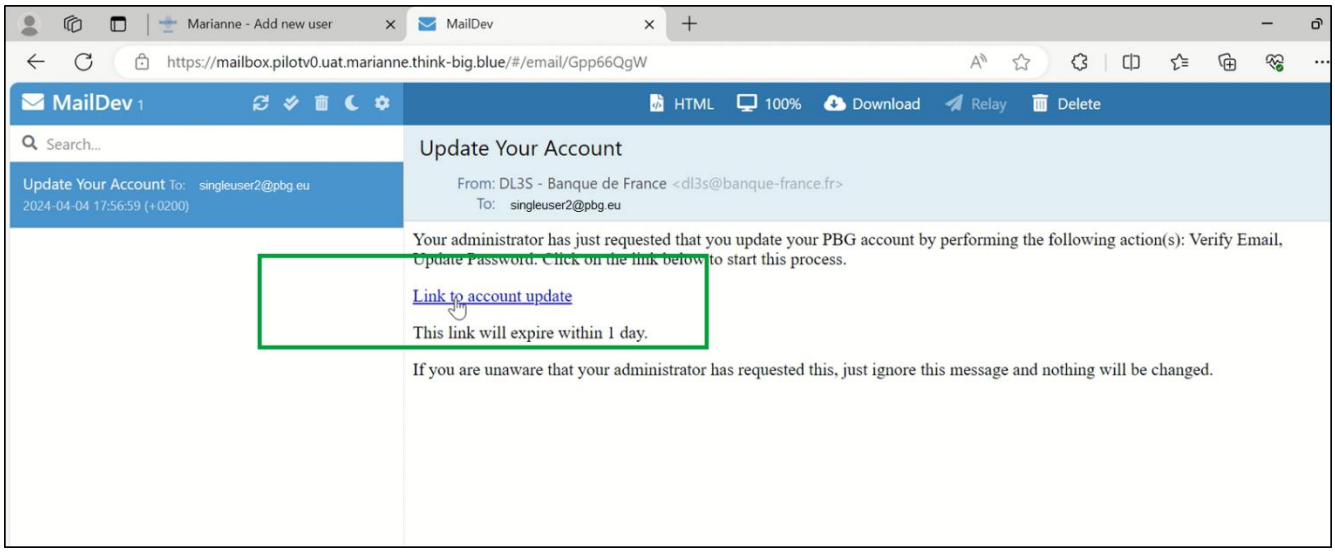
3.5.1 Adding an internal User

Through the UI, ***DL3S Operator***, ***DCW manager*** or ***DCW Custodian*** are able to create a new user to a DL3S participant. One has tu ensure that the type is DL3S.

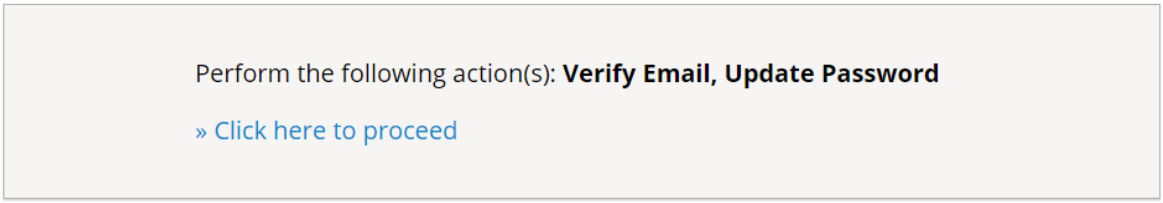
- Click on *the User administration* tab, *Create a new user* subtab
- Ensure the type DL3S is selected.
- For adding a new user to a participant, one has to fill in:
  - User email that will correspond to the email of the user
  - Username corresponds to the name that will be displayed in the UI on the top right of the dashboard to identify the user created
  - Entity is the BIC or the LEI of the BIC within which the user will be integrated
- Then the following steps will happen taking the example of a new user created for payment bank named PBG:



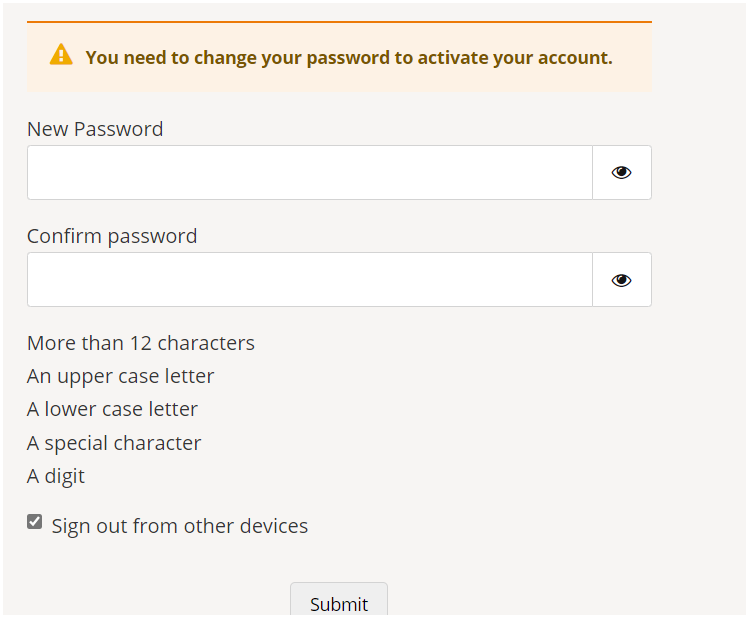
a) Connected on the Mailbox of the email of the new user : Click on the link **"Link to account update"** received on the **"Update your Account"** email



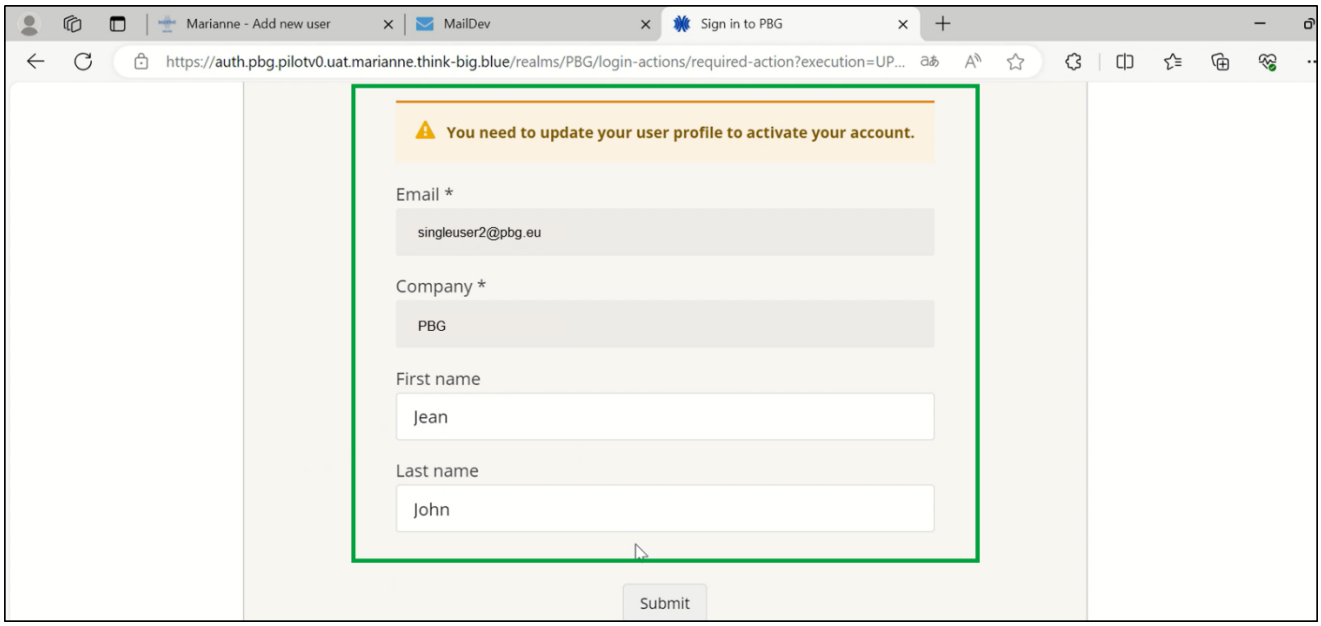
b) Following the previous link, you will get to this page



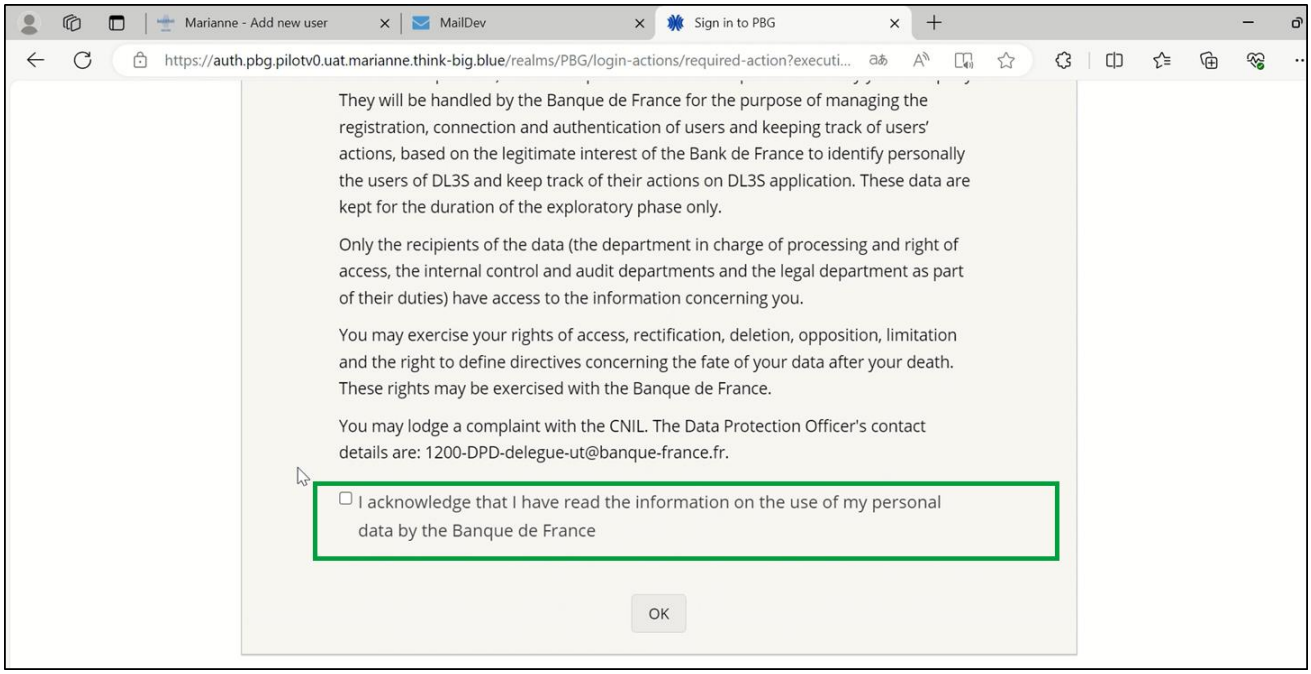
c) Click on set up the account by first changing the password



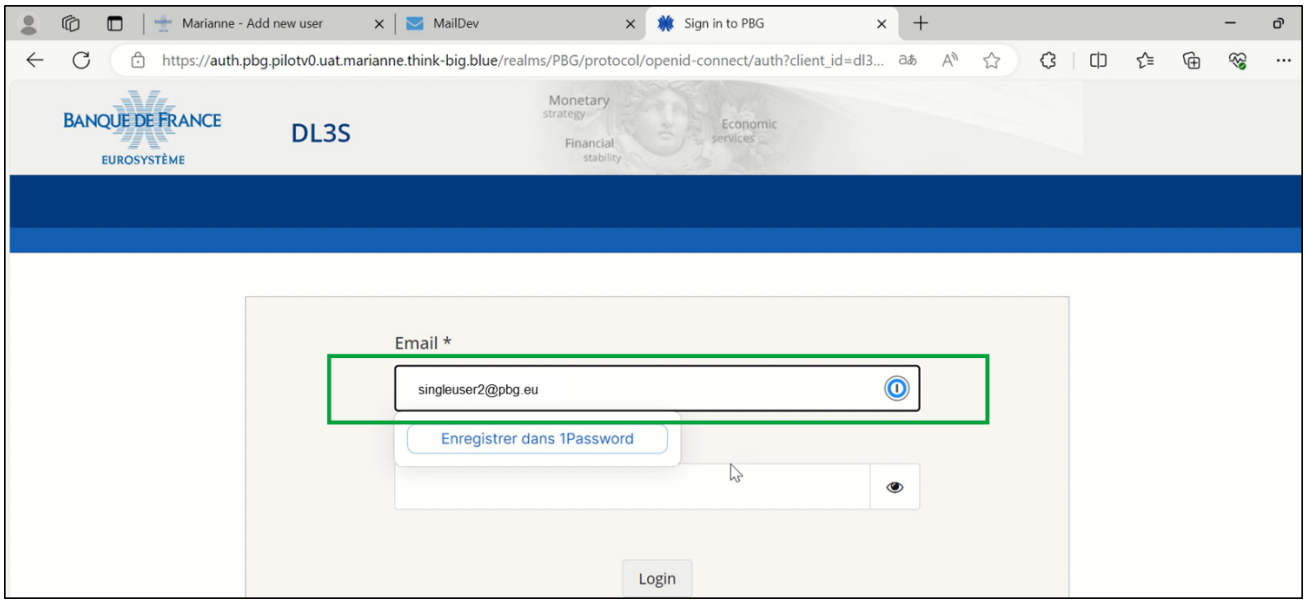
d) Complete the profile with the expected information



e) Acknowledge the GDPR notice to finalize the activation of the account



f) Finally, login using the credentials set up earlier



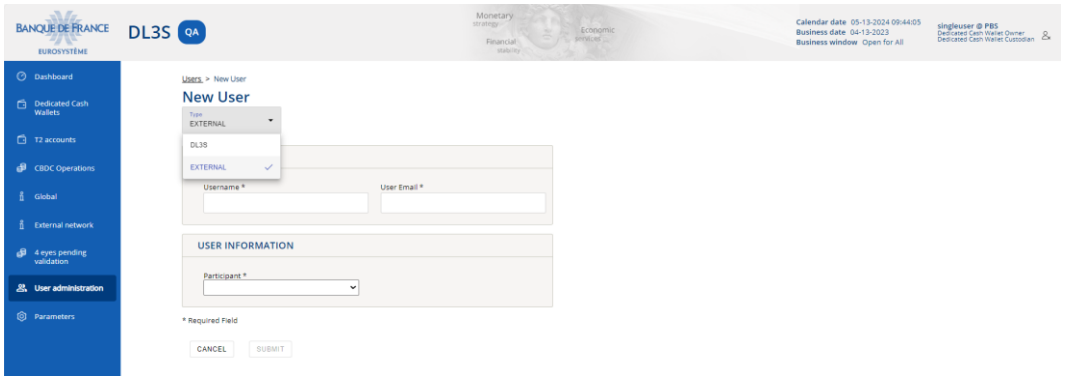
The creation of user through DL3S UI only authorizes the granting of "regular user", for a more specific creation of user, one needs to use Keycloack (see 6.2)

3.5.2 Adding an external User

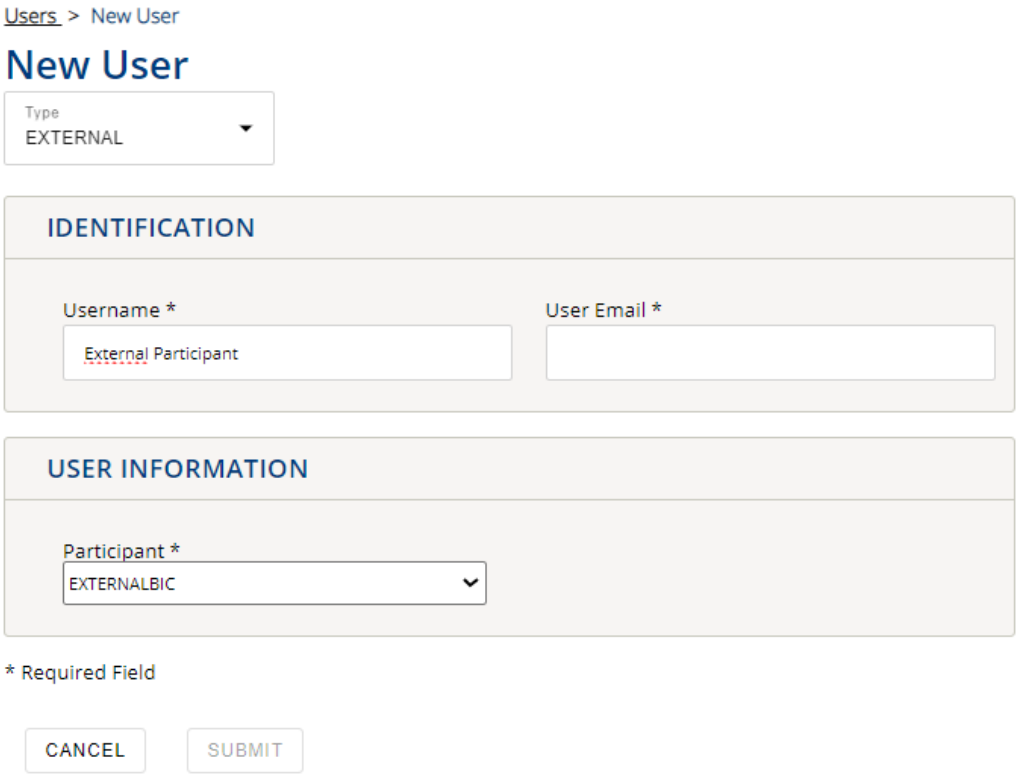
To fully onboard an external participant of an external network, it is needed to create a user for him. ***DL3S Operator***, ***DCW manager*** and ***DCW custodian*** can perform this operation for any external participant added to a network (see 3.3.3).

Is is to be noted that the user has to be created by the DL3S participant that added the external participant.

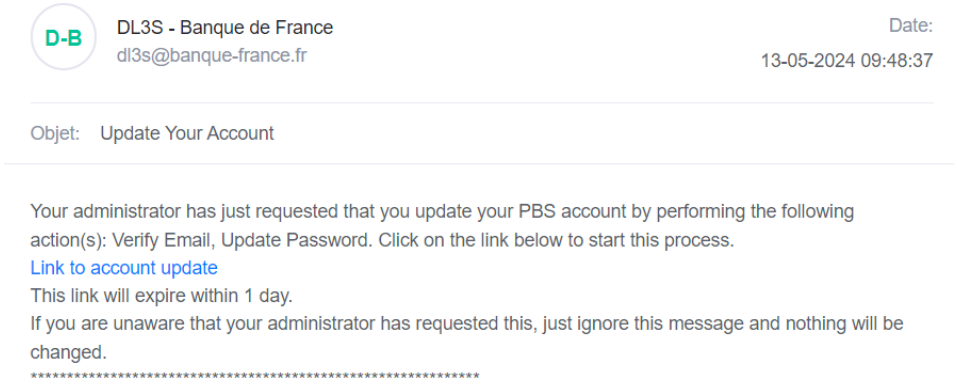
On the user *administration* tab, one has to select the external participant type.



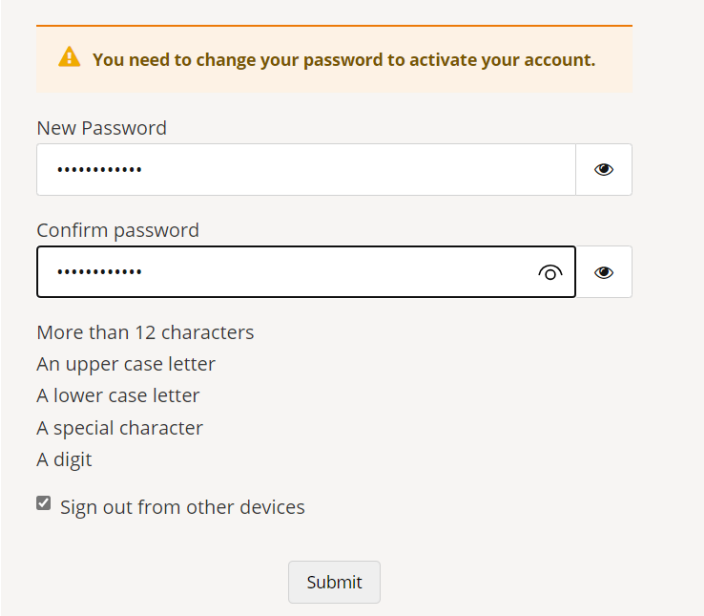
Then, it is needed to select the participant for which we are creating a user, to fill in the username and the user email.



Then the procedure is the same as for the adding of an internal user described above. The external participant will receive an email on the user email entered to specify a password.

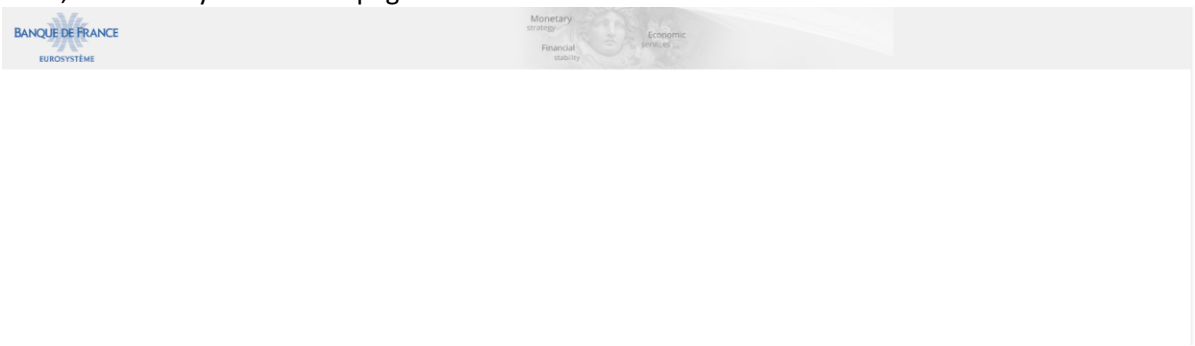


By clicking on the link, the user is able to activate its account.



After entering its first name and its last name, the participant needs to approve the GDPR notice. After this step, the external participant is able to send a message to DL3S.

It should be noted that the creation of this user allows the external participant to send messages to DL3S. However, this external participant does not have access to the DL3S UI. If he tries to connect to DL3S, he will only see a blank page.



3.6 Business Day management

Similarly to Target services, we've introduced a business day management under DL3S platform. To do so, we've first defined different time slots (windows hereafter) through the day with specific rules in terms of access and actions permitted by each DL3S roles as listed below. The change of business window is automatic under DL3S.

1st Window (e.g. 9:00-9:59) "Start of Day"

- All *DCW Managers, Owners, Custodians and Users* can connect to the platform and instruct CBDC Operations.
- Market DLTs cannot connect to DL3.
- No transactions (other than CBDC operations) can be instructed.

2nd Window (e.g. 10:00-13:59) "Open for All"

- All participants can access DL3S and instruct CBDC Operations.
- Market DLTs can connect to DL3S and trigger DvP settlements.

3rd Window (e.g. 14:00-15:30) "End of Day"

- The only permitted operation is cash sweep by the Operator.
- No intra or cross platform operation is allowed.
- Ongoing operations must be settled before the cash sweep is triggered.
- The business date can be updated by DL3S Operators after the successful cash sweep process

4th Window (e.g. 15:30-8:59 D+1) "Closed"

- DL3S is not open.
- Only the Operator can access the platform.

The table below summarize the access and action management depending on the window considered:

	Operator	NCB		Other participants		Market DLTs	
Liquidity Only	Y	Login	CBDC	Login	CBDC	Login*	DvP
		Y	Y	Y	Y	N	N
All	Y	Login	CBDC	Login	CBDC	Login	DvP
		Y	Y	Y	Y	Y	Y
End of Day	Y	Login	CBDC	Login	CBDC	Login	DvP
		Y	N	Y	N	N	N
Closed	Y	Login	CBDC	Login	CBDC	Login*	DvP
		N	N	N	N	N	N

Only DL3S Operators have access to the business windows setup. This will be described under section 5. The business date update and the CBDC full redemption are enabled only during the End of Day window.

4 Description of Use Cases

Disclaimer: *Please be aware that at this stage of development, cantonment by jurisdiction is not implemented. It is therefore currently technically possible for a central bank to create a Dedicated Cash Wallet outside its jurisdiction or to issue on a Dedicated Cash Wallet outside its jurisdiction. Be careful to respect your jurisdiction.*

4.1 Dedicated Cash Wallet management

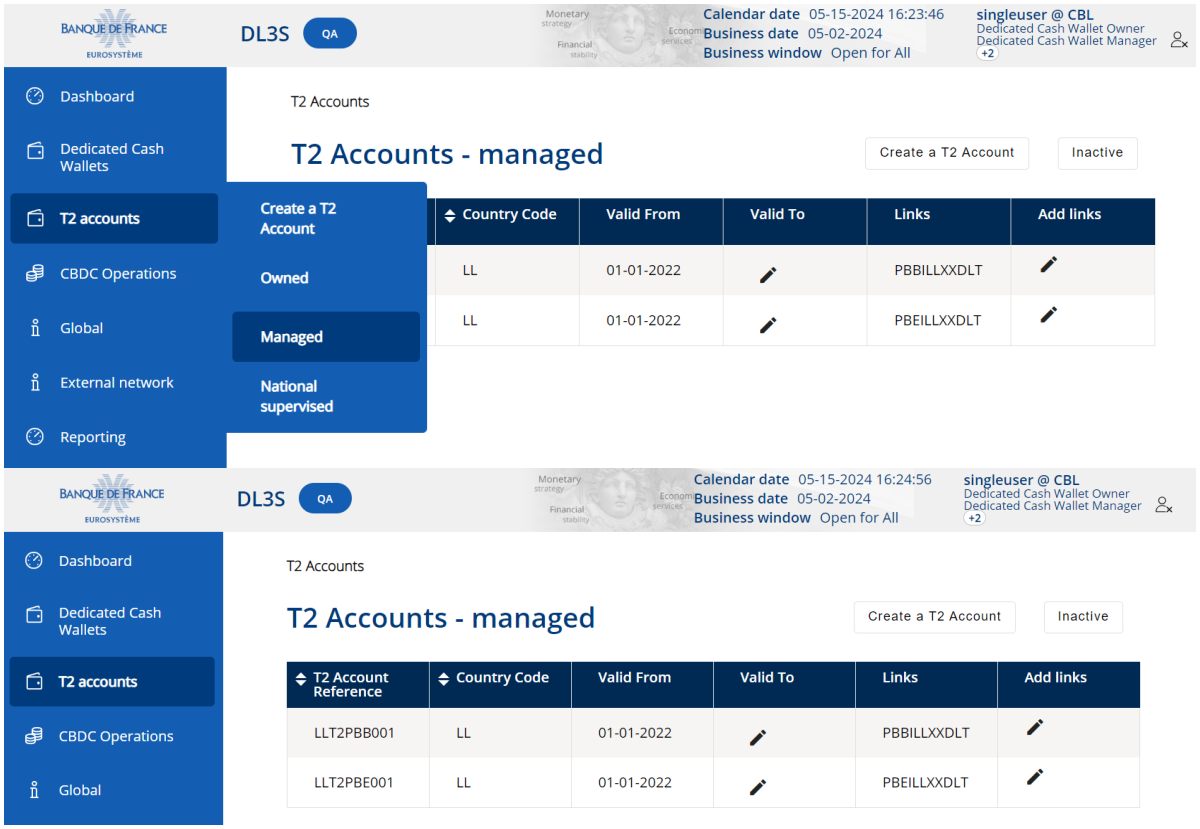
4.1.1 Dedicated Cash Wallet creation by a *Dedicated Cash Wallet Manager*

Only a ***Dedicated Cash Wallet Manager*** can create Dedicated Cash Wallets for ***Dedicated Cash Wallet Owners*** he manages. Thus, one needs to connect as a participant with ***Dedicated Cash Wallet manager*** role.

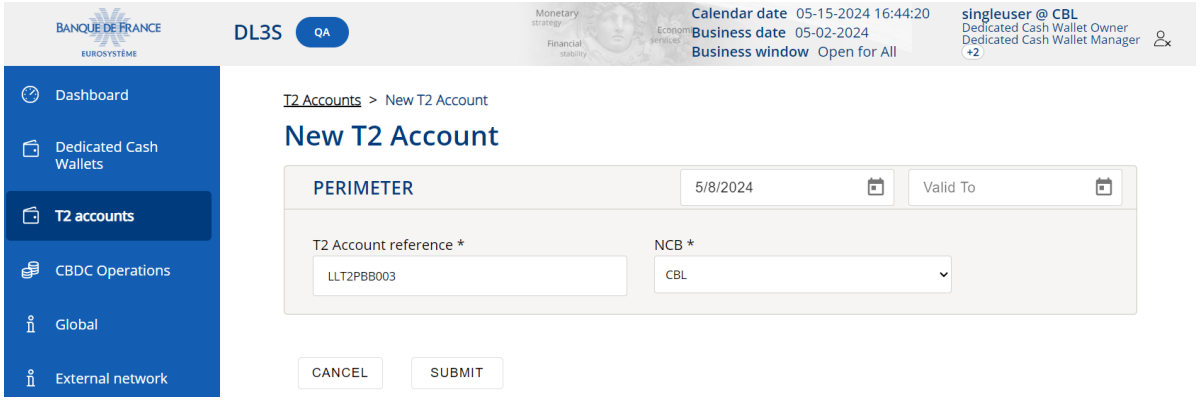
To create a Dedicated Cash Wallet, a ***Dedicated Cash Wallet manager*** needs at first to create the T2 account that will be linked to the new Dedicated Cash Wallet

4.1.1.1 T2 account creation and link

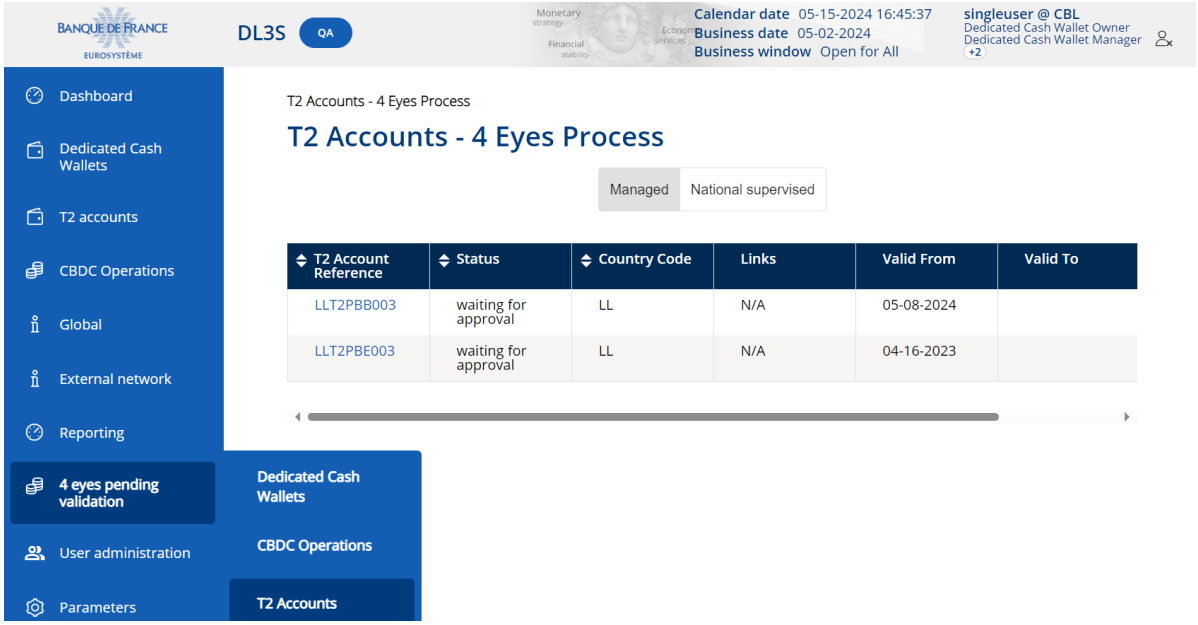
- Click on *T2 Accounts – managed tab* and click on *Create a T2 Account* button on the top right corner



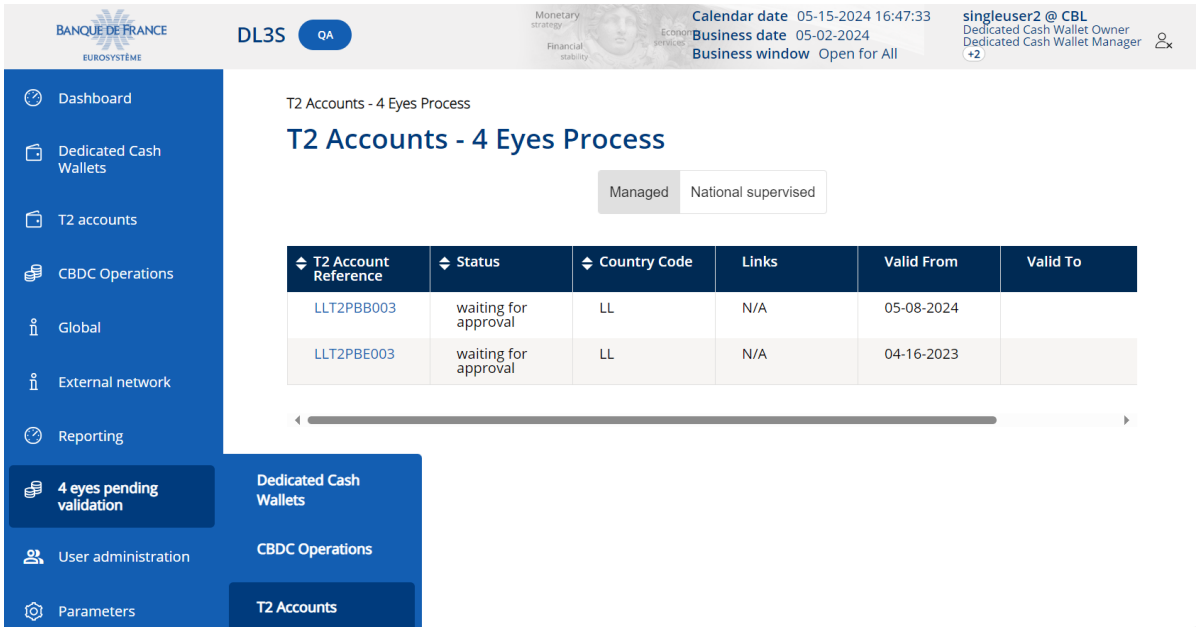
- Fill in the following fields with *T2 Account Reference* and the related *NCB, the Valid from date and valid To date (not mandatory).*



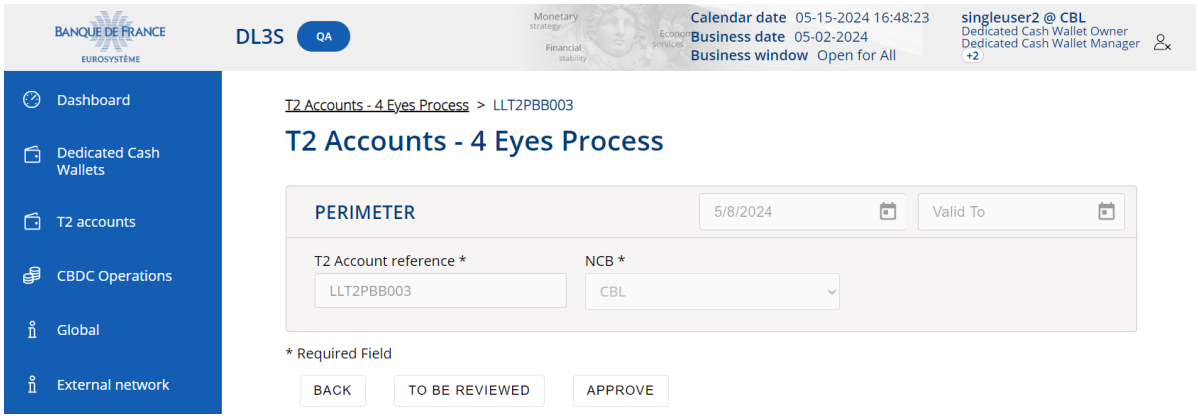
- After you click on the ***Submit*** button, you will see the *T2 Account* waiting for approval in the ***4 eyes pending validation / T2 Account***



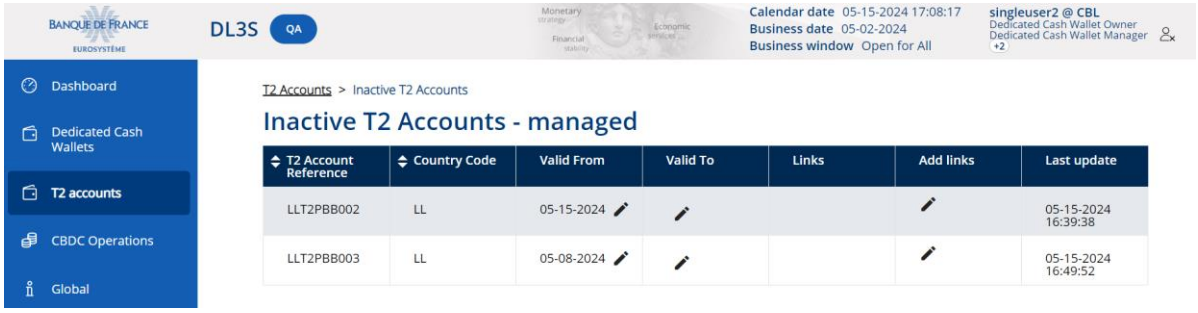
- You need to connect with the single user you didn't use to create the operation
- Go to ***4 eyes process / T2 Account*** and click on the ***T2 Account Reference*** just created with the previous singleuser



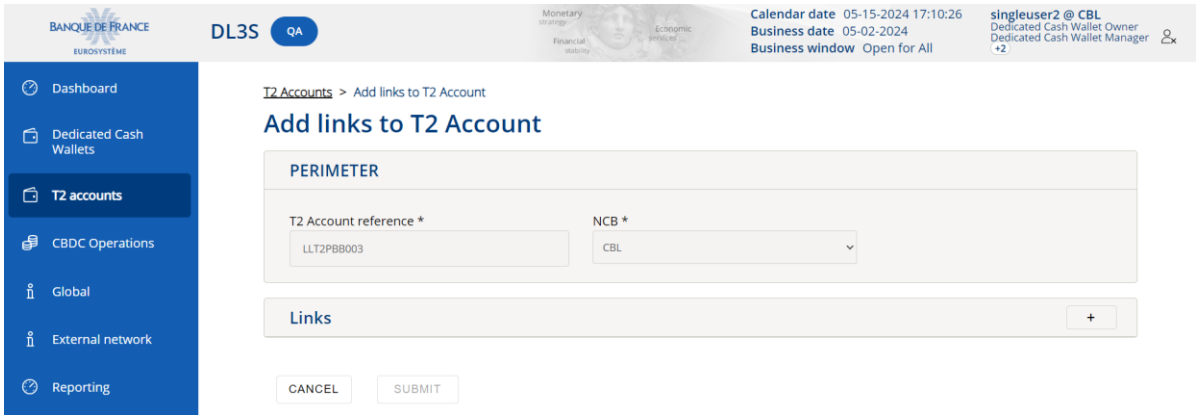
- Validate the T2 Account by clicking on the **Approve** button



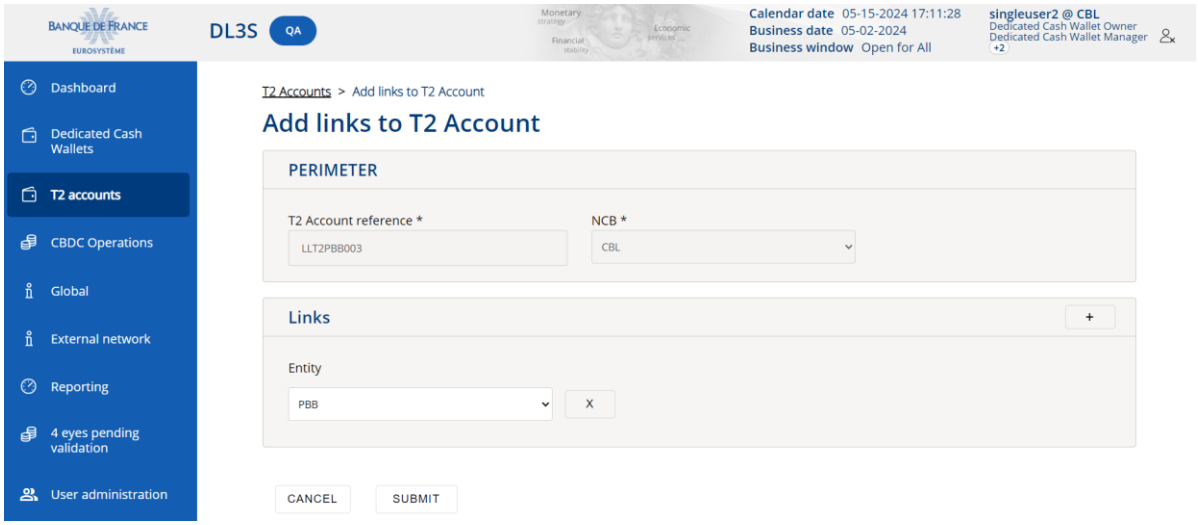
- The newly T2 Account now appears in the list *Inactive T2 accounts – managed* tab list. It is needed to link it to the participant. Once the Valid from date is reached, the T2 account reference becomes valid and appears on *Dedicated Cash Wallets –managed* tab.
- Click on the pencil in the add links column.



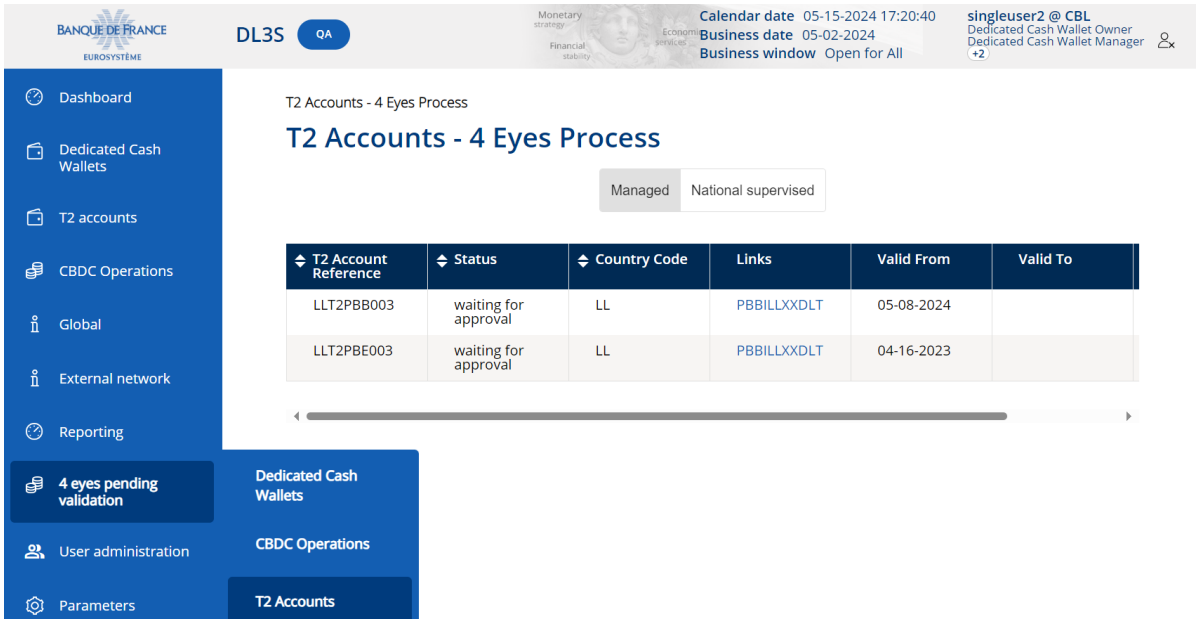
- Click on "+" on the right and link T2 account reference to the right entity by selecting the correct entity in dropdown menu.



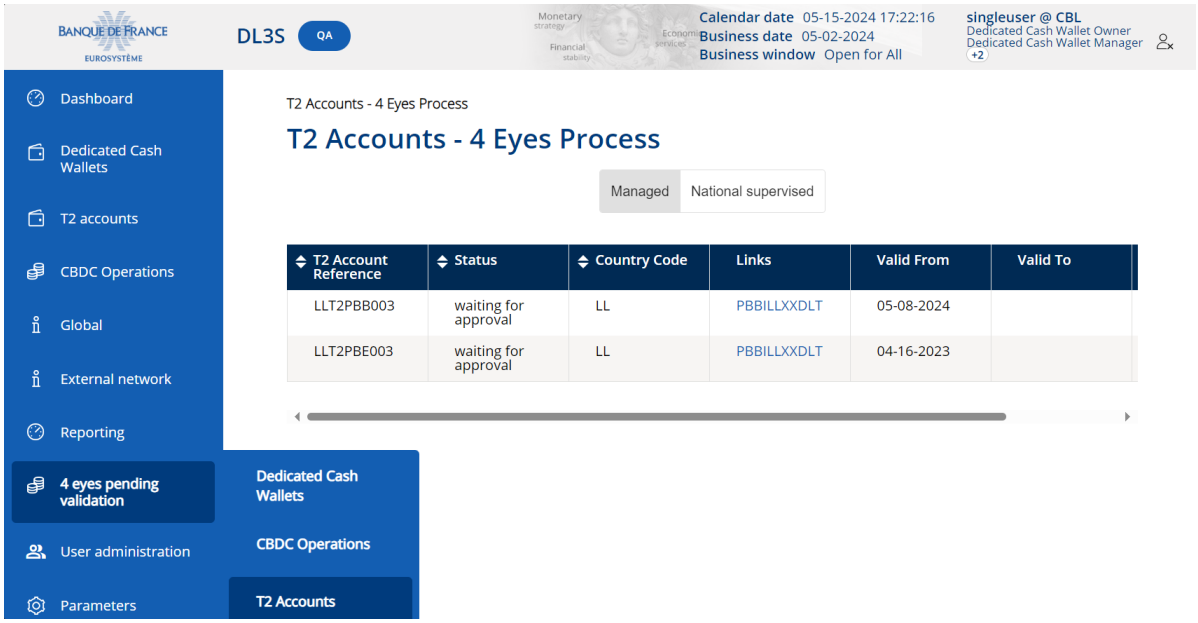
- Select the Entity
- Click on the **Submit** button



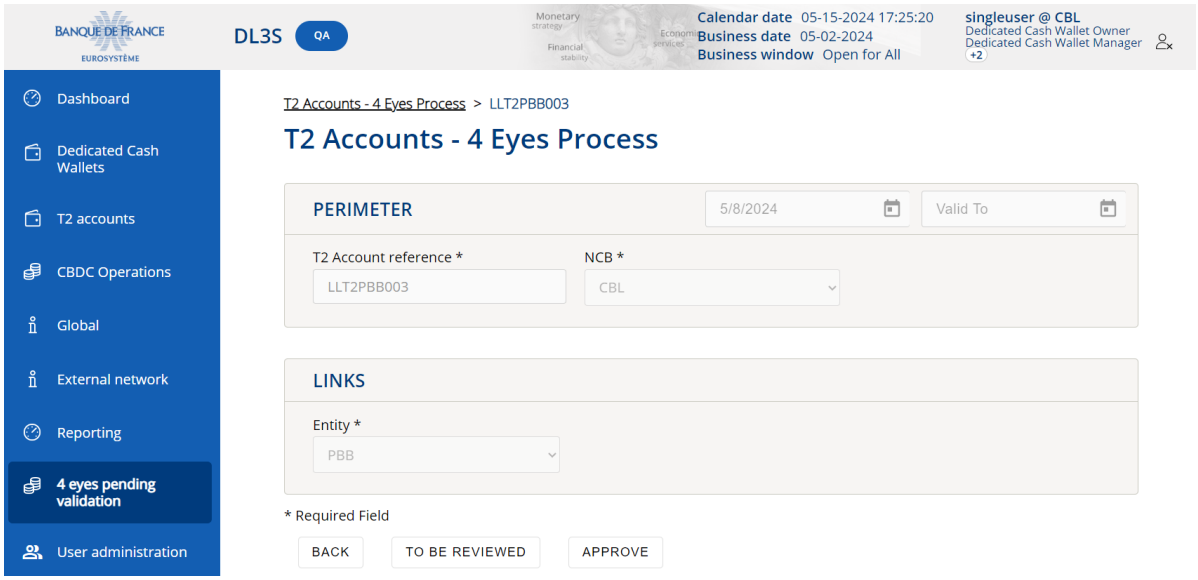
- After you click on the ***Submit*** button, you will see the ***T2 Account Link*** waiting for approval in the ***4 eyes pending validation / T2 Account***



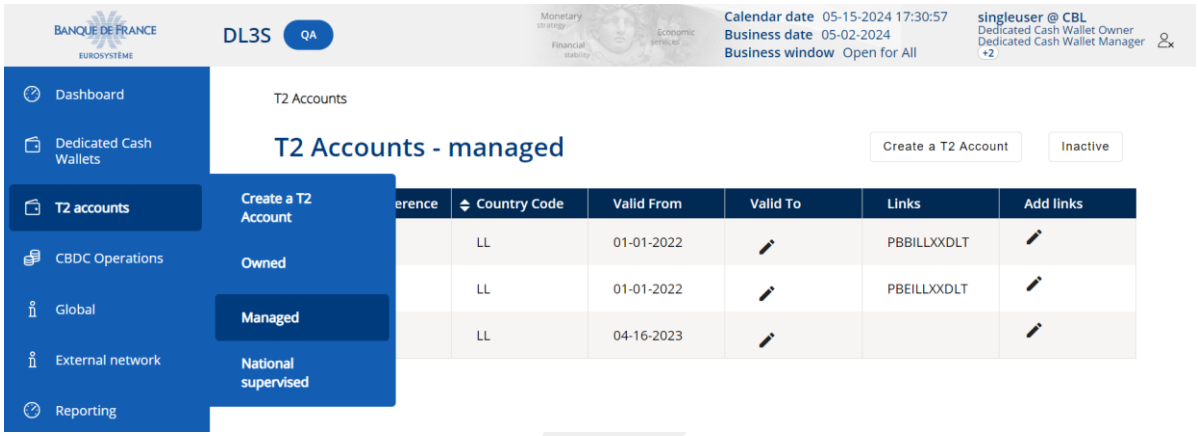
- You need to connect with the single user you didn't use to create the operation
- Go to ***4 eyes process / T2 Account*** and click on the ***T2 Account Links*** just created with the previous singleuser



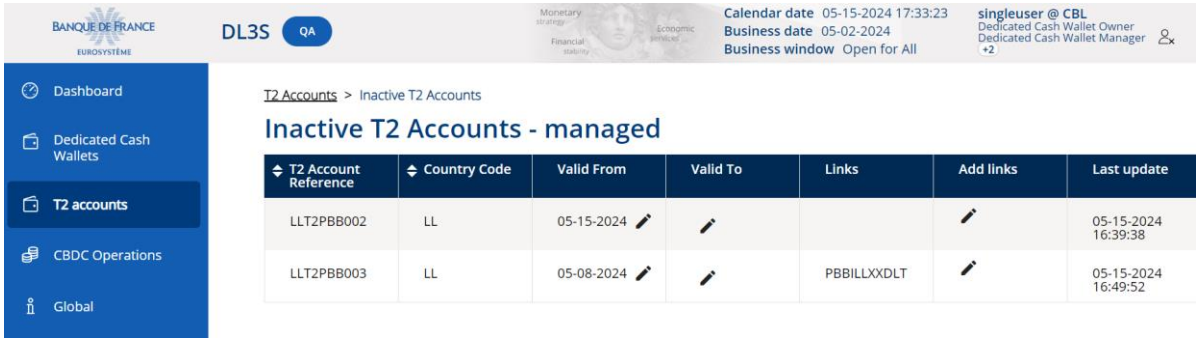
- Validate the T2 Account by clicking on the **Approve** button



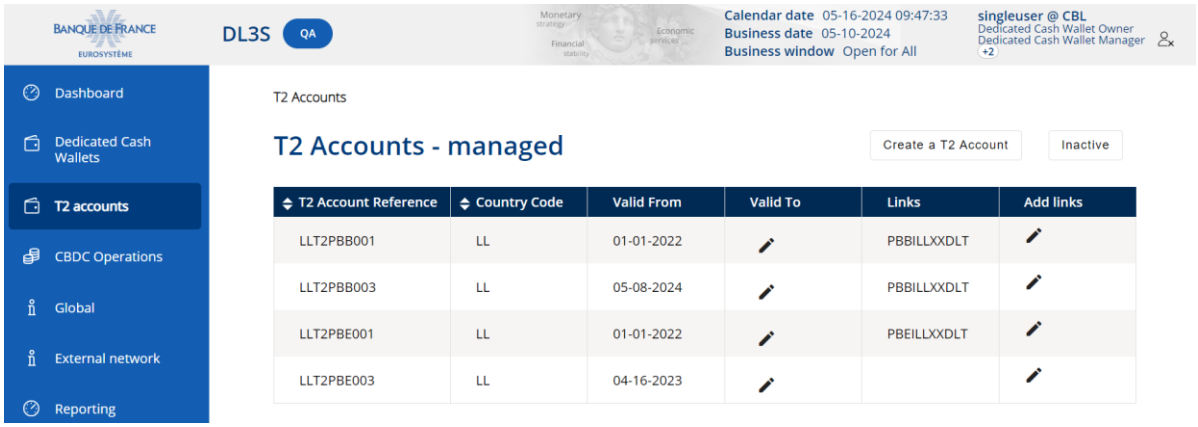
- Go to the ***T2 Accounts / Managed*** tab and click on the ***Inactive*** button



- The newly created *T2 Account* with its *Link* appears in the *Inactive T2 accounts* list



- Once the Valid from date is reached, the newly created T2 account become valid and appears on *T2 accounts – managed* tab.

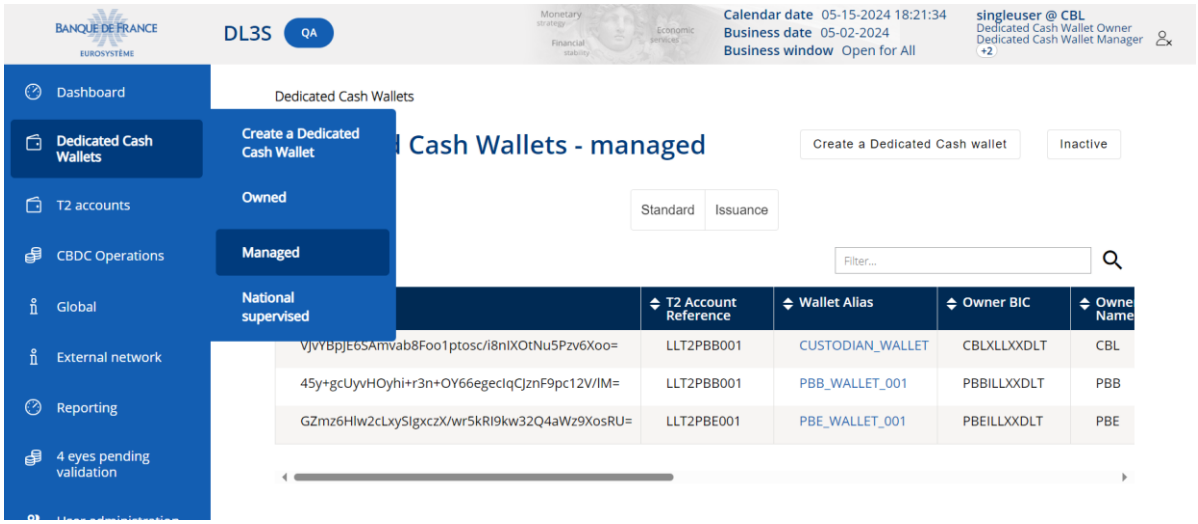


- *T2 Account Reference* column corresponds to the reference of the account in Target 2
- *Country Code* column corresponds to the jurisdiction code of the participant in DL3S
- *Links* corresponds to the entity's BIC linked to the T2 account
- *Valid From* corresponds to the beginning of validity of the T2 account
- *Valid To* corresponds to the end of validity of the T2 account
- Several entities can be linked to the same T2 account

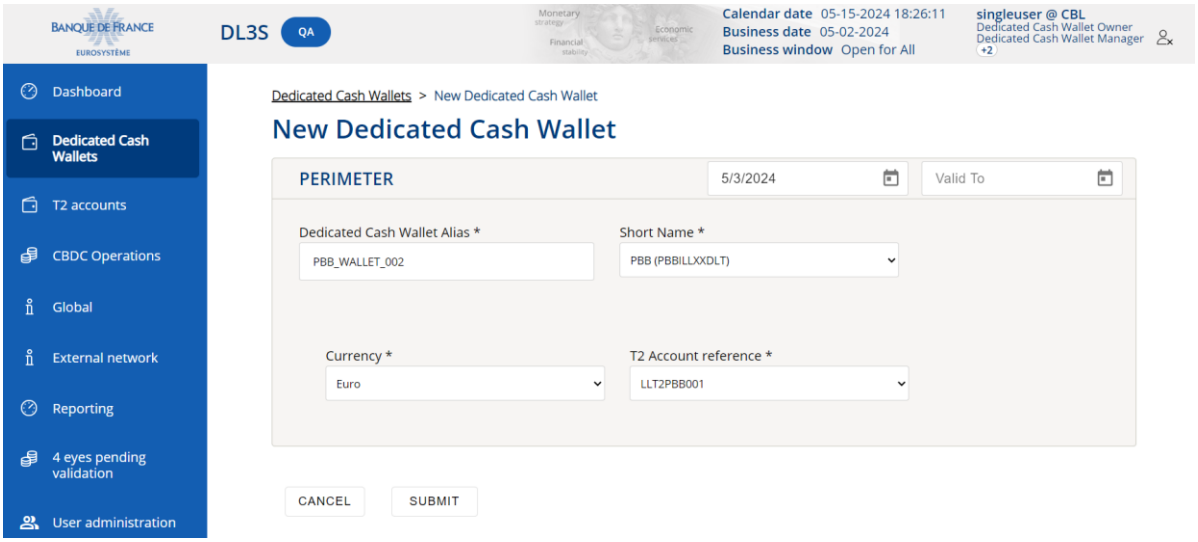
4.1.1.2 Creation of a Dedicated Cash Wallet

Once the T2 account is created, the ***Dedicated Cash Wallet manager*** can create the Dedicated Cash Wallet.

- Click on *Dedicated Cash Wallets – managed tab* and click on *Create a Dedicated Cash Wallet* button on the top right corner

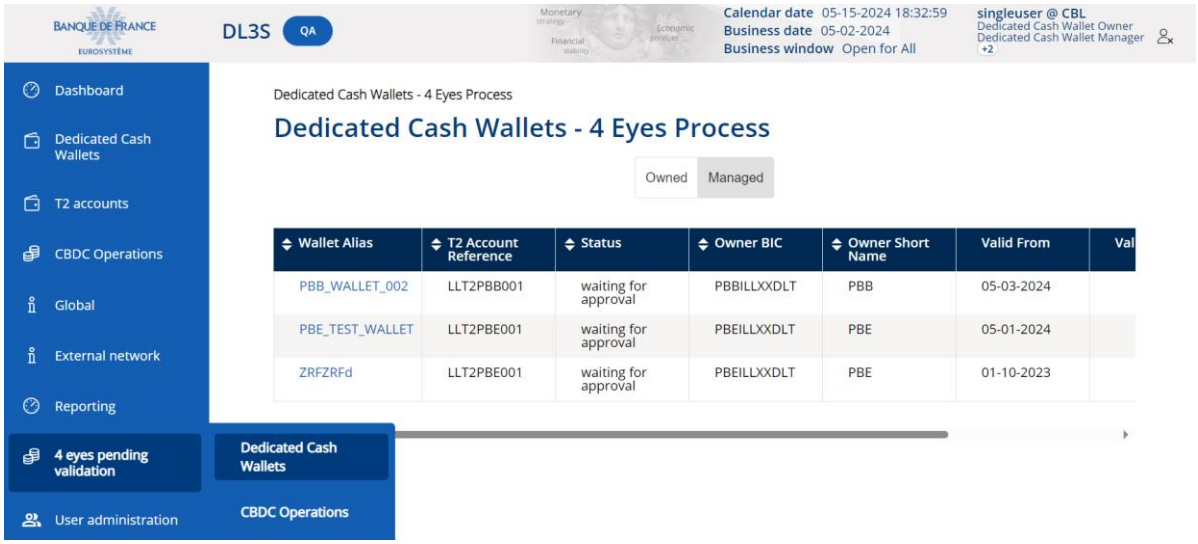


- Fill in for the following fields:

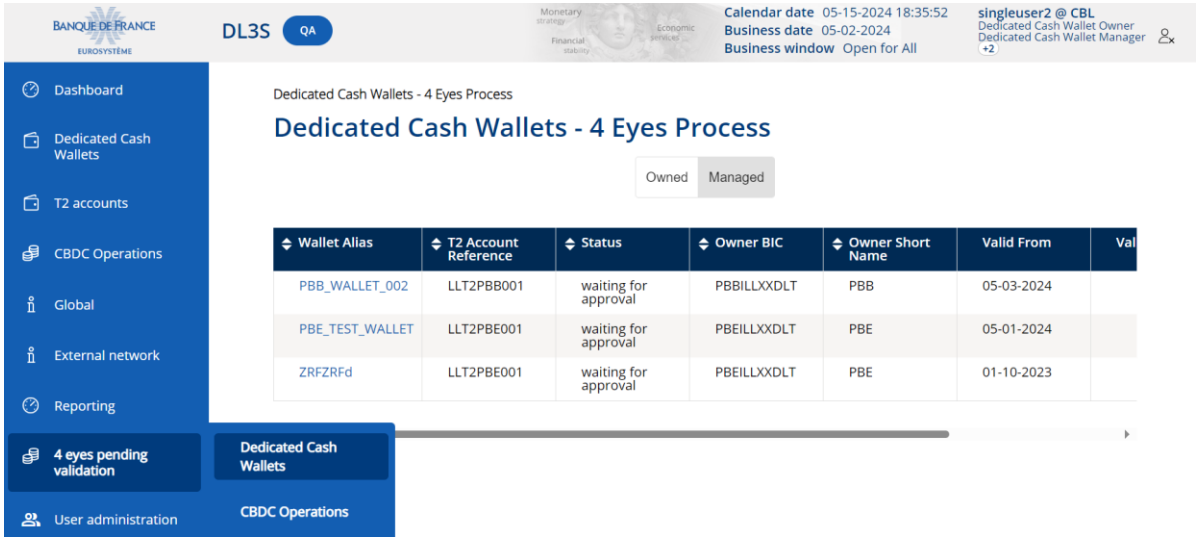


  - *Dedicated Cash Wallet Alias* is usually *Short Name_WALLET_001.* The *DCW alias* can only contain alphanumeric characters, hyphen and underscore. If the *DCW alias* is filled with another special character, an error message will appear and prevent the submission of the request.
  - Select the *Short Name* that correspond to the Entity name
  - *Client Name* has to be filled in with the short name of the participant. The short name appears in the *global* tab – *Participant List* sub tab
  - Choose the *currency* for the wallet
  - Choose the right *T2 account reference* to link to the wallet to
  - Choose a valid from date starting from which the wallet is valid
  - Valid To date is not mandatory

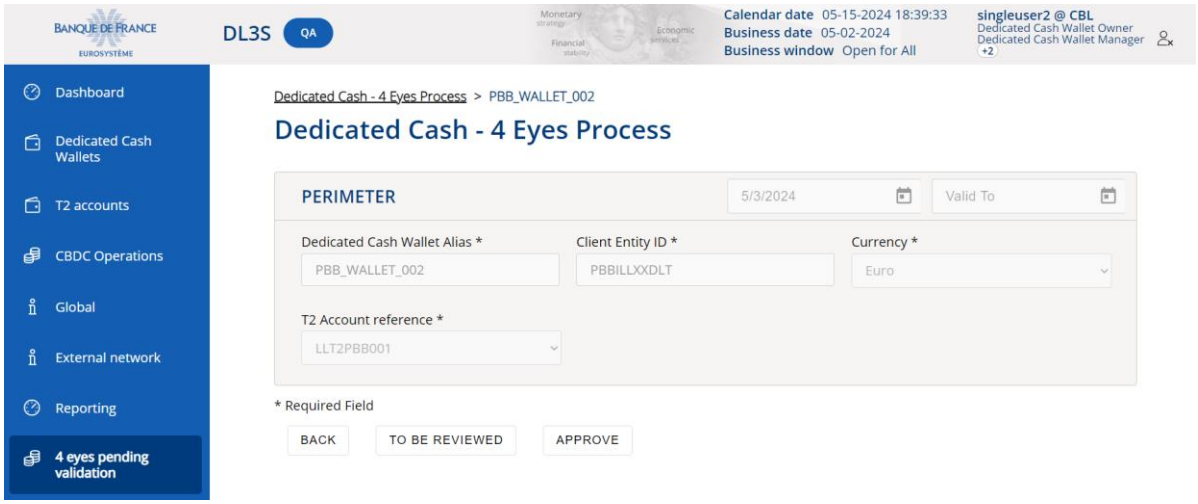
- After you click on the ***Submit*** button, you will see the ***Dedicated Cash Wallet*** waiting for approval in the ***4 eyes pending validation / Dedicated Cash Wallets***



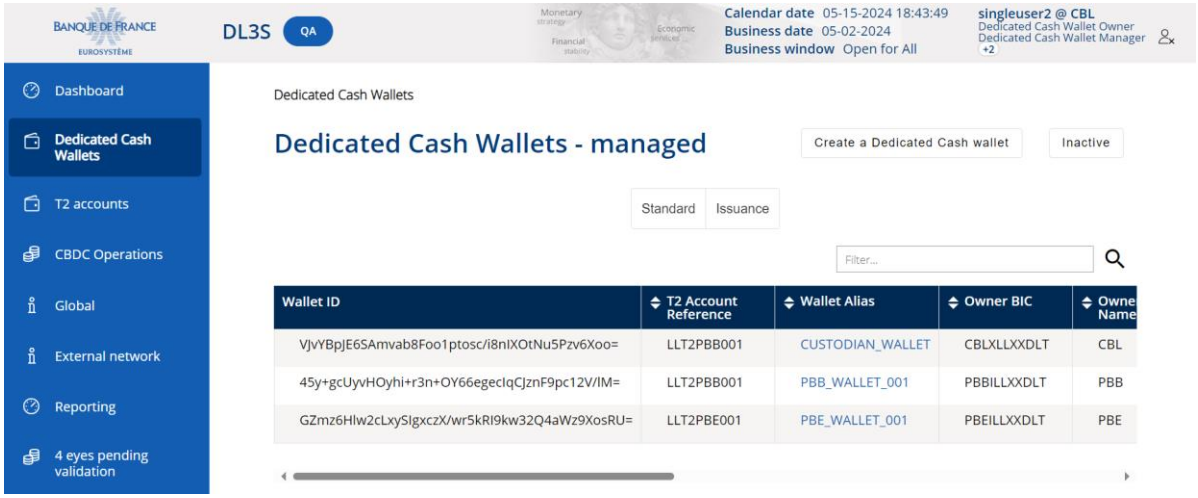
- You need to connect with the single user you didn't use to create the operation
- Go to ***4 eyes process / Dedicated Cash Wallets*** and click on the ***Wallet Alias*** just created with the previous singleuser



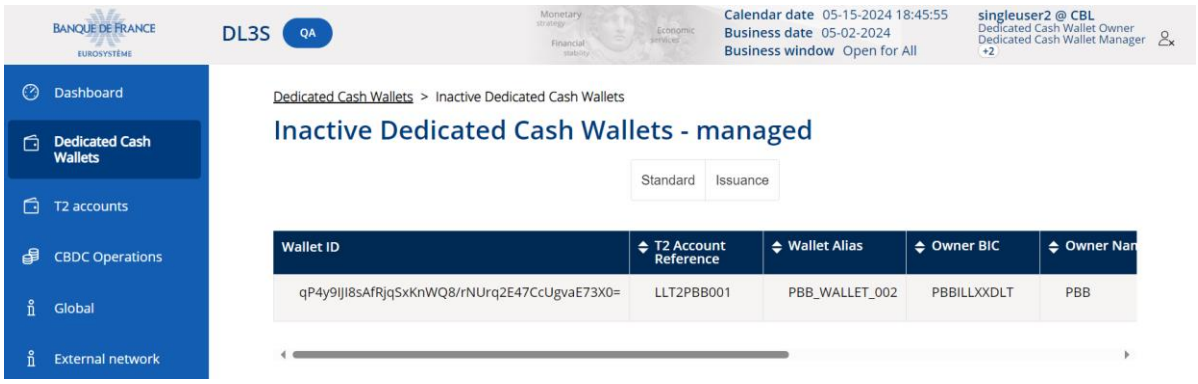
- Validate the Dedicated Cash Wallet by clicking on the **Approve** button

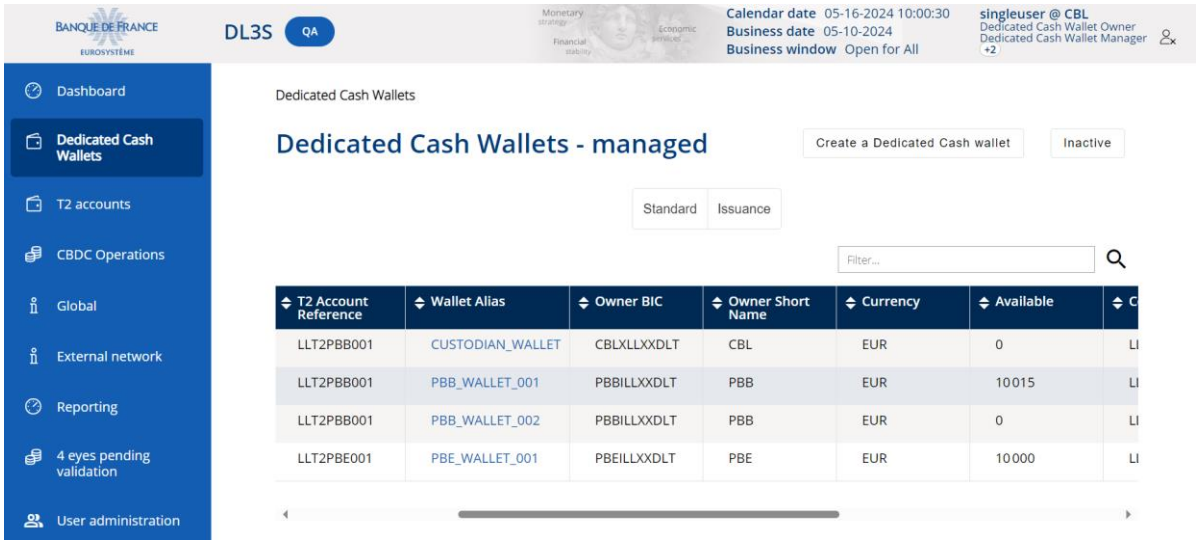


- Go to the ***Dedicated Cash Wallets / Managed*** tab and click on the ***Inactive*** button



- The newly created *Dedicated Cash Wallet* appears in the *Inactive Dedicated Cash Wallets* list. Once the Valid from date is reached, the dedicated cash wallet becomes valid and appears on *Dedicated Cash Wallets – managed* tab.



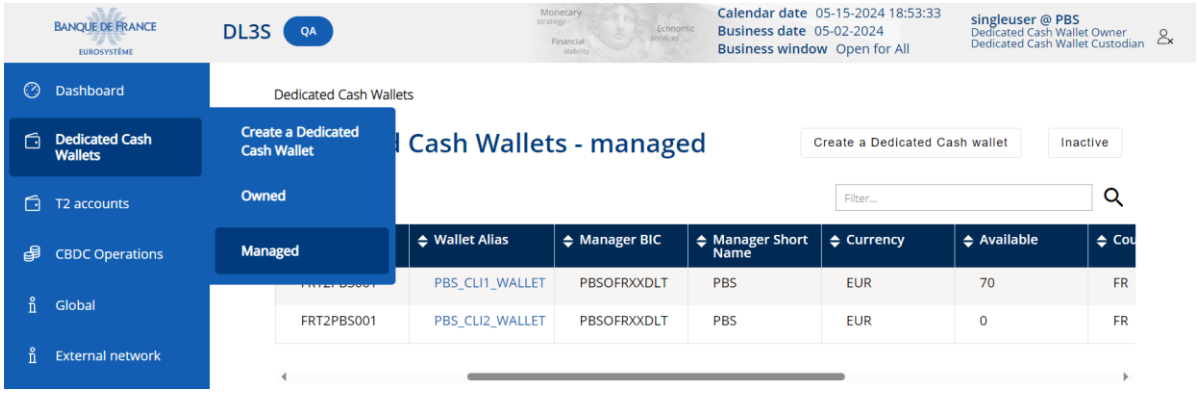


- *Wallet ID* column corresponds to the technical identity of the wallet in DL3S
- *T2 Account reference* column corresponds to the reference of T2 account the Dedicated Cash Wallet is linked to
- *Wallet alias* corresponds to name of the wallet on DL3S platform
- *Owner BIC* corresponds to the BIC of the owner of the wallet
- *Owner Name* corresponds to the name of the owner of the Dedicated Cash Wallet in DL3S
- *Currency* corresponds to the currency of the Dedicated Cash Wallet in DL3S
- *Available* corresponds to the amount of CBDC available in the Dedicated Cash Wallet
- *Country Code* is the jurisdiction code of the participant in DL3S
- *Token details* contains technical details about tokens hold in the wallet. At first, when the wallet is empty, it contains no data.
- *Valid From,* the beginning of the wallet validity date
- *Valid to*, the end of the wallet validity date

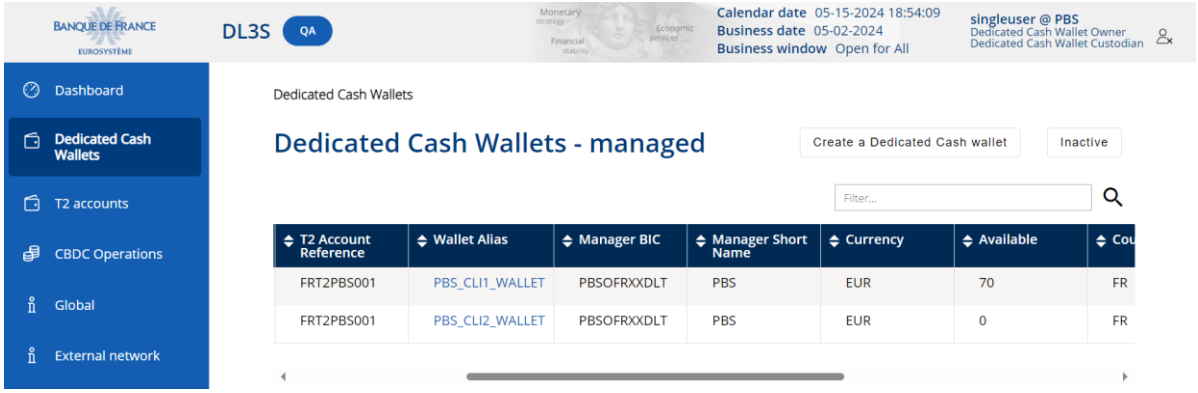
4.1.2 Dedicated Cash Wallet creation by a *Dedicated Cash Wallet Custodian*

A ***Dedicated Cash Wallet custodian*** can create a Dedicated Cash Wallet that will be used by one of its clients. Before creating a Dedicated Cash Wallet, the ***Dedicated Cash Wallet Custodian*** must have added its client to DL3S (see 3.2.3.2) and create a user for him (see 3.5.2).

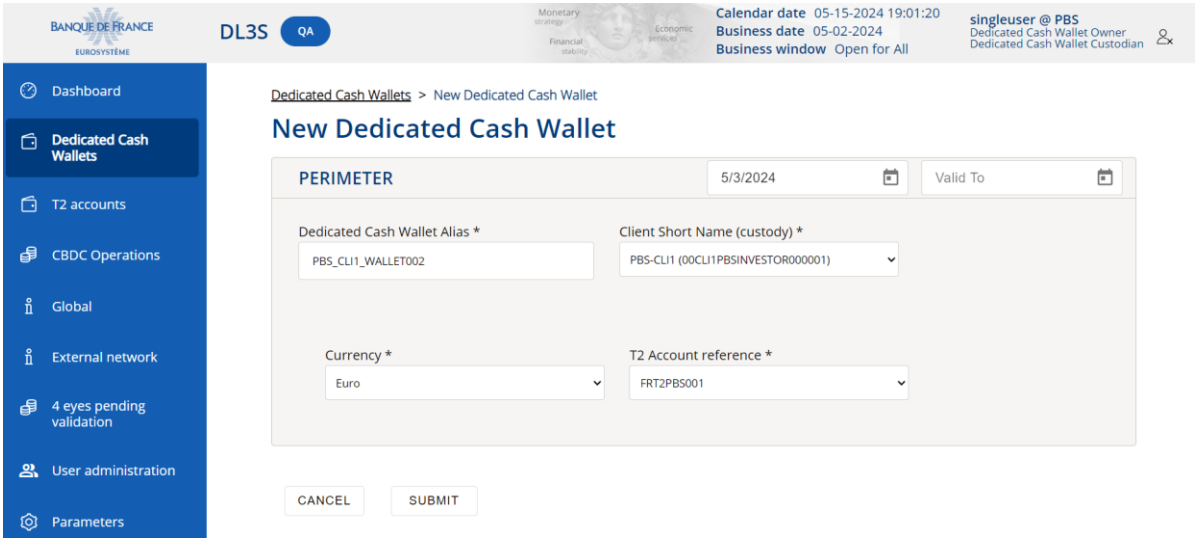
- Connect as a ***Dedicated Cash Wallet custodian***
- Make sure a T2 account is owned by the custodian, elsewhere the ***Dedicated Cash Wallet manager*** of the custodian has to link its T2 account to the custodian (see 4.1.1.1)
- Go to the ***Dedicated Cash Wallets / Managed*** tab



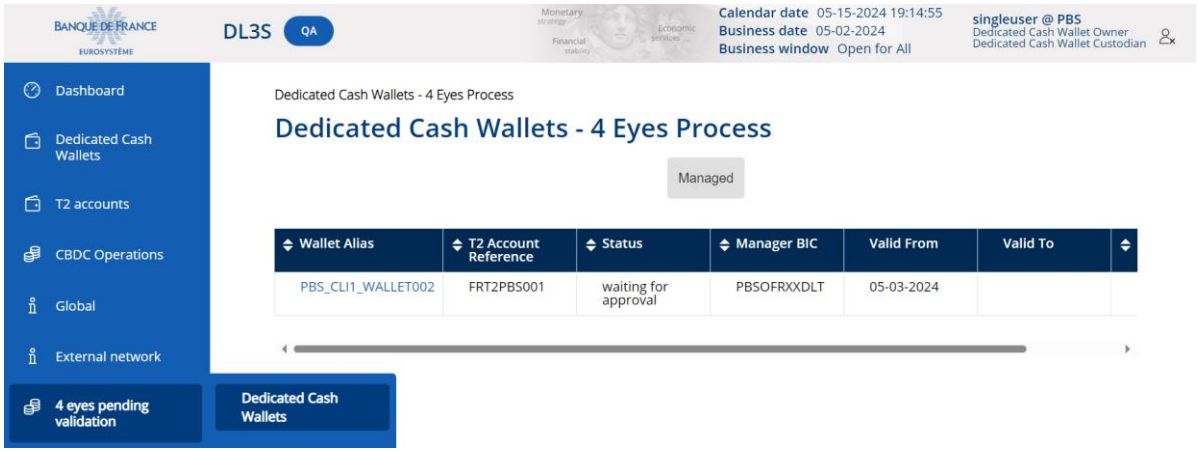
- Click on the *Create a Dedicated Cash Wallet* button



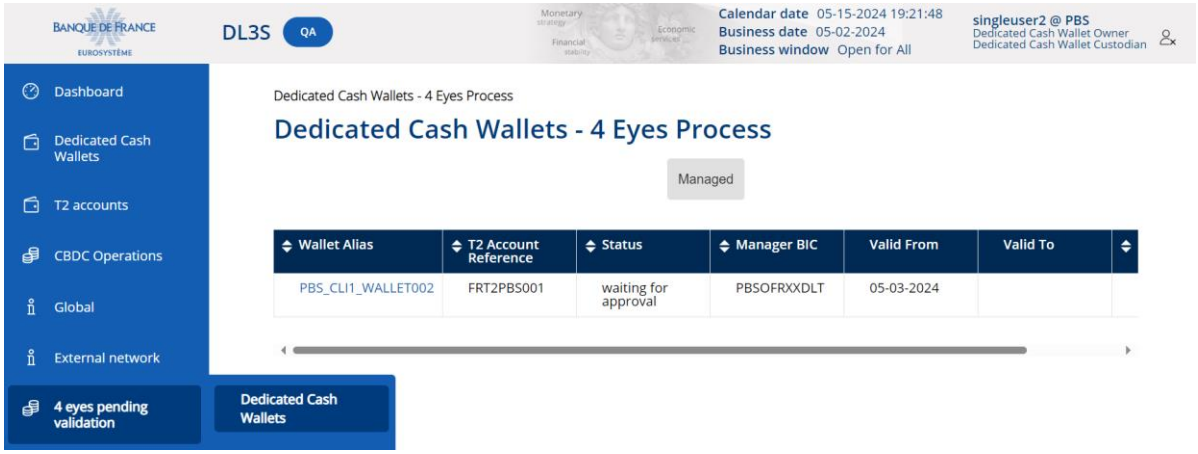
- Fill in for the following fields:
  - *Dedicated Cash Wallet Alias* is usually *ShortName_WALLET_001, for example.* The *DCW alias* can only contain alphanumeric characters, hyphen and underscore. If the *DCW alias* is filled with another special character, an error message will appear and prevent the submission of the request.
  - *Client Name* is the Short Name of the client that will use the Dedicated Cash Wallet. It must correspond to the short name that appears in the *global* tab – *Client List* sub tab
  - Choose the *currency* for the wallet
  - Choose the right *T2 account reference* to link to the wallet to
  - Choose a valid from date starting from which the wallet is valid
  - Valid To date is not mandatory



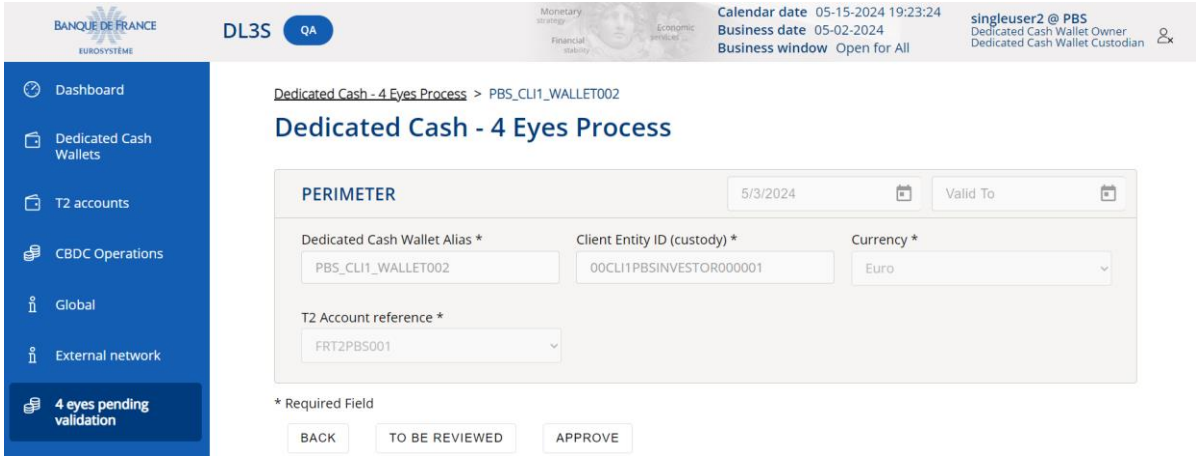
- After you click on the ***Submit*** button, you will see the ***Dedicated Cash Wallet*** waiting for approval in the ***4 eyes pending validation / Dedicated Cash Wallets***



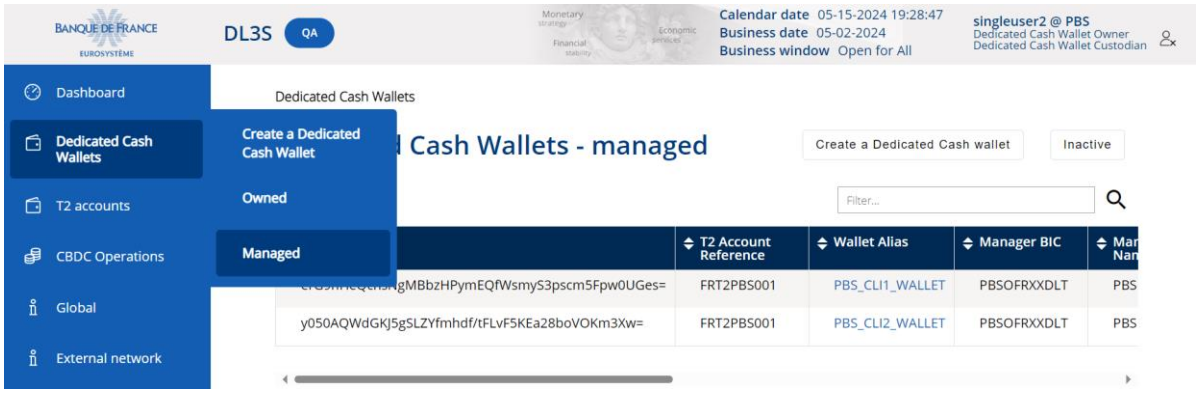
- You need to connect with the single user you didn't use to create the operation
- Go to ***4 eyes process / Dedicated Cash Wallets*** and click on the ***Wallet Alias*** just created with the previous single user



- Validate the Dedicated Cash Wallet by clicking on the **Approve** button

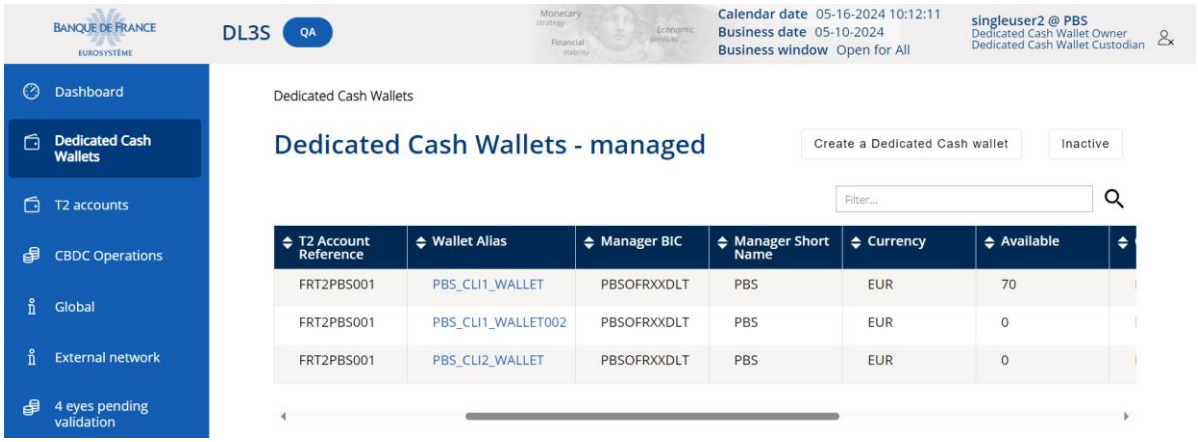


- Go to the ***Dedicated Cash Wallets / Managed*** tab and click on the ***Inactive*** button



- The newly created *Dedicated Cash Wallet* appears in the *Inactive Dedicated Cash Wallets* list.

- Once the Valid from date is reached, the dedicated cash wallet becomes valid and appears on *Dedicated Cash Wallets – managed* tab.



- *Wallet ID* column corresponds to the technical identity of the wallet in DL3S
- *T2 Account reference* column corresponds to the reference of T2 account the Dedicated Cash Wallet is linked to
- *Wallet alias* corresponds to name of the wallet on DL3S platform
- *Owner BIC* corresponds to the BIC of the owner of the wallet
- *Owner Name* corresponds to the name of the owner of the Dedicated Cash Wallet in DL3S
- *Currency* corresponds to the currency of the Dedicated Cash Wallet in DL3S
- *Available* corresponds to the amount of CBDC available in the Dedicated Cash Wallet
- *Country Code* is the jurisdiction code of the participant in DL3S

  Token details contains technical details about tokens hold in the wallet. At first, when the wallet is empty, it contains no data.

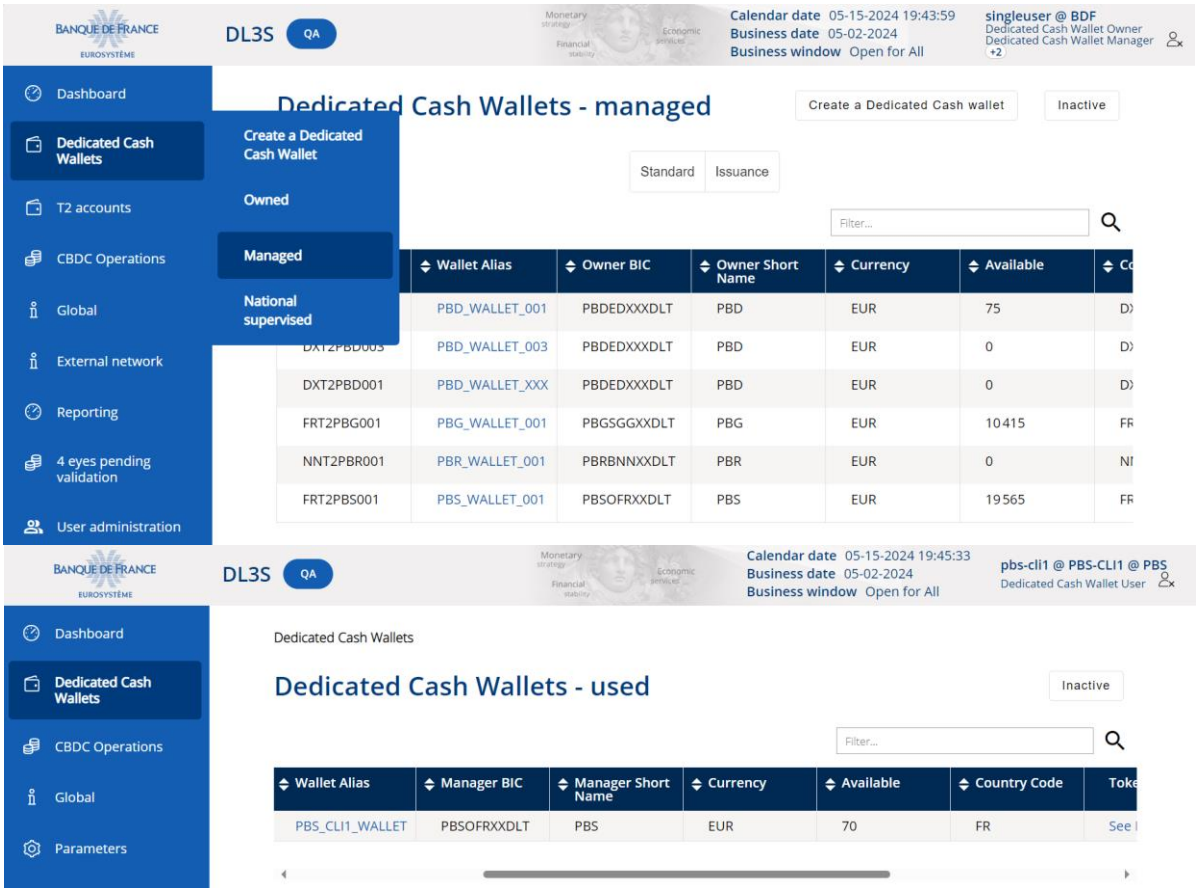
- Connected as the client whom the Dedicated Cash Wallet has been created for, the Dedicated Cash Wallet appears in the *Inactive Dedicated Cash Wallets-used* tab.

Once the Valid from date is reached, the dedicated cash wallet appears on the Dedicated Cash Wallets-used tab.

4.1.3 Dedicated Cash Wallets view

Depending on the roles of the participant, four wallets view exist:

- Dedicated Cash Wallet Owned
  - This tab is accessible to every ***Dedicated Cash Wallet owner*** and contains the list of every Dedicated Cash Wallet owned by the participant.
- Dedicated Cash Wallet Managed
  - This tab is accessible to every ***Dedicated Cash Wallet manager*** and contains the list of every Dedicated Cash Wallet managed by the participant.
- Dedicated Cash Wallet National Supervised
  - This tab is accessible to every ***National CBDC supervisor*** and contains the list of every Dedicated Cash Wallet supervised by the participant.
- Dedicated Cash Wallet Used
  - This tab is accessible to every ***Dedicated Cash Wallets user*** and contains the list of every Dedicated Cash Wallet used by the participant.



4.1.4 Administration of Dedicated Cash Wallets

The participant has access to different information about Dedicated Cash Wallet he is responsible for in order to administrate them.

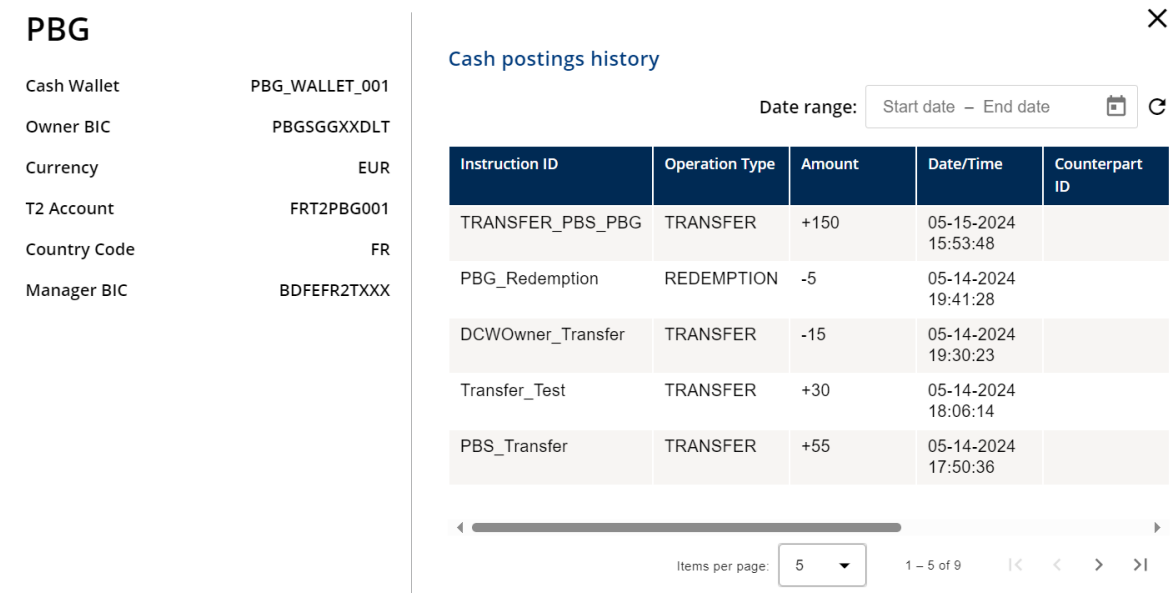
4.1.4.1 Dedicated Cash Wallet owned

This tab is accessible to every ***Dedicated Cash Wallet owner*** and contains the list of every Dedicated Cash Wallet owned by the participant. Plus, it summarizes all characteristics of Dedicated Cash Wallets owned.

- *Wallet ID* column corresponds to the technical identity of the wallet in DL3S
- *T2 Account reference* column corresponds to the reference of T2 account the Dedicated Cash Wallet is linked to
- *Wallet alias* corresponds to name of the wallet on DL3S platform
- *Manager BIC* corresponds to the BIC of the manager of the wallet
- *Manager Name* corresponds to the name of the manager of the Dedicated Cash Wallet in DL3S
- *Currency* corresponds to the currency of the Dedicated Cash Wallet in DL3S
- *Available* corresponds to the amount of CBDC available in the Dedicated Cash Wallet
- *Country Code* is the jurisdiction code of the participant in DL3S

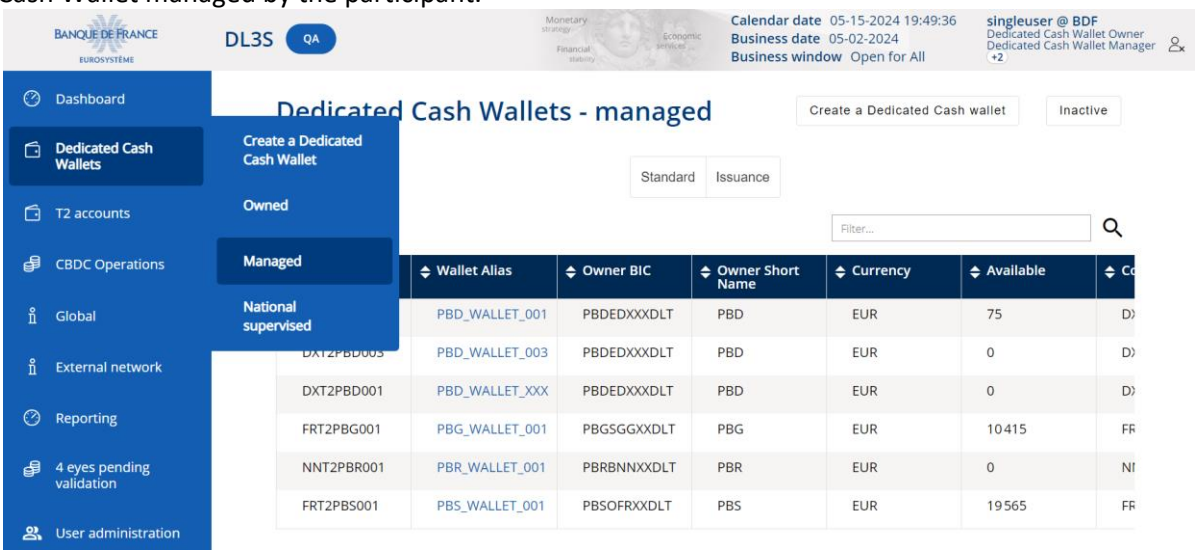
- *Token details* contains technical details about tokens hold in the wallet. At first, when the wallet is empty, it contains no data.
- *Valid From* date
- *Valid To* date

- By clicking on the wallet alias, the participant has access to the movement history of the Dedicated Cash Wallet. Each instruction on the Dedicated Cash Wallet is registered with the date and time, the counterpart (accordingly to operations' type privacy requirements), the amount of the transaction and the ID instruction. The owner can also check the balance of the wallet.



4.1.4.2 Dedicated Cash Wallet managed

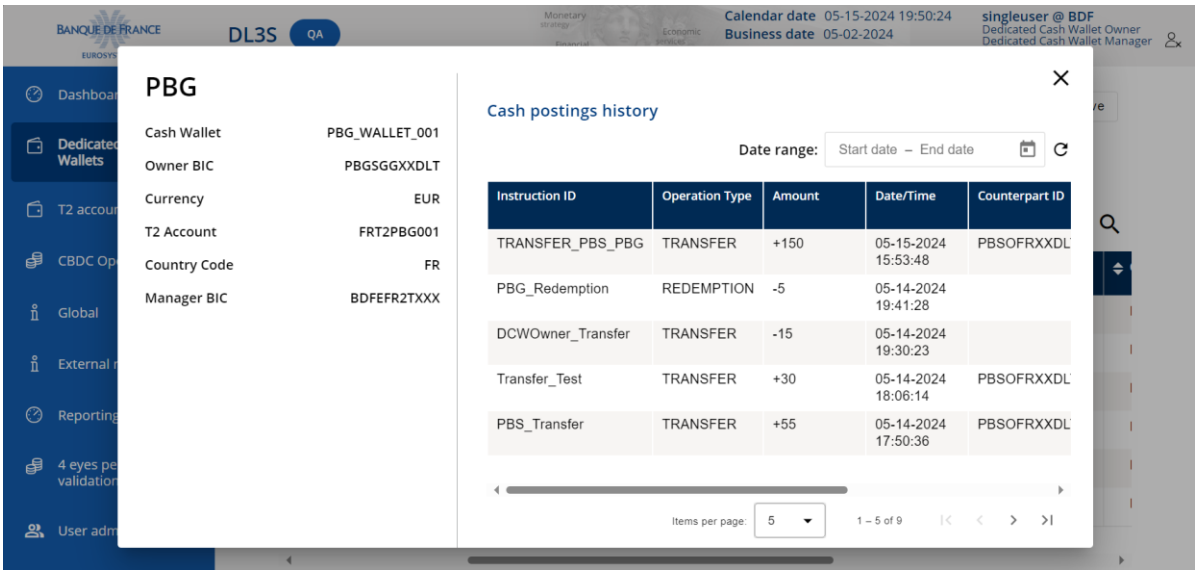
This tab is accessible to every ***Dedicated Cash Wallet manager*** and contains the list of every Dedicated Cash Wallet managed by the participant.



- *Wallet ID* column corresponds to the technical identity of the wallet in DL3S
- *T2 Account reference* column corresponds to the reference of T2 account the Dedicated Cash Wallet is linked to
- *Wallet alias* corresponds to name of the Dedicated Cash Wallet on DL3S platform
- *Owner BIC* corresponds to the BIC of the owner of the Dedicated Cash Wallet

- *Owner Name* corresponds to the name of the owner of the Dedicated Cash Wallet in DL3S
- *Currency* corresponds to the currency of the Dedicated Cash Wallet in DL3S
- *Available* corresponds to the amount of CBDC available in the Dedicated Cash Wallet
- *Country Code* is the jurisdiction code of the participant in DL3S
- *Token details* contains technical details about tokens hold in the wallet. At first, when the wallet is empty, it contains no data.
- *Valid From* date
- *Valid To* date

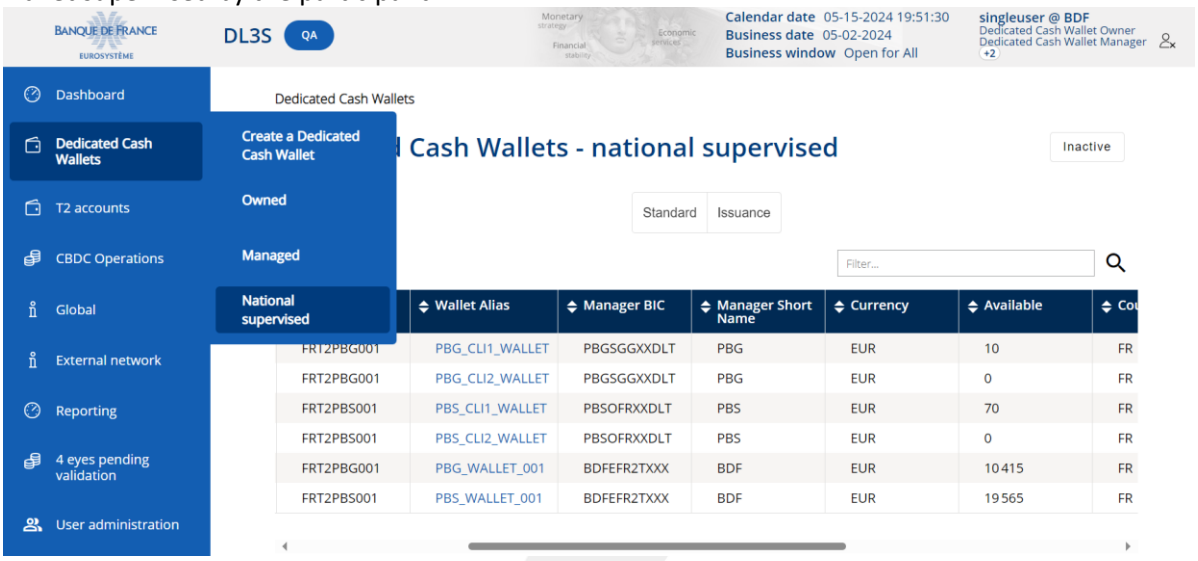
- By clicking on the wallet alias, the participant has access to the movement history of the Dedicated Cash Wallet managed. Each instruction on the Dedicated Cash Wallet is registered with the date and time, the counterpart (accordingly to operations' type privacy requirements), the amount of the transaction and the ID instruction. The manager can also check the balance of the Dedicated Cash Wallet.



It is to be noted that this page also enables to create a Dedicated Cash Wallet as ***Dedicated Cash Wallet manager*** (see 4.1.1).

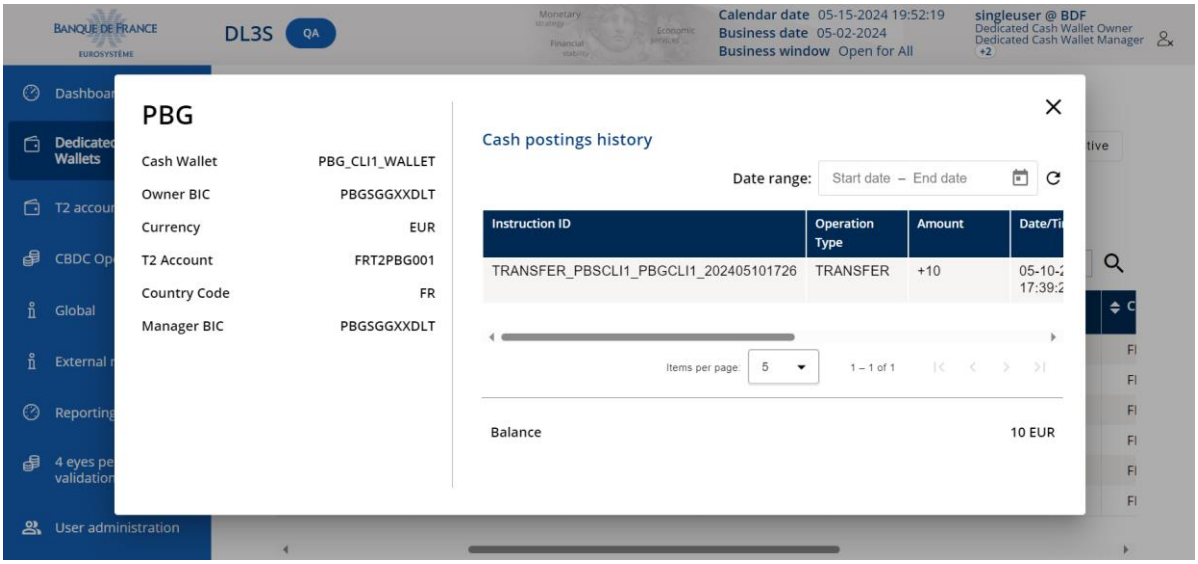
4.1.4.3 Dedicated Cash Wallet National supervised

This tab is accessible to every ***National CBDC supervisor*** and contains the list of every Dedicated Cash Wallet supervised by the participant.



- *Wallet ID* column corresponds to the technical identity of the Dedicated Cash Wallet in DL3S
- *T2 Account reference* column corresponds to the reference of T2 account the Dedicated Cash Wallet is linked to
- *Wallet alias* corresponds to name of the Dedicated Cash Wallet on DL3S platform
- *Manager BIC* corresponds to the BIC of the manager of the Dedicated Cash Wallet
- *Manager Name* corresponds to the name of the manager of the Dedicated Cash Wallet in DL3S
- *Currency* corresponds to the currency of the Dedicated Cash Wallet in DL3S
- *Available* corresponds to the amount of CBDC available in the Dedicated Cash Wallet
- *Country Code* is the jurisdiction code of the participant in DL3S
- *Token details* contains technical details about tokens hold in the Dedicated Cash Wallet. At first, when the Dedicated Cash Wallet is empty, it contains no data.
- *Valid From* date
- *Valid To* date

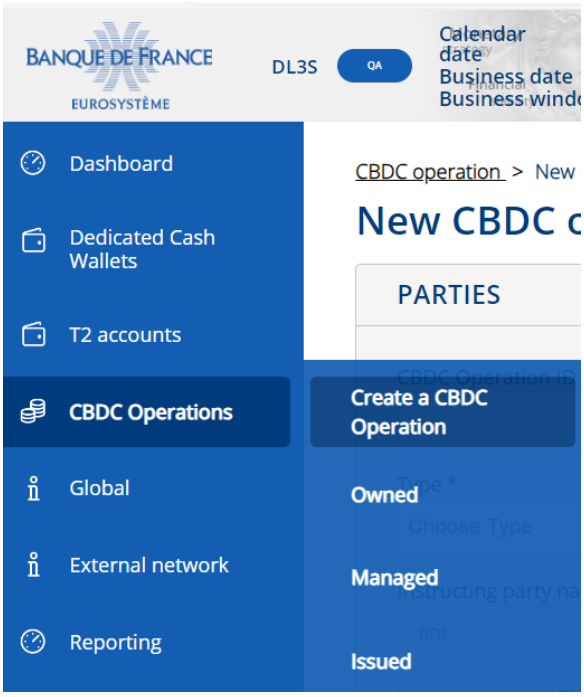
- By clicking on the wallet alias, the participant has access to the movement history of the Dedicated Cash Wallet supervised. Each instruction on the Dedicated Cash Wallet is registered with the date and time, the counterpart (accordingly to operations' type privacy requirements), the amount of the transaction and the ID instruction. The manager can also check the balance of the Dedicated Cash Wallet.



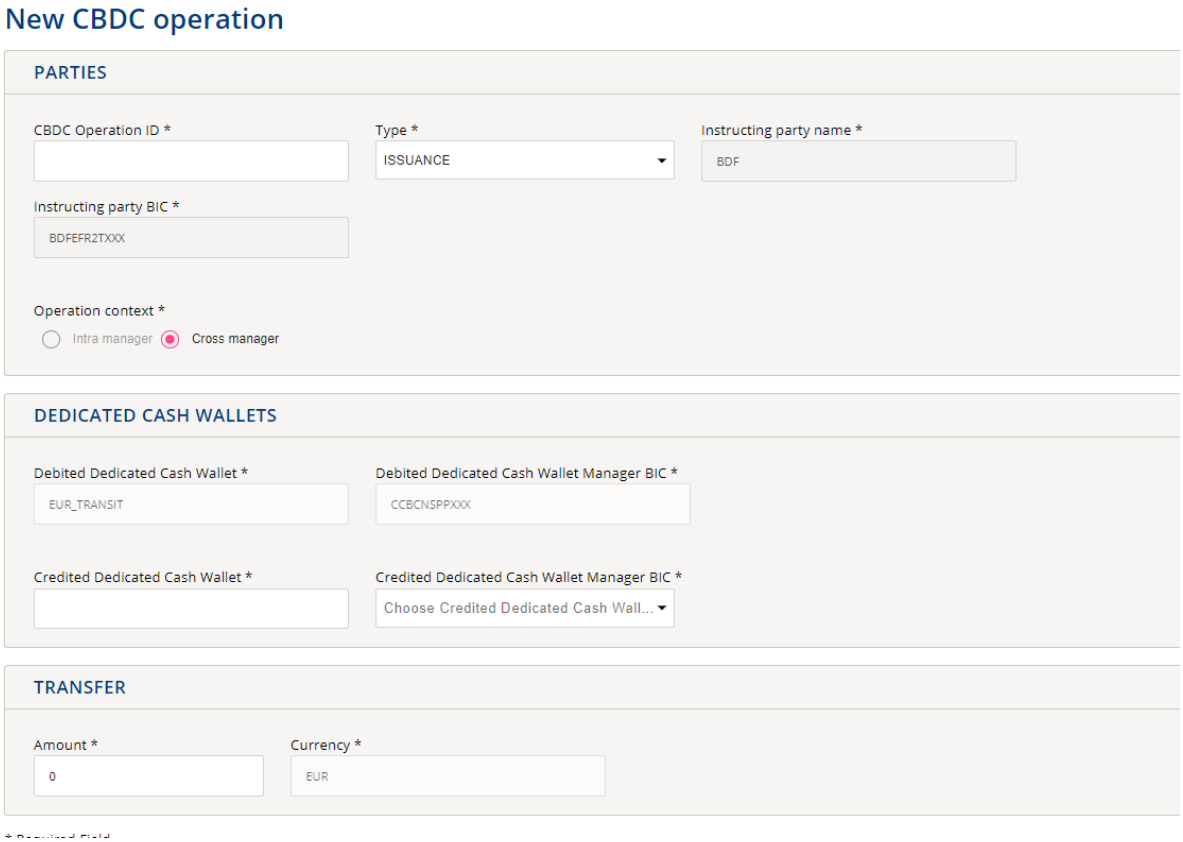
4.2 CBDC issuance (CBDC issuer only)

To operate a CBDC issuance, one needs to connect as a ***CBDC issuer*** since only a ***CBDC issuer*** can issue CBDCs. The CBDC issuance includes a four eyes process to ensure a verification of the issuance.

- To access the issuance creation file, select the Create a *CBDC Operation* subtab

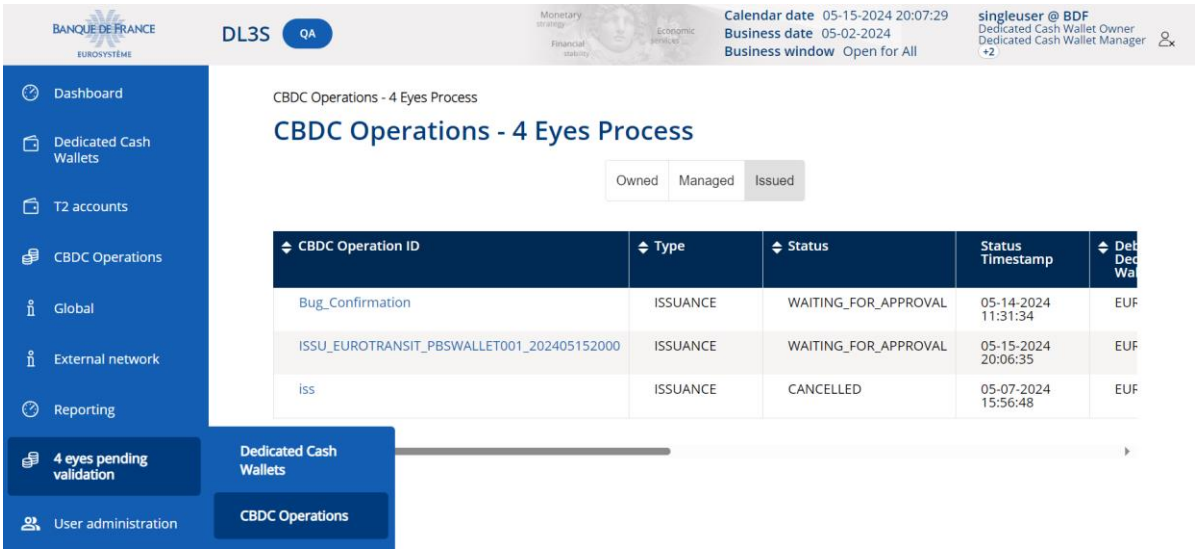


- Select the issuance type so that debited parties will be automatically filled in and operation context cross-manager will be automatically selected.

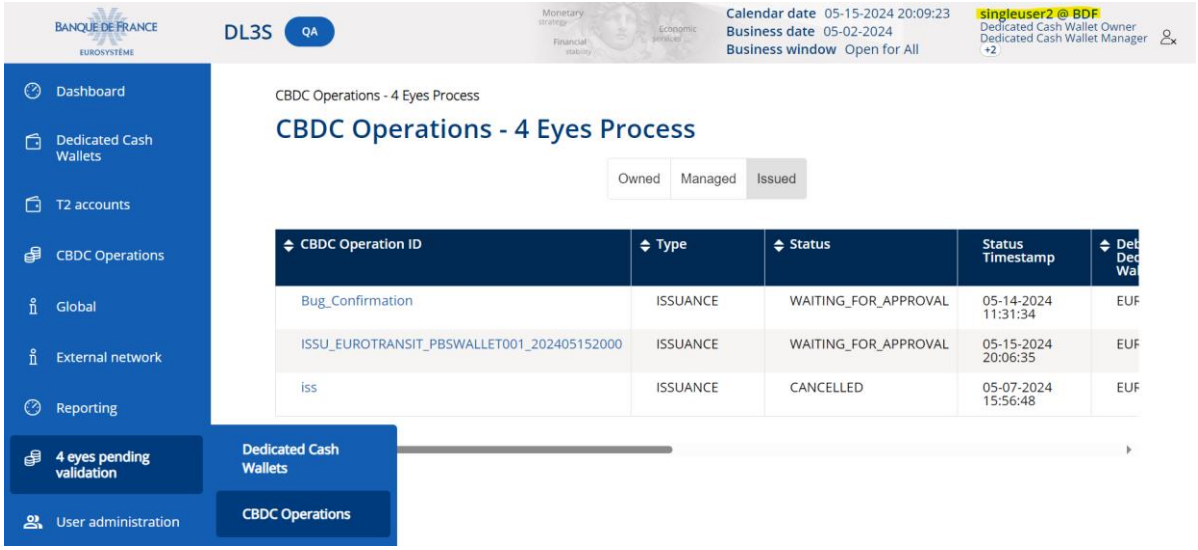


- Then, one has to fill in:
  - *CBDC Operation ID,* it is to be unique. Commonly the form is ISSUANCE_debited wallet alias_credited wallet alias_date&time_. The *CBDC Operation ID* can only contain

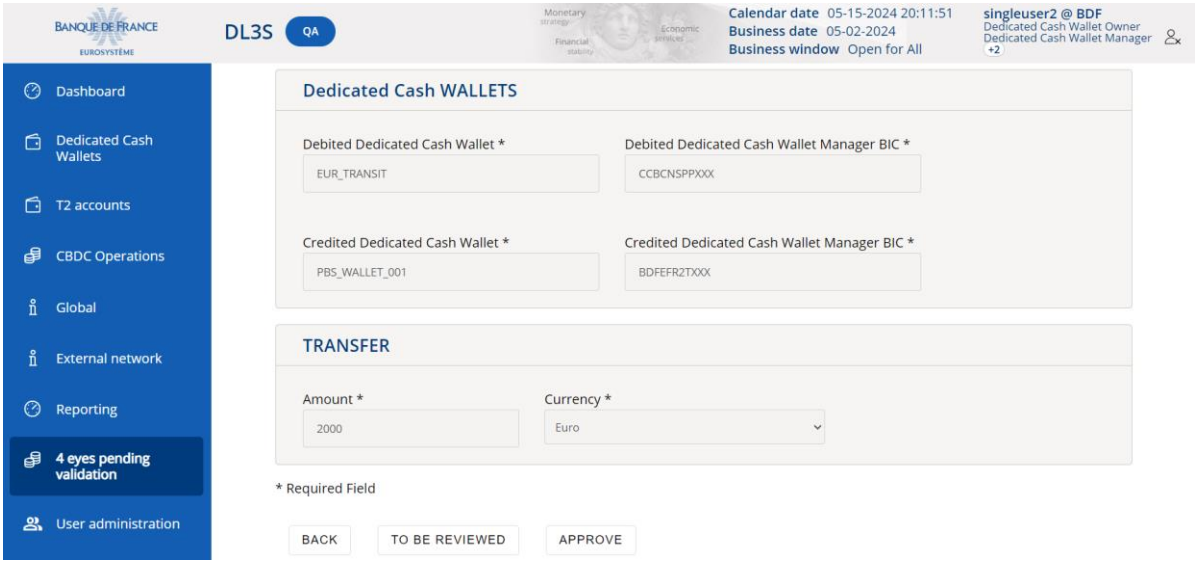
alphanumeric characters, hyphen and underscore. If the *CBDC Operation ID* is filled with another special character, an error message will appear and prevent the submission of the request.
    - *Credited Dedicated Cash Wallet* corresponds to the credited Wallet alias
    - *Credited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the credited Dedicated Cash Wallet
    - *Amount* corresponds amount of the issuance
- Following information are already filled in:
    - *Instructing party name,* the name of the issuer instructing the issuance
    - *Instructing party BIC,* the BIC of the issuer instructing the issuance
    - *Debited Dedicated Cash Wallet* corresponds to the debited Wallet alias
    - *Debited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the debited Dedicated Cash Wallet
    - *Currency* corresponds to the currency of the issued CBDC
- Once the issuance is submitted, the four eyes process intervenes.
- In the 4 eyes process tab the issuance operation just launched appeared with the "WAITING_FOR_APPROVAL" status. The 4 eyes process is a Central bank internal process of checking of an issuance. Concretely, another user of the central bank issuing CBDC will need to approve or to send back to be reviewed the issuance operation.



- One need now to connect as another user of the same central bank and click on the *4 eyes process* tab



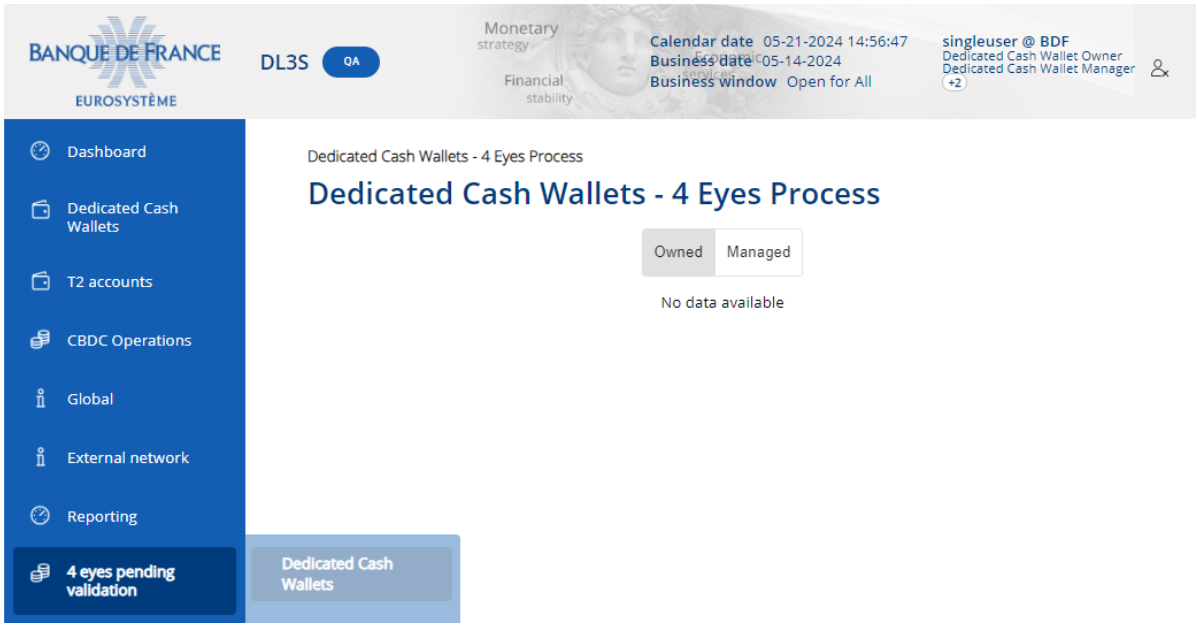
- By clicking on the operation ID, the second user has access to the issuance operation information. It is only readable information, no modification can be made.



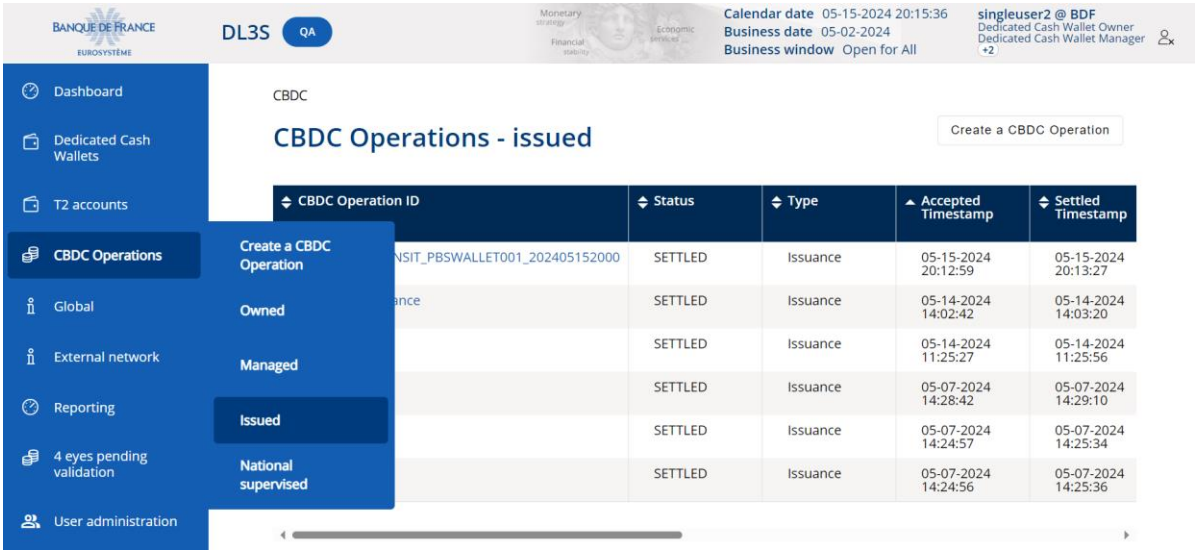
- After checking, the second user can either approve the issuance or send it back to be reviewed

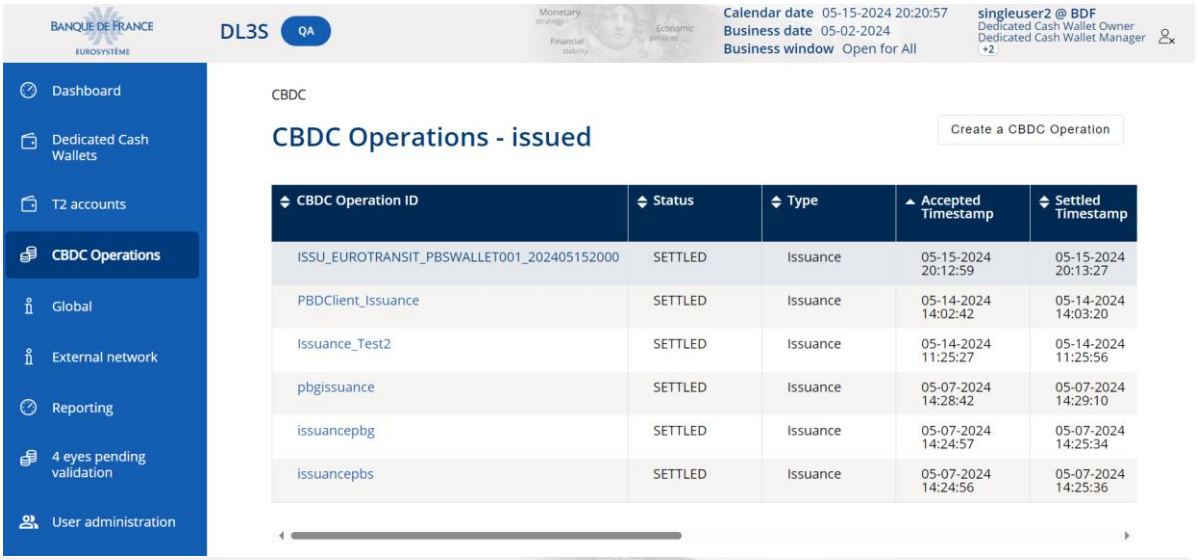
4.2.1 4 eyes process approval

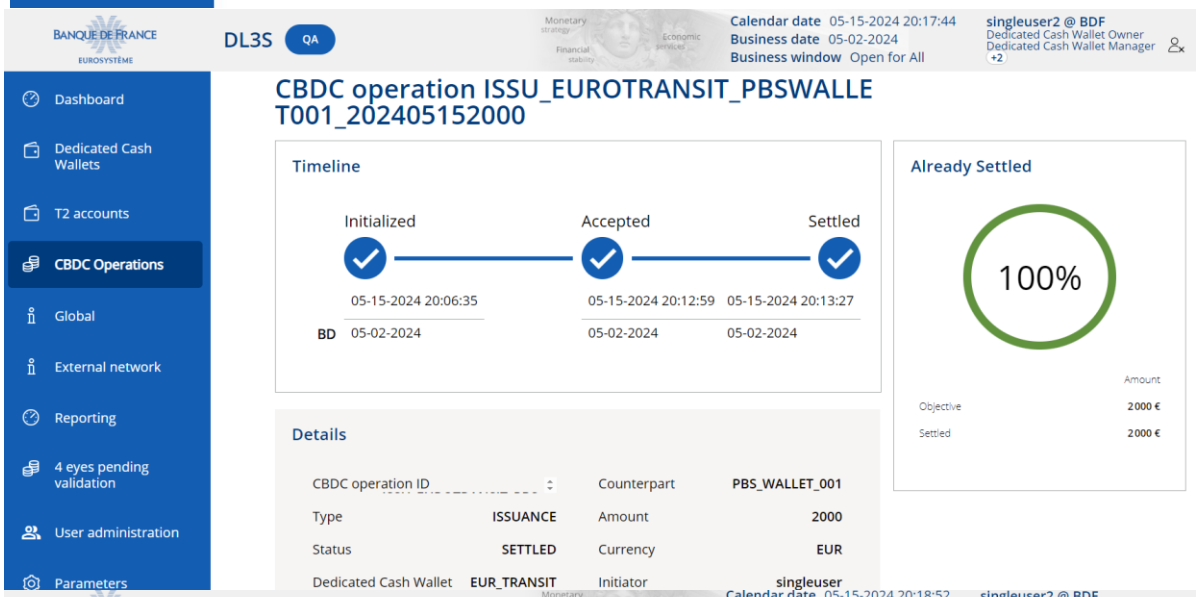
- If the second user approves the issuer, the issuance operation disappears from the *4 eyes pending validation* tab

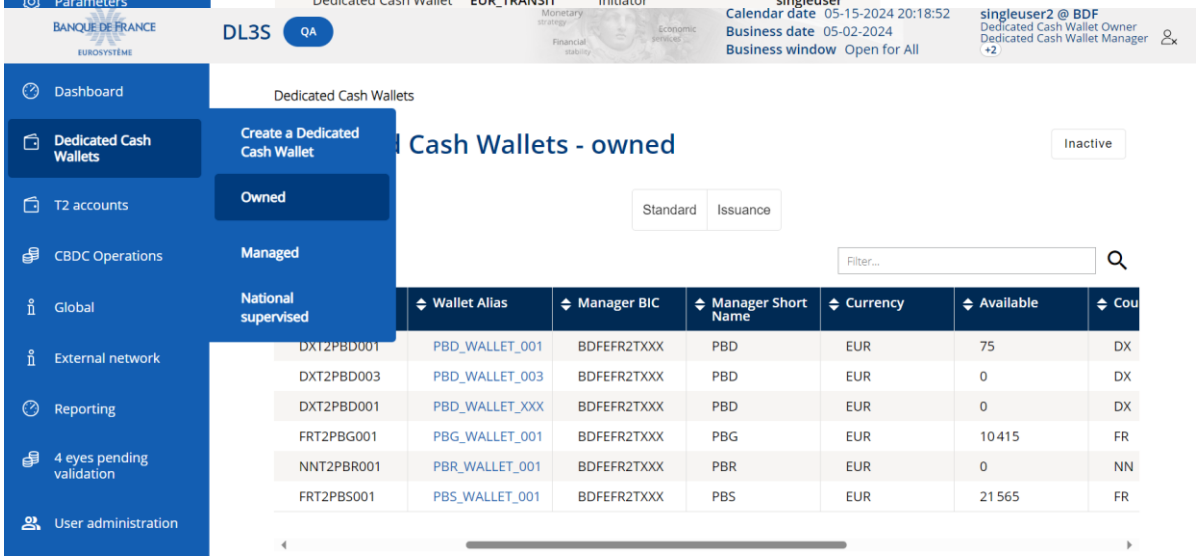


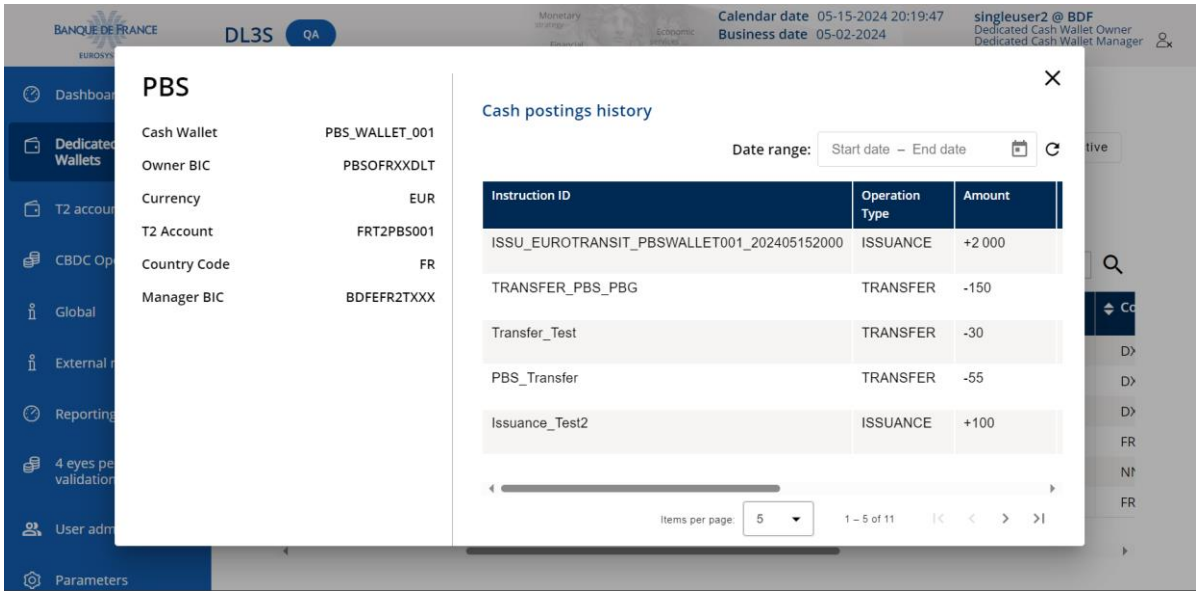
- Connecting back as the first user who instructed the operation, the operation now appears in the *issued* tab with the "settled" status.
- One can control by checking the credited and the debited wallets that the issuance indeed happened.




BANQUE DE FRANCE
EUROSYSTÈME
DL3S
QA
Calendar date 05-15-2024 20:20:57
Business date 05-02-2024
Business window Open for All
singleuser2 @ BDF
Dedicated Cash Wallet Owner
Dedicated Cash Wallet Manager
+2
Dashboard
Dedicated Cash Wallets
T2 accounts
CBDC Operations
Global
External network
Reporting
4 eyes pending validation
User administration
CBDC
CBDC Operations - issued
Create a CBDC Operation
CBDC Operation ID
Status
Type
Accepted Timestamp
Settled Timestamp
ISSU_EUROTRANSIT_PBSWALLET001_202405152000
SETTLED
Issuance
05-15-2024 20:12:59
05-15-2024 20:13:27
PBDClient_Issuance
SETTLED
Issuance
05-14-2024 14:02:42
05-14-2024 14:03:20
Issuance_Test2
SETTLED
Issuance
05-14-2024 11:25:27
05-14-2024 11:25:56
pbgissuance
SETTLED
Issuance
05-07-2024 14:28:42
05-07-2024 14:29:10
issuancepbg
SETTLED
Issuance
05-07-2024 14:24:57
05-07-2024 14:25:34
issuancepbs
SETTLED
Issuance
05-07-2024 14:24:56
05-07-2024 14:25:36

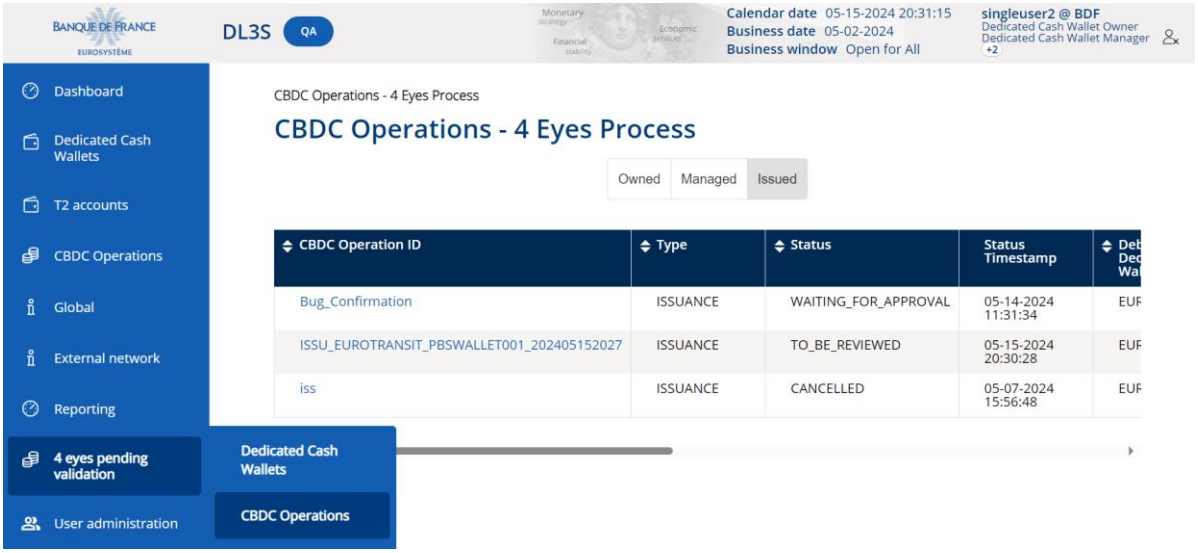

BANQUE DE FRANCE
EUROSYSTÈME
DL3S
QA
Calendar date 05-15-2024 20:17:44
Business date 05-02-2024
Business window Open for All
singleuser2 @ BDF
Dedicated Cash Wallet Owner
Dedicated Cash Wallet Manager
+2
Dashboard
Dedicated Cash Wallets
T2 accounts
CBDC Operations
Global
External network
Reporting
4 eyes pending validation
User administration
Parameters
CBDC operation ISSU_EUROTRANSIT_PBSWALLET001_202405152000
Timeline
Initialized
Accepted
Settled
05-15-2024 20:06:35
05-15-2024 20:12:59
05-15-2024 20:13:27
BD
05-02-2024
05-02-2024
05-02-2024
Already Settled
100%
Amount
Objective
2000 €
Settled
2000 €
Details
CBDC operation ID
Counterpart
PBS_WALLET_001
Type
ISSUANCE
Amount
2000
Status
SETTLED
Currency
EUR
Dedicated Cash Wallet
EUR_TRANSIT
Initiator
singleuser


BANQUE DE FRANCE
EUROSYSTÈME
DL3S
QA
Calendar date 05-15-2024 20:18:52
Business date 05-02-2024
Business window Open for All
singleuser2 @ BDF
Dedicated Cash Wallet Owner
Dedicated Cash Wallet Manager
+2
Dashboard
Dedicated Cash Wallets
T2 accounts
CBDC Operations
Global
External network
Reporting
4 eyes pending validation
User administration
Dedicated Cash Wallets
Create a Dedicated Cash Wallet
Owned
Managed
National supervised
Cash Wallets - owned
Inactive
Standard
Issuance
Filter...
Wallet Alias
Manager BIC
Manager Short Name
Currency
Available
PBD_WALLET_001
BDFEFR2TXXX
PBD
EUR
75
PBD_WALLET_003
BDFEFR2TXXX
PBD
EUR
0
PBD_WALLET_XXX
BDFEFR2TXXX
PBD
EUR
0
PBG_WALLET_001
BDFEFR2TXXX
PBG
EUR
10 415
PBR_WALLET_001
BDFEFR2TXXX
PBR
EUR
0
PBS_WALLET_001
BDFEFR2TXXX
PBS
EUR
21 565

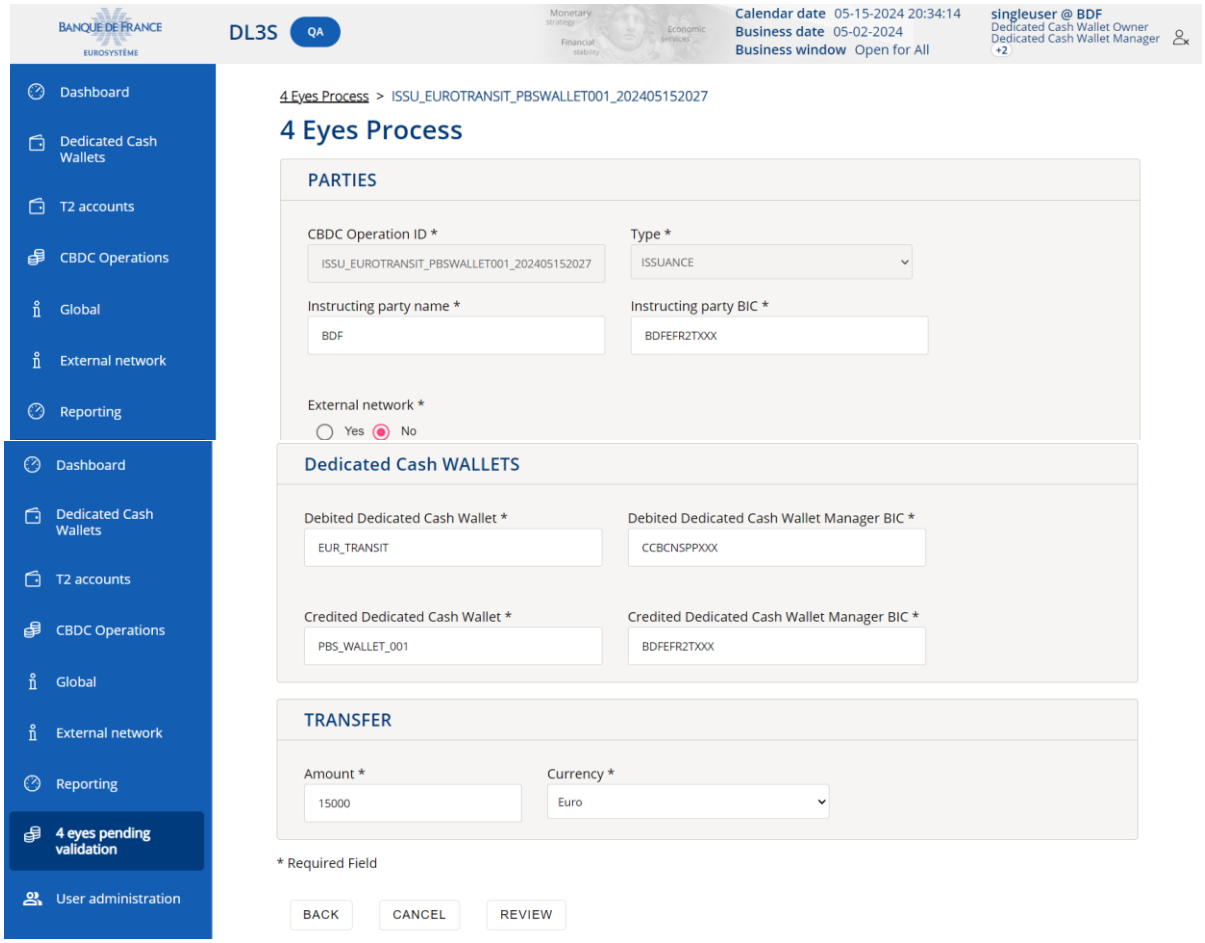


4.2.2 4 eyes process review

- If the second user chooses to review the issuance, the issuance operation appears in the *4 eyes process* tab with the "TO_BE_REVIEWED" status



- The instructing issuer needs to connect on click on the *4 eyes process* tab where the issuance instruction also appears with the "TO_BE_REVIEWED" status.
- By clicking on the issuance operation ID, the instructing issuer can review the characteristics of the issuance and correct them.



- Once corrections have be made, the instructing issuer can review its issuance operation that will appear in the 4 eyes process tab with “WAITING_FOR_APPROVAL” status and enter the 4 eyes process again until its approval (see 4.2.1).

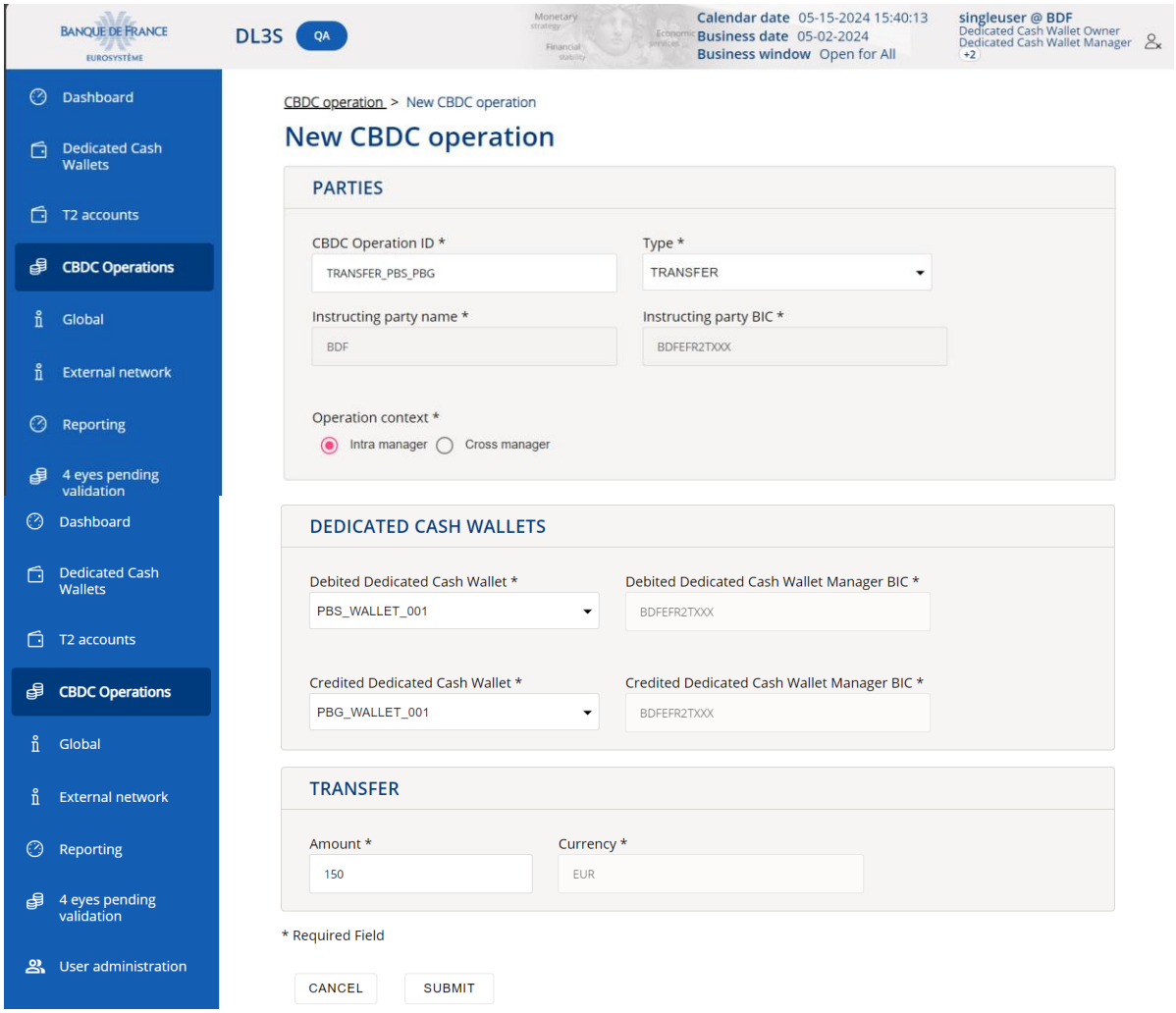
4.3 CBDC transfer

CBDC transfer can be instructed by:

- ***Dedicated Cash Wallet Manager*** on a Dedicated Cash Wallet he manages
- ***Dedicated Cash Wallet Owner*** on a Dedicated Cash Wallet he owns
- ***Dedicated Cash Wallet Custodian*** on behalf of a ***Dedicated Cash Wallet user***

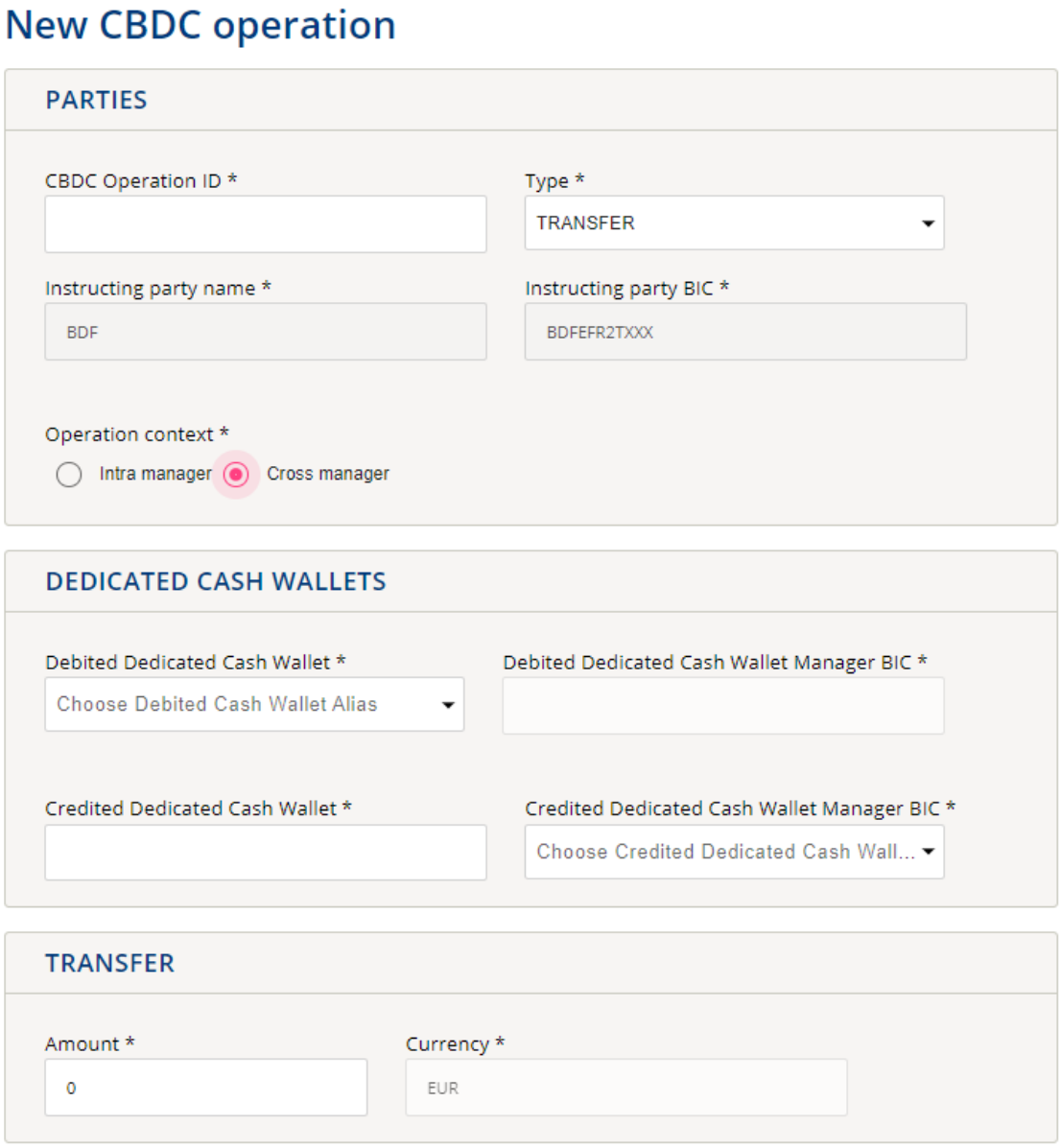
4.3.1 CBDC transfer instructed by a *Dedicated Cash Wallet manager*

- One needs to connect as a ***Dedicated Cash Wallet manager*** and to click on the *Create a CBDC Operations* tab in *CBDC Operations* tab.
- One firstly needs then to select the transfer type and the operation context, intra-manager or cross-manager. Depending on context, some fields will be pre-filled:
- For a transfer in an intra-manager context, one has to fill in



- *CBDC Operation ID,* it is to be unique. Commonly the form is TRANSFER_debited wallet alias_credited wallet alias_date&time. The *CBDC Operation ID* can only contain alphanumeric characters, hyphen and underscore. If the *CBDC Operation ID* is filled with another special character, an error message will appear and prevent the submission of the request.
- *Debited Dedicated Cash Wallet* corresponds to the debited Wallet alias
- *Credited Dedicated Cash Wallet* corresponds to the credited Wallet alias
- *Amount* corresponds amount of the issuance

- The following information will be pre-filled for an intra-manager transfer:
  - *Instructing party name,* the name of the party instructing the transfer
  - *Instructing party BIC,* the BIC of the party instructing the transfer
  - *Debited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the debited Dedicated Cash Wallet
  - *Credited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the credited Dedicated Cash Wallet
  - *Currency* corresponds to the currency of the CBDC transferred
- For a transfer in a cross-manager context, one has to fill in

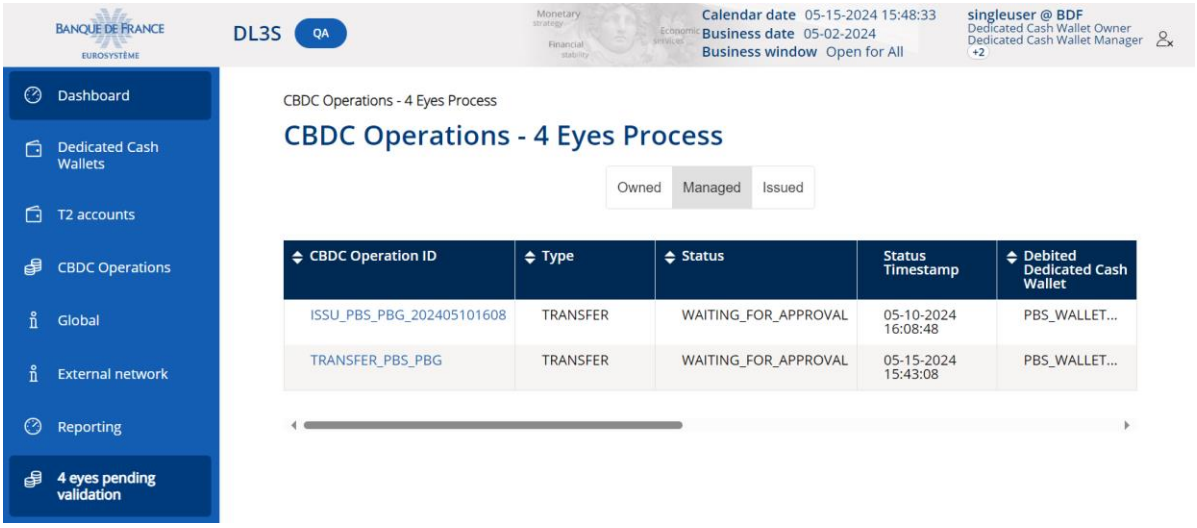


- *CBDC Operation ID,* it is to be unique. Commonly the form is TRANSFER_debited wallet alias_credited wallet alias_date&time. The *CBDC Operation ID* can only contain alphanumeric characters, hyphen and underscore. If the *CBDC Operation ID* is filled with another special character, an error message will appear and prevent the submission of the request.
- *Debited Dedicated Cash Wallet* corresponds to the debited Wallet alias
- *Credited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the credited Dedicated Cash Wallet
- *Credited Dedicated Cash Wallet* corresponds to the credited Wallet alias
- *Amount* corresponds amount of the issuance

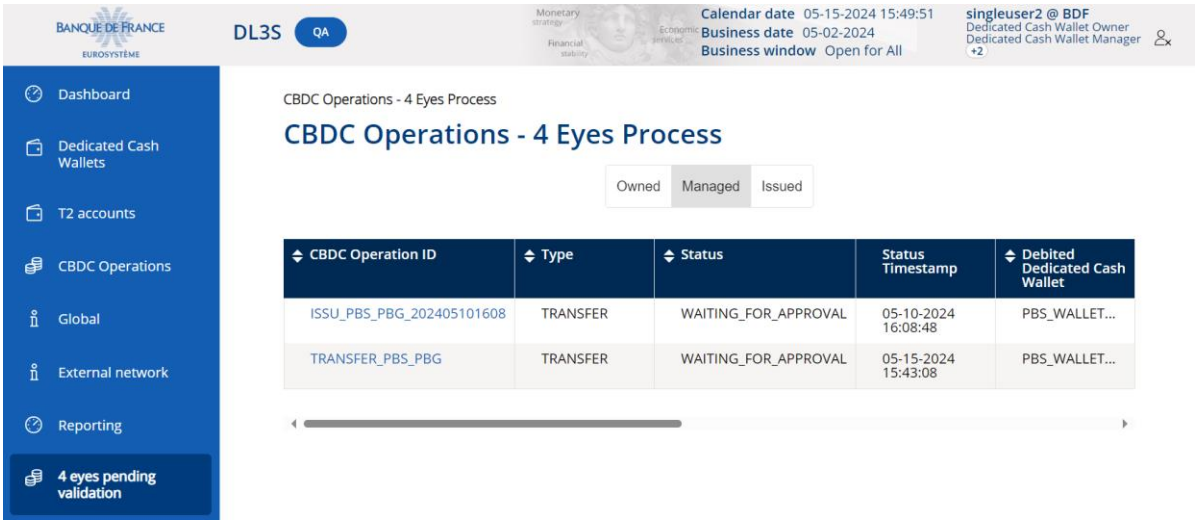
- The following information will be pre-filled for an intra-manager transfer:
  - *Instructing party name,* the name of the party instructing the transfer
  - *Instructing party BIC,* the BIC of the party instructing the transfer
  - *Debited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the debited Dedicated Cash Wallet

- *Currency* corresponds to the currency of the CBDC transferred

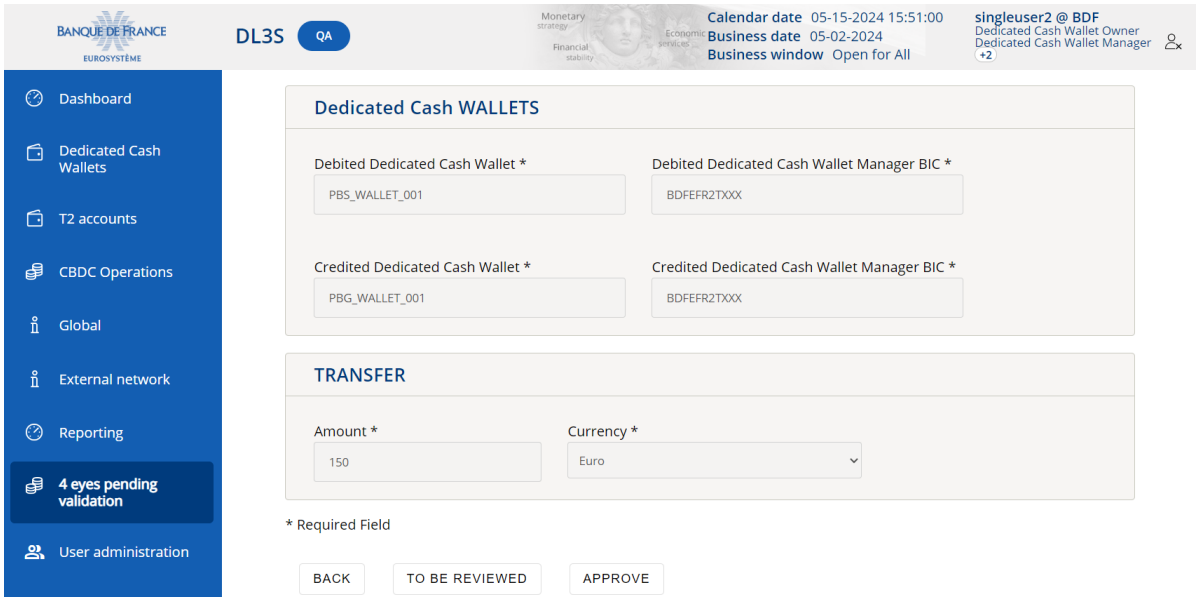
- After you click on the ***Submit*** button, you will see the operation waiting for approval in the ***CBDC Operations – 4 eyes*.**



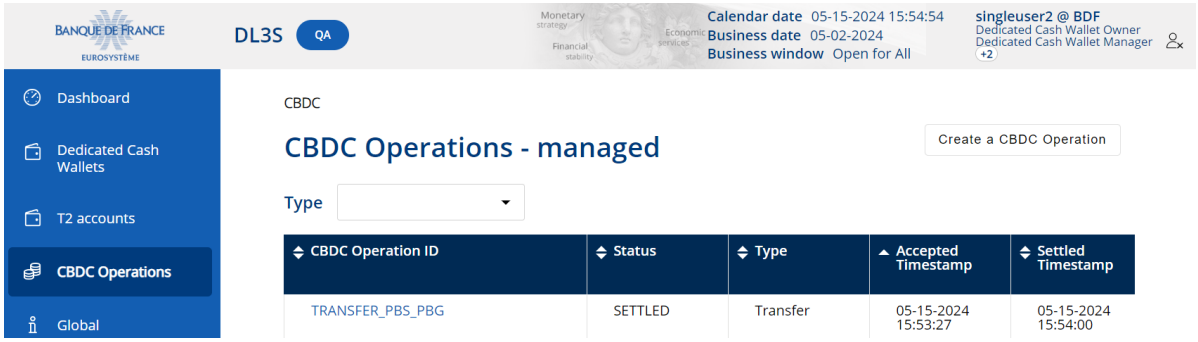
- You need to connect with the single user you didn't use to create the operation
- Go to ***4 eyes process / CBDC operations*** and click on the ***CBDC operation ID*** just created with the previous single user



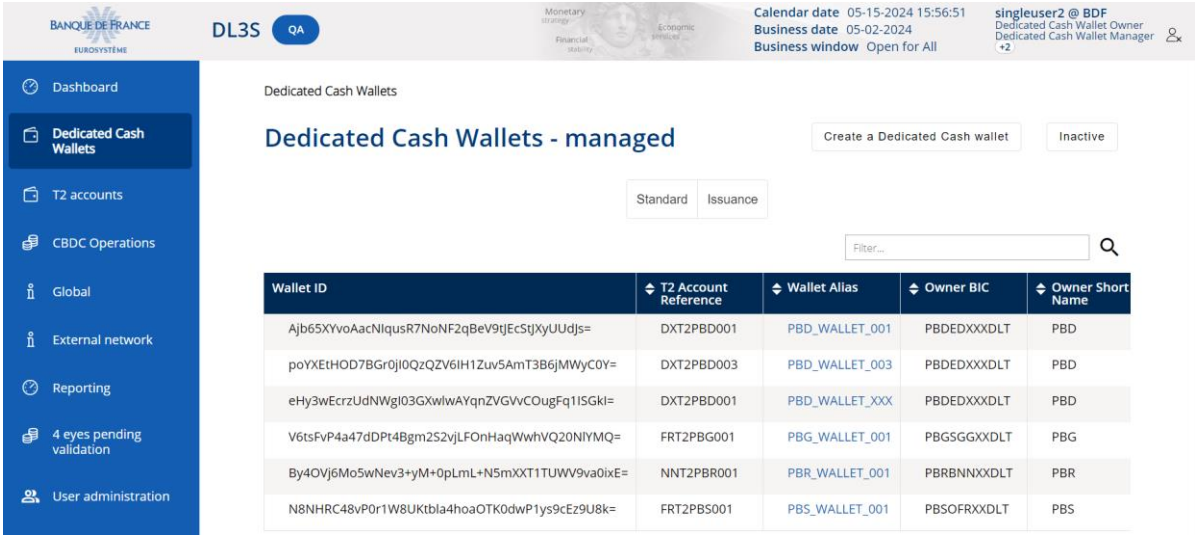
- Validate the transfer operation by clicking on the ***Approve*** button

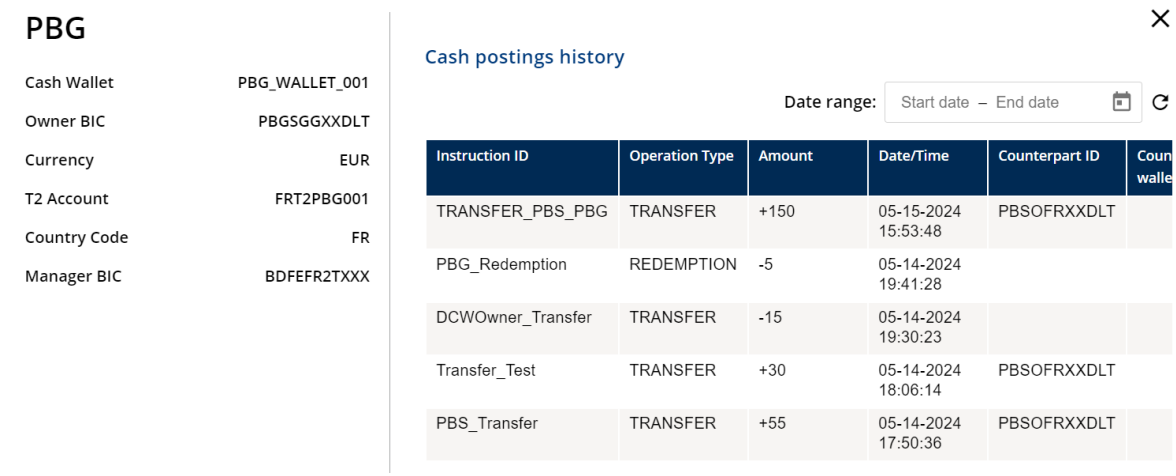


- Go to the CBDC ***Operations / managed***, the transfer appears with the "ACCEPTED" status at first until it is "SETTLED" or "UNSETTLED".



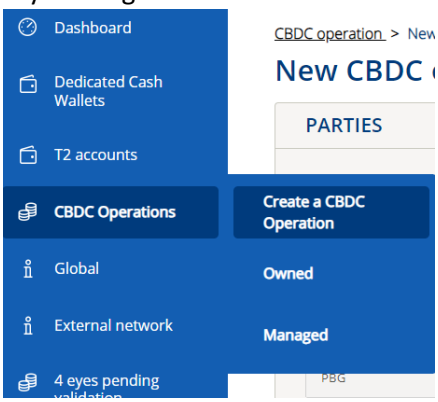
The manager can check in the *Dedicated Cash Wallet managed* tab that wallets have been correctly debited and credited or by checking wallet's movement history.



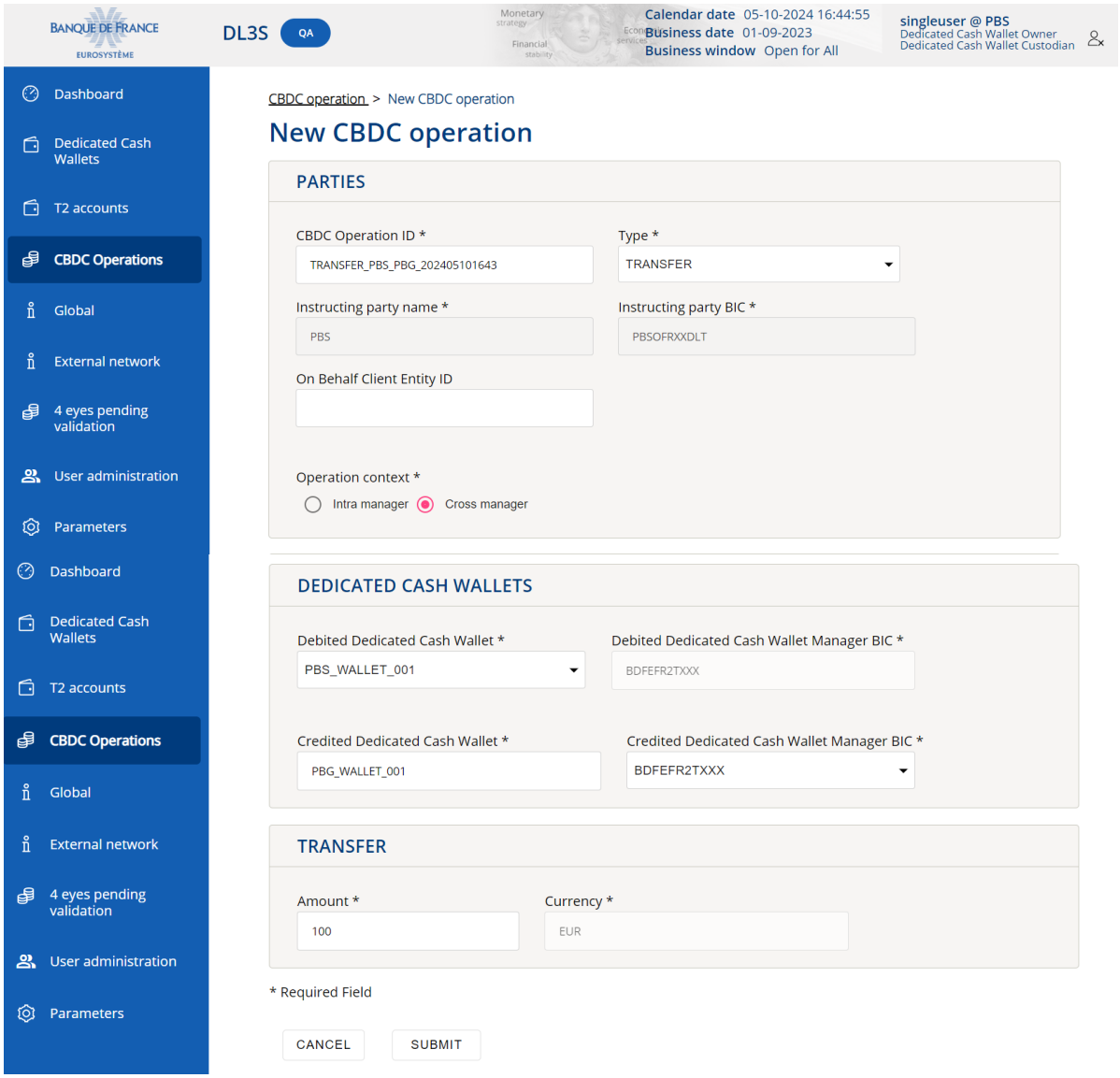


4.3.2 CBDC transfer instructed by a *Dedicated Cash Wallet owner*

- The flow is exactly the same as for a ***Dedicated Cash Wallet manager***
- One can access the creation file by clicking on the subtab *Create a CBDC Operation* subtab



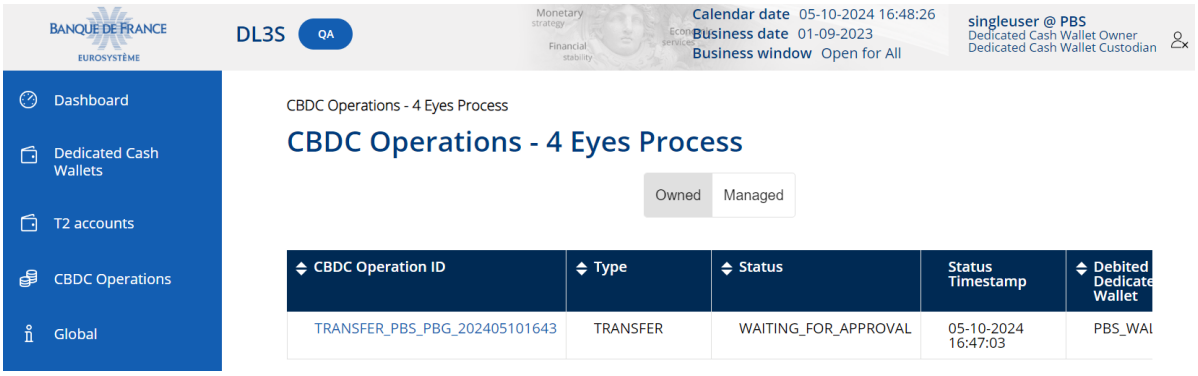
- Select the transfer type and the operation context, intra-manager or cross-manager.
- Depending on the operation context selected, some field will be pre-filled or not. The *Dedicated Cash Wallet Owner* has to fill in the form:



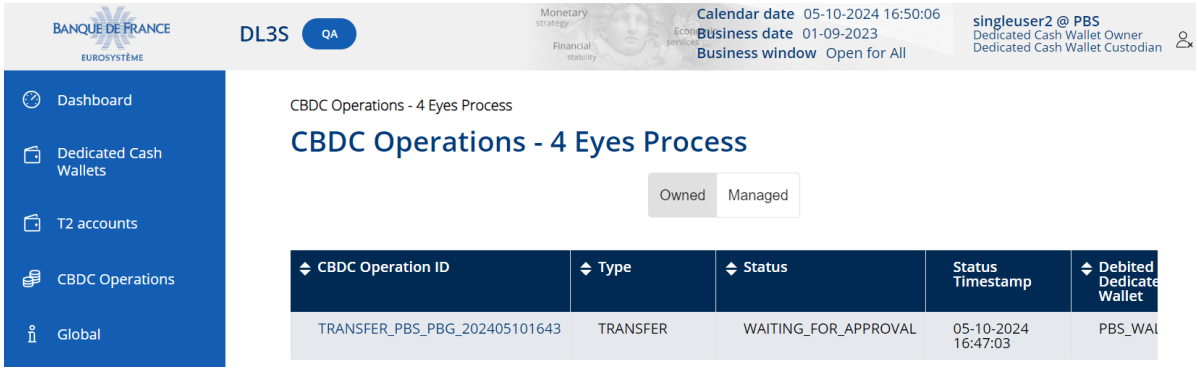
- *CBDC Operation ID*, it is to be unique. Commonly the form is TRANSFER_debited wallet alias_credited wallet alias_date&time_. The *CBDC Operation ID* can only contain alphanumeric characters, hyphen and underscore. If the *CBDC Operation ID* is filled with another special character, an error message will appear and prevent the submission of the request.
- *Type is transfer*
- *Instructing party name,* the name of the party instructing the transfer
- *Instructing party BIC,* the BIC of the party instructing the transfer
- *On behalf Client Entity ID* should not be filled as the party is instructed on its own name
- *External button* should be no has the transfer happens on DL3S platform
- *Debited Dedicated Cash Wallet* corresponds to the debited Wallet alias
- *Debited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the debited Dedicated Cash Wallet
- *Credited Dedicated Cash Wallet* corresponds to the credited Wallet alias
- *Credited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the credited Dedicated Cash Wallet
- *Amount* corresponds amount of the issuance

- *Currency* corresponds to the currency of the CBDC transferred

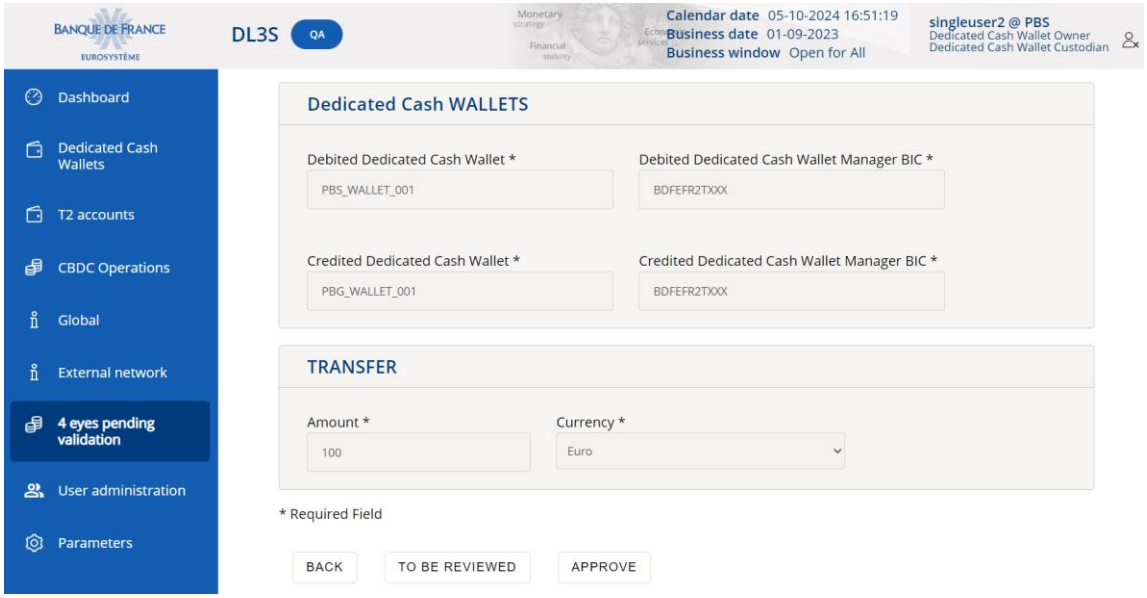
- After you click on the *Submit* button, you will see the operation waiting for approval in the *CBDC Operations – 4 eyes*.



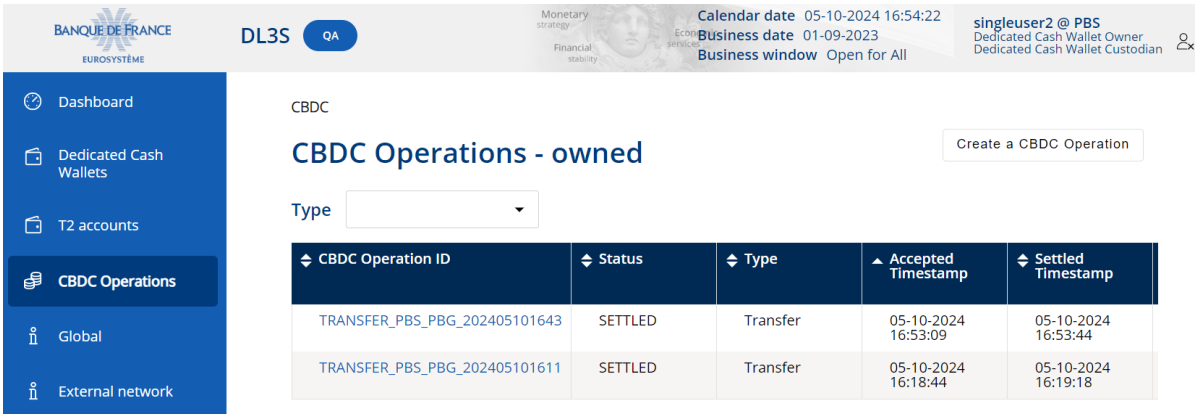
- You need to connect with the single user you didn't use to create the operation
- Go to *4 eyes process / CBDC operations* and click on the *CBDC operation ID* just created with the previous single user



- Validate the transfer operation by clicking on the *Approve* button



- Go to the CBDC *Operations / owned*, the transfer appears with the "ACCEPTED" status at first until it is "SETTLED" or "UNSETTLED".

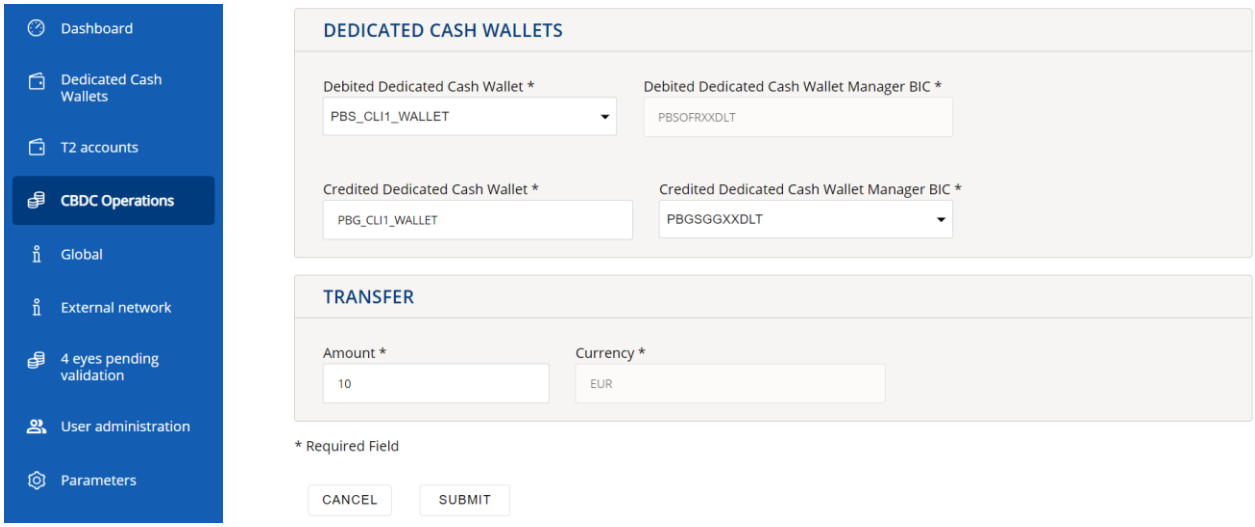


- ***Dedicated Cash Wallet owners*** can control on their respective wallets that the correct amount has been credited or debited.

4.3.3 CBDC transfer instructed by a *Dedicated Cash Wallet custodian* on behalf of a *Dedicated Cash Wallet user*

- The ***Dedicated Cash Wallet custodian*** accesses the file to create a CBDC operation by clicking on the *create a CBDC operation* subtab.

- Select the transfer type and the operation context, intra-manager or cross-manager.
- Fill the On Behalf Client Entity ID field
- One has to fill in the form:

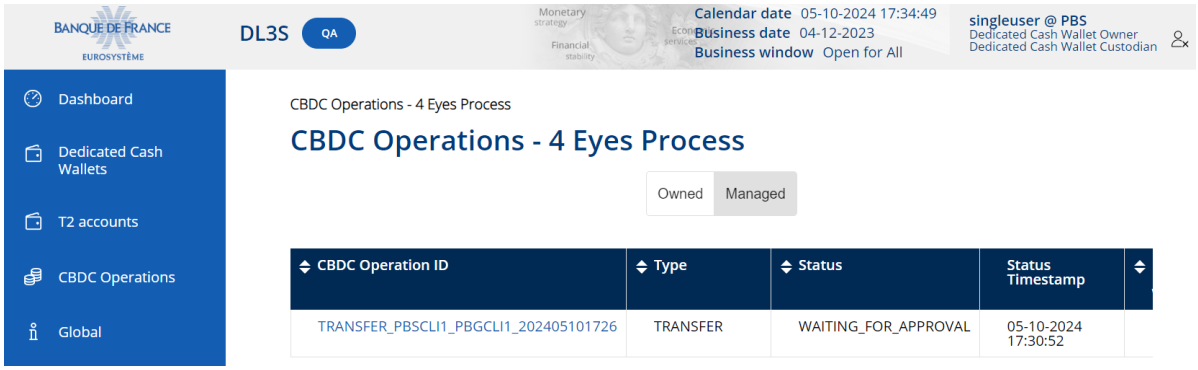


- *CBDC Operation ID*, it is to be unique. Commonly the form is TRANSFER_debited wallet alias_credited wallet alias_date&time_ . The *CBDC Operation ID* can only contain alphanumeric characters, hyphen and underscore. If the *CBDC Operation ID* is filled with another special character, an error message will appear and prevent the submission of the request.
- *Type* is transfer
- *Instructing party name*, the name of the party instructing the transfer
- *Instructing party BIC***,** the BIC of the party instructing the transfer
- *On behalf Client Entity ID* corresponds to the LEI of the client
- *Eternal button* should be no has the transfer happens on DL3S platform
- *Debited Dedicated Cash Wallet* corresponds to the debited Wallet alias
- *Debited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the debited Dedicated Cash Wallet
- *Credited Dedicated Cash Wallet* corresponds to the credited Wallet alias
- *Credited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the credited Dedicated Cash Wallet
- *Amount* corresponds amount of the issuance
- *Currency* corresponds to the currency of the CBDC transferred

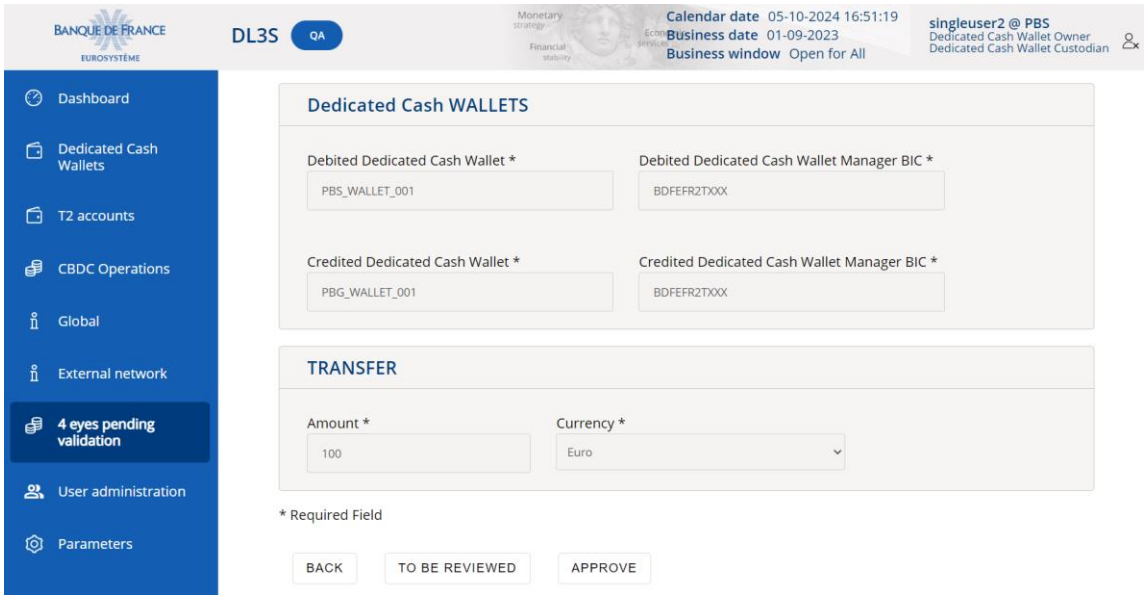
- *It is to be noted that according to the operation context selected, some field will be pre-filled or not.*
- After you click on the *Submit* button, you will see the operation waiting for approval in the *CBDC Operations – 4 eyes*.

- You need to connect with the single user you didn't use to create the operation

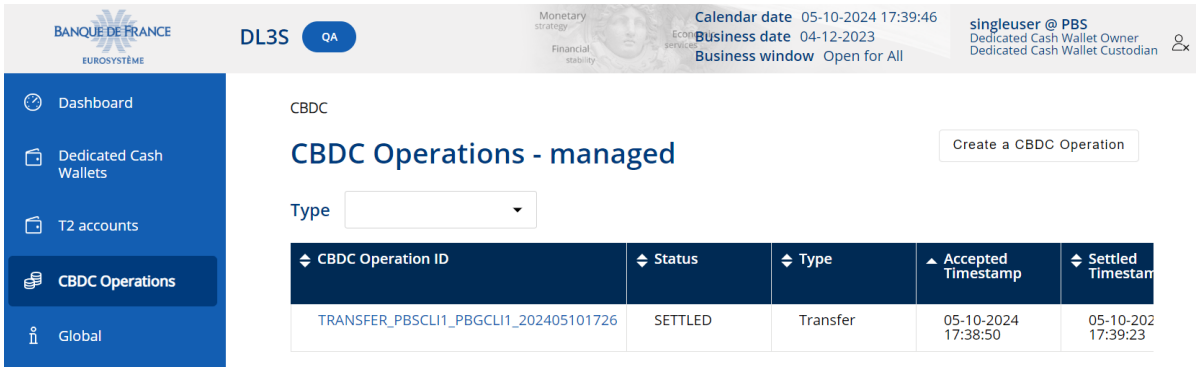
- Go to *4 eyes process / CBDC operations* and click on the *CBDC operation ID* just created with the previous single user



- Validate the transfer operation by clicking on the *Approve* button



- Go to the CBDC *Operations / owned*, the transfer appears with the “ACCEPTED” status at first until it is “SETTLED” or “UNSETTLED”.



- ***Dedicated Cash Wallet owners*** can control on their respective wallets that the correct amount has been credited or debited.

4.4 CBDC payments

A CBDC payment consist in paying a cash amount by debiting a Cash Wallet and crediting another Cash Wallet. It can be instructed by:

- ***Dedicated Cash Wallet Manager*** on a Dedicated Cash Wallet he manages
- ***Dedicated Cash Wallet Owner*** on a Dedicated Cash Wallet he owns
- ***Dedicated Cash Wallet Custodian*** on behalf of a ***Dedicated Cash Wallet user***
- ***Dedicated Cash Wallet user*** on a Dedicated Cash Wallet he owns

4.4.1 CBDC payment instructed by a *Dedicated Cash Wallet manager*

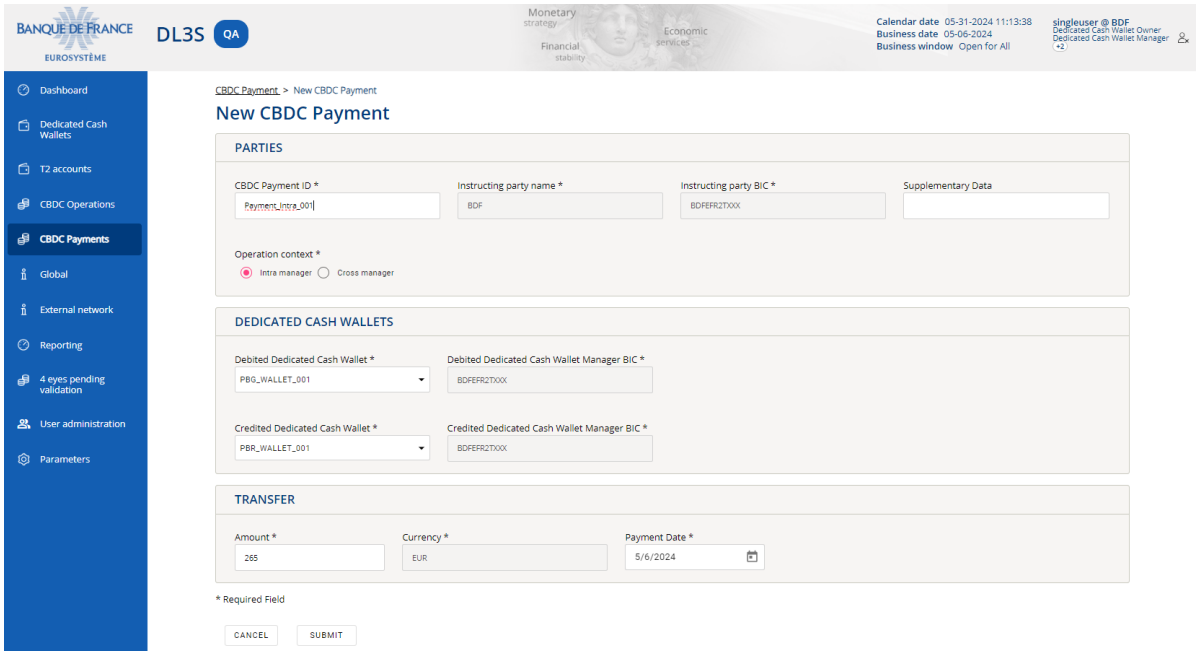
- One needs to connect as a ***Dedicated Cash Wallet manager*** and to click on the *Create a CBDC Payments* tab in *CBDC Payments* tab.
- The screen is open, displaying 3 main parts
    - Parties
        - CBDC Payment ID
            - it is to be unique
            - *Commonly the form is PAYMENT_debited_wallet_alias_credited wallet alias_date&time*
            - *CBDC Operation ID can only contain alphanumeric characters, hyphen and underscore*
            - *If filled with another special character, an error message will appear and prevent the submission of the request*
        - 'Instructing party name' is pre-filled with manager details
        - 'Instructing party BIC' is pre-filled with manager details
        - Supplementary Data
            - Optional field
        - Operation context
            - intra-manager
            - cross-manager
    - Dedicated Cash Wallets
        - *Debited Dedicated Cash Wallet*
            - *Is select from a dropdown list populated by all the wallets managed*
        - *Debited Dedicated Cash Wallet Manager BIC*
            - *Is deduced from the 'Debited Dedicated Cash Wallet'*
        - *Credited Dedicated Cash Wallet*
        - *Credited Dedicated Cash Wallet Manager BIC*
    - Transfer
        - *Amount :* corresponds amount of the payment
        - *Currency :* corresponds to the currency of the CBDC transferred
        - *Payment Date :*
            - *Is the current business Date by default*
        - *can be in the past or in the future*

4.4.1.1 Intra-manager context : specific behaviour

- Dedicated Cash Wallets
    - *Credited Dedicated Cash Wallet*
        - *Is select from a dropdown list populated by all the wallets managed*
    - *Credited Dedicated Cash Wallet Manager BIC*

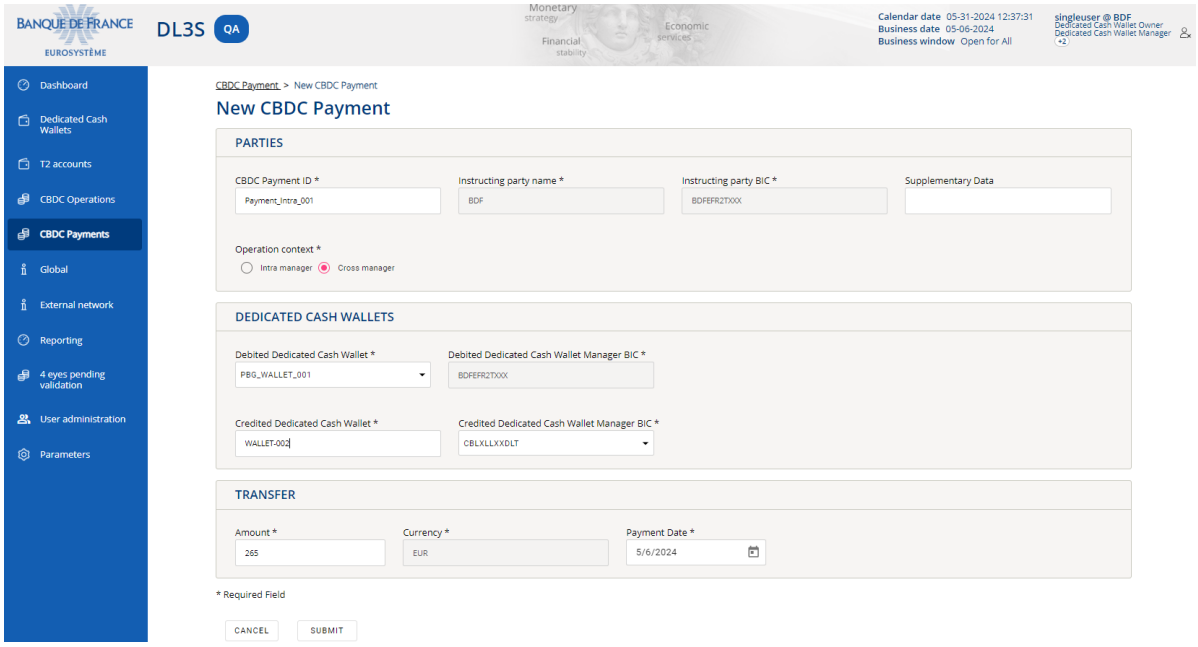
- *Is deduced from the 'Credited Dedicated Cash Wallet'*

- *Copy screen*



4.4.1.2 Cross-manager context: specific behaviour

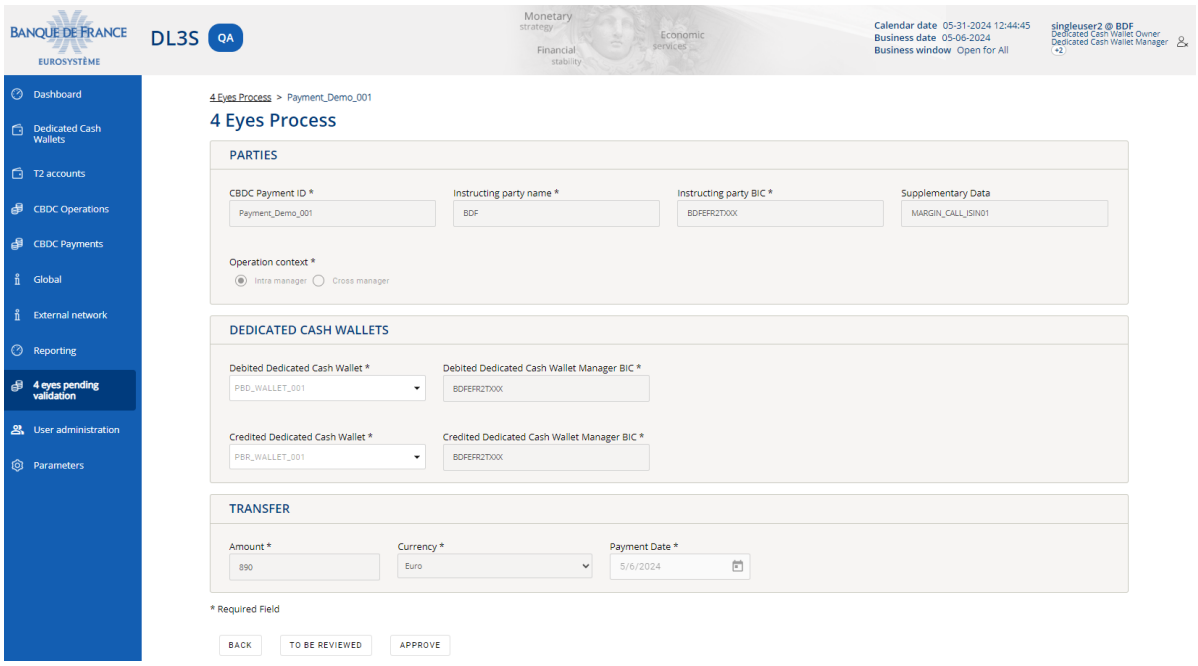
- Dedicated Cash Wallets
  - *Credited Dedicated Cash Wallet*
    - *Is to be entered manually*
    - *Must be the exact value of the wallet alias*
  - *Credited Dedicated Cash Wallet Manager BIC*
    - *Is select from a dropdown list populated by all the BIC managers known on DL3S*
- *Copy screen*



4.4.1.3 Action

- After you click on the ***Submit*** button, you will see the operation waiting for approval in the ***CBDC Operations – 4 eyes*.**

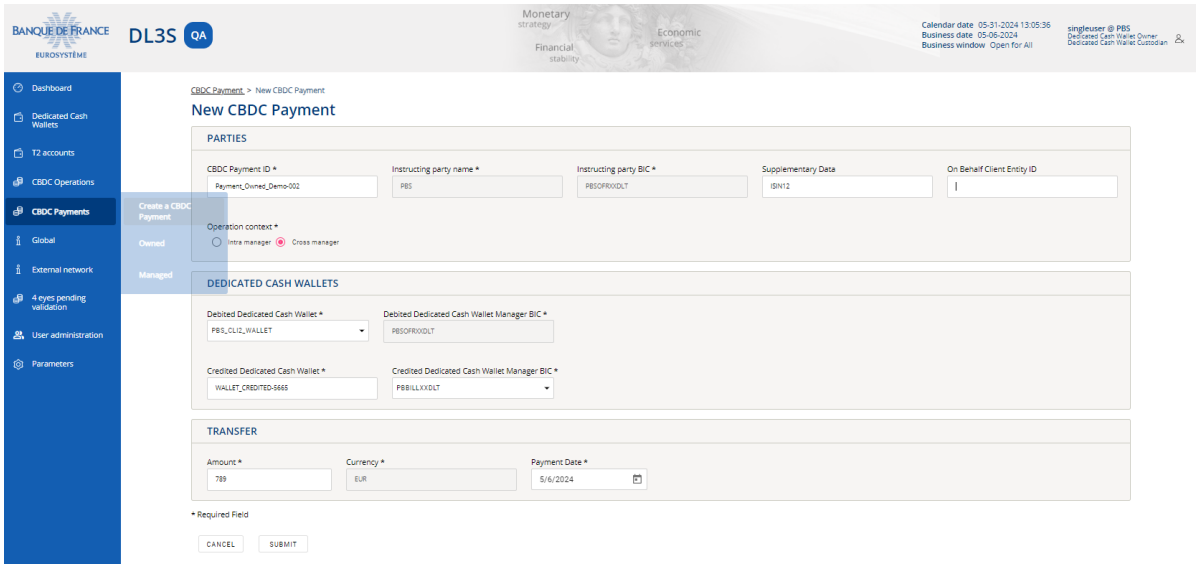
- You need to connect with the single user you didn't use to create the operation
- Go to ***4 eyes process / CBDC payment*** and click on the ***CBDC payment ID*** just created with the previous single user
- Validate the transfer operation by clicking on the ***Approve*** button



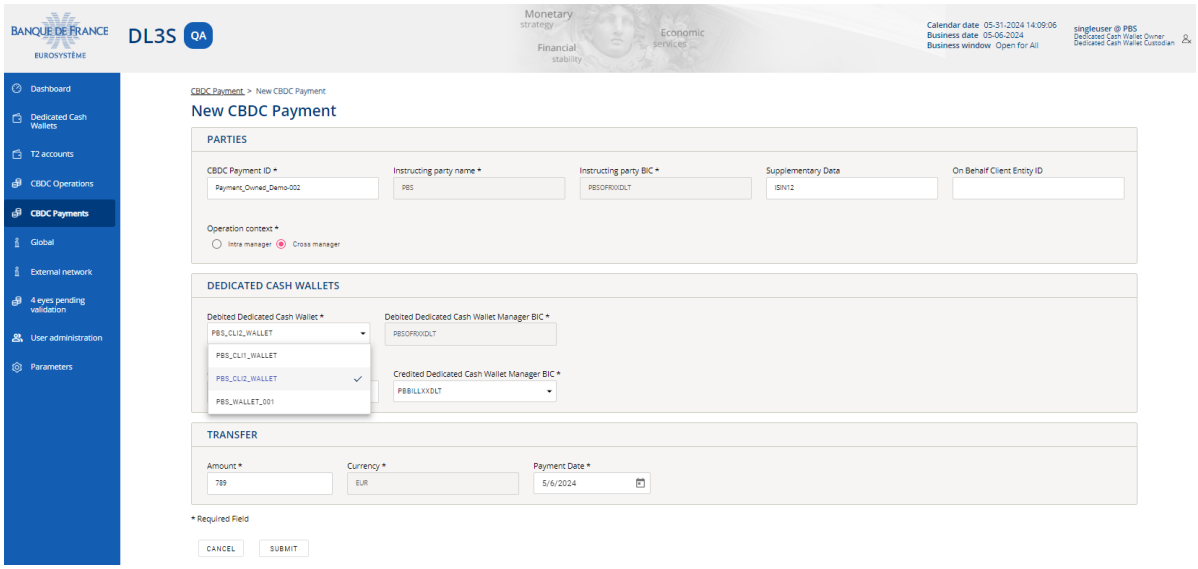
- Go to the CBDC ***Payments / managed***, the transfer appears with the "ACCEPTED" status at first until it is "SETTLED" or "UNSETTLED".
- List of payments

4.4.2 CBDC payment instructed by a *Dedicated Cash Wallet Owner or Custodian*

- The flow is exactly the same as for a ***Dedicated Cash Wallet manager***
- One can access the creation file by clicking on the subtab *Create a CBDC Payment* subtab



- Select the operation context, intra-manager or cross-manager.
- Depending on the operation context selected, some field will be pre-filled or not. The *Dedicated Cash Wallet Owner* has to fill in the form:
  - See 'DEDICATED CASH WALLETS' details on 'managed part'
- On Behalf Client Entity ID
- *Debited Dedicated Cash Wallet :*
  - **<u>Role of owner</u>**
    - The select wallet belongs to the (Direct) Participant itself
  - **<u>Role of Custodian</u>**
    - The select wallet belongs to Client User
    - CBDC Payments is instructed by a Dedicated Cash Wallet custodian on behalf of a Dedicated Cash Wallet user
    - In case of a Client User Cash Wallet, the field 'On Behalf Client Entity ID' will be populated with the Client Entity Id

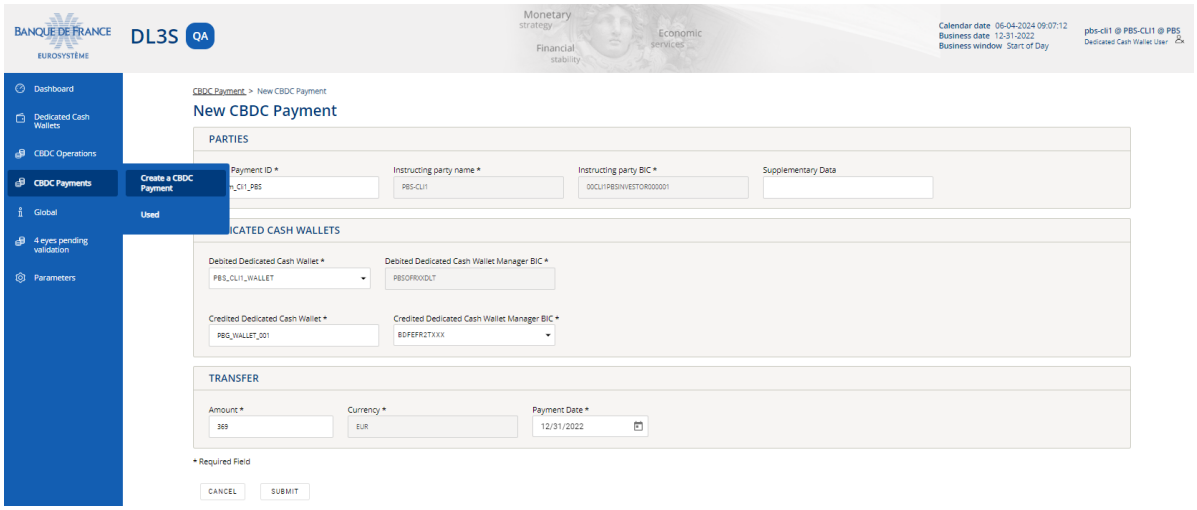


- After you click on the *Submit* button, you will see the operation waiting for approval in the *CBDC Operations – 4 eyes*.
- You need to connect with the single user you didn't use to create the operation
- Go to *4 eyes process / CBDC Payment* and click on the *CBDC Payment ID* just created with the previous single user
- Validate the transfer operation by clicking on the *Approve* button
- Go to the CBDC *Payment / owned*, the transfer appears with the "ACCEPTED" status at first until it is "SETTLED" or "UNSETTLED".

- ***Dedicated Cash Wallet owners*** can control on their respective wallets that the correct amount has been credited or debited.

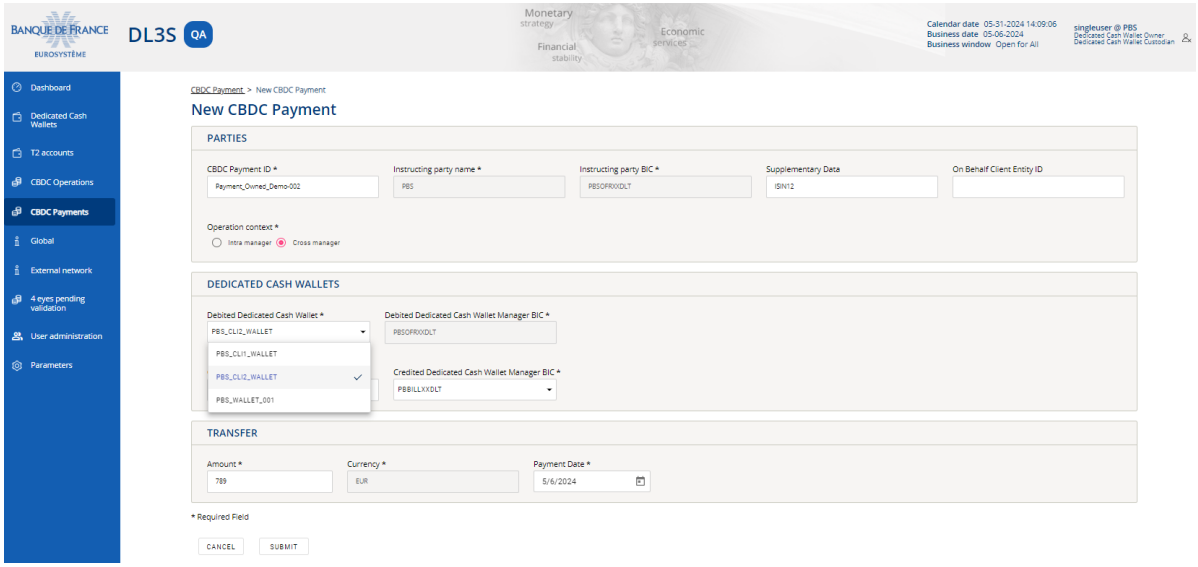
4.4.3 CBDC payment instructed by Client user

- The flow is the same as for a ***Dedicated Cash Wallet manager or owner***
- One can access the creation file by clicking on the subtab *Create a CBDC Payment* subtab



- The screen is open with defaulted to 'Cross Manager' context

- Some fields are pre-filled.
- *Debited Dedicated Cash Wallet :*
  - The selected wallet belongs to Client User
- The *Credited Dedicated Cash Wallet Owner* has to fill in the form:
  - Select the *Credited Dedicated Cash Wallet Manager BIC* in the dropdown list
  - Input *Credited Dedicated Cash Wallet*
    - Is to be entered manually
    - Must be the exact value of the wallet alias

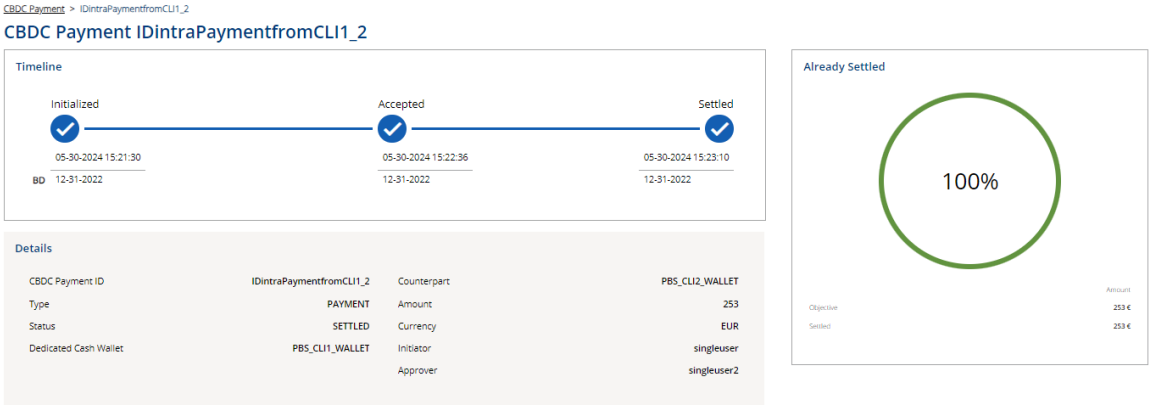


- After you click on the *Submit* button, you will see the operation waiting for approval in the *CBDC Operations – 4 eyes***.**
- You need to connect with the single user you didn't use to create the operation.
  - An other user of the client entity
  - A user of the entity managing the client user (as a custodian)
- Go to *4 eyes process / CBDC Payment* and click on the *CBDC Payment ID* just created with the previous single user
- Validate the transfer operation by clicking on the *Approve* button
- Go to the CBDC *Payment / owned*, the transfer appears with the "ACCEPTED" status at first until it is "SETTLED" or "UNSETTLED".
- ***Dedicated Cash Wallet Client user*** can control on their respective wallets that the correct amount has been credited or debited.

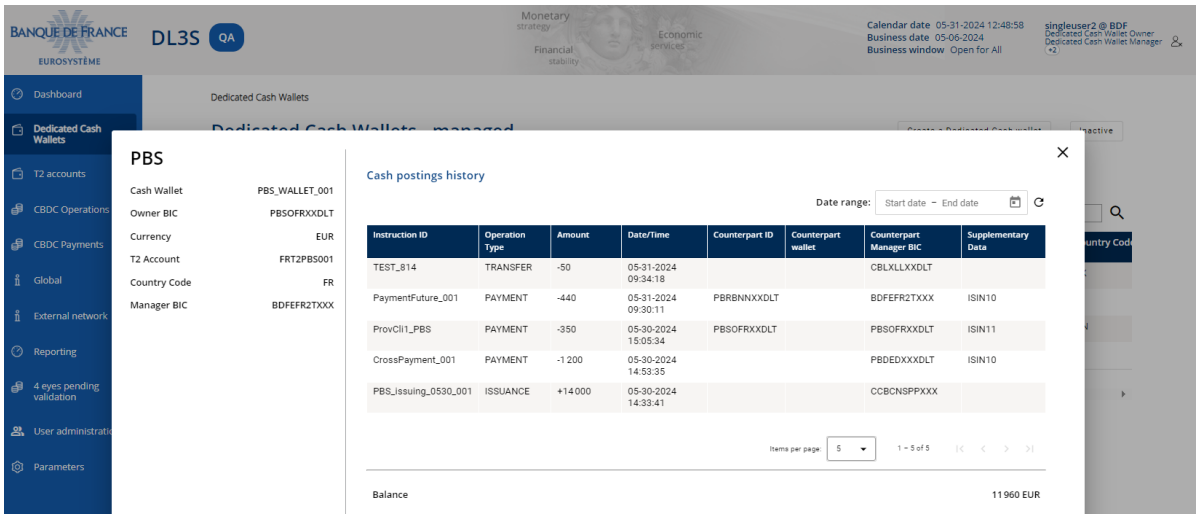
4.4.4 Payments view

- List of payments are displayed and segregated by roles
  - Owned
    - For owned asset
    - As a custodian for Client users
  - Managed
  - National supervised
-

- Payment details
    - By clicking on a specific entry, a screen will display the payment details



- Payment integration in Cash Posting history
    - The manager can check in the *Dedicated Cash Wallet managed* tab that wallets have been correctly debited and credited or by checking wallet's movement history.
    - Payments are consolidated with other operation types



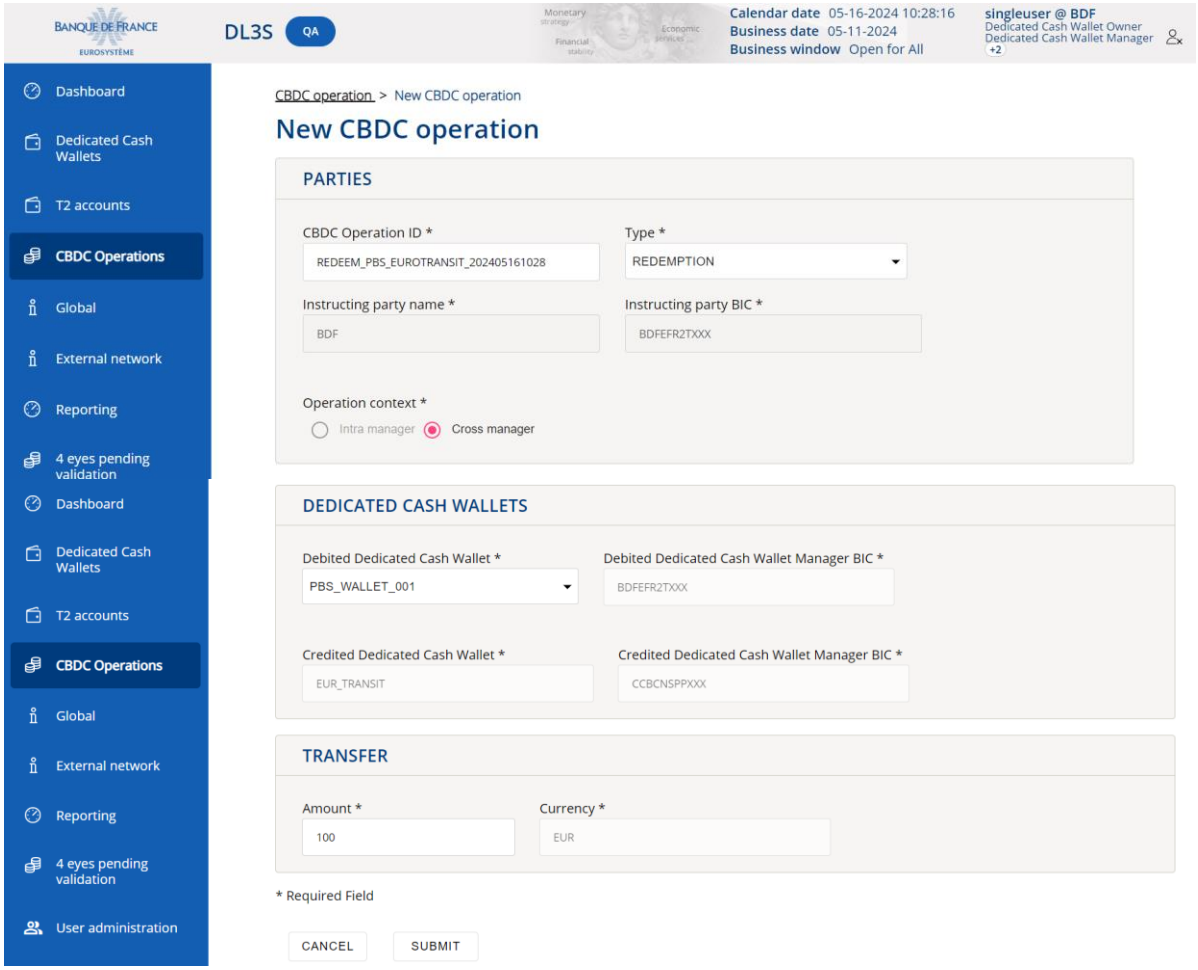
4.5 CBDC redemption

CBDC redemption can be instructed by:

- ***Dedicated Cash Wallet manager*** on a wallet he manages
- ***Dedicated Cash Wallet owner*** on a wallet he owns
- ***Dedicated Cash Wallet custodian*** on be behalf of the ***Dedicated Cash Wallet user***

4.5.1 CBDC redemption instructed by a *Dedicated Cash Wallet manager*

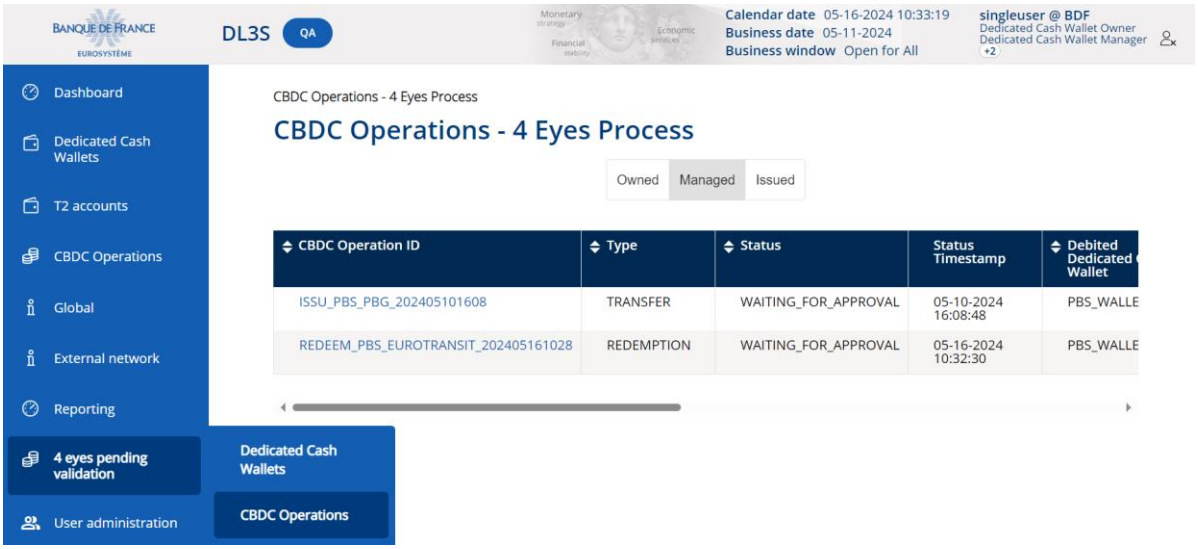
- One needs to connect as a ***Dedicated Cash Wallet manager*** and to click on the *Create a CBDC Operation* tab in *CBDC Operations* tab.
- Select the type redemption. The button operation context will be automatically set to cross-manager.
- Then, one has to fill in:



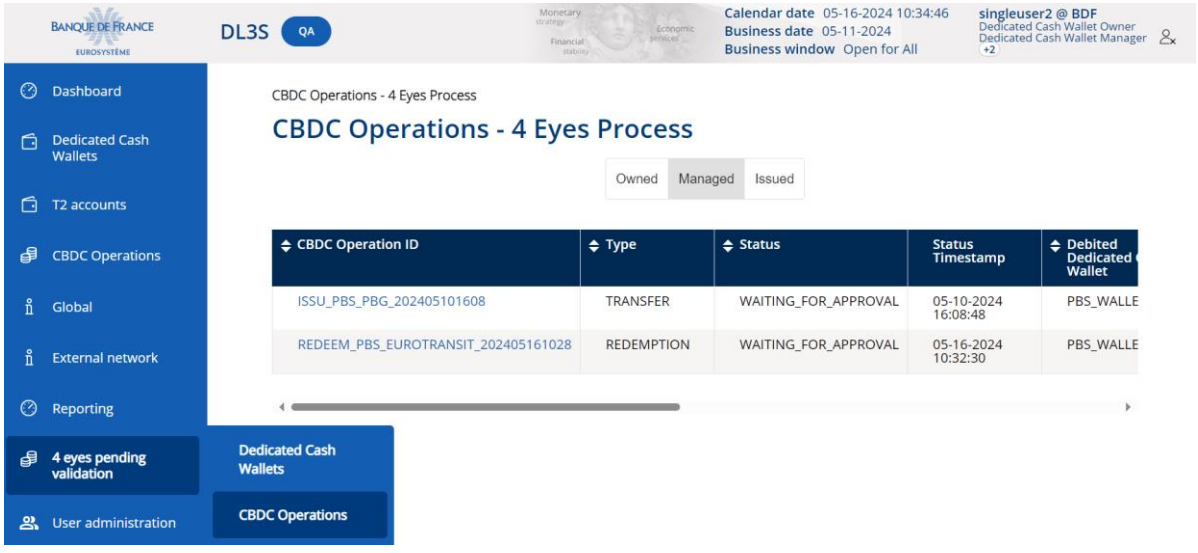
  - *CBDC Operation ID*, it is to be unique. Commonly the form is REDEEM_debited wallet alias_credited wallet alias_date&time_. The *CBDC Operation ID* can only contain alphanumeric characters, hyphen and underscore. If the *CBDC Operation ID* is filled with another special character, an error message will appear and prevent the submission of the request.
  - *Debited Dedicated Cash Wallet* corresponds to the debited Wallet alias
  - *Debited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the debited Dedicated Cash Wallet
  - *Amount* corresponds amount of the issuance
- The following information will be automatically filled in:
  - *Instructing party name*, the name of the party instructing the transfer

- *Instructing party BIC*, the BIC of the party instructing the transfer
- *Credited Dedicated Cash Wallet* corresponds to the credited Wallet alias
- *Credited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the credited Dedicated Cash Wallet
- *Currency* corresponds to the currency of the CBDC transferred

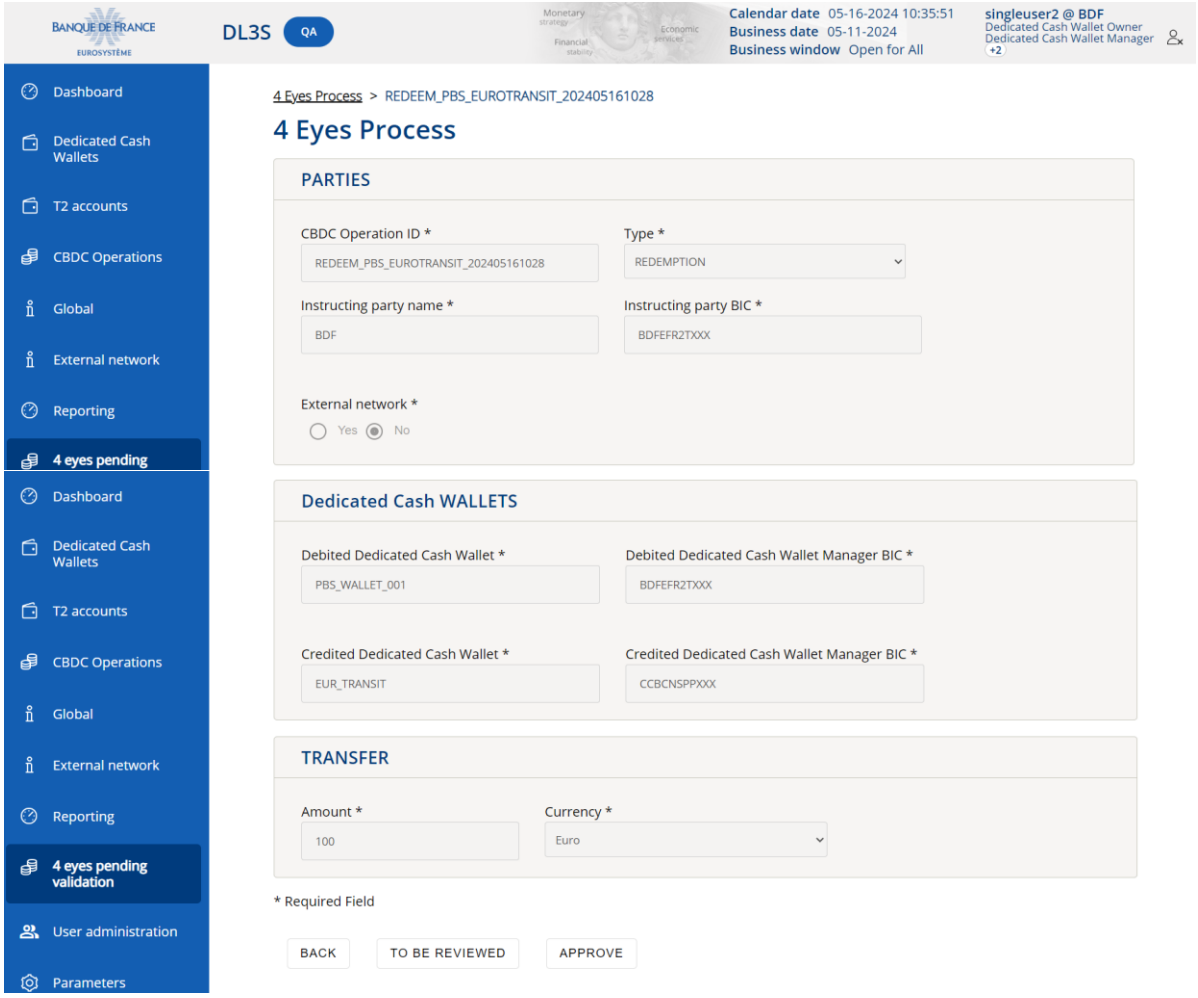
- After you click on the *Submit* button, you will see the operation waiting for approval in the *CBDC Operations – 4 eyes*.



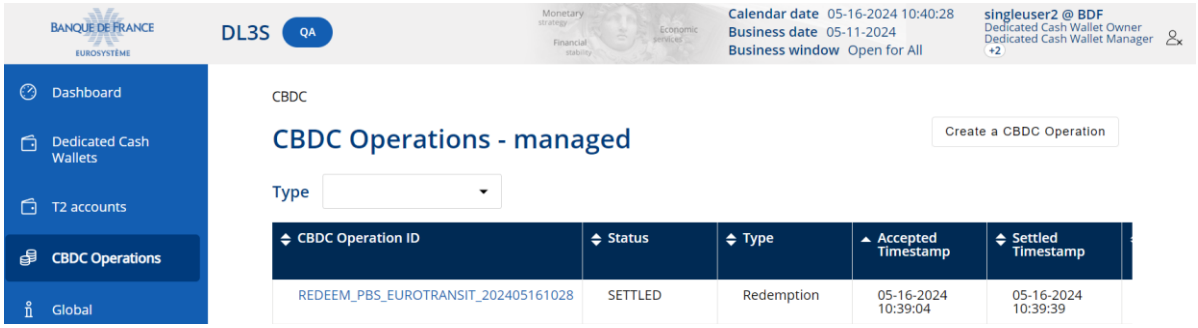
- You need to connect with the single user you didn't use to create the operation
- Go to *4 eyes process / CBDC operations* and click on the *CBDC operation ID* just created with the previous single user



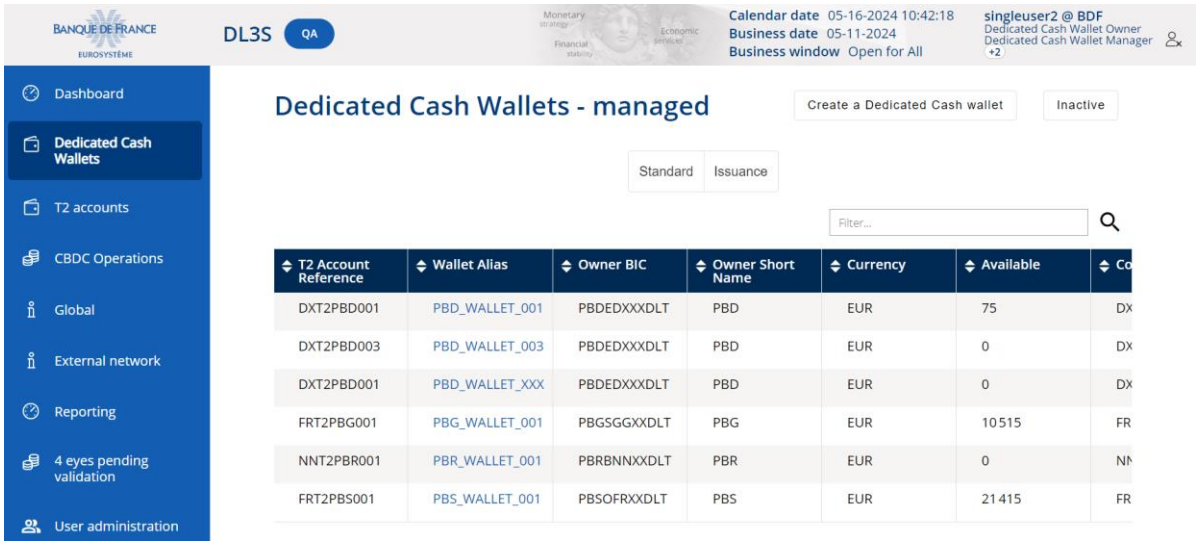
- Validate the transfer operation by clicking on the *Approve* button



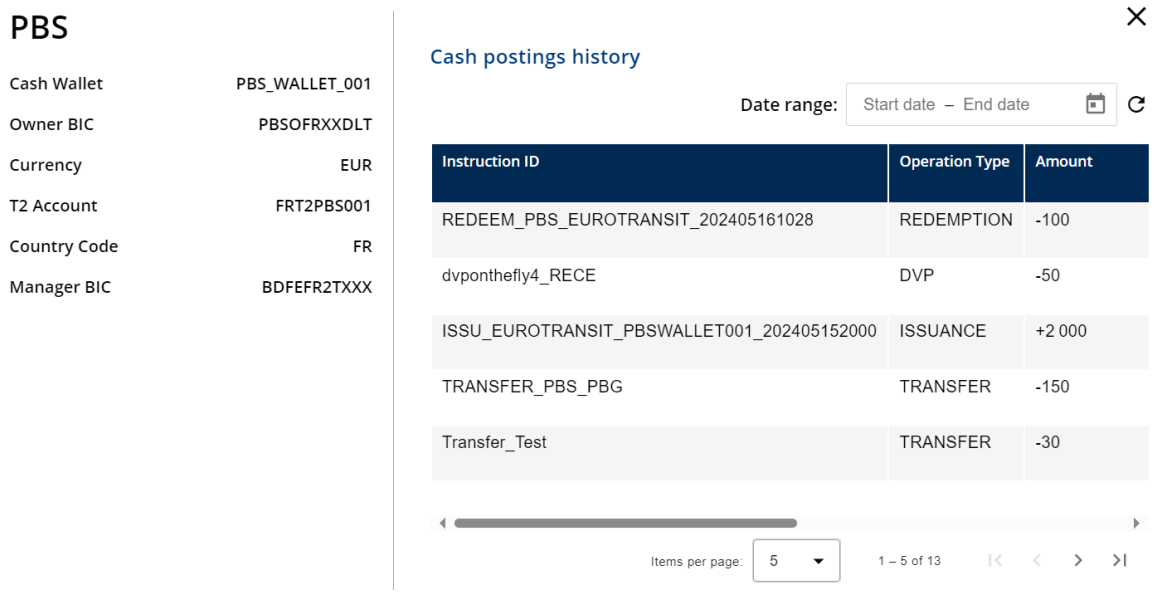
- Go to the CBDC *Operations / managed*, the transfer appears with the “ACCEPTED” status at first until it is “SETTLED” or “UNSETTLED”.



- ***Dedicated Cash Wallet manager*** can control that the correct amount has been credited or debited.

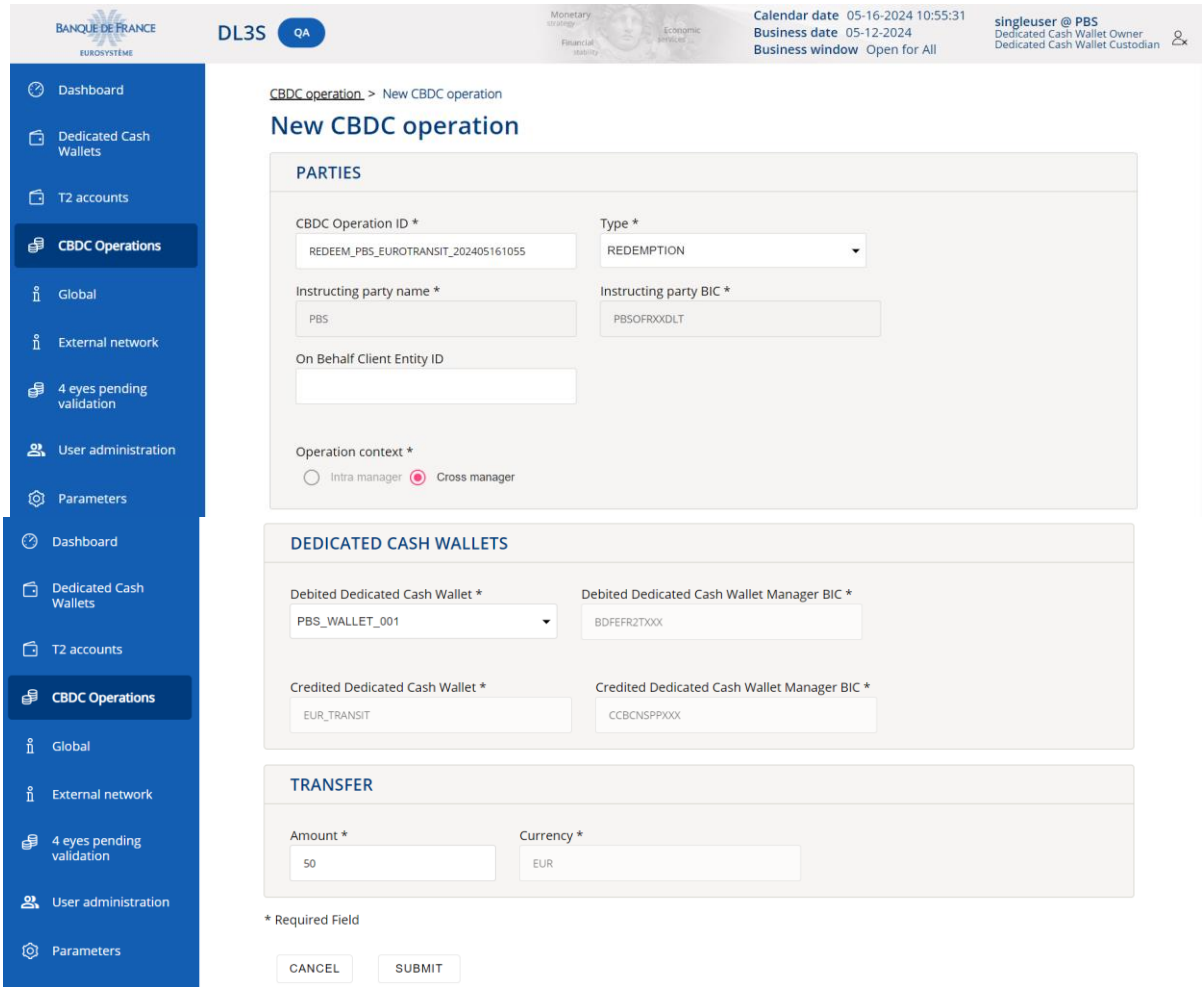


- The manager can check in the *Dedicated Cash Wallet managed* tab that the correct amount has been redeemed from the wallets.



4.5.2 CBDC redemption instructed by a *Dedicated Cash Wallet owner*

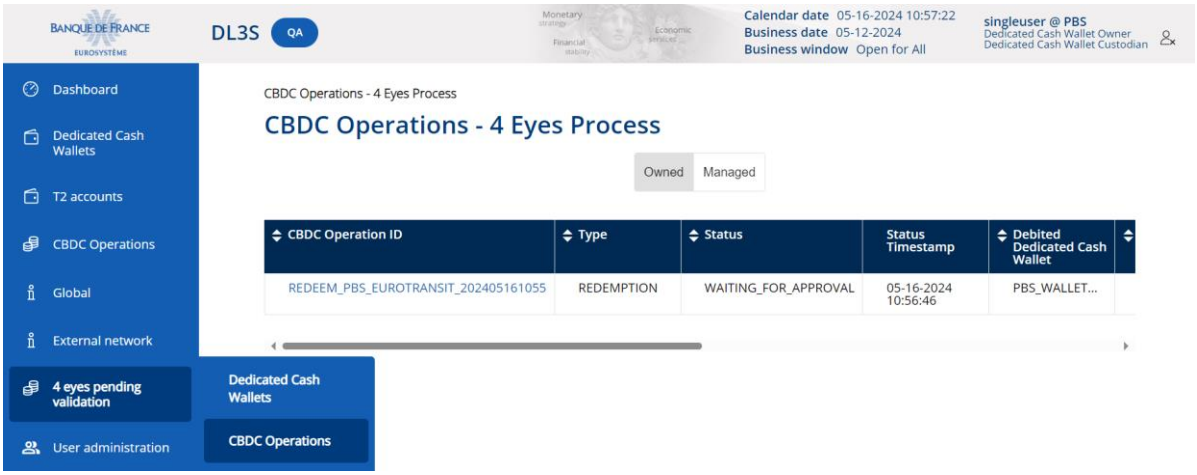
- The flow is exactly the same as for previously described. Dedicated Cash Wallet Owner accesses the file to create a CBDC Operation by clicking on the subtab *Create a CBDC Operation*
- Select the type redemption. The operation context will be automatically set to cross-manager
- The *Dedicated Cash Wallet owner* has to fill in the form:



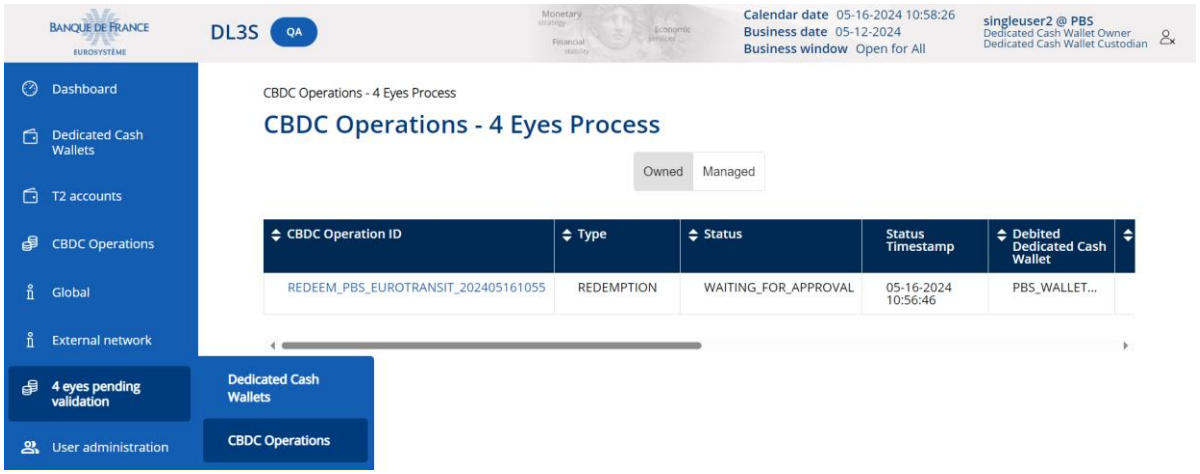
- *CBDC Operation ID*, it is to be unique. Commonly the form is REDEEM_debited wallet alias_credited wallet alias_date&time_. The *CBDC Operation ID* can only contain alphanumeric characters, hyphen and underscore. If the *CBDC Operation ID* is filled with another special character, an error message will appear and prevent the submission of the request.
- *On behalf Client Entity ID* should not be filled as the party is instructed on its own name
- *Debited Dedicated Cash Wallet* corresponds to the debited Wallet alias
- *Debited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the debited Dedicated Cash Wallet
- *Amount* corresponds amount of the issuance

- The following fields will be automatically filled in:
  - *Instructing party name*, the name of the party instructing the transfer
  - *Instructing party BIC***,** the BIC of the party instructing the transfer
  - *Credited Dedicated Cash Wallet* corresponds to the credited Wallet alias
  - *Credited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the credited Dedicated Cash Wallet
  - *Currency* corresponds to the currency of the CBDC transferred

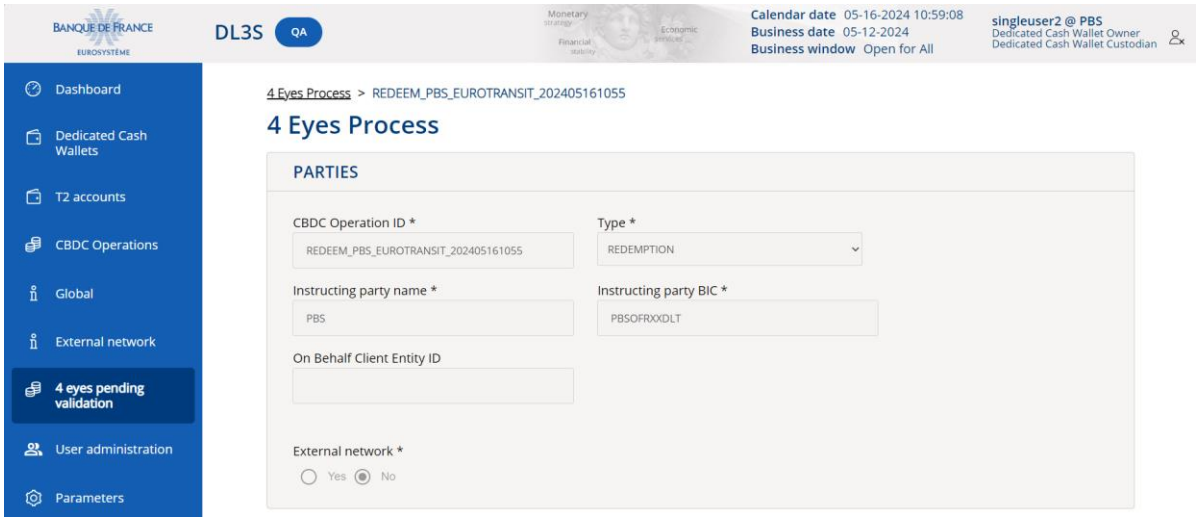
- After you click on the *Submit* button, you will see the operation waiting for approval in the *CBDC Operations – 4 eyes***.**

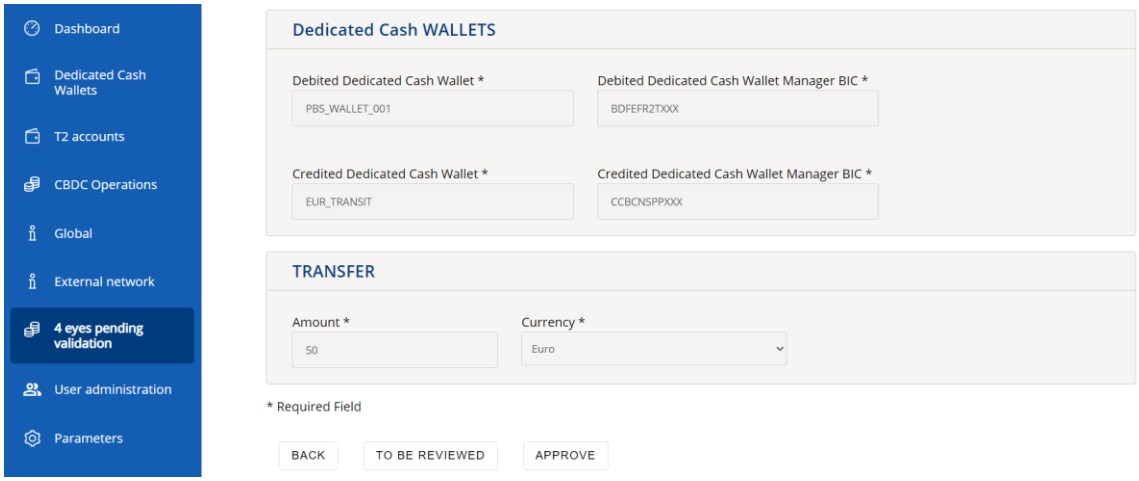


- You need to connect with the single user you didn't use to create the operation
- Go to *4 eyes process / CBDC operations* and click on the *CBDC operation ID* just created with the previous single user



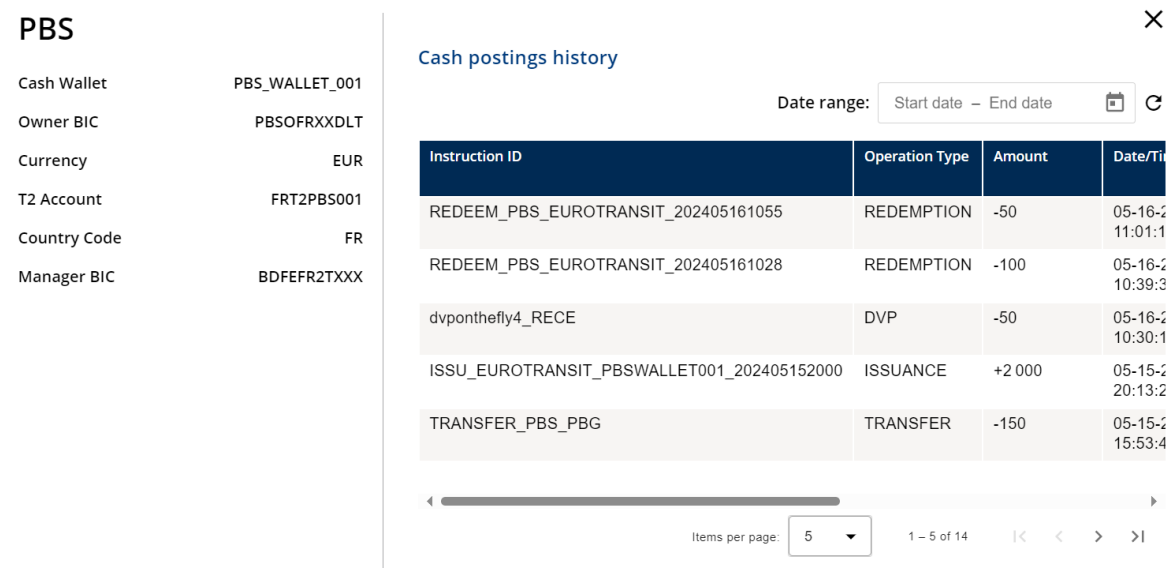
- Validate the transfer operation by clicking on the *Approve* button





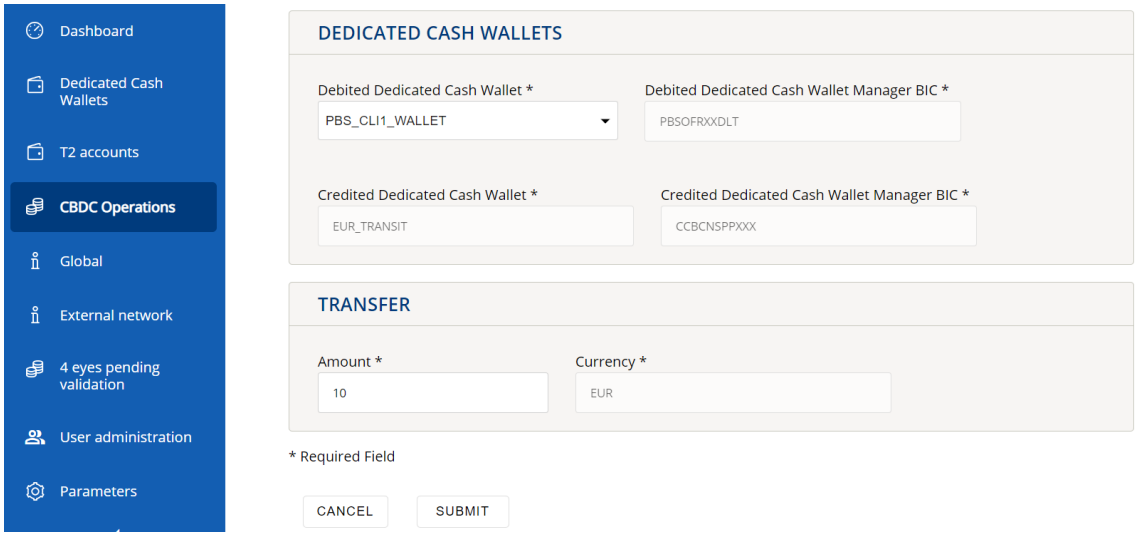
- Go to the CBDC *Operations / owned*, the transfer appears with the “ACCEPTED” status at first until it is “SETTLED” or “UNSETTLED”.

- ***Dedicated Cash Wallet owner*** can control on their respective wallets that the correct amount has been credited or debited.



4.5.3 CBDC redemption instructed by a *Dedicated Cash Wallet custodian* on behalf of a *Dedicated Cash Wallet user*

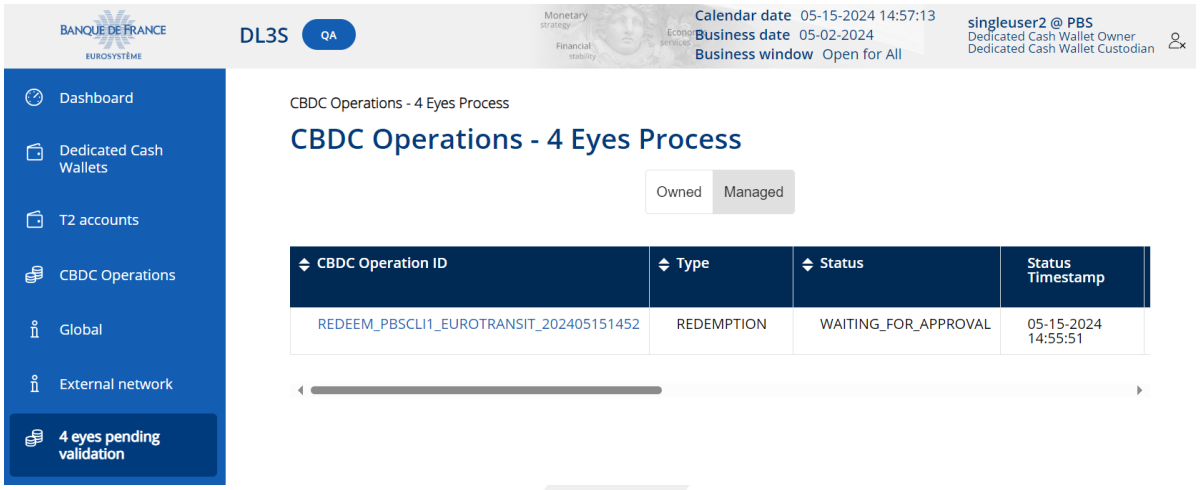
- The flow is exactly the same as for previously described. ***Dedicated Cash Wallet Custodian*** accesses the file to create a CBDC Operation by clicking on the subtab *Create a CBDC Operation*
- Select the type redemption. The operation context will be automatically set to cross-manager
- One has to fill in the form:



- *CBDC Operation ID*, it is to be unique. Commonly the form is REDEEM_debited wallet alias_credited wallet alias_date&time_. The *CBDC Operation ID* can only contain alphanumeric characters, hyphen and underscore. If the *CBDC Operation ID* is filled with another special character, an error message will appear and prevent the submission of the request.
- *On behalf Client Entity ID* corresponds to the LEI of the client
- *Debited Dedicated Cash Wallet* corresponds to the debited Wallet alias
- *Debited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the debited Dedicated Cash Wallet
- *Amount* corresponds amount of the issuance

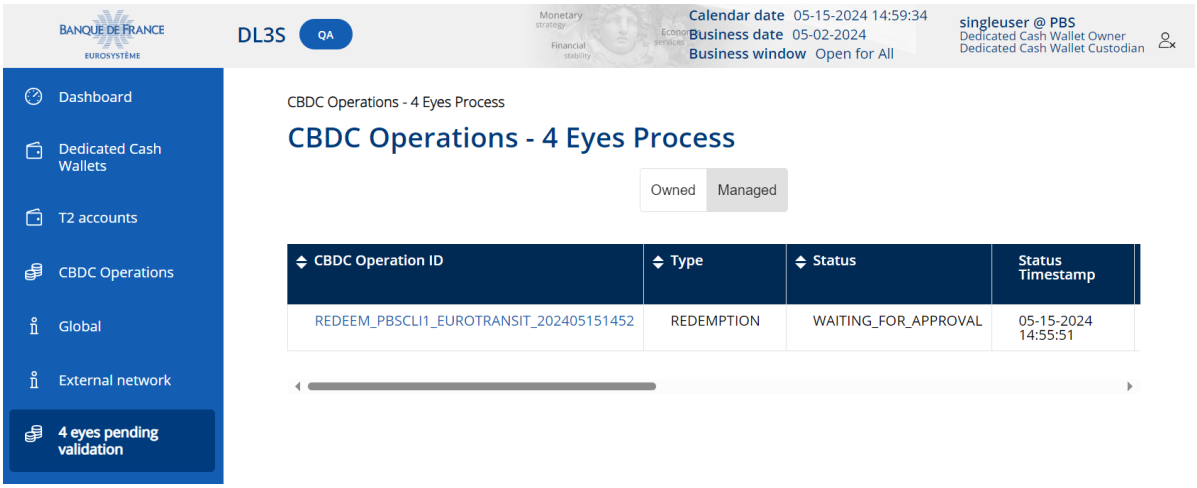
- The following information will be automatically filled in:
  - *Instructing party name*, the name of the party instructing the transfer
  - *Instructing party BIC*, the BIC of the party instructing the transfer
  - *Credited Dedicated Cash Wallet* corresponds to the credited Wallet alias
  - *Credited Dedicated Cash Wallet Manager BIC* corresponds to the BIC of the manager of the credited Dedicated Cash Wallet
  - *Currency* corresponds to the currency of the CBDC transferred

- After you click on the *Submit* button, you will see the operation waiting for approval in the *CBDC Operations – 4 eyes*.

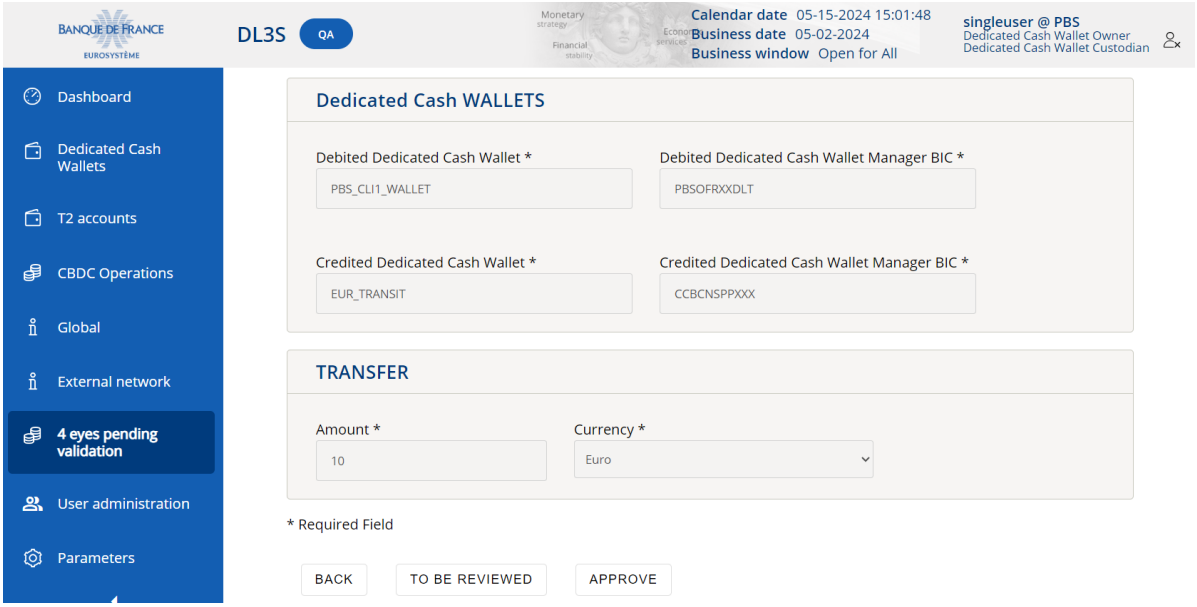


- You need to connect with the single user you didn't use to create the operation

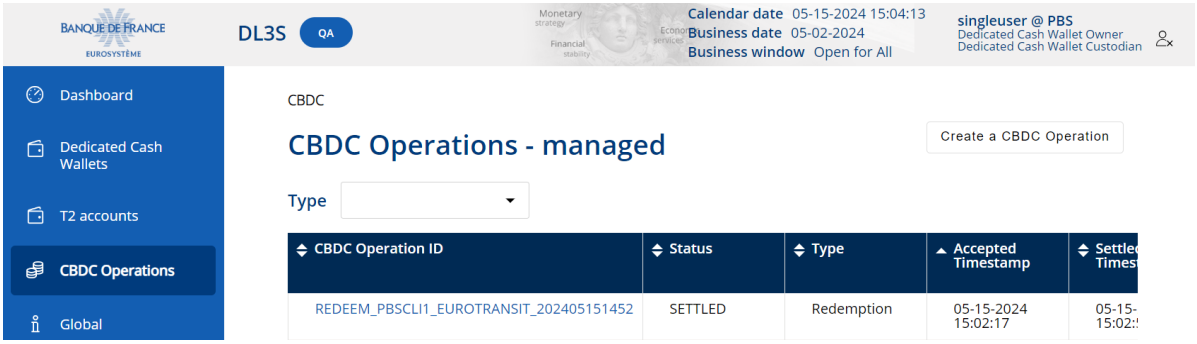
- Go to *4 eyes process / CBDC operations* and click on the *CBDC operation **ID*** just created with the previous single user



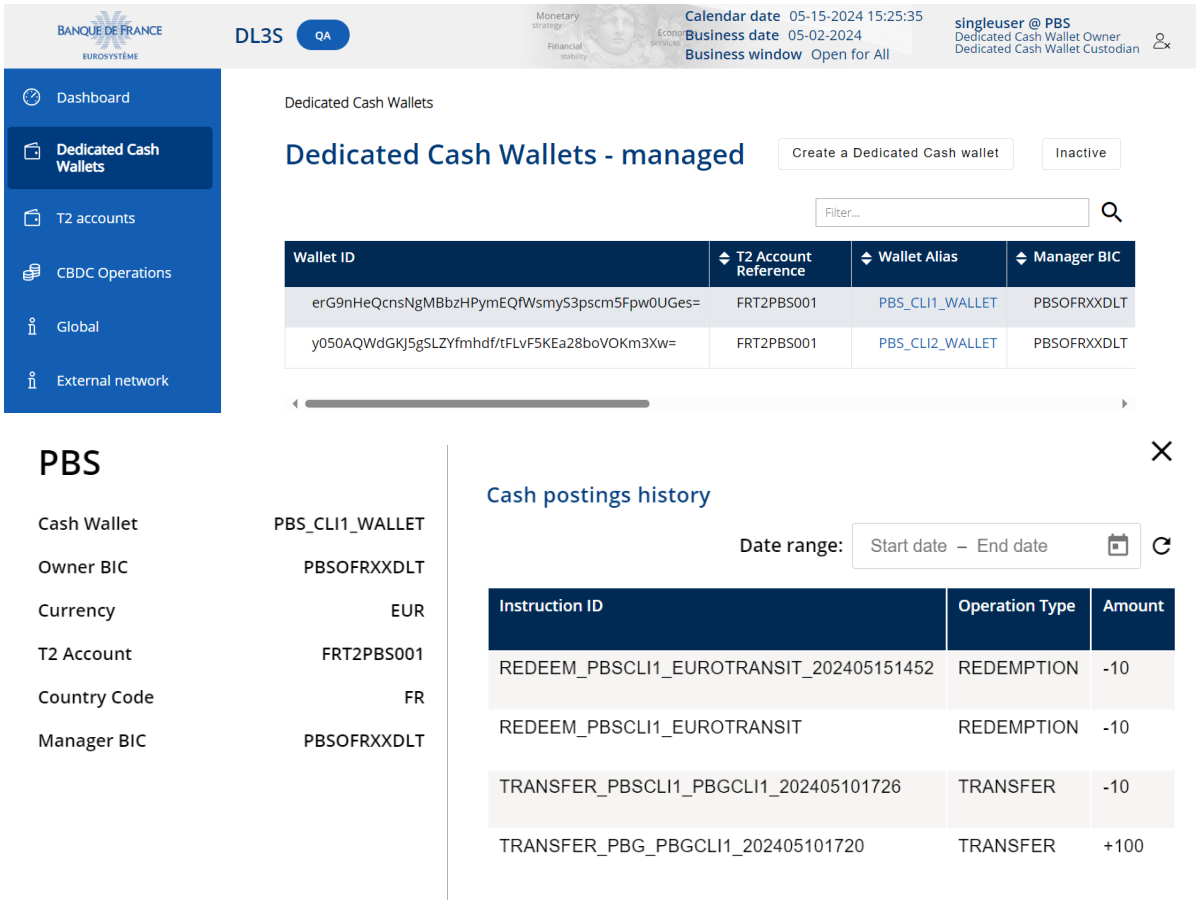
- Validate the transfer operation by clicking on the *Approve* button



- Go to the CBDC *Operations / managed*, the transfer appears with the “ACCEPTED” status at first until it is “SETTLED” or “UNSETTLED”.



- ***Dedicated Cash Wallet custodian*** can control on their respective wallets that the correct amount has been credited or debited.

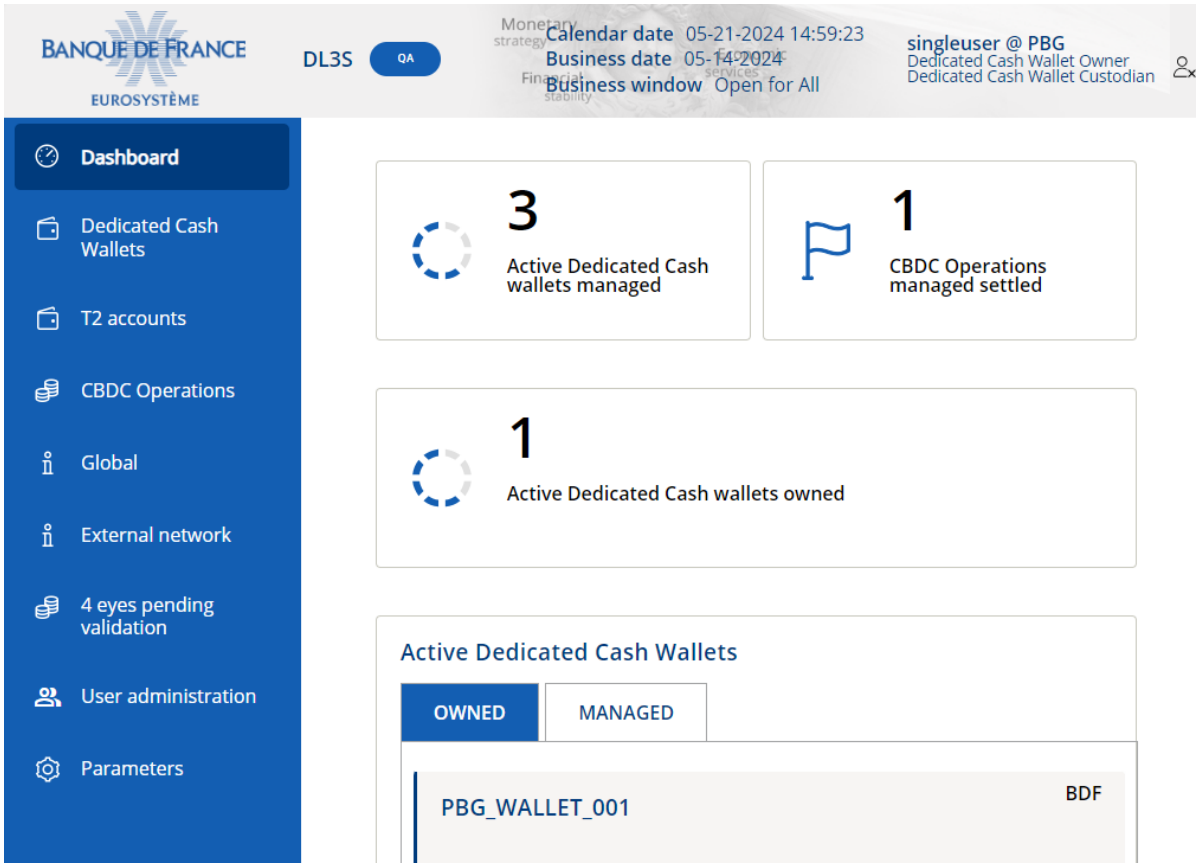


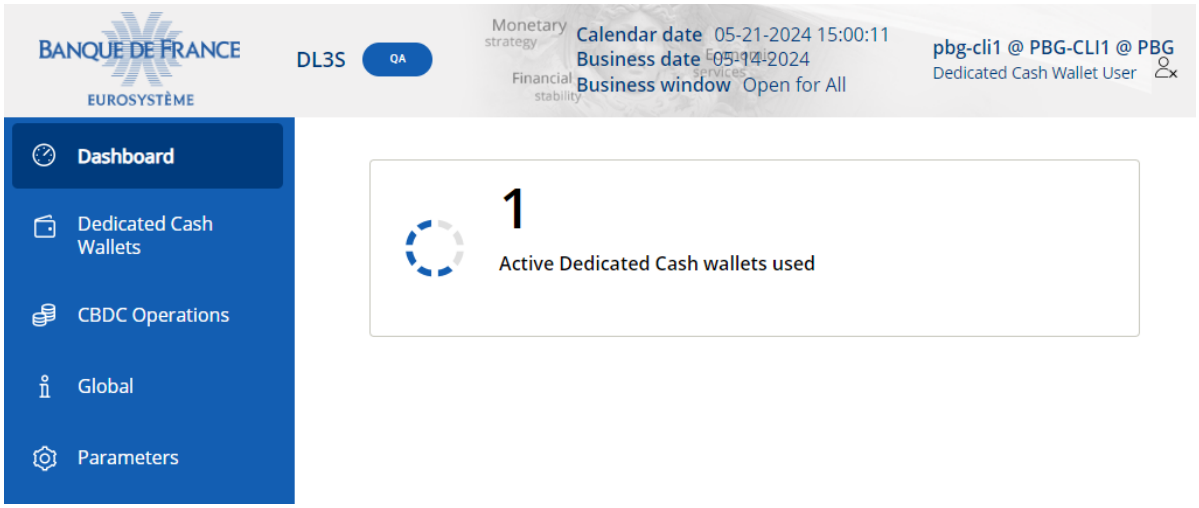
4.6 Monitoring and reporting

A DL3S participant (***Dedicated Cash Wallet owner***, ***Dedicated Cash Wallet custodian*** or ***Dedicated Cash Wallet owner***) can monitor his wallets or his operation and can also access the status of his operations during their lifecycle.

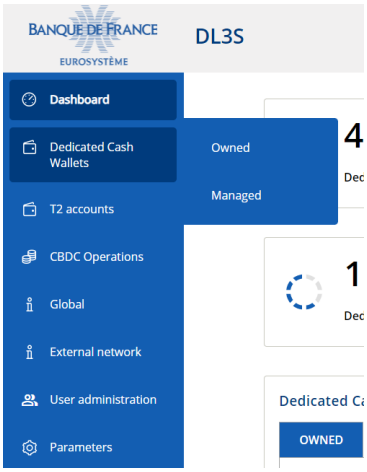
4.6.1 Monitoring

- The number and the list of Dedicated Cash Wallets owned or managed are available on the dashboard. In case of a ***Dedicated Cash Wallet user***, only the number of Dedicated Cash Wallets used is available.





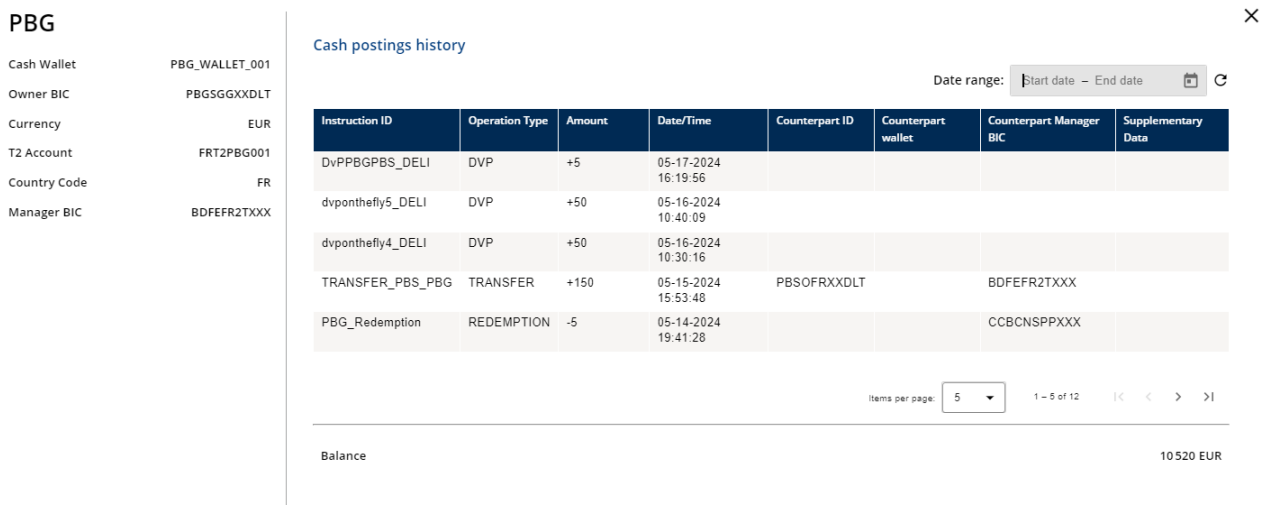
- By clicking on the *Dedicated Cash Wallets* tab, one will access to more detailed information about his owned, managed or used wallets.



- Information available are:

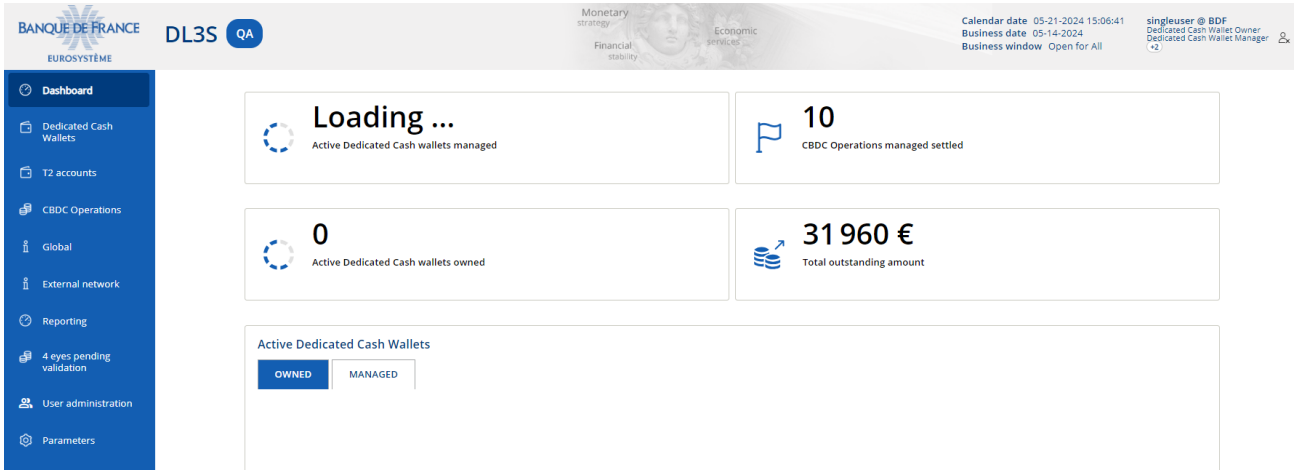
- *Wallet ID* column corresponds to the technical identity of the wallet in DL3S
- *T2 Account reference* column corresponds to the reference of T2 account the Dedicated Cash Wallet is linked to
- *Wallet alias* corresponds to name of the wallet on DL3S platform
- *Owner BIC* corresponds to the BIC of the owner of the wallet (on managed view)
- *Owner Short Name* corresponds to the name of the owner of the Dedicated Cash Wallet in DL3S (on managed view)
- *Manager BIC* corresponds to the BIC of the manager of the wallet (on owned view)
- *Manager Short Name* corresponds to the name of the manager of the Dedicated Cash Wallet in DL3S (on owned view)
- *Currency* corresponds to the currency of the Dedicated Cash Wallet in DL3S
- *Available* corresponds to the amount of CBDC available in the Dedicated Cash Wallet
- *Country Code* is the jurisdiction code of the participant in DL3S
- *Token details* contains technical details about tokens hold in the wallet. At first, when the wallet is empty, it contains no data.
- *Valid from* corresponds to the business date on which the wallet is active
- *Valid to* corresponds to the business date on which the wallet is expired
- *Blocking Status* corresponds to the status of the wallet blocked or unblocked

- By clicking on the wallet alias, the participant has access to the cash postings history of the Dedicated Cash Wallet managed. Each instruction on the Dedicated Cash Wallet is registered with the date and time, the counterpart (accordingly to operations' type privacy requirements), the amount of the transaction and the ID instruction. The participant can also check the balance of the wallet.

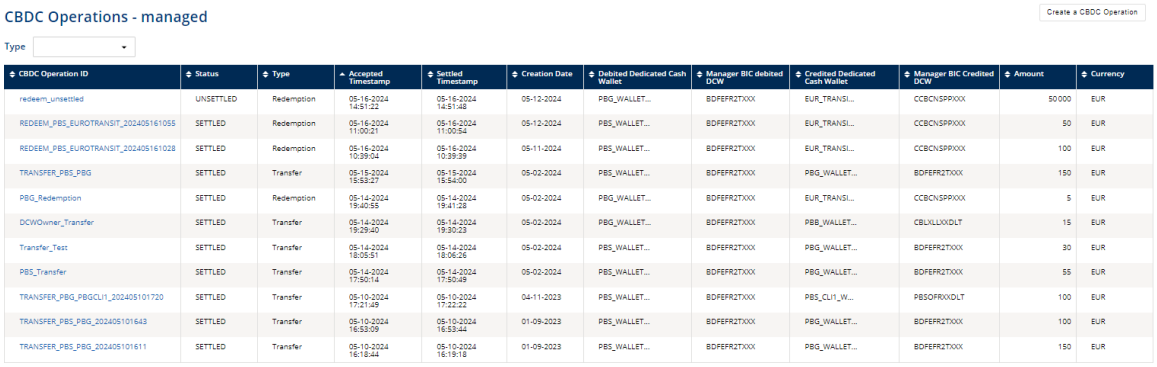


4.6.2 Reporting

- An operation can have different status:
  - Settled: the operation is successful
  - Unsettled: the operation failed for eligibility reasons
  - Waiting_for_approval: the operation needs to be approved in the 4-eyes process
  - To_Be_Reviewed: the operation has been disapproved in the 4-eyes process and needs to be reviewed
  - Accepted: the operation has been correctly submitted and is being processed
- For or ***Dedicated Cash Wallet manager***, the number of CBDC operations settled managed is available on the dashboard.



- By clicking on the *CBDC operations* tab, one will access to more detailed information about his owned, managed or used operation.

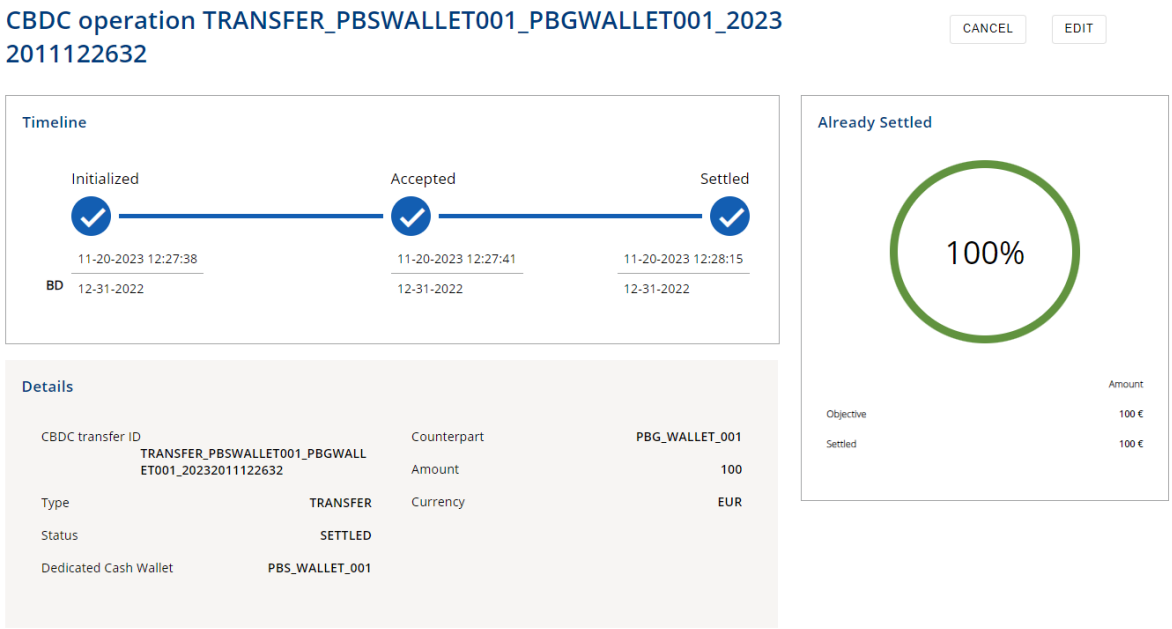


CBDC Operation ID	Status	Type	Accepted Timestamp	Settled Timestamp	Creation Date	Debited Dedicated Cash Wallet	Manager BIC debited DCW	Credited Dedicated Cash Wallet	Manager BIC Credited DCW	Amount	Currency
redeem_unsettled	UNSETTLED	Redemption	05-16-2024 14:51:22	05-16-2024 14:51:48	05-12-2024	PBG_WALLET...	BDFEFR2TXXX	EUR_TRANSI...	CCBCNSPPXXX	50000	EUR
REDEEM_PBS_EUROTRANSIT_202405161055	SETTLED	Redemption	05-16-2024 11:00:21	05-16-2024 11:00:54	05-12-2024	PBS_WALLET...	BDFEFR2TXXX	EUR_TRANSI...	CCBCNSPPXXX	50	EUR
REDEEM_PBS_EUROTRANSIT_202405161028	SETTLED	Redemption	05-16-2024 10:39:04	05-16-2024 10:39:39	05-11-2024	PBS_WALLET...	BDFEFR2TXXX	EUR_TRANSI...	CCBCNSPPXXX	100	EUR
TRANSFER_PBS_PBG	SETTLED	Transfer	05-15-2024 15:53:27	05-15-2024 15:54:00	05-02-2024	PBS_WALLET...	BDFEFR2TXXX	PBG_WALLET...	BDFEFR2TXXX	150	EUR
PBG_Redemption	SETTLED	Redemption	05-14-2024 19:40:55	05-14-2024 19:41:28	05-02-2024	PBG_WALLET...	BDFEFR2TXXX	EUR_TRANSI...	CCBCNSPPXXX	5	EUR
DCWOwner_Transfer	SETTLED	Transfer	05-14-2024 19:29:40	05-14-2024 19:30:23	05-02-2024	PBG_WALLET...	BDFEFR2TXXX	PBB_WALLET...	CBLXLLXXDLT	15	EUR
Transfer_Test	SETTLED	Transfer	05-14-2024 18:05:51	05-14-2024 18:06:26	05-02-2024	PBS_WALLET...	BDFEFR2TXXX	PBG_WALLET...	BDFEFR2TXXX	30	EUR
PBS_Transfer	SETTLED	Transfer	05-14-2024 17:50:14	05-14-2024 17:50:49	05-02-2024	PBS_WALLET...	BDFEFR2TXXX	PBG_WALLET...	BDFEFR2TXXX	55	EUR
TRANSFER_PBG_PBGCLI1_202405101720	SETTLED	Transfer	05-10-2024 17:21:49	05-10-2024 17:22:22	04-11-2023	PBS_WALLET...	BDFEFR2TXXX	PBS_CLI1_W...	PBSOFRXXDLT	100	EUR
TRANSFER_PBS_PBG_202405101643	SETTLED	Transfer	05-10-2024 16:53:09	05-10-2024 16:53:44	01-09-2023	PBS_WALLET...	BDFEFR2TXXX	PBG_WALLET...	BDFEFR2TXXX	100	EUR
TRANSFER_PBS_PBG_202405101611	SETTLED	Transfer	05-10-2024 16:18:44	05-10-2024 16:19:18	01-09-2023	PBS_WALLET...	BDFEFR2TXXX	PBG_WALLET...	BDFEFR2TXXX	150	EUR

- Information available are:

- *CBDC operation ID* column corresponds to the ID of CBDC operations
- *Type* corresponds to the type of the operation (redeem, transfer or issuance)
- *Status* column corresponds to the current status of operation
- *Accepted timestamps* corresponds date and time when the operation has been correctly submitted
- *Settled timestamps* corresponds date and time when the operation has been settled or unsettled
- *Creation Date* corresponds business date
- *Debited Dedicated cash Wallet* corresponds to the alias of the debited cash wallet
- *Manager BIC debited DCW* corresponds to BIC of the manager of the debited cash wallet
- *Credited Dedicated Cash Wallet* corresponds to the name of the credited cash wallet
- *Manager BIC Credited DCW* corresponds to the BIC of the manager of the credited cash wallet
- *Amount* corresponds to the amount of the operation
- *Currency* corresponds to the currency of the operation

- By clicking on the ID instruction, one can have detailed information about the instruction:



- *Timeline* corresponds to the lifecycle of the instruction
- *CB transfer ID* corresponds to the ID of the operation
- *Type* corresponds to the type of the operation among redeem, transfer and issuance
- *Status* corresponds to the final status of the operation

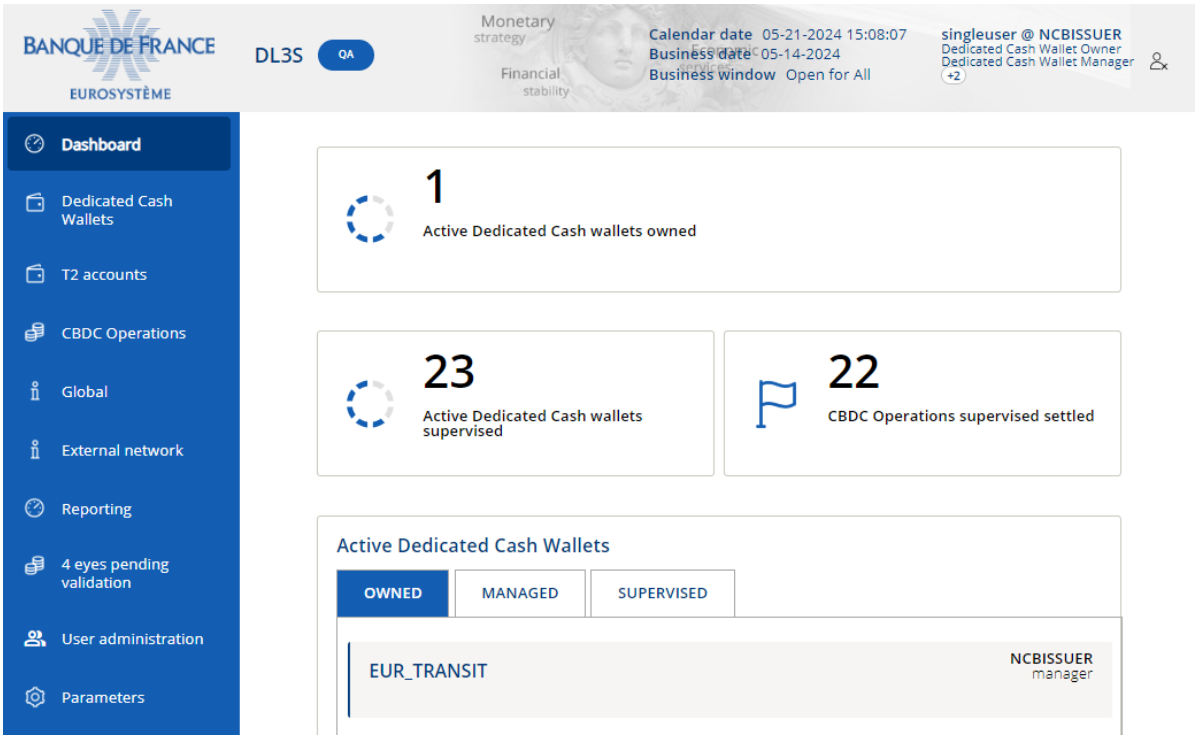
- *Dedicated Cash Wallet* corresponds to the wallet of the participant involved in the operation
- *Counterpart* corresponds to the counterparty of the operation
- *Amount* corresponds to the amount of the operation
- *Currency* corresponds to the currency of the operation
- *Percentage* correspond to the percentage of the operation that is settled and below is the corresponding amount settled

4.7 Supervision

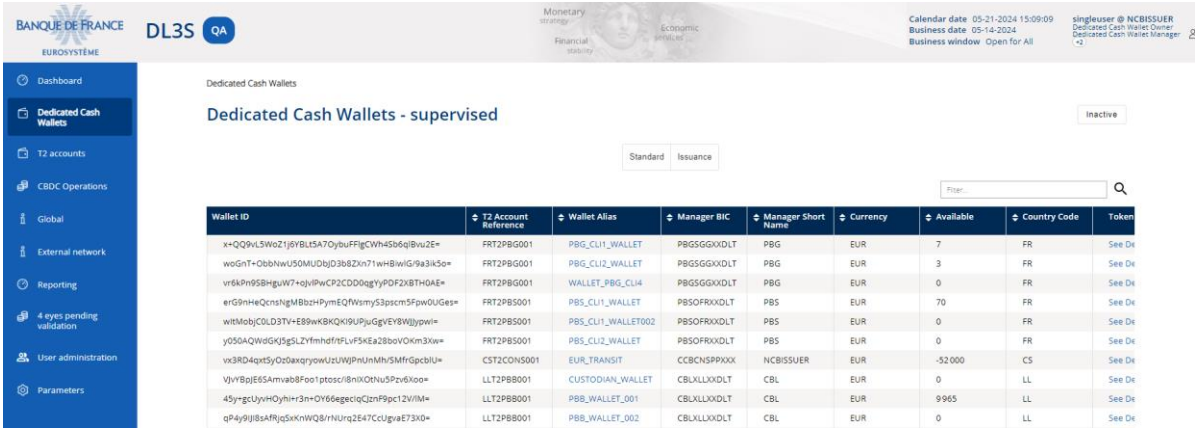
4.7.1 Supervised Dedicated Cash Wallets

Supervision of Dedicated Cash Wallets is accessible to ***CBDC Supervisor*** and ***National CBDC supervisor***. ***National CBDC Supervisor*** can only supervise participant of his jurisdiction whereas ***CBDC Supervisor*** can supervise every participant.

- For a ***CBDC supervisor***, the number and the list of active Dedicated Cash Wallets supervised are available on the dashboard.



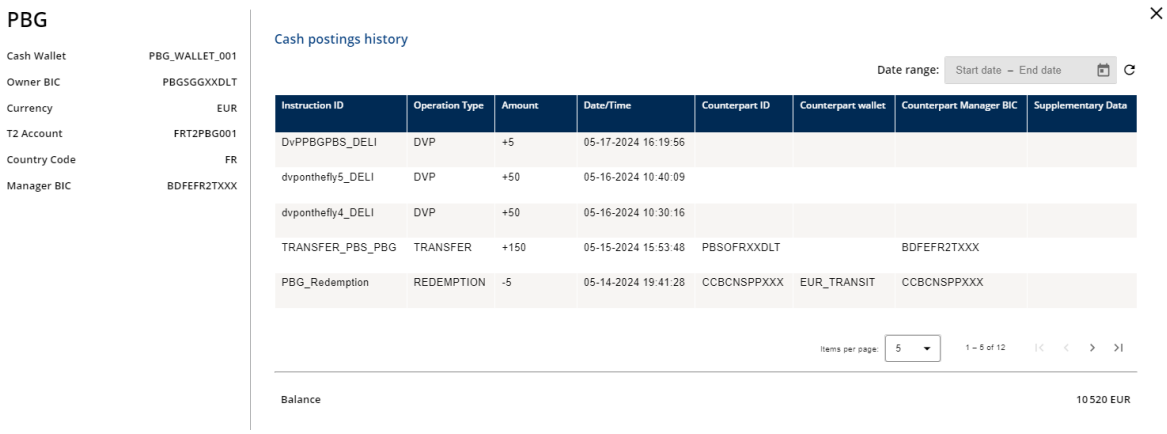
- A ***National CBDC Supervisor*** or a ***CBDC Supervisor*** can access to more detailed information about wallets they supervised, by clicking on the *Supervised* tab on ***Dedicated Cash Wallets*** tab for the ***CBDC Supervisor*** or by clicking on the *National Supervised* tab on *Dedicated Cash Wallets* tab for the ***National CBDC Supervisor***



- Information available are:

- *Wallet ID* column corresponds to the technical identity of the Dedicated Cash Wallet in DL3S
- *T2 Account reference* column corresponds to the reference of T2 account the Dedicated Cash Wallet is linked to
- *Wallet alias* corresponds to name of the wallet on DL3S platform
- *Manager BIC* corresponds to the BIC of the manager of the wallet
- *Manager Name* corresponds to the name of the owner of the Dedicated Cash Wallet in DL3S
- *Currency* corresponds to the currency of the Dedicated Cash Wallet in DL3S
- *Available* corresponds to the amount of CBDC available in the Dedicated Cash Wallet
- *Country Code* is the jurisdiction code of the participant in DL3S
- *Token details* contains technical details about tokens hold in the wallet. At first, when the wallet is empty, it contains no data.

- By clicking on the wallet alias, ***CBDC Supervisor*** or ***National CBDC Supervisor*** have access to the movement history of the wallet supervised. Each instruction on the wallet is registered with the date and time, the counterpart (accordingly to operations' type privacy requirements), the amount of the transaction and the ID instruction. The balance can also be checked the balance of the Dedicated Cash Wallet.

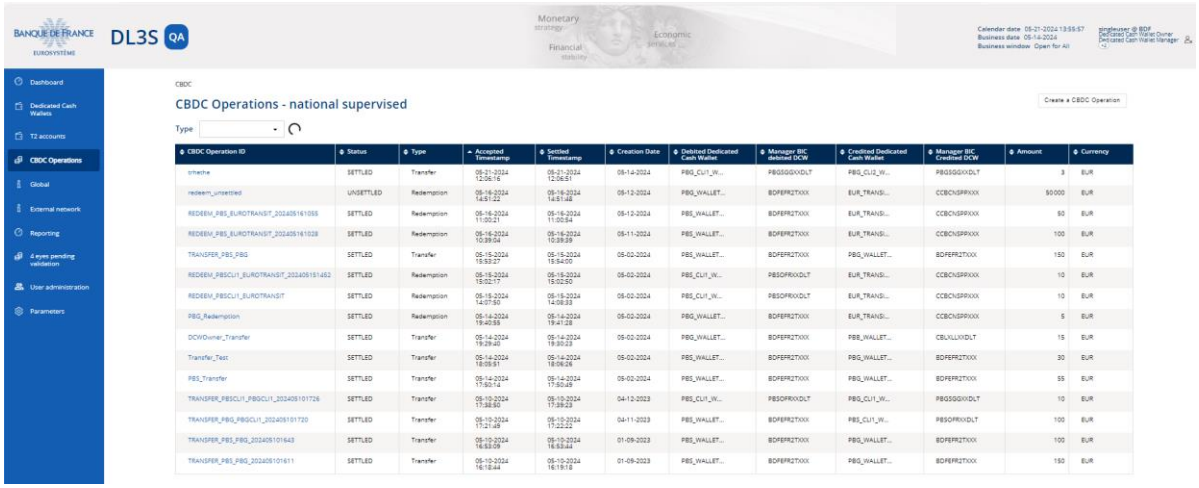


4.7.2 Operations under NCB jurisdiction

Supervision of CBDC operation is accessible to ***CBDC Supervisor*** and ***National CBDC supervisor***. ***National CBDC Supervisor*** can only supervise CBDC operations of his jurisdiction whereas ***CBDC Supervisor*** can supervise every CBDC operation.

- A ***National CBDC Supervisor*** or a ***CBDC Supervisor*** can access to information about CBDC operations of their jurisdiction by clicking on the *Supervised* tab on *CBDC Operations* tab for the

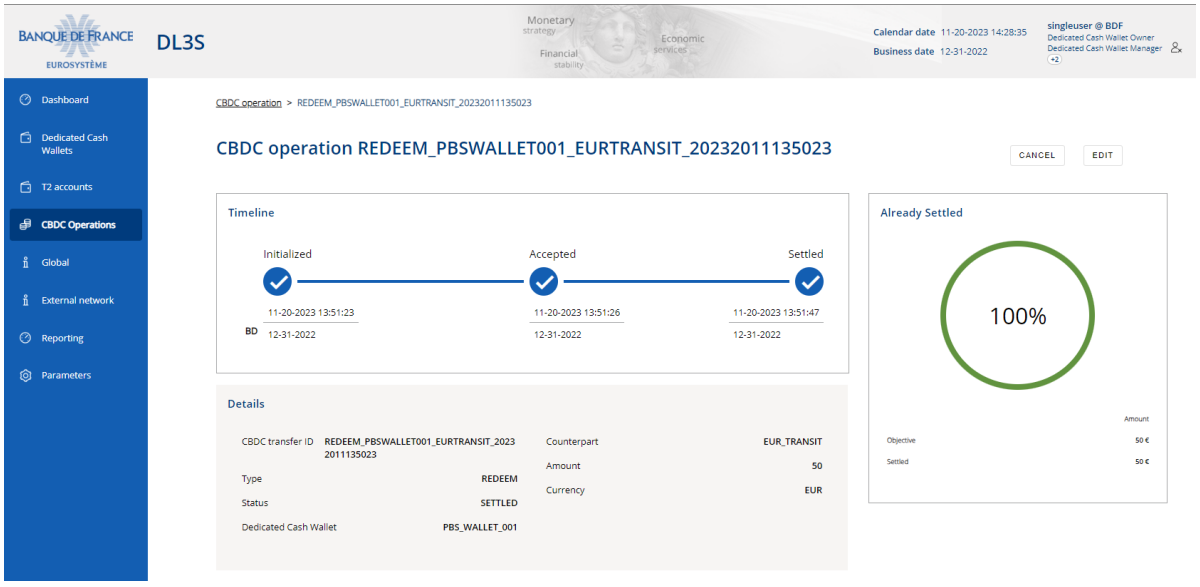
CBDC Supervisor or by clicking on the *National Supervised* tab on *CBDC Operations* tab for the ***National CBDC Supervisor***



- Information available are:

- *CBDC operation ID* column corresponds to the ID of CBDC operations
- *Status* column corresponds to the current status of operation
- *Type* corresponds to the type of the operation (redeem, transfer or issuance)
- *Accepted timestamps* corresponds date and time when the operation has been correctly submitted
- *Creation Date* corresponds business date
- *Debited Dedicated Cash Wallet* corresponds to the name of the debited Dedicated Cash Wallet
- *Manager BIC debited DCW* corresponds to BIC of the manager of the debited Dedicated Cash Wallet
- *Credited Dedicated Cash Wallet* corresponds to the name of the credited Dedicated Cash Wallet
- *Manager BIC Credited DCW* correspond to the BIC of the credited Dedicated Cash Wallet
- *Amount* corresponds to the amount of the operation
- *Currency* corresponds to the currency of the operation

- By clicking on the ID instruction, one can have detailed information about the instruction:



- *Timeline* corresponds to the lifecycle of the instruction
- *CB transfer ID* corresponds to the ID of the operation
- *Type* corresponds to the type of the operation among redeem, transfer and issuance

- *Status* corresponds to the final status of the operation
- *Dedicated Cash Wallet* corresponds to the wallet of the participant involved in the operation
- *Counterpart* corresponds to the counterparty of the operation
- *Amount* corresponds to the amount of the operation
- *Currency* corresponds to the currency of the operation
- *Percentage* correspond to the percentage of the operation that is settled and below is the corresponding amount settled

4.8 Data extraction

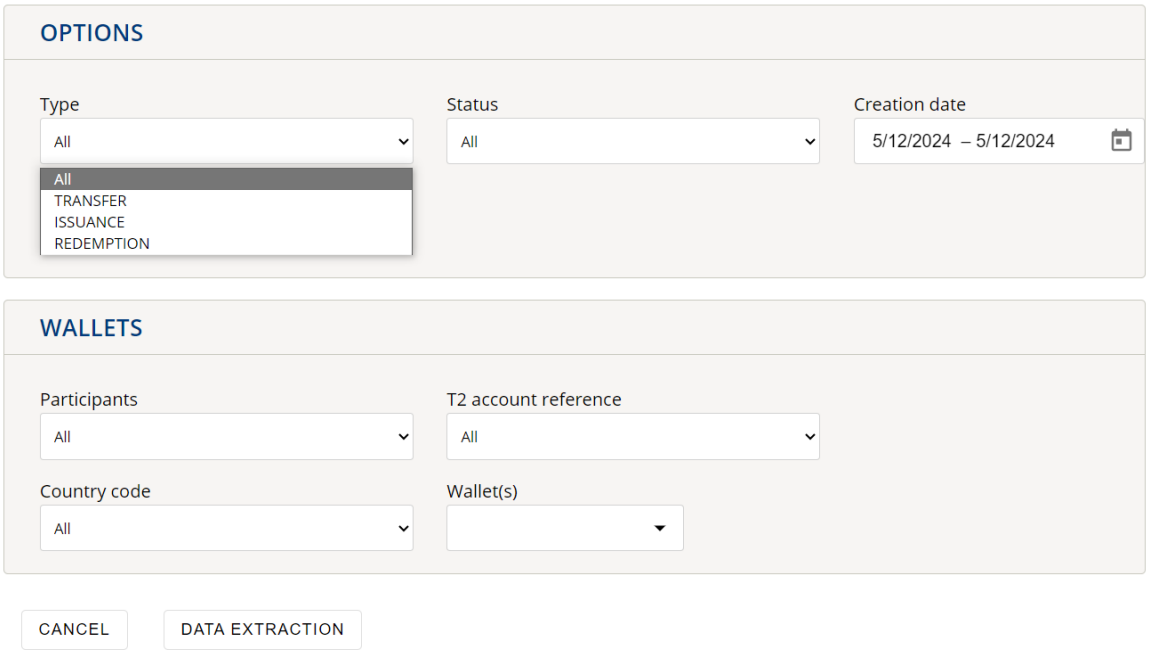
The *reporting tab* allows ***National CBDC Supervisor*** and ***DL3S Operator*** to extract CBDC Operations (*CBDC operations extraction subtab*) and cash postings history (*Cash postings history extraction subtab*).

4.8.1 CBDC Operations extraction

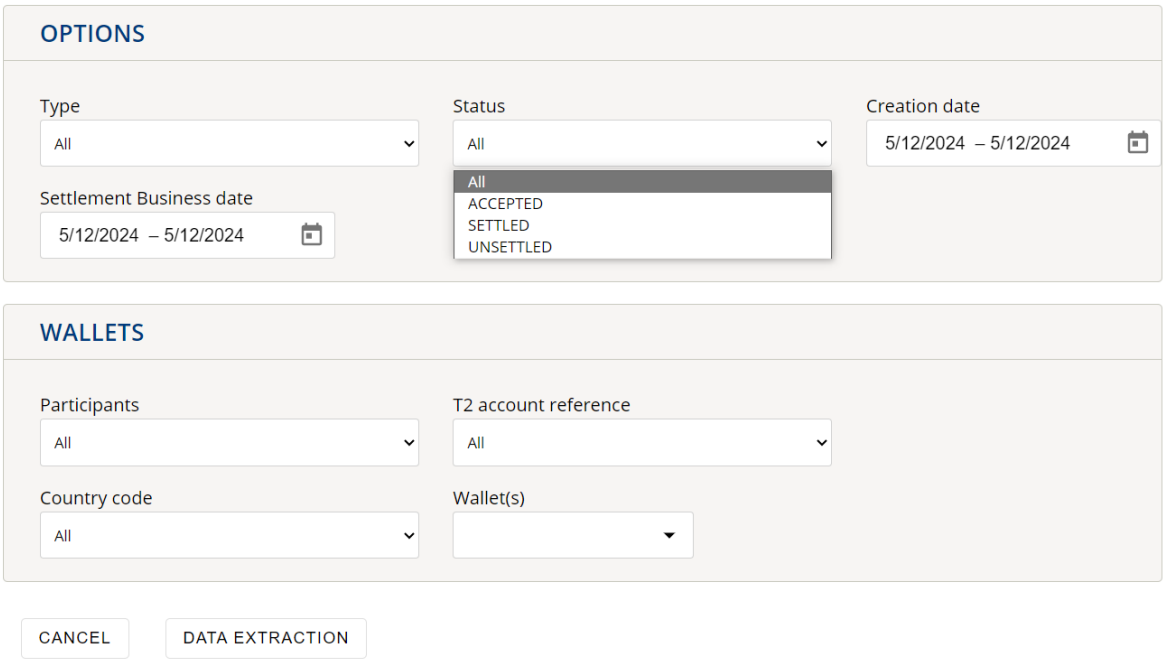
National CBDC Supervisor can extract CBDC operations for any participant under its jurisdiction. ***National CBDC Supervisor*** with Dedicated Cash Wallet manager can extract CBDC operations for participant they manage event if he is not under its jurisdiction.
DL3S Operator can extract CBDC Operations for every participant of DL3S.

When doing an extraction, it is possible to filter on:

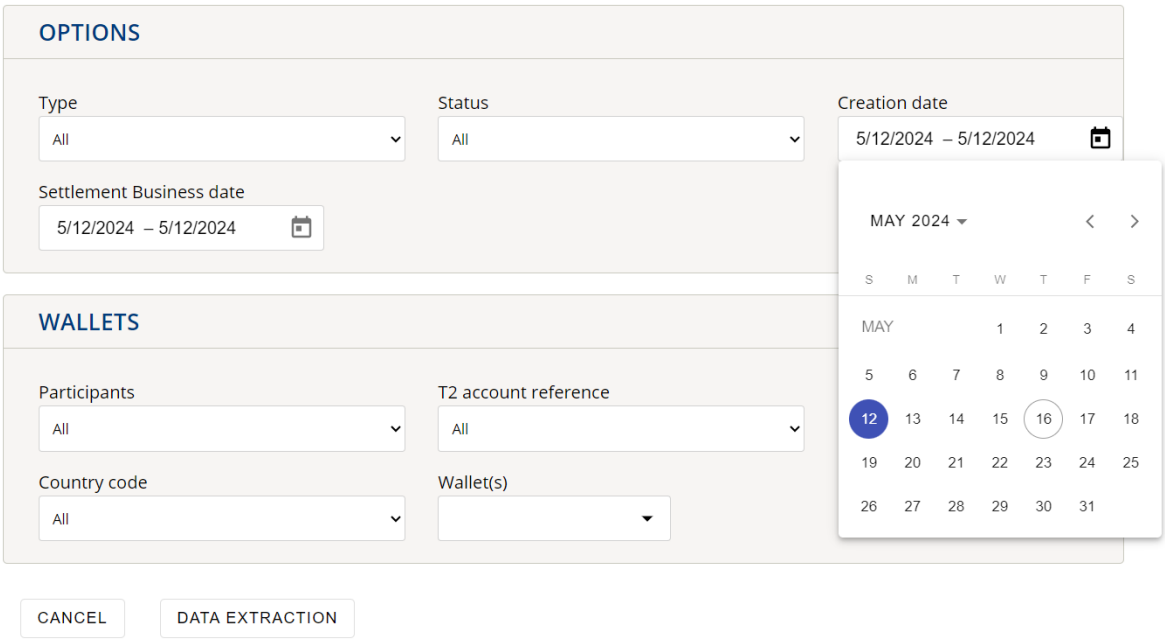
- *Type,* whether the CBDC operation is an issuance, a transfer, a redemption



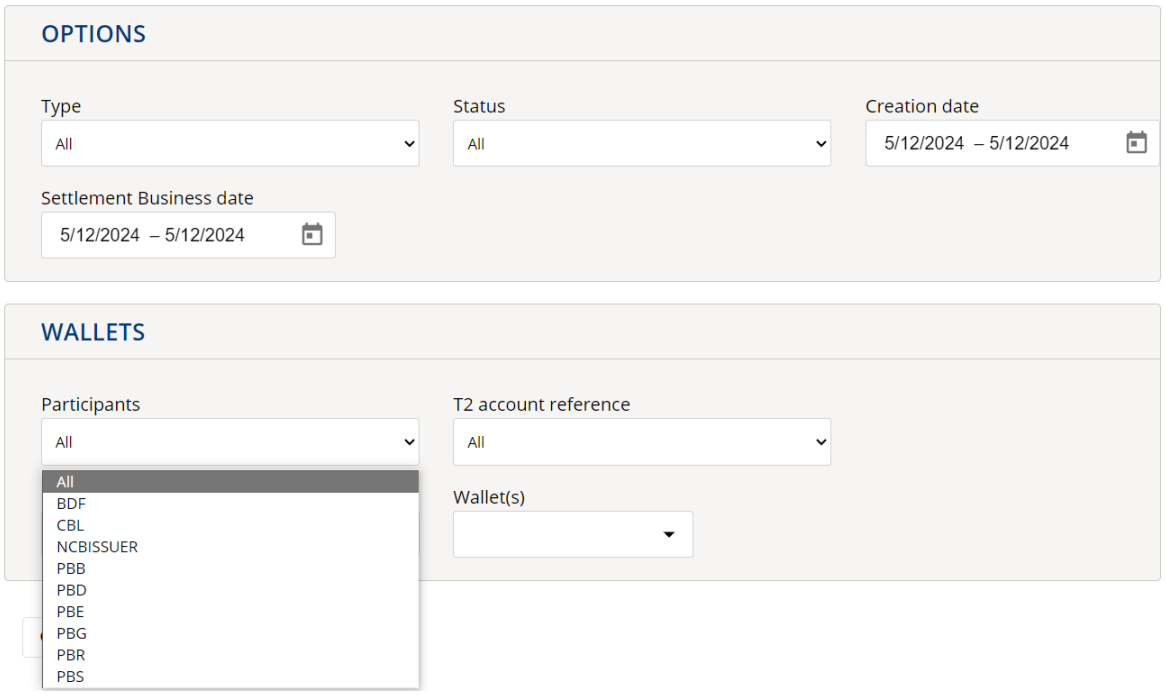
- *Status*, whether the CBDC is in *accepted*, *settled*, *unsettled* status



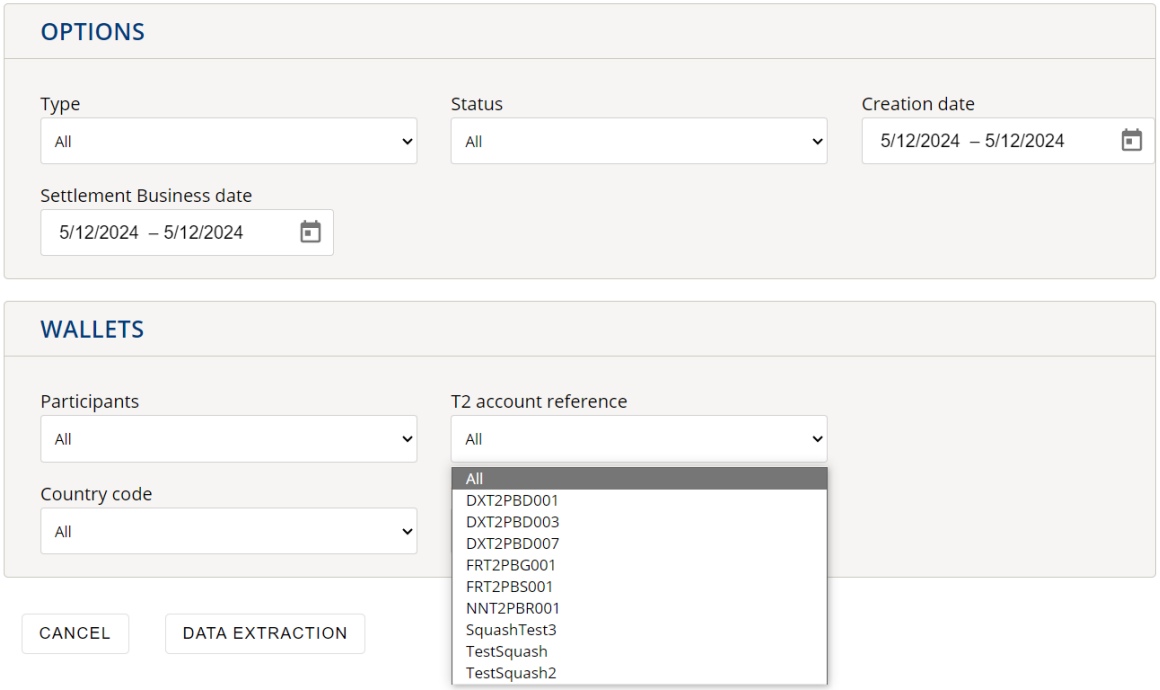
- *Business date* of the operation



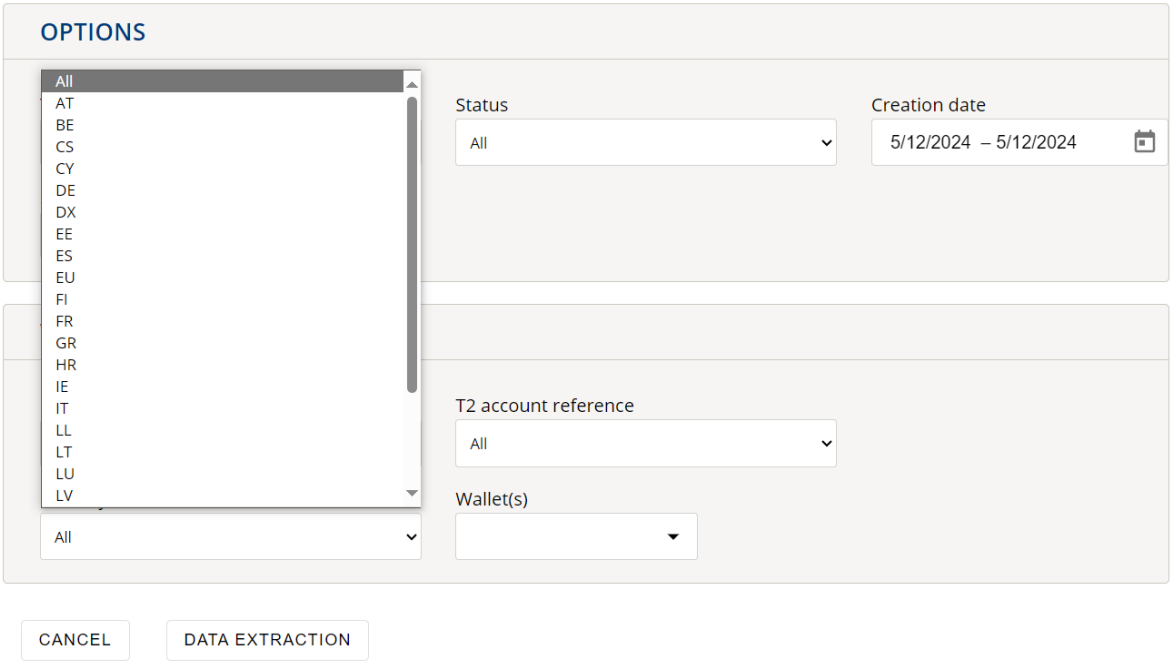
- *Participants*, which participant to extract data from.



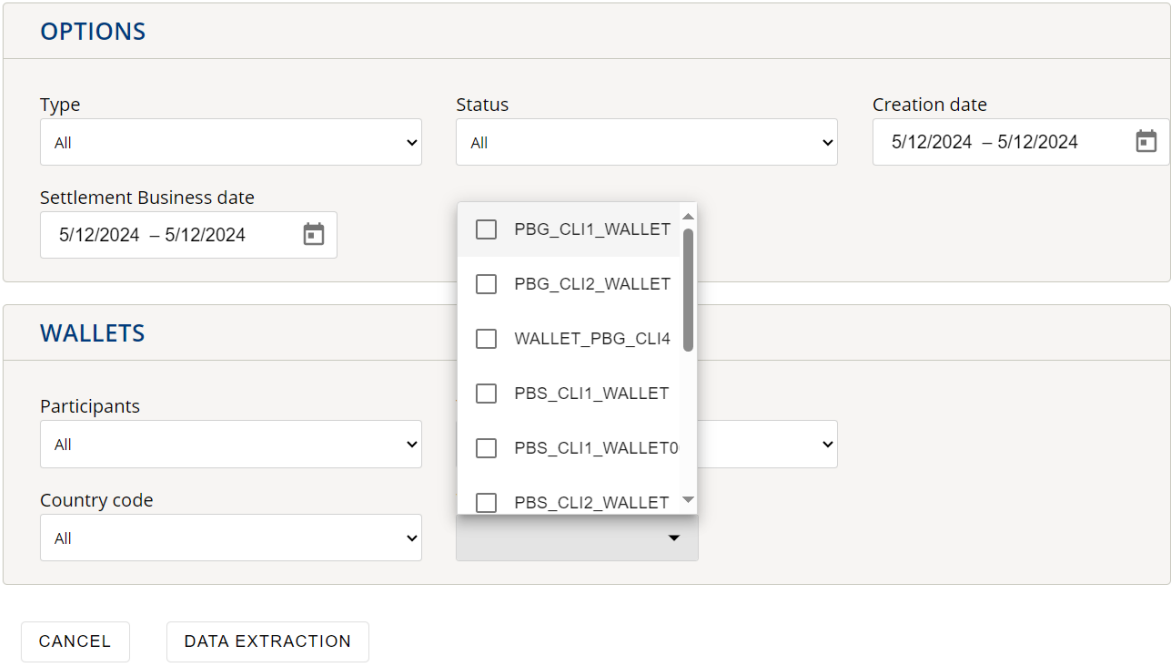
- *T2 Account Reference*, a participant can extract data related to a specific T2 account reference



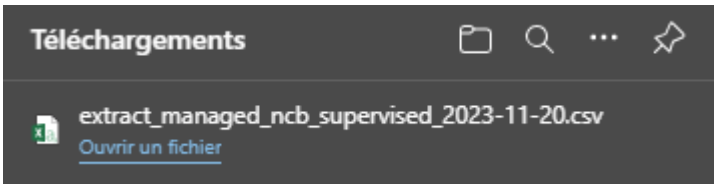
- *Country code*. It is possible to filter on the country code of participants involved in CBDC Operations



- *Wallets*. A participant can filter on wallets to extract CBDC Operations.



- Once the NCB chose its filters it clicks on “Data Extraction” and a CSV files is downloaded

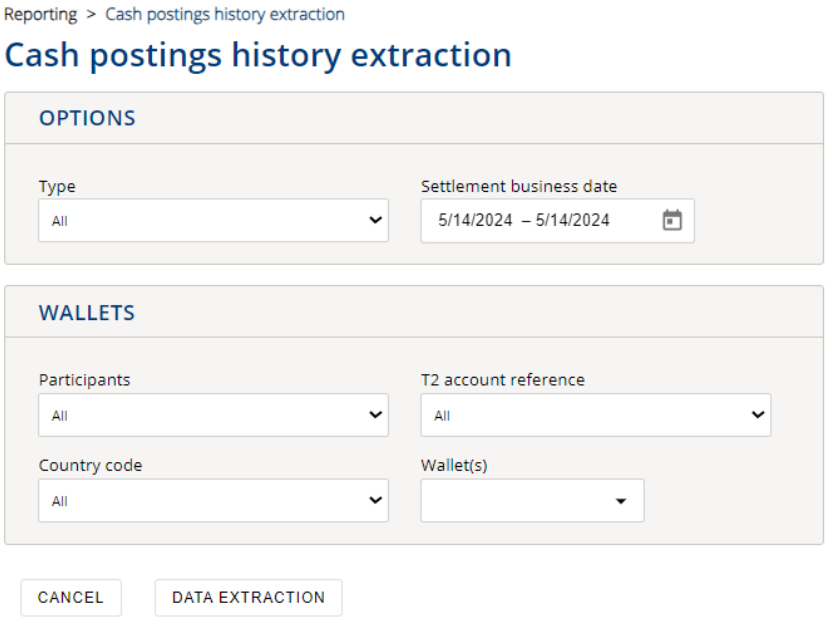


- The file looks like this and the columns are the following:
  - CBDC Operation ID
  - CBDC Operation type
  - Debited Dedicated Cash Wallet
  - Debited Dedicated Cash Wallet Owner BIC
  - Debited Dedicated Cash Wallet Manager BIC
  - Debited Country Code
  - Debited T2/CLM account reference
  - Credited Dedicated Cash Wallet
  - Credited Dedicated Cash Wallet Owner BIC
  - Credited Dedicated Cash Wallet Manager BIC
  - Credited Country Code
  - Credited T2/CLM Account Reference
  - Settled Amount
  - Currency
  - Status
  - Last Status- Business Date
  - Last Status Timestamp

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	CBDC Operat	CBDC Operat	Debited CBD	Debited CBD	Debited CBD	Debited Cou	Debited T2/(	Credited CB(	Credited CB(	Credited CB(	Credited Cou	Credited T2/	Amount	Currency	Status (last s	Last status B	Last status Timestamp		
2	issuance_PB	ISSUANCE	EUR_TRANSIT		CBCONSPPXXX			PBG_WALLET	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	150000.00	EUR	SETTLED	31/12/2022	2023-11-15 09:55:37 +0000 UTC		
3	issuance -pl	ISSUANCE	EUR_TRANSIT		CBCONSPPXXX			PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	1000.00	EUR	SETTLED	31/12/2022	2023-11-20 09:22:29 +0000 UTC		
4	ISSUANCE_P	ISSUANCE	EUR_TRANSIT		CBCONSPPXXX			PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	234000.00	EUR	SETTLED	31/12/2022	2023-11-15 09:55:42 +0000 UTC		
5	issuance_EU	ISSUANCE	EUR_TRANSIT		CBCONSPPXXX			PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	2000.00	EUR	SETTLED	31/12/2022	2023-11-20 10:29:01 +0000 UTC		
6	redeem_pbg	REDEEM	PBG_CLI1_W	PBGSGGXXDI	PBGSGGXXDI	FR	FRT2PBG001	EUR_TRANSIT		CBCONSPPXXX			50.00	EUR	SETTLED	31/12/2022	2023-11-20 13:05:06 +0000 UTC		
7	trnasfer_pbg	TRANSFER	PBG_CLI1_W	PBGSGGXXDI	PBGSGGXXDI	FR	FRT2PBG001	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	10.00	EUR	SETTLED	31/12/2022	2023-11-20 12:46:21 +0000 UTC		
8	transfer_pbg	TRANSFER	PBG_WALLET	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	PBB_WALLET_001		CBLXLLXXDLT			13500.00	EUR	SETTLED	31/12/2022	2023-11-15 12:46:02 +0000 UTC		
9	transfer_pbs	TRANSFER	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	PBG_WALLET	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	45000.00	EUR	SETTLED	31/12/2022	2023-11-15 12:46:50 +0000 UTC		
10	transfer pbs	TRANSFER	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	PBB_WALLET_001		CBLXLLXXDLT			1200.00	EUR	SETTLED	31/12/2022	2023-11-15 12:47:24 +0000 UTC		
11	TRANSFER_P	TRANSFER	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	PBG_WALLET	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	100.00	EUR	SETTLED	31/12/2022	2023-11-20 11:28:15 +0000 UTC		
12	REDEEM_PBS	REDEEM	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	EUR_TRANSIT		CBCONSPPXXX			200.00	EUR	SETTLED	31/12/2022	2023-11-20 13:01:23 +0000 UTC		
13	REDEEM_PBS	REDEEM	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	EUR_TRANSIT		CBCONSPPXXX			50.00	EUR	SETTLED	31/12/2022	2023-11-20 12:51:47 +0000 UTC		
14	BD_CLOSURE	REDEEM	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	EUR_TRANSIT		CBCONSPPXXX			2156.00	EUR	SETTLED	31/12/2022	2023-11-16 17:36:40 +0000 UTC		
15	tt	TRANSFER	PBG_WALLET	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	PBG_CLI1_W	PBGSGGXXDI	PBGSGGXXDI	FR	FRT2PBG001	100.00	EUR	SETTLED	31/12/2022	2023-11-20 12:42:47 +0000 UTC		
16	transfer_pbg	TRANSFER	PBG_WALLET	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	15000.00	EUR	SETTLED	31/12/2022	2023-11-15 12:45:38 +0000 UTC		
17	BD_CLOSURE	REDEEM	PBG_WALLET	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	EUR_TRANSIT		CBCONSPPXXX			169908.00	EUR	SETTLED	31/12/2022	2023-11-16 17:36:37 +0000 UTC		
18	TT	TRANSFER	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	PBS_CLI1_W	PBSOFRXXDI	PBSOFRXXDI	FR	FRT2PBS001	100.00	EUR	SETTLED	31/12/2022	2023-11-20 11:34:02 +0000 UTC		
19	transfer-pbs	TRANSFER	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	PBG_WALLET	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	150.00	EUR	SETTLED	31/12/2022	2023-11-20 11:21:45 +0000 UTC		

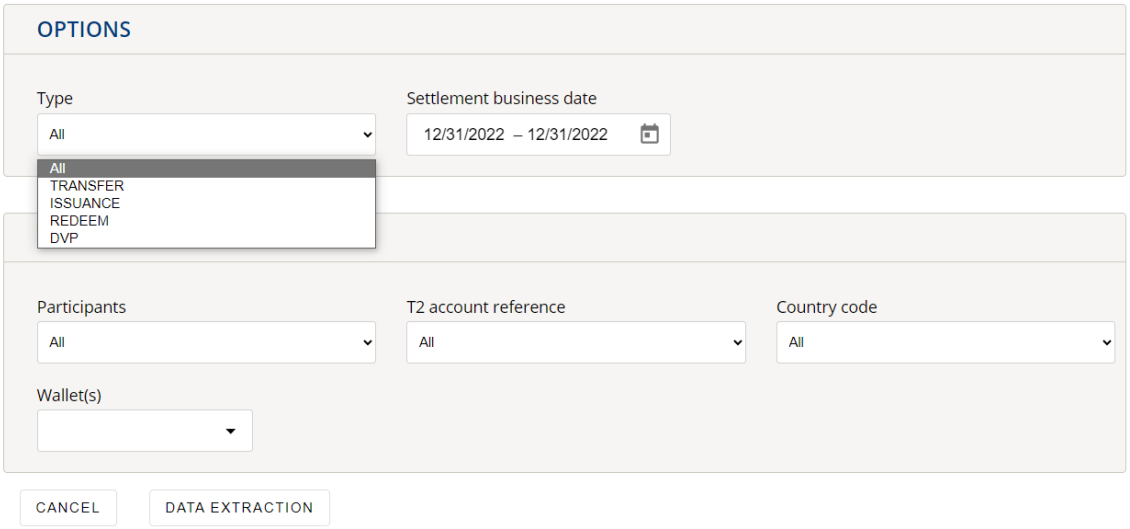
4.8.2 Cash postings history extraction

National CBDC Supervisor can extract cash postings history for any participant under its jurisdiction.
National CBDC Supervisor with Dedicated Cash Wallet manager can extract cash postings history for participant they manage even if he is not under its jurisdiction.
DL3S Operator can extract cash postings history for every participant of DL3S.

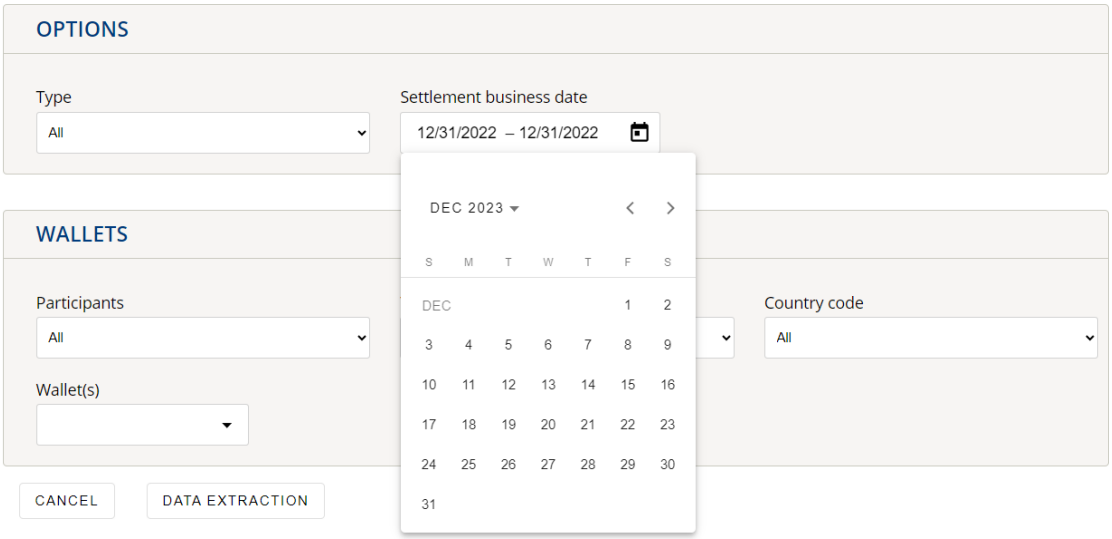


When doing an extraction, it is possible to filter on:

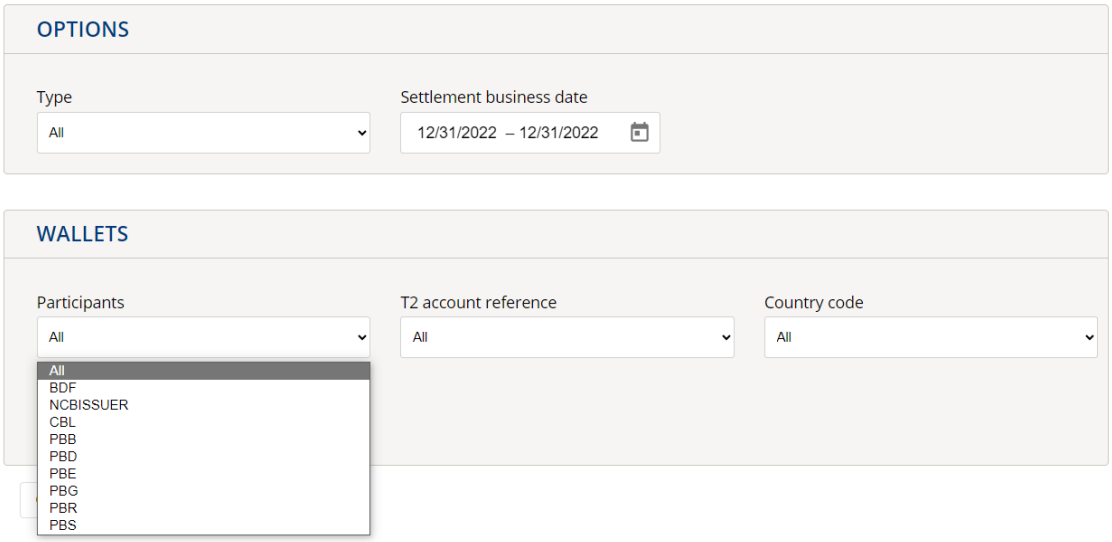
- *Type,* whether the movement is an issuance, a transfer, a redemption or a DvP



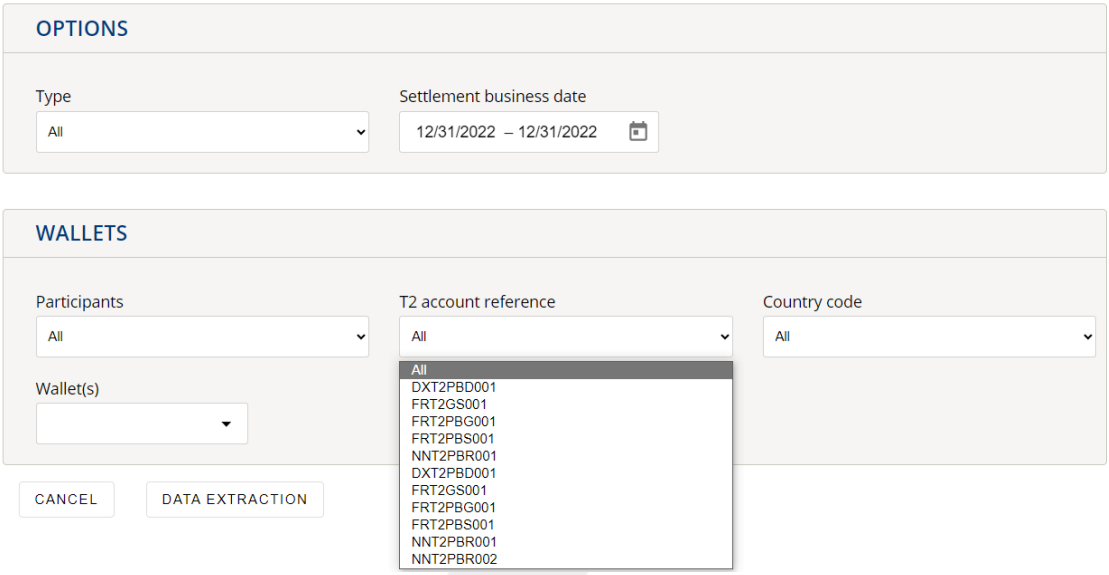
- *Business date* of movements



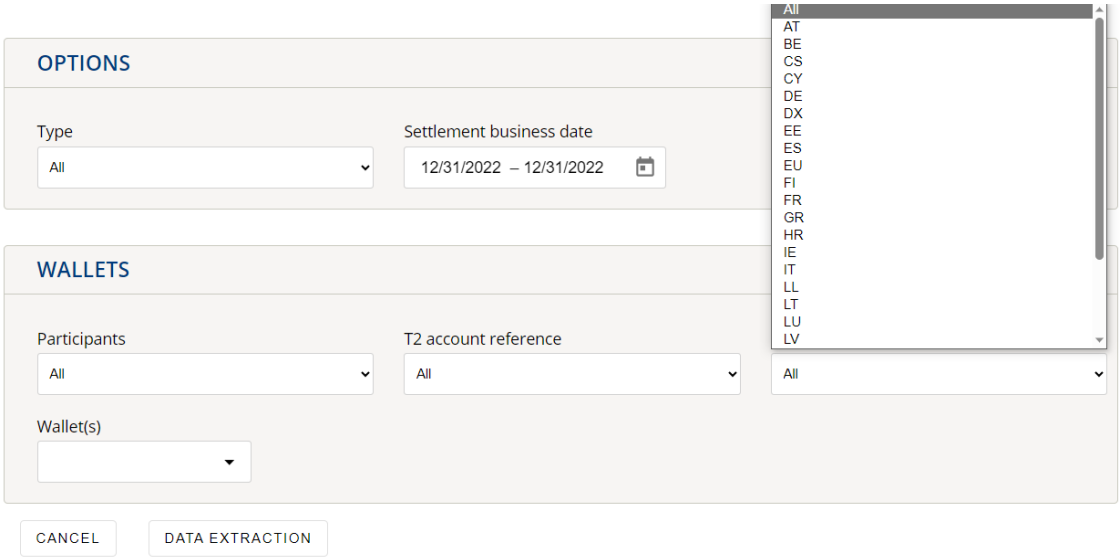
- *Participants*, which participant to extract movements from.



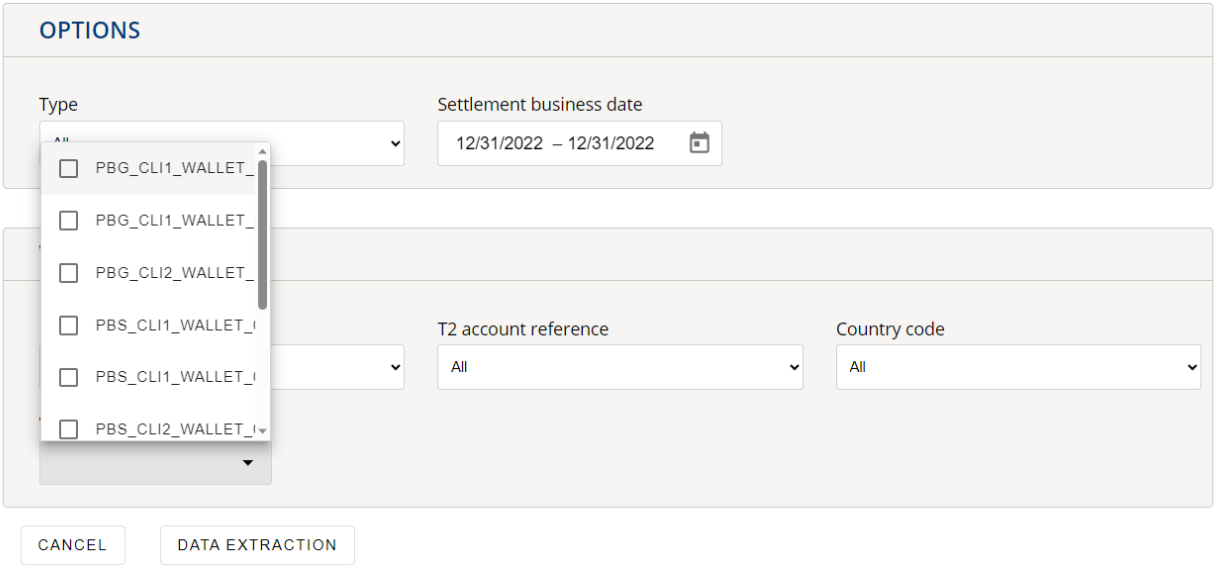
- *T2 Account Reference*, a participant can extract movements related to a specific T2 account reference



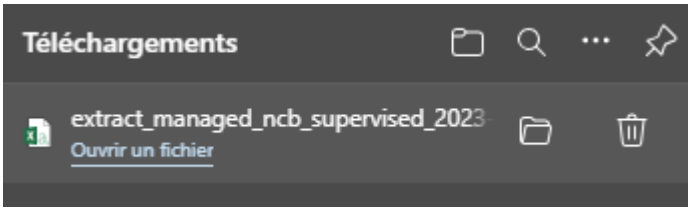
- *Country code*. It is possible to filter on the country code of participants involved in movements



- *Wallets.* A participant can filter on wallets for extracting cash postings.

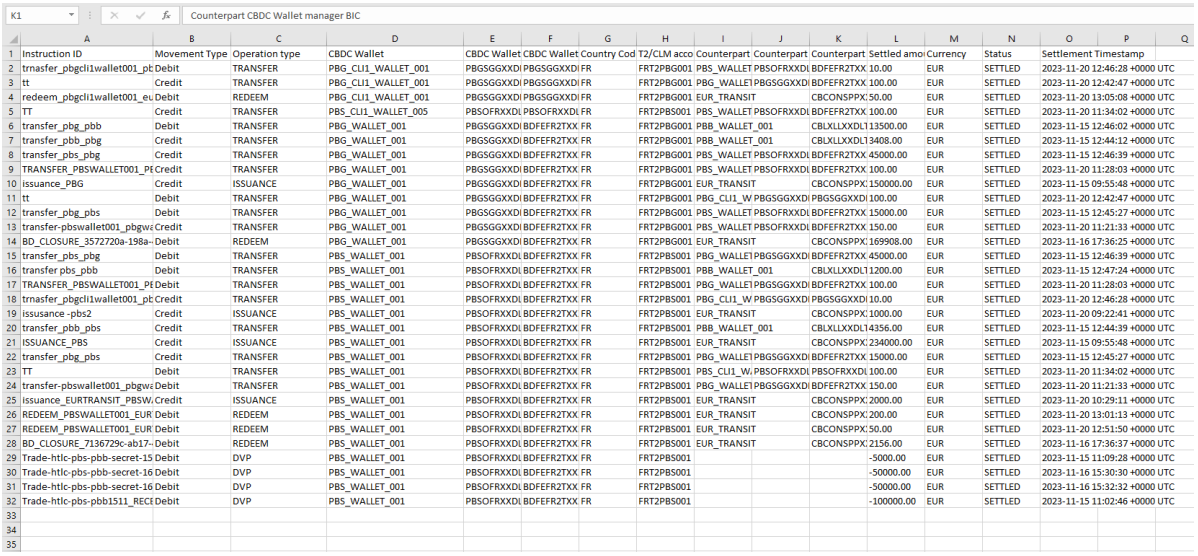


- Once the NCB chose its filters it clicks on “Data Extraction” and a CSV files is downloaded



- The file looks like this and the columns are the following:
  - Instruction ID
  - Movement type
  - Operation type
  - Dedicated Cash Wallet
  - Dedicated Cash Wallet Owner BIC
  - Dedicated Cash Wallet Manager BIC
  - Country Code

- Debited T2/CLM account reference
- Counterpart Dedicated Cash Wallet
- Counterpart Dedicated Cash Wallet Owner BIC
- Counterpart Dedicated Cash Wallet Manager BIC
- Settled Amount
- Currency
- Status
- Settlement timestamps



Instruction ID	Movement Type	Operation type	CBDC Wallet	CBDC Wallet	CBDC Wallet	Country Cod	T2/CLM acco	Counterpart	Counterpart	Counterpart	Settled amo	Currency	Status	Settlement Timestamp
trnasfer_pbgcli1wallet001_pb	Debit	TRANSFER	PBG_CLI1_WALLET_001	PBGSGGXXDI	PBGSGGXXDI	FR	FRT2PBG001	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	10.00	EUR	SETTLED	2023-11-20 12:46:28 +0000 UTC
tt	Credit	TRANSFER	PBG_CLI1_WALLET_001	PBGSGGXXDI	PBGSGGXXDI	FR	FRT2PBG001	PBG_WALLET	PBGSGGXXDI	BDFEFR2TXX	100.00	EUR	SETTLED	2023-11-20 12:42:47 +0000 UTC
redeem_pbgcli1wallet001_eu	Debit	REDEEM	PBG_CLI1_WALLET_001	PBGSGGXXDI	PBGSGGXXDI	FR	FRT2PBG001	EUR_TRANSIT	CBCONSPPX	CBCONSPPX	50.00	EUR	SETTLED	2023-11-20 13:05:08 +0000 UTC
TT	Credit	TRANSFER	PBS_CLI1_WALLET_005	PBSOFRXXDI	PBSOFRXXDI	FR	FRT2PBS001	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	100.00	EUR	SETTLED	2023-11-20 11:34:02 +0000 UTC
transfer_pbg_pbb	Debit	TRANSFER	PBG_WALLET_001	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	PBB_WALLET_001	CBLXLLXXDL	13500.00	EUR	SETTLED	2023-11-15 12:46:02 +0000 UTC
transfer_pbb_pbg	Credit	TRANSFER	PBG_WALLET_001	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	PBB_WALLET_001	CBLXLLXXDL	13408.00	EUR	SETTLED	2023-11-15 12:44:12 +0000 UTC
transfer_pbs_pbg	Credit	TRANSFER	PBG_WALLET_001	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	45000.00	EUR	SETTLED	2023-11-15 12:46:39 +0000 UTC
TRANSFER_PBSWALLET001_PE	Credit	TRANSFER	PBG_WALLET_001	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	100.00	EUR	SETTLED	2023-11-20 11:28:03 +0000 UTC
issuance_PBG	Credit	ISSUANCE	PBG_WALLET_001	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	EUR_TRANSIT	CBCONSPPX	CBCONSPPX	150000.00	EUR	SETTLED	2023-11-15 09:55:48 +0000 UTC
tt	Debit	TRANSFER	PBG_WALLET_001	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	PBG_CLI1_W	PBGSGGXXDI	PBGSGGXXDI	100.00	EUR	SETTLED	2023-11-20 12:42:47 +0000 UTC
transfer_pbg_pbs	Debit	TRANSFER	PBG_WALLET_001	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	15000.00	EUR	SETTLED	2023-11-15 12:45:27 +0000 UTC
transfer-pbswallet001_pbgwa	Credit	TRANSFER	PBG_WALLET_001	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	PBS_WALLET	PBSOFRXXDI	BDFEFR2TXX	150.00	EUR	SETTLED	2023-11-20 11:21:33 +0000 UTC
BD_CLOSURE_3572720a-198a-	Debit	REDEEM	PBG_WALLET_001	PBGSGGXXDI	BDFEFR2TXX	FR	FRT2PBG001	EUR_TRANSIT	CBCONSPPX	CBCONSPPX	169908.00	EUR	SETTLED	2023-11-16 17:36:25 +0000 UTC
transfer_pbs_pbg	Debit	TRANSFER	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	PBG_WALLET	PBGSGGXXDI	BDFEFR2TXX	45000.00	EUR	SETTLED	2023-11-15 12:46:39 +0000 UTC
transfer pbs_pbb	Debit	TRANSFER	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	PBB_WALLET_001	CBLXLLXXDL	11200.00	EUR	SETTLED	2023-11-15 12:47:24 +0000 UTC
TRANSFER_PBSWALLET001_PE	Debit	TRANSFER	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	PBG_WALLET	PBGSGGXXDI	BDFEFR2TXX	100.00	EUR	SETTLED	2023-11-20 11:28:03 +0000 UTC
trnasfer_pbgcli1wallet001_pb	Credit	TRANSFER	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	PBG_CLI1_W	PBGSGGXXDI	PBGSGGXXDI	10.00	EUR	SETTLED	2023-11-20 12:46:28 +0000 UTC
issuance -pbs2	Credit	ISSUANCE	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	EUR_TRANSIT	CBCONSPPX	CBCONSPPX	1000.00	EUR	SETTLED	2023-11-20 09:22:41 +0000 UTC
transfer_pbb_pbs	Credit	TRANSFER	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	PBB_WALLET_001	CBLXLLXXDL	14356.00	EUR	SETTLED	2023-11-15 12:44:39 +0000 UTC
ISSUANCE_PBS	Credit	ISSUANCE	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	EUR_TRANSIT	CBCONSPPX	CBCONSPPX	234000.00	EUR	SETTLED	2023-11-15 09:55:48 +0000 UTC
transfer_pbg_pbs	Credit	TRANSFER	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	PBG_WALLET	PBGSGGXXDI	BDFEFR2TXX	15000.00	EUR	SETTLED	2023-11-15 12:45:27 +0000 UTC
TT	Debit	TRANSFER	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	PBS_CLI1_W	PBSOFRXXDI	PBSOFRXXDI	100.00	EUR	SETTLED	2023-11-20 11:34:02 +0000 UTC
transfer-pbswallet001_pbgwa	Debit	TRANSFER	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	PBG_WALLET	PBGSGGXXDI	BDFEFR2TXX	150.00	EUR	SETTLED	2023-11-20 11:21:33 +0000 UTC
issuance_EURTRANSIT_PBSW	Credit	ISSUANCE	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	EUR_TRANSIT	CBCONSPPX	CBCONSPPX	2000.00	EUR	SETTLED	2023-11-20 10:29:11 +0000 UTC
REDEEM_PBSWALLET001_EUR	Debit	REDEEM	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	EUR_TRANSIT	CBCONSPPX	CBCONSPPX	200.00	EUR	SETTLED	2023-11-20 13:01:13 +0000 UTC
REDEEM_PBSWALLET001_EUR	Debit	REDEEM	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	EUR_TRANSIT	CBCONSPPX	CBCONSPPX	50.00	EUR	SETTLED	2023-11-20 12:51:50 +0000 UTC
BD_CLOSURE_7136729c-ab17-	Debit	REDEEM	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001	EUR_TRANSIT	CBCONSPPX	CBCONSPPX	2156.00	EUR	SETTLED	2023-11-16 17:36:37 +0000 UTC
Trade-htlc-pbs-pbb-secret-15	Debit	DVP	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001				-5000.00	EUR	SETTLED	2023-11-15 11:09:28 +0000 UTC
Trade-htlc-pbs-pbb-secret-16	Debit	DVP	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001				-50000.00	EUR	SETTLED	2023-11-16 15:30:30 +0000 UTC
Trade-htlc-pbs-pbb-secret-16	Debit	DVP	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001				-50000.00	EUR	SETTLED	2023-11-16 15:32:32 +0000 UTC
Trade-htlc-pbs-pbb1511_REC	Debit	DVP	PBS_WALLET_001	PBSOFRXXDI	BDFEFR2TXX	FR	FRT2PBS001				-100000.00	EUR	SETTLED	2023-11-15 11:02:46 +0000 UTC

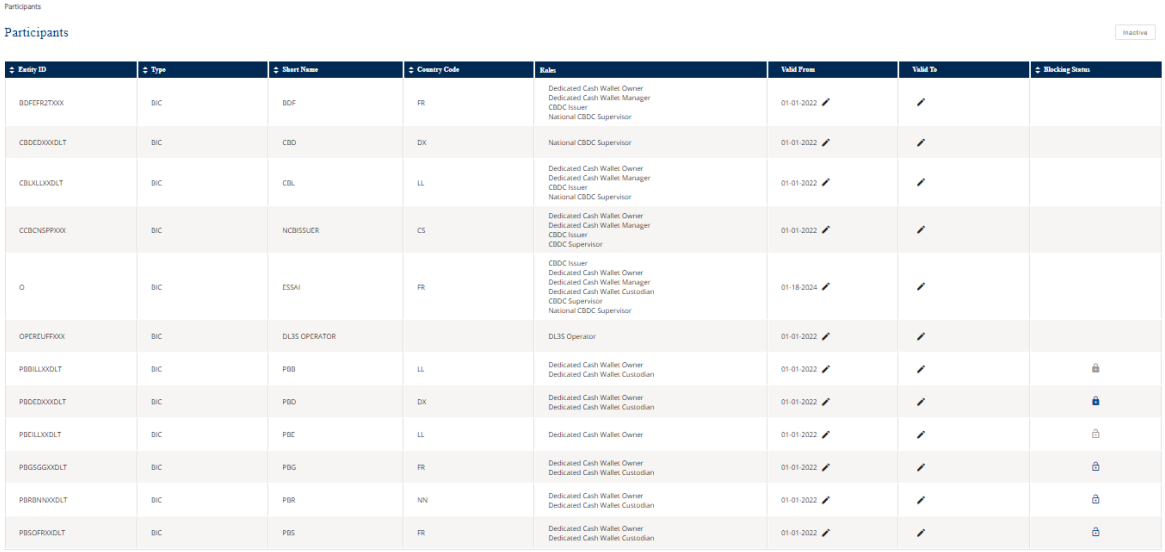
4.9 Blocking and unblocking of participant

4.9.1 Blocked and unblocked statuses

Participants with the role of ***DCW owner*** or ***DCW user*** (commonly payment bank and their clients) have a blocking status which can be blocked or unblocked. It is to be noted, that National CBDC Supervisor and CBDC Issuer do not have this status as they cannot be blocked. The blocking status of a participant is accessible in the global tab

4.9.1.1 Participant status

By clicking on the *participant list* subtab in the *global tab*, one can access to the blocking status of participant with ***DCW Owner*** role. It is accessible to every participant on DL3S.



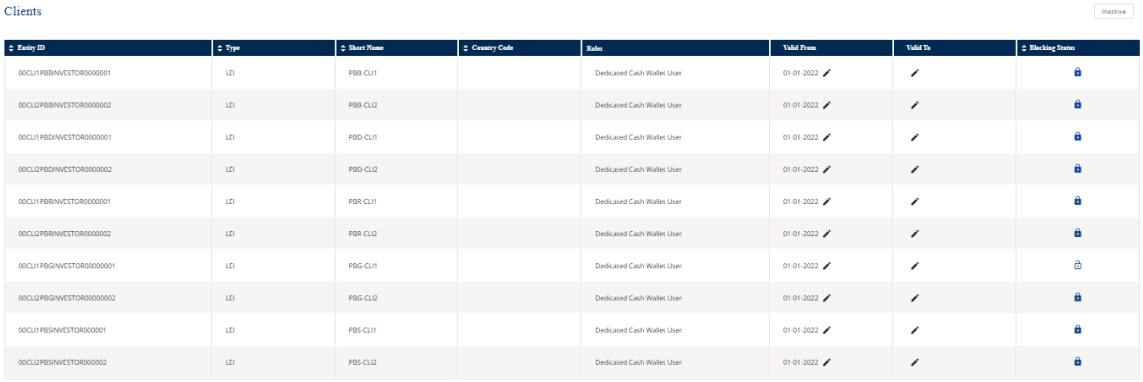
Participants

Participants

Inactive

Entity ID	Type	Short Name	Country Code	Roles	Valid From	Valid To	Blocking Status
BDFEFR2TXXX	BIC	BDF	FR	Dedicated Cash Wallet Owner Dedicated Cash Wallet Manager CBDC Issuer National CBDC Supervisor	01-01-2022		
CBDEDIXXDLT	BIC	CBD	DX	National CBDC Supervisor	01-01-2022		
CBLXLLXXDLT	BIC	CBL	LL	Dedicated Cash Wallet Owner Dedicated Cash Wallet Manager CBDC Issuer National CBDC Supervisor	01-01-2022		
CCBCNSPPXXX	BIC	NCBISSUER	CS	Dedicated Cash Wallet Owner Dedicated Cash Wallet Manager CBDC Issuer CBDC Supervisor	01-01-2022		
O	BIC	ESSAI	FR	CBDC Issuer Dedicated Cash Wallet Owner Dedicated Cash Wallet Manager Dedicated Cash Wallet Custodian CBDC Supervisor National CBDC Supervisor	01-18-2024		
OPERCUFFXXX	BIC	DL3S OPERATOR		DL3S Operator	01-01-2022		
PBBILLXXDLT	BIC	PBB	LL	Dedicated Cash Wallet Owner Dedicated Cash Wallet Custodian	01-01-2022		
PBDEDIXXDLT	BIC	PBD	DX	Dedicated Cash Wallet Owner Dedicated Cash Wallet Custodian	01-01-2022		
PBDILLXXDLT	BIC	PBE	LL	Dedicated Cash Wallet Owner	01-01-2022		
PBGSGGXXDLT	BIC	PBG	FR	Dedicated Cash Wallet Owner Dedicated Cash Wallet Custodian	01-01-2022		
PBRBNNXXDLT	BIC	PBR	NN	Dedicated Cash Wallet Owner Dedicated Cash Wallet Custodian	01-01-2022		
PBSOFRXXDLT	BIC	PBS	FR	Dedicated Cash Wallet Owner Dedicated Cash Wallet Custodian	01-01-2022		

By clicking on the *client list* subtab in the *global tab*, one can access to the blocking status of participant with ***DCW User*** role. It is only accessible to ***DL3S Operator*** and ***DCW Custodian.*** DL3S Operator will be able to see all ***DCW User*** on DL3S whereas ***DCW Custodian*** will have the visibility only on its clients.

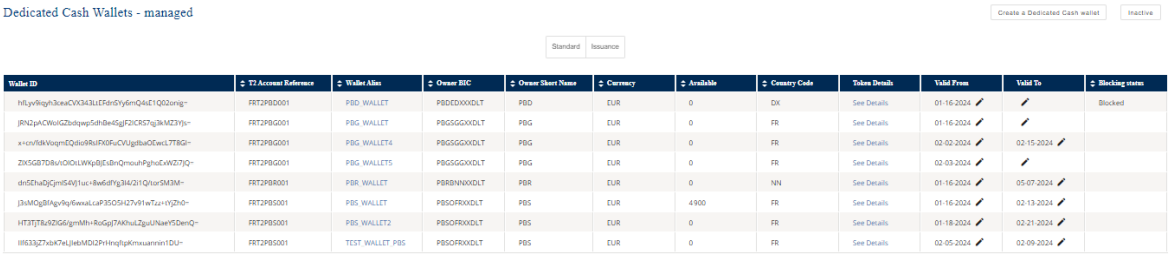


The blocking status appears in the column “Blocking Status” and is represented by a padlock.

- If the padlock blue, you are allow to act on the participant status, meaning you can either block or unblock the participant
- If the padlock is grey, you are not allowed to act on the participant status.
- If the padlock is closed, the participant is blocked
- If the padlock is open, the participant is unblocked

4.9.1.2 DCW status

Dedicated Cash Wallets of participant also have a blocking status. The blocking status of a wallet can be blocked or unblocked and reflect the participant blocking status. If DCW owner is blocked, its DCW owned will be blocked. In the *Dedicated Cash Wallets* tab, a column “blocking status” displays the corresponding DCW status.



If the DCW is blocked, the column will displays “blocked”. If the DCW is not blocked, the column will stay empty. When a *DCW owner* is blocked, all his owned DCW are automatically blocked including DCW used by its clients.

4.9.2 Blocking of a participant

4.9.2.1 Blocking capability

Participants allowed to block are:

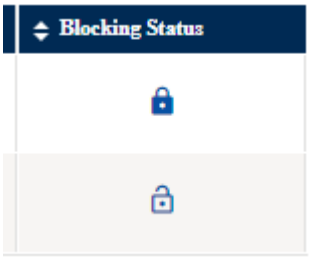
- ***DL3S Operator***
- ***DCW Manager***
- ***DCW Custodian***

DL3S Operator can block every participants with ***DCW owner*** or ***DCW User*** role.
DCW Manger can block participant with ***DCW Owner*** role for which he manages a DCW.
DCW Custodian can block participant with ***DCW User*** role that use one of its DCW.

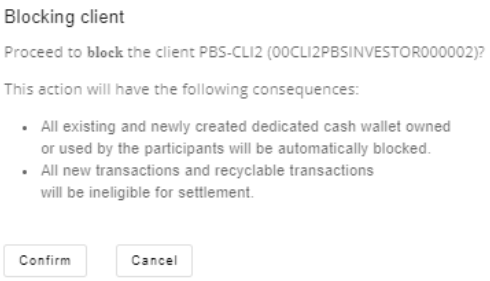
4.9.2.2 Participant blocking

To block a participant, one need to access the *participant list* or the *client list* subtab in the *global tab* depending on the type of participant that has to be blocked. One need to click on the padlock in the

"blocking status" column. The padlock has to be blue and open for the blocking to be accessible (as the padlock on the second line in the example below).



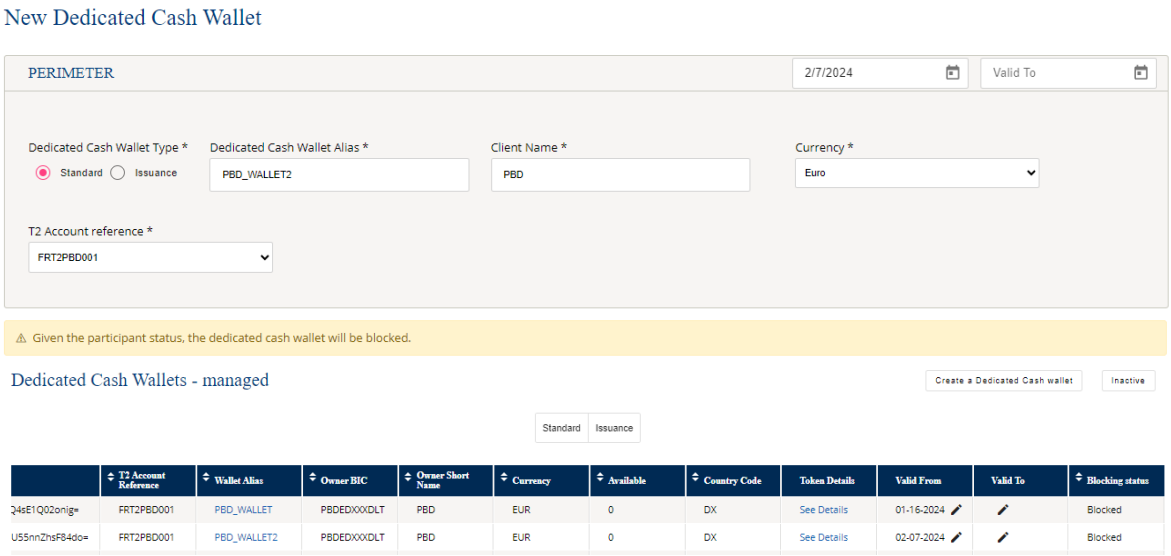
When clicking on the padlock, a confirmation message appears to confirm the blocking. It is possible to confirm or to cancel the blocking. The blocking happens immediately after the confirmation of this message.



After the confirmation, the participant status is "blocked" and it's owned DCW are "blocked".

4.9.2.2.1 DCW management of a blocked participant

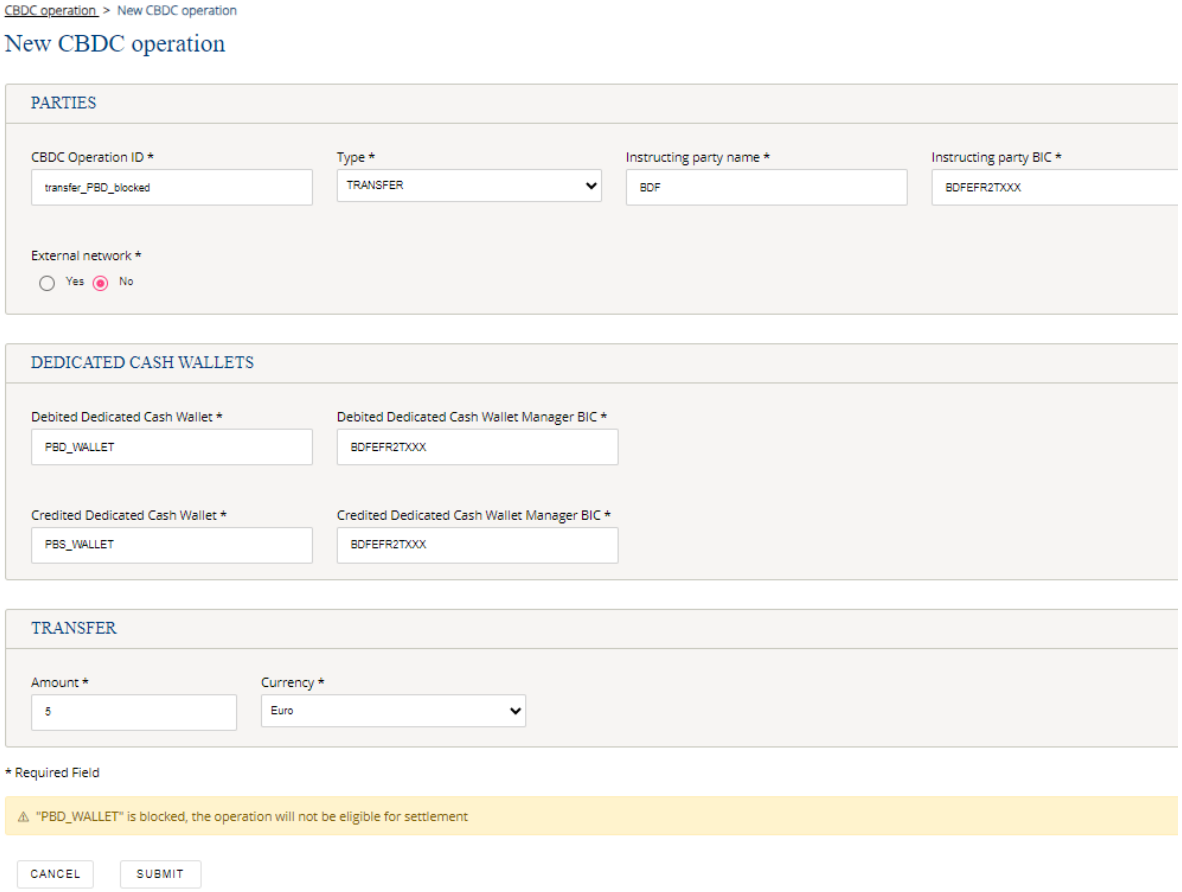
DCW of a blocked participant are automatically blocked. It is possible to create a new DCW for a blocked participant but this one will have the "blocked" status. A warning message will appear when creating a DCW for a blocked participant.



The newly created DCW will appear with the blocked status after its creation.

4.9.2.2.2 Operations involving a blocked participant

A transaction involving a blocked participant will be ineligible for settlement. When submitting a request for an operation involving a blocked participant, a warning message will appear to inform that the operation will be ineligible for settlement.



After submission of the request, the operation is unsettled.

4.9.3 Unblocking of a participant

4.9.3.1 Unblocking capability

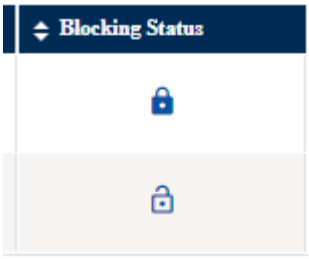
Participants allowed to unblock are the same one as the one allowed to block, e.g.:

- ***DL3S Operator***
- ***DCW Manager***
- ***DCW Custodian***

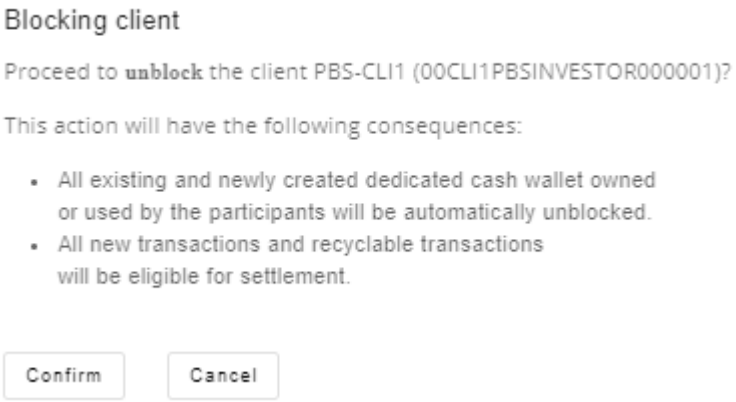
DL3S Operator can unblock every participants with ***DCW owner*** or ***DCW User*** role.
DCW Manger can unblock participant with ***DCW Owner*** role for which he manages a DCW.
DCW Custodian can unblock participant with ***DCW User*** role that use one of its DCW.
The participant unblocking does not have to be the one who blocked the participant initially.

4.9.3.2 Participant unblocking

To unblock a participant, one need to access the *participant list* or the *client list* subtab in the *global tab* depending on the type of participant that has to be unblocked. One need to click on the padlock in the "blocking status" column. The padlock has to be blue and closed for the unblocking to be accessible (as the padlock on the first line in the example below).



When clicking on the padlock, a confirmation message appears to confirm the unblocking. It is possible to confirm or to cancel the unblocking. The unblocking happens immediately after the confirmation of this message.



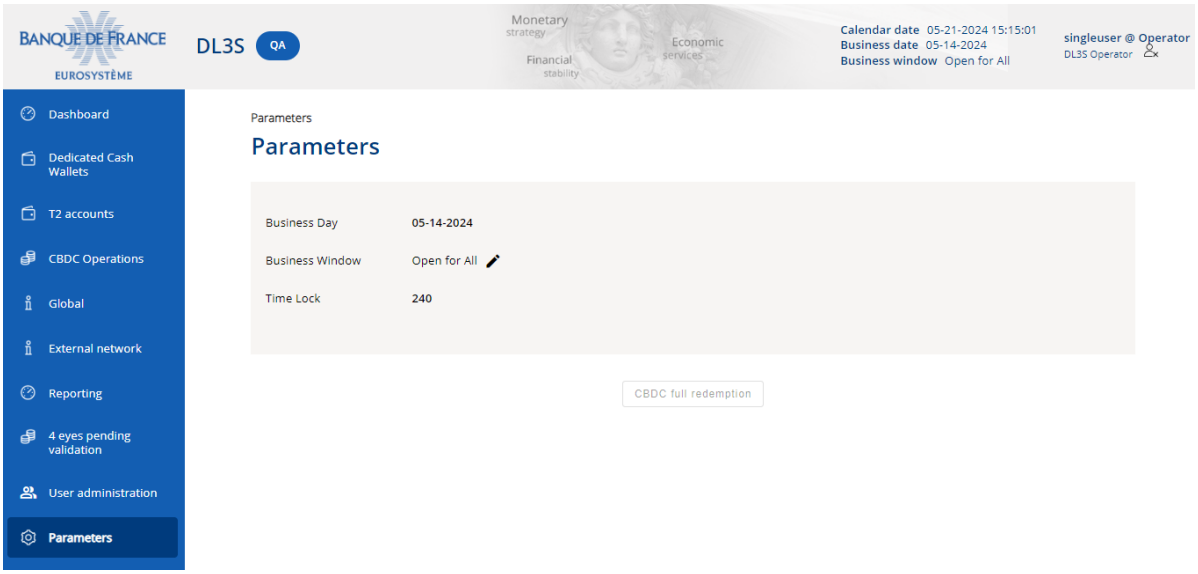
After the confirmation, the participant status is “unblocked” and it’s owned DCW are “unblocked”.

5 DL3S Operator Screens

5.1 End of Day processes

The ***DL3S Operator*** can do three actions in *Parameters tab* that other roles cannot do:

- Cash Sweep, also called *CBDC full redemption*
- *Updating the business window time slots*
- Updating the *Business Date*

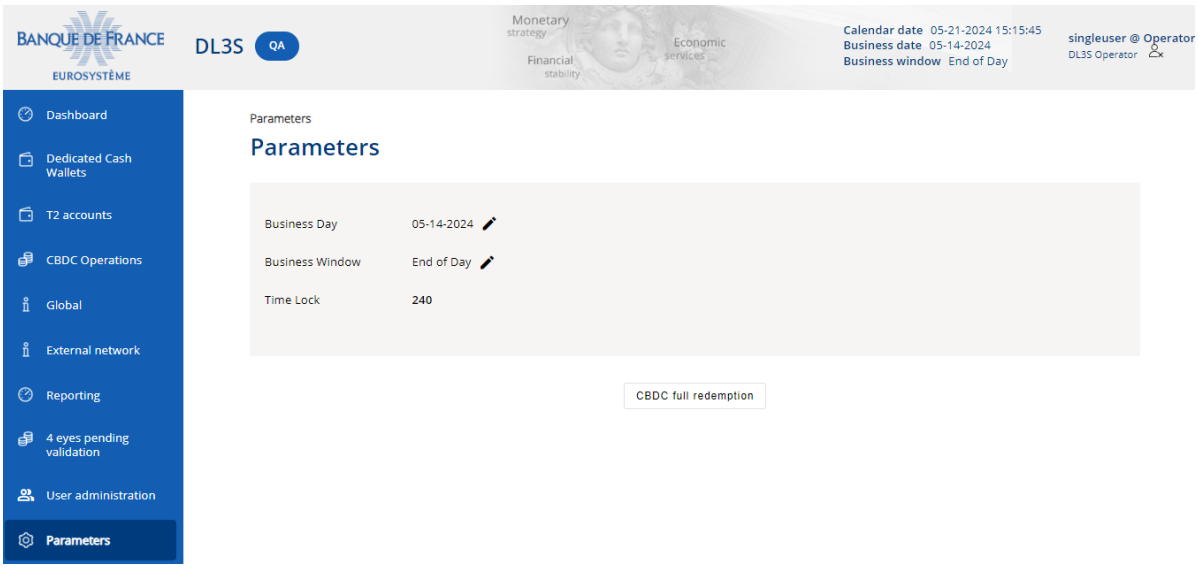


5.1.1 CBDC Full Redemption

CBDC full redemption is a daily operation monitored by the DL3S Operator only and by default.
This action is enabled only during the End of Day window, meaning that the button isn't clickable during other business windows.
If the current business window is "End of Day", when the ***DL3S Operator*** clicks on *CBDC full redemption,* every Dedicated Cash Wallets go back to 0 balance and EUR_TRANSIT wallet is credited back of the total amount of CBDC it previously issued. EUR_TRANSIT Dedicated Cash Wallet balance that was previously negative should go back to 0 balance.

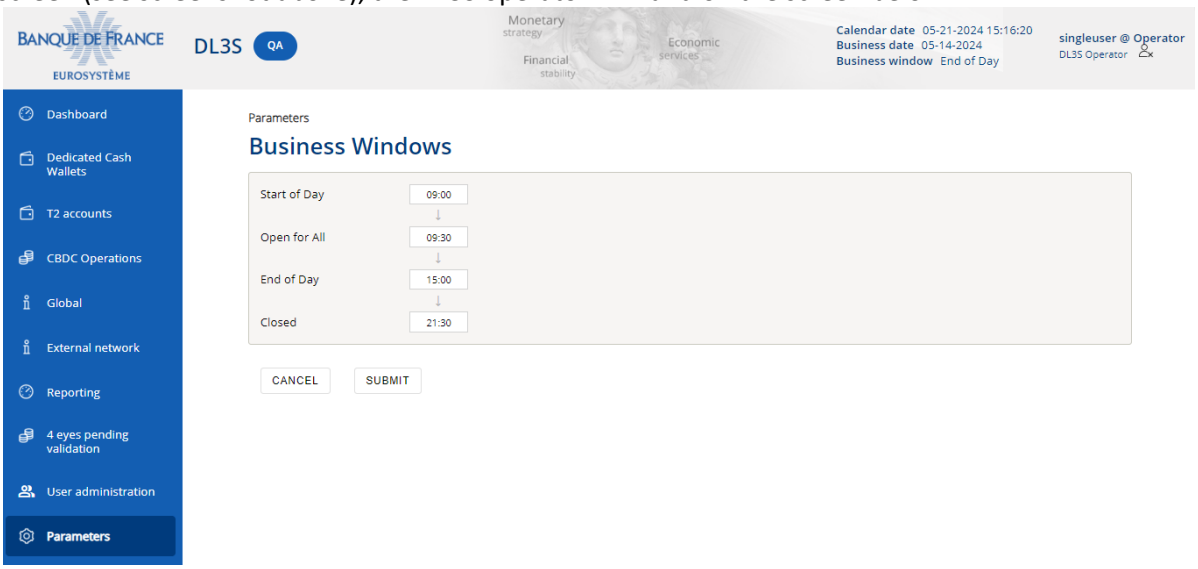
5.1.2 Updating the Business Date

The ***DL3S Operator*** can also change the DL3S *business date* by clicking on the little pen next to *Business Day*.
Once again and similarly to the CBDC full redemption, this action is enabled on the DL3S GUI only during the End of Day window.
After choosing the required date that can only be in the future, it must click on the little save picture to validate the new date.



5.2 Business Window time slots setup

Any time in the day, DL3S operators are able to setup and update the different time slots defining the business windows under DL3S platform.
When clicking on the pen on the right of the current window shown on the DL3S Operator Parameters' screen (see screenshot above), the DL3S operator will land on the screen below:



The time slots are defined as above by default on DL3S platform. Nevertheless, the DL3S Operators can change them anytime. This will be taken automatically into account and be updated instantaneously.

5.3 Whitelisting

See the external network part (3.3).

5.4 Data Extraction

The DL3S Operator can extract CBDC Operation and cash postings history for every participant on DL3S.
See Data extraction section previously described (4.7).

6 Annexes

6.1 Annex 1: NCBs levels of participation

There are 3 levels of participation for a National Central Bank:
Level 1 - NCB not participating to DL3S: The NCB is not present in DL3S but is responsible of the relationship with commercial banks under its jurisdiction that wish to participate to DL3S. Commercial banks' Dedicated Cash Wallets are thus managed by a different NCB, which is going to be BdF which participates to DL3S and has in particular the role of Dedicated Cash Wallet manager.
In this case, a Level 1- NCB has no role and no type of participation in DL3S.

Level 2 - NCB participating to DL3S with an observer role: The NCB is responsible of the commercial banks under its jurisdiction and has a read-only access to information related to Dedicated Cash Wallets, operations as well as the total outstanding amount within the same country (same jurisdiction). Commercial banks' Dedicated Cash Wallets are managed by a different NCB, which is going to be BdF which participates to DL3S and has in particular the role of Dedicated Cash Wallet manager.
In this case, a Level2-NCB will only have the role of National Supervisor and could be either a Blockchain participant or a Direct participant

Level 3 - NCB participating to DL3S with an active role: The NCB handles the creation of Dedicated Cash Wallets for commercial banks, has visibility on information related to Dedicated Cash Wallets, CBDC operations and the total amount outstanding in the same country.
The NCB is also able to:
Initiate CBDC operations for owned and managed Dedicated Cash Wallets (issuance, transfers and redemption operations).
Store and manage crypto materials for owned and managed Dedicated Cash Wallets
In DvP with Hash Time Lock Contract ("HTLC") process:
Locks funds, audits cash lock and claims the CBDC for its managed Dedicated Cash Wallets.
Operates HTLC connector for the Dedicated Cash Wallets managed.
In this case, a Level 3-NCB has the roles of CBDC Issuer, National CBDC Supervisor, Dedicated Cash Wallet Owner, Dedicated Cash Wallet Manager and must be a Blockchain participant.

6.2 Annexe 2: Keycloack

6.2.1 Overview

Keycloack is an instance allowing the managing of user apart from DL3S. It is an Identity and Access Management solution. It provides functionalities such as user authentication, authorization, centralised user management for application and services, in this case dedicated to DL3S.

6.2.1.1 Keycloack roles

Keycloack enables to grant several types of roles described below:

Roles	Creation mode			Business rules			
	Config.	Keycloak	DL3S UI	Scope	Create User	Grant Admin	Manage the realm
Super admin	Yes	Yes	No	All realms*	Yes	Yes	Yes
Admin	Yes	Yes	No	One realm	Yes	Yes	No
Regular user	Yes	Yes	Yes	One realm	No	No	No
External user	Yes	Yes	Yes	One realm	No	No	No
Technical user	Yes	Yes	No	One realm	No	No	No

Super admin: It has **highest level of privileges**, including the ability to manage users, roles, clients, and all other administrative settings **over its Keycloak instance.** *The super admin has access to all realms in his instance. However, in the current setup we only have one realm per instance. There can be as many super admins as there are instances. A super admin can manage all realms within its instance.*
Admin: It has **administrative privileges over its realm:** manage users and certain roles. The Admin user is a user type that can be given to a payment bank for instance. It allows the creation and the handling of users within the same entity. *An Admin can only manage its realm.*
Regular user: It has **limited permissions:** can use Keycloak to authenticate itself and access the platform with its assigned roles and permissions.
External user: It has **limited permissions** and can use Keycloak to authenticate itself and execute HTLC operations.
Technical user: It is employed by applications/services to **interact with other organizations services**

6.2.1.2 Keycloak administration - additional information

In this party, one will find several information on keycloack which is divided in realm and instance. It is to be noted that an admin role can only be given using Keycloack.

- ***Realm in Keycloak:*** represents a security domain where identities, applications, and their configurations are managed. Each realm has its own users, roles, groups, authentication settings,

and client applications. Realms are often used to isolate different applications or parts of an application for security and administrative purposes.

- For example we could have separate realms based on user types: regular user for Payment Bank, regular user for Clients, external users, etc. Each realm contains its own set of users, roles, and applications, and admin of one realm can't access or manage resources in another realm, only the super admin does.

- ***Instance in Keycloak**:* refers to an individual installation or deployment of the Keycloak server. Each instance of Keycloak can host one or more realms. They handle authentication requests, manage user sessions, and enforce security policies for the realms hosted on them.
- For example, DL3S has multiple Keycloak instances deployed for different organizations (one for BDF, PBG, CBL, etc.) to ensure isolation, customization, etc. Only the super admin is able to manage a Keycloak instance
- Currently There is one keycloak instance per org, on each instance, we have at least one super admin

- ***Admin and DL3S UI**:* It is not possible to assign the admin role directly via the DL3S UI. Existing admins come from the instance configuration, and are not assigned manually. New users created via the UI, e.g. singleuser3 for BDF, will only have a simple user role by default. To assign the admin role, you need to use Keycloak from an admin account.

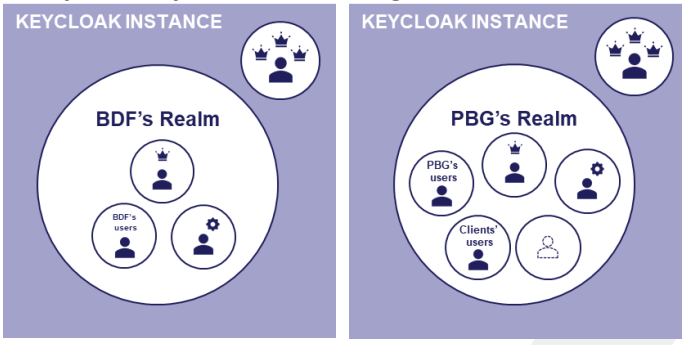
- ***Manage the realm**:* In the current implementation, for each Keycloak instance we have a Master realm and a realm for the entity (e.g. PBG).
  - The Master realm is only used to create and manage super admins and realms within the instance.
  - The super admin is in the master realm and has full rights to manage the master realm and the PBG realm.
  - The admin, on the other hand, is restricted to its realm (here PBG realm), where he can only manage users and administer certain roles (only the roles he owns).

On each instance, we have one master realm and one realm that manages all the users > However, in the current setup we only have one realm per instance as the master realm is a particular realm.

Business rules:

Participant type	Roles					Business rules		
	Sup. Admin	Admin	Reg. User	Ext. User	Tech. User	Scope	Create User	Grant Admin
NCB	Yes	Yes	Yes	*TBD*	Yes	One realm	Yes	Yes (Keycloak only)
Payment Banks	Yes	Yes	Yes	Yes	Yes	One realm	Yes	Yes (Keycloak only)
Clients	No	No	Yes	No	Same as its custodian	Same as its custodian	No	No

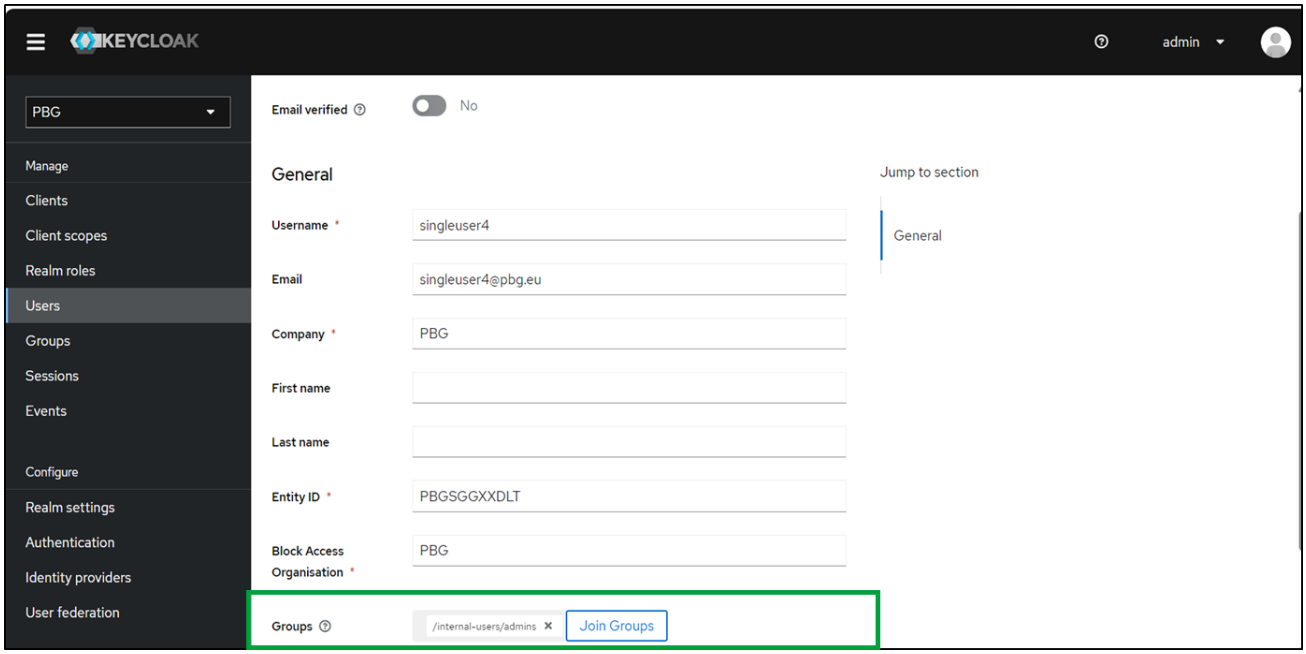
Example of Keycloak instance organization



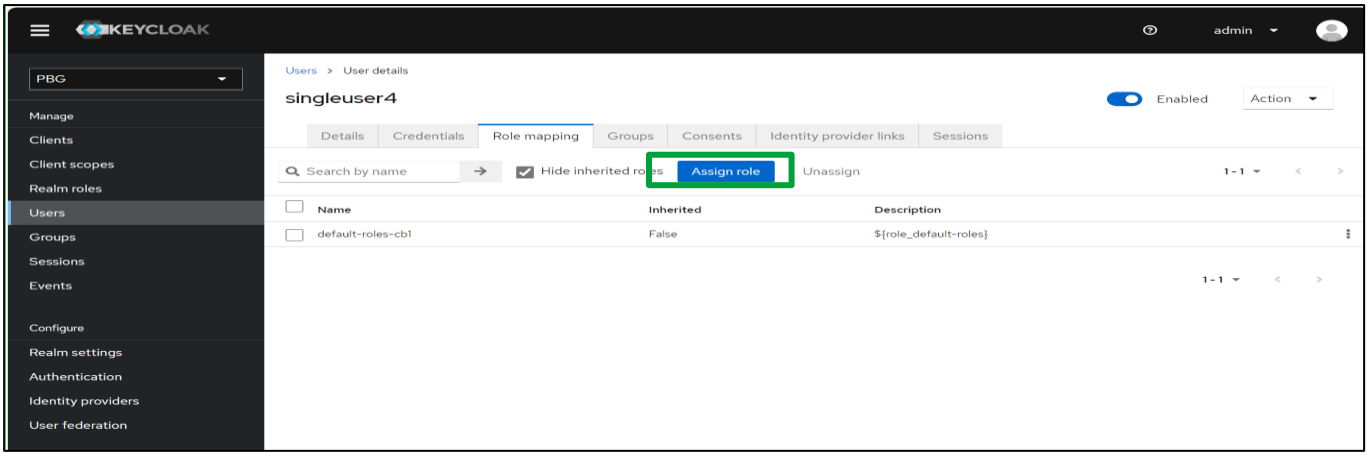
6.2.2 Add an Admin with KEYCLOAK

To assign admin role, one need to use Keycloack and follow the following steps:

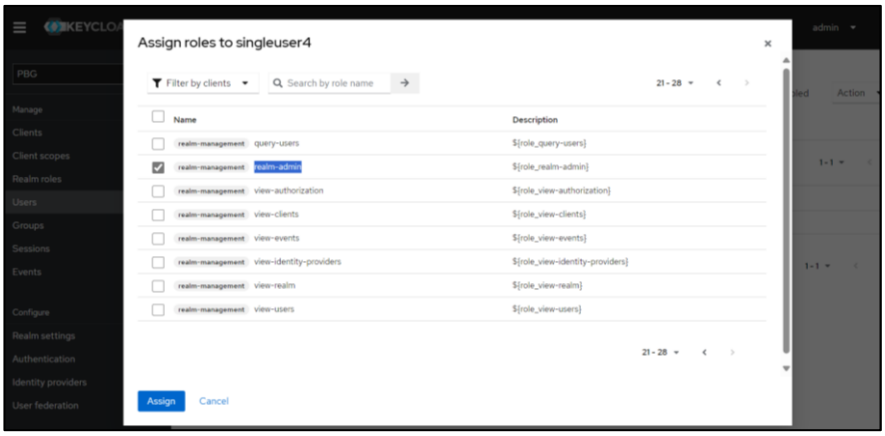
1. Connected as existing PBG admin on Keycloak interface: Select the internal-users/admin groups to grant singleuser2 as Super User (admin role)



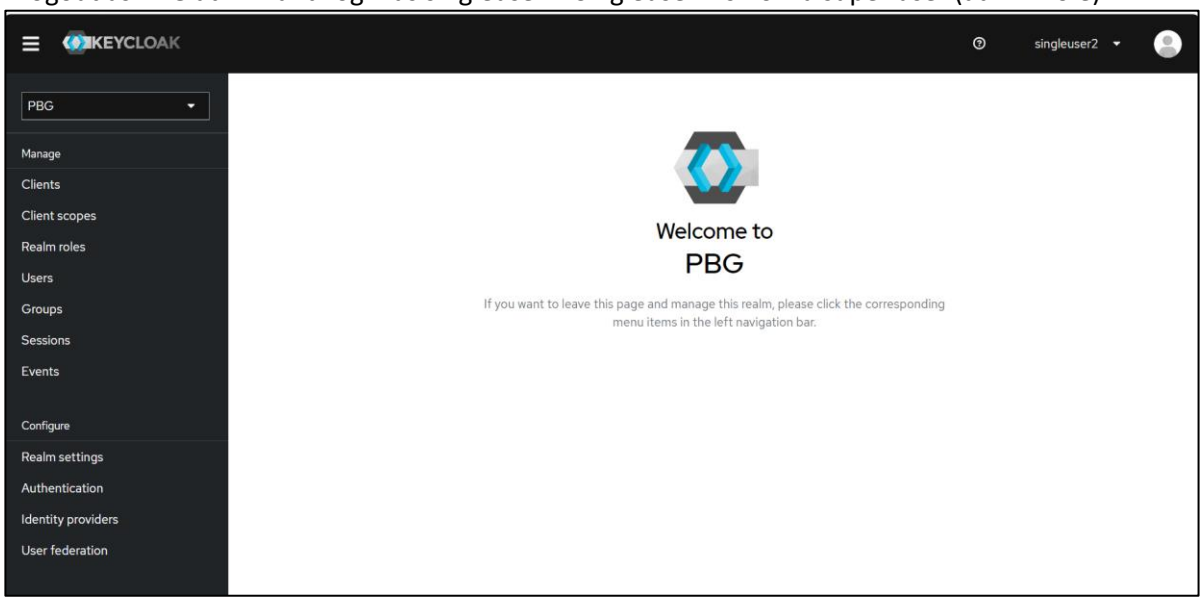
2. Connected as existing PBG admin on Keycloak interface: Click on role mapping & then “Assign role” to add the Super User role on the custodian domain



3. Connected as existing PBG admin on Keycloak interface: Click on “Filter by Clients” and search the "realm-admin role“ *(Super User role)*



4. Logout as PBG admin and login as singleuser2. Singleuser2 is now a super user (admin role)

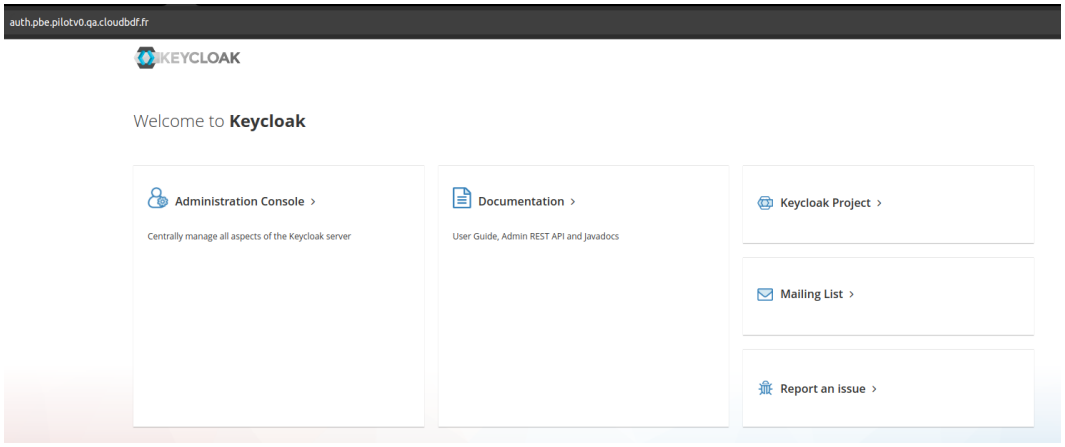


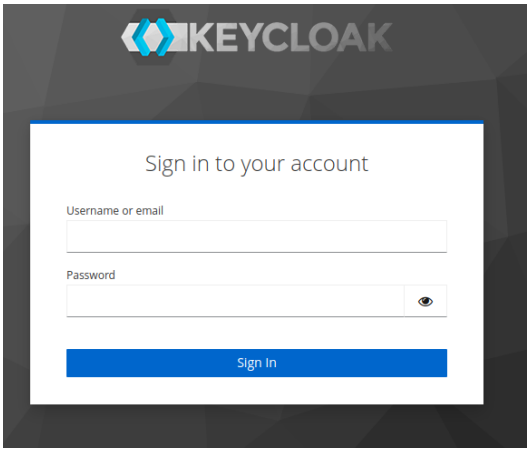
6.2.3 Add and manage a user with KEYCLOAK

One can add a user using DL3S UI. It is also possible thanks to Keycloack following the steps described below:

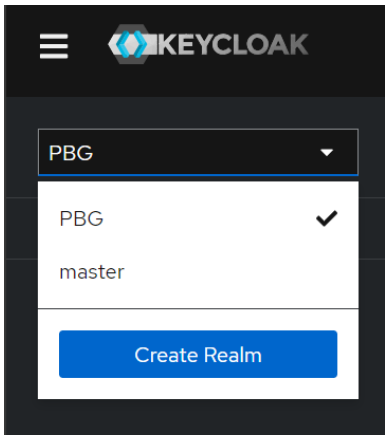
6.2.3.1 Login

- Open the Keycloak Administration Console and Connect as existing admin



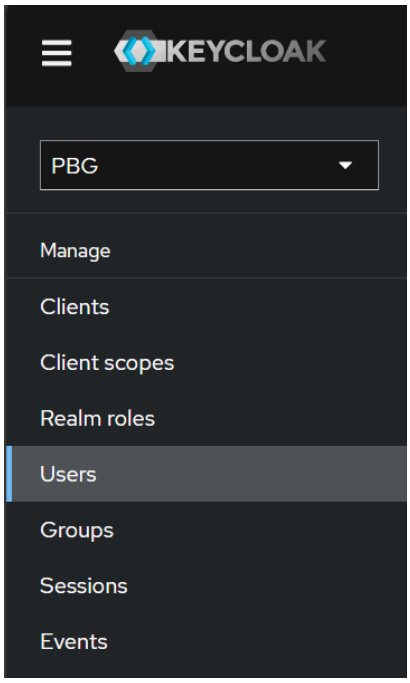


- Click on the upper left drop down menu and select your organization or master (default)

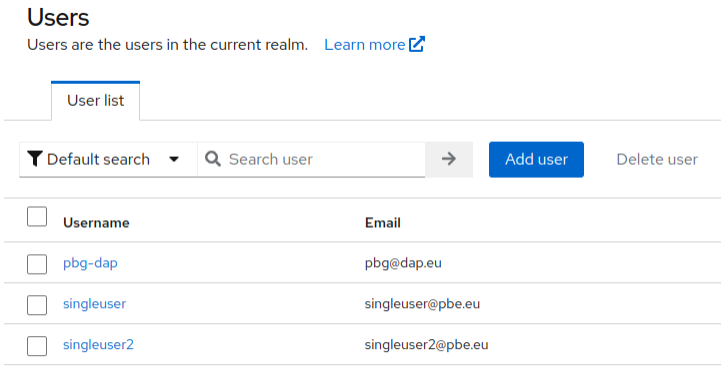


6.2.3.2 Add a user

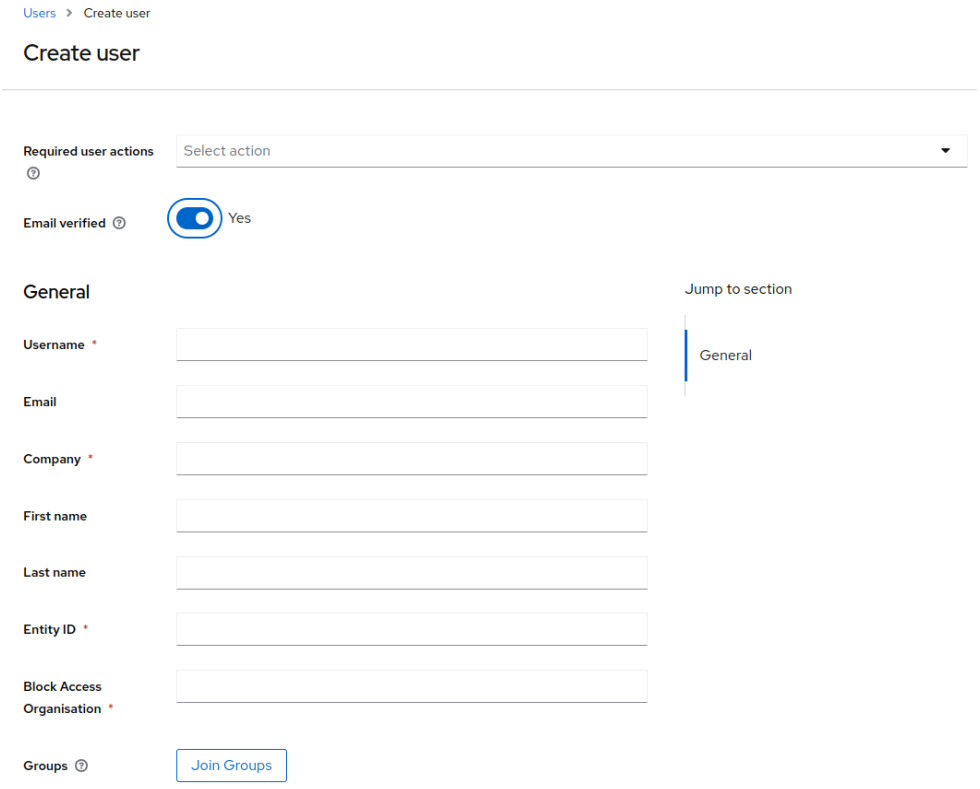
- Click on the Users field on the left to focus on the users



- Click on the Add user button

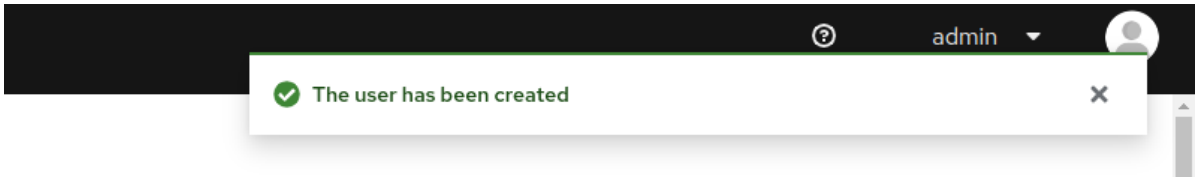


- Switch the Email verified button to Yes if you don't want the email to be verified (on the proper email address you will enter) otherwise if you want the user to be verified by receiving a mail on his address let the Email verified button on No.



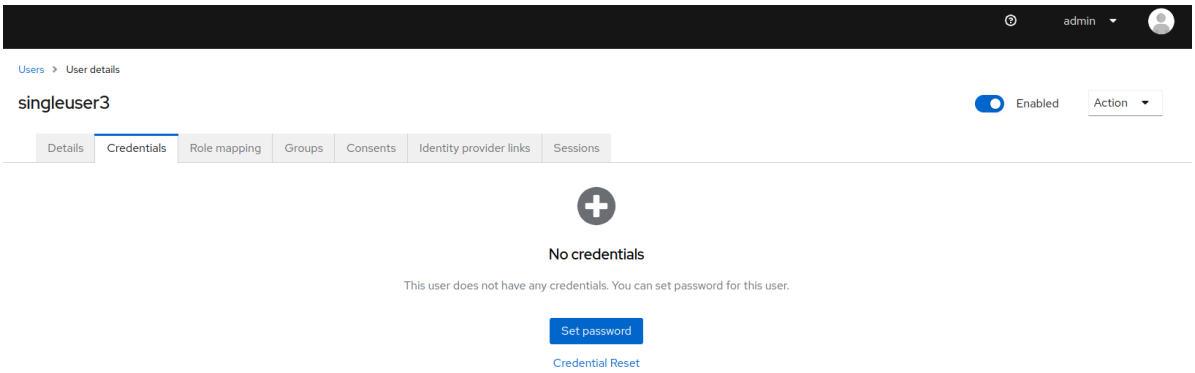
- Enter the Username (usually the first part of the mail), and enter Email
- Click on the Join Groups button to select the group you want to add to the user
- Finalize the user creation by clicking on the Create button

  You should see a green pop up on the upper right side of your screen

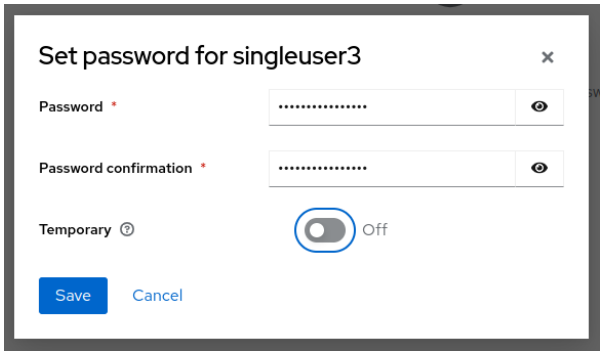


6.2.3.3 Setting the password

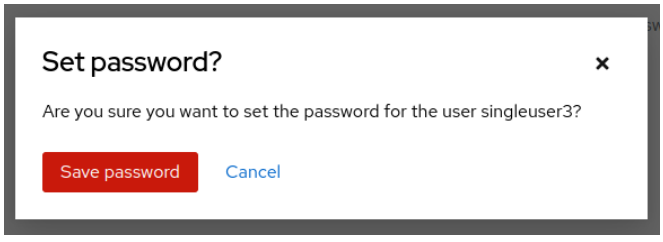
- Click on the Credentials tab (on the right of details)
- Click on Set password button



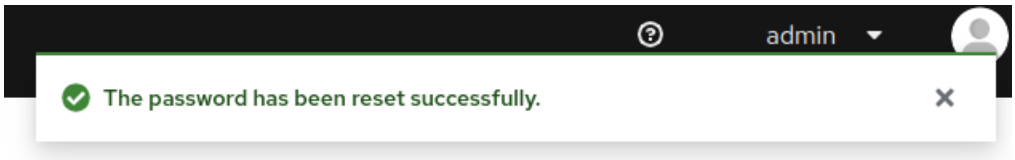
- Enter the password and password confirmation fields



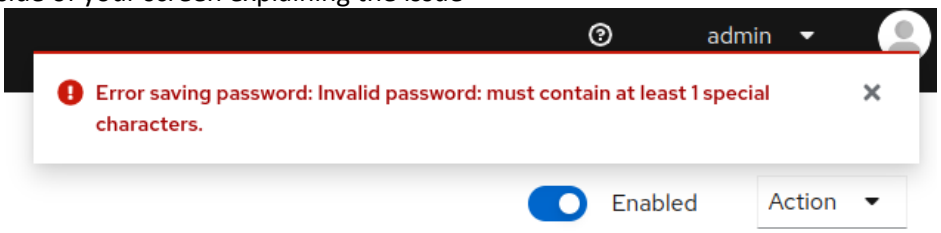
- Switch Off the Temporary button if you want this password to be definitive otherwise switch it On if you want the user to set its own password
- Click the Save button and after confirm again by clicking on the Save password button



If everything is good you should see a success message in the pop-up on the upper right side of your screen



Otherwise, if your password does not meet the required policy you may see an error in a pop-up on the upper right side of your screen explaining the issue

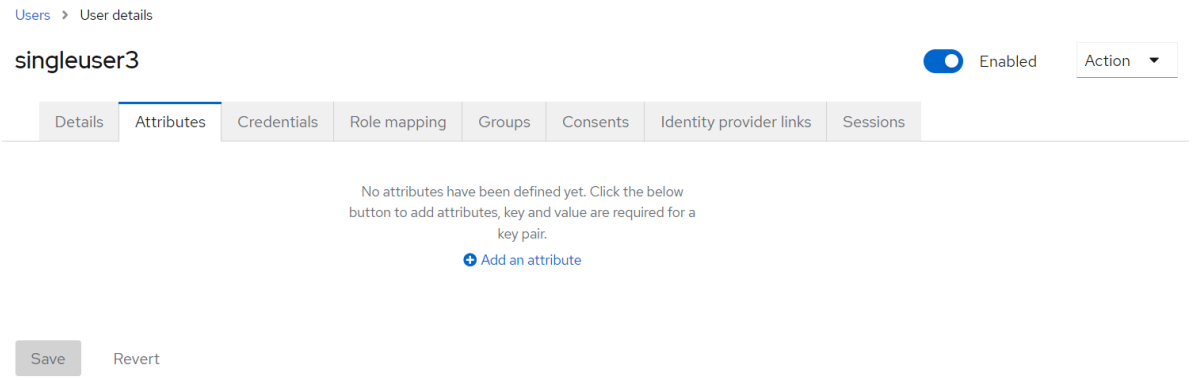


Password policies:

- *12 characters minimum*
- *At least 1 upper case letter*
- *At least 1 lower case letter*
- *At least 1 special character*
- *At least 1 digit*
- *Not the username*
- *Not the email*

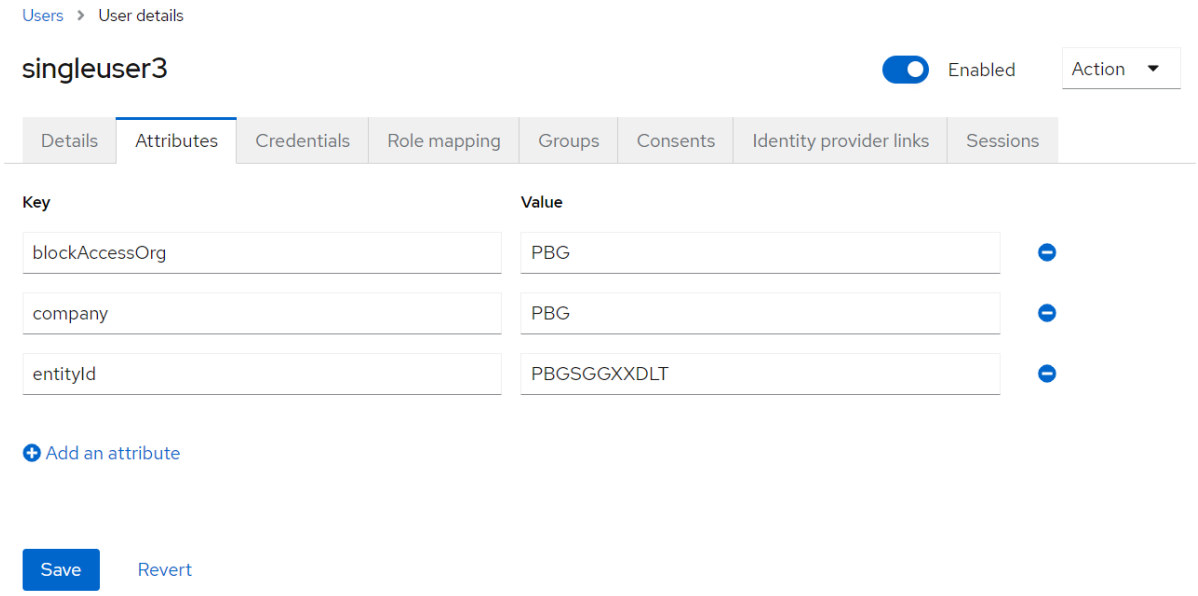
6.2.3.4 Attributes gestion

- In the Attributes tab of the user add the attributes fields by clicking on the Add an attribute button

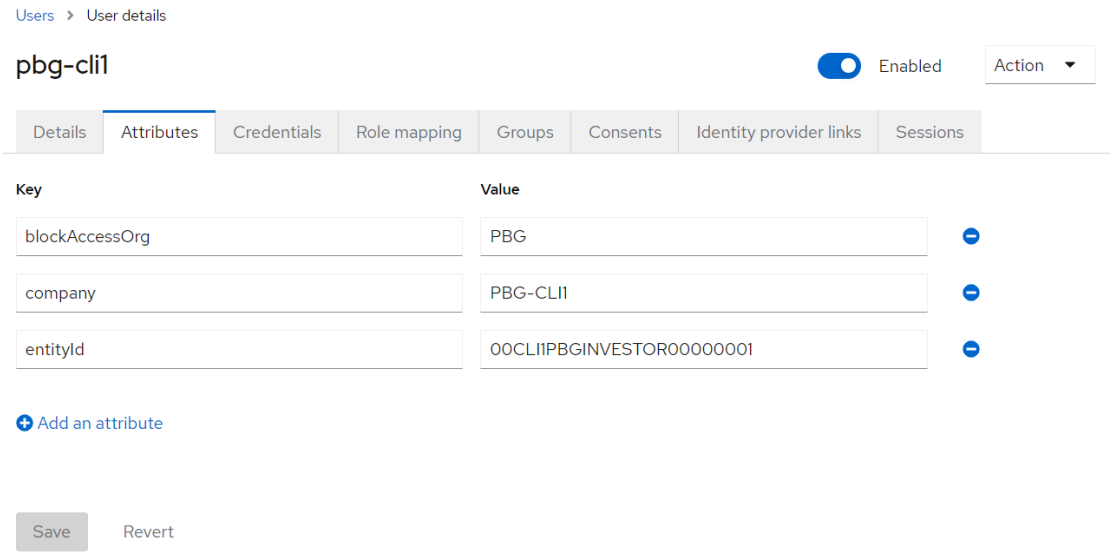


- Complete as follow the Key and Value fields *(copy and past the attributes of a similar user)* :

For a Bank user (ex: PBG)



For a Bank client (ex: PBG)

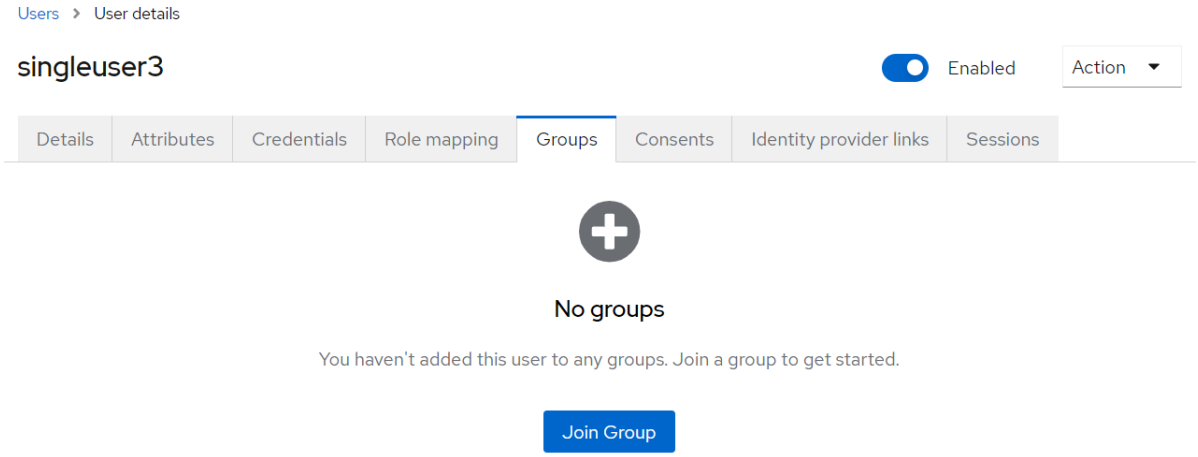


- Save the attributes by clicking on the Save button

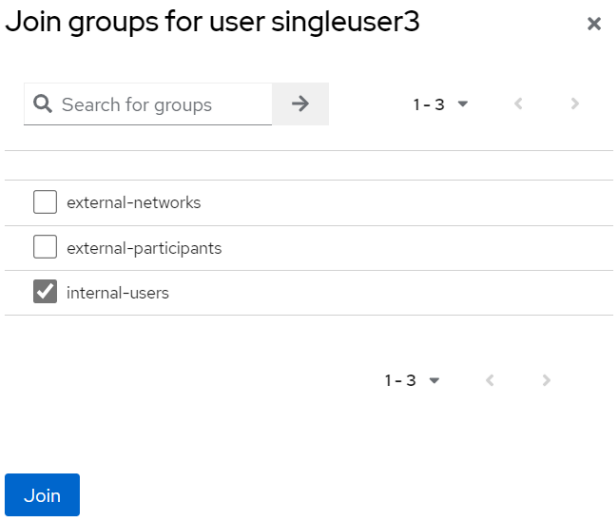
6.2.3.5 Groups

- In the Groups tab of the user add the existing Group by clicking on the Join Group button

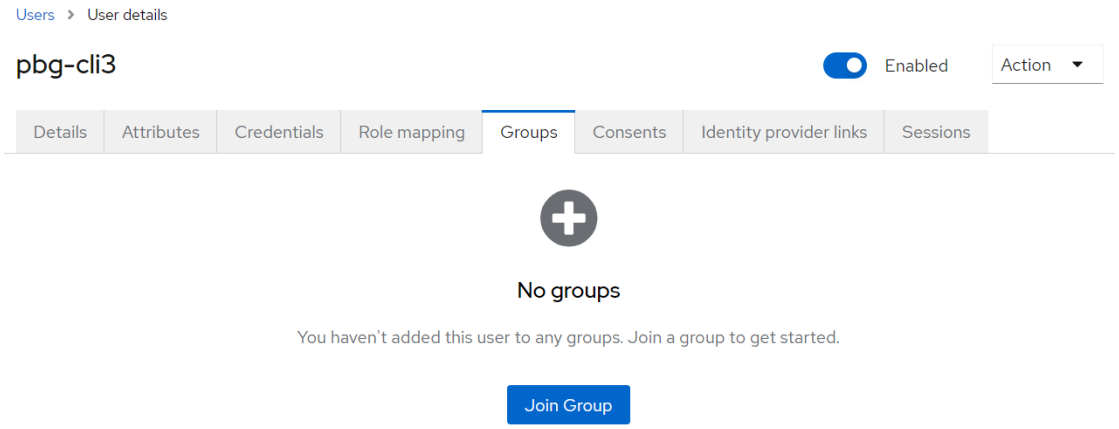
For a Bank user (ex: PBG)



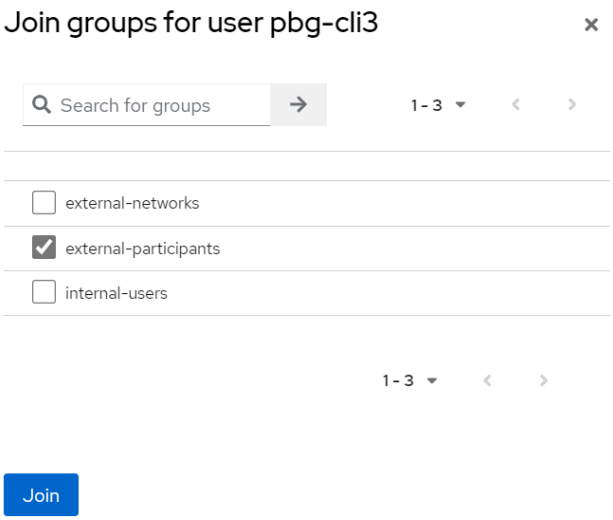
In the **Join Groups** pop up window tick the **internal-users** group and click on the **Join** button (*tick the same group of a similar user)*



For a Client user (ex: PBG)



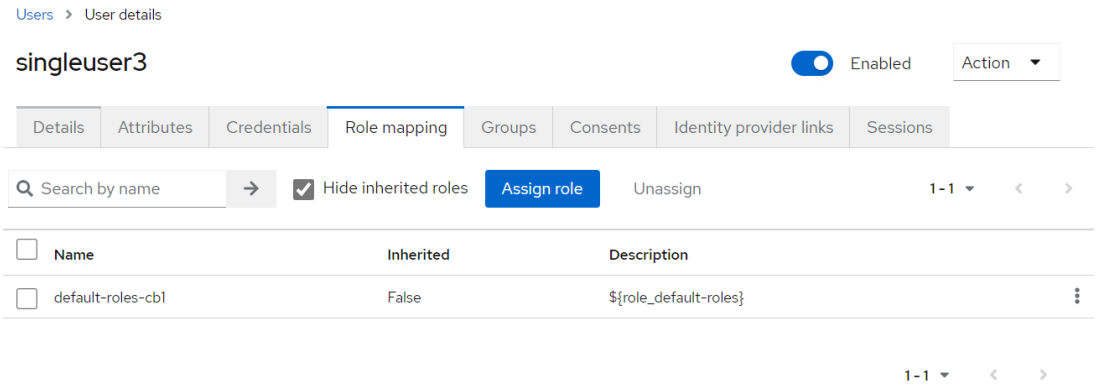
In the Join Groups pop up window tick the external-participant group and click on the Join button (*tick the same group of a similar user)*



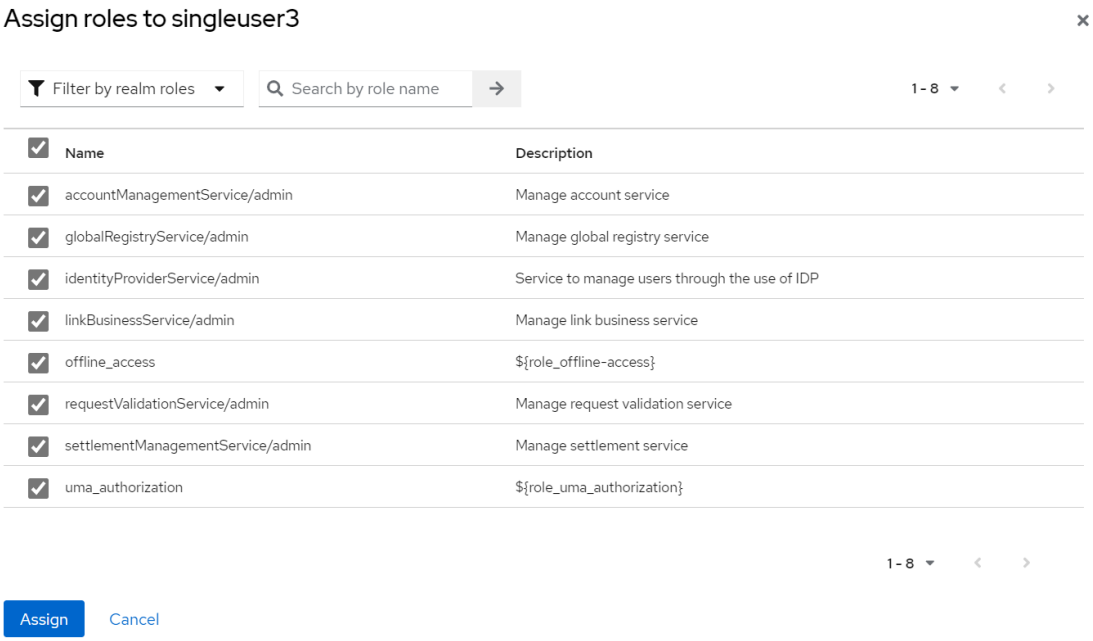
6.2.3.6 Role mapping

- In the Role mapping tab of the user add the roles by clicking on the Assign role button

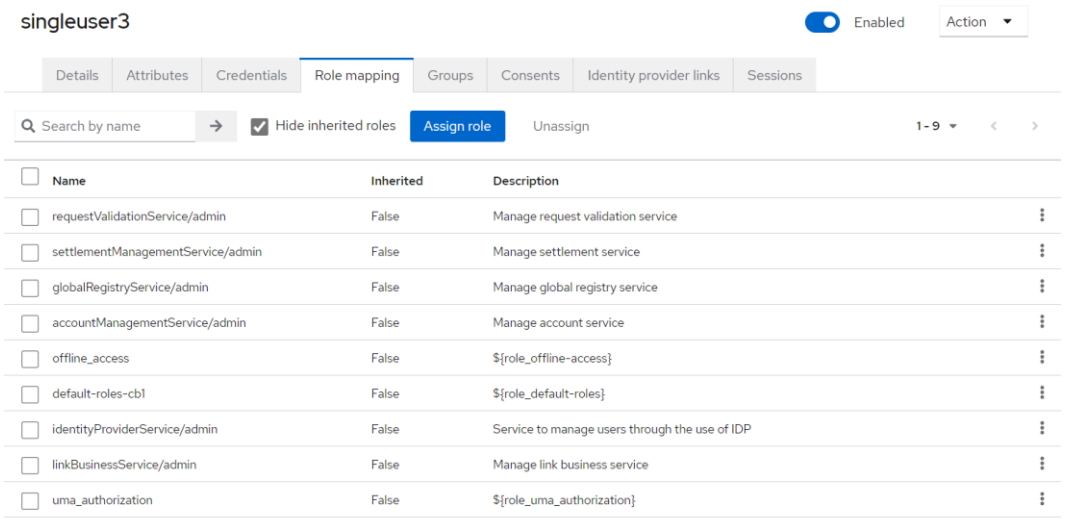
For a Bank user (ex: PBG)



- Tick all the roles as follow and click the Assign button (*tick the same role of a similar user)*

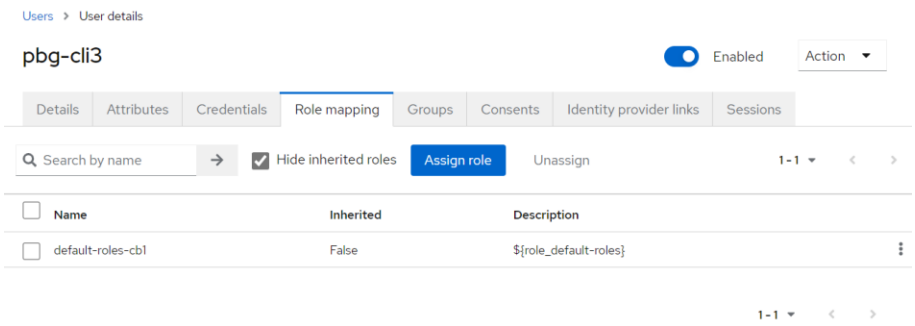


- You will get this view of assigned roles ;



For a Client user (ex: PBG)

- No roles are needed to be assigned, keep the default setting as follow:



7.2. Onboarding procedures

7.2.1. **DL3S DLT onboarding** *(Test Phase 1B)*

Document available for Eligible Market DLT Operator and Eligible Market Participant.

7.2.2. Liquidity management process

Date: *March 2024*
Version: *v1.5*

This document depicts the steps to undertake in order to onboard participants on DL3S in a view to use the Full DLT solution Interoperability for the exploratory work and the liquidity management process that will apply in order to support the DL3S settlement day.

The participants on DL3S (Cash DLT participants) can be:

- National Central Banks (NCB)
- Payment Banks on DLT (PBD)
- Clients of Payment Banks on DLT (Clients of PBD).

The below procedures assume that the DL3S DLT participants meet the Eurosystem eligibility criteria for the exploratory work.

This operational set-up for liquidity management only applies to NCBs and PBs involved in trials (i.e. transactions in real) of the Eurosystem exploratory work.

Operational set up for liquidity management in the RTGS and in DL3S

1. **General considerations / Definitions**

This liquidity management procedure only apply to trials (i.e. involving transactions in real) of the Eurosystem exploratory work. There are two type of actors requesting a liquidity management's set up in the BdF ***Full-DLT Interoperability*** **s**olution:

- **Nationals Central Banks (NCBs)** that would operational support in TARGET Services for their participants during exploratory work, this includes the setting up and operation of NCB RTGS accounts for an escrow mechanism.
- **PBD** are any entity with access to T2/RTGS (i.e. being a "RTGS participant"), within the meaning of Articles 4 and Articles 7, Annex 1 Part I of the TARGET Guideline, and participating in exploratory work in that capacity.

Market DLT platforms are not involved in liquidity management procedure.

2. National Central Bank

Each NCB sets up escrow accounts to support their own market participants interested in participating to trials with the *Full DLT Interoperability* solution. Participants fund those accounts at the beginning of the trial intraday process and the NCBs defund them at the end. These NCB accounts could be created specifically for exploratory work or could be existing accounts. They can be RTGS CB Accounts or RTGS DCAs. The management of these accounts would be under the sole responsibility of the individual NCBs involved.

The funding is made with full transfer of ownership. Funds held in the NCB escrow account belong therefore to the NCB, not to Payment Banks. As they do not remain on these accounts overnight, funds held in escrow accounts would bear no interest and would not be counted for compliance with minimum reserves requirements. Exploratory liquidity is minted at the start of the trial day on a 1:1 basis relative to the total amount held on NCB escrow accounts in T2.

The participant should have a claim only towards its local NCB for the funds held in the escrow account held by the same local NCB. This should be ensured via dedicated provisions in the contractual documentation governing the relationship between the local NCB and the participant.

BdF as Central Bank Solution Provider of the *Full DLT Interoperability* solution should not be subject to direct claims from participants for the funds held in escrow accounts (with the exception of those held by participants under their jurisdiction) as no direct contractual relationship is foreseen between the participants and Banque de France. This is derived from the principle that each NCB manages an escrow account for its participants.

The funding and defunding process would be performed manually by the PBD and the local NCB as the DL3S DLT has no direct technical connection to TARGET Services in an automated way during trials in the first step. The use of an escrow mechanism during the first step of trialling the Full-DLT Interoperability solution is a temporary construct implemented so that CeBM settlement would occur in TARGET Services (and not in BdF DL3S platform) in compliance with the Eurosystem's legal, policy and operational frameworks. As a result, final CeBM settlement during trials with both solutions would be reached in TARGET Services (T2) through defunding of those escrow accounts in the RTGS reflecting the updated balances following the settlement process in the new environments. This implies that exploratory work assessing these solutions would focus on the steps occurring in the market DLT (for the securities leg) and the DLT DL3S (for the settlement of the cash leg in exploratory cash token) and the technical DVP implemented between the transfer of exploratory liquidity on DL3S DLT and the securities delivery on the market DLT.

Defunding occurs at the end of the trial intraday process (by 15:30 CET in the standard case) on a net basis (reflecting all DVPs in trials settled by the participants) and exceptionally, for the market participants that request it, before 12:00[16] to reflect specific DVPs on a gross basis. Funds are held on the escrow accounts by NCBs intraday only and the balance of the account is zeroed at the end of the day (by 15:30 CET) as part of the defunding process.

Additional time, until 17:00 CET (at the latest 18:00 and the interbank cutoff), can be available to zero NCB escrow accounts. Should that time be insufficient, NCBs would hold funds overnight until the funds can be returned to the relevant market participants (subject to MOC and AMICO consultation).

[16] **Exceptional requests for early (gross) defunding** should be notified by the Payment bank on DLT to its NCB and the BdF operational team at least 48 hours in advance. On D-day, the ECT burning should occur no later than 11:00, for defunding to then take place by 12:00.

All steps mentioned – funding and defunding, will take place in T2 via liquidity transfer (camt.050).

3. Payment banks on DLT

Payment banks on DLT prefund escrow accounts held and managed by their local Eurosystem NCB in TARGET Services (T2) in order to receive the same amount in form of cash tokens on their wallet for use on the DL3S DLT. The settlement process in this case involves the following steps:

- At the start of trials, Payment banks on DLT fund their wallets in the DL3S DLT from their RTGS DCA to each participant's local NCB RTGS escrow accounts, thereby transferring ownership of these funds to their local NCB.
- Once confirmation is received that the funds have been credited to each of the participants' NCB RTGS accounts, Banque de France and NCBs active on DL3S[17] instruct the minting of the same amount to the Payment bank on its DLT wallet in DL3S. As SPCB, BdF reconciles the number of minted ECT with the declaration provided by actives NCBs (form 1b) before opening the settlement window. BdF strongly recommends to send form 1b prior to 09:45 CET in order for BdF as Solution Provider to checks that the total amount held in escrow in T2 matches the total amount of exploratory cash tokens minted in DL3S (between 9:45 and 9:59 CET).

- Then DVPs can occur across the Market DLT and the DL3S DLT platforms via the HLTC interoperability mechanism.
- At the end of the trial settlement period (equivalent of EoD), or on an exceptional basis at the Payment bank on DLT's request upon completion of the technical DVP process, BdF and other involved NCBs start an alignment process, then the Payment bank on DLT's exploratory cash tokens are burnt and the relevant NCB defund their escrow accounts, transferring the EOD balance of the wallet to its participant (i.e. the participant's exploratory cash tokens are converted 1:1 in CeBM in T2).

[17] NCBs can actively participate to DL3S and directly mint and burn liquidity for their eligible market participants during trials.

4. Settlement process in trials step by step

Figure 1 - Settlement process in trials with the full-DLT Interoperability

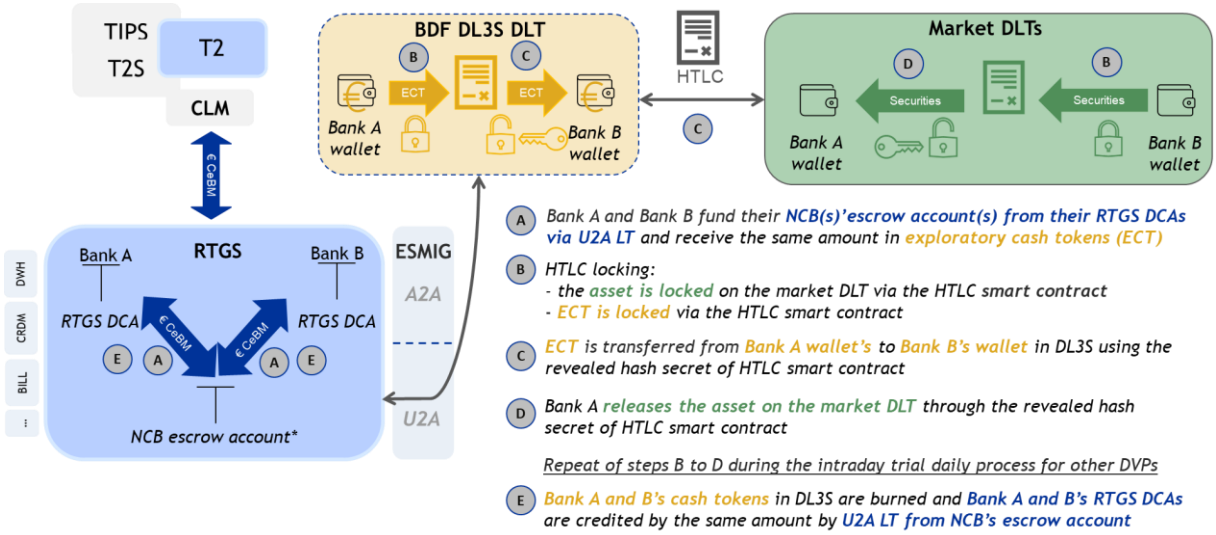
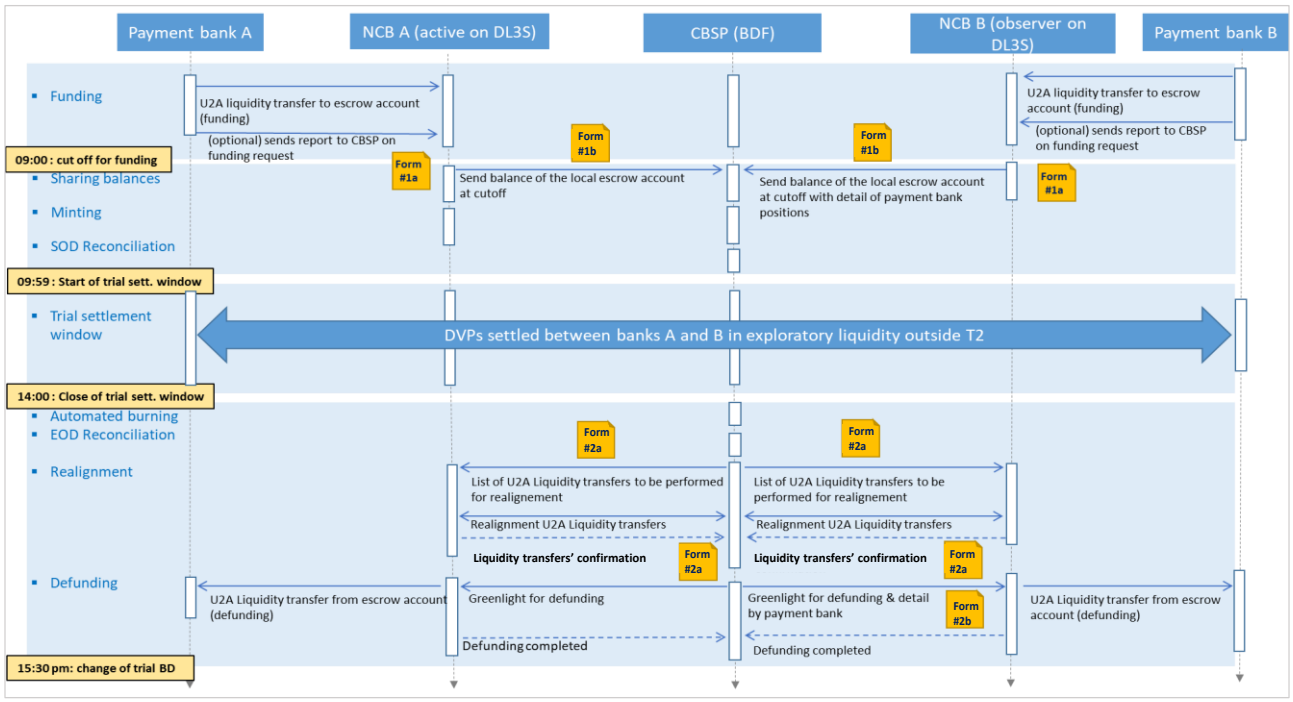


Figure 2 – Communication flows related to escrow process



During trials, the settlement process with the *full-DLT Interoperability solution* involves the following steps (cf. figure 1) and the following communications between market participants, NCBs and BdF (see figure 2 and proposed templates):

A. Funding of escrow accounts via Liquidity Transfer: participants will interact with their *local NCB* and each participant will fund its NCB's RTGS escrow account. Funds held in escrow on NCB RTGS escrow accounts belong to the NCBs, bear no interest, and are not be counted for compliance with minimum reserves requirements. Optionally, participants can also send a report to their local NCBs to inform them of their funding request (form 1a).[18] Upon validation of the funding requests, including that (i) it was addressed in the proper format – e.g. via liquidity transfer and (ii) received on time before 09:00 (per the entry timestamp, not the settlement timestamp – bearing in mind that LTs cannot partially settle) NCBs will reject all funding requests from participants above the value restriction decided by the MIPC. If a funding request is rejected, NCBs will transfer the funds back to the market participant via liquidity transfer. Once the funding phase is complete, the local NCBs either (1) in case they are not active in DL3S report to BdF the overall balance of their escrow account and the breakdown of funds held from their different payment banks participating to trials (form 1b) or (2) report to BdF only the overall balance of their escrow account (if they actively participate to DL3S). Based on the information received from forms 1b:

- Either BdF mints the equivalent amount funded by payment banks by crediting their wallets in DL3S by that equivalent amount in exploratory cash tokens (for its own participants and those of NBC with no access to DL3S or having an Observer role[19]);
- Or active NCBs directly perform the minting.

Reconciliations and checks are performed by BdF as Solution Provider to ensure that the total amount held in escrow in T2 matches the total amount of exploratory cash tokens minted in DL3S.

B. A DVP with the full-DLT Interoperability solution is initiated by the market DLT based on trade information that are legally binding. Then, both the asset on the market DLT and the Exploratory Cash Tokens on DL3S are locked via *Hash-Time-Locked-Contracts* and the timelock starts;

C. Exploratory Cash Tokens are unlocked and transferred to the payee through the revealed hash secret of HTLC (settlement of the cash leg of the technical DVP occurs in DL3S). If the timelock expires before the transfer of ECTs, both ECTs and the asset are unlocked and returned to the payer and the payee, respectively.

[18] *NCBs choosing to rely on an existing account may opt for this optional form to (i) keep track of the specific funding requests made by their participants and (ii) where their participants participate to trials with both the BDF and BDI solutions, identify for which solution the funding request is made. NCBs relying on two segregated escrow accounts can directly query the balance of their escrow accounts and identify the funding requests made and identify the solutions of relevance.*

[19] As detailed in section 6.1 of the Service Description, there are 3 levels of participation for a National Central Bank:

- Level 1 - NCB not participating to DL3S
- Level 2 - NCB participating to DL3S with an observer role
- Level 3 - NCB participating to DL3S with an active role

D. **The Asset is similarly unlocked and transferred to the payer through the revealed hash secret of HTLC.** Should the DVP fail due to unforeseen reasons (other than lack of resources), a pre-agreed contigency procedure between BDF and the market DLT operator is initiated.

Steps B to D can be repeated during the trial intraday process for the settlement of other technical DVPs.

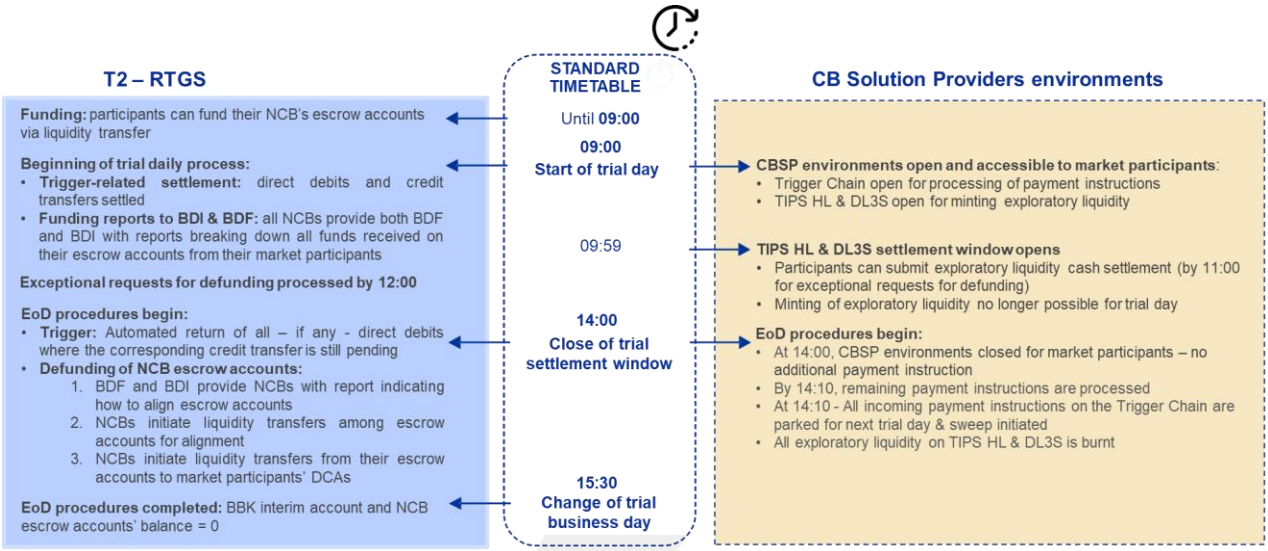
E. **At the end of the intraday settlement window, the EoD is initiated including burning, alignment and defunding.** First, all exploratory cash tokens on DL3S are burnt at the EoD milestone (i.e. 14h00 CET). Then, alignment occurs to redistribute CeBM between the different NCB escrow accounts in order to take into account the transfers which occurred during trial settlement phase (unless all transactions during the trial day are between participants of the same jurisdictions). As a prerequisite for the alignment, BdF sends a report to all NCBs (form 2a) with a breakdown of the liquidity transfers between NCB RTGS accounts to be performed. The updated balances on the NCB RTGS accounts correspond to the total amount of CeBM that each NCB will defund for their market participants. Then, after effective execution of realignments, BdF provides all observer NCBs with the breakdown of funds to be defunded for each of their market participants (form 2b) while active NCBs already have this information from their participation to DL3S. Then, each escrow account is defunded by the relevant NCB by liquidity transfer.

E.bis **In exceptional cases and on request from the participant expressed at least 48h in advance (see form 3), defunding can occur on a gross basis for a specific DVP.** Then, only that participant's exploratory cash tokens are burnt by BdF or the active NCB, before limited alignment (only for that participant's NCB escrow account) and partial defunding of that NCB's escrow account takes place.

In the case of need, **BDF as Central Bank Solution Provider will undertake any coordinating activities required** (this may be required depending on the number of NCBs involved).

5. Liquidity management in trials step by step

Overview of standard opening hours of settlement in trials (standard case)



Note: indicated timing is Central European Time – CET. Timing and steps occurring on the market DLT is not represented here. Only steps occurring in TARGET Services (blue) and in DL3S DLT (yellow) are shown here

Details of the operational process

- **Funding of escrow accounts would occur during a single daily window ending at 09:00** on the trial day. After that, participants could not request additional funding during the trial daily process. Under a specific window from 09:00 until 09:30, all NCBs in the Eurosystem would report to BdF on the funding made by their respective participants in the RTGS. On the basis of these reports, either BdF or active NCB would mint exploratory cash tokens on DL3S, respectively, by 09:59.
- **Settlement with the *Full-DLT Interoperability* solution, requiring an escrow mechanism, would be available from 10:00 until 14:00**.
- Exceptional requests for early (gross) defunding could be processed during this window assuming:
  - That the participants issuing such request notified both BdF and their local NCB *at least 48 hours in advance,*
  - That the transfer of exploratory cash tokens as part of the settlement process that the participants wish to see reflected on a gross basis in T2-RTGS occurs *no later than 11:00*, for defunding to then take place *by 12:00*.
  - BdF and the local NCB(s) of the participants issuing such a request reserve the right to reject this request in case of capacity constraints limitations and may ask those participants to schedule their trial operations at another point in time or that they rely on the regular EoD procedure below.
- **From 14:00 until 15:30, the End of Day trial procedures would be conducted:** no new transactions in trials from market participants would be processed then and access to DL3S DLT would no longer be available to market participants. For the ***Full-DLT Interoperability*** solution, requiring an escrow mechanism, the EoD process would involve burning all remaining[20] exploratory cash tokens issued in the morning and transferring CeBM funds held by NCBs on their escrow accounts back to market participants (defunding). This process requires that all NCBs manually align their escrow accounts on the basis of the information provided by BDF, before manually initiating liquidity transfers to each of their market participants involved with trials with either of the two solutions (*estimated end: by 15:30*).

No CeBM funds shall remain on the RTGS escrow accounts used by NCBs overnight, There would be no risk for the daily EoD processes in T2-RTGS, since exploratory work-related incidents would not (specifically) be treated as a TARGET Services incident with no delay to the cut-off possible (unless they are part of a more general incident affecting TARGET Services).

6. BdF escrow account references

FR RTGS participants active in the Exploratory Work should use the following BdF escrow accounts:

[20] Where some exceptional requests for defunding have been processed by 12:00, some exploratory liquidity issued in the morning will have already been burnt by CBSPs.

Full DLT solution	TIPS Hash Link BdF Escrow account	Trigger Chain solution
RFREURBDFEFR2TTEM-TEM	**RFREURBDFEFR2TTEM-SPE**	Not applicable
In case NCB use standard RTGS accounts (and not CB accounts), they should add this account in their LTG: **FRLBDFEFR2TTEM-MNBC**		

TEMPLATE REPORTS FOR ESCROW PROCESS

Please use the attached model forms [click here for a download from the ECB's website]

1. Forms sent for registration prior to trials

Form 0a - Registration of NCB escrow account to CBSPs: this template defines the details of the RTGS CB account or the RTGS DCA that each NCB intends to use for implementing the escrow mechanism. NCBs will not be required to set a new dedicated account in the RTGS for the purpose of exploratory work and may rely on an existing account to implement the escrow mechanism.

	Escrow account for BDF
NCB	
NCB BIC	
NCB Account Number [1]	
RTGS DCA[2] [3] /RTGS CB account	Choose an item.

Form 0b - Registration of market participant's RTGS DCA for escrow process: this template defines the details of the RTGS DCA that each market participants intends to use for implementing the escrow mechanism. Market participants are not required to set a new dedicated account in the RTGS for the purpose of exploratory work and may rely on an existing account to implement the escrow mechanism.

	RTGS DCA used for BDF
Market participant	
Market participant party BIC	
RTGS DCA account number	

1 Please consider the T2 naming convention for the setup of new accounts for the escrow mechanism

2 Each NCB with an RTGS DCA registered for the escrow process in trials can search the LTGs and add their RTGS DCA to the relevant LTG.

3 Each NCB will manage Liquidity Transfer Groups comprised of eligible market participants' RTGS DCAs registered for the escrow process and, where applicable, NCB's RTGS DCA(s) and registered for the escrow process in their jurisdiction.

2. Forms to be used during the funding process / Start of Day (SoD) processes for Trial

Form 1a (optional) – Market participants' funding requests to their local NCB:

NCBs choosing to rely on a single existing account may opt for this optional form to

(i) keep track of the specific funding requests made by their market participants and
(ii) where their market participants participate to trials with BDF solution, identify for which solution the funding request is made.

	Funding used for BDF
Date	Click or tap to enter a date.
Market participants name	
Market participant BIC	
RTGS DCA	
Amount funded on NCBs escrow account = amount of Exploratory Liquidity	

Form 1b (mandatory) – minting requests: NCBs provide this form to BdF including the overall amount received during funding on their escrow account and the breakdown of funds received and held from each payment bank for all valid funding requests.

On that basis, BdF will mint exploratory cash tokens on Full-DLT interoperability solution for its own participants and those of NCB with no access to DL3S or having an Observer role.

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In the case of NCBs that are active on the Full-DLT interoperability solution, they have to submit form 1b to inform on the overall amount received during funding.

From: a local National Central Bank having received funds before 09:00 am from one or several market participants participating in trials
To: the Central Bank acting as SPCB for the trials
Purpose:

(i) trial SoD reconciliation between funds escrowed and Exploratory cash tokens
(ii) for the reporting CB not performing the minting to specify the amount to be minted for each market participant in the wallet.

BdF strongly recommends to send form 1b prior to 09:45 CET in order for BdF as Solution Provider to checks that the total amount held in escrow in T2 matches the total amount of exploratory cash tokens minted in DL3S (between 9:45 and 9:59 CET).

Business date	Click or tap to enter a date.
Reporting NCB entity [Party BIC]	
Solution Provider	Choose an item.
Total amount escrowed = Exploratory cash tokens to be minted	

Details per market participants (*not necessary if local NCB is active in DL3S)*	
Payment Bank (PB) [Party BIC]	Amount escrowed by PB on NCBs escrow account

3. Realignment transfer form for End of Day (EoD) procedures

Form 2a (mandatory) – alignment procedures: BDF provide this form to NCBs including the amount(s) to transfer to escrow accounts of other NCBs via liquidity transfers prior to defunding.

From: BdF as SPCB for the trial

To: a local National Central Bank with one or several payment bank(s) participating in the trials Purpose: request to perform some inter-NCB realignment transfers as prerequisites for the defunding process. BdF strongly recommends to process inter-NCB realignment transfers prior to 15:00 CET in order to secure defunding process before 15:30 CET.

Once realignment processed (before 15:00 CET), NCBs send back the filled form 2a with an updated status of the Liquidity transfer.

Business date	Click or tap to enter a date.
Instructing Solution Provider	Choose an item.
NCB entity involved in the realignment process (Party BIC)	
transfers to perform (Y/N)	Choose an item.

Details of the liquidity transfers to be performed			
Account to be credited (RTGS Account Number of the credit NCB)	BIC of the credit NCB	Amount	transfer settled (Y/N)
			Choose an item.
			Choose an item.
			Choose an item.

Form 2b (mandatory) – defunding launch after successful alignment: BdF provides this form to NCBs including the breakdown of funds to defund to each of the NCBs' participants. In the case of NCBs being active on DL3S, form 2b serves only as the greenlight to defund.

From: BdF acting as solution provider for the trial
To: a Central Bank with one or several payment bank(s) participating in the trials
Purpose: provide the details of the defunding liquidity transfers to be performed, which will credit the RTGS DCA of the domestic payment banks and leave the local escrow account empty.

Once defunding processed (before 15:30 CET), NCBs send back the filled form 2b with an updated status of the Liquidity transfer.

Business date	Click or tap to enter a date.
Instructing Solution Provider	Choose an item.

NCB entity requested to defund (Party BIC)	

Details of the liquidity transfers to be performed		
Payment bank to be credited (Party BIC)	Amount	transfer settled (Y/N)
		Choose an item.
		Choose an item.
		Choose an item.

4. Form sent 48h in advance of the trial process – special request for early defunding

Form 3 - request for defunding before the standard EoD process during the trial settlement window: this template details the request made by a market participant to benefit from early defunding during the trial intraday process. This request can be accepted subject to the following:

- That the participants issuing such request notified their local NCB at least 48 hours in advance, that swiftly transfers the information to BdF as SPCB.
- That the transfer of exploratory liquidity as part of the settlement process that the participants wish to see reflected on a gross basis in T2-RTGS occurs no later than 11:00, for defunding to then take place by 12:00.
- BdF and the local NCB(s) coordinate to organise the ECT burning, the defunding and any potential realignment.
- BdF and the local NCB(s) of the participants issuing such a request reserve the right to reject this request in case of capacity constraints limitations and may ask those participants to schedule their trial operations at another point in time or that they rely on the regular EoD procedure.

Business date (at least 48 hours before)	Click or tap to enter a date.
Instructed Solution Provider	Choose an item.
NCB entity requested to defund (Party BIC)	

Details of the liquidity transfers to be performed		
Payment bank to be credited (Party BIC)	Amount	transfer settled (Y/N)
		Choose an item.
		Choose an item.
		Choose an item.

7.2.3. **Playbook** *(Test Phase 2A)*

Bespoke document established once use case defined with the participants of the experiment or trial.

7.3. Contractual framework

Legal documents available for Eligible Market DLT Operator and /or Eligible Market Participant.

7.3.1. Agreement between BdF as National Central Bank and Eligible Market Participant under French jurisdiction

7.3.2. Agreement between BdF as National Central Bank and Eligible Market DLT Operator under French jurisdiction

7.3.3. Agreement between BdF as Solution Provider and Eligible Market DLT Operators

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